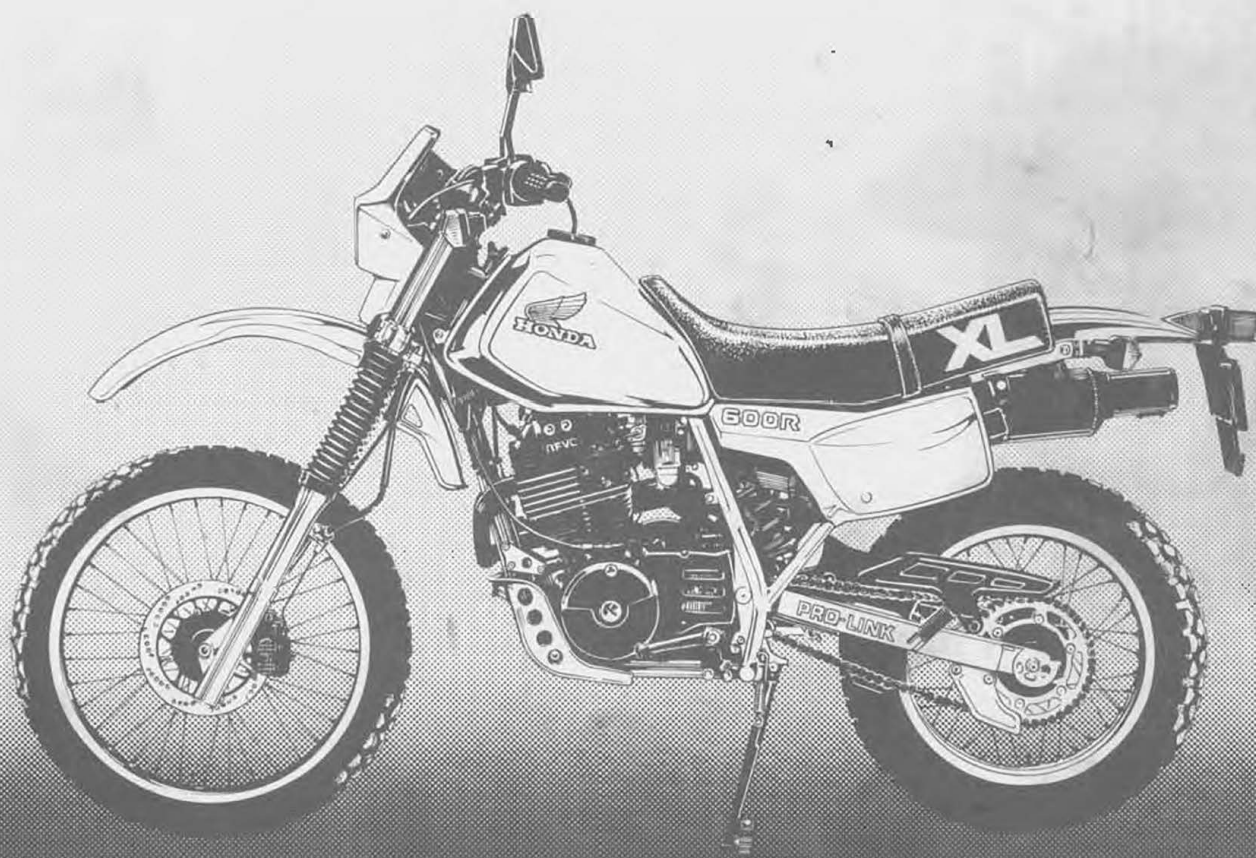


Official

# HONDA

## SHOP MANUAL

### XL600R



# '83~'84

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PRINTED IN JAPAN

61MG201  
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## IMPORTANT SAFETY NOTICE



### **WARNING**

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

### **CAUTION:**

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

**NOTE:** Gives helpfull information.

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



## HOW TO USE THIS MANUAL

This manual is based on the '83 model. Any information that differs between '83 and '84 models is called out in the text or in a note.

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

Sections 1 through 3 apply to the whole motorcycle, while sections 4 through 18 describe parts of the motorcycle, grouped according to location.

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

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

If you are not familiar with this motorcycle, read the TECHNICAL FEATURES in section 19.

If you don't know the source of the trouble, go to section 20 TROUBLESHOOTING.

ALL INFORMATION, ILLUSTRATIONS, DIRECTIONS AND SPECIFICATIONS INCLUDED IN THIS PUBLICATION ARE BASED ON THE LATEST PRODUCT INFORMATION AVAILABLE AT THE TIME OF APPROVAL FOR PRINTING. HONDA MOTOR CO., LTD. RESERVES THE RIGHT TO MAKE CHANGES AT ANY TIME WITHOUT NOTICE AND WITHOUT INCURRING ANY OBLIGATION WHATEVER.

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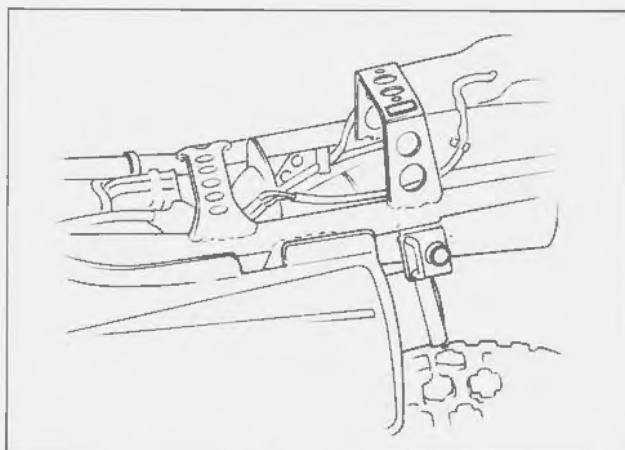
## CONTENTS

|            |                                           |    |
|------------|-------------------------------------------|----|
|            | GENERAL INFORMATION                       | 1  |
|            | LUBRICATION                               | 2  |
|            | INSPECTION/ADJUSTMENT                     | 3  |
| ENGINE     | FUEL SYSTEM                               | 4  |
|            | ENGINE REMOVAL/INSTALLATION               | 5  |
|            | CYLINDER HEAD/VALVES                      | 6  |
|            | CYLINDER/PISTON                           | 7  |
|            | CLUTCH/OIL PUMP                           | 8  |
|            | ALTERNATOR                                | 9  |
|            | CRANKCASE CRANKSHAFT/<br>BALANCER         | 10 |
|            | TRANSMISSION                              | 11 |
| CHASSIS    | FRONT WHEEL/BRAKE/<br>SUSPENSION/STEERING | 12 |
|            | REAR WHEEL/BRAKE/SUSPENSION               | 13 |
|            | HYDRAULIC BRAKE                           | 14 |
|            | REAR FENDER/EXHAUST PIPE                  | 15 |
| ELECTRICAL | BATTERY/CHARGING SYSTEM                   | 16 |
|            | IGNITION SYSTEM                           | 17 |
|            | SWITCHES/HORN/LIGHTS                      | 18 |
|            | TECHNICAL FEATURES                        | 19 |
|            | TROUBLESHOOTING                           | 20 |



**HONDA**  
**XL600R**

## MODEL IDENTIFICATION



The color label is attached to the frame behind the left side cover.



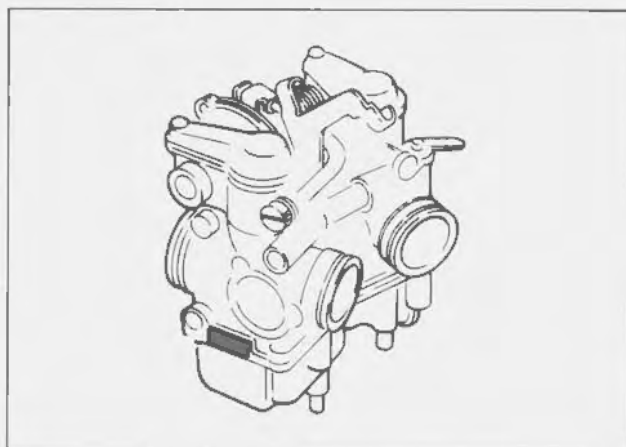
The frame serial number is stamped on the steering head right side.



The vehicle identification number (VIN) is on the steering head left side.



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



The carburetor identification number is on the





**HONDA**  
**XL600R**

# 1. GENERAL INFORMATION

1

|                                       |      |
|---------------------------------------|------|
| GENERAL SAFETY                        | 1-1  |
| SERVICE RULES                         | 1-1  |
| SPECIFICATIONS                        | 1-2  |
| TORQUE VALUES                         | 1-4  |
| TOOLS                                 | 1-6  |
| CABLE & HARNESS ROUTING               | 1-7  |
| WIRING DIAGRAM                        | 1-11 |
| EMISSION CONTROL SYSTEM (U.S.A. only) | 1-13 |
| MAINTENANCE SCHEDULE                  | 1-15 |

## 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 your eyes were exposed.*

### 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 the larger-diameter or inner bolts first, and tighten to the specified torque diagonally in 2-3 steps, unless a particular sequence is specified.
6. Clean parts in non-flammable or high flash point solvent upon disassembly. Lubricate any sliding surfaces before re-assembly.
7. After reassembly, check all parts for proper installation and operation.



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## SPECIFICATIONS

CA: California model

|            |                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DIMENSIONS | Overall length<br>Overall width<br>Overall height<br>Wheel base<br>Seat height<br>Foot peg height<br>Dry weight                                                                                                                                                                      | 2,170 mm (85.4 in)<br>865 mm (34.1 in)<br>1,235 mm (48.6 in)<br>1,420 mm (55.9 in)<br>860 mm (33.9 in)<br>375 mm (14.8 in)<br>134 kg (295 lb)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| FRAME      | Type<br>Front suspension, travel<br>Rear suspension, travel<br>Front tire size, pressure<br>Rear tire size, pressure<br>Front brake, swept area<br>Rear brake, swept area<br>Fuel capacity<br>Fuel reserve capacity<br>Caster<br>Trail<br>Front fork oil capacity                    | Semi-double cradle<br>Telescopic fork, 229 mm (9.0 in)<br>Pro link, 203 mm (8.0 in)<br>3.00-21-4PR, 150 kPa (1.5 kg/cm <sup>2</sup> , 21 psi)<br>5.10-17-4PR, 150 kPa (1.5 kg/cm <sup>2</sup> , 21 psi)<br>Dual piston caliper 342.8 cm <sup>2</sup> (53.1 sq-in)<br>Internal expanding shoes 122.5 cm <sup>2</sup> (18.9 sq-in)<br>12.0 lit (3.2 US gal, 2.7 Imp gal)<br>2.0 lit (0.5 US gal, 0.4 Imp gal)<br>29°<br>118 mm (4.6 in)<br>455 cc (15.4 oz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| ENGINE     | Type<br>Cylinder arrangement<br>Bore x stroke<br>Displacement<br>Compression ratio<br>Valve train<br>Maximum horsepower<br>Maximum torque<br>Oil capacity<br>Lubrication system<br>Air filtration system<br>Cylinder compression<br>Intake valve<br>Exhaust valve<br>Valve clearance | Gasoline, air-cooled 4-stroke<br>Single cylinder inclined 15°<br>100.0 x 75.0 mm (3.94 x 2.95 in)<br>589 cc (35.9 cu-in)<br>8.6 : 1<br>OHC, chain driven, 4-valve<br>43 BHP/6,000 rpm<br>5 kg-m/5,000 rpm<br>2.5 lit (2.6 US qt)<br>Forced pressure and wet sump<br>Oiled polyurethane foam<br>1,250 kPa (12.5 kg/cm <sup>2</sup> , 175 psi)<br><div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> <math>\left. \begin{array}{l} 5^{\circ} \text{ (BTDC)} \\ 40^{\circ} \text{ (ABDC)} \\ 45^{\circ} \text{ (BBDC)} \\ 5^{\circ} \text{ (ATDC)} \end{array} \right\} \text{ at 1 mm lift}</math> </div> <div> <math>\left. \begin{array}{l} 58^{\circ} \text{ (BTDC)} \\ 106^{\circ} \text{ (ABDC)} \\ 94^{\circ} \text{ (BBDC)} \\ 80^{\circ} \text{ (ATDC)} \end{array} \right\} \text{ at 0 lift}</math> </div> </div><br>$\left. \begin{array}{l} \text{Intake} \\ \text{Exhaust} \end{array} \right\}$<br>0.05 mm (0.002 in)<br>0.10 mm (0.004 in) |
| CARBURETOR | Type<br>I.D. number<br>Venturi dia.<br>Main jet<br>Slow jet (49 state only)<br>Air screw ('83), Pilot screw ('84)<br>Float level<br>Idle speed                                                                                                                                       | PISTON VALVE<br>PH60A<br>PH64A<br>PH66A<br>30 mm (1.2 in), 28 mm [1.1 in (CA)]<br>Pri #125 2nd #112<br>Pri #120 2nd #120<br>Pri #118 2nd #118<br>#65<br>See page 4-14 and 4-15<br>20.0 mm (0.79 in)<br>1,200 rpm<br>1,300 ± 100 rpm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |



|             |                       |                                    |
|-------------|-----------------------|------------------------------------|
| DRIVE TRAIN | Clutch                | Wet multi-plate type               |
|             | Transmission          | 5-speed constant mesh              |
|             | Primary reduction     | 2.188 : 1                          |
|             | Gear ratio I          | 2.462 : 1                          |
|             | Gear ratio II         | 1.647 : 1                          |
|             | Gear ratio III        | 1.250 : 1                          |
|             | Gear ratio IV         | 1.000 : 1                          |
|             | Gear ratio V          | 0.840 : 1                          |
|             | Final reduction       | 2.867 : 1                          |
| ELECTRICAL  | Gear shift pattern    | Left foot operated return system   |
|             | Ignition              | C.D.I.                             |
|             | Ignition timing       | Initial '83 6° BTDC at 1,200 rpm   |
|             |                       | '84 11° BTDC at 1,300 rpm          |
|             |                       | Full advance 31° BTDC at 4,000 rpm |
|             | Alternator            | AC. GENERATOR 0.23 kw/5000 rpm     |
|             | Battery capacity      | 12V-3AH                            |
|             | Spark plug [STANDARD] | DPR8EA-9 (NGK)                     |
|             |                       | X24EPR-U9 (ND)                     |
|             | Spark plug gap        | 0.8—0.9 mm (0.031—0.035 in)        |
|             | Headlight             | 55/60 watt                         |
|             | Tail/stoplight        | 8/27 watt 3/32 cp SAE 1157         |
|             | Turn signal light     | 23/23 watt 32/32 cp SAE 1073       |
|             | Speedometer light     | 1.7 watt x 2 1 cp x 2              |
|             | Neutral indicator     | 3.4 watt 2 cp SAE 158              |
|             | Turn signal indicator | 3.4 watt 2 cp SAE 158              |
|             | High beam indicator   | 1.7 watt 1 cp                      |



## TORQUE VALUES

### ENGINE

| TIGHTENING POINT                 | Q'TY | THREAD DIA X PITCH | TORQUE N-m (kg-m, ft-lb)   |
|----------------------------------|------|--------------------|----------------------------|
| Kick starter stopper plate       | 1    | 8                  | 22-28 (2.2-2.8, 16-22)     |
| Primary drive gear               | 1    | 18                 | 50-60 (5.0-6.0, 36-43)     |
| Gear shift drum stopper arm bolt | 2    | 8                  | 22-28 (2.2-2.8, 16-22)     |
| Rocker arm shaft                 | 4    | 14                 | 25-30 (2.5-3.0, 18-22)     |
| Sub rocker arm shaft (IN)        | 2    | 14                 | 25-30 (2.5-3.0, 18-22)     |
| (EX)                             | 2    | 12                 | 20-25 (2.0-2.5, 14-18)     |
| Cam sprocket                     | 2    | 7                  | 18-22 (1.8-2.2, 13-16)     |
| Rocker arm adjust screw          | 4    | 7                  | 18-22 (1.8-2.2, 13-16)     |
| Shift fork center                | 1    | 7                  | 13-17 (1.3-1.7, 9-12)      |
| Change return spring pin         | 1    | 8                  | 22-26 (2.2-2.6, 16-19)     |
| Clutch center                    | 1    | 18                 | 50-60 (5.0-6.0, 36-43)     |
| Flywheel                         | 1    | 16                 | 100-120 (10.0-12.0, 72-87) |
| Cylinder bolt                    | 2    | 10                 | 47-53 (4.7-5.3, 34-39)     |
| Cylinder head                    | 6    | 8                  | 26-30 (2.6-3.0, 19-22)     |
| Cylinder head cover (SH)         | 3    | 6                  | 8-12 (0.8-1.2, 6-9)        |
| (BF)                             | 2    | 6                  | 10-14 (1.0-1.4, 7-10)      |
| Cylinder head cover (BF)         | 2    | 8                  | 20-26 (2.0-2.6, 14-19)     |
| Gear shift drum                  | 1    |                    | 10-14 (1.0-1.4, 7-10)      |
| Engine oil bolt                  | 1    | 12                 | 30-40 (3.0-4.0, 22-29)     |

### FRAME

| TIGHTENING POINT               | Q'TY | THREAD DIA X PITCH | TORQUE N-m (kg-m, ft-lb) |
|--------------------------------|------|--------------------|--------------------------|
| Fuel tank                      | 2    | 6                  | 8-12 (0.8-1.2, 6-9)      |
| Exhaust pipe joint nut         | 4    | 8                  | 8-12 (0.8-1.2, 6-9)      |
| Exhaust pipe protector         | 2    | 6                  | 8-12 (0.8-1.2, 6-9)      |
| Steering stem nut              | 1    | 24                 | 80-120 (8.0-12, 58-87)   |
| Swing arm pivot bolt           | 1    | 14                 | 80-100 (8.0-10.0, 58-72) |
| Handle holder                  | 4    | 8                  | 18-30 (1.8-3.0, 14-22)   |
| Front top bridge pinch bolt    | 4    | 8                  | 18-30 (1.8-3.0, 14-22)   |
| Front bottom bridge pinch bolt | 4    | 8                  | 30-35 (3.0-3.5, 22-25)   |
| Front fork axle holder         | 4    | 6                  | 10-14 (1.0-1.4, 7-10)    |
| Front axle                     | 1    | 12                 | 50-80 (5.0-8.0, 36-58)   |
| Rear axle nut                  | 1    | 16                 | 80-110 (8.0-11.0, 58-80) |





#### FRAME

| ITEM                          | Q'TY | THREAD DIA | TORQUE N·m (kg·m, ft·lb) |
|-------------------------------|------|------------|--------------------------|
| Final driven sprocket         | 6    | 8          | 27-33 (2.7-3.3, 20-24)   |
| Rear shock absorber (upper)   | 1    | 10         | 40-50 (4.0-5.0, 29-36)   |
| (lower)                       | 1    | 10         | 40-50 (4.0-5.0, 29-36)   |
| Shock arm (Swing arm)         | 1    | 12         | 90-120 (9.0-12.0, 65-87) |
| Connecting rod (front)        | 1    | 10         | 40-50 (4.0-5.0, 29-36)   |
| (Rear)                        | 1    | 10         | 40-50 (4.0-5.0, 29-36)   |
| Change pedal                  | 1    | 6          | 8-12 (0.8-1.2, 6-9)      |
| Kick starter pedal            | 1    | 8          | 20-35 (2.0-3.5, 14-25)   |
| Side stand                    | 1    | 10         | 35-45 (3.5-4.5, 25-33)   |
| Fuel cock                     | 1    | 6          | 8-12 (0.8-1.2, 6-9)      |
| Engine hanger bolt 10 mm bolt | 4    | 10         | 55-65 (5.5-6.5, 40-47)   |
| 8 mm bolt                     | 5    | 8          | 30-37 (3.0-3.7, 22-27)   |
| Front brake caliper           | 2    | 8          | 20-30 (2.0-3.0, 14-22)   |
| Front brake disc              |      | 6          | 14-16 (1.4-1.6, 10-12)   |
| Seat                          | 2    | 6          | 8-12 (0.8-1.2, 6-9)      |
| Seat band                     | 1    | 8          | 15-25 (1.5-2.5, 11-18)   |
| Rear brake pedal pivot        | 1    | 12         | 35-45 (3.5-4.5, 25-33)   |
| Skid plate                    | 2    | 6          | 8-12 (0.8-1.2, 6-9)      |
| Oil drain bolt (frame)        | 1    | 6          | 8-12 (0.8-1.2, 6-9)      |
| Air cleaner bolt              | 2    | 6          | 8-12 (0.8-1.2, 6-9)      |
| Foot peg bracket              | 1    | 10         | 38-48 (3.8-4.8, 27-35)   |

Torque specifications listed above are for the most important tightening points. If a specification is not listed follow the standards below.

#### STANDARD TORQUE VALUES

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



## TOOLS

## SPECIAL

| TOOL DESCRIPTION           | TOOL NO.      | ALTERNATE TOOL                                                                            | REF. PAGE    |
|----------------------------|---------------|-------------------------------------------------------------------------------------------|--------------|
| Race remover               | 07953-KA50000 | Race remover 07953-4250002                                                                | 12-22        |
| Snap ring pliers           | 07914-3230001 | Commercially available in U.S.A.                                                          | 12-16        |
| Hex wrench, 6 mm           | 07917-3230000 |                                                                                           | 12-16, 12-19 |
| Cam chain tensioner holder | 07973-MG30001 | M967X-038-XXXXX (U.S.A. only)                                                             | 6-22         |
| Bearing remover            | 07936-3710600 |                                                                                           | 10-9, 13-3   |
| Bearing remover handle     | 07936-3710100 |                                                                                           | 10-9, 13-3   |
| Bearing remover weight     | 07936-3710200 |                                                                                           | 10-9, 13-3   |
| Front fork seal driver     | 07947-4630100 |                                                                                           |              |
| Valve guide reamer, 6.6 mm | 07984-6570100 | Steering stem driver 07946-MB00000<br>and Attachment GN-HT-54 (U.S.A. only)               | 6-16         |
| Steering stem socket       | 07916-3710100 |                                                                                           | 12-21, 12-23 |
| Steering stem driver       | 07946-4300100 |                                                                                           | 12-22, 12-23 |
| Bearing remover, 17 mm     | 07936-3710300 | KS-AHM-32-003 (U.S.A. only)<br>ST-AH-255-MC7 (U.S.A. only)<br>ST-AH-260-MC7 (U.S.A. only) | 10-9         |
| Threaded adapter           | 07931-KF00200 |                                                                                           | 10-10        |
| Assembly collar            | 07931-KF00100 |                                                                                           | 10-11        |
| Shaft puller               | 07931-ME40000 |                                                                                           | 10-11        |
| Attachment                 | 07946-3710400 |                                                                                           | 13-14        |
| Digital multimeter         | 07411-0020000 |                                                                                           | 17-3         |
| Pressure pump              |               |                                                                                           | 4-18         |
| Vacuum pump                |               |                                                                                           | 4-18         |

## COMMON

| TOOL DESCRIPTION              | TOOL NO.      | ALTERNATE TOOL                        | REF. PAGE         |
|-------------------------------|---------------|---------------------------------------|-------------------|
| Float level gauge             | 07401-0010000 | Commercially available in U.S.A.      | 4-13              |
| Spoke wrench, 5.8 x 6.1 mm    | 07701-0020300 |                                       | 3-19              |
| Wrench, 10 x 12 mm            | 07708-0030200 | Valve adjusting wrench 07908-3230000  | 3-8               |
| Adjusting wrench A            | 07708-0030300 |                                       | 3-8               |
| Retainer wrench attachment    | 07710-0010200 | Retainer wrench 07910-3230101         | 13-7              |
| Retainer wrench body          | 07710-0010401 |                                       | 13-7              |
| Socket wrench, 30 x 32 mm     | 07716-0020400 | Commercially available in U.S.A.      | 12-21             |
| Extension bar                 | 07716-0020500 |                                       | 12-21             |
| Rotor puller                  | 07733-0020001 | Rotor puller 07933-3290001            | 9-3               |
| Valve guide remover, 6.6 mm   | 07742-0010200 | Valve guide driver 07942-6570100      | 6-16              |
| Attachment, 32 x 35 mm        | 07746-0010100 | Valve spring compressor 07957-3290001 | 8-5, 12-11        |
| Pilot, 15 mm                  | 07746-0040300 |                                       | 12-11             |
| Attachment, 37 x 40 mm        | 07746-0010200 |                                       | 10-10, 13-7       |
| Attachment, 42 x 47 mm        | 07746-0010300 |                                       | 11-8, 13-7        |
| Pilot, 17 mm                  | 07746-0040400 |                                       | 13-7              |
| Pilot, 20 mm                  | 07746-0040500 |                                       | 8-5, 11-8, 13-7   |
| Attachment, 72 x 75 mm        | 07746-0010600 |                                       | 10-10             |
| Pilot, 40 mm                  | 07746-0040900 |                                       | 10-10             |
| Attachment, 52 x 55 mm        | 07746-0010400 |                                       | 11-8              |
| Pilot, 25 mm                  | 07746-0040600 |                                       | 11-8              |
| Attachment, 62 x 68 mm        | 07746-0010500 |                                       | 11-8              |
| Pilot, 35 mm                  | 07746-0040800 |                                       | 10-10             |
| Driver                        | 07749-0010000 |                                       | 8-4, 12-11, 13-14 |
| Valve spring compressor       | 07757-0010000 |                                       | 10-10, 12-22,     |
| Lock nut wrench, 17 x 27 mm   | 07716-0020300 |                                       | 11-8, 13-7        |
| Flywheel holder               | 07725-0040000 |                                       | 6-13, 6-20        |
| Bearing remover expander      | 07746-0050100 | Commercially available in U.S.A.      | 9-3, 9-4          |
| Bearing remover collet, 15 mm | 07746-0050400 |                                       | 12-11, 13-6       |
| Bearing remover collet, 17 mm | 07746-0050500 |                                       | 12-11             |
| Clutch center holder          | 07724-0050000 |                                       | 13-6              |

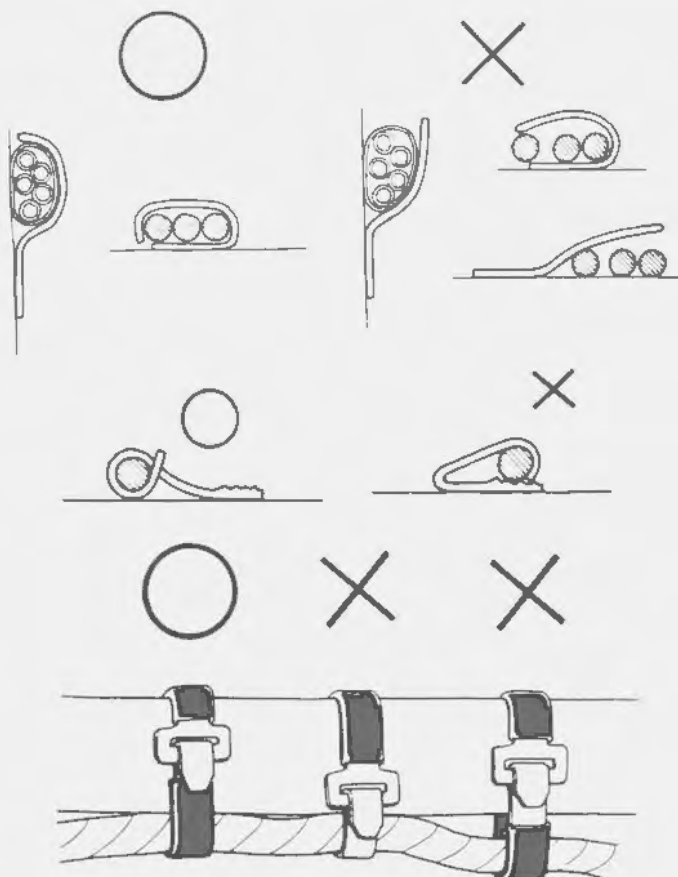


### CABLE & HARNESS ROUTING

Note the following when routing cables and wire harnesses.

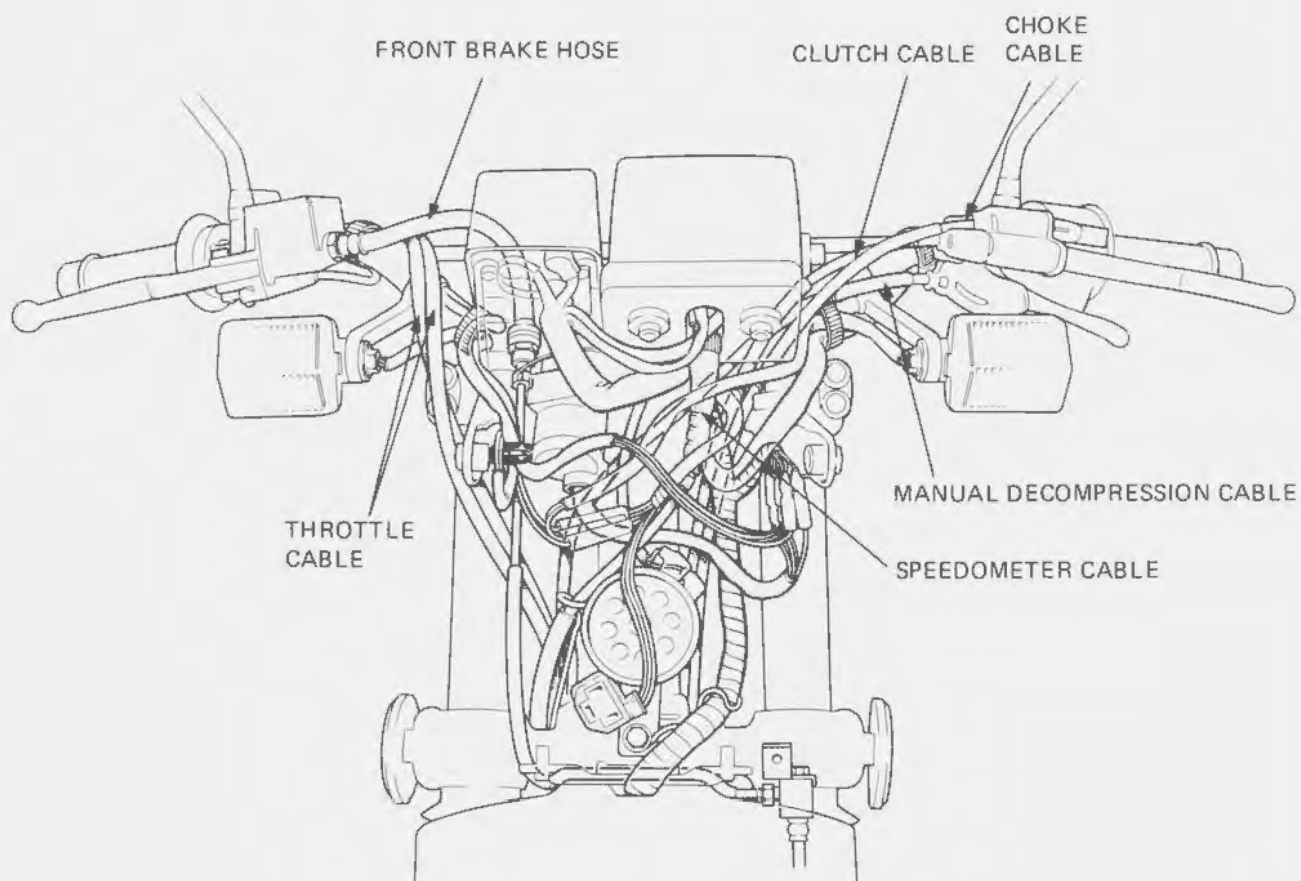
A loose wire, harness or cable can be safety hazard. After clamping, check each wire to be sure it is secure.

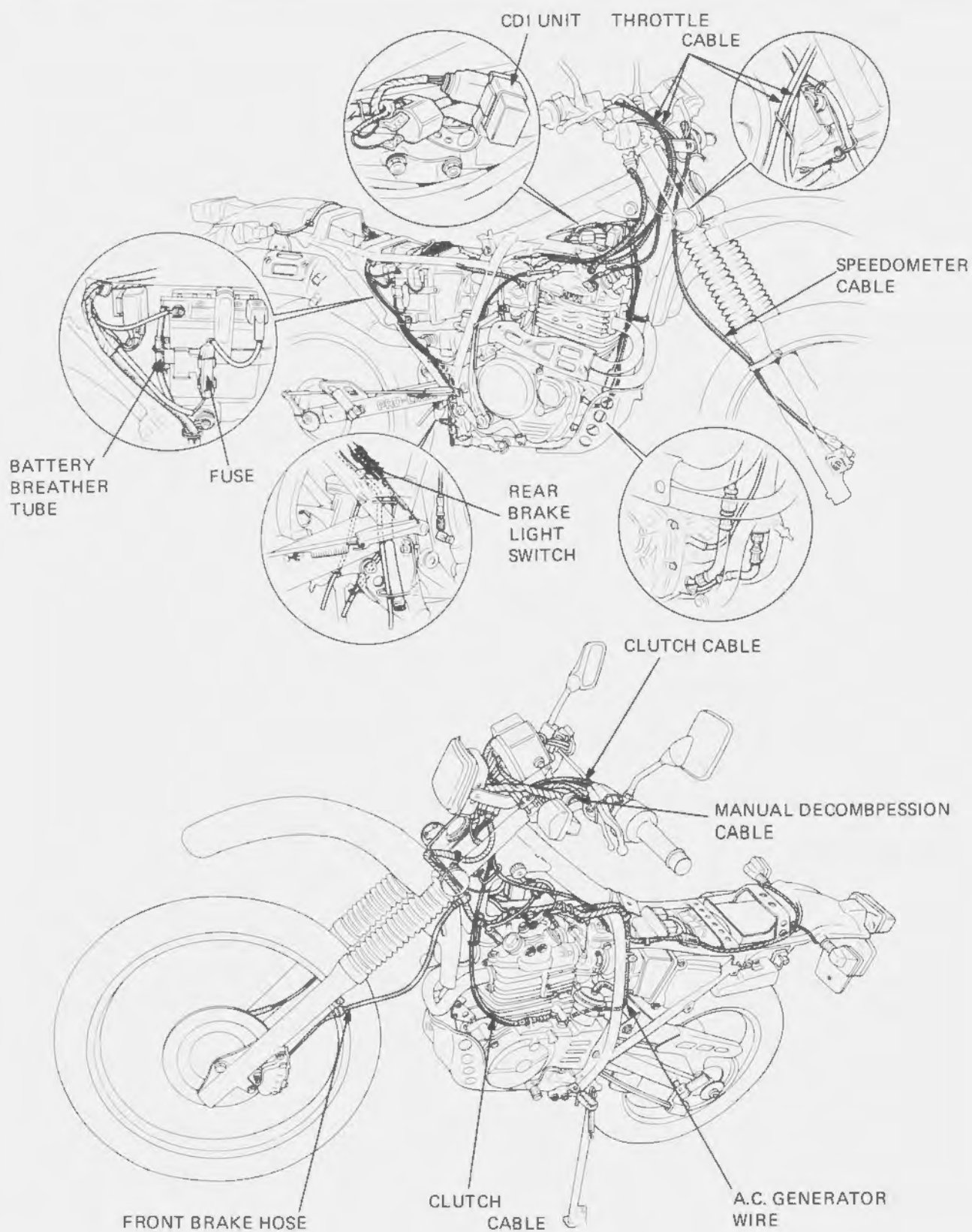
- Do not squeeze wires against the weld or end of its clamp when a weld-on clamp is used.
- Secure wires and wire harnesses to the frame with their respective wire bands at the designated locations. Tighten the bands so that only the insulated surfaces contact the wires or wire harnesses.
- Route harnesses 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.



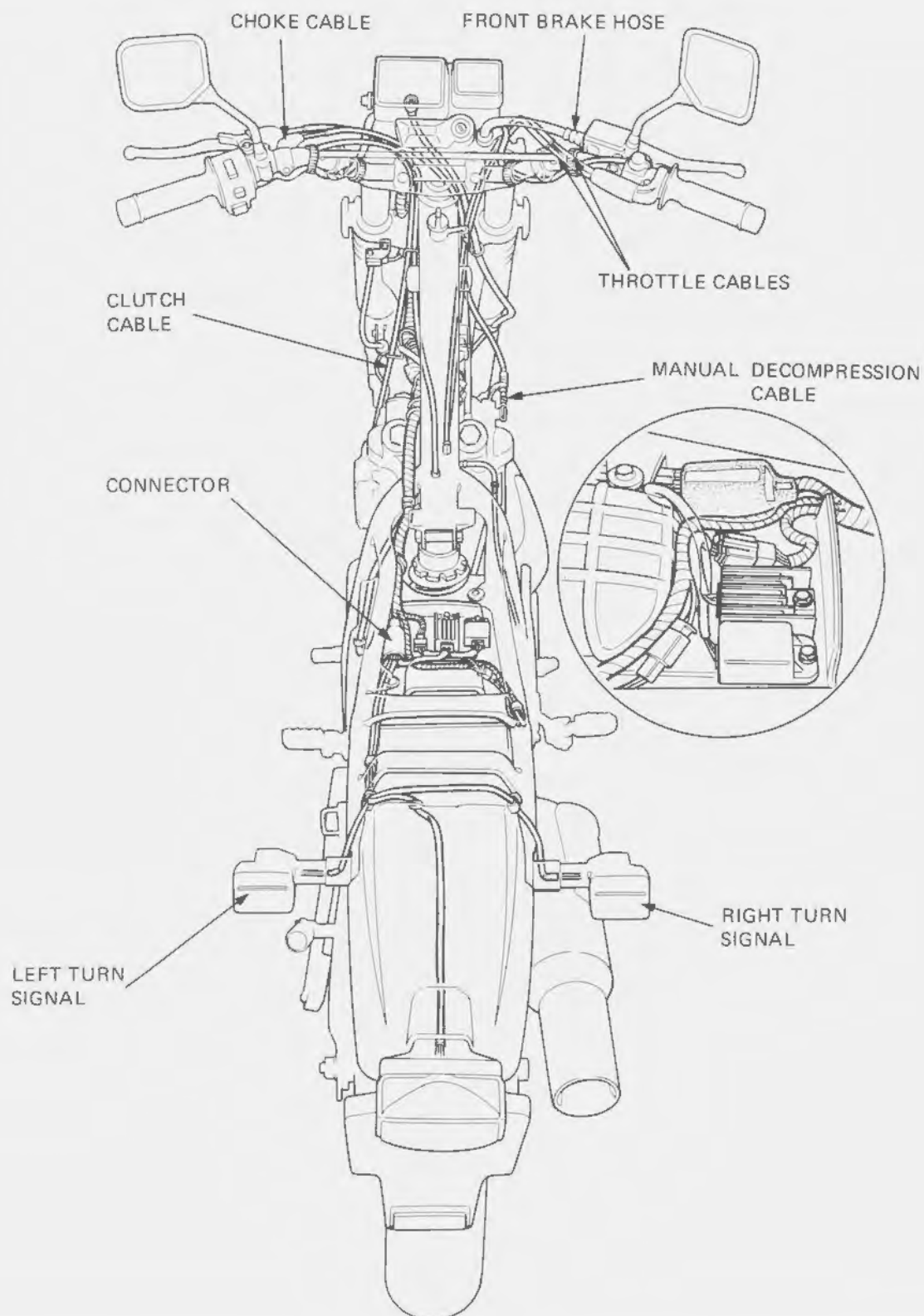


## WIRING DIAGRAM





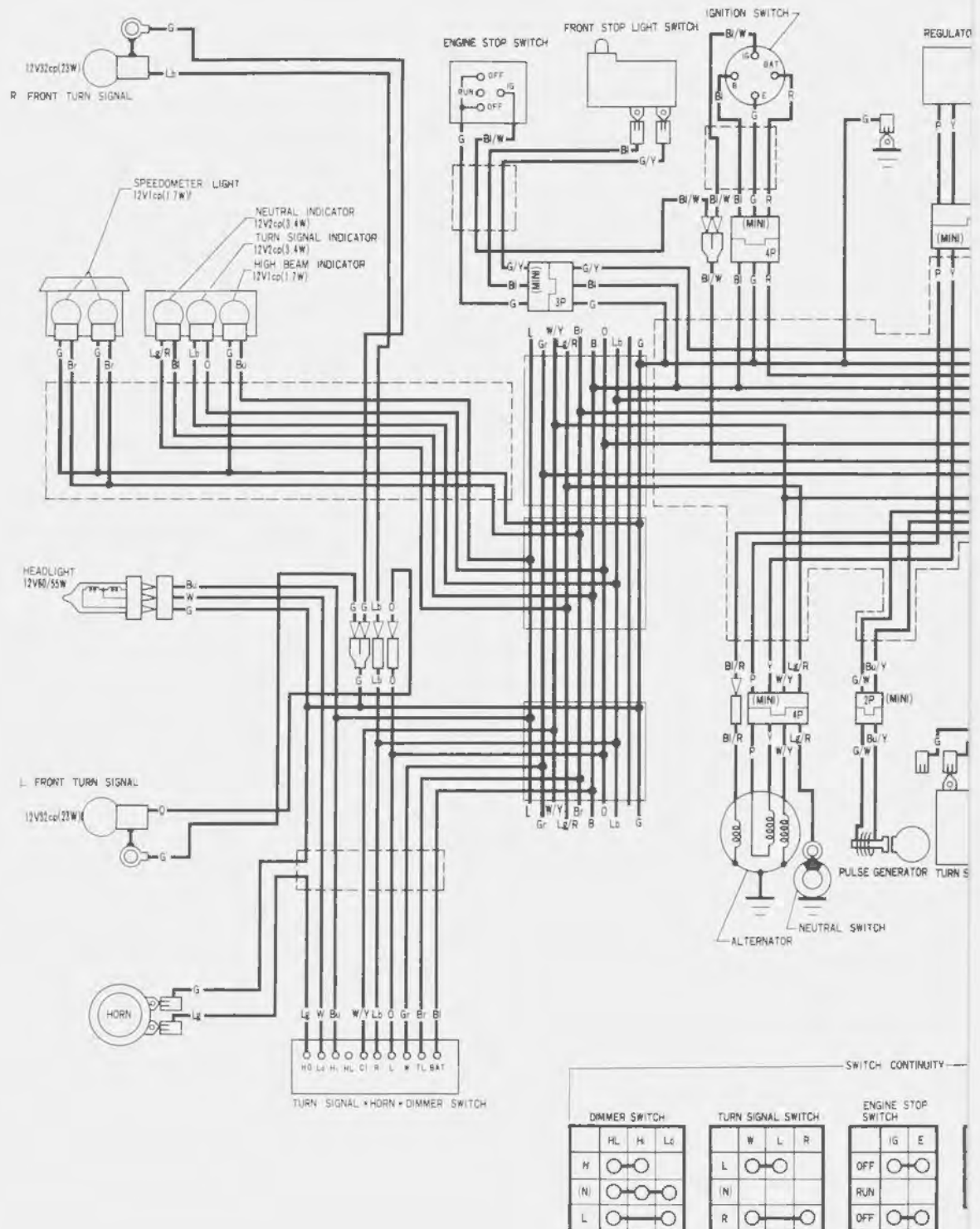






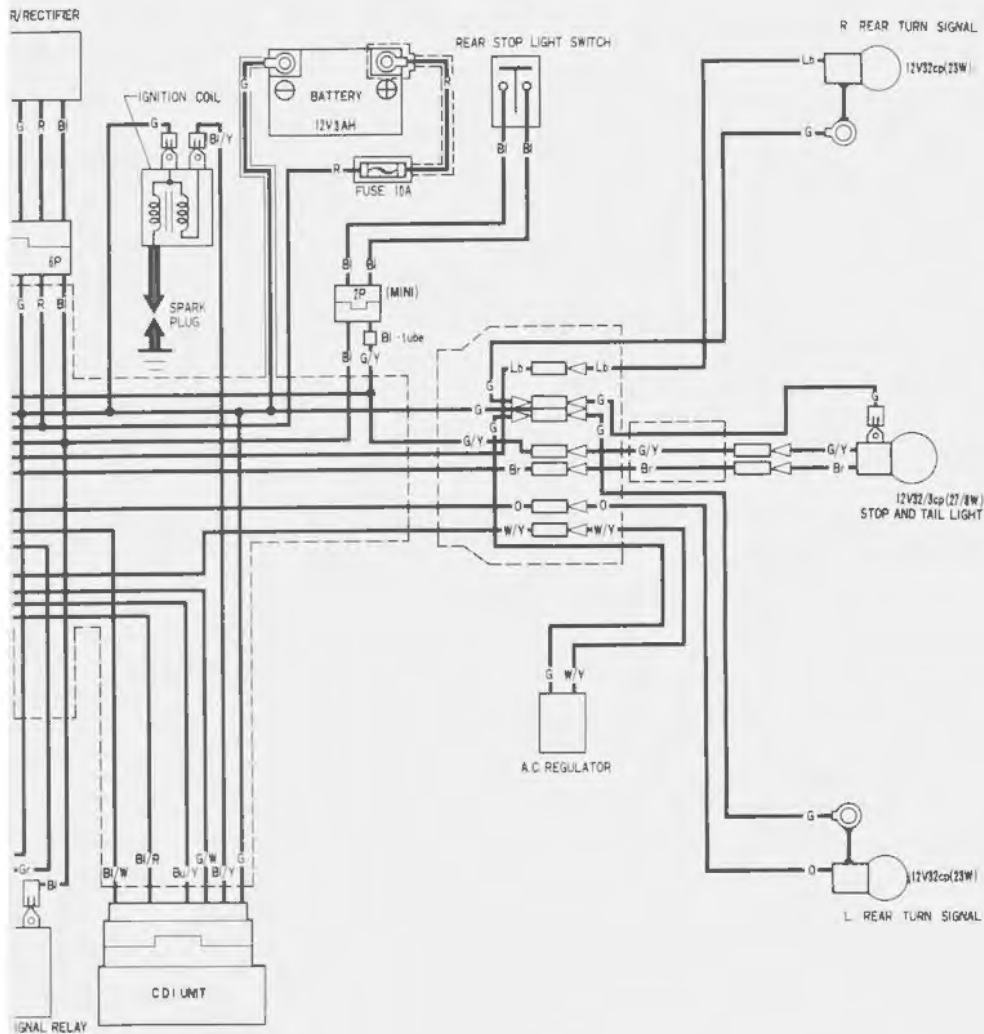
**HONDA**  
**XL600R**

## WIRING DIAGRAM

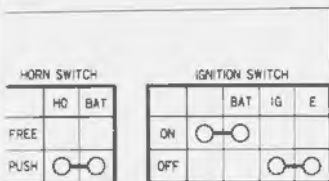


# GENERAL INFORMATION

**DA**  
**IR**



Bl — BLACK    Br — BROWN  
Y — YELLOW    O — ORANGE  
Bl — BLUE    Lb — LIGHT BLUE  
G — GREEN    Lg — LIGHT GREEN  
R — RED    P — PINK  
W — WHITE    Gr — GRAY



**0030Z—MG2—6710**



## EMISSION CONTROL SYSTEM (U.S.A. only)

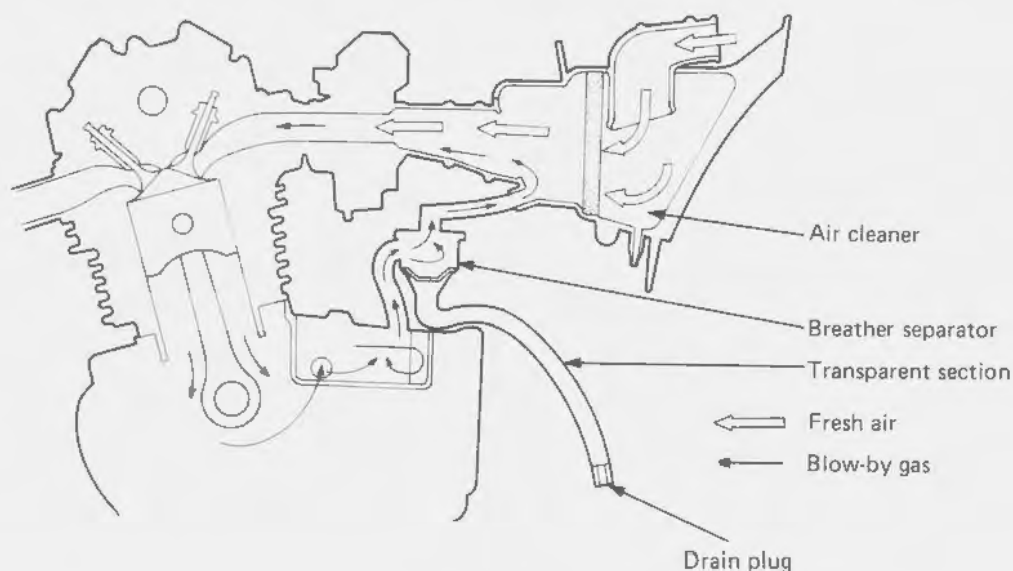
The U.S. Environmental Protection Agency and California Air Resources Board (CARB) require manufacturers to certify that their motorcycle comply with applicable exhaust emissions standards during their useful life, when operated and maintained according to the instructions provided, and that motorcycles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

### • EXHAUST EMISSION CONTROL SYSTEM

The exhaust emission control system is composed of a factory pre-set carburetor. No adjustments should be made except to idle speed with the throttle stop screw. This system is separate from the crankcase emission control system.

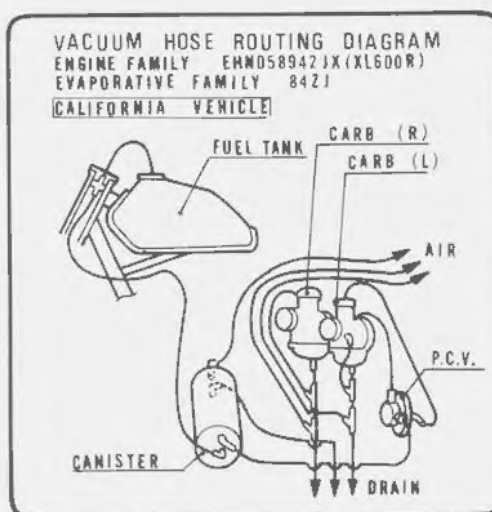
### • CRANKCASE EMISSION CONTROL SYSTEM

Blow-by gas is returned to the combustion chamber through the breather tube, separator and intake pipe.



### • EVAPORATIVE EMISSION CONTROL SYSTEM (California model only)

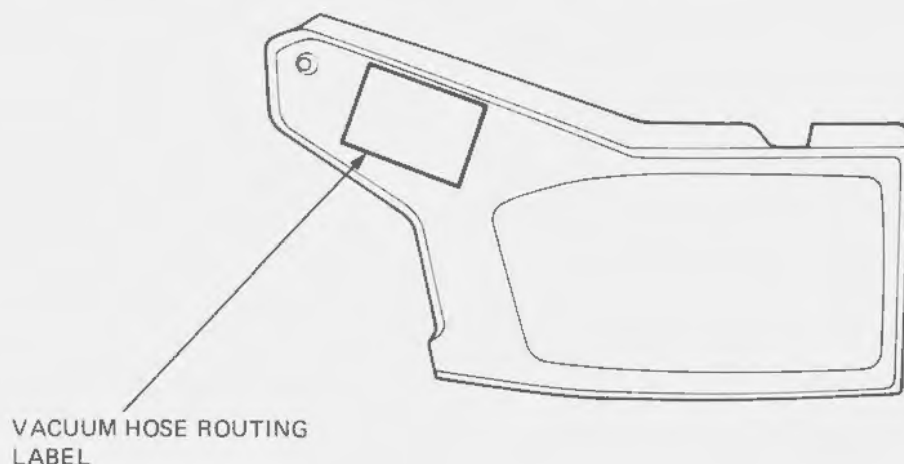
Fuel vapor from the fuel tank is directed into the charcoal canister where it is absorbed and stored while the engine is stopped. When the engine is running, fuel vapor in the charcoal canister is drawn into the engine through the carburetor.





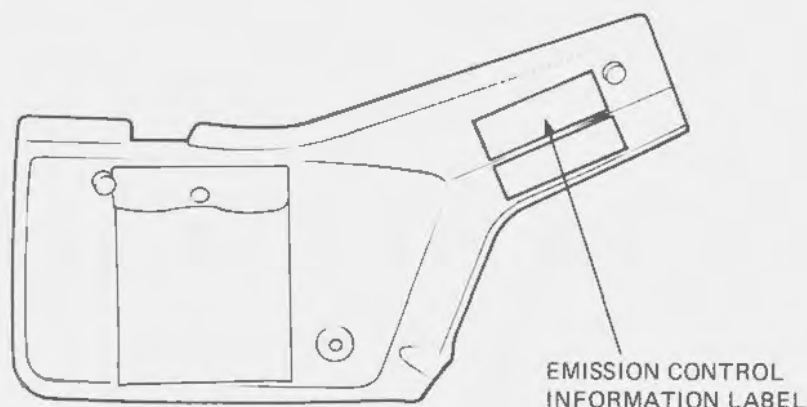
- **VACUUM HOSE ROUTING LABEL ('84 California model only)**

The Vacuum Hose Routing Label is attached to the inside of the right side cover.



- **EMISSION CONTROL INFORMATION LABEL**

The Vehicle Emission Control Information Label is attached to the left side cover.



- **NOISE EMISSION CONTROL SYSTEM**

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

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

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



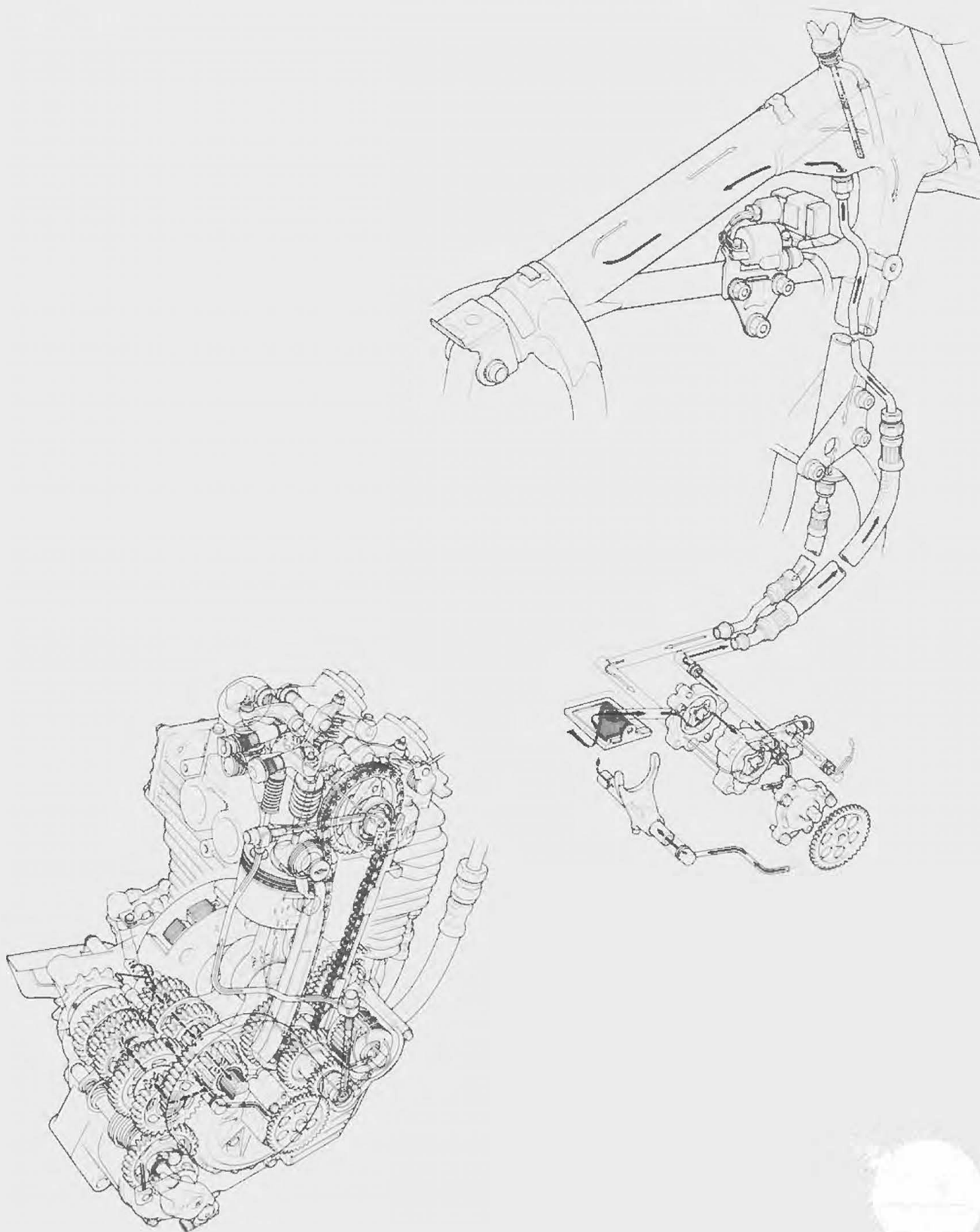


**HONDA**  
**XL600R**

GENERAL INFORMATION

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MEMO





|                        |     |
|------------------------|-----|
| SERVICE INFORMATION    | 2-1 |
| TROUBLESHOOTING        | 2-1 |
| ENGINE OIL LEVEL CHECK | 2-2 |
| ENGINE OIL CHANGE      | 2-2 |
| ENGINE OIL FILTER      | 2-3 |
| LUBRICATION POINTS     | 2-4 |

## SERVICE INFORMATION

### GENERAL INSTRUCTIONS

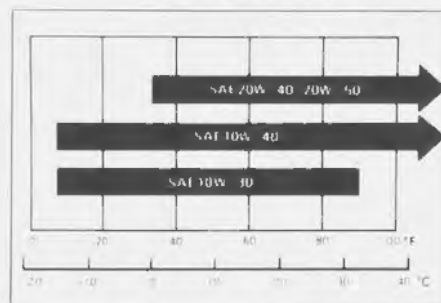
- This section describes inspection and replacement of engine oil, oil filter, cleaning of the oil filter screen and the strainer bolt.
- Oil pump service is described in Section 8.

### SPECIFICATIONS

|                    |                                                                                                           |
|--------------------|-----------------------------------------------------------------------------------------------------------|
| Oil capacity       | 2.5 liter (2.6 US qt, 2.2 Imp qt) at engine assembly<br>2.0 liter (2.1 US qt, 1.7 Imp qt) at oil change   |
| Oil Recommendation | Use HONDA 4-STROKE OIL or equivalent.<br>API SERVICE CLASSIFICATION: SE or SF<br>VISCOSITY:<br>SAE 10W-40 |

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

OIL VISCOSITIES



|                   |                                        |
|-------------------|----------------------------------------|
| Oil pump delivery |                                        |
| (Pump A)          | 7.5 lit (7.9 US qt)/min at 5,300 rpm   |
| (Pump B)          | 10.0 lit (10.6 US qt)/min at 5,300 rpm |

### TORQUE VALUE

|                      |                                       |
|----------------------|---------------------------------------|
| Downtube drain plug  | 25-32 N·m (2.5-3.2 kg·m, 18-23 ft-lb) |
| Crankcase drain plug | 30-40 N·m (3.0-4.0 kg·m, 22-29 ft-lb) |
| Strainer nut         | 35-45 N·m (3.5-4.5 kg·m, 25-32 ft-lb) |

## TROUBLESHOOTING

#### Oil Level Too Low

1. Normal oil consumption
2. External oil leaks
3. Worn piston rings

#### Oil Contamination

1. Oil not changed often enough
2. Faulty head gasket

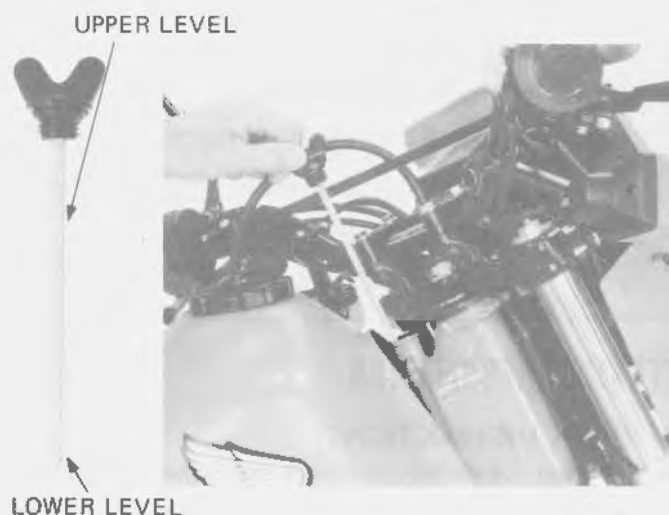


## ENGINE OIL LEVEL CHECK

Support the motorcycle upright on level ground. Start the engine and let it idle for a few minutes. Keep the motorcycle upright, stop the engine and remove the oil filler cap/dipstick.

Wipe the dipstick clean, and reinsert the dipstick without screwing it in. The oil level should be between the upper and lower level marks on the dipstick.

If the level is below the lower level mark on the dipstick, fill to the upper level mark with the recommended oil.



## ENGINE OIL CHANGE

### NOTE

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

Remove the oil filler cap/dipstick and skid plate. Remove the down tube drain plug and the crankcase drain plug.

After the oil has drained, check that the drain plug sealing washers are in good condition, then install the plugs.

Crankcase drain plug torque:

30–40 N·m (3.0–4.0 kg·m, 22–29 ft·lb)

Downtube drain plug torque:

25–32 N·m (2.5–3.2 kg·m, 18–23 ft·lb)





### NOTE

- If maintenance is also scheduled for the oil filter screen and the strainer nut (page 2-4 and 2-5) do these before filling the frame oil tank with oil.
- The engine takes about 2 liters (2.1 Qts) at oil change. But since only a portion of that oil is held in the frame's oil tank, you cannot add the full amount initially.

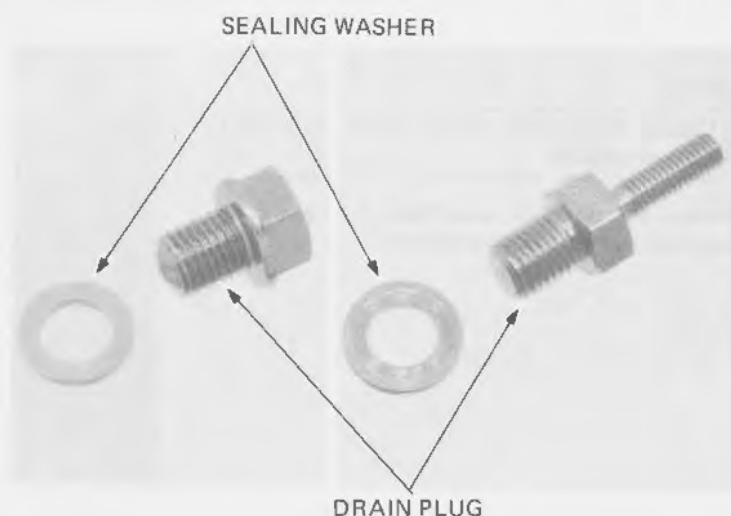
Pour 1.5 liter of the specified oil (page 2-1) into the oil tank fast.

Install the oil filler cap/dipstick.

Start the engine and let it idle for a few minutes. Stop the engine and add the specified oil until it reaches the upper level mark with the motorcycle upright.

Reinstall the skid plate and the filler cap/dipstick.

Check for oil leaks.

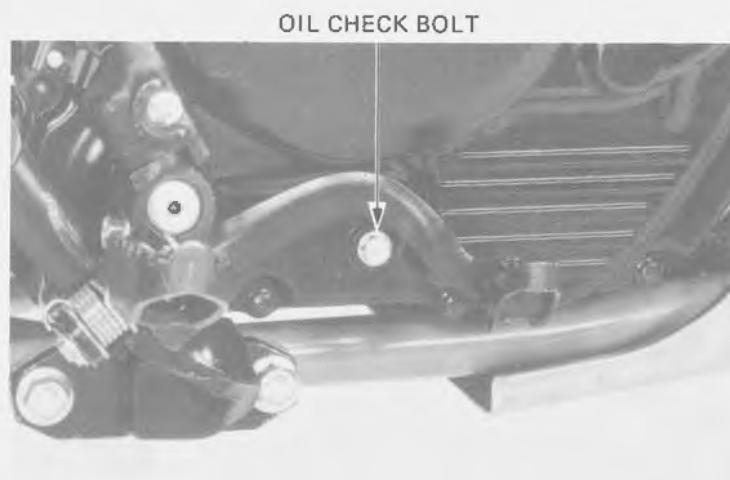


### CRANKCASE OIL CHECK BOLT

#### NOTE

The crankcase oil level check bolt is useful when checking the lubrication system; the oil pump adjusts the oil level so that the crankcase is always kept at the proper level. If this check shows otherwise, some portion of the lubrication system is not working properly.

The crankcase oil level is correct if the oil is not flush with the bottom of the check bolt hole.





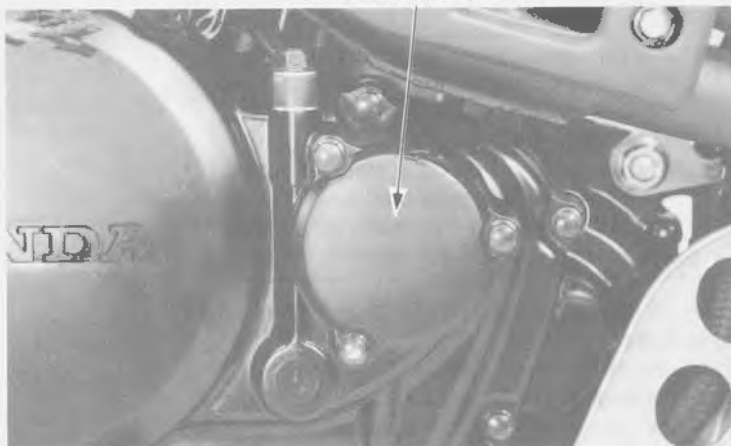
## ENGINE OIL FILTER

### NOTE

Change the oil filter before filling the frame oil tank with oil.

Remove the oil filter cover from the right crankcase, then remove the filter element.

OIL FILTER COVER



Check that the O-ring on the oil filter cover is in good condition.

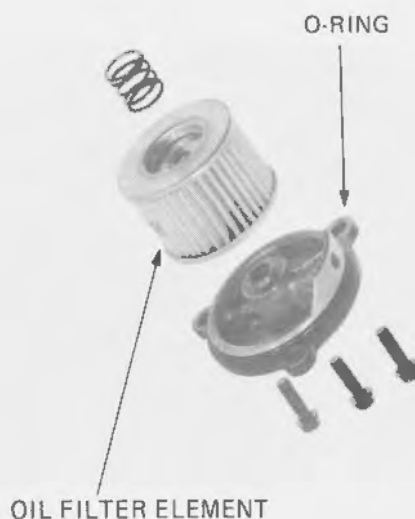
Insert a new oil filter element.

Install the oil filter cover and tighten its screw.

**TORQUE:** 8–10 N·m  
(0.8–1.0 kg-m, 5–7 ft-lb)

O-RING

OIL FILTER ELEMENT



## OIL STRAINER NUT

### NOTE

Clean the screen on the oil strainer nut before filling the frame oil tank with oil.

Disconnect the oil hose nut from the oil strainer nut.

Remove the oil strainer nut.

OIL STRAINER NUT



OIL HOSE NUT





Clean the strainer with clean gasoline and blow dry with compressed air.

### NOTE

Remove remaining sediments from the strainer through the oil hole.

Check O-ring is in good condition.  
Reinstall the oil strainer nut and tighten.

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

Reconnect the oil hose and tighten its nut.

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

O-RING



OIL STRAINER

### CRANKCASE OIL SCREEN (On the right crankcase)

### NOTE

Clean the oil filter screen whenever the right crankcase has been removed.

Clean the oil filter whenever the right crankcase cover is removed.



Remove the oil screen and clean it.  
Install the oil screen.

Check that the right crankcase cover gasket is in good condition.  
Install the removed parts in the reverse order of disassembly.

Adjust the brake pedal (Page 3-14), clutch lever (Page 3-18) and starter decompressor (Page 3-8).

Fill the crankcase with the recommended oil (Page 2-2).



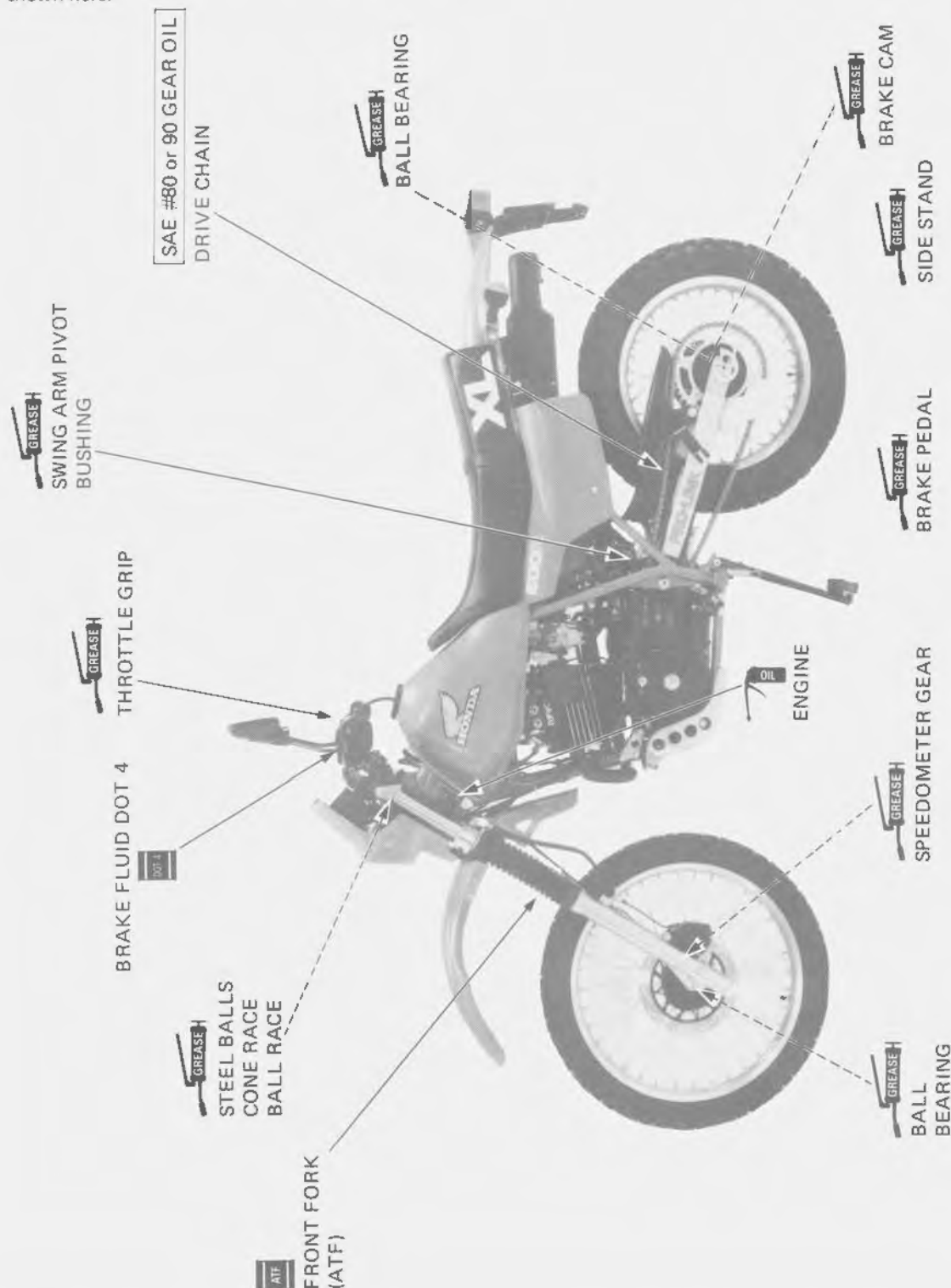
OIL FILTER SCREEN



## LUBRICATION POINTS

Use general purpose grease where a specification is not given.

Apply oil or grease to sliding surfaces and cables not shown here.



### SPECIAL LUBRICANT

- SHOCK ABSORBER UPPER MOUNT BUSHINGS (Page 13-12)
- SUSPENSION LINKAGE PIVOTS (Page 13-12)



# 3. MAINTENANCE

|                                     |      |                                       |      |
|-------------------------------------|------|---------------------------------------|------|
| SERVICE INFORMATION                 | 3-2  | « CHASSIS »                           |      |
| MAINTENANCE SCHEDULE                | 3-3  | DRIVE CHAIN                           | 3-12 |
| «ENGINE »                           |      | BATTERY                               | 3-14 |
| FUEL LINE                           | 3-4  | BRAKE FLUID                           | 3-14 |
| THROTTLE OPERATION                  | 3-4  | BRAKE SHOE/PAD WEAR                   | 3-15 |
| CARBURETOR-CHOKE                    | 3-5  | BRAKE FLUID                           | 3-14 |
| AIR CLEANER                         | 3-6  | REAR BRAKE                            | 3-15 |
| CRANKCASE BREATHER                  | 3-7  | BRAKE LIGHT SWITCH                    | 3-16 |
| SPARK PLUG                          | 3-7  | HEADLIGHT AIM                         | 3-17 |
| VALVE CLEARANCE                     | 3-8  | CLUTCH                                | 3-17 |
| IGNITION TIMING                     | 3-9  | SIDE STAND                            | 3-18 |
| STARTER DECOMPRESSOR                | 3-9  | SUSPENSION                            | 3-18 |
| CARBURETOR IDLE SPEED               | 3-11 | WHEEL/SPOKES                          | 3-19 |
| EVAPORATIVE EMISSION CONTROL SYSTEM | 3-11 | STEERING HEAD BEARING                 | 3-20 |
| CYLINDER COMPRESSION                | 3-11 | SPARK ARRESTER CLEANING (U.S.A. only) | 3-20 |
|                                     |      | NUTS, BOLTS, FASTENERS                | 3-21 |

## SERVICE INFORMATION

### GENERAL

|                                         |          |
|-----------------------------------------|----------|
| Engine oil level check . . . . .        | Page 2-2 |
| Engine oil change . . . . .             | Page 2-2 |
| Engine oil filter replacement . . . . . | Page 2-4 |
| Engine oil strainer cleaning . . . . .  | Page 2-4 |
| Oil filter screen cleaning . . . . .    | Page 2-5 |

### SPECIFICATIONS

#### ENGINE

|                  |               |                             |
|------------------|---------------|-----------------------------|
| Ignition timing: | Initial       | 6° B.T.D.C at 1200 rpm      |
|                  | Full advance: | 31° B.T.D.C. at 4000 rpm    |
| Spark plug:      | Plug gap:     | 0.8-0.9 mm (0.031-0.035 in) |

Plug type:

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



**MAINTENANCE**

---

## Valve clearance:

INTAKE: 0.05 (0.002 in)

EXHAUST: 0.10 mm (0.004 in)

Throttle grip free play: 2–6 mm (1/8–1/4 in)

Idle speed: 1,200 ± 100 rpm

Manual decompression valve

lifter free play: 1–2 mm (1/32–1/16 in)

Kickstarter decompression

valve lifter free play: 1–3 mm (1/32–1/8 in)

Cylinder compression: 12.5 kg/cm<sup>2</sup> (175 psi)**CHASSIS**

Drive chain slack: 30–40 mm (1-1/4–1-5/8 in)

Rear brake pedal free play: 20–30 mm (3/4–1-1/4 in)

Clutch lever free play: 10–20 mm (3/8–3/4 in)

Side stand spring tension: 2–3 kg (4.4–6.6 lb)

Tire pressures: Front 1.5 kg/cm<sup>2</sup> (21 psi)  
Rear 1.5 kg/cm<sup>2</sup> (21 psi)Tire size: Front 3.00–21–4PR  
Rear 5.10–17–4PR**TORQUE VALUES**

Rear axle nut: 80–110 N·m (8.0–11.0 kg-m, 58–80 ft-lb)

Spoke nipple: 2.5–5.0 N·m (25–50 kg-cm, 28–58 in-lb)

Valve adjusting screw lock nut: 15–18 N·m (1.5–1.8 kg-m, 11–13 ft-lb)

Side stand pivot bolt: 35–45 N·m (3.5–4.5 kg-m, 25–33 ft-lb)

**TOOL**

Spoke wrench: 07701–0020300 (5.8 mm) (Commercially available in U.S.A.)

Wrench, 10 x 12 mm 07708–0030200 (□ or 07908–3230000)

Adjusting wrench A 07708–0030300



### MAINTENANCE SCHEDULE

Perform the PRE-RIDE INSPECTION at each scheduled maintenance period.

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

C: Clean

R: Replace

L: Lubricate

|                            | ITEM                                   | FREQUENCY             | WHICHEVER COMES FIRST<br>↓ | ODOMETER READING (NOTE 5) |                                   |                         |                          |                          |                          | Refer to page |
|----------------------------|----------------------------------------|-----------------------|----------------------------|---------------------------|-----------------------------------|-------------------------|--------------------------|--------------------------|--------------------------|---------------|
|                            |                                        | EVERY                 |                            | 600 mi<br>(1,000 km)      | 4,000 mi<br>(6,400 km)            | 8,000 mi<br>(12,800 km) | 12,000 mi<br>(19,200 km) | 16,000 mi<br>(25,600 km) | 20,000 mi<br>(32,000 km) |               |
| EMISSION RELATED ITEMS     | * FUEL LINE                            |                       |                            |                           | I                                 | I                       | I                        | I                        | I                        | 3-4           |
|                            | * FUEL STRAINER                        |                       |                            | C                         | C                                 | C                       | C                        | C                        | C                        | 3-4           |
|                            | * THROTTLE OPERATION                   |                       |                            | I                         | I                                 | I                       | I                        | I                        | I                        | 3-4           |
|                            | * CARBURETOR-CHOKE                     |                       |                            |                           | I                                 | I                       | I                        | I                        | I                        | 3-5           |
|                            | AIR CLEANER                            | NOTE 1                |                            |                           | C                                 | C                       | C                        | C                        | C                        | 3-6           |
|                            | CRANKCASE BREATHER                     | NOTE 2                |                            |                           | C                                 | C                       | C                        | C                        | C                        | 3-7           |
|                            | SPARK PLUG                             |                       |                            |                           | R                                 | R                       | R                        | R                        | R                        | 3-7           |
|                            | * VALVE CLEARANCE                      |                       |                            | I                         | I                                 | I                       | I                        | I                        | I                        | 3-8           |
|                            | ENGINE OIL                             | YEAR                  |                            | R                         | REPLACE EVERY 2,000 mi (3,200 km) |                         |                          |                          |                          | 2-2           |
|                            | * ENGINE OIL FILTER SCREEN (DOWN TUBE) |                       |                            | C                         | C                                 | C                       | C                        | C                        | C                        | 2-3           |
|                            | ENGINE OIL FILTER                      |                       |                            | R                         | R                                 | R                       | R                        | R                        | R                        | 2-4           |
| NON-EMISSION RELATED ITEMS | * STARTER DECOMPRESSOR                 |                       |                            | I                         | I                                 | I                       | I                        | I                        | I                        | 3-9           |
|                            | * CARBURETOR-IDLE SPEED                |                       |                            | I                         | I                                 | I                       | I                        | I                        | I                        | 3-11          |
|                            | EVAPORATIVE EMISSION CONTROL SYSTEM    | NOTE 3                |                            |                           |                                   | I                       |                          | I                        |                          | 3-11          |
|                            | DRIVE CHAIN                            | NOTE 4                |                            |                           | I, L EVERY 300 mi (500 km)        |                         |                          |                          |                          | 3-12          |
|                            | BATTERY                                | MONTH 1               |                            | I                         | I                                 | I                       | I                        | I                        | I                        | 3-14          |
|                            | BRAKE PAD/SHOE WEAR                    |                       |                            |                           | I                                 | I                       | I                        | I                        | I                        | 3-15          |
|                            | BRAKE FLUID (FRONT)                    | MONTH 1<br>2 YEARS *R |                            | I                         | I                                 | I                       | *R                       | I                        | I                        | 3-14          |
|                            | BRAKE SYSTEM                           |                       |                            | I                         | I                                 | I                       | I                        | I                        | I                        | 3-16          |
|                            | * BRAKE LIGHT SWITCH                   |                       |                            | I                         | I                                 | I                       | I                        | I                        | I                        | 3-16          |
|                            | * HEADLIGHT AIM                        |                       |                            | I                         | I                                 | I                       | I                        | I                        | I                        | 3-17          |
|                            | CLUTCH                                 |                       |                            | I                         | I                                 | I                       | I                        | I                        | I                        | 3-17          |
|                            | SIDE STAND                             |                       |                            |                           | I                                 | I                       | I                        | I                        | I                        | 3-18          |
|                            | * SUSPENSION                           |                       |                            | I                         | I                                 | I                       | I                        | I                        | I                        | 3-18          |
|                            | SPARK ARRESTER                         |                       |                            |                           | C                                 | C                       | C                        | C                        | C                        | 3-20          |
|                            | * NUTS, BOLTS, FASTENERS               | NOTE 4                |                            | I                         | I                                 | I                       | I                        | I                        | I                        | 3-21          |
|                            | ** WHEELS/SPOKES                       | NOTE 4                |                            | I                         | I                                 | I                       | I                        | I                        | I                        | 3-19          |
|                            | ** STEERING HEAD BEARING               |                       |                            | 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 these items be serviced *only* by an authorized Honda dealer.

- NOTE: 1. Service more frequently when riding in dusty areas.  
 2. Service more frequently when riding in rain or at full throttle.  
 3. '84 California model only.  
 4. Service more frequently when riding off-road.  
 5. For higher odometer readings, repeat at the frequency interval established here.



## FUEL LINE/FUEL STRAINER

Turn the fuel valve OFF.

Remove the fuel cup, O-ring and filter screen and drain the gasoline into a suitable container.

### WARNING

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

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.

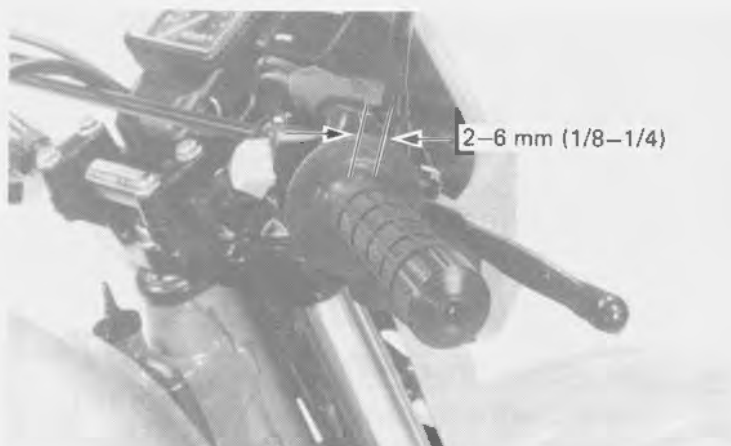
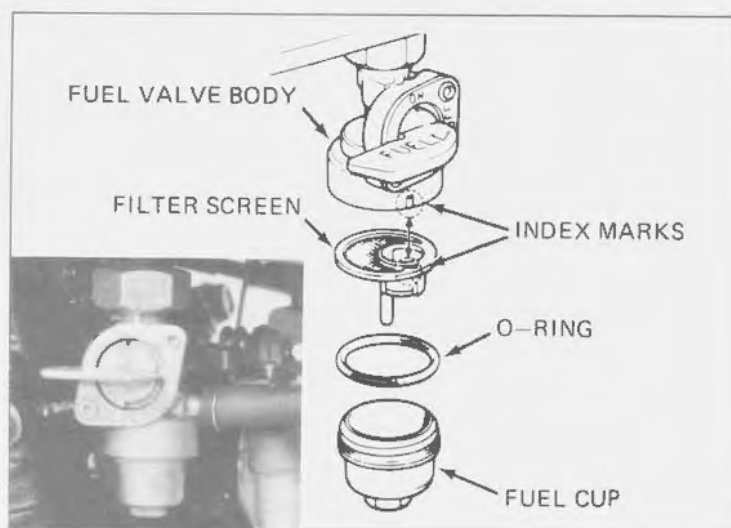
Hand tighten the fuel cup and then torque it to specification.

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

### NOTE

Do not overtighten the fuel cup.

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



## THROTTLE OPERATION

Check that the throttle grip opens smoothly to full throttle and fully closes automatically in all steering positions.

Make sure there is no deterioration, damage, or kinking in the throttle cables, and that the throttle grip free play is 2–6 mm (1/8–1/4 in) at the throttle grip flange.

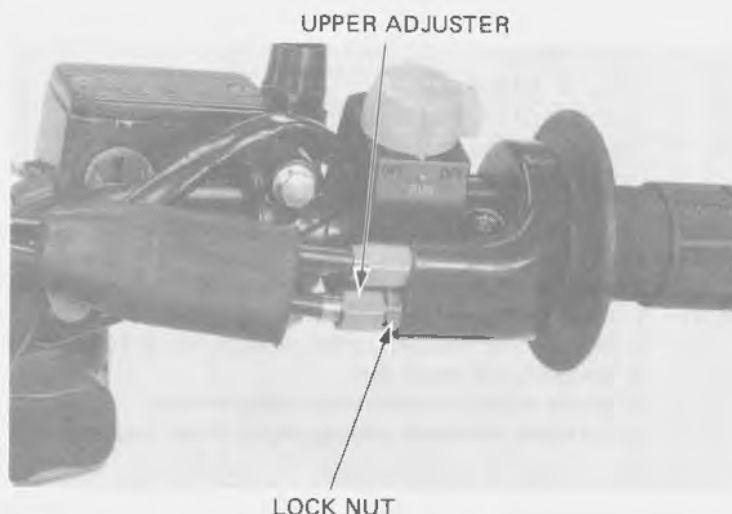
Throttle grip free play can be adjusted at either end of the throttle cable. Replace any damaged parts before beginning this adjustment.

Minor adjustments are made with the upper throttle cable adjuster.

Adjust free play by loosening the lock nuts and turning the adjusters.

Tighten the locknuts.

Recheck throttle operation.



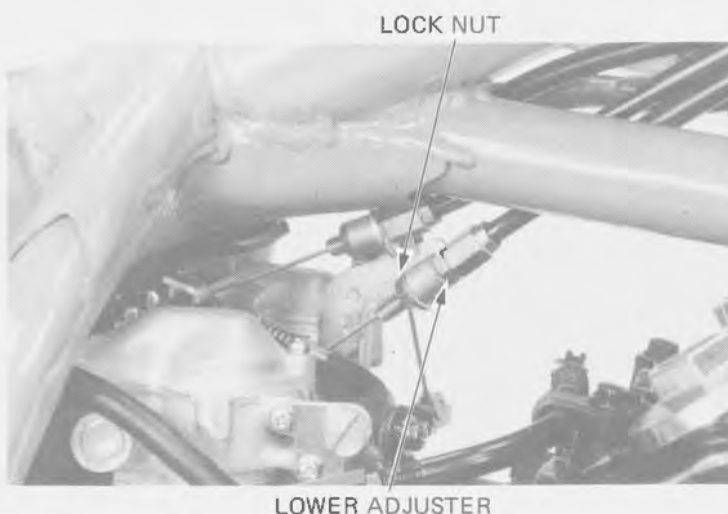




Major adjustments are made with the lower adjuster.  
Remove seat and fuel tank.

