HONDA

SERVICE MANUAL

1986-2002

XR200R

HOW TO USE THIS MANUAL

Follow the Maintenance Schedule (Section 3) recommendations to ensure that the vehicle is in peak operating condition and the emission levels are within the standards set by the California Air Resources Board.

Sections 1 through 3 apply to the whole motorcycle, while sections 4 through 15 describe parts of the motorcycle, grouped according to location.

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

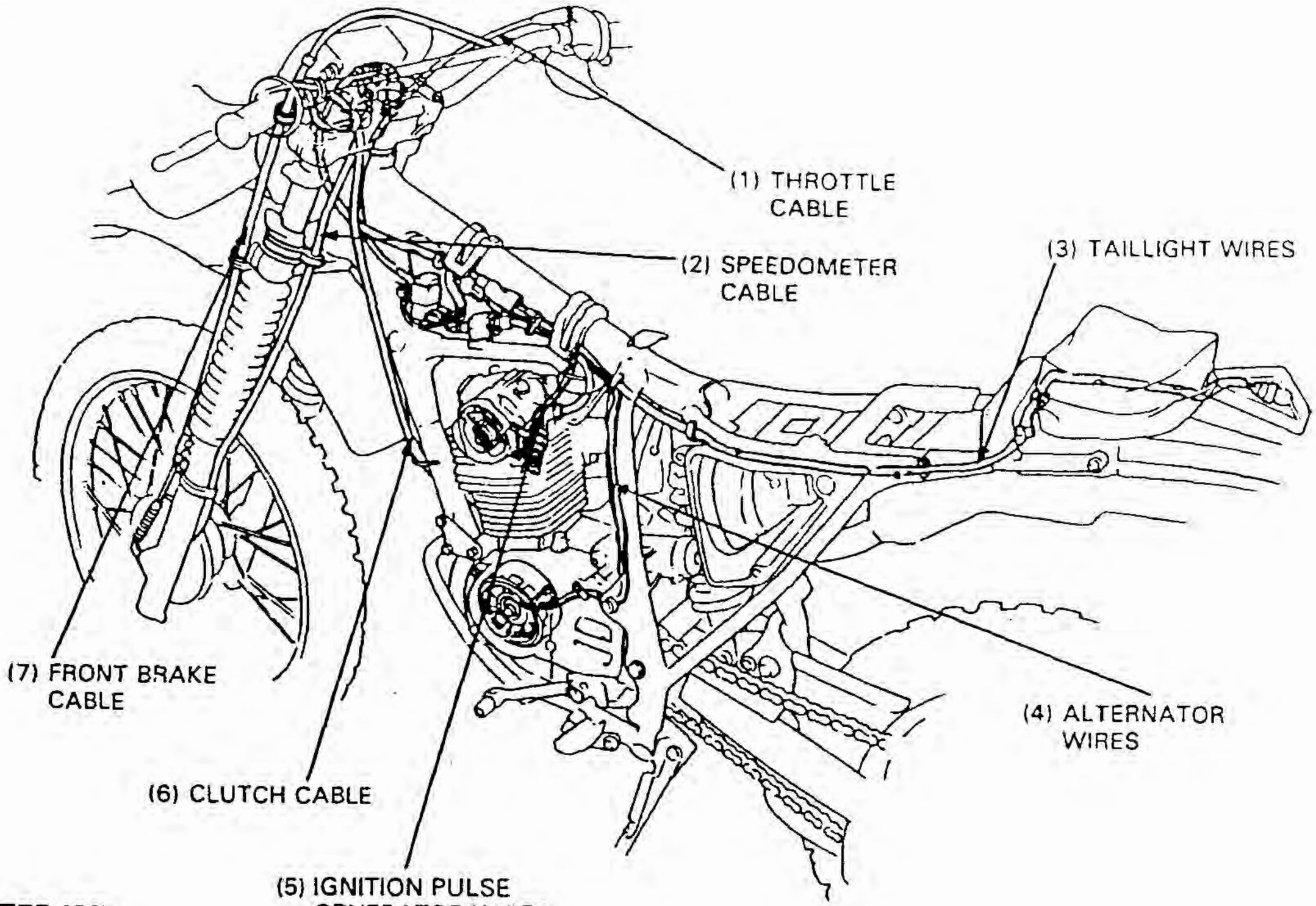
Most sections start with an assembly or system illustration, service information and troubleshooting for the section. The subsequent pages give detailed procedures.

If you don't know what the source of the trouble is, refer to section 16, Troubleshooting.

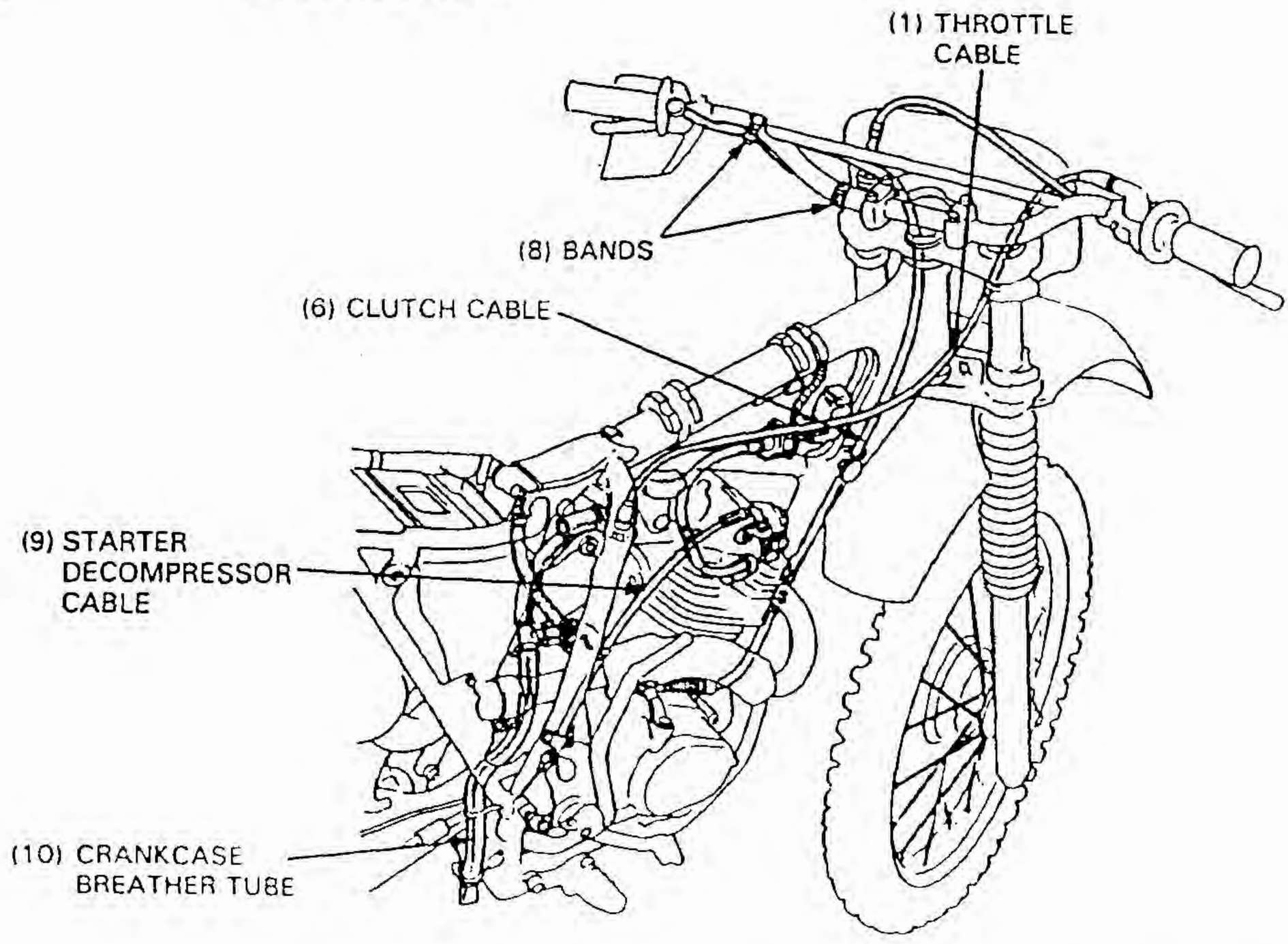
HONDA MOTOR CO., LTD.
Service Publication Office

CONTENTS

'88:

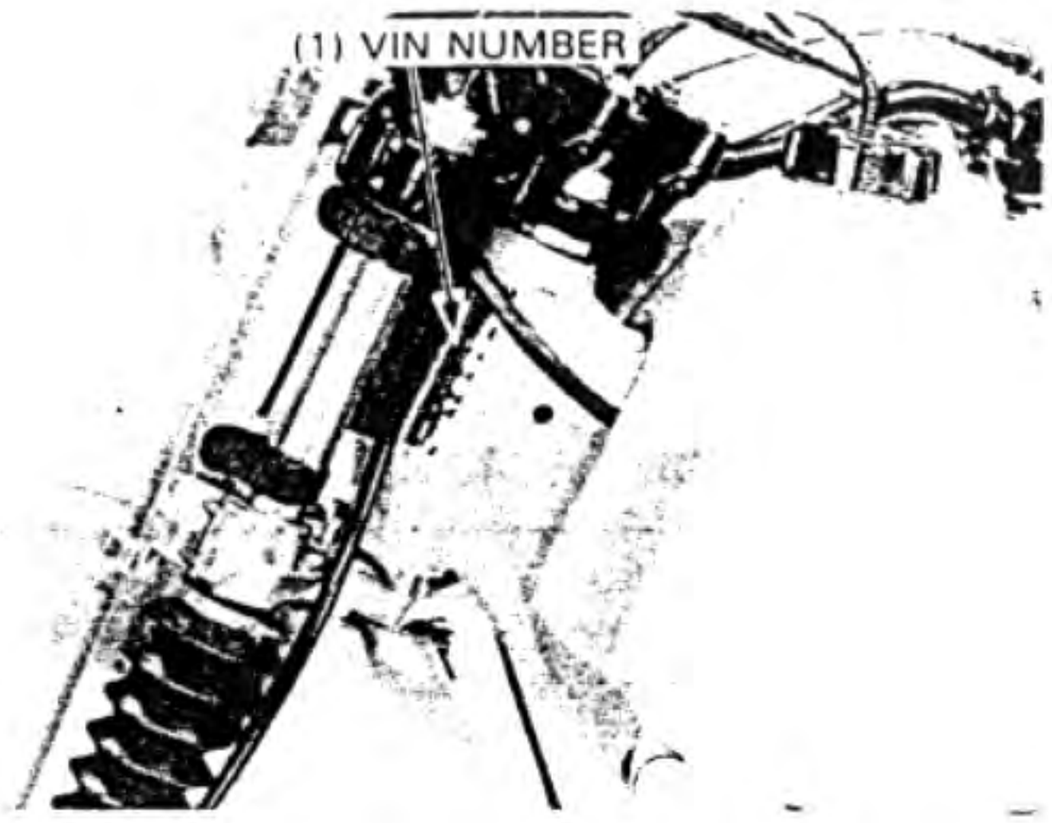

(1) THROTTLE CABLE
(2) SPEEDOMETER CABLE
(3) TAILLIGHT WIRES
(4) ALTERNATOR WIRES
(5) IGNITION PULSE GENERATOR WIRES
(6) CLUTCH CABLE
(7) FRONT BRAKE CABLE

AFTER '87:

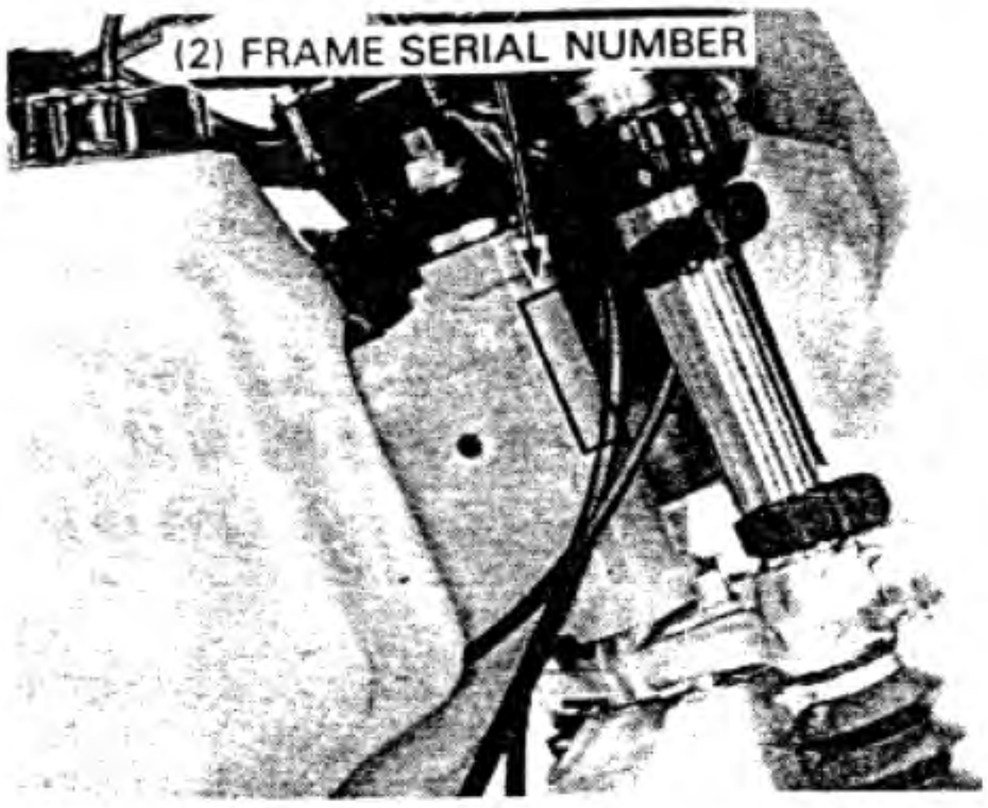

(1) THROTTLE CABLE
(8) BANDS
(6) CLUTCH CABLE
(9) STARTER DECOMPRESSOR CABLE
(10) CRANKCASE BREATHER TUBE

MODEL IDENTIFICATION

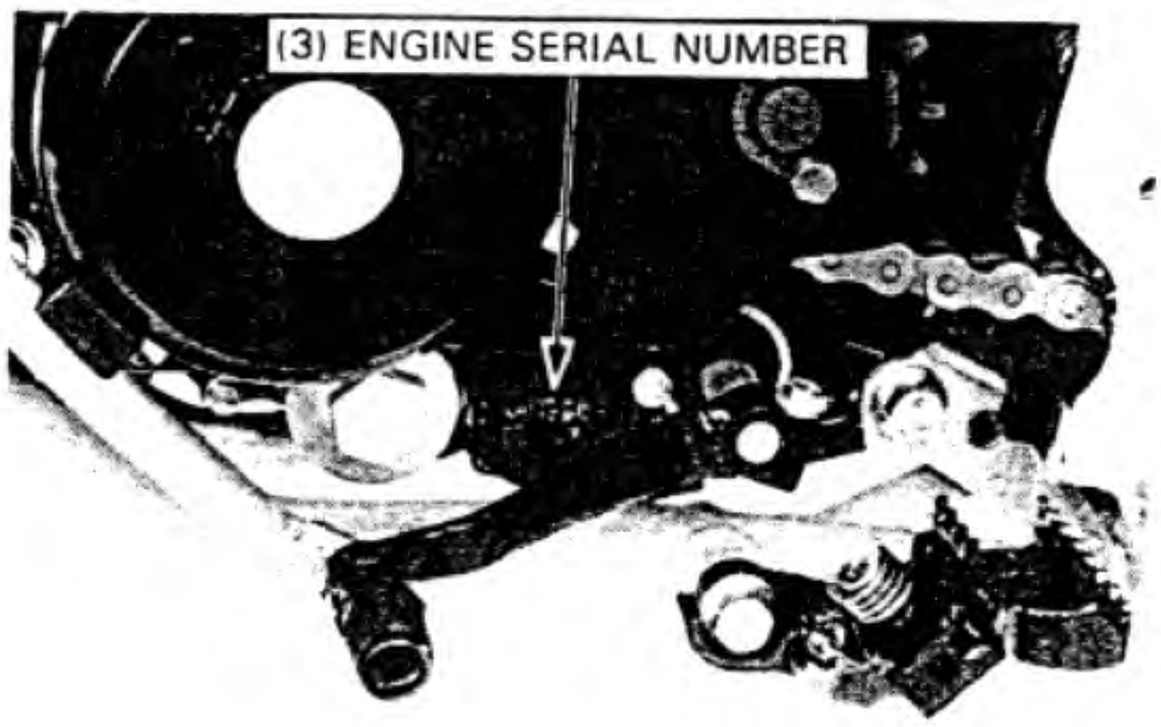
'86 shown: After '86 similar



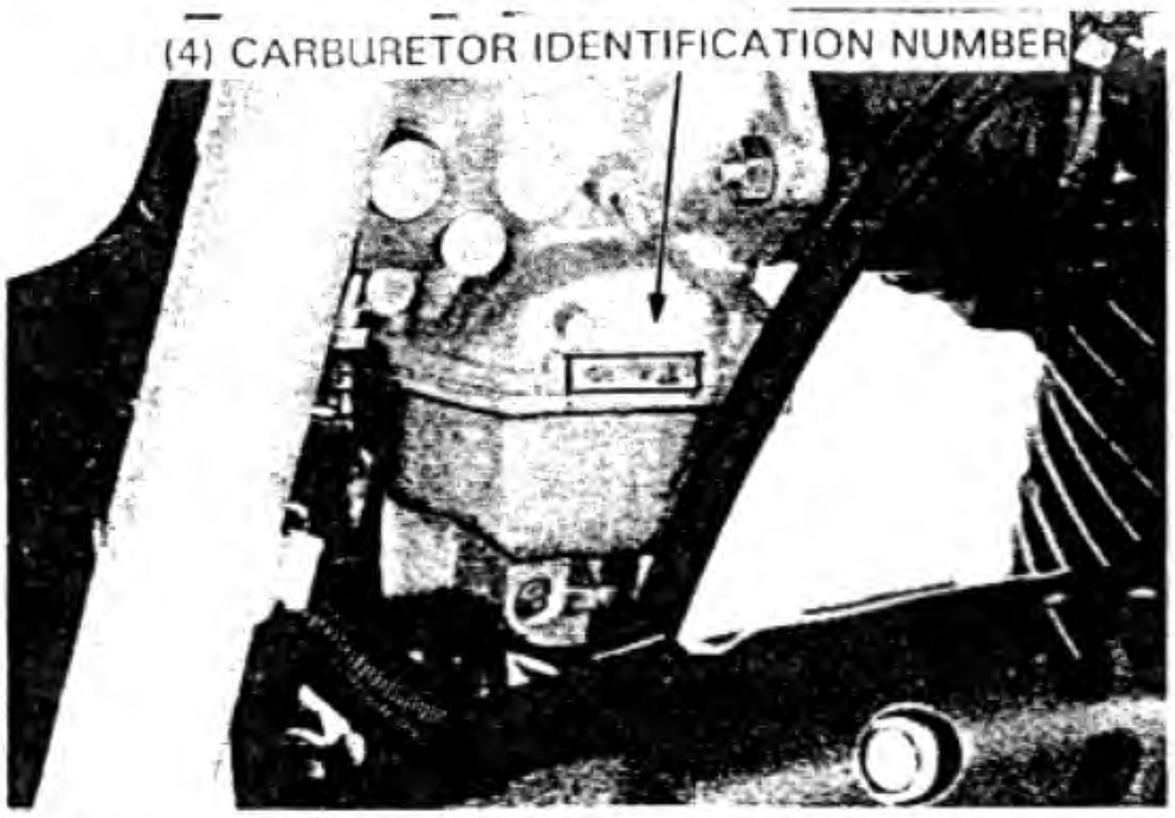
The vehicle identification number (VIN) is on the left side of the steering head.



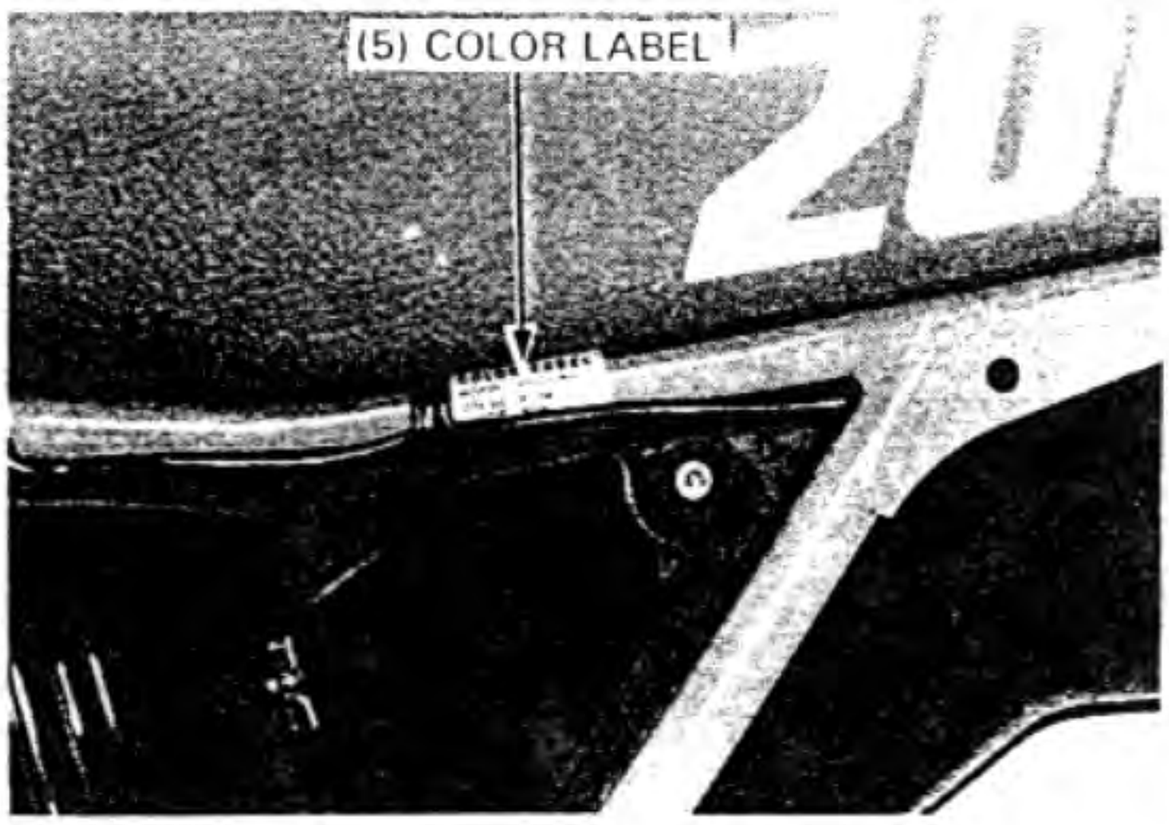
The frame serial number is stamped on the right side of the steering head.



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



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



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

SPECIFICATIONS

ITEM			SPECIFICATION
DIMENSIONS	Overall length	('86 – '88, '90 – '91:)	2,035 mm (80.1 in)
		(After '92:)	2,045 mm (80.5 in)
	Overall width		865 mm (34.1 in)
	Overall height	('86 – '88, '90 – '91:)	1,180 mm (46.5 in)
		(After '92:)	1,130 mm (44.5 in)
	Ground clearance		305 mm (12.0 in)
		(After '92:)	277 mm (10.9 in)
	Wheelbase		1,360 mm (53.5 in)
	Seat height		885 mm (34.8 in)
		(After '92:)	850 mm (33.5 in)
	Foot peg height		380 mm (15.0 in)
		(After '92:)	340 mm (13.4 in)
	Dry weight	('86 – '88, '90 – '91:)	98 kg (216 lb)
		(After '92:)	101 kg (223 lb)
FRAME	Type		Semi double cradle
	Front suspension, travel	('86 – '88, '90 – '91:)	Telescopic 254 mm (10.0 in)
		(After '92:)	Telescopic 208 mm (8.2 in)
	Rear suspension, travel	('86 – '88, '90 – '91:)	Pro-link 245 mm (9.6 in)
		(After '92:)	Pro-link 211 mm (8.3 in)
	Front tire size, pressure		80/100-21 51M, 100 kPa(1.0 kg/cm², 15 psi)
	Rear tire size, pressure		100/100-17 58M, 100 kPa(1.0 kg/cm², 15 psi)
	Front brake, swept area		Internal expanding shoes, 86.3 cm² (13.4 sq. in)
	Rear brake, swept area		Internal expanding shoes, 86.3 cm² (13.4 sq. in)
	Fuel capacity		9.0 lit (2.4 U.S. gal, 2.0 Imp gal)
	Fuel reserve capacity		1.5 lit (0.4 U.S. gal, 0.3 Imp gal)
	Caster	('86 – '88, '90 – '91:)	64°
		(After '92:)	63°
	Trail	('86 – '88, '90 – '91:)	100 mm (3.9 in)
		(After '92:)	113.6 mm (4.47 in)
	Front fork oil capacity	('86 – '88, '90 – '91:)	350 cc (11.8 U.S. oz, 12.3 Imp oz)
		(After '92:)	377 cc (12.8 U.S. oz, 13.3 Imp oz)
ENGINE	Type		Gasoline, air-cooled 4-stroke SOHC
	Cylinder arrangement		Single cylinder inclined 15°
	Bore and stroke		65.5 x 57.8 mm (2.6 x 2.3 in)
	Displacement		195 cc (11.9 cu in)
	Compression ratio		10.0 : 1
	Valve train		2-valve, single chain driven SOHC
	Maximum horsepower		19.0 PS/9,000 rpm
	Maximum torque		1.7 kg-m, 7,000 rpm
	Oil capacity		1.1 lit (1.16 U.S. qt, 0.97 Imp qt)
	Lubrication system		Forced pressure and wet sump
	Air filtration system		Oiled polyurethane foam
	Cylinder compression		1,373 kPa (14.0 kg/cm², 199 psi)
	Intake valve	Opens	15° (BTDC) at 1 mm lift
		Closes	45° (ABDC) at 1 mm lift
	Exhaust valve	Opens	45° (BBDC) at 1 mm lift
		Closes	15° (ATDC) at 1 mm lift
	Valve clearance	Intake	0.05 mm (0.002 in)
		Exhaust	0.08 mm (0.003 in)
CARBURETOR	Type		Piston valve
	Identification number	('86 – '97:)	PD97A
		(After '97/Except California type:)	PD97A
		(After '97/California type:)	PD97B
	Venturi dia.		26 mm (1.0 in)
	Main jet	('86:)	#112
		('87 – '97:)	#110
		(After '97/Except California type:)	#110
		(After '97/California type:)	#102
	Slow jet	('86 – '97:)	#38
		(After '97/Except California type:)	#38
		(After '97/California type:)	#35
	Jet needle setting	('86:)	2nd groove
		(After '86:)	3rd groove
	Pilot screw		(see page 4-11)
	Float level		12.5 ± 0.5 mm (0.49 ± 0.02)
	Idle speed		1,300 ± 100 rpm

ITEM			SPECIFICATION
DRIVE TRAIN	Clutch		Wet multi-plate
	Transmission		6-speed constant mesh
	Primary reduction		3.333 : 1
	Gear ratio I		2.769 : 1
	Gear ratio II		1.941 : 1
	Gear ratio III		1.450 : 1
	Gear ratio IV		1.130 : 1
	Gear ratio V		0.923 : 1
	Gear ratio VI		0.785 : 1
	Final reduction		3.615 : 1 (drive sprocket 13T, driven sprocket 47T)
	Gear shift pattern		Left foot operated return system (1 – N – 2 – 3 – 4 – 5 – 6)
ELECTRICAL	Ignition		CDI (Capacitive Discharge Ignition)
	Ignition timing	Initial	10° BTDC at idle (F mark)
		Full advance	30° BTDC at 3,500 ± 150 rpm
	Alternator		108 W/5,000 rpm
	Spark plug	For cold climate (below 5°C/41°F)	DR7ES (NGK) X22ESR-U (DENSO)
		Standard	DR8ES-L (NGK) X24ESR-U (DENSO)
		For extended high speed riding	DR8ES (NGK) X27ESR-U (DENSO)
	Spark plug gap		0.6 – 0.7 mm (0.024 – 0.028 in)
	'86 through '88:		
	Headlight		12 V 35 W
	Taillight		12 V 3.4 W

TORQUE VALUES

ENGINE

ITEM	THREAD DIA. mm	TORQUE
Oil filter screen cap	36	10 – 20 N·m (1.0 – 2.0 kg-m, 7 – 14 ft-lb)
Valve clearance adjusting screw lock nut	6	17 – 23 N·m (1.7 – 2.3 kg-m, 12 – 17 ft-lb)
Cam chain tensioner adjusting bolt	16	15 – 22 N·m (1.5 – 2.2 kg-m, 11 – 16 ft-lb)
Cylinder head cap nut	8	28 – 30 N·m (2.8 – 3.0 kg-m, 20 – 22 ft-lb)
6 mm cylinder head bolt	6	8 – 12 N·m (0.8 – 1.2 kg-m, 6 – 9 ft-lb)
6 mm socket bolt	6	8 – 12 N·m (0.8 – 1.2 kg-m, 6 – 9 ft-lb)
Cam sprocket bolt	6	8 – 12 N·m (0.8 – 1.2 kg-m, 6 – 9 ft-lb)
Carburetor insulator bolt	6	8 – 12 N·m (0.8 – 1.2 kg-m, 6 – 9 ft-lb)
Pulse rotor mounting bolt	6	8 – 12 N·m (0.8 – 1.2 kg-m, 6 – 9 ft-lb)
Oil filter rotor nut	16	40 – 50 N·m (4.0 – 5.0 kg-m, 29 – 36 ft-lb)
Clutch center nut	16	40 – 50 N·m (4.0 – 5.0 kg-m, 29 – 36 ft-lb)
Flywheel bolt	8	45 – 55 N·m (4.5 – 5.5 kg-m, 33 – 40 ft-lb)
Kickstarter pedal bolt	8	20 – 35 N·m (2.0 – 3.5 kg-m, 14 – 25 ft-lb)

FRAME

ITEM	THREAD DIA. mm	TORQUE
Fuel tank mounting screw	6	8 – 12 N·m (0.8 – 1.2 kg-m, 6 – 9 ft-lb)
Fuel valve mounting screw	6	5 – 9 N·m (0.5 – 0.9 kg-m, 4 – 6 ft-lb)
Seat mounting bolt	6	8 – 12 N·m (0.8 – 1.2 kg-m, 6 – 9 ft-lb)
8 mm engine mounting bolt	8	30 – 40 N·m (3.0 – 4.0 kg-m, 22 – 29 ft-lb)
10 mm engine mounting bolt	10	55 – 65 N·m (5.5 – 6.5 kg-m, 40 – 48 ft-lb)
Exhaust pipe socket bolt	8	12 – 15 N·m (1.2 – 1.5 kg-m, 9 – 11 ft-lb)
Exhaust pipe flange nut	6	8 – 12 N·m (0.8 – 1.2 kg-m, 6 – 9 ft-lb)
Steering bearing adjusting nut	26	1.0 – 2.0 N·m (0.1 – 0.2 kg-m, 0.7 – 1.4 ft-lb)
Steering stem nut	24	95 – 140 N·m (9.5 – 14.0 kg-m, 69 – 101 ft-lb)
Fork upper pinch bolt	8	25 – 30 N·m (2.5 – 3.0 kg-m, 18 – 22 ft-lb)
Fork lower pinch bolt	8	30 – 35 N·m (3.0 – 3.5 kg-m, 22 – 25 ft-lb)
Handlebar holder bolt	8	24 – 30 N·m (2.4 – 3.0 kg-m, 17 – 22 ft-lb)
Front axle nut	12	50 – 80 N·m (5.0 – 8.0 kg-m, 36 – 58 ft-lb)
Front axle holder nut	6	10 – 14 N·m (1.0 – 1.4 kg-m, 7 – 10 ft-lb)
Fork cap bolt	32	25 – 35 N·m (2.5 – 3.5 kg-m, 18 – 25 ft-lb)
Fork socket bolt	10	25 – 35 N·m (2.5 – 3.5 kg-m, 18 – 25 ft-lb)
Spoke	BC3.5	2.5 – 5.0 N·m (0.25 – 0.50 kg-m, 1.8 – 3.6 ft-lb)

ITEM	THREAD DIA. mm	TORQUE
Rim lock	6	10–15 N·m (1.0–1.5 kg-m, 7–11 ft-lb)
Front brake arm bolt	6	8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)
Final driven sprocket nut	8	34–40 N·m (3.4–4.0 kg-m, 25–29 ft-lb)
Rear axle nut	16	80–110 N·m (8.0–11.0 kg-m, 58–80 ft-lb)
Rear shock absorber mounting bolt		
(upper)	10	40–50 N·m (4.0–5.0 kg-m, 29–36 ft-lb)
(lower)	10	40–50 N·m (4.0–5.0 kg-m, 29–36 ft-lb)
Swingarm pivot nut	14	80–100 N·m (8.0–10.0 kg-m, 58–72 ft-lb)
Shock arm-to-swing arm bolt	12	90–120 N·m (9.0–12.0 kg-m, 65–87 ft-lb)
Shock arm-to-shock link bolt	10	40–50 N·m (4.0–5.0 kg-m, 29–36 ft-lb)
Shock link-to-frame bolt	10	40–50 N·m (4.0–5.0 kg-m, 29–36 ft-lb)
Rear brake arm bolt	6	8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)
Damper rod end nut ('86–'88, '90–'91:)	12	24–29 N·m (2.4–2.9 kg-m, 17–21 ft-lb)
Compression damping valve ('86–'88, '90–'91:)	24	25–35 N·m (2.5–3.5 kg-m, 18–25 ft-lb)
Reservoir hose oil bolt ('86–'88, '90–'91:)	10	25–35 N·m (2.5–3.5 kg-m, 18–25 ft-lb)
Reservoir hose joint lock nut ('86–'88, '90–'91:)	12	20–25 N·m (2.0–2.5 kg-m, 14–18 ft-lb)
Rear shock spring lock nut	46	80–100 N·m (8.0–10.0 kg-m, 58–72 ft-lb)
Muffler mounting bolt	8	20–30 N·m (2.0–3.0 kg-m, 14–22 ft-lb)
Fork drain bolt	4	1–2 N·m (0.1–0.2 kg-m, 0.7–1.4 ft-lb)
Foot peg bolt	10	55–65 N·m (5.5–6.5 kg-m, 40–47 ft-lb)
Brake pedal bolt	8	24–30 N·m (2.4–3.0 kg-m, 17–22 ft-lb)
Gearshift pedal bolt	6	8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)
Kick starter pedal bolt	8	20–35 N·m (2.0–3.5 kg-m, 14–25 ft-lb)
Side stand pivot bolt	10	35–45 N·m (3.5–4.5 kg-m, 25–33 ft-lb)
Exhaust pipe protector bolt	6	10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)

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

STANDARD TORQUE VALUES

TYPE	TORQUE N·m (kg-m, ft-lb)	TYPE	TORQUE N·m (kg-m, ft-lb)
5 mm bolt, nut	4.5–6.0 (0.45–0.6, 3.3–4.3)	5 mm screw	3.5–5 (0.35–0.5, 2.5–3.6)
6 mm bolt, nut	8–12 (0.8–1.2, 6–9)	6 mm screw	7–11 (0.7–1.1, 5–8)
8 mm bolt, nut	18–25 (1.8–2.5, 13–18)	6 mm bolt with 8 mm head	7–11 (0.7–1.1, 5–8)
10 mm bolt, nut	30–40 (3.0–4.0, 22–29)	6 mm flange bolt, nut	10–14 (1.0–14, 7–10)
12 mm bolt, nut	50–60 (5.0–6.0, 36–43)	8 mm flange bolt, nut	24–30 (2.4–3.0, 17–22)
		10 mm flange bolt, nut	35–45 (3.5–4.5, 25–32)

TOOLS

VALVE SEAT CUTTERS

DESCRIPTION	TOOL NUMBER	ALTERNATIVE TOOL/NUMBER	REF. TO PAGE
Seat cutter, 27.5 mm (45° IN)	07780–0010200	Not available in U.S.A. Equivalent commercially available in U.S.A.	6-10, 11
Seat cutter, 33 mm (45° EX)	07780–0010800		6-10, 11
Flat cutter, 33 mm (32° IN)	07780–0012900		6-10, 11
Flat cutter, 28 mm (32° EX)	07780–0012100		6-10, 11
Interior cutter, 30 mm (60° IN/EX)	07780–0014000		6-10, 11
Cutter holder, 5.5 mm	07781–0010101		6-10, 11

COMMON

DESCRIPTION	TOOL NUMBER	ALTERNATIVE TOOL/NUMBER	REF. TO PAGE
Carburetor float level gauge	07401 – 0010000		4-9
Wrench, 10 x 12 mm	07708 – 0030200	or equivalent commercially available in U.S.A.	3-7
Adjusting wrench A	07708 – 0030300		3-7
Spanner C, 5.8 x 6.1 mm	07701 – 0020300		3-17
Retainer wrench attachment	07710 – 0010100		12-4, 6
Retainer wrench body	07710 – 0010401		12-4, 6
Wrench, 20 x 24 mm	07716 – 0020100		8-5, 7
Wrench, 30 x 32 mm	07716 – 0020400		11-18, 21
Extension bar	07716 – 0020500	or equivalent commercially available in U.S.A.	8-5, 7, 11-18, 19, 21
Gear holder	07724 – 0010200	not available in U.S.A.	8-4, 7
Flywheel holder	07725 – 0040000	or equivalent commercially available in U.S.A.	9-2, 3
Flywheel puller	07733 – 0010000	07933 – 3000000	9-3
Valve guide driver, 5.5 mm	07742 – 0010100		6-8, 9
Attachment, 24 x 26 mm	07746 – 0010700		12-28
Attachment, 32 x 35 mm	07746 – 0010100		10-8, 11-7, 12-26
Attachment, 37 x 40 mm	07746 – 0010200		12-6
Attachment, 42 x 47 mm	07746 – 0010300		10-8, 11-19
Attachment, 52 x 55 mm	07746 – 0010400		10-8
Pilot, 15 mm	07746 – 0040300		10-8, 11-7
Pilot, 17 mm	07746 – 0040400		12-6
Pilot, 20 mm	07746 – 0040500		10-8, 12-26
Pilot, 30 mm	07746 – 0040700		10-8
Bearing remover shaft	07746 – 0050100		11-6, 12-5
Bearing remover head, 15 mm	07746 – 0050400		11-6
Bearing remover head, 17 mm	07746 – 0050500		12-5
Driver	07749 – 0010000		10-8, 11-7, 19, 12-6, 27, 28
Valve spring compressor	07757 – 0010000		6-7, 12

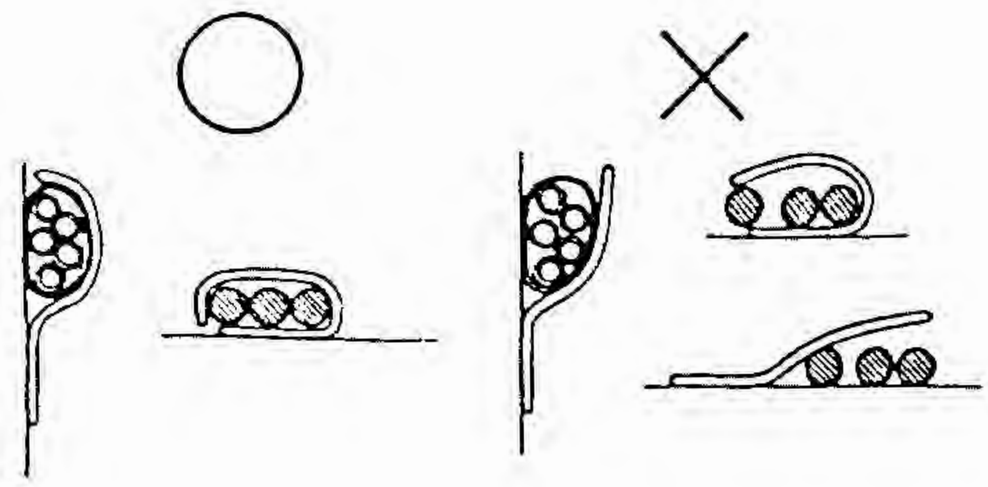
SPECIAL

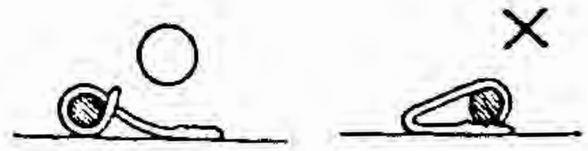
DESCRIPTION	TOOL NUMBER	ALTERNATIVE TOOL/NUMBER	REF. TO PAGE
Fork seal driver	07947 – 2730100	or 07947 – 3710101	11-16
Steering stem socket	07916 – KA50100	or equivalent commercially available in U.S.A.	11-19, 20
Ball race remover	07953 – 4250002	or 07953 – MJ1000B or 07953 – MJ1000A	11-19
Steering stem driver	07946 – 4300101	07946 – MB0000 and 07946 – KA6000A or GN-HT-54	11-20
Needle bearing remover	07931 – MA70000	Not available in U.S.A. or 07936 – 3710600 07936 – 3710100 07936 – 371020A or 07936 – 3710200 (U.S.A. only)	12-27
Spherical bearing driver	07946 – KA30200	not available in U.S.A.	12-23, 28, 29
Spherical bearing driver	07HMF – HC00100		12-29
Slider guide, 14 mm	07974 – KA40000		12-17
Damping valve wrench	07920 – KA30001		12-20, 21
Clutch center holder	07923 – 9580000	or 07HGB – 001010B or 07HGB – 001010A and 07HGB – 001020B or 07HGB – 001020A	8-5, 7
Holder attachment	07930 – KA50100		11-16
Bearing remover, 15 mm	07936 – KC10000		10-8
— remover assy, 15 mm	07936 – KC10500		10-8
— remover head, 15 mm	07936 – KC10200		10-8
— remover shaft, 15 mm	07936 – KC10100	not available in U.S.A.	10-8
— remover sliding weight	07741 – 0010201	or 07936 – 371020A or 07936 – 3710200	10-8
Valve guide reamer, 5.5 mm	07984 – 0980000	or 07984 – 098000D	6-8

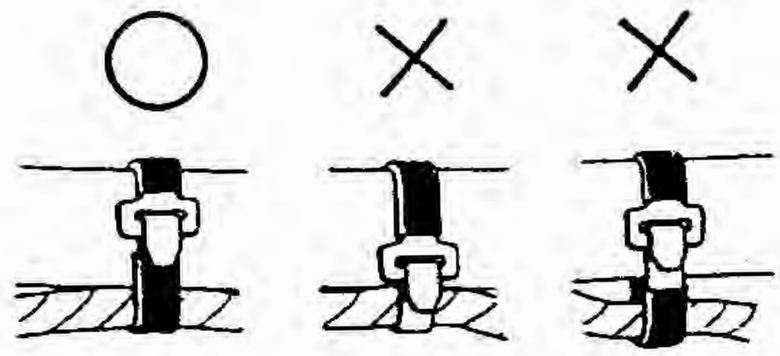
CABLE & HARNESS ROUTING

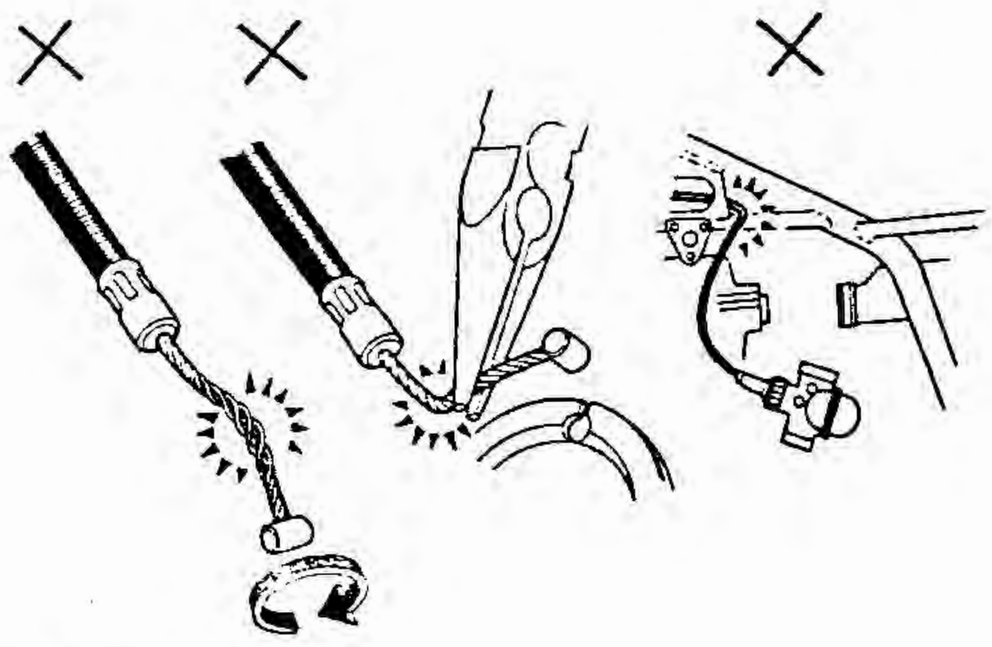
Note the following when routing cables and wire harnesses:

- 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 a wire against a weld, or the end of its clamp.
- Secure wires and wire harnesses to the frame with their respective bands at the designated locations. Tighten the bands so that only the insulated surfaces contact the wires or wire harneses.
- Route harnesses so they are neither pulled taut nor have excessive slack.
- Protect wires and harnesses with electrical tape or tubing where they contact a sharp edge or corner. Clean all surfaces thoroughly before applying tape.
- Do not use wires or harnesses with damaged insulation. Repair the wires by wrapping them with protective tape.
- Route wire harnesses to avoid sharp edges or corners.
- Avoid the projected ends of bolts and screws.
- Keep wire harnesses away from the exhaust pipes and other hot parts.
- Be sure grommets are seated in their grooves properly.
- After clamping, check each harness to be certain that it is not interfering with any moving or sliding parts.
- After routing, check that the wire harnesses are not twisted or kinked.
- Wire harnesses routed along the handlebars should not be pulled taut, have excessive slack, or interfere with adjacent or surrounding parts in any steering position.
- Do not bend or twist control cables. Damaged control cables will not operate smoothly and may stick or bind.









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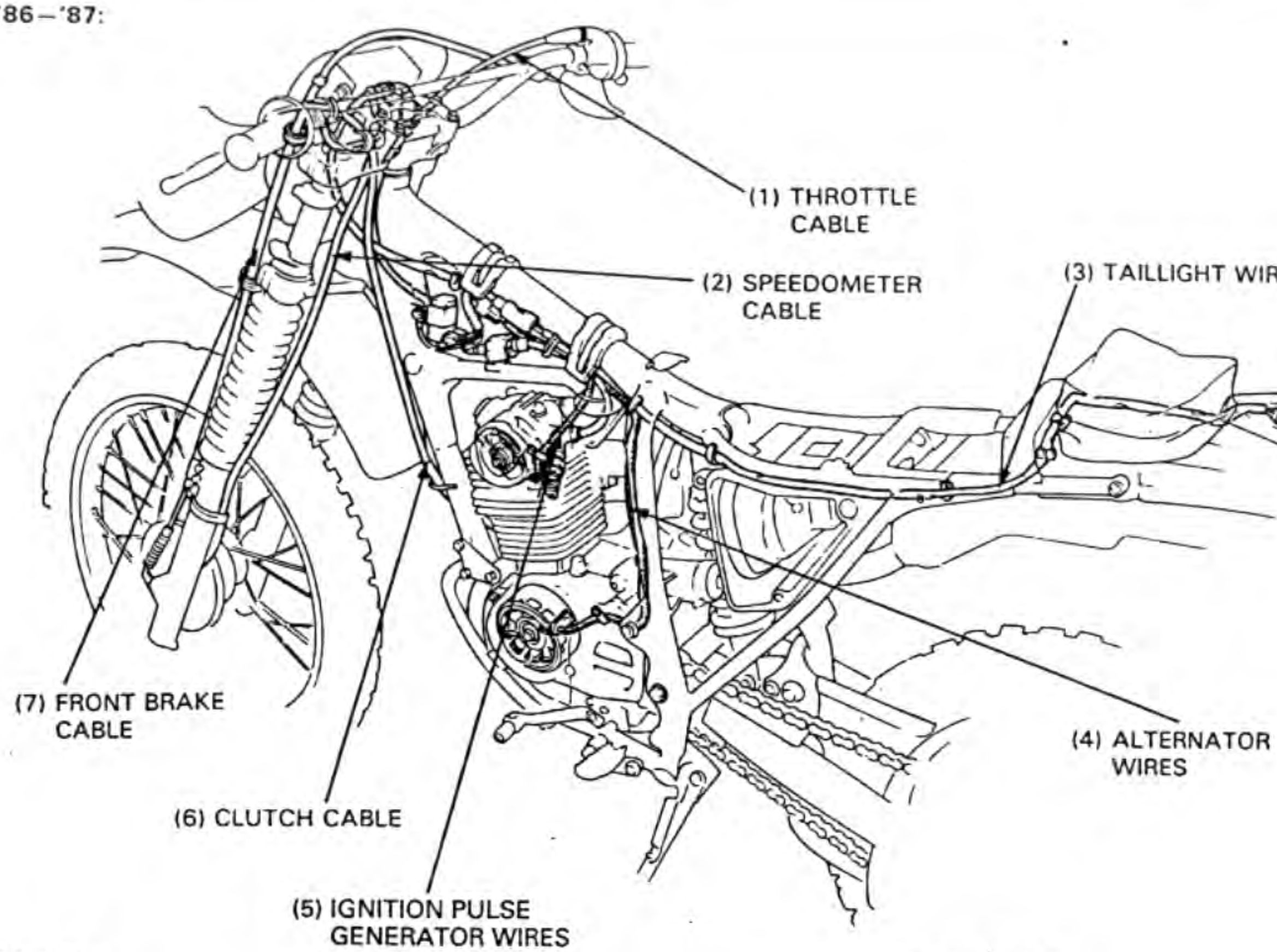
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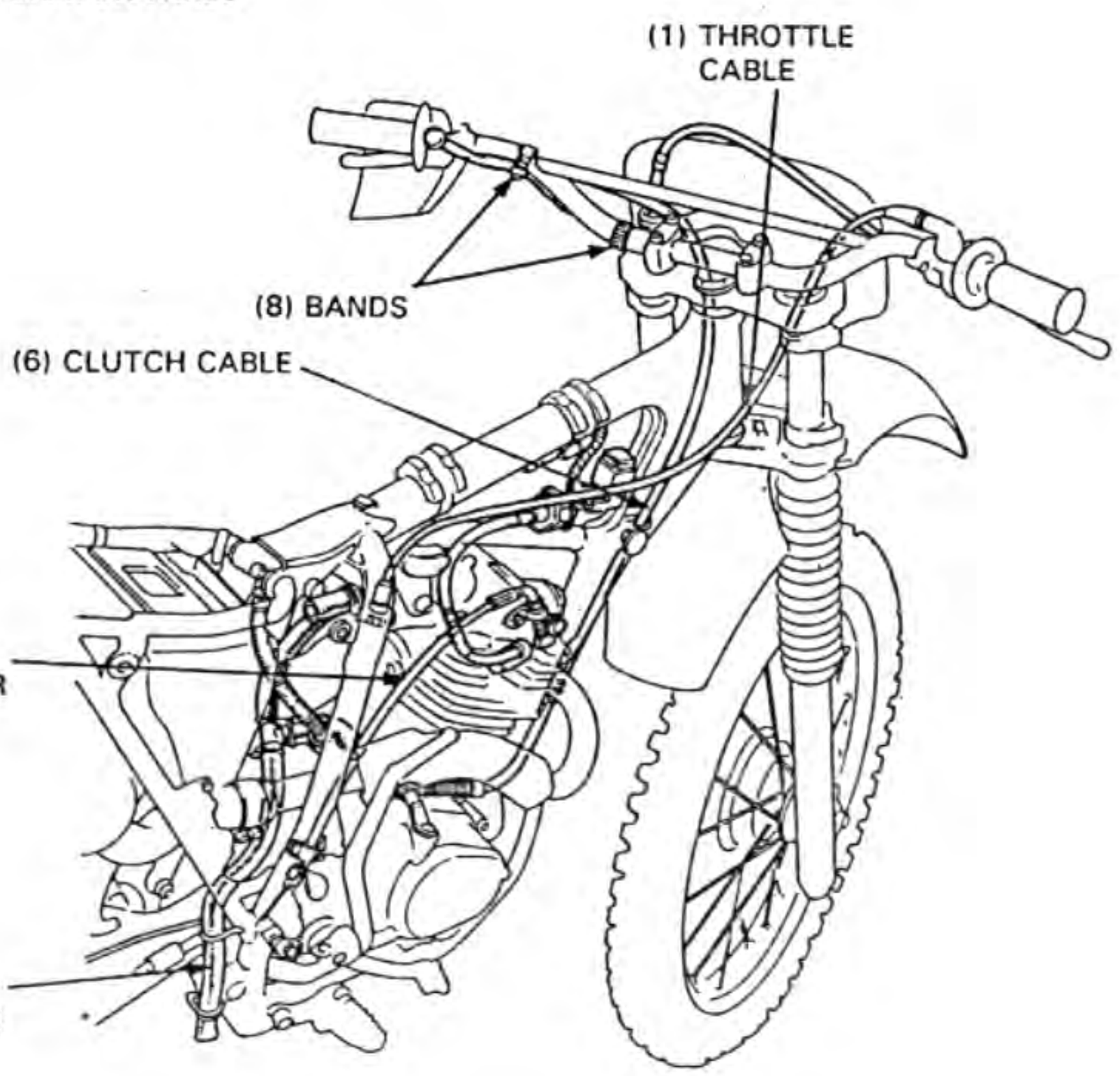
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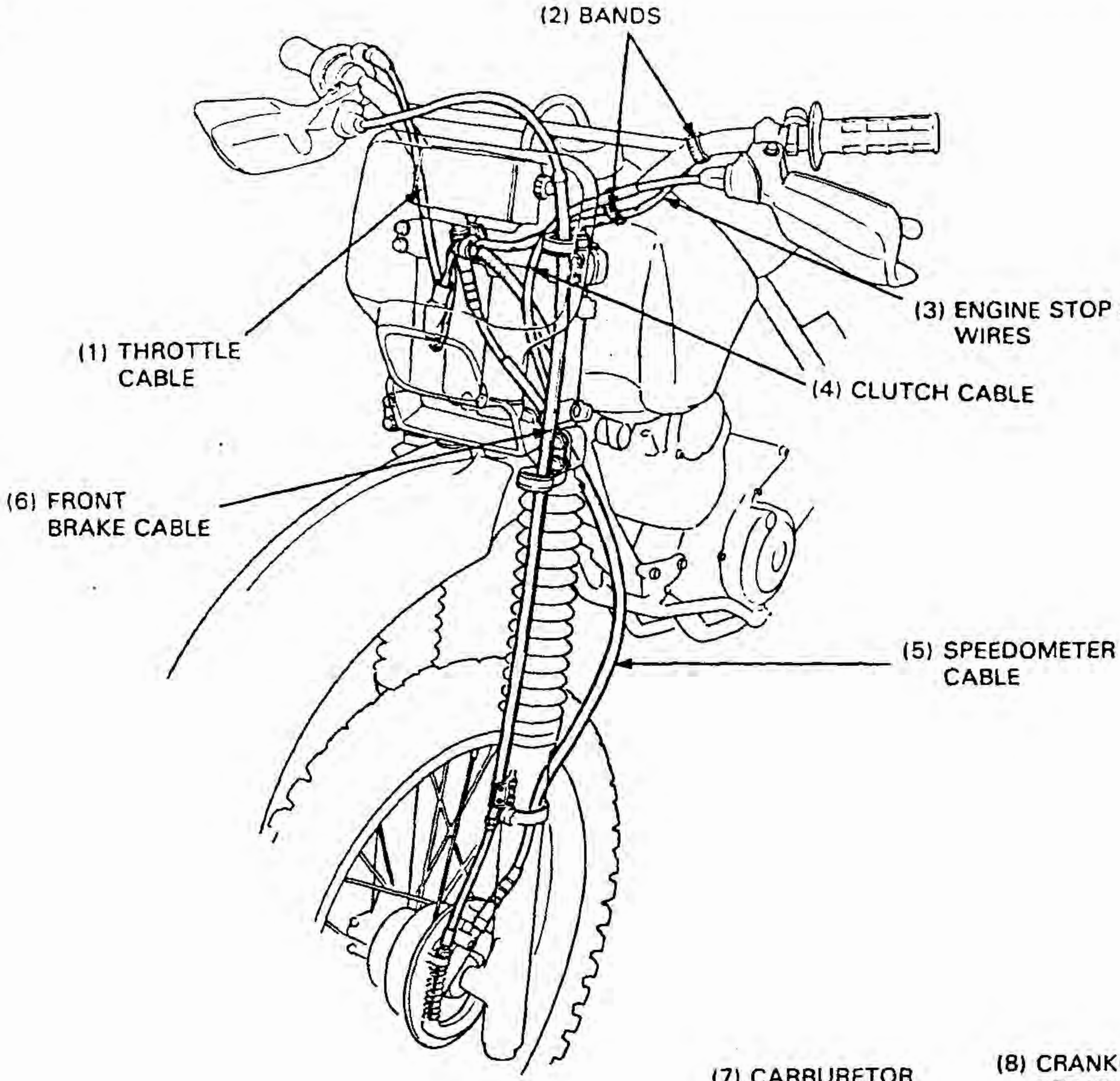
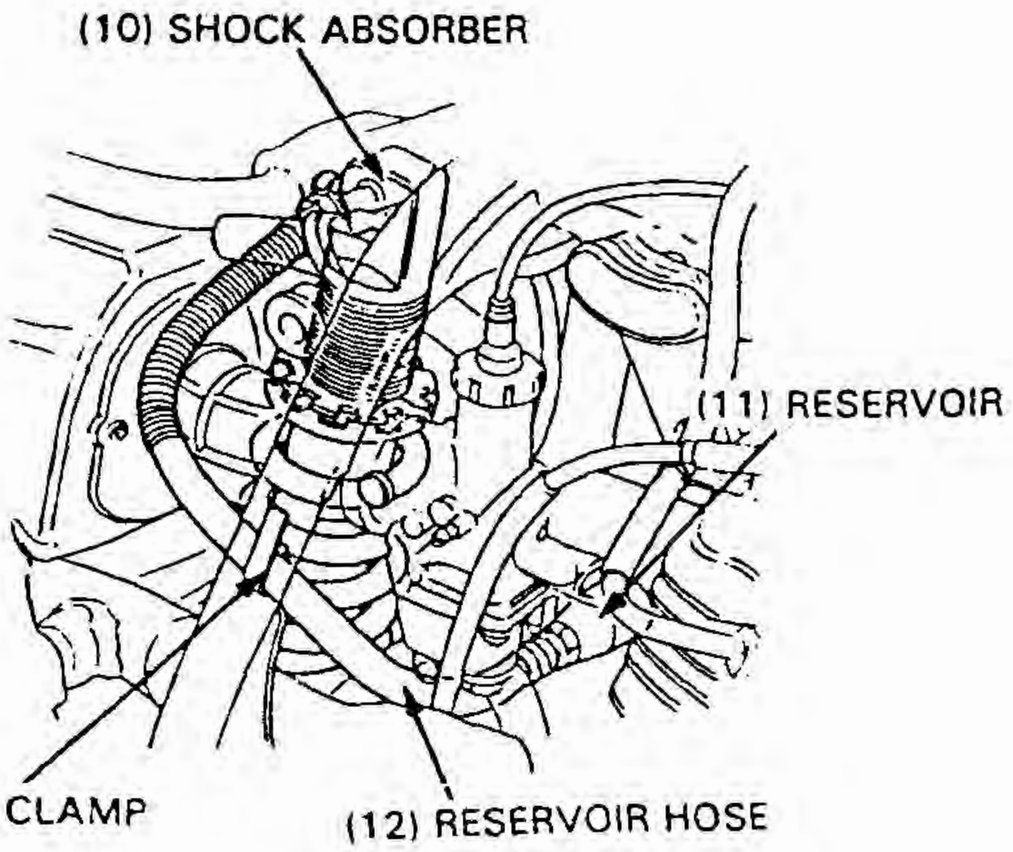
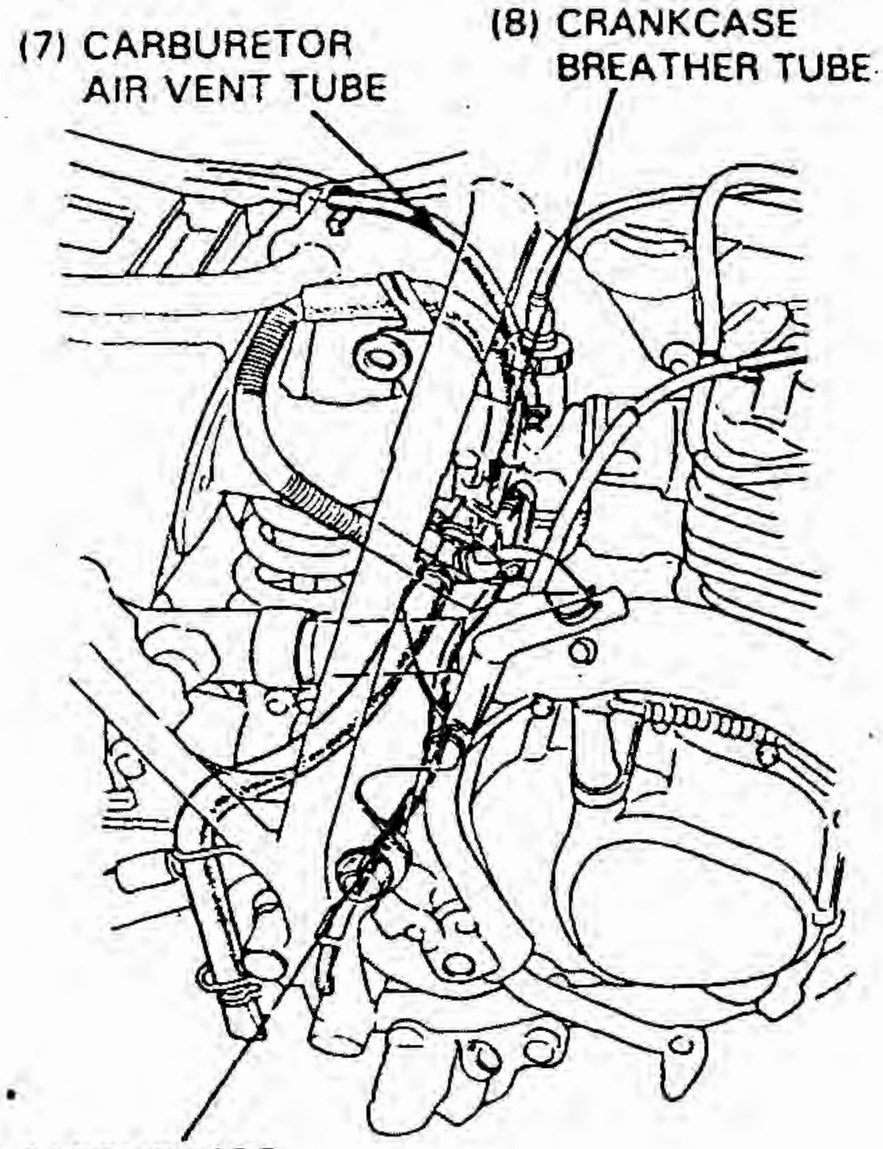
(9) STARTER DECOMPRESSOR CABLE
(10) CRANKCASE BREATHER TUBE

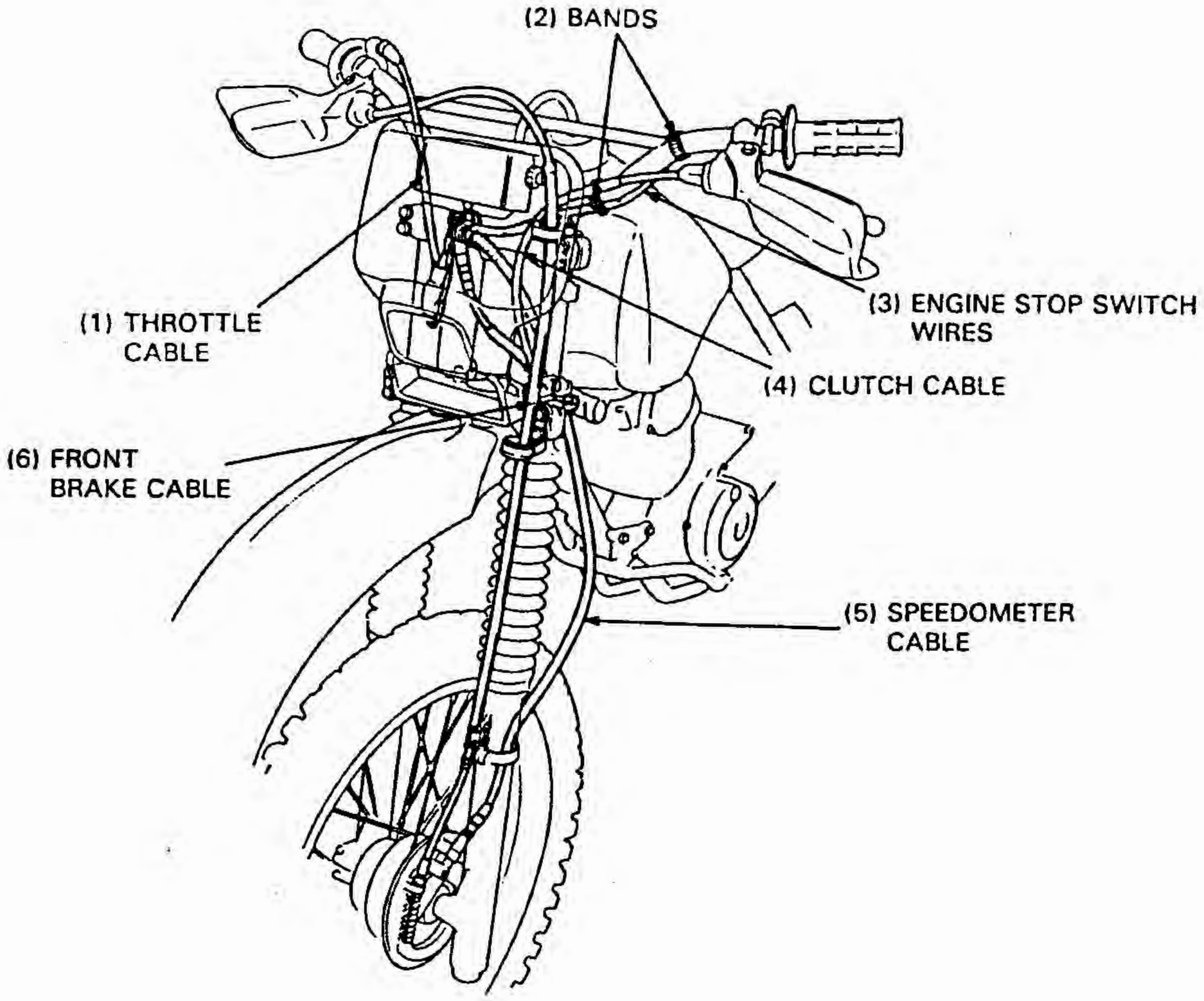
'86—'87:


(2) BANDS
(1) THROTTLE CABLE
(3) ENGINE STOP SWITCH WIRES
(4) CLUTCH CABLE
(6) FRONT BRAKE CABLE
(5) SPEEDOMETER CABLE

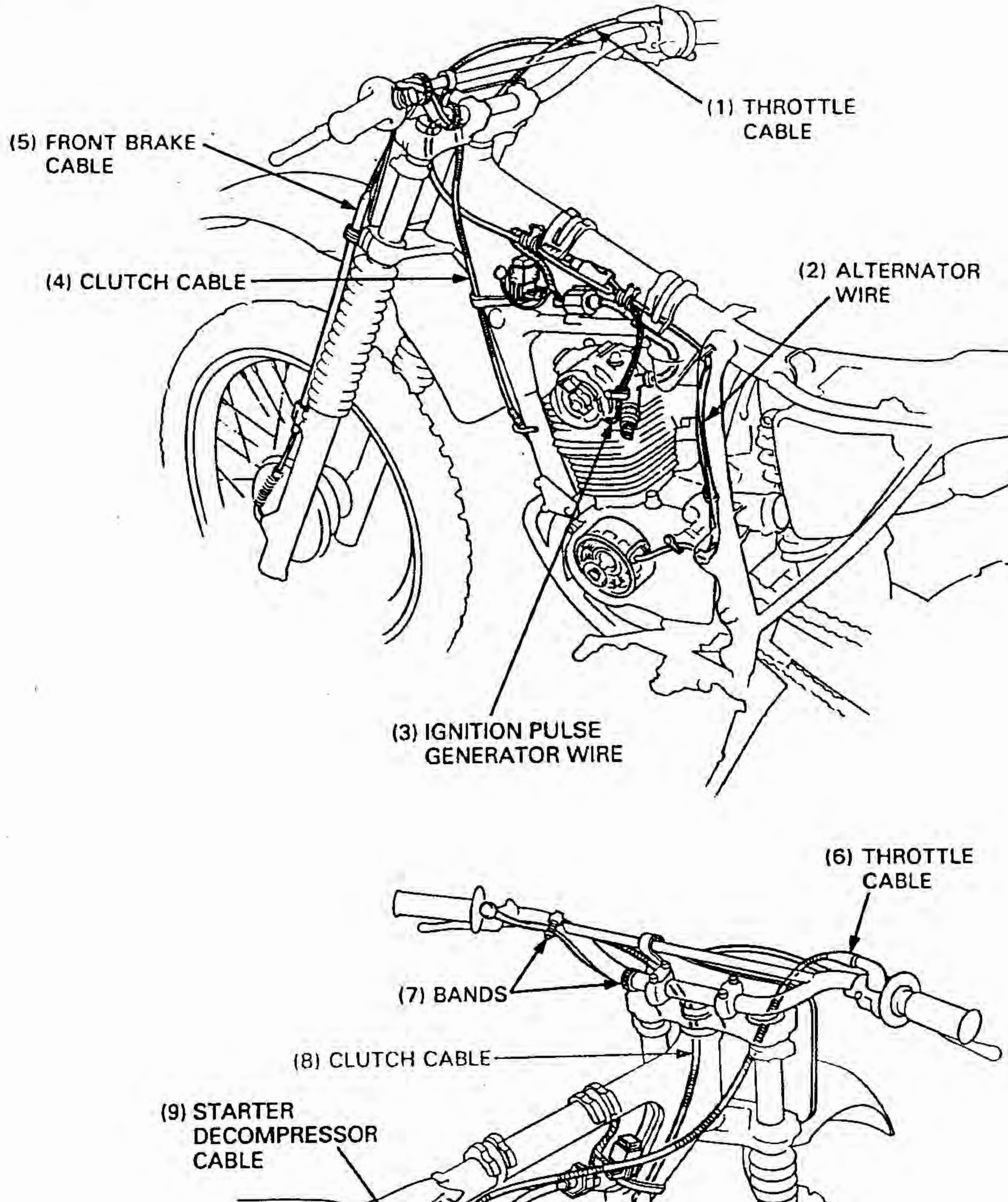

(10) SHOCK ABSORBER
(11) RESERVOIR
(13) CLAMP
(12) RESERVOIR HOSE


(7) CARBURETOR AIR VENT TUBE
(8) CRANKCASE BREATHER TUBE
(9) CARBURETOR OVERFLOW TUBE

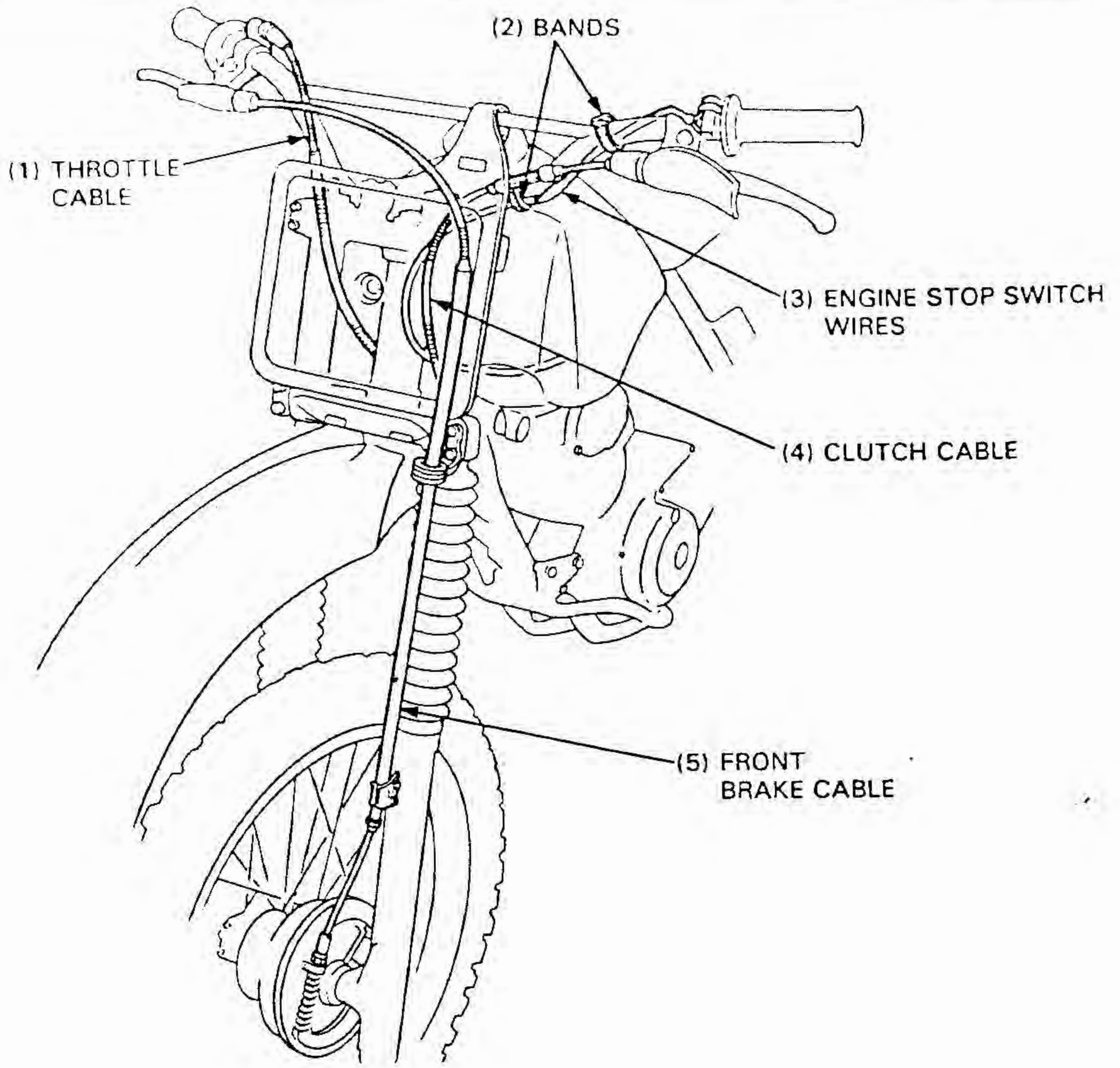
8:


(2) BANDS
(1) THROTTLE CABLE
(3) ENGINE STOP SWITCH WIRES
(4) CLUTCH CABLE
(6) FRONT BRAKE CABLE
(5) SPEEDOMETER CABLE

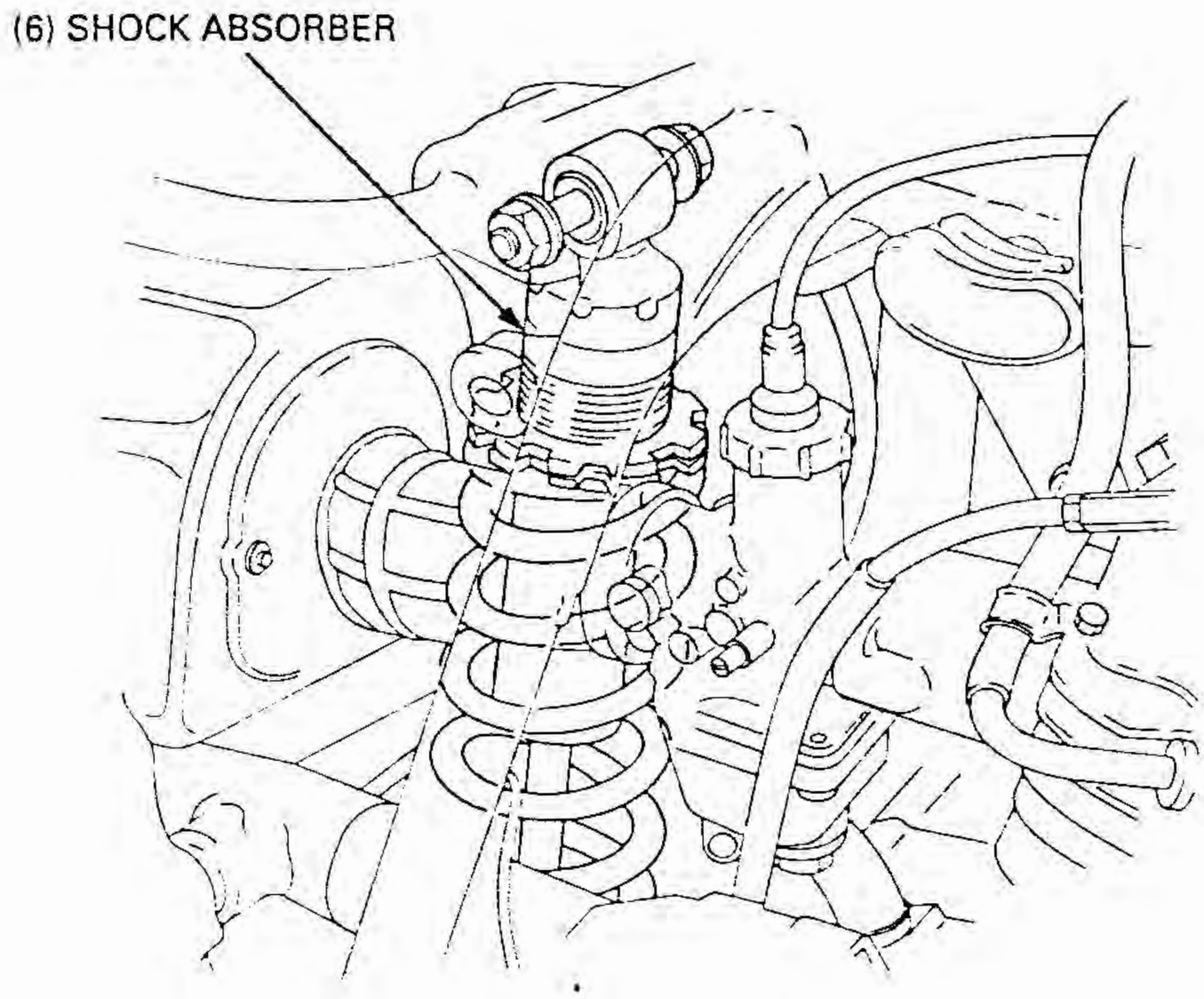
AFTER '89:


(1) THROTTLE CABLE
(2) ALTERNATOR WIRE
(3) IGNITION PULSE GENERATOR WIRE
(4) CLUTCH CABLE
(5) FRONT BRAKE CABLE
(6) THROTTLE CABLE
(7) BANDS
(8) CLUTCH CABLE
(9) STARTER DECOMPRESSOR CABLE
(10) CRANKCASE BREATHER TUBE

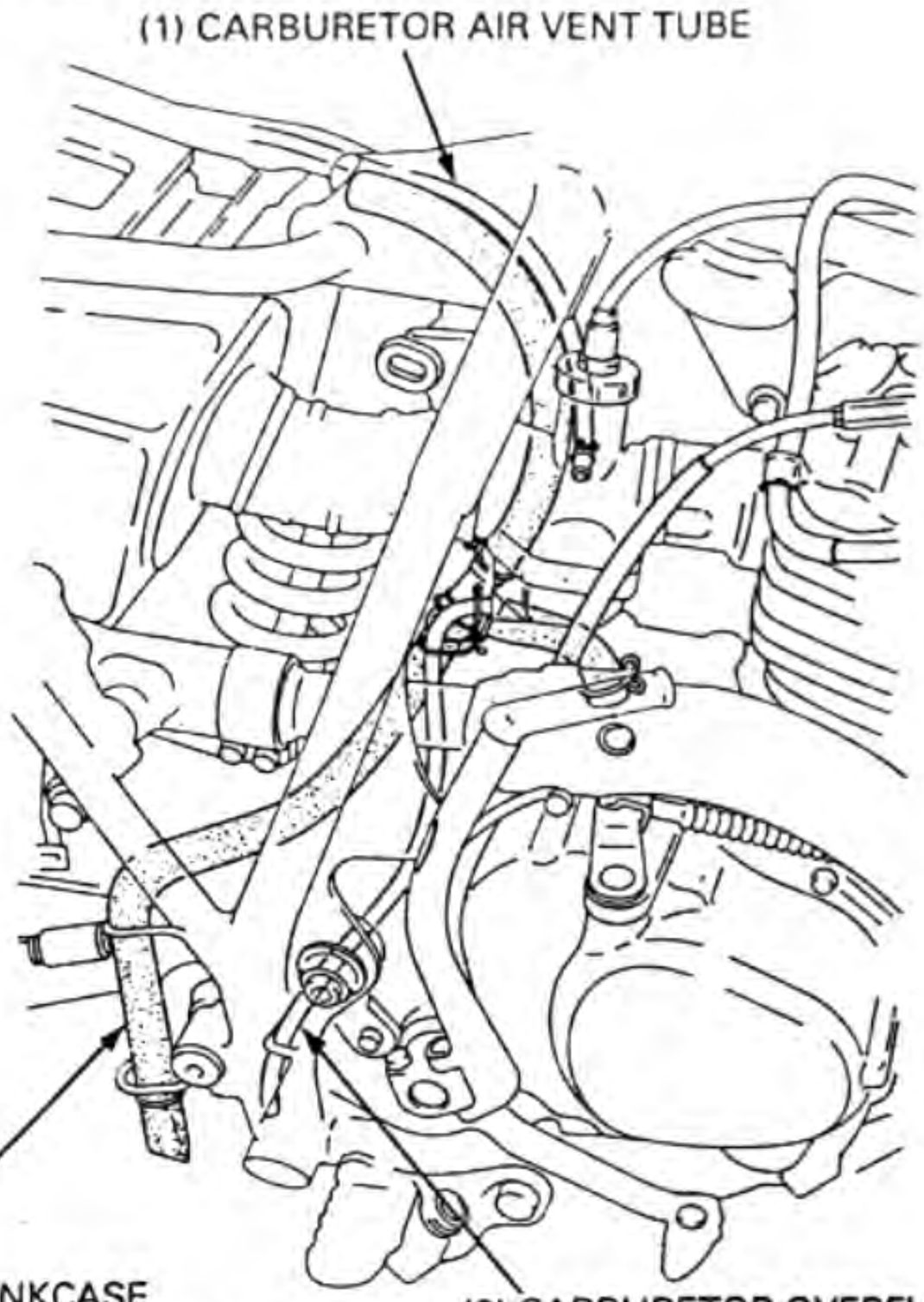
After '88:



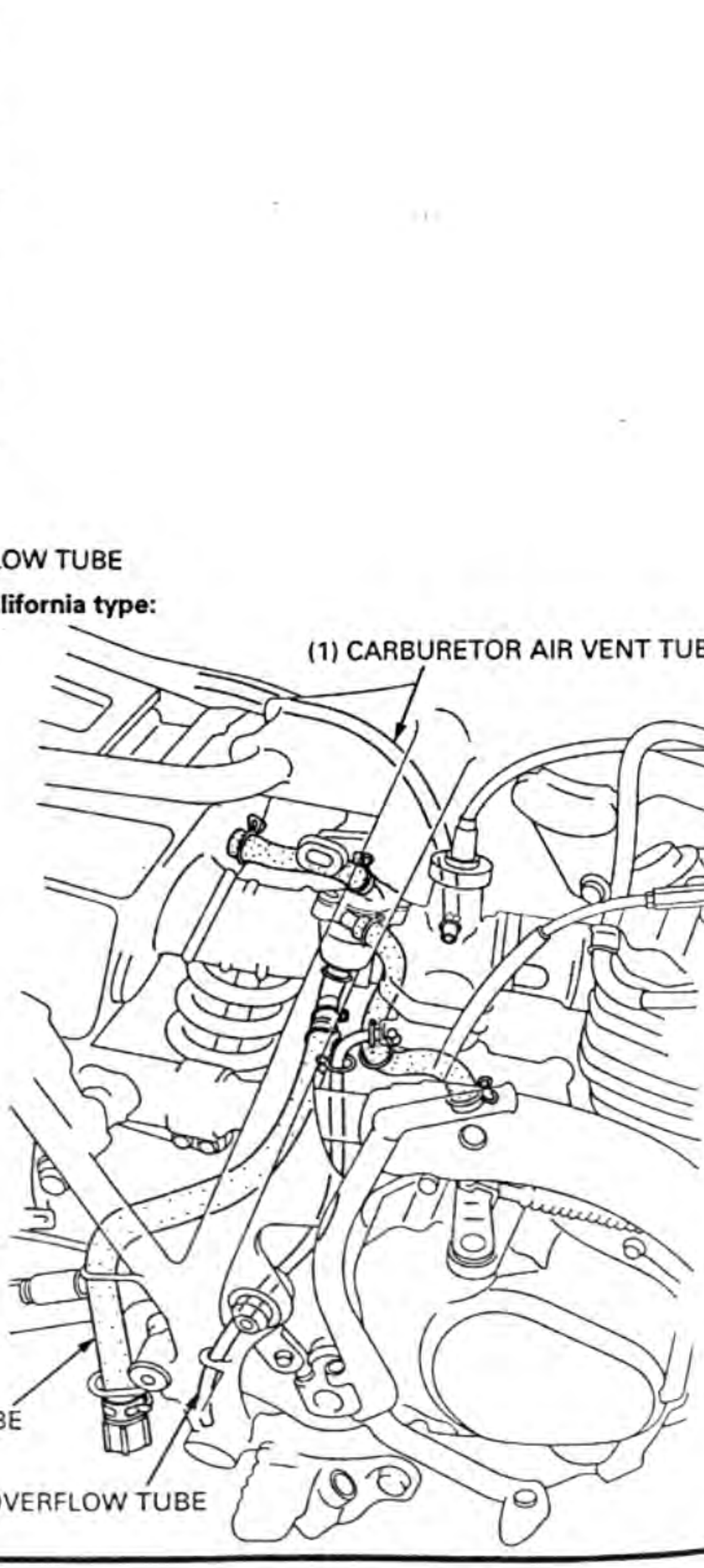
After '92:



'93 – '97:
After '97/Except California type:



After '97/California type:



EMISSION CONTROL SYSTEMS (AFTER '97/CALIFORNIA TYPE ONLY)

The California Air Resources Board (CARB) requires manufacturers to certify that their motorcycles comply with applicable exhaust emissions standards during their useful life, when operated and maintained according to the instructions provided (California type only).

SOURCE OF EMISSIONS

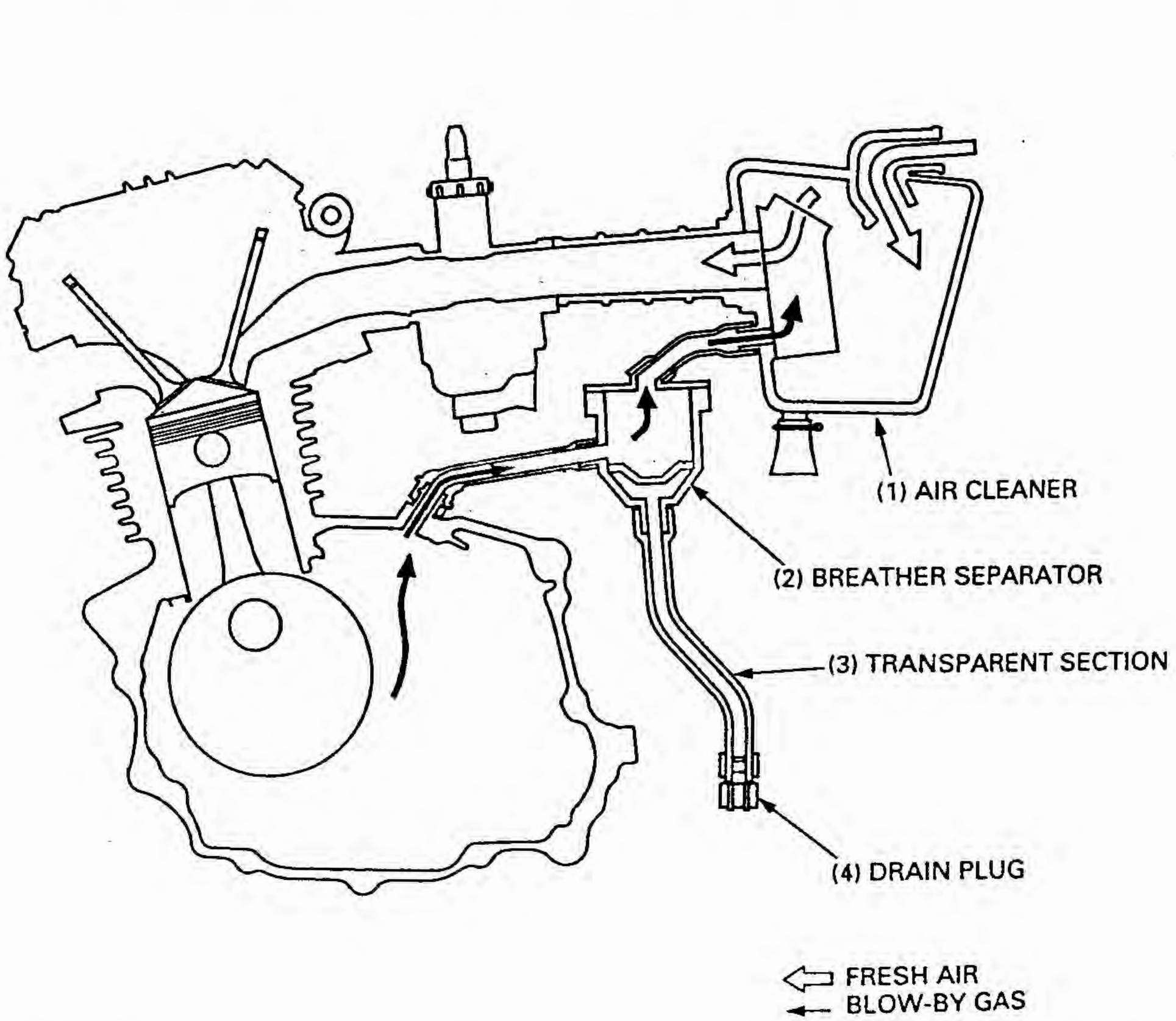
The combustion process produces carbon monoxide and hydrocarbons. Control of hydrocarbons is very important because, under certain conditions, they react to form photochemical smog when subjected to sunlight. Carbon monoxide does not react in the same way, but it is toxic.
Honda Motor Co., Ltd. utilizes lean carburetor settings as well as other systems, to reduce carbon monoxide and hydrocarbons.

EXHAUST EMISSION CONTROL SYSTEM (CALIFORNIA TYPE ONLY)

The exhaust emission control system is composed of a lean carburetor setting, and no adjustments should be made except idle speed adjustment with the throttle stop screw. The exhaust emission control system is separate from the crankcase emission control system.

CRANKCASE EMISSION CONTROL SYSTEM (CALIFORNIA TYPE ONLY)

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



NOISE EMISSION CONTROL SYSTEM (U.S.A. ONLY)

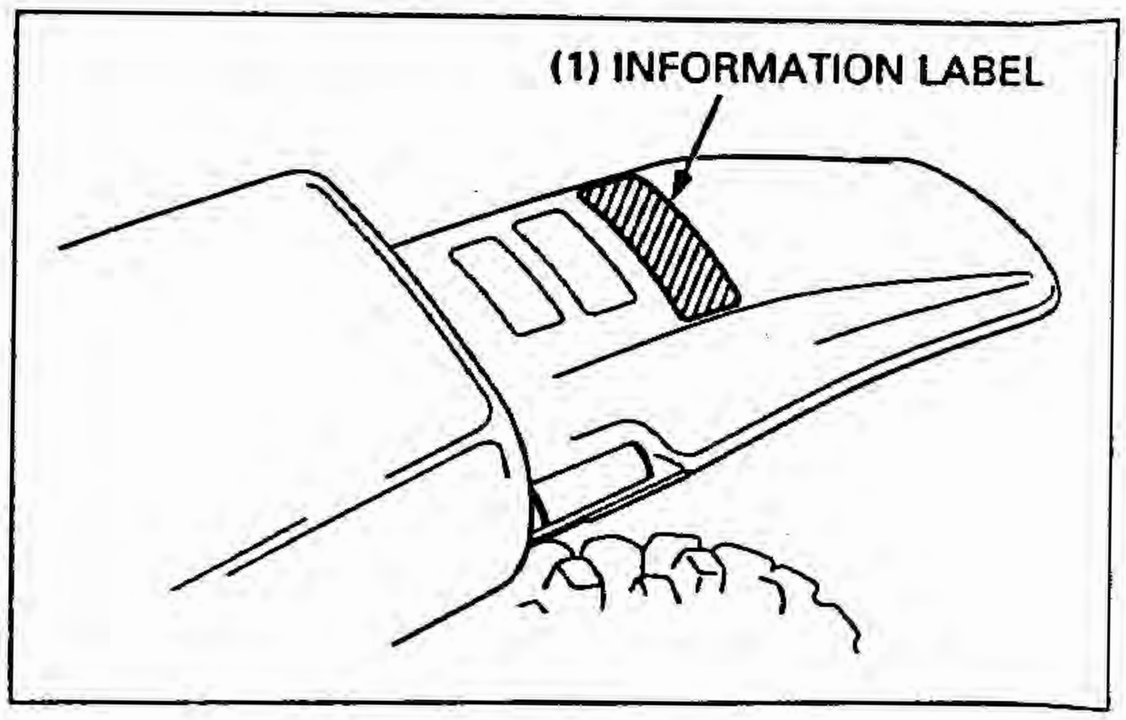
- The U.S. Environmental Protection Agency requires manufacturers to certify that motorcycles built after January 1, 1983 comply with applicable noise emission standards for one year or 1,865 miles (3,000 km) after the time of sale to the ultimate purchaser, when operated and maintained according to the instructions provided. Compliance with the terms of the Distributor's Warranty for the Honda Motorcycle Noise Emission Control System is necessary in order to keep the noise emission control system in effect.

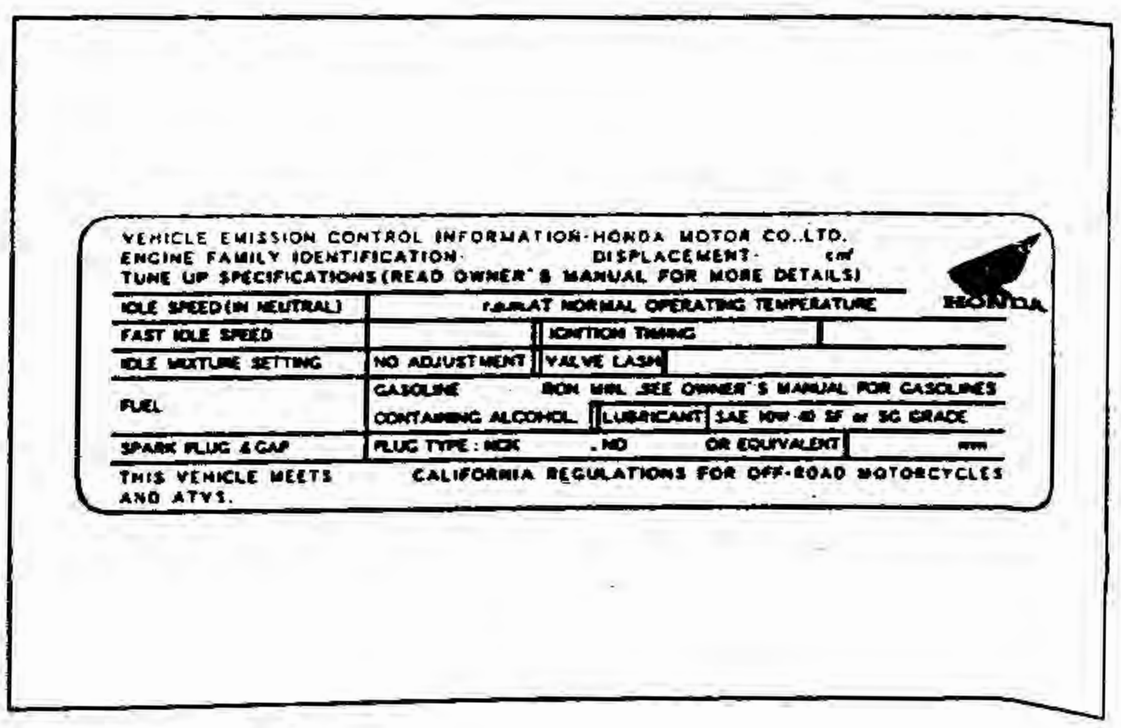
- TAMPERING WITH THE NOISE CONTROL SYSTEM IS PROHIBITED: Federal law prohibits the following acts or the causing thereof: (1) The removal or rendering inoperative by any person, other than for purposes of maintenance, repair, or replacement, of any device or element of design incorporated into any new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

- AMONG THOSE ACTS PRESUMED TO CONSTITUTE TAMPERING ARE THE ACTS LISTED BELOW:
  1. Removal of, or puncturing the muffler, baffles, header pipes or any other component which conducts exhaust gases.
  2. Removal of, or puncturing of any part of the intake system.
  3. Lack of proper maintenance.
  4. Replacing any moving parts of the vehicle, or parts of the exhaust or intake system, with parts other than those specified by the manufacturer.

VEHICLE EMISSION CONTROL INFORMATION LABEL (AFTER '97/CALIFORNIA TYPE ONLY)

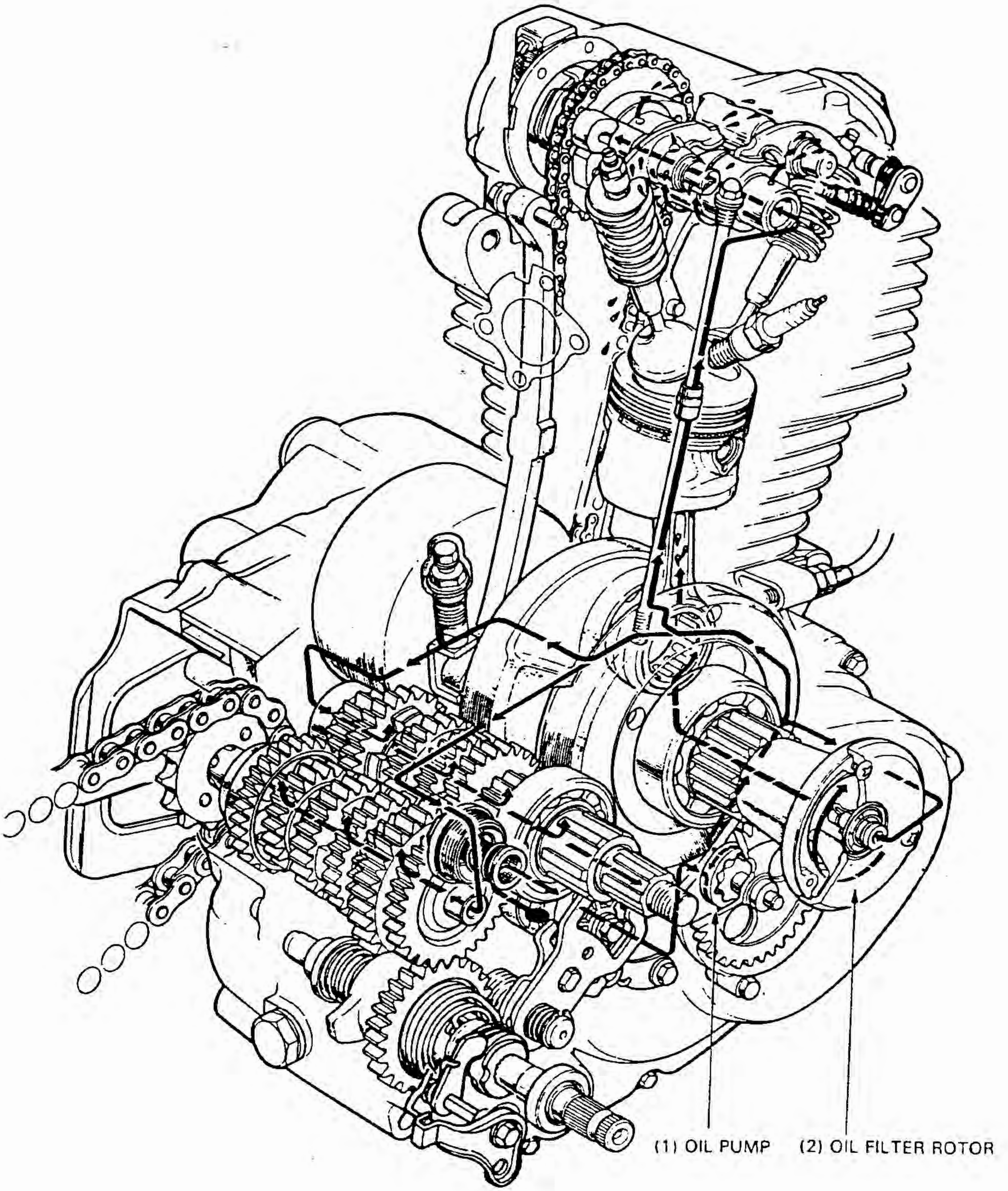
A Vehicle Emission Information Label is located on the rear fender as shown. It gives basic tune-up specifications.




VEHICLE EMISSION CONTROL INFORMATION-HONDA MOTOR CO.,LTD.
ENGINE FAMILY IDENTIFICATION- DISPLACEMENT- cm³
TUNE UP SPECIFICATIONS (READ OWNER'S MANUAL FOR MORE DETAILS)

IDLE SPEED (IN NEUTRAL)	r.p.m AT NORMAL OPERATING TEMPERATURE		
FAST IDLE SPEED		IGNITION TIMING	
IDLE MIXTURE SETTING	NO ADJUSTMENT	VALVE LASH	
FUEL	GASOLINE	RON MIN. SEE OWNER'S MANUAL FOR GASOLINES	
	CONTAINING ALCOHOL	LUBRICANT	SAE 10W-40 SF or SG GRADE
SPARK PLUG & GAP	PLUG TYPE : NGK . ND OR EQUIVALENT		mm

THIS VEHICLE MEETS CALIFORNIA REGULATIONS FOR OFF-ROAD MOTORCYCLES AND ATVS.


(1) OIL PUMP
(2) OIL FILTER ROTOR

2. LUBRICATION

SERVICE INFORMATION

GENERAL

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

SPECIFICATIONS

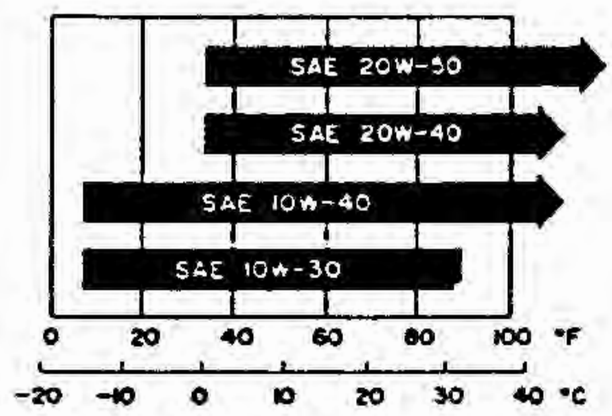
Oil capacity	1.1 lit (1.16 US qt, 0.97 Imp qt) at disassembly 0.9 lit (0.95 US qt, 0.80 Imp qt) at draining.
Recommended oil	Use HONDA GN4 4-STROKE OIL or equivalent. API SERVICE CLASSIFICATION: SF or SG VISCOSITY: SAE 10W—40/20W—50

NOTE

- Use SAE 10W—40 oil when the outside temperature is below 0°C (32°F).

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

Recommended oil viscosity



TORQUE VALUES

Oil filter screen cap:	10—20 N·m (1.0—2.0 kg-m, 7—14 ft-lb)

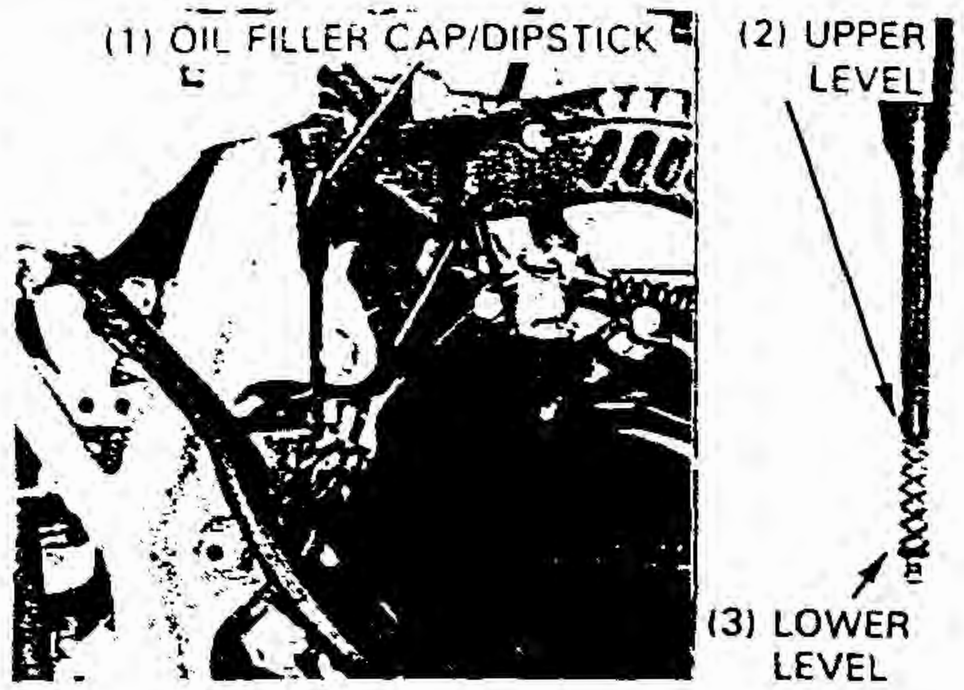
TROUBLESHOOTING

Oil level too low:
- Normal oil consumption
- External oil leaks
- Worn piston rings

Oil consumption:
- Oil not changed often enough
- Faulty head gasket

ENGINE OIL LEVEL CHECK

Start the engine and let it idle for 2-3 minutes. Turn off the engine and support the motorcycle in an upright position on level ground. Remove the filler cap/dipstick, wipe it clean, but do not screw it. Remove the filler cap/dipstick and check the oil level.
If the oil level is below the lower mark on the dipstick, fill to the upper level mark with the recommended oil.



ENGINE OIL CHANGE AND OIL FILTER SCREEN CLEANING

NOTE

- Drain the oil while the engine is warm and the motorcycle is on its side stand.
- The oil filter screen and spring will come out when the oil filter screen cap is removed.
- Use a 6-sided wrench or 24 mm socket to prevent rounding the corners on the screen cap.

Remove the oil filter screen cap.
Operate the kick starter pedal several times to completely drain any residual oil.
Clean the oil filter screen.

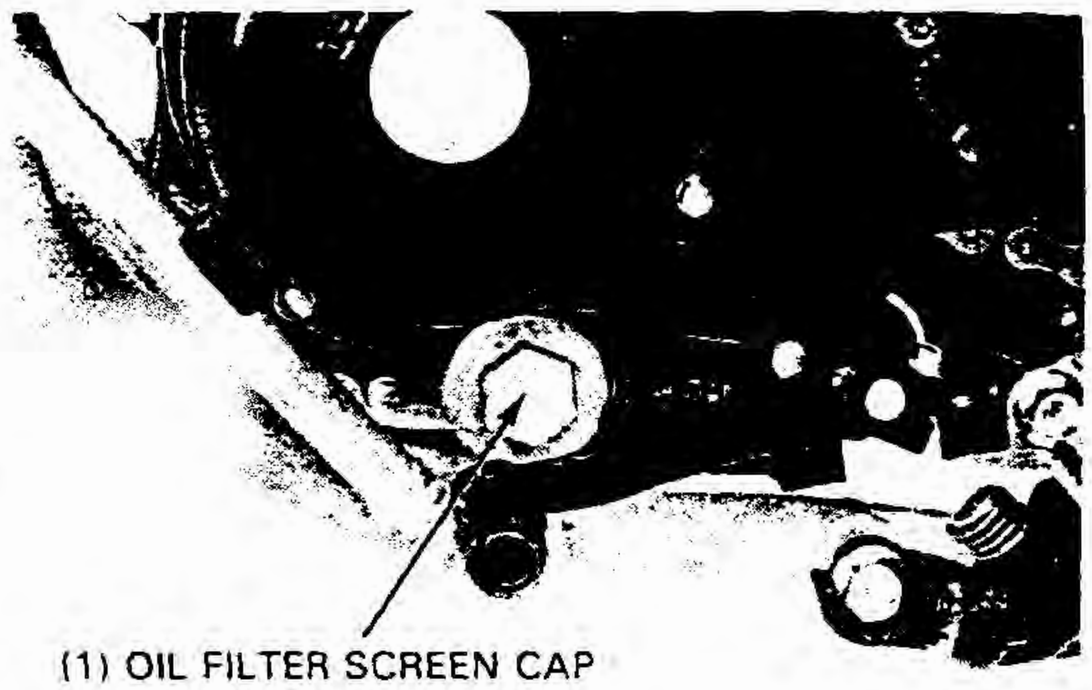
Make sure that the oil filter screen, sealing rubber, screen cap and O-ring are in good condition.
Install the oil filter screen with its sealing rubber toward the crankcase.
Install the spring and oil filter screen cap.
Tighten the oil filter screen cap.

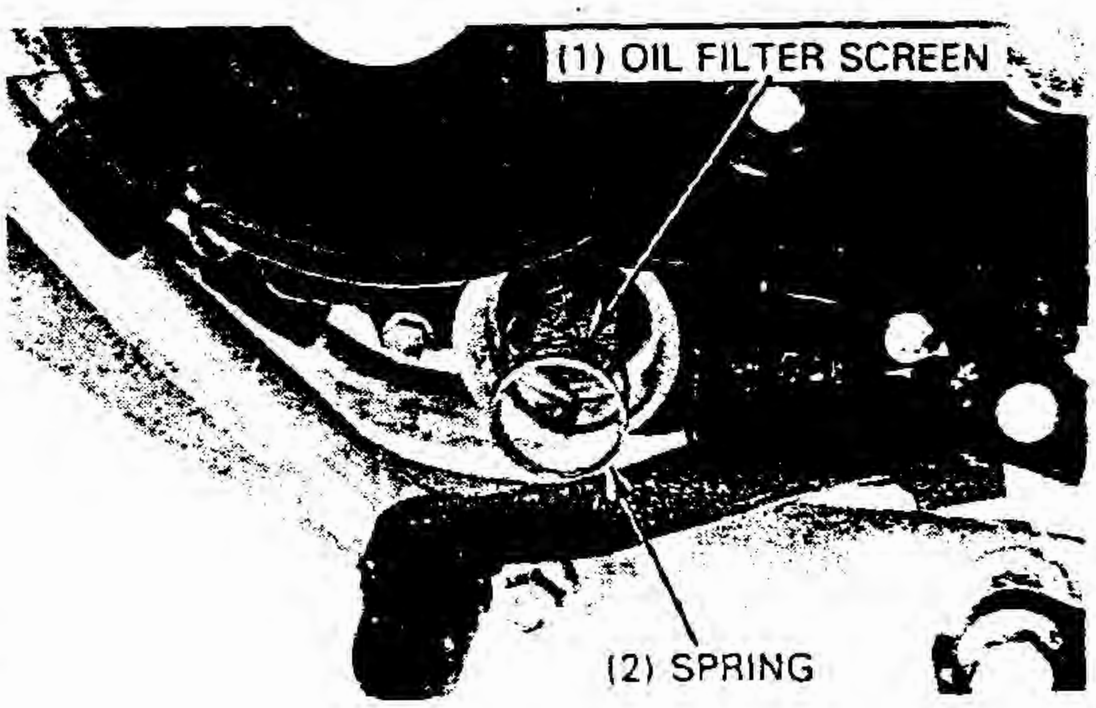
TORQUE: 10—20 N·m (1.0—2.0 kg-m, 7—14 ft-lb)

Fill the crankcase with the recommended grade oil.

ENGINE OIL CAPACITY:
0.9 liters (0.95 US qt, 0.80 Imp qt) after draining.

Start the engine and let it idle for 2-3 minutes.
Stop the engine.
With the motorcycle upright on level ground, make sure the oil level is at the upper level mark.
Be sure there are no leaks.



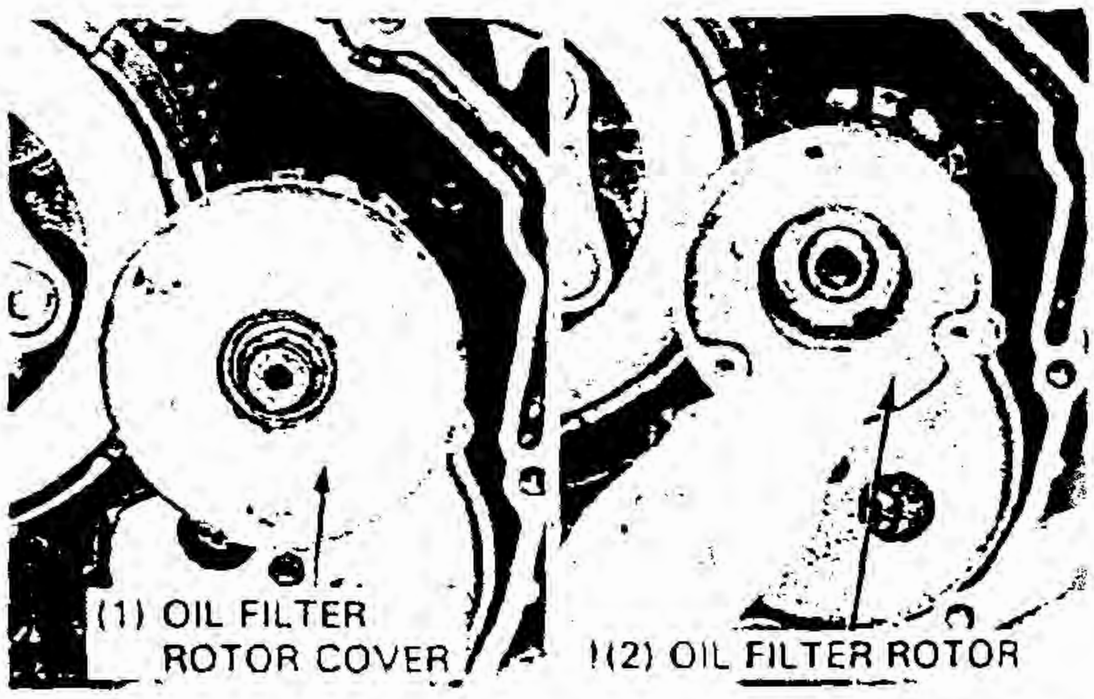


OIL FILTER ROTOR CLEANING

NOTE

- Clean the oil filter rotor before adding oil.

Remove the right crankcase cover (page 8-3).
Remove the oil filter rotor cover.
Clean the oil filter rotor.
Make sure that the rotor cover gasket is in good condition and then install the oil filter rotor cover.
Install the right crankcase cover (page 8-12).



CONTROL CABLE LUBRICATION

Periodically disconnect the throttle, clutch, brake, and decompressor control cables at their upper ends. Thoroughly lubricate the cables and their pivot points with a commercially available cable lubricant.

LUBRICATION

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

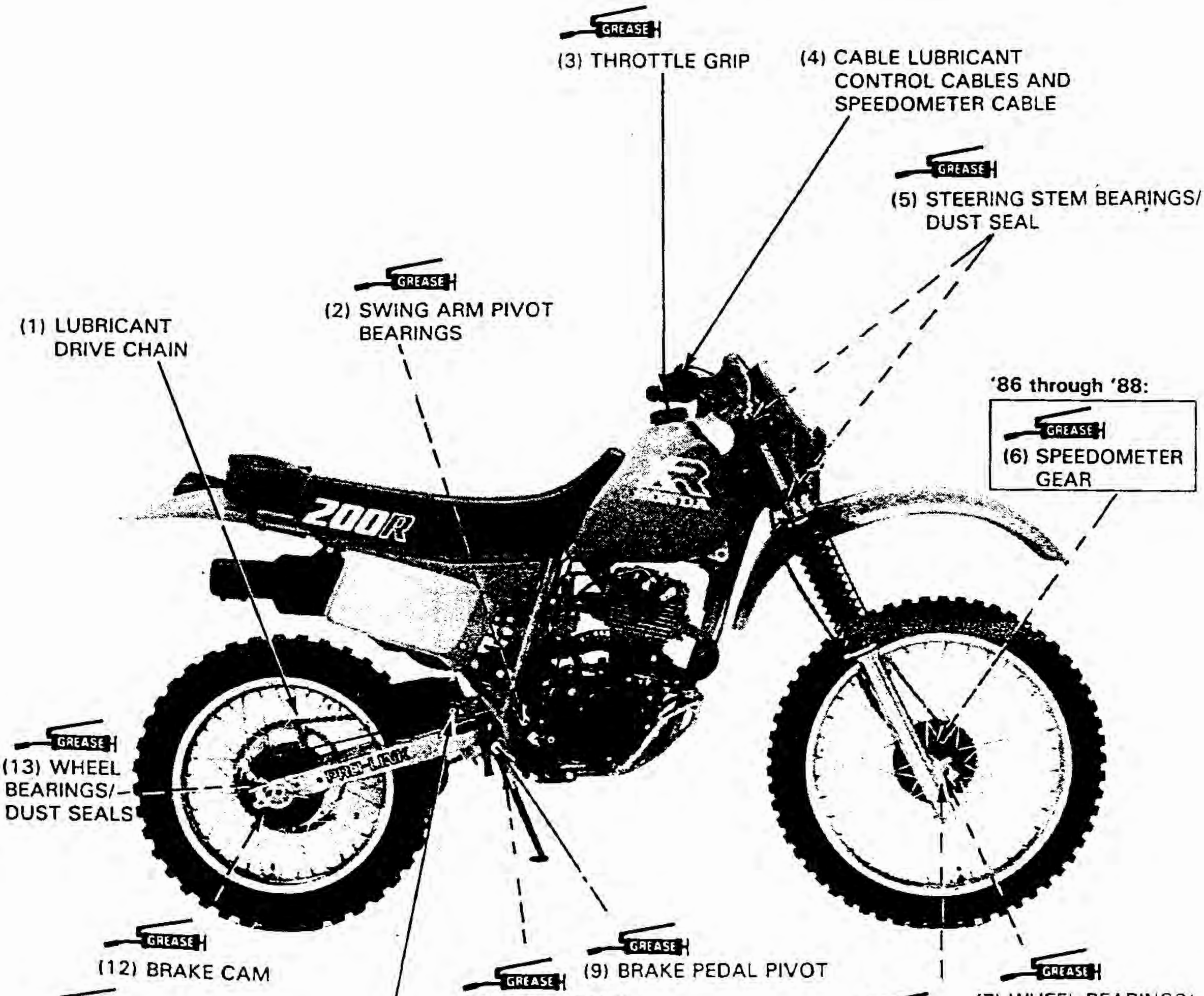
Apply paste grease with 40% or more molybdenum disulfide to the * mark components.

NOTE

Some sources of MoS_2 paste grese with 40% or more molybdenum are:

- Molykote® G-n Paste manufactured by Dow Corning, U.S.A.
- Pro Honda Moly 60 (U.S.A. only)
- Rocol ASP manufactured by Rocol Limited, U.K.
- Rocol Paste manufactured by Sumico Lubricant, Japan

Any other manufacturer's paste grese equivalent to the above may also be used.



'86 shown: After '86 similar

3. MAINTENANCE

SERVICE INFORMATION

SPECIFICATIONS

ENGINE

Spark plug gap:		0.6–0.7 mm (0.024–0.028 in)
Recommended spark plugs:		

For cold climate (Below 5°C/41°F)		Standard		For extended high speed riding	
NGK	DENSO	NGK	DENSO	NGK	DENSO
DR7ES	X22ESR-U	DR8ES-L	X24ESR-U	DR8ES	X27ESR-U

Valve clearance	IN:	0.05 mm (0.002 in)
	EX:	0.08 mm (0.003 in)
Throttle grip free play:		2–6 mm (1/8–1/4 in)
Idle speed:		'86: 1,300 ± 100 rpm
		AFTER '86: 1,400 ± 100 rpm
Cylinder compression:		1,373 kPa (14.0 kg/cm², 199 psi)
Starter decompressor lever free play:		1–2 mm (1/16 in)

CHASSIS

Front brake lever free play:		10–20 mm (3/8–3/4 in)
Rear brake pedal free play:		20–30 mm (3/4–1-1/4 in)
Clutch lever free play:		10–20 mm (3/8–3/4 in)
Drive chain slack:		35–45 mm (1-3/8–1-3/4 in)
Drive chain slipper service limit:		15 mm (0.6 in)
Drive chain standard length (107 pins):		1,699 mm (66.9 in)
Front suspension air pressure:		0 kPa (0 kg/cm², 0 psi)
Tire size	Front:	80/100–21 51M
	Rear:	110/100–17 58M
Tire pressure	Front:	100 kPa (1.0 kg/cm², 15 psi)
	Rear:	100 kPa (1.0 kg/cm², 15 psi)

TORQUE VALUES

Valve clearance adjusting screw lock nut	17–23 N·m (1.7–2.3 kg-m, 12–17 ft-lb)
Cam chain tensioner adjusting bolt	15–22 N·m (1.5–2.2 kg-m, 11–16 ft-lb)
Rear axle nut	80–110 N·m (8.0–11.0 kg-m, 58–80 ft-lb)
Rim lock	10–15 N·m (1.0–1.5 kg-m, 7–11 ft-lb)
Spoke	2.5–5.0 N·m (0.25–0.50 kg-m, 1.8–3.6 ft-lb)
Fuel valve mounting screw	5–9 N·m (0.5–0.9 kg-m, 4–6 ft-lb)

TOOLS

Common

Adjusting wrench A	07708–0030300	or equivalent commercially available in U.S.A.
Wrench, 10 x 12 mm	07708–0030200	
Spanner C, 5.8 x 6.1 mm	07701–0020300	

MAINTENANCE SCHEDULE

'86 – '97:
Perform the PRE-RIDE INSPECTION in the Owner's Manual at each maintenance period.
I: Inspect and Clean, Adjust, Lubricate or Replace if necessary.
C: Clean
R: Replace
A: Adjust
L: Lubricate

	ITEM / FREQUENCY	BREAKIN MAINTENANCE	REGULAR MAINTENANCE INTERVAL	
		First week of operation -about 200 mi (350 km)	Every 30 operating days -about 1000 mi (1600 km)	REFER TO PAGE
*	FUEL LINE		I	3-6
**	FUEL STRAINER SCREEN		C	3-6
*	THROTTLE OPERATION		I	3-6
	AIR CLEANER NOTE 1		C	3-7
	SPARK PLUG		I	3-8
*	VALVE CLEARANCE	I	I	3-8
	ENGINE OIL	R	R	2-2
*	ENGINE OIL STRAINER SCREEN		C	2-2
**	ENGINE OIL CENTRIFUGAL FILTER		C	2-2
*	CAM CHAIN TENSION	A	A	3-9
*	DECOMPRESSOR SYSTEM	I	I	3-9
*	ENGINE IDLE SPEED	I	I	3-10
	DRIVE CHAIN NOTE 1	I, L	I, L every 10 operating days -about 300 mi (500 km).	3-11
	DRIVE CHAIN SLIDER	I	I	3-12
	BRAKE SHOE WEAR		I	3-13
	BRAKE SYSTEM	I	I	3-13
*	HEADLIGHT AIM ('86 through '88)		I	3-14
	CLUTCH SYSTEM	I	I	3-14
	SIDE STAND		I	3-15
*	SUSPENSION		I	3-15
*	SPARK ARRESTER NOTE 2		C	3-17
*	NUTS, BOLTS, FASTENERS	I	I	3-17
**	WHEELS/TIRES	I	I	3-17
**	STEERING HEAD BEARINGS	I	I	3-18

* SHOULD BE SERVICED BY AN AUTHORIZED HONDA DEALER, UNLESS THE OWNER HAS PROPER TOOLS AND SERVICE DATA AND IS MECHANICALLY QUALIFIED. REFER TO THE OFFICIAL HONDA SERVICE MANUAL.
** IN THE INTEREST OF SAFETY, WE RECOMMEND THESE ITEMS BE SERVICED ONLY BY AN AUTHORIZED HONDA DEALER.

NOTES: 1. Service more frequently when ridden in wet or dusty conditions.
2. USA only.
3. Service more frequently when riding in rain, or at full throttle.

After '97:
Perform the Pre-ride inspection in the Owner's Manual at each scheduled maintenance period.
I: Inspect and Clean, Adjust, Lubricate or Replace if necessary. C: Clean. R: Replace. A: Adjust. L: Lubricate.
The following items require some mechanical knowledge. Certain items (particularly those marked * and **) may require more technical information and tools. Consult their authorized HONDA dealer.

		ITEMS / FREQUENCY	WHICHEVER COMES FIRST		INITIAL MAINTENANCE	REGULAR MAINTENANCE INTERVAL				REFER TO PAGE
			⇨	mi	100	600	1,200	1,800	2,400	
				km	150	1,000	2,000	3,000	4,000	
			NOTE	MONTH	1	6	12	18	24	
EMISSION RELATED ITEMS	*	FUEL LINE					I		I	3-6
	**	FUEL STRAINER SCREEN					C		C	3-6
	*	THROTTLE OPERATION					I		I	3-6
		AIR CLEANER	NOTE 1			C	C	C	C	3-7
		CRANKCASE BREATHER	NOTE 2			I	I	I	I	3-7
		SPARK PLUG				I	I	I	I	3-8
	*	VALVE CLEARANCE			I	I	I	I	I	3-8
		ENGINE OIL			R	R	R	R	R	2-2
	**	ENGINE OIL STRAINER SCREEN					C		C	2-2
	**	ENGINE OIL CENTRIFUGAL FILTER					C		C	2-2
	*	CAM CHAIN TENSION			A	A	A	A	A	3-9
	*	DECOMPRESSOR SYSTEM			I	I	I	I	I	3-9
	**	ENGINE IDLE SPEED			I	I	I	I	I	3-10
NON-EMISSION RELATED ITEMS		DRIVE CHAIN	NOTE 1		I	I: Every 500 mi (500 km) or 3 months				3-11
		DRIVE CHAIN SLIDER								3-12
		BRAKE SHOE WEAR								3-13
		BRAKE SYSTEM								3-14
		CLUTCH SYSTEM								3-14
		SIDE STAND								3-15
	*	SUSPENSION								3-16
	*	SPARK ARRESTER								3-17
	*	NUTS, BOLTS, FASTENERS								3-17
	**	WHEELS/TIRES								3-18
	**	STEERING HEAD BEARINGS								3-18

* Should be serviced by an authorized HONDA dealer, unless the owner has proper tools and service data and is mechanically qualified.
** In the interest of safety, we recommend these items be serviced only by an authorized HONDA dealer.

NOTES: 1. Service more frequently when ridden in wet or dusty conditions.
2. California type only.

COMPETITION INSPECTION

Check all items before each race.
Refer to the Maintenance Schedule (page 3-3, 4) for regular service intervals.

ITEMS	INSPECT FOR	ACTION
ALL PRE-RIDE INSPECTION ITEMS	As listed	
ENGINE OIL	Contaminants	Change
FUEL LINE	Deterioration, damage or leakage	Replace
VALVE CLEARANCE	Correct clearance	Adjust
CAM CHAIN	Abnormal noise	Adjust
ENGINE-IDLE	Correct idle speed	Adjust
DECOMPRESSION MECHANISM	Proper free play	Adjust
CLUTCH DISCS	*Wear	Replace
AIR CLEANER ELEMENT	Contamination or tears	Clean or replace
SPARK PLUG	Tightness, proper heat range, and high-tension terminal security	Tighten, replace or secure
STEERING HEAD	Free rotation of handlebars and steering stem nut tightness	Adjust or tighten
FRONT SUSPENSION	Smooth operation, air pressure, oil quantity, no oil leaks and good boot condition	Replace or adjust
REAR SUSPENSION	Smooth operation, oil leaks and spring height	Replace
SWINGARM BEARINGS	Smooth operation	Replace
REAR SUSPENSION LINKAGE BUSHINGS	Wear	Replace
BRAKE SHOES	Wear beyond service limit	Replace
DRIVE CHAIN	Length: 1,716 mm (67.6 in) 107 pins. max.	Replace
SPROCKETS	Wear and secure installation	Replace or tighten
SEAT	Security	Tighten
HEADLIGHT	Proper beam aim	Adjust
SPEEDOMETER/TRIPMETER	Proper operation	Replace
CONTROL CABLES	Smooth operation, kinks and correct routing	Lubricate or replace
ENGINE MOUNTING BOLTS	Tightness	Tighten

* Competition use may cause rapid clutch disc wear.

ADDITIONAL ITEMS REQUIRING FREQUENT REPLACEMENT

- ENGINE OIL

ITEM		NOTE
Engine oil	'86 – '97	Change after first 350 km (200 mi); thereafter every 1,600 km (1,000 mi)
	After '97	Change after first 150 km (100 mi); thereafter every 1,000 km (600 mi)

- FAST WEARING COMPONENTS

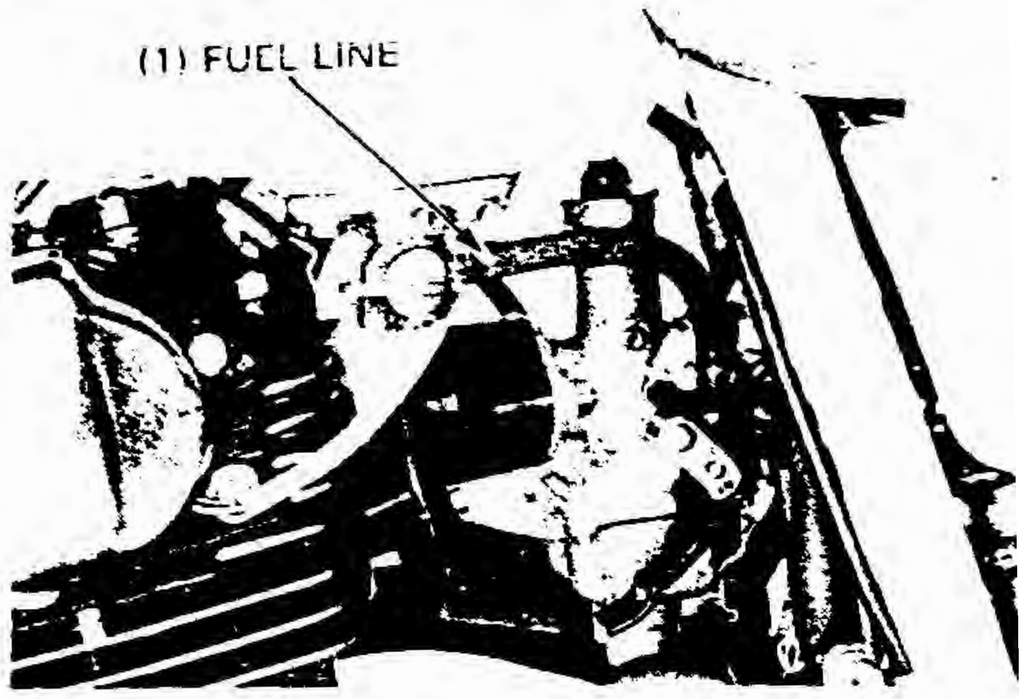
ITEM	NOTE
Drive chain	Service limit: 107 pins 1,716 mm (67.6 in)
Drive and driven sprockets Chain guide slipper Chain slider Cables	Replace when damaged or worn

- OTHER COMPONENTS TO BE REPLACED AS REQUIRED

ITEM	NOTE
Cylinder head gasket Gaskets, O-rings	Replace whenever the engine is disassembled
Clutch disc	Service limit: Thickness 2.6 mm (0.10 in)
Tires	Service Limit: Tread depth 8 mm (0.3 in)
Spark plug Fender Lights Handlebar Throttle housing Grip Gear shift pedal Rear brake pedal Air cleaner element	Replace when damaged or worn
Brake shoes	Replace when the "Δ" mark aligns index mark

FUEL LINE

Replace the fuel line if it is cracked, damaged or leaking.
If the fuel flow is restricted, inspect the fuel line and fuel strainer for blockage. Clean or repalce as necessary.



FUEL STRAINER SCREEN

Turn the fuel valve OFF.
Remove the fuel valve mounting screws, fuel valve, fuel strainer screen and O-ring and drain the gasoline into a suitable container.

WARNING

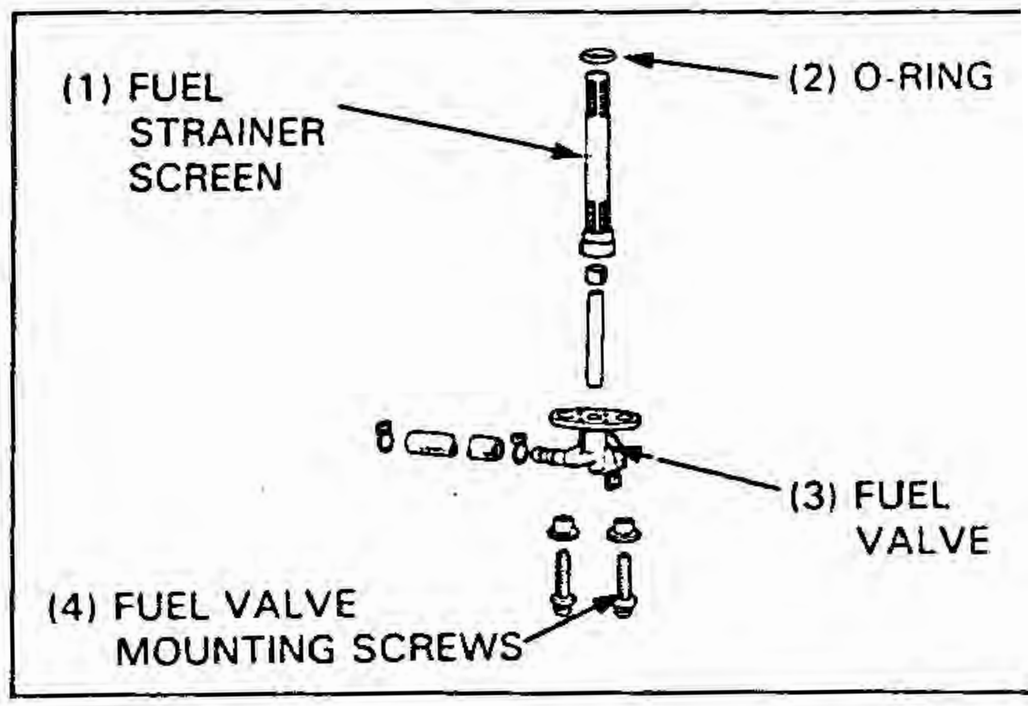
- ***Gasoline is flammable and is explosive under certain conditions. Do not smoke or allow flames or sparks near the equipment while draining fuel.***

Wash the fuel strainer screen in clean non-flammable or high flash point solvent.

Install the new O-ring, strainer screen and fuel valve and tighten the screws to the specified torque.

TORQUE: 5—9 N·m (0.5—0.9 kg-m, 4—6 ft-lb)

Turn the fuel valve ON and be sure there are no fuel leaks.

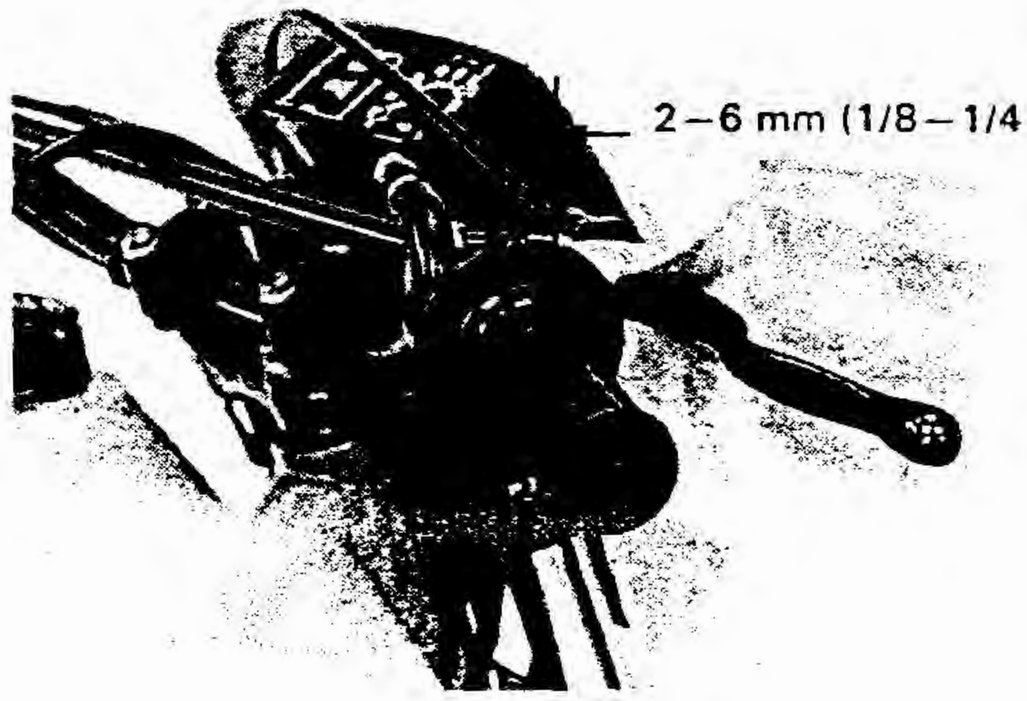


THROTTLE OPERATION

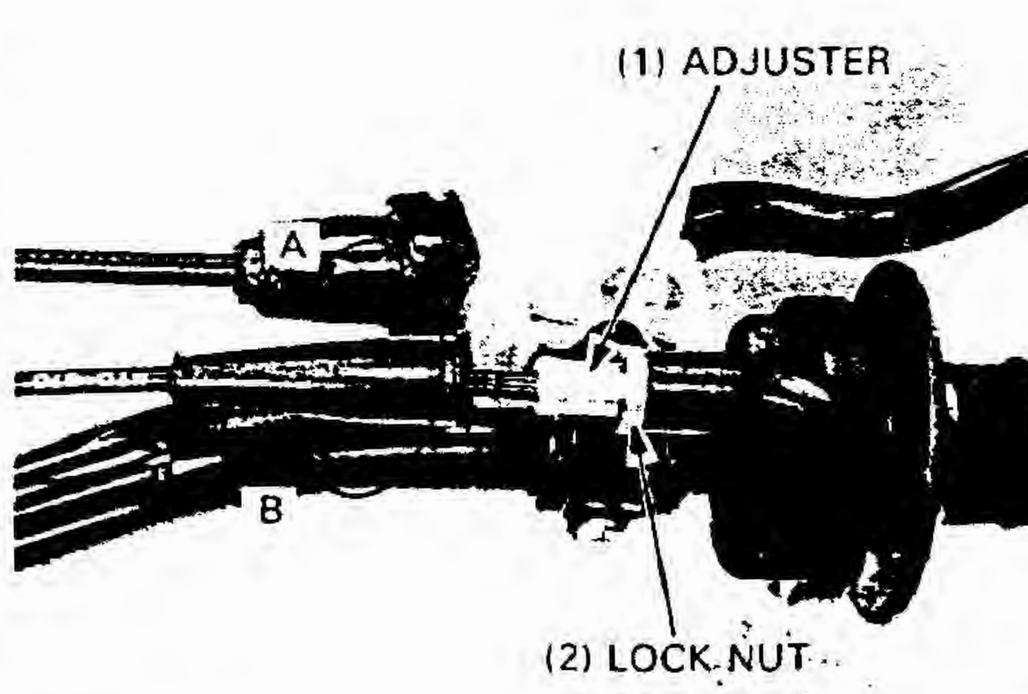
Inspect the throttle cable for deterioration, damage, or kinks and replace the cable as required.

Measure throttle grip free play at the throttle grip flnage.

THROTTLE GRIP FREE PLAY: 2—6 mm (1/8—1/4 in)

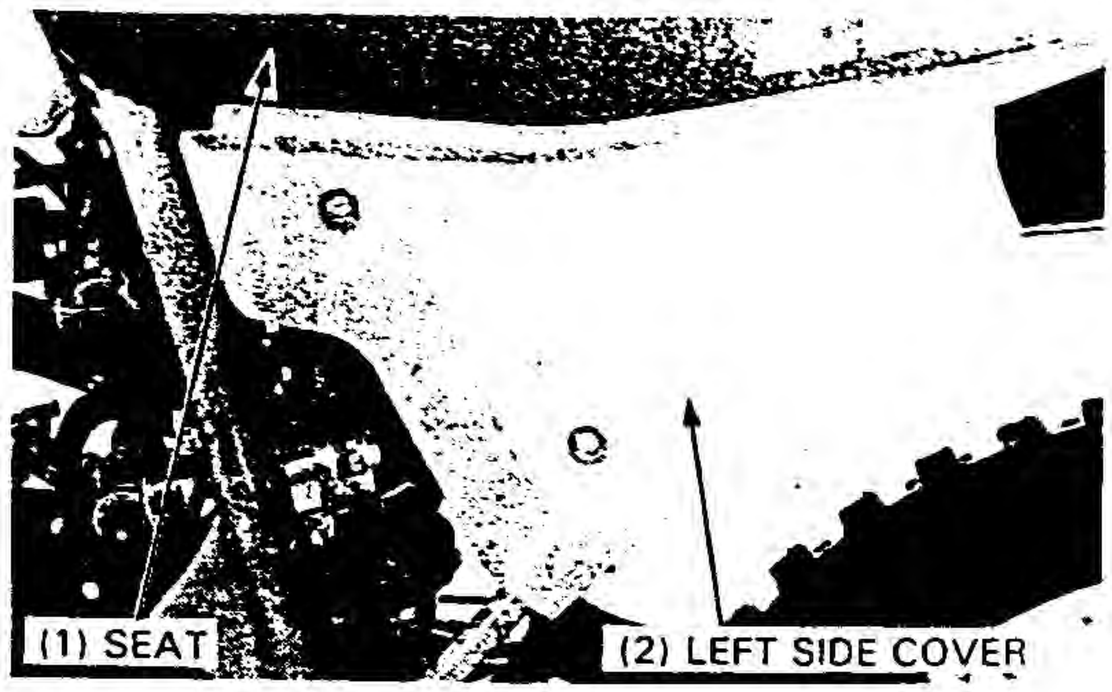


Throttle grip free play can be adjusted using the adjuster at the handlebar.
Slide the rubber cover off the lower mount and loosen the lock nut. Turn the adjuster to obtain 2—6 mm (1/8—1/4 in) of free play.
Turn the adjuster in direction A to decrease free play.
Turn the adjuster in derection B to increase free play.
Then tighten the lock nut and slide the rubber cover back.
Repalce the throttle calbe with a new one if the adjuster or cable is damaged.



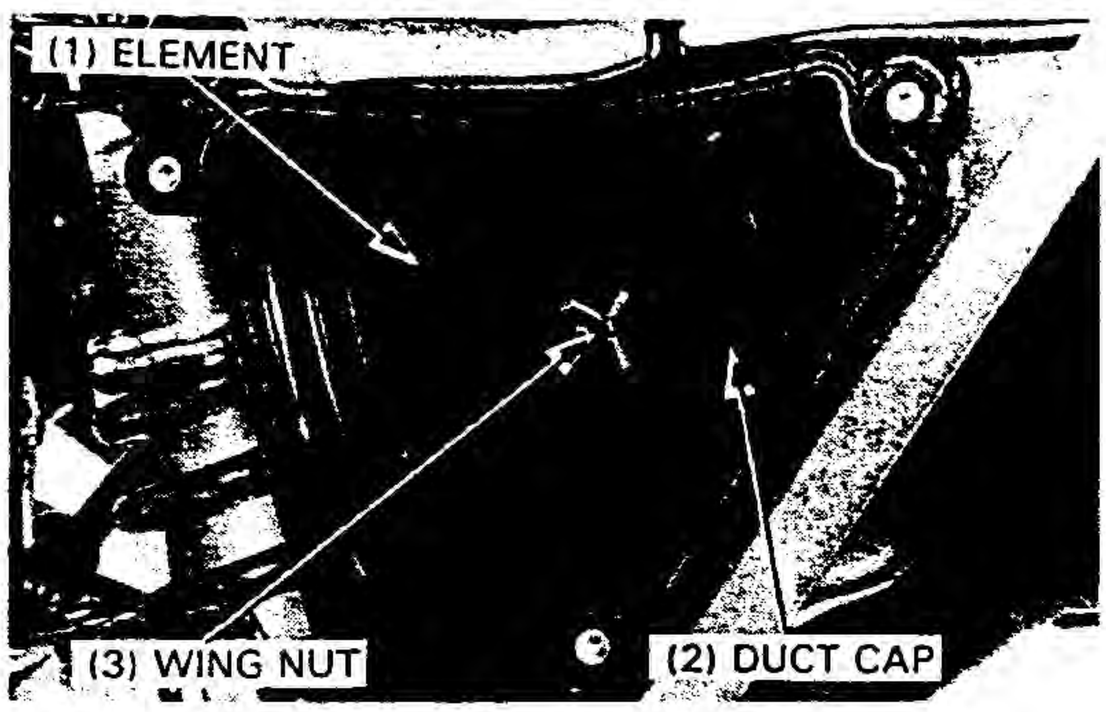
AIR CLEANER

Remove the seat and left side cover.



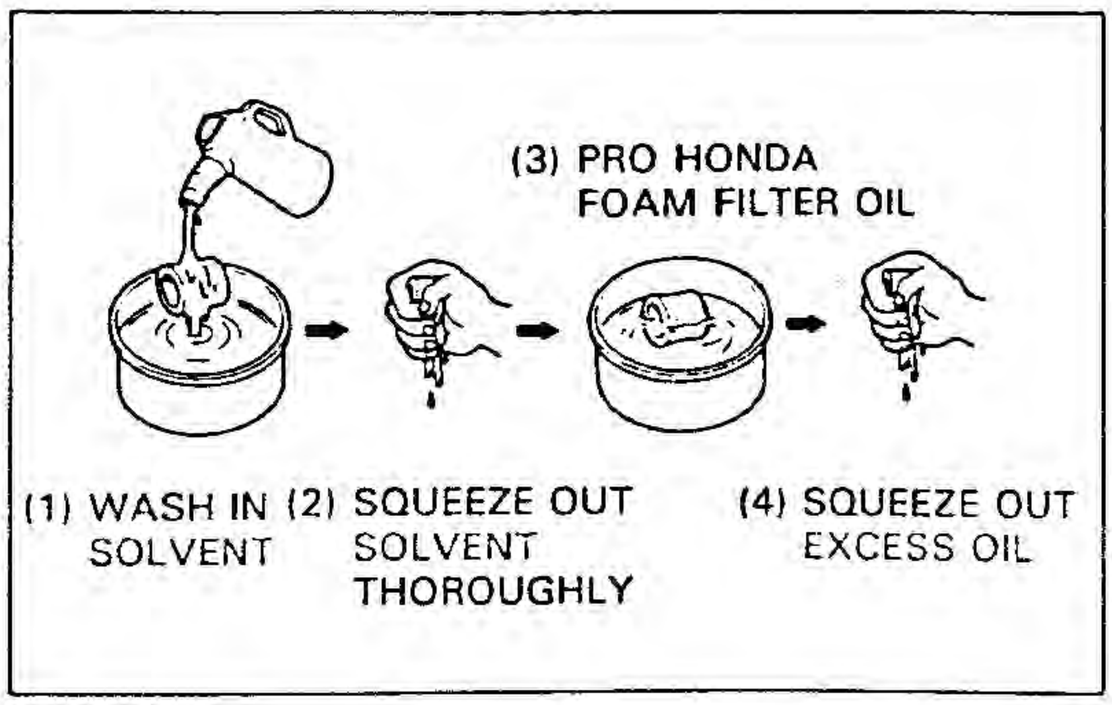
Remove the air cleaner inlet duct cap.

Remove the wing nut and element from the air cleaner case.



Wash the element in non-flammable or high flash point solvent, squeeze out the solvent throughly, and allow the element to dry. Soak the element in Pro Honda Foam Filter Oil or equivalent and squeeze out the excess oil thoroughly.

Install the removed parts in the reverse order of removal.



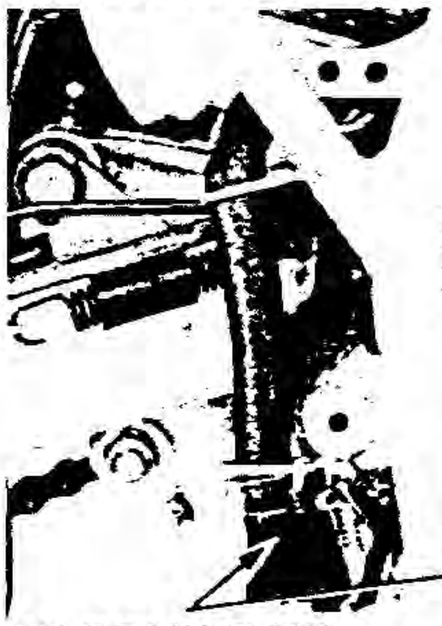
CRANKCASE BREATHER

Except California type:
Push the drain tube open to empty any deposits.
California type:
Loosen the tube clip and remove the drain plug.
Empty any deposits.

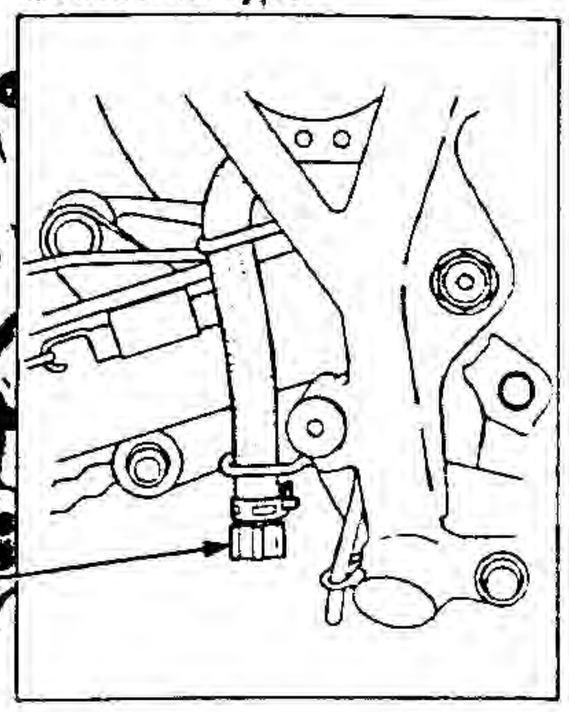
NOTE

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

Except California type:

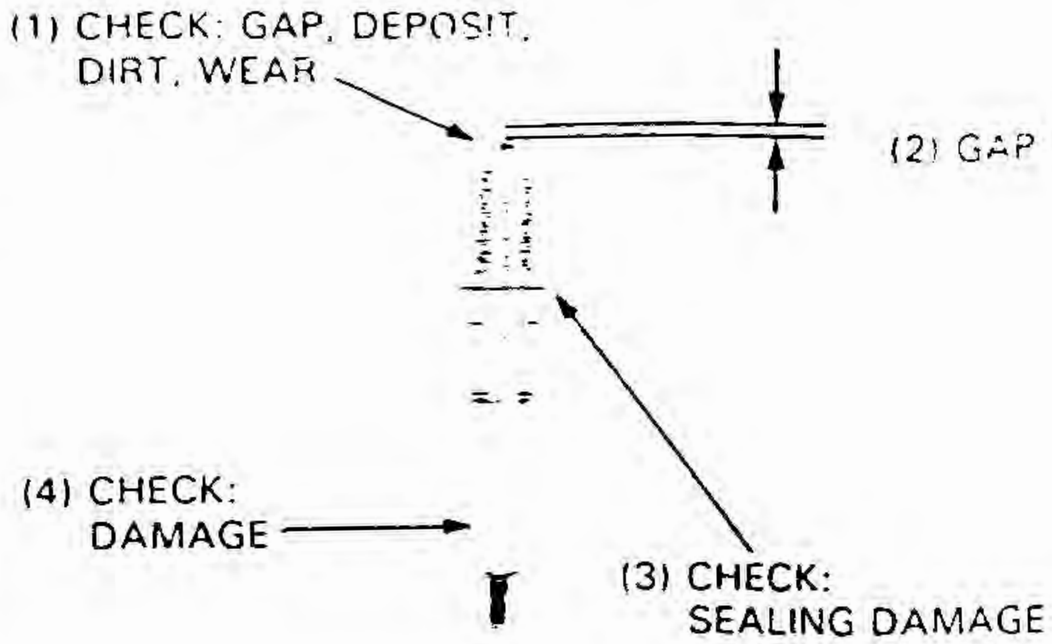


California type:



SPARK PLUG

Remove the spark plug, then visually inspect it for damage
Discard if if the insulator is cracked or chipped.
Adjust the gap by carefully bending the side electrode to the required specifications then reinstall.



SPARK PLUG:

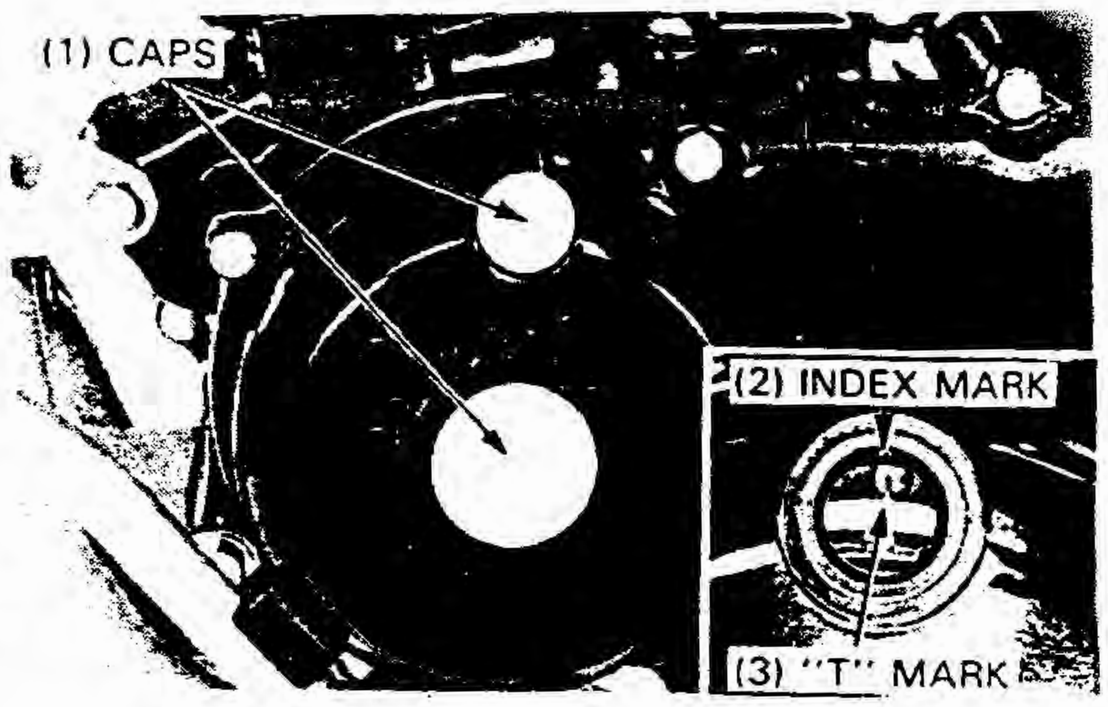
For cold climate (Below 5°C/41°F)	Standard	For extended high speed riding
DR7ES (NGK) X22ESR-U (DENSO)	DR8ES-L (NGK) X24ESR-U (DENSO)	DR8ES (NGK) X27ESR-U (DENSO)

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

VALVE CLEARANCE

NOTE

- Inspect and adjust valve clearance while the engine is cold (below 35°C/95°F).
- Check for proper free play at the starter decompressor. Adjust as required (page 3-9).
- Make sure the decompressor valve lifter has cam free play.

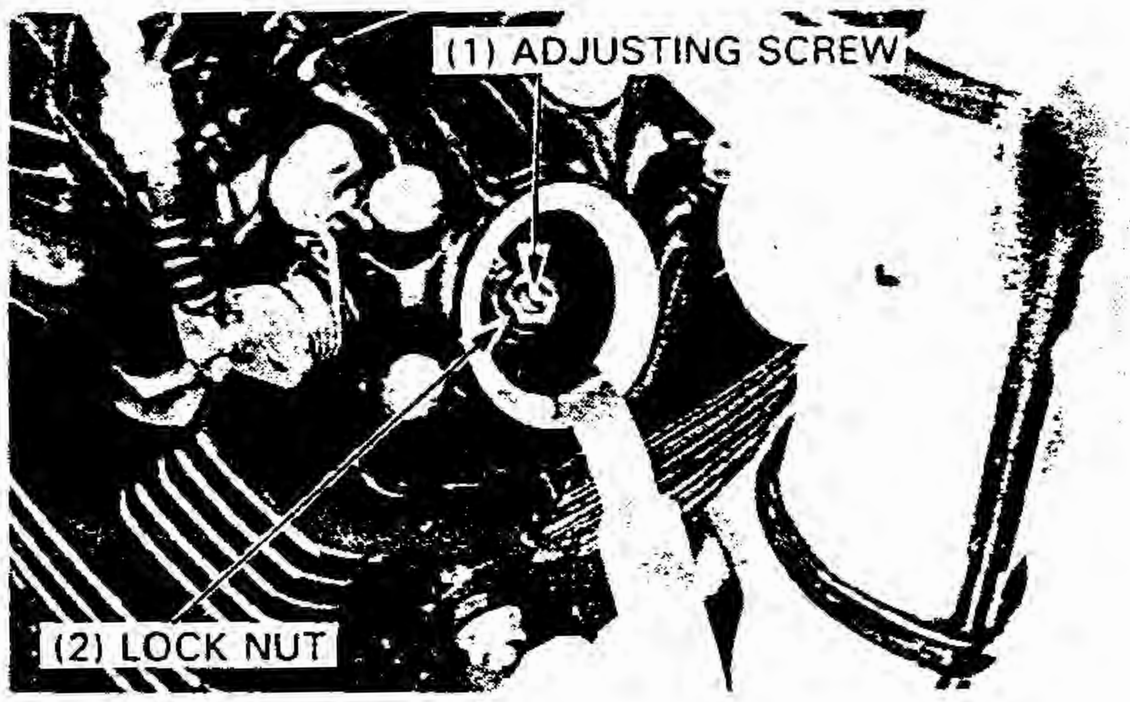


Remove the fuel tank (page 4-3).
Remove the crankshaft hole cap and timing mark hole cap.

Remove the valve adjuster covers.
Rotate the crankshaft counterclockwise and align the "T" mark on the generator rotor with the index mark on the left crankcase cover. The piston must be at TDC of the compression stroke (both rocker arms loose).

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: 0.08 mm (0.003 in)



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: 17–23 N·m (1.7–2.3 kg-m, 12–17 ft-lb)

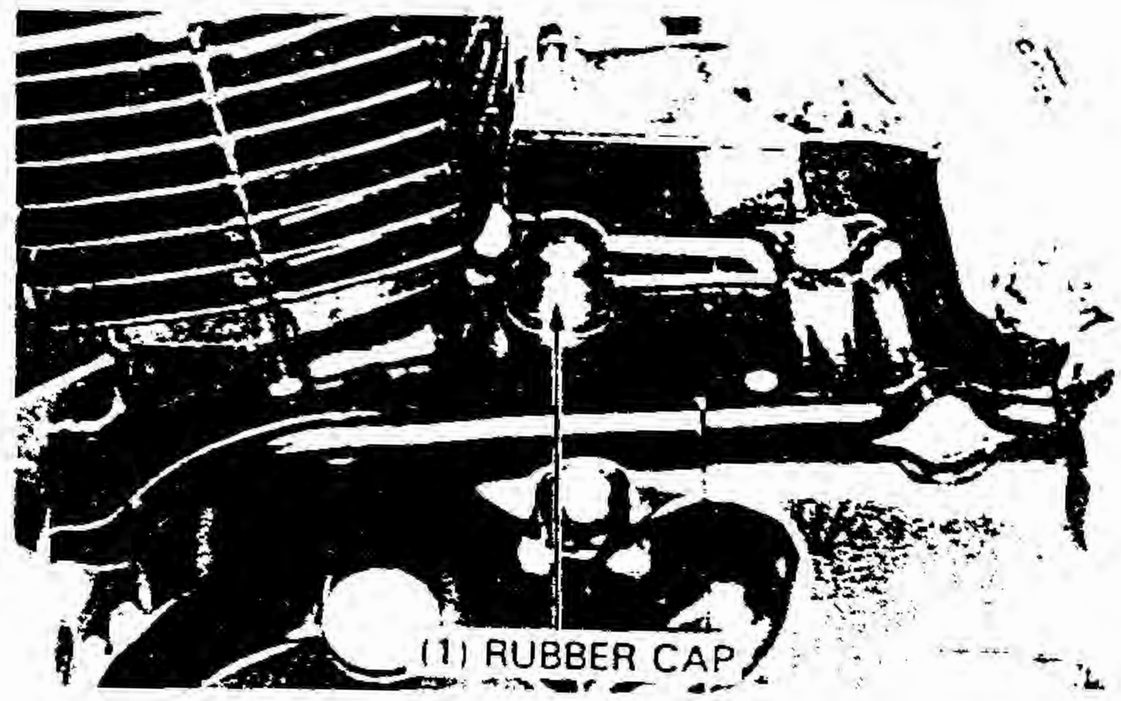
Re-check the valve clearance and adjust if necessary.

Adjust the starter decompressor free play (page 3-9).

Install the removed parts in the reverse order of disassembly.

CAM CHAIN TENSION

Remove the rubber cap.
Start the engine and allow it to idle.



Loosen the cam chain tensioner adjusting bolt.

