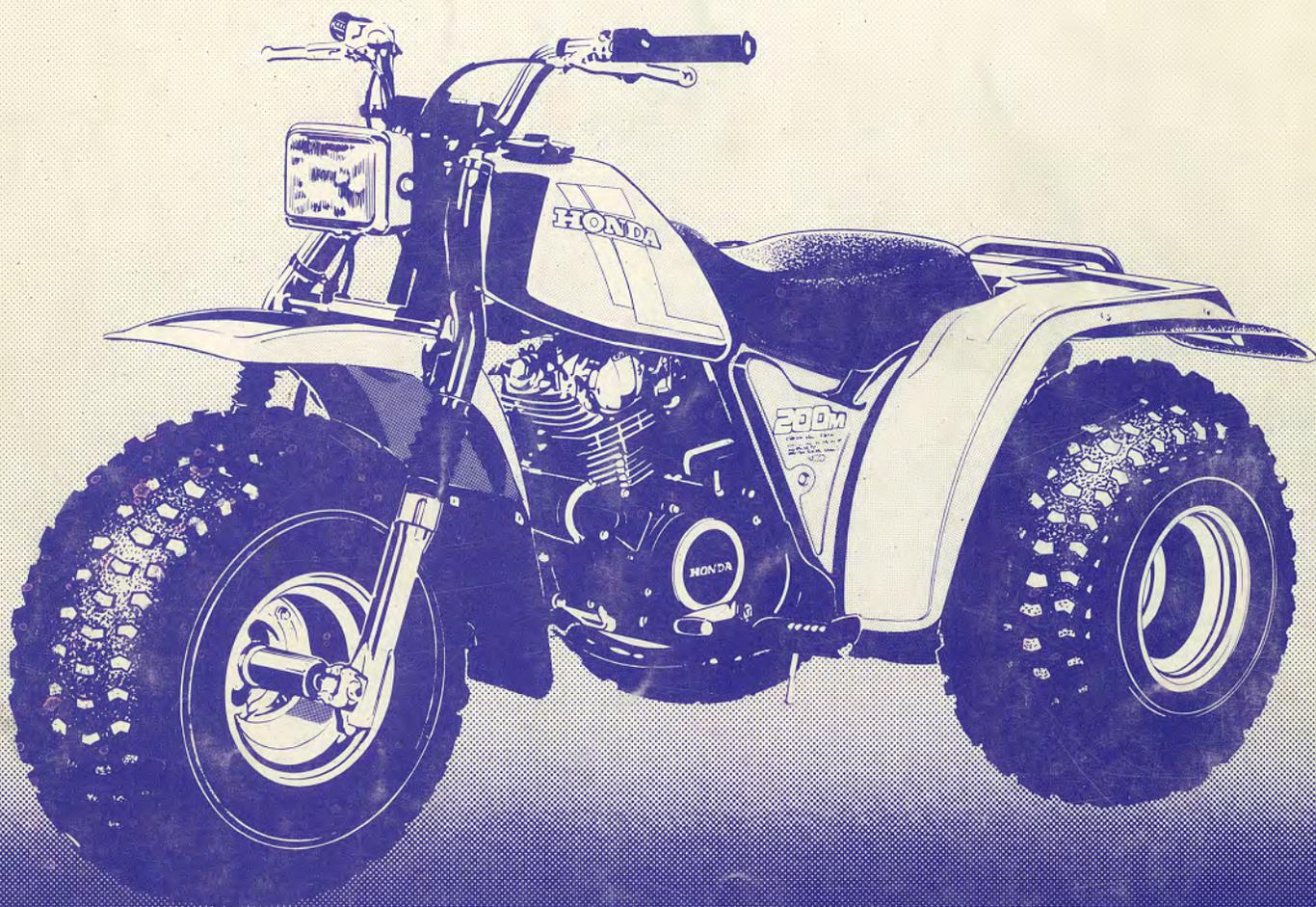


**Official**

# **HONDA**

## **SHOP MANUAL**

### **ATC200M**



**'84-'85**

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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 helpful information.

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

## HOW TO USE THIS MANUAL

Sections 1 through 3 apply to the whole motorcycle, while sections 4 through 17 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 and all the required specifications, torque values, general instructions, tools and troubleshooting for the section. The subsequent pages give detailed procedures.

If you don't know the source of the trouble, see section 18, 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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HONDA MOTOR CO., LTD.  
SERVICE PUBLICATIONS OFFICE

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MEMO

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# 1. GENERAL INFORMATION

1

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## GENERAL SAFETY

### WARNING

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

### WARNING

- *Gasoline is extremely flammable and is explosive under certain conditions. Do not smoke or allow flames or sparks in your work area.*
- *The battery electrolyte contains sulfuric acid. Protect your eyes, skin and clothing. In case of contact, flush thoroughly with water and call a doctor if electrolyte gets in your eyes.*

## SERVICE RULES

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

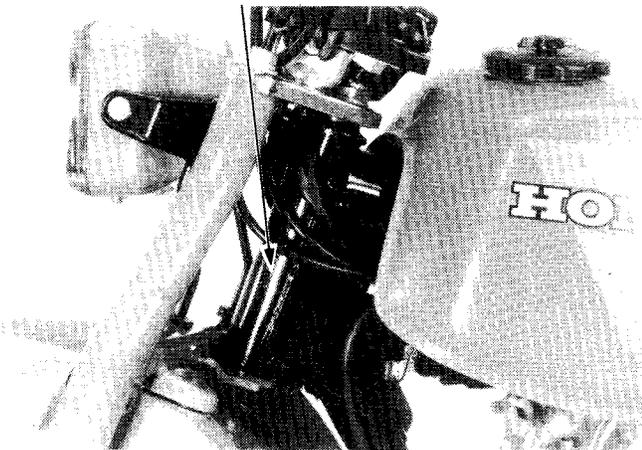
**GENERAL INFORMATION**

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**MODEL IDENTIFICATION**

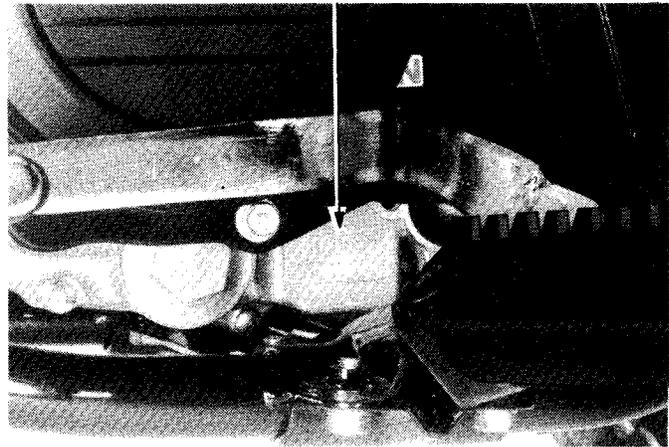


**FRAME SERIAL NUMBER**



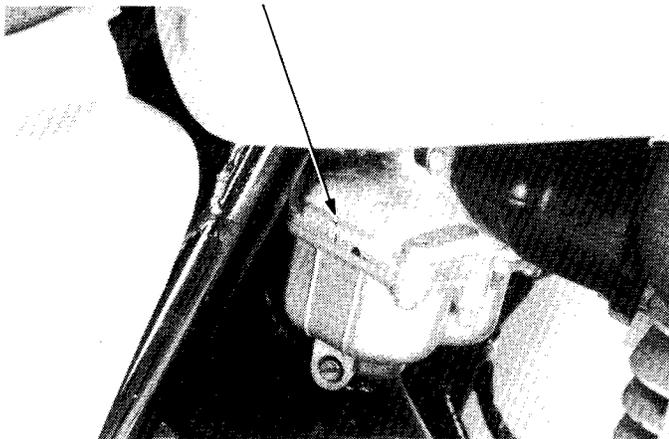
The frame serial number is stamped on the steering head left side.

**ENGINE SERIAL NUMBER**



The engine serial number is stamped on the crankcase lower left side.

**CARBURETOR IDENTIFICATION NUMBER**



The carburetor identification number is on the carburetor body right side.

**SPECIFICATIONS**

<p><b>DIMENSIONS</b></p>	<p>Overall length Overall width Overall height Wheelbase Rear tread Seat height Foot peg height Ground clearance Dry weight</p>	<p>1,855 mm (73.0 in) 1,080 mm (42.5 in) 1,005 mm (39.6 in) 1,205 mm (39.6 in) 800 mm (31.5 in) 685 mm (27.0 in) 260 mm (10.2 in) 110 mm ( 4.3 in) 149 kg (328 lb)</p>
<p><b>FRAME</b></p>	<p>Type Rim size  Front tire size, pressure Rear tire size, pressure Front brake Rear brake Fuel capacity '84: After '84:  Fuel reserve capacity Caster Trail</p>	<p>Semi-double cradle 9.2 x 9.0 9.2 x 9.0 25 x 12-9, 0.15 kg/cm<sup>2</sup> (2.2 psi) 25 x 12-9, 0.15 kg/cm<sup>2</sup> (2.2 psi) Cable operated leading shoe Cable operated leading shoe 11.5 liters (3.04 US gal, 2.53 Imp gal) 10.5 liters (2.77 US gal, 2.31 Imp gal) 1.0 liters (0.26 US gal, 0.22 Imp gal) 69° 10 mm (0.39 in)</p>
<p><b>ENGINE</b></p>	<p>Type Cylinder arrangement Bore x stroke Displacement Compression ratio Valve train Maximum horsepower Maximum torque  Oil capacity  Lubrication system Cylinder compression Intake valve  Exhaust valve  Valve clearance (Cold)</p>	<p>Gasoline, air-cooled 4-stroke Single cylinder inclined 15° 65.0 x 57.8 mm (2.56 x 2.28 in) 192 cc (11.7 cu in) 7.8 : 1 Overhead camshaft chain driven 13.0 BHP/7,000 rpm 1.46 kg-m/5,500 rpm (10.6 ft-lb/5,500 rpm) 1.5 lit (1.59 US qt, 1.32 Imp qt) 1.3 lit (1.37 US qt, 1.14 Imp qt) after draining Forced pressure and wet sump 11.0 ± 1.0 kg/cm<sup>2</sup> (156 ± 14 psi) 5° BTDC 35° ABDC 35° BBDC 5° ATDC } at 1 mm lift Intake Exhaust</p>
<p><b>CARBURETOR</b></p>	<p>Type Venturi dia. Main jet Pilot screw opening Jet needle Float level Idle speed</p>	<p>Piston valve 22 mm (0.9 in) #95 2-1/8 turns out 3rd 14 mm (0.55 in) 1,400 ± 100 rpm</p>

## GENERAL INFORMATION

<p>DRIVE TRAIN</p>	<p>Clutch Transmission Primary reduction Gear ratio (Posi-torque gear ratio)</p> <p style="text-align: center;">I II III IV V</p> <p>Final reduction Gearshift pattern Drive chain</p>	<p>Wet multi-plate, semi-automatic 5-speed constant mesh 3.333 : 1 2.769 : 1 1.722 : 1 1.273 : 1 1.000 : 1 0.815 : 1 4.273 : 1 Left foot operated return system, N-1-2-3-4-5 520, 92 Links</p>
<p>ELECTRICAL</p>	<p>Ignition Ignition timing Initial Full advance Capacity</p> <p>Alternator Battery Spark plug</p> <p>Spark plug gap Headlight Taillight</p>	<p>CDI 10° ± 2° BTDC at idle 30° ± 2° BTDC at 3,350 rpm 70 W/5,000 rpm 12V-14 AH DR8ES-L (NGK) X24ESR-U (ND) 0.6–0.7 mm (0.024–0.028 in) 12 V 45 W/45 W 12 V 5 W</p>

# TORQUE VALUES

## ENGINE

Item	Q'ty	Thread Size (mm)	Torque		
			N·m	kg·m	ft·lb
Cylinder head cap nut	4	8 x 1.25	28-30	2.8-3.0	20-22
Clutch lock nut	1	16 x 1.0	50-60	5.0-6.0	36-43
Centrifugal clutch lock nut	1	22 x 1.25	105-115	10.5-11.5	76-83
Clutch adjuster lock nut	1	8 x 1.25	19-25	1.9-2.5	14-18
Alternator flywheel bolt	1	8 x 1.25	40-50	4.0-5.0	29-36
Valve adjuster cover	2	36 x 1.5	10-14	1.0-1.4	7-10
Oil filter screen cap	1	36 x 1.5	9-15	0.9-1.5	7-11
Spark plug	1	12 x 1.25	12-19	1.2-1.9	9-14
Cam sprocket bolt	2	6 x 1.0	8-12	0.8-1.2	6-9
Oil filter rotor cover bolt	3	6 x 1.0	10-14	1.0-1.4	7-10
Clutch lifter stopper bolt	1	8 x 1.25	18-25	1.8-2.5	13-18
Gearshift drum stopper arm bolt	1	6 x 1.0	10-14	1.0-1.4	7-10
Pulse generator screw	2	5 x 0.8	4-7	0.4-0.7	2.9-5
Pulse cover screw	2	5 x 0.8	4-7	0.4-0.7	2.9-5
Valve adjuster lock nut	2	6 x 0.75	15-18	1.5-1.8	11-13
Gearshift stopper plate bolt	1	6 x 1.0	8-12	0.8-1.2	6-9
Cam chain tensioner adjuster bolt	1	16 x 1.0	15-22	1.5-2.2	11-16
Cam chain tensioner check bolt	1	6 x 1.0	8-10	0.8-1.0	6-7
Decompressor lever guide bolt	1	6 x 1.0	5-7	0.5-0.7	3.6-5
Right crankcase protector screw	3	Self tapping screw	3-7	0.3-0.7	2.2-5

## FRAME

Item	Q'ty	Thread Size (mm)	Torque		
			N·m	kg·m	ft·lb
Handlebar upper holder bolt	4	8 x 1.25	18-30	1.8-3.0	13-22
Handlebar lower holder nut	2	10 x 1.25	40-48	4.0-4.8	29-35
Fork top bridge bolt	2	12 x 1.25	50-70	5.0-7.0	36-51
Steering stem nut	1	22 x 1.0	50-70	5.0-7.0	36-51
Front axle	1	14 x 1.5	70-110	7.0-11.0	51-80
Front hub nut	4	8 x 1.25	20-25	2.0-2.5	14-18
Rear brake drum nut (INNER)	1	32 x 1.0	35-45	3.5-4.5	25-33
(OUTER)			120-140	12.0-14.0	87-101
Rear hub nut	8	8 x 1.25	20-25	2.0-2.5	14-18
Rear axle nut	2	14 x 1.5	60-80	6.0-8.0	43-58
Bearing holder bolt	4	12 x 1.25	50-70	5.0-7.0	36-51
Front fork mounting bolt	4	10 x 1.25	40-50	4.0-5.0	29-36

## GENERAL INFORMATION

Item	Q'ty	Thread Size (mm)	Torque		
			N·m	kg·m	ft·lb
Front engine hanger nut	2	10 x 1.25	40–48	4.0–4.8	29–35
Front engine hanger nut	2	8 x 1.25	23–27	2.3–2.7	17–20
Rear engine hanger nut upper	1	10 x 1.25	40–48	4.0–4.8	29–35
Rear engine hanger nut lower	1	10 x 1.25	60–80	6.0–8.0	44–57
Upper engine hanger nut	1	8 x 1.25	20–25	2.0–2.5	14–18
Carburetor nut	2	6 x 1.0	6–9	0.6–0.9	4.5–7
Gearshift pedal	1	6 x 1.0	10–14	1.0–1.4	7–10
Foot peg bolt	8	8 x 1.25	20–25	2.0–2.5	14–18
Drive chain slider nut	2	6 x 1.0	6–9	0.6–0.9	4.5–7
Front axle holder nut	4	6 x 1.0	10–14	1.0–1.4	7–10
Air cleaner cover wing bolt	4	6 x 1.0	1.5–3	0.15–0.3	1.1–2.2
Driven sprocket damper nut	4	8 x 1.25	25–30	2.5–3.0	18–22

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

## STANDARD TORQUE VALUES

Item	Torque N·m (kg·m, ft·lb)	Item	Torque N·m (kg·m, ft·lb)
5 mm bolt, nut	4.5–6 (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	10–14 (1.0–1.4, 7–10)
8 mm bolt, nut	18–25 (1.8–2.5, 13–18)	6 mm flange bolt, nut	10–14 (1.0–1.4, 7.2–10)
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

Description	Tool No.	Alternative	Ref. page
Valve guide reamer, 5.48 mm	07984-0980000		6-10
Clutch center holder	07923-9580000		8-12, 8-15
Lock nut wrench, 30 mm	07907-PD10000	Equivalent commercially available in U.S.A.	8-6, 8-10
Ball race remover	07944-1150001	M9360-277-91774 (U.S.A.)	11-28
Universal bead breaker	GN-AH-958-BB1	Available in U.S.A. only	11-10
Lock nut spanner, 41 mm	07916-9580200	Not available in U.S.A.	12-10
Lock nut wrench, 41 mm	07916-9580300	07916-9580400	12-10
Bearing remover, 17 mm	07936-3710300		8-5
Bearing remover handle	07936-3710100		8-5
Sliding weight	07741-0010201	07936-3710200	8-5
Bearing remover, 15 mm	07936-KC10000		10-8
Hollow set wrench, 6 mm	07917-3230000	Equivalent commercially available in U.S.A.	11-20
Digital Multi-tester	KS-AHM-32-003	U.S.A. only	14-3

COMMON

Description	Tool No.	Alternative	Ref. page
Float level gauge	07401-0010000		4-9
Pin spanner	07702-0020000	07902-0010000, 07702-0010000 or M9361-412-099788 (Available in U.S.A.)	11-28, 11-30
Valve adjusting wrench, 10 x 12 mm	07708-0030200	07908-3230000	3-6
Valve adjuster A	07708-0030300		3-6
Lock nut wrench, 20 x 24 mm	07716-0020100	07916-3710000	8-12, 8-15
Lock nut wrench, 30 x 32 mm	07716-0020400	Commercially available in U.S.A.	11-27, 11-30
Extension bar	07716-0020500	Commercially available in U.S.A.	8-6, 8-10
Flywheel puller	07733-0010000	07933-2000000	9-8
Valve guide remover 5.5 mm	07742-0010100	07942-3290100	6-10
Valve guide driver B	07742-0020200	07942-3290200	6-10
Attachment, 37 x 40 mm	07746-0010200		11-29
Driver	07749-0010000	07949-6110000	8-5, 10-8
Pilot, 15 mm	07746-0040300		11-14
Attachment, 42 x 47 mm	07746-0010300		10-8, 11-14
Pilot, 35 mm	07746-0040800		12-17
Attachment, 62 x 68 mm	07746-0010500		12-17
Valve spring compressor	07757-0010000	07957-3290001	6-8, 6-14
Driver	07746-0030100		10-4
Pilot, 30 mm	07746-0040700		10-8
Attachment, 32 x 35 mm	07746-0010100		10-8
Pilot, 20 mm	07746-0040500		10-8
Attachment, 52 x 55 mm	07746-0010400		10-8
Attachment, 30 mm I.D.	07746-0030300		10-4
Fork seal driver	07747-0010100	07947-3550000	11-25
Fork seal driver attachment C	07747-0010400		11-25
Pilot, 17 mm	07746-0040300		8-5

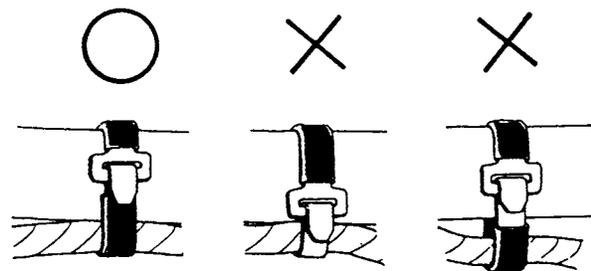
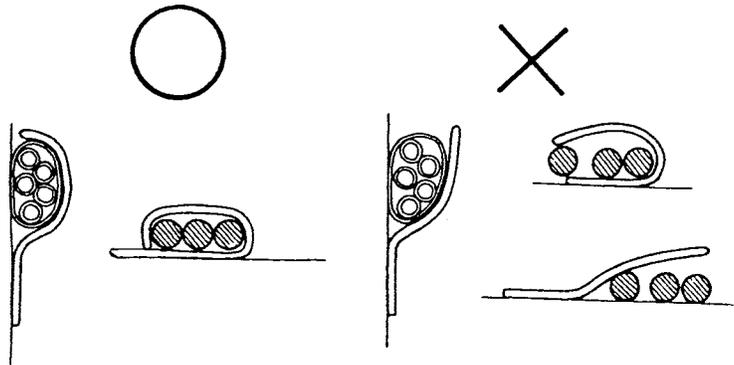
## GENERAL INFORMATION

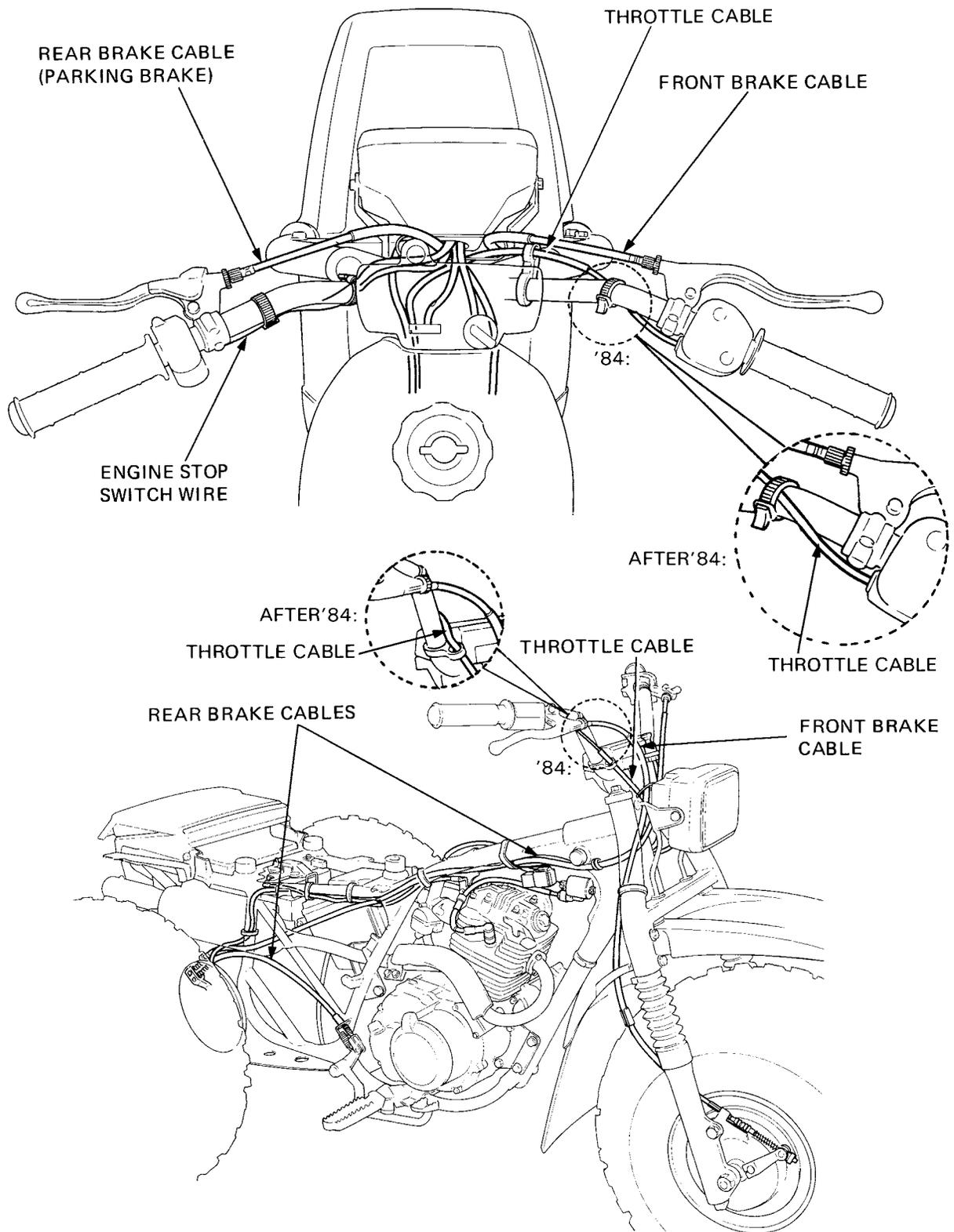
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### CABLE & HARNESS ROUTING

Note the following when routing cables and wire harnesses:

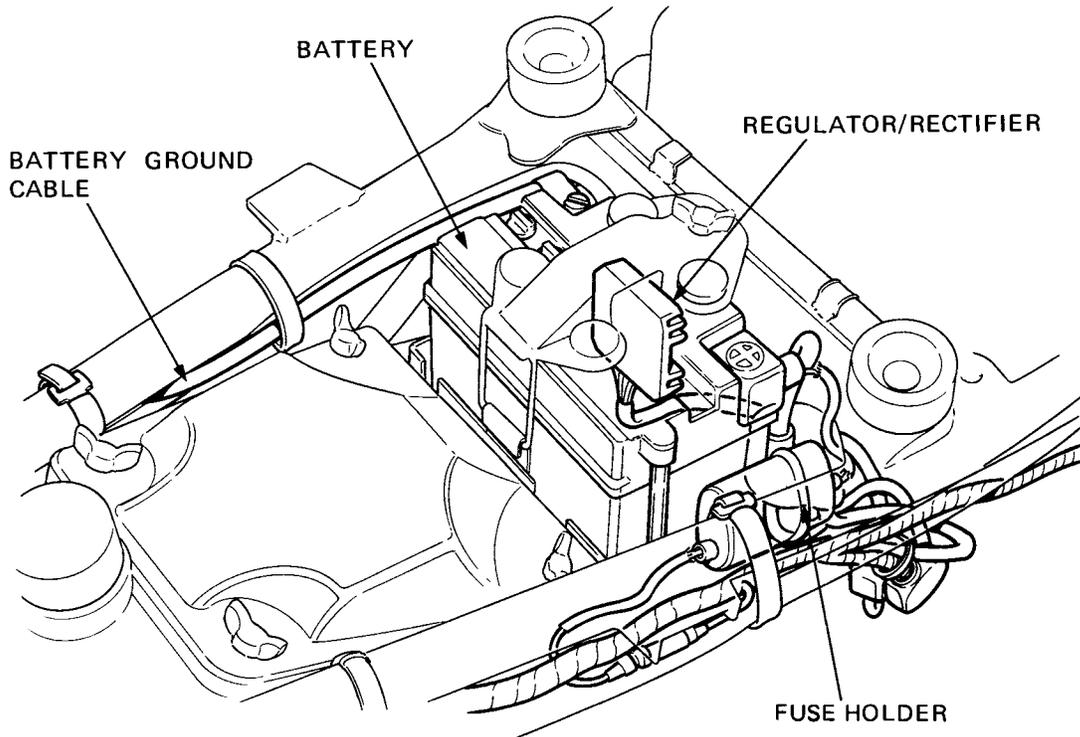
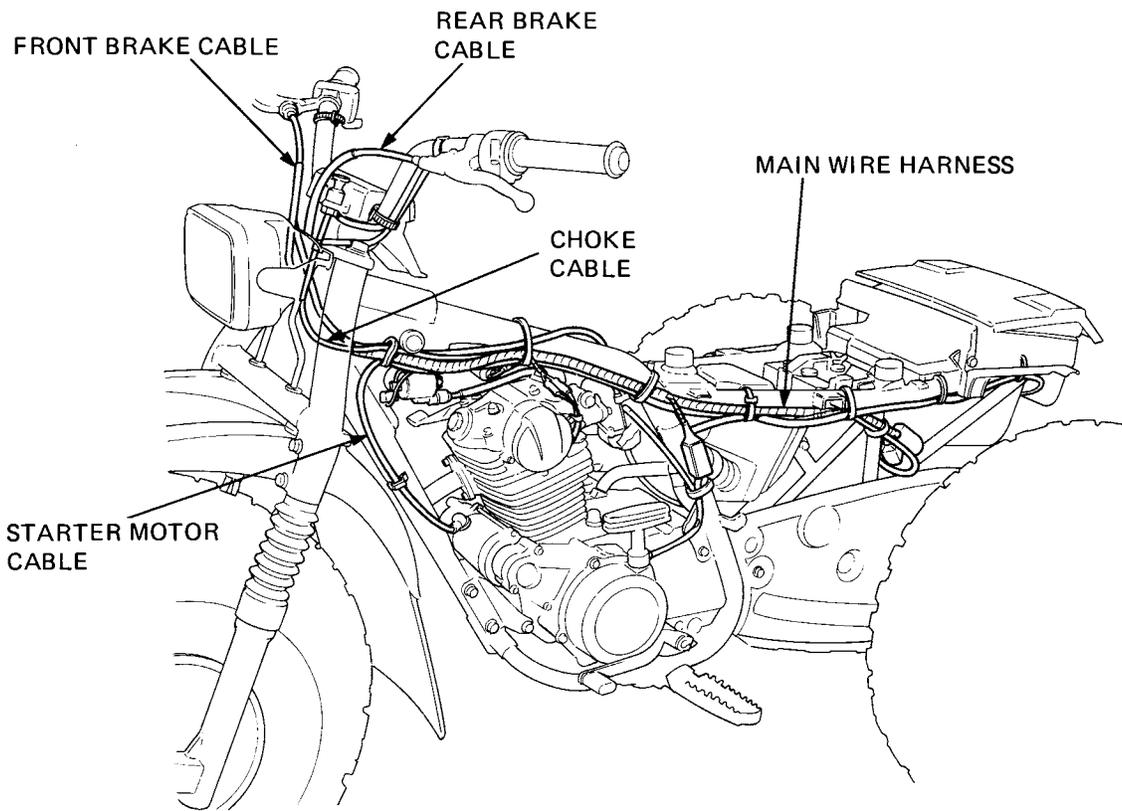
- A loose wire, harness or cable can be a safety hazard. After clamping, check each wire to be sure it is secure.
- Do not squeeze wires against the weld or end of its clamp when a weld-on clamp is used.
- Secure wires and wire harnesses to the frame with their respective wire bands at the designated locations. Tighten the bands so that only the insulated surfaces contact the wires or wire harnesses.
- Route harnesses so they are not pulled taut or have excessive slack.
- Protect wires and harnesses with electrical tape or tubes if they contact a sharp edge or corner. Clean the attaching surface thoroughly before applying tape.
- Do not use a wire or harness with a broken insulator. Repair by wrapping them with 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 parts that get hot.
- 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.
- 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.
- After routing, check that the wire harnesses are not twisted or kinked.





**GENERAL INFORMATION**

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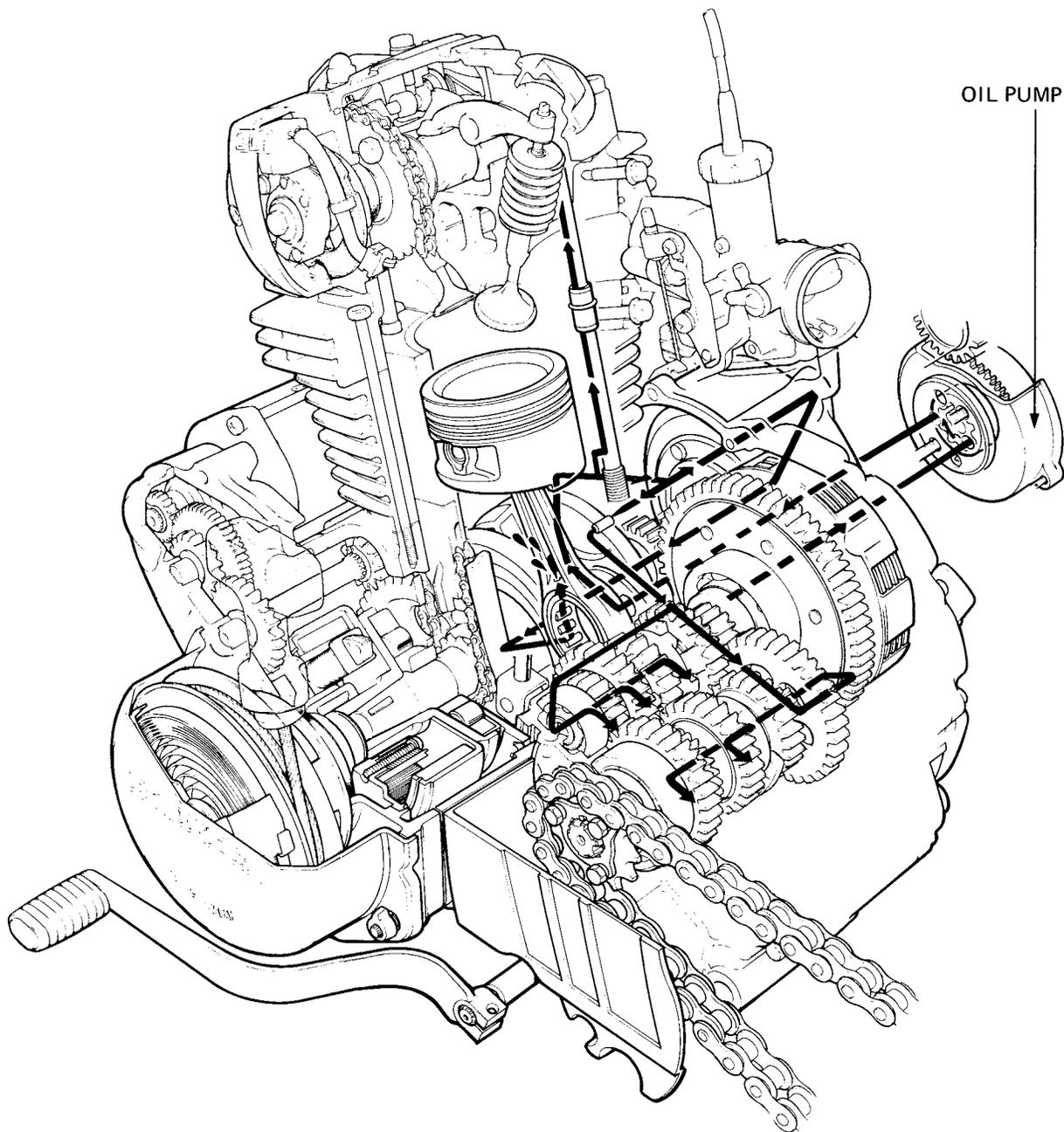


## NOISE EMISSION CONTROL SYSTEM

- The U.S. Environmental Protection Agency requires manufacturers to certify that vehicles built after January 1, 1983 will comply with applicable noise emission standards for one year or 1,865 miles (3,000 km) 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 Warranty for the Honda Vehicle Noise Emission Control System is necessary in order to keep the noise emission control system in effect.

**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 **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.



# 2. LUBRICATION

SERVICE INFORMATION	2-1
TROUBLESHOOTING	2-1
ENGINE OIL LEVEL CHECK	2-2
ENGINE OIL CHANGE AND OIL FILTER SCREEN CLEANING	2-2
OIL FILTER ROTOR CLEANING	2-3
LUBRICATION POINTS	2-4

## SERVICE INFORMATION

### GENERAL

- This section describes how to inspect and replace the engine oil and clean the oil filter screen.
- Section 8 shows how to service the oil pump.

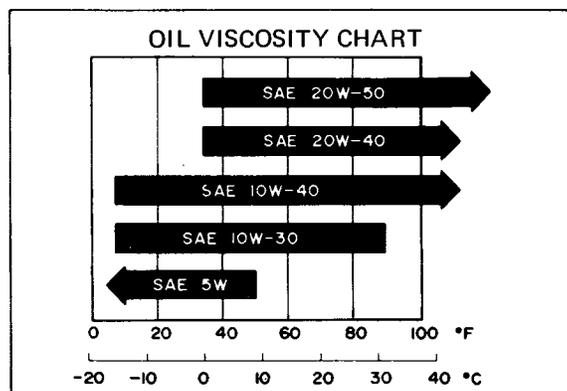
### SPECIFICATIONS

Oil capacity 1.5 liter (1.59 US qt, 1.32 Imp qt) at disassembly  
1.3 liter (1.37 US qt, 1.14 Imp qt) at draining

#### Engine oil recommendation

Use Honda 4-Stroke Oil or equivalent.  
API Service Classification: SE or SF  
Viscosity: SAE 10W-40

Other viscosities shown in the chart may be used for the temperature ranges indicated.



### TORQUE VALUES

Oil filter screen cap 9-15 N·m (0.9-1.5 kg-m, 7-11 ft-lb)  
Oil filter rotor cover bolt 10-14 N·m (1.0-1.4 kg-m, 7-10 ft-lb)

## TROUBLESHOOTING

#### Oil level too low

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

#### Oil consumption

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

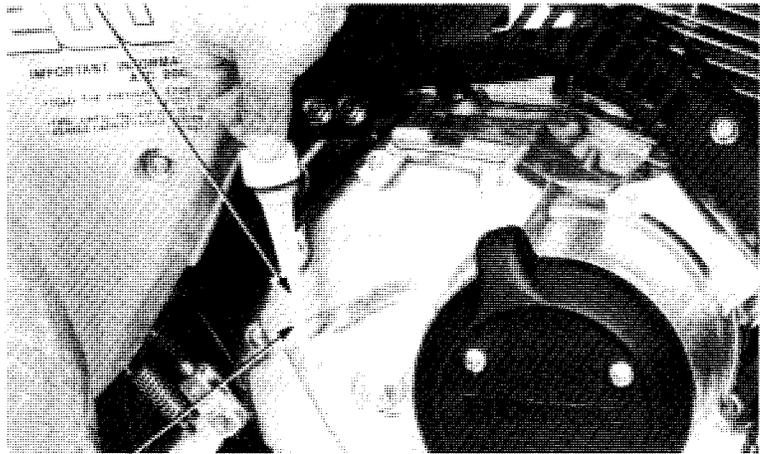
## LUBRICATION

### ENGINE OIL LEVEL CHECK

Place the ATC on level ground.  
Check the oil level with the oil cap/dipstick.  
Do not screw in the cap when making this check.

If the oil level is below the lower level mark on the dipstick, fill to the upper level mark with the recommended oil (Page 2-1).

UPPER LEVEL



LOWER LEVEL

### ENGINE OIL CHANGE AND OIL FILTER SCREEN CLEANING

#### NOTE

- Drain the oil with the engine warm.
- The oil filter screen and spring will come out when the oil filter screen cap is removed.

Remove the oil filler cap and oil filter screen cap to drain the oil.

Operate the recoil starter several times to completely drain any residual oil.

Clean the oil filter screen.

Make sure that the oil filter screen, sealing rubber, screen cap and O-ring are in good condition.

Install the oil filter screen, spring and screen cap.

**TORQUE: 9–15 N·m**  
**(0.9–1.5 kg·m, 7–11 ft·lb)**

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

**ENGINE OIL CAPACITY:**  
**1.3 liters (1.37 US qt, 1.14 Imp qt) after draining**

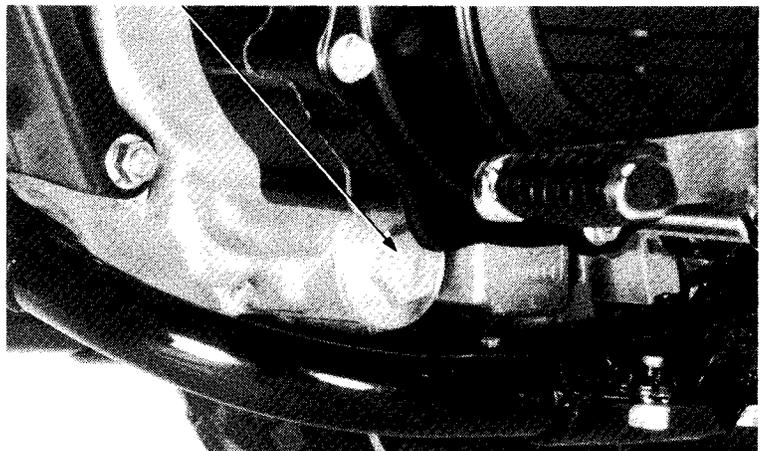
Install the oil filler cap.

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

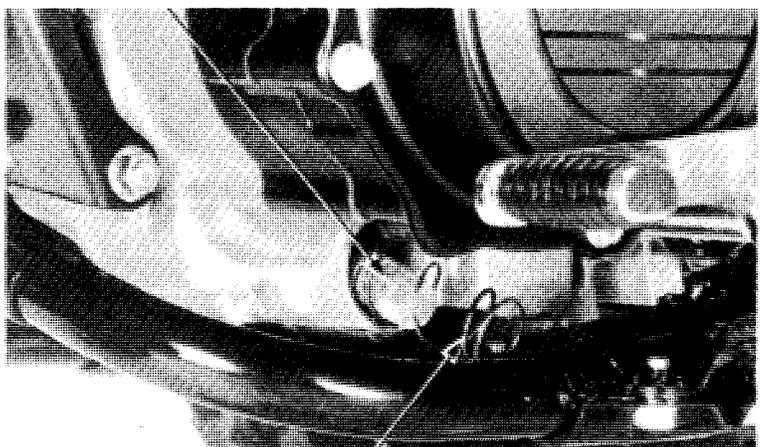
Stop the engine.

With the ATC on level ground, make sure that the oil level is at the upper level mark and that there are no oil leaks.

OIL SCREEN CAP BOLT



OIL FILTER SCREEN



SPRING

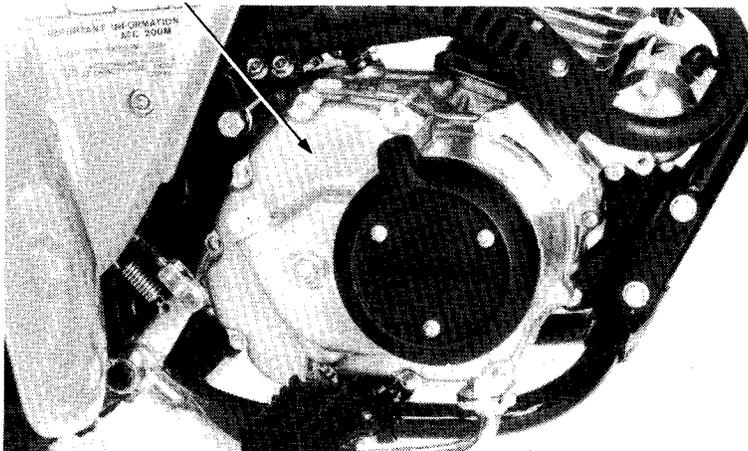
## OIL FILTER ROTOR CLEANING

### NOTE

Clean the oil filter rotor before adding oil.

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

RIGHT CRANKCASE COVER



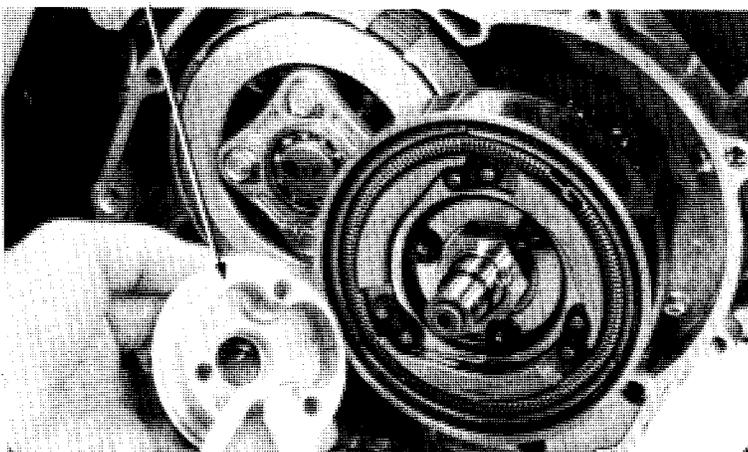
Remove the oil filter rotor cover and clean the inside of the rotor cover and rotor.

Install the oil filter rotor cover (Page 8-11).

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

Install the right crankcase cover (Page 8-21).  
Fill the engine with recommended grade oil (Pages 2-1 and 2-2).

OIL FILTER ROTOR COVER

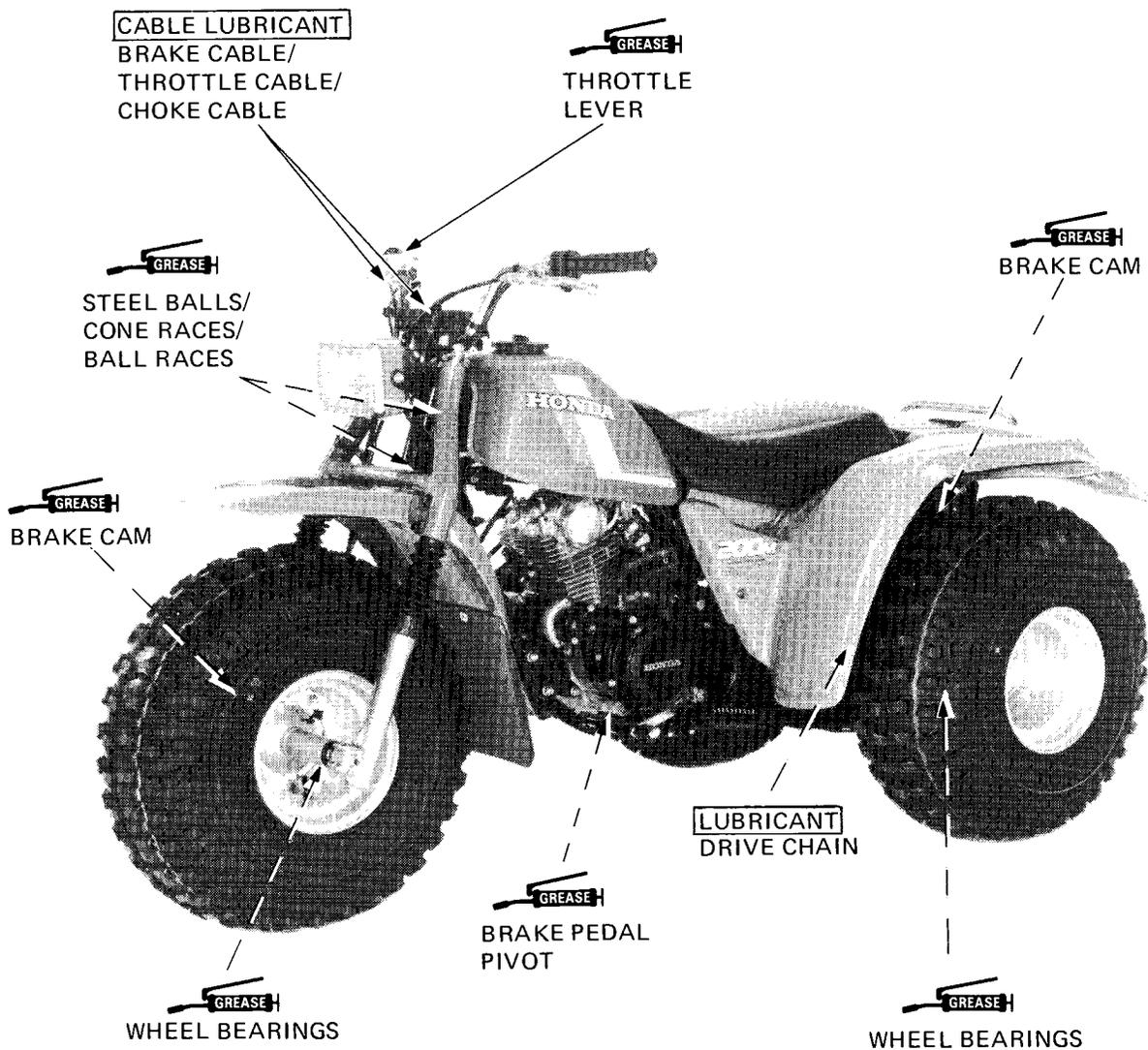


## LUBRICATION

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### LUBRICATION POINTS

Use general purpose grease when no other specification is given. Apply oil or grease to any 2 sliding surfaces and cables not shown here.



# 3. MAINTENANCE

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## SERVICE INFORMATION

### SPECIFICATIONS

Ignition timing:	
Initial	10° ± 2° BTDC at idle
Full advance	30° ± 2° BTDC at 3,350 rpm
Spark plug:	
Spark plug gap	0.6–0.7 mm (0.024–0.028 in)
Recommended spark plugs:	DR8ES-L (NGK) X24ESR-U (ND)
Valve clearance (cold)	
Intake	0.05 mm (0.002 in)
Exhaust	0.05 mm (0.002 in)
Throttle lever free play	5–10 mm (3/16–3/8 in)
Idle speed	1,400 ± 100 rpm
Cylinder compression	11.0 ± 1.0 kg/cm <sup>2</sup> (156 ± 14 psi)

## MAINTENANCE

---

Front brake lever free play	15–20 mm (5/8–3/4 in)
Rear brake pedal free play	15–20 mm (5/8–3/4 in)
Rear brake lever (parking brake) lever free play	15–20 mm (5/8–3/4 in)
Drive chain free play	10–20 mm (3/8–3/4 in)
Drive chain length (45 pins):	
Standard	698.5 mm (27.50 in)
Service limit	705.5 mm (27.78 in)
Front/rear rim size	9.2 x 9.0
Front/rear tire size	25 x 12–9
Front/rear tire pressure	2.2 psi (0.15 kg/cm <sup>2</sup> , 15 kPa)
Front/rear tire circumference	
Standard	1,870 mm (73.6 in)

## TORQUE VALUES

Spark plug	12–19 N·m (1.2–1.9 kg-m, 9–14 ft-lb)
Valve adjuster cover	10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)
Cam chain tensioner adjusting bolt	15–22 N·m (1.5–2.2 kg-m, 11–16 ft-lb)
Rear axle bearing holder bolt	50–70 N·m (5.0–7.0 kg-m, 36–51 ft-lb)
Clutch adjuster lock nut	19–25 N·m (1.9–2.5 kg-m, 14–18 ft-lb)
Valve adjuster lock nut	15–18 N·m (1.5–1.8 kg-m, 11–13 ft-lb)

## MAINTENANCE SCHEDULE

The maintenance intervals shown in the following schedule are based upon average riding conditions. ATC's subjected to severe use, or ridden in wet or unusually dusty areas, require more frequent servicing. Items marked \* should be serviced by an authorized Honda dealer, unless the owner has the proper tools and is mechanically proficient. Other maintenance items are simple to perform and may be serviced by the owner.

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

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

C: Clean

R: Replace

A: Adjust

L: Lubricate

	ITEM		INITIAL SERVICE PERIOD (First week of operation)	REGULAR SERVICE PERIOD (Every 30 operating days)
	ENGINE OIL	NOTE (1), (2)	R	R
*	ENGINE OIL FILTER SCREEN		C	C
*	ENGINE OIL FILTER ROTOR			C
	AIR CLEANER ELEMENT	NOTE(2)		I
	SPARK PLUG			I
	BATTERY		I	I
*	VALVE CLEARANCE		I	I
*	CAM CHAIN TENSIONER		A	A
*	CARBURETOR		I	I
	FUEL LINE		I: (EVERY YEAR)	
*	FUEL FILTER		C: (EVERY YEAR)	
	THROTTLE OPERATION		I	I
	DRIVE CHAIN	NOTE (2)	I,L	I,L
*	FRONT & REAR BRAKE SHOES	NOTE (3)	I: (EVERY YEAR)	
	FRONT & REAR BRAKE SYSTEM		I	I
*	CLUTCH		A	A
*	SPARK ARRESTER			C
	ALL NUTS, BOLTS, FASTENERS		I	I
	LIGHTING EQUIPMENT		I	I
	TIRES		I	I
*	STEERING HEAD BEARINGS		A: (EVERY YEAR)	

NOTES: (1) Replace every 30 operating days or every 3 months, whichever comes first.

(2) Service more frequently when riding in dusty areas, sand or snow.

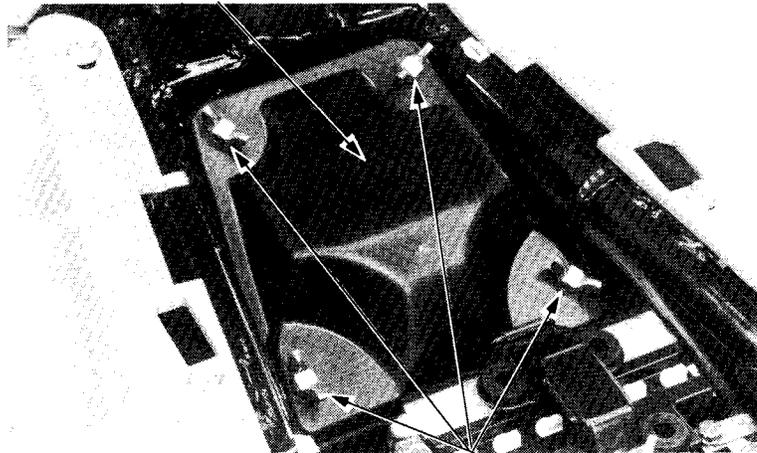
(3) Service more frequently after riding in very wet or muddy conditions.

## MAINTENANCE

### AIR CLEANER

Remove the seat by pulling the seat lever.  
Loosen the four wing bolts attaching the air cleaner case cover.  
Remove the air cleaner case cover.

AIR CLEANER CASE COVER

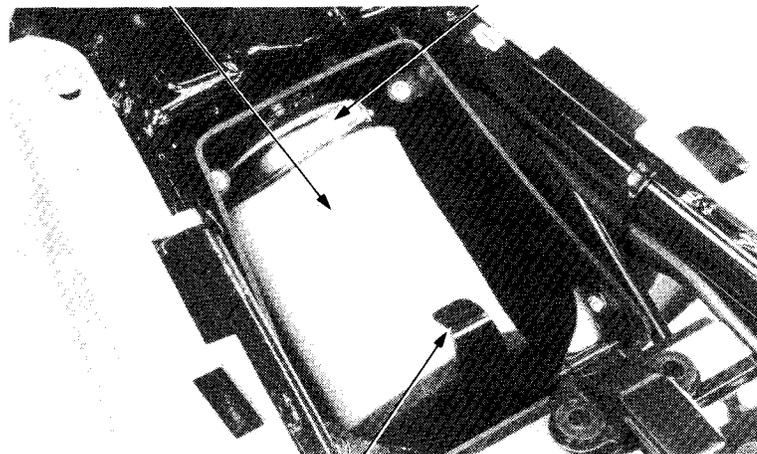


WING BOLTS

Remove the air cleaner element assembly from the air cleaner case.  
Remove the bracket from the element holder.  
Remove the air cleaner element from the element holder.

AIR CLEANER ELEMENT

TUBE BAND



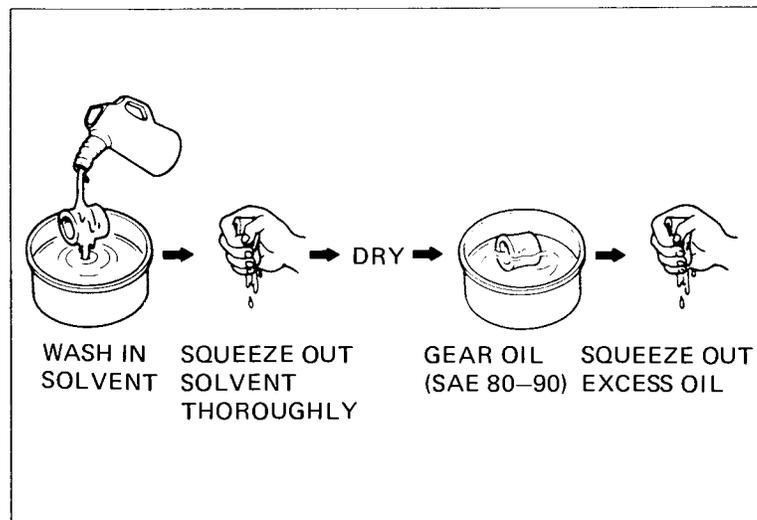
BRACKET

Wash the element in non-flammable or high flash point solvent, squeeze out the solvent thoroughly, and allow to dry.

Soak the element in gear oil (SAE 80–90) and squeeze out excess.  
Place the element onto the element holder.

Install the bracket onto the element holder.  
Install the element assembly into the air cleaner case.

Install the air cleaner case cover by using four wing bolts.  
Install the seat.



## SPARK PLUG

Disconnect the spark plug cap and remove the spark plug.

Visually inspect the spark plug electrodes for wear. The center electrode should have square edges and the side electrode should have a constant thickness. Discard the spark plug if there is apparent wear or if the insulator is cracked or chipped. Measure the gap with a wire-type feeler gauge and adjust by carefully bending the side electrode.

**SPARK PLUG GAP:**  
0.6–0.7 mm (0.024–0.028 in)

**RECOMMENDED REPLACEMENT PLUG:**  
DR8ES-L (NGK)  
X24ESR-U (ND)

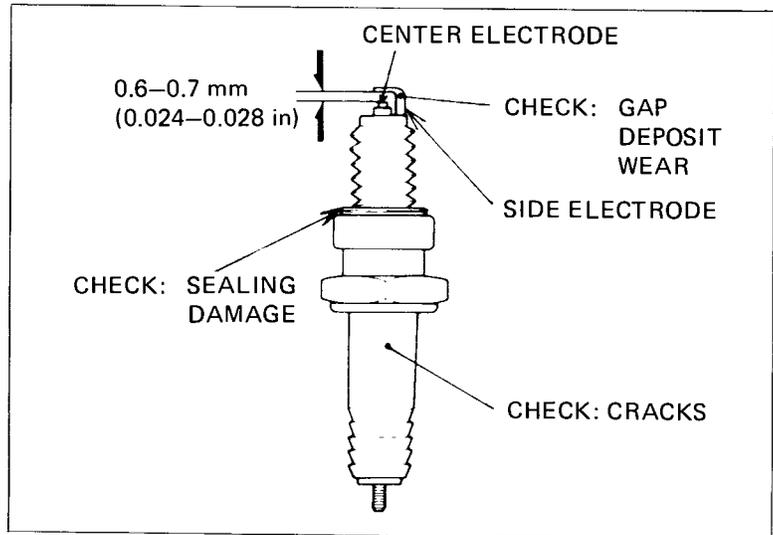
Check the sealing washer and replace with a new one if damaged.

With the sealing washer attached, thread the spark plug in by hand to prevent cross-threading.

Tighten the spark plug to the specified torque.

**TORQUE:** 12–19 N·m  
(1.2–1.9 kg·m, 9–14 ft·lb)

Connect the spark plug cap.



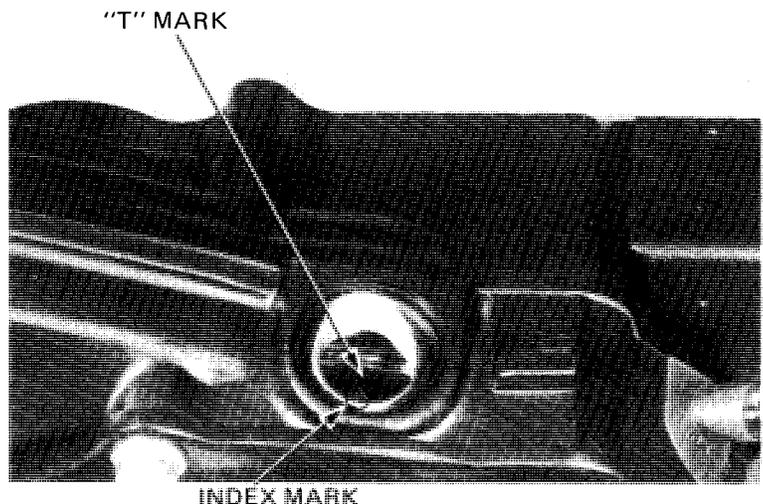
## VALVE CLEARANCE

### NOTE

- Inspect and adjust valve clearance while the engine is cold (below 35°C/95°F).
- Make sure the decompressor valve lifter has free play.

Remove the timing mark hole cap.  
Remove the valve adjuster covers.

Rotate the crankshaft by using the recoil starter and align the "T" mark on the rotor with the index mark. The piston must be at TDC of the compression stroke.



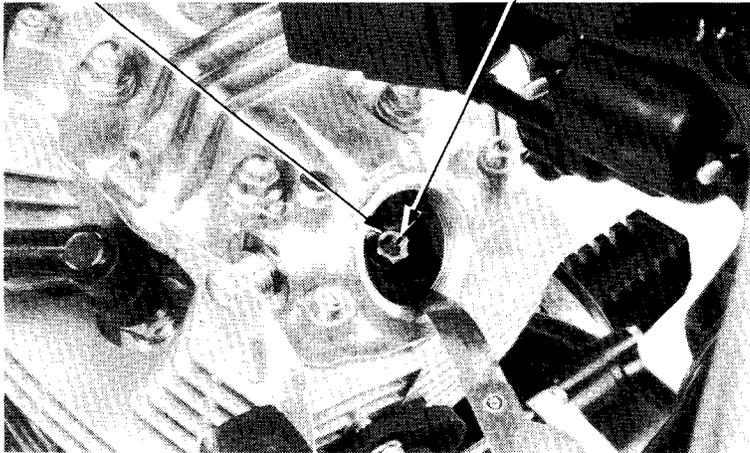
## MAINTENANCE

Inspect the intake and exhaust valve clearances by inserting the feeler gauge between the adjusting screw and valve stem.

### VALVE CLEARANCES:

Intake: 0.05 mm (0.002 in)  
Exhaust: 0.05 mm (0.002 in)

LOCK NUT                      ADJUSTING SCREW



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.

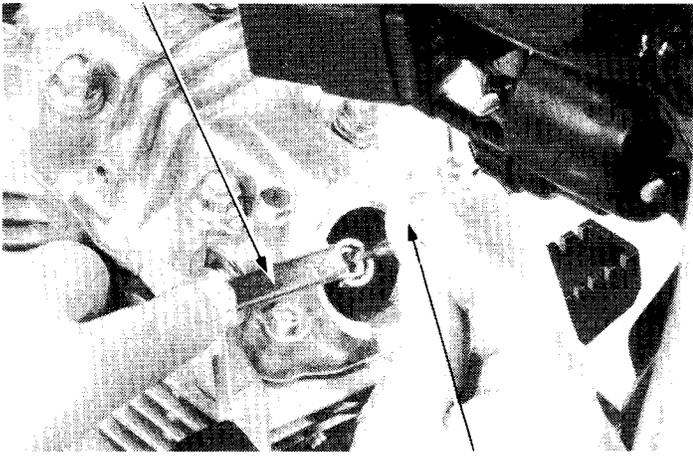
**TORQUE: 15–18 N·m**  
(1.5–1.8 kg·m, 11–13 ft·lb)

Recheck the valve clearance and install the valve adjuster covers.

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

Install the timing hole cap.

VALVE ADJUSTING WRENCH, 10 x 12 mm  
07708-0030200



VALVE ADJUSTER A  
07708-0030300

## FUEL FILTER

Disconnect the fuel tube and drain fuel from the fuel tank.

### WARNING

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

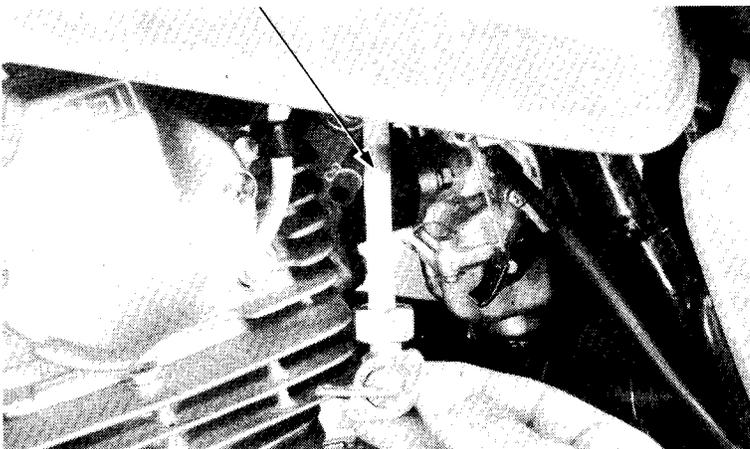
Remove the fuel valve by loosening the valve nut.

Remove the fuel filter and wash it in clean non-flammable or high flash point solvent.

Install the filter and valve and attach the fuel line.

Fill the fuel tank and turn the fuel valve "ON" and check for leaks.

FUEL FILTER



## THROTTLE OPERATION

Check for smooth throttle lever full opening and automatic full closing in all steering positions.

Make sure there is no deterioration, damage or kinking in the throttle cable.  
Replace any damaged parts.

Disconnect the throttle cable at the upper end. Thoroughly lubricate the cable and pivot point with a commercially available cable lubricant to prevent premature wear.

Install the throttle cable in the reverse order of removal.

Make sure the throttle lever free play is 5–10 mm (3/16–1/8 in) at the tip of the throttle lever.

Adjust as follows:

'84:  
Remove the fuel tank

Slide the rubber cap off the adjuster on the carburetor cap.

Adjust the throttle lever free play by turning the adjuster on the carburetor.

Install the adjuster rubber cap securely.  
Install the fuel tank.

After '84:  
Slide rubber cap off the adjuster on the throttle lever housing.  
Adjust the throttle lever free play by loosening the lock nut and turning the adjuster.  
Tighten the lock nut and install the adjuster rubber cap securely.

## CAM CHAIN TENSION

Start the engine and allow it to idle.  
Remove the rubber cap and loosen the cam chain tensioner adjusting bolt.

When the cam chain tensioner adjusting bolt is loosened, the tensioner will automatically position itself to provide the correct tension.

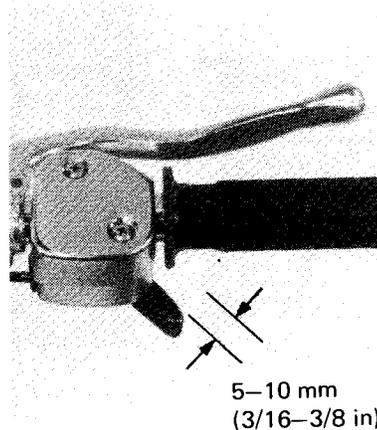
Retighten the adjusting bolt and install the rubber cap.

**TORQUE: 15–22 N·m**  
**(1.5–2.2 kg·m, 11–16 ft·lb)**

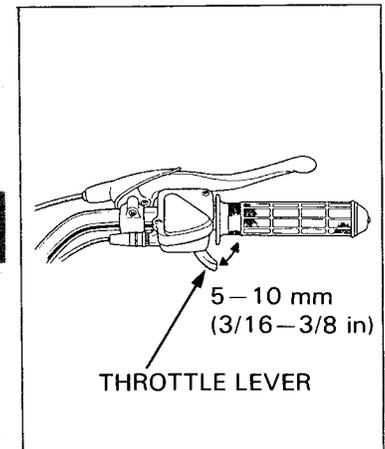
### NOTE

Do not attempt to loosen the 6 mm bolt while adjusting.

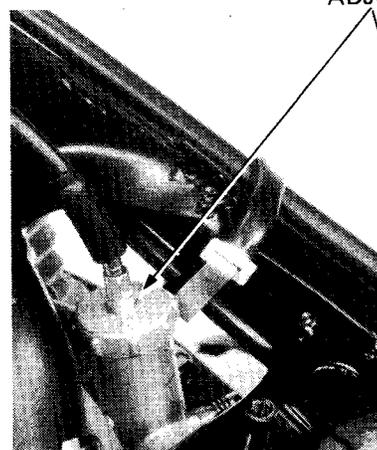
'84:



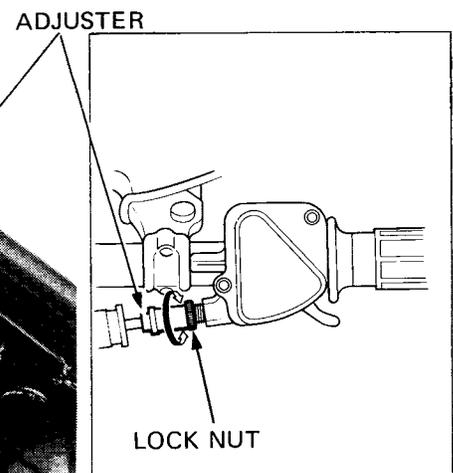
AFTER '84:



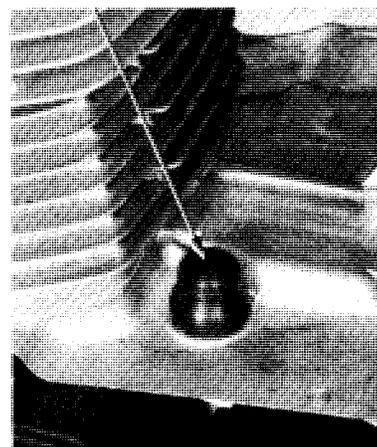
'84:



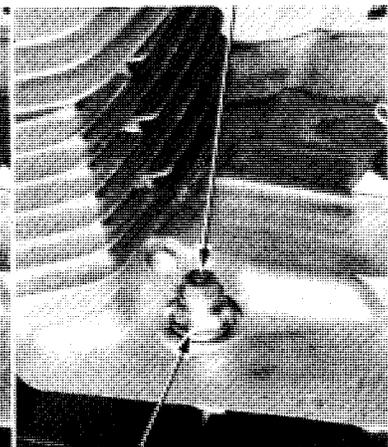
AFTER '84:



RUBBER CAP



6 MM BOLT



ADJUSTING BOLT

## MAINTENANCE

### CARBURETOR IDLE SPEED

#### NOTE

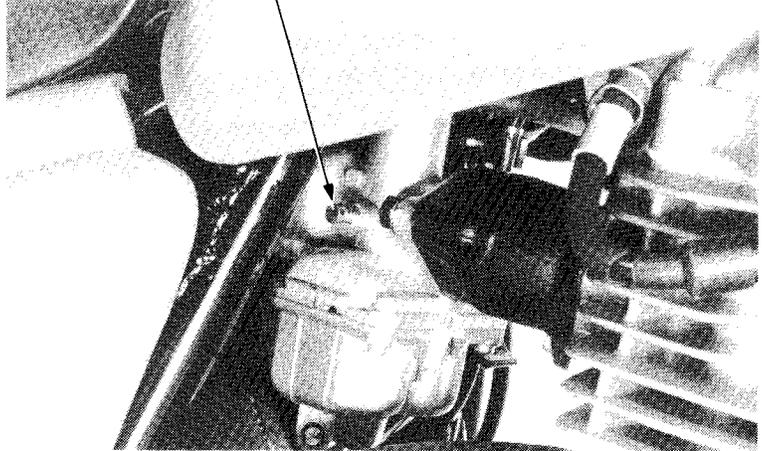
- Inspect and adjust the idle speed after all other maintenance items have been performed and are within specifications.
- The engine must be warm for accurate idle speed inspection and adjustment.

Warm up the engine for about ten minutes.

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

**IDLE SPEED: 1,400 ± 100 rpm**

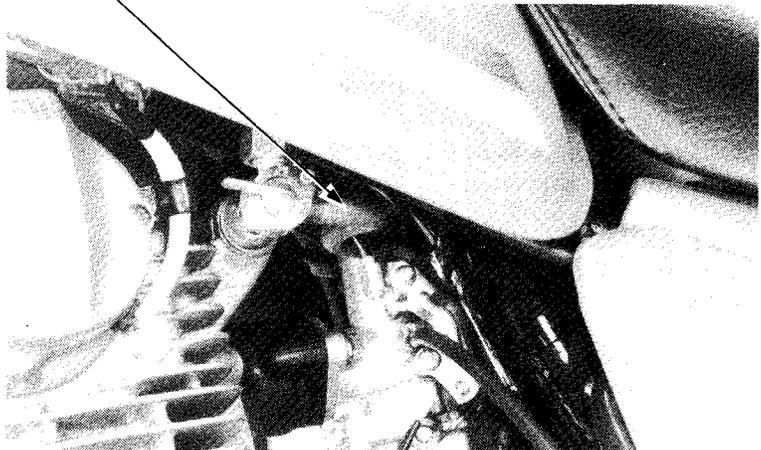
THROTTLE STOP SCREW



### FUEL LINE

Replace any parts which show signs of deterioration, damage or leaks.

FUEL LINE



### IGNITION TIMING

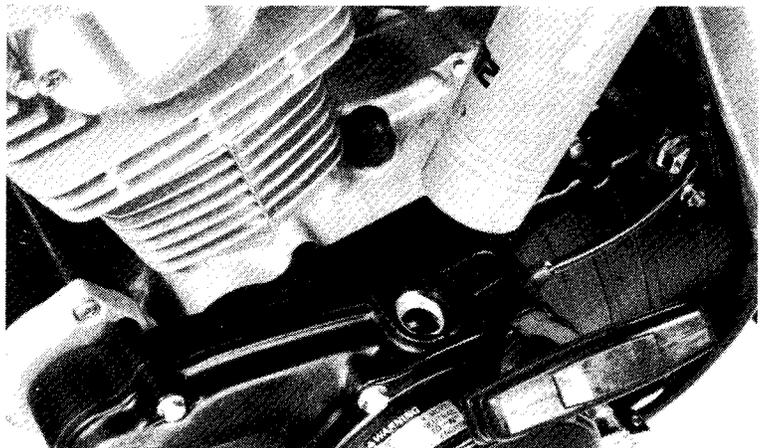
#### NOTE

The Capacitive Discharge Ignition (CDI) system is factory pre-set and does not require adjustment. To inspect the function of the CDI components, ignition timing inspection procedures are given here.

Remove the timing hole cap.  
Connect a tachometer and timing light.  
Start the engine and allow it to idle.

**IDLE SPEED: 1,400 ± 100 rpm**

Inspect the ignition timing. Timing is correct, if the "F" mark on the flywheel is aligned with the index mark on the left crankcase cover at idle.



## CYLINDER COMPRESSION

Warm up the engine. After the engine is warm, stop the engine and remove the spark plug.  
Insert a compression gauge.

Pull out the choke knob all the way and fully open the throttle.  
Push the starter button until the compression gauge reading stops rising.

### NOTE

Watch for compression leaking at the gauge connection.

**COMPRESSION:**  $11.0 \pm 1.0 \text{ kg/cm}^2$  ( $159 \pm 14 \text{ psi}$ )

### Low compression can be caused by:

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

### High compression can be caused by:

- Carbon deposits in combustion chamber or on piston crown.  
The maximum reading is usually reached with in 4–7 seconds.



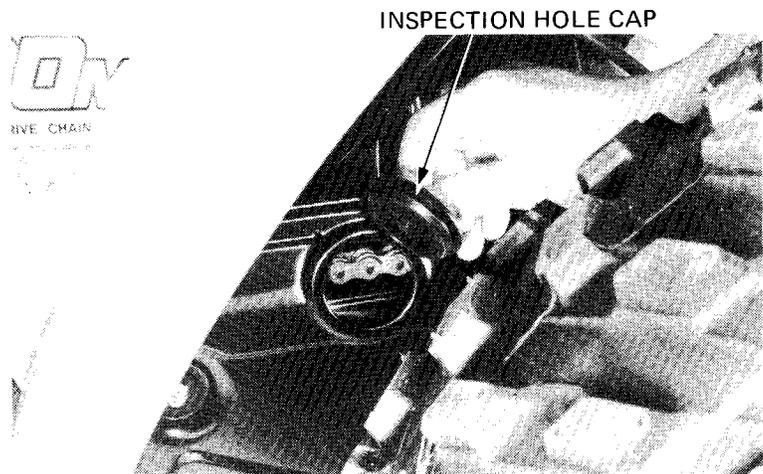
COMPRESSION GAUGE

## DRIVE CHAIN

Stop the engine and shift the transmission into neutral.  
Remove the drive chain inspection hole cap.

Check the amount of chain free play through the inspection hole.

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



## MAINTENANCE

### Adjust as follows:

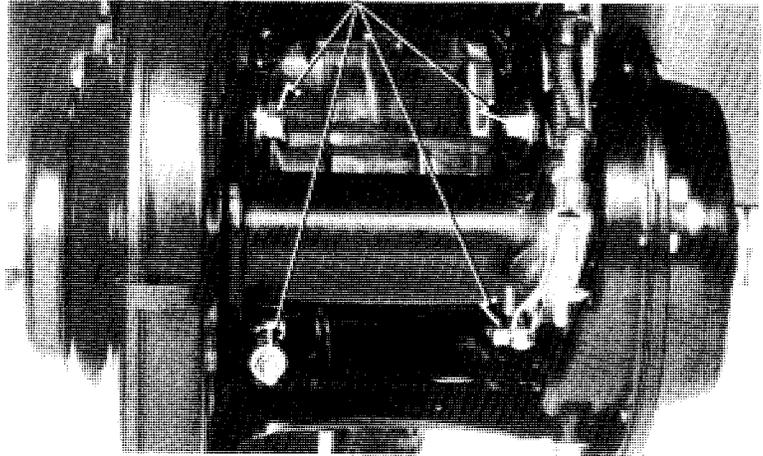
Loosen the rear axle bearing holder bolts.  
Turn the adjusting nut to obtain the specified free play.

Retighten the rear axle bearing holder bolts.

**TORQUE: 50–70 N·m  
(5.0–7.0 kg·m, 36–51 ft·lb)**

Check the rear wheels for free rotation.  
Adjust the rear brake (Page 3–14).

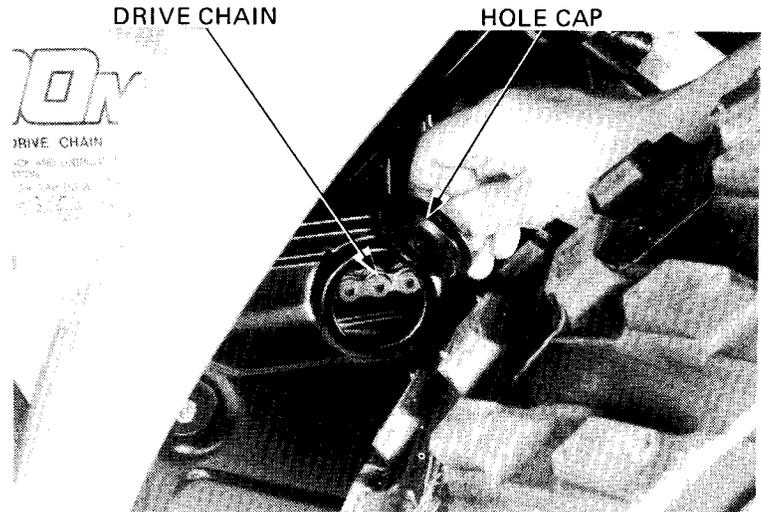
REAR WHEEL BEARING HOLDER BOLTS



ADJUSTING NUT

Lubricate the drive chain with SAE 80 or 90 gear oil lubricant through the inspection hole.

Install the inspection hole cap.



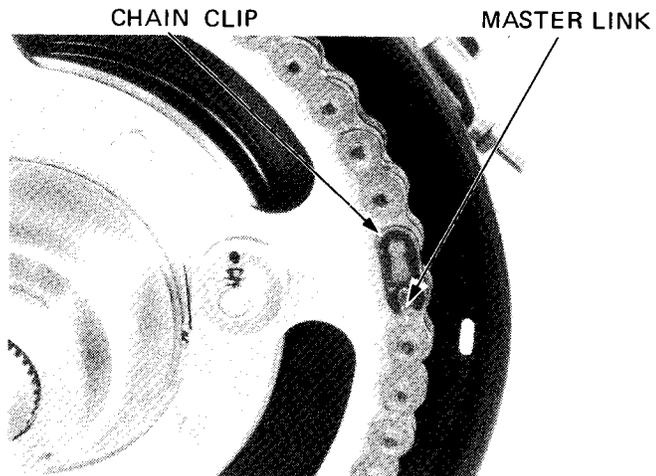
When the drive chain becomes extremely dirty, it should be removed and cleaned prior to lubrication.

Remove the left rear wheel (Page 12–3).

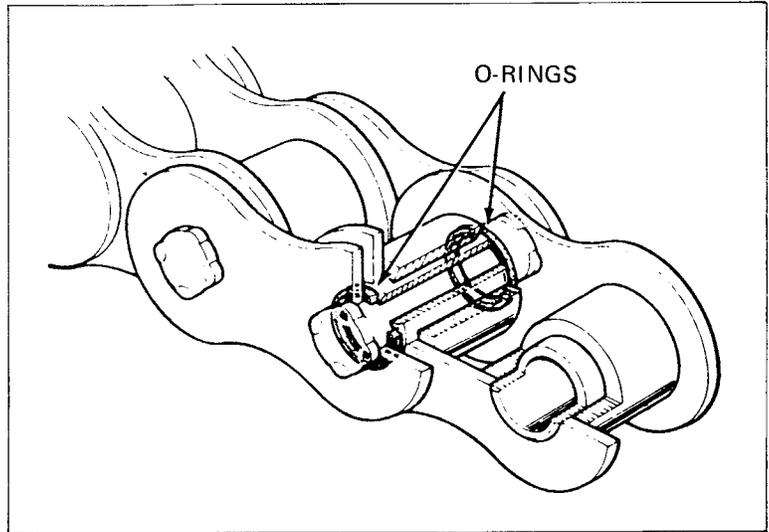
Remove the sealed cover and chain case clips (Page 12–4).

Remove the drive chain cover (Page 12–4).

Remove the chain clip, master link, drive chain, and O-rings.



The drive chain is equipped with grease-retaining O-rings inside the chain to improve its service life. However, special precautions must be taken when adjusting, lubricating, washing and replacing the chain.



Clean the drive chain with kerosene and wipe dry.

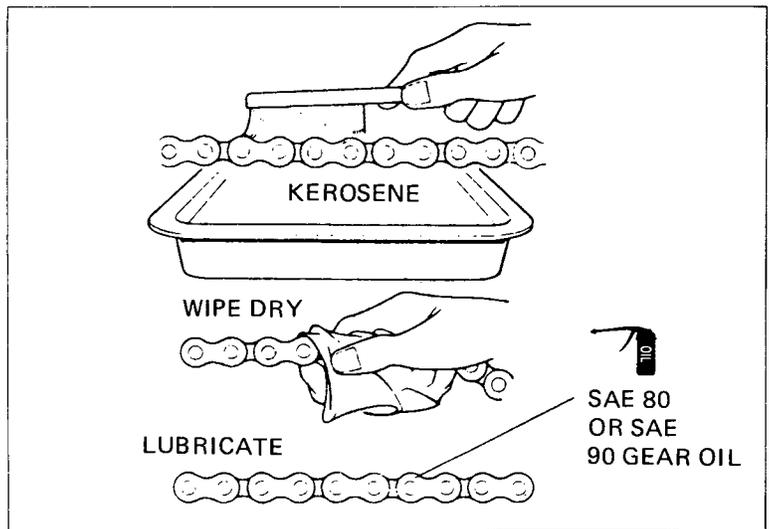
**CAUTION**

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

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

**CAUTION**

*Use aerosol chain lubricants unless they are specifically for O-ring equipped chains. Other aerosol lubricants may contain solvents which could damage the O-rings.*



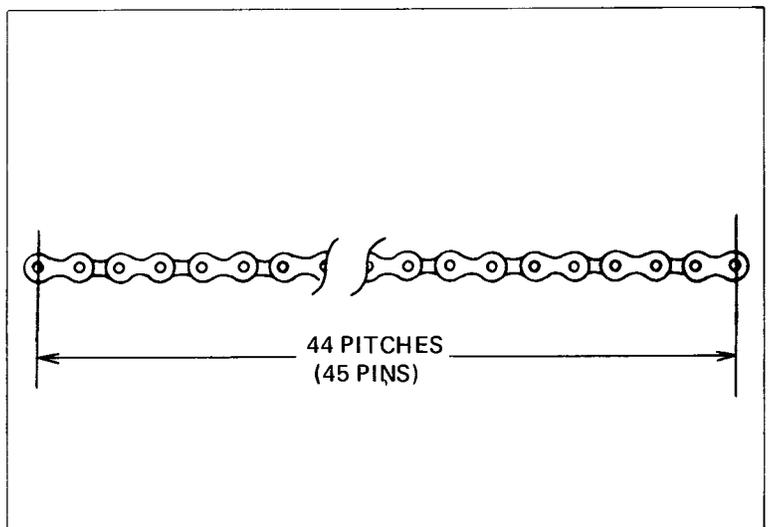
Inspect the drive chain and O-rings for possible wear or damage. Replace the chain, if it is worn excessively or damaged.

Measure the drive chain length with the chain held so that all links are straight.

**45 PINS LENGTH:**

**STANDARD: 698.5 mm (27.50 in)**

**SERVICE LIMIT: 705.5 mm (27.78 in)**



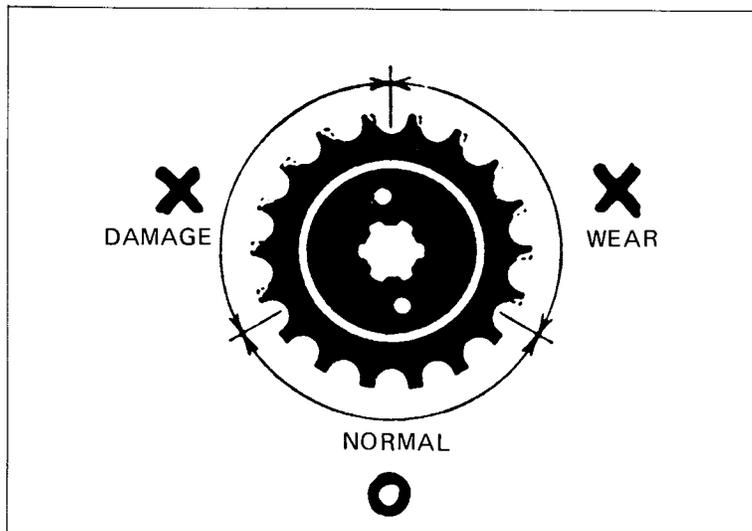
## MAINTENANCE

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.

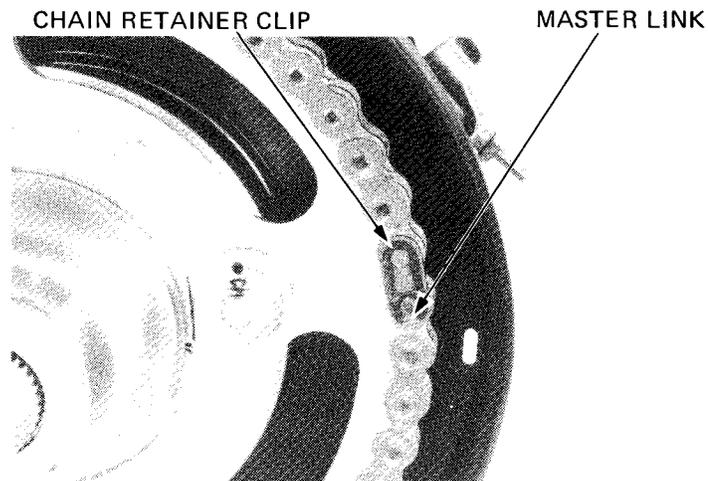
To remove the drive sprocket, remove the left crankcase cover.



Install the drive chain in the reverse order of removal noting the chain clip direction.

### CAUTION

- Do not assemble the drive chain without the four O-rings.
- Be sure that there is no space between the master link and chain retaining clip.



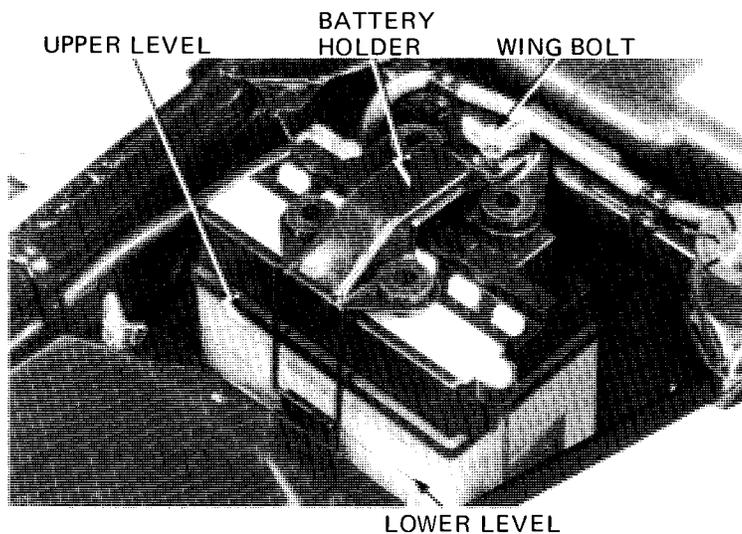
## BATTERY

Remove the seat by pulling the seat lever. Inspect the battery fluid level.

When the fluid level nears the lower level, remove the battery holder by loosening the wing bolt and refill with distilled water to the upper level.

### NOTE

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



**WARNING**

- The battery electrolyte contains sulfuric acid. Protect your eyes, skin and clothing. In case of contact, flush thoroughly with water and contact a doctor if electrolyte gets in your eyes.
- Batteries produce explosive gases. Keep sparks, flames and cigarettes away.

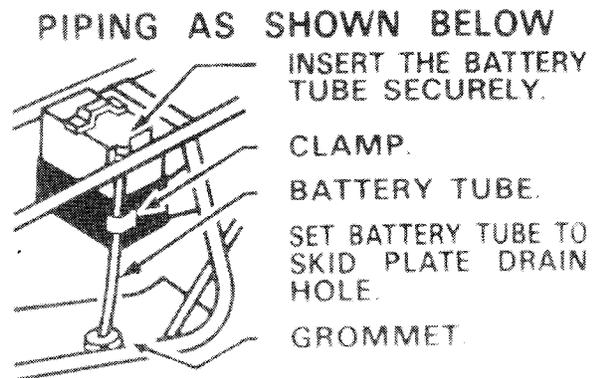
**CAUTION**

The battery breather tube must be routed as shown on the label attached on the tool box. Do not bend or twist the breather tube. A bent or kinked breather tube may pressurize the battery and damage its case causing electrolyte leakage.

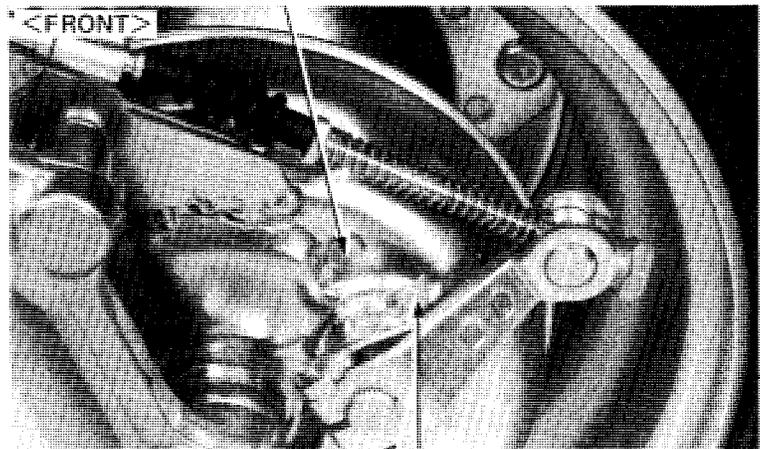
Replace the battery if sulphation forms or sediments (paste) accumulate on the bottom.