Adjust free play by loosening the lock nut and  
turning the adjuster.  
Tighten the lock nut.

Recheck throttle operation. Replace any damaged  
parts.  
Reinstall fuel tank and seat.  
Turn the fuel valve OFF.  
Check for fuel leaks.



## CARBURETOR-CHOKE

Check that the choke lever moves smoothly.  
Lubricate the choke cable, if the operation is not  
smooth.



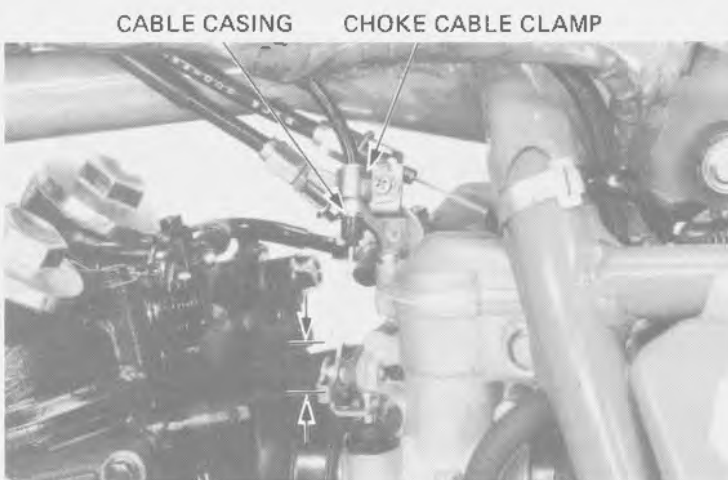
Remove the seat and fuel tank.  
Pull the choke lever on the handlebar all the way  
back to fully open position and measure the choke  
valve stroke between the fully closed and fully open  
positions.

**CHOKE VALVE STROKE: 5–7 mm (3/16–1/4 in)**

Adjust if necessary by loosening the choke cable  
clamp on the carburetor and moving the cable  
casing.

Recheck the choke valve stroke.

Install the fuel tank and seat.





## AIR CLEANER

Remove the left frame side cover.  
Remove the air cleaner cover screws and the cover.

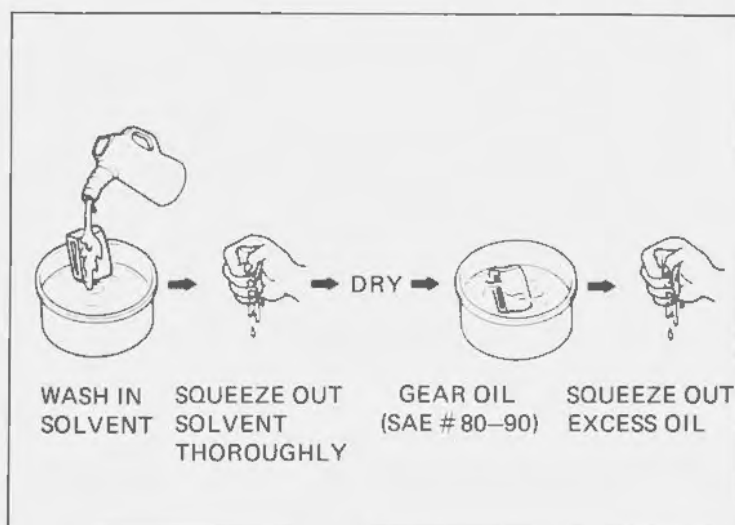


Remove the element holder and air cleaner element.



Wash the element in non-flammable or high flash point solvent, and let it dry.  
Soak the element in gear oil (SAE # 80-90) and squeeze out the excess.

Installation is the reverse order of disassembly.



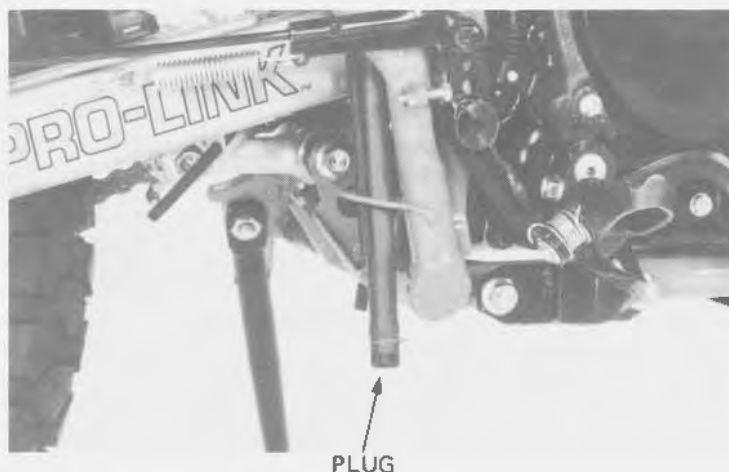


### CRANKCASE BREATHER

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

#### NOTE

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



### SPARK PLUG

Disconnect the spark plug cap and remove the spark plug.

Visually inspect the spark plug. Discard it if the insulator is cracked or chipped.

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

Adjust the gap by bending the side electrode carefully.

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

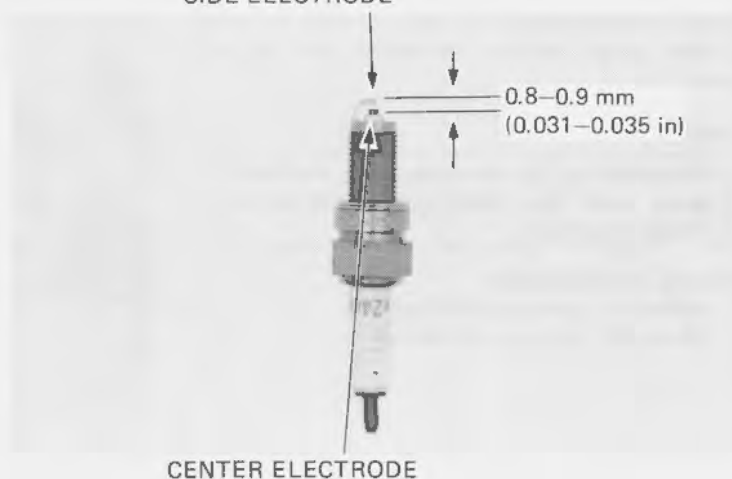
#### RECOMMENDED SPARK PLUG:

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

Make sure the sealing washer is in good condition.  
Install the spark plug, tighten it by hand, then  
tighten with a spark plug wrench.

Connect the spark plug cap.

#### SIDE ELECTRODE





## VALVE CLEARANCE

### NOTE

Inspect and adjust valve clearance while the engine is cold (Below 35°C/95°F).  
 Make sure that the decompressor valves lifters have free play (page 3-9).

Remove the seat.

Turn the fuel valve "OFF", disconnect the fuel line and remove the tank.

Remove the crankshaft and timing mark hole caps.

Remove the valve adjusting covers.

Rotate the flywheel counterclockwise to align the "T" mark with the index notch on the left crankcase cover. Make sure the piston is at T D C (Top Dead Center) on the compression stroke.

INDEX NOTCH



"T" MARK

Check the clearance of all four valves by inserting a feeler gauge between the rocker arm and sub rocker arm.

### NOTE

When checking the clearance, slide the feeler gauge from the inside out in the arrow direction as shown.

### VALVE CLEARANCES:

INTAKE: 0.05 mm (0.002 in)

EXHAUST: 0.10 mm (0.004 in)

ROCKER ARM



FEELER GAUGE

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

Hold the adjusting screw and tighten the lock nut.

TORQUE: 1.5–1.8 kg-m (11–13 ft-lb)

Recheck the valve clearance.

Adjust starter and manual decompressor valve lifter lever free play (page 3-9).

Install parts in the reverse order of disassembly.

VALVE ADJUSTER



LOCK NUT



## IGNITION TIMING

### NOTE

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

Remove the timing hole cap.

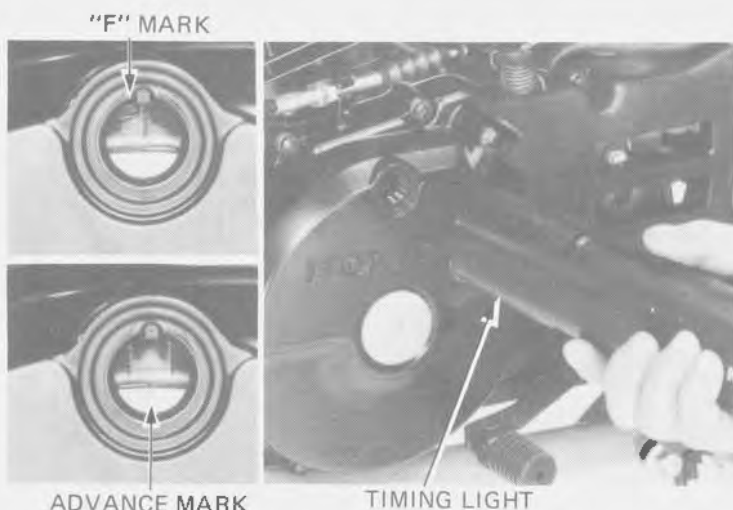
Connect a tachometer and timing light.

Start the engine.

The timing at idle is correct if the index notch aligns with the "F" mark at  $1,200 \pm 100$  rpm ('83) or  $1,300 \pm 100$  rpm ('84).

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

If the ignition timing is incorrect, check the CDI unit, pulser rotor and pulser generator, and replace any faulty parts.



## STARTER DECOMPRESSOR

### NOTE

Always adjust the decompressor linkage (manual and kickstarter) after adjusting the valve clearance.

Remove the crankshaft and timing mark hole caps. Rotate the flywheel counterclockwise to align the "T" mark with the index notch. Make sure the piston is at TDC (Top Dead Center) on the compression stroke.



Measure the free play at the tip of the manual decompressor valve lifter.

**FREE PLAY: 1-2 mm (1/32-1/16 in)**





Adjust by loosening the lock nut and turning the adjusting nut.

## CAUTION

*Excessive free play causes hard starting.  
Insufficient free play may cause erratic engine idle and valve damage.*

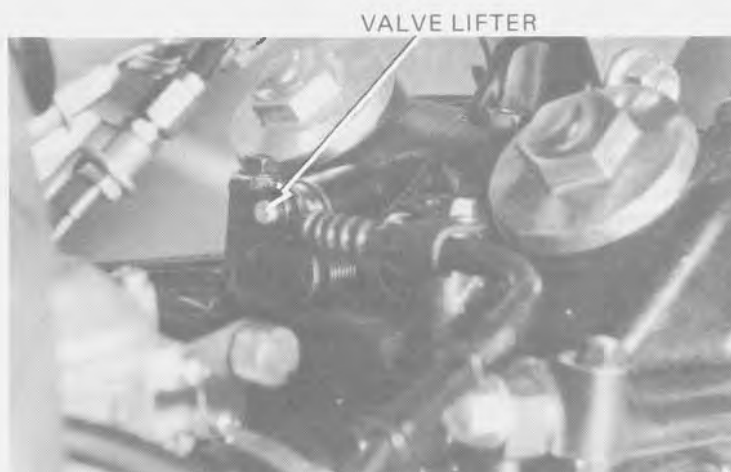
Tighten the lock nut.



(Kickstarter)

Measure the free play at the tip of the kickstarter decompressor valve lifter.

FREE PLAY: 1–3 mm (1/32–7/64)



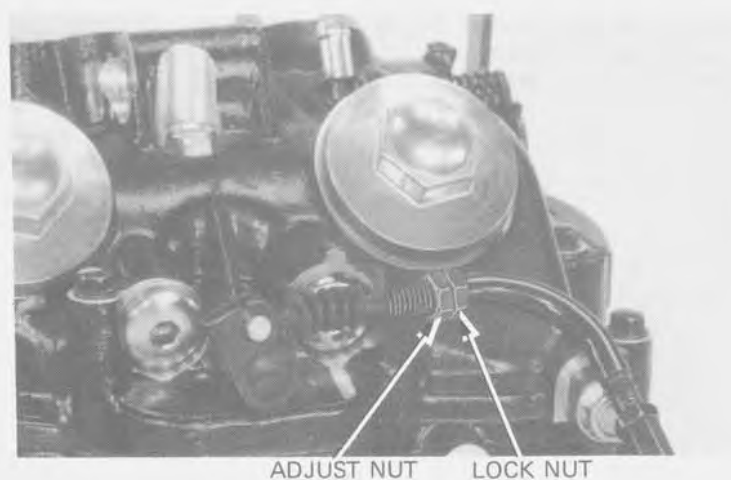
Adjust by loosening the lock nut and turning the adjusting nut.

## CAUTION

*Excessive free play causes hard starting.  
Insufficient free play may cause erratic engine idle and valve damage.*

Tighten the lock nut.

Reinstall the timing mark hole cap.







## CARBURETOR IDLE SPEED

### NOTE

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

Warm up the engine, shift to NEUTRAL, and hold the motorcycle upright.

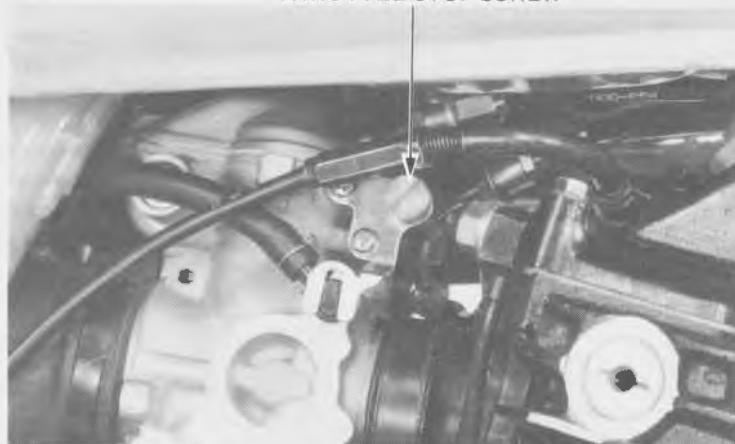
Adjust the idle speed with the throttle stop screw.

### IDLE SPEED:

'83: 1,200  $\pm$  100 rpm

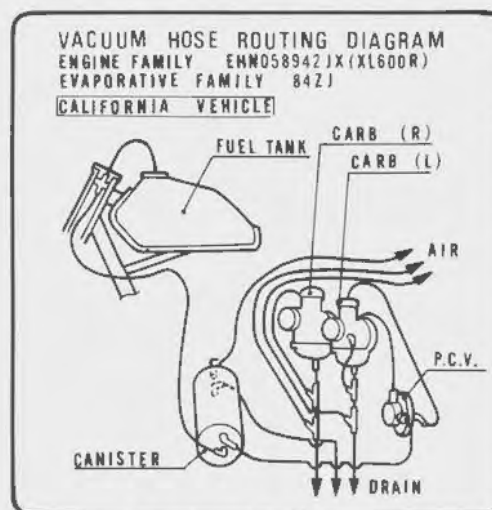
'84: 1,300  $\pm$  100 rpm

THROTTLE STOP SCREW



## EVAPORATIVE EMISSION CONTROL SYSTEM (California model only)

Check all fuel tank, charcoal canister, and purge control valve hoses to be sure they are securely connected and are not kinked or clogged. If a canister or purge control valve problem is suspected, refer to test procedures on page 4-18.



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## CYLINDER COMPRESSION

Warm up the engine.

Stop the engine and remove the fuel tank and spark plug.

Disconnect the kickstarter decompressor linkage at the cylinder head.

Connect a compression gauge.

Push the choke knob forward until it stops.

Open the throttle grip fully.

Operate the kick starter pedal several times and check the gauge reading.

### NOTE

Be sure compression is not leaking at the gauge connection.

COMPRESSION GAUGE



COMPRESSION: 12.5 kg/cm<sup>2</sup> (175 psi)



Low compression can be caused by;

Improper valve adjustment  
Valve leakage  
Leaking cylinder head gasket  
Worn piston rings or cylinder

## NOTE

To remove foreign particles stuck between the valve and seat, operate the lifter lever about 10 times with force. Then test the cylinder compression.

High compression can be caused by:

Carbon deposits in the combustion chamber or on the piston head.  
Disconnect the compression gauge, then reinstall the kick starter decompressor linkage.  
Adjust the kick starter decompressor free play, as required.  
Reinstall the spark plug.

## DRIVE CHAIN

### REMOVAL

Turn the engine off. Raise the rear wheel off the ground by placing a workstand or box under the engine.

Shift the transmission into neutral.

Measure the slack in the higher drive chain run midway between the sprockets.

**STANDARD SLACK:** 30–40 mm (1-1/4–1-5/8 in)

Inspect the chain guide rollers and chain slider for wear.



CHAIN SLIDERS

Adjust as follows:

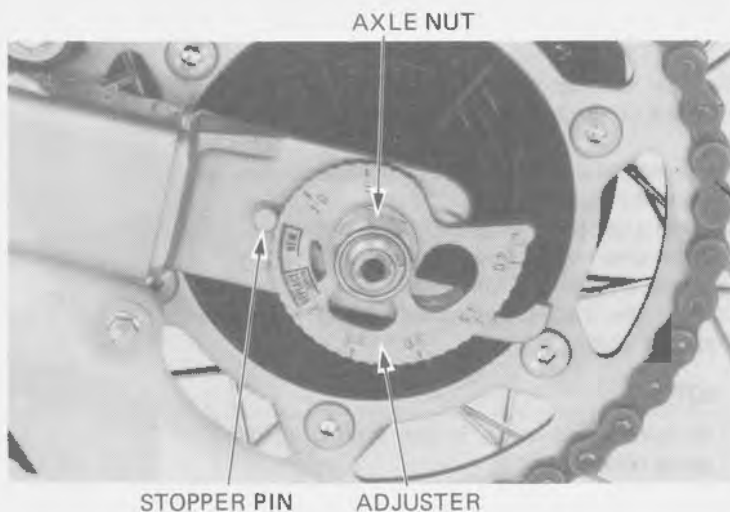
Loosen the rear axle nut, then turn both adjusters equally until chain slack is correct.

### CAUTION

*Be sure the same adjuster index marks align with the stopper pins on both sides of the swingarm.*

Tighten the axle nut.

**TORQUE:** 80–110 N·m (8–11 kg·m, 58–80 ft·lb)





When the drive chain becomes extremely dirty, it should be removed and cleaned prior to lubrication.

Remove the rear wheel (Page 13-3).

Disconnect the rear shock, then remove the swingarm. (Page 13-3)

Remove the drive sprocket cover.

Remove the drive chain.



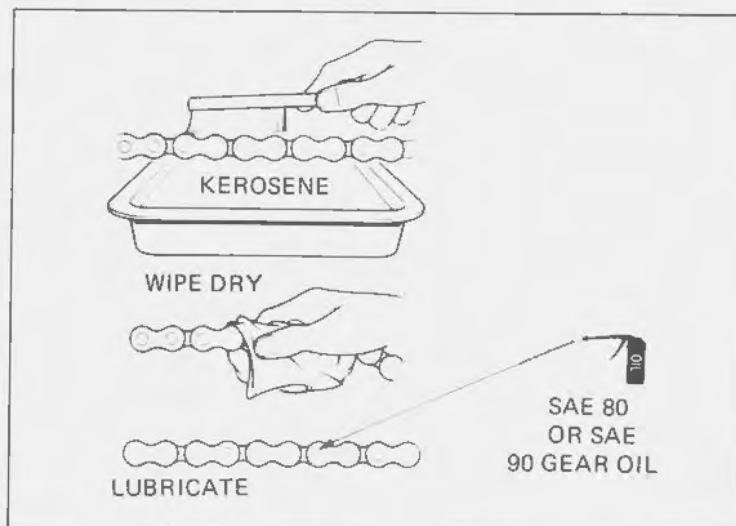
Clean the drive chain with a non-flammable or high flash point solvent that will not damage the O-rings and wipe dry.

### CAUTION

*Do not use a steam cleaner, high pressure washers or aerosol chain lubricants as these will damage the O-rings.*

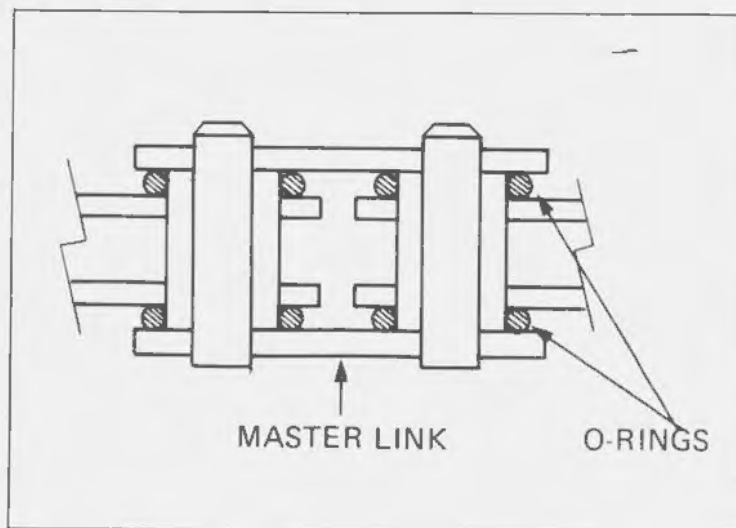
### CAUTION

*Do not use commercial aerosol chain lubricants. They contain solvents which could damage the O-rings.*



Inspect the drive chain and O-rings for possible wear or damage. Replace the chain, if it is worn excessively or damaged.

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





Inspect the sprocket teeth for excessive wear or damage. Replace if necessary.

## NOTE

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



## BATTERY

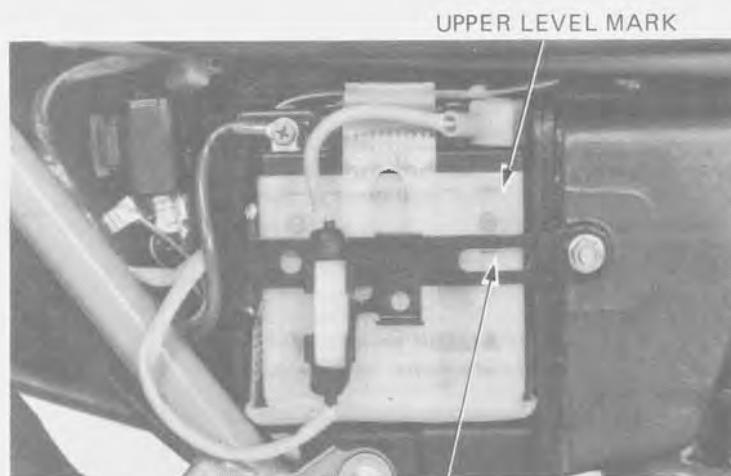
Remove the battery cover.  
Inspect the battery fluid level.  
When the fluid level nears the lower level, add distilled water to the upper level.

## CAUTION

*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 call a doctor.*



LOWER LEVEL MARK

## BRAKE FLUID

Check the front brake fluid reservoir level.  
If the level is very low, check the entire system for leaks.  
If the level is near the lower level mark, remove the cover and diaphragm.  
Fill the reservoir with **DOT-4 BRAKE FLUID** from a sealed container above to the lower level.

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

## CAUTION

- Do not remove the cover until the handle-bar has been turned so that the reservoir is level.
- Avoid operating the brake lever with the cap removed. Brake fluid will squirt out if the lever is pulled.
- Do not mix different types of fluid, they are not compatible with each other.



LOWER LEVEL MARK



### BRAKE SHOE/PAD WEAR

#### BRAKE PAD WEAR

Check the brake pads for wear by looking under the caliper.

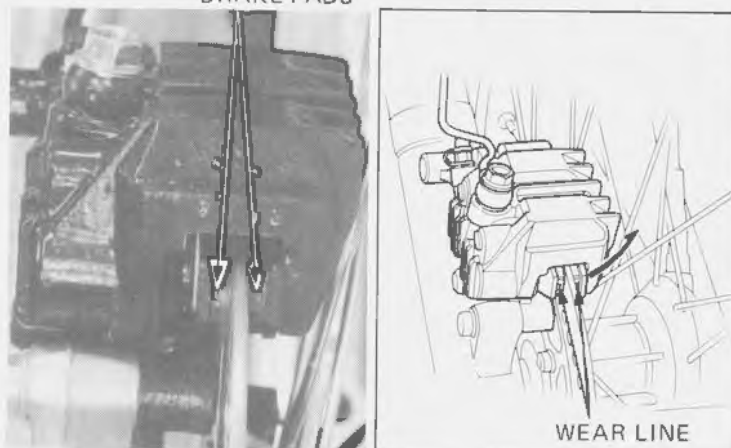
Replace the brake pads if the wear line on the pads reaches the edge of the brake disc (Page 14-5).

#### CAUTION

*Always replace the brake pads in pairs to assure even disc pressure.*

Refer to section for brake bleeding procedures.

BRAKE PADS



Replace the rear brake shoes if the arrow on the indicator plate aligns with the "Δ" mark on the brake panel when the brake is applied.

"Δ" MARK

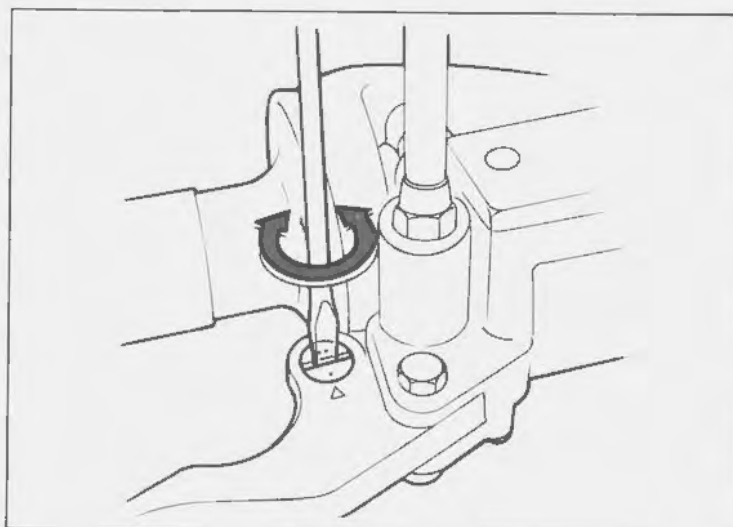


#### FRONT BRAKE LEVER FREE PLAY

Front brake lever adjuster:

The front brake lever adjuster has two positions. To increase free play, align the mark "●" with the arrow on the brake lever bracket. To decrease free play, align the mark "●●" with the arrow.

Do not leave the adjuster between the two positions.



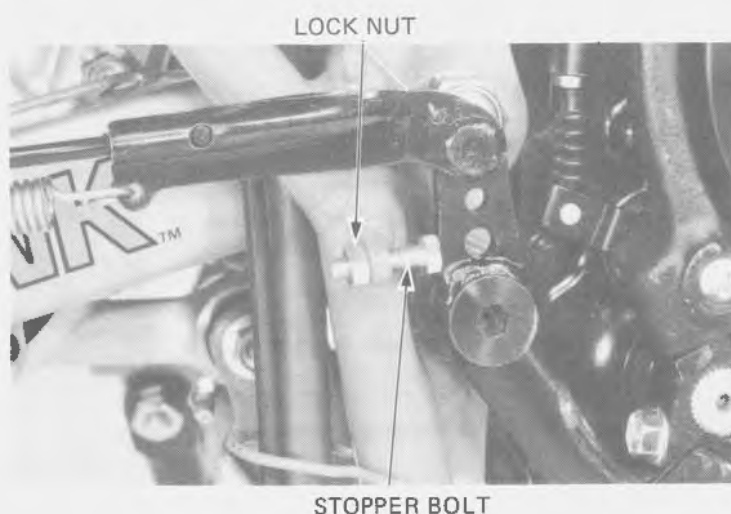




## REAR BRAKE

### BRAKE PEDAL HEIGHT

Loosen the lock nut and adjust the pedal height by turning the stopper bolt.  
 Tighten the lock nut.  
 Adjust the brake pedal free play (Page 3-15).



### BRAKE PEDAL FREE PLAY

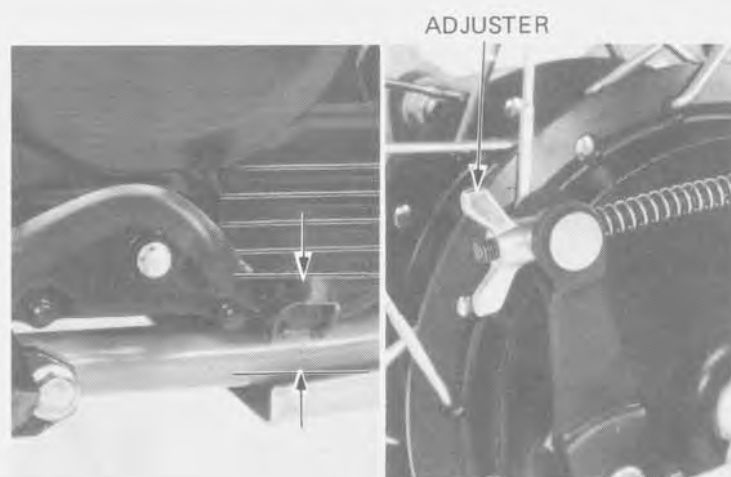
#### NOTE

Adjust the rear brake pedal free play after adjusting the brake pedal height.

Measure the rear brake pedal free play.

**FREE PLAY:** 20–30 mm (3/4–1-1/4 in)

Adjust the free play by turning the adjuster.



## BRAKE LIGHT SWITCH

#### NOTE

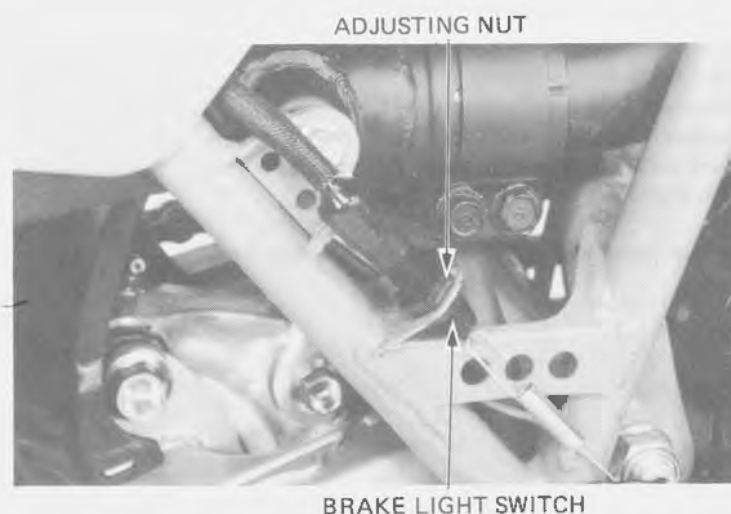
Perform this adjustment after adjusting brake pedal height and free play.

The brake light should go on when the brake pedal is depressed 10 mm (3/8 in).

Adjust by turning the adjusting nut.

#### CAUTION

*Do not turn the switch body.*







### HEADLIGHT AIM

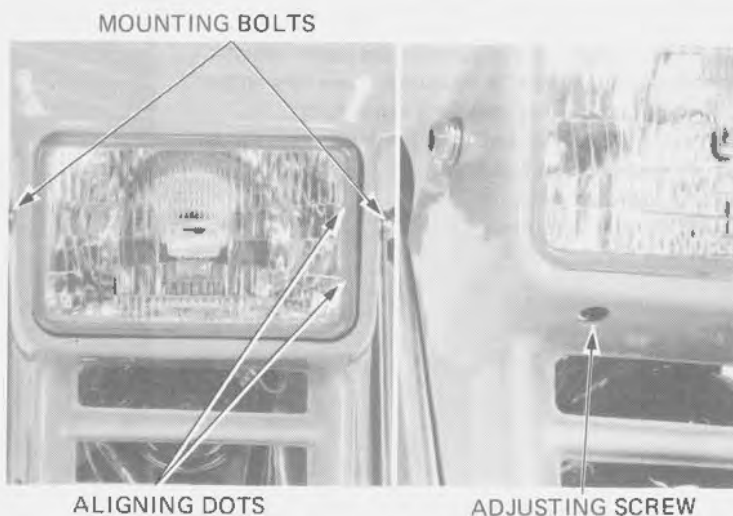
Adjust vertically by loosening both headlight case mounting bolts and tilting the headlight.  
Adjust horizontally by turning the adjusting screw on the headlight rim.

#### NOTE

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

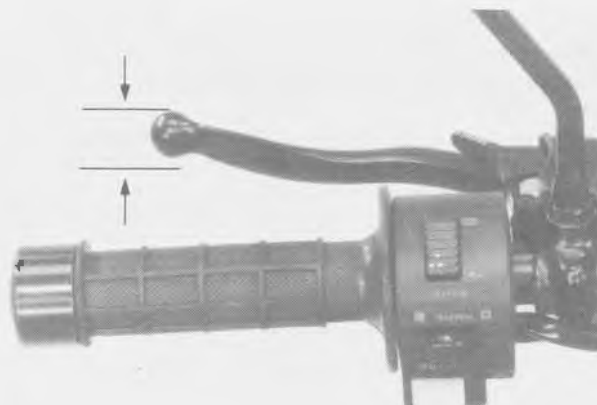
#### WARNING

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

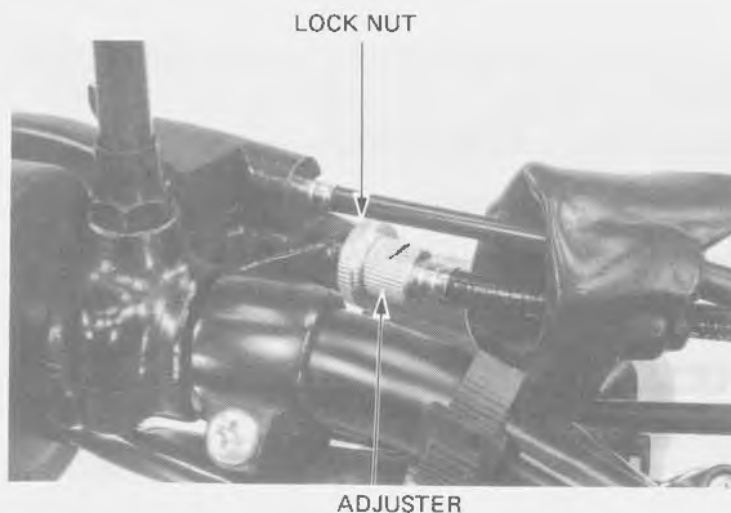


### CLUTCH

Measure the clutch free play at the lever end.  
FREE PLAY: 10–20 mm (3/8–3/4 in)

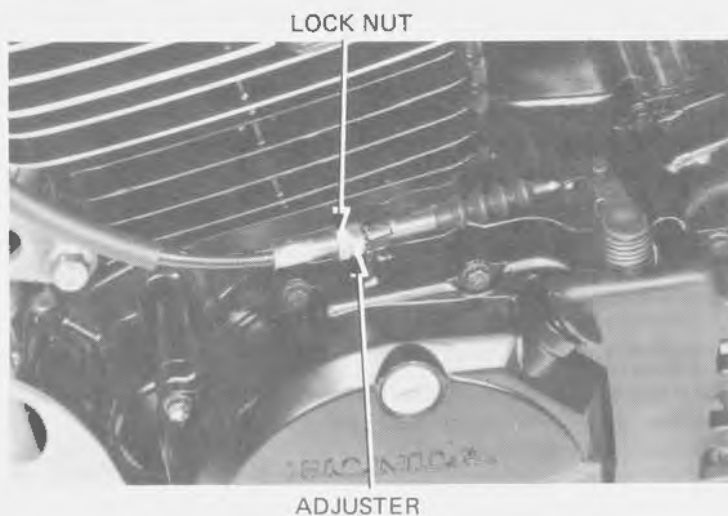


Minor adjustment are made with the upper adjuster.  
Pull the cover back.  
Loosen the lock nut and turn the adjuster to obtain the specified free play.  
Tighten the lock nut and install the cover.  
Check clutch operation.





Major adjustments are made with the lower adjuster. If major adjustment is required, turn the upper adjuster in all the way and back out 1 turn. Loosen the lock nut and turn the lower adjuster to obtain the specified free play. Tighten the lock nuts. Check clutch operation.



## SIDE STAND

Check the rubber pad for deterioration or wear. Replace it if it's worn, or cracked, up to the wear line.

Check the side stand spring for damage and loss of tension, and the side stand assembly for freedom of movement and bending.

### NOTE

When replacing it, use a rubber pad with the mark "above 260 lb only".



## SUSPENSION

### FRONT

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

Check the entire fork assembly for signs of leaks, or damage.

Replace any components which are unrepairable. Tighten all nuts and bolts to their specified torque values.

### WARNING

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





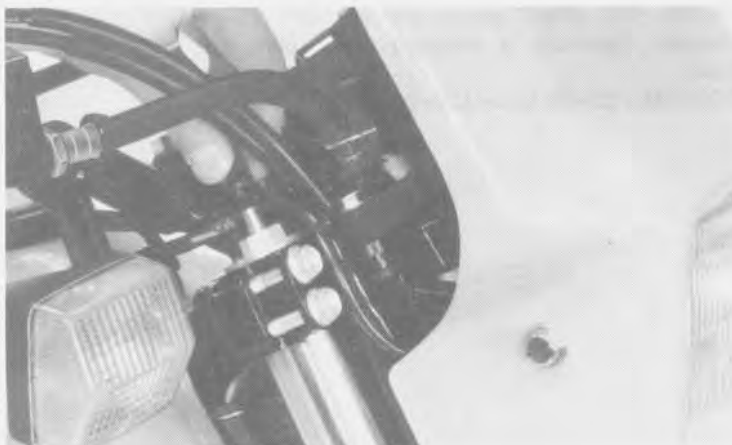
Adjust the air pressure to suit the conditions.

**Recommended pressure:**

0–2.8 psi (0–20 kPa, 0–0.2 kg/cm<sup>2</sup>)

### NOTE

Do not exceed the recommended air pressure at the ride will be harsh and uncomfortable.



## REAR

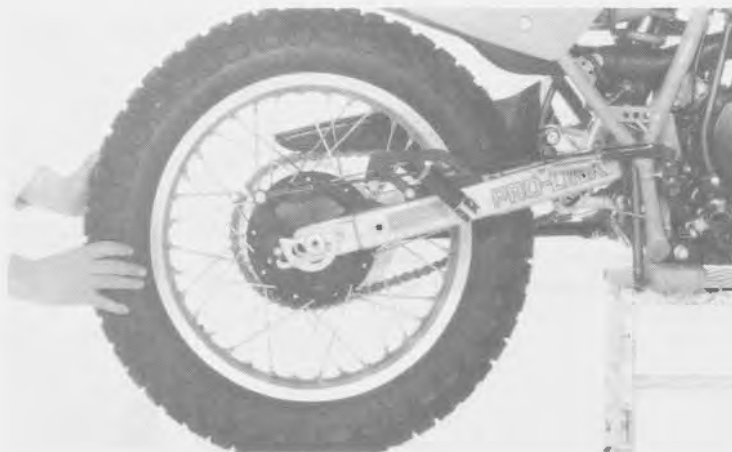
Place the vehicle on a support to raise the rear wheel.

Move the rear wheel sideways with force to see if the swing arm bushings are worn.

Replace if excessively worn.

Check the entire suspension system to be sure it is securely mounted and not damaged or distorted. Tighten all nuts and bolts to their specified torque values.

Grease the swing arm pivot bushing through the swing arm grease fitting.



## WHEEL/SPOKES

### TIRE PRESSURE

#### NOTE

Tire pressure should be checked when the tires are COLD.

#### PRESSURE:

FRONT: 1.5 kg/cm<sup>2</sup> (21.3 psi)

REAR: 1.5 kg/cm<sup>2</sup> (21.3 psi)

#### SIZE:

FRONT: 3.00–21–4PR

REAR: 5.10–17–4PR



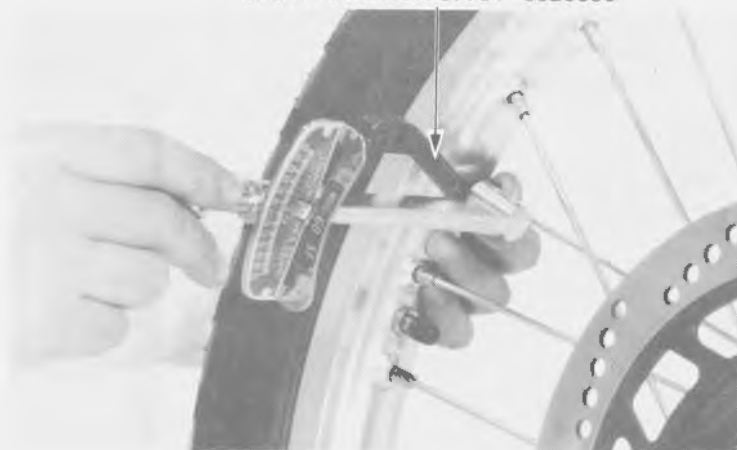
Check the tires for cuts, imbedded nails, or other sharp objects.



Tighten the wheel spokes periodically. More frequent inspection is necessary when riding off-road.

**TORQUE: 25–50 kg-cm (29–57 in-lb)**

SPOKE WRENCH 07701-0020300



## STEERING HEAD BEARING

### NOTE

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

Raise the front wheel off the ground.  
 Check that the handlebar rotates freely.  
 If the handlebar moves unevenly, binds or has vertical movement, adjust the steering head bearings by turning the steering head adjusting nut with a pin spanner.



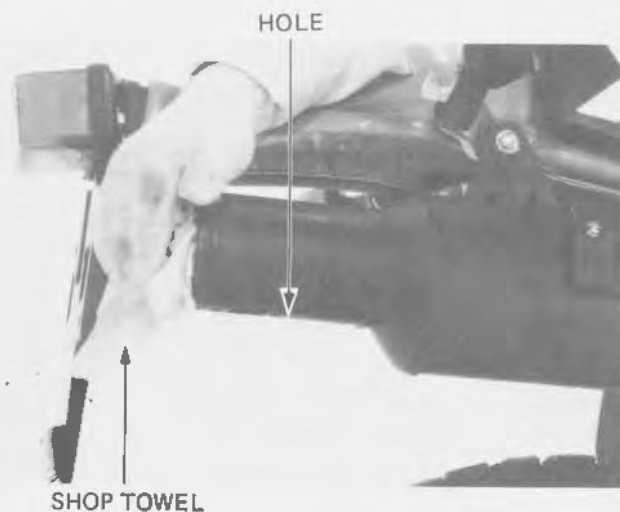
## SPARK ARRESTER CLEANING

(U.S.A. only)

Remove the muffler lid.  
 Start the engine and increase rpm's to blow carbon out of the exhaust pipe while momentarily creating exhaust system back pressure by blocking the end of the muffler with a shop towel. Repeat until carbon stops coming out.

### WARNING

- Do not perform this operation while the exhaust pipe is hot.
- Perform this operation in a wellventilated area, free from fire hazard.
- Use adequate eye protection.





After cleaning the spark arrester install the muffler lids and gasket.

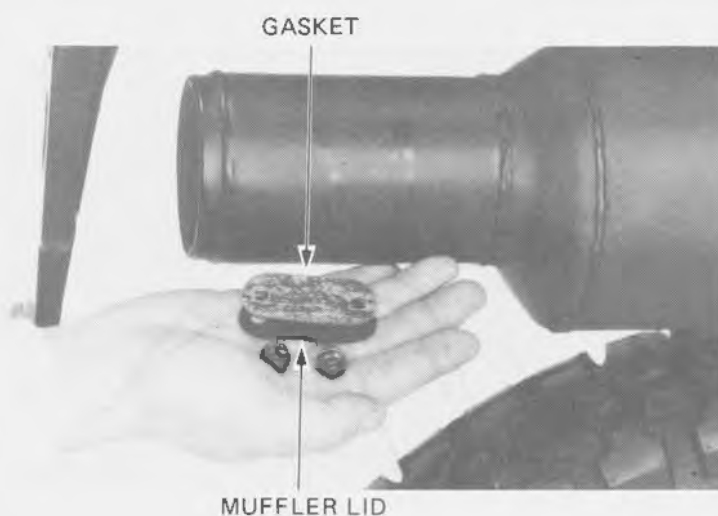
**NOTE**

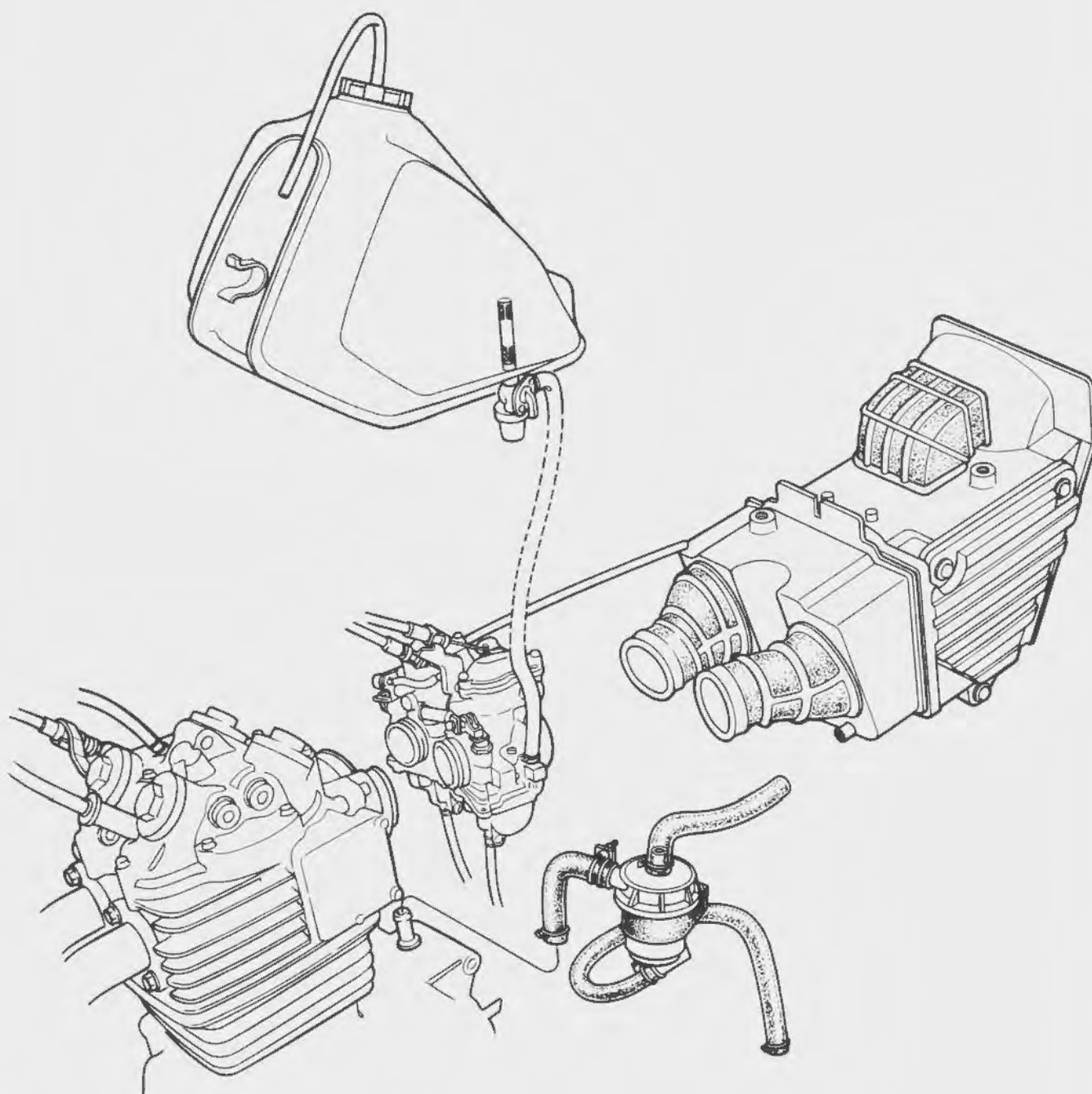
Check that the muffler lid and gasket is in good condition and the bolts are tightened securely.

## NUTS,BOLTS,FASTENERS

Tighten the bolts, nuts and fasteners at the intervals shown in the Regular Maintenance Schedule (Page 1-13).

Check that all chassis nuts and bolts are tightened to their correct torque values (Page 1-4 and 5).  
Check all cotter pins and safety clips.





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# 4. FUEL SYSTEM

|                          |      |                                                   |      |
|--------------------------|------|---------------------------------------------------|------|
| SERVICE INFORMATION      | 4-1  | SECONDARY CARBURETOR TOUCH LEVER ADJUSTMENT       | 4-13 |
| TROUBLESHOOTING          | 4-2  | AIR SCREW ADJUSTMENT                              | 4-13 |
| FUEL TANK                | 4-3  | CARBURETOR INSTALLATION                           | 4-14 |
| AIR CLEANER CASE REMOVAL | 4-4  | AIR SCREW ('83 MODEL)                             | 4-14 |
| CRANKCASE BREATHER       | 4-7  | PILOT SCREW ('84 MODEL)                           | 4-15 |
| CARBURETOR REMOVAL       | 4-8  | HIGH ALTITUDE ADJUSTMENT (USA ONLY)               | 4-17 |
| CARBURETOR DISASSEMBLY   | 4-8  | PURGE CONTROL VALVE INSPECTION (CALIFORNIA MODEL) | 4-18 |
| CARBURETOR SEPARATION    | 4-9  |                                                   |      |
| CARBURETOR ASSEMBLY      | 4-12 |                                                   |      |
| FLOAT LEVEL ADJUSTMENT   | 4-13 |                                                   |      |

## SERVICE INFORMATION

### GENERAL

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

### SPECIFICATIONS

| Item                    | '83                | '84                | '84 California model |
|-------------------------|--------------------|--------------------|----------------------|
| Venturi bore            | 30 mm (0.2 in)     | ←                  | 28 mm (1.10 in)      |
| Type                    | Piston valve       | ←                  | ←                    |
| Identification number   | PH60A              | PH64A              | PH66A                |
| Float level             | 20 mm (0.79 in)    | ←                  | ←                    |
| Air/pilot screw opening | See page 4-14      | See page 4-15      | ←                    |
| Main jet                | Pri #125, 2nd #112 | Pri #120, 2nd #120 | Pri #118, 2nd #118   |
| Slow jet                | #55                | #65                | ←                    |
| Idle speed              | 1,200 ± 100 rpm    | 1,300 ± 100 rpm    | ←                    |

|                                      |                                  |
|--------------------------------------|----------------------------------|
| Fuel tank capacity                   | 12.0 ℓ (3.2 US gal, 2.7 Imp gal) |
| Reserve capacity                     | 2.0 ℓ (0.5 US gal, 0.4 Imp gal)  |
| Air cut-off valve operating pressure | 420 mmHg (16.5 inHg)             |
| Throttle grip free play              | 2-6 mm (1/8-1/4 in)              |

### TOOL

|                   |               |
|-------------------|---------------|
| Float level gauge | 07401-0010000 |
|-------------------|---------------|

### TORQUE VALUE

|                         |                                    |
|-------------------------|------------------------------------|
| Fuel tank mounting bolt | 8-12 N·m (0.8-1.2 kg·m, 6-9 ft·lb) |
|-------------------------|------------------------------------|



## TROUBLESHOOTING

### Engine Cranks But Won't Start

1. No fuel in tank
2. No fuel to cylinder
3. Too much fuel getting to cylinder
4. No spark at plug (ignition malfunction)
5. Air cleaner clogged

### Engine Idles Faster Roughly, falls, or Runs Poorly

1. Idle speed incorrect
2. Ignition malfunction
3. Low compression
4. Rich mixture
5. Lean mixture
6. Air cleaner clogged
7. Air leaking into manifold
8. Fuel contaminated
9. Secondary carburetor touch-point too late
10. Secondary carburetor not closed properly

#### Lean Mixture

1. Carburetor fuel jets clogged
2. Fuel cap vent blocked
3. Fuel filter clogged
4. Fuel line kinked or restricted
5. Float valve faulty
6. Float level too low

#### Rich Mixture

1. Choke stuck closed
2. Float valve faulty
3. Float level too high
4. Carburetor air jets clogged
5. Sticking float
6. Dirty air cleaner



### FUEL TANK

#### FUEL TANK REMOVAL

Remove the seat.  
Turn the fuel valve OFF and disconnect the fuel tube.  
Remove the mounting bolts and tank.

#### WARNING

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

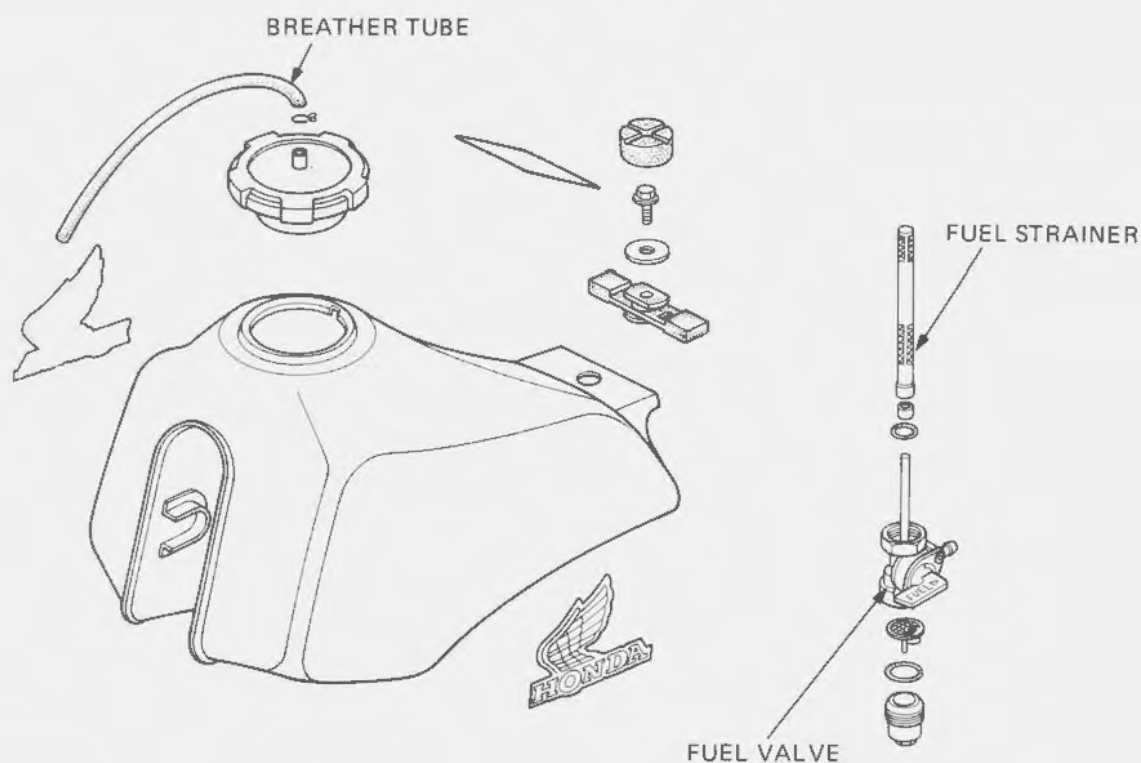
Check that fuel flows out of the fuel valve freely.  
If flow is restricted, clean the fuel strainer.

#### FUEL TANK INSTALLATION

Install the fuel tank with the two mounting bolts.  
Connect the fuel tube.  
Install the seat.

#### NOTE

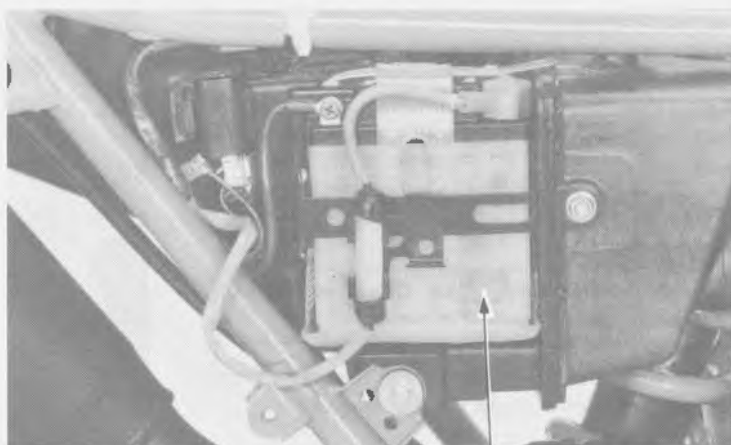
- After assembling, make sure there are no fuel leaks.
- Do not overtighten the fuel valve bolts.





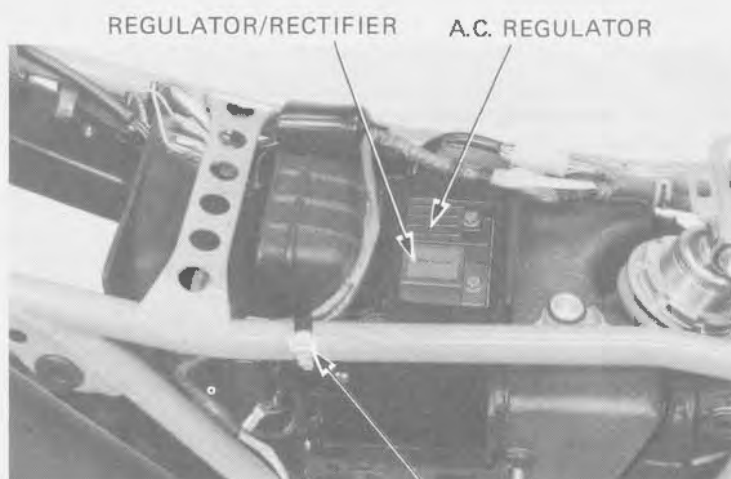
## AIR CLEANER CASE REMOVAL

Remove the seat and side covers.  
Remove the battery from the battery mount.



BATTERY

Remove the wire band and coupler.  
Remove the A.C. REGULATOR and the regulator rectifier.



WIRE BANDS

Remove the air cleaner mount bolts.



AIR CLEANER MOUNT BOLTS



Remove the muffler by removing the mounting bolts.  
Remove the muffler.



Remove the tool kit and air cleaner cover.



AIR CLEANER COVER

Remove the air cleaner case.



## AIR CLEANER INSTALLATION

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

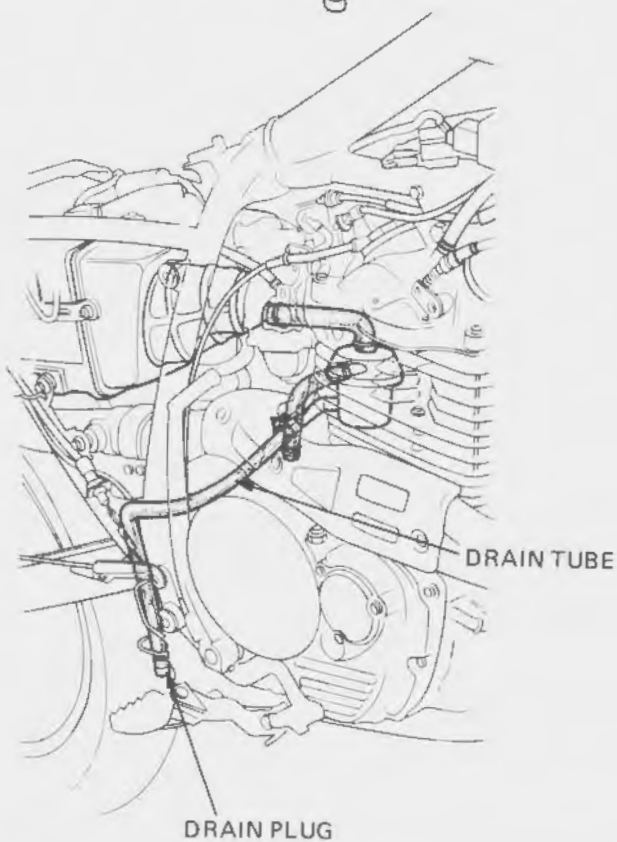
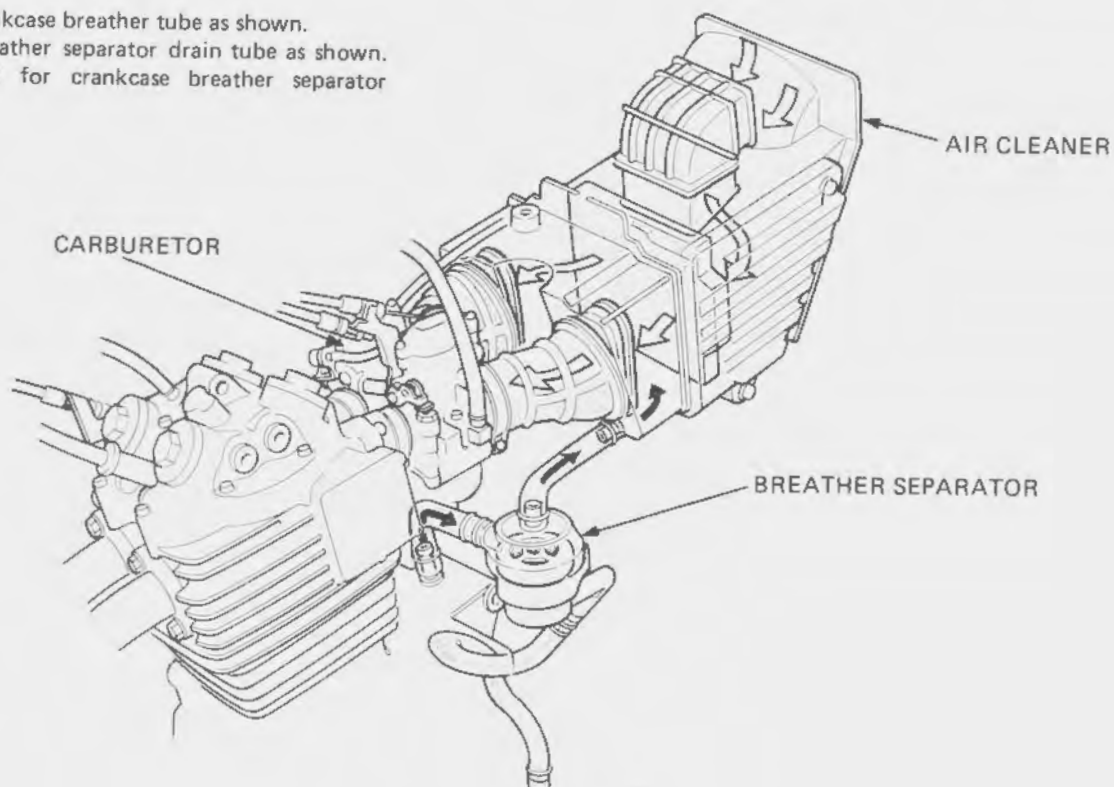






## CRANKCASE BREATHER

Route the crankcase breather tube as shown.  
Route the breather separator drain tube as shown.  
See page 3-6 for crankcase breather separator service.





## CARBURETOR REMOVAL

### CARBURETOR REMOVAL

Remove the seat and fuel tank.  
 Remove the left and right side covers.

Disconnect the throttle cables, and choke cable.  
 Loosen the drain screw and drain the fuel.

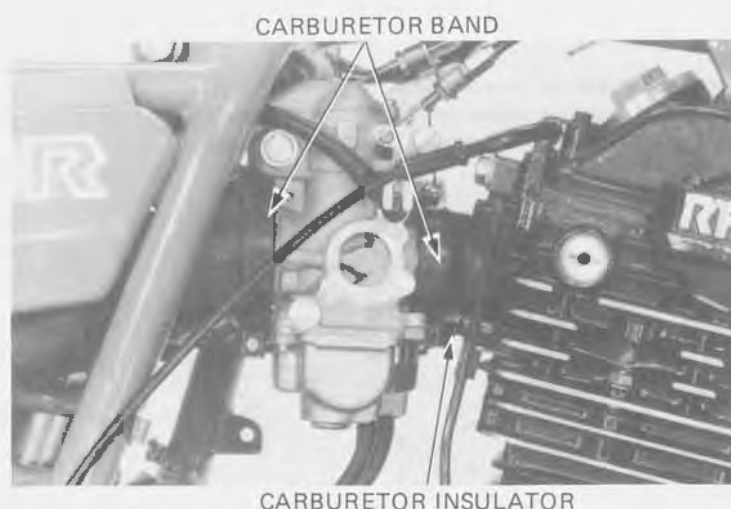
#### **WARNING**

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

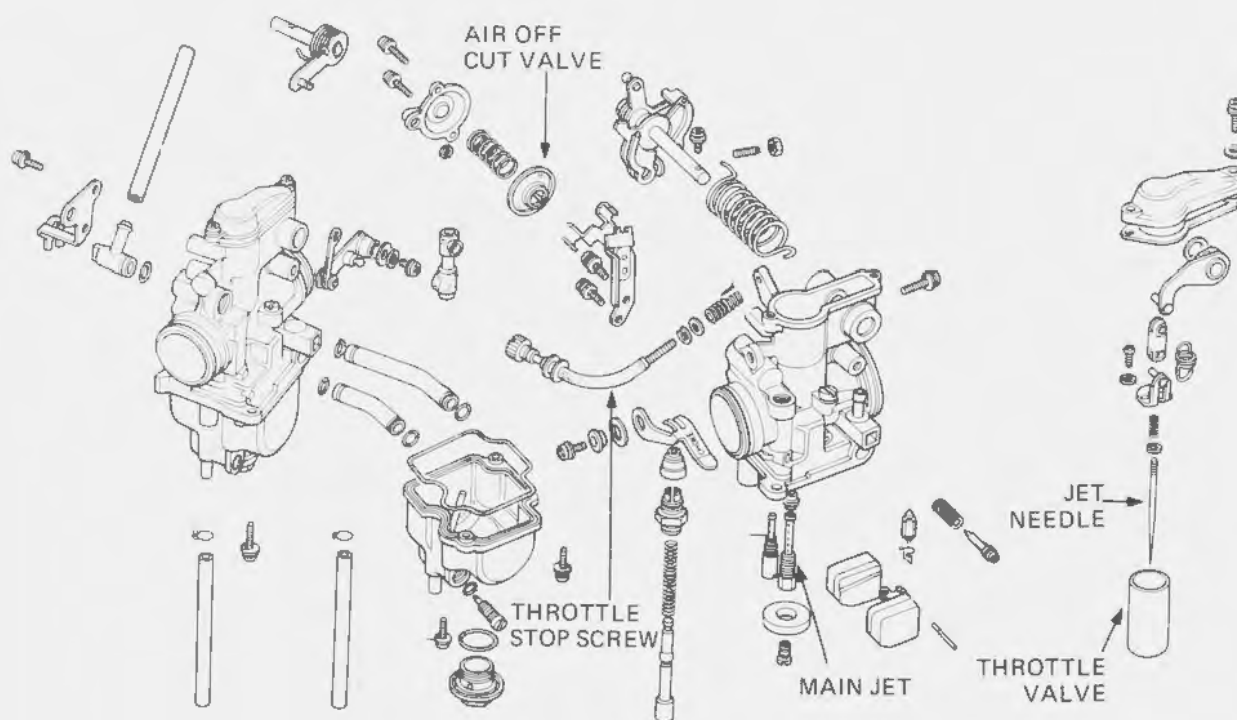
Loosen the screws securing the carburetor bands.  
 Remove the carburetor.

#### NOTE

Do not pry between the insulator and engine.  
 Carefully pull it back, away from the engine.



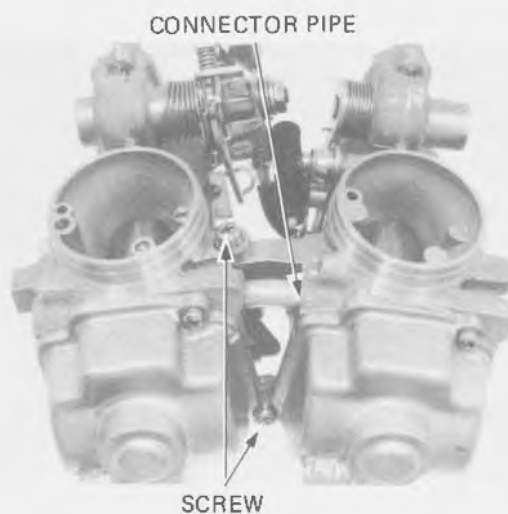
## CARBURETOR DISASSEMBLY





## CARBURETOR SEPARATION

Remove two screws and disconnect the connector pipe.

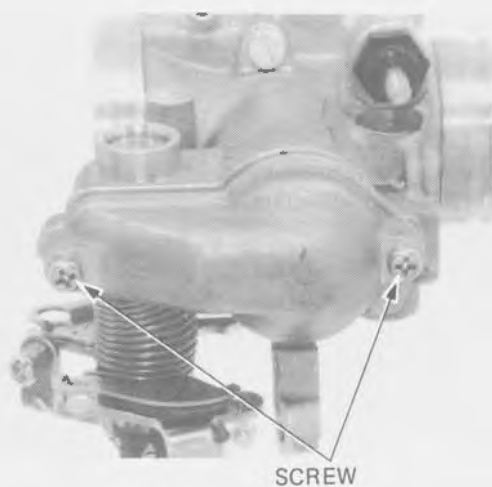


Remove the throttle stop adjuster bracket.



## PRIMARY CARBURETOR DISASSEMBLY

Remove the carburetor top.





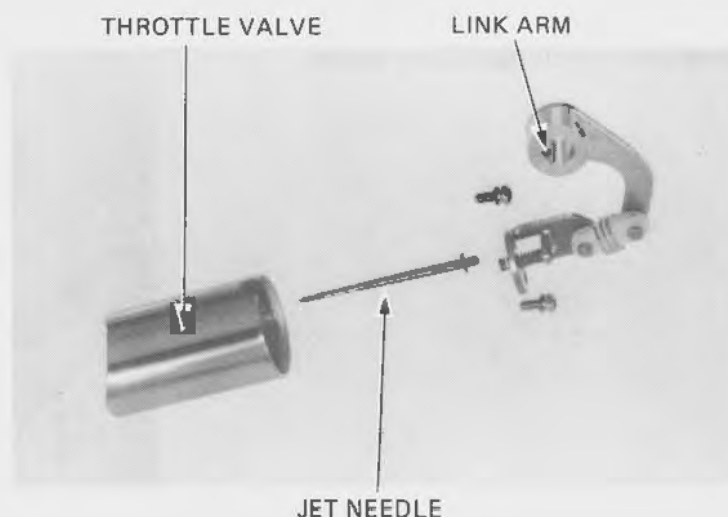
Remove the screw and remove the throttle valve.  
Remove the nut and remove the link arm shaft,  
washers, spring and collars.



THROTTLE VALVE

## THROTTLE VALVE DISASSEMBLY

Remove the link arm.  
Remove the jet needle.  
Check the throttle valve for wear or damage.



THROTTLE VALVE

LINK ARM

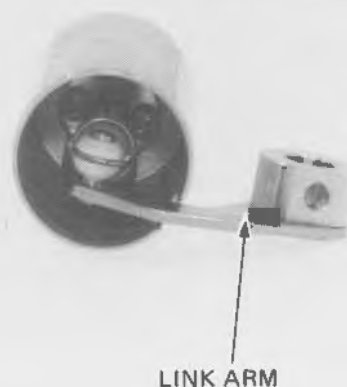
JET NEEDLE

## THROTTLE VALVE ASSEMBLY

Installation is reverse order of disassembly.

### CAUTION

*When assemble the throttle valve, install the link arm in its original direction.*



LINK ARM



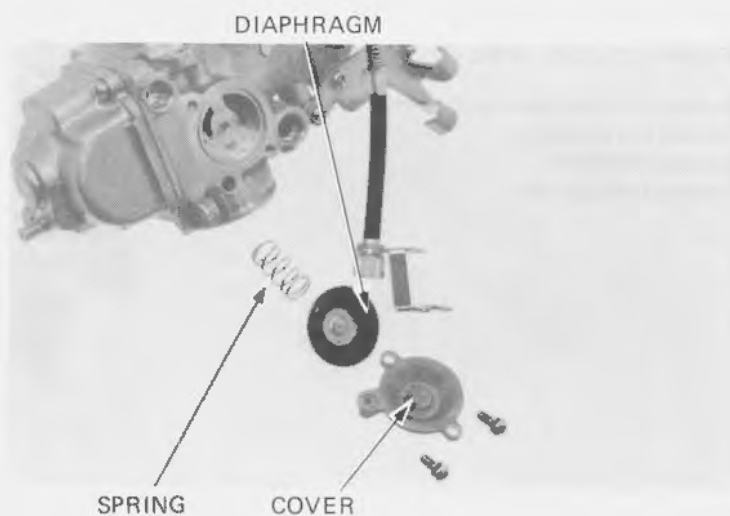
[www.hxl.it](http://www.hxl.it)



### AIR CUT-OFF VALVE DISASSEMBLY

Remove the air cut-off valve cover and pull out the spring.

Remove the diaphragm and inspect it for tears or pin holes.



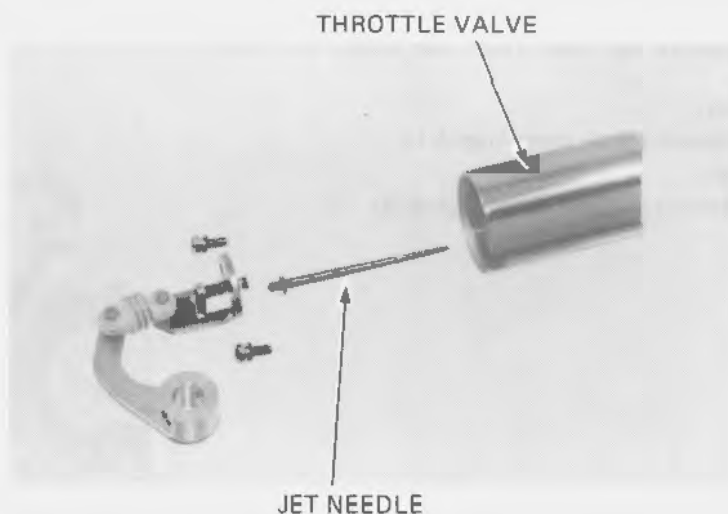
### CARBURETOR ASSEMBLY

#### NOTE

- Use new O-rings whenever the carburetor is reassembled.
- Handle all jets and needles with care. They can easily be scored or scratched.
- Be sure to install the top cover screw washers during assembly.

Assemble the carburetors in the reverse order of disassembly. Turn the air screws to the position recorded during disassembly.

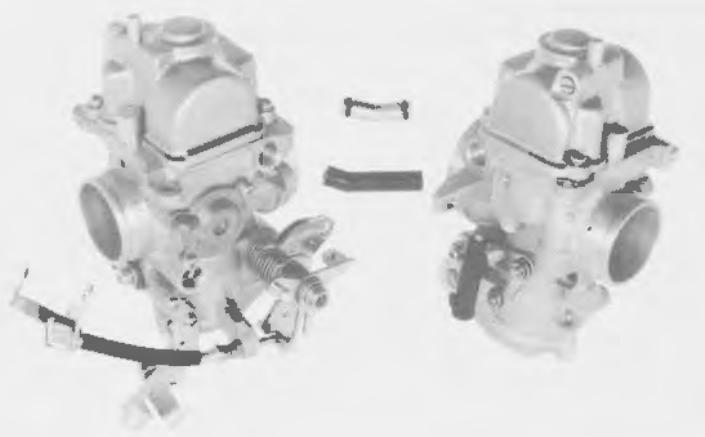
Install the jet needle clip on the jet needle.



### CARBURETOR COMBINATION

Assemble the carburetors in the reverse order of separation.

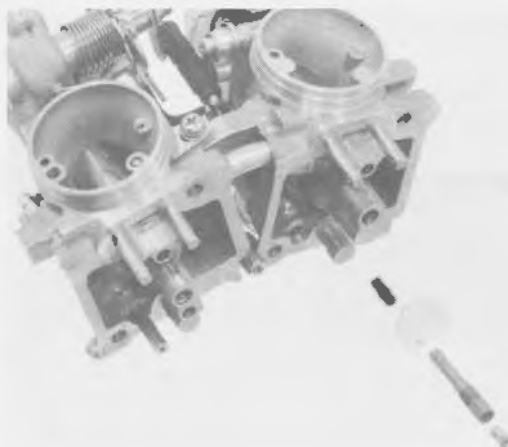
After reinstalling the carburetors, adjust the idle speed and secondary carburetor touch lever adjustment.





### FLOAT, FLOAT VALVE, AND JETS

Remove the float chamber bodies.  
Pull out the float pins.  
Remove the floats.  
Remove the main jets.



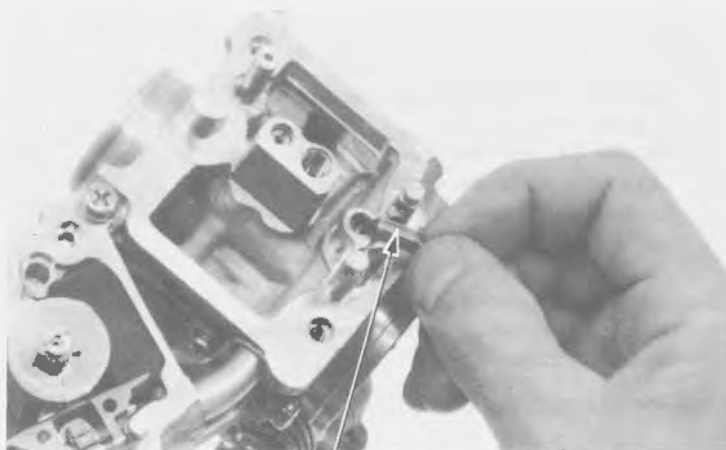
Remove the float valve and needle jet holder.

'83:

Remove the air screw (page 4-14).

'84:

Remove the pilot screw (page 4-15).



FLOAT VALVE

Check each part for wear or damage.  
Blow open all jets and passages with compressed air.





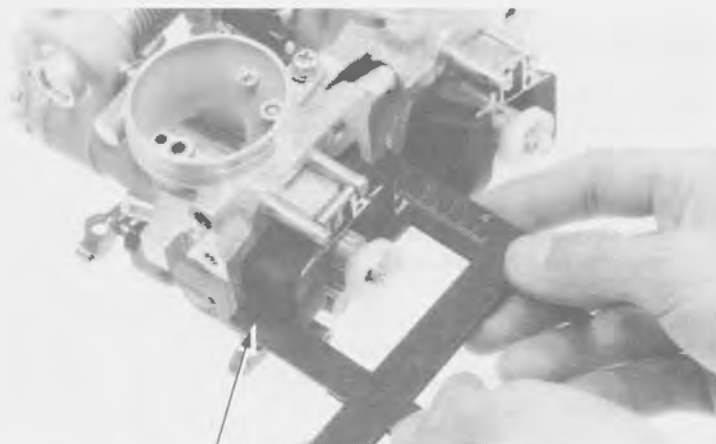


### FLOAT LEVEL ADJUSTMENT

Adjust the float level by carefully bending the float arm until the float tip just contacts the float valve.

**FLOAT LEVEL: 20.0 mm (0.79 in)**

Reinstall the float chamber bodies.

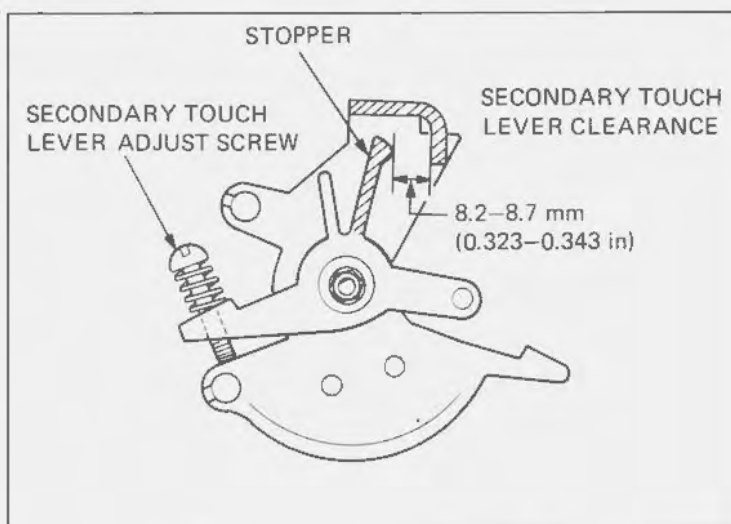


FLOAT LEVEL GAUGE 07401-0010000

### SECONDARY CARBURETOR TOUCH LEVER ADJUSTMENT

Turn the throttle stop screw counter-clockwise fully. Turn the touch lever adjust screw until the stopper on the lever is contact the lug on the throttle lever.

Turn the touch lever adjust screw in so that the clearance between the stopper and lug is 8.2–8.7 mm (0.323–0.343 in).



### CARBURETOR INSTALLATION

Install the carburetor in the reverse order of removal. Adjust the throttle grip free play (Page 3-3).





## '83: AIR SCREW

### REMOVAL/INSTALLATION

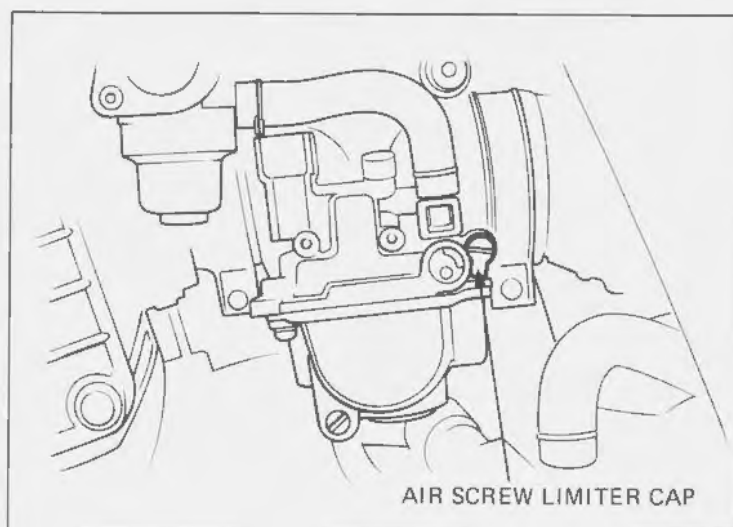
#### NOTE

- The air screw is factory preset and should not be removed unless the carburetor is overhauled.
- The air screw must be replaced with a new one whenever it is removed.

Using pliers, break off the air screw limiter cap and then remove the remainder of the air screw. Install a new air screw and then adjust it as described below.

#### NOTE

Do not install a limiter cap on a new air screw until after adjustment has been made (see below).



### IDLE DROP PROCEDURE

#### NOTE

- The air screw is factory preset and no adjustment is necessary unless the air screw is replaced (see removal above).
- Use a tachometer with graduations of 100 rpm or smaller and that will accurately indicate a 100 rpm change.

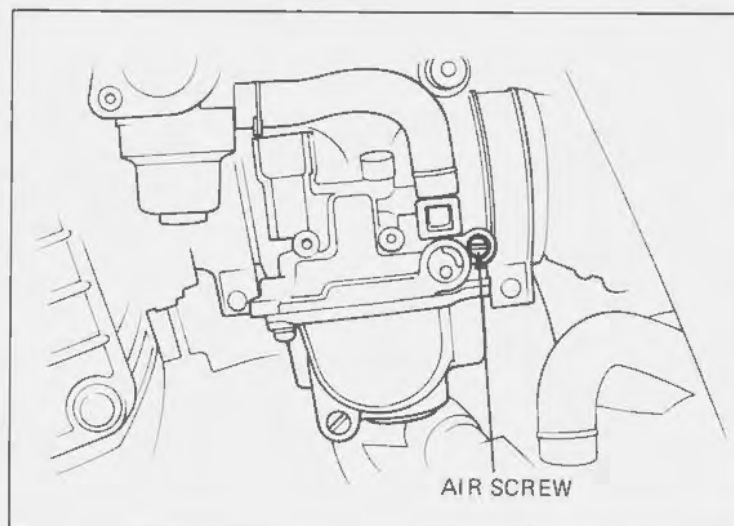
1. Turn the new air screw clockwise until it seats lightly and back it out to the specification given. This is an initial setting prior to the final air screw adjustment.

#### INITIAL OPENING: 1 turn out

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

#### IDLE SPEED: 1,200 ± 100 rpm

5. Turn the air screw in or out slowly to obtain the highest engine speed.
6. Readjust the idle speed with the throttle stop screw.
7. Turn the air screw in gradually until the engine speed drops 100 rpm.





8. Turn the air screw 1 turn out from the position obtained in step 7.
9. Readjust the idle speed with the throttle stop screw.
10. Apply Loctite® 601 or equivalent to the inside of the limiter cap. Place the cap over the air screw so that its tab rests against the stop, preventing adjustment that would enrich the fuel mixture (limiter cap position permits counter-clockwise rotation and prevents clockwise rotation).

**NOTE**

An air screw limiter cap must be installed. It prevents misadjustment that could cause poor performance and increased emissions. Be careful not to turn the air screw when installing the limiter cap.

## '84: PILOT SCREW

### REMOVAL/INSTALLATION

**NOTE**

The pilot screw is factory preset and should not be removed unless the carburetor is overhauled.

**CAUTION**

*Any forcible attempt to remove the pilot screw limiter cap will cause screw breakage.*

Remove the carburetor (page 4-8).

Remove the float chamber.

Turn the pilot screw in, carefully counting the number of turns before it seats lightly. Make a note of this to use as a reference when reinstalling the pilot screw.

**CAUTION**

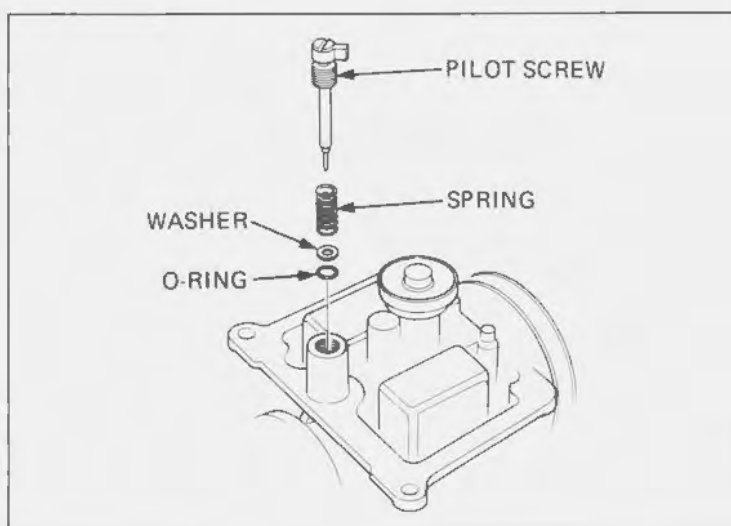
*Damage to the pilot screw seat will occur if the pilot screw is tightened against the seat.*

Remove the pilot screw and inspect it for wear. Replace it if necessary.

Install the pilot screw and return it to its original position as noted during removal. Perform pilot screw adjustment if a new pilot screw is installed.

**NOTE**

Do not install a limiter cap on a new pilot screw until after adjustment has been made (See next page).





## ADJUSTMENT (IDLE DROP PROCEDURE)

### NOTE

- The pilot screw is factory preset and no adjustment is necessary unless the pilot screw is replaced (see removal on page 4-15).
- A limiter cap restricts adjustment to 7/8 of a turn.
- Use a tachometer with graduations of 100 rpm or smaller and that will accurately indicate a 100 rpm change.