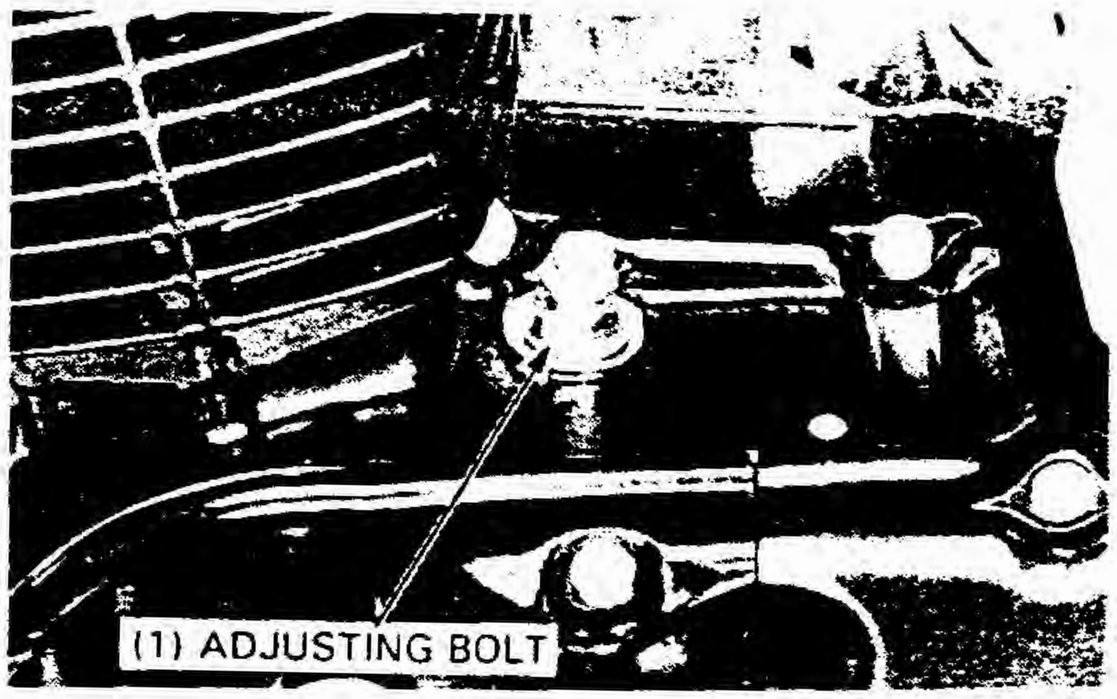
When the cam chain tensioner adjusting bolt is loosened, the tensioner will automatically position itself to provide the correct tension.

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 loosen the 6 mm bolt on top of the adjusting bolt.

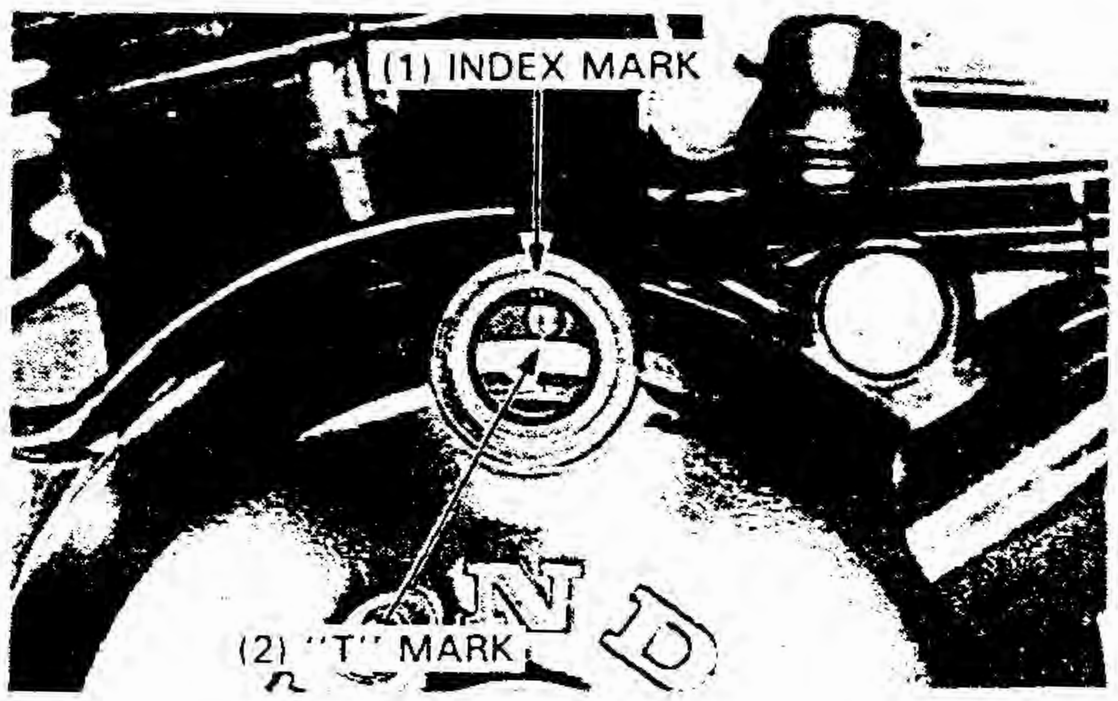


STARTER DECOMPRESSOR

NOTE

- Perform the starter decompressor adjustment after the valve clearance has been adjusted.

Remove the crankshaft hole cap and timing mark hole cap.
Rotate the crankshaft counterclockwise and align the "T" mark on the generator rotor with the index mark on the left crankcase cover. Be sure that the piston is at TDC of the compression stroke.



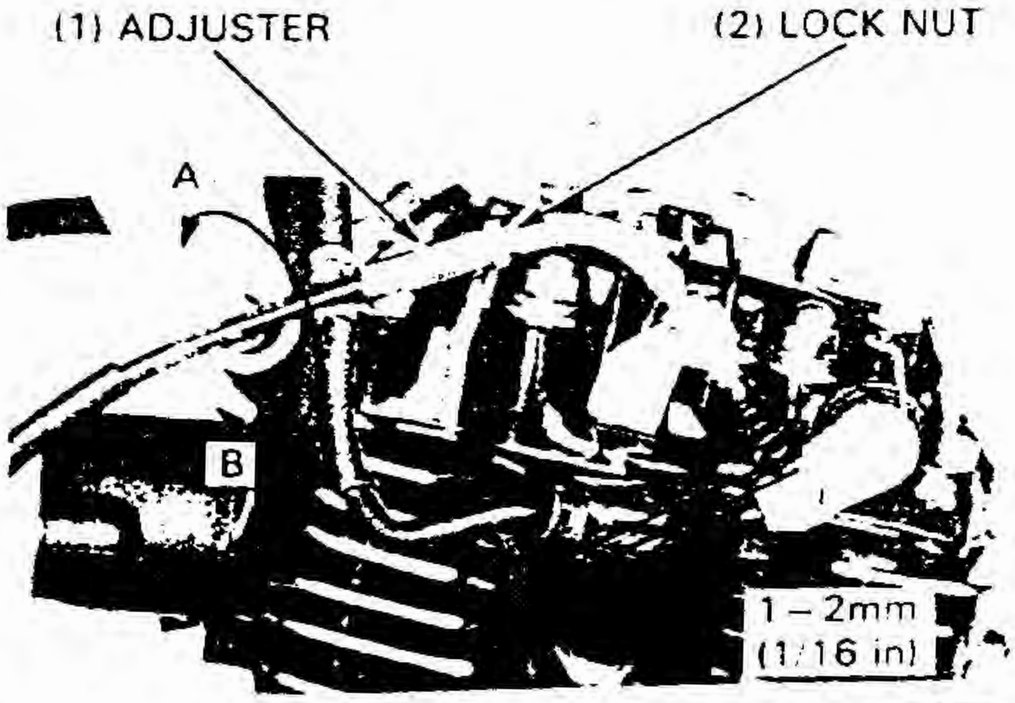
Measure the free play at the tip of the decompressor lever.

FREE PLAY: 1 – 2 mm (1/16 in)

Perform major adjustments with the front adjuster and minor adjustments with rear adjuster.

To adjust, loosen the lock nut and turn the adjuster.

Turn the adjuster in direction A to decrease free play.
Turn the adjuster in direction B to increase free play.



CAUTION

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

Recheck the free play.
Install the timing mark and crankshaft hole caps.

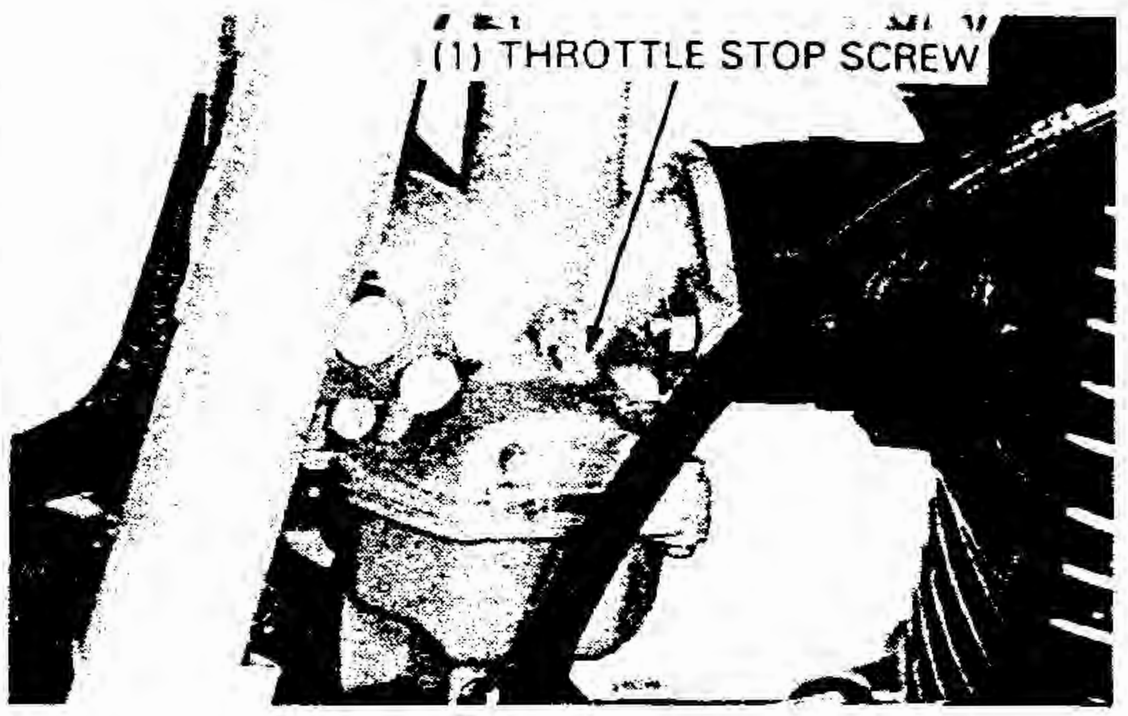
ENGINE-IDLE SPEED

NOTE

- Inspect and adjust the idle speed after all other maintenance items have been performed and are within specification.
- The engine must be warm for an accurate idle speed inspection and adjustment. Stop-and-go riding for ten minutes is sufficient.

Warm up the engine.
After warming up the engine, shift the transmission into neutral.

Support the vehicle in an upright position.
Turn the throttle stop screw as required to obtain the specified idle speed.

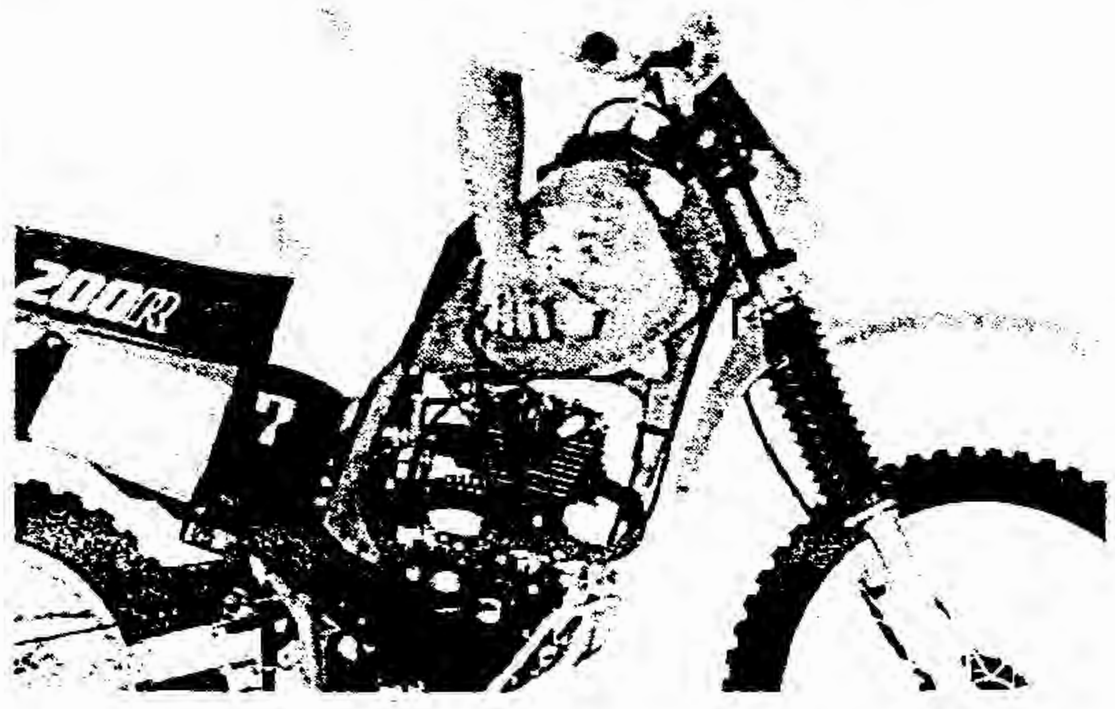


IDLE SPEED: **'86: 1,300 ± 100 rpm**
AFTER '86: 1,400 ± 100 rpm

CYLINDER COMPRESSION

Warm up the engine.
Stop the engine and remove the spark plug.
Install a compression gauge.

Push the choke lever down fully.
Open the throttle grip fully.
Operate the kick starter pedal several times.



NOTE

- Be sure compression does not leak at the gauge connection.

COMPRESSION: 1,373 kPa (14.0 kg/cm², 199 psi)

Low compression can be caused by:
- Improper valve adjustment.
- Valve leakage.
- Blown cylinder head gasket.
- Worn piston ring or cylinder.
- Misadjusted decompressor lever free play.

High compression can be caused by:
- Carbon deposits in combustion chamber or on piston head.

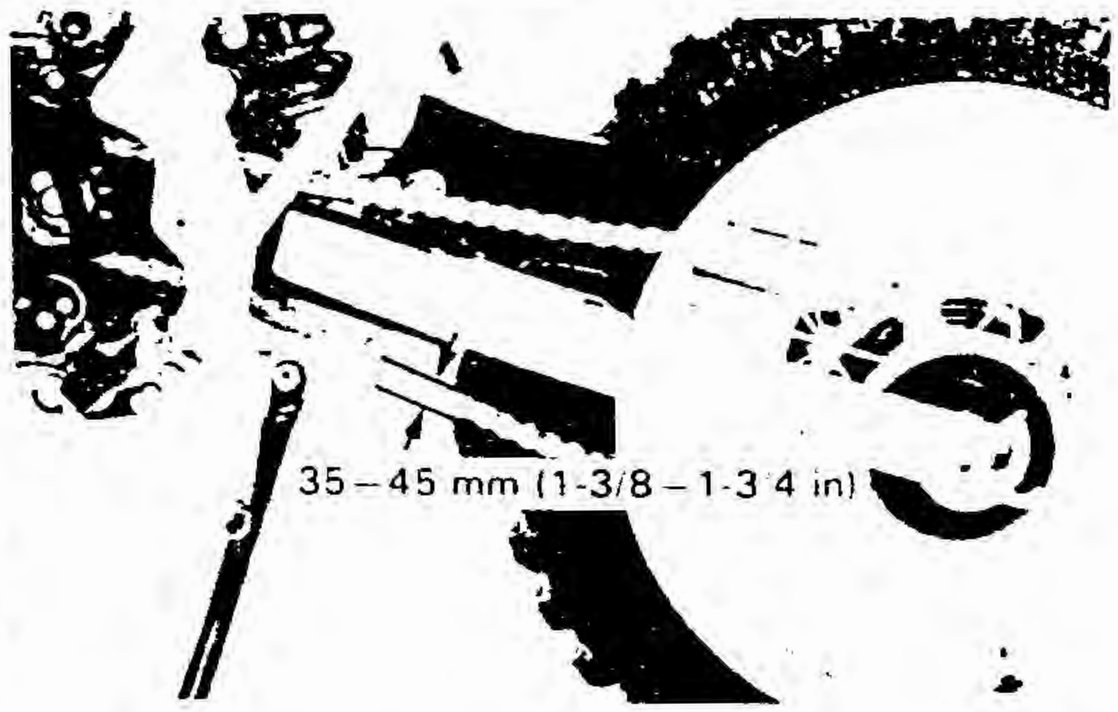
DRIVE CHAIN

ADJUSTMENT

WARNING

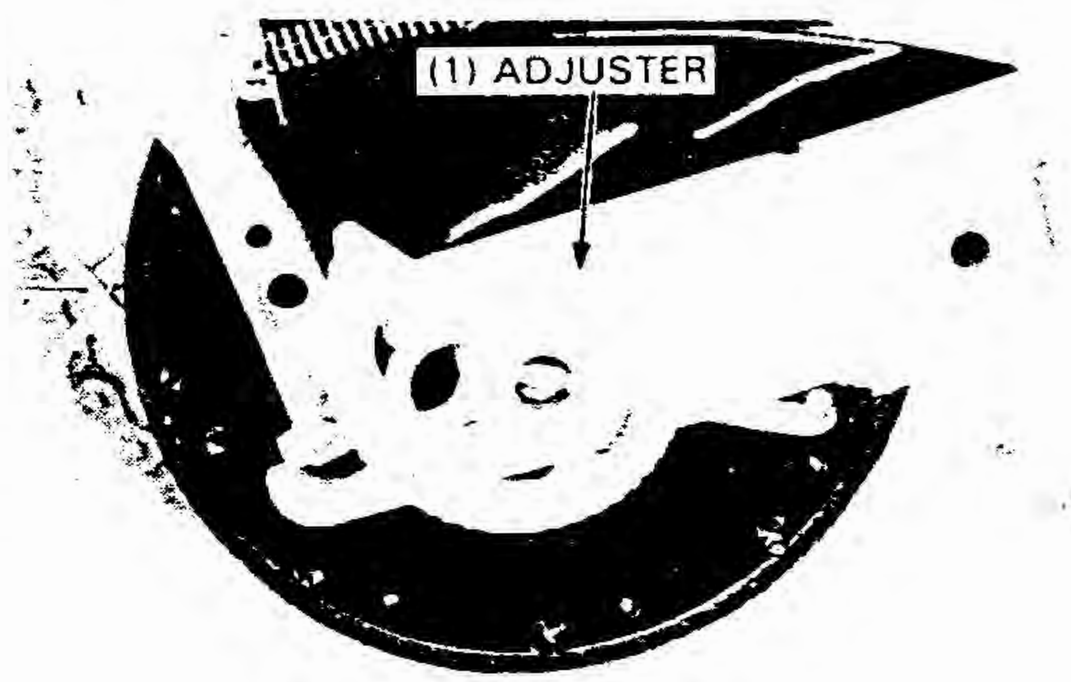
- *Never inspect or adjust the drive chain while the engine is running.*

Shift the transmission into neutral.
Turn the engine off. Raise the rear wheel off the ground by placing a work stand or box under the engine.
Measure the slack in the upper drive chain run midway between the sprockets.



STANDARD SLCK: 35 – 45 mm (1-3/8 – 1-3/4 in)

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



CAUTION

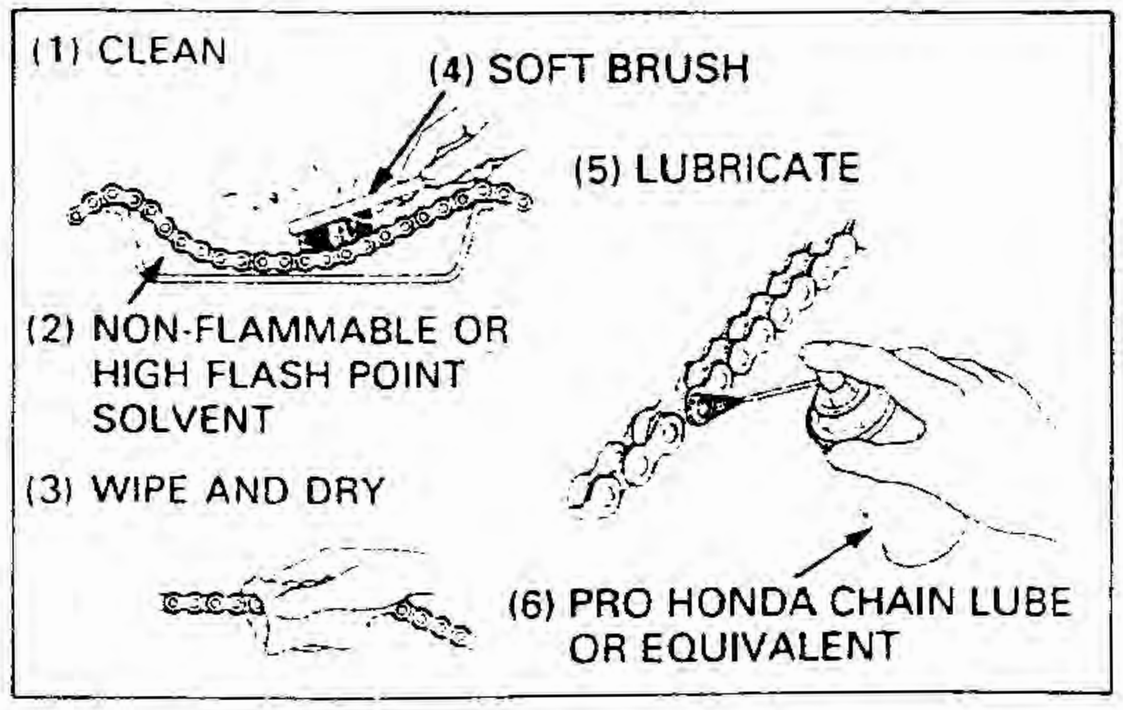
- *Be sure the same adjuster index marks align with the stopper pins on both sides of the swingarm.*

Tighten the axle nut.

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

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

Carefully remove the master link clip with pliers.
Remove the master link and the drive chain.
Clean the chain with non-flammable or high flash point solvent and wipe it dry. Be sure the chain has dried completely before lubricating.



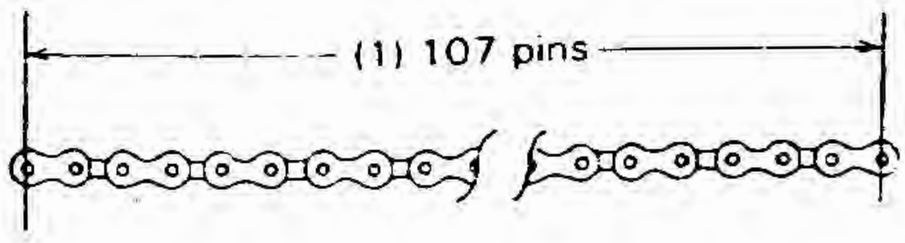
CAUTION

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

Lubricate the chain with Pro Honda Chain Lube or equivalent chain lubricant designed specifically for use on O-ring chains.

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

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

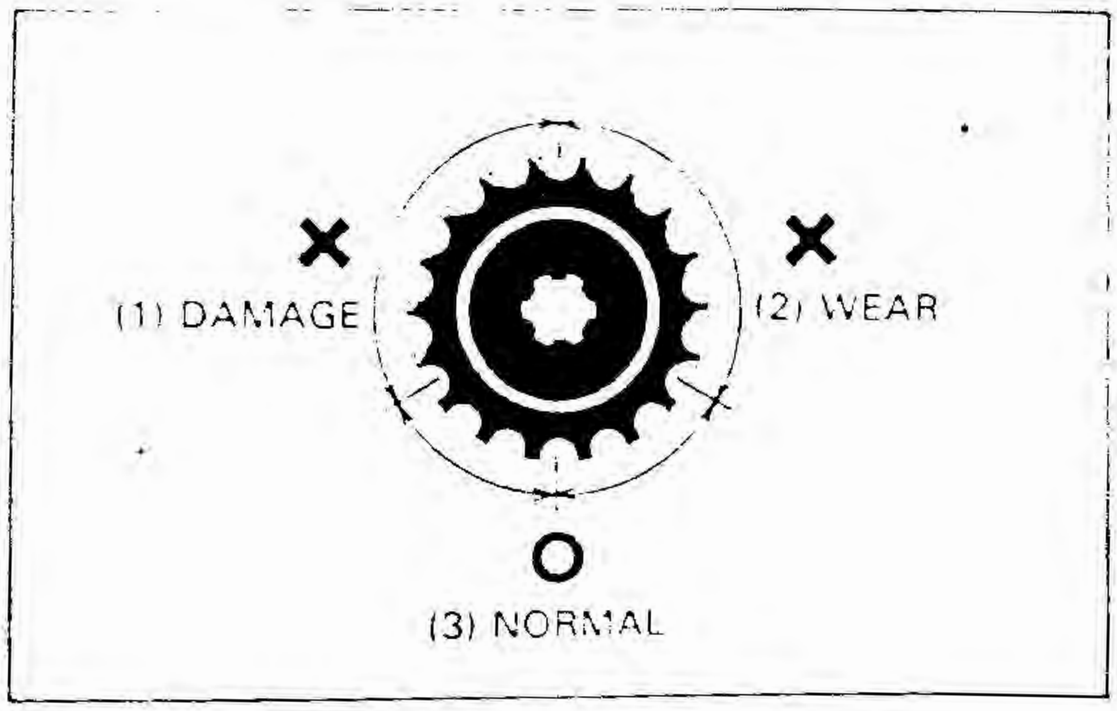


107 PINS LENGTH:
STANDARD: 1,699 mm (66.9 in)
SERVICE LIMIT: 1,716 mm (67.6 in)

Inspect the drive 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 sproket must be in good condition, or the new replacement chain or sprockets will wear rapidly.

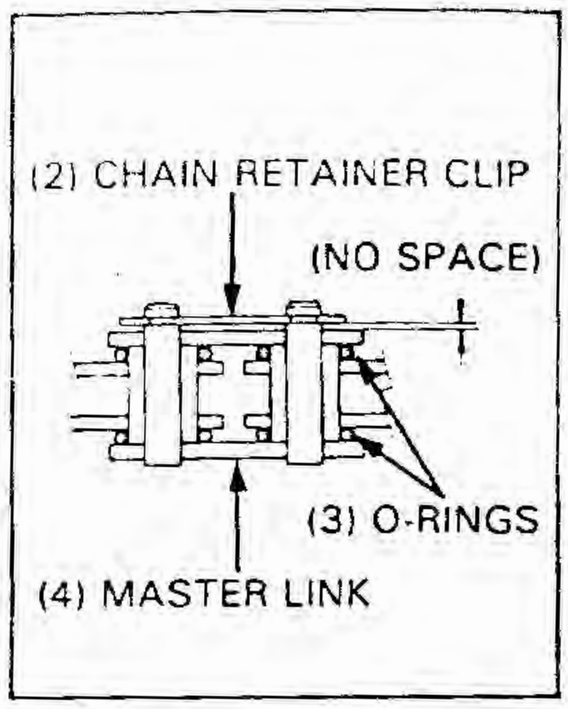


Install the drive chain with the master link clip closed end facing the direction of the chain's travel.

Install the drive sprocket cover and gearshift pedal.
Adjust the drive chain. (page 3-11).
Check the brake pedal free play and adjust, if necessary.

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.*



DRIVE CHAIN SLIDER

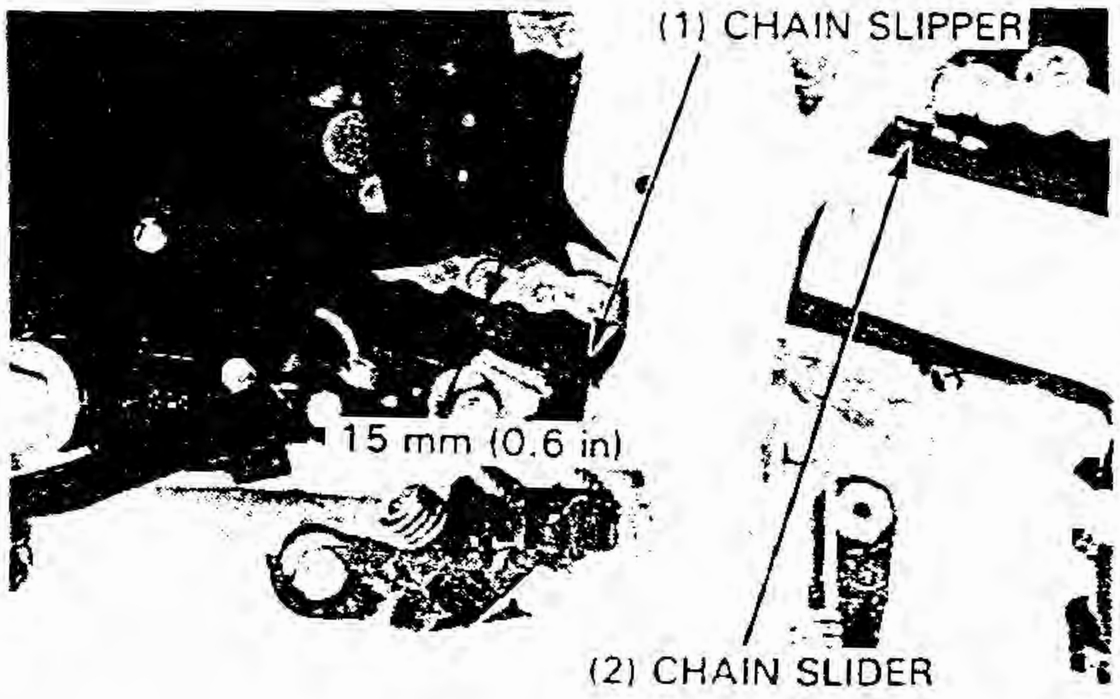
Check the chain slipper, chain slider and chain guide slider for wear.

CAUTION

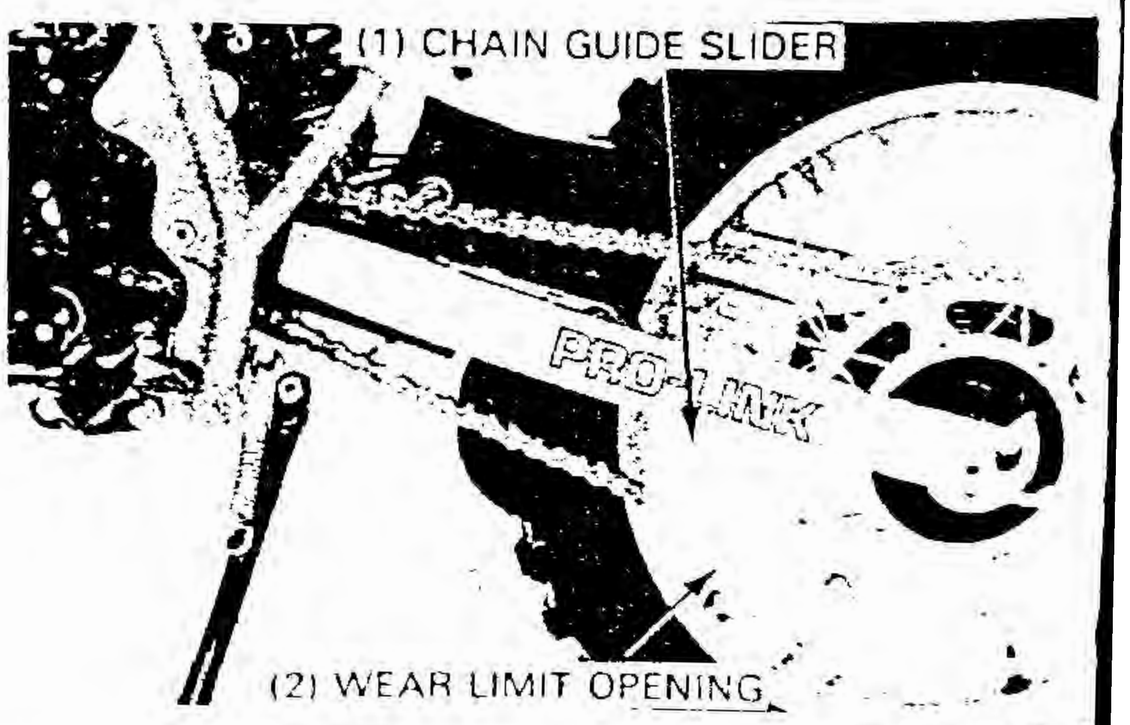
- *If the chain slipper and chain slider becomes worn through to the swing arm, the chain will begin to wear against the swing arm.*

Measure the chain slipper and repalce it if its thickness is less than specified.

SERVICE LIMIT: 15 mm (0.6 in)

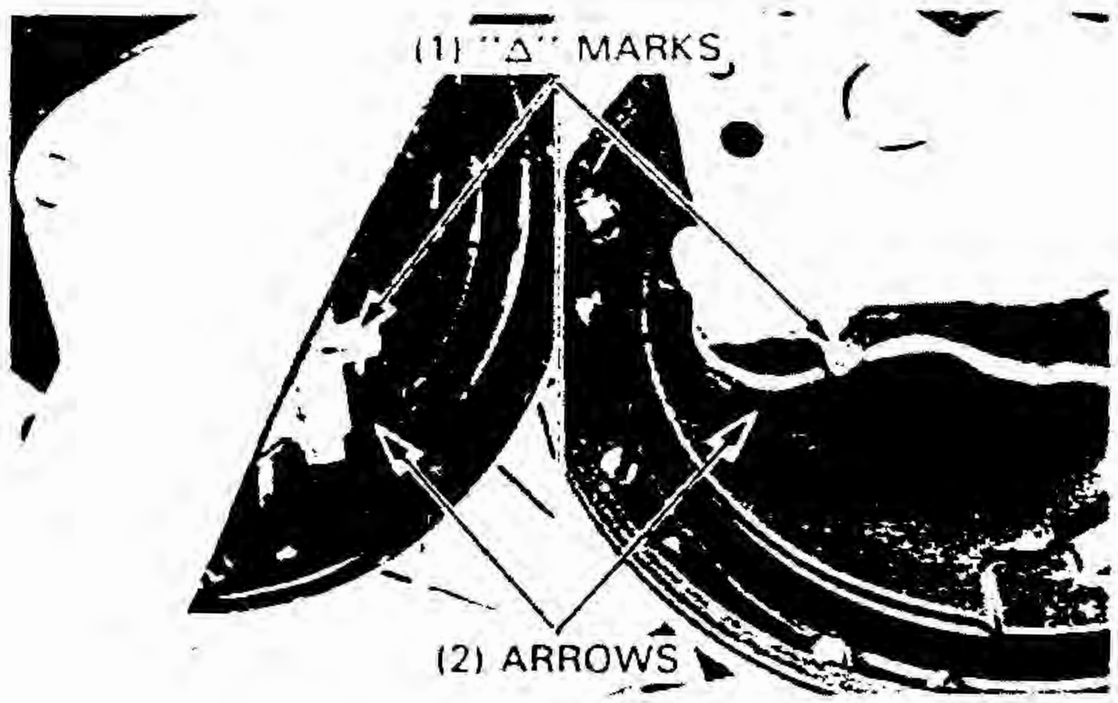


Inspect the chain guide slider for wear and repalce it if you can see the chain through the wear limit opening.



BRAKE SHOE WEAR

Replace the brake shoes if the arrows on the indicator plates align with the "Δ" marks on the brake panels when the front brake lever and rear brake pedal are applied.

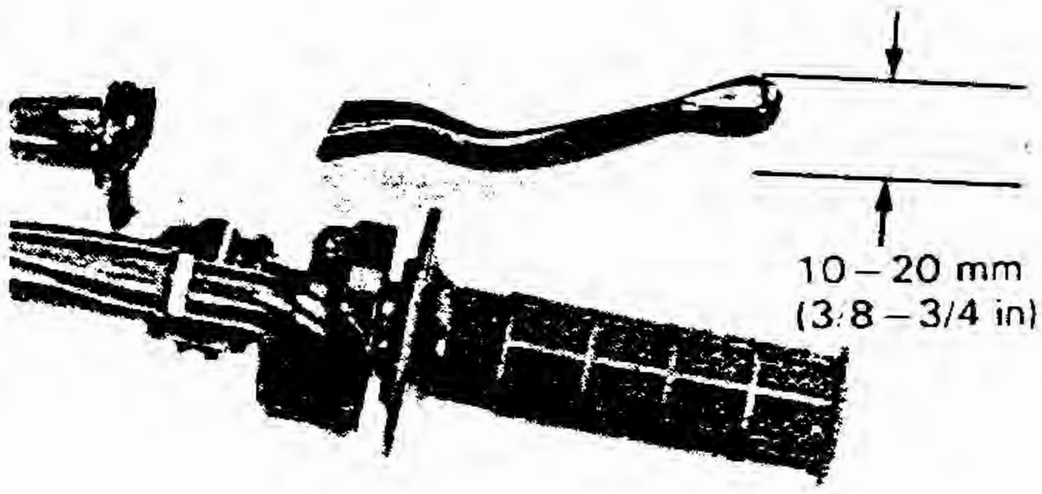


BRAKE SYSTEM

FRONT

Measure the front brake lever free play at the tip of the brake lever.

BRAKE LEVER FREE PLAY: 10–20 mm (3/8–3/4 in)

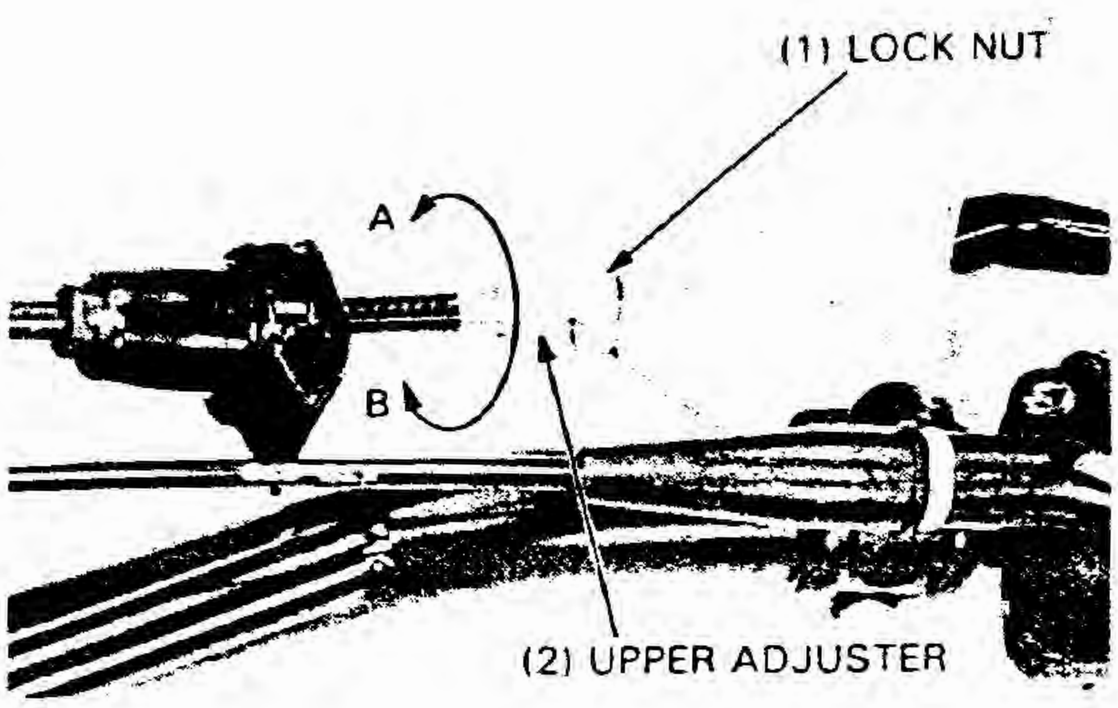


Perform minor adjustments with the upper adjuster on the handlebar.

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

Turn the upper adjuster in direction A to decrease free play, and in direction B to increase free play.

Tighten the lock nut.

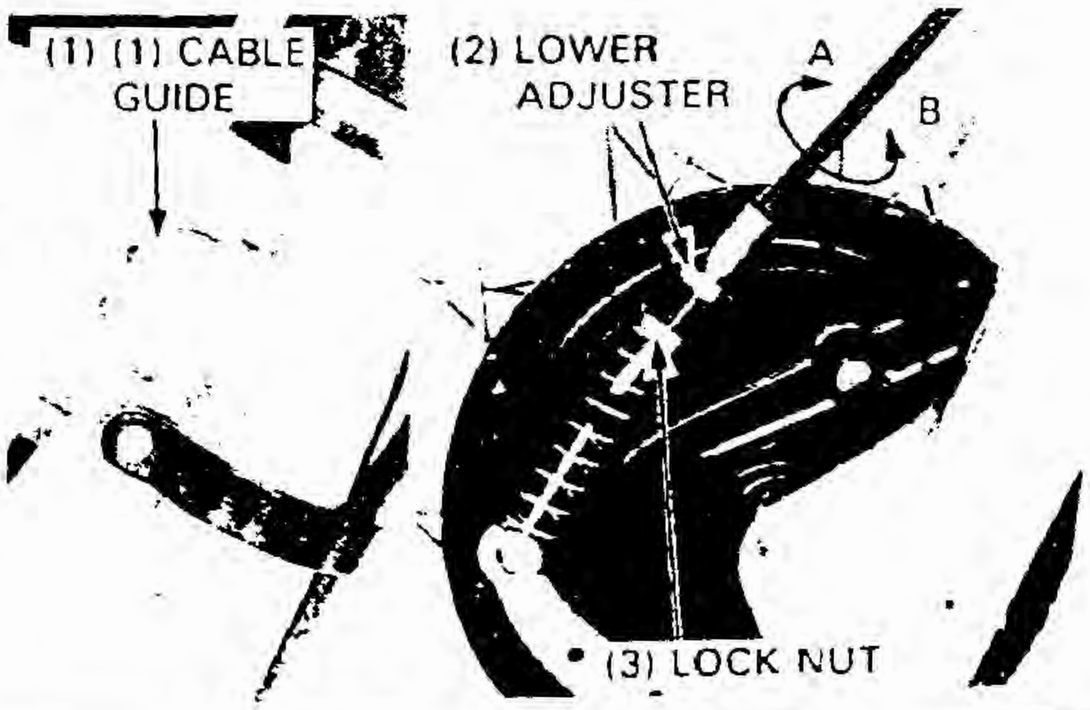


Perform major adjustments with the lower adjuster on the brake panel.

Loosen the front brake cable guide bolts. Adjust the free play by loosening the lock nut and turning the lower adjsuter.

Turn the lower adjuster in direction A to decrease free play, and in derection B to increase free play.

Tighten the lock nut and cable guide bolts.

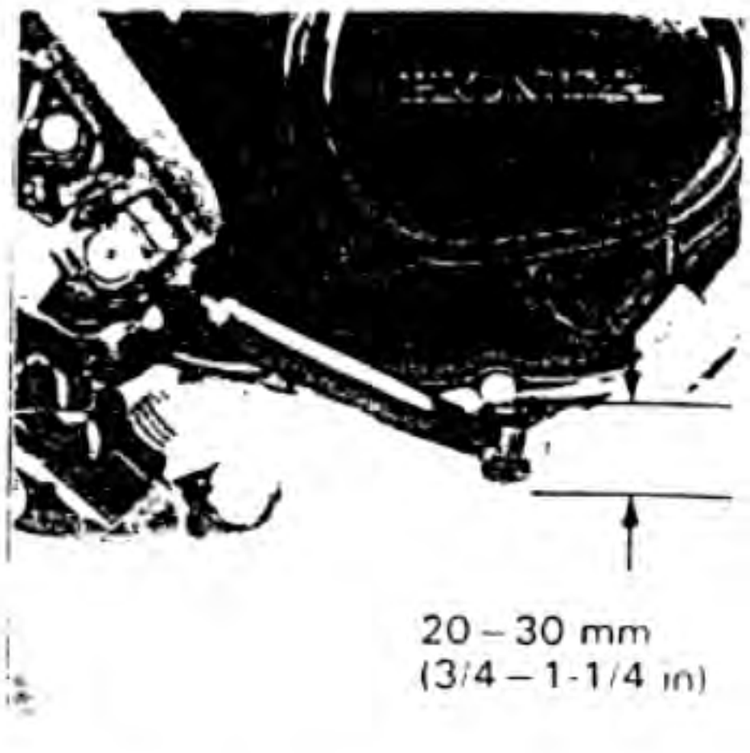


REAR

NOTE

- The pedal height can be adjusted for the rider's preference. Adjust the brake pedal free play after the pedal height adjustment has been made.

Loosen the lock nut and adjust the brake pedal height by turning the adjusting bolt.
Tighten the lock nut securely.

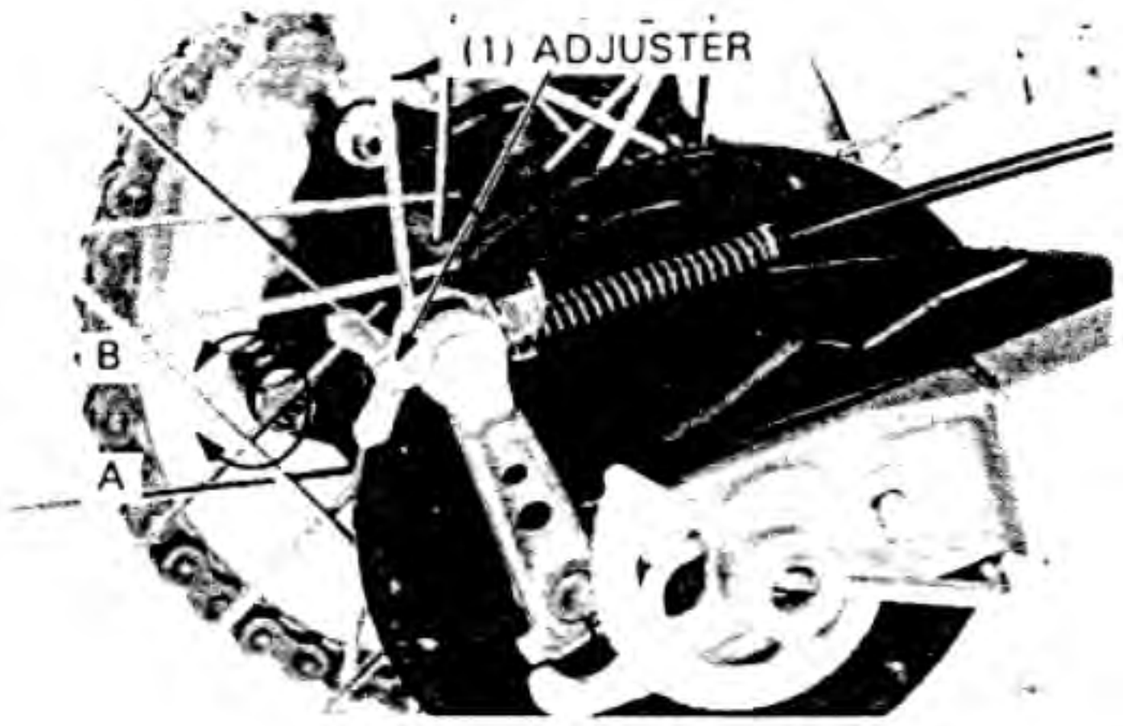


Measure the brake pedal free play.

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

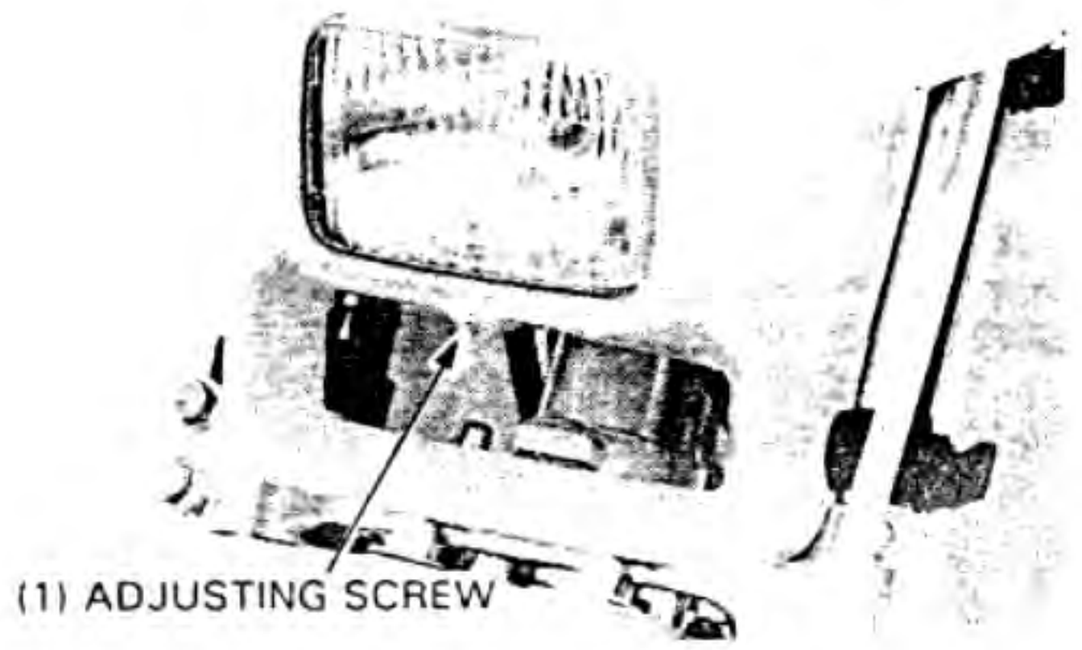
Adjust the free play by turning the adjuster.

Turn the adjuster in direction A to decrease free play, and in direction B to increase free play.



HEADLIGHT AIM ('86 – '88)

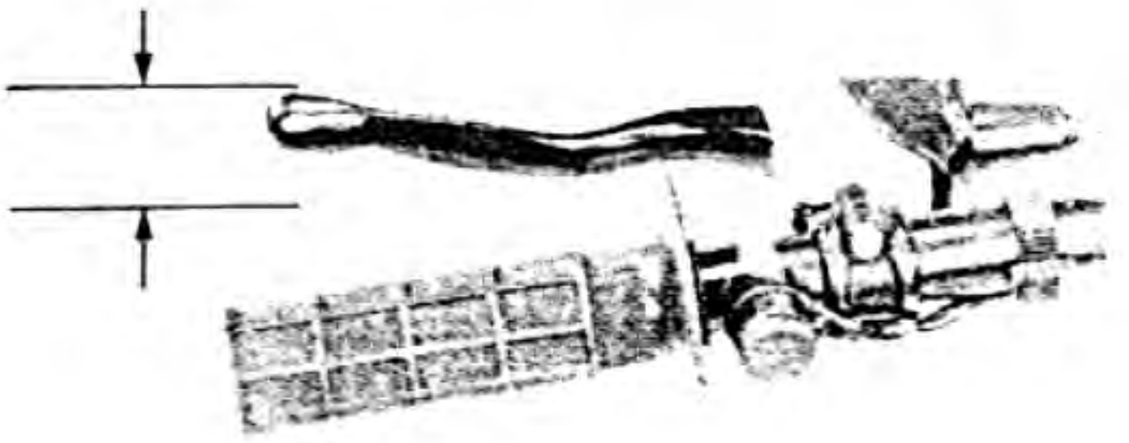
Turn the adjusting screw to adjust the headlight vertical aim.



CLUTCH

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

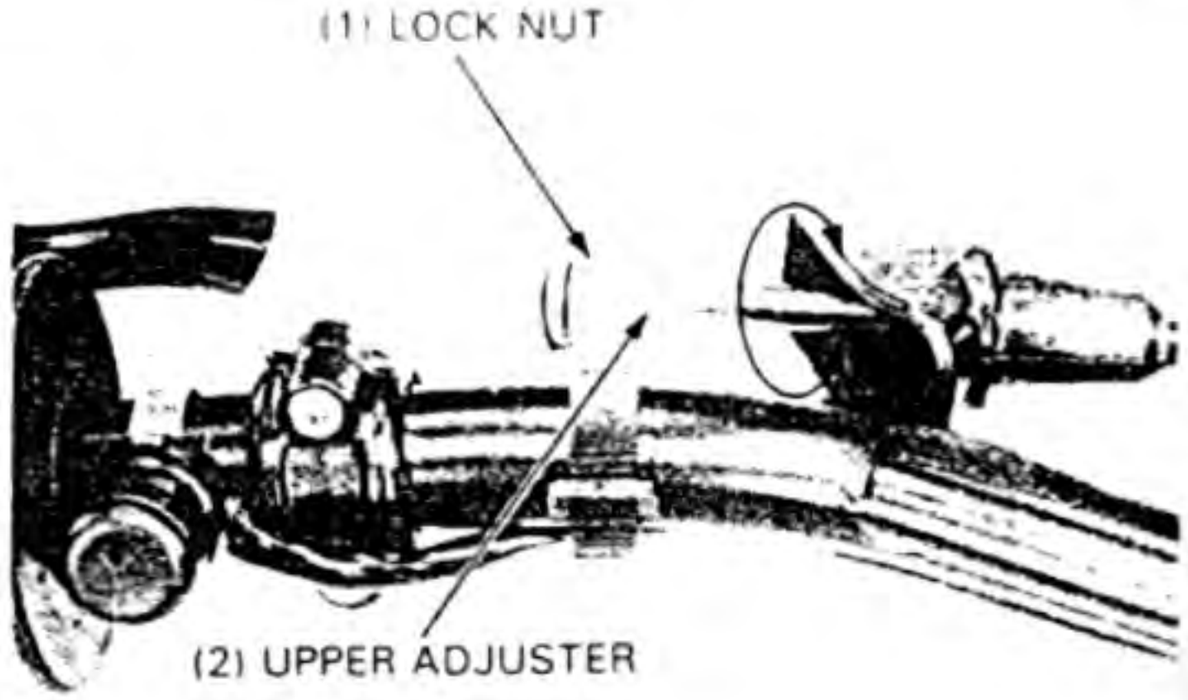
CLUTCH LEVER FREE PLAY: 10 – 20 mm (3/8 – 3/4 in).



Perform minor adjustments with the upper adjuster.
Loosen the lock nut and turn the adjuster.

Turn the adjuster in direction A to decrease free play, and in direction B to increase free play.

Tighten the lock nut.

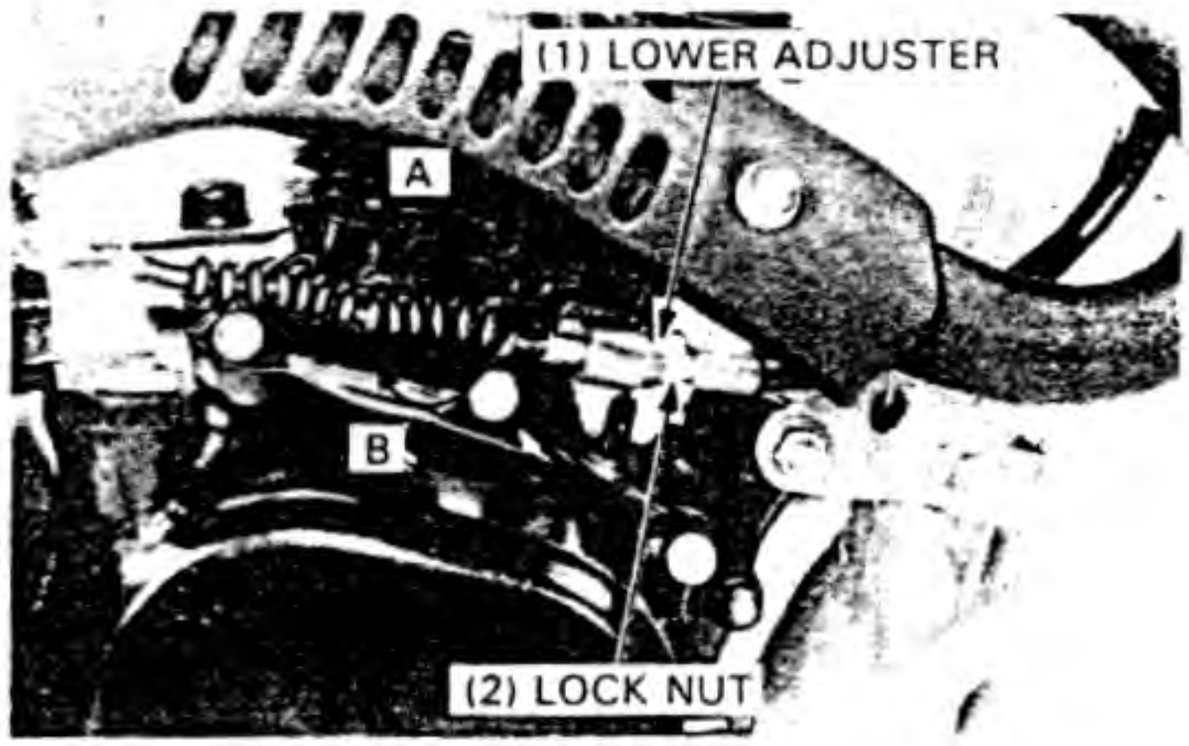


Perform major adjustments with the lower adjuster.
Loosen the lock nut and turn the adjuster.

Turn the adjuster in direction A to decrease free play, and in direction B to increase free play.

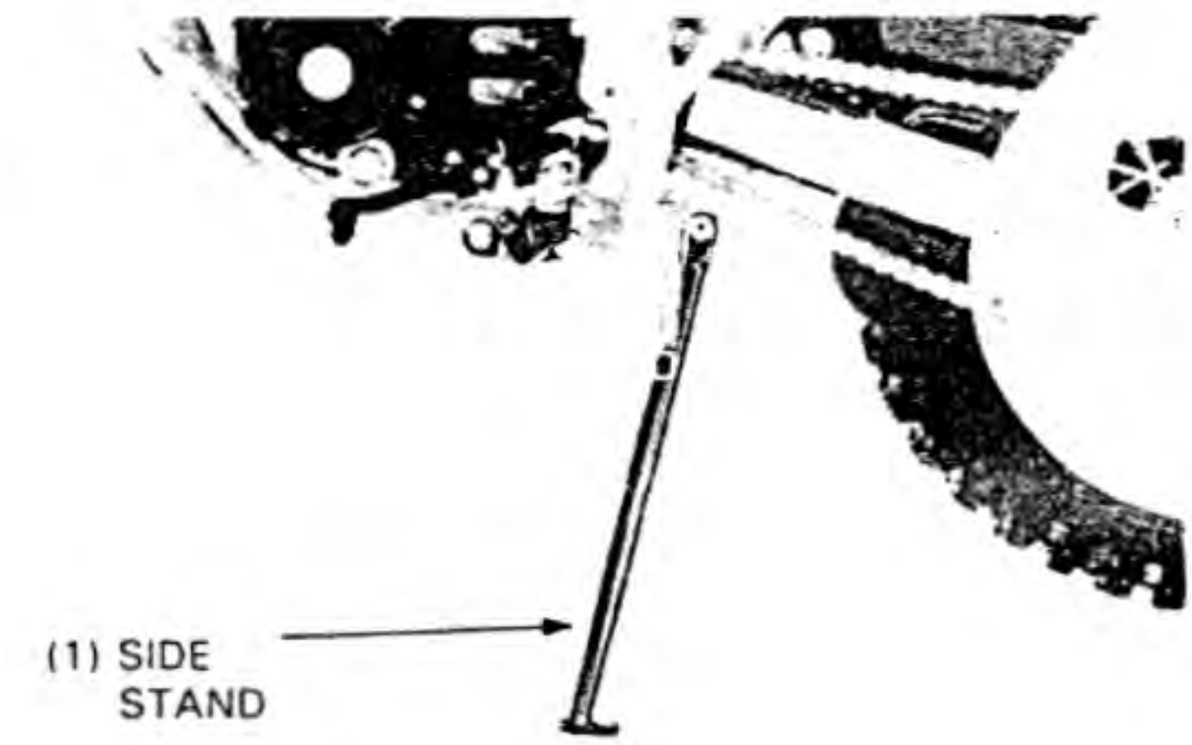
Tighten the lock nut.

Check the clutch operation.



SIDESTAND

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



SUSPENSION

FRONT

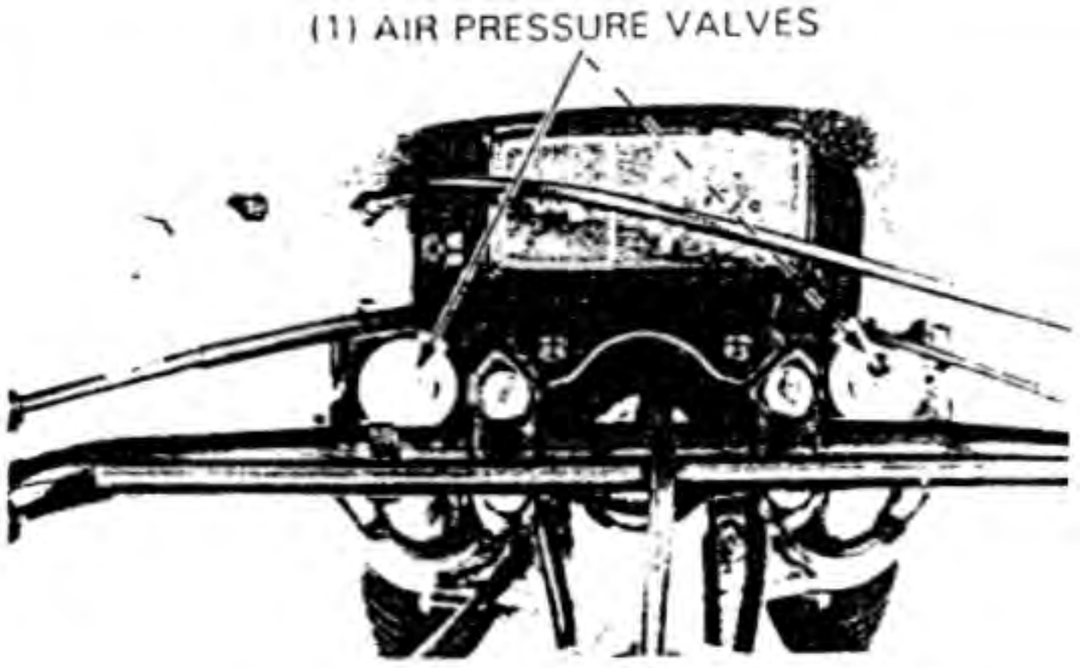
Check the action of the front forks by compressing them several times.
Check the entire fork assembly for signs of leaks, or damage.
Replace any components which are unrepairable.
Torque all nuts and bolts.

WARNING

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

Check the front fork air pressure when the fork is cold.
Lift the front wheel off the ground by placing a work stand or box under the engine.
Remove each air valve cap and measure the air pressure.

STANDARD AIR PRESSURE: 0 kPa (0 kg/cm², 0 psi)



REAR

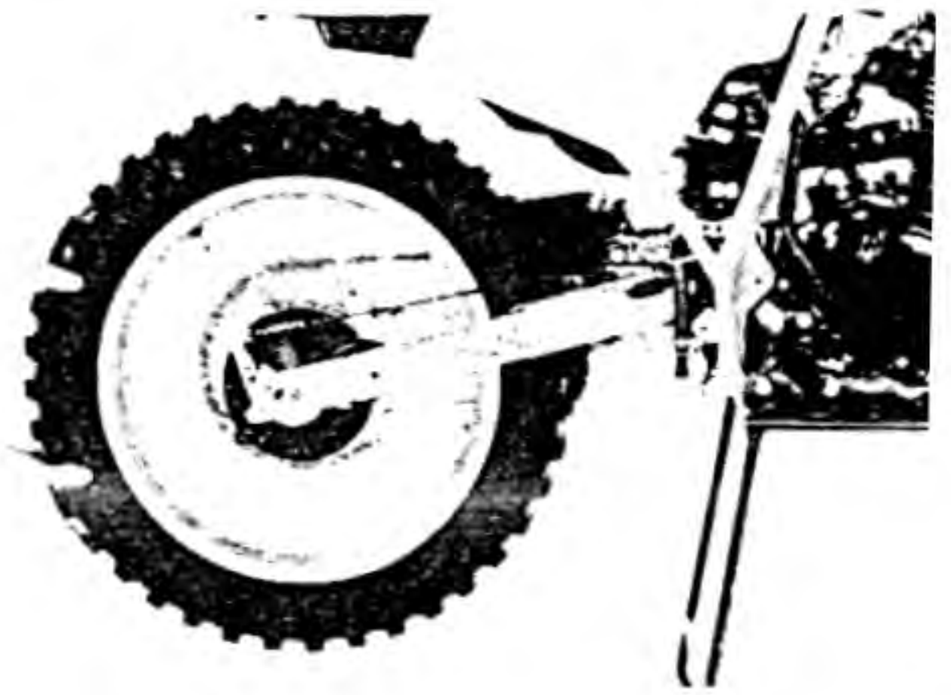
Check the operation of the rear suspension and the entire suspension assembly. Be sure it is securely mounted and not damaged or leaking. Make sure the spring is within the specified length (page 12-23).

Place the motorcycle on a support to raise the rear wheel off the ground.

Move the rear wheel sideways forcefully to check the swingarm bearings or wheel bearings for wear.

Forcefully move the rear wheel vertically to check the suspension linkage bushings for wear.

Replace bearings or bushings if excessively worn.
Tighten all bolts and nuts to their specified torque.



Apply grease to the swing arm pivot bearings through the grease fitting on the swing arm.

Apply a paste grease with 40% or more molybdenum disulfide to the linkage bushings through the grease fittings on the linkage pivots.

NOTE

Some sources of MoS_2 paste grease with 40% or more molybdenum disulfide are:

- Molykote® G-n Paste manufactured by Dow Corning U.S.A.
- Honda Moly 45 (U.S.A. only)
- Rocol Paste manufactured by Sumico Lubricant, Japan.
- Rocol ASP manufactured by Rocol Limited, U.K.

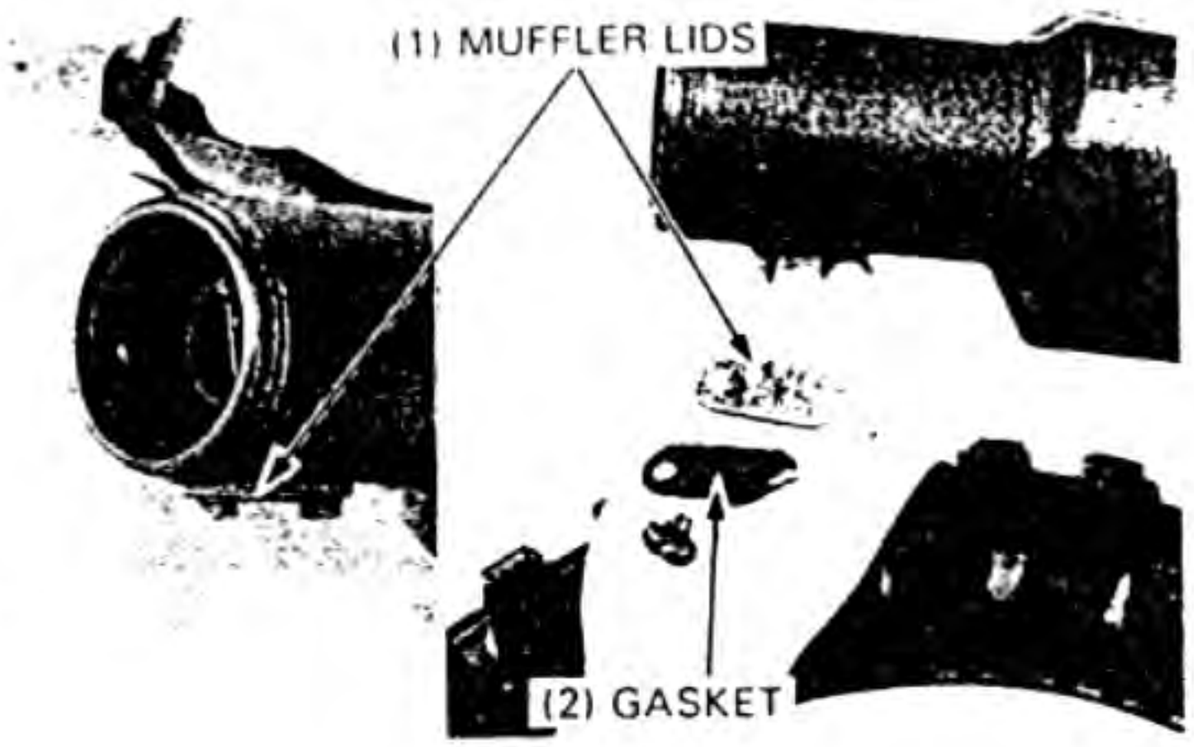
Any other manufacturer's paste grease equivalent to the above may also be used.

SPARK ARRESTER CLEANING

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

WARNING

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



After cleaning the spark arrester, install the muffler lid and gasket and tighten the bolts.

NOTE

- Be sure that the muffler lid and gasket are in good condition and the bolts are tightened securely.

CAUTION

- *Be sure that the spark arrester screws are securely in place.*

NUTS, BOLTS, FASTENERS

Tighten bolts, nuts and fasteners at regular intervals as shown in the Maintenance Scheduls (page 3-3, 4).

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

WHEELS/TIRES

NOTE

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

PRESSURES:
Front: 100 kPa (1.0 kg/cm², 15 psi)
Rear: 100 kPa (1.0 kg/cm², 15 psi)

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

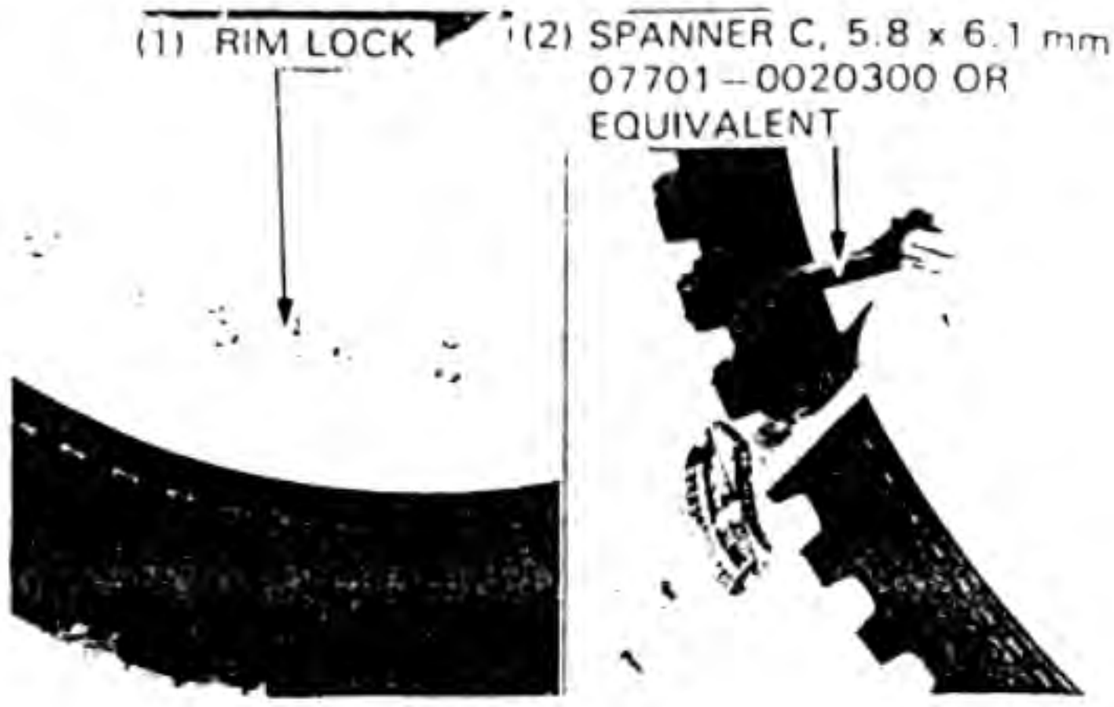
Check the tightness of the rim locks.

TORQUE: 10 – 15 N·m (1.0 – 1.5 kg-m, 7 – 11 ft-lb)

Tighten the wheel spokes periodically as per the maintenance schedule (page 3-3, 4).

TORQUE: 2.5 – 5.0 N·m (0.25 – 0.50 kg-m, 1.8 – 3.6 ft-lb)

Check the wheel rim runout (page 11-5, 12-4).



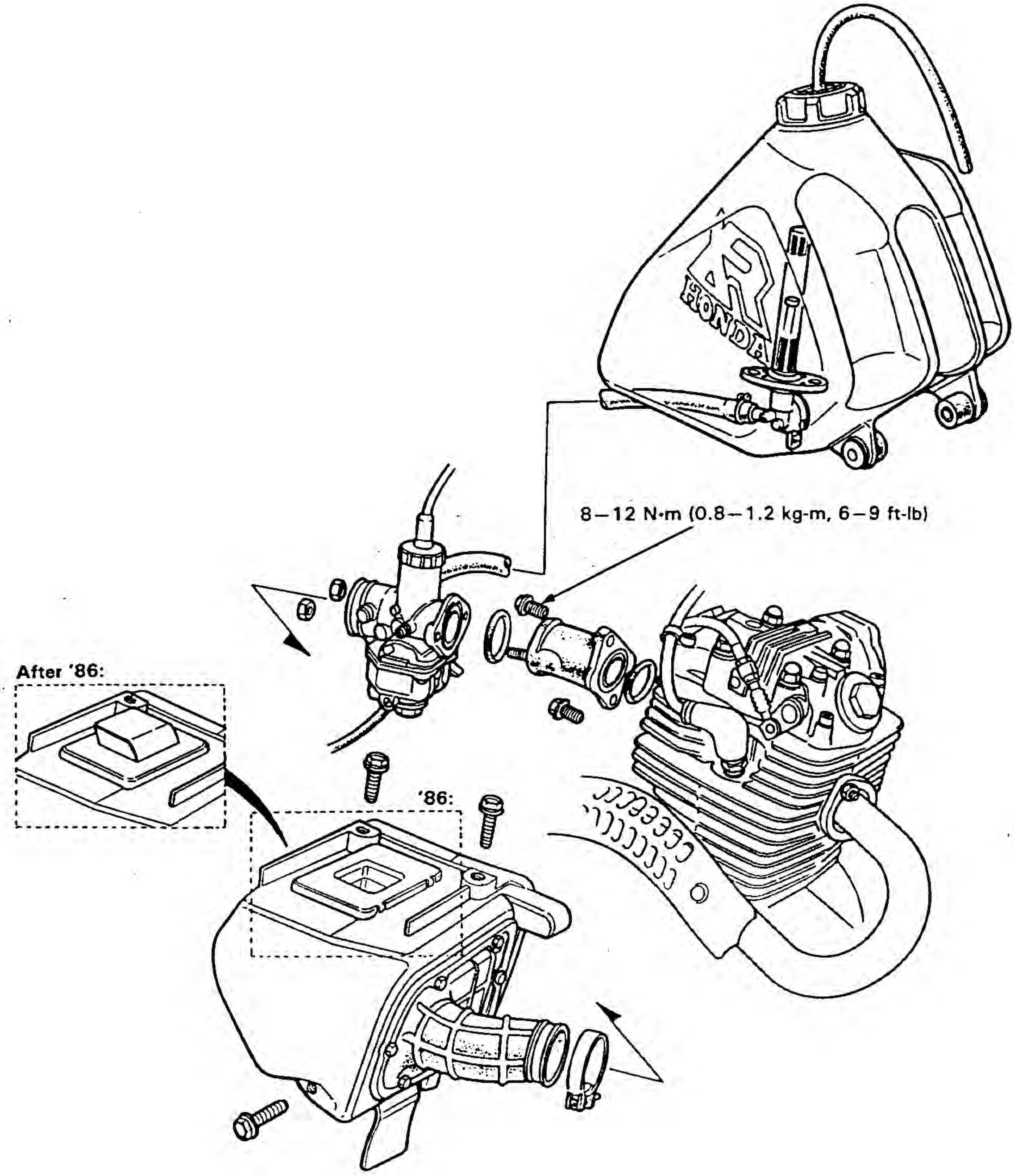
STEERING HEAD BEARINGS

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 steering stem socket (page 11-20).


8—12 N·m (0.8—1.2 kg-m, 6—9 ft-lb)
After '86:
'86:

4. FUEL SYSTEM

SERVICE INFORMATION

GENERAL

WARNING

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

- When disassembling fuel system parts, note the locations of the O-rings. Replace them during reassembly.
- The carburetor float bowl has a drain plug that can be loosened to drain residual fuel.

NOTE

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

SPECIFICATIONS

Fuel tank capacity	9.0 liters (2.4 U.S. gal, 2.0 Imp gal)		
Fuel reserve capacity	1.5 liters (0.4 U.S. gal, 0.3 Imp gal)		
Carburetor	Identification number	'86 – '97:	PD97A
		After '97/Except California type:	PD97A
		After '97/California type:	PD97B
	Type	Piston valve	
	Venturi dia.	26 mm (1.0 in)	
	Float level	12.5 ± 0.5 mm (0.49 ± 0.02 in)	
	Pilot screw opening	See page 4-11	
	Idle speed	1,300 ± 100 rpm	
	Main jet	'86:	#112
		'87 – '97:	#110
		After '97/Except California type:	#110
		After '97/California type:	#102
	Slow jet	'86 – '97:	#38
		After '97/Except California type:	#38
		After '97/California type:	#35
	Needle clip position	'86: 2nd groove	
		After '86: 3rd groove	
	Throttle grip free play	2 – 6 mm (1/8 – 1/4 in)	

TOOL

Common	
Carburetor float level gauge	07401–0010000

TORQUE VALUES

Fuel tank mounting bolt	8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)
Fuel valve mounting screw	5–9 N·m (0.5–0.9 kg-m, 4–6 ft-lb)
Seat mounting bolt	8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)
Carburetor insulator bolt	8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)

TROUBLESHOOTING

Engine cranks but won't start
- No fuel in tank
- No fuel to cylinder
- Too much fuel getting to cylinder
- No spark at plug (ignition malfunction)
- Air cleaner clogged

Engine idles roughly, stalls, or runs poorly
- Idle speed incorrect
- Ignition malfunction
- Rich mixture
- Lean mixture
- Air cleaner dirty
- Air leaks into intake pipe
- Cylinder compression too low
- Restricted fuel line

Lean mixture
- Carburetor fuel jet clogged
- Fuel cap vent blocked
- Breather tube clogged
- Fuel filter clogged
- Fuel line kinked or restricted
- Float valve faulty
- Float level too low
- Insulator leaks

Rich mixture
- Carburetor choke stuck closed
- Float valve faulty
- Float level too high
- Carburetor air jet clogged
- Air cleaner dirty

FUEL TANK

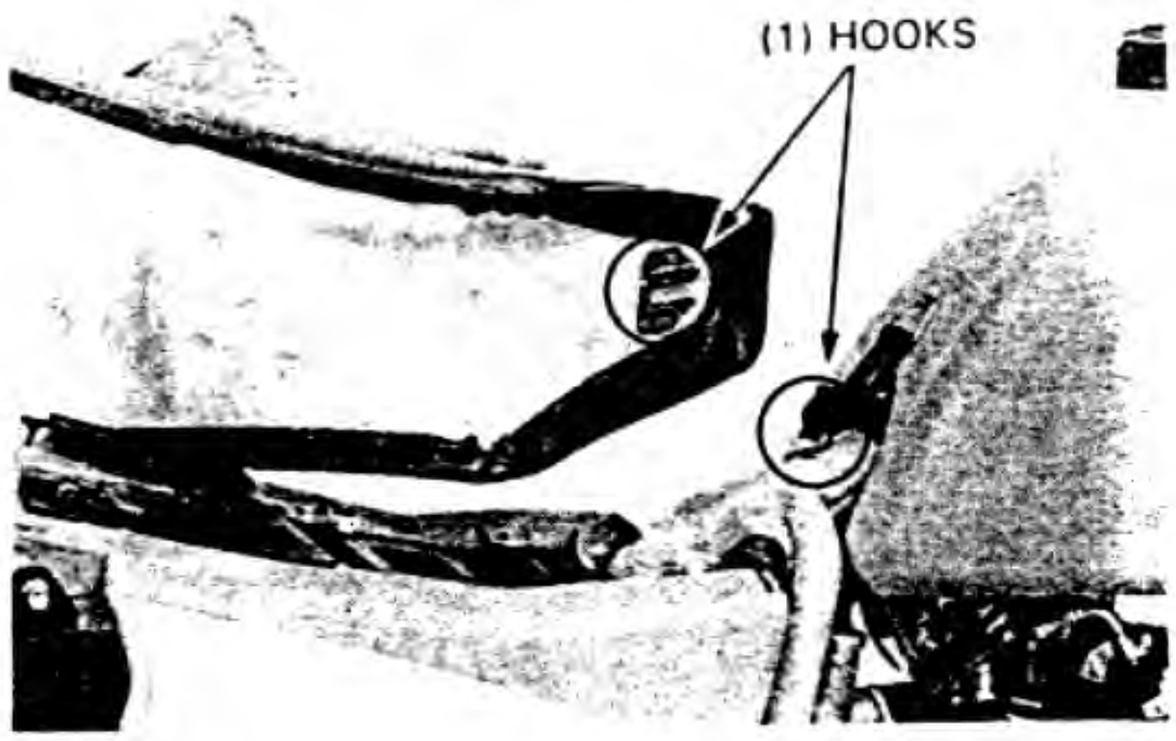
REMOVAL

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

WARNING

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

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



INSTALLATION

Flush out the tank and reinstall the fuel valve.
Install the fuel tank with two mounting bolts and strap.

Connect the fuel tube.
Align the seat hook with the frame hook and install the seat.

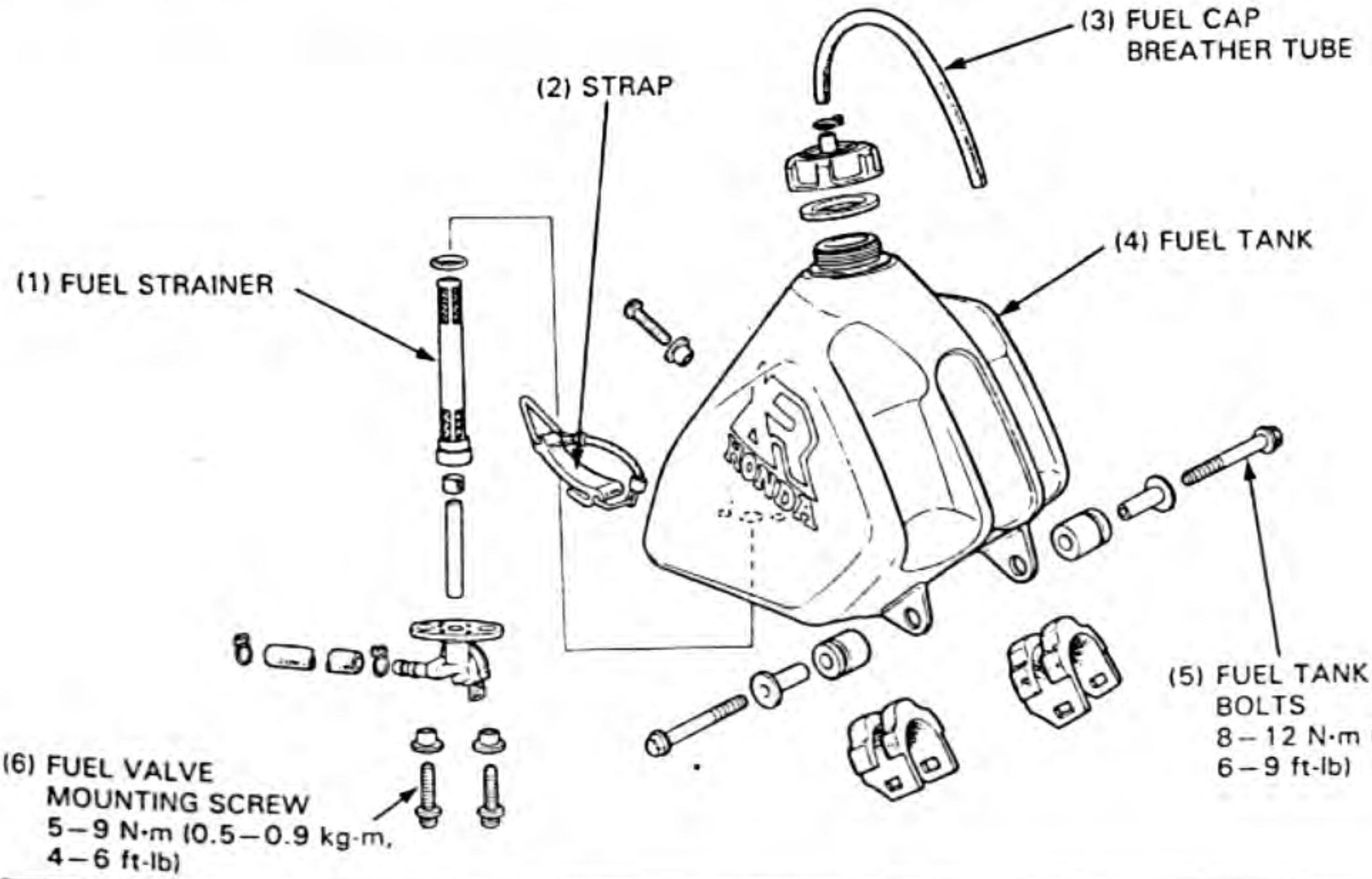
Tighten the seat mounting bolts (page 13-2).

CAUTION

- *Do not overtighten the fuel valve mounting screws. Excessive torque may damage the fuel tank.*

NOTE

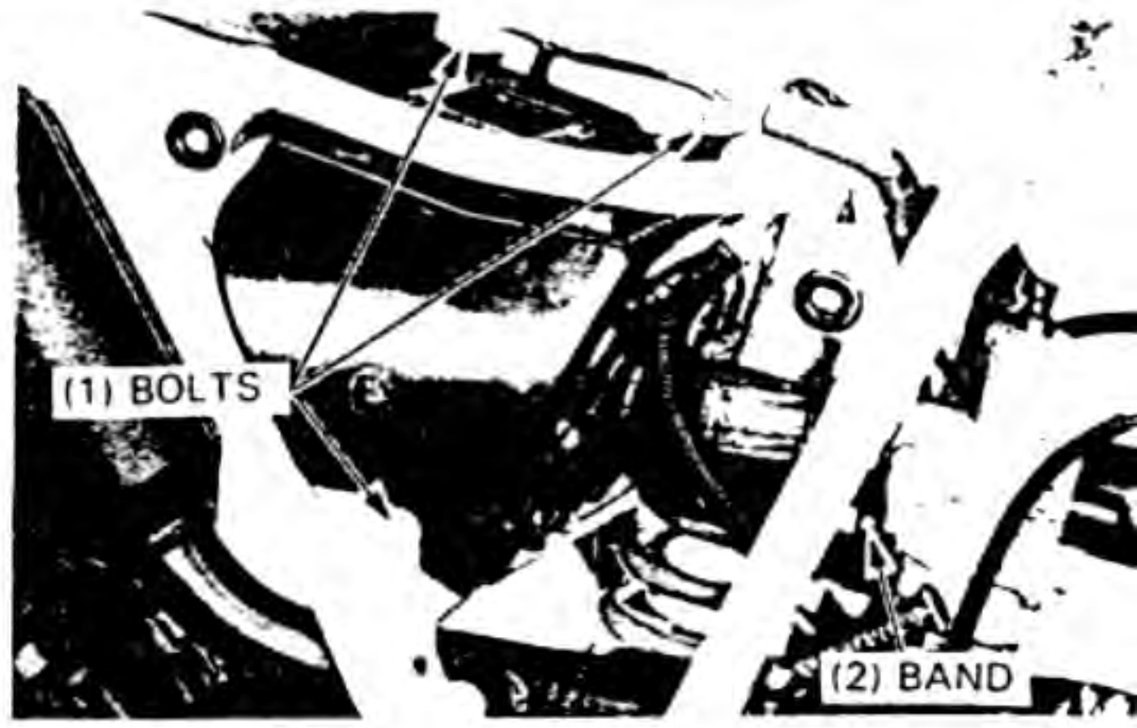
- After assembly, make sure there are no fuel leaks.



AIR CLEANER CASE

REMOVAL

Remove the seat and side covers.
Loosen the air cleaner connecting tube band.
Remove the air cleaner mounting bolts.



'86–'88, '90–'91:
Loosen the reservoir bands and remove the reservoir from the frame.

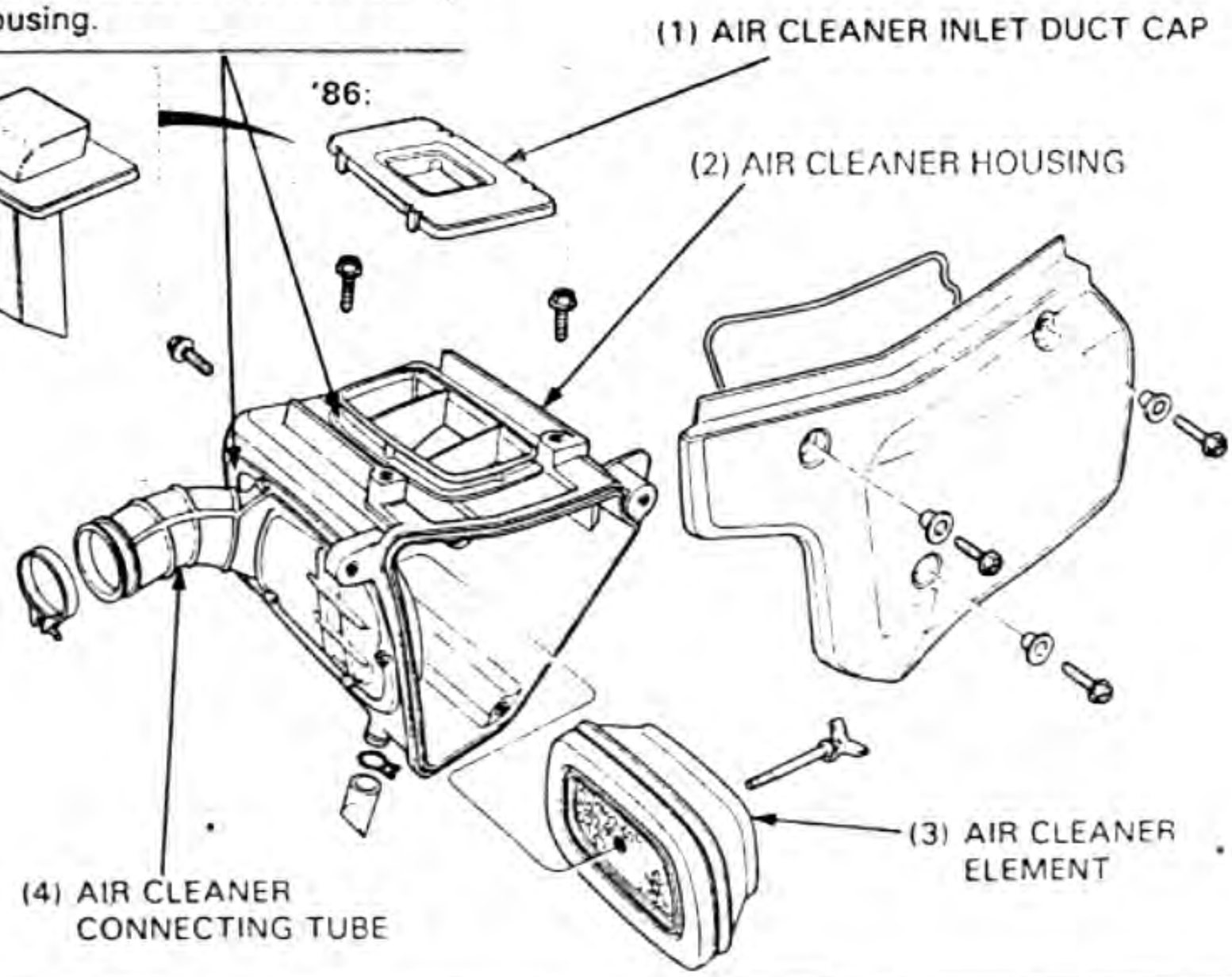
Remove the air cleaner housing from the left side of the frame by pressing down on the left rear portion of the air cleaner housing and sliding it forward.

INSTALLATION

Install the air cleaner in the reverse order of removal.

NOTE

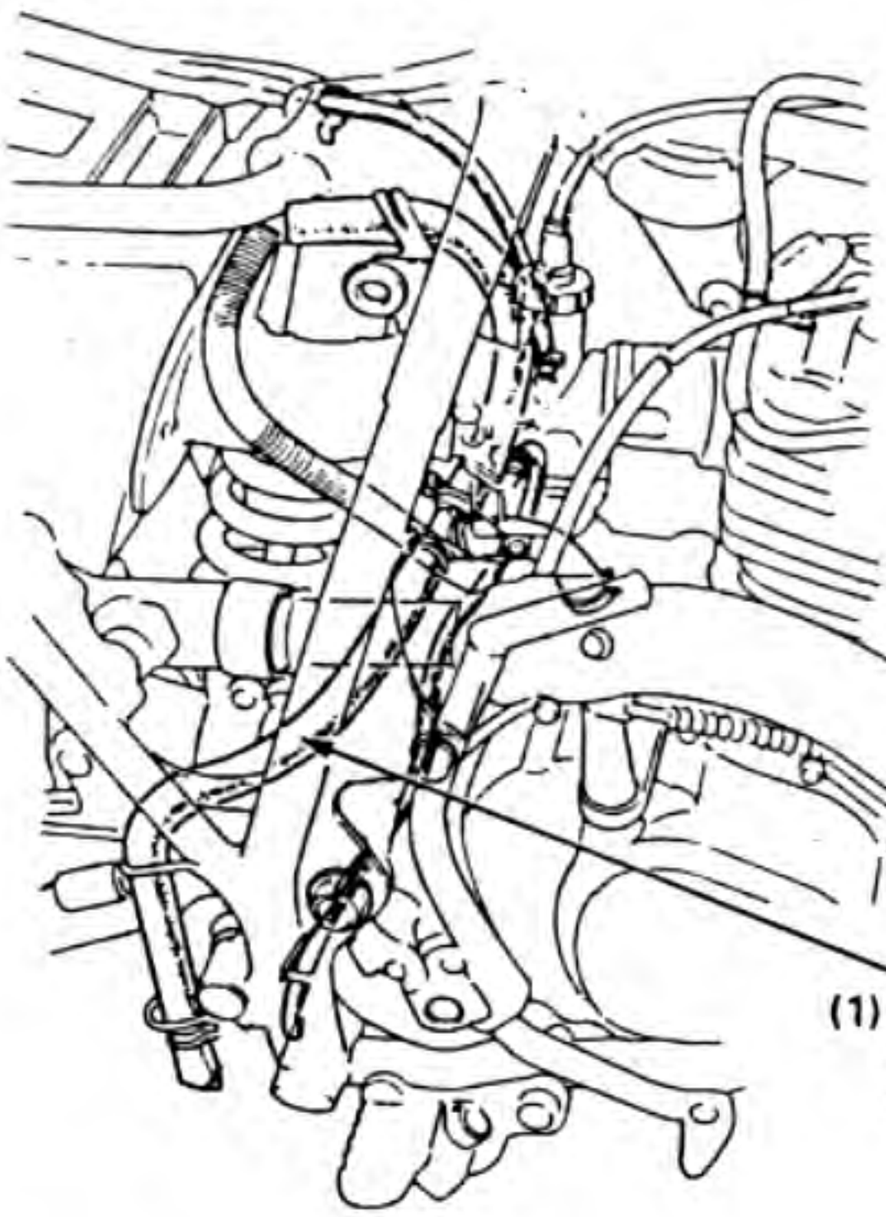
- Apply sealing agent all the way around the connecting surfaces of the air cleaner housing.



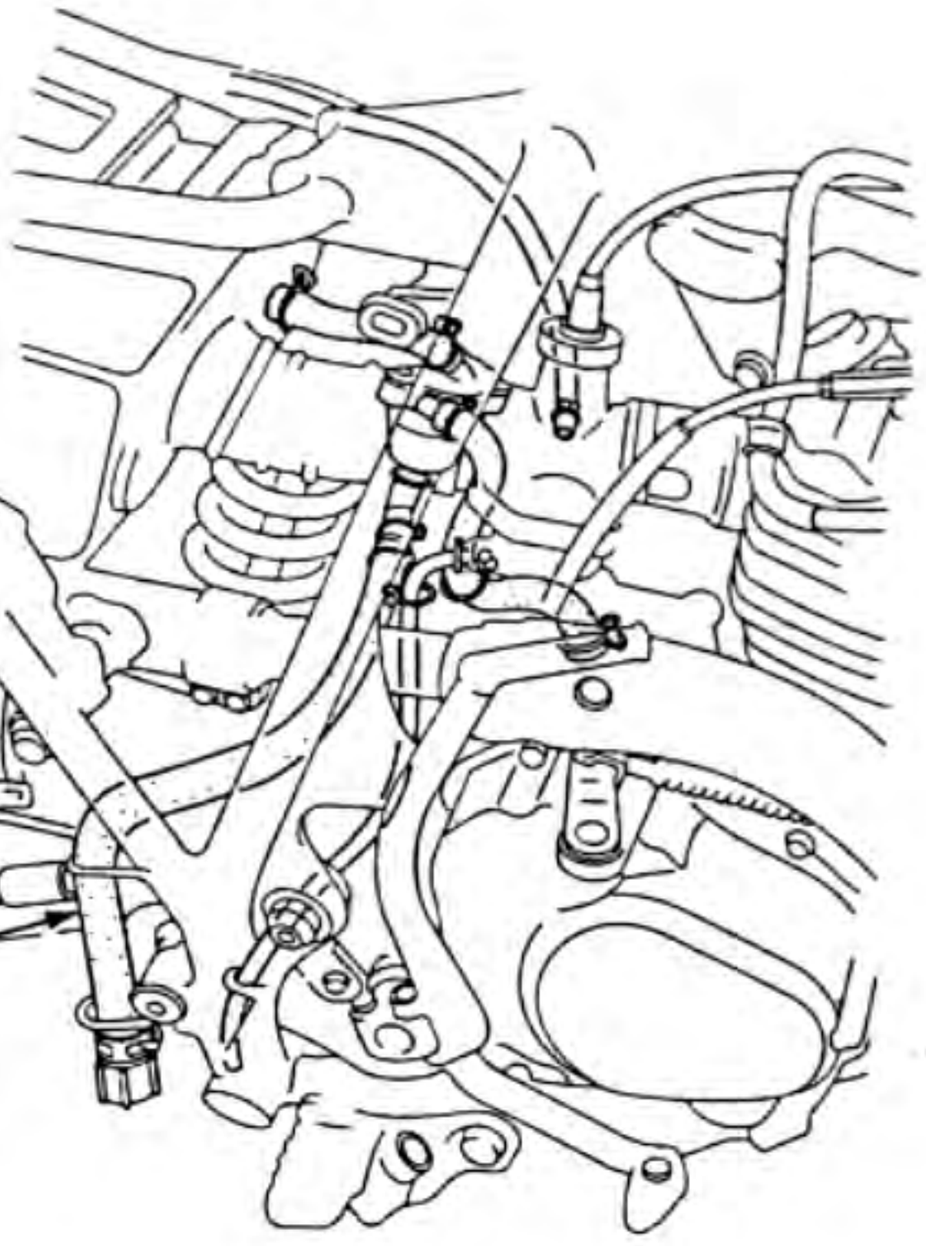
CRANKCASE BREATHER

Route the crankcase breather tube as shown.

'86 – '97:
After '97/Except California type:



After '97/California type:



(1) CRANKCASE BREATHER TUBE

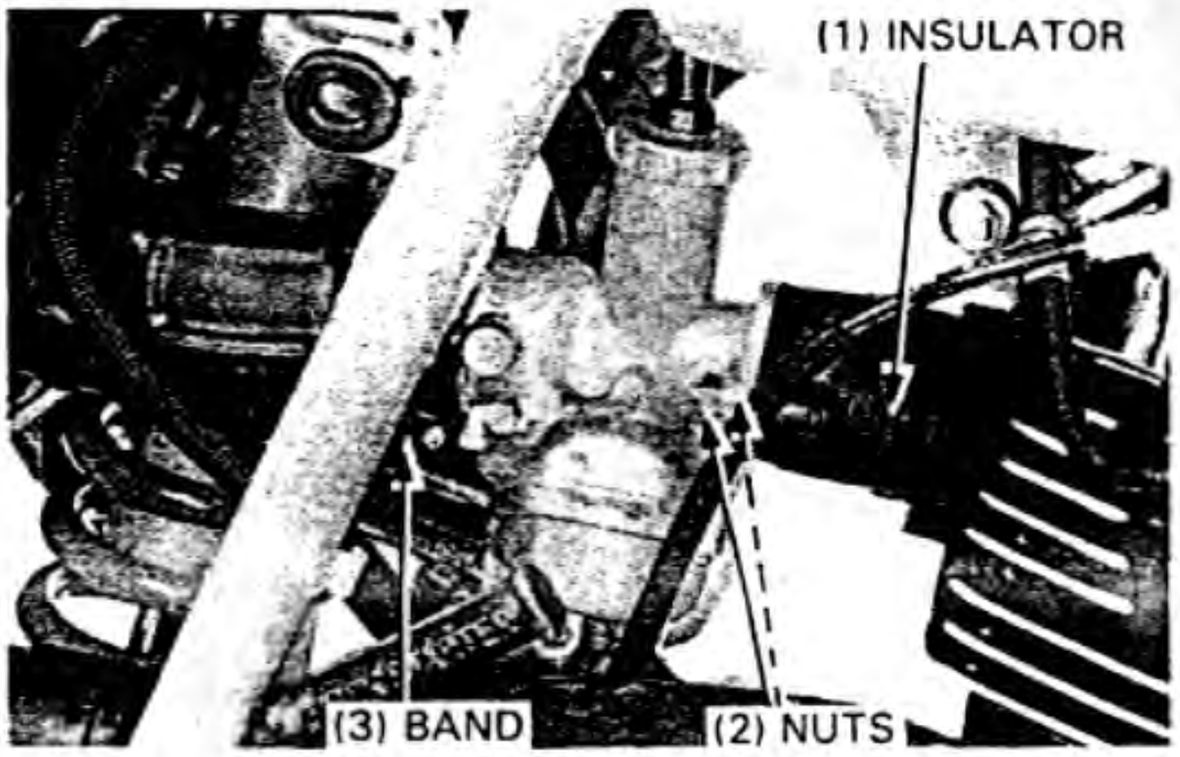
CARBURETOR REMOVAL

Remove the seat and fuel tank.
Remove the right side cover.
Disconnect the fuel line from the carburetor.
Remove the air vent and overflow tubes.

Loosen the drain screws and drain the fuel into a suitable container.

WARNING

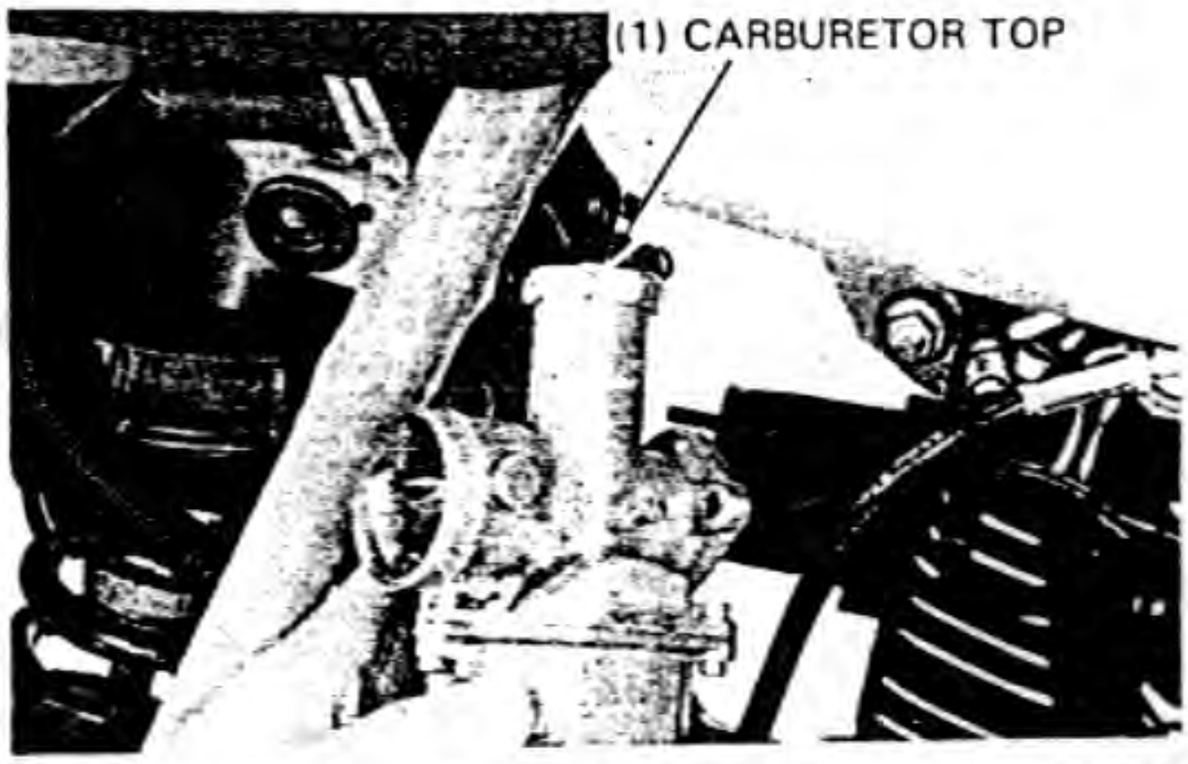
- *Keep gasoline away from flames or sparks.*
  Wipe up spilled gasoline at once.



Loosen the air cleaner connecting tube band.
Remove the two bolts attaching the carburetor to the insulator.

Pull the carburetor away from the right side of the engine.

Unscrew the carburetor top and pull the throttle valve out.



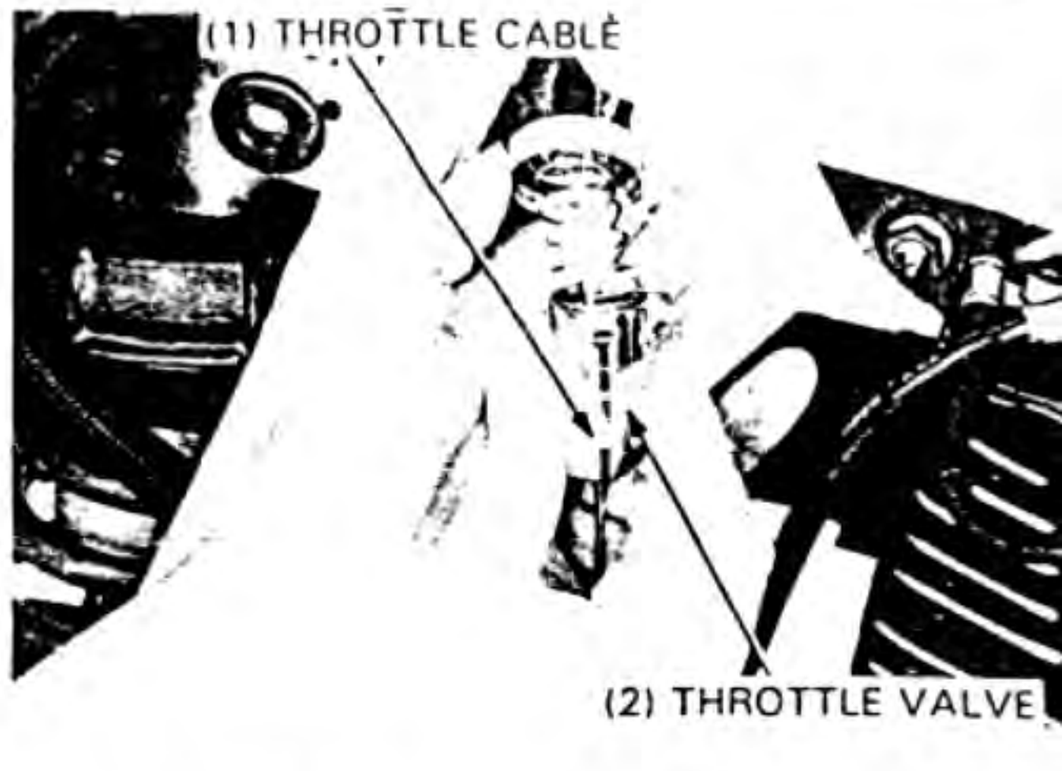
CARBURETOR DISASSEMBLY

THROTTLE VALVE DISASSEMBLY

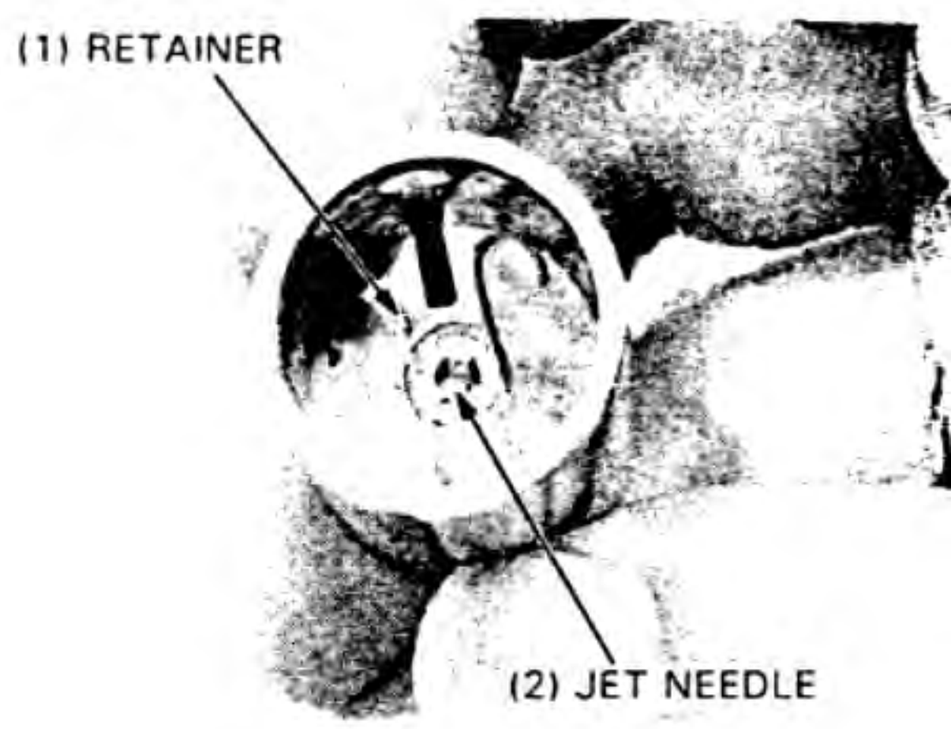
Remove the throttle cable from the throttle valve while depressing the throttle valve spring.

CAUTION

- *The carburetor top is an integral part of the throttle cable assembly. The top cannot be separated from the assembly without causing damage to the cable.*

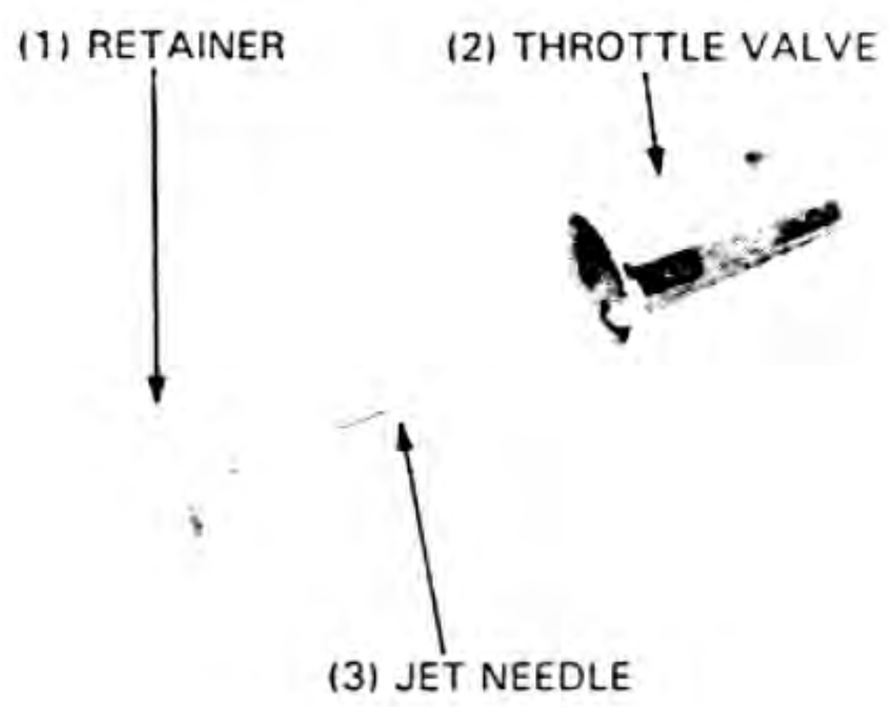


Remove the retainer.
Remove the jet needle with the clip attached.



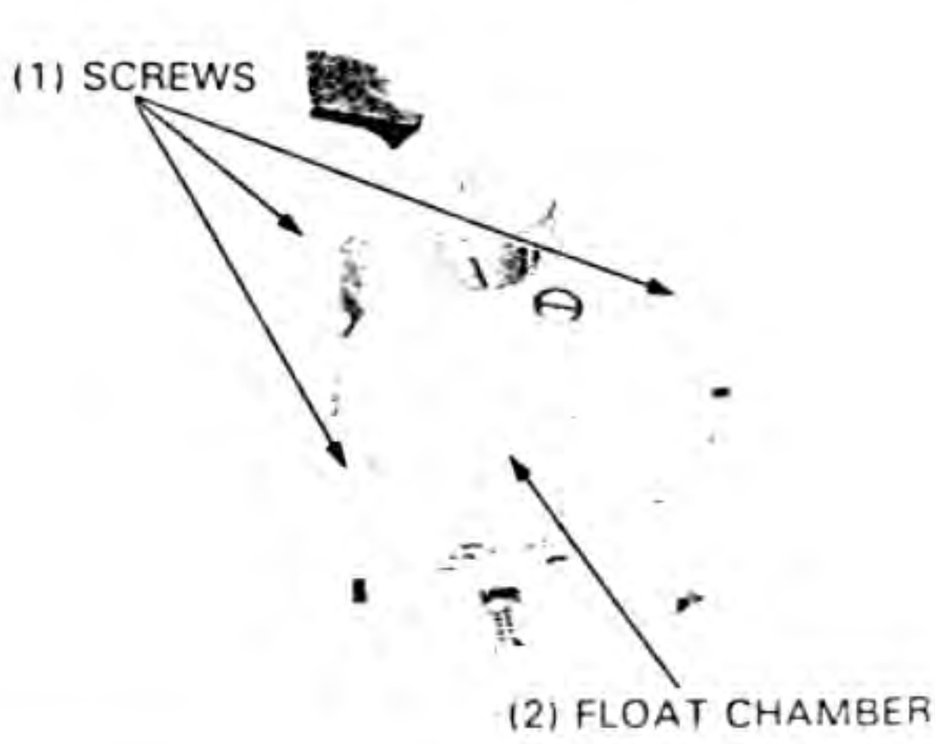
Inspect the throttle valve for wear or scratches.

Inspect the jet needle for damage.

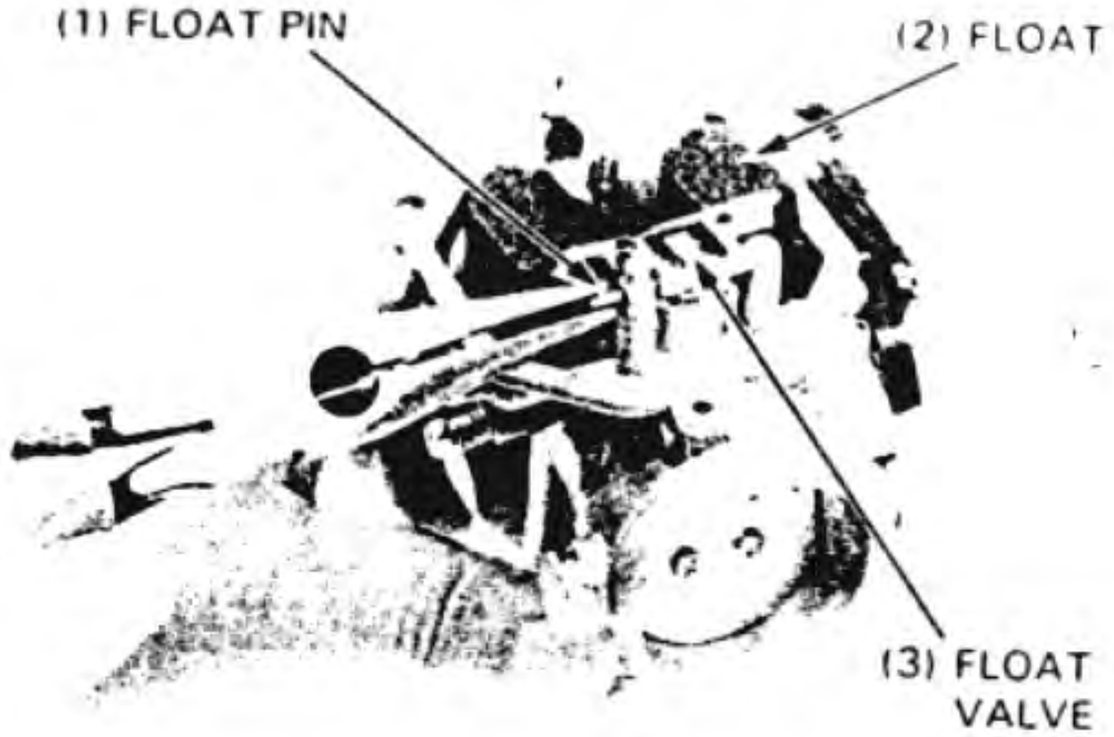


FLOAT, FLOAT VALVE AND JETS

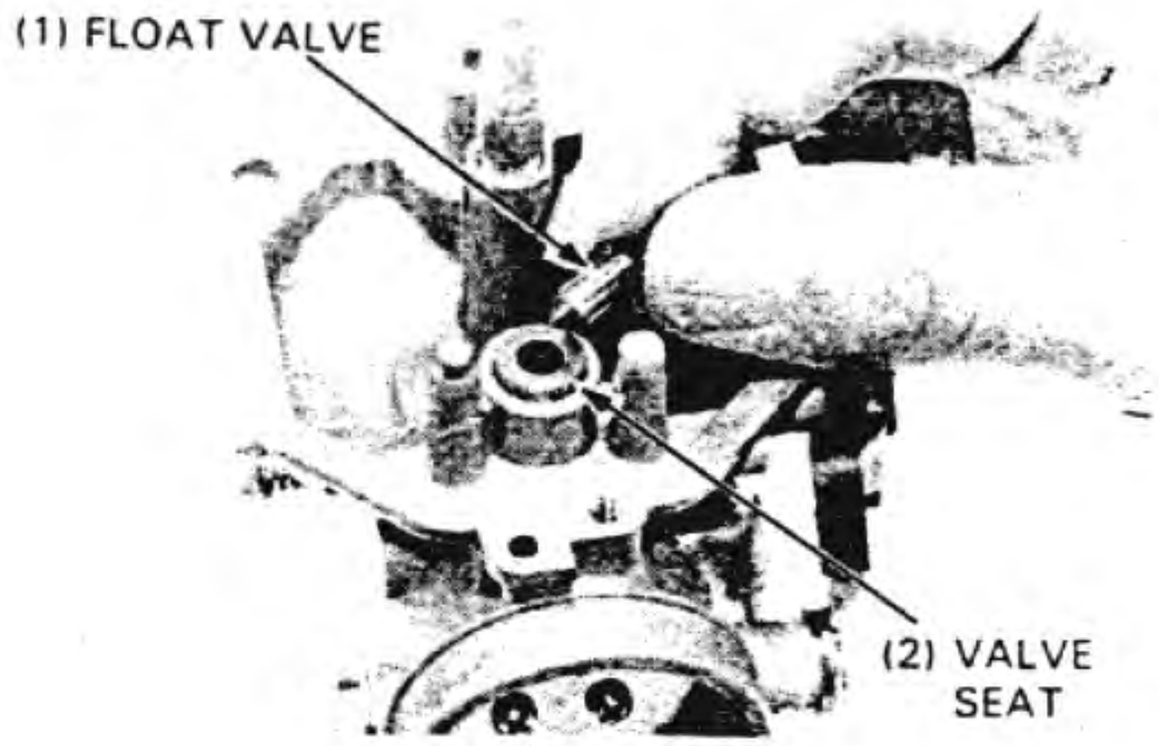
Remove the float chamber by removing the three screws.



Remove the float pin with pliers.
Remove the float and float valve.



Check the float valve and seat for wear or damage, and replace if necessary.
Check the float for deformation.
Replace the float if it's deformed.

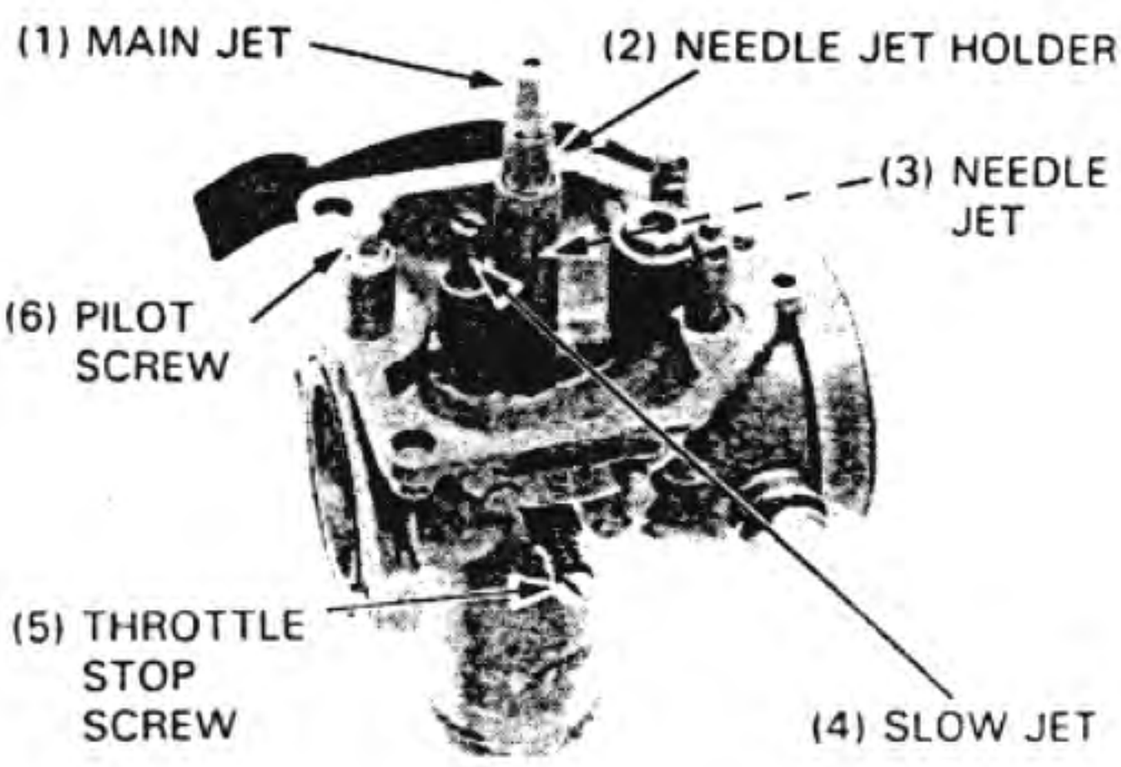


Remove the main jet, needle jet holder and needle jet.

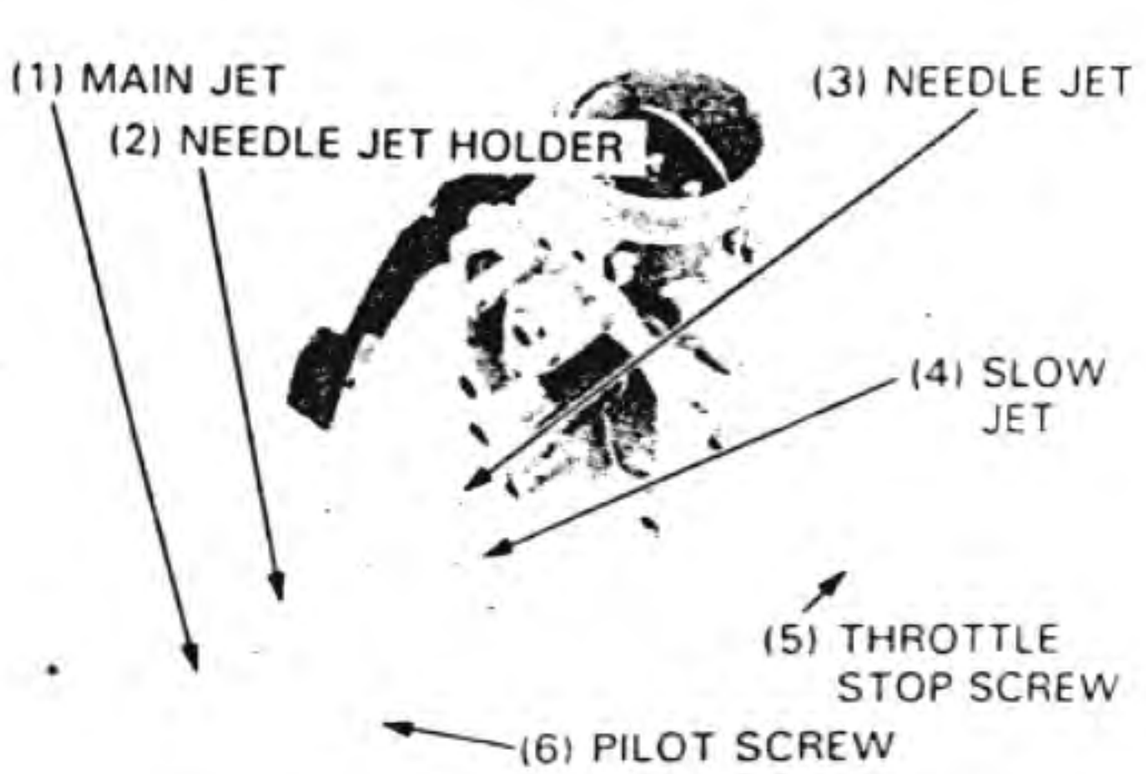
Remove the slow jet.
Remove the throttle stop screw, and pilot screw.

NOTE

- Before removing the throttle stop screw, and pilot screw, record the number of rotations until they seat lightly, so they can be returned to their original positions.

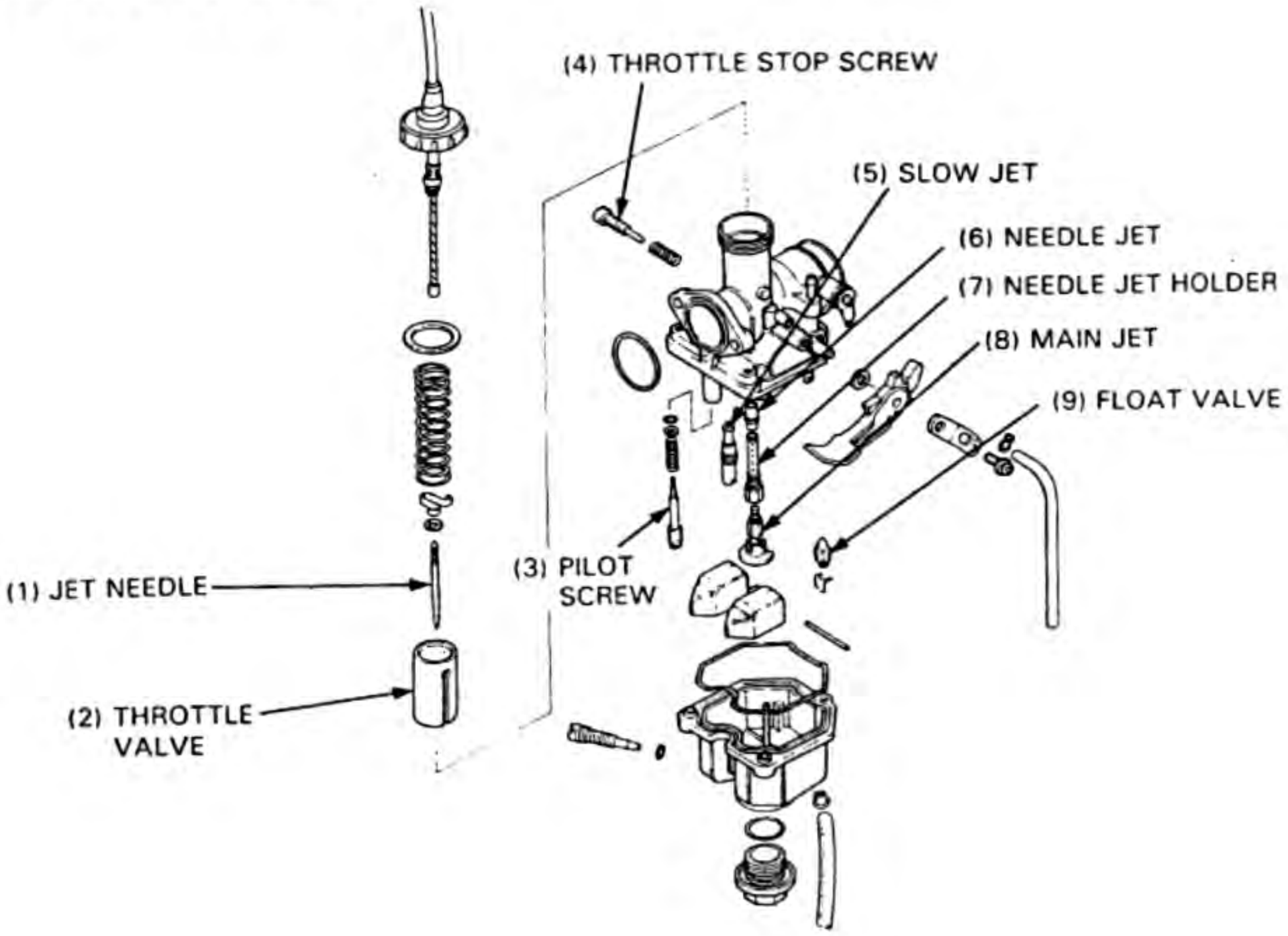


Inspect the throttle stop screw, pilot screw and jets for signs of wear or damage.



Clean and blow open all jets and openings with compressed air.

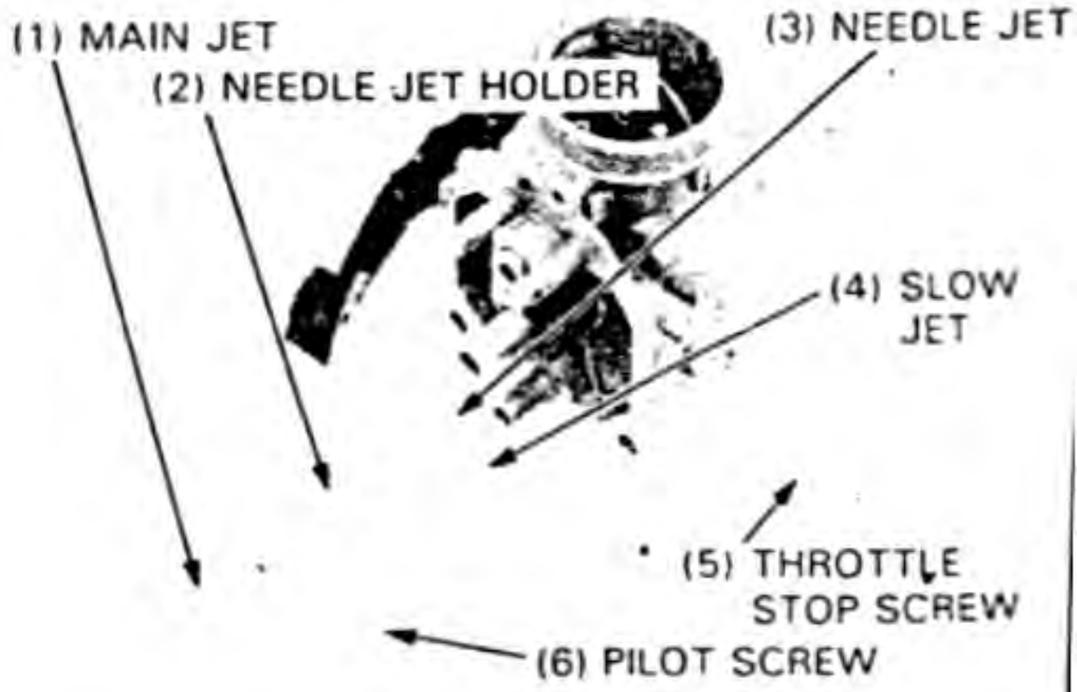
CARBURETOR ASSEMBLY



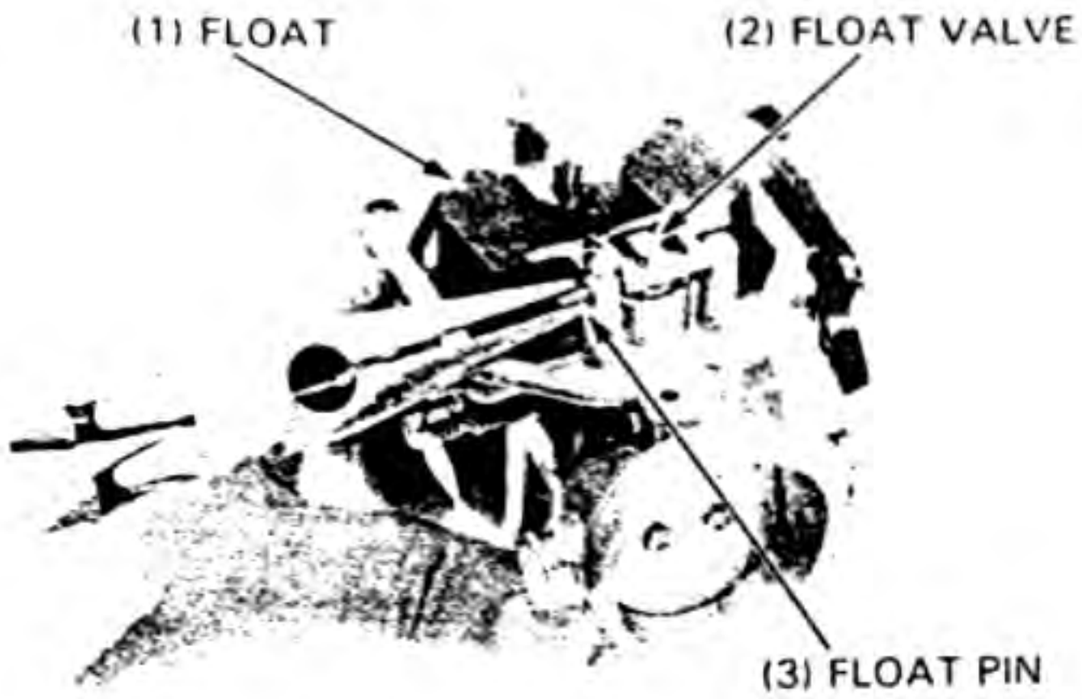
Install the throttle stop and pilot screws and return them to their original positions as noted during removal.

PILOT SCREW OPENING: 1-1/8 turns out

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



Install the float valve, float and float pin.
Check operation of the float.



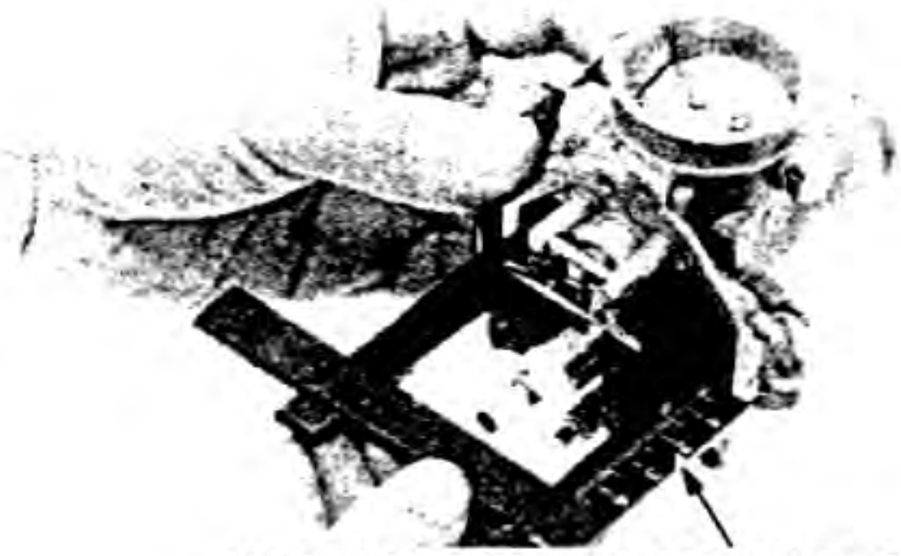
FLOAT LEVEL ADJUSTMENT

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

FLOAT LEVEL: 12.5 ± 0.5 mm (0.49 ± 0.02 in)

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

Install the float chamber, overflow and air vent tubes.



THROTTLE VALVE ASSEMBLY

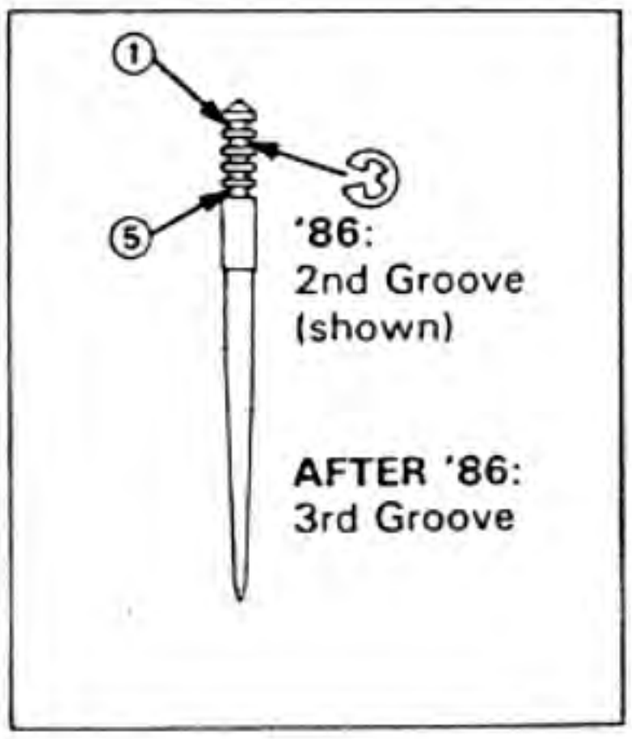
Install the needle clip on the jet needle.

STANDARD SETTING POSITION:
'86: 2nd groove
AFTER '86: 3rd groove

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

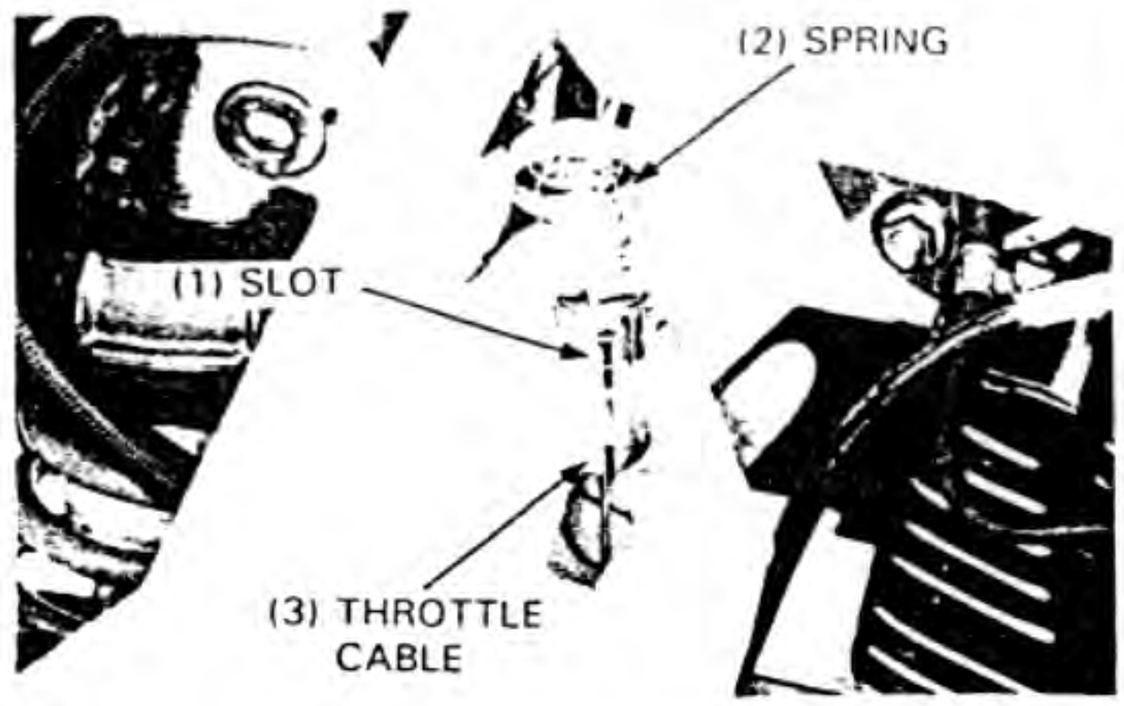
NOTE

- Install the retainer on the lower position of the throttle valve.



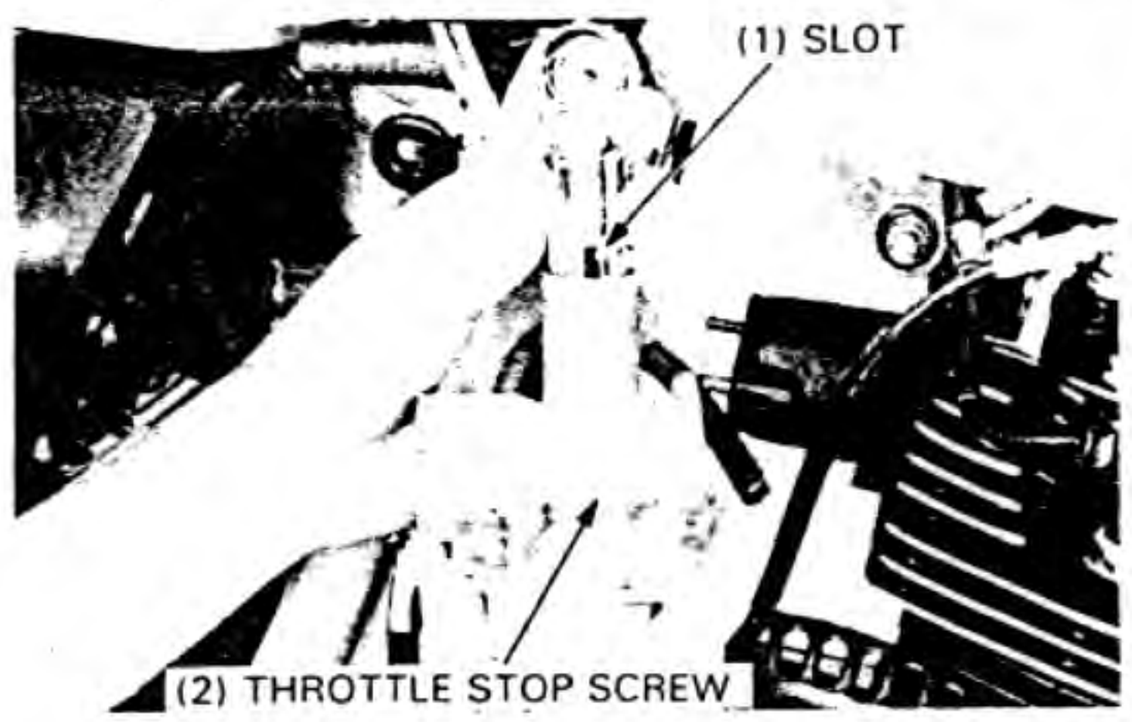
Slip the rubber cap, carburetor top and spring over the throttle cable.

Compress the throttle valve spring and insert the cable into the slot of the throttle valve.



Install the throttle valve assembly into the carburetor, aligning the slot in the valve with the throttle stop screw in the carburetor.

Tighten the carburetor top securely.



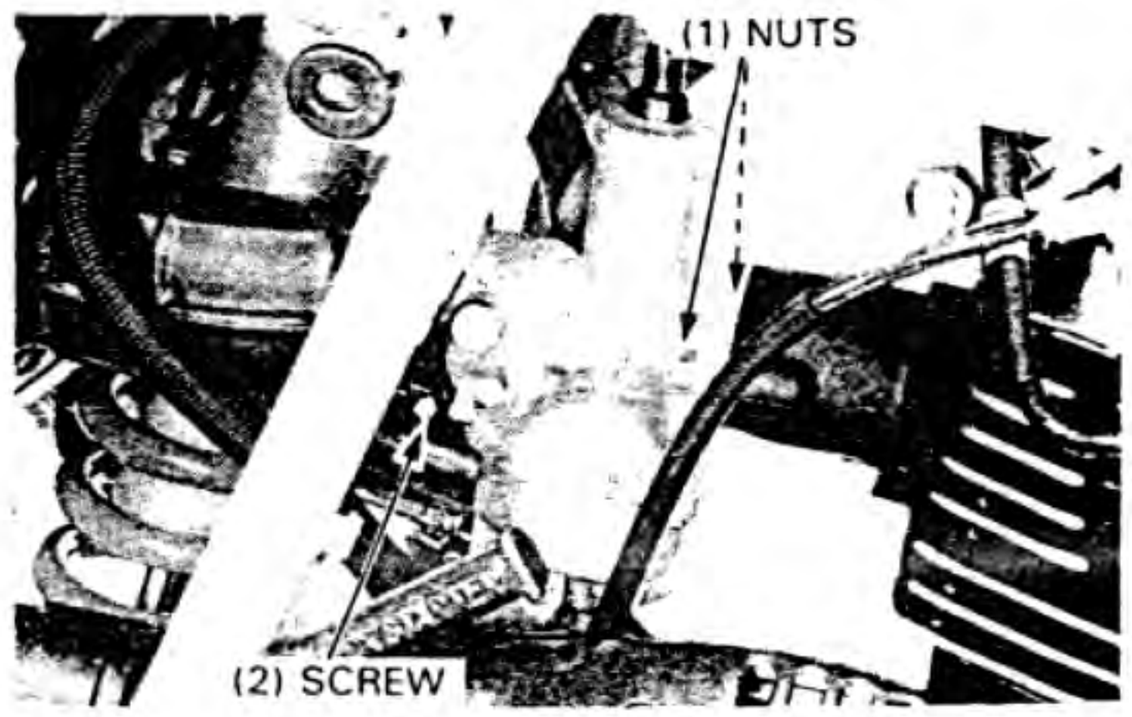
CARBURETOR INSTALLATION

Install the carburetor between the insulator and air cleaner connecting tube. Tighten the nuts and clamp screw securely.

NOTE

- After installing the carburetor, perform the following adjustments:
  Throttle grip free play (Page 3-6).
  Carburetor pilot screw adjsutment if the carburetor was overhauled.

Route the carburetor overflow and air vent tubes properly (Section 1 Cable and harness routing).



PILOT SCREW ADJUSTMENT

IDLE DROP PROCEDURE

WARNING

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

NOTE

- The pilot screw factory pre-set and no adjustment can be done unless it is replaced.
- Use a tachometer with graduations of 50 rpm or smaller that will accurately indicate a 50 rpm change.

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

INITIAL OPENING: '86 – '97: 1-1/8
After '97/Except California type: 1-1/8
After '97/California type: 1-7/8

CAUTION

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

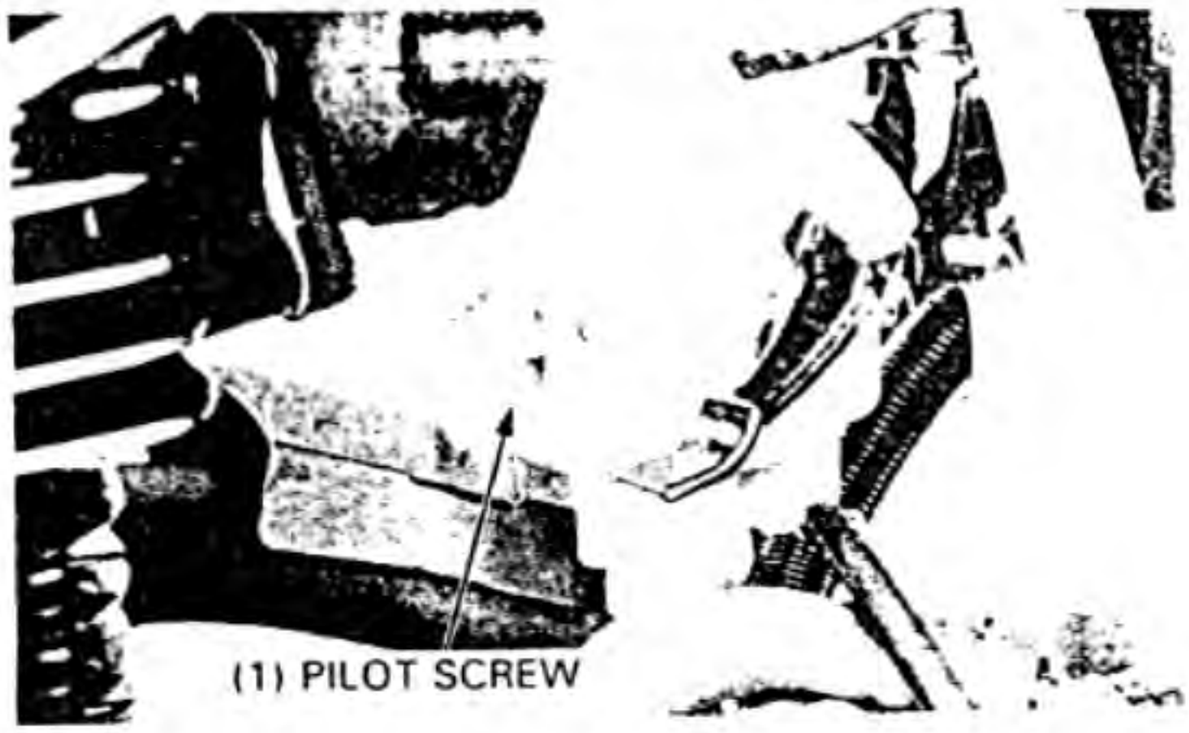
2. Warm up the engine to operating temperature. Stop and go riding for 10 minutes is sufficient.
3. Attach a tachometer according to its manufacture's instructions.
4. Start the engine and adjust the engine idle speed to the specified rpm with the throttle stop screw.

IDLE SPEED: 1,300 ± 100 rpm

5. Turn the pilot screw in or out slowly to obtain the highest engine speed.
6. Readjust the idle speed with the throttle stop screw.
7. Turn the pilot screw in gradually until the engine speed drops 100 rpm.
8. Turn the pilot screw counterclockwise the number of turns to the specification given.

FINAL OPENING: 1/2 turn out

9. Readjust the idle speed with the throttle stop screw.



TEMPERATURE AND ALTITUDE SETTING

Use the chart on the right to determine if carburetor adjustments are necessary because of changes in temperature and altitude.
Decide where the approximate elevation and temperature factors intersect to get C, the correction factor.

To Determine Main Jet Size:
Multiply the standard main jet size times C.

To Determine Jet Needle and Pilot Screw Adjustments:
If C is 0.95 or below, lower the jet needle one groove and screw the pilot screw in 1/2 turn.
Adjustments are not needed if C is over 0.95.

Example: ('88 model)
At a temperature of 30°C (86°F) and altitude of 3,000 m (9,840 ft), carburetor recommendations are as follows:

Main Jet:
#110 × 0.92 = #102 (closed jet number)

Jet Needle:
3 − 1 = 2 groove

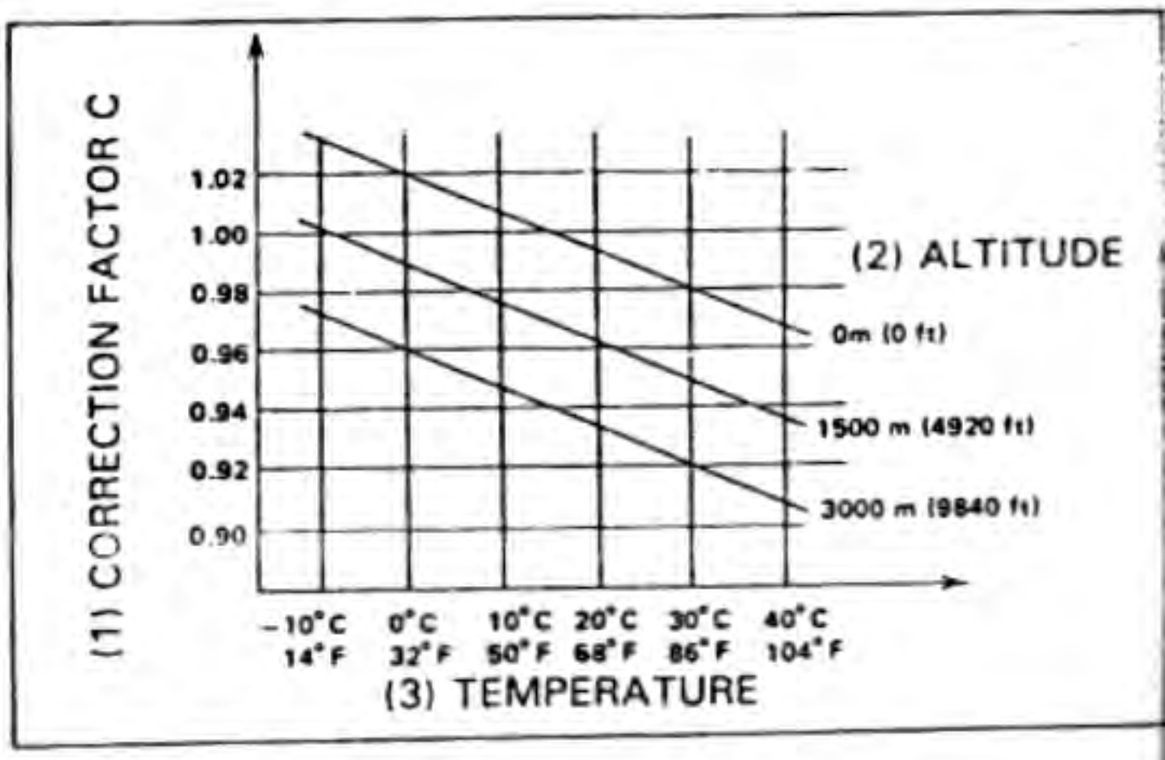
Pilot Screw Opening:
1-1/8 − 1/2 = 5/8 turns out

STANDARD SETTINGS

Identification number	
'86 – '97:	PD97A
After '97/Except California type:	PD97A
After '97/California type:	PD97B
Float level	12.5 ± 0.5 mm (0.49 ± 0.02 in)
Pilot screw opening	
'86 – '97:	1-1/8 turns out
After '97/Except California type:	1-1/8 turns out
After '97/California type:	1-7/8 turns out
Slow jet	
'86 – '97:	#38
After '97/Except California type:	#38
After '97/California type:	#35
Needle clip position	
'86:	2nd groove
After '86:	3rd groove
Main jet	
'86:	#112
'87 – '97:	#110
After '97/Except California type:	#110
After '97/California type:	#102

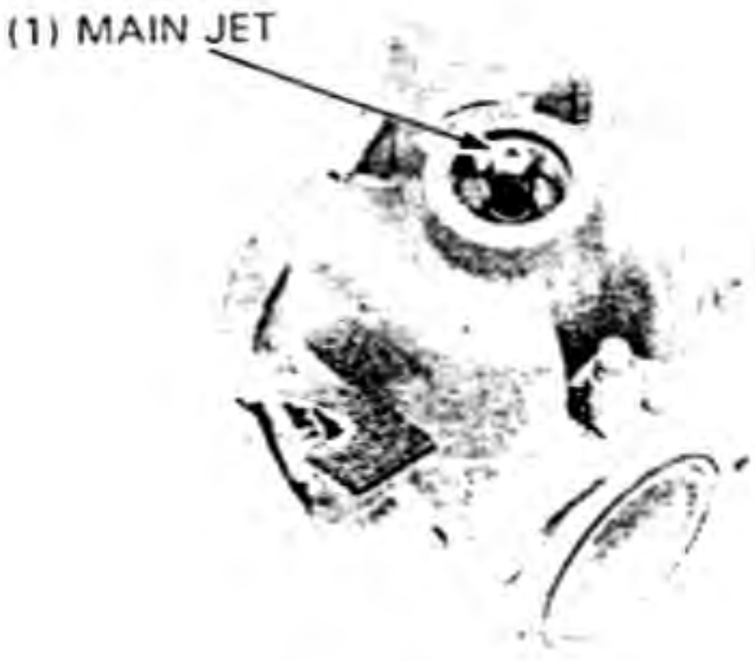
NOTE

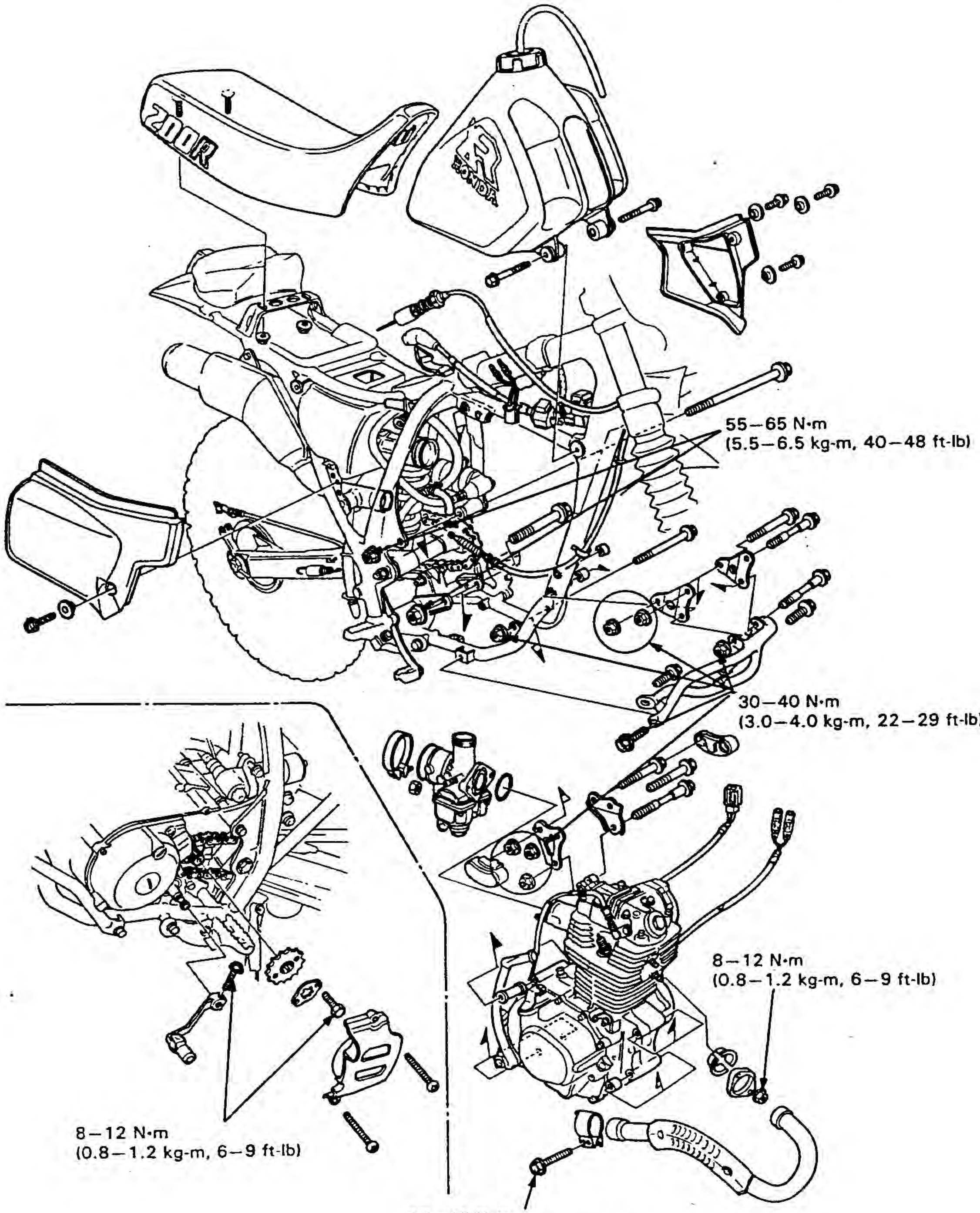
- For the following recommendations to be accurate, you must use these standard settings as a baseline.



Optional Parts:
The following main jets are available for temperature and altitude tuning.