**BRAKE SHOES**

Replace the brake shoes if the indicator plate aligns with the brake panel index mark when the front brake lever, rear brake lever or pedal is applied.

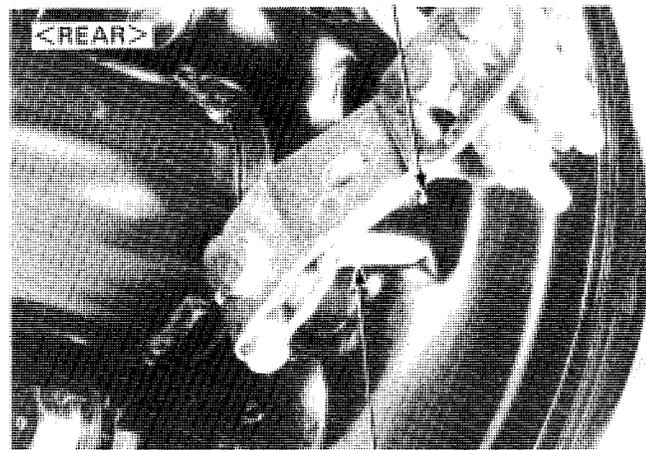


INDEX MARK



INDICATOR PLATE

INDEX MARK



INDICATOR PLATE

## MAINTENANCE

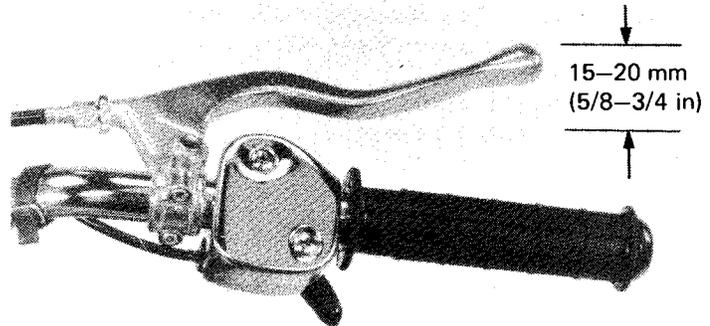
### FRONT BRAKE

Check the cable and brake lever for loose connections, excessive play, or other damage. Replace or repair if necessary.

Disconnect the brake cable at the upper end. Thoroughly lubricate the cable and pivot point with a commercially available cable lubricant to prevent premature wear.

Install the brake cable.

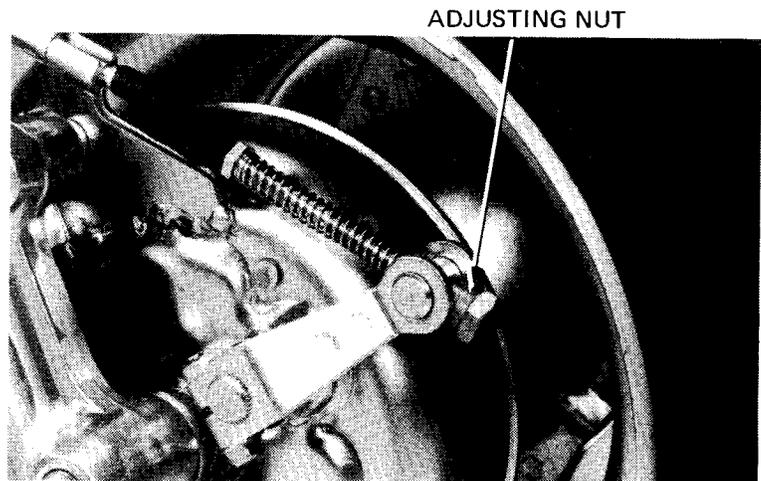
Make sure brake lever free play is 15–20 mm (5/8–3/4 in) at the brake lever tip.



Adjust free play by turning the adjusting nut.

#### NOTE

Make sure the cut-out of the adjusting nut is seated on the brake arm pin.



### REAR BRAKE

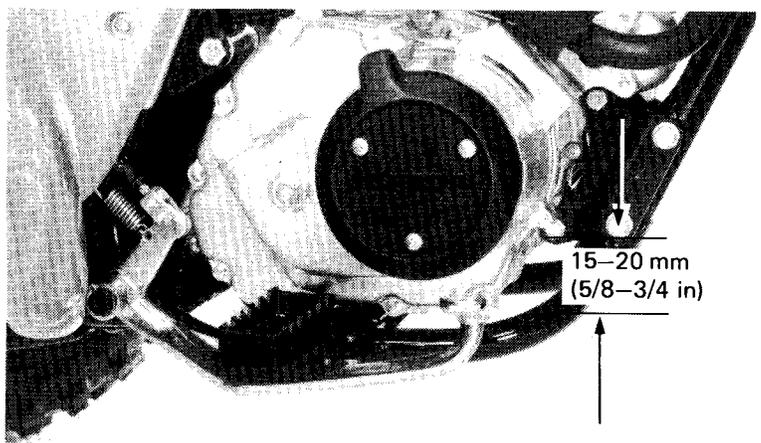
Check the cable, brake lever and brake pedal for loose connections, excessive play, or other damage. Replace or repair if necessary.

Disconnect the brake cables at the brake lever or pedal ends. Thoroughly lubricate the cables and their pivot points with a commercially available cable lubricant to prevent premature wear.

Install the cables.

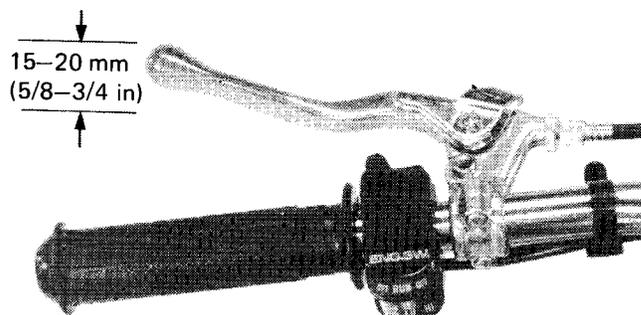
Measure the brake pedal free play at the end of the brake pedal.

**BRAKE PEDAL FREE PLAY:**  
15–20 mm (5/8–3/4 in)



Measure the rear brake lever (parking brake) free play at the end of the brake lever.

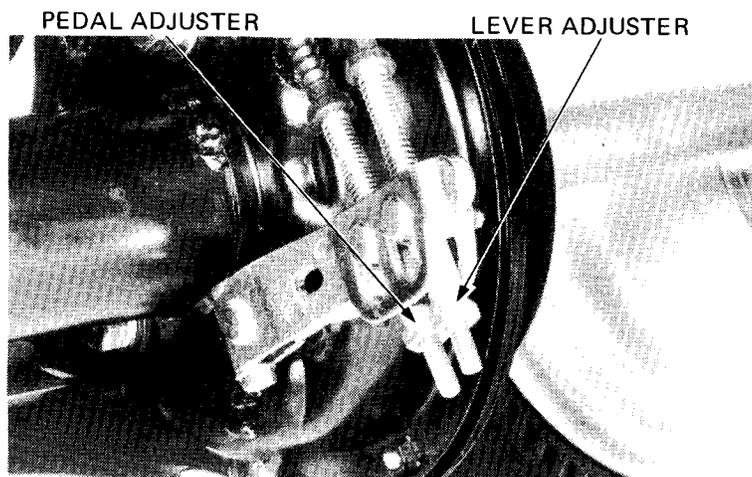
**REAR BRAKE LEVER FREE PLAY:**  
15–20 mm (5/8–3/4 in)



Adjust the lever and pedal free play by turning the adjusters at the lower end of the cables.

**NOTE**

Make sure the cut-out of each adjuster is seated on the brake arm pin.



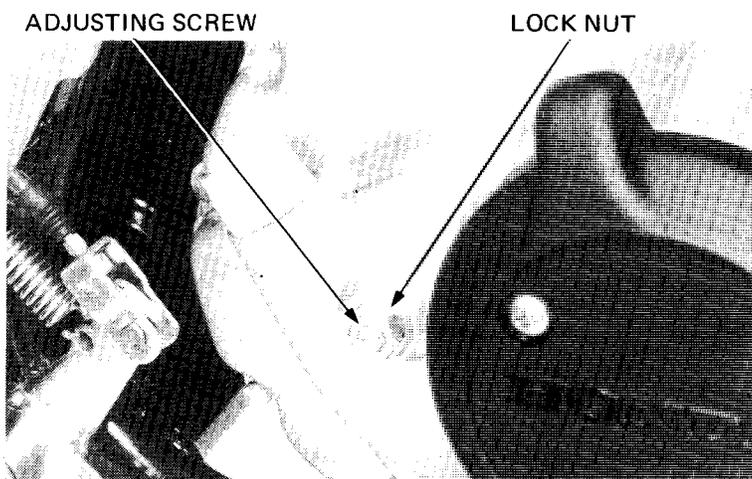
**CLUTCH**

Stop the engine.  
Loosen the clutch adjusting screw lock nut.

Slowly turn the adjusting screw counterclockwise until resistance is felt.

Then turn the adjusting screw clockwise 1/4 turn, and tighten the lock nut.

After adjustment, start the engine and check for proper clutch operation.



**MAINTENANCE**

**SPARK ARRESTER CLEANING**

**WARNING**

- *The exhaust system becomes very HOT even after short periods of engine operation.*
- *Perform this operation in a well-ventilated area, free from fire hazard.*
- *Use adequate eye protection.*

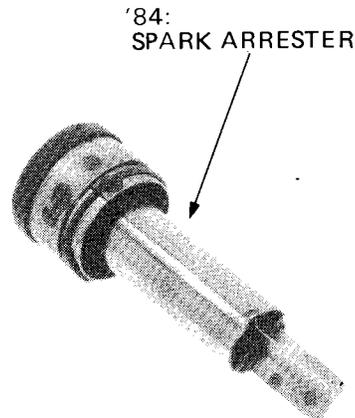
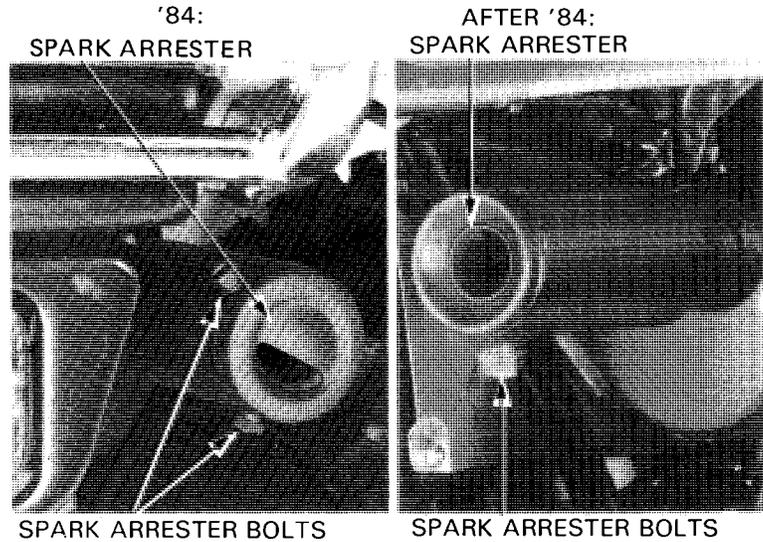
Remove the spark arrester bolt(s).

On '84 models, remove the spark arrester.

Start the engine and remove accumulated carbon from the exhaust system by momentarily revving up the engine several times. Stop the engine.

On '84 models, remove any accumulated carbon from the spark arrester and then install it in the muffler.

Install and tighten the spark arrester bolt(s) securely.



**NUTS, BOLTS, FASTENERS**

Tighten bolts, nuts and fasteners at regular intervals shown in the Maintenance Schedule (Page 3-3).

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

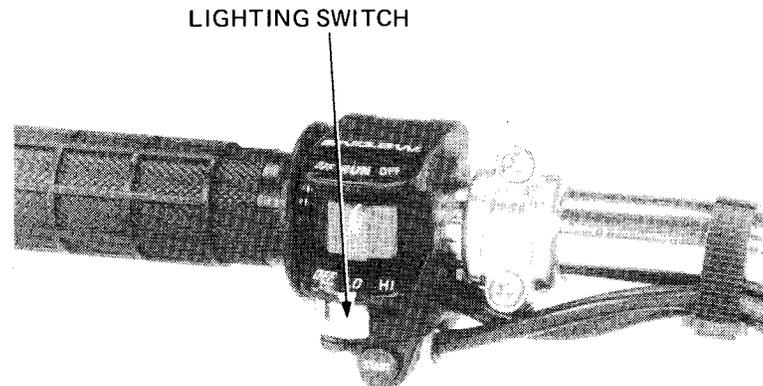
**LIGHTING EQUIPMENT**

Apply the parking brake lever.  
Start the engine.

Check the headlight and taillight by operating the lighting switch.

Position	Function
OFF	Headlights are OFF.
LO	Headlight low beam and taillight should be ON.
HI	Headlight high beam and taillight should be ON.

If the lights do not work properly, check the bulbs and refer to page 17-6 to test the switch if necessary.



## TIRES

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

### NOTE

Tire pressure should be checked when the tires are COLD.

Check the tire pressure.

### TIRE PRESSURES:

Recommended pressure:

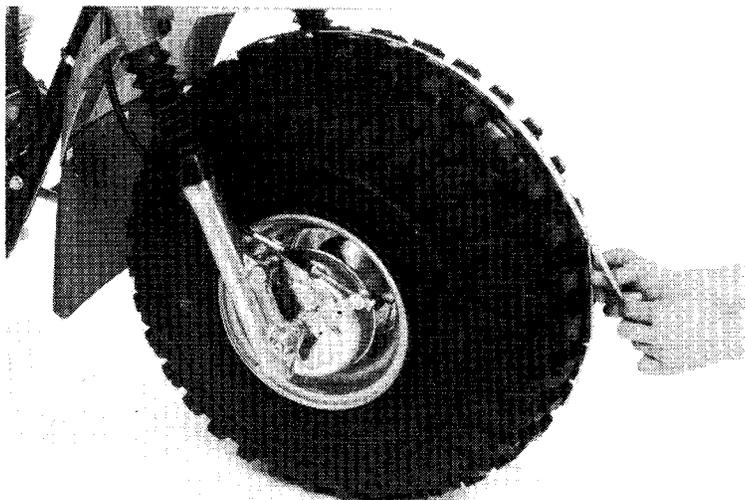
2.2 psi (0.15 kg/cm<sup>2</sup>, 15 kPa)

Minimum pressure: 1.7 psi (0.12 kg/cm<sup>2</sup>, 12 kPa)

### STANDARD TIRE CIRCUMFERENCE:

1,870 mm (73.6 in)

Maximum pressure: 3.6 psi (0.25 kg/cm<sup>2</sup>, 25 kPa)



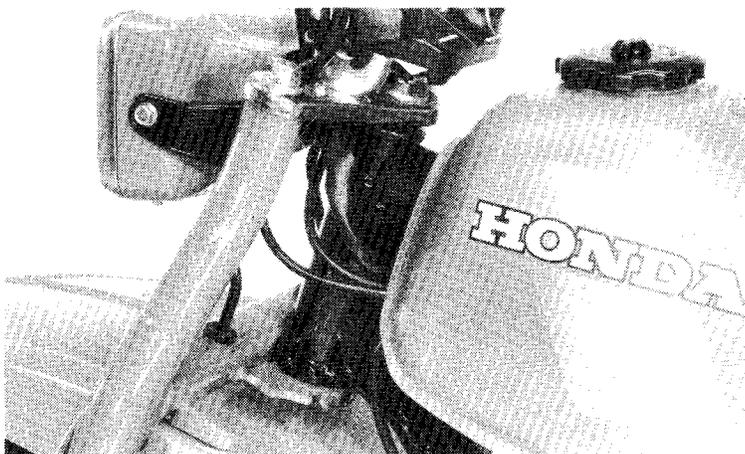
## STEERING HEAD BEARINGS

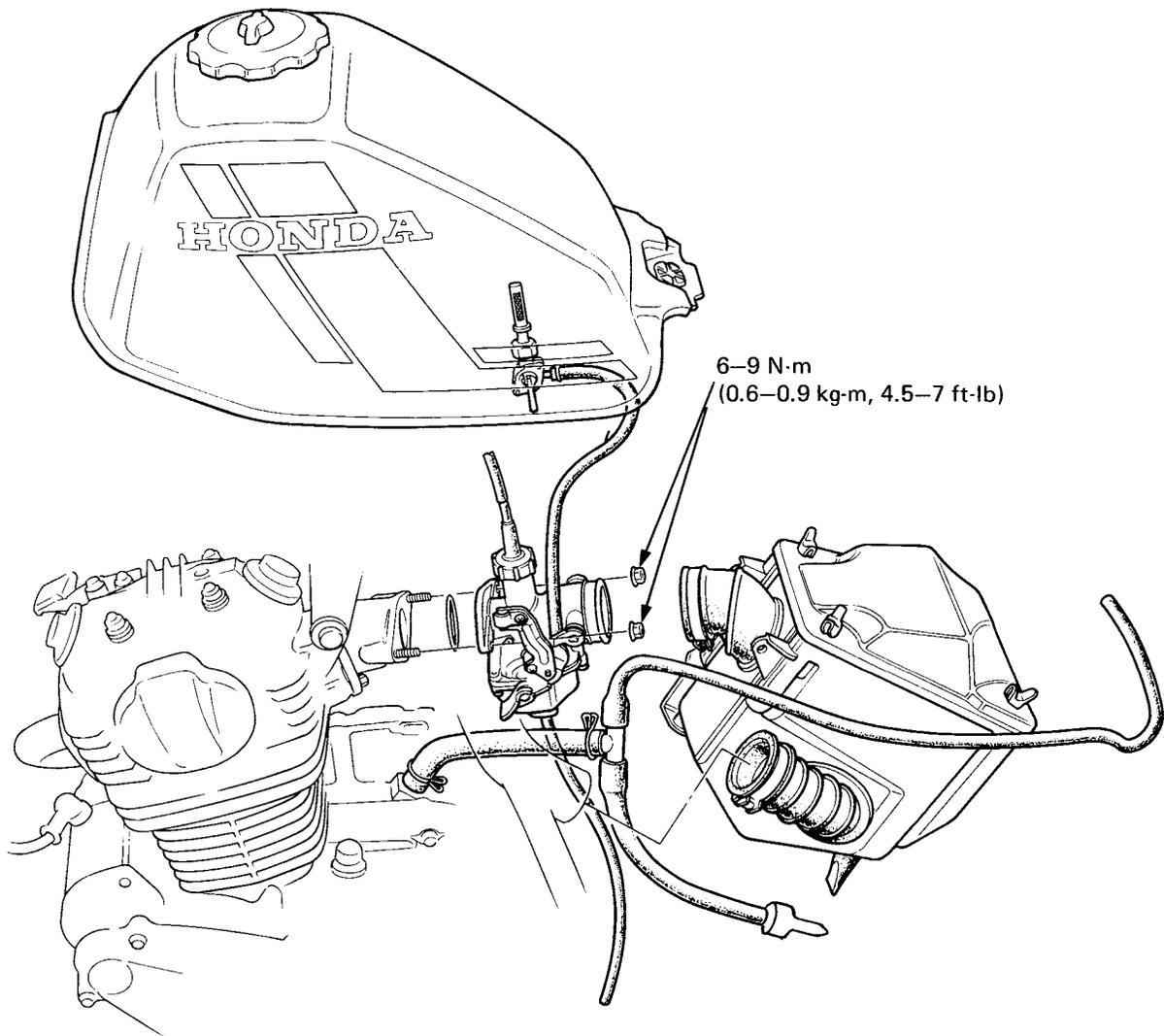
### NOTE

Make sure the cables do not interfere with the rotation of the handlebar.

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

If the handlebar moves unevenly, binds or has vertical movement, adjust the steering head bearing by turning the steering head adjusting nut with a pin spanner (Page 11–30).





# 4. FUEL SYSTEM

SERVICE INFORMATION	4-1
TROUBLESHOOTING	4-2
FUEL TANK	4-3
AIR CLEANER CASE	4-4
CRANKCASE BREATHER	4-5
THROTTLE VALVE DISASSEMBLY	4-6
CARBURETOR REMOVAL	4-7
FLOAT, FLOAT VALVE AND JETS	4-8
CARBURETOR ASSEMBLY	4-9
FLOAT LEVEL ADJUSTMENT	4-9
CARBURETOR INSTALLATION	4-10
THROTTLE VALVE ASSEMBLY	4-10
PILOT SCREW ADJUSTMENT	4-11
HIGH ALTITUDE ADJUSTMENT	4-11

## SERVICE INFORMATION

### GENERAL

- Use caution when working with gasoline. Always work in a well ventilated area away from sparks or flames.
- When disassembling fuel system parts, note the locations of the O-rings. Replace them with new O-rings during reassembly.
- The carburetor float bowl has a drain screw that can be loosened to drain gasoline.

### SPECIFICATIONS

Fuel tank capacity	'84:	11.5 liter 3.04 US gal, 2.53 Imp. gal)
	After '84:	10.5 liter (2.77 US gal, 2.31 Imp. gal)
Fuel reserve capacity		1.0 liter (0.26 US gal, 0.22 Imp. gal)
Carburetor		

	'84:	After'84:
Identification mark	PD55A	PD55C
Type	Piston valve	←
Venturi dia.	22 mm (0.9 in)	←
Float level	14 mm (0.55 in)	←
Pilot screw opening	2-1/8 turns out	←
Idle speed	1,400 ± 100 rpm	←
Main jet	#95	←
Throttle lever free play	5-10 mm (3/16-3/8 in)	←
Jet needle	3rd	←

### TOOL

Common	
Float level gauge:	07401-0010000

### 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 roughly, stalls, or runs poorly

1. Idle speed incorrect.
2. Ignition malfunction.
3. Rich mixture.
4. Lean mixture.
5. Air cleaner dirty.
6. Insulator leaks.

#### Lean mixture

1. Carburetor fuel jet 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. Carburetor choke stuck closed.
2. Float valve faulty.
3. Float level too high.
4. Carburetor air jet clogged.
5. Air cleaner dirty.

## FUEL TANK

Remove the seat.  
Turn the fuel valve OFF, and disconnect the fuel line. Remove the fuel tank.

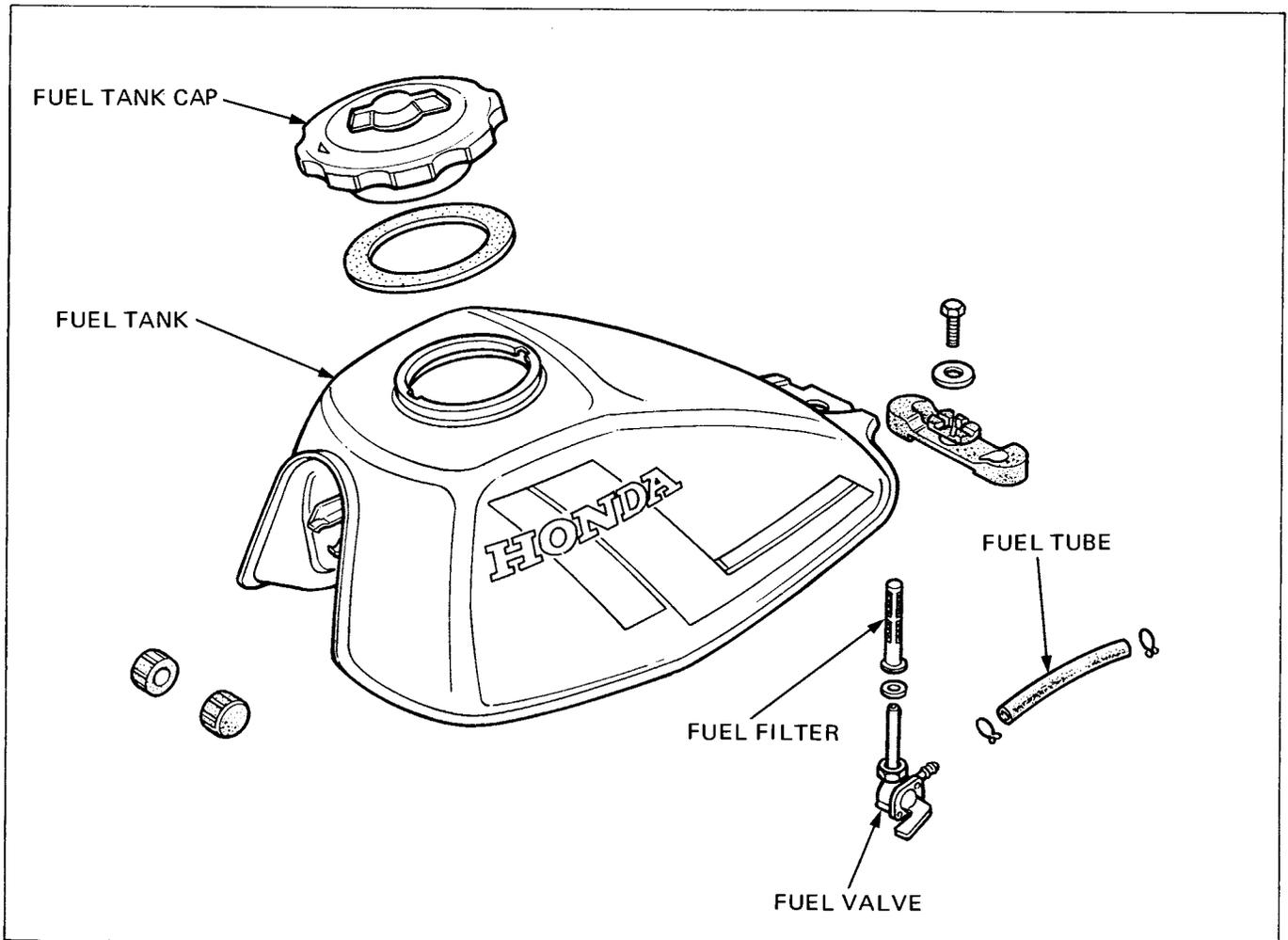
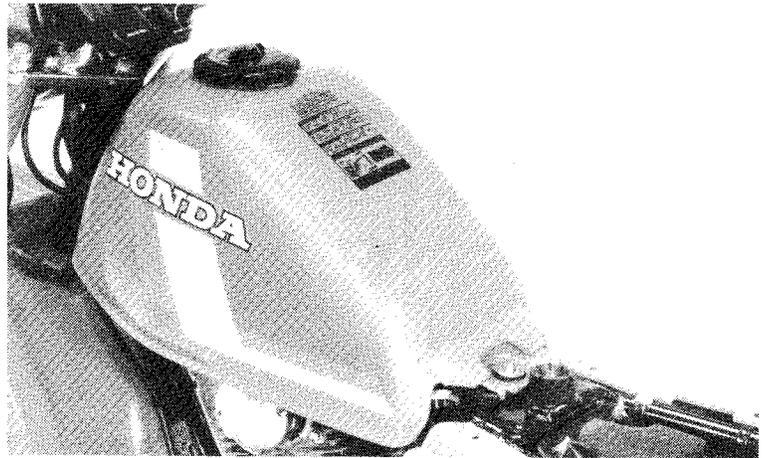
**WARNING**

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

Use a drain pan and check that fuel flows freely out of the fuel valve. If flow is restricted, clean the fuel filter (Page 3-6).  
Install the fuel tank and connect the fuel tube.  
Install the seat.

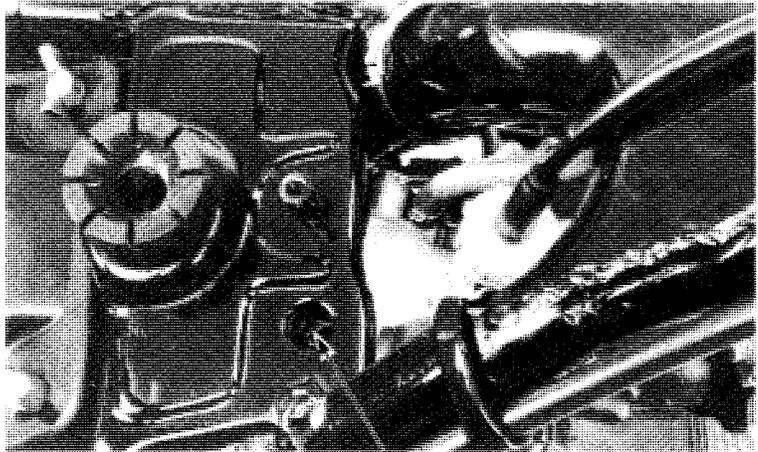
**NOTE**

- Be sure the front fuel tank brackets are on the rubber cushions.
- After assembly, make sure there are no fuel leaks.
- Do not overtighten the fuel valve lock nut.



## AIR CLEANER CASE

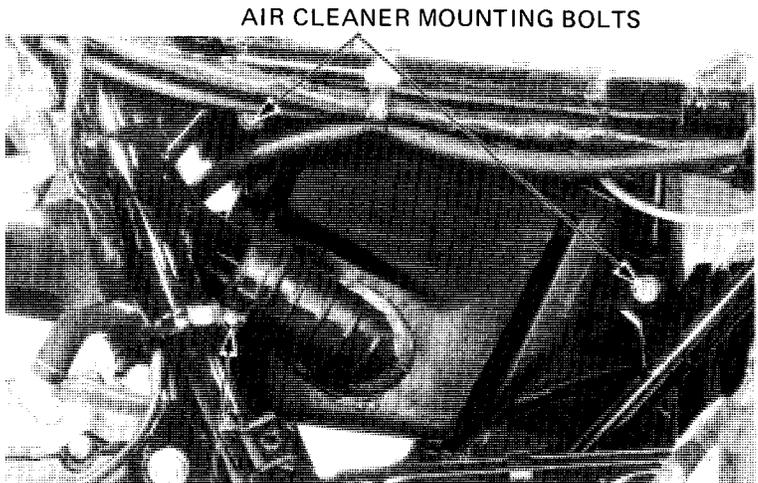
Remove the seat, fuel tank and rear fenders (Page 13-1).  
Loosen the air cleaner-to-carburetor connecting tube band.



AIR CLEANER-TO-CARBURETOR  
CONNECTING TUBE BAND

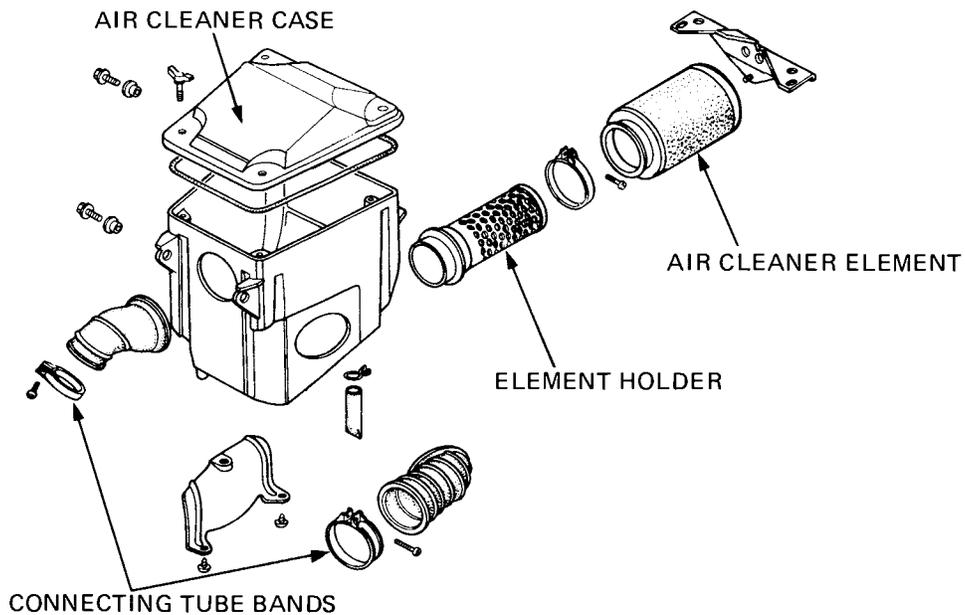
Loosen the air cleaner-to-frame connecting tube band.

Remove the two air cleaner mounting bolts and the air cleaner case.



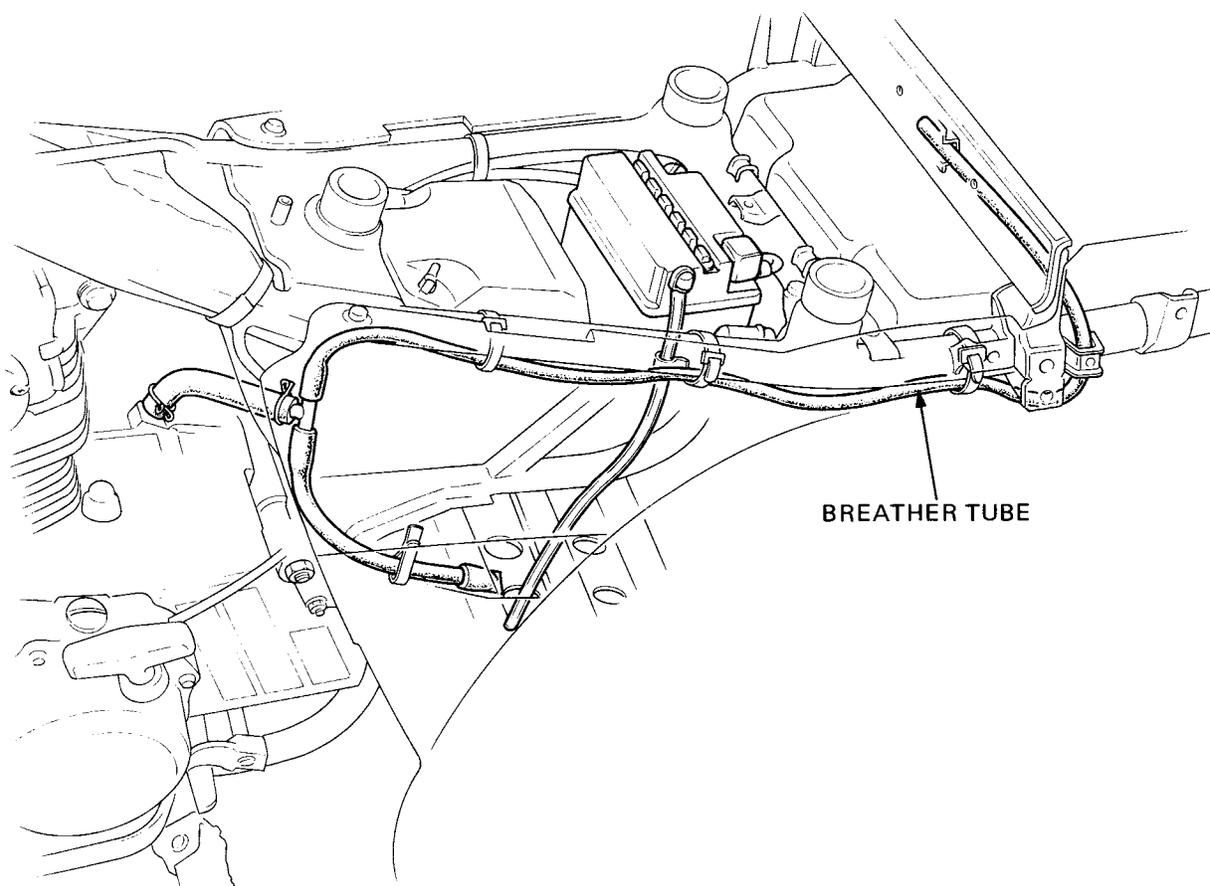
AIR CLEANER MOUNTING BOLTS

AIR CLEANER-TO-FRAME CONNECTING TUBE BAND



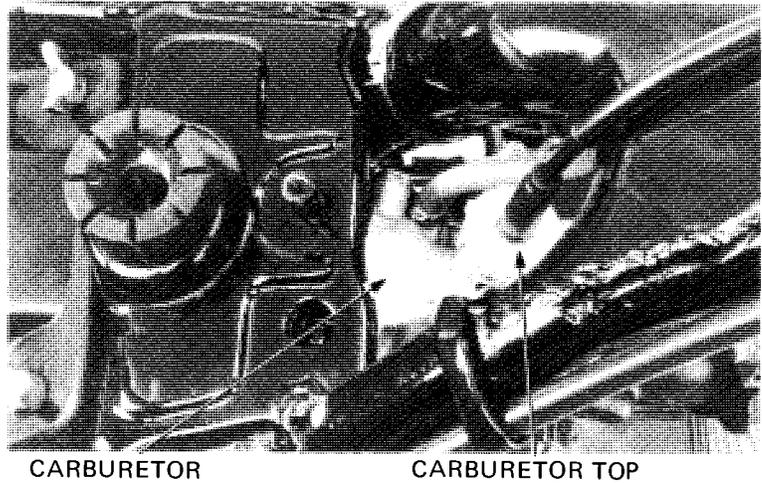
## CRANKCASE BREATHER

Route the crankcase breather tube as shown.

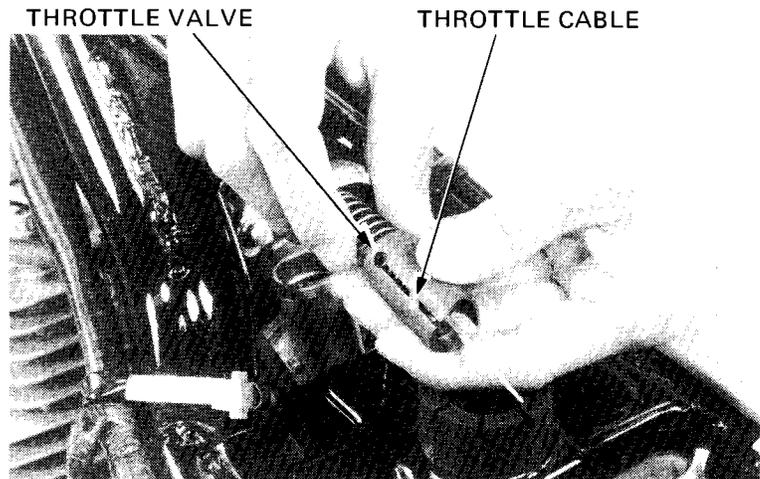


## THROTTLE VALVE DISASSEMBLY

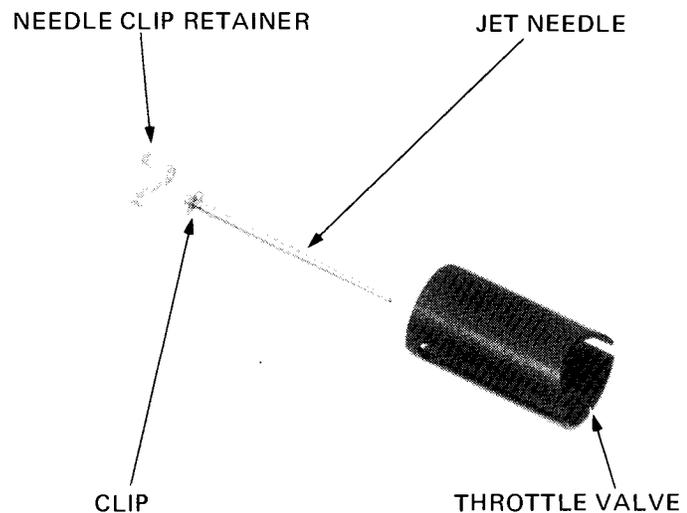
Remove the seat and fuel tank.  
Remove the carburetor top from the carburetor by loosening it.



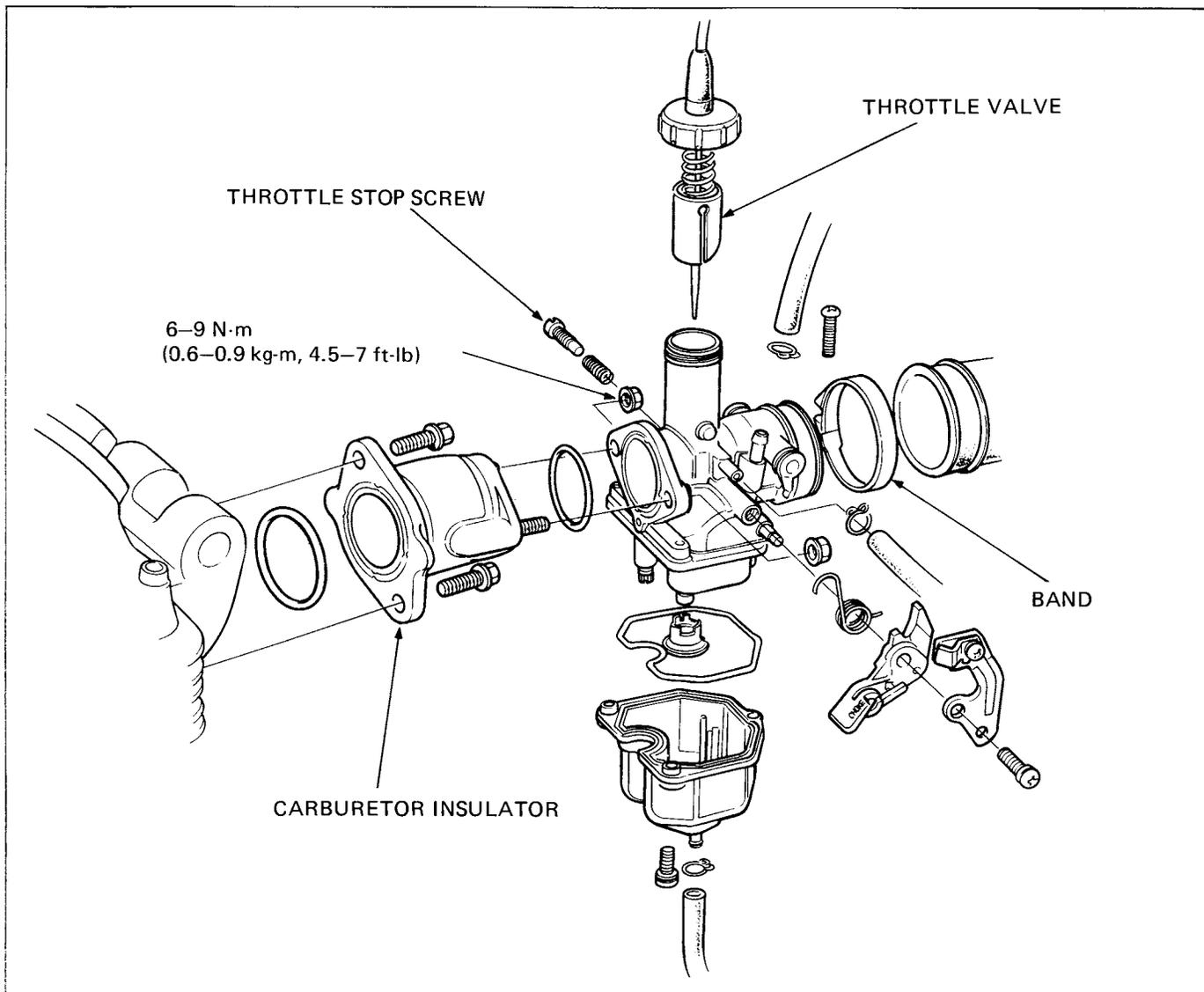
Remove the needle clip retainer, jet needle and needle clip. Inspect the throttle valve and jet needle surfaces for dirt, scratches or wear.



Remove the needle clip retainer, jet needle and needle clip. Inspect the throttle valve and jet needle surfaces for dirt, scratches or wear.



## CARBURETOR REMOVAL

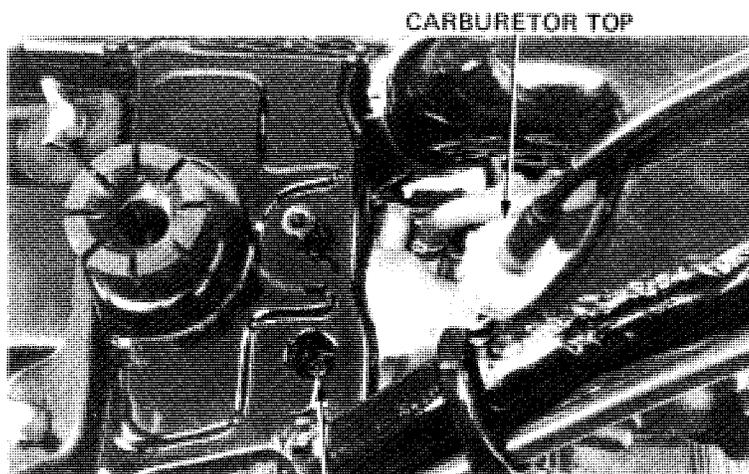


Remove the seat.  
Turn the fuel valve OFF and disconnect the fuel line.

Remove the fuel tank.  
Loosen the carburetor drain screw and drain the gasoline.

Unscrew the carburetor top and pull the throttle valve out.

Loosen the screw securing the carburetor band with a screw driver through the hole in the frame.

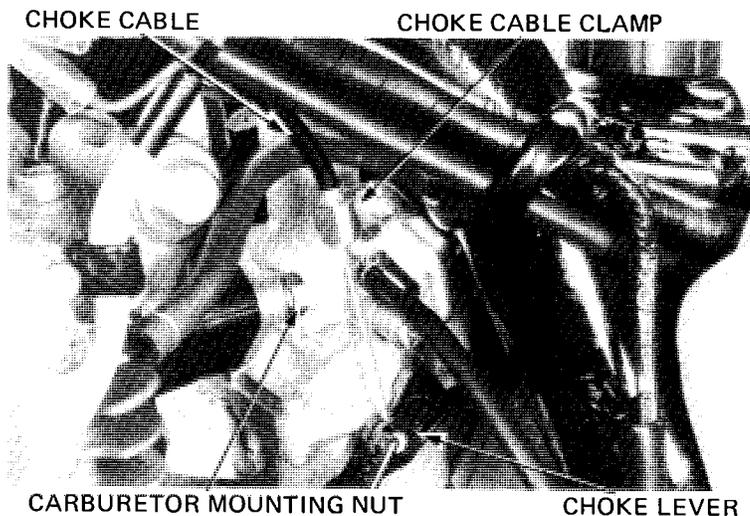


CARBURETOR BAND SCREW

## FUEL SYSTEM

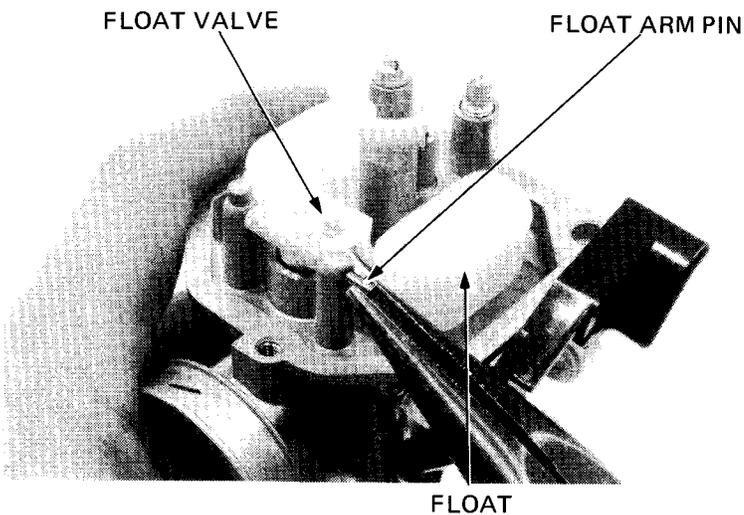
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Loosen the choke cable clamp screw and disconnect the choke cable from the carburetor.  
Remove the two carburetor mounting nuts and the carburetor.



## FLOAT, FLOAT VALVE AND JETS

Remove the float chamber body.  
Remove the float arm pin with pliers.  
Remove the float and float valve.



Inspect the float valve and seat for wear or damage.  
Replace them as a set if wear or damage can be seen.



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

Then remove the slow jet.

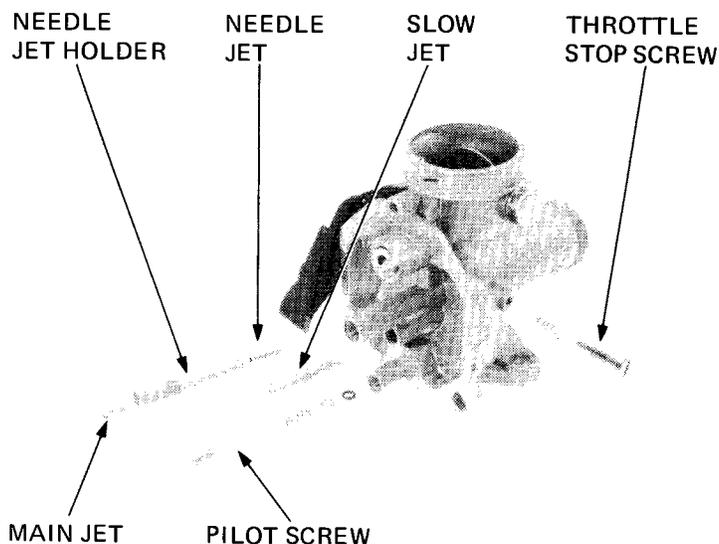
Before removing the pilot screw, record the number of turns in before the screw seats lightly. The pilot screw can then be returned to its original position, during reassembly without performing pilot screw adjustment.

Remove the pilot screw.

Blow open all jets and body openings with compressed air.

Inspect the pilot screw, needle jet, needle jet holder and main jet for wear or damage.

Replace any parts that show wear or damage.

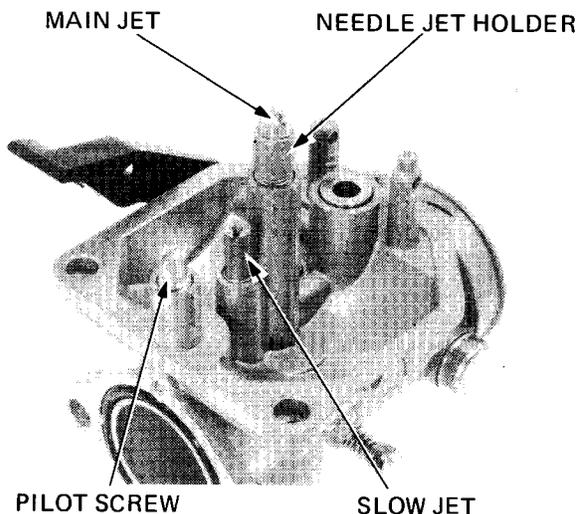


## CARBURETOR ASSEMBLY

Carburetor assembly is essentially the reverse order of disassembly.

### NOTE

- Use new O-rings whenever the carburetor is reassembled.
- Handle all jets and needles with care. They can easily be scored or scratched.
- Set the pilot screw to the position recorded during disassembly.

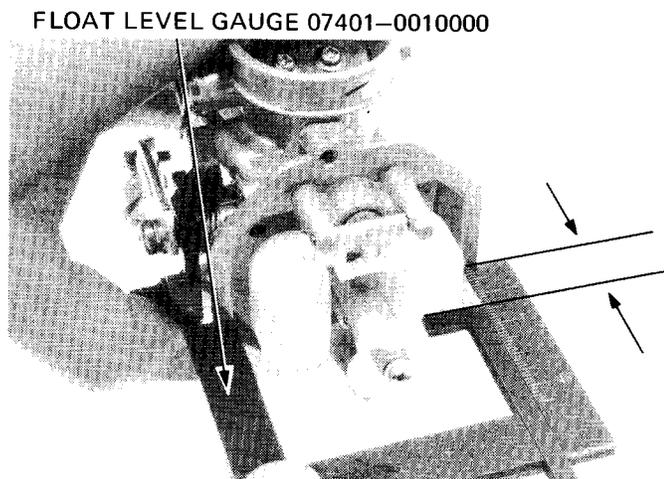


## FLOAT LEVEL ADJUSTMENT

Measure the float level with a float level gauge as shown.

**FLOAT LEVEL: 14 mm (0.55 in)**

To adjust the float level, bend the float arm carefully until the float tip just contacts the float valve.



## CARBURETOR INSTALLATION

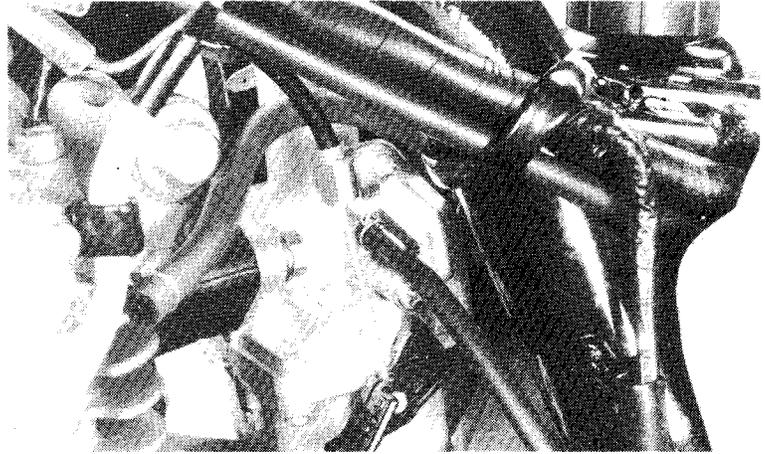
Carburetor installation is essentially the reverse of removal.

### NOTE

After installing the carburetor, perform the following adjustments:

Throttle lever free play (Page 3–7).

Carburetor pilot screw adjustment (Page 4–11) if the carburetor was overhauled.



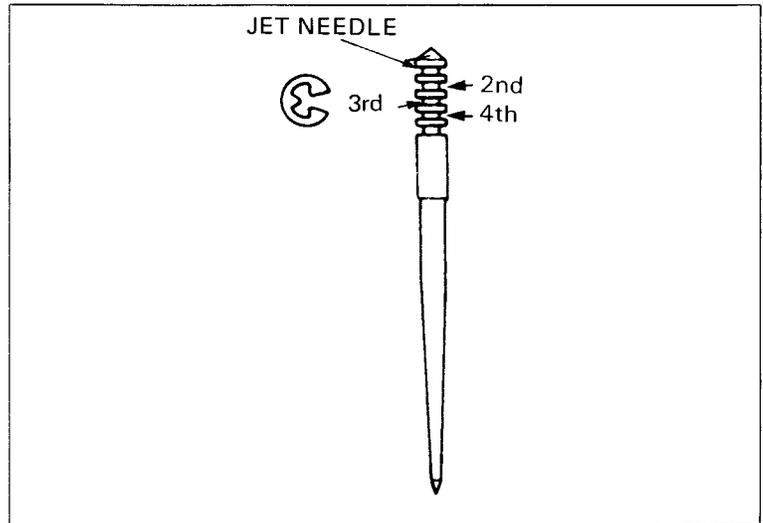
## THROTTLE VALVE ASSEMBLY

Install the needle clip on the jet needle.

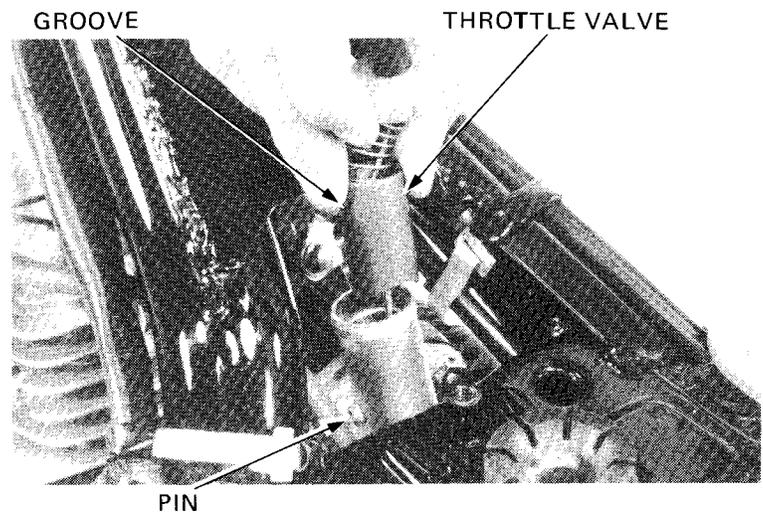
**STANDARD SETTING: 3rd groove**

Install the jet needle into the throttle valve and secure it with the needle clip retainer.

Install the throttle cable and spring into the throttle valve.



Install the throttle valve into the carburetor body aligning the groove on the valve with the pin in the carburetor.



## PILOT SCREW ADJUSTMENT

### NOTE

The pilot screw is factory pre-set. Adjustment is not necessary unless the carburetor is overhauled or a new pilot screw installed.

### CAUTION

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

Turn the pilot screw clockwise until it seats lightly and back it out 2-1/8.

This is an initial setting prior to the final pilot screw adjustment.

Warm the engine up to operating temperature.

Stop the engine and connect a tachometer.

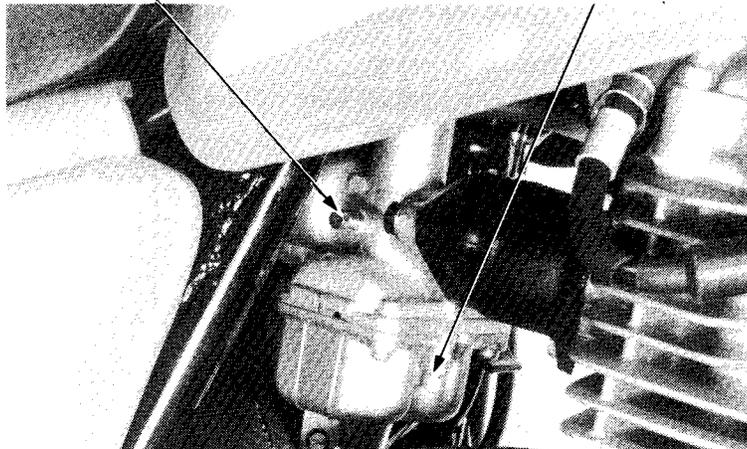
Start the engine and adjust the idle speed with the throttle stop screw.

### IDLE SPEED: 1,400 ± 100 rpm

Turn the pilot screw clockwise slowly until the engine stops, and then back it out 1 turn. Start the engine and readjust the idle speed with the throttle stop screw, if necessary.

THROTTLE STOP SCREW

PILOT SCREW



### SPECIFICATIONS

	Below 6,000 ft (1,800 m)	Above 5,000 ft (1,500 m)
Main jet	No. 95	No. 90
Jet needle	3rd groove	2nd groove

## HIGH ALTITUDE ADJUSTMENT

The carburetor must be adjusted for high altitude riding (above 6,000 ft/1,800 m).

**STANDARD SETTING: 6,000 ft (1,800 m) max.**

**HIGH ALTITUDE SETTING:**

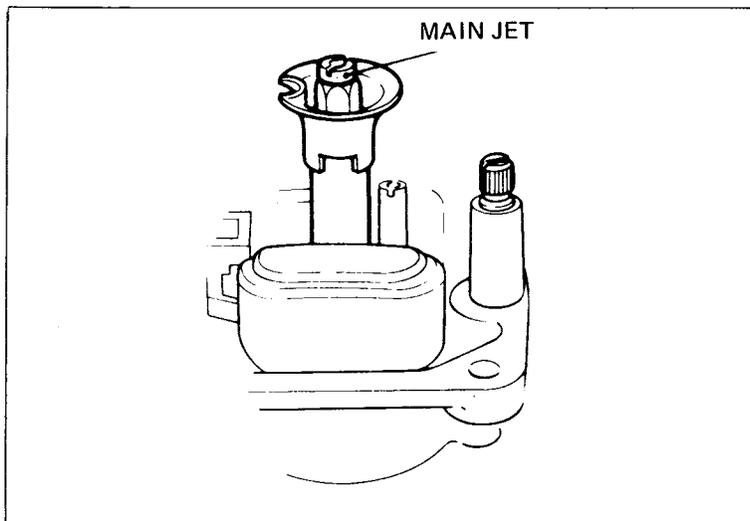
**5,000 ft (1,500 m) min.**

High altitude carburetor adjustment is performed as follows:

Remove and disassemble the carburetor (Page 4-7 and 4-8).

Replace the standard main jet with the high altitude type (#90).

MAIN JET



## FUEL SYSTEM

---

Remove the throttle valve and remove the jet needle (Page 4-6).

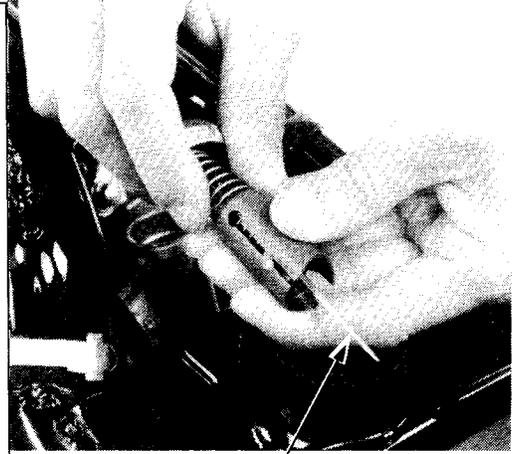
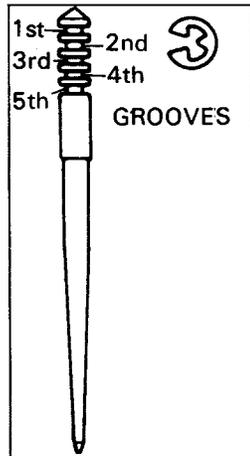
Change the jet needle clip position from the 3rd groove (standard) to the 2nd groove.

Install the jet needle and install the throttle valve.

Assemble and install the carburetor.  
Start the engine and adjust the idle speed at high altitude to ensure proper high altitude operation.

### CAUTION

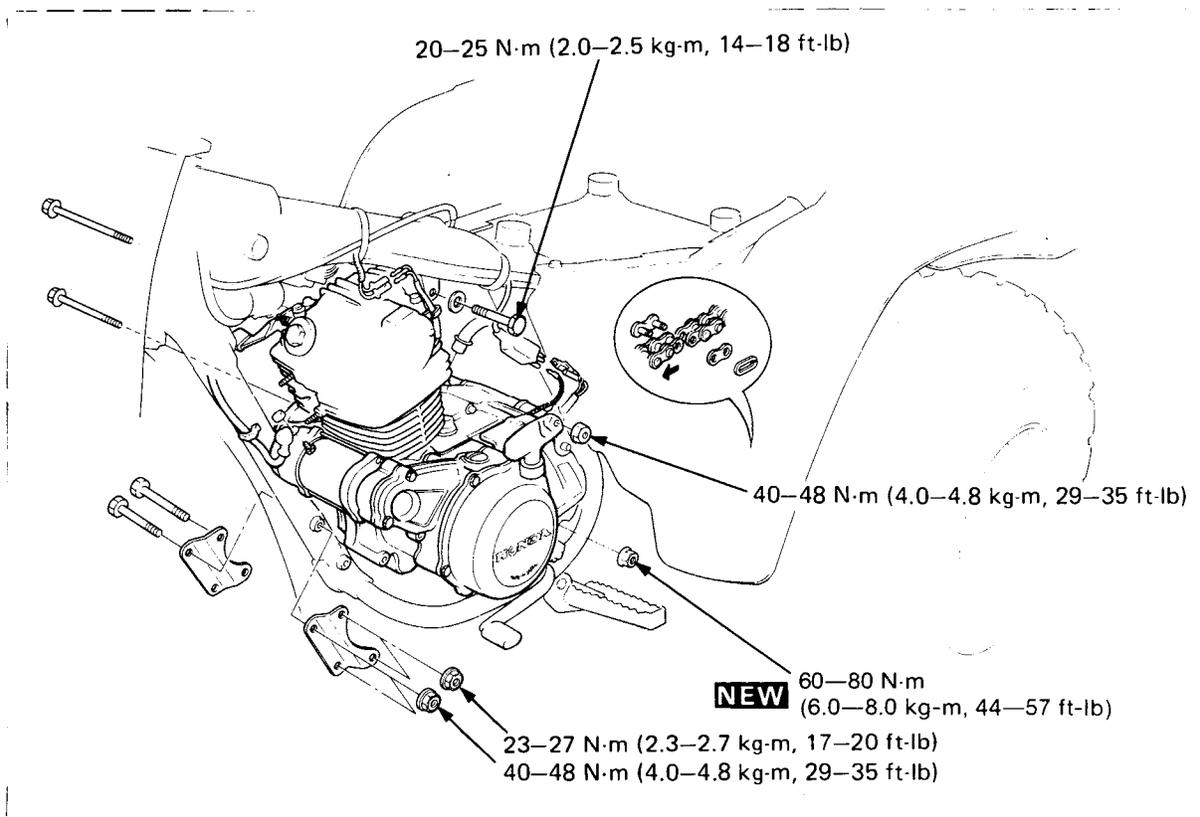
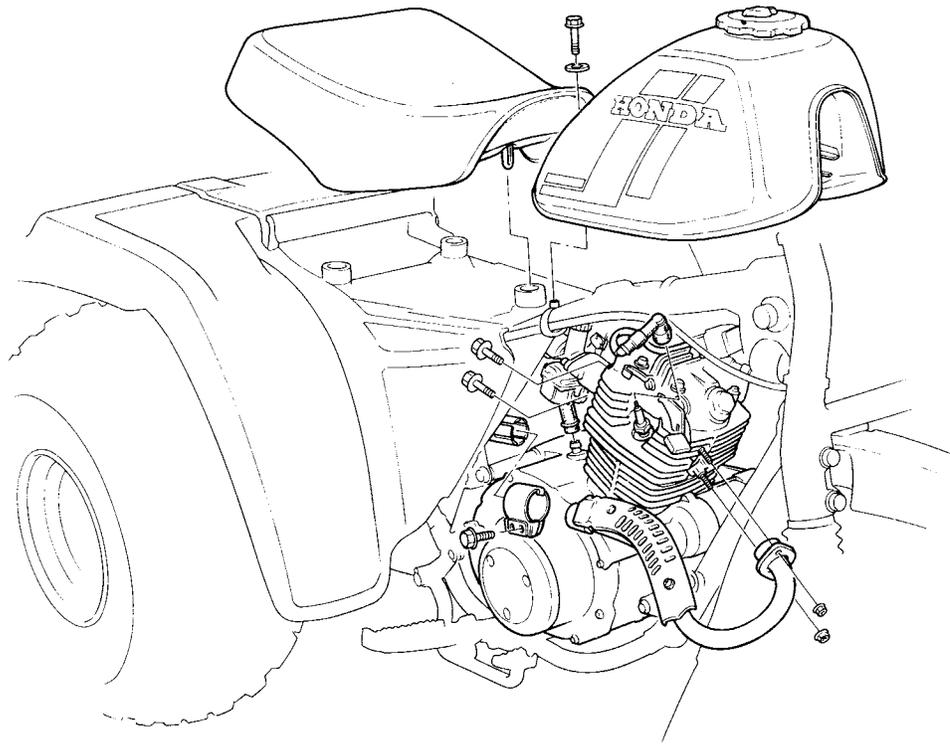
*Sustained operation below 5,000 feet (1,500 m) with the high altitude settings may cause engine overheating and engine damage. Install the #95 main jet, return the jet needle clip position to the 3rd groove. When riding below 5,000 feet (1,500 m).*



JET NEEDLE

---

MEMO



# 5. ENGINE REMOVAL/ INSTALLATION

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

## SERVICE INFORMATION

### GENERAL

This section covers removal and installation of the engine.

Operations requiring engine removal:

- Cylinder head Section 6
- Cylinder and piston Section 7
- Crankshaft, transmission Section 9

Upon reassembly, make sure that no exhaust gas leaks past the exhaust pipe connection.

### SPECIFICATIONS

Engine dry weight (except carburetor)	33.5 kg (73.9 lbs)
Engine oil capacity	1.5 lit (1.59 US qt, 1.32 Imp qt) after disassembly 1.3 lit (1.37 US qt, 1.14 Imp qt) after draining

### TORQUE VALUES

Upper engine hanger nut	20–25 N·m (2.0–2.5 kg-m, 14–18 ft-lb)
Front engine hanger, 8 mm nut	23–27 N·m (2.3–2.7 kg-m, 17–20 ft-lb)
10 mm nut	40–48 N·m (4.0–4.8 kg-m, 29–35 ft-lb)
Lower, 10 mm nut	<b>NEW</b> 60–80 N·m (6.0–8.0 kg-m, 44–57 ft-lb)
Rear engine hanger upper, 10 mm nut	40–48 N·m (4.0–4.8 kg-m, 29–35 ft-lb)
Carburetor mounting nut	6–9 N·m (0.6–0.9 kg-m, 4.5–7 ft-lb)
Rear axle bearing holder bolt	50–70 N·m (5.0–7.0 kg-m, 36–51 ft-lb)

## ENGINE REMOVAL/INSTALLATION

### ENGINE REMOVAL

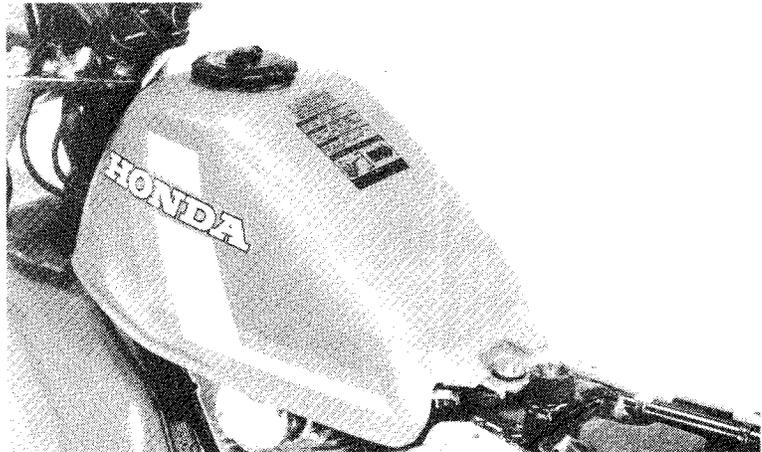
Drain the oil from the engine (Page 2-2).

Remove the seat.

Turn the fuel valve OFF, disconnect the fuel tube and remove the fuel tank (Page 4-3).

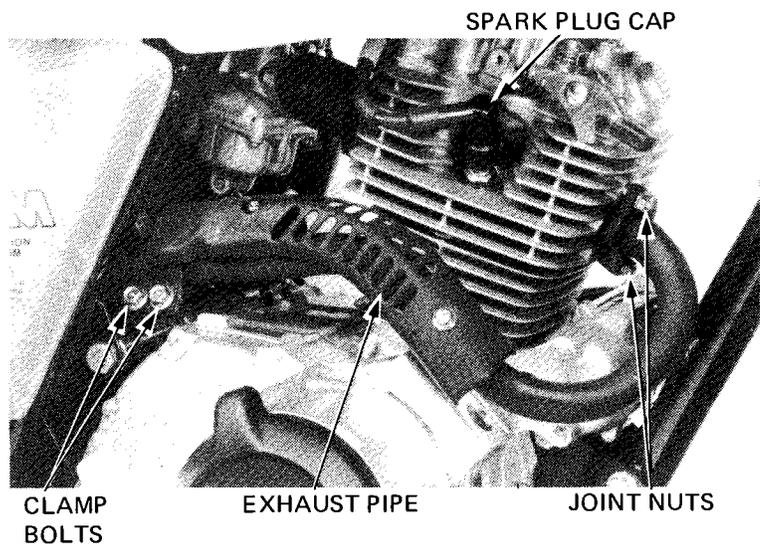
Shift the transmission to neutral.

Disconnect the battery negative cable at the battery.



Disconnect the spark plug cap.

Remove the exhaust pipe (Page 13-3).

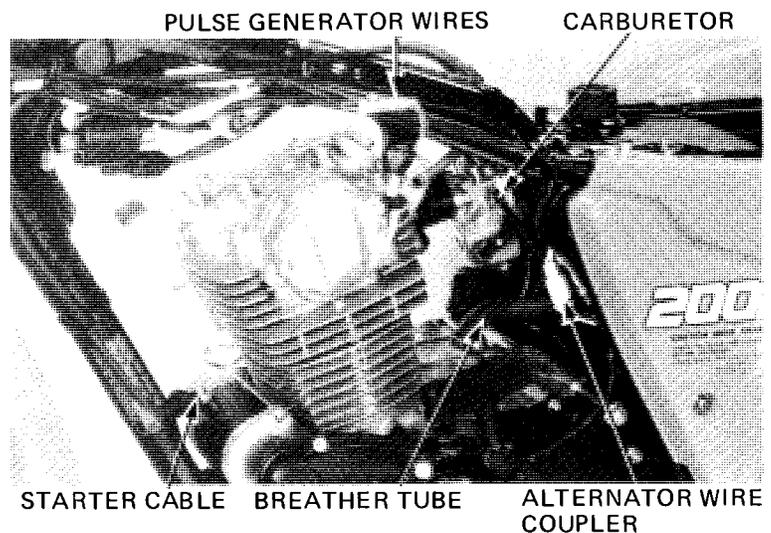


Disconnect the crankcase breather tube from the crankcase.

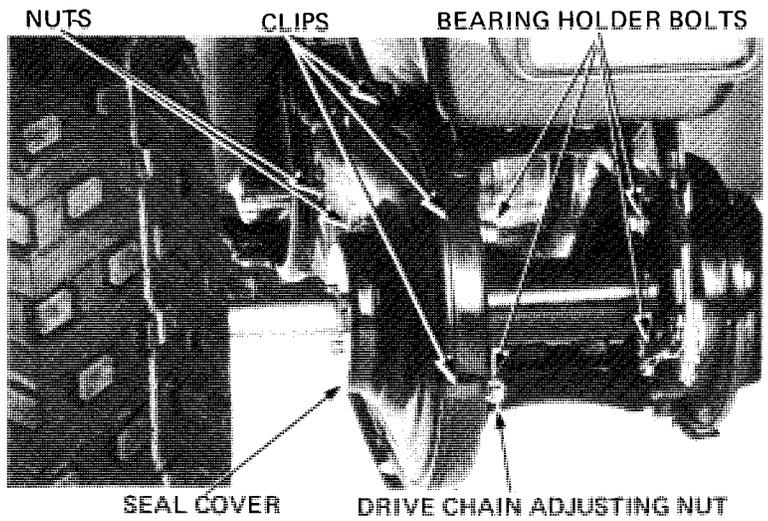
Disconnect the alternator coupler, pulse generator wires and starter cable.

Remove the carburetor (Page 4-6).

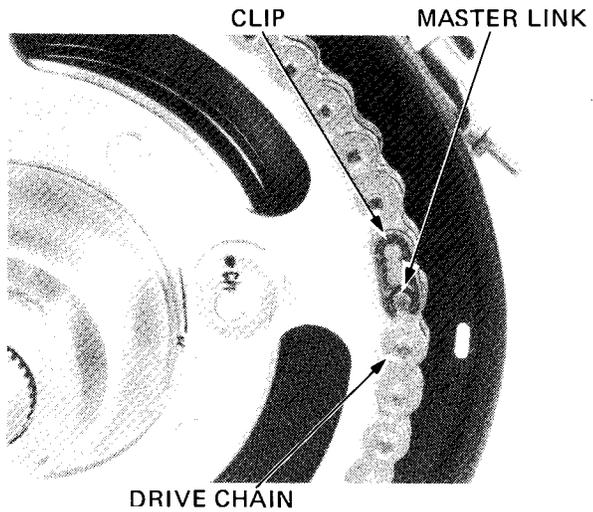
Disconnect the starter motor cable at the starter motor.



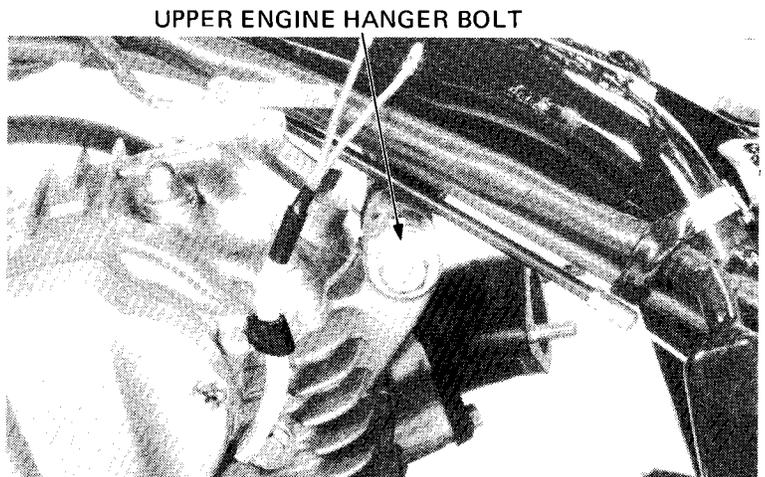
Remove the three bolts attaching the seal cover to the drive chain cover and the seal cover.  
Remove the drive chain cover clips and two bolts and remove the drive chain cover.  
Loosen the rear wheel bearing holder attaching bolts and drive chain adjusting nut.



Remove the drive chain master link clip, master link and drive chain.



Remove the upper engine hanger bolt.

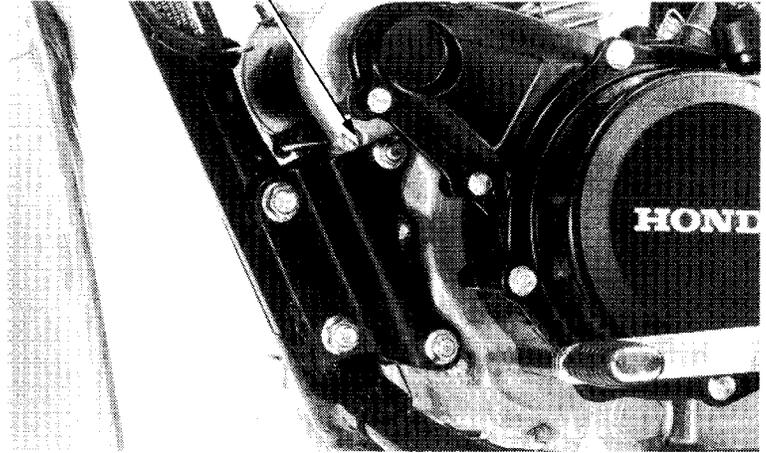


## ENGINE REMOVAL/INSTALLATION

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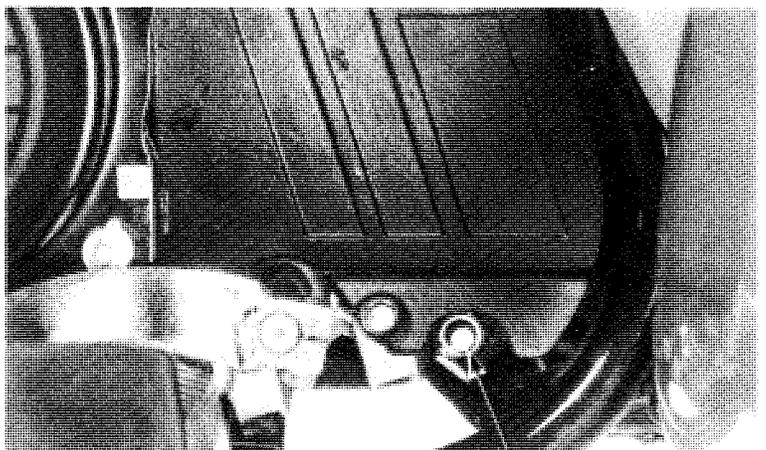
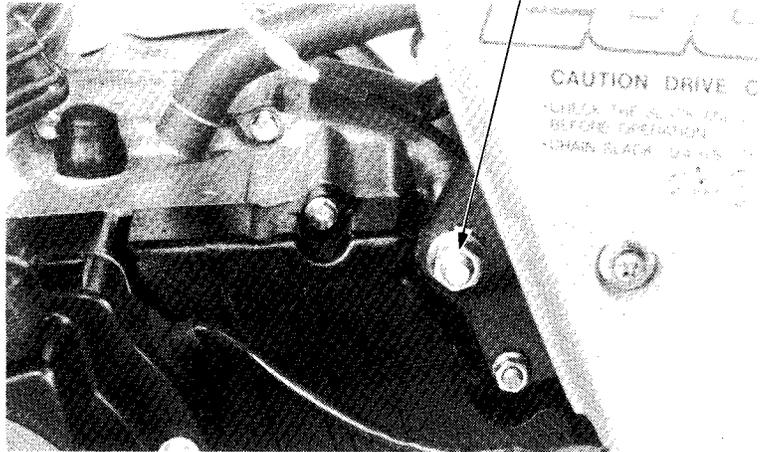
Remove the front engine hanger bolts and plates.

FRONT ENGINE HANGER PLATE



Remove the rear engine hanger bolts.  
Remove the engine from the left side of the frame.

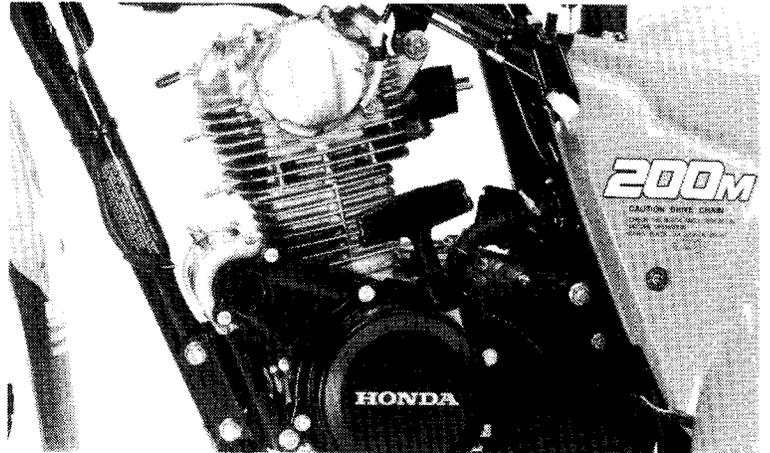
REAR ENGINE HANGER BOLT



REAR ENGINE HANGER BOLT

## ENGINE INSTALLATION

Install the engine in the reverse order of removal.



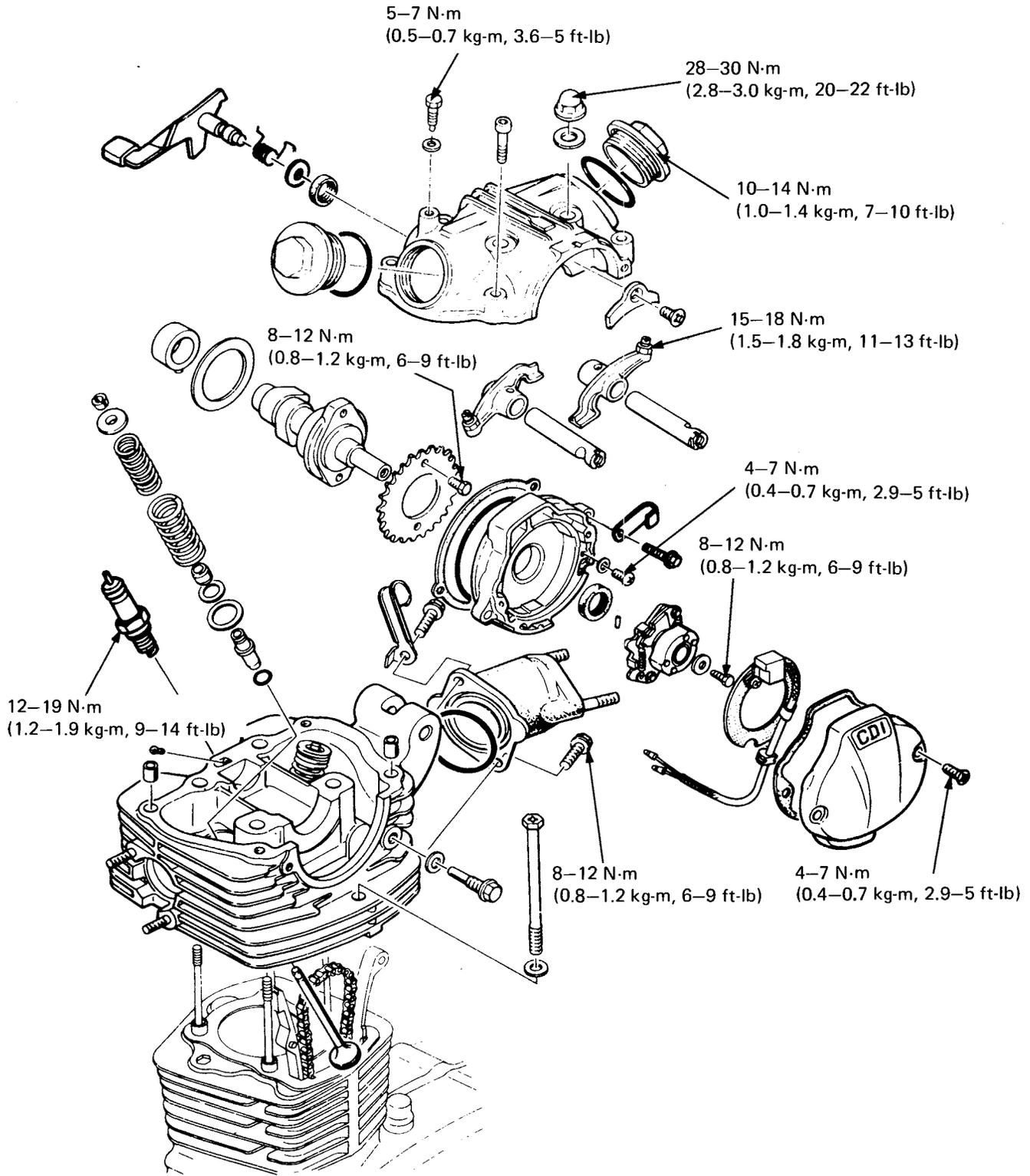
### TORQUE:

- Upper engine hanger nut  
20–25 N·m (2.0–2.5 kg-m, 14–18 ft-lb)
- Front engine hanger, 8 mm nut  
23–27 N·m (2.3–2.7 kg-m, 17–20 ft-lb)
- Front engine hanger, 10 mm nut  
40–48 N·m (4.0–4.8 kg-m, 29–35 ft-lb)
- Lower, 10 mm nut  
**NEW** 60–80 N·m (6.0–8.0 kg-m, 44–57 ft-lb)
- Rear engine hanger upper, 10 mm nut  
40–48 N·m (4.0–4.8 kg-m, 29–35 ft-lb)
- Carburetor mounting nut  
6–9 N·m (0.6–0.9 kg-m, 4.5–7 ft-lb)
- Rear axle bearing holder bolt  
50–70 N·m (5.0–7.0 kg-m, 36–51 ft-lb)

### NOTE

After installing the engine, perform the following inspections and adjustments:

- Engine oil level (Page 2–2)
- Throttle lever free play (Page 3–7)
- Drive chain slack (Page 3–9)
- Check that exhaust gas is not leaking past the exhaust pipe connection.
- Check the performance of the electrical equipment.



# 6. CYLINDER HEAD/ VALVES

SERVICE INFORMATION	6-1	CYLINDER HEAD DISASSEMBLY	6-8
TROUBLESHOOTING	6-2	VALVE SEAT INSPECTION/REFACING	6-11
CAMSHAFT REMOVAL	6-3	CYLINDER HEAD ASSEMBLY	6-13
CYLINDER HEAD COVER REMOVAL	6-5	CYLINDER HEAD INSTALLATION	6-14
CYLINDER HEAD REMOVAL	6-7	CAMSHAFT INSTALLATION	6-17

## SERVICE INFORMATION

### GENERAL

- This Section covers cylinder head, valves, camshaft and rocker arm maintenance.
- The engine must be removed from the frame to service the cylinder head and valves. To remove the cylinder head cover or the rocker arms, engine removal is not required.
- Camshaft lubrication oil is fed to the cylinder head through an oil control orifice in the engine case. Be sure this orifice is not clogged and that the O-rings and dowel pins are in place before installing the cylinder head.
- Before assembly, apply molybdenum disulfide grease to the camshaft bearings to provide initial lubrication.
- Pour clean engine oil into the oil pockets in the cylinder head during assembly to lubricate the camshaft lobes.

### SPECIFICATIONS

ITEM		STANDARD		SERVICE LIMIT
Cylinder compression		11.0 ± 1.0 kg/cm <sup>2</sup> (159 ± 14 psi)		—————
Camshaft	Cam lift	IN	31.379 mm (1.2354 in)	31.199 mm (1.2283 in)
		EX	30.978 mm (1.2196 in)	30.798 mm (1.2125 in)
	Journal OD	R	19.967–19.980 mm (0.7861–0.7866 in)	19.90 mm (0.783 in)
		L	33.957–33.970 mm (1.3370–1.3376 in)	33.90 mm (1.335 in)
Cylinder head	Bearing ID	L	33.980–34.075 mm (1.3378–1.3415 in)	34.05 mm (1.341 in)
	Warpage	—————		0.10 mm (0.004 in)
Camshaft bushing	ID	20.005–20.026 mm (0.7876–0.7884 in)		20.05 mm (0.789 in)
Rocker arm	ID	12.000–12.018 mm (0.4724–0.4730 in)		12.05 mm (0.474 in)
Rocker arm shaft	OD	11.977–11.995 mm (0.4715–0.4722 in)		11.93 mm (0.470 in)
Rocker arm-to-shaft clearance		0.005–0.041 mm (0.0002–0.0016 in)		0.08 mm (0.003 in)
Valve spring	Free length	Inner	39.4 mm (1.55 in)	35.5 mm (1.40 in)
		Outer	45.5 mm (1.79 in)	41.0 mm (1.61 in)
	Preload	Inner	83.0 ± 0.6 kg/33.7 mm (18.3 ± 1.3 lb/1.33 in)	—————
		Outer	21.0 ± 1.5 kg/38.4 mm (46.3 ± 3.3 lb/1.51 in)	—————
Valve, valve guide	Stem OD	IN	5.450–5.465 mm (0.2146–0.2152 in)	5.42 mm (0.213 in)
		EX	5.430–5.445 mm (0.2138–0.2144 in)	5.40 mm (0.213 in)
	Guide ID	IN	5.475–5.485 mm (0.2156–0.2159 in)	5.50 mm (0.217 in)
		EX	5.475–5.485 mm (0.2156–0.2159 in)	5.50 mm (0.217 in)
	Stem-to-guide clearance	IN	0.010–0.035 mm (0.0004–0.0014 in)	0.12 mm (0.005 in)
		EX	0.030–0.055 mm (0.0012–0.002 in)	0.14 mm (0.006 in)
Valve face width		1.7 mm (0.07 in)		2.0 mm (0.08 in)
Valve seat width		1.2 mm (0.05 in)		1.5 mm (0.06 in)

## CYLINDER HEAD/VALVES

---

### TORQUE VALUES

Cylinder head	28–30 N·m (2.8–3.0 kg-m, 20–22 ft-lb)
Cam sprocket	8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)
Carburetor insulator	8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)
Pulse rotor	8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)
Decompressor guide bolt	5–7 N·m (0.5–0.7 kg-m, 3.6–5 ft-lb)
Valve adjuster cover	10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)
Spark plug	12–19 N·m (1.2–1.9 kg-m, 9–14 ft-lb)
Pulse cover screw	4–7 N·m (0.4–0.7 kg-m, 2.9–5 ft-lb)
Pulse generator screw	4–7 N·m (0.4–0.7 kg-m, 2.9–5 ft-lb)
Valve adjuster lock nut	15–18 N·m (1.5–1.8 kg-m, 11–13 ft-lb)

### TOOLS

#### Special

Valve guide reamer, 5.48 mm 07984–0980000

#### Common

Valve guide remover, 5.5 mm 07742–0010100 or 07942–3290100

Valve spring compressor 07757–0010000 or 07957–3290001

## TROUBLESHOOTING

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

#### Low compression

##### 1. Valves:

- Incorrect valve adjustment.
- Burned or bent valve.
- Incorrect valve timing.
- Weak valve spring.