### CAUTION

*Any forcible attempt to remove the pilot screw limiter cap will cause screw breakage.*

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

### INITIAL OPENING: 2 turns out

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

### IDLE SPEED: 1,300 $\pm$ 100 rpm

5. Turn the pilot screw in or out slowly to obtain the highest engine speed.
6. Readjust the idle speed with the throttle stop screw.
7. Turn the pilot screw in gradually until the engine speed drops 100 rpm.

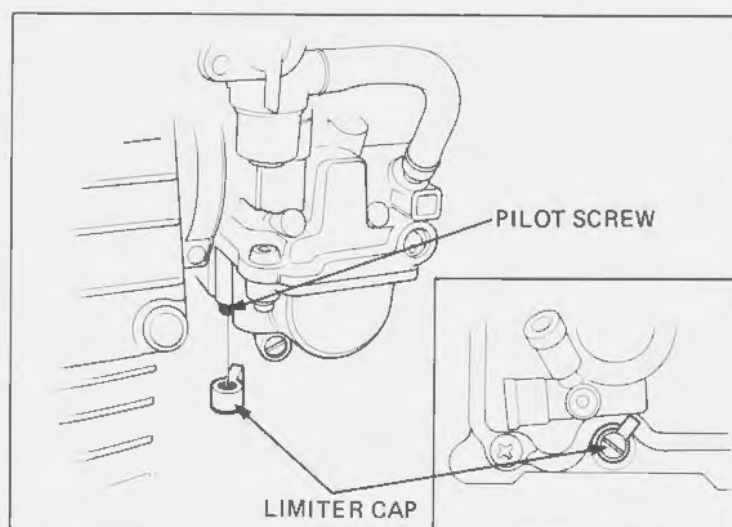
### NOTE

*If the pilot screw seats before lowering the engine speed 100 rpm, continue to step 8.*

8. Turn the pilot screw 1-1/2 turn open from the position obtained in step 7.
9. Readjust the idle speed with the throttle stop screw.
10. Apply Loctite® 601 or equivalent to the inside of the limiter cap. Place the cap over the pilot screw so that its tab rests against the float chamber stop so it can be turned clockwise only. This will prevent adjustment in the counterclockwise direction which richens the fuel mixture.

### NOTE

*Be careful not to turn the pilot screw when installing the limiter cap.*





## HIGH ALTITUDE ADJUSTMENT (USA only)

When the vehicle is to be operated continuously above 2,000 m (6,500 feet) the carburetors must be readjusted as follows to improve driveability and decrease exhaust emissions.

Warm up the engine to operating temperature. Stop and go driving for 10 minutes is sufficient.

'83:

Turn the air screw counterclockwise 1/2 turn.

Adjust the idle speed to  $1,200 \pm 100$  rpm with the throttle stop screw.

'84:

Remove the carburetor (page 4-7) and remove the carburetor float chamber.

Remove the primary and secondary main jets and install the new jet as follows:

### MAIN JET SPECIFICATION

| ALTITUDE                   | '84                    | '84 CALIFORNIA MODEL   |
|----------------------------|------------------------|------------------------|
| Above 2,000 m (6,500 feet) | Pri: #112<br>2nd: #112 | Pri: #110<br>2nd: #110 |
| Below 1,500 m (5,000 feet) | Pri: #120<br>2nd: #120 | Pri: #118<br>2nd: #118 |

Turn the pilot screw clockwise 1/2 turn.

Reassemble and install the carburetor.

Warm up the engine to operating temperature.

Stop and go driving for 10 minutes is sufficient.

Adjust the idle speed to  $1,300 \pm 100$  rpm with the throttle stop screw.

ALL MODELS:

### NOTE

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

Attach a Vehicle Emission Control Information Update label to the left frame cover as shown. Refer to Service Bulletin SL#132 for information on obtaining the label.

### CAUTION

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

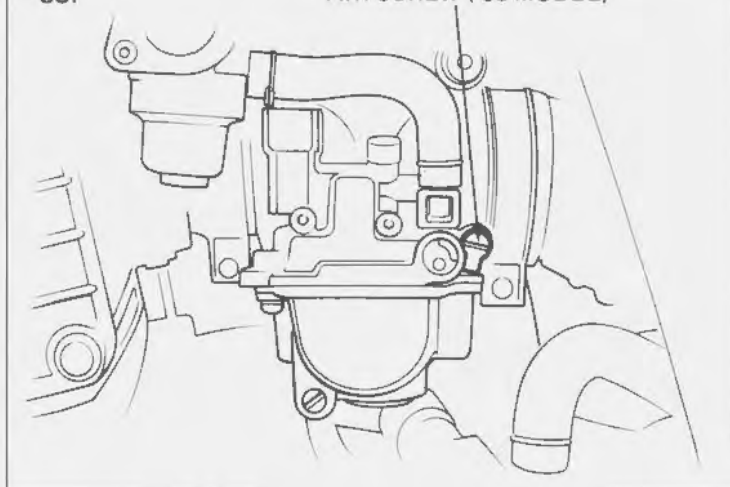
'83:

When the vehicle is to be operated continuously below 5,000 feet (1,500 m), turn the air screw clockwise to its original position against its stop. Adjust the idle speed to  $1,200 \pm 100$  rpm. Be sure to do these adjustments at low altitude.

'84:

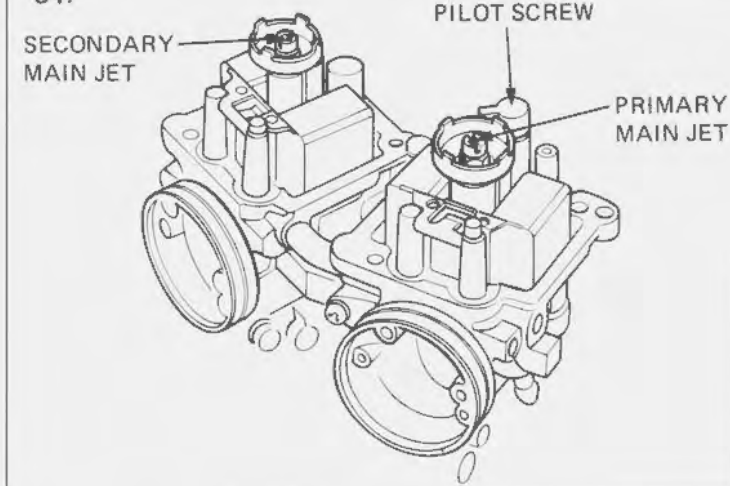
When the vehicle is to be operated continuously below 5,000 feet (1,500 meters); reinstall the original main jets and turn the pilot screw counterclockwise to its original position against its stop and adjust the idle speed to  $1,300 \pm 100$  rpm. Be sure to do these adjustments at low altitude.

'83: AIR SCREW ('83 MODEL)



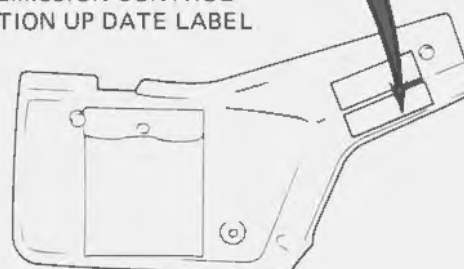
'84:

SECONDARY MAIN JET PILOT SCREW PRIMARY MAIN JET



VEHICLE EMISSION CONTROL INFORMATION UPDATE  
HONDA MOTOR CO., LTD.  
THIS VEHICLE HAS BEEN ADJUSTED TO  
IMPROVE EMISSION CONTROL PERFORMANCE  
WHEN OPERATED AT HIGH ALTITUDE.  
ALTITUDE PERFORMANCE ADJUSTMENT INSTRUCTIONS  
ARE AVAILABLE AT YOUR AUTHORIZED HONDA DEALER.

VEHICLE EMISSION CONTROL  
INFORMATION UP DATE LABEL





## PURGE CONTROL VALVE INSPECTION (CALIFORNIA MODEL)

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

Replace any hose that shows signs of damage or deterioration.

### NOTE

The PCV is located under the right carburetor.

Disconnect the PCV hoses from their connections and remove the PCV from its mount. Refer to the routing label on the inside of the frame right side cover for hose connections.

Connect a vacuum pump to the 8 mm I.D. hose that goes to the left carburetor body. Apply the specified vacuum to the PCV.

### SPECIFIED VACUUM: 250 mm (9.8 in) Hg

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

Remove the vacuum pump and connect it to the hose that goes to the left carburetor cap. Apply the specified vacuum to the PCV.

### SPECIFIED VACUUM: 250 mm (9.8 in) Hg

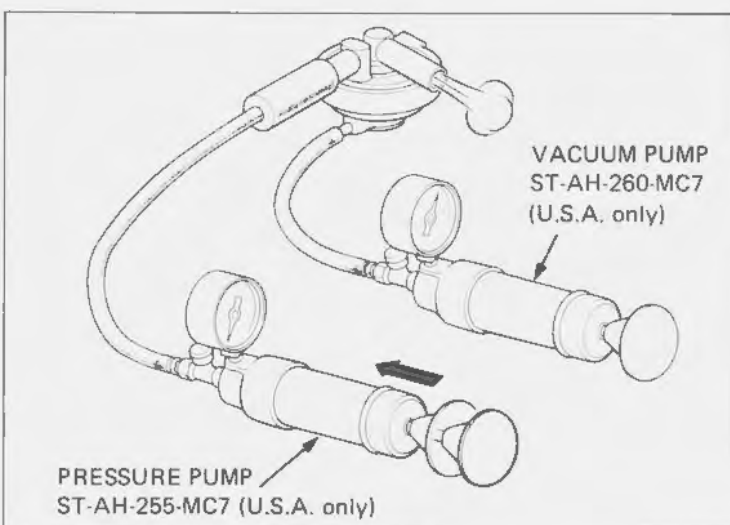
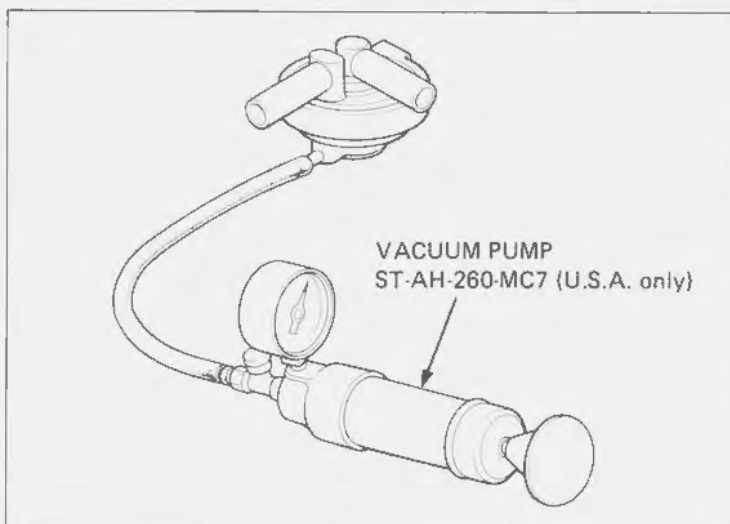
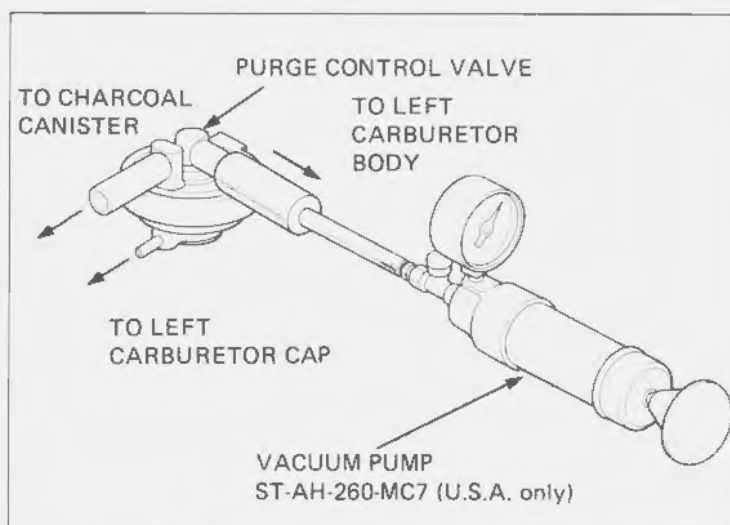
The specified vacuum should be maintained. Replace the PCV if vacuum is not maintained.

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

### CAUTION

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

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







### VACUUM TUBE ROUTING

Connect the vacuum tubes noting the numbers indicated on the canister:

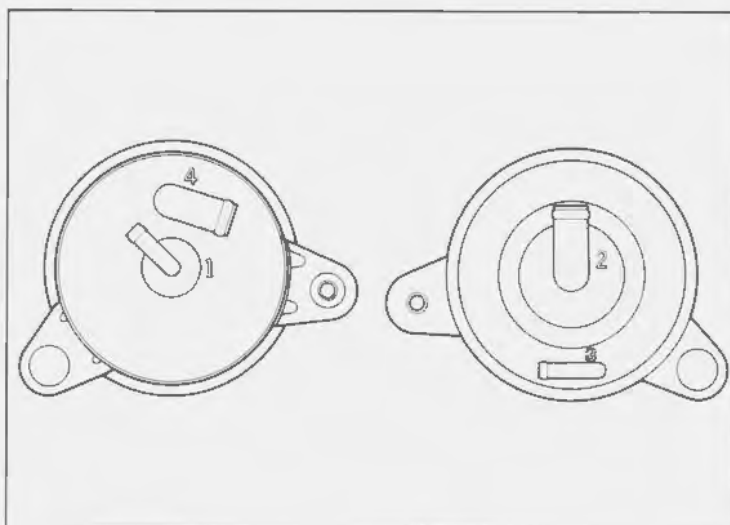
Destinations:

No. 1: Fuel tank

No. 2: Atmosphere

No. 3: Drain

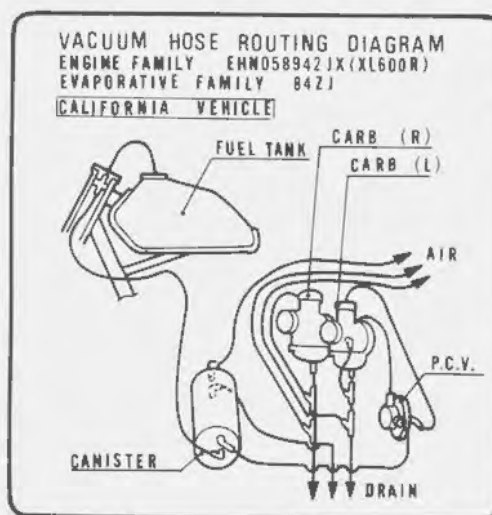
No. 4: Purge control valve



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

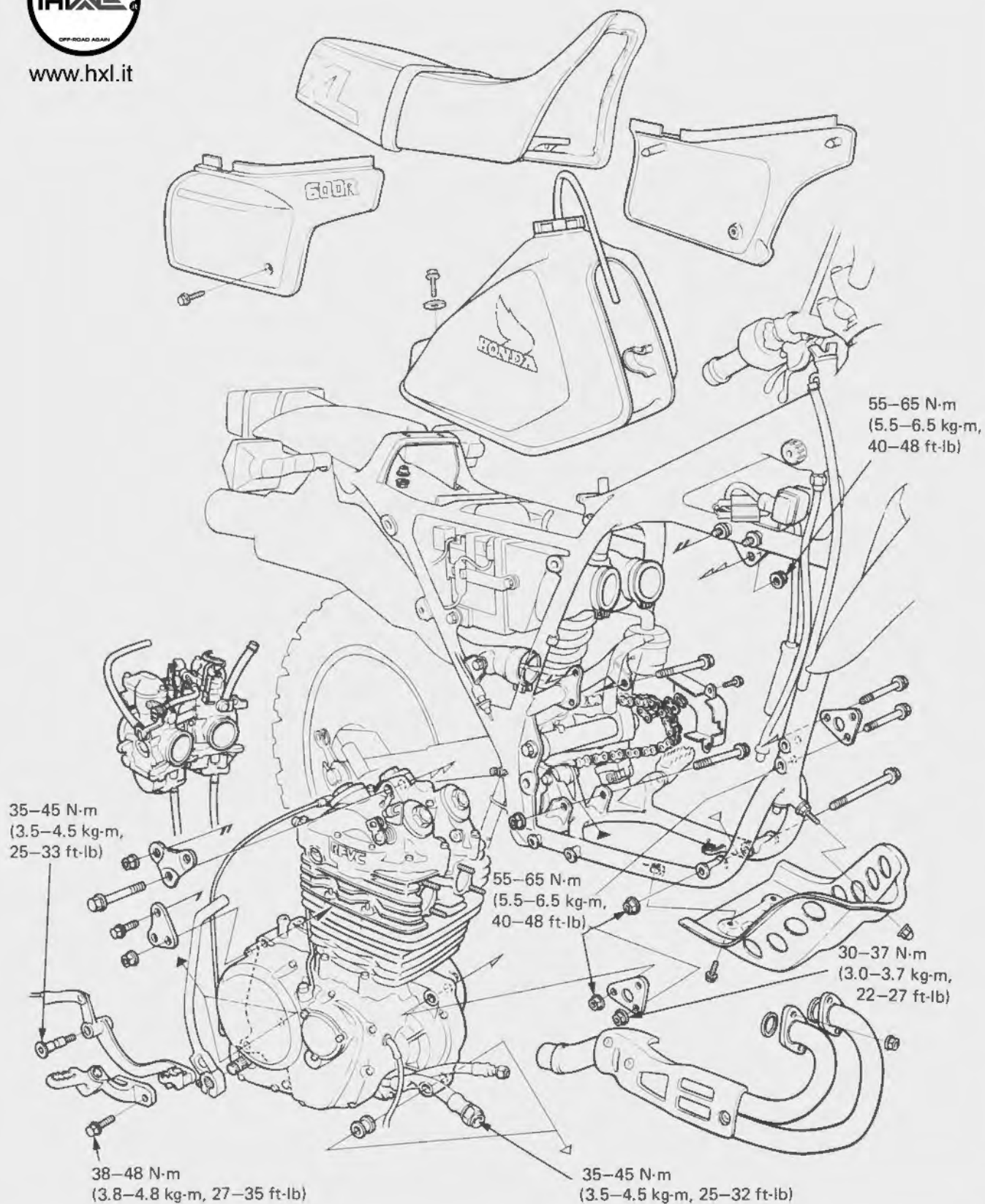
#### NOTE

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





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|                     |     |
|---------------------|-----|
| SERVICE INFORMATION | 5-1 |
| ENGINE REMOVAL      | 5-2 |
| ENGINE INSTALLATION | 5-6 |

## SERVICE INFORMATION

### GENERAL INSTRUCTIONS

- During removal and installation, support the vehicle with a suitable box or workstand.
- A jack or adjustable support is required to maneuver the engine.

- Parts requiring engine removal for servicing:

|               |            |
|---------------|------------|
| Cylinder head | Section 6  |
| Cylinder      | Section 7  |
| Crankshaft    | Section 11 |
| Balancer      | Section 11 |
| Transmission  | Section 12 |

### SPECIFICATIONS

|               |                                                                                                     |
|---------------|-----------------------------------------------------------------------------------------------------|
| Engine weight | 44 kg (97 ft-lb)                                                                                    |
| Oil capacity  | 2.5 lit (2.6 US qt, 2.2 Imp qt) after disassembly<br>2.0 lit (2.1 US qt, 1.8 Imp qt) after draining |

### TORQUE VALUES

|                        |                                       |
|------------------------|---------------------------------------|
| Engine hanger bolts:   |                                       |
| 8 mm bolt              | 30-37 N·m (3.0-3.7 kg-m, 22-27 ft-lb) |
| 10 mm bolt             | 55-65 N·m (5.5-6.5 kg-m, 40-47 ft-lb) |
| Foot peg bolt          | 38-48 N·m (3.8-4.8 kg-m, 27-35 ft-lb) |
| Muffler band           | 15-25 N·m (1.5-2.5 kg-m, 11-18 ft-lb) |
| Exhaust manifold nut   | 18-25 N·m (1.8-2.5 kg-m, 13-18 ft-lb) |
| Oil pipe flange nuts   | 35-45 N·m (3.5-4.5 kg-m, 25-32 ft-lb) |
| Exhaust pipe protector | 8-12 N·m (0.8-1.2 kg-m, 6-9 ft-lb)    |
| Rear axle nut          | 80-100 N·m (8.0-10 kg-m, 58-72 ft-lb) |
| Seat                   | 8-12 N·m (0.8-1.2 kg-m, 6-9 ft-lb)    |

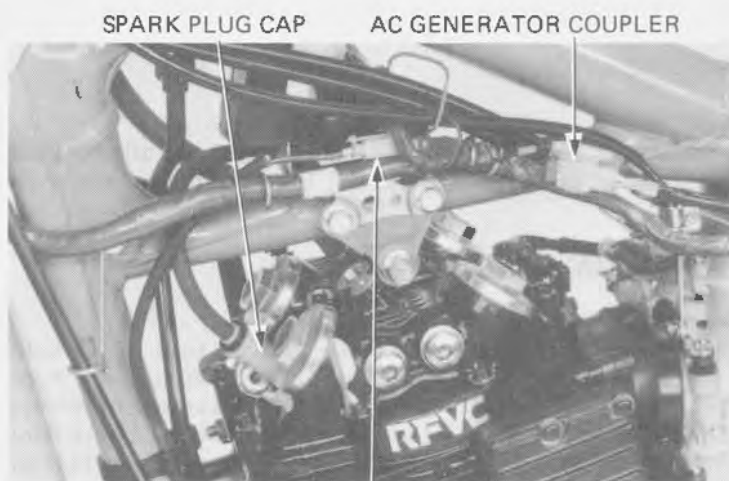


## ENGINE REMOVAL

Drain the oil from the engine and down tube.  
Remove the seat.  
Turn the fuel valve "OFF" and disconnect the fuel lines. Remove the fuel tank.

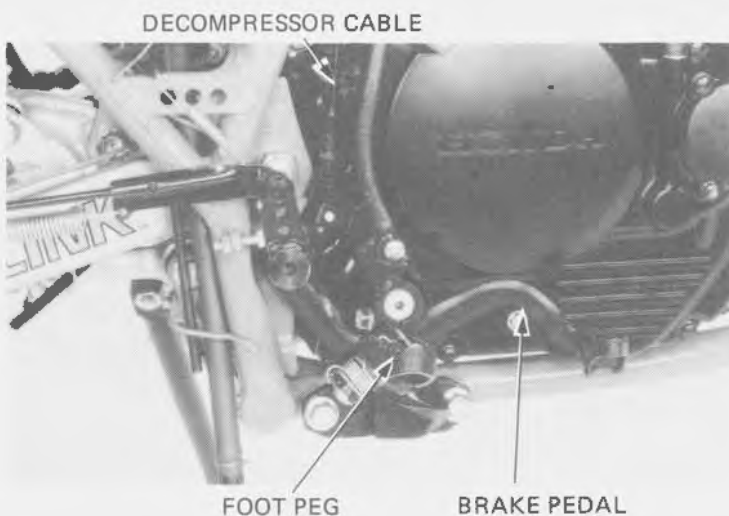


Disconnect the alternator and pulse generator wire.  
Remove the spark plug cap.



PULSE GENERATOR COUPLER

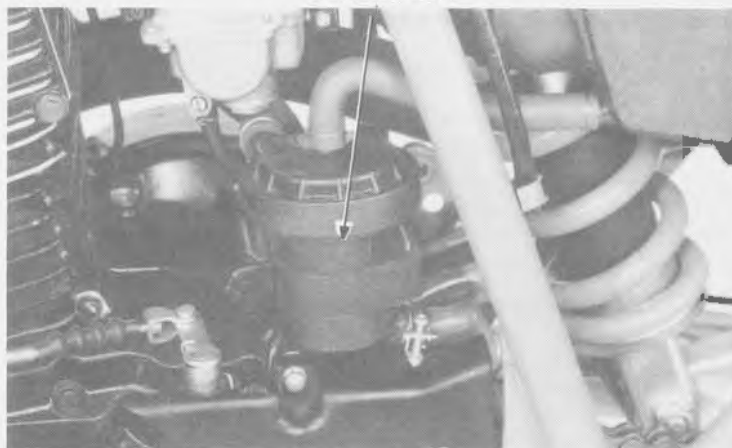
Remove the right foot peg.  
Remove the rear brake linkage and rear brake pedal.  
Disconnect the kick starter decompressor cable.





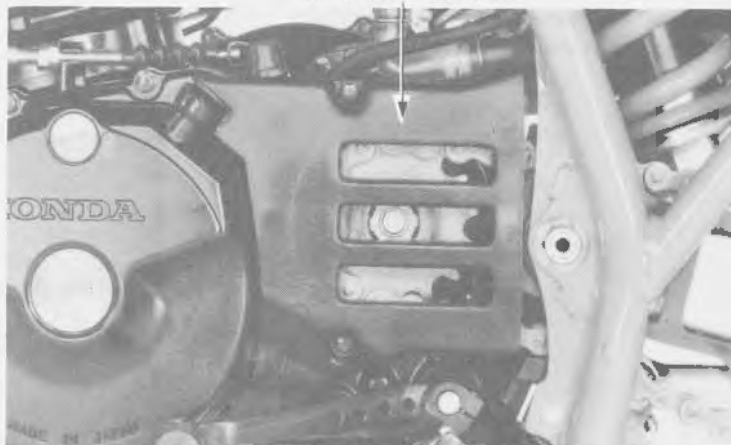
Disconnect the separator tubes and remove the separator.

SEPARATOR



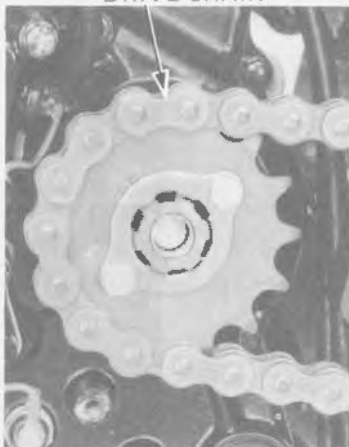
Remove the left foot peg.  
Loosen the rear axle nut.  
Turn the chain adjuster to loosen the chain.  
Remove the drive sprocket cover.

SPROCKET COVER



Disconnect the drive chain from sprocket.  
Remove the clutch cable.

DRIVE CHAIN



CLUTCH CABLE





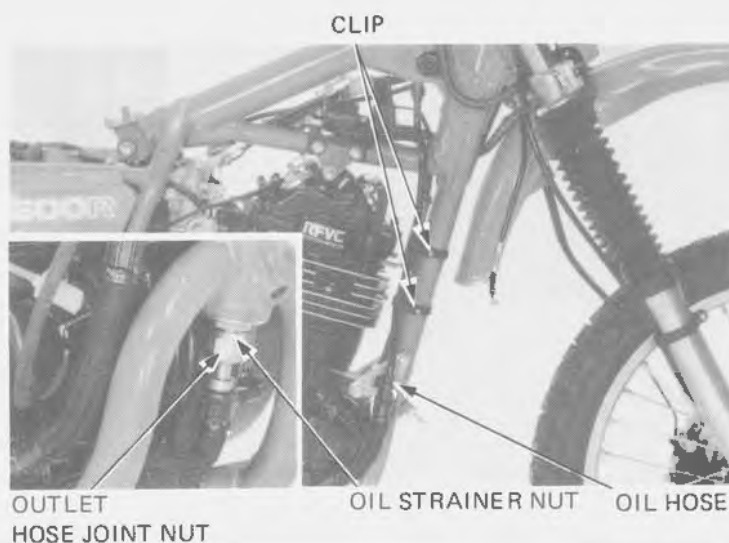
Remove the exhaust pipe protector and exhaust pipe.



Disconnect the manual decompressor cable.  
Disconnect the oil over flow tube.



Loosen the oil inlet and outlet hose joint nuts and disconnect.  
The hoses from the oil outlet pipe and the oil strainer nut.





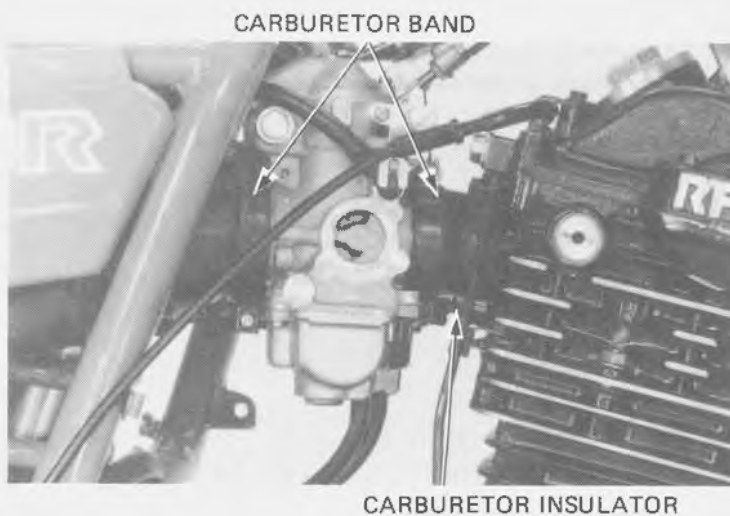


Remove the three bolts on the carburetor insulator. Loosen the carburetor bands, then remove the carburetors.

Place a jack or padded block under the engine. Remove the upper engine hanger bracket. Remove the front engine hanger bracket, and bolt. Remove the rear engine hanger bracket and bolts. Remove the engine.

### NOTE

Jack height must be continuously adjusted during engine removal and installation to prevent damage to mounting bolt threads, wire harnesses and cables.





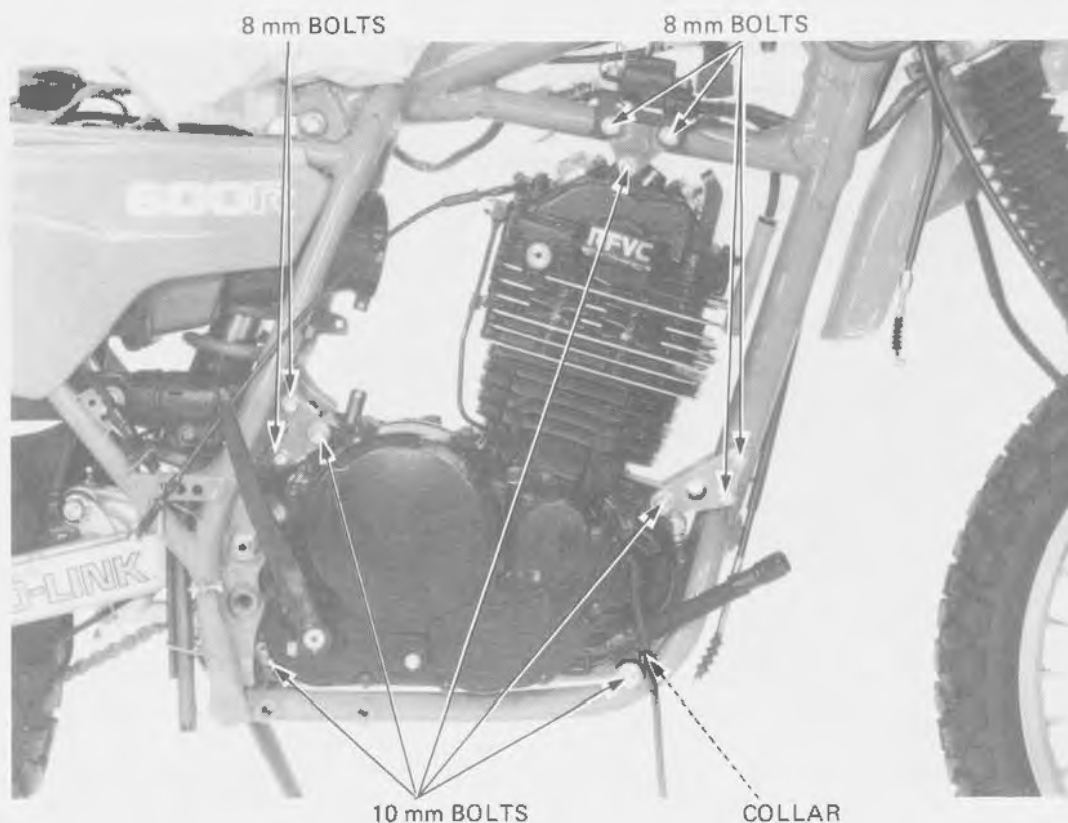
## ENGINE INSTALLATION

Install the engine in the reverse order of removal, noting the following:

Replace any damaged or leaking exhaust pipe gaskets.

Tighten all bolts to the proper torque specifications.

Route all wire harnesses and cables properly (Page 1-8 and 1-9).



Perform the following inspections and adjustments:

Engine oil (Page 2-2).

Throttle grip free play (Page 3-3).

Drive chain (Page 3-11).

Rear brake pedal free play (Page 3-14).

Clutch lever free play (Page 3-16).

Decompressor lever free play (Page 3-8).

Check all electrical equipment.



**HONDA**  
**XL600R**

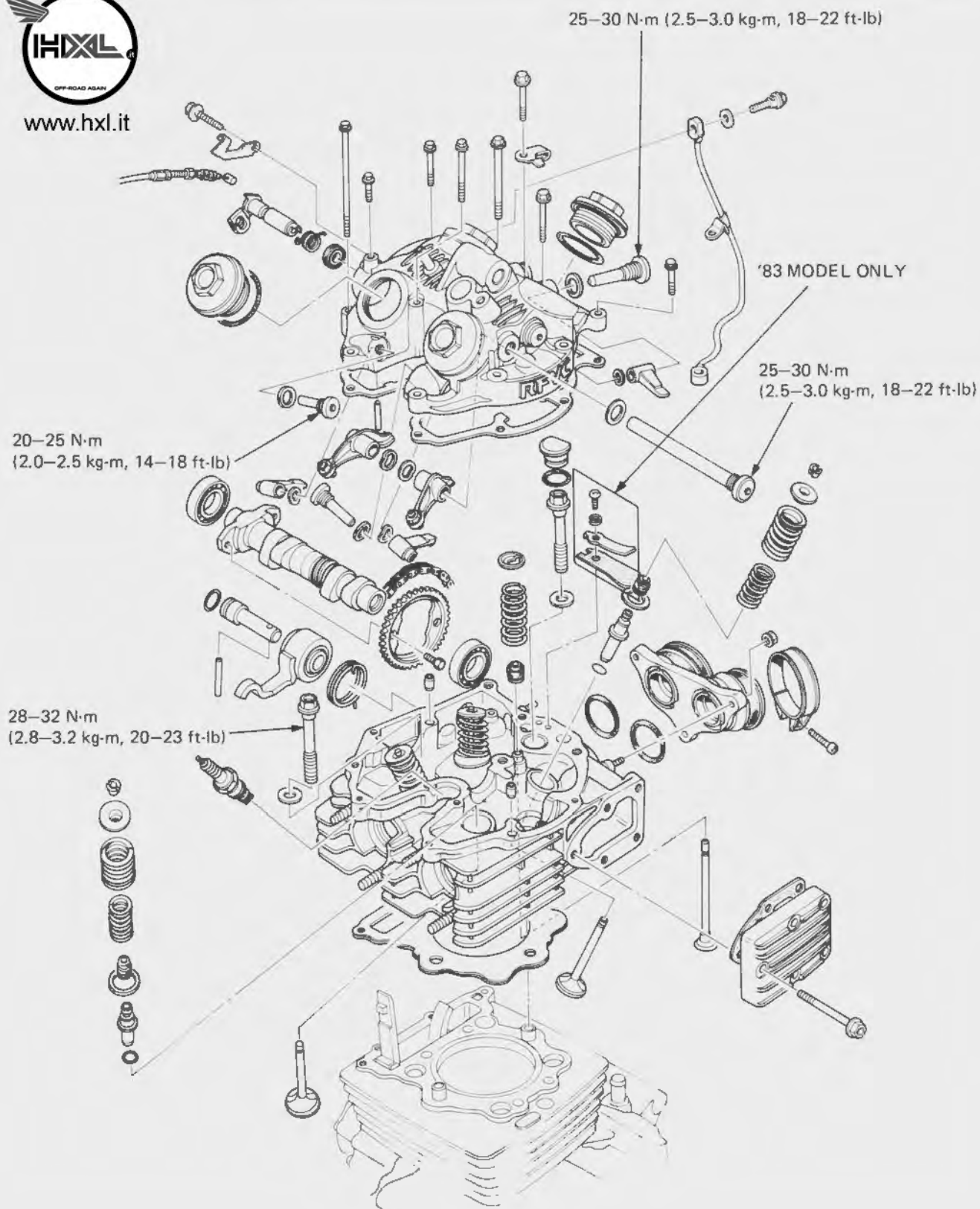
ENGINE REMOVAL/INSTALLATION

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MEMO



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|                                         |      |
|-----------------------------------------|------|
| SERVICE INFORMATION                     | 6-1  |
| TROUBLESHOOTING                         | 6-3  |
| CYLINDER HEAD COVER REMOVAL             | 6-4  |
| CYLINDER HEAD COVER DISASSEMBLY         | 6-5  |
| CAM CHAIN TENSIONER REMOVAL             | 6-8  |
| CAMSHAFT REMOVAL                        | 6-10 |
| CYLINDER HEAD REMOVAL                   | 6-12 |
| CYLINDER HEAD DISASSEMBLY               | 6-13 |
| VALVE SEAT INSPECTION AND REFACING      | 6-17 |
| CYLINDER HEAD ASSEMBLY                  | 6-20 |
| CAM CHAIN TENSIONER LIFTER INSTALLATION | 6-22 |
| CYLINDER HEAD INSTALLATION              | 6-22 |
| CAMSHAFT INSTALLATION                   | 6-23 |
| CYLINDER HEAD COVER ASSEMBLY            | 6-25 |
| CYLINDER HEAD COVER INSTALLATION        | 6-28 |

## SERVICE INFORMATION

### GENERAL INSTRUCTIONS

- This section covers maintenance of the cylinder head, valves, camshaft, rocker arms and subrocker arms.
- The engine must be removed from the frame for top-end service.
- Before assembly, apply molybdenum disulfide grease to the camshaft journal to provide initial lubrication.
- Pour clean engine oil into the oil pockets in the cylinder head to lubricate the cams.

### TOOLS

#### SPECIAL TOOL

|                            |               |
|----------------------------|---------------|
| Camchain tensioner holder  | 07973-MG30001 |
| Valve guide reamer, 6.6 mm | 07984-6570100 |

#### COMMON TOOLS

|                            |                                                          |
|----------------------------|----------------------------------------------------------|
| Valve guide driver, 6.6 mm | 07742-0010200 (Not available in U.S.A.) or 07942-6570100 |
| Valve spring compressor    | 07757-0010000                                            |

### TORQUE VALUES

|                               |                                       |
|-------------------------------|---------------------------------------|
| Cylinder head bolt            | 28-32 N·m (28-32 kg-m, 20-23 ft-lb)   |
| Cam sprocket bolt             | 18-22 N·m (1.8-2.2 kg-m, 13-16 ft-lb) |
| Rocker arm adjuster lock nut  | 18-22 N·m (1.8-2.2 kg-m, 13-16 ft-lb) |
| Rocker arm shaft              | 25-30 N·m (2.5-3.0 kg-m, 14-22 ft-lb) |
| Subrocker arm shaft (IN)      | 25-30 N·m (2.5-3.0 kg-m, 18-22 ft-lb) |
| Subrocker arm shaft (EX)      | 20-25 N·m (2.0-2.5 kg-m, 14-18 ft-lb) |
| Cylinder head cover (6 mm SH) | 8-12 N·m (0.8-1.2 kg-m, 6-9 ft-lb)    |
| Cylinder head cover (6 mm)    | 10-14 N·m (1.0-1.4 kg-m, 7-10 ft-lb)  |
| Cylinder head cover (8 mm)    | 20-26 N·m (2.0-2.6 kg-m, 14-19 ft-lb) |
| Spark plug                    | 15-20 N·m (1.5-2.0 kg-m, 11-14 ft-lb) |



## SPECIFICATIONS

| ITEM                                    |                         |       | STANDARD                            | SERVICE LIMIT                     |                    |
|-----------------------------------------|-------------------------|-------|-------------------------------------|-----------------------------------|--------------------|
| Compression                             |                         |       | 12.5 kg/cm <sup>2</sup> (175 psi)   |                                   |                    |
| Camshaft                                | Cam lift                | IN    | 31.023 mm (1.2214 in)               | 30.85 mm (1.215 in)               |                    |
|                                         |                         | EX    | 30.976 mm (1.2195 in)               | 30.81 mm (1.213 in)               |                    |
|                                         | Runout                  |       |                                     | 0.04 mm (0.002 in)                |                    |
|                                         | Side clearance          |       | 0.05–0.25 mm (0.002–0.010 in)       | 0.40 mm (0.016 in)                |                    |
| Rocker arm                              | I.D.                    |       | 11.50–11.518 mm (0.4528–0.4535 in)  | 11.55 mm (0.455 in)               |                    |
| Subrocker arm                           | I.D.                    | IN    | 8.00–8.015 mm (0.3150–0.3155 in)    | 8.05 mm (0.317 in)                |                    |
|                                         |                         | EX    | 7.00–7.015 mm (0.2756–0.2761 in)    | 7.05 mm (0.277 in)                |                    |
| Rocker arm shaft                        | O.D.                    |       | 11.466–11.484 mm (0.4514–0.4521 in) | 11.41 mm (0.449 in)               |                    |
| Subrocker arm shaft                     | O.D.                    | IN    | 7.972–7.969 mm (0.3137–0.3139 in)   | 7.92 mm (0.312 in)                |                    |
|                                         |                         | EX    | 6.972–6.969 mm (0.2744–0.2745 in)   | 6.92 mm (0.272 in)                |                    |
| Rocker arm shaft-to-arm clearance       |                         |       | 0.016–0.052 mm (0.0006–0.0020 in)   | 0.14 mm (0.006 in)                |                    |
| Valve spring                            | Free length             | Inner | 35.1 mm (1.240 in)                  | 34.1 mm (1.34 in)                 |                    |
|                                         |                         | Outer | 36 mm (1.417 in)                    | 35.0 mm (1.38 in)                 |                    |
|                                         | Preload/length          | Inner | 6.14 ± 0.4 kg/28 mm                 |                                   |                    |
|                                         |                         | Outer | 11.8 ± 1.0 kg/31.5 mm               |                                   |                    |
| Sub chamber valve spring free length    |                         |       | 40.5 mm (1.594 in)                  | 39.3 mm (1.55 in)                 |                    |
| Sub chamber valve spring preload/length |                         |       | 4.1 ± 0.4 kg/                       |                                   |                    |
| Valve                                   | Stem O.D.               | IN    | 6.575–6.59 mm (0.2589–0.2594 in)    | 6.56 mm (0.257 in)                |                    |
|                                         |                         | EX    | 6.565–6.575 mm (0.2585–0.2589 in)   | 6.55 mm (0.258 in)                |                    |
|                                         | Stem-to-guide clearance | IN    | 0.010–0.040 mm (0.0004–0.0016 in)   |                                   |                    |
|                                         |                         | EX    | 0.030–0.055 mm (0.0012–0.0022 in)   | 0.080 mm (0.0031 in)              |                    |
|                                         | Valve seat width        | IN/EX | 1.2–1.4 mm (0.05–0.06 in)           | 2.0 mm (0.08 in)                  |                    |
|                                         | Valve face              | IN    | 1.20–1.85 mm (0.047–0.071 in)       | 2.6 mm (0.10 in)                  |                    |
|                                         | Width                   | EX    | 0.9–1.7 mm (0.04–0.67 in)           | 2.4 mm (0.09 in)                  |                    |
|                                         |                         |       |                                     |                                   |                    |
| Valve guide                             | I.D.                    | IN    | 6.600–6.615 mm (0.2598–0.2421 in)   | 6.63 mm (0.261 in)                |                    |
|                                         |                         | EX    | 6.600–6.615 mm (0.2598–0.2421 in)   | 6.63 mm (0.261 in)                |                    |
| Sub chamber valve stem O.D.             |                         |       | 4.97–4.985 mm (0.1957–0.1963 in)    | 4.96 mm (0.195 in)                |                    |
| Guide I.D.                              |                         |       | IN                                  | 5.010–5.028 mm (0.1972–0.1980 in) | 5.02 mm (0.199 in) |
| Sub chamber valve face width            |                         |       | 1.00–1.40 mm (0.039–0.551 in)       | 2.0 mm (0.08 in)                  |                    |
| Cylinder head                           | Warpage                 |       |                                     | 0.1 mm (0.004 in)                 |                    |
| Sub chamber valve seat width            |                         |       |                                     | 1.5 mm (0.059 in)                 |                    |





### TROUBLESHOOTING

Engine top-end problems are usually performance-related and can usually be diagnosed by a compression test. Engine noises can usually be traced to the top-end with a sounding rod or stethoscope.

#### Low Compression

##### 1. Valves

- Incorrect valve adjustment
- Burned or bent valves
- Incorrect valve timing
- Broken valve spring

##### 2. Cylinder head

- Leaking or damaged head gasket
- Warped or cracked cylinder head

##### 3. Cylinder and piston (Refer to Section 7)

##### 4. Decompressor adjustment incorrect

#### High Compression

##### 1. Excessive carbon build-up on piston crown or combustion chamber

#### Excessive Noise

1. Incorrect valve adjustment
2. Sticking valve or broken valve spring
3. Damaged or worn rocker arm or camshaft
4. Loose or worn cam chain
5. Worn or damaged cam chain tensioner
6. Worn cam sprocket teeth

#### Poor Idling

1. Compression too low
2. Decompressor adjustment incorrect
3. Subchamber valve stuck open.

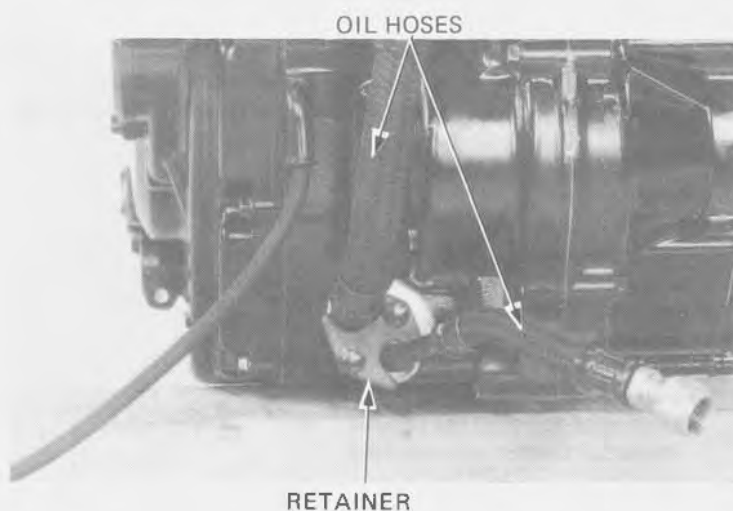
#### Kick Starting Difficult

1. Decompressor adjustment incorrect

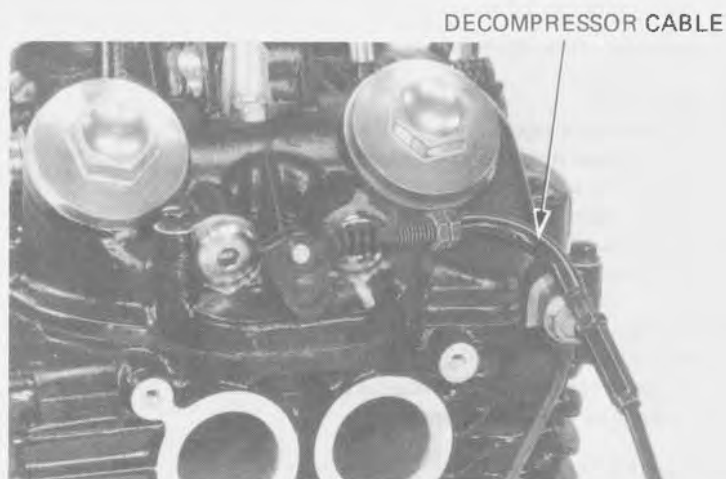


## CYLINDER HEAD COVER REMOVAL

Remove the engine from the frame (See Section 5).  
Remove the oil hoses by removing the retainer.



Loosen the kick starter decompressor cable lock nut and remove the cable from the holder.  
Disconnect the cable from the valve lifter lever.



Remove the oil pipe.  
Remove the kick starter pedal.





Remove the valve adjuster covers.  
Remove the cylinder head cover bolts.  
Removes the cylinder head cover.



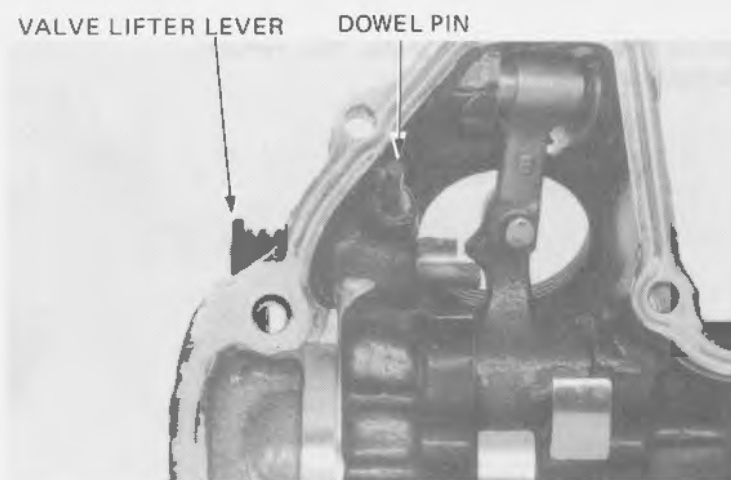
### OIL PIPE INSPECTION

Inspect the oil pipe and bolts for clogging.  
Inspect the condition of the sealing washers.



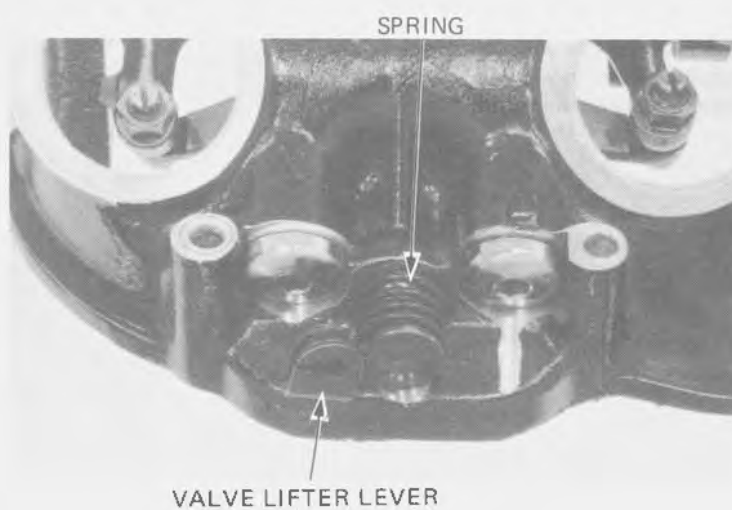
### CYLINDER HEAD COVER DISASSEMBLY

Hold the cylinder head cover securely and remove the dowel pin holding the valve lifter lever.

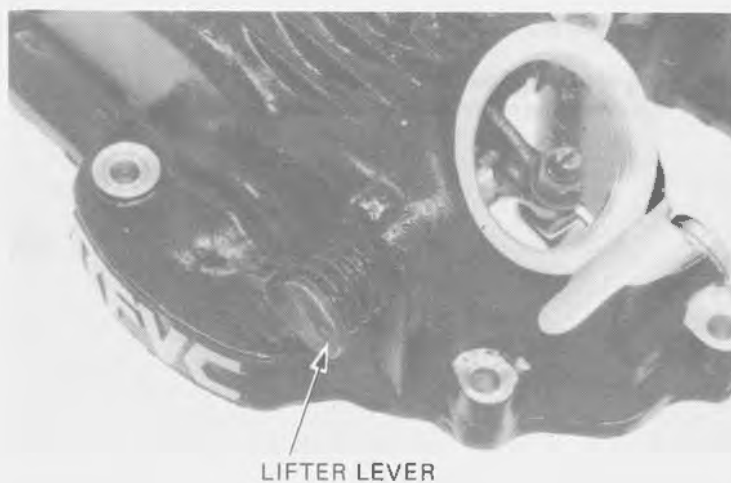




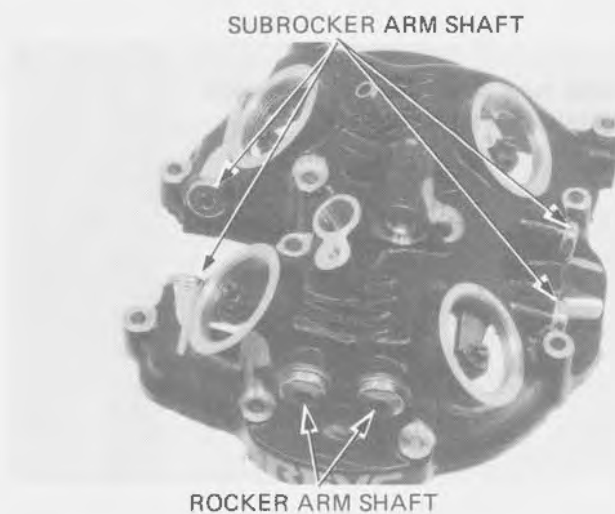
Disconnect the spring and remove the kickstarter valve lifter lever.



Disconnect the spring for the manual decompressor lever.

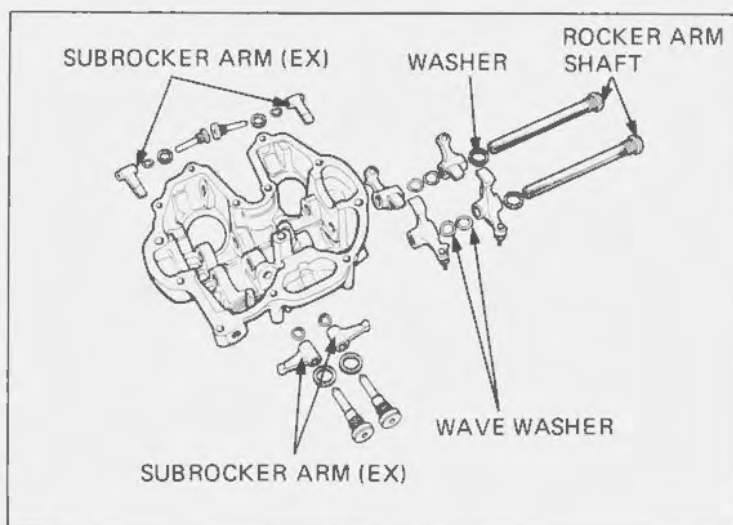


Remove the subrocker arm shafts, then remove the rocker arm shafts.





Remove the subrocker arms, rocker arms and wave washers from their shafts.



### ROCKER ARM AND SUBROCKER ARMS INSPECTION

Inspect the rocker arms and subrocker arms sub-rocker arm requires for damage, wear or clogged oil holes.

#### NOTE

If any rocker arm or require servicing or replacement, inspect the corresponding cam lobe for scoring, chipping or flat spots.



#### [Rocker arm and rocker arm shaft]

Measure the I.D. of each rocker arm.

**SERVICE LIMIT: 11.55 mm (0.455 in)**

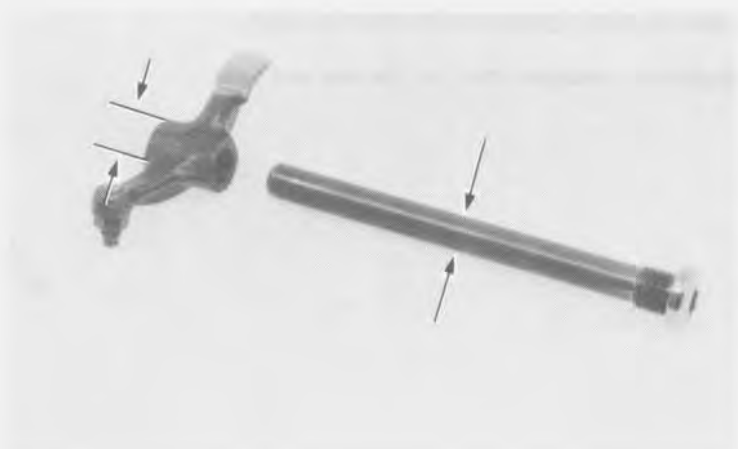
Inspect rocker arm shafts for wear or damage.

Measure the O.D.

**SERVICE LIMIT: 11.41 mm (0.449 in)**

Calculate the rocker arm-to-shaft clearance.

**SERVICE LIMIT: 0.14 mm (0.006 in)**




**[Subrocker arm and subrocker armshaft]**

Measure the I.D. of each subrocker arm EX and IN.

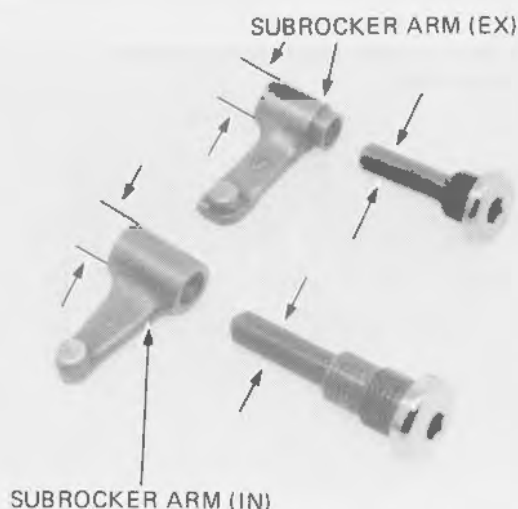
**SERVICE LIMIT:** EX 7.05 mm (0.277 in)  
 IN 8.05 mm (0.317 in)

Inspect subrocker arm shafts for wear or damage.  
 Measure the O.D.

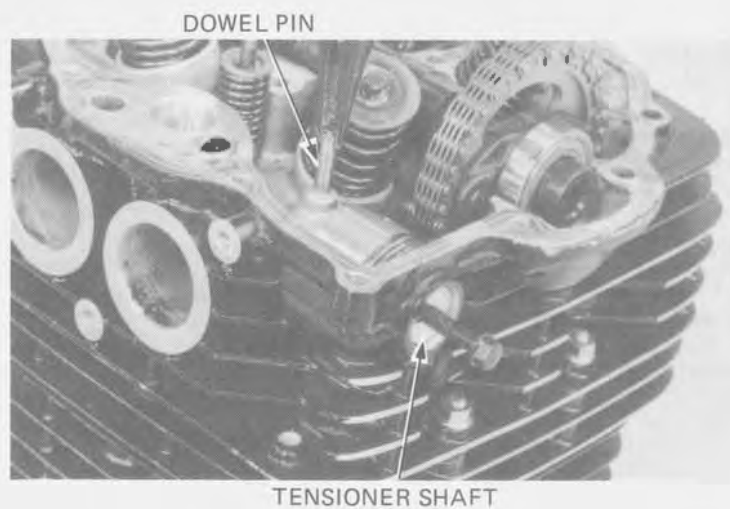
**SERVICE LIMIT:** EX 6.92 mm (0.272 in)  
 IN 7.92 mm (0.312 in)

Calculate the subrocker arms to shafts clearance.

**SERVICE LIMIT:** 0.13 mm (0.005 in)


**CAM CHAIN TENSIONER REMOVAL**

Remove the dowel pin holding the tensioner shaft.  
 Screw the bolt into the tensioner shaft, as shown  
 and pull the tensioner shaft out.  
 Remove the cam chain tensioner assembly.


**CAM CHAIN TENSIONER INSPECTION**

Inspect the tensioner shaft for damage and wear.







Insert the tensioner shaft into the tensioner and inspect the tensioner by turning the shaft. The tensioner shaft should turn clockwise freely and should not turn counter-clockwise.

CAM CHAIN TENSIONER



### '83: REED VALVE REMOVAL

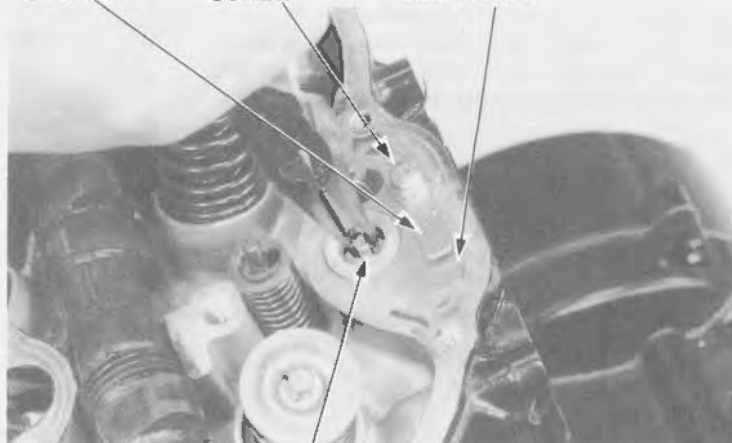
Remove the reed valve and stopper by removing the attaching screw.

**NOTE:**

Do not bend or distort the reed valve stopper.

Remove the cylinder head bolt hole plug.

STOPPER SCREW REED VALVE



### '83: REED VALVE INSPECTION

Inspect the reed valve for damage or distortion.

REED VALVE





## CAMSHAFT REMOVAL

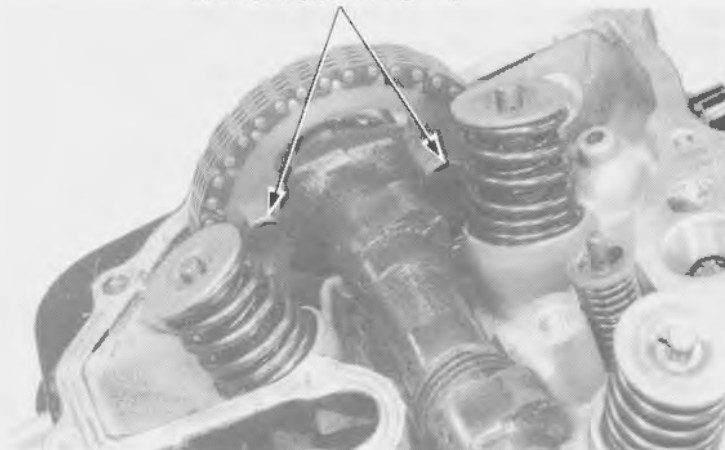
Remove the crankshaft hole cap and timing hole cap.

Rotate the crankshaft and remove the cam sprocket bolts.

### NOTE

Do not drop the bolts into the crankcase.

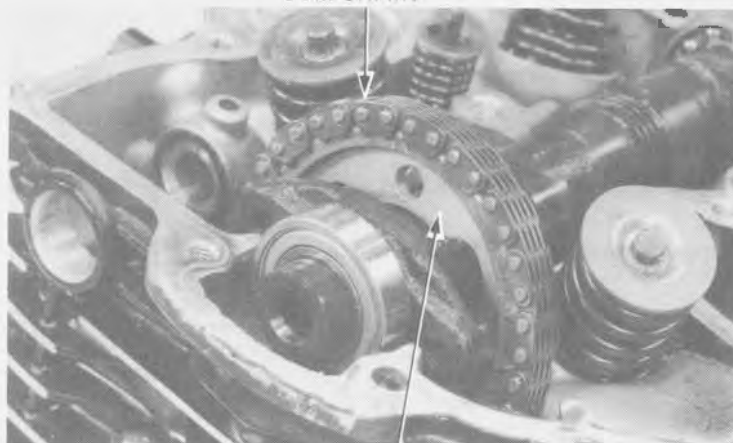
CAM SPROCKET BOLTS



Pull the cam sprocket off the camshaft.

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

CAM CHAIN



CAM SPROCKET

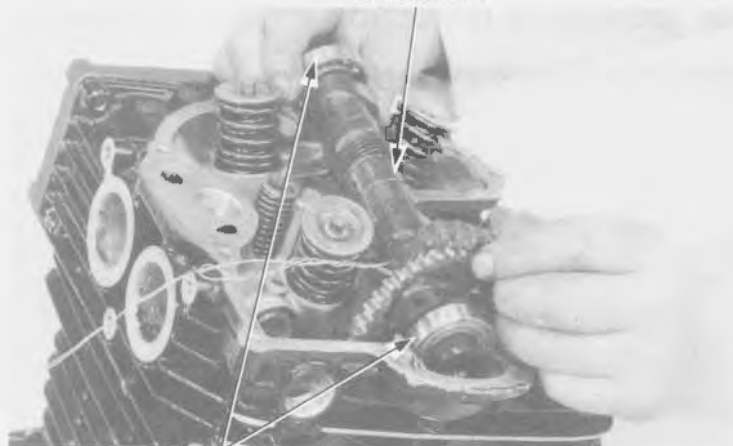
Pull the camshaft up and remove the sprocket and camshaft.

Remove the cam sprocket and cam bearings from the camshaft.

### NOTE

One of the cam bearings is shielded on one side; this bearing is for the sprocket side and the shield faces out.

CAM SHAFT



CAM SHAFT BEARINGS



### CAMSHAFT INSPECTION

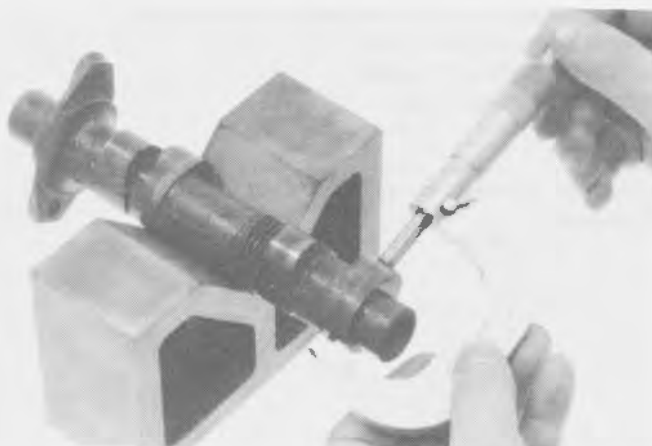
Check the camshaft journals for wear or damage.



Check each cam lobe for wear or damage.  
Measure the cam lobe height.

#### SERVICE LIMITS:

Intake: 30.85 mm (1.215 in)  
Exhaust: 30.81 mm (1.213 in)

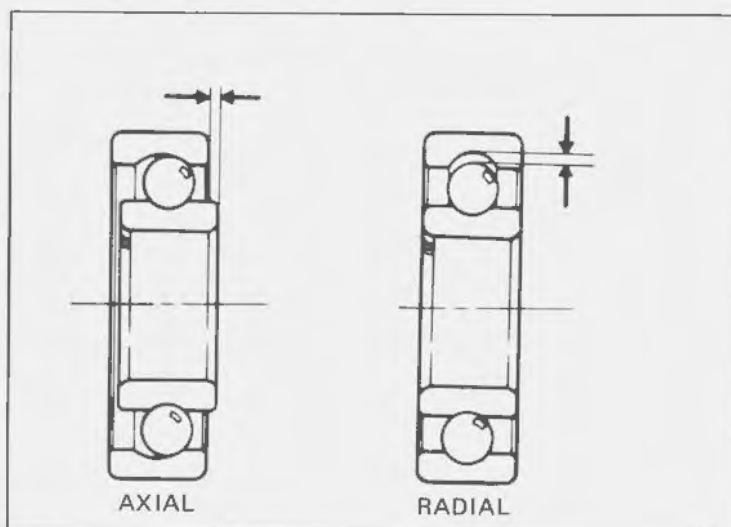


### CAMSHAFT BEARING INSPECTION

Spin the camshaft bearings by hand check for play.  
Replace a bearing with a new one if it is noisy or has excessive play.

#### SERVICE LIMITS

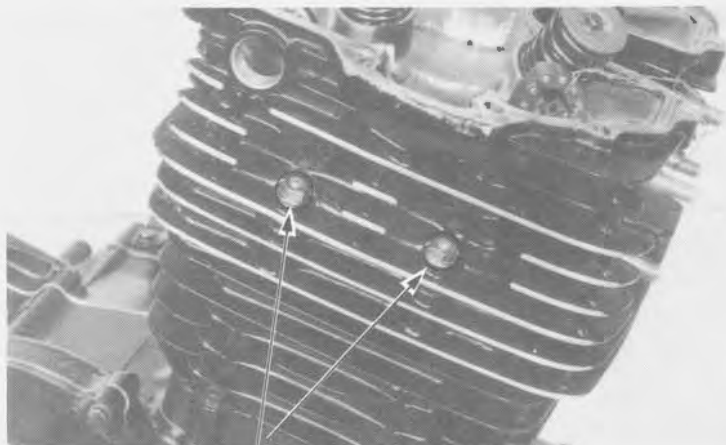
AXIAL: 0.10 mm (0.004 in)  
RADIAL: 0.05 mm (0.002 in)





## CYLINDER HEAD REMOVAL

Remove the cylinder head cover.  
Remove the camshaft (Page 6-10)  
Remove the cam chain tensioner (Page 6-8)  
Remove the read valve and cap (Page 6-9)  
Remove the cylinder head nuts.

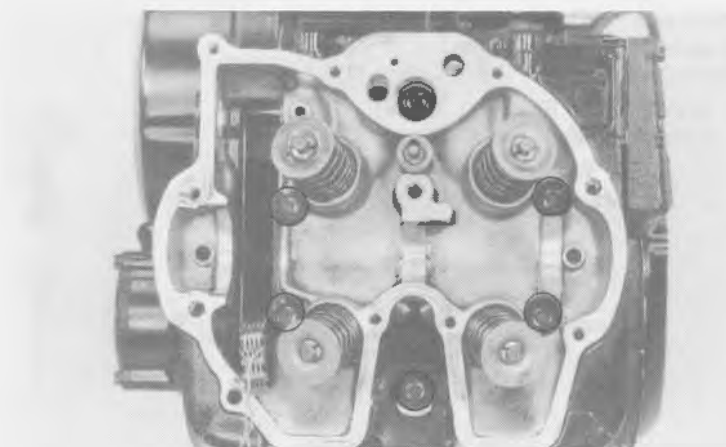


NUTS

Loosen the six cylinder head bolts in a crisscross pattern, in two or more steps.  
Remove the bolts and washers.  
Remove the cylinder head.

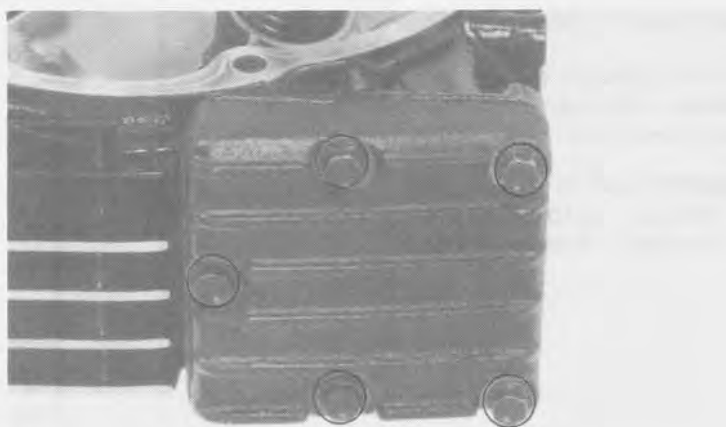
**CAUTION**

*Do not damage the cylinder head mating surfaces.*



## SUBCHAMBER INSPECTION

Remove the bolts and subchamber cover.

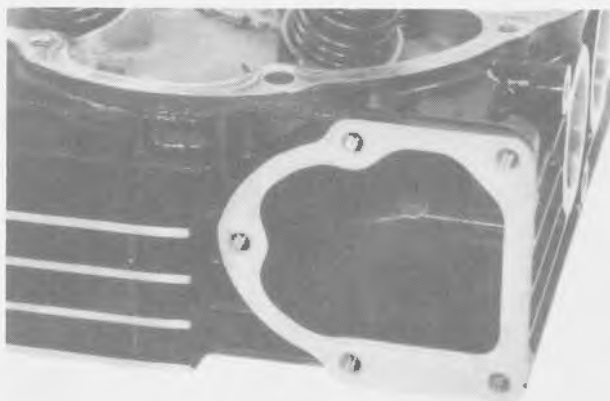




Clean the subchamber and reinstall the cover.

### NOTE

Leave the cover off if you intend to install new guides or grind new valve seat, since you'll need to clean all cutting and grinding residue from the cylinder head.



## CYLINDER HEAD DISASSEMBLY

### CYLINDER HEAD DISASSEMBLY

Remove the valve spring cotters, retainers, springs, and valves with a valve spring compressor.

### CAUTION

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

### NOTE

Mark all parts to ensure that they are re-assembled in their original locations.

VALVE SPRING COMPRESSOR  
07757-0010000



Compress the subchamber valve spring, then grasp the retainer and slide it off the valve stem groove. Remove the subchamber valve, valve spring and retainer.

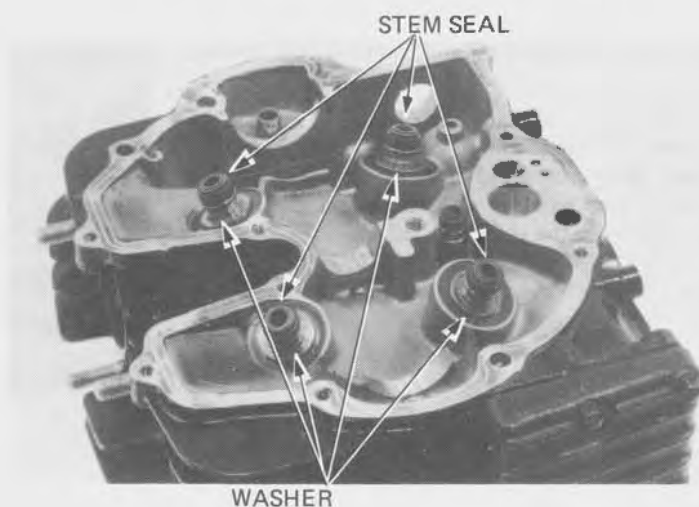
VALVE RETAINER



SPRING



Remove the valve stem seals and washers.



Remove the carbon deposits from the combustion chamber.

Clean any gasket material from the cylinder head.

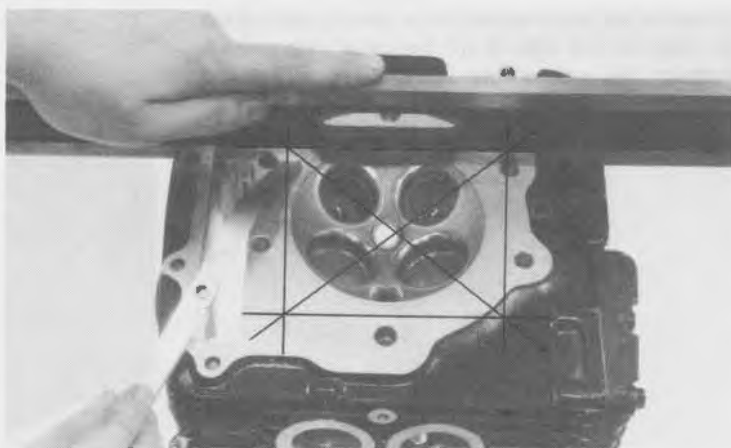


### CYLINDER HEAD INSPECTION

Check the spark plug hole and valve areas for cracks.

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

**SERVICE LIMIT: 0.1 mm (0.004 in)**



[www.hxl.it](http://www.hxl.it)





### VALVE SPRING INSPECTION

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

#### SERVICE LIMITS:

Inner: 34.1 mm (1.34 in)

Outer: 35.0 mm (1.38 in)

SUBCHAMBER VALVE SPRING: 39.3 mm (1.55 in)

### VALVE/VALVE GUIDE INSPECTION

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

Check the valve movement in the guide.

Measure and record each valve stem O.D.

#### SERVICE LIMITS:

Intake: 6.56 mm (0.257 in)

Exhaust: 6.55 mm (0.258 in)

SUBCHAMBER: 4.96 mm (0.195 in)

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

#### SERVICE LIMITS:

Intake: 6.63 mm (0.261 in)

Exhaust: 6.63 mm (0.261 in)

SUBCHAMBER VALVE: 4.96 mm (0.195 in)

#### NOTE

Ream the guides to remove any carbon build-up before checking the valve guide I.D.

Calculate the stem-to-guide clearance.

### VALVE STEM-TO-GUIDE CLEARANCE

#### SERVICE LIMITS:

Intake: 0.065 mm (0.0026 in)

Exhaust: 0.08 mm (0.0031 in)

### SUBCHAMBER VALVE STEM-TO-GUIDE

CLEARANCE: 0.06 mm (0.0023 in)

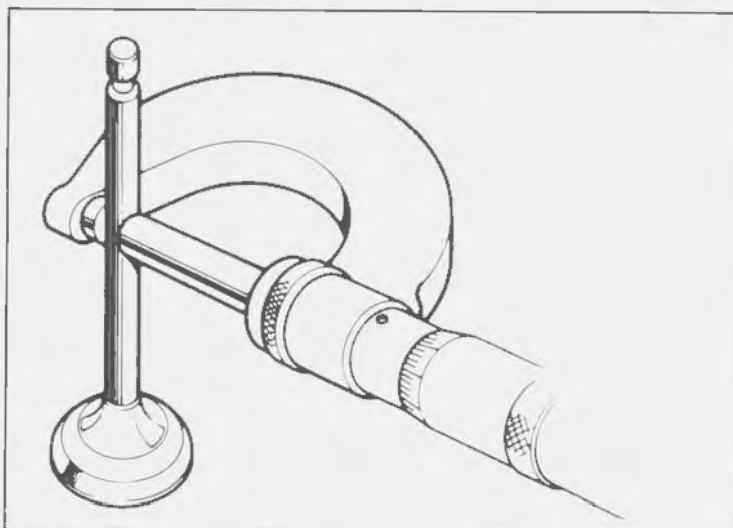
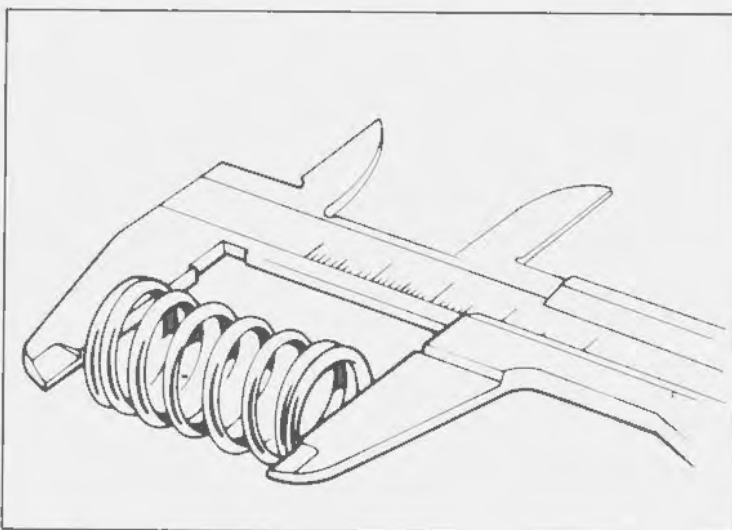
#### NOTE

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

If stem-to-guide clearance still exceeds the service limit when new guides are installed, replace the valves.

#### NOTE

Reface valve seats whenever new valve guides are installed.





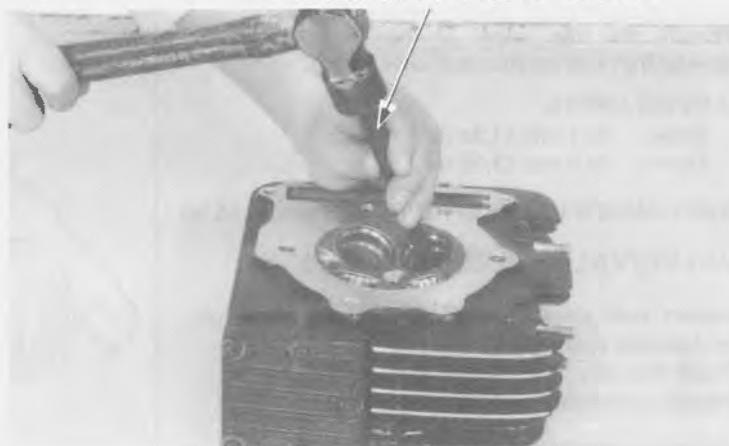
**VALVE GUIDE REPLACEMENT**

Support the cylinder head and drive out the guide from combustion chamber side.

**CAUTION**

*Do not damage the cylinder head during guide removal.*

VALVE GUIDE DRIVER  
07742-0010200 or 07946-6570100



Install a new valve guide from the top of the head, then check that it wasn't damaged during installation.

VALVE GUIDE DRIVER  
07742-0010200 or 07942-6570100



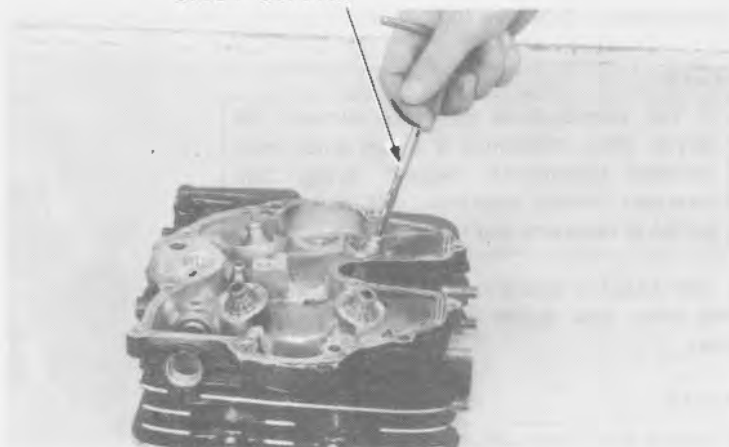
Ream the new valve guides after installation.

**NOTE**

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

Reface the valve seats (Page 6-18).  
Clean the cylinder head thoroughly to remove any metal particles.

VALVE GUIDE REAMER, 6.6 mm  
07984-6570100





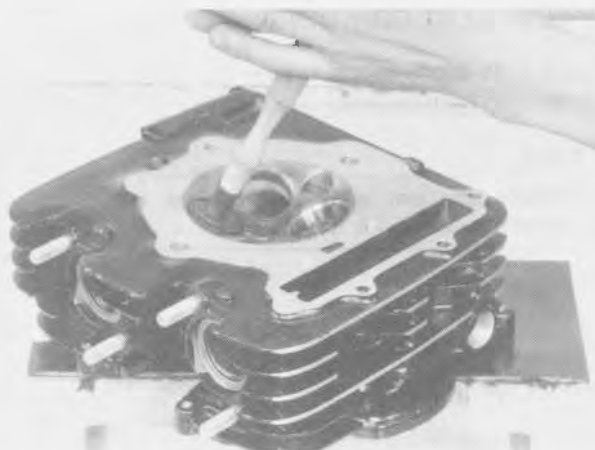
### VALVE SEAT INSPECTION AND REFACING

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.

#### CAUTION

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



Inspect the width of each valve seat.

STANDARD: 1.2–1.4 mm (0.05–0.06 in)

SERVICE LIMIT: 2.0 mm (0.08 in)

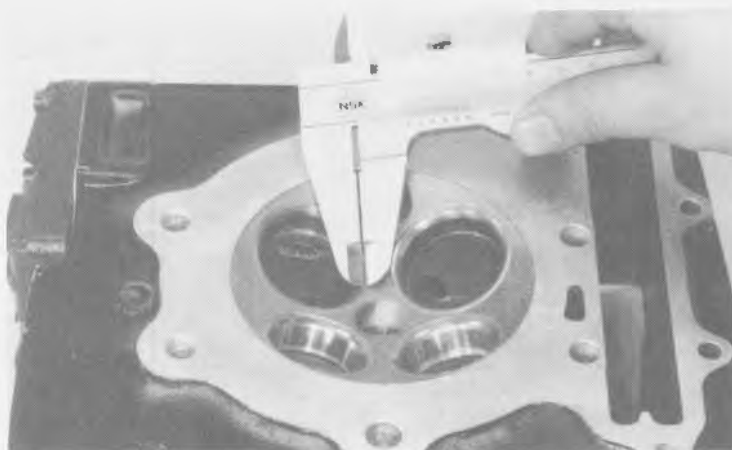
SUBCHAMBER VALVE SEAT:

SERVICE LIMIT: 1.5 mm (0.059 in)

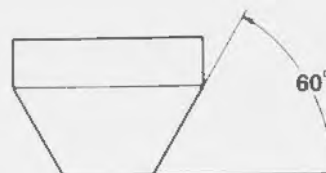
If the seat is too wide, too narrow, or has low spots, the seat must be refinished for good sealing.

#### NOTE

Follow the refacer manufacturer's operating instructions.



### VALVE SEAT CUTTERS



**VALVE SEAT GRINDING**

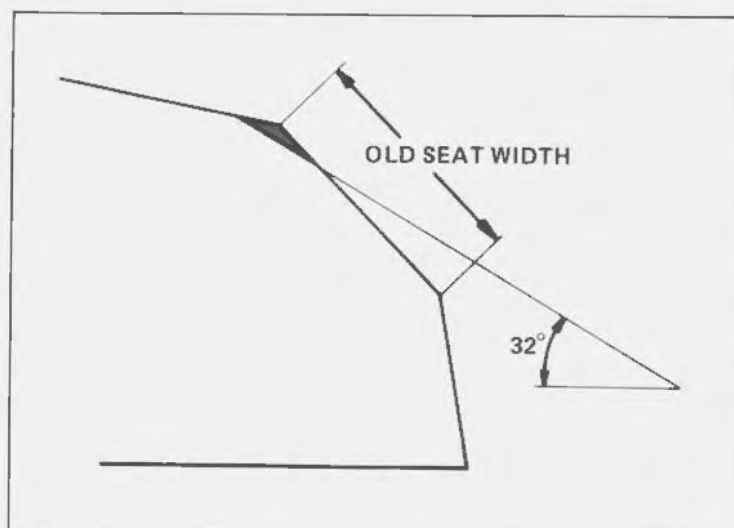
Using a 45 degree cutter, remove any roughness or irregularities from the seat.

**NOTE**

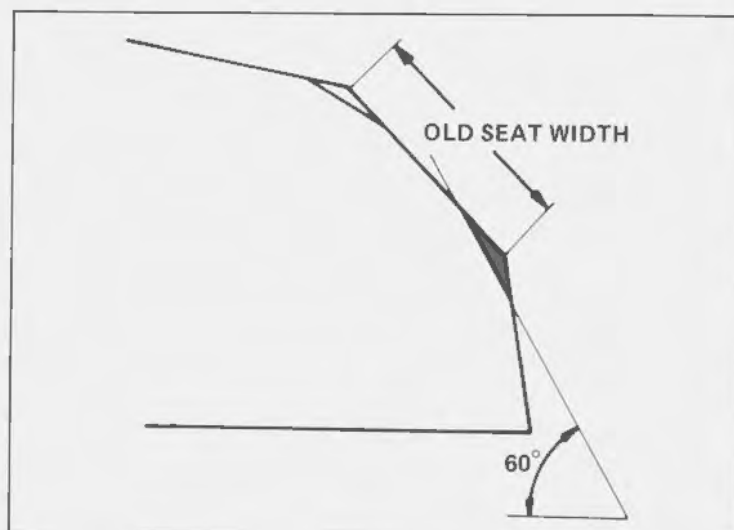
Reface the seat with a 45 degree cutter when the valve guide is replaced.

**VALVE SEAT GRINDER**

Using a 32 degree cutter, remove 1/4 of the existing valve seat material.



Use a 60 degree cutter and remove the bottom 1/4 of the old seat.