MAIN JET No.
#95
#98
#100
#102
#105
#108
#110
#112
#115
#118
#120
#122




200R
55—65 N·m
(5.5—6.5 kg-m, 40—48 ft-lb)
30—40 N·m
(3.0—4.0 kg-m, 22—29 ft-lb)
8—12 N·m
(0.8—1.2 kg-m, 6—9 ft-lb)
8—12 N·m
(0.8—1.2 kg-m, 6—9 ft-lb)
12—15 N·m
(1.2—1.5 kg-m, 9—11 ft-lb)

5. ENGINE REMOVAL/INSTALLATION

SERVICE INFORMATION

GENERAL

- This section covers removal and installation of the engine.
- During removal and installation, support the vehicle with suitable blocks. A jack or adjustable support is required to maneuver the engine.
- Jack height must be continuously adjusted during operation to prevent damage to mounting threads, wiring harnesses, and cables.
- Operations requiring engine removal:

Cylinder head	Section 6
Cylinder and piston	Section 7
Crankshaft, transmission and kick starter	Section 10

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

SPECIFICATIONS

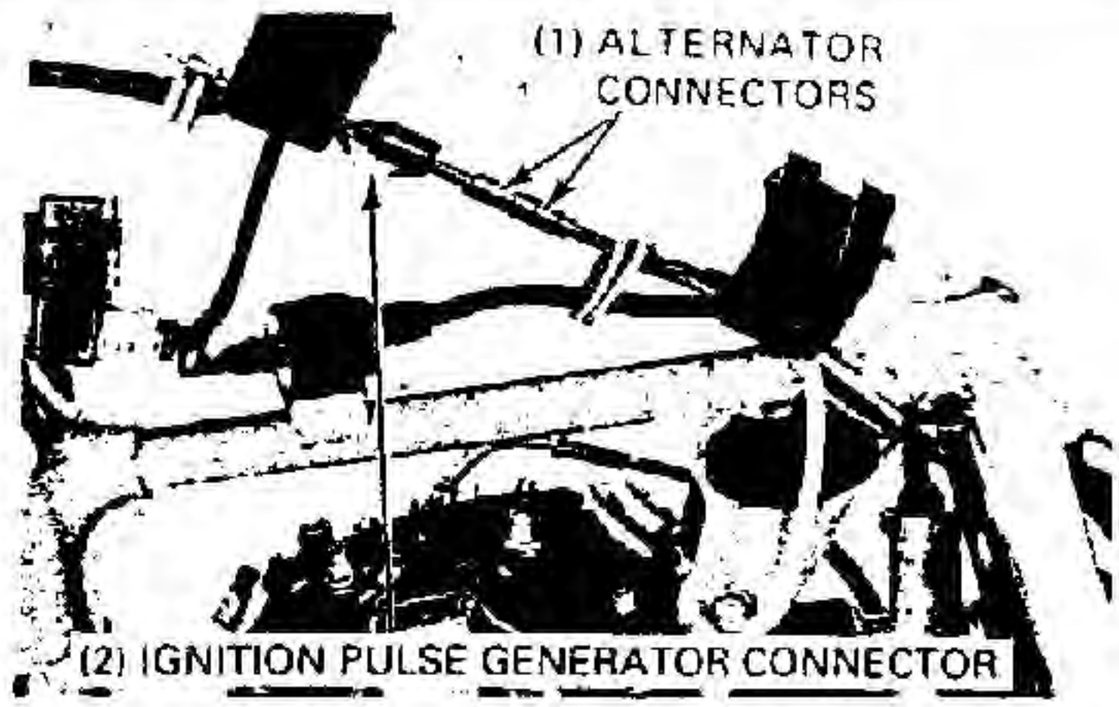
Engine dry weight	27 kg (59.5 lb)
Engine oil capacity	1.1 liters (1.16 US qt, 0.97 Imp qt) after disassembly
	0.9 liters (0.95 US qt, 0.80 Imp qt) after draining

TORQUE VALUES

8 mm bolt	30–40 N·m (3.0–4.0 kg-m, 22–29 ft-lb)
10 mm bolt	55–65 N·m (5.5–6.5 kg-m, 40–48 ft-lb)
Rear axle nut	80–110 N·m (8.0–11.0 kg-m, 58–80 ft-lb)
Exhaust pipe socket bolt	12–15 N·m (1.2–1.5 kg-m, 9–11 ft-lb)
Exhaust pipe flange nut	8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)

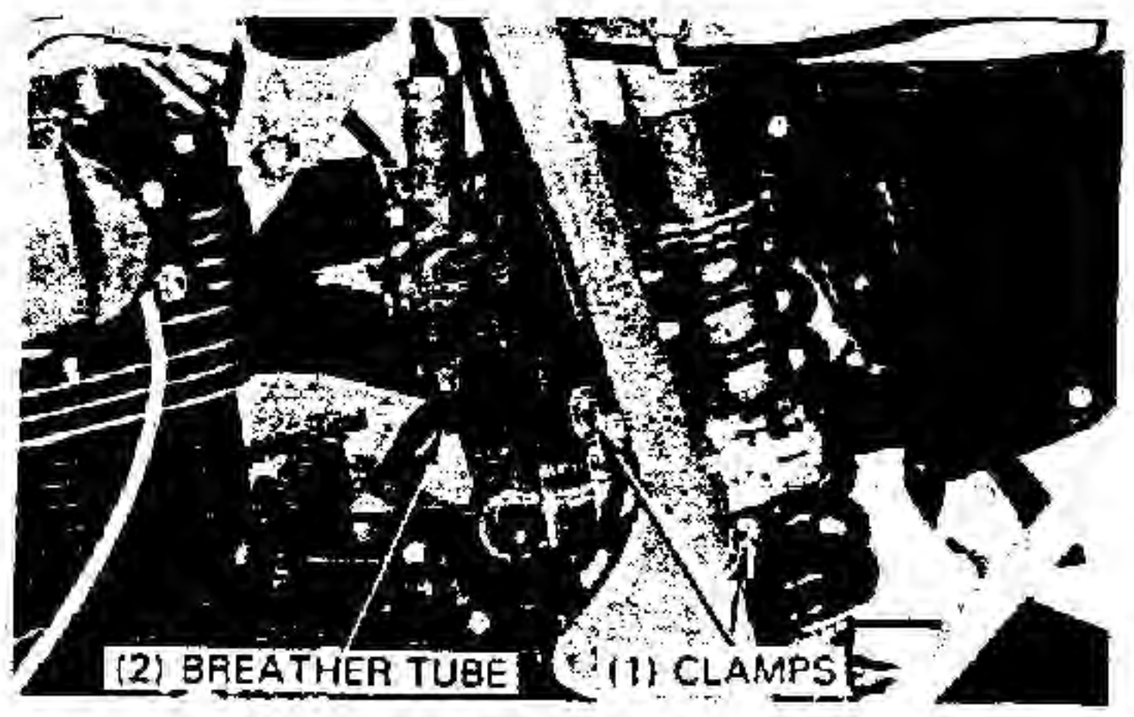
ENGINE REMOVAL

Drain the engine oil (page 2-2).
Place a jack or work stand under the engine.
Remove the fuel tank, seat and side cover.
Disconnect the ignition pulse generator connectors.
Disconnect the alternator connectors.



Disconnect the crankcase breather tube from the crankcase.

'86 – '88, '90 – '91:
Loosen the rear shock reservoir clamps, and move the reservoir backward.

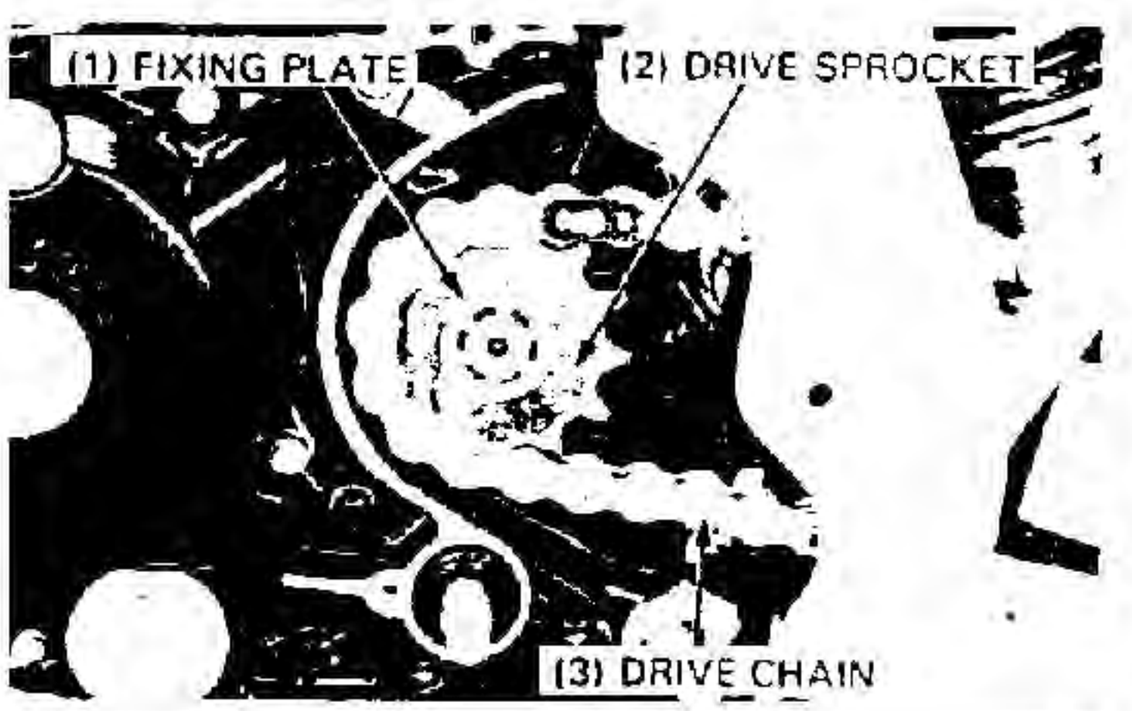


Remove the drive sprocket cover.

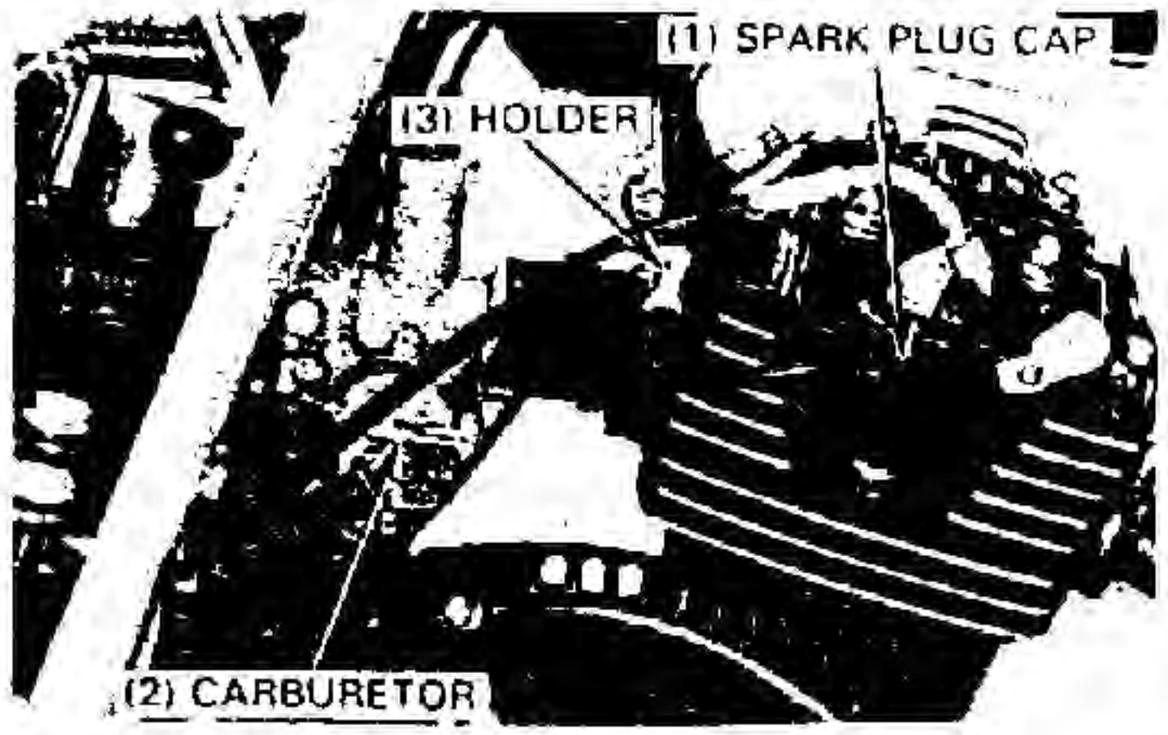
Loosen the fixing plate bolts by holding the rear wheel with your hand.
Loosen the rear axle nut.
Remove the fixing plate bolts, plate, sprocket and drive chain.

NOTE

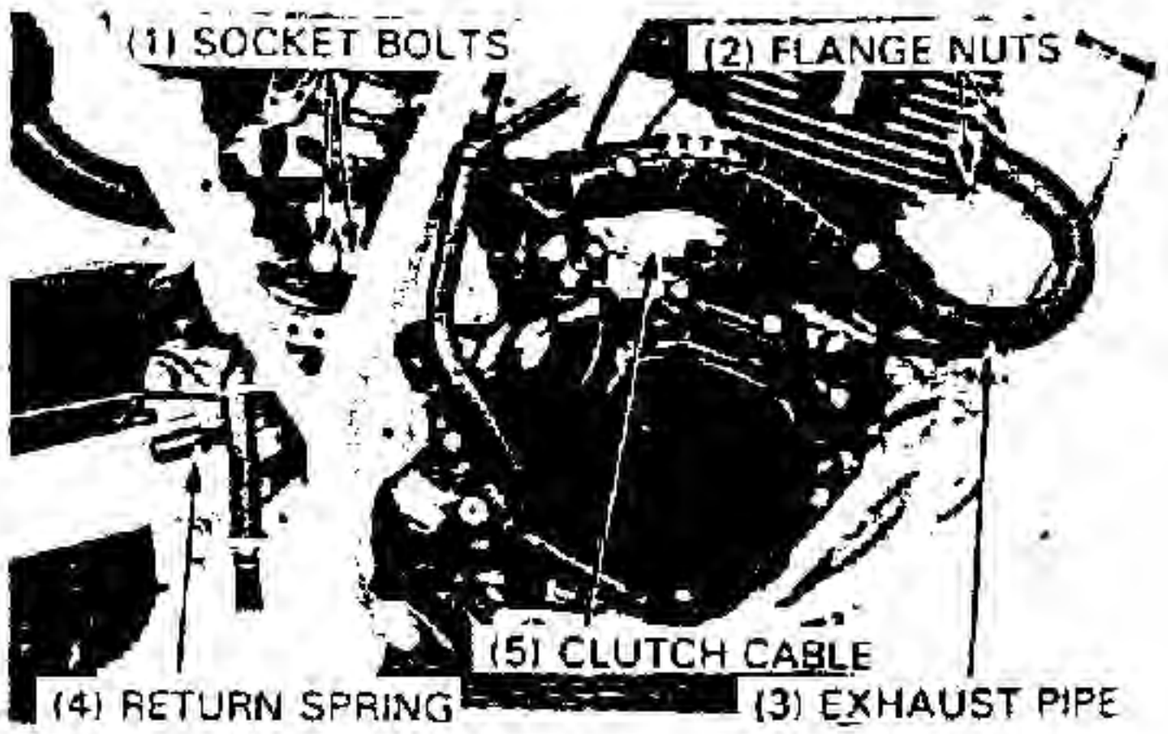
- If the sprocket needs to be replaced, replace both the sprocket and fixing plate as a matched set.
- Replace drive and driven sprockets, and the drive chain as a set.



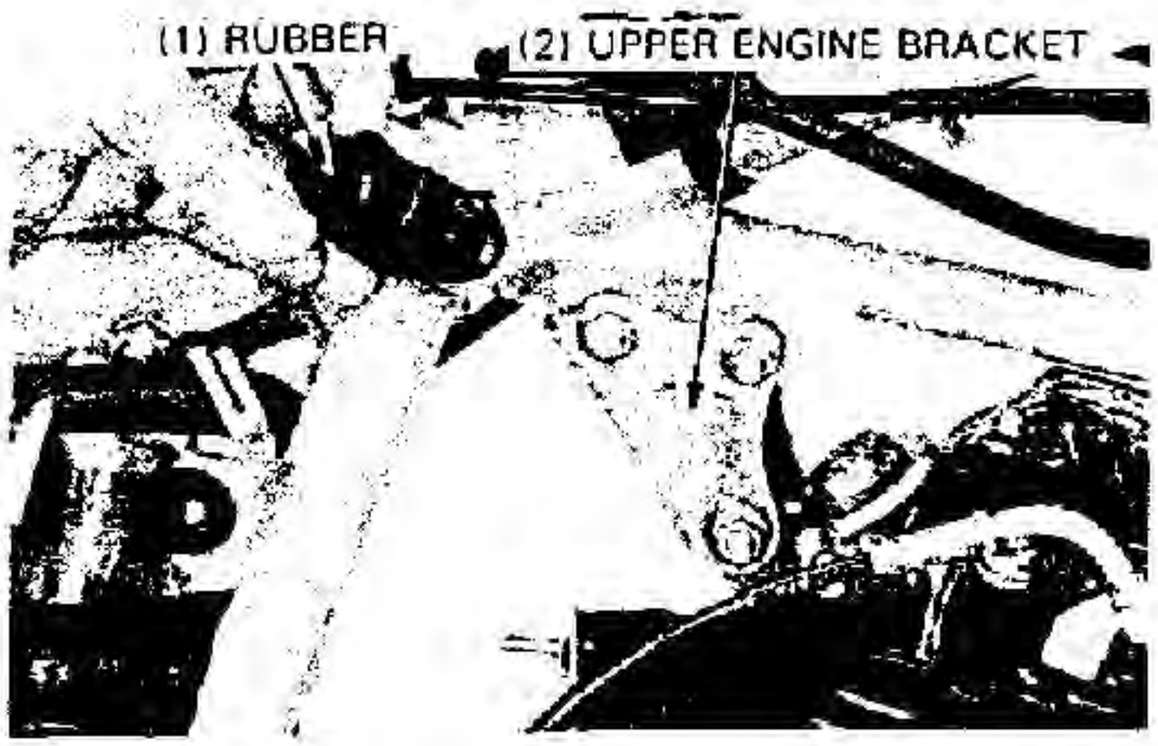
Remove the spark plug cap.
Remove the spark plug wire from the holder on the cylinder head cover
Remove the carburetor (page 4-5).



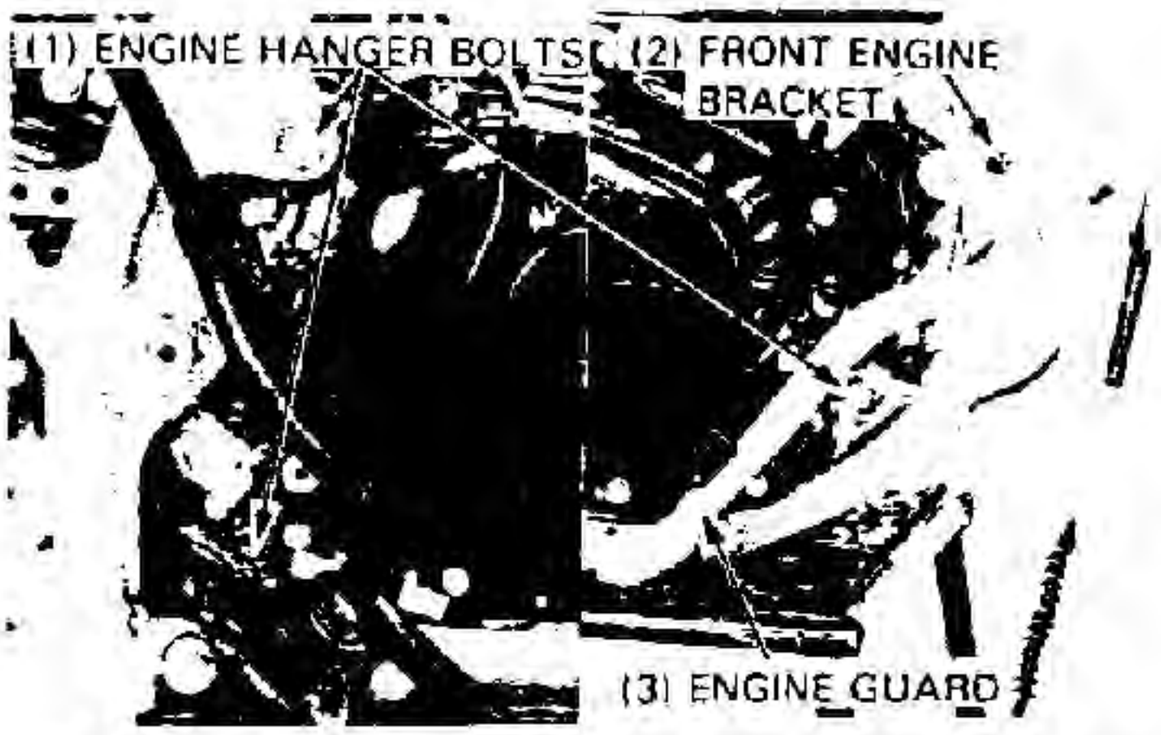
Loosen the exhaust pipe socket bolts. Remove the exhaust pipe flange nuts and remove the exhaust pipe.
Disconnect the brake rod from the brake arm (page 12-10).
Remove the brake pedal return spring.
Disconnect the clutch cable and remove the cable from the clutch cable clamp.



Remove the upper engine bracket rubber and then the bracket itself.



Remove the left foot peg.
Remove the engine guard and front engine bracket.
Remove the engine hanger bolts.
Remove the engine from the frame.



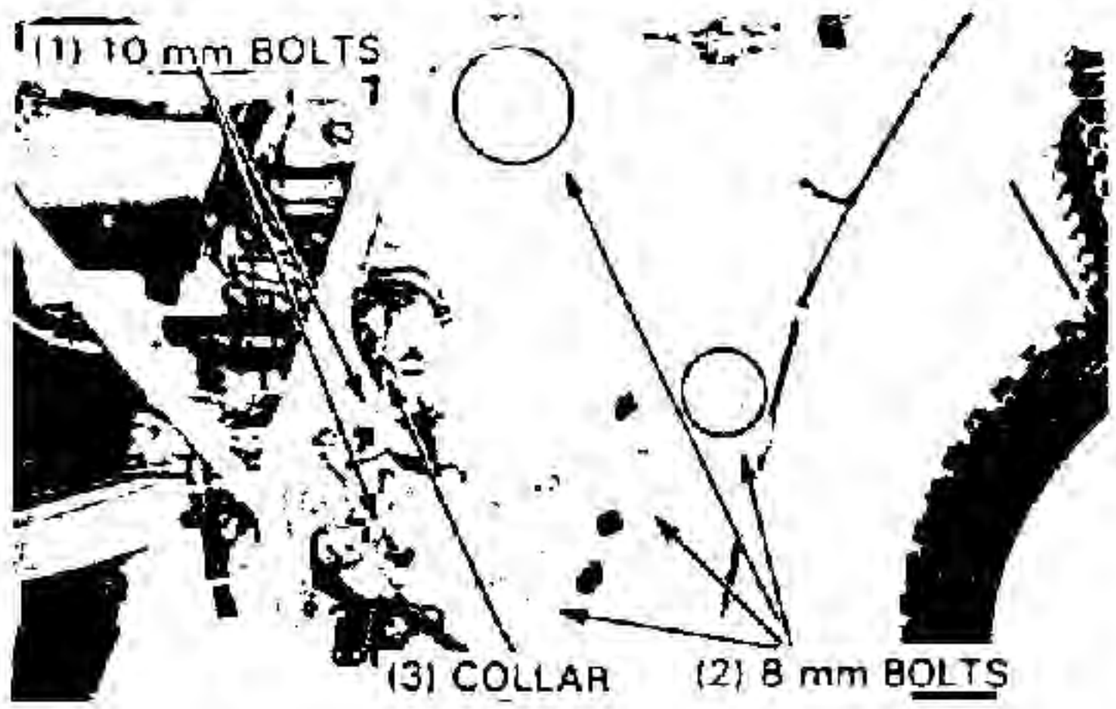
ENGINE INSTALLATION

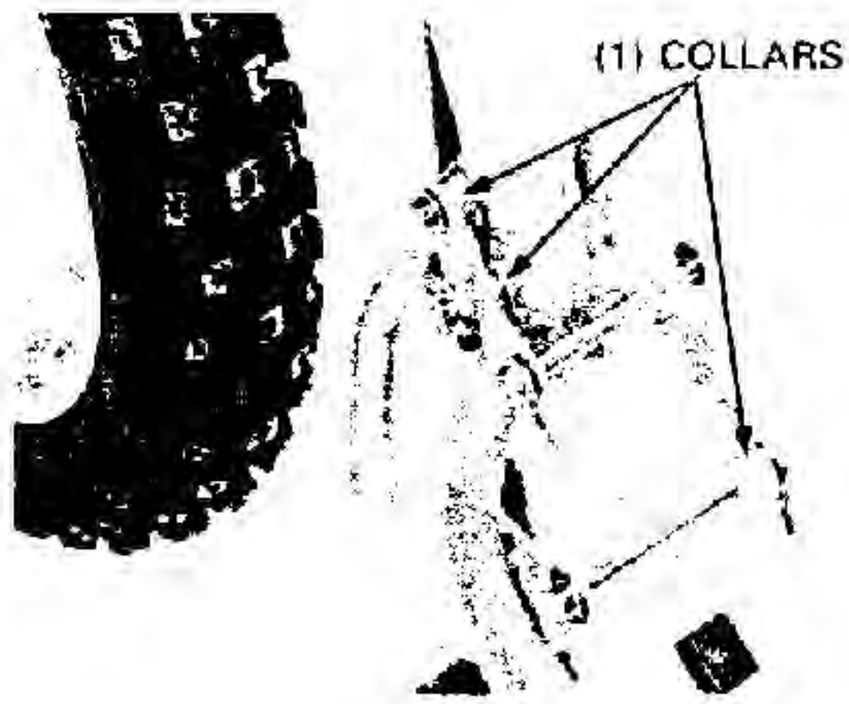
Installation is essentially the reverse order of removal.
Add engine oil up to the correct level (page 2-2).

NOTE

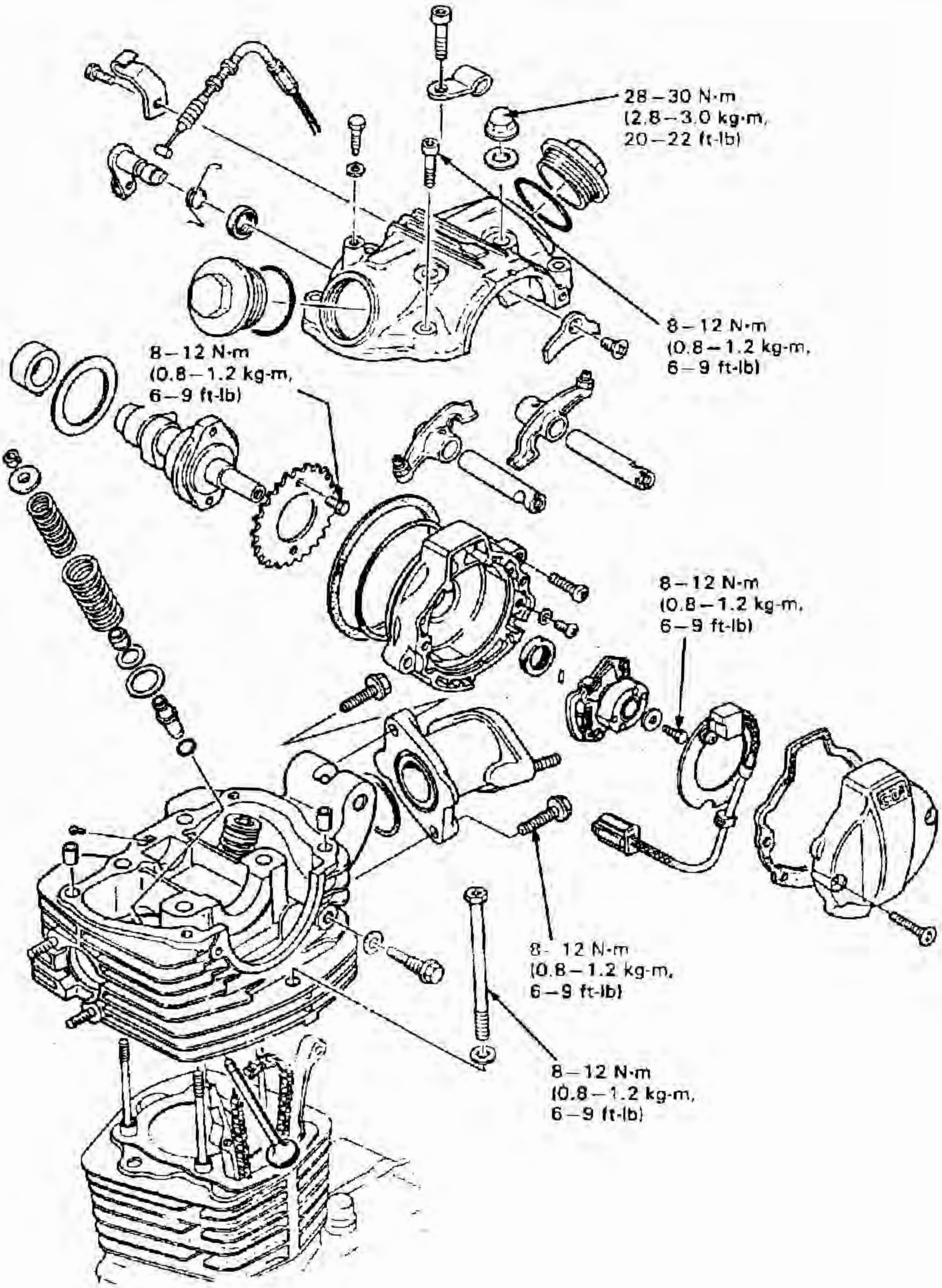
- Use the correct bolts in their proper positions.
- Tighten the bolts to the specified torque.
- Route the wires and cables properly (Section 1 Cable and harness routing).

TORQUE:
8 mm bolt: 30—40 N·m (3.0—4.0 kg-m, 22—29 ft-lb)
10 mm bolt: 55—65 N·m (5.5—6.5 kg-m, 40—48 ft-lb)
Exhaust pipe socket bolt:
12—15 N·m (1.2—1.5 kg-m, 9—11 ft-lb)
Exhaust pipe flange nut:
8—12N·m (0.8—1.2 kg-m, 6—9 ft-lb)
Rear axle nut: 80—110 N·m (8.0—11.0 kg-m, 58—80 ft-lb)





After installing the engine, perform the following inspections and adjustments:
Engine oil level (page 2-2).
Throttle grip free play (page 3-6).
Decompressor cable adjustment (page 3-9).
Drive chain (page 3-11).
Rear brake pedal free play (page 3-14).
Clutch lever free play (page 3-14).
Check the performance of the electrical system.


28 – 30 N·m
(2.8 – 3.0 kg·m,
20 – 22 ft-lb)
8 – 12 N·m
(0.8 – 1.2 kg-m,
6 – 9 ft-lb)
8 – 12 N·m
(0.8 – 1.2 kg-m,
6 – 9 ft-lb)
8 – 12 N·m
(0.8 – 1.2 kg-m,
6 – 9 ft-lb)
8 – 12 N·m
(0.8 – 1.2 kg-m,
6 – 9 ft-lb)

6. CYLINDER HEAD/VALVES

SERVICE INFORMATION

GENERAL

- This section covers maintenace of the cylinder head, valves, camshaft and rocker arms.
- The engine must be removed to service the cylinder head and valves.
- The pulse generator and camshaft can be removed with the engine in the frame.
- 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 to lubricate the cam.

SPECIFICATIONS

ITEM			STANDARD	SERVICE LIMIT
Compression pressure			1373 kPa (14.0 kg/cm², 199 psi)	——
Camshaft	Cam height	IN	31.675–31.875 mm (1.2470–1.2549 in)	31.55 mm (1.242 in)
		EX	31.279–31.479 mm (1.2315–1.2393 in)	31.25 mm (1.230 in)
	Journal O.D.	R	19.967–19.980 mm (0.7861–0.7866 in)	19.90 mm (0.783 in)
		L	33.959–33.975 mm (1.3370–1.3376 in)	33.90 mm (1.335 in)
Cylinder head	Journal I.D.	L	34.000–34.025 mm (1.3386–1.3396 in)	34.05 mm (1.341 in)
	Warpage		——	0.10 mm (0.004 in)
Camshaft bushing	I.D.		20.005–20.026 mm (0.7876–0.7884 in)	20.05 mm (0.789 in)
Rocker arm	I.D.		12.000–12.018 mm (0.4724–0.4731 in)	12.05 mm (0.474 in)
Rocker arm shaft	O.D.		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 (183.0 ± 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 O.D.	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 I.D.	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 (0.0012–0.0022 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 journal-to-camshaft clearance			0.025–0.066 mm (0.001–0.003 in)	0.10 mm (0.004 in)

TORQUE VALUES

Cylinder head cap nut	28 – 30 N·m (2.8 – 3.0 kg-m, 20 – 22 ft-lb)
6 mm cylinder head bolt/socket bolt	8 – 12 N·m (0.8 – 1.2 kg-m, 6 – 9 ft-lb)
Cam sprocket bolt	8 – 12 N·m (0.8 – 1.2 kg-m, 6 – 9 ft-lb)
Carburetor insulator bolt	8 – 12 N·m (0.8 – 1.2 kg-m, 6 – 9 ft-lb)
Pulse rotor mounting bolt	8 – 12 N·m (0.8 – 1.2 kg-m, 6 – 9 ft-lb)

TOOLS

Special

Valve guide reamer, 5.5 mm	07984 – 0980000 or 07984 – 098000D

Common

Valve guide driver, 5.5 mm	07742 – 0010100
Valve spring compressor	07757 – 0010000

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
- Valve
  - Incorrect valve adjustment
  - Burned or bent valves
  - Incorrect valve timing
  - Weak valve spring
- Cylinder head
  - Leaking or damaged head gasket
  - Warped or cracked cylinder head
- Cylinder and piston (Section 7)
- Decompressor out of adjustment

High compression
- Excessive carbon build-up on piston head or combustion chamber

Excessive noise
- Incorrect valve adjustment
- Sticking valve or broken valve spring
- Damaged or worn rocker arm or camshaft
- Worn or damaged cam chain
- Worn or damaged cam chain tensioner
- Worm cam sprocket teeth

Poor idling
- Compression too low
- Decompressor out of adjustment

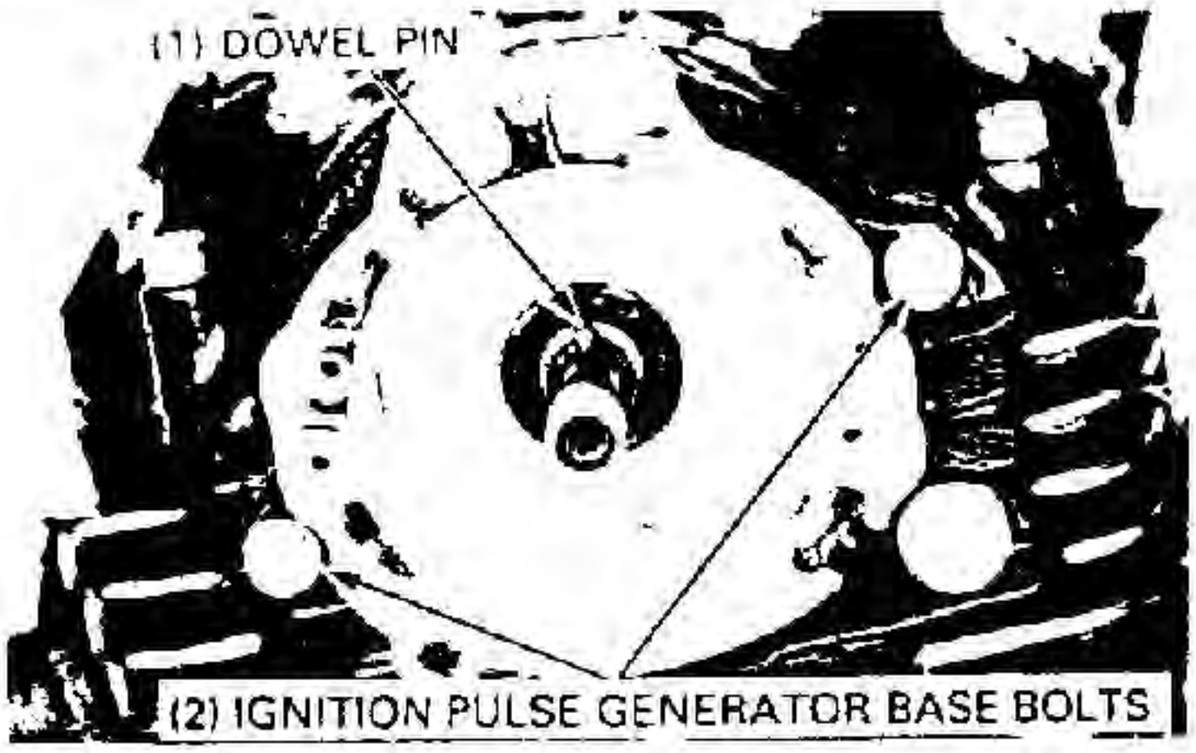
Hard starting
- Decompressor out of adjustment

CAMSHAFT

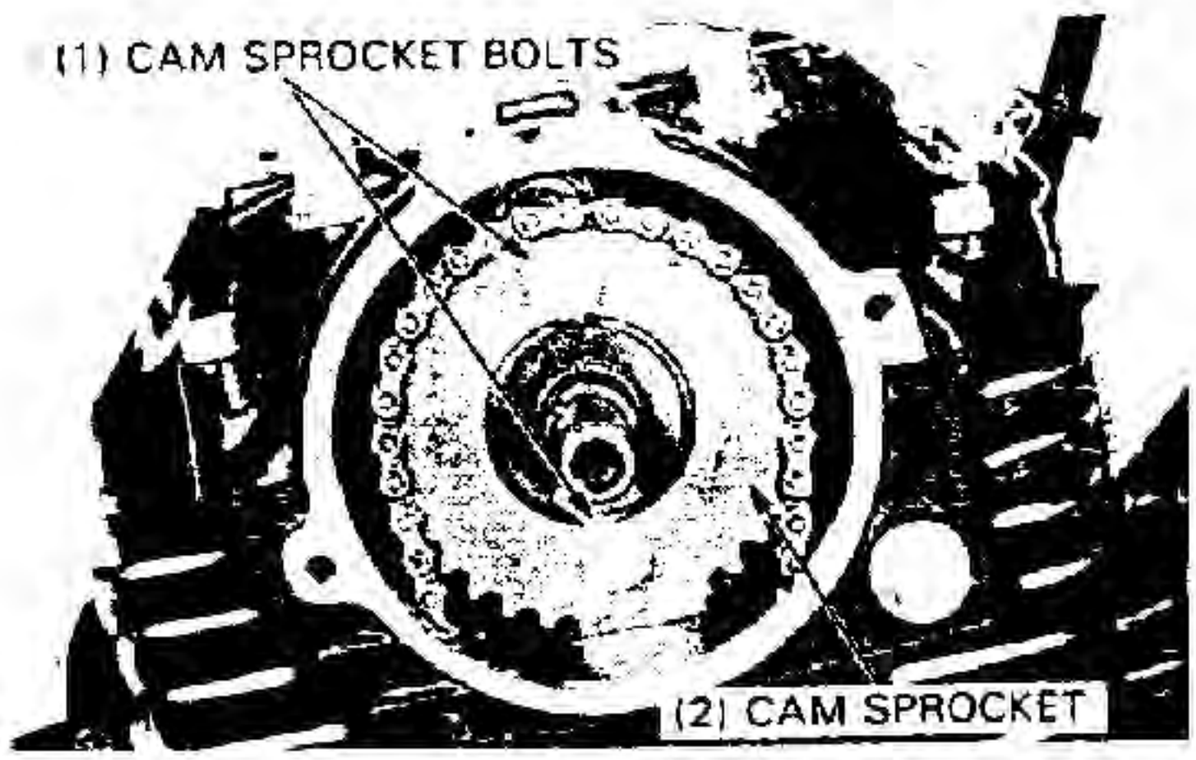
REMOVAL

Remove the ignition pulse generator and ignition pulse rotor (page 14-5).

Remove the dowel pin.
Remove the ignition pulse generator base by removing the two attaching bolts.



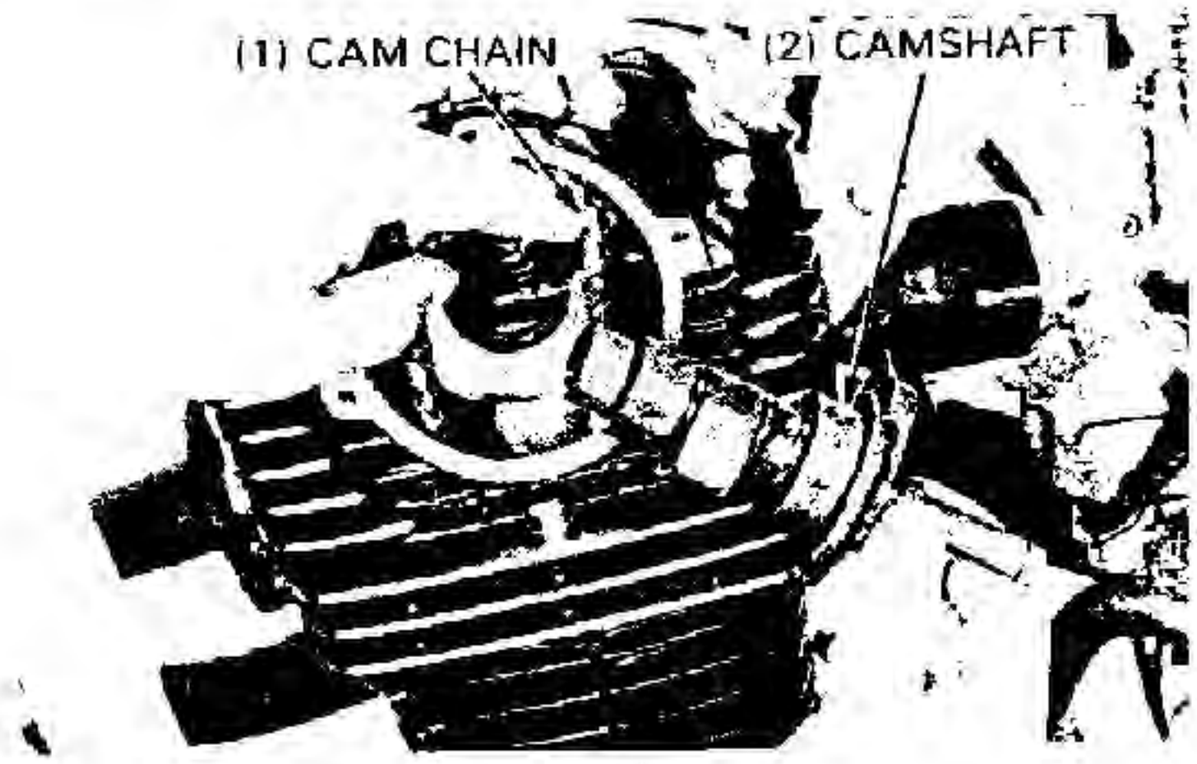
Remove the crankshaft hole cap and timing hole cap.
Turn the crankshaft to bring the piston to T.D.C. (Top Dead Center) of the compression stroke.
Remove the cam sprocket bolts, and remove the sprocket.



Remove the camshaft.

NOTE

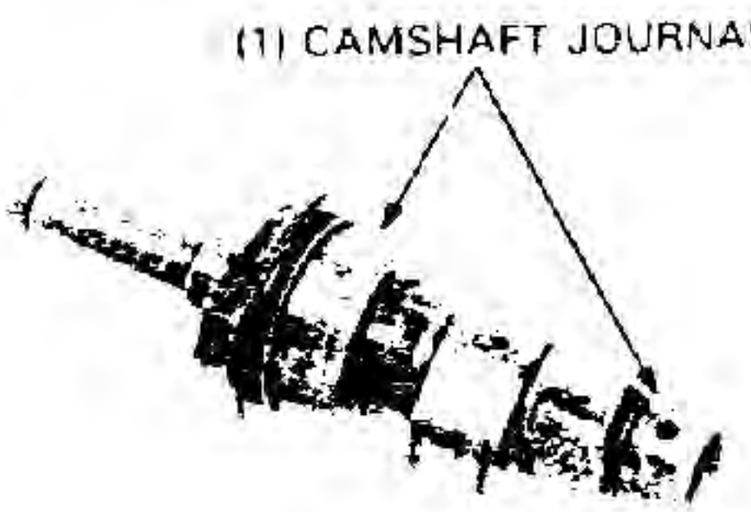
- Suspend the cam chain with a piece of wire to prevent it from falling into the crankcase.



CAMSHAFT INSPECTION

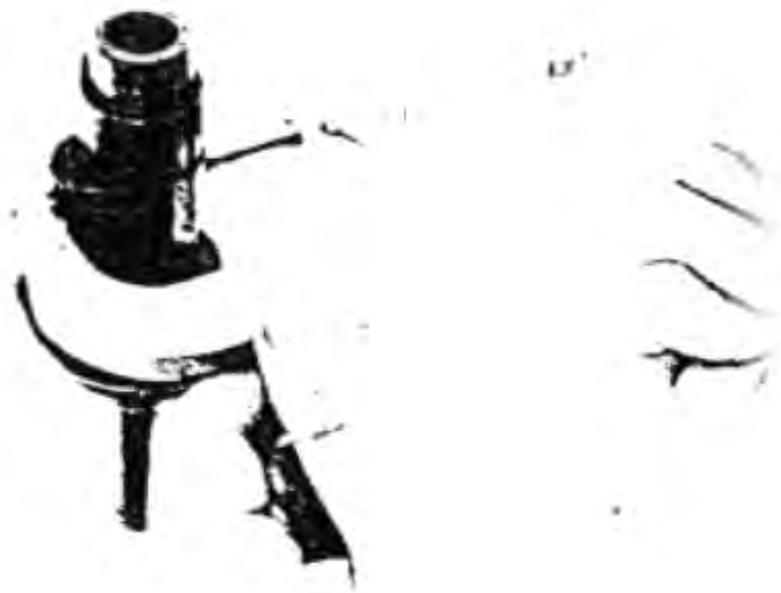
Measure the camshaft journal O.D. with a micrometer.

SERVICE LIMIT:
RIGHT: 19.90 mm (0.783 in)
LEFT: 33.90 mm (1.335 in)



Using a micrometer, measure each cam height and check it for wear or damage.

SERVICE LIMIT:
INTAKE: 31.55 mm (1.242 in)
EXHAUST: 31.25 mm (1.230in)



CAMSHAFT JOURNAL/BUSHING INSPECTION

Measure the camshaft bushing I.D.

SERVICE LIMIT: 20.05 mm (0.789 in)

Calculate the camshaft bushing-to-camshaft clearance.

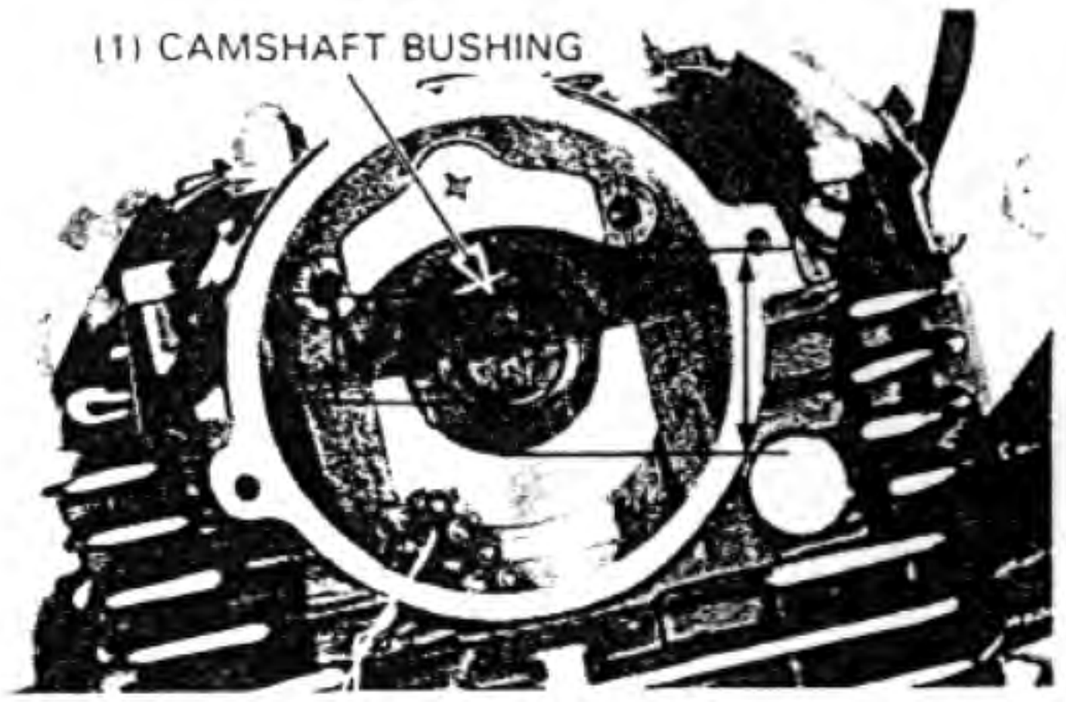
SERVICE LIMIT: 0.1 mm (0.004 in)

Measure the cylinder head journal I.D.

SERVICE LIMIT: 34.05 mm (1.341 in)

Calculate the cylinder head journal-to-camshaft clearance.

SERVICE LIMIT: 0.10 mm (0.004 in)



INSTALLATION

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

Coat the camshaft journals with molybdenum disulfide grease.

Install the thrust washser on the camshaft.

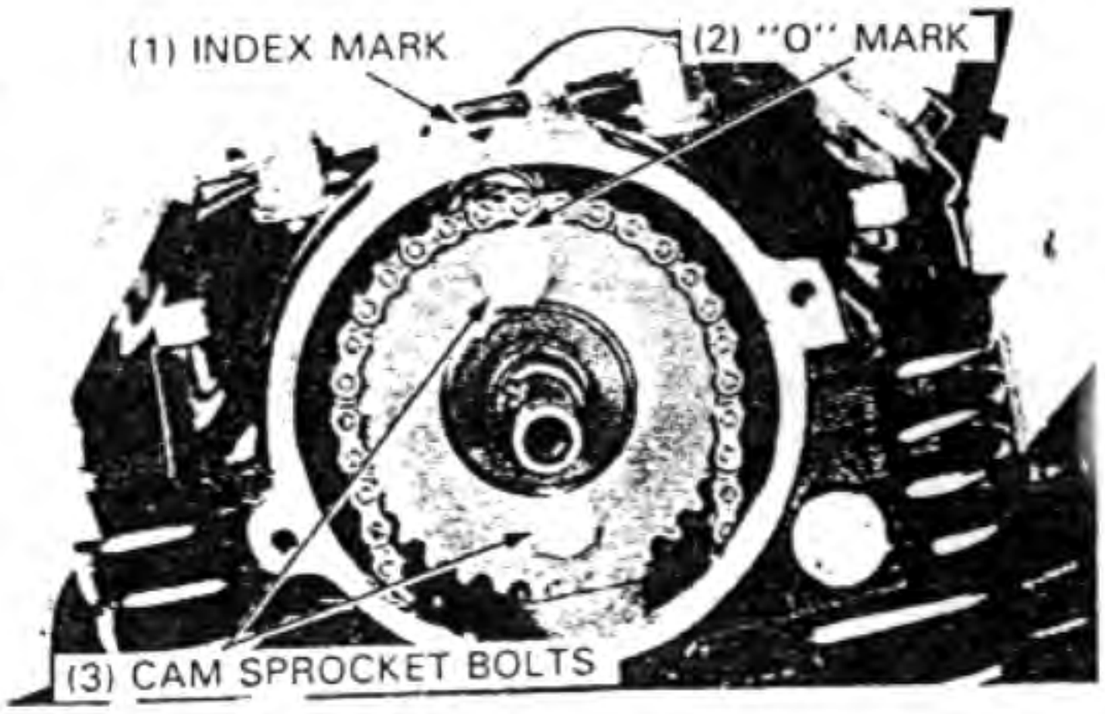
Route the camshaft through the cam chain and install the camshaft.

Turn the crankshaft counterclockwise and align the"T" mark with the index mark.
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)



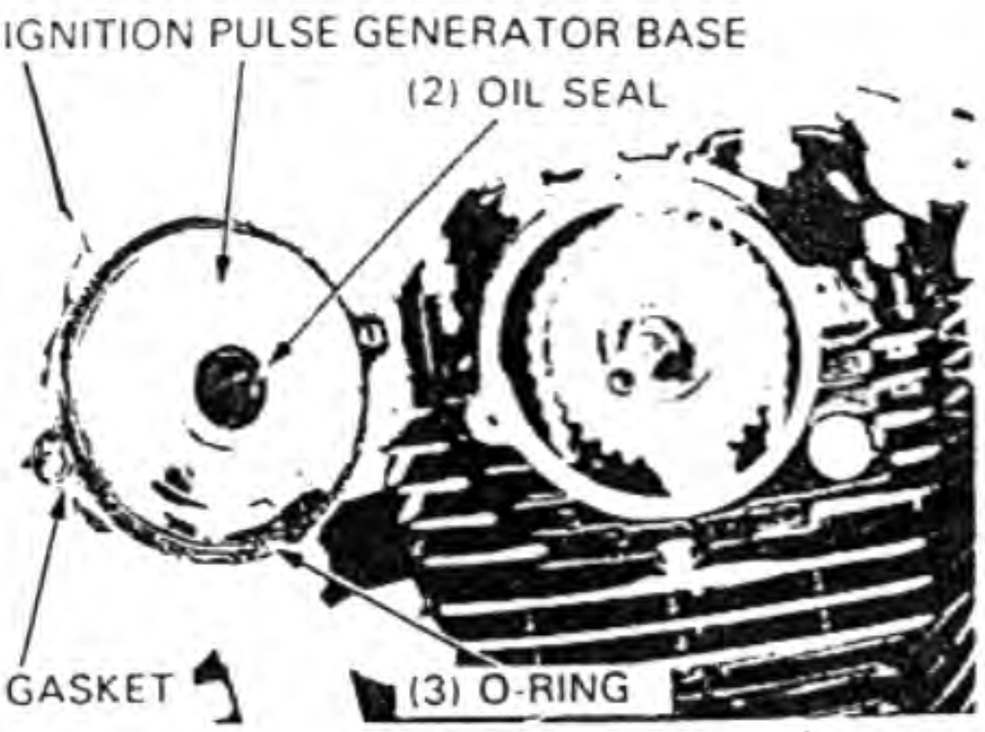
Check the O-ring and oil seal for wear or fatigue.

Apply oil to the O-ring and apply grease to the oil seal.

Install the new gasket.
Install the ignition pulse generator base.

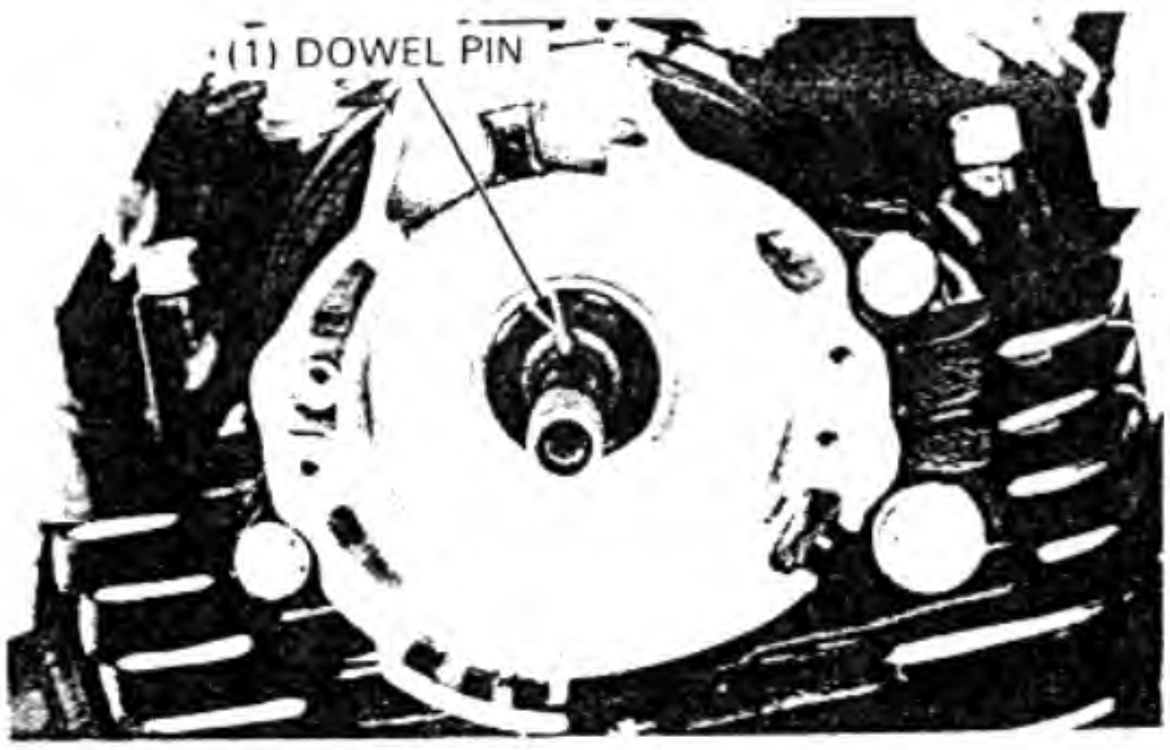
NOTE

- Do not turn the oil seal lip inside out.



Install the dowel pin.
Install the ignition pulse rotor and pulse generator (page 14-6).

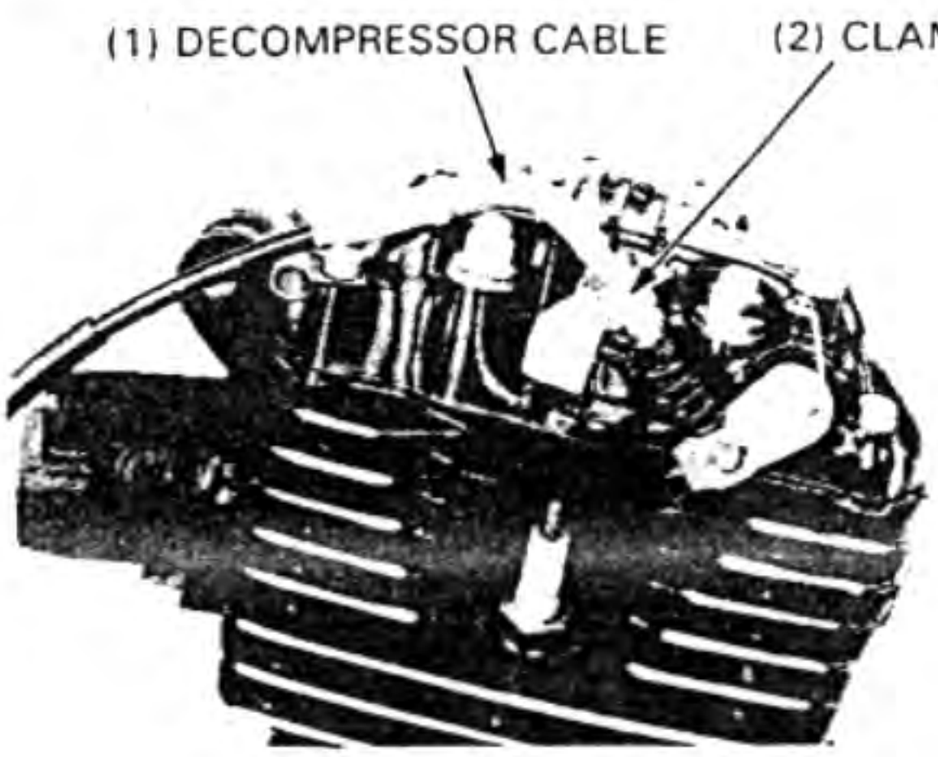
Inspect and adjust the ignition timing (page 14-7).
Adjust the cam chain tension (page 3-9).



CYLINDER HEAD COVER REMOVAL

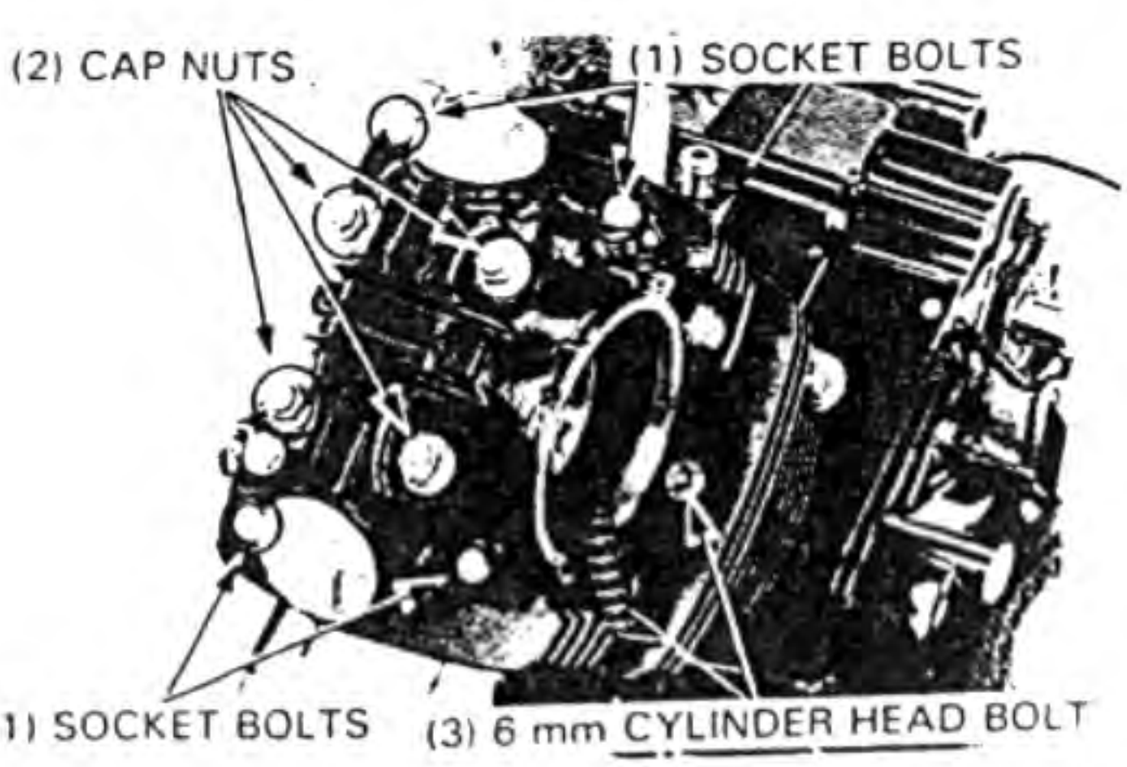
Remove the engine from the frame (section 5).
Remove the starter decompressor cable clamp and disconnect the decompressor cable.

Remove the camshaft (page 6-3).

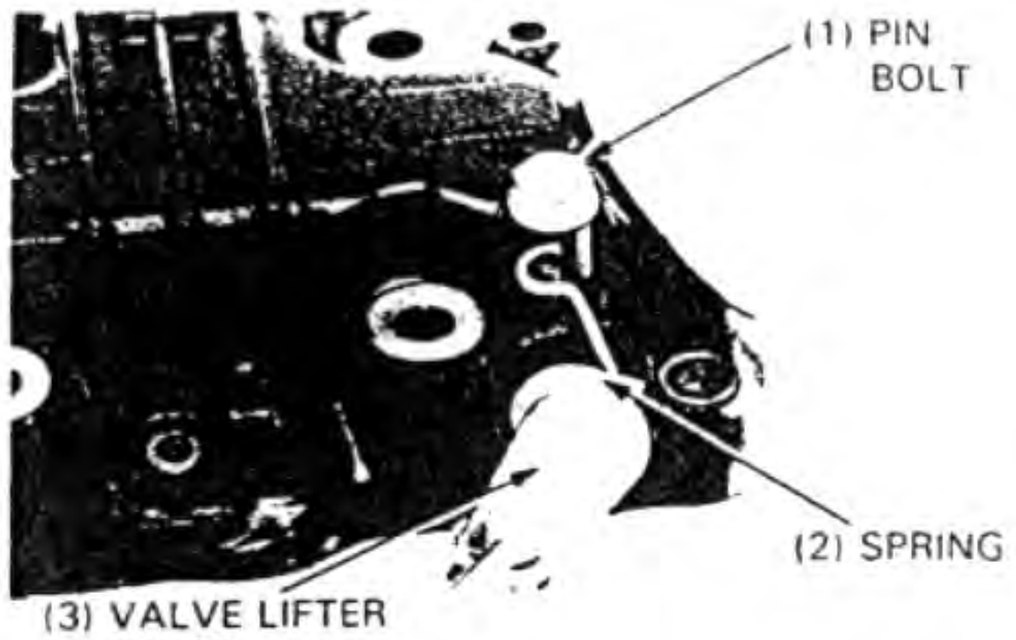


Loosen the 6 mm cylinder head bolt.

Remove the 6 mm socket bolts and 8 mm cap nuts attaching the cylinder head cover to the cylinder head.
Remove the cylinder head cover.



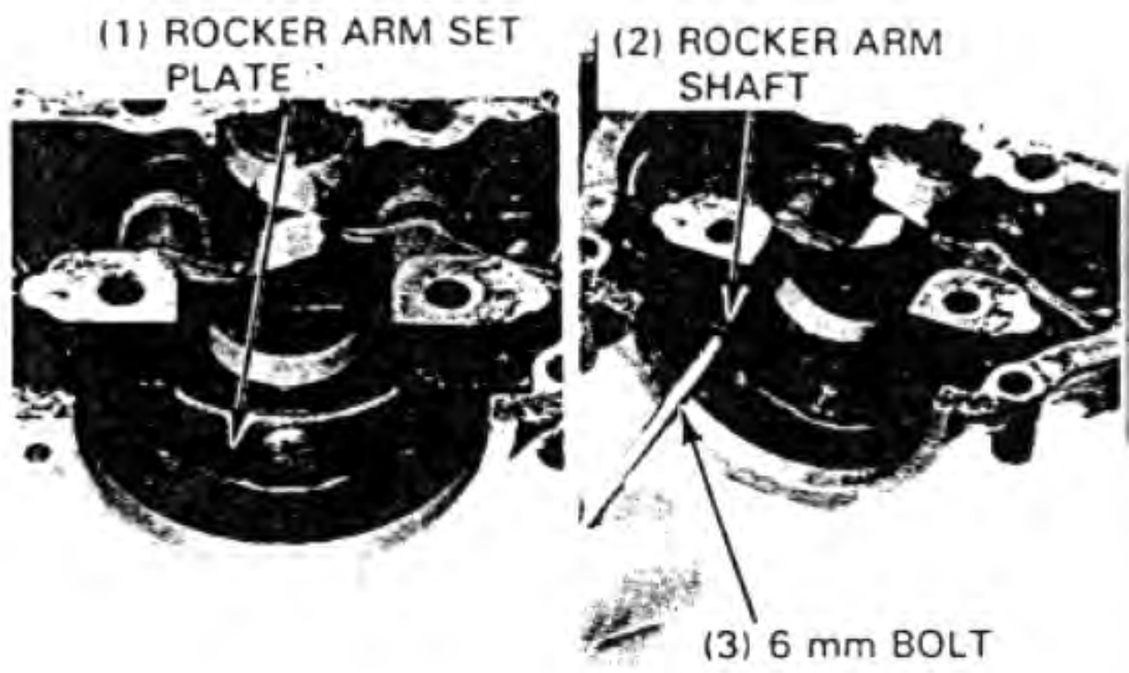
Remove the valve lifter lever and spring by removing the pin bolt.



Remove the rocker arm shaft set plate.
Remove the rocker arm shafts, and rocker arms.

NOTE

- Screw a 6 mm bolt into the threaded end of the rocker arm shaft to remove it.



ROCKER ARM/ROCKER ARM SHAFT 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)

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

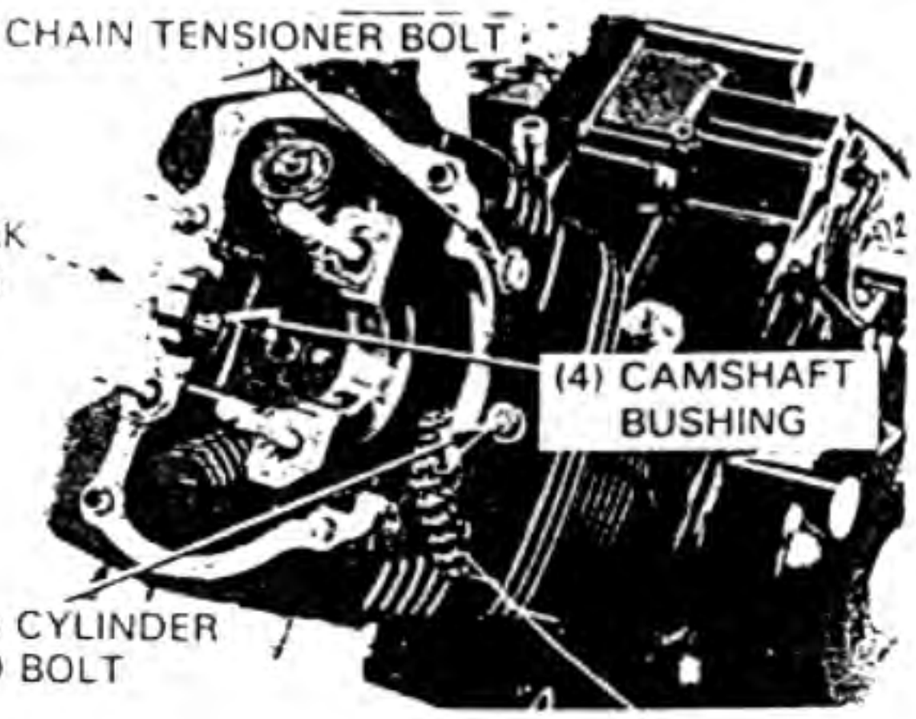
SERVICE LIMIT: 11.93 mm (0.470 in)

Calculate the rocker arm-to-shaft clearance.

SERVICE LIMIT: 0.08 mm (0.003 in)

CYLINDER HEAD REMOVAL

Remove the cam chain tensioner bolt.
Remove the camshaft bushing.
Remove the 6 mm cylinder head bolts.
Remove the cylinder head and spark plug.
Remove the gasket, dowel pins and O-ring.

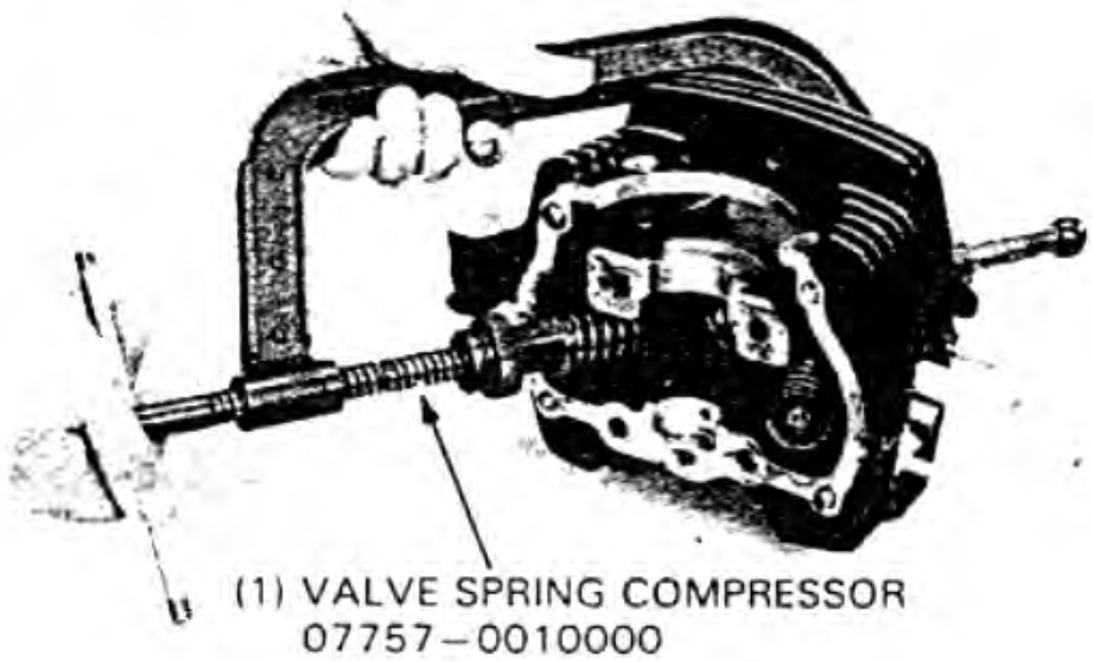


DISASSEMBLY

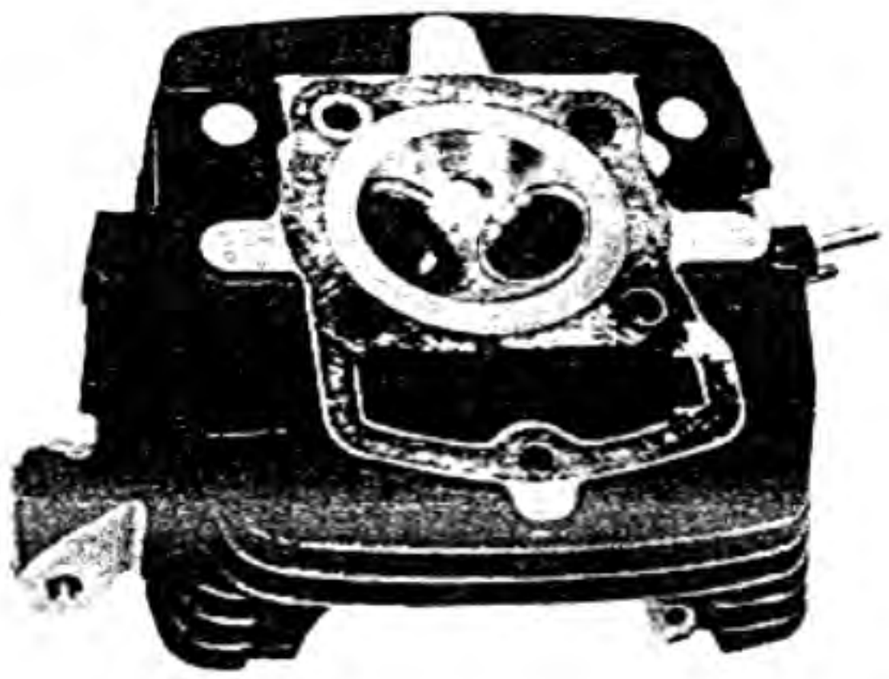
Remove the valve cotters, spring retainers and valve springs with a valve spring compressor.

CAUTION

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



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



CYLINDER HEAD INSPECTION

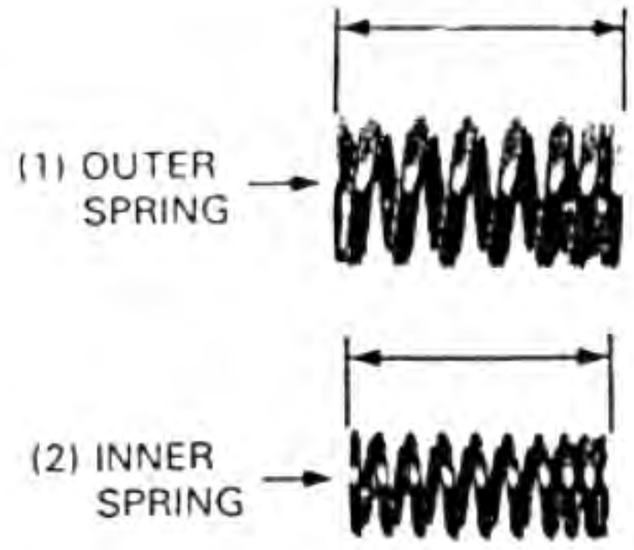
Check the spark plug hole and valve area for cracks.
Check the cylinder head for warpage with a straight edge and feeler gauge.

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 O.D.

SERVICE LIMITS:
INTAKE: 5.42 mm (0.213 in)
EXHAUST: 5.40 mm (0.213 in)

Measure and record the valve guide I.D.

SERVICE LIMIT:
IN/EX: 5.50 mm (0.217 in)

NOTE

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

Calculate the stem-to-guide clearance.

SERVICE LIMITS:
IN: 0.12 mm (0.005 in)
EX: 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 the guides as necessary and ream to fit.
- If the valve guide is replaced, the valve seat must be refaced.

VALVE GUIDE REPLACEMENT

Heat the cylinder head to 100° – 150°C (212° – 300°F) with a hot plate or oven.

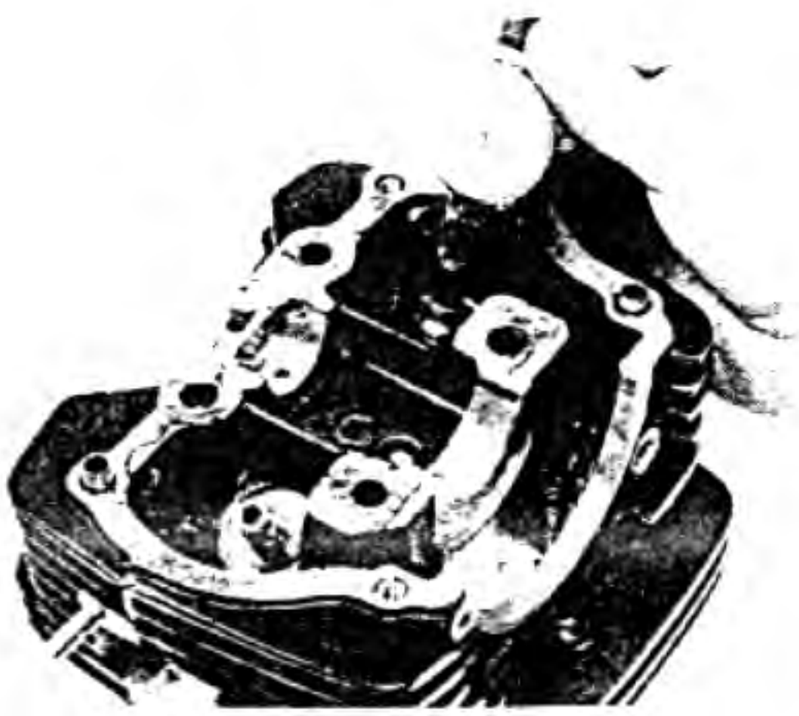
WARNING

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

CAUTION

- *Do not use a torch to heat the cylinder head, it may cause warping.*
- *Avoid damaging the cylinder head when removing the guides.*

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



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

NOTE

- Inspect the valve guide for damage.

Ream the new valve guide after installation.

NOTE

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

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

VALVE SEAT INSPECTION/REFACING

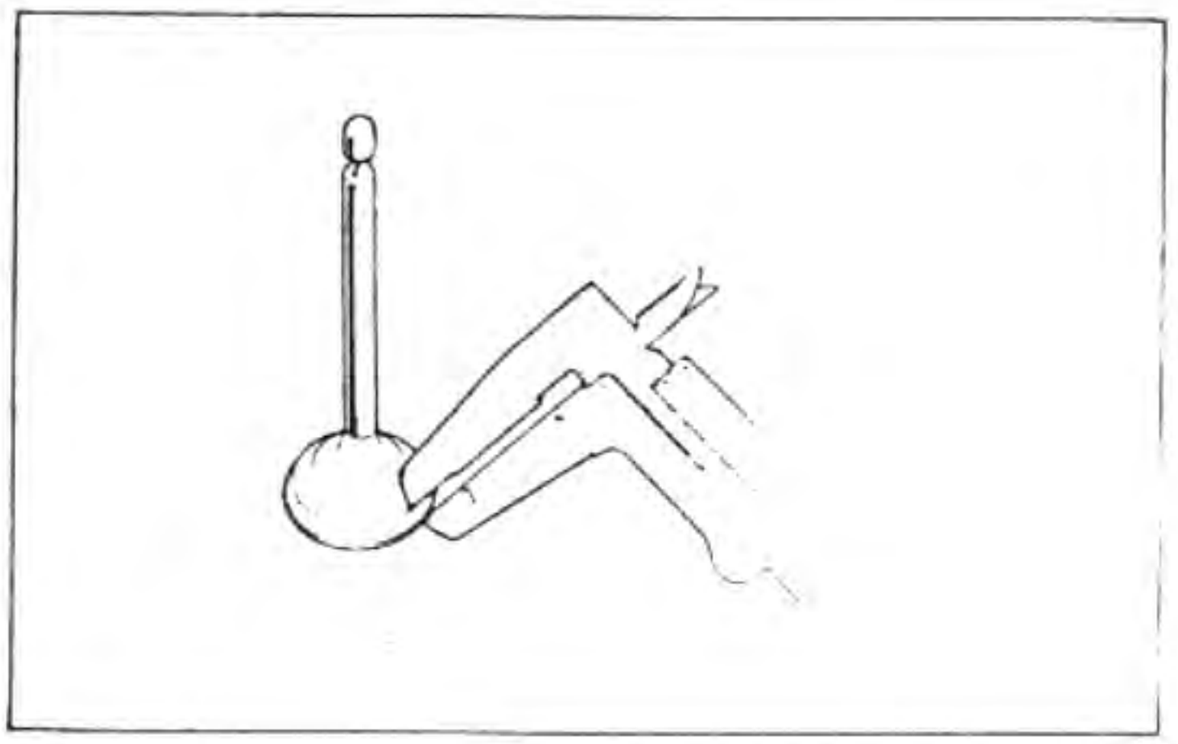
Clean all intake and exhaust valves thoroughly to remove carbon deposits.

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

SERVICE LIMIT: 2.0 mm (0.08 in)

CAUTION

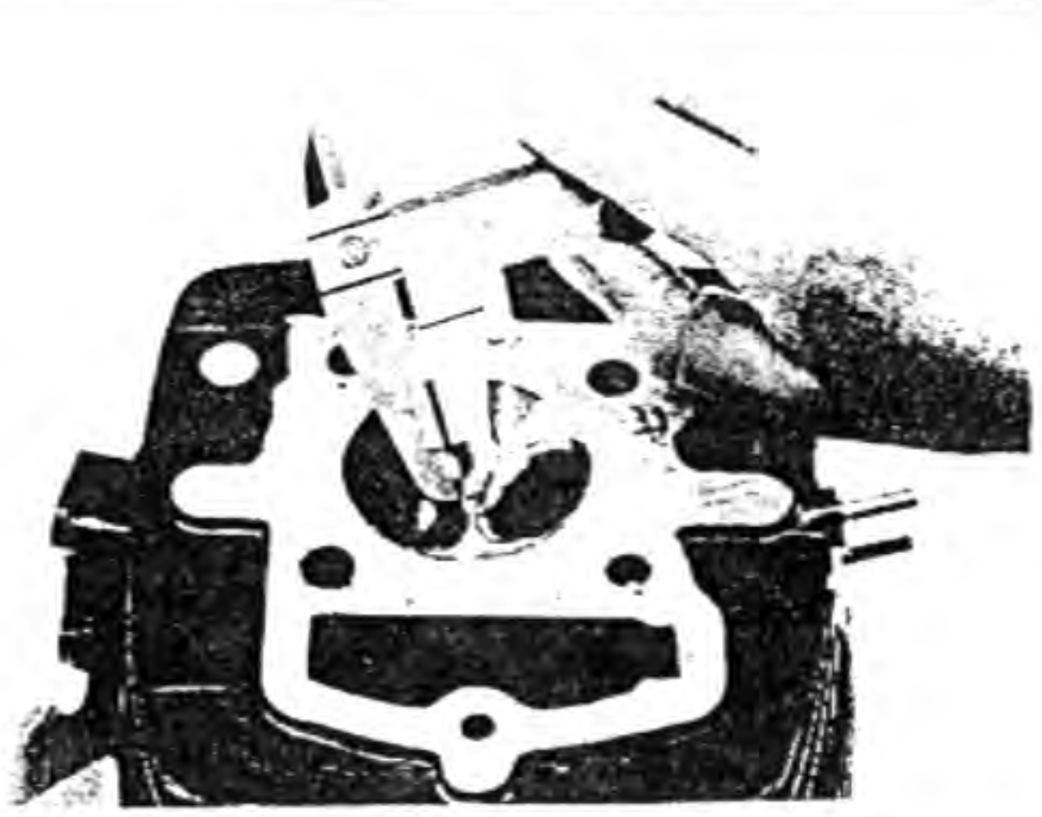
- *The valve cannot be ground. If the valve face is burned or badly worn or if it contacts the seat unevenly, replace the valve.*



Inspect each valve seat.

SERVICE LIMIT: 1.5 mm (0.06 in)

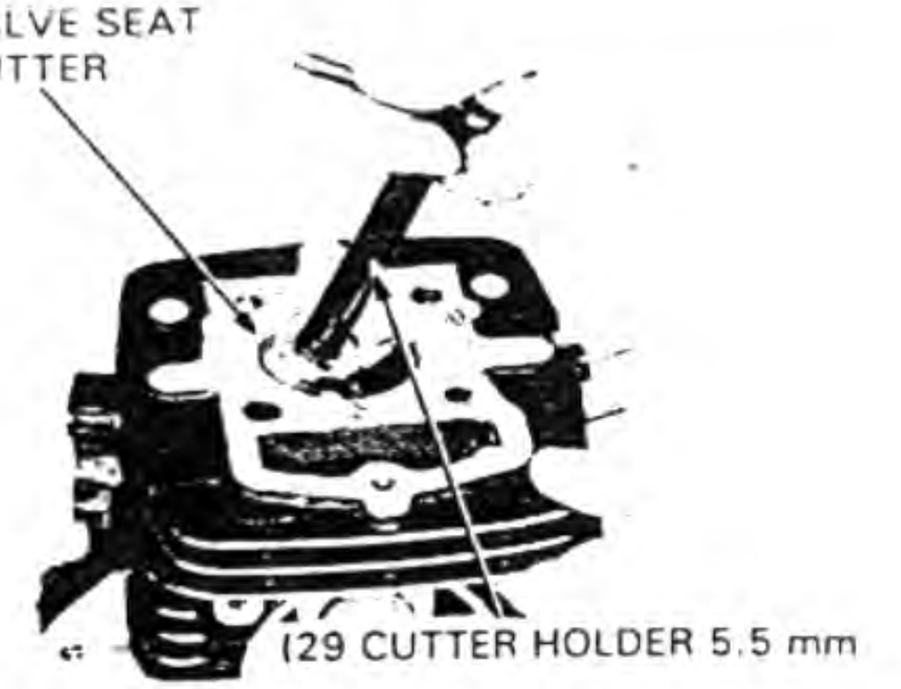
If the seat is too wide, too narrow, or has low spots, the seat must be refinished to seal properly.



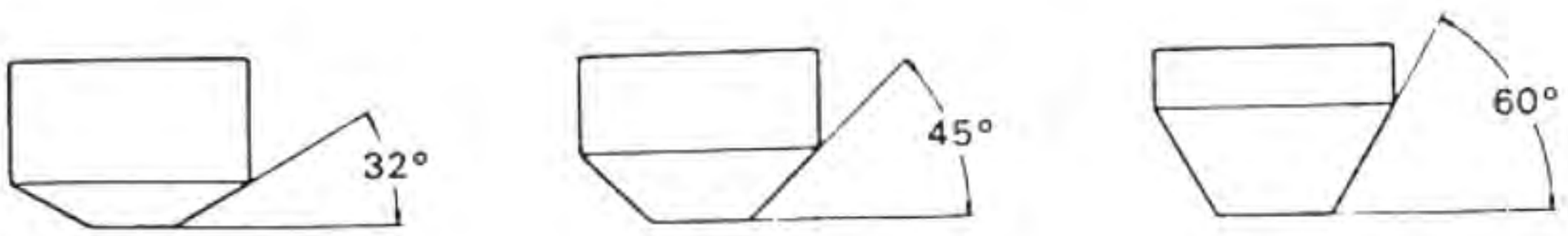
VALVE SEAT GRINDING

HONDA VALVE SEAT CUTTERS, grinder or equivalent valve seat refacing equipment are recommended to correct a worn valve seat.

Follow the instructons supplied with the valve seat refacing equipment.



VALVE SEAT CUTTERS



NOTE

- The above valve seat cutters or equivalent are commercially available in U.S.A.

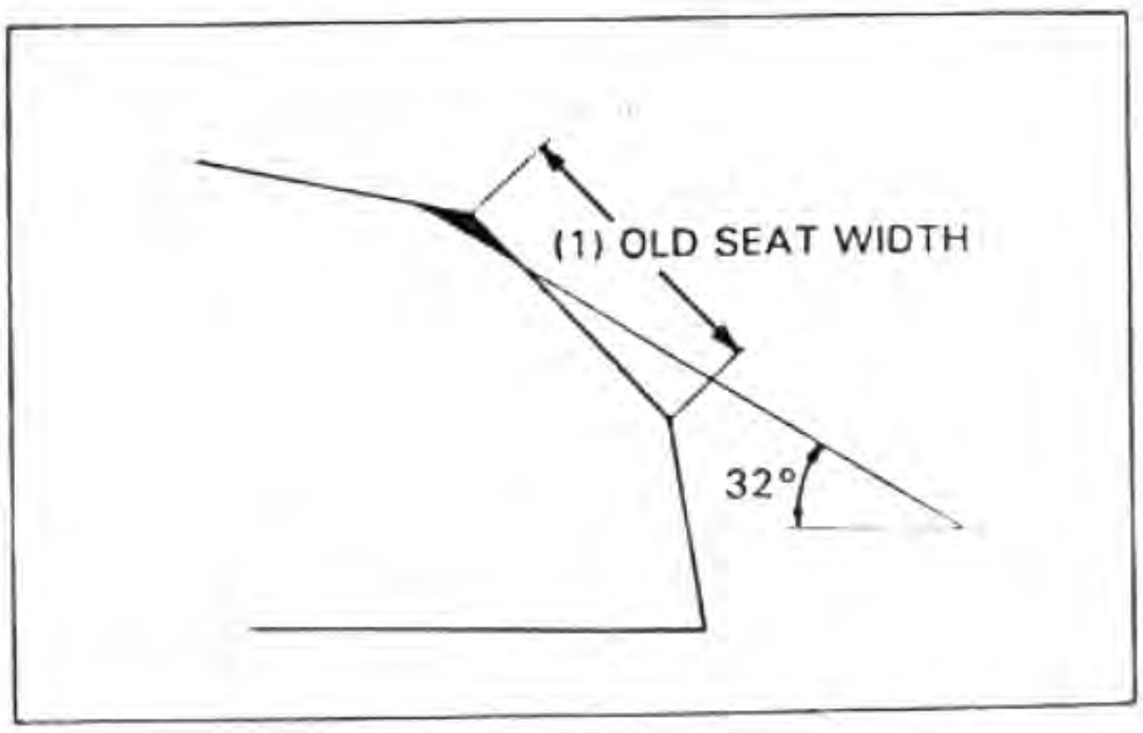
VALVE SEAT REFACING

Follow the refacer manufacturer's instructions.
Use a 45 degree cutter to remove any roughness or irregularities from the seat.

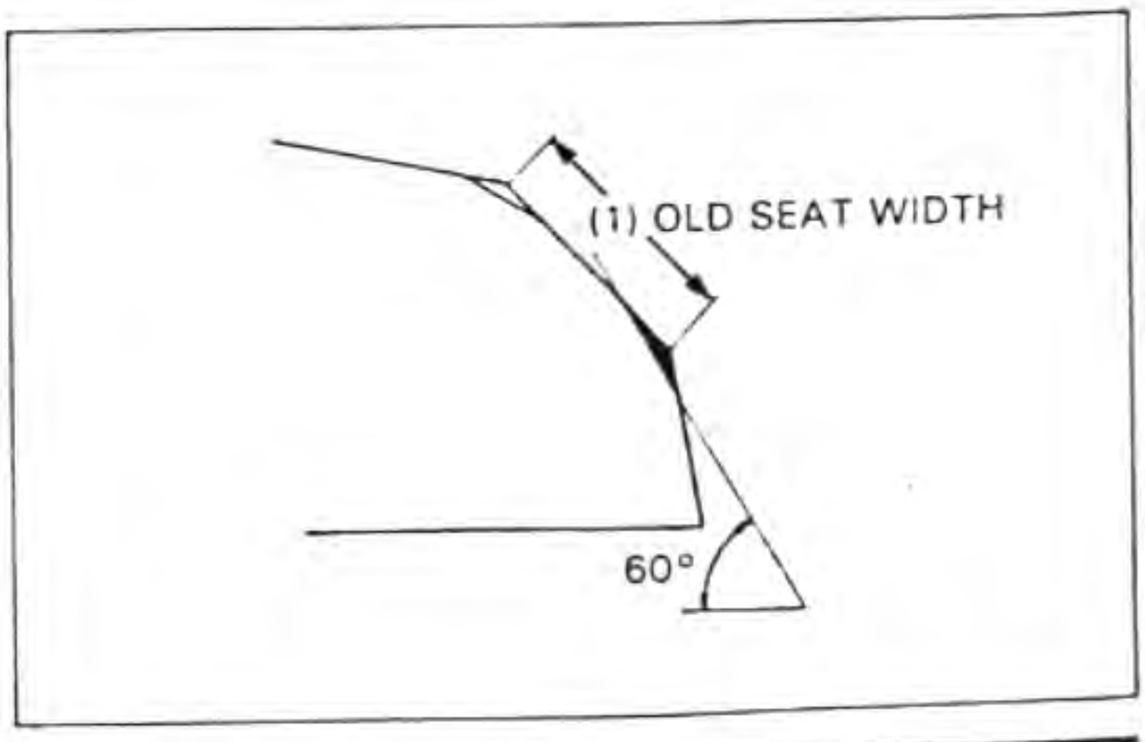
NOTE

- 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.



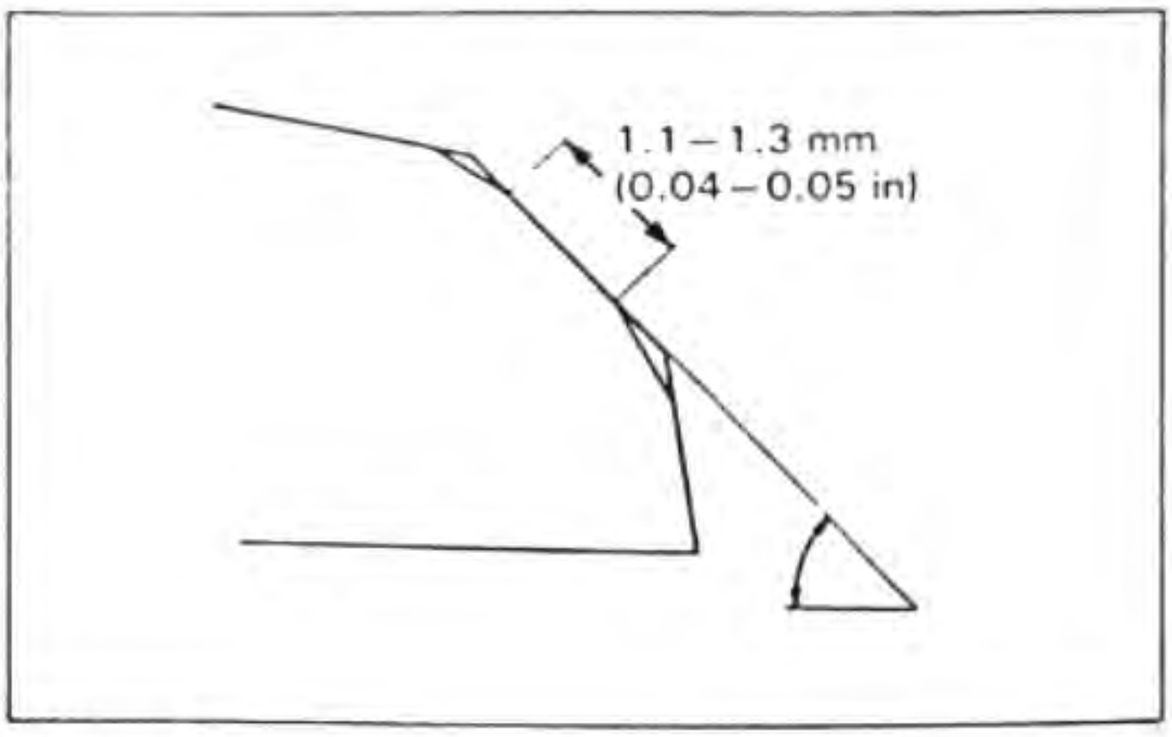
Use a 60 degree cutter to remove the bottom 1/4 of the old seat. Remove the cutter and inspect the area you have just removed.



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.



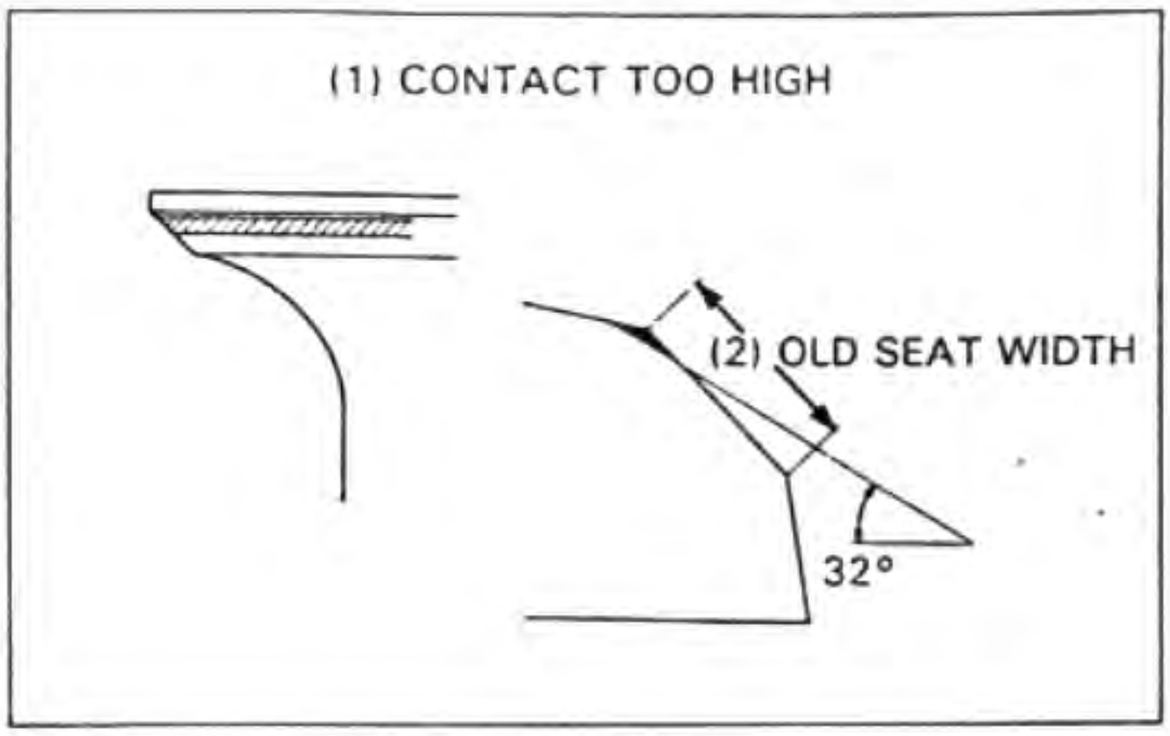
Apply a thin coating of Prussian Blue to the valve seat.

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

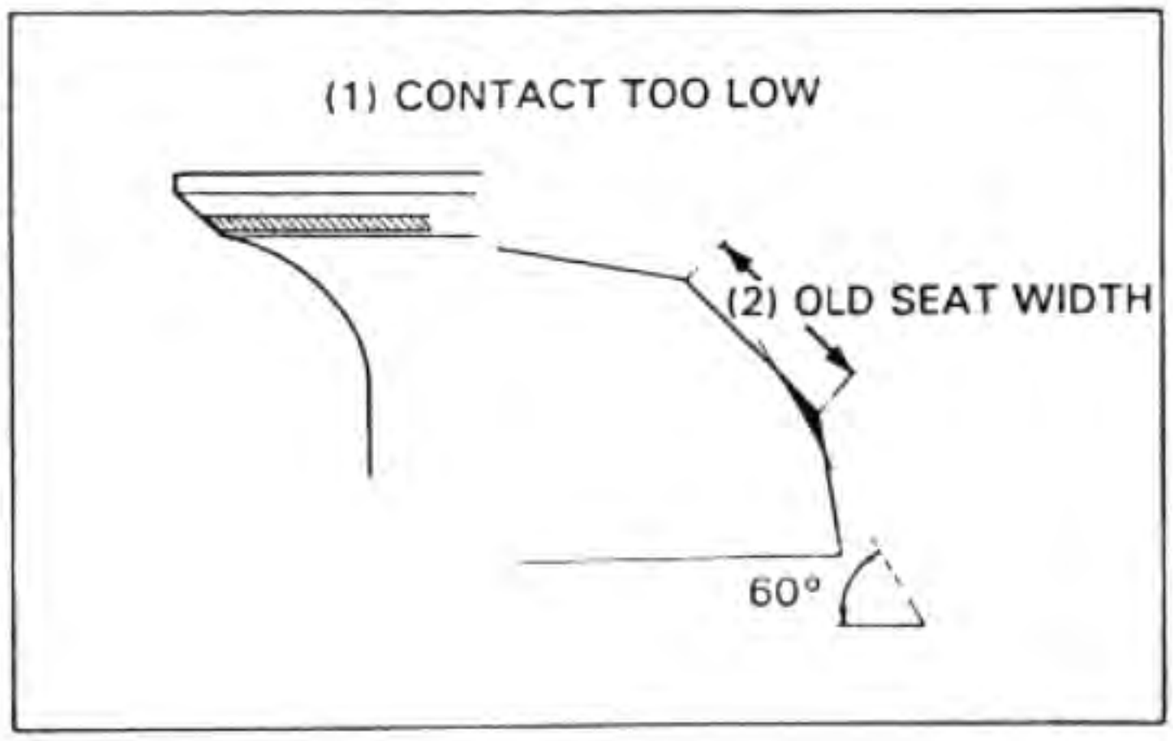
NOTE

- 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 finish cutter.

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

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

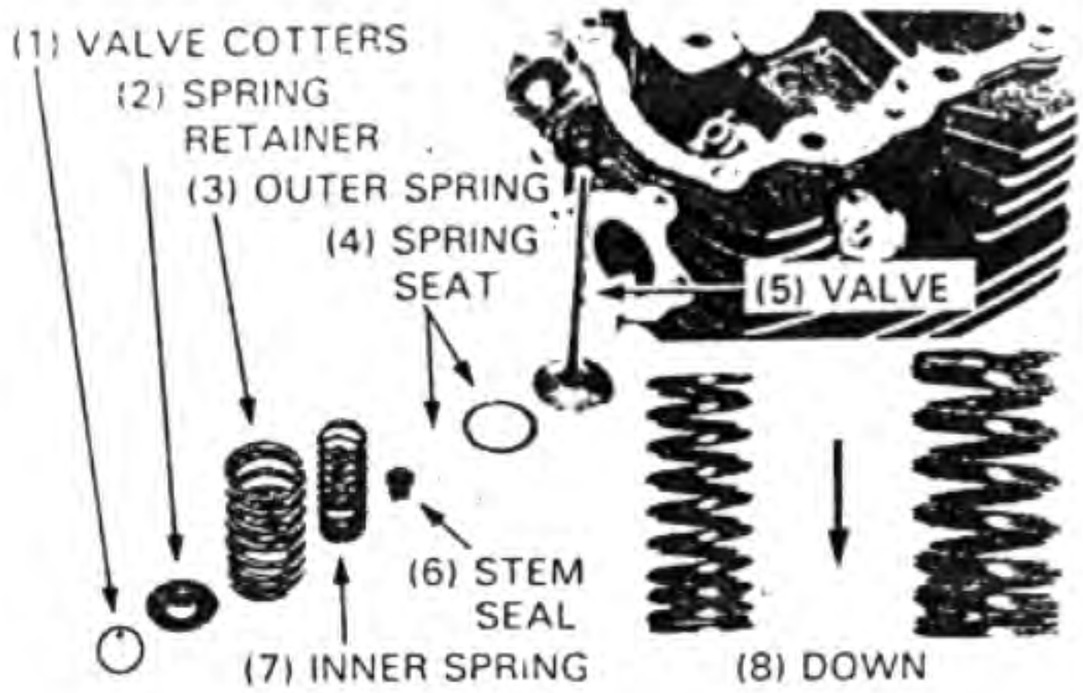
CYLINDER HEAD INSTALLATION

ASSEMBLY

NOTE

- Install new valve stem seals after disassembling.

Lubricate each valve stem with oil.
Insert the valves into the valve guides.
Install the valve springs with the tightly wound coils facing the cylinder head.



Install the valve spring retainers.
Install the valve cotters.

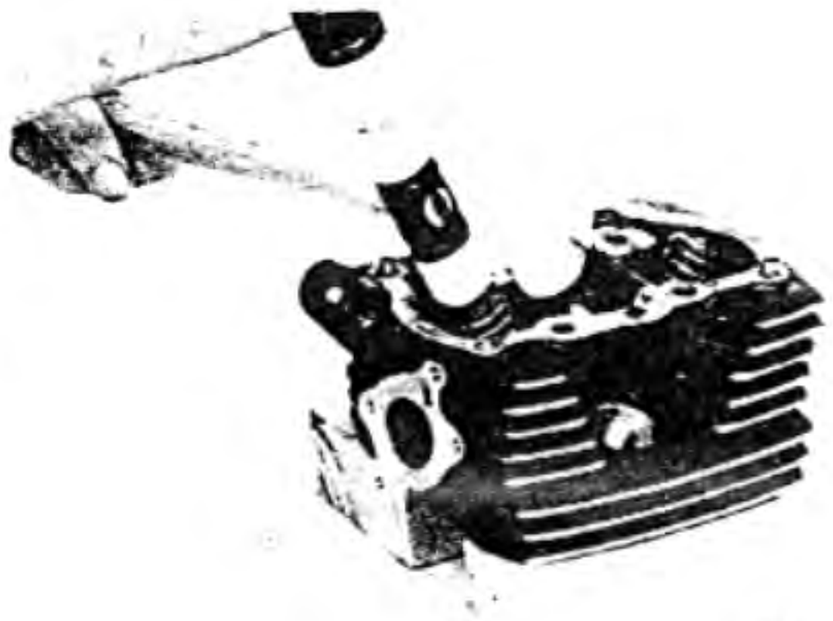
CAUTION

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

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

CAUTION

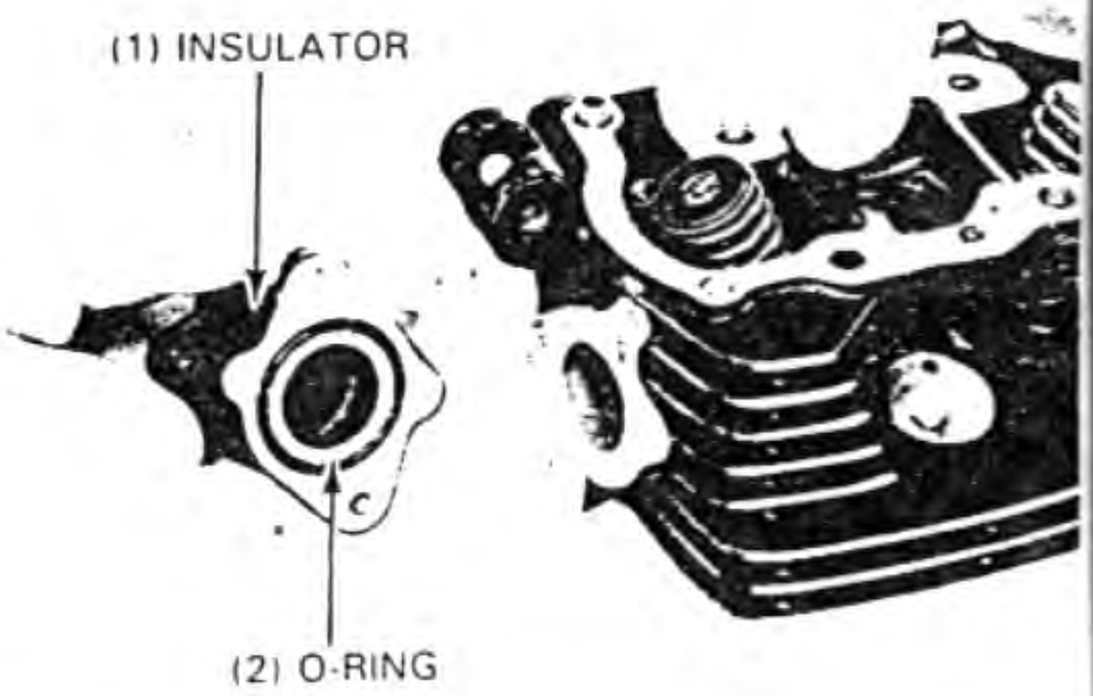
- *Support the cylinder head above the work bench surface to prevesnt possible valve damage.*



Check the insulator O-ring of insulator for wear or fatigue.

Apply oil to the O-ring and tighten the insulator to the specified torque.

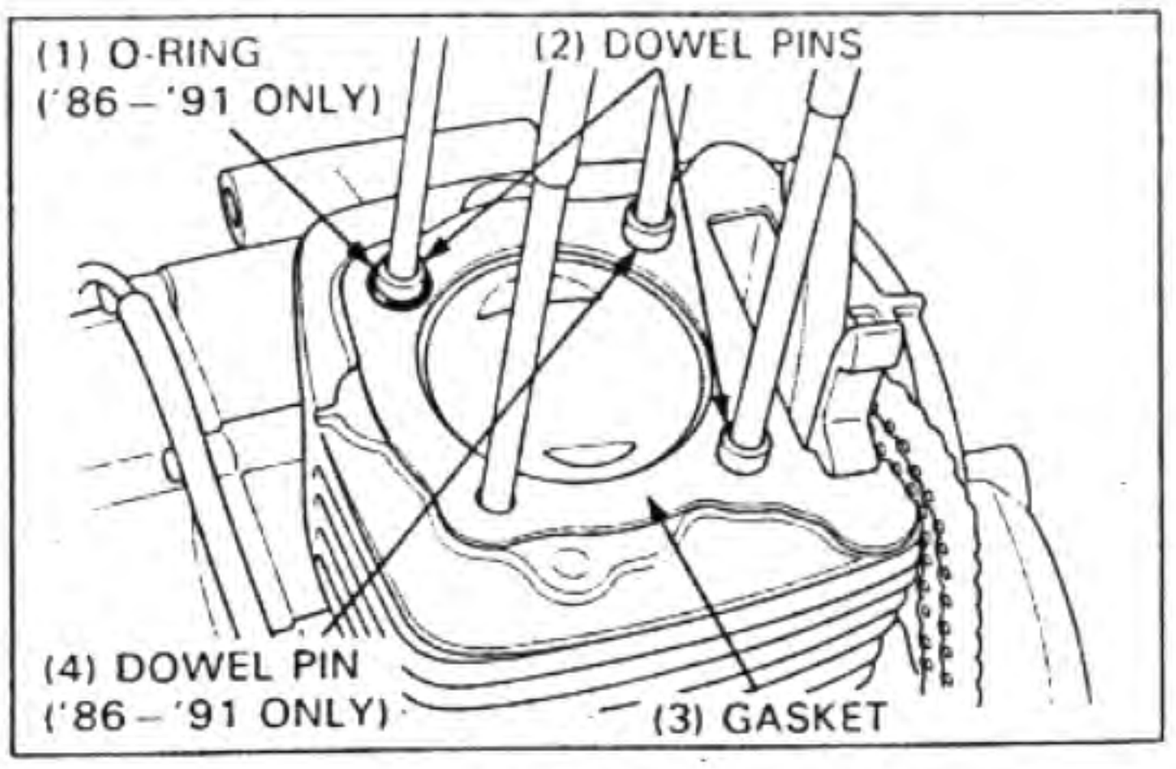
TORQUE: 8 – 12 N·m (0.8 – 1.2 kg-m, 6 – 9 ft-lb)



INSTALLATION

Place a shop towel in the cylinder and oil hole.
Remove the cylinder gasket and throughly clean the gasket surface.

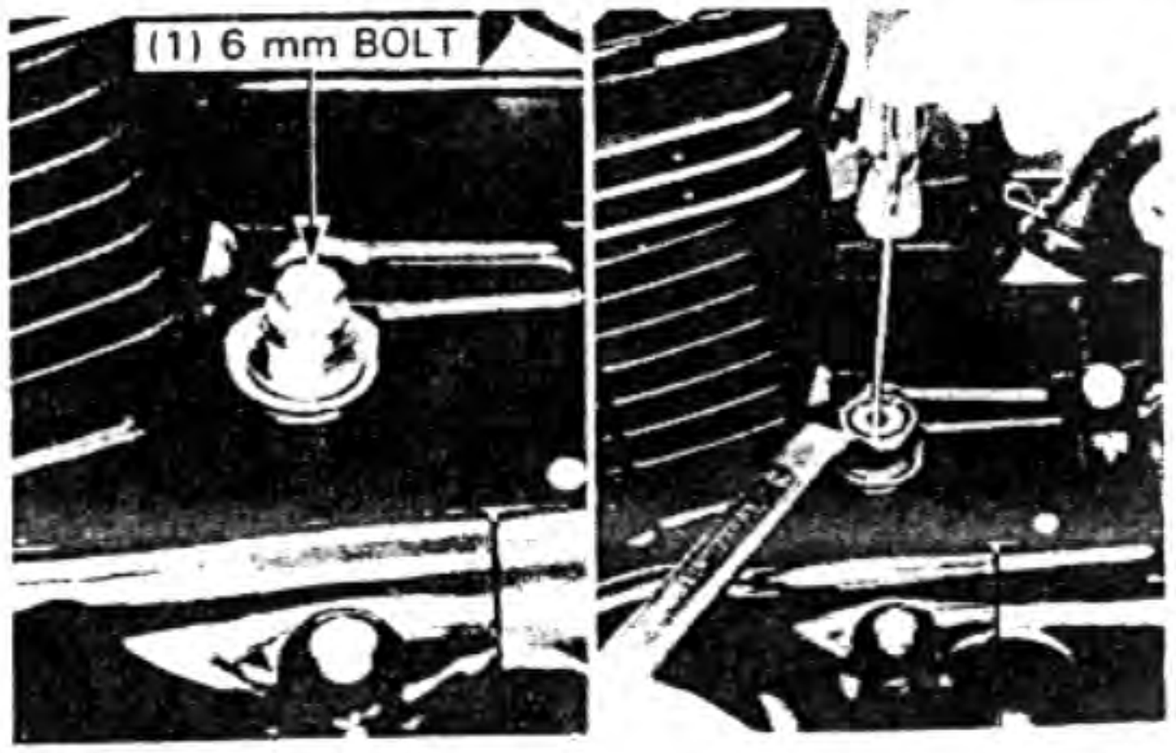
Install the O-ring, three dowel pins and a new gasket.



After '92:

Install the two dowel pins and a new gasket.

Remove the rubber cap.
Remove the 6 mm bolt and the tensioner adjusting bolt.
Push the tensioner set bar down with a screw driver, as shown, and tighten the adjusting bolt.



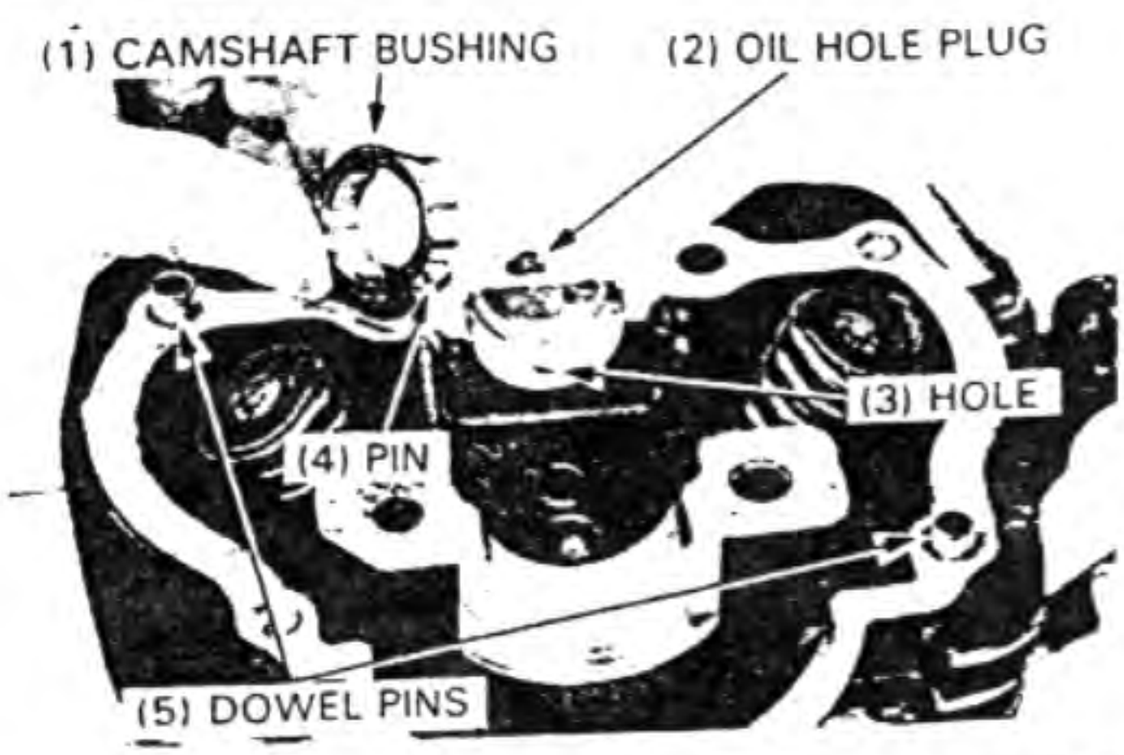
Install the 6 mm bolt and rubber cap.

Install the dowel pins and camshaft bushing.

NOTE

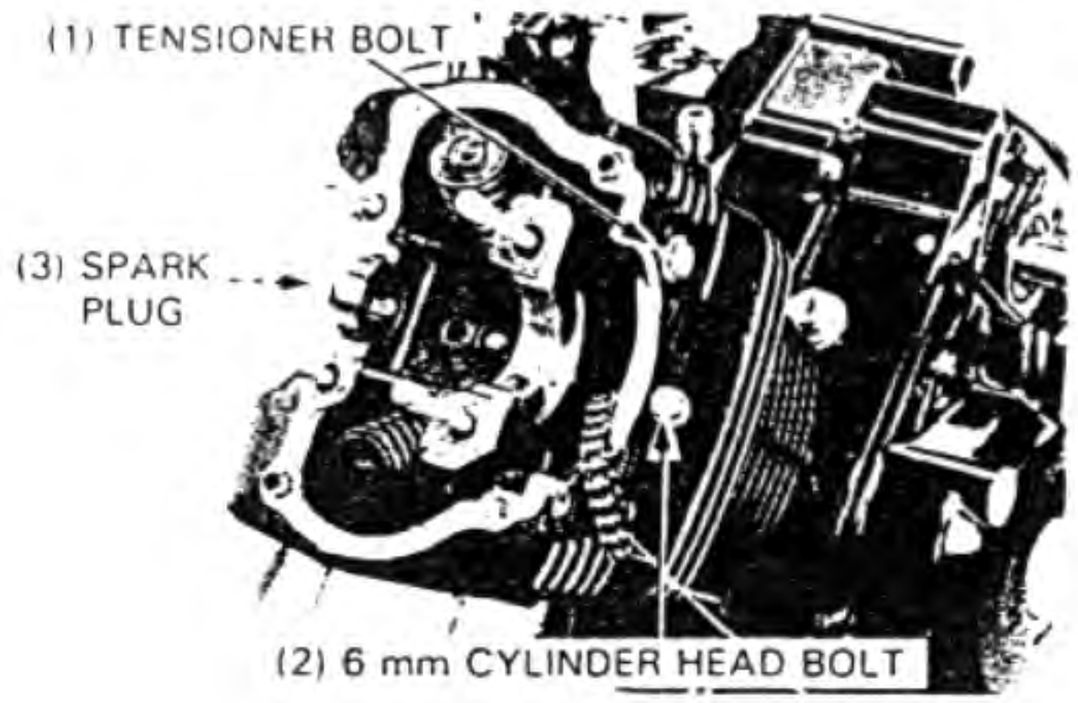
- Align the camshaft bushing dowel pin with the hole in the cylinder head.

Install the oil hole plug.
Install the dowel pins into the cylinder head.



Install the cylinder head.
Tighten the cam chain tensioner bolt securely.
Temporarily install the 6 mm cylinder head bolt loosely.

Install the spark plug.



CYLINDER HEAD COVER INSTALLATION

Install the rocker arms and rocker arm shafts in the cylinder head cover.

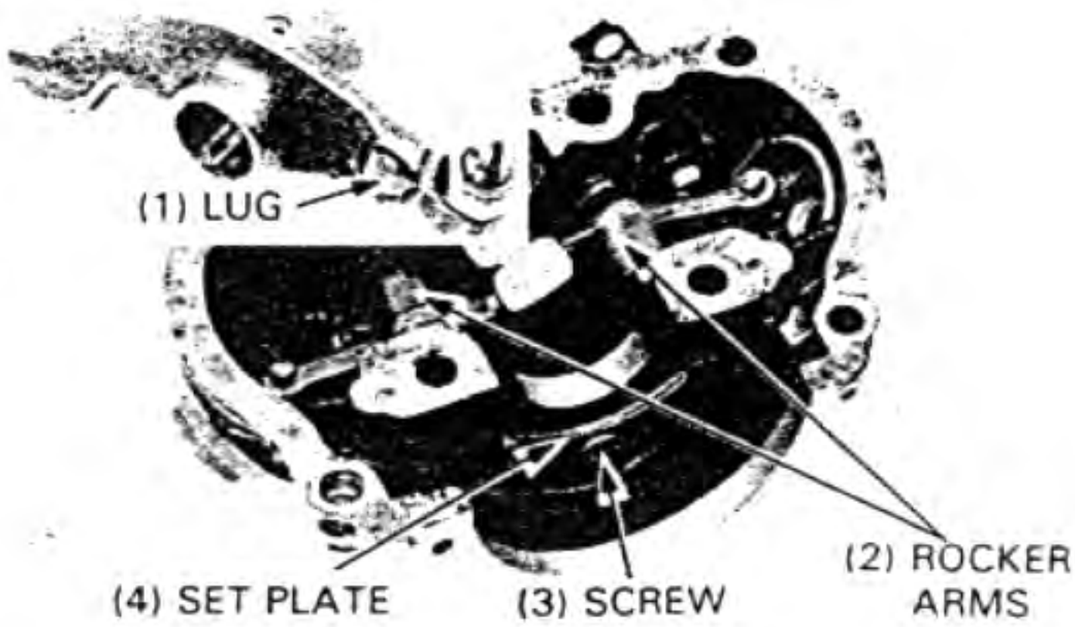
NOTE

- Install the rocker arm having a decompression lug on the exhaust side.

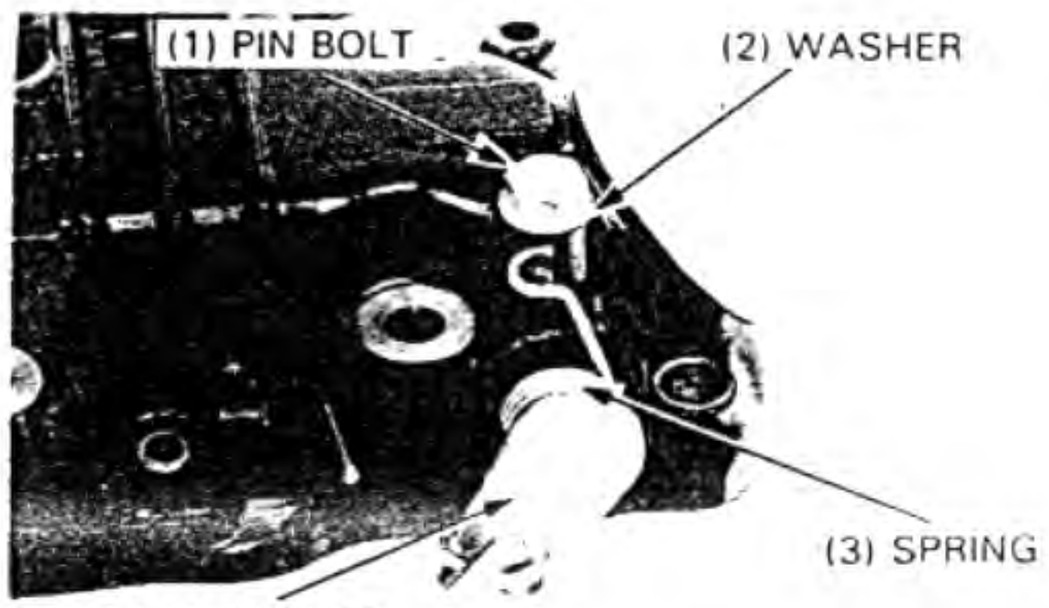
Install the set plate and tighten the set plate screw.

NOTE

- Clean the threads of the set plate screw and use a thread locking compound during assembly.



Install the spring and valve lifter lever with the pin bolt and washer as shown.

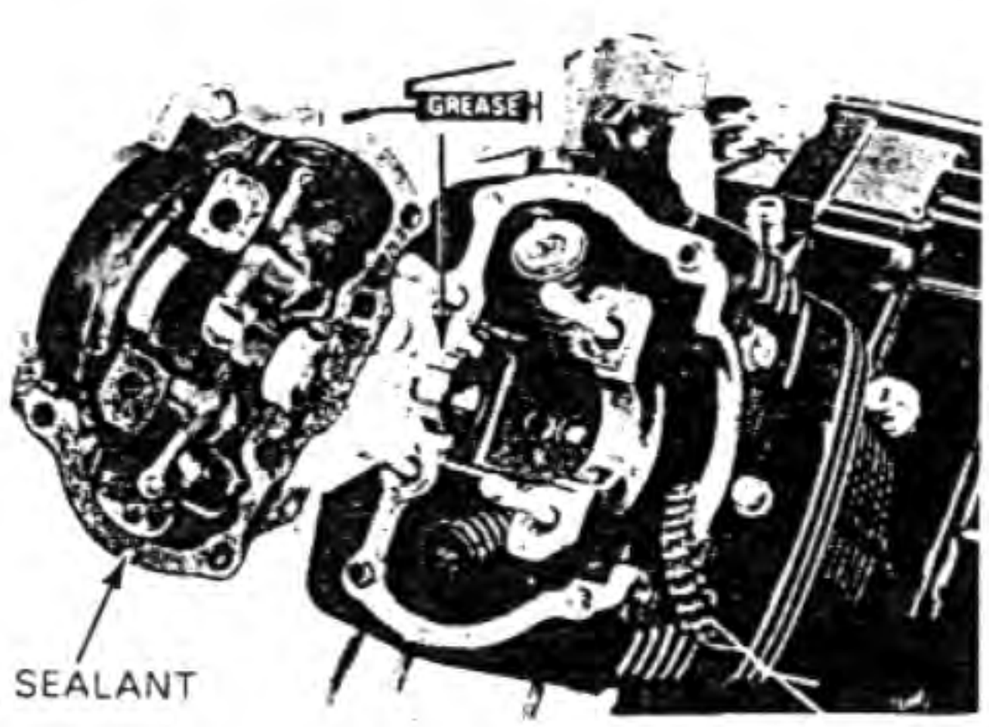


Apply liquid sealant to the cylinder head cover mating surface.

NOTE

- Keep sealant away from the camshaft bushing surfaces.

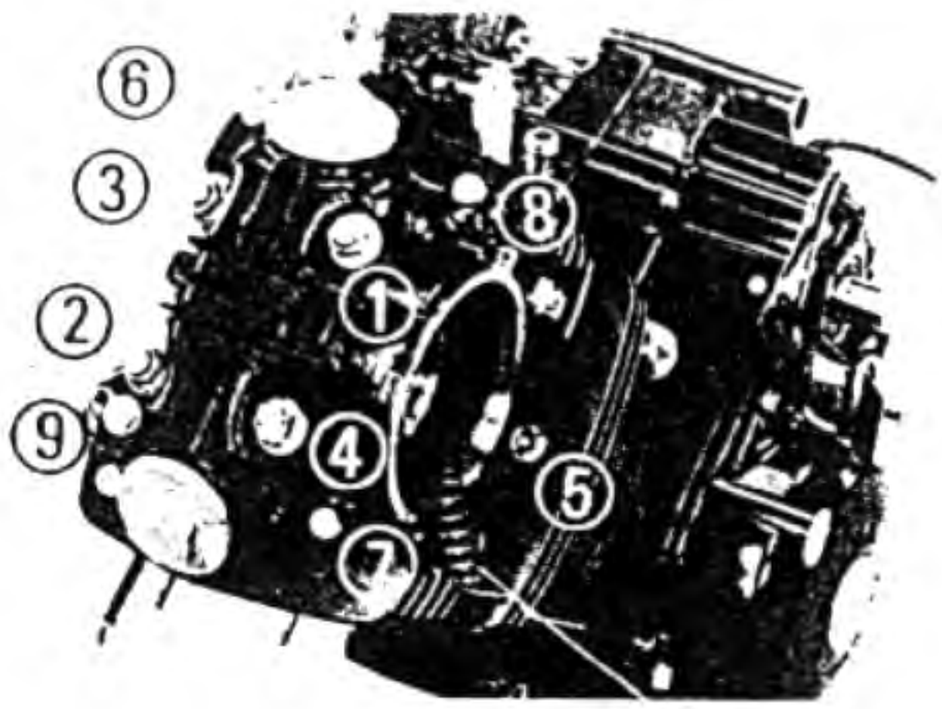
Coat the camshaft bushing with molybdenum disulfide grease.



Install the cylinder head cover.
Install the 8 mm cap nuts and 6 mm socket bolts.

Tighten the nuts and bolts in 2 – 3 steps in the number pattern as shown.

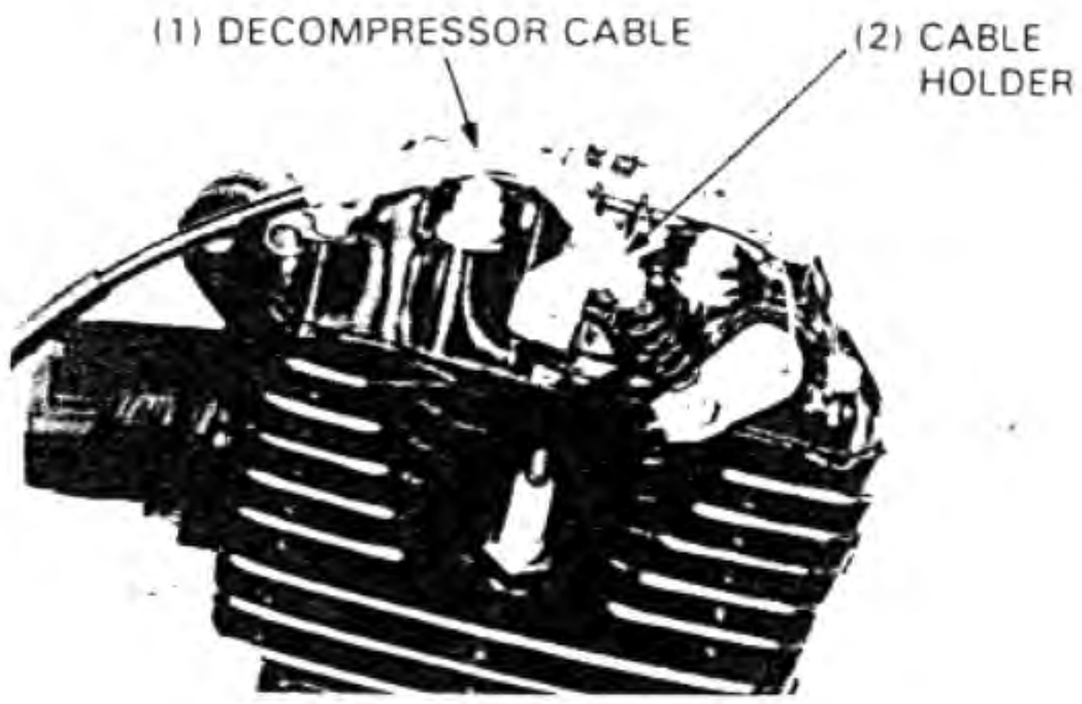
TORQUE:
8 mm nuts:
28 – 30 N·m (2.8 – 3.0 kg-m, 20 – 22 ft-lb)
6 mm cylinder head bolt and socket bolts:
8 – 12 N·m (0.8 – 1.2 kg-m, 6 – 9 ft-lb)

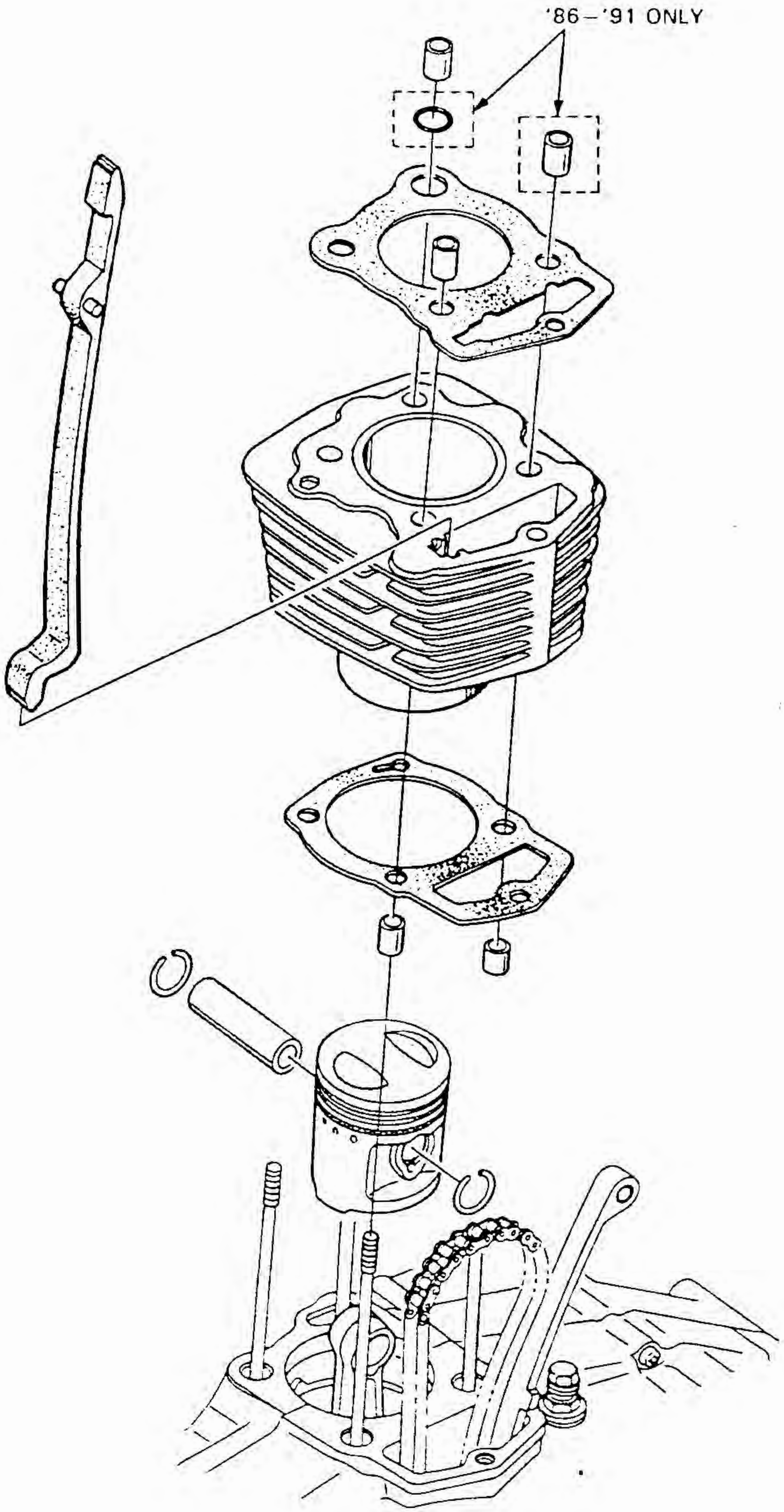


Install the camshaft (page 6-5).

Install the decompressor cable holder.
Connect the starter decompressor cable.
Install the engine into the frame (page 5-4).

Adjust the valve clearance (page 3-8).
Adjust the decompressor free play (page 3-9).
Inspect and adjust the ignition timing (page 14-7).
Test the cylinder compression (page 3-10).
Adjust the cam chain tension (page 3-9).




'86 – '91 ONLY

7. CYLINDER/PISTON

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 not 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.		65.500–65.510 mm (2.5787–2.5791 in)	65.60 mm (2.583 in)
	Taper		—	0.10 mm (0.004 in)
	Out of round		—	0.10 mm (0.004 in)
	Warpage across top		—	0.10 mm (0.004 in)
Piston, piston pin, piston rings	Piston O.D.		65.465–65.485 mm (2.577–2.578 in)	65.40 mm (2.575 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)
	Connecting rod small end I.D.		15.010–15.028 mm (0.5909–0.5917 in)	15.06 mm (0.5929 in)
	Piston-to-pin clearance		0.002–0.014 mm (0.0001–0.0006 in)	0.02 mm (0.001 in)
	Piston pin-to-connecting rod small end clearance		0.010–0.034 mm (0.0004–0.0013 in)	0.10 mm (0.004 in)
	Piston ring-to-ring groove clearance	TOP	0.010–0.045 mm (0.0004–0.0018 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/SEC	0.20–0.40 mm (0.008–0.016 in)	0.5 mm (0.02 in)
		OIL	0.30–0.90 mm (0.012–0.035 in)	—
Cylinder-to-piston clearance			0.015–0.045 mm (0.0006–0.0018 in)	0.10 mm (0.004 in)

TROUBLESHOOTING

Low or unstable compression
- Worn cylinder or piston rings
- Decompressor out of adjustment

Excessive smoke
- Worn cylinder, piston, or piston rings
- Improper installation of piston rings
- Scored or scratched piston or cylinder wall

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

Knocking or abnormal nosie
- Worn piston and cylinder
- Excessive carbon build-up

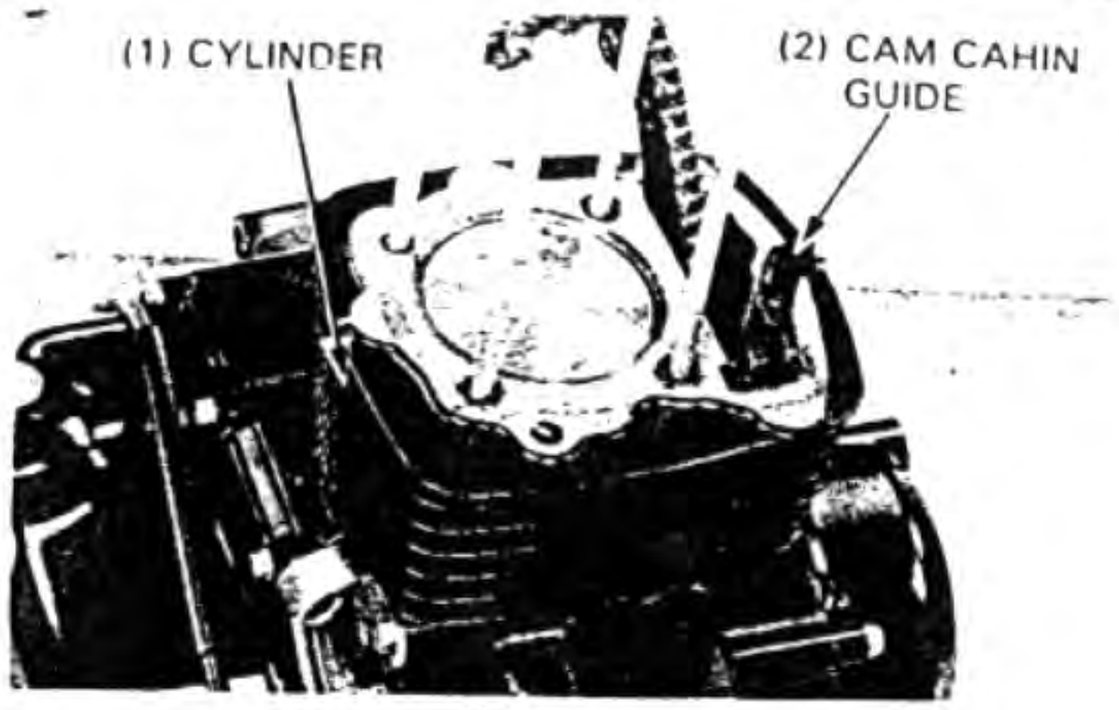
CYLINDER REMOVAL

Remove the engine from the frame (section 5).
Remove the cylinder head cover and cylinder head (section 6).
Remove the cam chain guide.

NOTE

- Prevent the cam chain from falling into the crankcase when removing the cylinder.

Remove the cylinder.
Remove the cylinder gasket and dowel pins.



Clean off any gasket material from the cylinder surface.

NOTE

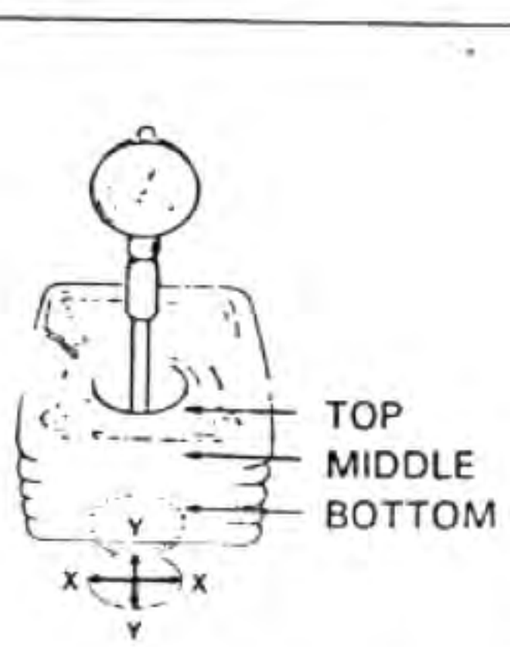
- Do not remove metal from the gasket surface.

CYLINDER INSPECTION

Calculate piston-to-cylinder clearance by comparing the maximum cylinder measurement to the piston O.D. measurement. The difference between the two measurements is the piston-to-cylinder clearance.
Refer to page 7-3 for measurement of the piston O.D.

SERVICE LIMIT: 0.10 mm (0.004 in)

Calculate cylinder taper by comparing the top, middle and bottom measurements along the X axis.
The difference between the maximum and minimum readings is the cylinder taper for the X axis.
Determine cylinder taper for the Y axis in the same manner.



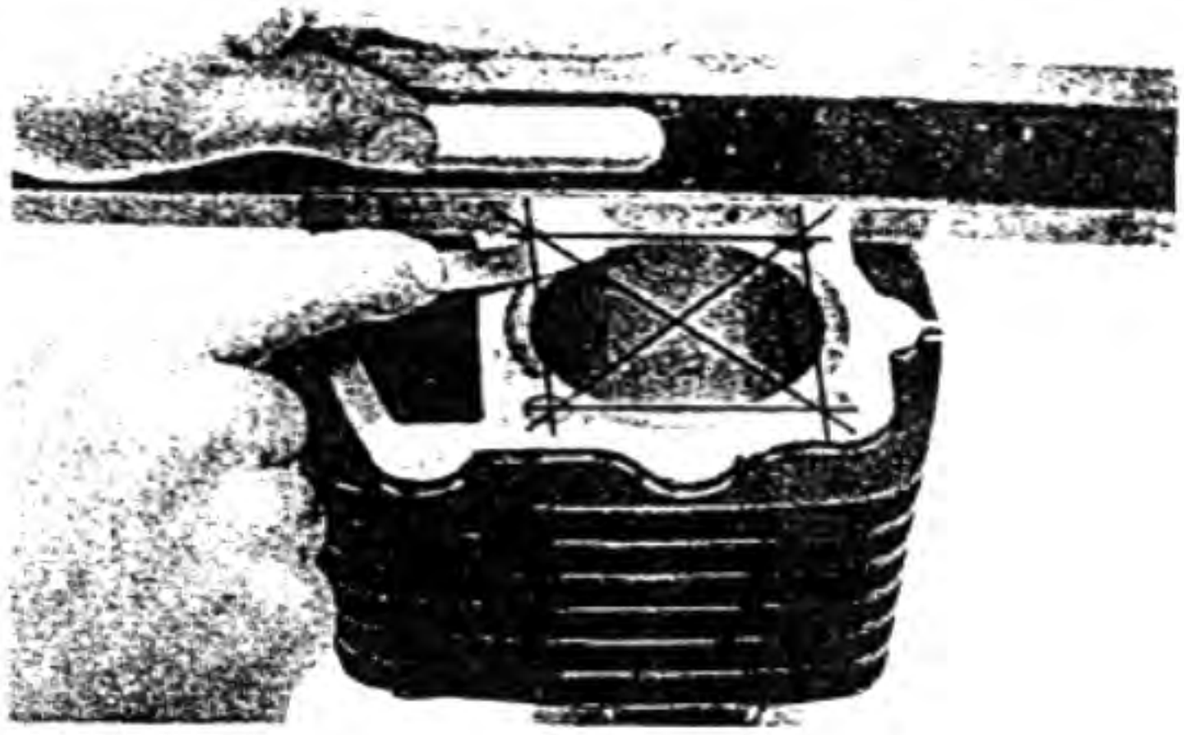
SERVICE LIMIT: 0.10 mm (0.004 in)

Calculate cylinder out-of-round by comparing the X axis and Y axis measuremnets from the top of the cylinder. The difference between the maximum and minimum readings is the cylinder out-of-round for the top level. Determine cylinder out-of-round for the middle and bottom levels in the same manner.

SERVICE LIMIT: 0.10 mm (0.004 in)

Inspect the top of the cylinder for warpage.

SERVICE LIMIT: 0.10 mm (0.004 in)

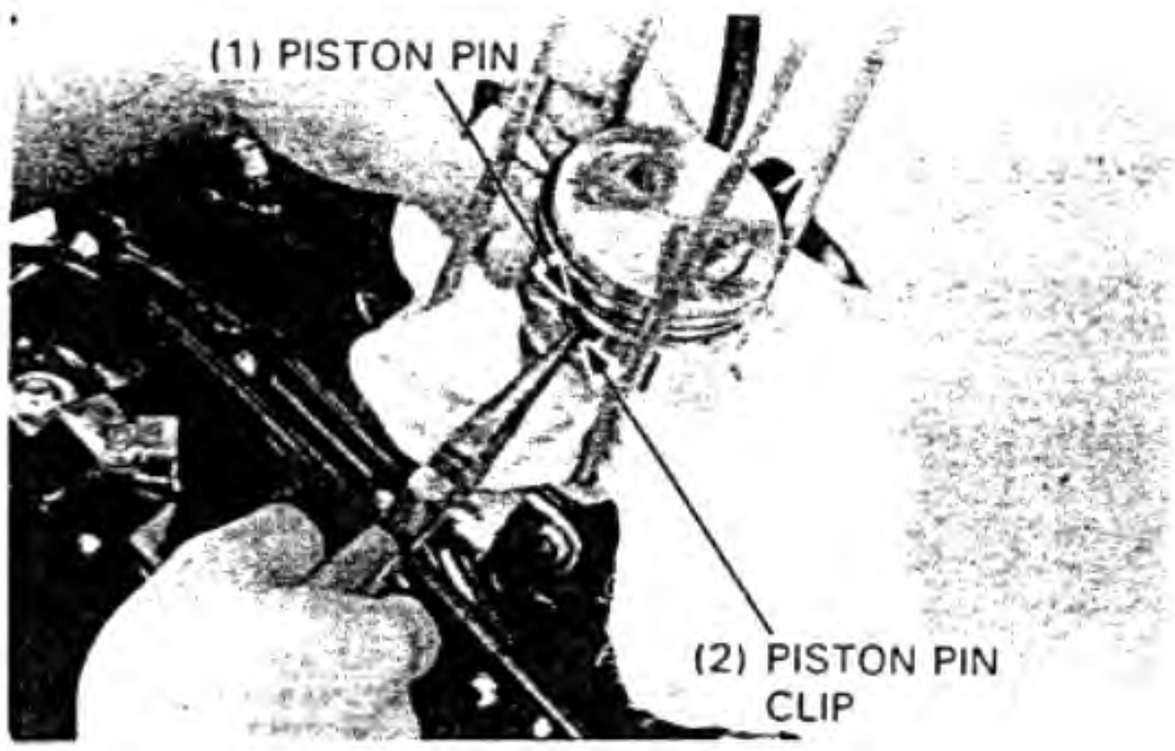


PISTON REMOVAL

NOTE

- Stuff a shop towel into the crankcase to prevent objects from fallling in.

Remove the piston pin clip with pliers.
Press the piston pin out of the piston.
Remove the piston.



PISTON RING REMOVAL

Spread each piston ring and remove by lifting it up at a point on the other side of the gap.

CAUTION

- *Do not damage the piston rings by spreading the ends too far.*

PISTON/PISTON RING INSPECTION

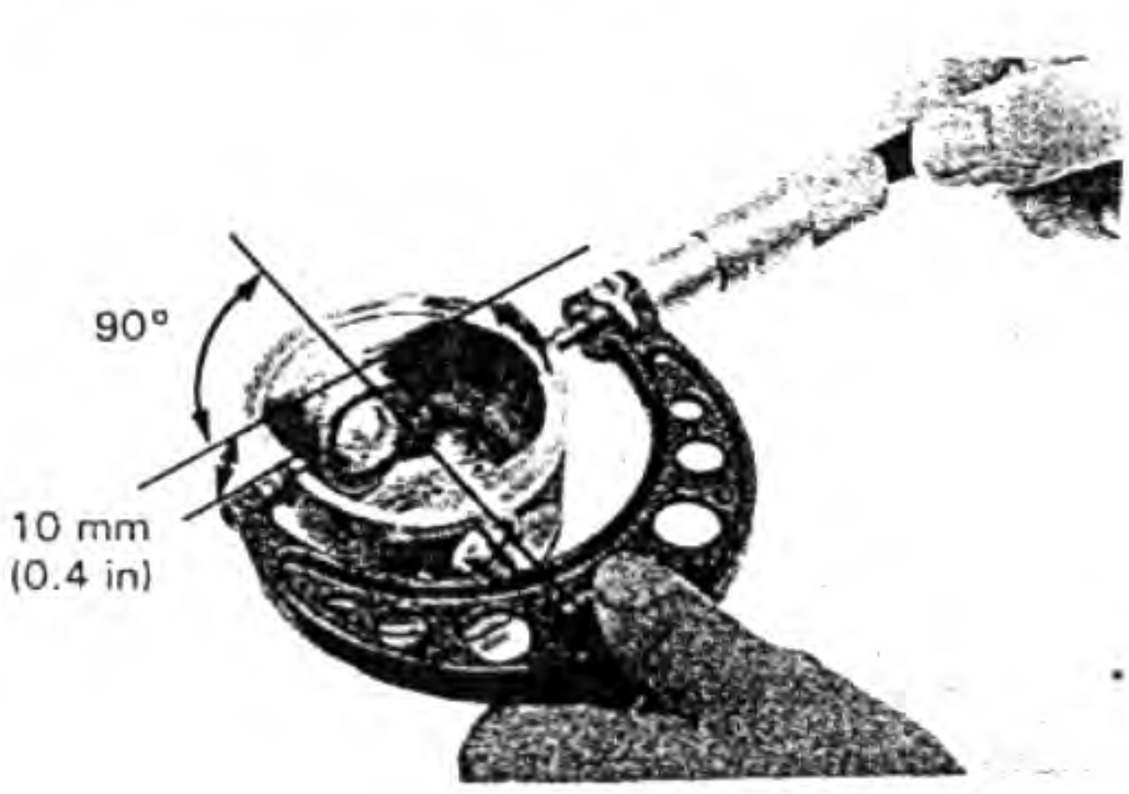
Measure the piston diameter 10 mm (0.4 in) from the bottom of the skirt.

SERVICE LIMIT: 65.40 mm (2.575 in)

NOTE

- Measure the piston diameter perpendicular to the piston pin hole.

Compare this measurement against the service limit and calculate piston-to-cylinder clearance.
Refer to page 7-2 for measuring the cylinder.



CYLINDER/PISTON

Measure the piston pin bore.

SERVICE LIMIT: 15.04 mm (0.592 in)

Measure the piston pin O.D.

SERVICE LIMIT: 14.96 mm (0.589 in)

Calculate the piston-to-piston pin clearance.

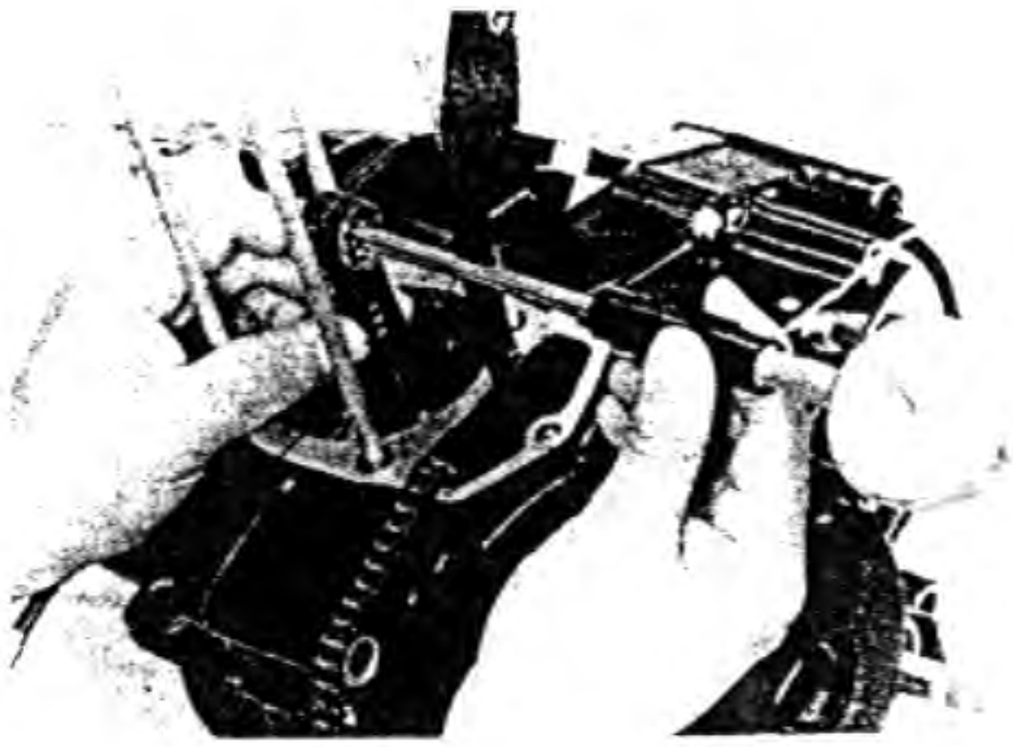
SERVICE LIMIT: 0.02 mm (0.001 in)

Measure the connection rod small end I.D.

SERVICE LIMIT: 15.06 mm (0.5929 in)

Calculate the piston pin-to-connecting rod small end clearance.

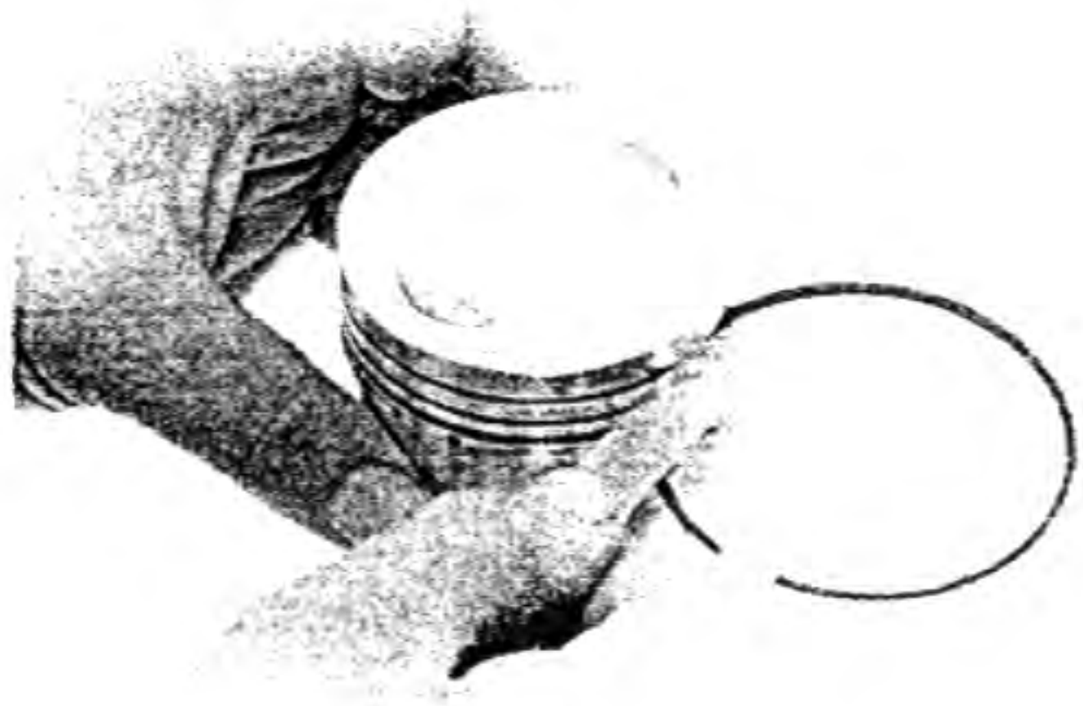
SERVICE LIMIT: 0.10 mm (0.004 in)



Measure the piston ring-to-groove clearance.

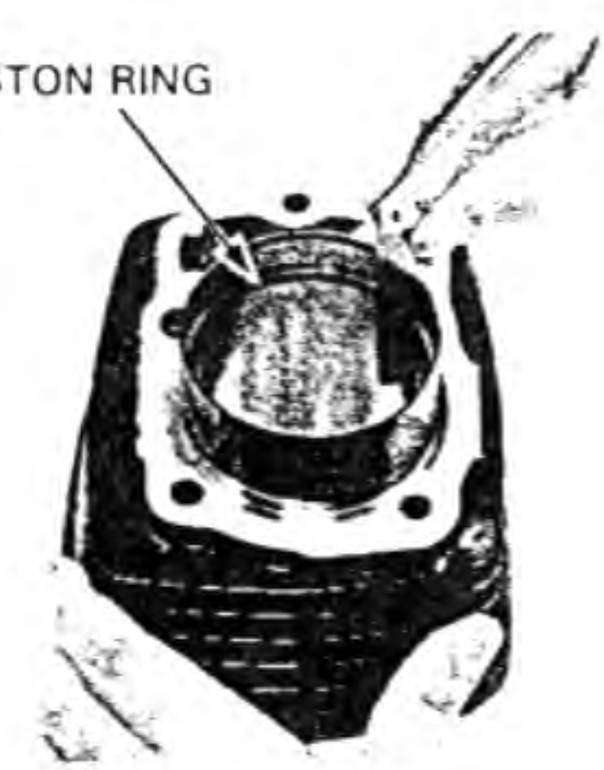
SERVICE LIMIT:
TOP/SECOND: 0.09 mm (0.004 in)

Inspect the piston for wear or damage.

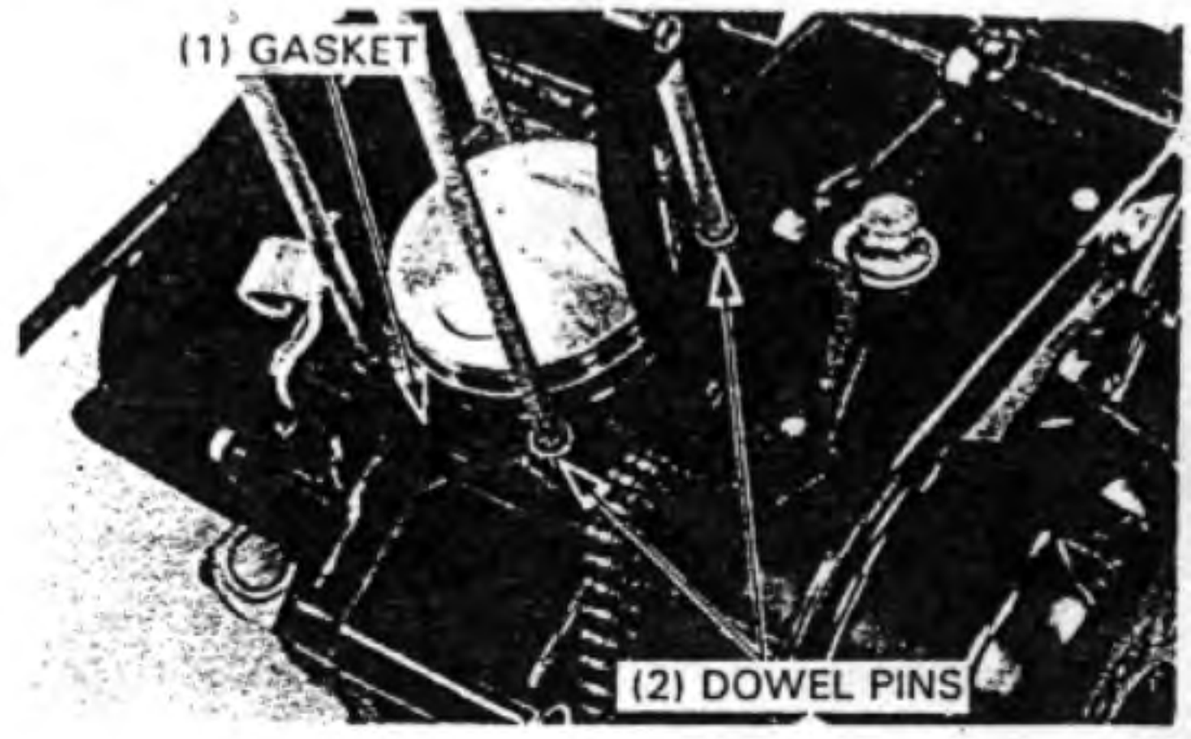


Insert each piston ring into the cylinder and measure the ring end gap.

SERVICE LIMIT:
TOP/SECOND: 0.5 mm (0.02 in)



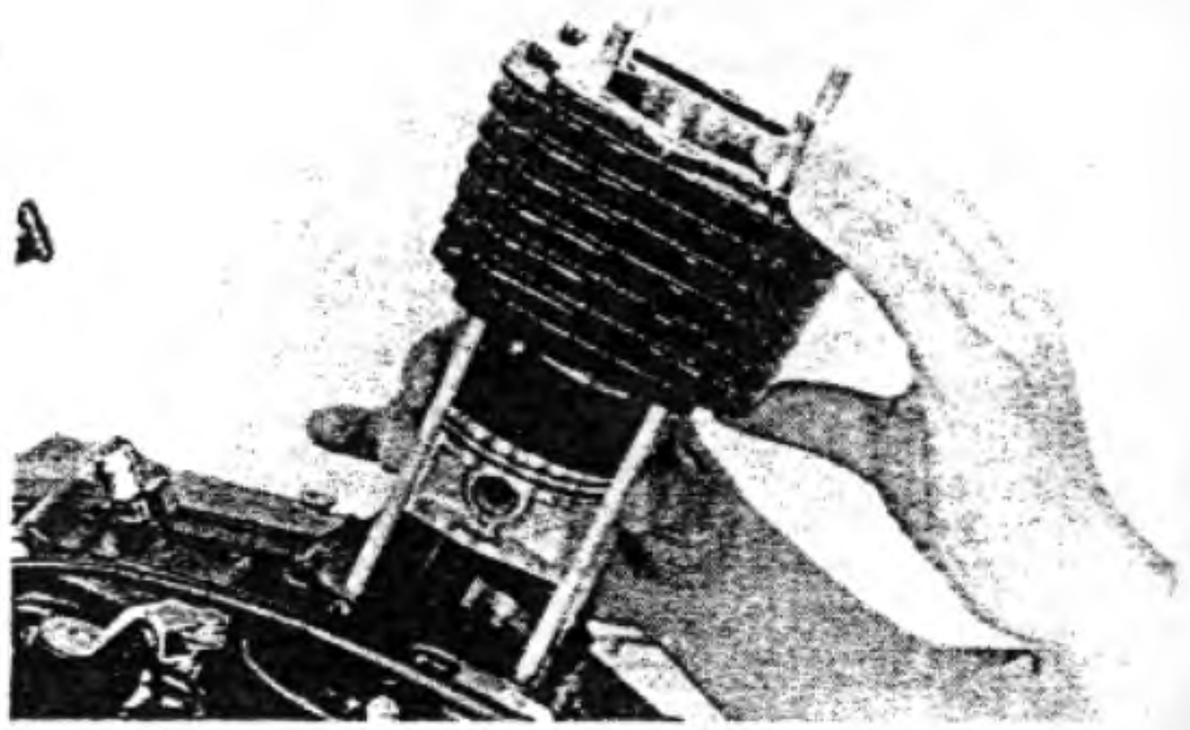
Install a new cylinder base gasket on the crankcase.
Install the dowel pins.



