

1986-1987



HONDA



SERVICE MANUAL

CMX450C

REBEL

HOW TO USE THIS MANUAL

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

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

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

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

If you don't know the source of a problem, go to section 19, TROUBLESHOOTING.

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HONDA MOTOR CO., LTD.
Service Publications Office

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1. GENERAL INFORMATION

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1

GENERAL SAFETY

WARNING

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

WARNING

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

WARNING

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

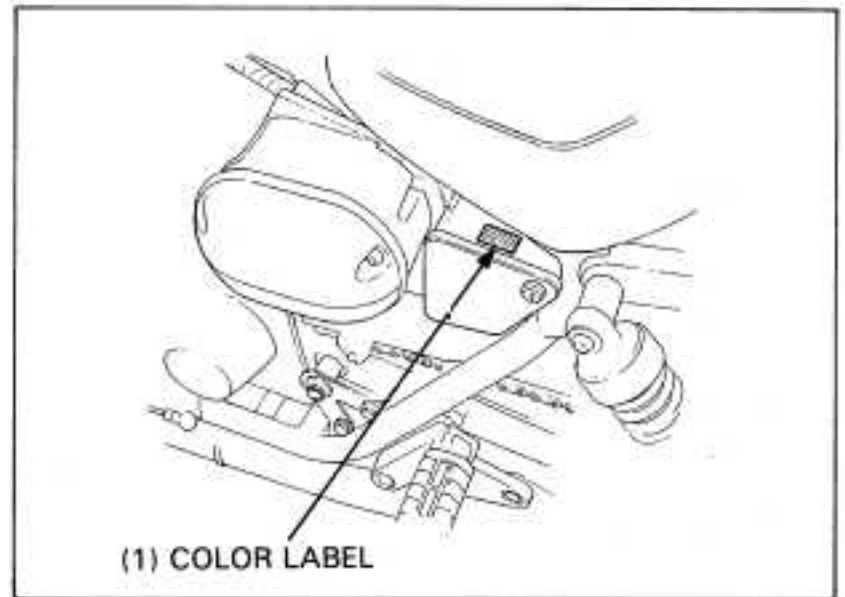
WARNING

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

SERVICE RULES

1. Use genuine Honda or Honda-recommended parts and lubricants or their equivalents. Parts that don't meet Honda's design specifications may damage the motorcycle.
2. Use the special tools designed for this product.
3. Install new gaskets, O-rings, cotter pins, lock plates, etc. when reassembling.
4. When torquing a series of bolts or nuts, begin with larger-diameter or inner bolt first, and tighten to the specified torque diagonally in 2-3 steps, unless a particular sequence is specified.
5. Clean parts in non-flammable or high flash point solvent upon disassembly. Lubricate any sliding surfaces before re-assembly.
6. After reassembly, check all parts for proper installation and operation.
7. Use only metric tools when servicing this motorcycle. Metric bolts, nuts, and screws are not interchangeable with English fasteners. The use of incorrect tools and fasteners may damage the motorcycle.
8. Route all electrical wires as shown on pages 1-8 through 1-13 Cable and Harness Routing.

MODEL IDENTIFICATION



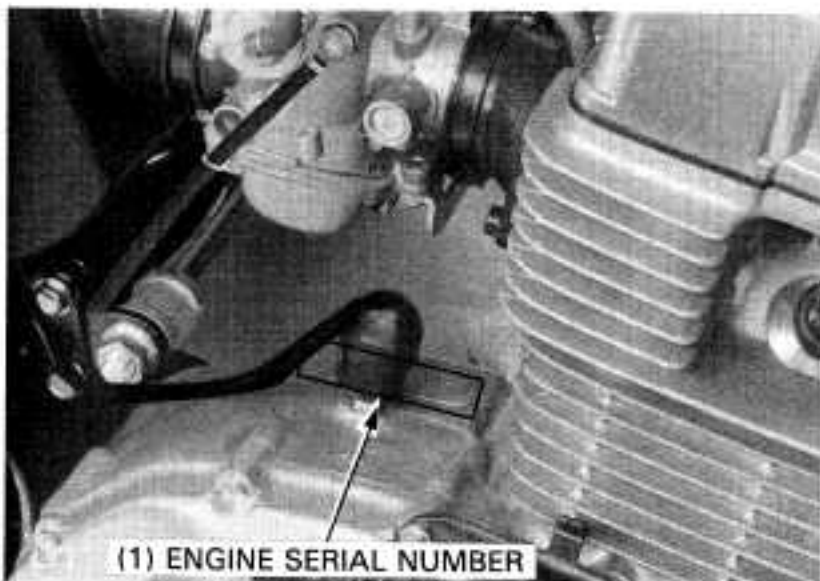
The color label is attached to the storage compartment under the seat.



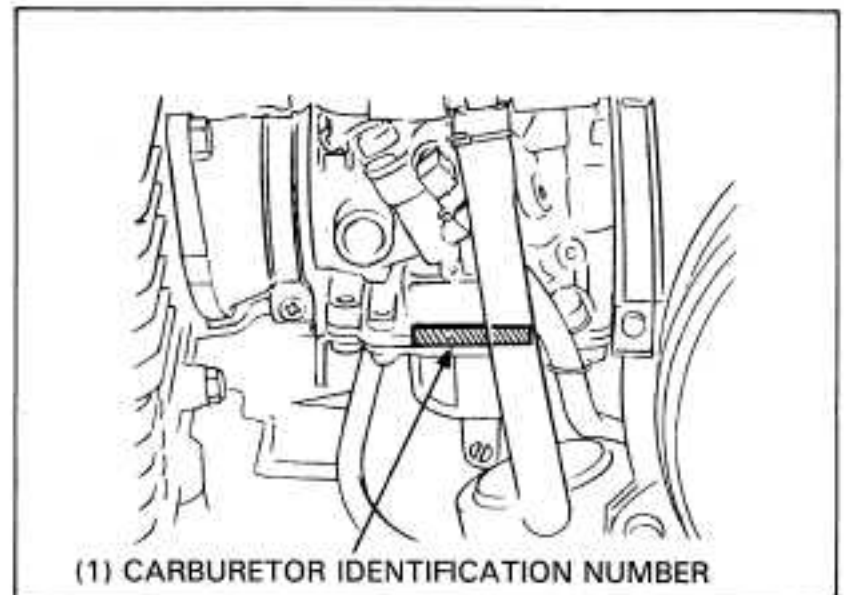
The legal vehicle identification number (VIN) is on the left side of the steering head.



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



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



The carburetor identification number is stamped on the left side of the carburetor body.

SPECIFICATIONS

[]: California model

ITEM		SPECIFICATIONS	
DIMENSIONS	Overall length	2,230 mm (87.8 in)	
	Overall width	800 mm (31.5 in)	
	Overall height	1,170 mm (46.0 in)	
	Wheelbase	1,530 mm (60.2 in)	
	Seat height	690 mm (27.2 in)	
	Ground clearance	155 mm (6.1 in)	
	Dry weight Curb weight	174 kg (383 lb) 185 kg (408 lb)	
FRAME	Type	Double cradle	
	Front suspension	Telescopic fork	
	Rear suspension	Swing arm-shock absorber	
	Front tire size	100/90-18 56S (Tubeless)	
	Rear tire size	140/90-15 70S (Tubeless)	
	Cold tire pressure	Up to vehicle capacity load	Front 200 kPa (2.00 kg/cm ² , 28 psi) Rear 200 kPa (2.00 kg/cm ² , 28 psi)
		Up to 90 kg (200 lb) load	Front 200 kPa (2.00 kg/cm ² , 28 psi) Rear 200 kPa (2.00 kg/cm ² , 28 psi)
Front brake, lining swept area	Disc brake, 452 cm ² (70.1 sq in)		
Rear brake, lining swept area	Drum brake, 176 cm ² (27.3 sq in)		
Fuel capacity	12.0 liters (3.2 US gal, 2.6 Imp gal)		
Fuel reserve capacity	2.5 liters (0.7 US qt, 0.6 Imp qt)		
Caster angle	58°		
Trail	135 mm (5.3 in)		
Front fork oil capacity	366 cc (12.4 US oz, 12.9 Imp oz)		
ENGINE	Type	Air cooled 4-stroke O.H.C engine	
	Cylinder arrangement	Vertical twin, paralalled	
	Bore and stroke	75 x 50.6 mm (2.95 x 1.99 in)	
	Displacement	447 cc (27.3 cu in)	
	Compression ratio	9.3 : 1	
	Valve train	Chain driven over head camshaft	
	Maximum horsepower	38 BHP/8,000 rpm	
	Maximum torque	3.8 kg-m/6,000 rpm	
	Oil capacity	2.2 ℓ (2.3 US qt, 1.9 Imp qt) After draining	
		3.0 ℓ (3.2 US qt, 2.6 Imp qt) After disassembly	
	Lubrication system	Forced pressure and wet sump	
	Air filtration	Paper	
	Cylinder compression	1,117 ± 98 kPa (12.0 ± 1.0 kg/cm ² , 171 ± 14 psi)	
	Valve clearance IN	0.08–0.12 mm (0.003–0.005 in)	
	(cold) EX	0.12–0.16 mm (0.005–0.006 in)	
	Intake valve	Opens	0° (TDC) at 1 mm lift
		Closes	35° (ABDC) at 1 mm lift
	Exhaust valve	Opens	40° (BBDC) at 1 mm lift
		Closes	0° (TDC) at 1 mm lift
Engine weight	60 kg (132 lb)		
Idle speed	1,200 ± 100 rpm		
CARBURETION	Carburetor type, venture bore	CV type, 29.3 mm (1.15 in)	
	Identification number	VE24A [VE28A]	
	Pilot screw	Refer to page 4-12	
	Float level	18.5 mm (0.73 in)	

GENERAL INFORMATION

ITEM		SPECIFICATIONS	
DRIVE TRAIN	Clutch	Wet, multi-plate	
	Transmission	5 speed + O.D. (6 speed)	
ELECTRICAL	Primary reduction	2.960 (74/25)	
	Gear ratios: (overall: 1)		
	I	2.769 (36/13)	
	II	1.947 (37/19)	
	III	1.545 (34/22)	
	IV	1.280 (32/25)	
	V	1.074 (29/27)	
	O.D.	0.867 (26/30)	
	Final reduction	2.176 (37/17)	
	Gear shift pattern	Left foot operated return system , 1-N-2-3-4-5-O.D.	
ELECTRICAL	Ignition	Capacitive Discharge Ignition	
	Ignition timing "F" mark	10° BTDC at 1,200 rpm	
	Full advance	43° BTDC at 4,800 ± 500 rpm	
	Starting system	Starting motor only	
	Generator	Three phase alternator 170 W/5,000 rpm	
ELECTRICAL	Battery capacity	12 V—12 AH	
	Spark plug		
		NGK	ND
	Standard	DPR8EA-9	X24EPR-U9
ELECTRICAL	For extended high speed riding	DPR9EA-9	X27EPR-U9
	For cold climate (Below 5°C)	DPR7EA-9	X22EPR-U9
ELECTRICAL	Spark plug gap	0.8—0.9 mm (0.031—0.035 in)	
LIGHTS	Headlight (high/low beam)	12 V— 60/55 W	
	Tail/brakelight	12 V—3/32 CP SAE NO. 1157	
	Front turn signal/position light	12 V—32/3 CP x 2 SAE NO. 1157	
	Rear turn signal light	12 V—32 CP x 2 SAE NO. 1073	
	Instrument	12 V—5 W	
	Neutral indicator	12 V—3 W	
	Turn signal indicator	12 V—3 W x 2	
	High beam indicator	12 V—3 W	
LIGHTS	Oil pressure warning light	12 V—3 W	
	Overdrive indicator	12 V—3 W	
FUSE	Main fuse	20 A	
	Sub-fuse	10 A x 4, 15 A x 1	

TORQUE VALUES

ENGINE

ITEM	Q'ty	THREAD DIA. mm	TORQUE N·m (kg·m, ft·lb)	REMARKS
Oil drain bolt	1	14	32–38 (3.2–3.8, 23–27)	Apply 3-BOND sealant to the threads
Oil filter bolt	1	20	29–31 (2.9–3.1, 21–22)	
Oil pressure switch	1	–	15–20 (1.5–2.0, 11–14)	
Balancer stopper plate nut	8 mm	1	20–25 (2.0–2.5, 14–18)	
	10 mm	1	30–35 (3.0–3.5, 22–25)	
Valve adjuster lock nut	6	6	22–26 (2.2–2.6, 16–19)	
Cylinder head cover bolt	2	6	8–12 (0.8–1.2, 6–9)	
Cylinder head bolt	8	10	30–36 (3.0–3.6, 22–26)	
Cam sprocket bolt	2	7	18–20 (1.8–2.0, 13–14)	
Clutch lock nut	1	20	55–60 (5.5–6.0, 40–43)	
Primary drive gear bolt	1	12	46–50 (4.6–5.0, 33–36)	
Flywheel bolt	1	12	110–130 (11.0–13.0, 80–94)	
Crankcase bolt	6 mm	15	10–14 (1.0–1.4, 7–10)	
	8 mm	1	22–28 (2.2–2.8, 16–20)	
Connecting rod bearing cap nut	4	8	25–29 (2.5–2.9, 18–21)	
Crankshaft bearing holder bolt	6	10	30–37 (3.0–3.7, 22–27)	
Starter clutch socket bolt	3	8	33–37 (3.3–3.7, 24–27)	
Gearshift pedal arm bolt	1	6	10–14 (1.0–1.4, 7–10)	
Exhaust pipe joint nut	4	6	12–16 (1.2–1.6, 9–12)	

FRAME

ITEM	Q'ty	THREAD DIA. mm	TORQUE N·m (kg·m, ft·lb)	REMARKS
Fuel cup	1		3–5 (0.3–0.5, 2–4)	Apply thread lock agent to the threads
Front engine mounting bolt	1	12	60–70 (6.0–7.0, 43–51)	
Rear engine mounting bolt	2	12	60–70 (6.0–7.0, 43–51)	
Upper engine mounting bolt	1	10	35–45 (3.5–4.5, 25–33)	
Engine mounting bracket bolt	8	8	24–30 (2.4–3.0, 17–22)	
Rear exhaust pipe band bolt	1	8	24–30 (2.4–3.0, 17–22)	
Rear brake pedal arm bolt	1	8	24–30 (2.4–3.0, 17–22)	
Front brake master cylinder holder bolt	2	6	10–14 (1.0–1.4, 7–10)	
Front axle nut	1	12	55–65 (5.5–6.5, 40–47)	
Front axle holder nut	2	8	18–25 (1.8–2.5, 13–18)	
Fork piston socket bolt	2	8	15–25 (1.5–2.5, 11–18)	
Fork top pinch bolt	2	7	9–13 (0.9–1.3, 7–9)	
Fork bottom pinch bolt	2	10	45–55 (4.5–5.5, 33–40)	
Fork tube cap	2	31	15–30 (1.5–3.0, 11–22)	
Steering bearing adjustment nut	1	26	23–27 (2.3–2.7, 17–20)	
Steering stem nut	1	26	90–120 (9.0–12.0, 65–87)	
Brake caliper bracket bolt	2	8	20–30 (2.0–3.0, 14–22)	
Front brake disc bolt	8	8	37–43 (3.7–4.3, 27–31)	
Rear brake torque link nut	2	8	18–25 (1.8–2.5, 13–18)	
Rear axle nut	1	16	80–100 (8.0–10.0, 58–72)	
Rear shock absorber damper lock nut	2		30–45 (3.0–4.5, 22–33)	
Rear shock absorber mounting bolt	Upper	2	24–30 (2.4–3.0, 17–22)	Apply thread lock agent to the threads
	Lower	2	30–40 (3.0–4.0, 22–29)	
Swingarm pivot bolt	1	14	60–70 (6.0–7.0, 43–51)	
Final driven sprocket nut	5	10	60–70 (6.0–7.0, 43–51)	
Rear shock absorber upper mount	2	14	100–120 (10.0–12.0, 72–87)	
Spoke nipple			7–11 (0.7–1.1, 5–8)	

GENERAL INFORMATION

ITEM	Q'ty	THREAD DIA. mm	TORQUE N·m (kg-m, ft-lb)	REMARKS
Brake caliper bleed valve	1	—	4–7 (0.4–0.7, 2.9–5.1)	
Brake hose oil bolt	1	10	25–35 (2.5–3.5, 18–25)	
Pad pin retainer bolt	1	6	8–13 (0.8–1.3, 6–9)	
Caliper mounting bolt	1	8	20–25 (2.0–2.5, 14–18)	
Caliper pin bolt	1	10	25–30 (2.5–3.0, 18–22)	

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

STANDARD TORQUE VALUES

ITEM	TORQUE VALUES N·m (kg-m, ft-lb)	ITEM	TORQUE VALUES N·m (kg-m, ft-lb)
5 mm bolt and nut	4–6 (0.4–0.6, 3–4)	5 mm screw	3–5 (0.3–0.5, 2–4)
6 mm bolt and nut	8–12 (0.8–1.2, 6–9)	6 mm screw	7–11 (0.7–1.1, 5–8)
8 mm bolt and nut	18–25 (1.8–2.5, 13–18)	6 mm flange bolt and nut	10–14 (1.0–1.4, 7–10)
10 mm bolt and nut	30–40 (3.0–4.0, 22–29)	8 mm flange bolt and nut	24–30 (2.4–3.0, 17–22)
12 mm bolt and nut	50–60 (5.0–6.0, 36–43)	10 mm flange bolt and nut	35–45 (3.5–4.5, 25–33)

TOOLS

SPECIAL

DESCRIPTION	TOOL NUMBER	ALTERNATIVE TOOL	TOOL NUMBER	REF. SECT.
Oil pressure gauge	07506-3000000	Equivalent commercially available in U.S.A.		2
Oil pressure gauge attachment	07510-4220100			2
Pilot screw wrench	07908-4220201			3, 4
Vacuum gauge	07404-0030000			3
Pressure pump/gauge	ST-AH-255-MC7	Vacuum gauge (U.S.A. only)	M937B-021-XXXXX	4
Vacuum pump/gauge	ST-AH-260-MC7			4
Valve guide reamer	07984-200000A	U.S.A. only		6
Valve guide reamer	07984-5510000			6
Piston base	07958-2500001	Not available in U.S.A.		7
Piston ring compressor	07954-5680000			7
Clutch center holder	07923-KE10000	Not available in U.S.A.		8
Steering stem socket	07916-3710100			11
Ball race remover	07953-KA50000	Ball race remover attachment	07953-MJ1000A	11
Bearing race remover	07946-3710500			11
Steering stem driver	07946-MB00000			11
Shock absorber compressor attachment	07959-MB10000			12
Bearing remover set	07946-MJ00000	Not available in U.S.A. or Bearing remover/installer	07946-KA50000	12
- Bearing driver shaft	07946-MJ00100			12
- Bearing driver head	07946-MJ00200			12
Attachment, 28 x 30 mm	07946-1870100			12
Snap ring pliers	07914-3230001			13
Circuit tester	07308-0020000	Circuit tester	TH-5-1 or -2	14, 15
Digital multimeter	KS-AHM-32-003	U.S.A. only		15

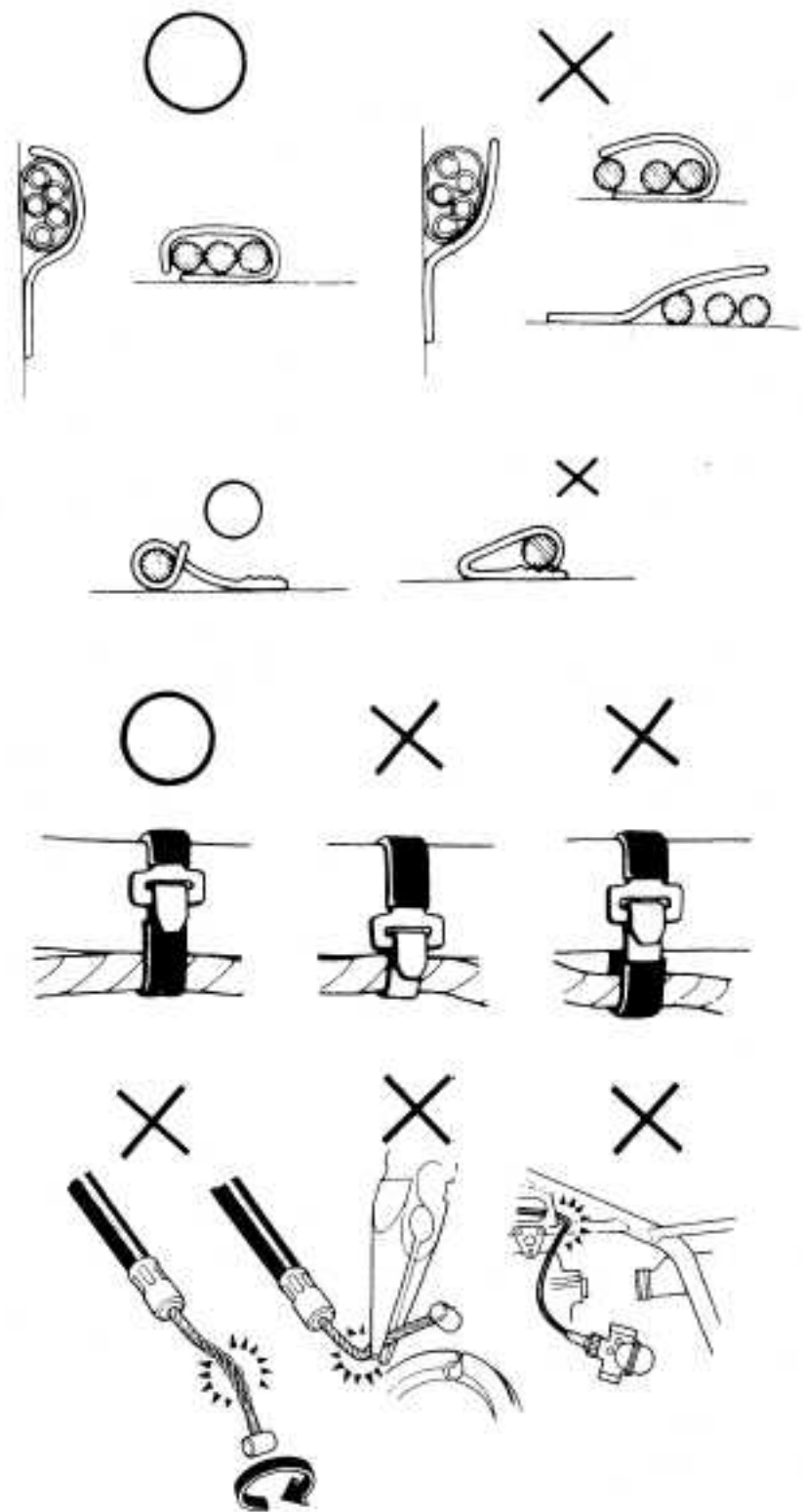
COMMON

DESCRIPTION	TOOL NUMBER	ALTERNATIVE TOOL	TOOL NUMBER	REF. SECT.
Spoke nipple wrench set	07701-0030000	Equivalent commercially available in U.S.A.		3, 11, 12
- Bit	07701-0030100			3, 11, 12
- Socket	07701-0030200			3, 11, 12
Float level gauge	07401-0010000			4
Valve guide remover, 5.5 mm	07742-0010100	Valve guide remover	07942-6570100	6
Valve guide remover, 6.5 mm	07742-0010200			6
Valve spring compressor	07757-0010000	Valve spring compressor	07957-3290001	6
Lock nut wrench, 26 x 30 mm	07716-0020203	Equivalent commercially available in U.S.A.		8
Extension bar	07716-0020500			8
gear holder	07724-0010100	Not available in U.S.A.		8
Universal holder	07725-0030000	Equivalent commercially available in U.S.A.		9
Rotor puller	07733-0020001			Rotor puller
Torx driver bit	07703-0010100			10
Inner driver	07746-0030100			10
Attachment, 25 mm I.D.	07746-0030200			10
Bearing remover shaft	07746-0050100	Equivalent commercially available in U.S.A.		11, 12
Bearing remover head, 15 mm	07746-0050400			11
Driver	07749-0010000			11, 12
Attachment, 42 x 47 mm	07746-0010300			11, 12
Pilot, 15 mm	07746-0040300			11, 12
Fork seal driver	07747-0010100			11
Seal driver attachment	07747-0010600	Fork seal driver	07947-3710101	11
Attachment, 52 x 55 mm	07746-0010400			11
Bearing remover head, 17 mm	07746-0050500	Equivalent commercially available in U.S.A.		12
Pilot, 17 mm	07746-0040400			12
Attachment, 37 x 40 mm	07746-0010200			12
Shock absorber compressor	07959-3290001			12
Pilot, 22 mm	07746-0041100			12
Attachment, 32 x 35 mm	07746-0010100			12

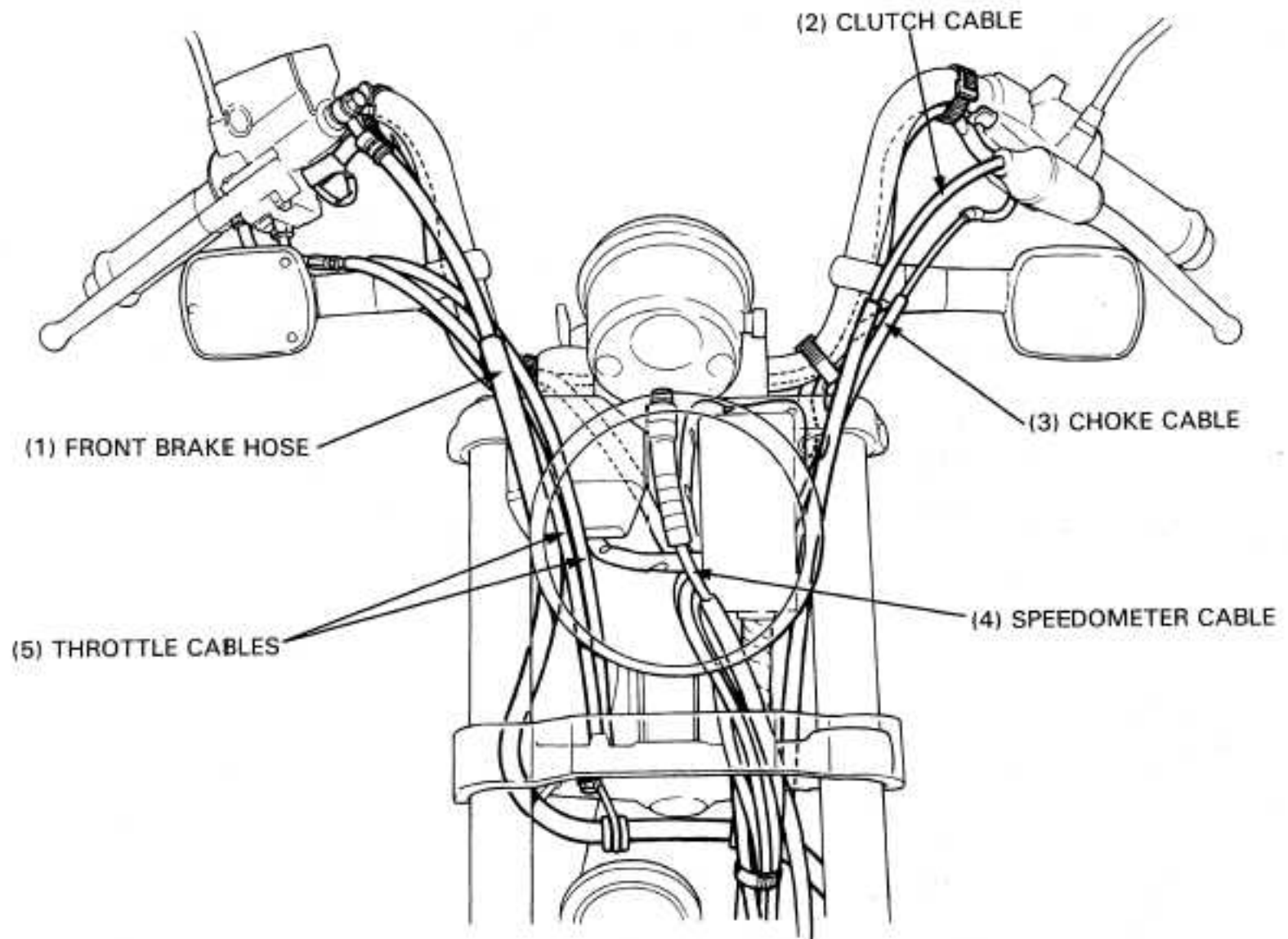
CABLE & HARNESS ROUTING

Note the following when routing cables and wire harnesses:

- A loose wire, harness or cable can be a safety hazard. After clamping, check each wire to be sure it is secure.
- Do not squeeze wires against a weld or end of a clamp.
- Secure wires and wire harnesses to the frame with their respective wire bands at the designated locations. Tighten the bands so that only the insulated surfaces contact the wire or wire harnesses.
- Route harnesses so they are not pulled taut or have excessive slack.
- Route wire harness so avoid sharp edges or corners. Also avoid the projected ends of bolts and screws.
- Protect wires and harnesses with electrical tape or tubes if they do contact a sharp edge or corner. Clean the attaching surface thoroughly before applying tape.
- Do not use wires or harnesses with broken insulation. Repair by wrapping them with a protective tape or replace them.
- 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.
- Wire harnesses routed along the handlebars should not be pulled taut, have excessive slack, be pinched, or interfere with adjacent or surrounding parts in all steering positions.
- After routing, check that the wire harnesses are not twisted or kinked.
- Do not bend or twist control cables. Damaged control cables will not operate smoothly and may stick or bind.

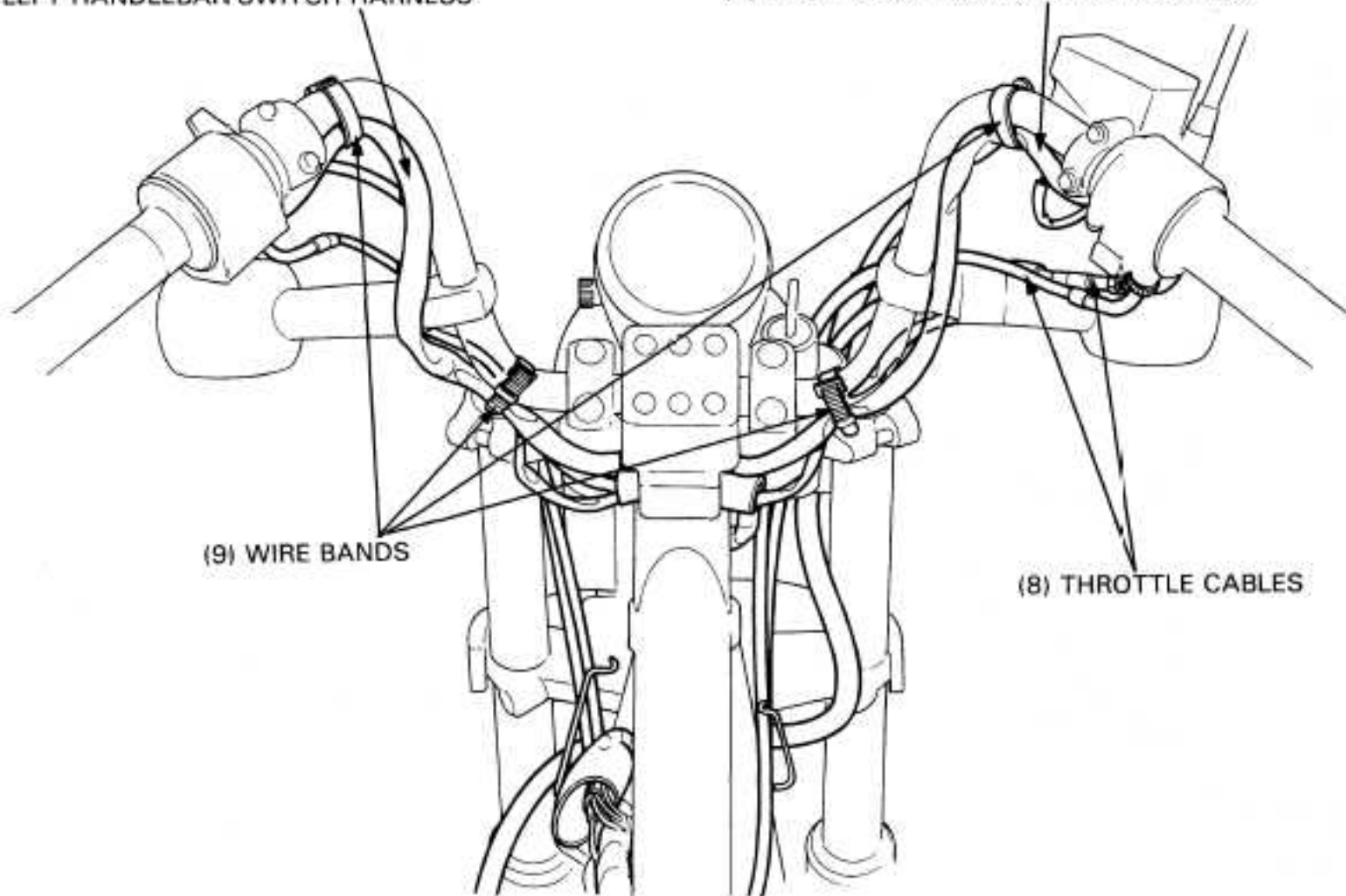


O: CORRECT
X: INCORRECT



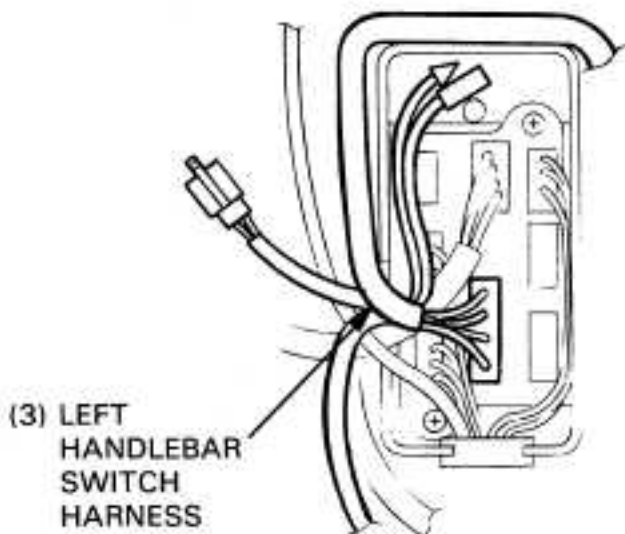
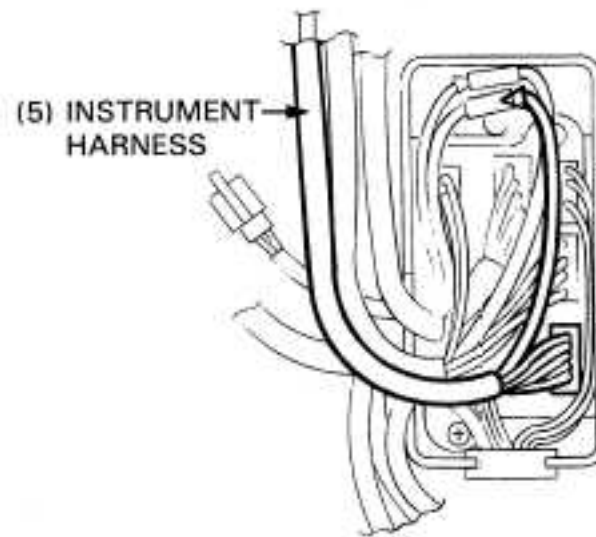
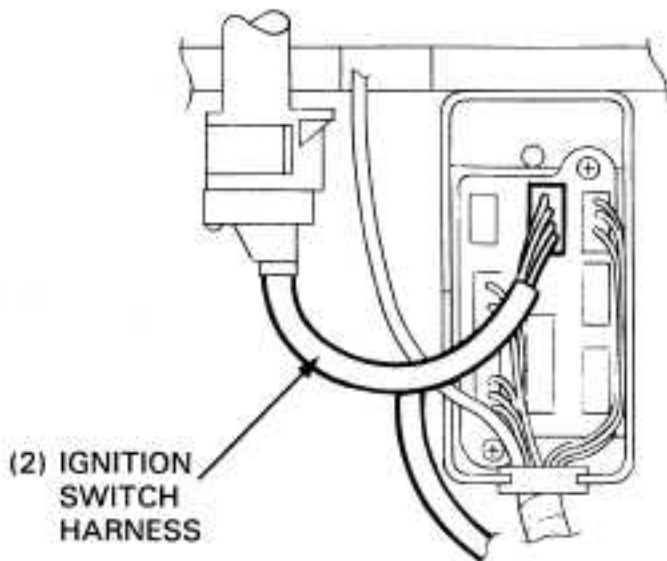
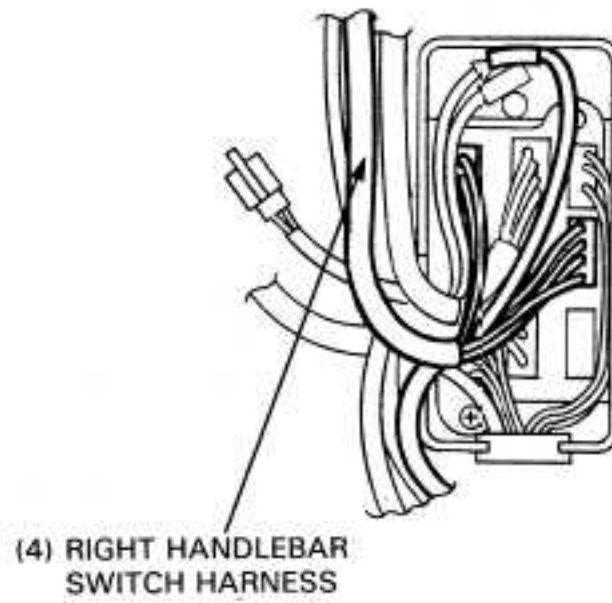
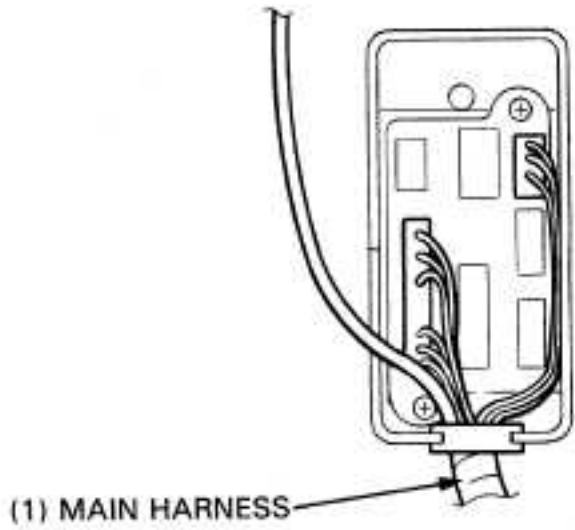
(6) LEFT HANDLEBAR SWITCH HARNESS

(7) RIGHT HANDLEBAR SWITCH HARNESS



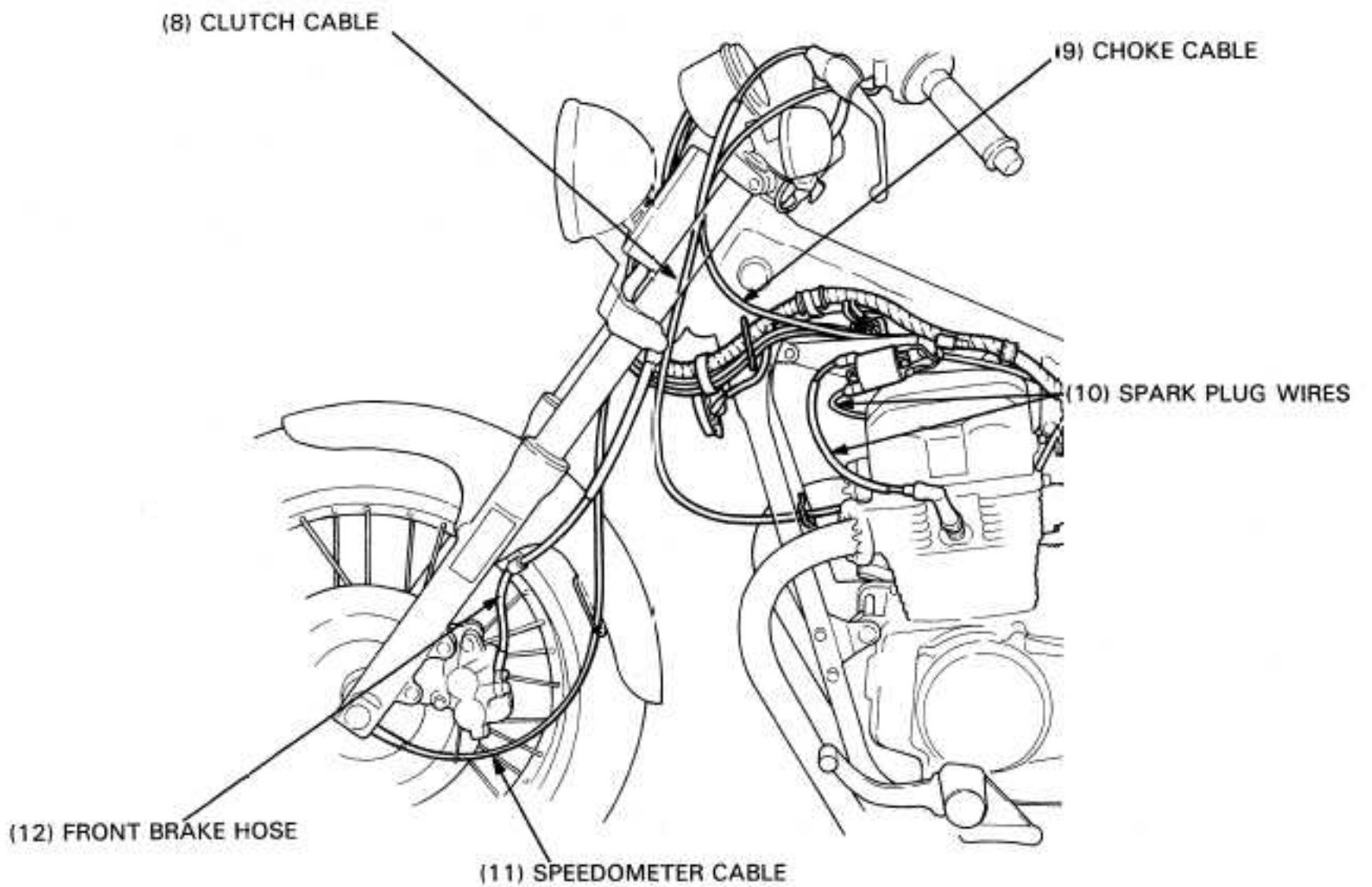
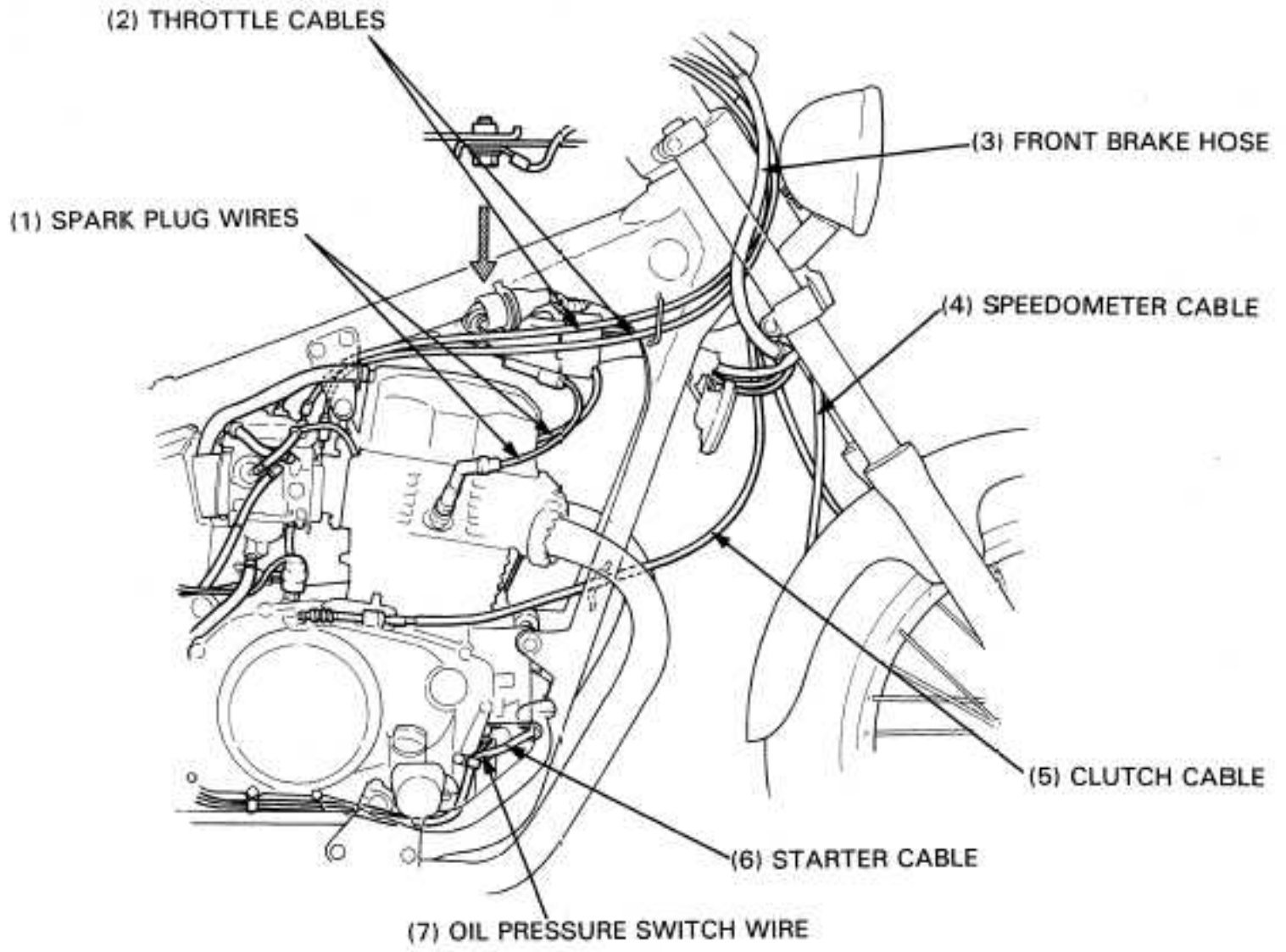
GENERAL INFORMATION