##### 2. Cylinder head:

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

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

##### 4. Faulty decompressor lever.

#### High compression

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

#### Excessive noise

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

#### Poor idling

1. Compression too low.
2. Faulty decompressor lever.

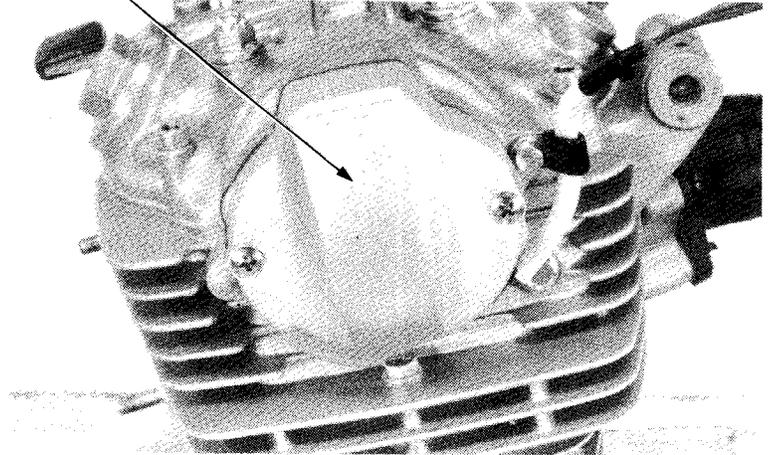
#### Hard starting

- Faulty decompressor lever.

## CAMSHAFT REMOVAL

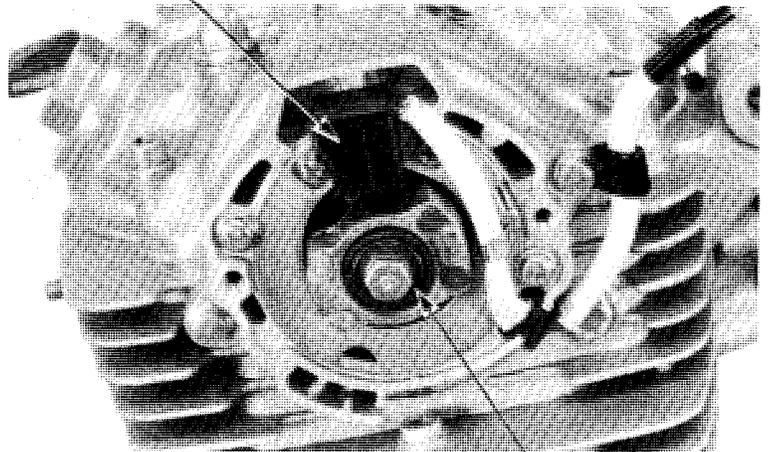
Remove the pulse cover.

PULSE COVER



Remove the pulse generator screws, and remove the pulse generator.  
Remove the pulse rotor.

PULSE GENERATOR

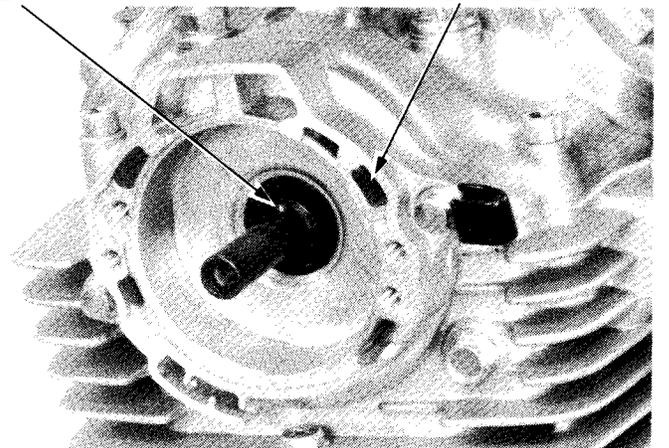


PULSE ROTOR

Remove the dowel pin.  
Remove the pulse base.

DOWEL PIN

PULSE BASE

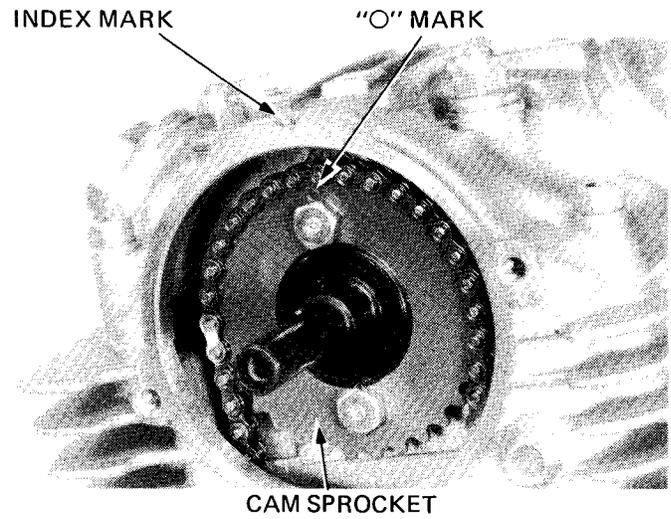


## CYLINDER HEAD/VALVES

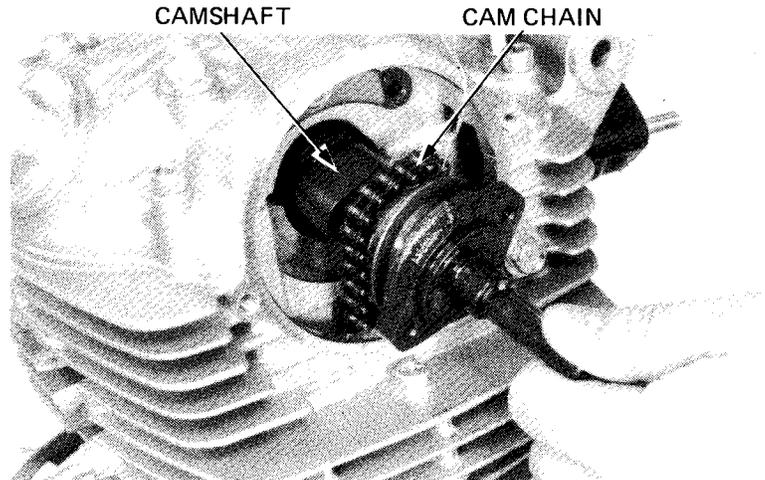
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Remove the timing mark hole cap.  
Turn the crankshaft with the recoil starter until the cam sprocket "O" mark and cylinder head index mark align.

Remove the cam sprocket bolts and cam sprocket.



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

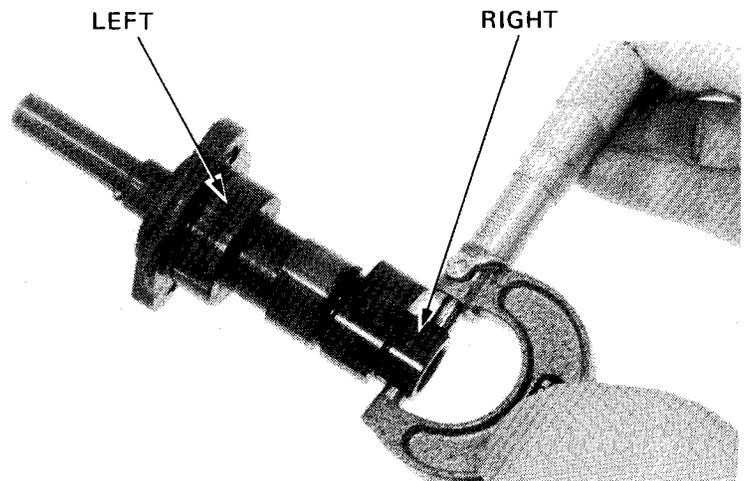


### CAMSHAFT INSPECTION

Measure the camshaft O.D. of the bushing and bearing surfaces with a micrometer.

#### SERVICE LIMITS:

- R: 19.90 mm (0.783 in)
- L: 33.90 mm (1.335 in)

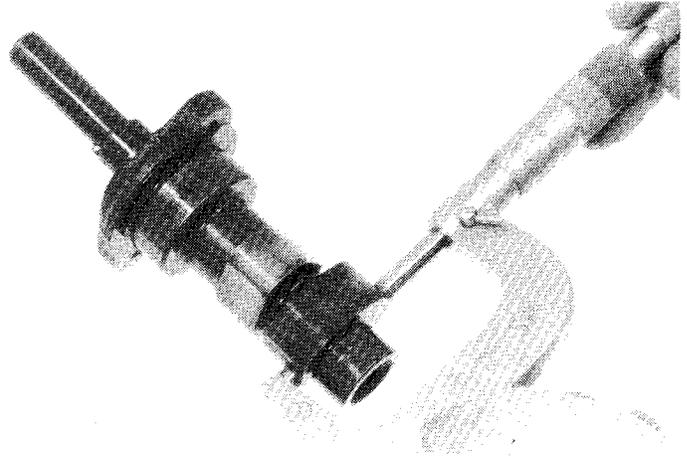


Using a micrometer, measure the height of each cam lobe and inspect it for wear or damage.

**SERVICE LIMIT:**

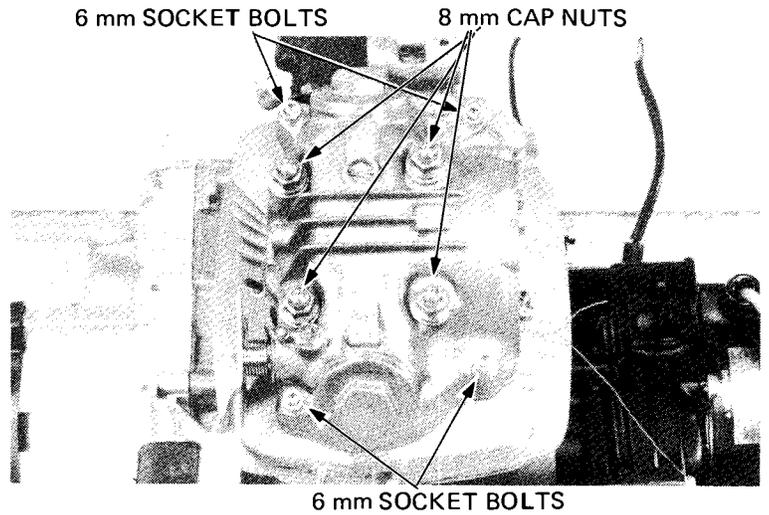
**INTAKE: 31.199 mm (1.2283 in)**

**EXHAUST: 30.798 mm (1.2125 in)**

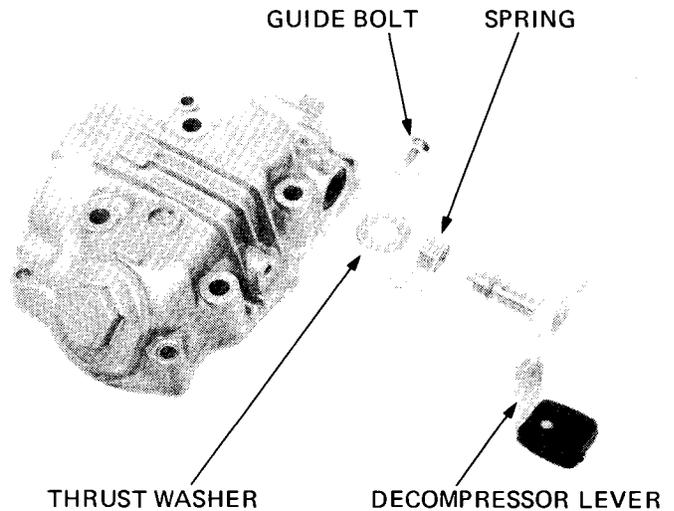


**CYLINDER HEAD COVER REMOVAL**

Remove the engine from the frame (Page 5-2).  
Remove the 6 mm socket bolts and 8 mm cap nuts.  
Remove the cylinder head cover and remove the camshaft bushing.



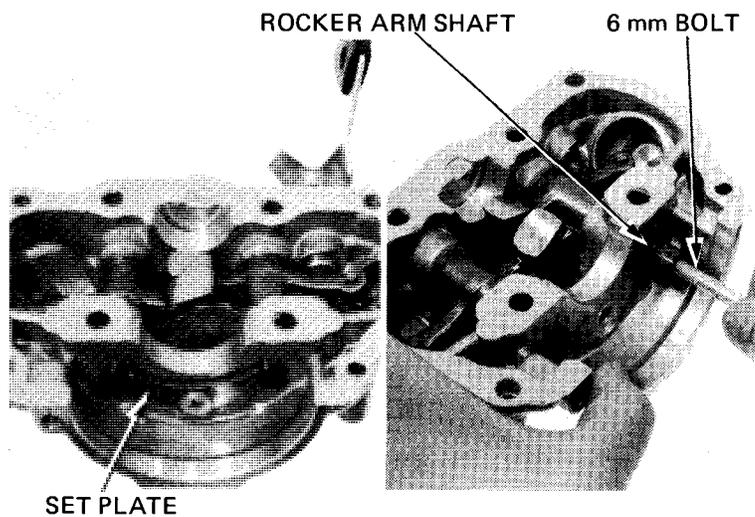
Remove the decompressor lever and spring by removing the decompressor lever guide bolt.



## CYLINDER HEAD/VALVES

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Remove the rocker arm shaft set plate.  
Screw a 6 mm bolt into the rocker arm shaft threaded end. Pull on the bolt to remove the shafts and rocker arms.



### ROCKER ARM INSPECTION

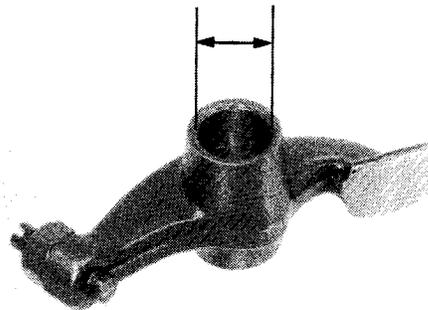
Inspect the rocker arms for damage, wear or clogged oil holes.

#### NOTE

If any rocker arms require servicing or replacement, inspect the cam lobes for scoring, chipping or flat spots.

Measure the I.D. of each rocker arm.

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



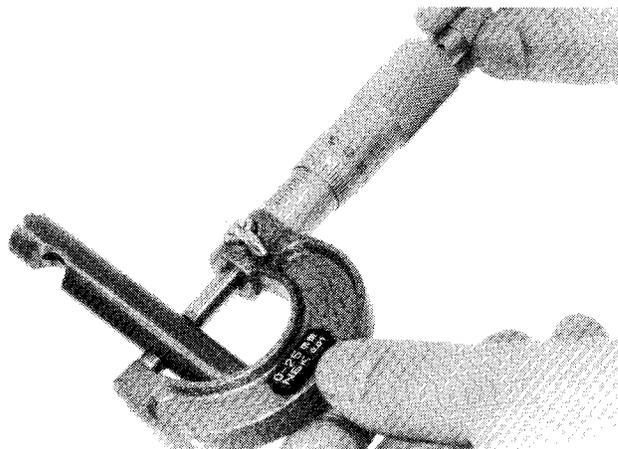
### ROCKER ARM SHAFT INSPECTION

Inspect the rocker arm shafts for wear or damage.  
Measure the O.D. with a micrometer.

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

Calculate the rocker arm-to-shaft clearance.

**SERVICE LIMIT: 0.08 mm (0.003 in)**



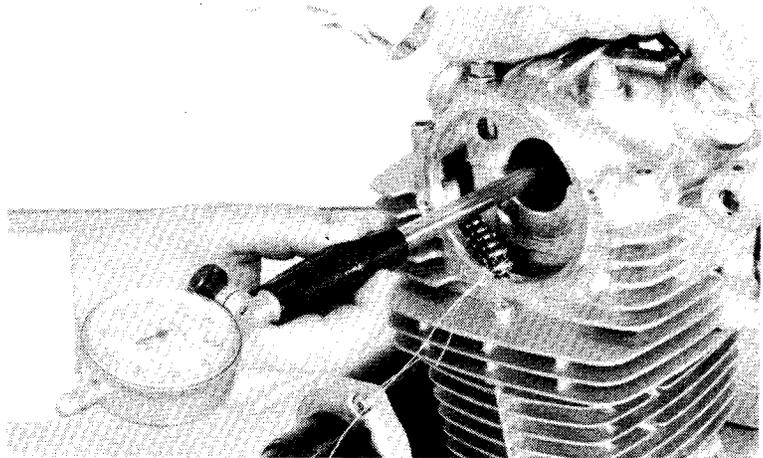
### CAMSHAFT BEARING INSPECTION

Install the cylinder head cover with 8 mm nuts.

Measure the camshaft bearing I.D. and calculate the camshaft-to-bearing clearance. Refer to page 6-4 for camshaft measurements.

**SERVICE LIMIT: 34.05 mm (1.3405 in)**

**CLEARANCE SERVICE LIMIT: 0.08 mm  
(0.003 in)**



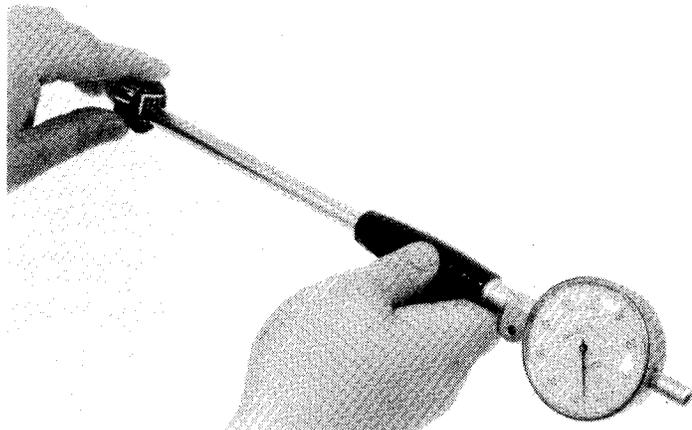
### CAMSHAFT BUSHING INSPECTION

Measure the camshaft bushing I.D.

**SERVICE LIMIT: 20.05 mm (0.789 in)**

Calculate the camshaft bushing-to-camshaft clearance.

**SERVICE LIMIT: 0.08 mm (0.003 in)**



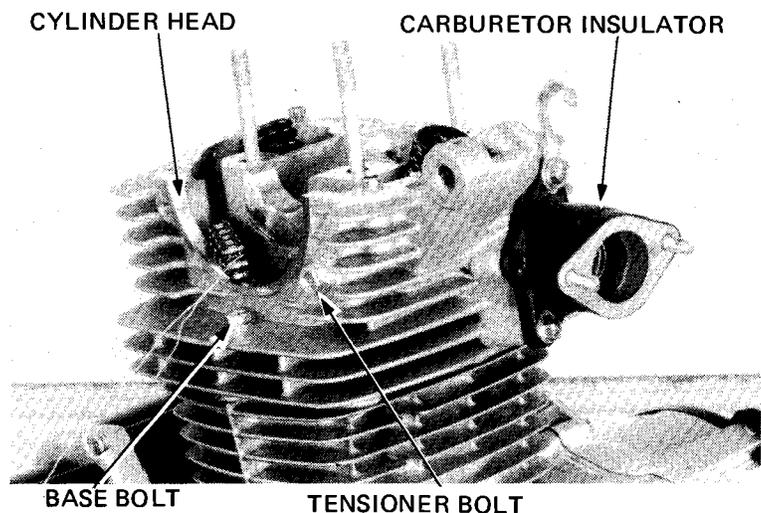
## CYLINDER HEAD REMOVAL

Remove the cylinder head cover (Page 6-5) and carburetor insulator.

Remove the cam chain tensioner bolt, cylinder head base bolt and cylinder head.

#### NOTE

To prevent the cam chain from dropping into the crankcase, the cam chain should be held by a piece of wire.



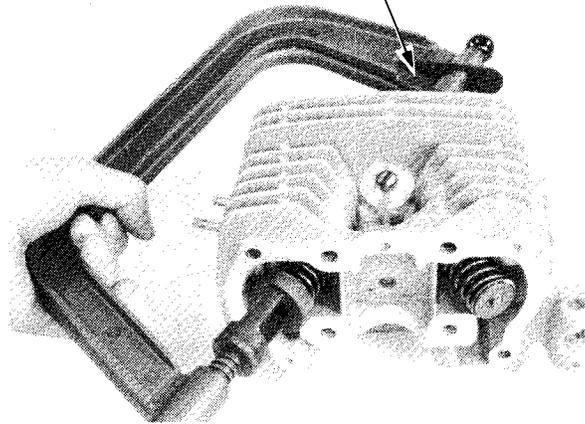
## CYLINDER HEAD/VALVES

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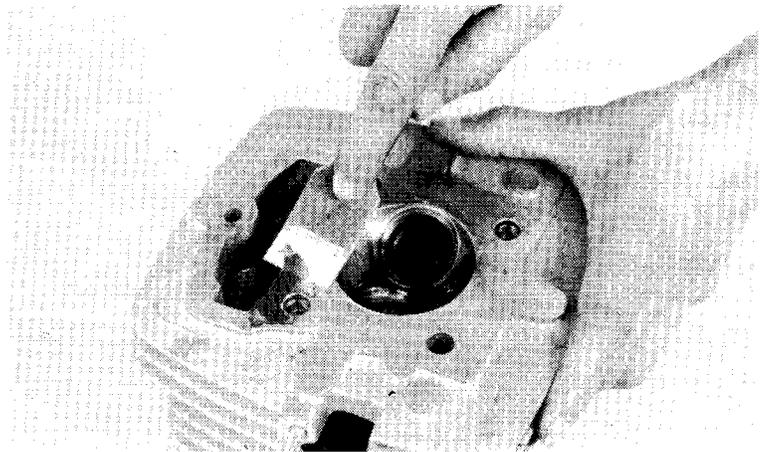
### CYLINDER HEAD DISASSEMBLY

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

VALVE SPRING COMPRESSOR  
07757-0010000 or 07957-3290001



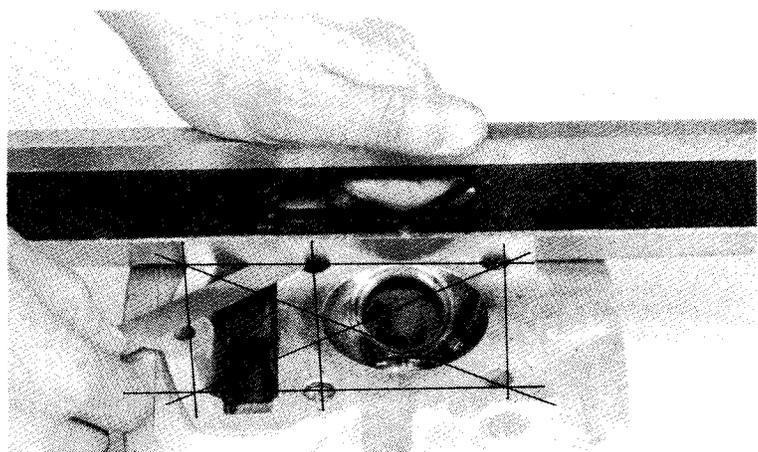
Remove carbon deposits from the combustion chamber.  
Clean off any gasket material from the cylinder head surface.



### CYLINDER HEAD INSPECTION

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

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

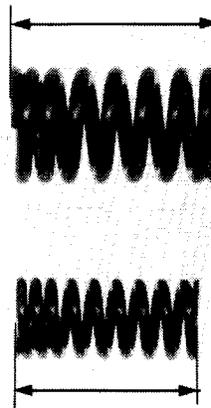


### VALVE SPRING INSPECTION

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

**SERVICE LIMITS:**

- INNER:** 35.5 mm (1.40 in)
- OUTER:** 41.0 mm (1.61 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's O.D.

**SERVICE LIMITS:**

- INTAKE:** 5.42 mm (0.213 in)
- EXHAUST:** 5.40 mm (0.213 in)

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

Measure and record the valve guide I.D.

**SERVICE LIMIT: 5.50 mm (0.217 in)**

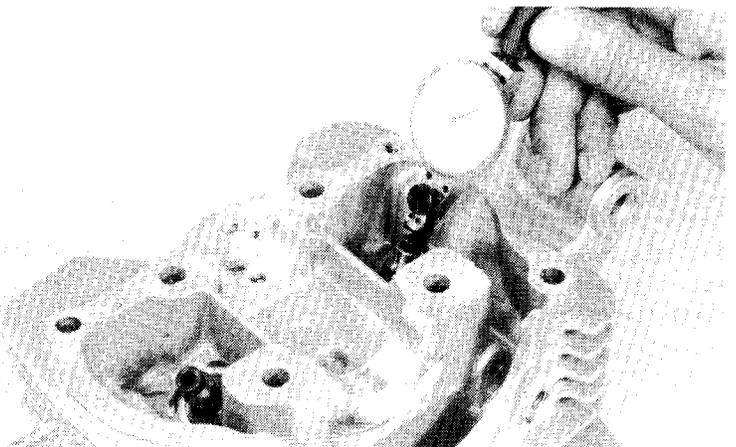
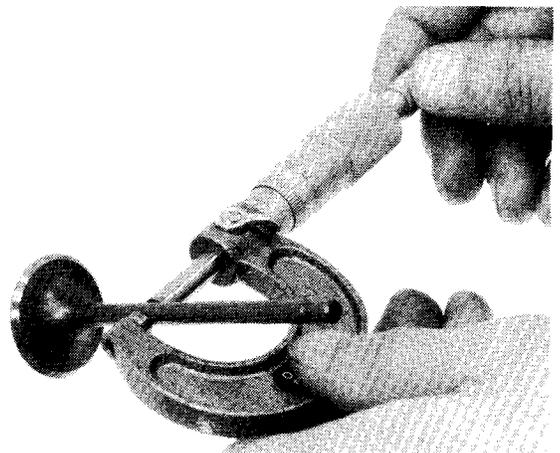
Calculate the stem-to-guide clearance.

**SERVICE LIMITS:**

- INTAKE:** 0.12 mm (0.005 in)
- EXHAUST:** 0.14 mm (0.006 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 the valve guide is replaced, the valve seat must be refaced.



## CYLINDER HEAD/VALVES

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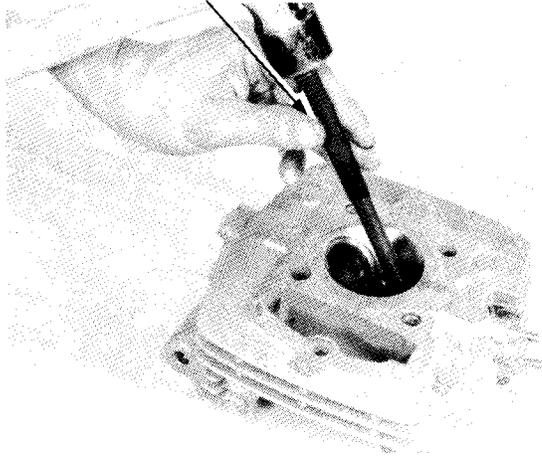
### VALVE GUIDE REPLACEMENT

Support the cylinder head and drive out the guide from the valve port side with a valve guide remover.

#### NOTE

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

VALVE GUIDE REMOVER  
07742-0010100 or 07942-3290100

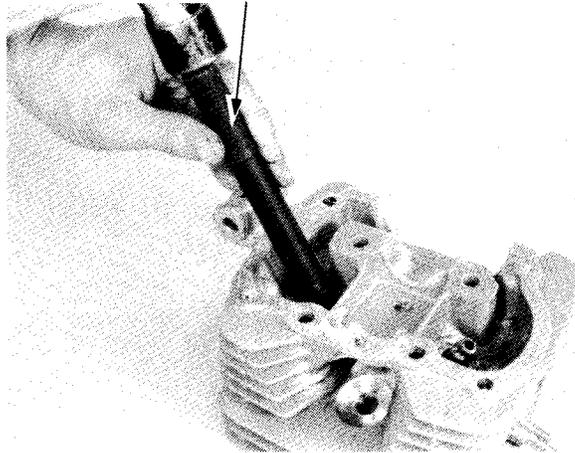


Install an O-ring on the new valve guide. Drive in the guide from the top of the head.

#### NOTE

Inspect the valve guide for damage.

VALVE GUIDE DRIVE B  
07742-0020200 or 07942-3290200



Ream the new valve guide after installation.

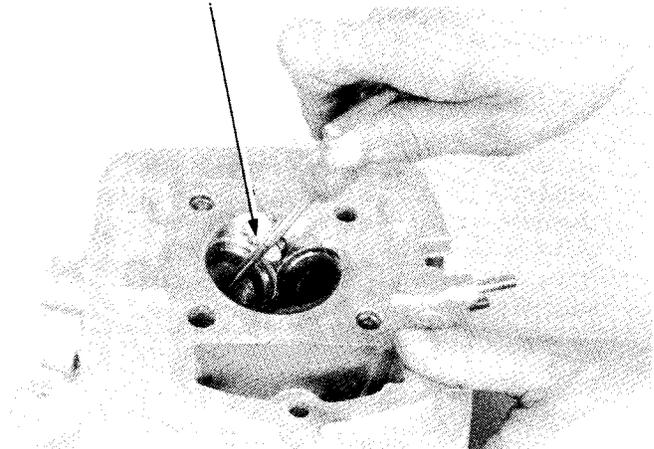
#### NOTE

- Use cutting oil on the reamer during this operation.
- Always rotate the reamer in the same direction.

Clean the cylinder head thoroughly to remove any metal particles.

Reface the valve seat (Page 6-11).

VALVE GUIDE REAMER 07984-0980000



## VALVE SEAT INSPECTION/ REFACING

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

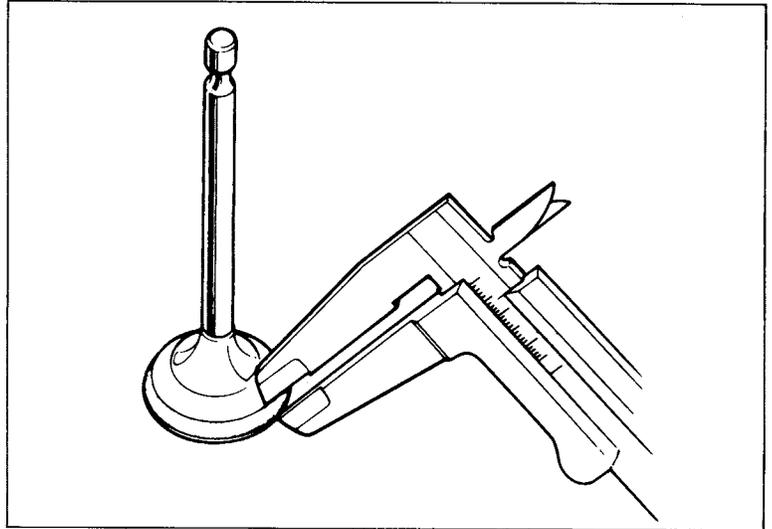
Apply a light coating of Prussian Blue to each valve seat. Lap each valve and seat using a rubber hose or other hand-lapping tool.

Remove and inspect each valve.  
Measure the width of the valve face.

**SERVICE LIMIT: 2.0 mm (0.08 in)**

### CAUTION

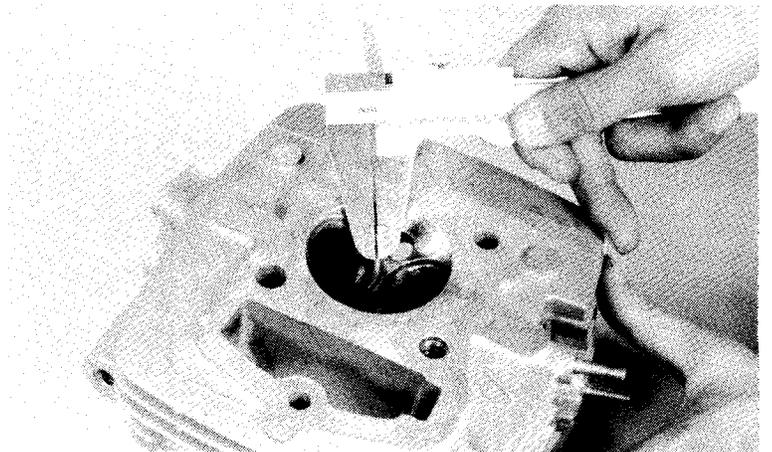
*The valve cannot be ground. If the valve face is burned or badly worn or if it contacts the seat unevenly, replace the valve.*



Inspect each valve seat.

If the seat is too wide, too narrow, or has low spots, the seat must be refinished to seal properly.

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

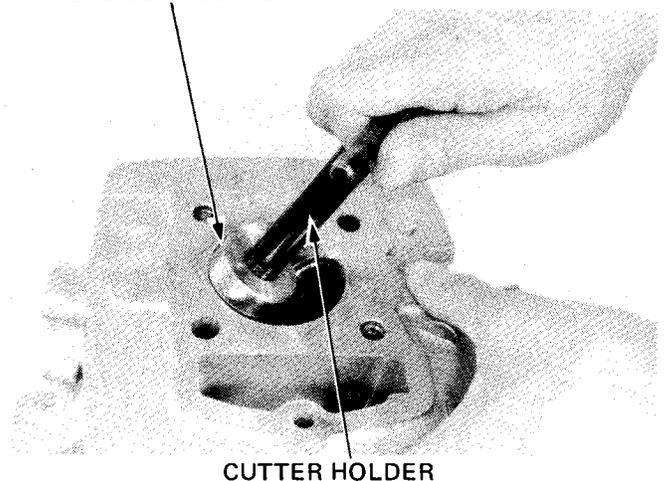


## VALVE SEAT GRINDING

Honda valve seat cutters, grinder or equivalent valve seat refacing equipment are recommended to correct a worn valve seat.

Follow the instructions supplied with the Valve Seat Refacing Equipment.

VALVE SEAT CUTTER



CUTTER HOLDER

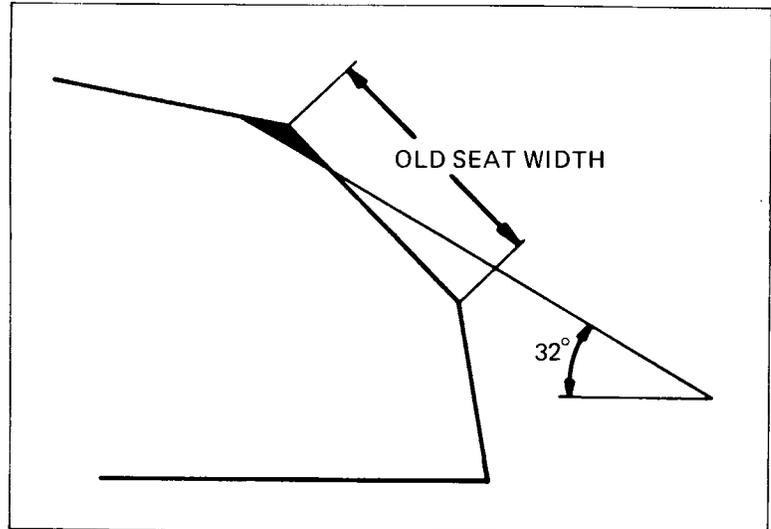
## CYLINDER HEAD/VALVES

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

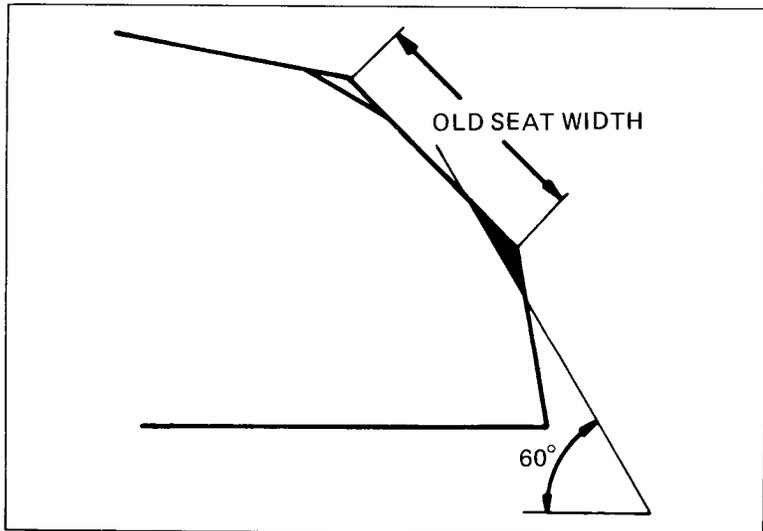
### NOTE

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

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



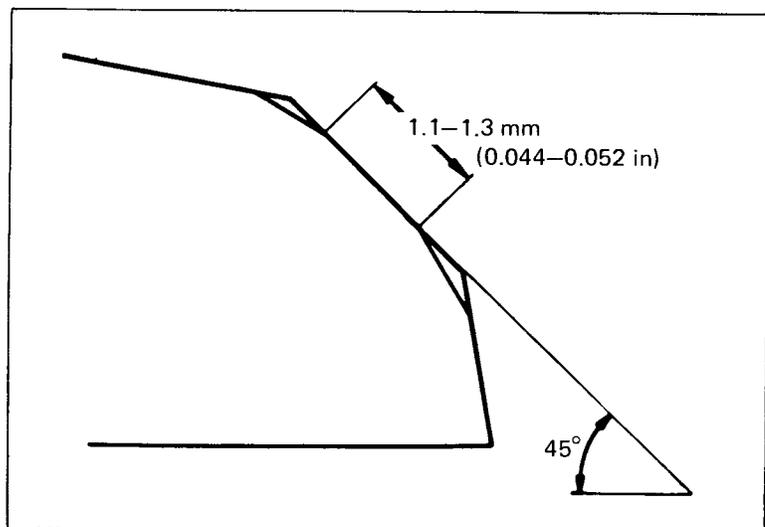
Use a 60 degree cutter to remove the lower 1/4 of the old seat. Remove the cutter and inspect the area you have just cut.



Install 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.



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

Press the valve through the valve guide and onto the seat without rotating it to make a clear pattern.

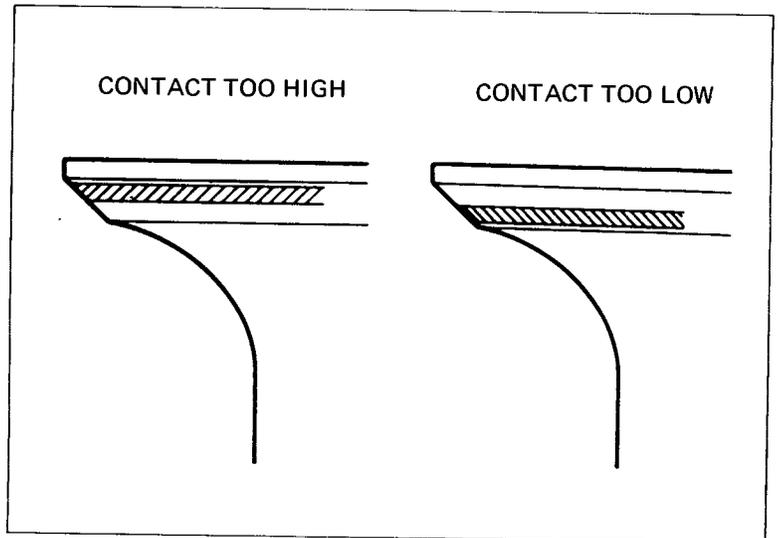
**NOTE**

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

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

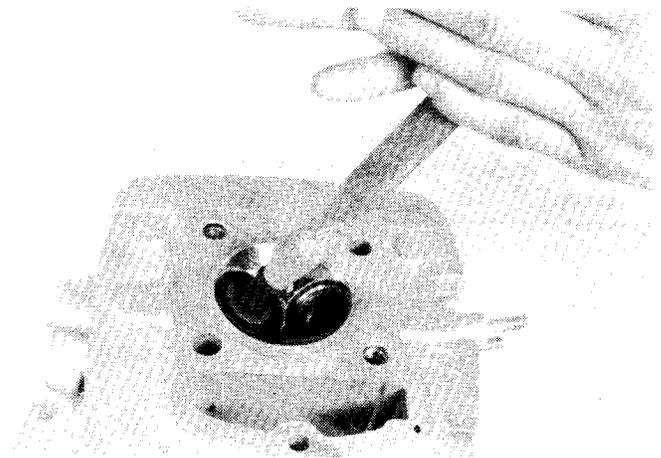
If the contact area is too low on the valve, the seat must be raised using a 60 degree inner cutter.

Refinish the seat to specifications using a 45 degree seat cutter.



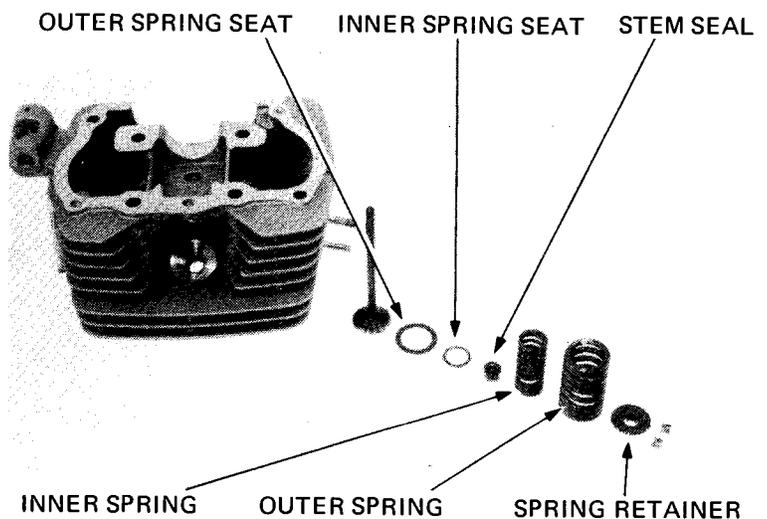
After cutting the seat, apply lapping compound to the valve face and lap the valve using light pressure.

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



**CYLINDER HEAD ASSEMBLY**

Install new valve stem seals.  
Lubricate each valve stem with oil and insert the valves into the valve guides.  
Install the valve spring seats and valve springs with the tightly wound coils facing the cylinder head.



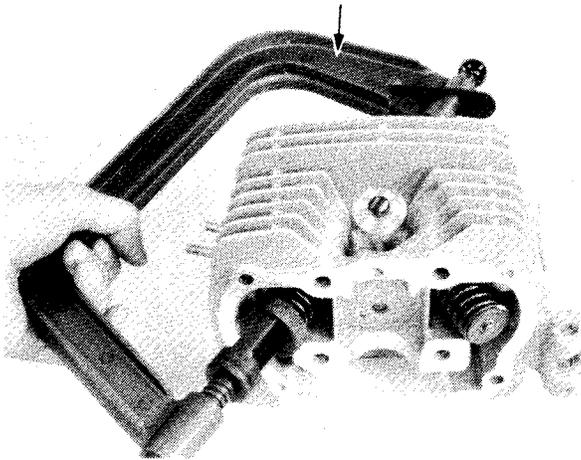
## CYLINDER HEAD/VALVES

Install the valve spring retainers and install the valve cotters.

### CAUTION

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

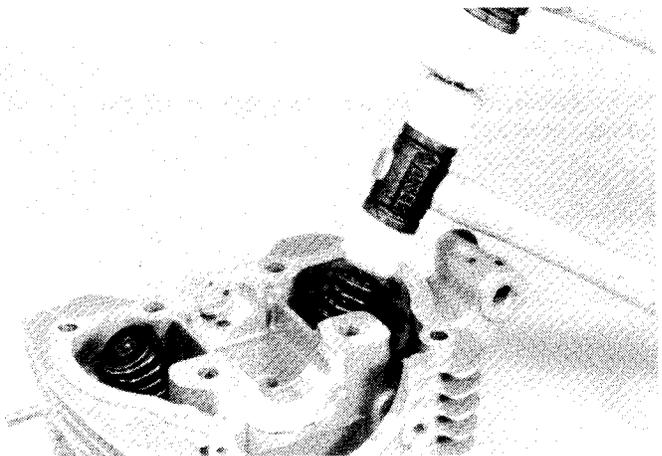
VALVE SPRING COMPRESSOR  
07757-0010000 or 07957-3290001



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

### CAUTION

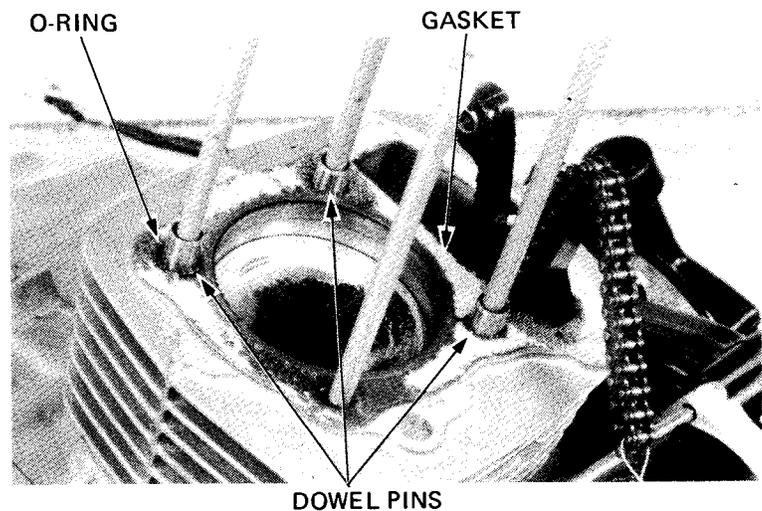
*Support the cylinder head above the work bench surface to prevent possible valve damage.*



## CYLINDER HEAD INSTALLATION

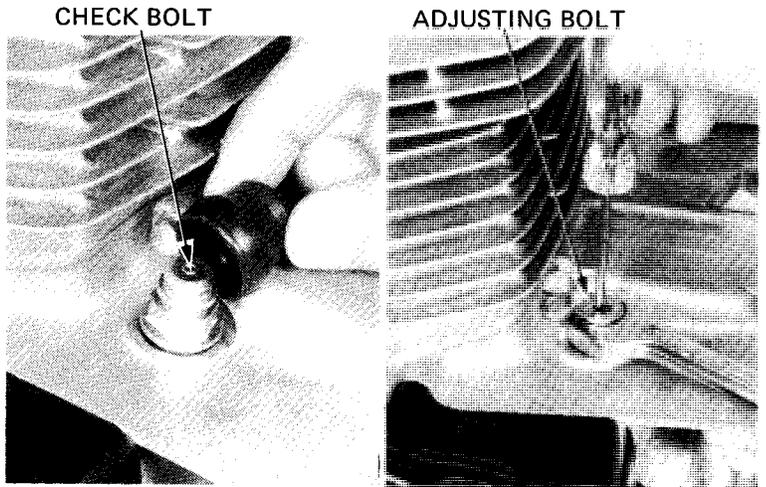
Clean off any gasket material from the cylinder surface.

Install the O-rings, dowel pins and a new gasket.

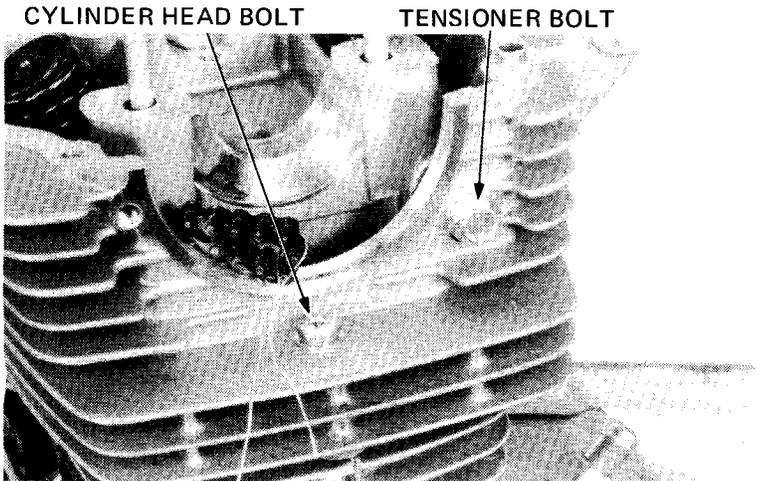


Remove the cam chain tensioner adjusting bolt rubber cap.  
Remove the check bolt and loosen the tensioner adjusting bolt.

Push the tensioner down with a screwdriver, as shown, while tightening the adjusting bolt. Install the check bolt and rubber cap.



Install the cylinder head.  
Install the cylinder head bolt and cam chain tensioner bolt.

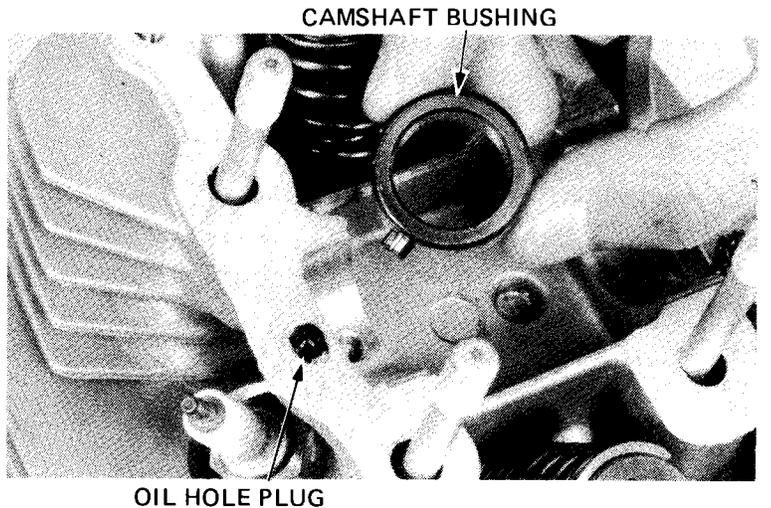


Install the dowel pins and camshaft bushing.

**NOTE**

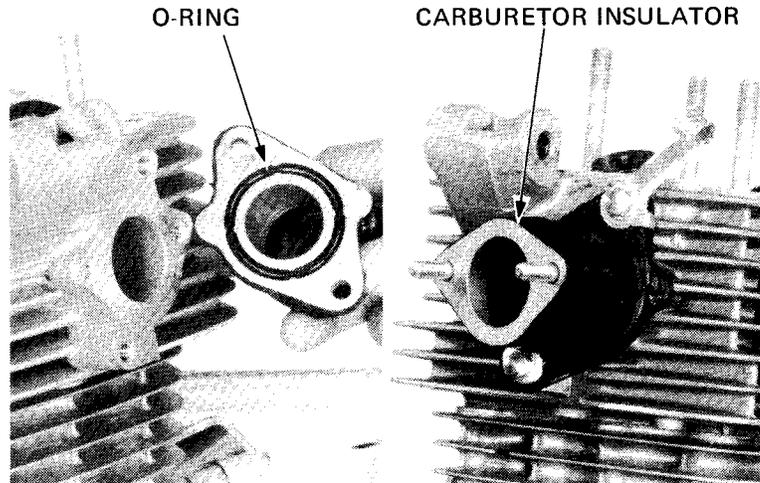
Align the camshaft bushing dowel pin with the hole in the cylinder head.

Install the oil hole plug and dowel pins.



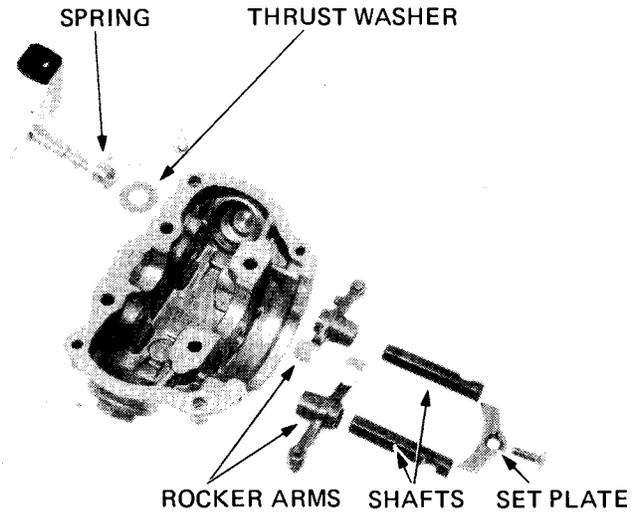
## CYLINDER HEAD/VALVES

Install the carburetor insulator making sure that the O-ring is properly seated.



Install the rocker arms and rocker arm shafts in the cylinder head cover.  
Install the set plate and tighten the set plate screw.  
Install the decompressor lever.  
Tighten the decompressor lever guide bolt.

**TORQUE: 5–7 N·m**  
(0.5–0.7 kg·m, 3.6–5 ft·lb)

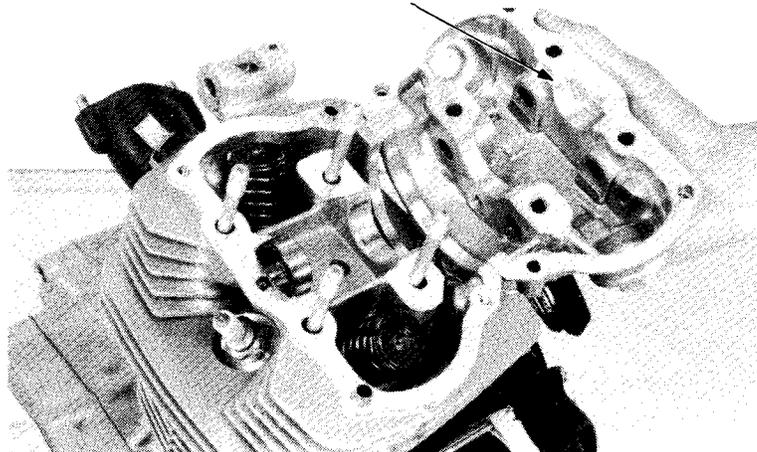


Loosen the valve adjusting screws.  
Apply liquid sealant to the cylinder head cover mating surface.

### NOTE

Keep sealant away from the camshaft bearing surfaces.

DO NOT APPLY SEALANT TO THIS AREA



Coat the camshaft bearing and bushing with molybdenum disulfide grease.

Install the cylinder head cover.

Install and tighten the 8 mm cap nuts.

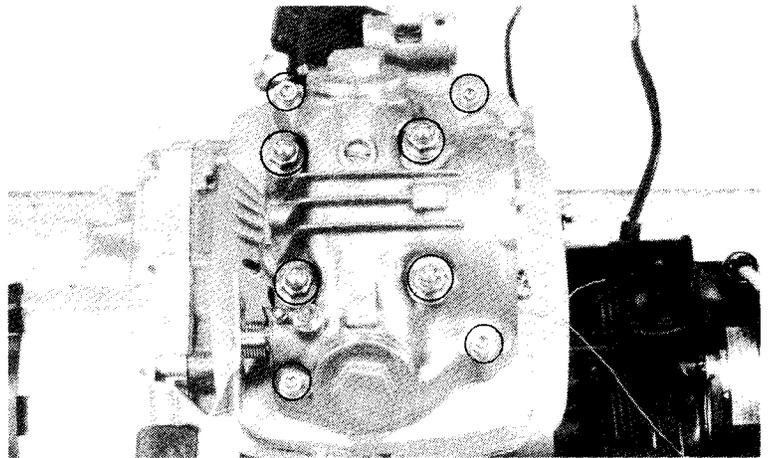
**TORQUE: 28–30 N·m**  
(2.8–3.0 kg·m, 20–22 ft·lb)

Install and tighten the 6 mm socket bolts.

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

**NOTE**

Tighten the 8 mm cap nuts and 6 mm bolts in a crisscross pattern in 2–3 steps.

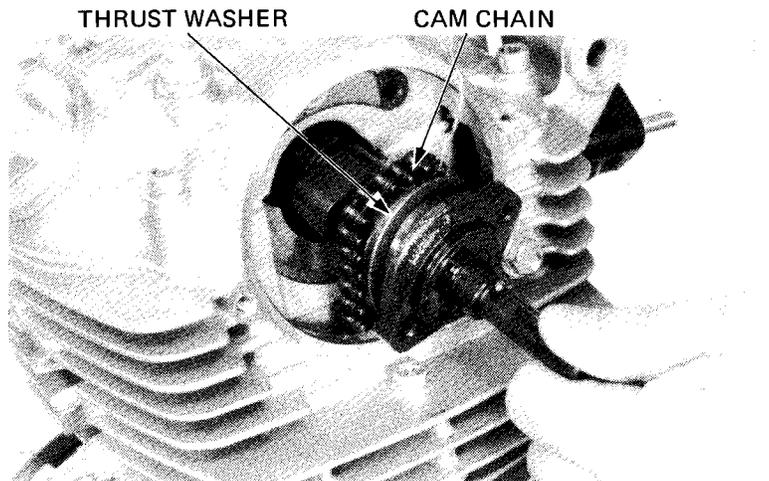


## CAMSHAFT INSTALLATION

Coat the camshaft journals with molybdenum disulfide grease.

Place the thrust washer onto the camshaft.

Place the camshaft through the cam chain and into the cylinder head.

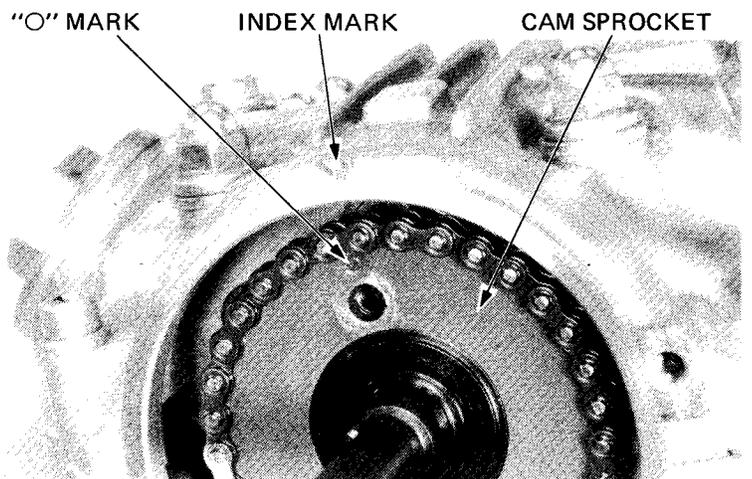


Turn the crankshaft counterclockwise and align the "T" and index marks.

Install the cam sprocket. Align the timing mark "O" on the cam sprocket with the index mark on the cylinder head cover.

Tighten the cam sprocket bolts.

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



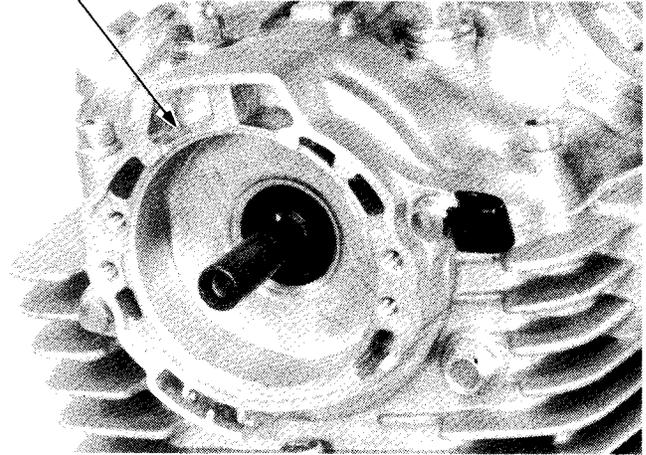
## CYLINDER HEAD/VALVES

Install the pulse base.

### CAUTION

*Do not turn the oil seal lip inside out.*

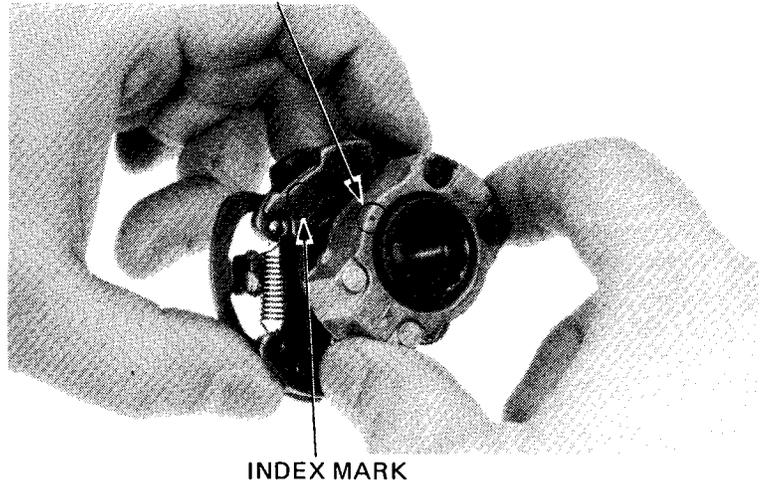
PULSE BASE



### PULSE ROTOR ASSEMBLY

Align the punch mark on the rotor with the index mark on the spark advancer and assemble.

PUNCH MARK



INDEX MARK

Install the dowel pin and pulse rotor/advancer assembly.

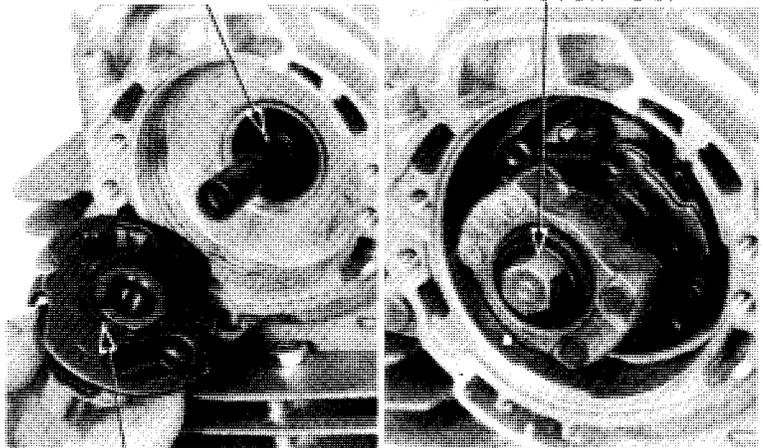
### NOTE

*Align the dowel pin with the advancer groove.*

Tighten the pulse rotor bolt.

DOWEL PIN

PULSE ROTOR BOLT

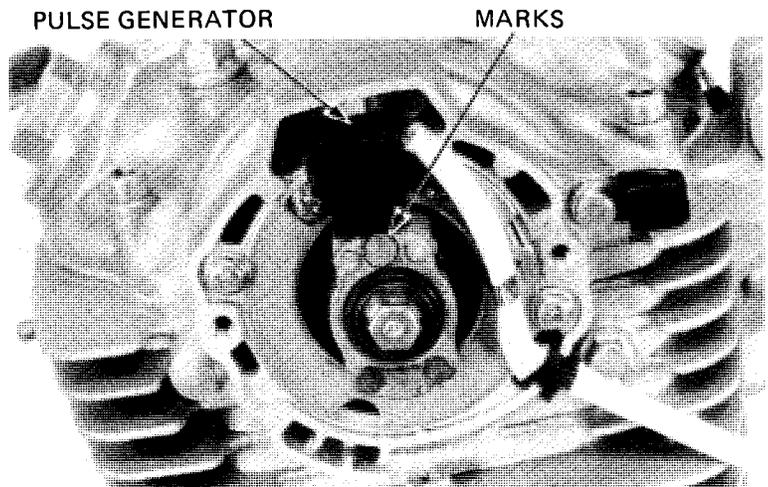


GROOVE

Install the pulse generator.  
Turn the crankshaft counterclockwise and align the "F" mark with the crankcase cover index mark.

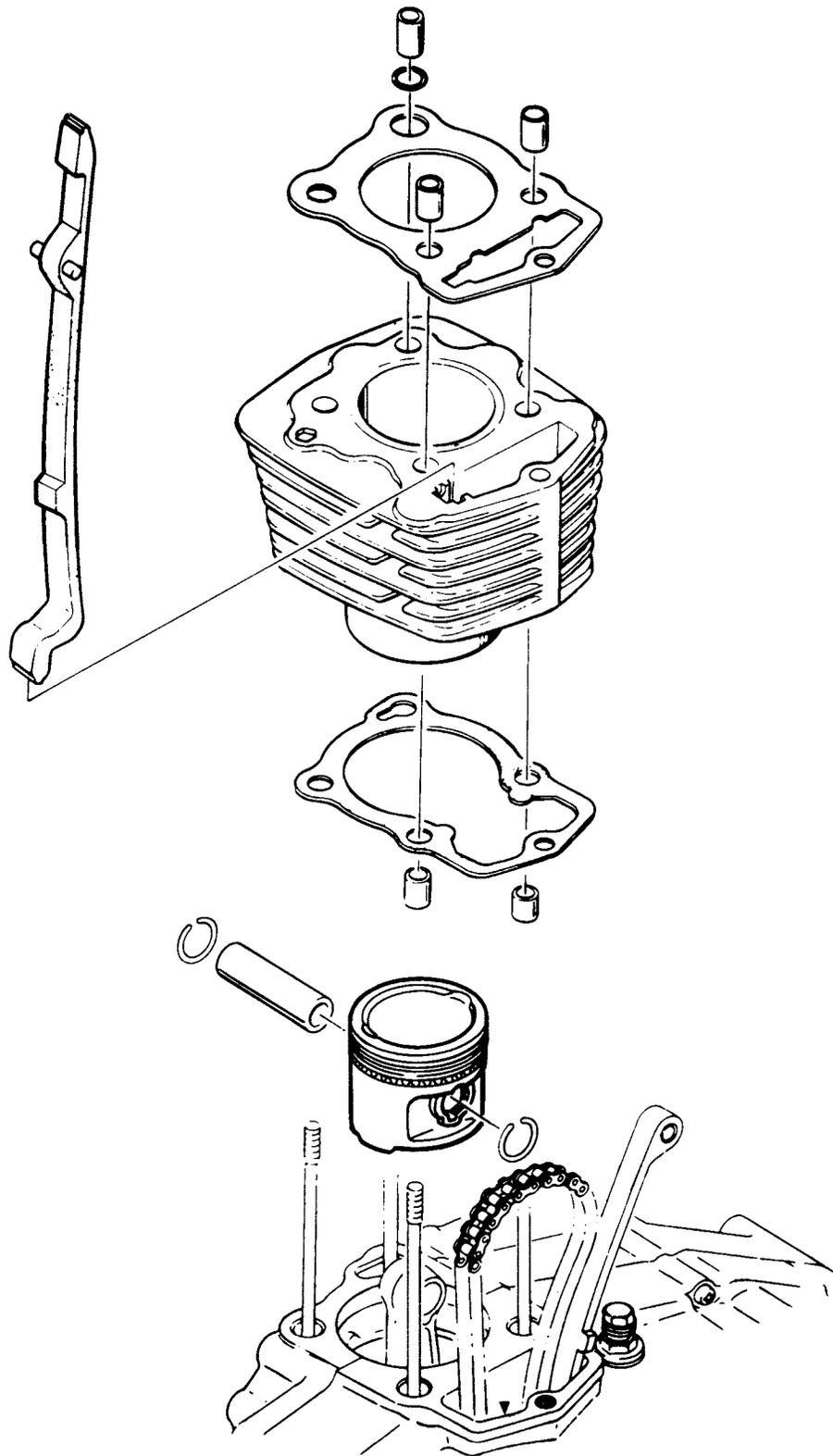
Align the pulse rotor and pulse generator index marks.  
Adjust the pulse rotor and generator air gap to 0.40–0.65 mm (0.015–0.025 in).

Install the pulse generator cover.  
Pour fresh oil into the oil pockets in the cylinder head so that the cam lobes are submerged.



Do the following after installing the pulse generator cover.

- Adjust valve clearance (Page 3–5).
- Adjust cam chain tension (Page 3–7).
- Inspect ignition timing (Page 3–8).
- Test cylinder compression (Page 3–9).



# 7. CYLINDER/PISTON

SERVICE INFORMATION	7-1
TROUBLESHOOTING	7-1
CYLINDER REMOVAL	7-2
PISTON REMOVAL	7-3
PISTON INSTALLATION	7-6
CYLINDER INSTALLATION	7-6

## SERVICE INFORMATION

### GENERAL

- Camshaft lubrication oil is fed to the cylinder head through an orifice in the cylinder and crankcase. Be sure this orifice is clogged and that the O-rings and dowel pins are in place before installing the cylinder head.

### SPECIFICATIONS

ITEM		STANDARD	SERVICE LIMIT	
Cylinder	I.D.	65.00–65.01 mm (2.559–2.560 in)	65.10 mm (2.563 in)	
	Taper	—————	0.10 mm (0.004 in)	
	Out of round	—————	0.10 mm (0.004 in)	
	Warping across top	—————	0.10 mm (0.004 in)	
Piston, piston pin, piston rings.	Piston O.D.	64.955–64.985 mm (2.5573–2.5585 in)	64.90 mm (2.555 in)	
	Piston pin bore	15.002–15.008 mm (0.5906–0.5909 in)	15.04 mm (0.592 in)	
	Piston pin O.D.	14.994–15.000 mm (0.5903–0.5906 in)	14.96 mm (0.589 in)	
	Piston-to-pin clearance	0.002–0.014 mm (0.0001–0.0006 in)	0.02 mm (0.001 in)	
	Piston ring-to-ring groove clearance	TOP	0.015–0.050 mm (0.0006–0.0020 in)	0.09 mm (0.004 in)
		SEC	0.015–0.045 mm (0.0006–0.0018 in)	0.09 mm (0.004 in)
	Piston ring end gap	TOP/SECOND	0.20–0.40 mm (0.008–0.016 in)	0.50 mm (0.020 in)
OIL		0.30–0.90 mm (0.012–0.035 in)	—————	
Cylinder-to-piston clearance		0.015–0.055 mm (0.0006–0.0022 in)	0.10 mm (0.004 in)	

## TROUBLESHOOTING

### Low or unstable compression

1. Worn cylinder or piston rings.
2. Decompressor lever out of adjustment.

### Excessive smoke

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

### Overheating

- Excessive carbon build-up on piston or combustion chamber wall.

### Knocking or abnormal noise

1. Worn piston and cylinder.
2. Excessive carbon build-up.

## CYLINDER/PISTON

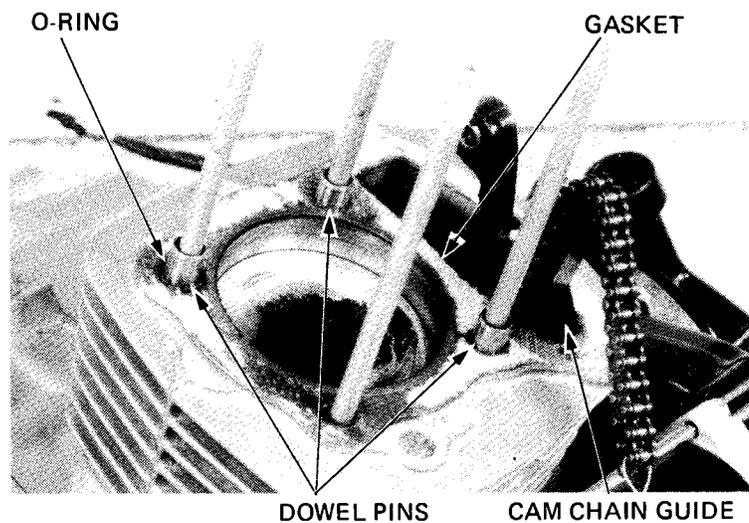
### CYLINDER REMOVAL

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

#### NOTE

Keep the cam chain from falling into the crankcase when removing the cylinder.

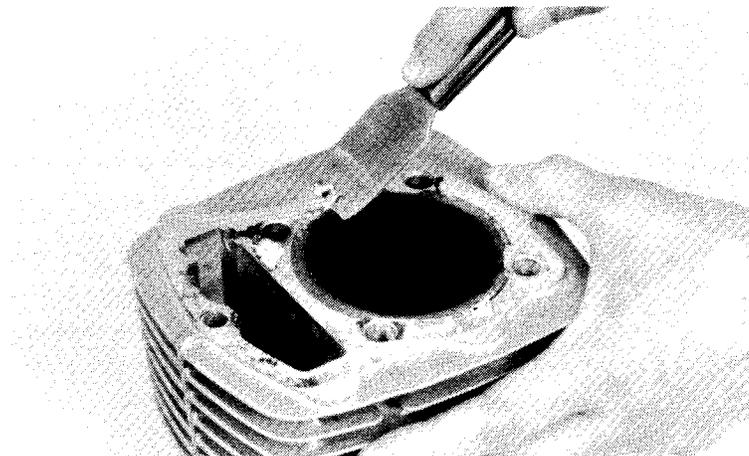
Remove the cylinder.  
Remove the gasket and dowel pins.



Clean off any gasket material from the cylinder surface.

#### NOTE

Be careful not to remove any metal from the gasket surface.



### CYLINDER INSPECTION

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

Check the cylinder I.D. at X and Y axis at three locations.

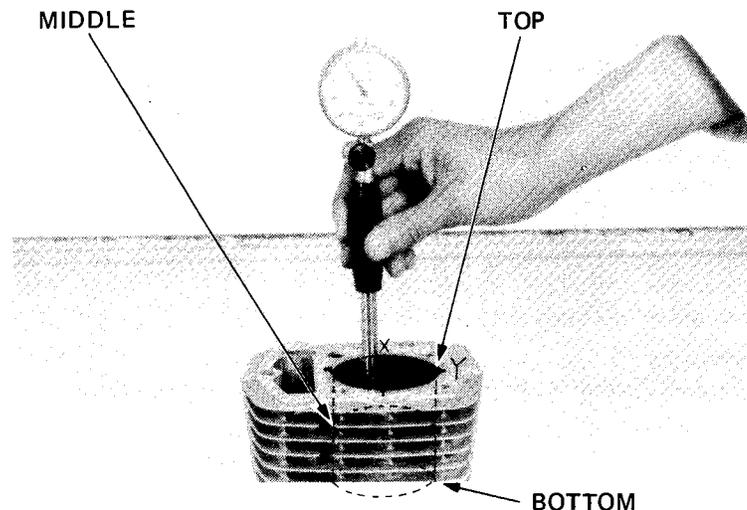
**SERVICE LIMIT: 65.10 mm (2.569 in)**

Calculate the taper and out of round.

#### SERVICE LIMITS:

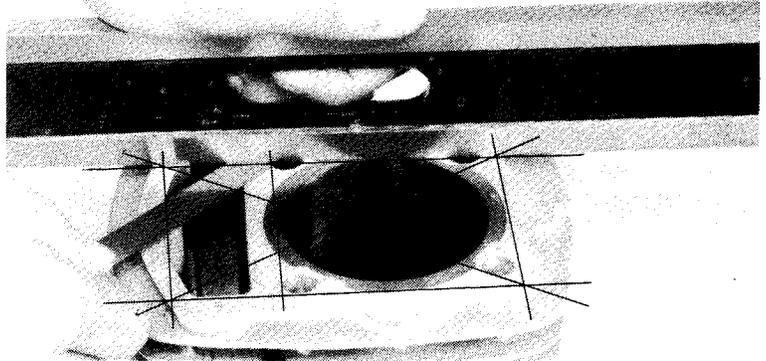
Taper: 0.10 mm (0.004 in)

Out of round: 0.10 mm (0.004 in)



Inspect the top of the cylinder for warpage.

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



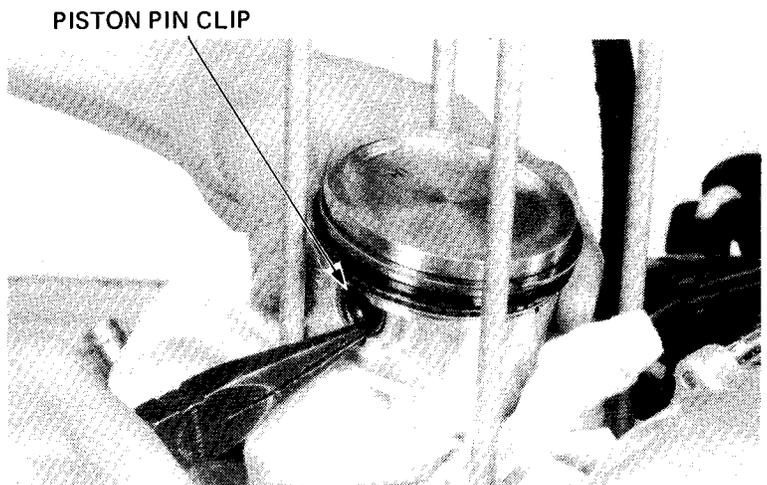
## PISTON REMOVAL

Remove the piston pin clip with pliers.

### NOTE

Do not let the clips fall into the crankcase.

Press the piston pin out of the piston and remove the piston.



## PISTON/PISTON RING INSPECTION

Measure the piston ring-to-groove clearance.

### SERVICE LIMITS:

**TOP: 0.09 mm (0.004 in)**

**SECOND: 0.09 mm (0.004 in)**

Remove the piston rings.

### NOTE

Do not damage the piston rings during removal.

Inspect the piston for wear or damage.



## CYLINDER/PISTON

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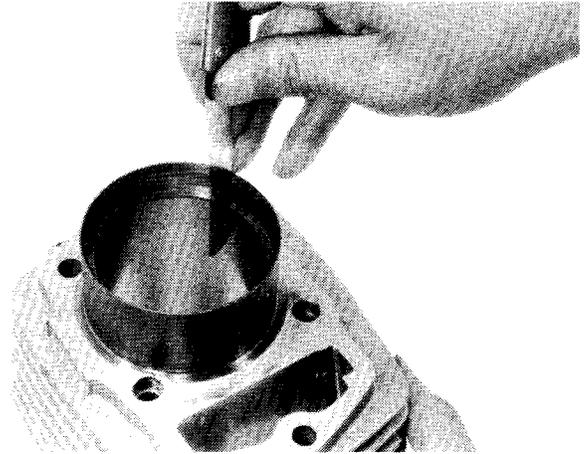
Insert each piston ring squarely into the cylinder and measure the ring end gap.

**SERVICE LIMIT:**

**TOP/SECOND: 0.50 mm (0.020 in)**

**NOTE**

Push the rings into the cylinder with the top of the piston to be sure they are squarely in the cylinder.

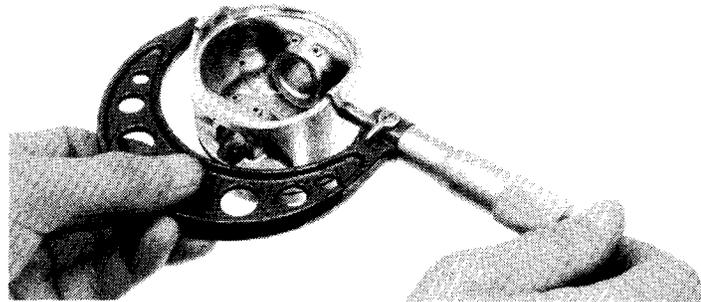


Measure diameter of the piston 10 mm from the bottom and 90° to the piston pin hole.

**SERVICE LIMIT: 64.90 mm (2.551 in)**

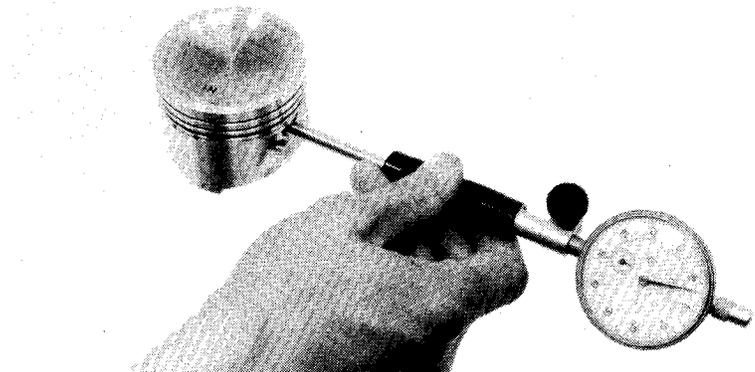
Calculate the piston-to-cylinder clearance. Refer to page 7-2 for cylinder bore inspection.

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



Measure the piston pin hole I.D.

**SERVICE LIMIT: 15.04 mm (0.592 in)**

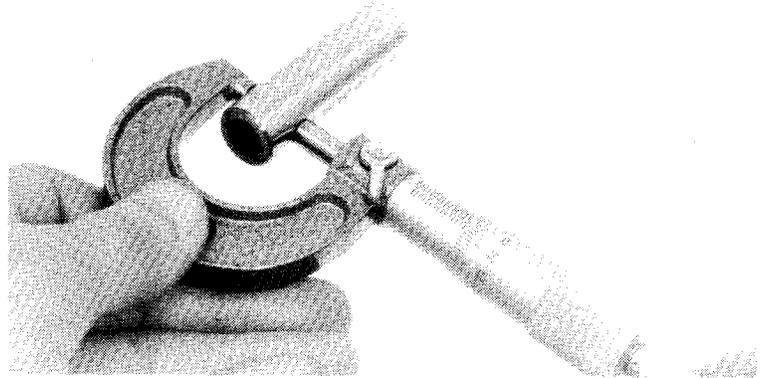


Measure the O.D. of the piston pin.

**SERVICE LIMIT: 14.96 mm (0.589 in)**

Calculate the piston-to-piston pin clearance.

**SERVICE LIMIT: 0.02 mm (0.001 in)**



**PISTON RING INSTALLATION**

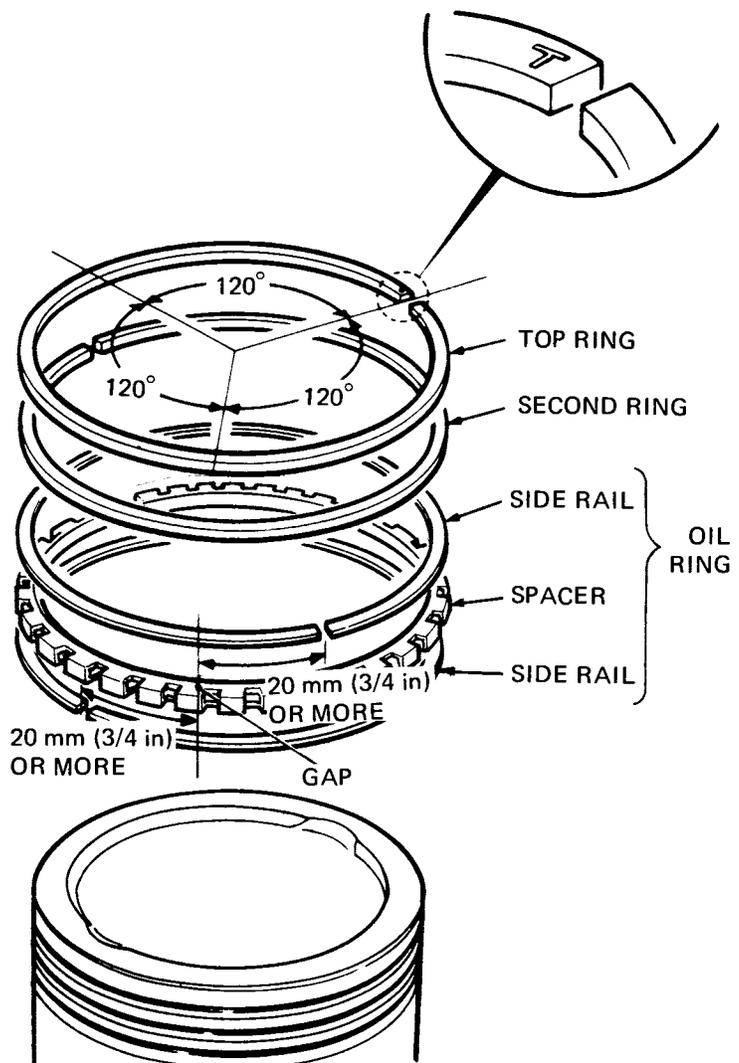
Clean the piston ring grooves thoroughly and install the piston rings.

**NOTE**

- Avoid piston and piston ring damage during installation.
- Install the piston rings with the markings facing up.
- Do not mix the top and second rings.

Space the piston ring end gaps 120 degrees apart. Do not align the gaps in the oil rings (side rails).

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

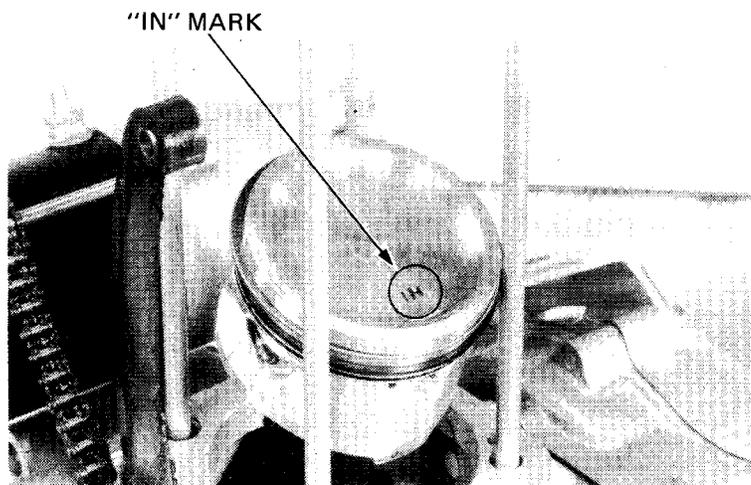


## **PISTON INSTALLATION**

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

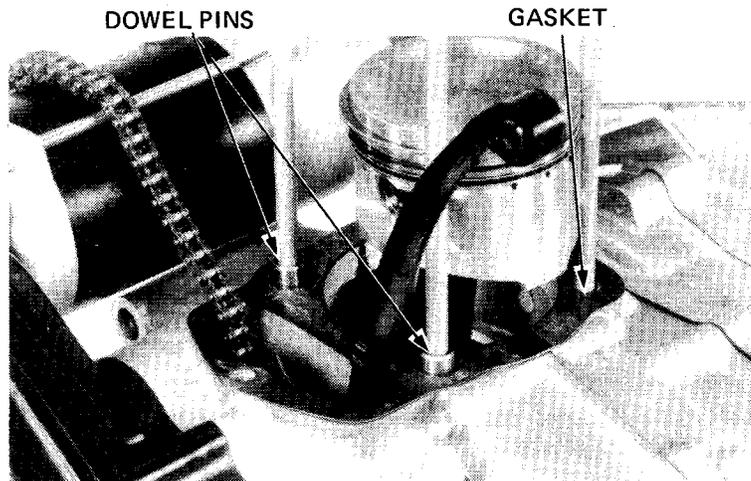
**NOTE**

- Position the piston "IN" mark on the intake valve side.
- Do not align the piston pin clip end gap with the piston cutout.
- Do not let the clip fall into the crankcase.



## **CYLINDER INSTALLATION**

Install the gasket and dowel pins.

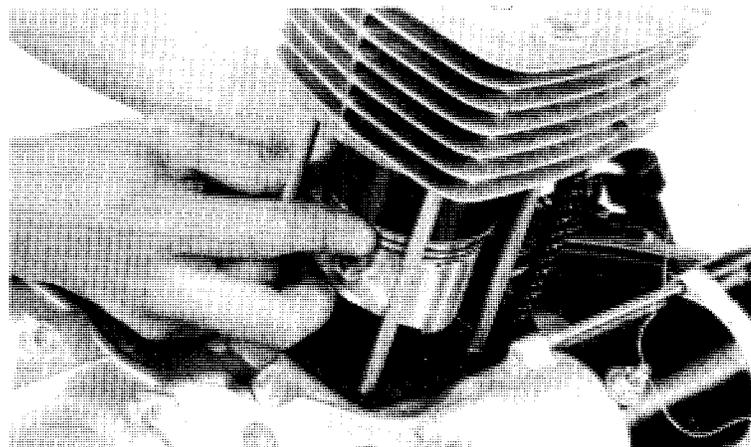


Coat the cylinder bore and piston rings with engine oil and install the cylinder.

**NOTE**

- Avoid piston ring damage during installation.
- Do not let the cam chain fall into the crankcase.

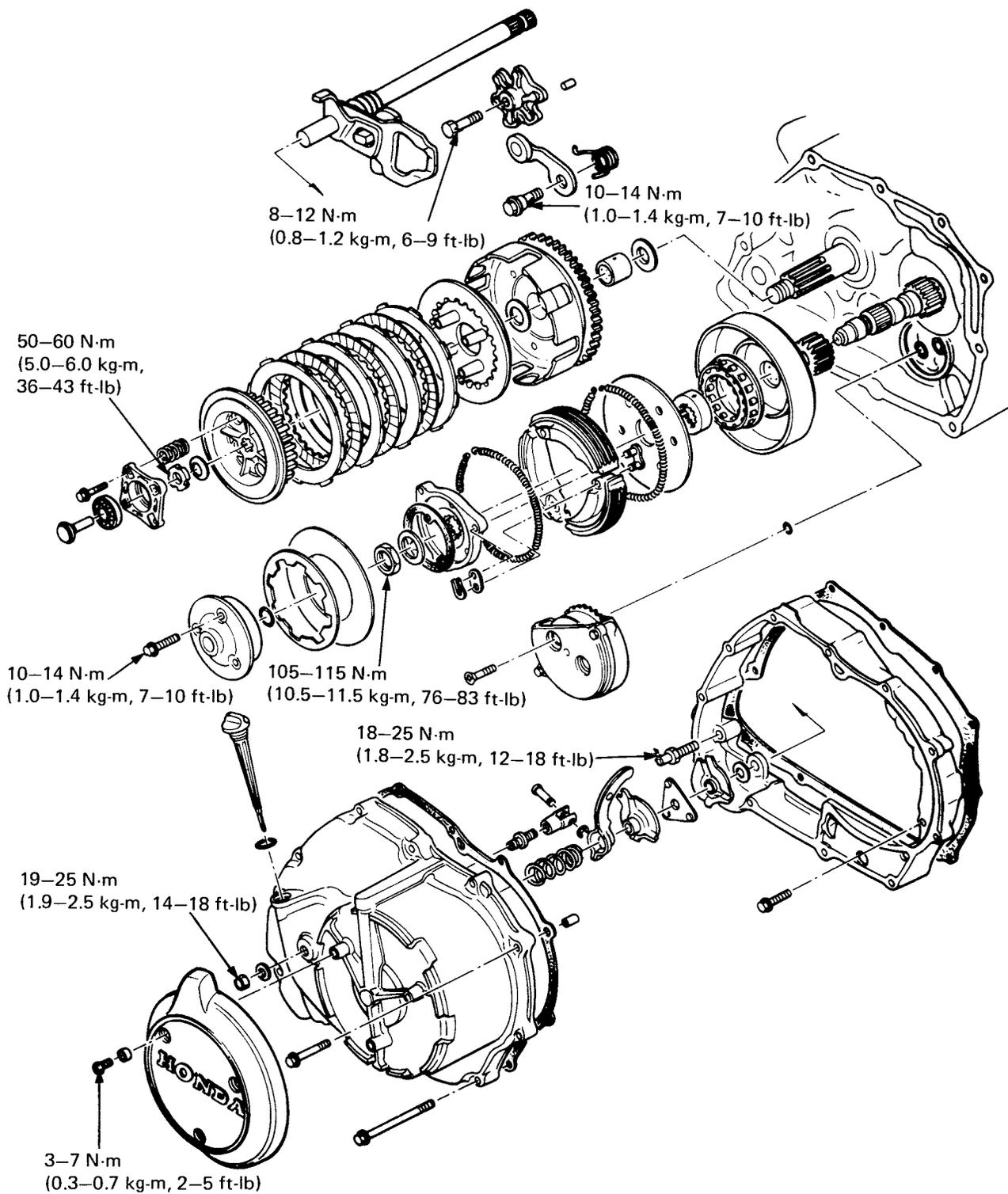
Install the cam chain guide.  
Install a new gasket, the dowel pins and a new O-ring.  
Install the cylinder head (Page 6–7).