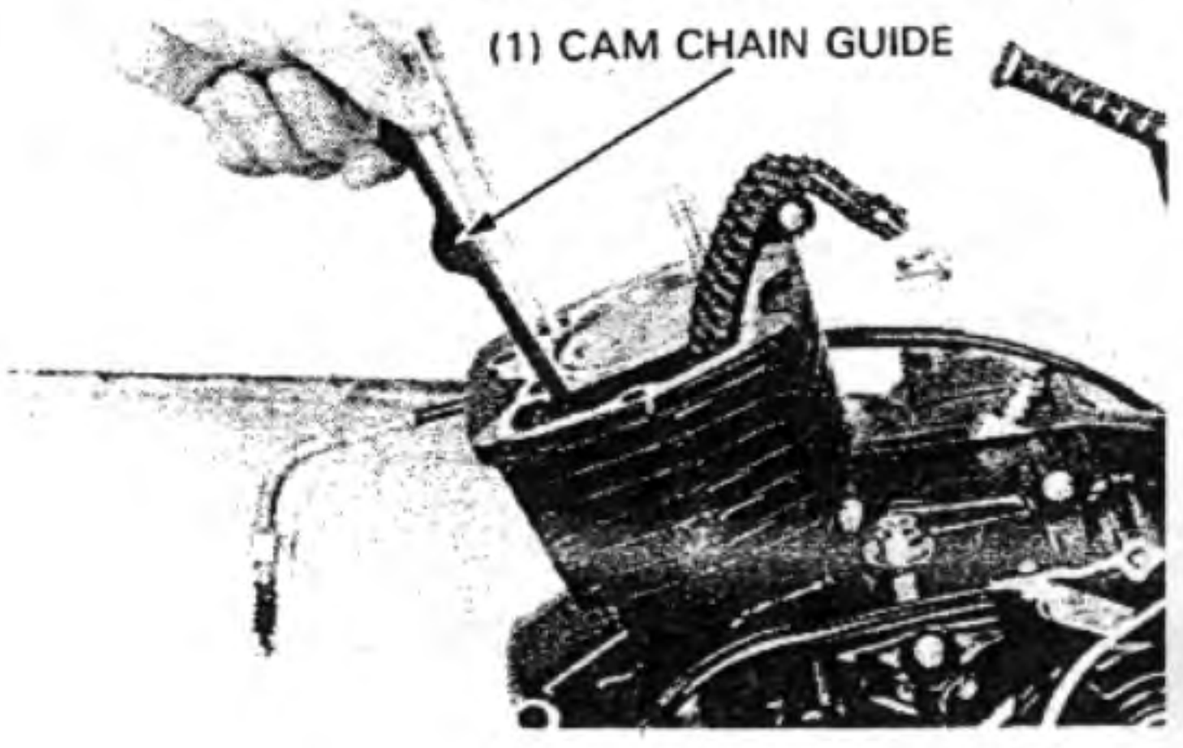
Coat the cylinder bore, piston and piston rings with engine oil and install the cylinder.

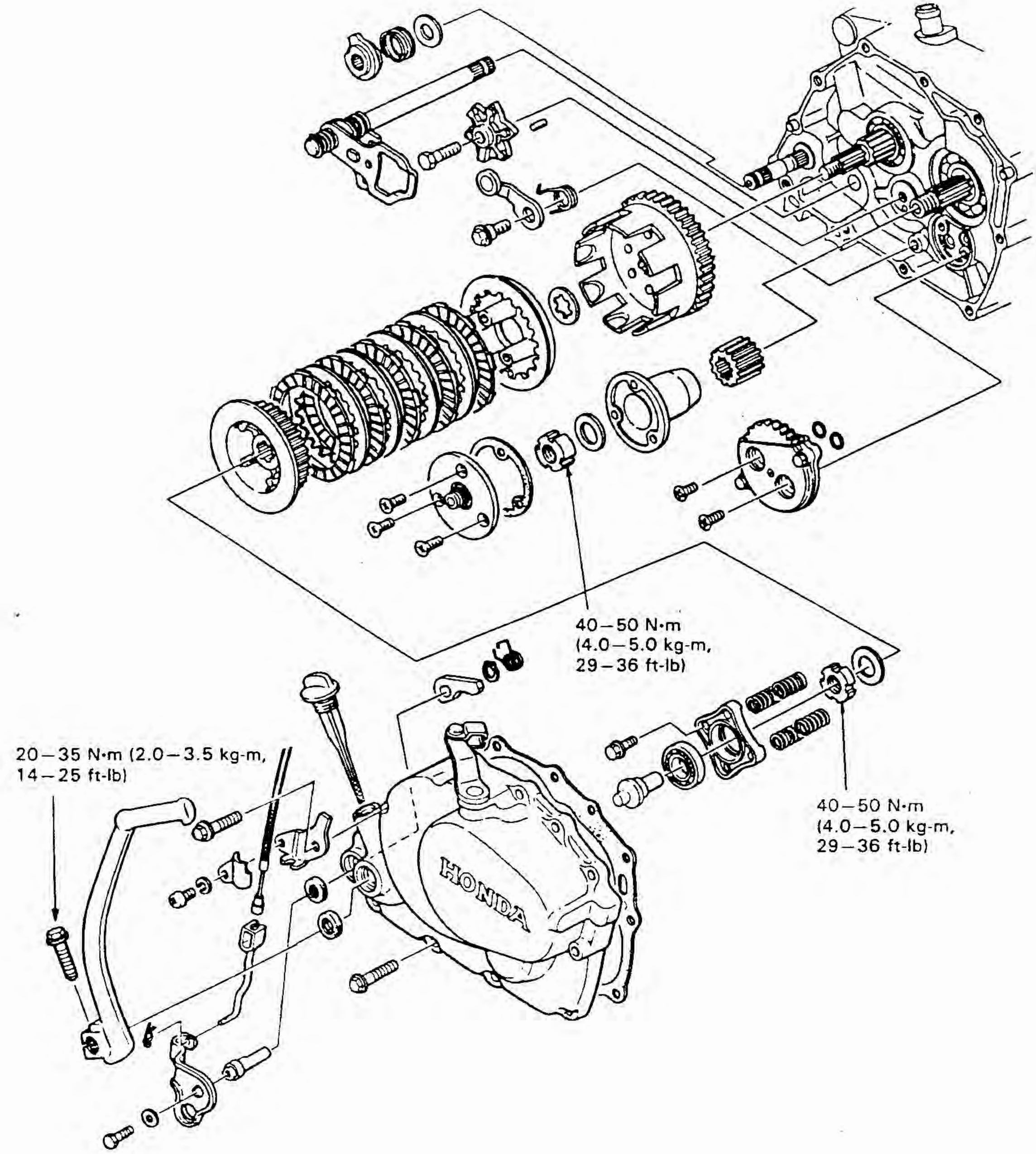
NOTE

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



Install the cam chain guide.
Install the cylinder head and cylinder head cover (section 6).




40—50 N·m
(4.0—5.0 kg-m,
29—36 ft-lb)
20—35 N·m (2.0—3.5 kg-m,
14—25 ft-lb)
40—50 N·m
(4.0—5.0 kg-m,
29—36 ft-lb)
HONDA

8. CLUTCH/OIL PUMP/GEARSHIFT LINKAGE

SERVICE INFORMATION

GENERAL

- This section covers removal and installation of the clutch, oil pump, oil filter rotor and gearshift linkage. All these operations can be done with the engine installed.
- When the existing clutch discs are replaced, coat the new discs with engine oil prior to assembly.

SPECIFICATIONS

8

ITEMS			STANDARD	SERVICE LIMIT
Clutch	Lever play		10–20 mm (3/8–3/4 in)	—
	Spring	Free length	37.9 mm (1.49 in)	34.7 mm (1.37 in)
		Preload	23.5–25.5 kg (51.8–56.2 lbs)	—
	Disc thickness		2.9–3.0 mm (0.11–0.12 in)	2.6 mm (0.10 in)
	Plate warpage		—	0.20 mm (0.008 in)
	Disc warpage		—	0.20 mm (0.008 in)
Oil pump	Tip clearance		0.15 mm (0.006 in)	0.20 mm (0.008 in)
	Body clearance		0.30–0.36 mm (0.012–0.014 in)	0.40 mm (0.016 in)
	Pump end clearance		0.15–0.20 mm (0.006–0.008 in)	0.25 mm (0.010 in)
	Output		4.0 lit. (4.2 US qt, 3.5 Imp qt) at 8,000 rpm/min.	—

TORQUE VALUES

Oil filter rotor nut	40–50 N·m (4.0–5.0 kg-m, 29–36 ft-lb)
Clutch center nut	40–50 N·m (4.0–5.0 kg-m, 29–36 ft-lb)
Kick starter pedal joint bolt	20–35 N·m (2.0–3.5 kg-m, 14–25 ft-lb)

TOOLS

Special

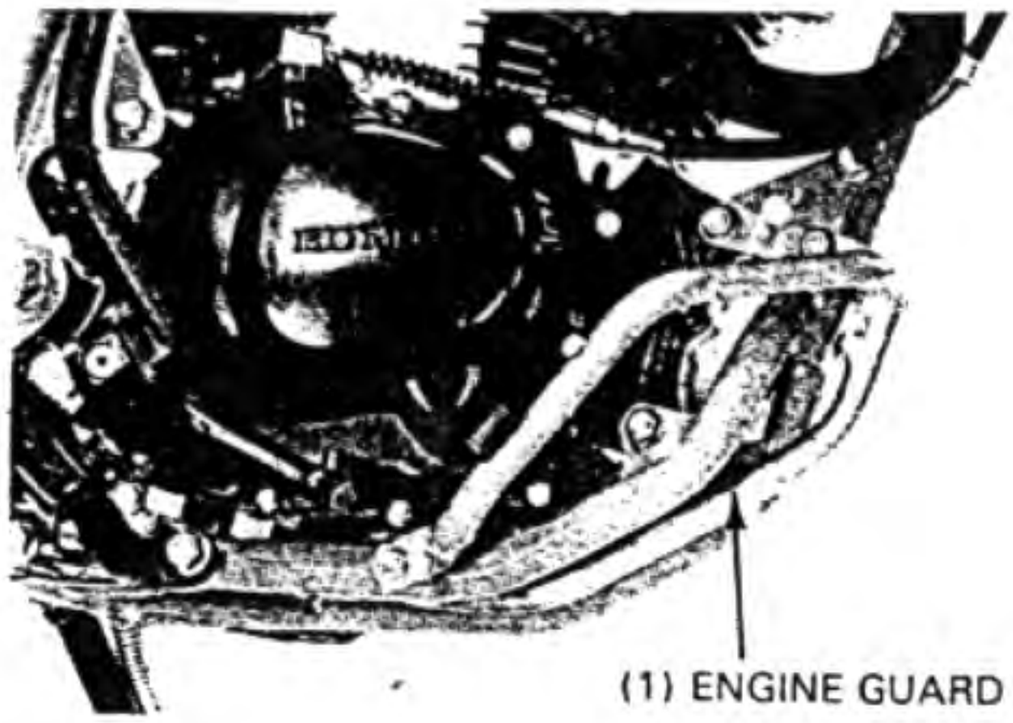
Clutch center holder	07923 – 9580000 or 07HGB – 001010B or 07HGB – 001010A and 07HGB – 001020B or 07HGB – 001020A

Common

Gear holder	07724 – 0010200 – NOT AVAILABLE IN U.S.A.
Lock nut wrench, 20 x 24 mm	07716 – 0020100
Extension bar	07716 – 0020500 or equivalent commercially available in U.S.A.

RIGHT CRANKCASE COVER REMOVAL

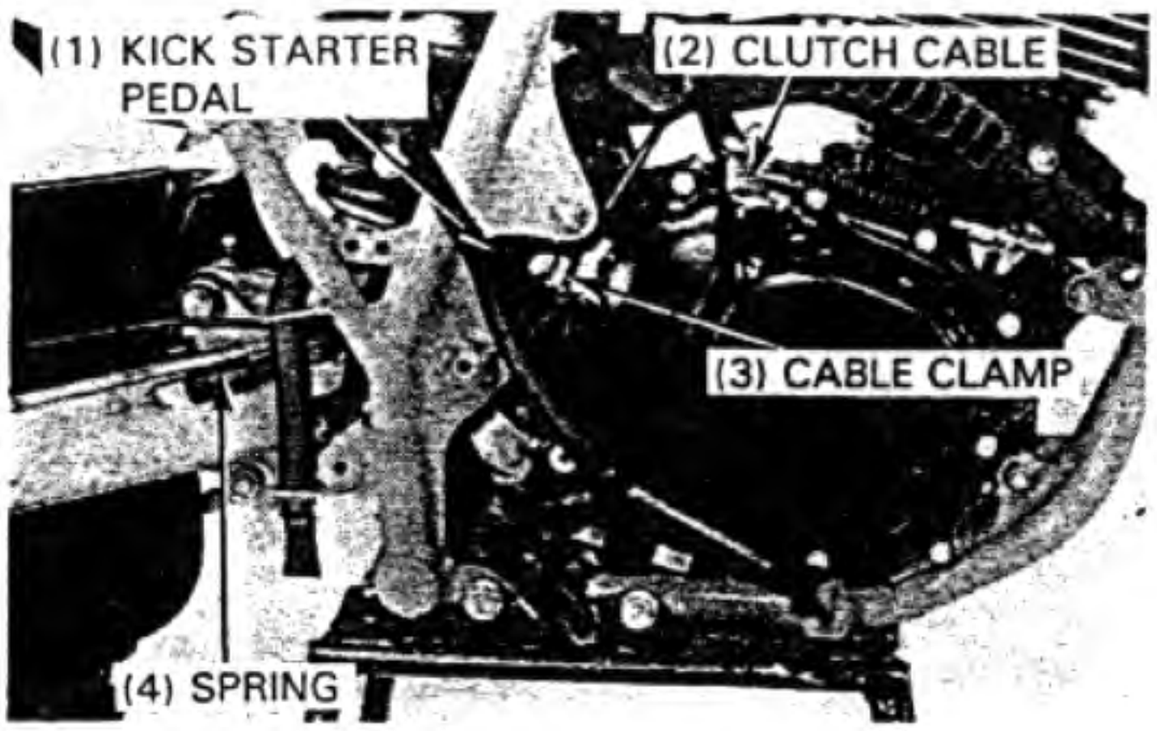
Drain oil from the engine.
Remove the engine guard.



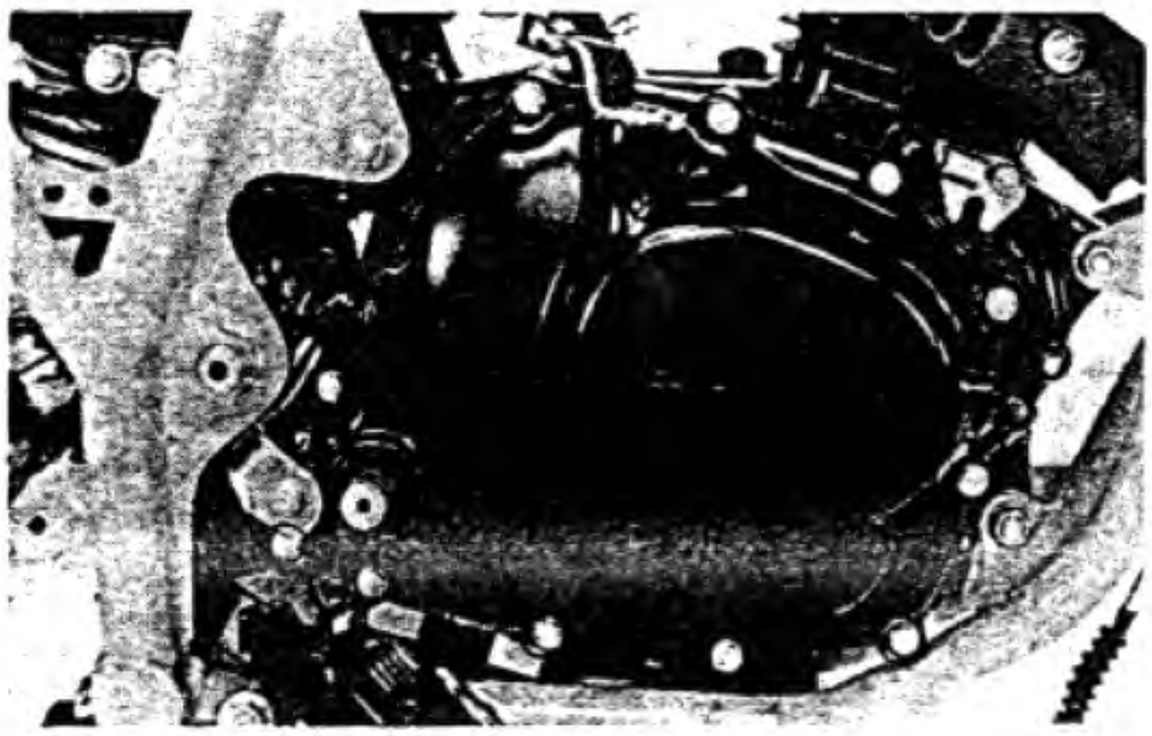
Support the motorcycle on a suitable device or optional work stand.
Disconnect the brake rod from the brake arm (page 12-10).
Remove the brake pedal return spring.
Remove the kick starter pedal.

Disconnect the clutch cable.

Remove the decompressor cable clamp. Disconnect the decompressor cable from the cam follower lever.



Remove the right crankcase cover.



CAM FOLLOWER DISASSEMBLY

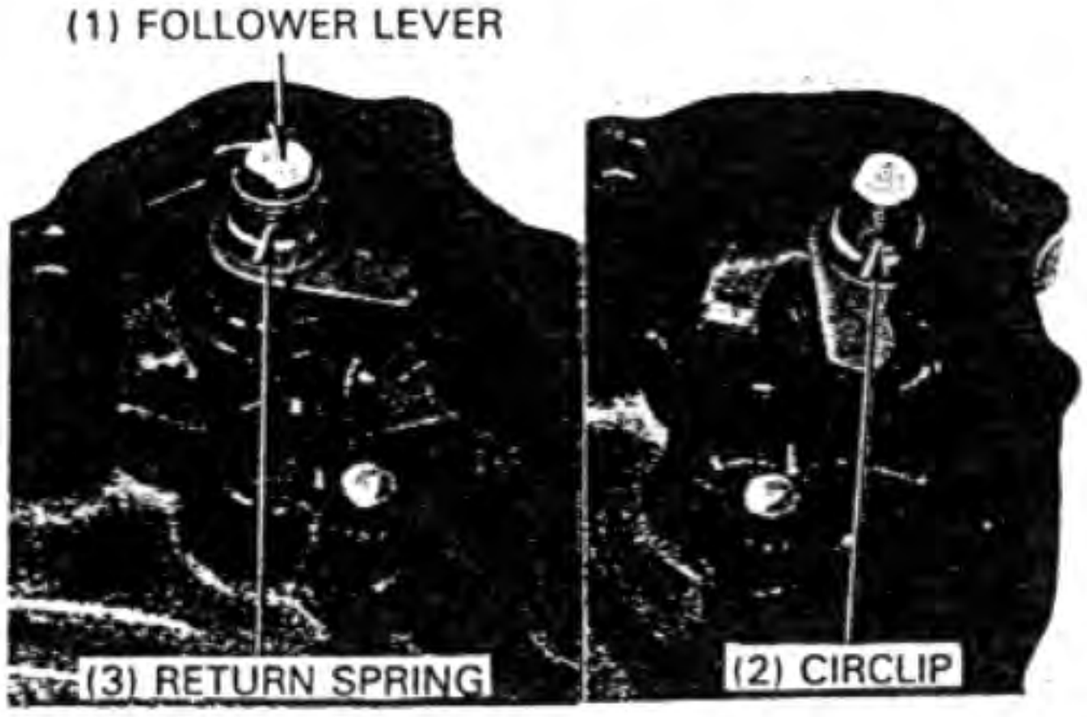
Remove the cam follower spring.
Remove the circlip.
Remove th cam follower lever and shaft.

CAM FOLLOWER LEVER ASSEMBLY

The installation sequence is essentially the reverse of removal.

NOTE

- Install the return spring as shown.



CLUTCH ARM DISASSEMBLY

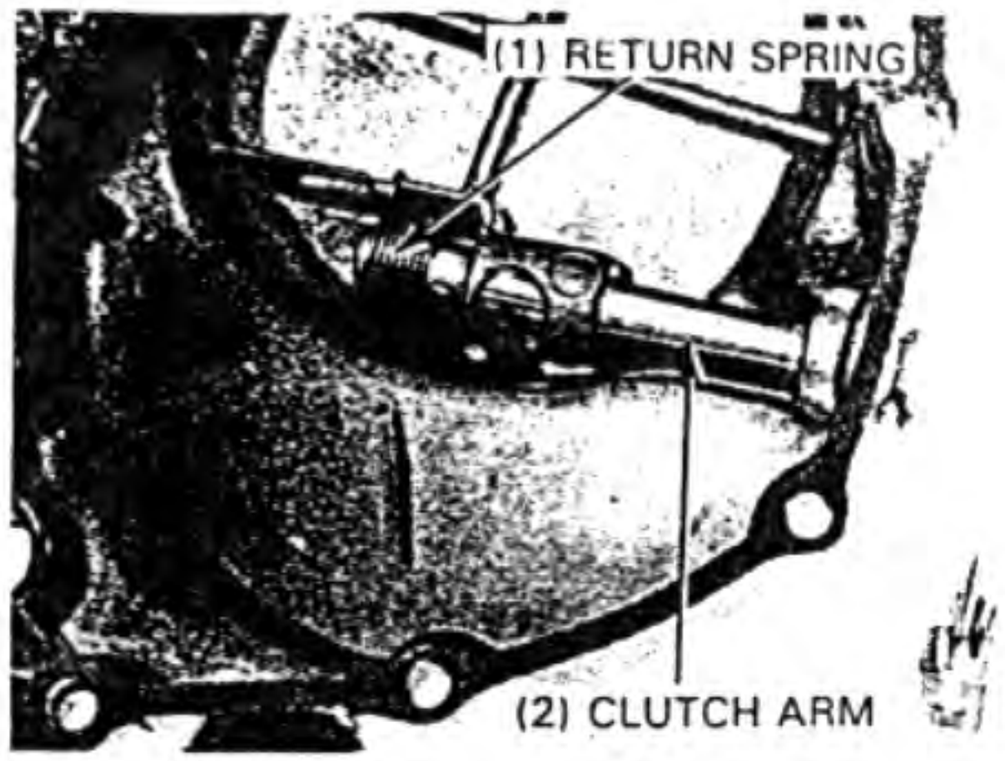
Remove the clutch arm.
Visually inspect the clutch arm for bending or damage.

CLUTCH ARM ASSEMBLY

Install the clutch arm on the right crankcase cover.

NOTE

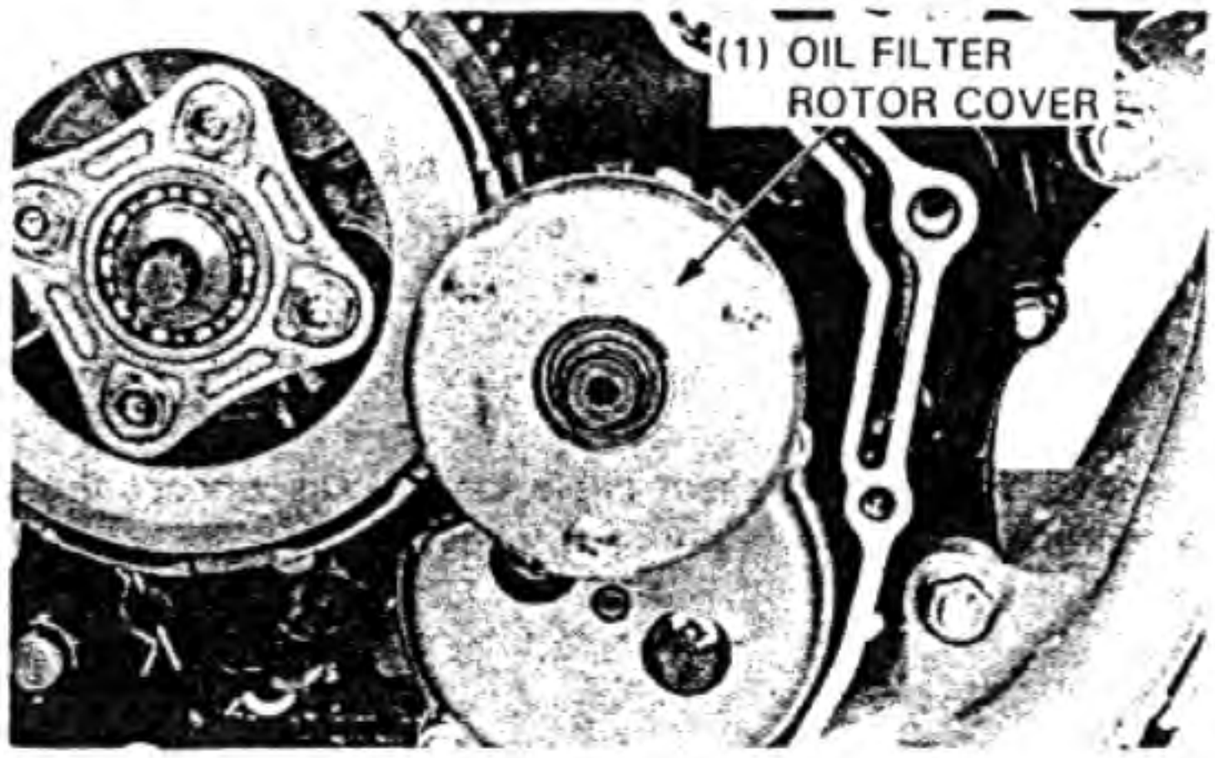
- Install the return spring as shown.



CLUTCH

REMOVAL

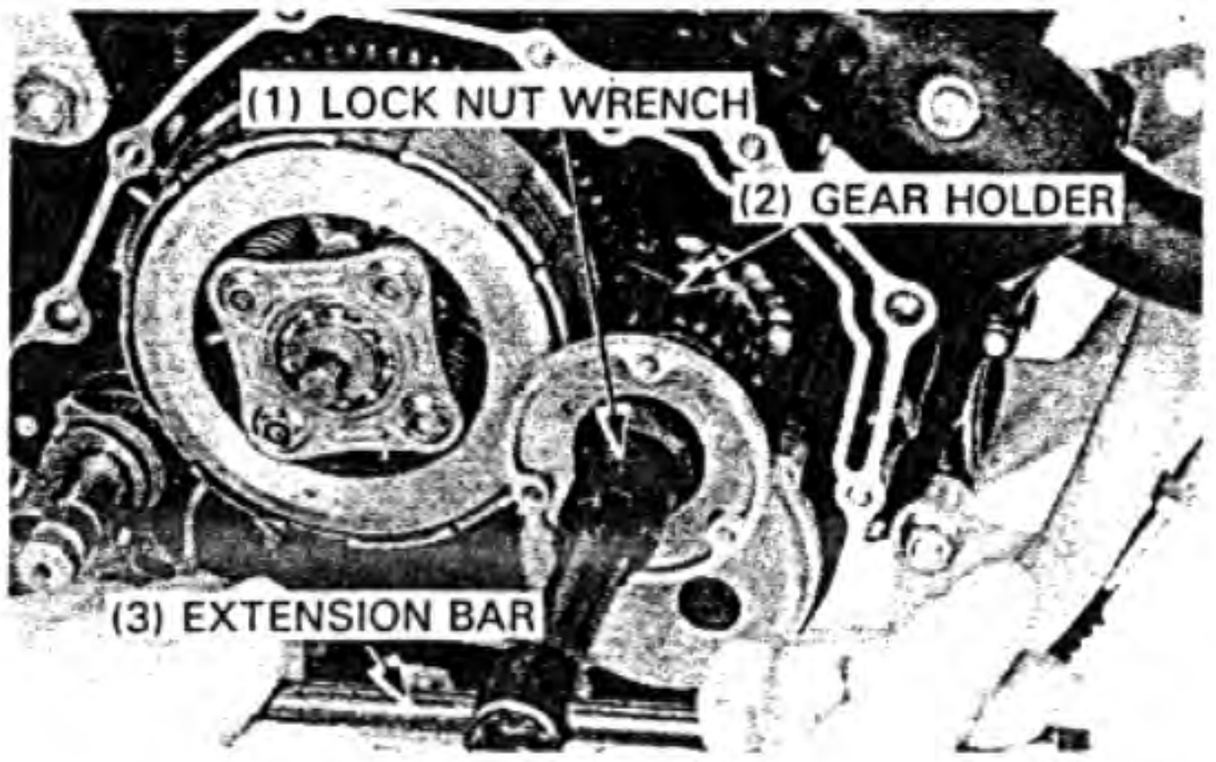
Remove the oil filter rotor cover.



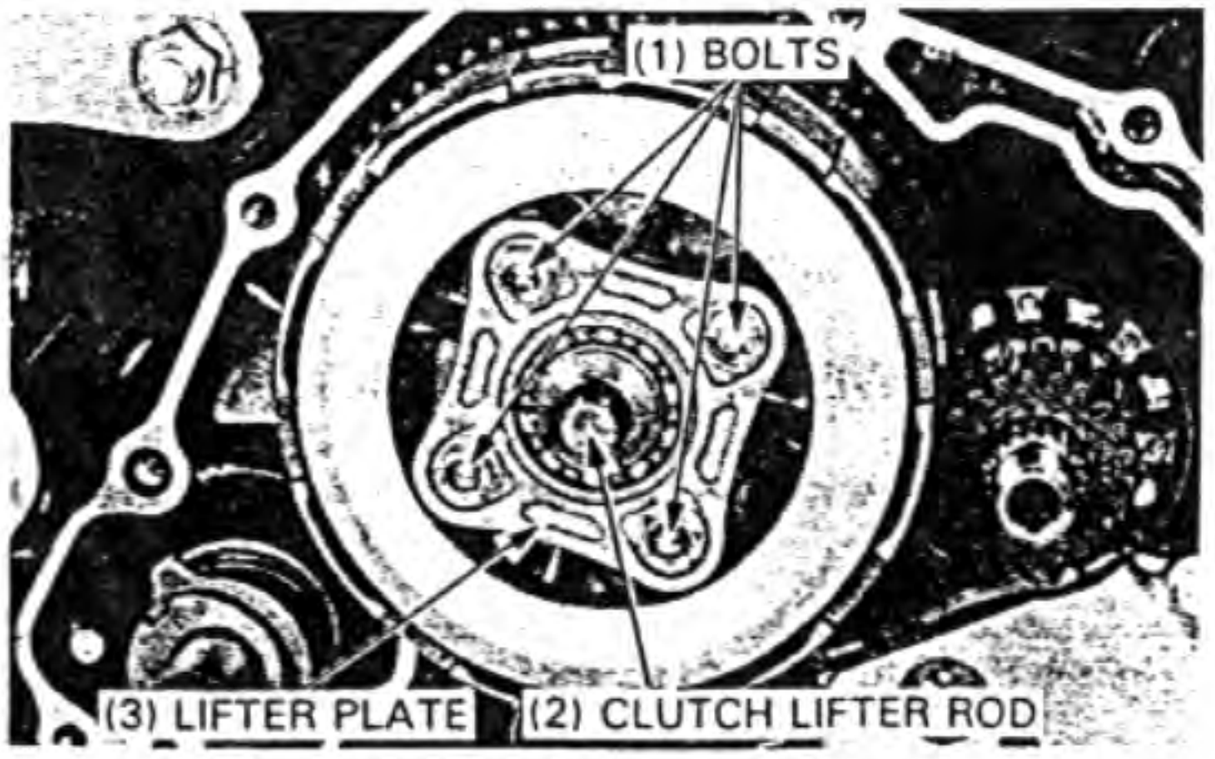
Remove the lock nut with a gear holder, lock nut wrench 20 x 24 mm and extension bar.
Remove the lock washer and oil filter rotor.

Tools:

Look nut wrench, 20 x 24 mm	**07716—0020100**
Gear holder	**07724—0010200** **Not available in U.S.A.**
Extension bar	**07716—0020500 or** equivalent commercially **available in U.S.A.**



Remove the clutch lifter rod.
Remove the clutch bolts, clutch lifter plate and clutch springs.

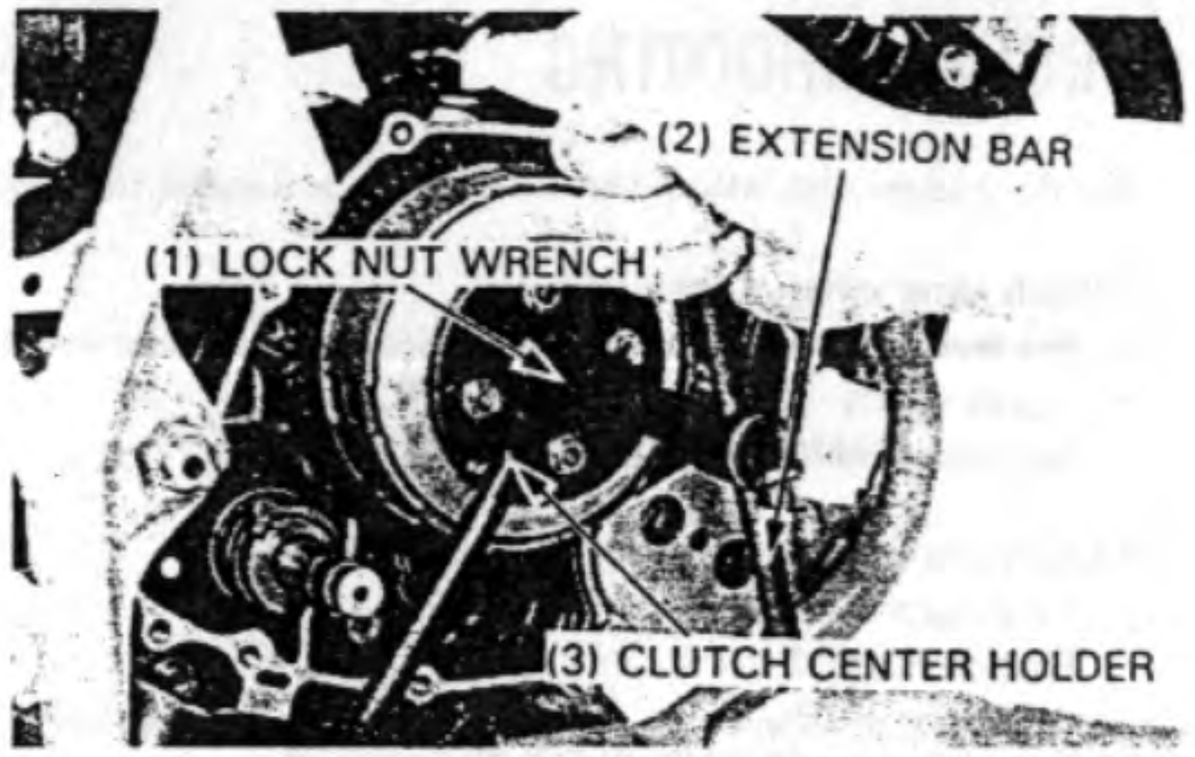


Hold the clutch center with a clutch center holder tool and remove the clutch lock nut and washer with a lock nut wrench 20 x 24 mm and extension bar.

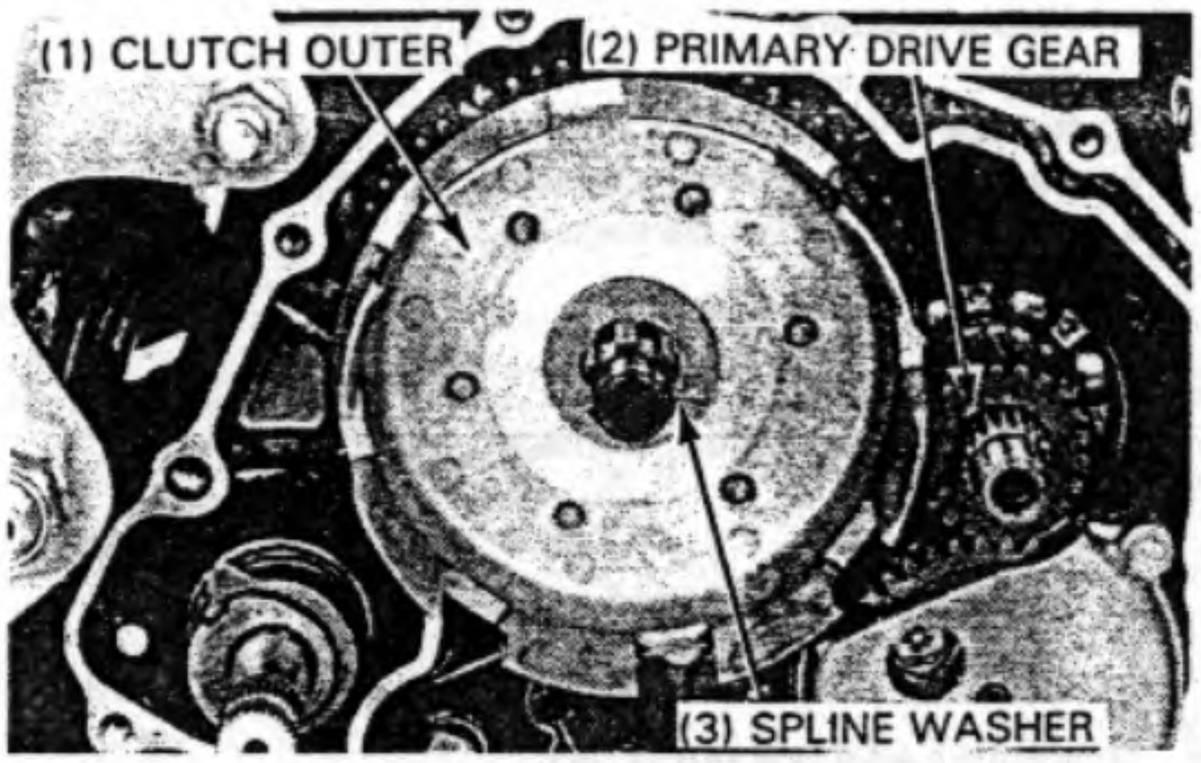
Remove the clutch center, clutch discs and clutch plates.

Tools:

Lock nut wrench, 20 x 24 mm	**07716–0020100**
Clutch center holder	**07923 – 9580000 or 07HGB – 001010B or 07HGB – 001010A and 07HGB – 001020B or 07HGB – 001020A**
Extension bar	**07716 – 0020500 or equivalent commercially available in U.S.A.**



Remove the spline washer and clutch outer.
Remove the primary drive gear.



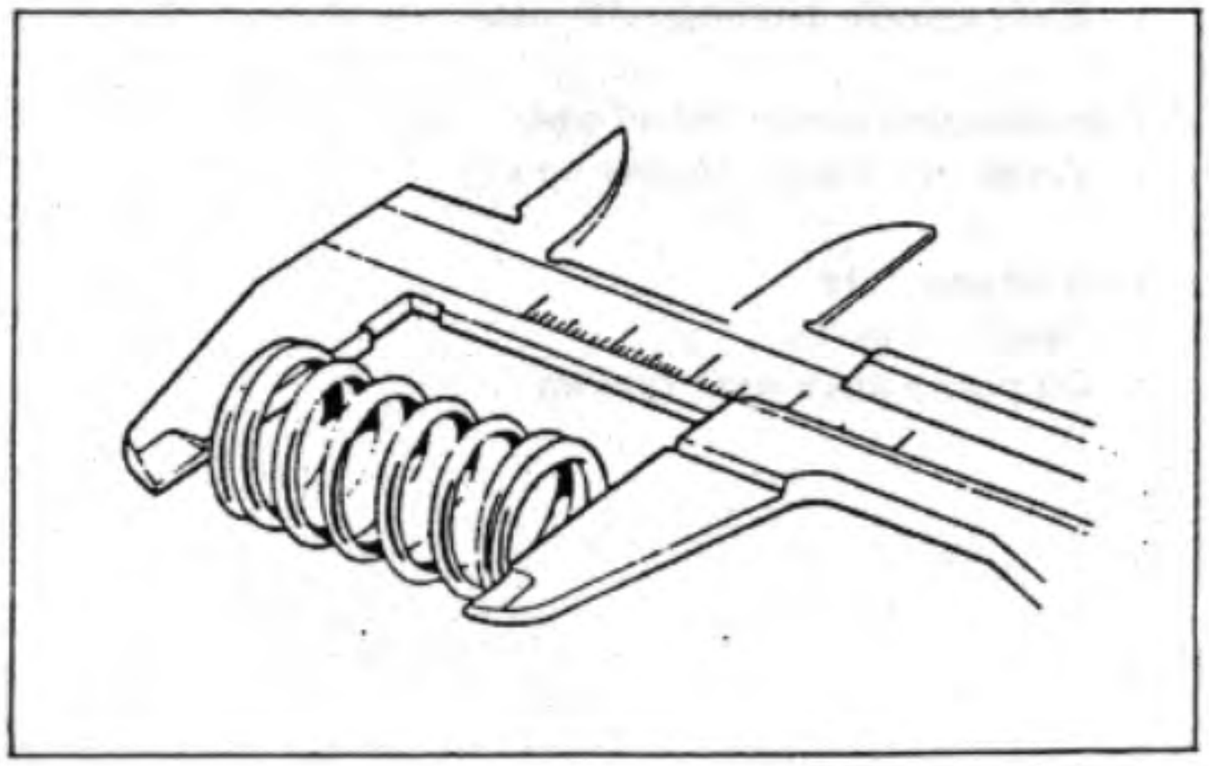
INSPECTION

Measure the spring free length.

SERVICE LIMIT: 34.7 mm (1.37 in)

NOTE

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

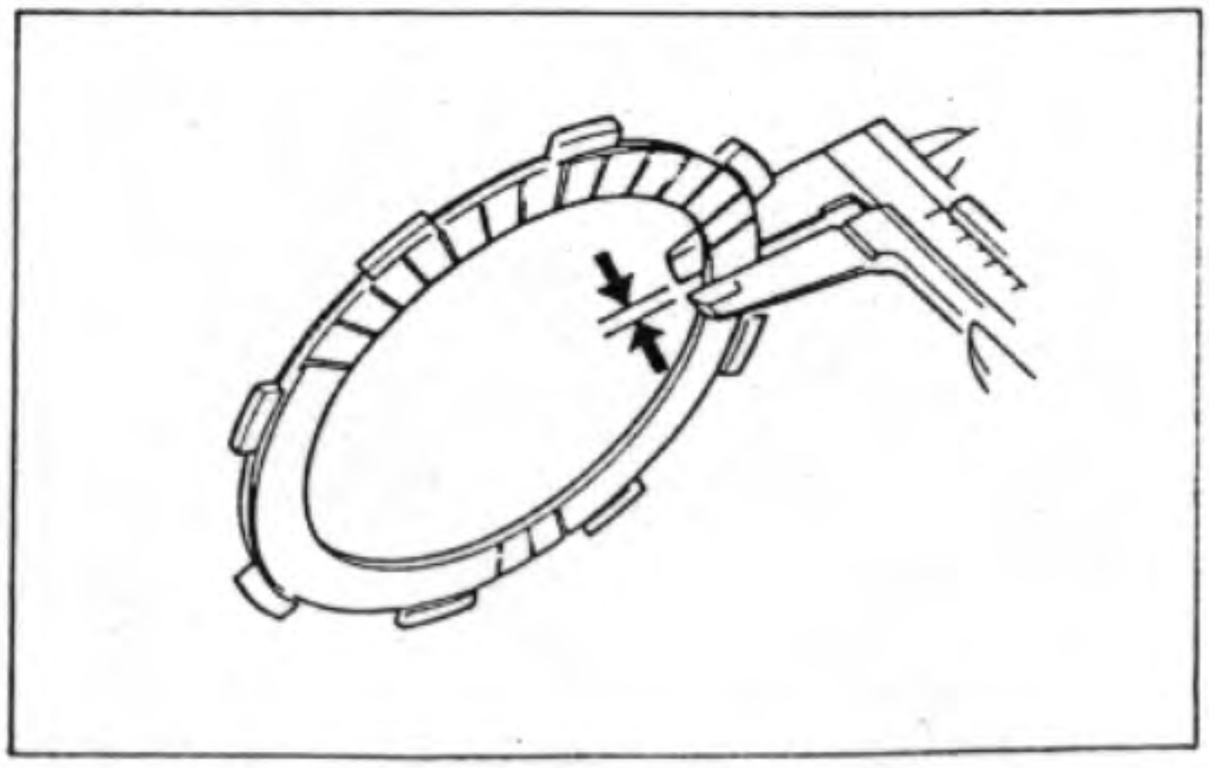


Replace the clutch discs if they show signs of scoring or discoloration.
Measure the disc thickness.

SERVICE LIMIT: 2.6 mm (0.10 in)

NOTE

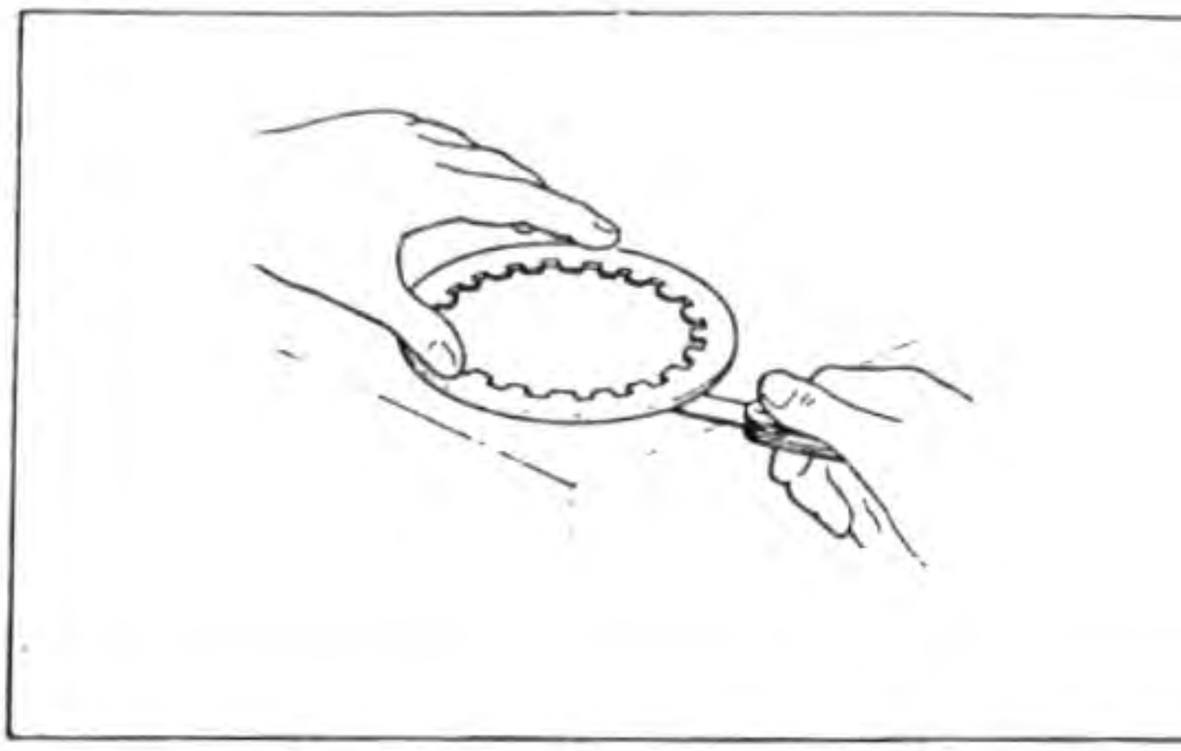
- Clutch discs and plates should be replaced as a set if any one is beyond the service limit.



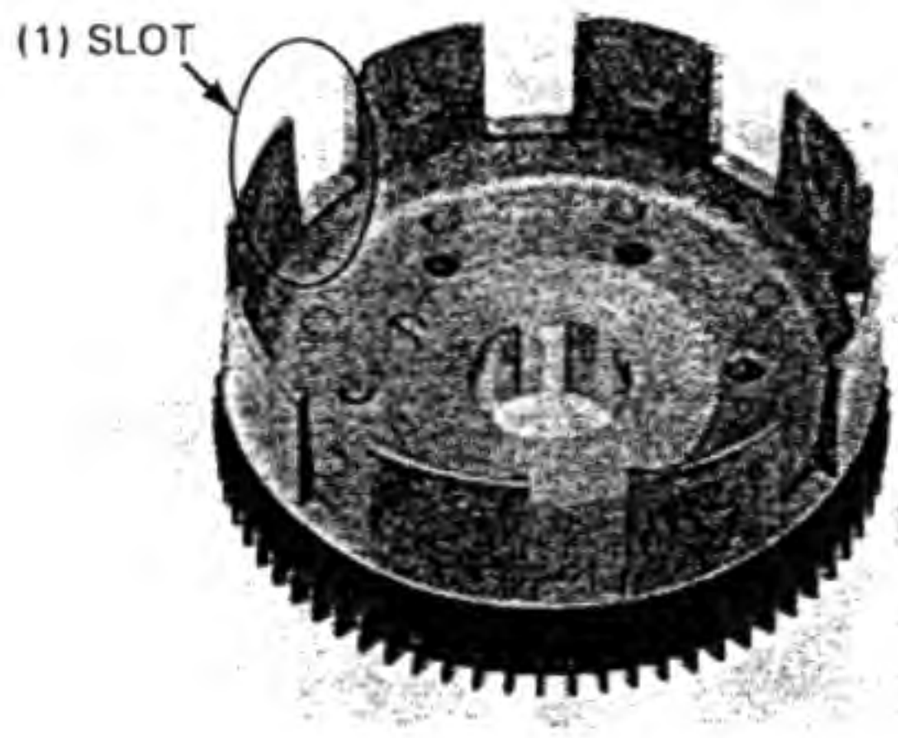
Check for plate warpage on the surface plate, using a feeler gauge.

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

SERVICE LIMIT: 0.20 mm (0.008 in)



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

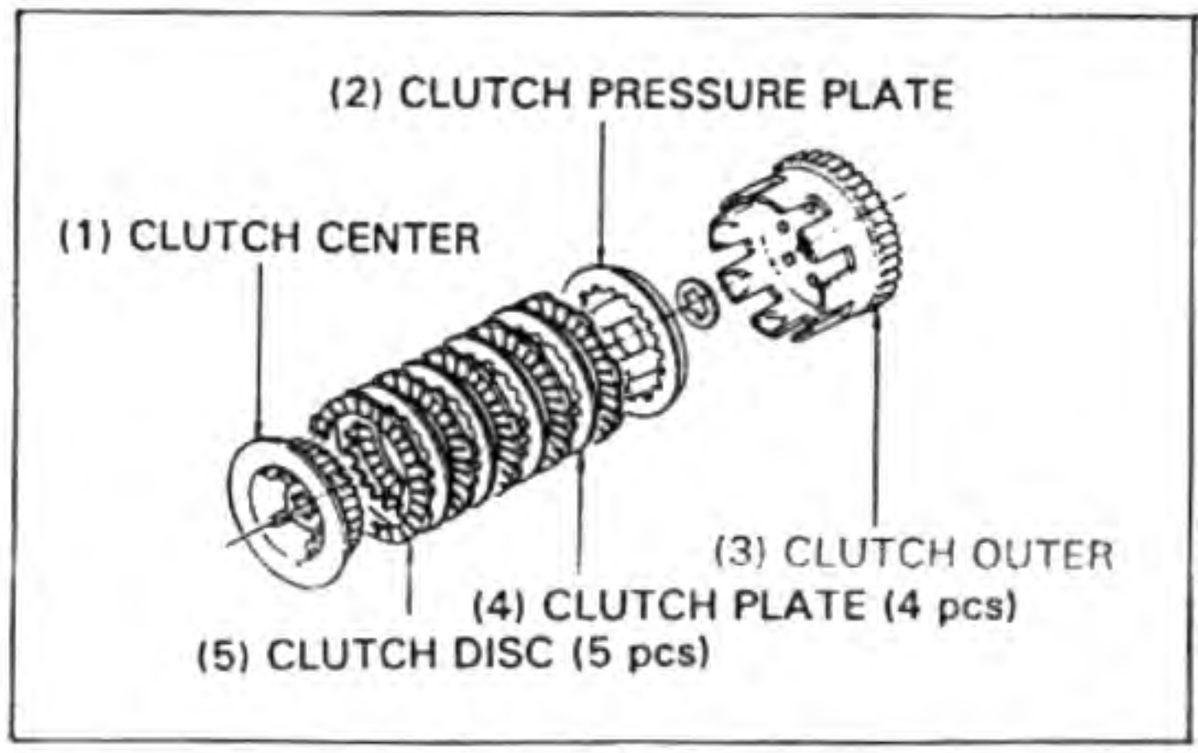


INSTALLATION

Install the primary drive gear.
Install the clutch outer.
Install the spline washer.
Assemble the pressure plate, discs, clutch plates and clutch center.

NOTE

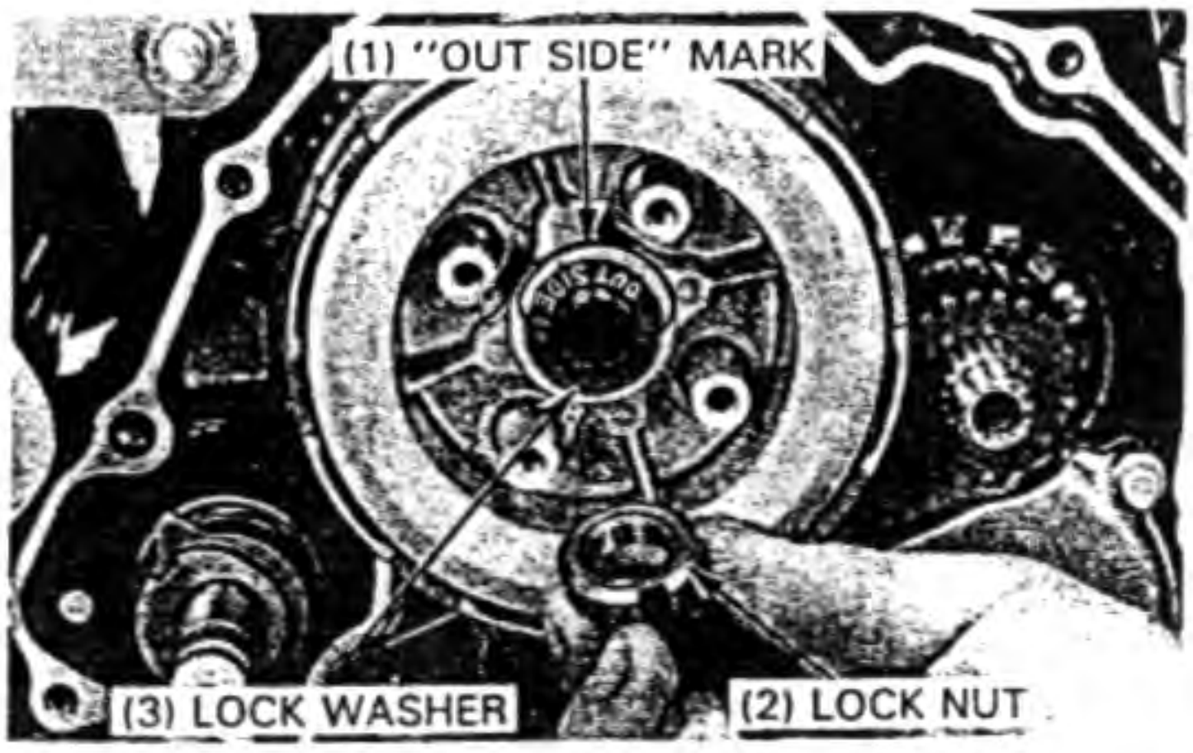
- Stack the discs and plates alternately.
- Coat new clutch discs with engine oil.



Install the lock washer and lock nut.

NOTE

- Install the lock washer with the word "OUT SIDE" facing outside.
- Install the lock nut with the chamfered surface side facing inside.

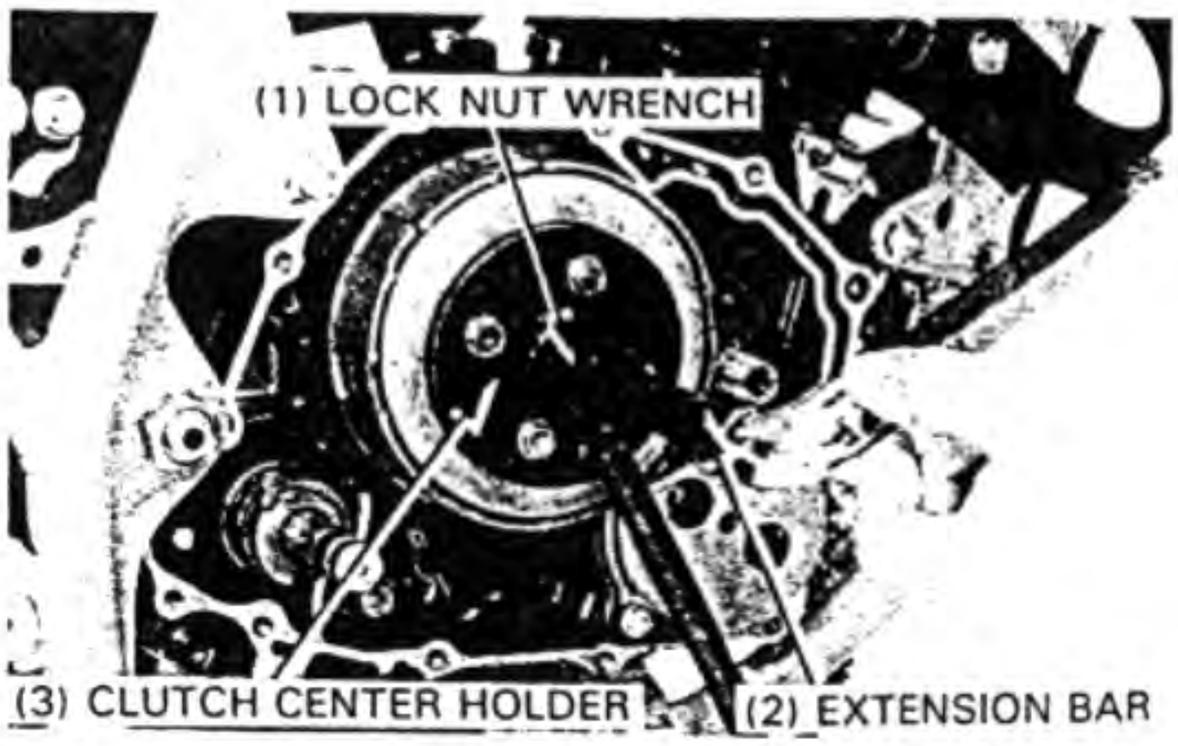


Hold the clutch with a clutch center holder tool and tighten the lock nut to the specified torque.

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

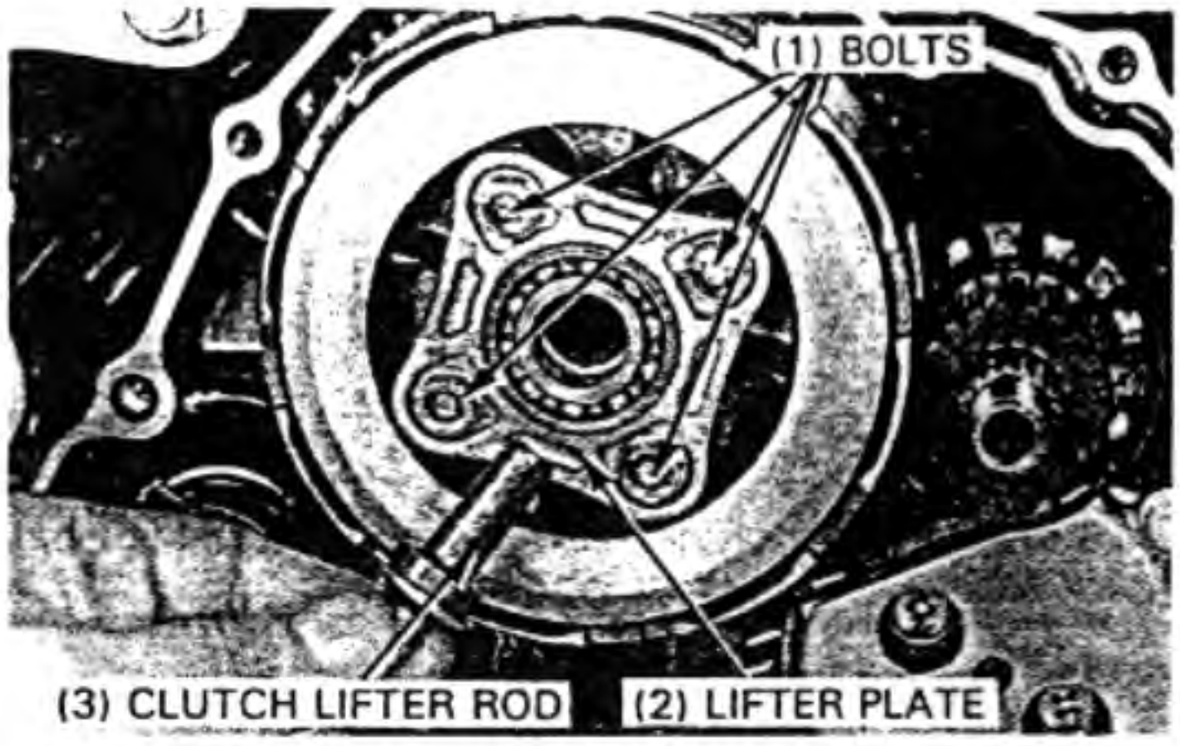
Tools:

Lock nut wrench, 20 x 24 mm	**07716—0020100**
Clutch center holder	**07923 – 9580000 or 07HGB – 001010B or 07HGB – 001010A and 07HGB – 001020B or 07HGB – 001020A**
Extension bar	**07716 – 0020500 or equivalent commercially available in U.S.A.**



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

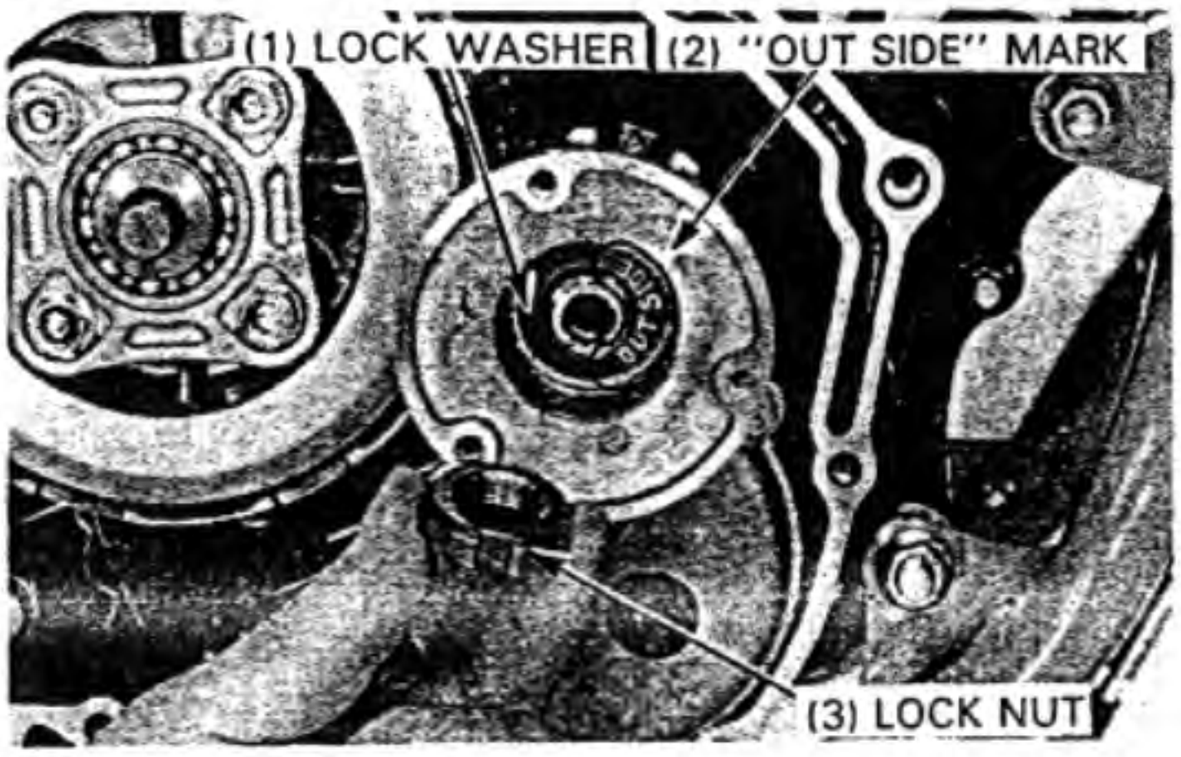
Install the clutch lifter rod.



Clean the oil filter rotor.
Install the oil filter rotor.
Install the lock washer and lock nut.

NOTE

- Install the lock washer with the word "OUT SIDE" facing out.
- Install the lock nut with the chamfered side facing, the lock washer.

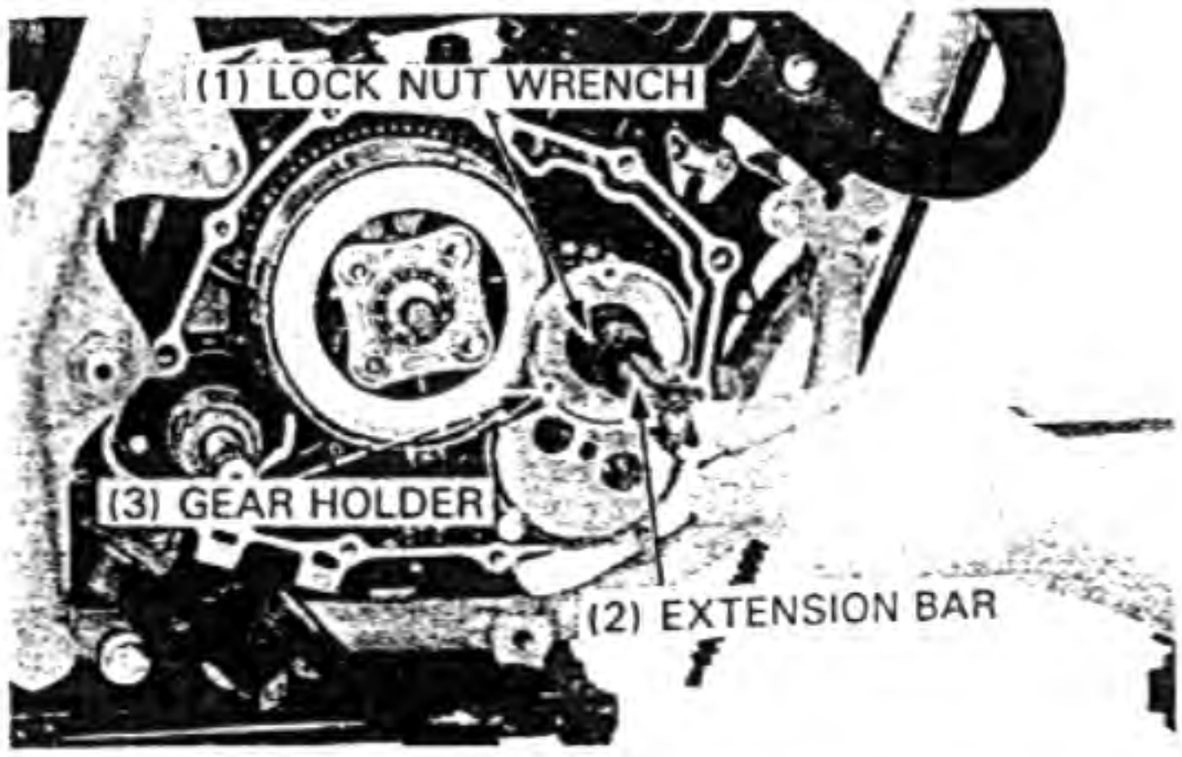


Tighten the lock nut to the specified torque.

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

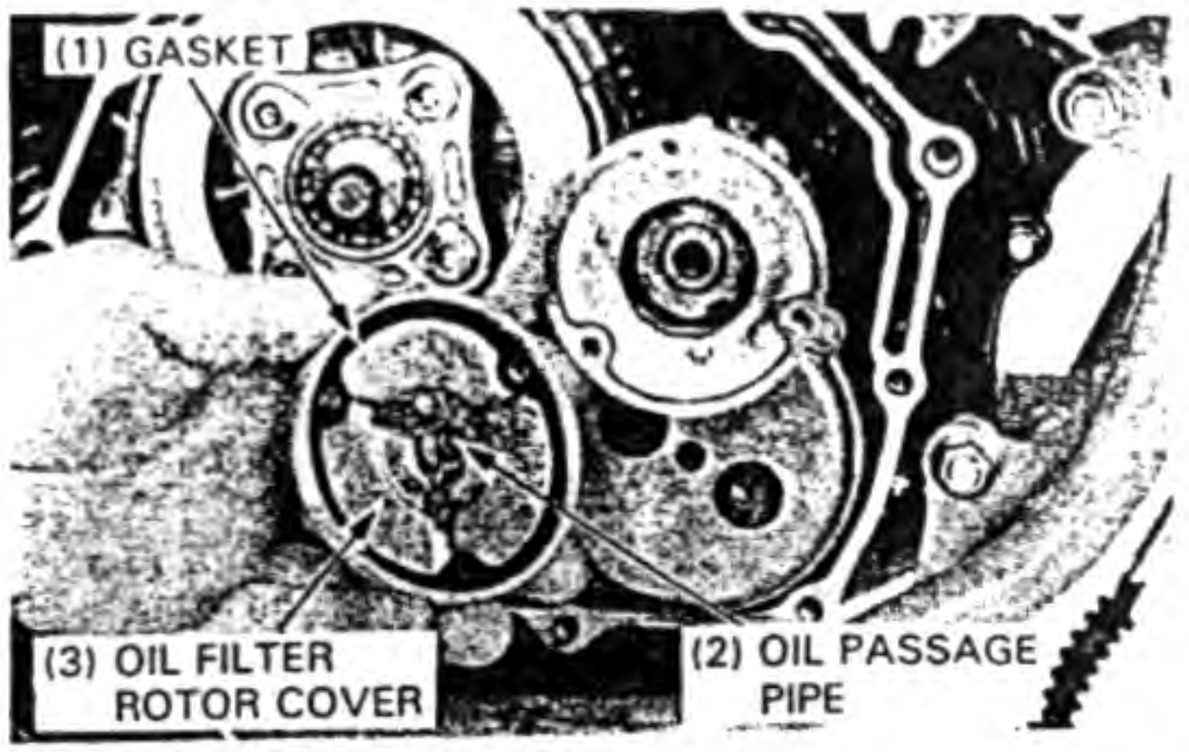
Tools:

Lock nut wrench, 20 x 24 mm	**07716—0020100**
Gear holder	**07724—0010200 Not available in U.S.A.**
Extension bar	**07716—0020500 or equivalent commercially available in U.S.A.**



Install the new gasket to the oil filter rotor cover.

Install the oil filter rotor cover.
Check that the oil passage pipe operates freely, without binding.

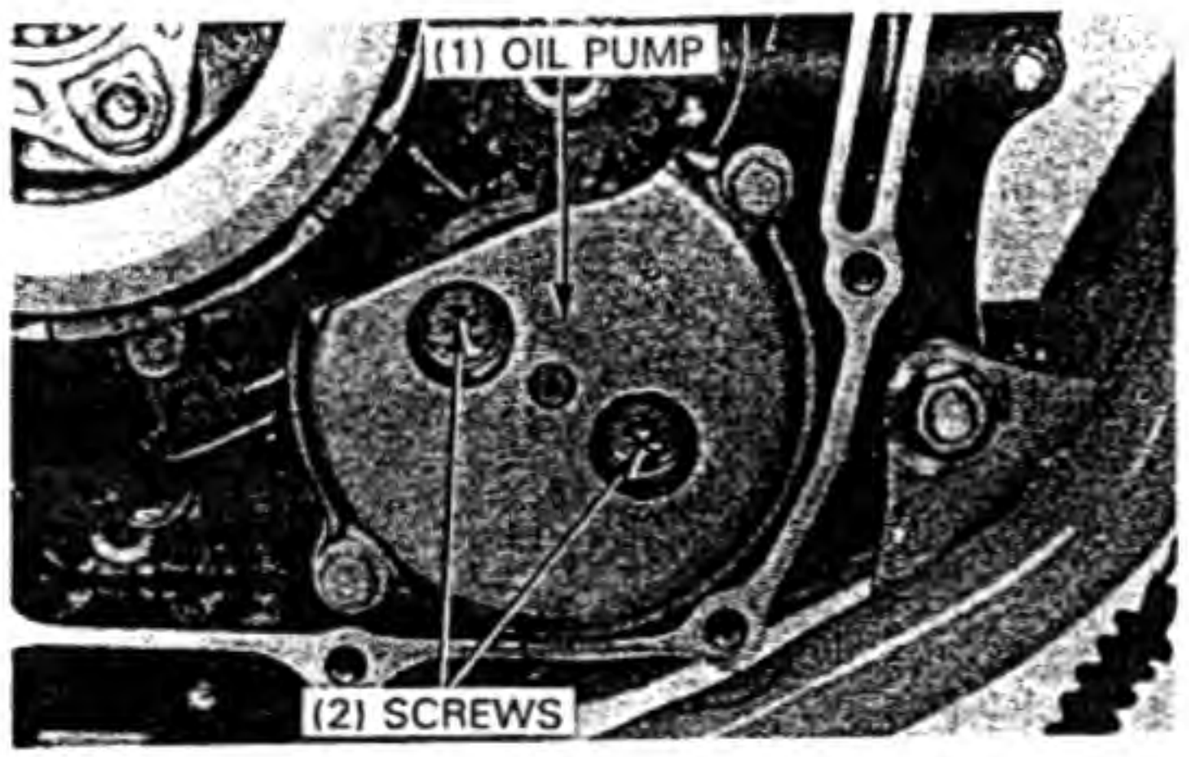


OIL PUMP

REMOVAL/DISASSEMBLY

Remove the oil filter rotor (page 8-4).
Remove the oil pump mounting screws, and remove the oil pump.

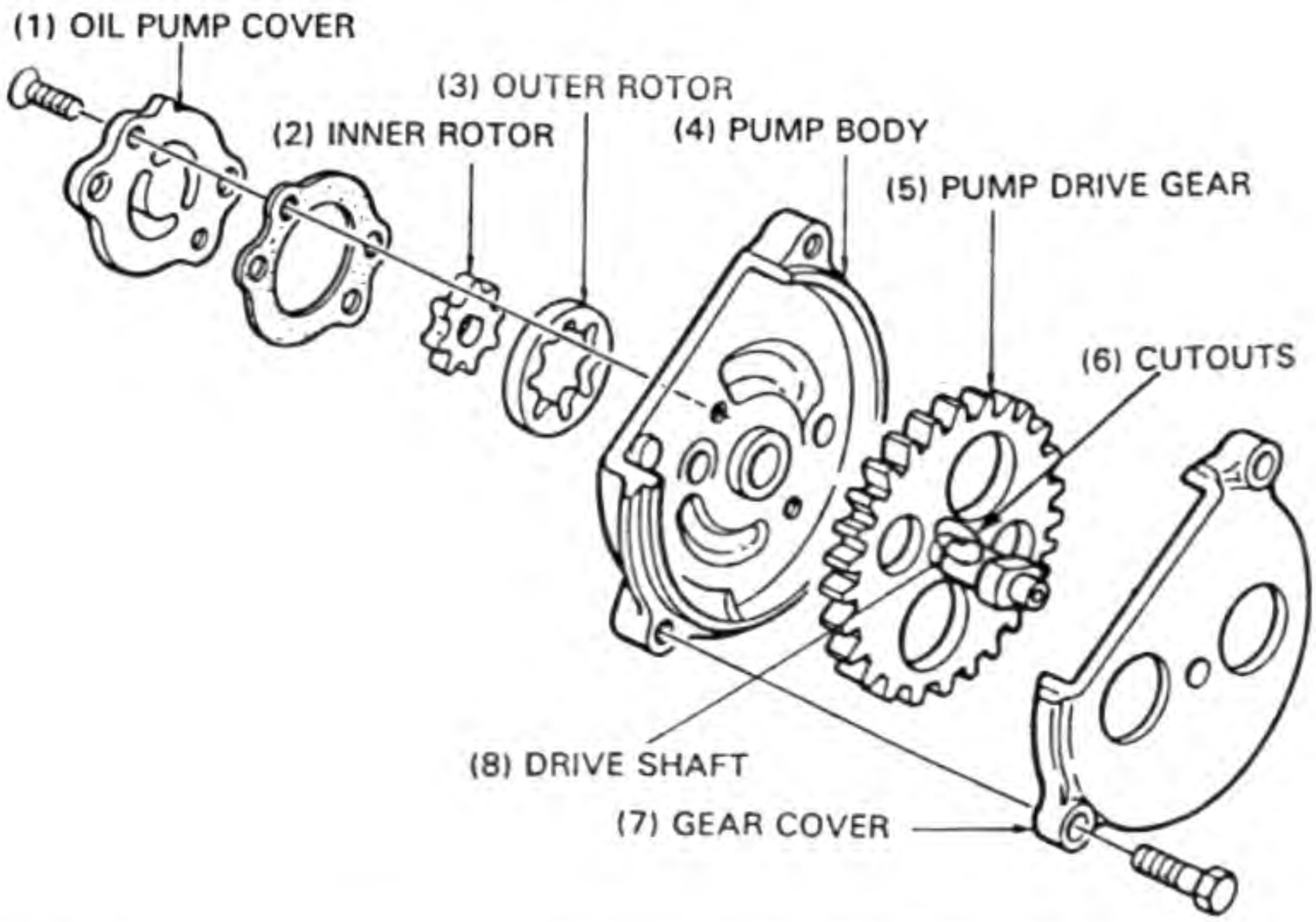
Disassemble the oil pump by removing the oil pump cover, inner rotor, outer rotor, gear cover, gear shaft and pump drive gear.



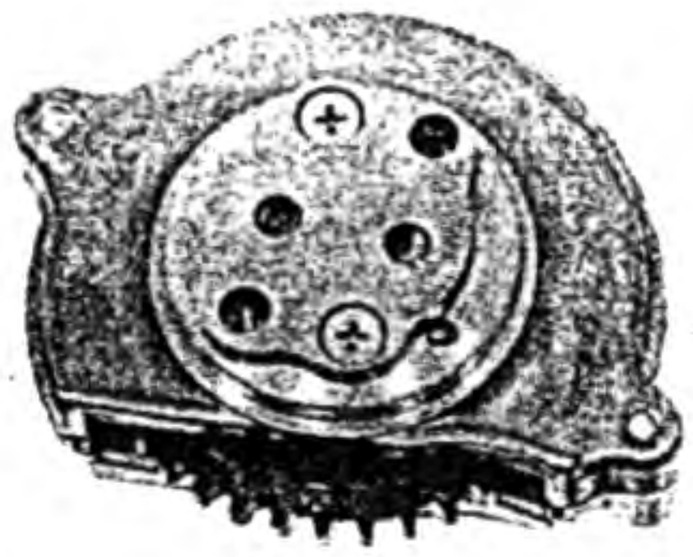
ASSEMBLY

Install the pump drive gear on the oil pump drive shaft, aligning the cutout in the shaft with the cutout in the pump drive gear.

Install the oil pump drive shaft and gear in the body.
Install the inner and outer rotors.



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



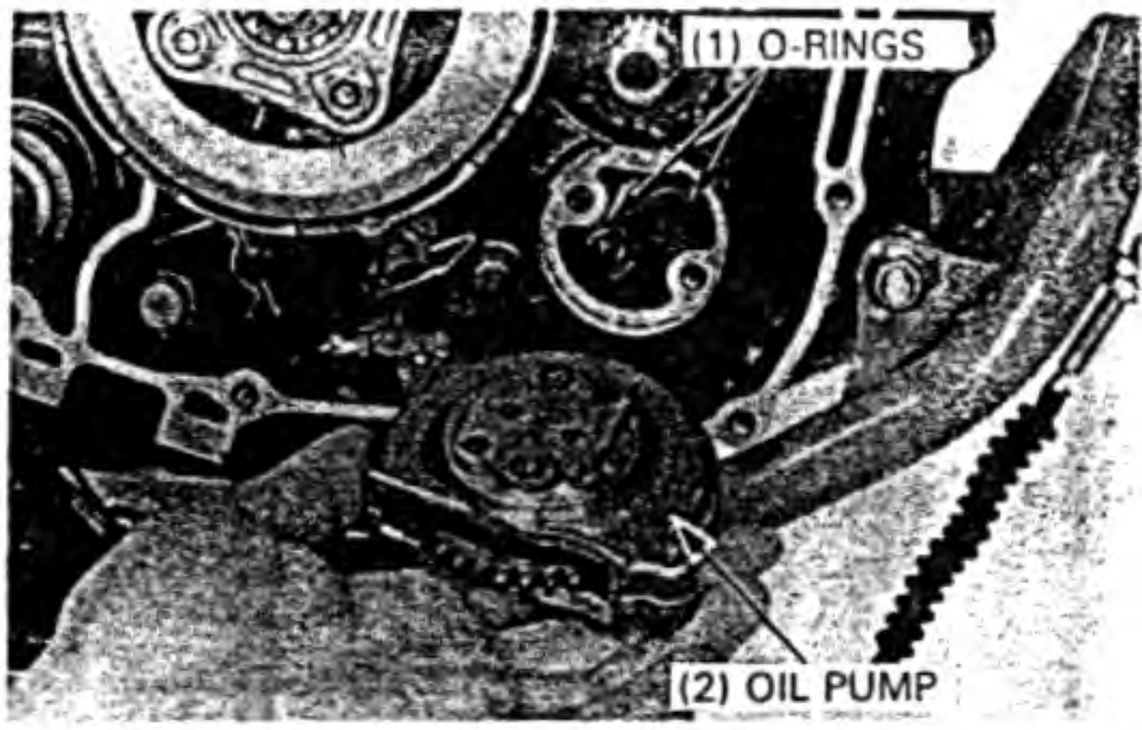
INSTALLATION

Install the O-rings and the oil pump.

NOTE

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

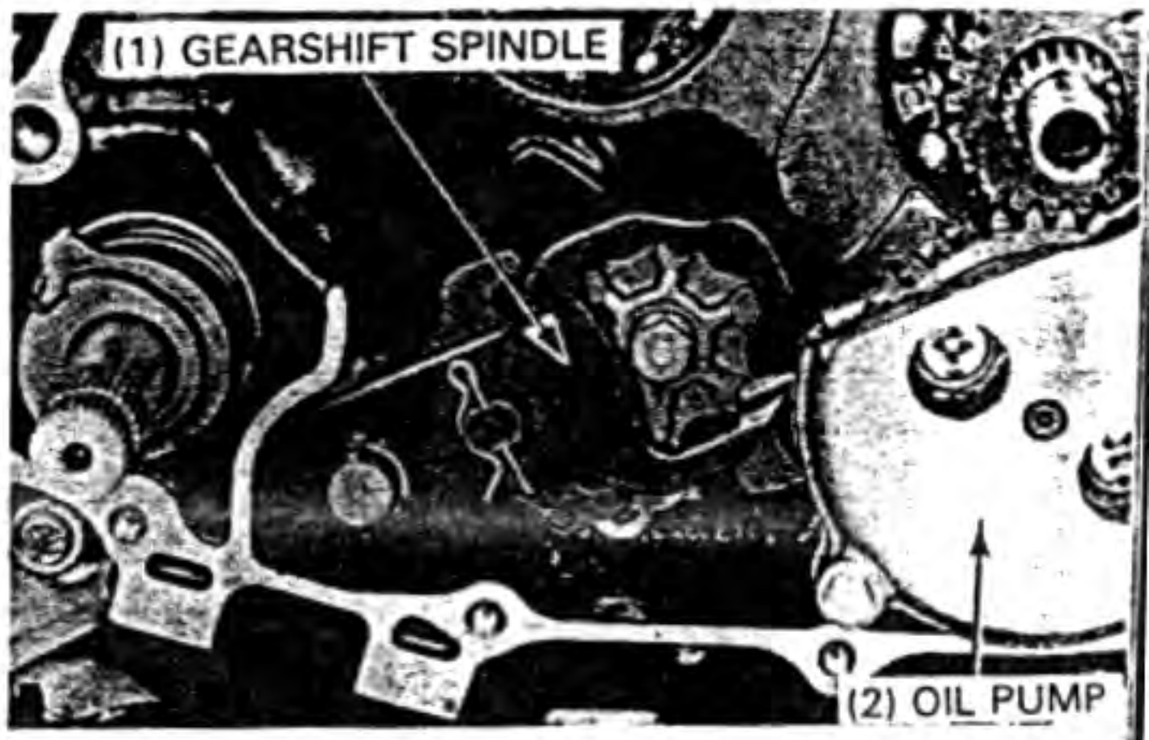
Install the oil filter rotor (page 8-8).



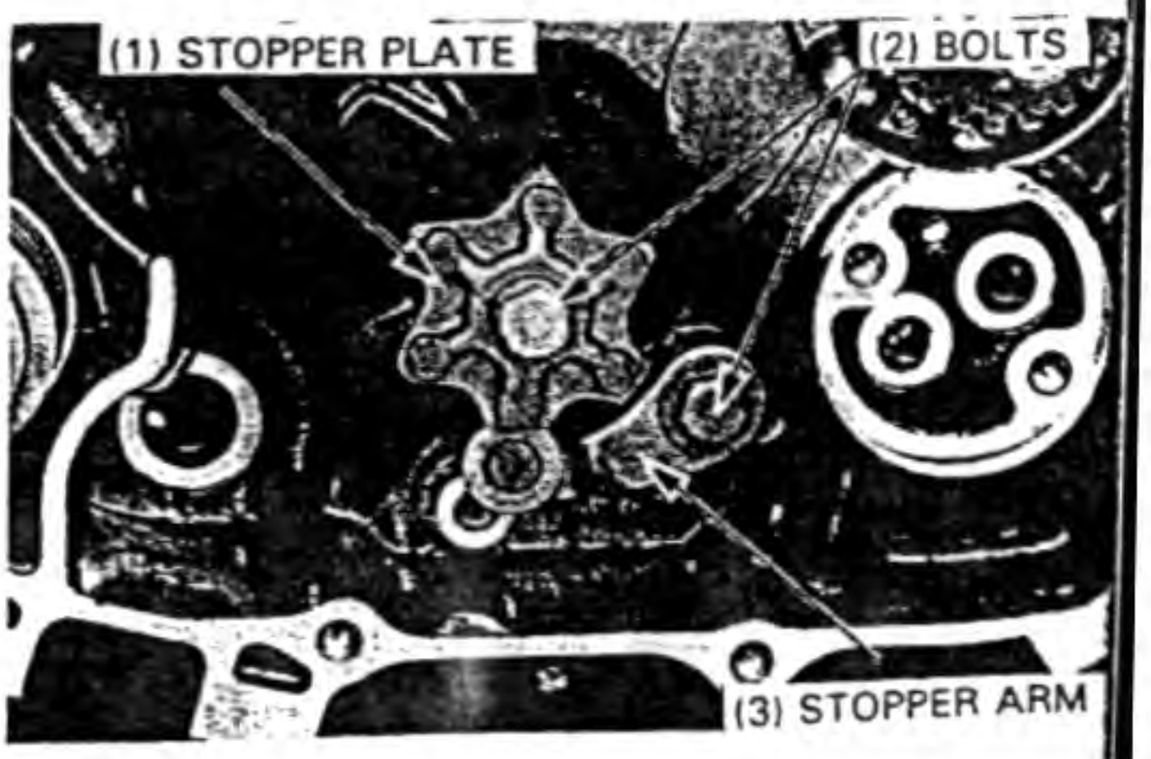
GEARSHIFT LINKAGE

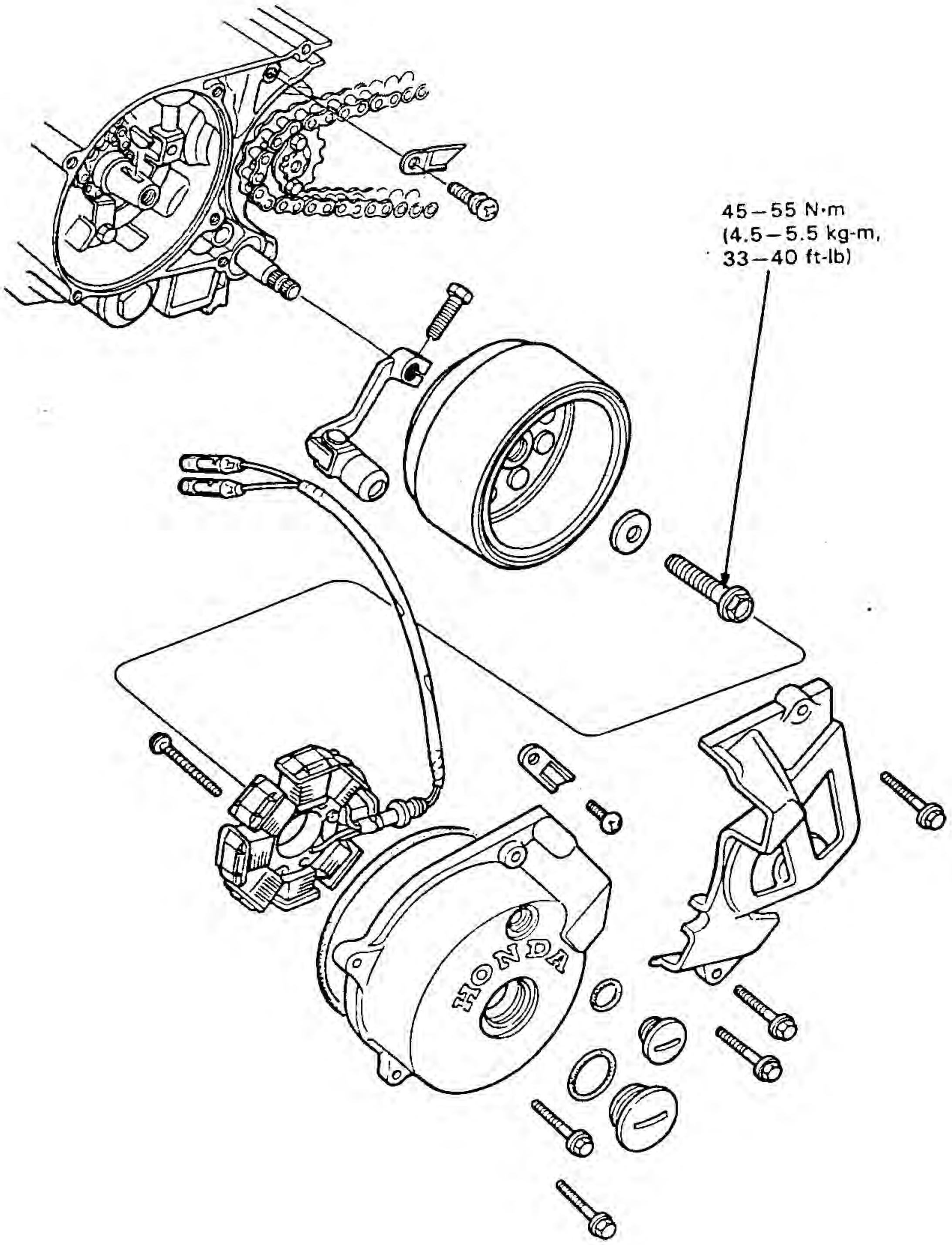
REMOVAL

Remove the clutch (page 8-4).
Remove the oil pump.
Remove the gearshift pedal.
Remove the gearshift spindle.



Remove the drum stopper plate and dowel pin on the shift drum.
Remove the drum stopper arm.




45—55 N·m
(4.5—5.5 kg-m,
33—40 ft-lb)
HONDA

9. ALTERNATOR

SERVICE INFORMATION

GENERAL

- This section covers removal and installation of the alternator. These operations can be done with the engine installed after removing the left crankcase cover.
- For alternator inspection and troubleshooting, refer to section 14.

TORQUE VALUE

Flywheel bolt	45–55 N·m (4.5–5.5 kg-m, 33–40 ft-lb)

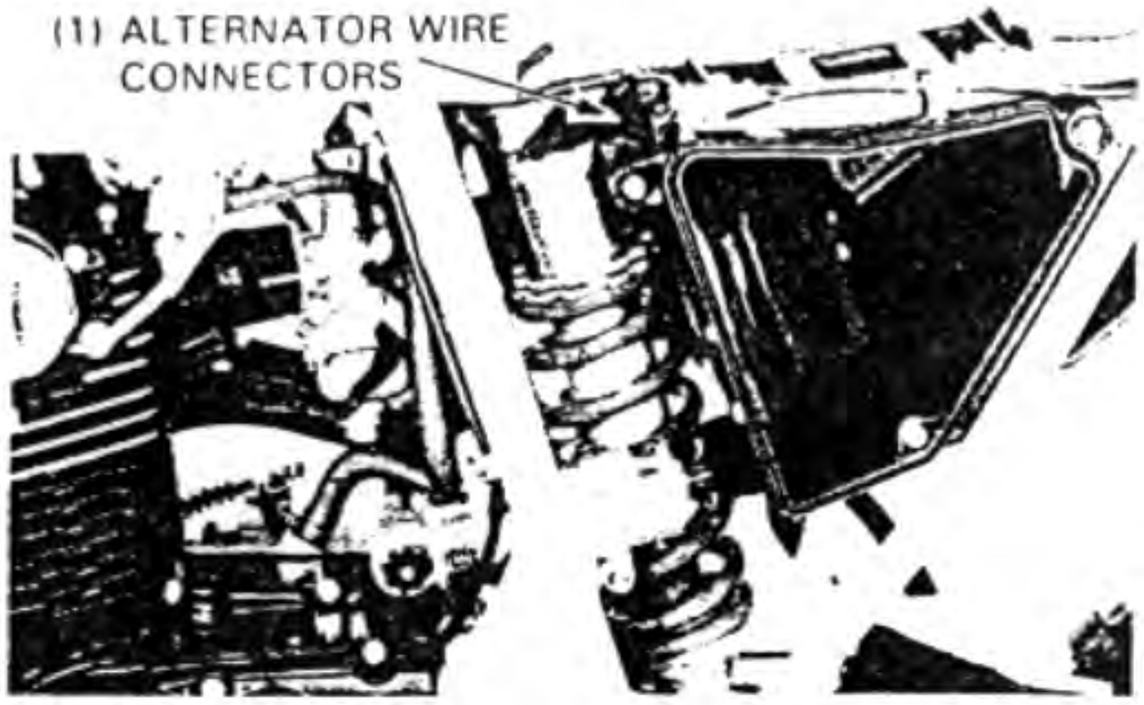
TOOLS

Common		
Flywheel holder	07725–0040000	or equivalent commercially available in U.S.A.
Flywheel puller	07733–0010000 or 07933–3000000	

LEFT CRANKCASE COVER REMOVAL

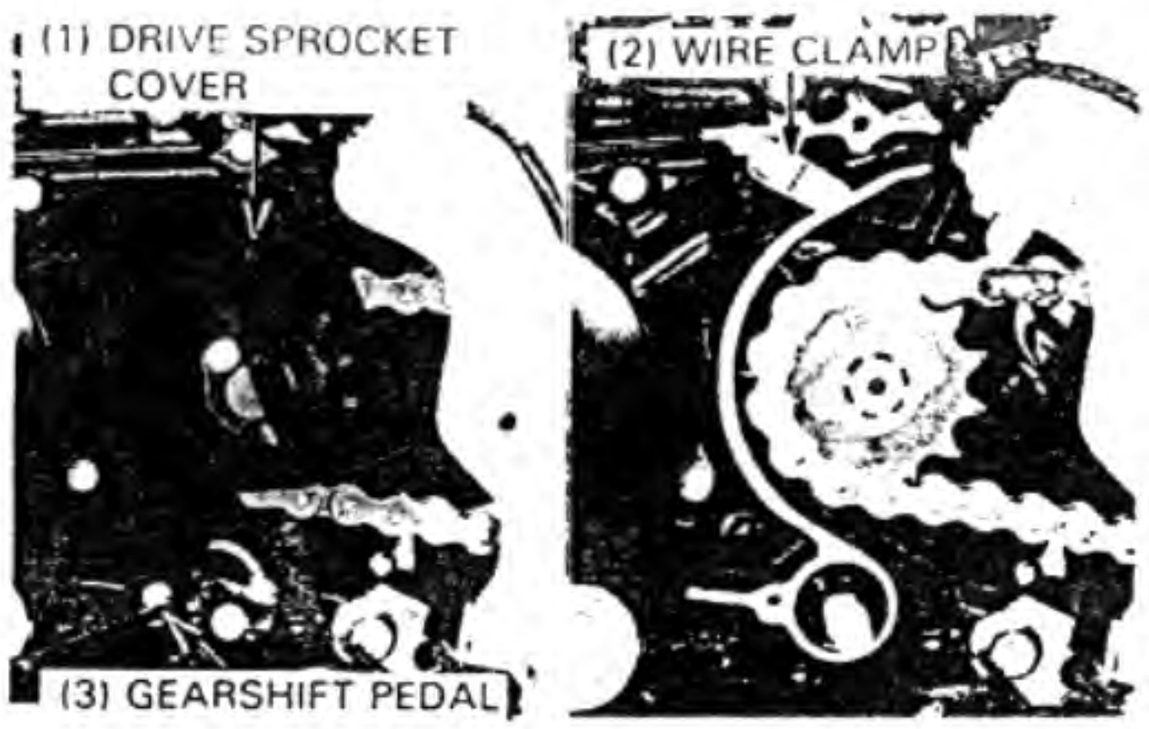
Remove the seat and left side cover.
Disconnect the alternator wire connectors.

Remove the skid pipe.



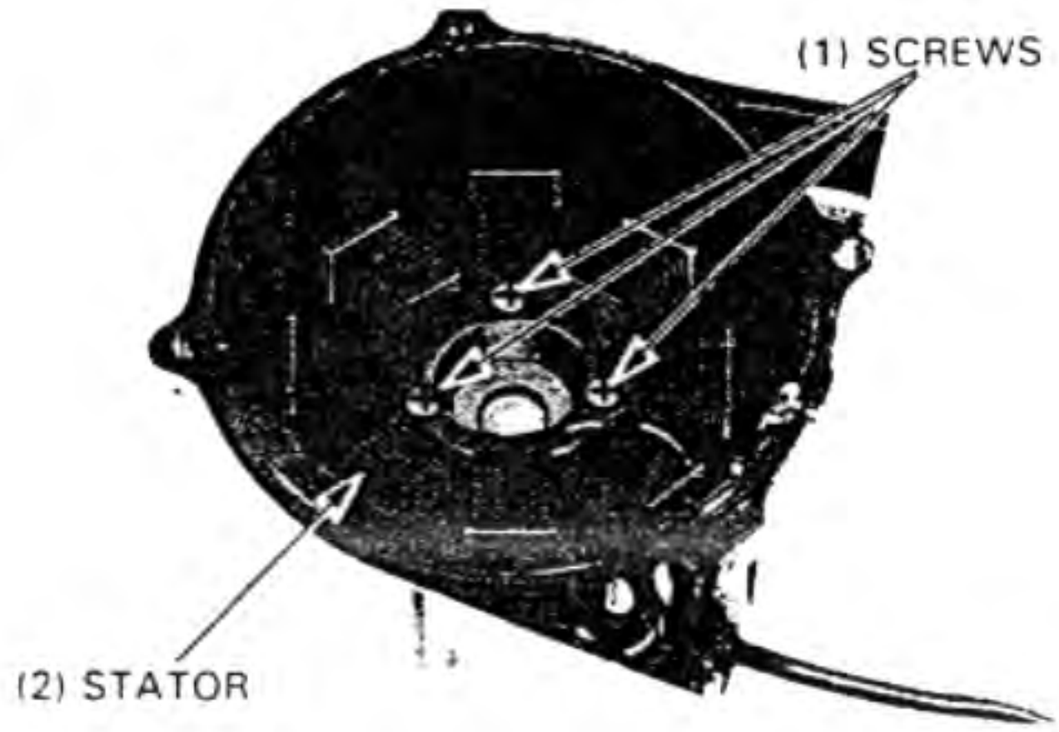
Drain oil from the engine.
Remove the gearshift pedal.
Remove the drive sprocket cover.

Remove the alternator wire clamp.
Remove the left crankcase cover.



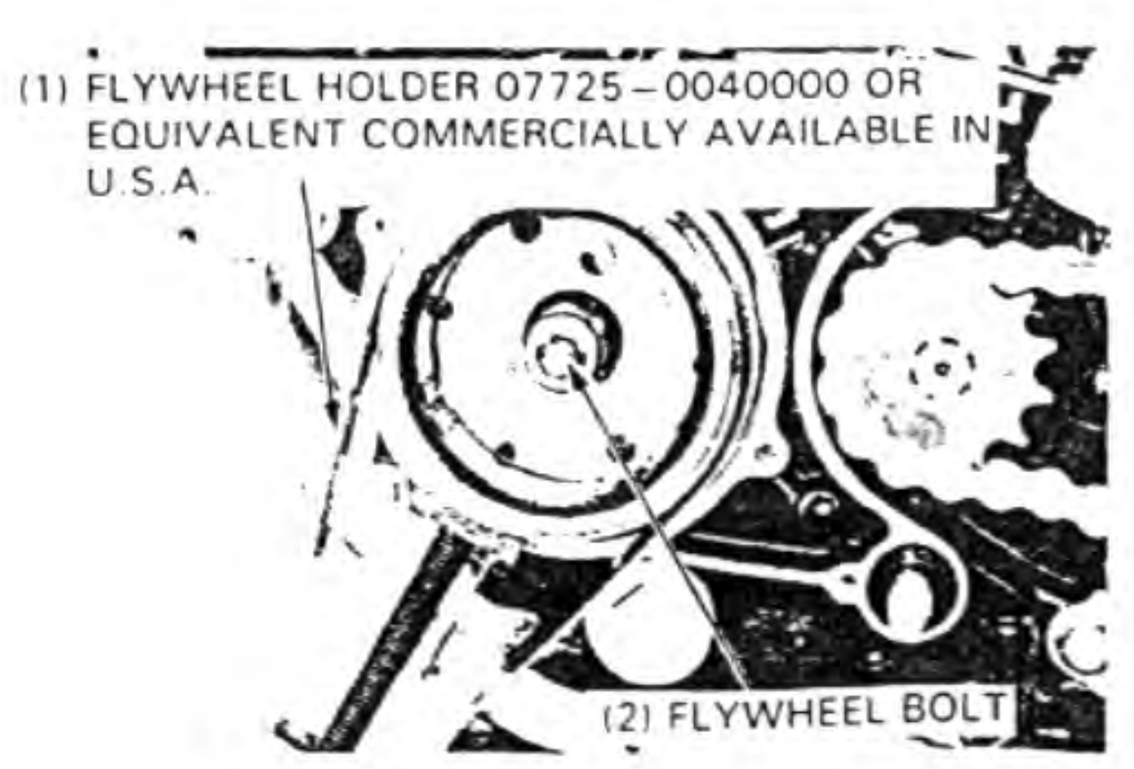
ALTERNATOR STATOR REMOVAL

Remove the four screws attaching the alternator stator to the left crankcase.
Then remove the stator.



FLYWHEEL REMOVAL

Hold the flywheel with the flywheel holder.
Remove the flywheel bolt and washer.

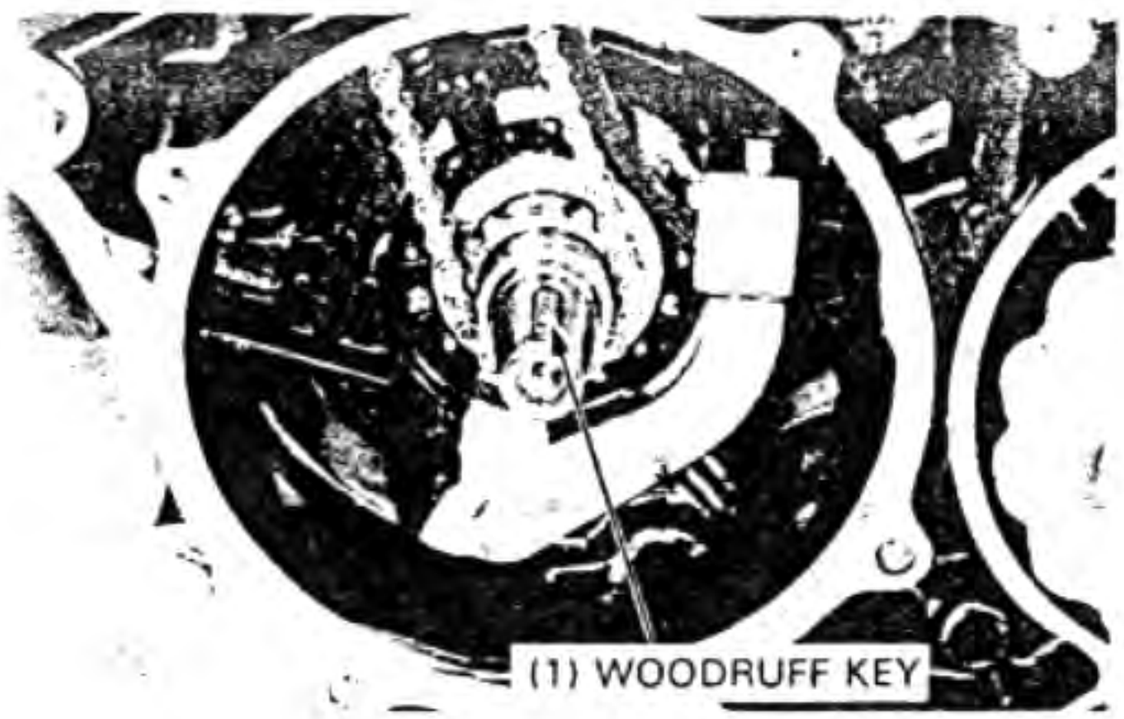


Remove the flywheel using the flywheel puller


(1) FLYWHEEL PULLER 07733–0010000 or 07933–3000000

FLYWHEEL INSTALLATION

Install the flywheel by aligning the woodruff key on the crankshaft with the flywheel keyway.


(1) WOODRUFF KEY

Hold the flywheel with the flywheel holder, install the washer and flywheel bolt and tighten the bolt.

TORQUE: 45–55 N·m (4.5–5.5 kg-m, 33–40 ft-lb)


(1) FLYWHEEL HOLDER 07725–0040000 OR EQUIVALENT COMMERCIALLY AVAILABLE IN U.S.A.

ALTERNATOR STATOR INSTALLATION

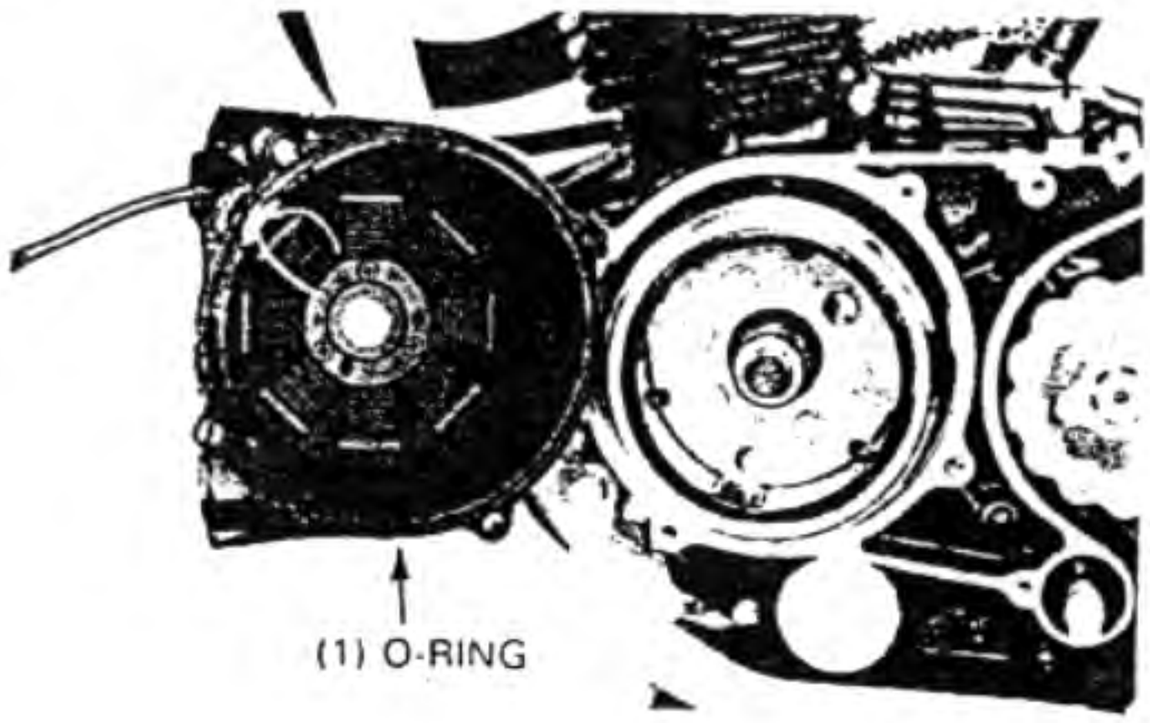
Apply a locking agent to the alternator screws.
Install the stator onto the left crankcase cover and tighten the four screws.
Route the stator wire and install the wire grommet into the groove in the cover as shown.

(1) SCREWS
(2) GROMMET
(3) STATOR

LEFT CRANKCASE COVER INSTALLATION

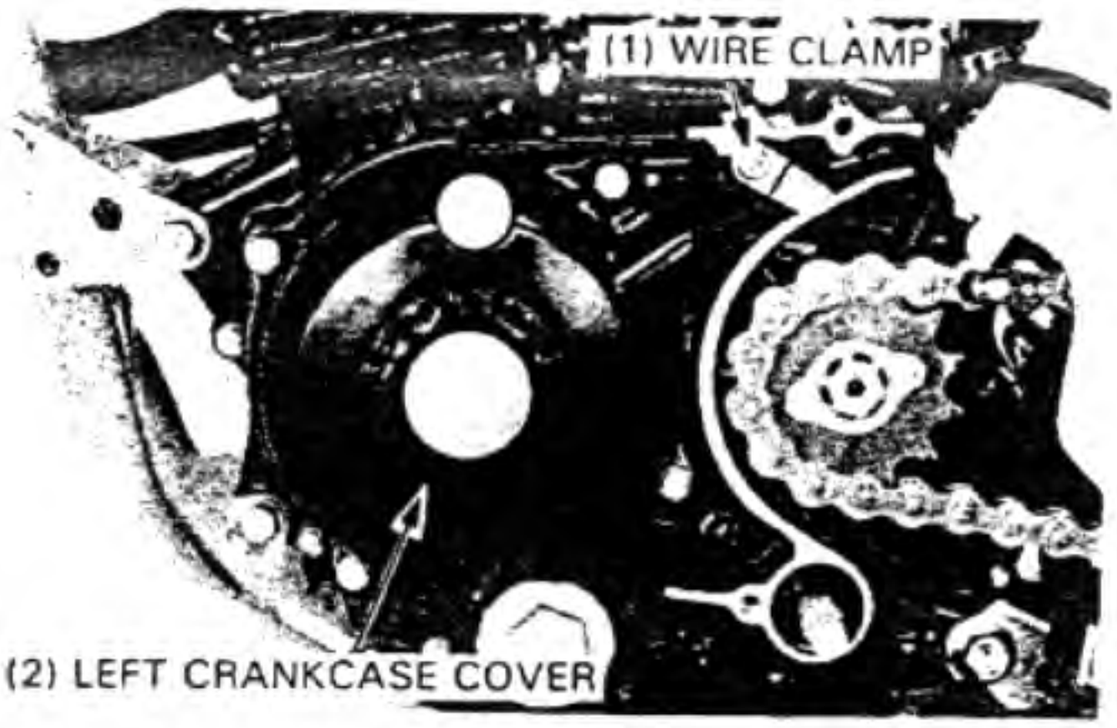
Install the O-ring in the left crankcase cover.

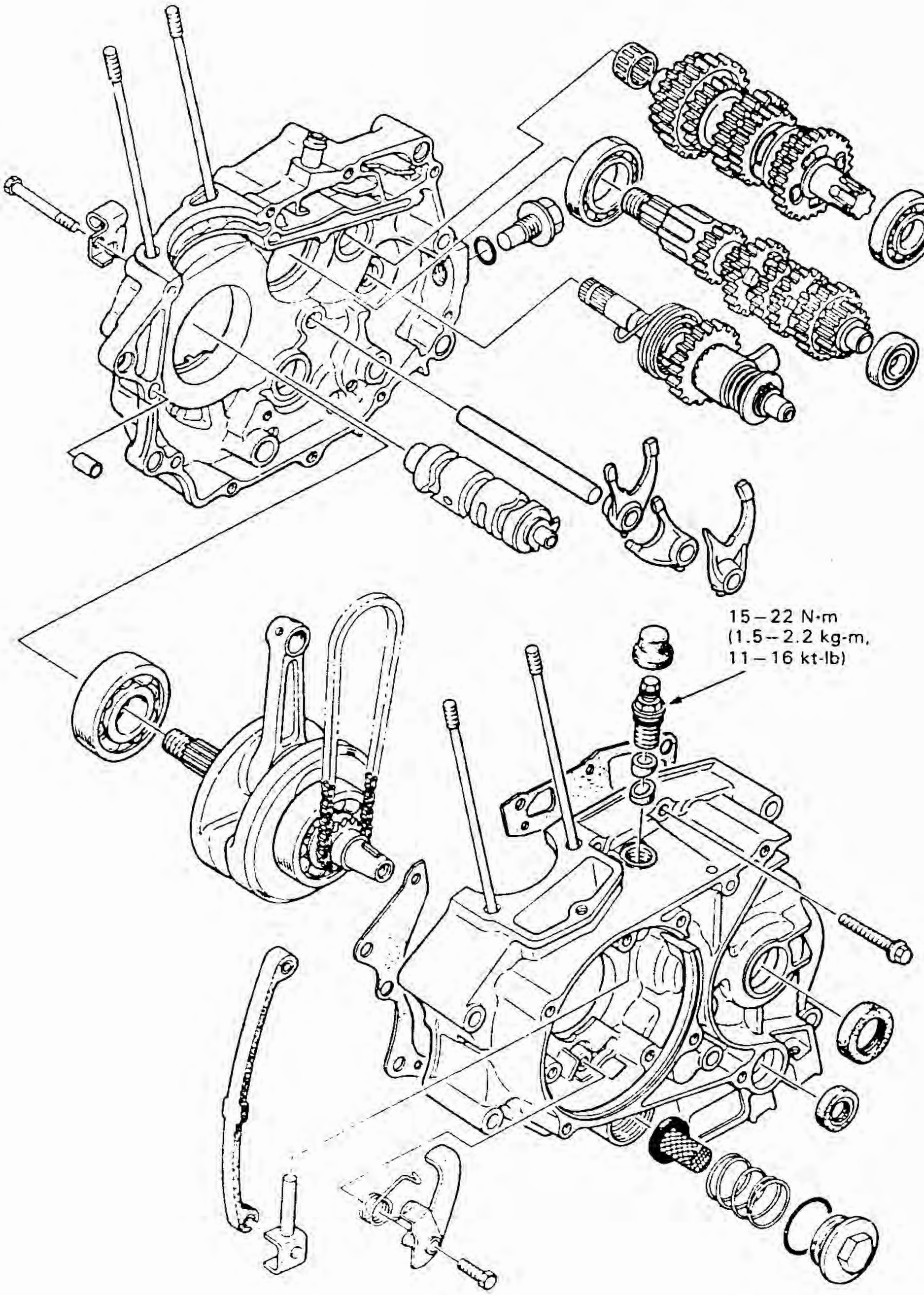
Apply oil to the O-ring.



Install the left crankcase cover by tightening the attaching screws.

Install the alternator wire clamp.
Connect the alternator wire connectors.
Install the drive sprocket cover.
Install the gearshift pedal.
Install the left side cover and seat.
Tighten the engine guard mounting bolts (page 5-4).
Fill the engine with the recommended grade oil up to the upper level mark (page 2-2).




15 – 22 N·m
(1.5 – 2.2 kg-m,
11 – 16 kt-lb)

10. TRANSMISSION/CRANKSHAFT/KICK STARTER

SERVICE INFORMATION

GENERAL

- The crankcase must be separated to repair the crankshaft, transmission and kick starter. Remove the following parts before separating the crankcase:
  - Cylinder head — Section 6
  - **Cylinder and piston** — **Section 7**
  - Clutch and gearshift linkage — Section 8
  - **Alternator** — **Section 9**

SPECIFICATIONS

mm (in)

ITEM		STANDARD	SERVICE LIMIT
Shift fork I.D.		12.000–12.018 (0.4724–0.4731)	12.05 (0.474)
Shift fork pawl thickness		4.93–5.00 (0.194–0.197)	4.50 (0.177)
Shift fork shaft O.D.		11.976–11.994 (0.4715–0.4722)	11.96 (0.471)
Gear I.D.	DRIVE GEAR	20.020–20.041 (0.7882–0.7890)	20.07 (0.790)
	M5	23.020–23.041 (0.9063–0.9071)	23.08 (0.937)
	M6	23.020–23.041 (0.9063–0.9071)	23.08 (0.937)
	IDLE GEAR	20.020–20.041 (0.7882–0.7890)	20.07 (0.790)
	C1	16.516–16.534 (0.6502–0.6509)	16.56 (0.652)
	C2	23.020–23.041 (0.9063–0.9071)	23.08 (0.937)
	C3, C4	22.020–22.041 (0.8669–0.8678)	22.08 (0.869)
Bushing I.D.	M6	20.020–20.041 (0.7882–0.7890)	20.07 (0.790)
	IDLE GEAR	16.516–16.534 (0.6502–0.6509)	16.56 (0.652)
	C2	20.020–20.041 (0.7882–0.7890)	20.07 (0.790)
	M5	20.020–20.041 (0.7882–0.7890)	20.07 (0.790)
Bushing O.D.	M6	22.984–23.005 (0.9049–0.9057)	22.94 (0.903)
	IDLE GEAR	19.989–22.000 (0.7810–0.8661)	19.96 (0.786)
	C2	22.984–23.005 (0.9049–0.9057)	22.94 (0.903)
	M5	22.959–22.980 (0.9039–0.9047)	22.92 (0.902)
Mainshaft O.D.	At M6, M5, Bushing	19.959–19.980 (0.7858–0.7866)	19.90 (0.783)
	At DRIVE GEAR	19.959–19.980 (0.7858–0.7866)	19.90 (0.783)
Countershaft O.D.	At C2 Bushing	19.974–19.987 (0.7864–0.7869)	19.94 (0.785)
	At C3, C4	21.959–21.980 (0.8645–0.8654)	21.90 (0.862)
	At C1, IDLE Bushing	16.466–16.484 (0.6483–0.6490)	16.41 (0.646)
Connecting rod big end radial clearance		0.05–0.30 (0.002–0.012)	0.80 (0.032)
Connecting rod big end axial clearance		0–0.008 (0–0.0003)	0.05 (0.002)
Crankshaft journal runout		—	0.05 (0.002)
Kick starter	Spindle O.D.	19.959–19.980 (0.7858–0.7866)	19.90 (0.783)
	Pinion I.D.	20.000–20.021 (0.7874–0.7882)	20.05 (0.789)

TORQUE VALUES

Cam chain tensioner adjusting bolt	15 – 22 N·m (1.5 – 2.2 kg·m, 11 – 16 ft·lb)

TOOLS

Special	
Bearing remover, 15 mm	07936 – KC10000 ┐
— remover assy, 15 mm	07936 – KC10500 ├
— remover head, 15 mm	07936 – KC10200 ├
— remover shaft, 15 mm	07936 – KC10100 ┘ Not available in U.S.A.
— remover sliding weight	07741 – 0010201 or 07936 – 371020A or 07936 – 3710200
Common	
Attachment 52 x 55 mm	07746 – 0010400
Pilot 30 mm	07746 – 0040700
Attachment 32 x 35 mm	07746 – 0010100
Pilot 15 mm	07746 – 0040300
Attachment 42 x 47 mm	07746 – 0010300
Pilot 20 mm	07746 – 0040500
Driver	07749 – 0010000

TROUBLESHOOTING

Hard to shift
- Shift fork bent
- Shift fork shaft bent

Transmission jumps out of gear
- Gear dogs or slots worn
- Shift fork bent or damaged
- Shift fork shaft bent

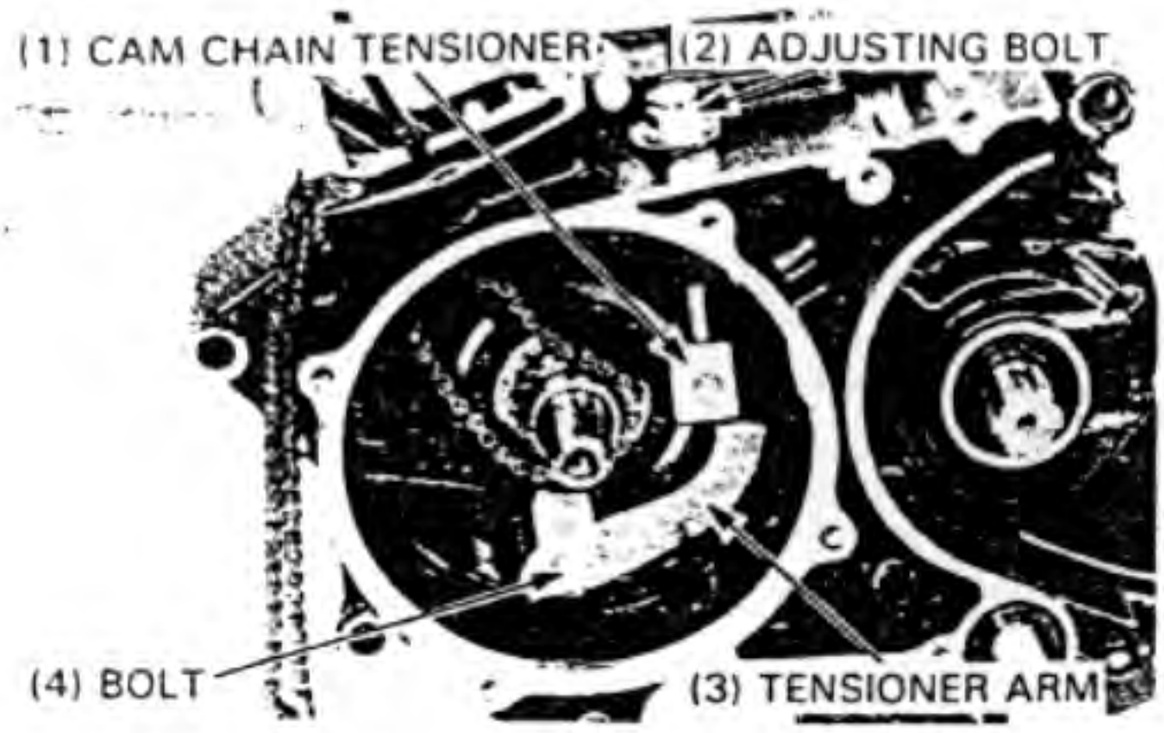
Crankshaft noisy
- Worn connecting rod big end bearing
- Bent connecting rod
- Worn crankshaft main journal bearing

Gears noisy
- Worn transmission gear
- Worn spline shafts

CAM CHAIN TENSIONER

REMOVAL

Remove the cam chain tensioner arm.
Remove the cam chain tensioner and cam chain by removing the adjusting bolt.



INSPECTION

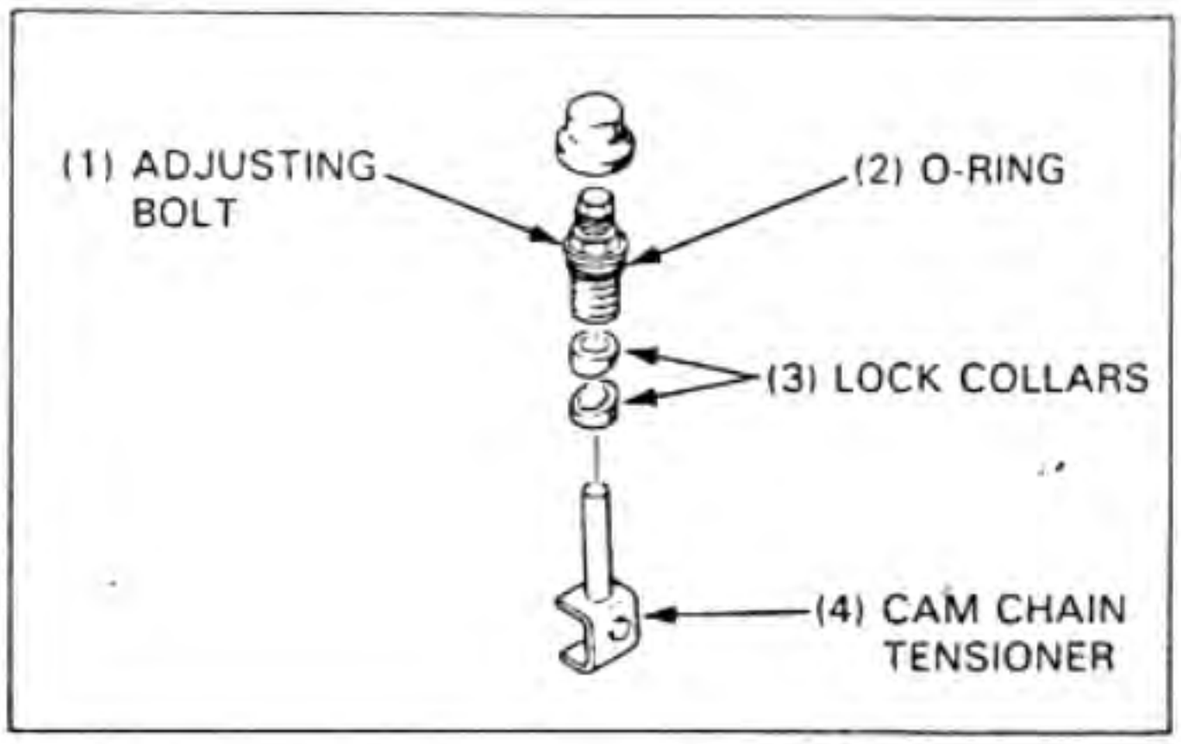
Check the O-ring of the adjusting bolt for wear or fatigue.

INSTALLATION

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, apply oil to the O-ring and tighten the adjusting bolt.

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

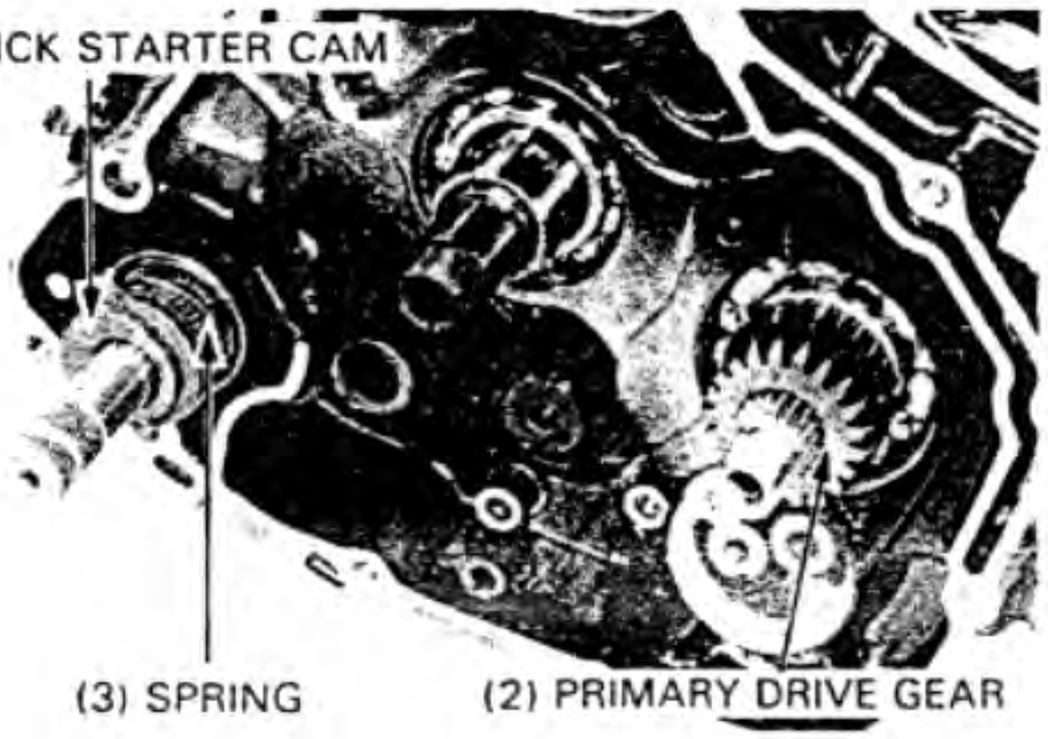


NOTE

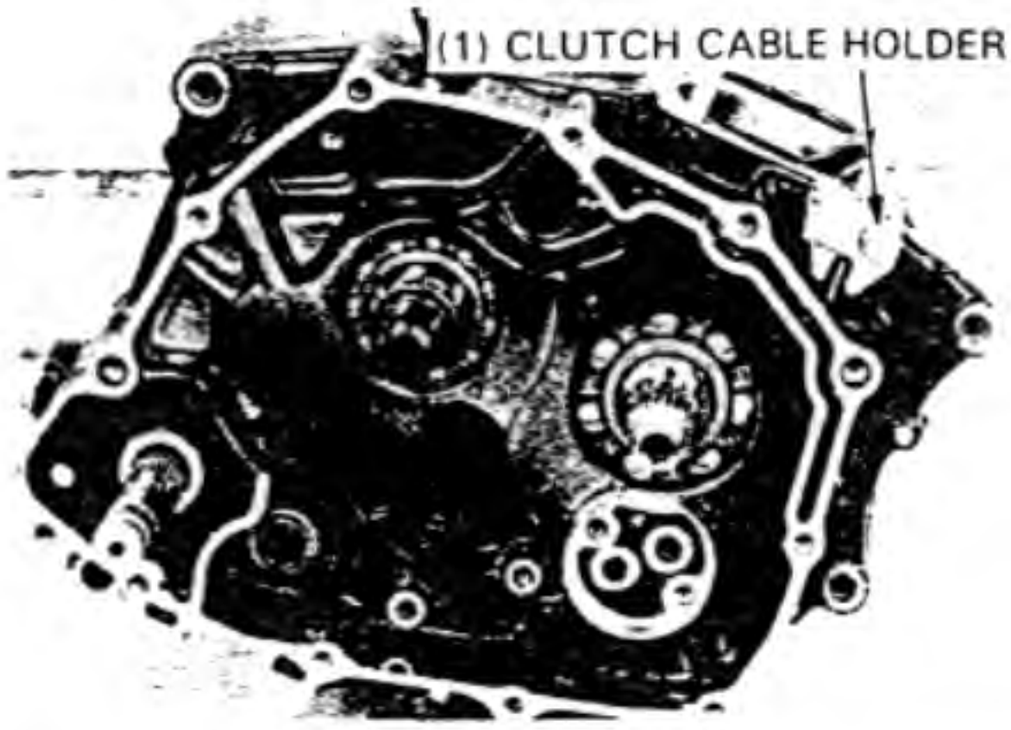
- Note the tensioner lock collar direction.

CRANKCASE SEPARATION

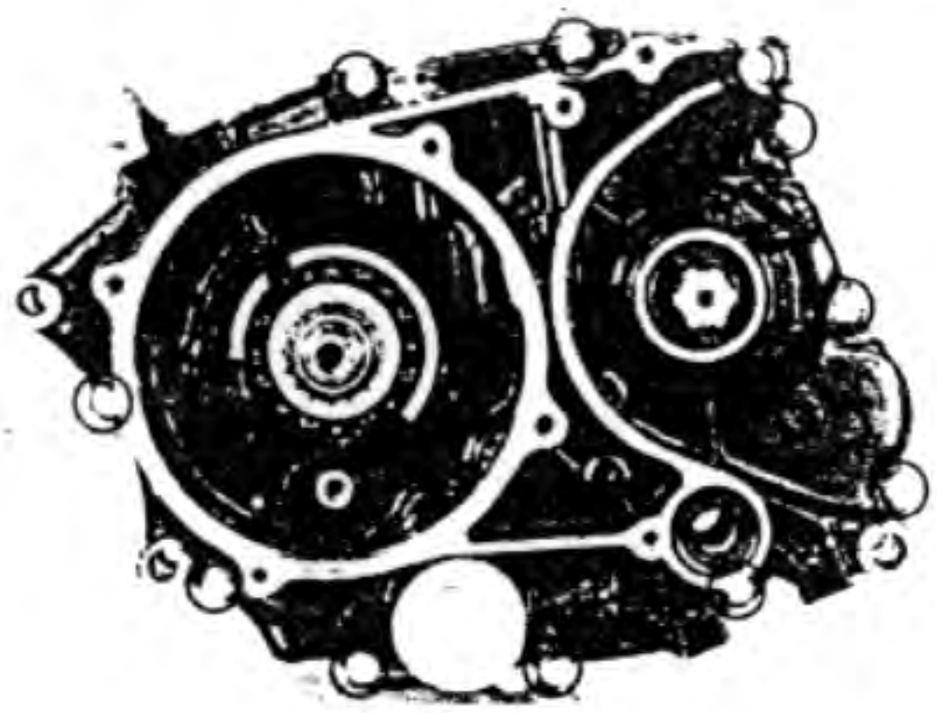
Remove the kick starter cam, spring and spring seat.
Remove the primary drive gear.



Remove the clutch cable holder bolt.



Remove the cam chain tensioner (page 10-3).
Remove the left crankcase 6 mm bolts.



Separate the left and right crankcase halves.

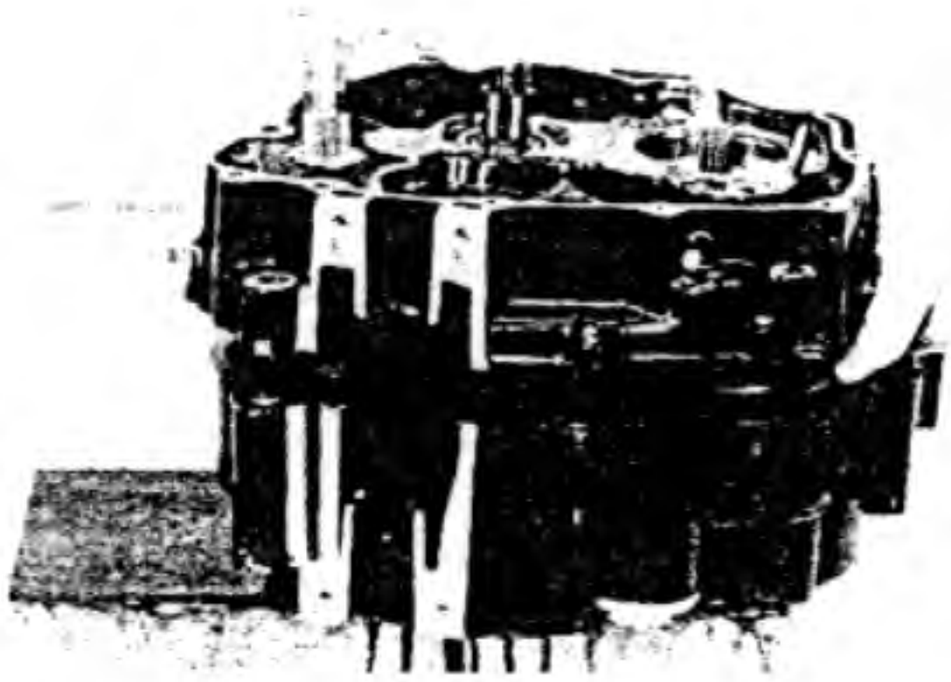
NOTE

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

CAUTION

Do not pry the crankcase halves apart with a screwdriver.

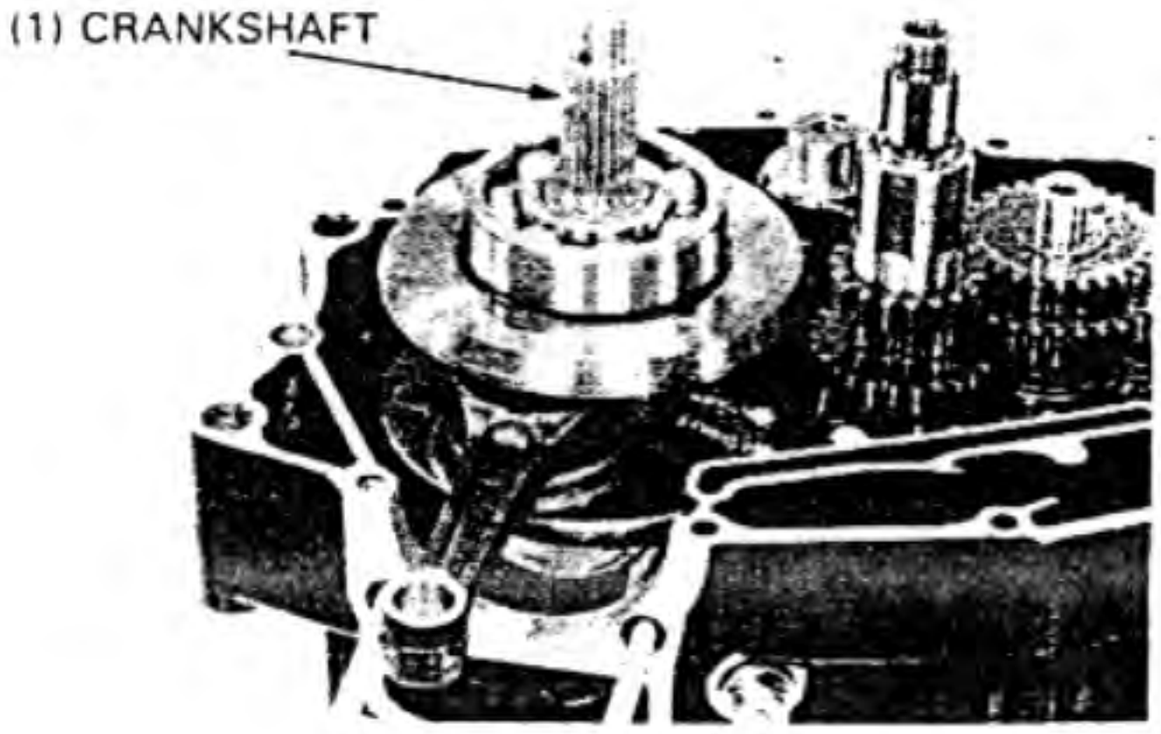
Remove the gasket and dowel pins.



CRANKSHAFT

REMOVAL

Remove the crankshaft from the crankcase.



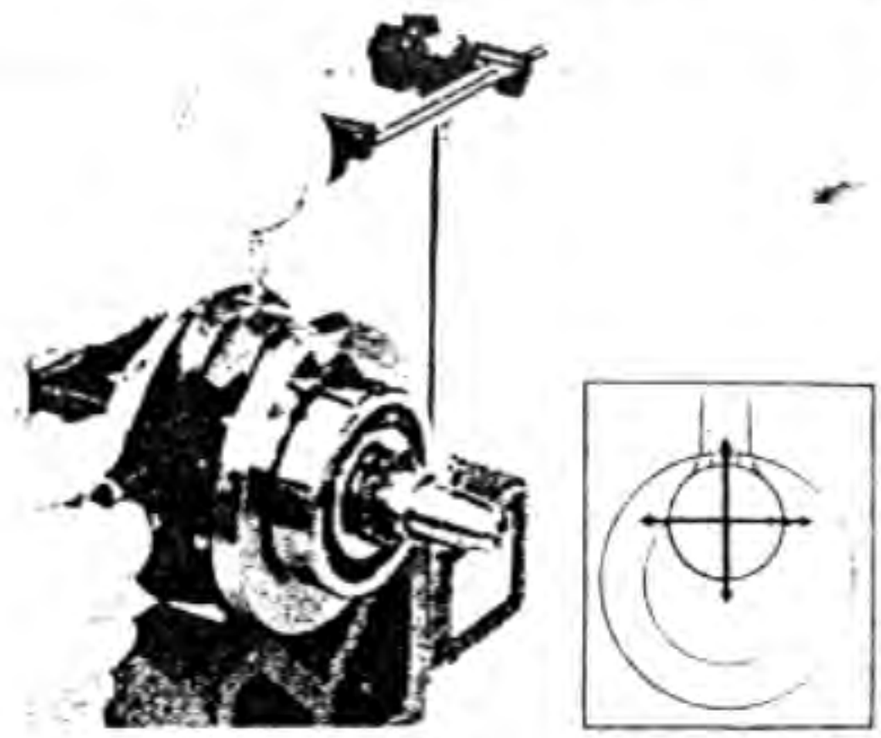
INSPECTION

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

SERVICE LIMIT: 0.80 mm (0.032 in)

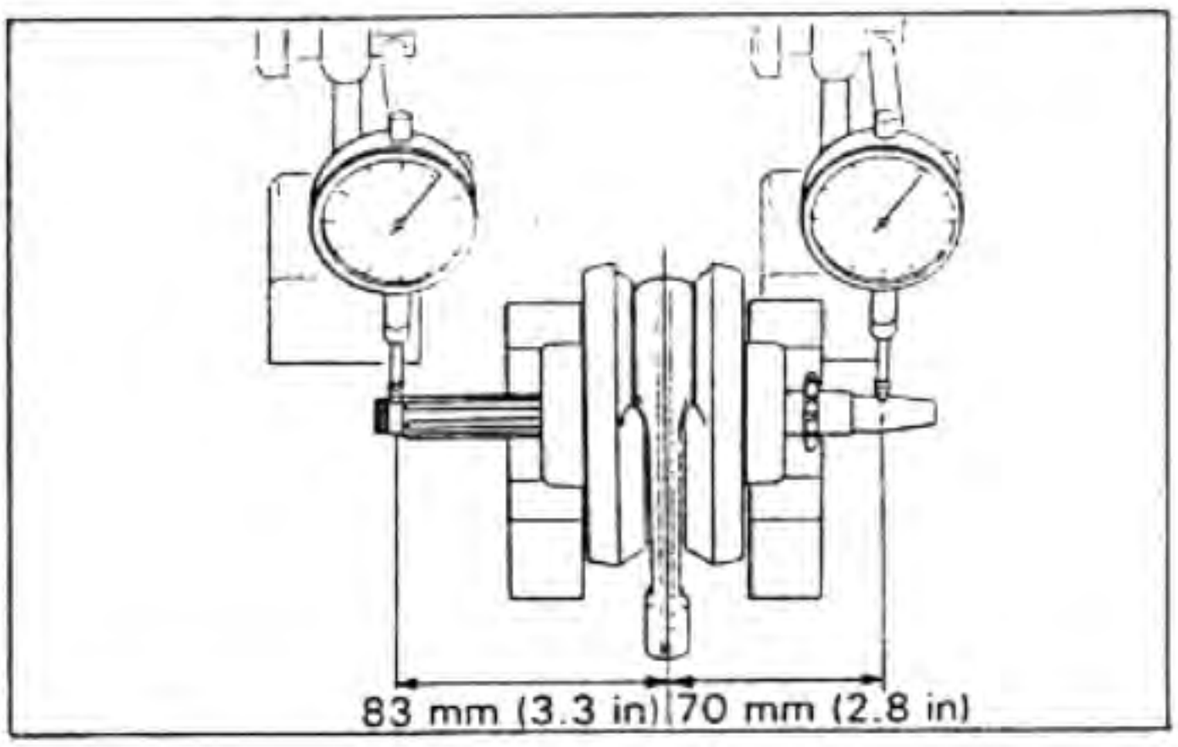
Measure the radial clearance at the connecting rod big end at two points in the directions indicated by the arrows.

SERVICE LIMIT: 0.05 mm (0.002 in)



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

SERVICE LIMIT: 0.05 mm (0.002 in)

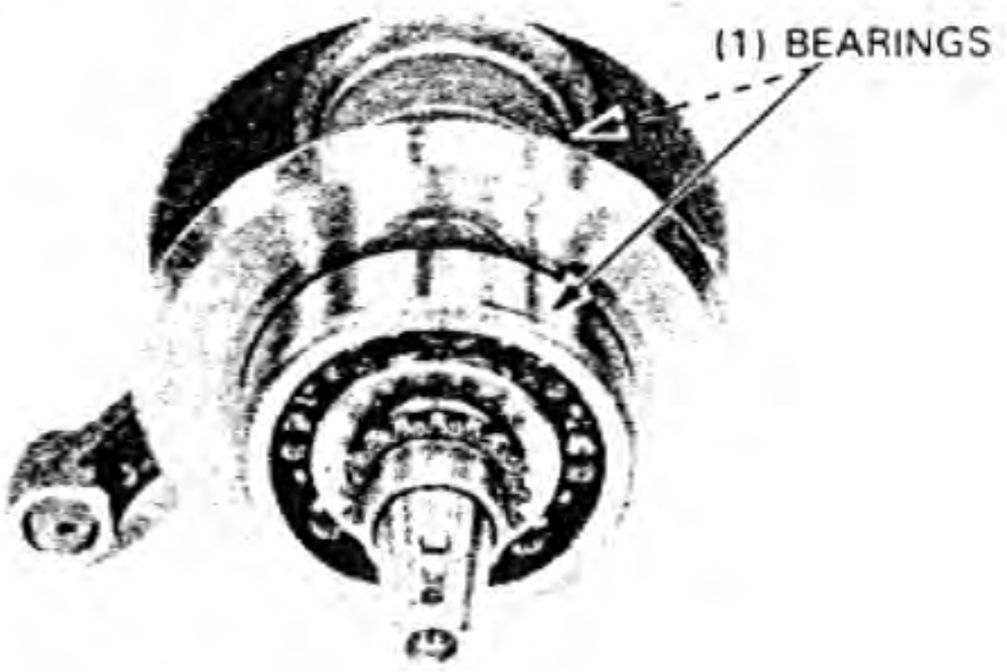


CRANKSHAFT BEARING INSPECTION

Remove the bearings from the crankcase or the crankshaft.

Turn the inner race of each bearing with your finger. The bearings should turn smoothly and quietly. Also check that the bearing outer race has not been spinning in the crankcase.

Replace the crankshaft if the races do not turn smoothly and quietly, or if they have been spinning in the crankcase.



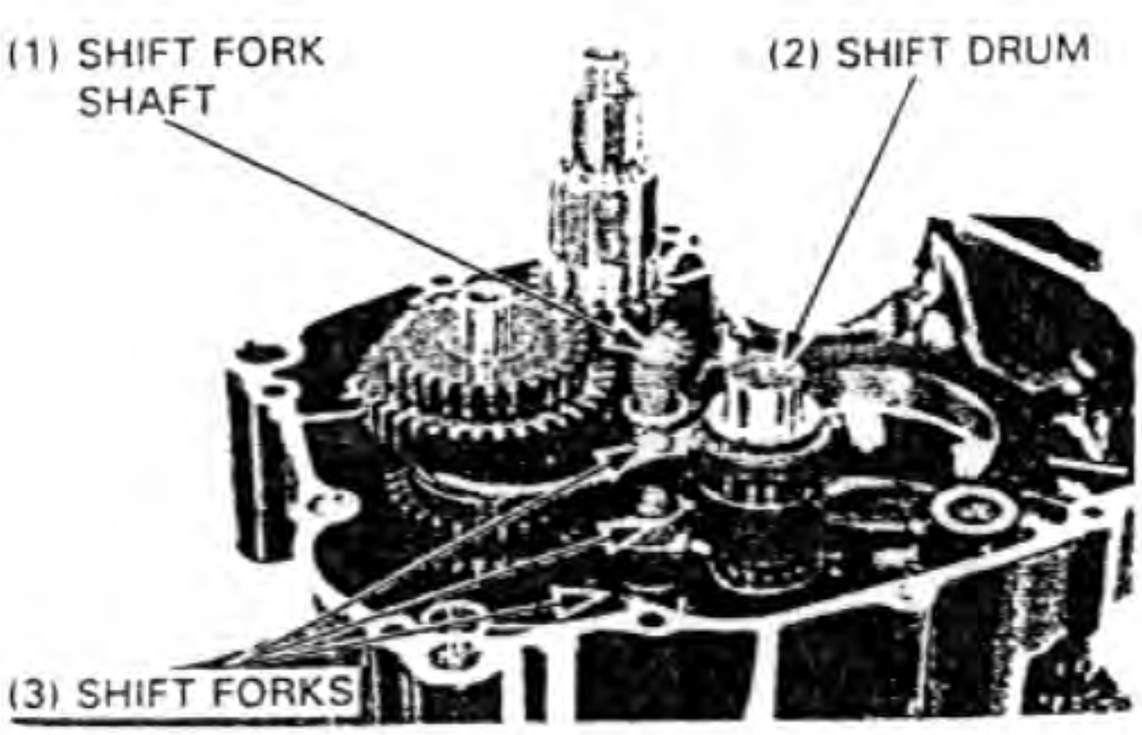
TIMING SPROCKET INSTALLATION

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

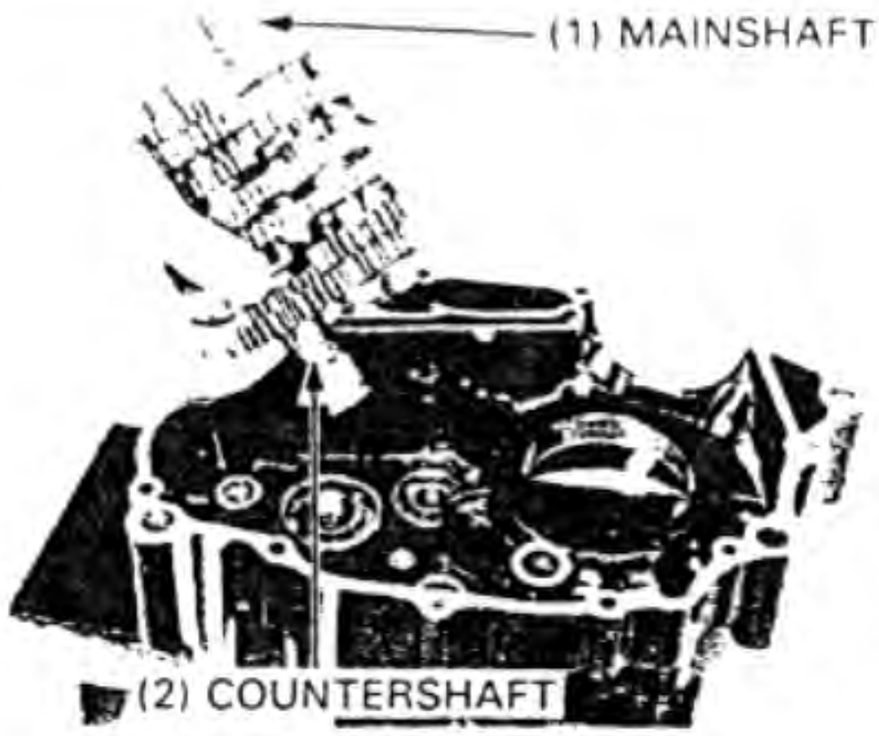
TRANSMISSION DISASSEMBLY

Remove the shift fork shaft and remove the shift forks.

Remove the shift drum.



Remove and disassemble the mainshaft and countershaft gear sets.



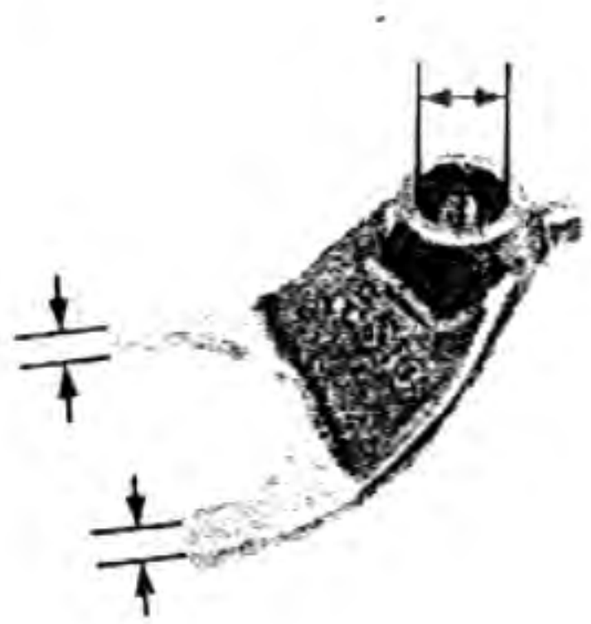
SHIFT FORK/SHIFT SHAFT INSPECTION

Check the shift fork for any wear, bending or damage.
Measure the I.D.

SERVICE LIMIT: 12.05 mm (0.474 in)

Measure the shift fork claw thickness.

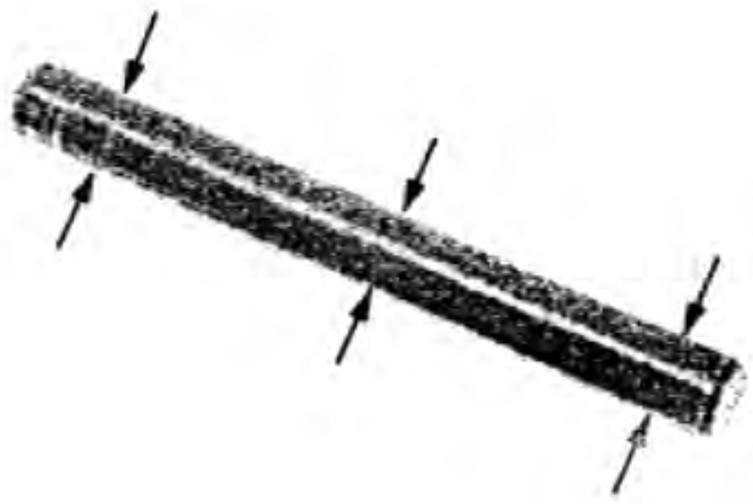
SERVICE LIMIT: 4.50 mm (0.177 in)



Check that the shift fork shafts are not bent, worn or damaged.

Measure the shift fork shaft O.D.

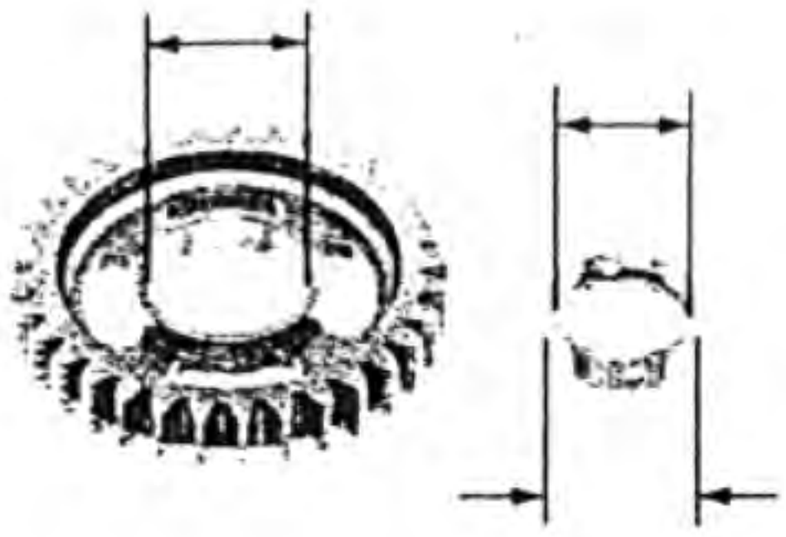
SERVICE LIMIT: **11.96 mm (0.471 in)**



Inspect the shift drum grooves.

Replace the drum if the grooves are damaged or worn excessively.

TRANSMISSION GEAR/SHAHT INSPECTION



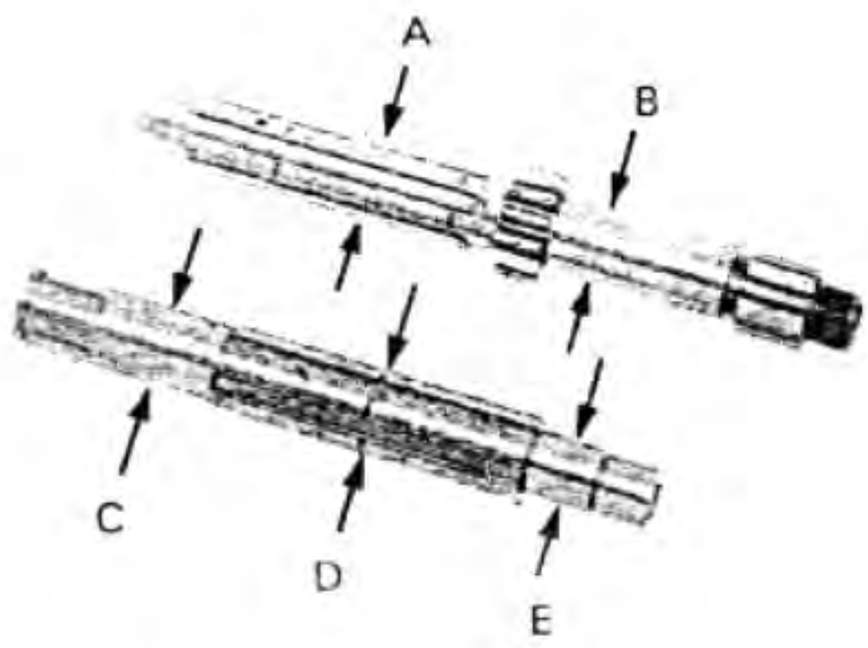
Inspect each gear for wear or damage and replace if necessary. Check the gear teeth and engagement dogs for wear or damage. Check the mainshaft and countershaft splines and sliding surfaces for wear or damage.

Measure the I.D. of each spinning gear and the I.D. and O.D. of the gear bushings.

SERVICE LIMIT:

Gear I.D.	DRIVE GEAR:	20.07 mm (0.790 in)
	M5:	23.08 mm (0.937 in)
	M6:	23.08 mm (0.937 in)
	IDLE GEAR:	20.07 mm (0.790 in)
	C1:	16.56 mm (0.652 in)
	C2:	23.08 mm (0.937 in)
	C3, C4:	22.08 mm (0.869 in)
Bushing I.D.	M6:	20.07 mm (0.790 in)
	IDLE GEAR:	16.56 mm (0.652 in)
	C2:	20.07 mm (0.790 in)
	M5:	20.07 mm (0.790 in)
Bushing O.D.	M6:	22.94 mm (0.903 in)
	IDLE GEAR:	19.96 mm (0.786 in)
	C2:	22.94 mm (0.903 in)
	M5:	22.92 mm (0.902 in)

Measure the O.D. of the mainshaft and countershaft in the locations as shown.



SERVICE LIMIT:

A (M6, M5 Bushing):	19.90 mm (0.783 in)
B (DRIVE GEAR):	19.90 mm (0.783 in)
C (C2 Bushing):	19.94 mm (0.785 in)
D (C3, C4 Gear):	21.90 mm (0.862 in)
E (C1 Gear, IDLE GEAR Bushing):	16.41 mm (0.646 in)

TRANSMISSION BEARING INSPECTION

Turn the inner race of each bearing with your finger. The bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the crankcase.

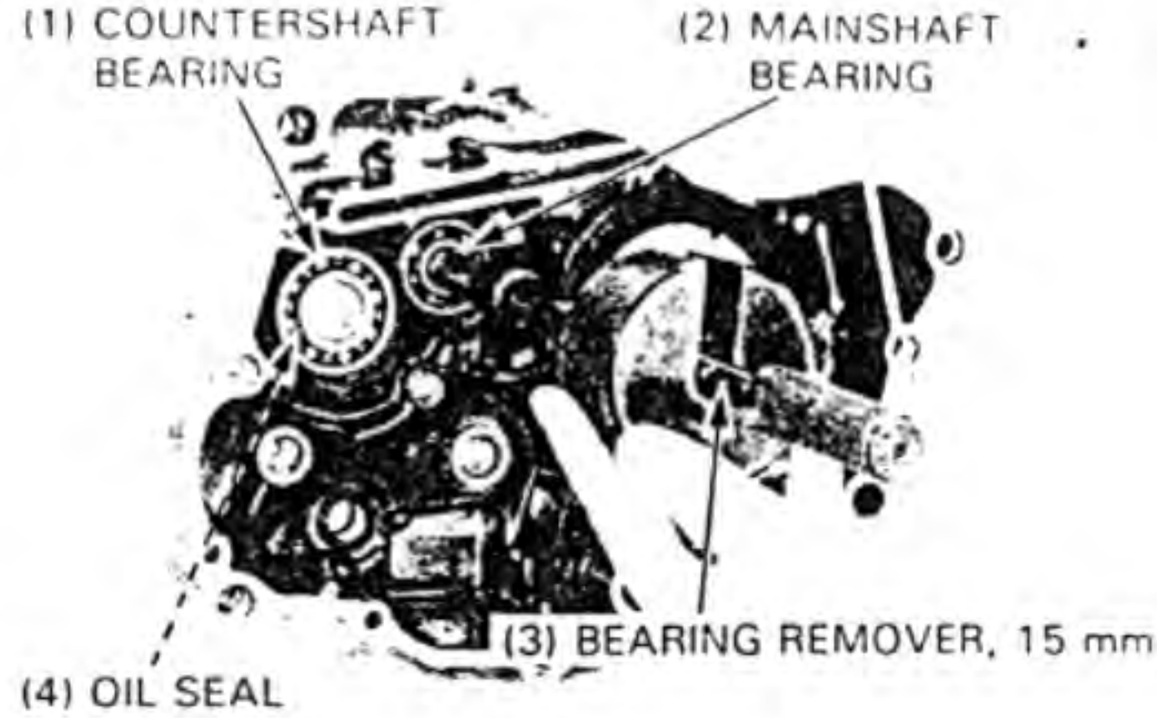
Remove and discard the bearings if the races do not turn smoothly, quietly, or if they fit loosely in the crankcase (page 10-8).