CONNECTING SEQUENCE OF COUPLERS IN THE JUNCTION BOX

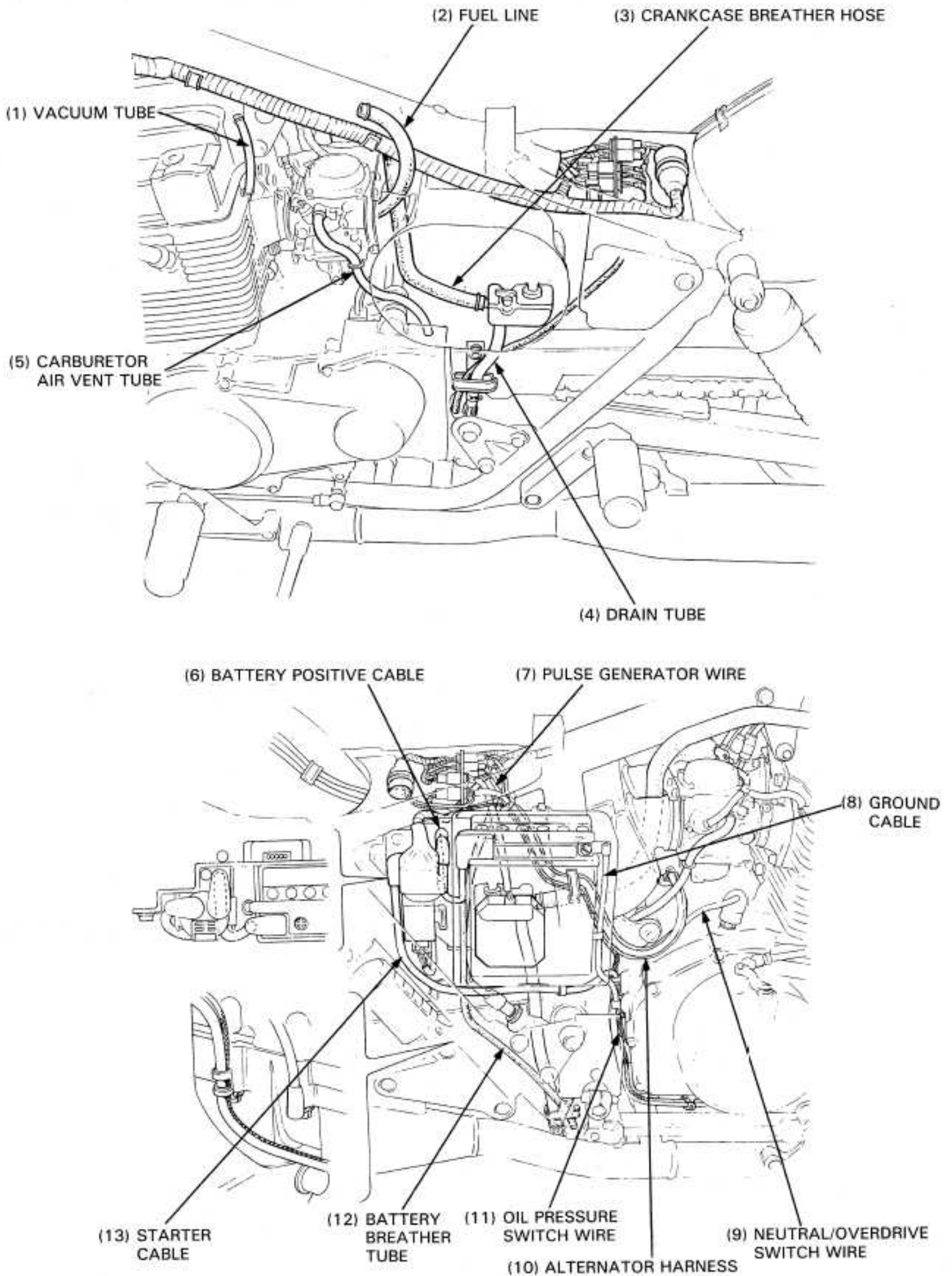


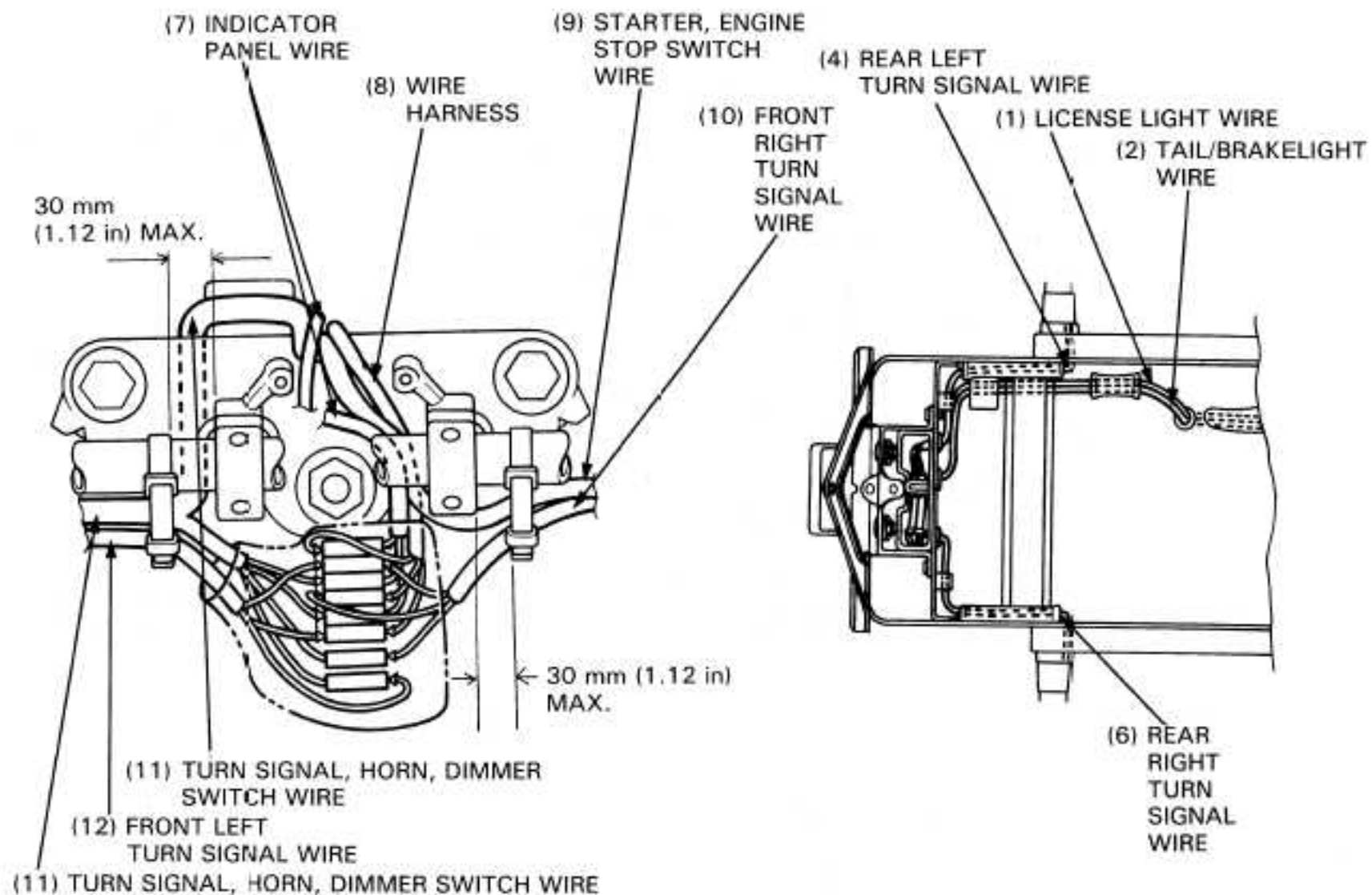
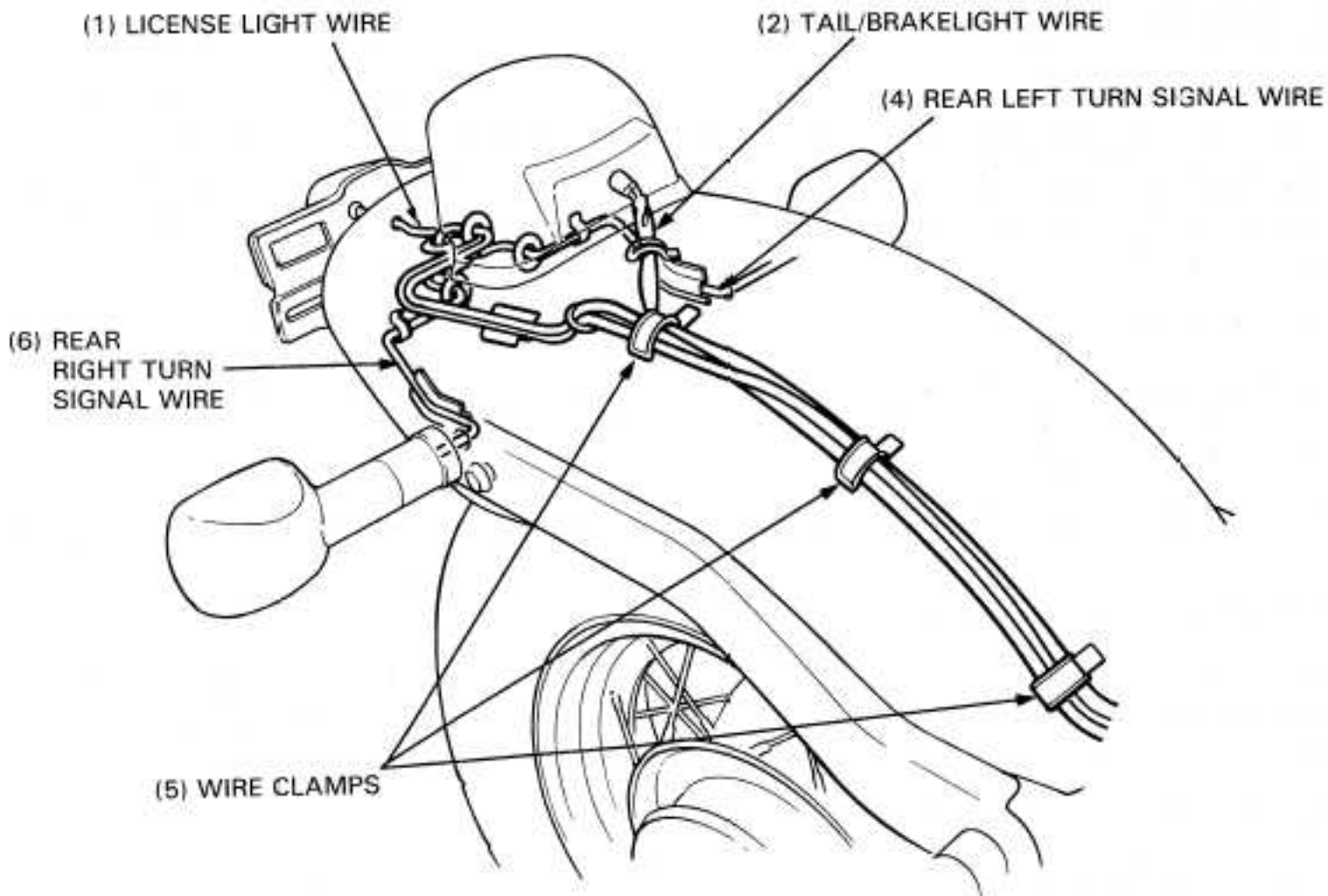
CAUTION

- *Be careful not to bind the wires and harnesses when installing the junction box cover.*



GENERAL INFORMATION





GENERAL INFORMATION

EMISSION CONTROL SYSTEMS

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

SOURCE OF EMISSIONS

The combustion process produces carbon monoxide and hydrocarbons. 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.

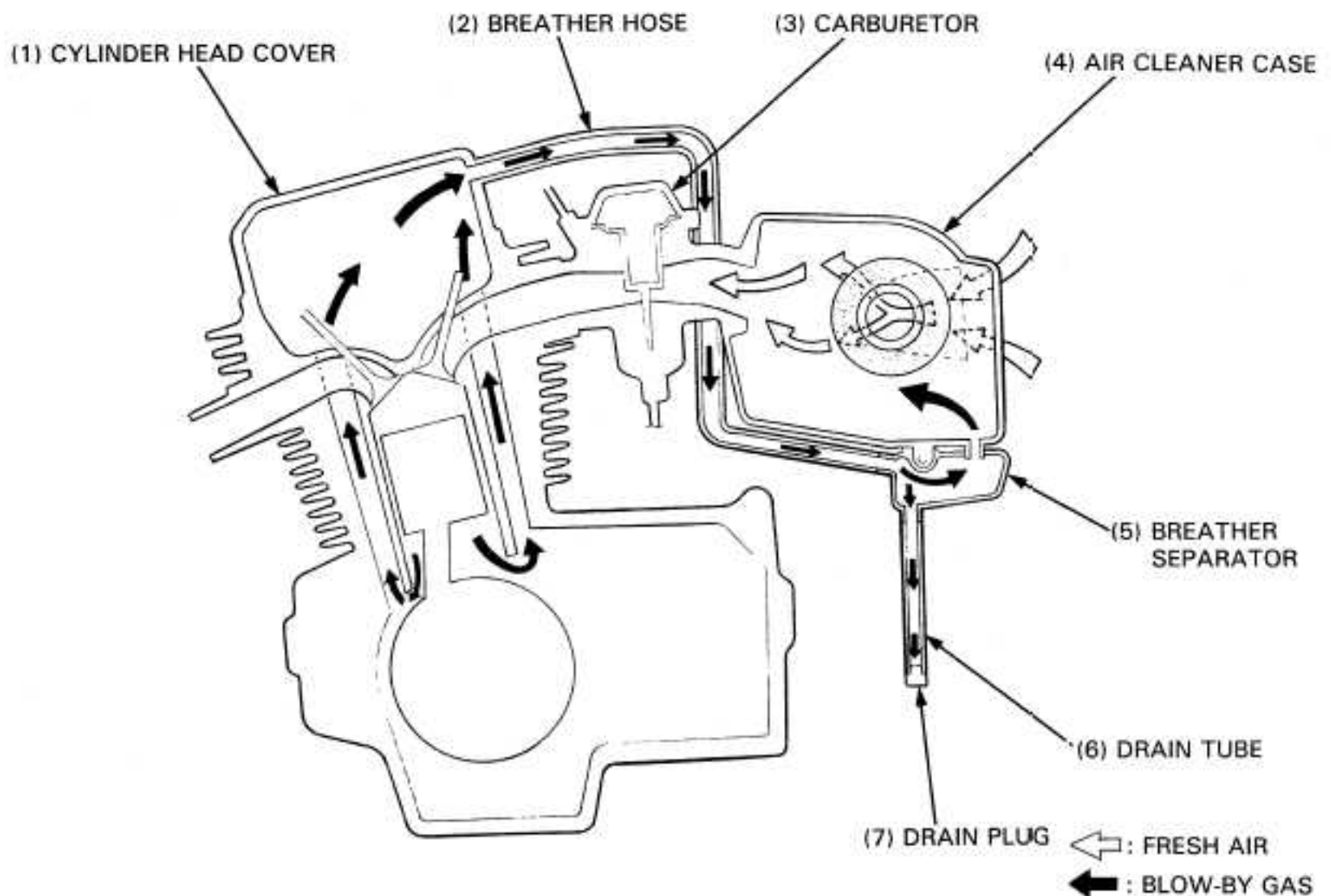
Honda Motor Co., Ltd. utilizes lean carburetor settings as well as other systems, to reduce carbon monoxide and hydrocarbons.

EXHAUST EMISSION CONTROL SYSTEM

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

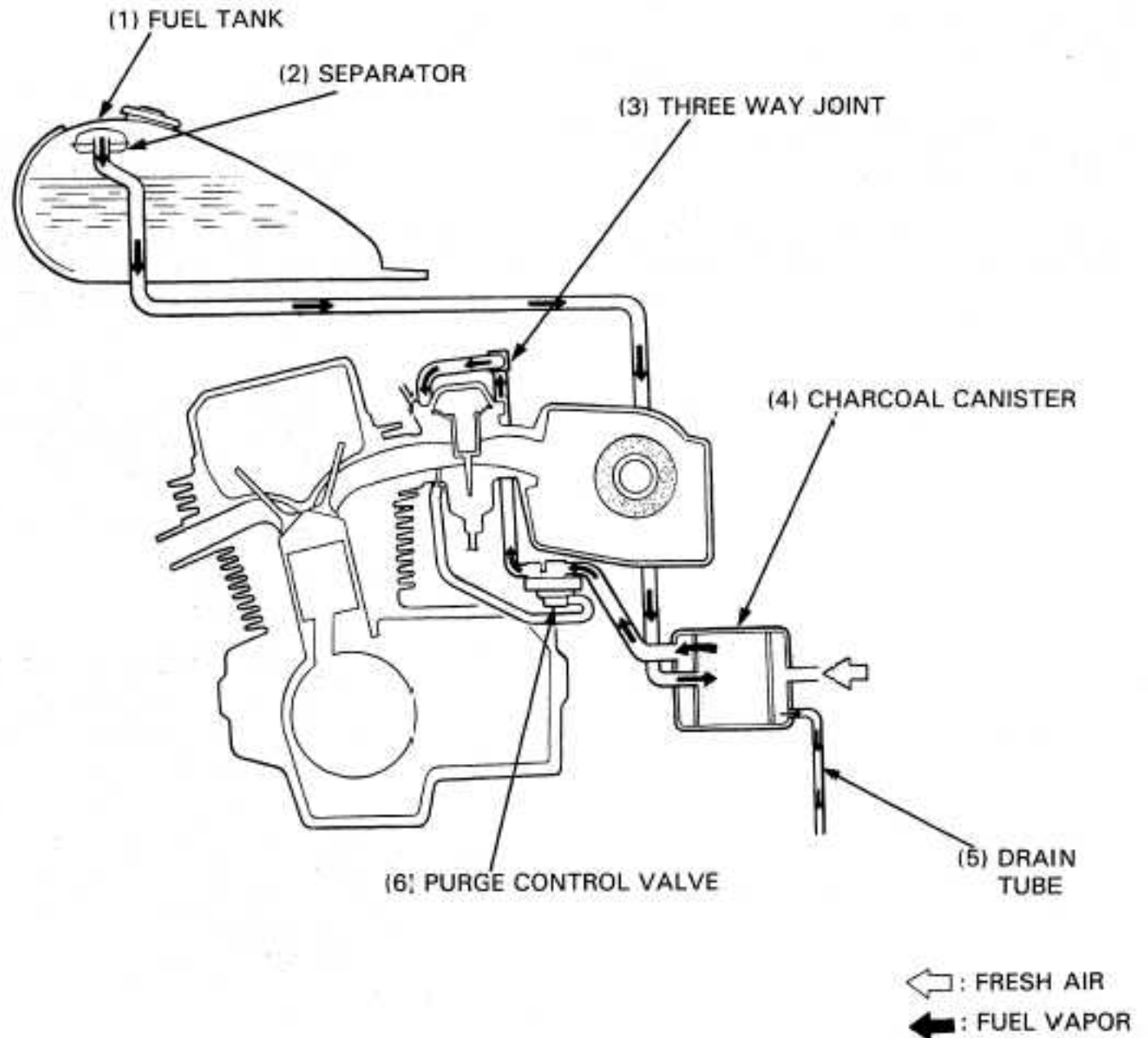
CRANKCASE EMISSION CONTROL SYSTEM

The engine is equipped with a closed crankcase system which routes crankcase emissions through the air cleaner into the combustion chamber.



EVAPORATIVE EMISSION CONTROL SYSTEM (California Model)

This model complies with California Air Resources Board requirements for evaporative emission regulations. Fuel vapor from the fuel tank is routed into a charcoal canister where it is adsorbed and stored while the engine is stopped. When the engine is running and the purge control diaphragm valve is open, fuel vapor in the charcoal canister is drawn into the engine through the carburetor.



NOISE EMISSION CONTROL SYSTEM

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

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

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

GENERAL INFORMATION

EMISSION CONTROL INFORMATION LABELS (U.S.A. only)

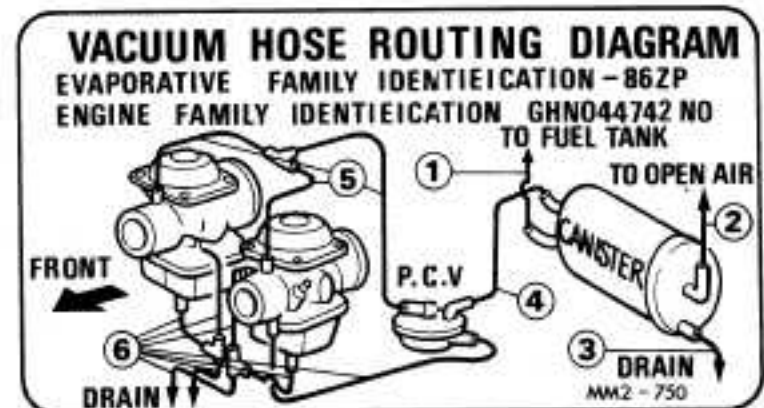
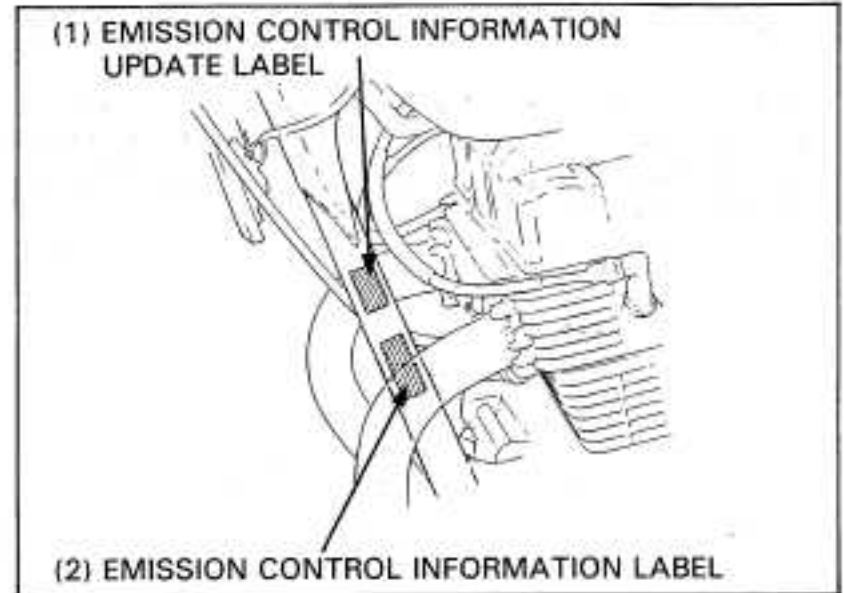
The Vehicle Emission Control Information label is attached to the left side of the front down tube.

EMISSION CONTROL INFORMATION UPDATE LABEL

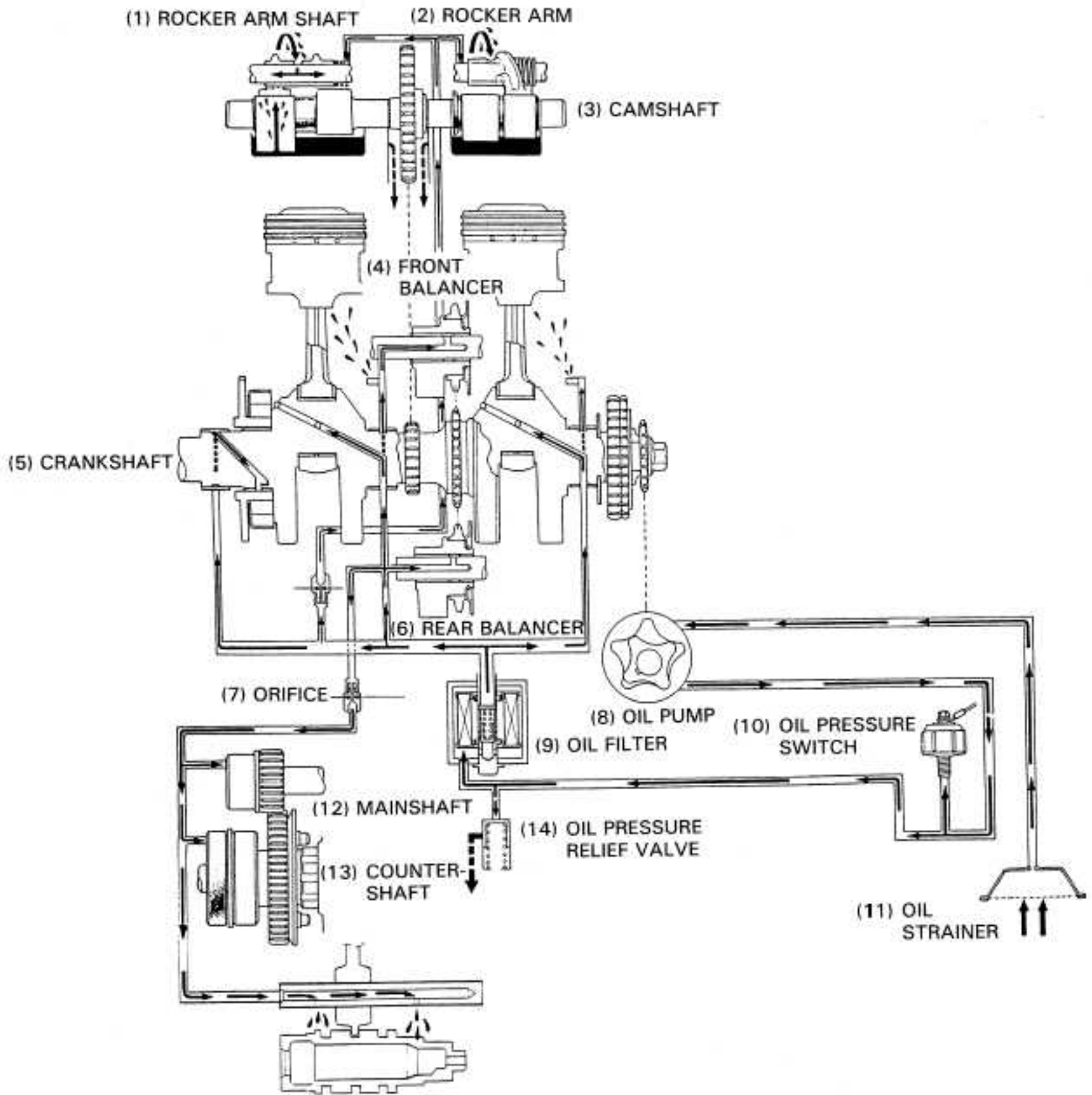
After making a high altitude carburetor adjustment (page 4-13), attach an update label onto the left side of the down tube, above the Emission Control Information label as shown. Instructions for obtaining the update label are given in Service Letter No. 132.

VACUUM HOSE ROUTING DIAGRAM LABEL (California model only)

The Vacuum Hose Routing Diagram label is attached to the left side of the rear down tube near the passenger footpeg.



MEMO



2. LUBRICATION

SERVICE INFORMATION	2-1	OIL PRESSURE CHECK	2-4
TROUBLESHOOTING	2-2	CONTROL CABLE LUBRICATION	2-5
ENGINE OIL LEVEL	2-3	LUBRICATION POINTS	2-5
ENGINE OIL & FILTER CHANGE	2-3		

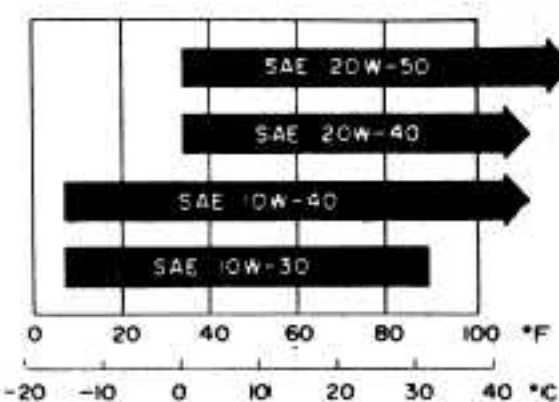
SERVICE INFORMATION

GENERAL

- Refer to section 8 for the oil pump and oil pressure relief valve service.
- To service the oil strainer screen, the crankcase must be separated after removing the engine from the frame. Clean the strainer screen whenever the crankcase is separated (section 10).

SPECIFICATIONS

Engine oil

Oil capacity	3.0 liters (3.2 US qt, 2.6 Imp qt) after disassembly 2.2 liters (2.3 US qt, 1.9 Imp qt) after draining
Oil recommendation	<p>Use Honda 4-Stroke Oil or equivalent. API Service Classification: SE or SF. Viscosity: SAE 10W-40</p> <p>Other viscosities shown in the chart may be used when the average temperature in your riding area is within the indicated range.</p> 
Oil pressure (at main oil gallery)	630 kPa (6.3 kg/cm ² , 90 psi)/ 6,000 rpm 80°C (176°F)

TORQUE VALUES

Oil drain bolt	32-38 N·m (3.2-3.8 kg-m, 23-27 ft-lb)
Oil filter bolt	29-31 N·m (2.9-3.1 kg-m, 21-22 ft-lb)
Oil pressure switch	15-20 N·m (1.5-2.0 kg-m, 11-14 ft-lb) Apply 3-BOND® sealant
Engine mounting bolts,	
Upper	35-45 N·m (3.5-4.5 kg-m, 25-33 ft-lb)
Front and rear	60-70 N·m (6.0-7.0 kg-m, 43-51 ft-lb)

TOOLS

Special

Oil pressure gauge	07506-3000000 or equivalent commercially available in U.S.A.
Oil pressure gauge attachment	07510-4220100

TROUBLESHOOTING

Oil level too low—high oil consumption

- External oil leaks
- Worn piston rings
- Worn valve guide or seal

Oil contamination

- Oil or filter not changed often enough
- Head gasket faulty
- Worn piston rings

Low oil pressure

- Oil level low
- Pressure relief valve stuck open
- Plugged oil strainer screen
- Oil pump worn
- External oil leaks

High oil pressure

- Pressure relief valve stuck closed
- Plugged oil filter, gallery, or metering orifice
- Incorrect oil being used

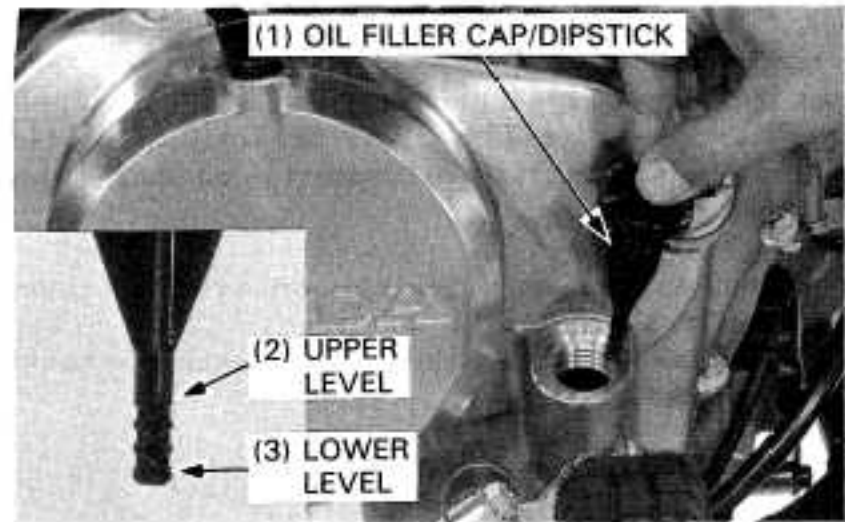
No oil pressure

- Oil level low
- Broken oil pump drive chain
- Oil pump faulty
- Internal oil leakage

ENGINE OIL LEVEL

Run the engine and allow it to idle for a few minutes. Stop the engine and support the motorcycle in an upright position. After 2-3 minutes, remove the oil filter cap/dipstick, wipe it clean, and reinstall the dipstick without screwing it in. The oil level should be between the upper and lower level marks on the dipstick.

Do not screw it in when making this check. If the oil level is below or near the lower level mark on the dipstick, add the recommended oil (page 2-1) up to the upper level mark.



ENGINE OIL & FILTER CHANGE

NOTE

- Engine oil change is performed with engine at normal operating temperature and vehicle upright to assure complete and rapid draining.

Remove the oil filler cap after the engine is warm. Remove the drain bolt and oil filter case to drain oil from the engine.

Discard the oil filter.

Check the operation of bypass valve in the oil filter bolt by manually pushing it open and verifying that it opens completely and closes automatically when released.

Make sure that the sealing washer on the drain bolt, and the O-rings on the oil filter bolt and the oil filter case are in good condition.

Install a new oil filter element, washer, spring and filter case in the reverse order of removal, and loosely install the oil filter bolt.

Tighten the oil filter bolt securely.

TORQUE: 29–31 N·m (2.9–3.1 kg-m, 21–22 ft-lb)

Reinstall the drain bolt.

TORQUE: 32–38 N·m (3.2–3.8 kg-m, 23–27 ft-lb)

Fill the crankcase with the recommended oil.

OIL CAPACITY: AFTER DRAINING

2.2 liters (2.3 US qt, 1.9 Imp qt)

SPECIFIED OIL: HONDA 4-STROKE OIL

OR AN EQUIVALENT

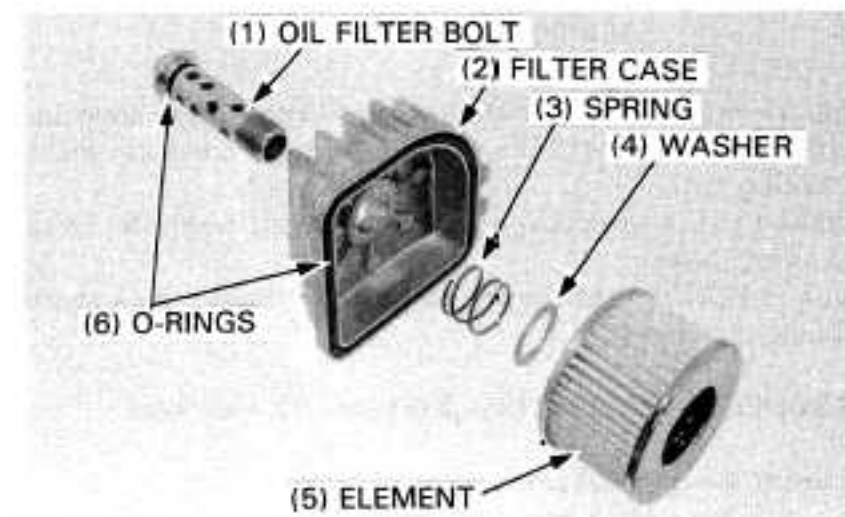
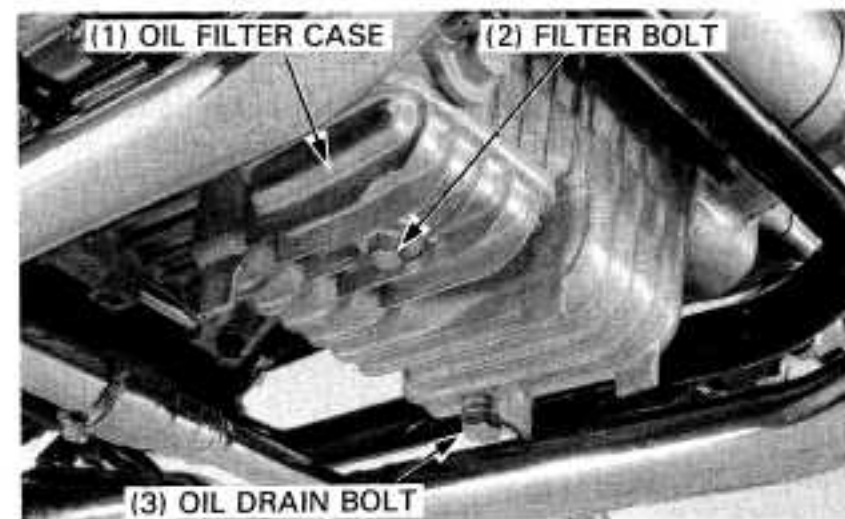
API Service Classification SE or SF

Viscosity: SAE 10W–40

Reinstall the oil filler cap.

Start the engine and allow to idle for a few minutes.

Stop the engine, make sure that oil level is at the upper level mark with the motorcycle upright, and there are no oil leaks.



OIL PRESSURE CHECK

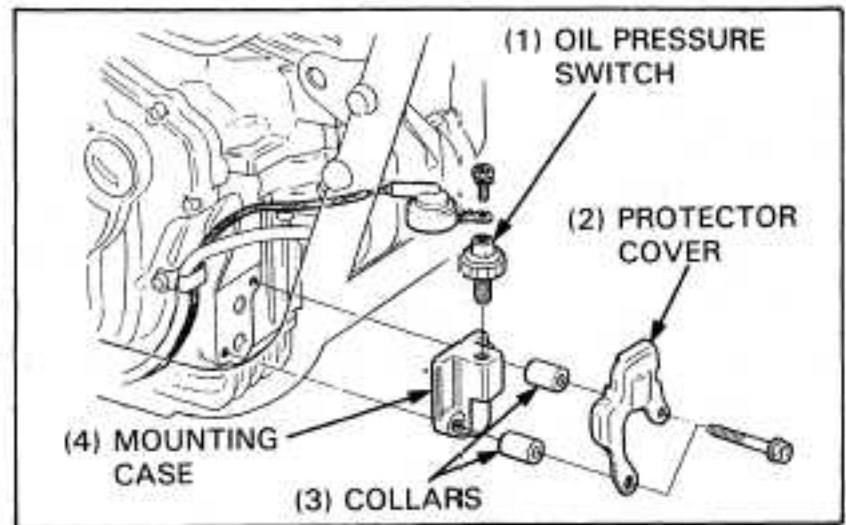
Drain the engine oil into a clean drain pan.

Place a jack under the engine, remove the front, upper and rear upper engine mounting bolts, and loosen the rear lower engine mounting bolt.

Lower the engine.

Remove the socket bolts, oil pressure switch protector cover, collars and mounting case.

Disconnect the oil pressure switch wire and remove the switch from the mounting case.



Install the oil pressure gauge attachment into the mounting case.

Reinstall the mounting case, collars and socket bolts.

Connect the oil pressure gauge to the attachment.

TOOLS:

Oil pressure gauge	07506-3000000 or equivalent commercially available in U.S.A.
Oil pressure gauge attachment	07510-4220100

Refill the crankcase with the engine oil up to the proper level. Warm up the engine up to the normal operating temperature and check the oil pressure at 6,000 rpm.

**OIL PRESSURE: 630 kPa (6.3 kg/cm², 90 psi)
at 6,000 rpm (80°C/176°F)**

Stop the engine and drain the engine oil into a clean drain pan. Remove the socket bolts, collars and oil pressure switch mounting case.

Remove the oil pressure gauge attachment from the switch mounting case.

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

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

Connect the oil pressure switch wire.

Reinstall the switch mounting case, collars, protector cover and socket bolts.

Install the front, upper and rear upper engine mounting bolts. Tighten the engine mounting bolts.

TORQUE:

Upper:	35-45 N·m (3.5-4.5 kg-m, 25-33 ft-lb)
Front and rear:	60-70 N·m (6.0-7.0 kg-m, 43-51 ft-lb)

Refill the crankcase with the recommended engine oil (page 2-1) up to the proper level.

Start the engine.

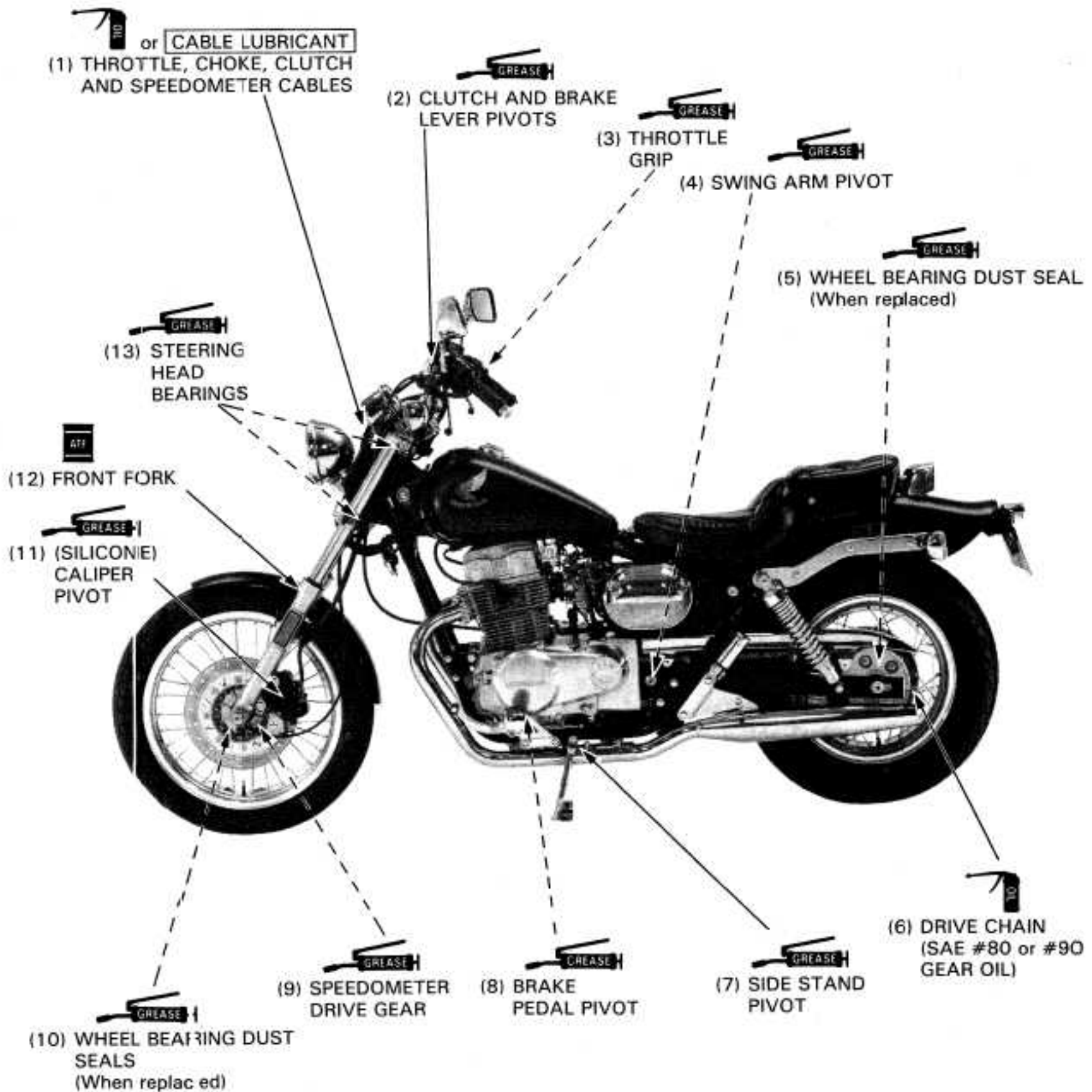
Check that the oil pressure warning light goes out after one or two seconds.

If the oil pressure warning light stays on, stop the engine immediately and determine the cause. Refer to page 17-6 for oil pressure switch inspection.

CONTROL CABLE LUBRICATION

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

LUBRICATION POINTS



MEMO

3. MAINTENANCE

3

SERVICE INFORMATION	3-1	CYLINDER COMPRESSION	3-11
MAINTENANCE SCHEDULE	3-3	DRIVE CHAIN	3-11
FUEL LINE	3-5	BATTERY	3-13
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THROTTLE OPERATION	3-5	BRAKE SHOE/PAD WEAR	3-13
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SERVICE INFORMATION

GENERAL

Engine oil See page 2-3
 Engine oil filter See page 2-3

WARNING

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

SPECIFICATIONS

<ENGINE>

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

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

Spark plug gap: 0.8–0.9 mm (0.031–0.035 in)
 Valve clearance IN: 0.08–0.12 mm (0.003–0.005 in)
 (cold, below 35°C/95°F) EX: 0.12–0.16 mm (0.005–0.006 in)
 Carburetor synchronization: Both carburetors within 40 mm (1.6 in) Hg of each other
 Idle speed: 1,200±100 rpm

MAINTENANCE

<FRAME>

Drive chain slack:		15–25 mm (5/8–1 in)
Brake pedal height:		50 mm (2.0 in)
Brake pedal free play:		20–30 mm (3/4–1-1/4 in)
Clutch lever free play:		10–20 mm (3/8–3/4 in)
Side stand spring tension:		2–3 kg (4.4–4.6 lb)
Tire pressure (cold):		
Up to vehicle capacity load:	Front	200 kPa (2.00 kg/cm ² , 28 psi)
	Rear	200 kPa (2.00 kg/cm ² , 28 psi)
Up to 90 kg (200 lb) load:	Front	200 kPa (2.00 kg/cm ² , 28 psi)
	Rear	200 kPa (2.00 kg/cm ² , 28 psi)
Tire size:	Front	100/90–18 56S
	Rear	140/90–15 70S
Min. tire tread depth:	Front	1.5 mm (1/16 in)
	Rear	2.0 mm (3/32 in)

TOOLS

Special

Pilot screw wrench	07908–4220201
Vacuum gauge	07404–0030000 or M937B-021-XXXX (U.S.A. only)

Common

Spoke nipple wrench set	07701-0030000
– Bit	07701-0030100
– Socket	07701-0030200

TORQUE VALUES

Fuel cup		3–5 N·m (0.3–0.5 kg-m, 2–4 ft-lb)
Balancer stopper plate nut	8 mm	20–25 N·m (2.0–2.5 kg-m, 14–18 ft-lb)
	10 mm	30–35 N·m (3.0–3.5 kg-m, 22–25 ft-lb)
Rear axle nut		80–100 N·m (8.0–10.0 kg-m, 58–72 ft-lb)
Spoke nipple		7–11 N·m (0.7–1.1 kg-m, 5–8 ft-lb)
Valve adjuster lock nut		22–26 N·m (2.2–2.6 kg-m, 16–19 ft-lb)

MAINTENANCE SCHEDULE

'86:

Perform the Pre-ride Inspection (see Owner's manual) at each scheduled maintenance period.

I: Inspect and clean, adjust, lubricate or replace if necessary

C: Clean R: Replace A: Adjust L: Lubricate

ITEM	FREQUENCY	WHICHEVER COMES FIRST ↓ EVERY	ODOMETER READING NOTE (4)							Refer page
			600 mi (1,000 Km)	4,000 mi (6,400 Km)	8,000 mi (12,800 Km)	12,000 mi (19,200 Km)	16,000 mi (25,600 Km)	20,000 mi (32,000 Km)	24,000 mi (38,000 Km)	
EMISSION RELATED ITEMS	* FUEL LINE				I		I		I	3-5
	* FUEL STRAINER			C	C	C	C	C	C	3-5
	* THROTTLE OPERATION				I		I		I	3-5
	* CARBURETOR CHOKE				I		I		I	3-6
	AIR CLEANER	NOTE (1)				R			R	3-7
	CRANKCASE BREATHER	NOTE (2)		C	C	C	C	C	C	3-7
	SPARK PLUGS			R	R	R	R	R	R	3-8
	* VALVE CLEARANCE		I	I	I	I	I	I		3-8
	ENGINE OIL	YEAR	R	R	R	R	R	R	R	2-3
	ENGINE OIL FILTER	YEAR	R		R		R		R	2-3
	** BALANCER CHAIN TENSION					A			A	3-9
	* CARBURETOR SYNCHRONIZATION				I		I		I	3-10
	* CARBURETOR IDLE SPEED		I	I	I	I	I	I	I	3-10
	* EVAPORATIVE EMISSION CONTROL SYSTEM	NOTE (3)				I			I	3-11
NON-EMISSION RELATED ITEMS	DRIVE CHAIN		I, L: EVERY 600 mi (1,000 km)							3-11
	BATTERY			I	I	I	I	I	I	3-13
	BRAKE FLUID	2 YEARS *R		I	I	*R	I	I	*R	3-13
	BRAKE SHOE/PAD WEAR			I	I	I	I	I	I	3-13
	BRAKE SYSTEM		I		I		I		I	3-14
	* BRAKE LIGHT SWITCH				I		I		I	3-15
	* HEADLIGHT AIM				I		I		I	3-15
	CLUTCH		I	I	I	I	I	I	I	3-16
	SIDE STAND				I		I		I	3-16
	* SUSPENSION				I		I		I	3-17
	* NUTS, BOLTS, FASTENERS		I		I		I		I	3-18
** WHEELS/TIRES		I	I	I	I	I	I	I	3-18	
** STEERING HEAD BEARINGS		I		I		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.

** In the interest of safety, we recommend these items be serviced only by an authorized Honda dealer.

NOTE:(1) Service more frequently when riding in dusty areas.

(2) Service more frequently when riding in rain or at full throttle.

(3) California type only.

(4) For higher odometer readings, repeat at the frequency interval established here.

MAINTENANCE

After '86:

Perform the Pre-ride Inspection (see Owner's manual) at each scheduled maintenance period.

I: Inspect and clean, adjust, lubricate or replace if necessary

C: Clean R: Replace A: Adjust L: Lubricate

ITEM	FREQUENCY	WHICHEVER COMES FIRST ↓ EVERY	ODOMETER READING NOTE 1							
			600 mi (1,000 Km)	4,000 mi (6,400 Km)	8,000 mi (12,800 Km)	12,000 mi (19,200 Km)	16,000 mi (25,600 Km)	20,000 mi (32,000 Km)	24,000 mi (38,000 Km)	Refer page
EMISSION RELATED ITEMS	* FUEL LINE			I		I		I	3-5	
	* FUEL STRAINER SCREEN		C	C	C	C	C	C	3-5	
	* THROTTLE OPERATION			I		I		I	3-5	
	* CARBURETOR CHOKE			I		I		I	3-6	
	AIR CLEANER	NOTE 2			R			R	3-7	
	CRANKCASE BREATHER	NOTE 3		C	C	C	C	C	3-7	
	SPARK PLUGS			R	R	R	R	R	3-8	
	* VALVE CLEARANCE		I	I	I	I	I	I	3-8	
	ENGINE OIL		R	R	R	R	R	R	2-3	
	ENGINE OIL FILTER		R		R		R		2-3	
	** BALANCER CHAIN TENSION				A			A	3-9	
	* CARBURETOR SYNCHRONIZATION				I		I		3-10	
	* CARBURETOR IDLE SPEED		I	I	I	I	I	I	3-10	
	* EVAPORATIVE EMISSION CONTROL SYSTEM	NOTE 4				I			I	3-11
NON-EMISSION RELATED ITEMS	DRIVE CHAIN		I, L: EVERY 600 mi (1,000 km)						3-11	
	BATTERY			I	I	I	I	I	3-13	
	BRAKE FLUID	2 YEAR *R		I	I	*R	I	I	*R	3-13
	BRAKE SHOE/PAD WEAR			I	I	I	I	I	3-13	
	BRAKE SYSTEM		I		I		I		3-14	
	* BRAKE LIGHT SWITCH				I		I		3-15	
	* HEADLIGHT AIM				I		I		3-15	
	CLUTCH		I	I	I	I	I	I	3-16	
	SIDE STAND				I		I		3-16	
	* SUSPENSION				I		I		3-17	
	* NUTS, BOLTS, FASTENERS		I		I		I		3-18	
	** WHEELS/TIRES		I	I	I	I	I	I	3-18	
	** STEERING HEAD BEARINGS		I	I	I	I	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.

** In the interest of safety, we recommend these items be serviced only by an authorized Honda dealer.

NOTE:(1) For higher odometer reading, repeat at the frequency interval established here.

(2) Service more frequently when riding in dusty areas.

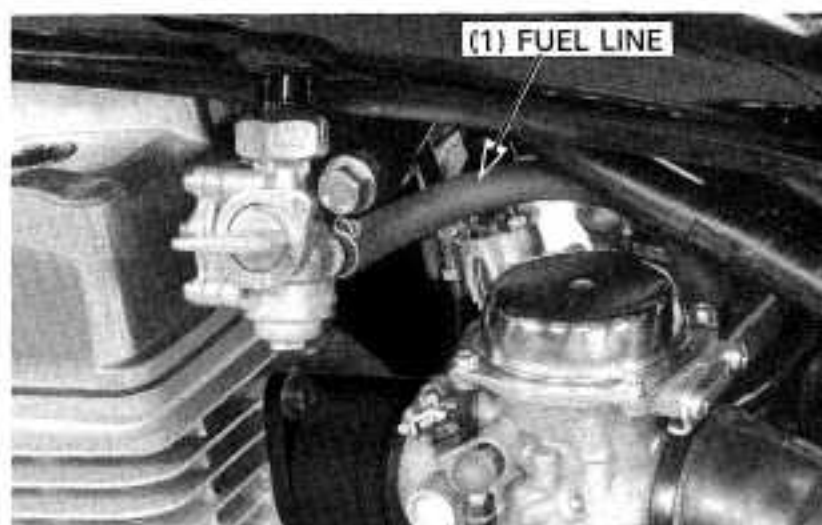
(3) Service more frequently when riding in rain or at full throttle.