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MEMO

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# 8. CLUTCH/OIL PUMP/ GEARSHIFT LINKAGE

SERVICE INFORMATION	8-1	MANUAL CLUTCH	8-12
TROUBLESHOOTING	8-2	OIL PUMP	8-16
RIGHT CRANKCASE COVER REMOVAL	8-3	GEARSHIFT LINKAGE	8-20
CENTRIFUGAL CLUTCH	8-6	RIGHT CRANKCASE COVER INSTALLATION	8-21

## SERVICE INFORMATION

### GENERAL

- This section covers removal and installation of the centrifugal clutch, manual clutch, oil pump and gearshift linkage.
- The clutches, oil pump and gearshift linkage can be serviced with the engine installed in the frame.

### SPECIFICATIONS

ITEM		STANDARD	SERVICE LIMIT
Manual clutch	Spring free length	25.7 mm (1.01 in)	25.0 mm (0.98 in)
	Spring preload	37.5 kg (86.67 lb)	—————
	Disc thickness	2.9–3.0 mm (0.11–0.12 in)	2.6 mm (0.10 in)
	Disc warpage	—————	0.20 mm (0.008 in)
	Plate warpage	—————	0.20 mm (0.008 in)
Centrifugal clutch	Drum I.D.	116 mm (4.57 in)	116.3 mm (4.58 in)
	Weight thickness	4.3 mm (0.17 in)	4.1 mm (0.16 in)
	Spring free length	267.5 mm (10.53 in)	282 mm (11.1 in)
	Spring preload	12.3–13.7 kg (27.1–30.20 lb)	—————
	Clutch outer guide O.D.	20.000–20.021 mm (0.7874–0.7882 in)	19.95 mm (0.785 in)
Oil pump	Rotor-to-cover clearance	0.15–0.20 mm (0.006–0.008 in)	0.25 mm (0.010 in)
	Rotor tip clearance	0.15 mm (0.006 in)	0.20 mm (0.008 in)
	Rotor-to-body clearance	0.30–0.36 mm (0.012–0.014 in)	0.40 mm (0.016 in)

### TORQUE VALUES

Oil filter rotor cover bolts	10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)
Manual clutch lock nut	50–60 N·m (5.0–6.0 kg-m, 36–43 ft-lb)
Centrifugal clutch lock nut	105–115 N·m (10.5–11.5 kg-m, 76–83 ft-lb)
Clutch adjusting screw lock nut	19–25 N·m (1.9–2.5 kg-m, 14–18 ft-lb)
Clutch lifter stopper bolt	18–25 N·m (1.8–2.5 kg-m, 13–18 ft-lb)
Gearshift drum stopper arm bolt	10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)
Gearshift drum stopper plate bolt	8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)

### TOOLS

#### Special

Lock nut wrench, 30 mm	07907–6890100	Equivalent commercially available in U.S.A.
Clutch center holder	07923–9580000	
Bearing remover, 17 mm	07936–3710300	
Bearing remover handle	07936–3710100	

#### Common

Lock nut wrench, 20 x 24 mm	07716–0020100 or 07916–3710000	
Extension bar	07716–0020500	Equivalent commercially available in U.S.A.
Sliding weight	07741–0010201	
Driver	07749–0010000	
Attachment, 37 x 40 mm	07746–0010200	
Pilot, 17 mm	07746–0040300	

8

### TROUBLESHOOTING

Faulty clutch operation can usually be corrected by adjusting the clutch.

#### **Clutch slips when accelerating**

1. Faulty clutch lifter.
2. Discs worn.
3. Weak springs.

#### **Clutch will not disengage**

1. Faulty clutch lifter.
2. Plates warped.

#### **ATC creeps with clutch disengaged**

1. Faulty centrifugal clutch.
2. Plates warped.

#### **Clutch operation feels rough**

- Outer drum slots rough.

#### **Hard to shift**

1. Stopper plate damaged.
2. Incorrect clutch adjustment.
3. Faulty clutch lifter.

#### **Gearshift pedal will not return**

1. Weak or broken shift return spring.
2. Shift spindle binding with case.

#### **Transmission jumps out of gears**

- Weak or broken stopper spring.

#### **Low oil pressure**

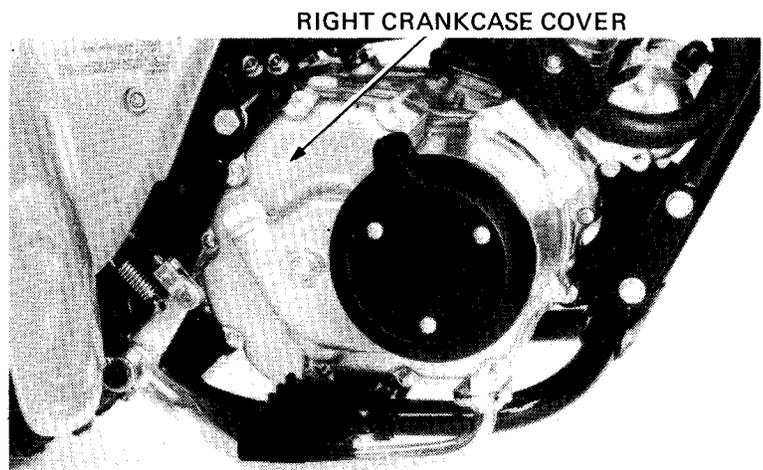
1. Faulty oil pump.
2. Oil pump drive gear broken.

## RIGHT CRANKCASE COVER REMOVAL

Drain the oil from the engine.

Remove the right crankcase cover bolts and cover.

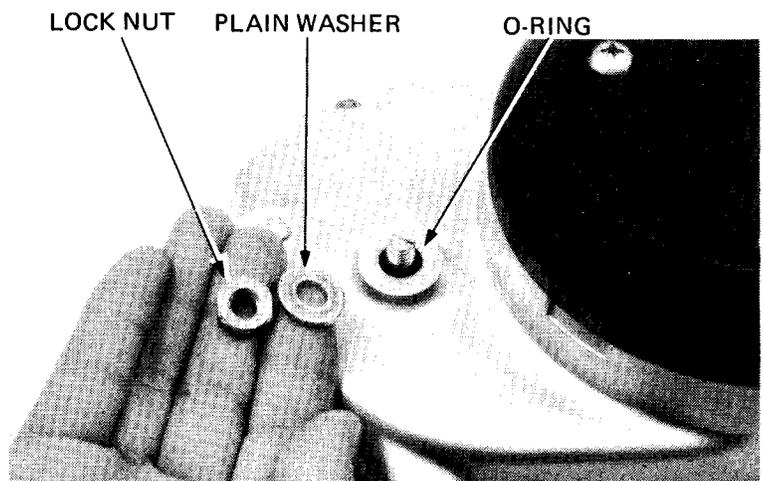
Remove the gasket and dowel pins.



## CLUTCH LIFTER LEVER DISASSEMBLY

Remove the clutch adjusting screw lock nut, washer and O-ring.

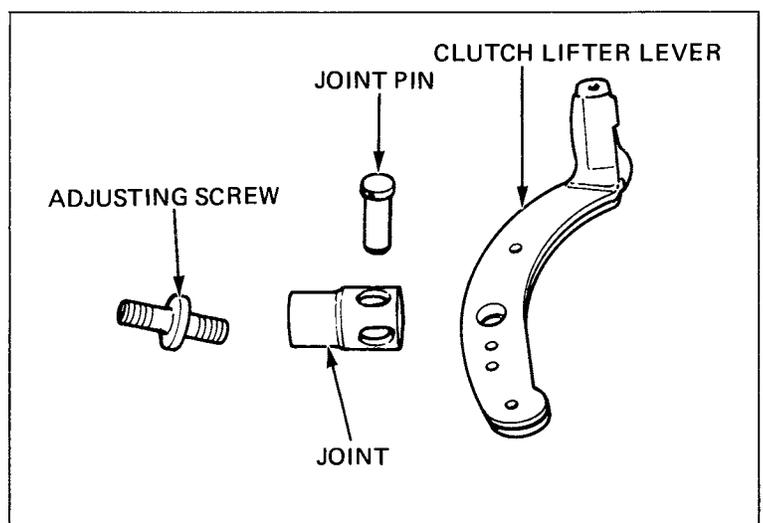
Remove the clutch lifter lever and spring.



Remove the clutch adjusting screw.

Remove the circlip and disassemble the clutch lifter lever.

Check the disassembled parts for damage or wear, replace the parts if necessary.

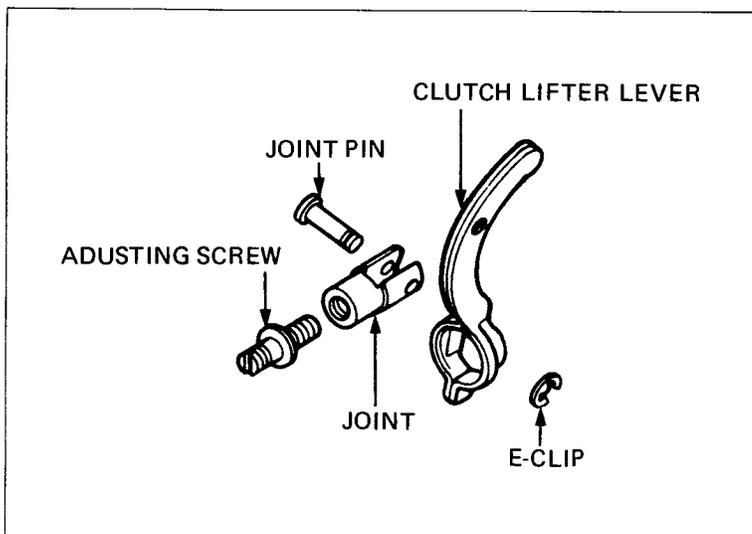


## CLUTCH/OIL PUMP

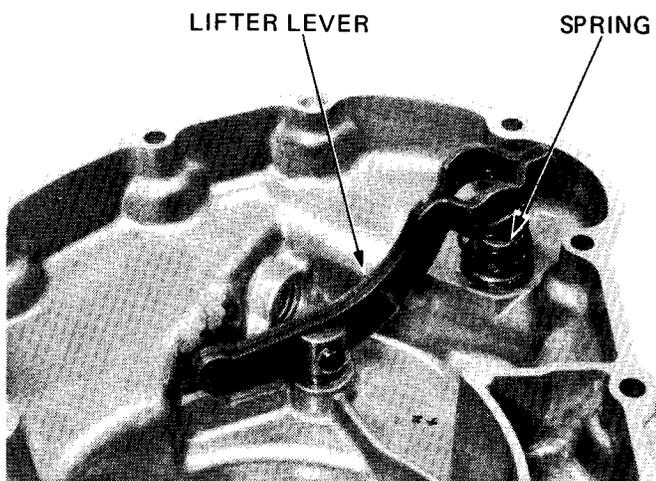
### CLUTCH LIFTER LEVER ASSEMBLY

Install the joint and joint pin on the lifter lever and secure them with the E-clip.

Install the clutch adjusting screw into the joint.



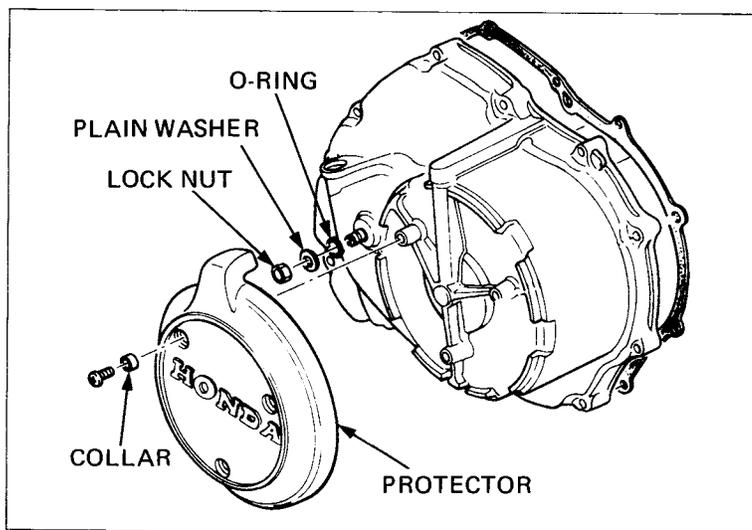
Install the spring and clutch lifter lever onto the right crankcase cover.



Slip the O-ring onto the clutch adjusting screw.

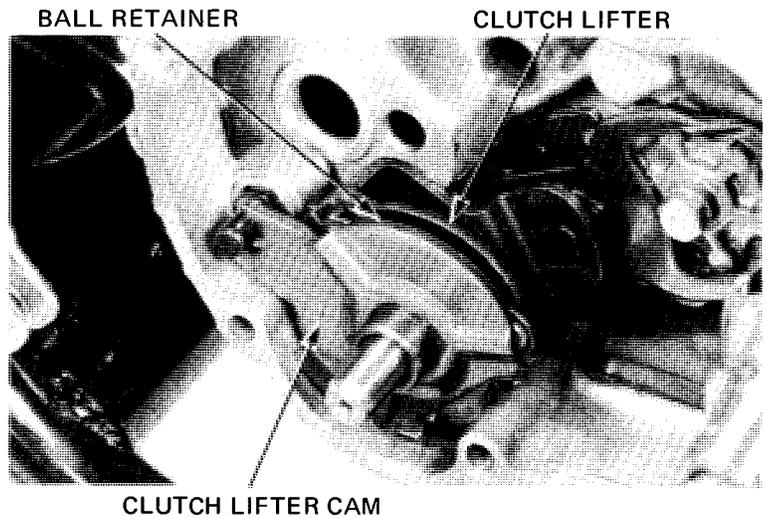
Install the lock nut and right crankcase cover protector.

Install the right crankcase cover (Page 8-21).



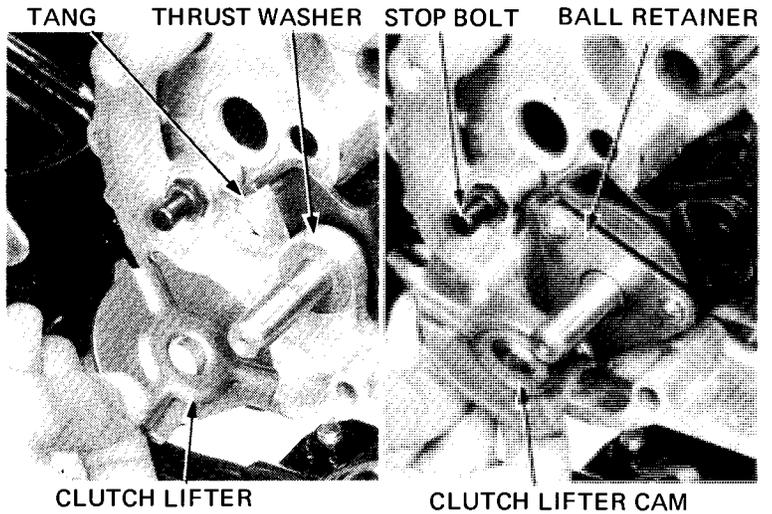
**CLUTCH LIFTER REMOVAL**

Remove the clutch lifter cam, ball retainer and clutch lifter.



**CLUTCH LIFTER INSTALLATION**

Install the thrust washer.  
 Install the clutch lifter, aligning its groove with the tang on the gearshift spindle.  
 Install the ball retainer.  
 Install the clutch lifter cam by aligning its groove with the stop bolt on the right crankcase spacer.



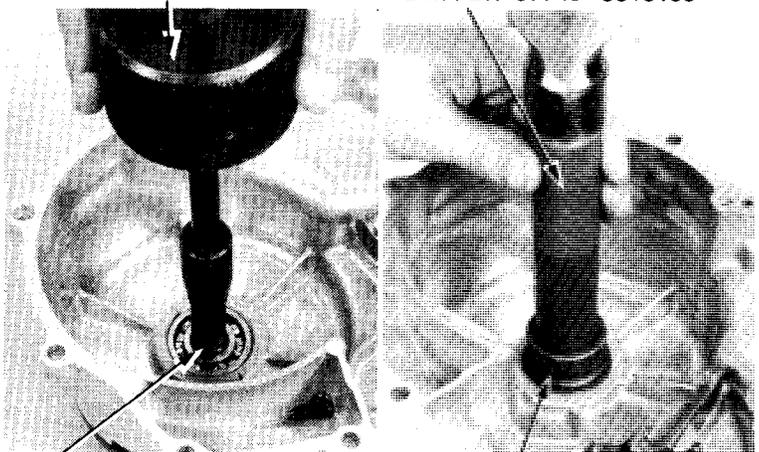
**BEARING REPLACEMENT**

Remove the bearing from the right crankcase cover with the special tool.

Drive a new bearing into the right crankcase.

REMOVER HANDLE 07936-3710100  
 SLIDING WEIGHT 07741-0010201

DRIVER 07749-0010100



BEARING REMOVER, 17 mm 07936-3710300    ATTACHMENT, 37 x 40 mm 07746-0010200  
 PILOT, 17 mm 07746-0040300

## CLUTCH/OIL PUMP

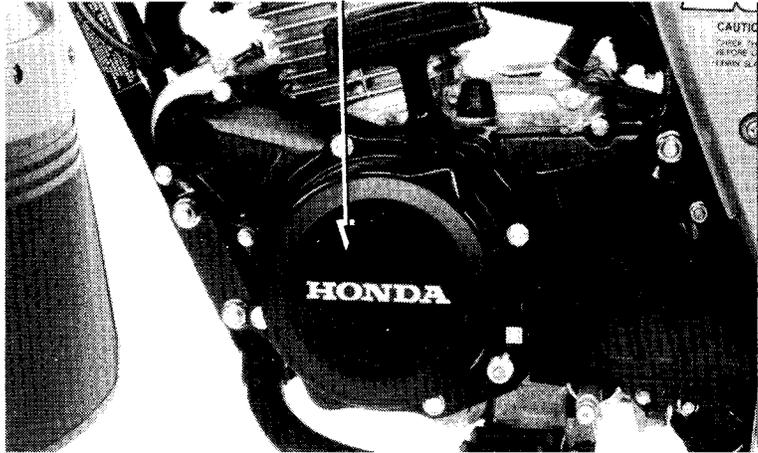
### CENTRIFUGAL CLUTCH

#### REMOVAL

Remove the recoil starter from the left crankcase cover (Page 9-2).

Hold the recoil starter driven pulley with a screwdriver or suitable lever.

RECOIL STARTER COVER



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

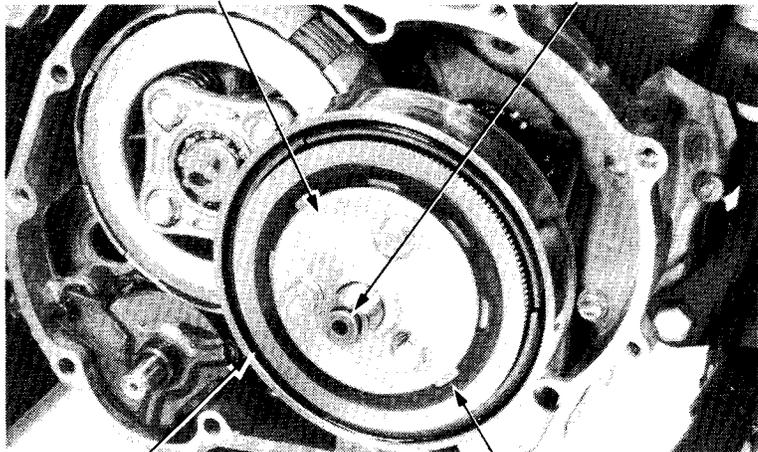
Remove the oil filter rotor cover, slide friction, spring, thrust washer and O-ring.

#### CAUTION

*Be careful not to damage the oil pressure pad.*

OIL FILTER ROTOR COVER

OIL PRESSURE PAD



THRUST WASHER

FRICITION SPRING

Remove the lock nut by turning it clockwise.

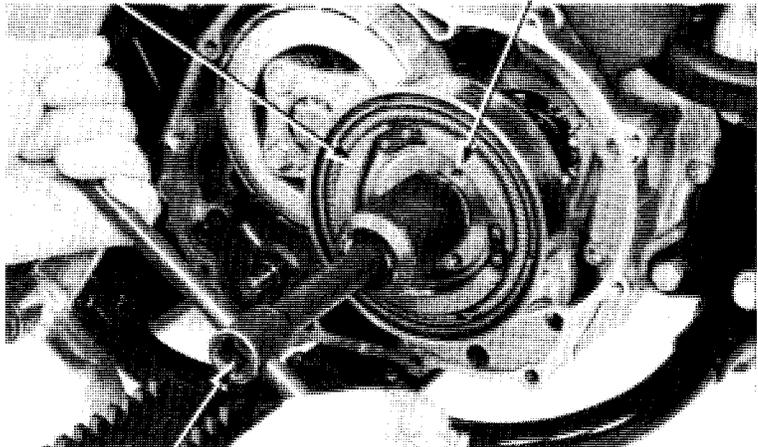
#### NOTE

The lock nut has left hand threads.

Remove the centrifugal clutch weights.

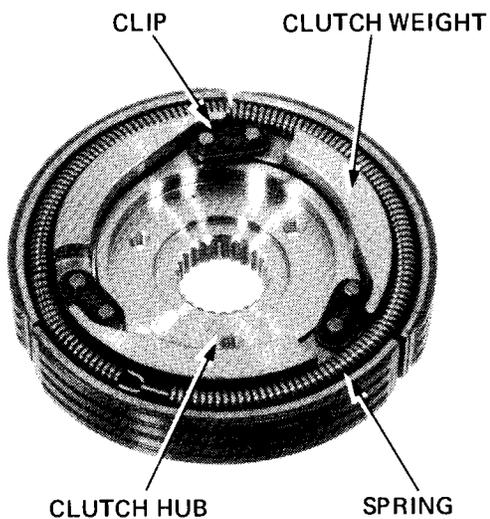
CENTRIFUGAL CLUTCH WEIGHT

LOCK NUT WRENCH, 30 mm  
07907-PD10000 (Equivalent  
commercially available in U.S.A.)



EXTENSION BAR 07716-0020500  
(Equivalent commercially available in U.S.A.)

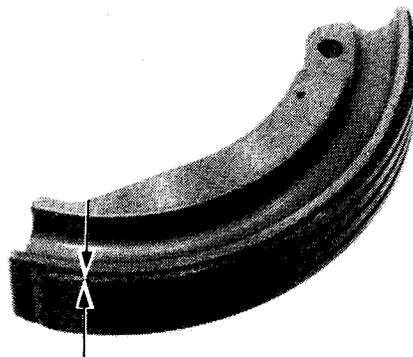
Remove the springs.  
Remove the clips and centrifugal clutch weights.



**WEIGHT INSPECTION**

Measure the weight lining thickness.

**SERVICE LIMIT: 4.1 mm (0.16 in)**



Measure the weight spring free length.

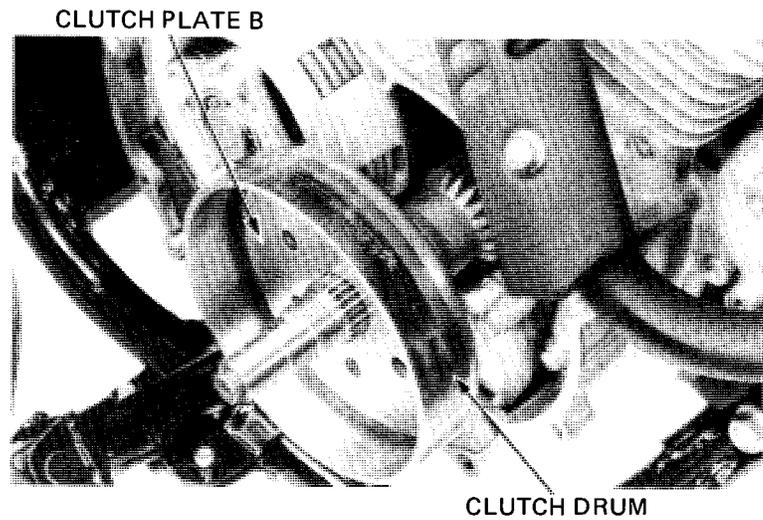
**SERVICE LIMIT: 282 mm (11.1 in)**



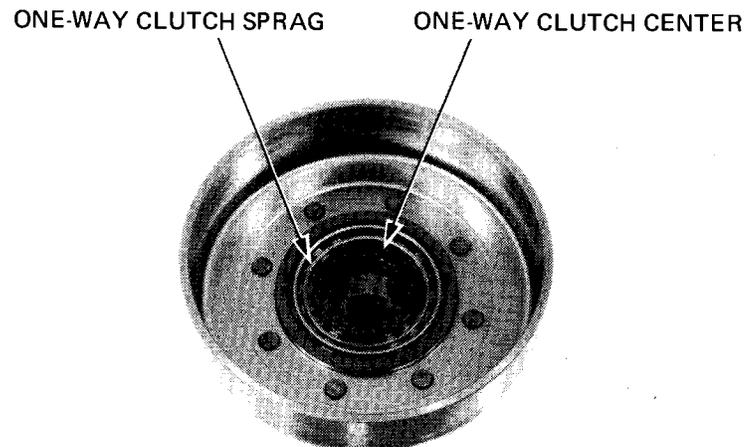
## CLUTCH/OIL PUMP

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Remove the clutch plate B.  
Align the clutch outer cutout with the drive gear  
and remove the clutch drum.



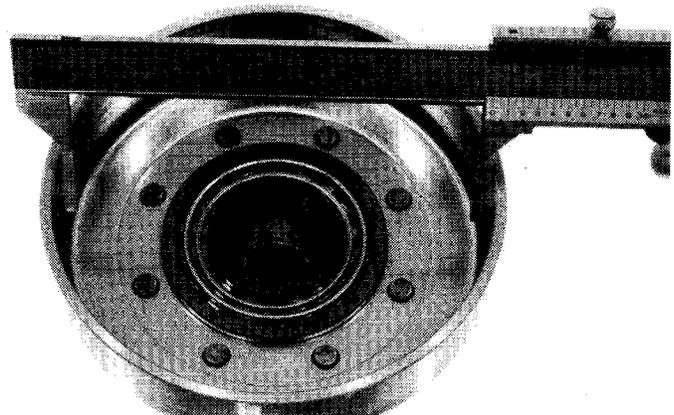
Remove the one-way clutch center and sprag.



### CLUTCH DRUM INSPECTION

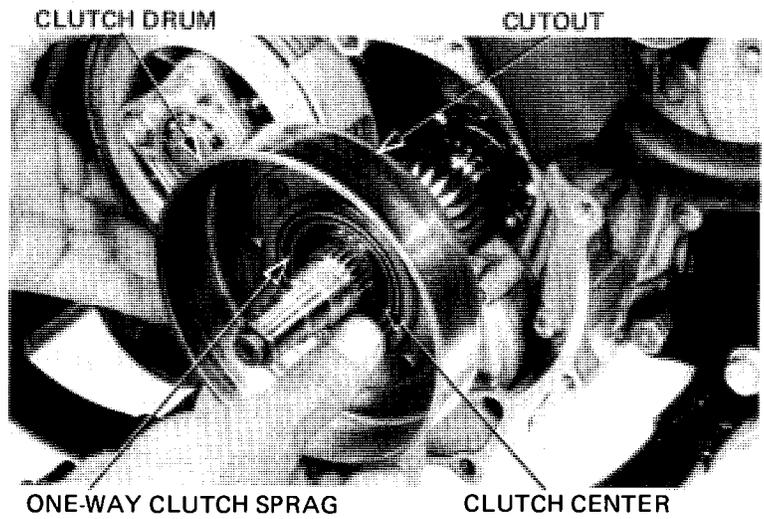
Check the inside of the centrifugal clutch drum for  
scratches or excessive wear. Replace if necessary.  
Measure the I.D. of the clutch drum.

**SERVICE LIMIT: 116.3 mm (4.58 in)**

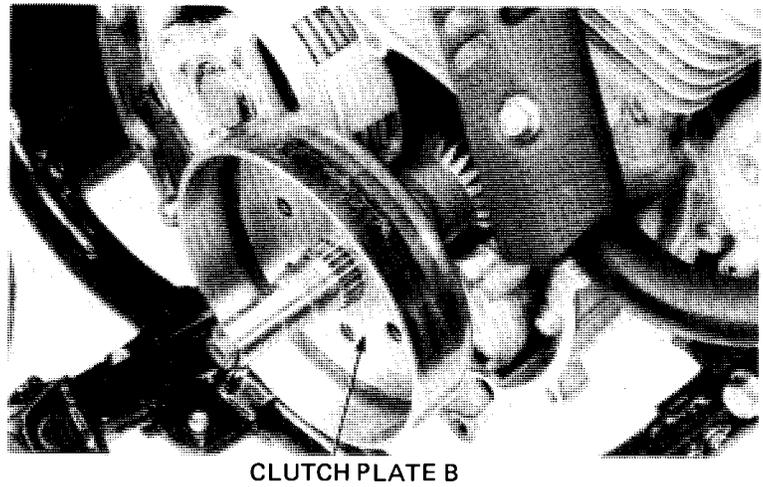


**INSTALLATION**

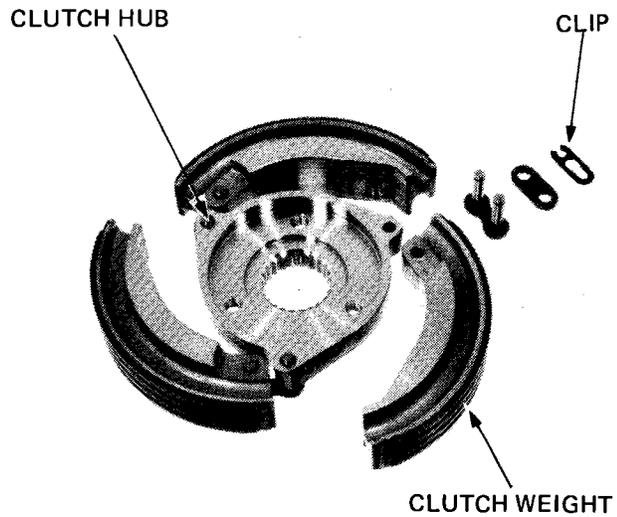
Install the one-way clutch sprag into the centrifugal clutch drum.  
Install the clutch center by turning it counterclockwise.  
Install the centrifugal clutch drum aligning the clutch outer cutout with the drive gear on the clutch drum.



Install clutch plate B onto the clutch drum.

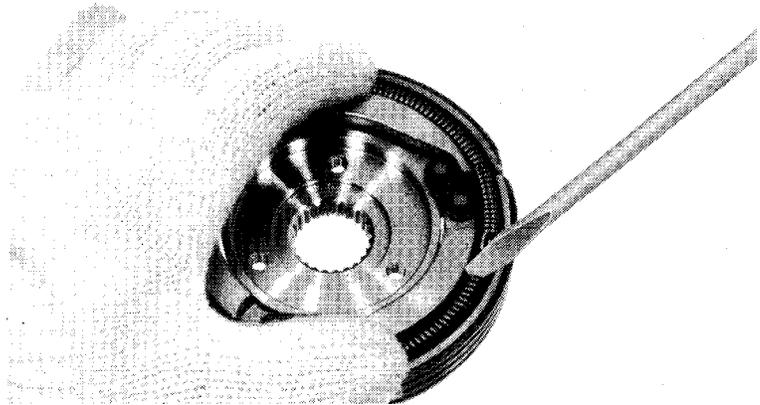


Attach the centrifugal clutch weights to the clutch hub with the links and clips.



## CLUTCH/OIL PUMP

Install the centrifugal clutch springs, using a screwdriver.

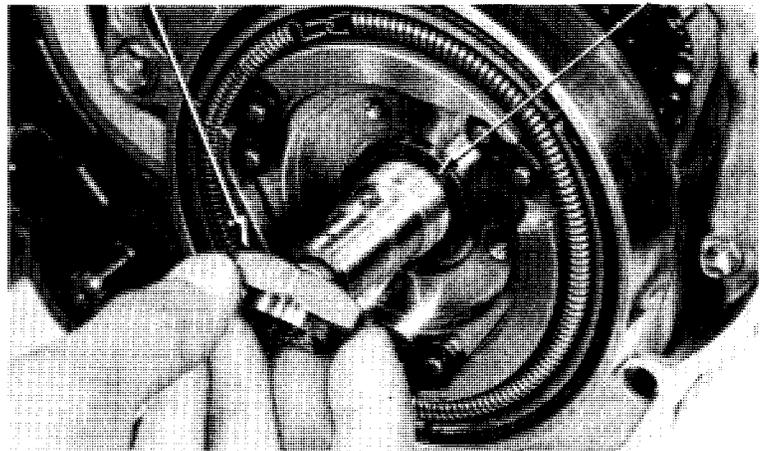


Install the centrifugal clutch weight assembly onto the clutch drum.  
Install the lock washer with its cupped face in.

Install the lock nut.

LOCK NUT (LEFT HAND THREADS)

LOCK WASHER



Hold the recoil starter driven pulley with a screwdriver or suitable lever (Page 9-7).

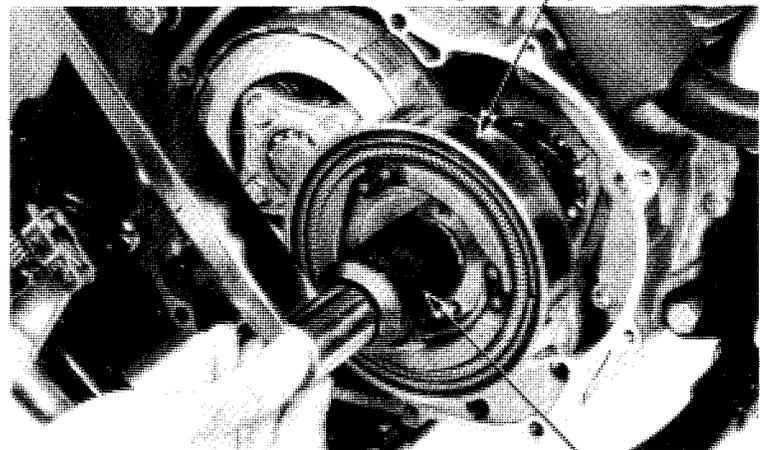
Turn the lock nut counterclockwise to tighten it.

**TORQUE: 105–115 N·m**  
**(10.5–11.5 kg·m, 76–83 ft·lb)**

### NOTE

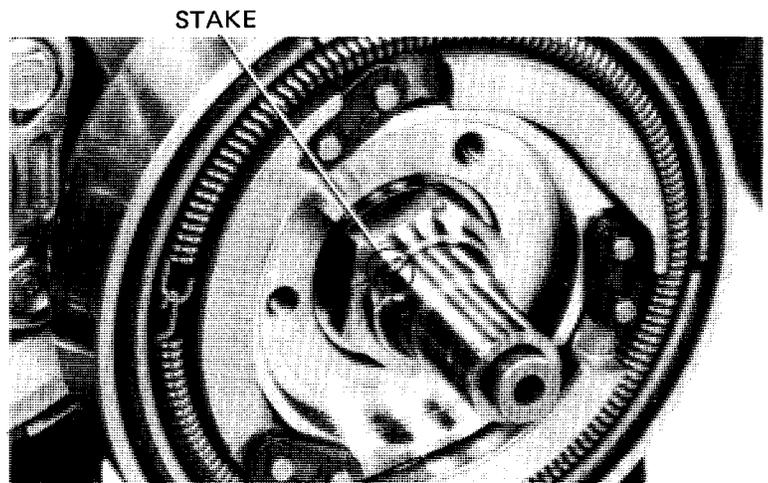
The lock nut has left hand threads.

CENTRIFUGAL CLUTCH



LOCK NUT WRENCH, 30 mm Equivalent commercially available in U.S.A.  
07907-6890100

Stake the lock nut into the hole in the crankshaft with a center punch.

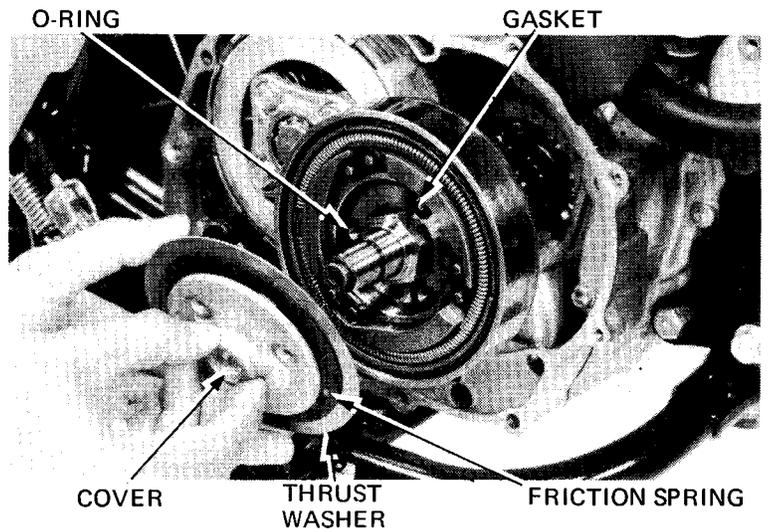


Place the oil filter rotor cover gasket onto the clutch hub.

Slip a new O-ring onto the crankshaft. Install the thrust washer, side friction spring and oil filter rotor cover.

**NOTE**

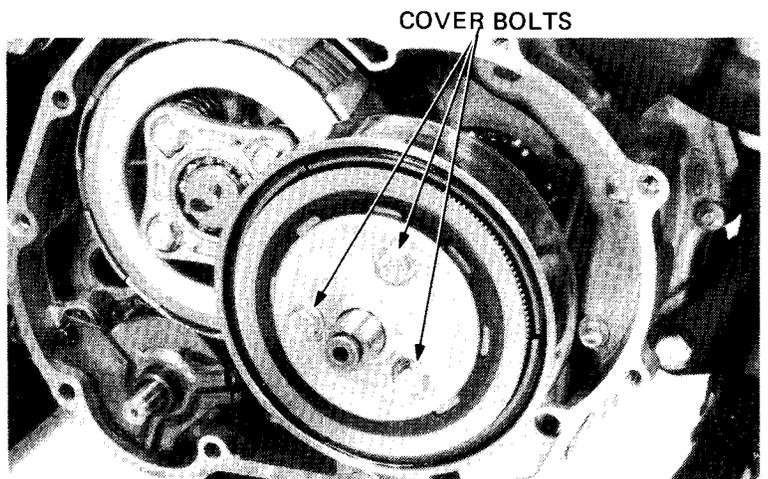
Align the teeth of the friction spring with the step on the cover.



Tighten the cover bolts.

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

Install the right crankcase cover (Page 8–21).  
Install the recoil starter and gearshift pedal (Page 9–6).



### MANUAL CLUTCH

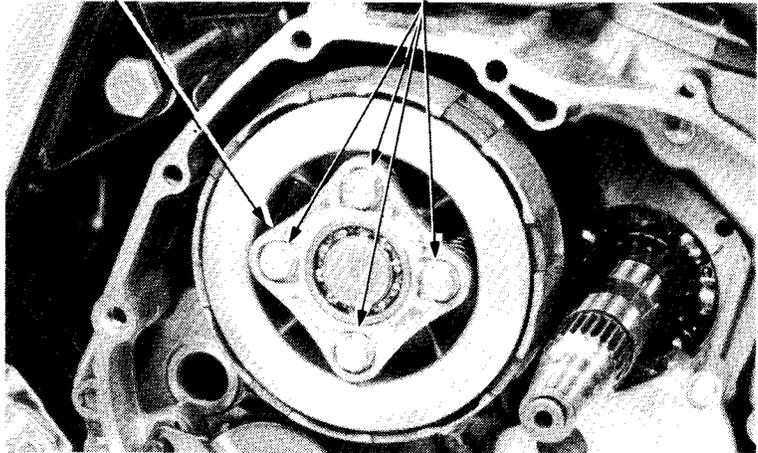
#### REMOVAL

Remove the following

- right crankcase cover (Page 8–3).
- centrifugal clutch (Page 8–6).
- clutch bolts.
- lifter plate.
- clutch springs.

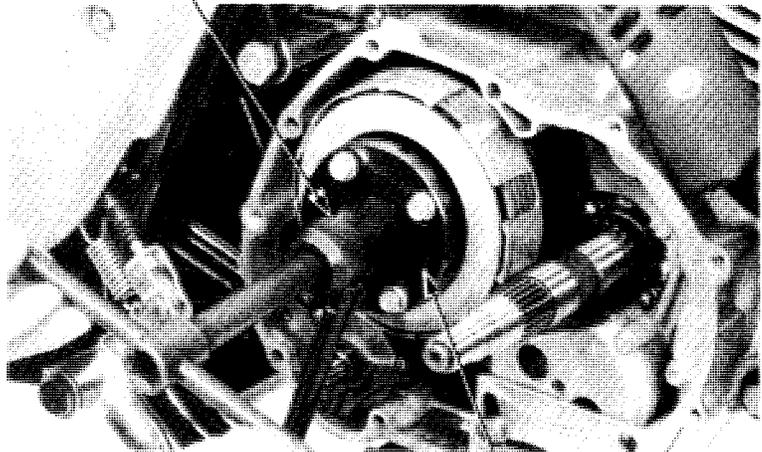
LIFTER PLATE

CLUTCH BOLTS



Install a CLUTCH CENTER HOLDER as shown, and remove the clutch lock nut.

LOCK NUT WRENCH, 20 x 24 mm  
07716–0020100



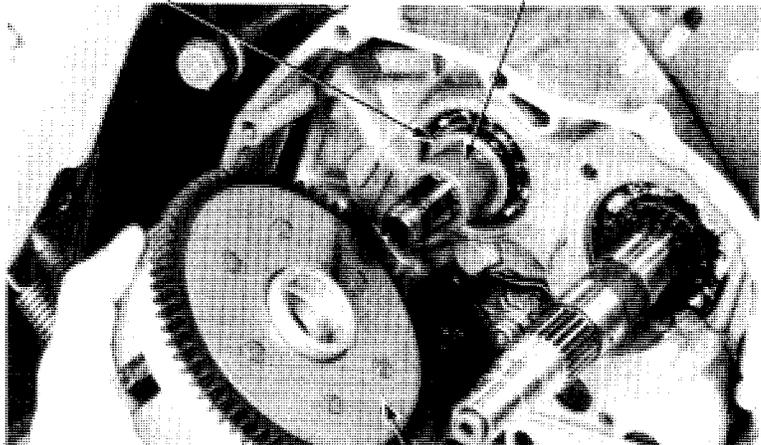
CLUTCH CENTER HOLDER  
07923–9580000

Remove the clutch center, discs, plates, pressure plate and thrust washer.

Remove the clutch outer, clutch outer guide and thrust washer.

THRUST WASHER

OUTER GUIDE



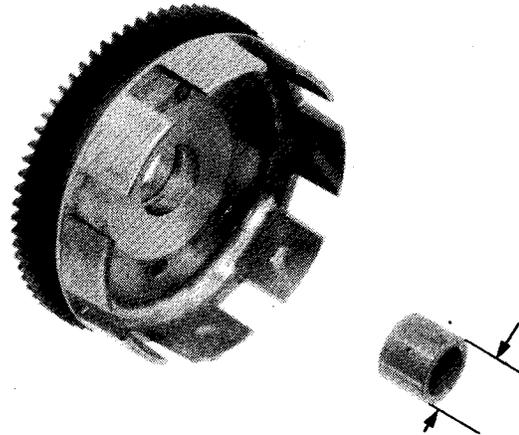
CLUTCH OUTER

**INSPECTION**

Check the slots of the clutch outer for nicks, cuts or indentations made by the clutch discs. Replace if necessary.

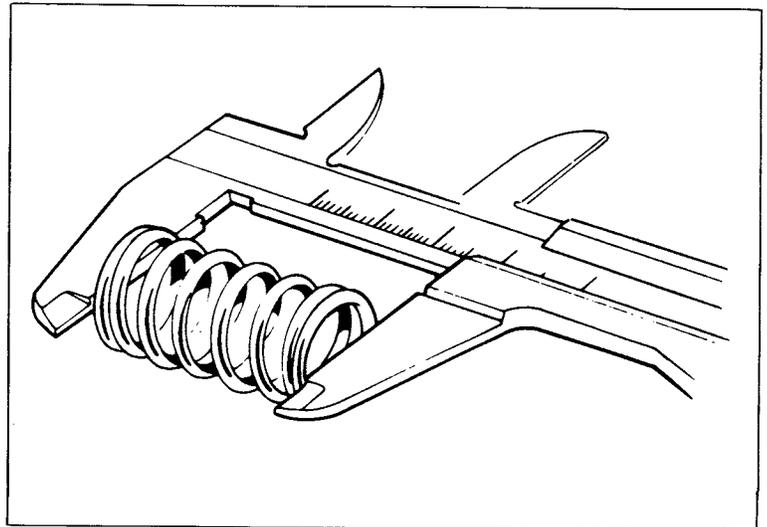
Measure the O.D. of the clutch outer guide.

**SERVICE LIMIT: 19.95 mm (0.785 in)**



Measure the spring free length.

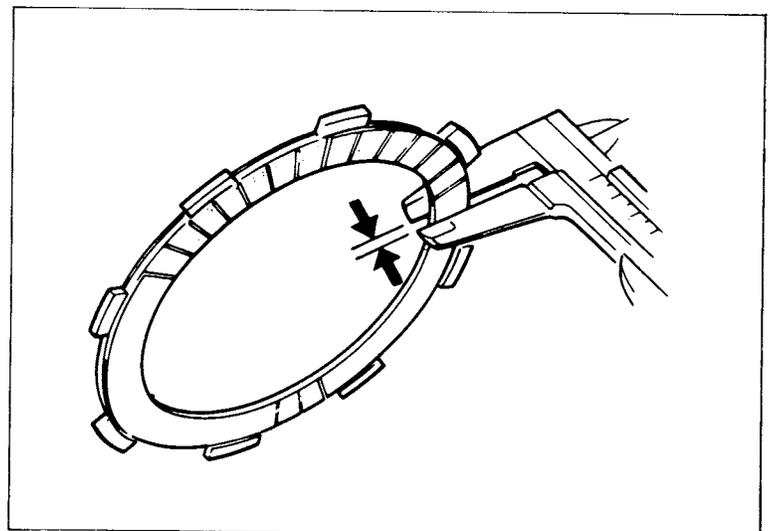
**SERVICE LIMIT: 25.0 mm (0.98 in)**



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

Measure the disc thickness.

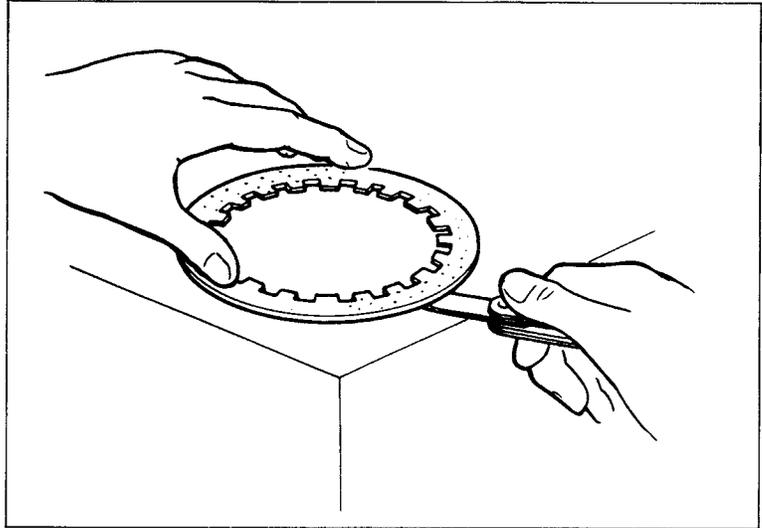
**SERVICE LIMIT: 2.6 mm (0.10 in)**



## CLUTCH/OIL PUMP

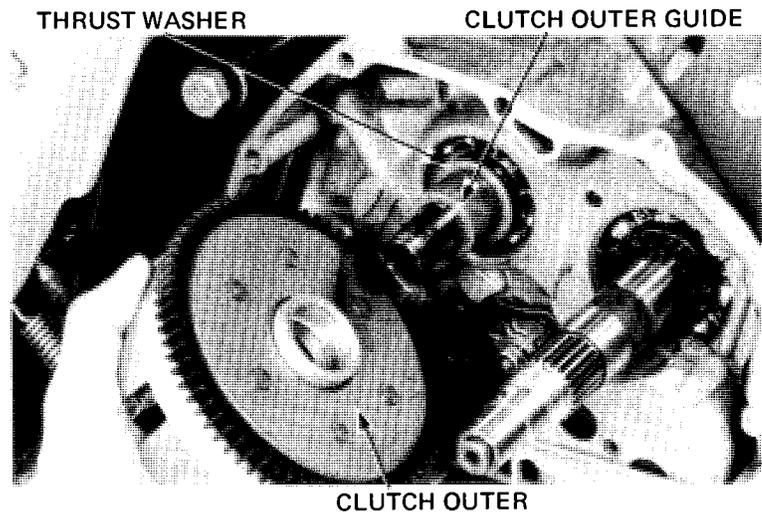
Check for plate and disc warpage on a surface plate using a feeler gauge.

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



## INSTALLATION

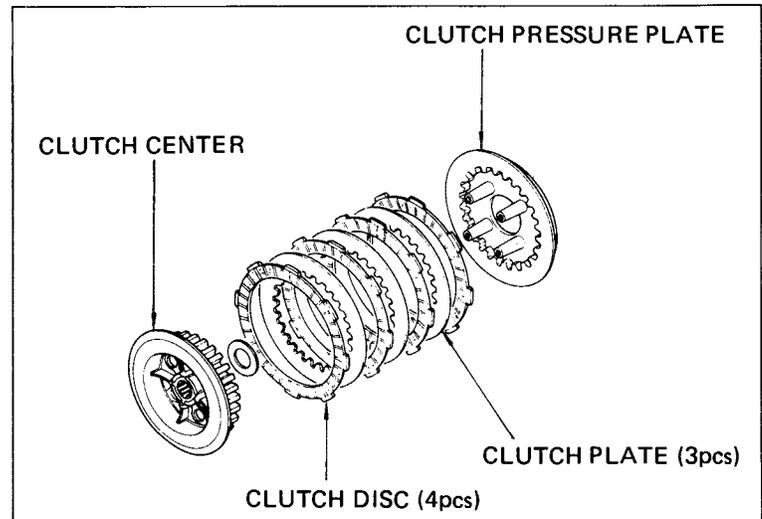
Install the thrust washer, clutch outer guide, and clutch outer.



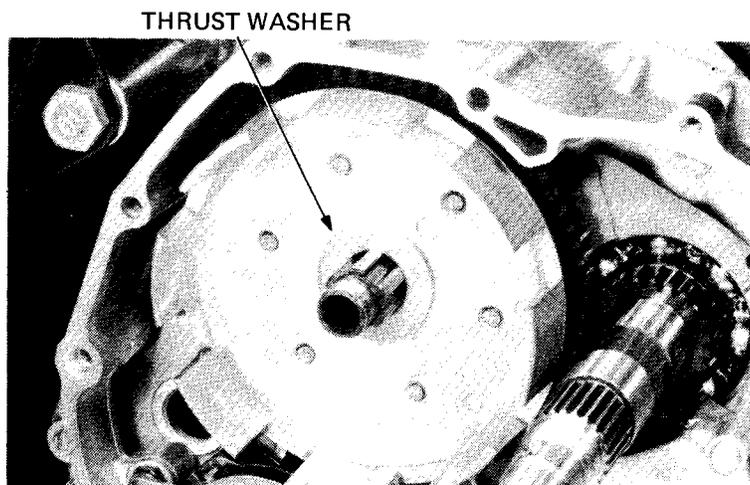
Assemble the clutch pressure plate, discs, plates and clutch center.

### NOTE

- Stack the discs and plates alternately.
- Coat new clutch discs with engine oil.



Install the thrust washer and clutch assembly.

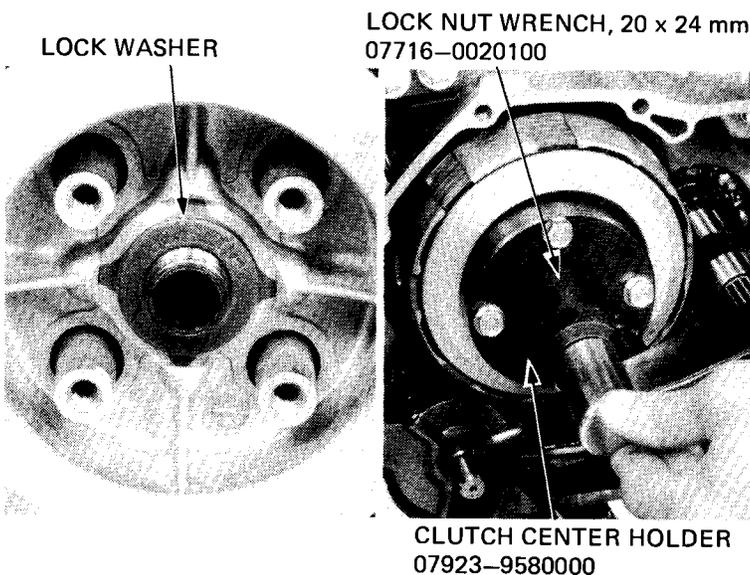


Install the lock washer with the word "OUTSIDE" facing out.

Install the clutch center holder with the clutch bolts.

Tighten the lock nut.

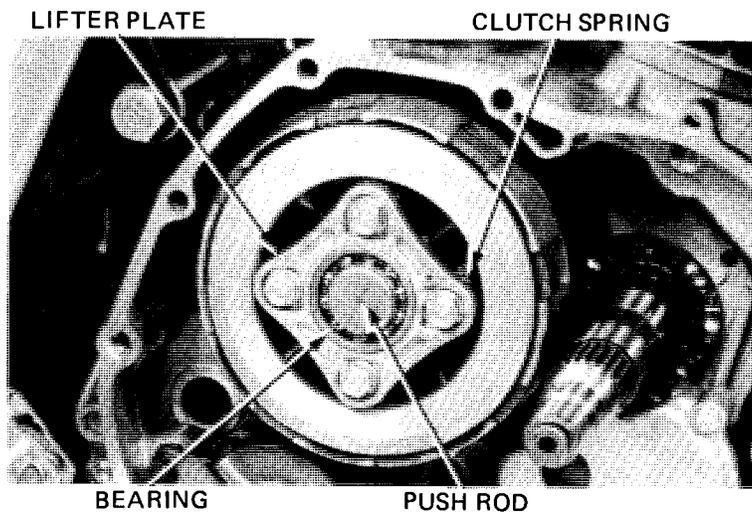
**TORQUE: 50–60 N·m**  
(5.0–6.0 kg·m, 36–43 ft·lb)



Install the clutch springs and lifter plate.  
Tighten the clutch bolts.

Install the bearing and push rod.  
Install the centrifugal clutch (Page 8–9).

Install the right crankcase cover (Page 8–21).



## CLUTCH/OIL PUMP

### OIL PUMP

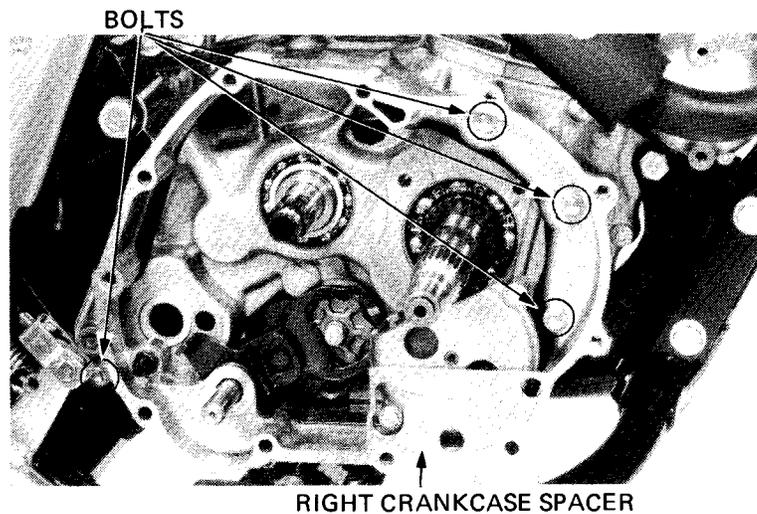
#### REMOVAL

Remove the following:

- centrifugal clutch (Page 8–6).
- clutch (Page 8–12).
- clutch lifter cam, ball retainer and clutch lifter (Page 8–5).

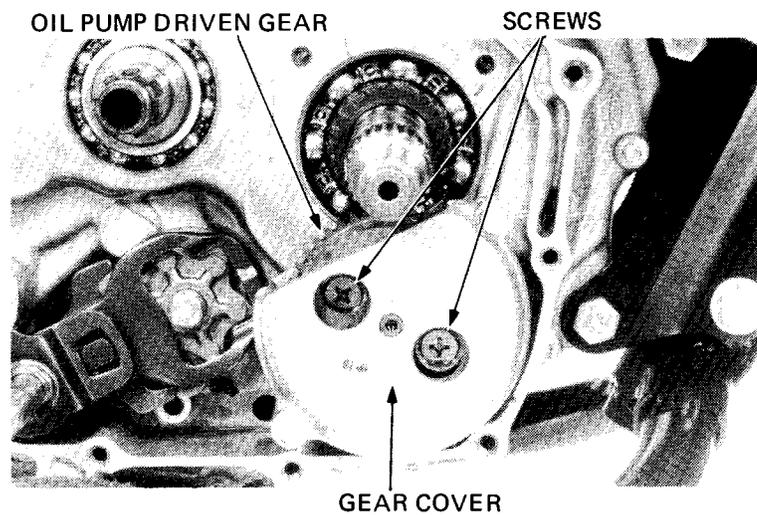
Remove the four bolts mounting the right crankcase spacer and the spacer.

Remove the gasket and dowel pins.



Turn the crankshaft and align the oil pump driven gear holes with the pump gear cover holes.

Remove the oil pump mounting screws and oil pump.

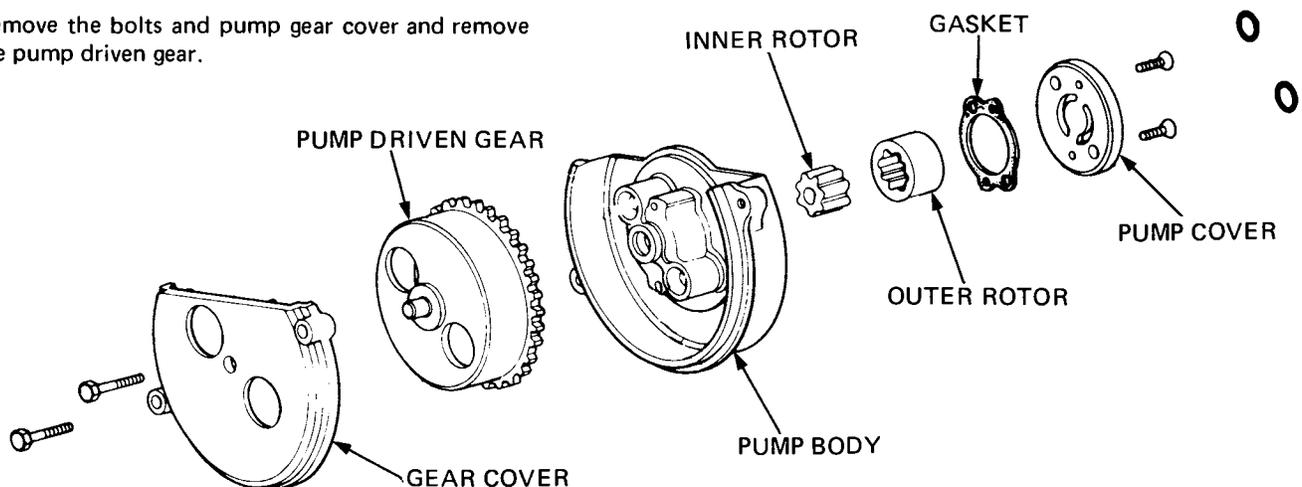


#### DISASSEMBLY

Remove the oil pump cover and gasket.

Remove the oil pump inner and outer rotors.

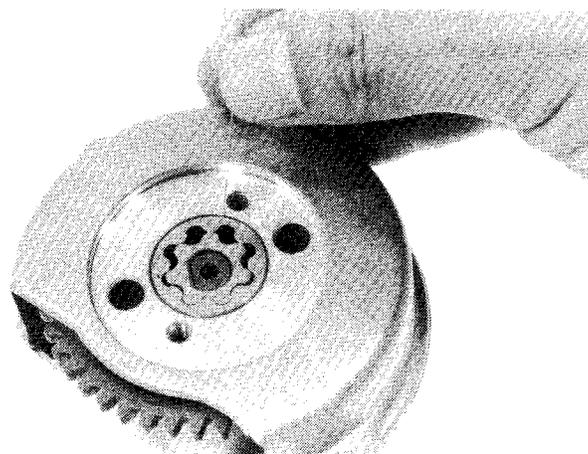
Remove the bolts and pump gear cover and remove the pump driven gear.



OIL PUMP INSPECTION

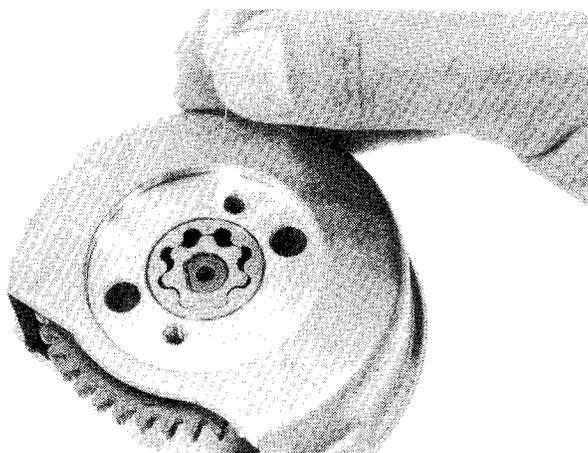
Measure the pump body-to-rotor clearance.

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



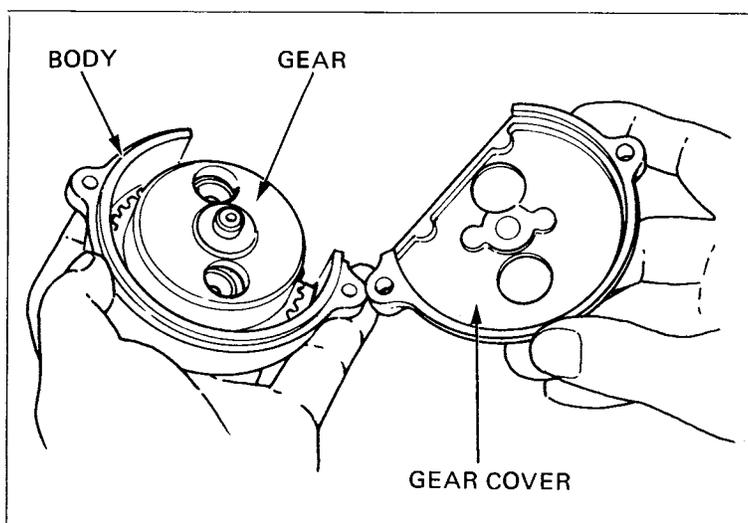
Measure the pump tip clearance.

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



ASSEMBLY

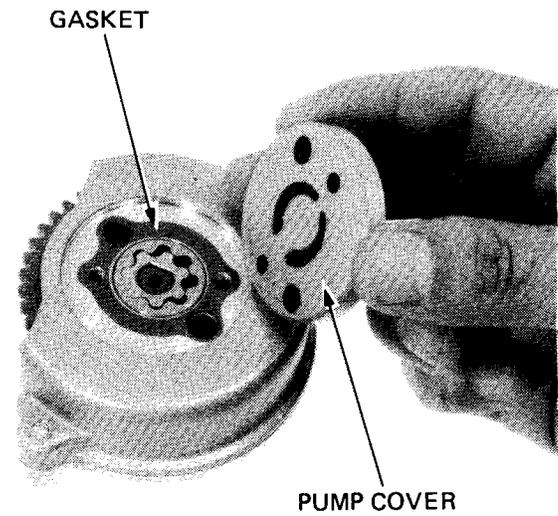
Install the pump gear and gear cover onto the oil pump body.



## CLUTCH/OIL PUMP

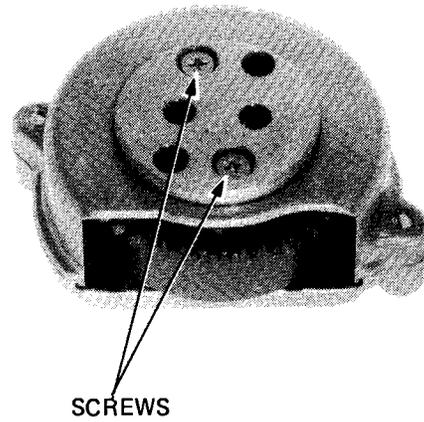
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Install the inner and outer rotors.  
Install the gasket and pump cover.



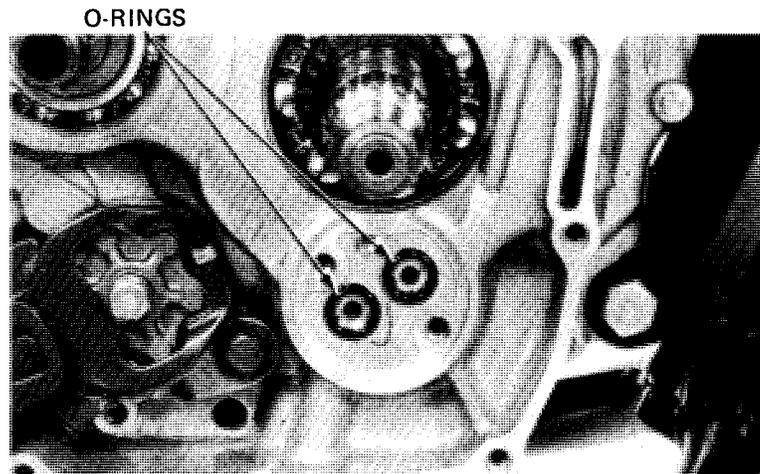
Tighten the screws.

Check the operation of the pump by rotating the pump gear by hand.



## INSTALLATION

Install the O-rings onto the crankcase.

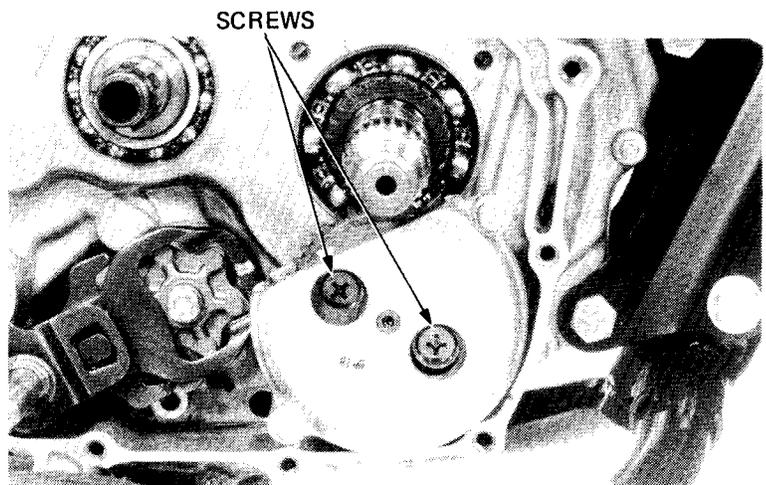


Align the oil pump driven gear holes with the gear cover holes and install the oil pump assembly.

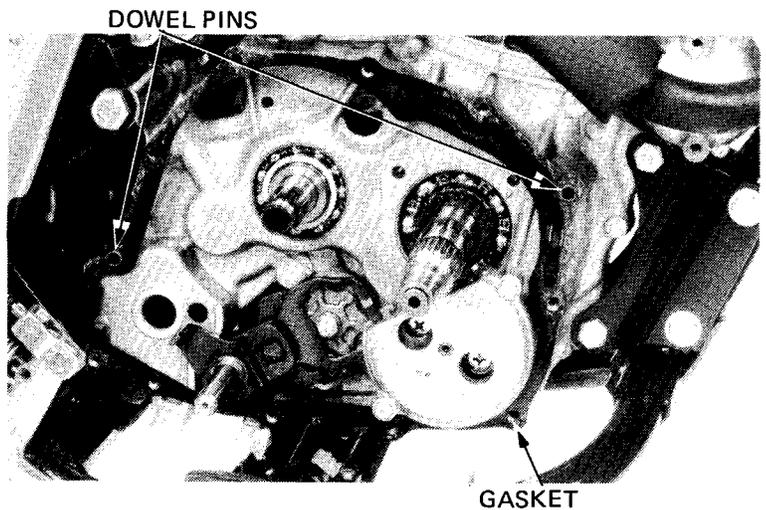
**NOTE**

Make sure that the O-rings remain in place when installing the pump.

Tighten the two oil pump mounting screws.



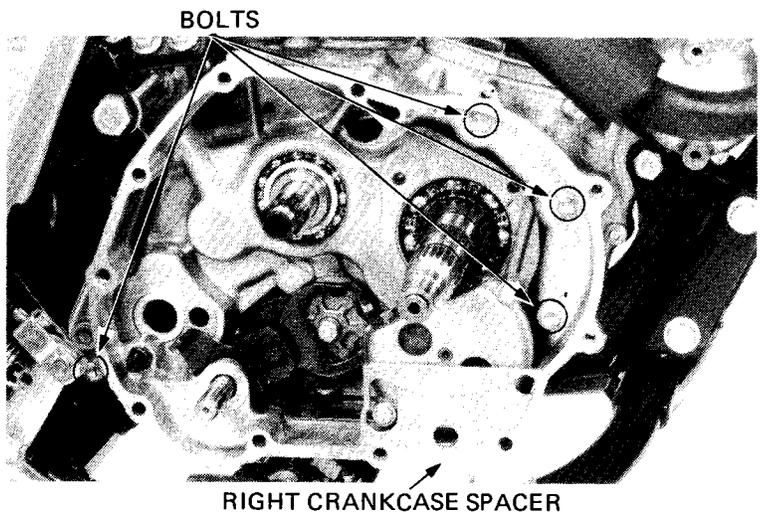
Install the two dowel pins and a new gasket.



Install the right crankcase spacer and tighten it with the four bolts.

Install the following:

- clutch (Page 8–14).
- centrifugal clutch (Page 8–9).
- clutch lifter, ball retainer and lifter cam (Page 8–5).
- right crankcase cover (Page 8–3).



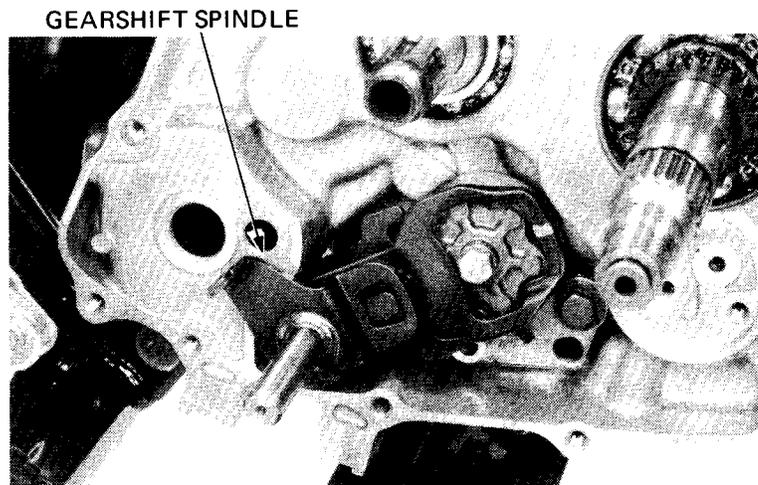
## **GEARSHIFT LINKAGE**

### **DISASSEMBLY**

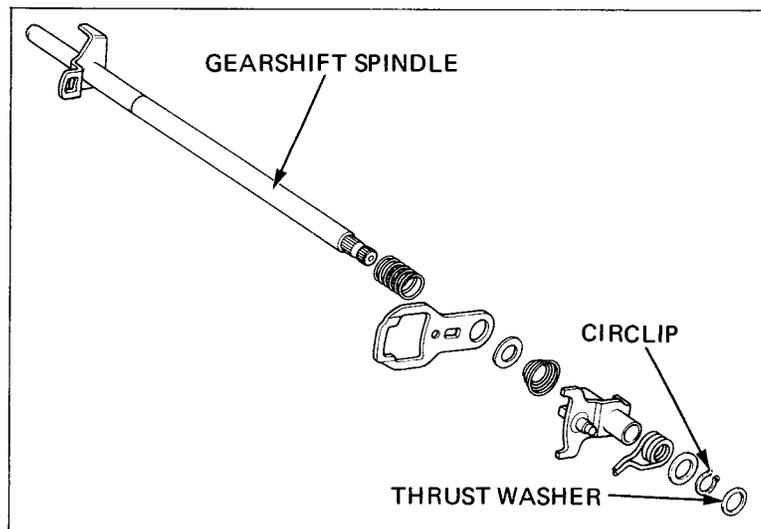
Remove the following.

- right crankcase cover (Page 8–3).
- centrifugal clutch (Page 8–6).
- manual clutch (Page 8–12).
- clutch lifter (Page 8–5).
- oil pump (Page 8–16).

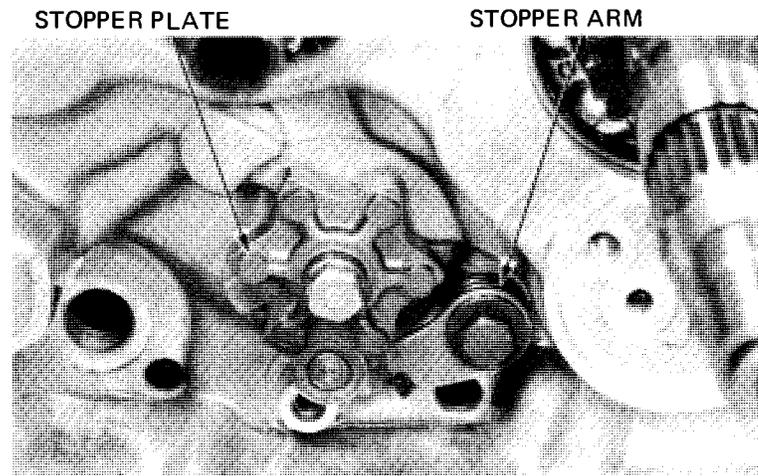
Pull the gearshift spindle out of the crankcase.



Remove the thrust washer, circlip and disassemble the gearshift spindle.



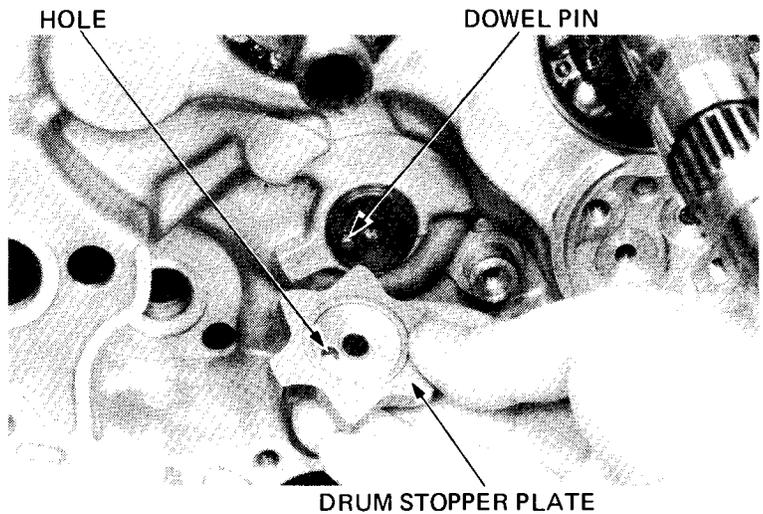
Remove the drum stopper plate and drum stopper arm.



**ASSEMBLY**

Install the drum stopper plate by aligning the hole and dowel pin.

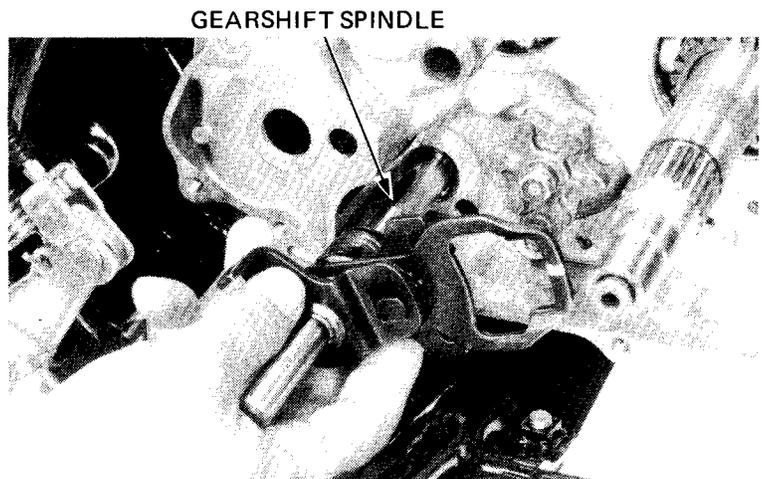
Install the stopper arm.



Assemble and install the gearshift spindle.

Install the following:

- oil pump (Page 8–18).
- manual clutch (Page 8–14).
- centrifugal clutch (Page 8–9).
- clutch lifter (Page 8–5).
- right crankcase cover.



## RIGHT CRANKCASE COVER INSTALLATION

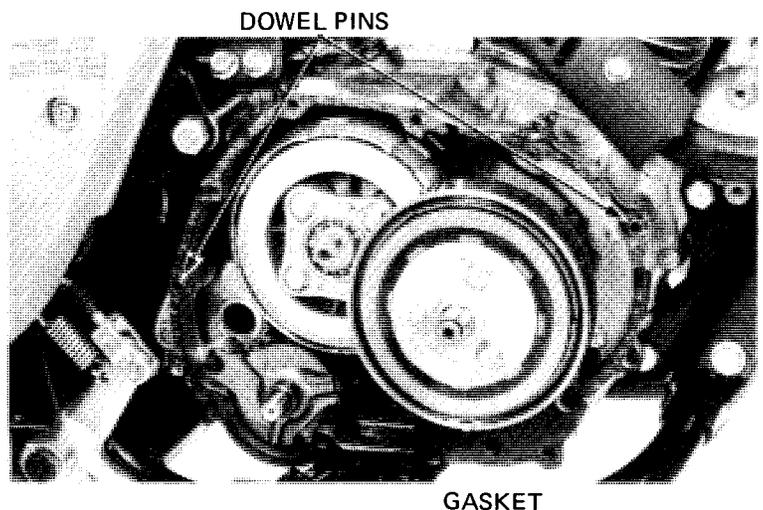
Install the dowel pins and a new gasket.  
Install the right crankcase cover.

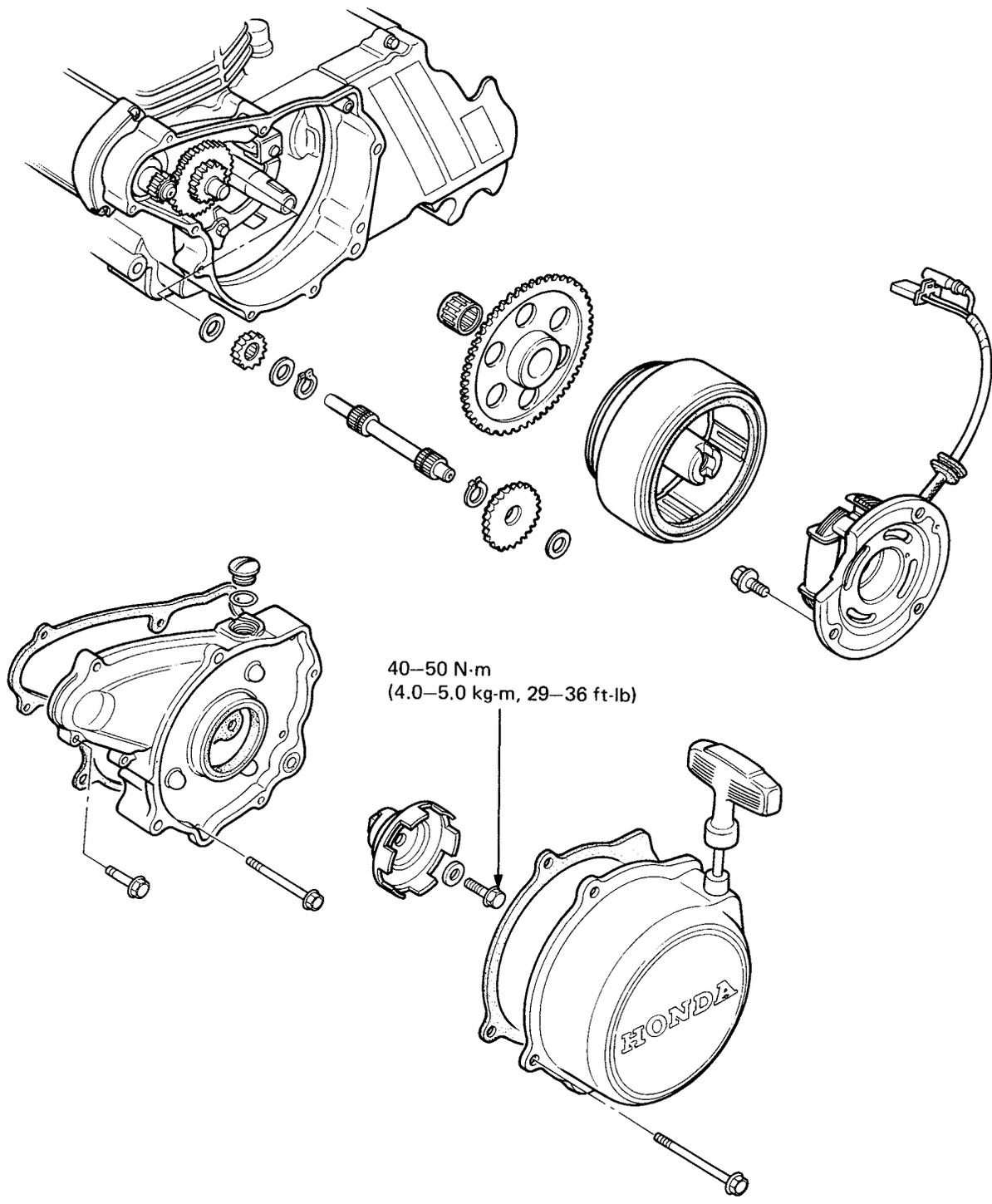
Adjust the clutch (Page 3–15).

Fill the engine with the recommended oil (Page 2–1).

Start the engine and check the clutch for smooth operation.

Be sure there are no oil leaks.





# 9. RECOIL STARTER/ ALTERNATOR/STARTER CLUTCH

SERVICE INFORMATION	9-1
TROUBLESHOOTING	9-1
RECOIL STARTER	9-2
ALTERNATOR	9-7
STARTER CLUTCH	9-10

## SERVICE INFORMATION

### GENERAL

- This section covers removal and installation of the recoil starter, alternator and starter clutch.
- Refer to Section 15 for alternator inspection.

### TORQUE VALUE

Alternator flywheel bolt 40–50 N·m (4.0–5.0 kg·m, 29–36 ft·lb)

### TOOL

Special  
Flywheel puller 07733-0010000 or 07933-2000000

9

## TROUBLESHOOTING

### Engine does not turn when operating recoil starter

1. Faulty starter ratchet
2. Faulty driven pulley
3. Faulty drive pulley

### Starter rope does not recoil

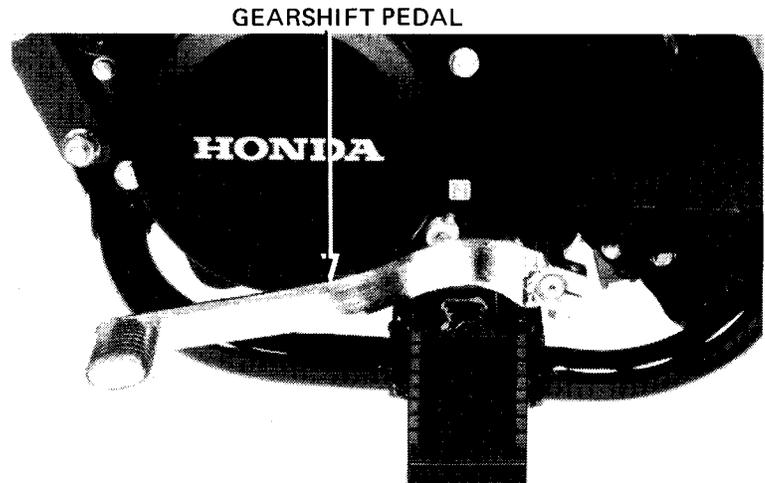
- Faulty recoil spring

## RECOIL STARTER/ALTERNATOR/STARTER CLUTCH

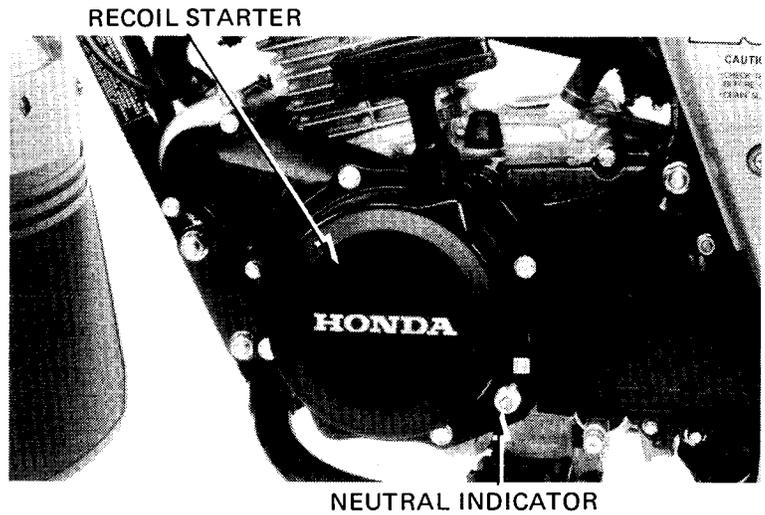
### RECOIL STARTER

#### REMOVAL

Shift the transmission into neutral.  
Remove the gearshift pedal.

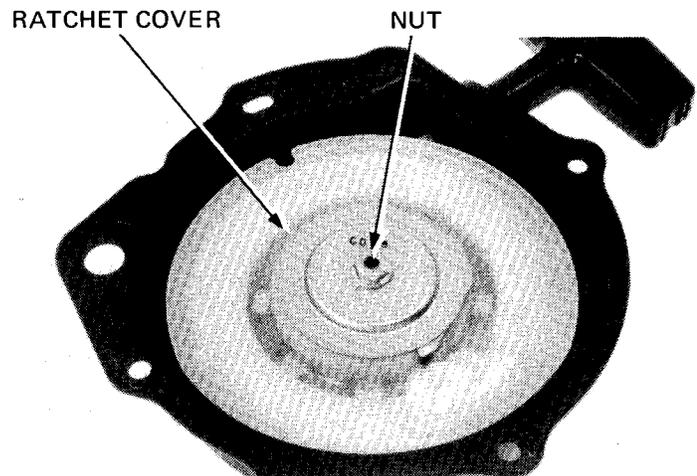


Remove the E-clip securing the neutral indicator and the indicator.  
Remove the four recoil starter mounting bolts and the recoil starter.



#### DISASSEMBLY

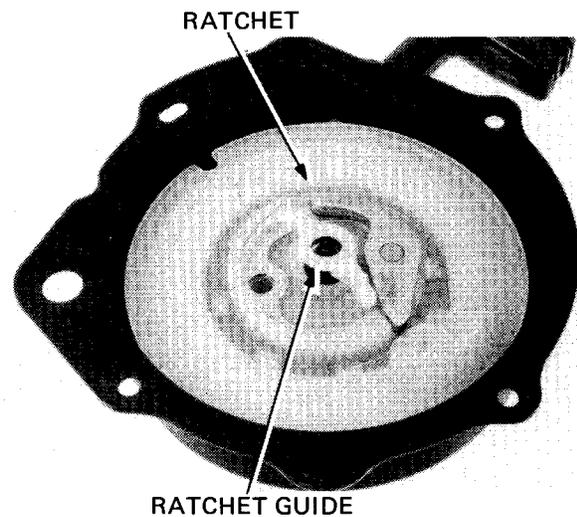
Remove the nut attaching the ratchet cover and cover.



## RECOIL STARTER/ALTERNATOR/STARTER CLUTCH

Remove the ratchet, ratchet guide, spring seat and spring.

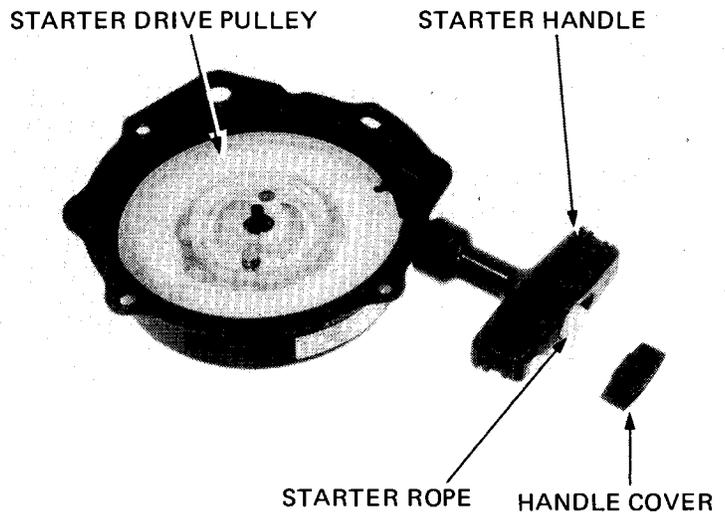
Check the ratchet, ratchet guide and spring for wear or damage.