Pack new bearings with grease and install them with the special tools (page 10-8).

TRANSMISSION BEARING REPLACEMENT

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

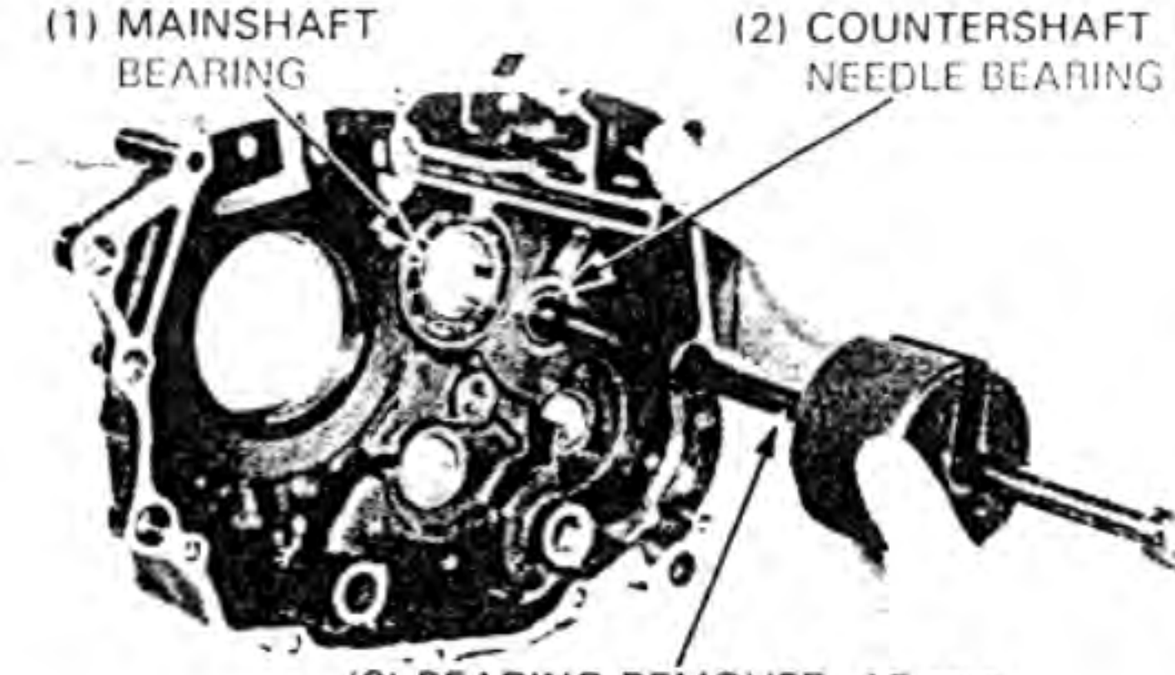
Remove the mainshaft bearing from the left crankcase.



Remove the mainshaft bearing and the countershaft needle bearing from the right crankcase.

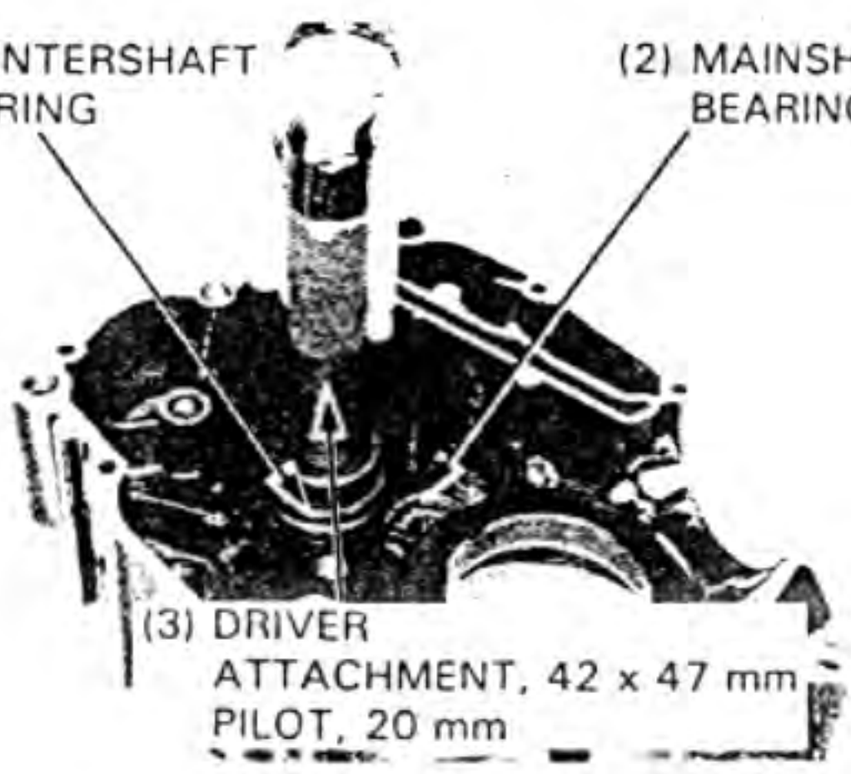
Remove the bearings with the following tool.

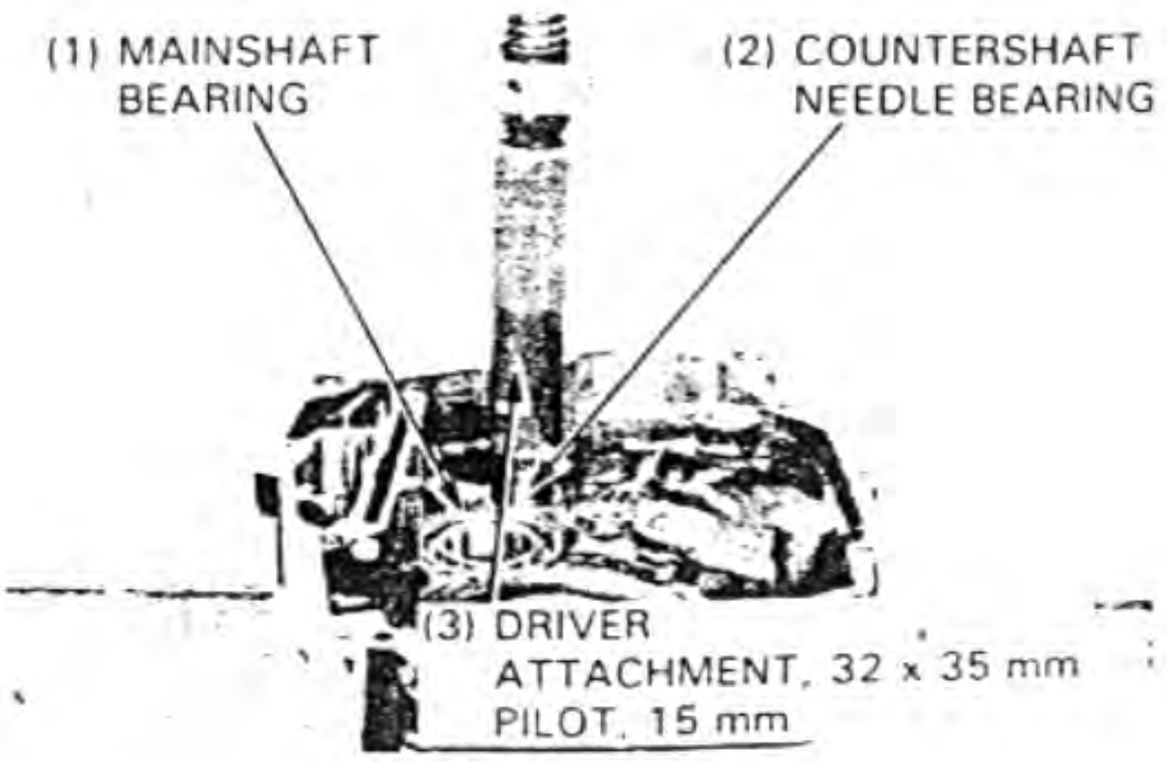
Bearing remover, 15 mm	07936 – KC10000 Not available in U.S.A.
— remover assy, 15 mm	07936 – KC10500
— remover head, 15 mm	07936 – KC10200 Not available in U.S.A.
— remover shaft, 15 mm	07936 – KC10100 Not available in U.S.A.
— remover sliding weight	07741 – 0010201 or 07936 – 371020A or 07936 – 3710200



Install the new bearings with the following tools.

Left crankcase countershaft bearing	
Driver	07749–0010000
Attachment, 42 x 47 mm	07746–0010300
Pilot, 20 mm	07746–0040500
Left crankcase mainshaft bearing	
Driver	07749–0010000
Attachment, 32 x 35 mm	07746–0010100
Pilot, 15 mm	07746–0040300
Right crankcase countershaft needle bearing	
Driver	07749–0010000
Attachment, 32 x 35 mm	07746–0010100
Pilot, 15 mm	07746–0040300
Hydraulic press	
Right crankcase mainshaft bearing	
Driver	07749–0010000
Attachment, 52 x 55 mm	07746–0010400
Pilot, 30 mm	07746–0040700

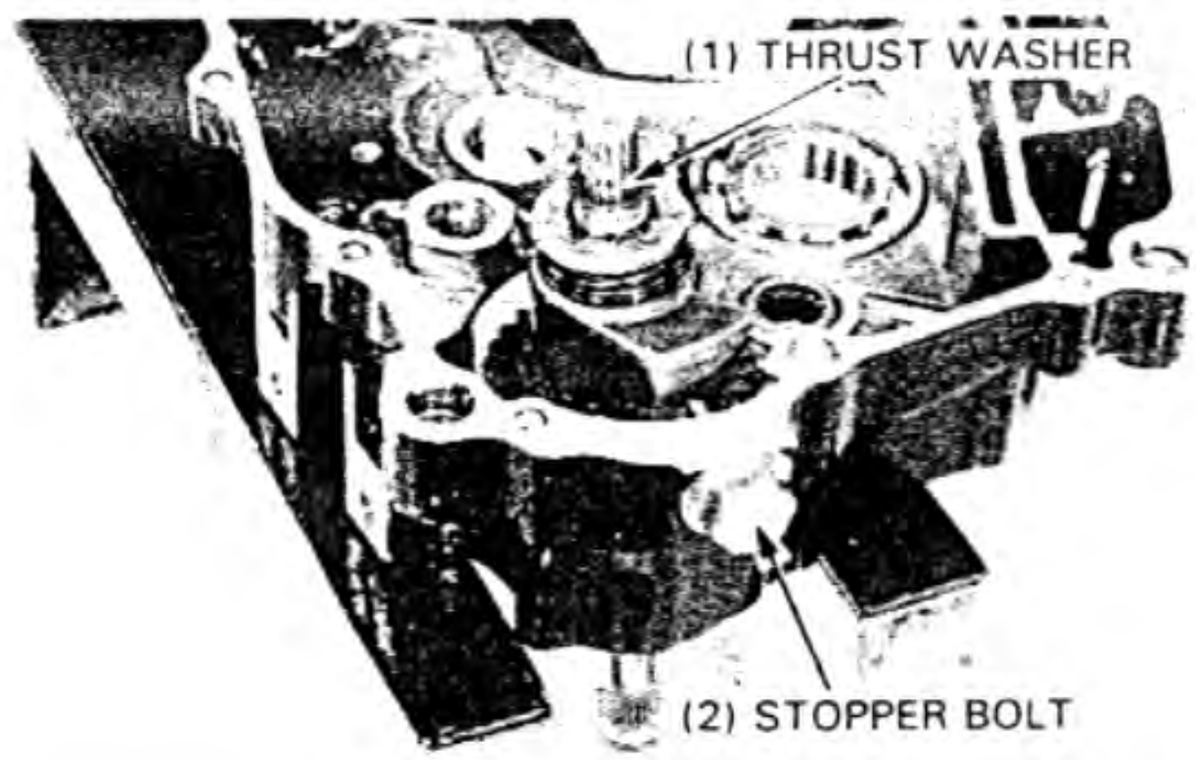




Install the new countershaft oil seal on the left crankcase.

KICK STARTER DISASSEMBLY

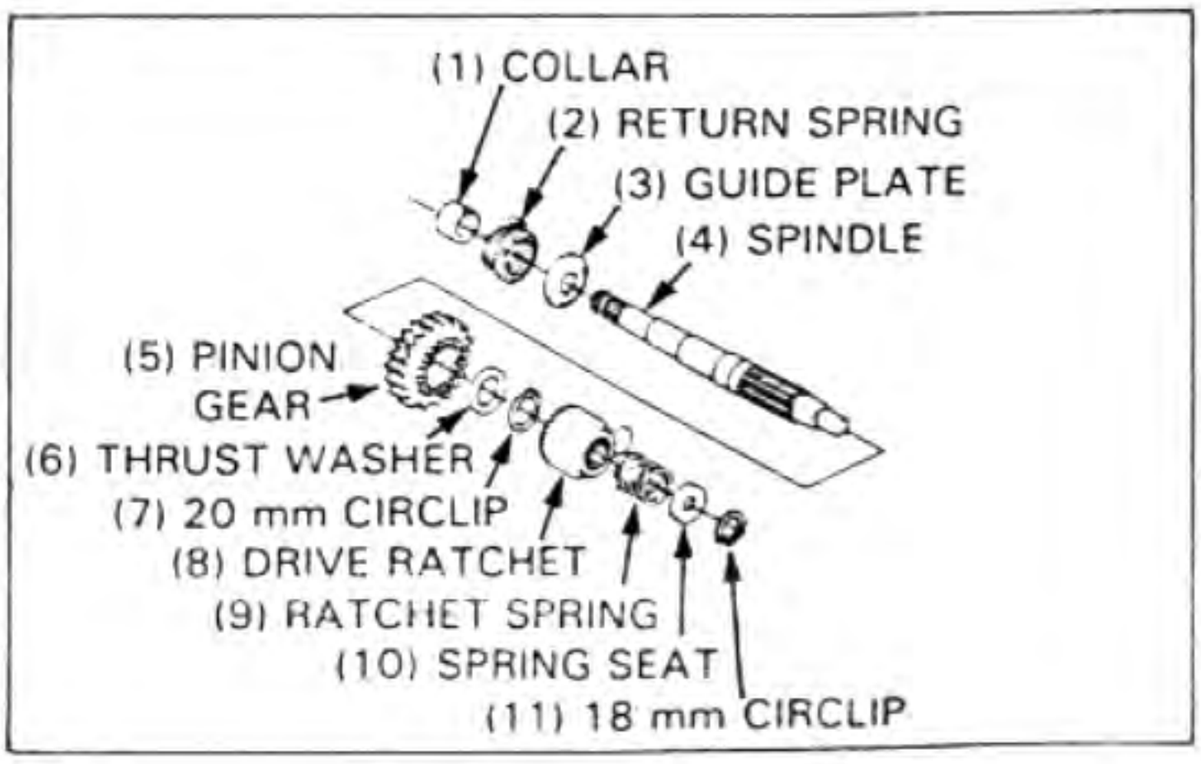
Remove the thrust washer.
Back off the stopper bolt and remove the kick starter.



Remove the collar, return spring and guide plate.

Remove the starter pinion gear and thrust washer.

Remove the 18 mm circlip, spring seat, ratchet spring, drive ratchet and 20 mm circlip.



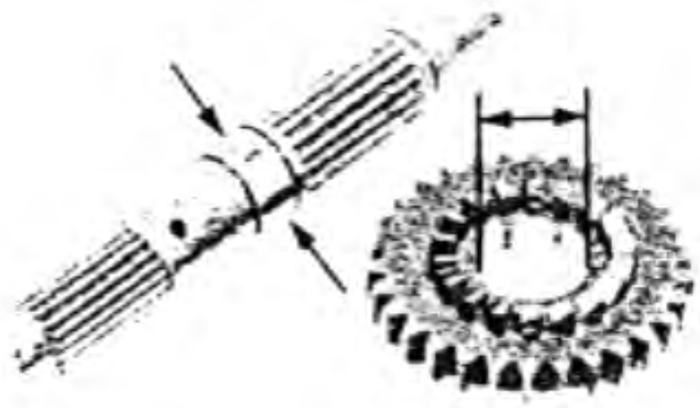
INSPECTION

Measure the pinion I.D.

SERVICE LIMIT: 20.05 mm (0.789 in)

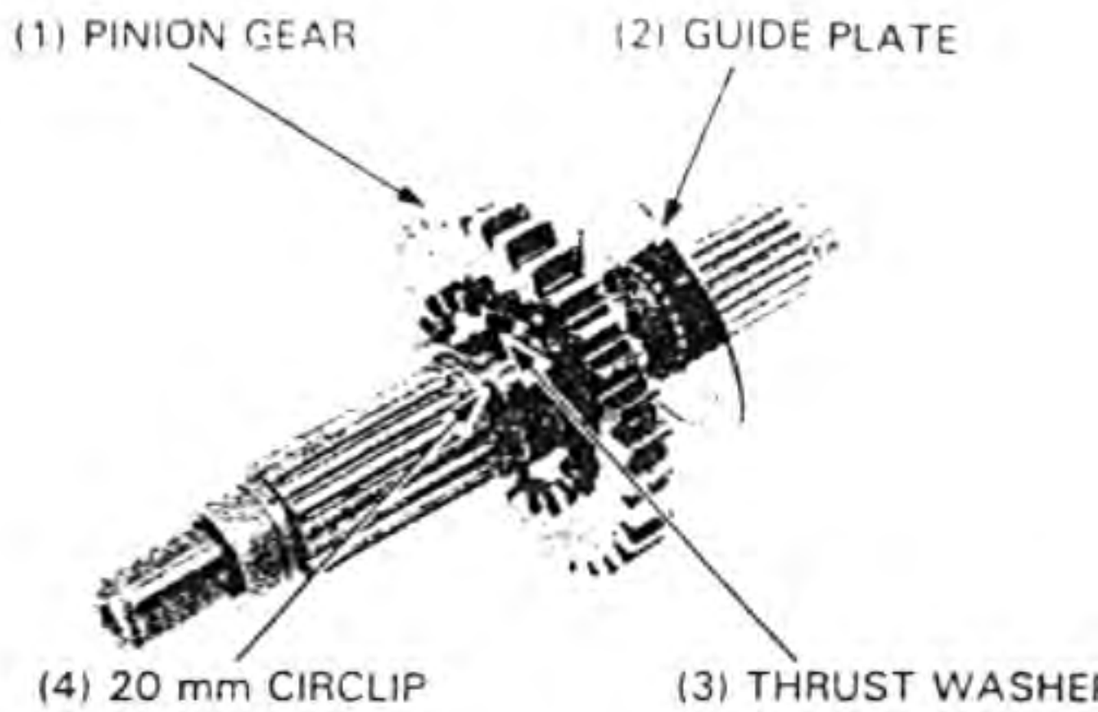
Measure the O.D. of the pinion gear sliding surface.

SERVICE LIMIT: 19.90 mm (0.783 in)



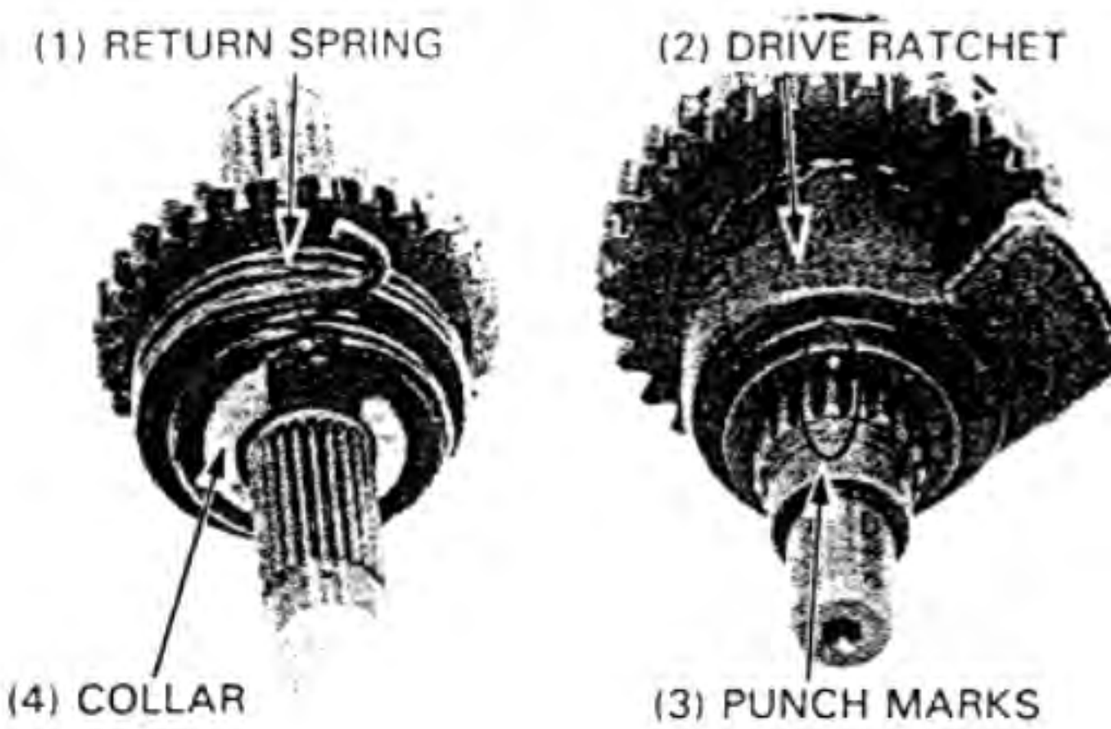
KICK STARTER ASSEMBLY

Install the guide plate, pinion gear, thrust washer and 20 mm circlip on the spindle.

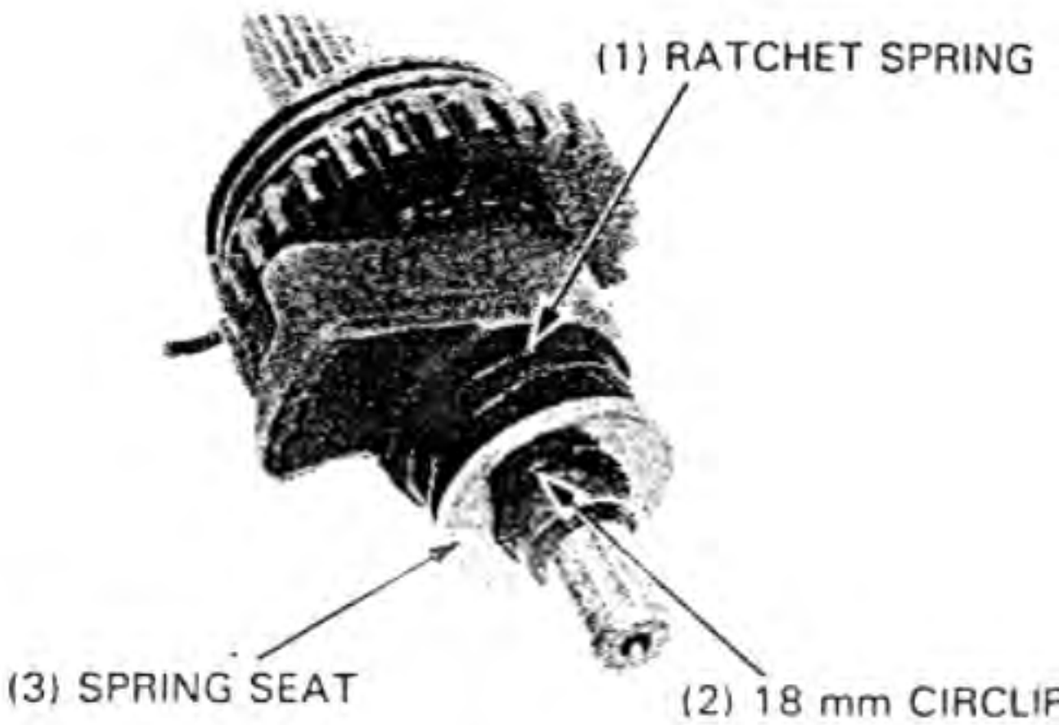


Aligning the collar groove with the return spring, install the collar and spring on the spindle.

Aligning the spindle punch mark with the drive ratchet punch mark, install the drive ratchet.



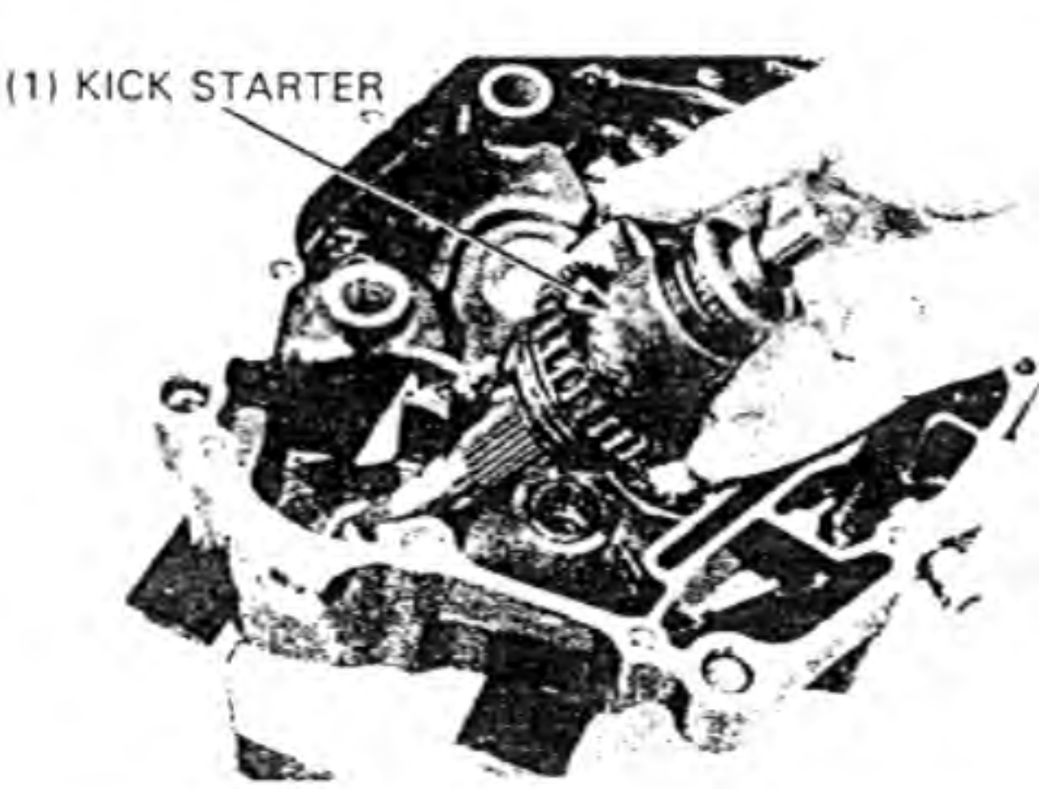
Install the ratchet spring, spring seat and 18 mm circlip.



Install the kick starter.

NOTE

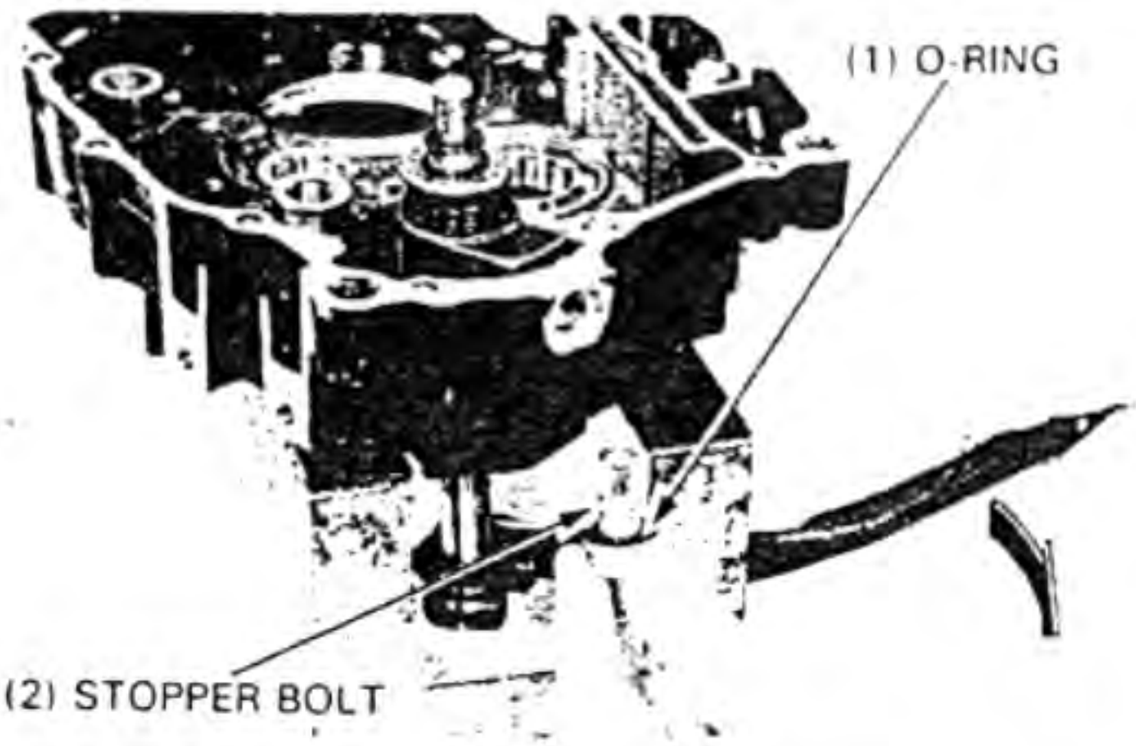
- Hook the end of the return spring over the right crankcase abutment as shown.



Install the O-ring on the stopper bolt.
Install the kick starter lever onto the spindle and rotate the spindle to align the drive ratchet boss with the stopper bolt hole.
Install the stopper bolt so it holds the drive ratchet as shown.

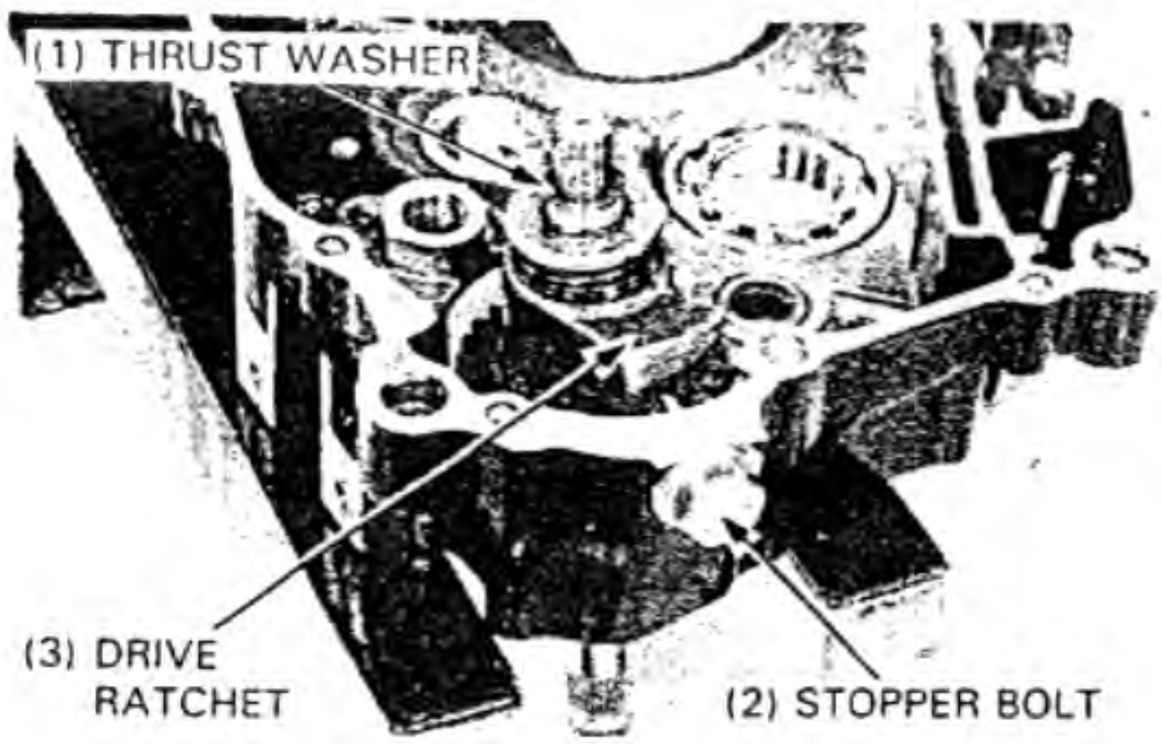
NOTE

- Do not forget to install the O-ring.



Remove the kick starter.

Tighten the stopper bolt securely.
Install the thrust washer on the kick spindle.



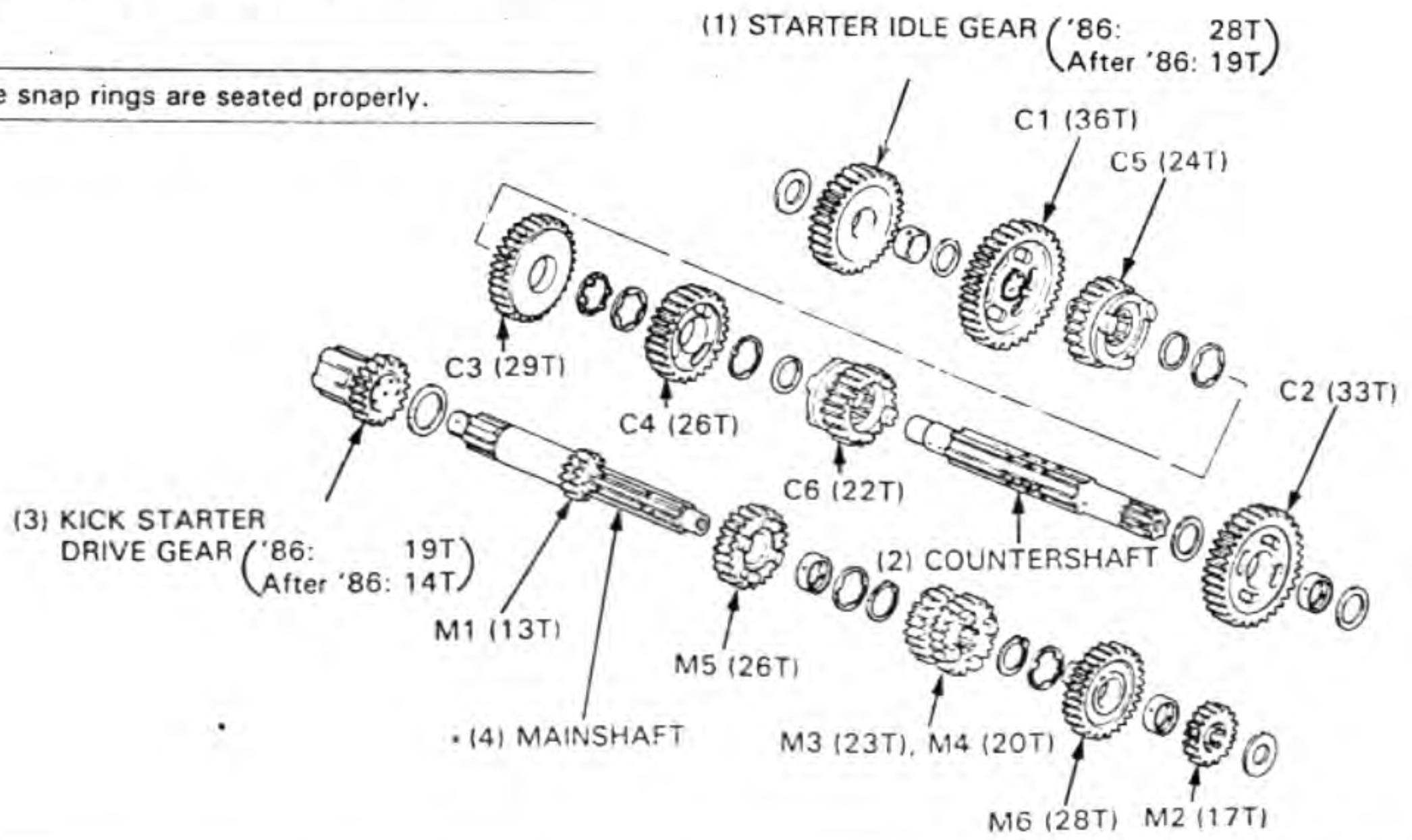
TRANSMISSION ASSEMBLY

Coat all parts with oil.

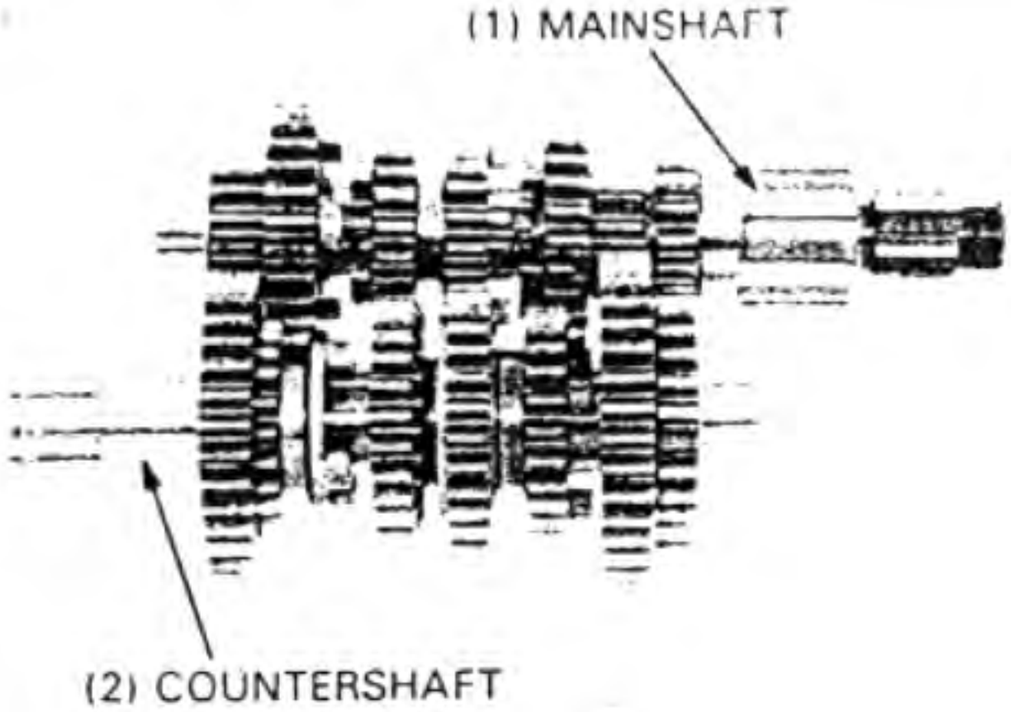
Assemble the transmission shafts and gears, noting the locations of the thrust washers and snap rings.

NOTE

- Make sure the snap rings are seated properly.



Assemble the mainshaft and countershaft.



Install the mainshaft and countershaft assembly in the left crankcase.

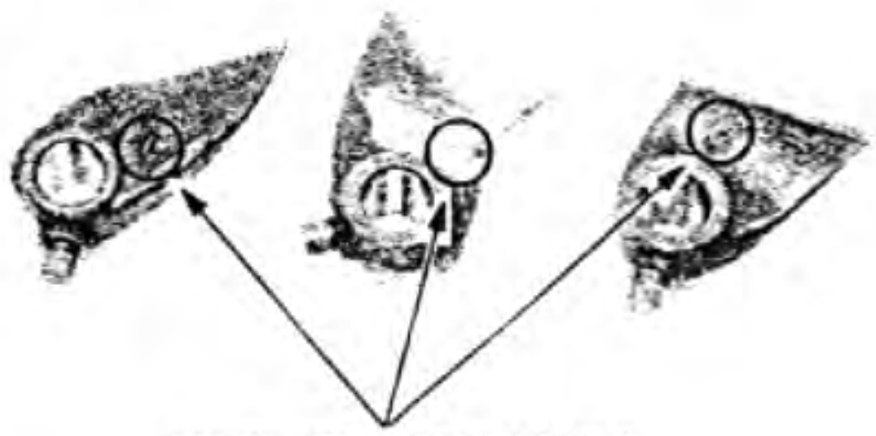
NOTE

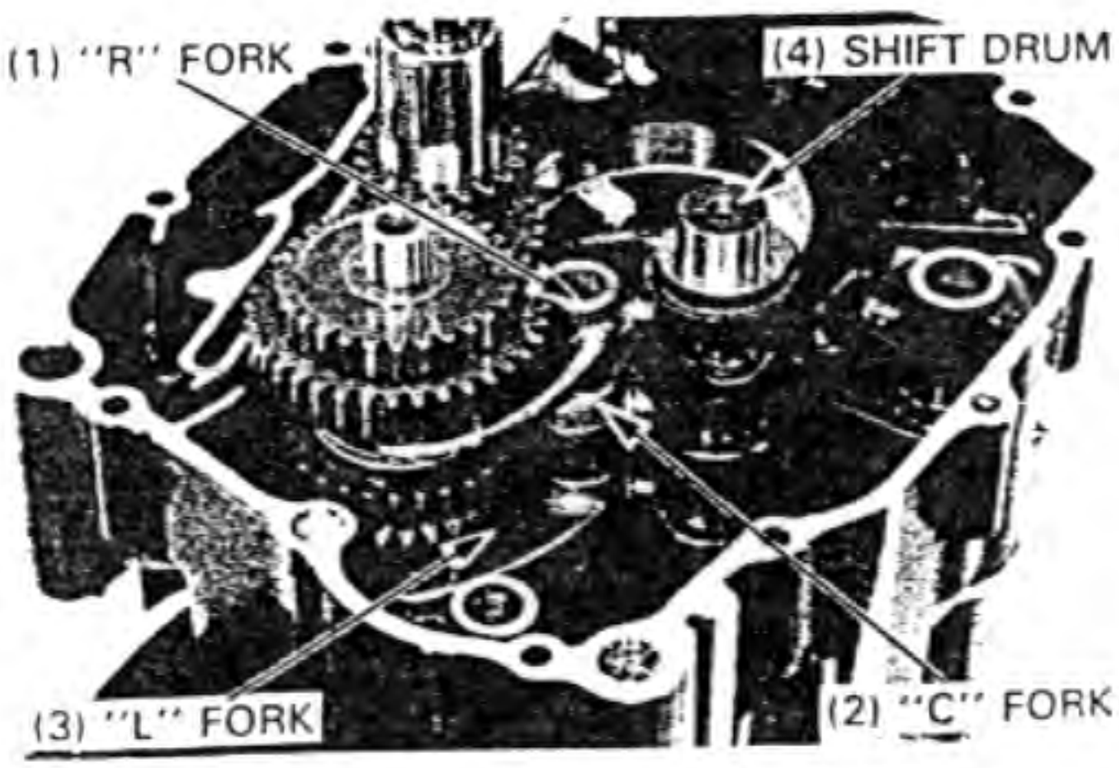
- Make sure the thrust washer stays in place during this operation.

Install the shift drum and shift forks.

NOTE

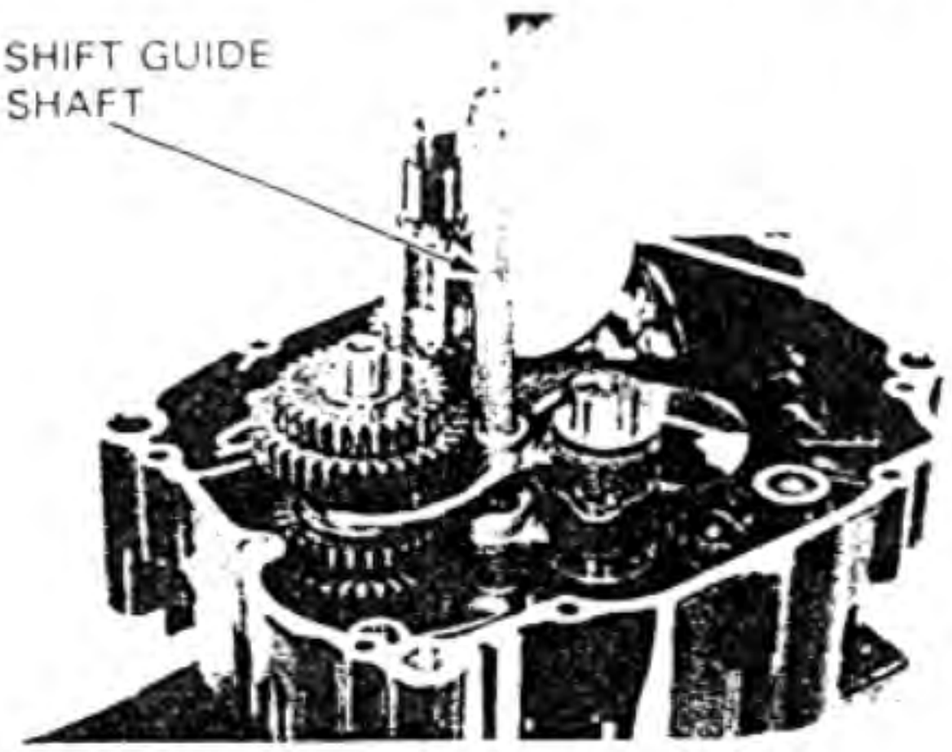
- Note the installation positions of the shift forks.
- Install the shift forks with the marking facing down.





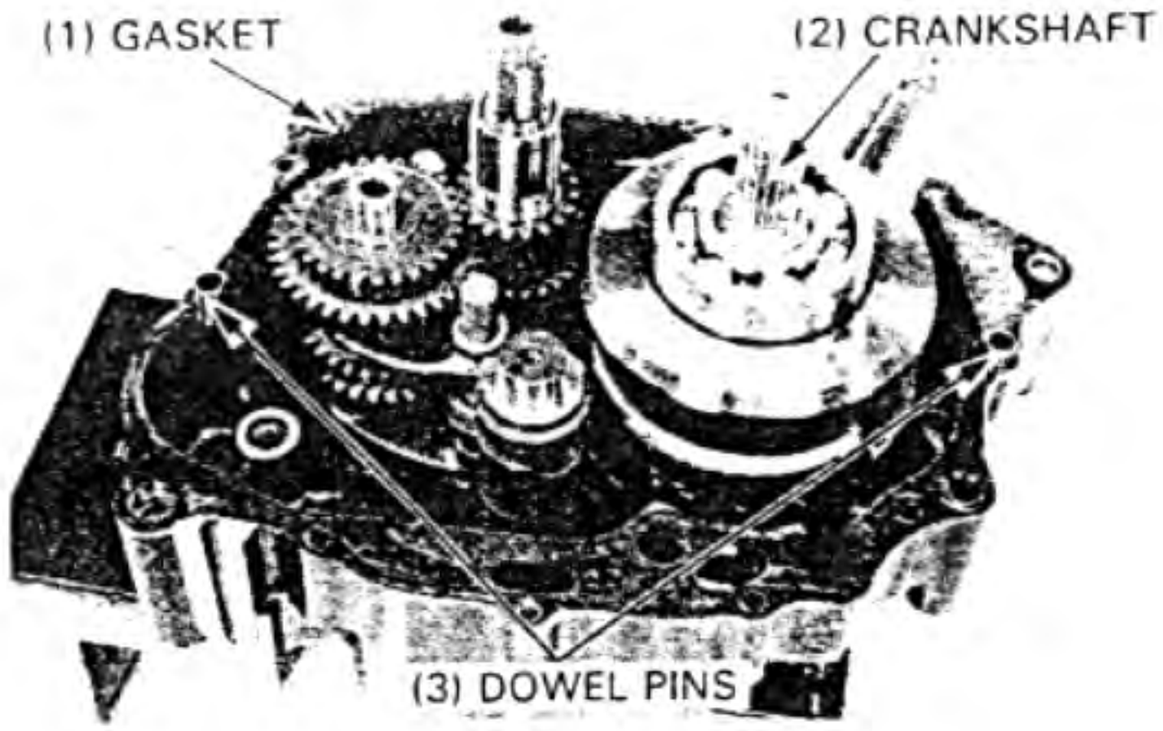
Install the fork guide shaft.

Rotate the mainshaft by hand to see if the gears rotate freely.



CRANKCASE ASSEMBLY

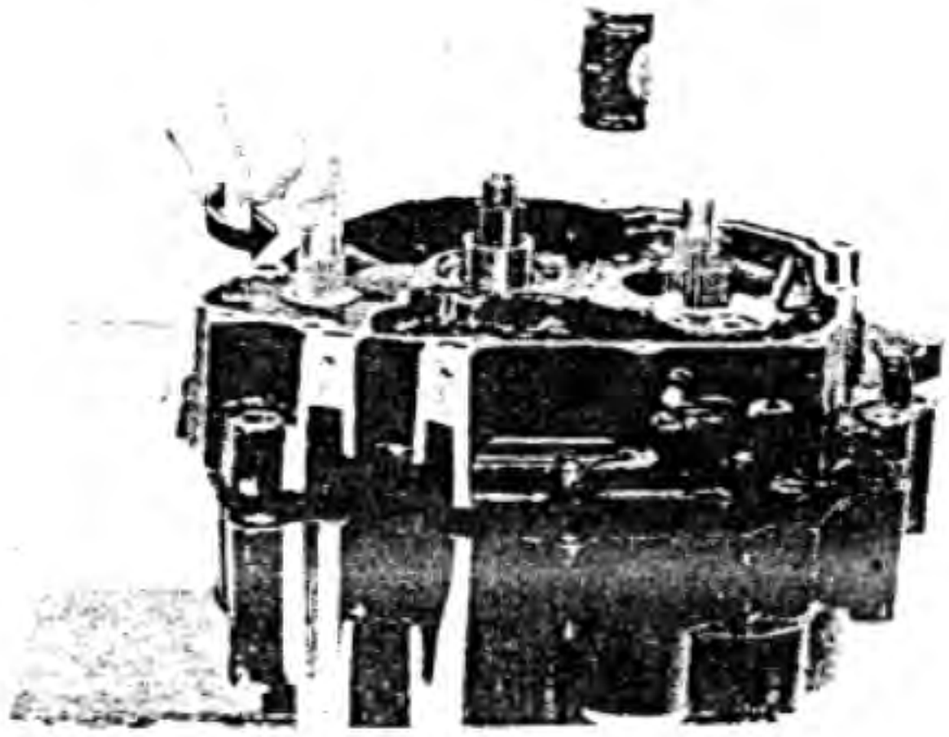
Install the crankshaft in the left crankcase.
Install the gasket and dowel pins.



Install the right crankcase on the left crankcase while turning the kick starter spindle as shown.

NOTE

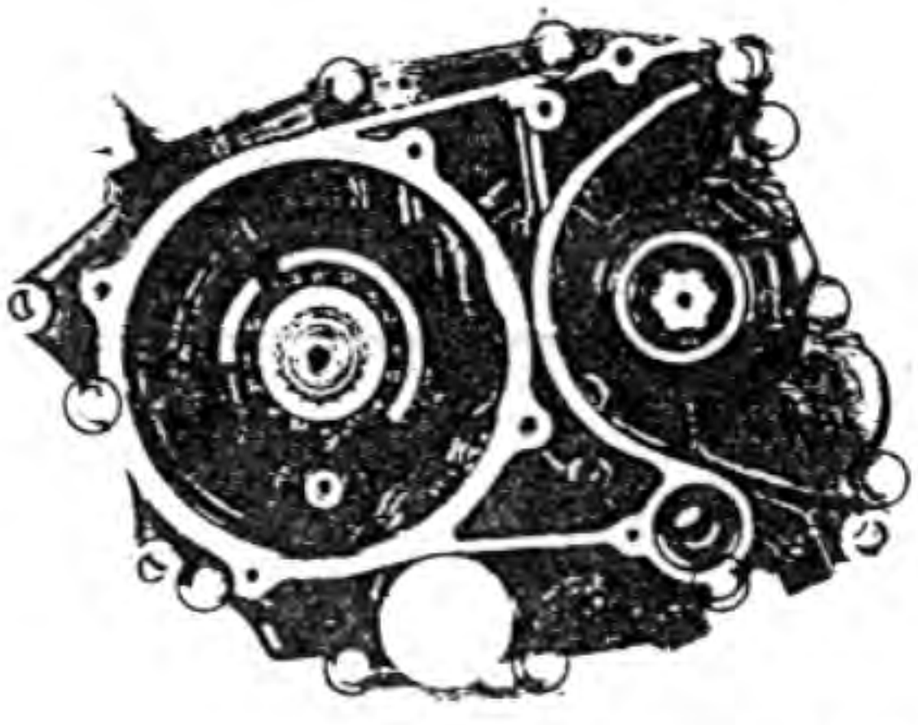
- Make sure that the gasket stays in place during this operation.



Install and tighten the crankcase 6 mm bolts securely.

NOTE

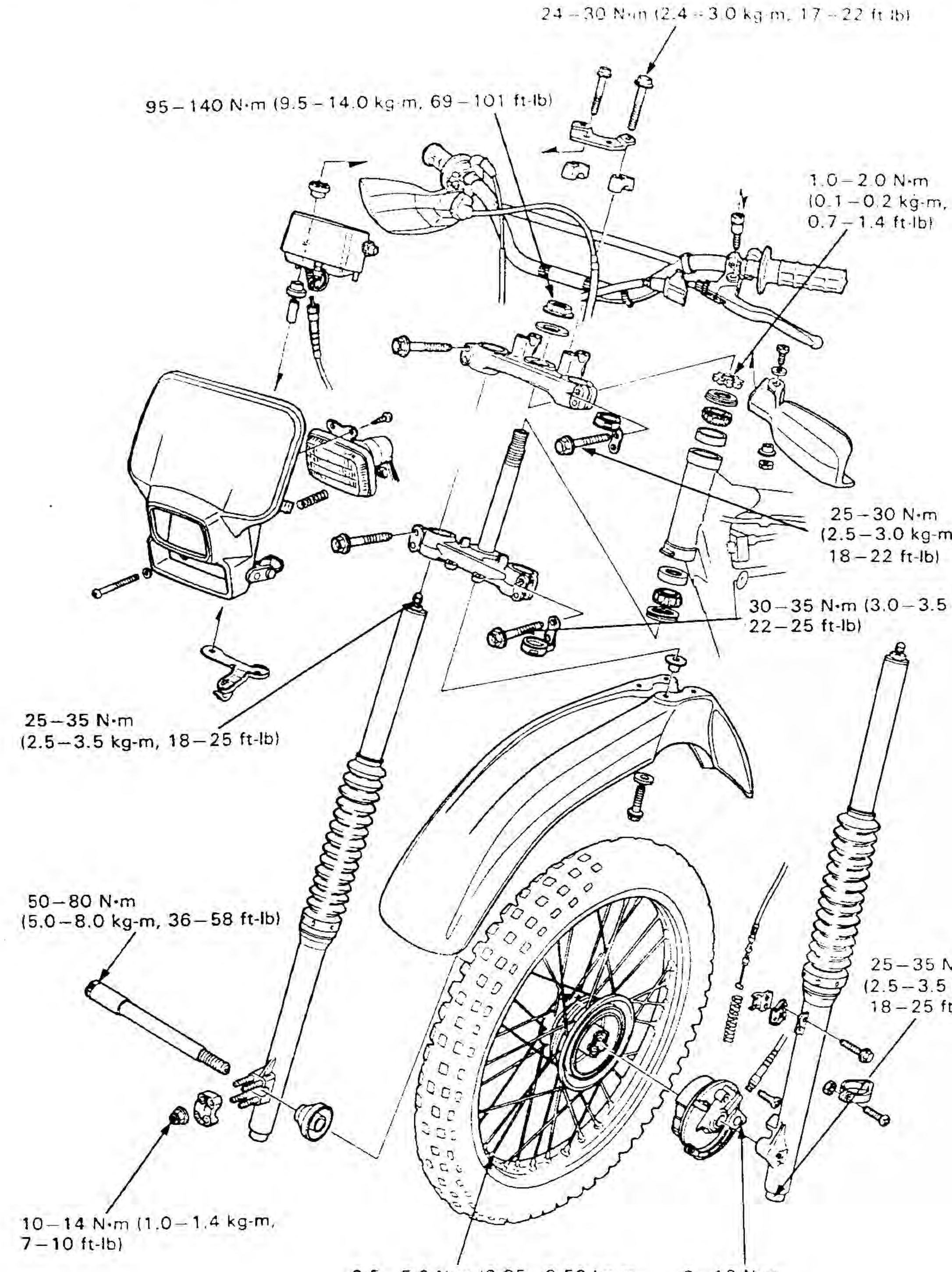
- Tighten the bolts in a crisscross pattern in 2–3 steps.



After tightening, check that the gears rotate freely.

Install the kick starter lever onto the spindle and check the operation.

Install the clutch cable holder, primary drive gear, spring seat, spring and kick starter cam on the right crankcase.
Install the cam chain tensioner (page 10-3).


24 – 30 N·m (2.4 – 3.0 kg-m, 17 – 22 ft-lb)
95 – 140 N·m (9.5 – 14.0 kg-m, 69 – 101 ft-lb)
1.0 – 2.0 N·m
(0.1 – 0.2 kg-m,
0.7 – 1.4 ft-lb)
25 – 30 N·m
(2.5 – 3.0 kg-m,
18 – 22 ft-lb)
30 – 35 N·m (3.0 – 3.5 kg-m
22 – 25 ft-lb)
25 – 35 N·m
(2.5 – 3.5 kg-m, 18 – 25 ft-lb)
50 – 80 N·m
(5.0 – 8.0 kg-m, 36 – 58 ft-lb)
25 – 35 N·m
(2.5 – 3.5 kg-m
18 – 25 ft-lb)
10 – 14 N·m (1.0 – 1.4 kg-m,
7 – 10 ft-lb)
2.5 – 5.0 N·m (0.25 – 0.50 kg-m,
1.8 – 3.6 ft-lb)
8 – 12 N·m
(0.8 – 1.2 kg-m,
6 – 9 ft-lb)

11. FRONT WHEEL/BRAKE/SUSPENSION/STEERING

SERVICE INFORMATION

GENERAL

- A work stand or box is required to support the motorcycle.

WARNING

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

SPECIFICATIONS

ITEM		STANDARD	SERVICE LIMIT
Axle shaft runout		—	0.2 mm (0.01 in)
Front wheel rim runout	Radial	—	2.0 mm (0.10 in)
	Axial	—	2.0 mm (0.10 in)
Front fork spring free length	'86–'88, '90–'91:	596 mm (23.5 in)	590 mm (23.2 in)
	After '92	457.6 mm (18.02 in)	453 mm (17.8 in)
Front fork tube runout		—	0.2 mm (0.01 in)
Front fork oil level	'86–'88, '90–'91:	150 mm (5.9 in)	—
	After '92	116 mm (4.6 in)	—
Front fork air pressure		0 kpa (0 kg/cm², 0 psi)	—
Brake drum		110 mm (4.3 in)	111 mm (4.4 in)
Brake shoe thickness		4.0 mm (0.16 in)	2.0 mm (0.08 in)

TORQUE VALUES

Steering bearing adjustment nut	1.0–2.0 N·m (0.1–0.2 kg-m, 0.7–1.4 ft-lb)
Steering stem nut	95–140 N·m (9.5–14.0 kg-m, 69–101 ft-lb)
Front fork upper pinch bolt	25–30 N·m (2.5–3.0 kg-m, 18–22 ft-lb)
Front fork lower pinch bolt	30–35 N·m (3.0–3.5 kg-m, 22–25 ft-lb)
Handlebar holder bolt	24–30 N·m (2.4–3.0 kg-m, 17–22 ft-lb)
Front axle nut	50–80 N·m (5.0–8.0 kg-m, 36–58 ft-lb)
Front axle holder nut	10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)
Fork cap bolt	25–35 N·m (2.5–3.5 kg-m, 18–25 ft-lb)
Front fork socket bolt	25–35 N·m (2.5–3.5 kg-m, 18–25 ft-lb)
Spokes	2.5–5.0 N·m (0.25–0.5 kg-m, 1.8–3.6 ft-lb)
Rim lock	10–15 N·m (1.0–1.5 kg-m, 7–11 ft-lb)
Brake arm bolt	8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)

TOOLS

Special	
Ball race remover	07953 – 4250002 or 07953 – MJ1000B or 07953 – MJ1000A
Steering stem driver	07946 – 4300101 or 07946 – MB00000 and 07946 – KA6000A or GN – HT – 54 (U.S.A. only)
Fork seal driver, 37 mm I.D.	07947 – 2730100 or 07947 – 3710101
Steering stem socket	07916 – KA50100 or commercially available in U.S.A.
Holder attachment	07930 – KA50100
Common	
Attachment, 32 x 35 mm	07746–0010100
Driver	07749–0010000
Pilot, 15 mm	07746–0040300
Socket wrench, 30 x 32 mm	07716–0020400 ┐ Commercially available in U.S.A.
Extension bar	07716–0020500 ┘
Attachment, 42 x 47 mm	07746–0010300
Bearing remover shaft	07746–0050100
Bearing remover head, 15 mm	07746–0050400

TROUBLESHOOTING

Hard Steering
- Steering stem nut too tight.
- Faulty steering stem bearing.
- Damaged steering stem bearing.
- Insufficient tire pressure.

Steers to One Side or Does Not Track Straight
- Bent front forks.
- Bent front axle, wheel installed incorrectly.

Front Wheel Wobbling
- Bent rim.
- Worn front wheel bearing.
- Bent or broken spokes.
- Faulty tire.
- Axle not tightened properly.

Soft Suspension
- Weak fork springs.
- Insufficient fluid in front forks.
- Incorrect fork air pressure.

Hard Suspension
- Incorrect fluid weight in front forks.
- Incorrect fork air pressure.
- Fork tube bent.

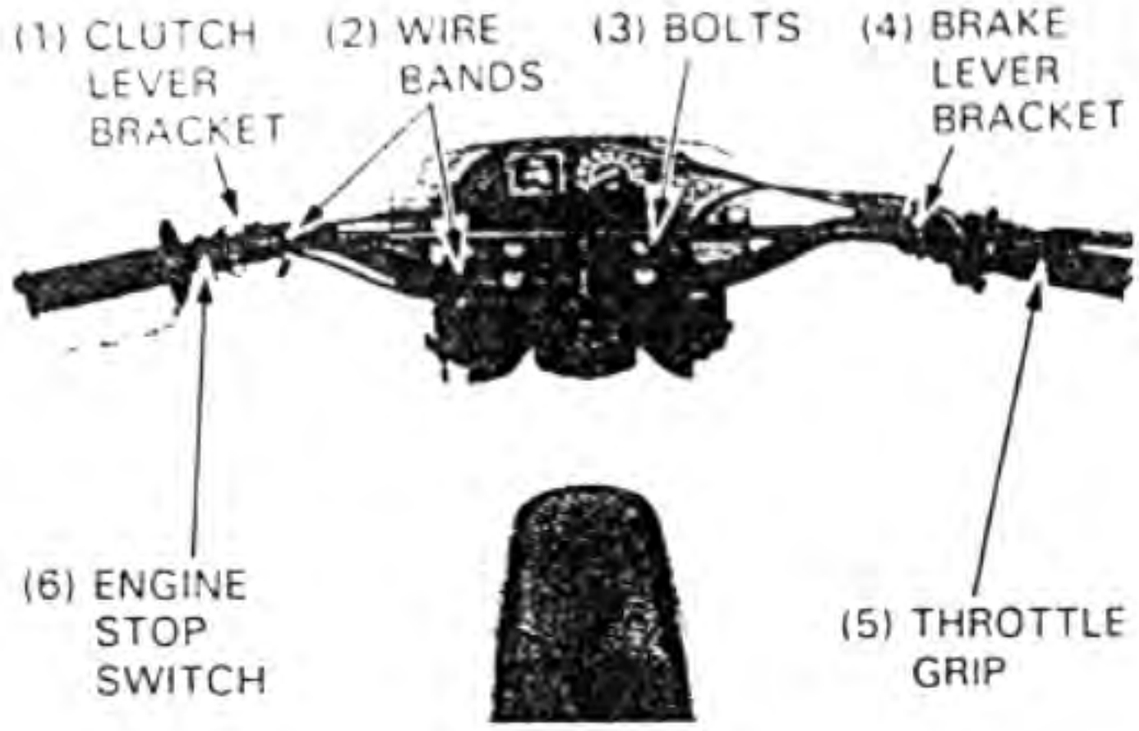
Front Suspension Noise
- Slider binding.
- Insufficient fluid in fork.
- Loose front fork fasteners.

Improper Brake Performance
- Brake shoes contaminated.
- Brake shoes worn.
- Brake cam worn.
- Brake drum worn.
- Brake arm serrations improperly engaged.

HANDLEBAR

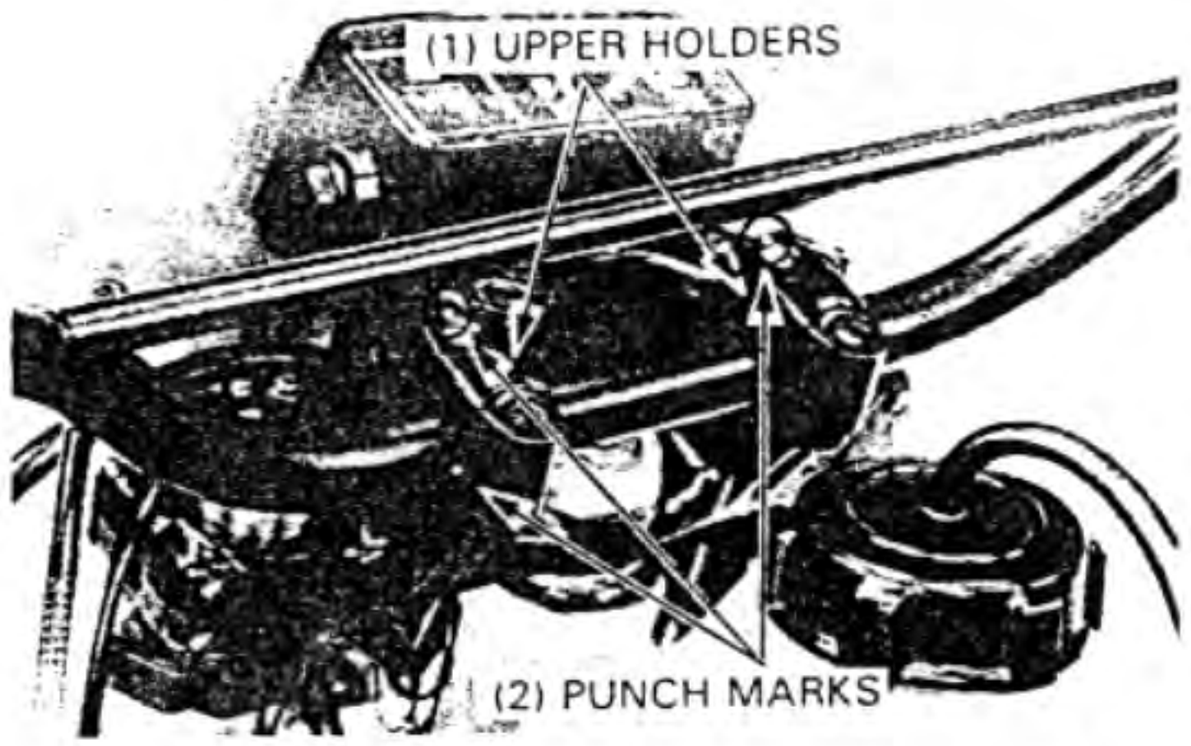
REMOVAL

Remove the followings:
- wire bands
- engine stop switch
- clutch lever bracket (by disconnecting the clutch cable)
- throttle grip
- brake lever bracket
- handlebar holder bolts and upper holders
- handlebar



INSTALLATION

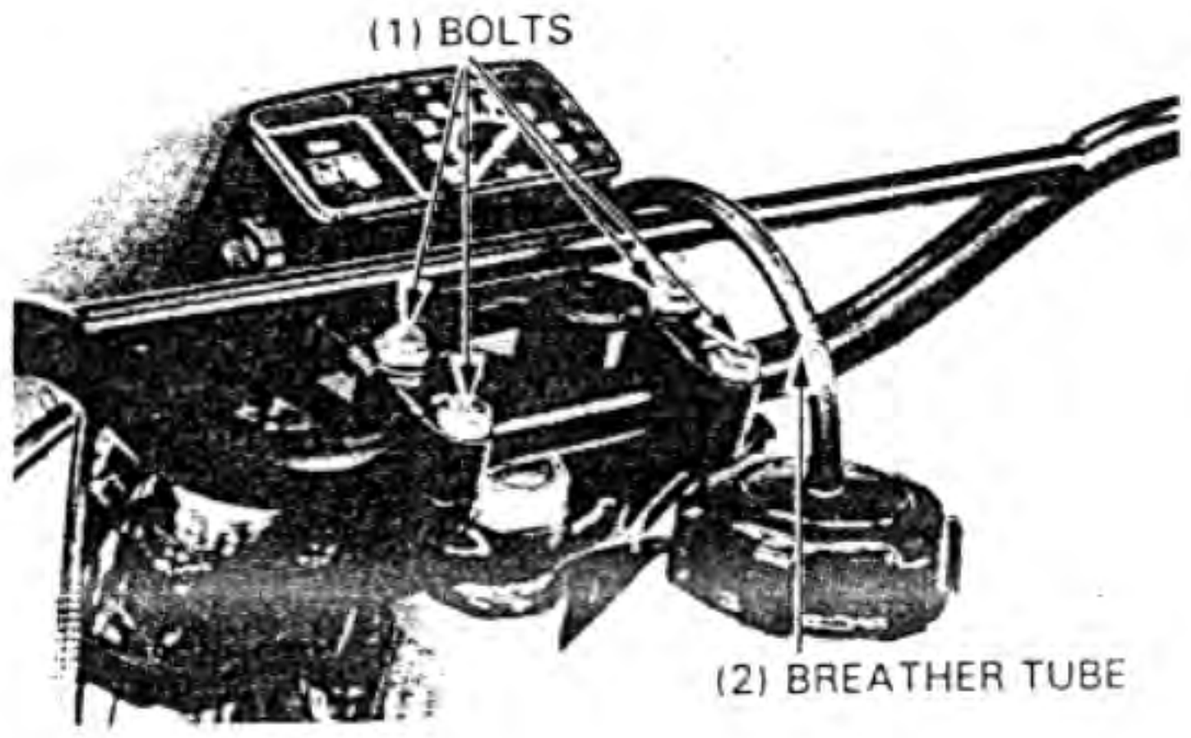
Install the handlebar.
Align the punch mark on the handlebar with the top edge of the lower holders.
Place the upper holders on the handlebars with the punch marks facing forward.



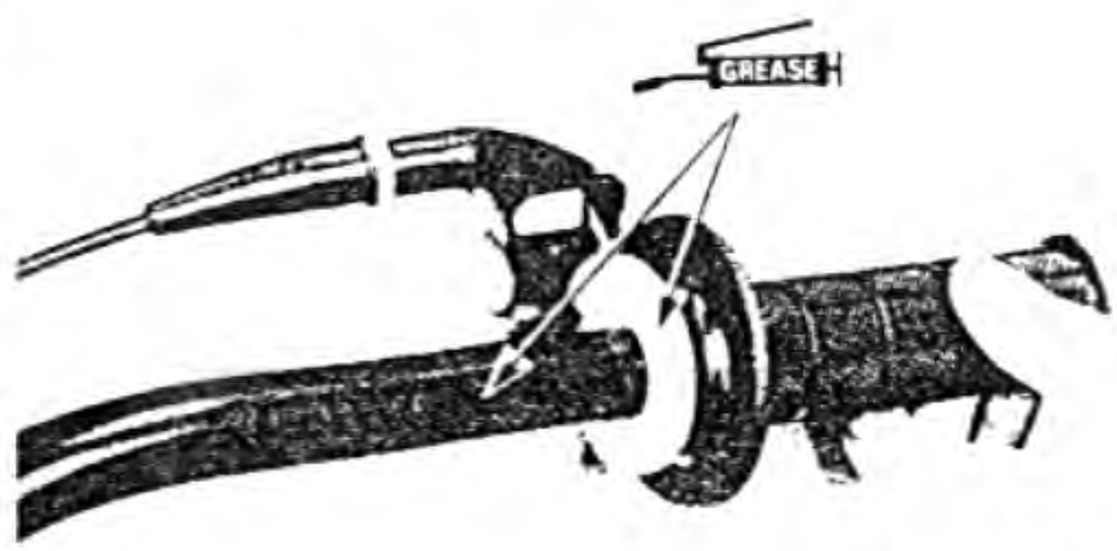
Insert the forward bolts through the speedometer bracket, upper holders and lower holders.
Tighten the forward bolts first, then tighten the rear bolts.

TORQUE: 24—30 N·m (2.4—3.0 kg-m, 17—22 ft-lb)

Install the fuel tank breather tube.



Apply a little grease to the throttle grip sliding surface and throttle housing and slide the throttle grip over the handlebar.

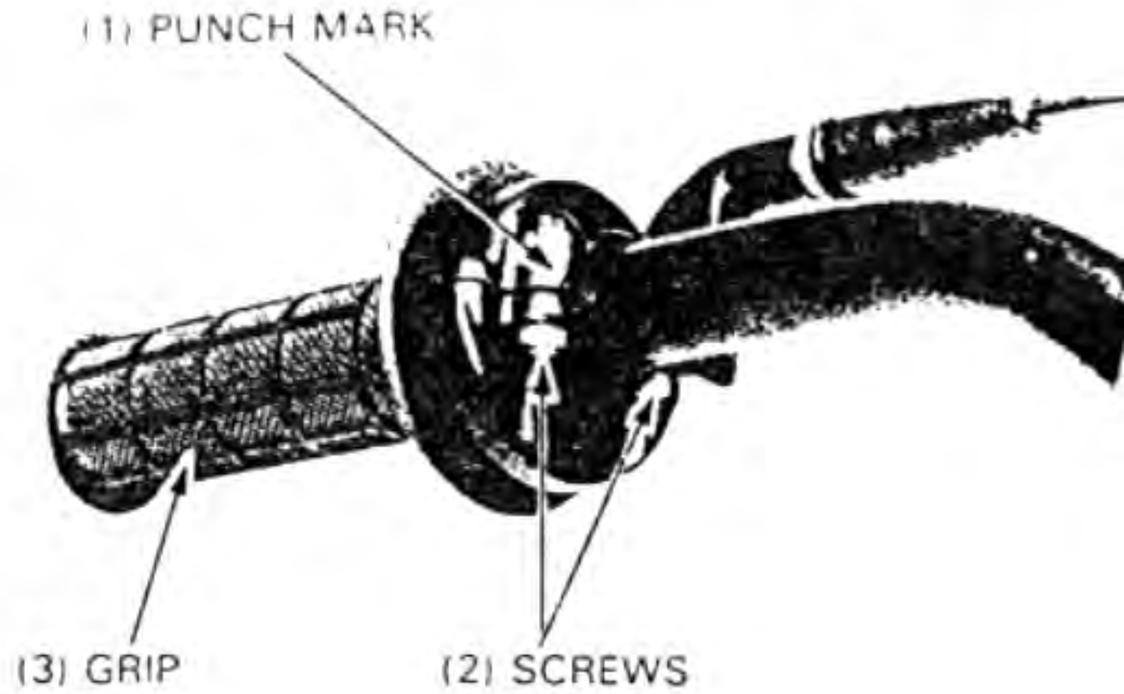


If you remove the rubber grip, apply Honda Bond A, Honda Grip Cement (U. S. A. only) to the inside surface of the grips and to the clean surface of the left handlebar and throttle pipe. Wait 3 – 5 minutes and install the grips. Rotate the grips for even application of the adhesive.

NOTE

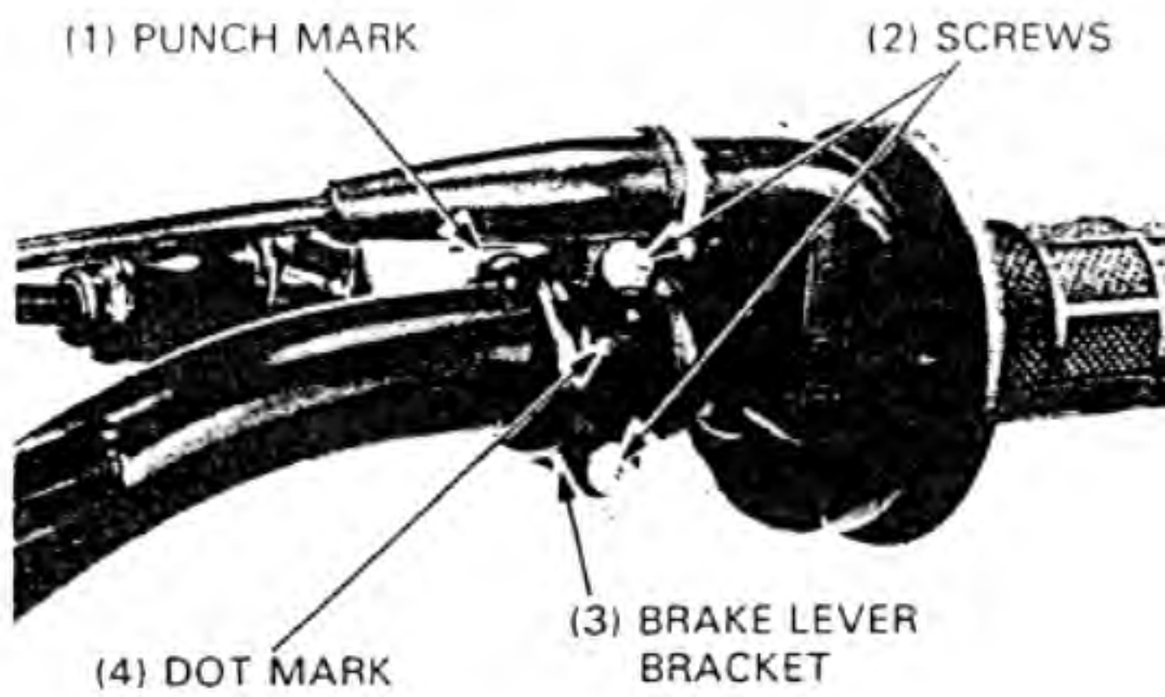
- Allow the adhesive to dry for an hour before using.

Align the split line of the throttle grip with the punch mark on the handlebar.
Tighten the forward screw first, then tighten the rear screw.

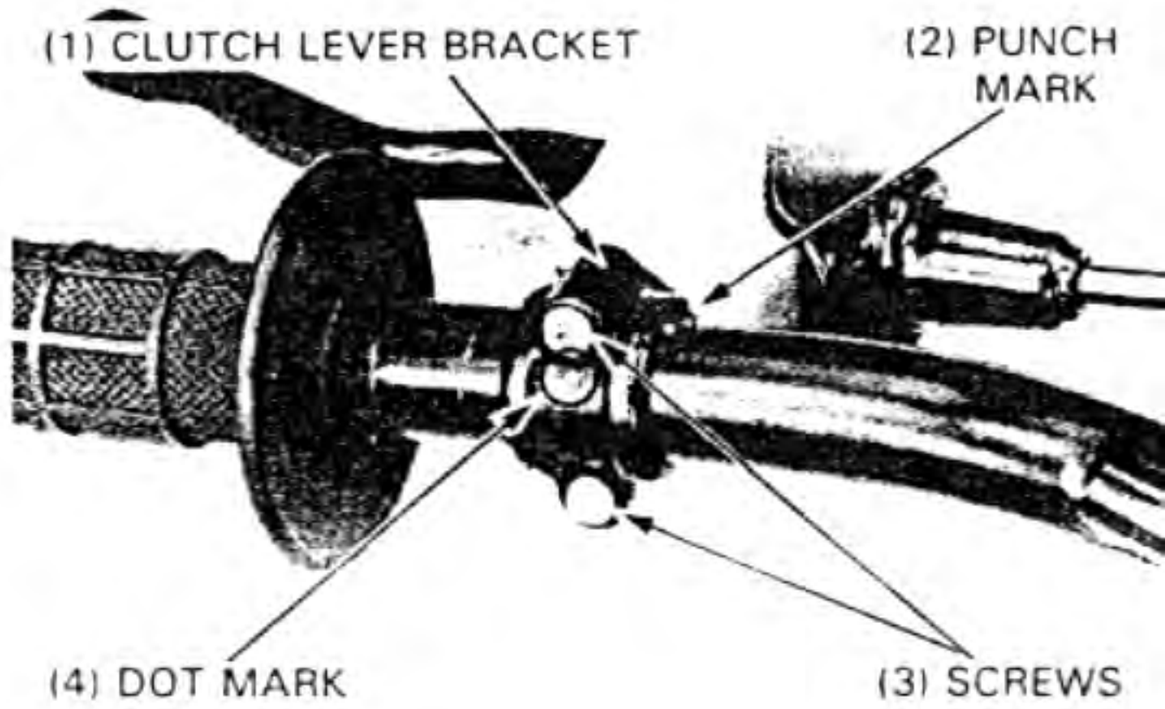


Install the brake lever bracket with the dot mark on the holder facing up.

Align the punch mark on the handlebar with the split of the brake lever bracket and install the bracket.
Tighten the upper screw first, then tighten the lower screw.

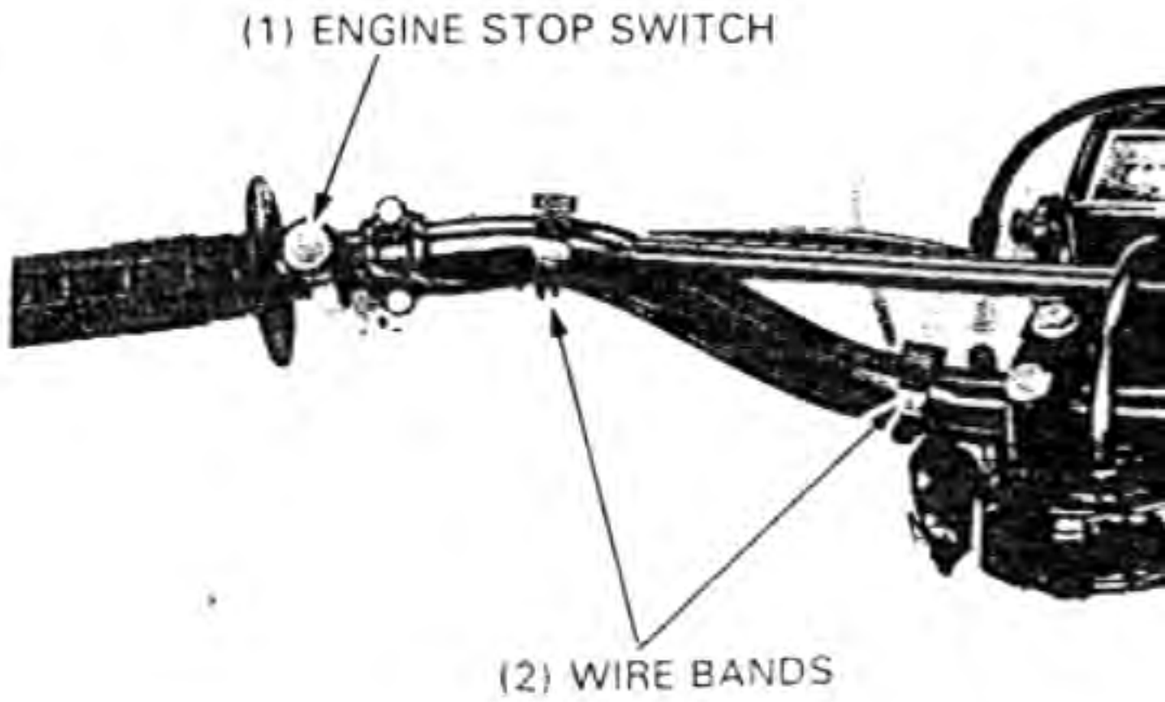


Install the clutch lever bracket with the dot mark on the holder facing up.
Align the punch mark on the handlebar with the split of the clutch lever bracket.
Tighten the upper screw first, then tighten the lower screw.
Connect the clutch cable.



Install the engine stop switch and connect its wires to the wire harness.
Install the wire bands.

Adjust the clutch (page 3-13).
Adjust the throttle cable (page 3-5).



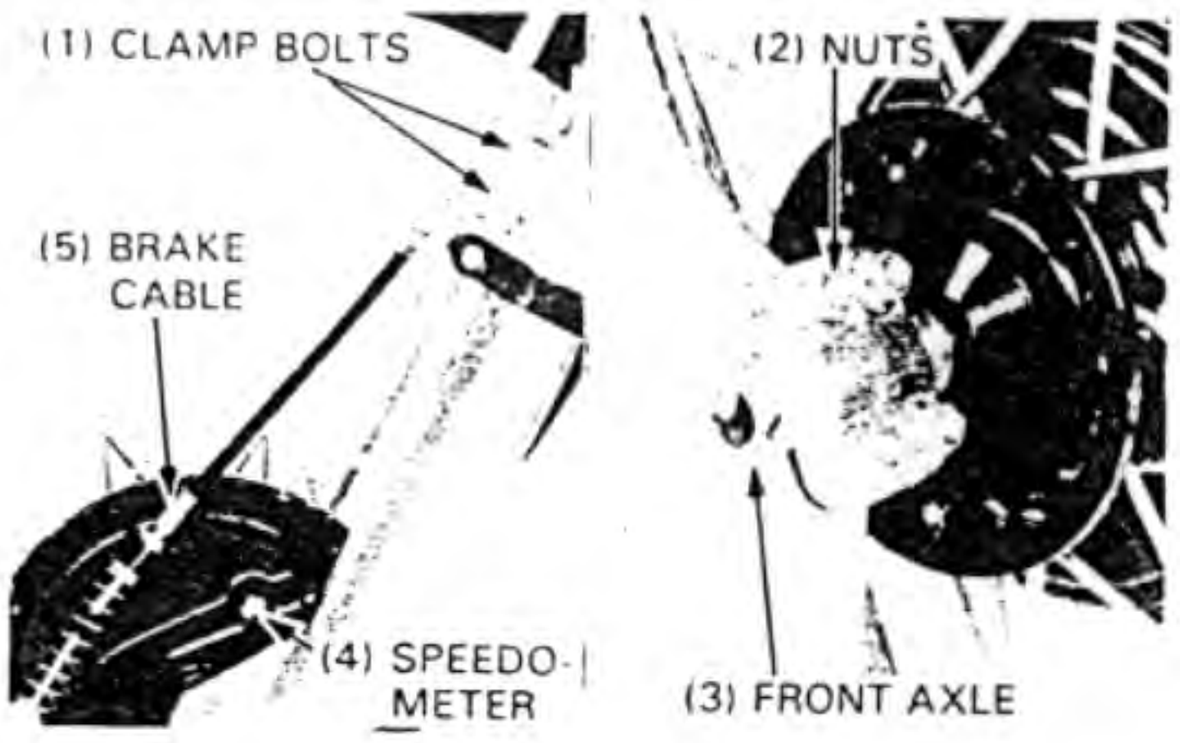
FRONT WHEEL

REMOVAL

Raise the front wheel off the ground by placing a block or safe work stand under the engine.
Remove the brake cable clamp bolts. Disconnect the front brake cable from the brake lever on the front wheel.

'86 through '88:
Disconnect the speedometer cable from the speedometer gearbox.

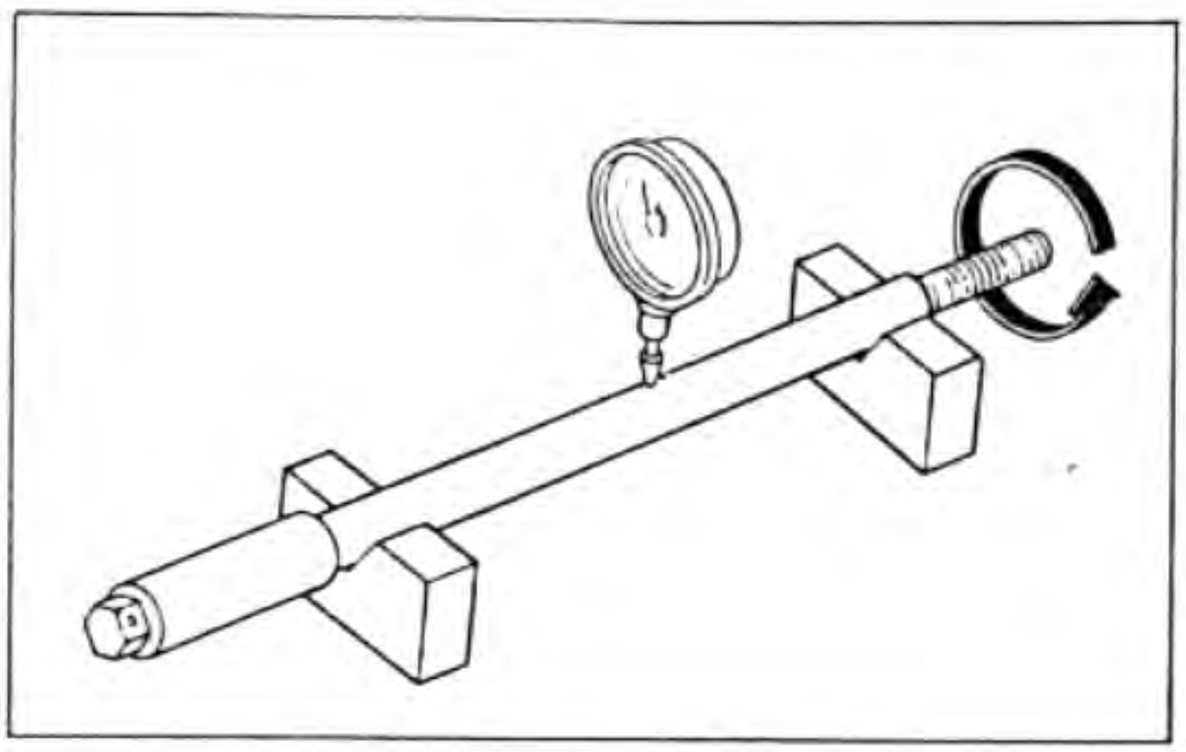
'86 through '88 and After '89:
Loosen the axle shaft holder nuts and remove the front axle.
Remove the front wheel.



FRONT AXLE RUNOUT

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

SERVICE LIMIT: 0.2 mm (0.01 in)



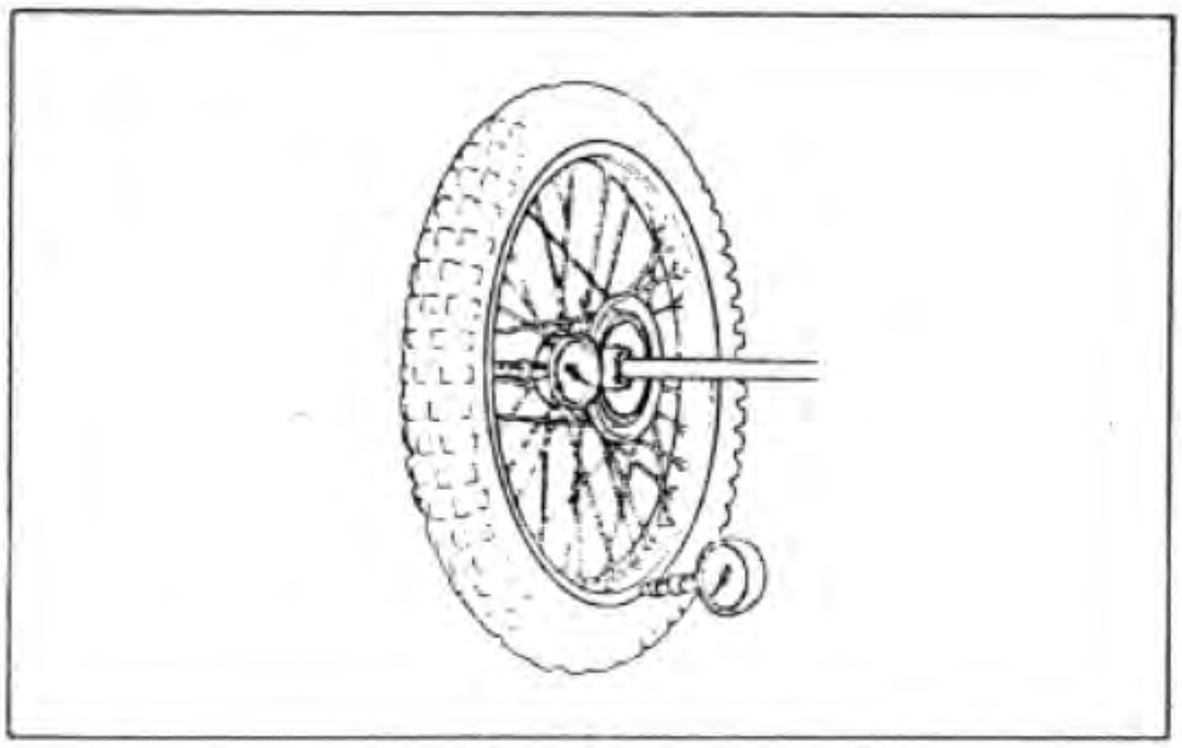
WHEEL RIM RUNOUT

Check the wheel rim for runout by placing the wheel in a truing stand. Spin the wheel by hand and read the runout using a dial indicator.

SERVICE LIMIT:
RADIAL: 2.0 mm (0.10 in)
AXIAL: 2.0 mm (0.10 in)

Tighten any loose spokes.

TORQUE: 2.5–5.0 N·m (0.25–0.5 kg-m, 1.8–3.6 ft-lb)



WHEEL BEARING INSPECTION

Turn the inner race of each bearing with your finger. The bearings should turn smoothly and quietly.

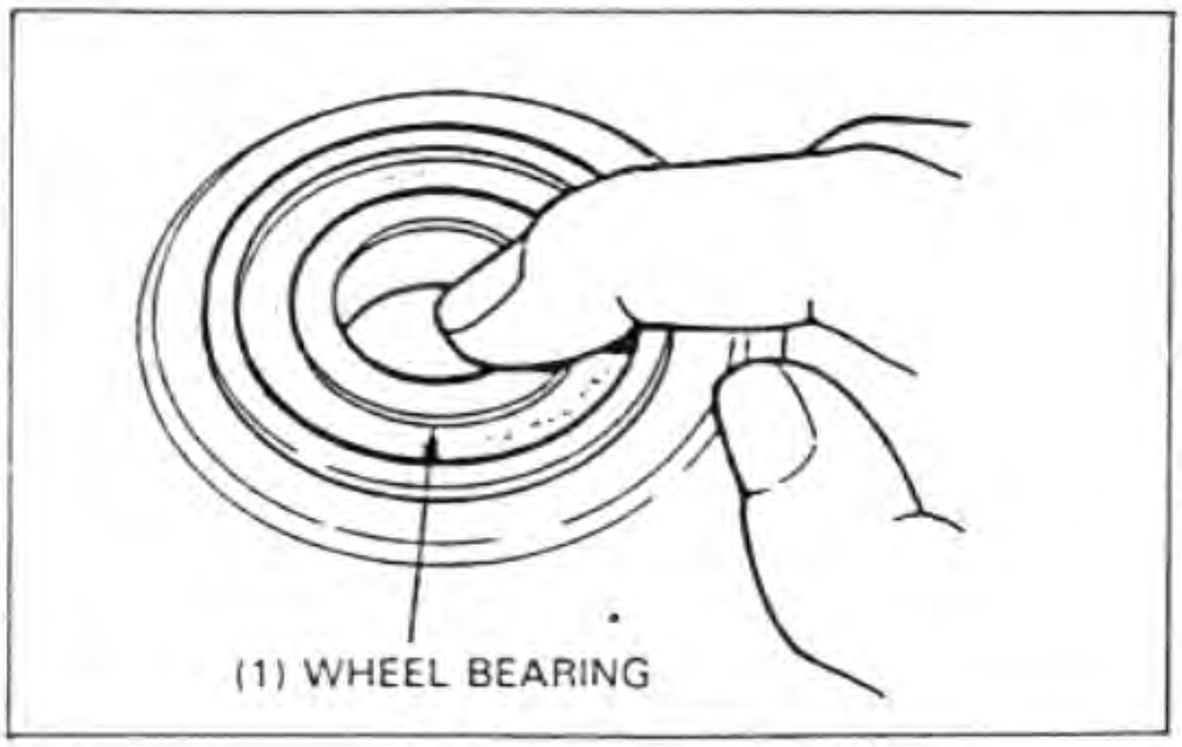
Also check that the bearing outer race fits tightly in the hub.

Remove and discard the bearings if the races do not turn smoothly, quietly, or if they fit loosely in the hub.

NOTE

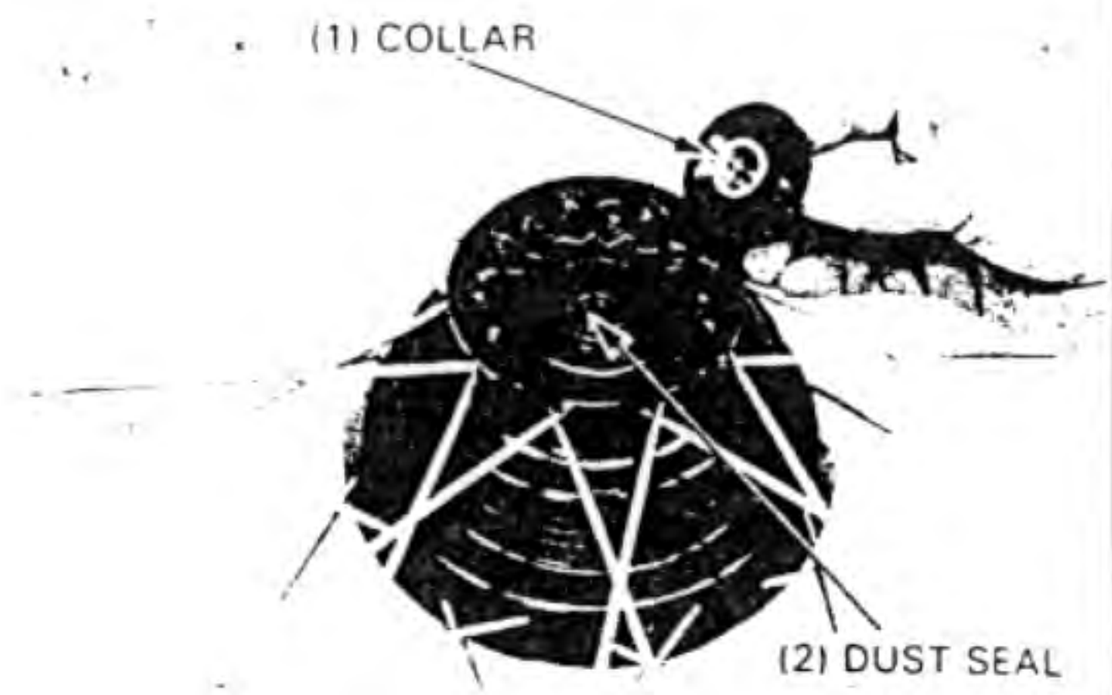
- Replace wheel bearings in pairs.

For bearing replacement, see page 11-6.



DISASSEMBLY

Remove the collar and dust seal from the hub.

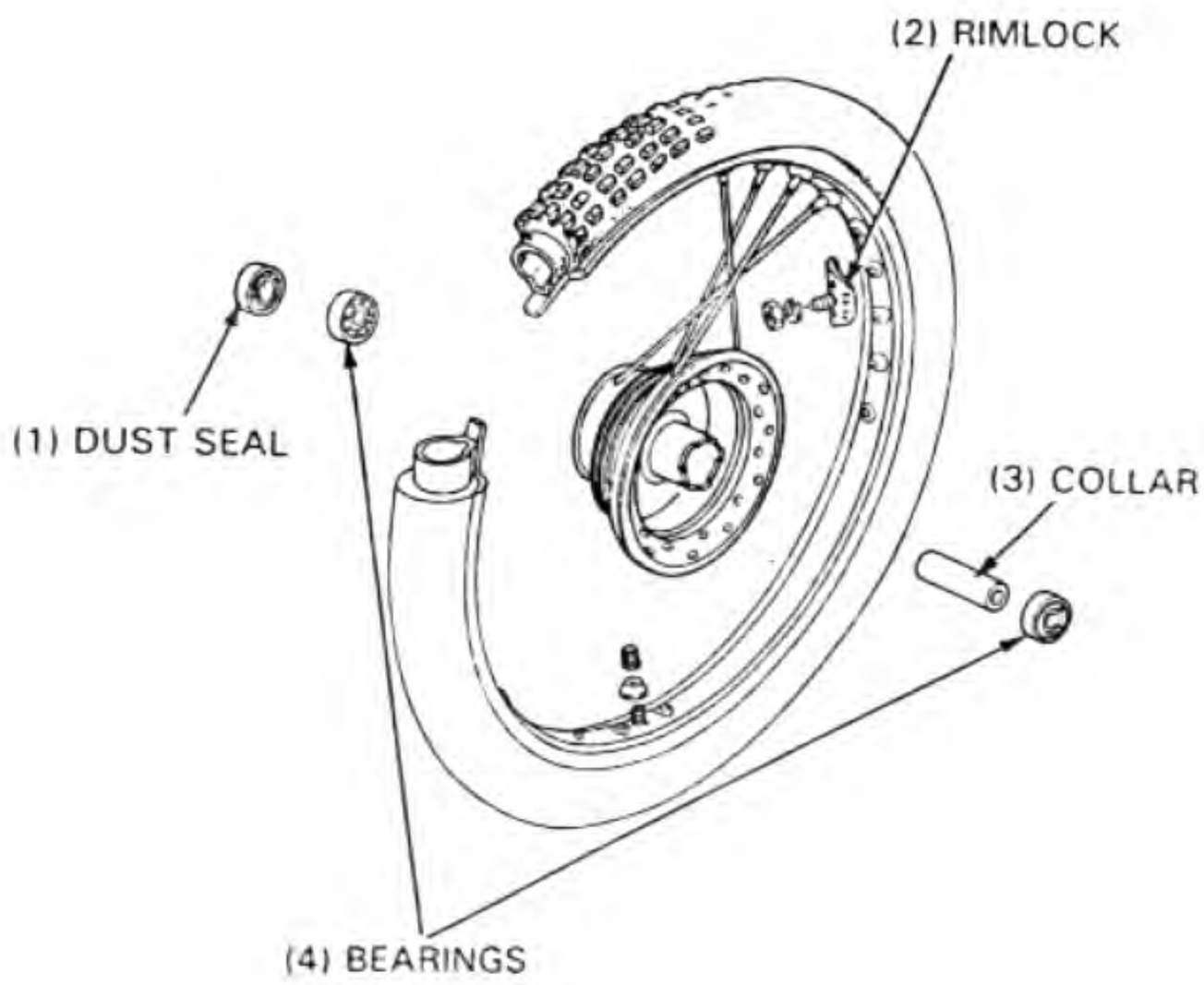


Remove the wheel bearings and the distance collar from the hub.

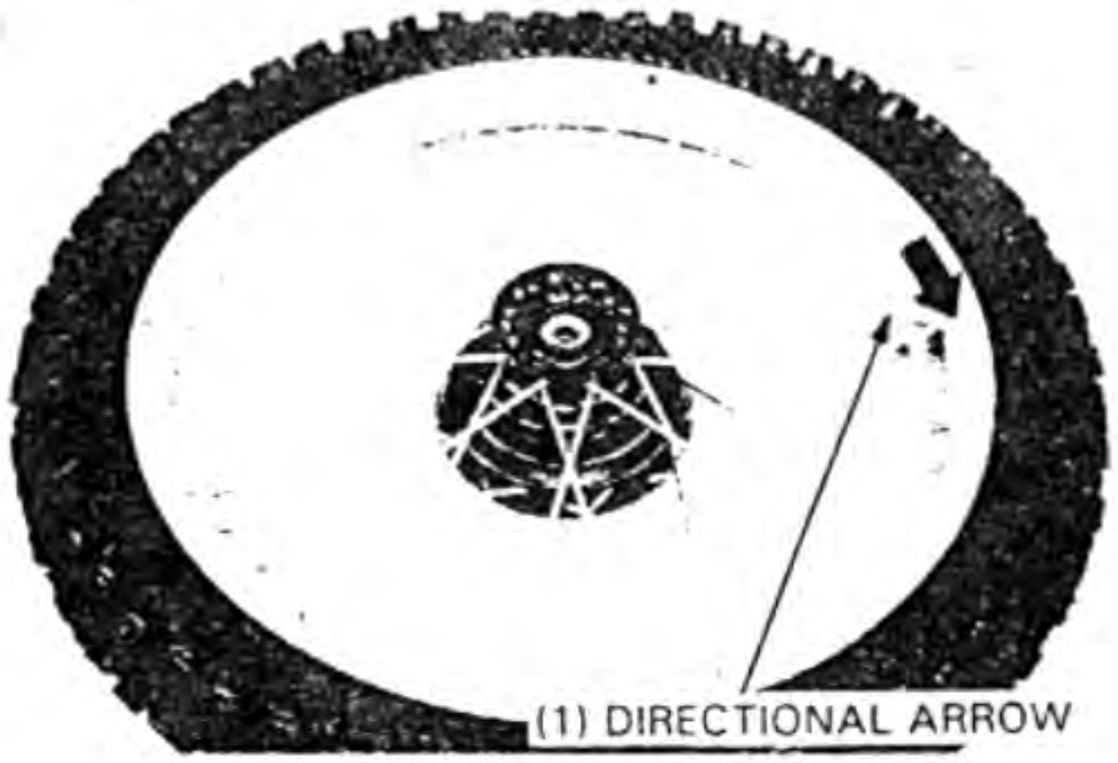
NOTE

- Never reinstall old bearings, once the bearings have been removed. They must be replaced with new ones.

ASSEMBLY



Place the rim on the workbench, with its directional arrow going clockwise.
Place the hub in the center, and begin lacing with new spokes.



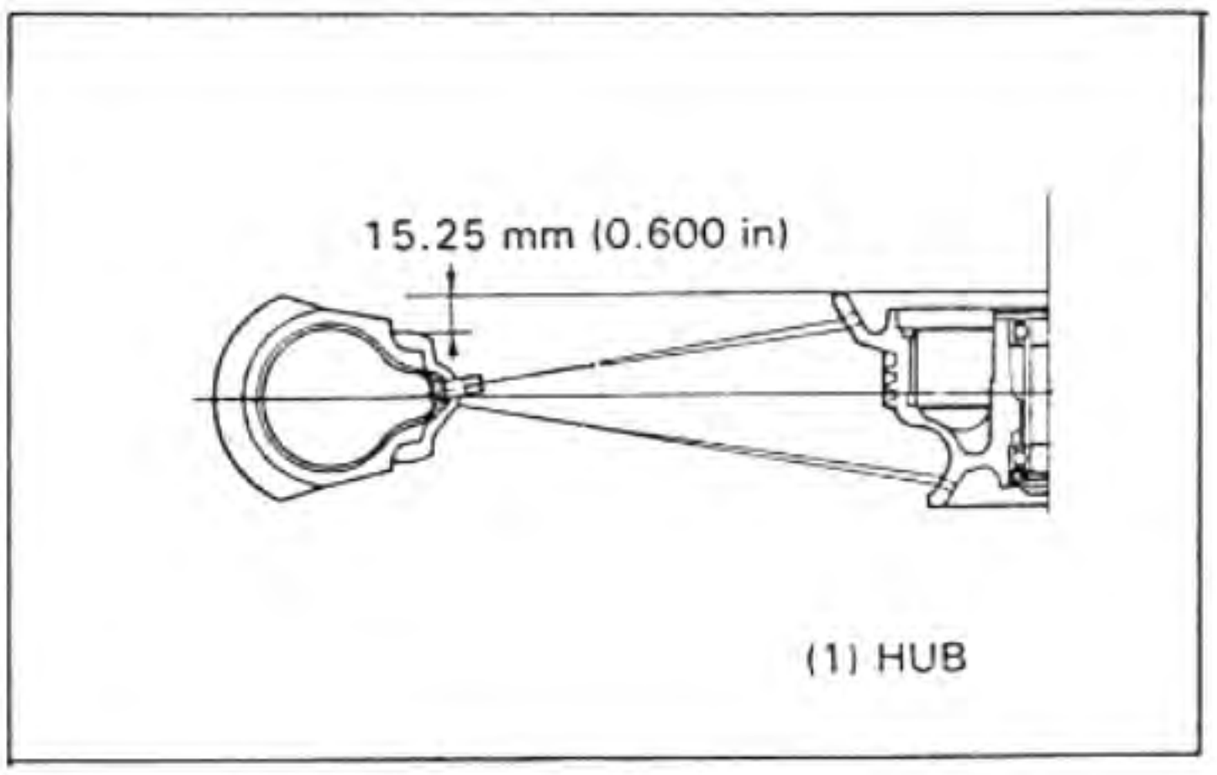
Adjust the hub position so that the distance from the hub left end surface to the side of rim is 15.25 mm (0.600 in) as shown.
Tighten the spokes in 2 or 3 progressive steps.

TORQUE: 2.5–5.0 N·m (0.25–0.50 kg-m, 1.8–3.6 ft-lb)

Install the rim band, rim lock, tube, and the tire.
Tighten the rim lock.

TORQUE: 10–15 N·m (1.0–1.5 kg-m, 7–11 ft-lb)

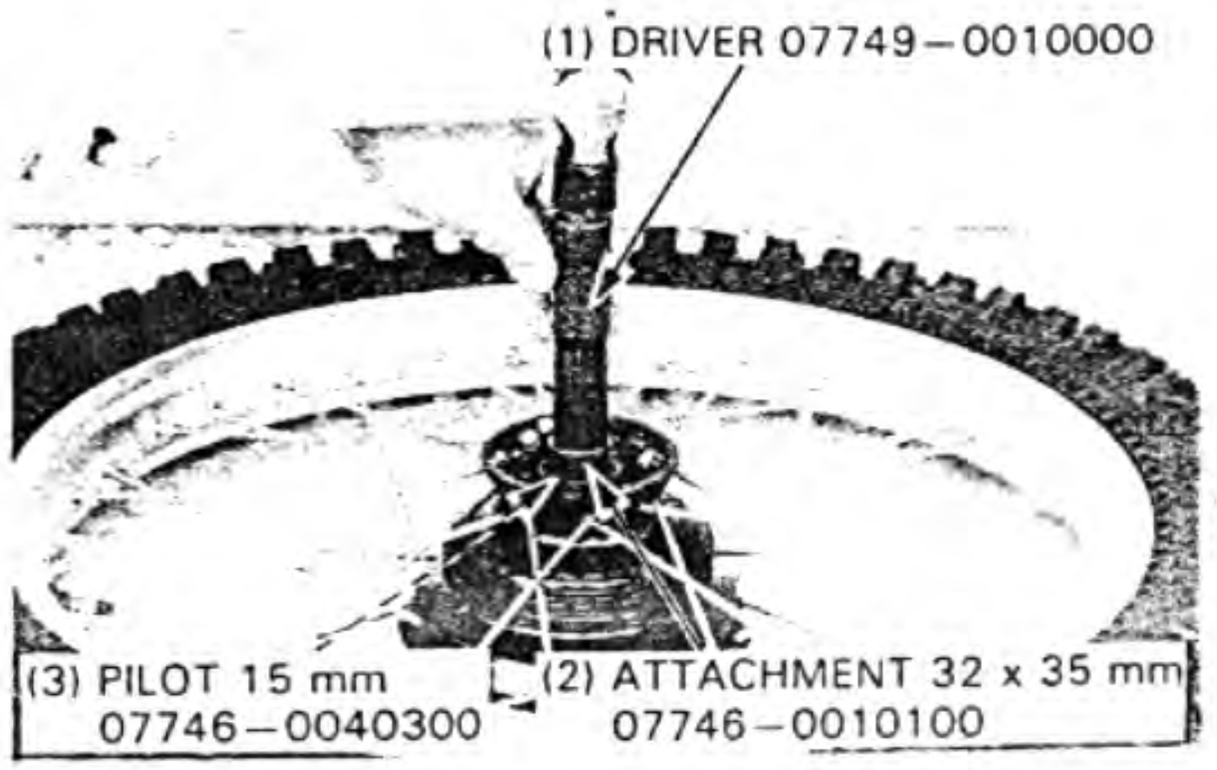
Check the wheel rim runout as shown on page 11-5, and adjust as required.



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

NOTE

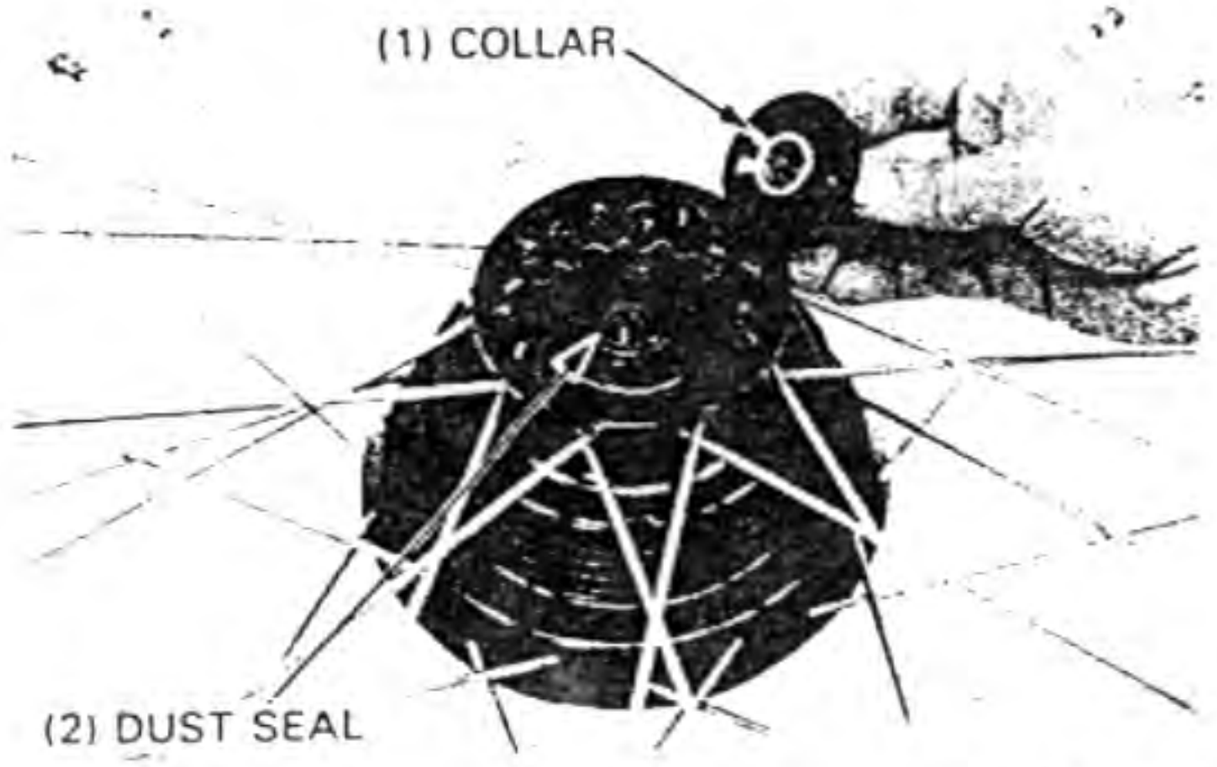
- Install the bearings with the sealed ends toward the outside.
- Be sure to drive the bearings in squarely.



Apply grease to the lip of the new dust seal.
Install the dust seal and collar into the wheel hub.

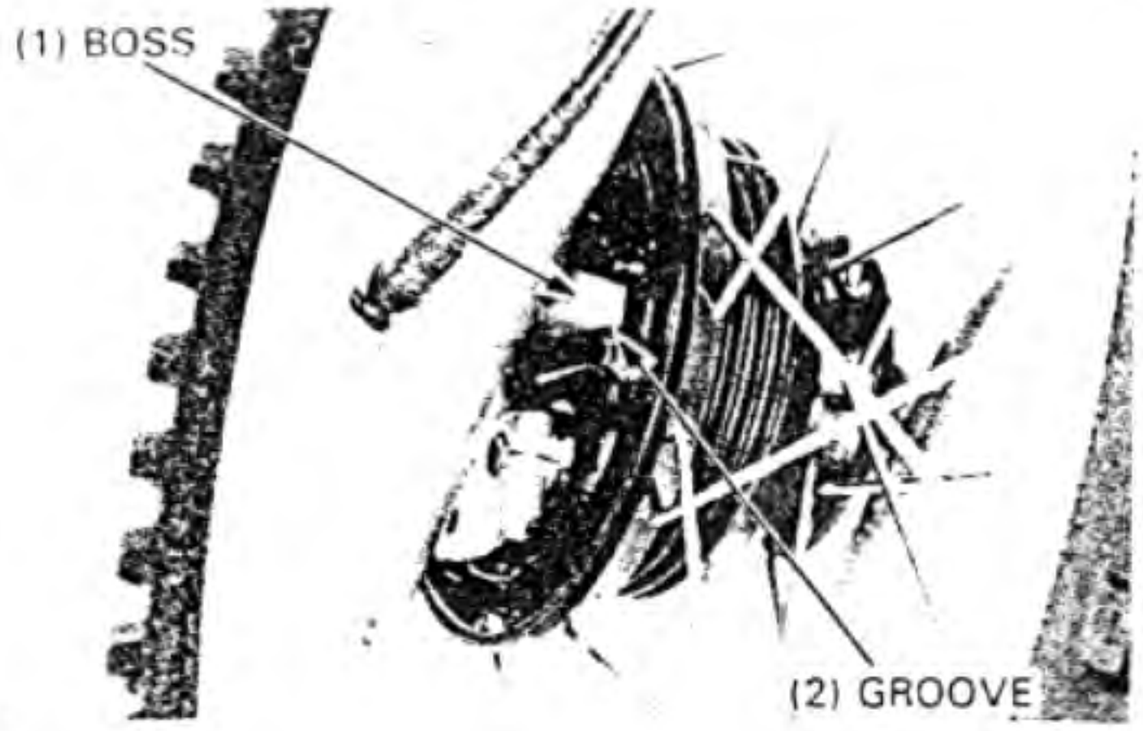
WARNING

- *Grease on the brakes reduces stopping power. Keep grease off the brake drum. Wipe excess grease off the cam.*



INSTALLATION

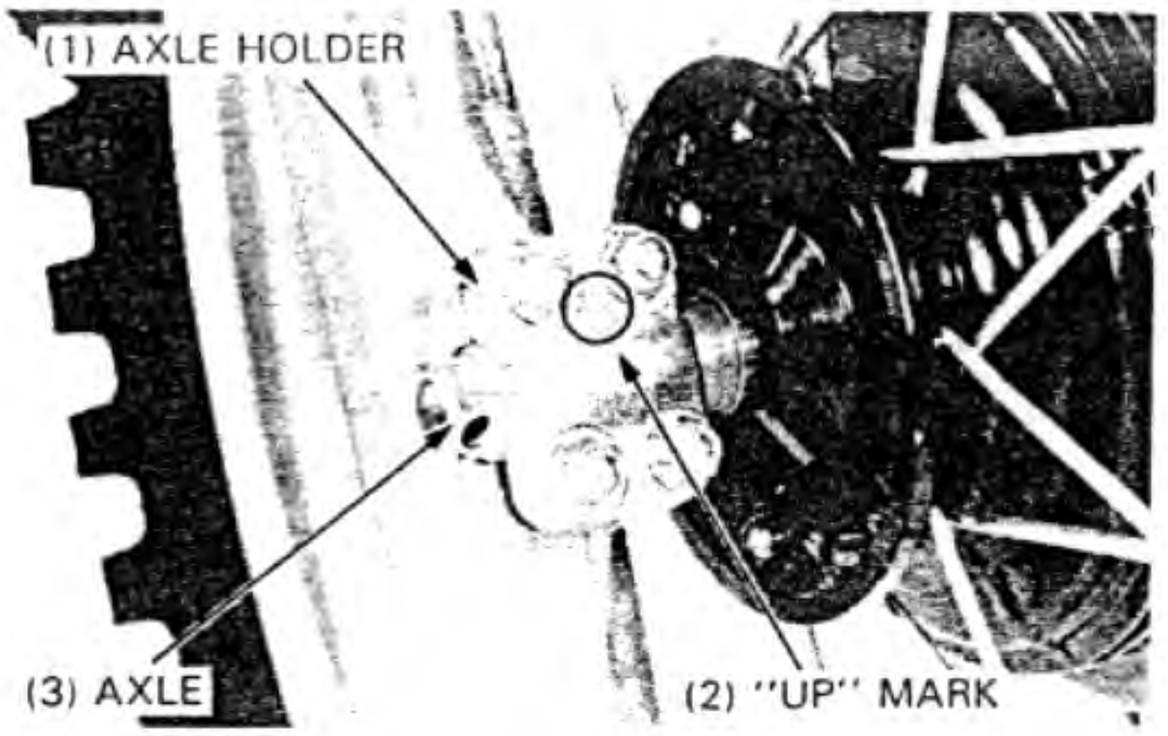
Install the front wheel, aligning the boss on the left fork leg with the groove in the brake panel.



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

Tighten the axle to the specified torque.

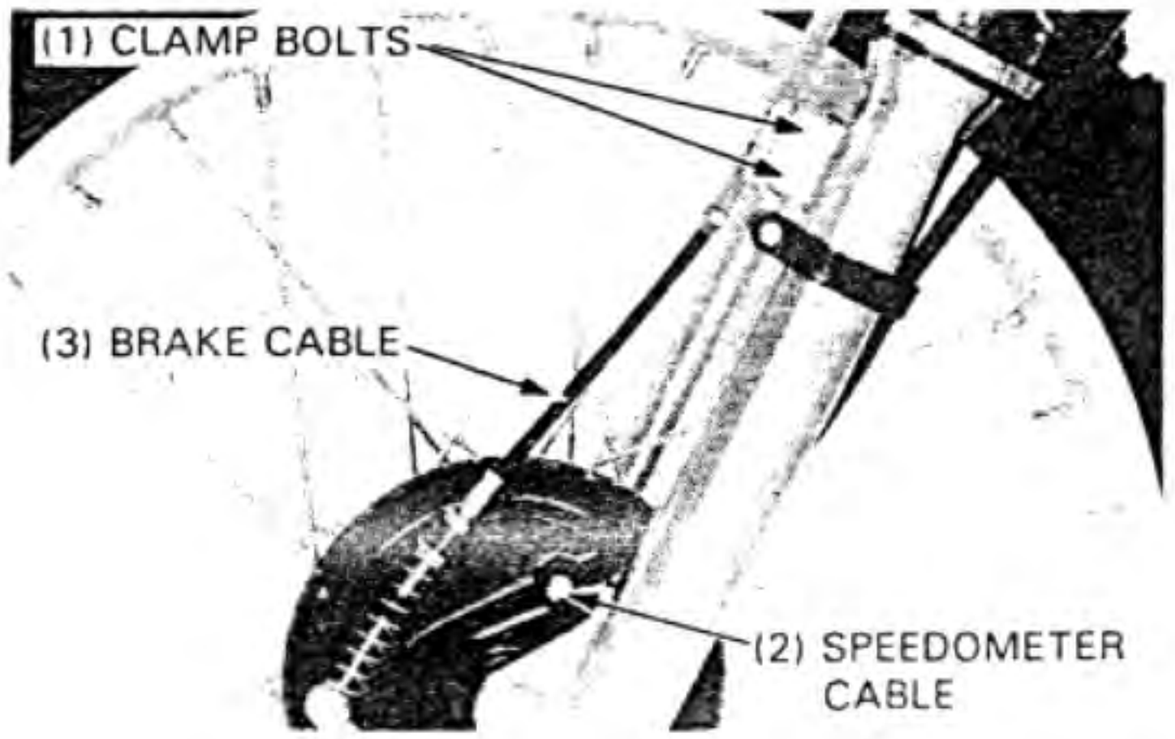
TORQUE: 50–80 N·m (5.0–8.0 kg-m, 36–58 ft-lb)



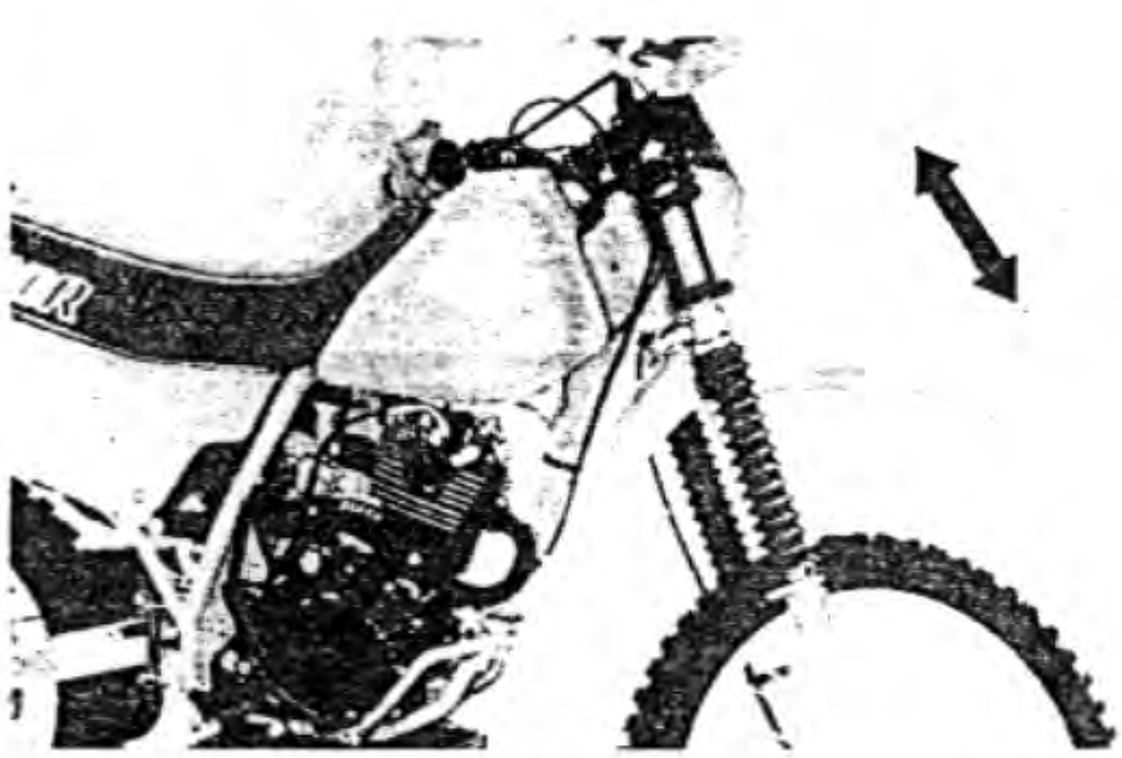
'86 through '88:
Connect the speedometer cable.

'86 through '88 and After '89:
Connect the front brake cable.
Adjust the front brake free play (page 3-12).

Install the brake cable on the brake cable clamp and tighten the brake cable clamp bolts securely.

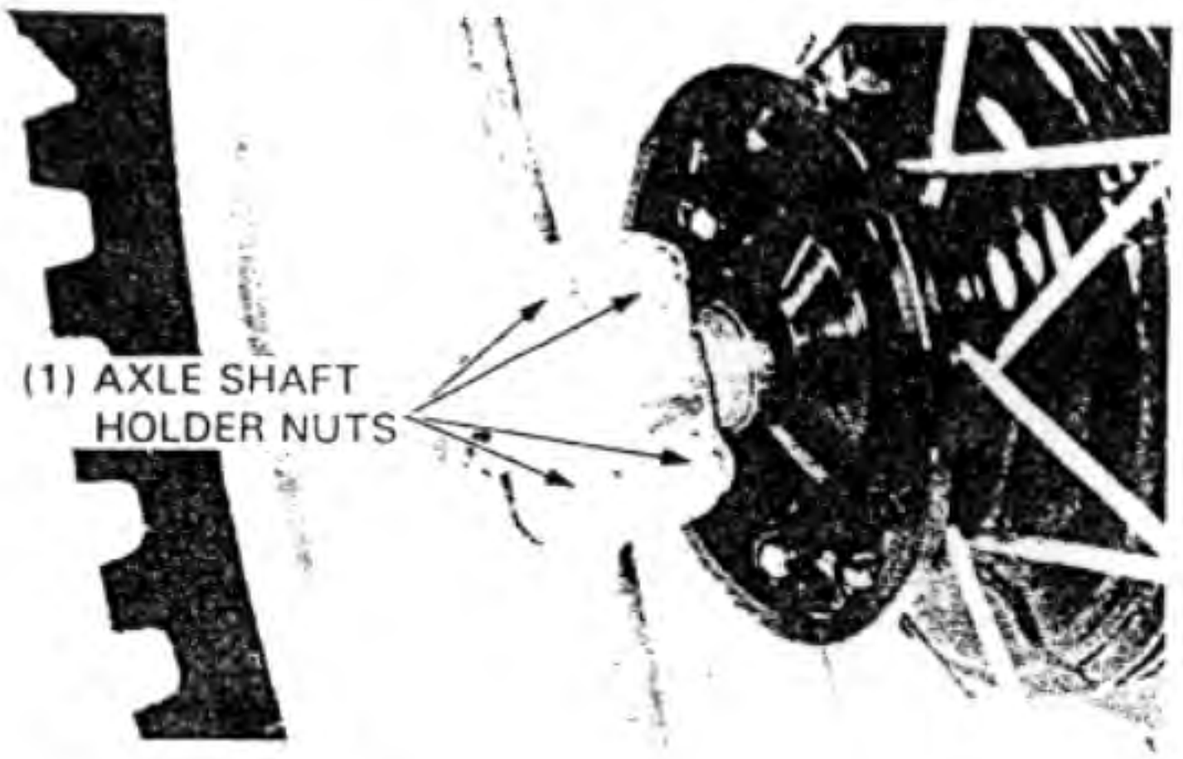


With the front brake applied, pump the front forks up and down several times to seat the axle in the axle holder.



Tighten the axle shaft holder nuts, the upper nuts first and then the lower nuts, in 2 – 3 steps.

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



FRONT BRAKE

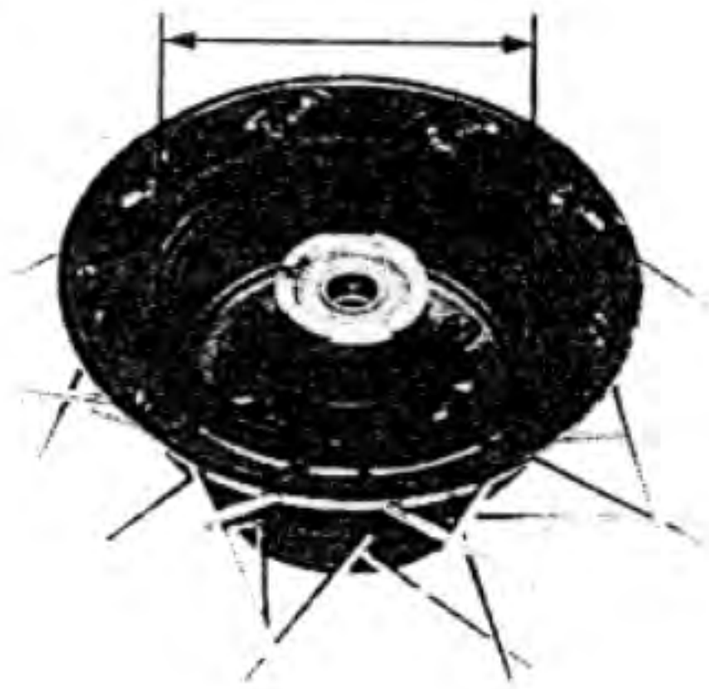
REMOVAL

Remove the front wheel and front brake panel (page 11-5).

BRAKE DRUM INSPECTION

Measure the I.D. of the brake drum.

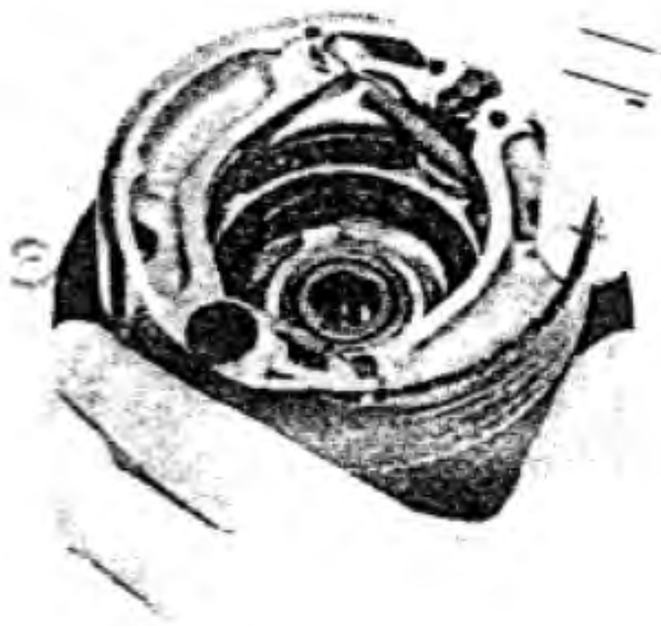
SERVICE LIMIT: 111 mm (4.4 in)



BRAKE LINING INSPECTION

Check the brake shoe springs for fatigue or damage.
Check the brake cam for wear or cracks.
Measure the brake lining thickness.

SERVICE LIMIT: 2.0 mm(0.08 in)

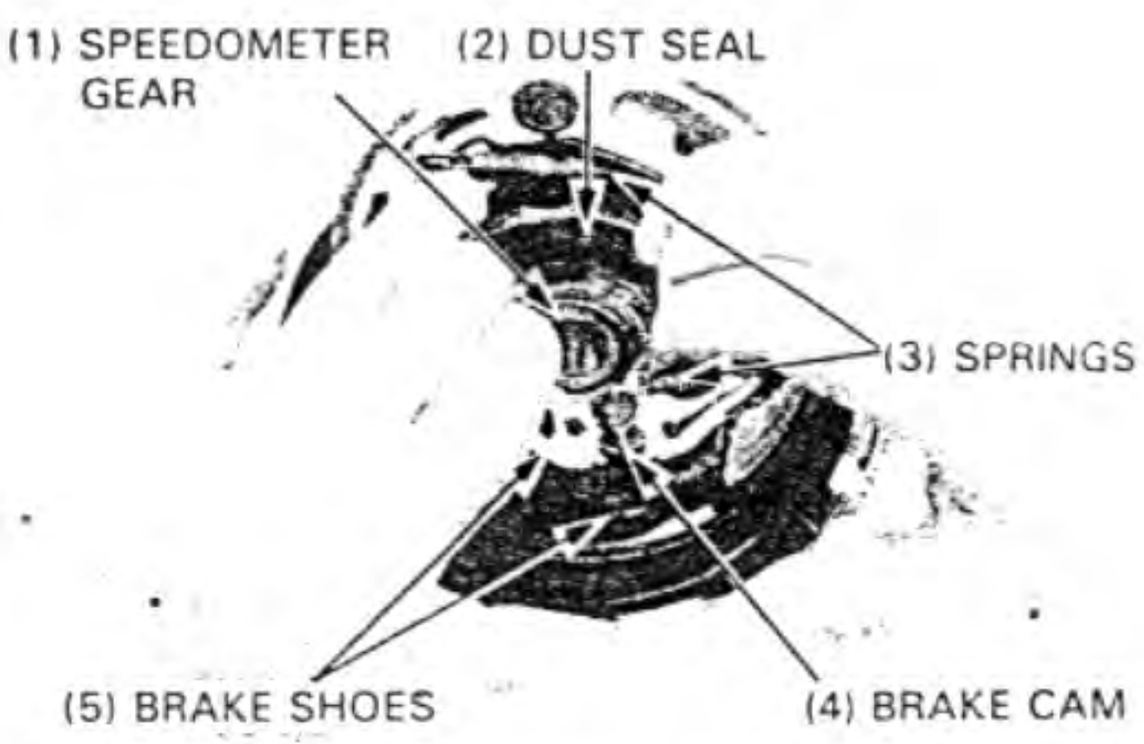


BRAKE PANEL DISASSEMBLY

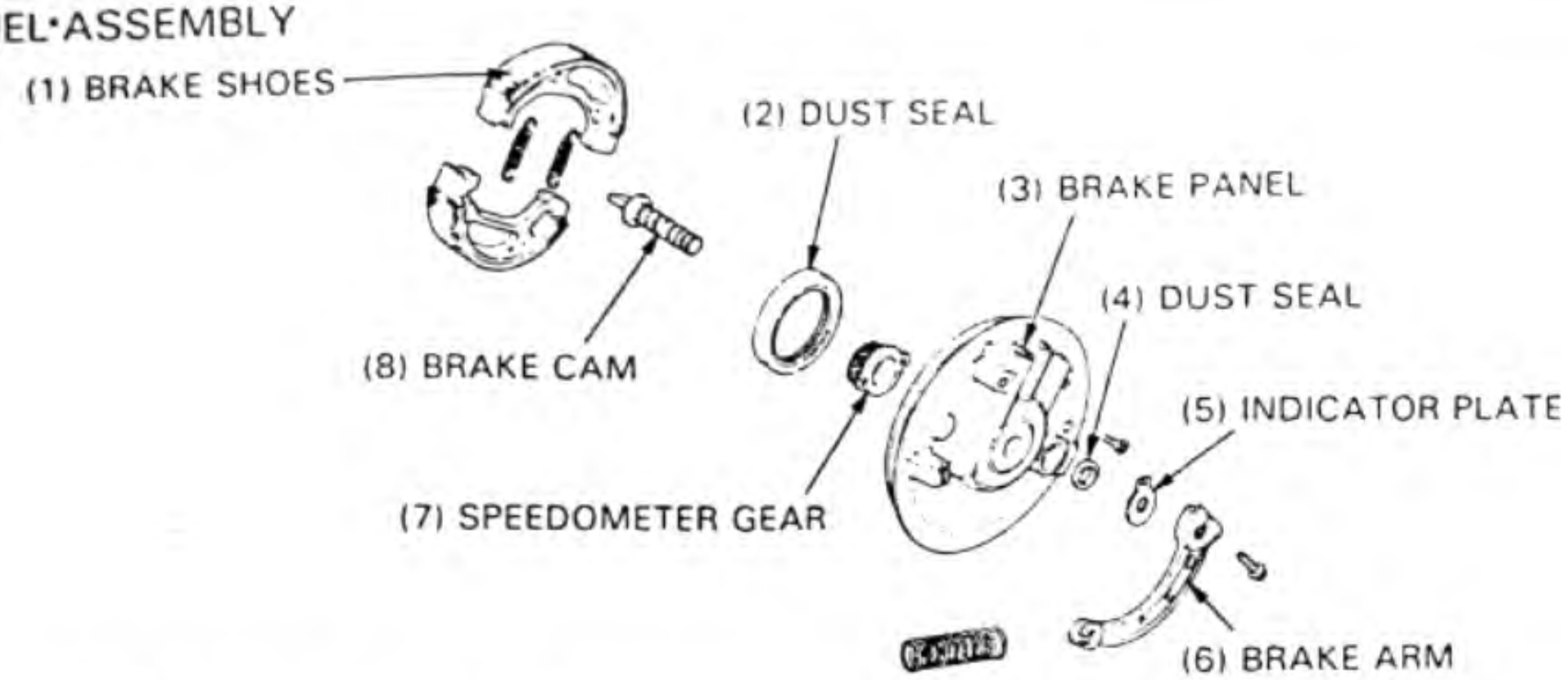
NOTE

- Mark the side of the brake shoes to indicate their original position, before removing them.

Pull the brake shoes apart and remove them from the brake panel.
Remove the springs.
Remove the brake arm, indicator plate, dust seal, and brake cam.
Remove the speedometer gear and the dust seal from the brake panel.



BRAKE PANEL·ASSEMBLY

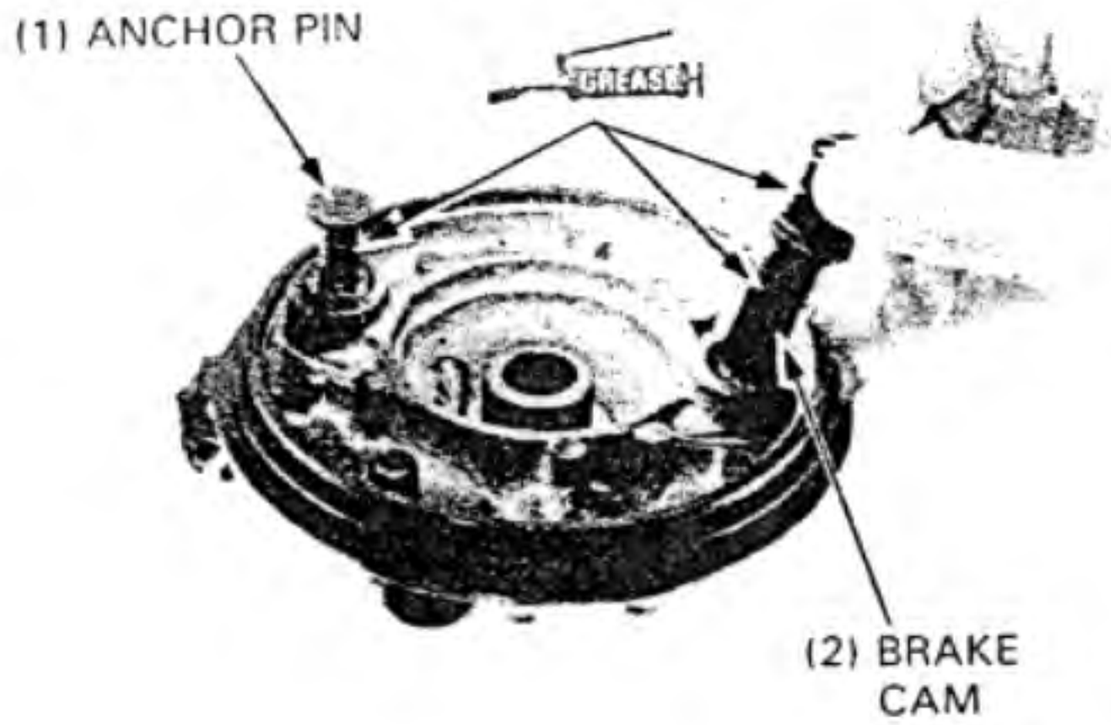


Apply a small mount of grease to the brake cam and insert it into the brake panel.

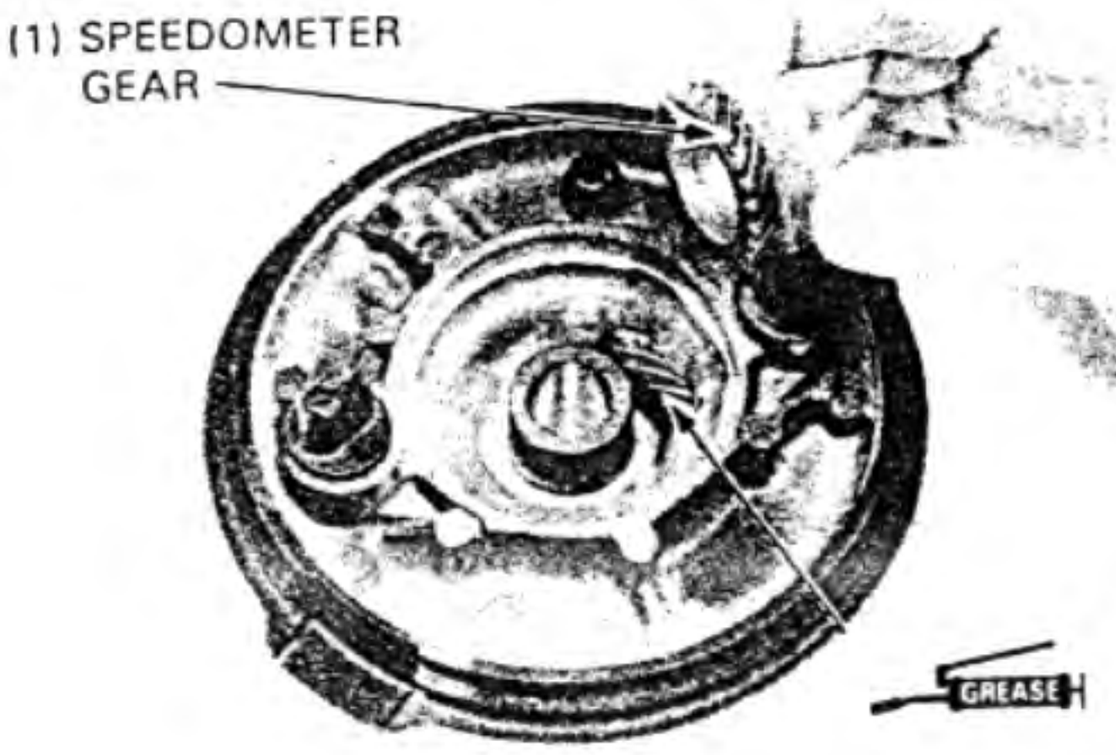
Apply a small mount of grease to the brake shoe anchor pin.

WARNING

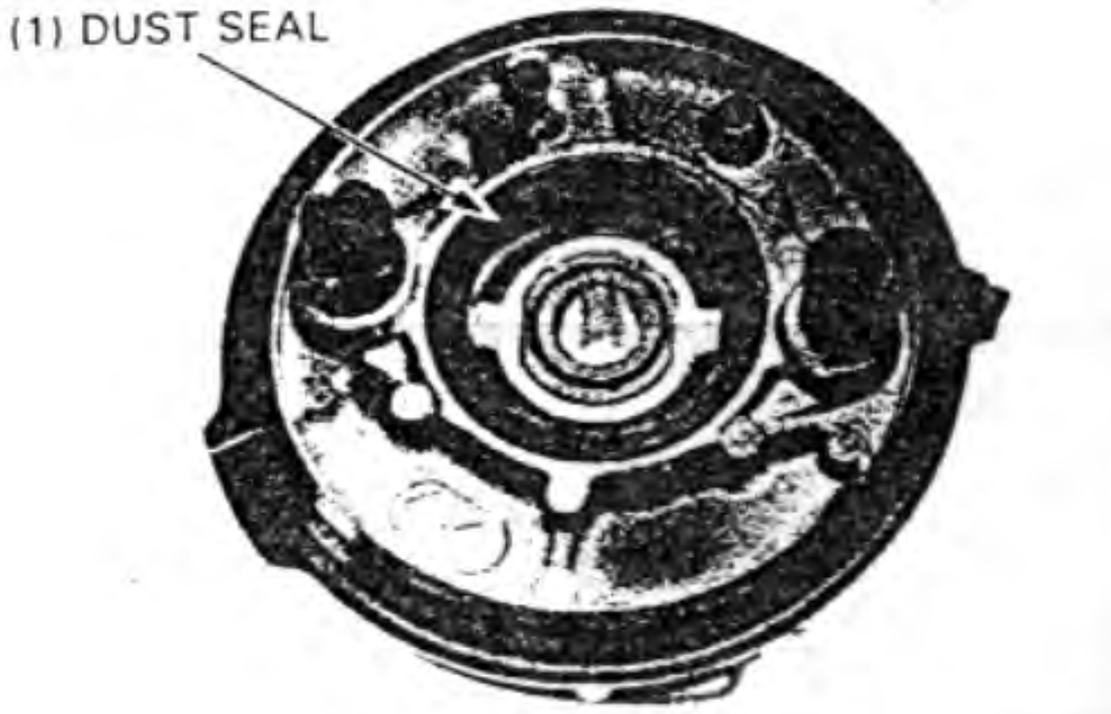
- ***Contaminated brake linings reduce stopping power. Keep grease off the brake linings. Wipe any excess grease off the brake cam.***



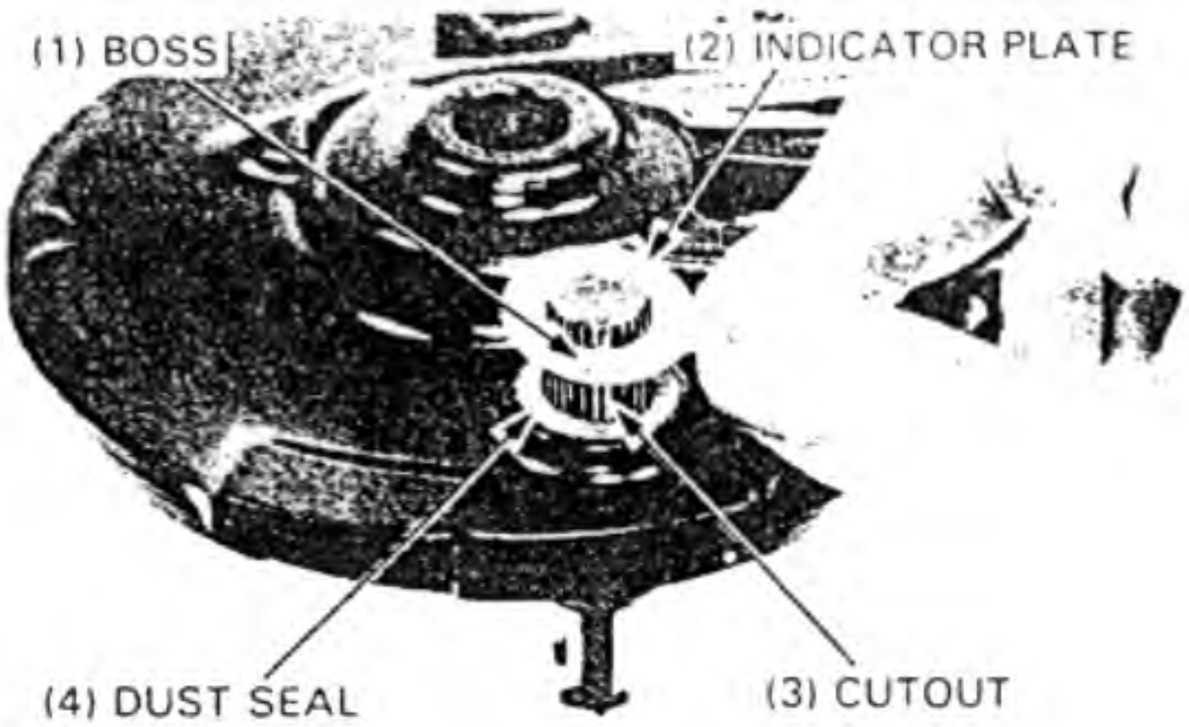
Apply grease to the speedometer gear and install it.



Install the dust seal to the brake panel.



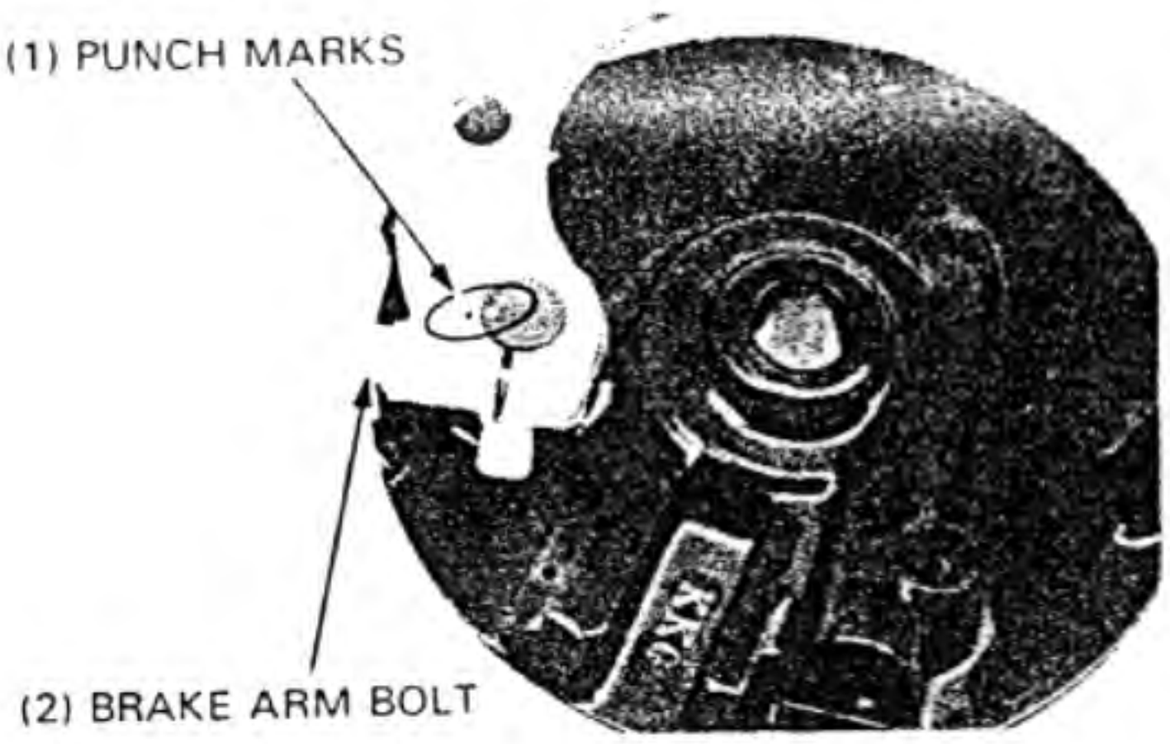
Install a new dust seal to the brake panel.
Align the boss on the indicator plate with the cutout in the brake cam, install the brake wear indicator plate.



Install the brake arm, aligning its punch mark with the cam punch mark.

Tighten the brake arm bolt.

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



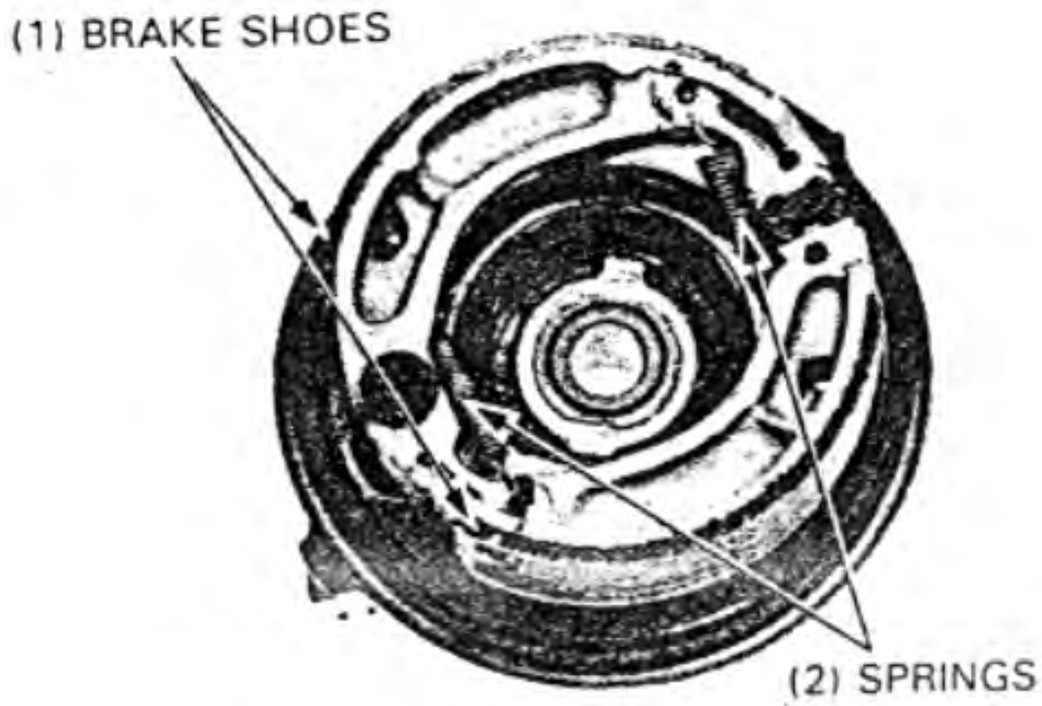
NOTE

- Install the brake shoes back to their original position.

Install the brake shoes and return springs onto the brake panel.

INSTALLATION

Place the brake panel assembly into the wheel.
Install the front wheel (page 11-8).



FRONT FORKS

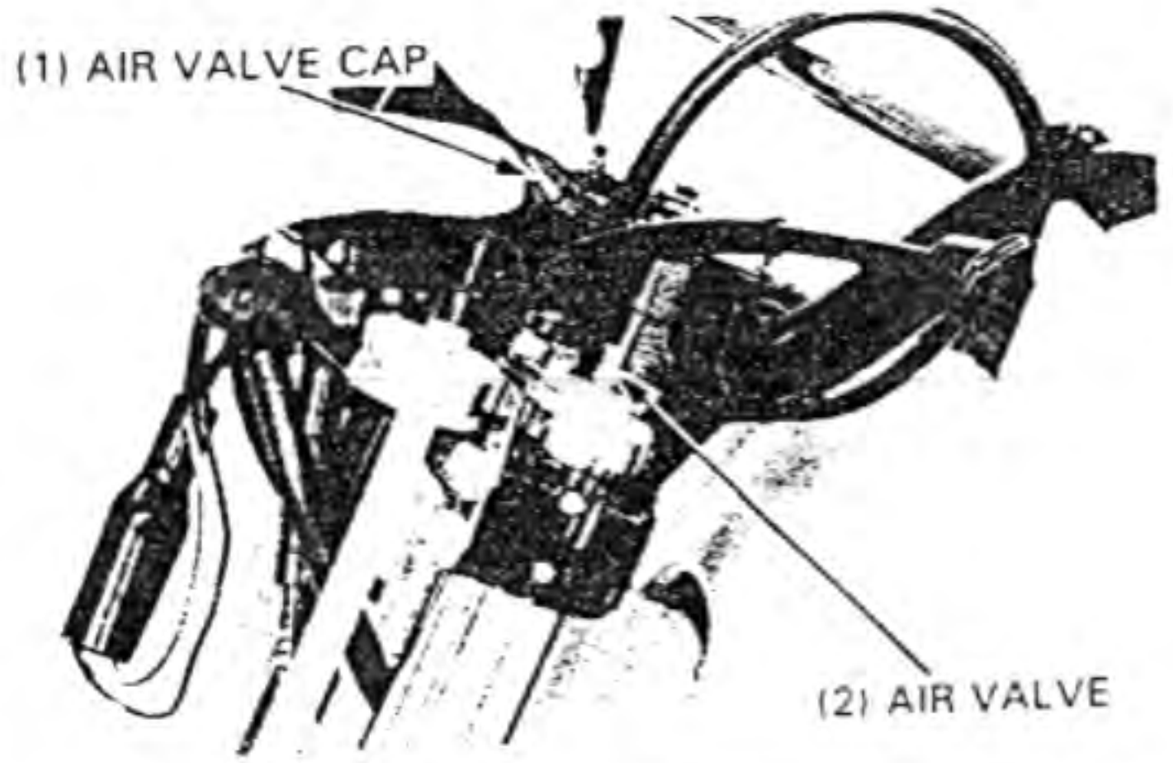
REMOVAL

Remove the front wheel (page 11-5).

Remove the air valve cap.
Depress the air valve and release front air pressure.

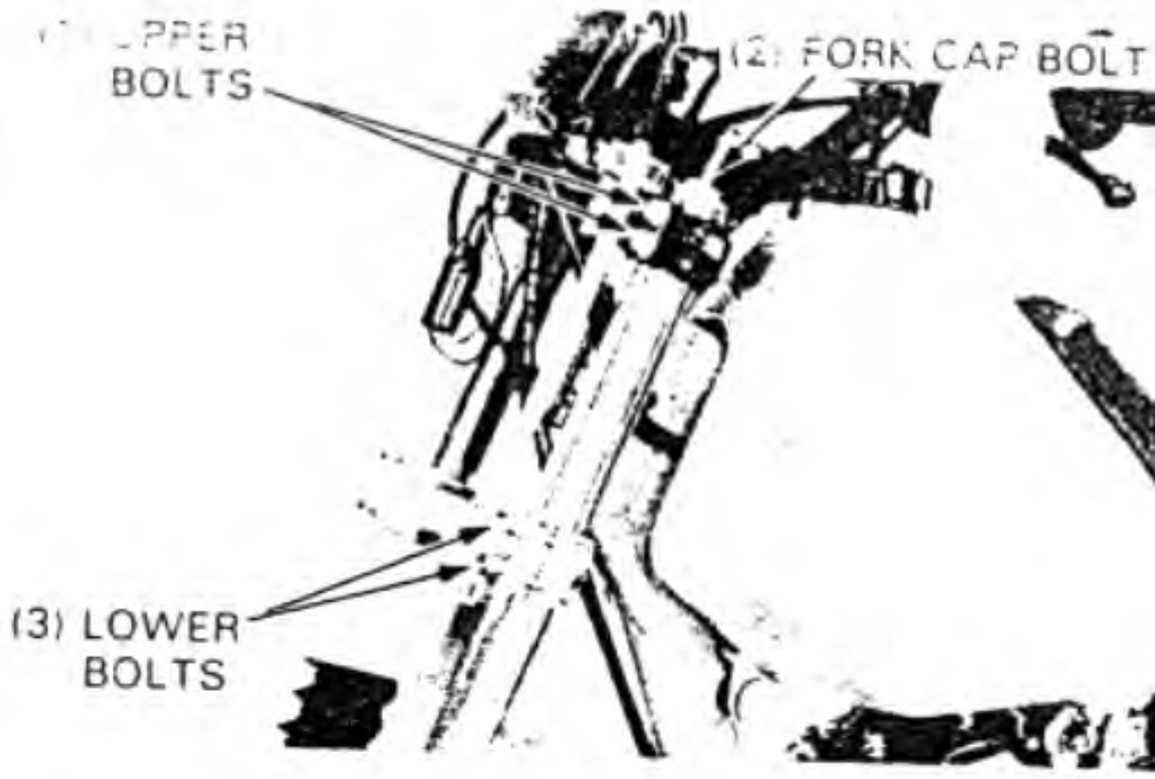
CAUTION

- *If air pressure is not released before disassembling, the fork tube cap may become a projectile.*
- *The cap is also under spring pressure. Use care when removing and wear eye and face protection.*



Temporarily loosen the fork cap bolt.

Loosen the upper and lower front fork pinch bolts and remove the front forks.



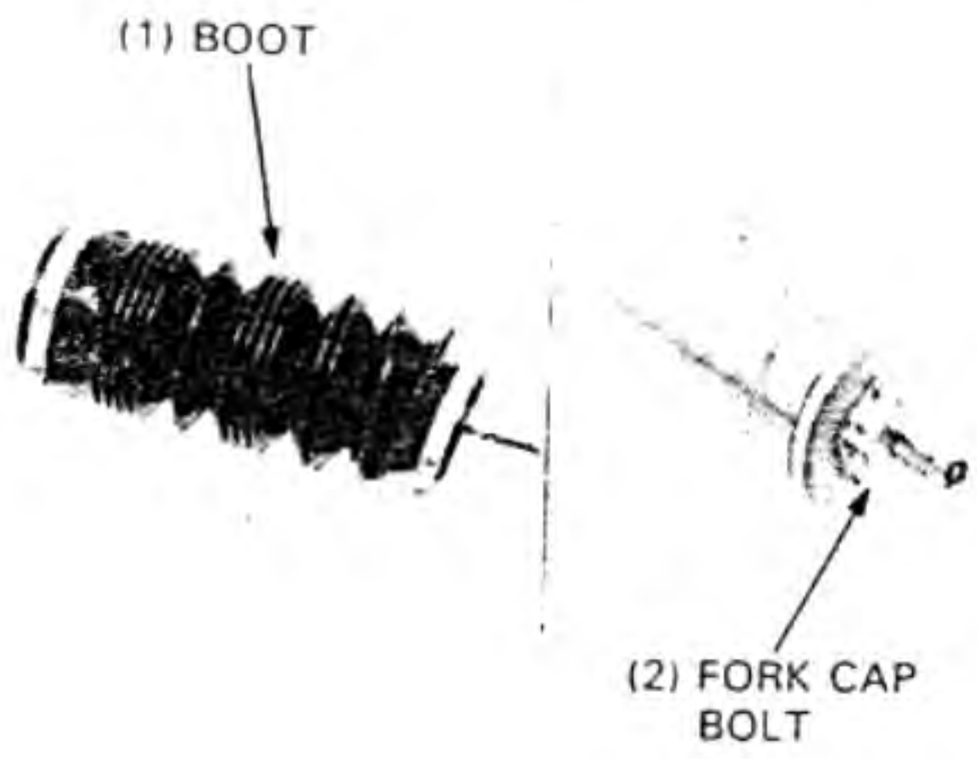
DISASSEMBLY

Loosen the fork boot clamp screws and remove the boot.