(4) California type only.

FUEL LINE

Check the fuel line for deterioration, damage or leakage.

Replace if necessary.



FUEL STRAINER

Turn the fuel valve OFF.

Remove the fuel cup and empty the gasoline into a suitable container. Remove the O-ring and strainer.

WARNING

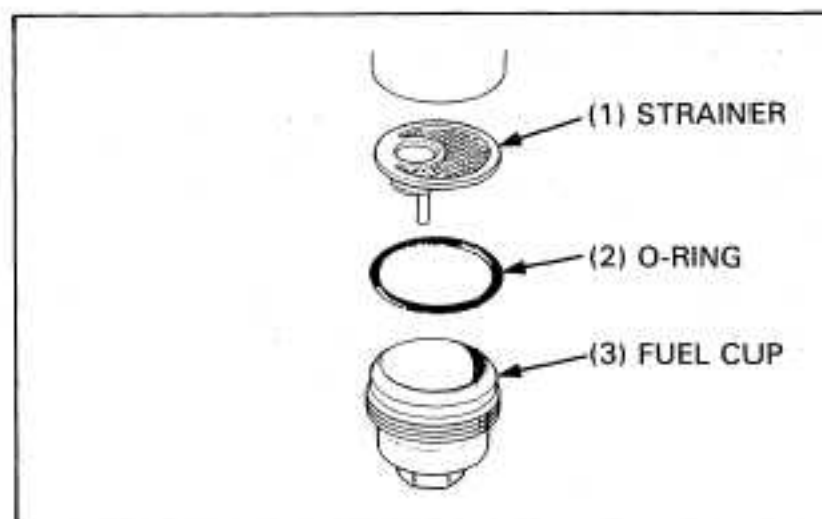
- *Gasoline is flammable and is explosive under certain conditions. Do not smoke or allow flames or sparks near the equipment while draining fuel.*

Wash the cup and strainer in clean nonflammable or high flash point solvent.

Reinstall the strainer, aligning the index marks on the fuel valve body and strainer. Install a new O-ring into the fuel valve body. Reinstall the fuel cup, making sure the new O-ring is in place. Hand tighten the fuel cup and torque to specification.

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

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



THROTTLE OPERATION

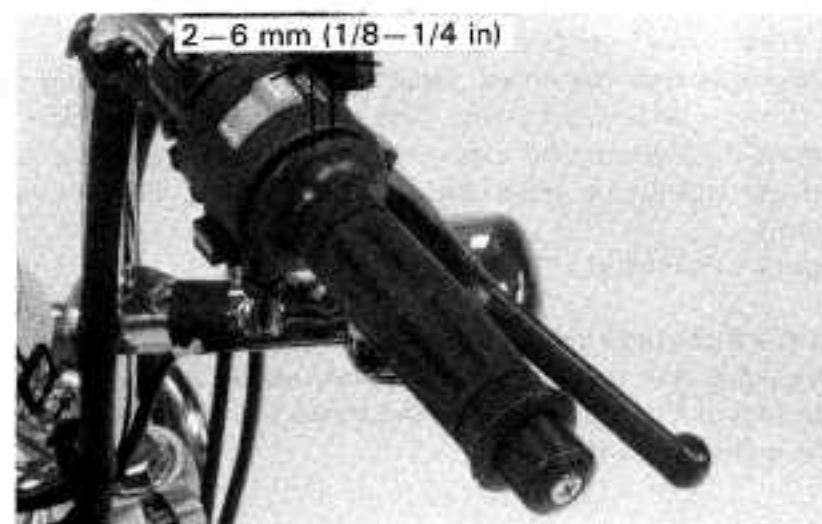
Check for smooth throttle grip full opening and automatic full closing in all steering positions.

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

Lubricate the throttle cables (page 2-5), if throttle operation is not smooth.

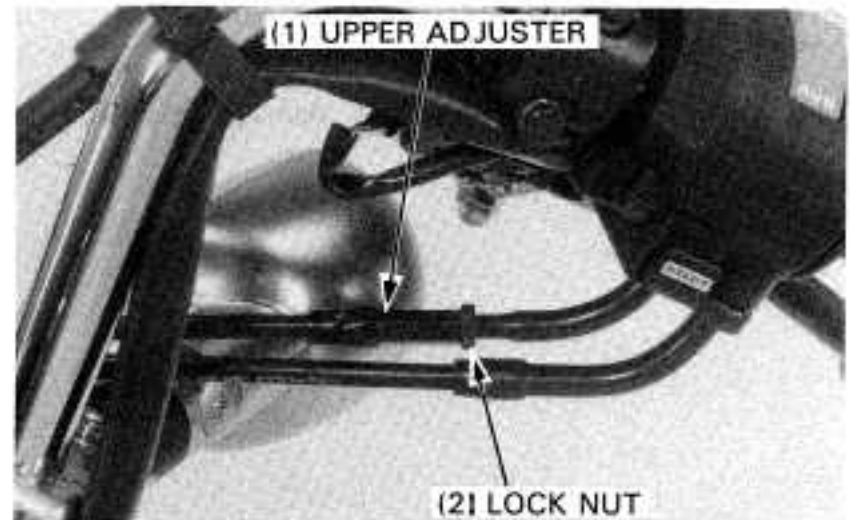
Measure throttle grip free play at the throttle grip flange.

FREE PLAY: 2–6 mm (1/8–1/4 in)



MAINTENANCE

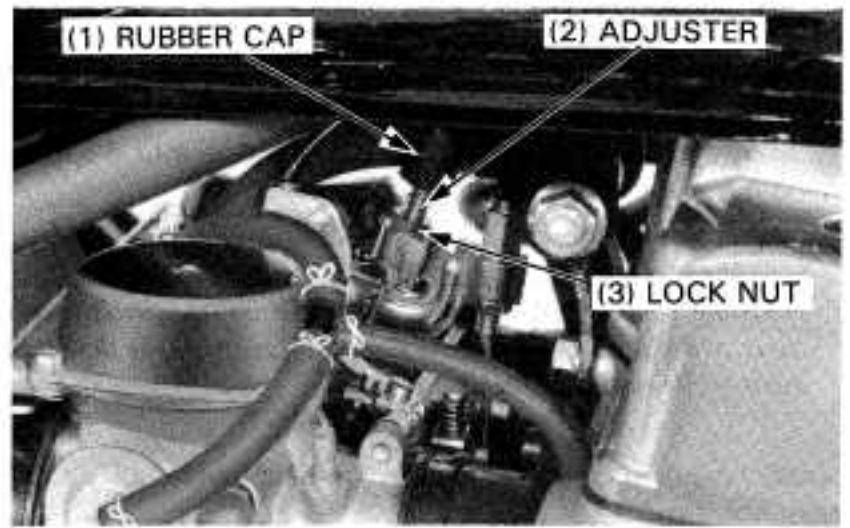
Throttle grip free play can be adjusted at either end of the throttle cable. Minor adjustments are made with the upper adjuster.



Major adjustments are made with the lower adjuster.

Adjust free play by pulling off the rubber cap, loosening the lock nut and turning the adjuster. Tighten the lock nut.

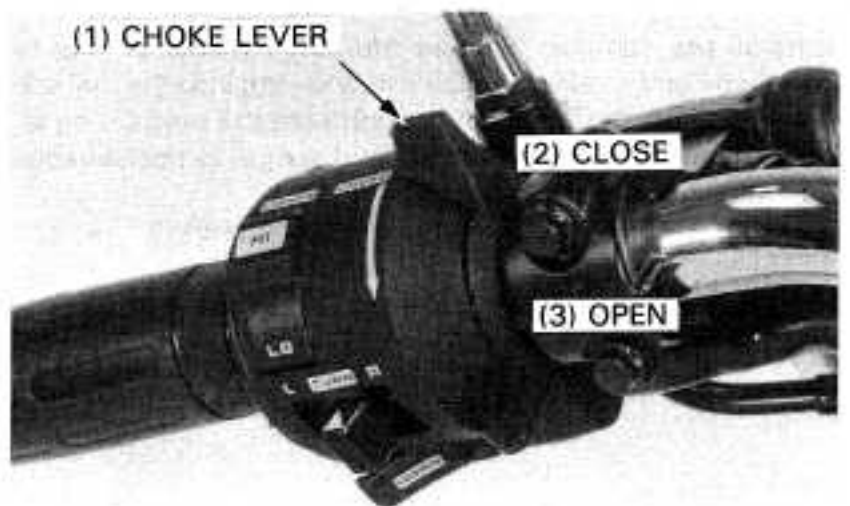
Recheck throttle operation in all steering positions.



CARBURETOR CHOKE

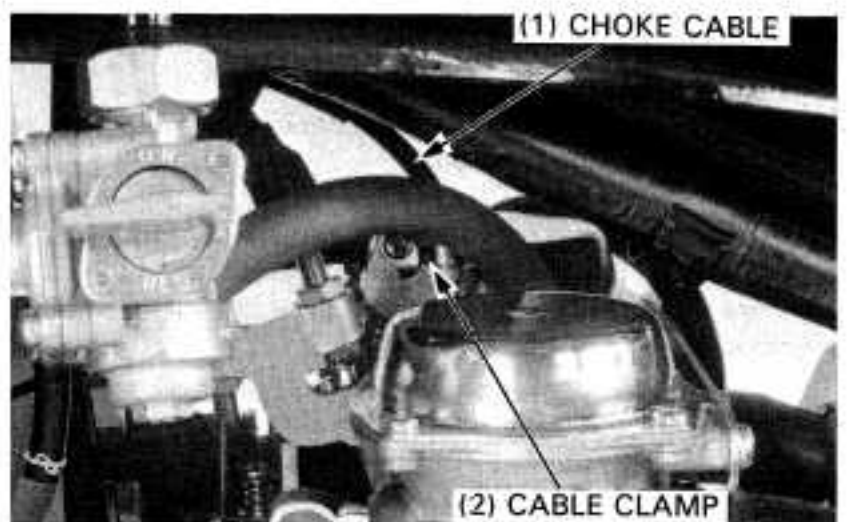
This choke system uses a fuel enriching circuit controlled by a bystarter valve. The bystarter valve opens the enriching circuit via a cable when the choke lever on the handlebar is pulled back.

Check for smooth upper choke lever operation. Lubricate the choke cable if the operation is not smooth.



Pull the choke lever back to the fully open position. Make sure that the choke valve is fully open by moving the choke arm at the carburetor. There should be no free play. Adjust if necessary by loosening the choke cable clamp and moving the choke cable casing so the choke valve is fully open. Tighten the clamp.

Push the choke lever up all the way to the fully closed position. Make sure that the choke valve is fully closed by checking the free play in the cable between the choke arm and cable casing. There should be free play.



AIR CLEANER

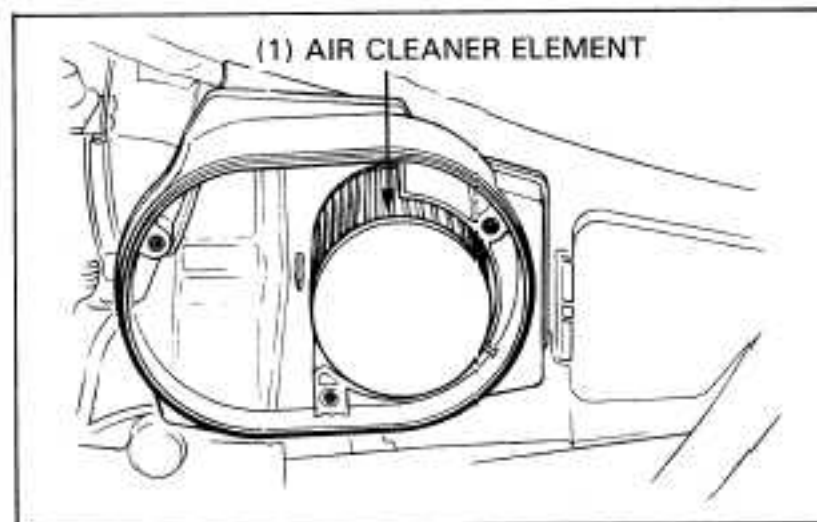
Remove the air cleaner case outer cover by removing the two bolts.



Remove the air cleaner case inner cover.



Remove and discard the air cleaner element.
Install a new element, and then install the removed parts in the reverse order of removal.



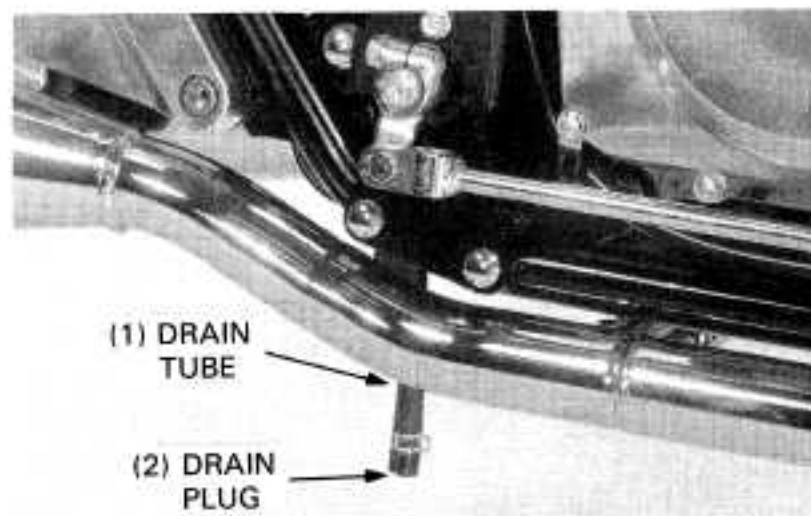
CRANKCASE BREATHER

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

Install the drain plug.

NOTE

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



MAINTENANCE

SPARK PLUGS

Recommended spark plugs

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

Disconnect the spark plug caps and clean any dirt from around the spark plug bases.

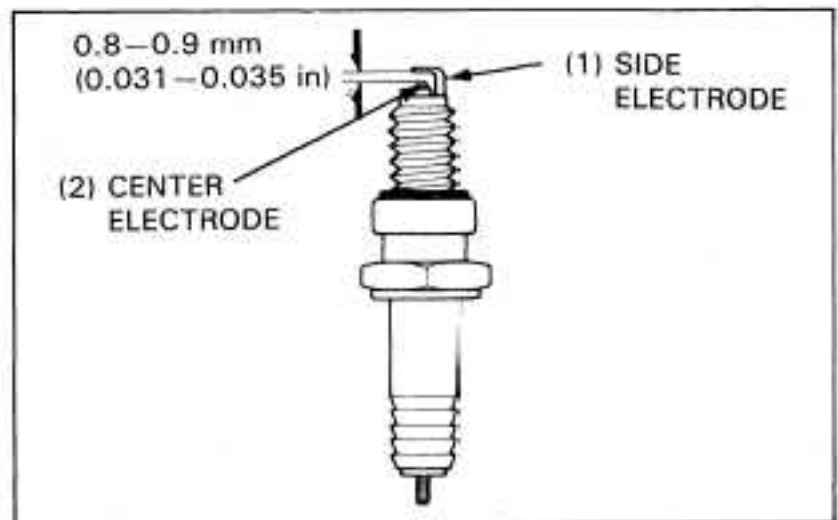
Remove and discard the spark plugs.

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

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

Adjust the spark plug gap by bending the side electrode carefully.

With the plug washer attached, thread each spark plug in by hand to prevent cross-threading. Tighten the spark plugs another 1/2 turn with a spark plug wrench to compress the plug washer. Connect the spark plug caps.



VALVE CLEARANCE

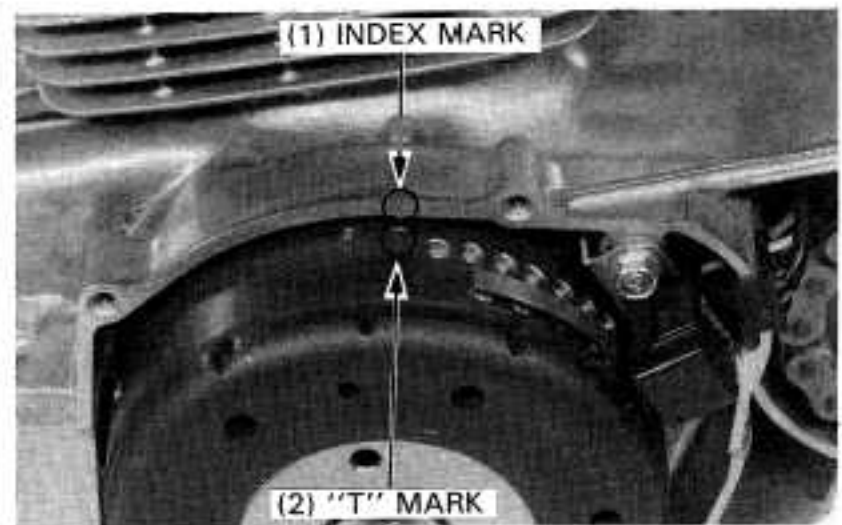
NOTE

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

Remove the left crankcase cover (page 9-2).

Remove the cylinder head cover (page 6-4).

Rotate the flywheel counterclockwise and align the flywheel "T" mark with the crankcase index mark.



Check the intake and exhaust valve clearance by inserting the feeler gauge between the clearance adjusting screw and the valve stem.

Before checking, make sure that the piston is at TDC on the compression stroke. (The rockers should be loose.)

VALVE CLEARANCE:

IN: 0.08–0.12 mm (0.003–0.005 in)

EX: 0.12–0.16 mm (0.005–0.006 in)

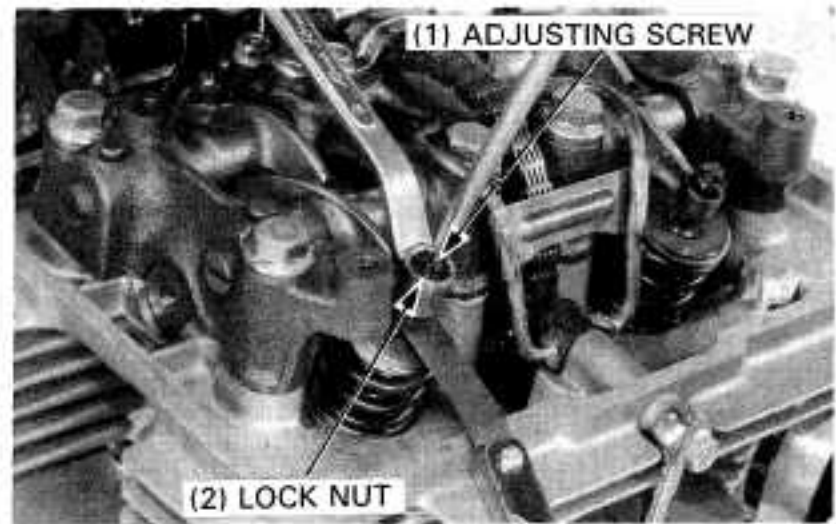


Adjust by loosening the lock nut and turning the screw until there is a slight drag on the feeler gauge.
Tighten the lock nut while holding the screw and recheck clearance.

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

Rotate the flywheel counterclockwise one full turn and align the "T" mark with the index mark.
Check the intake and exhaust valve clearance for the opposite cylinder.

Install the remove parts in the reverse order of removal.



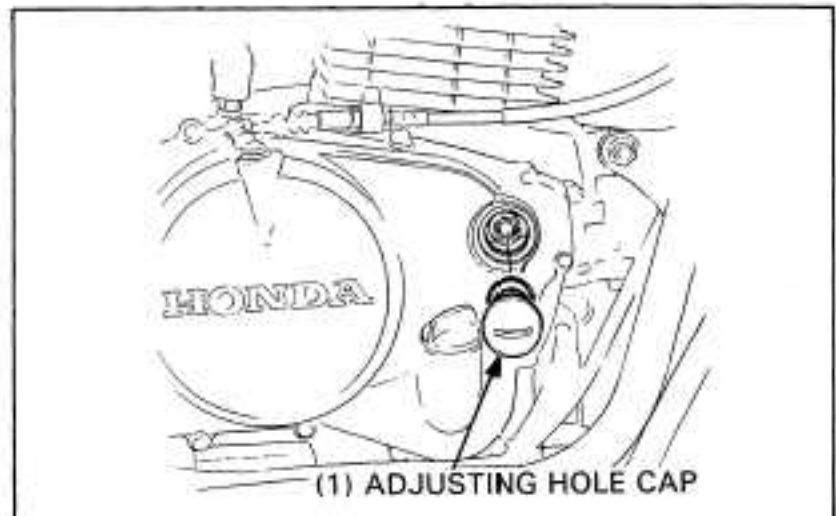
BALANCER CHAIN TENSION

Perform the following at the scheduled maintenance interval (pages 3-3 through 3-4) or if the balancer chain is noisy.
Remove the adjusting hole cap on the right crankcase cover.
Loosen the 8 mm adjusting nut.
When this nut is loosened, the balancer will position itself to provide proper chain tension.
Retighten the 8 mm nut to specified torque.

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

NOTE

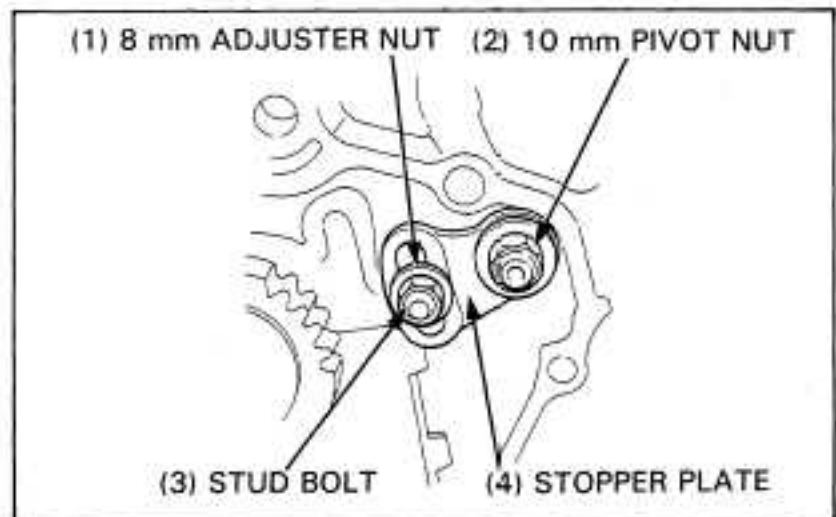
- Readjust as follows if the end of the stopper plate groove contacts the stud bolt.



Remove the right crankcase cover (page 8-3).
Remove the 10 mm and 8 mm nuts; remove the stopper plate.
Install the stopper plate, moving it over one spline to move the end of the stopper plate groove away from the stud bolt.
Reinstall the 8 mm nut first and then the 10 mm nut and tighten to the specified torques.

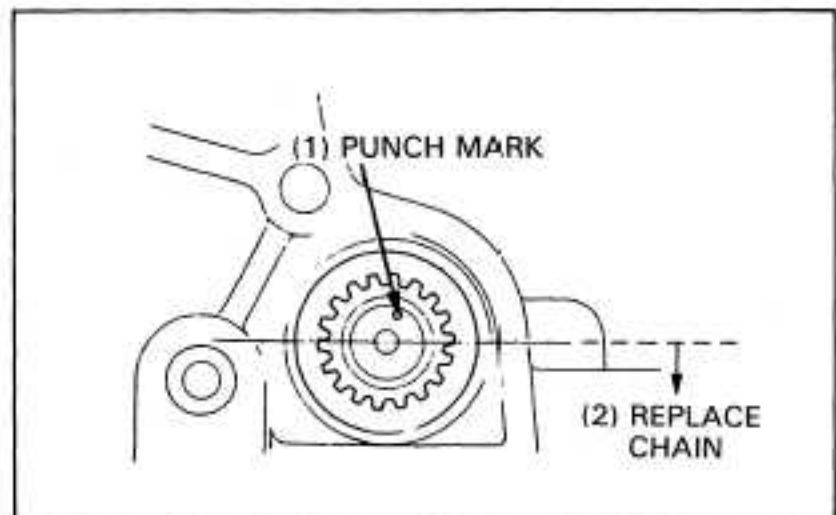
TORQUE:

- 8 mm: 20–25 N·m (2.0–2.5 kg-m, 14–18 ft-lb)
- 10 mm: 30–35 N·m (3.0–3.5 kg-m, 22–25 ft-lb)



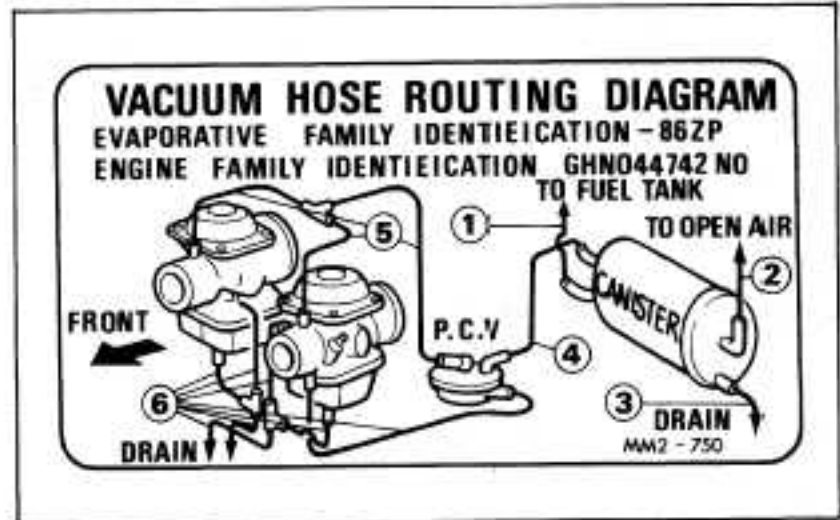
CAUTION

- Replace the chain if the punch mark on the shaft is below the horizontal line.
(Refer to Section 10)



EVAPORATIVE EMISSION CONTROL SYSTEM (California model only)

Check the tubes between the fuel tank, canister, purge control valve (P.C.V) and carburetors for deterioration, damage or loose connections.



Check the charcoal canister for cracks or damage and replace if necessary.

CYLINDER COMPRESSION

Warm up the engine to normal operating temperature.

Stop the engine and remove both spark plugs.

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

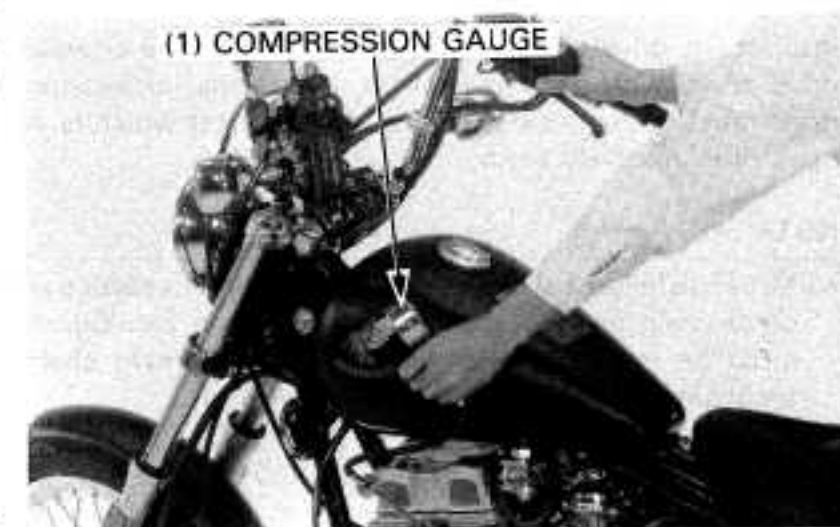
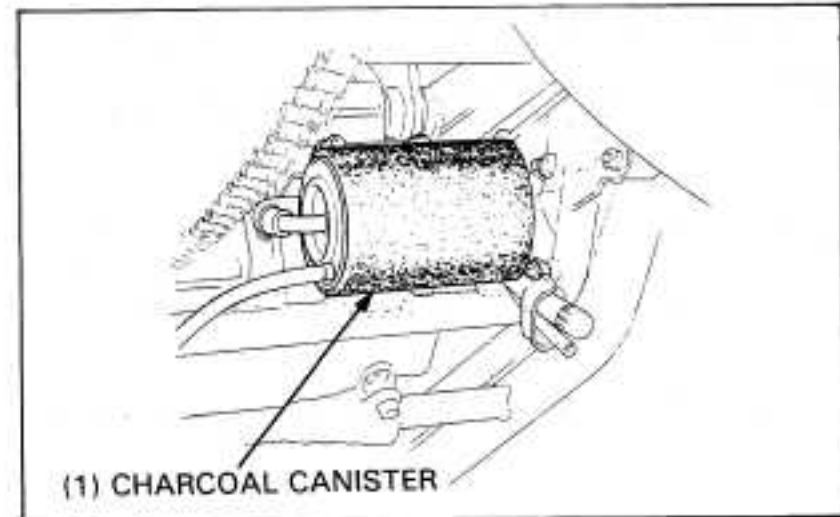
COMPRESSION PRESSURE:

1. 177 ± 196 kpa ($12.0 - 2.0$ kg/cm², 171 ± 28 psi)

If compression is low, check for the following:

- Leaky valves
- Improper valve clearance (too tight)
- Leaking cylinder head gasket
- Worn piston/ring/cylinder

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



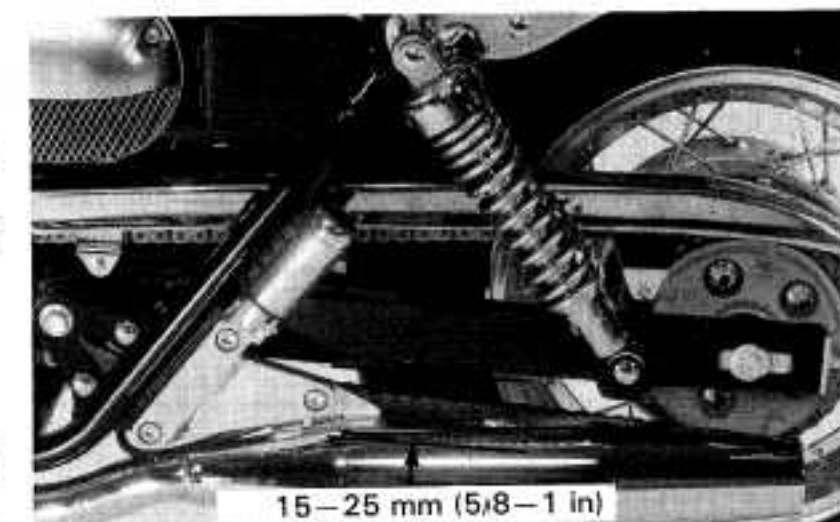
DRIVE CHAIN

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

STANDARD SLACK: 15–25 mm (5/8–1 in)

CAUTION

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



MAINTENANCE

Adjust as follows:

Loosen the rear axle nut and the lock nuts on both drive chain adjusting nuts.

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

NOTE

- Make sure that the same graduation scale on both adjusters align with the rear ends of the axle hole in the swingarm.

Tighten the adjusting nut lock nuts.

Tighten the rear axle nut.

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

Recheck the drive chain slack and free rotation of the rear wheel.

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

Check the chain wear label. If the red zone on the label aligns with or is beyond the arrow on the adjuster, the drive chain must be replaced and the sprockets probably need to be replaced as well.

REPLACEMENT DRIVE CHAIN: DID525V or RK525SMO-Z1

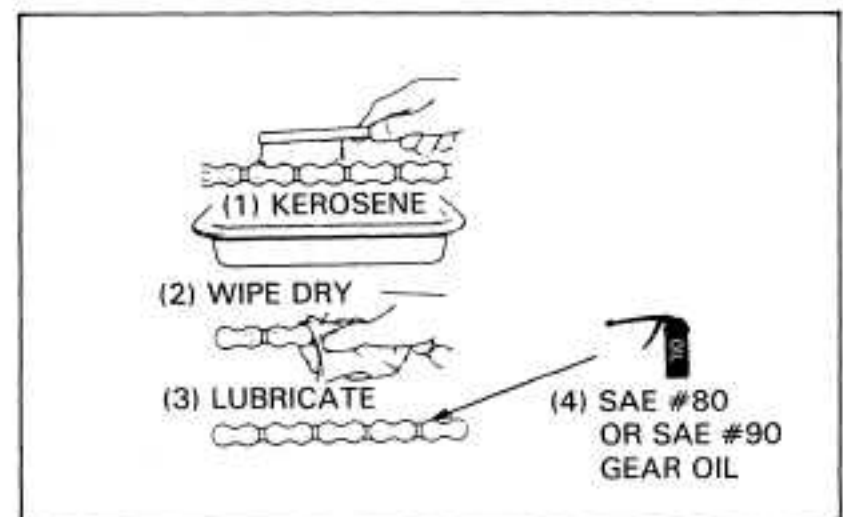
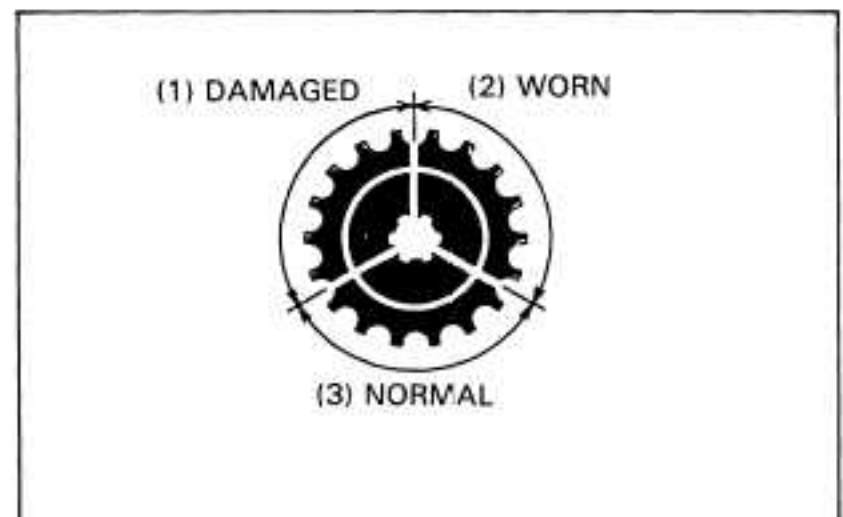
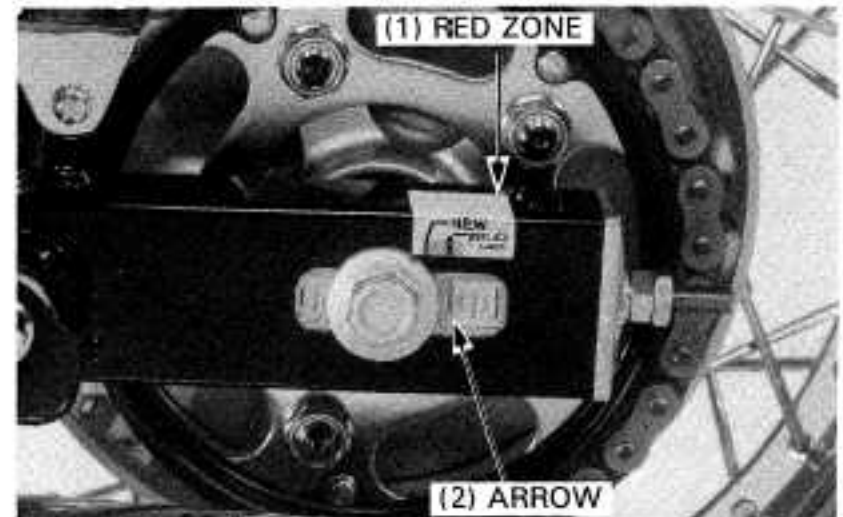
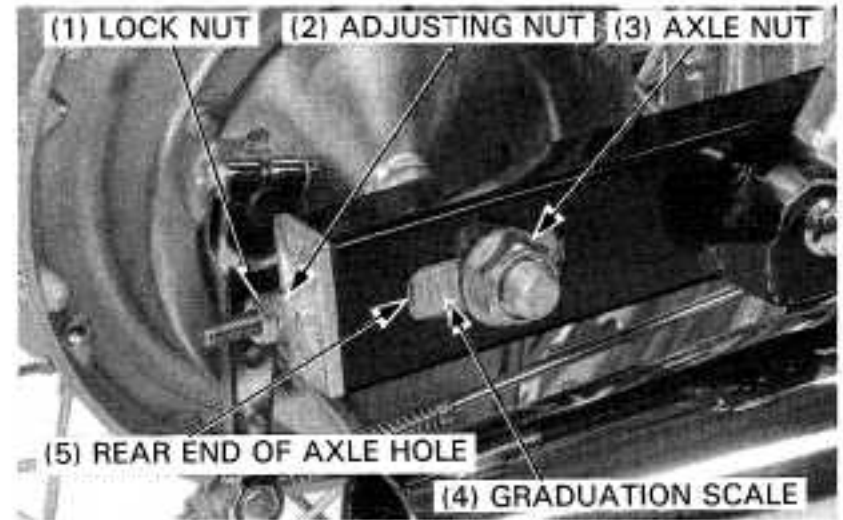
Inspect the drive chain and sprockets for damage or wear. A drive chain with damaged rollers, loose pins, or missing O-rings must be replaced. Replace any sprocket which is damaged or excessively worn.

NOTE

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

Lubrication and cleaning:

The drive chain on this motorcycle is equipped with small O-rings between the link plates. The O-rings can be damaged by steam cleaners, high pressure washers, and certain solvents. Clean the chain with kerosene. Wipe dry and lubricate only with SAE #80 or #90 gear oil. Commercial chain lubricants may contain solvents which could damage the rubber O-rings.



BATTERY

Support the motorcycle upright on level ground. Inspect the battery electrolyte level. When the electrolyte level nears the lower level line, remove the battery and add distilled water to the upper level as follows:

Remove the battery cover bolt and swing the cover down. Open the battery terminal cover. Disconnect the negative cable at the battery, then disconnect the positive cable. Disconnect the battery breather hose from the battery. Pull the battery out, remove the filler caps and add distilled water to the upper level line. Reinstall the filler caps and the battery.

NOTE

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

WARNING

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

BRAKE FLUID

Check the front brake fluid through the sight glass; if the level is visible, remove the cover, set plate and diaphragm. Fill the reservoir to the upper lever with DOT 3 or DOT 4 brake fluid from a sealed container. Check the system for leaks.

CAUTION

- Do not remove the reservoir cover until the handlebar has been turned so that the reservoir is level.
- Do not mix different types of fluid other than DOT 3 or DOT 4; as they are not compatible with each other.
- Do not allow foreign material to enter the system when filling the reservoir.
- Avoid spilling the fluid on painted, plastic or rubber parts.
- Place a rag over these parts whenever the system is serviced.

Refer to section 13 for brake bleeding procedures.

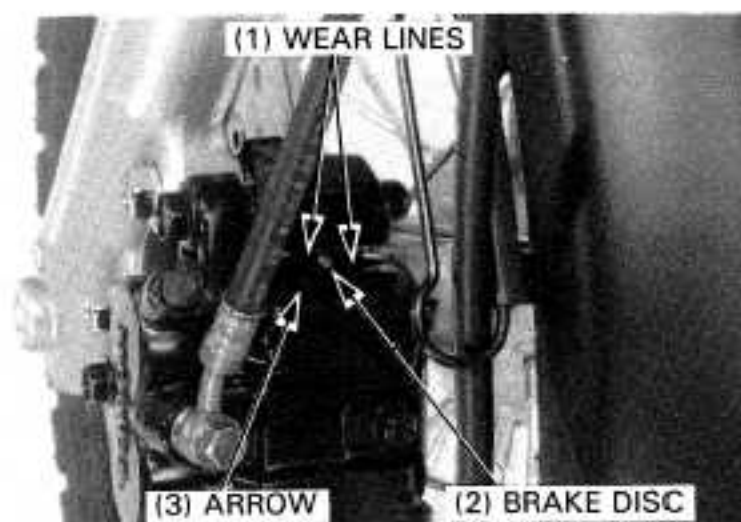
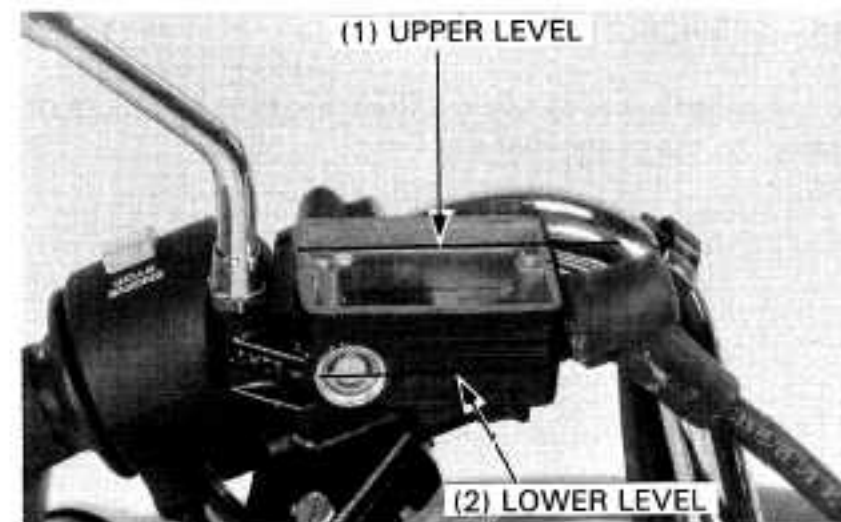
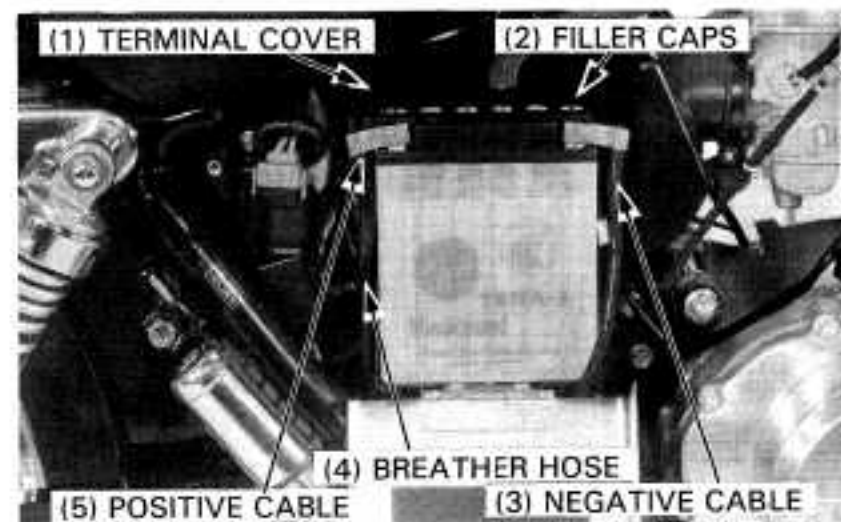
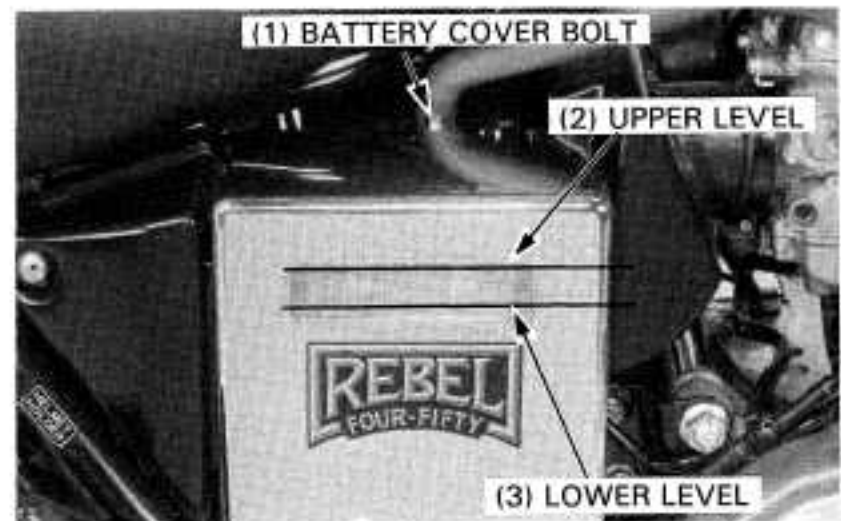
BRAKE SHOE/PAD WEAR

BRAKE PAD

Check the brake pads for wear by looking through the slot indicated by the arrow cast on the caliper assembly. Replace the brake pads if the wear line on either pad reaches the edge of the brake disc (page 13-3).

CAUTION

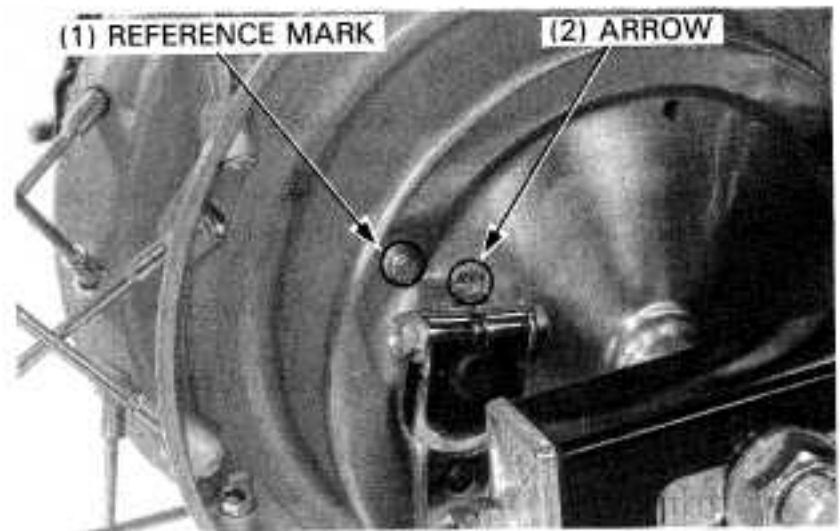
- Always replace the brake pads in pairs to assure even disc pressure.



MAINTENANCE

BRAKE SHOES

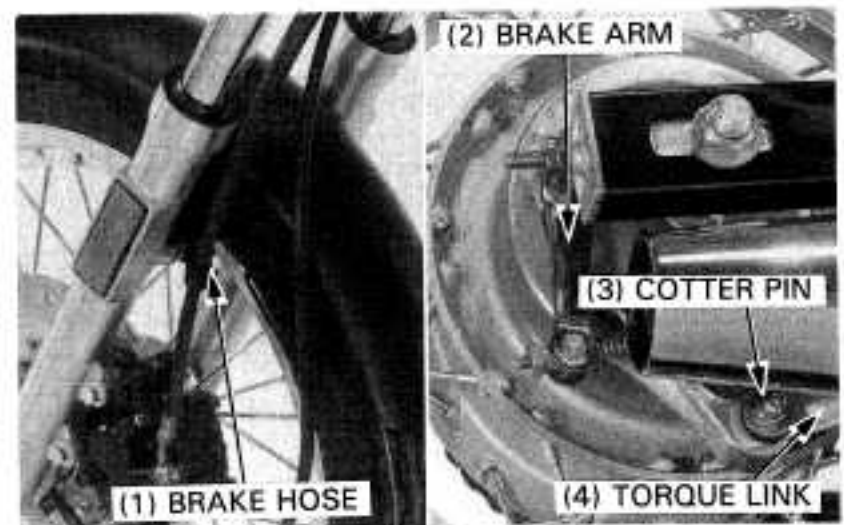
Replace the brake shoes if the arrow on the brake arm aligns with the reference mark "▲" when the brake is fully applied.



BRAKE SYSTEM

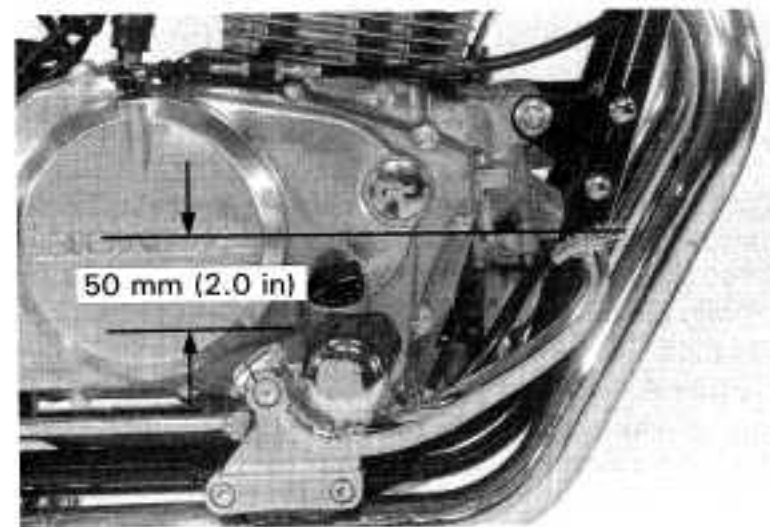
Inspect the brake hoses and fittings for deterioration, cracks and signs of leakage. Tighten any loose fittings. Replace hoses and fittings as required.

Inspect the brake arm and torque link for loose connections or damage. Check that the cotter pin is properly installed.



BRAKE PEDAL HEIGHT

Adjust brake pedal so that the pedal height is 50 mm (2.0 in) above the top of the foot peg.