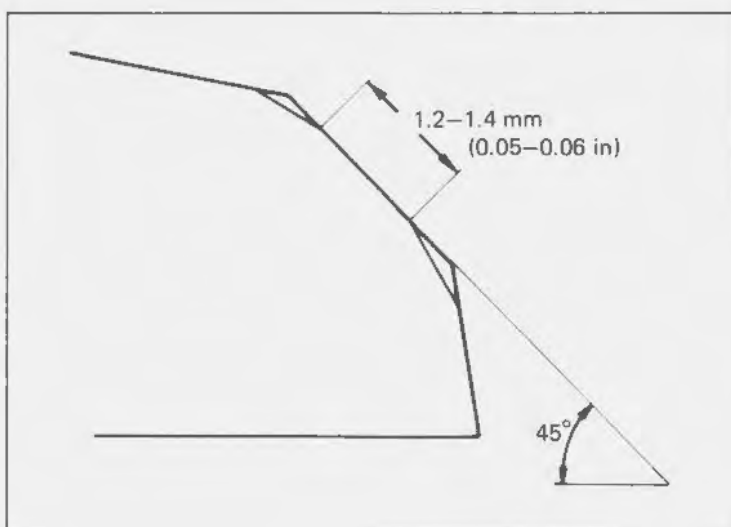




Use a 45 degree finish cutter and cut the seat to the proper width.

### NOTE

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



### NOTE

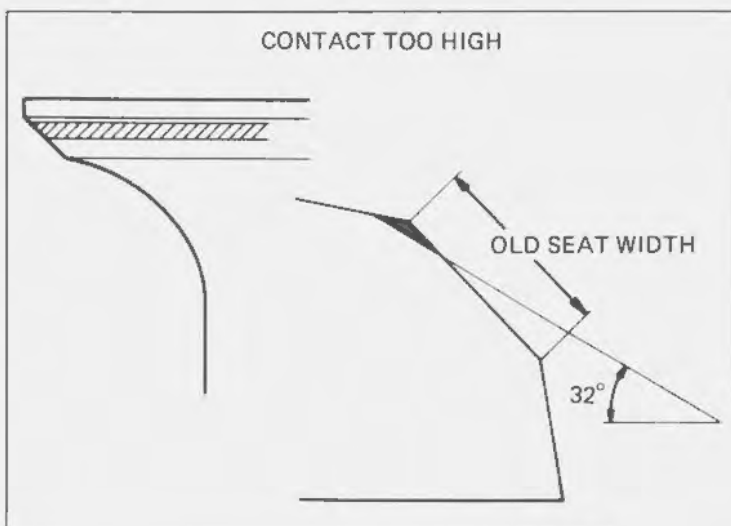
The location of the valve seat in relation to the valve face is very important for good sealing and maximum valve service.

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

Press the valve through the valve guide and onto the seat to make a clear pattern.

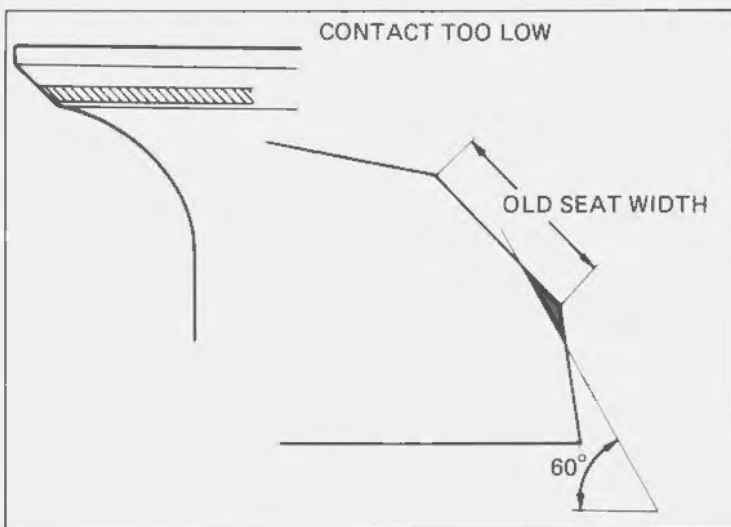
Remove to inspect the valve.

If the contact area is too high on the valve, the seat must be lowered using a 32 degree flat cutter. Refinish the seat to the correct width using a 45 degree finish cutter.



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

Refinish the seat to the correct width, using a 45 degree finish cutter.



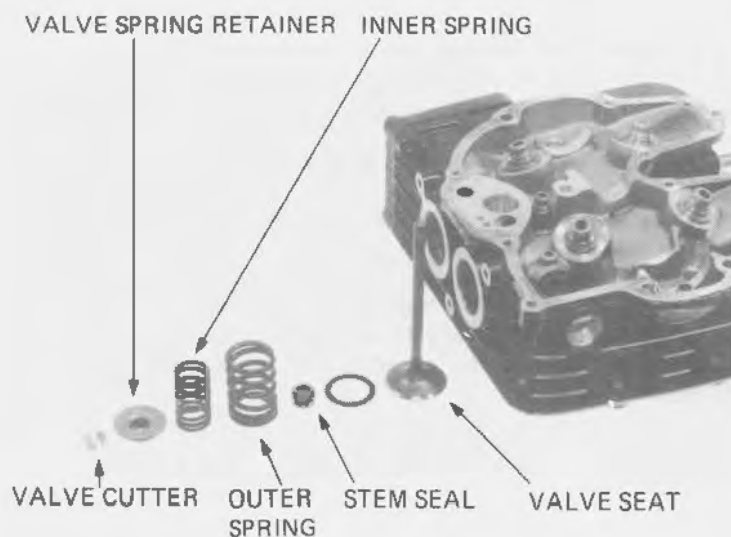


After cutting the seat, apply lapping compound to the valve face, and lap the valve using light pressure. After lapping, wash all residual compound off the cylinder head, valve, and valve guide.



## CYLINDER HEAD ASSEMBLY

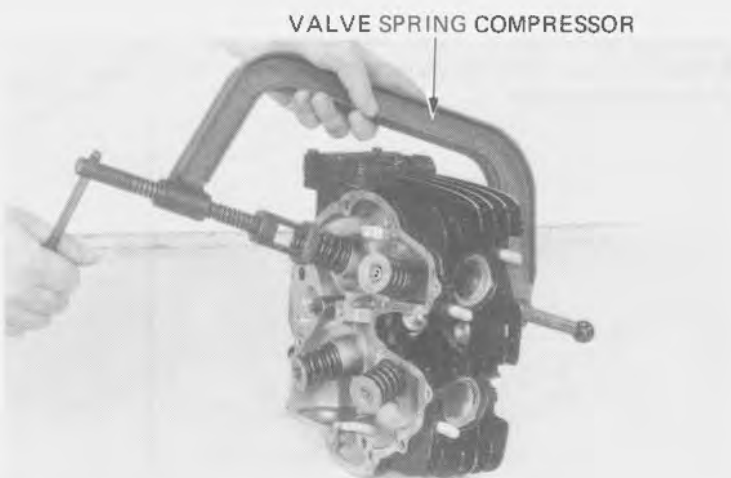
Lubricate each valve stem with oil.  
 Insert the valves into the valve guides.  
 Install new valve stem seals.  
 Install the valve spring seat, springs, and retainers.  
 The springs tightly wound coils should face in toward the combustion chamber.



Compress the valve springs using the valve spring compressor and install the valve cutters.

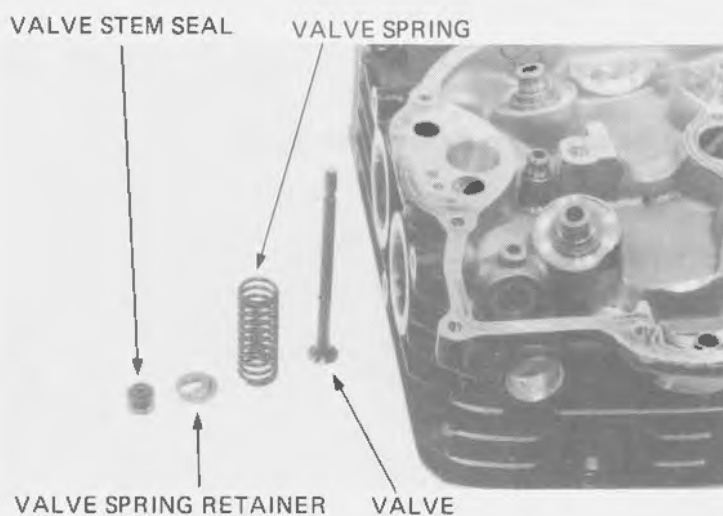
### CAUTION

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



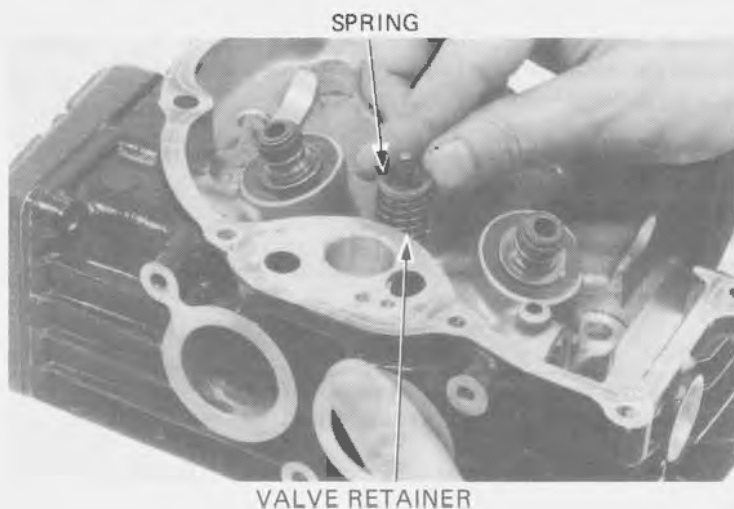
**SUB CHAMBER VALVE INSTALLATION**

Lubricate the valve stem with oil.  
Insert the valve into the valve guide.



Install the new valve stem seal.  
Install the valve spring and retainer.

Compress the subchamber valve spring, slip the retainer onto the groove on the valve stem.

**CAUTION**

*Support the cylinderhead above the working bench surface to prevent bending the valve stems.*

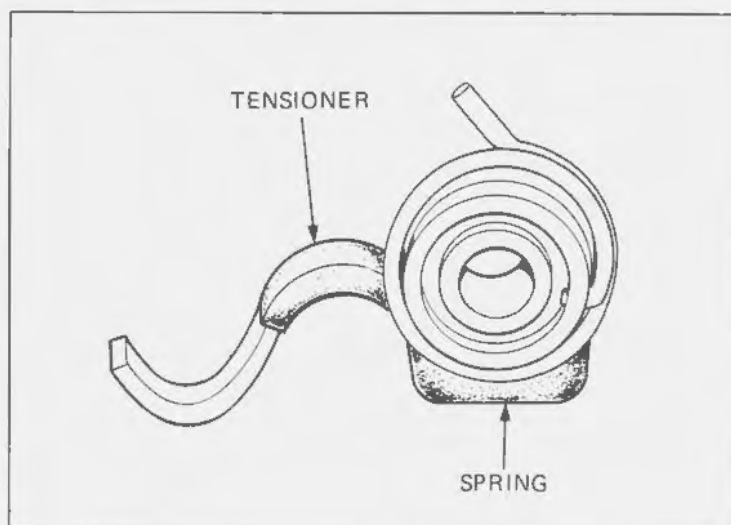
Tap the valve stems gently with a plastic hammer to firmly seat the cotters.





## CAM CHAIN TENSIONER INSTALLATION

Install the spring onto the cam chain tensioner as shown.



Place the cam chain tensioner and spring into the cylinder head.

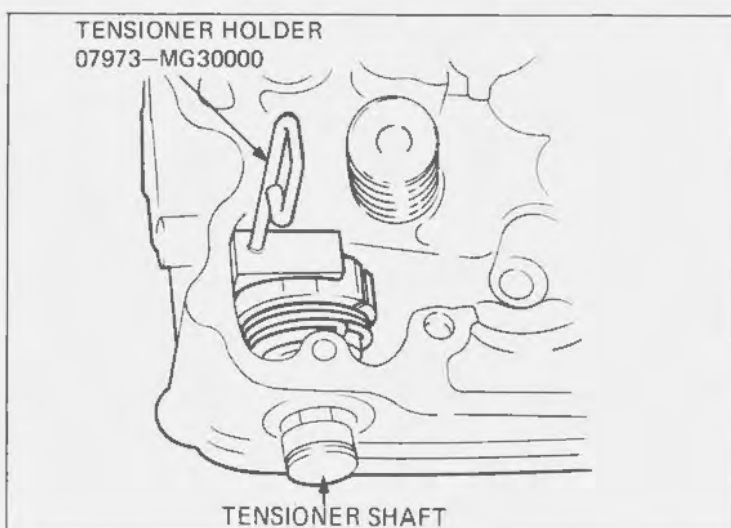
Install the tensioner shaft through the tensioner and into the cylinder head.

Push the tensioner's lever straight down and place the holder's pin into the hole in the tensioner, which will be facing up.

Slowly release the tensioner lever until the holder rests against the cylinder head casting.

### NOTE

Leave the tensioner holder in place until the camshaft, sprocket, and chain have been installed.



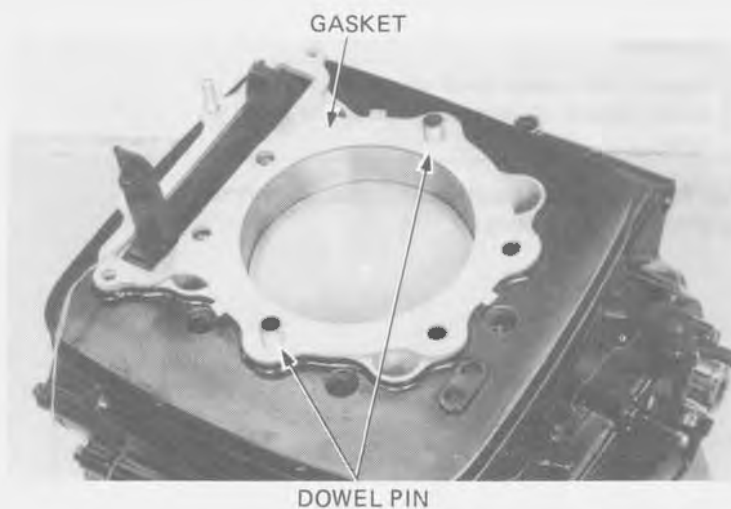
## CYLINDER HEAD INSTALLATION

Remove any gasket material from the cylinder surface.

Install the dowel pins and a new gasket.

### NOTE:

Be careful not to damage the silicone coating on the gasket surface.





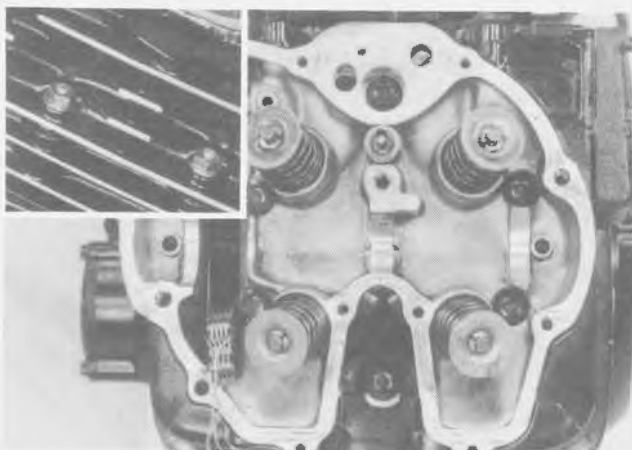


Install the cylinder head.

Tighten the six cylinder head bolts in a crisscross pattern in two or more steps.

**TORQUE:** 28–32 N·m  
(2.8–3.2 kg·m, 20–23 ft·lb)

Tighten the two cylinder head nuts.



## CAMSHAFT INSTALLATION

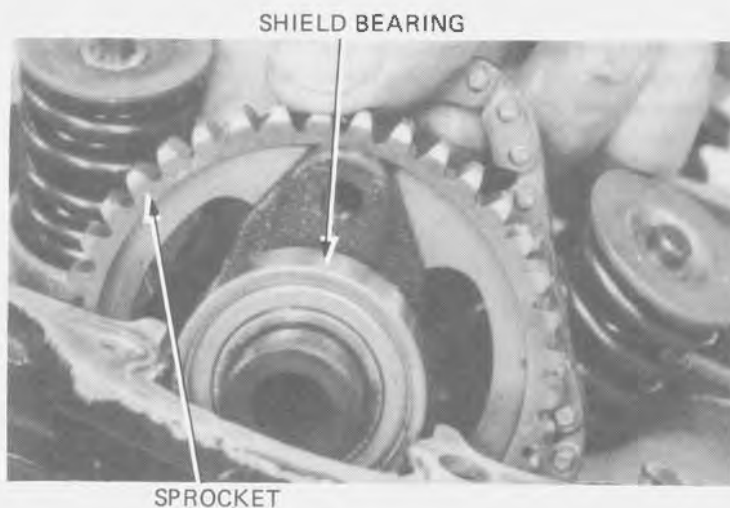
Install the cam bearings; the shielded bearing goes on the sprocket side with the shield facing out. Coat the camshaft journals with molybdenum disulfide grease.

Route the camshaft through the cam chain.

Install the cam sprocket on the camshaft.

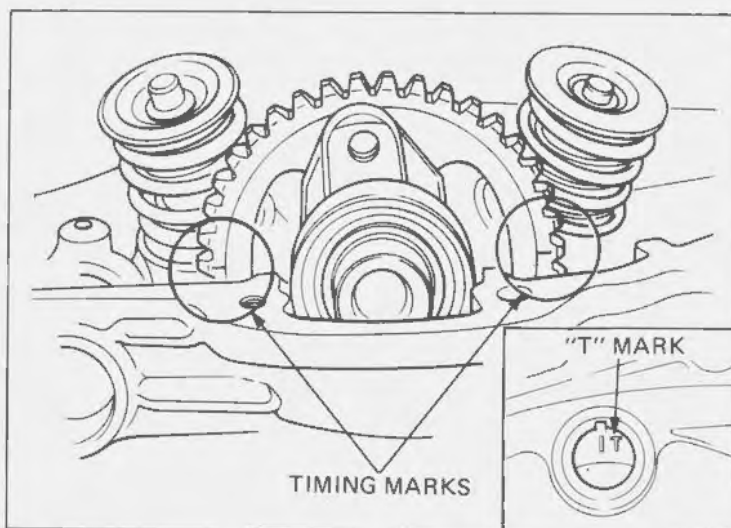
### NOTE

Install the cam sprocket so that the timing marks face outside.



Turn the crankshaft and align the "T" mark on the generator rotor with the index notch on the left crankcase cover.

Align the timing marks on the cam sprocket with the top of the cylinder head.

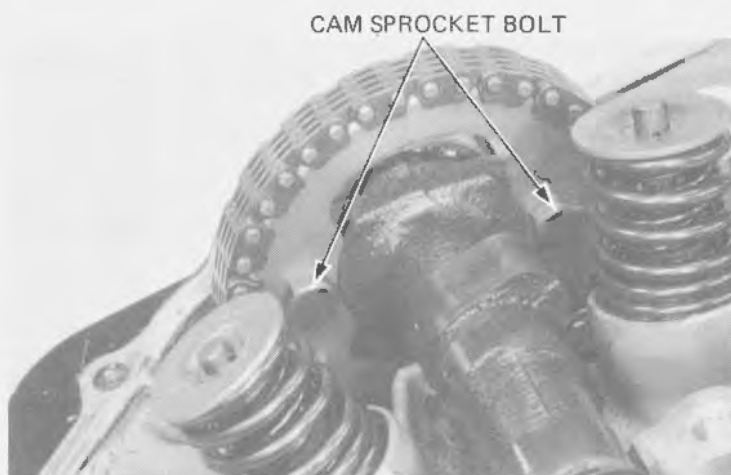




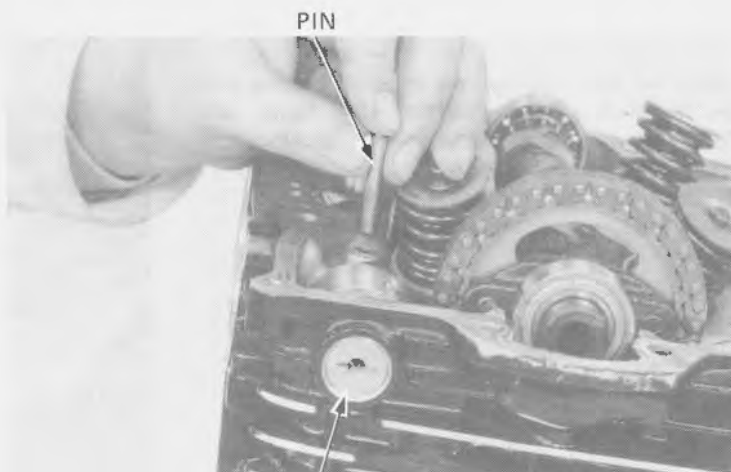
Slide the chain over the cam sprocket without rotating the sprocket.

Tighten the cam sprocket bolts.

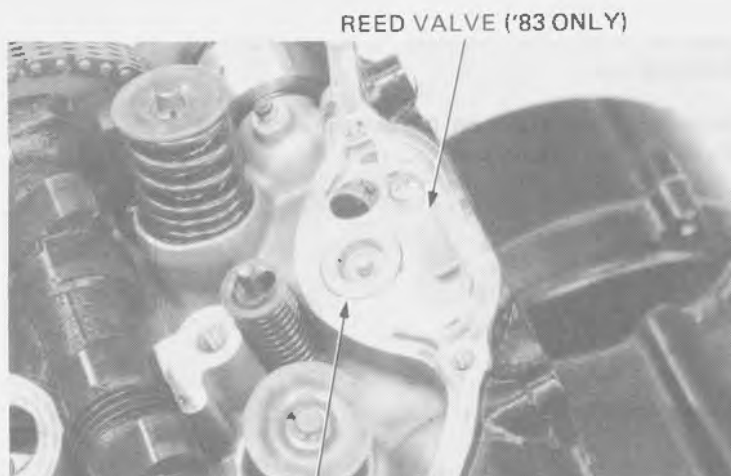
**TORQUE:** 18–22 N·m  
(1.8–2.2 kg-m, 13–16 ft-lb)



Remove the tensioner setting holder tool.  
Turn the tensioner shaft, aligning it with the cylinder head edge as shown.  
Insert the pin.



Make sure that O-ring on the cylinder head bolt hole plug is in good condition, then install the plug.  
Install the reed valve and reed valve stopper ('83 only).

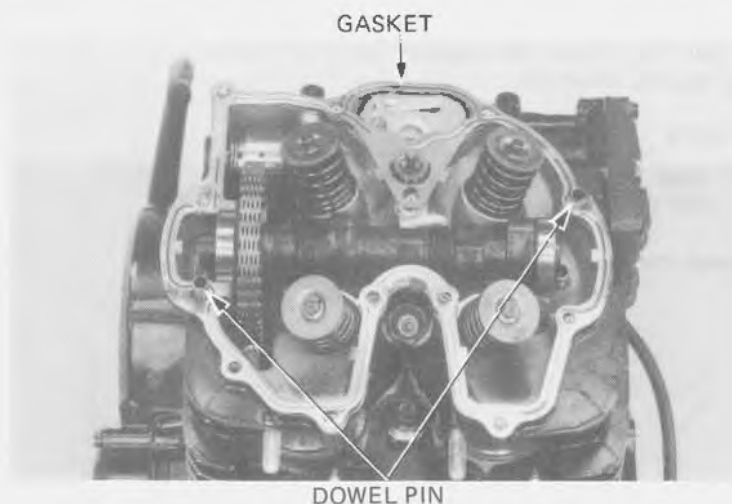




Install a new cylinder head cover gasket and dowel pins.

**NOTE:**

Be careful not to damage the silicone coating on the gasket surfaces.

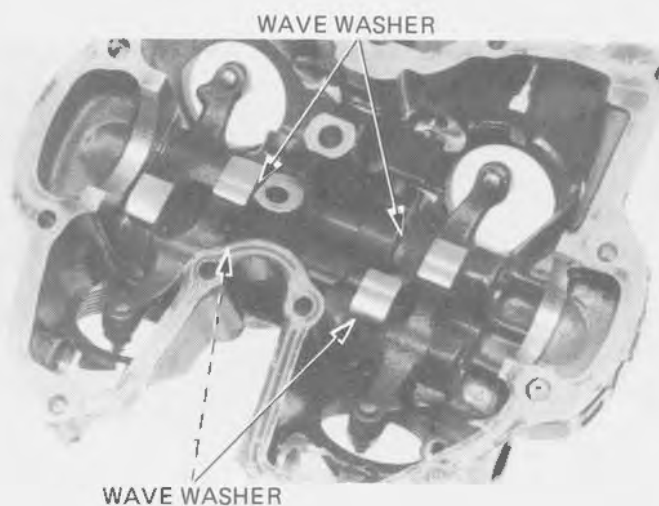


### CYLINDER HEAD COVER ASSEMBLY

Apply engine oil to the rocker arm shafts. Install the rocker arms, rocker arm shafts, washers and wave washers.

Tighten the rocker arm shafts to the specified torque.

**TORQUE:** 20–30 N·m  
(2.0–3.0 kg·m, 14–22 ft·lb)



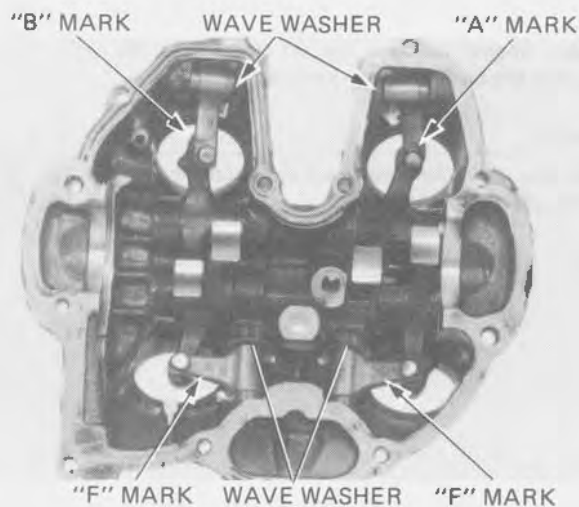
Apply engine oil to the subrocker arms shafts.

Install the subrocker arms, subrocker arm shafts, washers and wave washers.

Tighten the subrocker arm shafts.

**IN:** 25–30 N·m (2.5–3.0 kg·m, 18–22 ft·lb)

**EX:** 20–25 N·m (2.0–2.5 kg·m, 14–18 ft·lb)



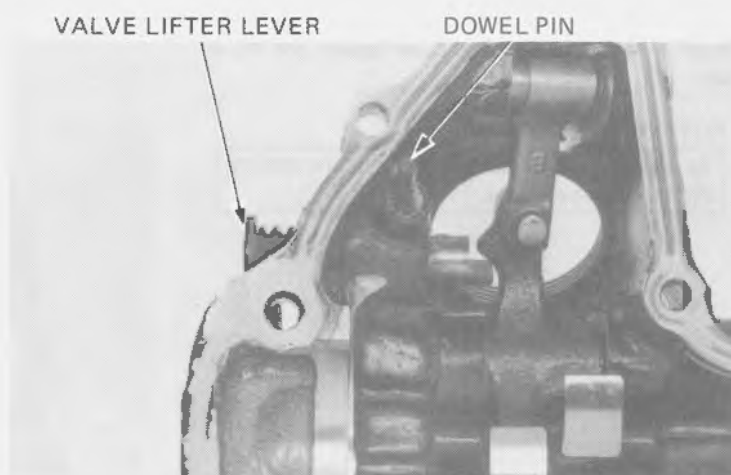


Install the manual decompressor valve lifter lever, spring, and dowel pins.

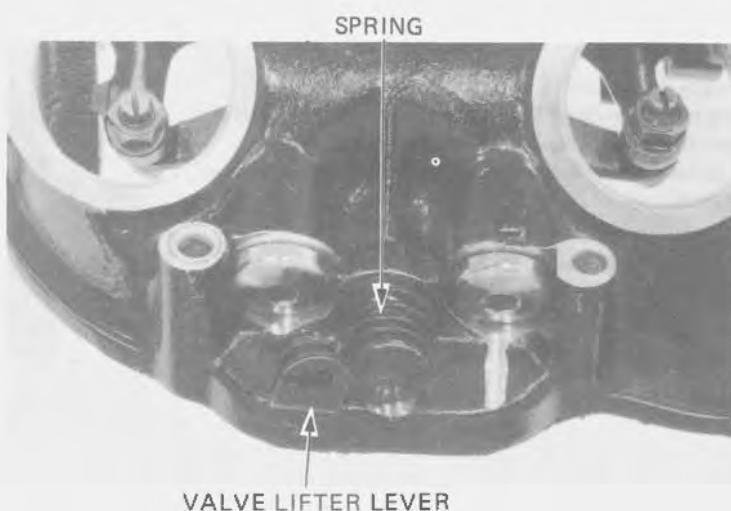
**NOTE**

Align the cut-out in the valve lifter shaft with the pin hole shown.

Install the dowel pin.



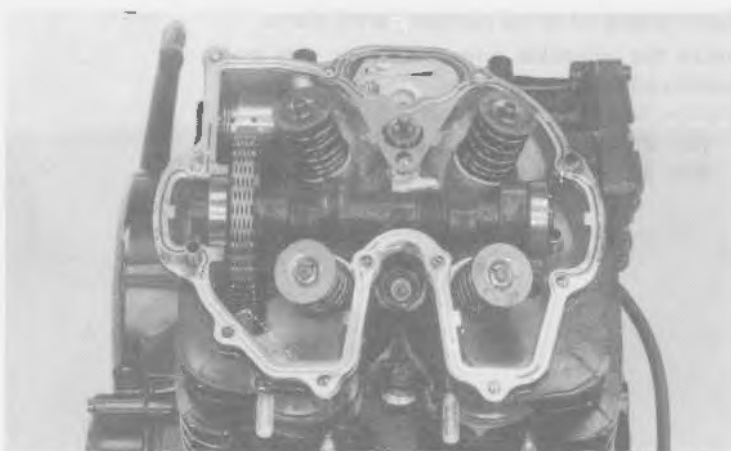
Install the kick starter decompressor valve lifter lever and spring.



Pour clean engine oil into the oil pockets in the head so that the cam lobes are submerged.

**CAUTION**

*Make sure that the cam lobes are submerged in oil in the oil pockets.*

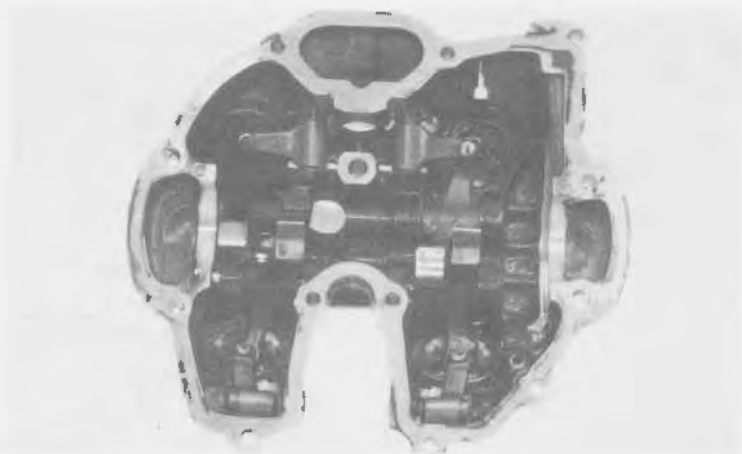




### CYLINDER HEAD COVER INSTALLATION

Clean the cylinder head mating surface of the cylinder head cover.

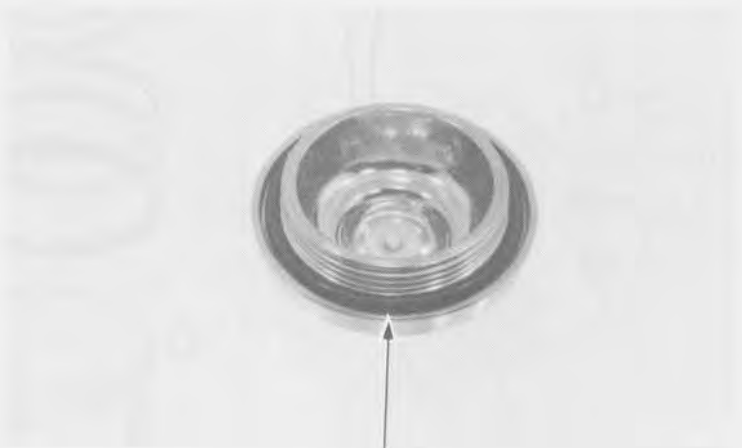
Loosen the valve adjusting screws and then install the cylinder head cover.



Install the valve adjuster covers.

#### NOTE

Make sure the cover O-ring is properly seated in the groove.



O-RING

Tighten the cylinder head cover bolts to the specified torque.

#### TORQUE:

|               |                                          |
|---------------|------------------------------------------|
| 8 mm bolt:    | 20–26 N·m<br>(2.0–2.6 kg-m, 15–19 ft-lb) |
| 6 mm bolt:    | 10–14 N·m<br>(1.0–1.4 kg-m, 7–10 ft-lb)  |
| 6 mm SH bolt: | 8–12 N·m<br>(0.8–1.2 kg-m, 6–9 ft-lb)    |

#### NOTE

- Tighten the head cover bolts in a criss-cross pattern in two or more steps.
- Clean excessive sealant from the head.

Adjust the valve clearance (Page 3-7).

Connect the decompression cables.

Install the oil pipe with four sealing washers and oil bolts.

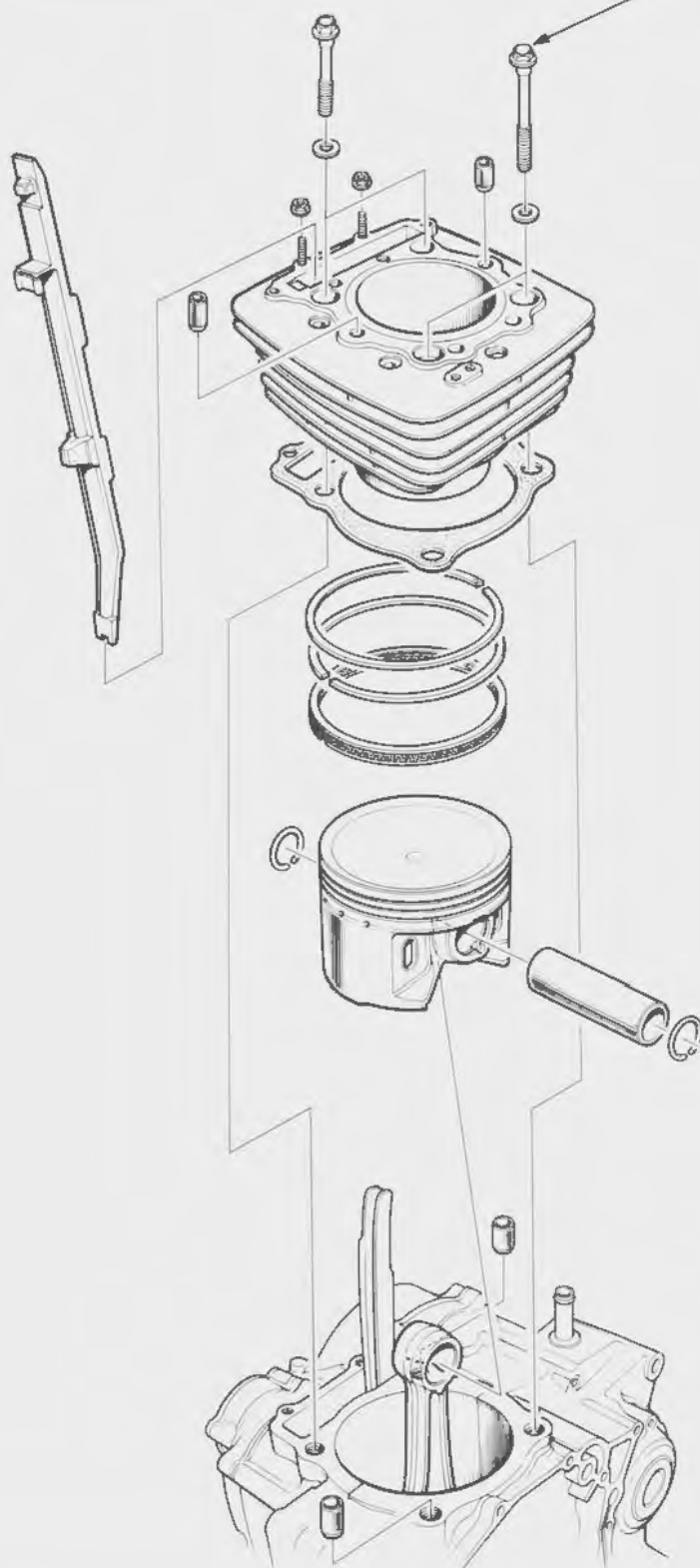
Adjust the manual starter decompressor (Page 3-8).

Adjust the kick starter decompressor (Page 3-9).



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47–53 N·m  
(4.7–5.3 kg·m, 34–38 ft·lb)







# 7. CYLINDER/PISTON

|                       |      |
|-----------------------|------|
| SERVICE INFORMATION   | 7-1  |
| TROUBLESHOOTING       | 7-2  |
| CYLINDER REMOVAL      | 7-3  |
| PISTON REMOVAL        | 7-5  |
| PISTON INSTALLATION   | 7-9  |
| CYLINDER INSTALLATION | 7-9  |
| CYLINDER COMPRESSION  | 7-10 |

## SERVICE INFORMATION

### SPECIFICATIONS

| ITEM                                |                                | STANDARD                            | SERVICE LIMIT        |
|-------------------------------------|--------------------------------|-------------------------------------|----------------------|
| Cylinder                            | I.D.                           | 100.00-100.01 mm (3.937-3.9375 in)  | 100.12 mm (3.942 in) |
|                                     | Taper                          | —                                   | 0.05 mm (0.002 in)   |
|                                     | Out of round                   | —                                   | 0.05 mm (0.002 in)   |
|                                     | Warping across top             | —                                   | 0.10 mm (0.004 in)   |
| Piston, piston rings and piston pin |                                |                                     |                      |
|                                     | O.D. at skirt                  | 99.95-99.98 mm (3.935-3.936 in)     | 99.85 mm (3.93 in)   |
|                                     | Piston pin bore                | 24.002-24.008 mm (0.9450-0.9452 in) | 24.03 mm (0.946 in)  |
|                                     | Piston pin O.D.                | 23.989-23.995 mm (0.9446-0.9447 in) | 23.96 mm (0.943 in)  |
|                                     | Piston pin-to-piston clearance | 0.002-0.014 mm (0.0001-0.0006 in)   | 0.07 mm (0.003 in)   |
| Piston ring end gap                 |                                |                                     |                      |
|                                     | Top/second                     | 0.20-0.40 mm (0.0079-0.0157 in)     | 0.5 mm (0.02 in)     |
|                                     | Oil (Side Rail)                | 0.2-0.9 mm (0.007-0.035 in)         | —                    |
| Piston ring-to-groove clearance     |                                |                                     |                      |
|                                     | Top                            | 0.030-0.065 mm (0.0012-0.0026 in)   | 0.12 mm (0.006 in)   |
|                                     | Second                         | 0.015-0.045 mm (0.0006-0.0018 in)   | 0.12 mm (0.006 in)   |
| Cylinder-to-piston Clearance        |                                | 0.010-0.040 mm (0.0004-0.0016 in)   | 0.10 mm (0.004 in)   |

### TORQUE VALUE

Cylinder bolt 47-53 N·m (4.7-5.3 kg·m, 34-38 ft·lb)





## **TROUBLESHOOTING**

### **Low or Unstable Compression**

1. Worn cylinder or piston rings

### **Excessive Smoke**

1. Worn cylinder, piston, or piston rings
2. Improper installation of piston rings
3. Scored or scratched piston or cylinder wall

### **Overheating**

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

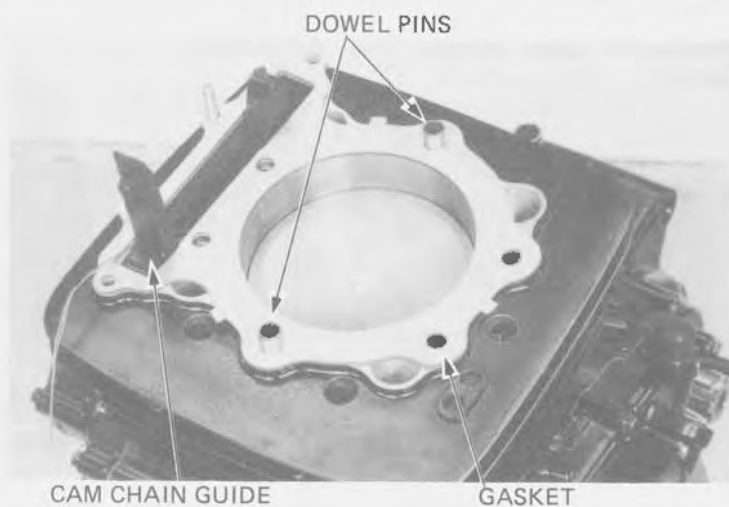
### **Knocking or Abnormal Noise**

1. Worn piston and cylinder
2. Excessive carbon build-up on piston crown or combustion chamber



### CYLINDER REMOVAL

Remove the cylinder head (Section 6).  
Remove the cylinder head gasket and dowel pins.  
Remove the cam chain guide.



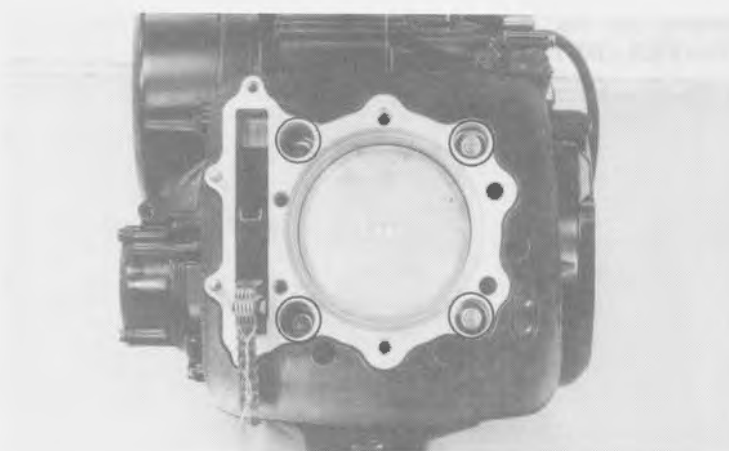
Remove the two bolts on the right side of the cylinder.



Remove the four cylinder mounting bolts, then remove the cylinder.

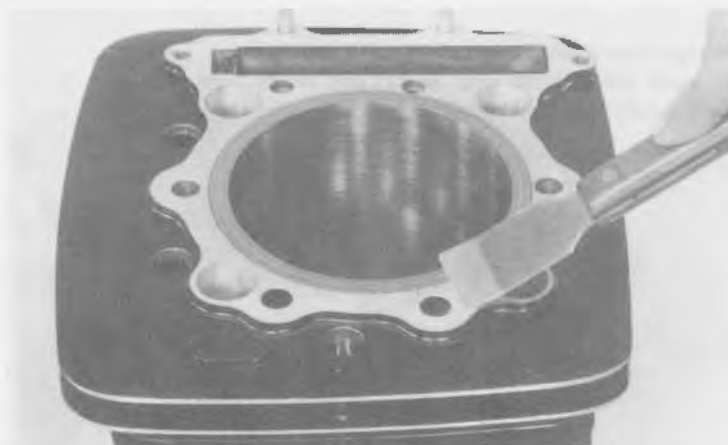
#### NOTE

Loosen the bolts in crisscross pattern in two or more steps.





Remove all gasket material from the cylinder surface.



### CYLINDER INSPECTION

Inspect the cylinder bore for wear or damage.  
Measure the cylinder I.D.

**SERVICE LIMIT: 100.12 mm (3.942 in)**

#### NOTE

Check for out of round on the X and Y axis at three locations.

Calculate the taper and out of round.

#### SERVICE LIMITS:

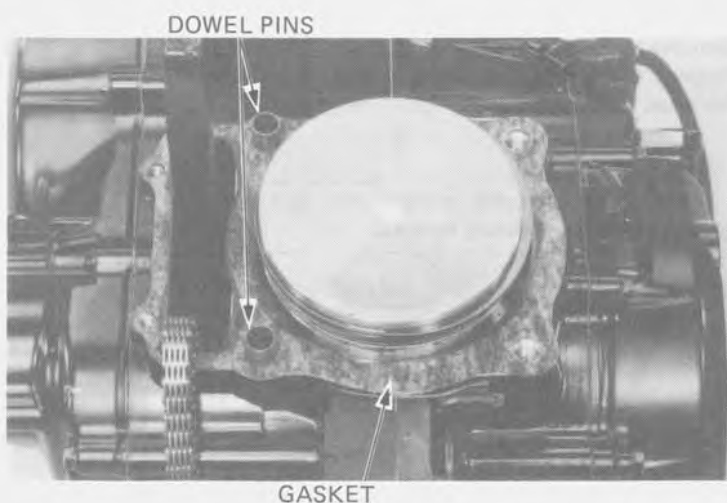
|               |                    |
|---------------|--------------------|
| Out of round: | 0.05 mm (0.002 in) |
| Taper:        | 0.05 mm (0.002 in) |



Inspect the top of the cylinder for warpage.  
**SERVICE LIMIT: 0.10 mm (0.004 in)**



Remove the base gasket and dowel pins.



## PISTON REMOVAL

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

Remove the piston pin clips with pliers.

Press the piston pin out of the piston.



## PISTON/PISTON RING INSPECTION

Measure the piston ring-to-groove clearance.

### SERVICE LIMIT:

TOP/SECOND: 0.12 mm (0.006 in)





Remove the piston rings.  
Inspect the pistons for damage and ring grooves for wear.

**CAUTION**

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



PISTON RING PLIERS

Insert each piston ring into the cylinder, about 20 mm (0.750 in) from the bottom.

To ensure that it's square in the bore, use a piston to push it in.

Measure the ring end gap.

**SERVICE LIMIT:**

**TOP/SECOND: 0.5 mm (0.02 in)**



Measure the piston diameter 10 mm from the bottom.

**SERVICE LIMIT: 99.85 mm (3.93 in)**

Calculate the piston-to-cylinder clearance, by subtracting the piston O.D. from the cylinder I.D. (Page 7-4).

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





Measure the piston pin hole I.D.

**SERVICE LIMIT: 24.03 mm (0.946 in)**



Measure the piston pin O.D.

**SERVICE LIMIT: 23.96 mm (0.943 in)**

Calculate the piston-to-piston pin clearance.

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



### PISTON RING INSTALLATION

Clean the piston ring grooves thoroughly.

Check for cleanliness by holding a ring in the grooves while turning the piston.

#### CAUTION

*Do not use a wire brush to clean ring lands, or cut lands deeper with a cleaning tool.*





Install the piston rings with the marks facing up.

**CAUTION**

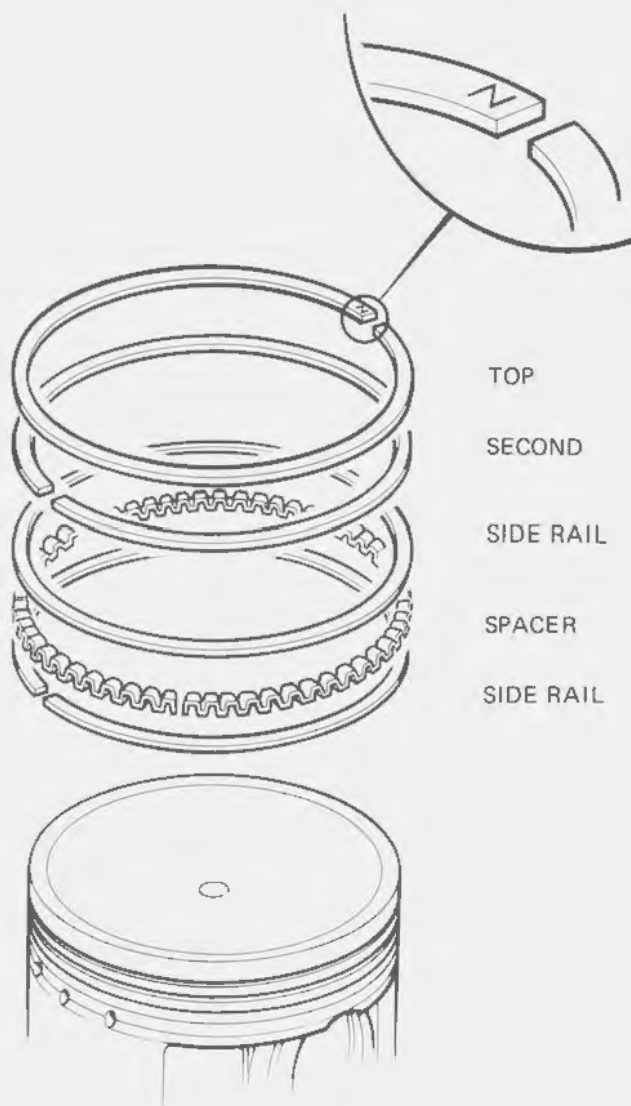
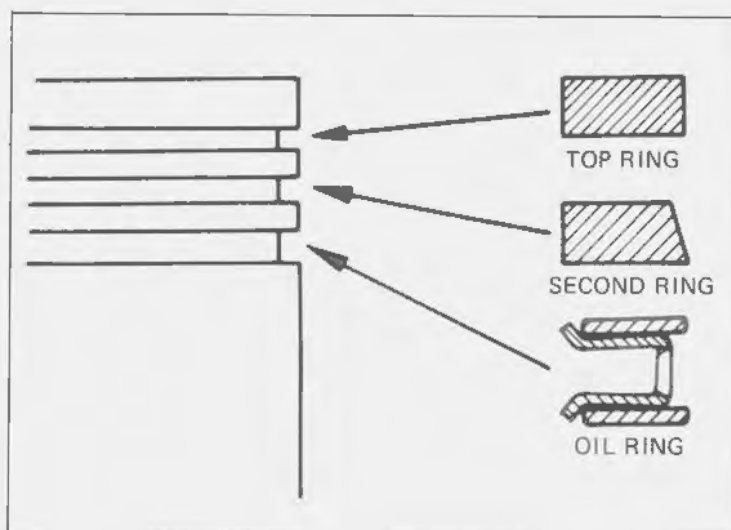
*Avoid piston and piston ring damage during installation.*

Stagger the compression (1st and 2nd) and oil rings (side rails) 180 degrees apart as shown.

**NOTE**

Install the oil ring spacer first, then install the side rails.

After installation, rings should be free to rotate in the grooves.







### PISTON INSTALLATION

Install the piston and piston pin.  
Install new piston pin clips.

#### NOTE

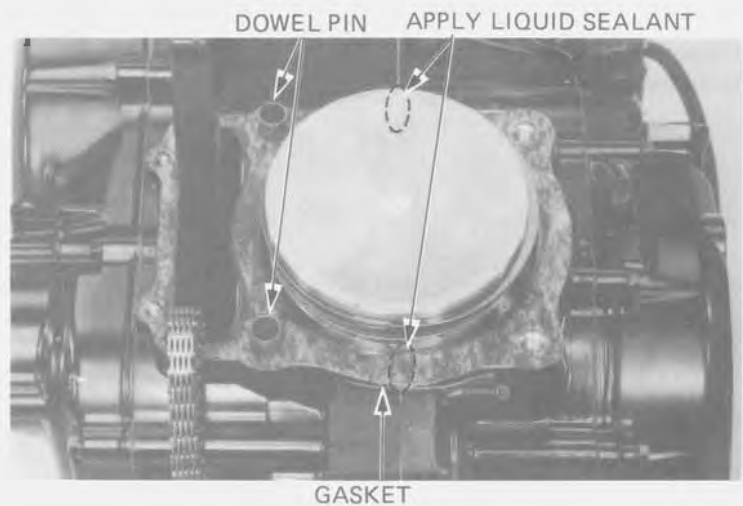
- Position the piston "IN" mark on the intake valve side.
- Do not align the piston pin clip end gap with the piston cut-out.
- Place a shop towel around the piston skirt and in the crankcase to prevent the piston pin clips from falling into the crankcase.



### CYLINDER INSTALLATION

Apply a liquid sealant to the crankcase mating area to prevent oil leaks.

Install the new cylinder base gasket and dowel pins.  
Place the piston at bottom dead center.



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

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

#### CAUTION

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





Apply engine oil to the cylinder bolts and tighten the cylinder bolts in a crisscross pattern in two or more steps.

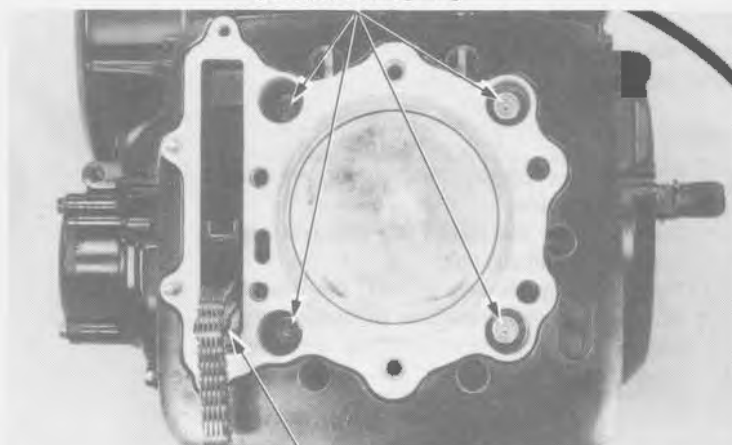
**TORQUE:** 47–53 N·m (4.7–5.3 kg-m, 34–38 ft-lb)

Install the cam chain guide.

**NOTE**

- Fit the cam chain guide tab in the cylinder cutout.
- Push the guide in until it bottoms in the crankcase guide hole.

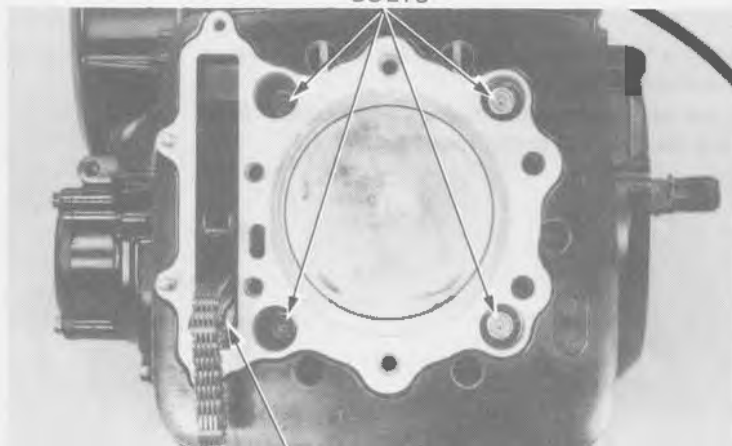
CYLINDER BOLTS



CAM CHAIN GUIDE

Tighten the cylinder base bolts.  
Install the cylinder head (Page 6-22).

BOLTS



CAM CHAIN GUIDE



**HONDA**  
**XL600R**

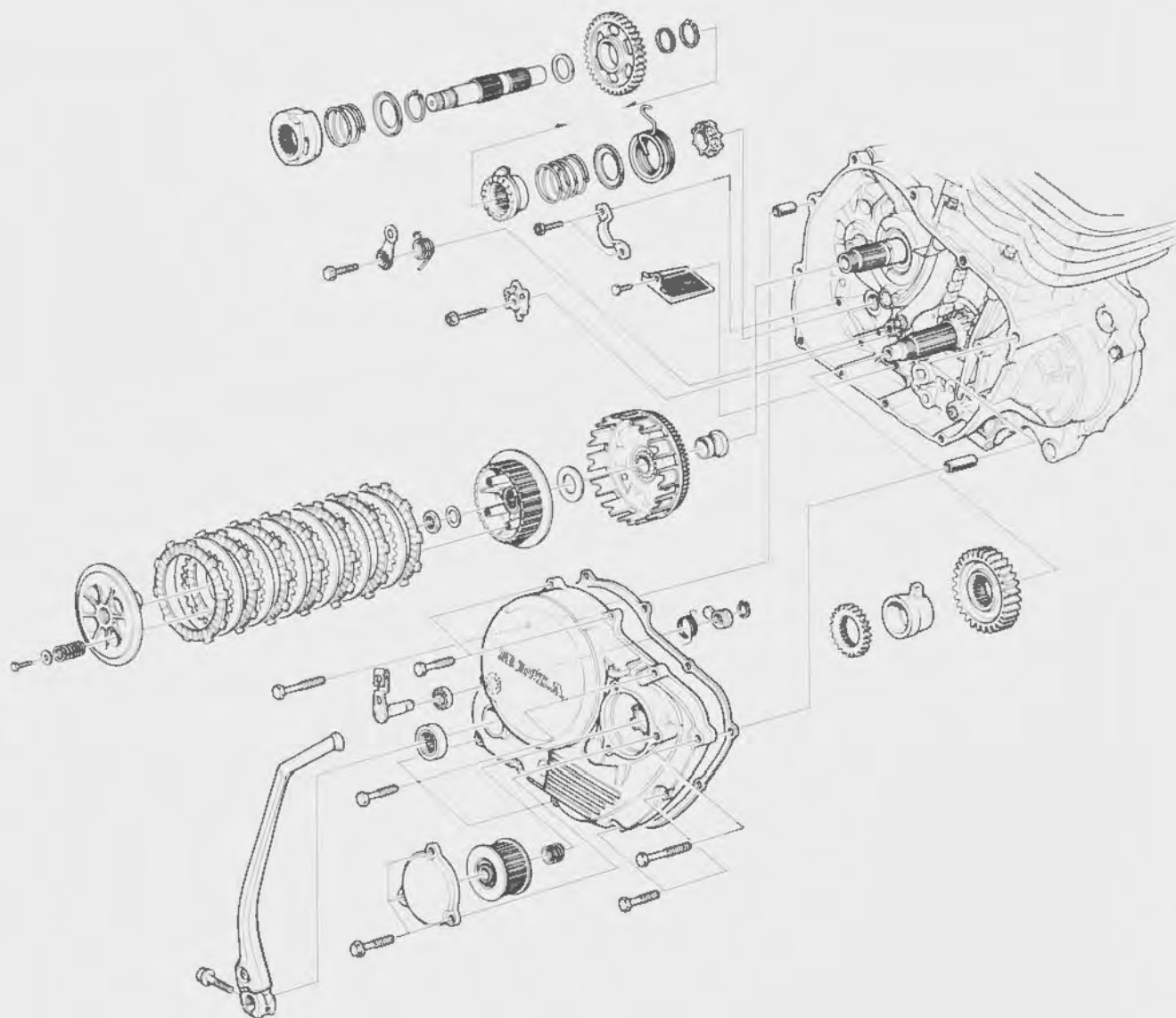
CYLINDER/PISTON

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|                                    |      |
|------------------------------------|------|
| SERVICE INFORMATION                | 8- 1 |
| TROUBLESHOOTING                    | 8- 2 |
| RIGHT CRANKCASE COVER REMOVAL      | 8- 3 |
| CLUTCH                             | 8- 5 |
| OIL PUMP                           | 8-10 |
| DRIVE GEAR REMOVAL                 | 8-17 |
| DRIVE GEAR INSTALLATION            | 8-18 |
| RIGHT CRANKCASE COVER INSTALLATION | 8-26 |

## SERVICE INFORMATION

### GENERAL INSTRUCTIONS

- This section covers removal and installation of the clutch, oil pump, kick starter and the right crankcase cover. All these operations can be accomplished with the engine installed.
- When the existing clutch discs are replaced, coat new discs with engine oil prior to assembly.

### SPECIFICATIONS

| ITEM                                      |                                      | STANDARD                           | SERVICE LIMIT       |
|-------------------------------------------|--------------------------------------|------------------------------------|---------------------|
| Clutch                                    | Lever free play (at lever end)       | 10-20 mm (0.4-0.8 in)              |                     |
|                                           | Spring free length                   | 44.3 mm (1.744 in)                 | 42.7 mm (1.68 in)   |
|                                           | Sprigg preload/length                | 25 ± 1.3 kg/28.5 mm                | —                   |
|                                           | Disc thickness                       | 2.92-3.08 mm (0.115-0.121 in)      | 2.6 mm (0.10 in)    |
|                                           | Plate warpage                        | —                                  | 0.3 mm (0.01 in)    |
|                                           | Primary drive gear I.D.              | 56.05-56.10 mm (2.2067-2.2087 in)  | 56.16 mm (2.211 in) |
|                                           | Clutch outer I.D.                    |                                    |                     |
|                                           | Outer guide O.D.                     | 26.959-26.98 mm (1.0614-1.0622 in) | 26.91 mm (1.059 in) |
| Oil pump                                  | I.D.                                 | 21.99-22.035 mm (0.8657-0.8675 in) | 22.05 mm (0.868 in) |
|                                           | Length                               | 31.3-31.4 mm (1.2322-1.2362 in)    | 31.2 mm (1.229 in)  |
|                                           | Inner rotor-to-outer rotor clearance | 0.15 mm (0.006 in) max.            | 0.2 mm (0.008 in)   |
|                                           | Outer rotor-to-body clearance        | 0.15-0.21 mm (0.006-0.008 in)      | 0.25 mm (0.01 in)   |
| Starter idler gear                        | Rotor-to-cover clearance             | 0.02-0.08 mm (0.001-0.003 in)      | 0.12 mm (0.005 in)  |
|                                           | I.D.                                 | 20.00-20.021 mm (0.7874-0.7882 in) | 20.11 mm (0.792 in) |
|                                           | O.D.                                 | 16.00-16.018 mm (0.6299-0.6366 in) | 16.03 mm (0.631 in) |
| Mainshaft-to-clutch outer guide clearance |                                      | 19.959-19.98 mm (0.7858-0.7866 in) | 19.90 mm (0.783 in) |
|                                           |                                      | 0.020-0.068 mm (0.0008-0.0027 in)  | 0.12 mm (0.005 in)  |

**CLUTCH/OIL PUMP**

---

**COMMON TOOL**

|                             |                                                                        |
|-----------------------------|------------------------------------------------------------------------|
| Clutch center holder        | 07724-0050000                                                          |
| Driver                      | 07749-0010000                                                          |
| Attachment, 32 x 35 mm      | 07746-0010100                                                          |
| Pilot, 20 mm                | 07746-0040500                                                          |
| Lock nut wrench, 17 x 27 mm | 07716-0020300 (Commercially available in U.S.A.)                       |
| Extension                   | 07716-0020500 (Commercially available in U.S.A.)                       |
| Flywheel holder             | 07725-0040000 ( or band strap wrench commercially available in U.S.A.) |

**TORQUE VALUES**

|                       |                                       |
|-----------------------|---------------------------------------|
| Clutch lock nut       | 50-60 N·m (5.9-6.0 kg-m, 36-43 ft-lb) |
| Drive gear            | 50-60 N·m (5.0-6.0 kg-m, 36-43 ft-lb) |
| Right crankcase cover | 8-12 N·m (0.8-1.2 kg-m, 6-9 ft-lb)    |

**TROUBLESHOOTING**

Faulty clutch operation can usually be corrected by adjusting the clutch lever free play.

**Clutch Slips When Accelerating**

1. No free play
2. Discs worn
3. Springs weak

**Clutch Will Not Disengage**

1. Too much free play
2. Plates warped

**Motorcycle Creeps With Clutch Disengaged**

1. Too much free play
2. Plates warped

**Excessive Lever Pressure**

1. Clutch cable kinked, damaged or dirty
2. Lifter mechanism damaged

**Clutch Operation Feels Rough**

1. Outer drum slots rough
2. Dirty clutch cable

**Low Oil Pressure**

1. Faulty oil pump
2. Oil pump drive gear broken



## RIGHT CRANKCASE COVER REMOVAL

Remove the skid plate and drain the engine oil (page 2-2).

Remove the kick starter pedal.

Remove the right foot peg.

Remove the rear brake pedal pivot bolt and rear brake pedal.

Disconnect the kick starter decompressor cable, at the kick starter end.

DECOMPRESSOR CABLE



BRAKE PEDAL  
PIVOT BOLT

KICK STARTER  
PEDAL

Remove the exhaust pipe.

Remove the oil pipe.

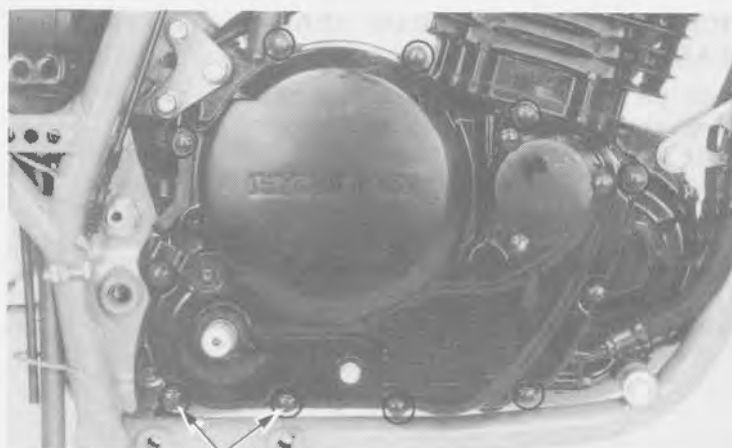
OIL PIPE



PROTECTOR

Remove the bolts and nuts ('84) holding the right crankcase cover, and remove the cover.

Remove the dowel pins and gasket.



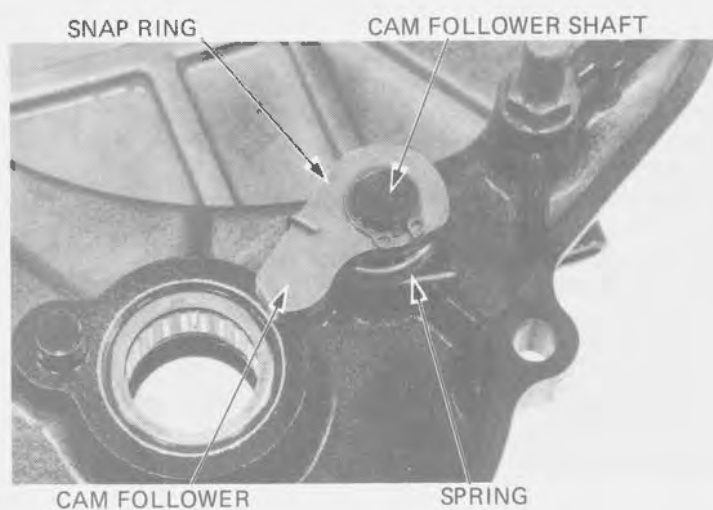
WASHER AND 6 mm NUT ('84 )





### CAM FOLLOWER SHAFT DISASSEMBLY

Remove the snap ring, cam, return spring and camshaft.



### OIL SEAL REPLACEMENT

Remove the snap ring and oil seal.  
 Install a new oil seal.  
 Install the snap ring.



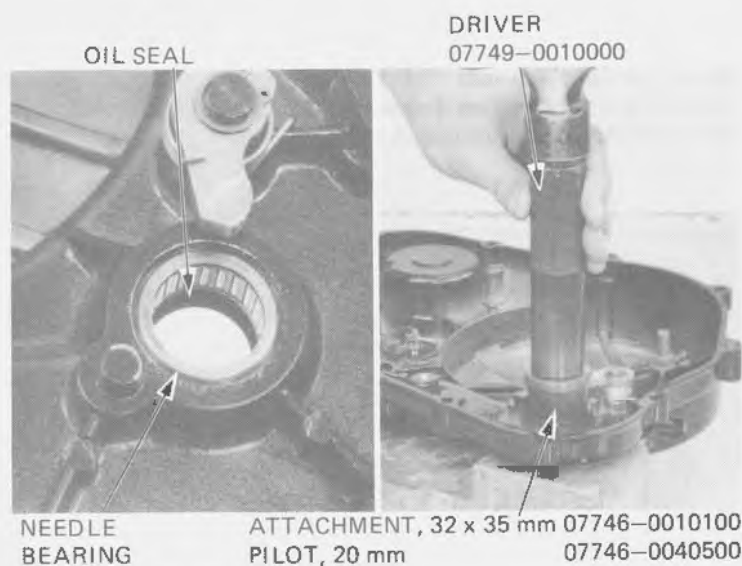
### KICK STARTER SPINDLE OIL SEAL/ BEARING REPLACEMENT

Check the oil seal and needle bearing for wear, excessive play or damage and replace if necessary.

Remove the oil seal and needle bearing from the right crankcase cover.

Drive a new needle bearing with the special tools.

Install a new oil seal.





## CLUTCH

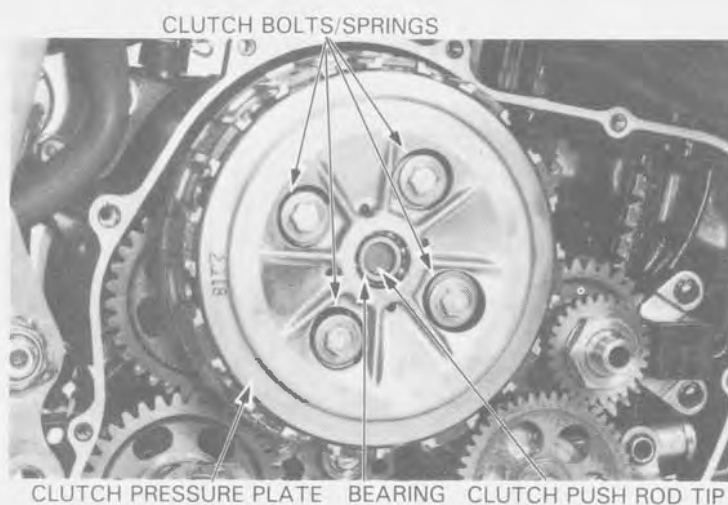
### REMOVAL

Remove the four clutch bolts and springs.

#### NOTE

Loosen the bolts in a criss cross pattern in 2—3 steps.

Remove the clutch pressure plate.  
Remove the clutch push rod tip and release bearing.



Remove the clutch discs and plates.



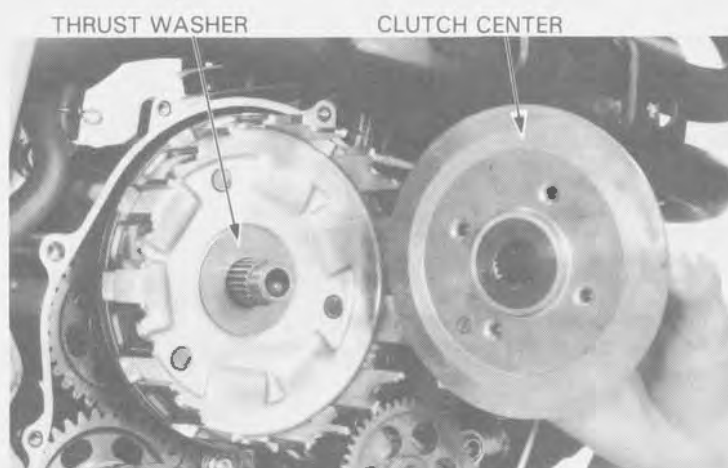
Attach the clutch center holder to the clutch center.

Remove the clutch lock nut and lock washer.  
Remove the clutch holder.

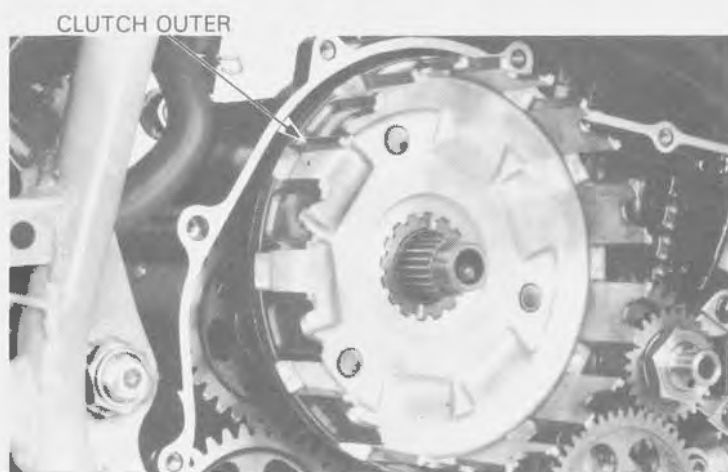




Remove the clutch center and thrust washer.



Remove the clutch outer from the mainshaft.



Remove the clutch outer guide and push rod from the mainshaft.





### INSPECTION

#### SPRINGS

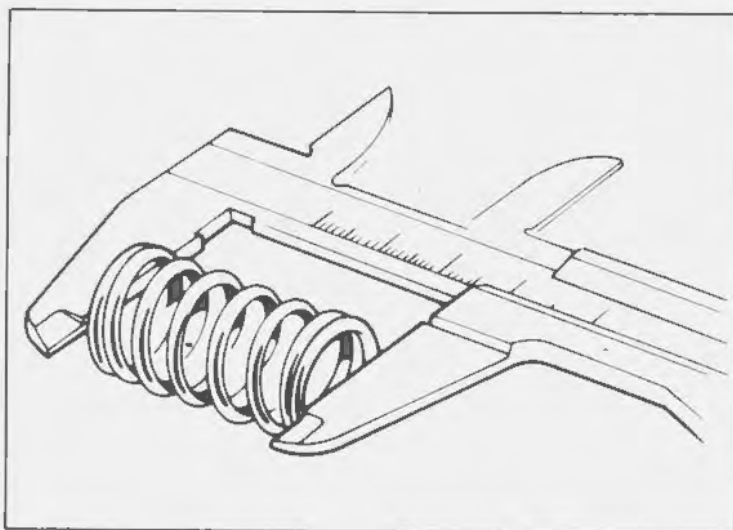
Measure the free length of each spring.

**SERVICE LIMIT : 42.7 mm (1.68 in)**

Replace if shorter than the service limit.

#### NOTE

Clutch springs should be replaced as a set if one or more is beyond the service limit.



#### CLUTCH DISC

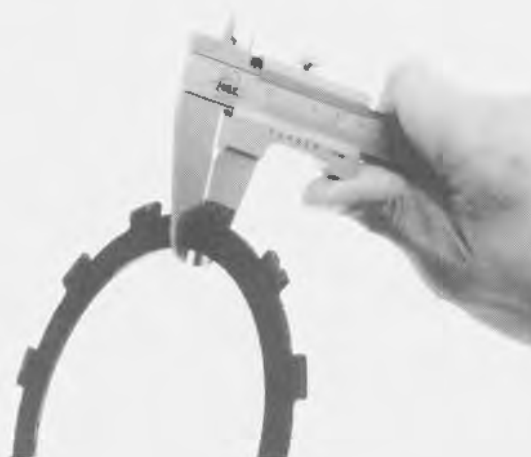
Replace the discs if they show signs of scoring or discoloration.

Measure the disc thickness.

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

#### NOTE

Clutch discs and plates should be replaced as a set if any one is beyond the service limit.



#### CLUTCH PLATE

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

**SERVICE LIMIT : 0.3 mm (0.01 in)**



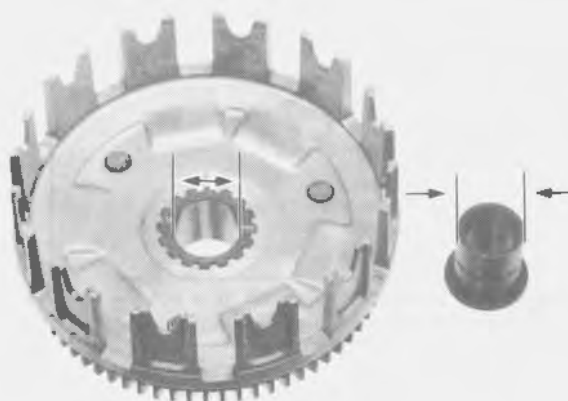
**CLUTCH OUTER AND OUTER GUIDE**

Check the slots in the outer drum for nicks, cuts or indentations made by the friction discs.

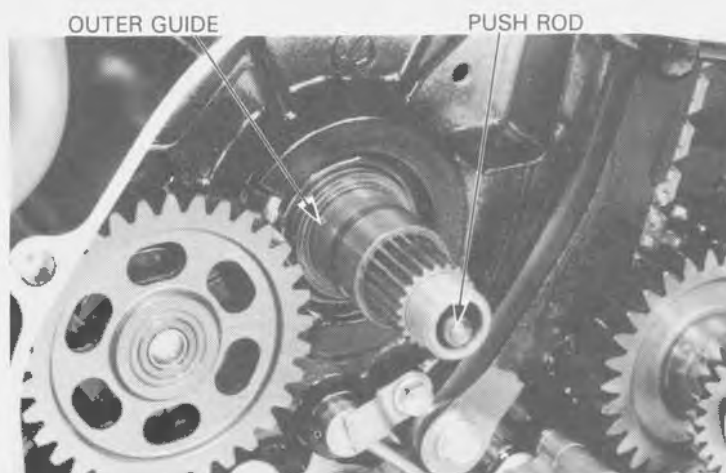
Measure the I.D. of the clutch outer and the O.D. of the outer guide.

**SERVICE LIMIT**

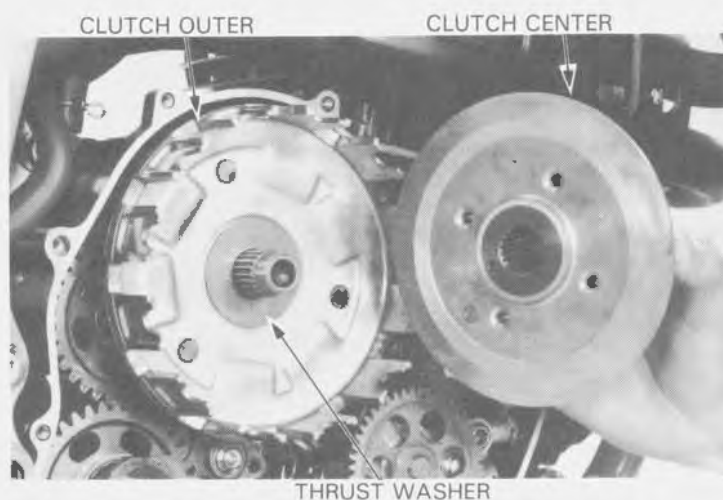
|                          |                            |
|--------------------------|----------------------------|
| <b>CLUTCH OUTER I.D.</b> | <b>27.05 mm (1.065 in)</b> |
| <b>OUTER GUIDE O.D.</b>  | <b>26.91 mm (1.059 in)</b> |

**INSTALLATION**

Install the clutch push rod and outer guide.



Install the clutch outer over the outer guide.  
Install the thrust washer and clutch center.





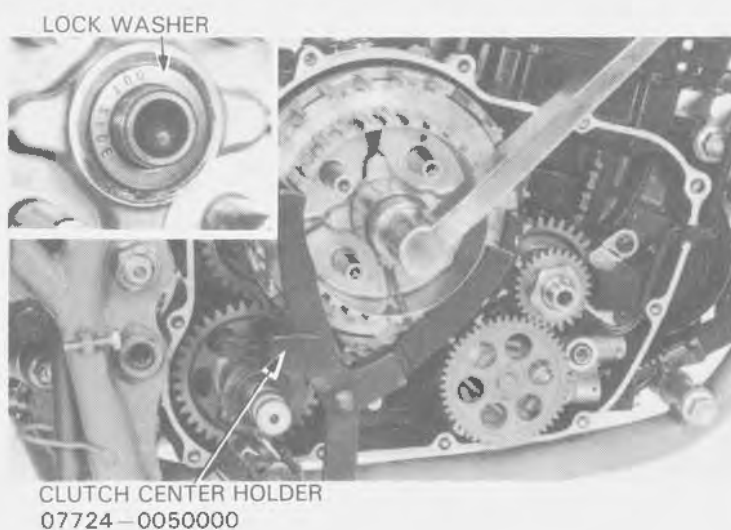
Install the clutch lock washer with "OUTSIDE" facing out.

Install the clutch lock nut.

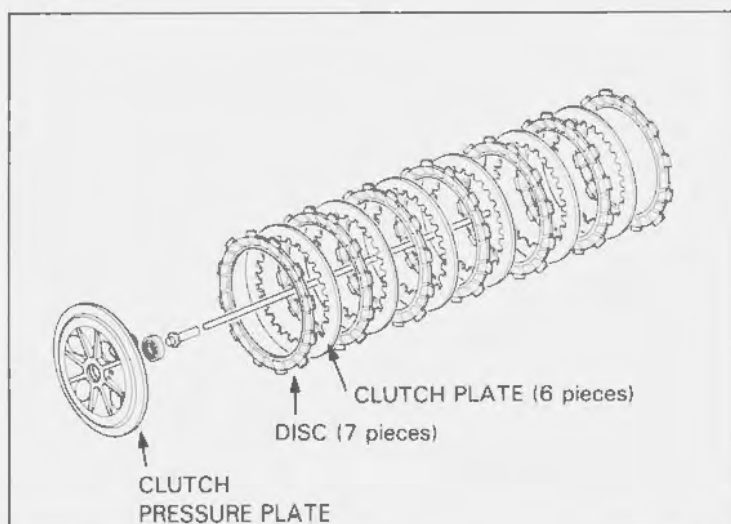
Install the clutch center holder to the clutch center.  
Tighten the lock nut to the specified torque.

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

Remove the clutch center holder.



Coat the discs and plates with clean engine oil.  
Install the clutch discs and plates as shown.

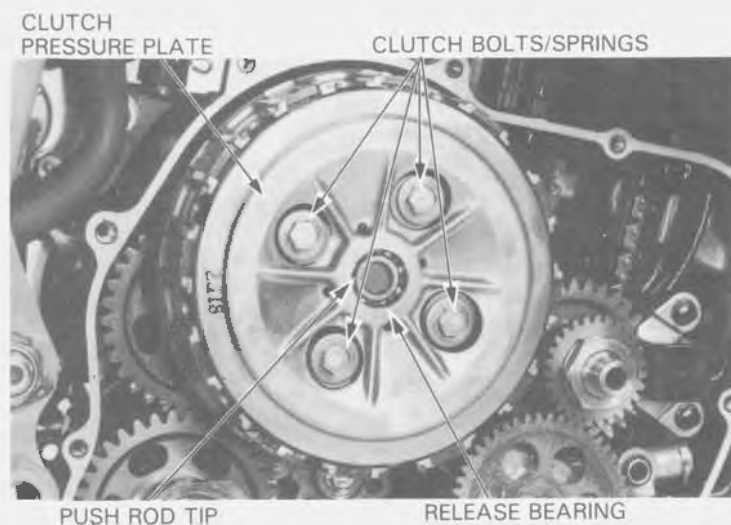


Install the clutch release bearing and push rod tip into the pressure plate.

Install the clutch pressure plate.

Install the clutch bolts in crisscross pattern in 2–3 steps.

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



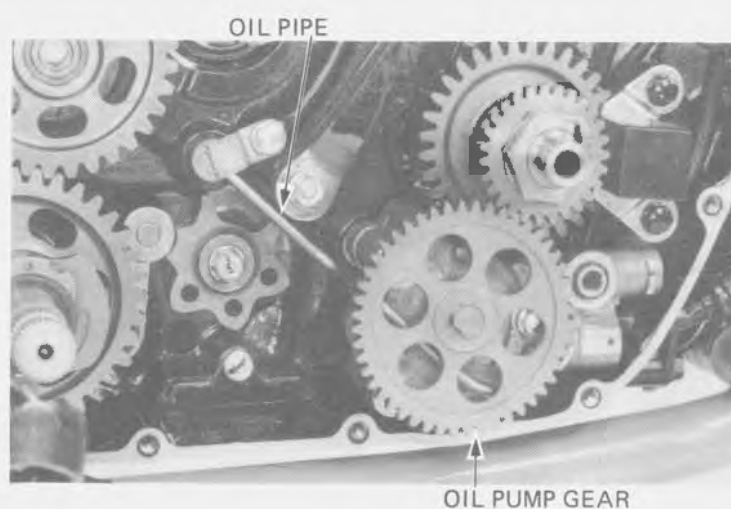




## OIL PUMP

### OIL PUMP REMOVAL

Remove the clutch (Page 8-5).  
Remove the oil pump gear and oil pipe.

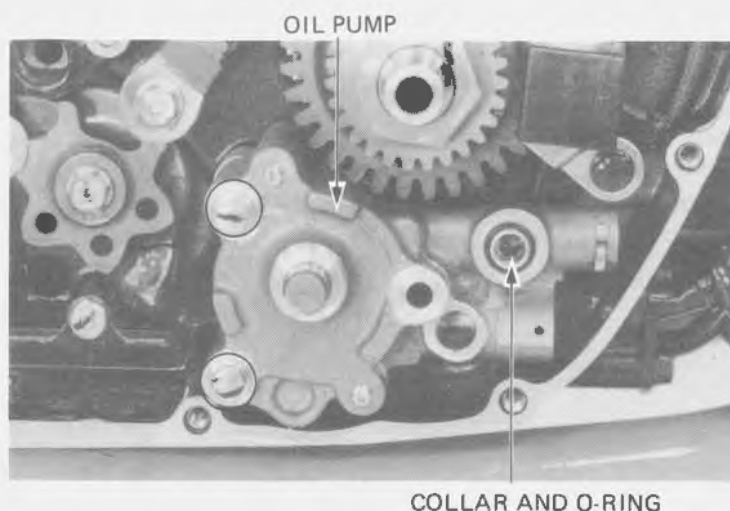


### OIL PIPE INSPECTION

Check that the oil pipe is clear.



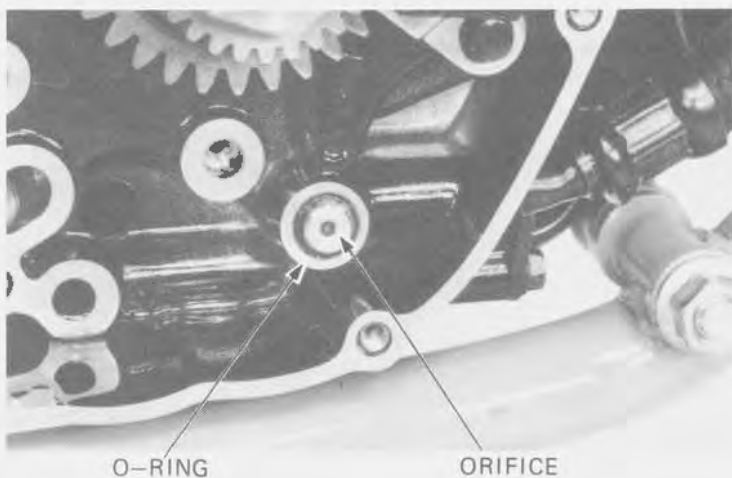
Remove the collar and O-ring.  
Remove the two oil pump bolts, then remove the oil pump from the right crankcase.