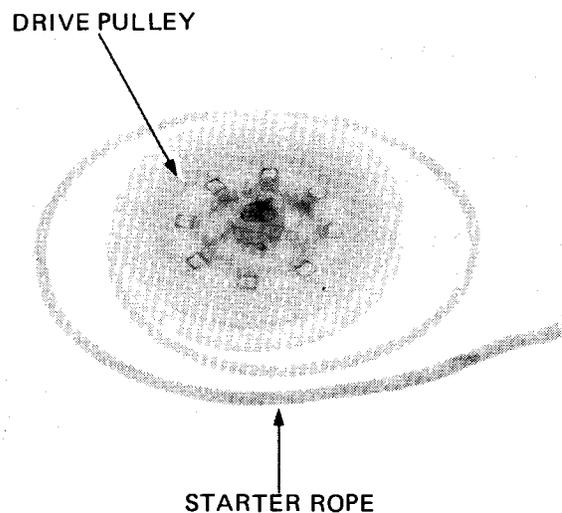
Remove the starter handle cover.  
Untie the starter rope and remove the starter handle.  
Release the starter rope slowly.  
Remove the starter drive pulley.

### CAUTION

*Wear eye protection and use care when removing the drive pulley and starter spring. The spring can pop out of the housing if care is not used.*



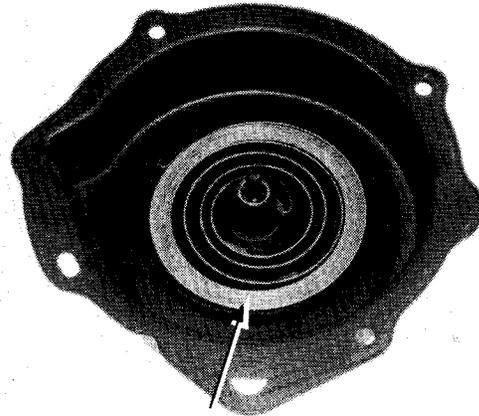
Remove the starter rope from the drive pulley.  
Check the starter rope for wear or damage.



## RECOIL STARTER/ALTERNATOR/STARTER CLUTCH

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Check the recoil starter spring.  
Remove the spring if it is broken.

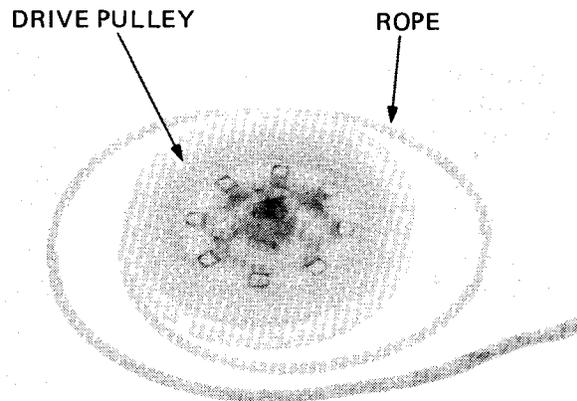


RECOIL STARTER SPRING

### ASSEMBLY

Install the starter rope and tie a square knot as shown.

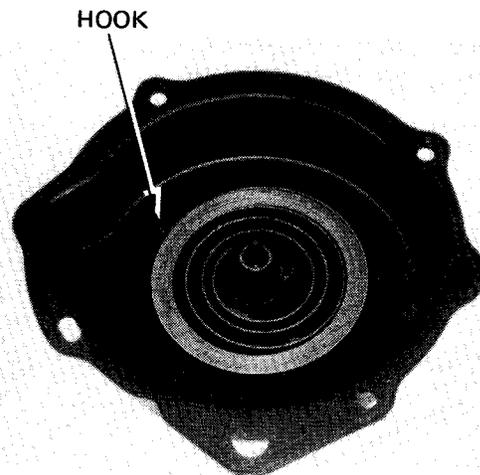
Wrap the rope around the starter pulley in a clockwise direction as viewed from the ratchet side as shown.



Install the spring by hooking the end on the starter housing hook.

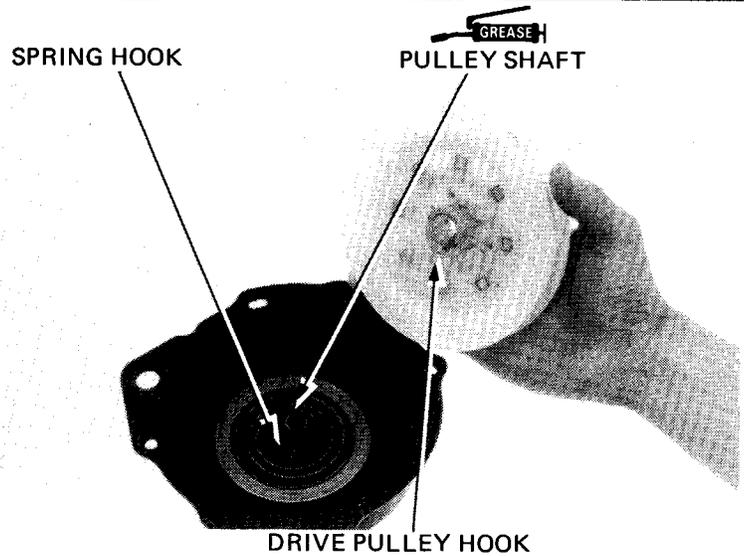
### CAUTION

*Wear eye protection and use care when installing the starter spring. The spring can pop out of the housing if care is not used.*

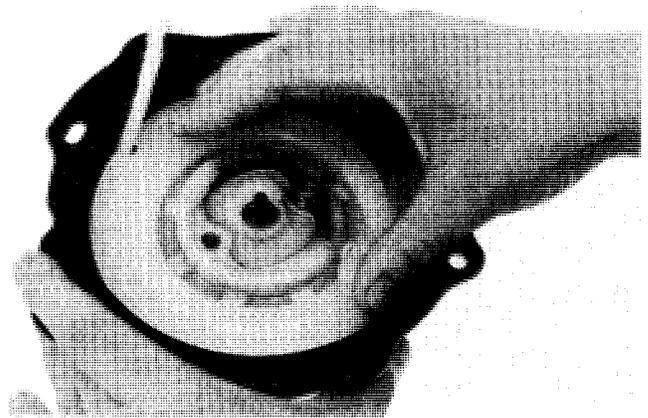


## RECOIL STARTER/ALTERNATOR/STARTER CLUTCH

Apply grease to the pulley shaft and install the drive pulley by hooking the end of the spring on the drive pulley hook.

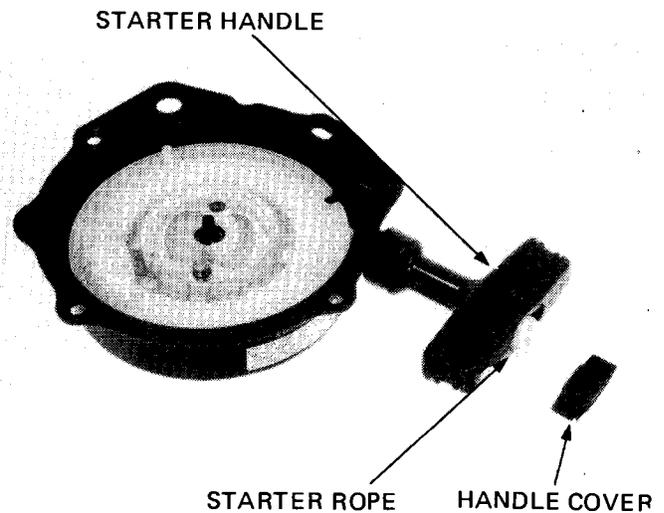


Preload the starter spring by turning the pulley 2 turns clockwise.



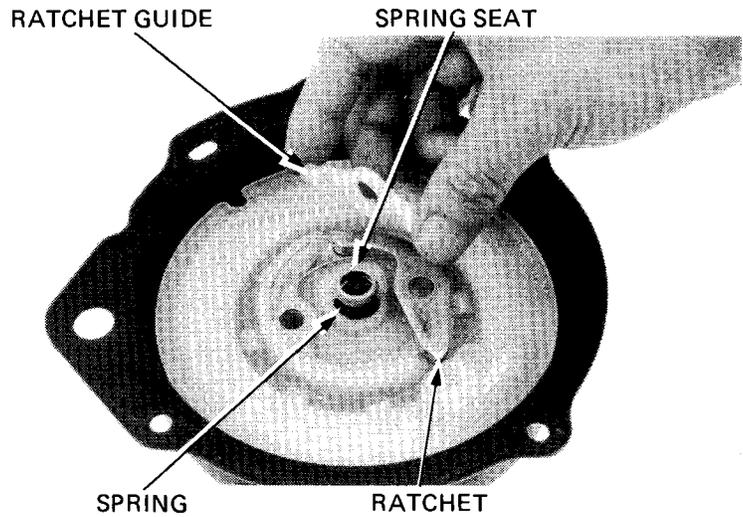
Route the rope end through the starter housing hole and install the handle.

Tie the rope end and install the handle cover.



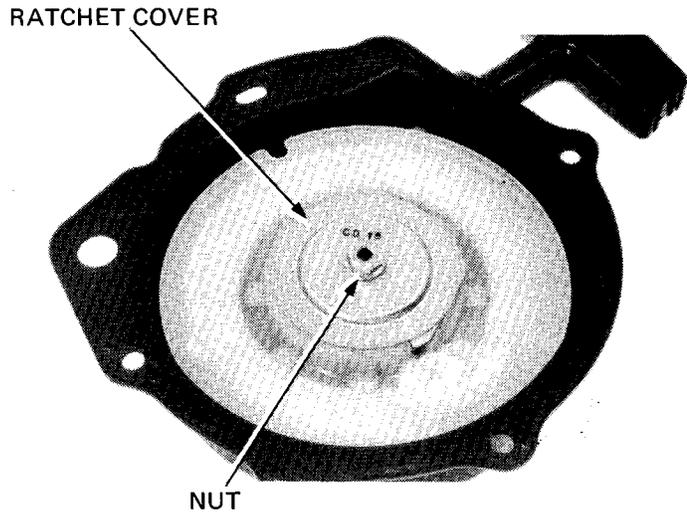
## RECOIL STARTER/ALTERNATOR/STARTER CLUTCH

Apply grease to the ratchet and install the ratchet onto the drive pulley.  
Install the spring, spring seat and ratchet guide.



Install the ratchet cover and tighten the nut.

Check recoil starter operation by pulling the starter grip.



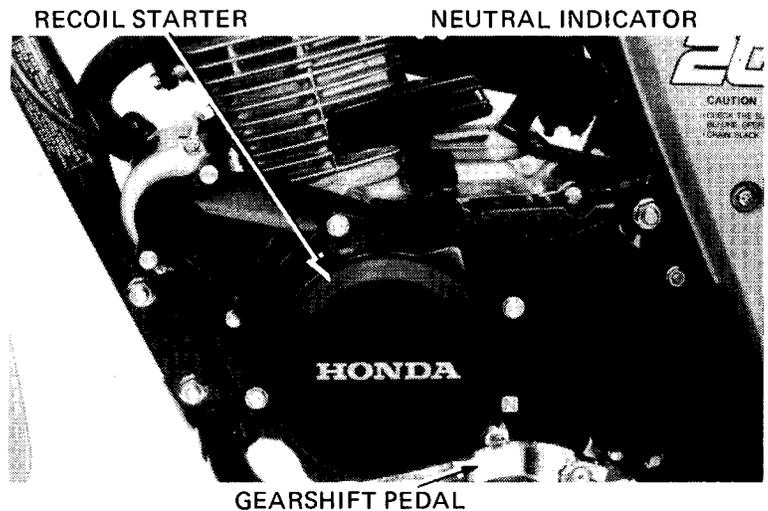
### INSTALLATION

Install the starter gasket and recoil starter with four bolts.

Install the neutral indicator and secure it with the E-clip.

Install the gearshift pedal.

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

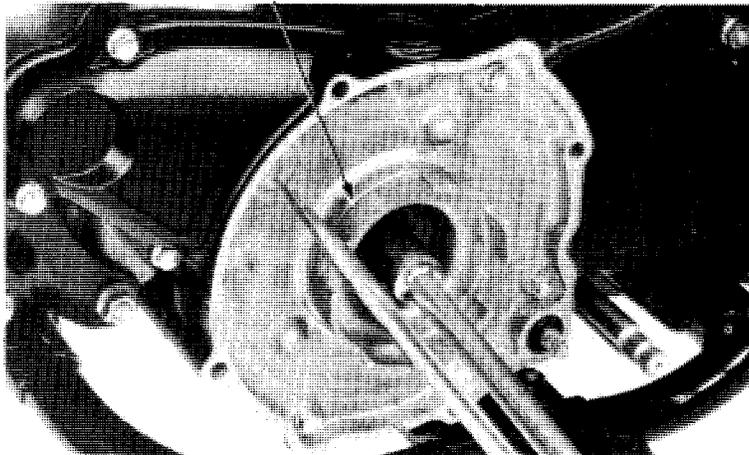


## ALTERNATOR

### LEFT CRANKCASE COVER REMOVAL

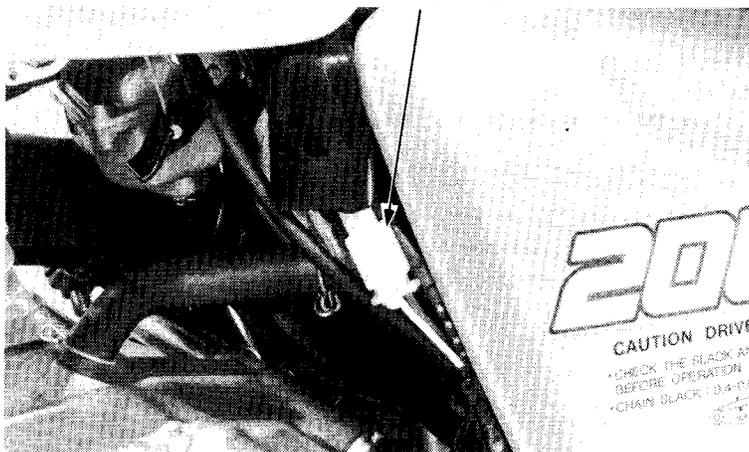
Drain the engine oil (Page 2-2).  
Remove the recoil starter (Page 9-2).  
Hold the starter driven pulley with a screwdriver.  
Remove the bolt attaching the starter driven pulley and the pulley.

STARTER DRIVEN PULLEY



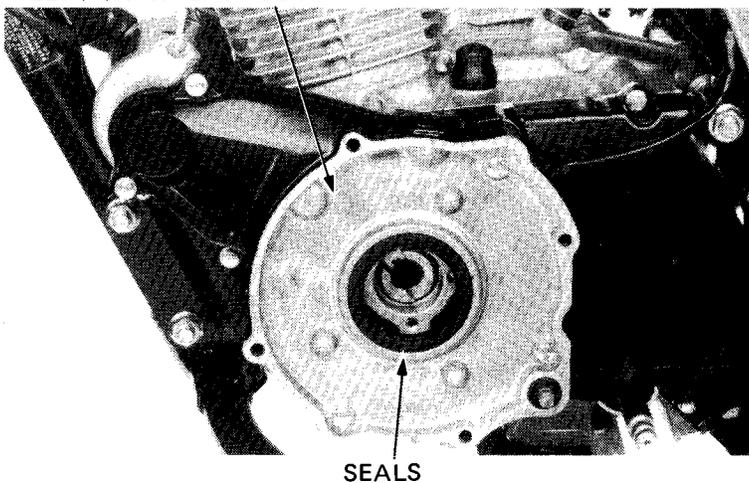
Disconnect the alternator coupler.

ALTERNATOR COUPLER



Remove the six bolts attaching the left crankcase cover and the cover.  
Check the seals on the left crankcase cover and replace if necessary.

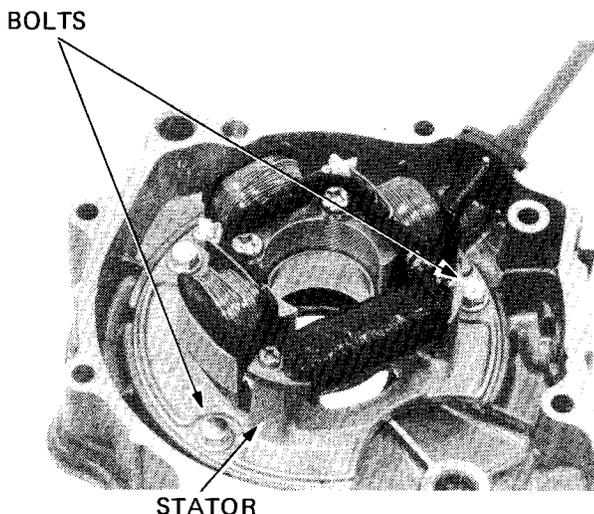
LEFT CRANKCASE COVER



## RECOIL STARTER/ALTERNATOR/STARTER CLUTCH

### STATOR REMOVAL

Remove the three bolts mounting the stator and the stator from the left crankcase.

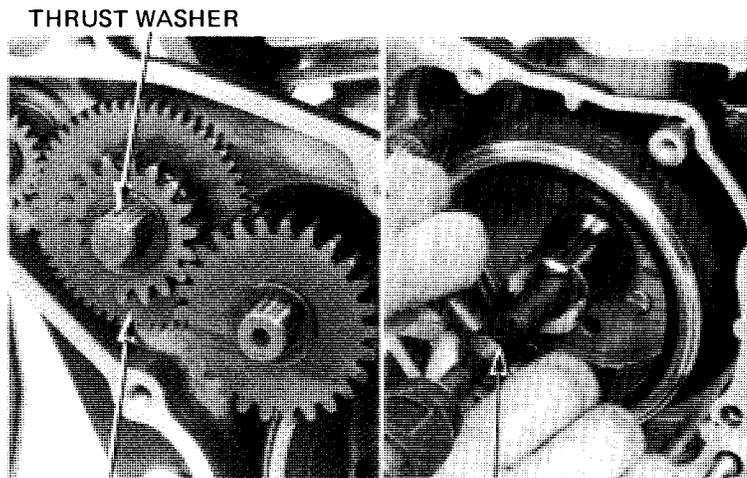


### FLYWHEEL REMOVAL

Remove the thrust washer and starter reduction gear B.  
Remove the flywheel with the flywheel puller.

### FLYWHEEL INSTALLATION

Align the key way in the flywheel with the key on the crankshaft and install the flywheel.  
Install starter reduction gear B and thrust washer.

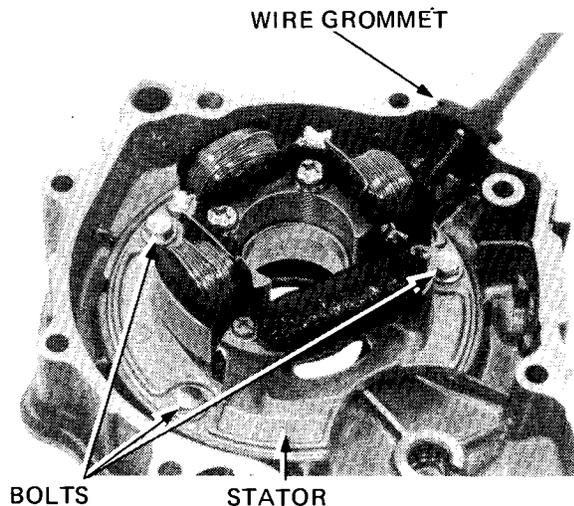


STARTER  
REDUCTION  
GEAR B

FLYWHEEL PULLER  
07733-0010000 or 07933-2000000

### STATOR INSTALLATION

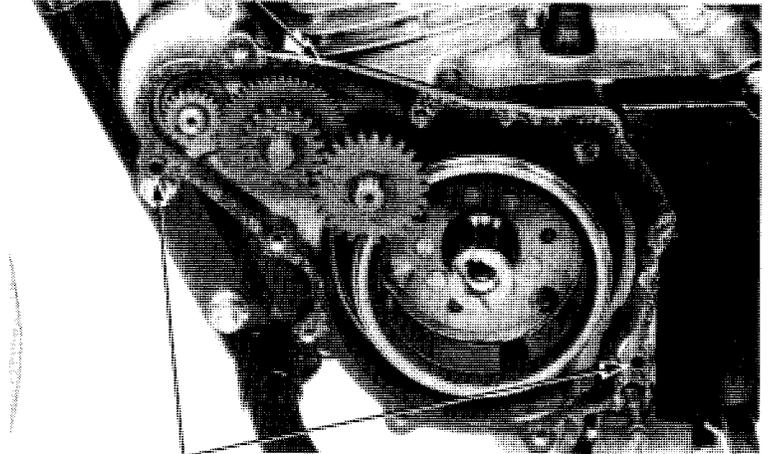
Install the stator onto the left crankcase cover and tighten it with the three bolts.  
Insert the wire grommet into the groove in the left crankcase cover.



LEFT CRANKCASE COVER  
INSTALLATION

Install the two dowel pins and new gasket.

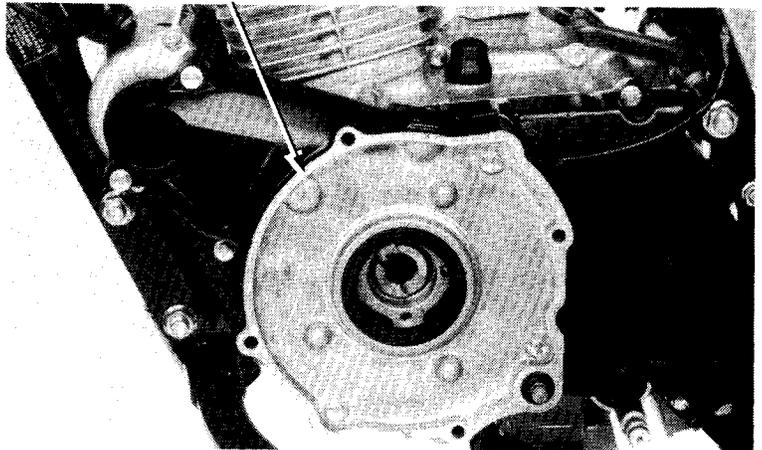
GASKET



DOWEL PINS

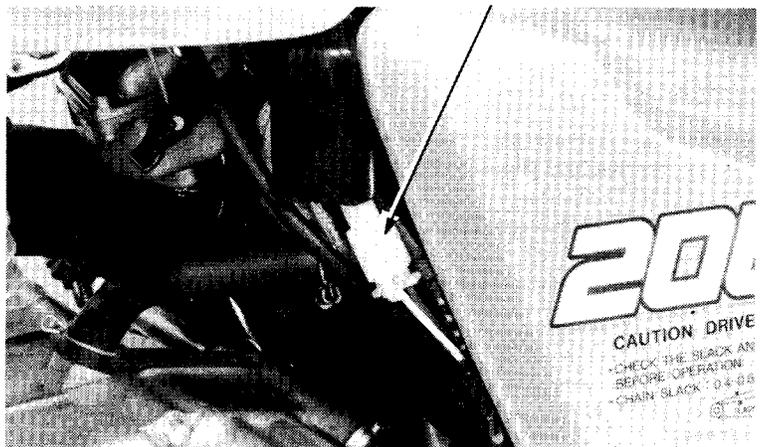
Install the left crankcase cover using the six bolts.

LEFT CRANKCASE COVER



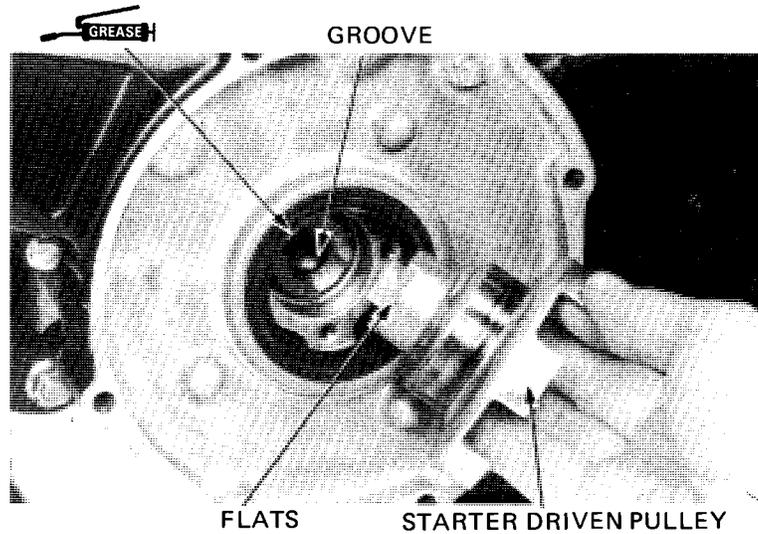
Connect the alternator coupler to the wire harness.

ALTERNATOR COUPLER



## RECOIL STARTER/ALTERNATOR/STARTER CLUTCH

Apply grease to the oil seal lip and install the starter driven pulley by aligning its flats with the groove in the flywheel.

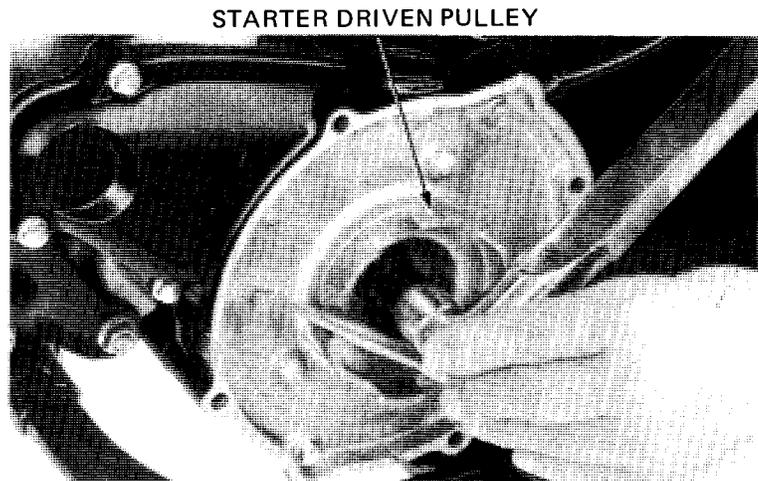


Install the pulley bolt, washer and O-ring.

Hold the driven pulley with a suitable tool and tighten the bolt.

**TORQUE: 40–50 N·m**  
(4.0–5.0 kg·m, 29–36 ft·lb)

Install the recoil starter (Page 9–6).  
Fill the crankcase with the recommended oil (Page 2–2).

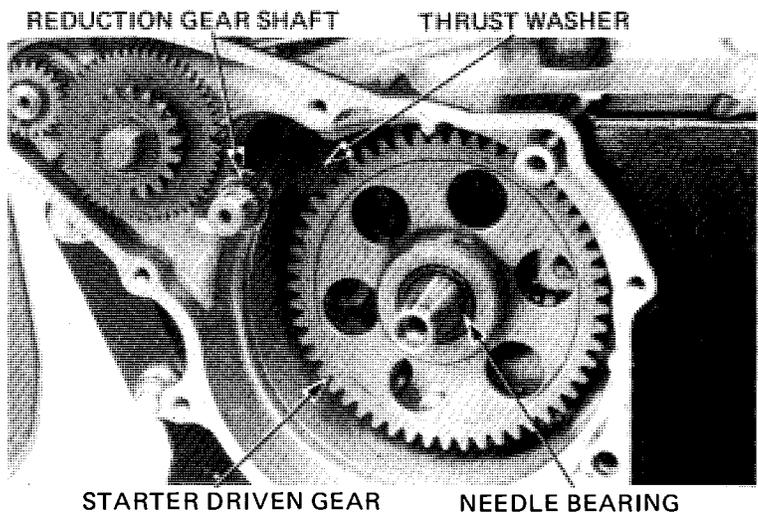


## STARTER CLUTCH

### REMOVAL

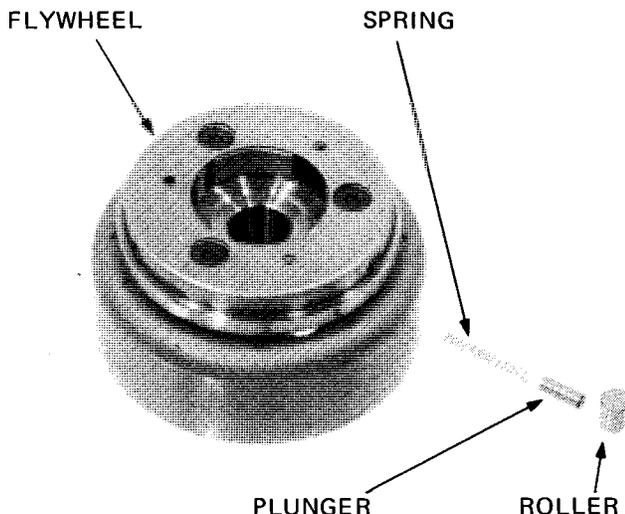
Remove the left crankcase cover (Page 9–7).  
Remove the flywheel (Page 9–8).

Remove the starter reduction gear shaft, thrust washers and gear A.  
Remove the starter driven gear and needle bearing.

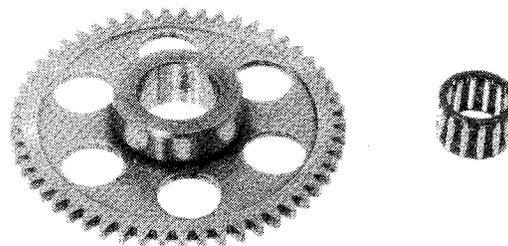


**INSPECTION**

Remove the one way clutch rollers, plungers and springs from the flywheel and check them for wear or damage.

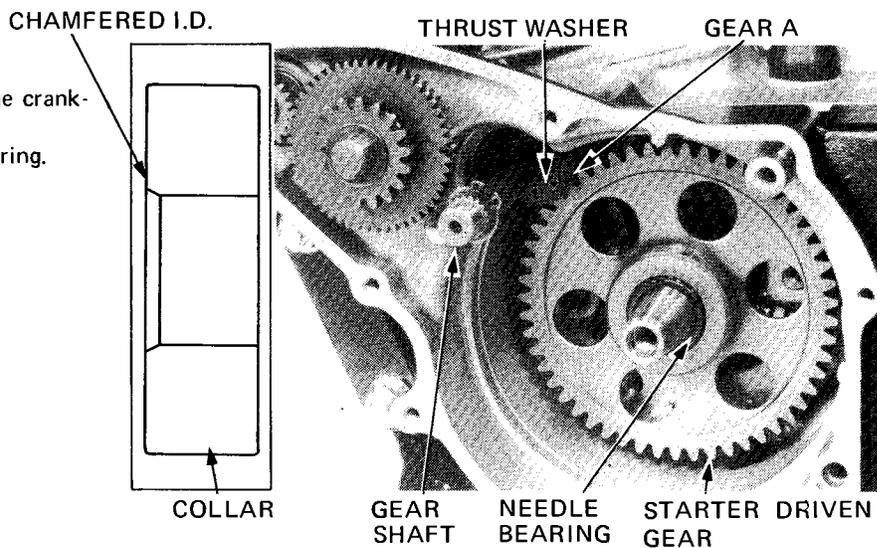


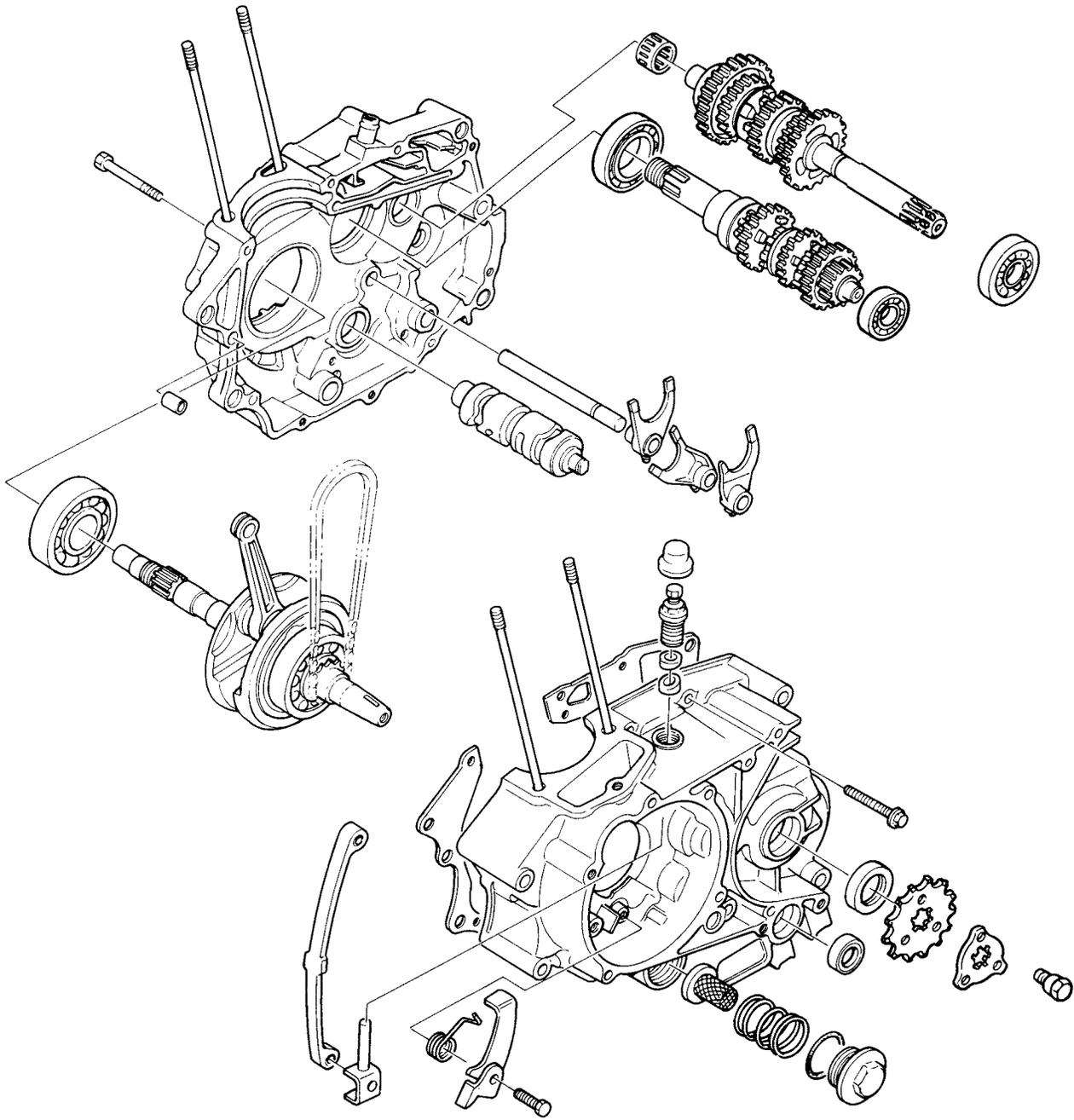
Check the needle bearing and starter driven gear for wear or damage and replace if necessary.



**INSTALLATION**

Install the starter driven gear collar over the crankshaft with its chamfered I.D. facing out.  
Install the starter driven gear and needle bearing.  
Install the flywheel (Page 9-8).  
Install the left crankcase cover (Page 9-9).  
Install the recoil starter (Page 9-6).





# 10. TRANSMISSION/ CRANKSHAFT

SERVICE INFORMATION	10-1	TRANSMISSION DISASSEMBLY	10-5
TROUBLESHOOTING	10-1	TRANSMISSION ASSEMBLY	10-9
CRANKCASE SEPARATION	10-2	CRANKCASE ASSEMBLY	10-10
CRANKSHAFT REMOVAL	10-3		

## SERVICE INFORMATION

### GENERAL

- Use care not to damage the oil pressure pad on the crankshaft right end.
- The crankcase must be separated to service the crankshaft and transmission.
- Remove the following parts before separating the crankcase.
  - Cylinder head Section 6
  - Cylinder and piston Section 7
  - Clutch and gearshift linkage Section 8
  - Alternator and starter clutch Section 9

### SPECIFICATIONS

ITEM			STANDARD	SERVICE LIMIT
Shift fork, guide shaft	Fork	I.D.	12.00–12.02 mm (0.472–0.473 in)	12.04 mm (0.474 in)
		Claw thickness	4.93–5.00 mm (0.194–0.197 in)	4.50 mm (0.177 in)
	Shaft O.D.		11.976–11.994 mm (0.4715–0.4722 in)	11.96 mm (0.471 in)
Trans- mission	Gear I.D.	C1	16.516–16.534 mm (0.6502–0.6509 in)	16.58 mm (0.653 in)
		C3, M4, M5	20.020–20.041 mm (0.7882–0.7890 in)	20.09 mm (0.791 in)
		C2	22.020–22.034 mm (0.8669–0.8675 in)	22.09 mm (0.870 in)
	Shaft O.D.	C1	16.466–16.484 mm (0.6483–0.6490 in)	16.42 mm (0.646 in)
		C2	21.959–21.980 mm (0.8645–0.8654 in)	21.91 mm (0.863 in)
		C3, M4, M5	19.959–19.980 mm (0.7858–0.7866 in)	19.91 mm (0.784 in)
Crankshaft	Connecting rod small end I.D.		15.010–15.028 mm (0.5909–0.5917 in)	15.06 mm (0.593 in)
	Connecting rod big end axial clearance		0.05–0.30 mm (0.002–0.012 in)	0.80 mm (0.032 in)
	Connecting rod big end radial clearance		0–0.008 mm (0–0.0003 in)	0.05 mm (0.002 in)
	Runout		_____	see page 10-3

### TOOLS

#### Special

Bearing remover, 15 mm 07936-KC70000

#### Common

Attachment, 32 x 35 mm 07746-0010100  
 Attachment, 42 x 47 mm 07746-0010300  
 Attachment, 52 x 55 mm 07746-0010400  
 Pilot, 20 mm 07746-0040500  
 Pilot, 30 mm 07746-0040700  
 Driver 07749-0010000

## TROUBLESHOOTING

### Hard to shift

1. Shift fork bent
2. Shift fork shaft bent

### Transmission jumps out of gear

1. Gear dogs worn
2. Shift fork bent or damaged
3. Shift fork shaft bent

### Crankshaft noisy

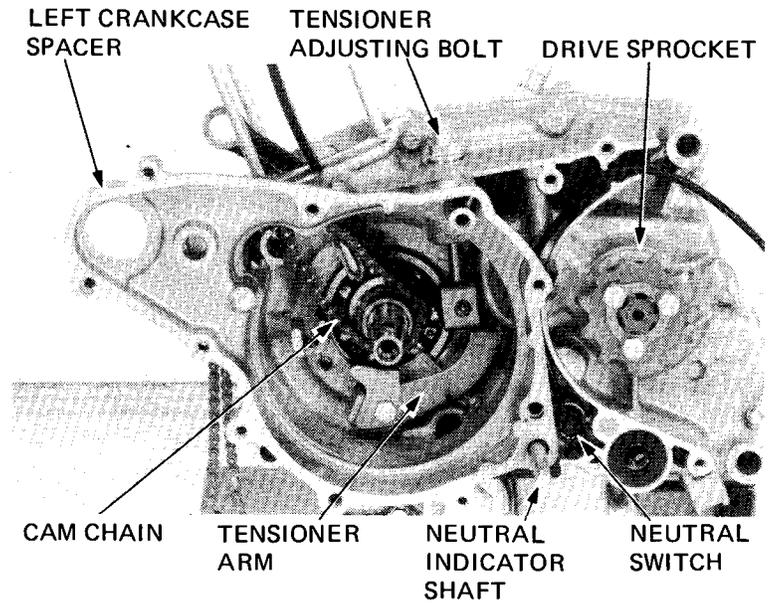
1. Worn connecting rod big end bearing
2. Bent connecting rod
3. Worn crankshaft main journal bearing

### Gears noisy

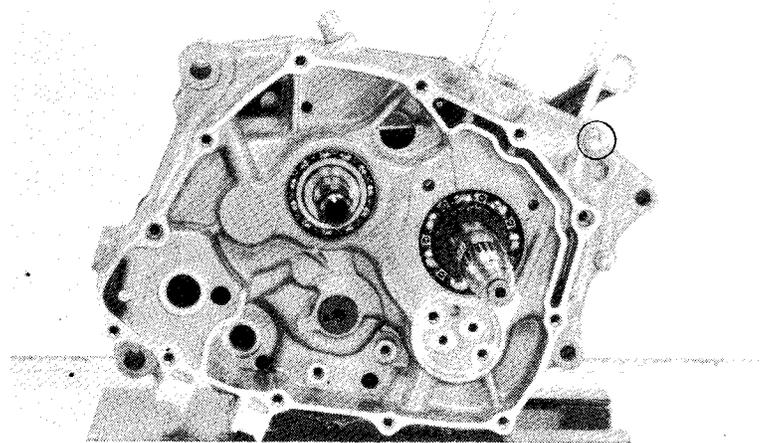
1. Worn transmission gear
2. Worn spline shafts

## **CRANKCASE SEPARATION**

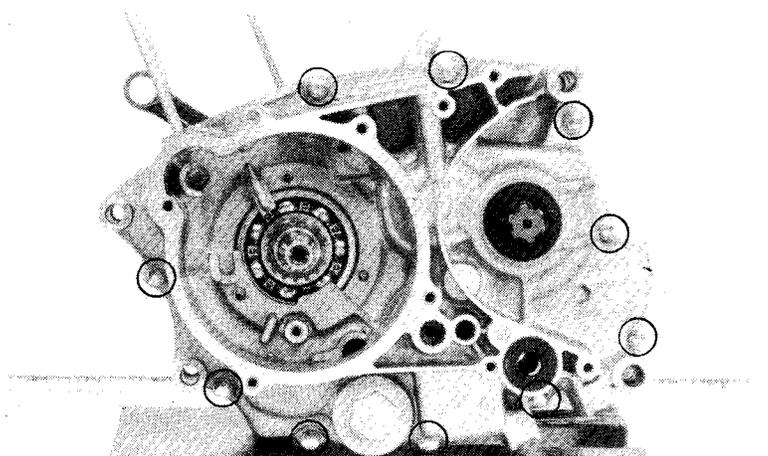
Remove the bolt mounting the left crankcase spacer and the spacer.  
Remove the neutral indicator shaft.  
Remove the cam chain tensioner adjusting bolt, cam chain tensioner arm, tensioner and cam chain.  
Remove the neutral switch.  
Remove the three drive sprocket bolts, fixing plate and sprocket.



Remove the right crankcase bolt.



Remove the ten left crankcase bolts.  
Place the engine with the right crankcase side down and separate the left crankcase from the right crankcase.  
Remove the gasket and dowel pins.



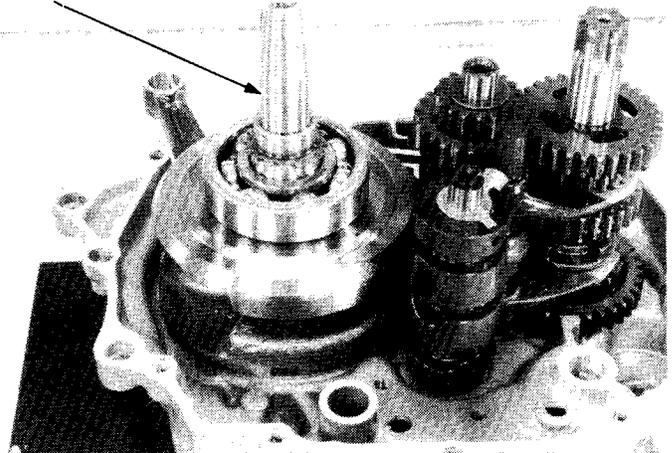
## CRANKSHAFT REMOVAL

Remove the left crankcase (Page 10-2).

### CAUTION

*Be careful not to damage the oil pressure pad.*

CRANKSHAFT

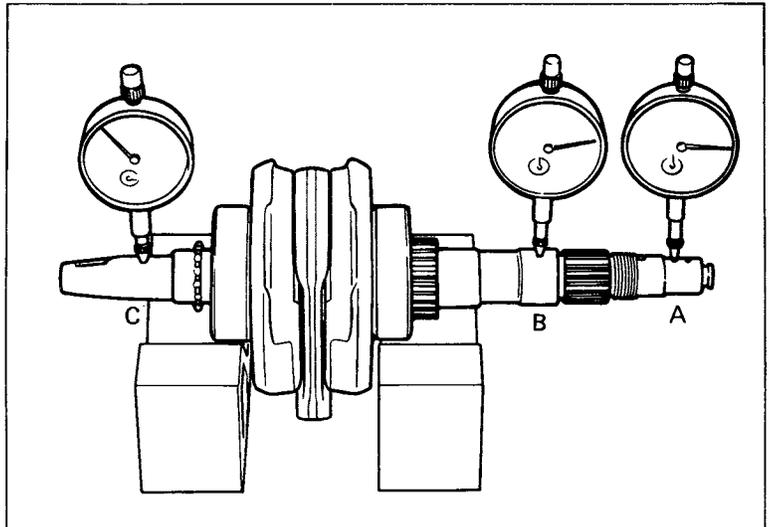


## CRANKSHAFT INSPECTION

Set the crankshaft on a stand or V-blocks and read the runout using dial indicators.

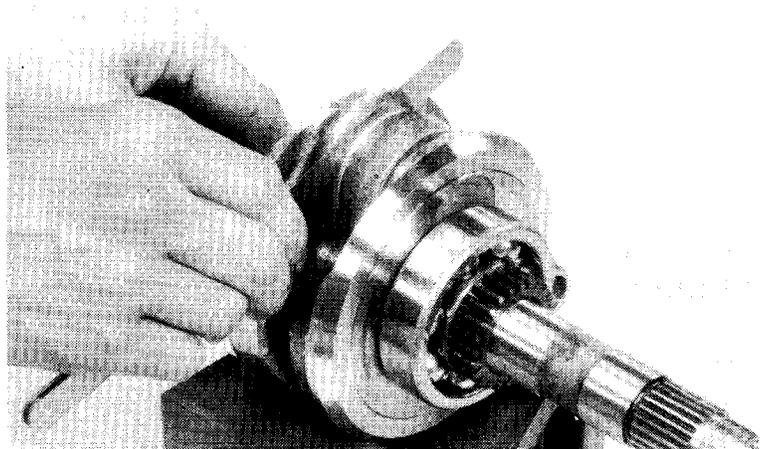
### SERVICE LIMITS:

- A: 0.12 mm (0.005 in)
- B, C: 0.08 mm (0.003 in)



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

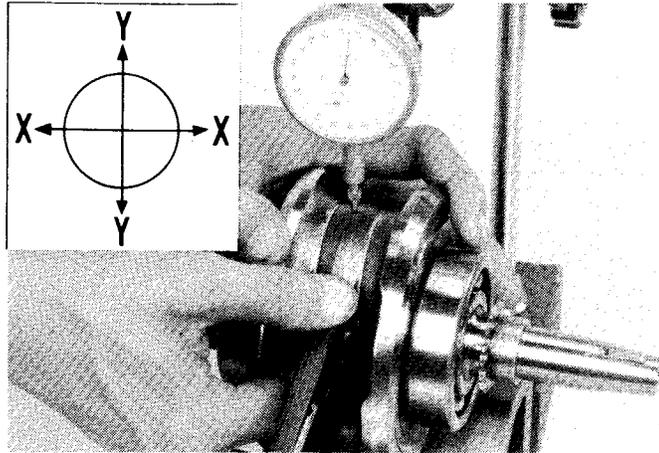
**SERVICE LIMIT: 0.80 mm (0.032 in)**



## TRANSMISSION/CRANKSHAFT

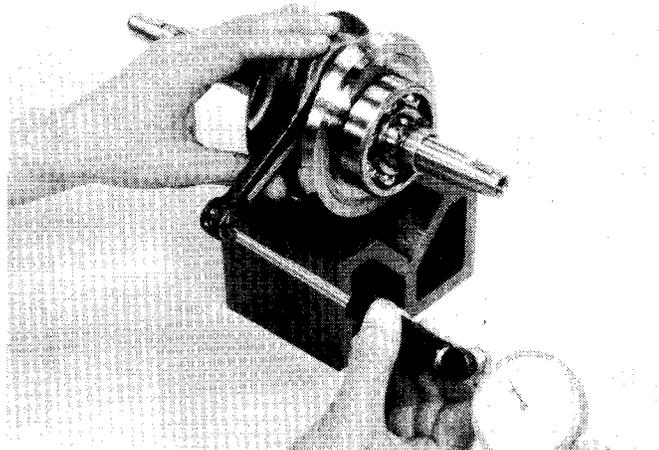
Measure the radial clearance at the connecting rod big end, at two points in the directions indicated by the arrows.

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



Measure the connecting rod small end I.D.

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



### CRANKSHAFT BEARING INSPECTION

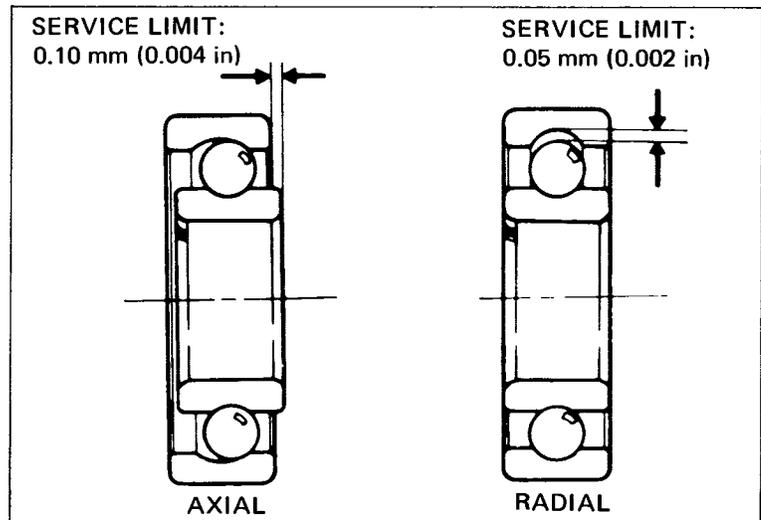
Spin the crankshaft bearings by hand and check for play.

The bearings must be replaced if they are noisy or have excessive play.

#### TOOLS:

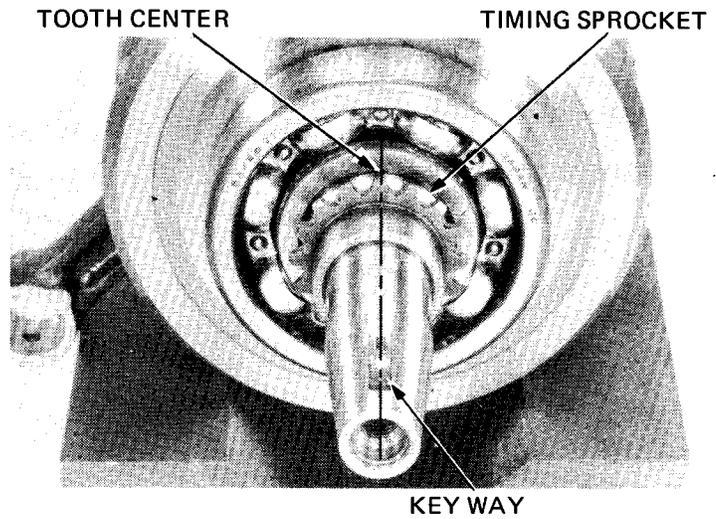
Driver 07746-0030100

Attachment, 30 mm I.D. 07746-0030300



**TIMING SPROCKET  
INSTALLATION**

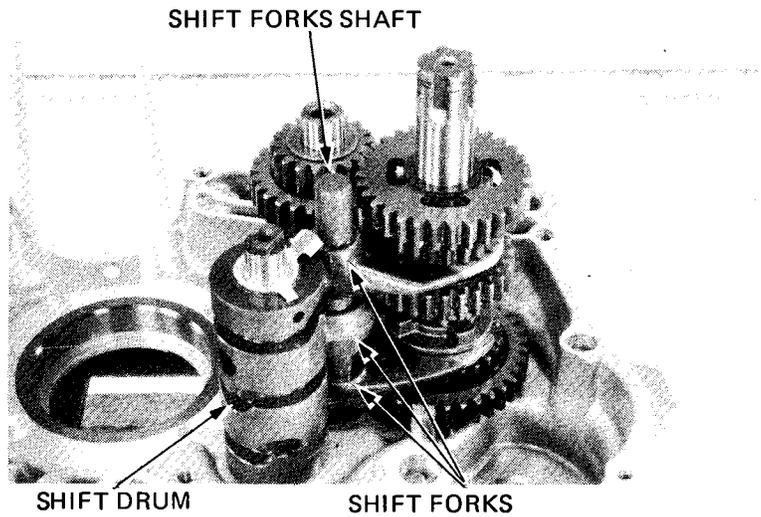
Install the sprocket, aligning any tooth center with the keyway center in the crankshaft.



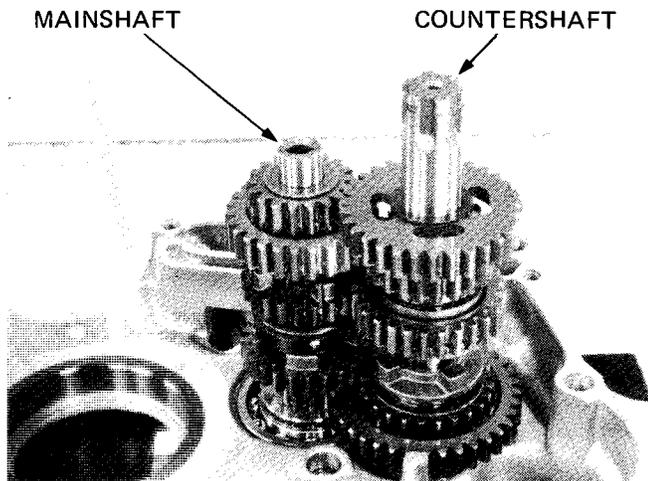
**TRANSMISSION DISASSEMBLY**

Remove the shift fork shaft and remove the shift forks.

Remove the shift drum.



Remove the mainshaft and countershaft.  
Disassemble the mainshaft and countershaft.



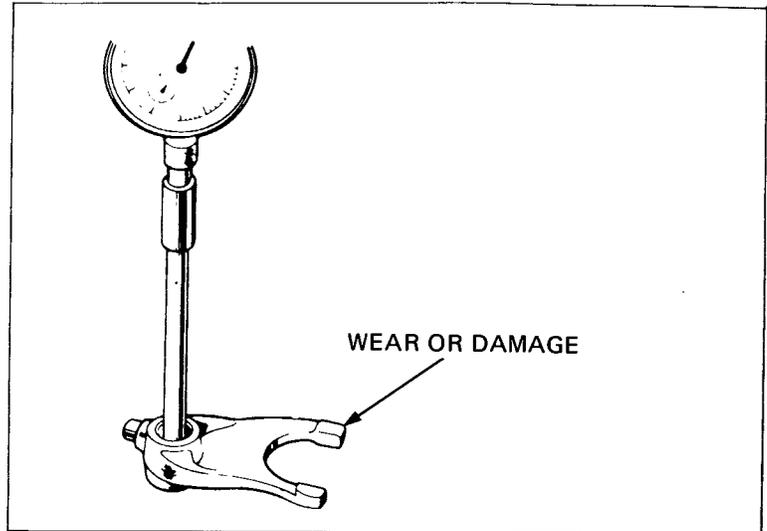
## TRANSMISSION/CRANKSHAFT

### INSPECTION

Check the shift fork for wear, bending or damage.

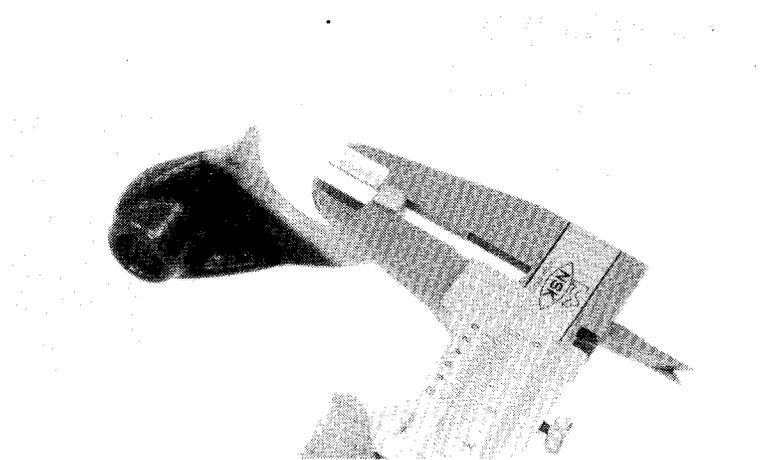
Measure the I.D. of the shaft hole.

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



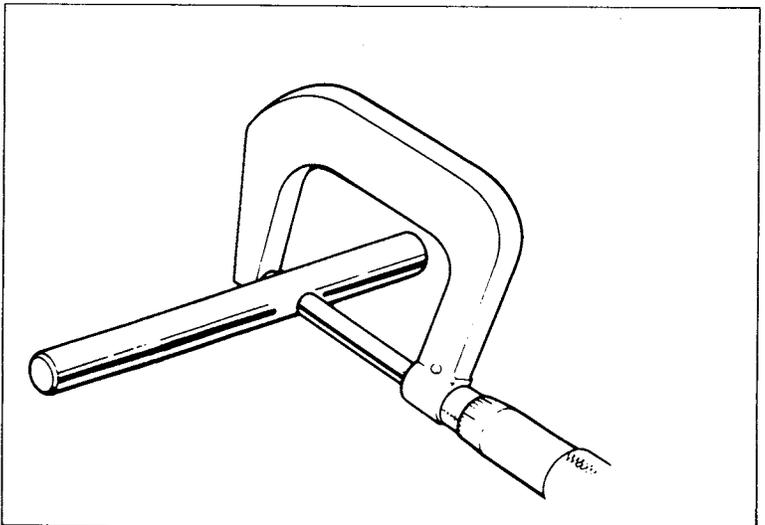
Measure the shift fork claw thickness.

**SERVICE LIMIT: 4.50 mm (0.177 in)**



Measure the shift fork shaft O.D.

**SERVICE LIMIT: 11.96 mm (0.471 in)**

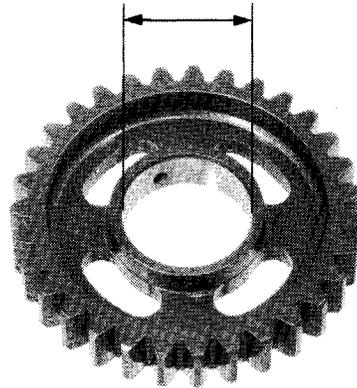


Check the gear dogs, dog holes and teeth for excessive or abnormal wear, or evidence of insufficient lubrication.

Measure the I.D. of each gear.

**SERVICE LIMITS:**

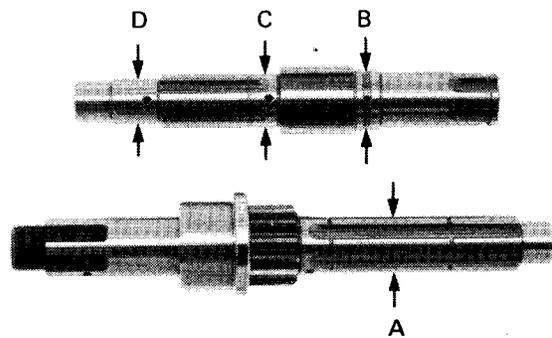
- M4 – 20.09 mm (0.791 in)
- M5 – 20.09 mm (0.791 in)
- C1 – 16.58 mm (0.653 in)
- C2 – 22.09 mm (0.870 in)
- C3 – 20.09 mm (0.791 in)



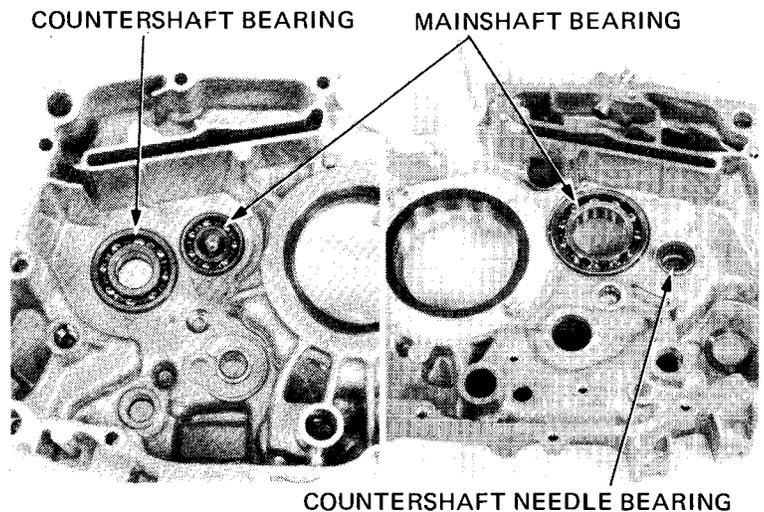
Measure the O.D. of the mainshaft and countershaft.

**SERVICE LIMITS:**

- A (at M4, M5 gears): 19.91 mm (0.784 in)
- B (at C3 gear): 19.91 mm (0.784 in)
- C (at C2 gear): 21.91 mm (0.863 in)
- D (at C1 gear): 16.42 mm (0.646 in)



Check the transmission bearings for excessive play or damage and replace if necessary.

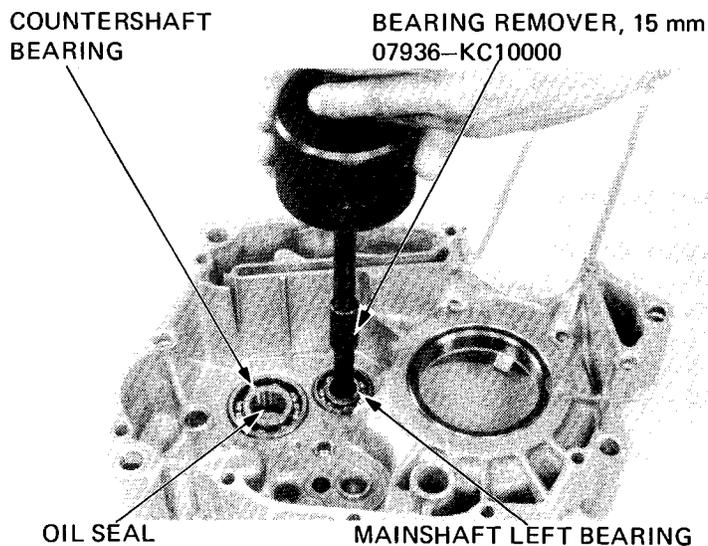


## TRANSMISSION/CRANKSHAFT

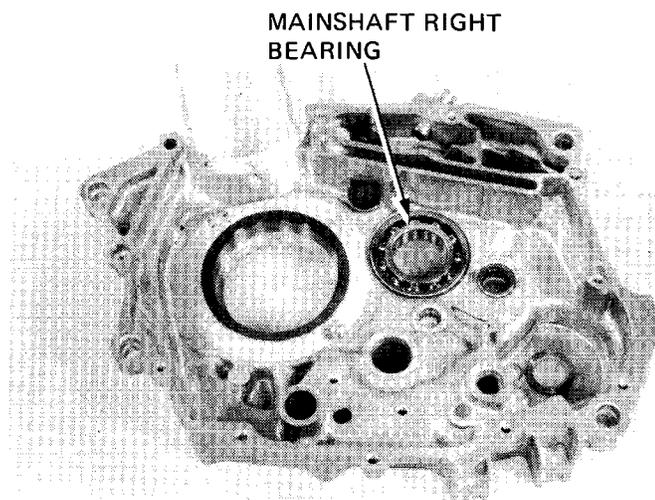
### BEARING REPLACEMENT

Remove the oil seal and countershaft bearing from the left crankcase.

Remove the mainshaft left bearing with the 15 mm bearing remover.



Remove the mainshaft right bearing from the right crankcase.



Drive the bearings into the right and left crankcases with the following tools:

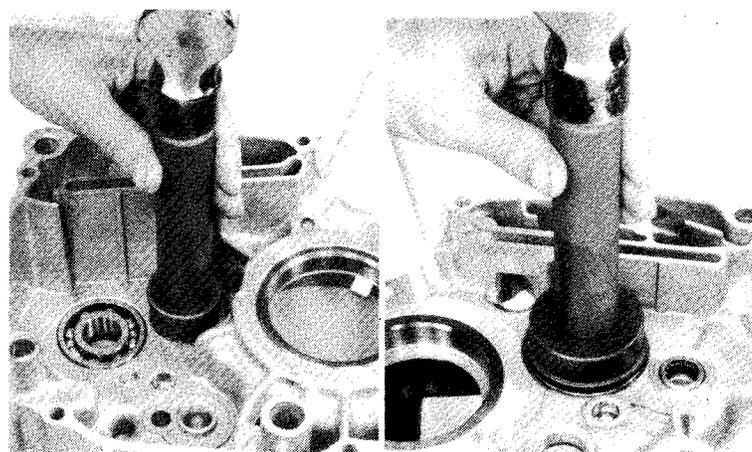
#### Left crankcase:

Countershaft bearing –	
Driver	07749-0010000
Attachment, 42 x 47 mm	07746-0010300
Pilot, 20 mm	07746-0040500
Mainshaft left bearing –	
Driver	07749-0010000
Attachment, 32 x 35 mm	07746-0010100

#### Right crankcase:

Mainshaft right bearing –	
Driver	07749-0010000
Attachment, 52 x 55 mm	07746-0010400
Pilot, 30 mm	07746-0040700

Install the new countershaft oil seal.



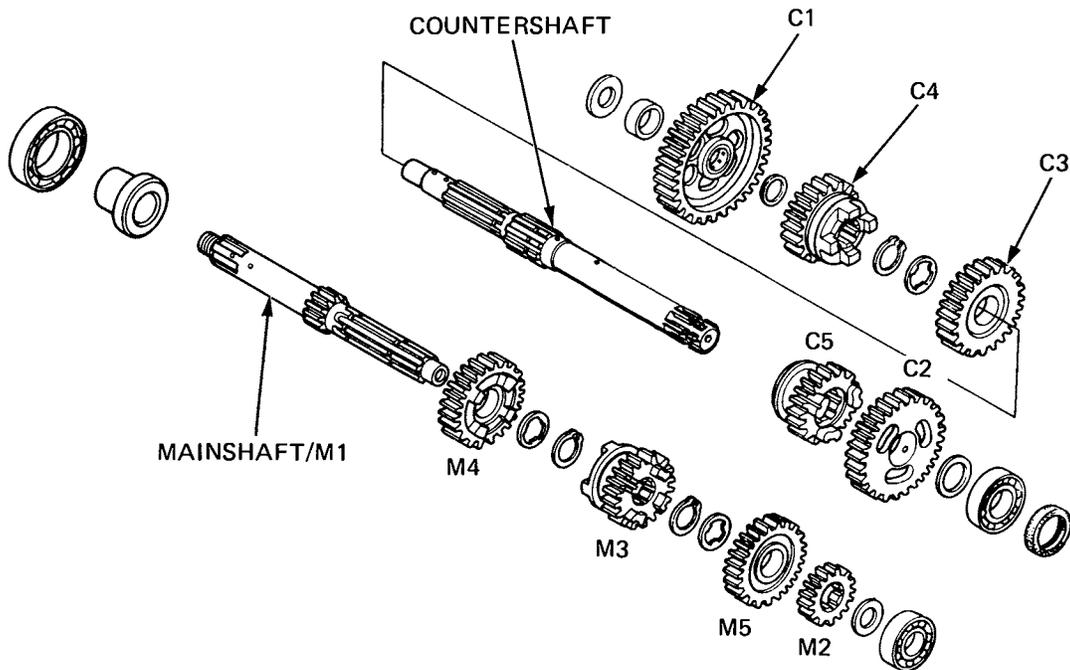
# TRANSMISSION ASSEMBLY

Coat all parts with oil.

Assemble the transmission shaft and gears noting the locations of the thrust washers and snap rings.

**NOTE**

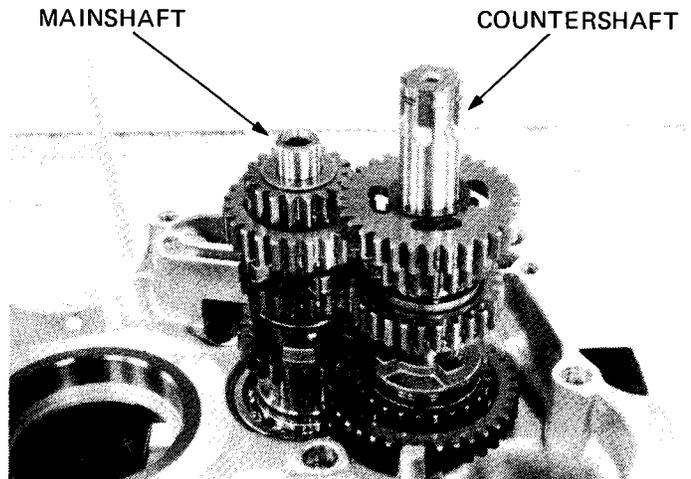
Make sure the snap rings are seated properly.



Install the mainshaft and countershaft assemblies into the right crankcase.

**NOTE**

Make sure the thrust washer stays in place during this operation.



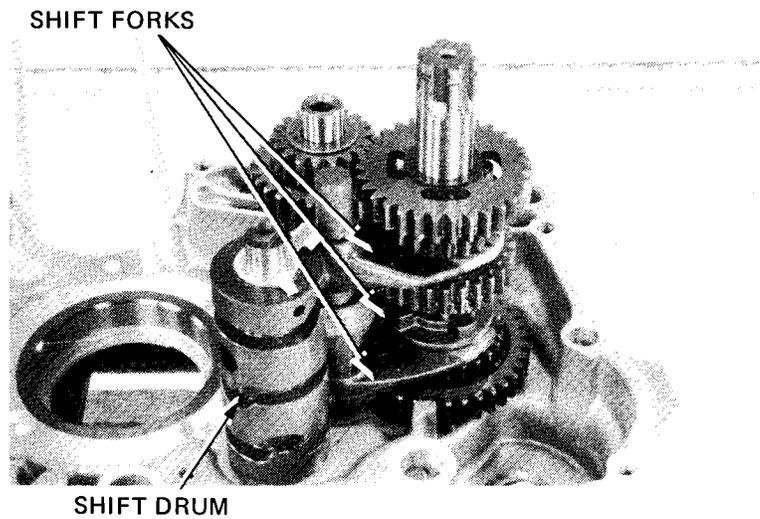
## TRANSMISSION/CRANKSHAFT

---

Install the shift drum and shift forks.

Install the fork guide shaft.

Rotate the mainshaft by hand to be sure the gears rotate freely.



## CRANKCASE ASSEMBLY

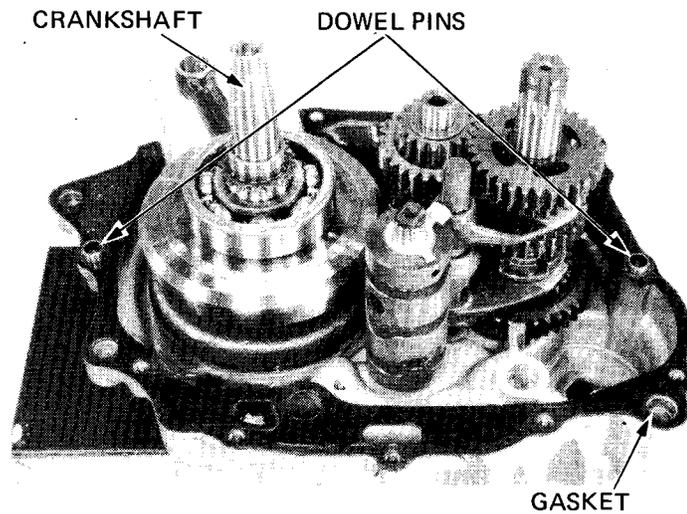
Install the crankshaft.

Install the dowel pins and a new gasket.

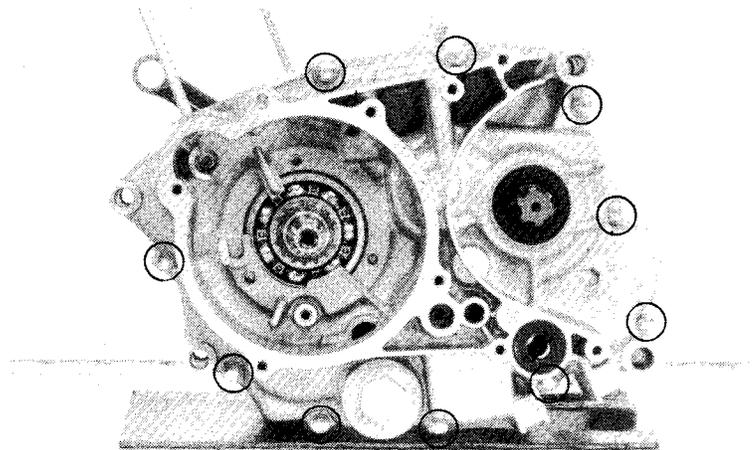
Install the left crankcase onto the right crankcase.

### NOTE

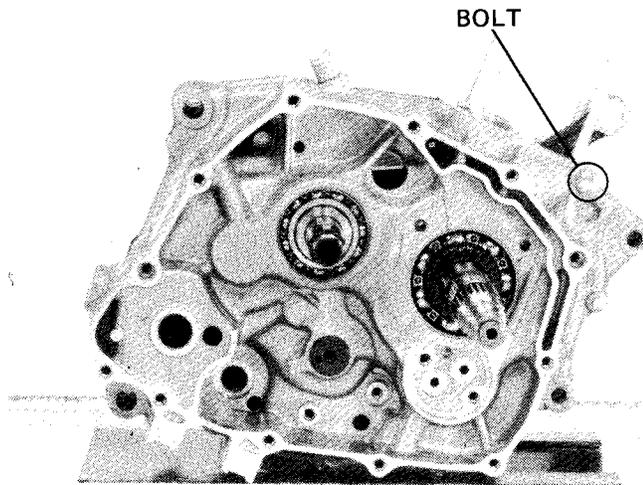
Make sure that the gasket stays in place.



Tighten the left crankcase 6 mm bolts in a criss-cross pattern.



Tighten the right crankcase bolt.

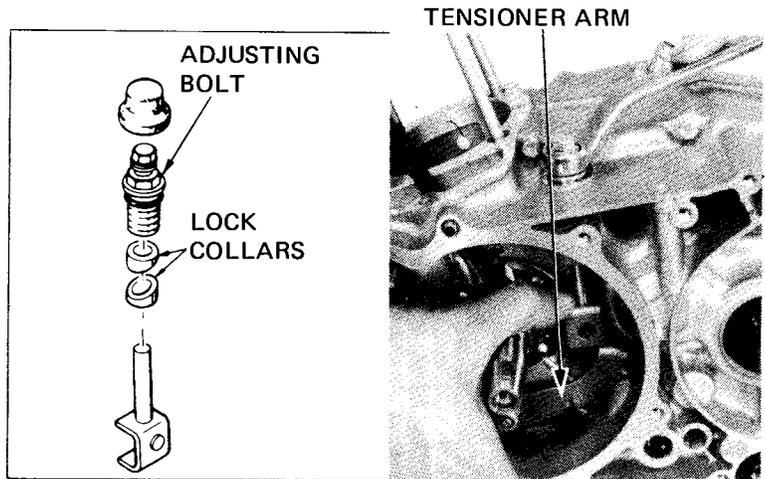


Install the cam chain tensioner and tensioner rod.

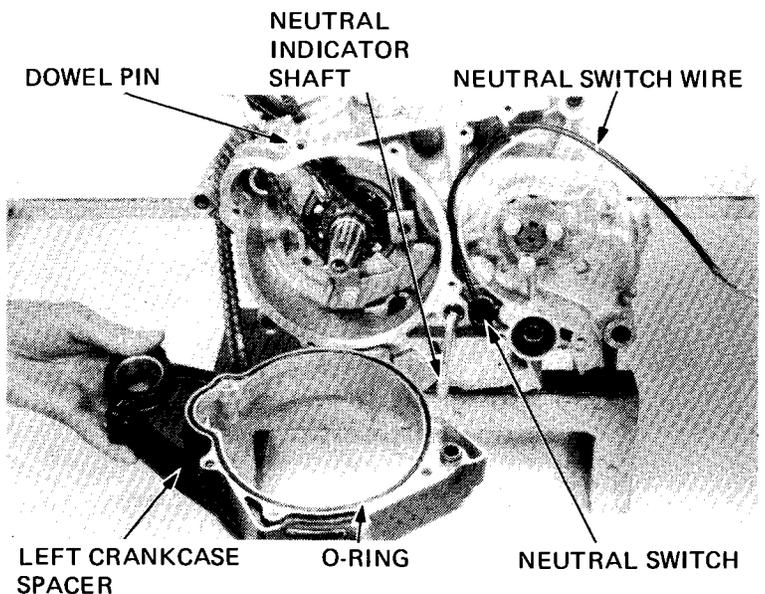
Install the cam chain and tensioner arm.  
Install the tensioner lock collar.  
With the tensioner arm held down all the way,  
tighten the adjusting bolt.

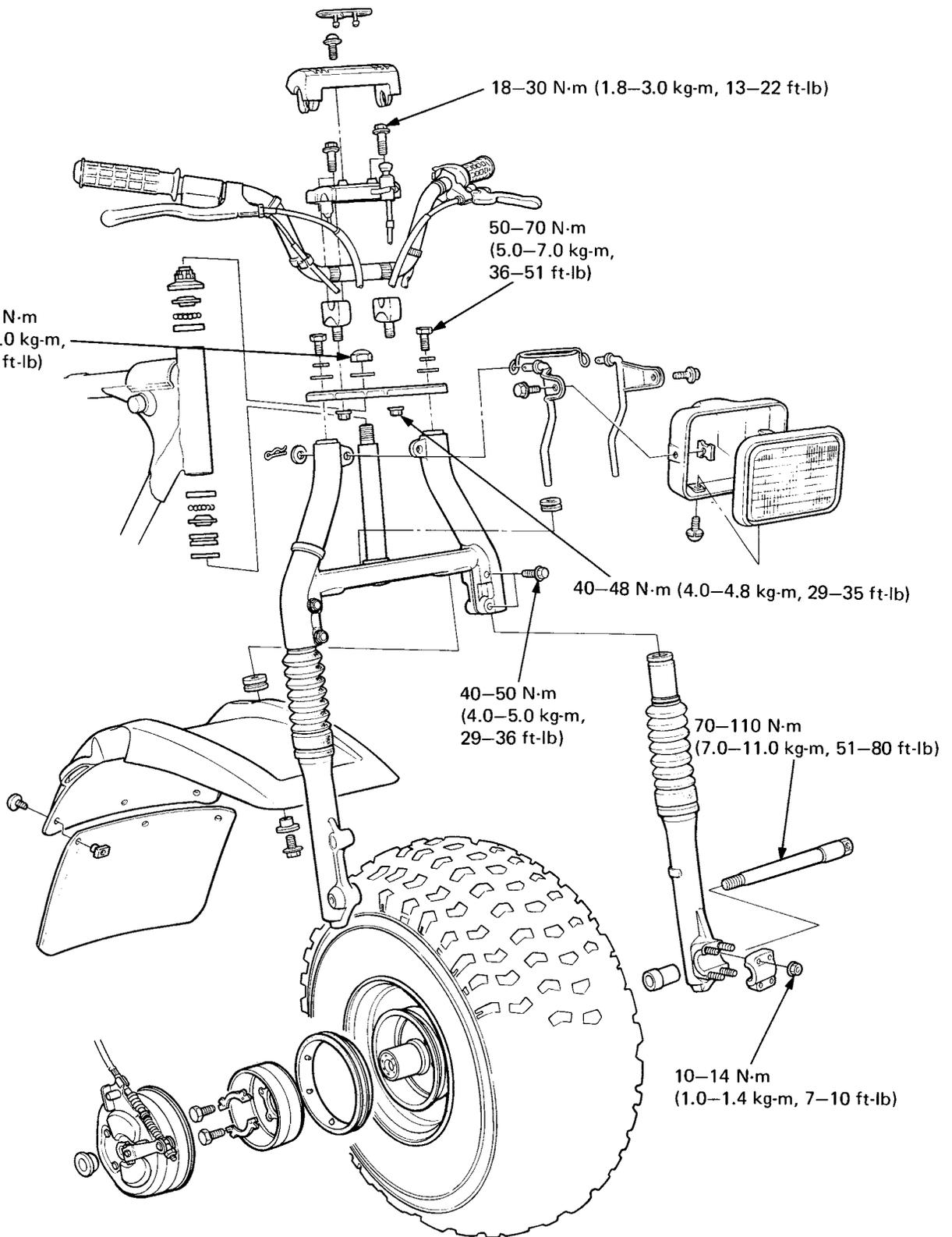
**NOTE**

Note the tensioner lock collar direction.



Install the neutral switch and route the switch wire as shown.  
Install the drive sprocket using the fixing plate and three bolts.  
Install the neutral indicator shaft.  
Install the dowel pin.  
Install a new O-ring in the groove of the left crankcase spacer and install the spacer.  
Tighten the left crankcase spacer bolt.





# 11. FRONT WHEEL/SUSPENSION/ BRAKE/STEERING

SERVICE INFORMATION	11-1
TROUBLESHOOTING	11-2
HANDLEBAR	11-3
FRONT WHEEL	11-6
FRONT BRAKE	11-18
FRONT FORK	11-21
STEERING STEM	11-27

## SERVICE INFORMATION

### GENERAL

- This section covers maintenance of the front wheel, front fork, front brake and steering system.
- A jack or other support is required to support the ATC.

### SPECIFICATIONS

ITEM		STANDARD	SERVICE LIMIT
Front axle runout		—————	0.5 mm (0.02 in)
Front brake drum I.D.		110 mm (4.3 in)	111 mm (4.4 in)
Front brake lining thickness		4 mm (0.2 in)	2 mm (0.1 in)
Front wheel bearing play	Radial	—————	0.05 mm (0.002 in)
	Axial	—————	0.10 mm (0.004 in)
Front fork spring free length	Spring A	76.9–82.9 mm (3.03–3.26 in)	76.1 mm (3.00 in)
	Spring B	232.7–238.7 mm (9.16–9.40 in)	230.3 mm (9.07 in)

### TORQUE VALUES

Handlebar upper holder bolt	8 mm	18–30 N·m (1.8–3.0 kg-m, 13–22 ft-lb)
Handlebar lower holder nut	10 mm	40–48 N·m (4.0–4.8 kg-m, 29–35 ft-lb)
Fork top bridge bolt	12 mm	50–70 N·m (5.0–7.0 kg-m, 36–51 ft-lb)
Steering stem nut	22 mm	50–70 N·m (5.0–7.0 kg-m, 36–51 ft-lb)
Front axle	14 mm	70–110 N·m (7.0–11.0 kg-m, 51–80 ft-lb)
Front wheel hub nut	8 mm	20–25 N·m (2.0–2.5 kg-m, 14–18 ft-lb)
Front fork socket bolt	8 mm	15–25 N·m (1.5–2.5 kg-m, 11–18 ft-lb)
Front fork mounting bolt	10 mm	40–50 N·m (4.0–5.0 kg-m, 29–36 ft-lb)
Front axle holder nut	6 mm	10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)

## FRONT WHEEL/SUSPENSION/BRAKE/ STEERING

---

### TOOLS

#### Special

Ball race remover	07944-1150001	or M9346-277-91774 (U.S.A. only)
Universal bead breaker	GH-AH-958-BB1	(U.S.A. only)
Hollow set wrench, 6 mm	07917-3230000	Equivalent commercially available in U.S.A.

#### Common

Driver	07749-0010000	
Attachment, 37 x 40 mm	07746-0010200	
Pilot, 15 mm	07746-0040300	
Attachment, 42 x 47 mm	07746-0010300	or 07949-6110000
Shock absorber compressor	07959-3290001	
Pin spanner	07702-0020000	or 07902-0010000 or 07702-0010000 or M9361-412-099788
Fork seal driver	07747-0010100	
Fork seal driver attachment C	07747-0010400	
Lock nut wrench, 30 x 32 mm	07716-0020400	Equivalent commercially available in U.S.A.
Extension bar	07716-0020500	

## TROUBLESHOOTING

#### Hard steering

1. Steering stem nut too tight.
2. Faulty steering stem bearings.
3. Damaged steering stem ball race or cone race.
4. Insufficient tire pressure.

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

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

#### Front wheel wobbling

1. Bent rim.
2. Worn front wheel bearing.
3. Faulty tire.
4. Axle not tightened properly.

#### Improper brake performance

1. Incorrect adjustment of lever.
2. Brake shoes worn.
3. Brake shoes contaminated.
4. Brake cam worn.
5. Brake drum worn.
6. Brake arm serrations improperly engaged.
7. Cam contacting area of shoes worn.

#### Soft suspension

- Weak fork springs.

#### Front suspension noise

- Loose fork fasteners.

## **HANDLEBAR**

### **REMOVAL**

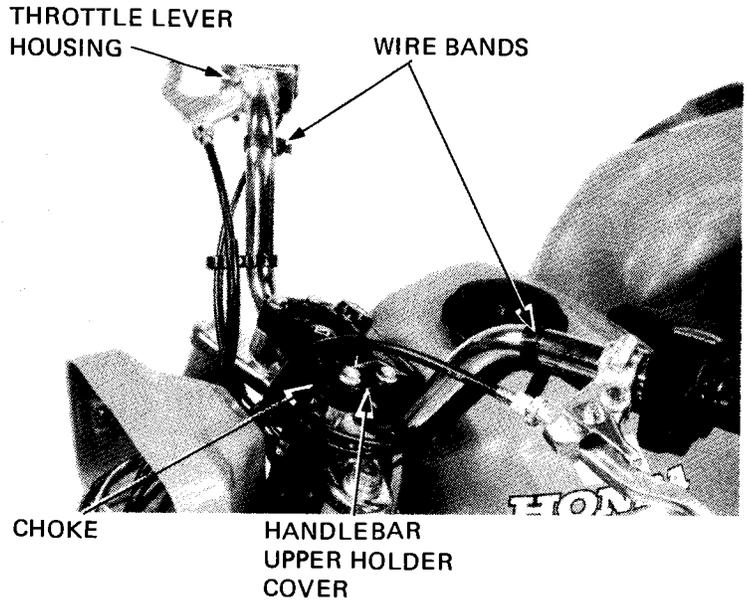
Remove the headlight (Page 17–2) and disconnect the wires for the ignition and headlight switches.

Remove the wire bands.  
Remove the throttle lever housing.

Remove the front and rear brake lever bracket holders and the brackets.  
Loosen the choke cable nut and remove the choke cable from the handlebar upper holder.

Remove the handlebar upper holder cover cap.  
Remove the screws attaching the upper holder cover and the cover.

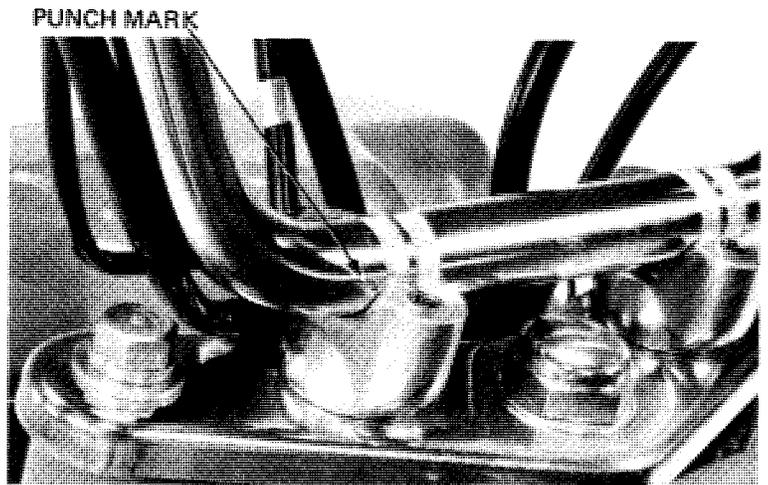
Remove the handlebar holder and handlebar.



### **INSTALLATION**

Place the handlebar on the handlebar lower holders.

Align the handlebar punch marks with the top of the handlebar lower holders.



Install the handlebar upper holders on the handlebar.

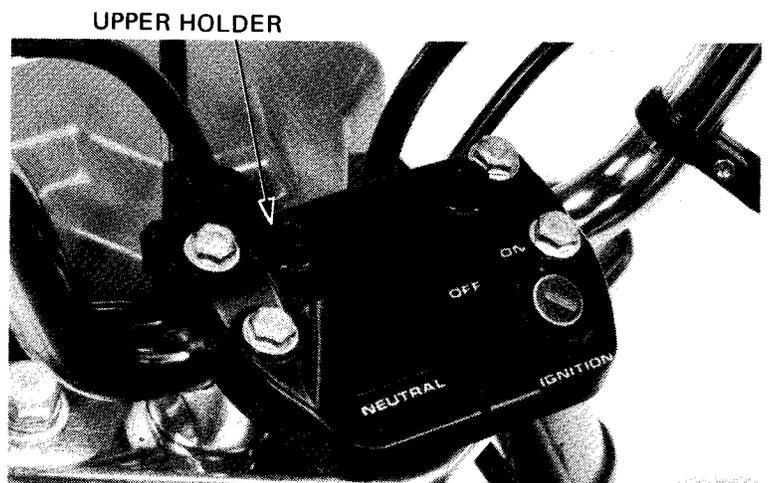
Tighten the forward bolts first, then tighten the rear bolts.

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

Connect the ignition switch and headlight switch wires color-to-color.  
Install the headlight.

Connect the brake cables.  
Install the throttle lever housing (Page 11–5).

Install the choke cable.  
Install the handlebar upper holder cover and cap.

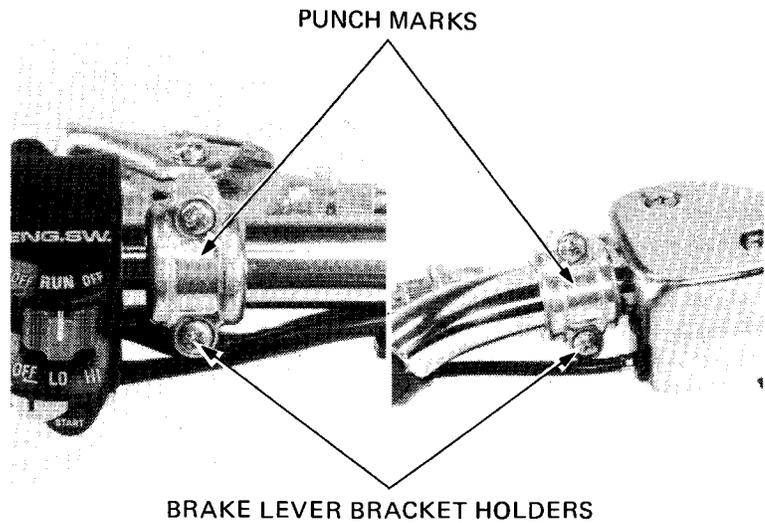


## FRONT WHEEL/SUSPENSION/BRAKE/STEERING

Install the front and rear brake lever brackets and holders on the handlebar and tighten the screws lightly.

### NOTE

Install the holders with their punch marks up.