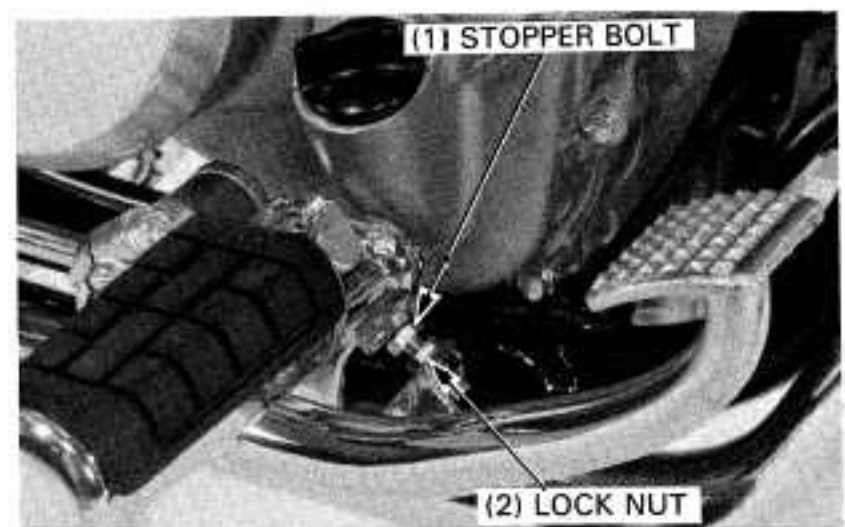


To Adjust:

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

NOTE

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



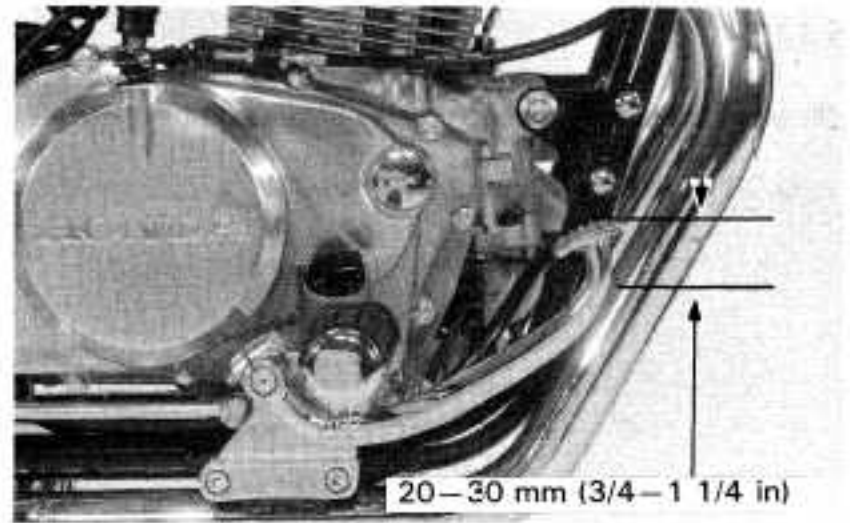
BRAKE PEDAL FREE PLAY

NOTE

- Perform brake pedal free play adjustment after adjusting brake pedal height.

Check the brake pedal free play.

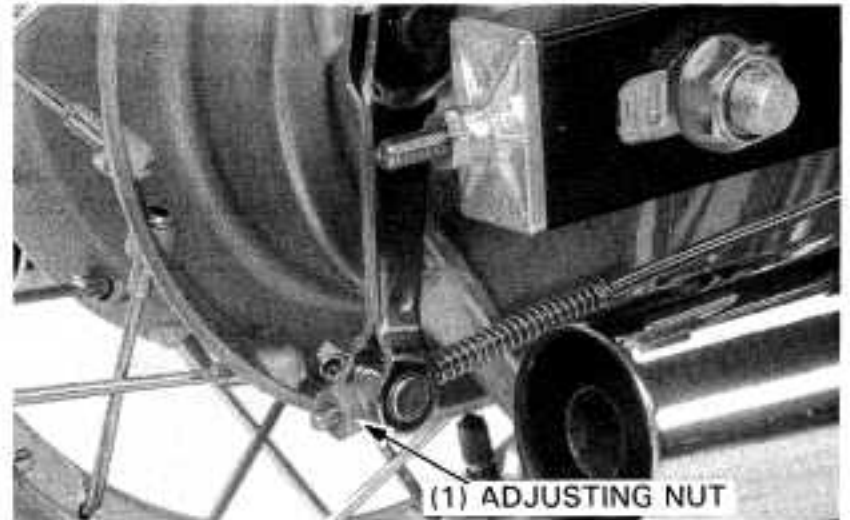
FREE PLAY: 20–30 mm (3/4–1-1/4 in)



If adjustment is necessary, use the rear brake adjusting nut.

NOTE

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

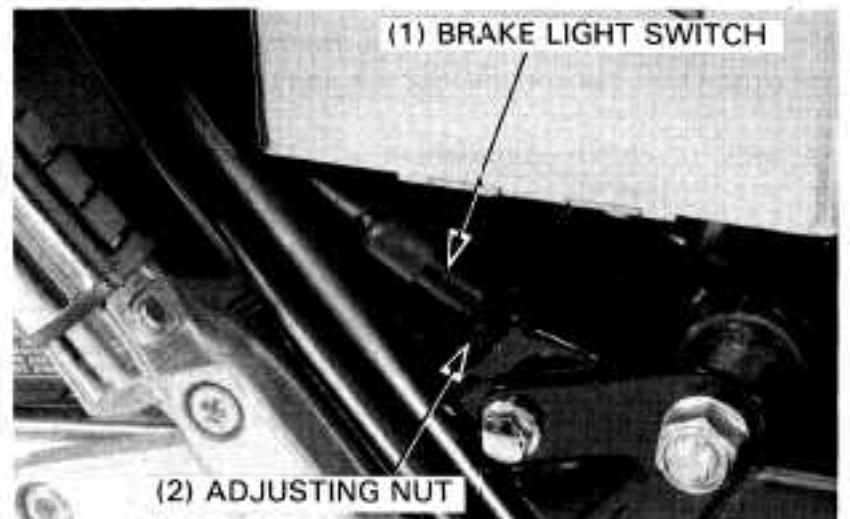


BRAKE LIGHT SWITCH

NOTE

- Perform rear brake light switch adjustment after adjusting the brake pedal play and height.
- The front brake light switch does not require adjustment.

Adjust the brake light switch so that the brake light will come on when the brake pedal is depressed 20 mm (3.4 in), and brake engagement begins. Hold the switch body and turn the adjusting nut. Do not turn the switch body.



HEADLIGHT AIM

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

Horizontal adjustments are made using the horizontal adjusting screw. A clockwise rotation directs the beam toward the right side of the rider.

NOTE

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

WARNING

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



MAINTENANCE

CLUTCH

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

FREE PLAY: 10–20 mm (3/8–3/4 in)

Minor adjustments are made with the upper adjuster at the clutch lever. Loosen the lock nut and turn the adjuster.

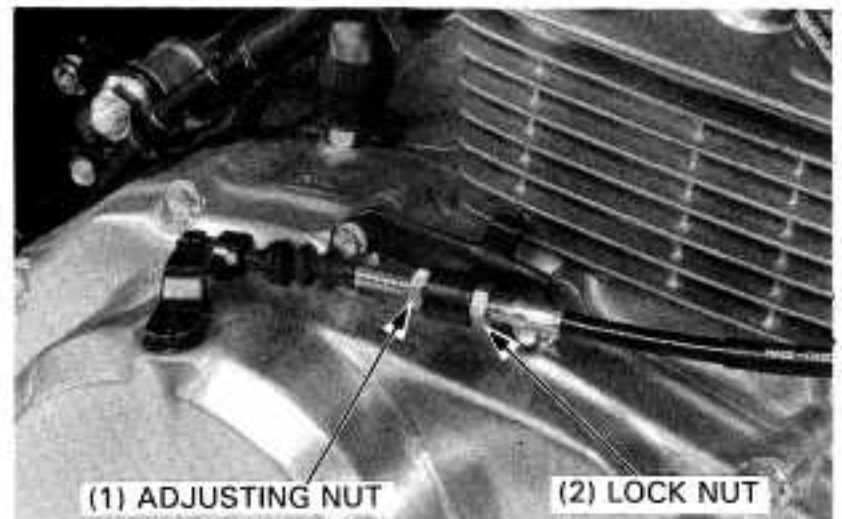
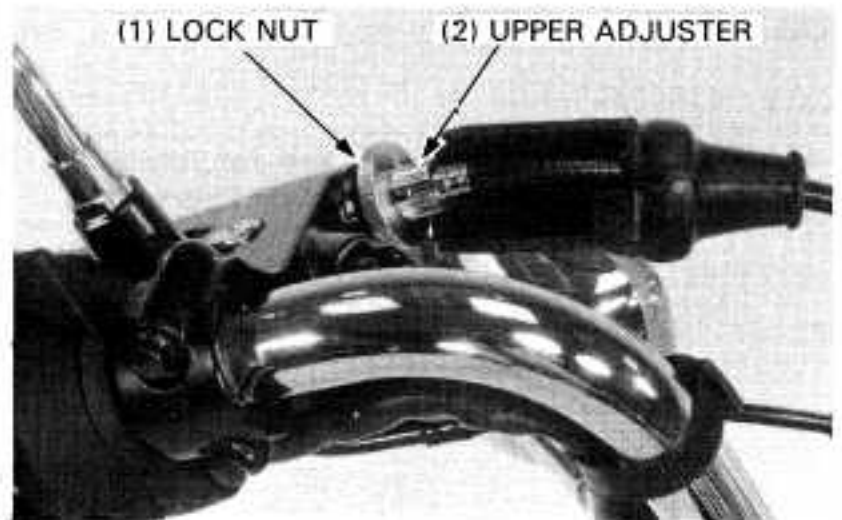
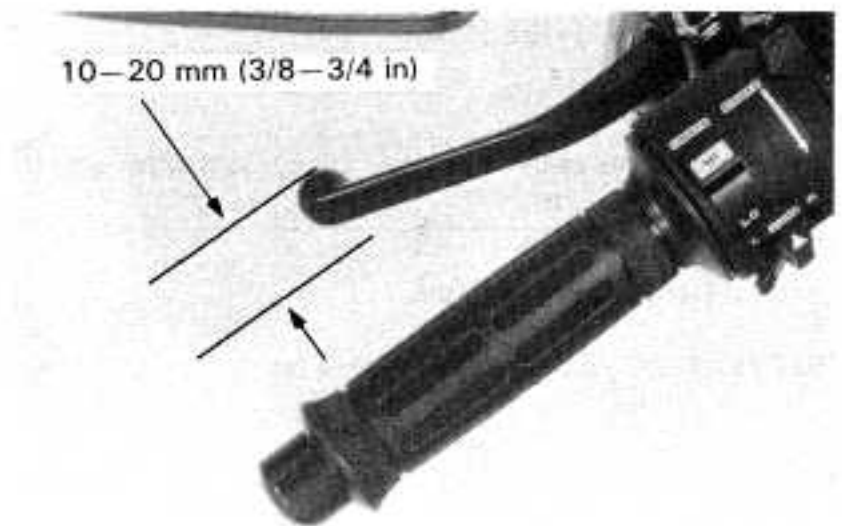
NOTE

- Do not expose the threads of the adjuster by more than 8 mm (3.8 in).

If the specified free play cannot be obtained with a minor adjustment, loosen the lock nut and turn in the upper adjuster completely; then make a major adjustment.

Major adjustments are made with the lower adjusting nut at the clutch arm. Loosen the lock nut and turn the adjusting nut.

Recheck the clutch operation.



SIDE STAND

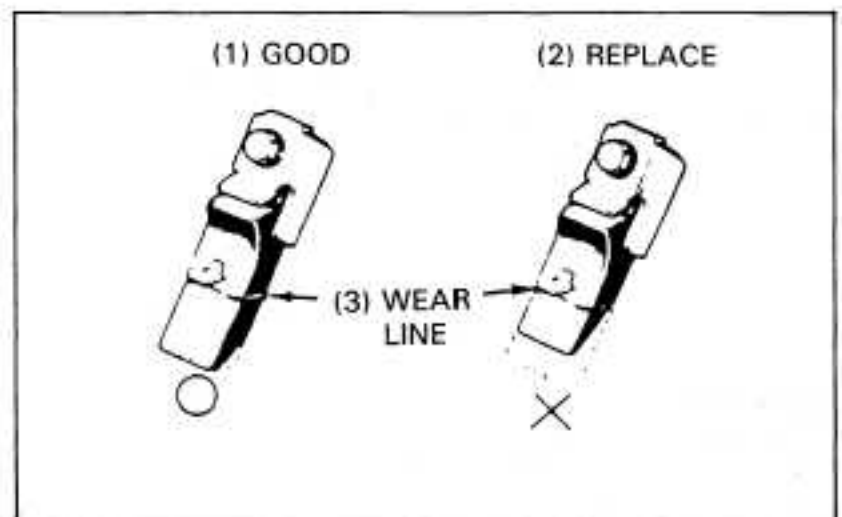
Support the motorcycle by placing a jack or block under the engine.

Check the rubber pad on the side stand for deterioration and wear.

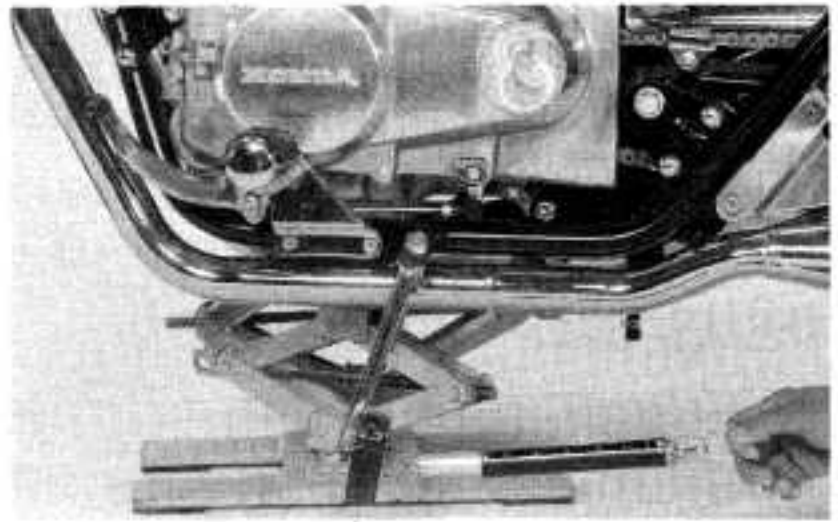
Replace the rubber pad if wear extends to any point of the wear line.

NOTE

- When replacing, use a rubber pad with the mark "Over 260 lbs. ONLY".



Check the side stand for damage or loss of tension. Using a spring scale, measure the force required to retract the side stand. It should be within 2–3 kg (4.4–6.6 lbs), as shown. Check the side stand assembly for freedom of movement. Make sure that the side stand is not bent.



SUSPENSION

WARNING

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

FRONT

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

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

Tighten all nuts and bolts.



REAR

Check the action of the rear shock absorbers by compressing them several times.

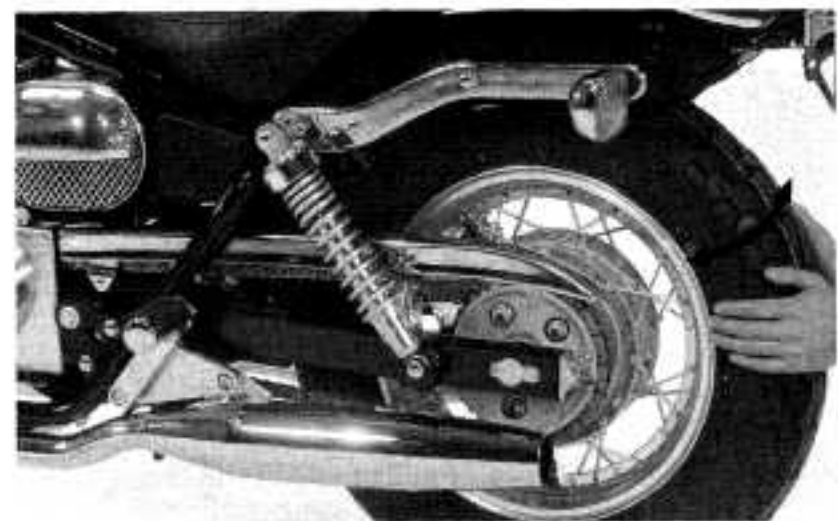
Check each shock absorber assembly for leaks or damage. Replace any damaged components which cannot be repaired.

Tighten all nuts and bolts.



Raise the rear wheel off the ground by placing jacks or support blocks under the exhaust pipes. Protect the exhaust pipe surfaces from damage with shop towels.

Check for worn swingarm bearings by grabbing the rear wheel as shown, and attempting to move the wheel side to side. Replace the bearings if any looseness is noted (page 12-13).



MAINTENANCE

NUTS, BOLTS, FASTENERS

Check that all chassis nuts and bolts are tightened to correct torque values (page 1-5).

Check that all cotter pins, safety clips, hose clamps and cable stays are in place.

WHEELS/TIRES

TIRE PRESSURE

NOTE

- The pressure should be checked when tires are COLD.

Check the tires for cuts, embedded nails, or other damage.

Recommended tire pressures and tire sizes:

Tire size		Front	Rear
Cold tire pressures psi (kPa, kg/cm ²)	Up to 90 kg (200 lbs) load	28 (200, 2.0)	28 (200, 2.0)
	90 kg (200 lbs) load to vehicle capacity load	28 (200, 2.0)	28 (200, 2.0)
Tire brand		TUBELESS ONLY	
BRIDGESTONE		L303	G508
DUNLOP		F11	K627

Check the front and rear wheels for trueness (Refer to sections 11 and 12).

Measure the tread depth at the center of the tires.

Replace the tires when the tread depth reaches the following limits:

Minimum tread depth: Front: 1.5 mm (1/16 in)
Rear: 2.0 mm (3/32 in)

Tighten the wheel spokes periodically.

TORQUE: 7–11 N·m (0.7–1.1 kg-m, 5–8 ft-lb)

TOOLS:

Spoke nipple wrench set	07701–0030000
– Bit	07701–0030100
– Socket	07701–0030200

or equivalents commercially available in U.S.A.

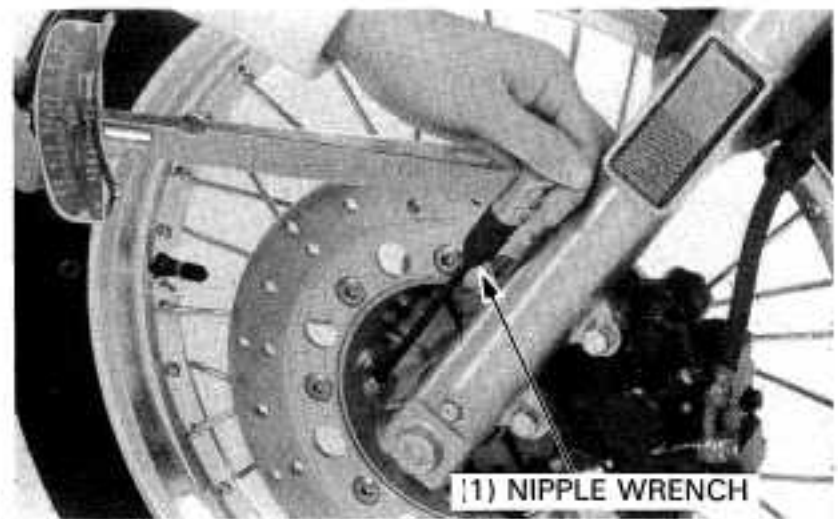
STEERING HEAD BEARINGS

NOTE

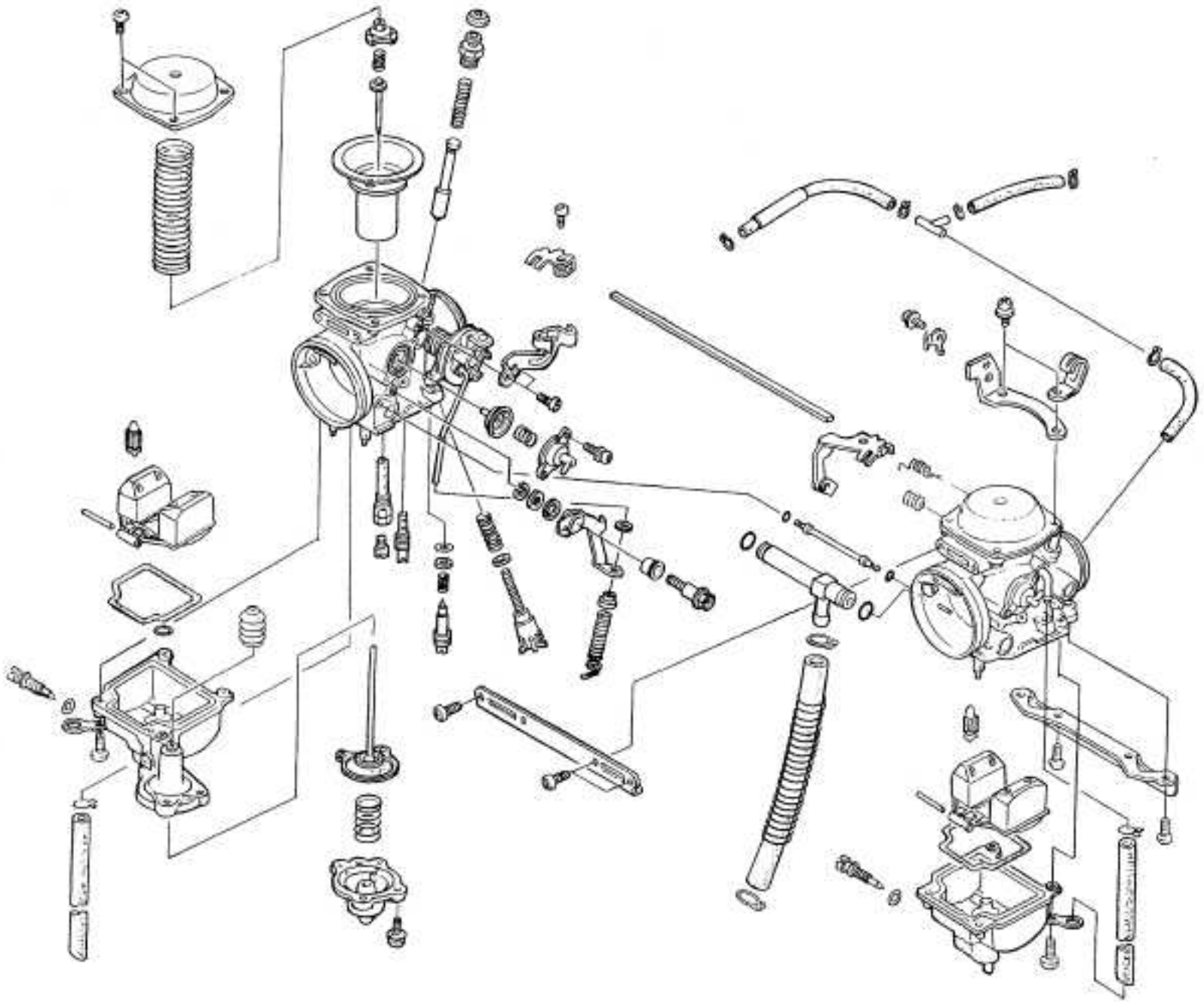
- Check that the control cables do not interfere with handlebar rotation.

Raise the front wheel off the ground.

Check that the handlebar moves freely from side to side. If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering head bearings (Section 11).



MEMO



4. FUEL SYSTEM

4

SERVICE INFORMATION	4-1	CARBURETOR ASSEMBLY	4-10
TROUBLESHOOTING	4-2	CARBURETOR INSTALLATION	4-12
CARBURETOR REMOVAL	4-3	PILOT SCREW ADJUSTMENT	4-12
VACUUM CHAMBER	4-3	LIMITER CAP INSTALLATION	4-13
FLOAT CHAMBER	4-4	HIGH ALTITUDE ADJUSTMENT	4-13
CARBURETOR CHOKE	4-6	FUEL TANK	4-14
ACCELERATOR PUMP	4-7	AIR CLEANER CASE	4-16
CARBURETOR SEPARATION	4-8	EVAPORATIVE EMISSION CONTROL SYSTEM (California model)	4-17
AIR CUT-OFF VALVE	4-9		
CARBURETOR CLEANING	4-10		

SERVICE INFORMATION

GENERAL

- All hoses used in the evaporative and exhaust emission control systems are numbered for identification. When connecting any of these, compare the hose number with the Vacuum Hose Routing Label, page 1-16 (California model only) for its correct routing and fitting connection.
- Use caution when working with gasoline. Always work in a well-ventilated area and away from sparks or open flames.
- When disassembling fuel system parts, note the locations of the O-rings. Replace them with new ones on reassembly.
- The float bowls have drain plugs that can be loosened to drain residual gasoline.

SPECIFICATIONS

<>: California model

Venturi dia.	29.3 mm (1.15 in)
Identification number	VE24A <VE26A>
Float level	18.5 mm (0.73 in)
Pilot screw opening	See page 4-12
Idle speed	1,200 ± 100 rpm
Fast idle	2,500 ± 500 rpm
Throttle grip free play	2–6 mm (0.08–0.24 in)
Main jet	#112

TOOLS

Special

Pressure pump/gauge	ST-AH-255-MC7 (U.S.A only)
Vacuum pump/gauge	ST-AH-260-MC7 (U.S.A only)
Pilot screw wrench	07908–4220201

Common

Float level gauge	07401–0010000
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TROUBLESHOOTING

Engine cranks but won't start

- No fuel in tank
- No fuel to carburetor
- Engine flooded with fuel
- No spark at plug (ignition malfunction)
- Air cleaner clogged
- Intake air leak
- Improper choke operation
- Improper throttle operation
- Faulty purge control valve (California model only)

Hard starting or stalling after starting

- Improper choke operation
- Ignition malfunction
- Fast idle speed incorrect
- Carburetor malfunction
- Fuel contaminated
- Intake air leak
- Idle speed incorrect
- Faulty purge control valve (California model only)
- Faulty hoses of evaporative emission control system (California model only)

Rough idle

- Ignition malfunction
- Idle speed incorrect
- Incorrect carburetor synchronization
- Carburetor malfunction
- Fuel contaminated
- Faulty purge control valve (California model only)
- Faulty hoses of the evaporative emission control system (California model only)

Misfiring during acceleration

- Ignition malfunction
- Faulty air cut-off valve
- Lean mixture

Backfiring

- Ignition malfunction
- Carburetor malfunction
- Faulty air cut-off valve
- Lean mixture

After burning during deceleration

- Ignition system faulty
- Faulty air cut-off valve
- Lean mixture
- Faulty exhaust emission control system
- Faulty hoses of the evaporative emission control system (California model only)

Incorrect fast idle speed

- Incorrect choke cable free play
- Choke valve stack or damage
- Choke valve not synchronized

Poor performance (driveability) and poor fuel economy

- Fuel system clogged
- Ignition malfunction
- Dirty air cleaner
- Faulty hoses of the evaporative emission control system (California model only)

Lean mixture

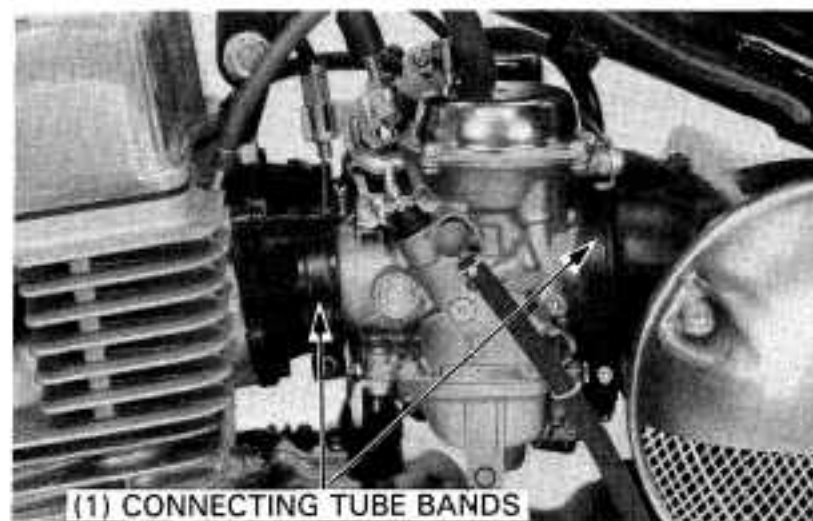
- Clogged fuel jets
- Vacuum piston sticking
- Faulty float valve
- Float level low
- Fuel cap vent blocked
- Fuel strainer screen clogged
- Restricted fuel line
- Air vent tube clogged
- Intake air leak

Rich mixture

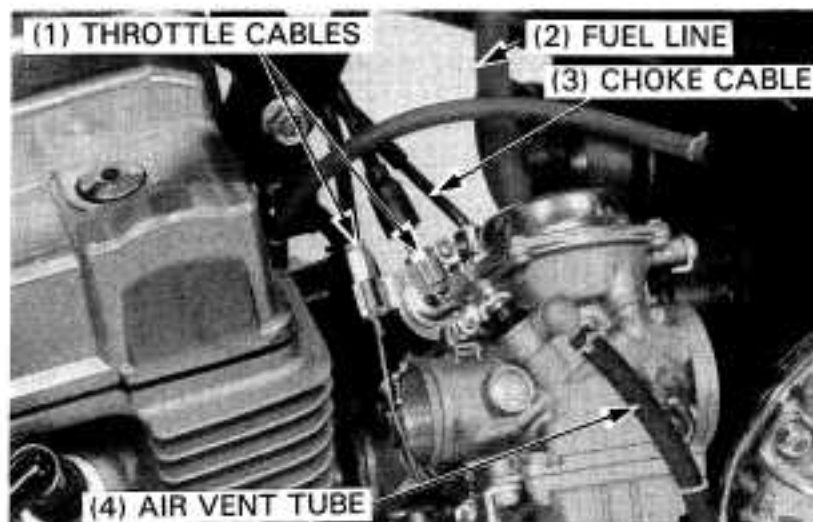
- Faulty float valve
- Float valve too high
- Choke stuck closed
- Air cut-off valve sticking closed
- Dirty air cleaner
- Needle and seat faulty or worn
- Faulty float valve

CARBURETOR REMOVAL

Remove the seat and frame side covers.
 Remove the fuel tank (page 4-14).
 Loosen the air cleaner and carburetor connecting tube bands.
 Remove the air cleaner mounting bolts (page 4-16) and slide the air cleaner to the rearward.

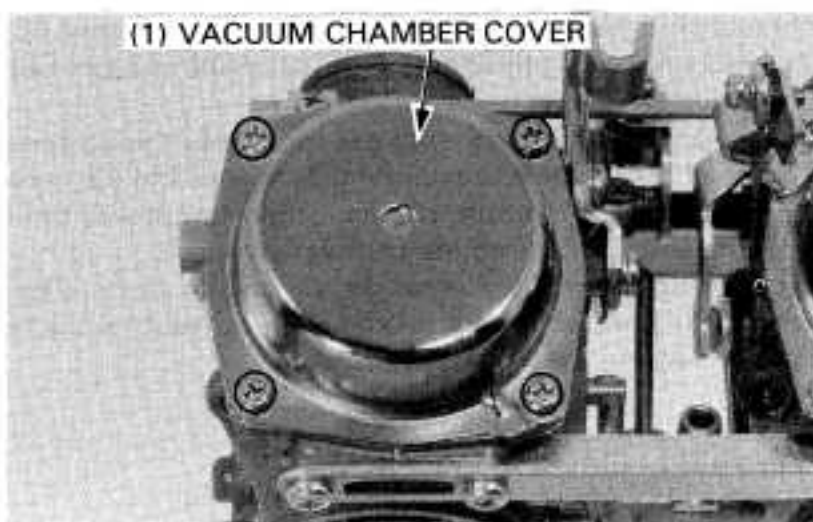


Disconnect the fuel line and the air vent and vacuum tubes from the carburetor.
 Disconnect the throttle and choke cables from the carburetors and then remove the carburetor.



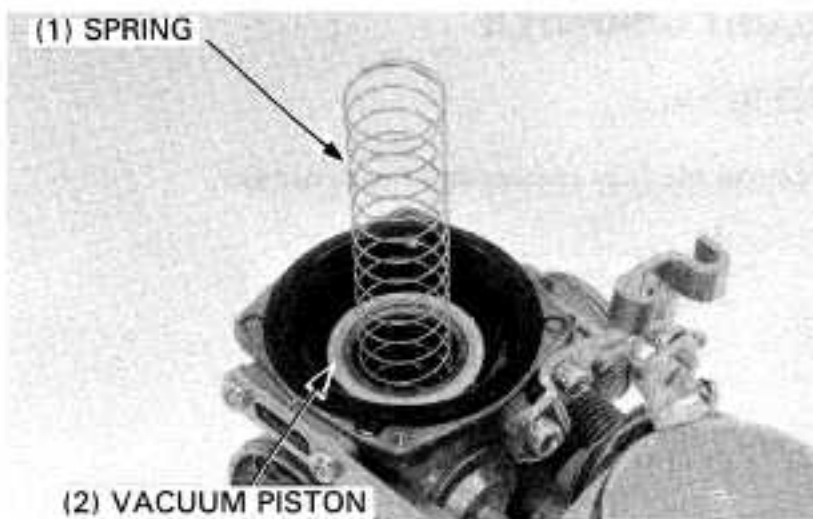
VACUUM CHAMBER

Remove the four screws and the vacuum chamber cover.



Remove the spring and vacuum piston.

Inspect the vacuum piston for wear, nicks, scratches or other damage. Make sure the piston moves up and down freely in the chamber.



FUEL SYSTEM

Push the needle holder in and turn it 60 degrees with an 8 mm socket. Then remove the needle holder, spring and needle from the vacuum piston.

Inspect the needle for excessive wear or other damage. Check the vacuum piston diaphragm for deterioration and tears.

Installation is essentially the reverse order of removal but to keep from distorting the diaphragm, install the vacuum piston/diaphragm as follows:

Insert the vacuum piston, with the spring into the carburetor. Stick your finger into the carburetor bore and hold the vacuum piston up, the full throttle position, then turn down the diaphragm so its lip fits into the carburetor groove.

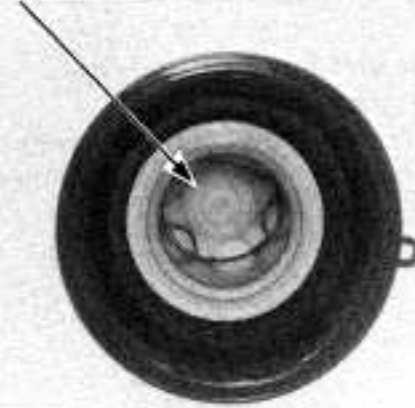
Install the vacuum chamber cover, aligning its cavity with the hole in the carburetor and secure with at least two screws before releasing the vacuum piston.

FLOAT CHAMBER

REMOVAL

Remove the four screws and float chamber.

(1) NEEDLE HOLDER



(1) DIAPHRAGM

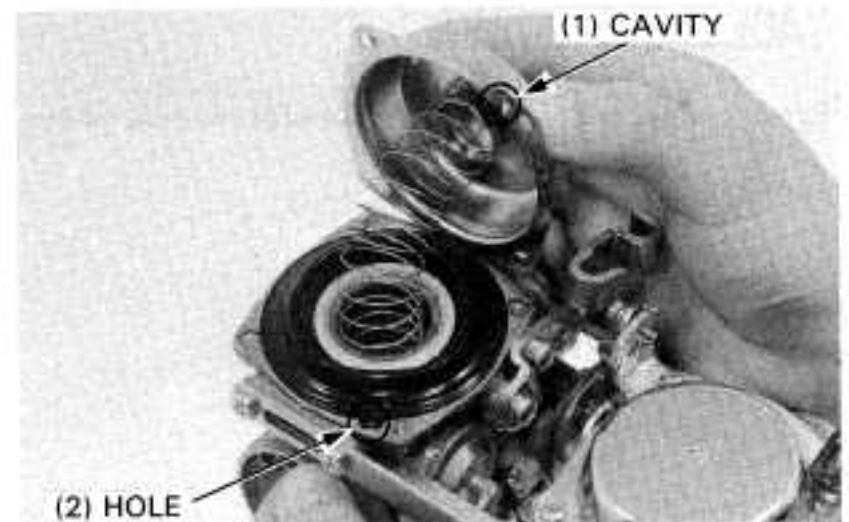


(2) JET NEEDLE



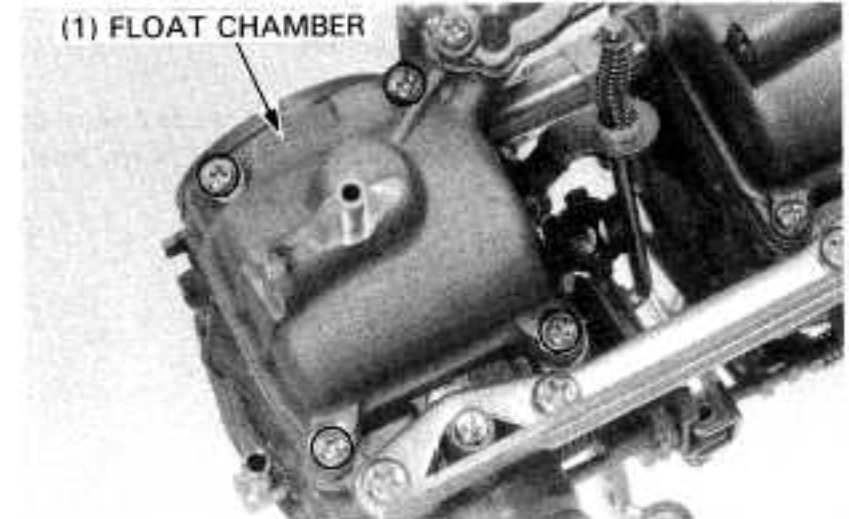
(3) SPRING

(1) CAVITY



(2) HOLE

(1) FLOAT CHAMBER



FLOAT LEVEL

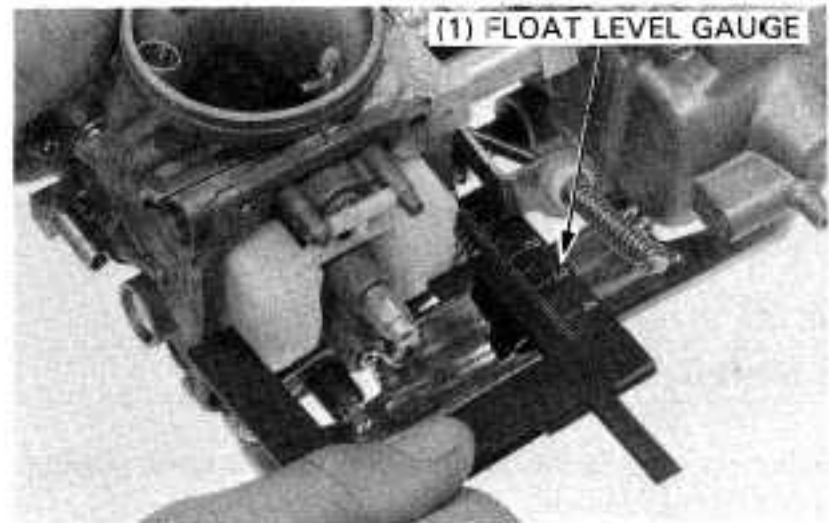
Measure the float level with the float tang just contacting the float valve.

SPECIFICATION: 18.5 mm (0.73 in)

Replace the float assembly, if it is not within specification.

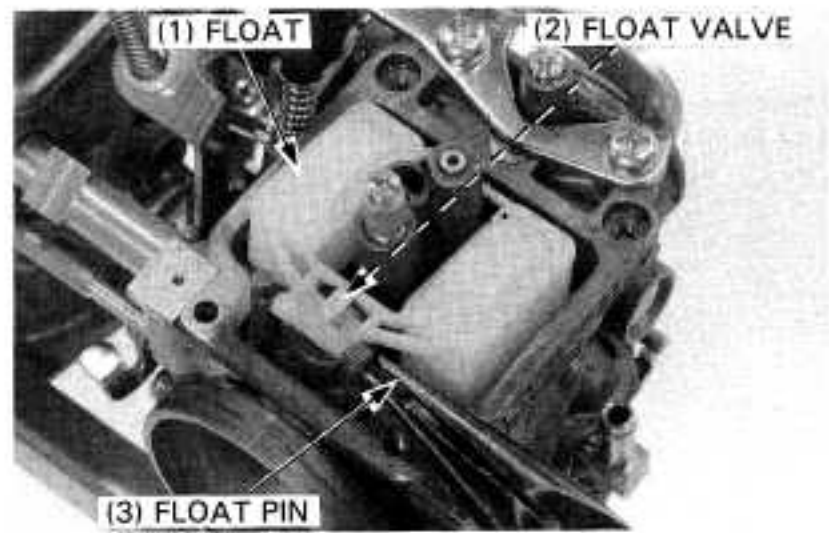
TOOL:

Float level gauge **07401-0010000**

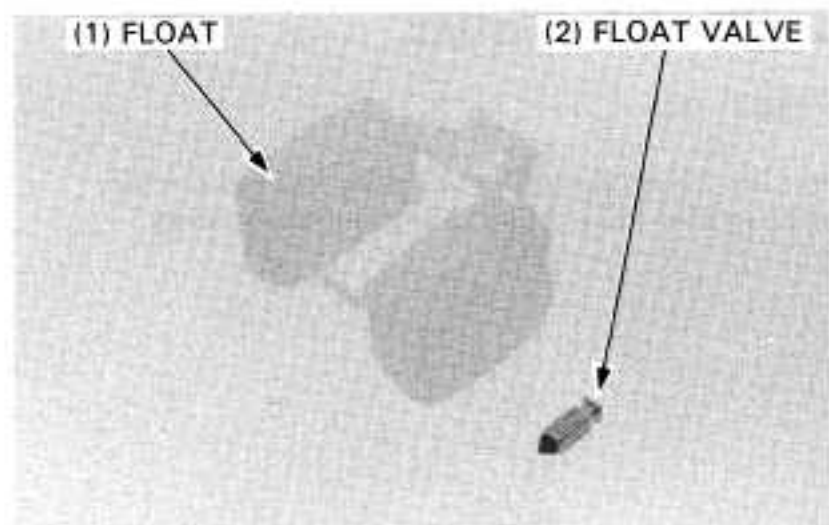


FLOAT AND JETS

Remove the float pin, float and float valve.



Inspect the float valve for grooves or damage.
Inspect the operation of the float valve.



NOTE

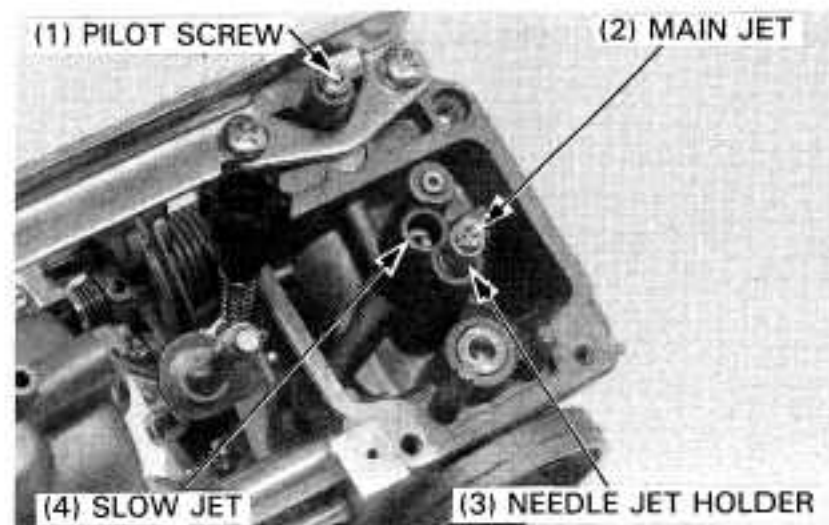
- The pilot screws are factory pre-set and should not be removed unless the carburetor is overhauled.

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

CAUTION

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

Remove the pilot screw, spring, washer and O-ring.
Remove the main jet, needle jet holder and needle jet.
Remove the slow jet.



FUEL SYSTEM

ASSEMBLY

Clean the main jet, needle jet holder, needle jet and slow jet in cleaning solvent and blow them open with compressed air.

Assemble the float chamber components in the reverse order of disassembly.

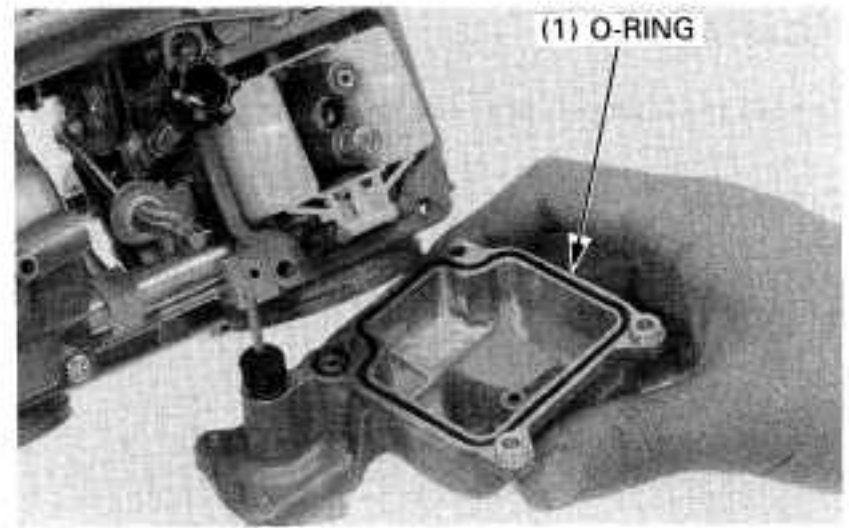
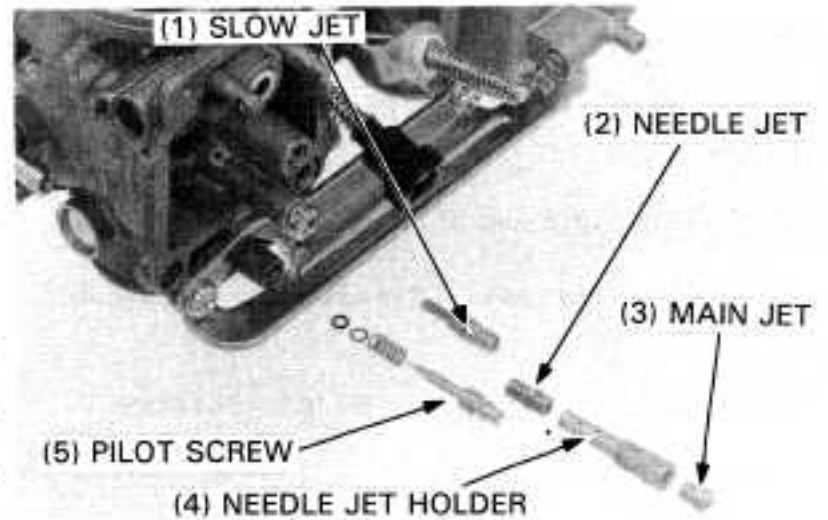
NOTE

- Install the float valve with the float.

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

Perform pilot screw adjustment if a new pilot screw is installed (page 4-12).

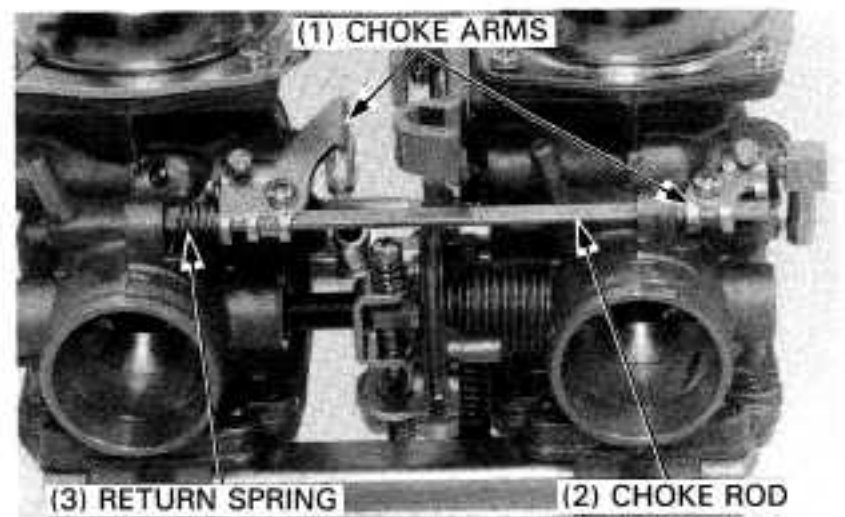
Install new O-ring on the float chamber grooves and install the float chamber with four screws.



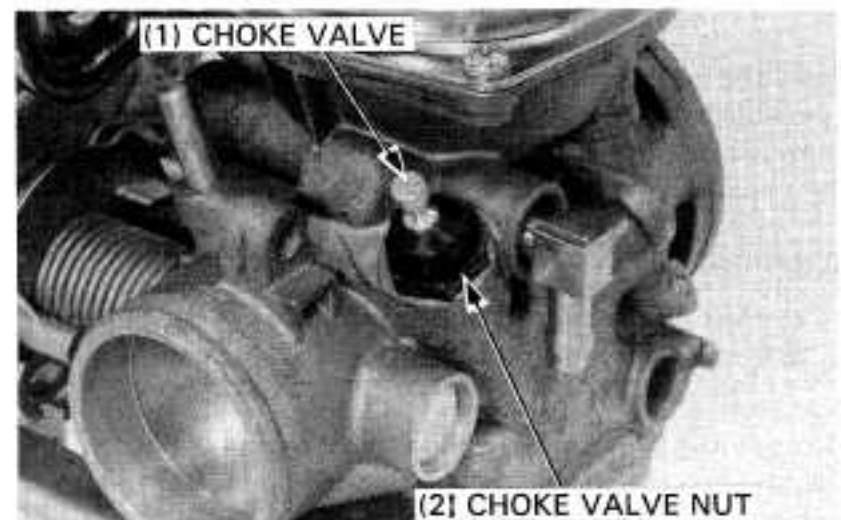
CARBURETOR CHOKE

REMOVAL

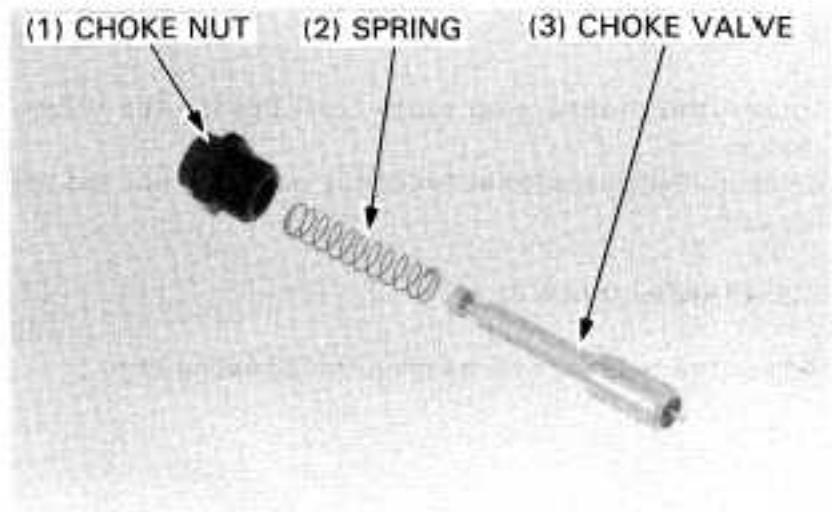
Remove the choke rod by removing the two screws.
Remove the choke return spring and choke arms.