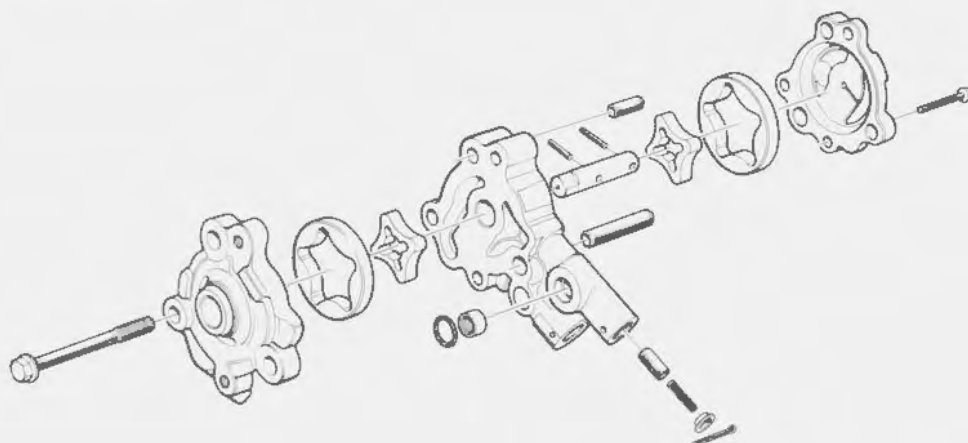




Remove the orifice and O-ring from the right crankcase. Check that the oil orifice in the crankcase is clean by blowing through with compressed air.



#### OIL PUMP DISASSEMBLY

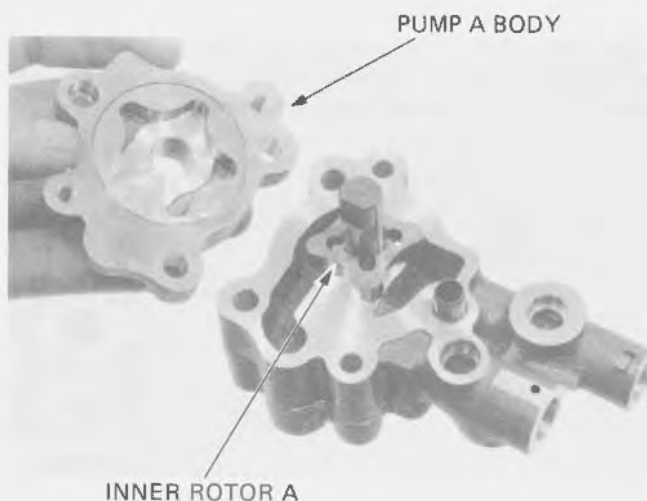


Remove the oil pump body screws.





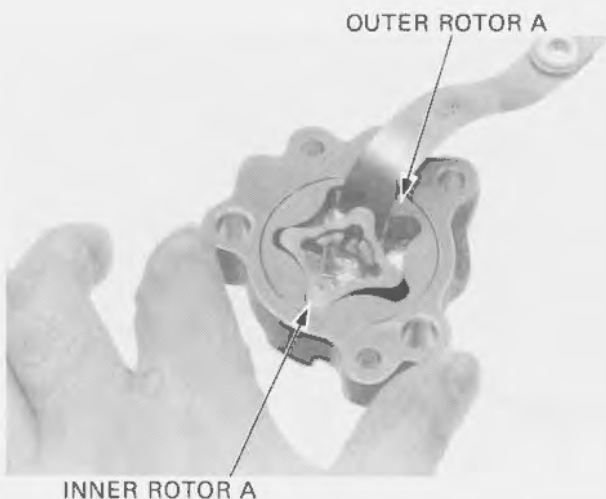
Remove the oil pump A body and inner rotor A from the check valve housing.



## OIL PUMP INSPECTION

Measure the tip clearance between the inner and outer A rotors.

**SERVICE LIMIT: 0.2 mm (0.008 in)**



Measure the clearance between the outer rotor A and the pump A body.

**SERVICE LIMIT: 0.25 mm (0.01 in)**





Measure the end clearance of pump A.  
SERVICE LIMIT: 0.12 mm (0.005 in)

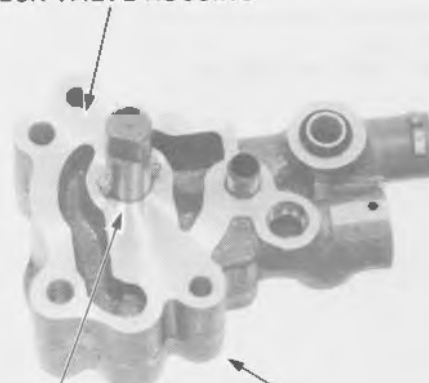


Remove the lock pin from the oil pump shaft.

CHECK VALVE HOUSING

LOCK PIN

OIL PUMP B BODY



Separate the check valve housing from oil pump B body.

Remove the dowel pins, pump shaft, inner and outer rotor B from the pump B body.

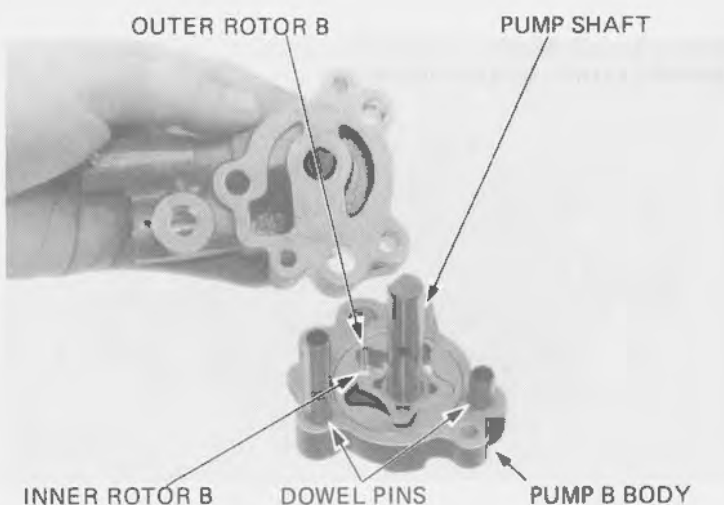
OUTER ROTOR B

PUMP SHAFT

INNER ROTOR B

DOWEL PINS

PUMP B BODY





Measure the tip clearance between the inner and outer B rotors.

**SERVICE LIMIT: 0.2 mm (0.008 in)**



Measure the clearance between the outer rotor B and the pump B body.

**SERVICE LIMIT: 0.25 mm (0.01 in)**



Measure the end clearance of pump B.

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

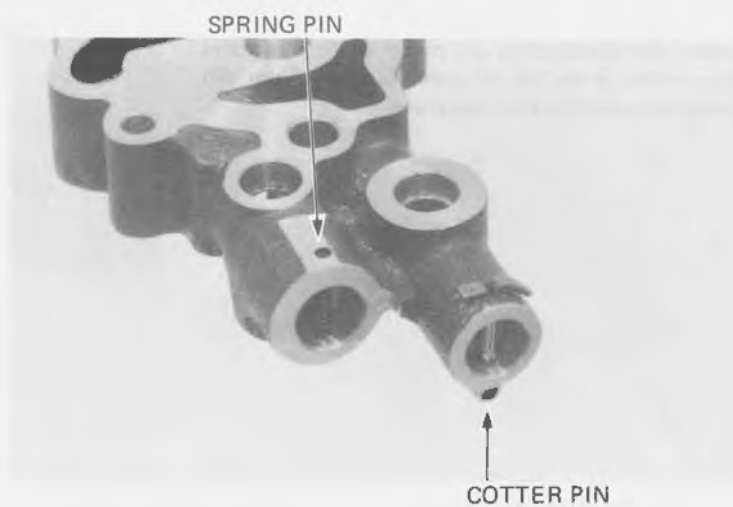


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### CHECK VALVE INSPECTION

Remove the cotter pin, washer, spring and check valve, from the check valve bore.



Inspect the check, valve and check valve bore for scoring or contamination.  
Clean, or replace, as necessary.



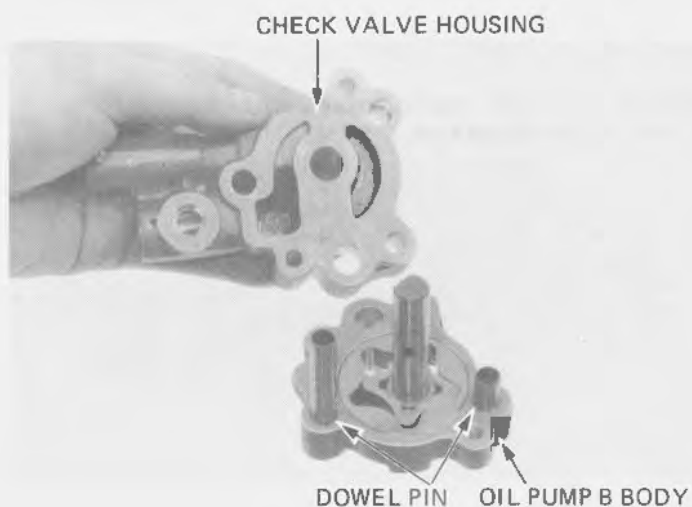
### OIL PUMP ASSEMBLY

Install the check valve, spring, and washer with a new cotter pin.



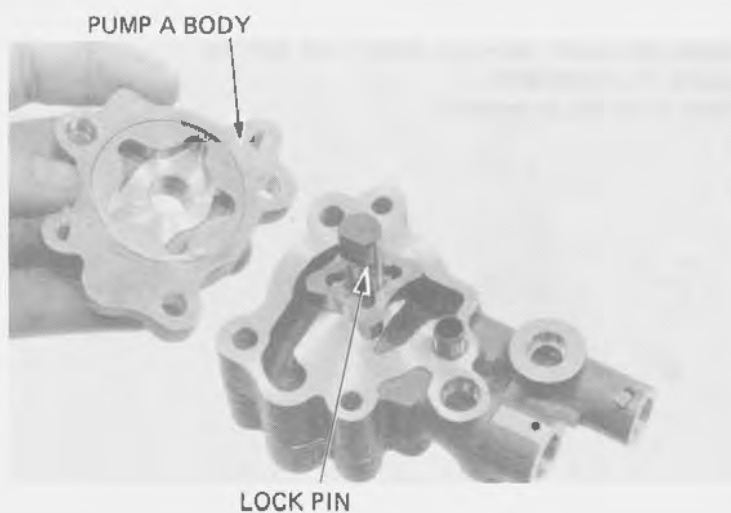


Install the dowel pins, oil pump shaft, inner and outer rotor B on the oil pump B body, then slip the check valve housing into place.



Press the lock pin in the pump shaft, then slip inner rotor A into place.

Install outer rotor A into the pump A body then assemble onto the check valve housing.



Tighten the two oil pump screws.





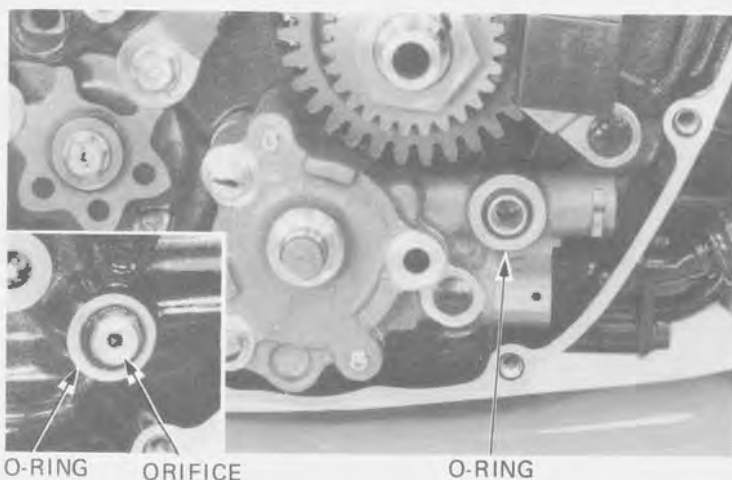
### OIL PUMP INSTALLATION

Install the orifice and a new O-ring onto the right crankcase.

Install the oil pump onto the right crankcase and tighten the two bolts.

Install the collar and a new O-ring.

Coat new O-rings with engine oil and install them on the oil pipe.

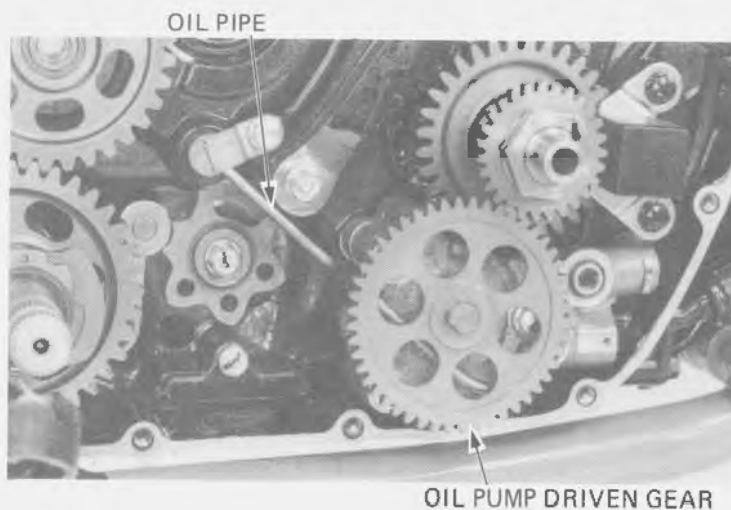


Install the oil pipe.

Tighten the oil pipe with two bolts.

Install the oil pump driven gear over the oil pump shaft.

Install the clutch (page 8-8).



### DRIVE GEAR

#### REMOVAL

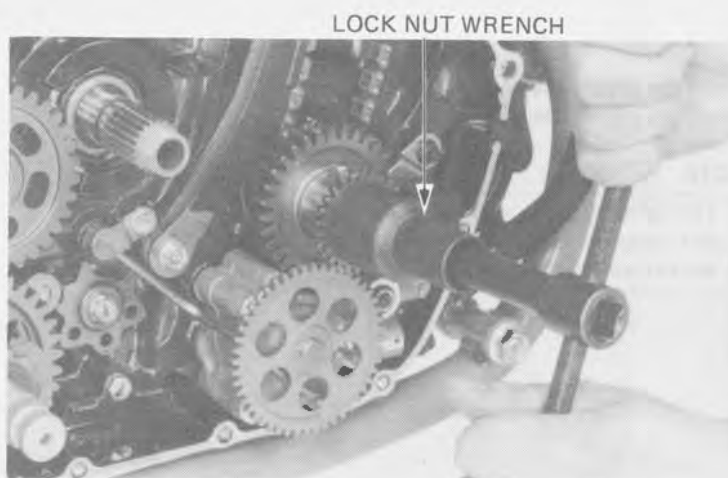
Remove the clutch (Page 8-5).

Remove the left crankcase cover.

Hold the flywheel with the flywheel holder.

Remove the driven gear lock nut.

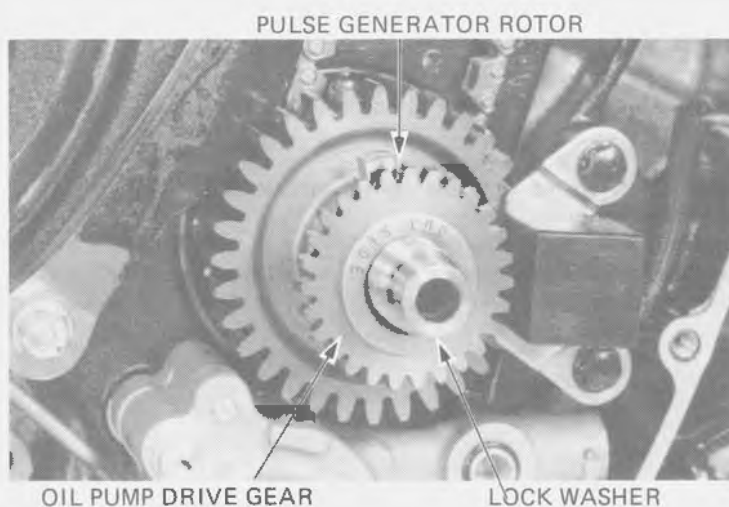
Remove the oil pump driven gear.







Remove the lock washer, oil pump drive gear, pulse generator rotor.



Remove the pulse generator and primary drive gear.

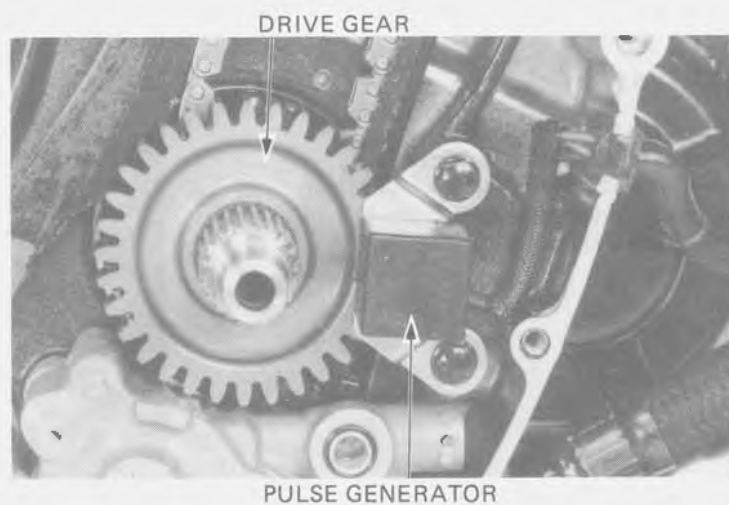


## DRIVE GEAR INSTALLATION

Install the primary drive gear.  
Install the pulse generator.

### NOTE

The primary drive and oil pump drive gears will only go on in one position because of the extra-wide aligning spline.





Install the pulse rotor and oil pump drive gear.  
Install the lock washer with the mark "Outside"  
facing out.



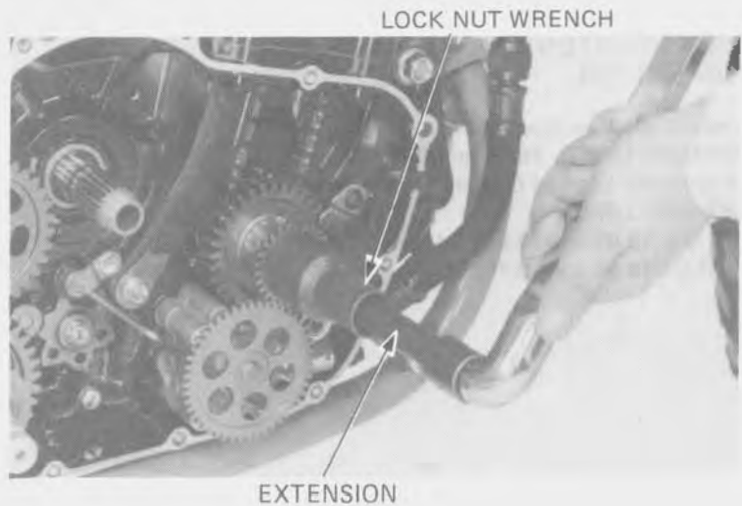
Install the lock nut and tighten to the specified torque.

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

Remove the flywheel holder and install the left crankcase cover. (page 9-4)

Install the oil pump driven gear.

Install the clutch (page 8-8).





### KICK STARTER REMOVAL

Remove the clutch (Page 8-5).

Remove the kick starter idler gear and its franged bushing.



### KICK STARTER IDLER GEAR INSPECTION

Measure the idler gear I.D.

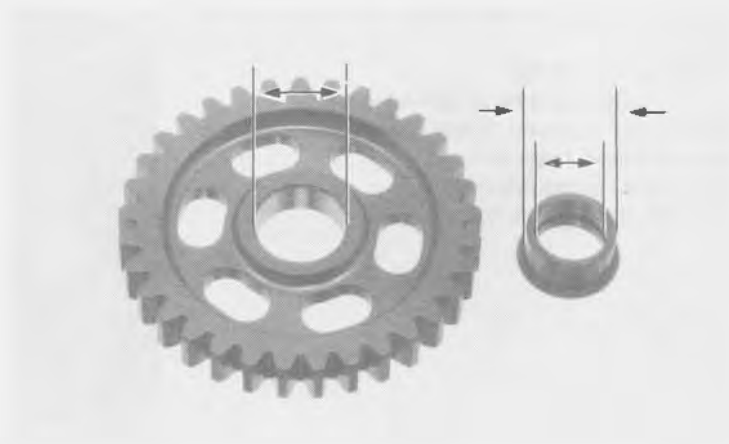
**SERVICE LIMIT: 20.11 mm (0.792 in)**

Measure the I.D. and O.D. of the idler gear bushing.

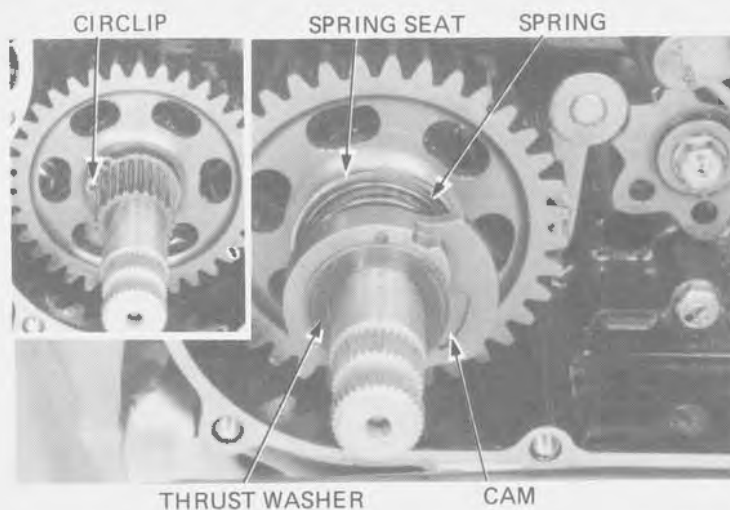
**SERVICE LIMIT:**

I.D.: 16.03 mm (0.631 in)

O.D.: 19.90 mm (0.783 in)



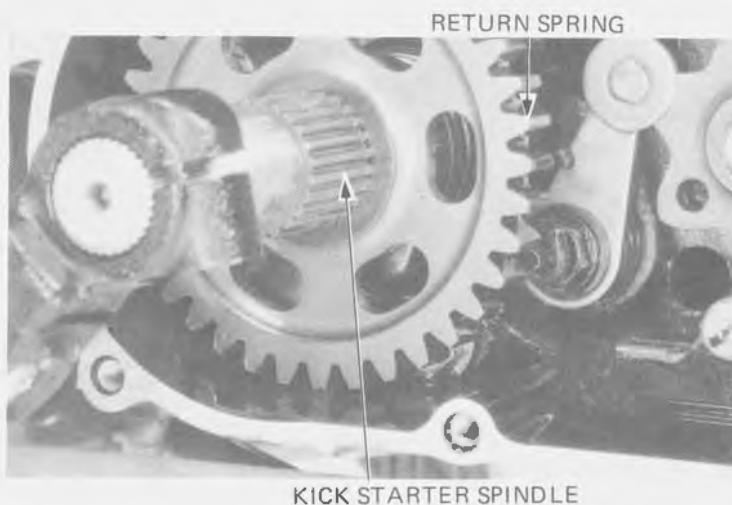
Remove the thrust washer, cam, return spring, spring seat and circlip.



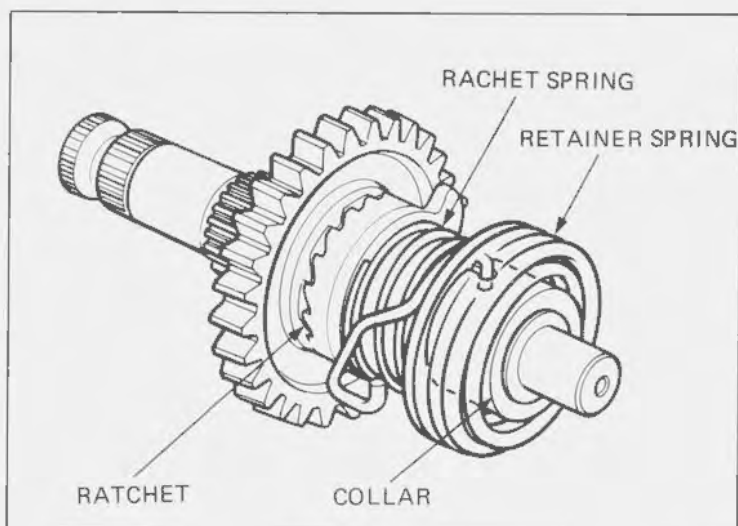


Unhook the kick starter return spring from right crankcase.

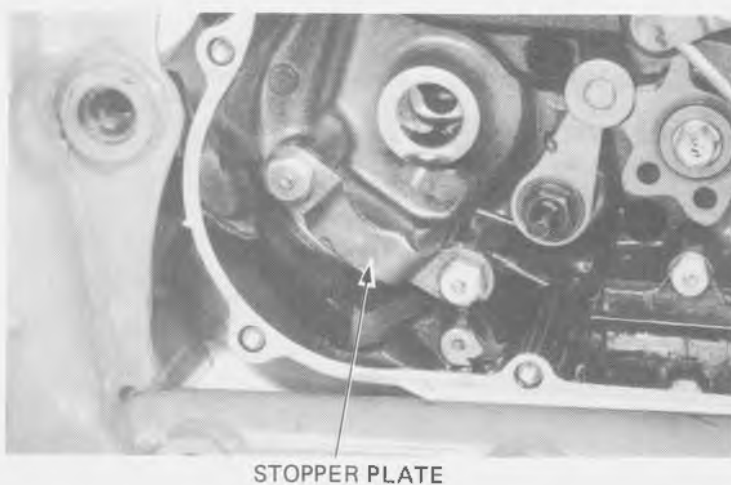
Temporarily install the kick starter pedal on the kick starter spindle and turn it counterclockwise to remove the spindle assembly.



Remove the retainer spring, collar washer, ratchet spring, ratchet, circlip and thrust washer.

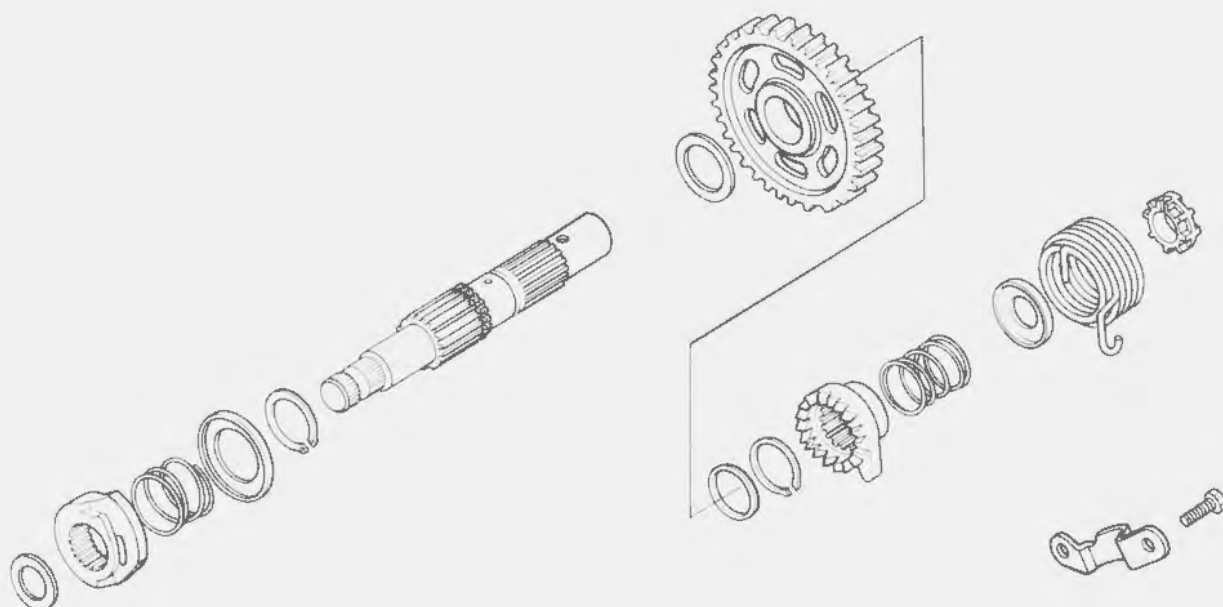


Remove the kick cam stopper plate.





## KICK STARTER SPINDLE DISASSEMBLY

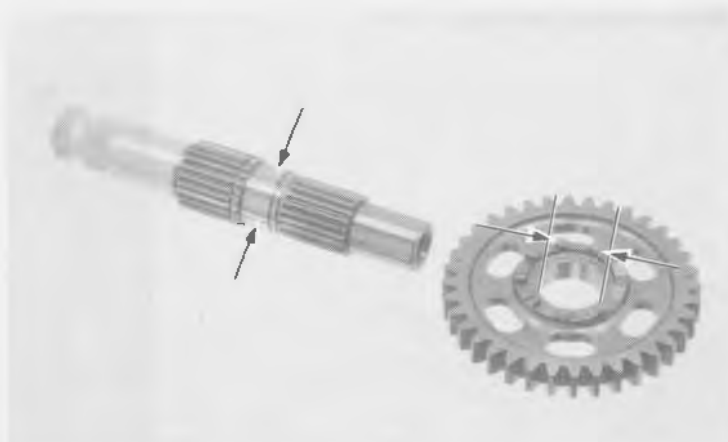


## KICK STARTER INSPECTION

Measure the kick starter pinion gear I.D. and spindle O.D.

## SERVICE LIMIT:

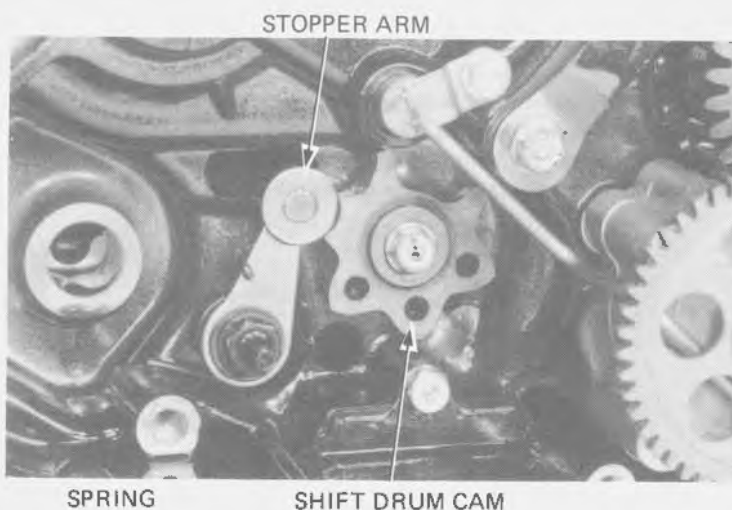
I.D.: 22.12 mm (0.871 in)  
O.D.: 21.90 mm (0.862 in)





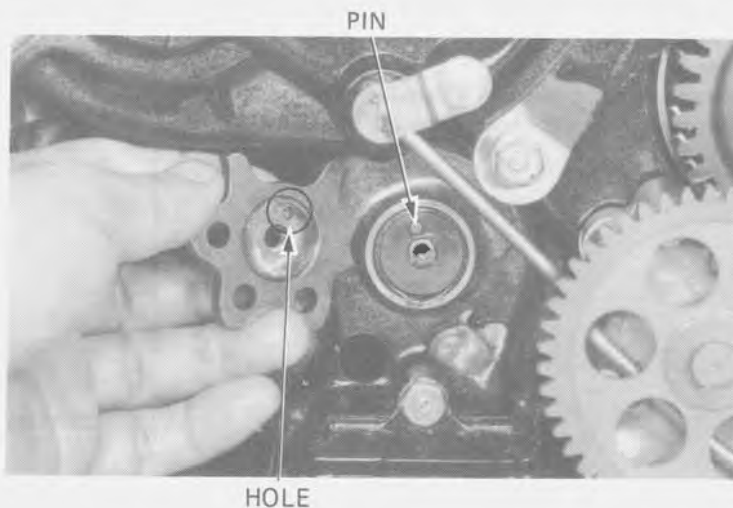
### GEAR SHIFT CAM REMOVAL

Remove the stopper arm, shift drum cam and return spring.



### SHIFT DRUM CAM INSTALLATION

Install the shift drum cam, aligning its hole with the shift drum pin.

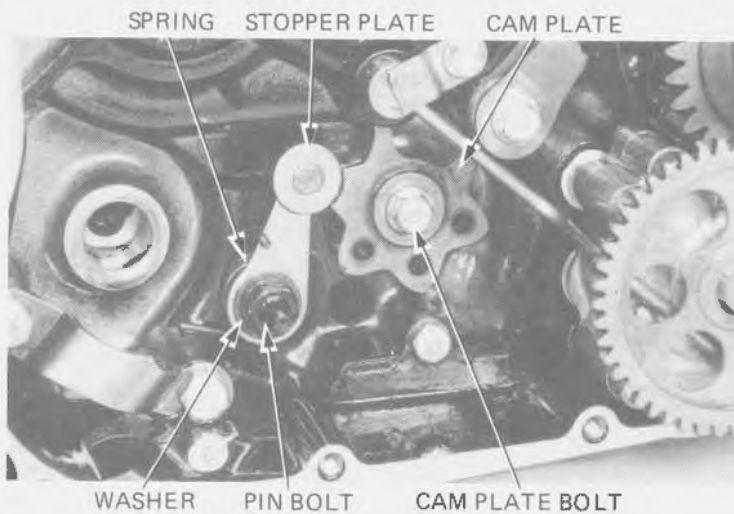


Apply locking agent to the threads of the cam plate bolt and tighten the bolt.

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

Install the spring, stopper arm, washer and pin bolt.

**TORQUE: 22–26 N·m (2.2–2.6 kg-m, 16–19 ft-lb)**

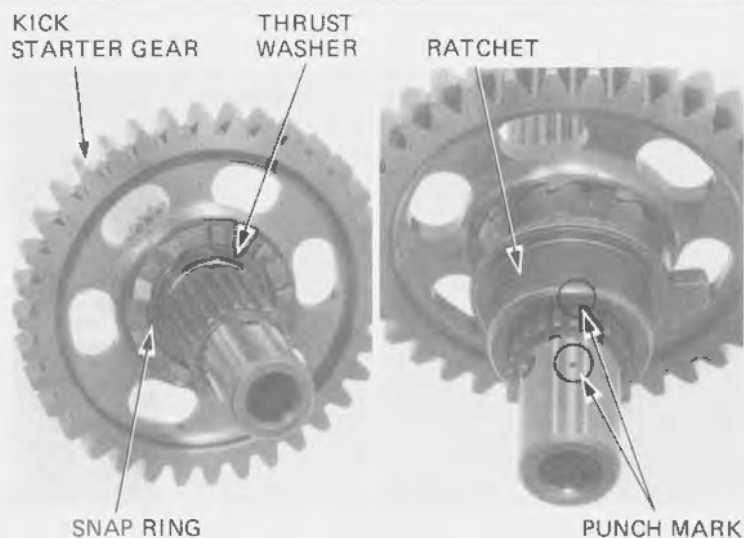






Install the thrust washer, kick starter gear, thrust washer and snap ring over the spindle.

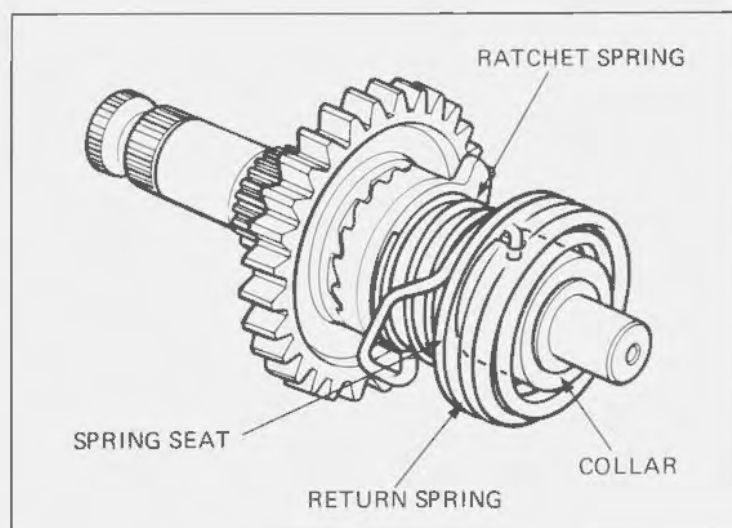
Align the punch marks on the ratchet and the spindle and install the ratchet over the spindle.



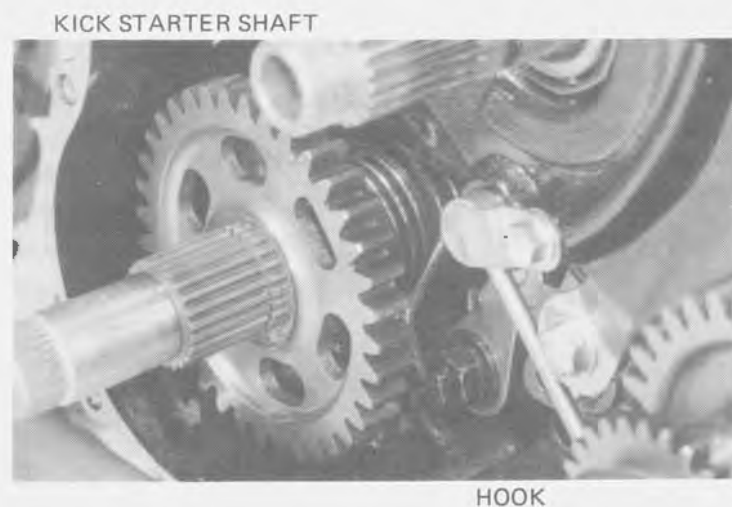
Install the ratchet spring and spring seat.

Install the return spring and insert its end into the hole in the spindle.

Install the collar aligning its groove with the spring end inserted into the hole in the spindle.



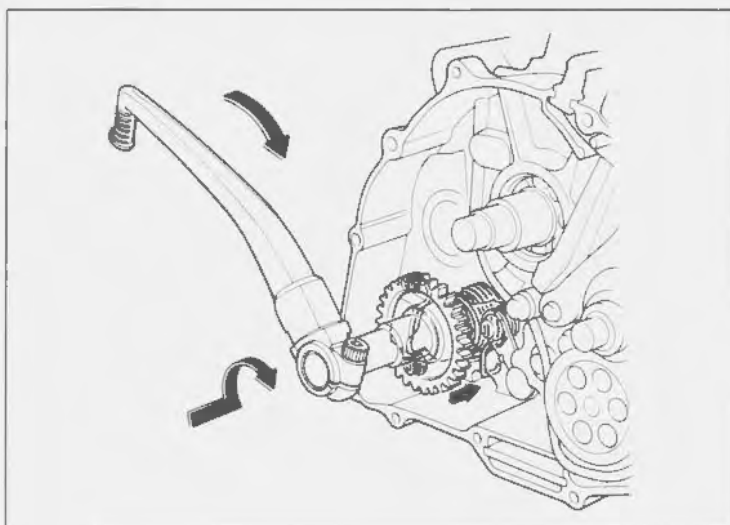
Install the kickstarter spindle into its hole in the right crankcase and hook the return spring into the hole in the crankcase.







Temporarily install the kick starter pedal on the kick spindle and rotate the shaft counterclockwise until the ratchet stub is clear of the stopper plate. Push the kick starter assembly into the crankcase.

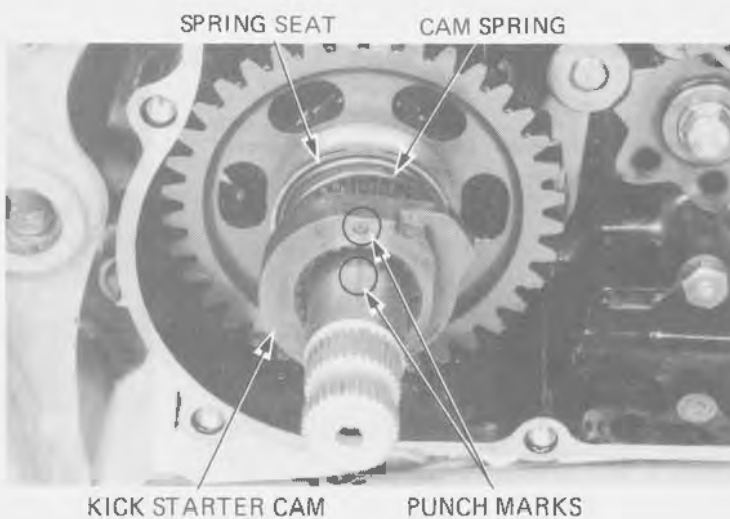


Install the circlip, spring seat, return spring and cam.

### NOTE

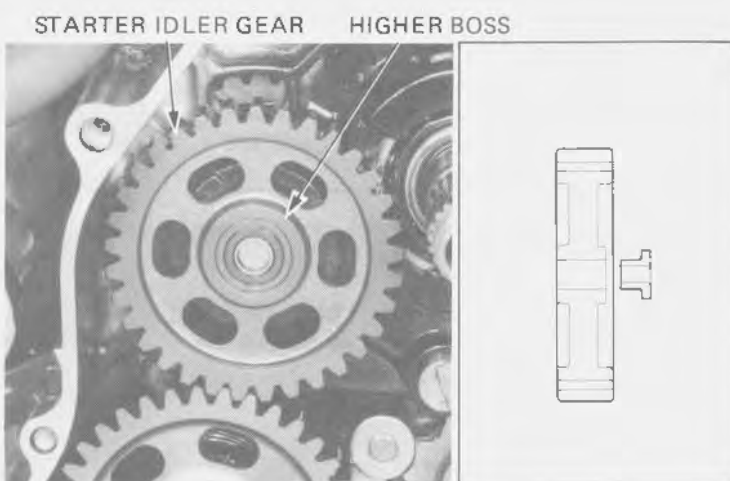
Align the cam punch mark with the spindle punch mark.

Install the thrust washer.



Install the starter idle gear bushing with its flange facing in.

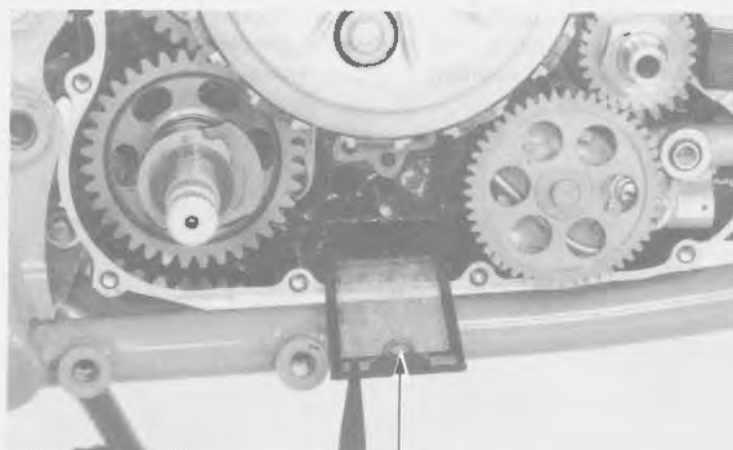
Install the starter gear with its higher boss facing out.





## RIGHT CRANKCASE COVER INSTALLATION

Remove the oil screen, clean it, then reinstall.

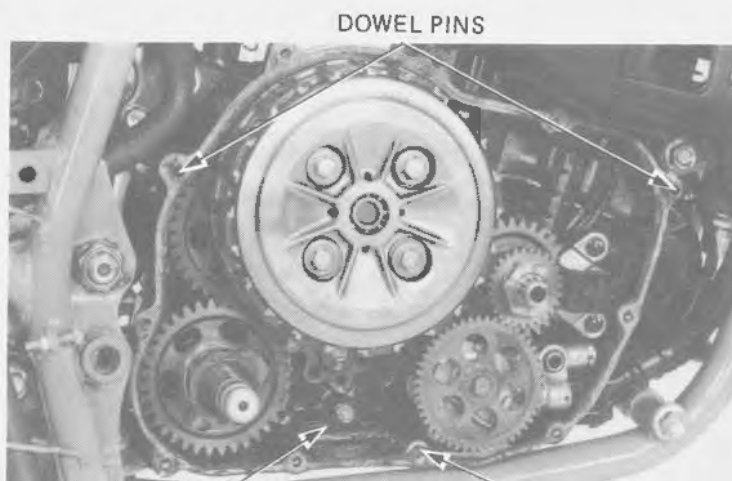


OIL FILTER SCREEN

Install the dowel pins and gasket.

### NOTE

Apply liquid sealer to the crankcase cover mating surface to hold the gasket.



DOWEL PINS

OIL FILTER SCREEN

GASKET

### NOTE

Before installing the crankcase cover, clean the threads of the bolts and nuts ('84) shown in the photo and apply Loctite® Lock and Seal or an equivalent.

Install the cover while holding the cam follower down.

Install the cover bolts and nuts ('84) with the conical washers. Be sure the cupped side of the washers face the cover.

Tighten the cover bolts.

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



WASHER AND 6 mm NUT ('84)



Install the oil pipe and exhaust pipe.  
Install the kick starter decompressor cable.  
Install the rear brake linkage and rear brake pedal.  
Install the right foot peg.  
Install the skid plate.

Fill the oil tank with the recommended oil up to the proper level.

Adjust the starter decompressor (See Page 3-8).

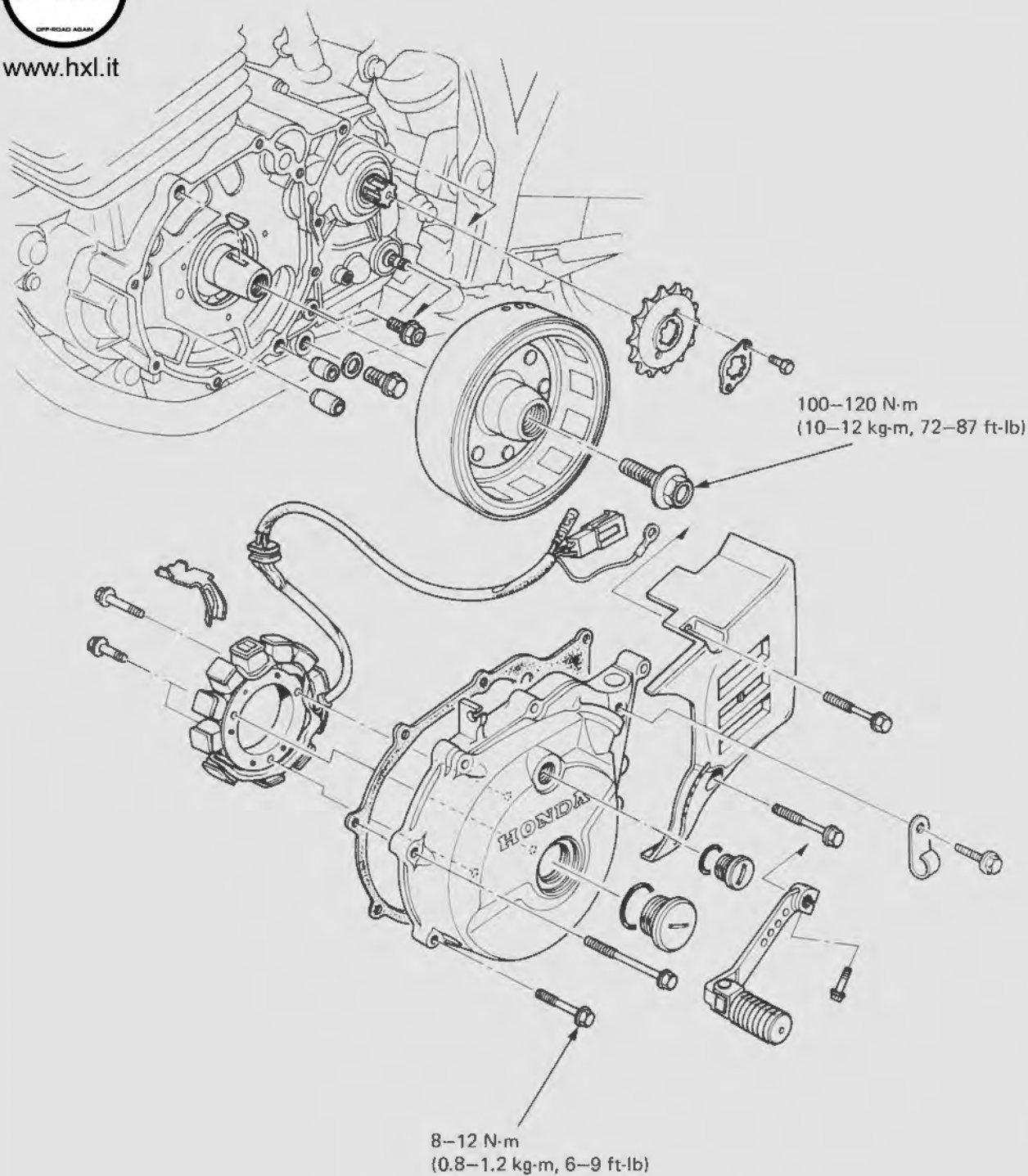
Adjust the clutch free play (See Page 3-16).

Check the brake light switch (See Page 3-15).





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# 9. ALTERNATOR

|                                   |     |
|-----------------------------------|-----|
| SERVICE INFORMATION               | 9-1 |
| LEFT CRANKCASE COVER REMOVAL      | 9-2 |
| FLYWHEEL REMOVAL                  | 9-3 |
| FLYWHEEL INSTALLATION             | 9-4 |
| LEFT CRANKCASE COVER INSTALLATION | 9-4 |

## SERVICE INFORMATION

### GENERAL INSTRUCTIONS

- This section pertains to removal and installation of the AC generator. These operations can be accomplished with the engine in the frame after removing the left crankcase cover.
- For alternator inspection, refer to section 16.

### TOOLS

#### Common Tools

|                 |                                                                       |
|-----------------|-----------------------------------------------------------------------|
| Flywheel Holder | 07725-0040000 or Band Strap Wrench (commercially available in U.S.A.) |
| Rotor Puller    | 07733-0020001 (or 07933-3290001)                                      |

9

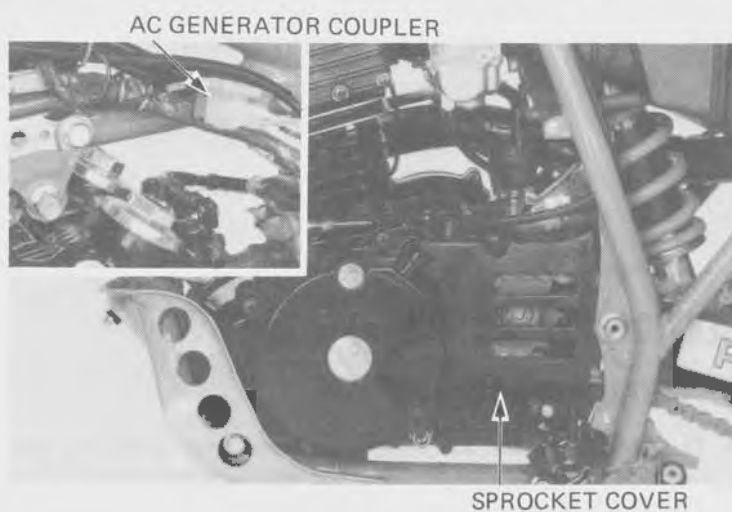
### TORQUE VALUES

|                      |                                       |
|----------------------|---------------------------------------|
| AC generator         | 100-120 N·m (10-12 kg-m, 72-87 ft-lb) |
| Left crankcase cover | 8-12 N·m (0.8-1.2 kg-m, 6-9 ft-lb)    |
| Gearshift pedal      | 8-12 N·m (0.8-1.2 kg-m, 6-9 ft-lb)    |
| Drain plug           | 30-40 N·m (3.0-4.0 kg-m, 22-29 ft-lb) |

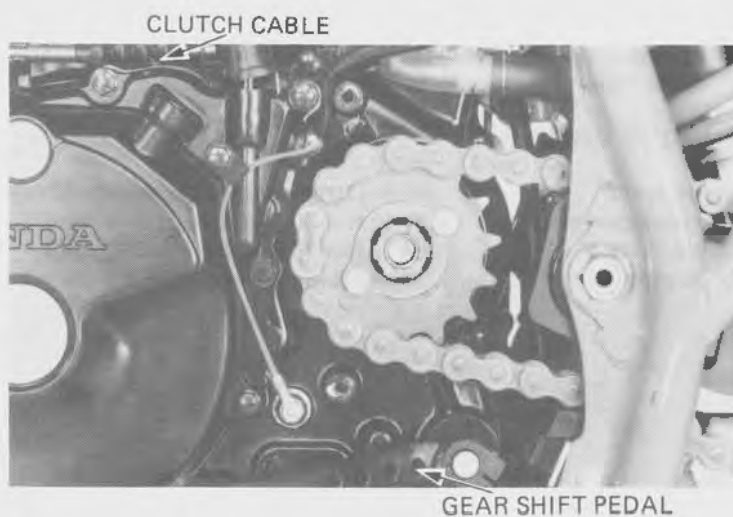


## LEFT CRANKCASE COVER REMOVAL

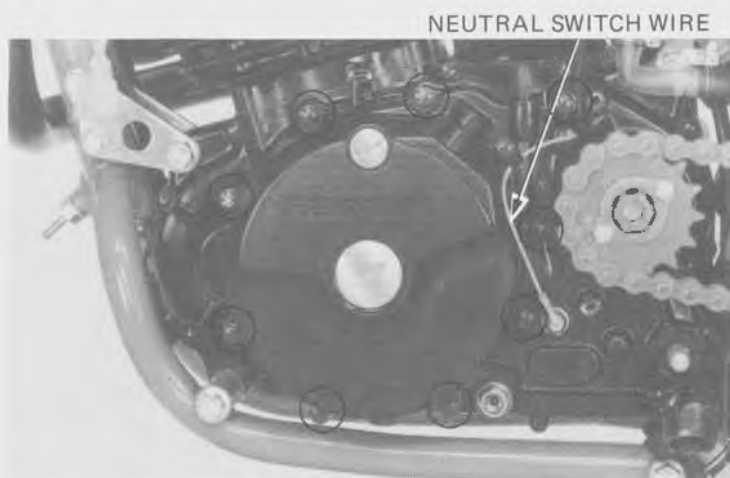
Remove the seat and fuel tank.  
Remove the skid plate and drain the oil.  
Disconnect the AC Generator coupler.  
Remove the sprocket cover.



Disconnect the clutch cable and gear shift pedal.



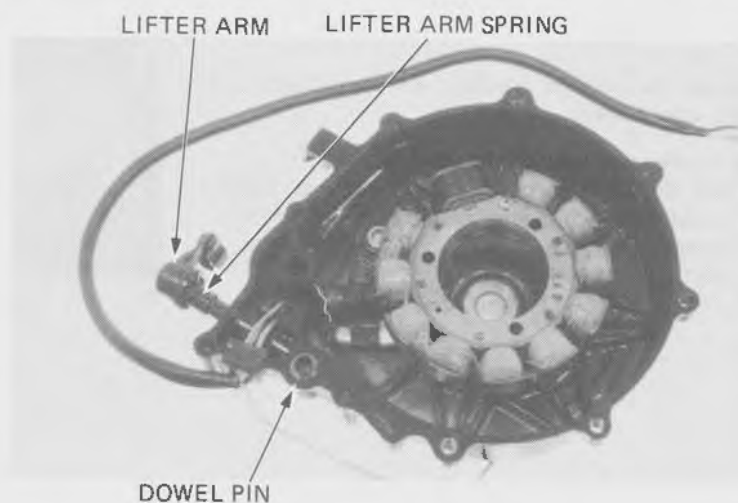
Disconnect the neutral switch wire.  
Remove the left crankcase cover.





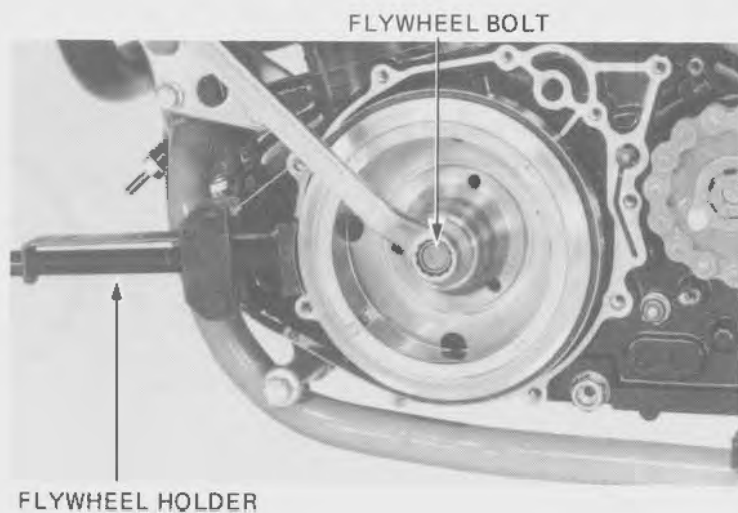
### CLUTCH LIFTER ARM DISASSEMBLY

Remove the dowel pin and lifter arm.  
Remove the lifter arm spring.

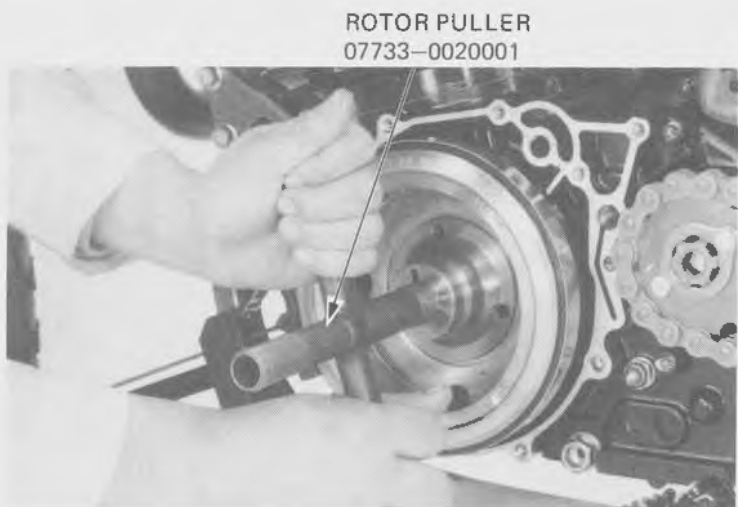


### FLYWHEEL

Shift the transmission into top gear.  
Hold the drive sprocket with a universal holder, or  
hold the flywheel with a band strap wrench.  
Remove the rotor bolt.



Remove the rotor using the rotor puller.







## FLYWHEEL INSTALLATION

Install the rotor by aligning the woodruff key with the rotor keyway.

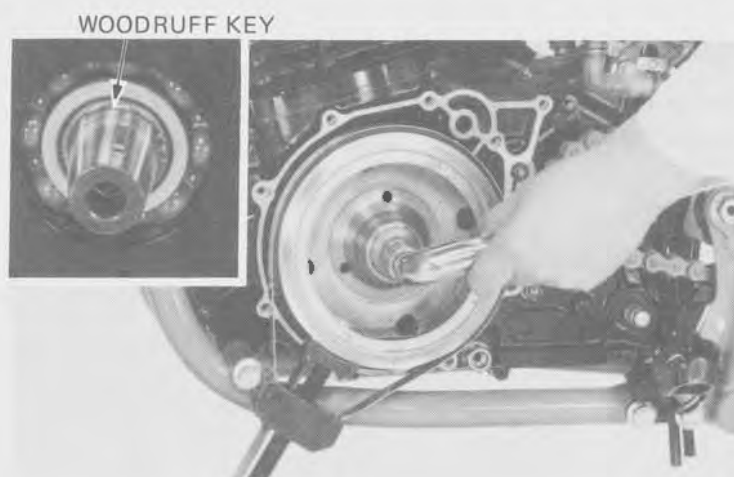
Shift the transmission into top gear.

Hold the drive sprocket with a universal holder, or hold the flywheel with a band strap wrench.

Tighten the rotor bolt.

**TORQUE: 100–120 N·m**

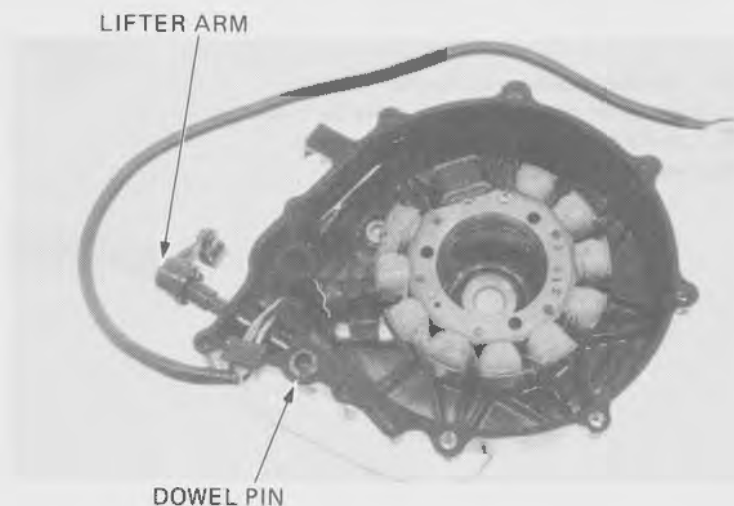
(10–12 kg-m, 72–87 ft-lb)



## LEFT CRANKCASE COVER INSTALLATION

Install the clutch lifter arm and spring.

Install the clutch lifter pin.

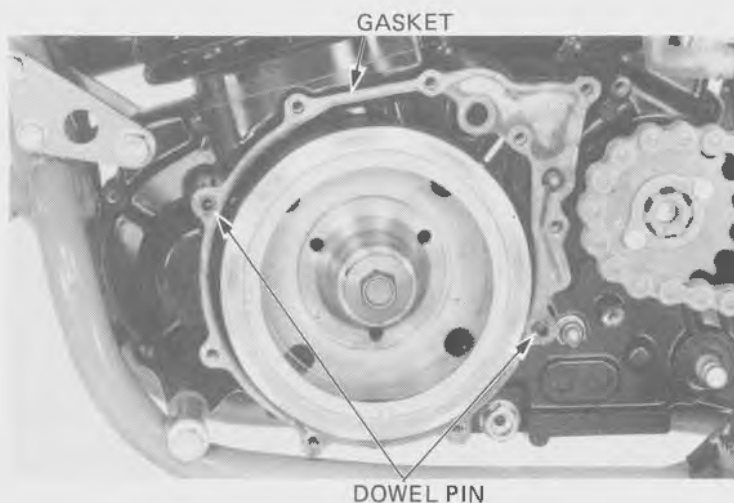


Install the crankcase dowel pins and a new gasket, if they were removed and gasket.

Install the left crankcase cover and tighten the

**TORQUE: 8–12 N·m**

(0.8–1.2 kg-m, 6–9 ft-lb)



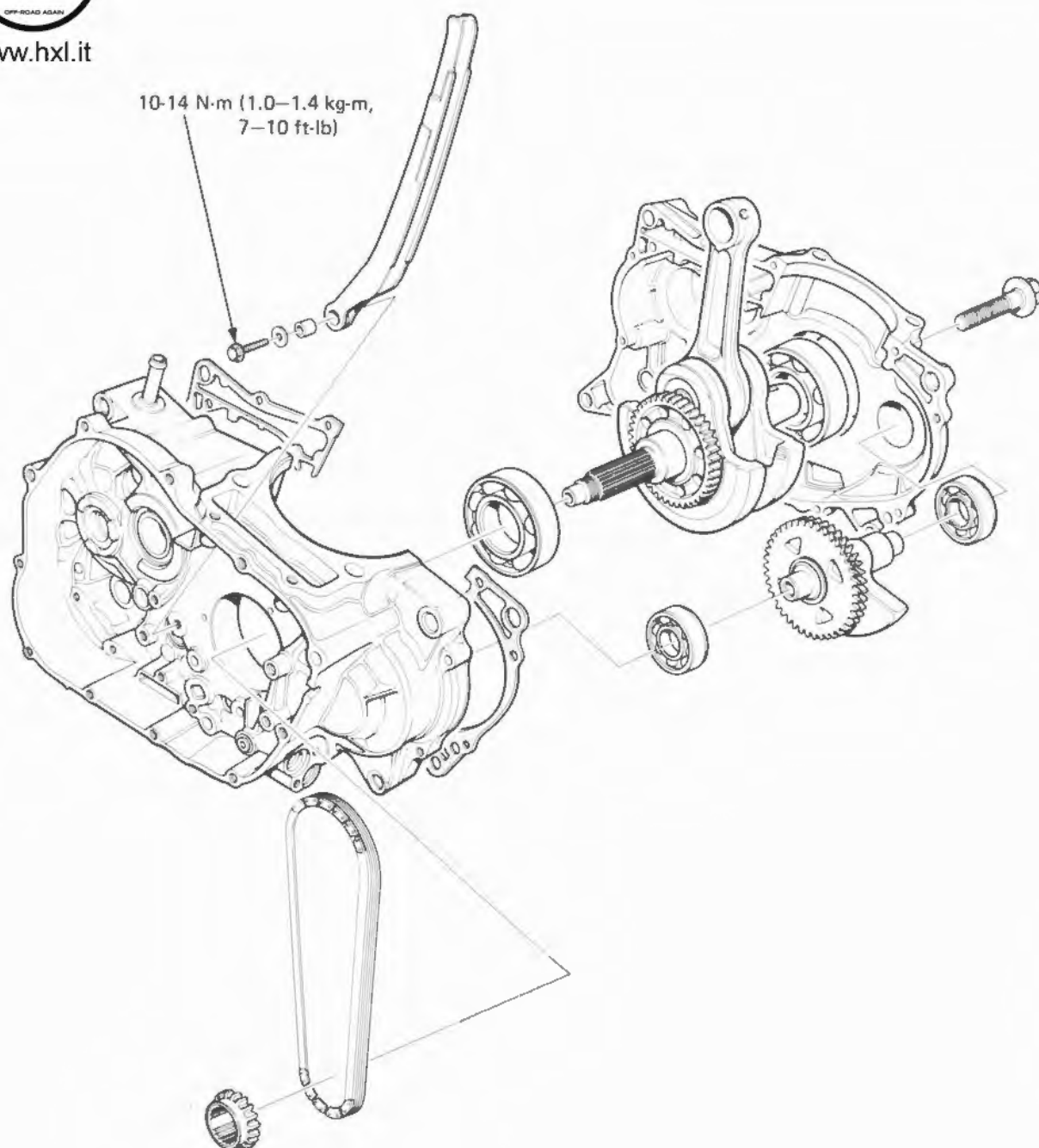


Connect the neutral switch wire.  
Connect and route the AC Generator coupler.  
Install the clutch cable and gear shift pedal.  
Install the sprocket cover.  
Fill the oil tank with the recommended oil up to the proper level.  
Install the fuel tank and seat.  
Adjust the clutch free play (See Page 3-16).





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|                                      |       |
|--------------------------------------|-------|
| SERVICE INFORMATION                  | 10- 1 |
| TROUBLESHOOTING                      | 10- 2 |
| CRANKCASE SEPARATION                 | 10- 3 |
| BALANCER REMOVAL                     | 10- 4 |
| CRANKSHAFT REMOVAL                   | 10- 7 |
| CRANKSHAFT AND BALANCER INSTALLATION | 10-10 |
| CRANKCASE ASSEMBLY                   | 10-11 |

## SERVICE INFORMATION

### GENERAL

- The crankcase must be separated to repair the crankshaft, connecting rod, kick starter, transmission and balancer.
- Remove the following parts before separating the crankcase.

|                             |           |
|-----------------------------|-----------|
| ENGINE REMOVAL              | Section 5 |
| CYLINDER HEAD               | Section 6 |
| CLUTCH/OIL PUMP/KICKSTARTER | Section 7 |
| CLUTCH/OIL PUMP             | Section 8 |
| AC GENERATOR                | Section 9 |

- To service the crankshaft or balancer, it is necessary to separate the crankcase.

### SPECIFICATIONS

| ITEM                    | STANDARD                                | SERVICE LIMIT                       |
|-------------------------|-----------------------------------------|-------------------------------------|
| Crankshaft              | Connecting rod big end side clearance   | 0.050–0.650 mm (0.0020–0.0256 in)   |
|                         | Connecting rod big end radial clearance | 0.006–0.018 mm (0.0002–0.0007 in)   |
|                         | Connecting rod small end I.D.           | 24.020–24.041 mm (0.9457–0.9465 in) |
|                         | Crankshaft runout                       | 0.1 mm (0.004 in)                   |
| Balancer                | Shaft O.D. A                            | 16.977–16.995 mm (0.6684–0.6691 in) |
| Crankshaft bearing play | Radial                                  | 0.05 mm (0.002 in)                  |
|                         | Axial                                   | 0.10 mm (0.004 in)                  |

### COMMON TOOLS (for crankshaft bearing installation)

|                        |               |                        |               |
|------------------------|---------------|------------------------|---------------|
| Driver                 | 07749-0010000 | Attachment, 37 x 40 mm | 07746-0010200 |
| Attachment, 72 x 75 mm | 07746-0010600 | Pilot, 17 mm           | 07746-0020300 |
| Pilot, 40 mm           | 07746-0040900 | Pilot, 35 mm           | 07746-0040800 |

### SPECIAL TOOL

|                        |               |                      |               |
|------------------------|---------------|----------------------|---------------|
| Crank assembly kit     | 07931-KF00000 | Assembly collar      | 07931-KF00100 |
|                        |               | Thread adapter       | 07931-KF00200 |
|                        |               | Shaft puller         | 07931-ME0000  |
| Bearing remover, 17 mm | 07936-3710300 | (Balancer bearing)   |               |
| Oil seal driver        | 07947-6930100 | (Crankshaft bearing) |               |
| Remover weight         | 07936-3710200 |                      |               |
| Remover handle         | 07936-3710100 |                      |               |



## TORQUE VALUES

|                     |                                      |
|---------------------|--------------------------------------|
| Right crankcase     | 8-12 N·m (0.8-1.2 kg-m, 6-9 ft-lb)   |
| Left crankcase      | 8-12 N·m (0.8-1.2 kg-m, 6-9 ft-lb)   |
| Cam chain tensioner | 10-14 N·m (1.0-1.4 kg-m, 7-10 ft-lb) |

## TROUBLESHOOTING

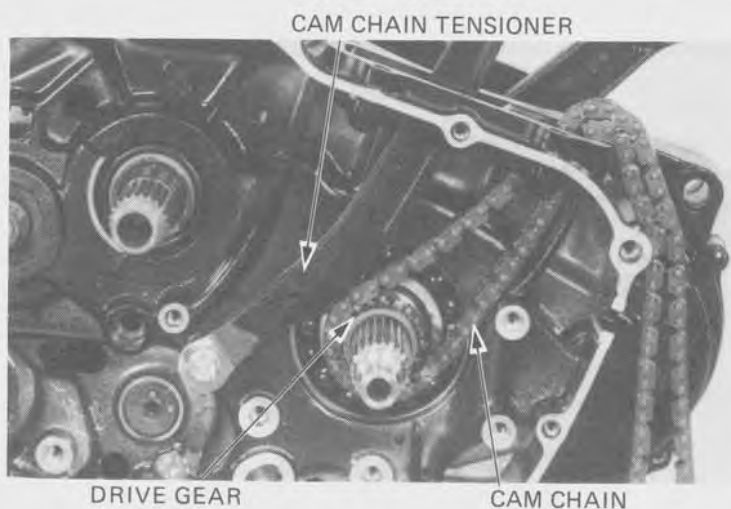
### Excessive Noise

1. Crankshaft
  - Worn connecting rod bearing
  - Bent connecting rod
  - Worn crankshaft bearing
2. Balancer
  - Improper installation

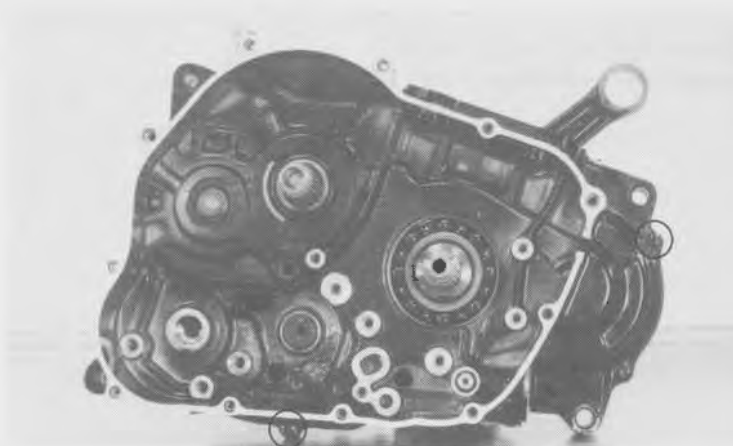


## CRANKCASE SEPARATION

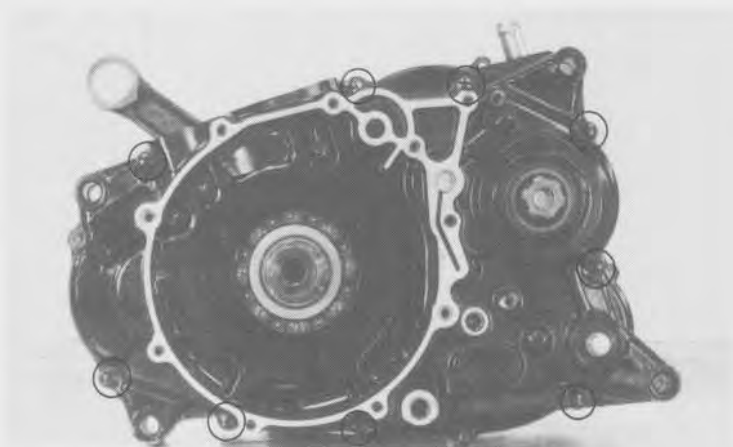
Remove the cam chain and cam chain drive gear.  
Remove the cam chain tensioner, collar and washer.



Remove the right crankcase bolts.



Remove the left crankcase bolts.





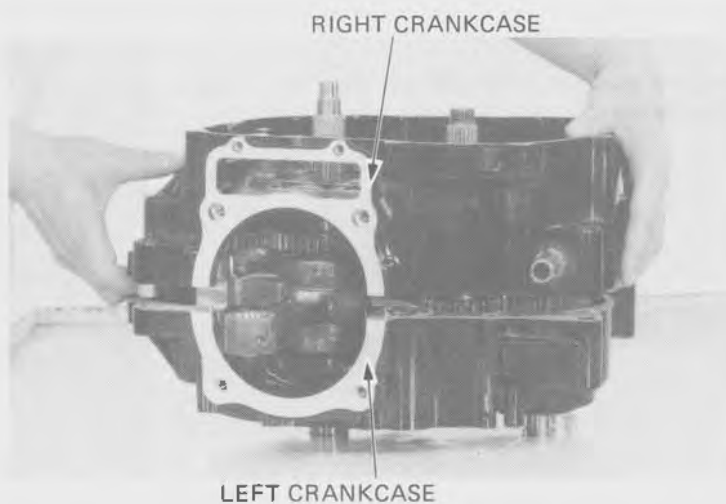
Remove the right crankcase from the left crankcase.

**NOTE**

Separate the right and left crankcases from each other while tapping them at several locations with a soft hammer.

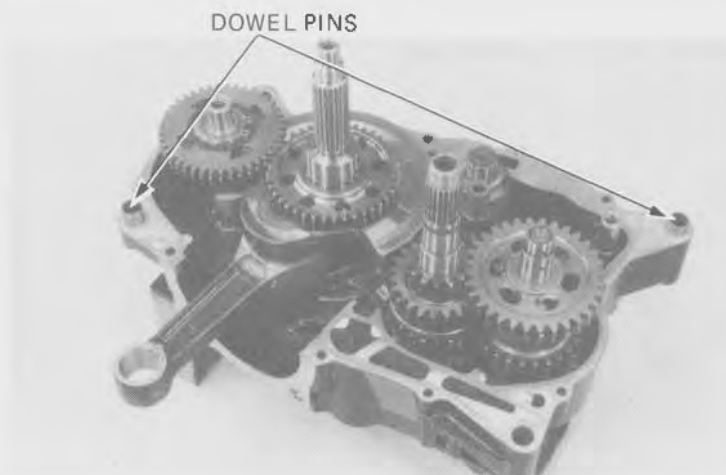
**CAUTION**

*Do not pry the crankcases apart with a screwdriver.*



## BALANCER REMOVAL

Remove the gasket and dowel pins.  
Remove the transmission (Page 11-3).



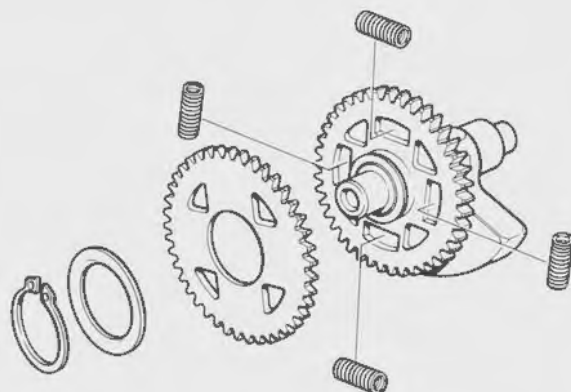
Remove the balancer.







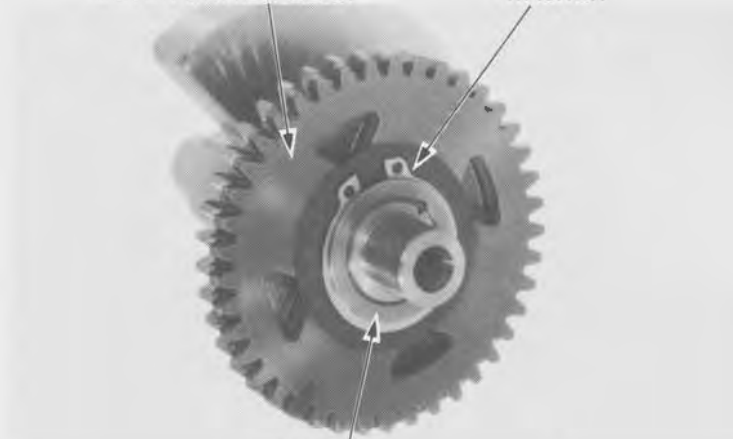
BALANCER DISASSEMBLY



Remove the snap ring, thrust washer and outer driven gear.

OUTER DRIVEN GEAR

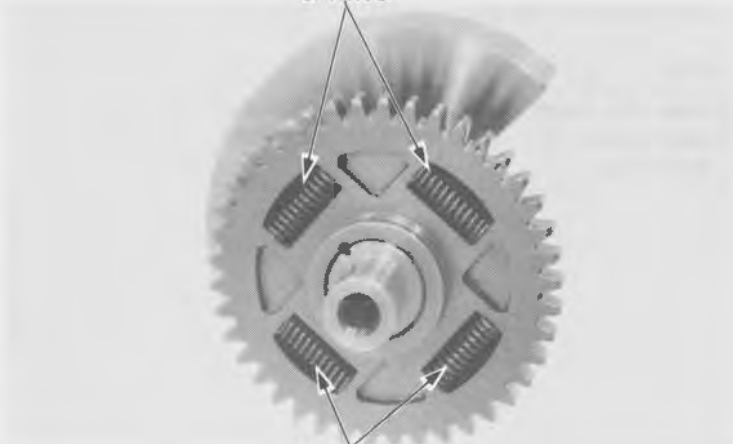
WASHER



SNAP RING

Remove the springs.

SPRING

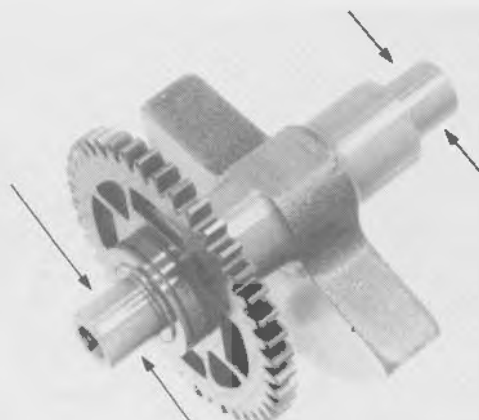


SPRING



### BALANCER INSPECTION

Measure the balancer O.D. on each side.  
**SERVICE LIMIT: 16.95 mm (0.667 in)**



### BALANCER ASSEMBLY

Install the springs into the inner driven gear.



Install the outer driven gear.

#### NOTE

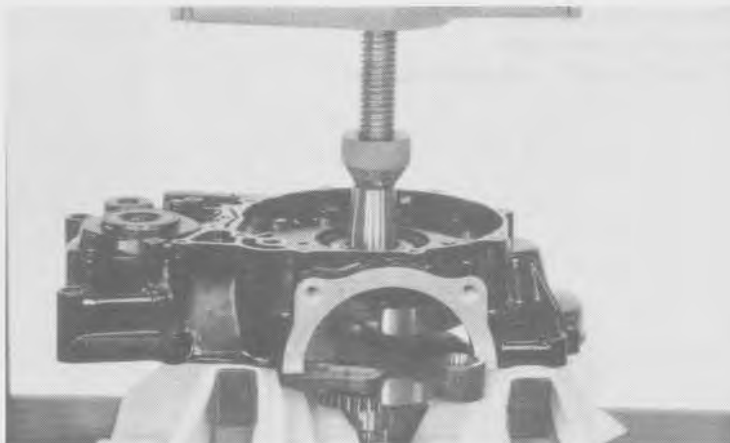
Align the index mark on the inner driven gear between the index marks on the outer driven gear.





### CRANKSHAFT REMOVAL

Remove the transmission and balancer.  
Remove the crank shaft from the left crankcase by  
using a hydraulic press, as shown.



Remove the left crankcase bearing using a bearing  
puller.

If it is remove with the crankshaft. Discard the  
bearing.

#### CAUTION

*Always replace the left bearing with a new  
one if it is removed with the crankshaft.*



BEARING PULLER

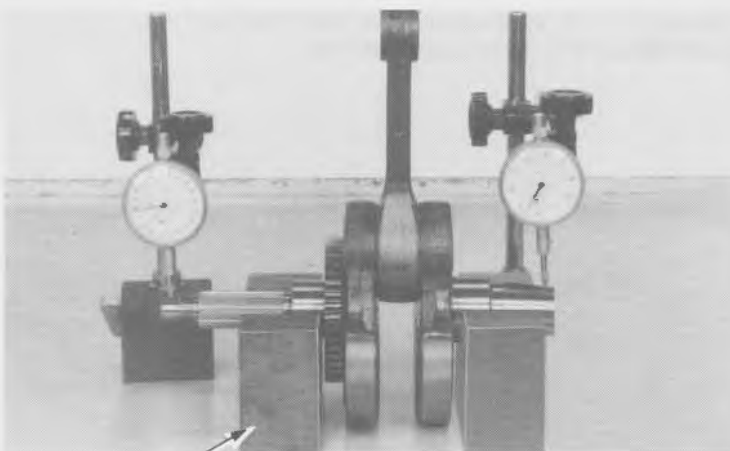
### CRANKSHAFT INSPECTION

Place the crankshaft in a truing fixture and place a  
2.5 mm shim under the left block.  
Measure the runout using a dial indicator.

#### NOTE

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

**SERVICE LIMIT: 0.1 mm (0.004 in)**

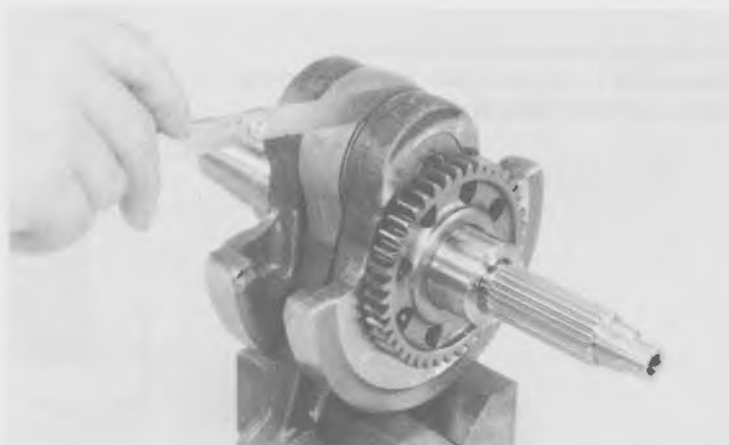


SHIM



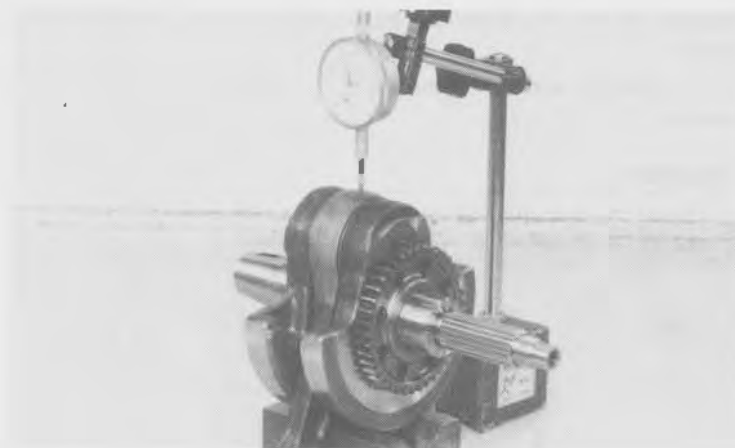
Measure the side clearance of the connecting rod big end with a feeler gauge.

**SERVICE LIMIT: 0.8 mm (0.031 in)**



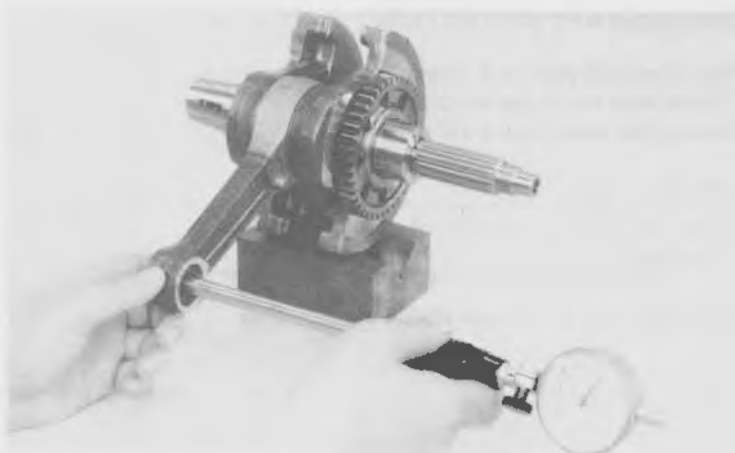
Measure the radial clearance of the connecting rod big end.

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



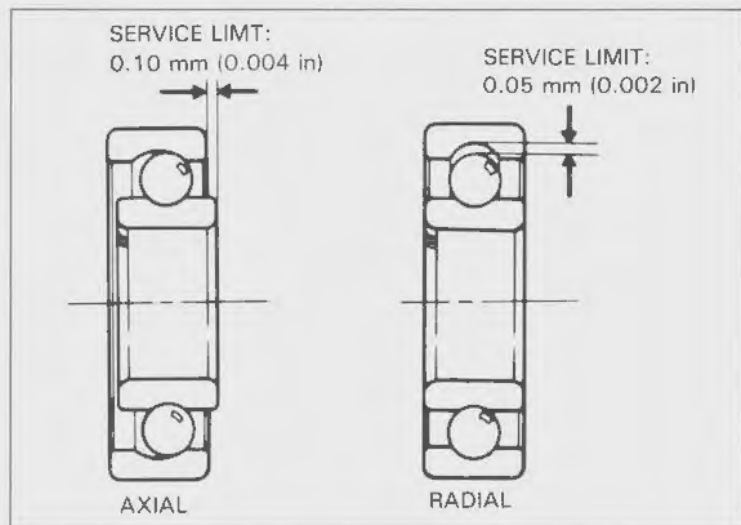
Measure the I.D. of the connecting rod small end.