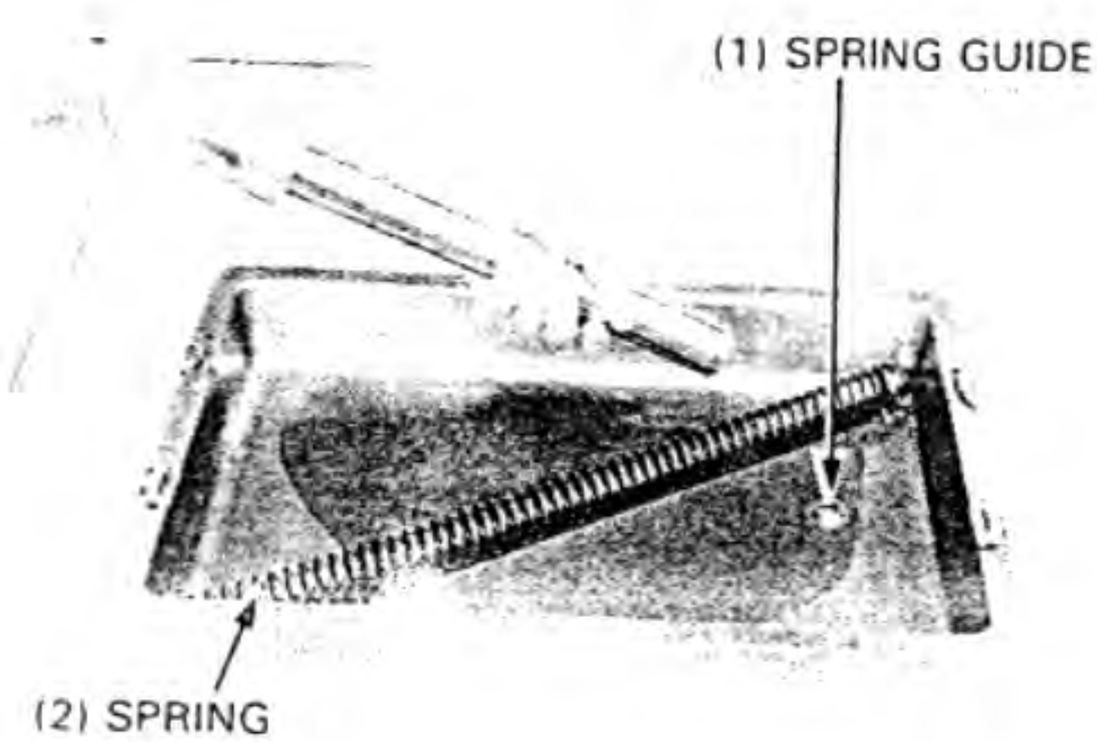
Remove the fork cap bolt.

CAUTION

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



Remove the spring guide and spring.
Pour out all the fork fluid by pumping the fork several times.

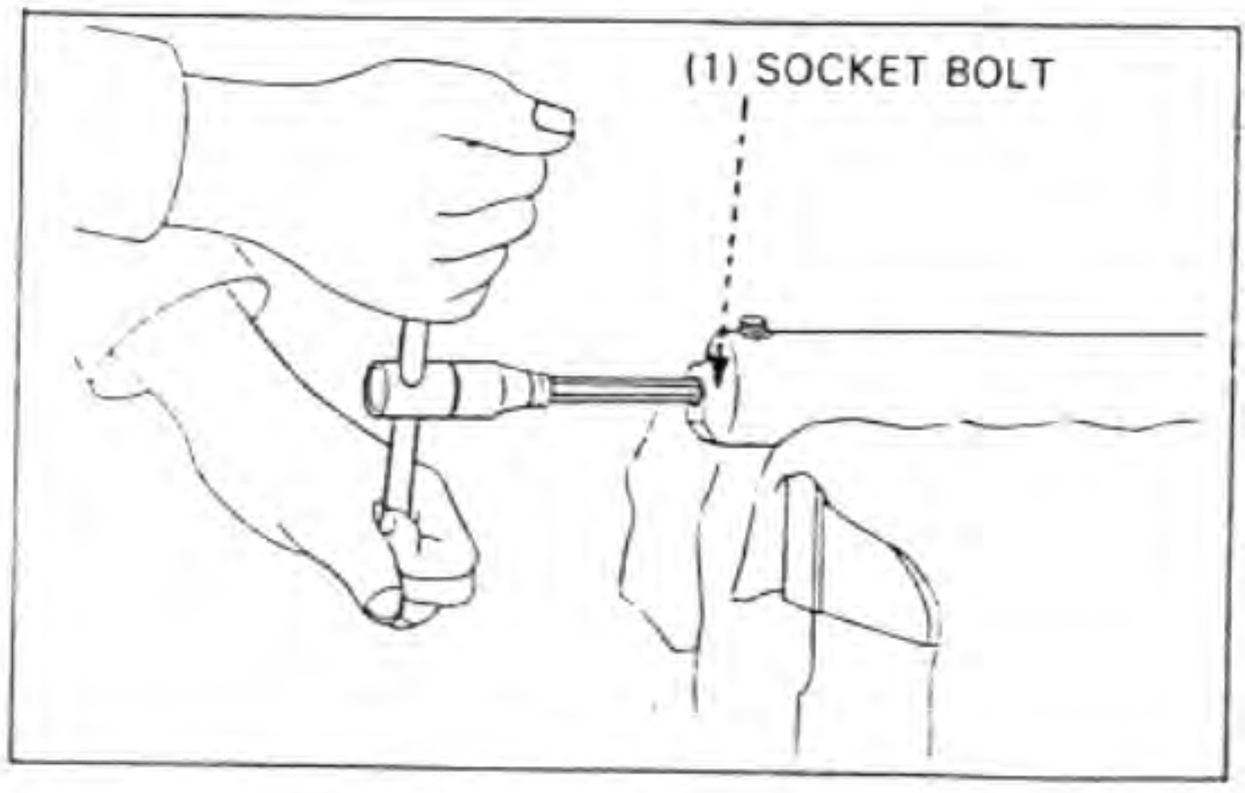


Temporarily install the spring and fork cap bolt.
Hold the fork slider in a vise with soft jaws or a shop towel.
Remove the socket bolt.

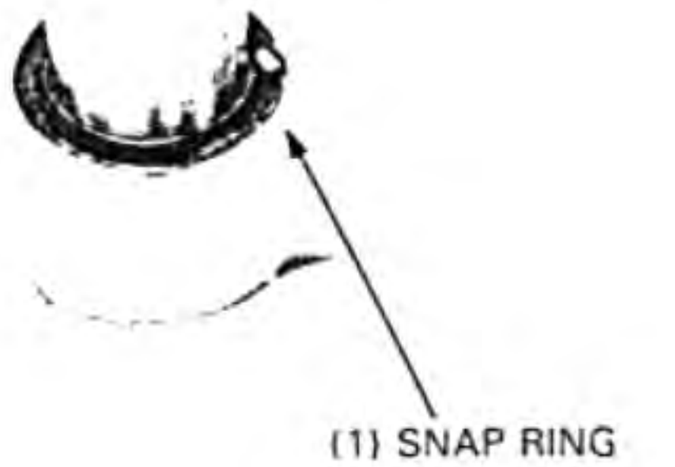
CAUTION

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

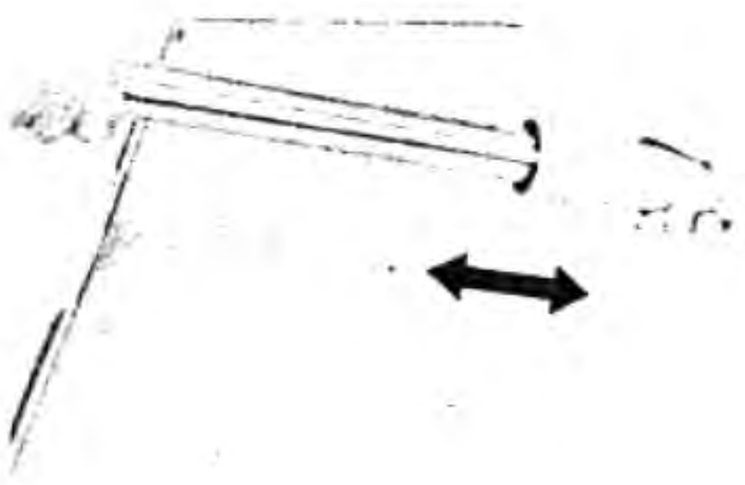
Remove the cap bolt, spring and fork piston.



Remove the snap ring.



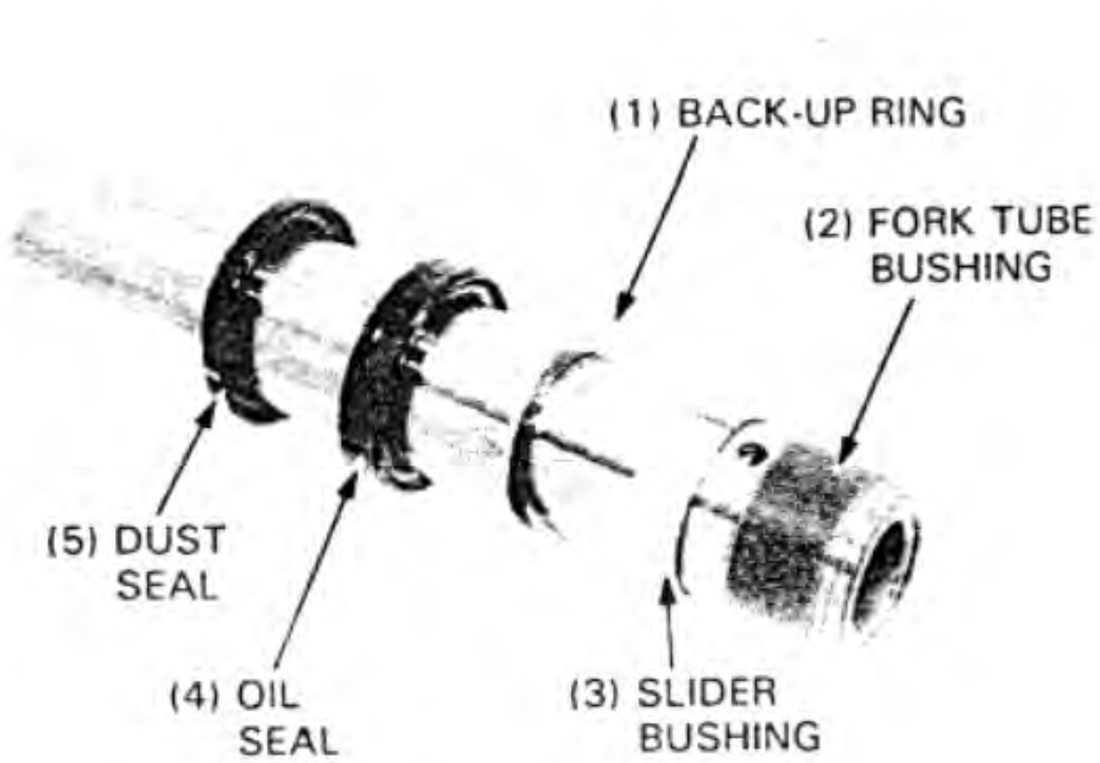
In quick successive back and forth strokes, pull the fork tube out of the slider. The slider bushing gives resistance and the fork tube bushing must be forced out.



Remove the dust seal, oil seal, back-up ring and slider bushing from the fork tube.

NOTE

- Do not remove the fork tube bushing unless it is necessary to replace it with a new one.

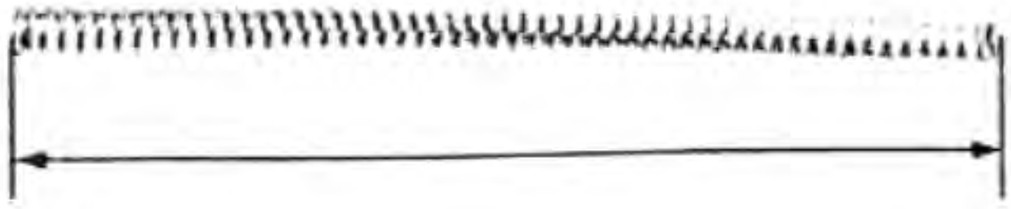


FORK SPRING FREE LENGTH

Measure the fork spring free length.

SERVICE LIMIT: '86–'88, '90–'91: 590 mm (23.2 in)
After '92: 453 mm (17.8 in)

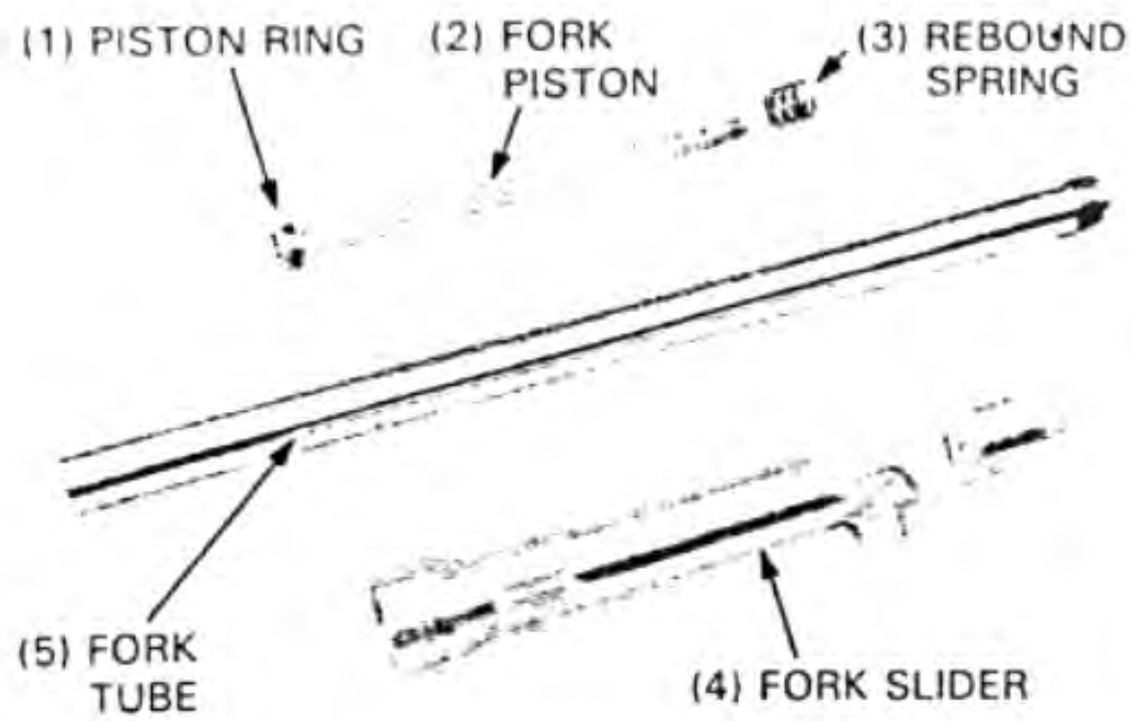
Replace the spring if it is shorter than the service limit.



FORK TUBE/FORK SLIDER/PISTON INSPECTION

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.

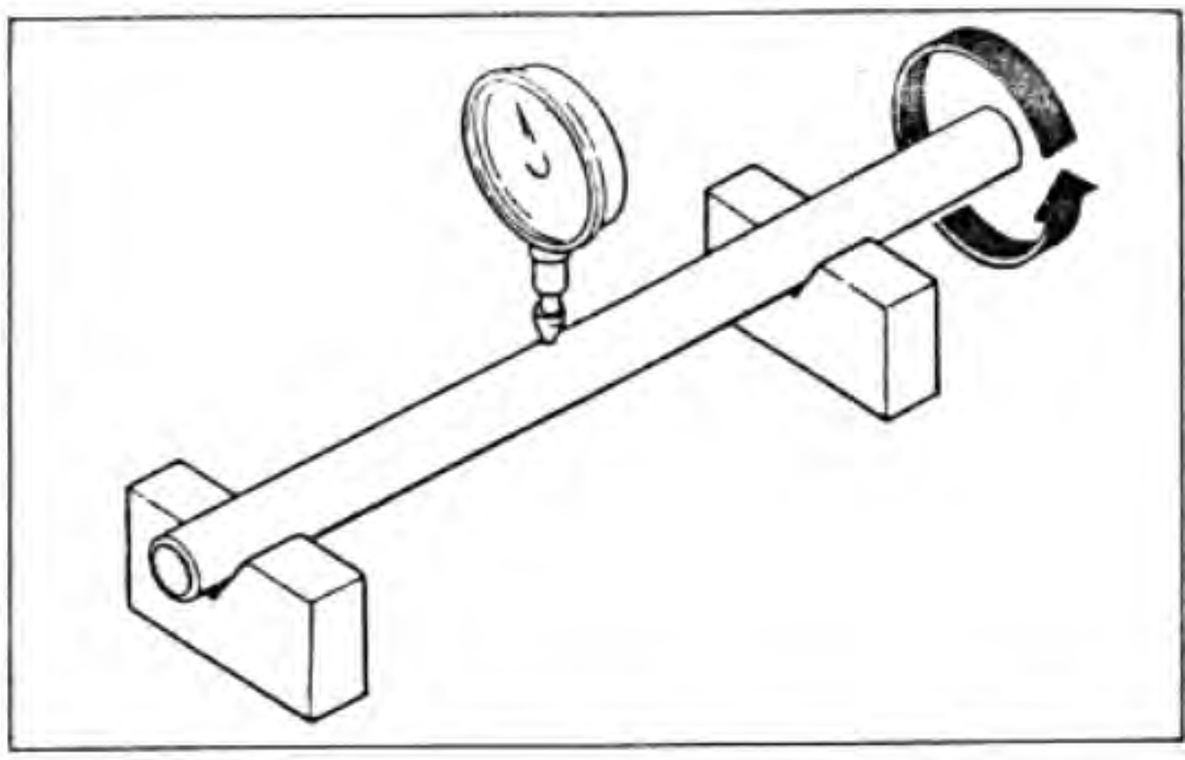
Check the fork piston ring for wear or damage.
Check the rebound spring for fatigue or damage.



FORK TUBE RUNOUT

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

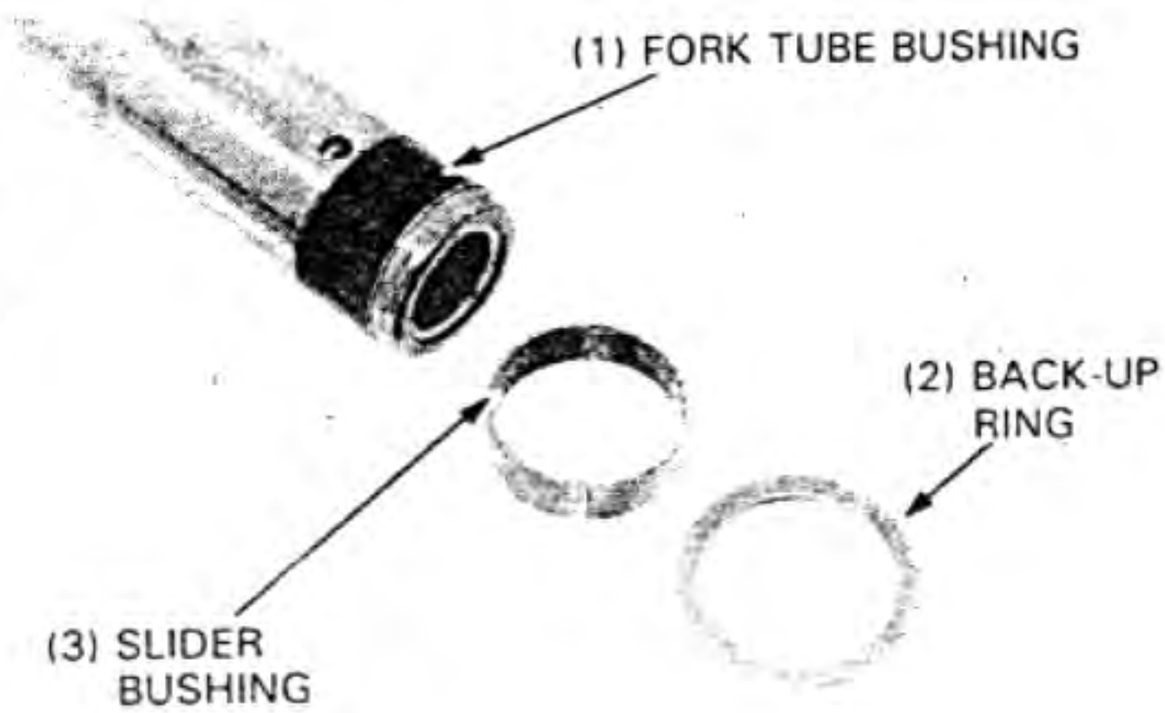
SERVICE LIMIT: 0.2 mm (0.01 in)



FORK TUBE BUSHING/SLIDER BUSHING/ BACK-UP RING INSPECTION

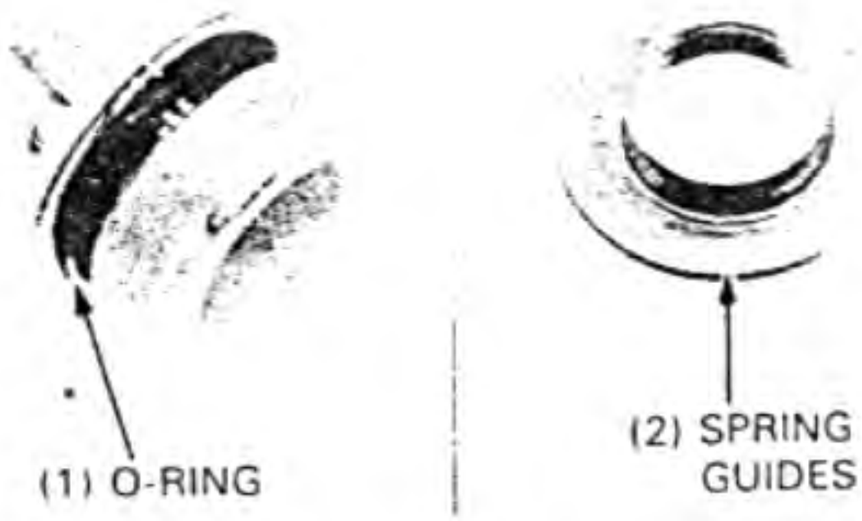
Check the outside of the fork tube bushing and the inside of the slider bushing for excessive wear or scratches. If copper appears on more than 3/4 of the entire surface, replace the bushings.

Replace the back-up ring if there is distortion.



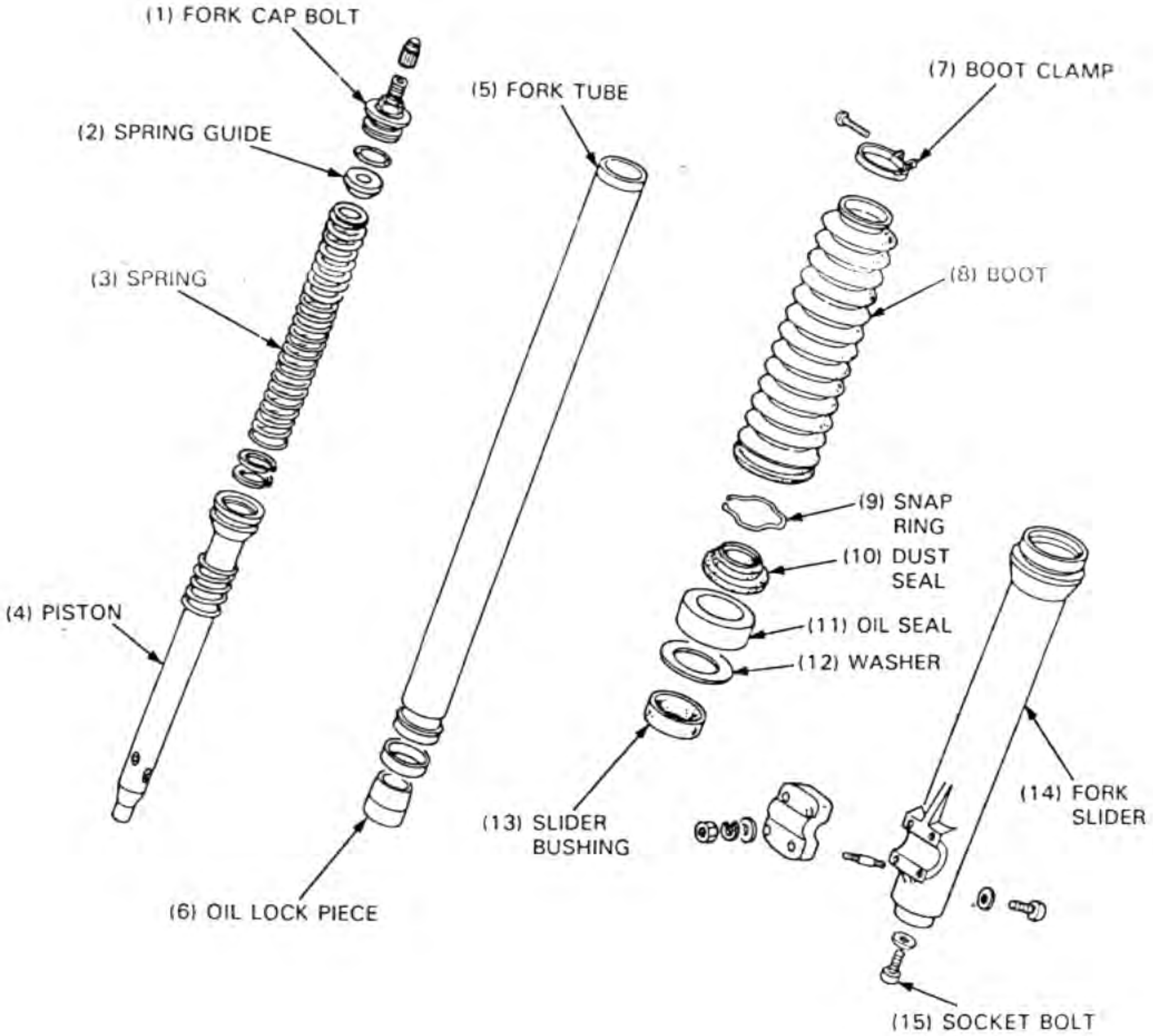
O-RING/SPRING GUIDES INSPECTION

Check the O-ring of the fork cap bolt for fatigue or wear.
Check the spring guides for wear or damage.



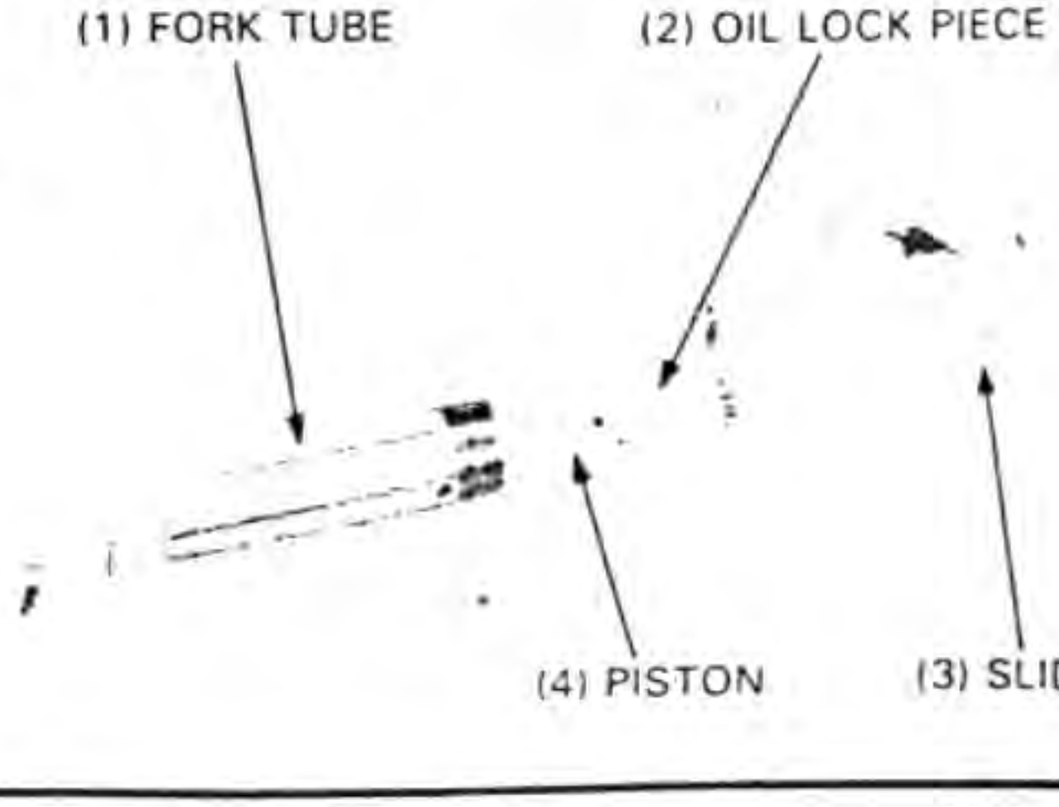
ASSEMBLY

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



Insert 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.

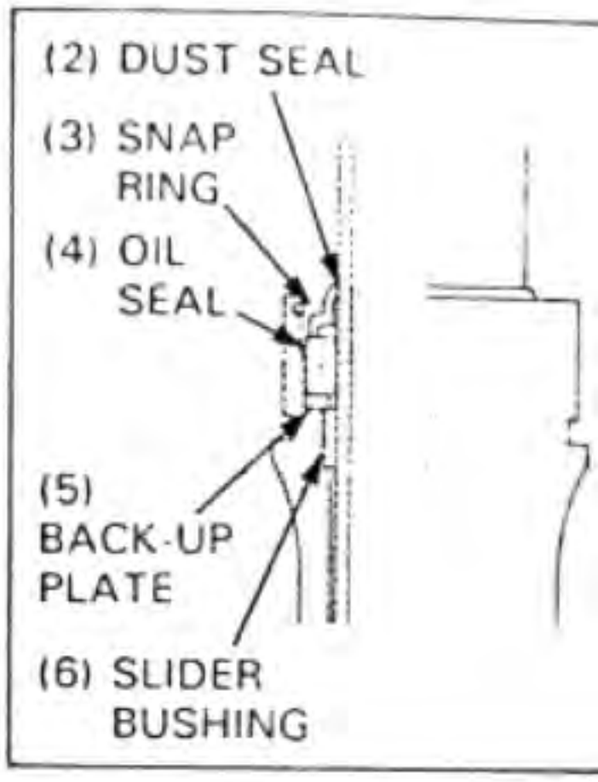


Place the slider bushing over the fork tube until it rests on the slider. Using a fork seal driver and attachment, drive the bushing into place.

Install the back-up plate.

Wrap a piece of tape around the groove at the top of the fork tube. This will prevent the oil seal from being damagedwhen it is installed.
Coat the oil seal lip with ATF fork oil and install it with the seal markings facing up.

(1) FORK SEAL DRIVER, 37 mm I.D.
07947 – 2730100
or 07947 – 3710101



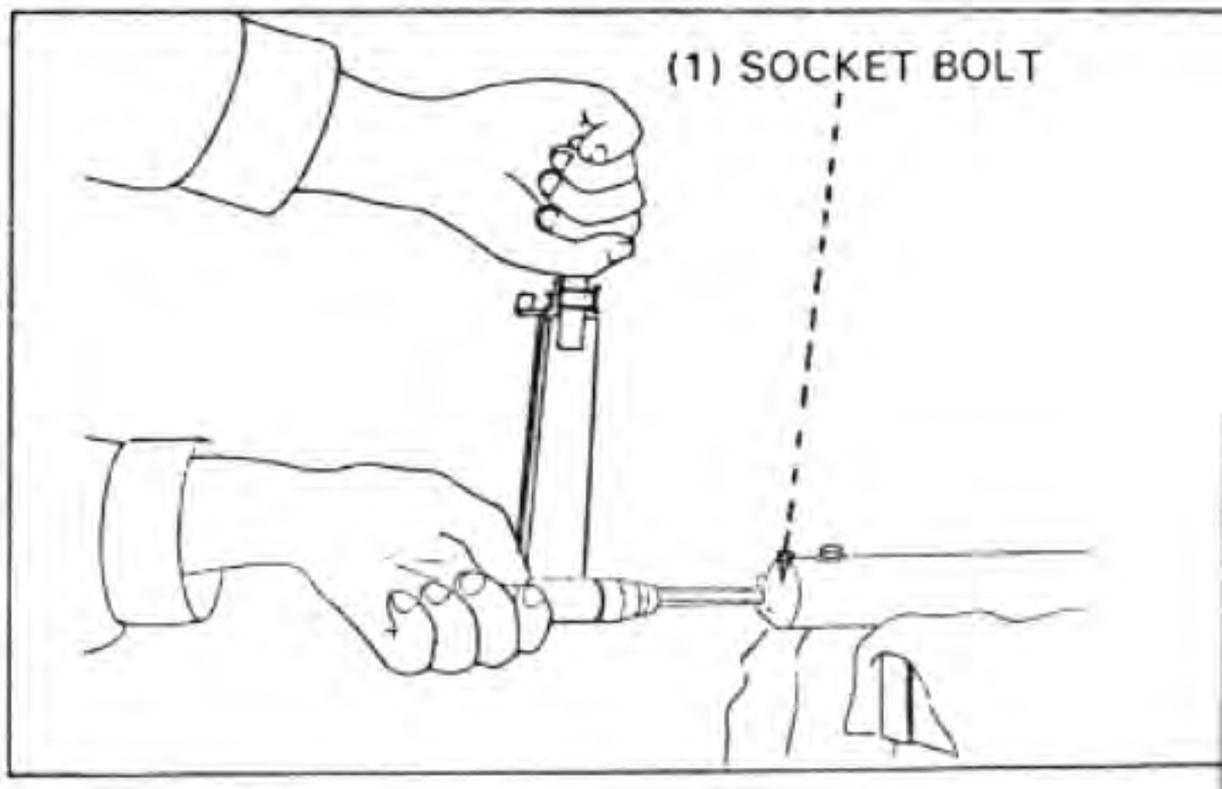
Drive the oil seal into place using the fork seal driver and attachment.
Drive in the dust seal until you can see the snap ring groove.

Install the snap ring with the sharp edge facing up.

Install the drain bolt with a sealing washer.
Temporarily install the spring and fork cap bolt.

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

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



Remove the fork cap bolt and spring.

Pour in the specified amount of ATF.

FLUID CAPACITY: '86–'88, '90–'91: 350 cc (11.8 oz)
After '92: 377 cc (12.8 oz)

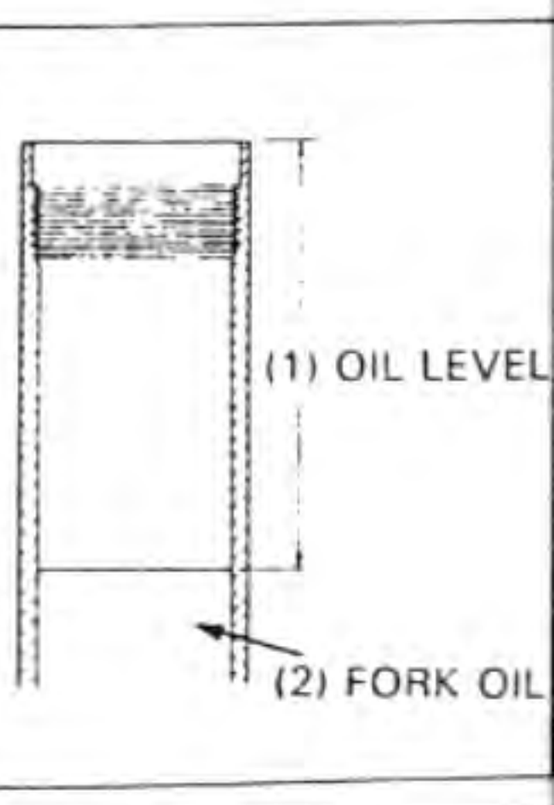
Pump the fork tube slowly several times to stabilize the fork oil level.
Compress the front fork all the way and measure the oil level from the top of the tube.

NOTE

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

STANDARD OIL LEVEL:
'86–'88, '90–'91: 150 mm (5.9 in)
After '92: 116 mm (4.6 in)

Maximum oil level	'86–'88, '90–'91: 140 mm (5.5 in) After '92: 108 mm (4.3 in)	Slightly stiffer fork spring effect when fork nears full compression.
Minimum oil level	'86–'88, '90–'91: 170 mm (6.7 in) After '92: 159 mm (6.3 in)	Slightly softer fork spring effect when fork nears full compression.



Install the front wheel (page 11-8).

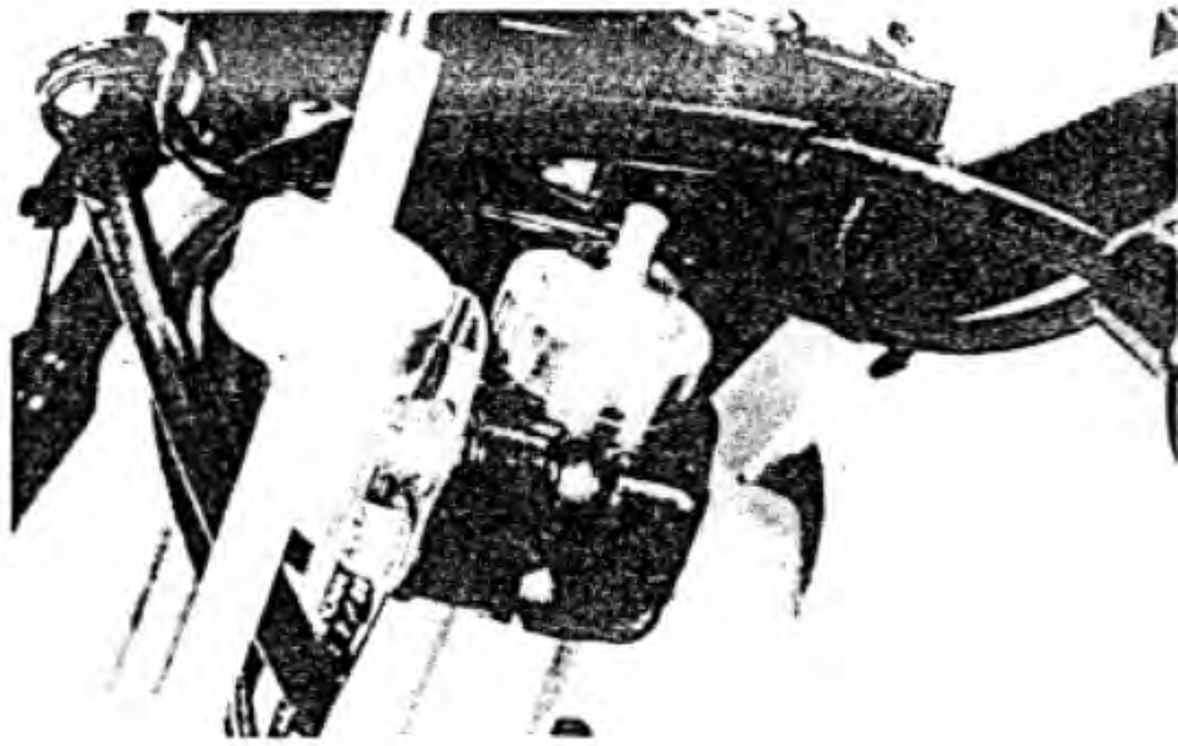
Push the fork boots up until they just touch the steering stem and tighten the boot clamps, with the clamp screw rearward.

Make sure all weights are off the front wheel and charge the forks with air.

STANDARD PRESSURE: 0 kPa (0 kg/cm², 0 psi)

CAUTION

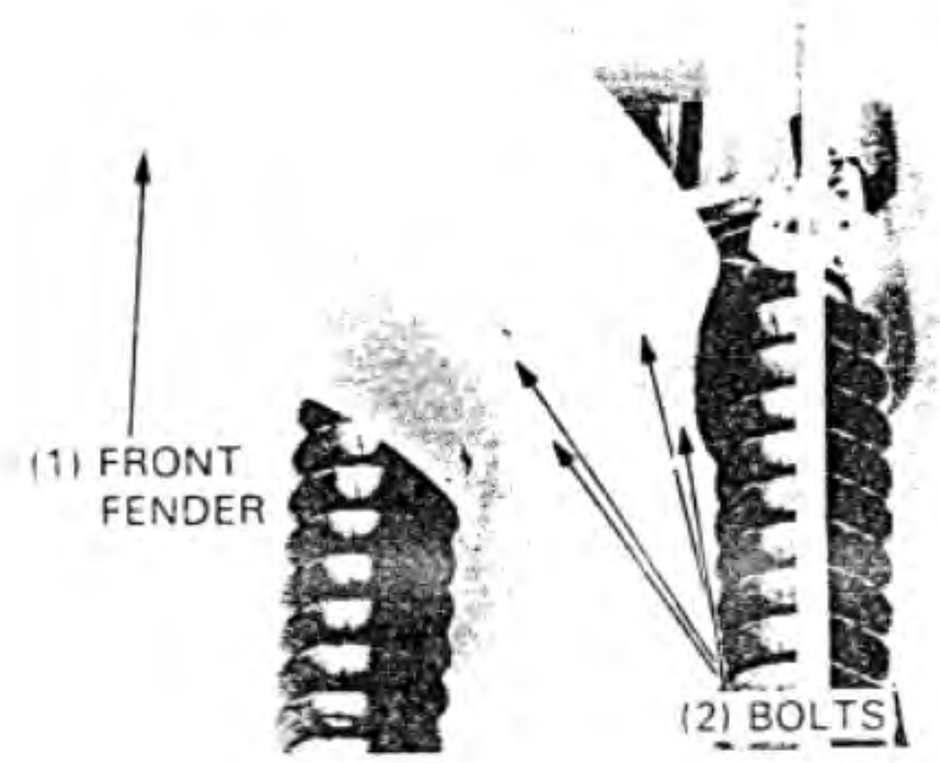
- *Use a low-volume low-pressure pump to charge the forks with air.*



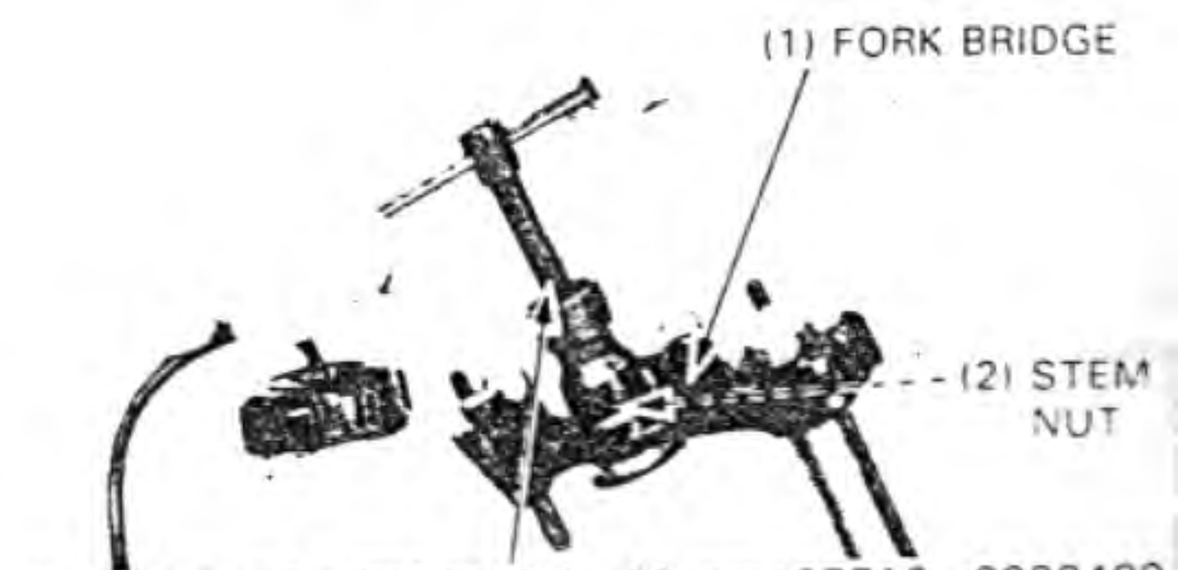
STEERING STEM

REMOVAL

Remove the followings:
- headlight (page 14-9)
- speedometer (page 11-21)
- handlebar (page 11-3)
- front wheel (page 11-5)
- front fender by removing the four bolts

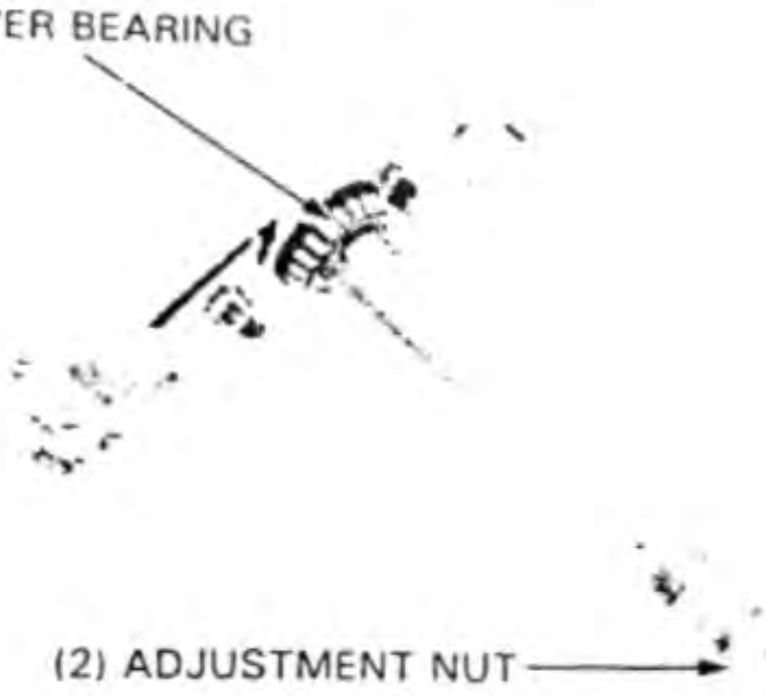


- steering stem nut
- front fork tubes (page 11-11)
- fork bridge

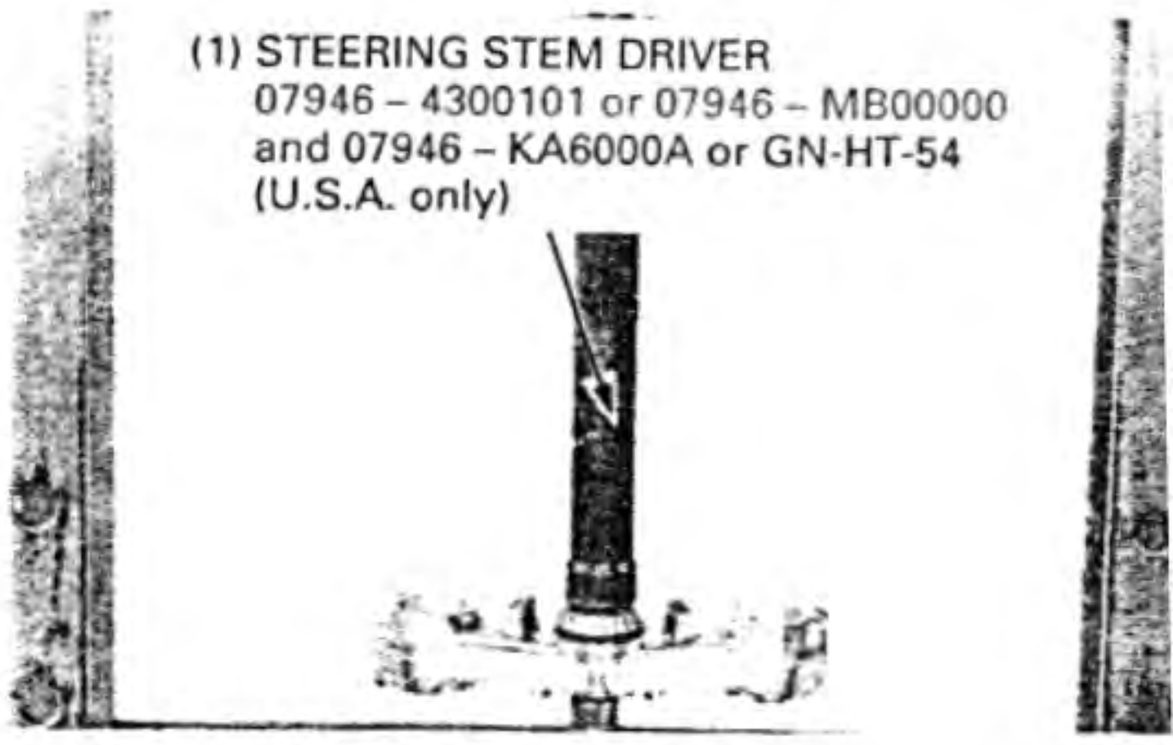


Install the bearing adjustment nut on the top end of the steering stem to prevent damage to the threads.

Remove the lower bearing from the steering stem.
Replace the dust seal with a new one whenever it is removed.

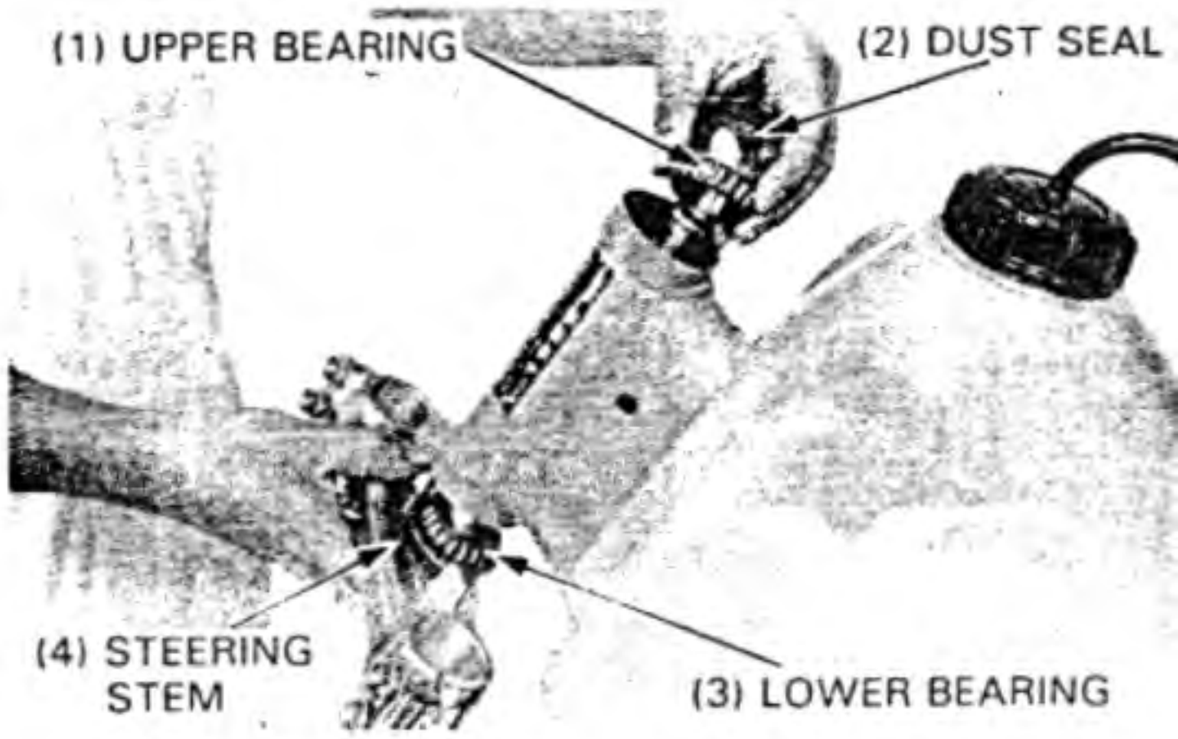


Install the new dust seal.
Install the lower bearing using a hydraulic press and steering stem driver.



INSTALLATION

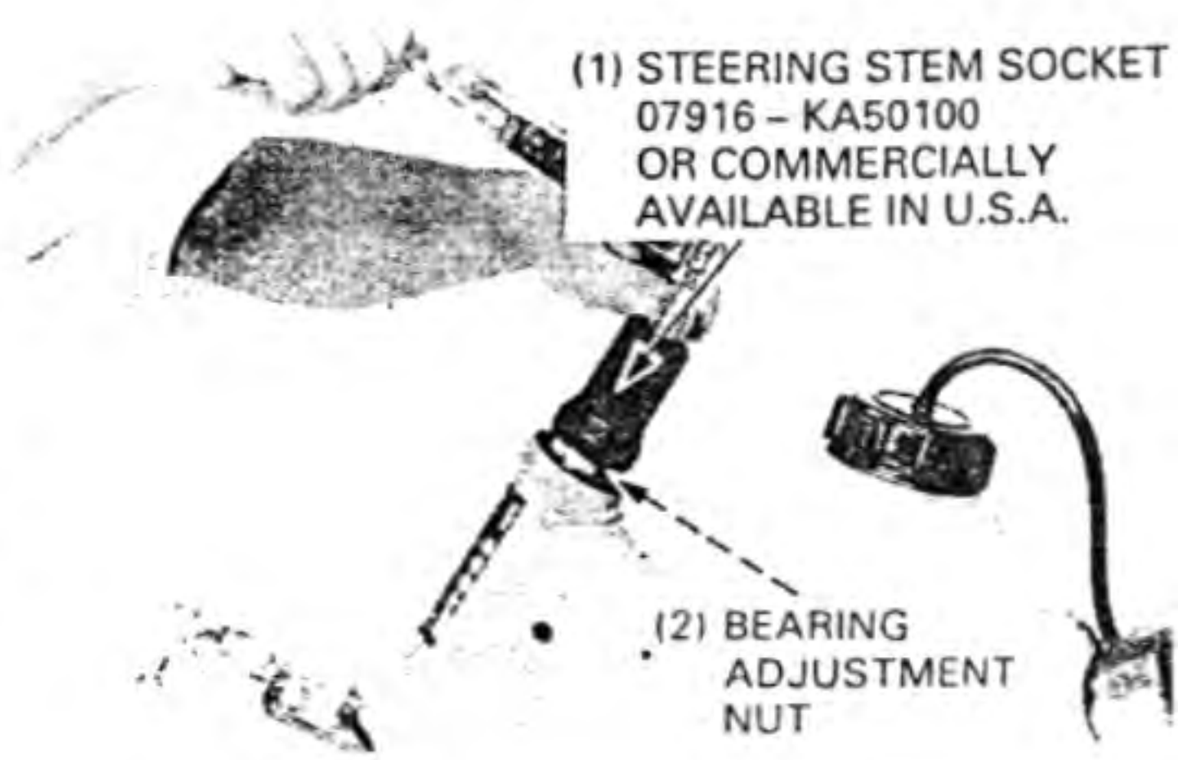
Pack the bearing cavities with bearing grease.
Install the steering stem into the steering head and install the upper bearing and dust seal.



Tighten the bearing adjustment nut.

TORQUE: 1.0 – 2.0 N·m (0.1 – 0.2 kg-m, 0.7 – 1.4 ft-lb)

Turn the steering stem lock-to-lock 5 times to seat the bearing and tighten the adjustment nut again.
Repeat the bearing tightening and steering stem turning sequence twice.
If the nut does not tighten after turning the steering stem the first or second time, remove the nut and inspect it and the steering stem threads for dirt or burrs.



Install the front fork tubes and temporarily tighten the lower fork pinch bolts.
Install the fork bridge and tighten the stem nut.

TORQUE: 95—140 N·m (9.5—14.0 kg-m, 69—101 ft-lb)

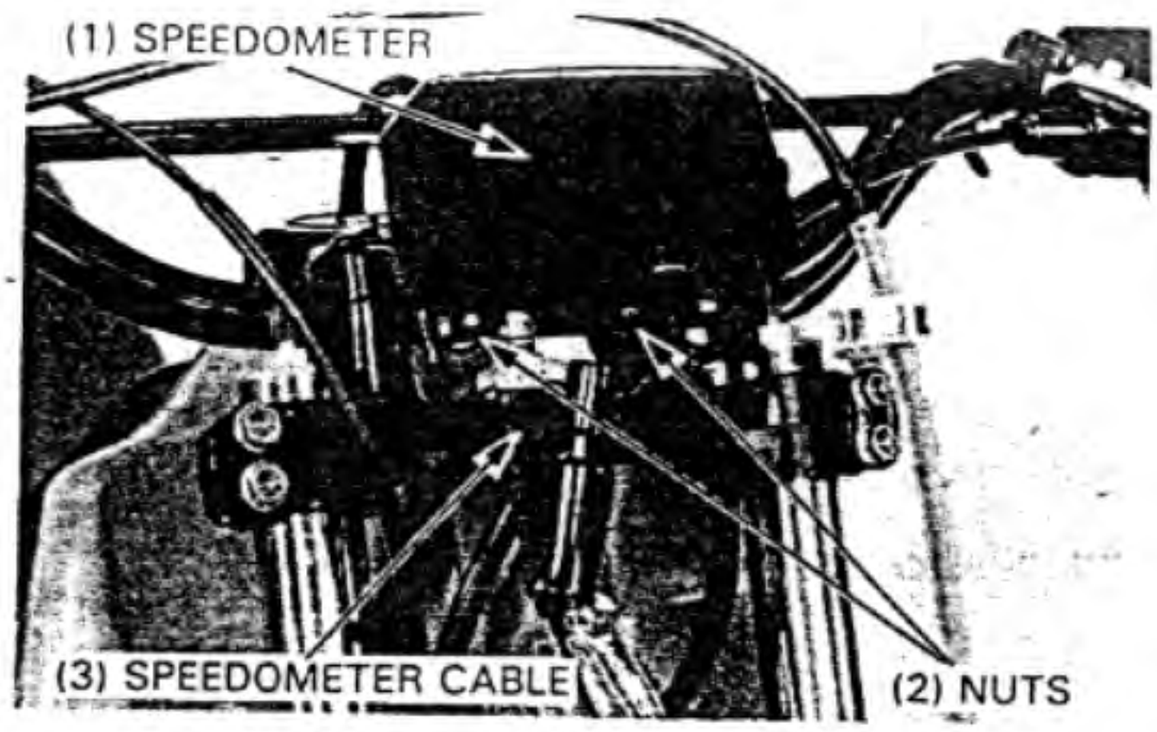
Recheck the steering stem adjustment before installing the removed parts.
Install the removed parts in the reverse order of removal.

'86 through '88:

SPEEDOMETER

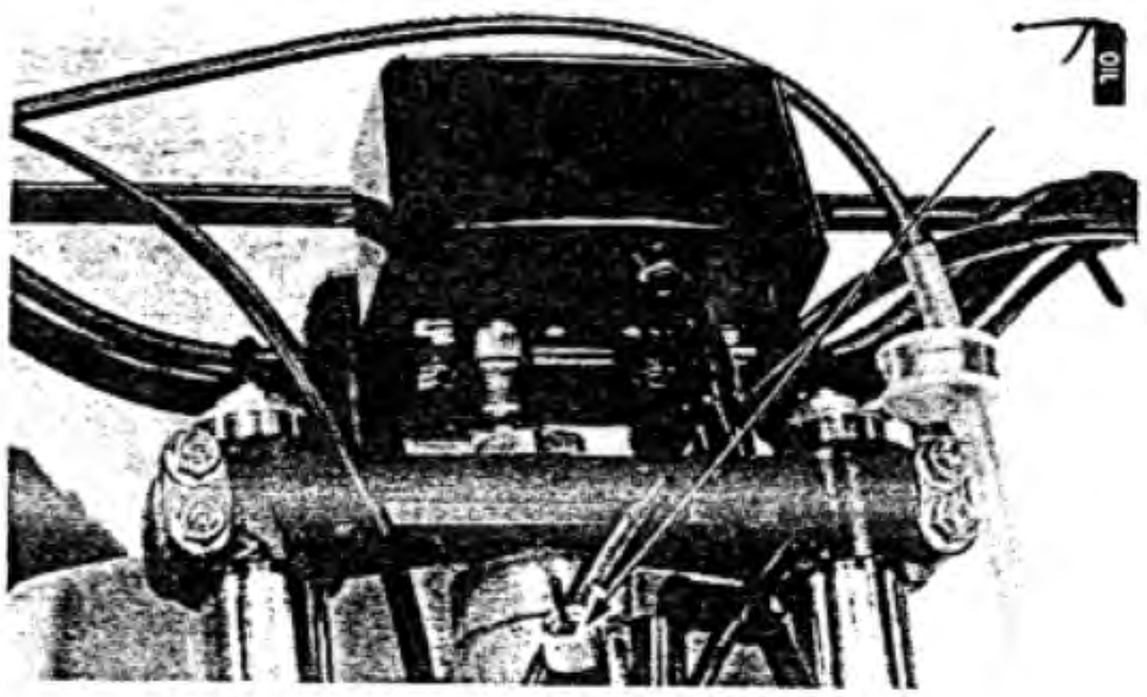
REMOVAL

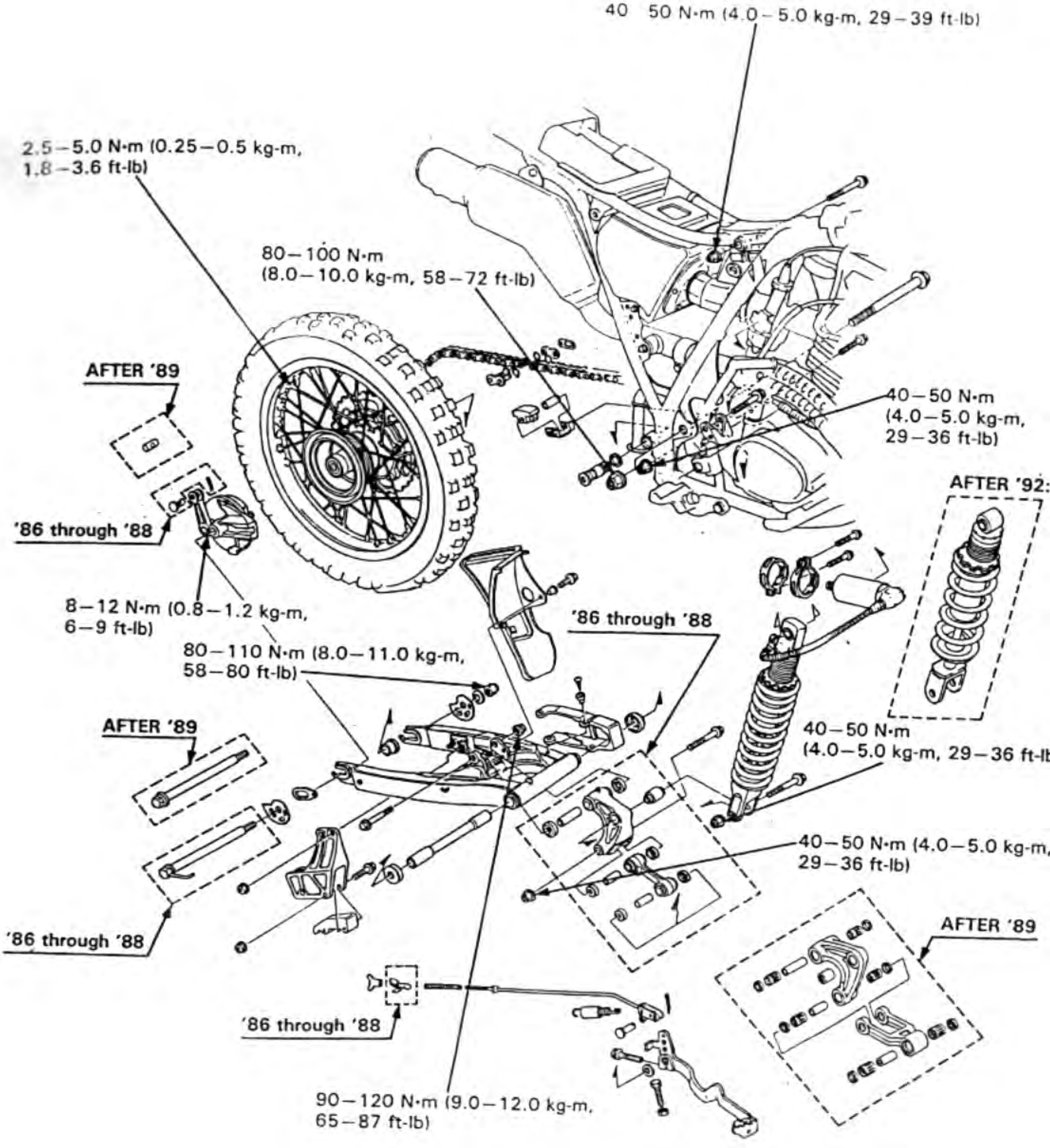
Remove the headlight case (page 14-9).
Disconnect the speedometer cable.
Remove the speedometer mounting nuts and the speedometer.



INSTALLATION

Squirt a small amount of oil into the speedometer cable before connecting it.
Install the speedometer in the reverse order of removal.




40 50 N·m (4.0 – 5.0 kg-m, 29 – 39 ft-lb)
2.5 – 5.0 N·m (0.25 – 0.5 kg-m, 1.8 – 3.6 ft-lb)
80 – 100 N·m (8.0 – 10.0 kg-m, 58 – 72 ft-lb)
40 – 50 N·m (4.0 – 5.0 kg-m, 29 – 36 ft-lb)
AFTER '89
'86 through '88
AFTER '92:
8 – 12 N·m (0.8 – 1.2 kg-m, 6 – 9 ft-lb)
80 – 110 N·m (8.0 – 11.0 kg-m, 58 – 80 ft-lb)
'86 through '88
40 – 50 N·m (4.0 – 5.0 kg-m, 29 – 36 ft-lb)
AFTER '89
AFTER '89
40 – 50 N·m (4.0 – 5.0 kg-m, 29 – 36 ft-lb)
'86 through '88
'86 through '88
90 – 120 N·m (9.0 – 12.0 kg-m, 65 – 87 ft-lb)

12. REAR WHEEL/BRAKE/SUSPENSION

SERVICE INFORMATION

GENERAL

- A work stand or box is required to support the motorcycle.
- Use genuine Honda rear shock linkage and shock absorber pivot/mount bolts.
- Note installation direction of the bolts.
- Rear shock absorber service can only be done after the air cleaner case is removed (page 4-4).

WARNING

- *The rear shock absorber contains nitrogen gas under high pressure. Do not allow fire or heat near the shock absorber.*
- *Before disposal of the shock absorber, release the nitrogen by pressing the valve core. Then remove the valve from the shock absorber.*
- *The shock absorber has a gas-filled reservoir. Use only nitrogen to pressurize the shock absorber. The use of an unstable gas can cause a fire or explosion resulting in serious injury.*
- *Brake dust may contain asbestos. Inhaled asbestos fibers have been shown to cause respiratory disease and cancer. Never use an air hose or dry brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner or alternate method approved by OSHA, designed to minimize the hazard caused by airborne asbestos.*

SPECIFICATIONS

mm (in)

ITEM		STANDARD	SERVICE LIMIT
Rear wheel runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Rear axle runout		—	0.2 (0.01)
Rear brake drum I.D.		110 (4.33)	111 (4.37)
Rear brake shoe lining thickness		4.0 (0.16)	2.0 (0.08)
Rear shock absorber spring free length	'86–'88, '90–'91:	190 (7.5)	186 (7.3)
	After '92:	184 (7.2)	180 (7.1)

TORQUE VALUES

Spokes	2.5–5.0 N·m (0.25–0.5 kg-m, 1.8–3.6 ft-lb)
Rim lock	10–15 N·m (1.0–1.5 kg-m, 7–11 ft-lb)
Final driven sprocket nut	34–40 N·m (3.4–4.0 kg-m, 25–29 ft-lb)
Rear axle nut	80–110 N·m (8.0–11.0 kg-m, 58–80 ft-lb)
Rear shock absorber mounting bolt (upper)	40–50 N·m (4.0–5.0 kg-m, 29–36 ft-lb)
(lower)	40–50 N·m (4.0–5.0 kg-m, 29–36 ft-lb)
Swingarm pivot nut	80–100 N·m (8.0–10.0 kg-m, 58–72 ft-lb)
Shock arm-to-swing arm bolt	90–120 N·m (9.0–12.0 kg-m, 65–87 ft-lb)
Shock arm-to-shock link bolt	40–50 N·m (4.0–5.0 kg-m, 29–36 ft-lb)
Shock link-to-frame bolt	40–50 N·m (4.0–5.0 kg-m, 29–36 ft-lb)
Brake arm bolt	8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)
Damper rod end nut ('86–'88, '90–'91:)	24–29 N·m (2.4–2.9 kg-m, 17–21 ft-lb)
Compression damping valve ('86–'88, '90–'91:)	25–35 N·m (2.5–3.5 kg-m, 18–25 ft-lb)
Reservoir hose oil bolt ('86–'88, '90–'91:)	25–35 N·m (2.5–3.5 kg-m, 18–25 ft-lb)
Reservoir hose joint lock nut ('86–'88, '90–'91:)	20–25 N·m (2.0–2.5 kg-m, 14–18 ft-lb)
Rear shock spring lock nut	80–100 N·m (8.0–10.0 kg-m, 58–75 ft-lb)

TOOLS

SPECIAL		
Slider guide, 14 mm	07974 – KA40000	Not available in U.S.A.
Spherical bearing driver	07946 – KA30200	
Damping valve wrench	07920 – KA30001	
Needle bearing remover	07931 – MA70000	Not available in U.S.A. or 07936 – 3710600 07936 – 3710100 07936 – 371020A or 07936 – 3710200 (U.S.A. only)
COMMON		
Attachment, 32 x 35 mm	07746 – 0010100	
Attachment, 37 x 40 mm	07746 – 0010200	
Driver	07749 – 0010000	
Pilot, 17 mm	07746 – 0040400	
Pilot, 20 mm	07746 – 0040500	
Retainer wrench body	07710 – 0010401	
Retainer wrench attachment	07710 – 0010100	
Bearing remover shaft	07746 – 0050100	
Bearing remover head, 17 mm	07746 – 0050500	

TROUBLESHOOTING

Wobble or Vibration in Motorcycle
- Bent rim
- Loose wheel bearings
- Loose or bent spokes
- Damaged tire
- Axle not tightened properly
- Swingarm pivot bearing worn
- Chain adjusters not adjusted equally

Soft Suspension
- Weak spring
- Improper rear suspension damping or spring preload adjusting

Hard Suspension
- Improper rear suspension damping or spring preload adjusting
- Spring thrust sleeve binding
- Bent shock absorber rod
- Swingarm pivot bearings damaged

Suspension Noise
- Faulty rear damper
- Loose fasteners
- Worn suspension linkage pivot bushings

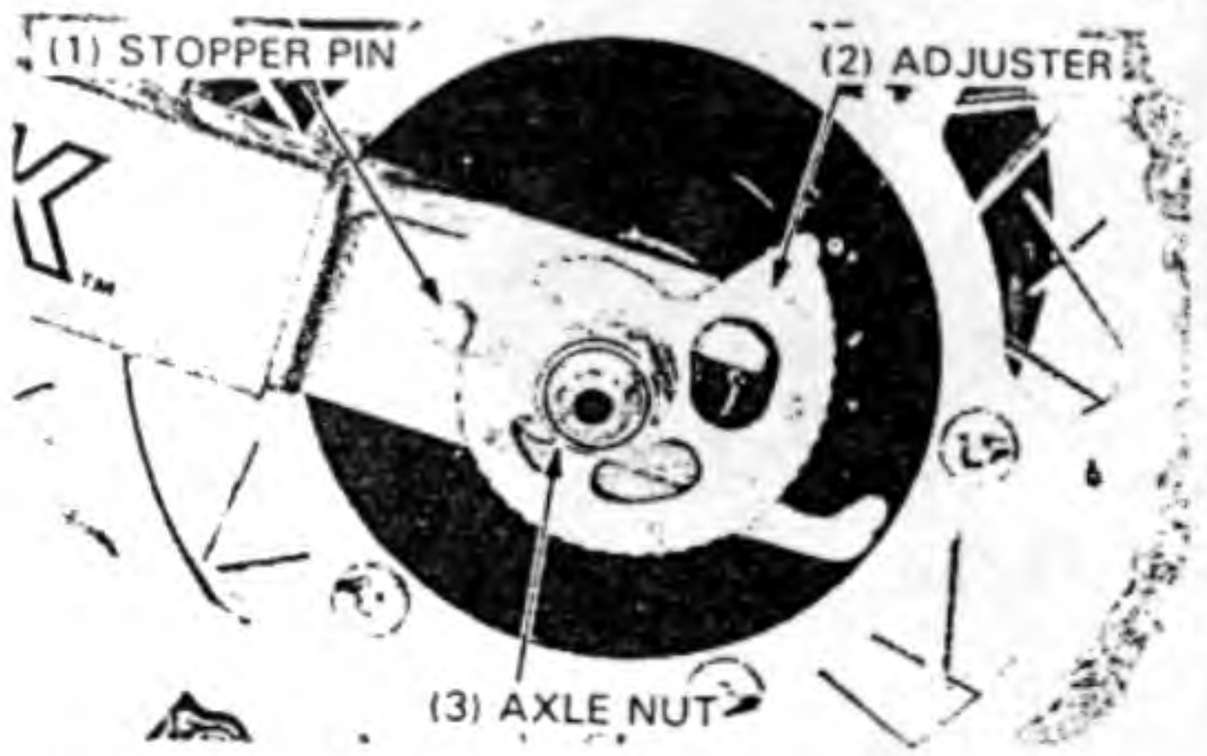
Poor Brake Performance
- Improper brake adjustment
- Worn brake shoes
- Brake linings oily, greasy or dirty
- Worn brake cam
- Worn brake drum
- Brake arm serrations improperly engaged
- Brake shoes worn at cam contact area

REAR WHEEL

REMOVAL

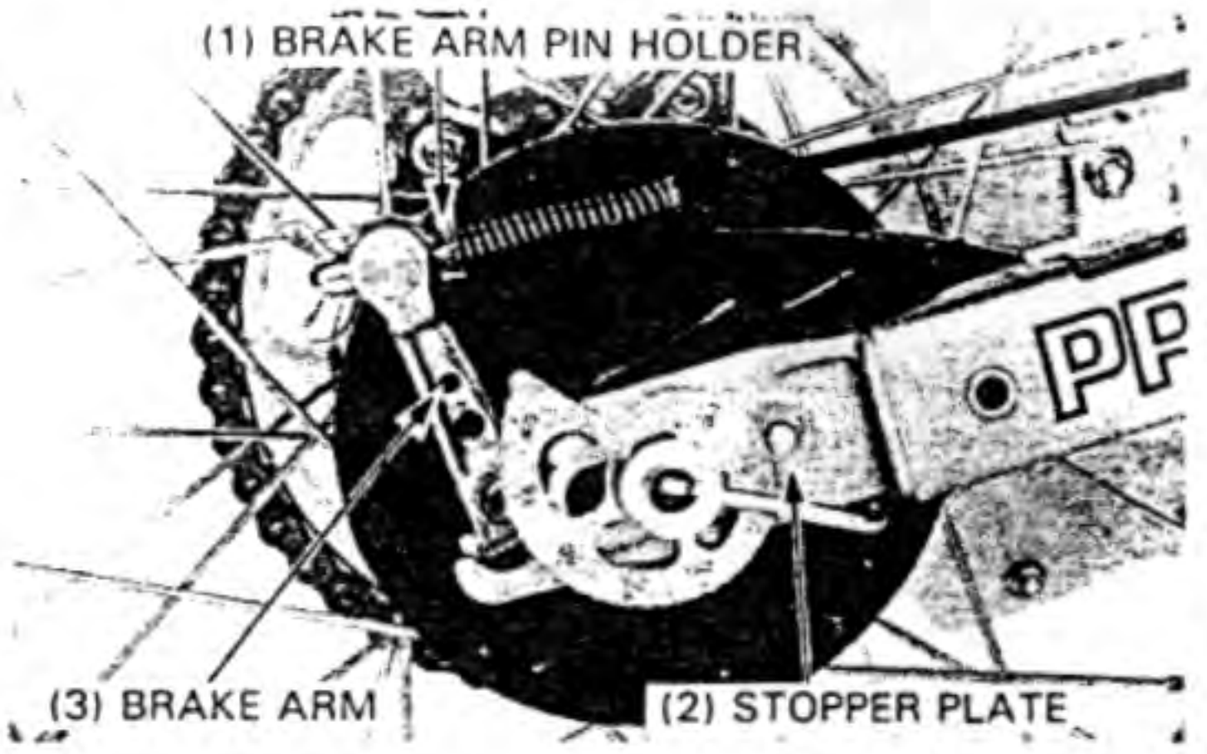
Raise the rear wheel off the ground by placing a workstand or box under the engine.

Loosen the rear axle nut.
Turn both adjusters so the rear wheel can be moved all the way forward for maximum drive chain slack.
Move the rear wheel forward and "hook" the adjusters over the stopper pins on the swingarm.



Pull the brake arm pin holder foward and disconnect the brake rod from the brake arm.

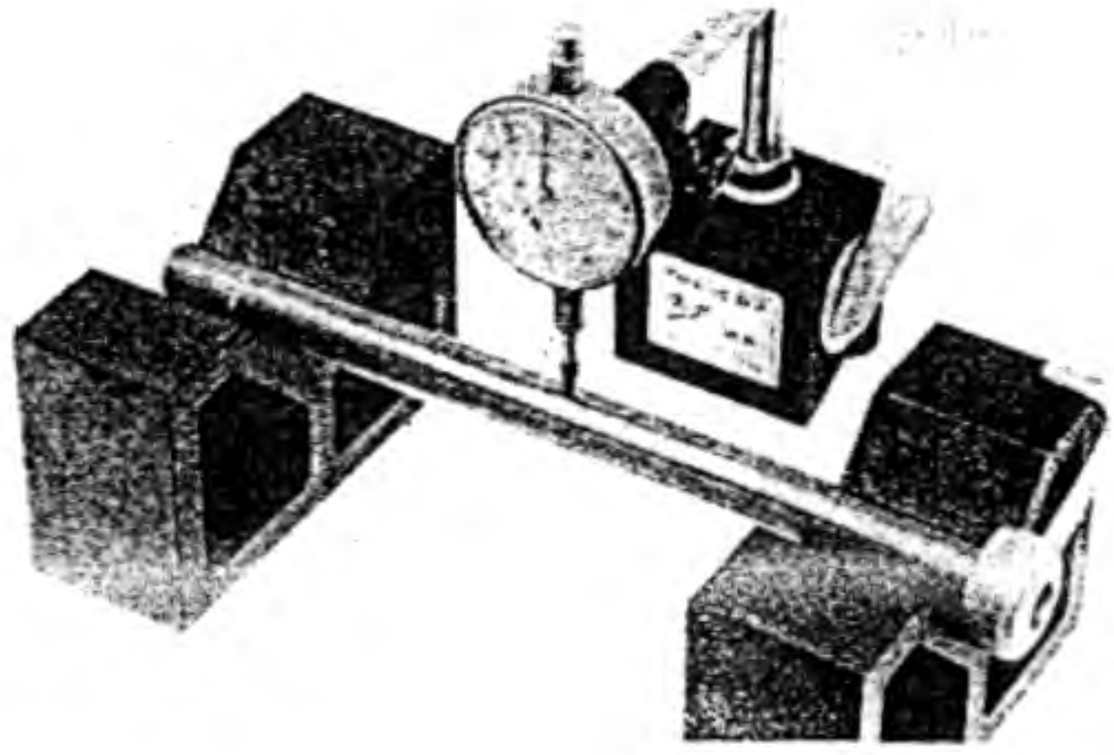
Derail the drive chain from the drive sprocket. Lift the stopper plate clear of the pin on the swingarm's right side.
Remove the rear wheel with the rear axle.



REAR AXLE RUNOUT

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

SERVICE LIMIT: 0.2 mm (0.01 in)



WHEEL BEARING INSPECTION

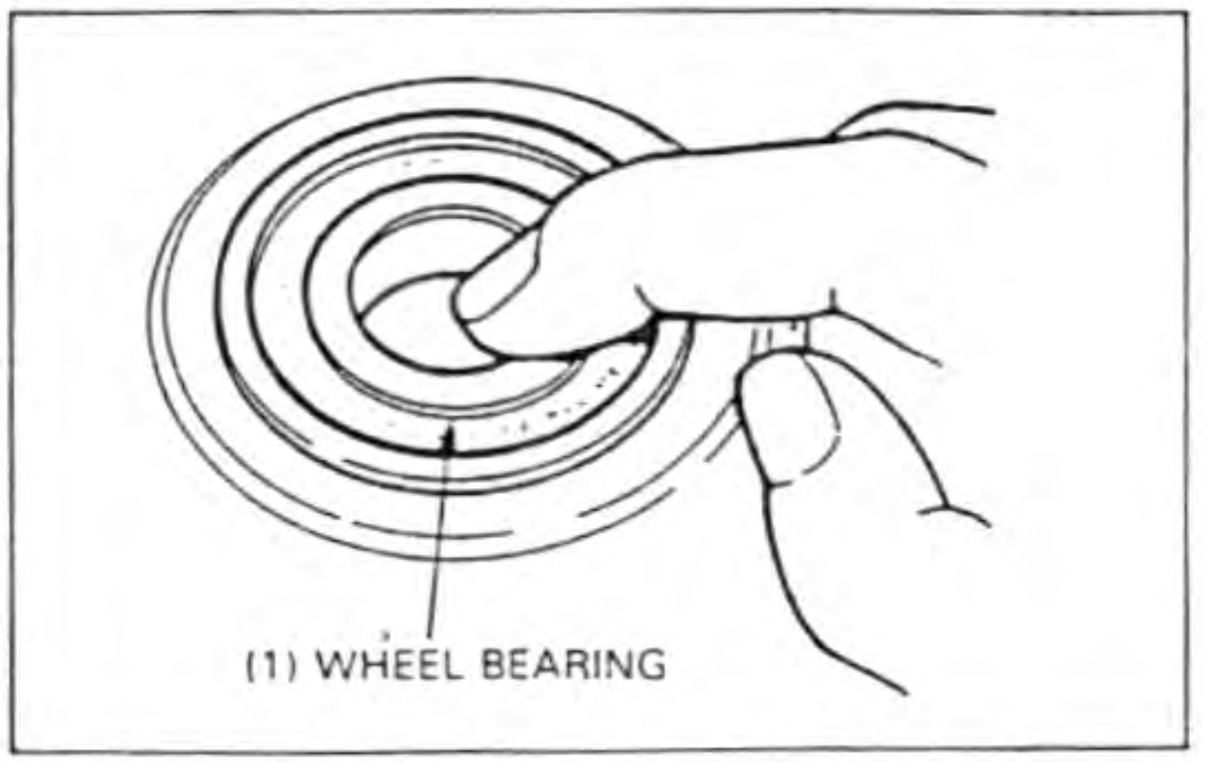
Turn the inner race of each bearing with your finger. The bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the hub.

Remove and discard the bearings if the races do not turn smoothly, quietly, or if they fit loosely in the hub.

NOTE

- Replace wheel bearings in pairs.

For bearing replacement, see page 12-5, 12-6.



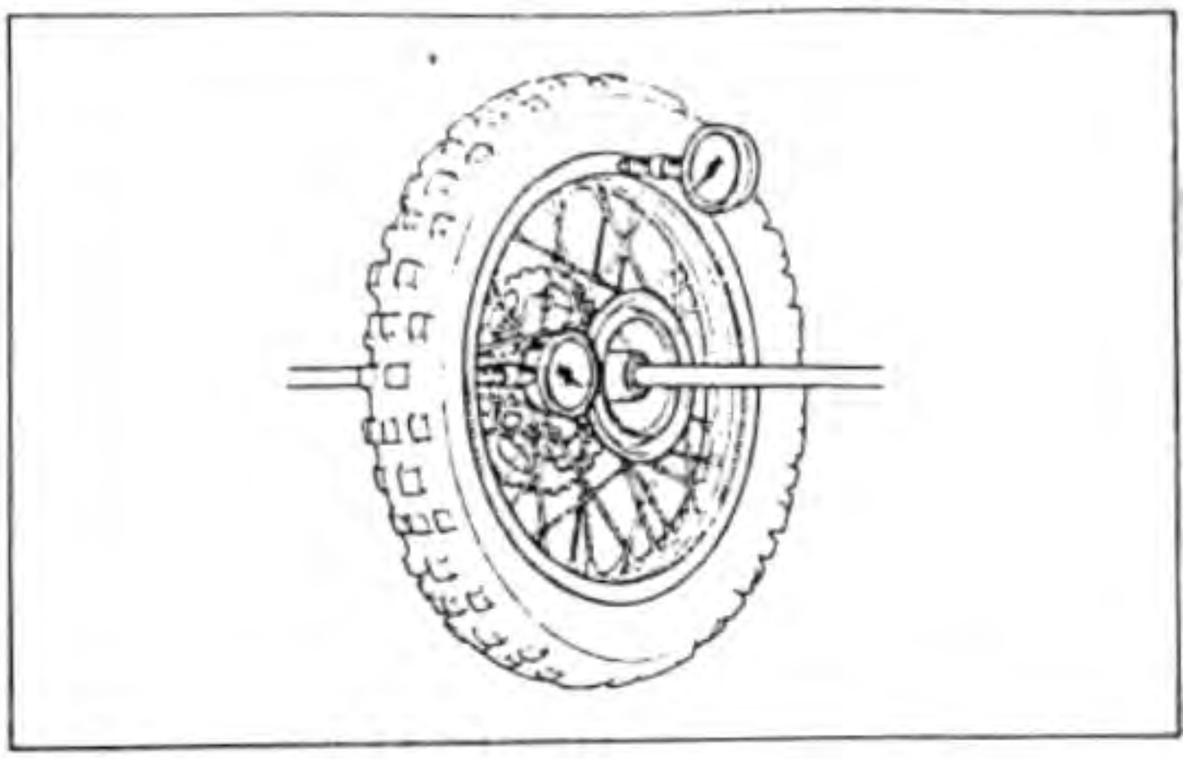
WHEEL RIM RUNOUT

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

SERVICE LIMIT:
Radial: 2.0 mm (0.08 in)
Axial: 2.0 mm (0.08 in)

Tighten any loose spokes.

TORQUE: 2.5–5.0 N·m (0.25–0.5 kg-m, 1.8–3.6 ft-lb)

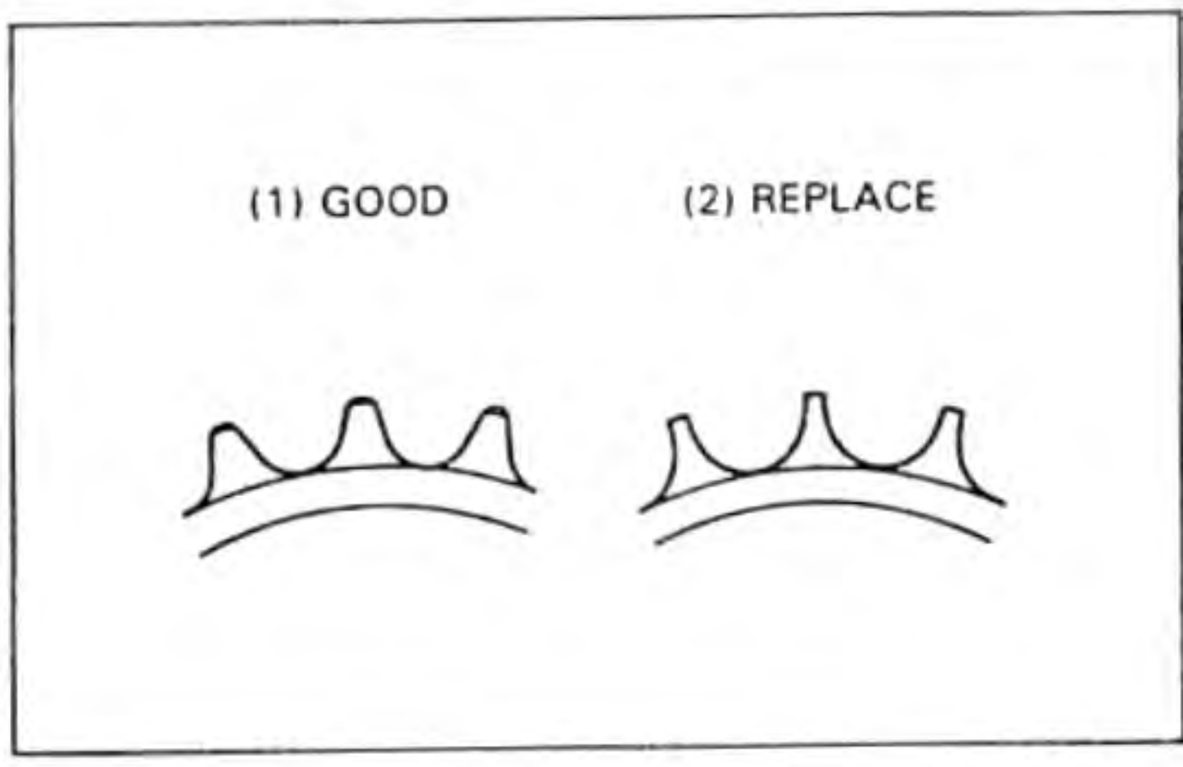


FINAL DRIVEN SPROCKET INSPECTION

Check the condition of the final driven sprocket teeth. Replace the sprocket if worn or damaged.

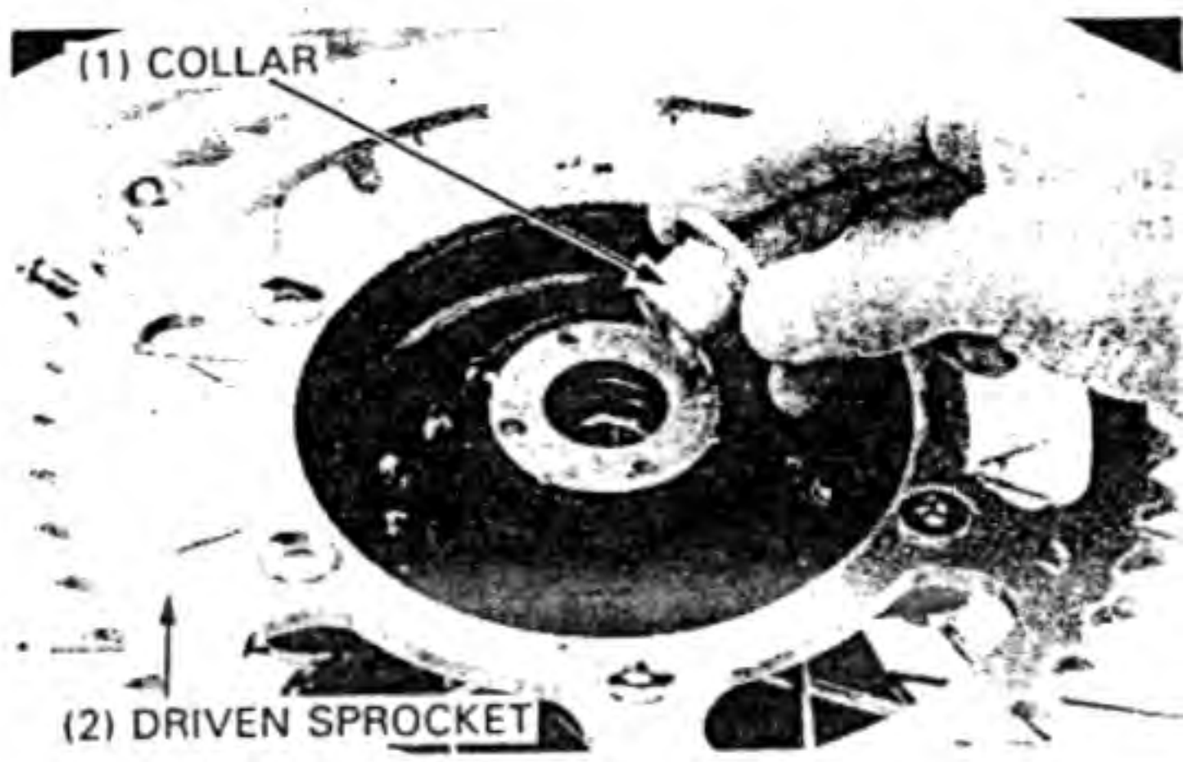
NOTE

- The drive chain and drive sprocket must also be inspected if the driven sprocket is worn or damaged.

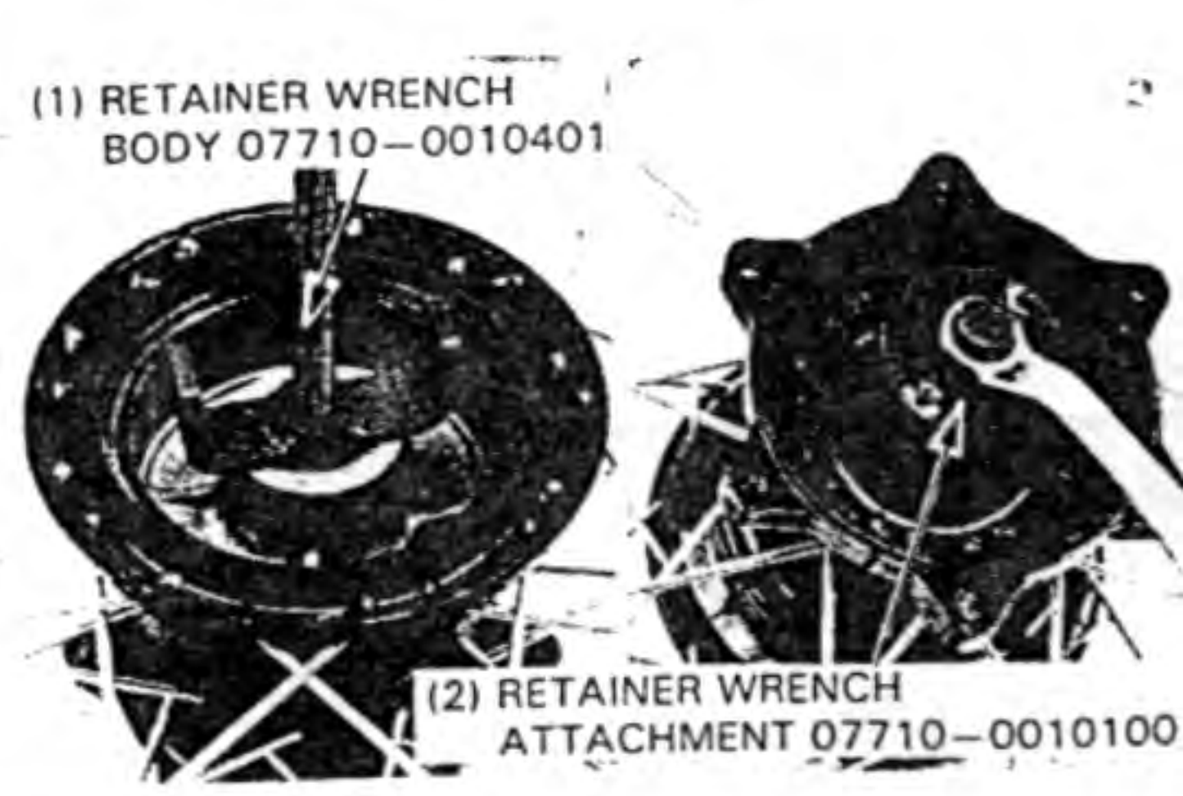


DISASSEMBLY

Remove the collar, driven sprocket bolts and sprocket.



Remove the bearing retainer using the retainer wrench body and attachment.



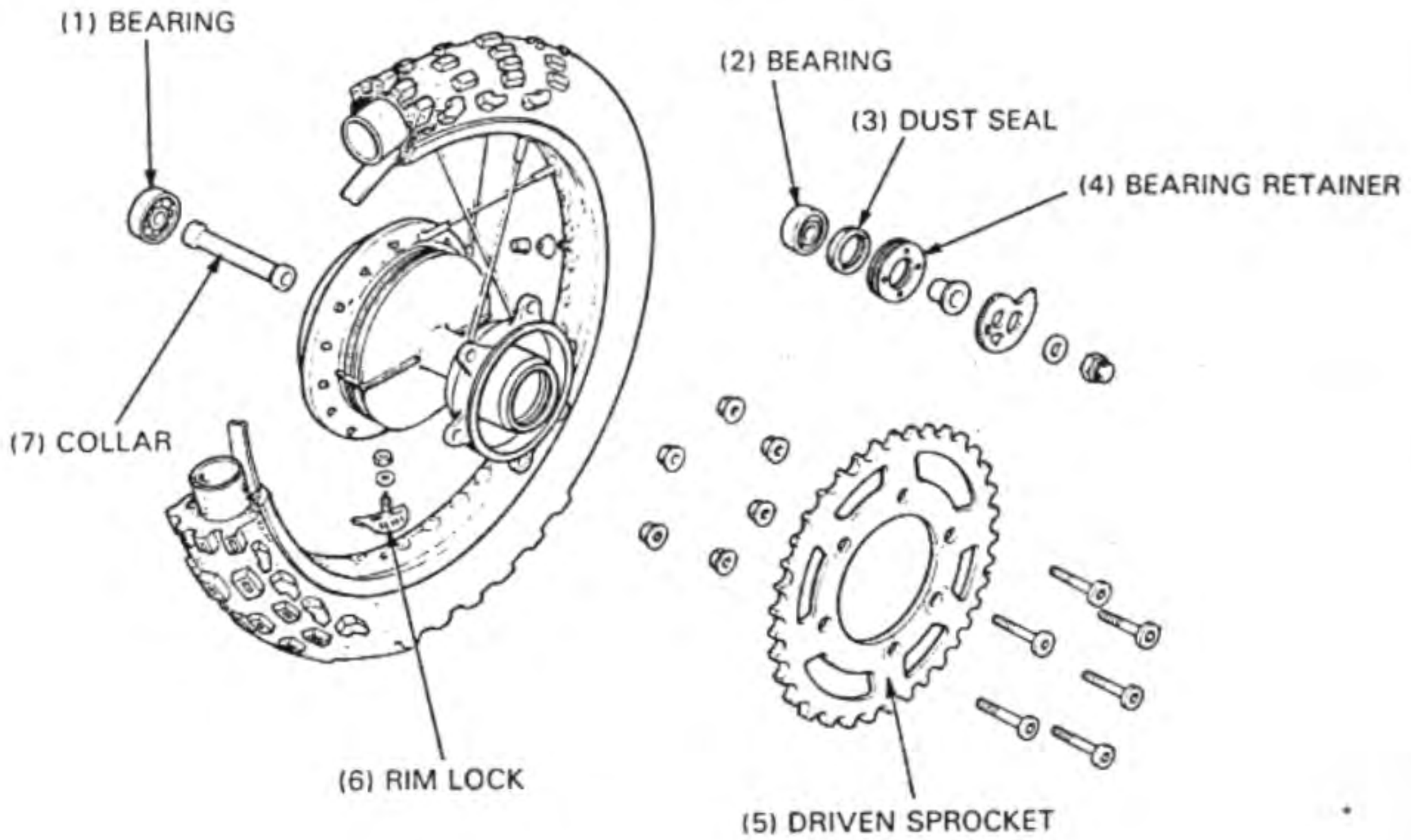
Remove the wheel bearings and distance collar with special tools.

NOTE

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

(1) BEARING REMOVER SHAFT 07746 – 0050100
BEARING REMOVER HEAD, 17 mm
07746 – 0050500

ASSEMBLY



Place the rim on the workbench.
Place the hub with the sprocket side down and begin lacing with new spokes.

Adjust the hub position so that the distance from the right end hub surface to the side of the rim is 21.0 mm (0.83 in) as shown.
Tighten the spokes in 2 or 3 progressive steps.

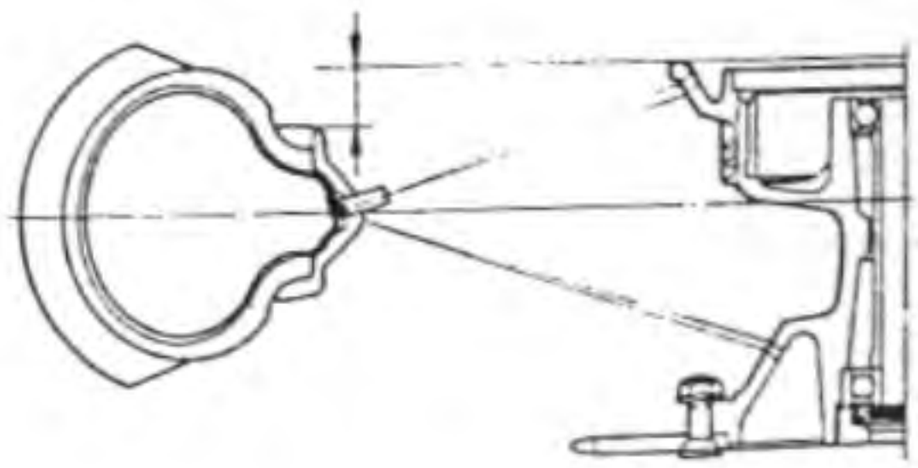
TORQUE: 2.5–5.0 N·m (0.25–0.50 kg-m, 1.8–3.6 ft-lb)

Install the rim band, rim lock, tube, and the tire.
Tighten the rim lock.

TORQUE: 10–15 N·m (1.0–1.5 kg-m, 7–11 ft-lb)

Check the wheel rim runout as shown on page 12-4 and adjust as required.

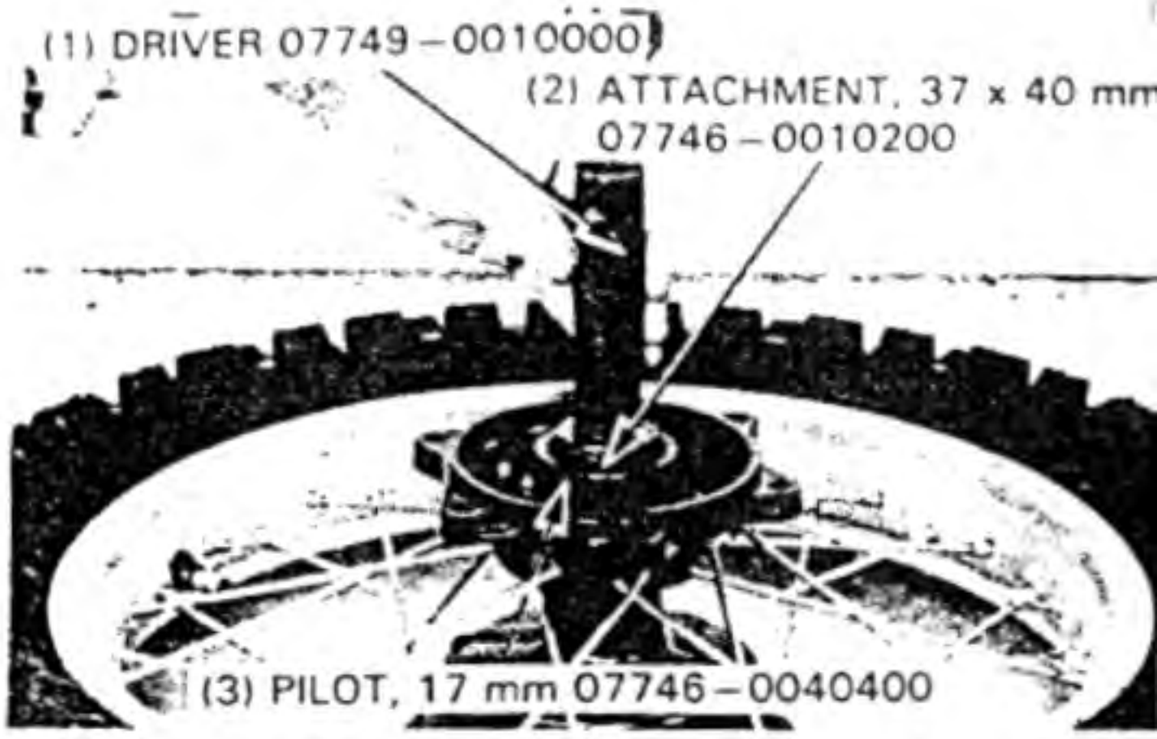
21.0 mm (0.83 in)



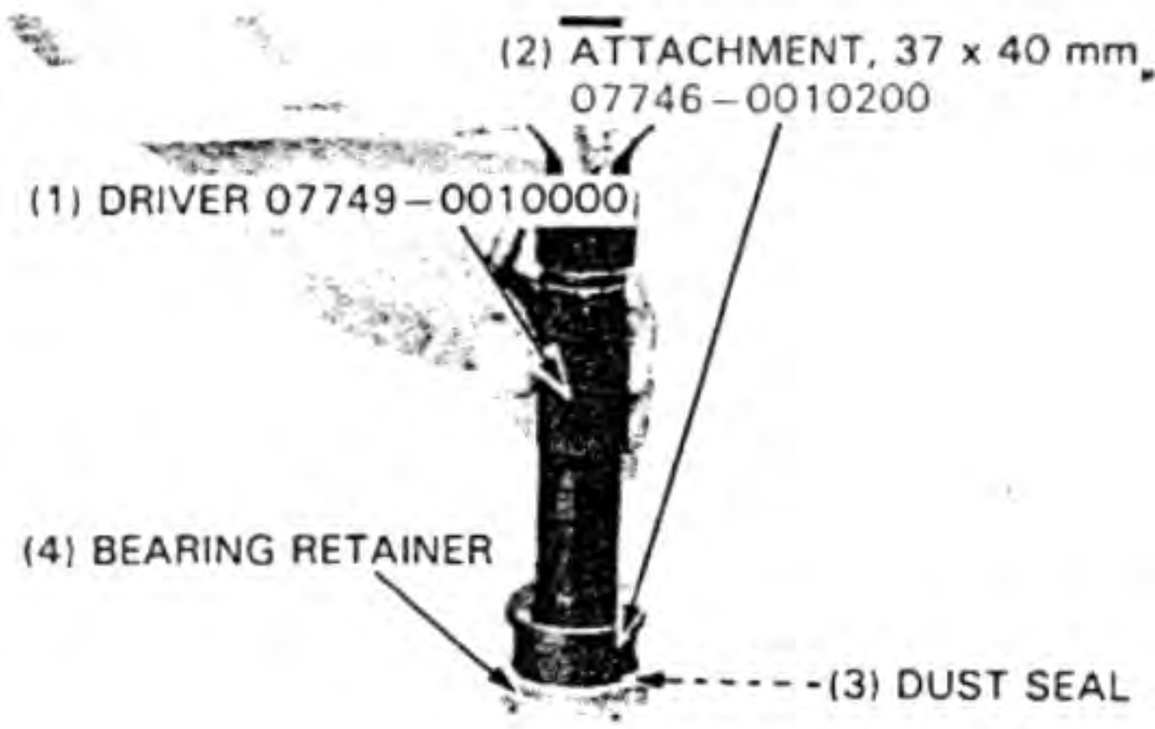
Pack all bearing cavities with grease.
Drive the right bearing in first, then install the distance collar into place.
Dirve the left bearing in.

CAUTION

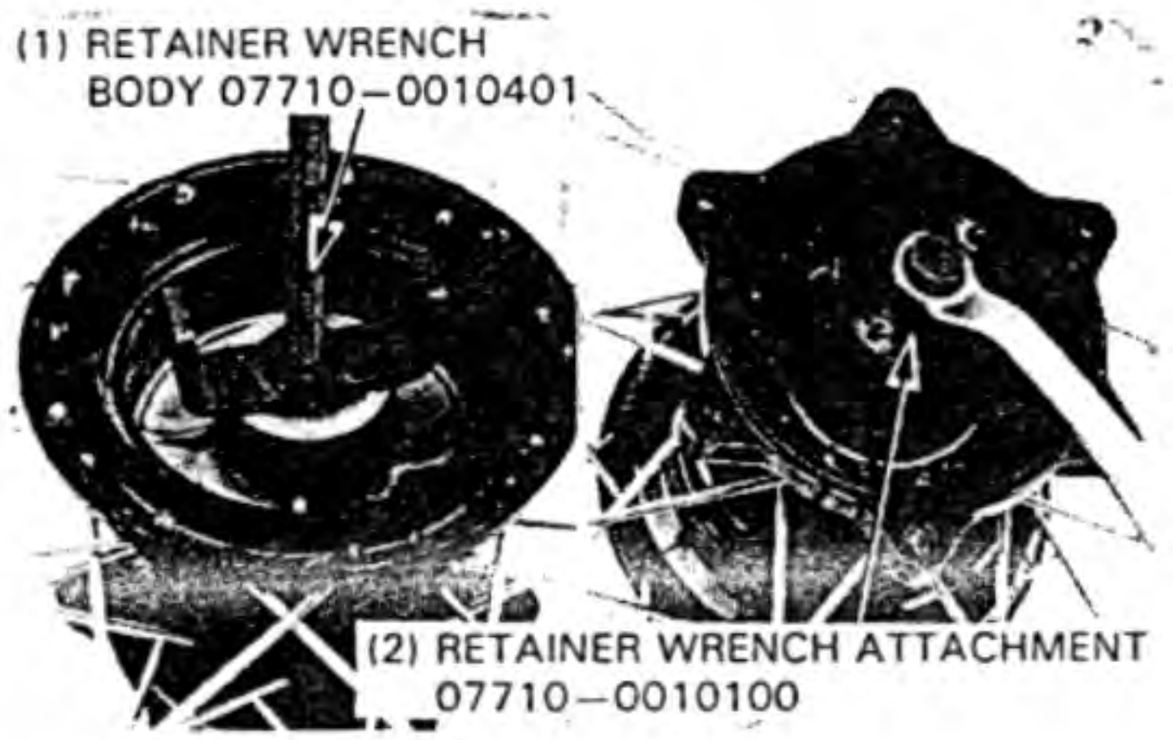
- *Drive the bearings in squarely, with the sealed sides facing out, making sure they are fully seated.*



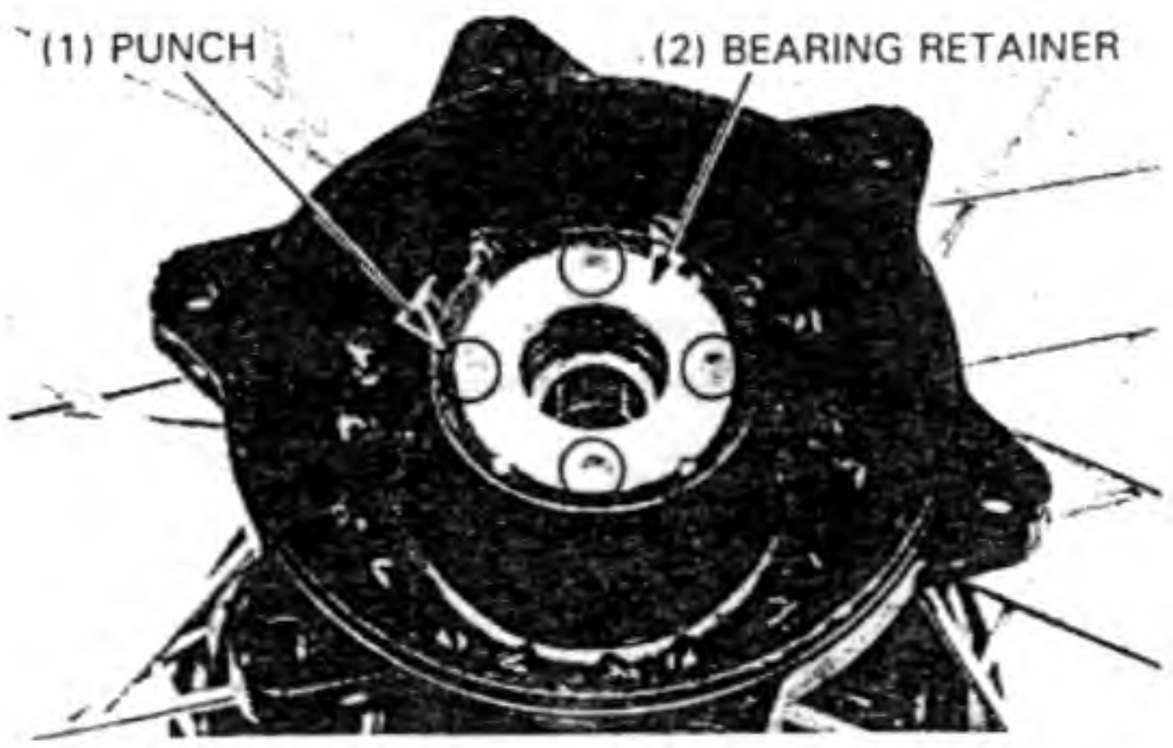
Use the driver and attachment to drive a new dust seal into the bearing retainer.



Grease the bearing retainer and install it into the hub with the retainer wrench body and attachment.

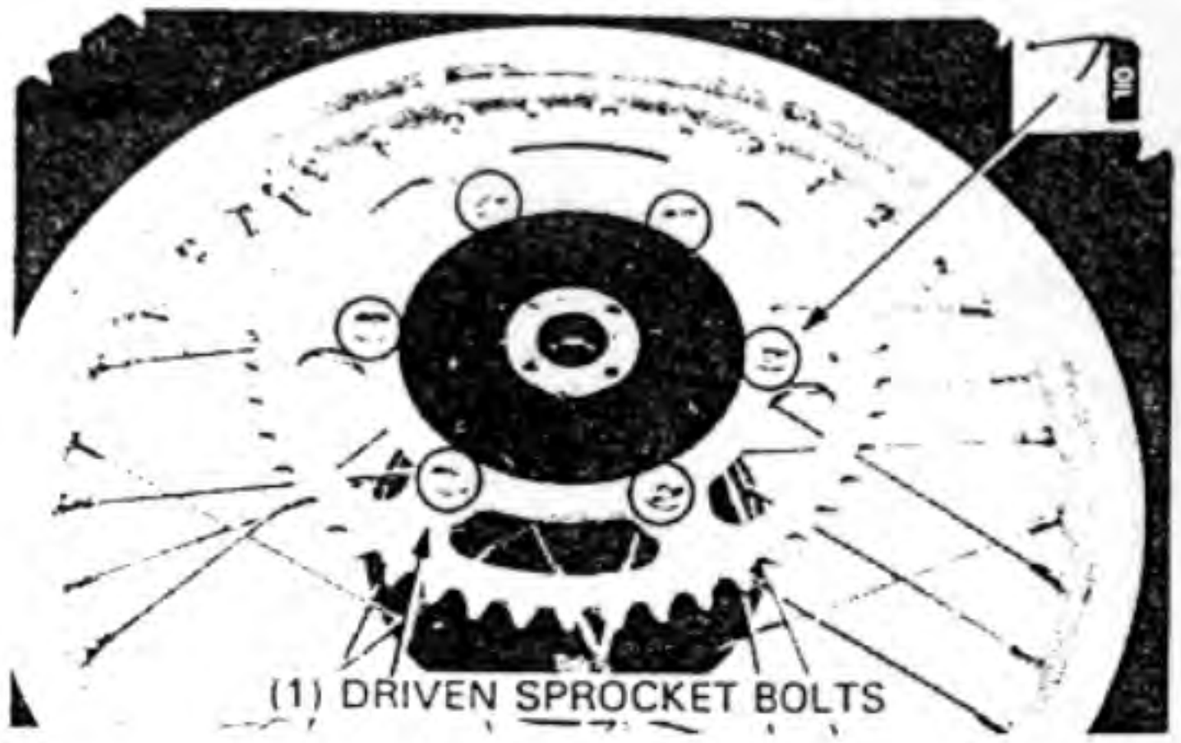


Peen the bearing retainer in four places with a center punch.

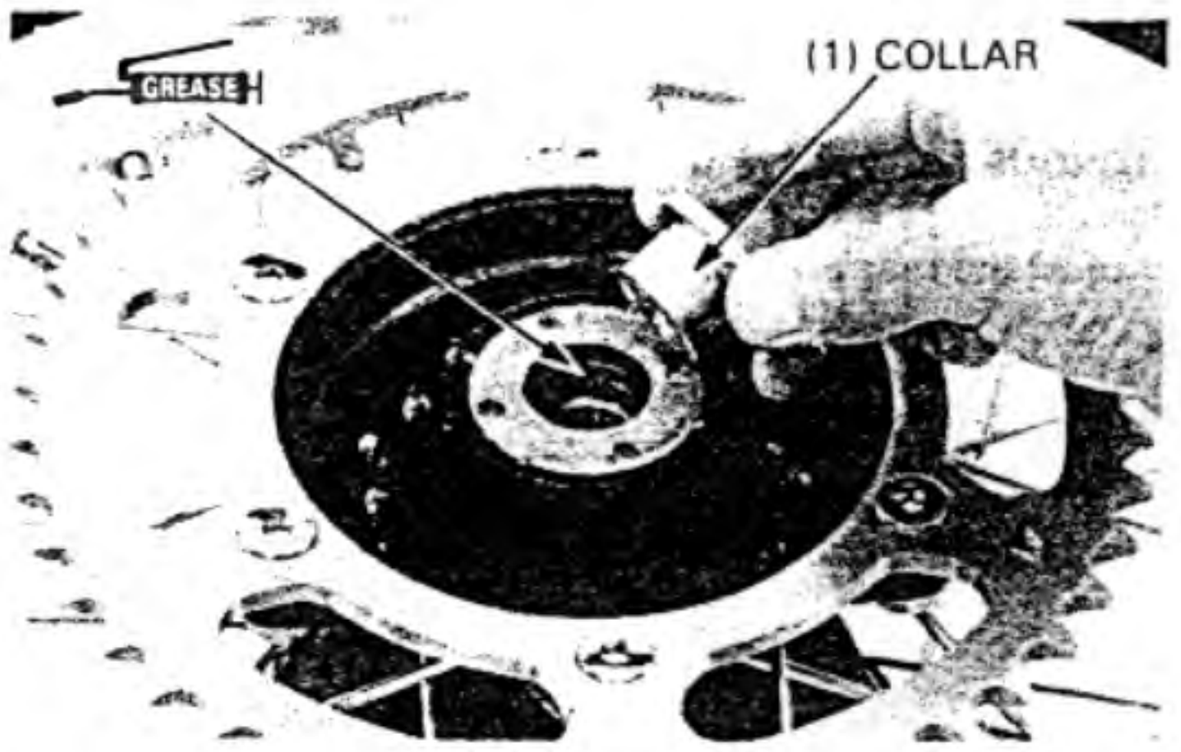


Apply oil to the driven sprocket bolts, install the driven sprocket onto the hub and tighten the nuts.

TORQUE: 34–40 N·m (3.4–4.0 kg-m, 25–29 ft-lb)

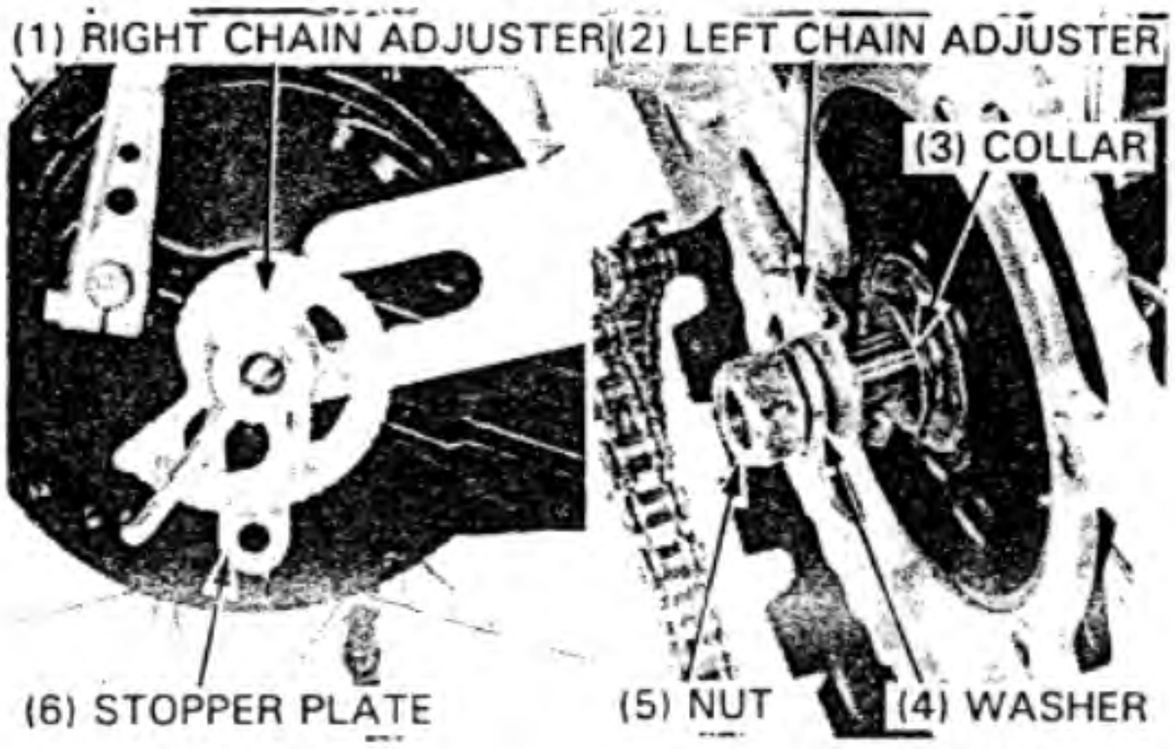


Apply grease to the dust seal and install the collar.

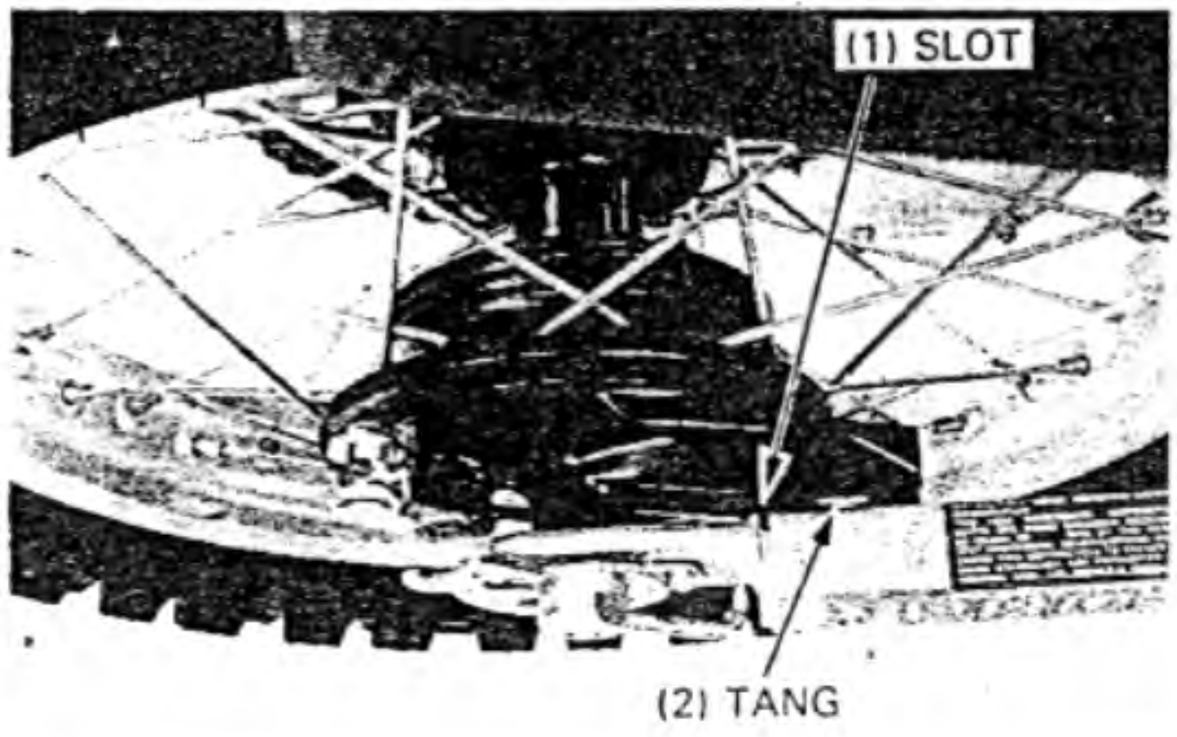


INSTALLATION

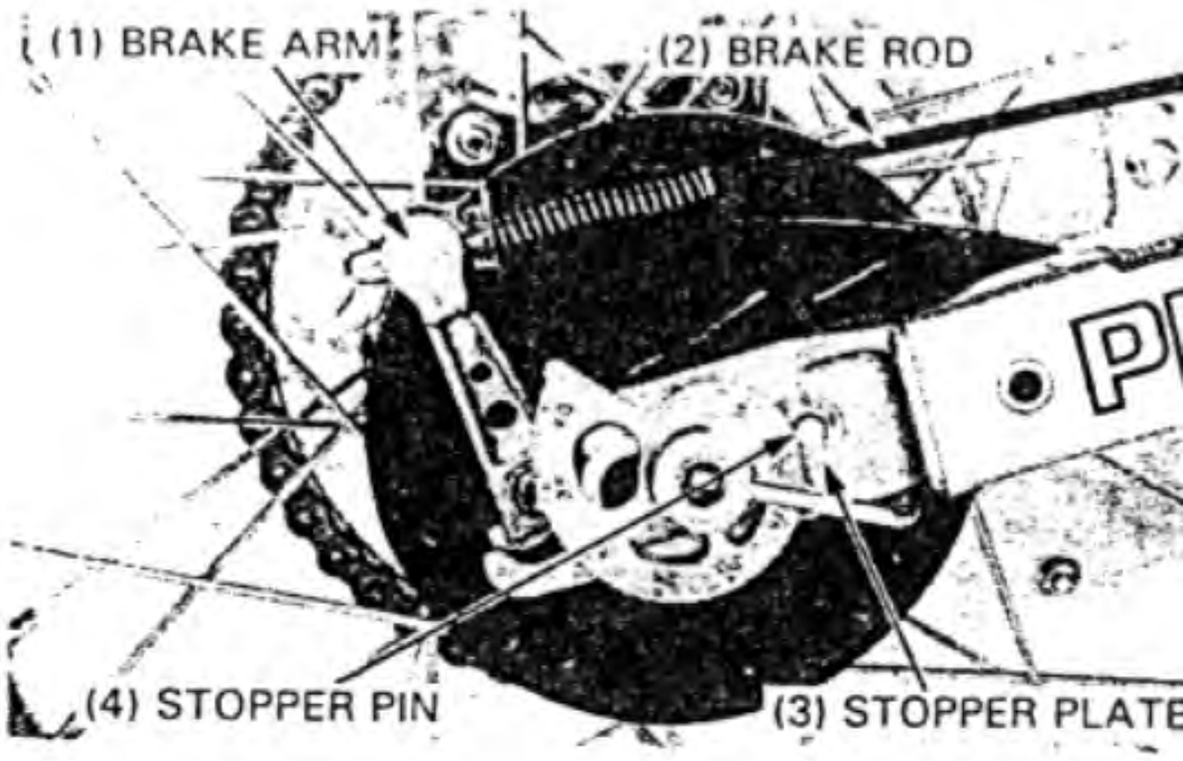
Install the brake panel in the brake drum.
Insert the rear axle through the right chain adjuster, stopper plate, brake panel, wheel hub, side collar and left chain adjuster and install the washer and axle nut.



Place the rear wheel into the swingarm, aligning the brake panel slot with the tang on the swingarm.



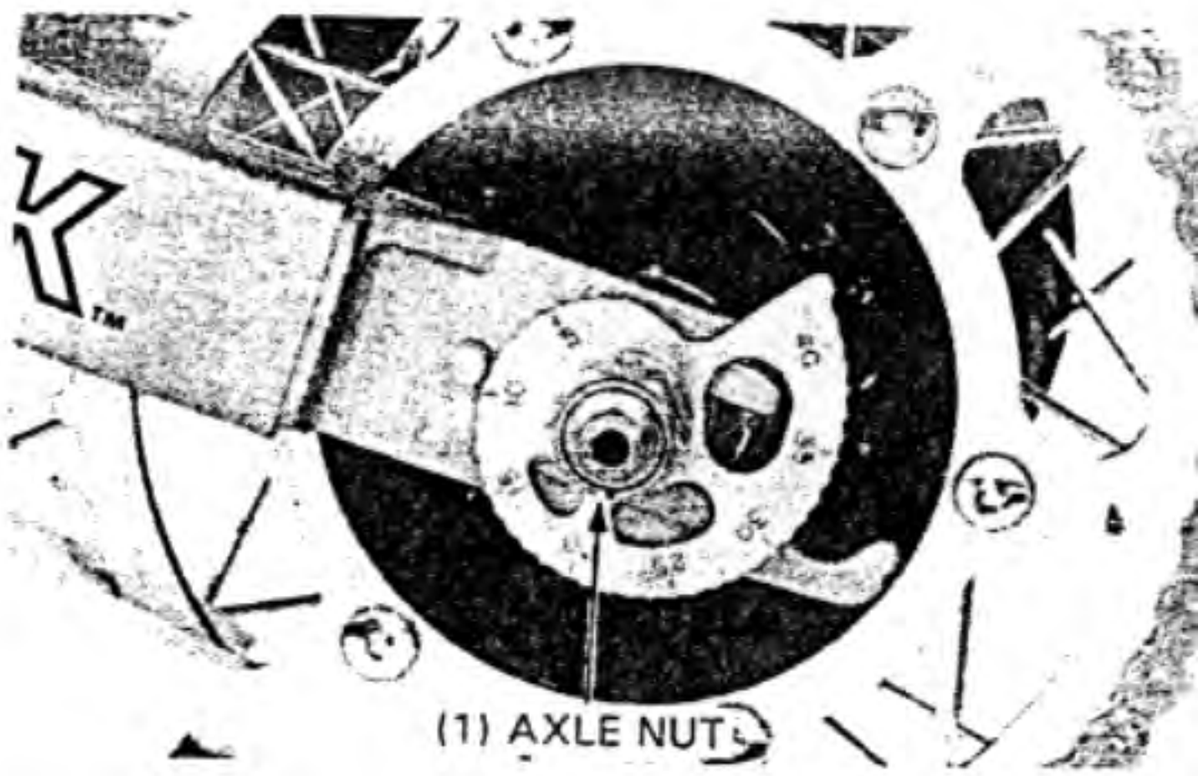
Install the drive chain.
Slip the stopper plate over the stopper pin on the swingarm.
Connect the brake rod to the brake arm.
Adjust the drive chain slack (page 3-11).



Tighten the axle nut.

TORQUE: 80—110 N·m (8.0—11.0 kg-m, 58—80 ft-lb)

Adjust the rear brake pedal free play (page 3-14).



REAR BRAKE

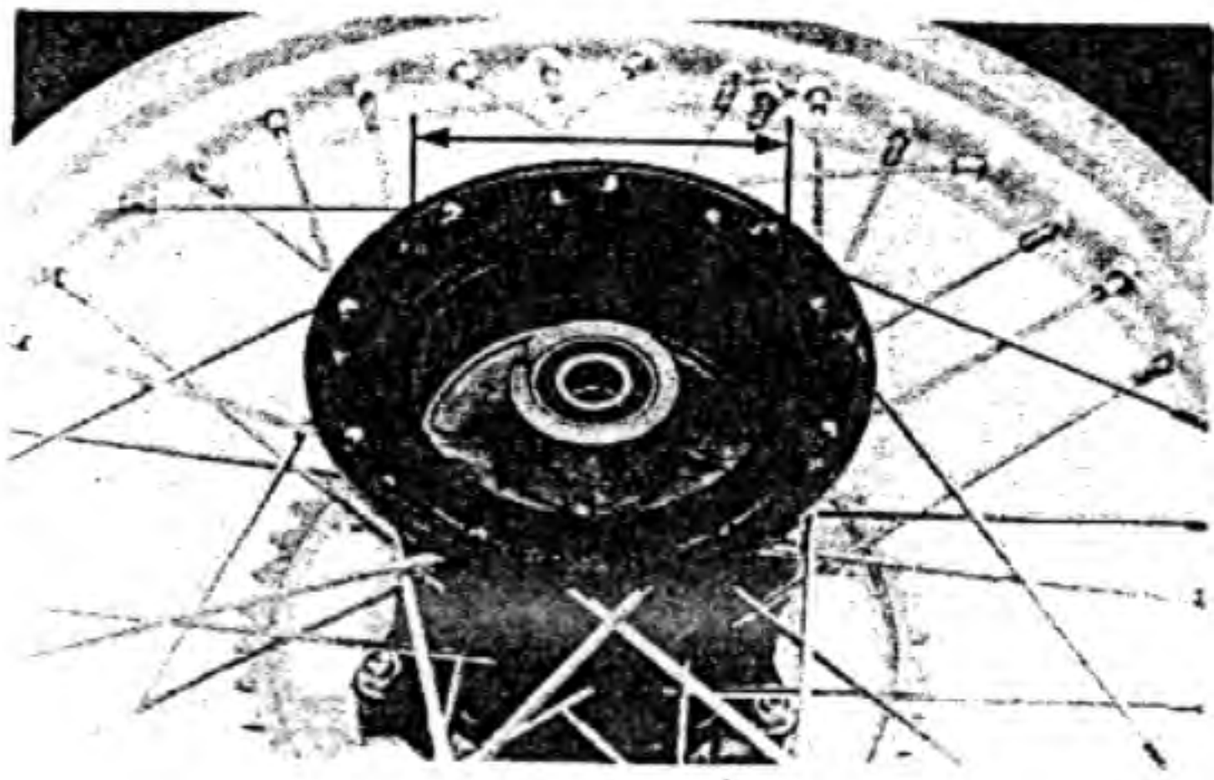
REMOVAL

Remove the rear wheel and brake panel (page 12-3).

BRAKE DRUM INSPECTION

Measure the I.D. of the rear brake drum.

SERVICE LIMIT: 111 mm (4.37 in)



BRAKE LINING INSPECTION

Check the brake shoe springs for fatigue or damage and check the brake cam for wear or cracks.
Measure the brake lining thickness.

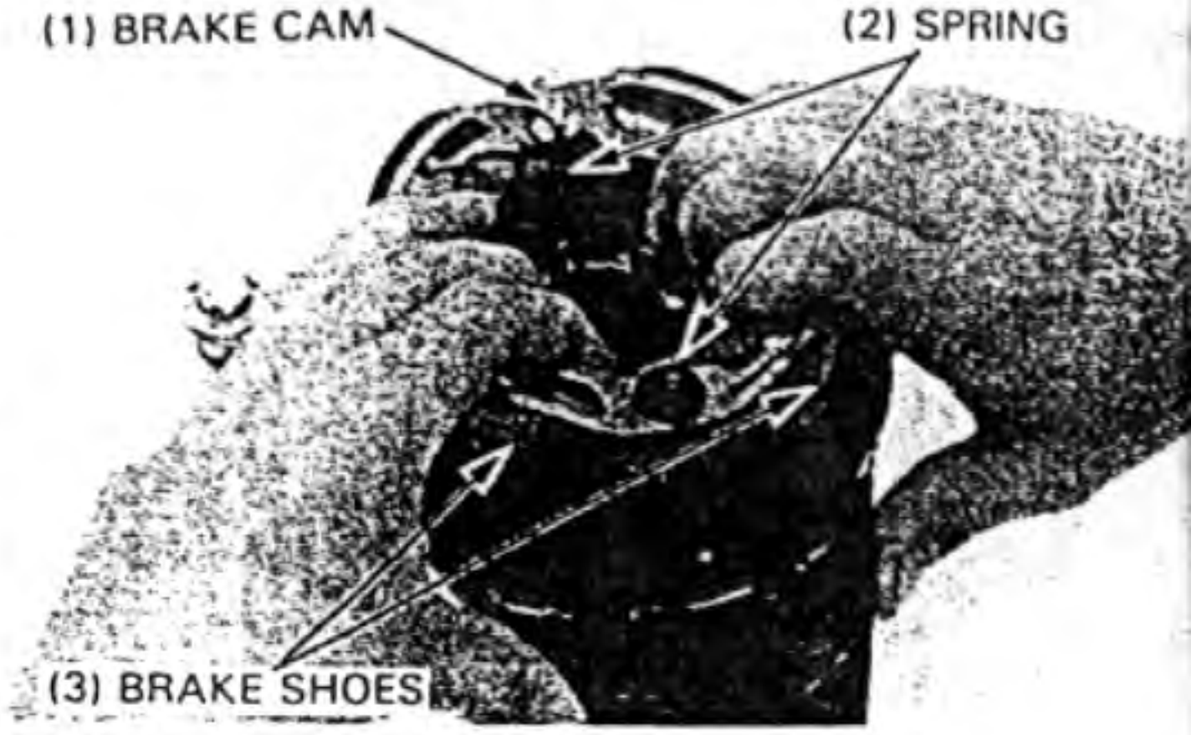
SERVICE LIMIT: 2.0 mm (0.08 in)

BRAKE PANEL DISASSEMBLY

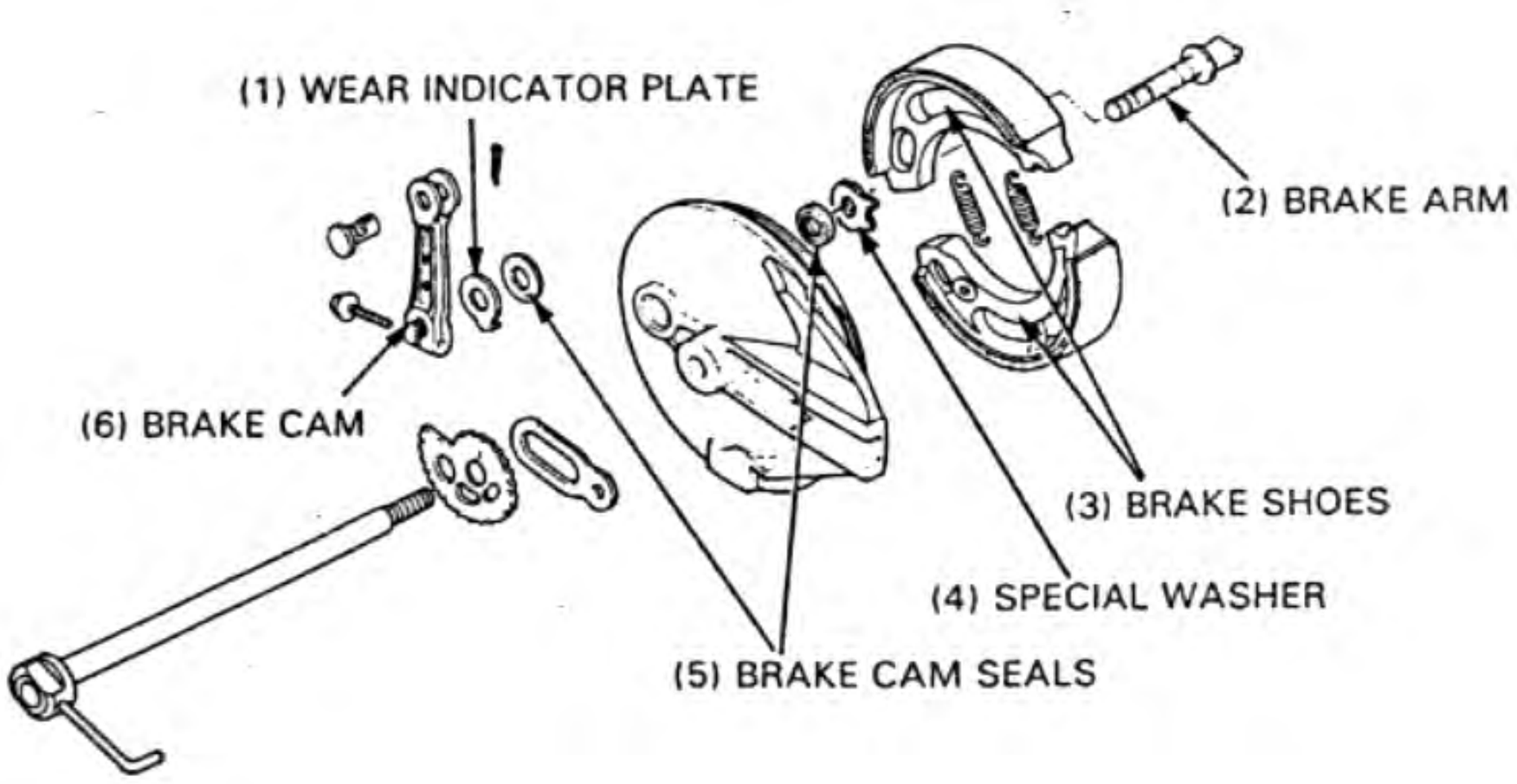
NOTE

- Mark the side of the brake shoes to indicate their original position, before removing them.

Pull the brake shoes apart and remove them from the brake panel.
Remove the springs.
Remove the brake arm, indicator plate, cam seals, brake cam and special washer.



BRAKE PANEL ASSEMBLY



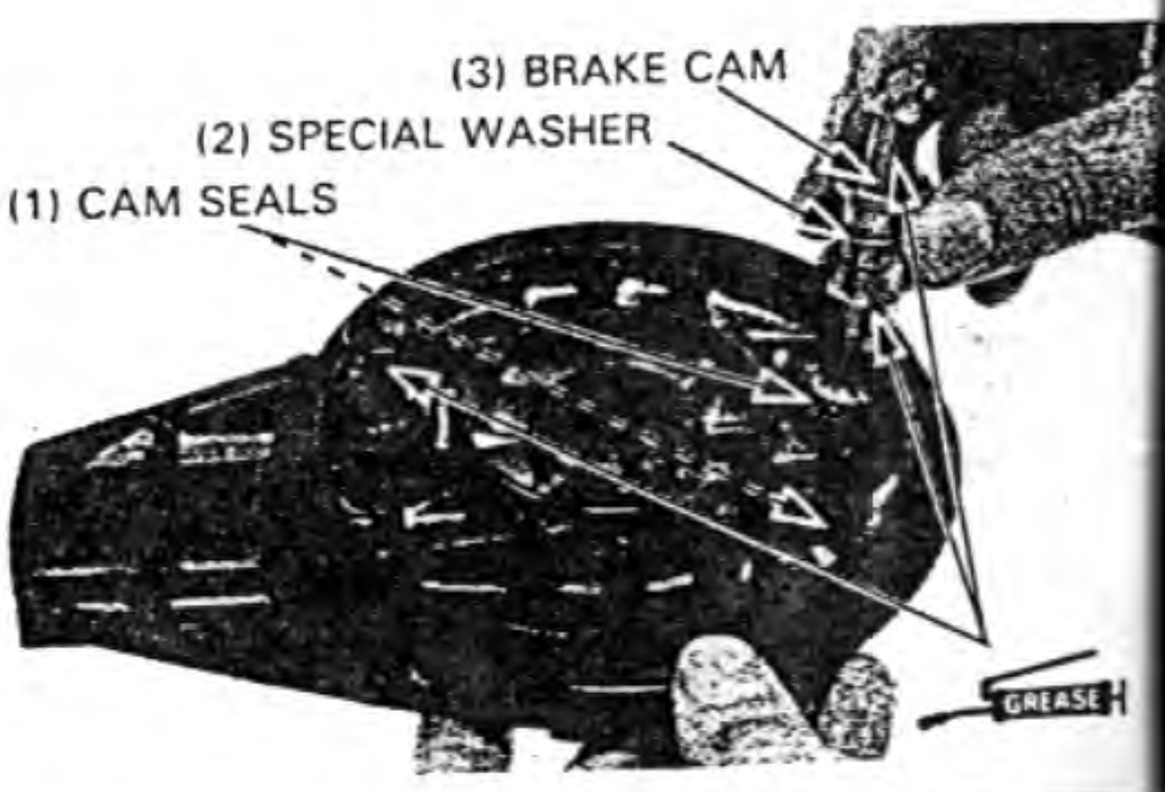
Install the new brake cam seals to the brake panel.

Apply a small amount of grease to the brake cam and brake shoe anchor pin.

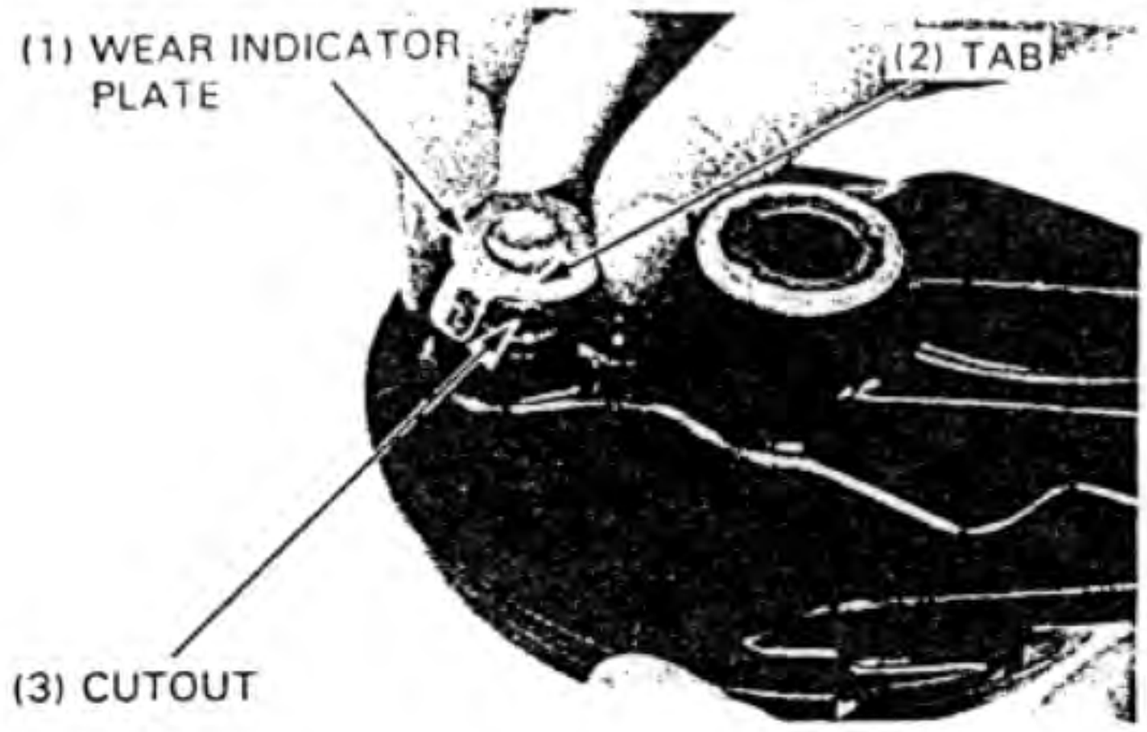
Install the special washer and the brake cam to the brake panel.

WARNING

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

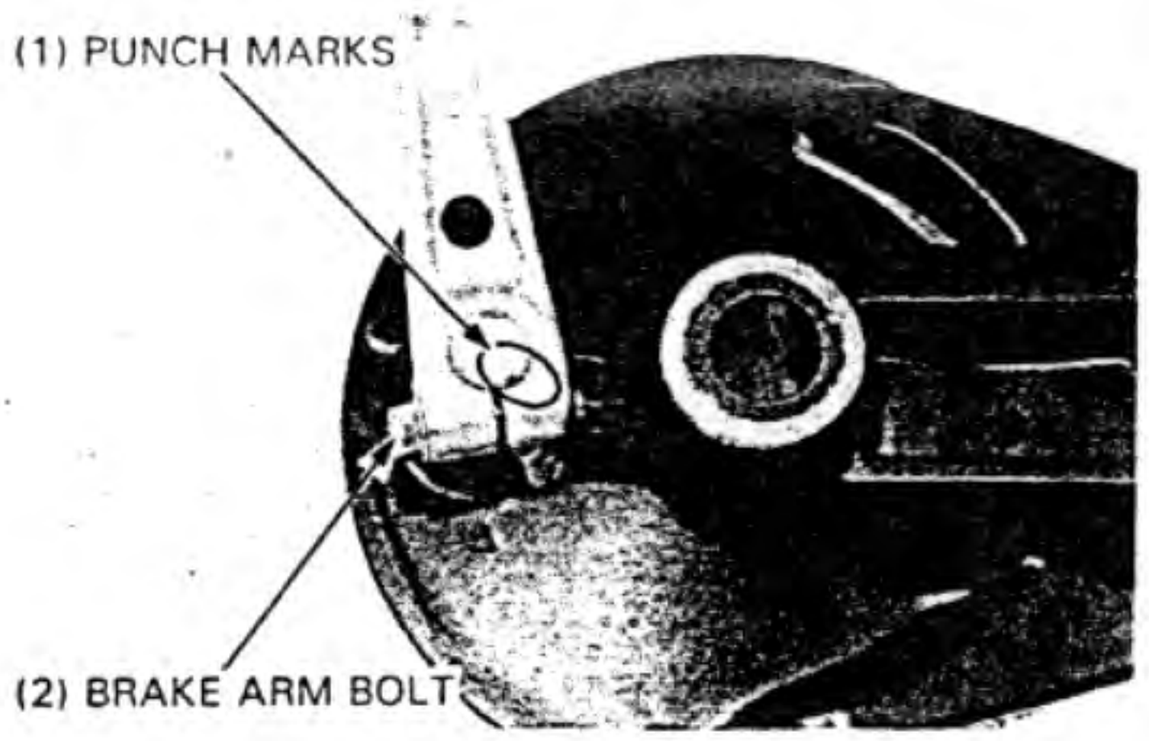


Align the wear indicator tab with the cutout in the brake cam and install the indicator over the cam.



Install the brake arm aligning the punch mark with the cam punch marks.
Tighten the brake arm bolt.

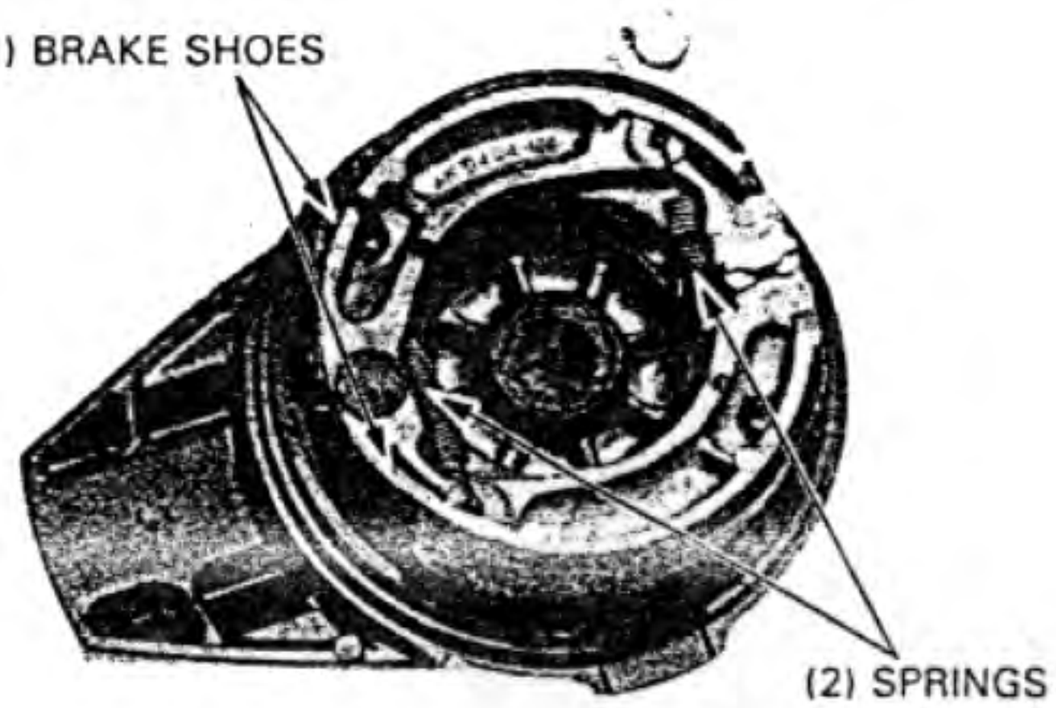
TORQUE: 8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)



NOTE

- **Install the brake shoes in their original position.**

Install the brake shoes and return springs onto the brake panel as shown.

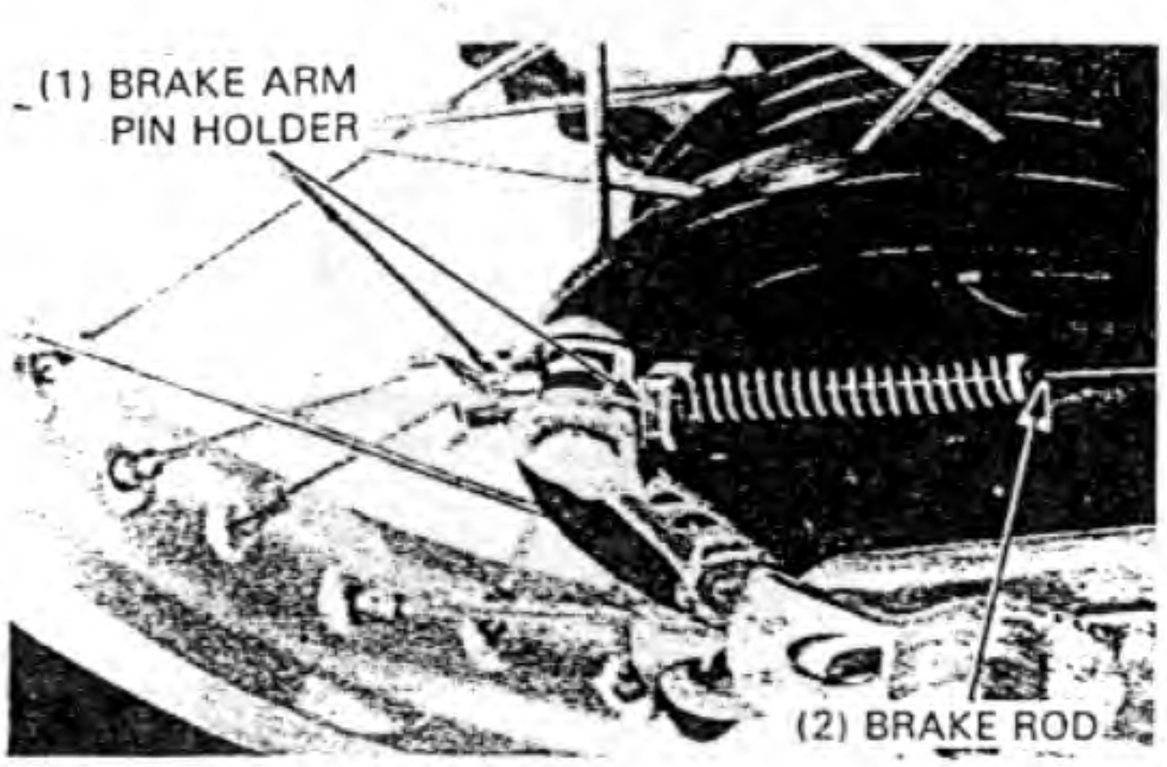


INSTALLATION

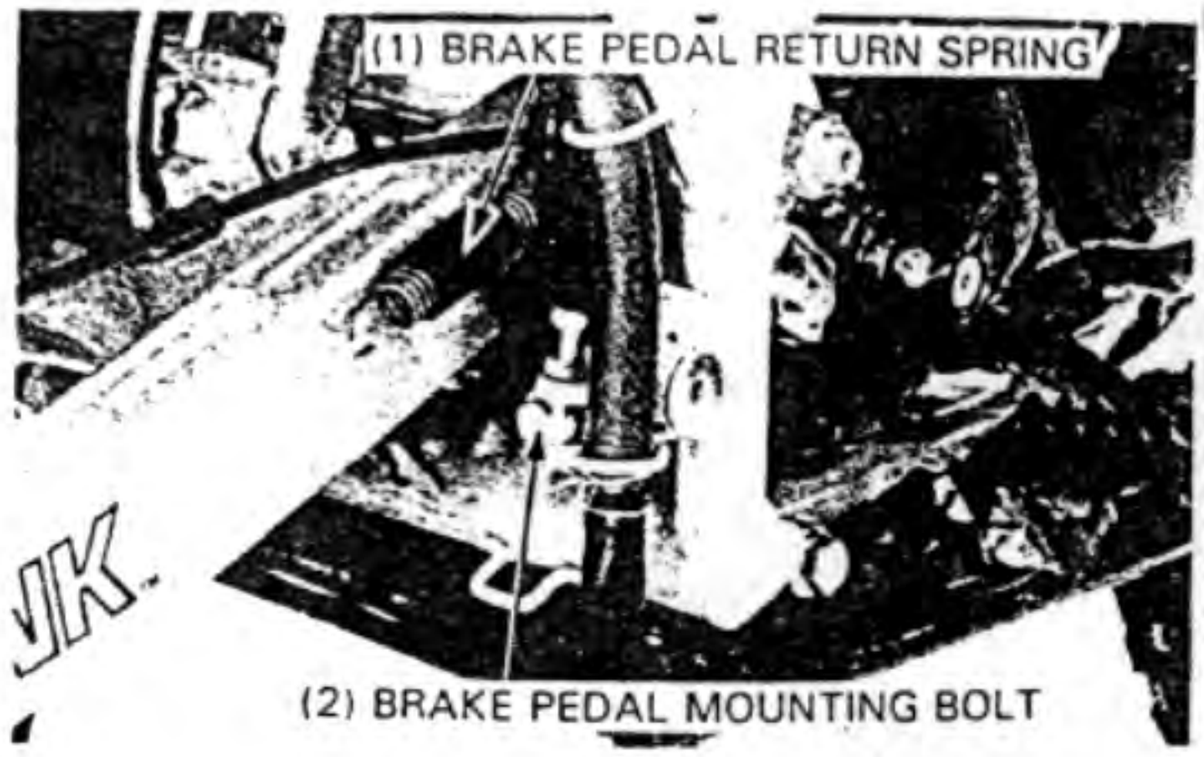
Place the brake panel assembly into the wheel.
Install the rear wheel (page 12-7).

BRAKE PEDAL REMOVAL

Pull the brake arm pin holder forward and disconnect the brake rod from the brake arm.

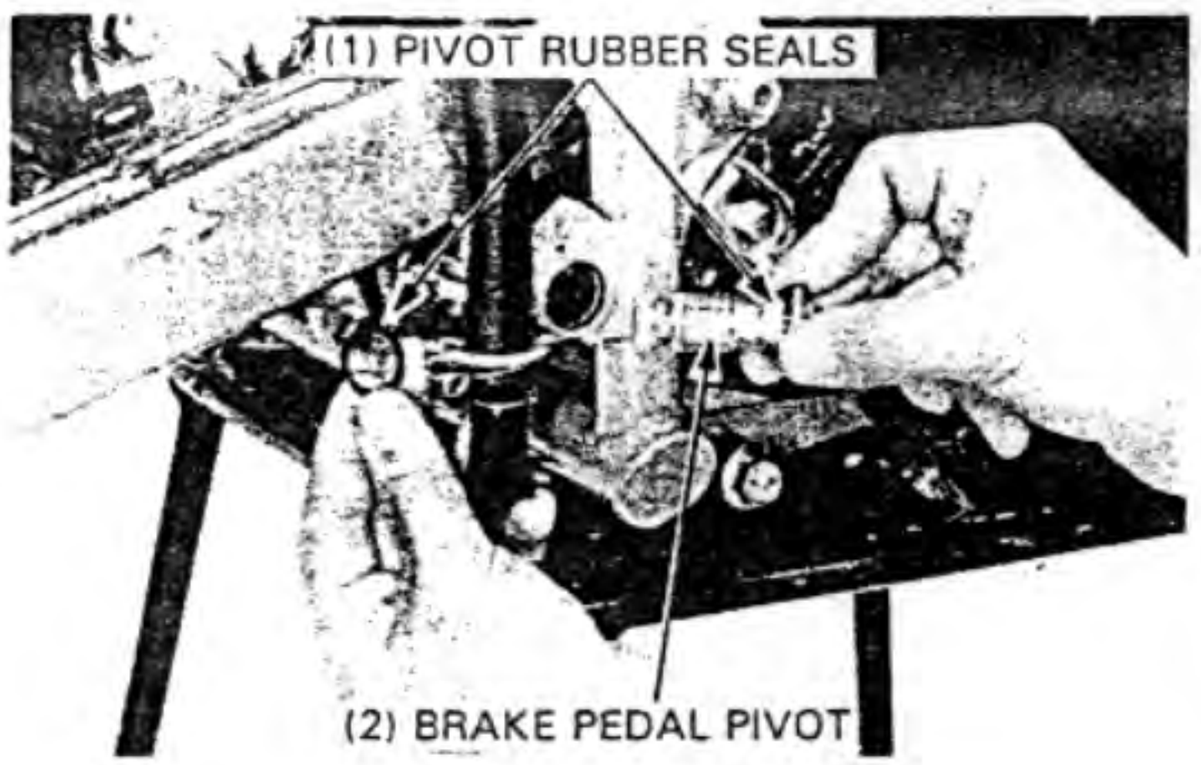


Remove the brake pedal return spring.
Remove the brake pedal mount bolt.



Remove the brake pedal pivot and remove the brake pedal.

Remove the pivot rubber seals.