Remove the choke valve nut, spring and choke valve.



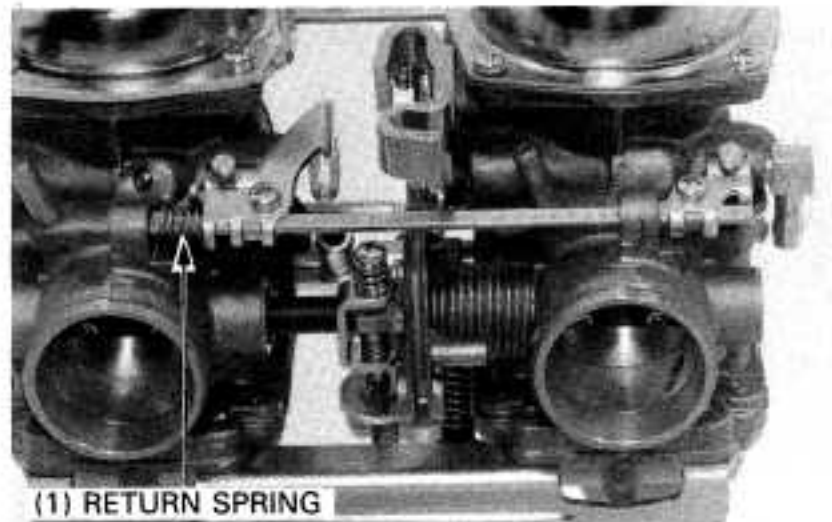
Check the choke valve for wear or damage.
 Check the spring for weakness or damage.
 Check the choke valve seat (in the carburetor body) for wear or damage.



Install the choke valve in the reverse order of removal.

NOTE

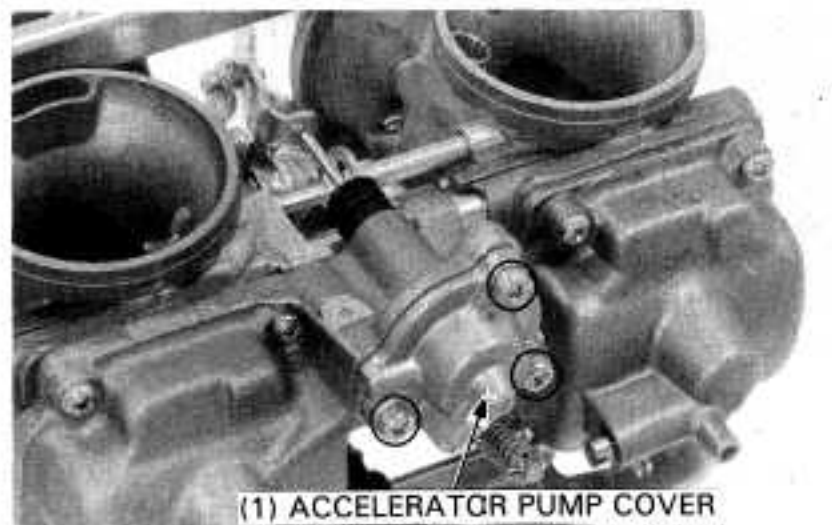
- Hook the choke return spring as shown.



ACCELERATOR PUMP

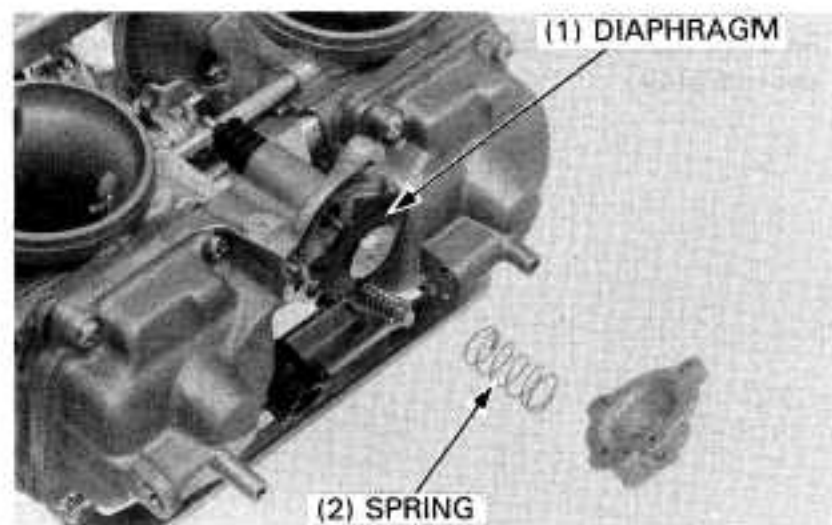
DISASSEMBLY

Remove the three screws attaching the accelerator pump cover and cover.
 Remove the spring and diaphragm.



INSPECTION

Inspect the diaphragm for deterioration or tears, and replace if necessary.



FUEL SYSTEM

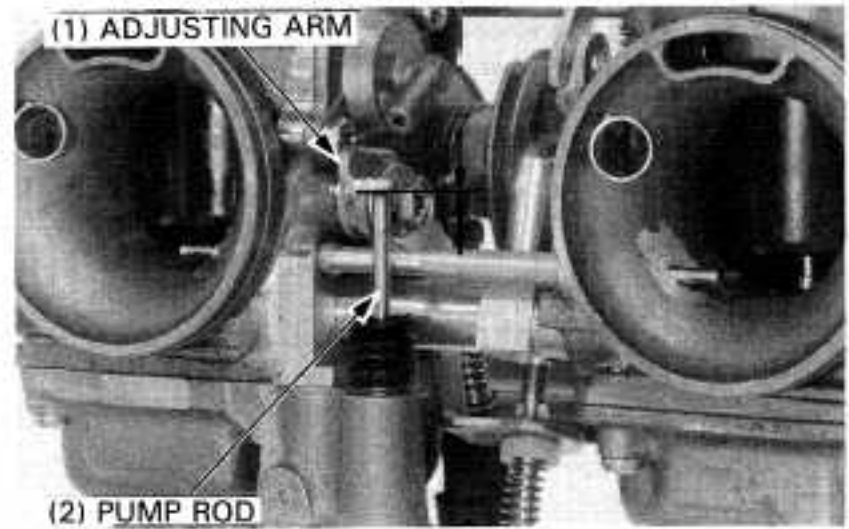
ADJUSTMENT

Loosen the throttle stop screw until the throttle valves are closed.

Measure the clearance between the pump rod and the adjusting arm.

CLEARANCE: 0 mm (0 in)

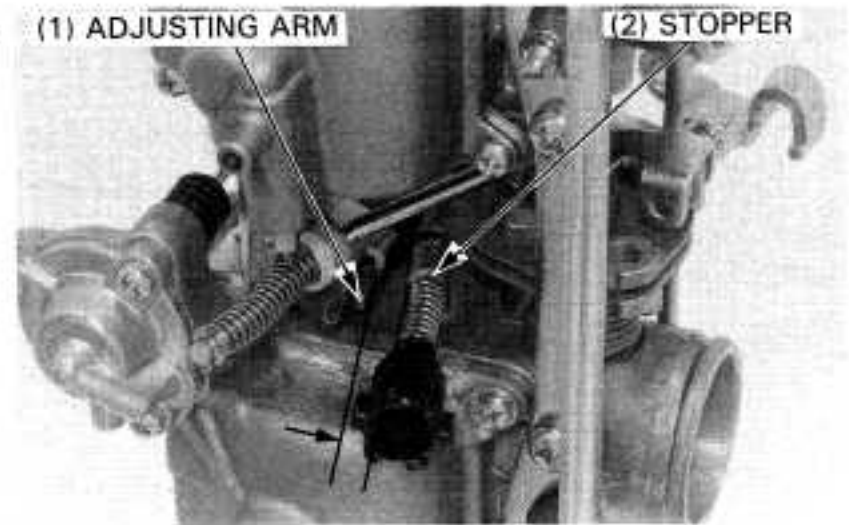
Adjust the clearance by bending the adjusting arm.



Measure the clearance between the adjusting arm and stopper on the carburetor body.

CLEARANCE: 2.5 mm (0.10 in)

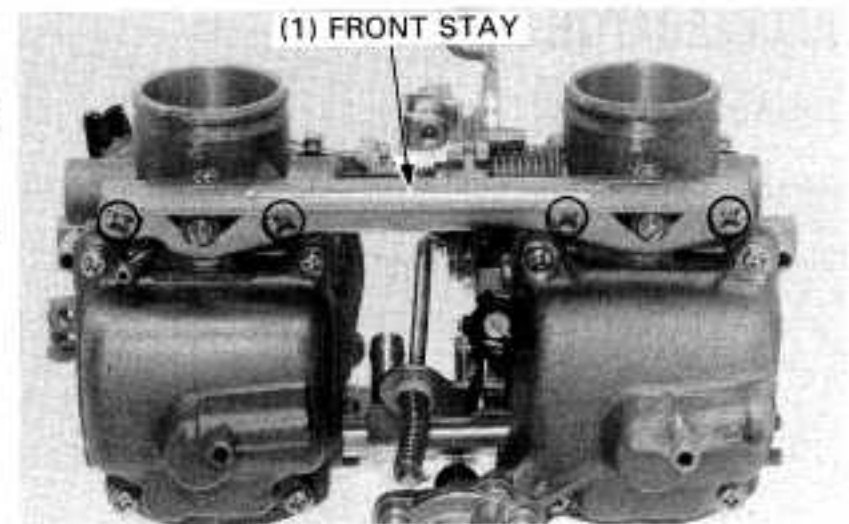
Adjust the clearance by bending the adjusting arm.



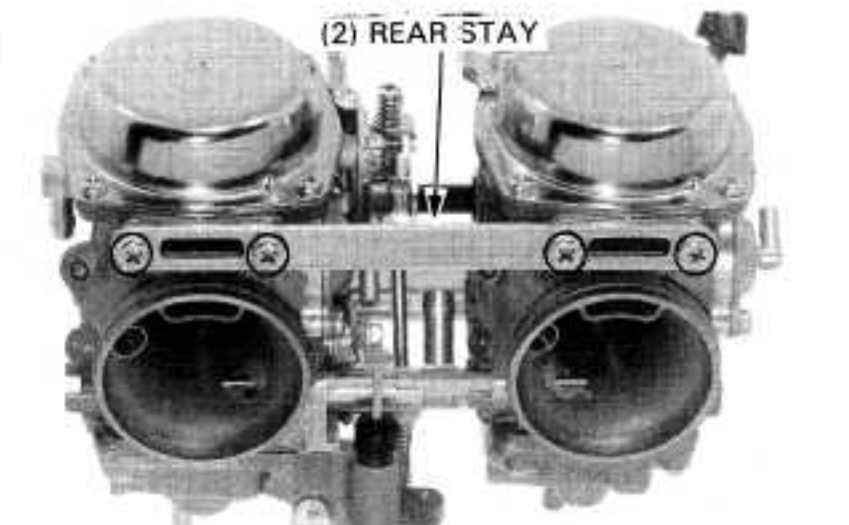
CARBURETOR SEPARATION

Remove the choke rod, choke arms and choke return spring (page 4-6).

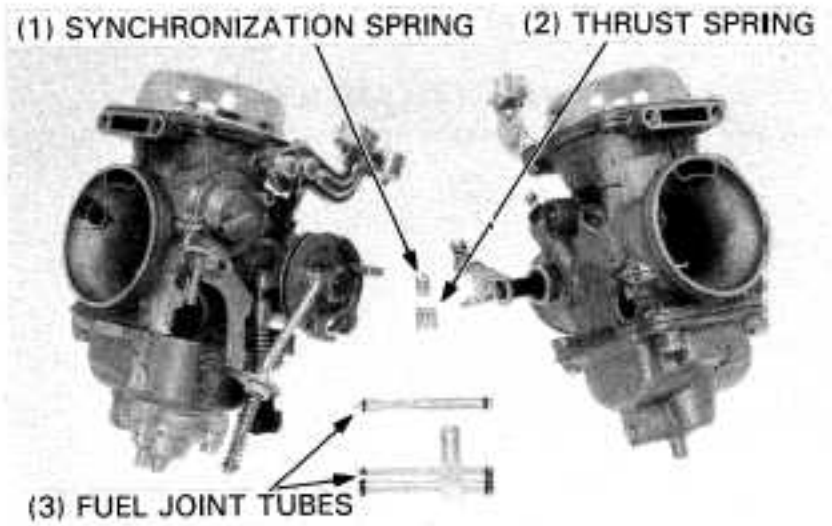
Remove the four screws attaching the front stay and remove the front stay.



Remove the four screws attaching the rear stay and remove the rear stay.

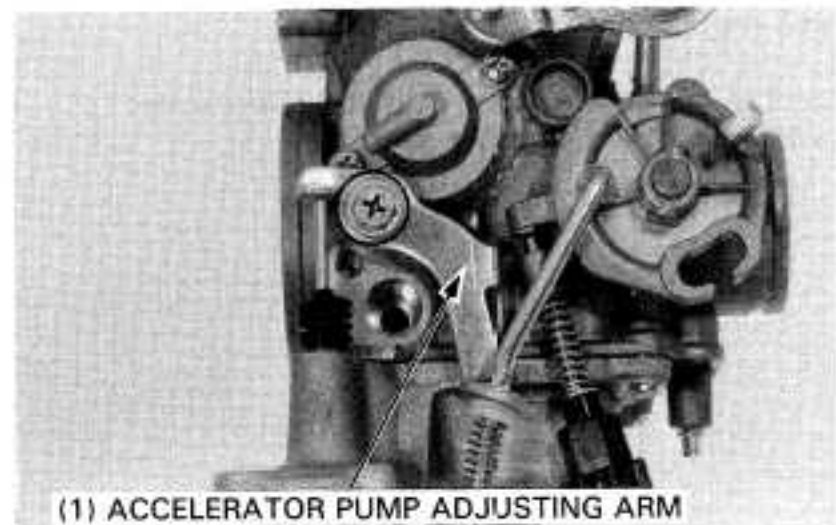


Separate the carburetors and remove the synchronization spring, thrust spring and fuel joint tubes.

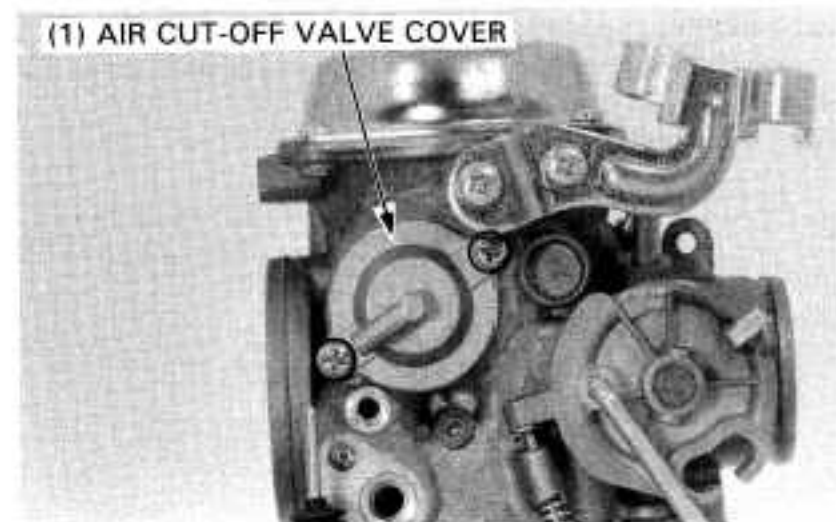


AIR CUT-OFF VALVE

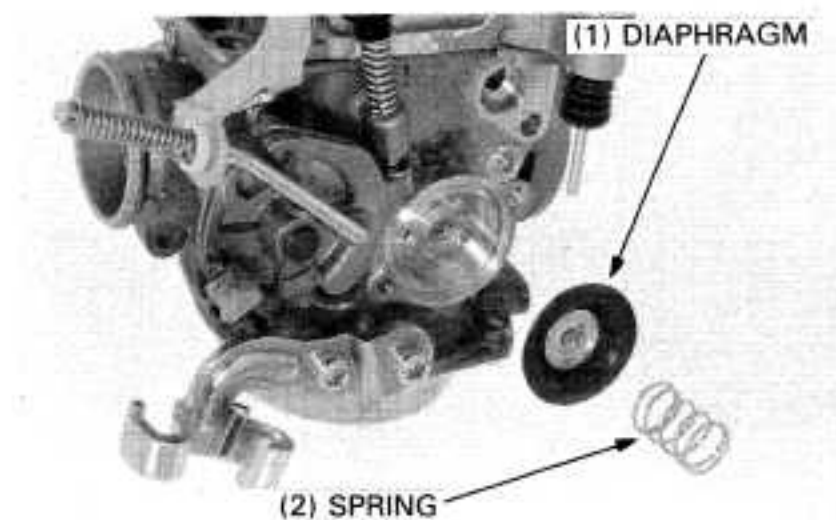
Remove the accelerator pump adjusting arm.



Remove the air cut-off valve cover screws and the cover.

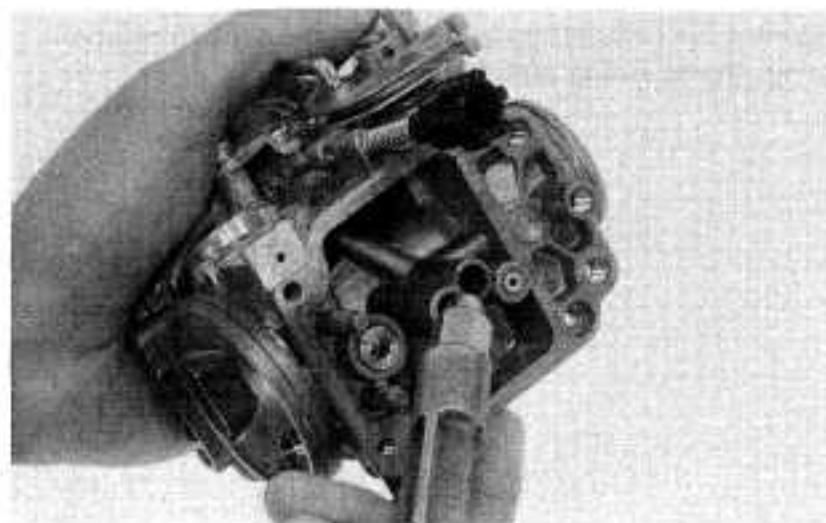


Remove the spring and diaphragm.
Inspect the diaphragm for deterioration and tears, and replace if necessary.
Assemble the air cut-off valve in the reverse order of disassembly.



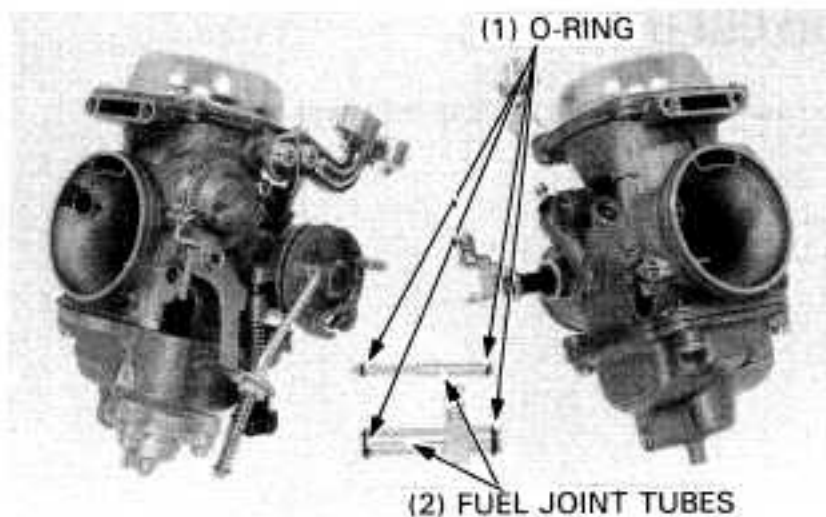
CARBURETOR CLEANING

Remove all jets, valves and the pilot screw.
Blow open all carburetor body openings with compressed air.

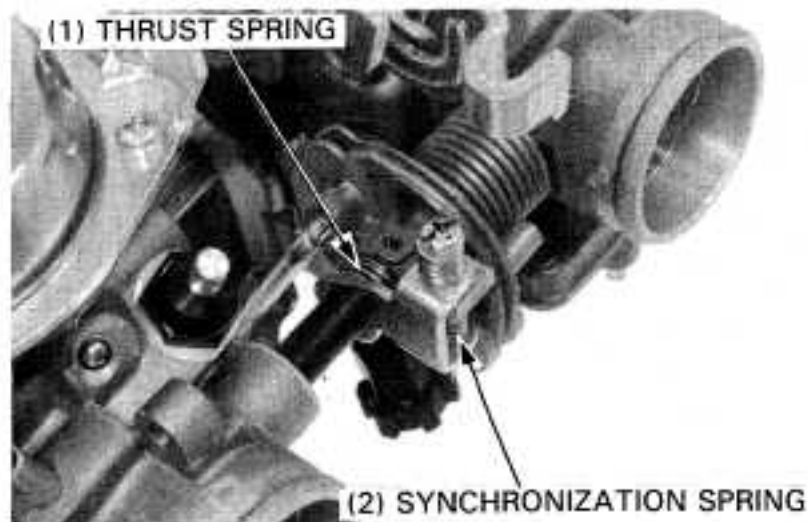


CARBURETOR ASSEMBLY

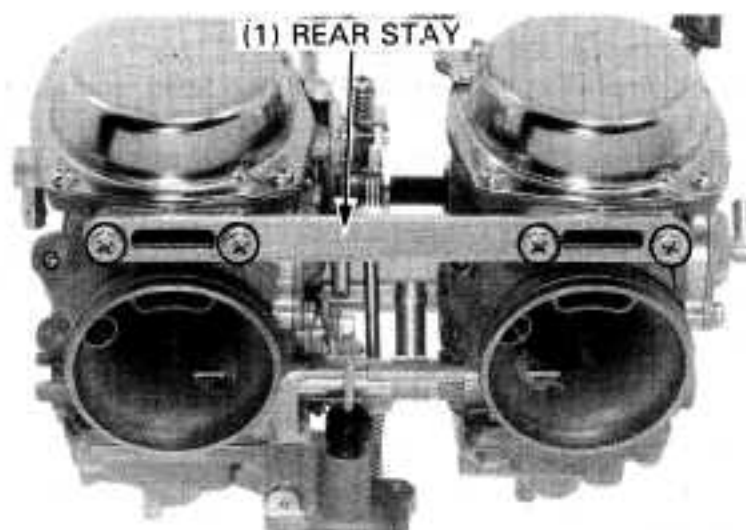
Install new O-rings over the ends of the fuel joints.
Assemble the right and left carburetors.



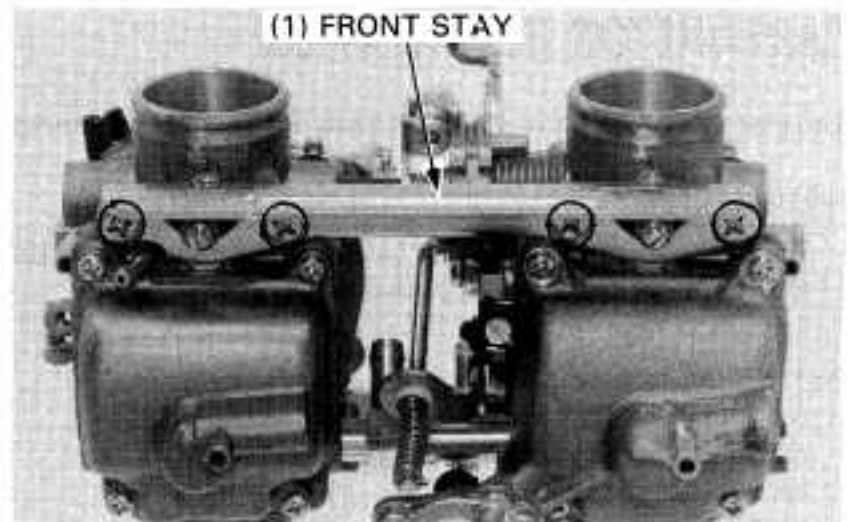
Install the thrust spring.
Loosen the synchronization adjusting screw until there is no tension.
Install the synchronization spring.



Loosely install the rear stay with four screws.



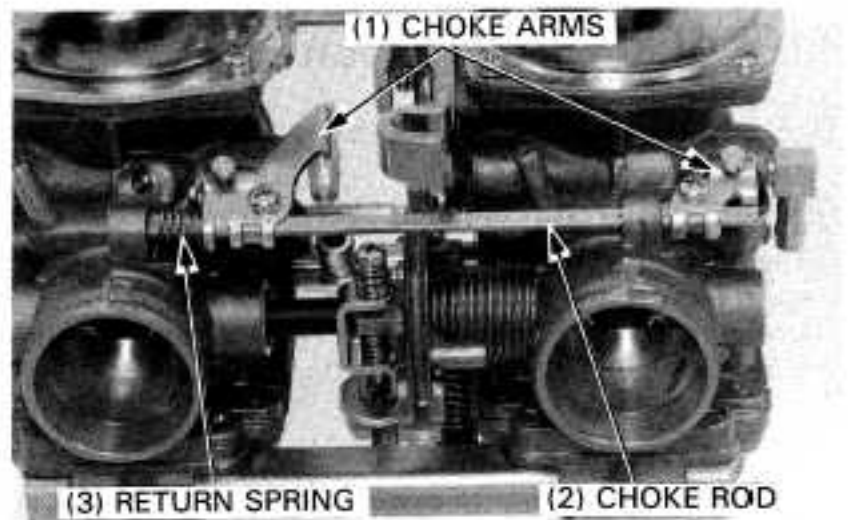
Install the front stay and tighten the screws.
Tighten the rear stay screws.



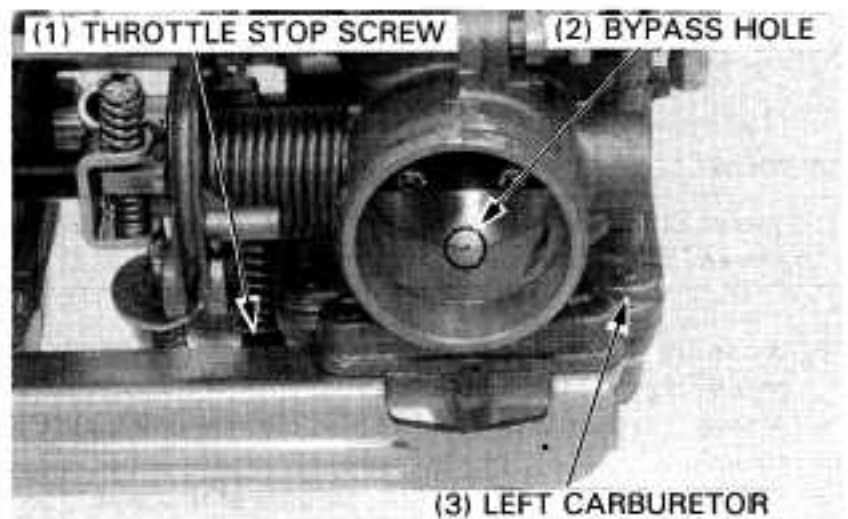
Install the choke arms, choke return spring and choke rod, and tighten the two screws.

NOTE

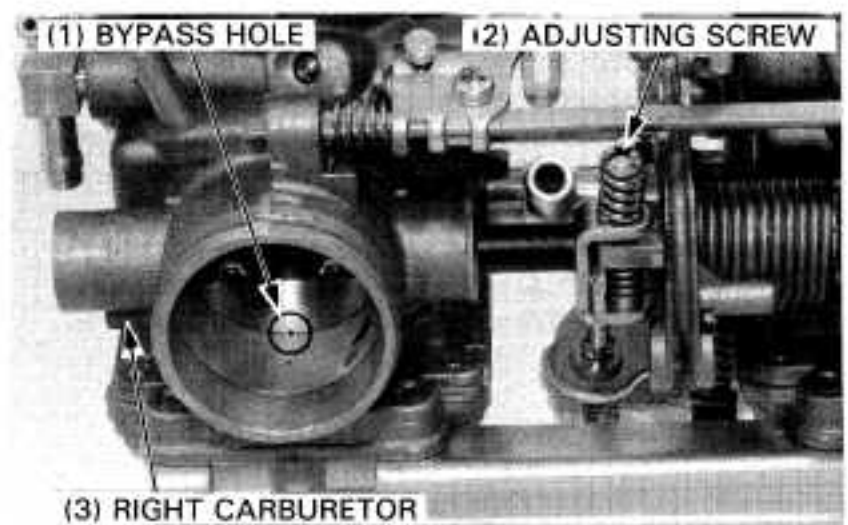
- Hook the choke return spring as shown.



Turn the throttle stop screw until the throttle valve edge of the left carburetor aligns with the bypass hole as shown.



Turn the synchronization adjusting screw until the throttle valve edge of the right carburetor aligns with the bypass hole as shown.



CARBURETOR INSTALLATION

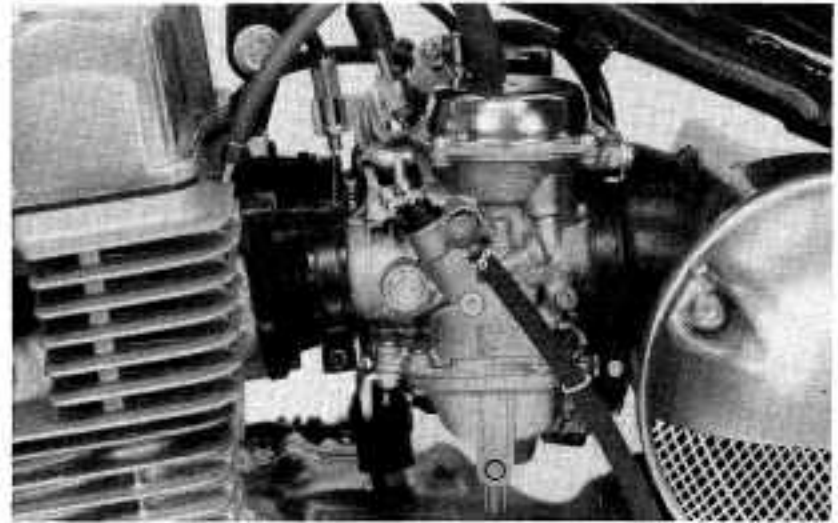
The installation sequence is essentially the reverse of removal.

NOTE

- Route the throttle and choke cables, vacuum tube, fuel tube and breather tube properly (pages 1-8 to 1-13).

Perform the following inspections and adjustments.

- throttle operation (page 3-5).
- carburetor choke (page 3-6).
- carburetor idle speed (page 3-10).
- carburetor synchronization (page 3-10).



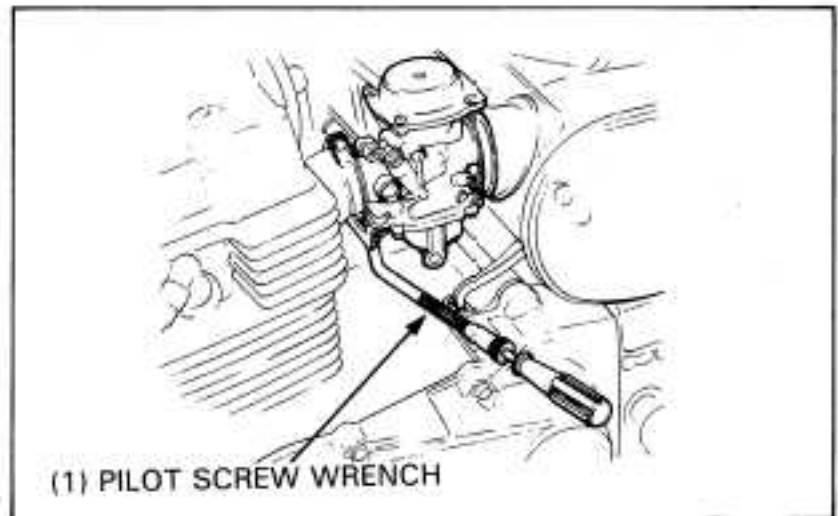
PILOT SCREW ADJUSTMENT

IDLE DROP PROCEDURE (U.S.A. ONLY)

NOTE

- The pilot screw is factory pre-set and no adjustment is necessary unless the pilot screw is replaced (page 4-5).
- Use a tachometer with graduation of 100 rpm or smaller that will accurately indicate a 100 rpm change.

1. Install a new pilot screw.
2. Turn the pilot screw clockwise until it seats lightly, and then back it out to the specification given. This is an initial opening prior to the final pilot screw adjustment.



INITIAL OPENING: '86: 2-1/4 turns out
After '86: 2 turns out

CAUTION

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

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

IDLE SPEED: 1,200 ± 100 rpm

6. Turn each pilot screw in or out slowly to obtain the highest engine speed.
7. Readjust the idle speed with the throttle stop screw.
8. Turn one of the pilot screws in gradually until the engine speed is lowered by 100 rpm.
9. Turn the pilot screw out from the above position.
10. Readjust the idle speed with the throttle stop screw.
11. Repeat steps 8 through 10 for the other carburetor.

TOOL:

Pilot screw wrench 07908-4220201

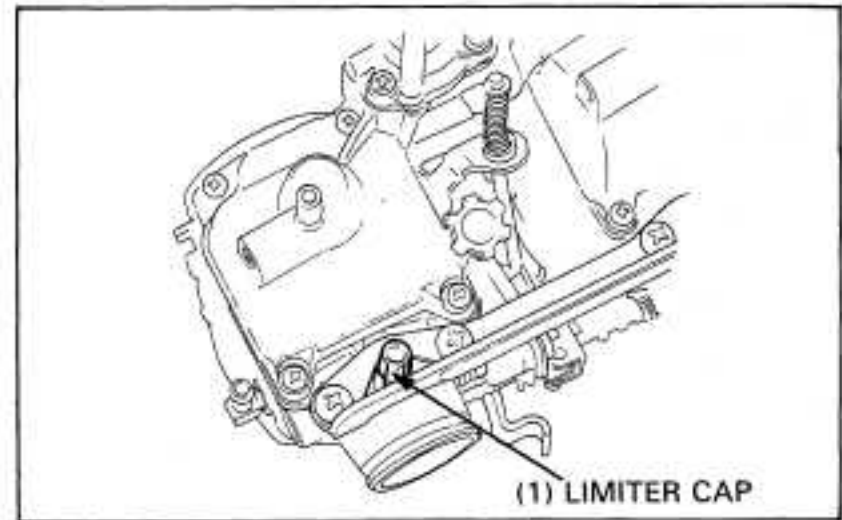
12. Install new limiter caps (page 4-13).

LIMITER CAP INSTALLATION

If the pilot screw is replaced, a new limiter cap must be installed after pilot screw adjustment is completed. After adjustment, cement the limiter caps over the pilot screws, using LOCTITE® 601 or equivalent. The limiter cap should be placed against its stop as shown, preventing further adjustment that would enrich the fuel mixture (limiter cap position permits clockwise rotation and prevents counterclockwise rotation).

NOTE

- Do not turn the pilot screw when installing the limiter cap.



HIGH ALTITUDE ADJUSTMENT

(U.S.A. only)

When the vehicle is to be operated continuously above 6,500 feet (2,000 meters) the carburetors must be readjusted as described below, to improve driveability and decrease exhaust emission.

NOTE

- The clearance between the pump rod and adjusting arm should not be adjusted for high altitude; it should be as specified on page 4-8.

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

Turn each pilot screw clockwise 1 turn.

Adjust the idle speed with the throttle stop screw.

IDLE SPEED: 1,200 ± 100 rpm

NOTE

- These adjustments must be made at high altitude to ensure proper high altitude operation.

Attach Vehicle Emission Control Information Update label as shown.

NOTE

- Instructions for obtaining Vehicle Emission Control Update label are given in Service Letter No. 132.
- Do not attach the label to any part that can be easily removed from the vehicle.

CAUTION

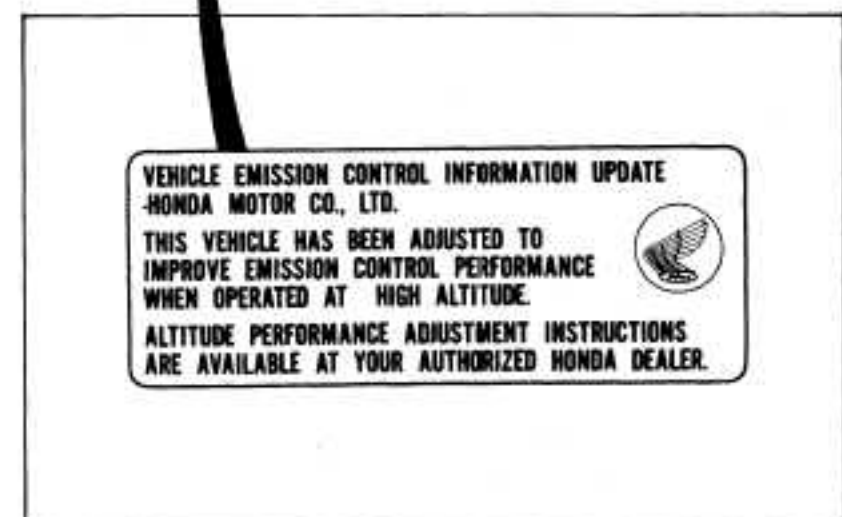
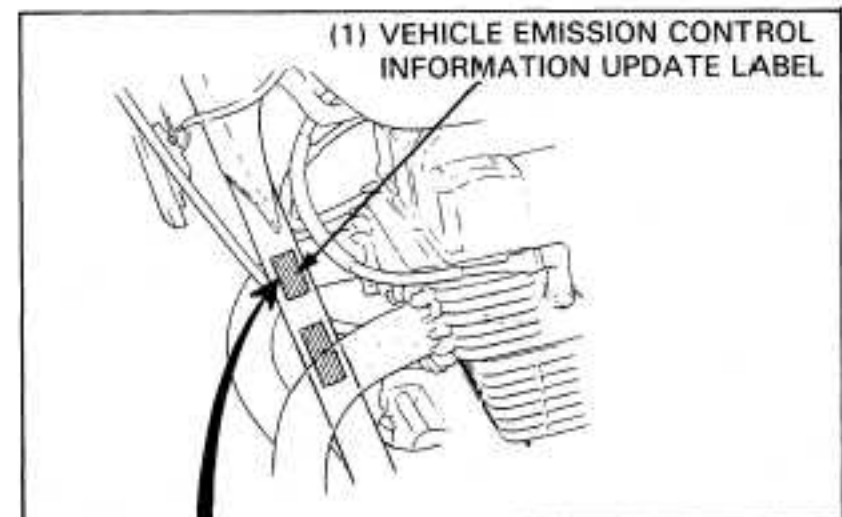
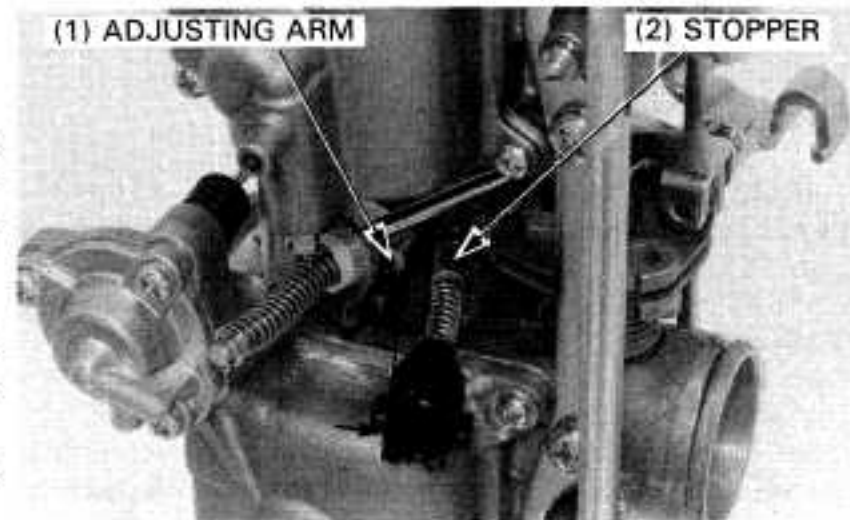
- Operation at an altitude lower than 5,000 feet (1,500 meters) with the carburetors adjusted for high altitudes may cause the engine to idle roughly and stall.

When the vehicle is to be operated continuously below 5,000 feet (1,500 meters):

Turn each pilot screw counterclockwise to its original position against its stop and adjust the idle speed with the throttle stop screw.

IDLE SPEED: 1,200 ± 100 rpm

Be sure to do these adjustments at low altitude.



FUEL SYSTEM

FUEL TANK

WARNING

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

REMOVAL/INSTALLATION

Remove the seat.
Turn the fuel valve OFF.
Disconnect the fuel and vacuum tubes from the fuel valve.
Disconnect the line to the charcoal canister.
Remove the three fuel tank mounting bolts and fuel tank.

Install the fuel tank in the reverse order of removal.

FUEL VALVE INSPECTION

Turn the fuel valve off.
Disconnect the fuel tube at the carburetor and hold a beaker under the tube.
Drain the remaining fuel in the fuel tube and valve (approx. 5-10 cc).
Turn the fuel valve on.
Fuel should not flow.
If fuel does flow, turn the fuel valve off, clean the vacuum tube between the intake manifold and fuel valve and recheck it.

Disconnect the vacuum tube from the intake manifold and apply vacuum with the vacuum pump.

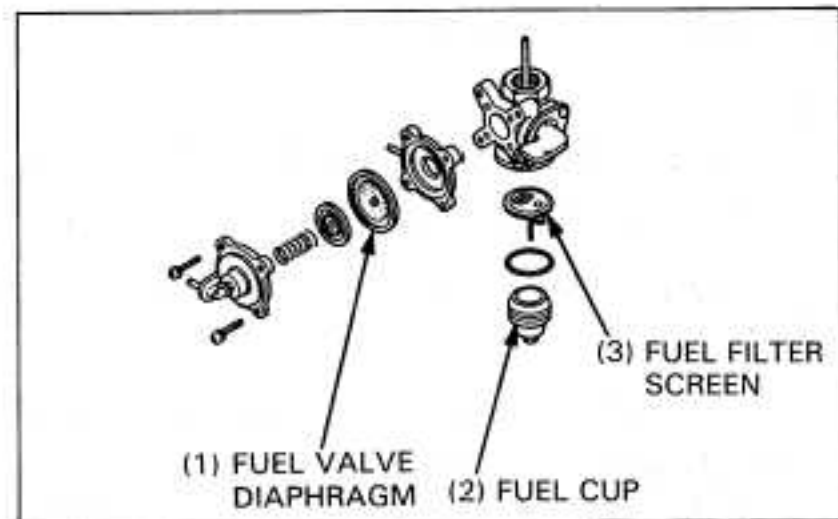
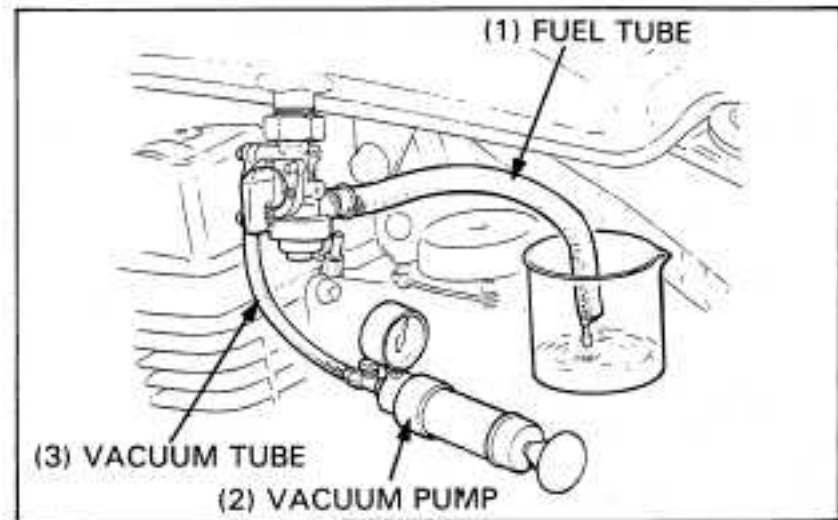
TOOL:

Vacuum pump ST-AH-260-MC7 (U.S.A. only)

The fuel valve is operating normally if fuel flows out from the fuel tube when vacuum is applied and if fuel stops flowing out when the vacuum pump is disconnected.

If the fuel valve does not operate normally;

- Inspect for clogging and clean the valve.
- Apply low pressure air to the vacuum tube to make sure diaphragm is in the closed position.



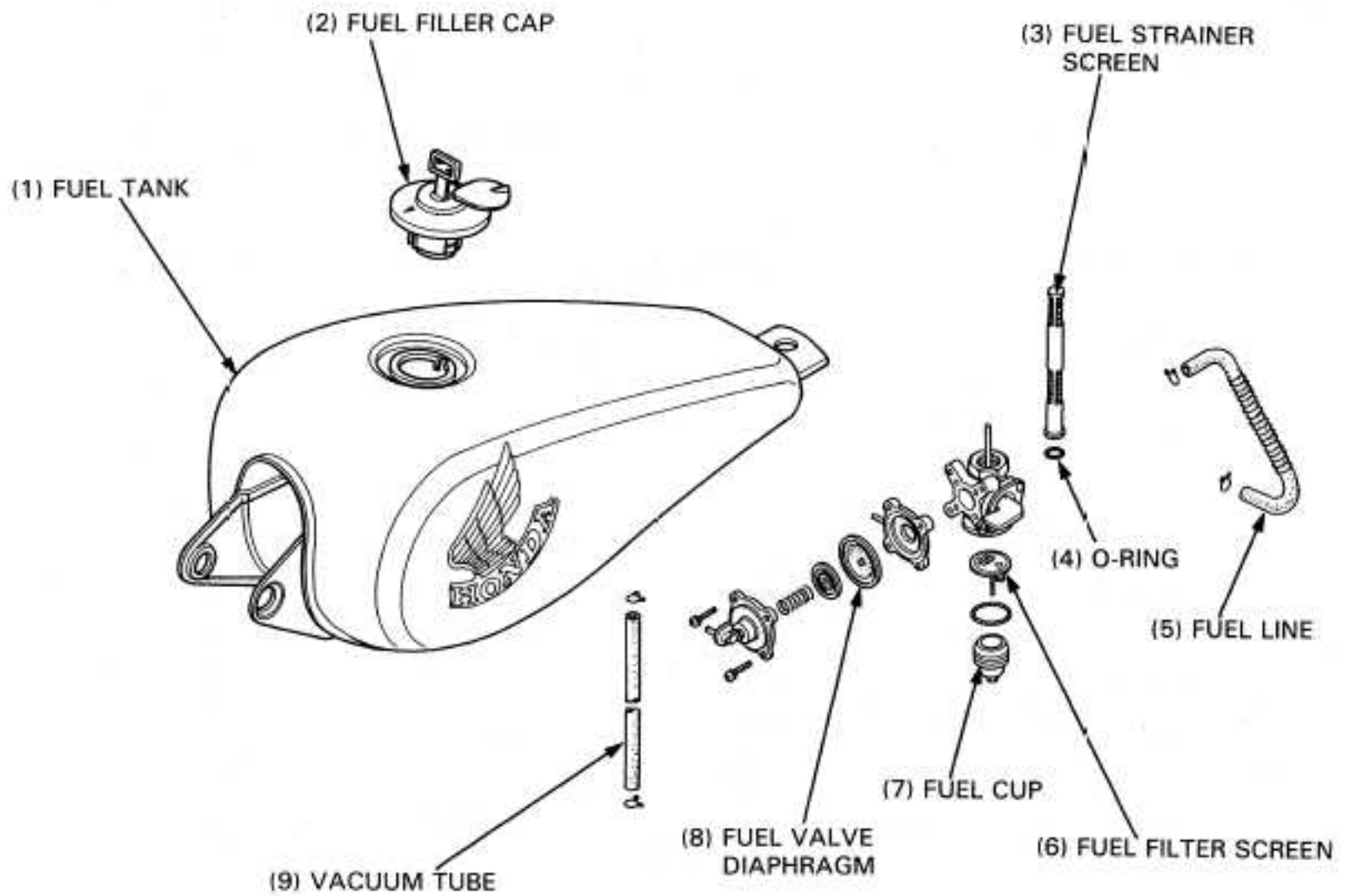
FUEL STRAINER CLEANING

Drain the fuel from the fuel tank.
 Loosen the fuel valve lock nut and remove the fuel valve.
 Remove the fuel strainer and O-ring.
 Clean the fuel strainer.
 Install the fuel strainer and new O-ring onto the fuel valve.
 Install the fuel valve and tighten the lock nut.

NOTE

- Do not over-tighten the lock nut.