**SERVICE LIMIT: 24.07 mm (0.948 in)**



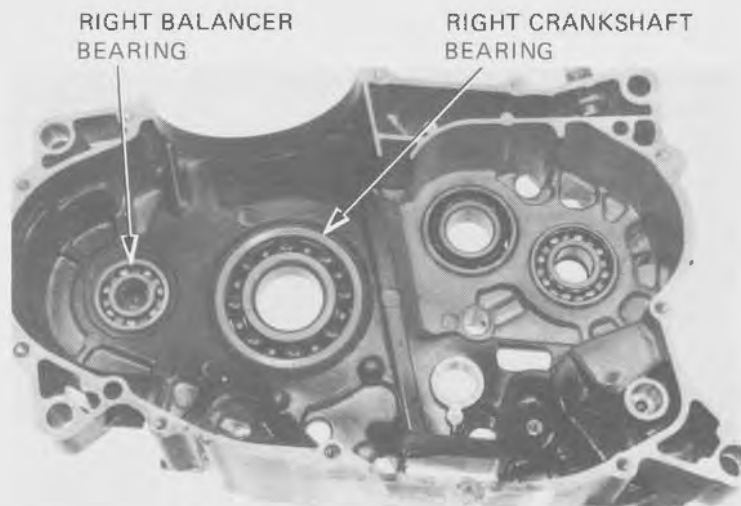


Spin the crankshaft bearings by hand and check for play.  
A bearing must be replaced if it is noisy or has excessive play.



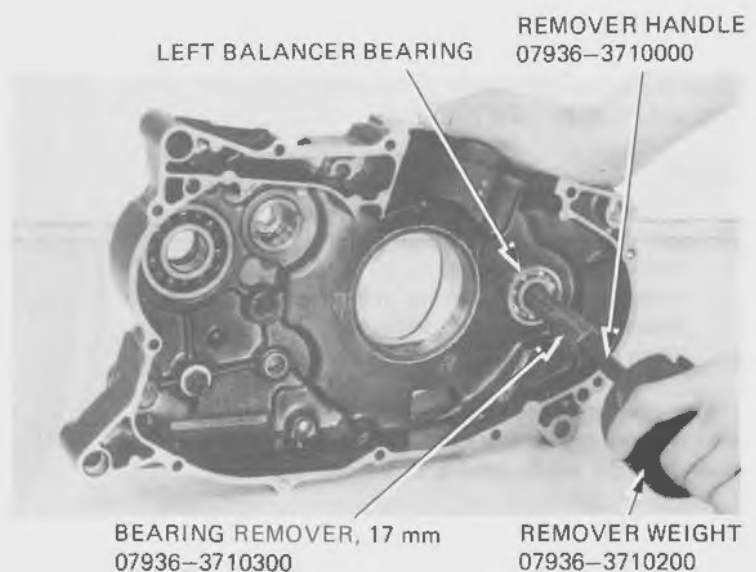
### BEARING REPLACEMENT

Remove the crankshaft bearing from the right crankcase.



Remove the left crankshaft bearing if it is left on the crankcase.

Remove the right and left balancer bearing with the special tool.

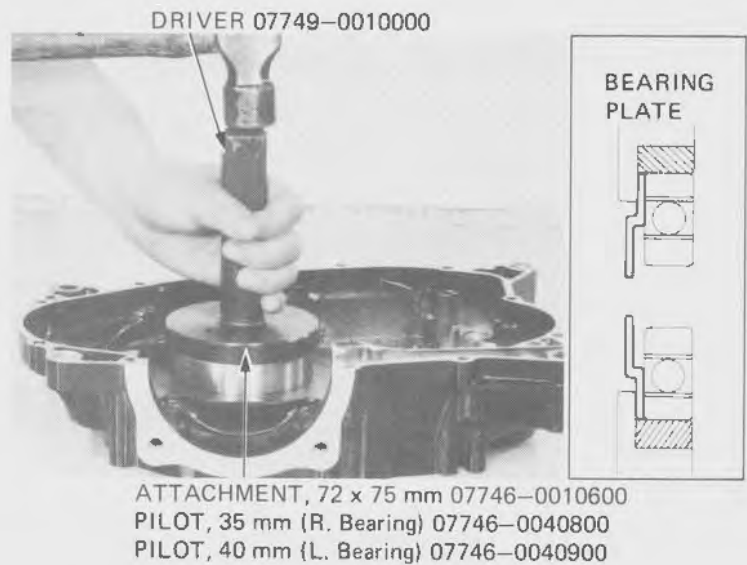




## CRANKSHAFT AND BALANCER INSTALLATION

Install the new right crankshaft bearing and bearing plate. Use the 35 mm pilot.

Install the new left crankshaft bearing into the right crankcase. Use the 40 mm pilot.



Install the balancer bearings into the right and left crankcases.

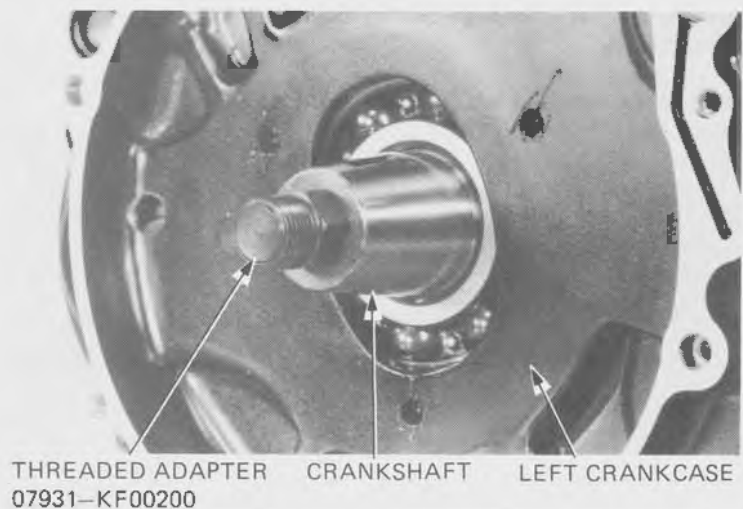


Clean the crankcase mating surfaces before assembling and check for wear or damage.

### NOTE

- If there is minor roughness or irregularities on the crankcase mating surfaces, dress them with an oil stone.
- After cleaning, lubricate the crankshaft bearings and other contacting surfaces with clean engine oil.

Install the threaded adapter, 07931-KF00200, into the left end of the crankshaft. Then push the shaft into the crank bearing in the left crankcase.





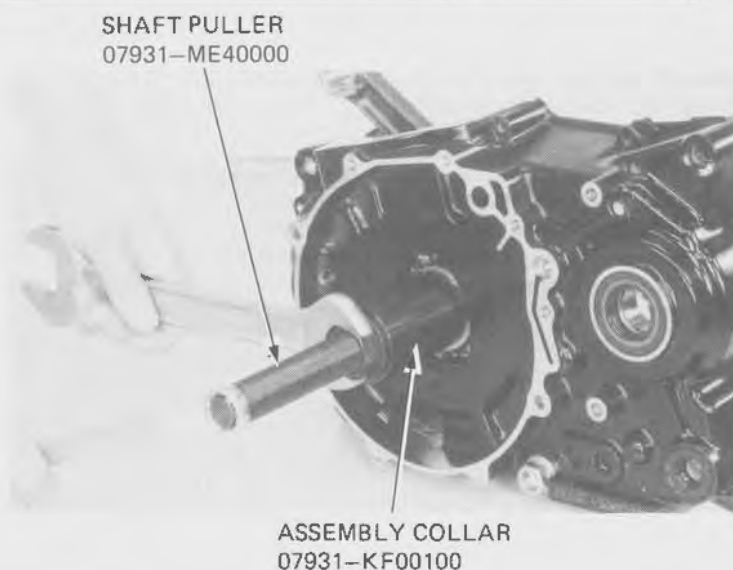
Place the small O.D. end of the assembly collar, 07931-KF00100, over the left crankshaft end and against the bearing inner race.

Attach a shaft puller, 07931-ME40000, to the threaded adapter. Screw the puller shaft's nut down until it fits into the recess in the assembly collar.

Hold the puller with a 17 mm box wrench, and turn the nut with a 27 mm wrench to pull the crankshaft completely into the left bearing.

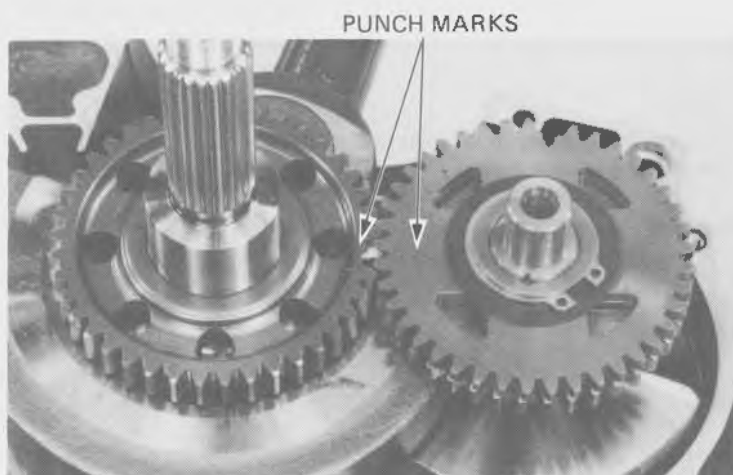
### NOTE

Be sure the connecting rod stays aligned with the cylinder opening in the case.



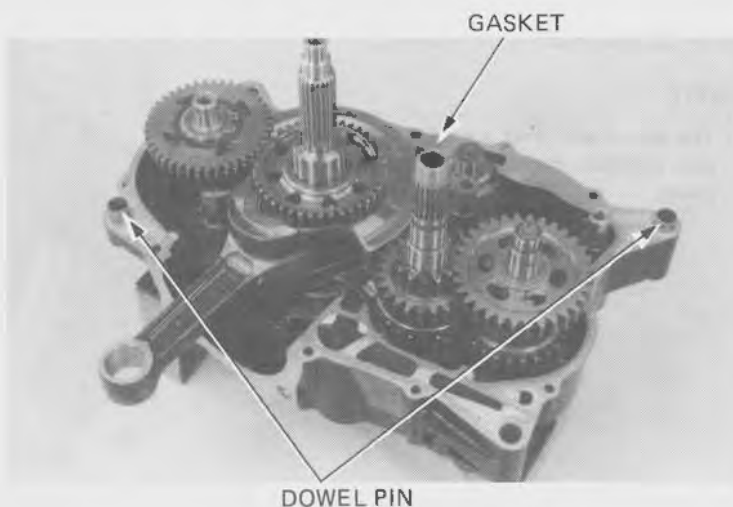
Install the balancer by aligning the punch marks on the gears.

Rotate the crankshaft to make sure that balancer does not interfere with the crankshaft.



## CRANKCASE ASSEMBLY

Install the transmission, crankshaft and balancer.  
Install the two dowel pins and new gasket.



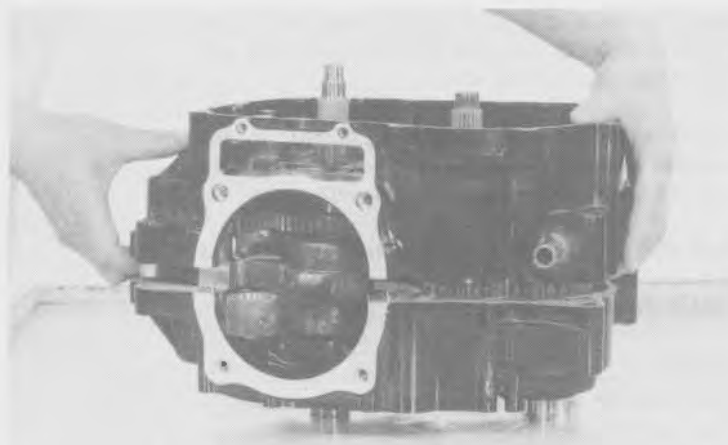




Assemble the right and left crankcase being careful to align the dowel pins and shafts.

**CAUTION**

*Don't force the crankcase halves together; if there is excessive force required, something is wrong. Remove the right crankcase and check for misaligned parts.*

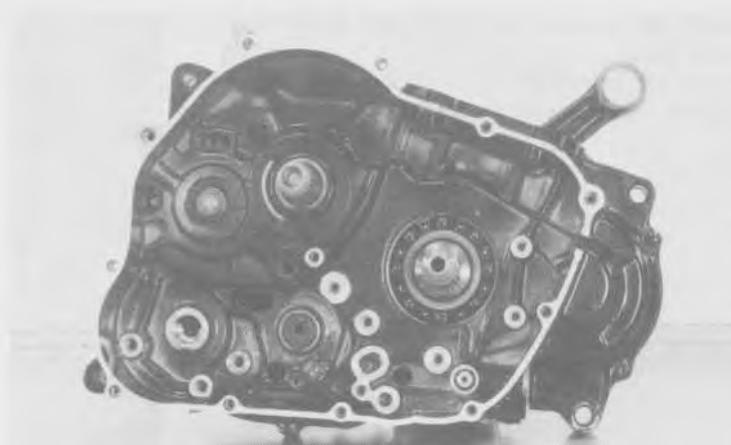


Install and tighten the left and right crankcase bolts.

**NOTE**

Tighten the bolts in a crisscross pattern in 2 or 3 progressive steps.

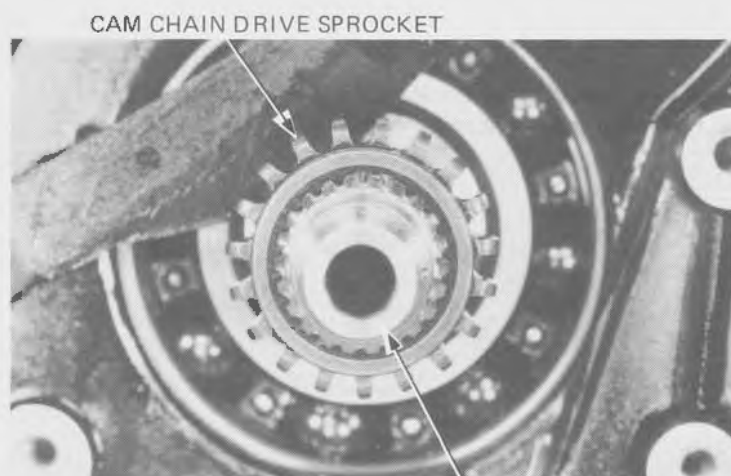
**TORQUE:** 8–12 N·m  
(0.8–1.2 kg·m, 6–9 ft·lb)



Install the cam chain drive sprocket.

**NOTE**

The cam chain drive sprocket will only go on one position because of extra-wide aligning spline.



CAM CHAIN DRIVE SPROCKET

CRANKSHAFT



Install the cam chain.

Install the cam chain tensioner with the washer, collar and bolt.

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

Install the cam chain drive gear and cam chain.

Install the AC generator (Section 9).

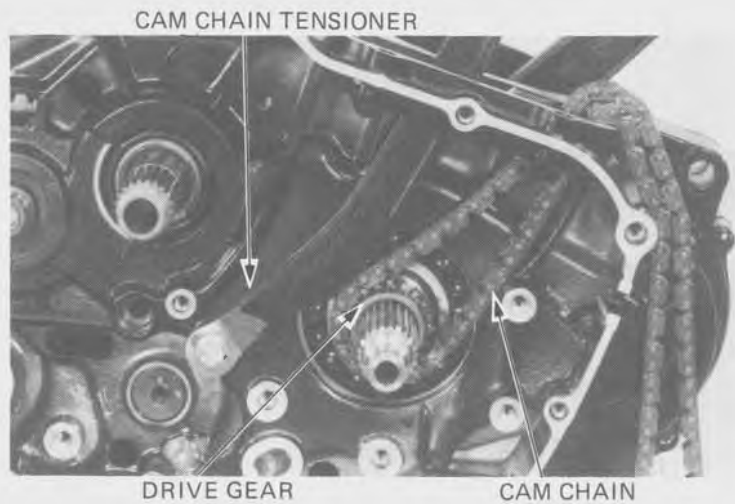
Install the clutch/oil pump (Section 8).

Install the kickstarter assembly (Section 5).

Install the cylinder/piston (Section 7).

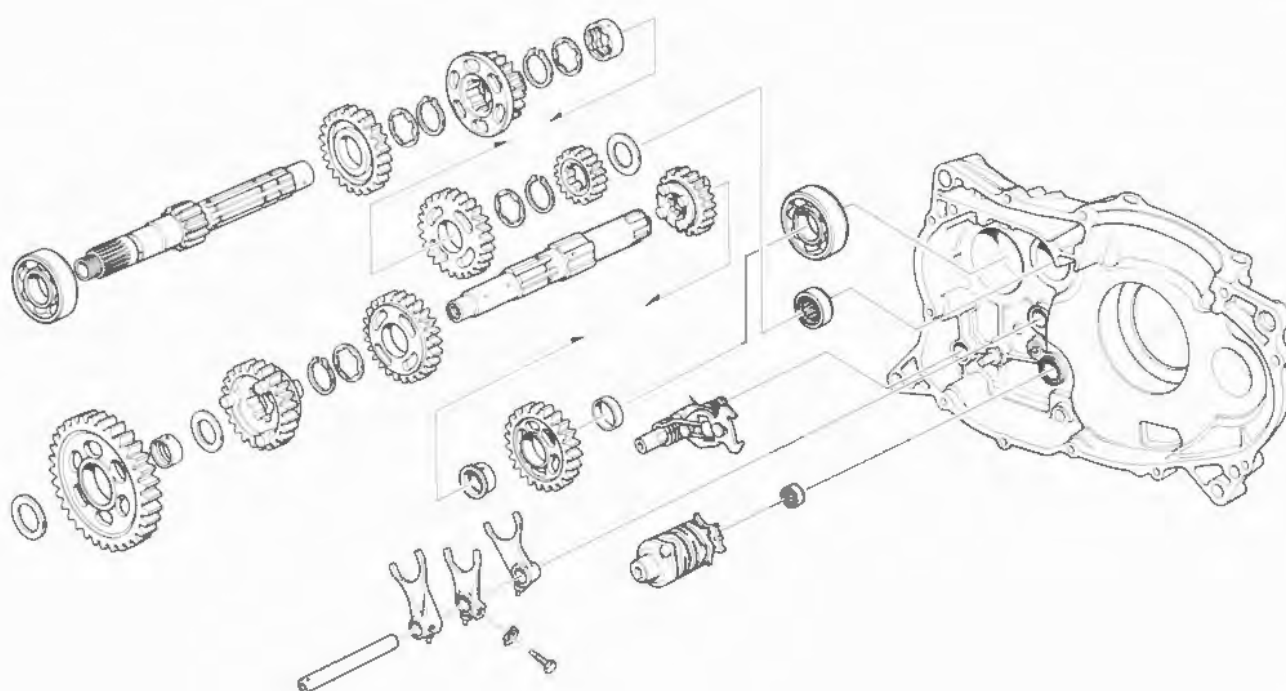
Install the cylinder head (Section 6).

Install the engine into the frame.





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|                          |      |
|--------------------------|------|
| SERVICE INFORMATION      | 11-1 |
| TROUBLESHOOTING          | 11-2 |
| TRANSMISSION DISASSEMBLY | 11-3 |
| TRANSMISSION ASSEMBLY    | 11-9 |

## SERVICE INFORMATION

### GENERAL INSTRUCTIONS

- The crankcase must be separated to service the transmission.
- The gear shift cam can be serviced with the engine installed in the frame.

### SPECIFICATIONS

| ITEM                       |               | STANDARD                            | SERVICE LIMIT       |
|----------------------------|---------------|-------------------------------------|---------------------|
| Gear side clearance        | M4            | 0.06–0.41 mm (0.002–0.016 in)       | 0.50 mm (0.020 in)  |
|                            | M5            | 0.05–0.58 mm (0.002–0.023 in)       | 0.65 mm (0.026 in)  |
| Gear I.D.                  | C3            | 0.06–0.41 mm (0.002–0.016 in)       | 0.50 mm (0.020 in)  |
|                            | M4            | 25.020–25.041 mm (0.9850–0.9859 in) | 25.10 mm (0.988 in) |
|                            | M5            | 28.000–28.021 mm (1.1024–1.1032 in) | 28.08 mm (1.106 in) |
|                            | C1            | 25.020–25.041 mm (0.9850–0.9859 in) | 25.10 mm (0.988 in) |
|                            | C3            | 25.021–25.041 mm (0.9850–0.9859 in) | 25.10 mm (0.988 in) |
|                            | C2            | 28.020–28.041 mm (1.1031–1.1040 in) | 28.10 mm (1.106 in) |
| Gear bushing               | M5 O.D.       | 27.949–27.980 mm (1.1004–1.1016 in) | 27.90 mm (1.098 in) |
|                            | C1 O.D.       | 24.984–25.005 mm (0.9836–0.9844 in) | 24.93 mm (0.981 in) |
|                            | C1 I.D.       | 20.02–20.041 mm (0.7880–0.7890 in)  | 20.01 mm (0.791 in) |
|                            | C2 O.D.       | 27.979–28.000 mm (1.1015–1.1024 in) | 27.93 mm (1.100 in) |
|                            | C2 I.D.       | 25.020–25.041 mm (0.9850–0.9859 in) | 25.10 mm (0.988 in) |
| Gear-to-bushing clearance  | M5            | 0.020–0.072 mm (0.0008–0.0028 in)   | 0.10 mm (0.004 in)  |
|                            | C1            | 0.015–0.057 mm (0.0006–0.0022 in)   | 0.10 mm (0.004 in)  |
|                            | C2            | 0.020–0.062 mm (0.0008–0.0024 in)   | 0.10 mm (0.004 in)  |
| Mainshaft O.D.             | M4            | 24.972–24.993 mm (0.9831–0.9840 in) | 24.92 mm (0.981 in) |
| Countershaft O.D.          | Starter idler | 15.966–15.984 mm (0.6286–0.6293 in) | 15.93 mm (0.627 in) |
|                            | C1            | 19.980–19.993 mm (0.7866–0.7871 in) | 19.94 mm (0.785 in) |
|                            | C2            | 24.972–24.993 mm (0.9831–0.9840 in) | 24.92 mm (0.981 in) |
|                            | C3            | 24.959–24.980 mm (0.9826–0.9835 in) | 24.92 mm (0.981 in) |
| Shaft-to-gear clearance    | M4            | 0.027–0.068 mm (0.0011–0.0027 in)   | 0.10 mm (0.004 in)  |
|                            | C3            | 0.041–0.082 mm (0.0016–0.0032 in)   | 0.15 mm (0.006 in)  |
| Shaft-to-bushing clearance | C1            | 0.027–0.061 mm (0.0011–0.0024 in)   | 0.10 mm (0.004 in)  |
|                            | C2            | 0.027–0.069 mm (0.0011–0.0027 in)   | 0.10 mm (0.004 in)  |
| Shift fork I.D.            |               | 14.000–14.018 mm (0.5512–0.5519 in) | 14.05 mm (0.553 in) |
| Shift fork claw thickness  |               | 4.93–5.00 mm (0.194–0.197 in)       | 4.5 mm (0.18 in)    |
| Shift fork shaft O.D.      |               | 13.966–13.984 mm (0.5498–0.5506 in) | 13.90 mm (0.547 in) |



## TRANSMISSION

---

### COMMON TOOL (for counter shaft and main shaft bearings installation)

|                        |               |
|------------------------|---------------|
| Attachment, 42 x 47 mm | 07746-0010300 |
| Pilot, 20 mm           | 07746-0040500 |
| Driver                 | 07749-0010000 |
| Attachment, 52 x 55 mm | 07746-0010400 |
| Pilot, 25 mm           | 07746-0040600 |
| Attachment, 62 x 68 mm | 07746-0010500 |

## TROUBLESHOOTING

### Hard to Shift

1. Improper clutch adjustment; too much free play
2. Shift forks bent
3. Shift shaft bent
4. Shift drum cam groove damaged

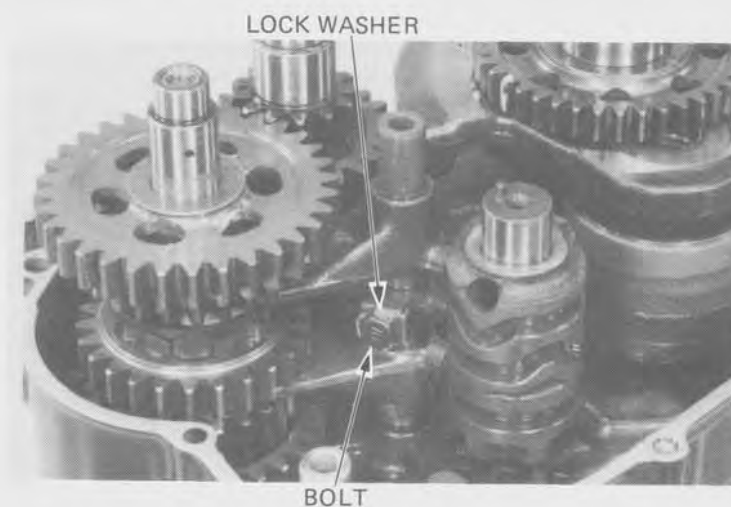
### Transmission Jumps Out of Gear

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

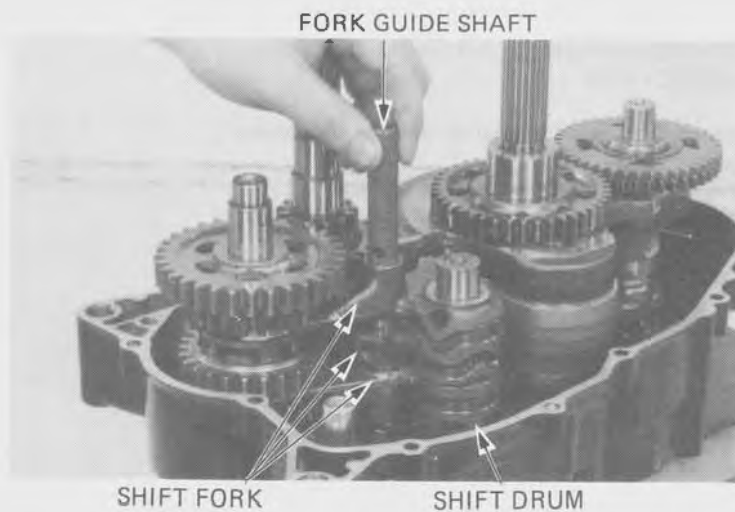


## TRANSMISSION DISASSEMBLY

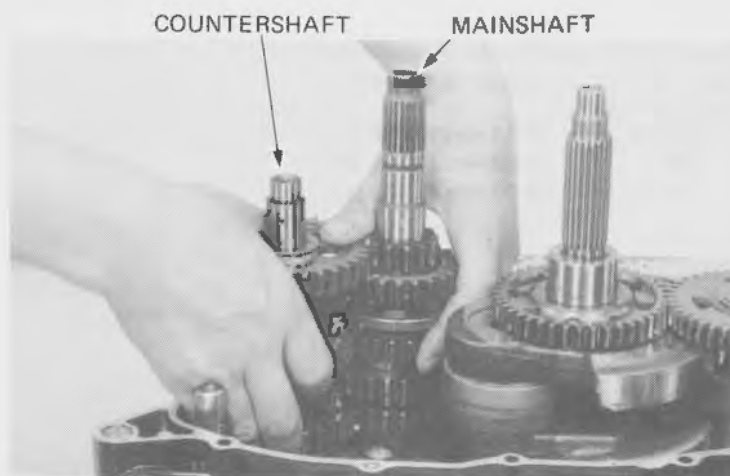
Separate the crankcase (Section 10).  
Bend down the lock washer tabs and remove the bolt and lock washer from the center shift fork.



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



Remove the mainshaft and countershaft as an assembly.





Remove the gear shift spindle.



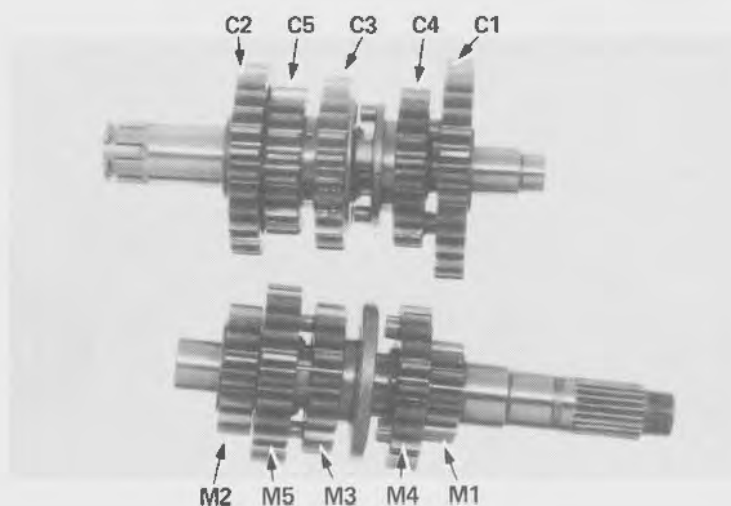
### TRANSMISSION GEAR/SHAFT INSPECTION

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

Check the gear teeth for wear or damage.

Check the engagement dogs of gears for wear or damage.

Check the gear side clearance.



Disassemble the mainshaft and countershaft.

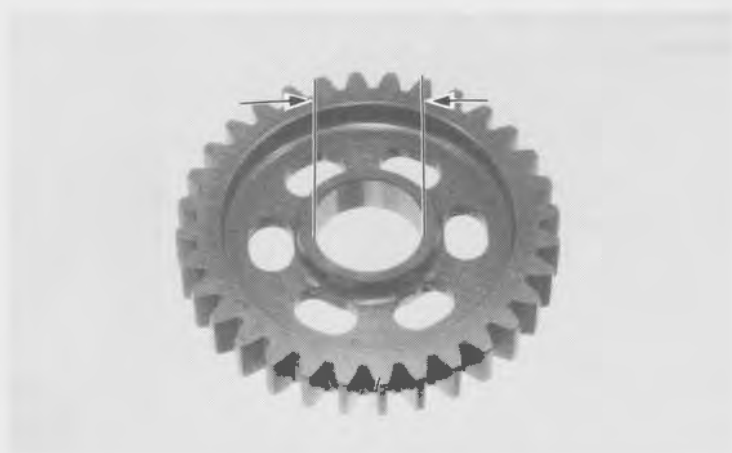
Measure the I.D. of each spinning gear.

#### SERVICE LIMIT:

C1, C3, M4 : 25.10 mm (0.988 in)

M5 : 28.08 mm (1.106 in)

C2 : 28.10 mm (1.108 in)







Measure the I.D. and O.D. of the countershaft bushings.

Calculate the clearance between the gear and bushing.

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

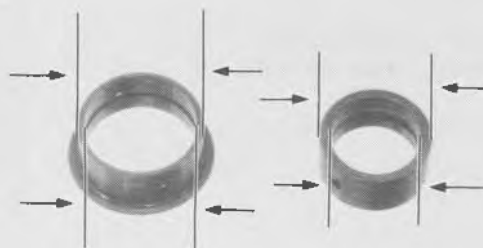
M5, OD : 27.90 mm (1.098 in)

C1, OD : 24.93 mm (0.981 in)

C1, ID : 20.01 mm (0.791 in)

C2, OD : 27.93 mm (1.100 in)

C2, ID : 25.10 mm (0.988 in)



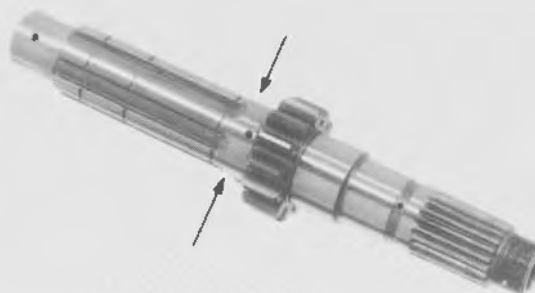
Measure the mainshaft O.D.

**SERVICE LIMIT:**

M4 : 24.92 mm (0.981 in)

Calculate the clearance between the mainshaft and gear or bushing.

**SERVICE LIMIT:** 0.15 mm (0.006 in)



Measure the countershaft O.D.

**SERVICE LIMIT:**

A (C2) : 24.92 mm (0.981 in)

B (C3) : 24.92 mm (0.981 in)

C (C1) : 19.94 mm (0.785 in)

D (Starter idler) : 15.93 mm (0.627 in)

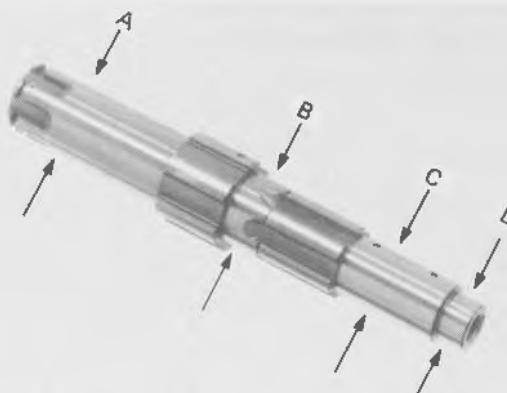
Calculate the clearance between the gear and countershaft.

**SERVICE LIMIT:**

C1 : 0.10 mm (0.004 in)

C2 : 0.10 mm (0.004 in)

C3 : 0.15 mm (0.006 in)

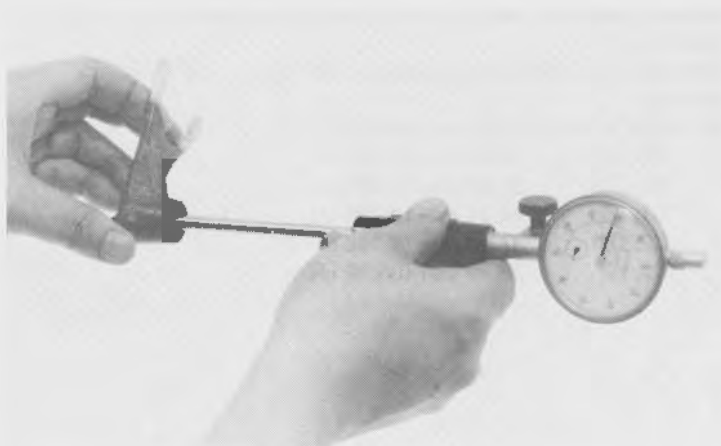




**SHIFT FORK/GUIDE SHAFT  
INSPECTION**

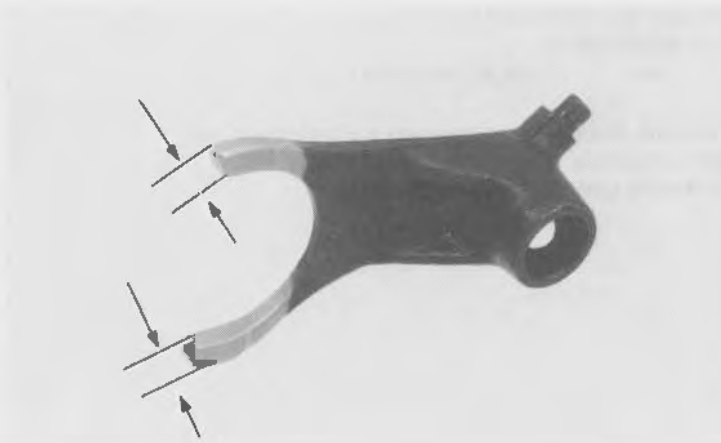
Measure the shift I.D. of the fork.

**SERVICE LIMIT: 14.05 mm (0.553 in)**



Measure the thickness of the shift fork claw.

**SERVICE LIMIT: 4.5 mm (0.177 in)**



Measure the O.D. of the shift fork shaft.

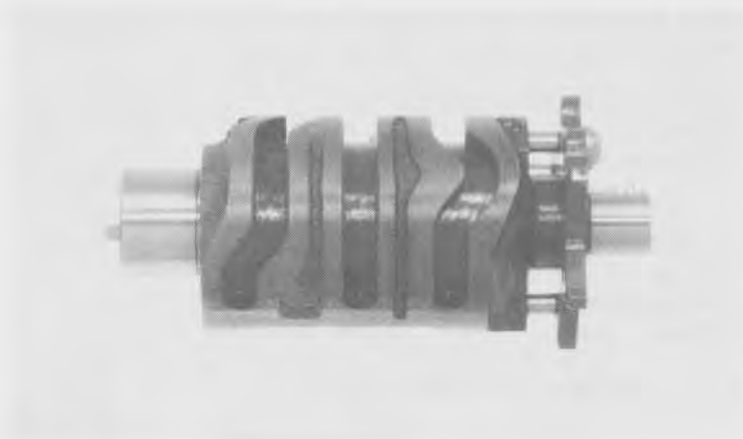
**SERVICE LIMIT: 13.90 mm (0.550 in)**





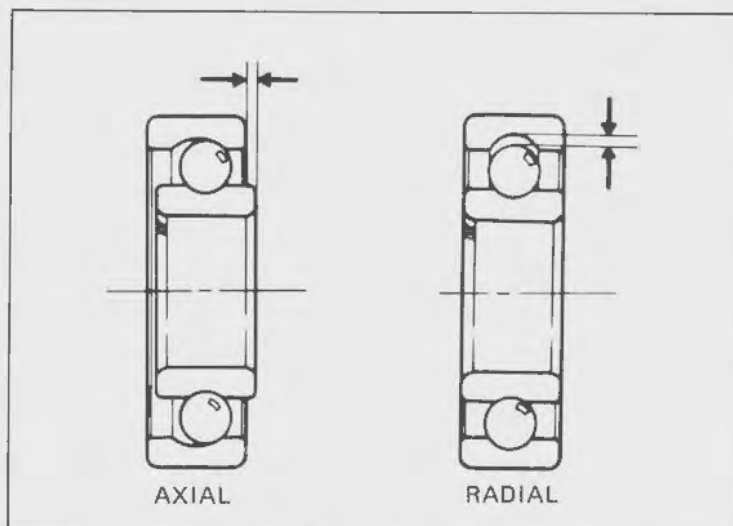
### GEARSHIFT DRUM INSPECTION

Inspect the drum grooves and replace the drum if it is damaged or shows excessive wear.



### TRANSMISSION BEARING INSPECTION

The bearing must be replaced if it is noisy or has excessive play.

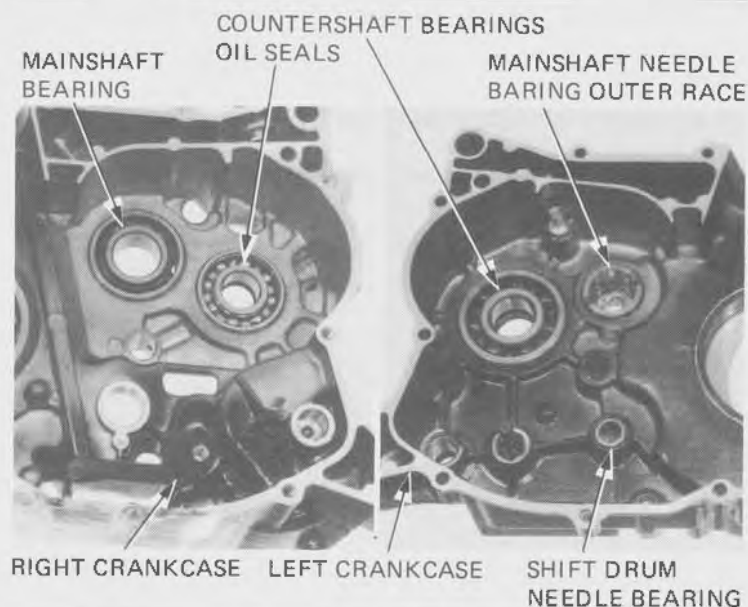


### BEARING REPLACEMENT

Remove the countershaft oil seals.

Remove the countershaft and mainshaft bearings from the right crankcase.

Remove the countershaft bearing from the left crankshaft.





Install the bearings into the crankcase with the following tools.

## MAINSHAFT RIGHT BEARING:

|                        |               |
|------------------------|---------------|
| Driver                 | 07749-0010000 |
| Attachment, 52 x 55 mm | 07746-0010400 |
| Pilot, 25 mm           | 07746-0040600 |

## COUNTERSHAFT RIGHT BEARING:

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

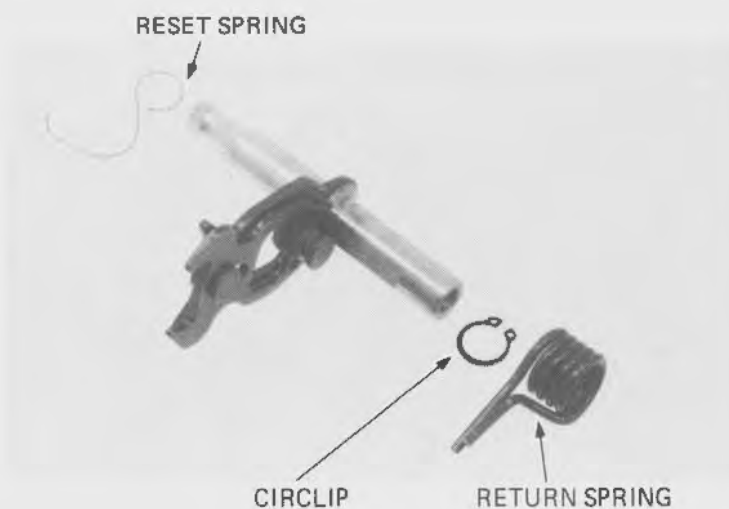
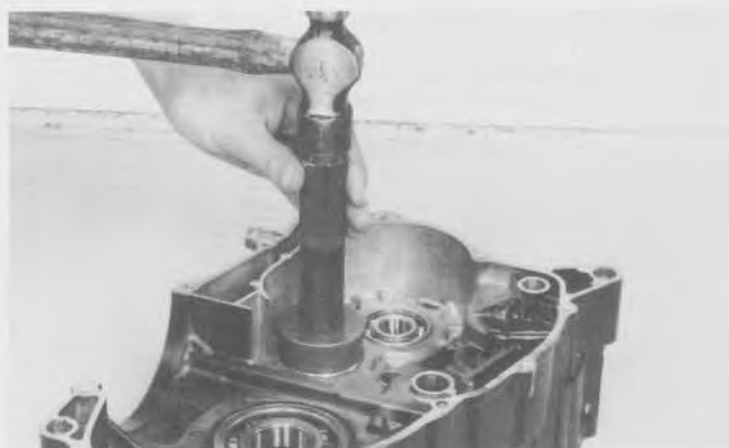
## COUNTERSHAFT LEFT BEARING:

|                        |               |
|------------------------|---------------|
| Driver                 | 07749-0010000 |
| Attachment, 62 x 68 mm | 07746-0010500 |
| Pilot, 25 mm           | 07746-0040600 |

Install new countershaft oil seals.

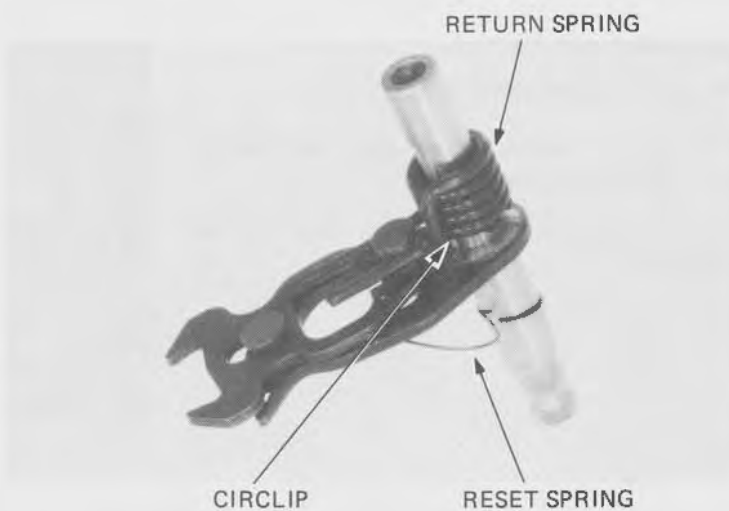
## GEAR SHIFT SPINDLE DISASSEMBLY

Remove the return spring, circlip and reset spring.



## GEAR SHIFT SPINDLE ASSEMBLY

Install the circlip, return spring and reset spring.

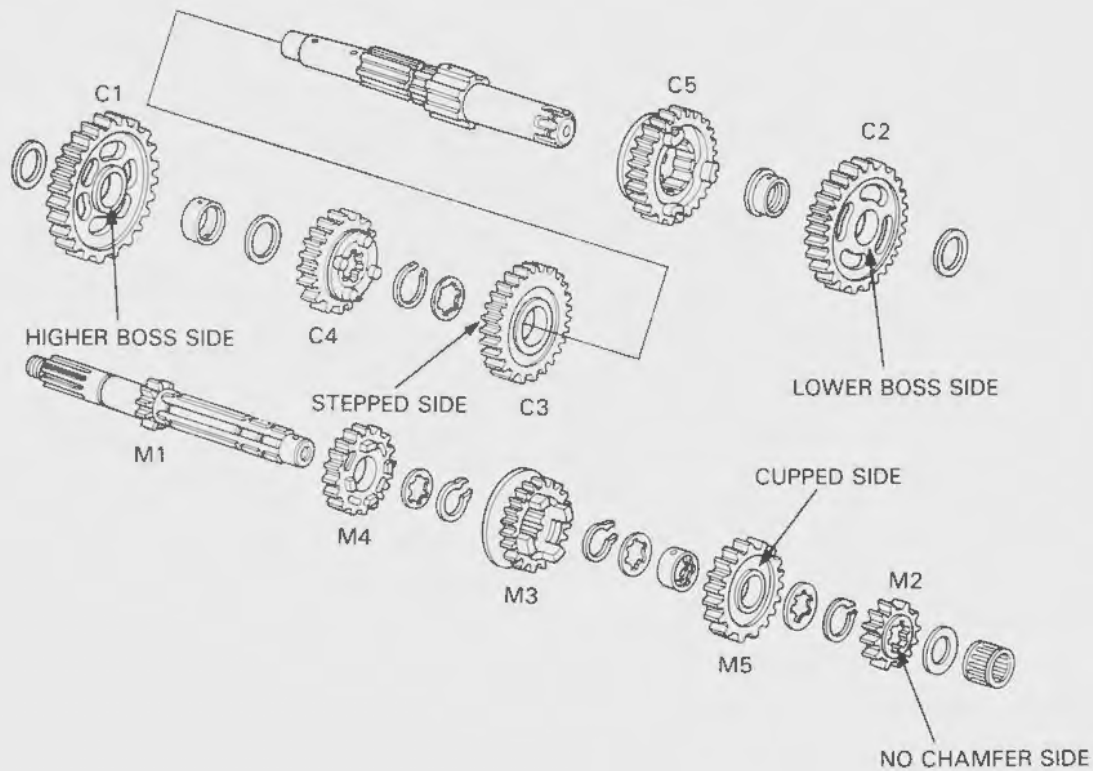




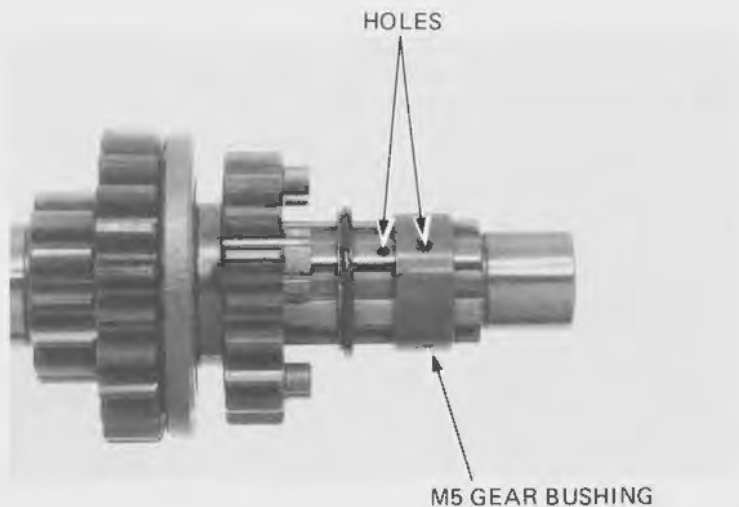
### TRANSMISSION ASSEMBLY

Check the gears for freedom of movement or rotation on the shaft.

Check that the snap rings are seated in the grooves.



Align the hole in the M5 gear bushing with the hole in the mainshaft when installing.



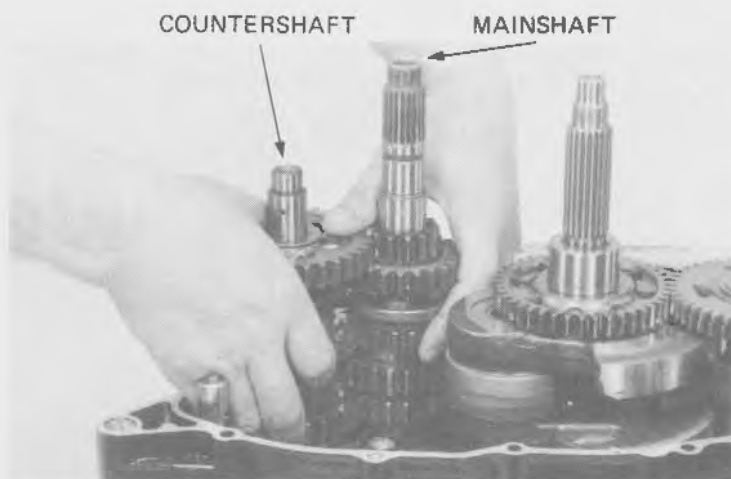


## TRANSMISSION INSTALLATION

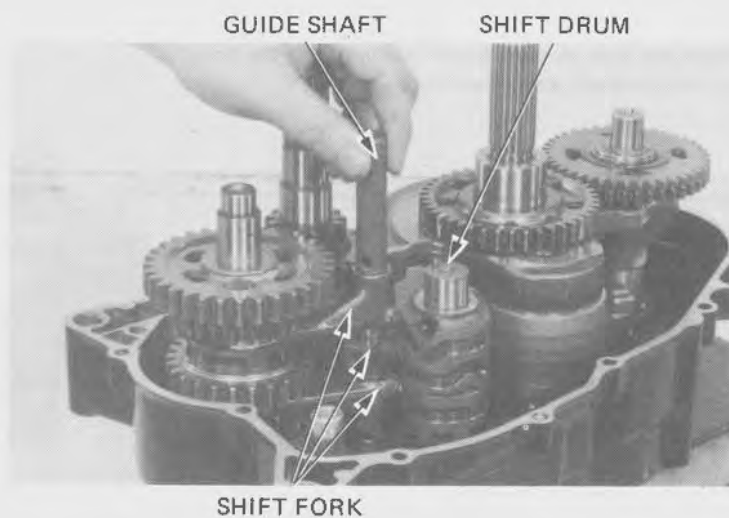
Install the gear shift spindle.



Install the mainshaft and countershaft assemblies.



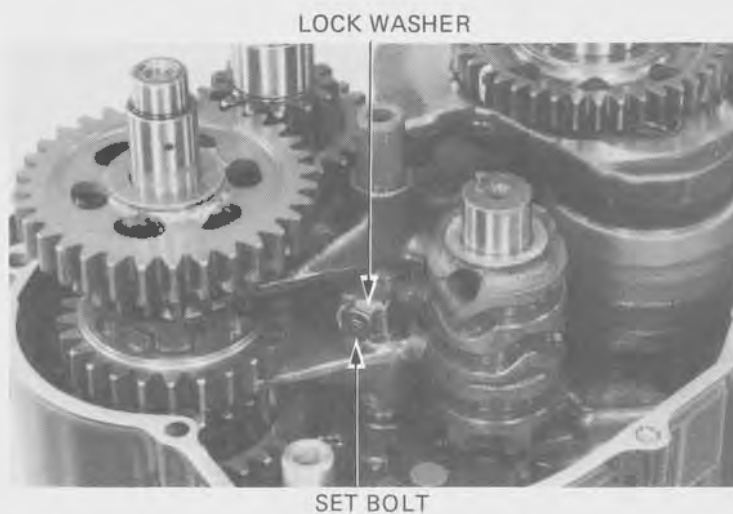
Install the gear shift drum, shift fork.  
Insert the shift fork shaft into the shift forks and align the center shift fork set bolt holes.





Install a new lock washer and set bolt.  
Tighten set bolt and bend the lock washer.  
**TORQUE: 13–17 N·m (1.3–1.7 kg-m, 9–12 ft-lb)**

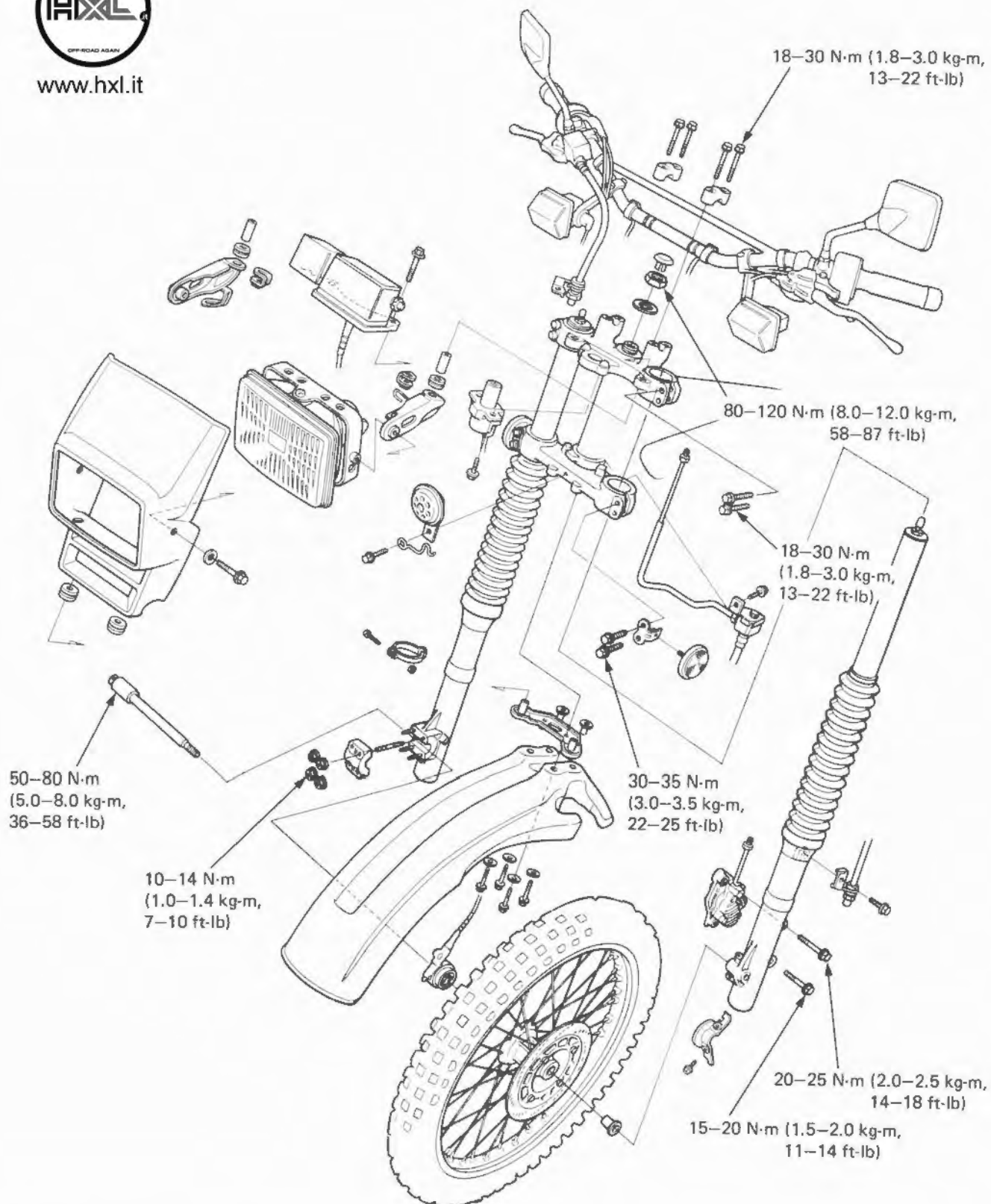
Install the shift cam plate, stopper arm and gear shift pedal and check the transmission for smooth shifting.







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|                     |       |
|---------------------|-------|
| SERVICE INFORMATION | 12- 1 |
| TROUBLESHOOTING     | 12- 2 |
| HEADLIGHT           | 12- 3 |
| INSTRUMENTS         | 12- 4 |
| HANDLEBAR           | 12- 5 |
| FRONT WHEEL         | 12- 8 |
| FRONT FORK          | 12-14 |
| STEERING STEM       | 12-20 |

## SERVICE INFORMATION

### GENERAL INSTRUCTION

- A jack or other support is required to support the motorcycle.

### TOOLS

#### SPECIAL

|                      |                                                                   |
|----------------------|-------------------------------------------------------------------|
| Fork seal driver     | 07947-4630100                                                     |
| 6 mm hex wrench      | 07917-3230000 or Equivalent tool commercially available in U.S.A. |
| Snap-ring pliers     | 07914-3230001                                                     |
| Steering stem socket | 07916-3710100                                                     |
| Steering stem driver | 07946-4300001 or — 07946-MB00000<br>GN-HT-54 (U.S.A. only)        |
|                      | 07946-4300200 or 07746-0010300                                    |
| Ball race remover    | 07953-KA50000 or 07953-4250002                                    |

#### COMMON

|                                   |                                                                     |
|-----------------------------------|---------------------------------------------------------------------|
| Driver                            | 07749-0010000                                                       |
| Pin spanner                       | 07702-0010000                                                       |
| Box wrench 30 x 32 mm             | 07716-0020400 — or Equivalent tool commercially available in U.S.A. |
| Extension bar                     | 07716-0020500                                                       |
| Attachment, 32 x 35 mm            | 07746-0010100                                                       |
| Pilot, 15 mm                      | 07746-0040300                                                       |
| Spoke wrench                      | 07701-0020300                                                       |
| Wheel bearing remover head, 15 mm | 07746-0050400 — or Equivalent tool commercially available in U.S.A. |
| Wheel bearing remover shaft       | 07746-0050100                                                       |

### SPECIFICATIONS

| ITEM                          |        | STANDARD            | SERVICE LIMIT     |
|-------------------------------|--------|---------------------|-------------------|
| Axle shaft runout             |        | ————                | 0.2 mm (0.008 in) |
| Front wheel rim runout        | Radial | ————                | 2.0 mm (0.08 in)  |
|                               | Axial  | ————                | 2.0 mm (0.08 in)  |
| Front fork spring free length |        | 563.5 mm (22.18 in) | 557 mm (21.93 in) |
| Front fork tube runout        |        | ————                | 0.2 mm (0.008 in) |



## TORQUE VALUES

|                               |                                          |
|-------------------------------|------------------------------------------|
| Handlebar upper holder        | 18–30 N·m (1.8–3.0 kg·m, 13–22 ft·lb)    |
| Front spoke                   | 2.5–5.0 N·m (25–50 kg·cm, 1.8–3.6 ft·lb) |
| Front axleshaft               | 50–80 N·m (5.0–8.0 kg·m, 36–58 ft·lb)    |
| Front axle shaft holder       | 10–14 N·m (1.0–1.4 kg·m, 7–10 ft·lb)     |
| Fork bolt                     | 15–30 N·m (1.5–3.0 kg·m, 11–22 ft·lb)    |
| Fork top bridge pinch bolt    | 18–30 N·m (1.8–3.0 kg·m, 13–22 ft·lb)    |
| Steering stem nut             | 80–120 N·m (8.0–12.0 kg·m, 58–87 ft·lb)  |
| Fork socket bolt              | 15–25 N·m (1.5–2.5 kg·m, 11–18 ft·lb)    |
| Fork bottom bridge pinch bolt | 30–35 N·m (3.0–3.5 kg·m, 22–25 ft·lb)    |

## TROUBLESHOOTING

### Hard Steering

1. Steering stem nut too tight
2. Faulty steering stem bearings
3. Insufficient air in front tire.

### Steers to One Side or Does Not Track Straight

1. Bent front forks
2. Bent front axle, wheel installed incorrectly

### Front Wheel Wobbling

1. Distorted rim
2. Worn front wheel bearings
3. Loose or broken spokes
4. Faulty tire
5. Axle not tightened properly

### Soft Suspension

1. Weak fork springs
2. Insufficient fluid in front forks
3. Incorrect fork air pressure

### Hard Suspension

1. Incorrect fluid weight in front forks
2. Incorrect fork air pressure
3. Fork tube bent

### Front Suspension Noise

1. Slider binding
2. Insufficient fluid in forks
3. Loose front fork fasteners



## HEADLIGHT

### HEADLIGHT REMOVAL

Remove two headlight case mounting bolts.  
Remove the headlight shell/number plate.

Remove the headlight.  
Disconnect the all wires at their couplers and connectors.



HEADLIGHT BRACKET

### HEADLIGHT REPLACEMENT

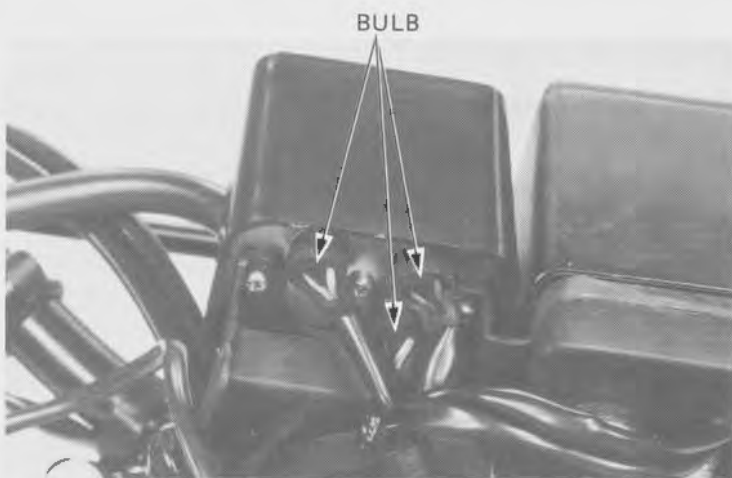
When installing the headlight bulb, make sure the top mark is up.



## INSTRUMENTS

### INDICATOR LIGHT BULB REPLACEMENT

Gently remove the bulb socket from the back of the instrument.  
Replace the bulb.





### SPEEDOMETER REMOVAL/ INSTALLATION

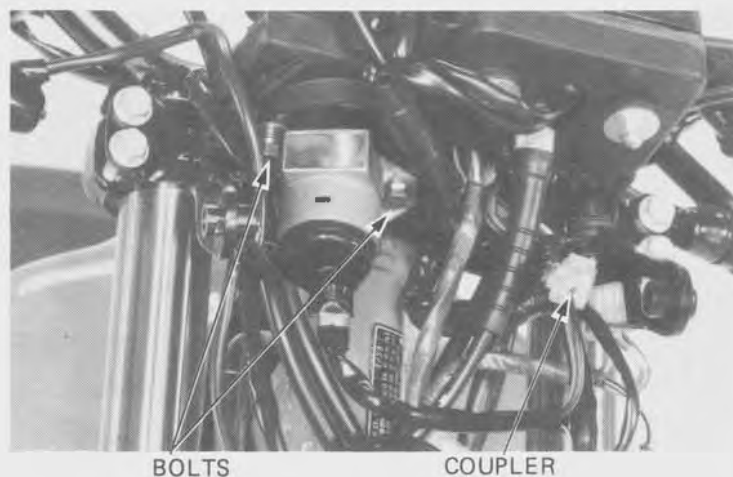
Disconnect the speedometer cable.  
Remove the speedometer attaching nuts.  
Remove the speedometer.

Installation is the reverse of removal.



### IGNITION SWITCH REMOVAL/INSTALLATION

Remove the headlight (Page 12-3).  
Disconnect the ignition switch wire coupler.  
Remove the ignition switch mounting bolts, and  
ignition switch.  
Install the ignition switch in the reverse order of  
removal.



### DISASSEMBLY/ASSEMBLY

Pry open the wire retainer.





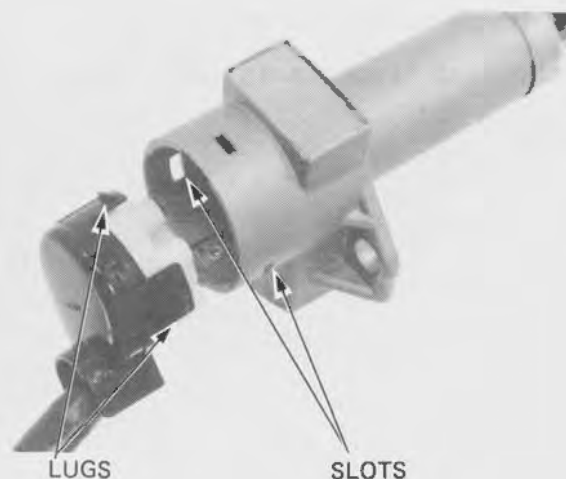
Insert the ignition key and turn it partway between the ON and OFF detent positions.



BETWEEN "ON" AND "OFF"

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.



## HANDLEBAR

### REMOVAL

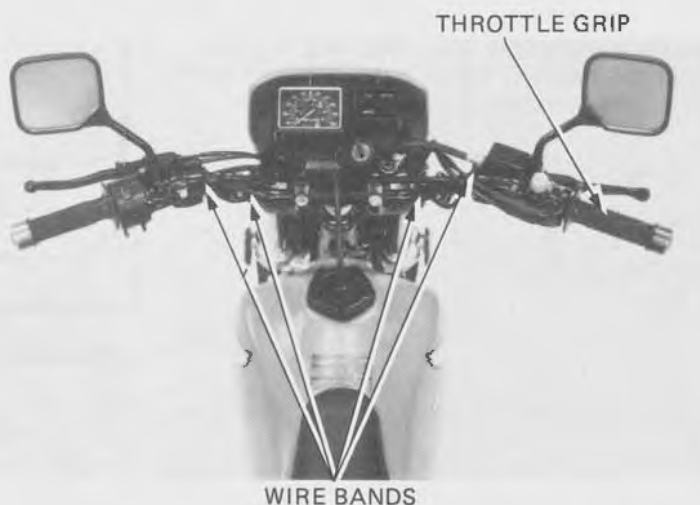
Remove the wire harness bands.

Remove the throttle grip.

Remove the engine stop switch and front brake lever bracket.

Remove the clutch lever.

Remove the handlebar holder bolts and the handlebar.



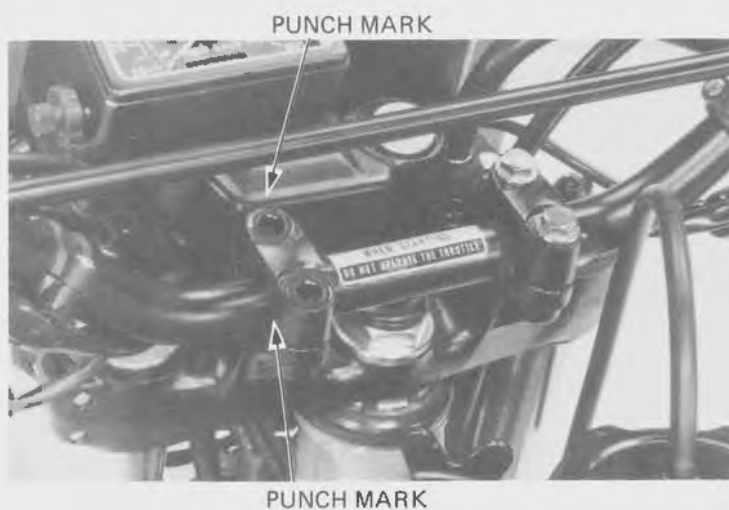


## HANDLEBAR INSTALLATION

Install the handlebar.

Align the punch mark on the handlebar with the top of the lower holders.

Place the upper holders on the handlebar with the punch marks forward.



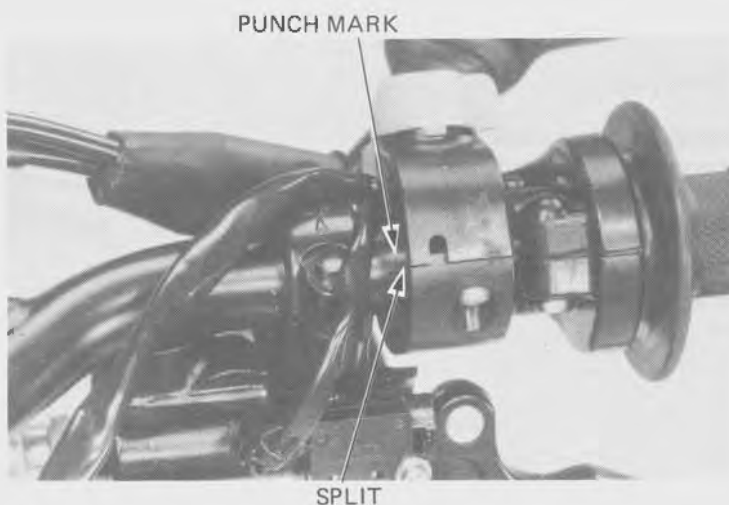
Tighten the forward bolts first, then tighten the rear bolts.

**TORQUE: 18–30 N·m (1.8–3.0 kg-m, 13–22 ft-lb)**



Install the engine stop switch housing.

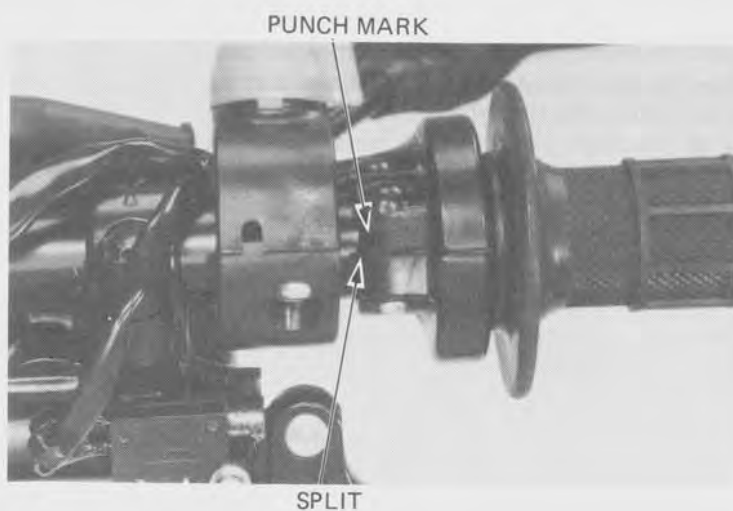
Align the split line of the switch with the punch mark on the handlebar.



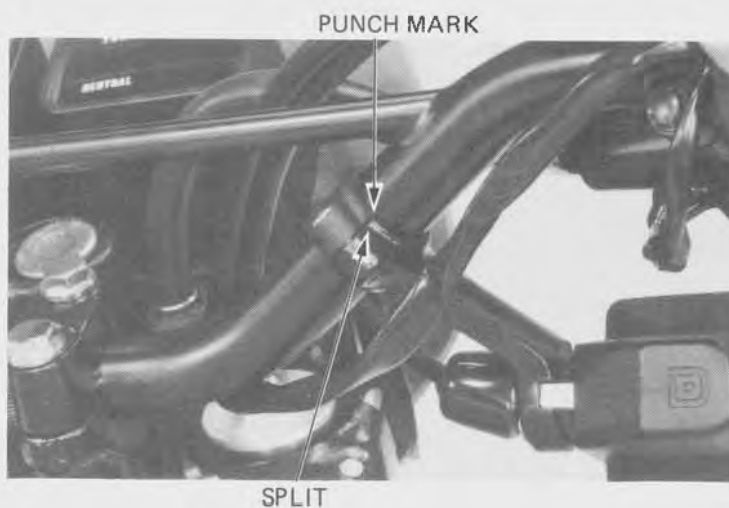




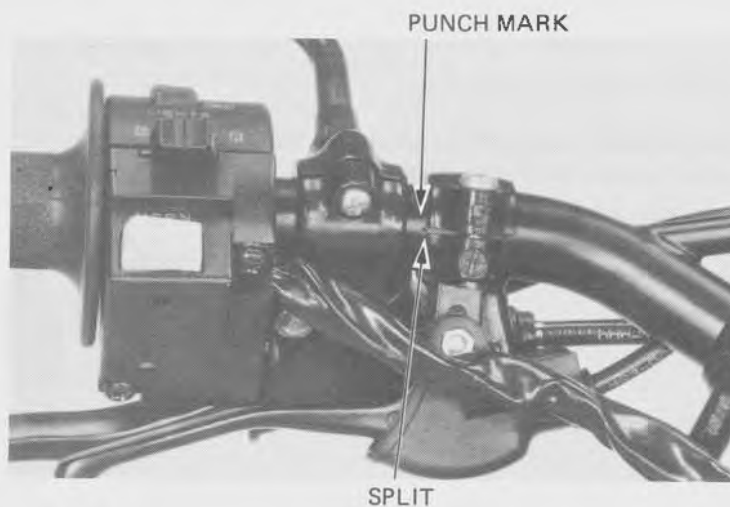
Install the throttle grip.  
Align the split line of the throttle housing with the punch mark on the handlebar.



Install the right turn signal.  
Align the split line of the bracket with the punch mark on the handlebar.  
Tighten the screw.



Install the manual decompressor lever.  
Align the split line of the bracket with the punch mark on the handlebar.

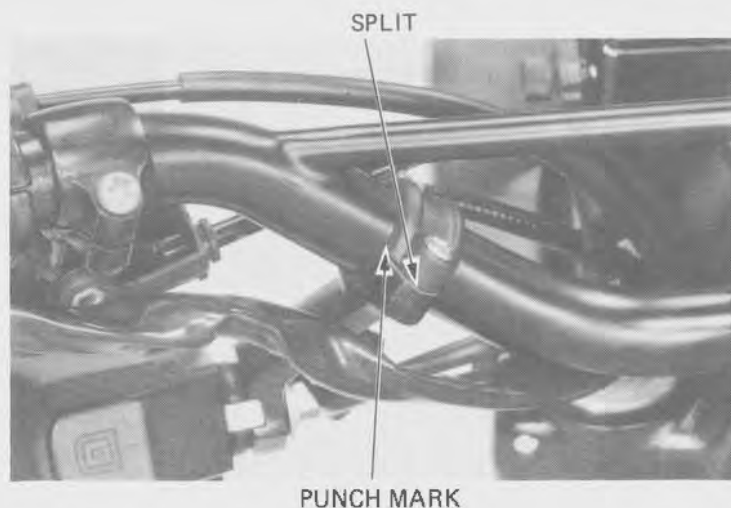




Install the clutch lever bracket and left switch case. Align the split lines of the bracket and case with the punch mark on the handlebar. Install the dwell pin of the left handlebar switch bracket into the hole of the handlebar.



Install the left turn signal. Align the split in the bracket with the punch mark on the handlebar.

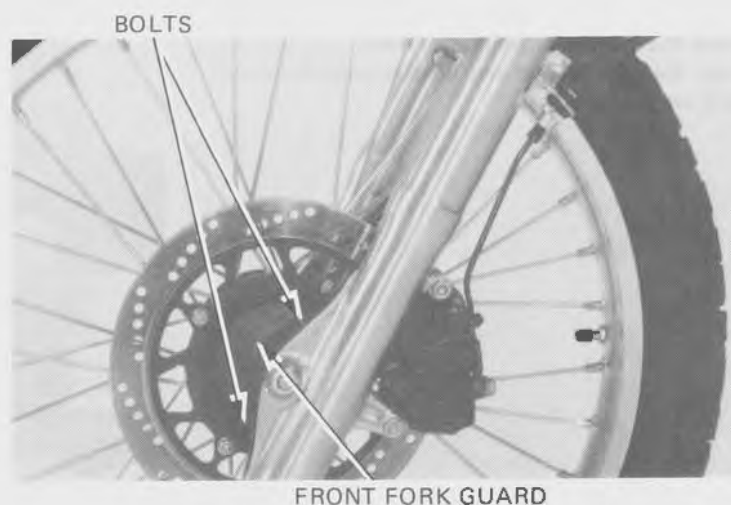


## **FRONT WHEEL**

### **FRONT WHEEL REMOVAL**

Raise the front wheel off the ground by placing a box or work stand under the engine.

Disconnect the speedometer cable from the speedometer gearbox at the front wheel.  
Remove the front fork guard.





Loosen the axle shaft holder nuts.  
Remove the front axle.  
Remove the front wheel.



FRONT AXLE

AXLE HOLDER NUTS

### AXLE INSPECTION

Set the axle in V blocks and measure the runout.  
The actual runout is 1/2 of the total indicator reading.

**SERVICE LIMIT:** 0.2 mm (0.01 in)



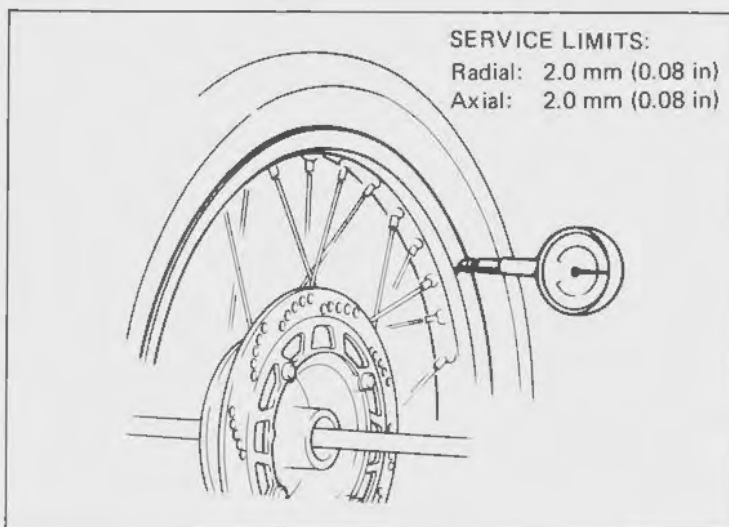
### WHEEL

Check the rim runout by placing the wheel on a truing stand. Then spin the wheel by hand, and read the runout using a dial indicator.

Check the spokes and tighten any that are loose.

**TORQUE:** 2.5–5.0 N·m

(25–50 kg-cm, 1.8–3.6 ft-lb)



#### SERVICE LIMITS:

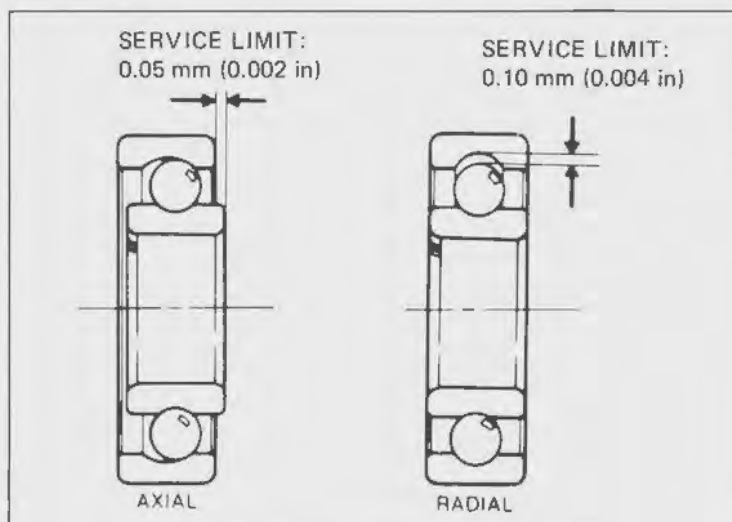
Radial: 2.0 mm (0.08 in)

Axial: 2.0 mm (0.08 in)

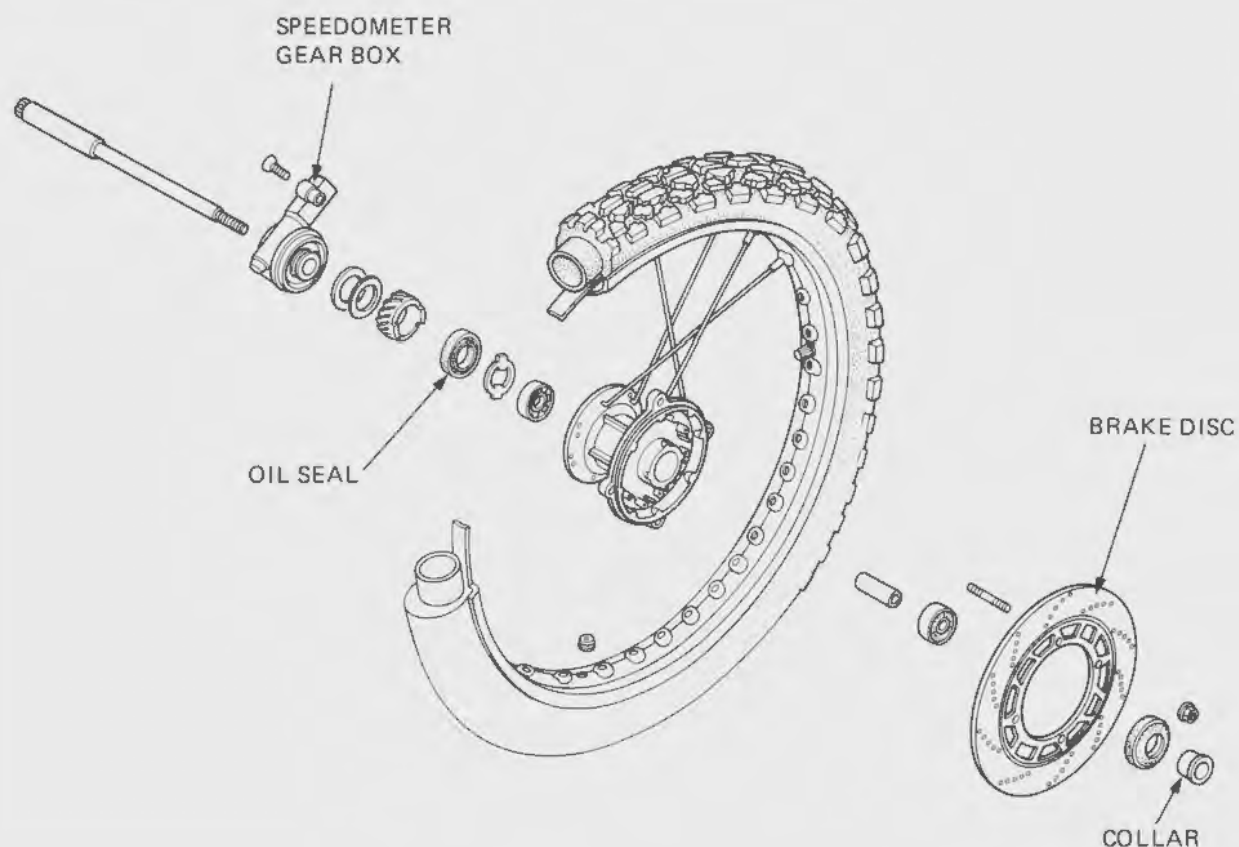


### WHEEL BEARING

Check the wheel bearing play by placing the wheel on a truing stand and spinning the wheel by hand. Replace the bearings with new ones if they are noisy or have excessive play.



### FRONT WHEEL DISASSEMBLY





### FRONT WHEEL DISASSEMBLY

Remove the wheel bearings and the distance collar from the hub.

#### NOTE

Never reinstall old bearings, once the bearings are removed, they must be replaced with new ones.



WHEEL BEARING REMOVER HEAD 15 mm 07746-0050400  
WHEEL BEARING REMOVER SHAFT 07746-0050100 OR  
EQUIVALENT COMMERCIALLY AVAILABLE IN U.S.A.

### ASSEMBLY

Pack the bearing cavities with grease.  
Drive in the left bearing and install the distance collar.  
Drive in the right bearing.

#### NOTE

- Install the bearings with the sealed end toward the outside.
- Be sure to drive the bearing in squarely.

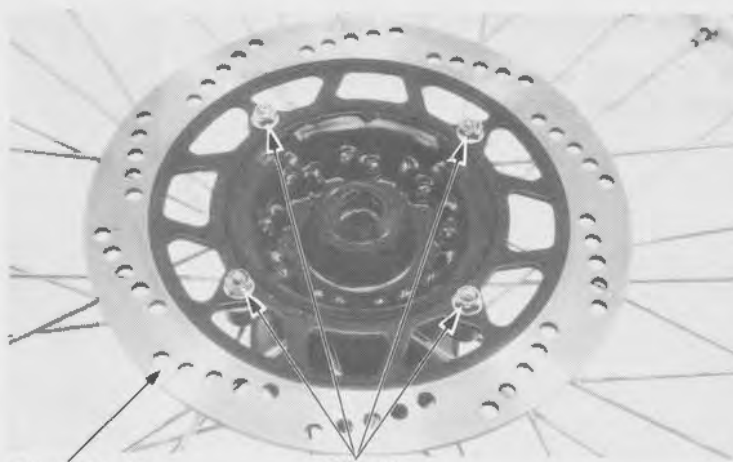


DRIVER 07749-0010000  
ATTACHMENT, 32 x 35 mm 07746-0010100  
PILOT, 15 mm 07746-0040300

Install the brake disc and tighten its nuts.

#### Torque specification:

14-16 N·m (1.4-1.6 kg-m, 10-12 ft-lb)



BRAKE DISC

BOLTS



Install the collar in the hub on the left side.



COLLAR

Install the speedometer gear in the wheel hub, aligning the groove in the speedometer gearbox with the slots.



GROOVE

SLOTS

### FRONT WHEEL INSTALLATION

Fit the caliper over the disc, taking care not to damage the brake pads.







Clean the axle shaft and holder.  
Install the shaft through the speedometer gearbox  
and wheel hub.

Temporarily tighten the axle shaft.

**NOTE**

Set the tang on the gearbox under the tang  
on the front fork.

AXLE SHAFT



Install the axle shaft holder with the "UP" mark  
facing up.

Temporarily tighten the holder nuts lightly.

"UP" MARK



Torque the axle.

**TORQUE:** 50–80 N·m  
(5.0–8.0 kg-m, 36–58 ft-lb)

Temporarily tighten the axle holder nuts.  
Connect the front brake cable and speedometer  
cable.







With the front brake applied, pump the front forks up and down several times to seat the axle.



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Torque the axle shaft holder nuts, the upper nuts first, then the lower nuts in 2-3 steps.

**TORQUE: 10–14 N·m**  
**(10–14 kg·m,**

Install the front fork guard.



## FRONT FORK

### REMOVAL

Remove the front wheel.

Loosen the fork boot clamp screw.

Remove the speedometer cable from the clamp on the right fork.

Remove the brake caliper from the left fork.

Remove the brake hose from the brake hose clamp.

Loosen the top and bottom fork pinch bolts.

Remove the front forks.

Remove the fork boot.





## DISASSEMBLY

Remove the air valve cap.  
Release the air from each fork tube.

### **WARNING**

*Be sure to release front fork air pressure before disassembling to prevent parts from becoming projectiles.*

FRONT FORK TUBE



Drain the fork oil by removing the drain plug;  
Hold the tube in a vise with soft jaws or a shop towel, avoiding the sliding surface.  
Remove the fork cap bolt.