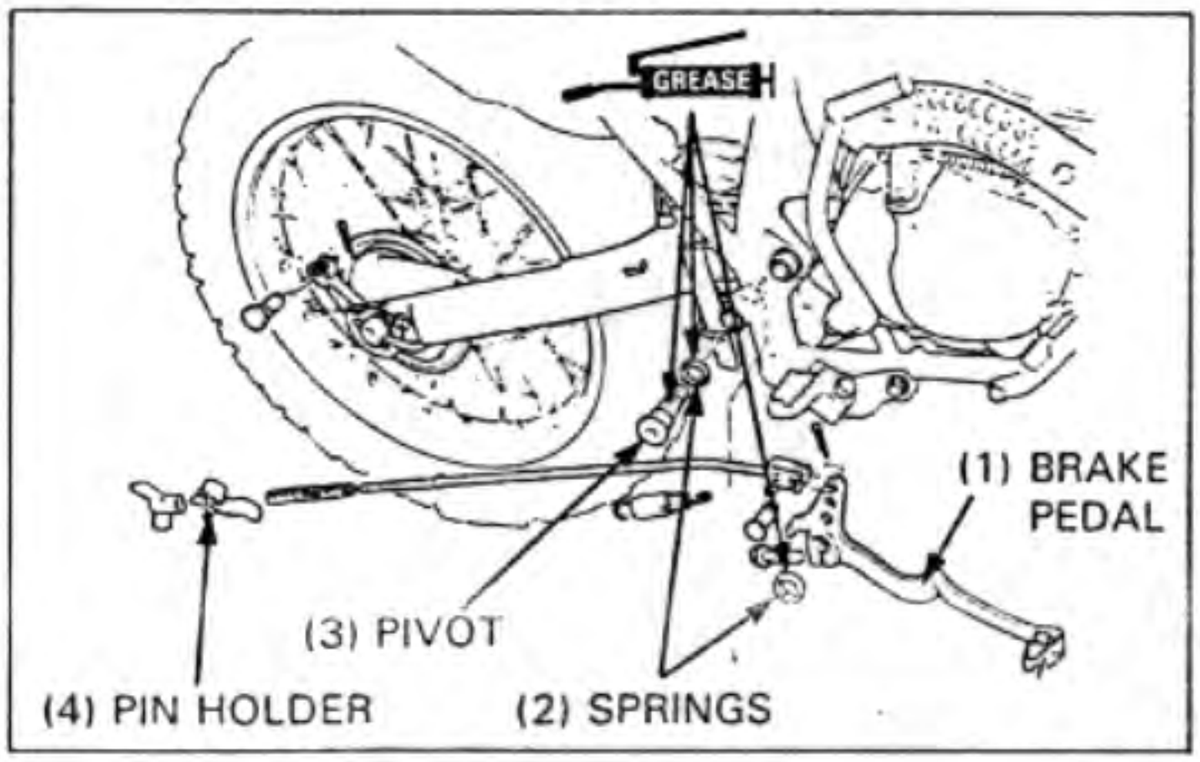


BRAKE PEDAL INSTALLATION

When assembling, apply grease to the brake pedal pivot bolt and pivot rubber seals.

Install the brake pedal in the reverse order of removal.

Adjust the brake pedal free play (page 3-14).

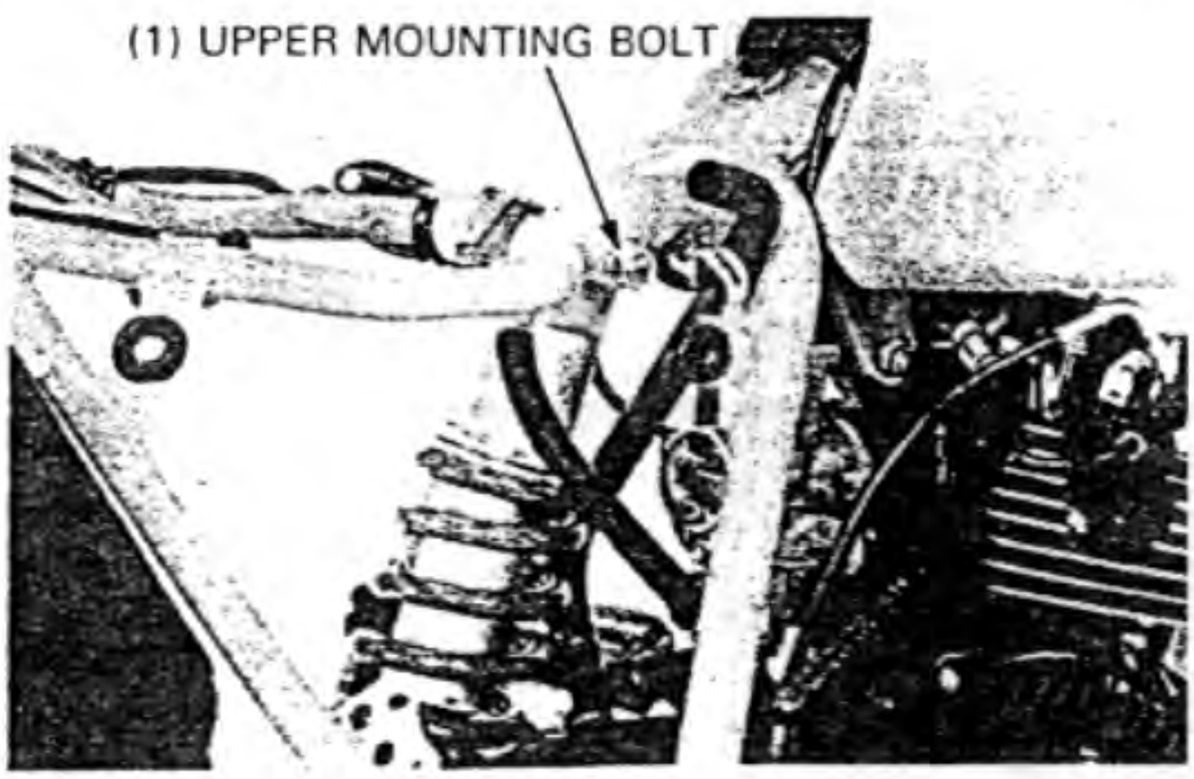


SHOCK ABSORBER

REMOVAL

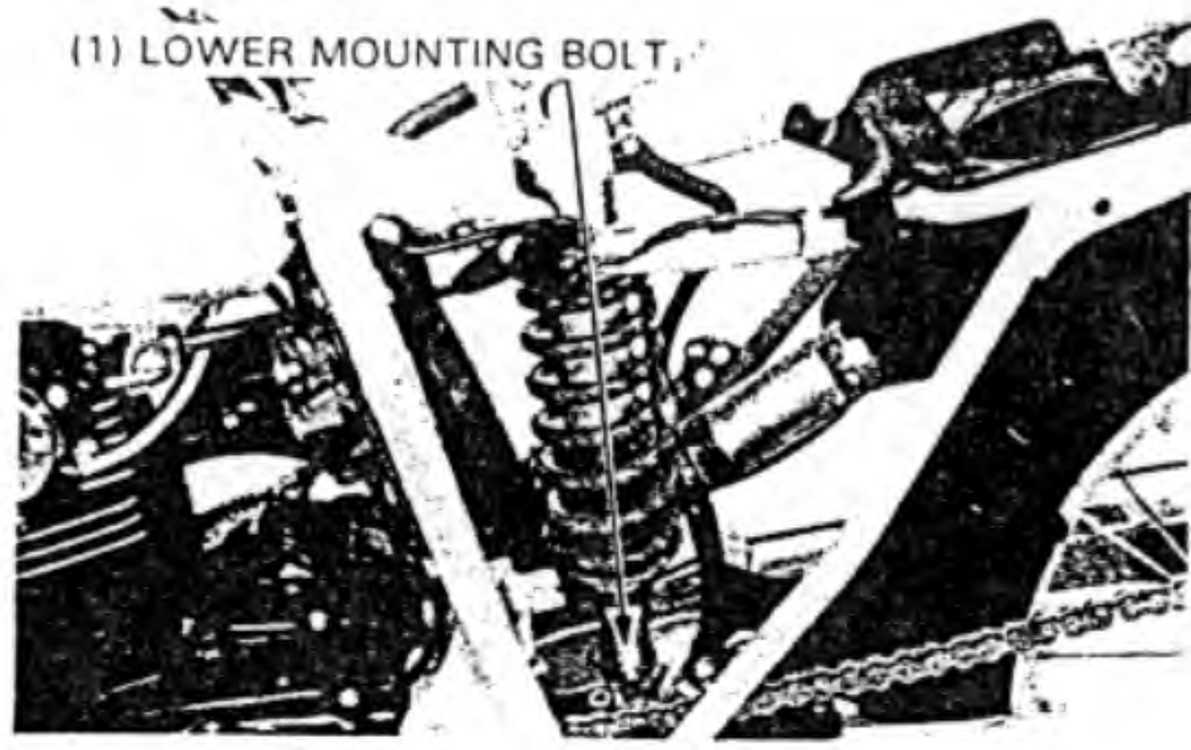
Remove the air cleaner housing (page 4-4).

Raise the rear wheel off the ground by placing a box or work-stand under the engine.
Remove the shock absorber upper mounting bolt.



Support the motorcycle securely, and raise the rear wheel until the shock absorber lower mounting bolt can be removed.

Remove the lower mounting bolt and shock absorber.

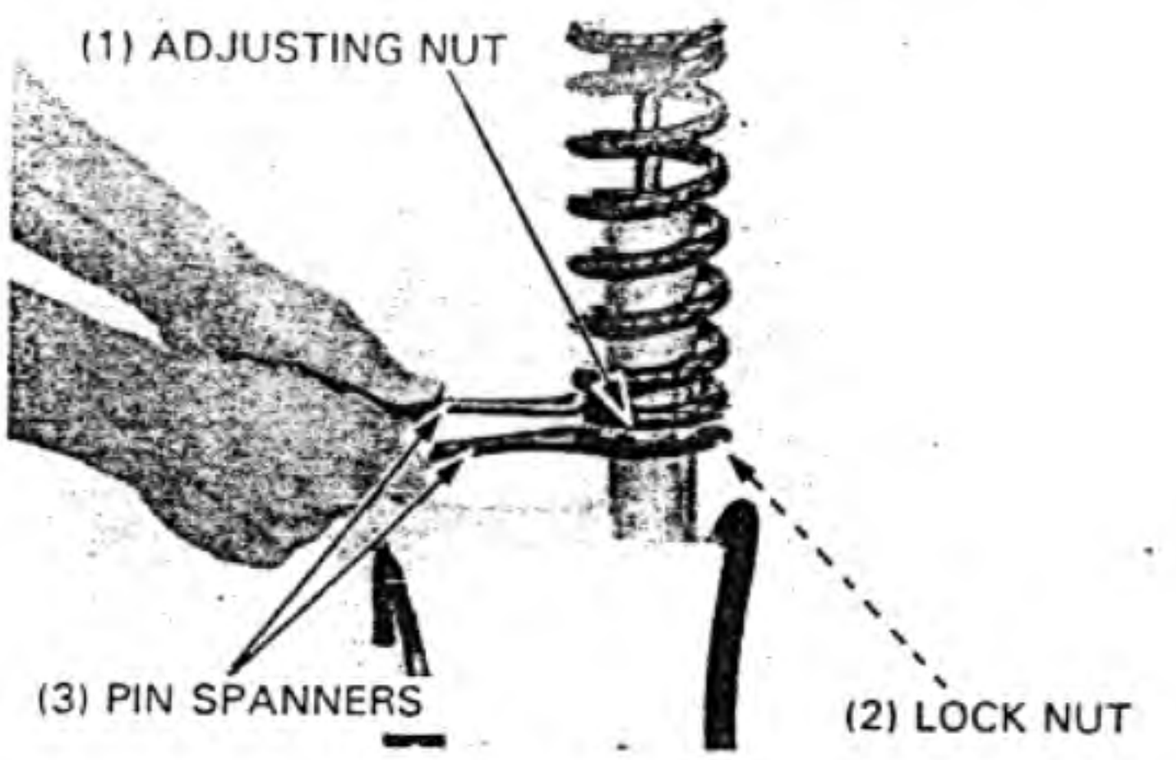


SPRING REMOVAL/INSPECTION

Hold the upper shock mount in a vise with soft jaws or a shop towel. Loosen the lock nut and adjusting nut.

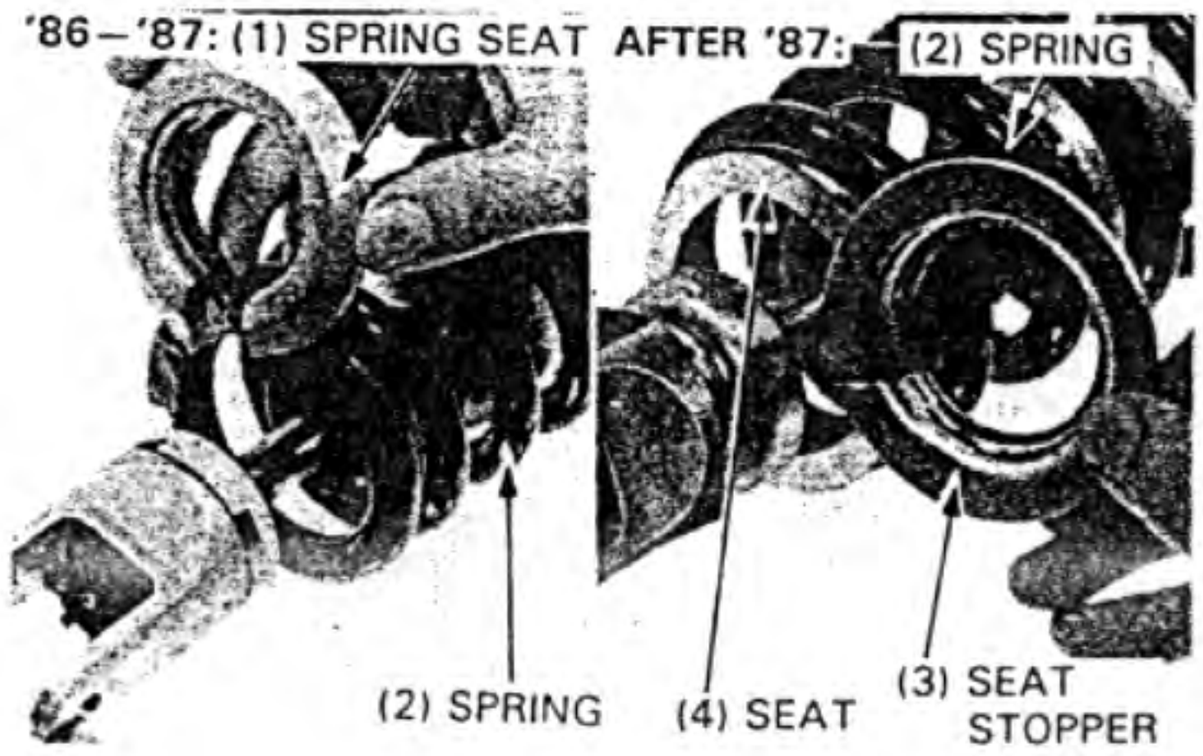
CAUTION

- *When clamping the shock in a vise, be careful not to damage the hose connection.*



'86–'87:
Remove the spring seat and spring.

AFTER '87:
Remove the spring seat stopper and lower spring seat.
Remove the spring.



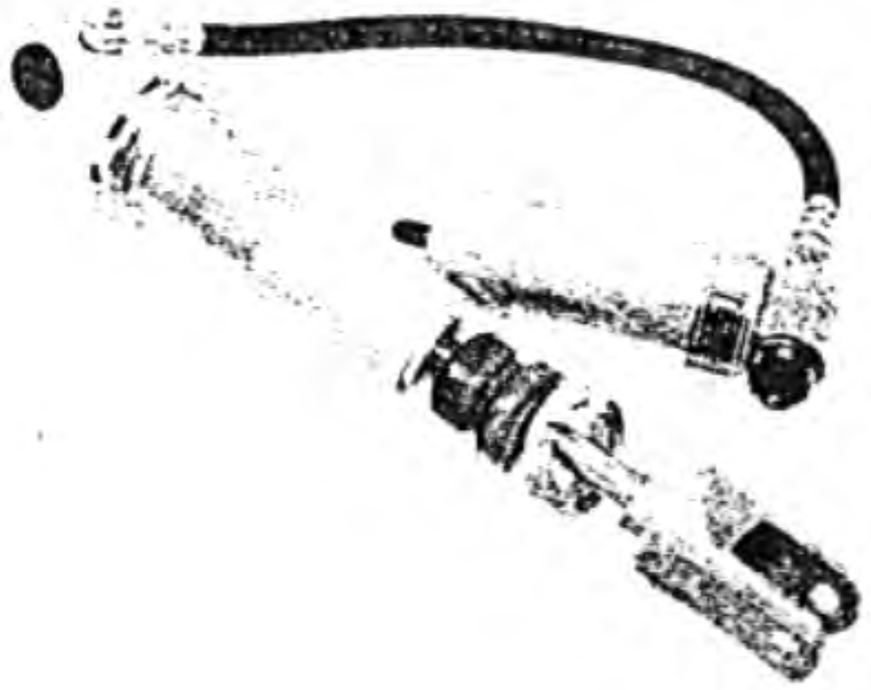
Measure the free length of the spring.

SERVICE LIMIT: '86–'88, '90–'91: 186 mm (7.3 in)
After '92: 180 mm (7.1 in)

DAMPER INSPECTION

Visually inspect the damper unit, reservoir hose and reservoir for dents, oil leaks or other faults. Replace the damper unit if necessary.

Inspect the damper rod and oil seal. Replace the damper rod if the rod is bent or scored, or the seal is leaking.

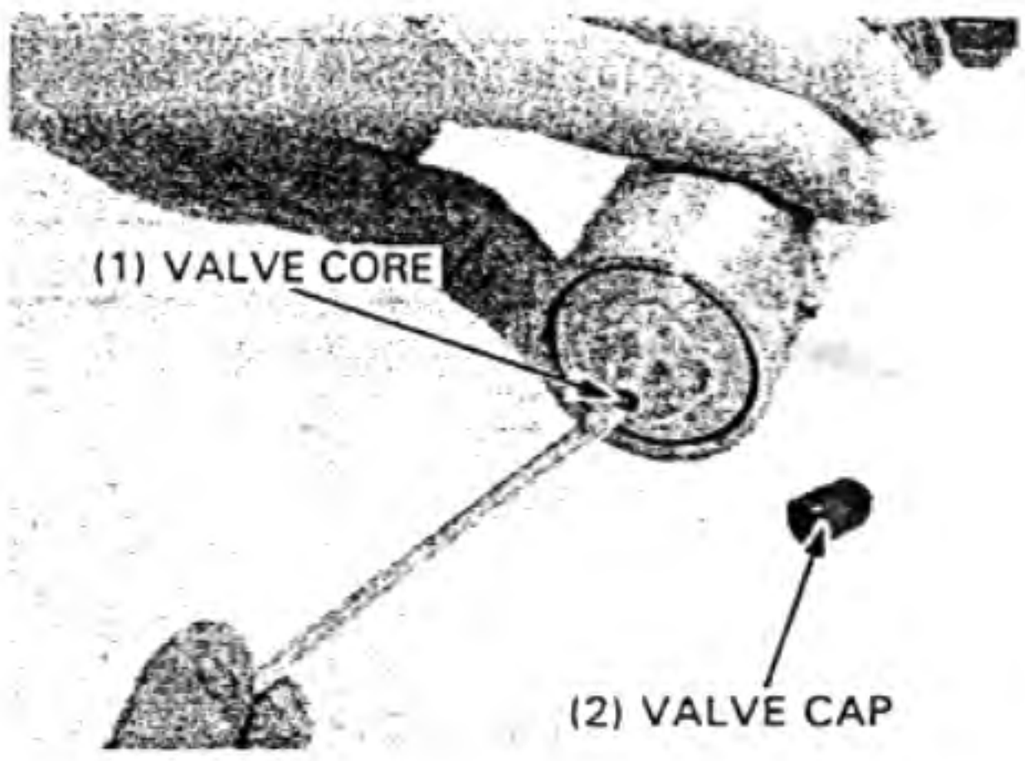


DAMPER DISASSEMBLY

Remove the valve cap.
Release the nitrogen from the reservoir by depressing the valve core. Do not remove the valve until pressure is released.

WARNING

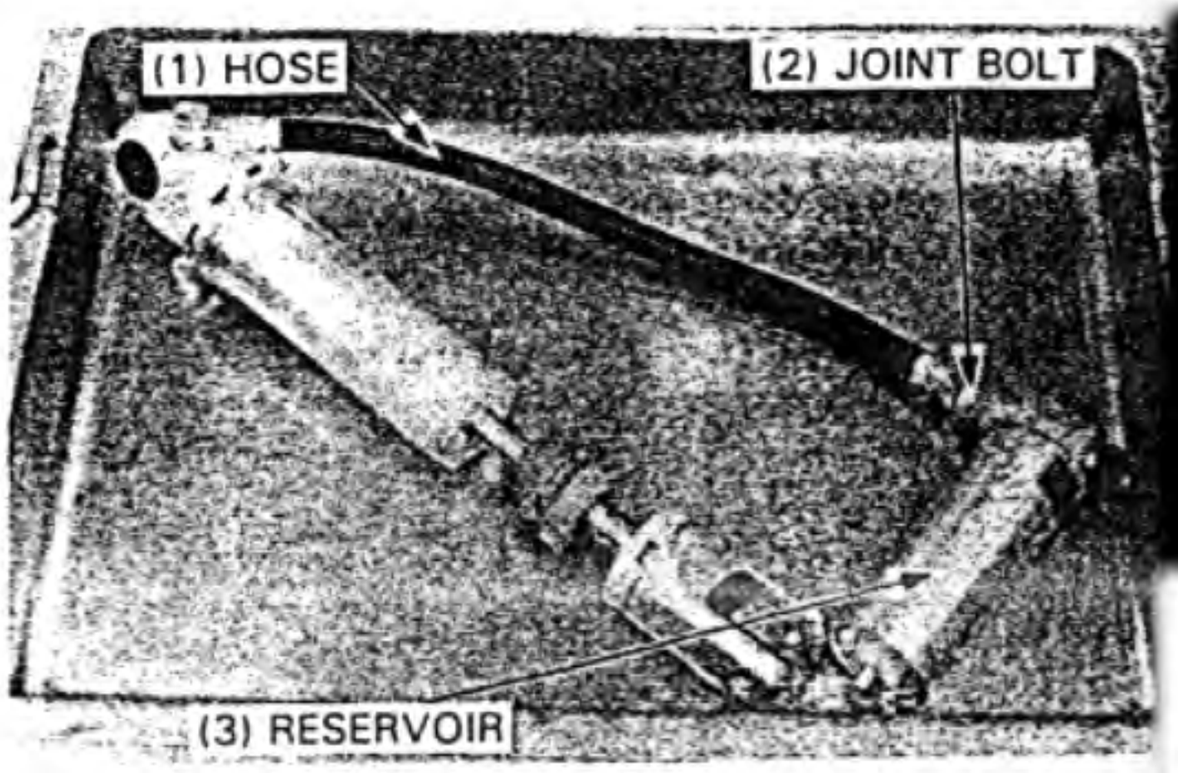
- ***Point the valve away from you to prevent debris getting in your eyes.***
- ***Before disposal of the shock absorber, release the nitorogen from the reservoir and then remove the valve.***



Remove the reservoir hose joint bolts, then separate the reservoir, hose and damper, and drain them.

To drain the damper oil from the hose and damper, pump the damper back-and-forth several times.

To drain the damper oil from the reservoir, go to page 12-20.



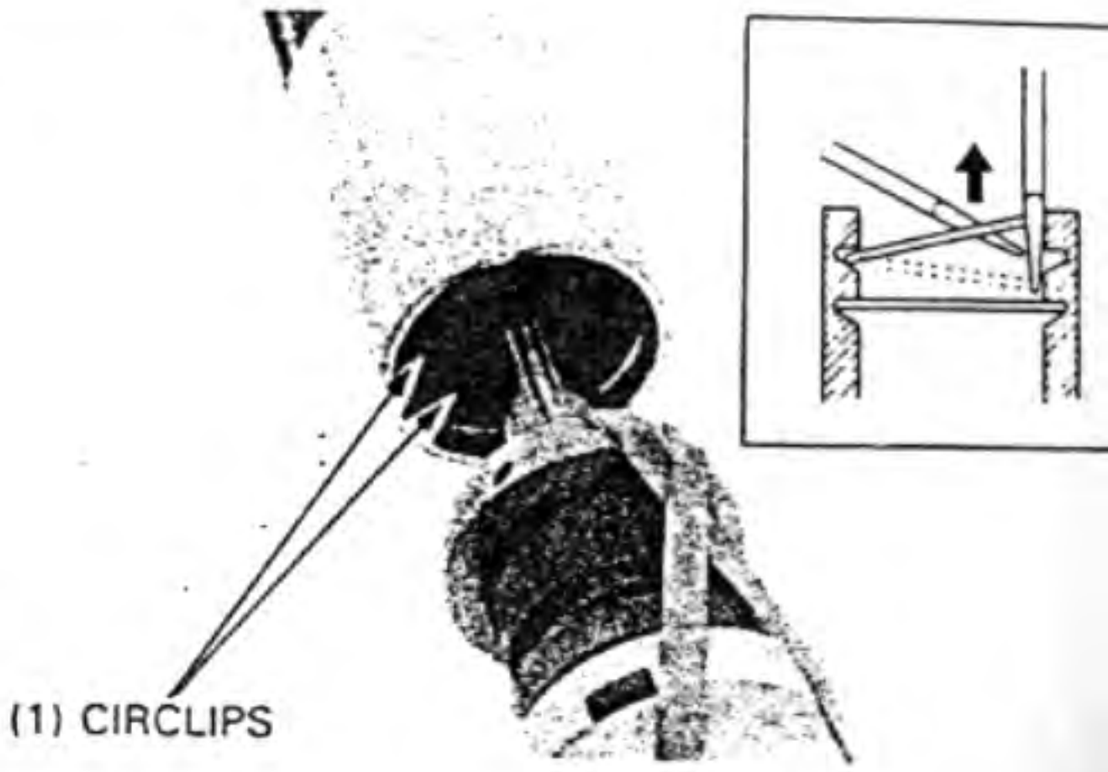
Remove the damper rod cap and tape or tie it to the anti-bottoming rubber bumper, so it won't get in the way.

Push in the seal holder until you have good access to the circlips.
You'll need two small screwdrivers to remove the circlips.

The circlip grooves in the damper are ramped toward the inside to give the circlips a square shoulder on which to seat securely.
To remove the circlip, first push one end of the circlip out of its groove, then slip the second screwdriver between the circlip and the damper to act as a ramp. Now, use the other screwdriver to pull the circlip completely out.

NOTE

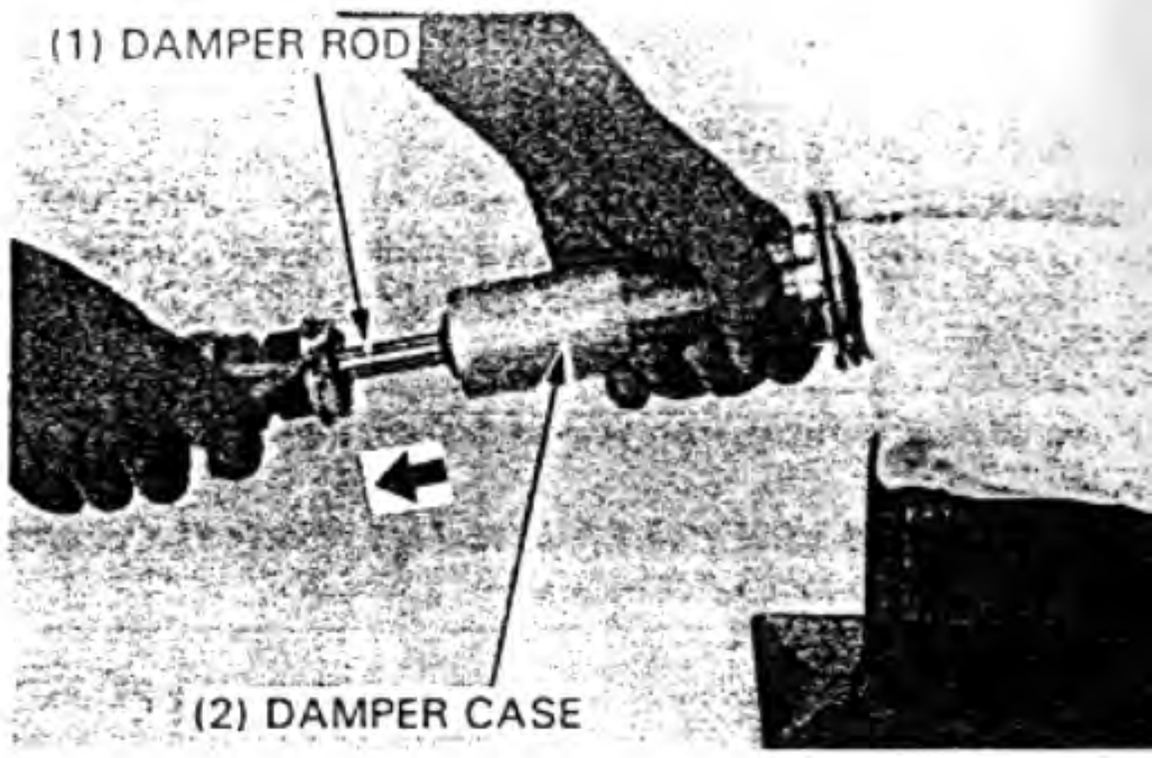
- Check the circlip groove for burrs. If any burrs are found, remove them before pulling the damper rod assembly out of the case.



Pull the damper rod assembly out of the damper case.

CAUTION

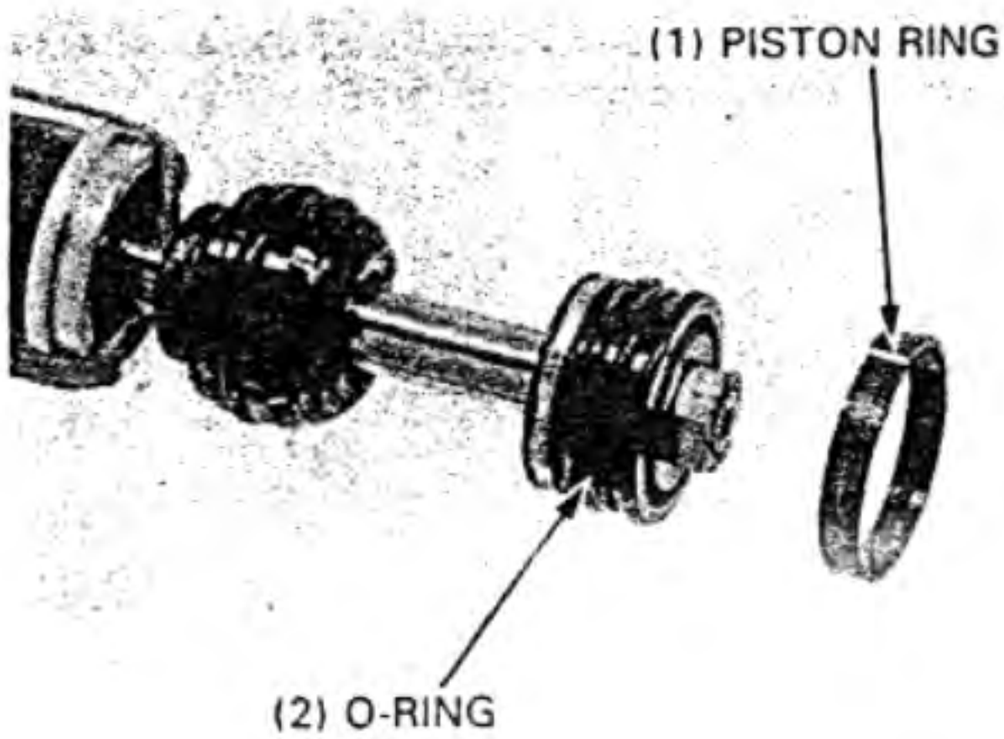
- *Burrs will damage the damper rod piston ring.*



PISTON RING REPLACEMENT

If the piston ring is damaged, remove it from the piston.
Replace the O-ring under the piston ring with a new one.

Apply the ATF to the O-ring, install the new piston ring.

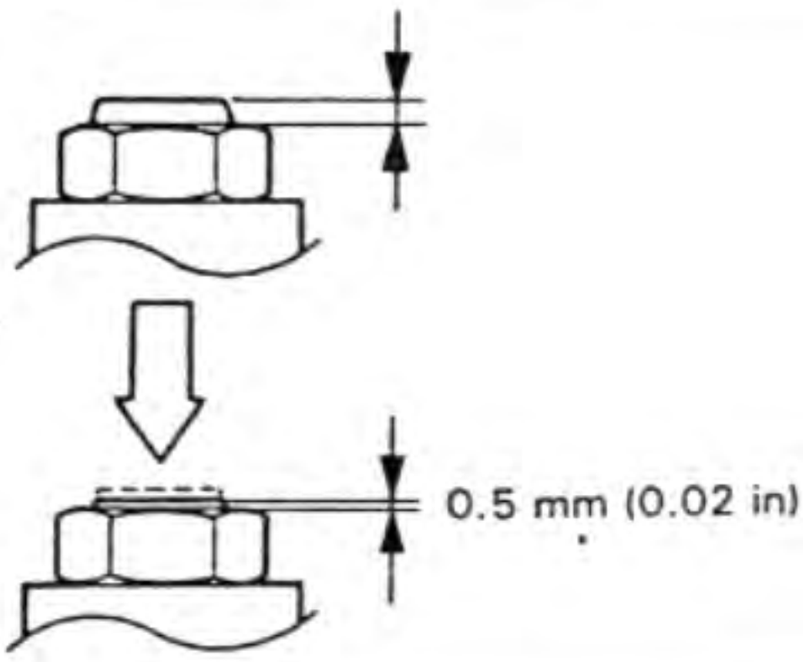


DAMPER ROD DISASSEMBLY

CAUTION

- *To keep lint or dirt from getting onto damper rod parts, do not wear gloves while working on the damper rod.*
- *Be careful not to grind more than 0.5 mm (0.02 in) from the end of the damper rod end nut described below.*

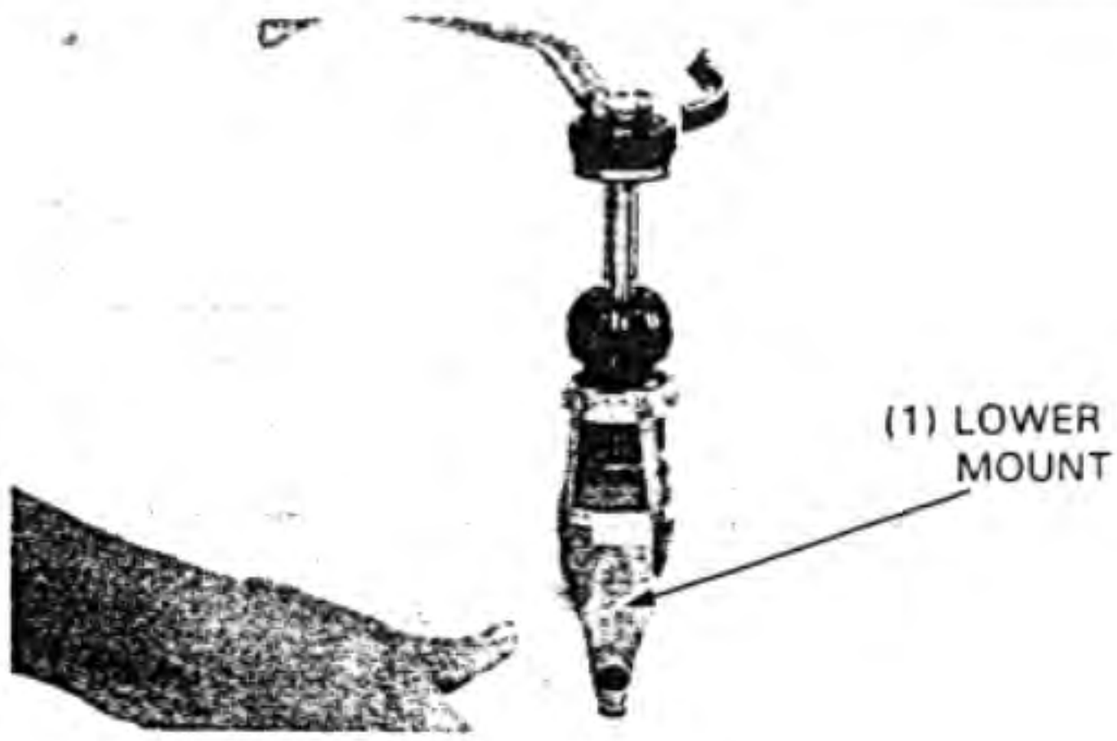
Unstake the damper rod end nut with a grinder as shown.



Place the damper rod in a vise with soft jaws or a shop towel, being careful not to distort the lower mount.
Remove the end nut and discard it.

NOTE

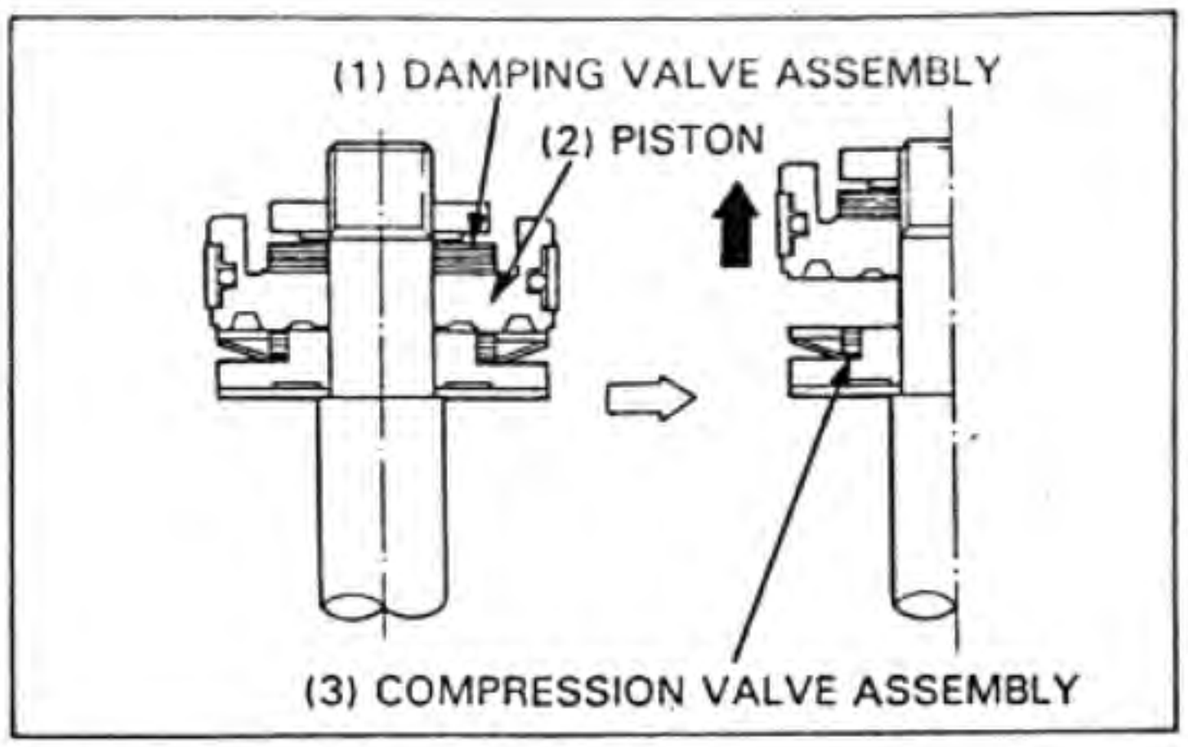
- If the damper rod is cracked or damaged when removing the end nut, replace the damper rod assembly with a new one.
- Remove the all burrs from the end of the damper rod.



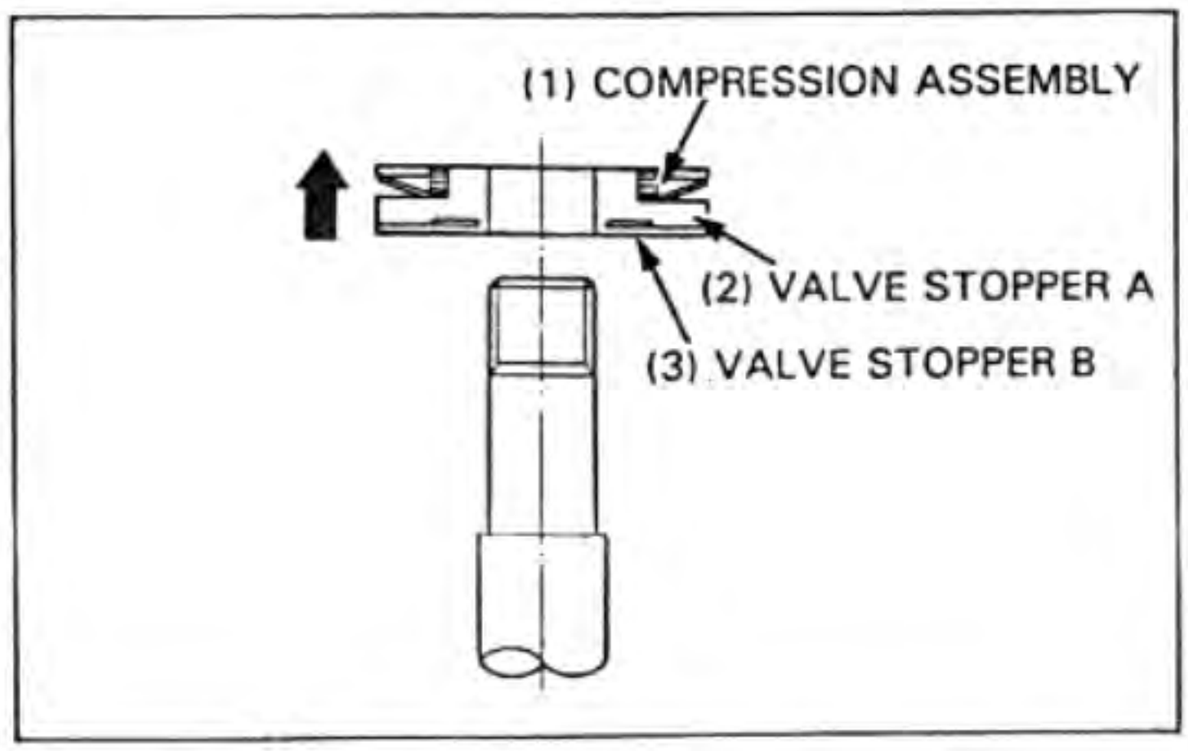
Remove the washers, piston and damping valves from the damper rod.

NOTE

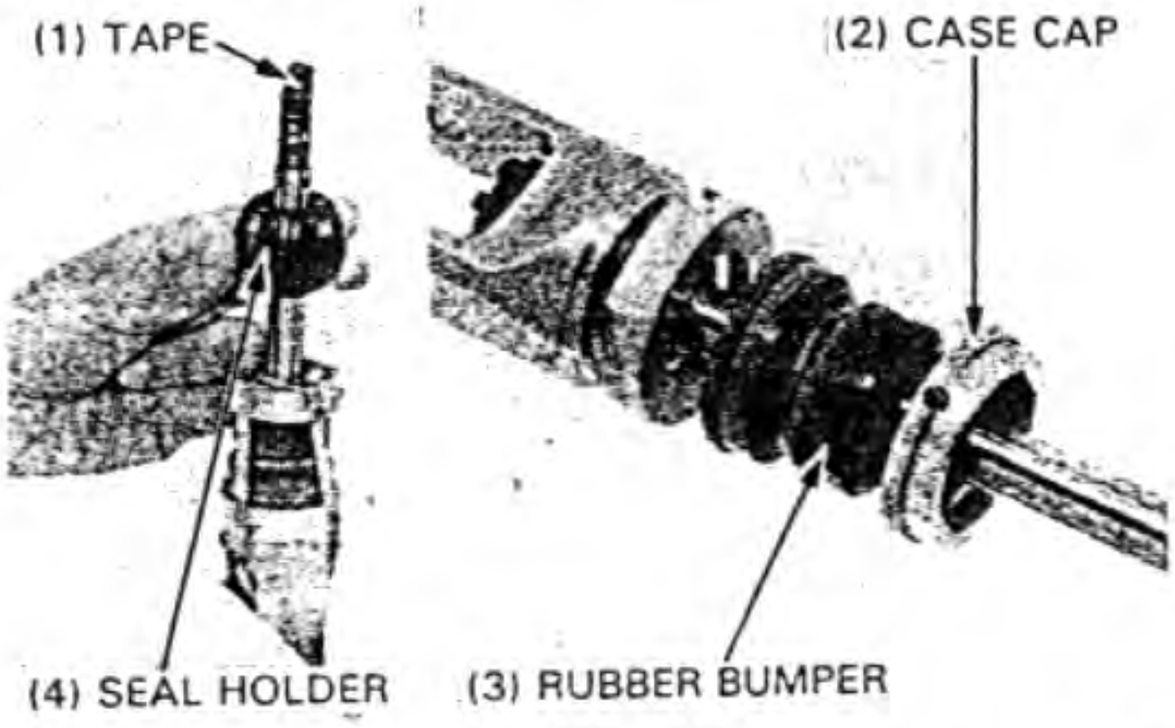
- Pry the compression valves from the damping valve with fingers before removing the damping valves.
- Pass a piece of wire through the disassembled valves to ensure correct reassembly.



Remove valve stoppers A and B and the compression valve as an assembly.



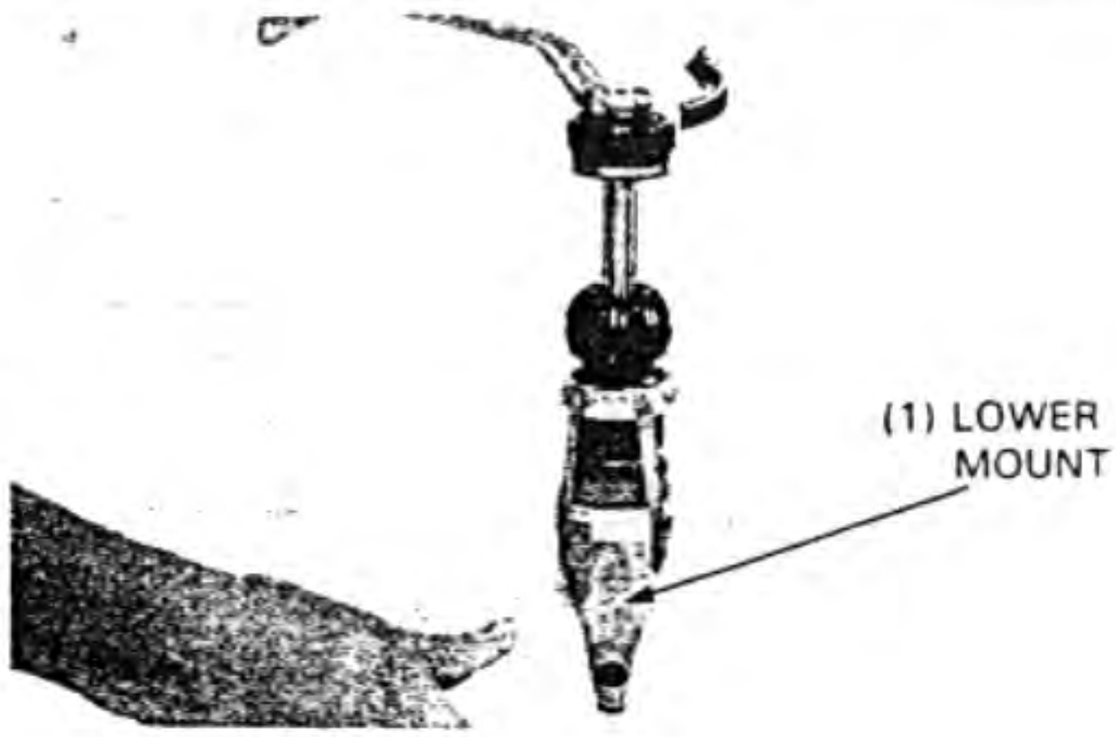
Tape the damper rod end threads with vinyl tape to avoid damaging the seal holder.
Remove the seal holder from the damper rod.
Remove the case cap and rubber bumper from the damper rod.
Remove the tape from the end threads.



Place the damper rod in a vise with soft jaws or a shop towel, being careful not to distort the lower mount.
Remove the end nut and discard it.

NOTE

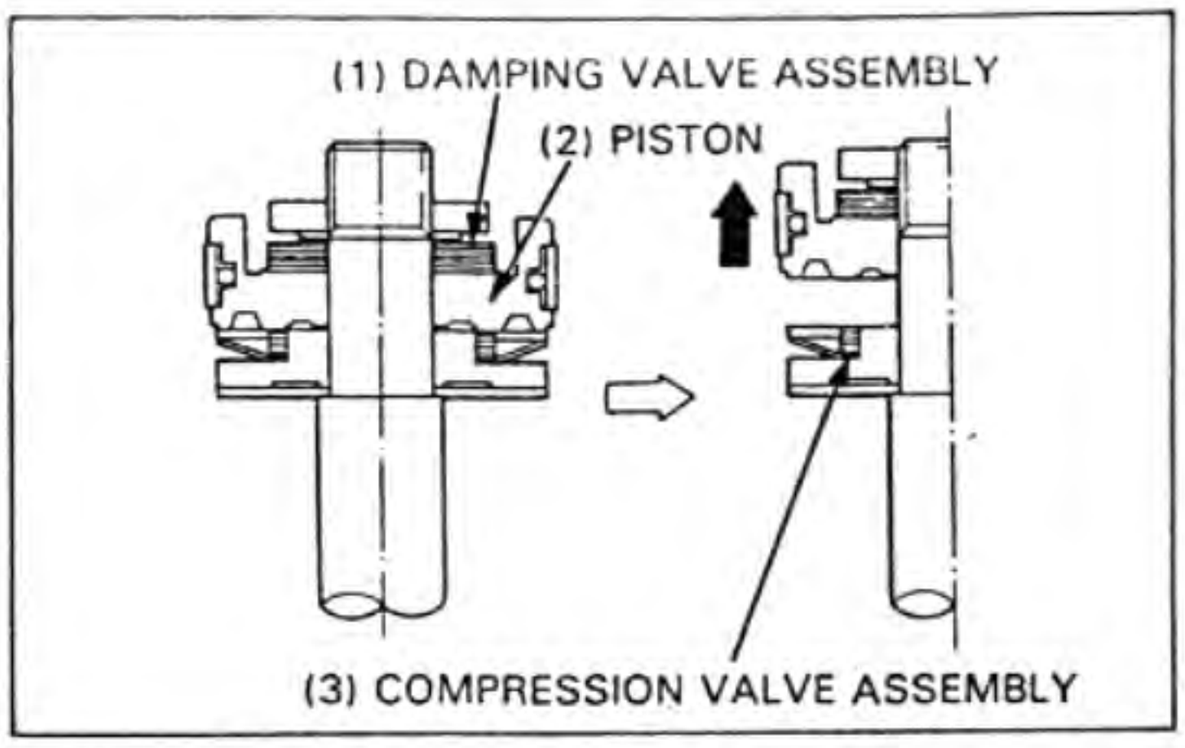
- If the damper rod is cracked or damaged when removing the end nut, replace the damper rod assembly with a new one.
- Remove the all burrs from the end of the damper rod.



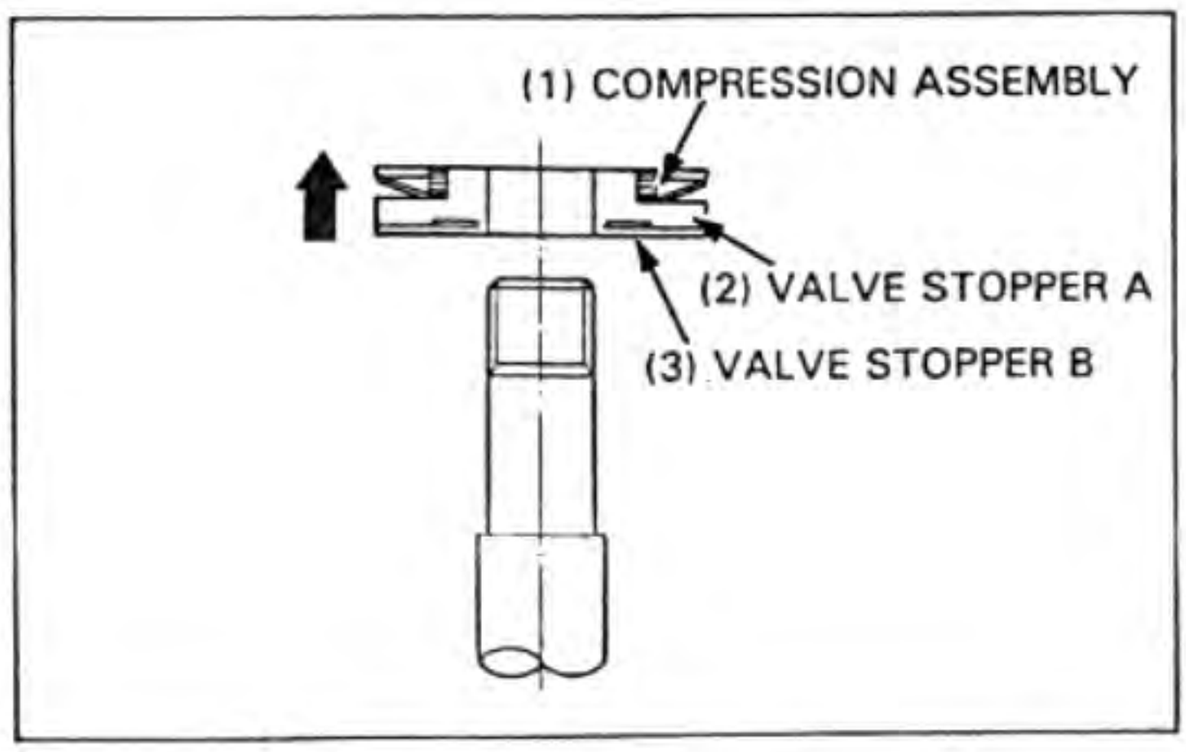
Remove the washers, piston and damping valves from the damper rod.

NOTE

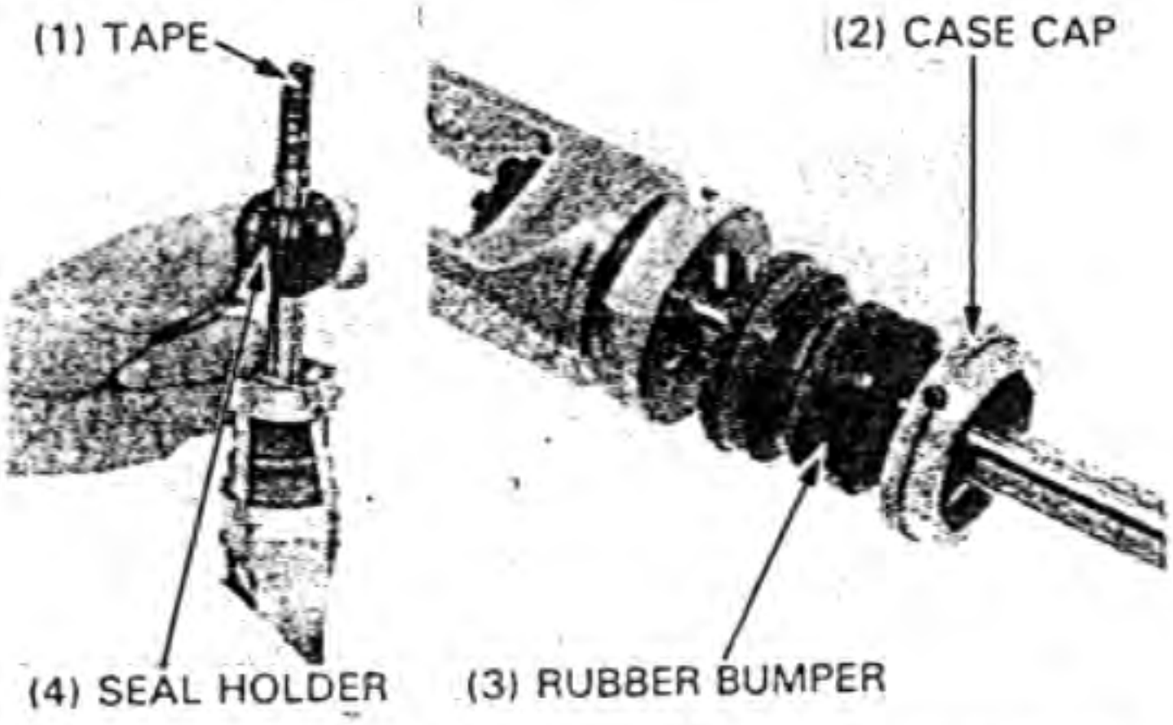
- Pry the compression valves from the damping valve with fingers before removing the damping valves.
- Pass a piece of wire through the disassembled valves to ensure correct reassembly.



Remove valve stoppers A and B and the compression valve as an assembly.



Tape the damper rod end threads with vinyl tape to avoid damaging the seal holder.
Remove the seal holder from the damper rod.
Remove the case cap and rubber bumper from the damper rod.
Remove the tape from the end threads.

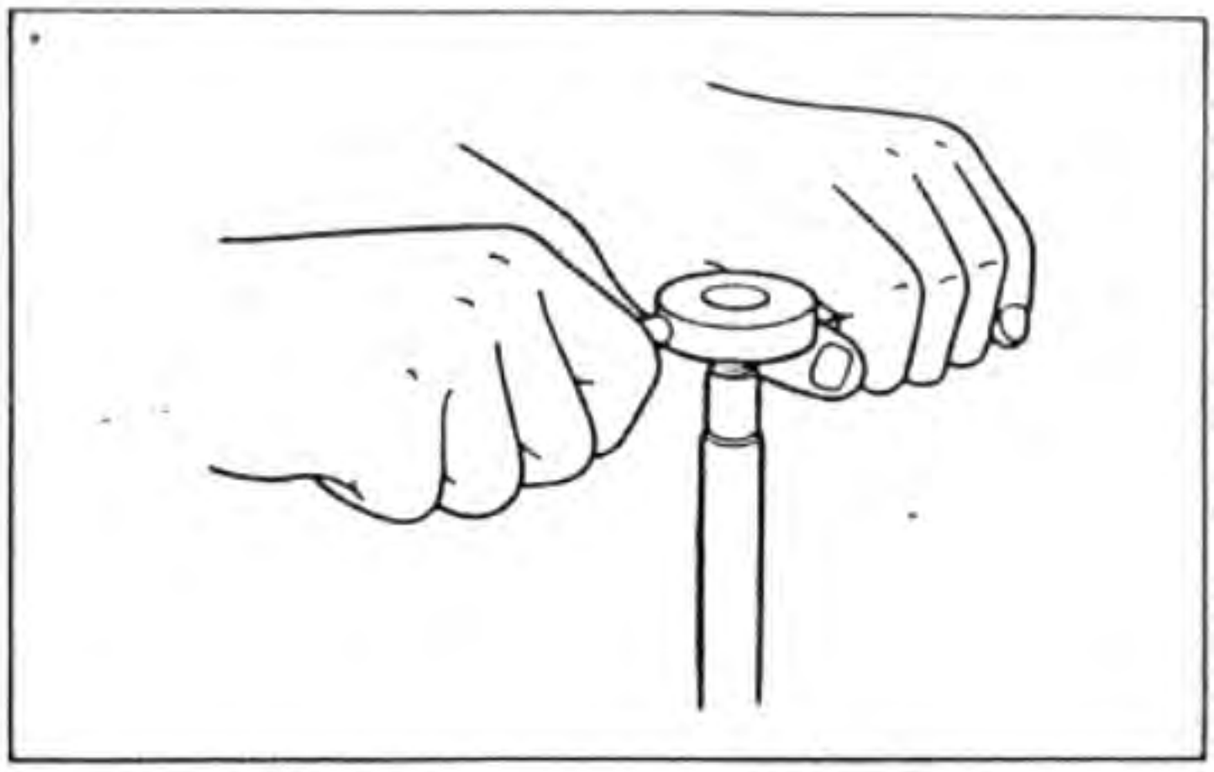


DAMPER ROD THREADS CORRECTION

Remove burrs from the damper rod end and correct the threads with a die or thread file.
Clean the damper rod with solvent after correcting the threads.

NOTE

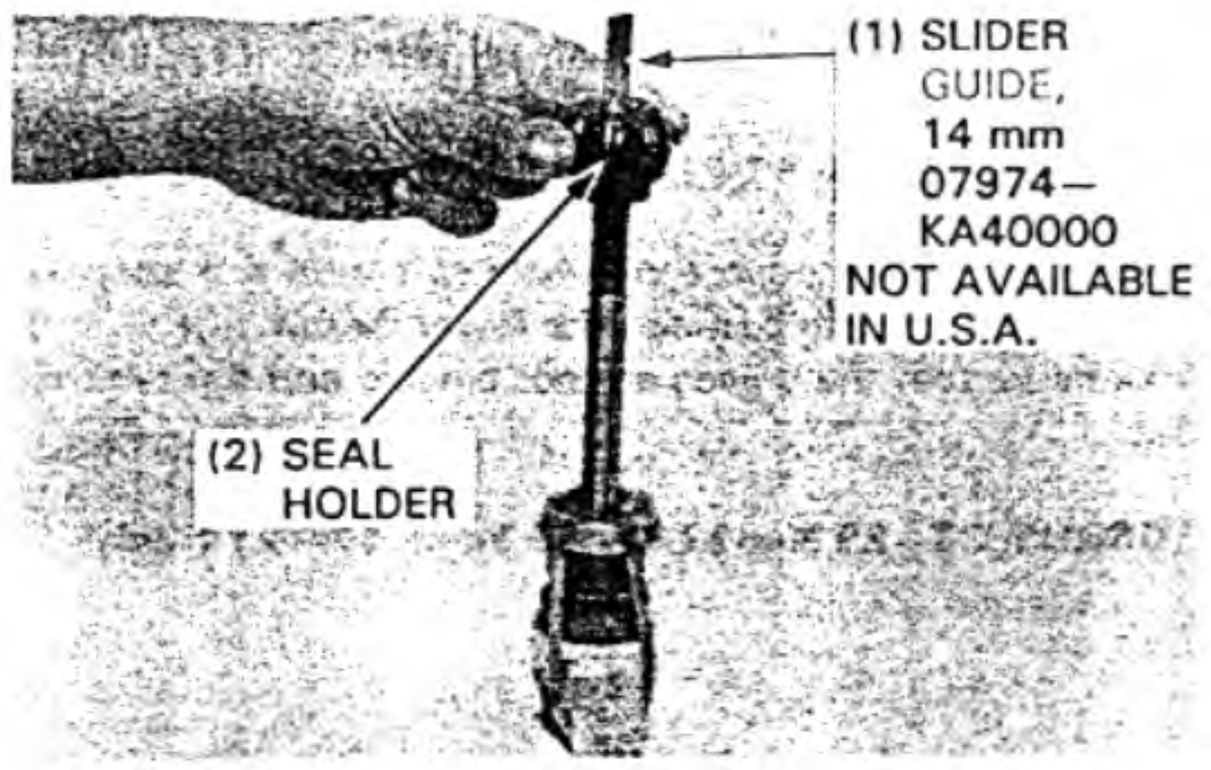
- Make sure the orifice in the damper rod I.D. is not clogged by burrs.



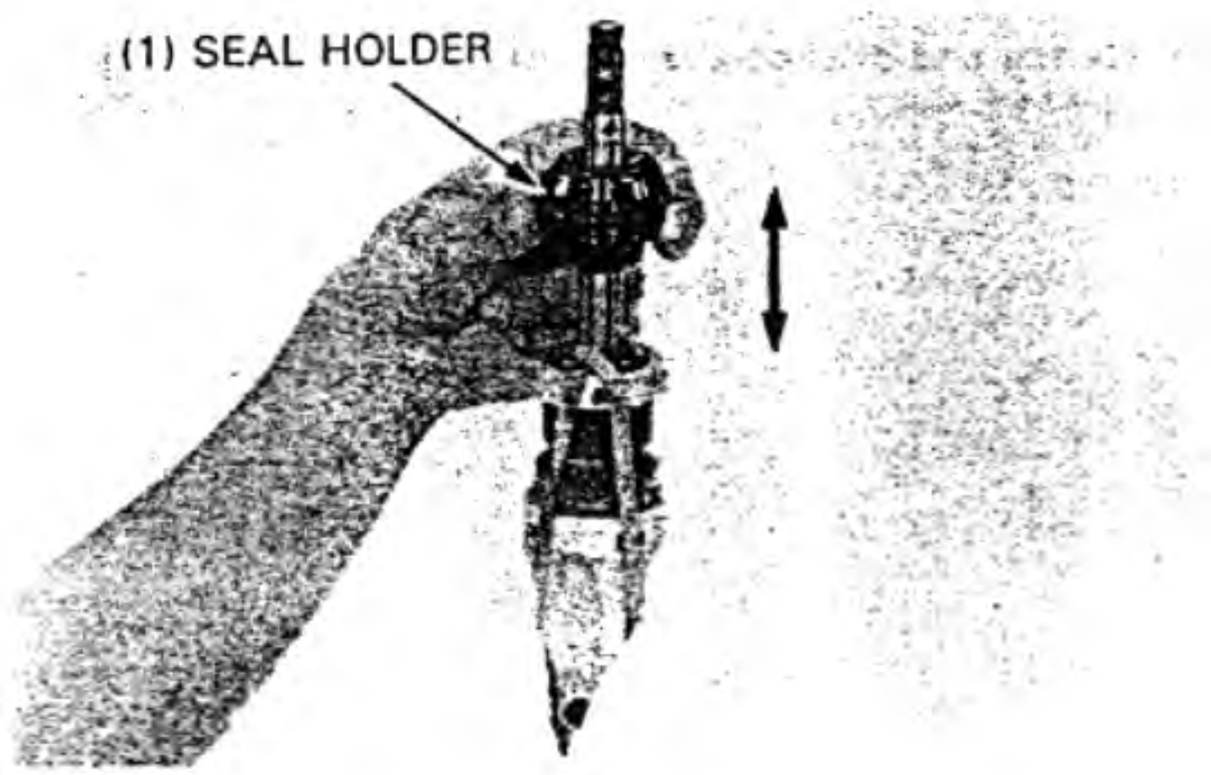
Install the rubber bamper and case cap over the damper rod, noting the installation direction.
Install the special tool onto the damper rod.
Install the seal holder carefully over the damper rod.

NOTE

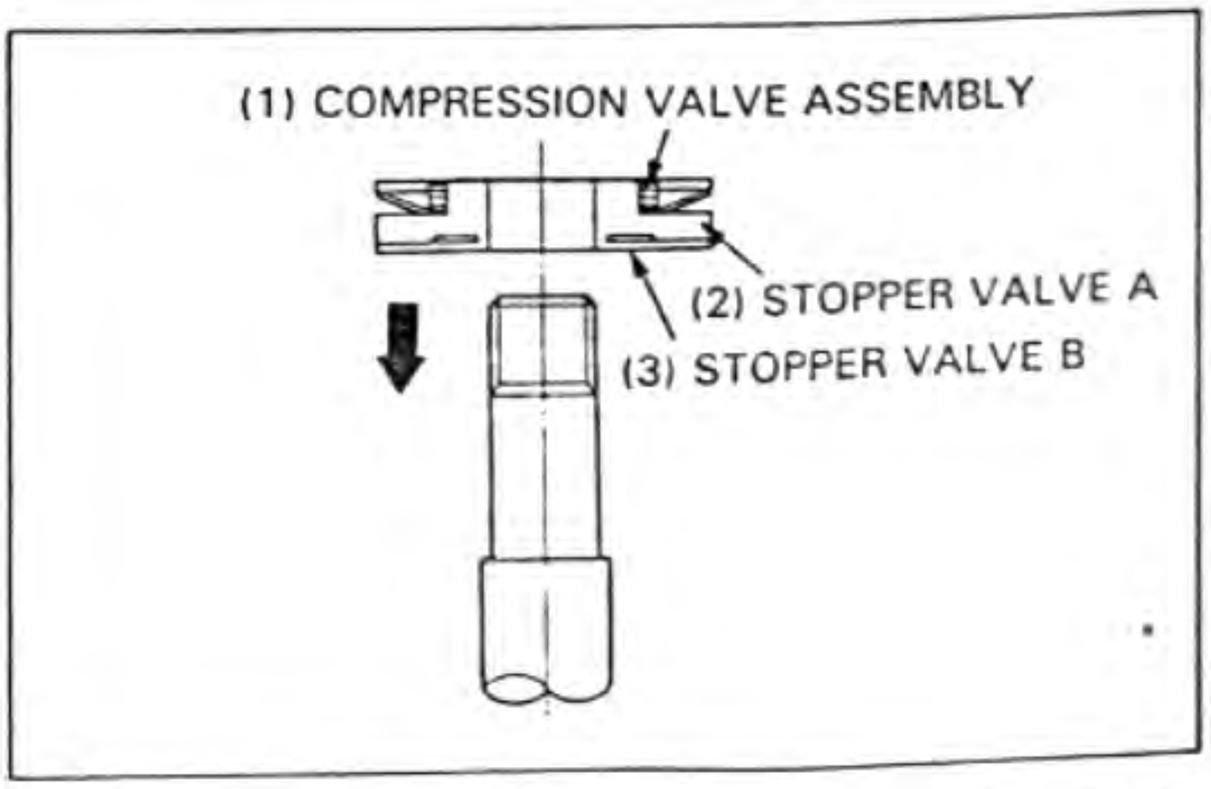
- The seal holder oil and dust seals are filled with grease. Be careful not to remove grease from the seals.
- Be careful not to damage the dust seal lip.



Check the seal holder for proper movement by sliding it up and down on the shaft; replace it if necessary.



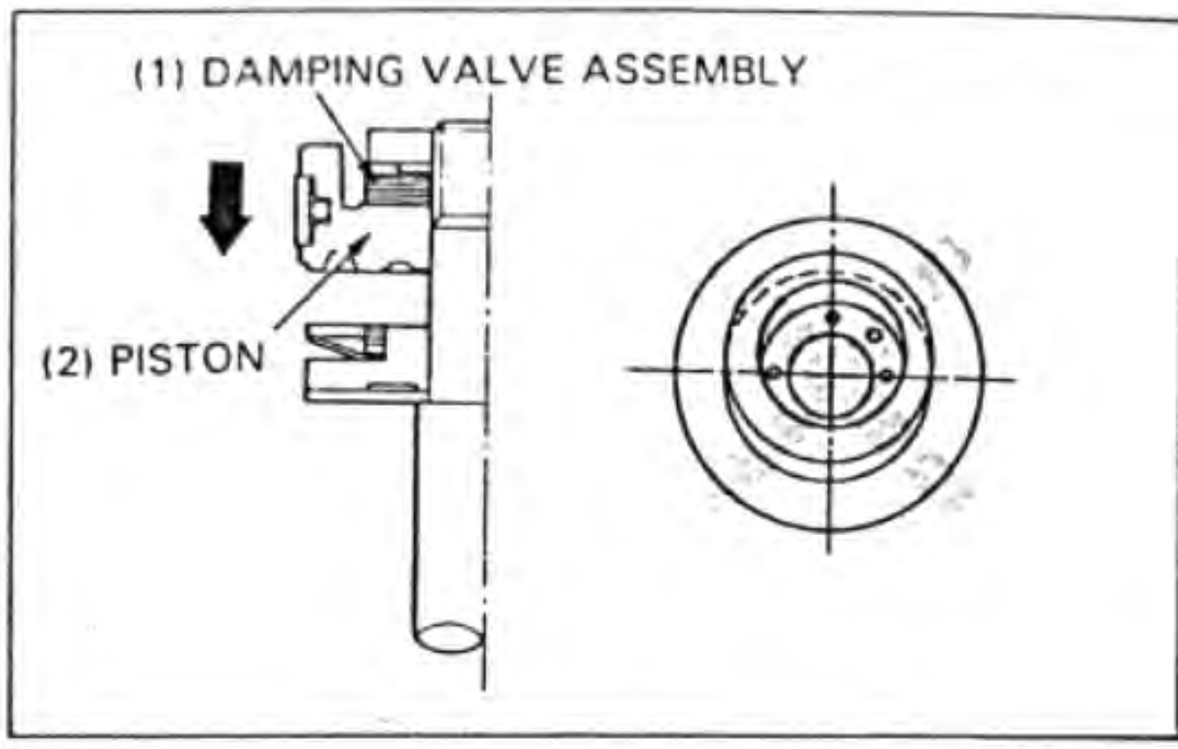
Assemble the compression valve and valve stoppers A and B and install them onto the damper rod.



Install the piston onto the damper rod and assemble the damping valves, noting the installation sequence.

CAUTION

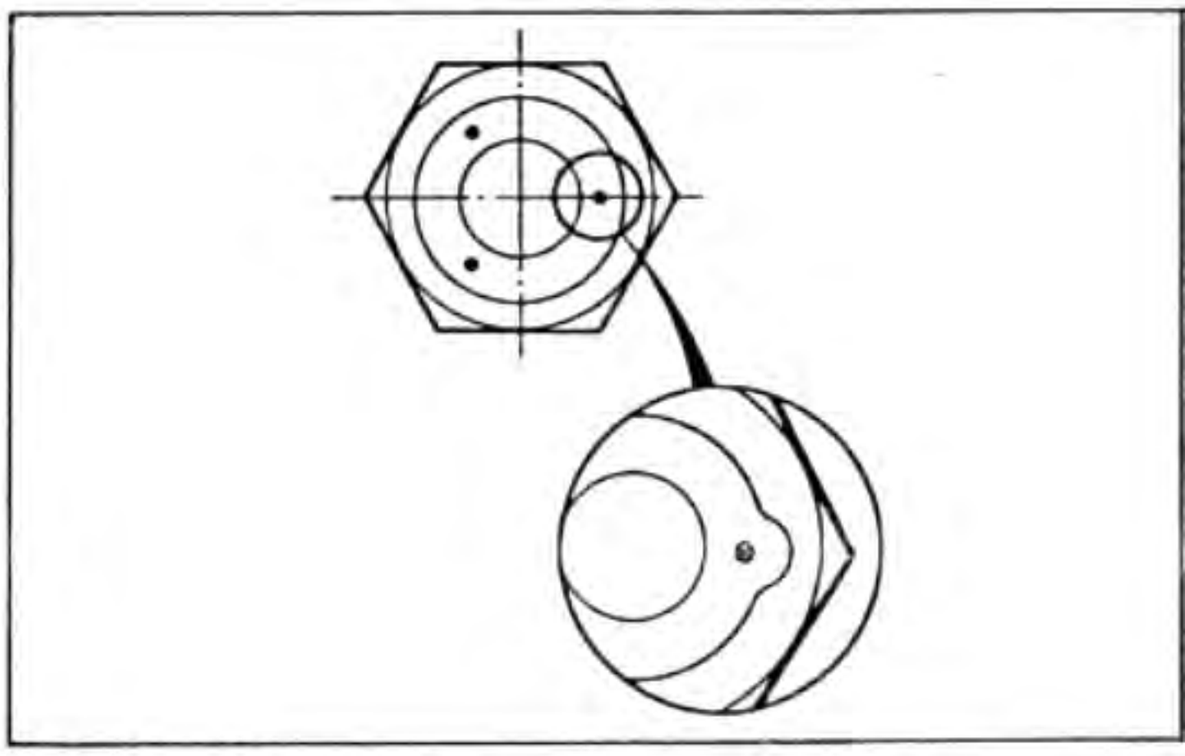
- *Be careful not bind the compression valves when installing the piston onto the damper rod.*



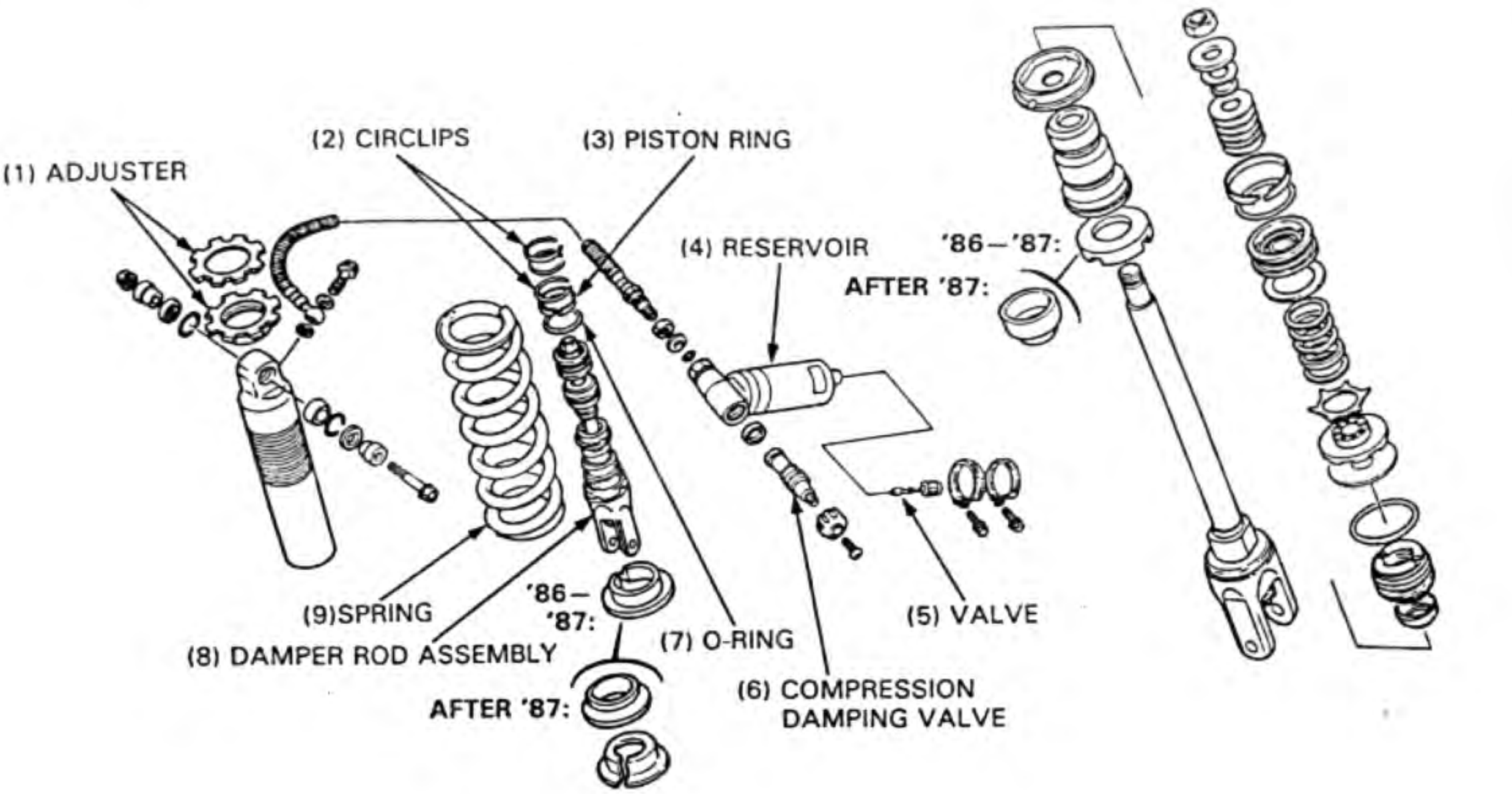
Install the washers onto the damper rod with its polished surface down.
Screw a new end nut on the damper rod while pressing the piston down.
Place the damper rod in a vise with soft jaws or a shop towel, being careful not to damage the lower mount.
Make sure that the valves are not binding and tighten the end nut.

TORQUE: 24—29 N·m (2.4—2.9 kg-m, 17—21 ft-lb)

Stake the end of the damper rod in three places as shown to secure the end nut.

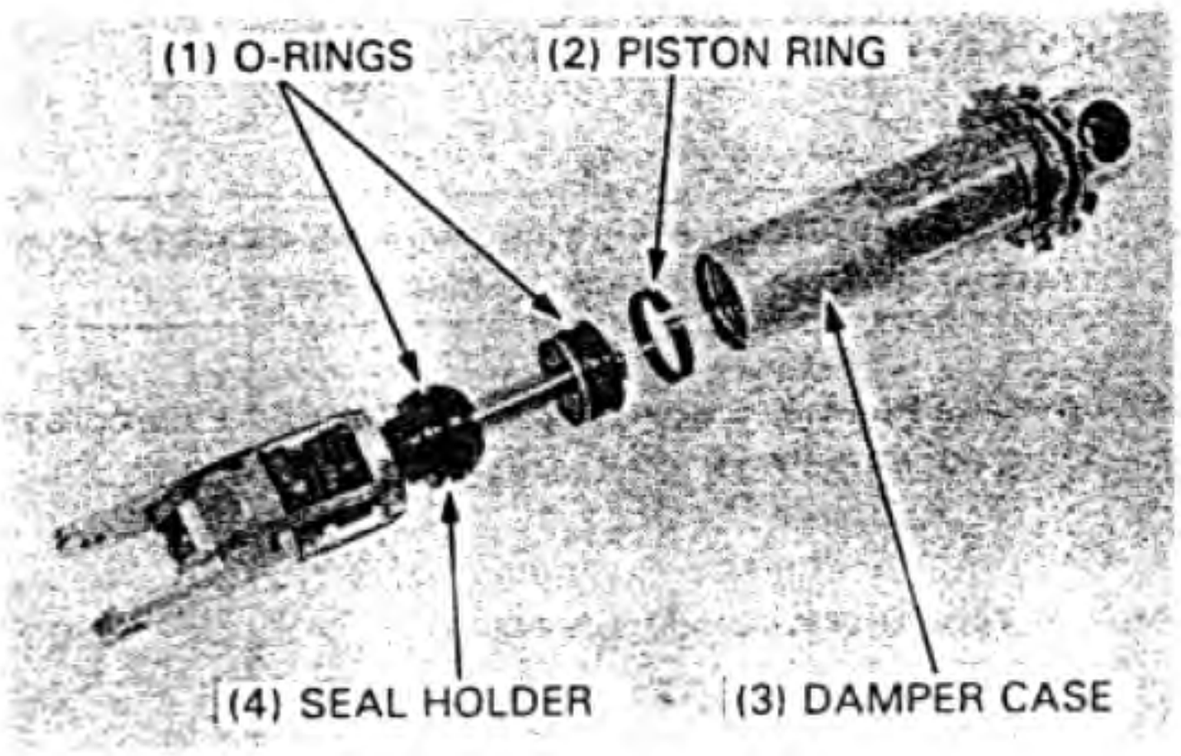


ASSEMBLY

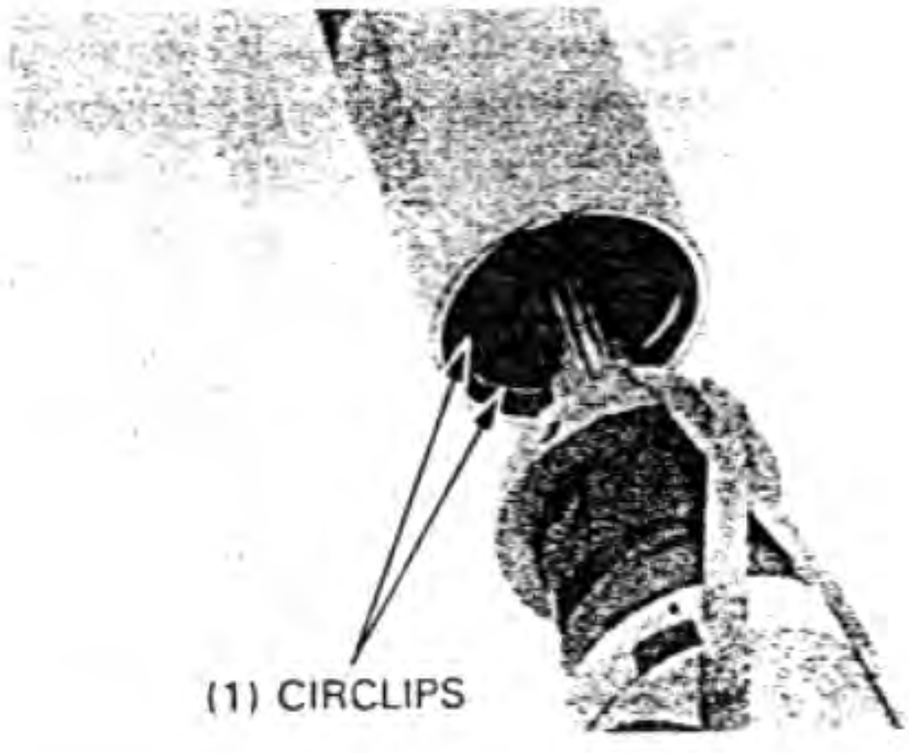


Coat the new O-rings and piston rings with clean shock oil. Install the seal holder O-rings.

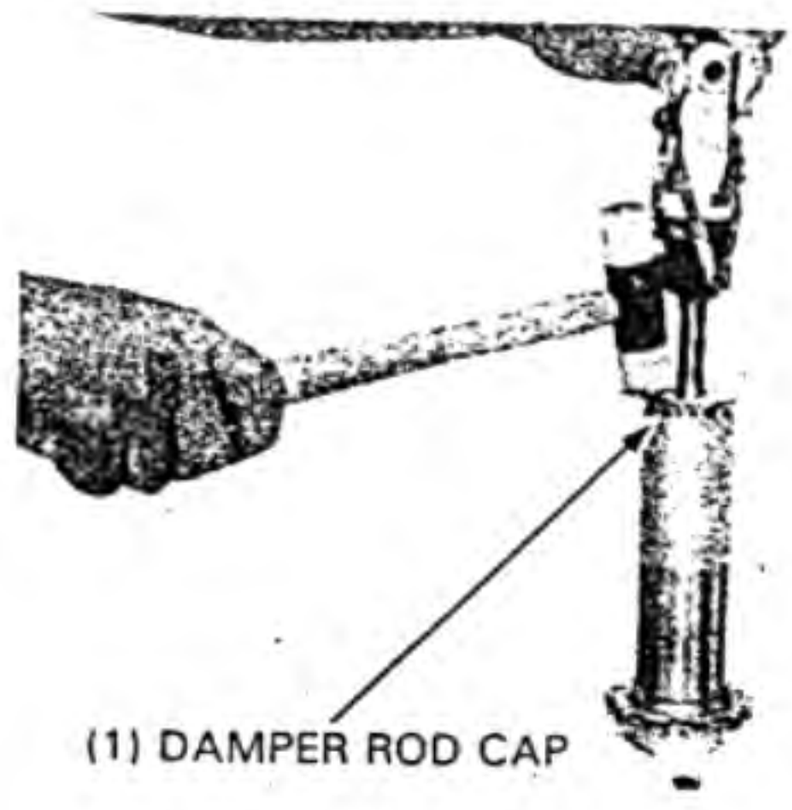
Coat the inside of the shock body with clean shock oil and insert the damper rod assembly, then slide the rod into the shock body while rocking the rod back-and-forth so that the piston ring will not get caught in the circlip grooves in the damper case.



Install the circlips securely.

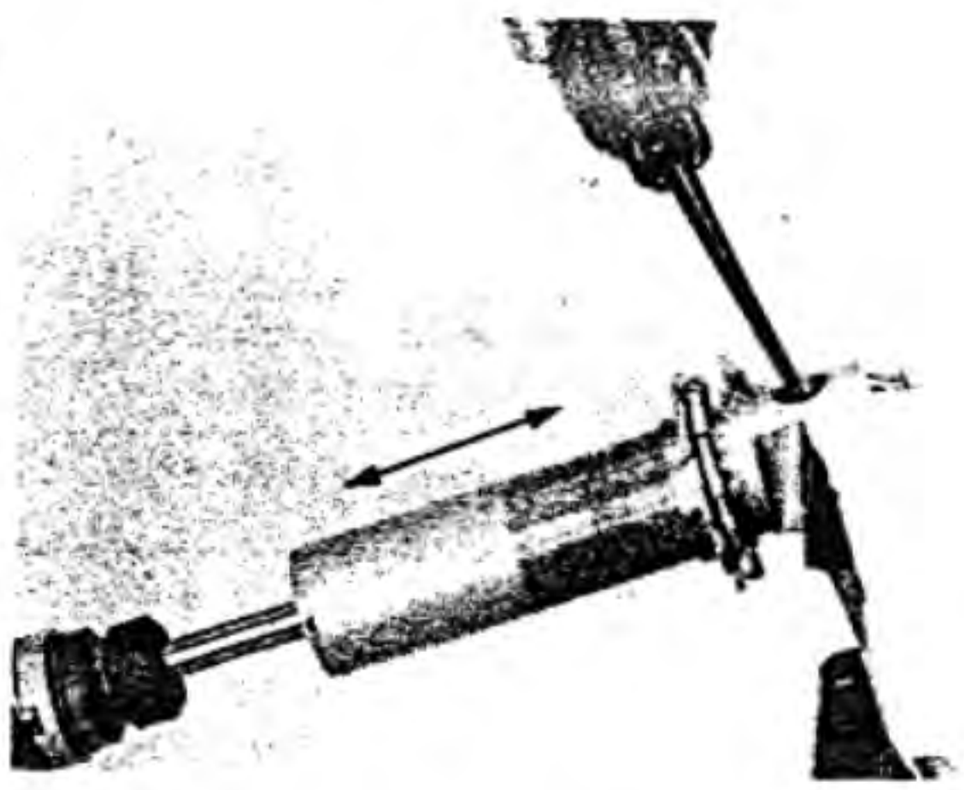


Drive the damper rod cap into the damper case.



Hold the upper shock mount in a vise with soft jaws or a shop towel as shown.
Compress the shock, then fill it with oil; it will only take a small amount.
Pull the damper rod out part way and refill the shock. Continue this incremental filling until the shock is full.

RECOMMENDED OIL: ATF or equivalent.



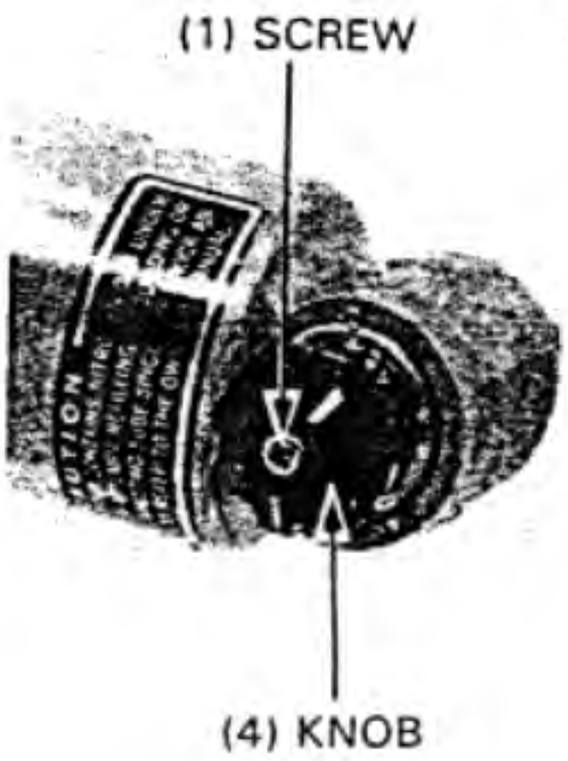
SERVICING THE RESERVOIR

NOTE

- **The compression damping valve must be removed from the reservoir to drain the shock oil completely.**

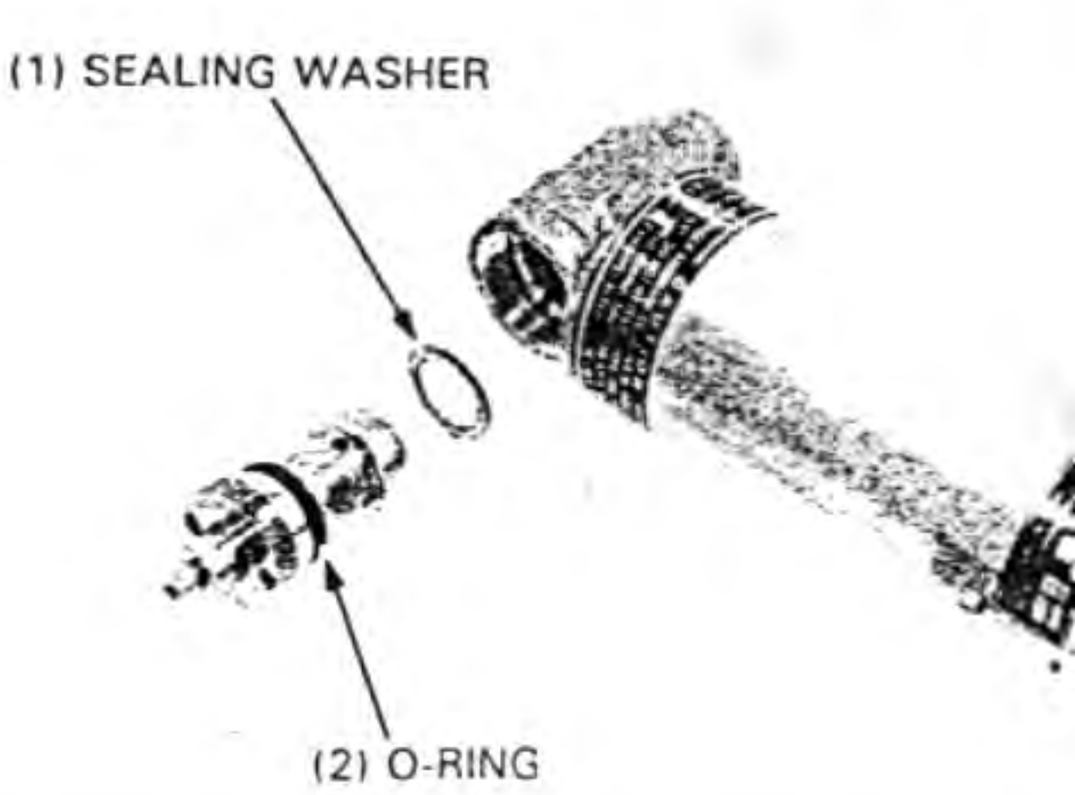
Remove the Phillips screw from the center of the compression damping adjustment knob, then remove the knob.

Remove the compression damping valve from the reservoir; turn counterclockwise to remove.



Turn the reservoir upside down to allow all the shock oil to drain. Then, flush out the reservoir using clean shock oil.
Allow all the oil to drain.

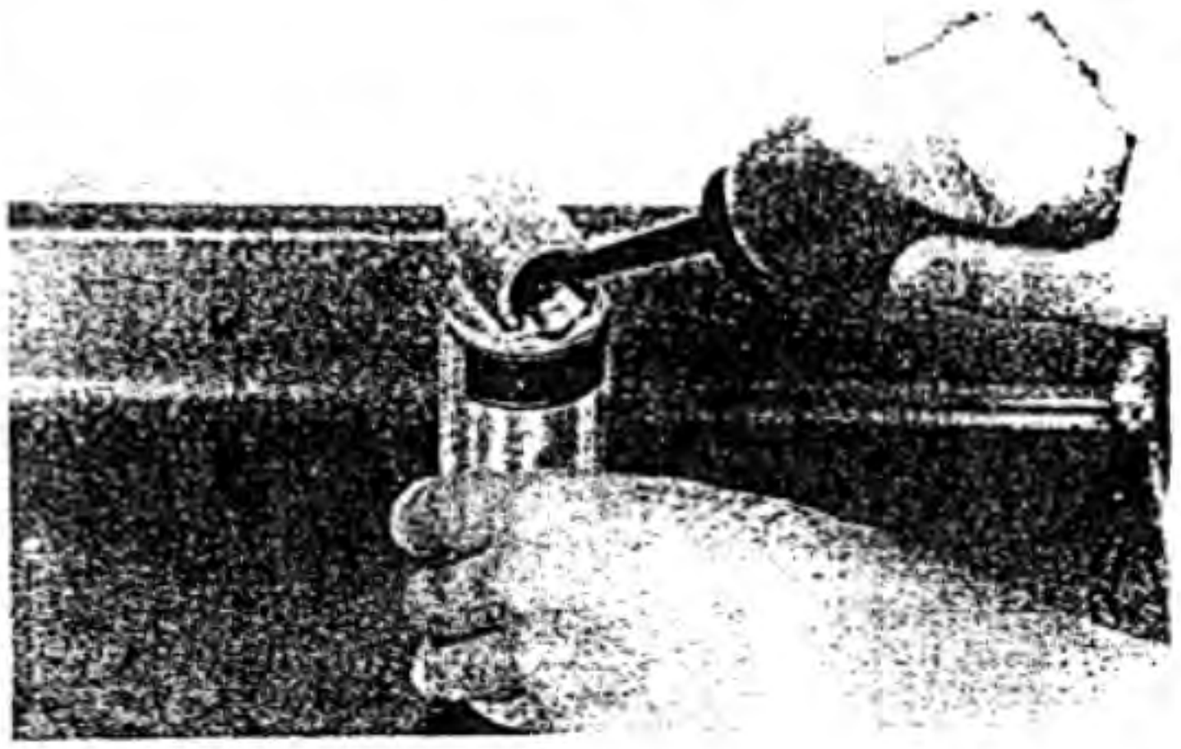
Check the compression damping valve O-ring for wear or fatigue.
Check the sealing washer for wear or damage.
Replace them if necessary.



- Reinstall the valve core into the Schrader valve on the bottom of the reservoir and charge it with 14 psi to inflate the diaphragm inside the reservoir.

Fill the reservoir with the recommended oil.

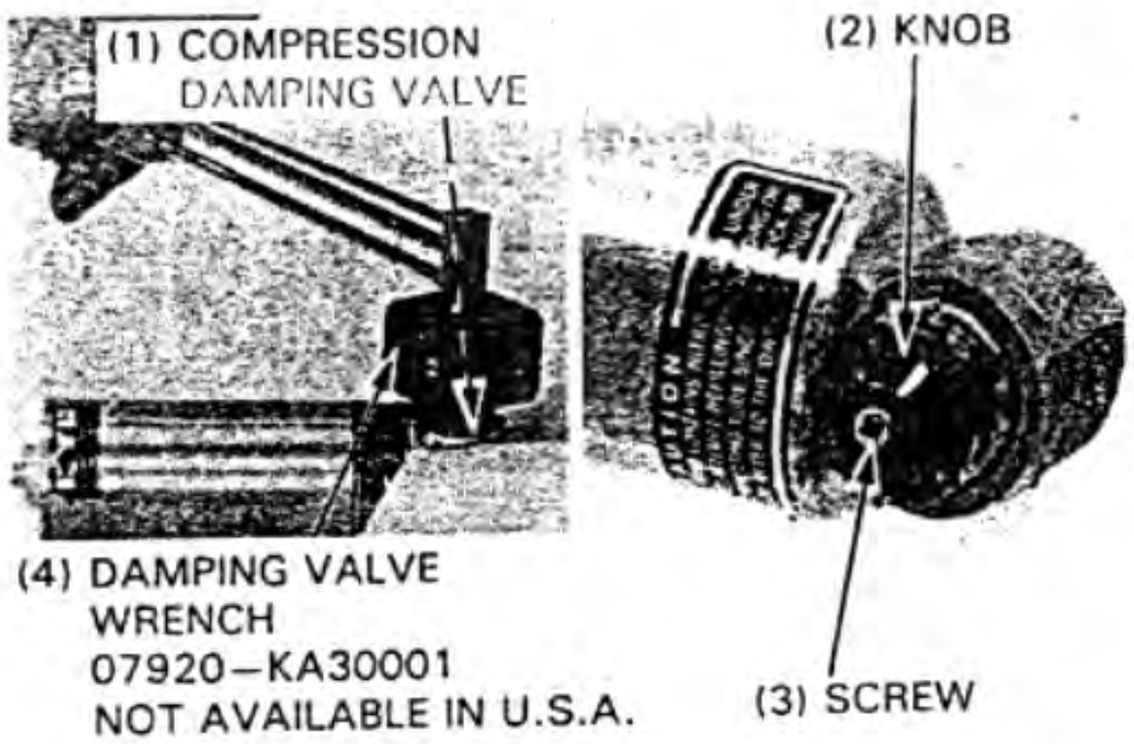
RECOMMENDED OIL: ATF or equivalent.



Install the compression damping valve into the reservoir; turn clockwise to install.

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

Install the compression damping adjustment knob, then install the Phillips screw.



DAMPER ASSEMBLY

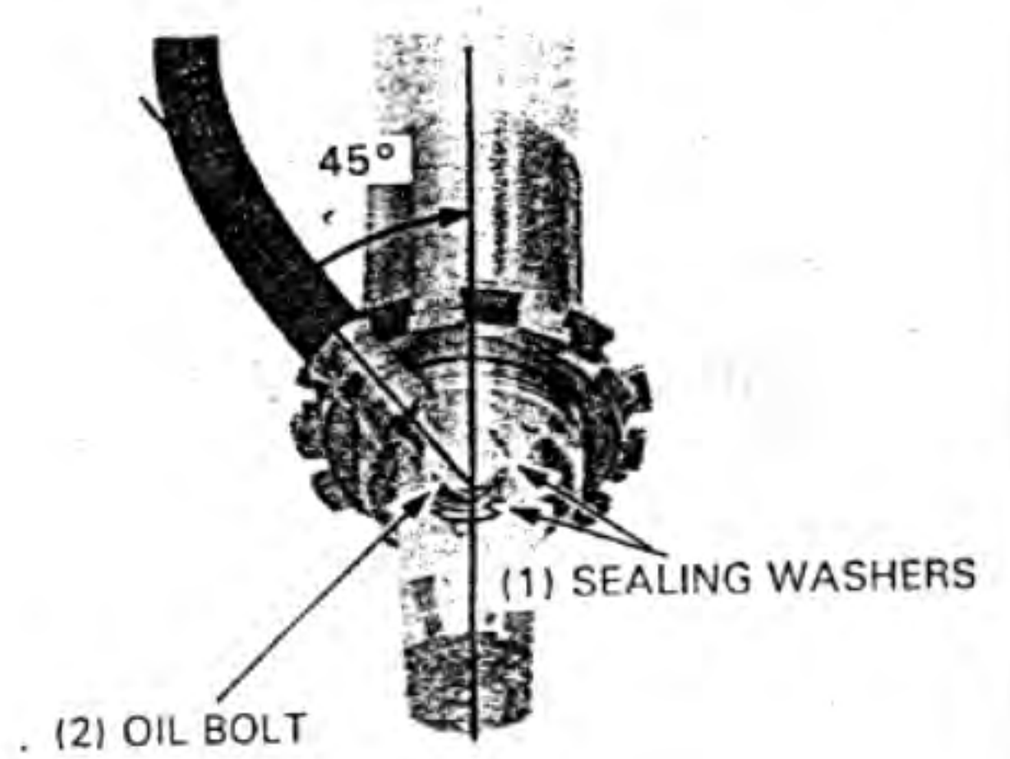
Connect the hose to the shock using new sealing washers.

NOTE

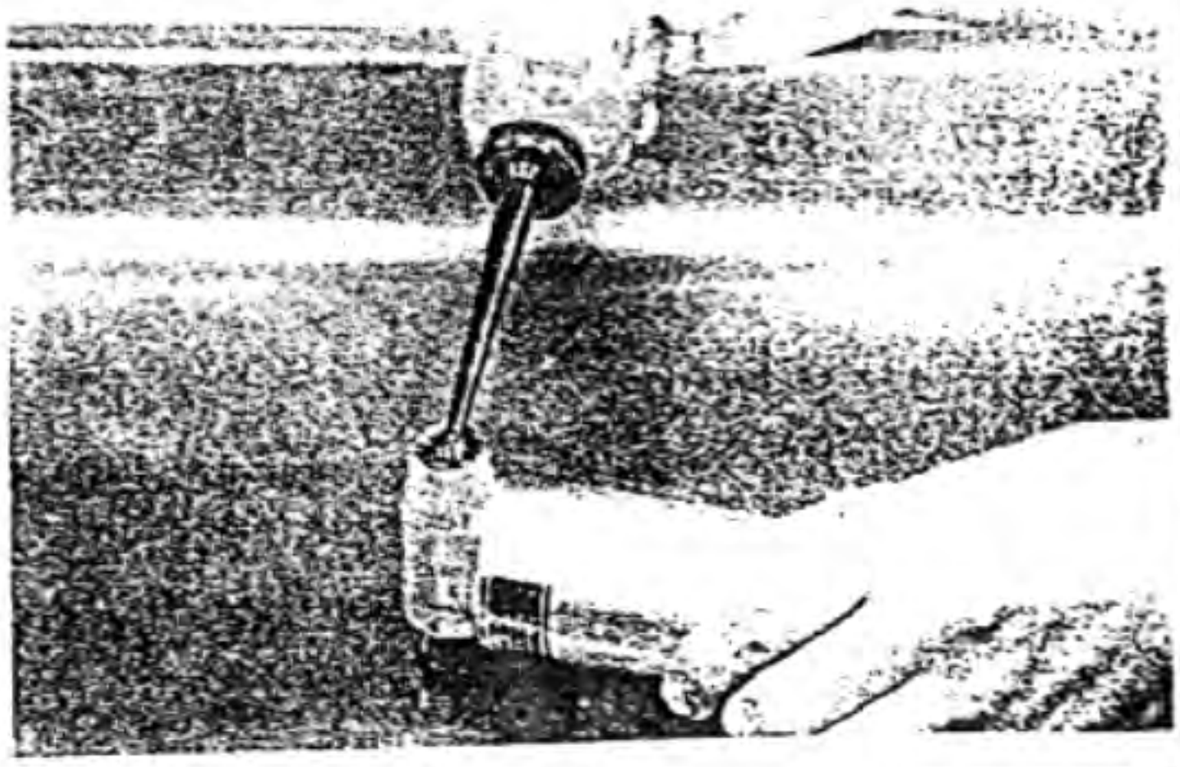
- Make sure that you install the hose in the direction as shown.

Tighten the oil bolt to the specified torque.

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



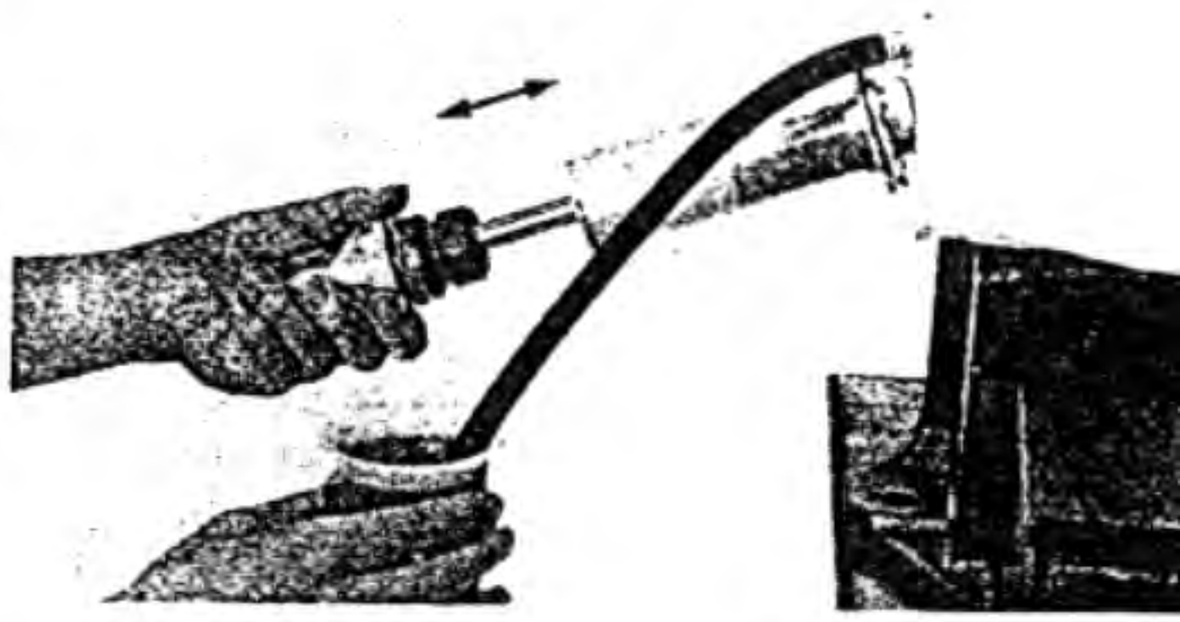
Top off the reservoir with shock oil to the top of the threads; this excess oil will be forced out when you install the hose fitting.



Dip the reservoir end of the hose into a container filled with the type of shock oil you're using.

Very slowly compress the damper rod until all the bubbles disappear, then slowly pull the rod out. Repeat this until all air has been bled from the hose and shock.

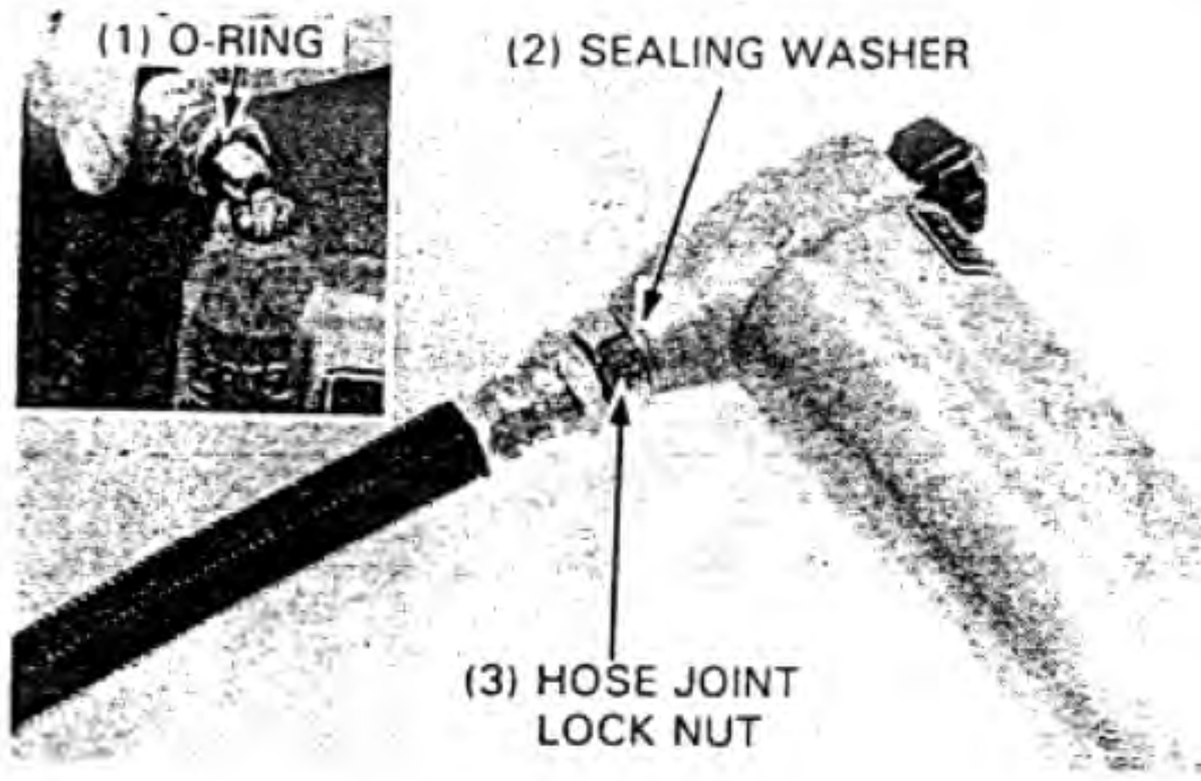
Remove the hose from the oil and keep the shock upright and the open hose end elevated to avoid losing any shock oil.



Connect the hose to the reservoir using a new sealing washer and O-ring.
Tighten the hose joint lock nut to the specified torque.

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

Wipe off any excess oil and check for oil leaks.



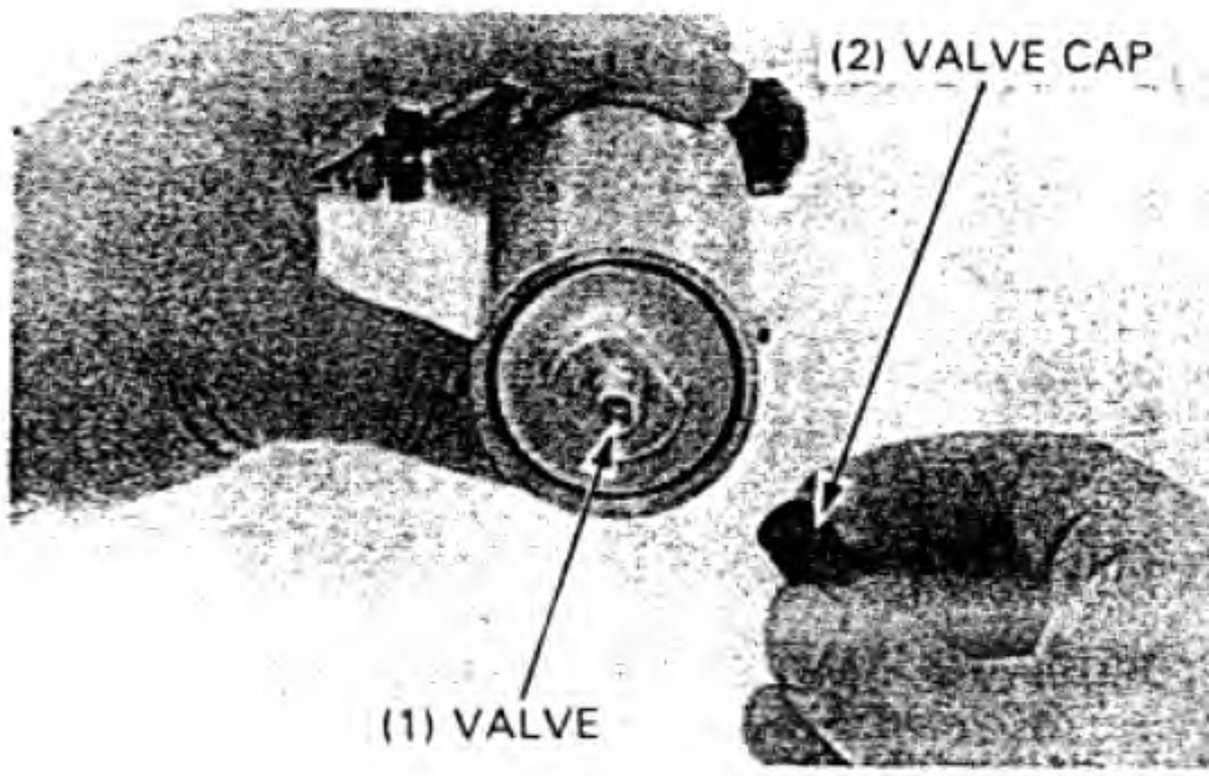
Release the 1.0 kg/cm² (14 psi) that was in the reservoir.

Fill the reservoir with 10 kg/cm² (142.2 psi) of nitrogen.

WARNING

- ***The shock absorber is fitted with a gas-filled reservoir. Use only nitrogen gas to pressurize the shock absorber. The use of an unstable gas can cause a fire or explosion resulting in serious injury.***

Install the valve cap.

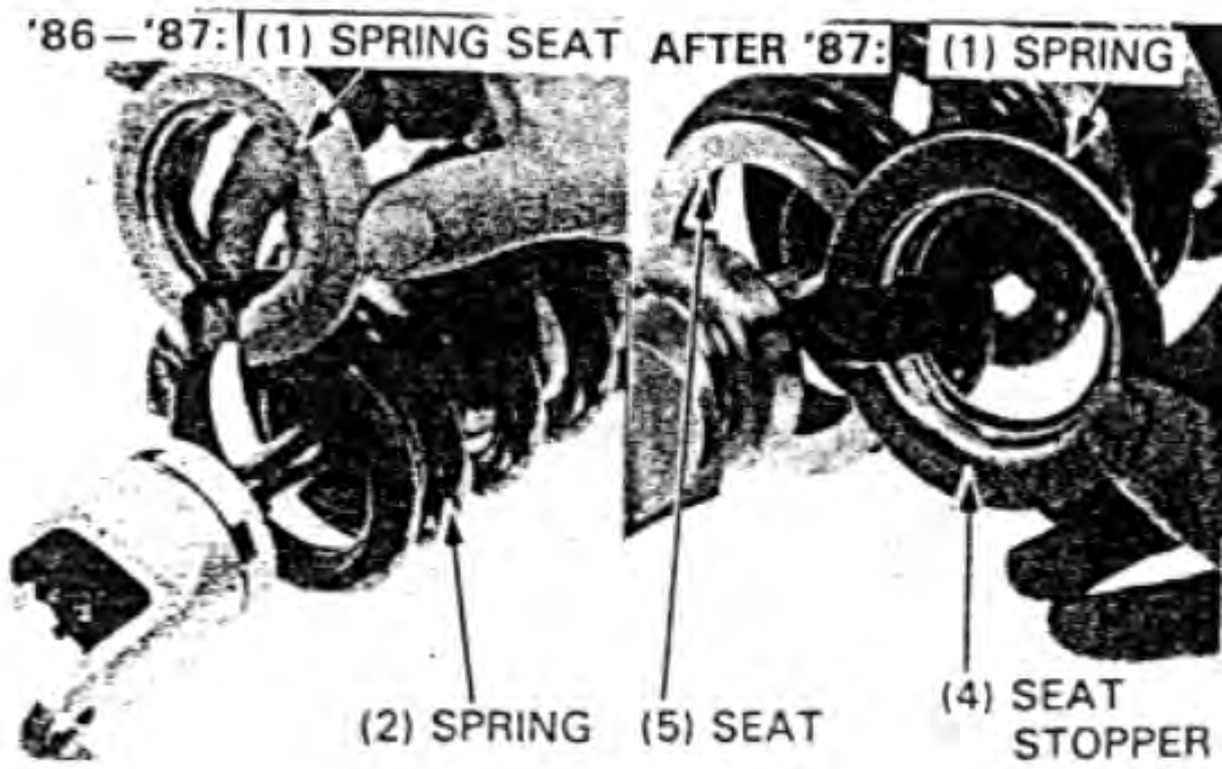


SPRING INSTALLATION

'86—'87:
Install the spring and spring seat.

AFTER '87:
Install the spring, lower spring seat and spring seat stopper.

Turn the lower shock mount so that the rebound adjuster is on the same side of the shock as the reservoir hose outlet.

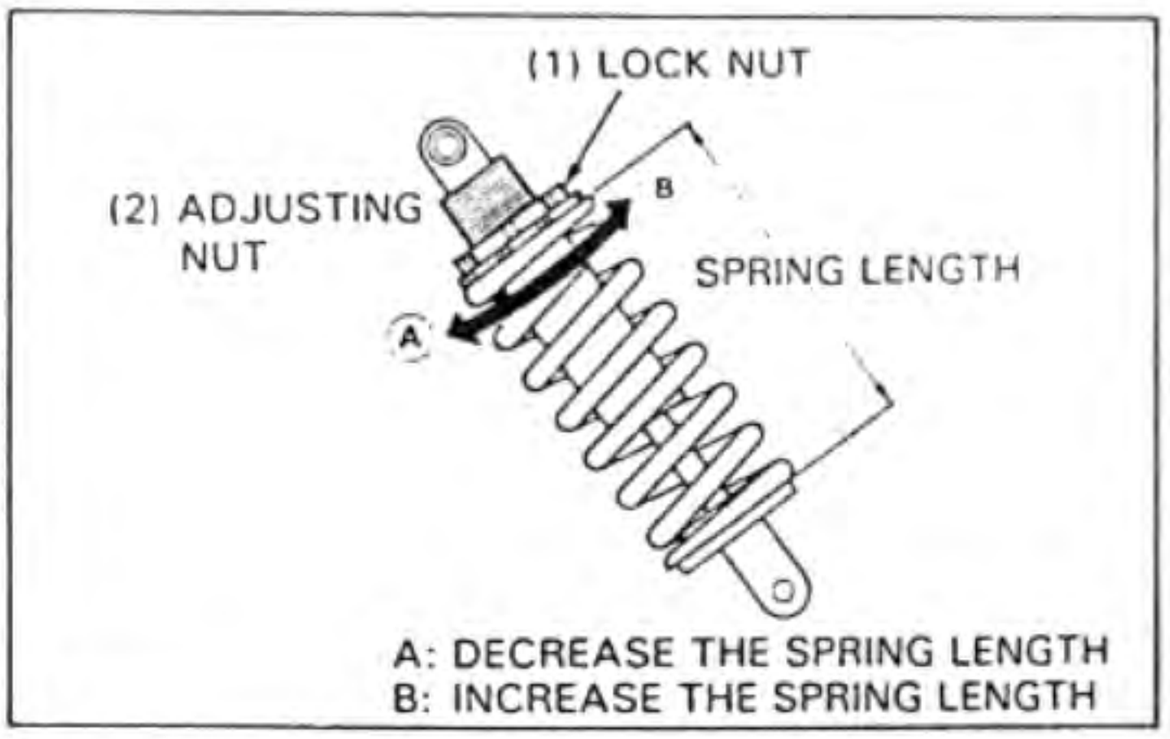


Tighten the spring adjuster nut until the spring length is as specified.

NOTE

- One turn of the adjuster nut changes the spring length by 1.5 mm (0.06 in).

STANDARD SPRING LENGTH:
'86–'88, '90–'91: 185.5 mm (7.30 in)
After '92: 181 mm (7.1 in)
MINIMUM: '86–'88, '90–'91: 180.5 mm (7.11 in)
After '92: 169.5 mm (6.67 in)
MAXIMUM: '86–'88, '90–'91: 185.5 mm (7.30 in)
After '92: 181.5 mm (7.15 in)



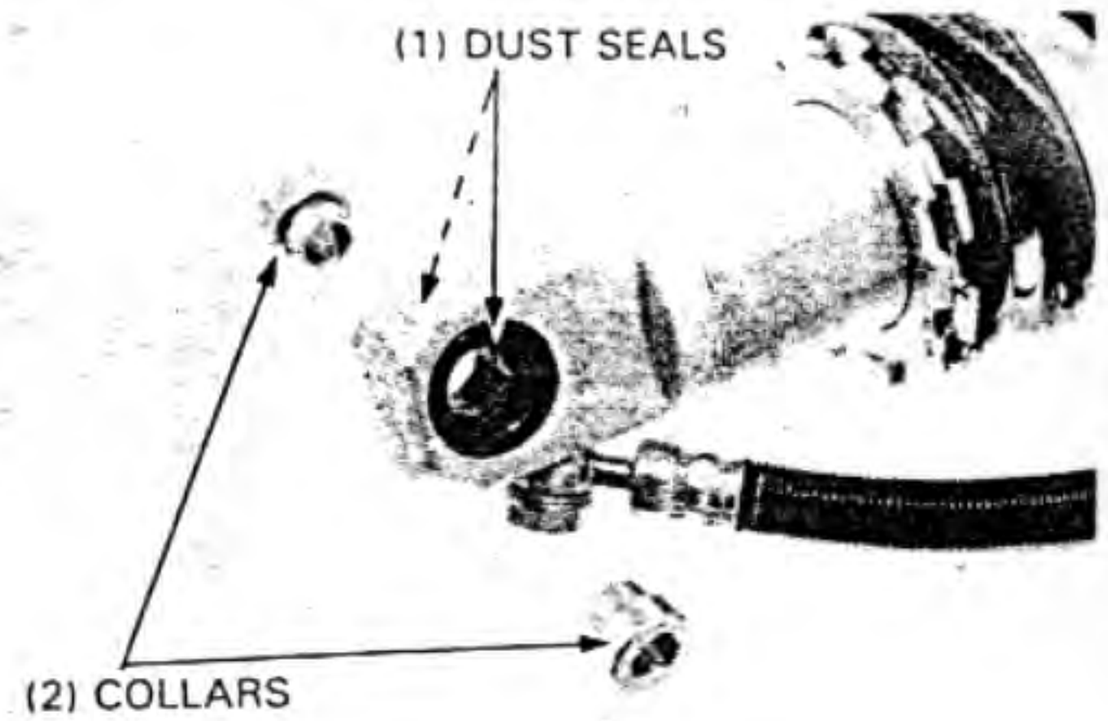
Hold the adjusting nut and tighten the lock nut.

TORQUE: 80–100 N·m (8.0–10.0 kg-m, 58–75 ft-lb)

Use this standard spring preload length just as a baseline. See the Owner's Manual for detailed instructions on adjusting preload for rider weight and setting damping for riding conditions and rider skill.

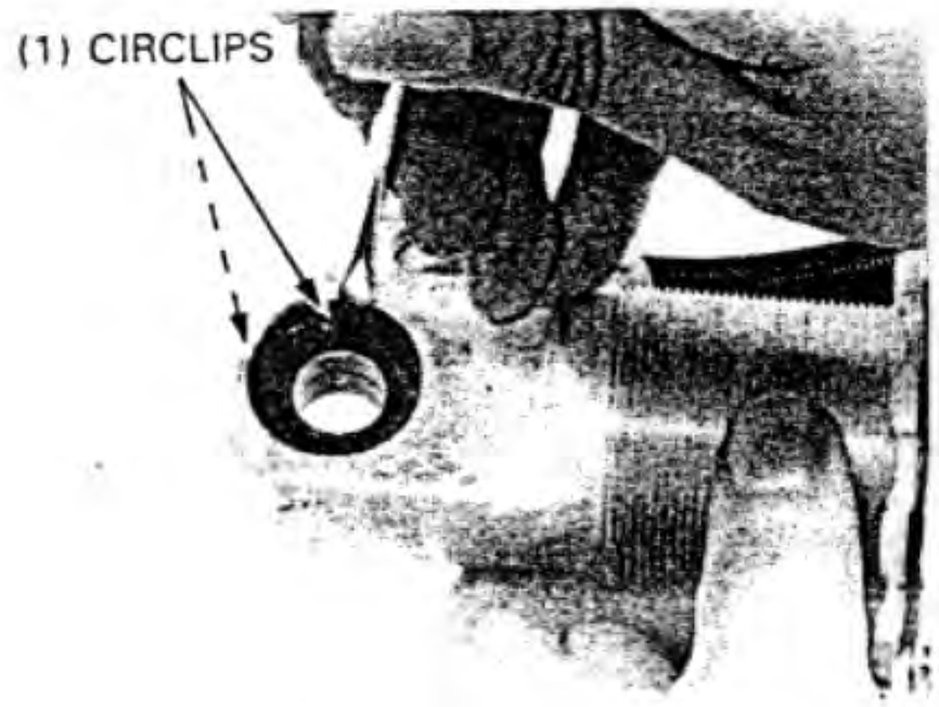
SPHERICAL BEARING REPLACEMENT

'86–'88, '90–'91:
Check the spherical bearing for wear or damage.
If it is worn or damaged, it must be replaced.



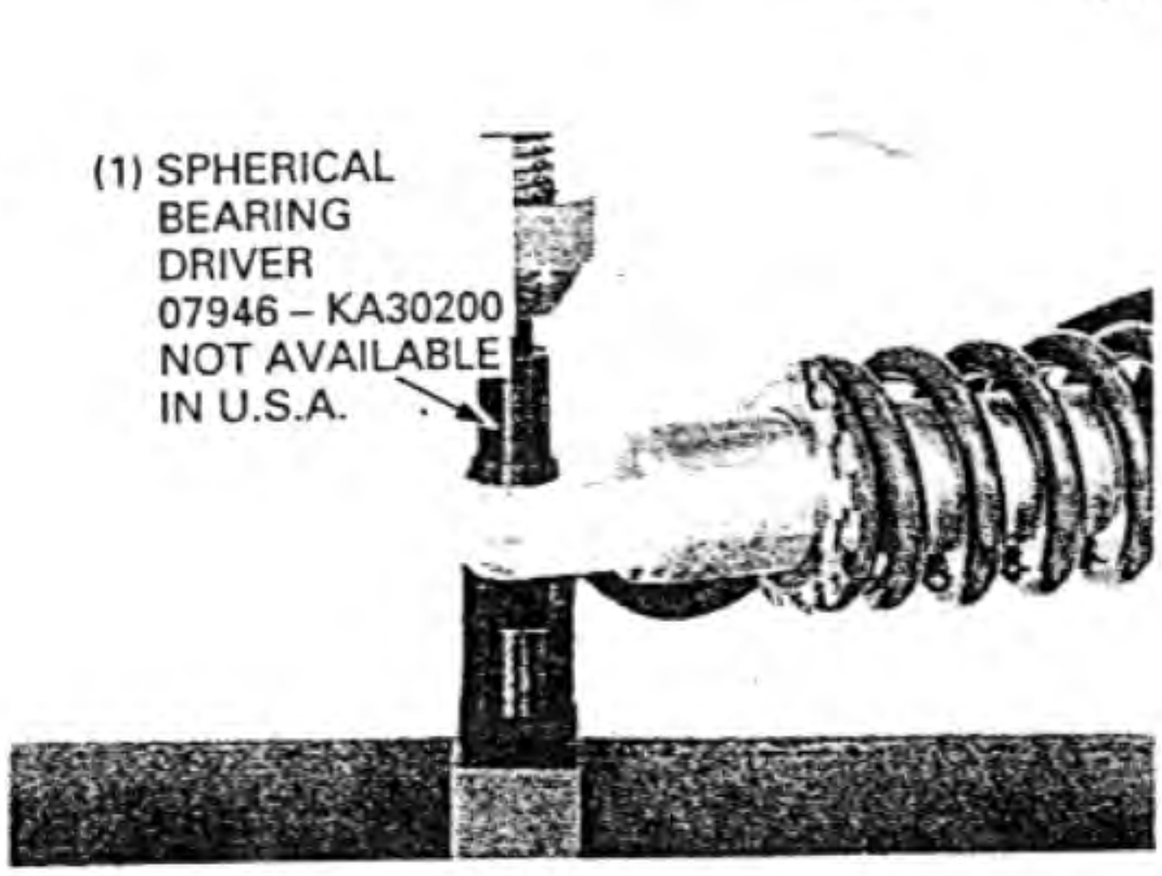
Remove collars and dust seals.

Remove the circlips.

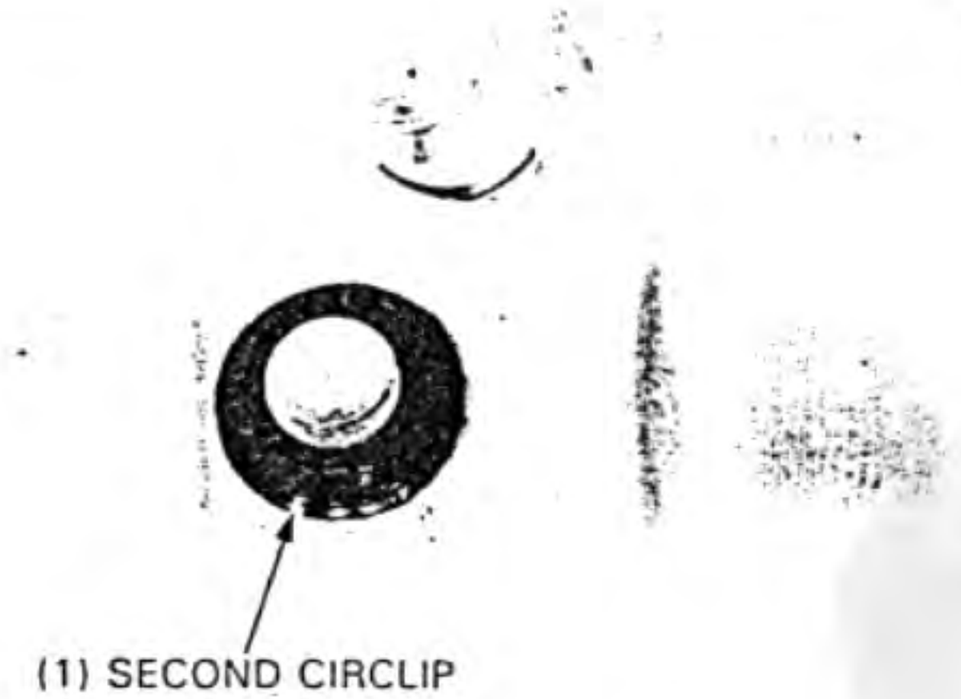


Press out the old spherical bearing from the rear shock absorber.

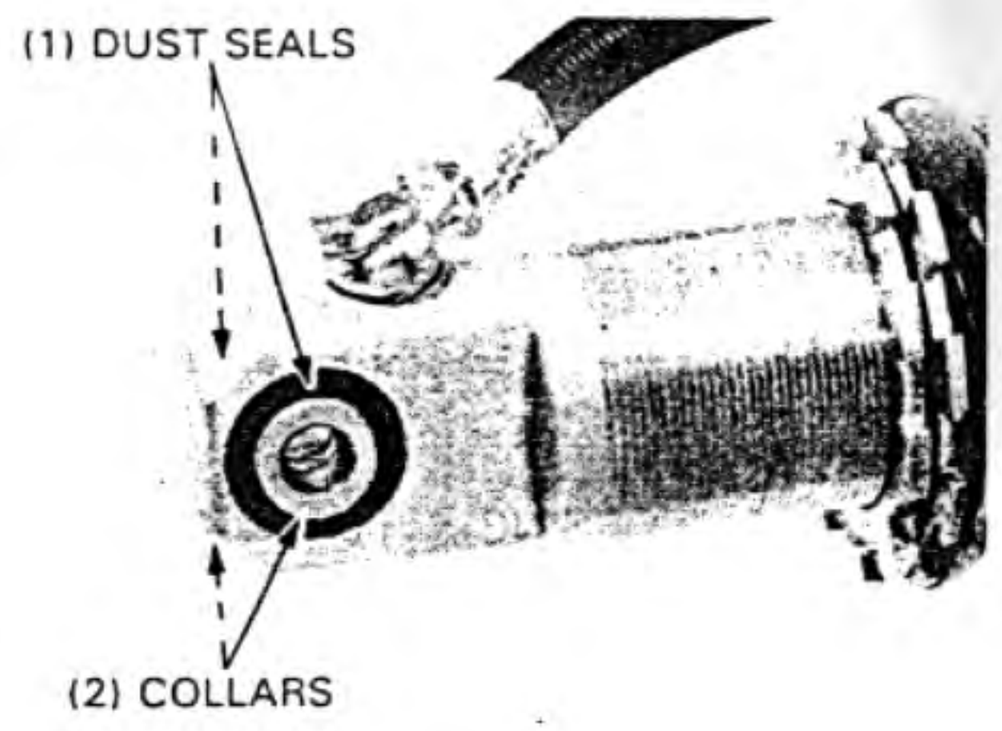
Install the circlip on one side and press in the new spherical bearing.



Install the second circlip on the other side.

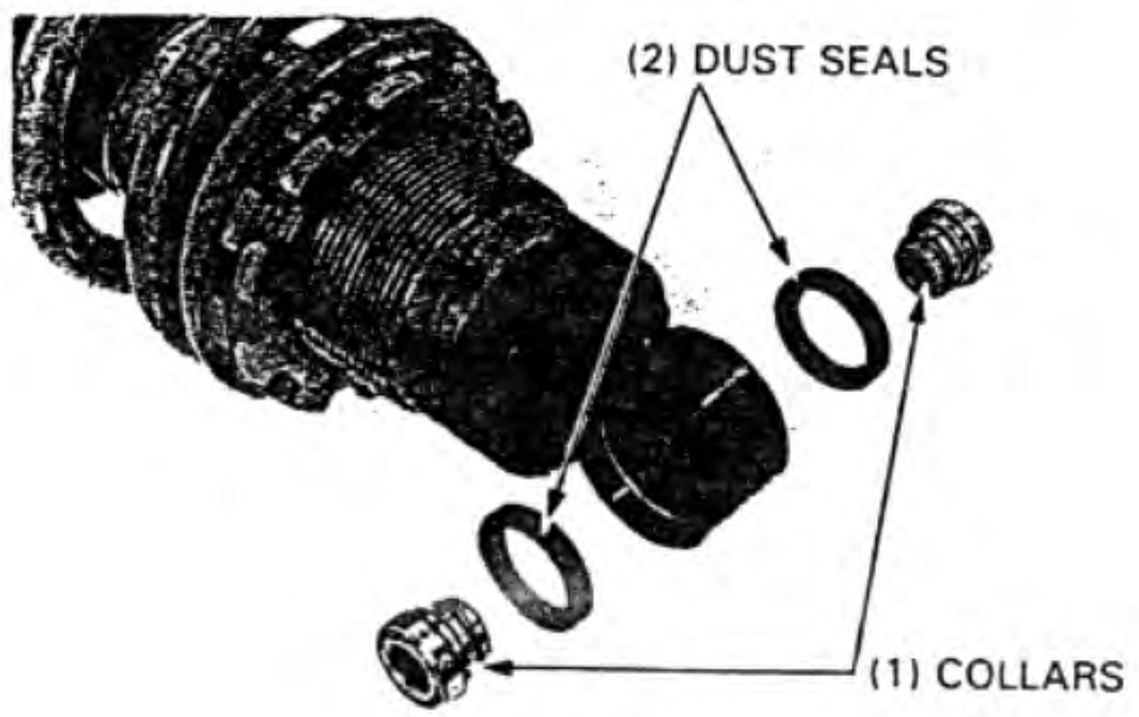


Install the dust seals and collars.

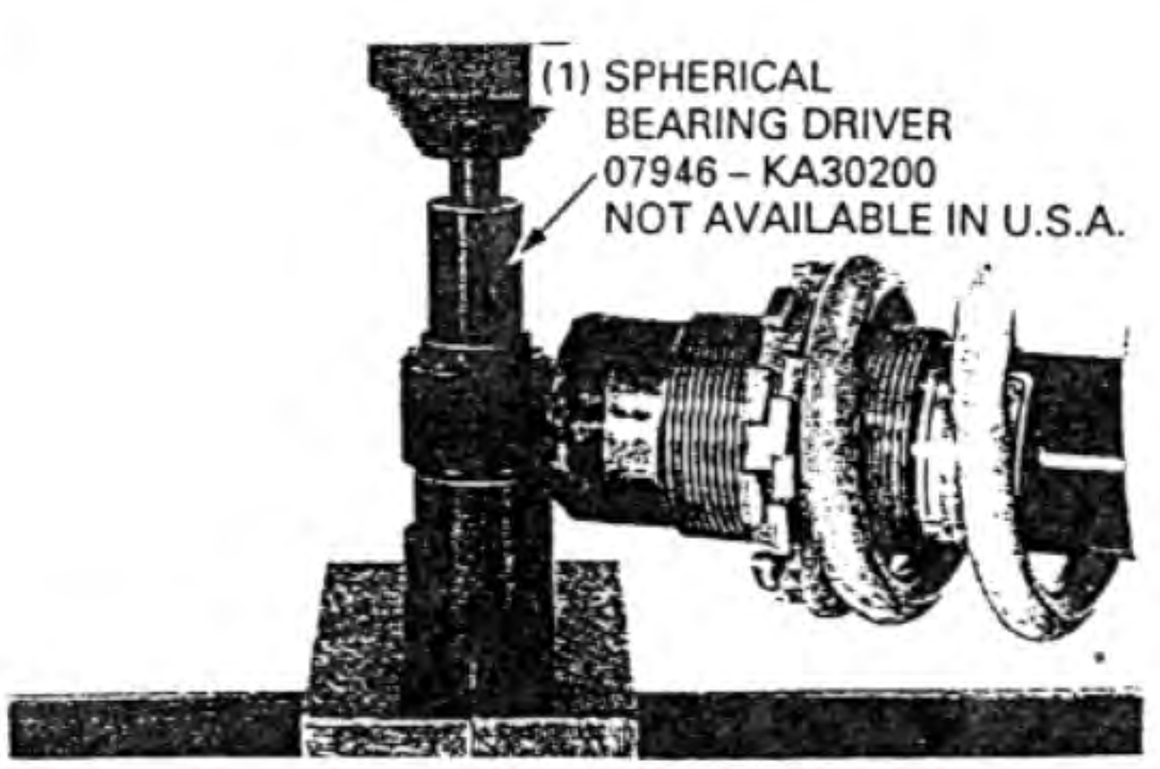


After '92:
Check the spherical bearing for wear or damage.
If it is worn or damaged, it must be replaced.

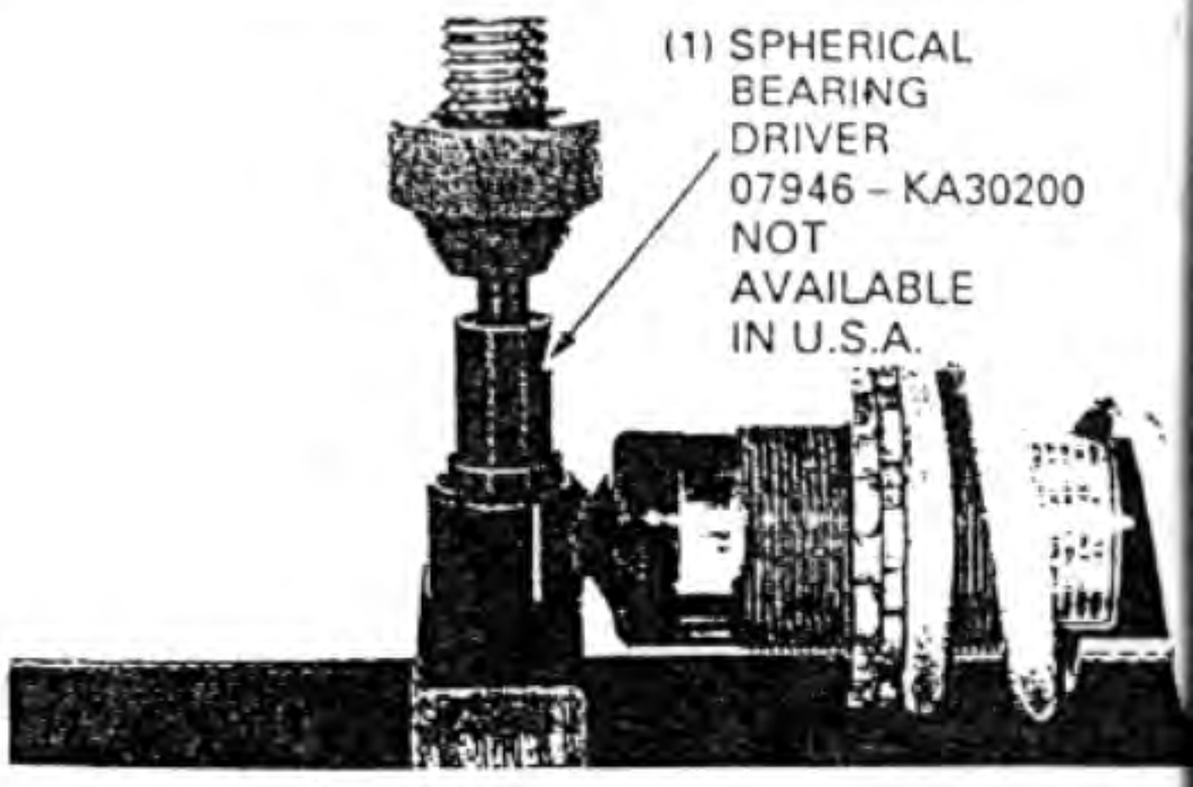
Remove the collars and dust seals.
Remove the circlip.



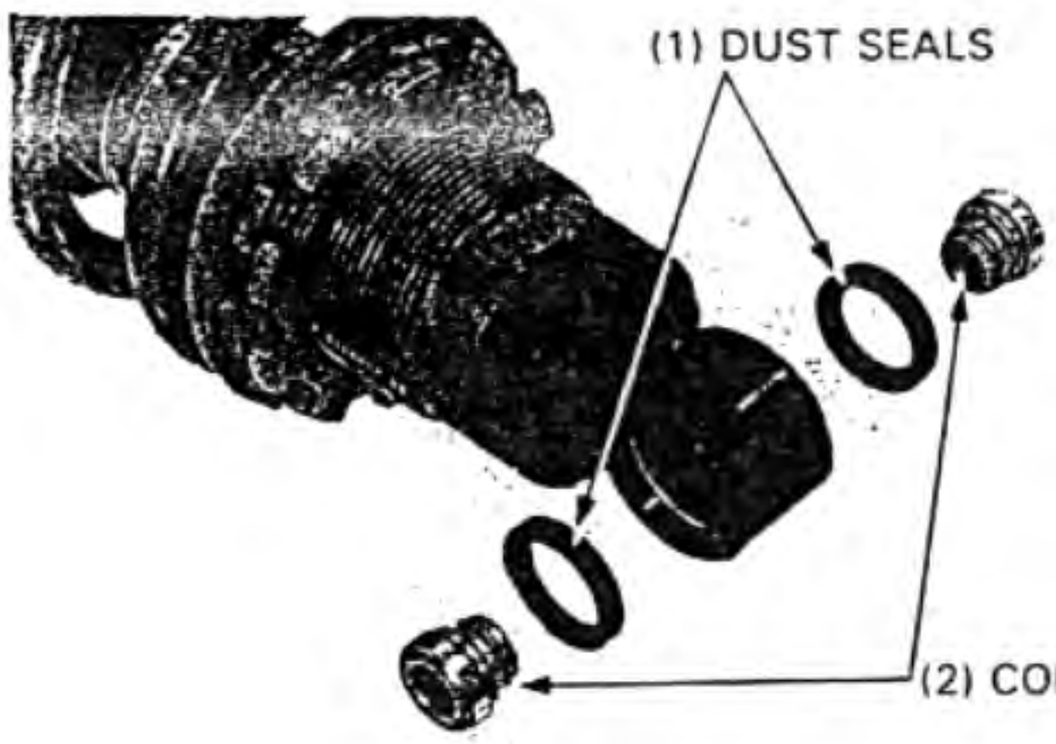
Press out the old spherical bearing from the rear shock absorber.



Install the circlip.
Press in the new spherical bearing using the special tool.



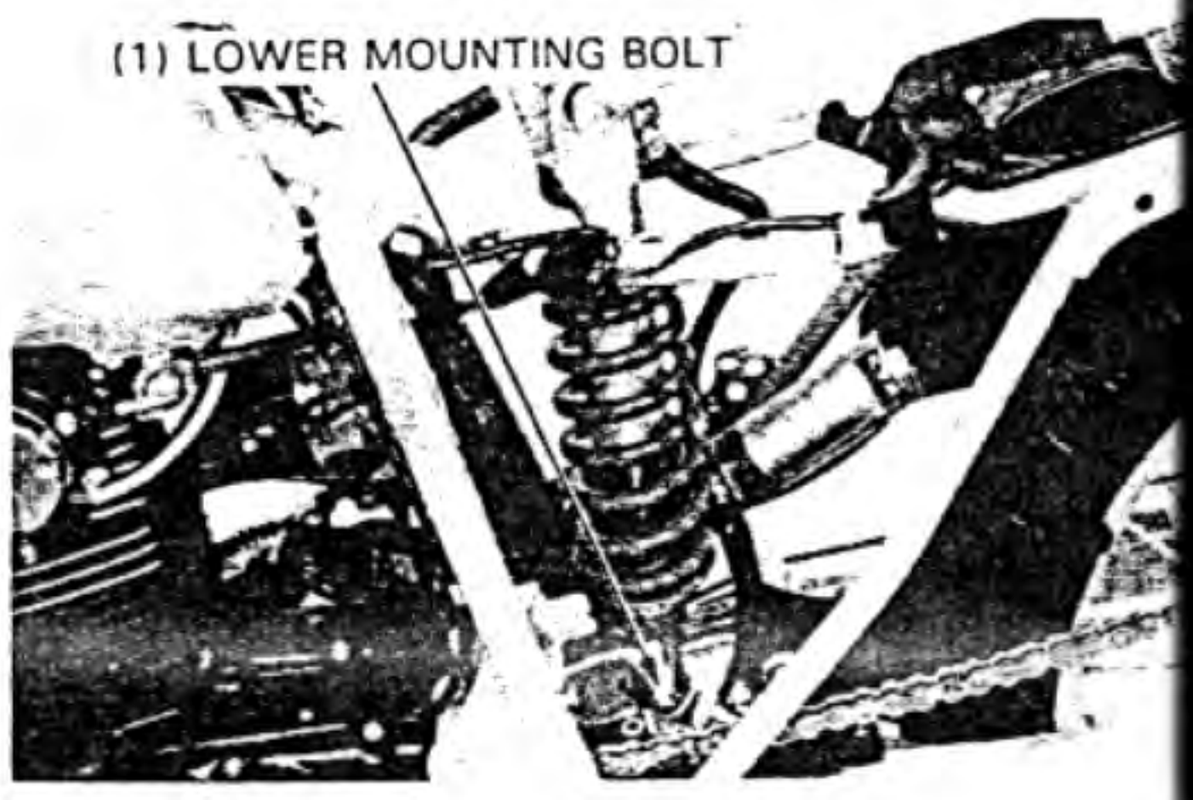
Install the dust seals and collars.



INSTALLATION

Raise the rear wheel off the ground by placing a jack or block under the engine.
Install the rear shock absorber to the shock arm.
Torque the lower mounting bolt to the specified torque.

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



Apply paste grease with 40% or more molybdenum disulfide to the shock absorber upper mount collars.

NOTE

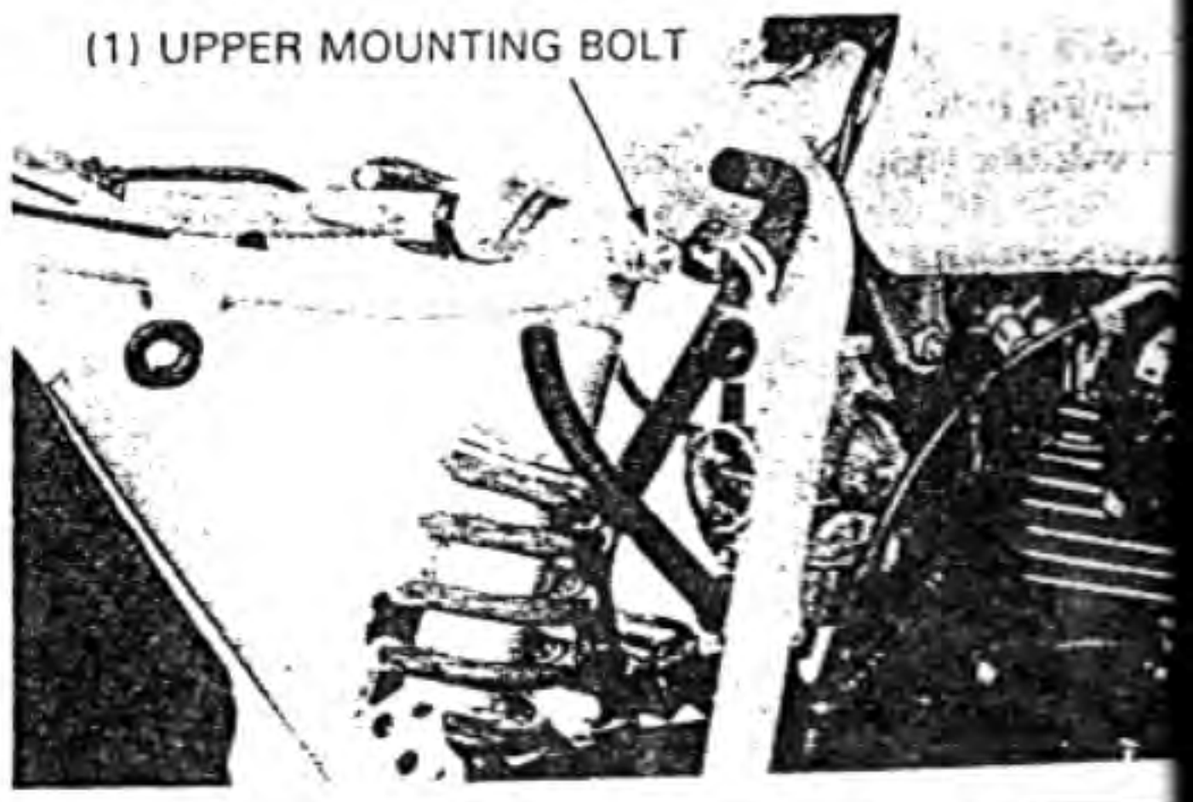
Some sources of MoS_2 paste grease with 40% or more molybdenum disulfide are:

- Molykote® G-n Paste manufactured by Dow Corning, U.S.A.
- Pro Honda Moly 60 (U.S.A. only)
- Rocol Paste manufactured by Sumico Lubricant, Japan.
- Rocol ASP manufactured by Rocol Limited, U.K.

Any other manufactuer's paste grease equivalent to the above may also be used.

Install and tighten the rear shock absorber upper mounting bolt.

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

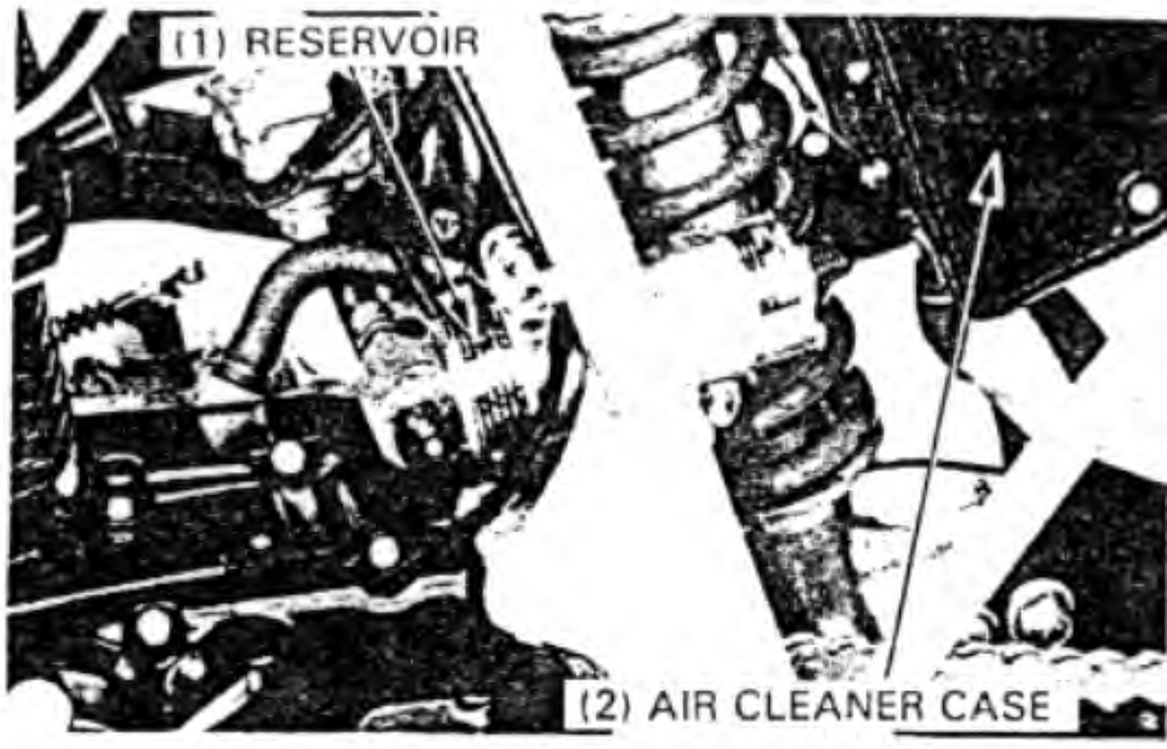


Install the air cleaner case (page 4-4).

'86–'88, '90–'91:
Route the reservoir hose (page 1-9).
Install the reservoir with the clamps and tighten their screws.

Install the side covers and seat.

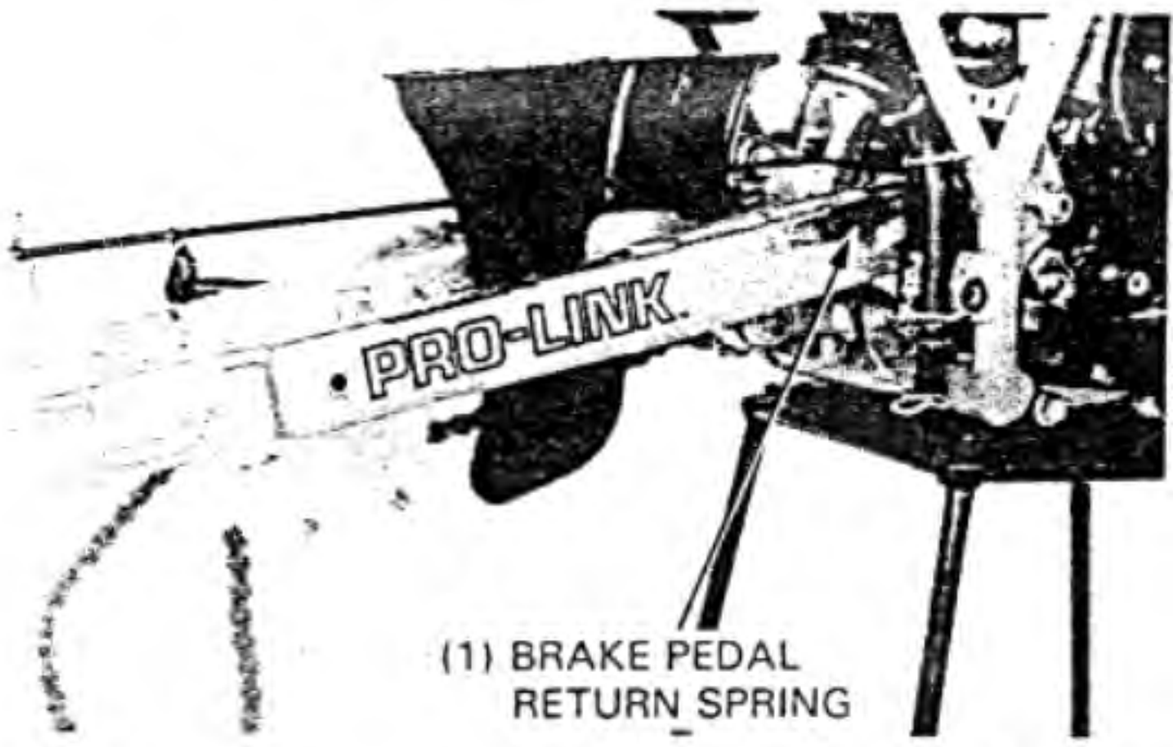
Check the operation of the shock absorber.



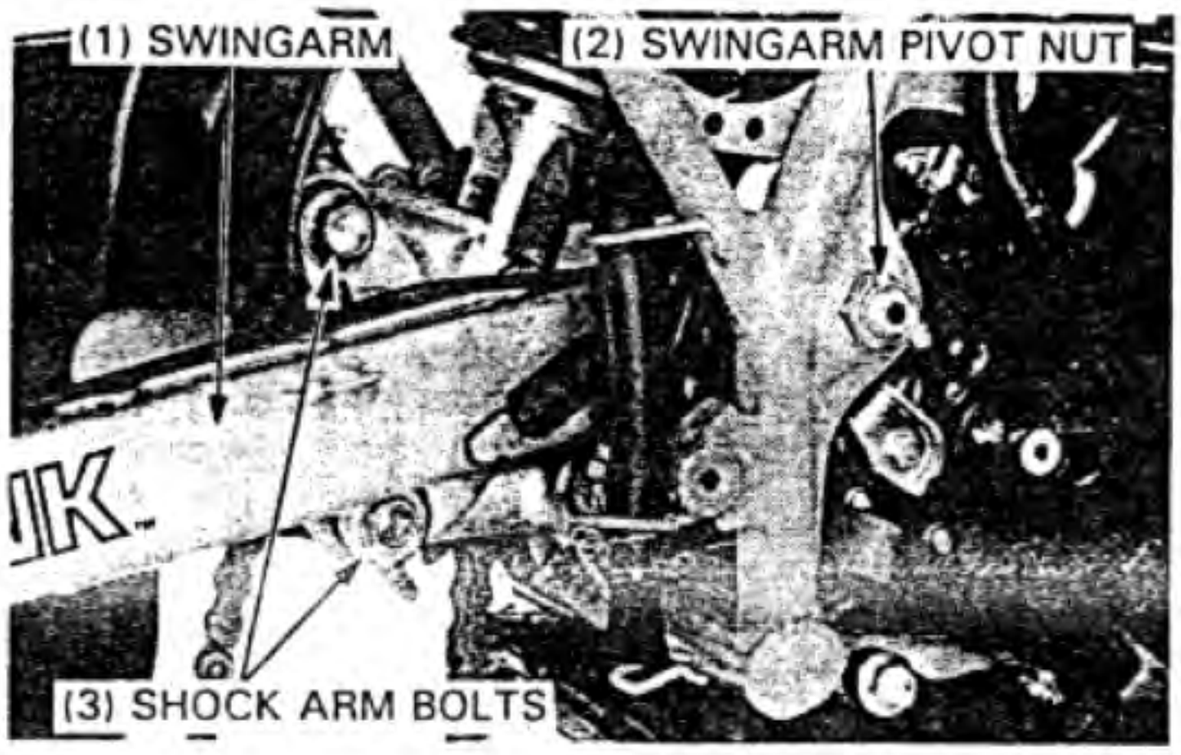
SWINGARM/SHOCK LINKAGE

REMOVAL

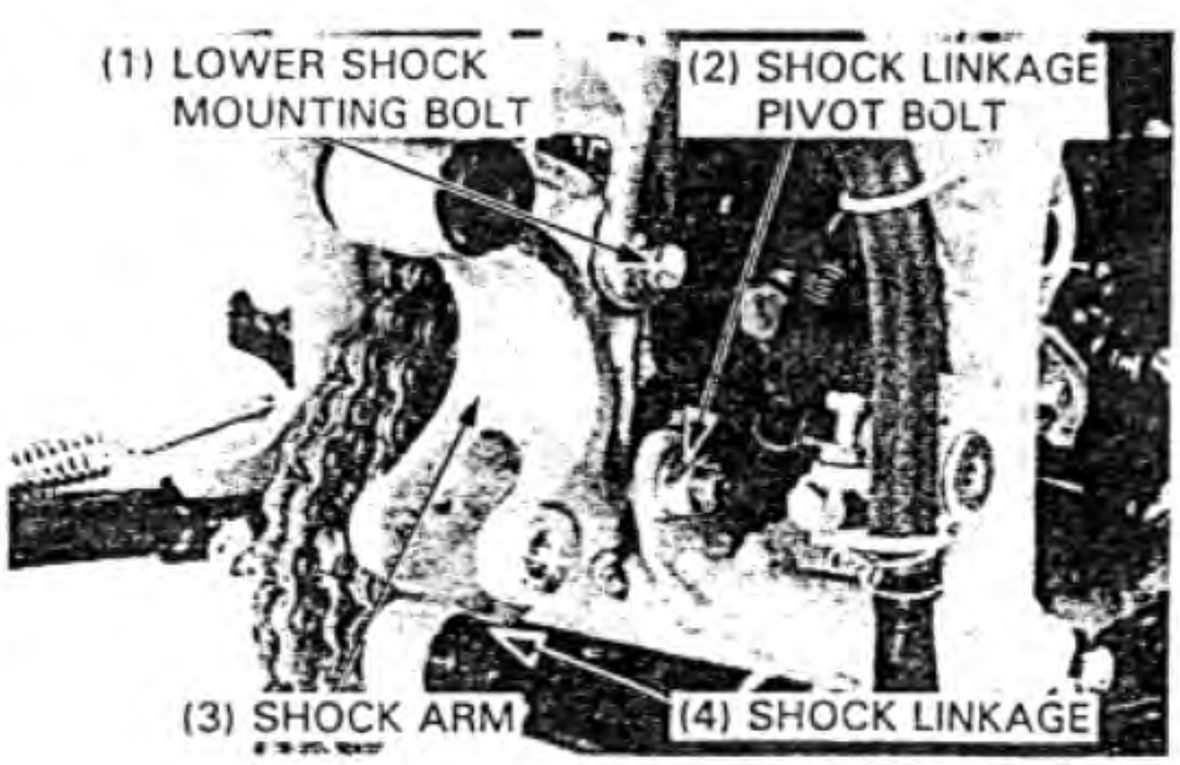
Raise the rear wheel off the ground by placing a work stand or box under the engine.
Remove the rear wheel (page 12-3).
Remove the brake pedal return spring.