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

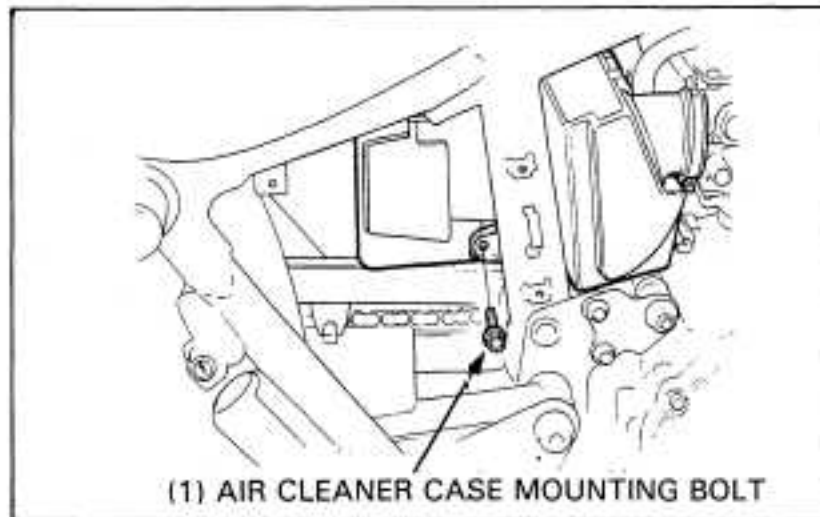


AIR CLEANER CASE

Remove the battery (page 14-2).

Remove the battery tray (page 14-4).

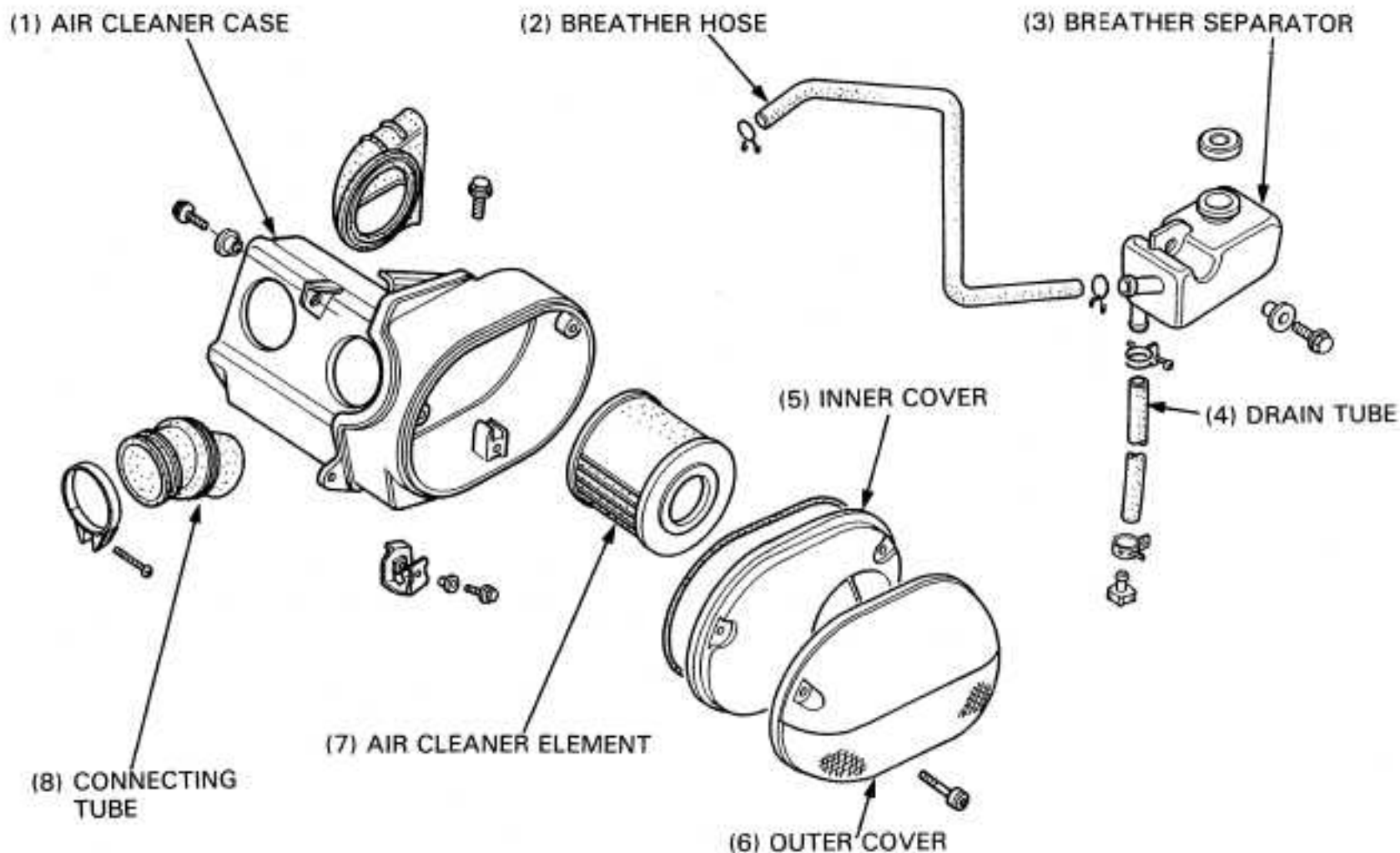
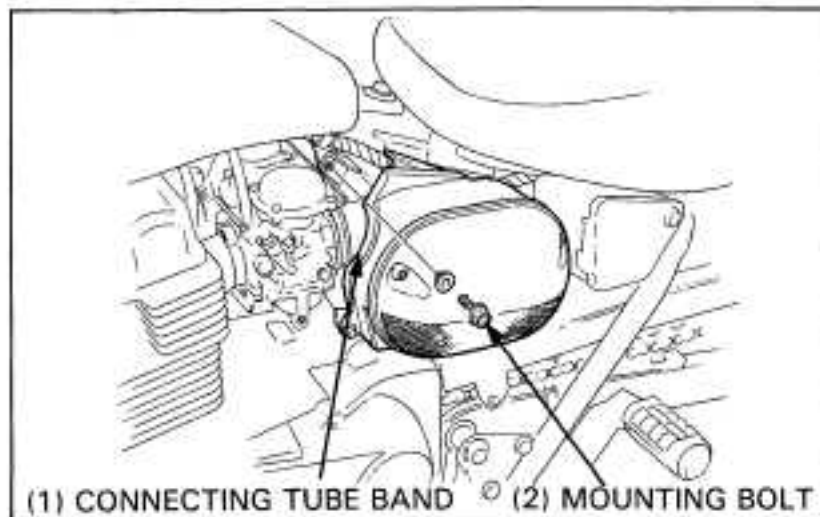
Remove the air cleaner case mounting bolt from the right side.



Remove the air cleaner case mounting bolt from the left side.

Loosen the air cleaner connecting tube bands and remove the air cleaner case.

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



EVAPORATIVE EMISSION CONTROL SYSTEM (California model only)

Check the system hoses for deterioration, clogging, damage, loose joints and connection.

Replace any hoses that shows signs of damage or deterioration.

PURGE CONTROL VALVE (PCV) INSPECTION

NOTE

- The purge control valve should be inspected if hot restart is difficult.

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

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

TOOL:

Vacuum pump **ST-AH-260-MC7 (U.S.A. only)**

SPECIFIED VACUUM: 250 mm (9.8 in) Hg

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

CAUTION

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

Connect a vacuum pump to the 8 mm I.D. hose that goes to the 3-way joint. Apply the specified vacuum to the PCV.

SPECIFIED VACUUM: 250 mm (9.8 in) Hg

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

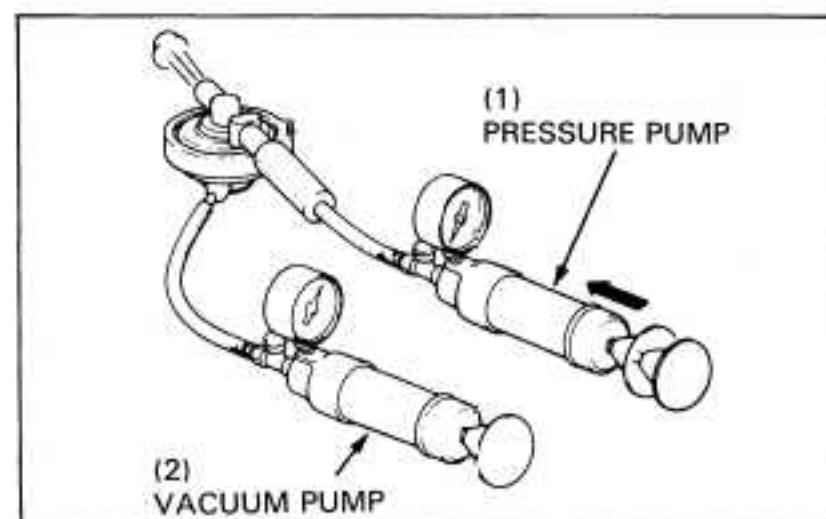
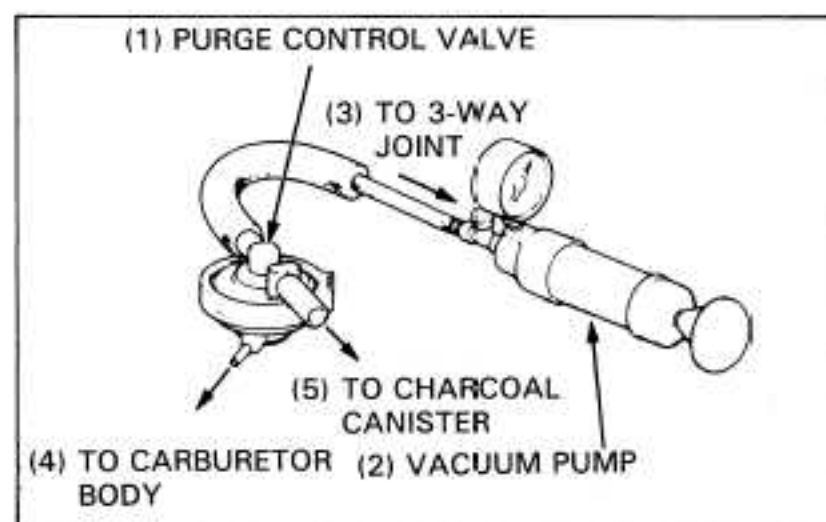
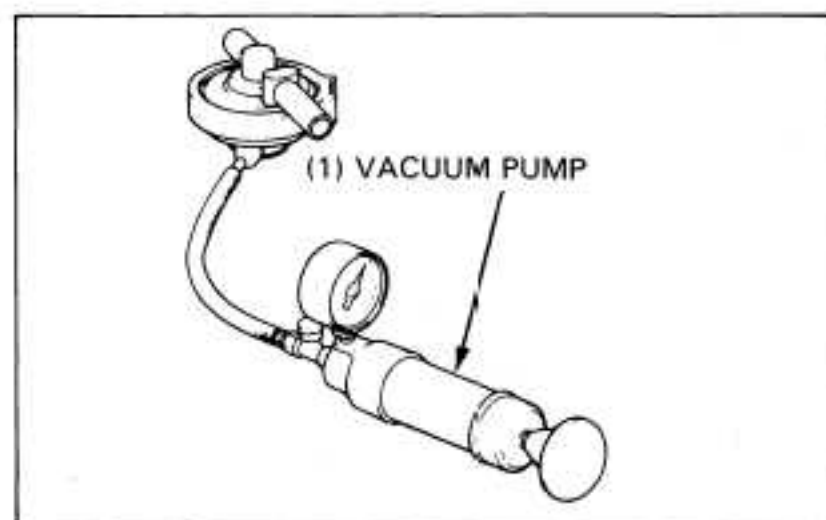
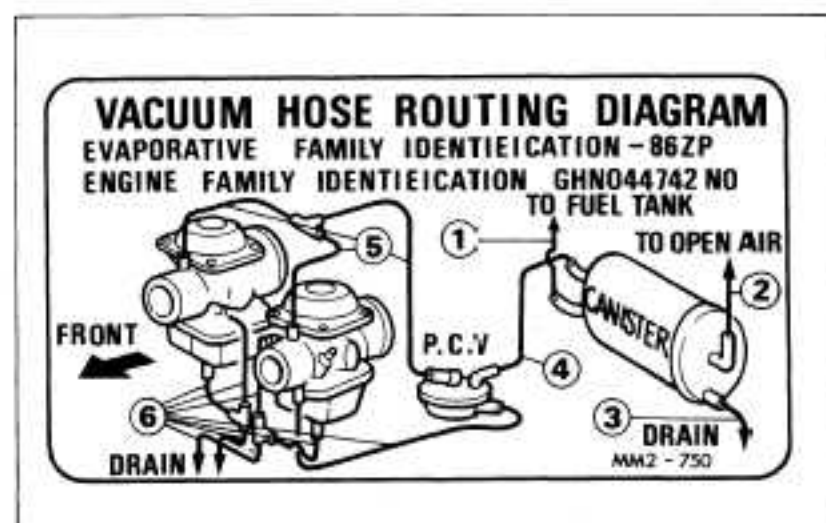
Connect a pressure pump to the 8 mm I.D. hose that goes to the charcoal canister. While applying the specified vacuum to the PCV hose that goes to the 3-way joint pump air through the canister hose. Air should flow through the PCV and out the hose that goes to the 3-way joint.

Replace the PCV if air does not flow out.

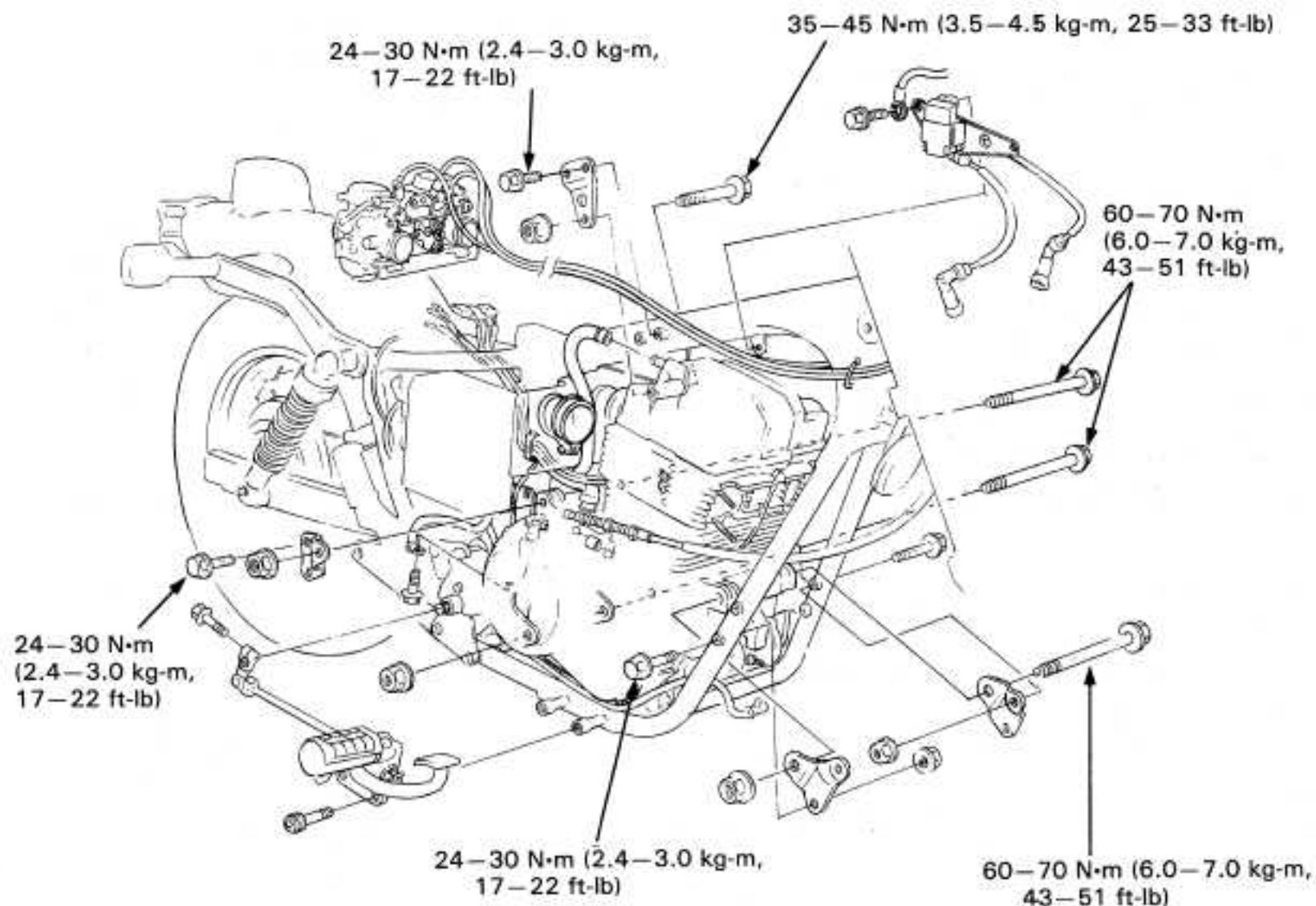
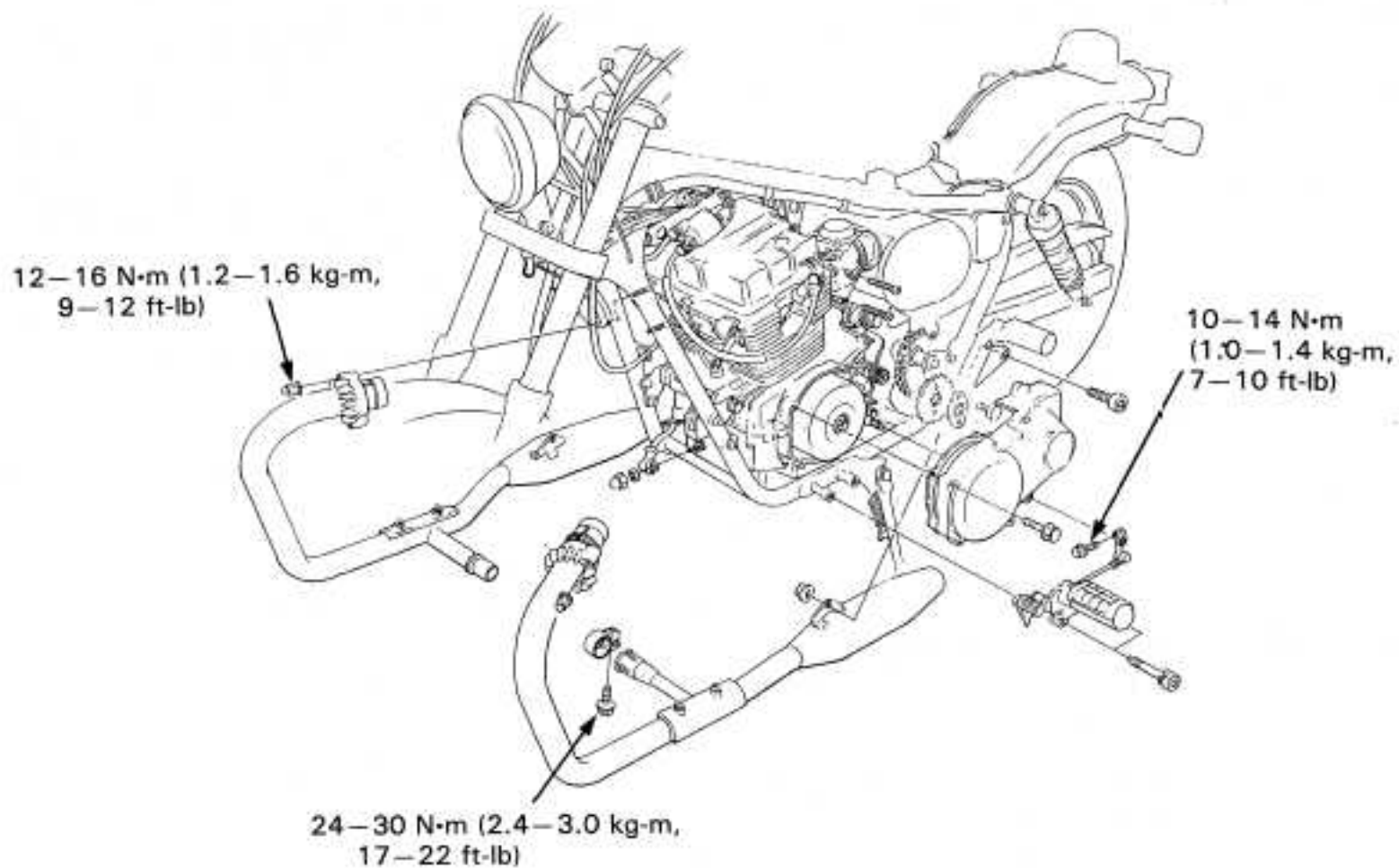
TOOL:

Pressure pump **ST-AH-255-MC7 (U.S.A. only)**

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



ENGINE REMOVAL/INSTALLATION



5. ENGINE REMOVAL/INSTALLATION

SERVICE INFORMATION	5-1	ENGINE INSTALLATION	5-4
ENGINE REMOVAL	5-2		

SERVICE INFORMATION

GENERAL

- A jack or adjustable support is required to maneuver the engine.
- Parts requiring engine removal for servicing:
 - Crankcase Section 10
 - Crankshaft/Balancer Section 11
 - Transmission Section 12

SPECIFICATIONS

Engine weight	60 kg (132 lb)
Oil capacity	3.0 ℓ (3.2 US qt, 2.6 Imp qt) after disassembly 2.2 ℓ (2.3 US qt, 1.9 Imp qt) after draining

TORQUE VALUES

Front engine mounting bolt	60–70 N·m (6.0–7.0 kg-m, 43–51 ft-lb)
Rear engine mounting bolts	60–70 N·m (6.0–7.0 kg-m, 43–51 ft-lb)
Upper engine mounting bolt	35–45 N·m (3.5–4.5 kg-m, 25–33 ft-lb)
Engine mounting bracket bolt	24–30 N·m (2.4–3.0 kg-m, 17–22 ft-lb)
Exhaust pipe joint nut	12–16 N·m (1.2–1.6 kg-m, 9–12 ft-lb)
Rear exhaust pipe band bolt	24–30 N·m (2.4–3.0 kg-m, 17–22 ft-lb)
Gearshift pedal arm bolt	10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)

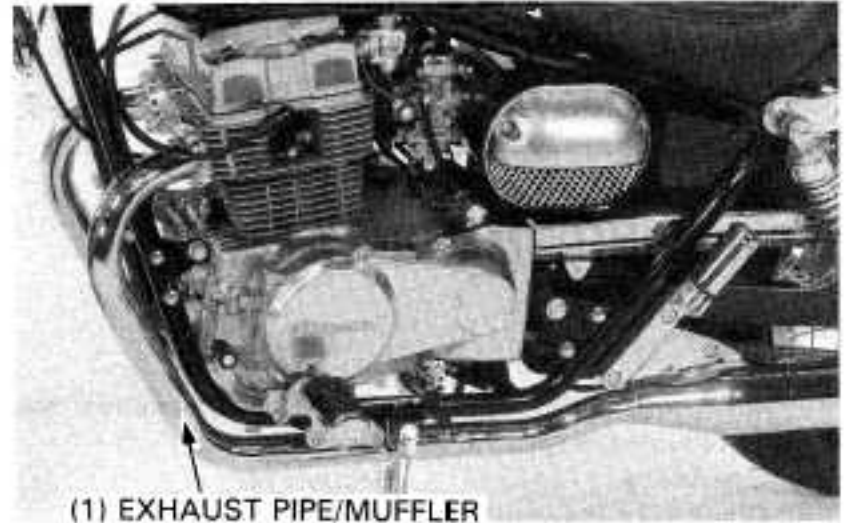
ENGINE REMOVAL/INSTALLATION

ENGINE REMOVAL

Drain the engine oil (page 2-2).

Remove the following:

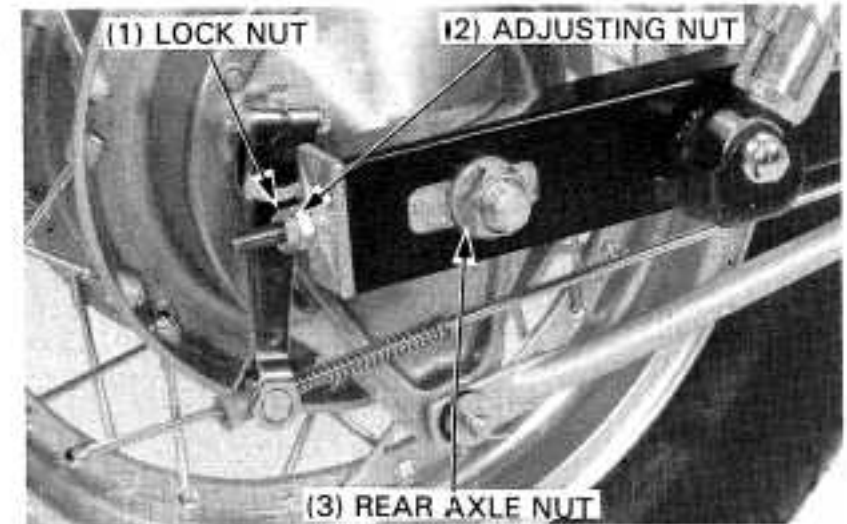
- fuel tank (page 4-14)
- carburetor (page 4-3)
- seats (page 12-16)
- exhaust pipe joint nuts, muffler mounting bolts and the exhaust pipe/mufflers.



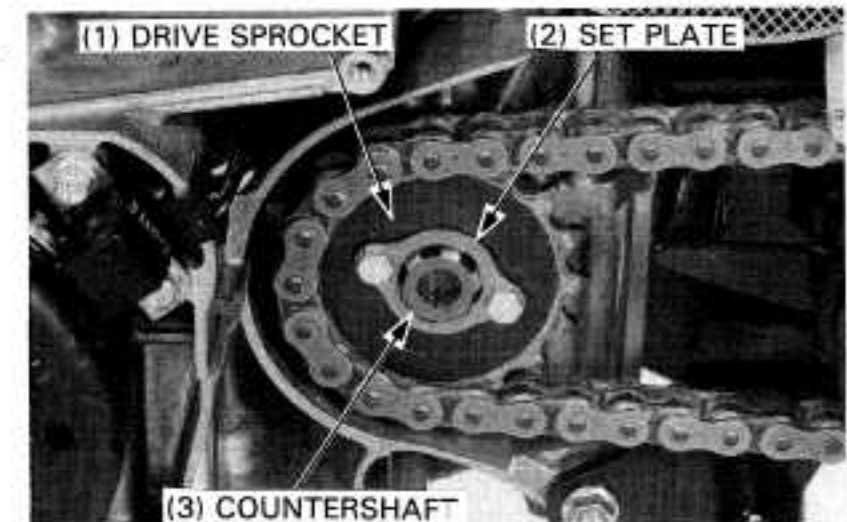
Remove the gearshift arm from the spindle.
Remove the left footpeg and gearshift pedal from the frame.
Remove the left crankcase cover.



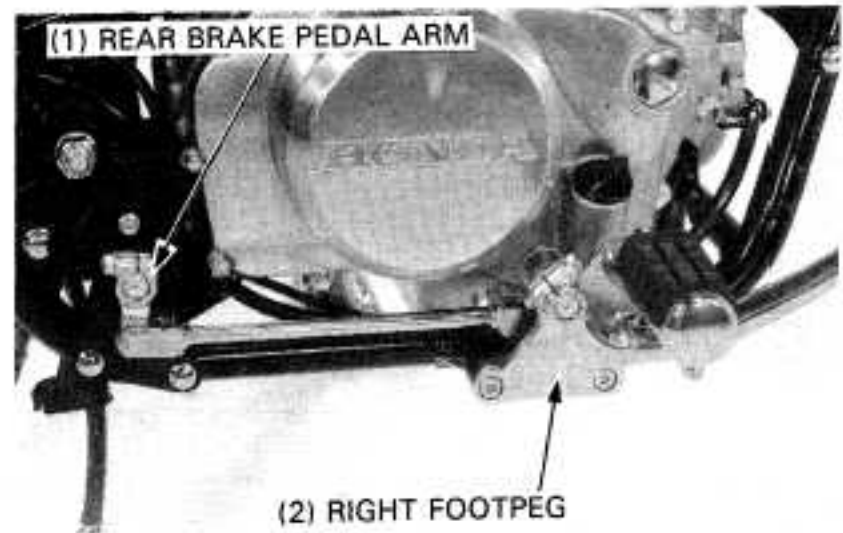
Loosen the drive chain lock and adjusting nuts and the rear axle nut.



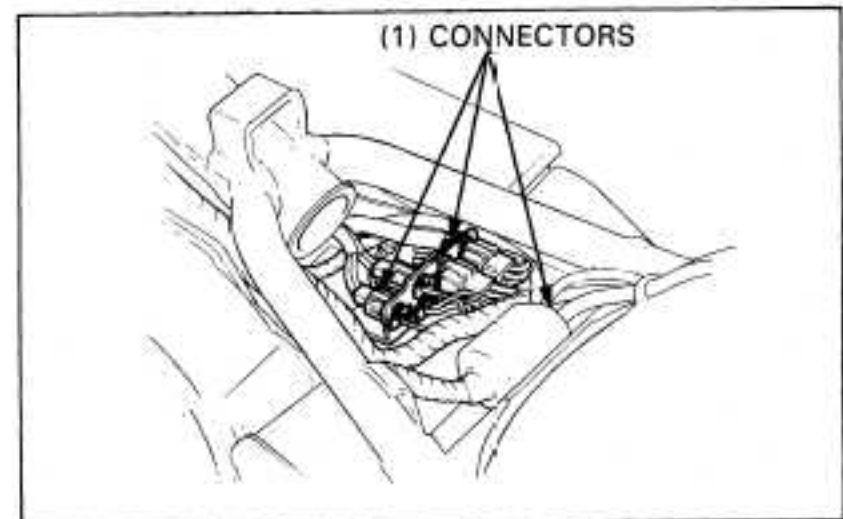
Remove the drive sprocket bolts and set plate, and remove the drive sprocket from the countershaft.



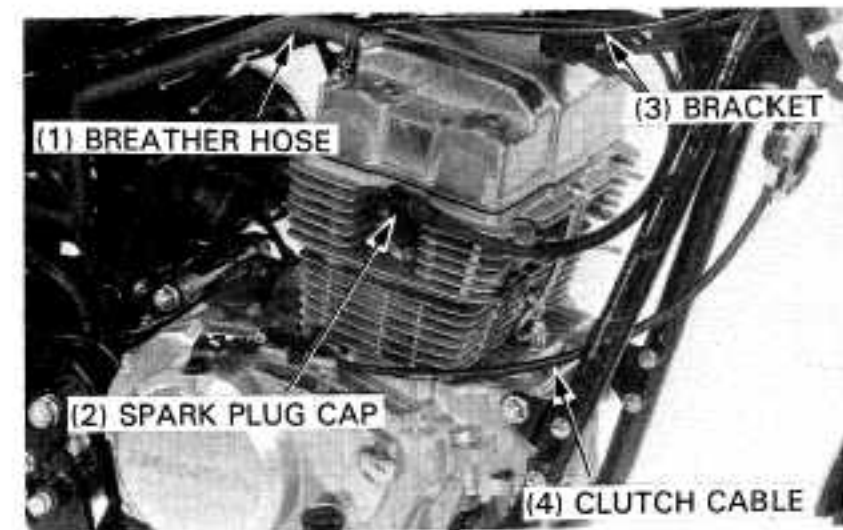
Remove the rear brake pedal arm bolt and the two socket bolts, and then remove the right footpeg and rear brake pedal assembly.



Disconnect the neutral/overdrive switch, oil pressure switch, pulse generator and alternator wire connectors.



Disconnect the breather hose from the cylinder head cover. Remove the spark plug caps from the plugs. Remove the CDI unit/ignition coil bracket from the frame. Disconnect the starter cable from the starter motor. Loosen the clutch cable adjusting nut and lock nut, disconnect the cable from the arm and remove the cable from the holder.



Place a floor jack or other adjustable support under the engine.

NOTE

- The jack height must be continually adjusted to relieve stress for ease of bolt removal.

Remove all engine mounting brackets and bolts, and remove the engine from the right side.



ENGINE INSTALLATION

Engine installation is essentially the reverse of removal. Use a floor jack or other adjustable support to carefully maneuver the engine into place.

CAUTION

- *Carefully align mounting points with the jack to prevent damage to mounting bolt threads and wire harnesses and cables.*

Tighten all the fasteners to the specified torque given on pages 5-0 and 5-1.

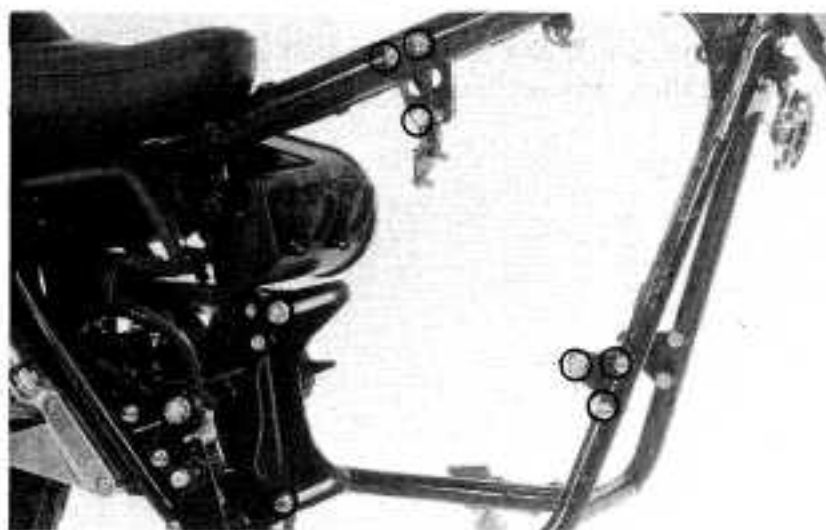
Route the wire harnesses, cables and hoses properly (pages 1-8 through 1-12).

Install the rear brake link arm on the shaft, aligning the punch marks on the arm and shaft.

Install the gearshift pedal arm onto the spindle, aligning the punch marks on the arm and spindle.

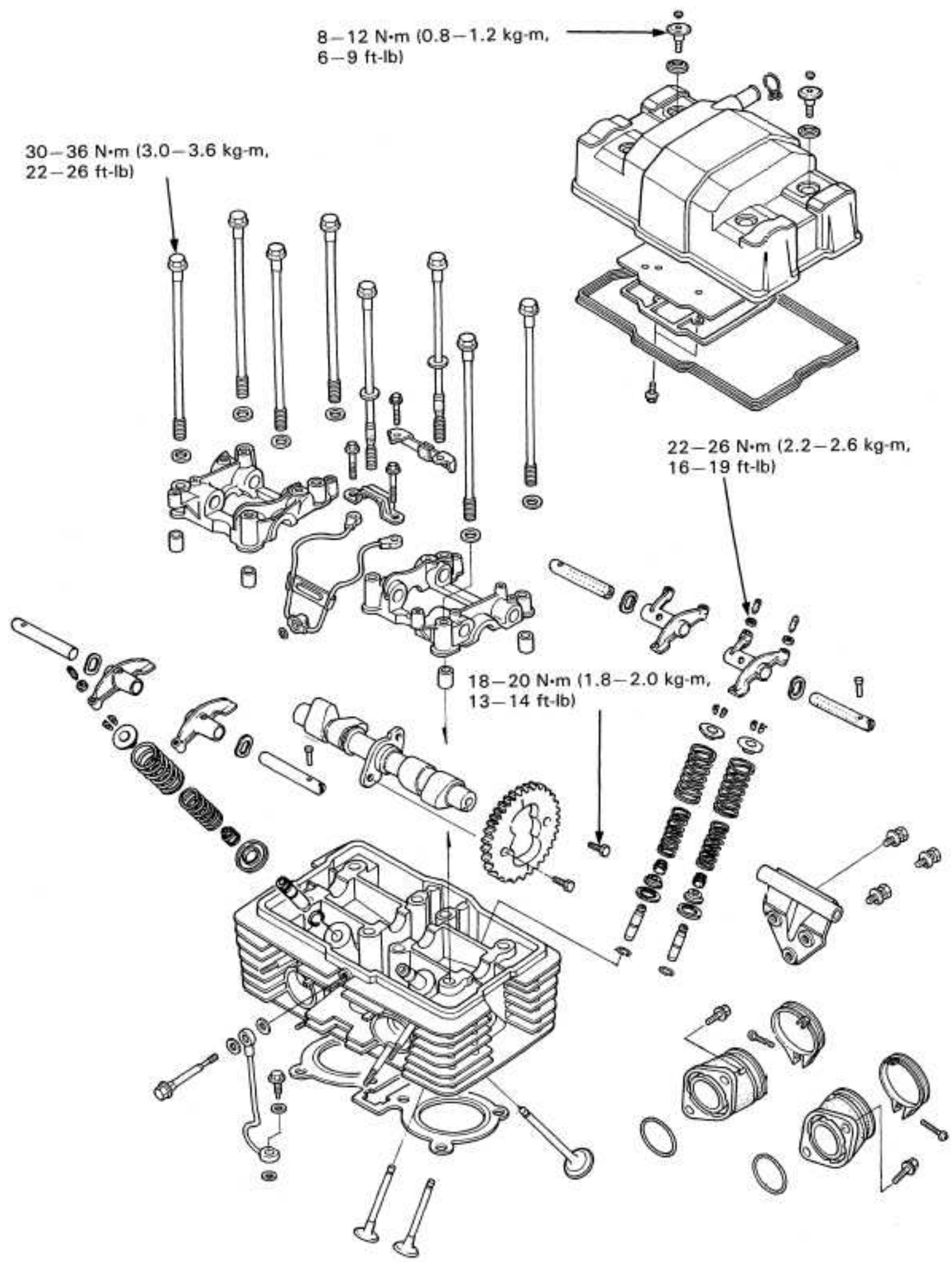
After installation, perform the following:

- fill the crankcase with the recommended engine oil (page 2-1).
- adjust the drive chain (page 3-11).
- adjust the clutch lever free play (page 3-16).



MEMO

CYLINDER HEAD/VALVES



6. CYLINDER HEAD/VALVES

SERVICE INFORMATION	6-1	VALVE SEAT INSPECTION AND GRINDING	6-12
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SERVICE INFORMATION

6

GENERAL

- This section covers maintenance of the cylinder head, valves, camshaft and rocker arms.
- All cylinder head services can be accomplished with the engine installed in the frame.
- Camshaft lubricating oil is fed through oil lines. Be sure that the holes in the oil lines are not clogged.
- 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.
- To remove the four cylinder head bolts, the upper, front and rear upper engine mounting bolts must be removed, and the engine must be supported with a jack.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Camshaft	Cam height	IN	36.220–36.420 (1.4260–1.4339)	36.10 (1.421)
		EX	35.851–36.051 (1.4115–1.4193)	35.75 (1.407)
	Oil clearance	Ends	0.040–0.141 (0.0016–0.0056)	0.20 (0.008)
		Center	0.090–0.191 (0.0035–0.0075)	0.23 (0.009)
	Runout		—	0.10 (0.004)
Rocker arm shaft	Arm I.D.		12.000–12.018 (0.4724–0.4731)	12.03 (0.474)
	Shaft O.D.		11.966–11.984 (0.4711–0.4718)	11.95 (0.470)
Valve spring	Free length	IN-OUTER	50.6 (1.99)	49.0 (1.93)
		IN-INNER	36.6 (1.44)	35.5 (1.40)
		EX-OUTER	51.1 (2.01)	49.5 (1.95)
		EX-INNER	40.8 (1.61)	39.5 (1.56)

CYLINDER HEAD/VALVES

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Valve guide	Valve stem O.D.	IN	5.455–5.470 (0.2148–0.2154)	5.44 (0.214)
		EX	6.555–6.570 (0.2581–0.2587)	6.54 (0.257)
	Valve guide I.D.	IN	5.500–5.510 (0.2165–0.2169)	5.60 (0.220)
		EX	6.600–6.615 (0.2598–0.2604)	6.70 (0.264)
	Stem-to-guide clearance	IN	—	0.10 (0.004)
		EX	—	0.10 (0.004)
Valve seat width			1.1–1.3 (0.04–0.05)	2.0 (0.08)
Cylinder head	Warpage		—	0.10 (0.004)

TORQUE VALUES

Cylinder head cover bolt	8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)
Cylinder head bolt	30–36 N·m (3.0–3.6 kg-m, 22–26 ft-lb)
Cam sprocket bolt	18–20 N·m (1.8–2.0 kg-m, 13–14 ft-lb)
Valve adjuster lock nut	22–26 N·m (2.2–2.6 kg-m, 16–19 ft-lb)
Front engine mounting bolt	60–70 N·m (6.0–7.0 kg-m, 43–51 ft-lb)
Rear engine mounting bolt	60–70 N·m (6.0–7.0 kg-m, 43–51 ft-lb)
Upper engine mounting bolt	35–45 N·m (3.5–4.5 kg-m, 25–33 ft-lb)
Engine mounting bracket	24–30 N·m (2.4–3.0 kg-m, 17–22 ft-lb)

TOOLS

Special

Valve guide reamer (IN)	07984–200000A
Valve guide reamer (EX)	07984–5510000 Not available in U.S.A.

Common

Valve guide remover (IN) 5.5 mm	07742–0010100
Valve guide remover (EX) 6.6 mm	07742–0010200 or 07942–6570100
Valve spring compressor	07757–0010000 or 07957–3290001

TROUBLESHOOTING

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

Low compression or uneven compression

- Valve
 - Incorrect adjustment
 - Burned or bent valves
 - Incorrect valve timing
 - Broken valve spring
- Cylinder head
 - Leaking or damaged head gasket
 - Warped or cracked cylinder head
- Cylinder and piston (Refer to Section 7)

Compression too high

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

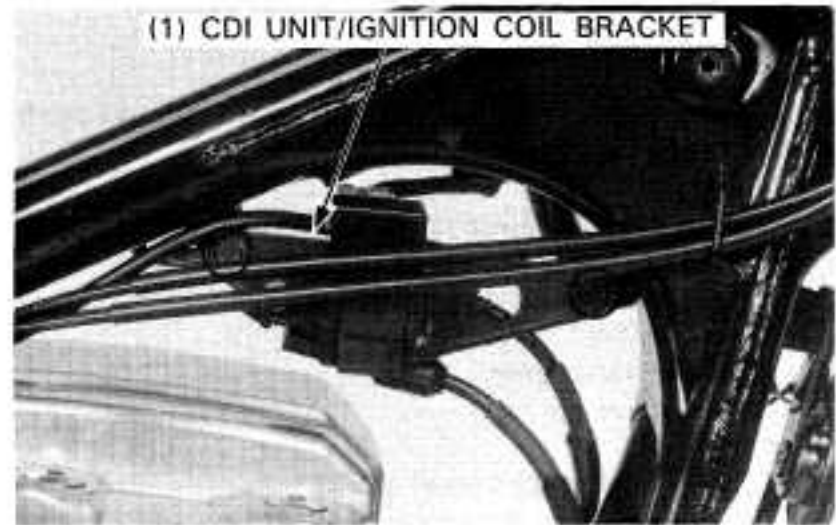
Excessive noise

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

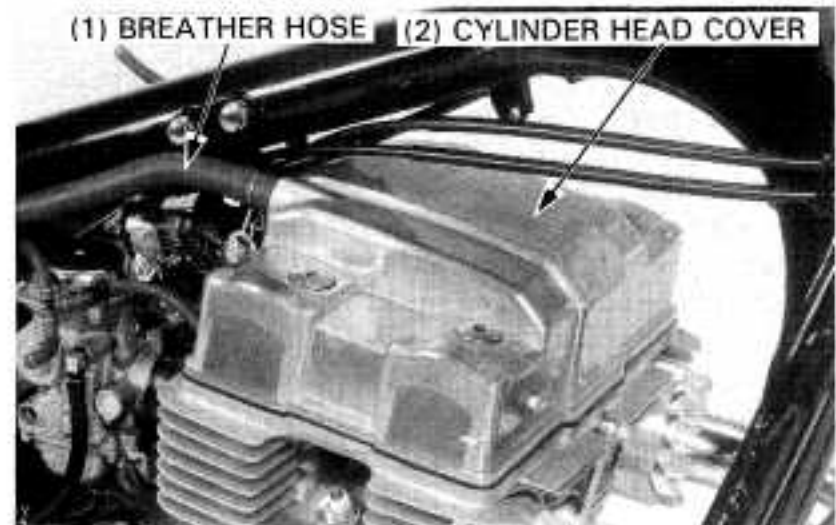
CYLINDER HEAD/VALVES

CYLINDER HEAD COVER REMOVAL

Remove the fuel tank (page 4-14).
Remove the spark plug caps from the plugs.
Remove the CDI unit/ignition coil bracket from the frame.



Disconnect the breather hose from the cylinder head cover.
Remove the four cylinder head cover bolt plugs and the bolts.
Remove the cylinder head cover from the right side.

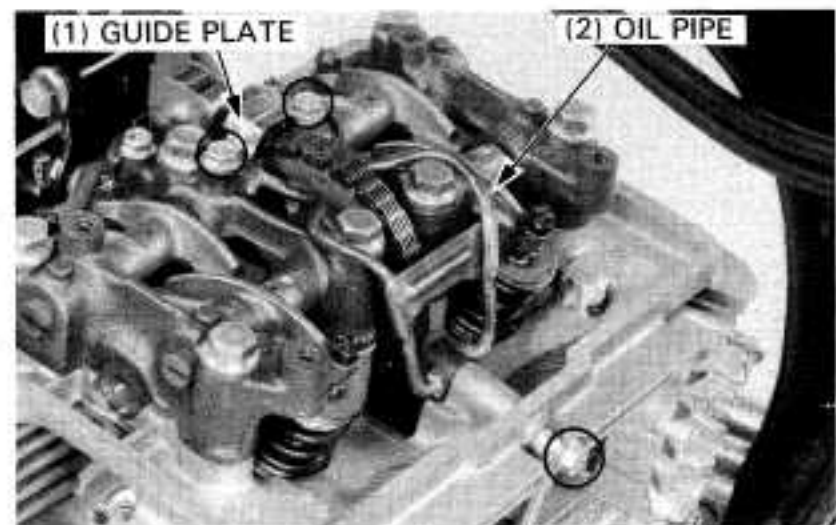


CAMSHAFT REMOVAL

Remove the guide plate and oil pipe.

CAUTION

- *When loosening the external oil pipe bolt, hold the flat portion of the oil pipe joint with a universal wrench or equivalent to prevent the joint from turning with the bolt.*

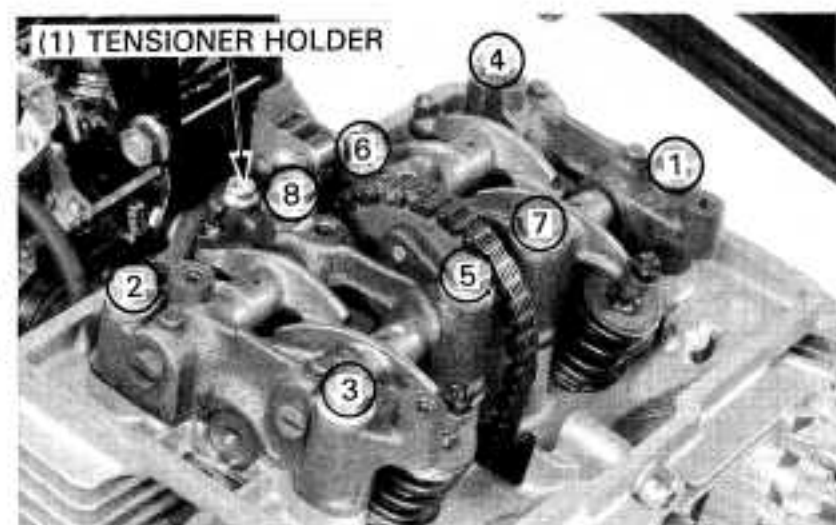


Remove the cam chain tensioner holder.
Loosen the cylinder head bolts.

CAUTION

- *Perform this operation while the engine is cold to prevent warpage due to heat.*
- *Loosen the cylinder head bolts in the sequence shown in 2-3 steps.*

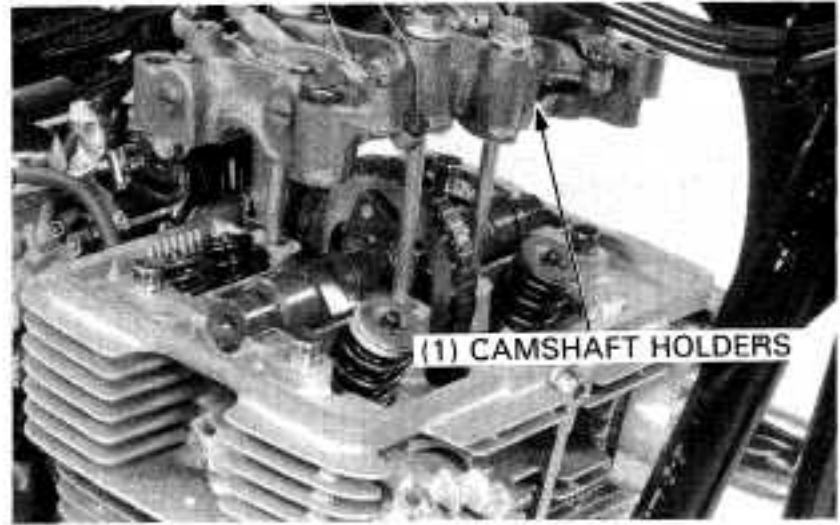
Remove the four outer cylinder head bolts.



Lift the camshaft holders and suspend them from the frame with wire.