### **WARNING**

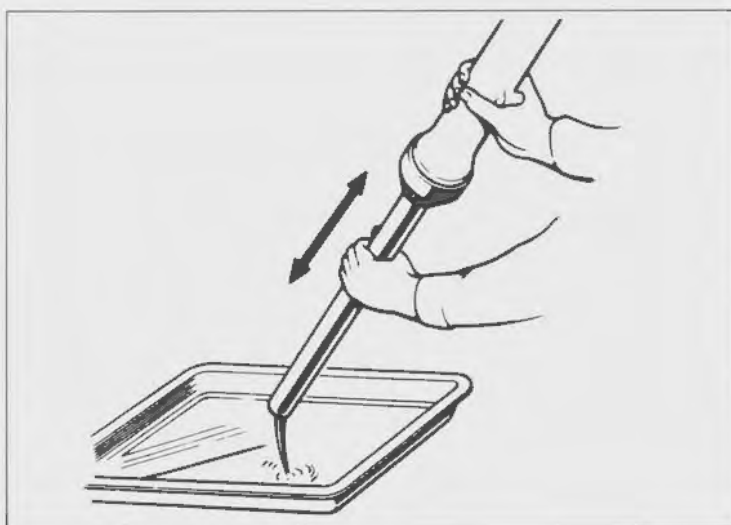
*The cap bolts are under spring pressure. Use care when removing and wear eye and face protection.*

FORK CAP BOLT



Remove the fork spring.

Pour out any remaining fork fluid by pumping the fork several times.



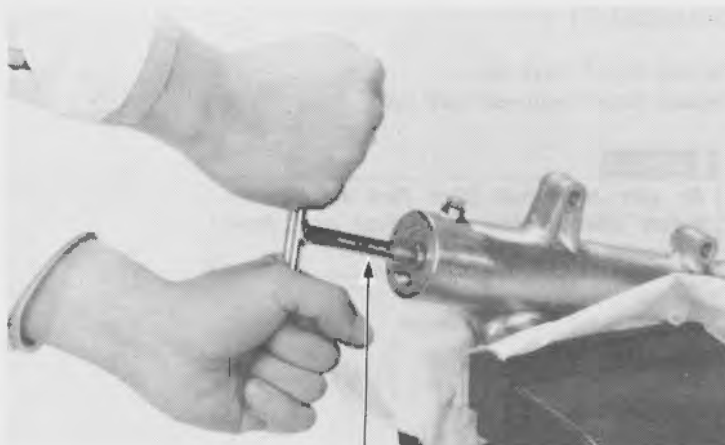


Hold the fork slider in a vise with soft jaws or a shop towel.  
Remove the hex bolt.

**CAUTION**

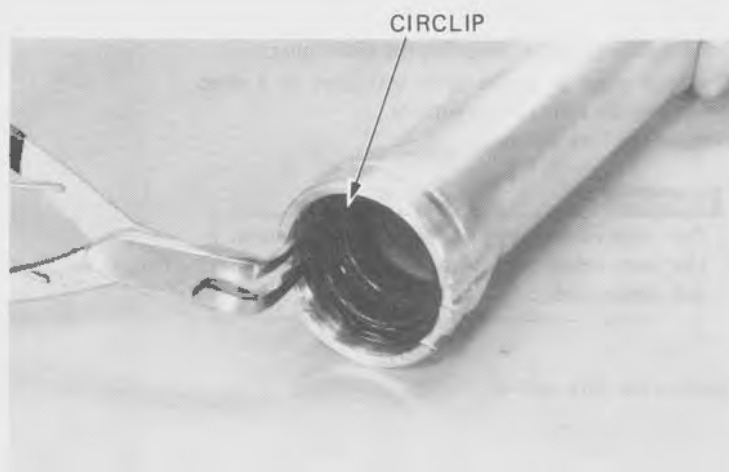
*Do not distort the fork slider in a vise.*

Remove the piston and the rebound spring, then separate the slider and fork tube.



6 mm HEX WRENCH

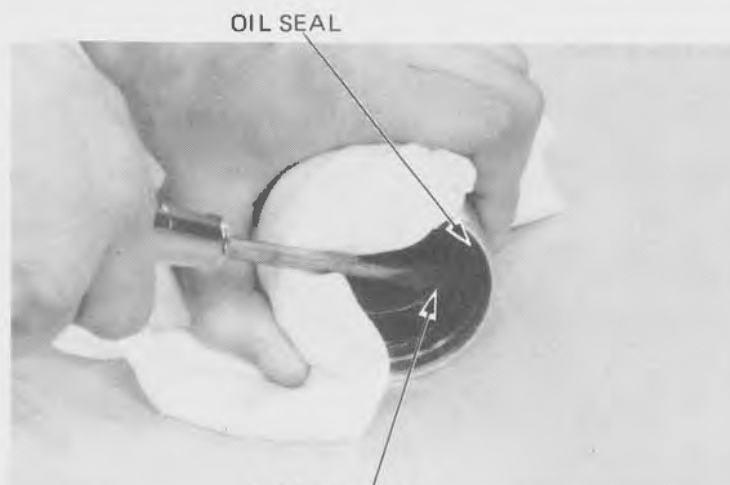
Remove the dust seal ('83).  
Remove the dust seal, foam seal and plastic washer ('84).  
Remove the circlip.



Remove the oil seal, and the back-up ring.

**NOTE**

Avoid damaging the inner and outer surfaces of the fork slider when removing the circlip and the oil seal.

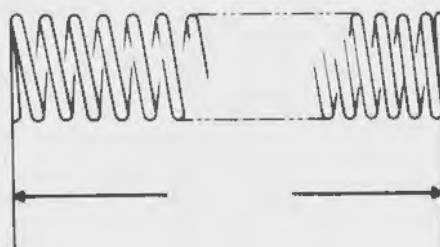




**INSPECTION  
FORK SPRING**

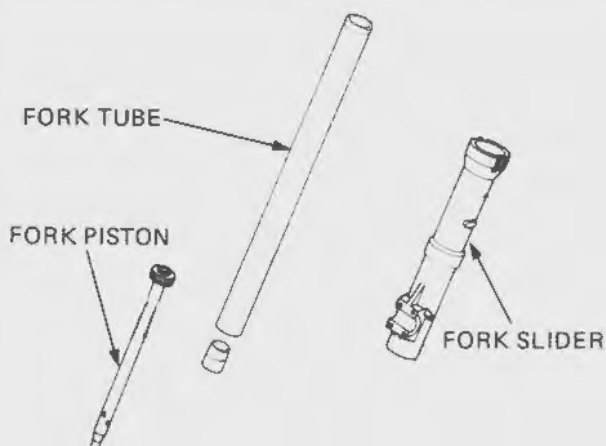
Measure the fork spring free length.  
**SERVICE LIMIT: 557 mm (21.93 in)**

**SERVICE LIMIT: 554.3 mm (21.82 in)**



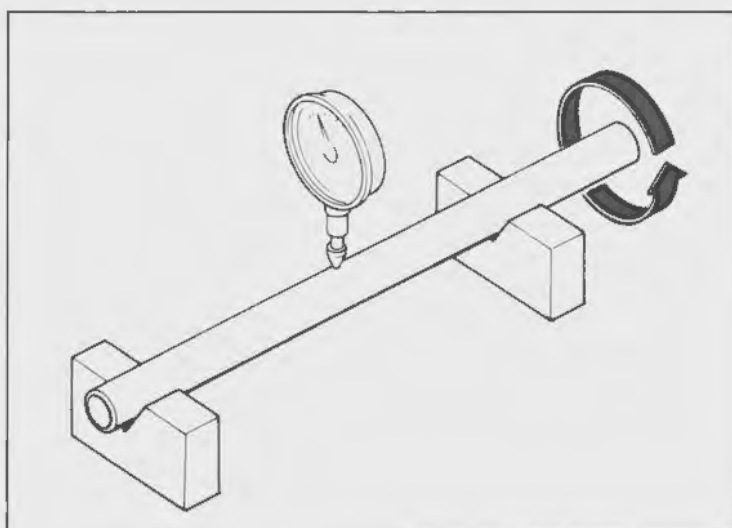
**FORK TUBE/FORK PISTON/SLIDER**

Check the fork tube, fork slider and piston for score marks, scratches, excessive or abnormal wear. Replace if necessary.



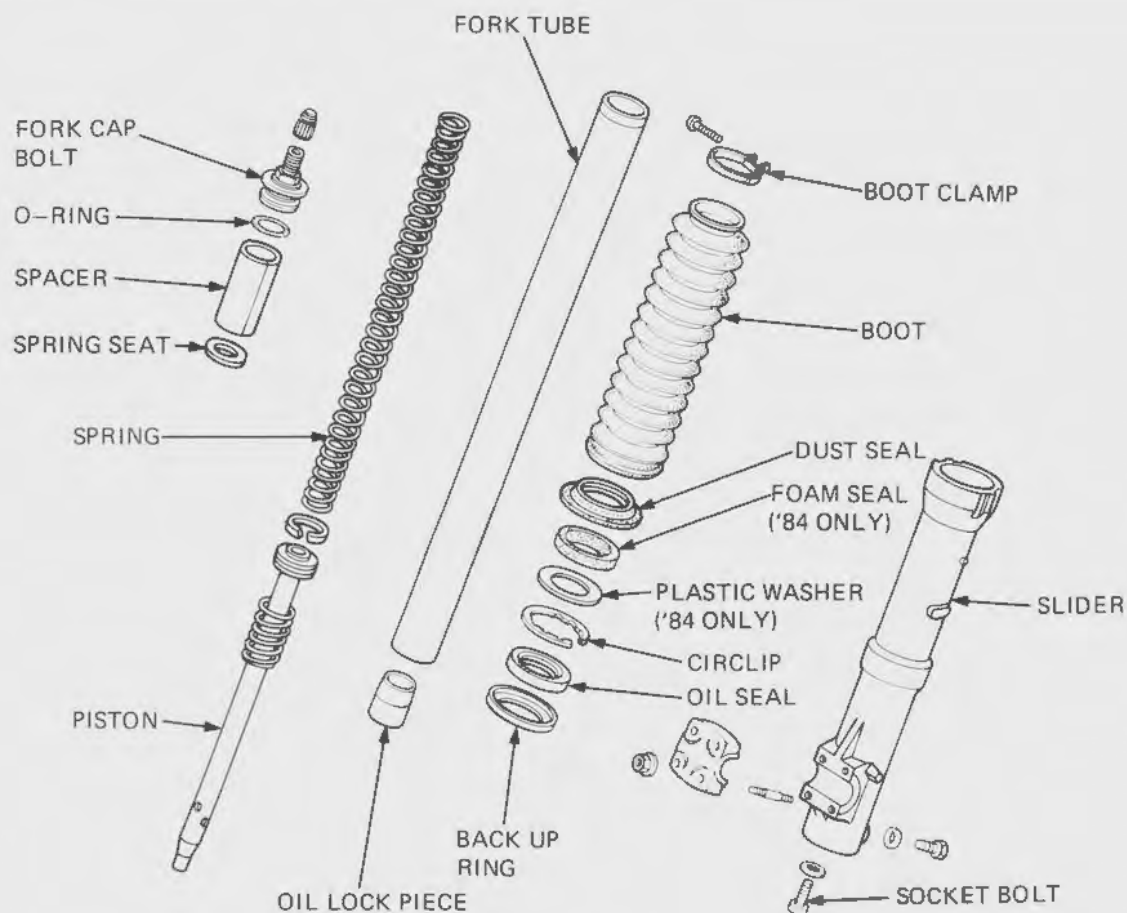
Set the fork tube on V blocks and measure the run out.

**SERVICE LIMIT: 0.2 mm (0.08 in)**





ASSEMBLY



Place the fork slider in a vise with soft jaws or a shop towel.

Apply a locking agent to the socket bolt threads and torque the bolt.

Temporarily install the fork springs, spring seating washer, spacer and fork tube cap to tighten the socket bolt. Remove them after the socket bolt is torqued.

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





Check the groove and top edge of the fork tube for burrs or scratches.

Wrap the fork tube groove or top edge with vinyl tape to prevent damage to the oil seal lip, during installation.

Install the back-up ring.

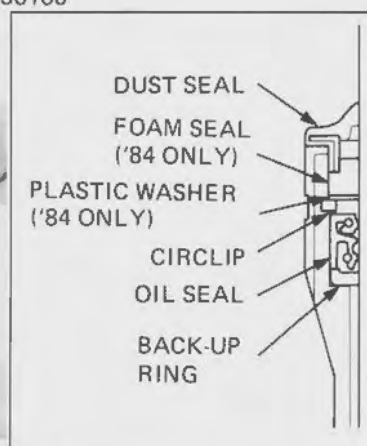
Coat a new oil seal with ATF and install it with the seal mark facing up.

Drive the oil seal in with the seal driver.

Install the circlip into the groove of the slider with the sharp edge facing up.

Install the plastic washer, foam seal and dust seal.

FORK SEAL DRIVER 07947-4630100



Pour in the specified amount of ATF.

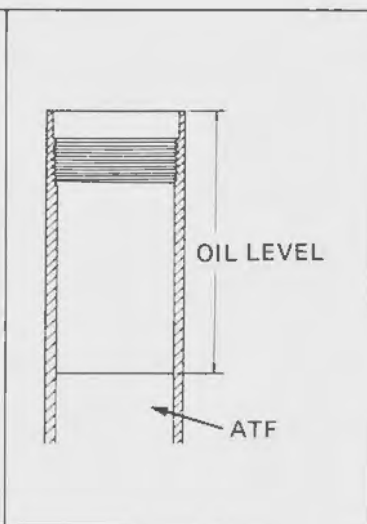
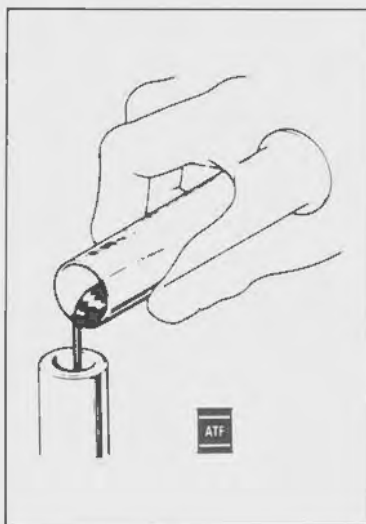
**CAPACITY: 455 cc (15.4 oz)**

Compress the front fork and measure the oil level from the top of the tube.

#### NOTE

Be sure the oil level is the same in both fork tubes.

**STANDARD OIL LEVEL: 150 mm (5.9 in)**



Wipe all oil from the fork springs and install them into the fork tubes with the narrow coils toward the bottom as shown.

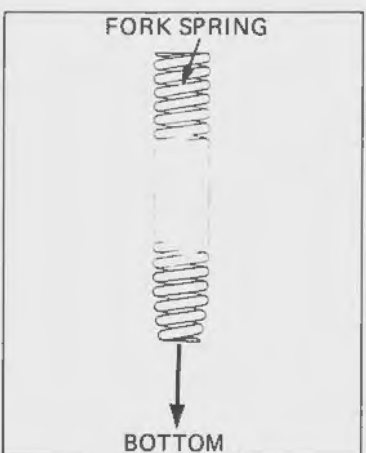
Install the fork spring seat and spacers.

Install and torque the fork cap.

**TORQUE: 15-30 N·m (1.5-3.0 kg-m, 11-22 ft-lb)**

#### CAUTION

Be careful not to cross-thread the fork caps.





## INSTALLATION

Install the fork tubes through the bridge and steering stem while rotating them by hand. The bottom edge of the fork cap should be flush with the top of the fork bridge.



Tighten the fork top bridge pinch bolt and steering stem pinch bolts.

### TORQUE:

Fork top bridge: 18–30 N·m  
Pinch bolt (1.8–3.0 kg·m, 13–22 ft·lb)

Fork bottom bridge: 30–35 N·m  
Pinch bolt (3.0–3.5 kg·m, 22–25 ft·lb)

Push the fork boots up until they just touch the steering stem and tighten the clamps. Add air pressure to each fork, as necessary, and reinstall the air valve caps.

### NOTE

Make sure the cable routing.

TOP BRIDGE PINCH BOLT



BOTTOM BRIDGE PINCH BOLT

## STEERING STEM

### FORK TOP BRIDGE REMOVAL

Remove the headlight. (Page 12-3)  
Disconnect the wires at the connectors.  
Remove the following parts:  
Speedometer (Page 12-4)  
Horn  
Speedometer cable guide  
Brake hose joint bolt  
Instrument bracket  
Handlebar (Page 12-5)  
Front wheel (Page 12-8)  
Front fender  
Front fork (Page 12-14)  
Front brake caliper

FRONT FENDER







Remove the steering stem nut.  
Loosen the fork bridge bolts and remove the bridge.  
Remove the front fork tube assemblies.

SOCKET WRENCH



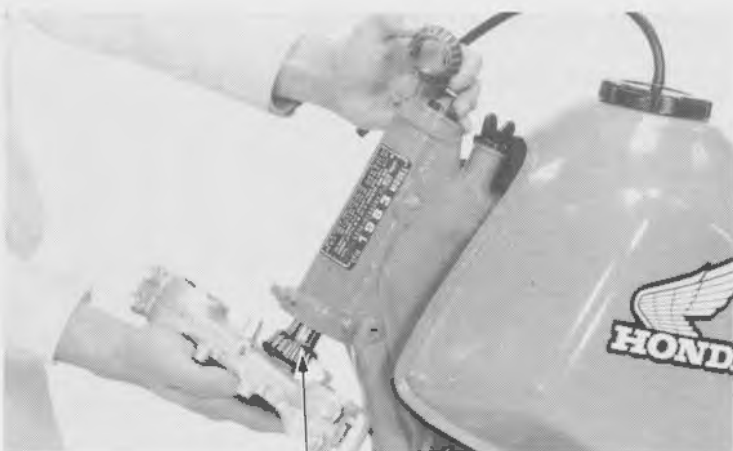
#### STEERING HEAD ADJUSTER REMOVAL

Remove the rubber cover.  
Remove the steering head adjuster.

STEERING STEM SOCKET 07916-3710100



Remove the steering stem.



STEERING SOCKET



Remove the inner races with the ball race driver.

RACE REMOVER 07953-4250002 or 07953-KA50000

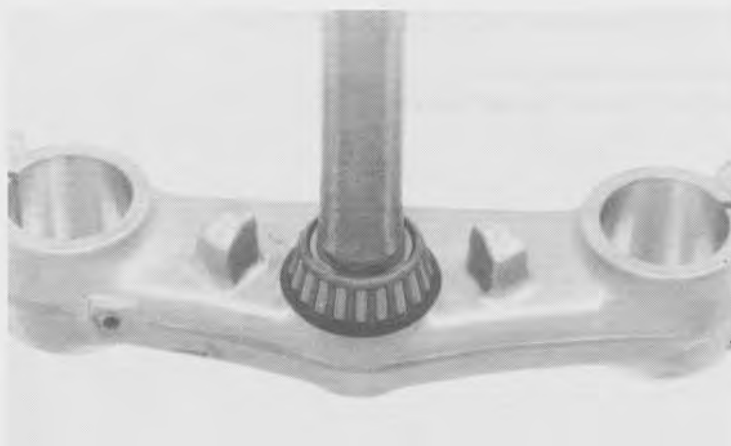


## BEARING REPLACEMENT

### NOTE

Always replace the bearing and bearing races as a set.

Remove the lower bearing from the steering stem.



## STEERING STEM INSTALLATION

Drive in the inner races.

DRIVER 07749-0010000



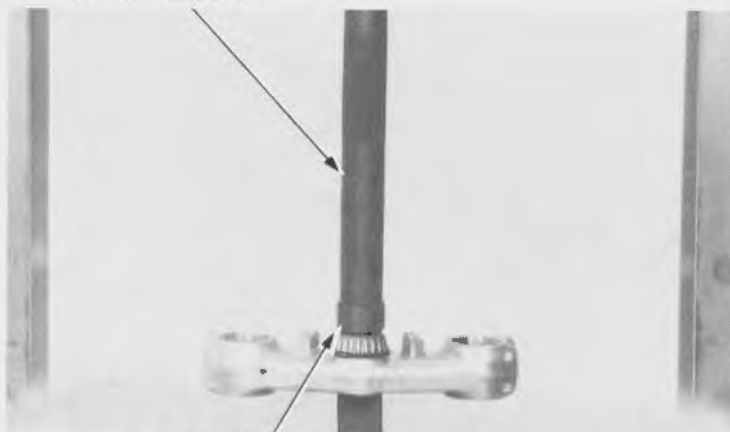
BALL RACE DRIVER 07946-4300100 or  
ATTACHMENT, 42 x 47 mm 07746-0010300



Install the dust seal.

Install the lower tapered roller bearing using a hydraulic press and Steering Stem Driver and Attachment.

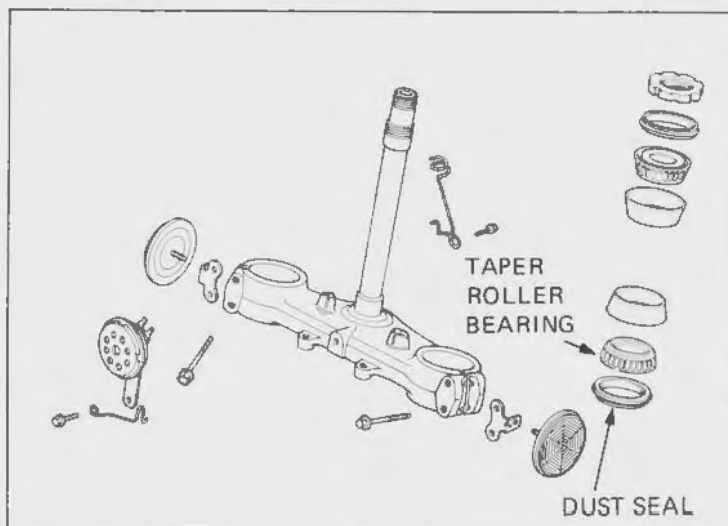
STEERING STEM DRIVER  
07946-MB00000



ATTACHMENT  
GN-HT-54 (U.S.A. only)

Install the upper taper roller bearing in the steering head.

Slide the steering stem through the steering head from the bottom.



Install the steering head adjusting nut and torque with the steering stem socket.

**TORQUE: 1-2 N·m**  
(0.1-0.2 kg-m, 0.7-1.4 ft-lb)

Install the rubber cover.

Install the fork bridge.

Tighten the steering stem nut.

**TORQUE: 80-120 N·m**  
(8.0-12.0 kg-m, 58-87 ft-lb)

Install the:

- front forks (Page 12-20)
- front fender
- front wheel (Page 12-13)
- handlebar (Page 12-6)

Install the speedometer and headlight.

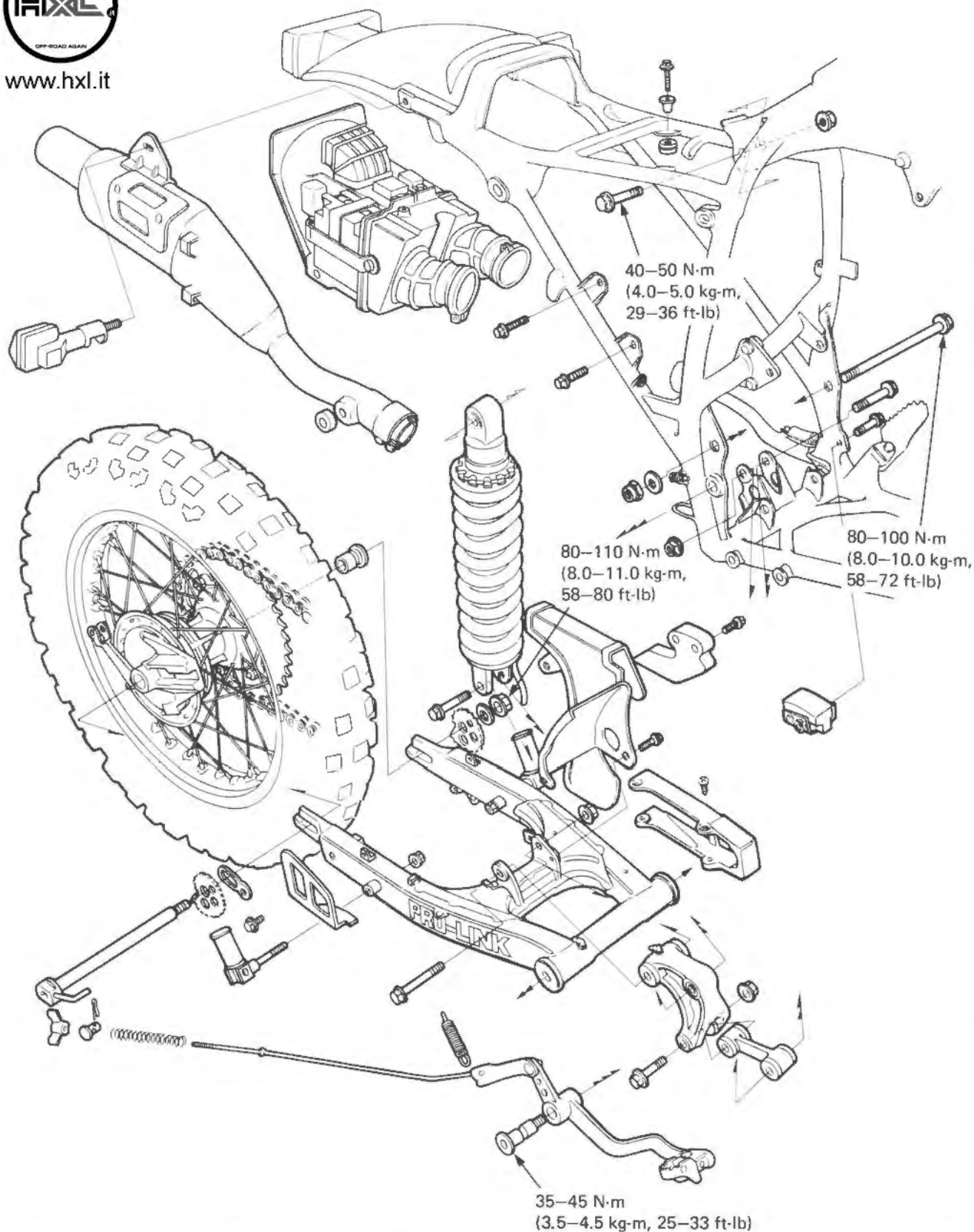
Connect the wiring.

STEERING STEM SOCKET 07916-3710100





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|                     |       |
|---------------------|-------|
| SERVICE INFORMATION | 13-1  |
| TROUBLESHOOTING     | 13-2  |
| REAR WHEEL          | 13-3  |
| SHOCK ABSORBER      | 13-9  |
| SWINGARM            | 13-13 |

## SERVICE INFORMATION

### GENERAL INSTRUCTIONS

- A jack block is required to support the motorcycle.
- Use genuine rear suspension linkage and shock absorber pivot/mount bolts.
- Note installation direction of the bolts.

#### WARNING

- *The rear shock absorber contains nitrogen under high pressure. Do not allow fire or heat near the shock absorber.*
- *Brake dust may contain asbestos which can be harmful to your health. Do not use compressed air to clean brake drums or brake panels. Use a vacuum with a sealed dust collector.*
- *Wear a protective face mask and thoroughly wash your hands when finished.*

### TOOLS

#### SPECIAL

|                                 |                                |
|---------------------------------|--------------------------------|
| Swing arm bearing remover<br>or | M967X-038-XXXXX (U.S.A. only)  |
| Bearing remover                 | 07936-3710600                  |
| Remover handle                  | 07936-3710100                  |
| Remover weight                  | 07936-3710200 or 07741-0010201 |
| Attachment                      | 07946-3710400                  |

#### COMMON

|                                   |                                |                                                       |
|-----------------------------------|--------------------------------|-------------------------------------------------------|
| Attachment, 32 x 35 mm            | 07746-0010100                  |                                                       |
|                                   | 07946-3000100                  |                                                       |
| Attachment, 42 x 47 mm            | 07746-0010300 or 07945-3330100 |                                                       |
| Driver                            | 07749-0010000                  |                                                       |
| Pilot, 17 mm                      | 07746-0040400                  |                                                       |
| Pilot, 20 mm                      | 07746-0040500                  |                                                       |
| Retainer wrench body              | 07710-0010400                  | ] or 07910-3230101                                    |
| Retainer wrench attachment        | 07710-0010200                  |                                                       |
| Attachment, 37 x 40 mm            | 07746-0010200                  |                                                       |
| Wheel bearing remover head, 17 mm | 07746-0050500                  | ] or Equivalent tool commercially available in U.S.A. |
| Wheel bearing remover shaft       | 07746-0050100                  |                                                       |



# TORQUE VALUES

|                             |                                            |
|-----------------------------|--------------------------------------------|
| Rear shock absorber (upper) | 40–50 N·m (4–5 kg-m, 29–36 ft-lb)          |
| (lower)                     | 40–50 N·m (4–5 kg-m, 29–36 ft-lb)          |
| Shock arm (swingarm)        | 90–120 N·m (9–12 kg-m, 65–87 ft-lb)        |
| (Shock link)                | 40–50 N·m (4–5 kg-m, 29–36 ft-lb)          |
| Connecting rod              | 40–50 N·m (4–5 kg-m, 29–36 ft-lb)          |
| Spokes                      | 2.5–5.0 N·m (0.25–0.5 kg-m, 1.8–3.6 ft-lb) |
| Final driven sprocket       | 32–35 N·m (3.2–3.5 kg-m, 23–25 ft-lb)      |
| Rear axle nut               | 80–110 N·m (8–11 kg-m, 58–80 ft-lb)        |
| Swingarm pivot bolt         | 80–100 N·m (8–10 kg-m, 58–72 ft-lb)        |
| Right foot peg bolt         | 38–48 N·m (3.8–4.8 kg-m, 27–35 ft-lb)      |
| Brake pedal pivot bolt      | 35–45 N·m (3.5–4.5 kg-m, 25–33 ft-lb)      |

| ITEM                                   |        | STANDARD          | SERVICE LIMIT     |
|----------------------------------------|--------|-------------------|-------------------|
| Rear shock absorber spring free length |        | 276 mm (10.87 in) | 273 mm (10.75 in) |
| Rear wheel runout                      | Radial | —                 | 2.0 mm (0.08 in)  |
|                                        | Axial  | —                 | 2.0 mm (0.08 in)  |
| Rear axle runout                       |        | —                 | 0.2 mm (0.008 in) |
| Rear brake drum I.D.                   |        | 130 mm (5.12 in)  | 131 mm (5.16 in)  |
| Rear brake shoe thickness              |        | 4.0 mm (0.16 in)  | 2.0 mm (0.08 in)  |
| Rear suspension damper compression     |        | 28.5 kg (62.8 lb) | 23.5 kg (51.8 lb) |

# TROUBLESHOOTING

## Wobber or vibration in motorcycle

1. Bent rim
2. Loose wheel bearings
3. Loose or bent spokes
4. Damaged tire
5. Axle not tightened properly
6. Swingarm pivot bearing worn
7. Chain adjusters not adjusted equally

## Soft suspension

1. Weak spring
2. Improper rear suspension spring preload.

## Hard suspension

1. Improper rear suspension spring preload.
2. Spring thrust sleeve binding
3. Bent shock absorber rod
4. Swingarm pivot bearings damaged

## Suspension noise

1. Faulty rear damper
2. Loose fasteners
3. Worn suspension linkage pivot bushings

## Poor brake performance

1. Improper brake adjustment
2. Worn brake shoes
3. Brake linings oily, greasy or dirty
4. Worn brake cam
5. Worn brake drum
6. Brake arm serrations improperly engaged
7. Brake shoes worn at cam contact area

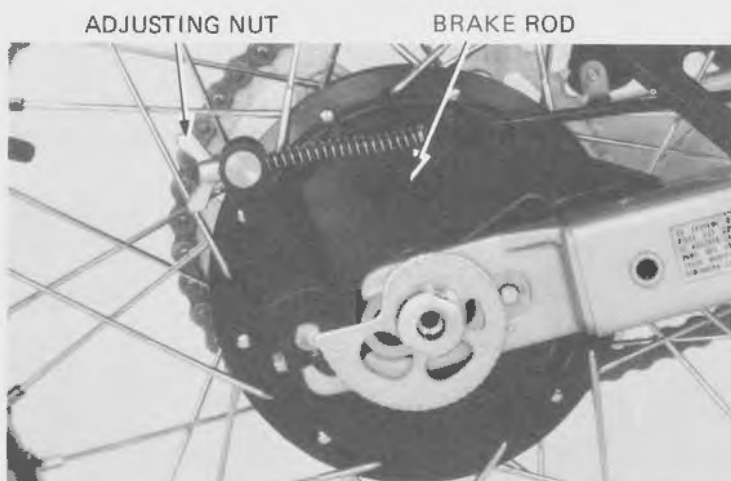


### REAR WHEEL

#### REAR WHEEL REMOVAL

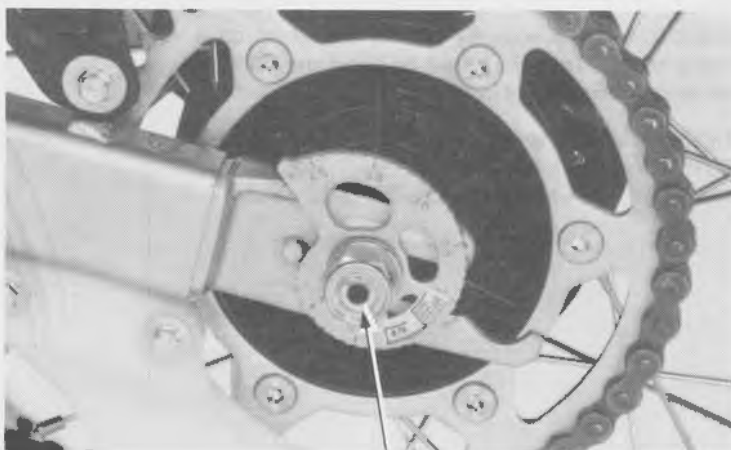
Raise the rear wheel off the ground by placing a box or workstand, under the engine.

Pull the brake arm for disconnect the brake rod from the brake arm.



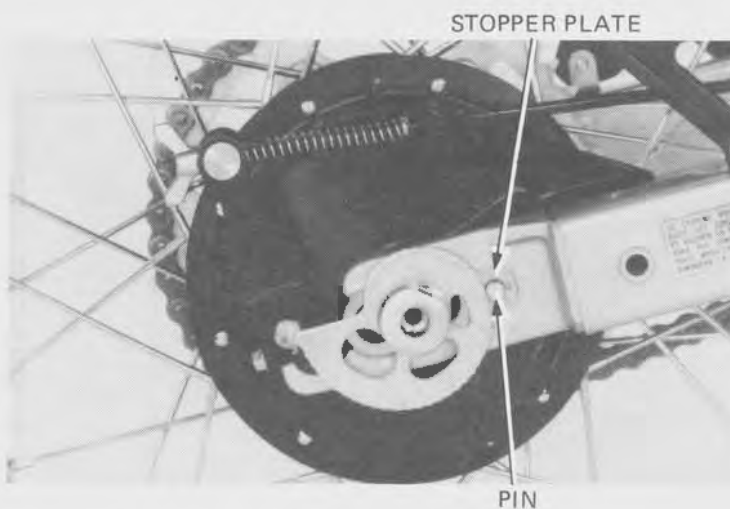
Loosen the rear axle nut.

Turn both adjusters so the rear wheel can be moved all the way forward for maximum drive chain slack. Move the rear wheel forward.



Derail the drive chain from the driven sprocket. Lift the stopper plate clear of the pin on the swingarm's right side.

Remove the rear wheel with the rear axle.



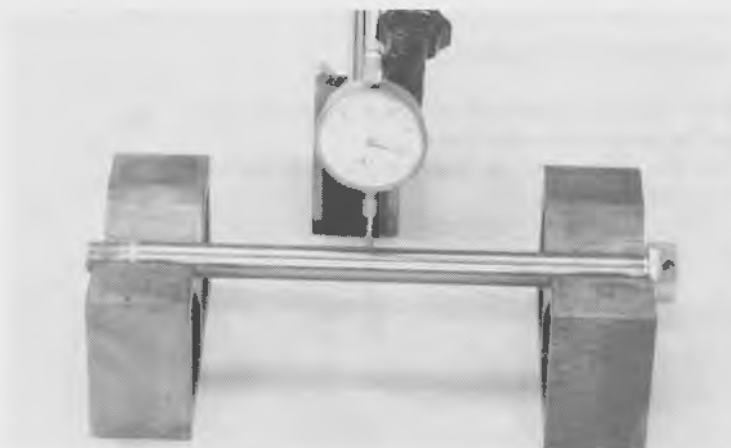




### AXLE INSPECTION

Set the axle on V blocks and measure the runout. The actual runout is 1/2 of the total indicator reading.

**SERVICE LIMIT:** 0.2 mm (0.008 in)

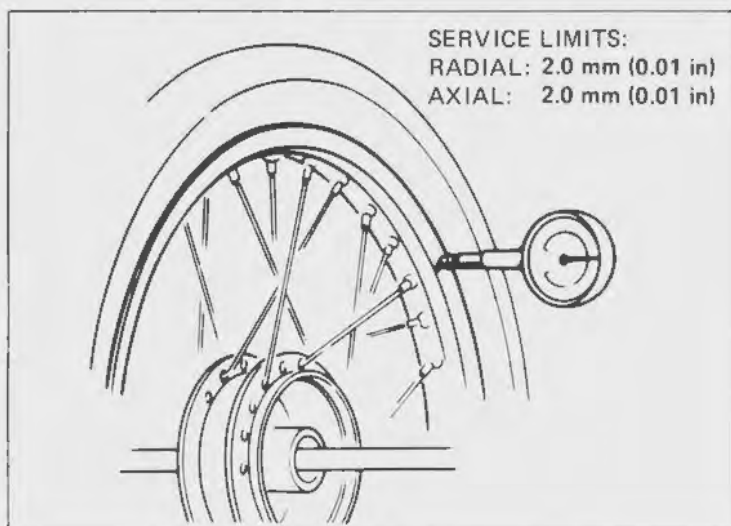


### REAR WHEEL RIM RUNOUT

Check the rim runout by placing the wheel on a truing stand. Turn the wheel by hand and measure the runout using a dial indicator.

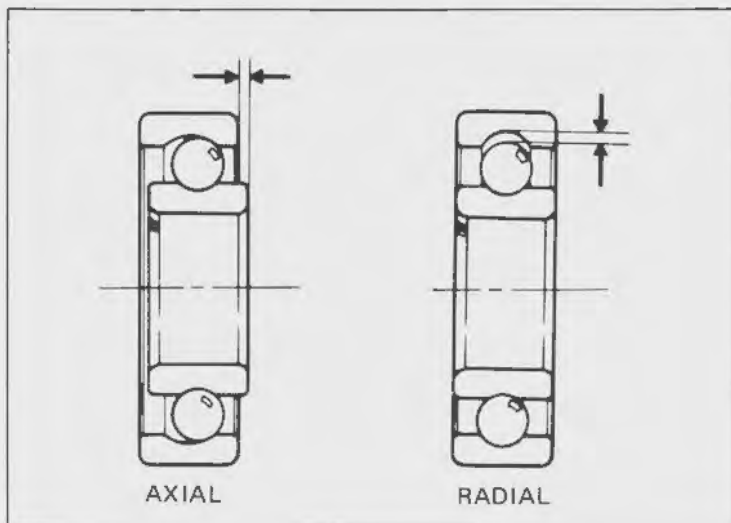
Tighten any loose spokes.

**TORQUE:** 2.5–5.0 N·m  
 (25–50 kg-cm, 1.8–3.6 ft-lb)



### REAR WHEEL BEARING PLAY

Check the 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.





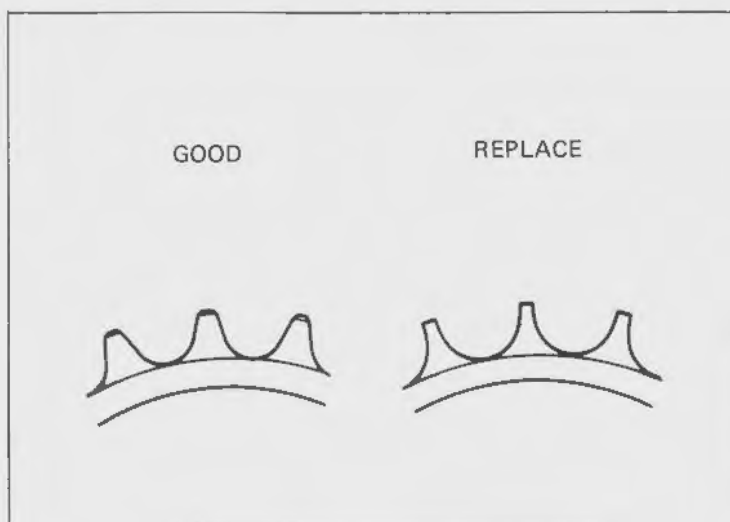
### FINAL DRIVEN SPROCKET

Check the condition of the final driven sprocket teeth.

Replace the sprocket if worn or damaged.

#### NOTE

The drive chain and drive sprocket must also be inspected if the driven sprocket is worn or damaged.



### BRAKE LINING

Measure the rear brake lining thickness.

**SERVICE LIMIT: 2.0 mm (0.008 in)**



### REAR BRAKE SHOE REPLACEMENT

Remove the brake arm, wear indicator plate and the brake shoes.

Apply grease to the face of the brake cam and anchor pin.

Install the brake cam and new brake shoes.

Install the springs.

#### WARNING

*Grease on the brake linings reduces stopping power. Keep grease off the linings.  
Wipe excess grease off the cam.*





Install the wear indicator plate onto the brake cam.

## NOTE

Align the indicator tab with the cut-out in the brake camshaft.

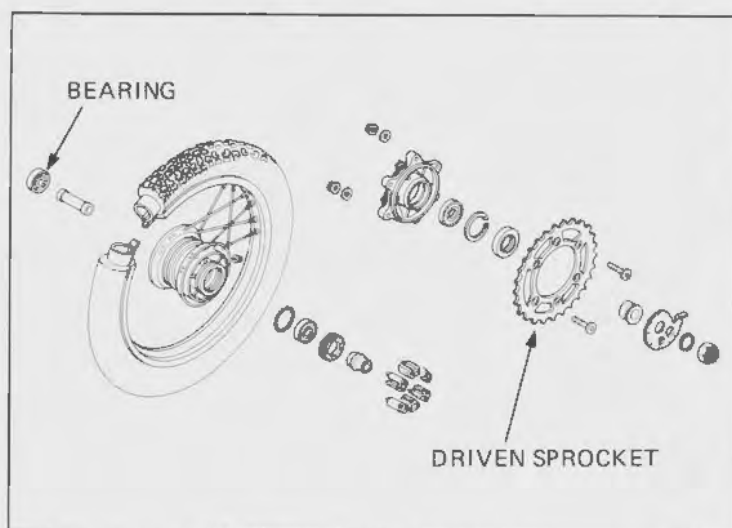
Install the brake arm aligning the punch mark with the punch mark on the brake cam.

Torque the brake arm bolt.

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



## REAR WHEEL DISASSEMBLY



WHEEL BEARING REMOVER HEAD 17 mm  
07746-0050500 AND WHEEL BEARING REMOVER SHAFT  
07746-0050100 OR EQUIVALENT TOOL COMMERCIALY  
AVAILABLE IN U.S.A.

Remove the bearing retainer with a retainer wrench.

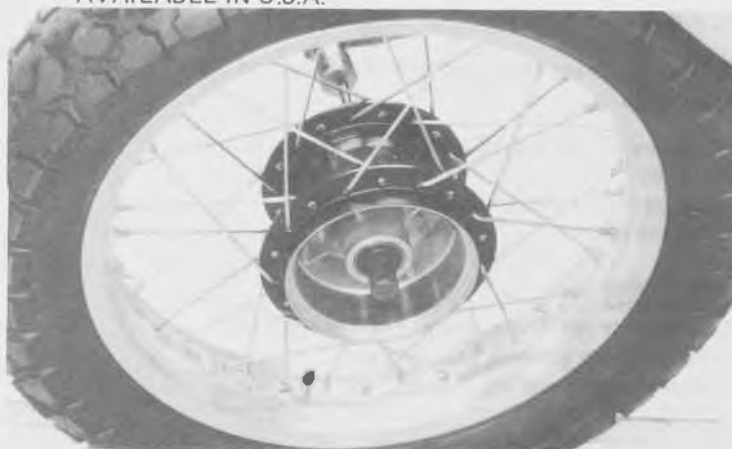
Remove the driven sprocket.

Remove the bearings, collar and O-ring.

Remove the wheel bearing.

## NOTE

Never reinstall old bearings; once the bearings are removed, they must be replaced with new ones.





### REAR BRAKE DRUM I.D.

Measure the rear brake drum I.D.

**SERVICE LIMIT: 131 mm (5.16 in)**



### REAR WHEEL ASSEMBLY

Install the final driven flange bearing.

Install the final driven sprocket and tighten the sprocket bolts.

**TORQUE VALUE: 32–35 N·m  
(3.2–3.5 kg·m, 23–25 ft·lb)**

Pack the bearing cavities with grease.

Install the right and left wheel bearings in the wheel hub.

Install the bearings with the sealed end facing out.

#### **WARNING**

*Grease on the brake linings reduces stopping power. Keep grease off the linings.*

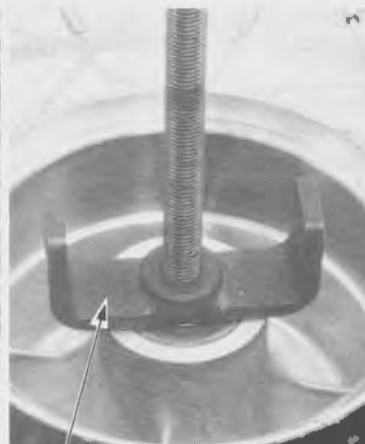
Grease and install the bearing retainer with the retainer wrench and body.



WHEEL BEARINGS: ATTACHMENT, 37 x 40 mm 07746-0010200 AND PILOT, 17 mm 07746-0040400 FINAL DRIVEN FLANGE BEARING: ATTACHMENT, 42 x 47 mm 07746-0010300 AND PILOT, 20 mm 07746-0040500



RETAINER WRENCH  
ATTACHMENT 07710-0010200



RETAINER WRENCH BODY  
07710-0010401



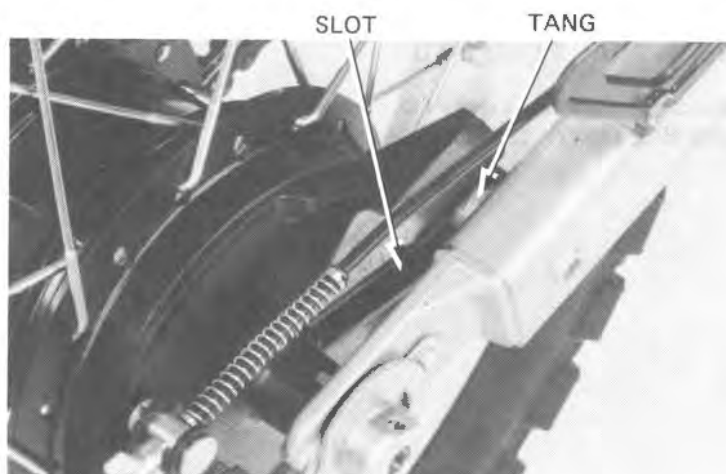
## REAR WHEEL INSTALLATION

Place the rear wheel into the swingarm locating the tang on the swingarm into the slot on the brake panel.

Place the stopper plate over the pin on the swingarm.

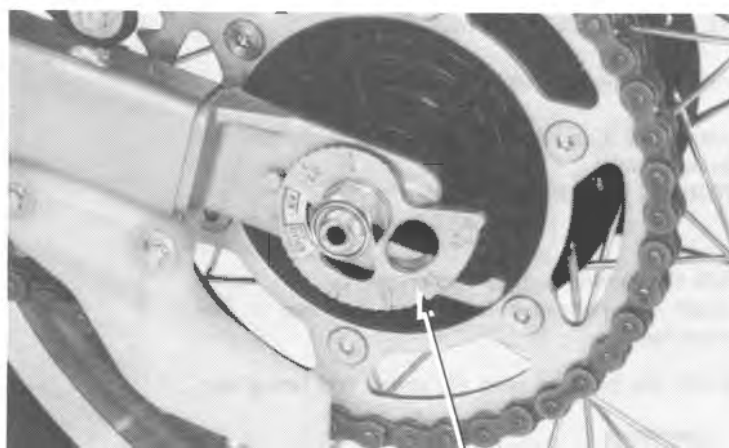


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Run the chain over the final driven sprocket.

Adjust the drive chain by turning the adjuster plates (left and right) to the same index mark on both sides (Page 3-13).



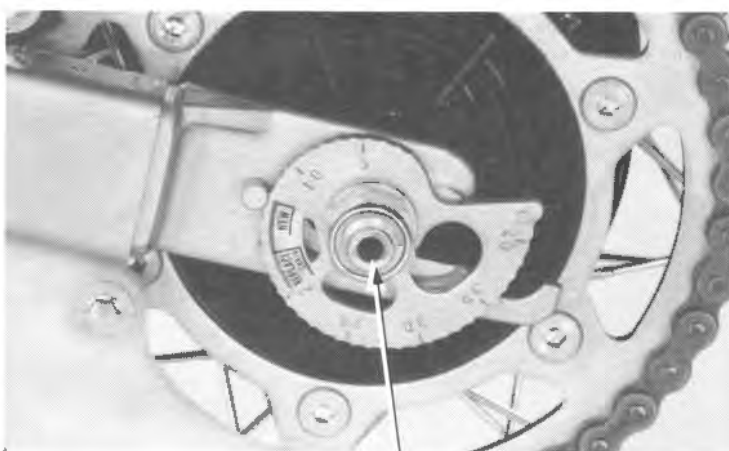
ADJUSTER PLATE

Tighten the axle nut.

**TORQUE: 80–110 N·m (8–11 kg-m, 58–80 ft-lb)**

Pull the brake arm pin holder and brake arm forward and insert the brake rod into the pin, then install the adjuster nut.

Adjust the brake pedal free play (3-15).



AXLE NUT



### SHOCK ABSORBERS

Raise the rear wheel off the ground by placing a box or workstand under the engine.

Remove the seat.

Remove the side covers.

Remove the air cleaner case (Page 4-4).

#### NOTE

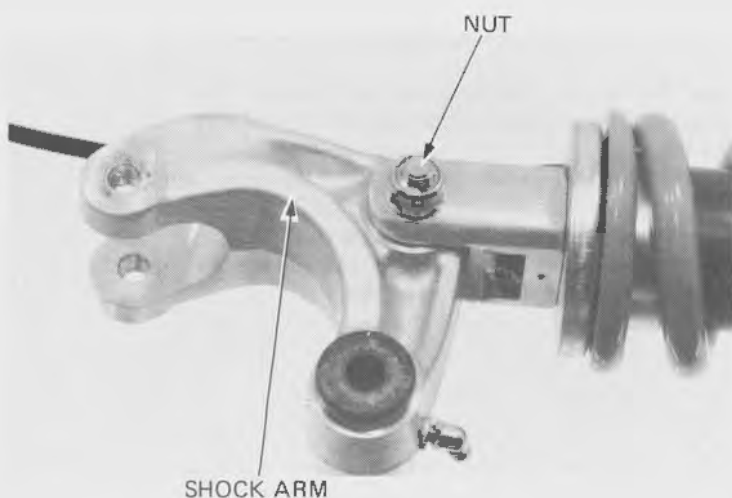
Seal the carburetor inlet with tape or clean cloth to keep dirt and debris from entering the intake tract.



Pull the shock absorber to the rear, then remove the shock absorber.



Remove the shock arm from the shock absorber.



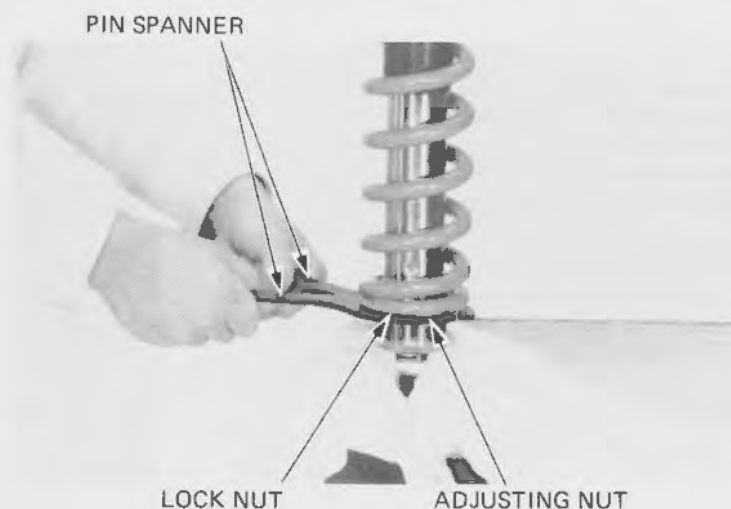




## DISASSEMBLY

Hold the upper part of the shock in a vise with soft jaws or a shop towel.

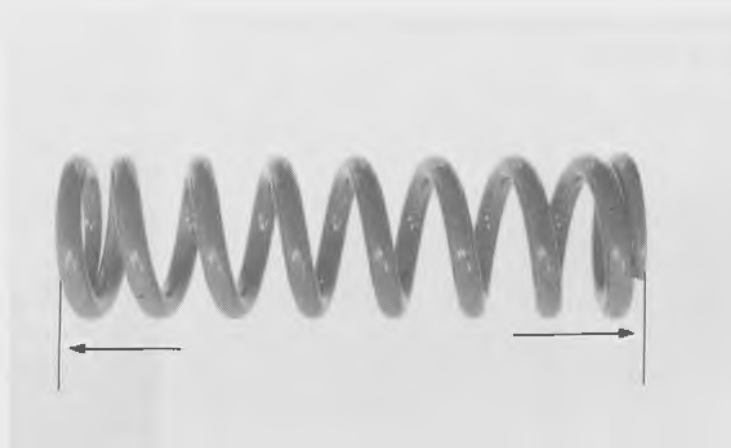
Loosen the lock nut and adjusting nut.



## SHOCK ABSORBER SPRING INSPECTION

Measure the spring free length.

**SERVICE LIMIT: 273 mm (10.75 in)**

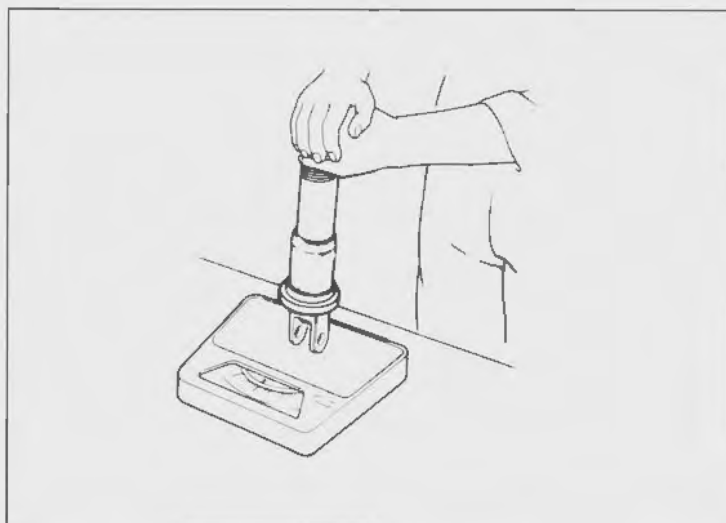


Visually inspect the damper unit for dents, oil leaks or other faults. Replace the damper unit if necessary.

Place the damper rod on a scale and measure the force required to compress the damper until 10 mm (0.4 in).

**COMPRESSION FORCE: 28.5 kg (62.8 lb)**

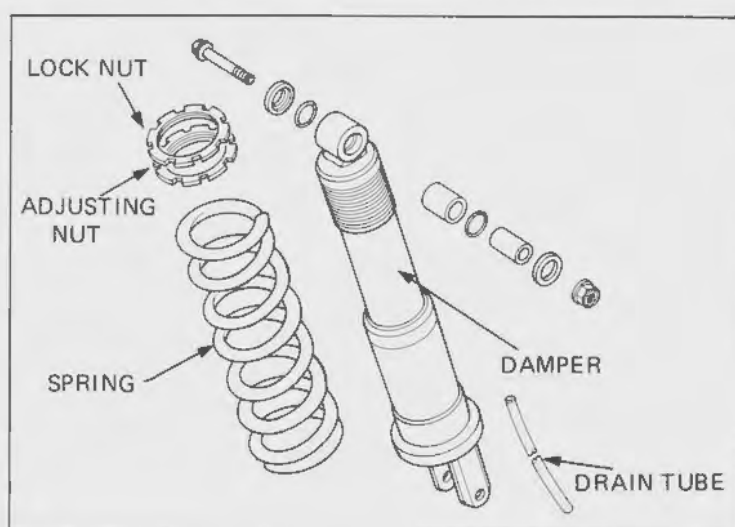
If the force required is less than 23.5 kg (51.8 lbs), gas is leaking. Examine the damper rod and replace the damper until if it is bent or scored.







### ASSEMBLY



Install the spring, spring seat and seat stopper.  
Align the upper and lower shock absorber mounts.

#### NOTE

Install the rear shock absorber with the index mark for the damping adjuster facing the rear.



Measure the spring's length.  
Turn the adjusting nut to obtain the standard spring length.

**STANDARD SPRING LENGTH: 265 mm (10.43 in)**

#### NOTE

One turn equals 1.5 mm (0.06 in) of spring length.

To increase spring preload; tighten the adjusting nut to shorten the spring length up to 5 mm (1/4 in) and tighten the lock nut.

#### CAUTION

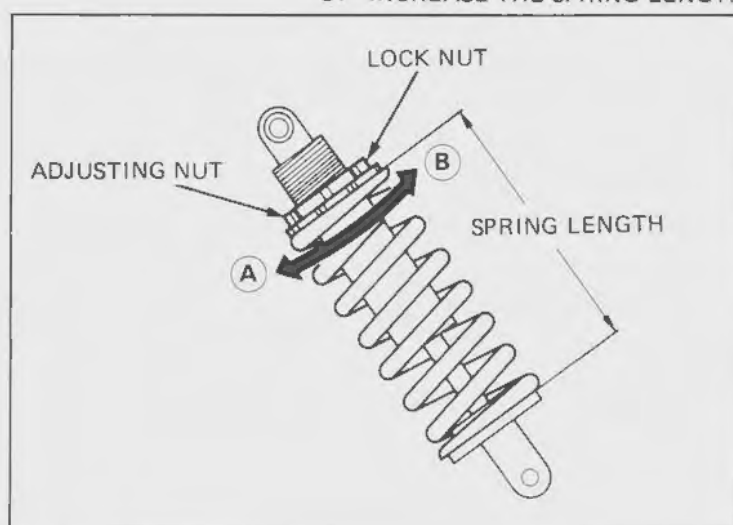
*Do not shorten the spring more than 5 mm (1/4 in), or damage to the spring could result.*

To reduce spring preload; loosen the adjusting nut to increase spring length 5 mm (1/4 in) and tighten the lock nut.

#### CAUTION

*Do not ride the motorcycle without the spring having preload. Loss of rider control could result.*

A: SHORTEN THE SPRING LENGTH  
B: INCREASE THE SPRING LENGTH





## SHOCK LINKAGE INSPECTION

Remove the dust seals and collars.  
 Check the bushings for damage.  
 Measure the bushing I.D.  
**LIMIT: 15.135 mm (0.596 in)**

Measure the collar O.D.  
**LIMIT: 14.941 mm (0.588 in)**

## REAR SHOCK ABSORBER INSTALLATION

Install the shock arm to the lower mount.  
 Temporarily tighten nut.

Apply molybdenum disulfide (MoS<sub>2</sub>) paste (containing more than 45 % of (MoS<sub>2</sub>) to the upper mount bushings.

### NOTE

Use MoS<sub>2</sub> paste (containing more than 45% of MoS<sub>2</sub>) as follows:

- Molykote® G-n Paste manufactured by Dow Corning U.S.A.
- Rocol Paste manufactured by Sumico Lubricant Co., LTD., Japan.
- Other lubricants of equivalent quality.

Attach the shock absorber to the frame and torque the upper bolt.

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

Connect the shock arm to the swing arm.

**TORQUE: 90–120 N·m**  
 (9.0–12.0 kg-m, 65–87 ft-lb)

Connect the shock arm to the shock link.

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

Torque the shock absorber lower mount nut.

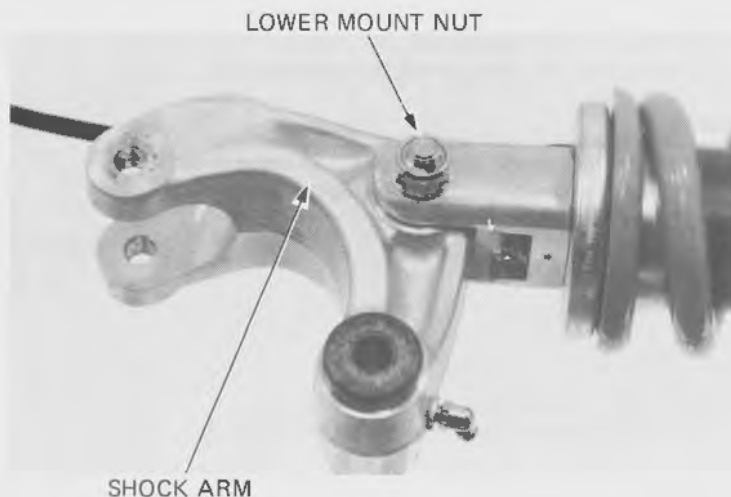
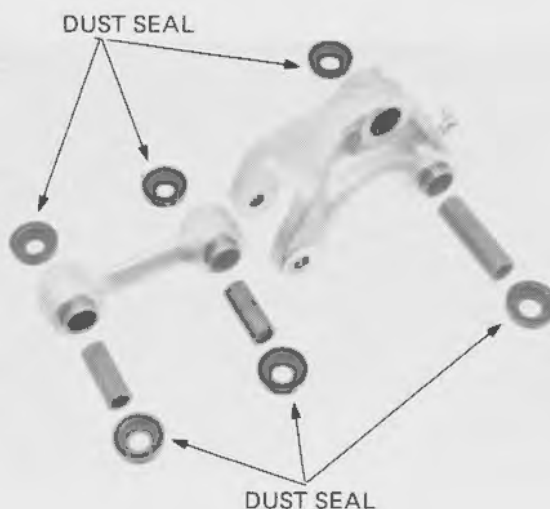
**TORQUE: 40–50 N·m**  
 (4.0–5.0 kg-m, 29–36 ft-lb)

### WARNING

*Use only the correct bolts. Do not substitute other fasteners. Since they may not have adequate strength and may fail during operation.*

Install the following:

- Air cleaner case
- Muffler
- Battery mount case
- Chain case
- Side covers
- Seat





### SWING ARM

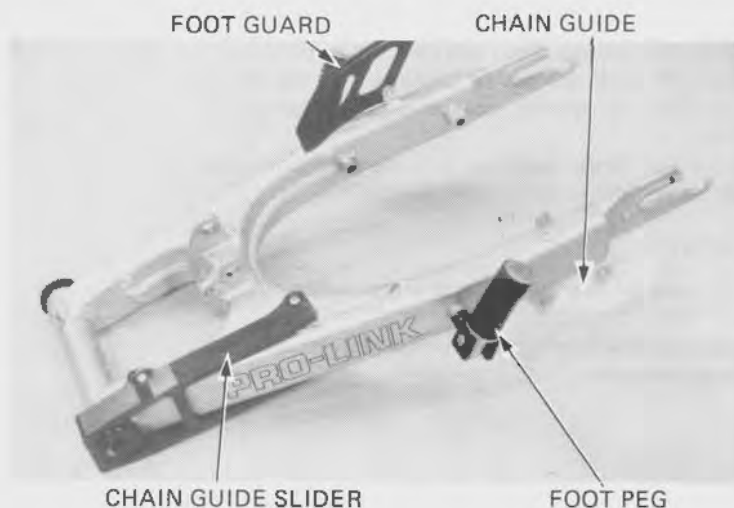
#### SWINGARM REMOVAL

Raise the rear wheel off the ground with a box or workstand under the engine.  
Remove the rear wheel. (Page 13-3)  
Remove the rear shock absorber. (Page 13-9)  
Remove the rear brake linkage.  
Remove the swingarm pivot bolt.  
Remove the shock link bolts.



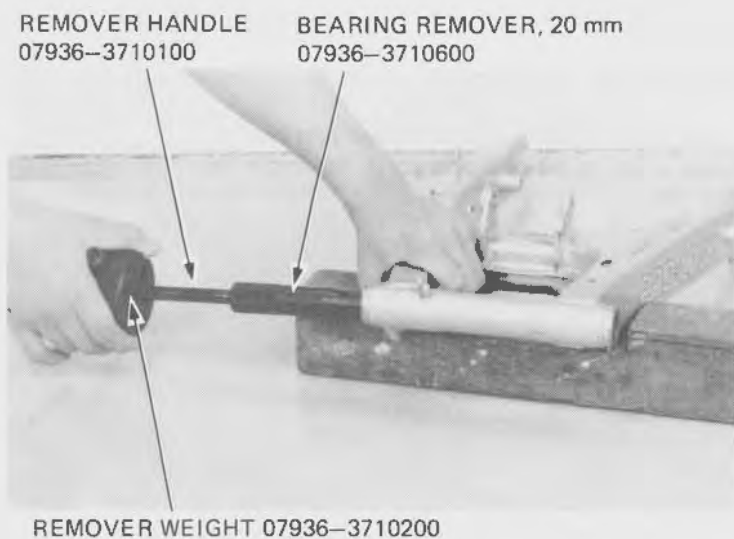
#### DISASSEMBLY

Remove the chain guide slider, chain guide, foot peg and foot guard.



#### PIVOT BEARING REPLACEMENT

Remove the dust covers and collar.  
Install the bearing remover into the swingarm pivot hole and expand the tool behind the bearing.  
Drive bearing out with the slide hammer.





## INSPECTION

Inspect the collars, bearings and dust seals. Replace them if they have score marks, scratches, or excessive or abnormal wear.

Apply molybdenum disulfide (MoS<sub>2</sub>) paste (containing more than 45 % of (MoS<sub>2</sub>) to the insides of the bushings and dust seal lips.

### NOTE

Use MoS<sub>2</sub> paste (containing more than 45% of MoS<sub>2</sub>) as follows:

- Molykote® G-n Paste manufactured by Dow Corning U.S.A.
- Rocol Paste manufactured by Sumico Lubricant Co., LTD., Japan.
- Other lubricants of equivalent quality.

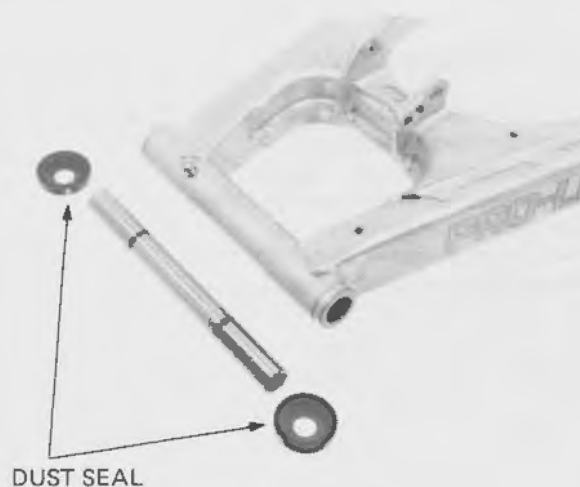
Clean the bearings, then lubricate them with grease. Carefully drive the needle bearings into the swingarm with the special tool below the edge of the hole.

Drive the thrust bushings into the swingarm with the same tool.

### NOTE

Install the bearings with the marks facing out.

Lubricate the bearings with grease after installation. Install the collar.



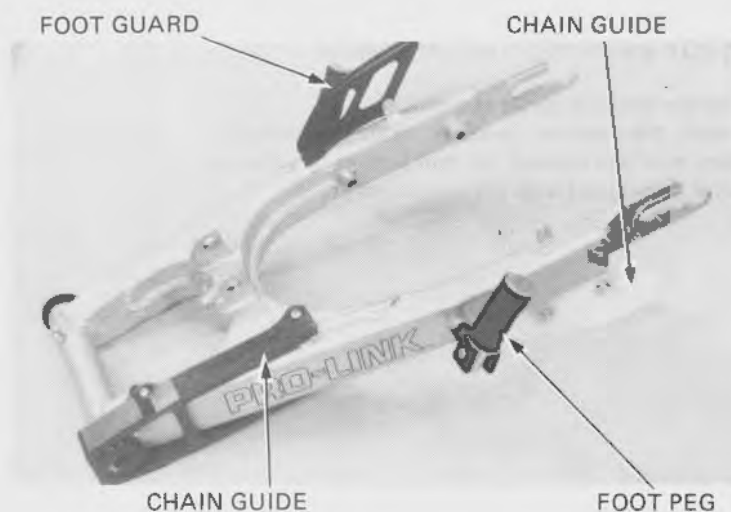
DRIVER 07749-0010000



ATTACHMENT, 07946-3710400

## SWINGARM ASSEMBLY

Install the foot guard, chain guide and foot peg. Apply grease to the swingarm pivot, and install the dust seal.





### SWINGARM INSTALLATION

Install the swingarm and torque the pivot bolt.

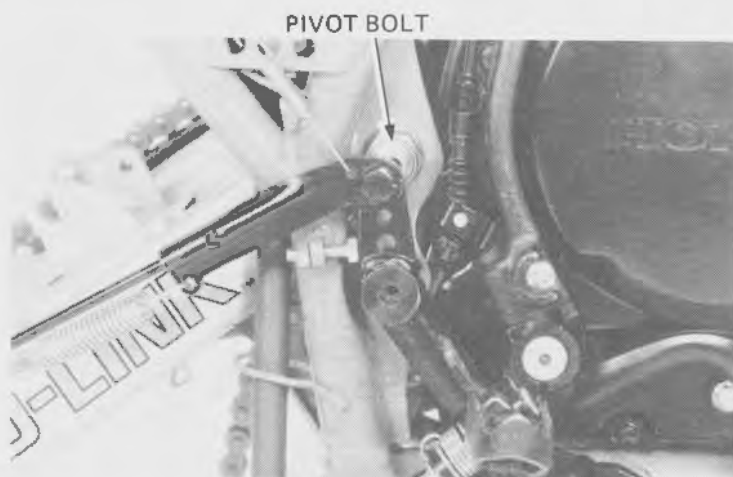
**TORQUE:** 70–100 N·m  
(7–10 kg-m, 50.6–72.2 ft-lb)

Install the rear wheel and the chain.

Install the shock absorber (Page 13-12).

Connect the rear brake rod.

Adjust the rear brake pedal free play (Page 3-16).



Apply grease to the swingarm pivot through the grease fitting.

Apply molybdenum disulfide (MoS<sub>2</sub>) paste to the linkage bushings through the grease fittings on the linkage pivots (Page 3-19).



### BRAKE PEDAL

#### REMOVAL

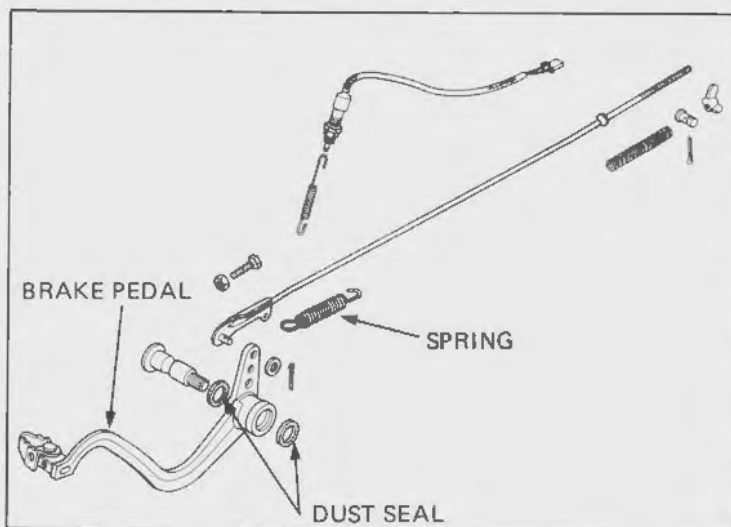
Disconnect the brake pedal spring.

Disconnect the brake rod and remove brake pedal.

#### INSTALLATION

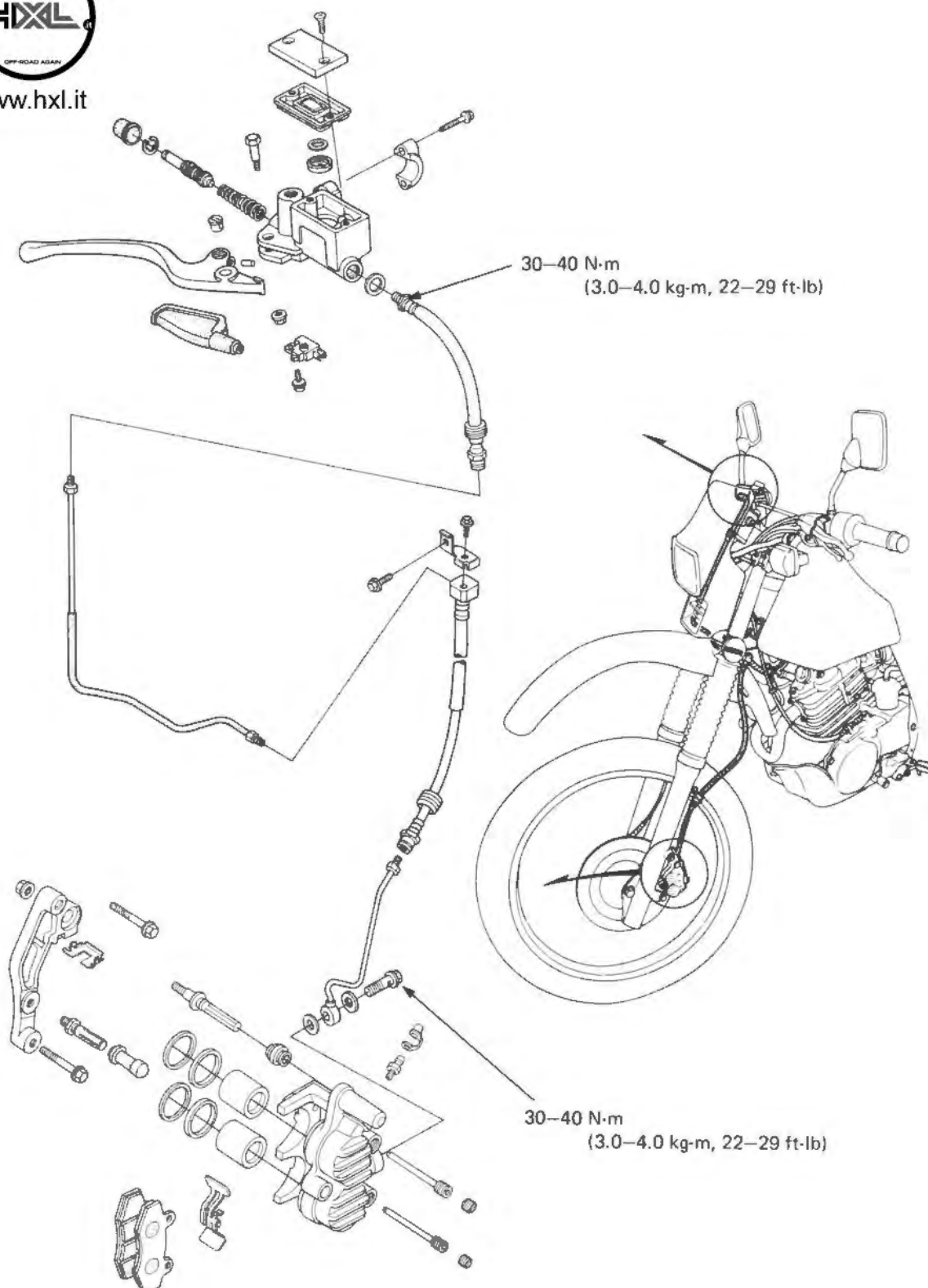
When assembling, apply grease to the brake pedal pivot bolt, and dust seals.

Install the brake pedal in the reverse order of removal.





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|                                      |      |
|--------------------------------------|------|
| SERVICE INFORMATION                  | 14-1 |
| TROUBLESHOOTING                      | 14-2 |
| BRAKE FLUID REPLACEMENT AIR BLEEDING | 14-3 |
| BRAKE PAD/DISC                       | 14-5 |
| FRONT MASTER CYLINDER                | 14-7 |
| BRAKE CALIPER                        | 14-9 |

## SERVICE INFORMATION

### GENERAL

- The front brake can be removed without disconnecting the hydraulic system.
- Once the hydraulic systems has been opened, or if the brakes feel spongy, the system must be bled.
- 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 will result.
- Always check brake operation before riding the motorcycle.
- Use only DOT 4 Brake fluid.

### SPECIFICATIONS

|                             | STANDARD                            | SERVICE LIMIT         |
|-----------------------------|-------------------------------------|-----------------------|
| Front disc thickness        | 3.5 mm (0.14 in)                    | 3.0 mm (0.12 in)      |
| Front disc runout           | —                                   | 0.30 mm (0.012 in)    |
| Front master cylinder I.D.  | 12.7–12.743 mm (0.5000–0.5017 in)   | 12.755 mm (0.5022 in) |
| Front master piston O.D.    | 12.716–12.743 mm (0.5006–0.5017 in) | 12.640 mm (0.4976 in) |
| Front caliper piston O.D.   | 25.3–25.40 (0.999 in–1.000 in)      | 25.45 (1.002 in)      |
| Front caliper cylinder I.D. | 25.40–25.45 (1.000–1.002 in)        | 25.30 (0.9961 in)     |

**14**

### TORQUE VALUES

|                             |                                       |
|-----------------------------|---------------------------------------|
| Brake hose bolt             | 25–35 N·m (2.5–3.5 kg·m, 18–25 ft·lb) |
| Front brake caliper bracket | 20–30 N·m (2.0–3.0 kg·m, 14–22 ft·lb) |
| Brake caliper 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) |

### TOOL

|                             |               |
|-----------------------------|---------------|
| Special<br>Snap ring pliers | 07914–3230001 |
|-----------------------------|---------------|





## TROUBLESHOOTING

### Brake Lever/Pedal Soft or Spongy

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

### Brake Lever/Pedal Too Hard

1. Sticking piston(s)
2. Clogged hydraulic system
3. Pads glazed or worn excessively

### Brakes Drag

1. Hydraulic system sticking
2. Incorrect adjustment of lever
3. Sticking piston(s)

### Brakes Grab or Pull to One Side

1. Disc or wheel misaligned

### Brakes Chatter or Squeal

1. Pads contaminated
2. Excessive disc runout
3. Caliper installed incorrectly
4. Disc or wheel misaligned



### BRAKE FLUID REPLACEMENT

#### AIR BLEEDING

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

#### CAUTION

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



#### BRAKE FLUID DRAINING

Connect a bleed hose to the bleeder valve. Loosen the caliper bleeder valve and pump the brake lever. Stop operating the lever when no fluid flows out of the bleeder valve.

#### WARNING

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



#### BRAKE FLUID FILLING

#### NOTE

Do not mix different types of fluid. They are not compatible.

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

To prevent piston overtravel and brake fluid seepage, keep a 20 mm (3/4 in) space between the lever and the handlebar grip when filling and bleeding the front brake 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.

Bleed the system as described on the next page.



**AIR BLEEDING****NOTE**

- Check the fluid level often while bleeding the system to prevent air from being pumped into the system.
- Use only DOT 4 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 that would impair the efficiency of the brake system.
- When using a brake bleeding tool, follow the manufacturer's operating instructions.

**AIR BLEEDER VALVE****MITYVAC BRAKE BLEEDER or EQUIVALENT**

Connect the Mitymac Brake Bleeder No. 6860 or equivalent to the bleed valve.

Loosen the bleed valve 1/2 turn and bleed air until no bubbles appear in the fluid.

Pump the brake lever to bring the caliper pads in contact with the disc.

Remove the master cylinder cap and fill the reservoir to near full.

Connect the Mityvac Brake Bleeder or equivalent to the bleed valve.

Pump the brake bleeder and loosen the bleeder valve.

Add fluid when the level in the master cylinder reservoir is low.

Repeat the above procedures until air bubbles do not appear in the plastic window.

**NOTE**

If air is entering the bleeder hose from around the bleeder valve the threads. Seal the threads with teflon tape.

If a brake bleeder is not available, perform the following procedure.

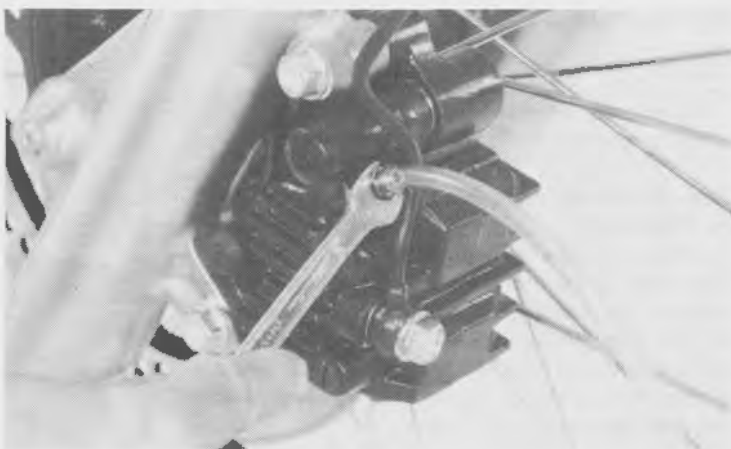
Squeeze the brake lever, then open the bleed valve 1/2 turn and close the valve.

**NOTE**

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

Release the brake lever 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.





## BRAKE PAD/DISC

### FRONT PAD REPLACEMENT

#### NOTE

Always replace the brake pads in pairs to assure even disc pressure.

Remove the caliper mounting bolts.  
Remove the caliper from the fork slider.



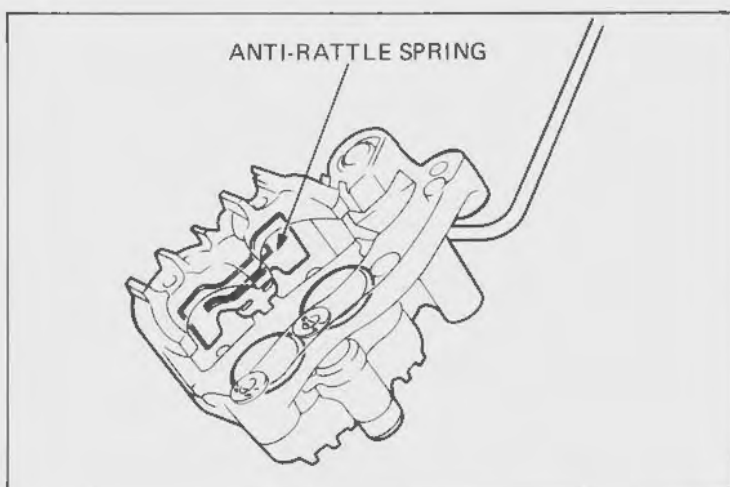
MOUNTING BOLTS

Remove two slot-head screws, then remove the two hex head bolts beneath them.  
Remove the brake pads.



HEX HEAD BOLTS

Position the anti-rattle spring in the caliper.  
Push the caliper pistons in all the way.



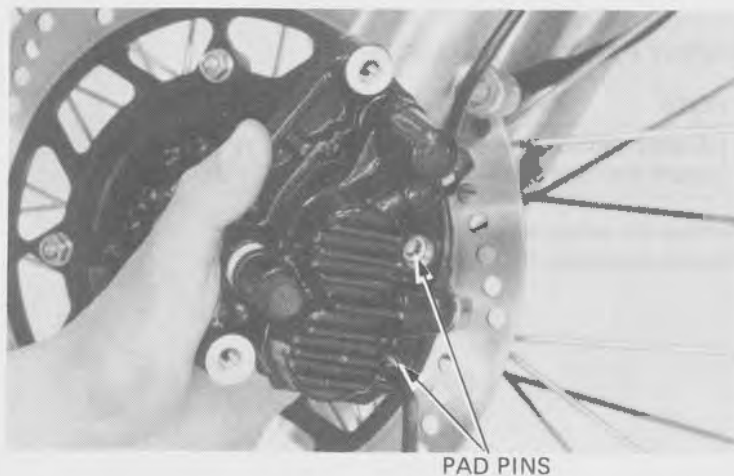
ANTI-RATTLE SPRING



Install the new pads in the caliper and install the pad pins.  
Install two cap bolts.

### NOTE

Install one pad pin first then install the other pin by pushing the pads against the caliper to depress the anti-rattle spring.



Push the piston all the way in to allow installation of new brake pads.



Install the caliper on the fork slider and tighten its bolts.

Torque: 20–30 N·m (2.0–3.0 kg-m, 14–22 ft-lb)





### DISK THICKNESS

Measure the disc thickness with a micrometer.

**SERVICE LIMIT:**

Front: 3.0 mm (0.12 in)

### BRAKE DISC WARPAGE

Measure brake disc warpage on a surface plate with a feeler gauge.

**SERVICE LIMIT:** 0.3 mm (0.012 in)



## MASTER CYLINDER

### DISASSEMBLY

Drain brake fluid from the hydraulic system.

Disconnect the brake light switch wires.

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 serviced.*



**NOTE**

- When removing the fluid bolt, cover the end of the hose to prevent contamination and secure the hose.
- When removing the brake lever, do not loose the push rod.

Remove the master cylinder.

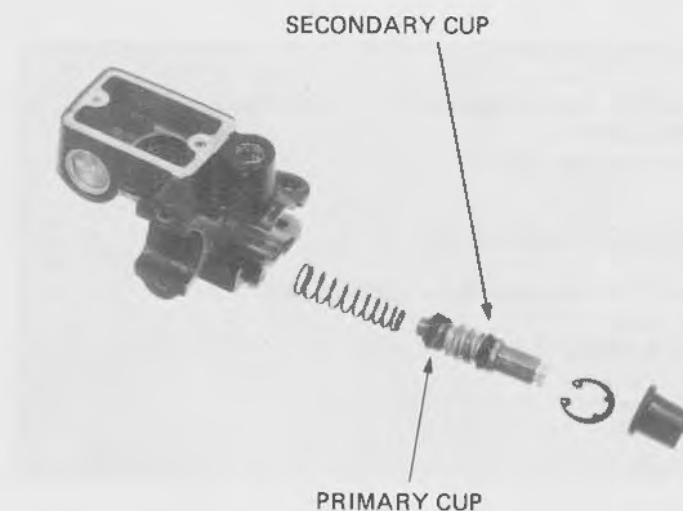
Remove the boot and circlip from the master cylinder body.





Remove the stop plate, secondary cup and piston.  
Then remove the primary cup and spring.

Clean the inside of the master cylinder and reservoir  
with brake fluid.