Remove the shock arm bolts.
Remove the swingarm pivot nut/bolt and the swingarm from the frame.

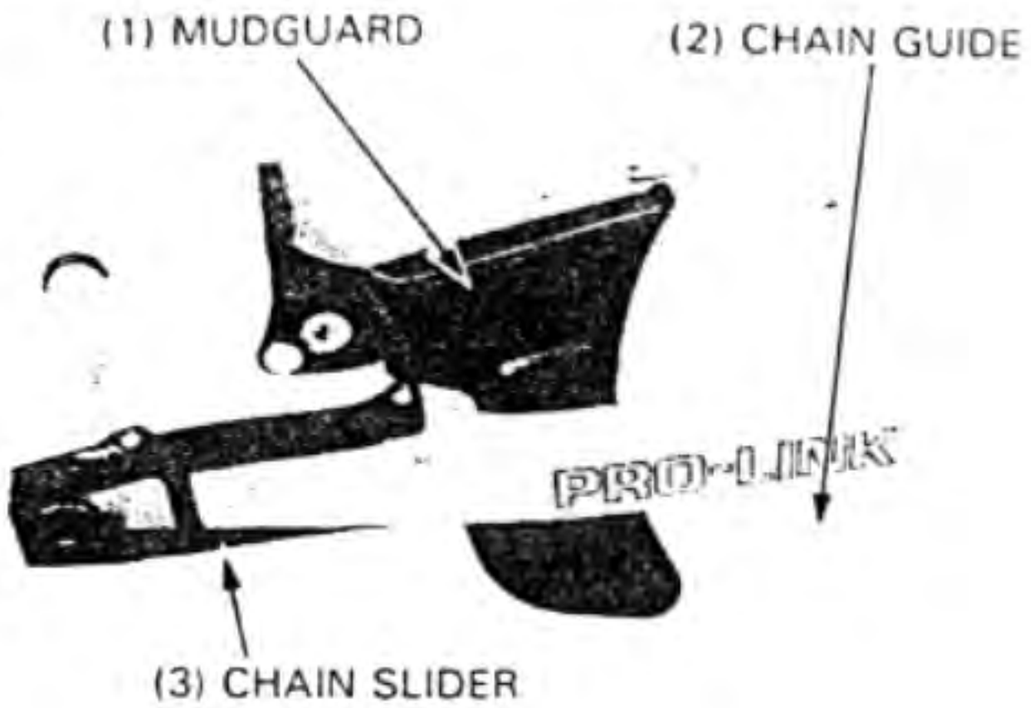


Remove the shock linkage pivot bolt and the lower shock mounting bolt.
Remove the shock arm and linkage.



DISASSEMBLY

Remove the chain slider, chain guide and mudguard from the swingarm.

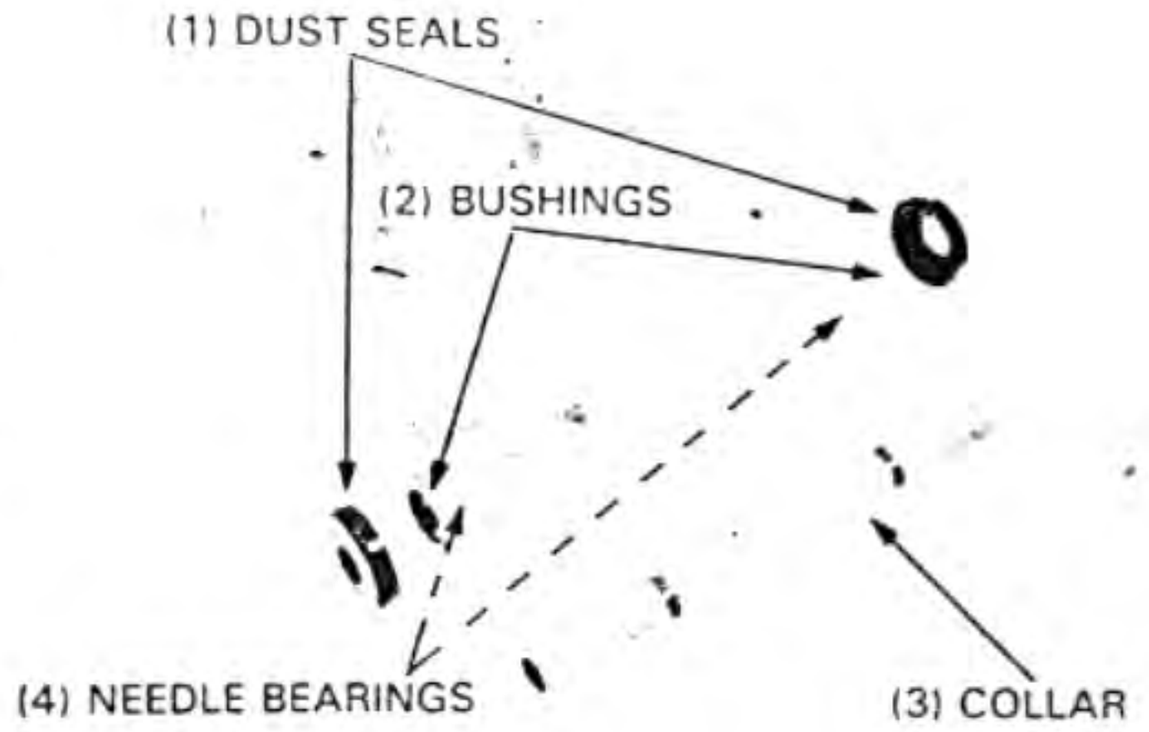


INSPECTION

Remove the dust seals and collar.

Inspect the collar, bushings and needle bearings.
Replace them if they have score marks, scratches, excessive or abnormal wear.

Check the shock mounts and swingarm for cracks or other damage.



PIVOT BEARING REPLACEMENT

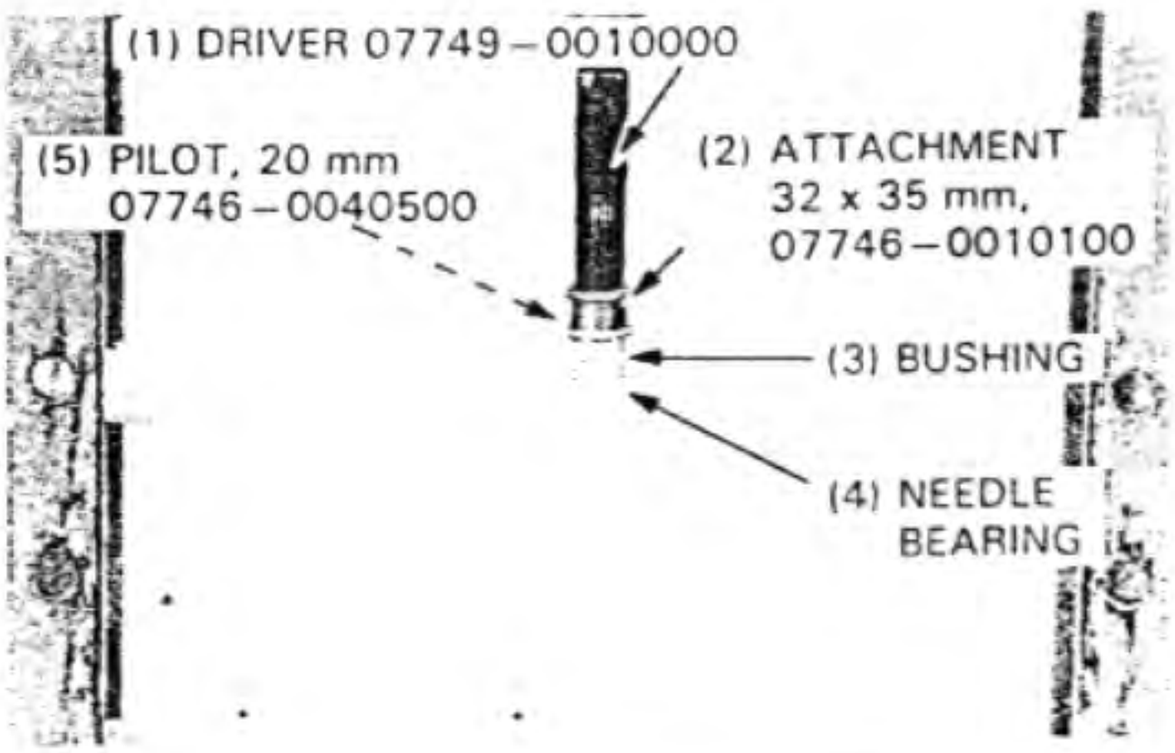
Drive out the bushing.
Remove the bearing with the needle bearing remover as shown.


(1) NEEDLE BEARING REMOVER 07931 – MA70000
NOT AVAILABLE IN U.S.A. or
07936 – 3710600, 07936 – 3710100, 07936 – 371020A
or 07936 – 3710200 (U.S.A. only)

Press the new bearing with the bushing into the swingarm pivot.
Pack the new needle bearings with grease.

NOTE

- Install the bearings with the marks facing out.



SHOCK LINKAGE INSPECTION

Inspect the collars and bushings.

Apply a paste grease with 40% or more molybdenum disulfide to the inside of the bushing and dust seal lip.
Be sure the sealing lip seats properly.

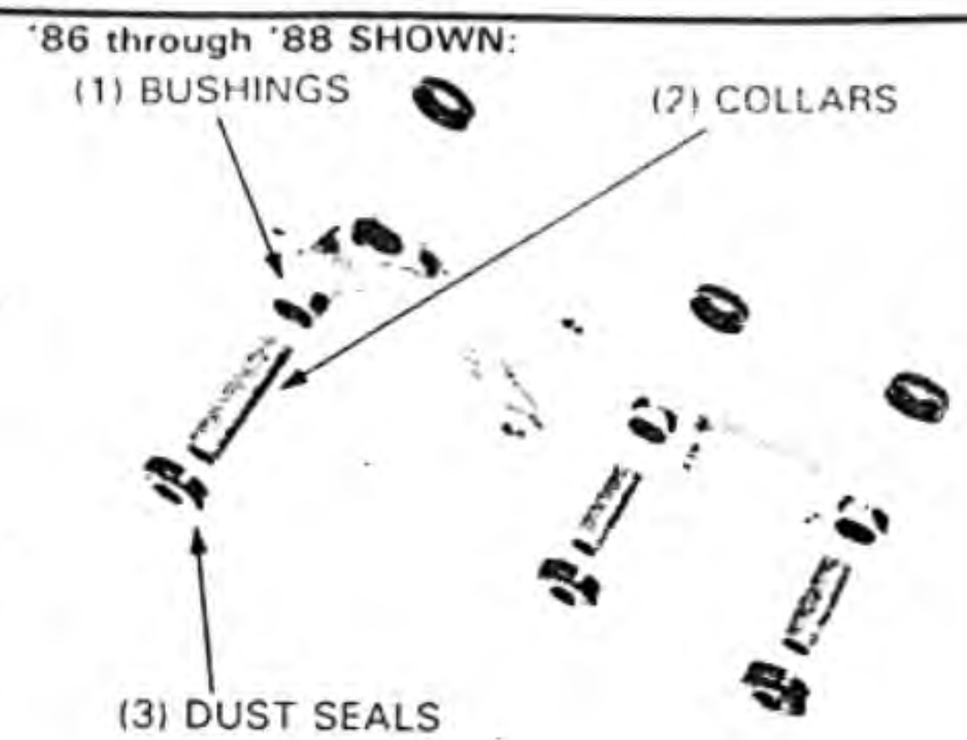
NOTE

Some sources of MoS_2 paste grease with 40% or more molybdenum disulfide are:

- Molykote® G-n Paste manufactured by Dow Corning, U.S.A.
- Pro Honda Moly 60 (U.S.A. only)
- Rocol Paste manufactured by Sumico Lubricant, Japan.
- Rocol ASP manufactured by Rocol Limited, U.K.

Any other manufactuer's paste grease equivalent to the above may also be used.

'86 through '88 SHOWN:



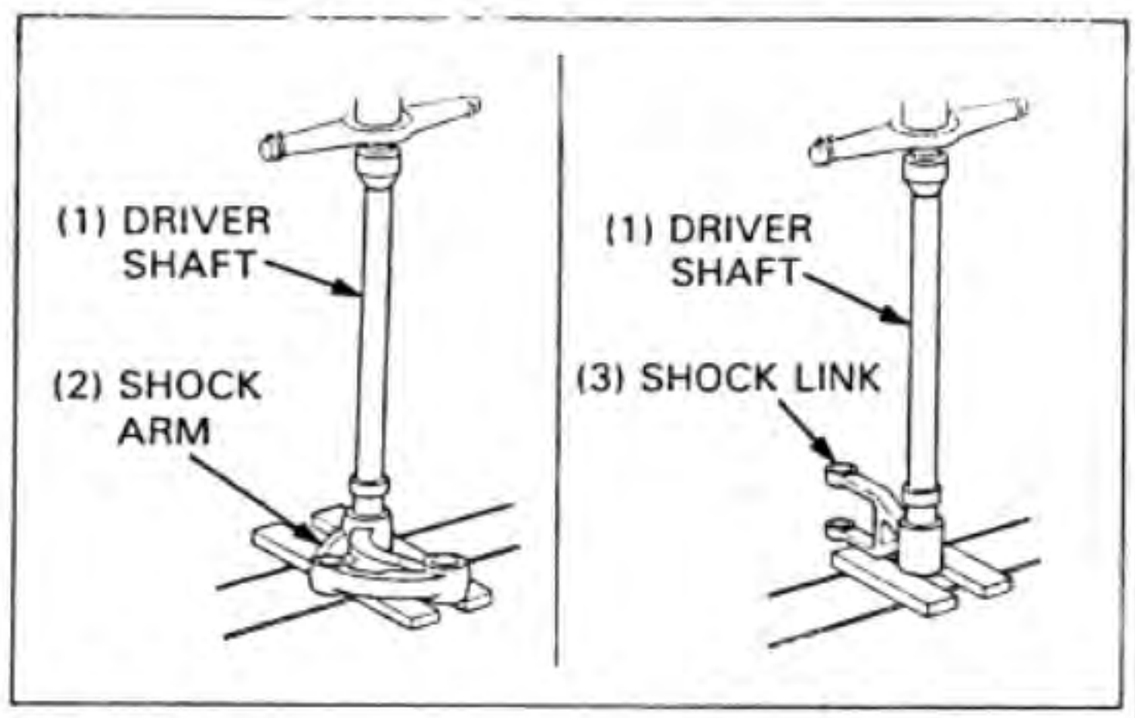
AFTER '89:

NEEDLE BEARING REPLACEMENT

Press the needle bearings out of the shock arm and link.

TOOL:

Driver shaft	**07946 – MJ00100**



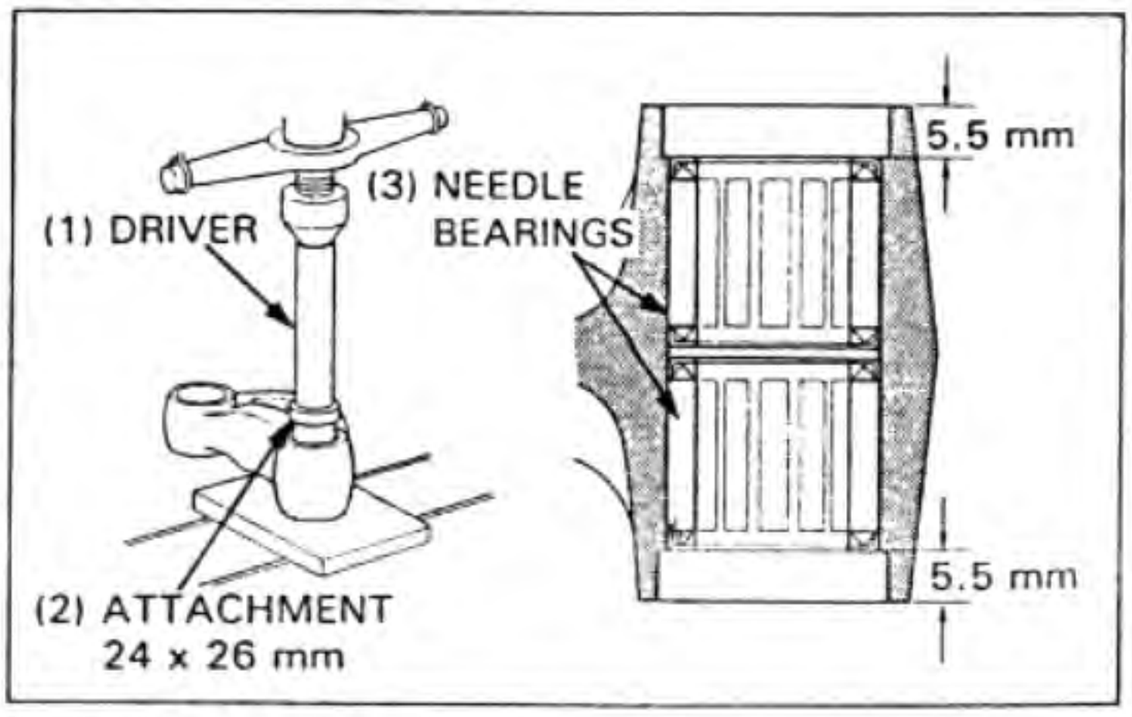
Pack the new needle bearings with grease.
Carefully press the needle bearings into the shock arm as shown.

NOTE

- Press the needle bearings in with the marks facing out.

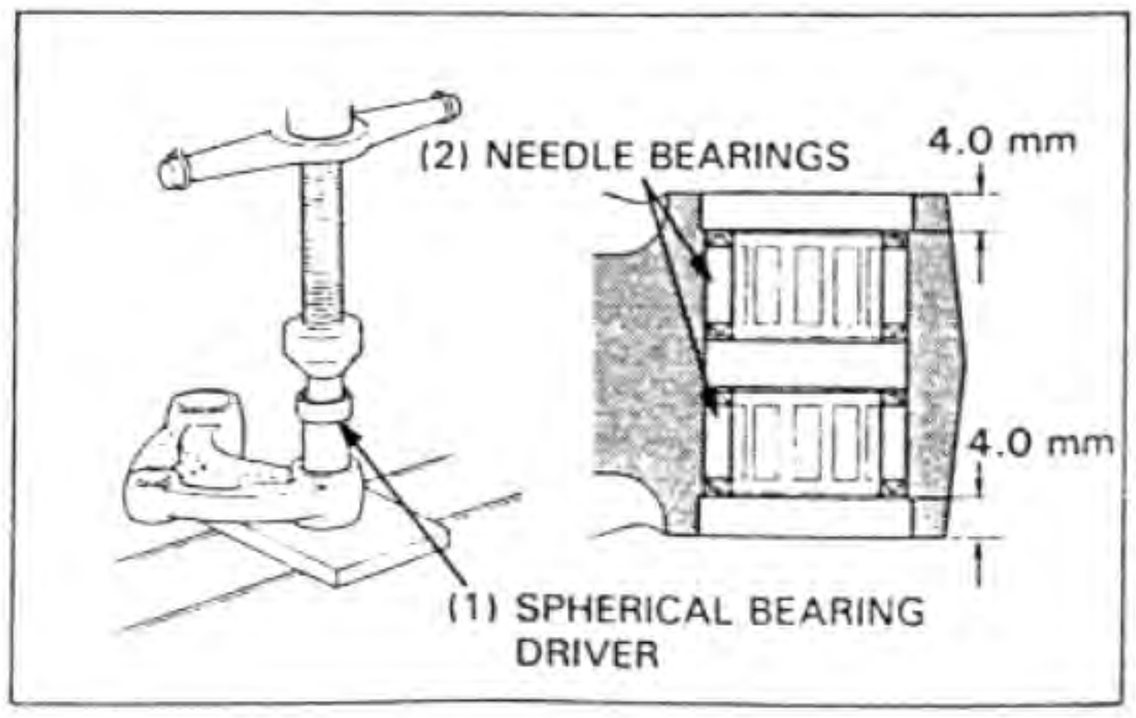
TOOLS:

Driver	**07749–0010000**
Attachment, 24 x 26 mm	07746–0010700

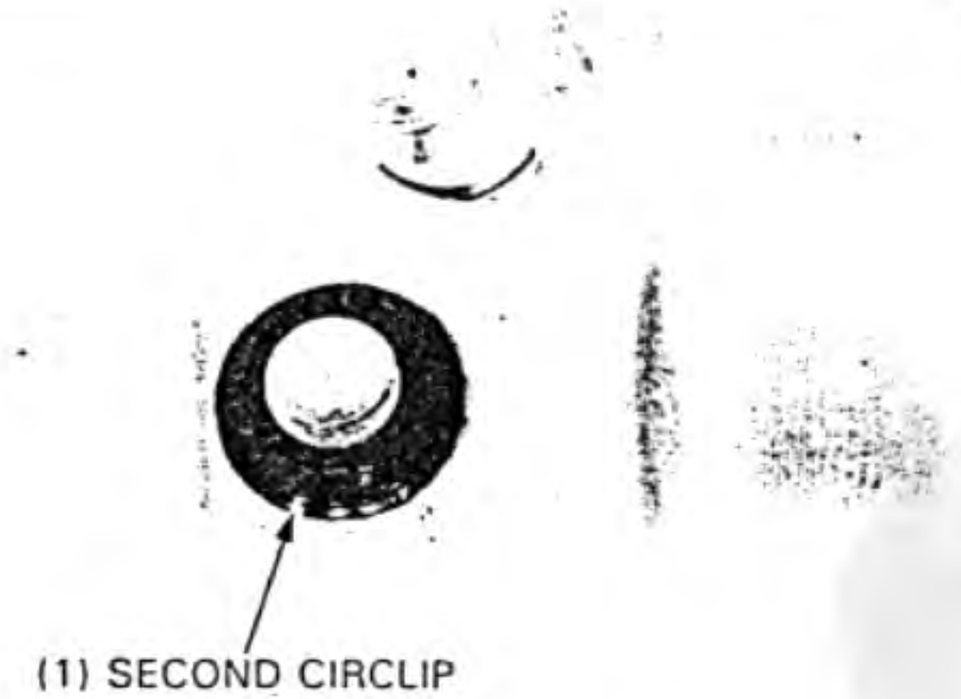


TOOL:

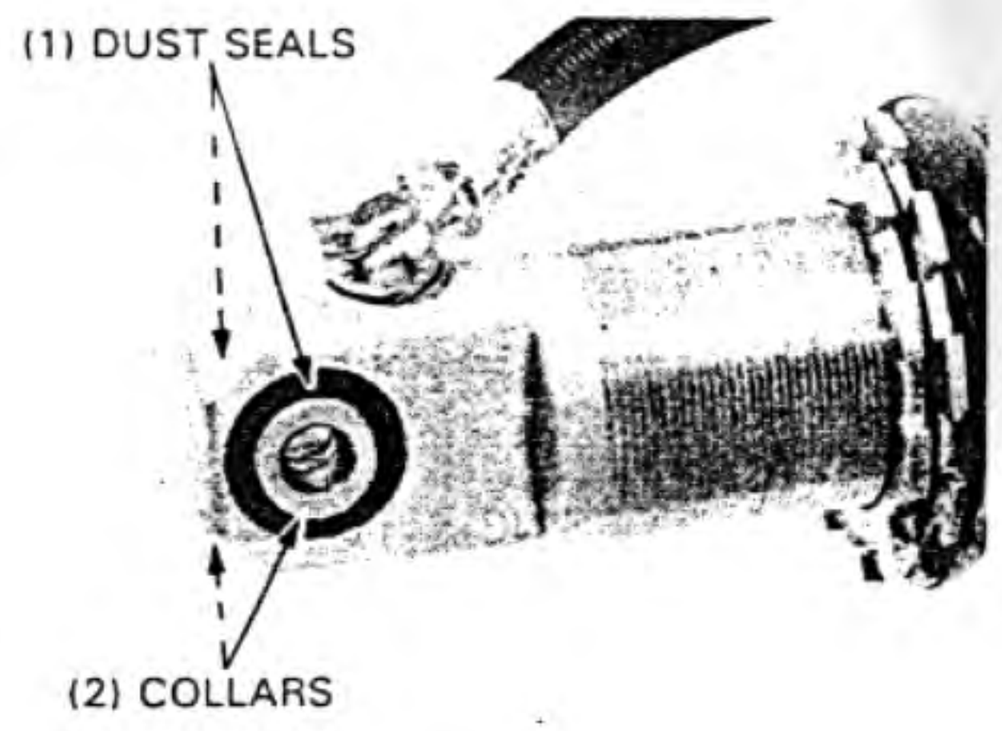
Spherical bearing driver	**07946 – KA30200** **Not available in U.S.A.**



Install the second circlip on the other side.

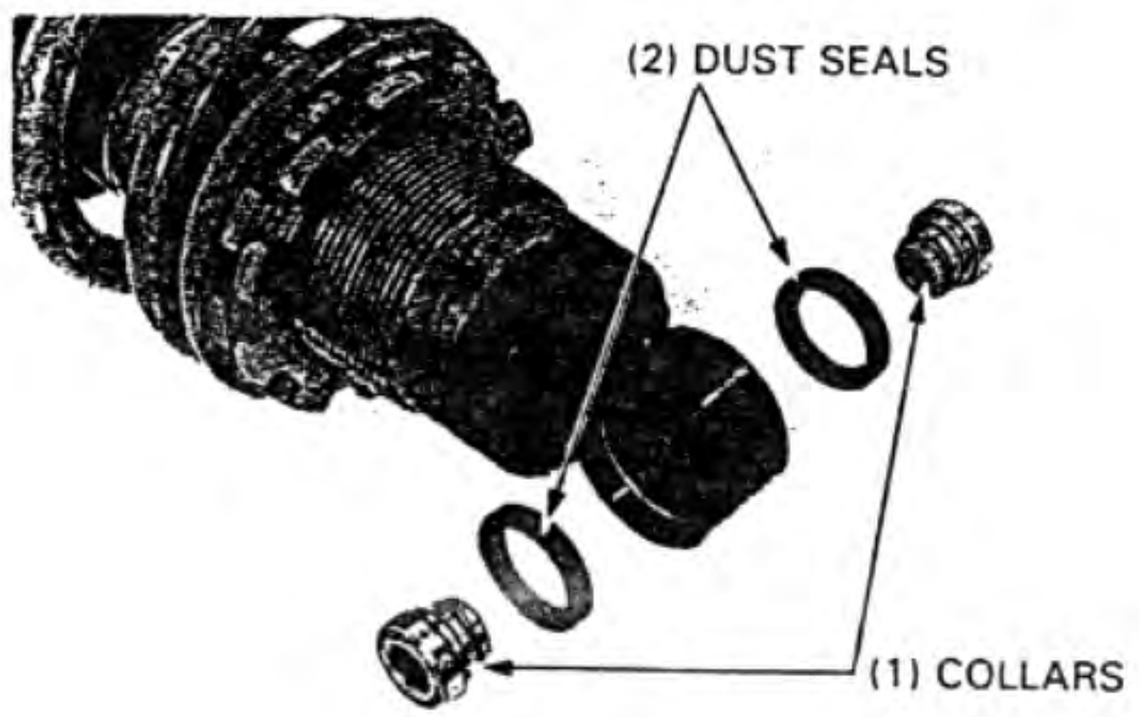


Install the dust seals and collars.

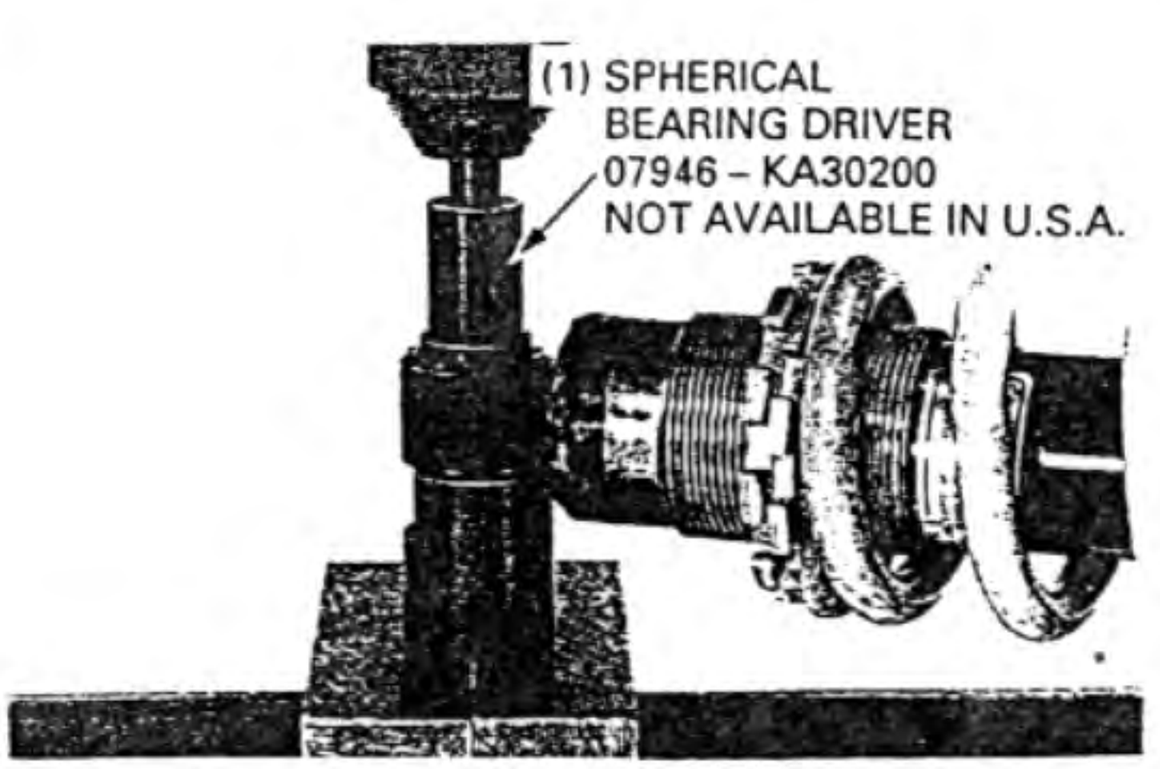


After '92:
Check the spherical bearing for wear or damage.
If it is worn or damaged, it must be replaced.

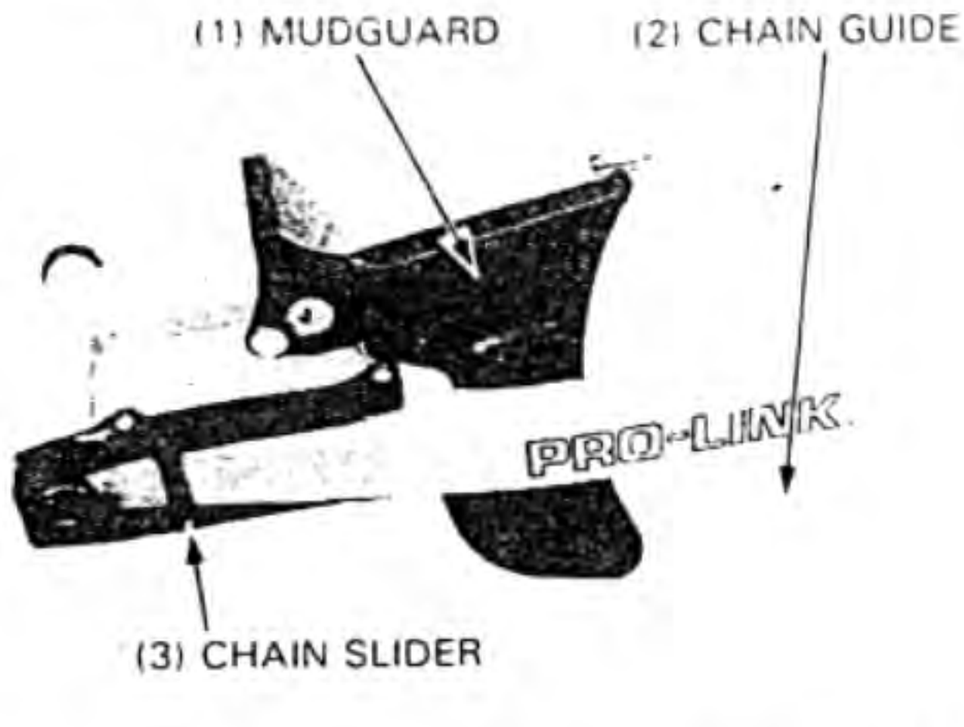
Remove the collars and dust seals.
Remove the circlip.



Press out the old spherical bearing from the rear shock absorber.



Install the pivot collar and dust seals.
Install the chain guide, chain slider and mudguard.

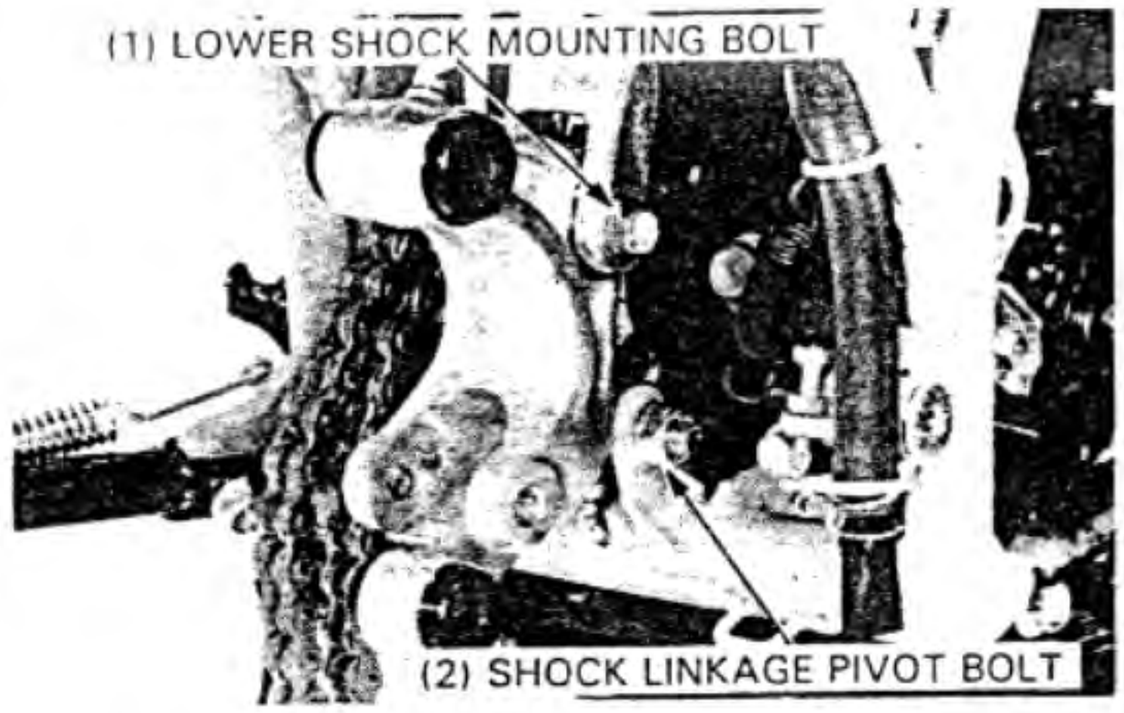


Install the shock arm onto the lower shock absorber mount.

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

Install the shock link with the connecting rod pivot bolt.

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



Install the swingarm and torque the swingarm pivot nut.

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

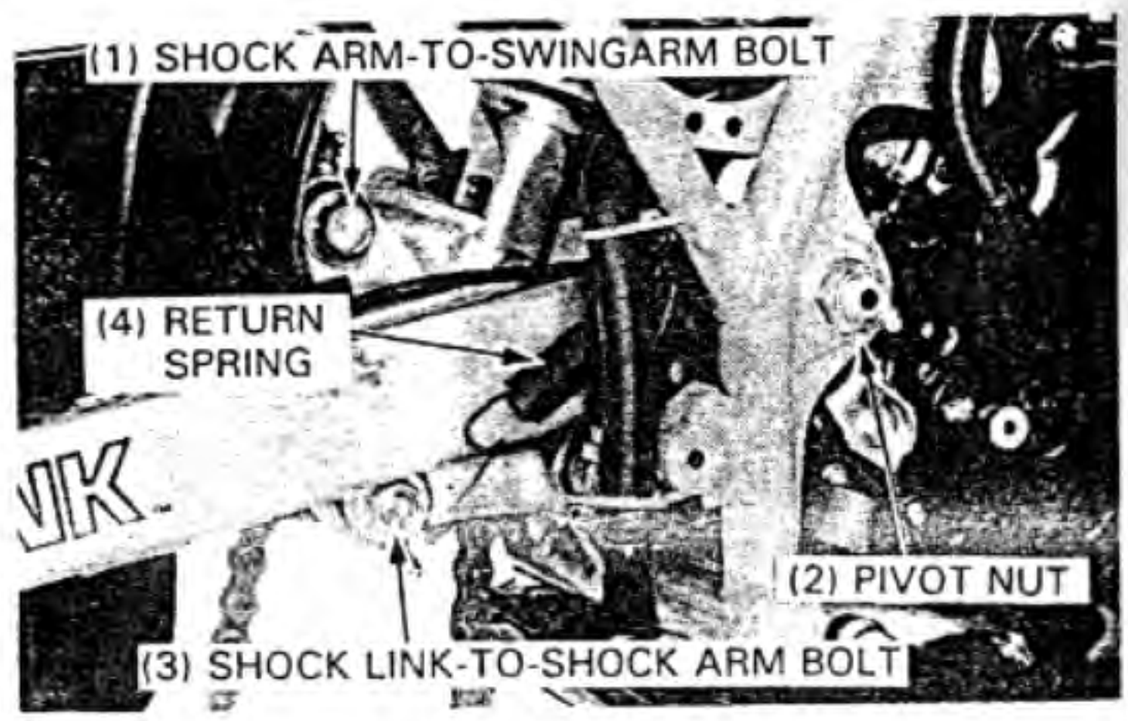
Install the shock arm onto the swingarm.

TORQUE: 90—120 N·m (9.0—12.0 kg-m, 65—87 ft-lb)

Install the shock link to the shock arm.

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

Apply grease to the swingarm pivot and the shock linkage bushings through the grease fittings (page 3-15).



Install the return spring.
Install the rear wheel (page 12-7).

13. REAR FENDER/EXHAUST PIPE

SERVICE INFORMATION

GENERAL

- This section describes removal/installation of the rear fender and exhaust pipe.

WARNING

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

TORQUE VALUES

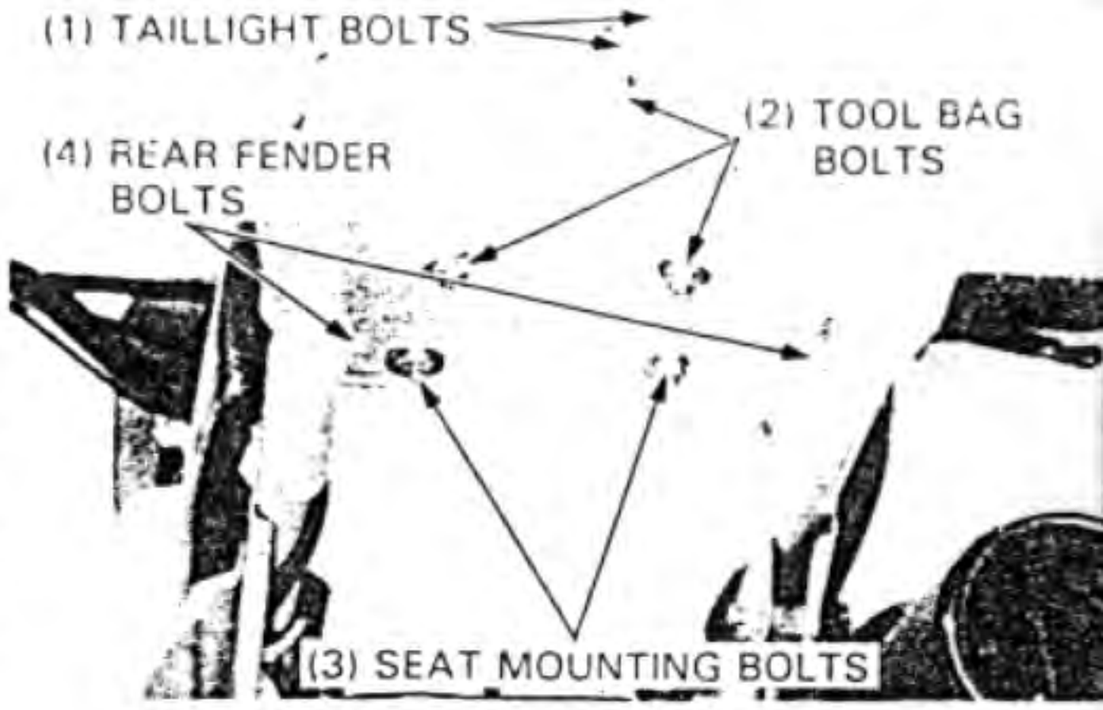
Seat mounting bolts	8–12 N·m (0.8–1.2 Kg-m, 6–9 ft-lb)
Exhaust pipe flange nut	8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)
Muffler mounting bolt	20–30 N·m (2.0–3.0 kg-m, 14–22 ft-lb)
Socket bolt	12–15 N·m (1.2–1.5 kg-m, 9–11 ft-lb)

REAR FENDER

REMOVAL

Remove the two bolts attaching the seat to the fender and remove the seat.
Disconnect the taillight wire connectors and clamp.

Remove the two bolts attaching the taillight and remove the taillight.
Remove the three nuts attaching the tool bag and remove the tool bag.
Remove the two bolts mounting the rear fender and remove the rear fender.



INSTALLATION

Install the fender in the reverse order of removal.
Tighten the seat mounting bolts.

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

EXHAUST PIPE

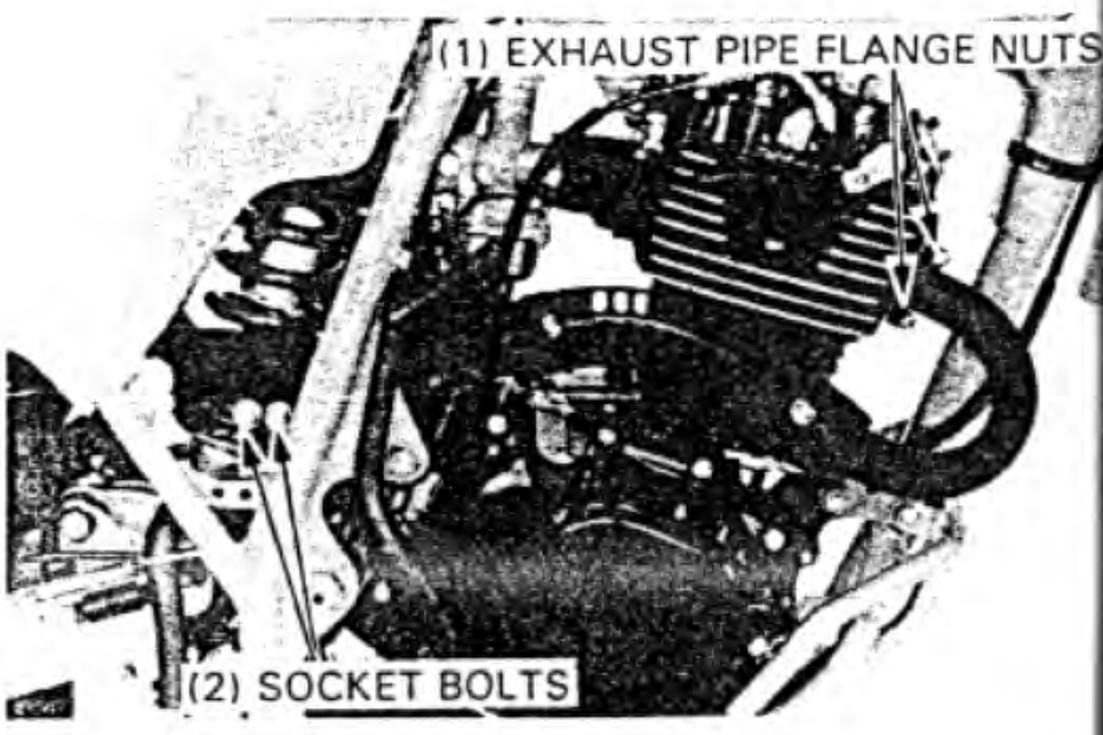
Refer to Page 3-17 for spark arrester cleaning.

WARNING

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

REMOVAL

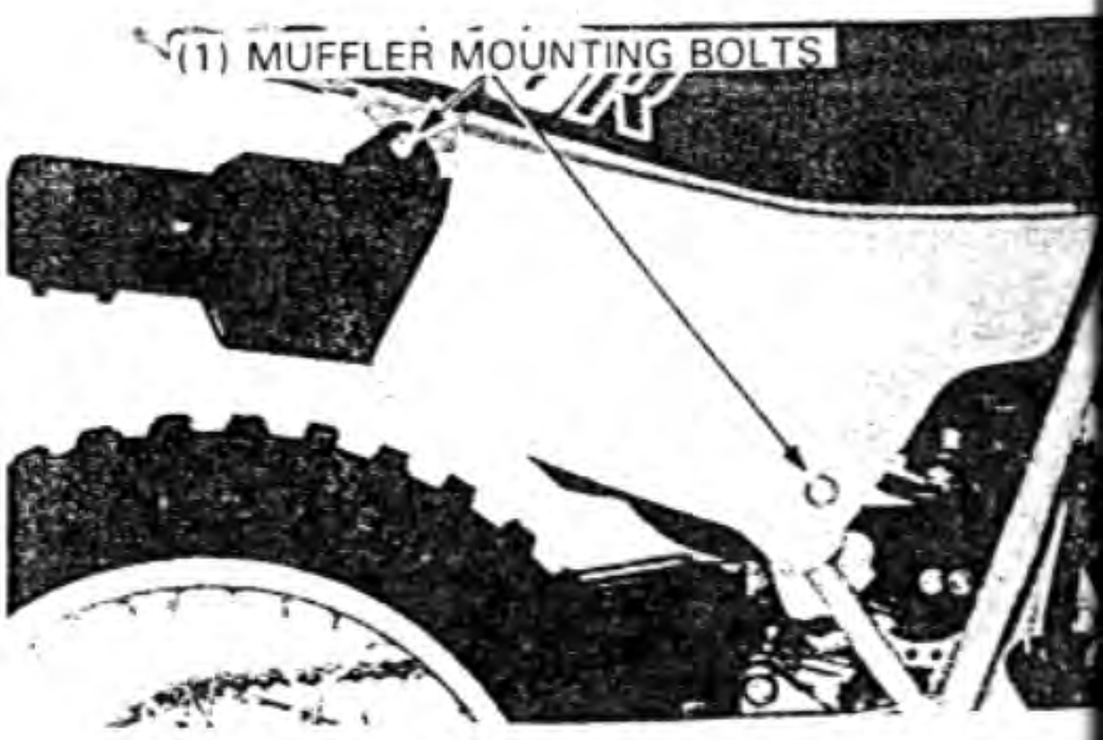
Remove the exhaust pipe flange nuts.
Remove the exhaust pipe by removing the two socket bolts.



Remove the two muffler mounting bolts and remove the muffler.

NOTE

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

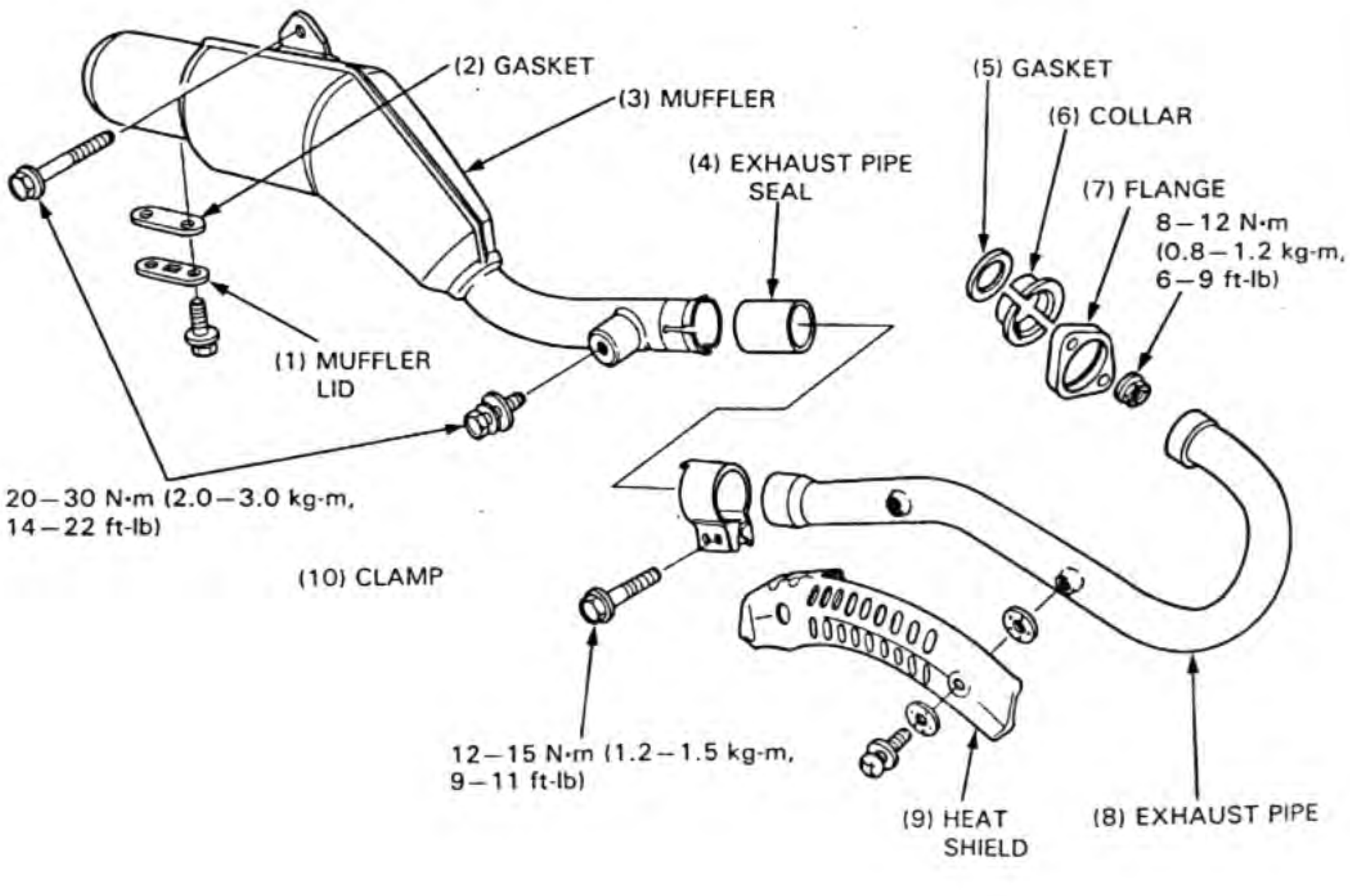


INSTALLATION

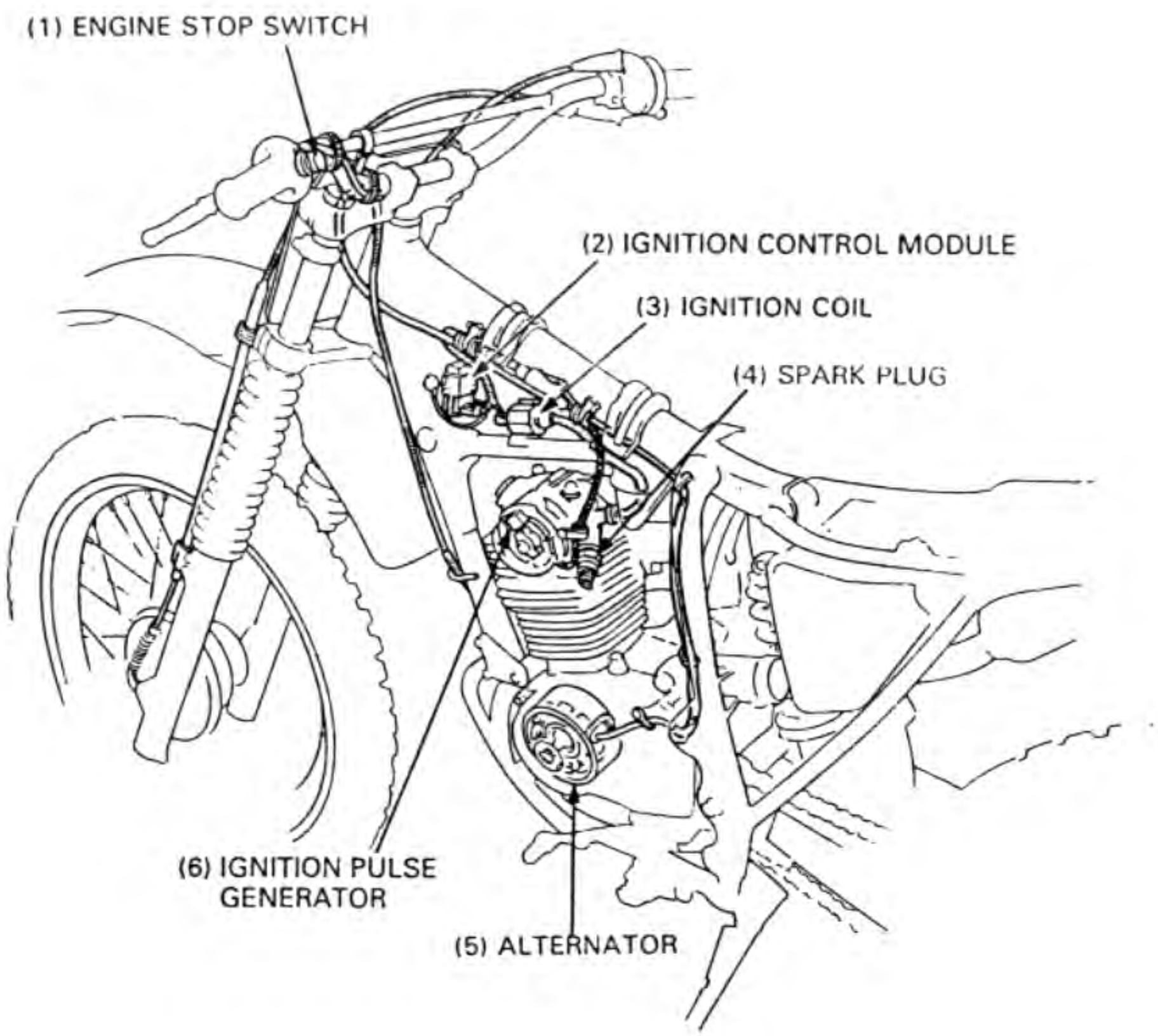
The installation sequence is essentially the reverse of removal.

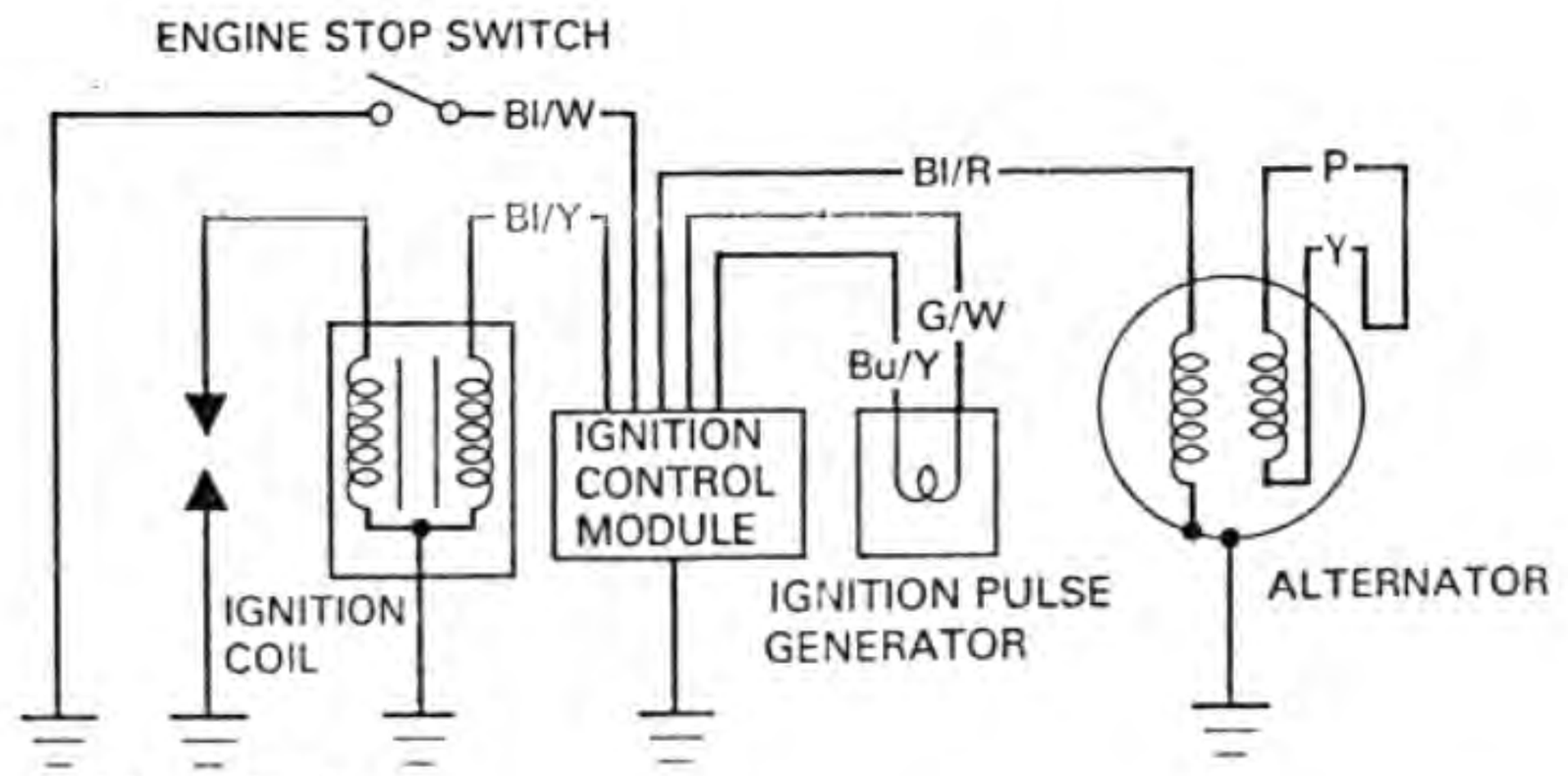
NOTE

- Tighten the exhaust flange nuts first, then tighten the other bolts.
- Align the tab of the clamp with the groove of the muffler.
- After installing, make sure that there are no exhaust leaks.



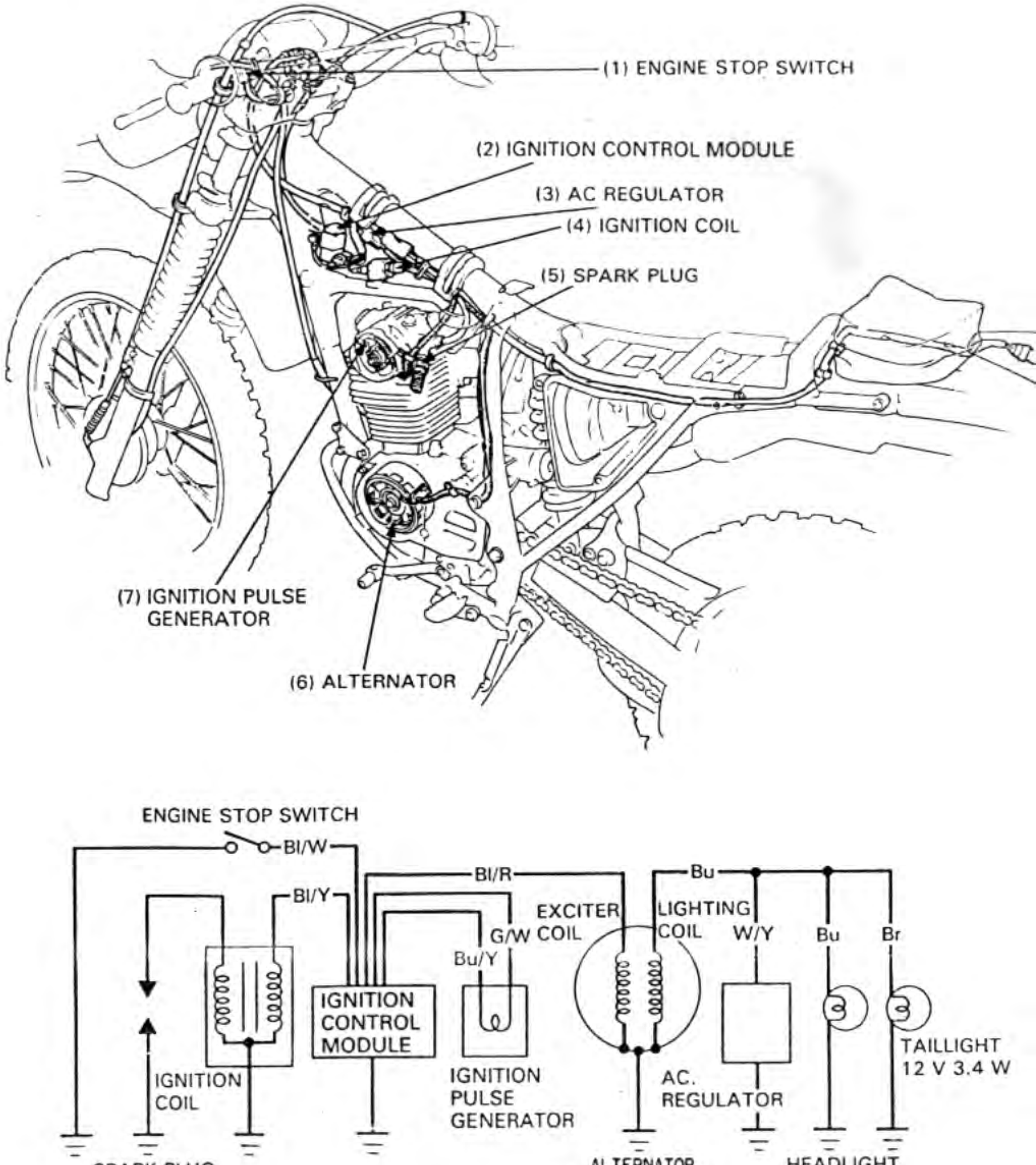
AFTER '89:





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

'86 through '88:



14. ELECTRICAL SYSTEM

SERVICE INFORMATION

GENERAL

- For spark plug gap inspection and adjustment procedure, see page 3-7.
- For alternator removal and installation, see section 9.
- The following color codes used are indicated throughout this section.

Bu = Blue	G = Green	Lg = Light Green	R = Red
Bl = Black	Gr = Gray	O = Orange	W = White
Br = Brown	Lb = Light Blue	P = Pink	Y = Yellow

SPECIFICATIONS

ITEM		STANDARD
Spark plug	For cold climate (below 5°C/41°F)	DR7ES (NGK), X22ESR-U (DENSO)
	Standard	DR8ES-L (NGK), X24ESR-U (DENSO)
	For extended high speed riding	DR8ES (NGK), X27ESR-U (DENSO)
Plug gap		0.6–0.7 mm (0.024–0.028 in)
Ignition timing	Initial	10°BTDC at idle
	Full advance	30°BTDC at 3,500 ± 150 rpm
Alternator output		108 W/5,000rpm
Ignition primary coil resistance		0.1–0.3 Ω (20°C/68°F)
Ignition secondary coil resistance	With spark plug cap	'86 through '88: 7.4–11 kΩ (20°C/68°F) AFTER '89: 6.4–9.8 kΩ (20°C/68°F)
	Without spark plug cap	'86 through '88: 3.7–4.5 kΩ (20°F/68°F) AFTER '89: 2.7–3.5 kΩ (20°C/68°F)
Alternator excitor coil resistance		50–200 Ω (20°C/68°F)
Ignition pulse generator resistance		460–520 Ω (20°C/68°F)
Ignition pulse generator air gap		0.3–0.4 mm (0.012–0.016 in)
Alternator lighting coil resistance		0.2–1.2 Ω (20°C/68°F)
A.C. regulator regulated voltage		12.0–14.0 V at 3,000 rpm
Headlight		12 V/35 W
Taillight		12 V/3.4 W

TORQUE VALUE

Ignition pulse rotor mounting bolt — 8 – 12 N·m (0.8 – 1.2 kg-m, 6 – 9 ft-lb)

TOOLS

Digital multimeter (KOWA) — 07411 – 0020000 or KS-AHM-32-003 or equivalent commercially available in U.S.A.

or Circuit tester (SANWA) — 07308 – 0020000

or Circuit tester (KOWA) — TH-5H

TROUBLESHOOTING

Engine starts but stops
- No spark at spark plug
- Improper ignition timing
- Faulty spark plug

No spark at plug
- Engine stop switch "OFF"
- Poorly connected, broken or shorted wires
  - — Between alternator and ignition control module
  - — Between ignition control module and engine stop switch
  - — Between ignition control module and ignition coil
  - — Between ignition coil and spark plug
  - — Between ignition pulse generator and ignition control module
- Faulty ignition coil
- Faulty ignition control module
- Faulty ignition pulse generator
- Faulty alternator
- Improper ignition pulse generator air gap

Engine starts but runs poorly
- Ignition primary circuit
  - — Faulty ignition coil
  - — Loose or bare wire
  - — Faulty alternator
  - — Faulty ignition control module
  - — Faulty ignition pulse generator
- Ignition secondary circuit
  - — Faulty spark plug
  - — Faulty spark plug wire
- Improper ignition timing
  - — Faulty advancer rotor
  - — Faulty ignition pulse generator
  - — Faulty ignition control module

Hard starting
- Improper ignition pulse generator coil air gap

No lights come on when engine is started
- Faulty bulb
- Poorly connected or loose connectors
- Alternator lighting coil open (page 14-8)

Engine will not stop when engine stop switch is turned on
- Faulty switch
- Poorly connected, loose or broken switch wire

Engine will not start
- Engine stop switch wires shorted

SYSTEM INSPECTION

If the spark is weak, or if there is no spark at all, inspect as follows:

NOTE

- This method does not include an inspection of the ignition timing advance system at the ignition control module.

Inspect the spark plug before inspecting the system (page 3-8).

Remove the fuel tank (page 4-3).
Disconnect the 2P and 4P connectors from the ignition control module connectors, and check them for a loose connection or corrosion.

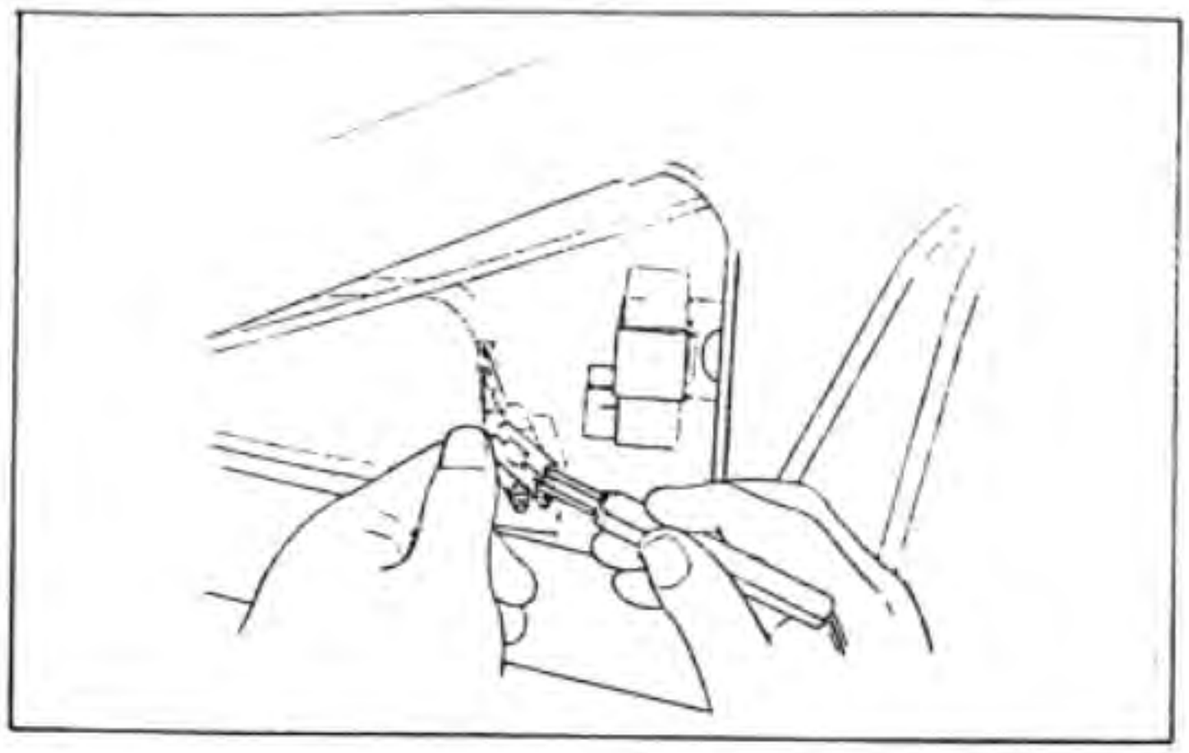
Measure the resistance between connector terminals using the following chart:

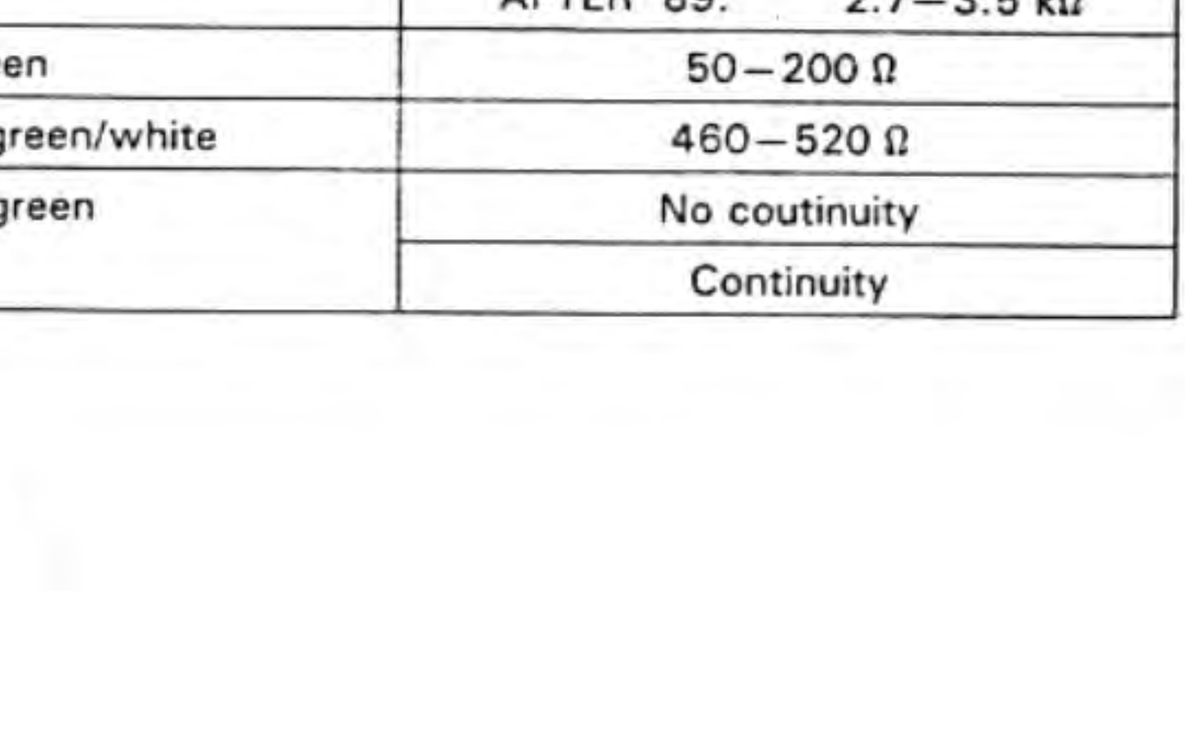
ITEM		TERMINALS	SPECIFICATIONS (20°C/68°F)
Ignition coil primary coil		black/yellow and green	0.1–0.3 Ω
Ignition coil secondary coil	with spark plug cap	green and spark plug wire	'86 through '88: 7.4–11 kΩ AFTER '89: 6.4–9.8 kΩ
	without spark plug cap		'86 through '88: 3.7–4.5 kΩ AFTER '89: 2.7–3.5 kΩ
Alternator exciter coil		black/red and green	50–200 Ω
Ignition pulse generator		blue/yellow and green/white	460–520 Ω
Engine stop switch	FREE	black/white and green	No coutinuity
	PUSH		Continuity

If there is no problem, replace the ignition control module.

If there is indication of abnormality, inspect the related circuit as follows:
– Ignition coil primary coil (page 14-4)
– Ignition coil secondary coil (page 14-4)
– Alternator exciter coil (page 14-4)
– Ignition pulse generator (page 14-5)
– Engine stop switch (page 14-8)

If related circuits are normal, check the wire harnesses for bare wires or open circuits. Replace or repair the harnesses if necessary.



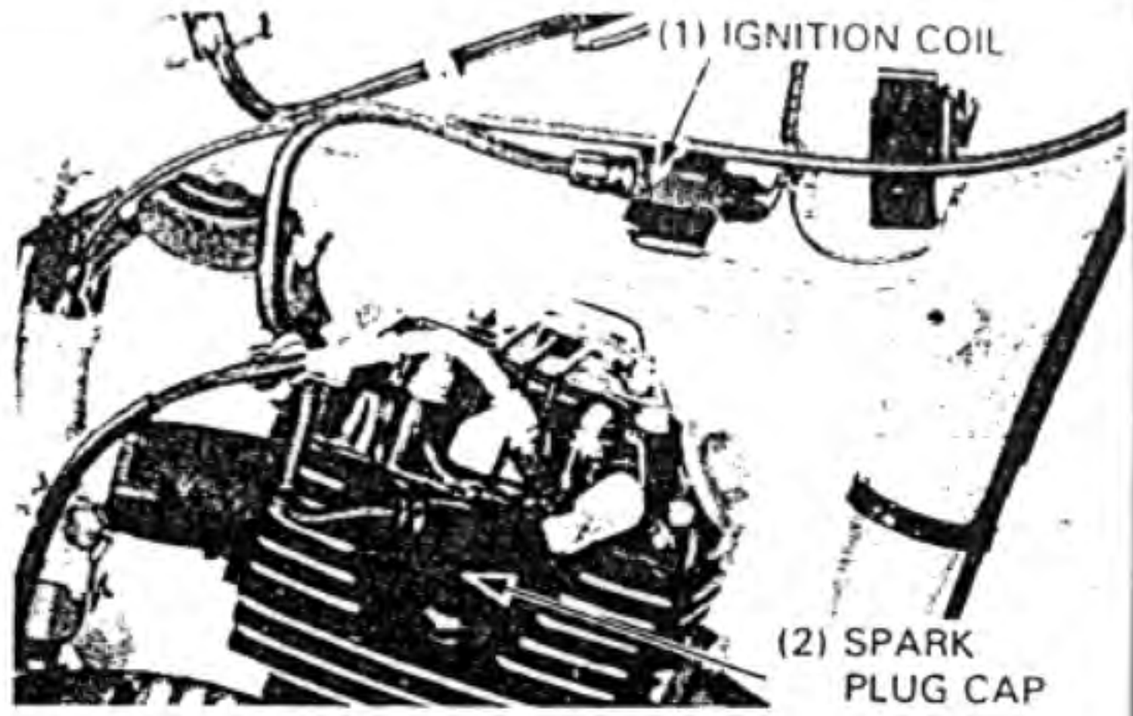


(1) IGNITION CONTROL MODULE

IGNITION COIL

REMOVAL

Remove the seat and fuel tank.
Disconnect the wire leads.
Remove the spark plug cap from the spark plug.
Remove the ignition coil.



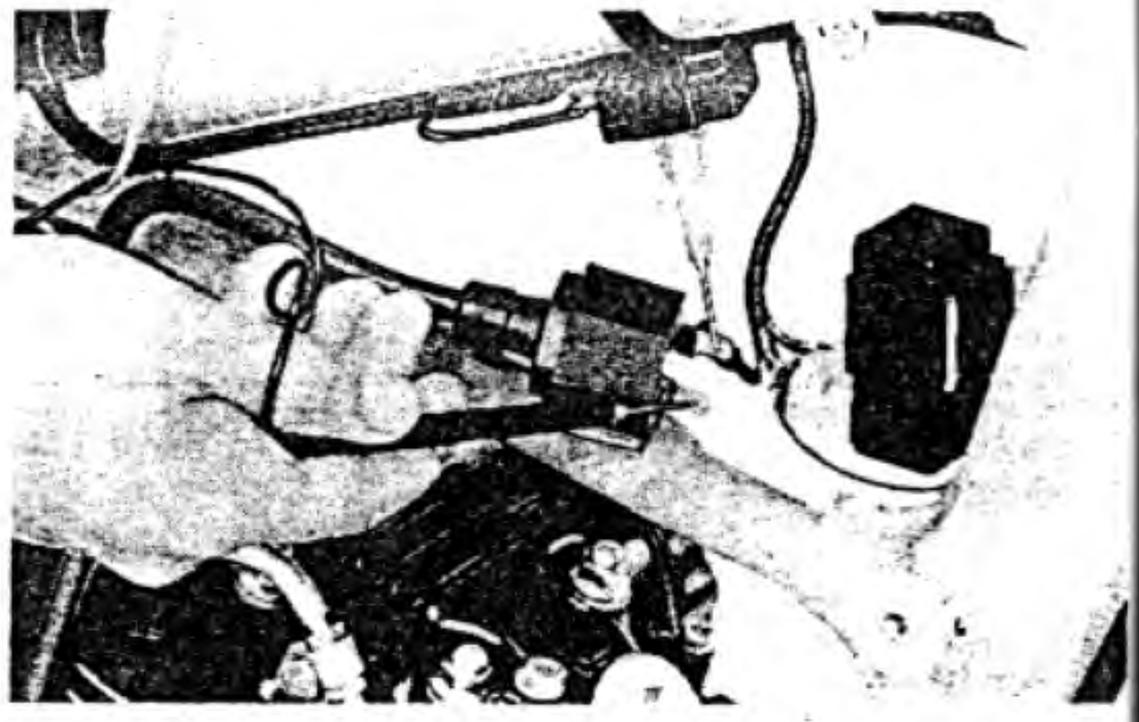
INSTALLATION

Installation is the reverse order of removal.
Connect the Bl/Y wire to the Black marked terminal and G wire to the Green marked terminal.
Install the fuel tank and seat.

CONTINUITY TEST

Measure the primary coil resistance by checking for continuity between the primary and ground terminals.

STANDARD: 0.1—0.3 Ω (20°C/68°F)

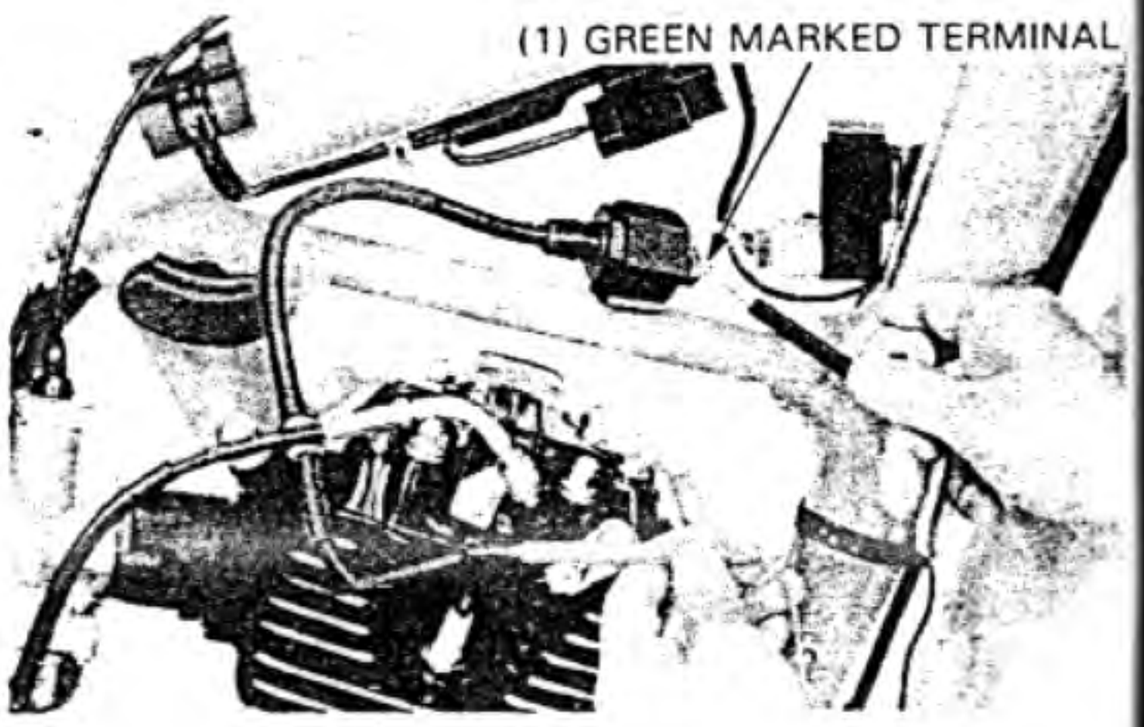


Measure the secondary coil resistance with the spark plug cap in place.

STANDARD:
'86 through '88: 7.4—11 kΩ (20°C/68°F)
AFTER '89: 6.4—9.8 kΩ (20°C/68°F)

Remove the spark plug cap by turning it counterclockwise.
Measure the secondary coil resistance as shown.

STANDARD:
'86 through '88: 3.7—4.5 kΩ (20°C/68°F)
AFTER '89: 2.7—3.5 kΩ (20°C/68°F)



ALTERNATOR EXCITER COIL

INSPECTION

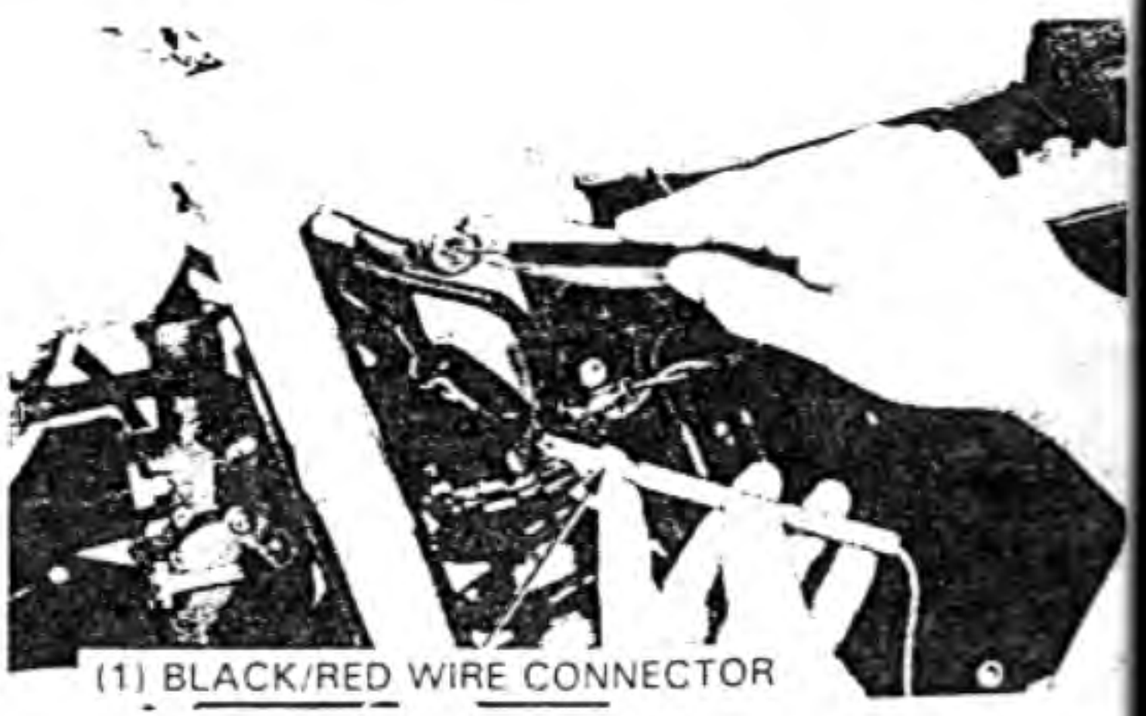
Disconnect the alternator wire connector and test as follows:

NOTE

- It is not necessary to remove the stator coil to make this test.

The exciter coil is normal if there is continuity between the black/red wire and body ground.

STANDARD: 50—200 Ω (20°C/68°F)

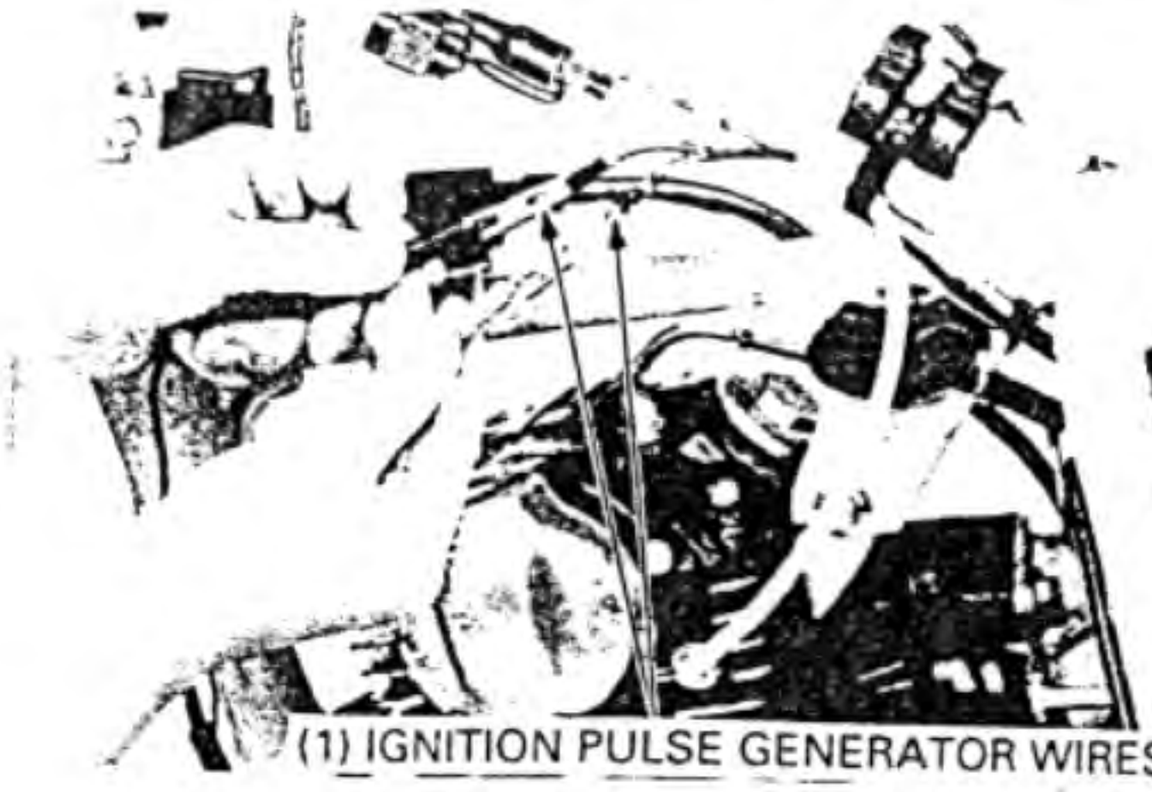


IGNITION PULSE GENERATOR

INSPECTION

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

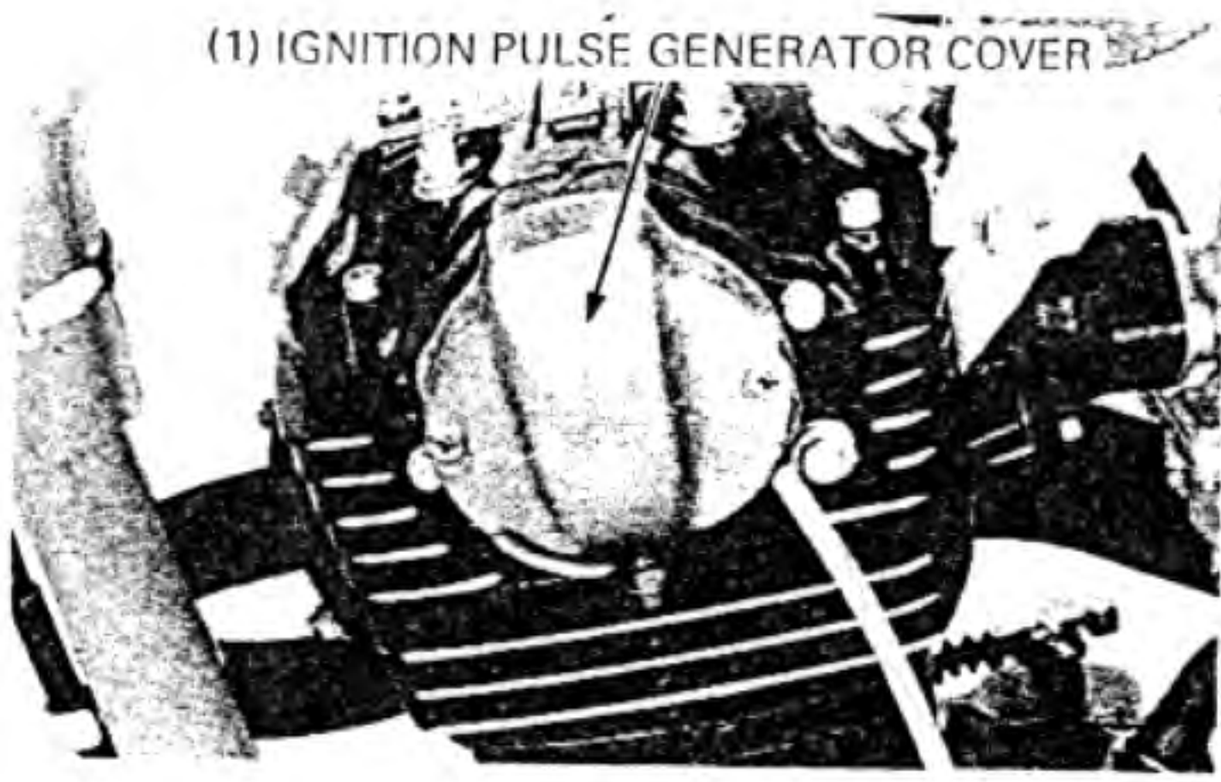
STANDARD: 460 – 520 Ω (20°C/68°F)


(1) IGNITION PULSE GENERATOR WIRES

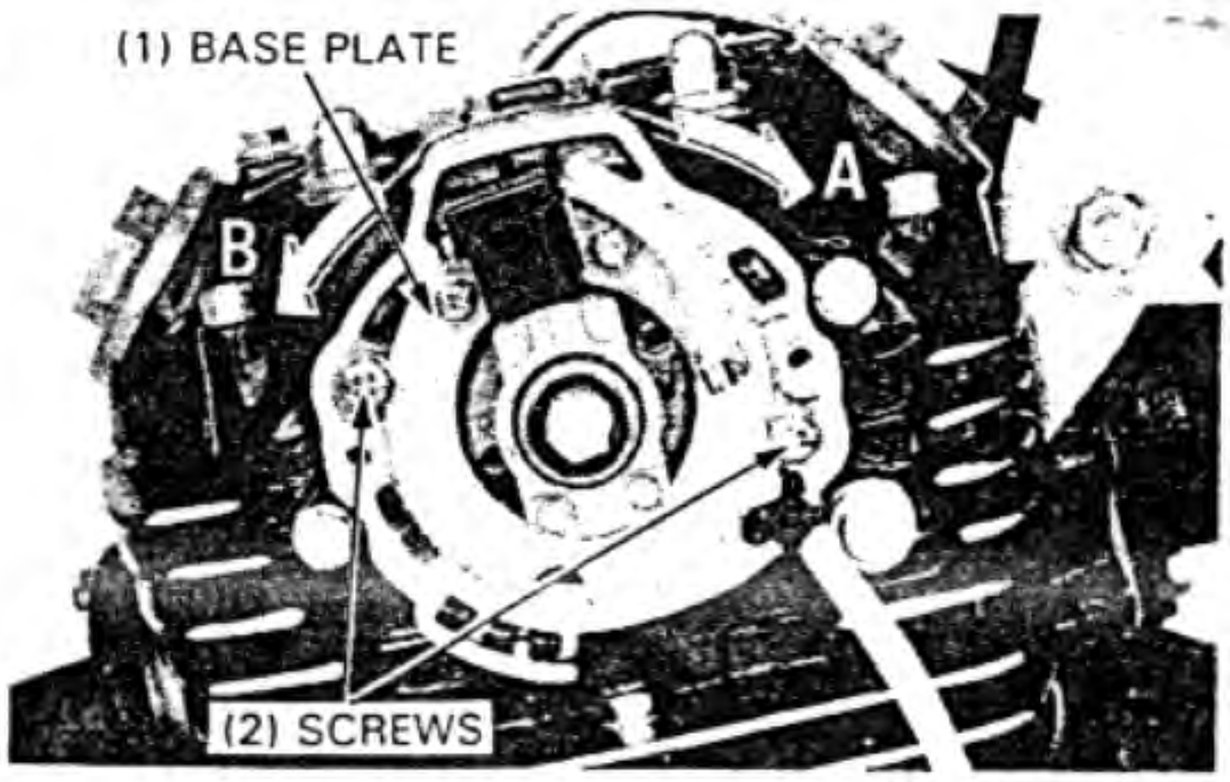
REMOVAL

Remove the seat and fuel tank.

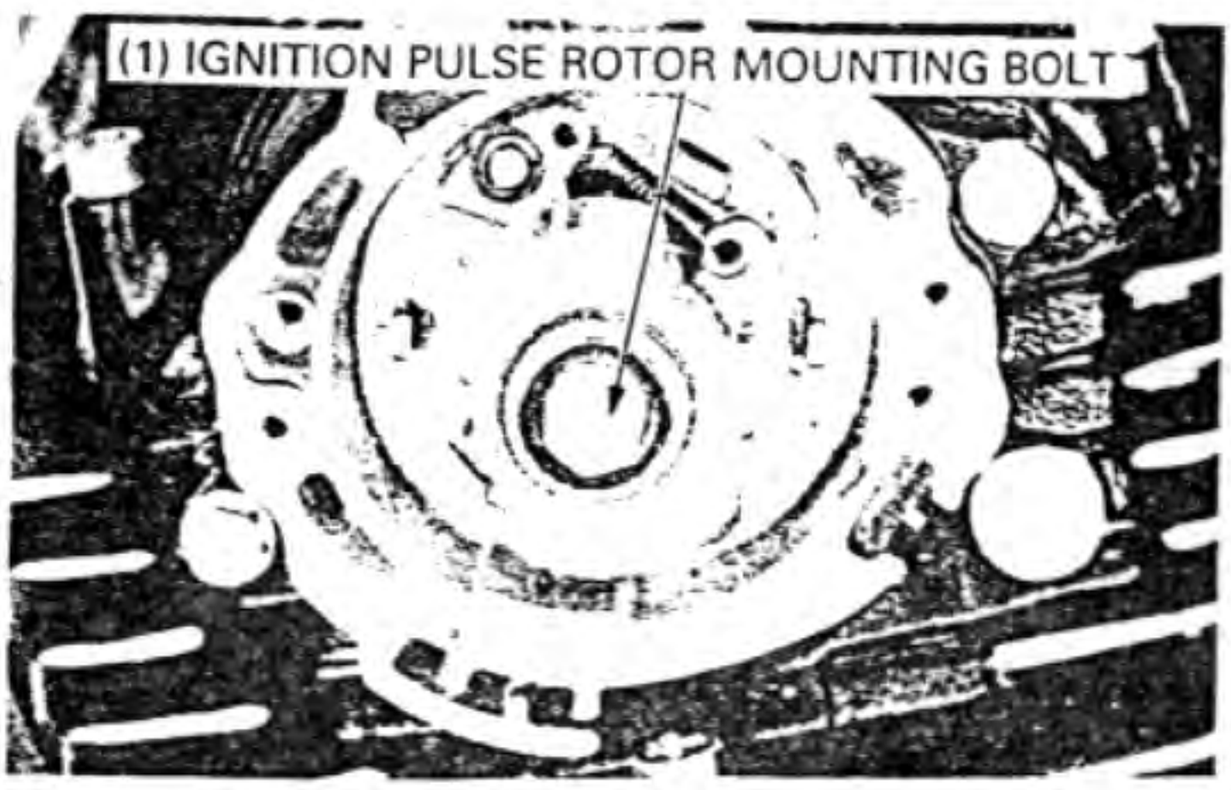
Remove the ignition pulse generator cover and gasket.


(1) IGNITION PULSE GENERATOR COVER

Remove the base plate by removing the two attaching screws.



Remove the ignition pulse rotor mounting bolt.
Remove the ignition pulse rotor.

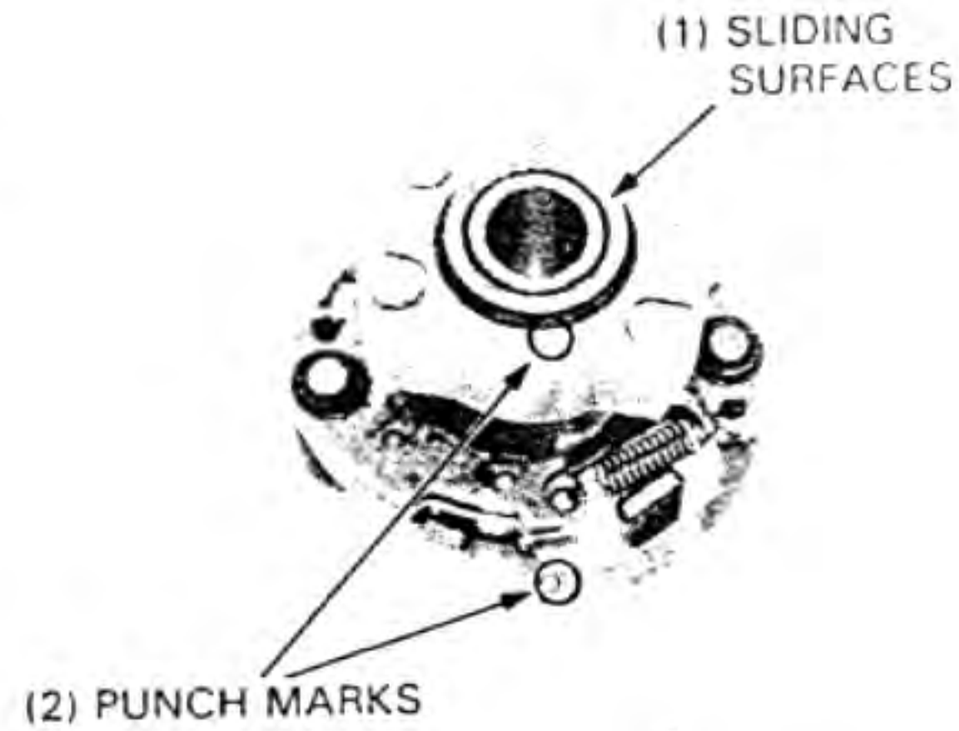

(1) IGNITION PULSE ROTOR MOUNTING BOLT

SPARK ADVANCER INSPECTION

Check the ignition pulse generator rotor for smooth operation.
Check for a weak spring or worn advancer weight pins.

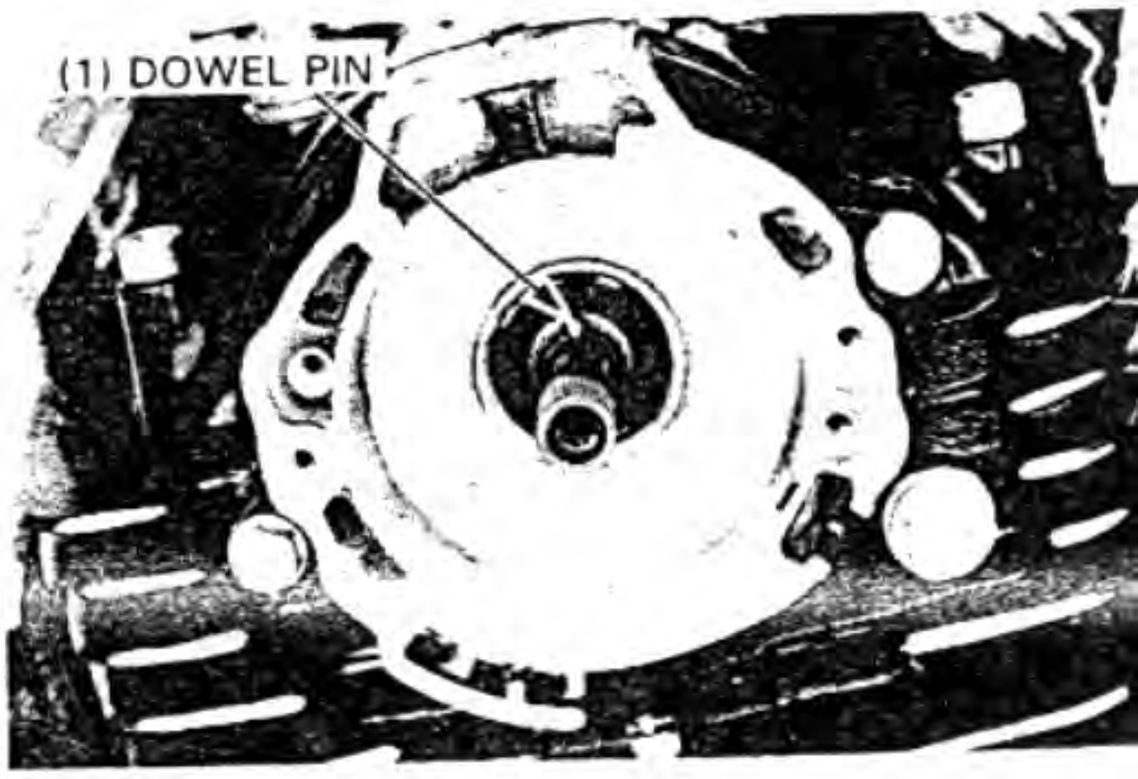
SPARK ADVANCER ASSEMBLY

Before installing, apply grease to the sliding faces of the rotor.
Install the rotor so that the punch mark on the rotor is on the same side as the punch mark on the base plate.



INSTALLATION

Apply grease to the sliding surface of the advancer.
Install the ignition pulse generator rotor onto the camshaft, aligning the dowel pin on the camshaft with the groove on the rotor.



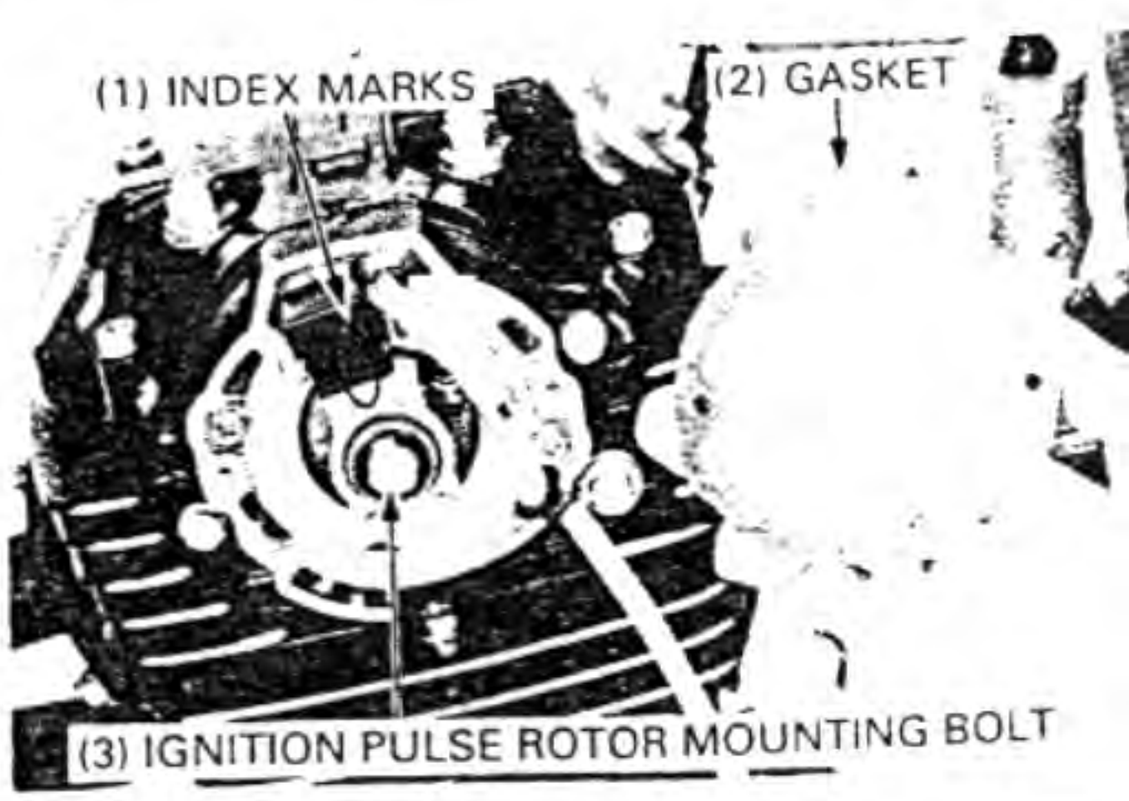
Install the ignition pulse rotor mounting bolt.
Install the base plate and ignition pulse generator.
Turn the crankshaft counterclockwise and align the "F" mark with the crankcase cover index mark.
Align the ignition pulse rotor and generator index marks and tighten the base plate screws.

Tighten the ignition pulse rotor mounting bolt.

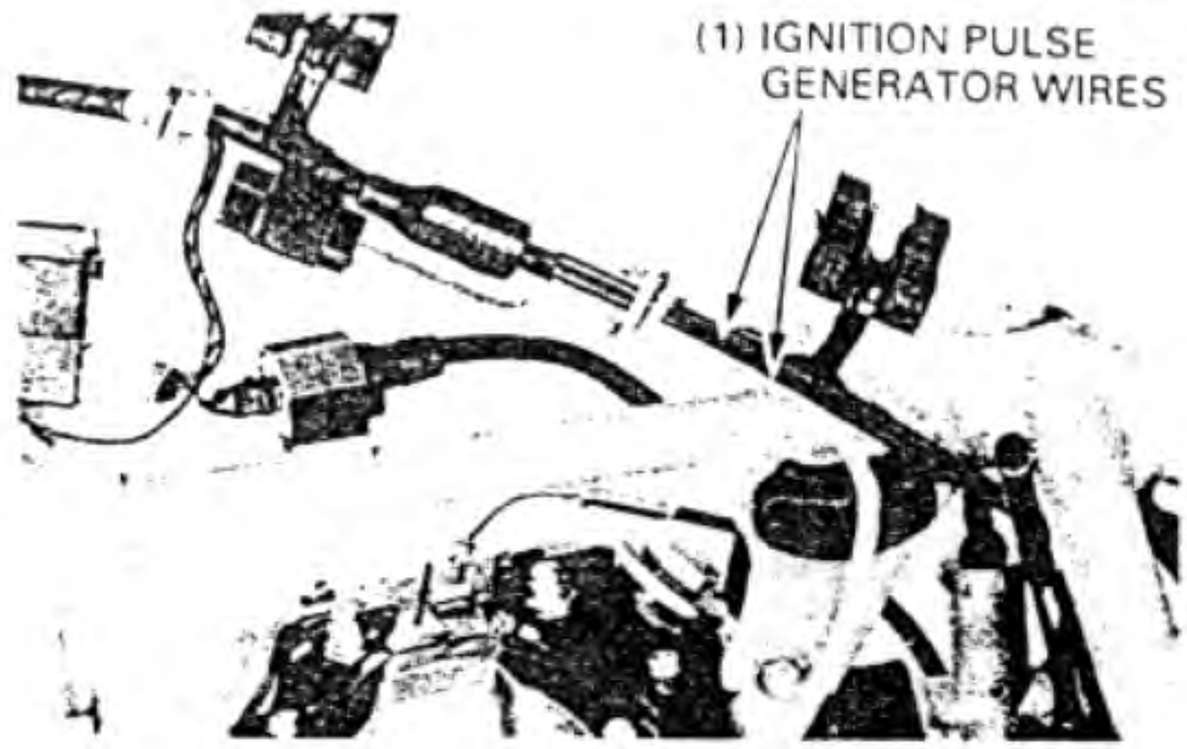
TORQUE: 8 – 12 N·m (0.8 – 1.2 kg-m, 6 – 9 ft-lb)

Adjust the ignition timing and ignition pulse air gap (page 14-7 and 14-8).

Install the ignition pulse generator cover with the gasket.



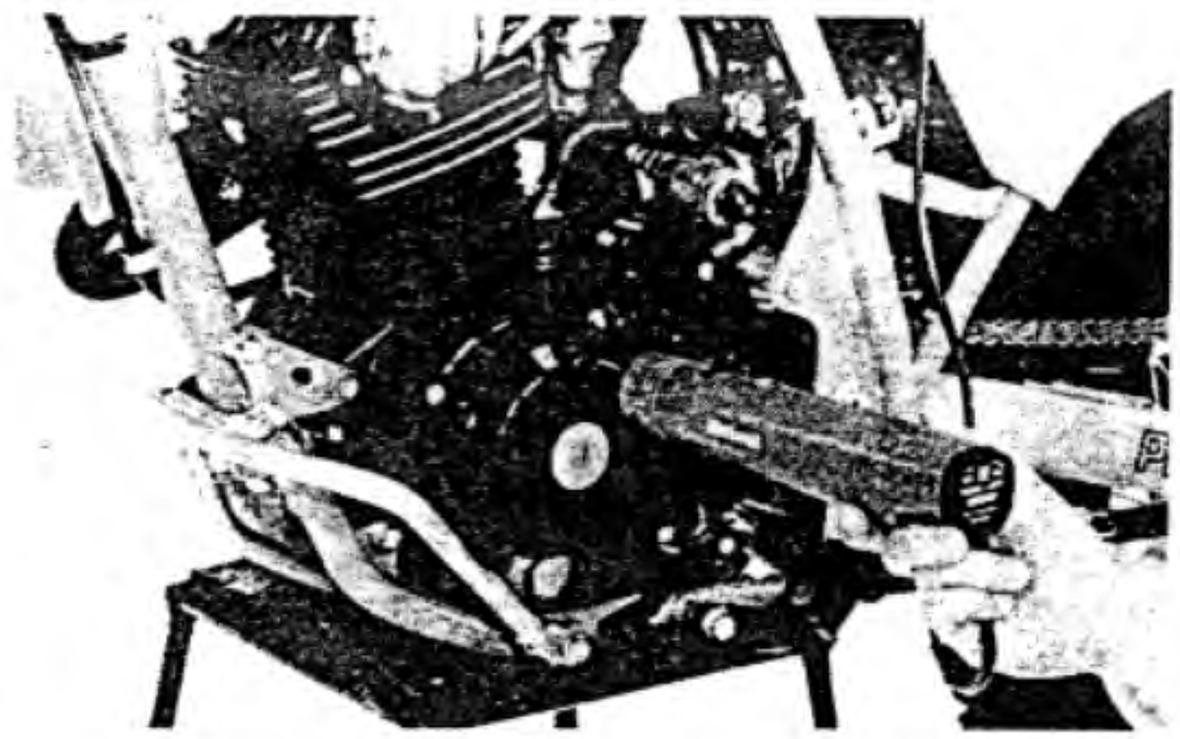
Connect the ignition pulse generator wires as shown.
Install the fuel tank and seat.



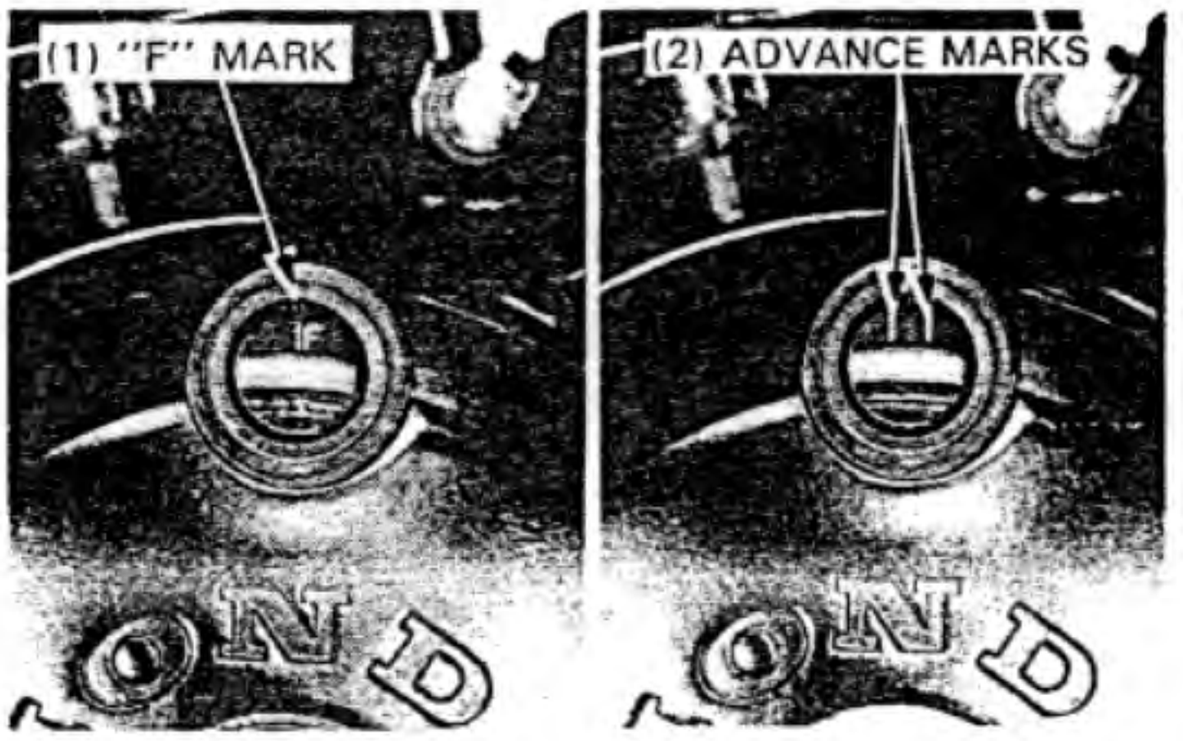
IGNITION TIMING

INSPECTION

Remove the timing hole cap.
Connect a timing light and tachometer.



Start the engine and check the ignition timing:
At 1,400 ± 100 rpm: The index mark should be aligned with the F mark.
At 1,700 ± 150 rpm: Timing advance should start.
At 3,500 ± 150 rpm: Timing advance should cease.
The index mark should be between the full advance marks.



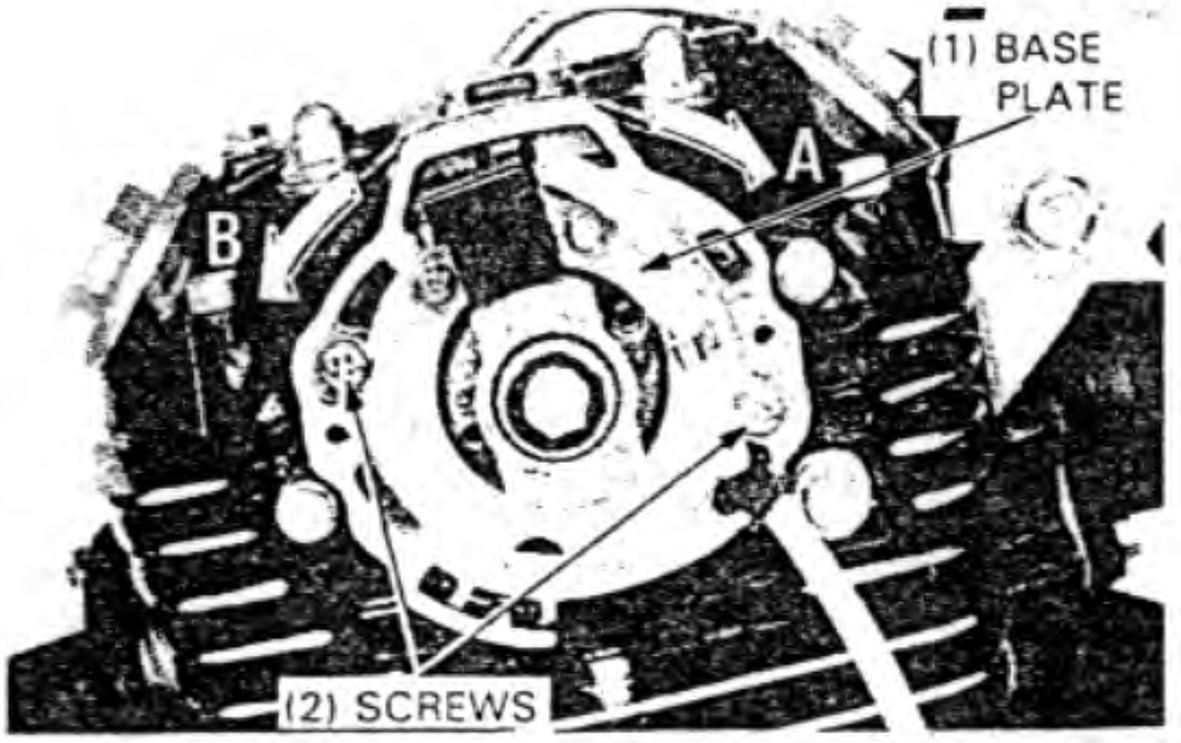
ADJUSTMENT

Remove the ignition pulse generator cover.
Loosen the screws attaching the ignition pulse generator base plate and rotate the base plate until the correct ignition timing is obtained.

Turn the base plate in direction A to advance the timing.
Turn the base plate in direction B to retard the timing.

Recheck the ignition timing.

Check the ignition pulse generator gap (page 14-8).

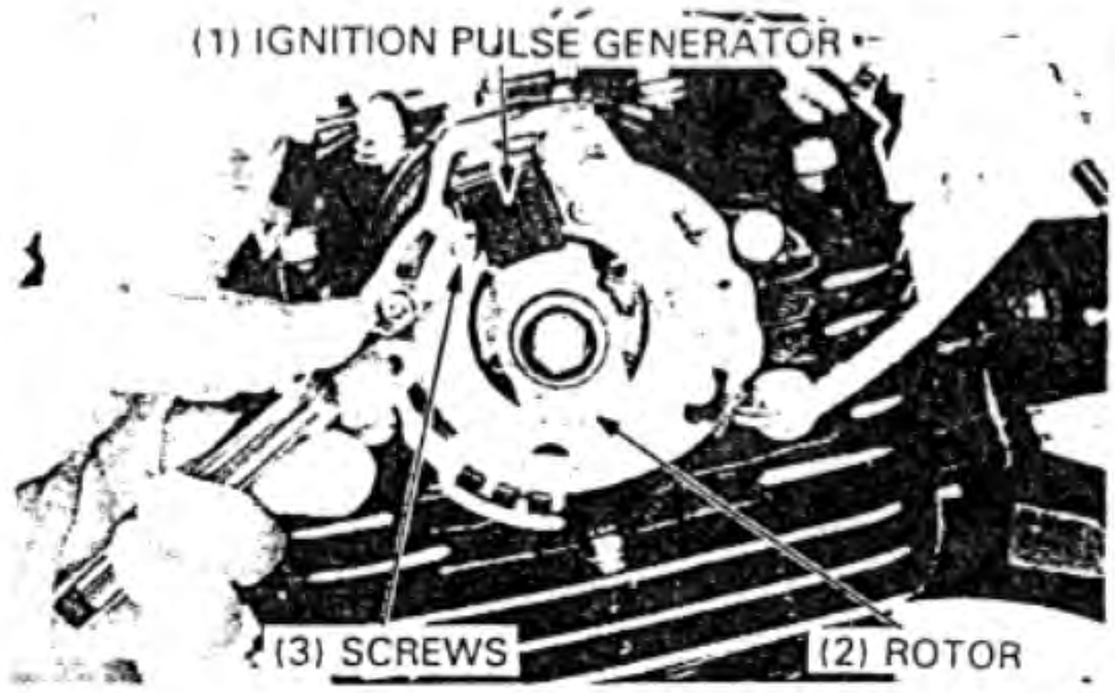


IGNITION PULSE AIR GAP ADJUSTMENT

Measure the air gap between the ignition pulse generator and rotor.

AIR GAP: 0.3 – 0.4 mm (0.012 – 0.016 in)

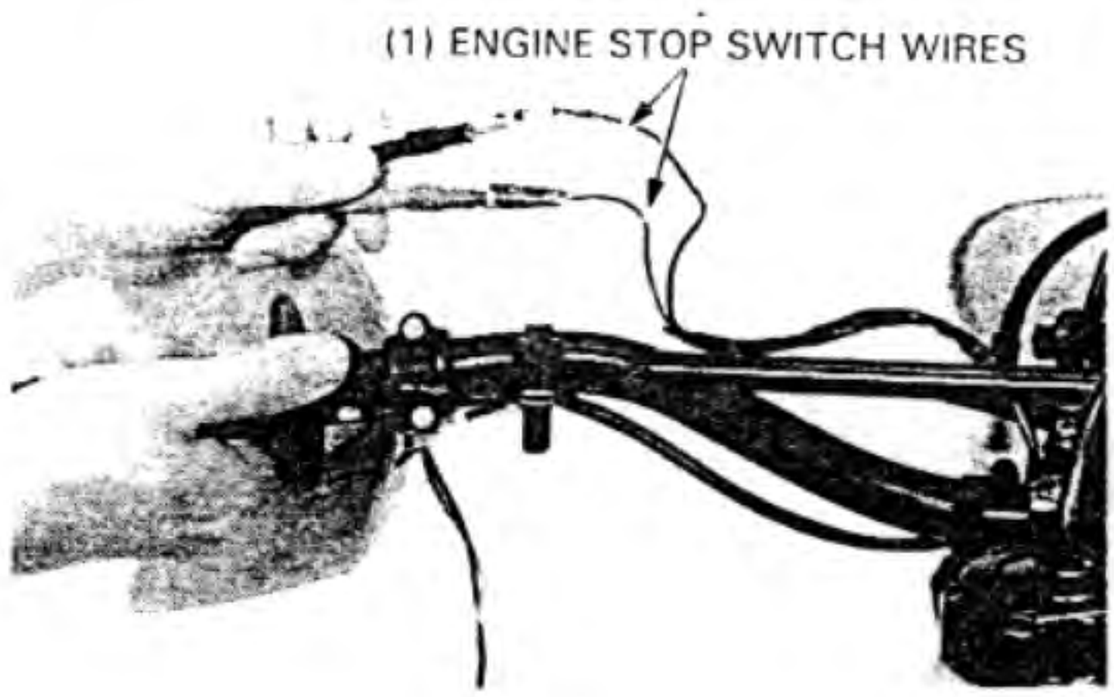
When adjustment is necessary, loosen the ignition pulse generator coil attaching screws and move the coil to achieve the correct gap.



ENGINE STOP SWITCH

'86 through '88:
Remove the headlight case (page 14-9).

'86 through '88 and AFTER '89:
Disconnect the switch leads and check for continuity between the black/white wire and the green tube wire.
The switch is normal if there is continuity when the switch is pushed in and no continuity when it is released.



ALTERNATOR LIGHTING COIL

INSPECTION

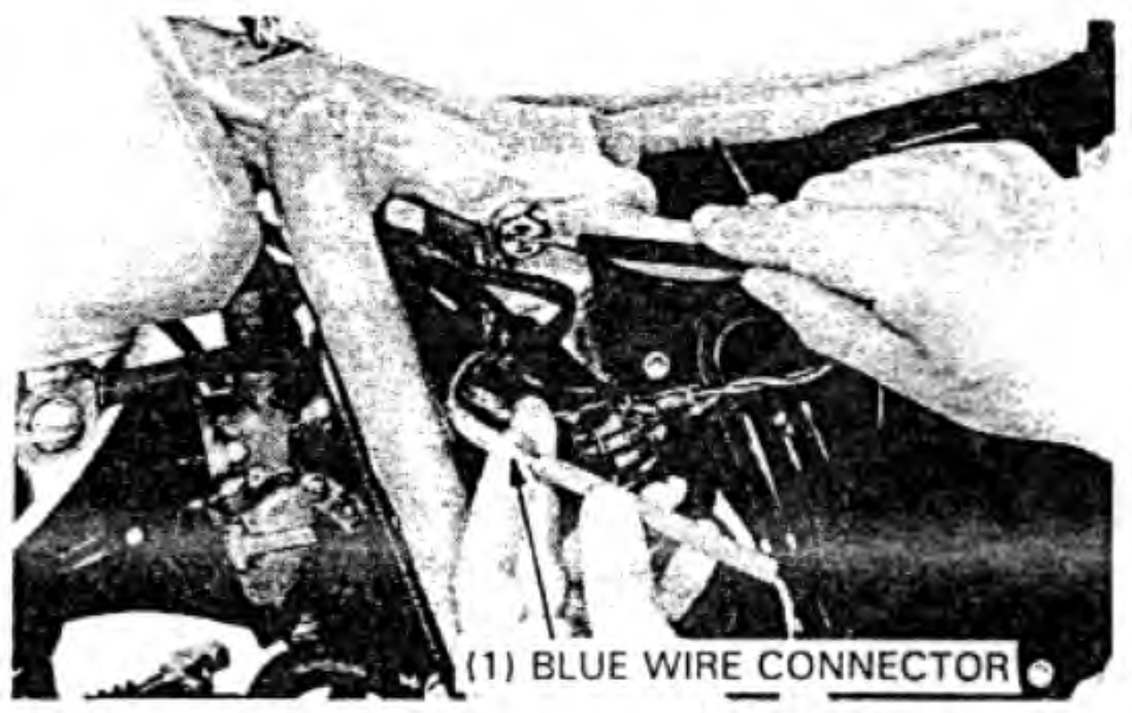
Disconnect the alternator wire connector and test as follows:

NOTE

- **It is not necessary to remove the stator coil to make this test.**

The lighting coil is good if there is continuity between the blue wire and body ground.

STANDARD: 0.2—1.2 Ω (20°C/68°F)



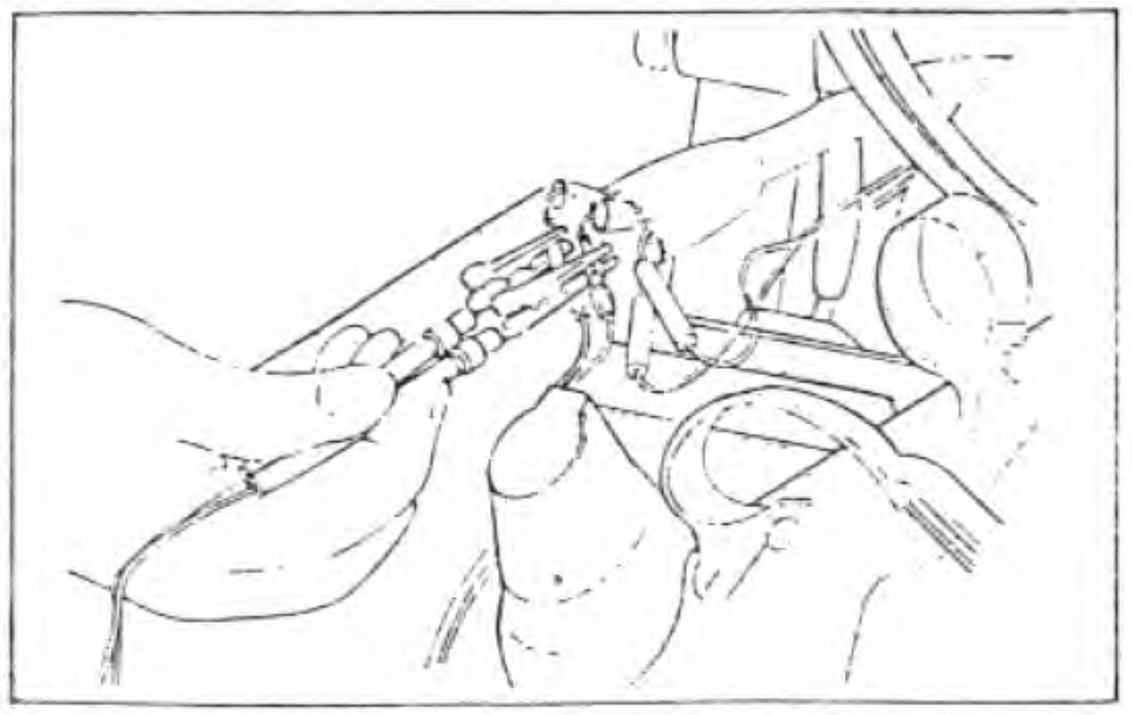
AC REGULATOR ('86 – '88)

Remove the headlight case mounting bands and remove the headlight case.

Connect a voltmeter between the green and blue wire connectors with the terminals connected.
Connect a tachometer.
Start the engine and check the meter reading while increasing engine speed slowly.

SPECIFIC REGULATED VOLTAGE:
12.0—14.0 V at 3,000 rpm

If regulated voltage is out of the specifications, check the wire harness and replace the AC regulator.



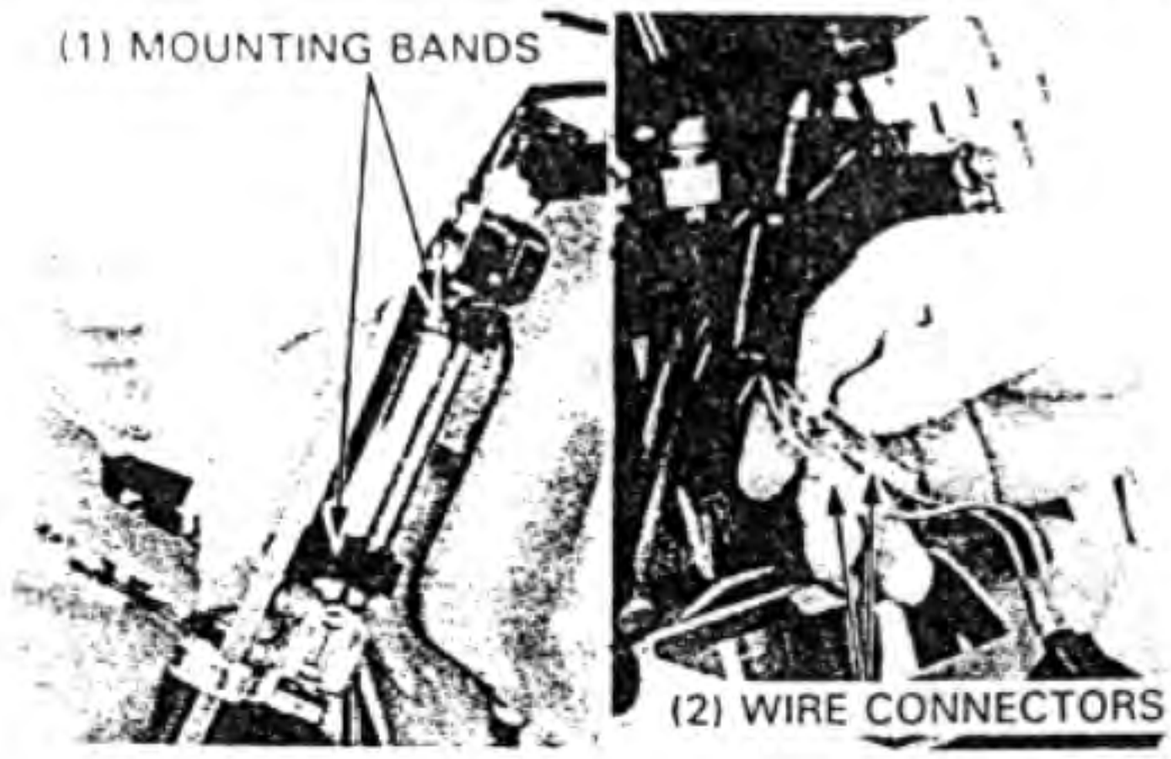
'86 through '88:
HEADLIGHT

REMOVAL

Remove the headlight case mounting bands and remove the headlight case.

Disconnect the headlight wire connectors.

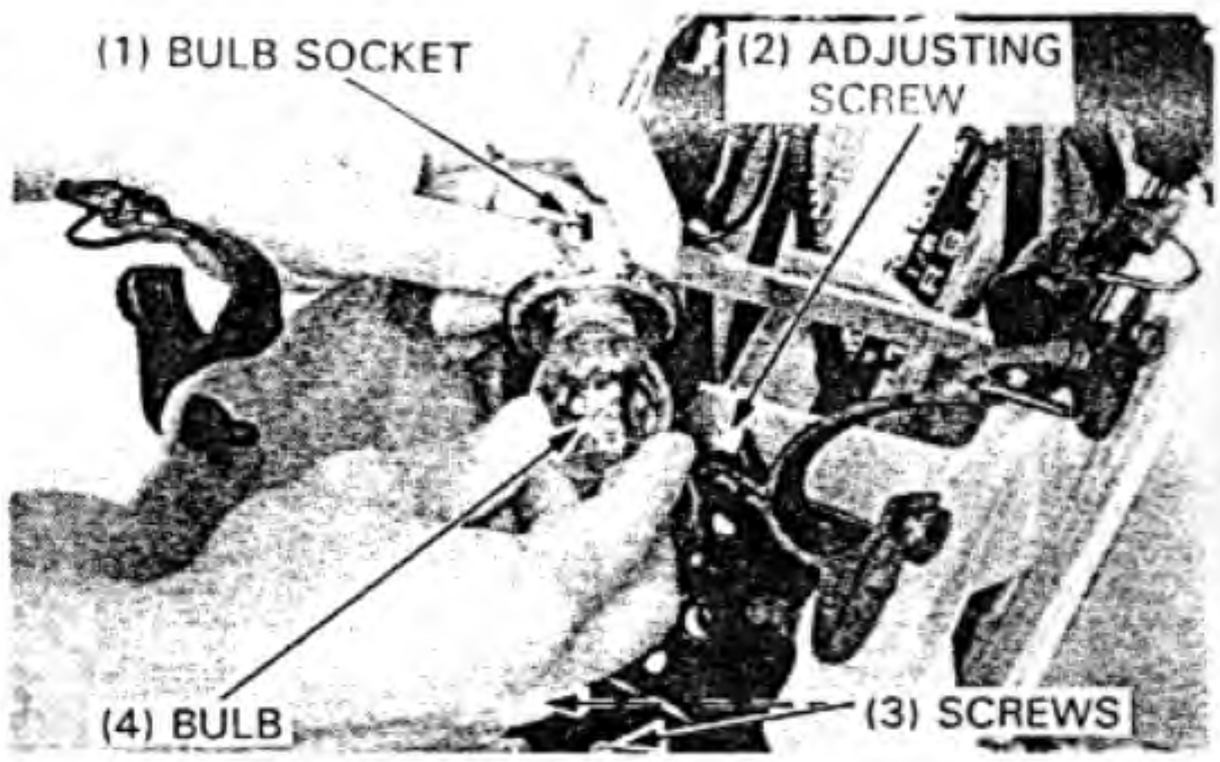
Remove the headlight.



Remove the clip securing the headlight bulb and socket, and replace the headlight bulb, if necessary.
Remove the headlight adjusting screw and the two mounting screws, then remove the headlight lens.

INSTALLATION

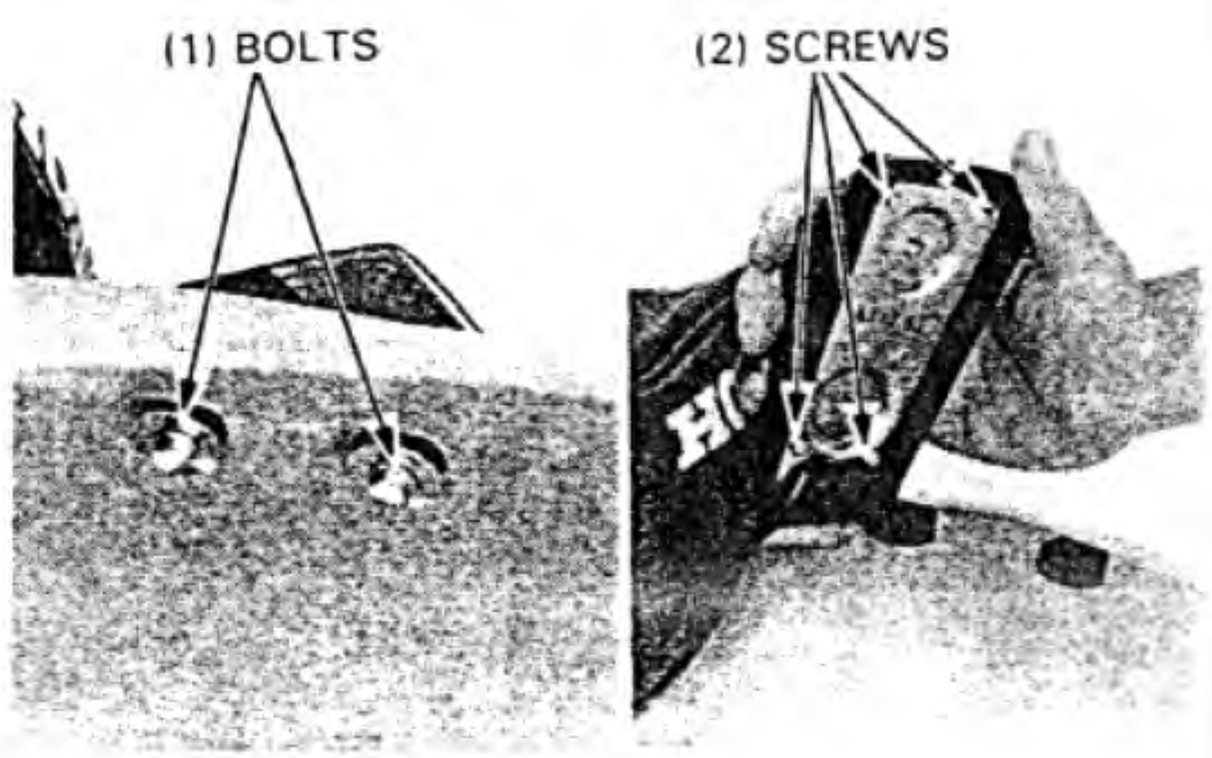
Install the headlight in the reverse order of removal.
Adjust the headlight vertical beam (page 3-13).



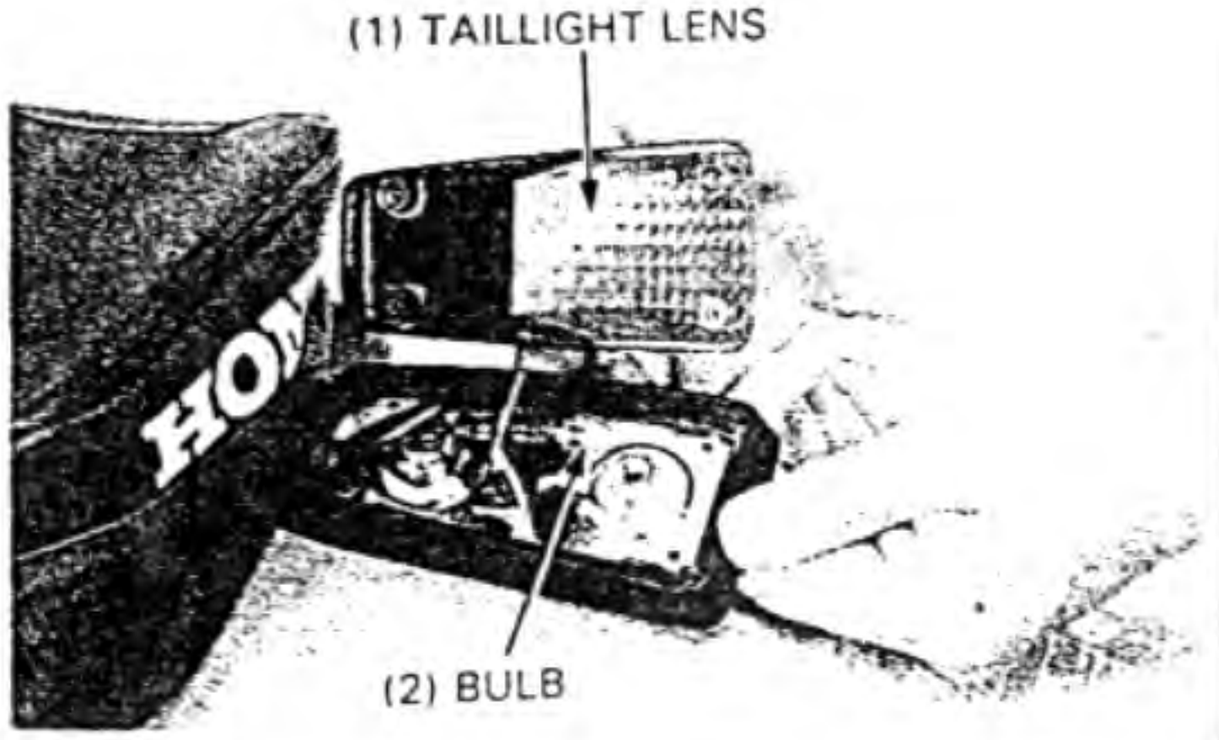
'86 through '88:
TAILLIGHT

BULB REPLACEMENT

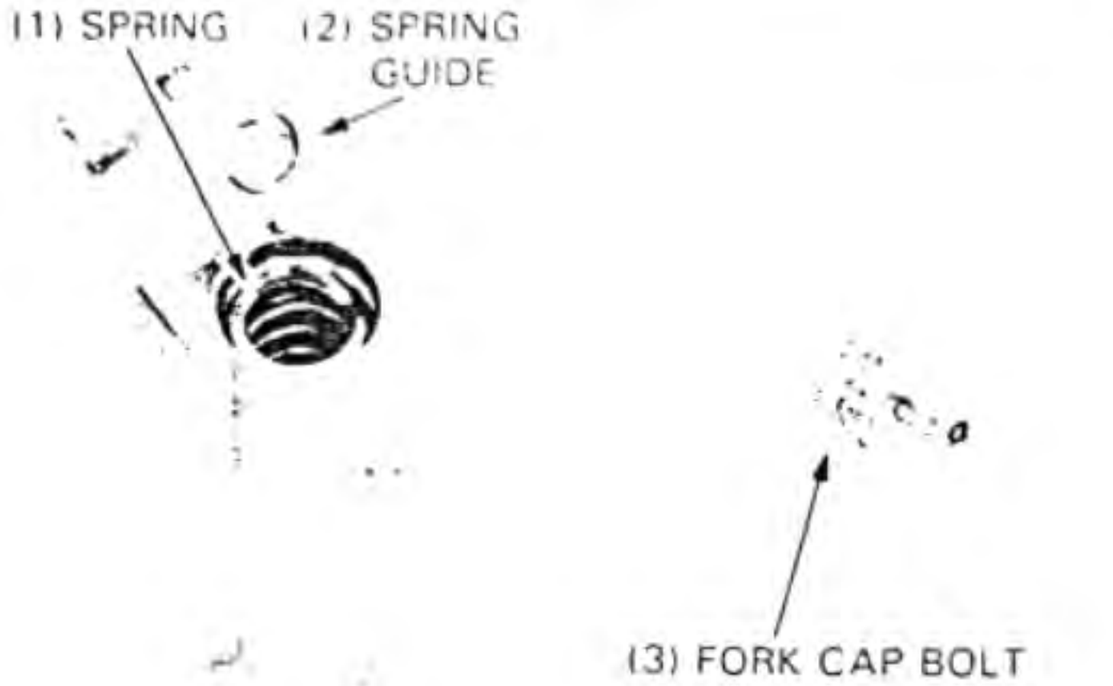
Remove the taillight by removing the mounting bolts.
Remove the lens from the taillight by unscrewing the attaching screws.



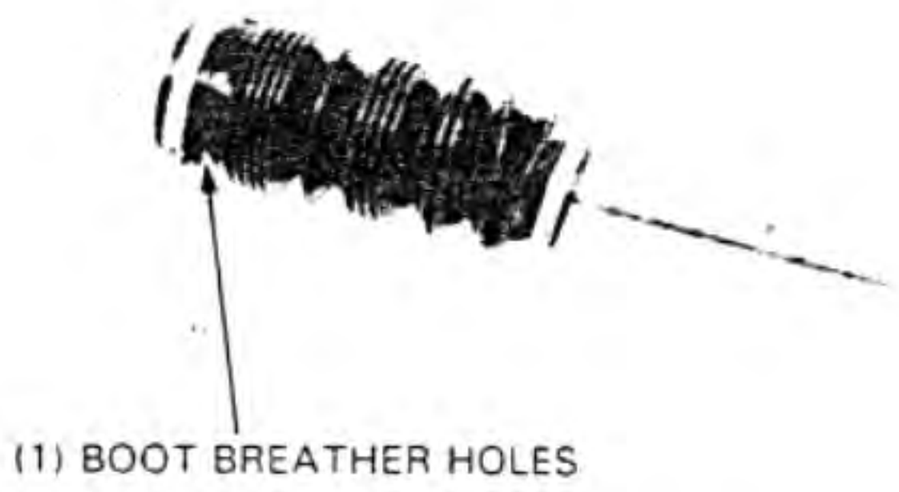
Install a new bulb.
Reinstall the lens and taillight in the reverse order of removal.



Install the spring and spring guide
Temporarily install the fork cap bolt



Install the fork boot with its breather holes toward the rear



INSTALLATION

Slip the fork tubes through the fork bridge and steering stem, while rotating them by hand.

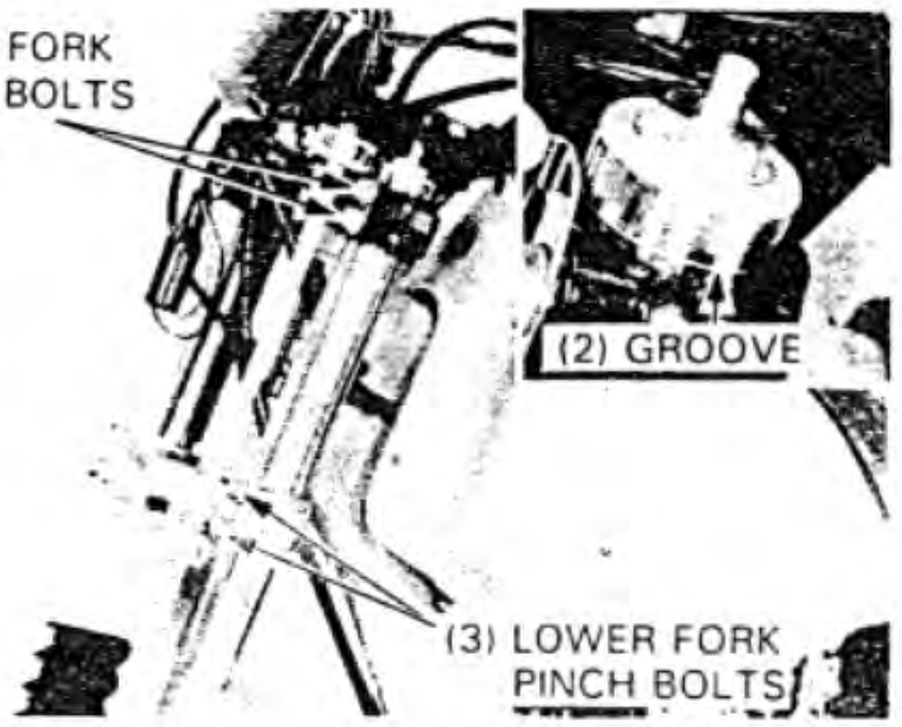
Align the lower groove of the fork tube with the top surface of the fork bridge.

Tighten the upper and lower fork pinch bolts.

TORQUE:
Upper: 25–30 N·m (2.5–3.0 kg-m, 18–22 ft-lb)
Lower: 30–35 N·m (3.0–3.5 kg-m, 22–25 ft-lb)

NOTE

- Be sure that the lower groove of each tube aligns with the top of the fork bridge.



Tighten the fork cap bolt to the specified torque.

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

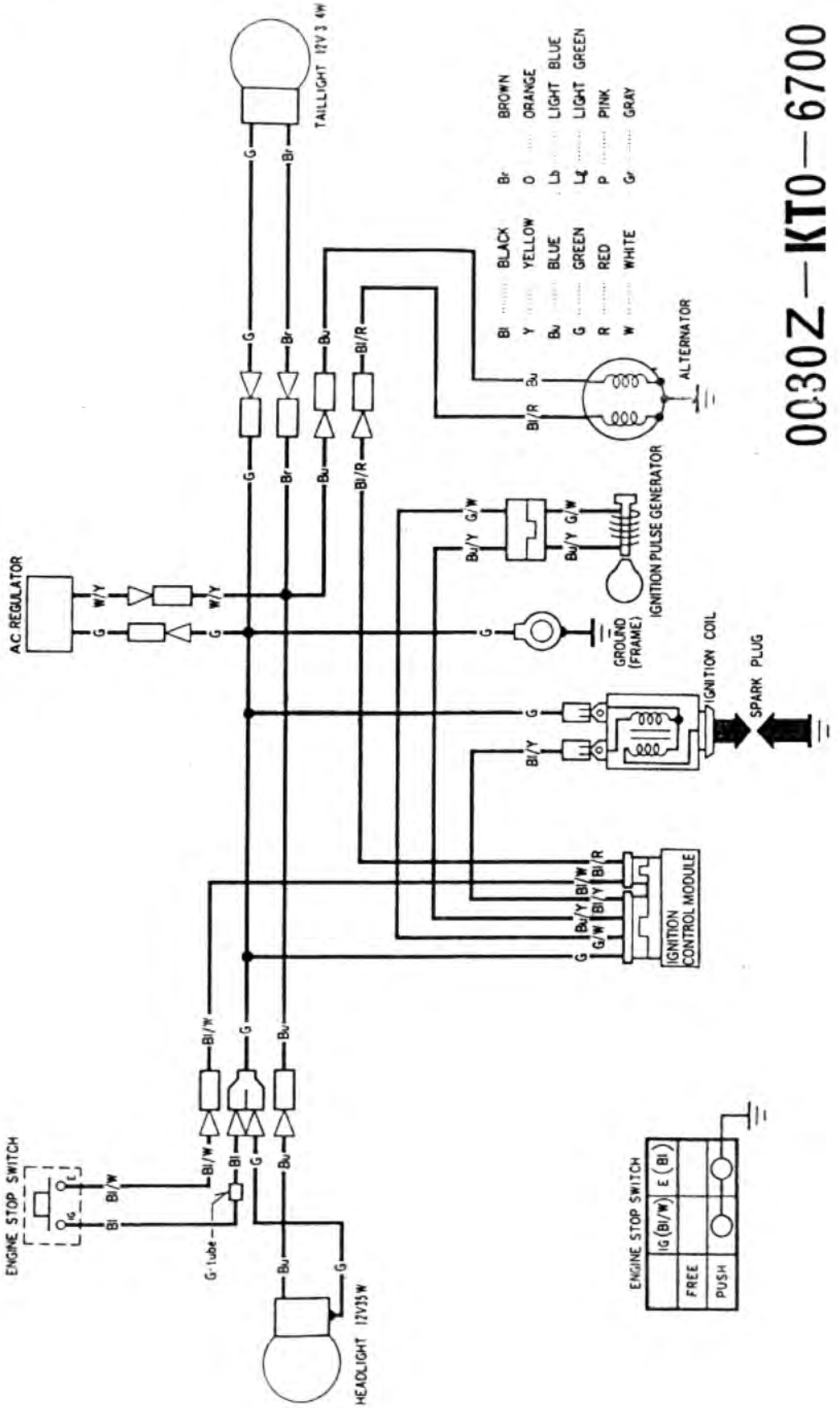
15. WIRING DIAGRAM

GENERAL INFORMATION

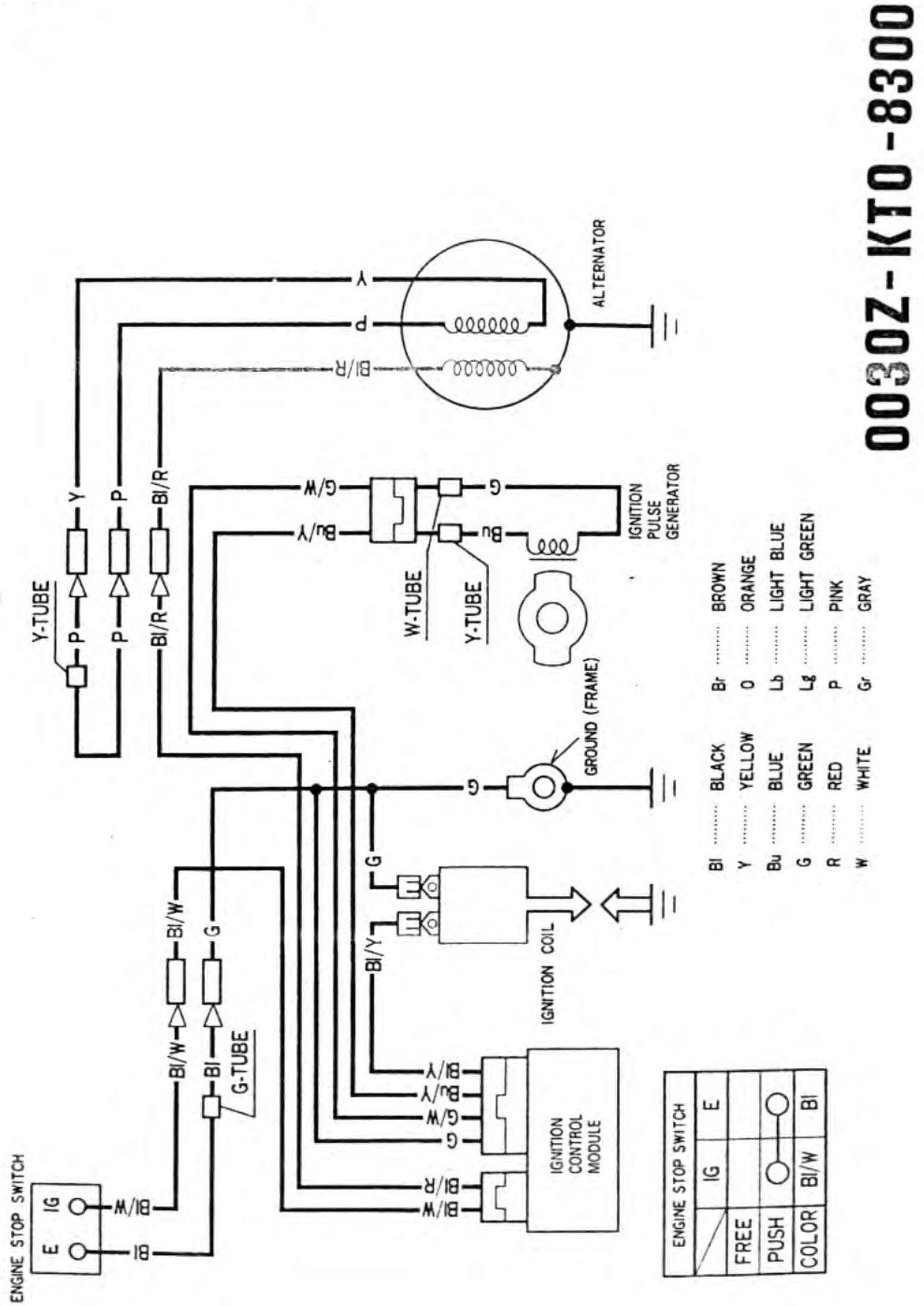
- The following color codes used are indicated on the wiring diagram.

Bu = Blue	G = Green	Lg = Light Green	R = Red
Bl = Black	Gr = Gray	O = Orange	W = White
Br = Brown	Lb = Light Blue	P = Pink	Y = Yellow

'86 through '88:



AFTER '89:


00302-KTO-8300
ALTERNATOR
Y
P
Bl/R
IGNITION PULSE GENERATOR
G/W
Bu/Y
G
Bu
W-TUBE
Y-TUBE
GROUND (FRAME)
IGNITION COIL
IGNITION CONTROL MODULE
Bl/Y
Bl/W
G-TUBE
ENGINE STOP SWITCH
E
IG
Bl
Bl ..... BLACK
Br ..... BROWN
Y ..... YELLOW
O ..... ORANGE
Bu ..... BLUE
Lb ..... LIGHT BLUE
G ..... GREEN
Lg ..... LIGHT GREEN
R ..... RED
P ..... PINK
W ..... WHITE
Gr ..... GRAY
ENGINE STOP SWITCH
FREE
PUSH
COLOR
Bl/W

16. TROUBLESHOOTING

ENGINE DOES NOT START OR IS HARD TO START

1. Check if fuel is getting to the carburetor

GETTING TO CARBURETOR

2. Try spark test

GOOD SPARK

3. Cylinder compression

COMPRESSION NORMAL

4. Start by following normal starting procedure

ENGINE DOES NOT FIRE

5. Remove spark plug

DRY

START WITH CHOKE APPLIED

Probable Cause:

NOT GETTING TO CARBURETOR →
- No fuel in fuel tank
- Clogged fuel tube or fuel strainer
- Clogged float valve
- Clogged fuel tank cap breather tube.

WEAK OR NO SPARK →
- Faulty spark plug
- Fouled spark plug
- Faulty ignition control module
- Broken or shorted spark plug wire
- Faulty alternator
- Broken or shorted ignition coil
- Faulty engine stop switch
- Faulty ignition pulse generator
- Poorly connected, broken or shorted wires

LOW COMPRESSION →
- Valve clearance too small
- Valve stuck open
- Worn cylinder and piston rings
- Damaged cylinder head gasket
- Improper valve timing
- Improperly adjusted decompression mechanism
- Seized valve
- Kick pedal slipping

ENGINE FIRES BUT SOON STOPS →
- Choke excessively open
- Carburetor pilot screw excessively closed
- Air leaking past intake manifold
- Improper ignition timing (Ignition control module or ignition pulse generator faulty)

WET PLUG →
- Carburetor flooded
- Clogged air cleaner

- Air-fuel mixture too rich

ENGINE LACKS POWER

1. Raise wheels off ground and spin by hand

WHEEL DOES NOT SPIN FREELY → Probable Cause
- Brake dragging
- Worn or damaged wheel bearing
- Wheel bearing needs lubrication
- Drive chain too tight
- Rear axle nut excessively tightened

WHEEL SPINS FREELY

2. Check tire pressure with tire gauge

PRESSURE TOO LOW →
- Punctured tire
- Faulty tire valve

PRESSURE NORMAL

3. Try rapid acceleration from low to second

ENGINE SPEED DOES NOT CHANGE WHEN CLUTCH IS RELEASED →
- Clutch slipping
- Worn clutch disc/plate
- Warped clutch disc/plate

ENGINE SPEED LOWERS WHEN CLUTCH IS RELEASED

4. Lightly accelerate engine

ENGINE SPEED DOES NOT INCREASE SUFFICIENTLY →
- Choke is on
- Clogged air cleaner
- Restricted fuel flow
- Clogged fuel tank breather tube
- Clogged muffler

ENGINE SPEED INCREASE

5. Check ignition timing

INCORRECT →
- Faulty ignition control modu
- Faulty ignition pulse genera
- Faulty alternator

CORRECT

6. Check valve clearance

INCORRECT →
- Improper valve adjustment
- Worn valve seat

CORRECT

7. Test cylinder compression using compression gauge

TOO LOW →
- Valve stuck open
- Worn cylinder and piston rings
- Leaking head gasket
- Improper valve timing
- Improperly adjusted starter decompressor

NORMAL

8. Check carburetor for clogging

CLOGGED →
- Carburetor not serviced frequently enough

NOT CLOGGED

9. Remove spark plug

FOULED OR DISCOLORED →
- Plug not replaced frequently enough
- Use of plug with improper heat range

NOT FOULED OR DISCOLORED

		Probable Cause:
10. Remove oil level gauge and check oil level.	OIL LEVEL INCORRECT →	• Oil level too high • Oil level too low
CORRECT ↓		
11. Remove cylinder head cover and inspect lubrication	VALVE TRAIN NOT LUBRICATED PROPERLY →	• Clogged oil passage • Clogged oil control orifice • Contaminated oil
VALVE TRAIN LUBRICATED PROPERLY ↓		
12. Check if engine overheats	OVERHEATED →	• Excessive carbon build-up in combustion chamber • Improper quality fuel • Clutch slipping • Fuel air mixture too lean
NORMAL ↓		
13. Accelerate or run at high speed	ENGINE KNOCKS →	• Worn piston and cylinder • Fuel-air mixture too lean • Use of improper grade of fuel • Excessive carbon build-up in combustion chamber • Ignition timing too advanced (Faulty ignition control module)
ENGINE DOES NOT KNOCK		

POOR PERFORMANCE AT LOW AND IDLE SPEEDS

		Probable Cause:
1. Check ignition timing and valve clearance	INCORRECT →	• Improper valve clearance • Improper ignition timing (Faulty ignition control module or spark advancer)
CORRECT ↓		
2. Check carburetor pilot screw adjustment	INCORRECT →	• Fuel-air mixture too lean (To correct, screw out) • Fuel-air mixture too rich (To correct, screw in)
CORRECT ↓		
3. Check if air is leaking past intake pipe	LEAKING →	• Deteriorated insulator O-ring • Loose carburetor
NOT LEAKING ↓		
4. Try spark test	WEAK OR INTERMITTENT SPARK →	• Faulty, carbon or wet fouled spark plug • Faulty ignition control module • Alternator faulty • Faulty ignition coil • Faulty ignition pulse generator
GOOD SPARK		

POOR PERFORMANCE AT HIGH SPEED

		Probable Cause:
1. Check ignition timing and valve clearance	INCORRECT →	• Improper valve clearance • Faulty ignition control module • Faulty ignition pulse generator • Faulty advancer
CORRECT ↓		
2. Disconnect fuel line at carburetor	FUEL FLOW RESTRICTED →	• Lack of fuel in tank • Clogged fuel line • Clogged fuel tank breather tube • Clogged fuel valve
FUEL FLOWS FREELY ↓		
3. Remove carburetor and check for clogged jet(s)	CLOGGED →	Clean
NOT CLOGGED ↓		
4. Check valve timing	INCORRECT →	Cam sprocket not installed properly
CORRECT ↓		
5. Check valve spring tension	WEAK →	Faulty spring
NOT WEAKENED		

POOR HANDLING

Check tire pressure

	Probable Cause:
1. If steering is heavy →	• Steering head adjuster too tight • Damaged steering bearing(s)
2. If either wheel is wobbling →	• Excessive wheel bearing play • Bent rim • Improperly installed wheel hub • Swingarm pivot bushing excessively worn • Bent frame • Loose swingarm pivot bolt • Improper drive chain tension or adjustment
3. If the motorcycle pulls to one side →	• Front and rear wheels not aligned • Bent front fork • Bent swingarm • Bent frame

17. INDEX