CAUTION

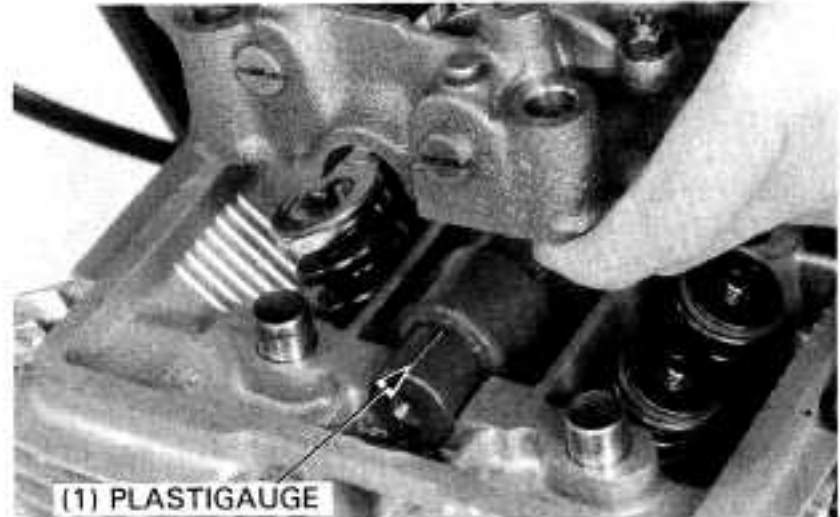
- *Be careful not to damage the camshaft holder mating and bearing surfaces.*

**CAMSHAFT OIL CLEARANCE**

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

NOTE

- Wipe any oil from the journals before using plastigauge.

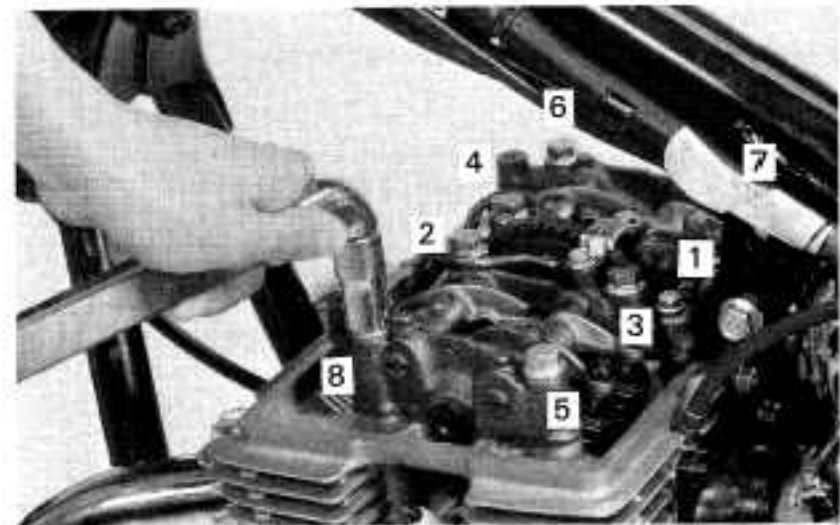


Loosen all the valve adjusters, then install the camshaft holders and tighten to the specified torque in the sequence shown.

TORQUE: 30–36 N·m (3.0–3.6 kg·m, 22–26 ft·lb)

NOTE

- Do not rotate the camshaft when using plastigauge.



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

SERVICE LIMIT: ENDS: 0.20 mm (0.008 in)
CENTER: 0.23 mm (0.009 in)

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

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



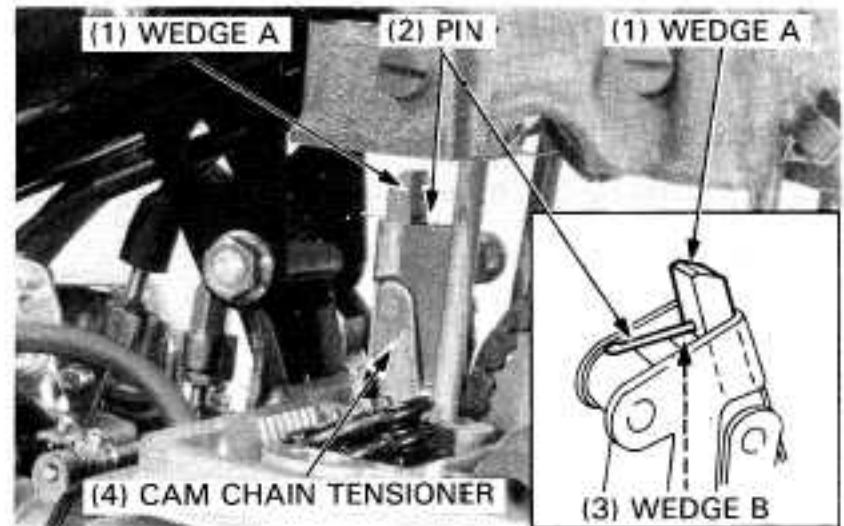
CYLINDER HEAD/VALVES

CAMSHAFT REMOVAL

Remove the camshaft holder dowel pins.

To release the tensioner mechanism:

- Pull wedge A straight up while holding wedge B down.
- Secure wedge A with a suitable pin as shown.



Remove the left crankcase cover (page 9-2).

Remove the cam sprocket bolt.

Rotate the crankshaft counterclockwise one turn (360°) and remove the other cam sprocket bolt.

NOTE

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

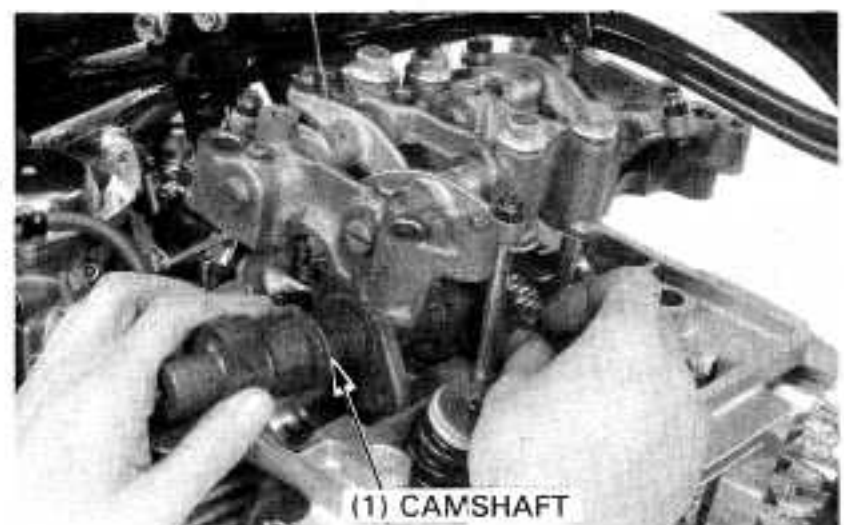
Remove the cam sprocket from the camshaft flange with the cam chain. Rotate the crankshaft counterclockwise half a turn (180°) and remove the cam chain from the sprocket.



Remove the camshaft from the right side.

NOTE

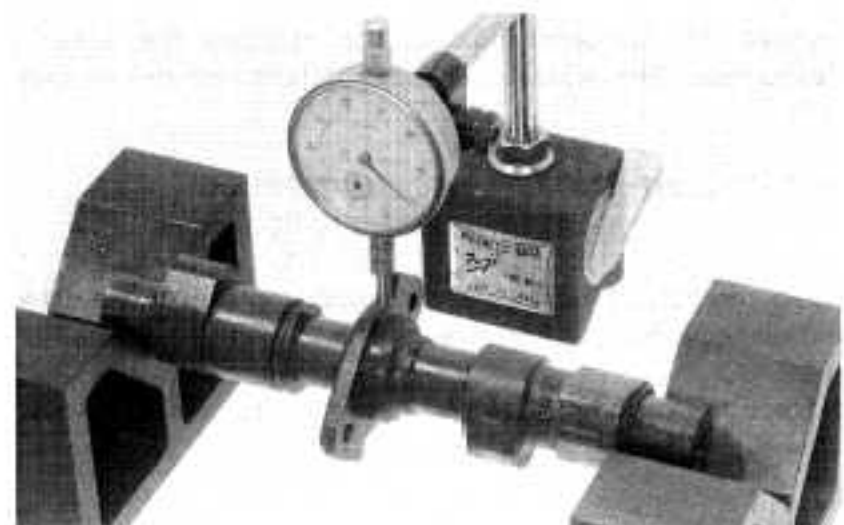
- Suspend the cam chain with a piece of wire to keep it from falling into the cylinder.



CAMSHAFT INSPECTION

Check the camshaft runout with a dial indicator. Support both ends of the camshaft with V-blocks.

SERVICE LIMIT: 0.10 mm (0.004 in)

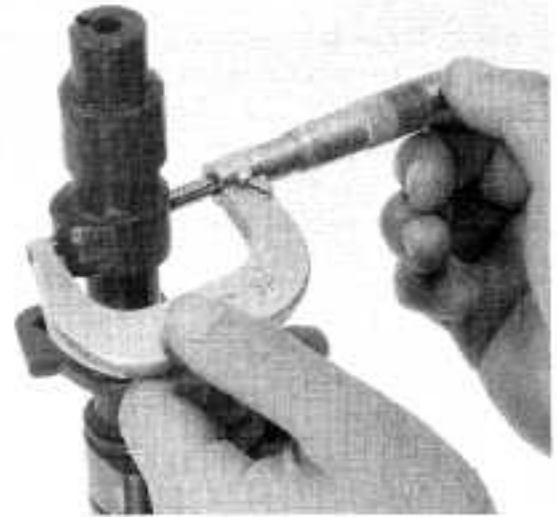
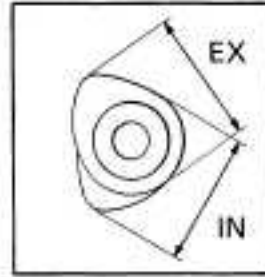


Using a micrometer, measure each cam lobe.
Check for wear or damage.

SERVICE LIMITS: IN: 36.10 mm (1.421 in)
EX: 35.75 mm (1.407 in)

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

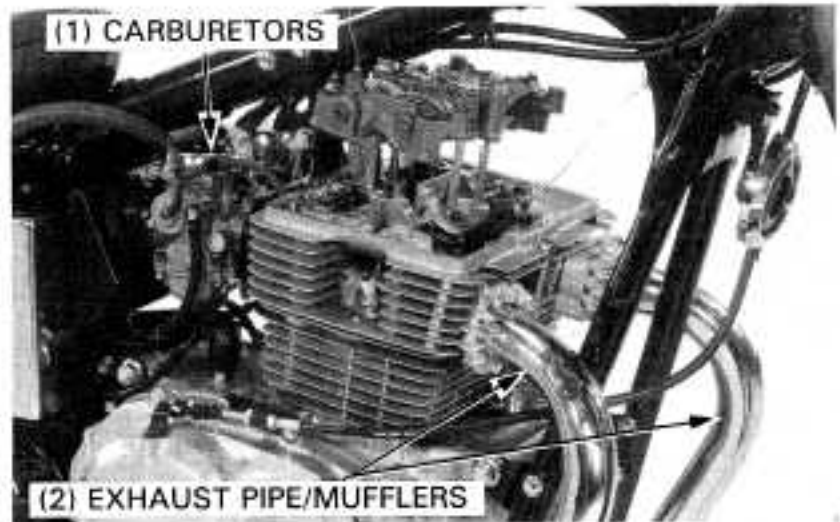
Replace the cylinder head and camshaft holders if the clearance still exceeds the service limits.



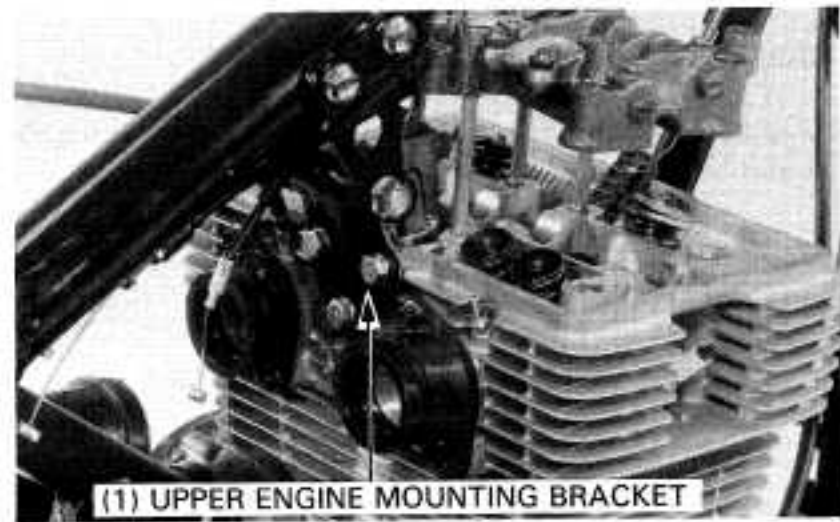
CYLINDER HEAD REMOVAL

REMOVAL

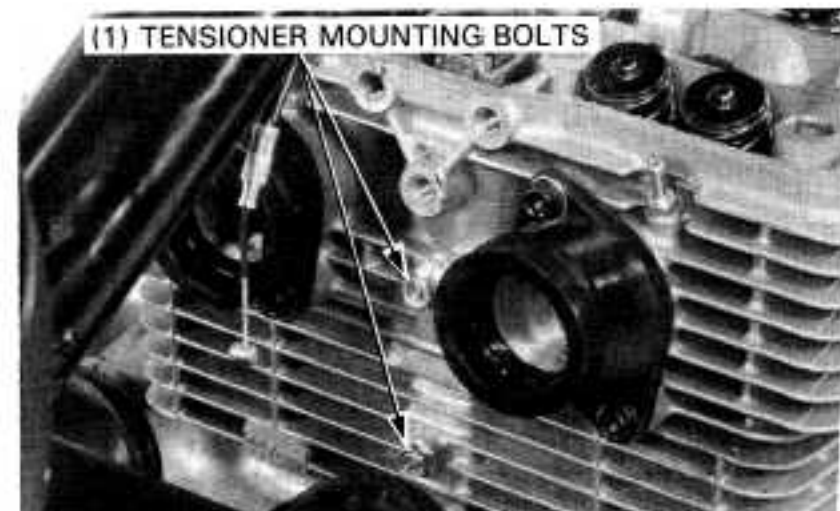
Remove the exhaust pipes/mufflers (page 5-2).
Remove the carburetors (page 4-3).



Remove the upper engine mounting bracket.

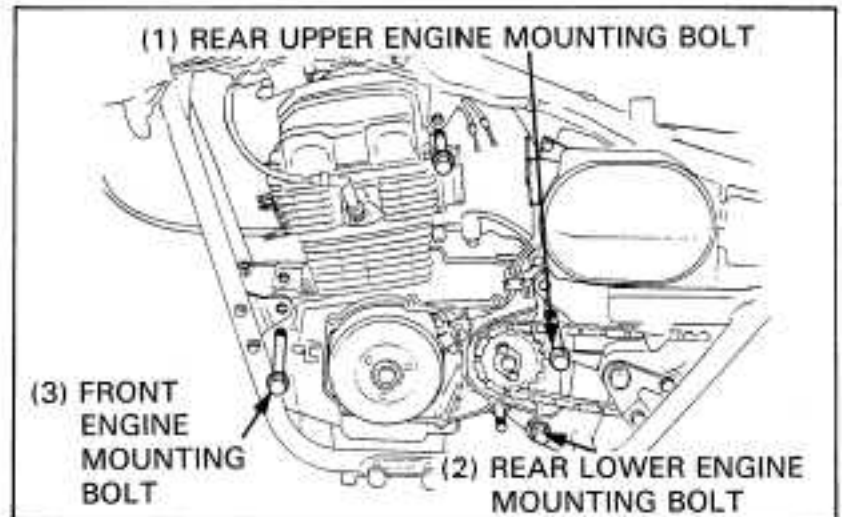


Remove the cam chain tensioner mounting bolts and the tensioner.



CYLINDER HEAD/VALVES

Support the engine with a jack and remove the front and rear upper engine mounting bolts and brackets.
Loosen the rear lower engine mounting bolt.
Tilt the engine slightly to the right and left to remove the four inner cylinder head bolts.
Remove the camshaft holders.

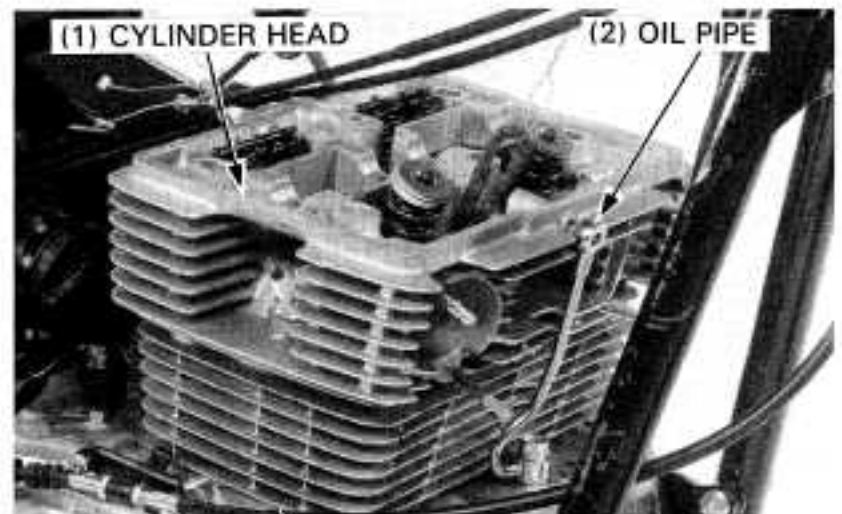


Remove the oil pipe.
Remove the cylinder head from the cylinder.

CAUTION

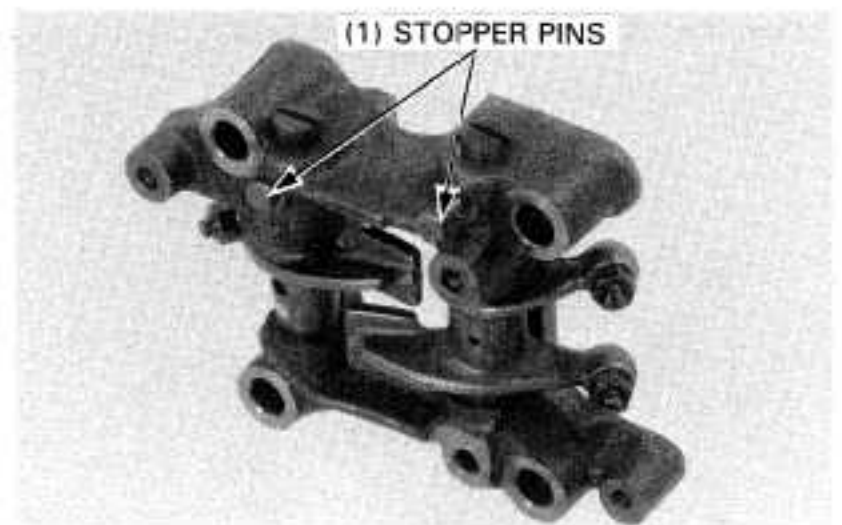
- *To prevent damage to the fins, pry only at the ribbed areas.*

Remove the cylinder head gasket and dowel pins.



CAMSHAFT HOLDER DISASSEMBLY

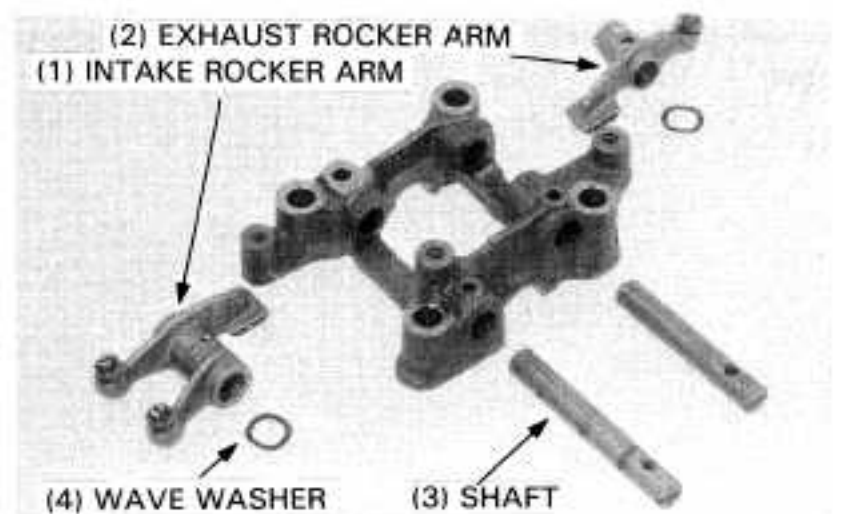
Drive the stopper pins out of the camshaft holder with a suitable pin driver.



Pull the rocker arm shafts out and remove the rocker arms and wave washers.

NOTE

- Mark each part to ensure original assembly.



ROCKER ARM INSPECTION

Inspect the rocker arms for damage, wear or clogged oil holes. Measure the I.D. of each rocker arm.

SERVICE LIMIT: 12.03 mm (0.474 in)

NOTE

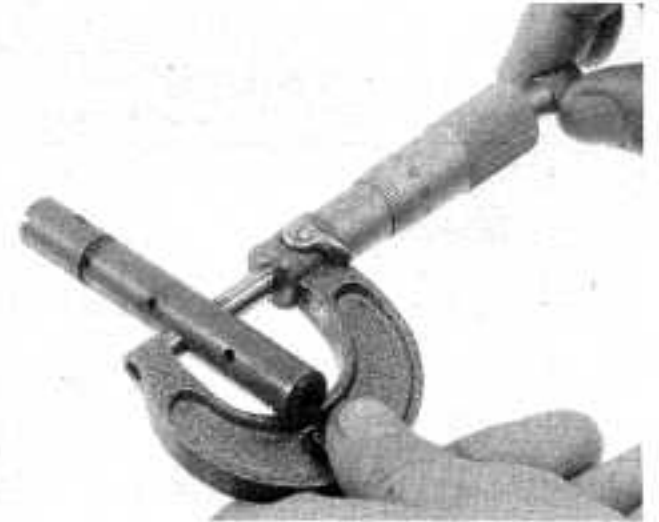
- If any rocker arms require servicing or replacement, inspect the camshaft lobes for scoring, chipping, or flat spots.



ROCKER ARM SHAFT INSPECTION

Inspect the rocker arm shafts for wear or damage. Measure the O.D. of each rocker arm shaft.

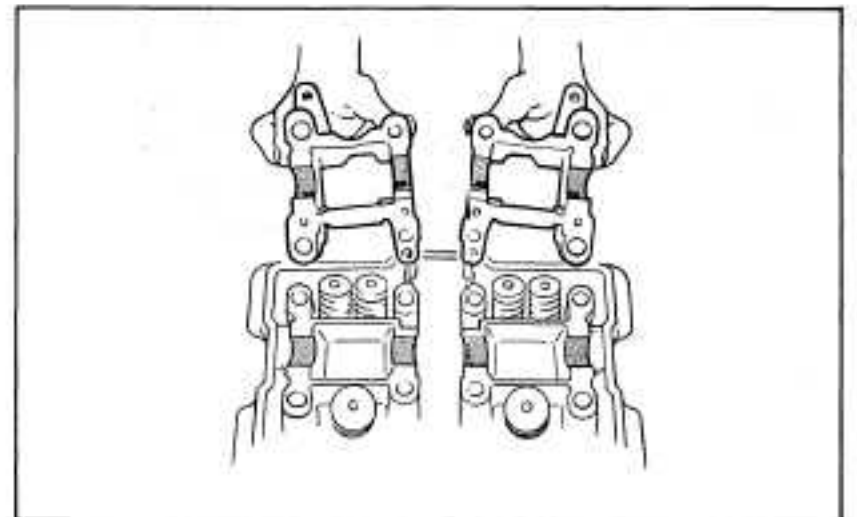
SERVICE LIMIT: 11.95 mm (0.470 in)



CAM BEARING SURFACE INSPECTION

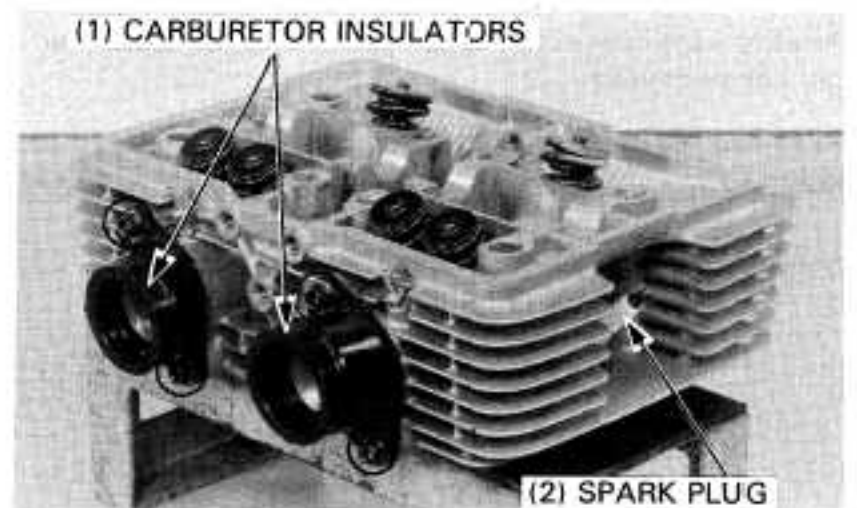
Inspect the cam bearing surfaces for damage; scoring, scratches, or evidence of insufficient lubrication.

Make sure the oil passages are clear.



CYLINDER HEAD DISASSEMBLY

Remove the carburetor insulators and the spark plugs from the cylinder head.



CYLINDER HEAD/VALVES

Remove the valve spring cotters, retainers springs and valves.

NOTE

- Do not compress the valve springs more than necessary to remove the valve spring cotters.
- Mark all disassembled parts to ensure correct reassembly.

TOOL:

Valve spring compressor 07757-0010000 or
07957-3290001

Remove the carbon deposits from the combustion chamber.

Clean off the head gasket surfaces.

NOTE

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

INSPECTION

Check the spark plug holes and valve areas for cracks.

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

SERVICE LIMIT: 0.10 mm (0.004 in)

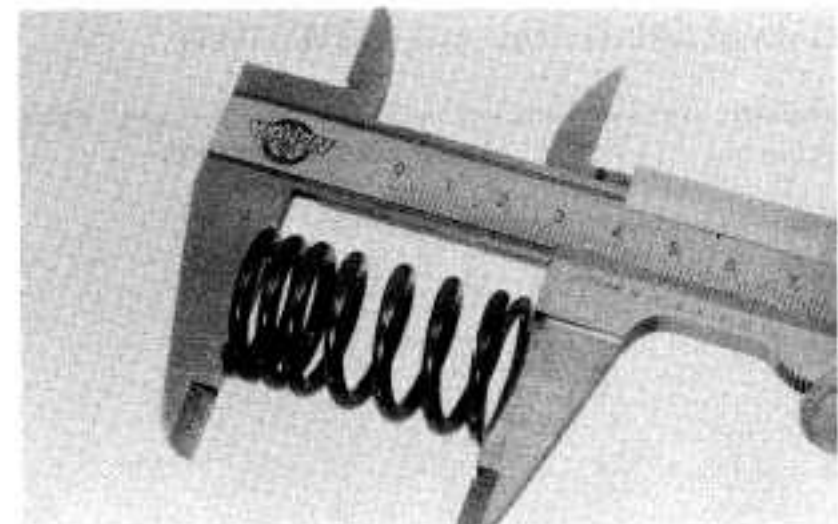
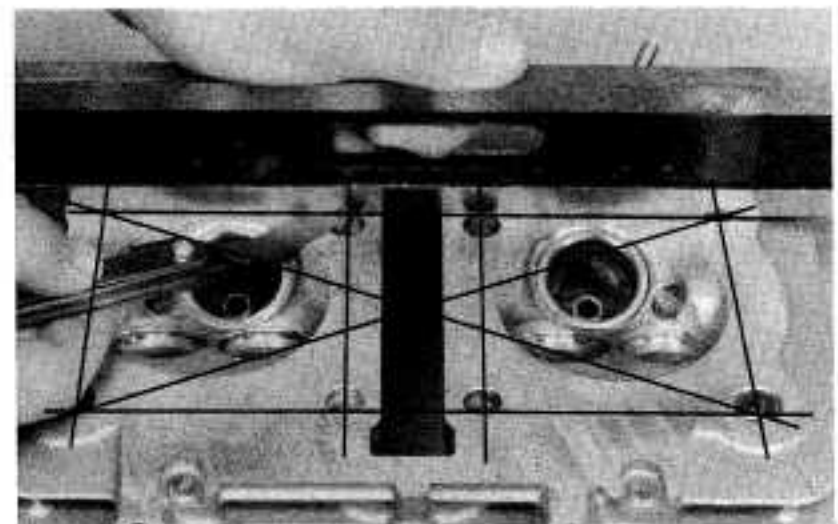
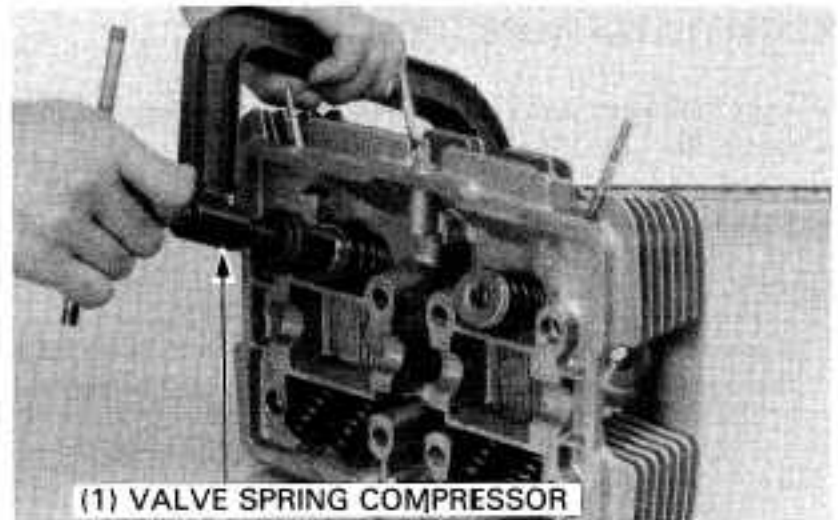
Measure the free length of the inner and outer valve springs.

**SERVICE LIMITS: INNER: IN. 35.5 mm (1.40 in)
EX. 39.5 mm (1.56 in)
OUTER: IN. 49.0 mm (1.93 in)
EX. 49.5 mm (1.95 in)**

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

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

**SERVICE LIMITS: IN: 5.44 mm (0.214 in)
EX: 6.54 mm (0.257 in)**



Ream the guide to remove any carbon build-up before checking clearance.

TOOLS:

Intake: Valve guide reamer 07984-20000A
 Exhaust: Valve guide reamer 07984-551000
 Not available in U.S.A.

NOTE

- Use cutting oil on the reamer during this operation.
- Always rotate the reamer clockwise, never counter-clockwise.

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

SERVICE LIMITS: IN: 5.60 mm (0.220 in)
EX: 6.70 mm (0.264 in)

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

SERVICE LIMITS: IN: 0.10 mm (0.004 in)
EX: 0.10 mm (0.004 in)

NOTE

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

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

NOTE

- Reface the valve seats whenever the valve guides are replaced.

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.*

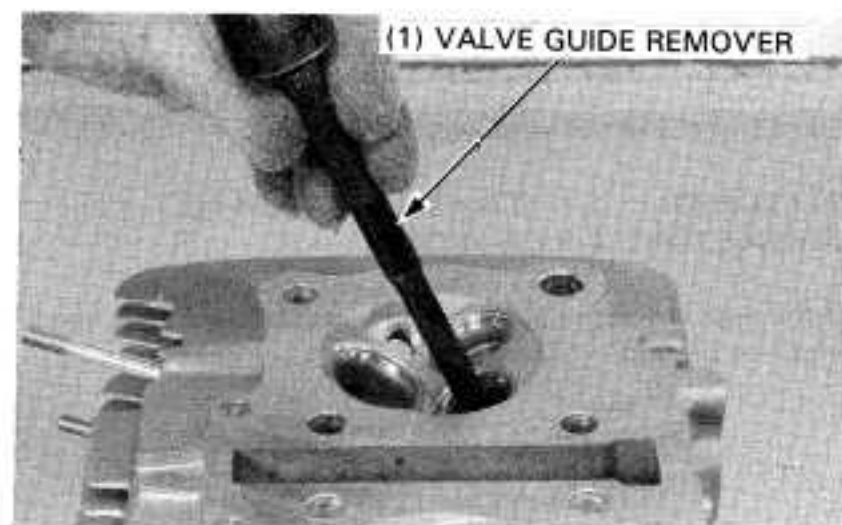
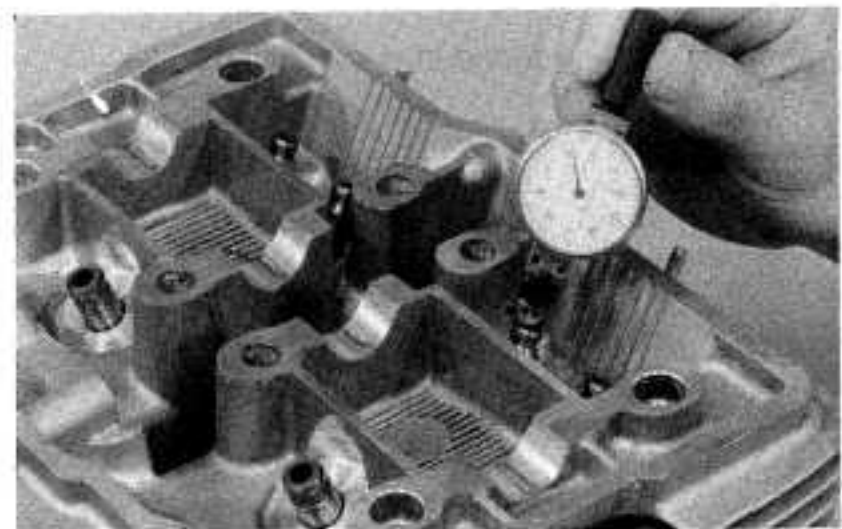
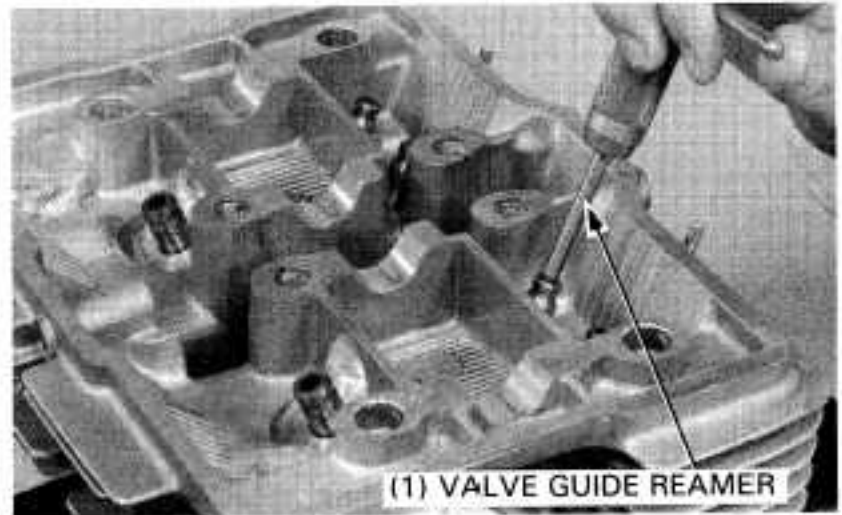
Support the cylinder head and drive out the old guides from the combustion chamber side of the cylinder head.

TOOLS:**Intake:**

Valve guide remover, 5.5 mm 07742-0010100

Exhaust:

Valve guide remover, 6.6 mm 07742-0010200 or
 07942-6570100



CYLINDER HEAD/VALVES

NOTE

- Avoid damaging the cylinder head.

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

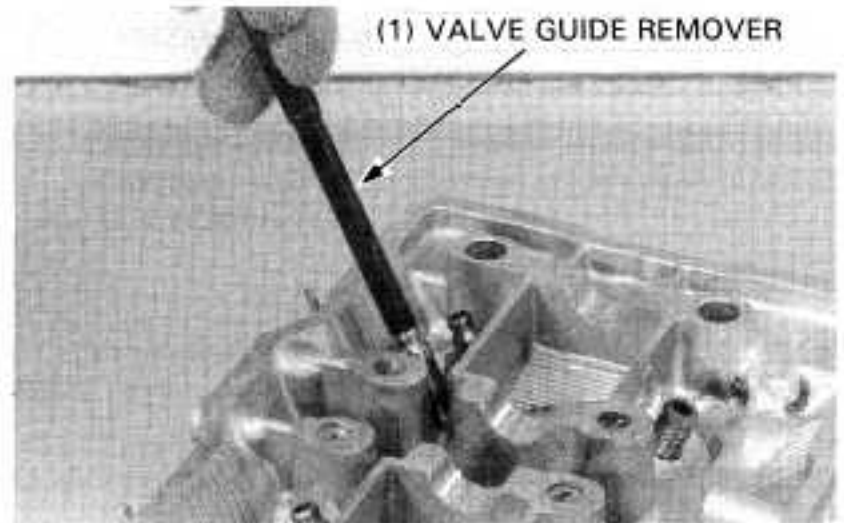
TOOLS:

Intake:

Valve guide remover, 5.5 mm 07742-0010100

Exhaust:

Valve guide remover, 6.6 mm 07742-0010200 or
07942-6570100



Ream the new valve guides after installation.

NOTE

- Use cutting oil on the reamer during this operation.
- Always rotate the reamer clockwise, never counter-clockwise.

TOOLS:

Intake: Valve guide reamer 07984-200000A

Exhaust: Valve guide reamer 07984-5510000
Not available in U.S.A.



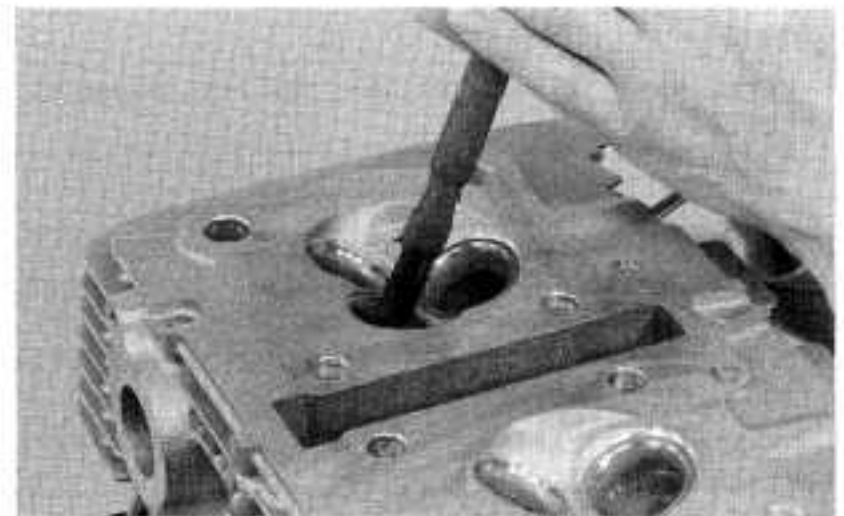
Clean the head thoroughly after reaming the valve guides.

VALVE SEAT INSPECTION AND GRINDING

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

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

Remove the valve and inspect the face.



NOTE

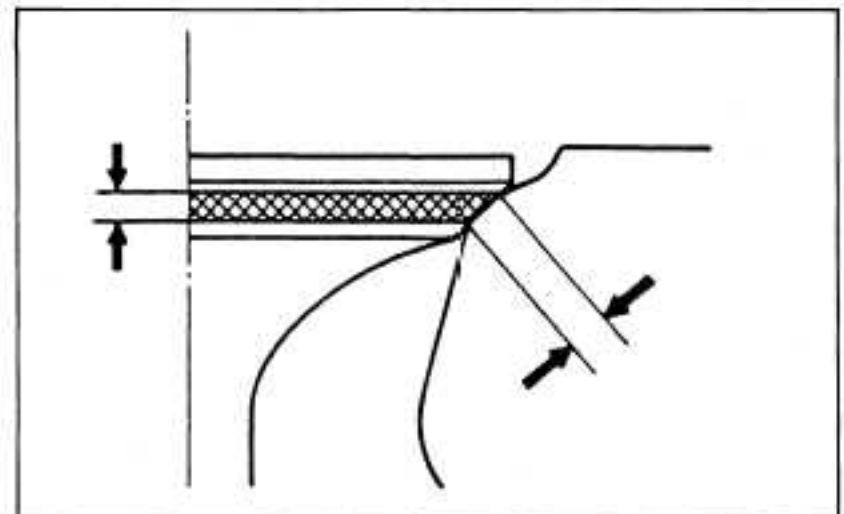
- The valves cannot be ground. If the valve face is rough, worn unevenly, or contacts the seat improperly, the valve must be replaced.

Inspect the width of each valve seat.

STANDARD: 1.1–1.3 mm (0.04–0.05 in)

SERVICE LIMIT: 2.0 mm (0.08 in)

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

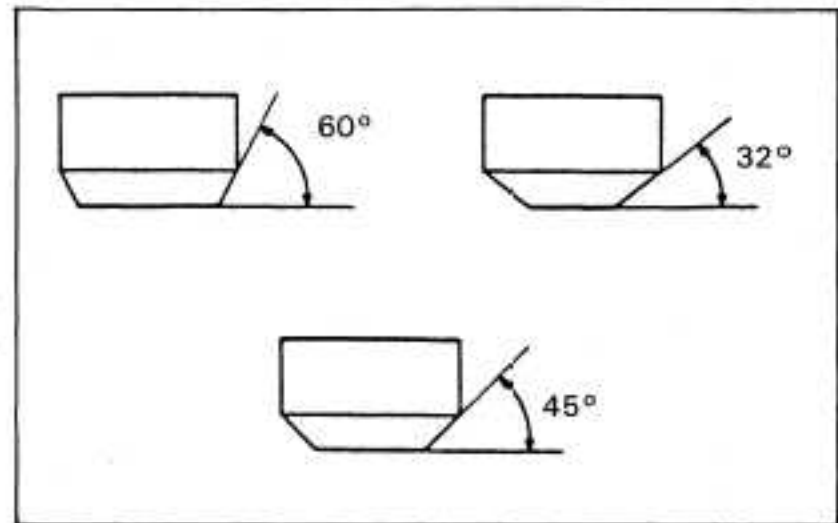


VALVE SEAT CUTTERS

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

NOTE

- Follow the refacer manufacturer's operating instructions.



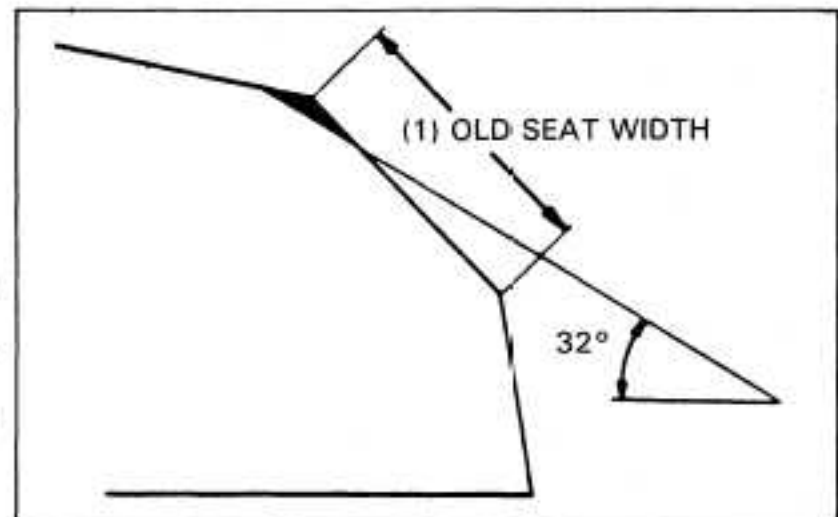
VALVE SEAT REFACING

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

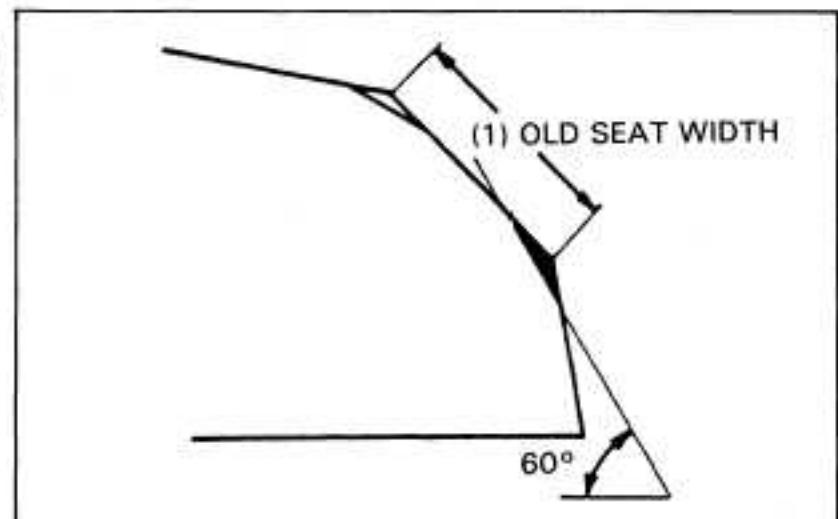
NOTE

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

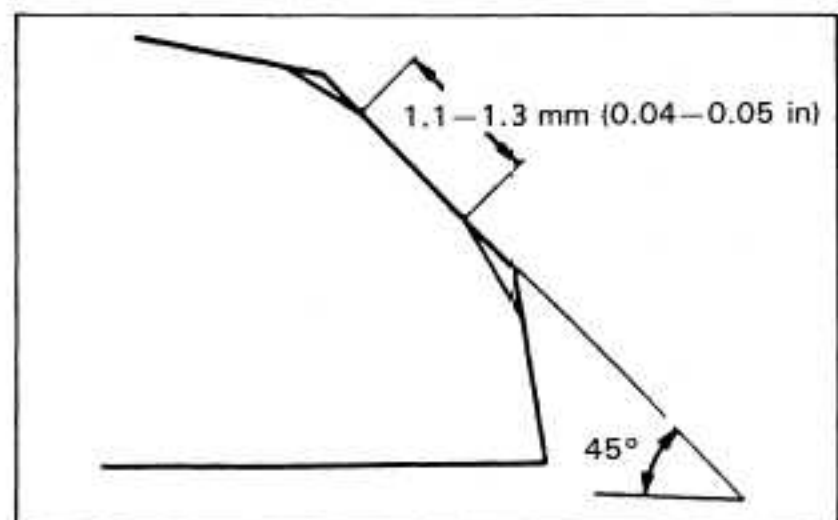
Use a 32 degree cutter to remove the top 1/4 of the existing valve seat material.



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



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



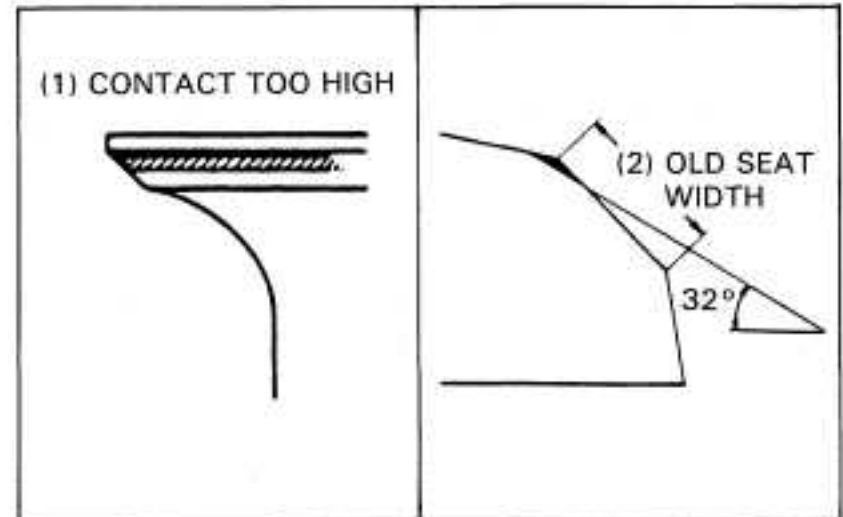
CYLINDER HEAD/VALVES

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.

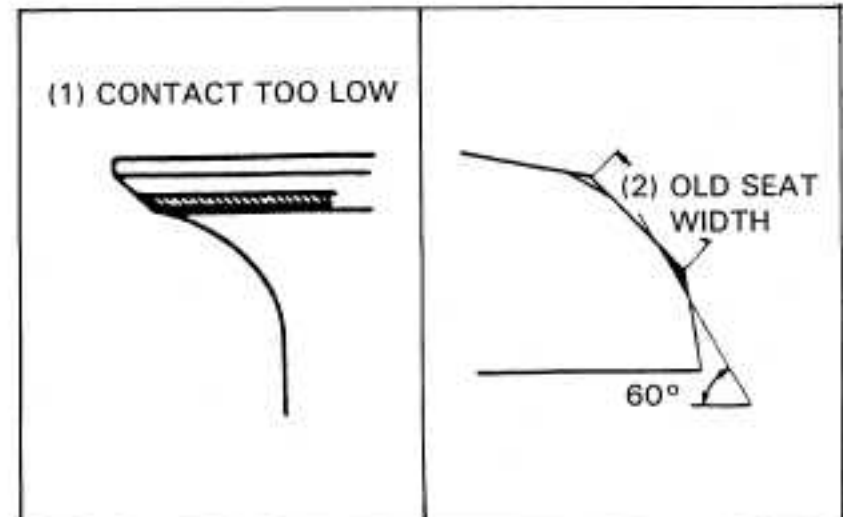
NOTE

- 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.