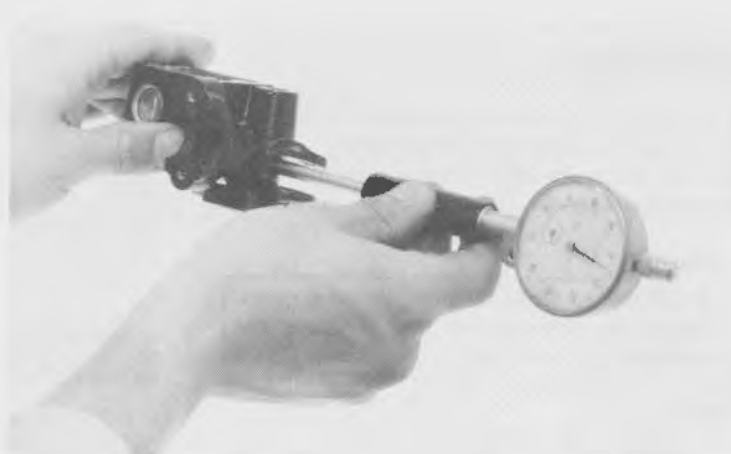


### FRONT MASTER CYLINDER I.D. INSPECTION

Measure the master cylinder I.D.

Check the master cylinder for scores, scratches or  
nicks.

**SERVICE LIMIT: 12.755 mm (0.5022 in)**



### MASTER PISTON O.D. INSPECTION

Measure the piston O.D.

**SERVICE LIMIT: 12.640 mm (0.4976 in)**

Check the primary cup and secondary cup for  
damage before assembly.







### ASSEMBLY

#### CAUTION:

*Handle the master cylinder piston, cylinder and spring as a set.*

Assemble the master cylinder. Coat all parts with clean brake fluid before assembly. Install the spring and valve together.

Dip the piston cup in brake fluid before assembly.

#### CAUTION:

*When installing the cups, do not allow the lips to turn inside out. Be certain the circlip is seated firmly in the groove.*

Install the boot, washer and clip.

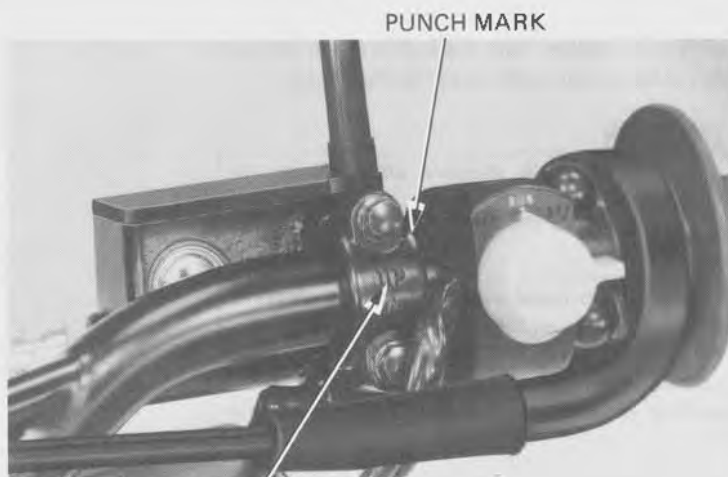
Install the reservoir on the master cylinder making sure that the O-ring is in good condition.

Place the master cylinder on the handlebar and install the holder and the two mounting bolts. Align the end of the holder with the punch mark on the handlebar.

Tighten the top bolt first. Install the fluid hose with the bolt and its two sealing washers.

Install the brake lever, but before installing the lever nut, install the rubber tube from the bottom side of the cylinder, the plate, and nut.

Fill the reservoir to the upper level and bleed the brake system according to page 14-4.



"UP" MARK

### BRAKE CALIPER

#### FRONT BRAKE CALIPER REMOVAL

Place a clean container under the caliper and disconnect the brake hose from the caliper.

#### CAUTION

*Avoid spilling brake fluid on painted surfaces to prevent paint damage.*

Remove the caliper bolts and caliper.



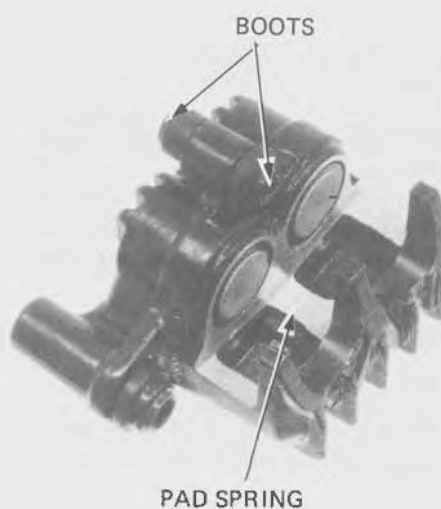
MOUNTING BOLTS



## CALIPER DISASSEMBLY

Remove the pads and anti-rattle spring.

Remove the caliper pivot collar and boots.



Position the caliper with the piston down and apply short bursts of air pressure to the fluid inlet.

### WARNING

*Do not use high pressure air or bring the nozzle too close to the inlet.*

### NOTE

*Place a shop towel over the pistons to prevent them from flying out.*

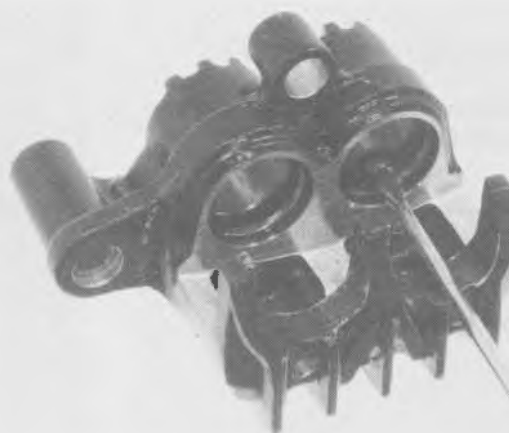
Examine the pistons and cylinders for scoring, scratches or other damage and replace if necessary.



Push the oil seals in and then lift them out. Clean the oil seal grooves with brake fluid.

### CAUTION

*Do not damage the piston sliding surfaces.*

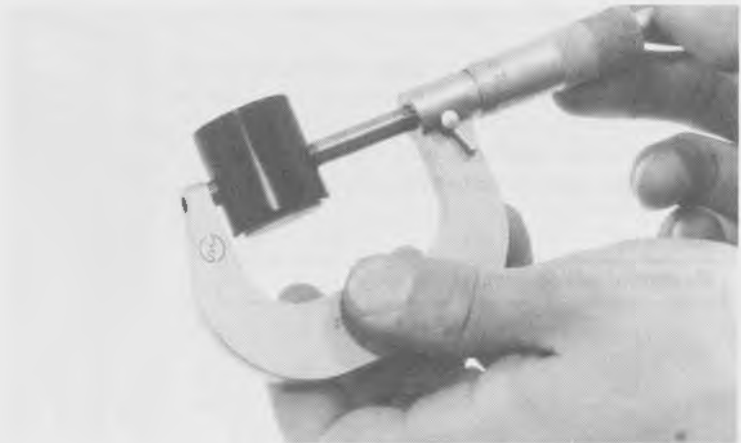




### CALIPER PISTON O.D. INSPECTION

Check the piston for scoring, scratches or other faults. Measure the piston diameter with a micrometer.

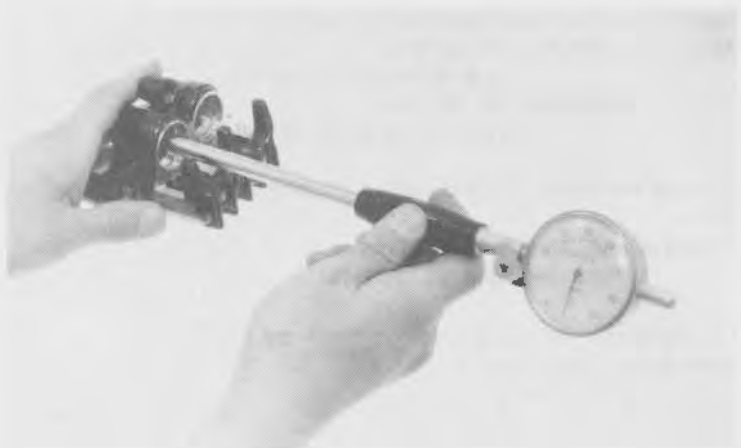
**SERVICE LIMIT: 25.45 mm (1.002 in)**



### CALIPER CYLINDER I.D. INSPECTION

Check the caliper cylinder for scoring, scratches or other faults. Measure the caliper cylinder bore.

**SERVICE LIMIT: 25.30 mm (0.9961 in)**



### CALIPER ASSEMBLY

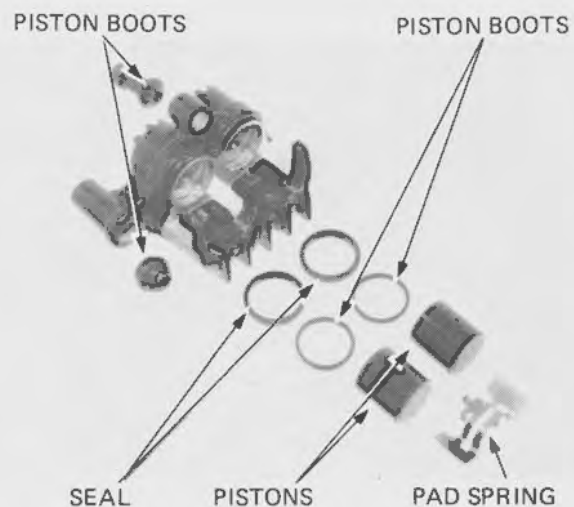
The seals must be replaced with new ones whenever they are removed.

Coat the seals with silicone grease or brake fluid before assembly.

Install the pistons with the dished ends toward the pads.

Install the boots and collar making sure that the boots are seated in the collar and caliper grooves properly.

Install the anti-rattle spring and pads.



**FRONT CALIPER INSTALLATION**

Inspect the condition of the caliper pivot bolt boot. Apply silicone grease or brake fluid to the caliper pivot bolt.

Install the caliper assembly over the brake disc so that the disc is positioned between the pads.

**CAUTION**

*Be careful not to damage the pads.*



CALIPER MOUNTING BOLTS

Install the caliper mounting bolts and tighten.

**TORQUE (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)

Connect the brake hose and tighten the brake hose bolt.

**TORQUE:** 30–40 N·m (3.0–4.0 kg·m,  
(3.0–4.0 kg·m, 22–29 ft·lb)

Fill the brake fluid reservoir and bleed the front brake system (Page 14-4).



## REAR FENDER

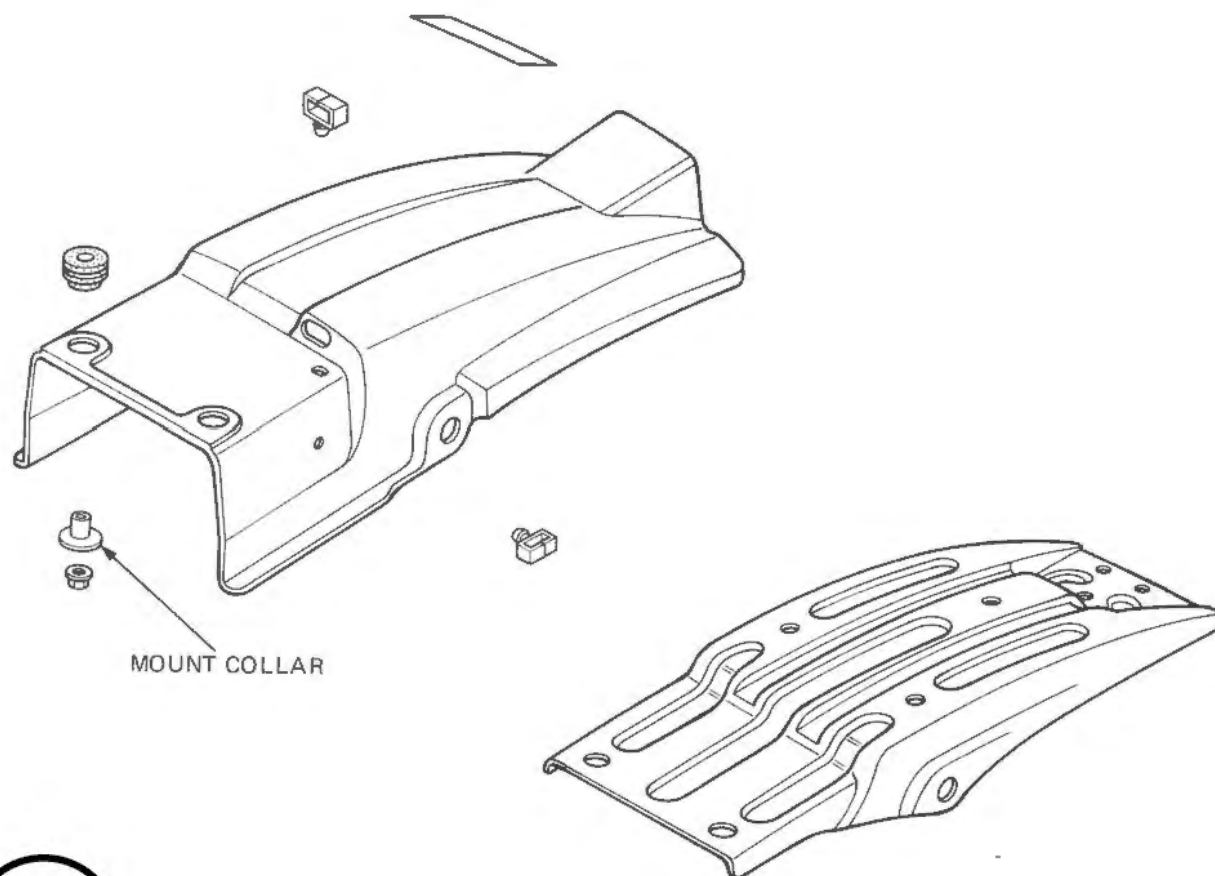
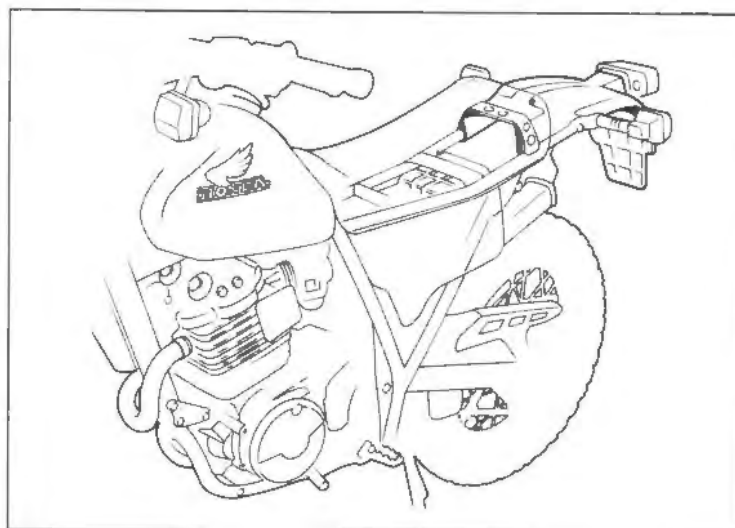
Remove the mounting bolts. Slide the seat back and lift it off.

Remove rear fender.

Install in reverse order of disassembly.

### NOTE

- Before installing the seat, check that the rear fender is set on the frame cross member properly.
- Install the collar with the long ends facing up.



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## EXHAUST PIPE

### WARNING

*Do not service the exhaust pipe or muffler while they are hot.*

Loosen the exhaust pipe and muffler connector.

Remove the muffler mount bolts.

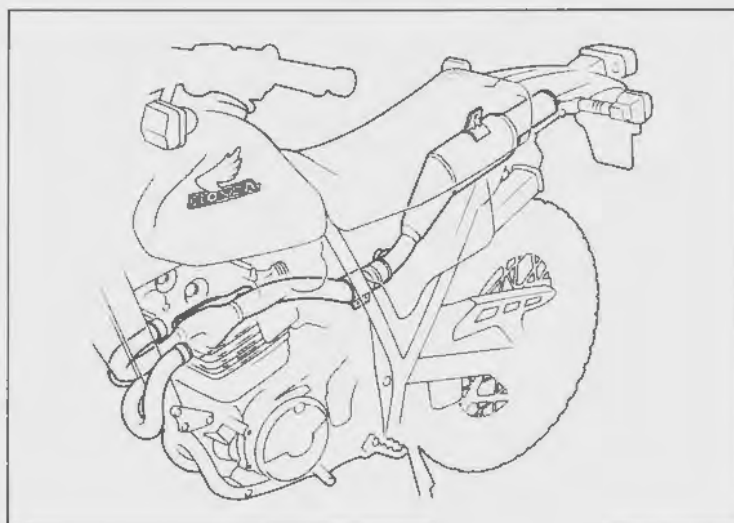
Remove the exhaust pipe.

Separate the muffler from the exhaust pipe.

Remove the exhaust pipe lower mount bolt.

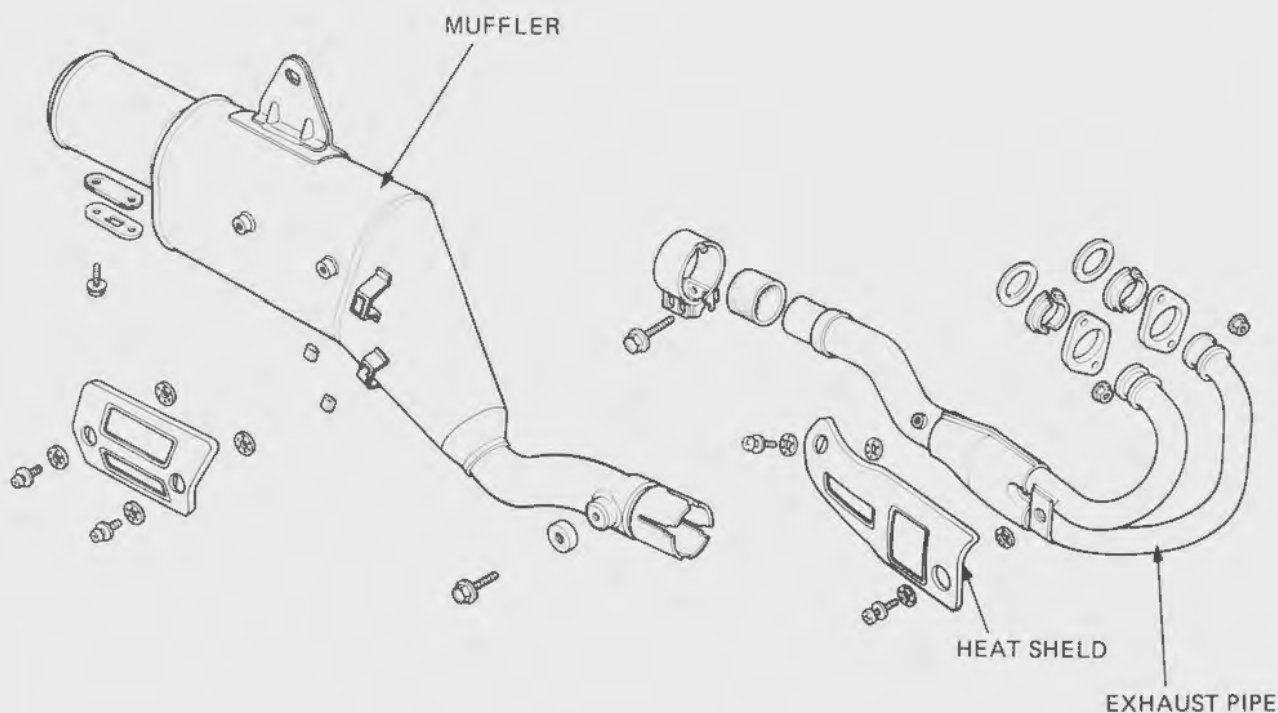
Then remove the nuts attaching the pipe to the cylinder head, and remove the pipe.

Install in the reverse order of disassembly.



### NOTE

After installing, make sure that there are no gas leaks.





**HONDA**  
**XL600R**

REAR FENDER/EXHAUST PIPE

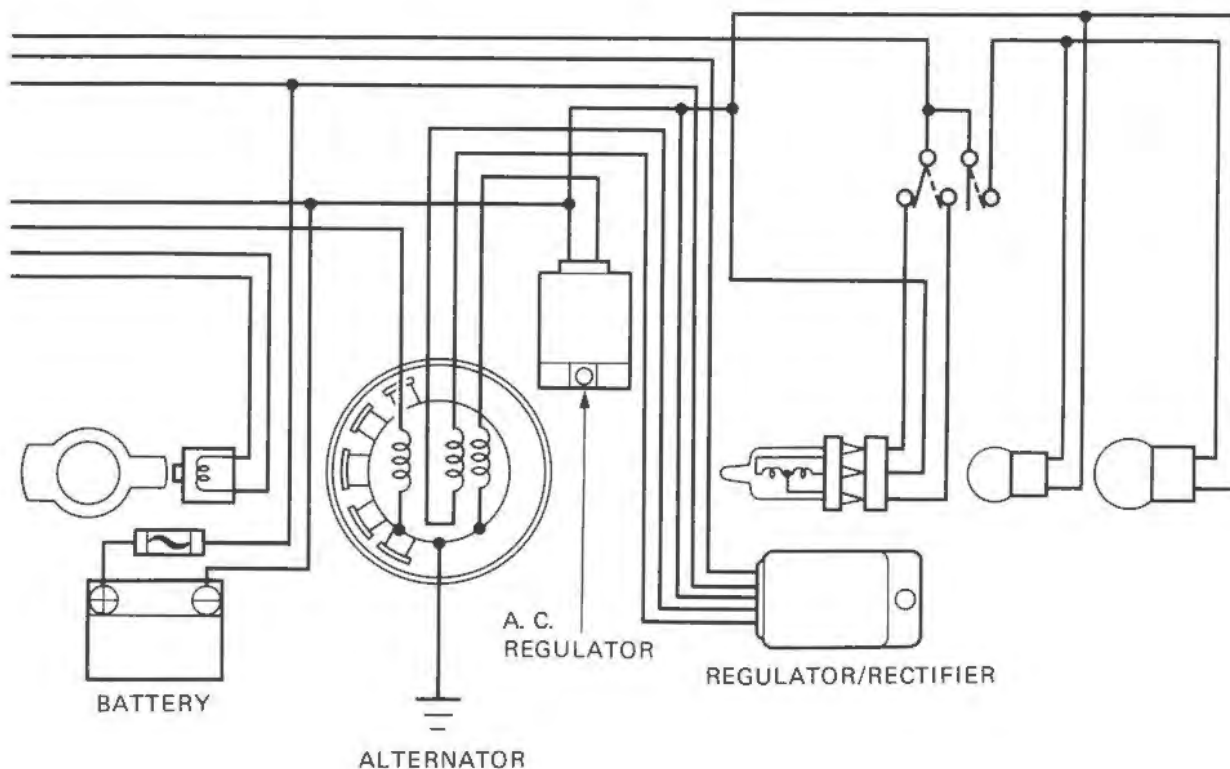
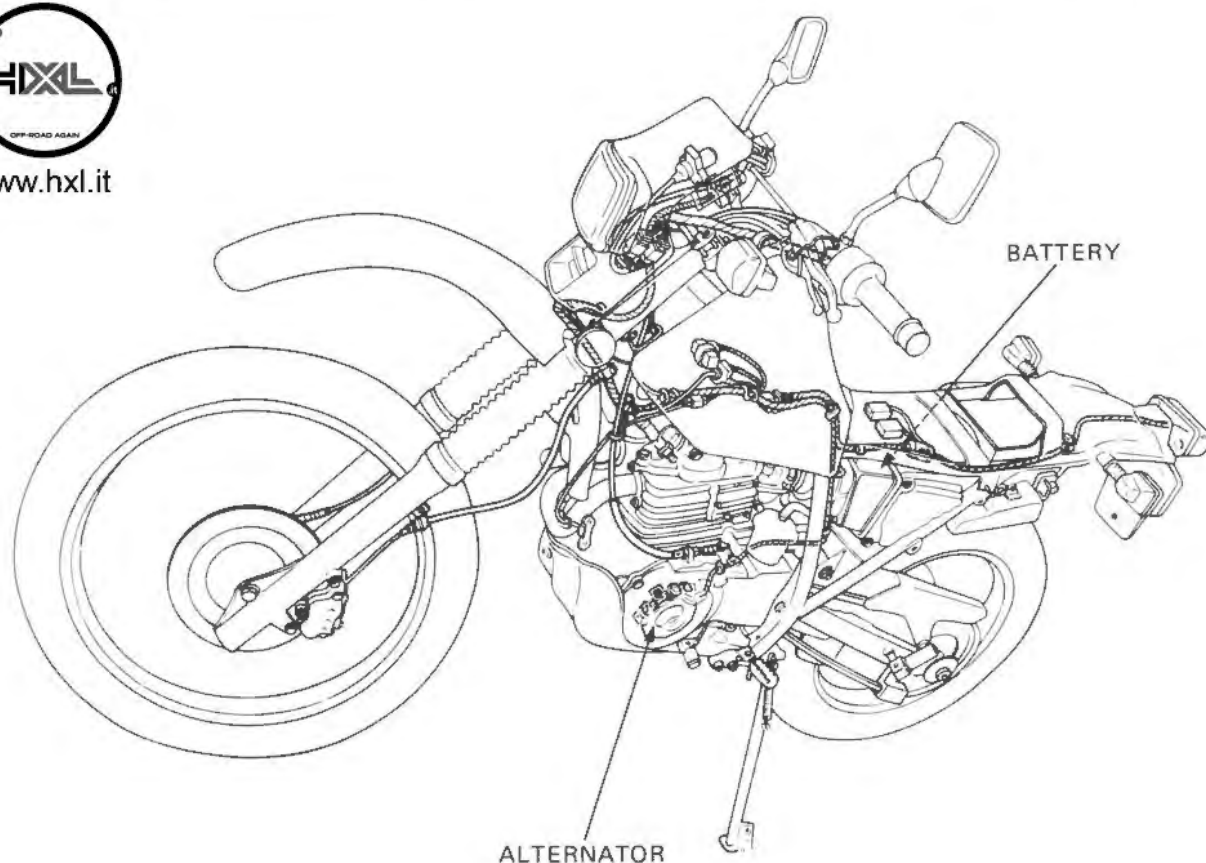
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MEMO





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|                     |      |
|---------------------|------|
| SERVICE INFORMATION | 16-1 |
| TROUBLESHOOTING     | 16-1 |
| BATTERY             | 16-2 |
| CHARGING SYSTEM     | 16-3 |

## SERVICE INFORMATION

### GENERAL

- Battery acid level should be checked regularly and fluid with distilled water when necessary.
- Remove the battery from the motorcycle for charging whenever possible. If the battery must be charged on the motorcycle, keep flames and sparks away from a charging battery because it produces hydrogen gas.
- All charging system components can be tested on the motorcycle.
- For alternator removal, see page
- Quick-charging should only be done in an emergency; slow-charging is preferred.

### SPECIFICATIONS

|                   |                                                                    |
|-------------------|--------------------------------------------------------------------|
| Alternator        |                                                                    |
| Charging rpm      | 8,000 rpm maximum                                                  |
| Charging output   | 6.5 amperes maximum at 8,000 rpm<br>3 amperes minimum at 2,500 rpm |
| Battery           | 12V 3AH                                                            |
| Capacity          |                                                                    |
| Fuse              | Main 10A                                                           |
| Rating            |                                                                    |
| Voltage regulator | Transistorized non adjustable regulator                            |

## TROUBLESHOOTING

### No Power — Key Turned On:

1. Dead battery
  - Battery not charged
  - Battery electrolyte evaporated
  - 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 battery electrolyte level
  - Battery run down
  - Charging system failure
2. Loose battery connection

### Low Power — Engine Running:

1. Battery undercharged
  - Low battery electrolyte level
  - One or more dead cells
2. Charging system failure

### Intermittent Power:

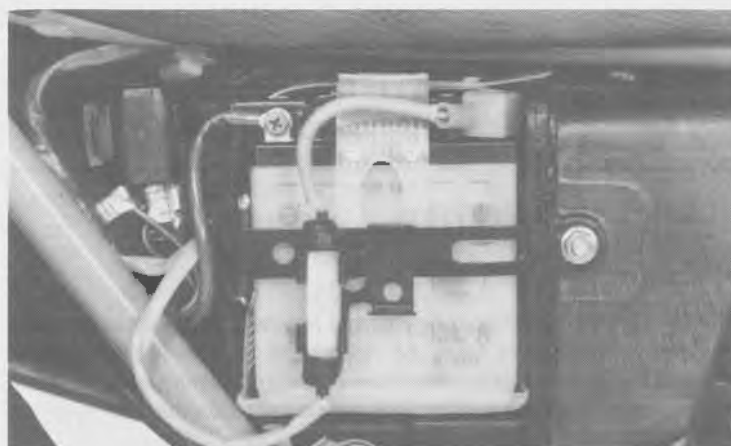
1. Loose battery connection
2. Loose charging system connection
3. Loose connection or short circuit in ignition system
4. Loose connection or short circuit in lighting system

### Charging System Failure:

1. Loose, broken, or shorted wire or connection
2. Faulty voltage regulator
3. Faulty rectifier
4. Faulty alternator

**BATTERY****REMOVAL**

Remove the right side frame cover.  
Remove the nut and open the battery holder.  
Disconnect the negative terminal, then positive terminal at the battery.  
Remove the battery.

**SPECIFIC GRAVITY TEST**

Test each cell by drawing electrolyte into a hydrometer.

**SPECIFIC GRAVITY (20°C/68°F)**

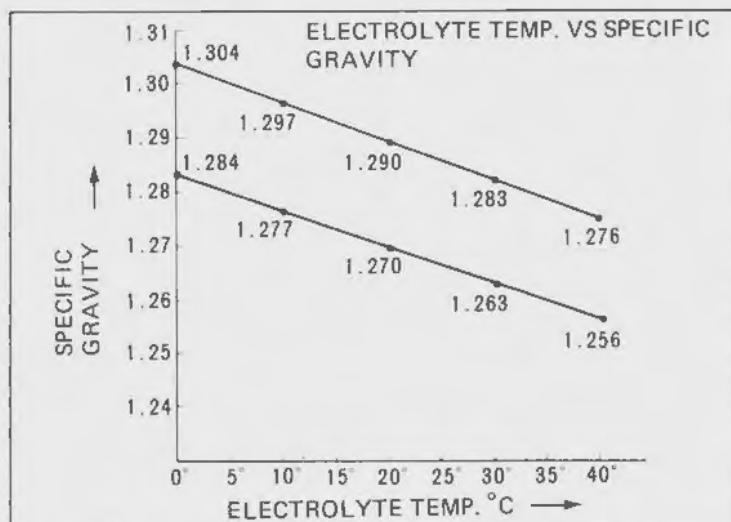
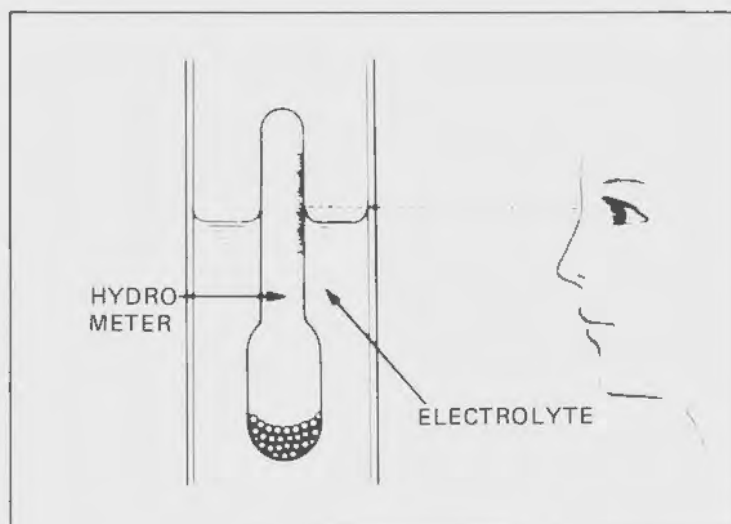
1.27–1.29      Fully charged  
1.26 or below      Undercharged

**NOTE**

- The battery must be recharged if the specific gravity is below 1.23.
- The specific gravity varies with the temperature as shown.
- Replace the battery if sulfation is evident.
- The battery must be replaced if there is sediment on the bottom of the cell.

**WARNING**

*The battery contains sulfuric acid. Avoid contact with skin, eyes, or clothing.  
Antidote: Flush with water and get prompt medical attention.*





### BATTERY CHARGING

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 maximum

Charging:  
Charge the battery until specific gravity is 1.27~1.29 at 20°C (68°F)

#### WARNING

- Before charging a battery, remove the cap from each cell.
- Keep fire and sparks away from a charging battery.
- Turn power ON/OFF at the charger, not at the battery terminals.
- Discontinue charging if the electrolyte temperature exceeds 45°C (117°F).

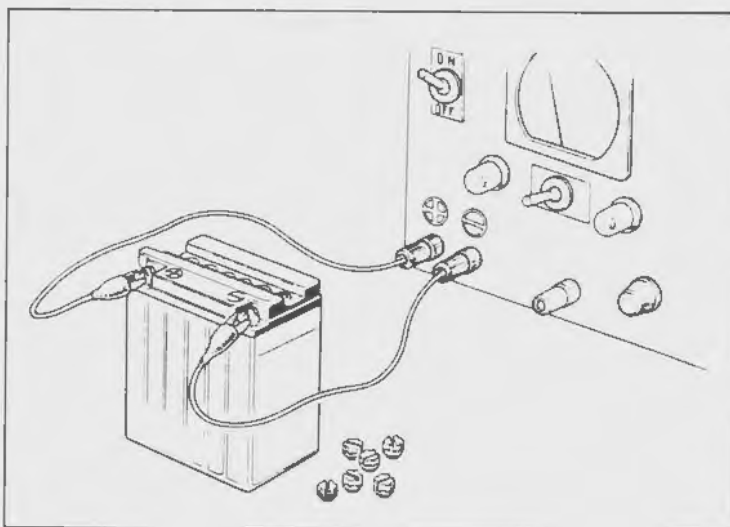
#### CAUTION

Quick-charging should only be done in an emergency; slow-charging is preferred.

After installing the battery, coat the terminals with clean grease.

#### CAUTION

Route the breather tube as shown on the battery caution label.



### CHARGING SYSTEM

#### NOTE

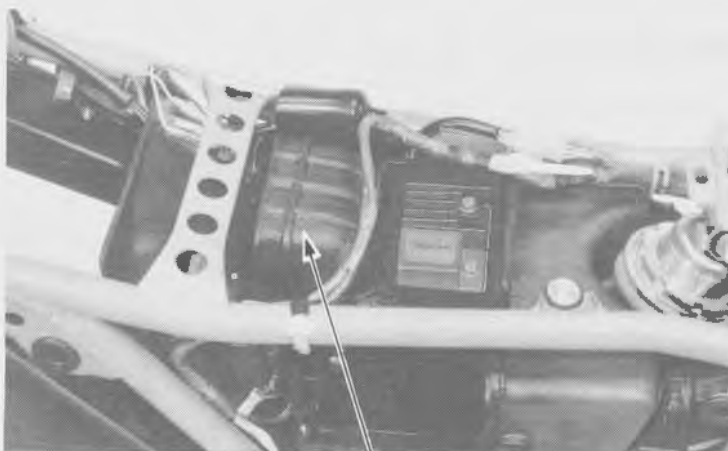
Use a fully charged battery to check the charging system output.

Warm up the engine by riding for 10 minutes before taking the reading. Disconnect the wire from the regulator/rectifier coupler.

#### NOTE

The regulator/rectifier is a critical part. Be careful not to damage it.

Disconnect the headlight, taillight and running lights.



REGULATOR/RECTIFIER



## BATTERY/CHARGING SYSTEM

Connect a voltmeter and an ammeter to check the charging system output.

Start the engine and check the meter readings while increasing engine speed slowly.

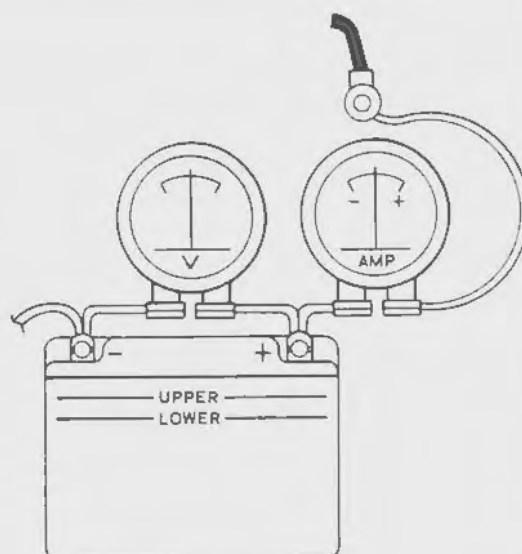
### • TECHNICAL DATA

Charging start begins at 1,000 rpm

2,500 rpm 16.8V/3A min.

8,000 rpm 18.4V/6.5 max.

If there is no charging current, check each charging circuit connection for looseness. If the connections are good, check the alternator charging coil for continuity.



## AC GENERATOR

### NOTE

It is not necessary to remove the stator to make this test.

### CHARGING COIL:

The charging coil is good if there is continuity between the pink wire and the yellow wire.

### RESISTANCE IN NORMAL DIRECTION:

0.95–1.29Ω

### LAMP COIL

The lamp coil is good if there is continuity between the white/yellow wire and ground.

### RESISTANCE IN NORMAL DIRECTION:

0.4–0.55Ω

If there is no continuity, there is an open circuit; replace the stator coil.



## VOLTAGE REGULATOR/RECTIFIER

### REGULATOR/RECTIFIER PERFORMANCE TEST

Disconnect the regulator/rectifier couplers.

Check the resistances between the leads with an ohmmeter. If the resistance is out of the specifications, replace the regulator rectifier.

### NOTE

- Use a SANWA [SP-10D] or KOWA [TH-5H] tester.
- The regulator/rectifier has a semiconductor, that if using a different tester the test results will be out of specification.



REGULATOR/RECTIFIER COUPLERS



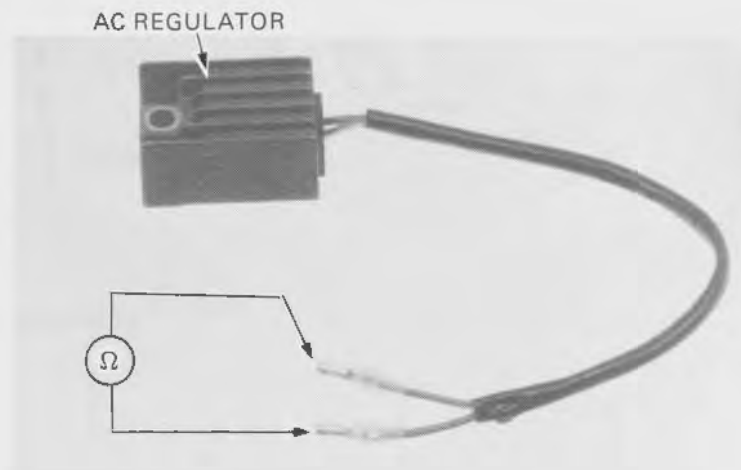
Tester range: KOWA X100 $\Omega$ , SANWA XK  $\Omega$

| + Probe<br>- Probe | Yellow   | Pink     | Green    | Red   | Black    |
|--------------------|----------|----------|----------|-------|----------|
| Yellow             |          | $\infty$ | $\infty$ | 1-20  | $\infty$ |
| Pink               | $\infty$ |          | $\infty$ | 1-20  | $\infty$ |
| Green              | 1-20     | 1-20     |          | 3-100 | 0.2-20   |
| Red                | $\infty$ | $\infty$ | $\infty$ |       | $\infty$ |
| Black              | 1-50     | 1-50     | 0.2-10   | 3-100 |          |

## AC REGULATOR

Remove the headlight and connect a voltmeter.  
Switch the dimmer to "HI" position.  
Start the engine and check the meter readings while increasing engine speed slowly.

**SPECIFIC VOLTAGE:** 13.5-14.5V at  
5,000 rpm



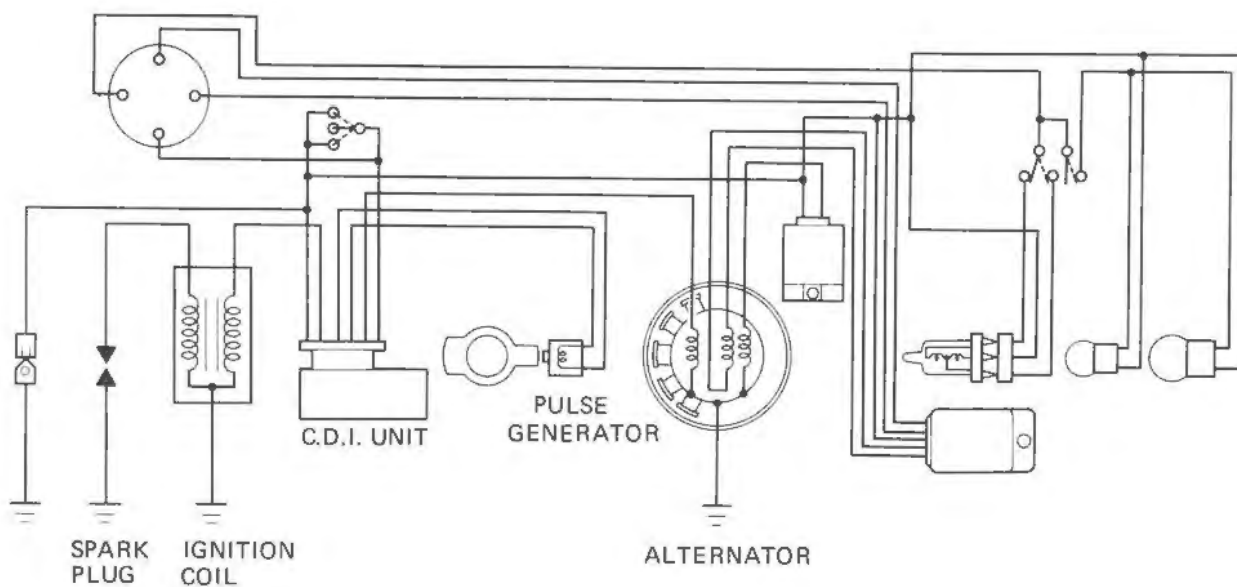
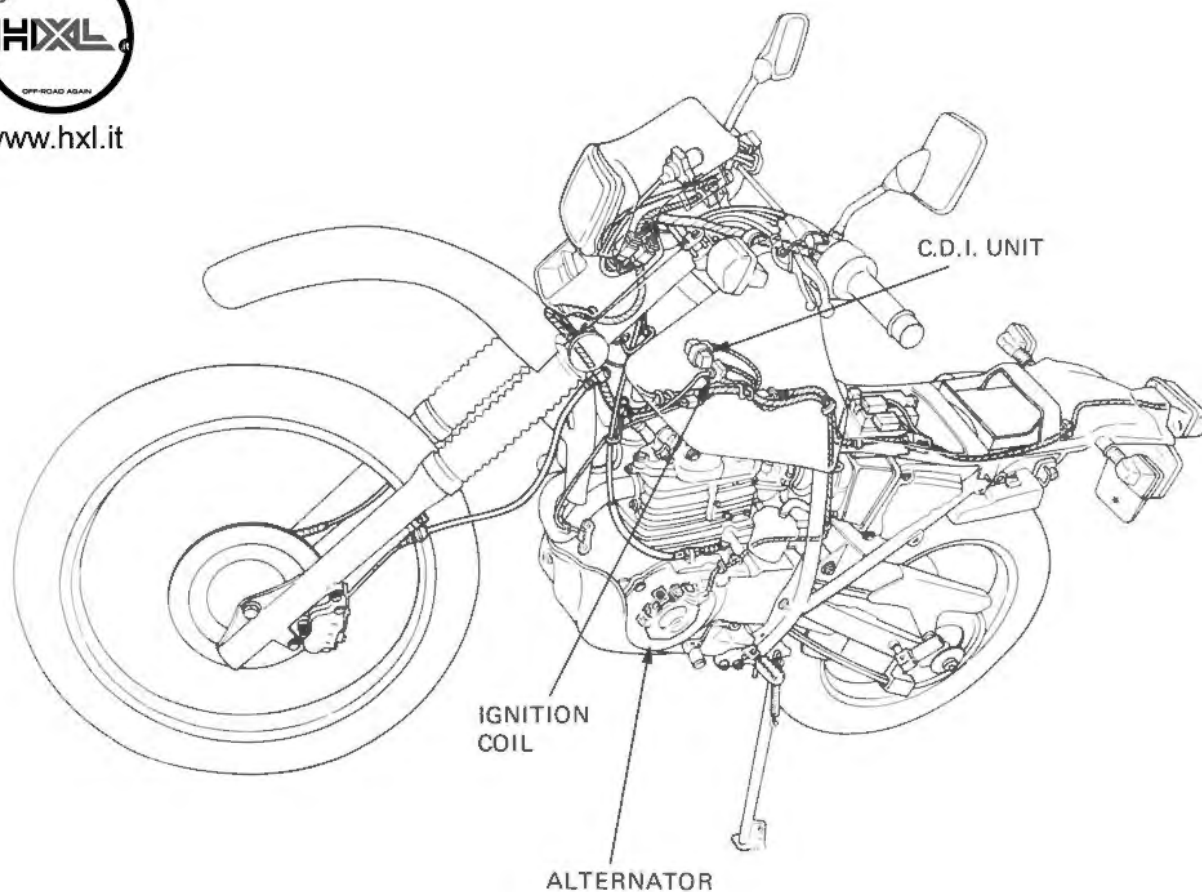
Check the resistance between the leads.

Tester range: KOWA X 100 $\Omega$ , SANWA X K  $\Omega$

| + Probe<br>- Probe | White  | Green  |
|--------------------|--------|--------|
| White              |        | 10-900 |
| Green              | 10-900 |        |



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|                     |      |
|---------------------|------|
| SERVICE INFORMATION | 17-1 |
| TROUBLESHOOTING     | 17-1 |
| SPARK PLUG          | 17-2 |
| IGNITION COIL       | 17-2 |
| CDI UNIT            | 17-3 |
| PULSE GENERATOR     | 17-3 |

## SERVICE INFORMATION

### GENERAL

- Ignition timing cannot be adjusted since the CDI (Capacitive Discharge Ignition) unit is non-adjustable.
- If ignition timing is incorrect, check the CDI unit and alternator and replace any faulty parts.

### SPECIFICATIONS

#### Spark plug

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

Plug gap: 0.8–0.9 mm (0.032–0.030 in)

#### Ignition timing:

Initial: '83: 6° BTDC at 1,200 rpm  
 '84: 11° BTDC at 1,300 rpm  
 Full advance: 31° BTDC at 4,000 rpm

### TOOL

#### SPECIAL

Multimeter (Kowa TH-5H-1)

or

Digital multimeter (Kowa) 07411-0020000 or KS-AHM-32-003 (U.S.A. only)

## TROUBLESHOOTING

### No Spark

1. Engine stop switch "OFF"
2. Poorly connected, broken or shorted wires
  - Between alternator and ignition coil
  - Between CDI unit and engine stop switch
  - Between CDI unit and ignition coil
  - Between CDI unit and main switch
  - Between ignition coil and plug
  - Between pulse generator and CDI unit
3. Faulty main switch
4. Faulty ignition coil
5. Faulty CDI unit
6. Alternator faulty
7. Faulty pulse generator

### Engine Starts but Runs Poorly

1. Ignition primary circuit
  - Faulty ignition coil
  - Loose or bare wire
  - Faulty pulse generator
2. Secondary circuit
  - Alternator faulty
  - CDI unit faulty
  - Faulty pulse generator
  - Faulty spark advancer



## SPERK PLUG

For spark plug gap inspection and adjustment procedures, see Page

## IGNITION COIL

### REMOVAL

Remove the fuel tank and disconnect the ignition coil wire leads.

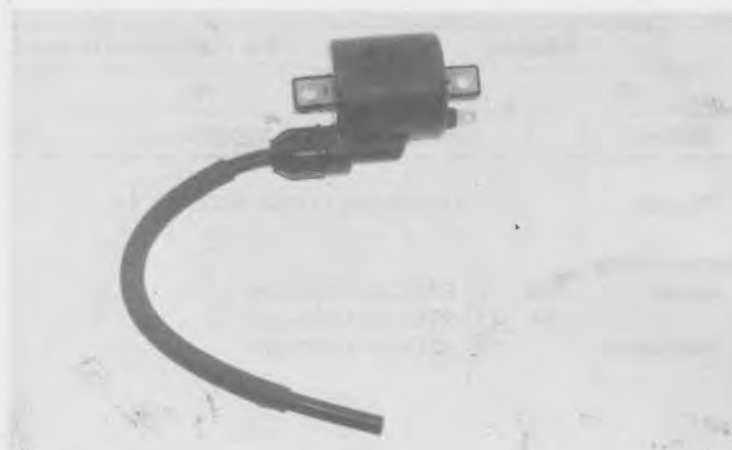
Remove the attaching bolt and remove the coil.



### INSPECTION

Measure the resistances of the primary and secondary coils.

|            |       |
|------------|-------|
| PRIMARY:   | 0.8Ω  |
| SECONDARY: | 4.1KΩ |



## ALTERNATOR (IGNITION CIRCUIT)

### INSPECTION

Disconnect the alternator wire coupler.

Disconnect the alternator wire coupler. Measure the resistances between the black/red wire and ground.

|                                 |              |
|---------------------------------|--------------|
| RESISTANCE IN NORMAL DIRECTION: | 235-319 ohms |
|---------------------------------|--------------|





### CDI UNIT

#### REMOVAL

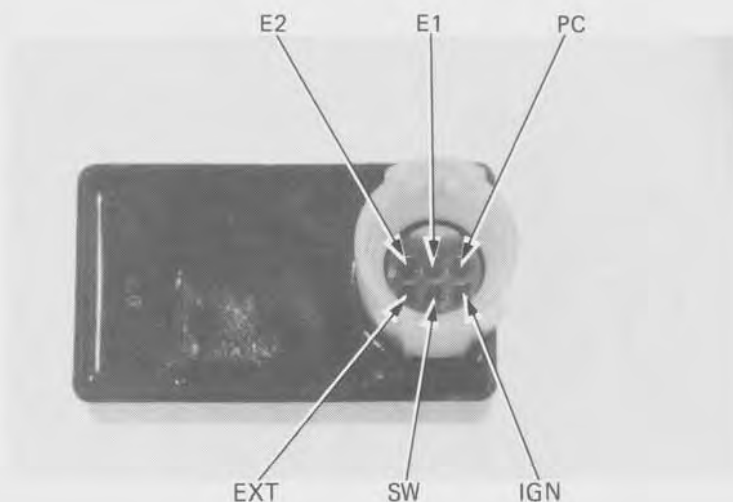
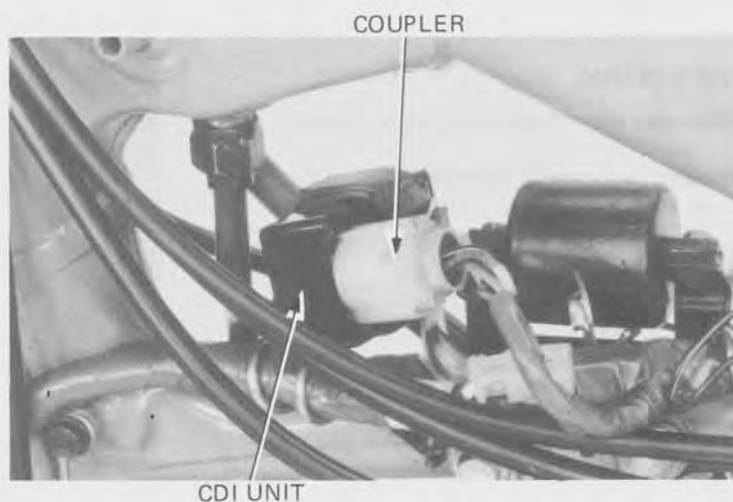
Remove the fuel tank and disconnect the coupler from the CDI unit and remove the CDI unit.

#### INSPECTION

Check continuity of the CDI terminals. Replace the CDI unit if the readings do not fall within the limits shown in the table.

#### NOTE

- The CDI unit is fully transistorized.
- For accurate testing, it is necessary to use a specified electric tester. Use of an improper tester or measurements in improper ranges may give false readings.
- Use Sanwa Electric Tester 07308-0020000, Kowa multimeter TH-5H-1 or Kowa Digital multimeter 07411-0020000 or KS-AHM-32-003 (U.S.A. only).



Tester range: KOWA X 100  $\Omega$ , SANWA X K  $\Omega$

| + Probe<br>- Probe | SW       | EXT      | P.C        | E1-E2      | IGN      |
|--------------------|----------|----------|------------|------------|----------|
| SW                 |          | $\infty$ | $\infty$   | $\infty$   | $\infty$ |
| EXT                | 0.1-20   |          | * $\infty$ | * $\infty$ | $\infty$ |
| P.C                | 30-300   | 10-200   |            | 1-100      | $\infty$ |
| E1-E2              | 1-50     | 0.1-20   | 1-100      |            | $\infty$ |
| IGN                | $\infty$ | $\infty$ | $\infty$   | $\infty$   |          |

\*( '83 only ): Analog tester: The needle will remain  $\infty$  or swing momentarily, then return to  $\infty$ .  
Digital tester: The indicator remains "1" ( $\infty$ ).



## PULSE GENERATOR

### INSPECTION

Disconnect the pulse generator wire coupler.

Measure the resistance between the Blue/Yellow and Green white wires.

**SPECIFICATION: 510—570  $\Omega$**





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|                          |      |
|--------------------------|------|
| SERVICE INFORMATION      | 18-1 |
| TROUBLESHOOTING          | 18-1 |
| IGNITION SWITCH          | 18-2 |
| TURN SIGNAL SWITCH       | 18-2 |
| HORN SWITCH              | 18-2 |
| DIMMER SWITCH            | 18-3 |
| ENGINE STOP SWITCH       | 18-3 |
| FRONT BRAKE LIGHT SWITCH | 18-3 |
| REAR BRAKE LIGHT SWITCH  | 18-3 |

## SERVICE INFORMATION

### GENERAL

- Some wires have different colored bands around them near the connector. These are connected to other with corresponding band colors.
- All plastic plugs have locking tabs that must be released before disconnecting, and must be aligned when reconnecting.
- Isolate an electrical failure, check the continuity of the electrical path through the part. A continuity check can usually be made without removing the part from the motorcycle — by simply disconnecting the wires and connecting a continuity tester or voltmeter to the terminals or connections.

### SPECIFICATIONS

|                       |              |
|-----------------------|--------------|
| Headlight             | 12V 60/55W   |
| Tail/stoplight        | 12V 3/32 cp  |
| Turn signal light     | 12V 2 cp     |
| Speedometer light     | 12V 1 cp x 2 |
| Neutral indicator     | 12V 2 cp     |
| Turn signal indicator | 12V 2 cp     |
| High beam indicator   | 12V 1 cp     |

## TROUBLESHOOTING

### No Lights Come On When Ignition Switch Is Turned ON:

1. Bulb at fault or burned out
2. Faulty switch
3. Wiring to that component has open circuit
4. Fuse blown
5. Wiring loose, broken, or at fault
6. Battery dead or disconnected

### All Lights Come On, but Dimly, when Ignition Switch Is Turned ON:

1. Battery voltage low
2. Wiring or switch has excessive resistance

### Headlight Beam Does Not Shift When HI-LO Switch Is Operated:

1. Beam filament burned out
2. Faulty dimmer switch



## IGNITION SWITCH

Remove the headlight and disconnect the ignition switch wires at the 4-P coupler. Check for continuity between terminals. For removal of the ignition switch, refer to Page 12-4.

|     | BI  | R | BI/W | G |
|-----|-----|---|------|---|
| ON  | ○—○ |   |      |   |
| OFF |     |   | ○—○  |   |

Continuity should exist between color coded wires indicated by interconnected circles.



## TURN SIGNAL SWITCH

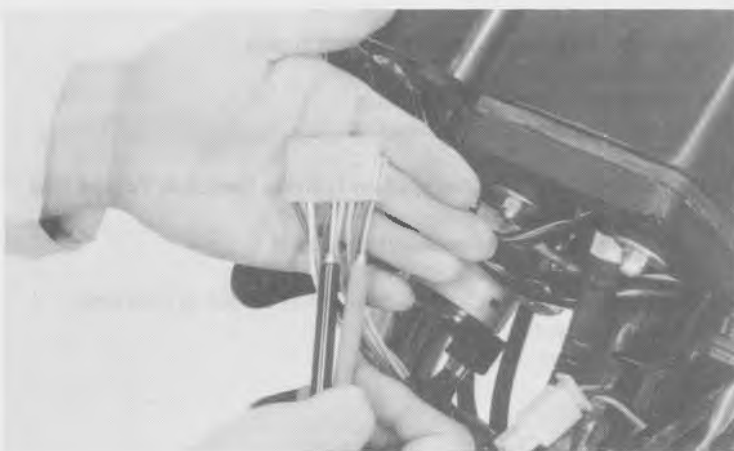
|     | Gr  | Lb | O |
|-----|-----|----|---|
| R   | ○—○ |    |   |
| (N) |     |    |   |
| L   | ○—○ |    | ○ |

The switch is normal if there is continuity between the interconnected circles.



## HORN SWITCH

|      | Lg  | B |
|------|-----|---|
| FREE |     |   |
| PUSH | ○—○ |   |





### DIMMER SWITCH

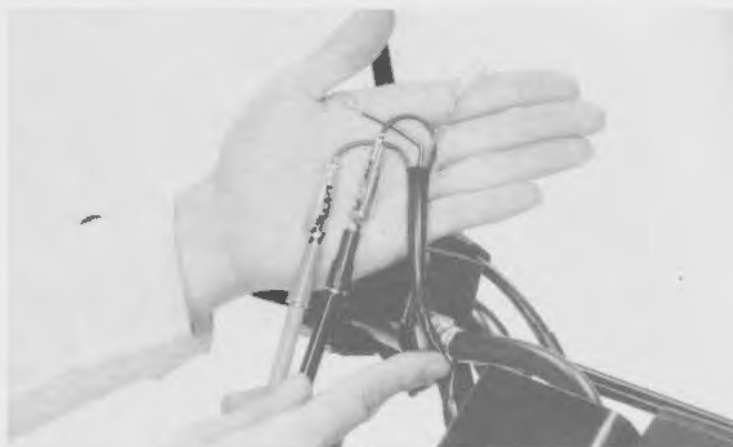
|     | W/Y | W | Bu |
|-----|-----|---|----|
| Lo  | ○   | ○ |    |
| (N) | ○   | ○ | ○  |
| Hi  | ○   |   | ○  |

Continuity should exist between color coded wires indicated by interconnected circles.



### ENGINE STOP SWITCH

|     | BI/W | G |
|-----|------|---|
| OFF | ○    | ○ |
| RUN |      |   |
| OFF | ○    | ○ |



### FRONT BRAKE LIGHT SWITCH

|     | BI | G/Y |
|-----|----|-----|
| ON  | ○  | ○   |
| OFF |    |     |

Check the front brake light switch for continuity with the front brake applied.

### REAR BRAKE LIGHT SWITCH

Check the rear brake light switch for continuity with the rear brake applied.

|     | BI | BI |
|-----|----|----|
| ON  | ○  | ○  |
| OFF |    |    |



The switch is normal if there is continuity.





MEMO



**HONDA**  
**XL600R**

# 19. TECHNICAL FEATURES

|                             |      |
|-----------------------------|------|
| R.F.V.C. ENGINE             | 19-1 |
| DUAL CARBURETOR             | 19-3 |
| DRY SUMP LUBRICATION SYSTEM | 19-4 |

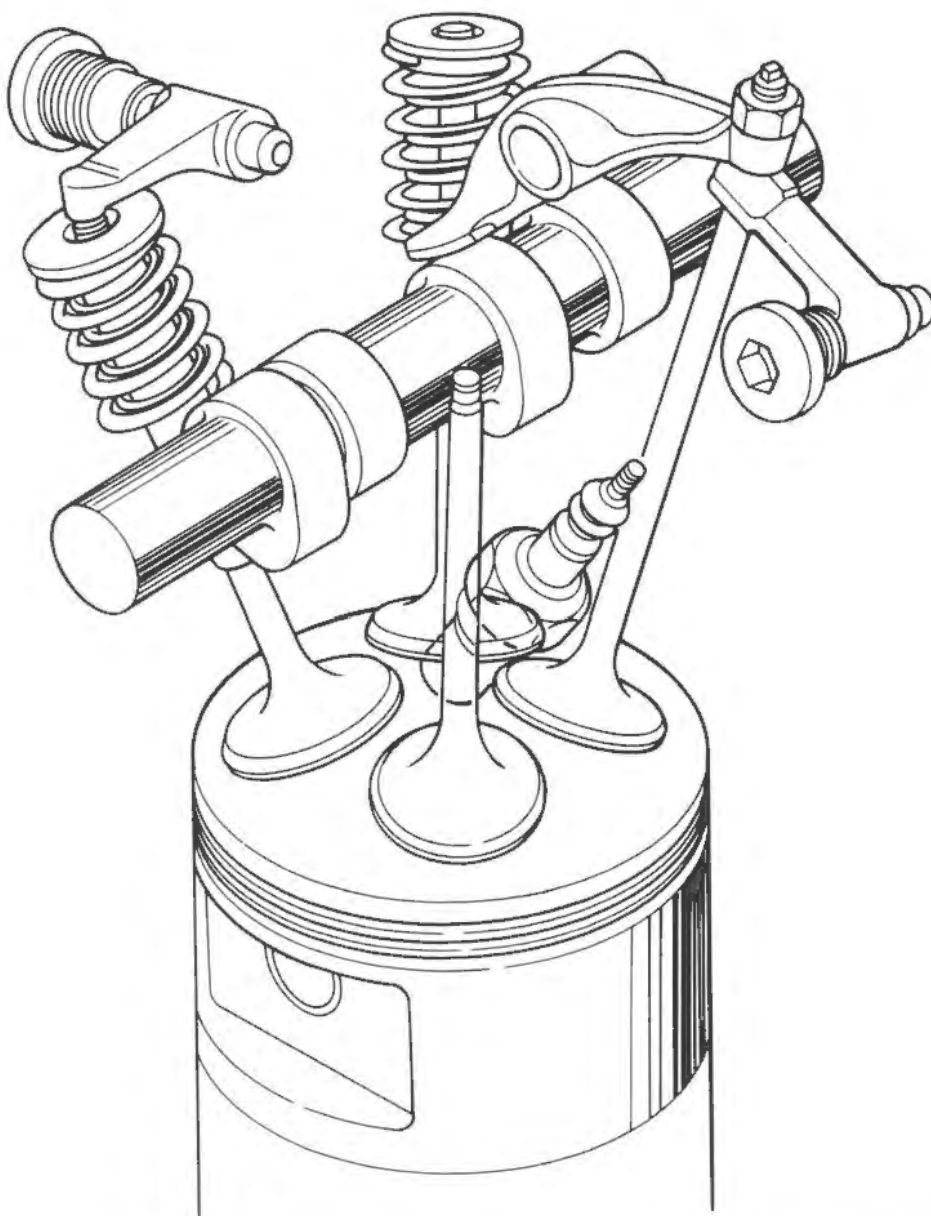
## RFVC (Radial Four Valve Combustion) ENGINE

The RFVC (Radial Four Valve Combustion) engine incorporates a cylinder head which has its two intake and two exhaust valves arranged radially. This design allows the largest possible valves to be used which maximizes intake and exhaust efficiency.

The radial valve arrangement also enables a shallow hemispherical combustion chamber with a centralized spark plug location to be formed. This shape provides a high compression ratio and promotes rapid combustion, both of which increase horsepower and torque.

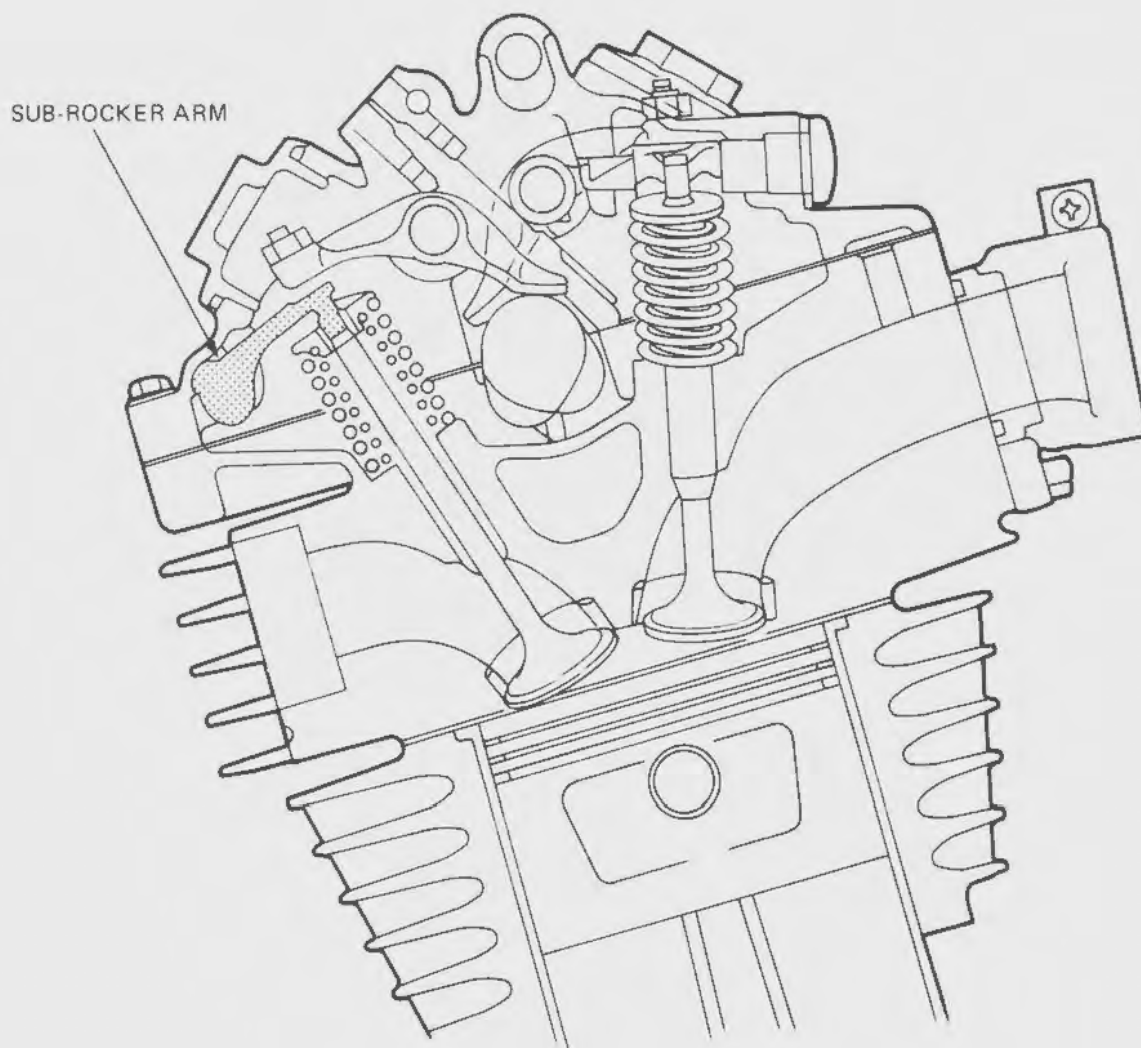


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To ensure positive and reliable valve operation, sub-rocker arms are used in conjunction with conventional rocker arms to open the radially arranged valves.  
The sub-rocker arms minimize side loads on the valve stems during operation.



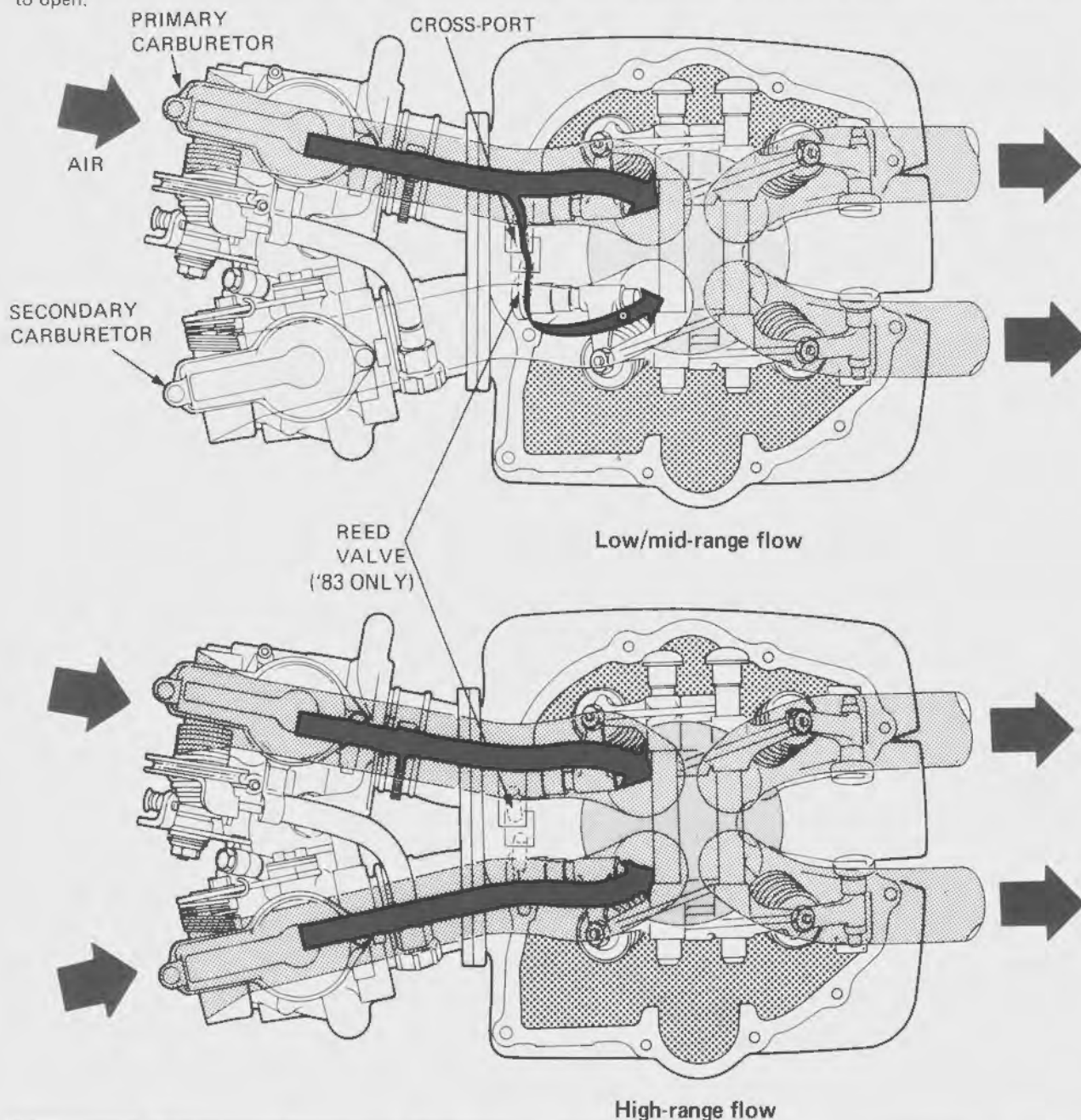


## DUAL CARBURETORS

The XL600R is equipped with dual carburetors to provide the large single with smooth drivability and precise throttle response at low speeds and the best carburetion for maximum power delivery at high speeds. Something that has often been a compromise on large single cylinder 4-stroke engines equipped with only one carburetor.

The primary carburetor is used for low to mid-range operation. The secondary carburetor is not used until the throttle is opened to about 1/3 to 1/2 when it begins to aid the primary carburetor. This allows high air velocity through the primary carburetor for smooth throttle response from 0 to 1/3 throttle. Both carburetors reach full opening simultaneously to provide the necessary fuel-air mixture for maximum power.

Each carburetor has its own intake tract into the cylinder head. These ports are connected by a cross-port in the cylinder head. This cross-port allows some fuel mixture to cross from the primary port to the secondary port to cool and lubricate the secondary intake port's valve. The cross-port has a reed valve on the 1983 model only, that closes as the secondary carburetor begins to open.

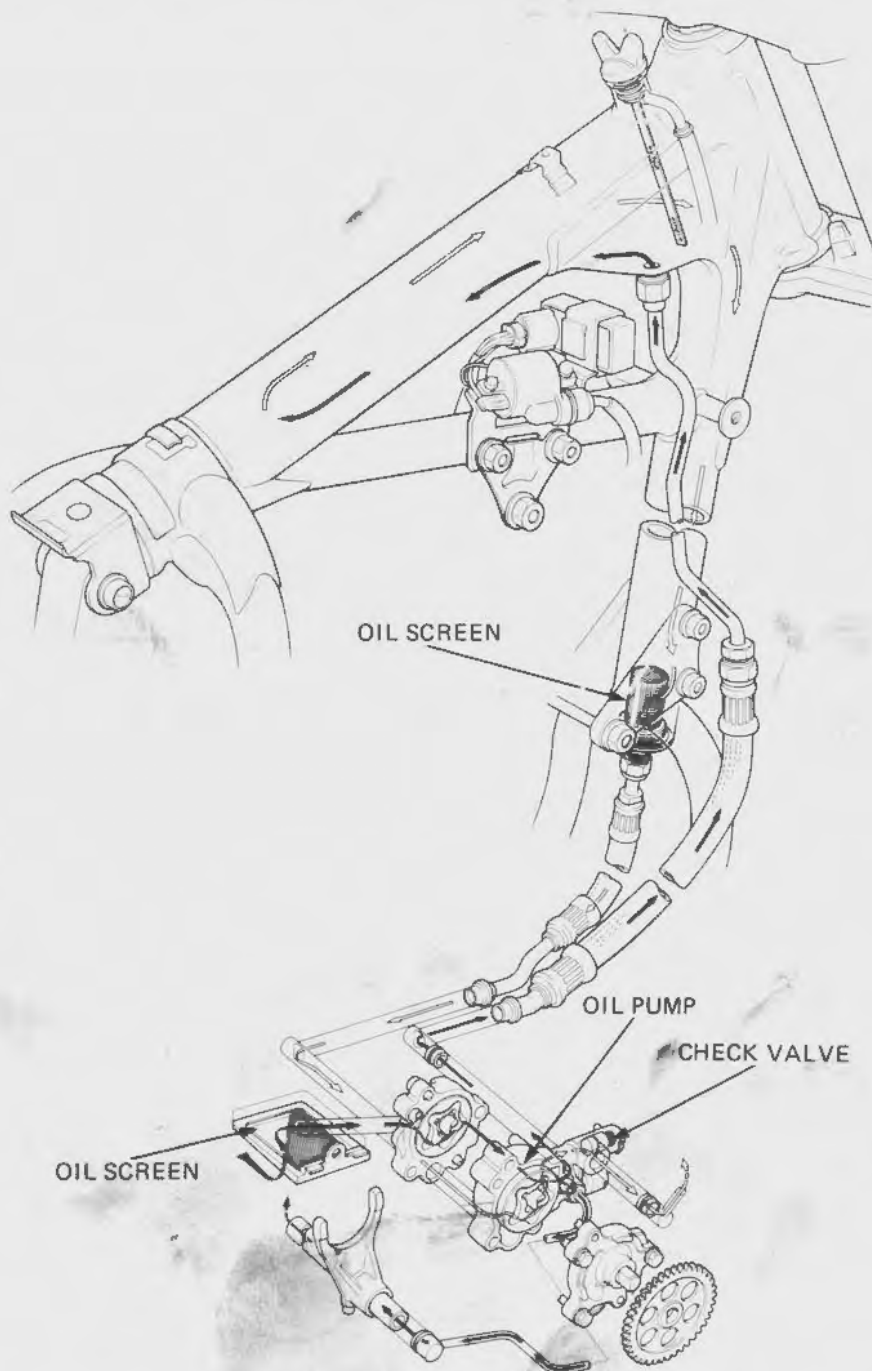




## DRY SUMP LUBRICATION SYSTEM

### LUBRICATION SYSTEM

The engine uses a dry sump in that the main frame is used as an oil tank. Oil in the main frame is sucked down by a trocoid type oil pump and is directed under pressure up into the cylinder head to cool and lubricate the valves, rocker arms and rocker arm shafts. Part of the oil from the oil pump is directed through an oil pipe into the transmission housing to lubricate the transmission gears and shafts. After lubricating the valves, gears and shafts, the oil is returned into the main frame via the oil pump. The design contributes to the compact, lightweight engine and greater ground clearance of the motorcycle. The separate oil tank also reduces deterioration of the engine oil to the minimum through improved cooling.





**HONDA**  
**XL600R**

# 20. TROUBLESHOOTING

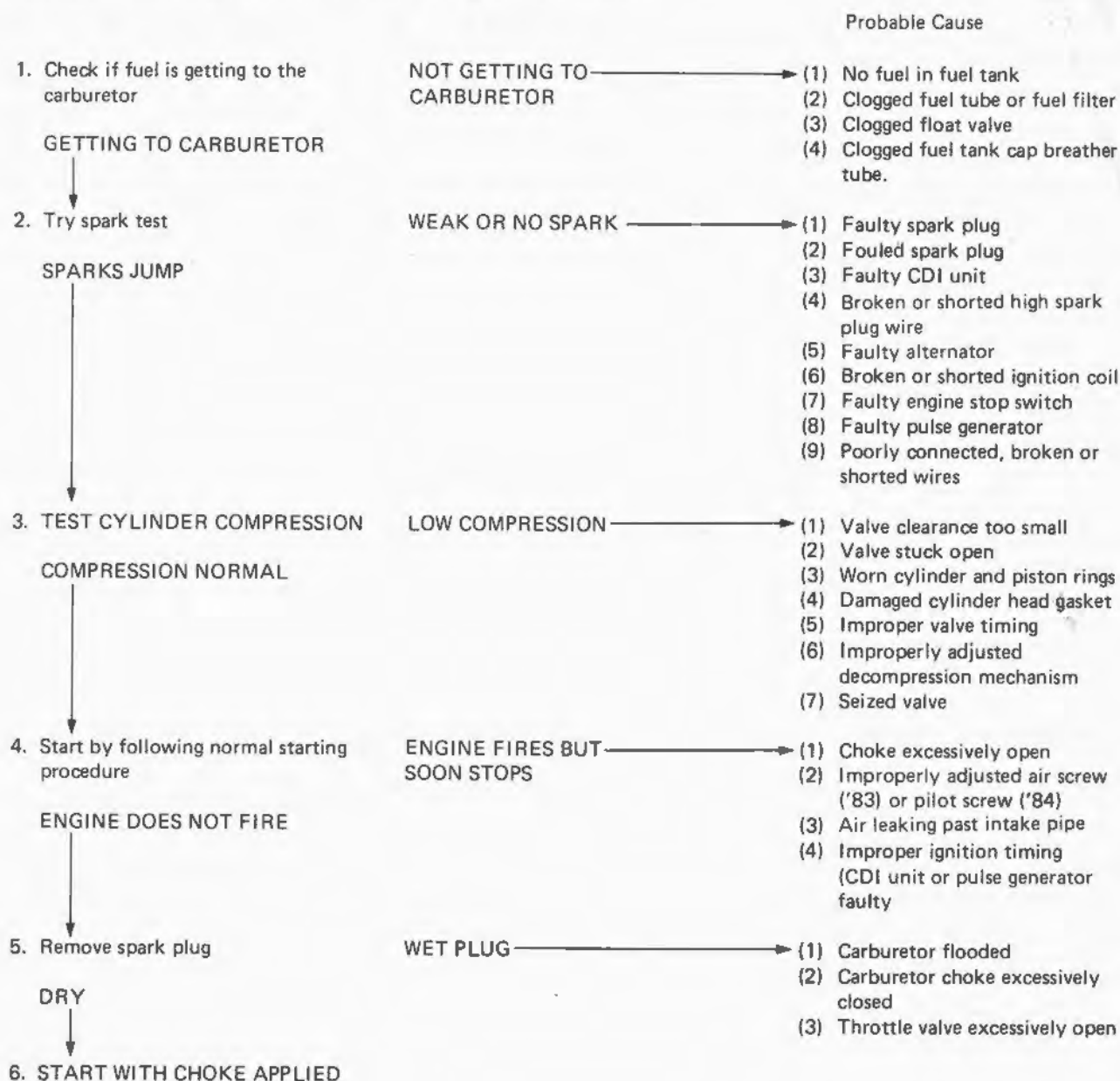
'83-'84

|                                           |      |
|-------------------------------------------|------|
| ENGINE DOES NOT START OR IS HARD TO START | 20-1 |
| ENGINE LACKS POWER                        | 20-2 |
| POOR PERFORMANCE AT LOW AND IDLE SPEEDS   | 20-3 |
| POOR PERFORMANCE AT HIGH SPEED            | 20-4 |
| POOR HANDLING                             | 20-4 |



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## ENGINE DOES NOT START OR IS HARD TO START



20





## ENGINE LACKS POWER

|                                                                                              | Probable Cause                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Raise wheels off ground and pin by hand<br>WHEEL SPINS FREELY                             | WHEEL DOES NOT SPIN FREELY → (1) Brake dragging<br>(2) Worn or damaged wheel bearing<br>(3) Drive chain too tight<br>(4) Rear axle nut excessively tightened                                   |
| 2. Check tire pressure with tire gauge<br>PRESSURE NORMAL                                    | PRESSURE TOO LOW → (1) Punctured tire and tube<br>(2) Faulty tire valve                                                                                                                        |
| 3. Try rapid acceleration from low to second<br>ENGINE SPEED LOWERED WHEN CLUTCH IS RELEASED | ENGINE SPEED DOES NOT CHANGE WHEN CLUTCH IS RELEASED → (1) Clutch slipping<br>(2) Worn clutch disc/plate<br>(3) Warped clutch disc/plate                                                       |
| 4. Lightly accelerate engine<br>ENGINE SPEED INCREASE                                        | ENGINE SPEED DOES NOT INCREASE SUFFICIENTLY → (1) Carburetor choke closed<br>(2) Clogged air cleaner<br>(3) Restricted fuel flow<br>(4) Clogged fuel tank breather tube<br>(5) Clogged muffler |
| 5. Check ignition timing<br>CORRECT                                                          | INCORRECT → (1) Faulty CDI unit<br>(2) Faulty pulse generator<br>(3) Faulty ignition advancer                                                                                                  |
| 6. Check valve clearance<br>CORRECT                                                          | INCORRECT → (1) Improper valve adjustment<br>(2) Worn valve seat                                                                                                                               |
| 7. Test cylinder compression using compression gauge<br>NORMAL                               | TOO LOW → (1) Valve stuck open<br>(2) Worn cylinder and piston rings<br>(3) Leaking head gasket<br>(4) Improper valve timing<br>(5) Improperly adjusted decompression mechanism                |
| 8. Check carburetor for clogging<br>NOT CLOGGED                                              | CLOGGED → (1) Carburetor not serviced frequently enough                                                                                                                                        |
| 9. Remove spark plug<br>NOT FOULED OR DISCOLORED                                             | FOULED OR DISCOLORED → (1) Plug not serviced frequently enough<br>(2) Use of plug with improper heat range                                                                                     |





10. Remove oil level gauge and check oil level and for dirty oil

CORRECT

11. Remove cylinder head cover and inspect lubrication

VALVE TRAIN LUBRICATED PROPERLY

12. Check if engine overheats

13. Accelerate or run at high speed

ENGINE DOES NOT KNOCK

OIL LEVEL INCORRECT

- (1) Oil level too high
- (2) Oil level too low
- (3) Contaminated oil

VALVE TRAIN NOT LUBRICATED PROPERLY

- (1) Clogged oil passage
- (2) Clogged oil control orifice

OVERHEATS

- (1) Excessive carbon build-up in combustion chamber.
- (2) Use of improper quality of fuel
- (3) Clutch slipping
- (4) Fuel-air mixture too lean

ENGINE KNOCKS

- (1) Worn piston and cylinder
- (2) Fuel-air mixture too lean
- (3) Use of improper grade of fuel
- (4) Excessive carbon build-up in combustion chamber
- (5) Ignition timing too advanced (Faulty CDI unit)

## POOR PERFORMANCE AT LOW AND IDLE SPEEDS

1. Check ignition timing and valve clearance

CORRECT

2. Check carburetor air screw ('83) or pilot screw ('84) adjustment

CORRECT

3. Check if air is leaking past intake pipe

NOT LEAKING

4. Try spark test

GOOD SPARK

INCORRECT

- (1) Improper valve clearance
- (2) Improper ignition timing (Faulty CDI unit)

INCORRECT

- (1) Fuel-air mixture too lean (To correct, turn air screw ('83) in or pilot screw ('84) out)
- (2) Fuel-air mixture too rich (To correct, turn air screw ('83) out or pilot screw ('84) in)

LEAKING

- (1) Deteriorated insulator O-ring
- (2) Loose carburetor

WEAK OR INTERMITTENT SPARK

- (1) Faulty, carbon or wet fouled spark plug
- (2) Faulty CDI unit
- (3) Alternator faulty
- (4) Faulty ignition coil
- (5) Faulty pulse advancer

Probable Cause:



## POOR PERFORMANCE AT HIGH SPEED

|                                                |                      | Probable Cause                                                                                           |
|------------------------------------------------|----------------------|----------------------------------------------------------------------------------------------------------|
| 1. Check ignition timing and valve clearance   | INCORRECT            | (1) Improper valve clearance<br>(2) Faulty CDI unit<br>(3) Faulty pulse generator<br>(4) Faulty advancer |
| CORRECT<br>↓                                   |                      |                                                                                                          |
| 2. Disconnect fuel tube at carburetor          | FUEL FLOW RESTRICTED | (1) Lack of fuel in tank<br>(2) Clogged fuel line<br>(3) Clogged fuel tank breather tube                 |
| FUEL FLOWS FREELY<br>↓                         |                      |                                                                                                          |
| 3. Remove carburetor and check for clogged jet | CLOGGED              | (1) Clean                                                                                                |
| NOT CLOGGED<br>↓                               |                      |                                                                                                          |
| 4. Check valve timing                          | INCORRECT            | (1) Cam sprocket not installed properly                                                                  |
| CORRECT<br>↓                                   |                      |                                                                                                          |
| 5. Check valve spring tension                  | WEAK                 | (1) Faulty spring                                                                                        |
| NOT WEAKENED                                   |                      |                                                                                                          |

## POOR HANDLING

Check tire pressure

|                                        | Probable Cause                                                                                                                                                                                                                                                                         |
|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. If steering is heavy                | (1) Steering head adjuster too tight<br>(2) Damaged steering cones or steel balls                                                                                                                                                                                                      |
| 2. If either wheel is wobbling         | (1) Excessive wheel bearing play<br>(2) Distorted rim<br>(3) Improperly installed wheel hub<br>(4) Swing arm pivot bushing excessively worn<br>(5) Distorted frame<br>(6) Improper drive chain tension or adjustment<br>(7) Loose swing arm pivot bolt<br>(8) Loose engine hanger bolt |
| 3. If the motorcycle pulls to one side | (1) Misadjusted shock absorber<br>(2) Front and rear wheels not aligned<br>(3) Bent front fork<br>(4) Bent swing arm                                                                                                                                                                   |