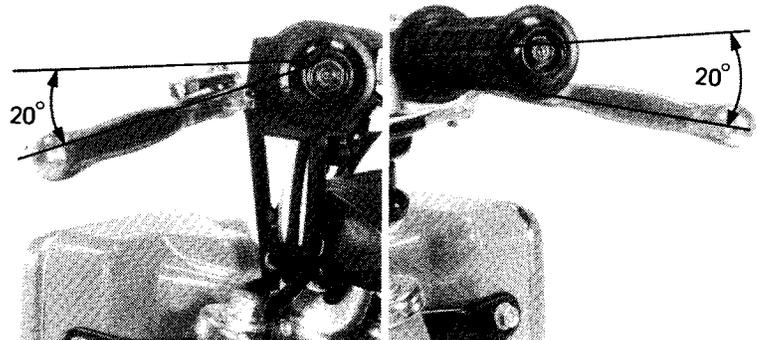


Position the front and rear brake lever brackets and holders at a angle as shown.

Tighten the holder upper screw first, then tighten the lower screw.

REAR BRAKE LEVER

FRONT BRAKE LEVER



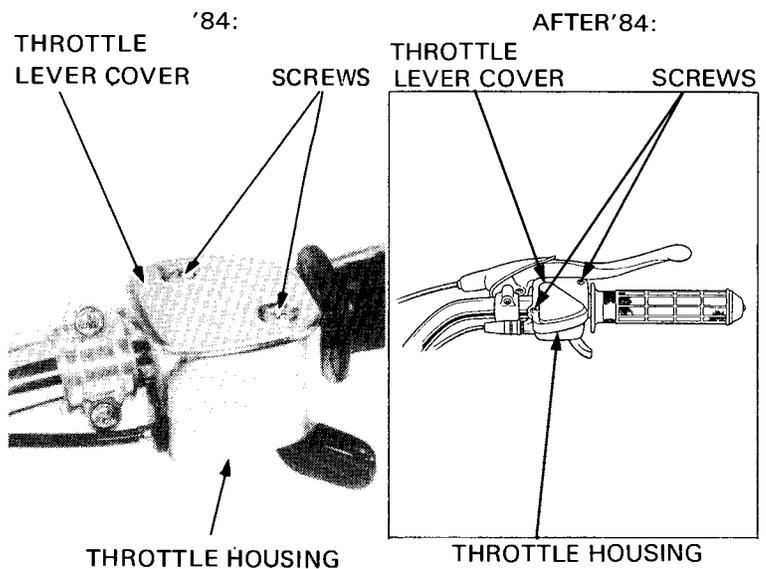
## THROTTLE LEVER

### DISASSEMBLY

'84:  
Remove the screws, throttle lever cover and throttle housing.

After '84:  
Remove the screws and throttle lever cover.

Disconnect the throttle cable from the throttle housing.

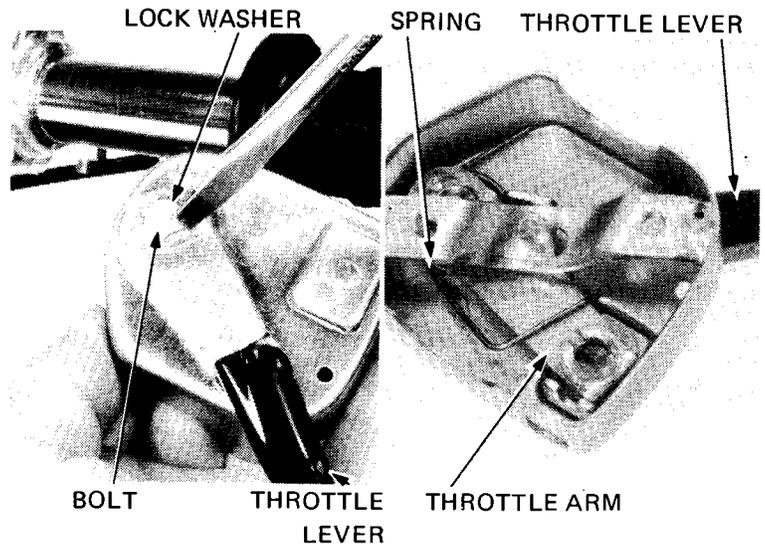


**FRONT WHEEL/SUSPENSION/BRAKE/STEERING**

'84:  
Bend down the lock washer tab and remove the bolt and lock washer.  
Remove the throttle lever, arm and spring from the throttle housing.

**ASSEMBLY**

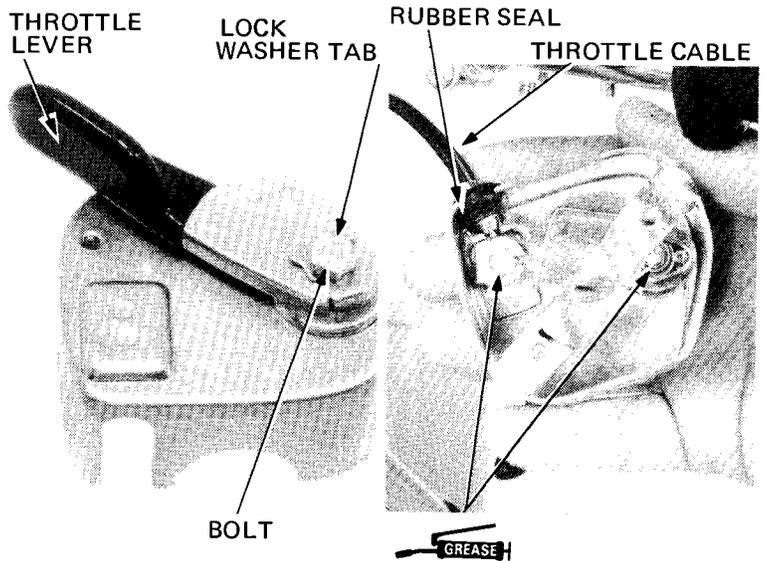
Install the throttle arm, spring and lever into the throttle housing.



Tighten the throttle lever using the bolt and new lock washer.  
Bend up the lock washer tab against the bolt head.

Check the lever for smooth operation.

Apply grease to the throttle cable end and connect the cable to the throttle arm.  
Insert the rubber seal into the groove of the throttle housing.

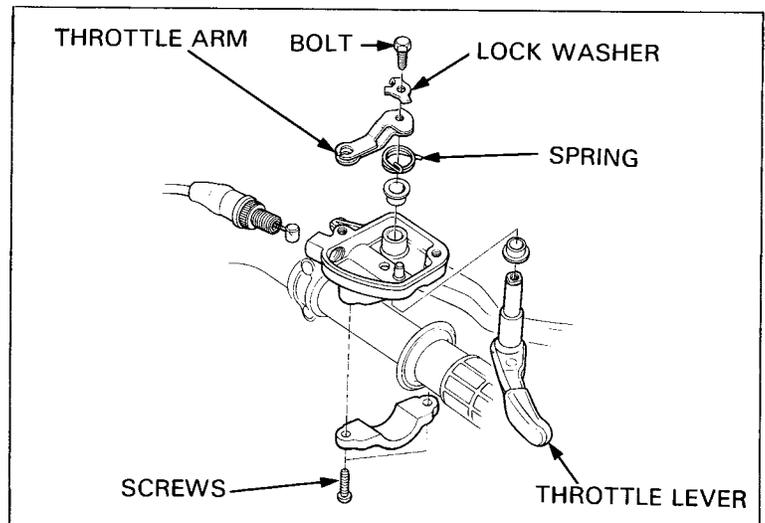


After '84:  
Bend down the lock washer tab and remove the bolt and lock washer.  
Remove the throttle lever, arm and spring from the throttle housing.  
Remove the screws and throttle housing.

**ASSEMBLY**

Install the throttle housing and screws.

Install the throttle arm, spring and lever into the throttle housing.

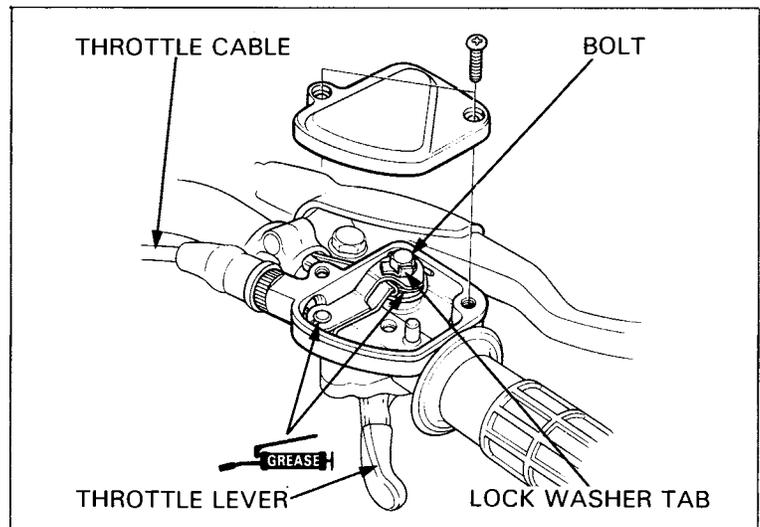


## FRONT WHEEL/SUSPENSION/BRAKE/ STEERING

Tighten the throttle lever using the bolt and new lock washer.  
Bend up the lock washer tab against the bolt head.

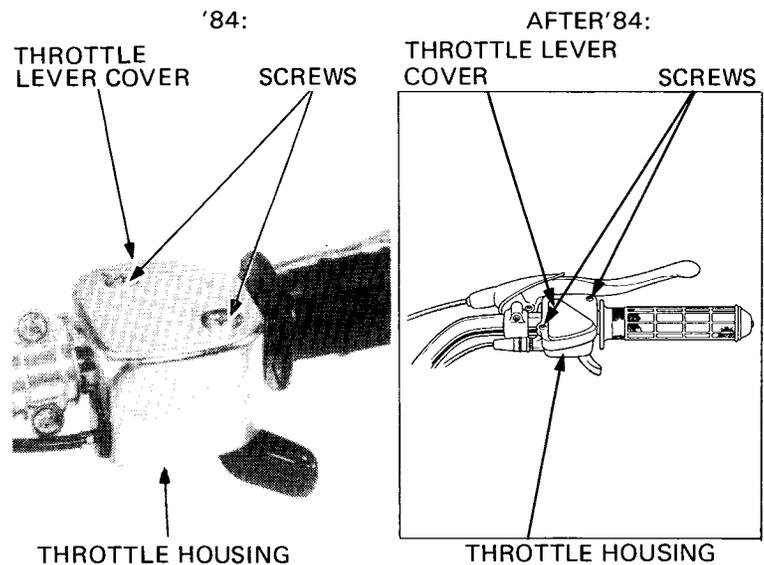
Check the lever for smooth operation.

Apply grease to the throttle cable end and connect the cable to the throttle arm.



'84:  
Install the throttle housing and lever cover onto the handlebar and tighten the forward screw first, then tighten the rear screw.

After '84:  
Install the throttle lever cover and screws.

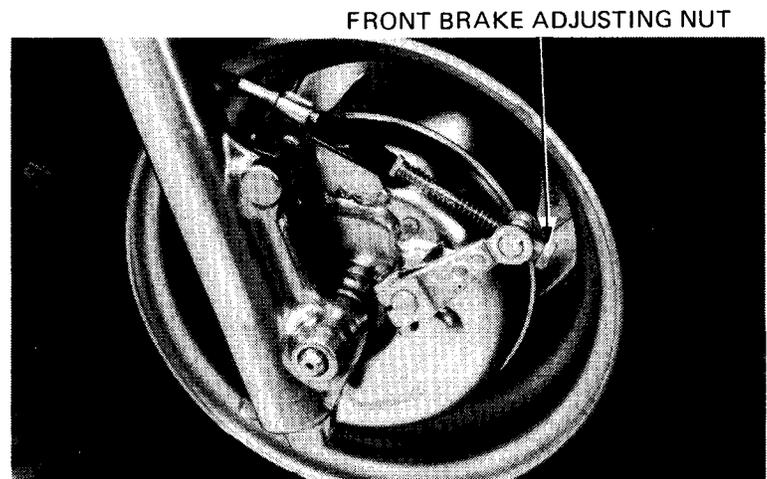


## FRONT WHEEL

### REMOVAL

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

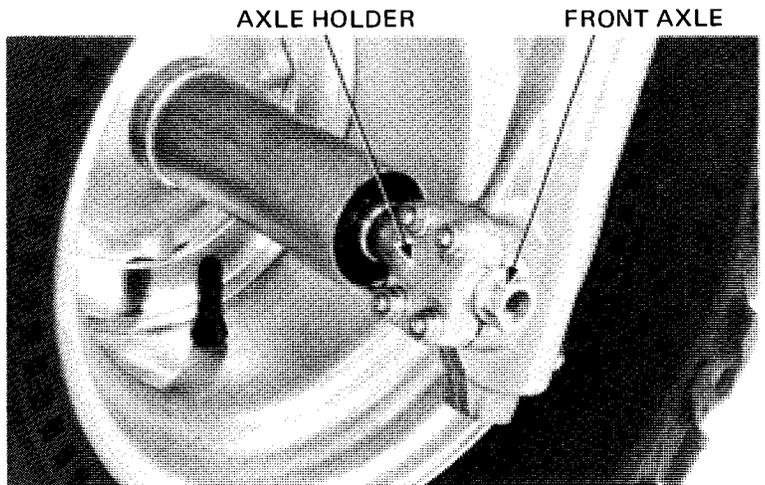
Remove the front brake adjusting nut and disconnect the front brake cable.



Loosen the axle holder nuts.

Loosen and remove the front axle.

Remove the front wheel.

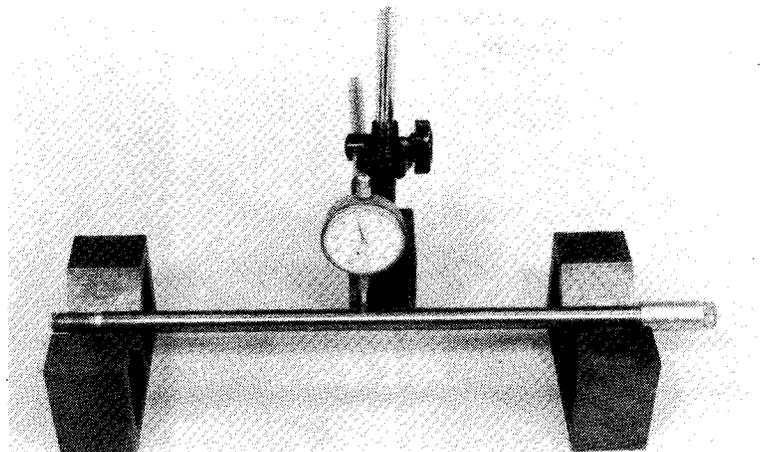


### FRONT AXLE INSPECTION

Set the axle in V-blocks, rotate and measure the runout.

Actual runout is 1/2 of TIR (Total Indicator Reading).

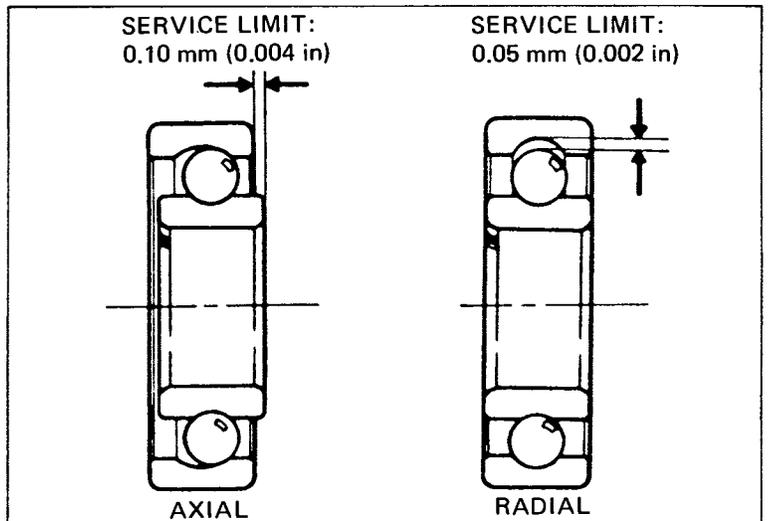
**SERVICE LIMIT: 0.5 mm (0.02 in)**



### BEARING INSPECTION

Check the wheel bearings by placing the wheel between V-blocks and spinning the wheel by hand.

Replace the bearings with new ones if they are noisy or have excessive play.



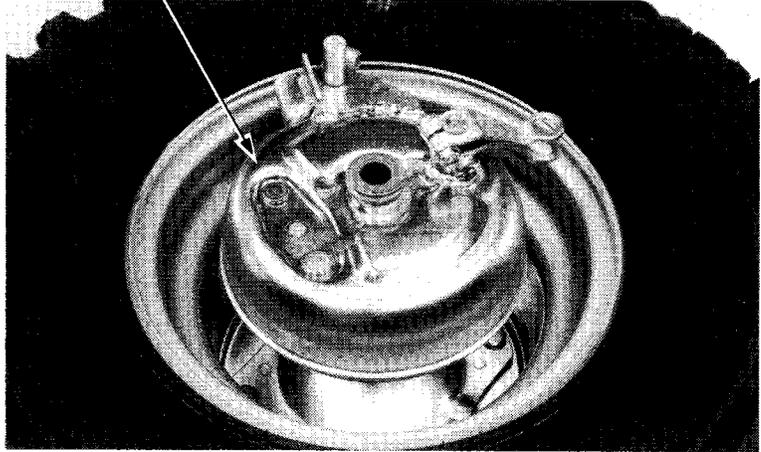
**FRONT WHEEL/SUSPENSION/BRAKE/  
STEERING**

---

**DISASSEMBLY**

Remove the brake panel.

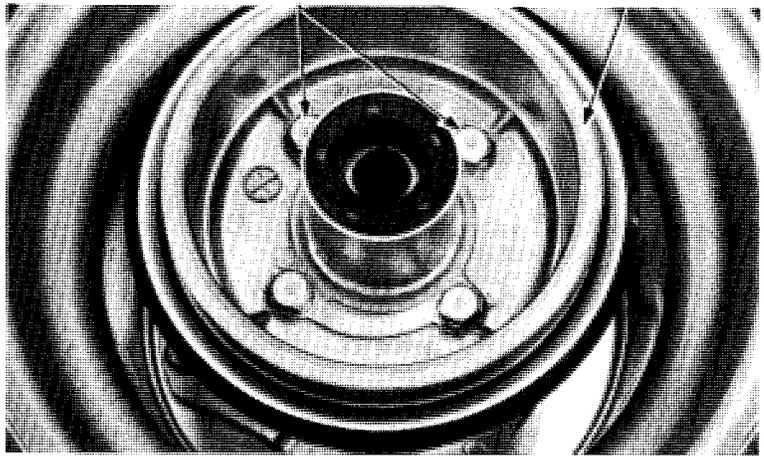
**BRAKE PANEL**



Bend down the lock washer tabs and remove the brake drum bolts and drum.

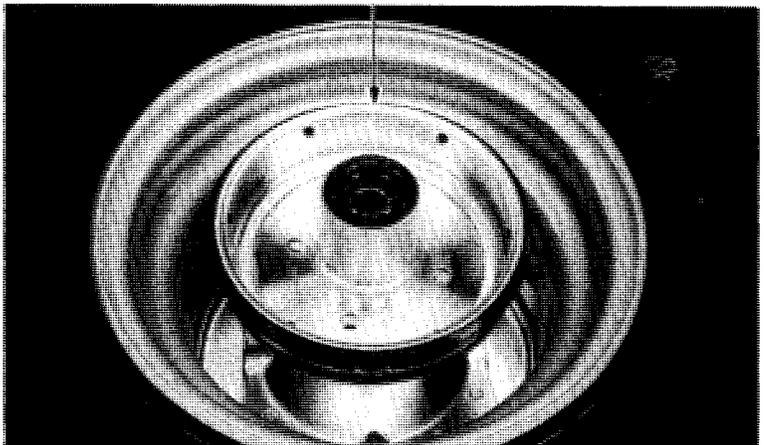
**LOCK WASHERS**

**BRAKE DRUM**



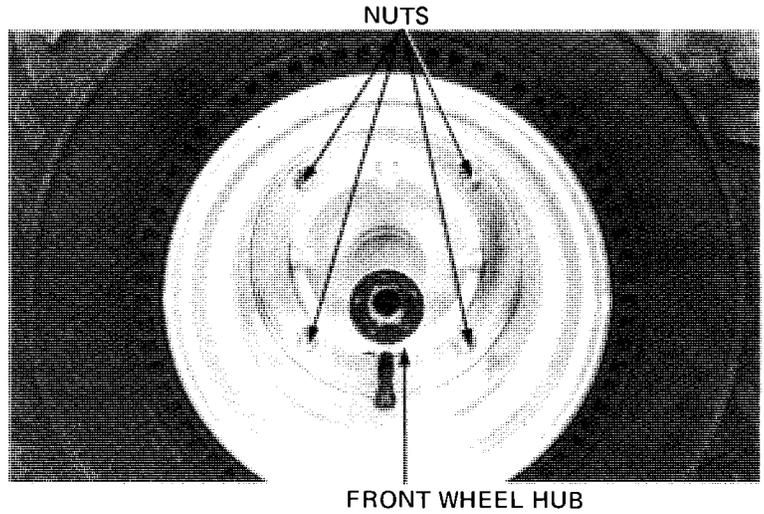
Remove the brake panel dust seal.

**DUST SEAL**

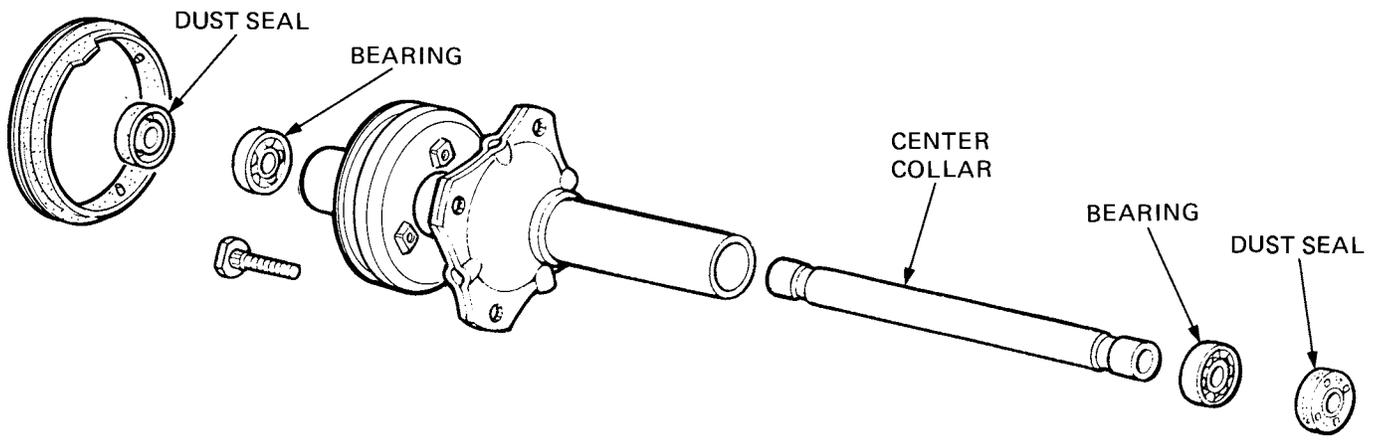
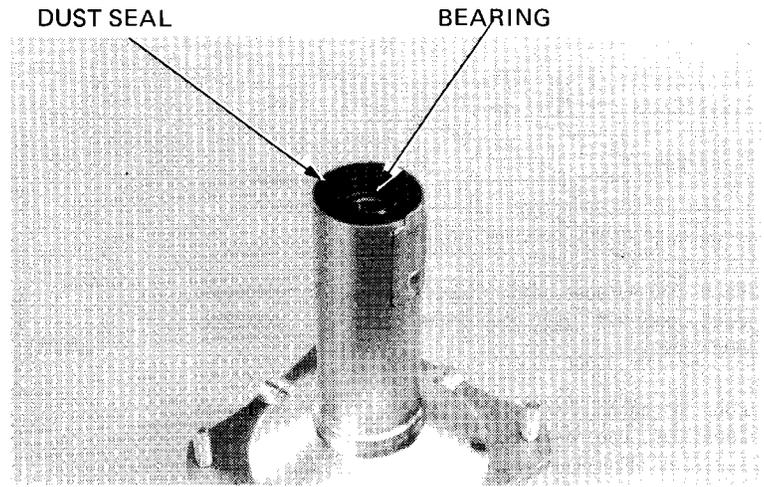


**FRONT WHEEL/SUSPENSION/BRAKE/  
STEERING**

Remove the front wheel hub nuts and hub.



Remove the dust seals.  
Drive out the bearings and remove the center collar.



## FRONT WHEEL/SUSPENSION/BRAKE/ STEERING

### TIRE REMOVAL

#### NOTE

This service requires the Universal Bead Breaker (GN-AH-958-BB1) available in U.S.A. only.

Remove the core from the valve stem.

#### CAUTION

- Use of the Bead Breaker tool is required for tire removal.
- Do not damage the bead seating area of the rim.
- Use a Coats 220 Tire Changer or equivalent to remove the tire from the rim. If a tire changer is not available, rim protectors and tire irons may be used.

Install the proper size blade onto the breaker arm assembly.

Short blade – 7"/8" rims.

Long blade – 9"/11" rims.

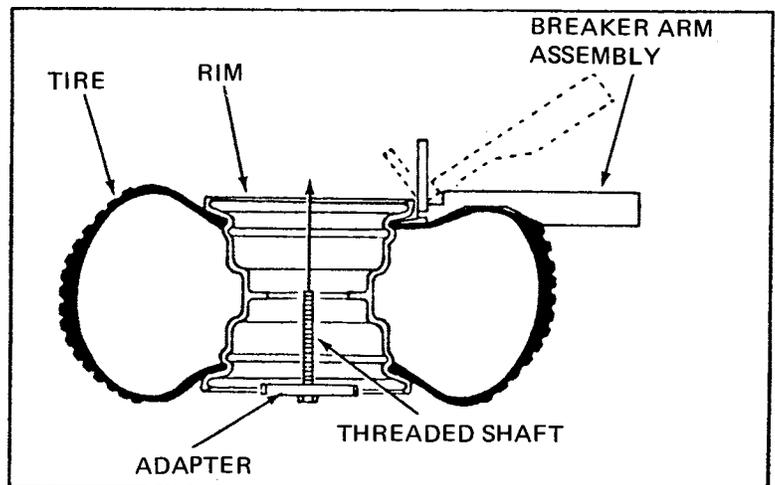
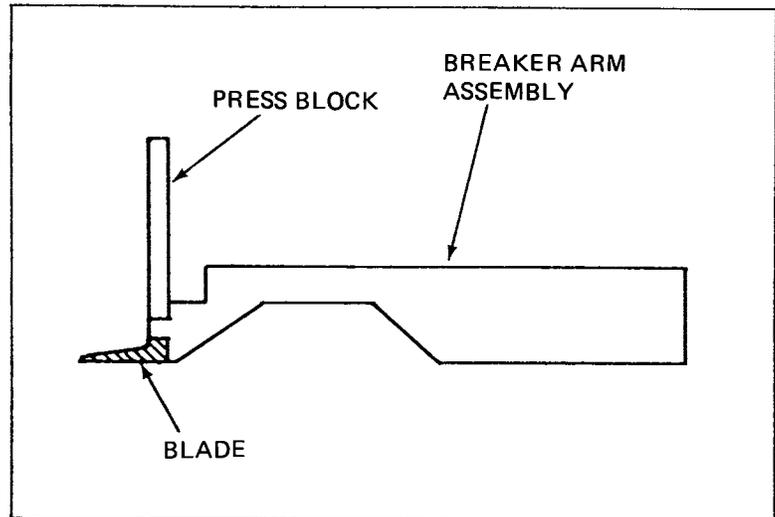
#### CAUTION

Use of an improper size blade may result in damage to the rim, tire or blade.

Place the proper size adapter onto the threaded shaft and then put the wheel over the threaded shaft and adapter.

Lube the bead area with rubber lubricant, pressing down on the tire sidewall/bead area in several places, to allow the lubricant to run into and around the bead. Also lube the area where the breaker arm will contact the sidewall of the tire.

While holding the breaker arm assembly at an approximate 45° position, insert the blade of the breaker arm between the tire and rim. Push the breaker arm inward and downward until it is in the horizontal position with its press block in contact with the rim.



With the breaker arm in the horizontal position, place the breaker press head assembly over the breaker arm press block. Make sure the press head bolt is backed out all the way and then position the nylon buttons on the press head against the inside edge of the rim.

Insert the threaded shaft through the appropriate hole in the breaker press head assembly and then tighten the lever nut until both ends of the breaker press head assembly are in firm contact with the rim.

**NOTE**

Insert bolts through the holes in the rim hub mounting tabs and the adapter to position the adapter properly.

Tighten the press head bolt until the reference mark on the press block is aligned with the top edge of the press head.

If the rest of the bead cannot be pushed down into the center of the rim by hand, loosen the press head bolt and the lever nut. Rotate the breaker arm assembly and breaker press head assembly 1/8 to 1/4 the circumference of the rim. Tighten the lever nut and then tighten the press head bolt as described. Repeat this procedure as necessary until the remainder of the bead can be pushed down into the center of the rim.

Assemble the Universal Bead Breaker on the other side of the wheel and break the bead following the same procedures.

Remove the tire from the rim using a tire changer machine or tire irons and rim protectors.

**TIRE REPAIR**

**NOTE**

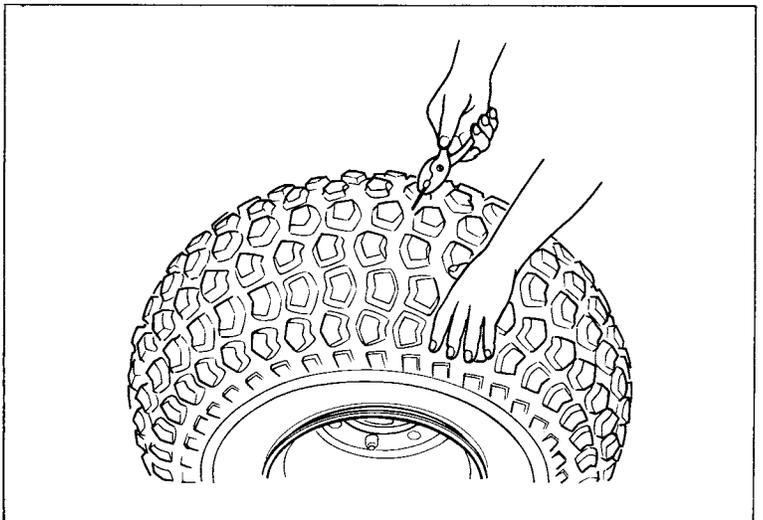
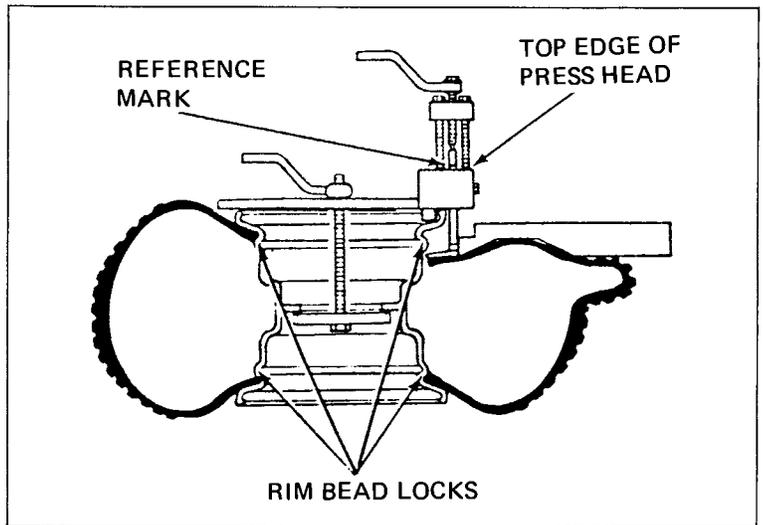
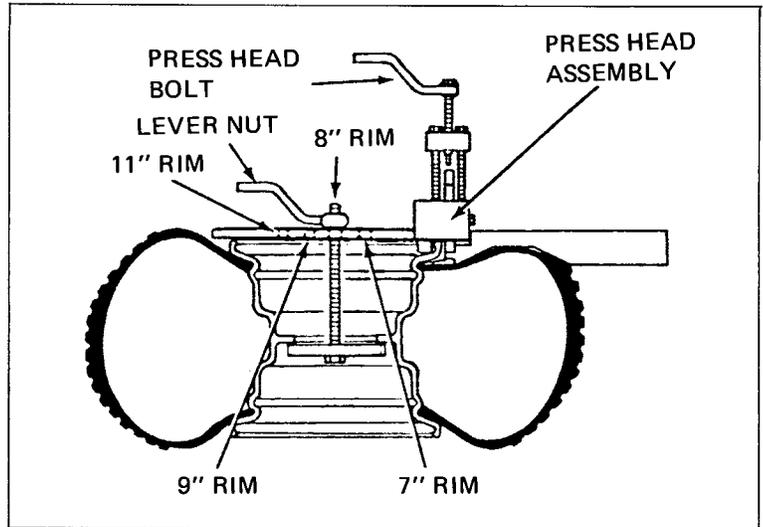
Use the manufacturer's instructions for the tire repair kit you are using. If your kit does not have instructions, use the procedures provided here.

Check the tire for puncturing objects. Chalk mark the punctured area and remove the puncturing object.

Inspect and measure the injury. Tire repairs for injuries larger than 15 mm (5/8 in) should be a section repair.

Section repairs should be done by a professional tire repair shop.

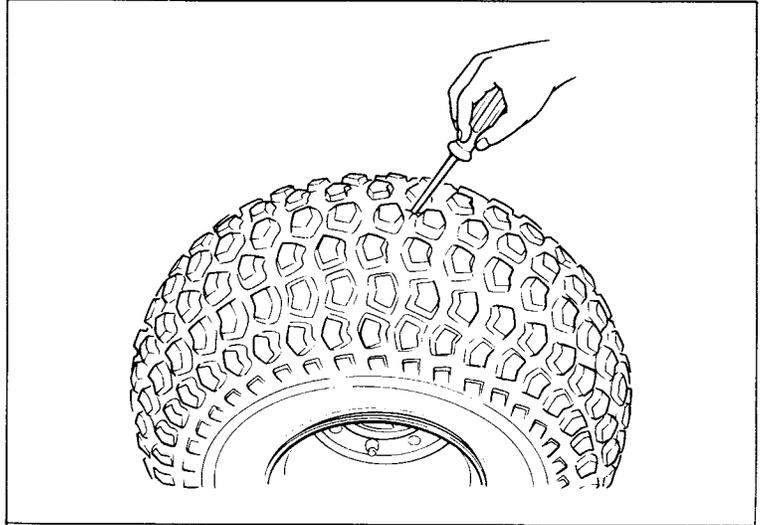
If the injury is smaller than 15 mm (5/8 in), proceed with the repair as described here.



## FRONT WHEEL/SUSPENSION/BRAKE/ STEERING

Install a rubber plug into the injury as follows:

Apply cement to a plug inserting needle and work the needle into the injury to clean and lubricate it. Do this three times. Do not let the cement dry.



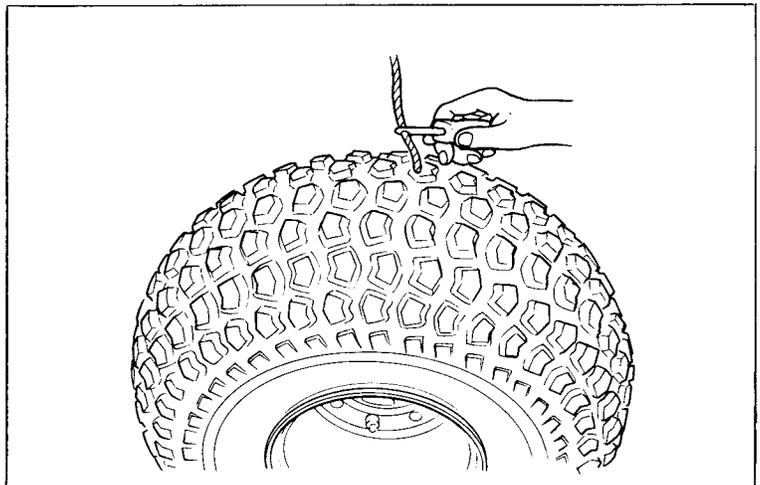
Insert and center a rubber plug through the eye of the inserting needle.

Apply cement to the rubber plug.

Push the inserting needle with plug into the injury until the plug is slightly above the tire. Twist the needle and remove it from the tire, the plug will stay in the tire.

### NOTE:

Be careful not to push the plug all the way in to the tire to prevent it from falling into the tire.



Trim the plug to 6 mm (1/4 in) above the tire surface.

Repeat the above procedure if the puncture is large. Do not use more than two plugs per injury.

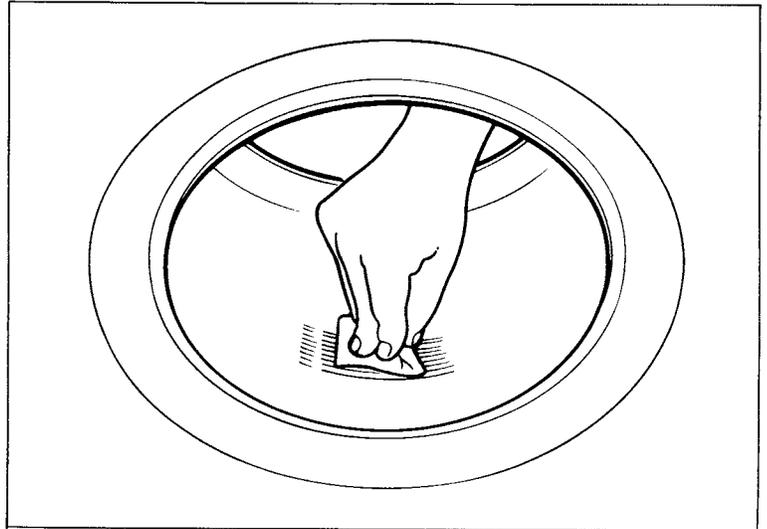
Allow the repair to dry. Drying time will vary with air temperature. Refer to the tire repair kit manufacturer's recommendations.

Inflate the tire and test the seal by dabbing a small amount of cement around the plug. Escaping air will cause a bubble in the cement. If there is leakage, remove the tire (page 11-6) and apply a cold patch to the inside of the tire as described.

If a plug has been inserted, trim it even with the inner tire surface.

Temporarily place a rubber patch that is at least twice the size of the puncture over the injury. Make a mark around the patch, slightly larger than the patch itself. Remove the patch.

Roughen the area marked inside the tire with a tire buffer or a wire brush. Clean the rubber dust from the buffed area.

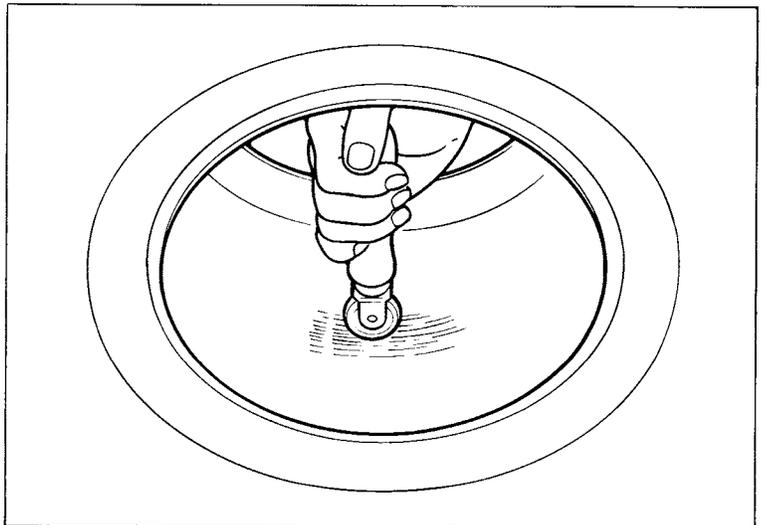


Apply cement over the area marked and allow it to dry. Remove the lining from the patch and center it over the injury.

Press the patch against the injury using a special roller.

**NOTE**

- Allow cement to dry until tacky before applying patch.
- Do not touch the cement with dirty or greasy hands.



**TIRE ASSEMBLY**

Clean the rim bead seat and flanges.

Apply clean water to the rim flanges, bead seat and base.

Inflate the tire to seat the tire bead.

**NOTE**

- Use tire mounting lubricant or a soap and water solution to help seat the tire bead.

Deflate the tire. Wait 1 hour and inflate the tire to the specified pressure.

**TIRE PRESSURE: 2.2 psi (0.15 kg/cm<sup>2</sup>, 15 kPa)**

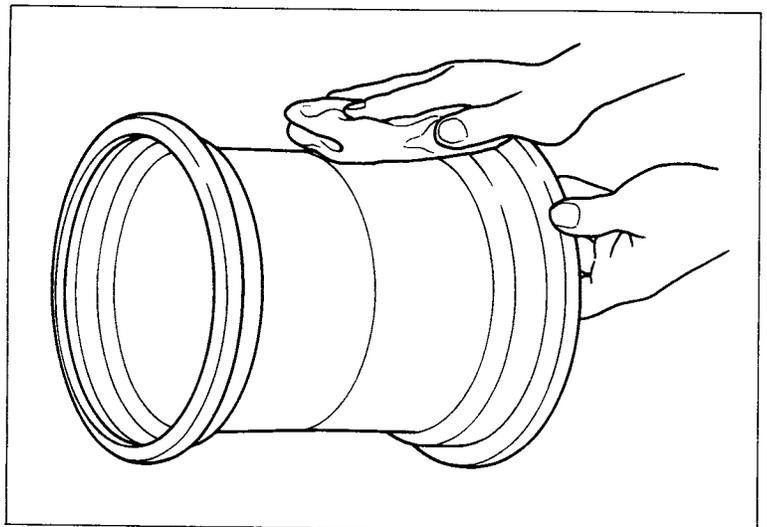
**Min. Pressure: 1.7 psi (0.12 kg/cm<sup>2</sup>, 12 kPa)**

**Max. Pressure: 3.6 psi (0.25 kg/cm<sup>2</sup>, 25 kPa)**

Measure the tire circumference.

**STANDARD TIRE CIRCUMFERENCE:  
1,870 mm (73.6 in)**

Check for air leaks and install the valve cap.



# FRONT WHEEL/SUSPENSION/BRAKE/ STEERING

## FRONT WHEEL ASSEMBLY

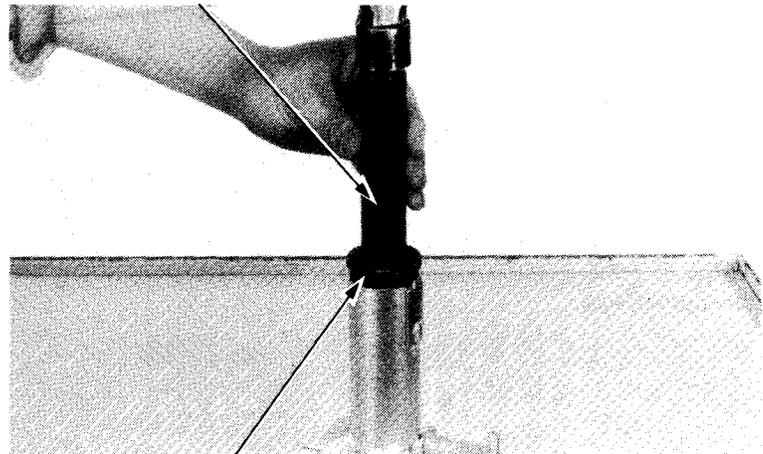
Pack all front wheel bearing cavities with grease.

Drive in the left bearing squarely until it seats. Install the center collar and drive in the right bearing squarely until it seats.

### NOTE

Do not allow the bearings to tilt while driving them in.

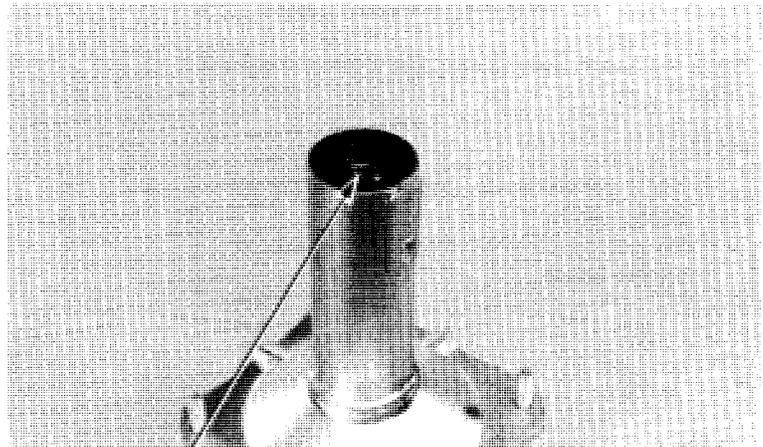
DRIVER 07749-0010000



ATTACHEMNT, 42 x 47 mm  
PILOT, 15 mm

07746-0010300  
07746-0040300

Apply grease to the inside of the dust seals and install them into the wheel hub.

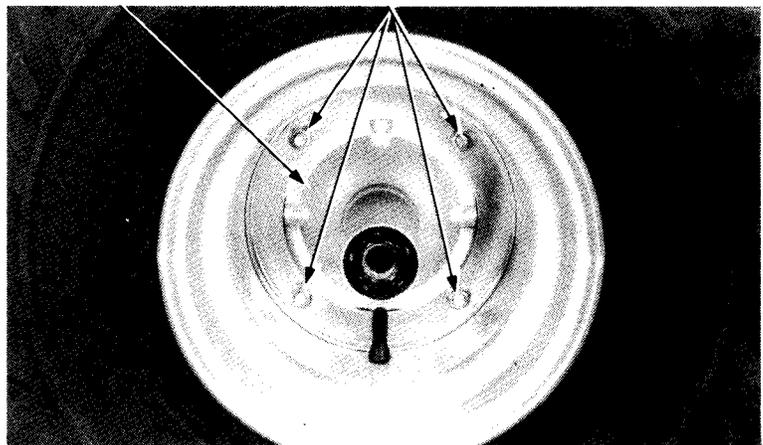


Install the front wheel hub and tighten the hub nuts.

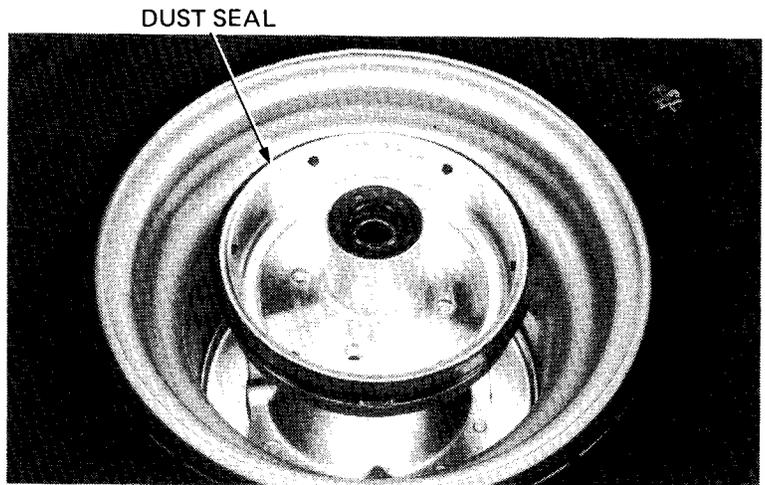
**TORQUE:** 20–25 N·m  
(2.0–2.5 kg·m, 14–18 ft·lb)

WHEEL HUB

NUTS

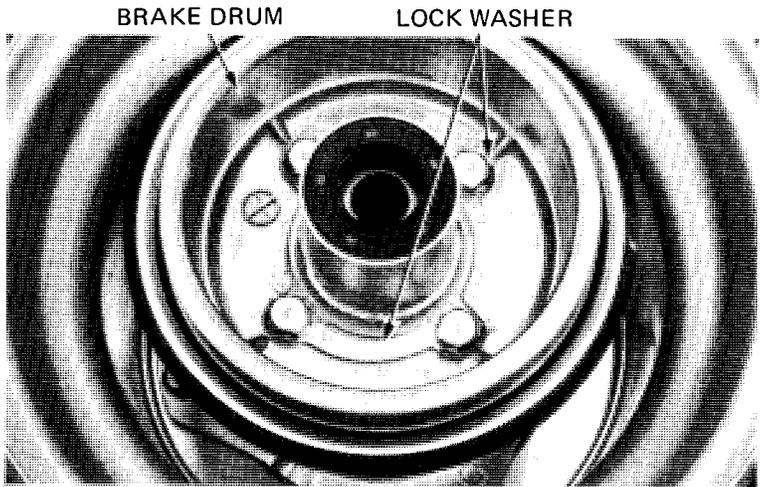


Make sure the dust seal on the wheel hub is in good condition.

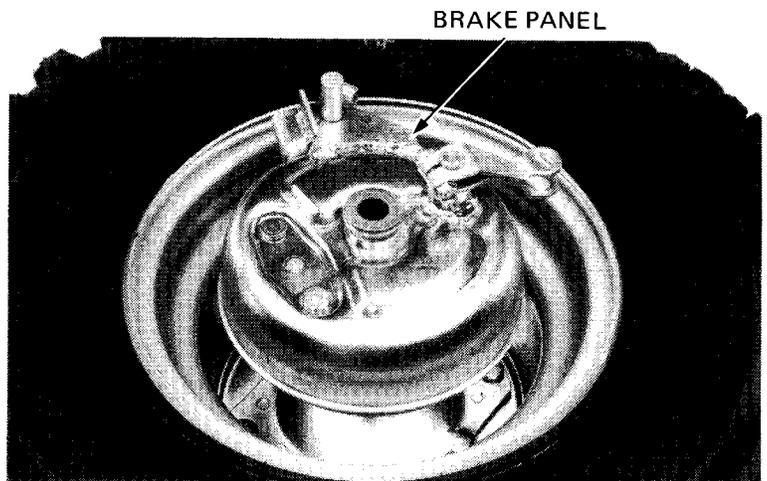


Install the brake drum onto the wheel hub using new lock washers and the bolts.

Tighten the bolts and bend up the lock washer tabs against the bolt heads.



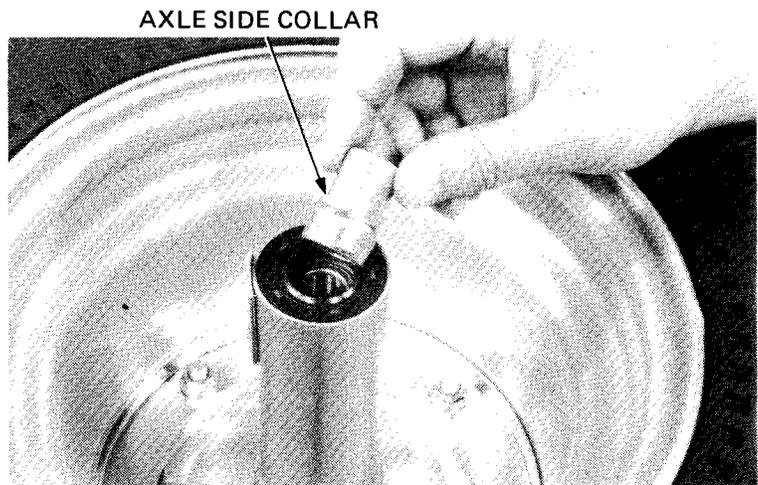
Install the brake panel.



## FRONT WHEEL/SUSPENSION/BRAKE/STEERING

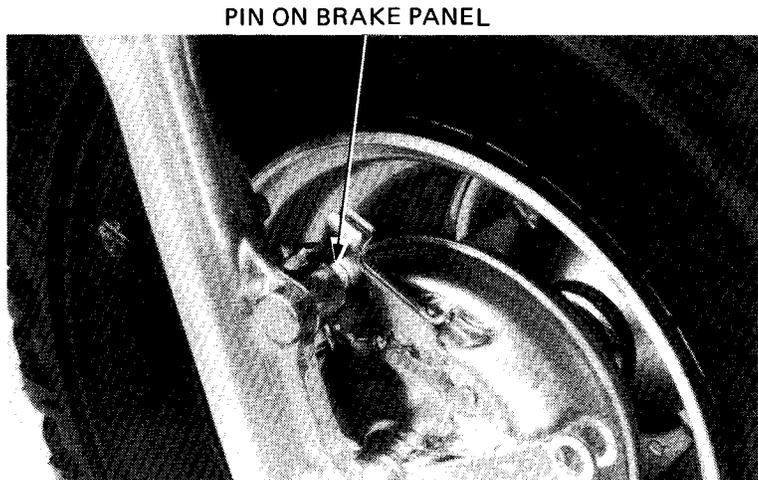
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Install the axle side collar into the left dust seal.



### INSTALLATION

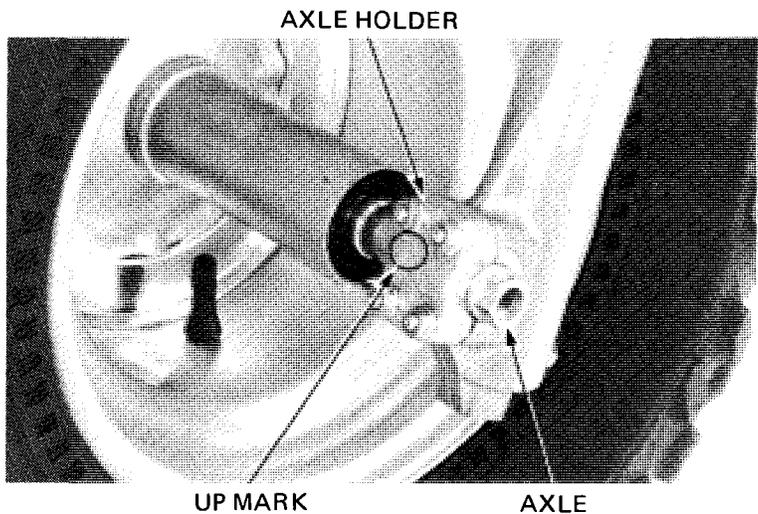
Fit the pin on the brake panel into the hole in the right fork leg.



Clean the axle shaft and holder.  
Install the holder with "UP" facing upwards.  
Install the axle holder nuts but do not tighten at this time.

Tighten the axle to the specified torque.

**TORQUE: 70–110 N·m**  
(7.0–11.0 kg-m, 51–80 ft-lb)

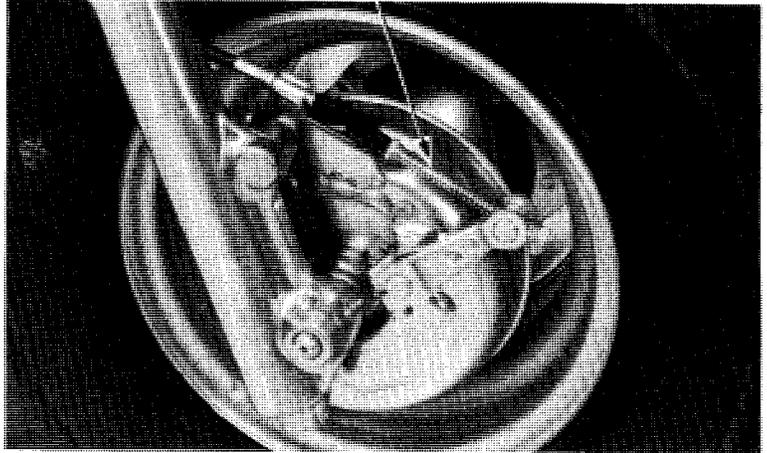


Connect the front brake cable.

Adjust the front brake (Page 3-14).

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

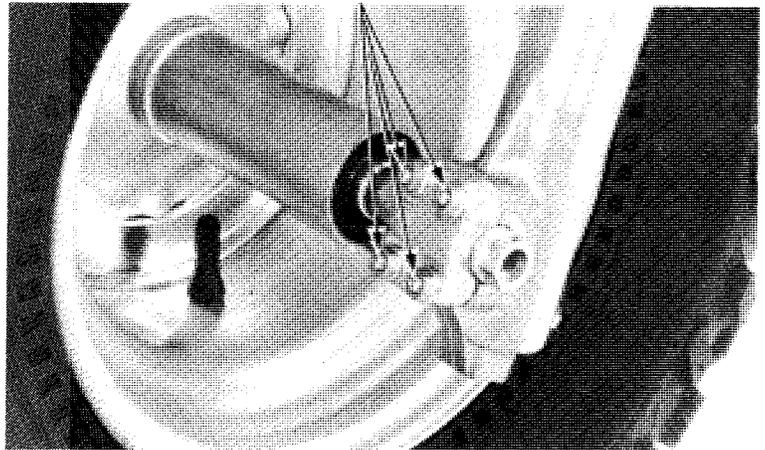
**FRONT BRAKE CABLE**



Tighten the axle shaft holder nuts; the upper nuts first, then the lower nuts.

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

**AXLE HOLDER NUTS**



## **FRONT BRAKE**

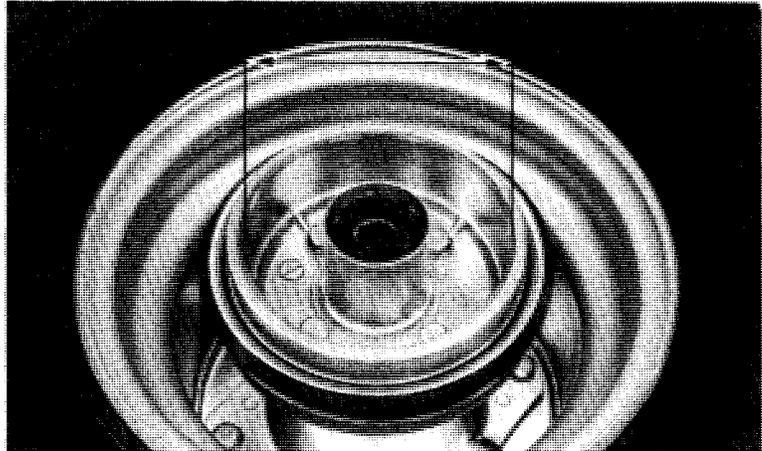
### **REMOVAL**

Remove the front wheel (Page 11-6).  
Remove the brake panel from the wheel (Page 11-8).

### **BRAKE DRUM INSPECTION**

Remove the brake panel assembly and measure the brake drum I.D.

**SERVICE LIMIT: 111 mm (4.4 in)**



### **BRAKE LINING INSPECTION**

Measure the brake lining thickness.

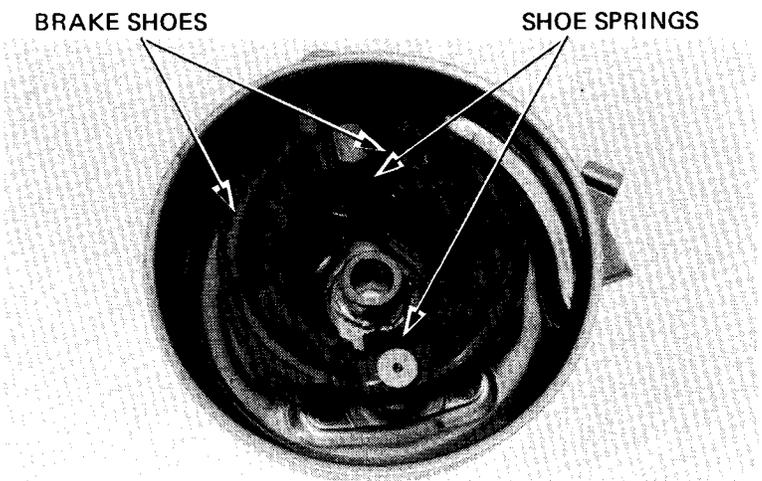
**SERVICE LIMIT: 2 mm (0.1 in)**

Replace the brake shoes if they are thinner than the service limit.

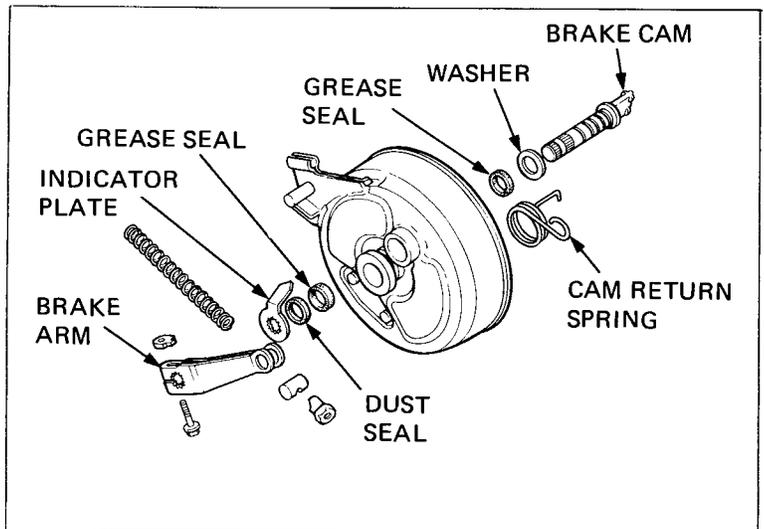


### **BRAKE PANEL DISASSEMBLY**

Expand and remove the brake shoes by hand.

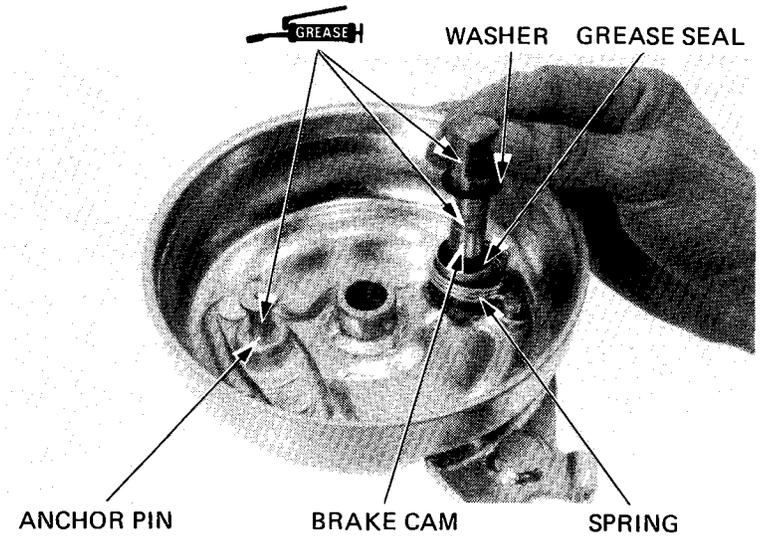


Remove the brake arm bolt, brake arm and indicator plate.  
Remove the brake cam, thrust washer, grease seals and dust seal.

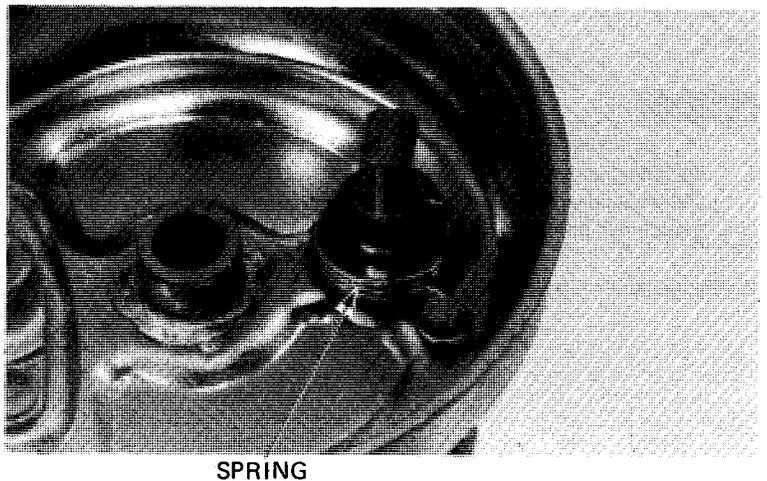


**BRAKE PANEL ASSEMBLY**

Install new grease seals.  
Install the cam return spring.  
Apply grease to the brake cam and anchor pin and insert the brake cam and washer onto the brake panel.



Insert the end of the spring into the hole in the brake cam.

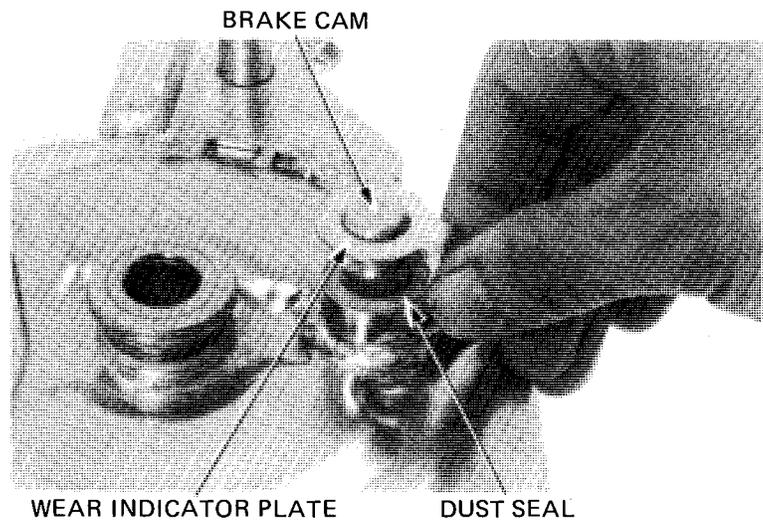


## FRONT WHEEL/SUSPENSION/BRAKE/STEERING

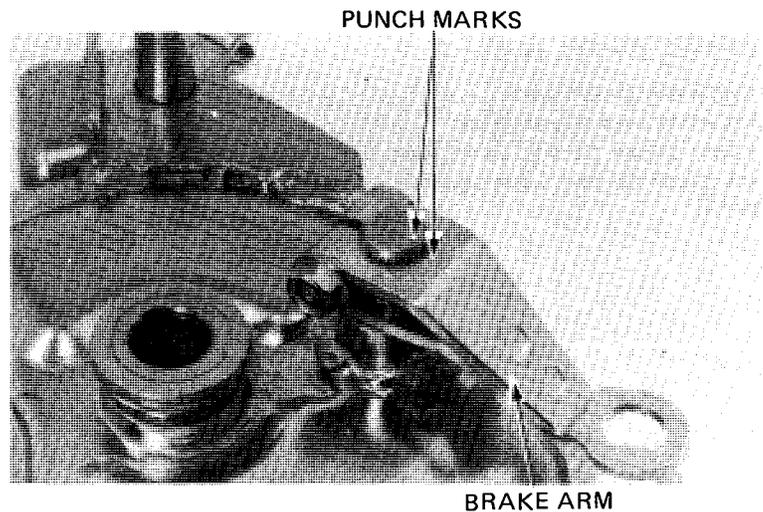
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Install the dust seal.

Install the wear indicator plate onto the brake cam by aligning the indicator tab with the cut-out in the brake cam.



Install the brake arm aligning the punch marks. Torque the brake arm bolt.

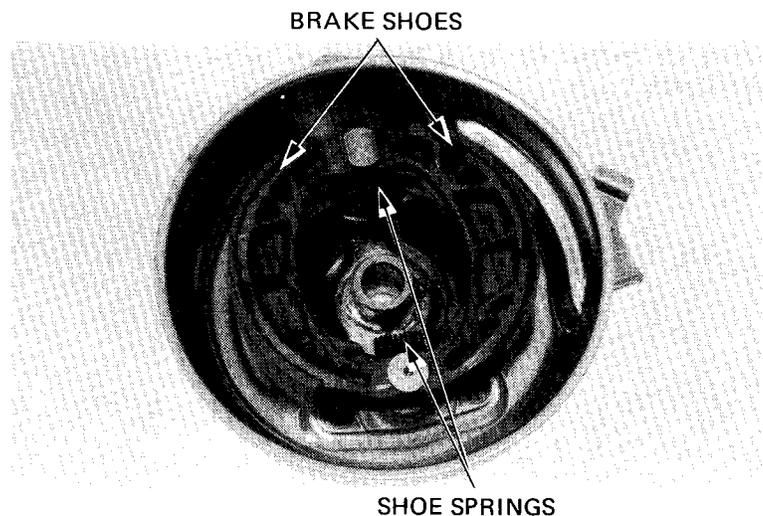


Install the brake shoes and springs onto the brake panel.

**WARNING**

- *A contaminated brake lining reduces stopping power.*
- *Keep grease off the linings. Wipe excess grease off the cam.*

Install the brake panel (Page 11–15).



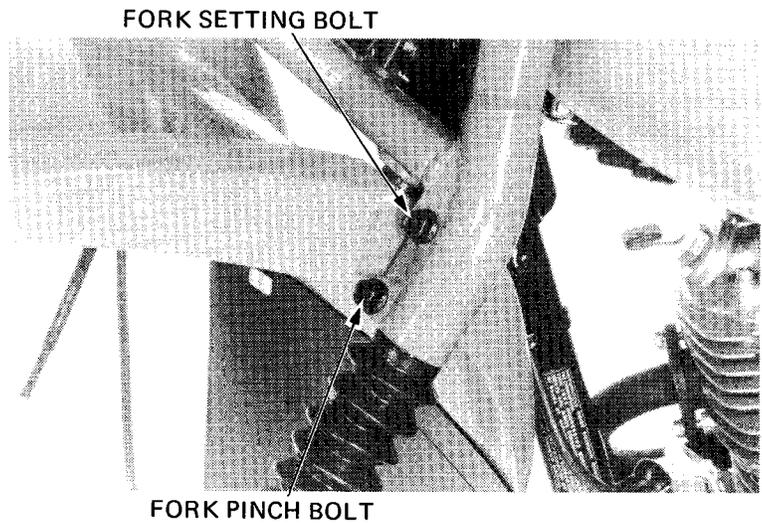
## FRONT FORK

### REMOVAL

Remove the front wheel (Page 11-6).

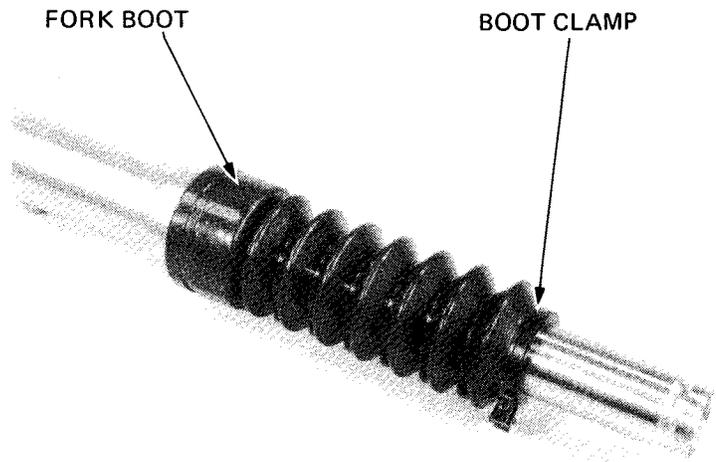
Remove the fork setting bolts.

Loosen the fork pinch bolts and remove the front forks.



### DISASSEMBLY

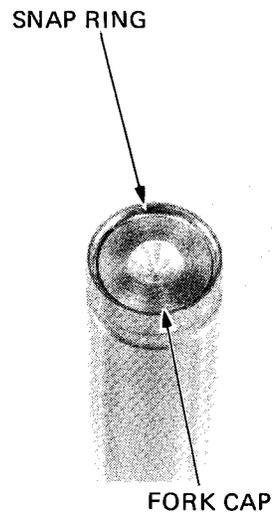
Loosen the fork boot clamp and remove the fork boot.



Depress the fork cap and remove the snap ring.

### CAUTION

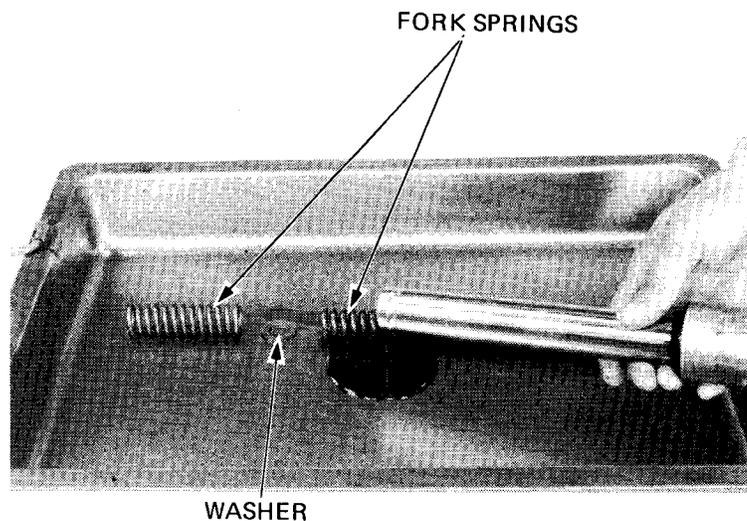
*The cap is under spring pressure. Use care when removing and wear eye and face protection.*



## FRONT WHEEL/SUSPENSION/BRAKE/STEERING

Remove the fork springs and washer.

Pour out the fork fluid by pumping the fork up and down several times.

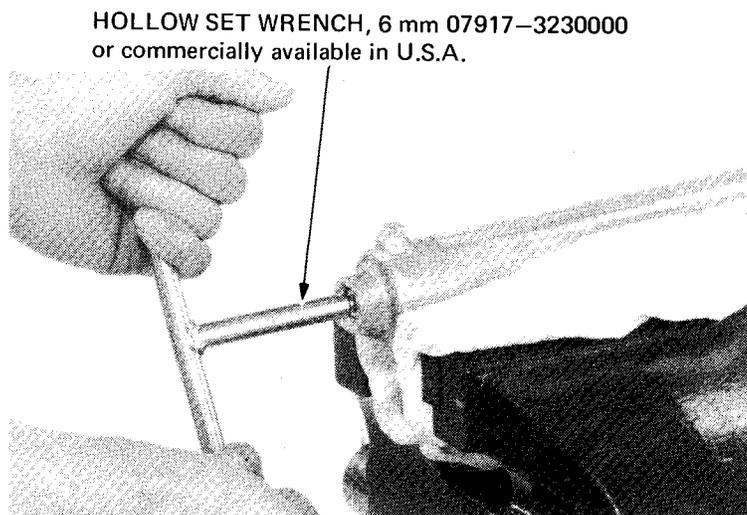


Hold the fork slider in a vise with soft jaws or a shop towel.  
Remove the socket bolt with a hex wrench.

### NOTE

Temporarily install the spring, washer and fork cap if difficulty is encountered in removing the bolt.

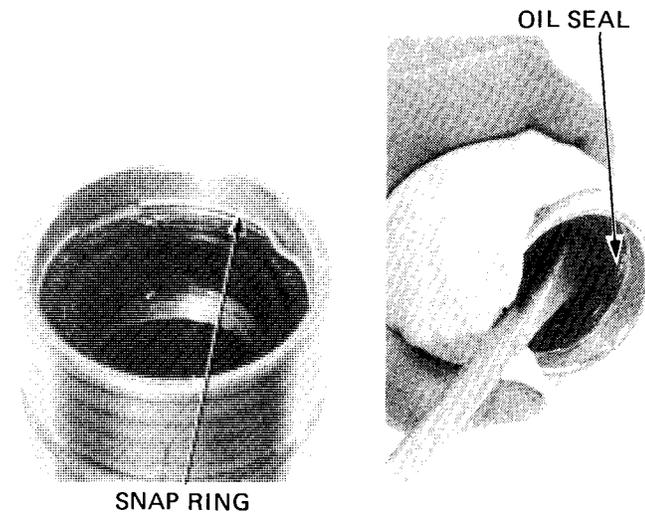
Remove the piston, rebound spring, then separate the slider and fork tube.



Remove the dust seal and the snap ring.  
Remove the oil seal.

### NOTE

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



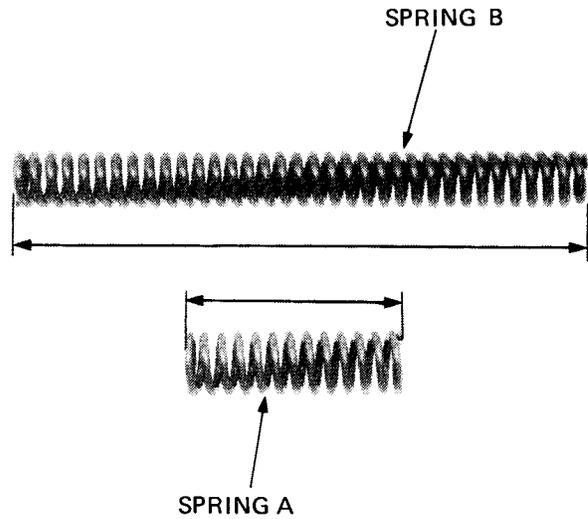
**INSPECTION**

**FORK SPRING FREE LENGTH**

Measure the fork spring free length.

**SERVICE LIMIT: SPRING A 76.1 mm (3.00 in)**  
**SPRING B 230.3 mm (8.07 in)**

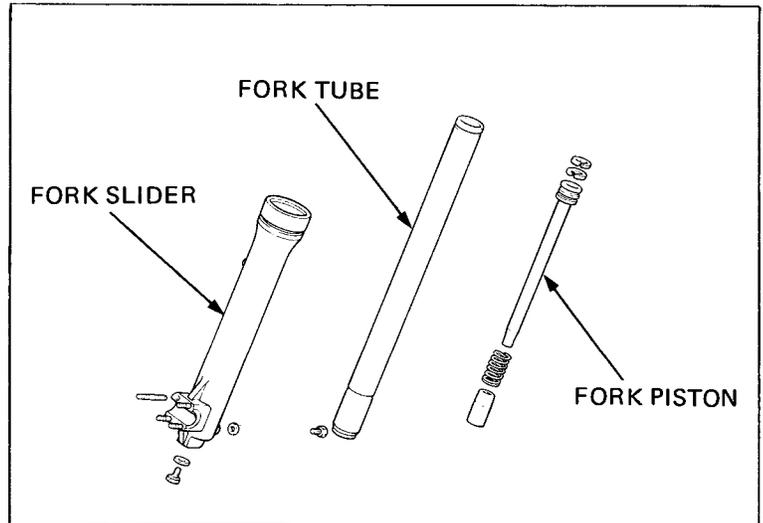
Replace the spring if it is shorter than the service limit.



**FORK TUBE/FORK SLIDER/PISTON**

Check the fork tube, fork slider and piston for score marks, scratches, or excessive or abnormal wear. Replace any components which are worn or damaged.

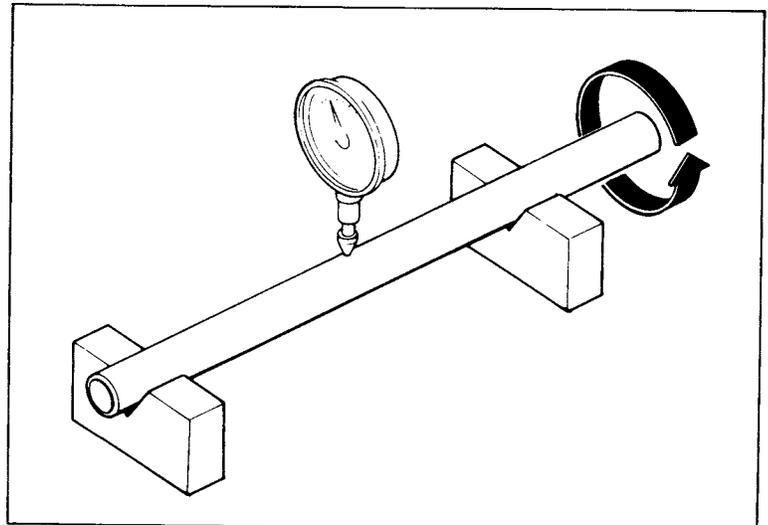
Check the fork piston ring for wear or damage.  
Check the rebound spring for fatigue or damage.



**FORK TUBE**

Set the fork tube in V blocks and read the runout.

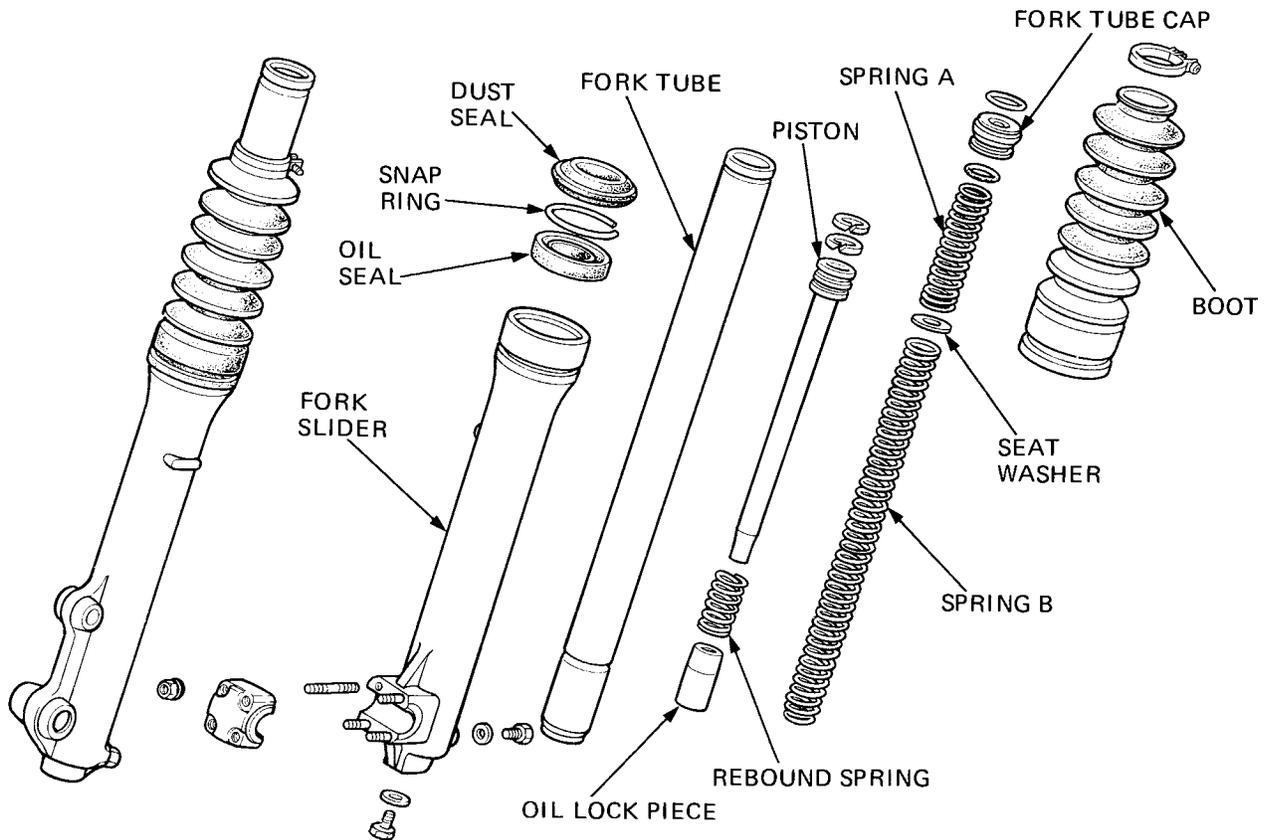
**SERVICE LIMIT: 0.20 mm (0.008 in)**



# FRONT WHEEL/SUSPENSION/BRAKE/ STEERING

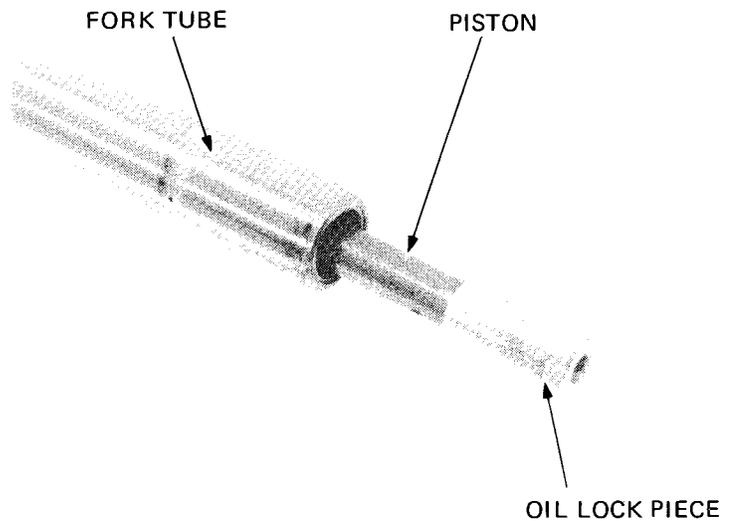
## ASSEMBLY

Clean all parts with non-flammable or high flash point solvent.



Install the rebound spring and piston into the fork tube.

Place the oil lock piece on the end of the piston and insert the fork tube into the slider.



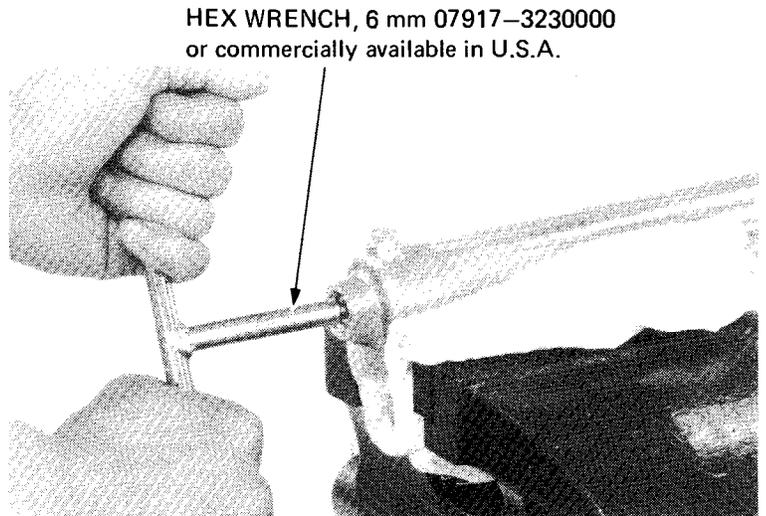
## FRONT WHEEL/SUSPENSION/BRAKE/STEERING

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.

### NOTE

Temporarily install the fork springs, seat washer, and fork tube cap to tighten the socket bolt.

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

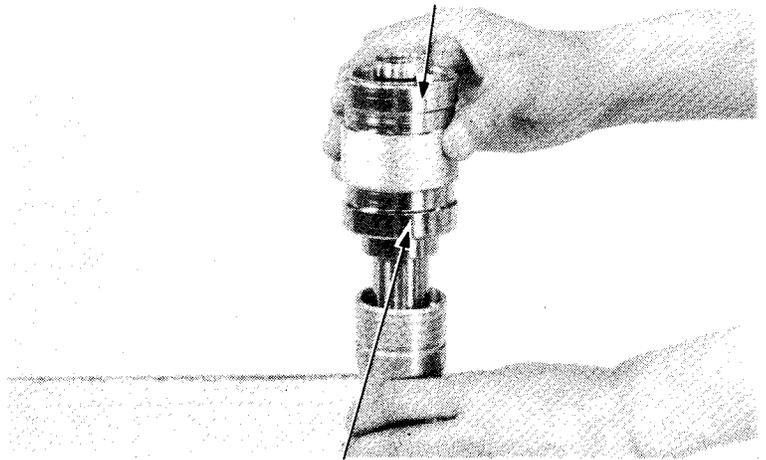


Coat a new oil seal with ATF and install it with the seal markings facing up.  
Drive the seal in with the seal driver.

Install the snap ring into the groove of the slider.

Install the dust seal.

### FORK SEAL DRIVER 07747–0010100



### ATTACHMENT 07747–0010400

Pour in the specified amount of ATF.

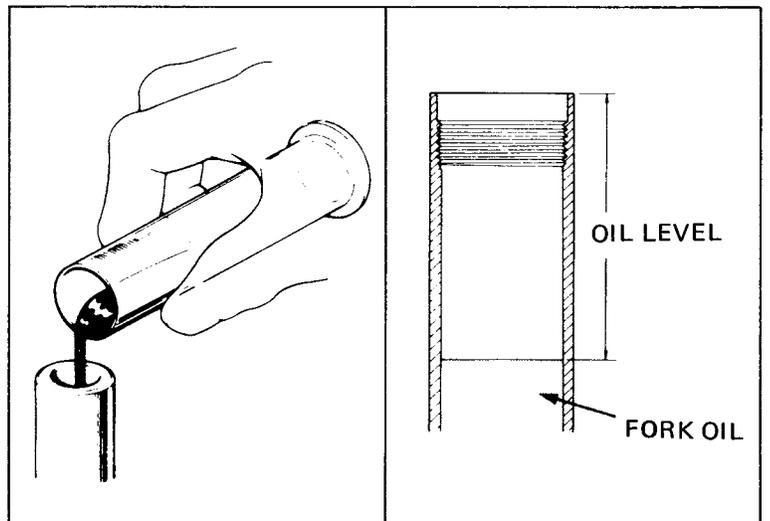
**FLUID CAPACITY: 88 cc (3.0 ozs)**

Compress the front fork all the way 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: 137 mm (5.4 in)**



## FRONT WHEEL/SUSPENSION/BRAKE/ STEERING

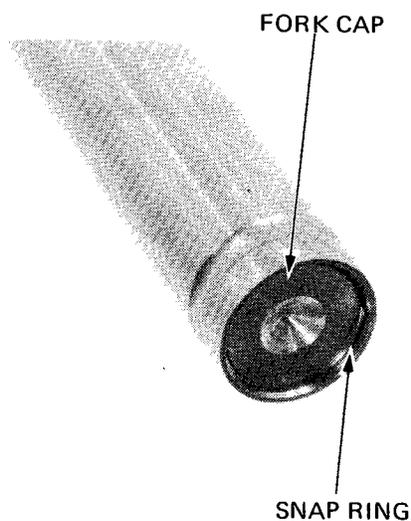
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Wipe all oil from the fork springs.

Install spring A, washer and spring B into the fork tube.

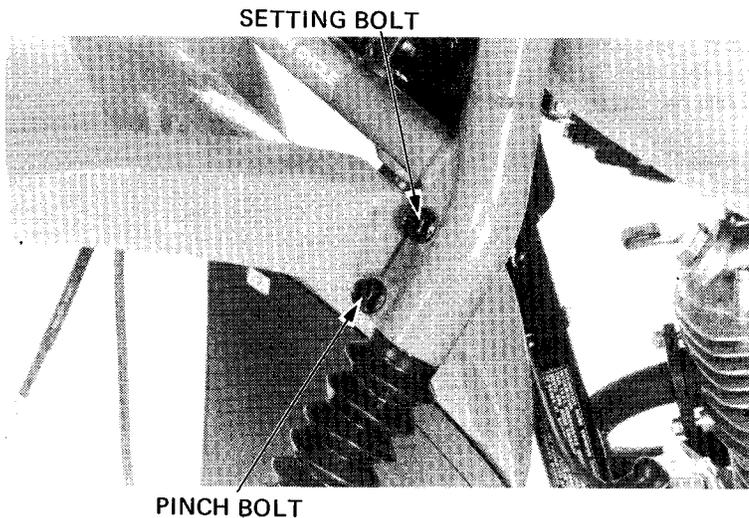
Install the fork cap and snap ring.

Install the fork boot.



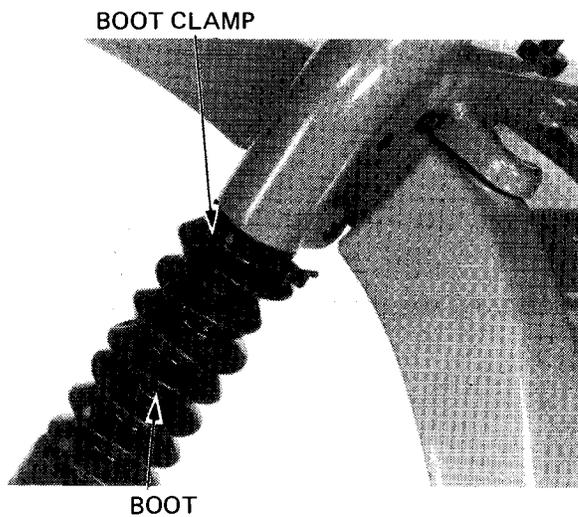
Install the front forks and tighten the fork pinch and setting bolts.

**TORQUE: 40–50 N·m**  
(4.0–5.0 kg-m, 29–36 ft-lb)



Pull the boot up and tighten the clamp screw.

Install the front wheel (Page 11–16).

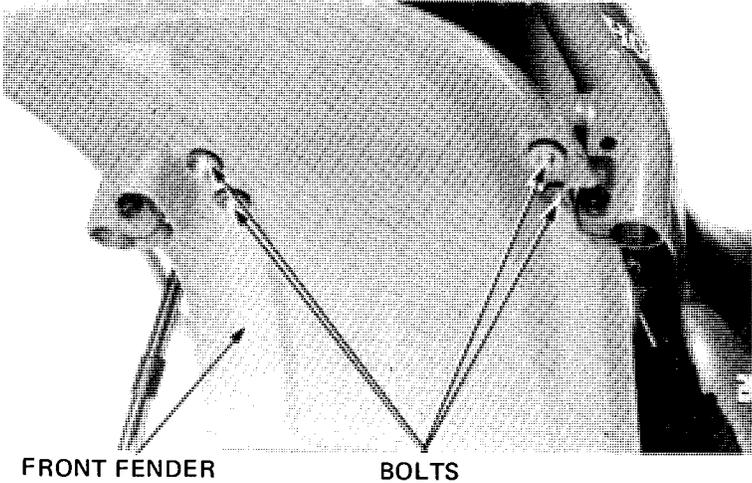


**STEERING STEM**

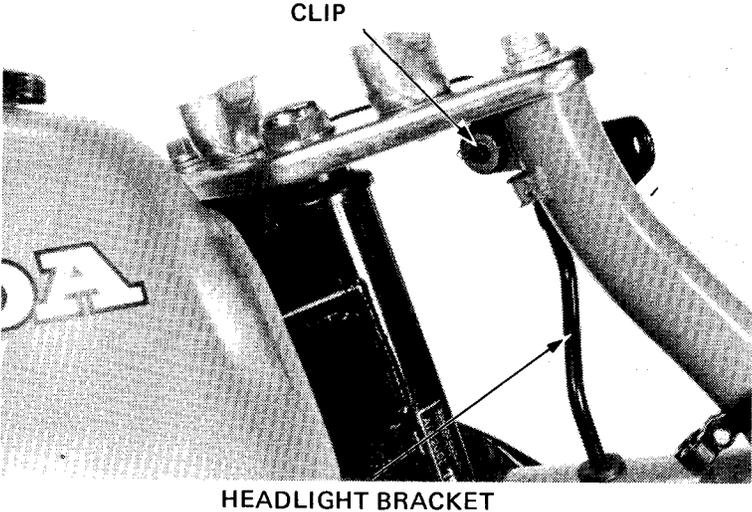
**REMOVAL**

Remove the following: .

- headlight (Page 17-2).
- handlebar (Page 11-3).
- front wheel (Page 11-6).
- front forks (Page 11-21).
- front fender.

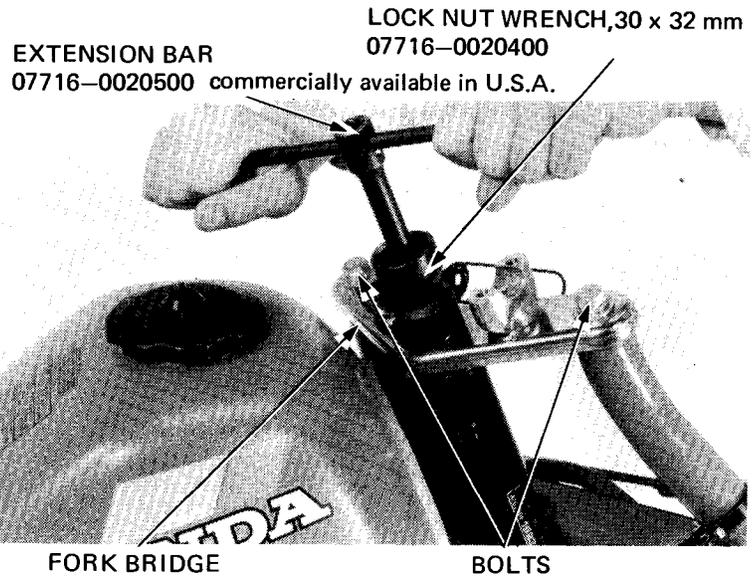


Remove the clips securing the headlight bracket and the bracket from the front fork.



Remove the steering stem nut and fork bridge bolts.

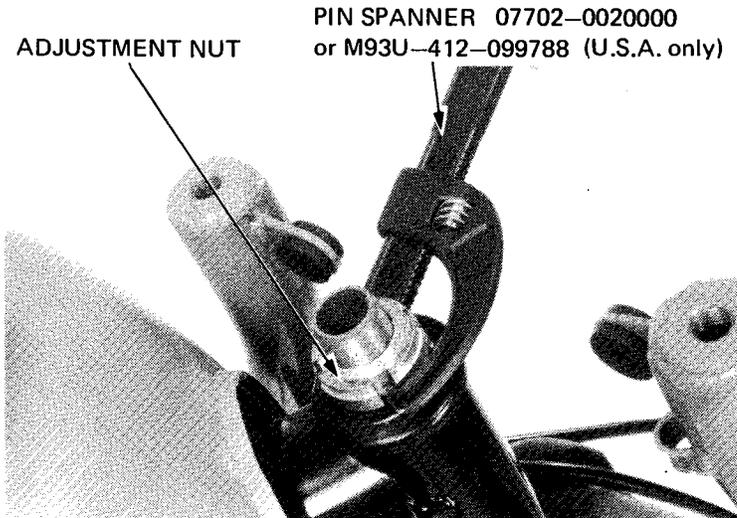
Remove the fork bridge.



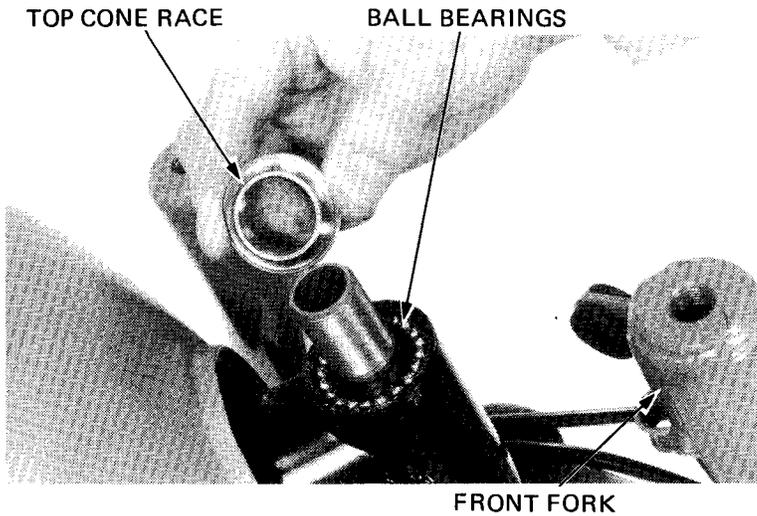
## FRONT WHEEL/SUSPENSION/BRAKE/ STEERING

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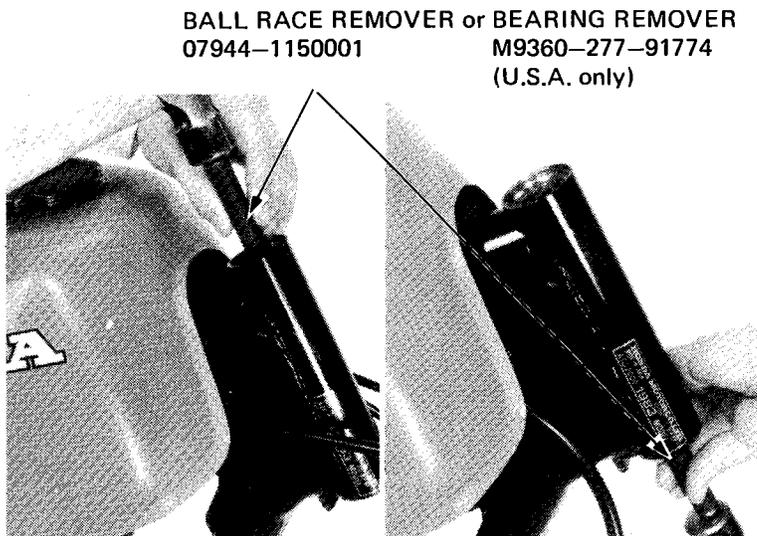
Remove the steering adjustment nut.



Remove the top cone race, ball bearings and front fork being careful not to drop the bearings.



Check the ball races for wear or damage and remove if necessary.

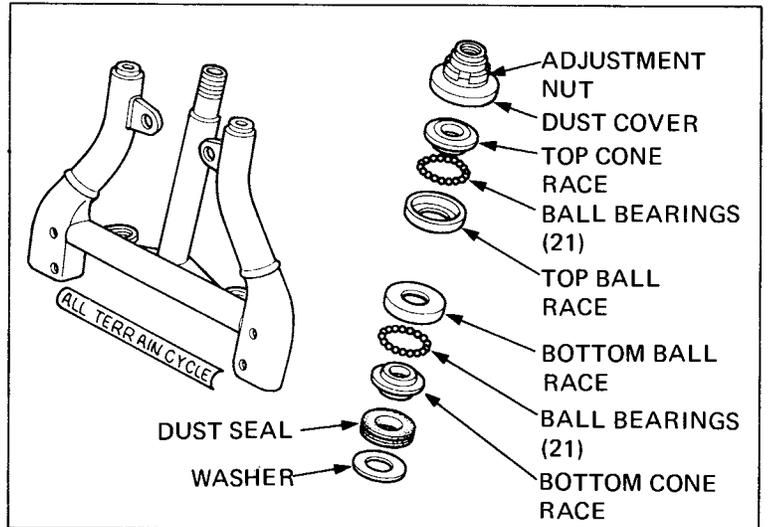


## FRONT WHEEL/SUSPENSION/BRAKE/STEERING

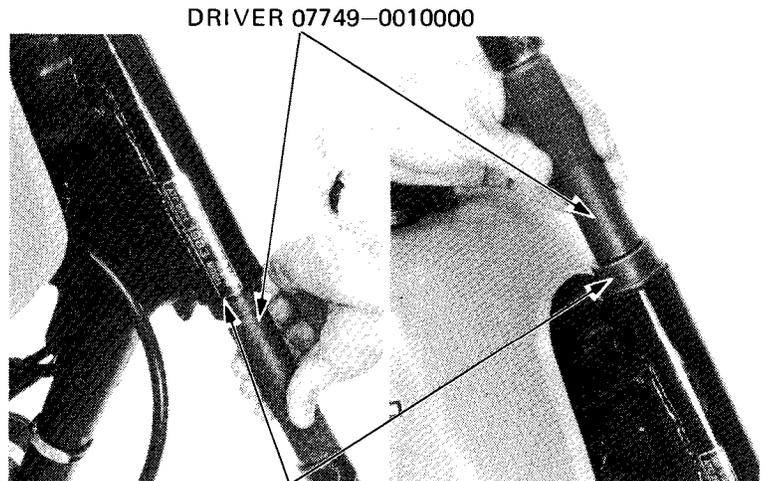
Inspect the bottom cone race for wear or damage and replace if necessary.  
Remove the bottom cone race with a hammer and a drift.

### INSTALLATION

Install a new washer and dust seal and drive a new cone race into place.

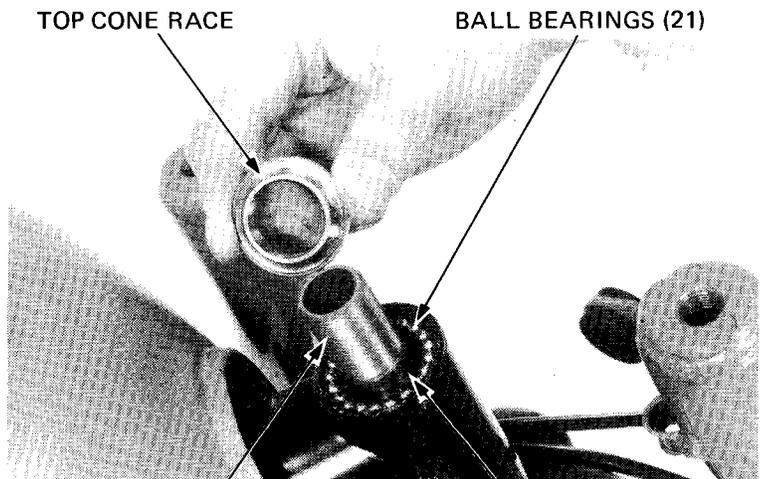


Drive new top and bottom ball races into head pipe with the special tools.



ATTACHMENT, 37 x 40 mm  
07746-0010200

Apply grease to the top and bottom ball races and install 21 ball bearings for both the top and bottom ball races.  
Insert the steering stem into the steering head pipe and install the top cone race.



STEERING STEM



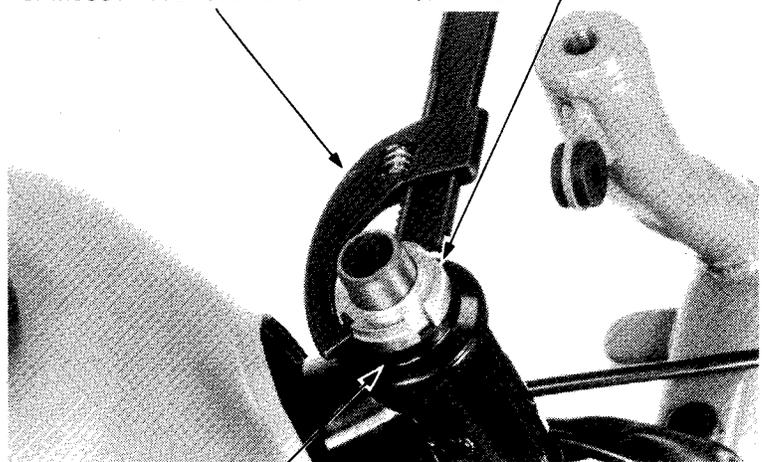
## FRONT WHEEL/SUSPENSION/BRAKE/ STEERING

Install the bearing adjustment nut and dust cover and tighten it snug against the top cone race. Then, back it off 1/8 turn.

Make sure that there is no vertical movement and that the stem rotates freely.

PIN SPANNER 07702-0020000  
or M9361-412-099788 (U.S.A. only)

BEARING ADJUSTMENT  
NUT



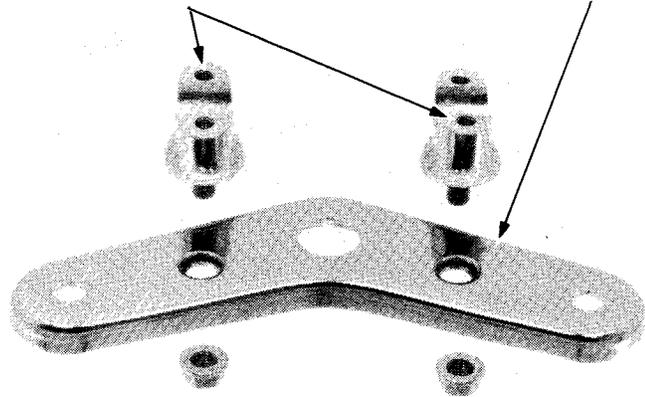
DUST COVER

Attach the handlebar lower holders loosely to the top bridge.

Place the top bridge into position on the fork tubes, and steering stem.

HANDLEBAR LOWER HOLDERS

TOP BRIDGE



Install the steering stem nut and fork bridge bolts.  
Tighten the stem nut.

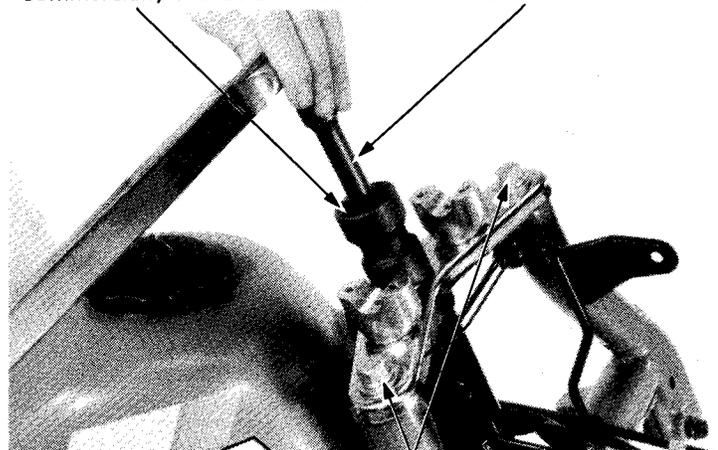
**TORQUE: 50-70 N·m**  
(5.0-7.0 kg-m, 36-51 ft-lb)

Tighten the fork bridge bolts.

**TORQUE: 50-70 N·m**  
(5.0-7.0 kg-m, 36-51 ft-lb)

LOCK NUT WRENCH, 30 x 32 mm  
Commercially available in U.S.A.

EXTENSION BAR  
Commercially available  
in U.S.A.

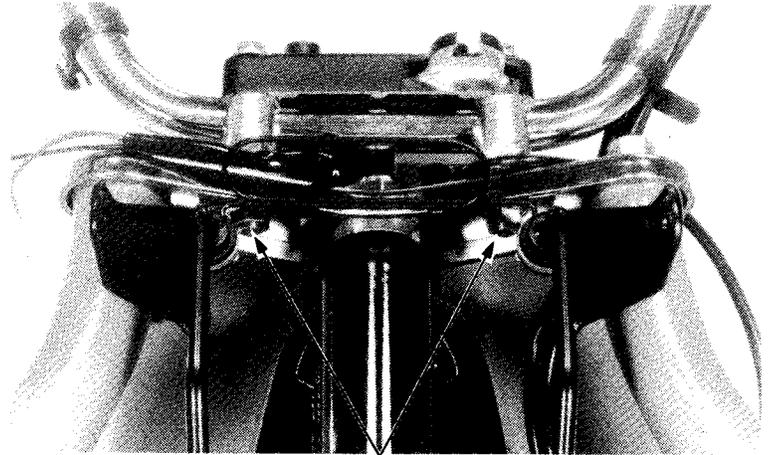


FORK BRIDGE BOLTS

Install the handlebar and upper holder (Page 11-3).  
Tighten the handlebar lower holder nuts.

**TORQUE:** 40–48 N·m  
(4.0–4.8 kg·m, 29–35 ft·lb)

Install the removed parts in the reverse order of  
removal.



**HANDLEBAR LOWER HOLDER NUTS**



# 12. REAR WHEEL/BRAKE/ DRIVE MECHANISM

SERVICE INFORMATION	12-1
TROUBLESHOOTING	12-2
REAR WHEEL	12-3
REAR AXLE/FINAL DRIVEN SPROCKET	12-4
REAR BRAKE	12-13
REAR AXLE BEARING HOLDER	12-15

## SERVICE INFORMATION

### GENERAL

- This section covers maintenance of the rear wheel and drive mechanism.
- A jack or block is required to support the ATC.

### SPECIFICATIONS

ITEM		STANDARD	SERVICE LIMIT
Rear axle runout		—	3.0 mm (0.12 in)
Rear brake drum I.D.		140 mm (5.5 in)	141 mm (5.6 in)
Rear brake lining thickness		4 mm (0.2 in)	2 mm (0.1 in)
Rear wheel bearing play	Radial	—	0.05 mm (0.002 in)
	Axial	—	0.10 mm (0.004 in)

### TORQUE VALUES

Rear brake drum nut	INNER NUT	35–45 N·m (3.5–4.5 kg·m, 25–33 ft·lb)
	OUTER NUT	120–140 N·m (12–14 kg·m, 87–101 ft·lb)
Rear wheel hub nut		20–25 N·m (2.0–2.5 kg·m, 14–18 ft·lb)
Rear axle bearing holder bolt		50–70 N·m (5.0–7.0 kg·m, 36–51 ft·lb)
Drive chain slider nut		6–9 N·m (0.6–0.9 kg·m, 4.5–7 ft·lb)
Rear axle nut		60–80 N·m (6.0–8.0 kg·m, 43–58 ft·lb)
Driven sprocket damper nut		25–30 N·m (2.5–3.0 kg·m, 18–22 ft·lb)

### TOOLS

Special		
Lock nut spanner, 41 mm	07916–9580200	Not available in U.S.A.
Lock nut wrench, 41 mm	07916–9580300	
Common		
Attachment, 62 x 68 mm	07746–0010500	
Drive	07749–0010000	
Pilot, 35 mm	07746–0040800	

## **TROUBLESHOOTING**

### **Wobble or vibration in ATC**

1. Bent rim.
2. Loose wheel bearing.
3. Faulty rear axle bearing holder.
4. Faulty tire.
5. Axle not tightened properly.

### **Poor brake performance**

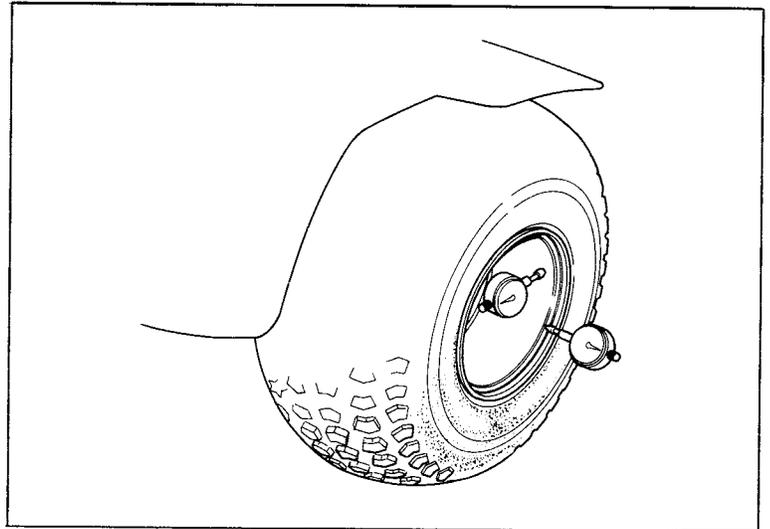
1. Improper brake adjustment.
2. Worn brake shoes.
3. Brake linings oily, greasy or dirty.
4. Worn brake cam.
5. Worn brake drum.
6. Brake arm serrations improperly engaged.
7. Brake shoes worn at cam contact area.

## REAR WHEEL

### RIM RUNOUT INSPECTION

Measure the rear wheel rim runout.

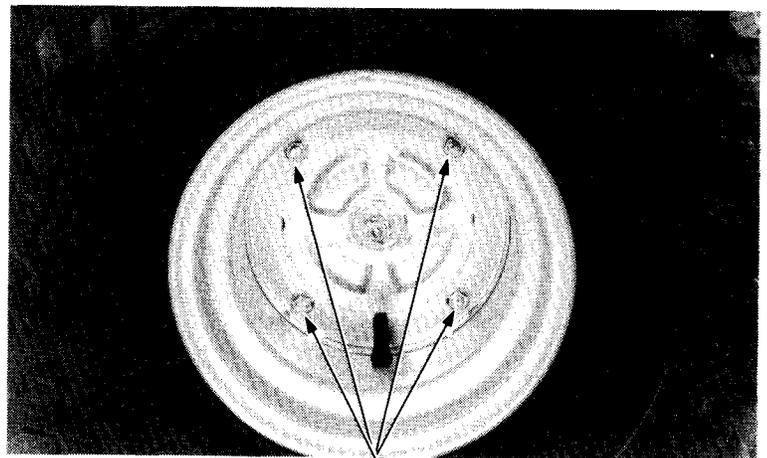
**SERVICE LIMIT: 4.0 mm (0.16 in)**



### REMOVAL

Raise the rear wheels off the ground with a jack or block under the engine.

Remove the rear wheel hub nuts.  
Remove the rear wheels.



REAR WHEEL HUB NUTS

### REAR TIRE DISASSEMBLY/ASSEMBLY

For tire disassembly, assembly and repair, refer to pages 11-10 to 11-13.

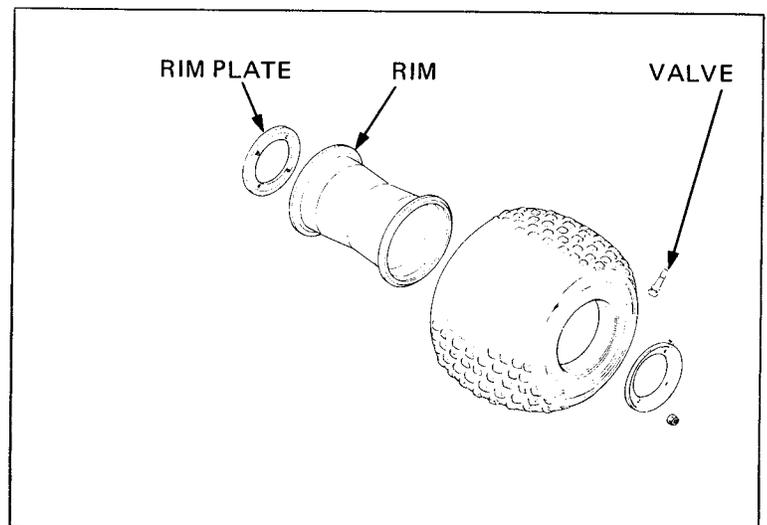
#### NOTE

The rear tire has one rim plate located on the inside rim.

### INSTALLATION

Install the rear wheel with the tire valve facing out.

Tighten the hub nuts.



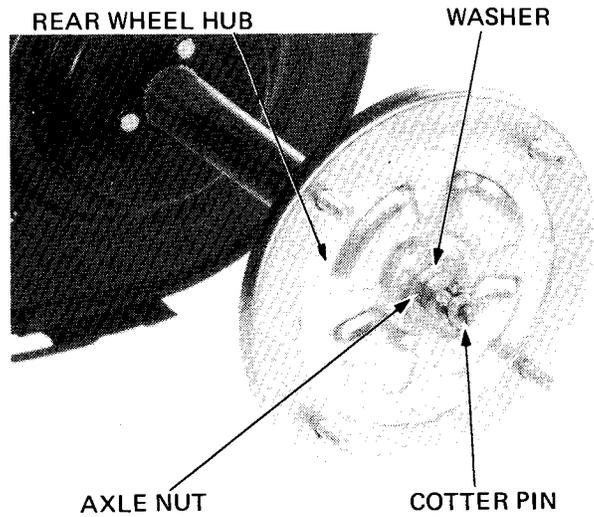
## REAR WHEEL/BRAKE/DRIVE MECHANISM

### REAR AXLE/FINAL DRIVEN SPROCKET

#### AXLE REMOVAL

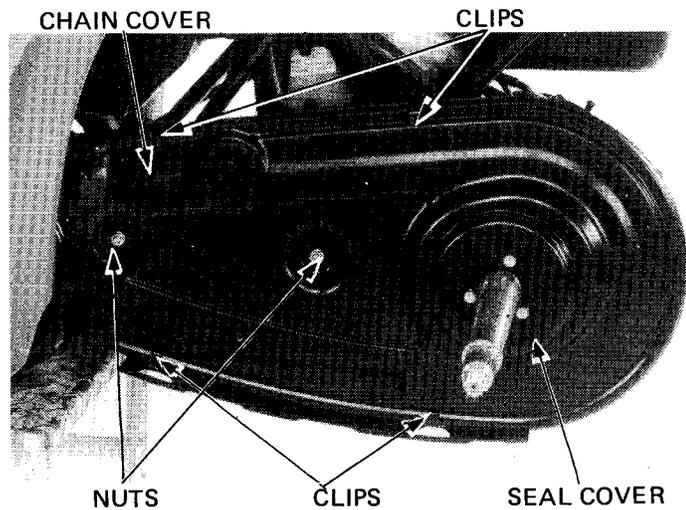
Remove the rear wheel (Page 12-3).

Remove the cotter pins and axle nuts.  
Remove the washers and rear wheel hubs.



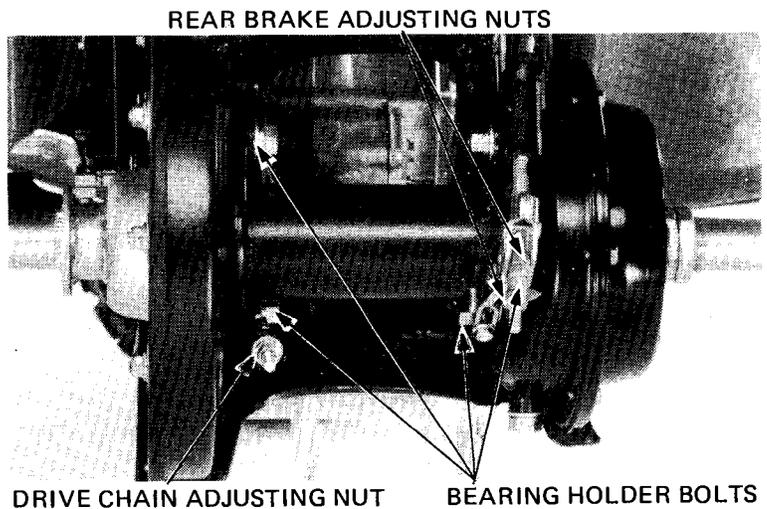
Remove the three seal cover bolts and the seal cover.  
Remove the two chain cover mounting nuts.

Pull off the five chain cover clips and remove the chain cover.

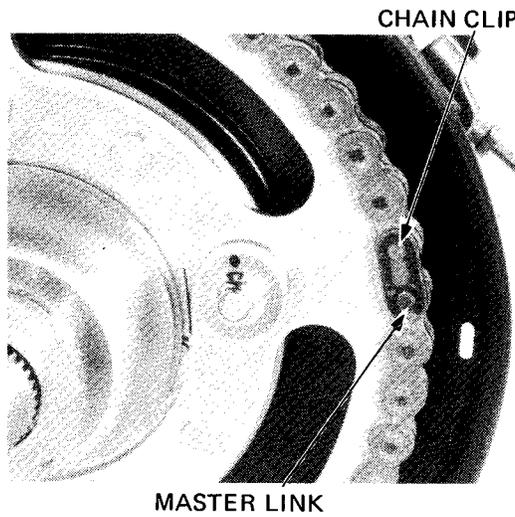


Loosen the rear brake adjusting nuts.

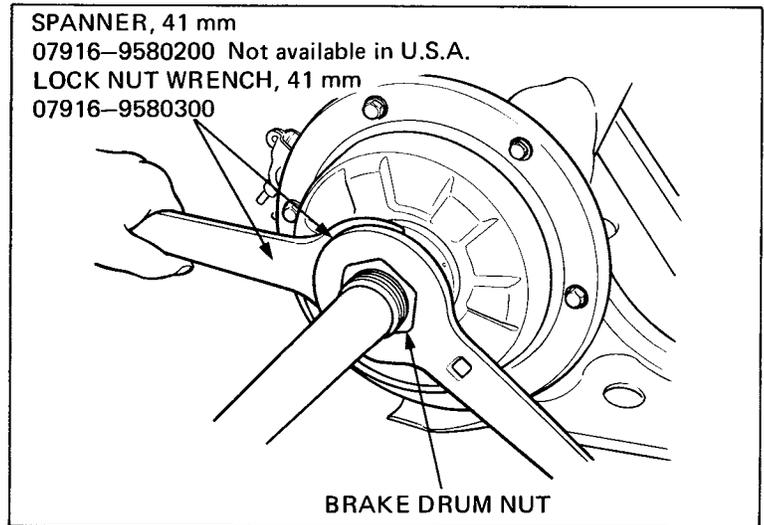
Loosen the drive chain adjusting nut and bearing holder mounting bolts.



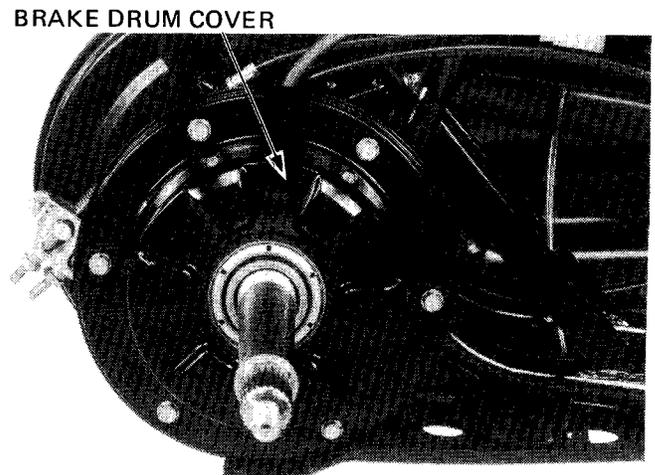
Remove the chain clip, master link and drive chain.



Remove the brake drum nuts using the special tools.



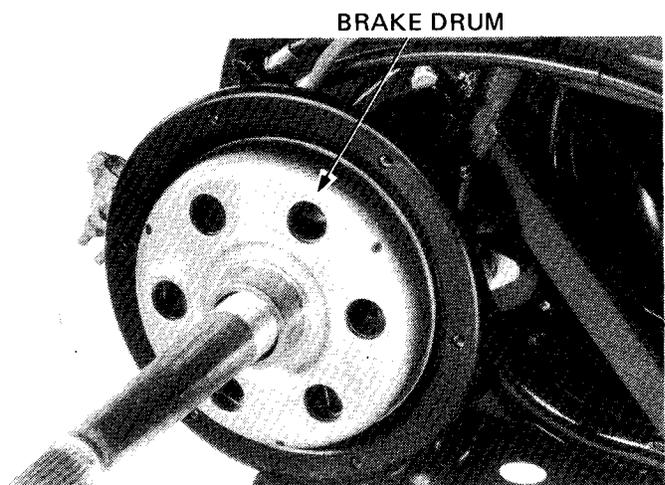
Remove the brake drum cover bolts and the cover.



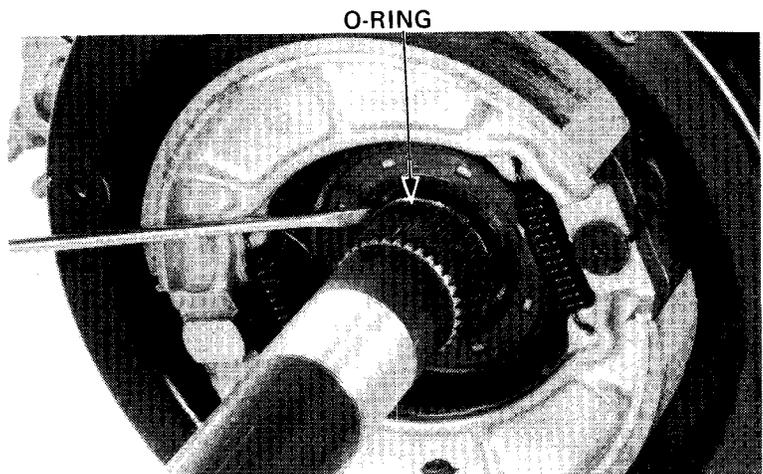
## REAR WHEEL/BRAKE/DRIVE MECHANISM

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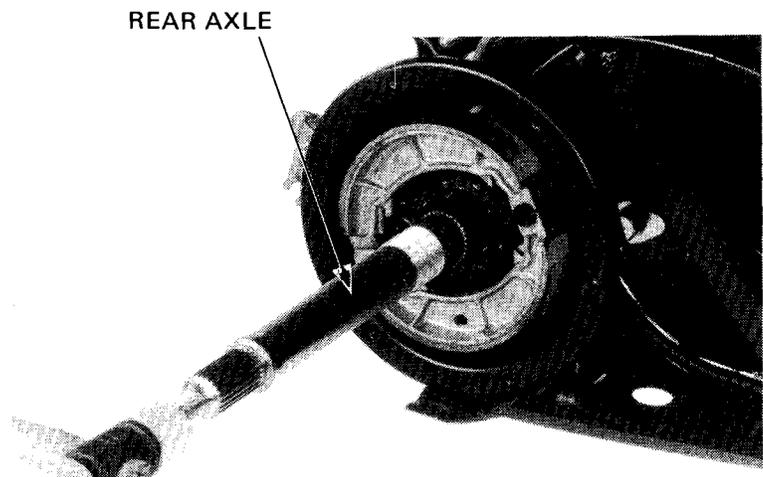
Remove the brake drum.



Remove the O-ring.

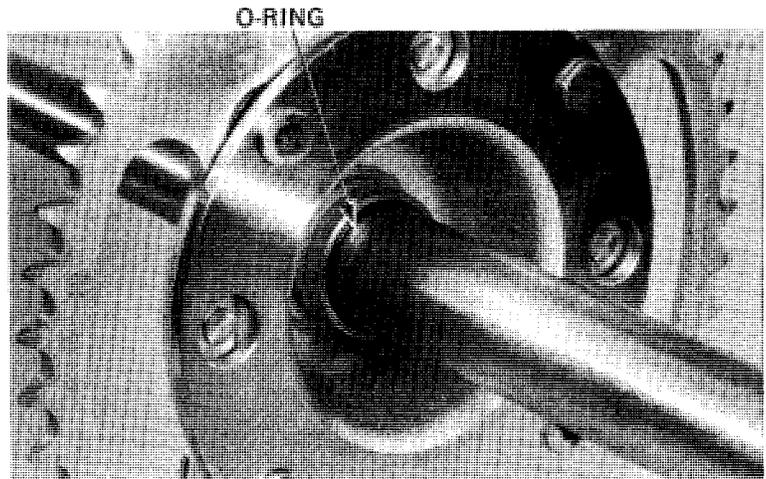


Drive the rear axle out from the right side using a soft hammer.

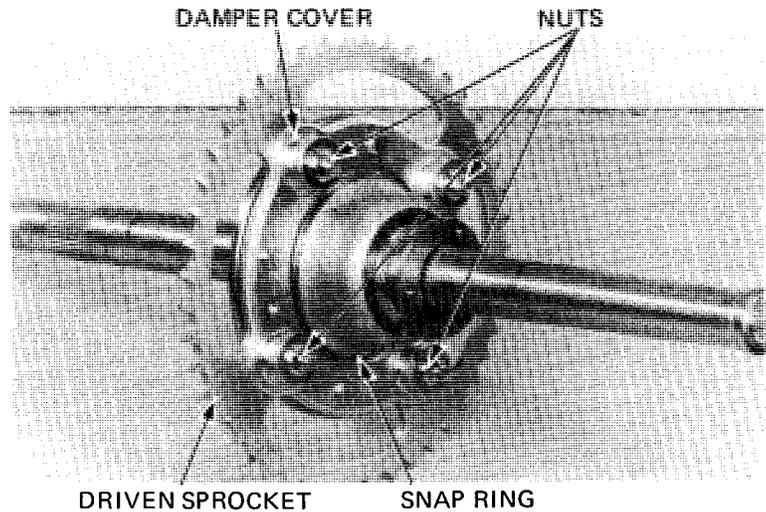


### AXLE DISASSEMBLY

Remove the O-ring from the rear axle.



Remove the four damper cover nuts and damper cover.  
Remove the snap ring and driven sprocket from the axle.



### FINAL DRIVEN SPROCKET INSPECTION

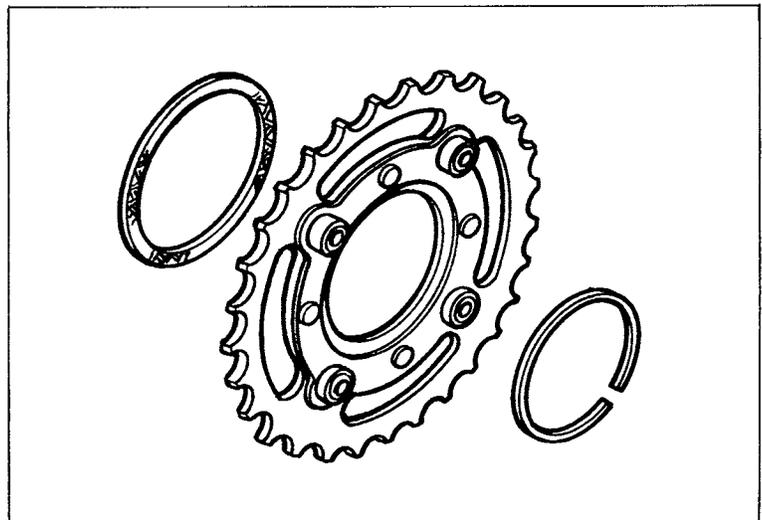
Check the damper rubbers for damage. Replace if necessary.

Check the condition of the final driven sprocket teeth.

Replace the sprocket if it is worn or damaged.

#### NOTE

- If the driven sprocket is worn or damaged, the drive chain and the drive sprocket must be inspected.
- Never install a new drive chain on worn sprocket or a worn chain on new sprockets. Both chain and sprocket must be in good condition or the replacement chain or sprockets will wear rapidly.



## REAR WHEEL/BRAKE/DRIVE MECHANISM

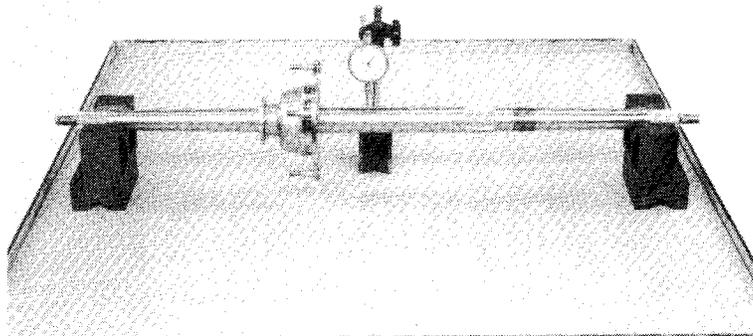
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### AXLE INSPECTION

Place the rear axle in V-blocks and measure the runout.

The actual runout is 1/2 of the Total Indicator Reading.

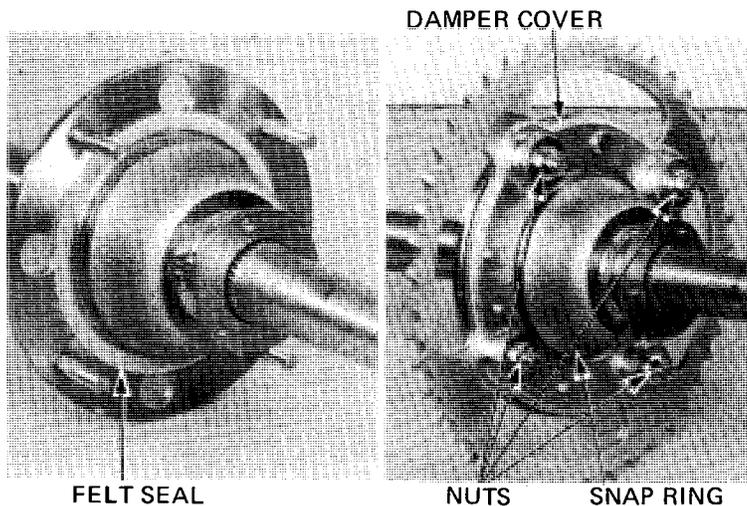
**SERVICE LIMIT: 3.0 mm (0.12 in)**



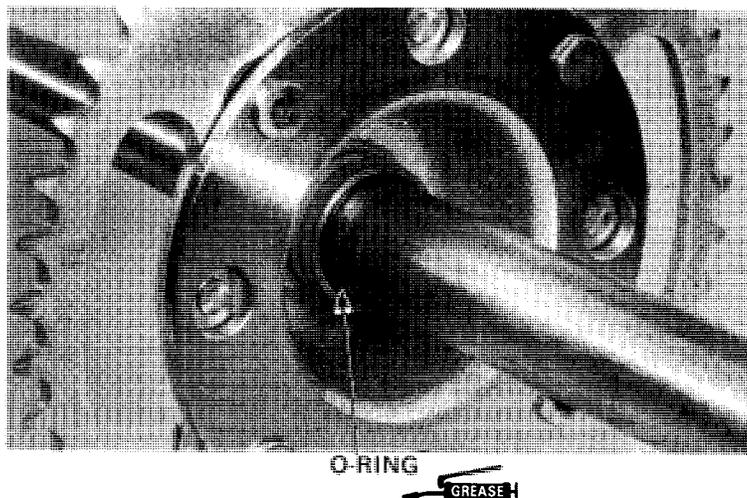
### AXLE ASSEMBLY

Place the felt seal onto the axle flange.  
Install the final driven sprocket onto the axle and secure it with the snap ring.  
Install the damper cover and tighten it with the four nuts.

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

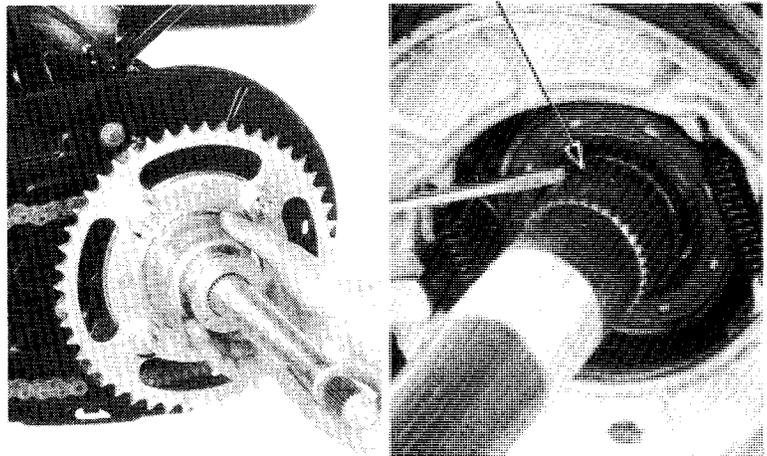


Apply grease to a new O-ring.  
Install the O-ring over the axle.

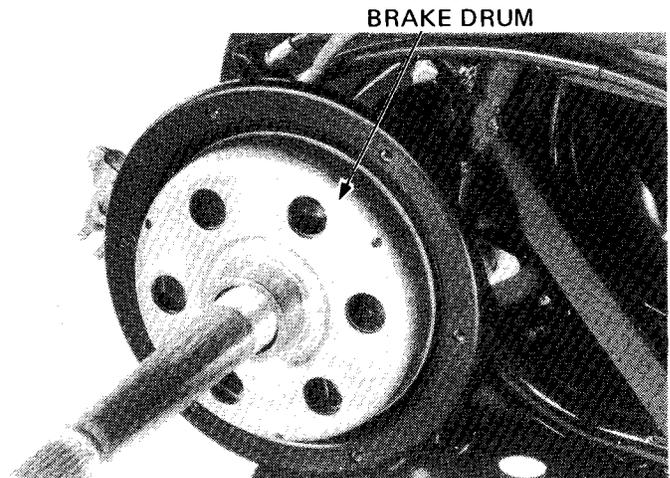


### AXLE INSTALLATION

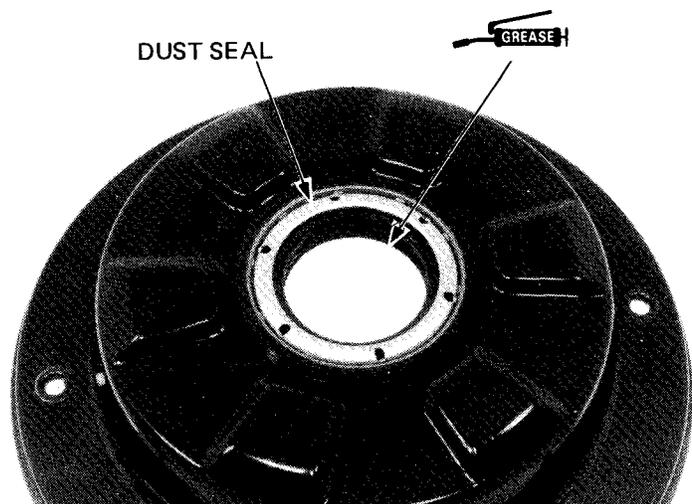
Insert the axle into the bearing holder from the left side.  
Apply grease to the new O-ring.  
Install the O-ring over the axle.



Install the brake drum.



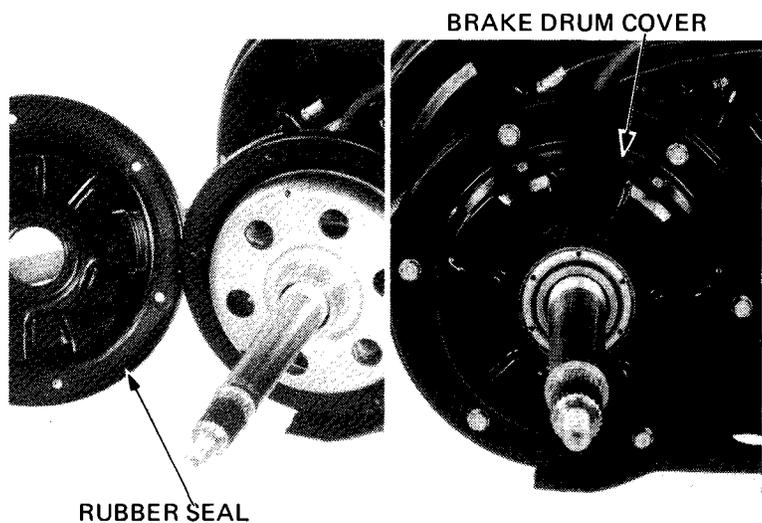
Make sure that the dust seal on the brake drum cover is in good condition.  
Replace the dust seal with a new one, if necessary.  
Apply grease to the lip of the dust seal.



## REAR WHEEL/BRAKE/DRIVE MECHANISM

Install the rubber seal onto the brake drum cover.

Install the brake drum cover using the six bolts.



Tighten the brake drum inner nut.

**TORQUE: 35–45 N·m**  
(3.5–4.5 kg·m, 25–33 ft·lb)

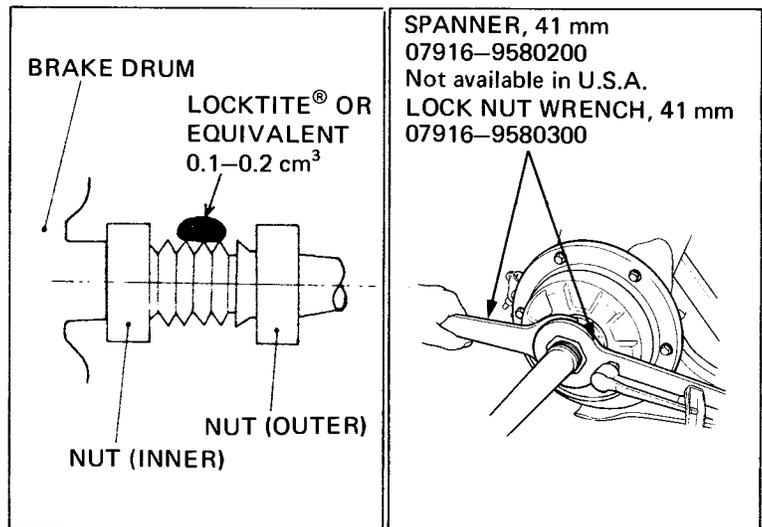
Apply LOCKTITE® or equivalent to the shaft threads.

Tighten the brake drum outer nut.

**TORQUE: 120–140 N·m**  
(12–14 kg·m, 87–101 ft·lb)

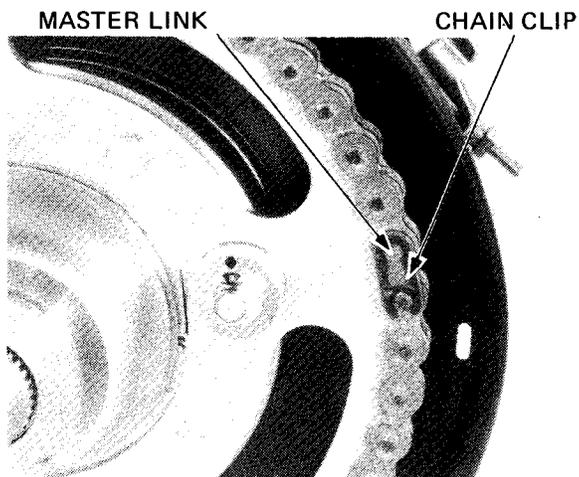
### NOTE

Wipe grease off the shaft before applying LOCKTITE® or equivalent.

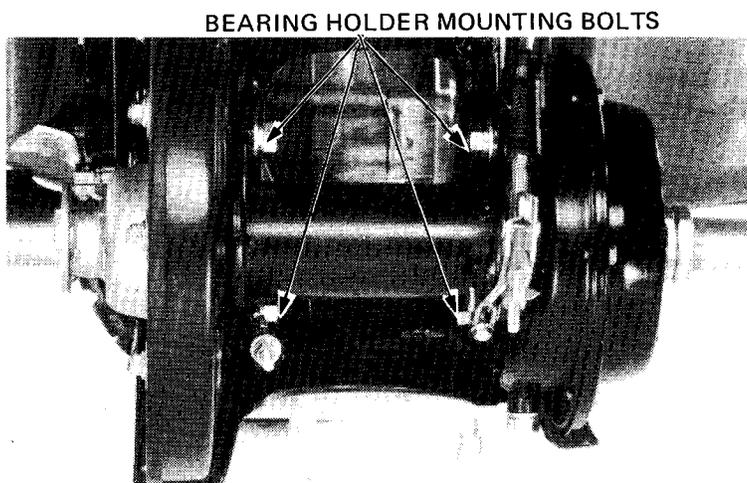


Install and connect the drive chain with the master link.

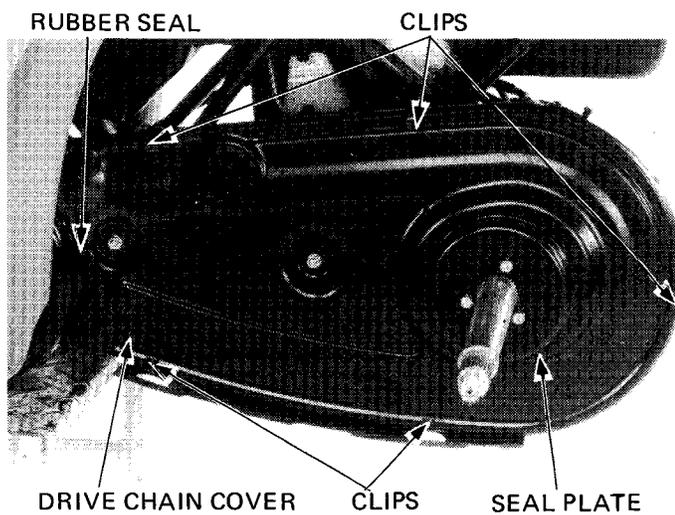
Install the master link clip in the direction shown.



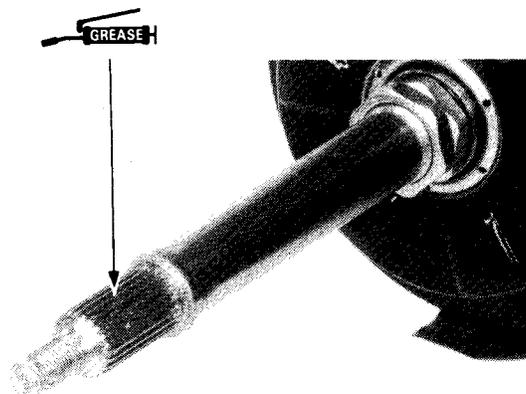
Adjust the drive chain and tighten the bearing holder mounting bolts.



Install the rubber seal onto the drive chain cover.  
Install the drive chain cover using the five clips and two nuts.  
Install the seal plate using the three bolts.



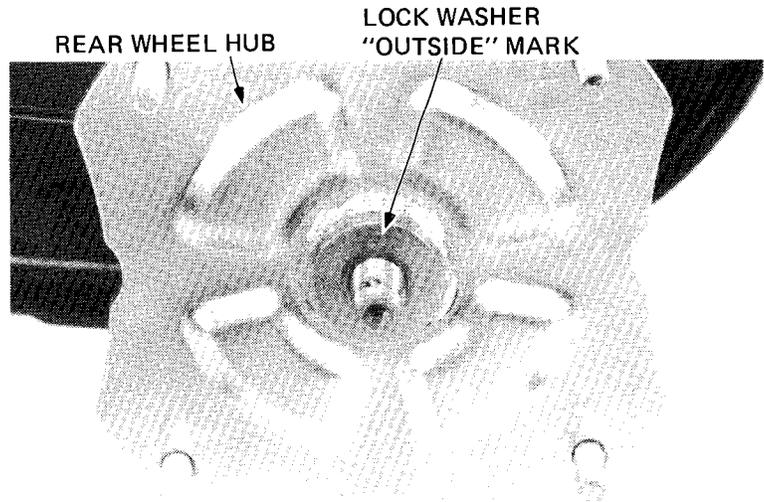
Apply grease to the splines on both end of the axle.



## REAR WHEEL/BRAKE/DRIVE MECHANISM

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Install the rear wheel hubs over the axle.  
Install the lock washers with its "OUTSIDE" mark facing out.

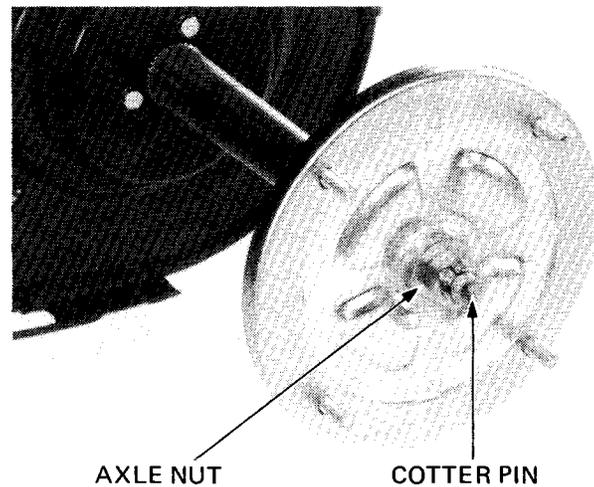


Tighten the rear axle nuts.

**TORQUE: 60–80 N·m**  
**(6.0–8.0 kg·m, 43–58 ft·lb)**

Install new cotter pins and bend the ends.  
Install the rear wheels (Page 12–3).

Adjust the rear brake (Page 3–14).



## REAR BRAKE

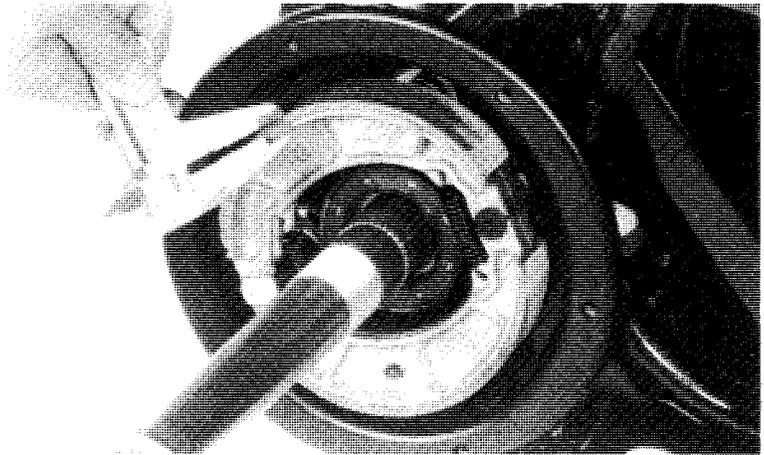
Remove the right rear wheel (Page 12-3).  
Remove the brake drum nuts, brake drum cover  
and drum (Pages 12-5 and 12-6).

### BRAKE LINING INSPECTION

Measure the brake lining thickness.

**SERVICE LIMIT: 2 mm (0.1 in)**

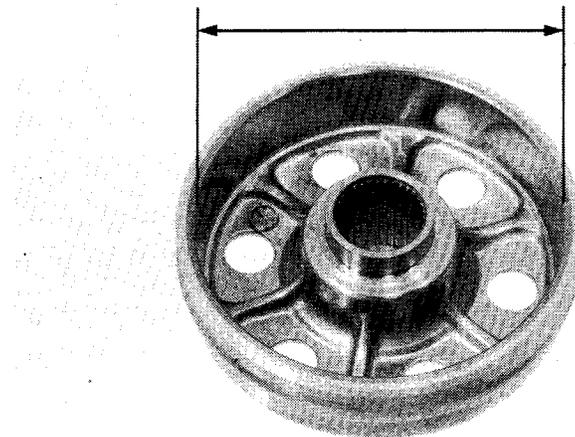
Replace the brake lining if it is thinner than the  
service limit.



### REAR BRAKE DRUM INSPECTION

Measure the brake drum I.D.

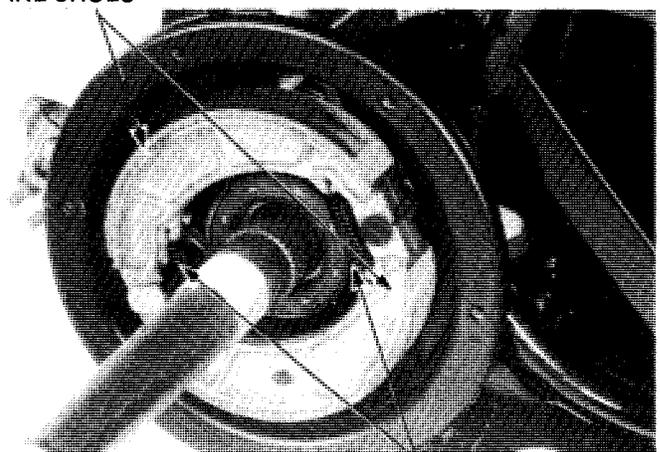
**SERVICE LIMIT: 141 mm (5.6 in)**



### REAR BRAKE DISASSEMBLY

Expand and remove the brake shoes by hand.

BRAKE SHOES

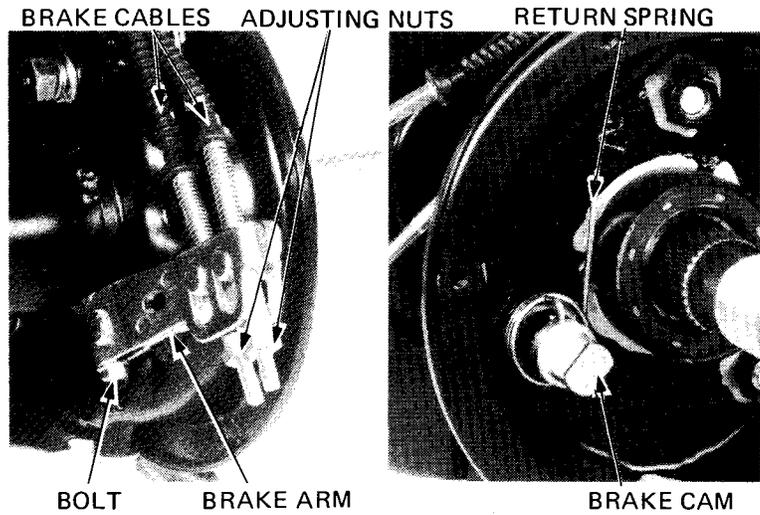


SPRING

## REAR WHEEL/BRAKE/DRIVE MECHANISM

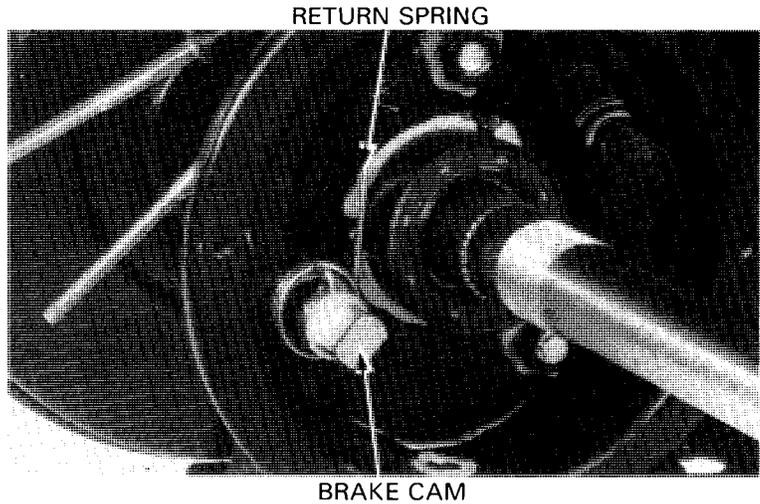
Remove the rear brake adjusting nuts and disconnect the brake cables from the brake arm. Remove the brake arm bolt, brake arm and indicator plate.

Remove the brake cam, return spring, dust seal and rubber seals.

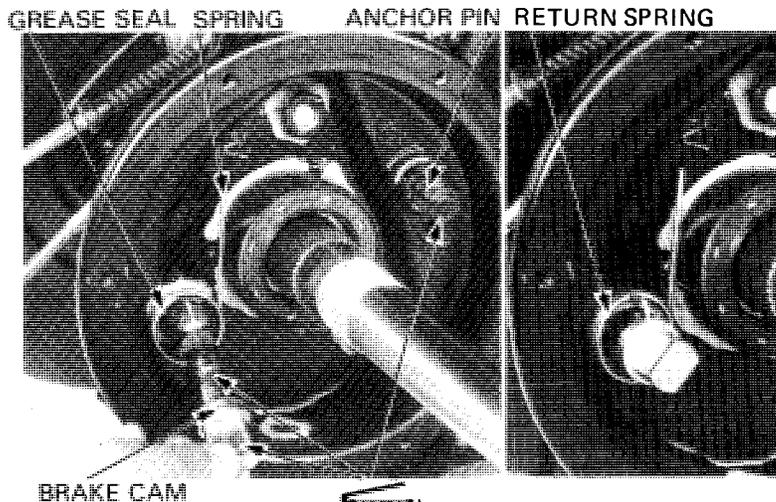


### REAR BRAKE ASSEMBLY

Install new grease seals into the brake cam hole. Install the return spring. Apply grease to the anchor pin and brake cam and insert the brake cam into the hole.



Insert the end of the return spring into the hole in the brake cam.

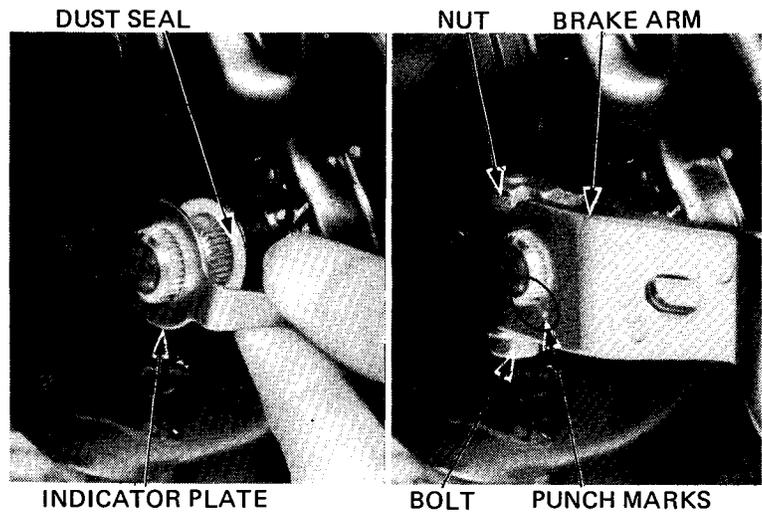


Install the dust seal.

Align the tab on the indicator plate with the punch mark on the brake cam and install the indicator plate.

Install the brake arm over the brake cam aligning the punch marks.

Install the brake arm bolt and nut and tighten the bolt.

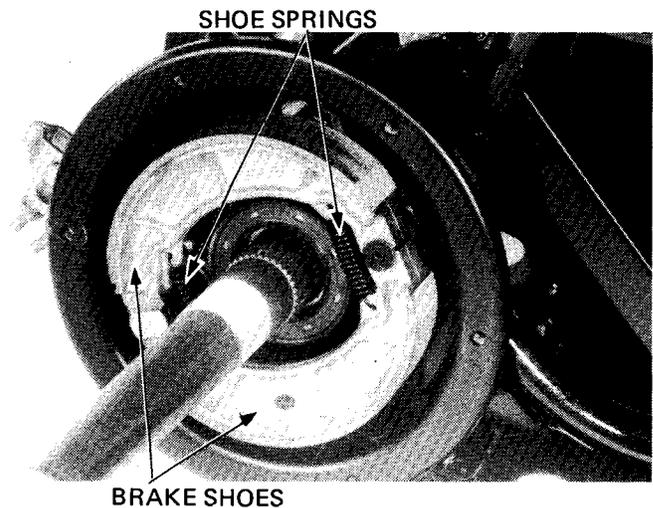


Install the brake shoes and springs.

### WARNING

- Contaminated brake linings reduce stopping power.
- Keep grease off the linings. Wipe excess grease off the cam.

Install the brake drum, drum cover and drum nuts (Pages 13–9 and 13–10).

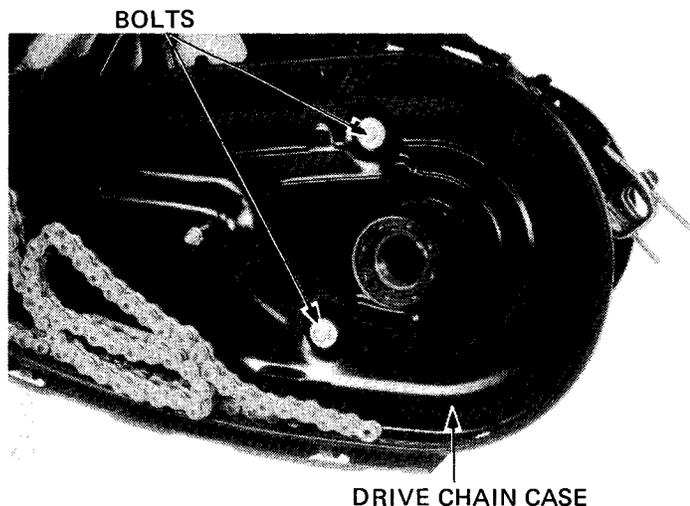


## REAR AXLE BEARING HOLDER

### REMOVAL

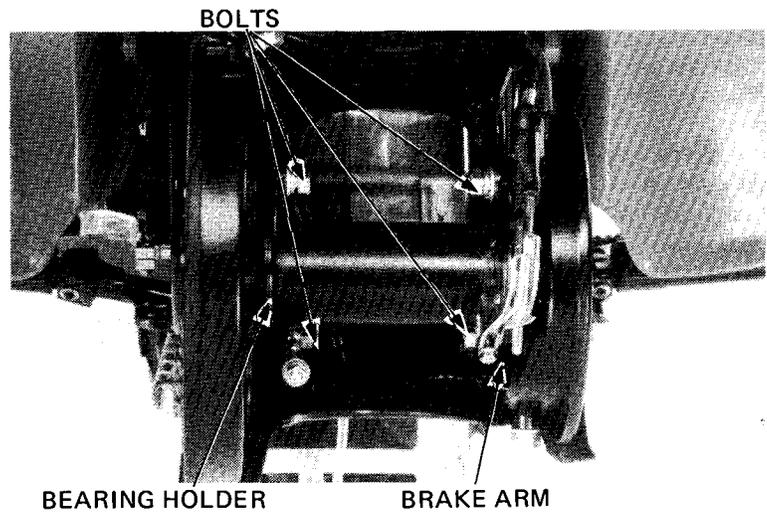
Remove the following:

- rear wheel (Page 12–3).
- drive chain and rear axle (Page 12–4).
- drive chain case bolts.



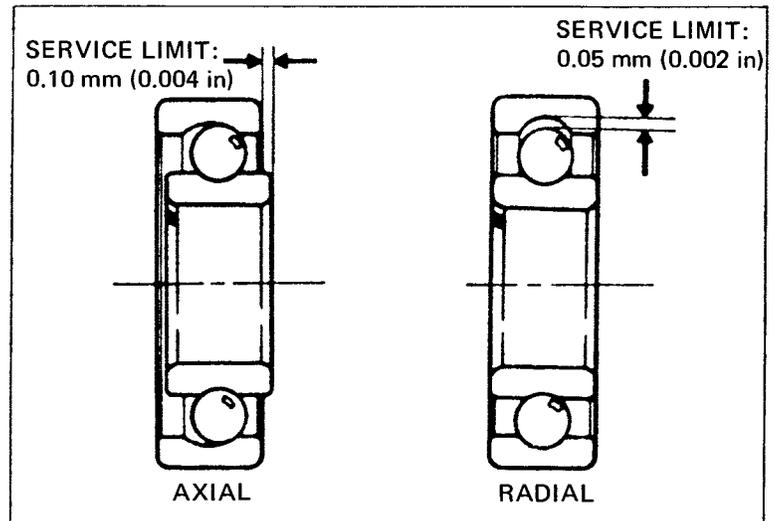
## REAR WHEEL/BRAKE/DRIVE MECHANISM

Remove the rear brake adjusting nuts and disconnect the brake cables from the brake arm. Remove the four bearing holder mounting bolts and the bearing holder from the frame.



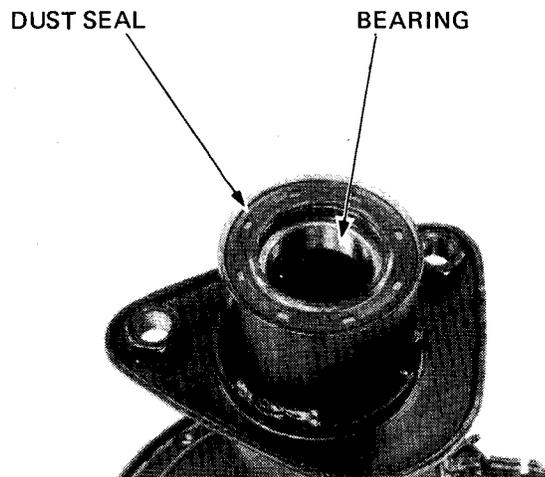
### REAR WHEEL BEARING INSPECTION

Check the rear wheel bearings. Replace the bearings if they are noisy or have excessive play.



### DISASSEMBLY

Remove the dust seals and drive out the bearings. Remove the center collar.



## REAR WHEEL/BRAKE/DRIVE MECHANISM

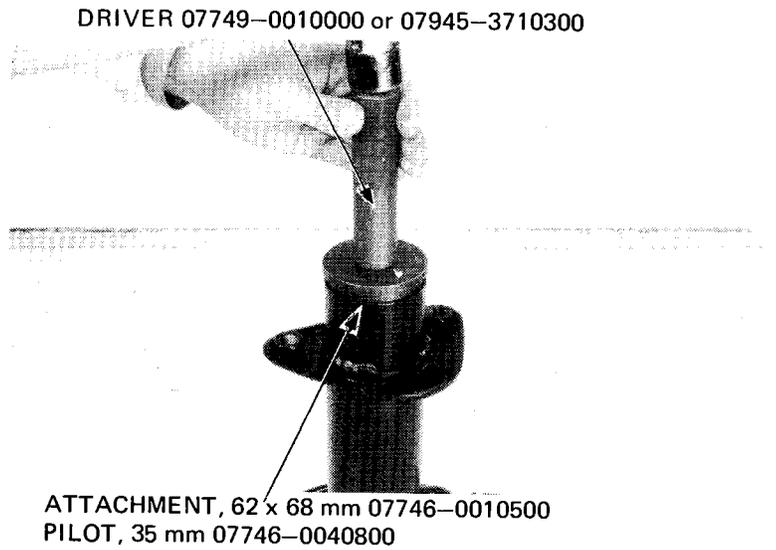
### ASSEMBLY

Pack the bearing cavities with grease.  
Drive the right bearing squarely into the bearing holder until it seats.

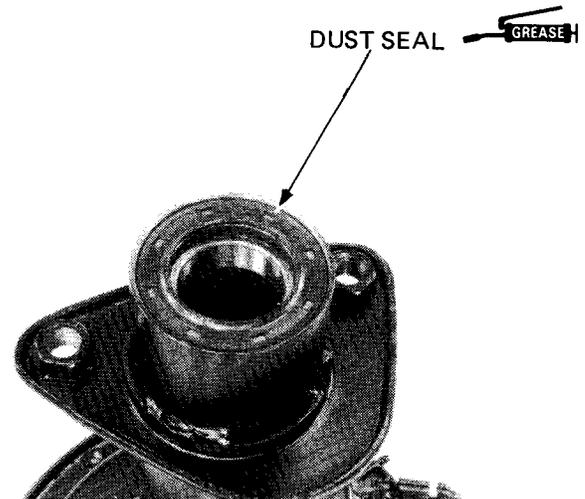
Install the center collar and drive the left bearing in squarely until it seats.

#### NOTE

Install the bearings with their marks facing out.



Coat the dust seal lips with grease and install the dust seals.



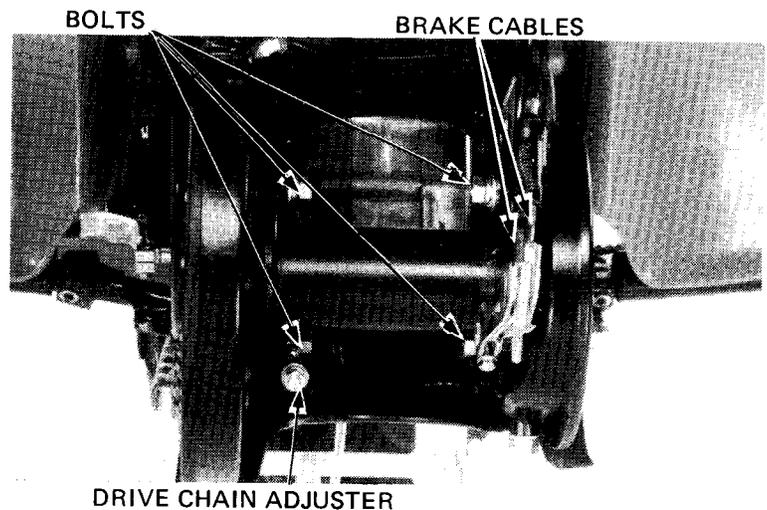
### INSTALLATION

Install the bearing holder and drive chain adjuster with the four mounting bolts.

#### NOTE

Do not tighten the bolts before adjusting the drive chain.

Connect the brake cables to the brake arm and install the brake adjusting nuts.

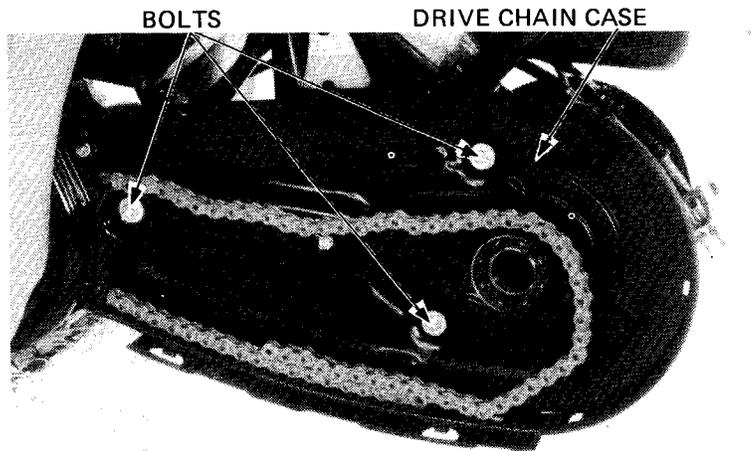


## REAR WHEEL/BRAKE/DRIVE MECHANISM

Install the drive chain case bolts.

Install the following:

- rear axle and drive chain (Page 12-9).
- rear wheel (Page 12-3).



## BRAKE PEDAL

### REMOVAL

Remove the rear brake adjusting nuts.

Remove the brake pedal return spring.

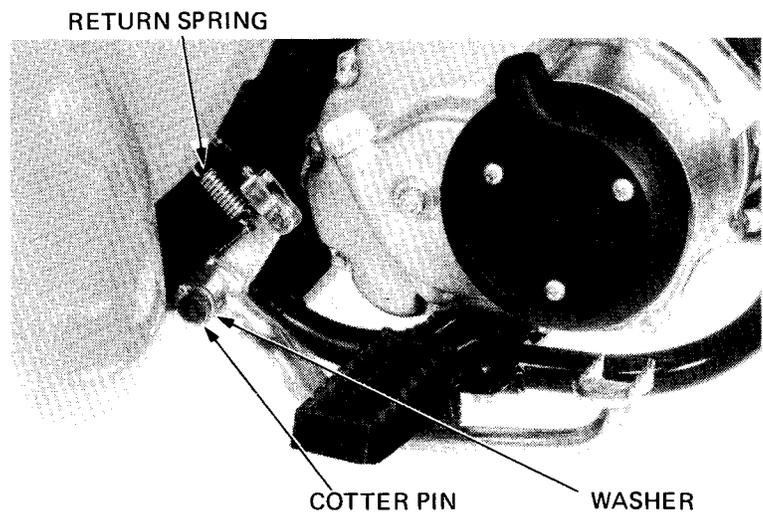
Remove the cotter pin, washer and rear brake pedal and disconnect the brake cable from the pedal.

### INSTALLATION

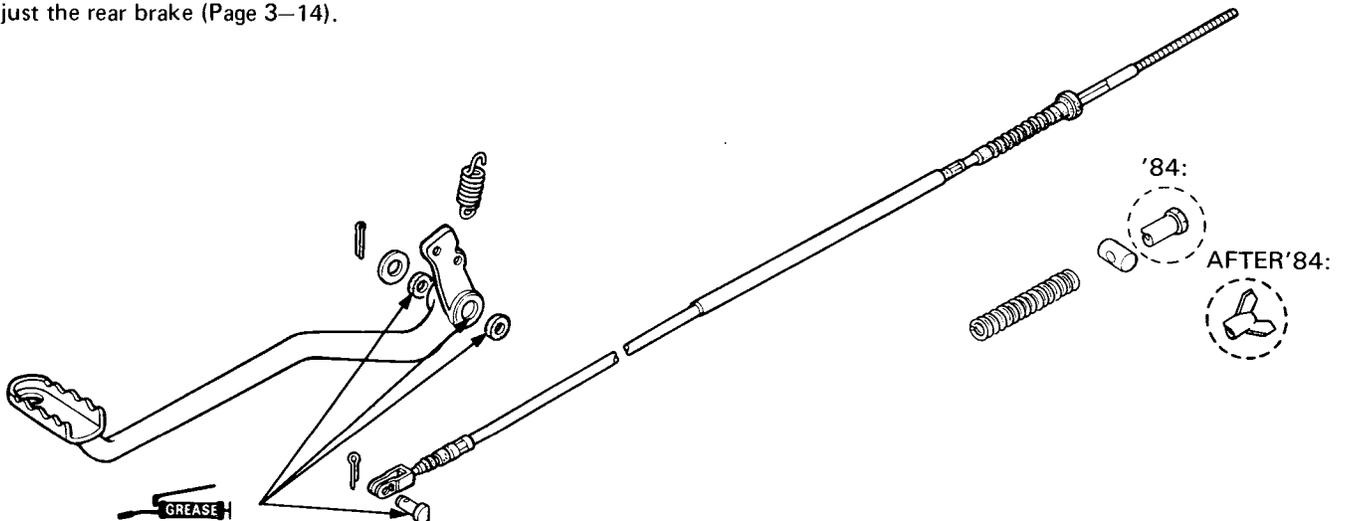
Install the brake pedal in the reverse order of removal.

### NOTE

Apply grease to the brake pedal pivot shaft, link pin and cable end.



Adjust the rear brake (Page 3-14).



# 13. REAR FENDER/ EXHAUST PIPE

REAR FENDERS

13-1

EXHAUST PIPE

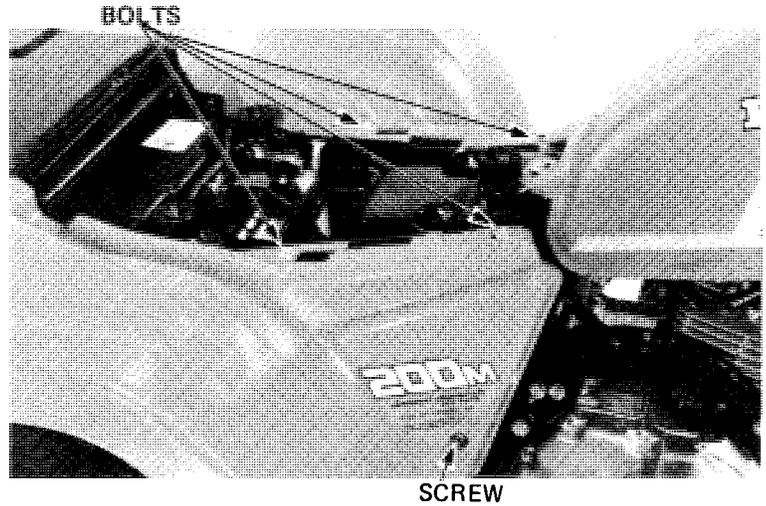
13-3

## REAR FENDERS

### REMOVAL

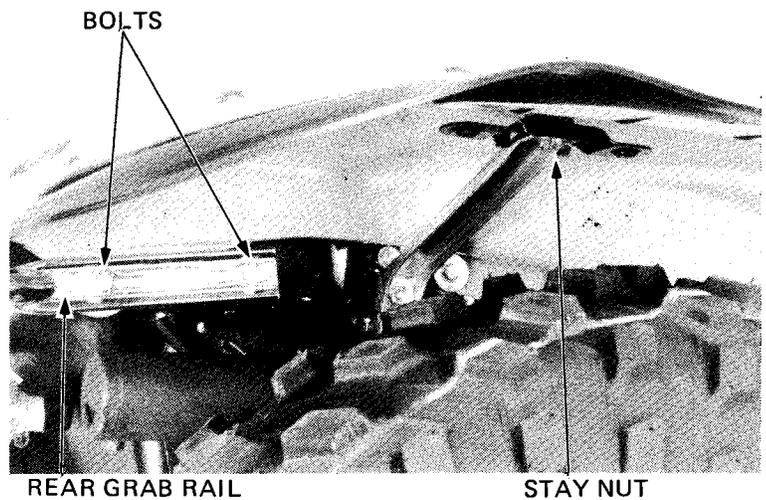
Remove the seat.

Remove the fender four bolts and two screws.



Remove the fender stay nuts.

Remove the rear grab rail bolts and the grab rail.  
Remove the fenders.

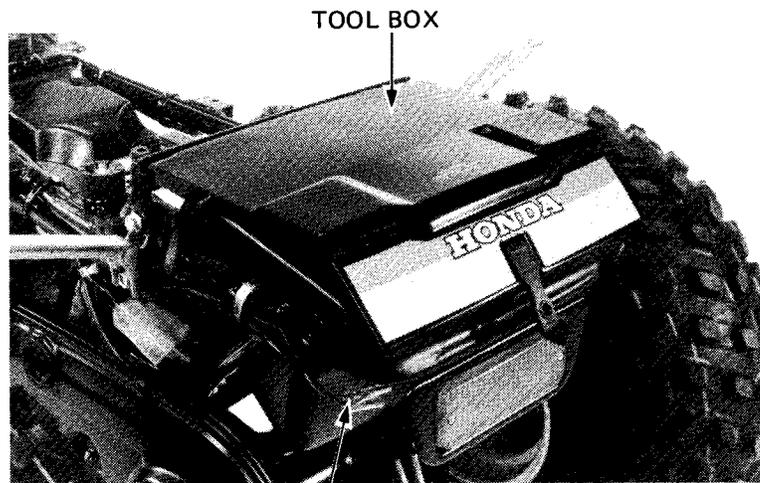


13

## REAR FENDER/EXHAUST PIPE/ CARRIERS

---

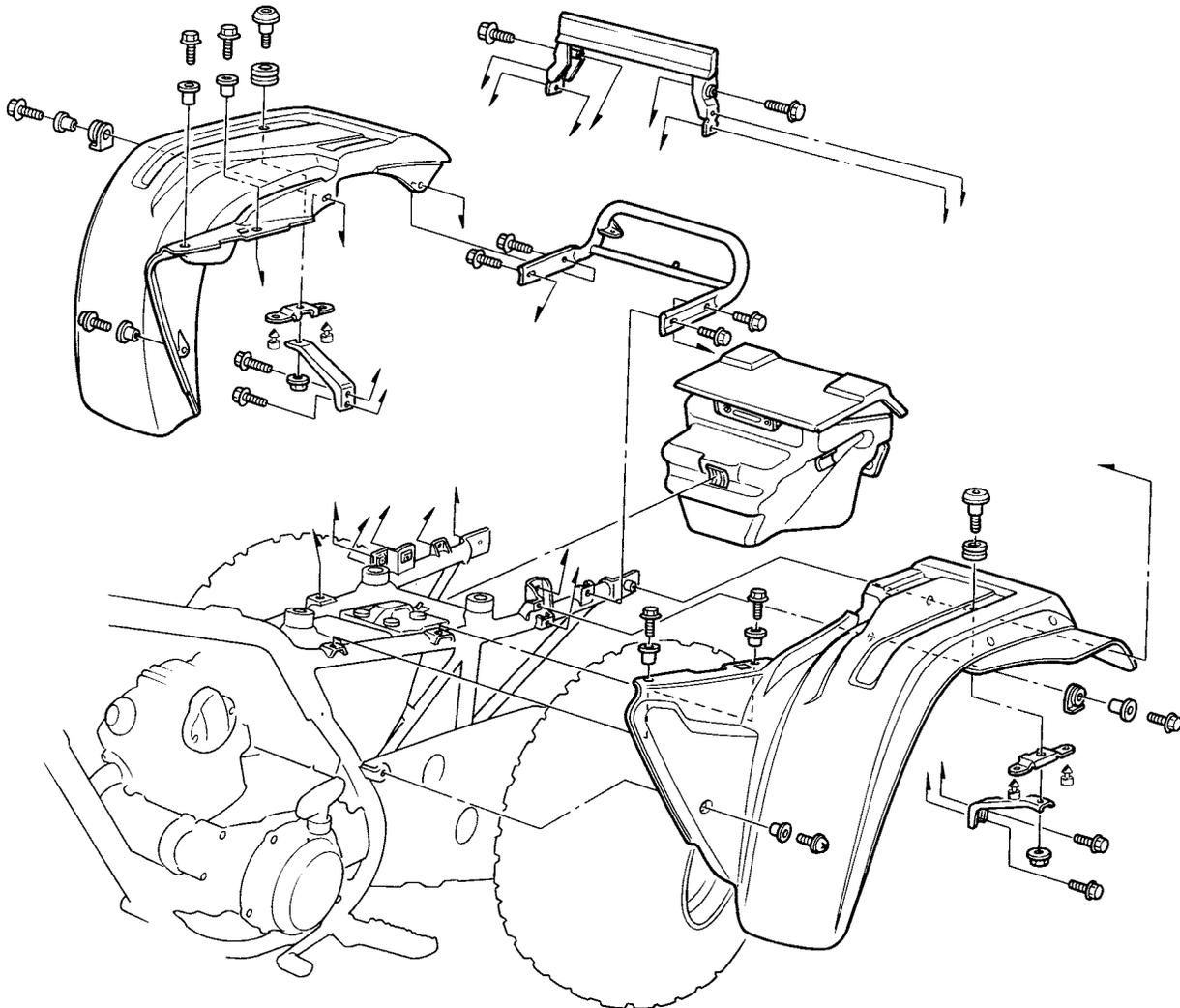
Disconnect the taillight wire connectors and remove the tool box.



TAILLIGHT WIRE CONNECTORS

### INSTALLATION

Install the tool box and rear fenders in the reverse order of removal.



## EXHAUST PIPE

Refer to Page 3-16 for spark arrester cleaning.

### CAUTION

*Do not service the exhaust pipe or muffler while they are hot.*

### REMOVAL

Loosen the exhaust pipe clamp bolts.

Remove the exhaust pipe joint nuts and exhaust pipe.

Remove the right rear fender.

Remove the muffler mounting bolts and muffler.

### NOTE

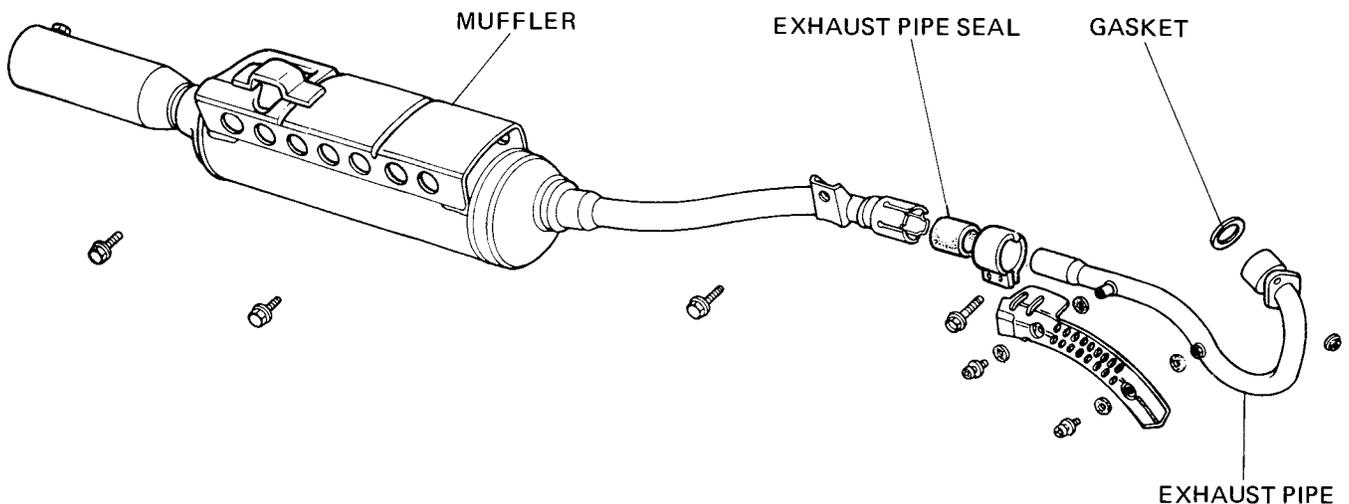
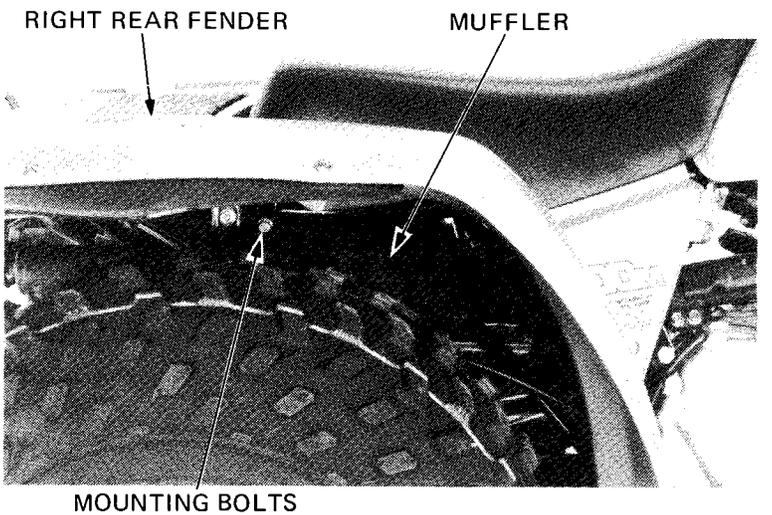
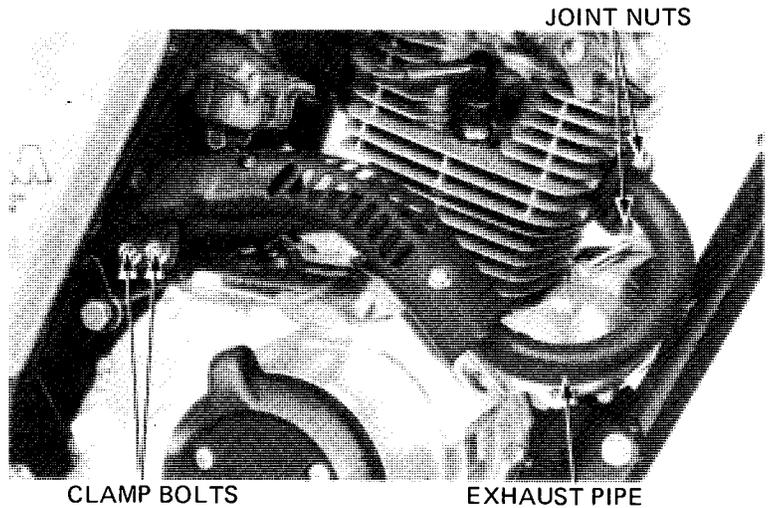
Check the gasket and pipe seal for wear. Replace with a new one if necessary.

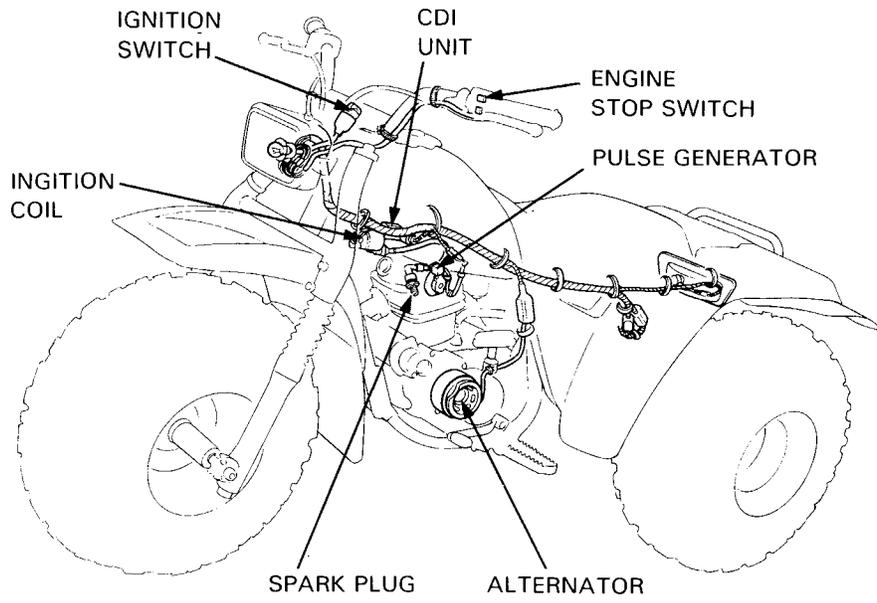
### EXHAUST PIPE INSTALLATION

The installation sequence is essentially the reverse of removal.

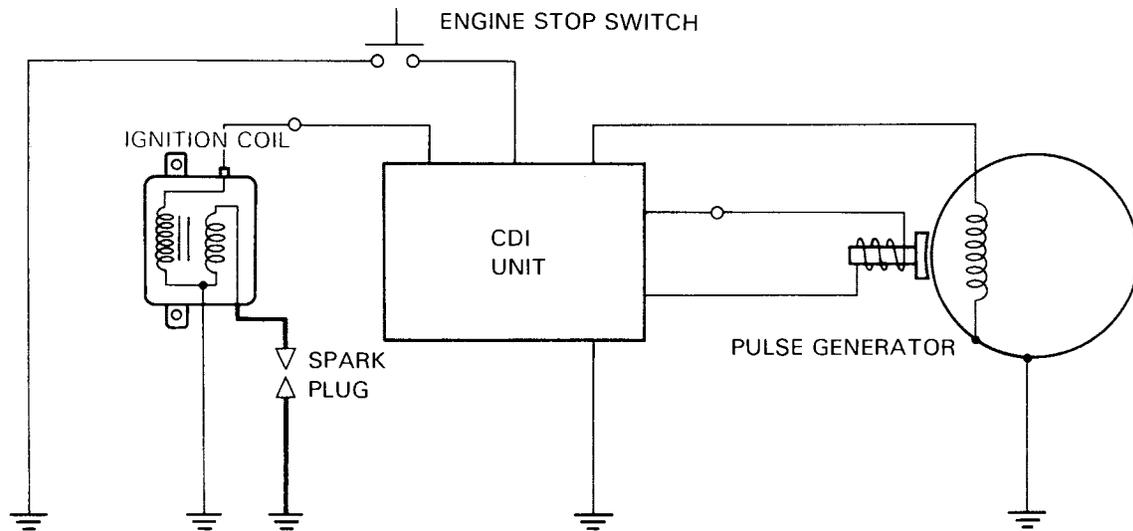
### NOTE

After installing, make sure that there are no exhaust leaks.

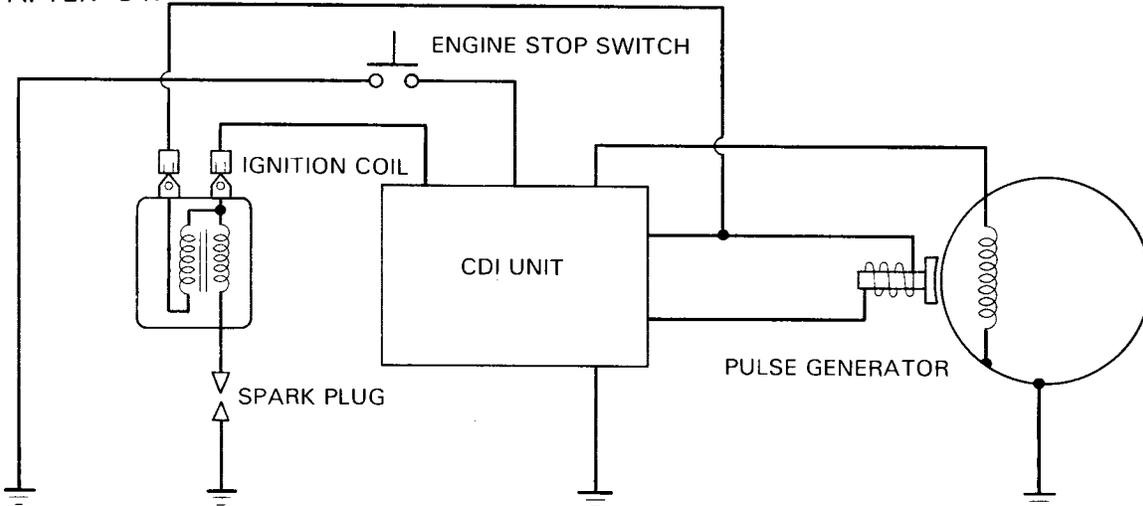




84:



AFTER '84:



# 14. IGNITION SYSTEM

SERVICE INFORMATION	14-1
TROUBLESHOOTING	14-1
IGNITION COIL	14-2
ALTERNATOR EXCITER COIL	14-3
CDI UNIT	14-3
PULSE GENERATOR	14-4
IGNITION TIMING	14-4

## SERVICE INFORMATION

### GENERAL

- Ignition timing does not normally need to be adjusted since the CDI (Capacitive Discharge Ignition) unit is factory preset.
- For spark plug inspection, refer to Page 3-5.
- For pulse generator removal, see Section 6.

### SPECIFICATIONS

Spark plug	DR8ES-L (NGK) X24ESR-U (ND)
Spark plug gap	0.6-0.7 mm (0.024-0.028 in)
Ignition timing:	
– Initial	10° ± 2° BTDC/1,400 ± 100 rpm
– Advance starts	1,950 ± 150 rpm
– Full advance	30° ± 2° BTDC/3,350 ± 150 rpm
– Alternator	2.4 A (above) at 2,000 rpm at 14 V

### TOOL

Digital multi-tester	KS-AHM-32-003 (U.S.A. only)
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## TROUBLESHOOTING

### Engine starts but stops

1. No spark at plug.
2. Improper ignition timing.
3. Faulty spark plug.

### No spark at plug

1. Engine stop switch "OFF".
2. Poorly connected, broken or shorted wires.
  - Between alternator and CDI unit.
  - Between CDI unit and engine stop switch.
  - Between CDI unit and ignition coil.
  - Between ignition coil and spark plug.
  - Between pulse generator and CDI unit.
3. Faulty ignition coil.
4. Faulty CDI unit.
5. Faulty pulse generator.
6. Faulty alternator.

### Engine starts but runs poorly

1. Ignition primary circuit.
  - Faulty ignition coil.
  - Loose or bare wire.
  - Faulty alternator.
2. Ignition secondary circuit.
  - Faulty plug.
  - Faulty CDI unit.
  - Faulty pulse generator.
  - Faulty spark plug wire.
3. Improper ignition timing.
  - Faulty advancer rotor.
  - Faulty pulse generator.
  - Faulty CDI unit.

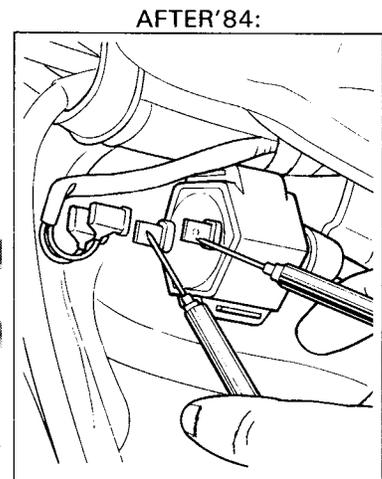
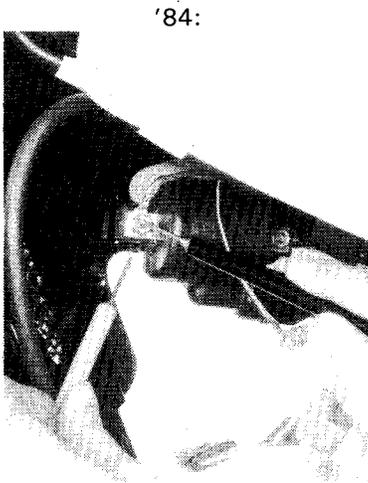
## IGNITION SYSTEM

### IGNITION COIL

#### CONTINUITY TEST

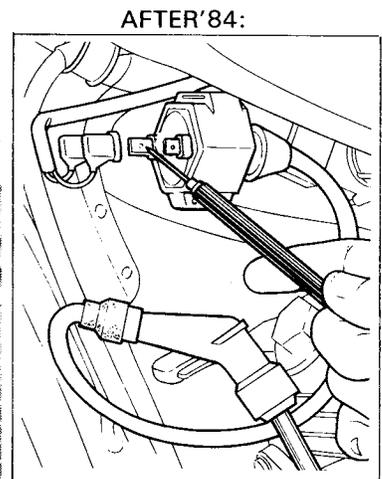
Measure the primary coil resistance.

**RESISTANCE: '84:** 0.2–0.4 ohms  
**After '84:** 0.16–0.20 ohms



Measure the secondary coil resistance with the spark plug cap in place.

**RESISTANCE: '84:** 10–18k ohms  
**After '84:** 7.0–11.2k ohms



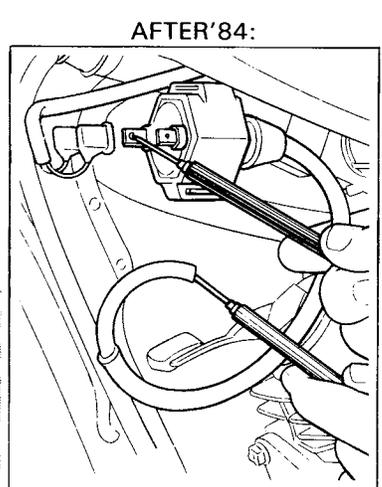
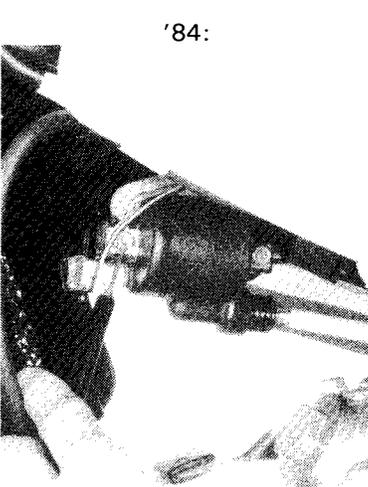
'84:  
Remove the spark plug wire from the ignition coil and measure the secondary coil resistance.

After '84:  
Remove the spark plug cap and measure the secondary coil resistance.

**RESISTANCE: '84:** 3–5k ohms  
**AFTER '84:** 3.7–4.5k ohms

#### REMOVAL

Disconnect the ignition coil wire leads.  
Remove the coil by removing the attaching bolts.

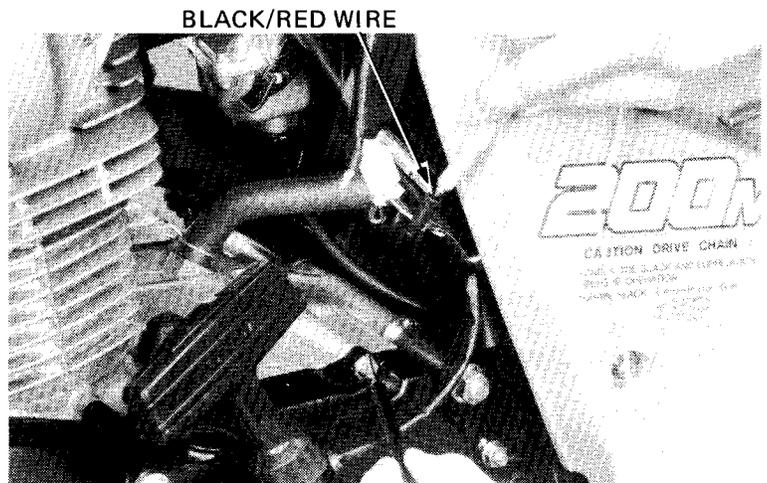


## ALTERNATOR EXCITOR COIL

Disconnect the alternator black/red wire connector. Check the resistance between the black/red wire and ground with an ohmmeter.

**RESISTANCE: 100–400 ohms**

Replace the alternator stator if the reading is not within the limit. See Alternator Removal (Page 9–6).



## CDI UNIT

### REMOVAL

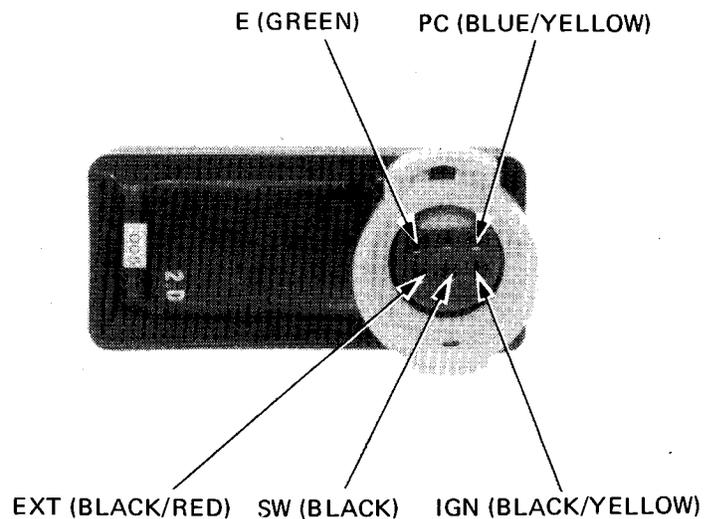
Remove the seat and fuel tank. Disconnect the wire coupler and remove the CDI unit.

### INSPECTION

Disconnect the wires and check continuity of the CDI terminals. Replace the CDI unit if the readings are not 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 may give false readings.
- Use a Sanwa Electric Tester (P/N 07308–0020000) or Kowa Electric Tester (TH–5H–1) or Digital Tester (KS–AHM–32–003).



Range:  
SANWA: x KΩ  
KOWA: x 100 Ω

+Probe -Probe	SW (Bk)	EXT (Bk/R)	PC (Bu/Y)	E (G)	IGN (Bk/Y)
SW (Bk)	—	∞	∞	∞	∞
EXT (Bk/R)	0.1–20	—	∞	∞	∞
PC (Bu/Y)	0.5–200	0.5–100	—	1–5	∞
E (G)	0.2–60	0.1–2.0	∞	—	∞
IGN (Bk/Y)	∞	∞	∞	∞	—

## IGNITION SYSTEM

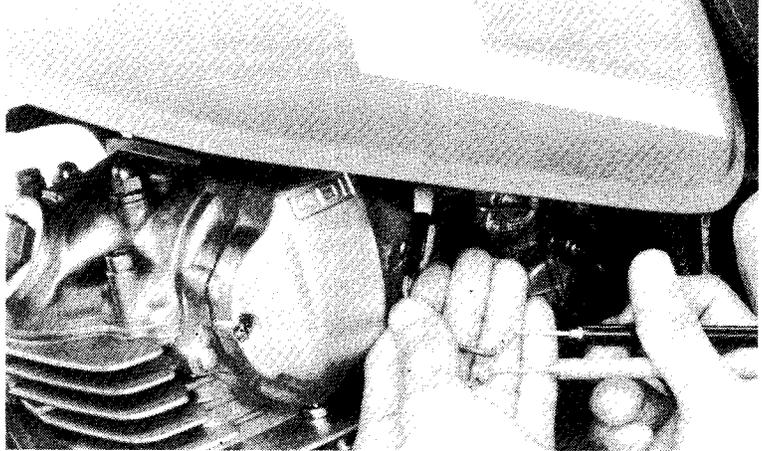
### PULSE GENERATOR

#### INSPECTION

Disconnect the pulse generator wire connectors. Measure the resistance between green and blue/yellow wires.

**RESISTANCE: 20–30 ohms**

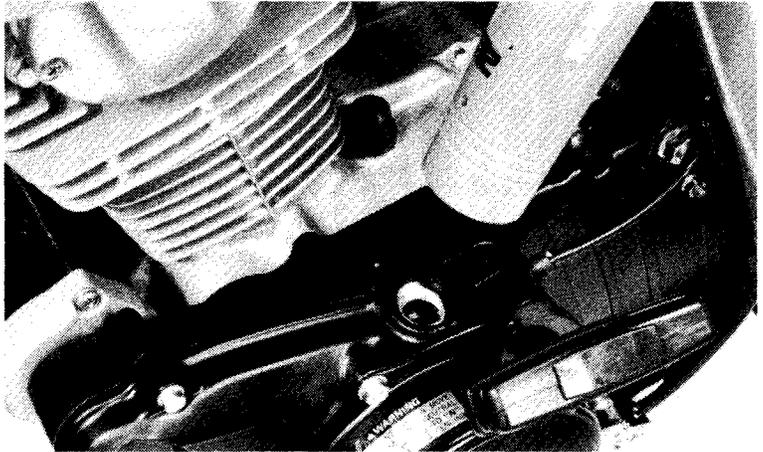
Replace the pulse generator if the reading is not within the specification. See Section 6 for pulse generator replacement.



### IGNITION TIMING

Remove the timing hole cap.  
Connect a timing light.  
Start the engine and allow it to idle.

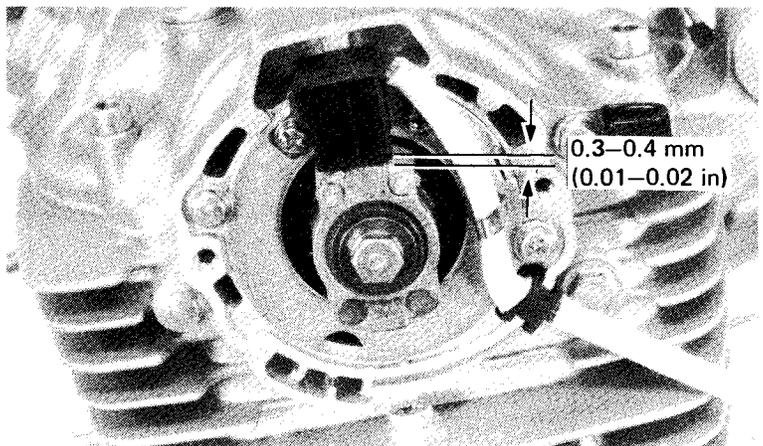
**IDLE (1,400 rpm): "F" mark should be aligned with the index mark**



To adjust, remove the pulse generator cover. Loosen the base plate attaching screws and turn the plate left or right as required.

If ignition timing cannot be corrected, inspect the CDI unit and pulse generator. Replace any faulty components.

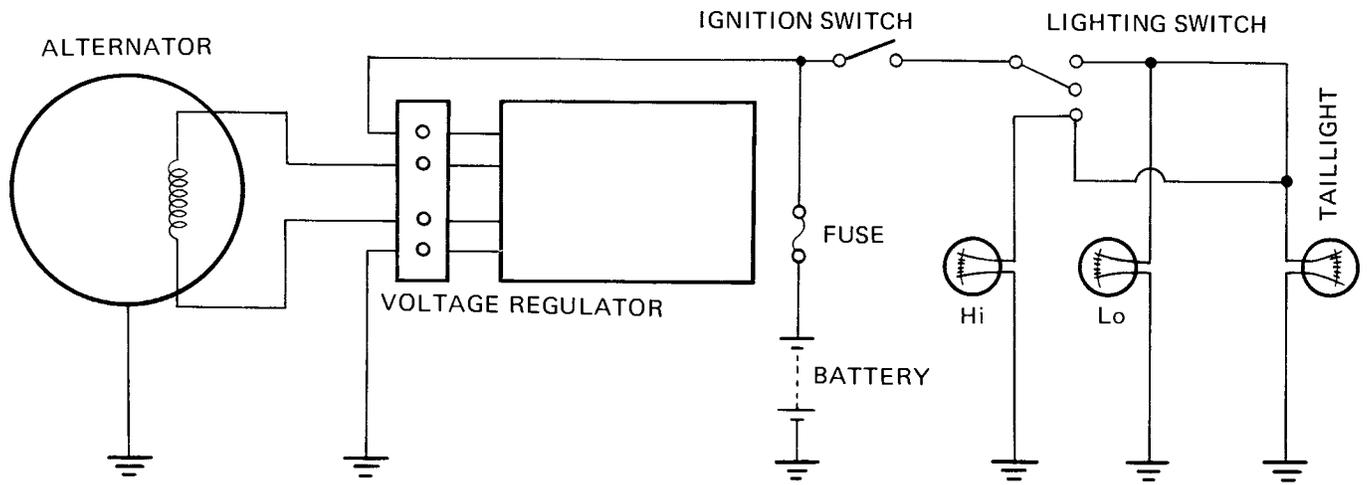
Maintain a pulse rotor-to-generator air gap of 0.3–0.4 mm (0.01–0.02 in).



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MEMO

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# 15. BATTERY/ CHARGING SYSTEM

SERVICE INFORMATION	15-1
TROUBLESHOOTING	15-2
BATTERY	15-3
CHARGING SYSTEM	15-4

## SERVICE INFORMATION

### GENERAL

- Battery fluid level should be checked regularly. Fill with distilled water when necessary.
- Quick charge a battery, only in an emergency. Slow-charging is preferred.
- Remove the battery from the motorcycle for charging. If the battery must be charged on the motorcycle, disconnect the battery cables.

#### **WARNING**

*Do not smoke, and keep flames away from a charging battery. The gas produced by a battery will explode if a flame or spark is brought near.*

- All charging system components can be tested on the ATC.

### SPECIFICATIONS

Battery	Capacity	12 V – 14 ampere – hours
	Specific gravity	1.270 – 1.290 (20°C, 68°F)
	Charging rate	1.4 amperes maximum
Alternator	Capacity	NIGHT: 4.5 amperes/5,000 rpm (14 volts)
Voltage regulator		Transistorized non-adjustable regulator

### TROUBLESHOOTING

#### No power – key turned on:

1. Dead battery
  - Low fluid level.
  - Low specific gravity.
  - Charging system failure.
2. Disconnected battery cable.
3. Burned out fuse.
4. Faulty ignition switch.

#### Low power – key turned on:

1. Weak battery.
  - Low fluid level.
  - Low specific gravity.
  - Charging system failure.
2. Loose battery connection.

#### Low power – engine running:

1. Battery undercharged.
  - Low fluid level.
  - One or more dead cells.
2. Charging system failure.
3. Loose connection or short circuit in lighting system.

#### Intermittent power:

1. Loose battery connection.
2. Loose charging system connection.
3. Loose starting system connection.

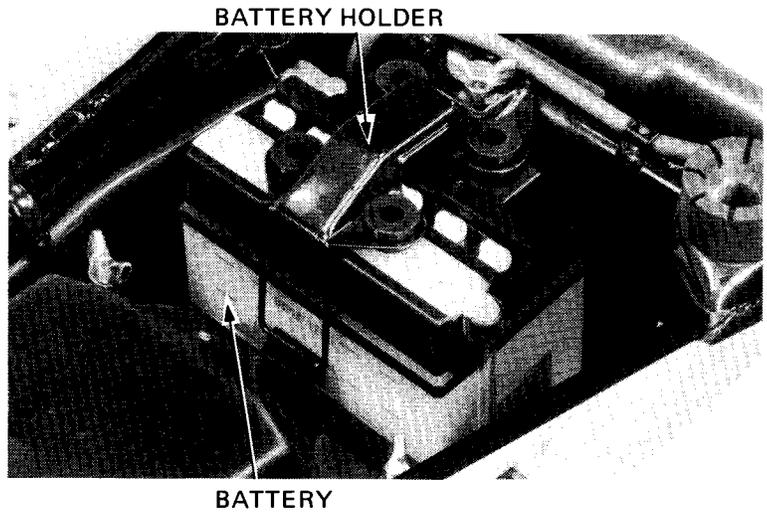
#### Charging system failure:

1. Loose, broken, or shorted wire or connection.
2. Faulty voltage regulator.
3. Faulty alternator.

# BATTERY

## REMOVAL

- Remove the seat.
- Remove the battery holder.
- Disconnect the negative cable at the battery.
- Disconnect the positive cable at the battery.
- Remove the battery.



## TESTING SPECIFIC GRAVITY

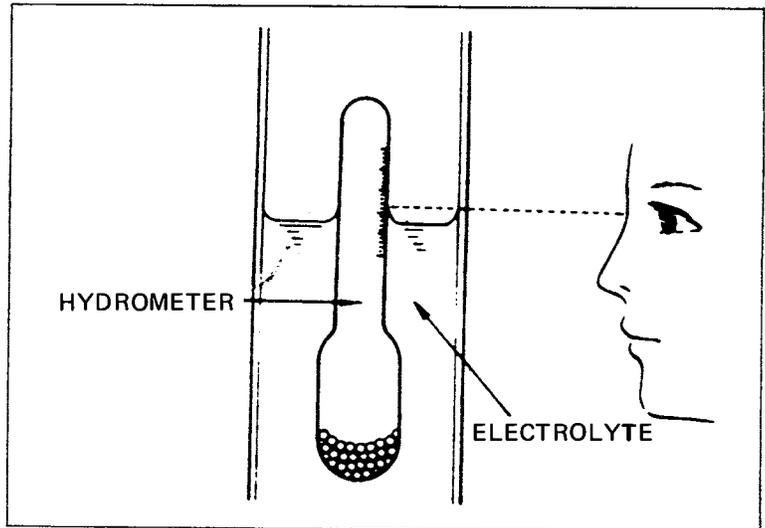
Test each cell with a hydrometer.

**SPECIFIC GRAVITY: 1.270–1.290 (20°C, 68°F)**

1,270–1.290	Fully charged
Below 1.260	Undercharged

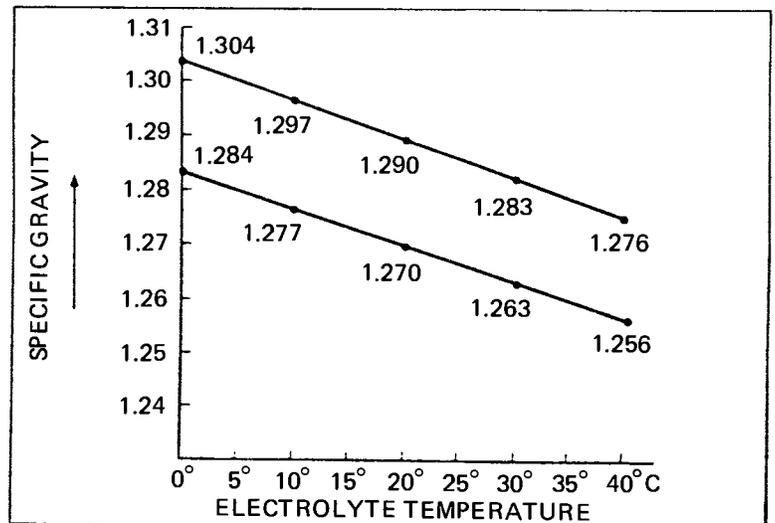
### NOTE

- The battery must be recharged if the specific gravity is below 1.230.
- The specific gravity varies with the temperature as shown in the accompanying table.
- Replace the battery if sulfation is evident or if the space below the cell plates is filled with sediment.



### WARNING

*The battery contains sulfuric acid. Avoid contact with skin, eyes, or clothing. Antidote: Flush with water and get prompt medical attention.*



## BATTERY/CHARGING SYSTEM

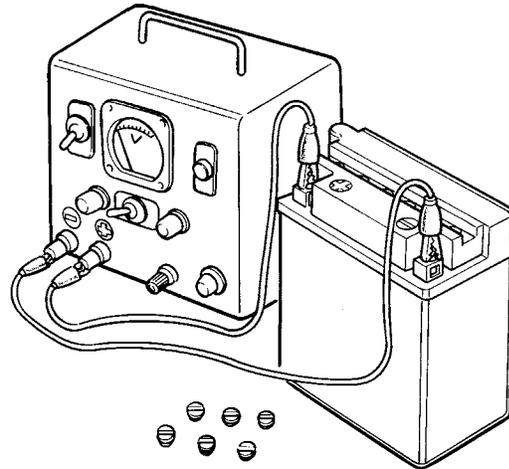
### CHARGING

Connect the charger positive (+) cable to the battery positive (+) terminal.

Connect the charger negative (-) cable to the battery negative (-) terminal.

**Charging current: 1.4 amperes max.**

**Charging: Charge the battery until specific gravity is 1.270–1.290 at 20°C (68°F).**



#### WARNING

- Before charging a battery, remove the cap from each cell.
- Keep flames and sparks away from a charging battery.
- Turn power ON/OFF at the charger, not at the battery terminals.
- Discontinue charging if the electrolyte temperature exceeds 45°C (113°F).

#### CAUTION

- Quick-charging should only be done in an emergency; slow-charging is preferred.
- Route the breather tube as shown on the battery caution label.

After installing the battery, coat the terminals with clean grease.

## CHARGING SYSTEM

### CHARGING OUTPUT TEST

#### NOTE

Be sure the battery is in good condition before performing this test.

Warm up the engine before testing.

Remove the seat.

Disconnect the red wire at the fuse connector.

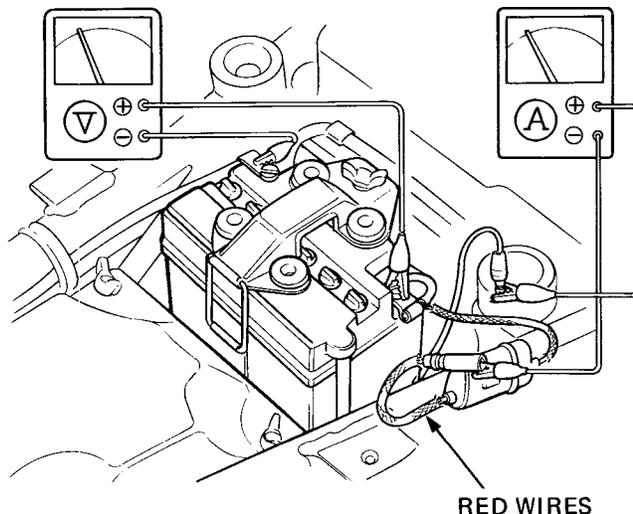
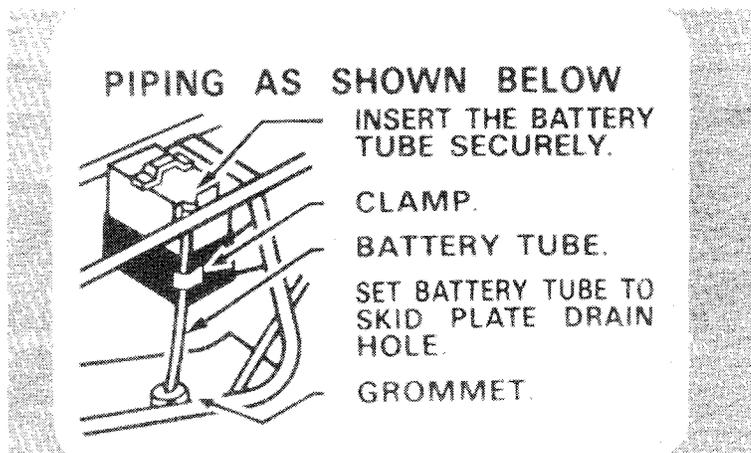
Connect an ammeter between the red wires.

Connect a voltmeter between the battery positive and negative terminals.

Start the engine.

#### TECHNICAL DATA:

IGNITION SWITCH	LIGHTING SWITCH	5,000 rpm
ON	ON	4.5 A (14V)



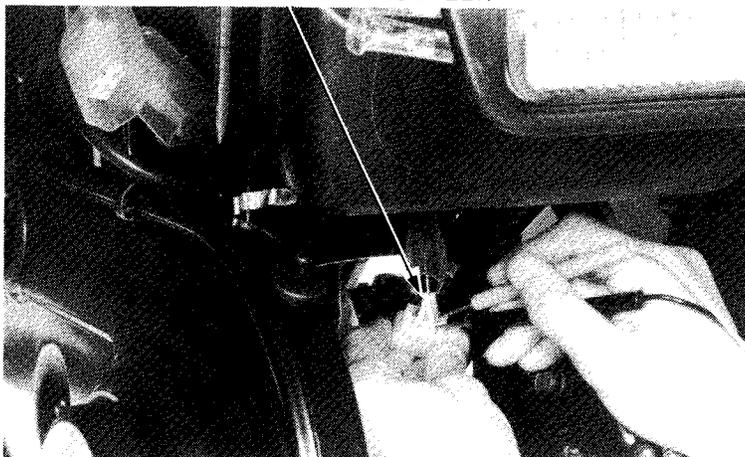
### VOLTAGE REGULATOR INSPECTION

Disconnect the voltage regulator coupler.  
Check the resistance between the leads with an ohmmeter.

Range: Sanwa:  $k\Omega$   
Kowa:  $100\ \Omega$

+Probe -Probe	Red	Yellow	Yellow	Green
Red	—	$\infty$	$\infty$	$\infty$
Yellow	0.1–10	—	1–50	0.5–50
Yellow	0.1–10	1–50	—	0.5–50
Green	0.2–30	0.1–10	0.1–10	—

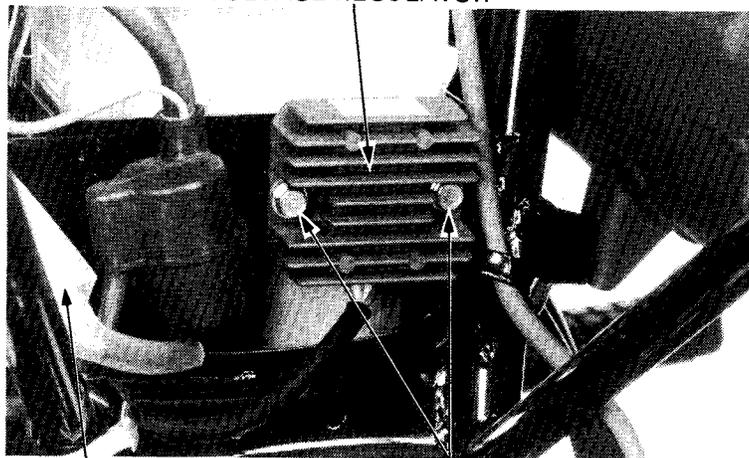
VOLTAGE REGULATOR COUPLER



### VOLTAGE REGULATOR REPLACEMENT

Remove the rear fenders and tool box (Page 13–1).  
Disconnect the voltage regulator wire coupler.  
Remove the two bolts attaching the voltage regulator and replace it with a new one.

VOLTAGE REGULATOR



WIRE COUPLER

BOLTS

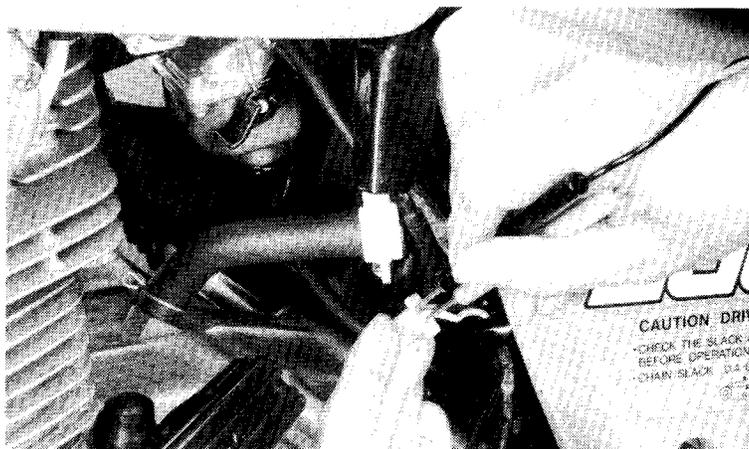
### ALTERNATOR CHARGING COIL

Disconnect the alternator wire coupler.  
Check the resistance between the coupler terminals.

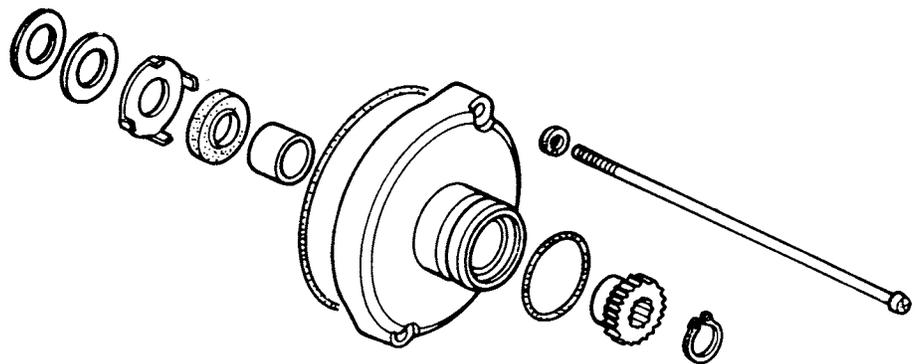
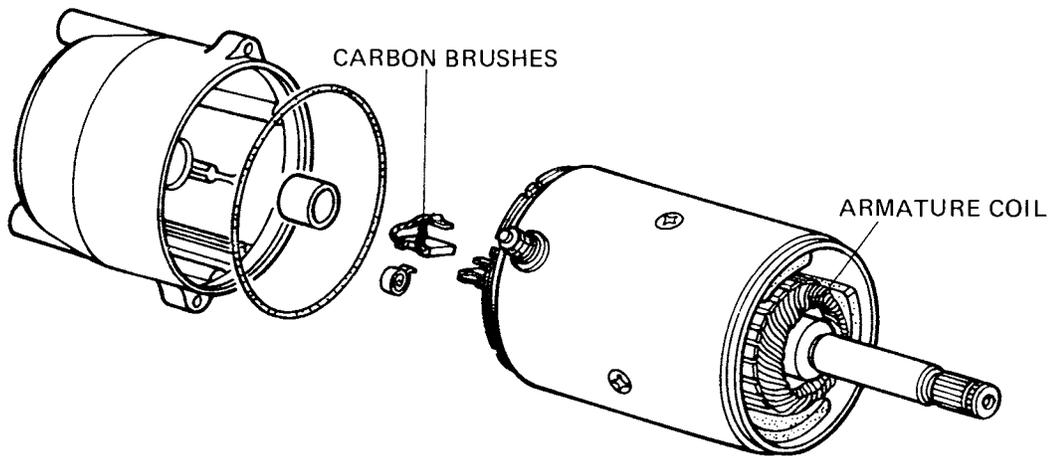
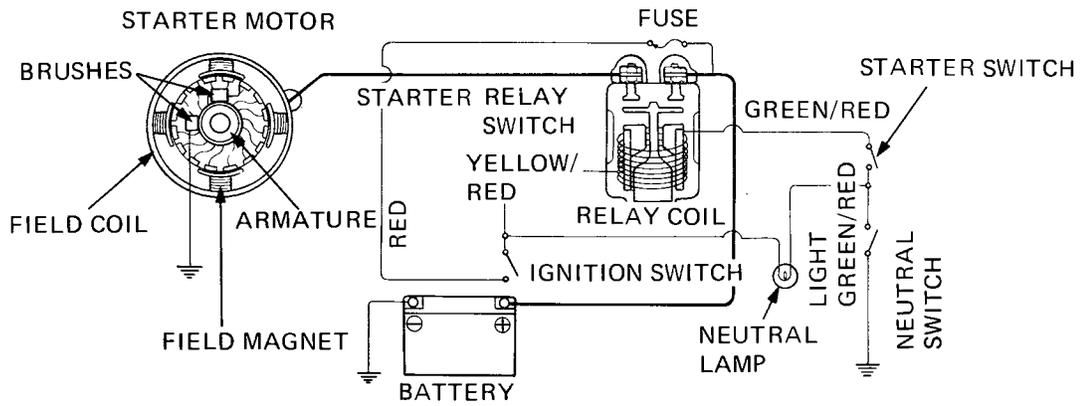
**RESISTANCE: 0.1–1 ohms**

Check for continuity between the coupler terminal and ground.

Replace the alternator stator if readings are not within the limit or if any lead has continuity to ground. See Stator Removal (Page 9–7).



CAUTION DRIVE  
CHECK THE SLACK AT  
BEFORE OPERATION  
CHAIN SLACK 0.5-0.8



# 16. STARTER SYSTEM

SERVICE INFORMATION	16-1
TROUBLESHOOTING	16-1
STARTER MOTOR	16-2
STARTER RELAY SWITCH	16-4

## SERVICE INFORMATION

### GENERAL

- The starter motor can be removed with the engine in the frame.

### SPECIFICATIONS

		STANDARD	SERVICE LIMIT
Starter motor	Brush spring tension	0.560–0.680 kg (1.23–1.50 lb)	400 g (14.1 oz)
	Brush length	12–13 mm (0.47–0.51 in)	5.5 mm (0.22 in)

## TROUBLESHOOTING

### Starter motor will not turn

1. Dead battery.
2. Faulty ignition switch.
3. Faulty starter switch.
4. Faulty neutral switch.
5. Faulty starter relay switch.
6. Loose or disconnected wire or cable.

### Starter motor turns engine slowly

1. Low battery.
2. Excessive resistance in circuit.
3. Binding in starter motor.

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

1. Faulty starter clutch.
2. Faulty starter motor gears.
3. Faulty starter motor or idle gear.

### Starter motor and engine turn, but engine does not start

1. Faulty ignition system.
2. Engine problems.
3. Faulty engine stop switch.

## STARTER MOTOR

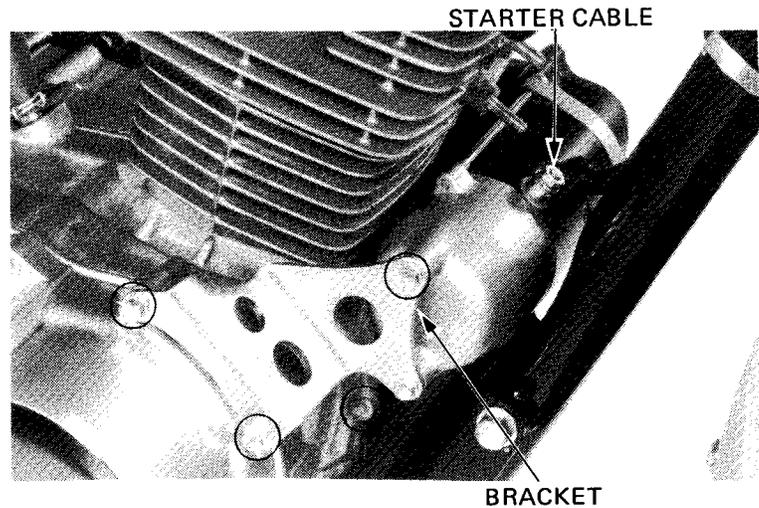
### STARTER MOTOR

#### REMOVAL

##### CAUTION

*With the ignition switch OFF, remove the negative cable at the battery before servicing the starter motor.*

Remove the exhaust pipe (Page 13–3).  
Disconnect the starter cable.  
Remove the starter motor mounting bolts and bracket and pull the motor out of the engine case.



#### BRUSH INSPECTION

Remove the starter motor case screws and rear cover.

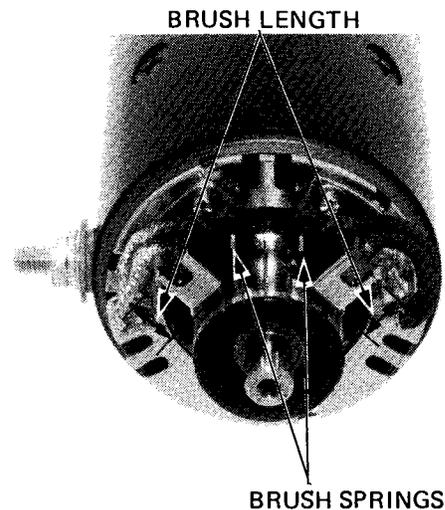
Inspect the brushes and measure the brush length.

Measure brush spring tension with a spring scale.

##### SERVICE LIMITS:

Brush length: 5.5 mm (0.22 in)

Brush spring tension: 400 g (14.1 oz)



#### COMMUTATOR INSPECTION

Remove the starter motor case.

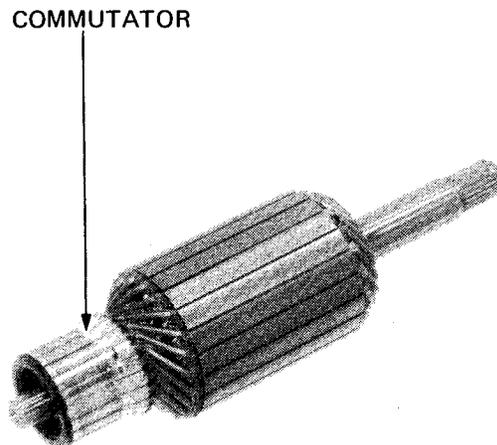
##### NOTE

Record the location and number of thrust washers.

Inspect the commutator bars for discoloration. Bars discolored in pairs indicate grounded armature coils, in which case the starter motor must be replaced.

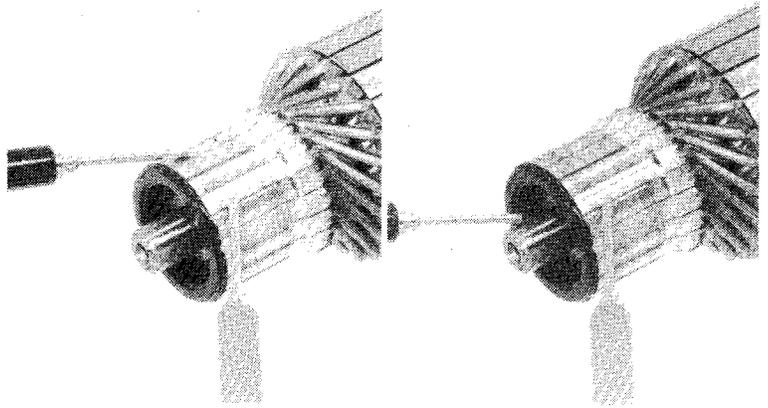
##### NOTE

Do not use emery or sand paper on the commutator.



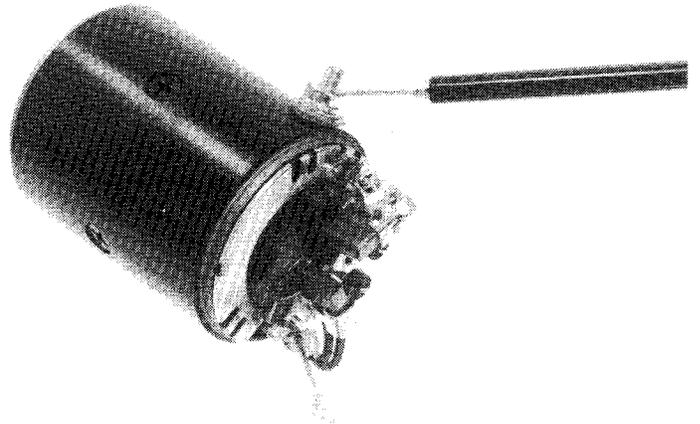
Check for continuity between pairs of commutator bars. Also, make a resistance check between individual commutator bars and the armature shaft. There should be no continuity.

**CONTINUITY BETWEEN  
COMMUTATOR BAR PAIRS: NORMAL**



**NO CONTINUITY BETWEEN  
COMMUTATOR BARS AND ARMATURE SHAFT: NORMAL**

**NO CONTINUITY BETWEEN  
CABLE TERMINAL AND MOTOR CASE: NORMAL**



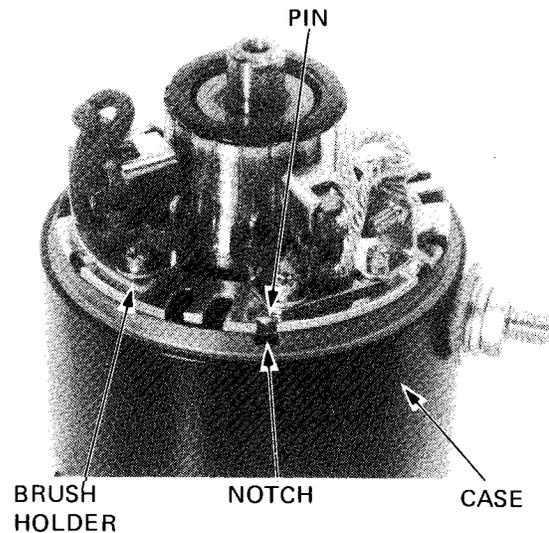
**CONTINUITY BETWEEN  
CABLE TERMINAL AND BRUSH WIRE (INSULATED): NORMAL**

**FIELD COIL INSPECTION**

Check for continuity from the cable terminal to the motor case and from the cable terminal to the brush wire. Replace the starter motor if the field coil does not have continuity or if it is shorted to the motor case.

**ASSEMBLY/INSTALLATION**

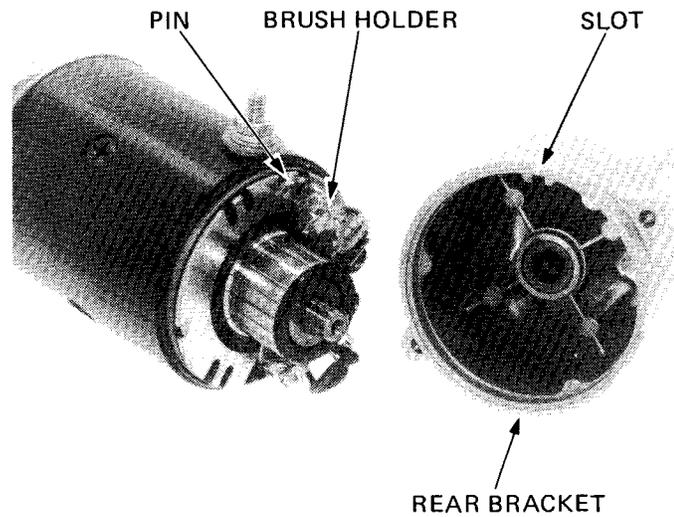
Assemble the starter motor. Align the case notch with the brush holder pin.



## STARTER MOTOR

Install the rear cover aligning its slot with the brush holder pin.

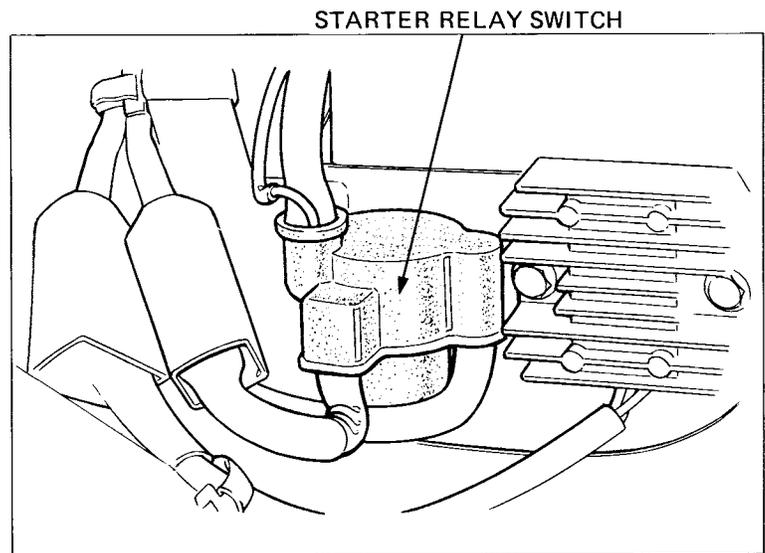
Install the starter motor in the reverse order of removal.



## STARTER RELAY SWITCH

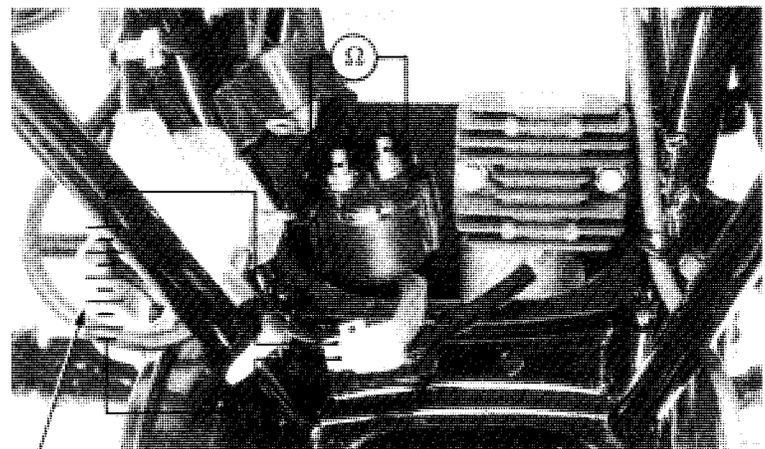
### INSPECTION

Remove the rear fenders and tool box (Page 13-1). Depress the starter switch button with the ignition ON. The coil is normal if the starter relay switch clicks.



Connect an ohmmeter to the starter relay switch terminals.

Connect a 12 V battery to the switch cable terminals. The switch is normal if there is continuity.



12V BATTERY

# 17. LIGHTS/SWITCHES

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TAILLIGHT	17-3
NEUTRAL INDICATOR LIGHT	17-4
IGNITION SWITCH	17-5
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WIRING DIAGRAMS	17-7

## SERVICE INFORMATION

### GENERAL

- A continuity check can usually be made without removing the part from the ATC by simply disconnecting the wires and connecting a continuity tester or voltmeter to the terminals.

### SPECIFICATIONS

Headlight	12 V 45/45 W
Taillight	12 V 5 W

## TROUBLESHOOTING

### Light does not come on when light switch is turned on (Engine is running)

1. Bulb burned out.
2. Faulty switch.
3. Wiring to that component has open circuit.

### Headlight beams do not shift when hi-lo switch is operated

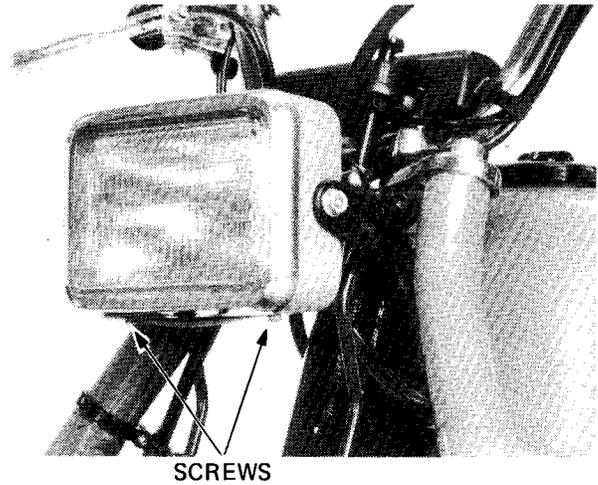
1. Faulty dimmer switch.
2. Bulb burned out.
3. Wiring to that component has open circuit.

## LIGHTS/SWITCHES

### HEADLIGHT

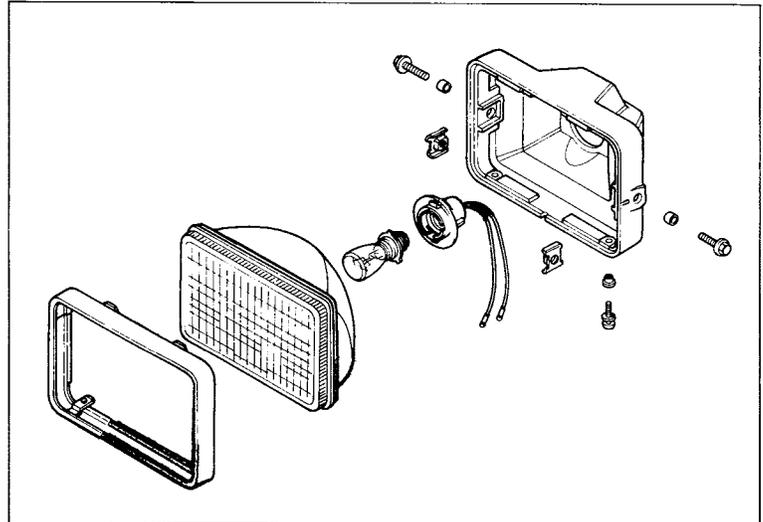
#### REMOVAL

Remove the two headlight mounting screws.  
Disconnect the headlight wires and remove the headlight.



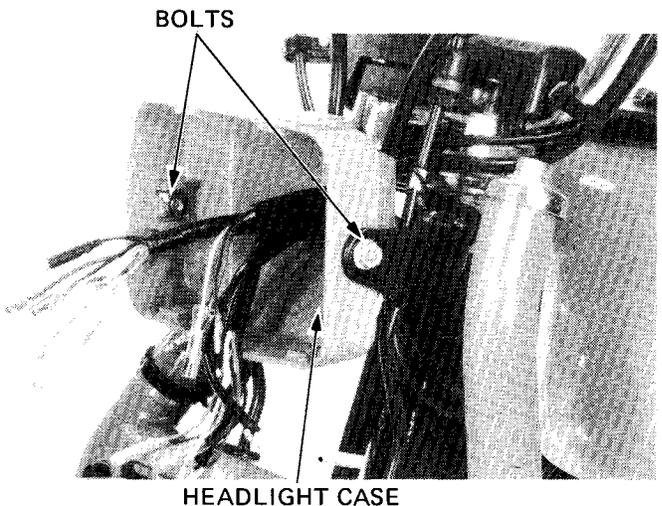
#### DISASSEMBLY/ASSEMBLY

Remove the two retaining springs and remove the headlight unit from the rim.  
Assembly is the reverse of disassembly.



#### CASE REMOVAL/INSTALLATION

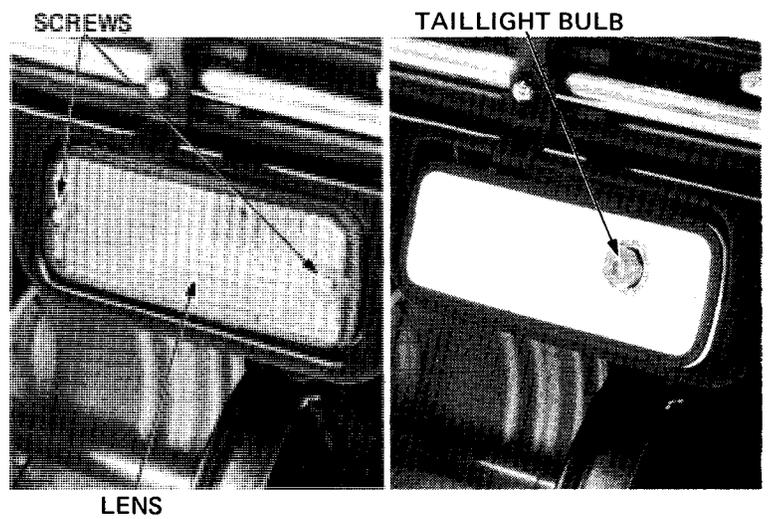
Remove the headlight.  
Remove the two case mounting bolts and the headlight case.  
Installation is the reverse of removal.



## TAILLIGHT

### BULB REPLACEMENT

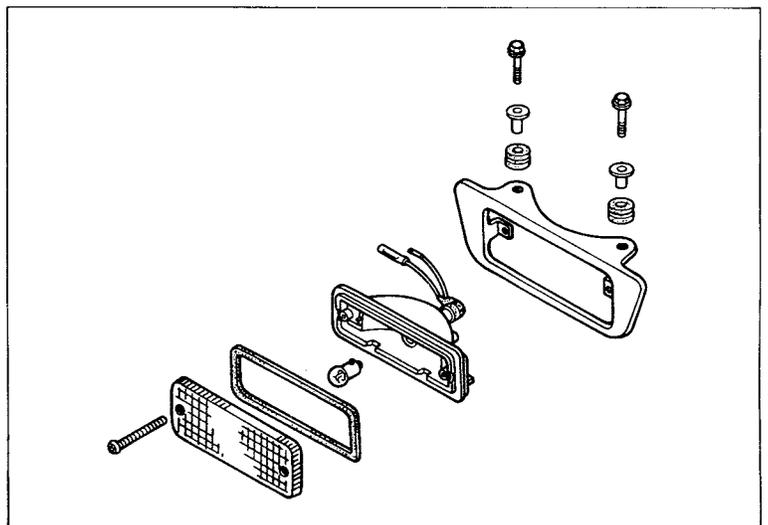
Remove the taillight lens by removing two screws.  
Replace the bulb with a new one.



### REMOVAL/INSTALLATION

Disconnect the taillight wire connector.

Open the tool box and remove the two bolts mounting the taillight unit and the taillight unit.



## LIGHTS/SWITCHES

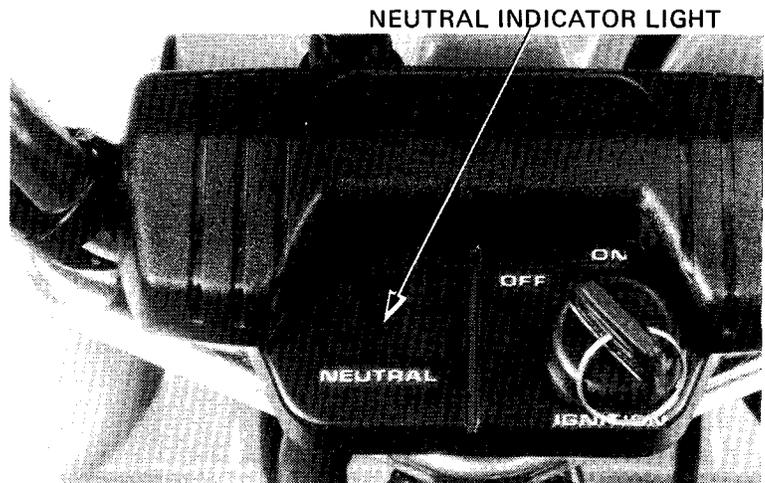
### NEUTRAL INDICATOR LIGHT

#### BULB REPLACEMENT

Pull the bulb socket from the neutral indicator light panel.

Replace the bulb with a new one.

Install the bulb socket.

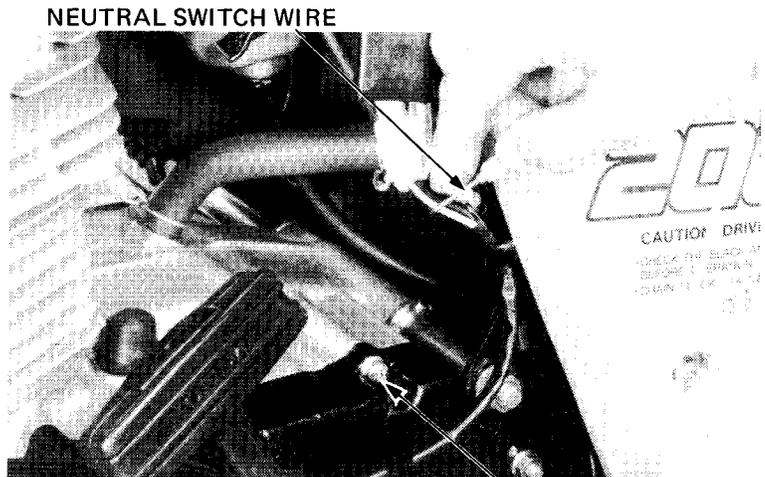


#### NEUTRAL SWITCH INSPECTION

Disconnect the neutral switch wire connector.

Check the switch for continuity between the switch wire (Light green/red) and ground with the transmission in neutral and with the transmission in any gear.

Replace the neutral switch if necessary (Page 9–10).



IN NEUTRAL: CONTINUITY  
IN ANY GEAR: NO CONTINUITY

GROUND

## IGNITION SWITCH

Remove the headlight and disconnect the ignition switch wire connector.

Check continuity of the ignition switch wires in each switch position.

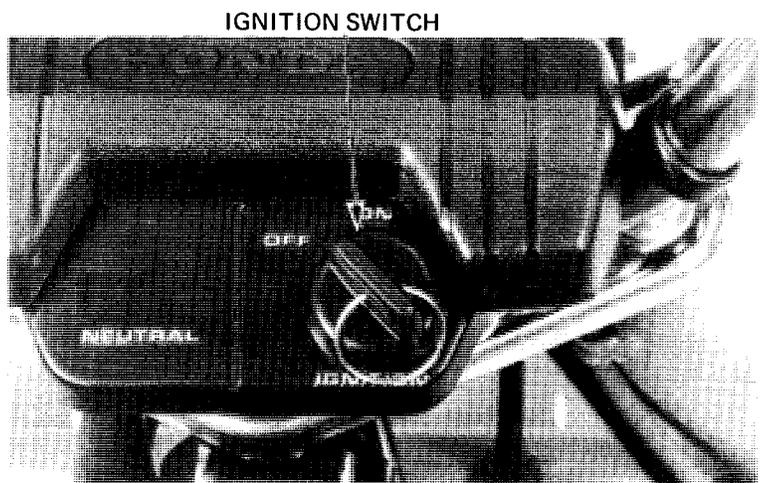
### SWITCH POSITION:

'84:

OFF: Black to Green — continuity

ON: Red to Yellow/Red — continuity

Terminal Position	IG	E	BAT	HO
OFF	○	○		
ON			○	○
Color	Black	Green	Red	Yellow/Red



After '84:

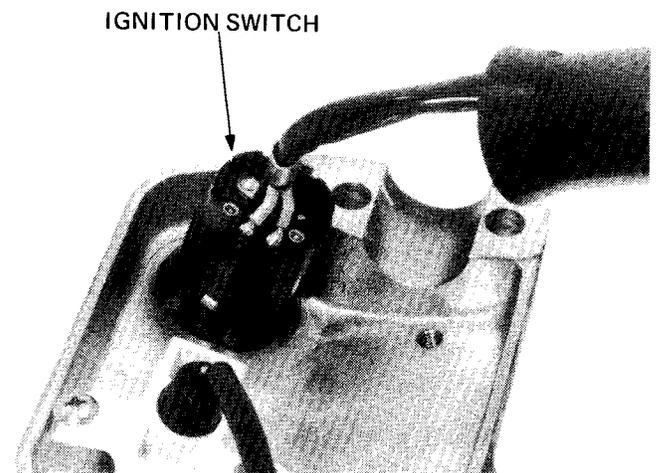
OFF: Black/White to Green — continuity

ON: Red to Black — continuity

Terminal Position	IG	E	BAT	HO
OFF	○	○		
ON			○	○
Color	Black/White	Green	Red	Black

## REMOVAL/INSTALLATION

Remove the handlebar upper holder (Page 11-3). Release the notches on the ignition switch and remove the switch from the handlebar upper holder. Installation is the reverse of removal.



## LIGHTS/SWITCHES

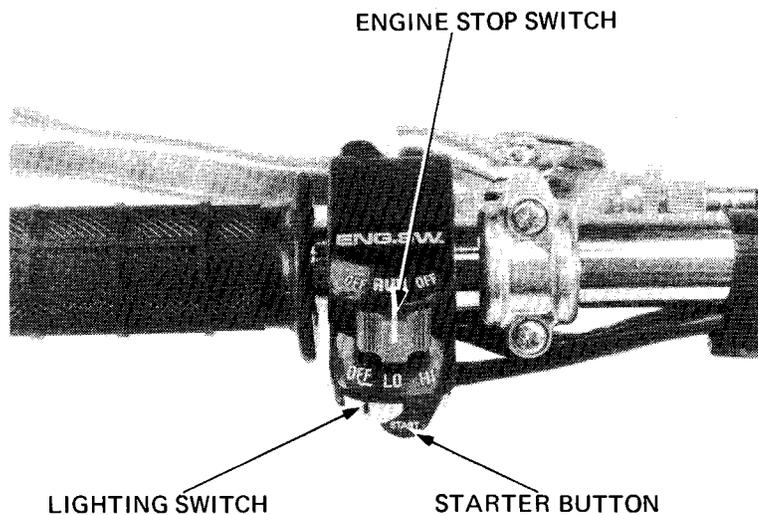
### HANDLEBAR SWITCHES

The handlebar cluster switches (lights, engine stop and starter) must be replaced as assemblies.

Remove the headlight and disconnect the switch wires.

Continuity tests for the components of the handlebar cluster switches follow:

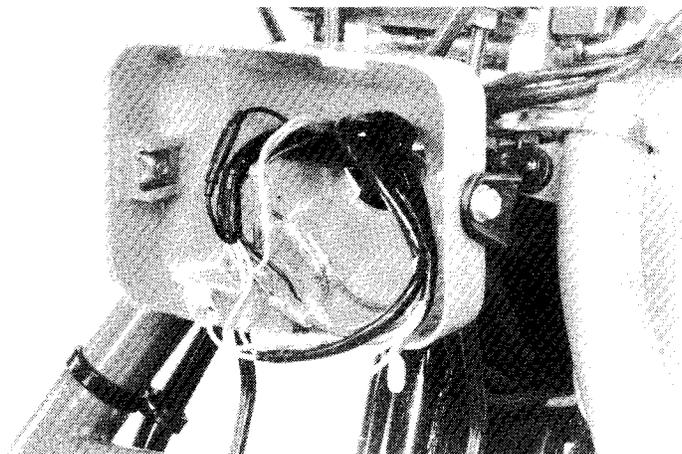
Continuity should exist between the color coded wires in each chart.



### ENGINE STOP SWITCH

RUN: Black to Green  
OFF: No continuity

Terminal Position	IG	E
OFF	○—○	○—○
RUN		
OFF	○—○	○—○



WIRE CONNECTORS

### LIGHTING SWITCH

'84:  
OFF: No continuity  
LO: Brown to Yellow to White  
MIDDLE (N): Brown to Yellow to White to Blue  
HI: Brown to Yellow to Blue

After '84:  
OFF: No continuity  
LO: Brown to Black/Brown to White  
MIDDLE (N): Brown to Black/Brown to White to Blue  
HI: Brown to Black/Brown to Blue

Terminal Position	TL	C	LO	HI
OFF				
LO	○—○	○—○	○—○	
(N)	○—○	○—○	○—○	○—○
HI	○—○	○—○		○—○
COLOR '84:	Brown	Yellow	White	Blue
COLOR AFTER '84:	Brown	Black/Brown	White	Blue

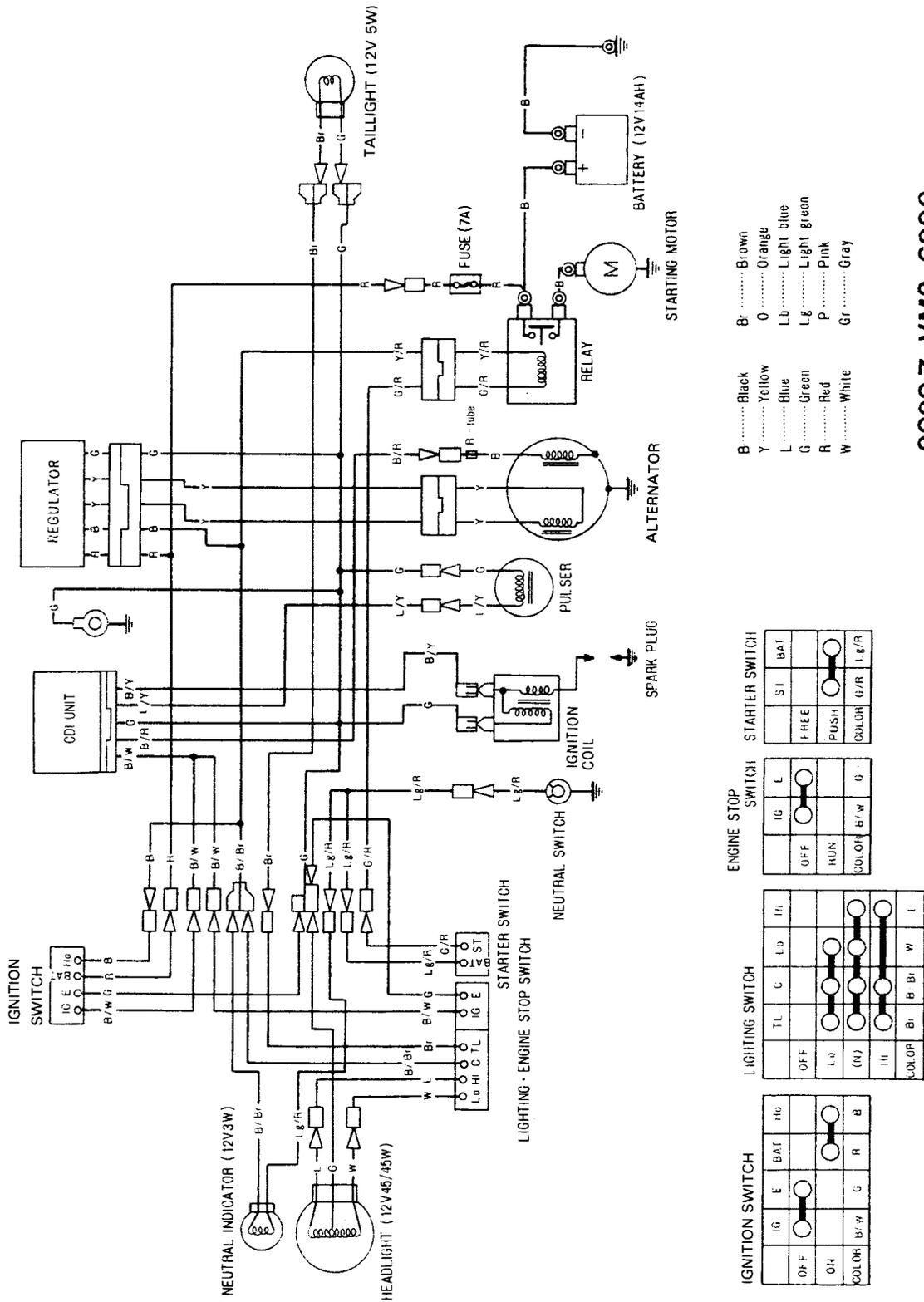
### STARTER BUTTON

Green/Red to Light green/red with button depressed.  
No continuity with button released.

Terminal Position	ST	E
OUT		
Start	○—○	○—○



After'84:

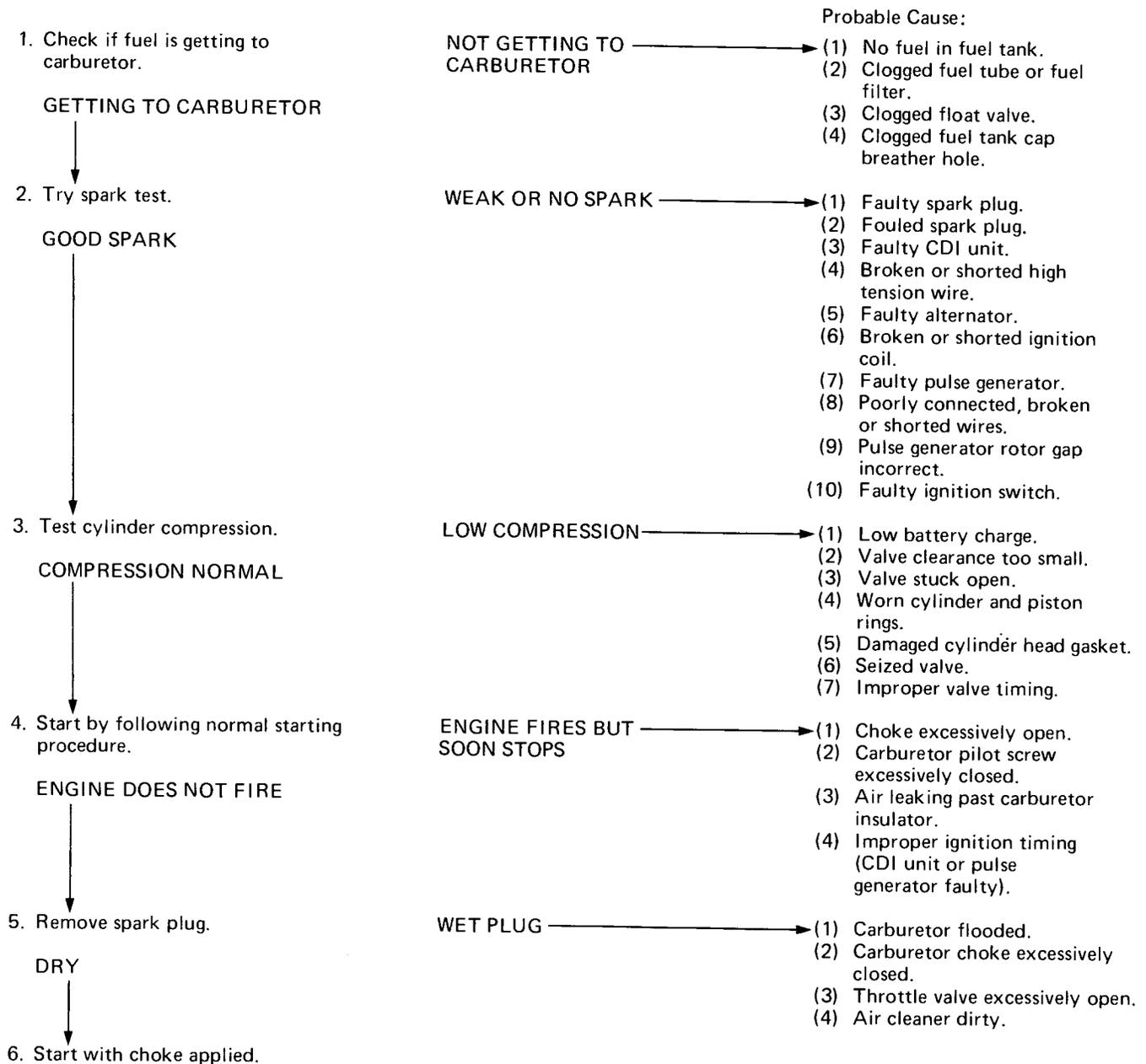


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# 18. TROUBLESHOOTING

ENGINE DOES NOT START OR IS HARD TO START	18-1
ENGINE LACKS POWER	18-2
POOR PERFORMANCE AT LOW AND IDLE SPEEDS	18-3
POOR PERFORMANCE AT HIGH SPEEDS	18-4
POOR HANDLING	18-4

## ENGINE DOES NOT START OR IS HARD TO START



## **ENGINE LACKS POWER**

1. Raise wheels off ground and spin by hand.

WHEEL SPINS FREELY

2. Check tire pressure with tire gauge.

PRESSURE NORMAL

3. Try rapid acceleration from low to second.

ENGINE SPEED LOWERED WHEN CLUTCH IS RELEASED

4. Lightly accelerate engine.

ENGINE SPEED INCREASED

5. Check ignition timing.

CORRECT

6. Check valve clearance.

CORRECT

7. Test cylinder compression using a compression gauge.

NORMAL

8. Check carburetor for clogging.

NOT CLOGGED

9. Remove spark plug.

NOT FOULED OR DISCOLORED

Probable Cause:

WHEEL DOES NOT SPIN FREELY

- (1) Brake dragging.
- (2) Worn or damaged wheel bearing.
- (3) Wheel bearing needs lubrication.
- (4) Drive chain too tight.

PRESSURE TOO LOW

- (1) Punctured tire.
- (2) Faulty tire valve.

ENGINE SPEED DOES NOT CHANGE WHEN CLUTCH IS RELEASED

- (1) Clutch slipping.
- (2) Worn clutch disc/plate.
- (3) Warped clutch disc/plate.

ENGINE SPEED NOT INCREASED SUFFICIENTLY

- (1) Carburetor choke closed.
- (2) Clogged air cleaner.
- (3) Restricted fuel flow vent.
- (4) Clogged fuel tank breather tube.
- (5) Clogged muffler.

INCORRECT

- (1) Faulty CDI unit.
- (2) Faulty pulse generator.
- (3) Faulty ignition advancer.

INCORRECT

- (1) Improper valve adjustment.
- (2) Worn valve seat.

TOO LOW

- (1) Valve stuck open.
- (2) Worn cylinder and piston rings.
- (3) Leaking head gasket.
- (4) Improper valve timing.

CLOGGED

- (1) Carburetor not serviced frequently enough.

FOULED OR DISCOLORED

- (1) Plug not serviced frequently enough.
- (2) Use of plug with improper heat range.

10. Remove oil level gauge and check oil level.

CORRECT



11. Remove cylinder head cover and inspect lubrication.

VALVE TRAIN LUBRICATED PROPERLY



12. Check if engine overheats.

NOT OVERHEATED



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.

OVERHEATED → (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 or advancer).

**POOR PERFORMANCE AT LOW AND IDLE SPEEDS**

1. Check ignition timing and valve clearance.

CORRECT



2. Check carburetor pilot screw adjustment.

CORRECT



3. Check if air is leaking past carburetor insulator.

NOT LEAKING



4. Try spark test.

GOOD SPARK

Probable Cause:

INCORRECT → (1) Improper valve clearance.  
(2) Improper ignition timing (Faulty CDI unit or spark advancer).

INCORRECT → (1) Fuel-air mixture too lean.  
(2) Fuel-air mixture too rich.

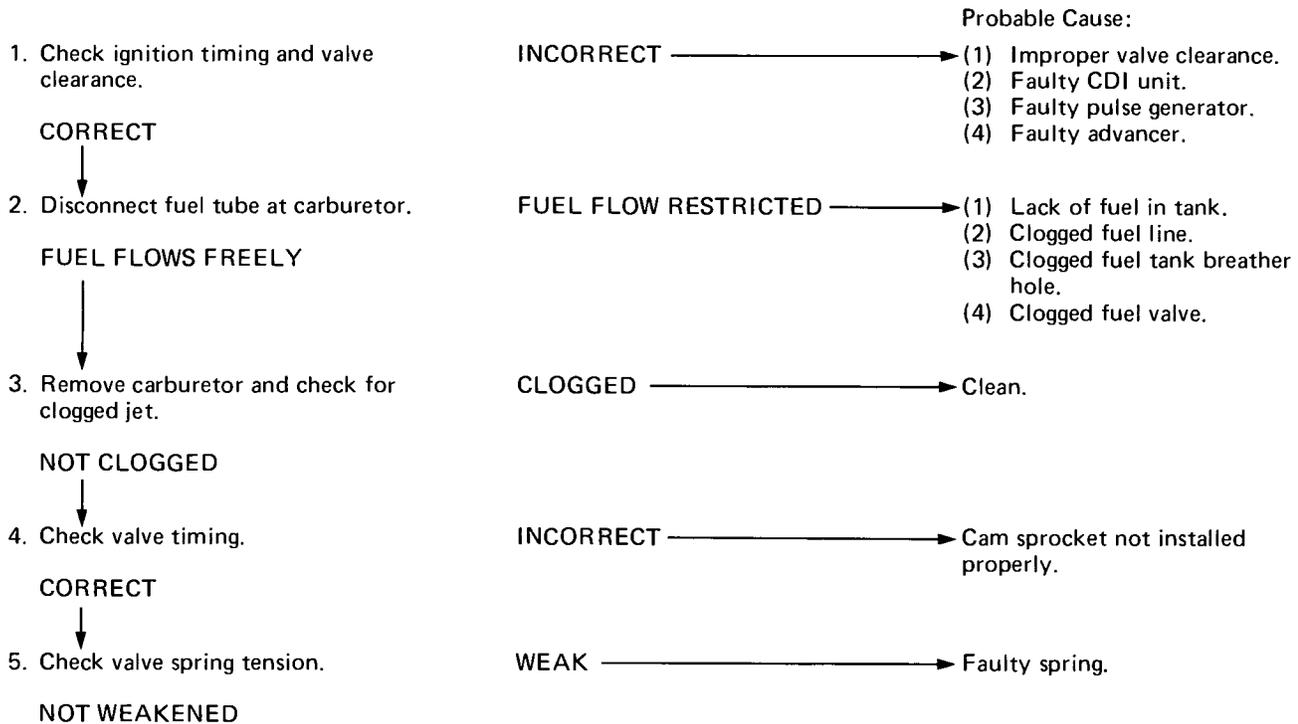
LEAKING → (1) Deteriorated insulator O-ring.  
(2) Loose carburetor.

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.

## TROUBLESHOOTING

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### POOR PERFORMANCE AT HIGH SPEEDS



### POOR HANDLING ————— Check tire pressure