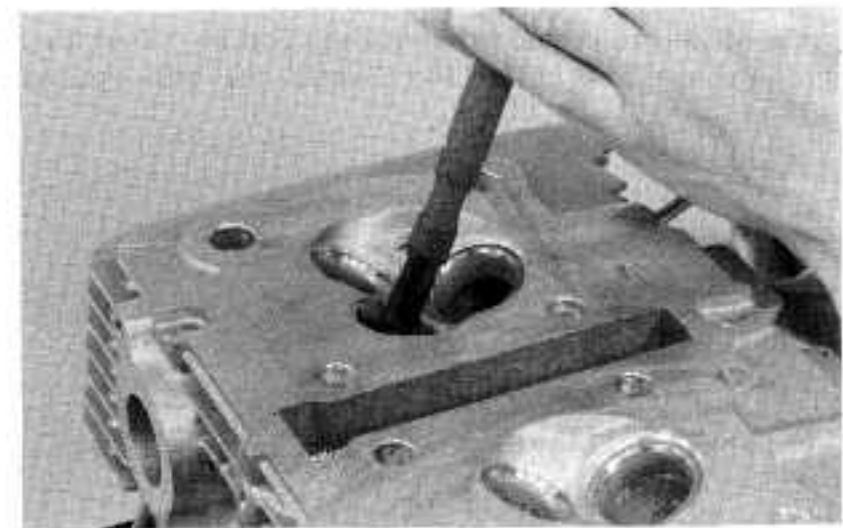


Refinish the seat to specifications, using a 45 degree finish cutter.

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

NOTE

- Do not allow lapping compound to enter the guides.



CYLINDER HEAD ASSEMBLY

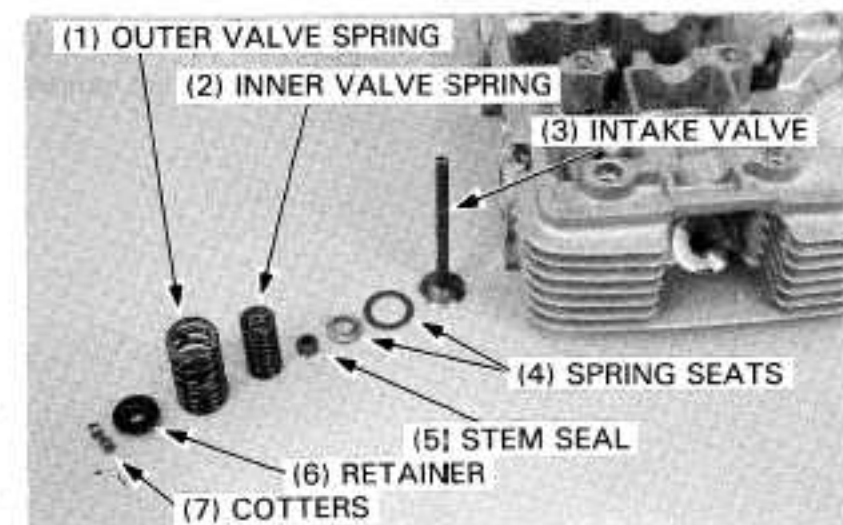
Install the valve spring seats and new stem seals.

Lubricate each valve stem with oil and insert the valve into the valve guide.

Install the valve springs and retainers.

NOTE

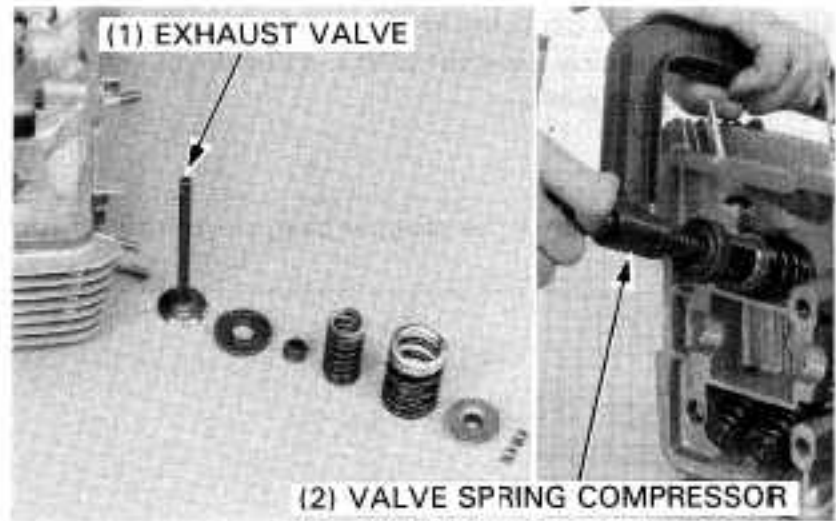
- Install the valve springs with the tightly wound coils facing the cylinder head.



Install the valve cotters.

CAUTION

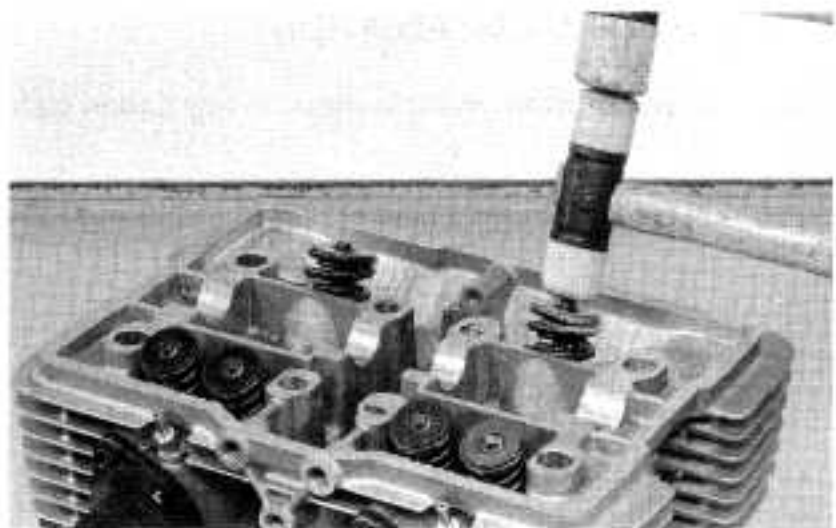
- *To prevent loss of tension, do not compress the valve spring more than necessary to install the valve cotters.*



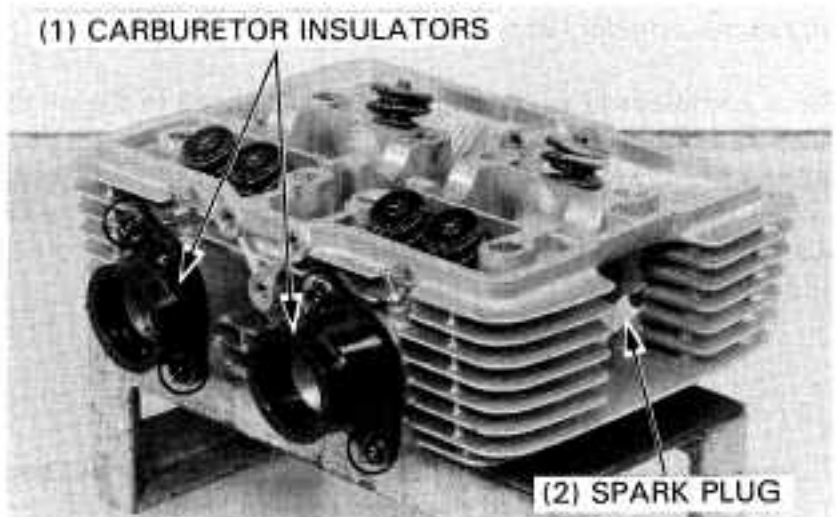
Tap the valve stems gently with a soft hammer to firmly seat the cotters.

CAUTION

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



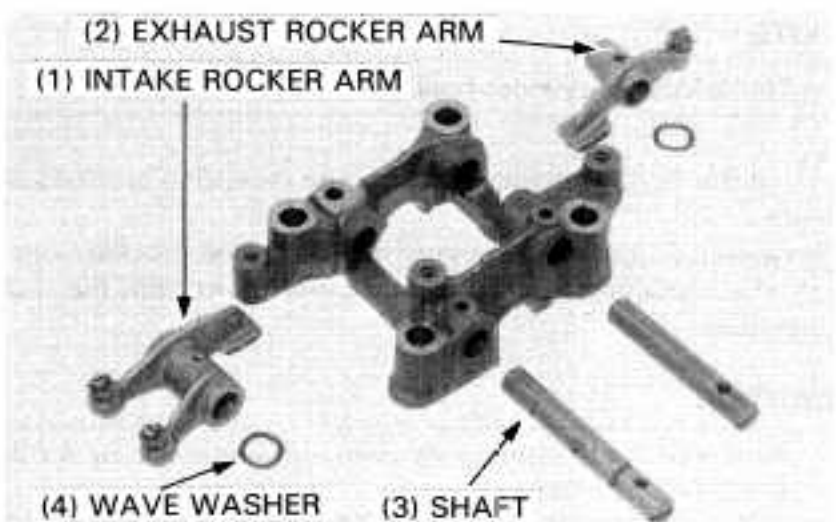
Install the carburetor insulators with new O-rings.
Install the spark plugs.



CYLINDER HEAD INSTALLATION

CAMSHAFT HOLDER ASSEMBLY

Install the rocker arms and wave washers, and insert the rocker arm shafts.

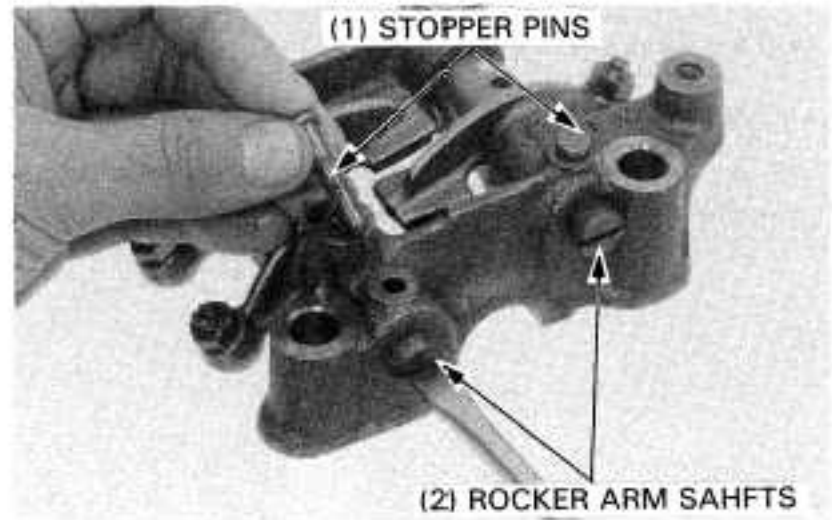


CYLINDER HEAD/VALVES

Align the stopper pin holes in the camshaft holder and rocker arm shaft by turning the shaft with a screwdriver, and then install the stopper pins.

NOTE

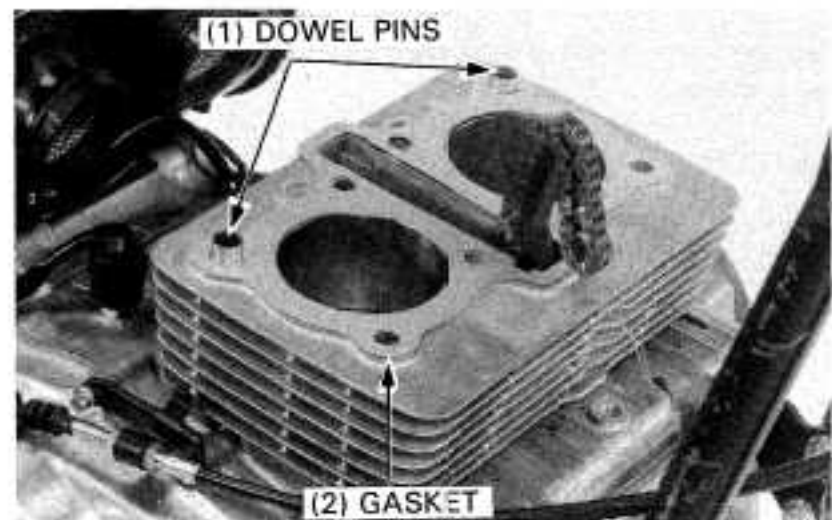
- If it is hard to install the stopper pins, drive them in with a plastic hammer.



CYLINDER HEAD INSTALLATION

Clean the cylinder head gasket surfaces of any gasket material.

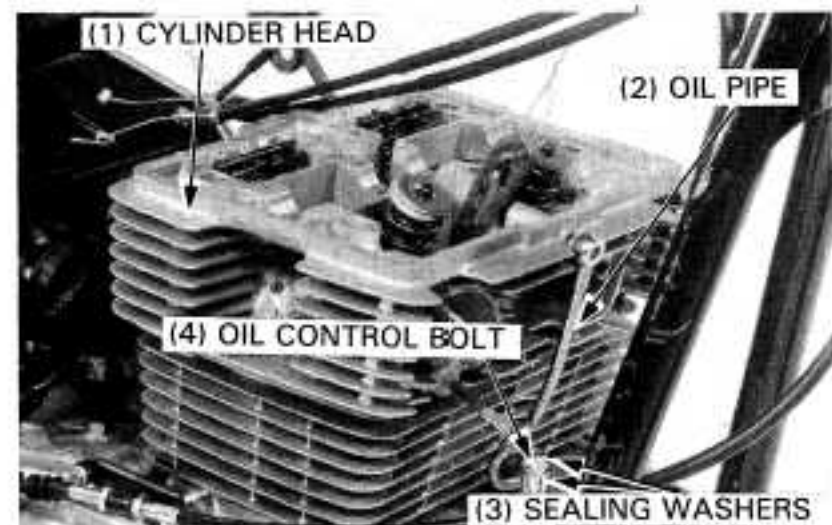
Install the dowel pins and a new gasket.



Install the cylinder head.

Blow compressed air through the oil passages in the oil pipe and control bolt to clean them.

Install the oil pipe onto the crankcase with the two sealing washers and oil control bolt.



Temporarily install the camshaft holders on the cylinder head. Tilt the engine slightly to the right and left to install the inner cylinder head bolts.

NOTE

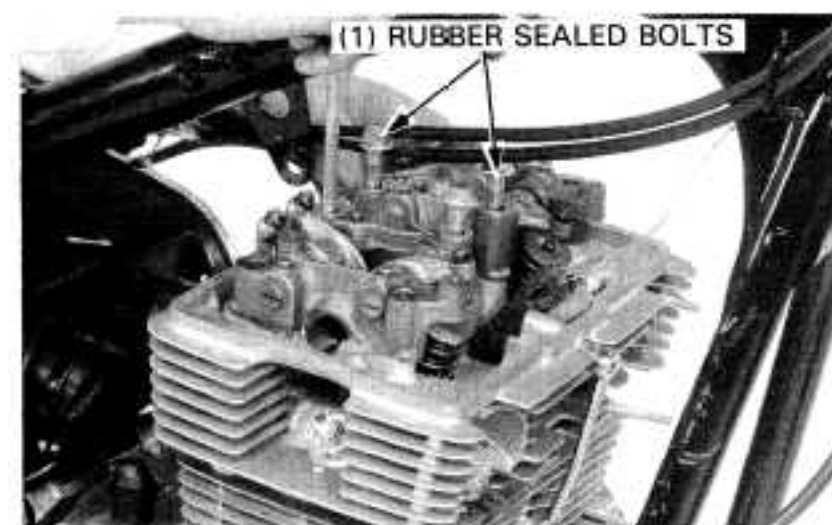
- The left inner cylinder head bolts are rubber sealed.

Install the front and rear upper engine mounting brackets and bolts.

Temporarily tighten the engine mounting and bracket bolts. Lift the camshaft holders and suspend them from the frame with wire.

CAUTION

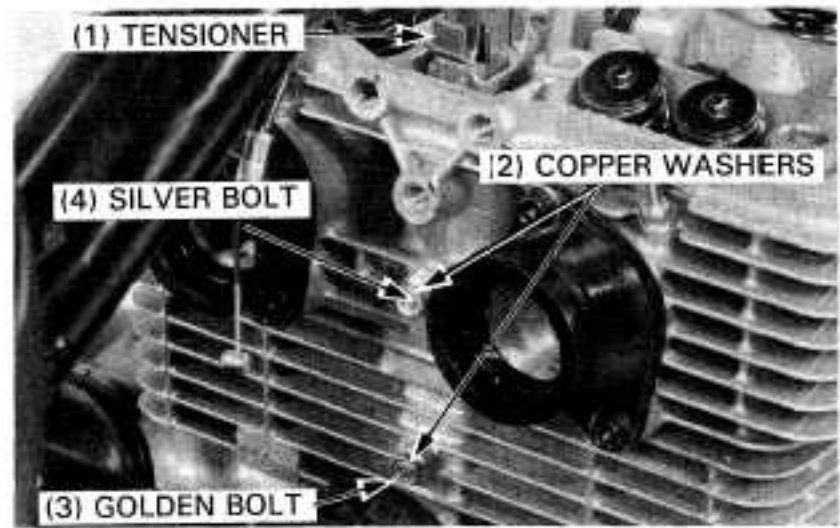
- Be careful not to damage the camshaft holder mating surfaces and bearing surfaces.



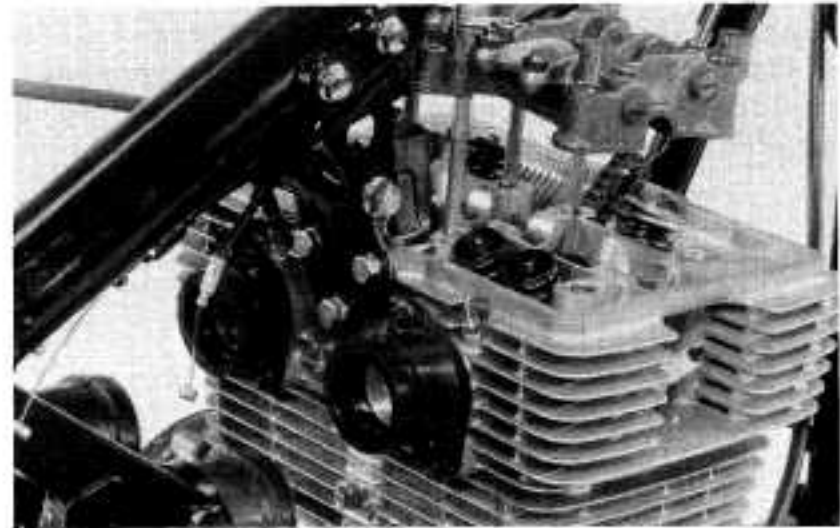
Install the cam chain tensioner with the two bolts and copper washers.

NOTE

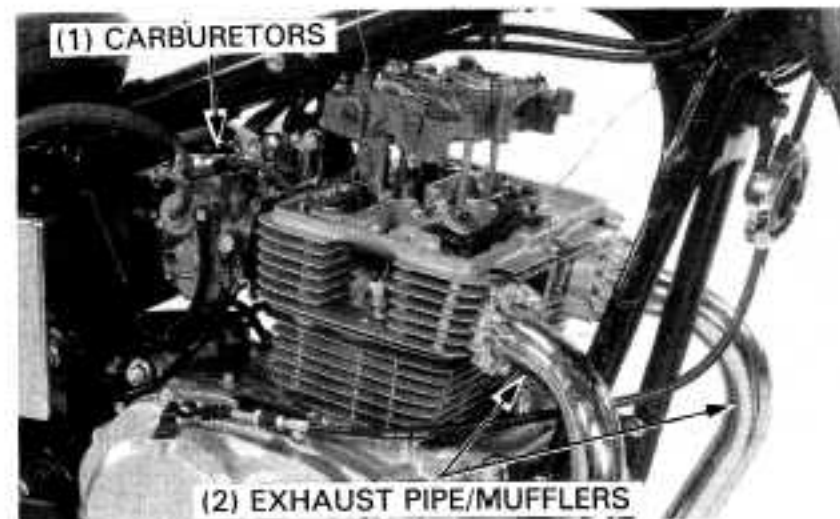
- The upper bolt is silver and lower bolt is golden.



Install the upper engine mounting bracket.



Install the exhaust pipes/mufflers.
Install the carburetors (page 4-12).



CAMSHAFT INSTALLATION

Lubricate the camshaft bearings with molybdenum disulfide grease.

Install the camshaft and cam sprocket with the timing marks facing the left.

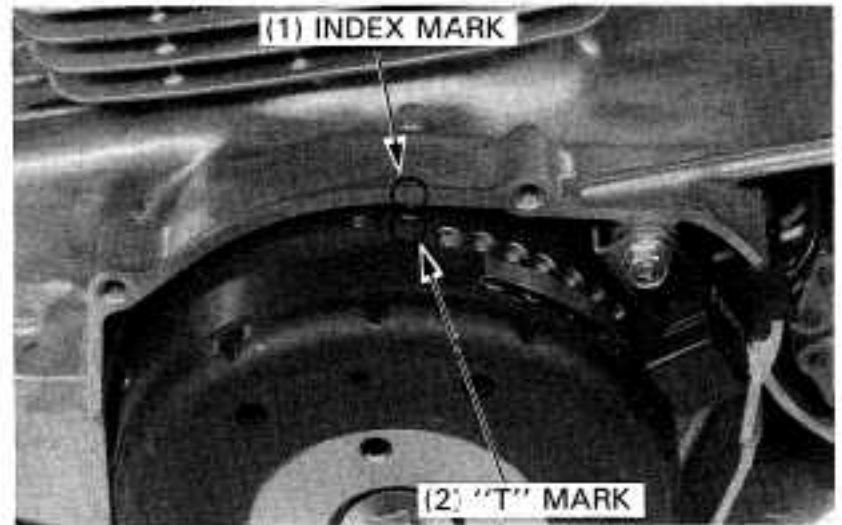


CYLINDER HEAD/VALVES

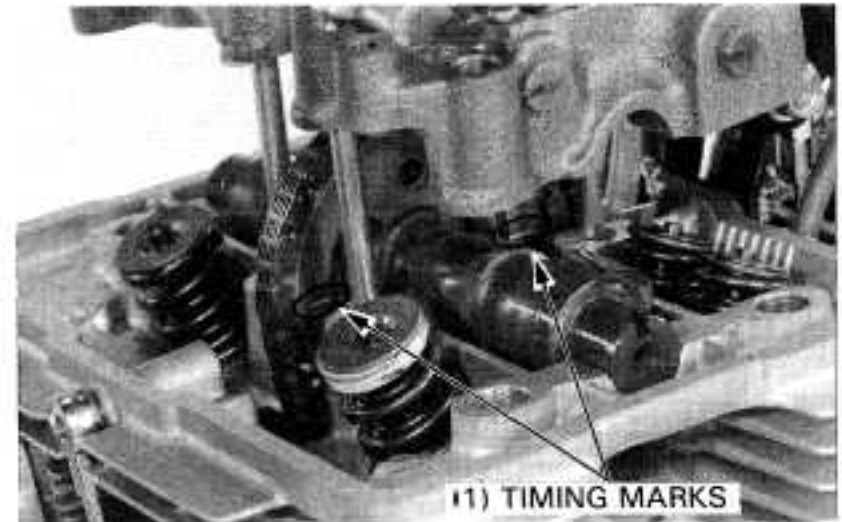
Turn the crankshaft counterclockwise and align the "T" mark on the flywheel with the index mark on the crankcase.

CAUTION

- When turning the crankshaft, make sure the cam chain does not jam at the cam chain tensioner or crankshaft.



Align the timing marks on the cam sprocket with the top of the cylinder head and install the cam chain over the sprocket. Install the cam sprocket onto the camshaft flange and align the cam sprocket bolt holes in the sprocket and shaft.

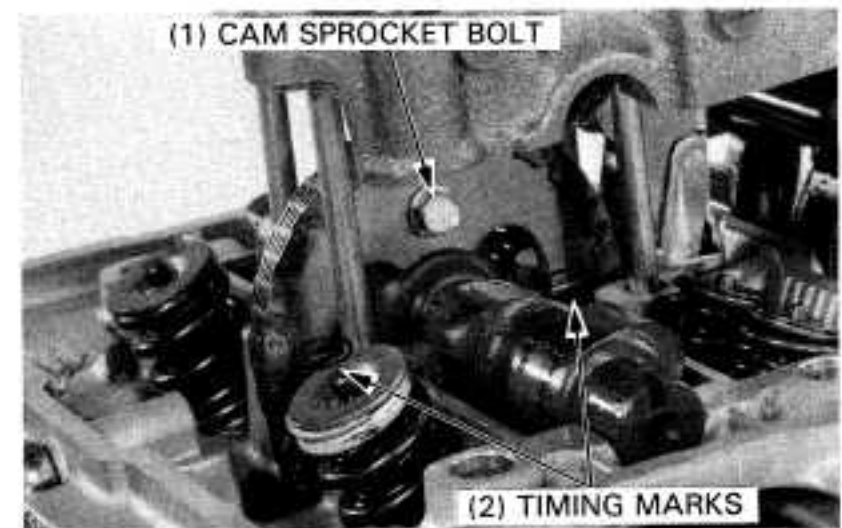


Install and tighten the cam sprocket bolt.

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

Turn the crankshaft counterclockwise 360° and install the other cam sprocket bolt.

Turn the crankshaft counterclockwise and align the "T" mark with the index mark, then check that the timing marks on the cam sprocket align with the top of the cylinder head.

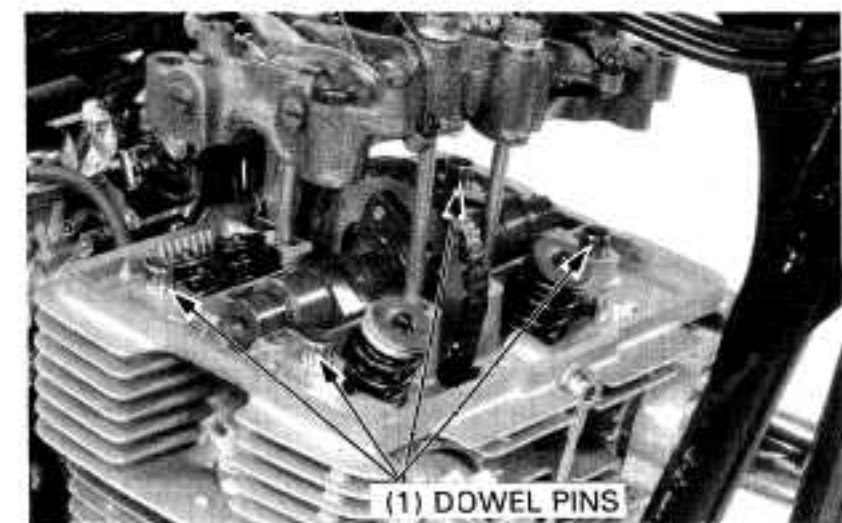
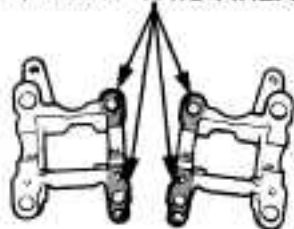


Install the camshaft holder dowel pins.

NOTE

- Apply sealant to the holder as shown.

(1) COAT THIS AREA



Install the camshaft holders and the four outer cylinder head bolts.

Tighten the cylinder head bolts in the sequence shown in 2 or 3 steps.

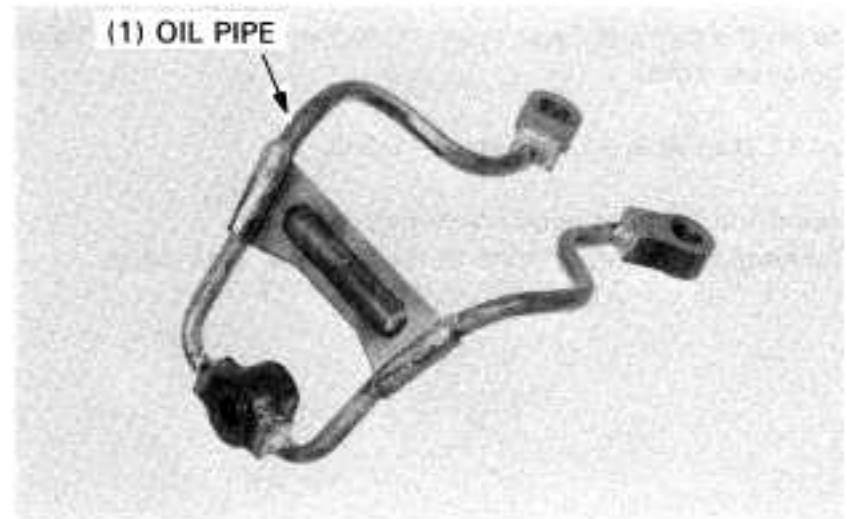
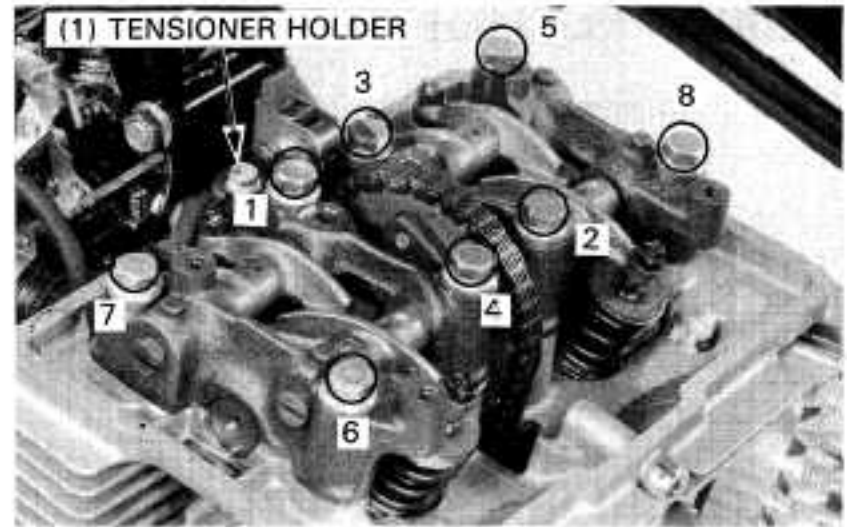
TORQUE: 30–36 N·m (3.0–3.6 kg-m, 22–26 ft-lb)

Install the cam chain tensioner holder.
Tighten the engine mounting and bracket bolts.

TORQUE:

- Bracket bolts:
24–30 N·m (2.4–3.0 kg-m, 17–22 ft-lb)
- Upper mounting bolt:
35–45 N·m (3.5–4.5 kg-m, 25–33 ft-lb)
- Front and rear mounting bolts:
60–70 N·m (6.0–7.0 kg-m, 43–51 ft-lb)

Blow compressed air through the oil passages in the oil pipe to clean them.

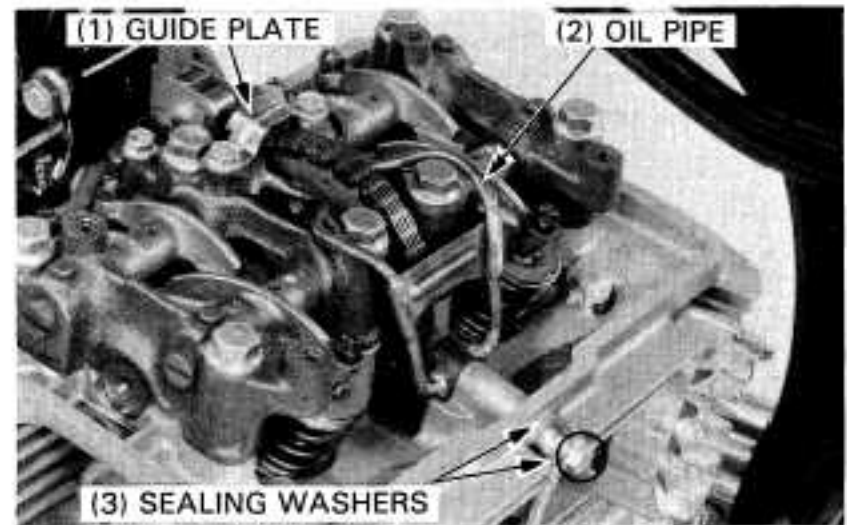


Install the oil pipe and guide plate.

CAUTION

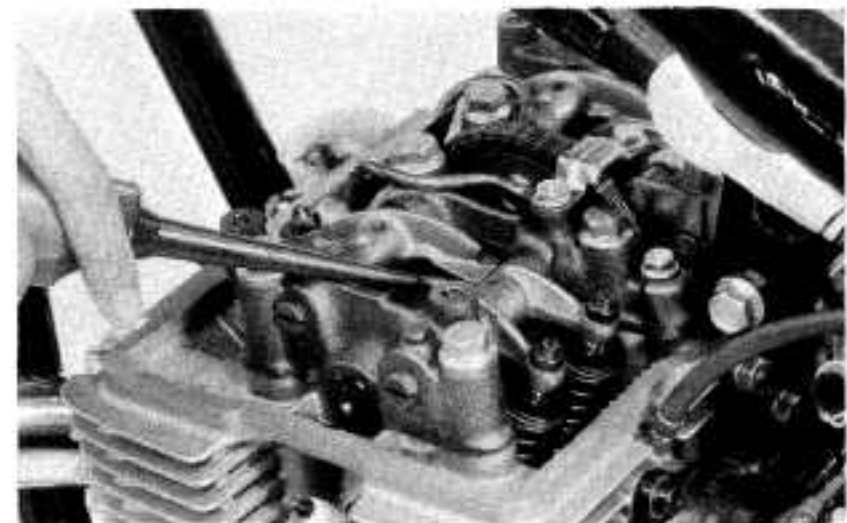
- *When tightening the external oil pipe bolt, hold the flat portion of the oil pipe joint with a universal wrench or equivalent to prevent the joint from turning with the bolt.*

Make sure that the oil pipe sealing washers are installed in correct position.



Fill the oil pockets in the head with oil so that the cam lobes are submerged.

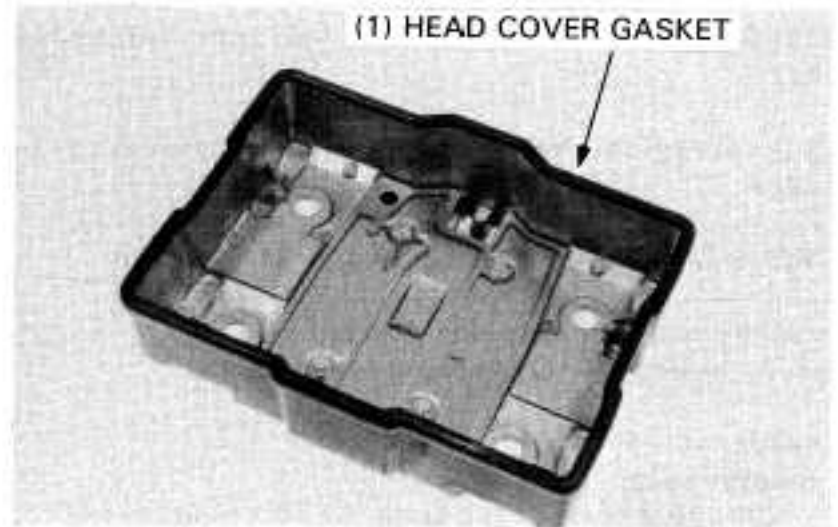
Adjust the valve clearance (page 3-8).



CYLINDER HEAD COVER INSTALLATION

Inspect the cylinder head cover gasket for damage or deterioration.

Coat the groove of the cylinder head cover with adhesive.
Place the head cover gasket in place.



Install the cylinder head cover from the right side and tighten the cover bolts.

8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)

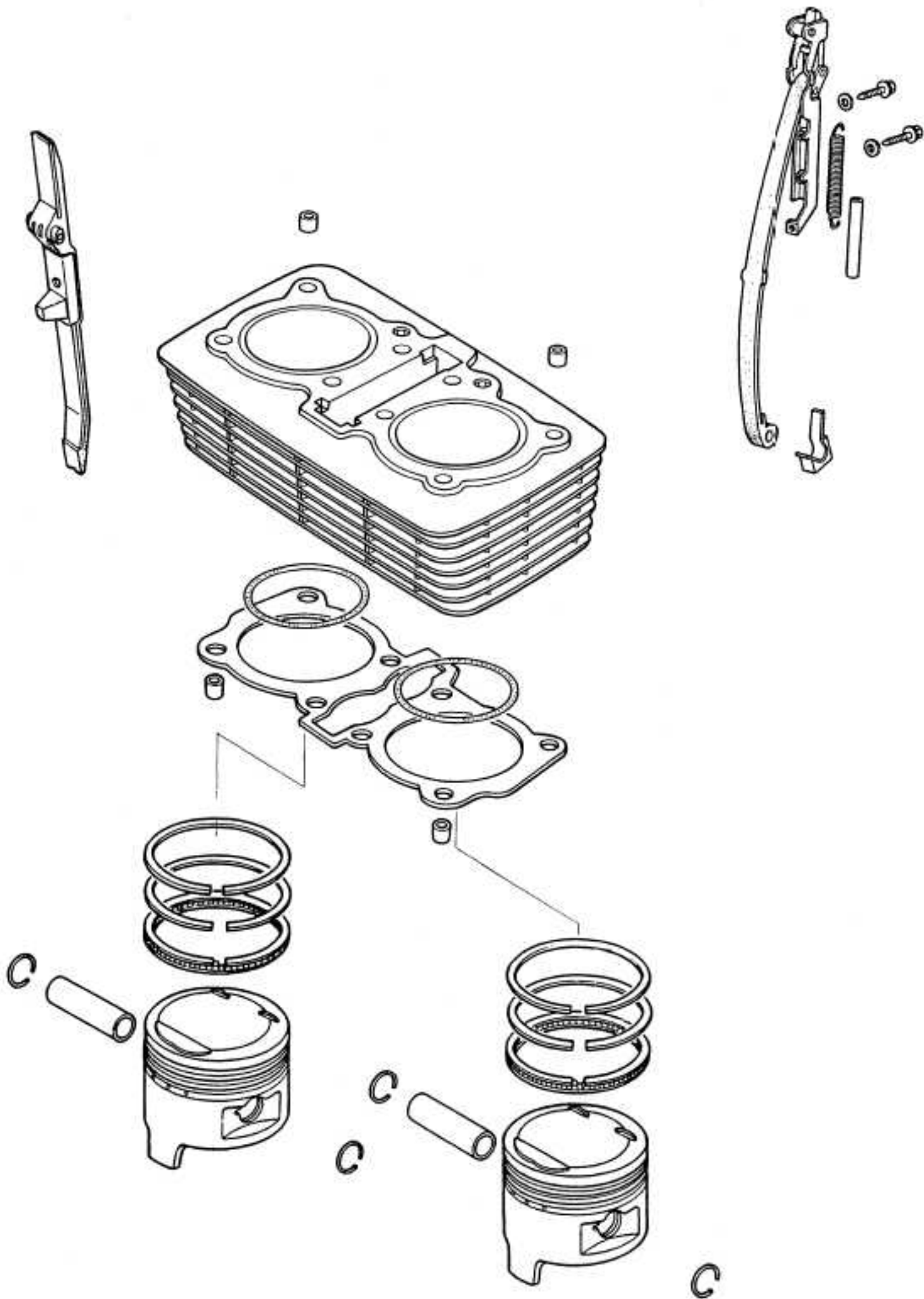
Install the cylinder head cover bolt plugs.
Connect the breather hose to the cylinder head cover.



Install the CDI unit/ignition coil bracket onto the frame.
Install the spark plug caps.
Install the fuel tank (page 4-14).



MEMO



7. CYLINDER/PISTON

SERVICE INFORMATION	7-1	PISTON REMOVAL	7-2
TROUBLESHOOTING	7-1	PISTON INSTALLATION	7-5
CYLINDER REMOVAL	7-2	CYLINDER INSTALLATION	7-6

SERVICE INFORMATION

GENERAL

- This section covers the removal, inspection and installation of the cylinder and piston. All these services can be accomplished with the engine installed in the frame.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Cylinder	I.D.	75.000–75.010 (2.9528–2.9531)	75.10 (2.957)
	Taper	—	0.10 (0.004)
	Out-of-round	—	0.10 (0.004)
	Warpage	—	0.10 (0.004)
Piston, piston rings and piston pin	Piston ring-to-ring groove clearance	TOP	0.03–0.06 (0.001–0.002)
		SECOND	0.025–0.055 (0.0009–0.0022)
	Ring end gap	TOP	0.10–0.30 (0.004–0.012)
		SECOND	0.10–0.30 (0.004–0.012)
		OIL (SIDE RAIL)	0.20–0.90 (0.008–0.035)
	Piston O.D.	74.960–74.990 (2.9512–2.9524)	74.90 (2.949)
	Piston pin bore	18.002–18.008 (0.7087–0.7090)	18.04 (0.710)
	Connecting rod small end I.D.	18.016–18.034 (0.7093–0.7100)	18.06 (0.711)
	Piston pin O.D.	17.994–18.000 (0.7084–0.7087)	17.98 (0.708)
	Piston-to-piston pin clearance	0.002–0.014 (0.0001–0.0006)	0.040 (0.0016)
Cylinder-to-piston clearance	0.010–0.050 (0.0004–0.0020)	0.10 (0.004)	

TOOLS

Special

Piston base	07958–2500001
Piston ring compressor	07954–5680000

TROUBLESHOOTING

Compression too low or unstable

- Worn cylinder or piston rings

Excessive smoke

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

Overheating

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

Knocking or abnormal noise

- Worn piston and cylinder
- Excessive carbon build-up

CYLINDER/PISTON

CYLINDER REMOVAL

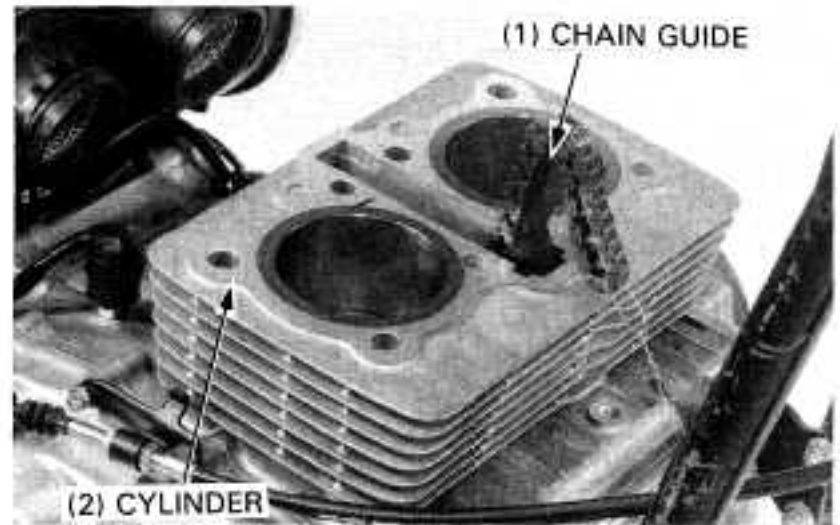
Remove the cylinder head. (Refer to Section 6).
Remove the cam chain guide.

Remove the cylinder.

Clean off any gasket material from the cylinder base and head gasket surfaces, being careful not to damage the cylinder surfaces.

NOTE

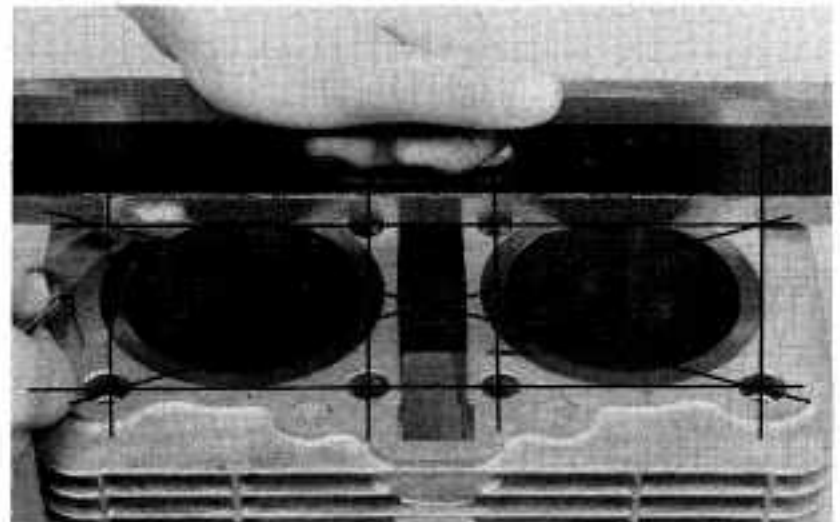
- The gasket will come off easier if it is soaked in solvent.



INSPECTION

Inspect the top of the cylinders for warpage.

SERVICE LIMIT: 0.10 mm (0.004 in)



PISTON REMOVAL

Remove each piston pin clip with pliers.

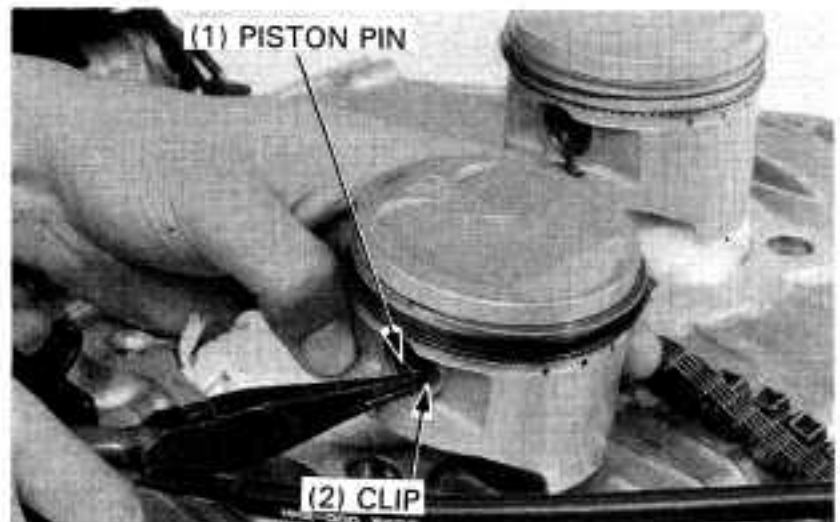
NOTE

- Be careful when removing clips to keep them from falling into the crankcase.

Press the piston pin out of the piston.

NOTE

- Mark the pistons to indicate the cylinder positions.



INSPECTION

Remove the piston rings.

NOTE

- Mark the rings so that they can be returned to their original locations.

Inspect the pistons for damage and cracks; inspect ring grooves for wear.

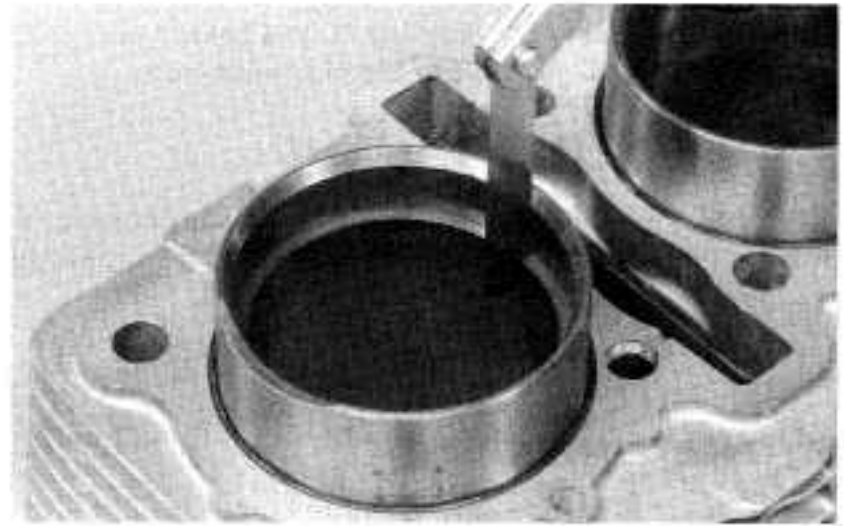
Inspect the piston ring-to groove clearance.

SERVICE LIMITS: TOP: 0.10 mm (0.004 in)
SECOND: 0.10 mm (0.004 in)



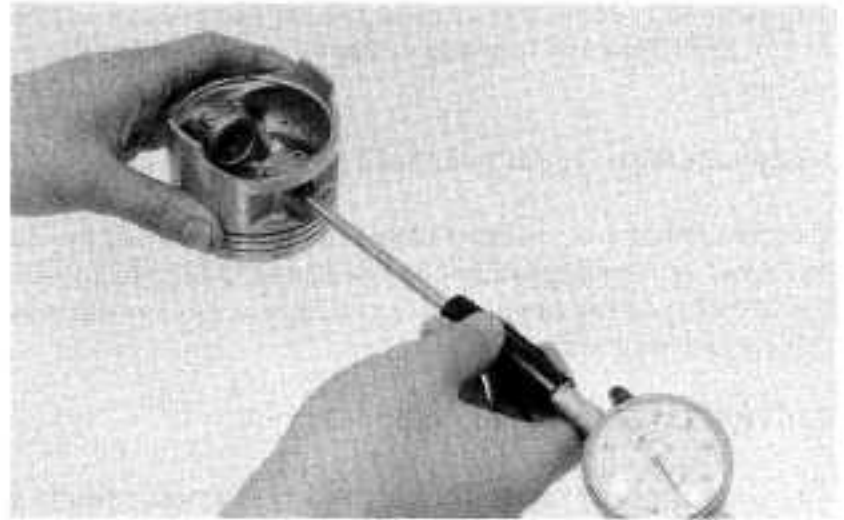
Measure each piston ring end gap; using a piston, push the ring into the cylinder squarely and make the measurement.

SERVICE LIMITS: TOP: 0.50 mm (0.020 in.)
SECOND: 0.50 mm (0.020 in.)
OIL (Side rail): 1.10 mm (0.043 in.)



Inspect the piston pin hole I.D.

SERVICE LIMIT: 18.04 mm (0.710 in)

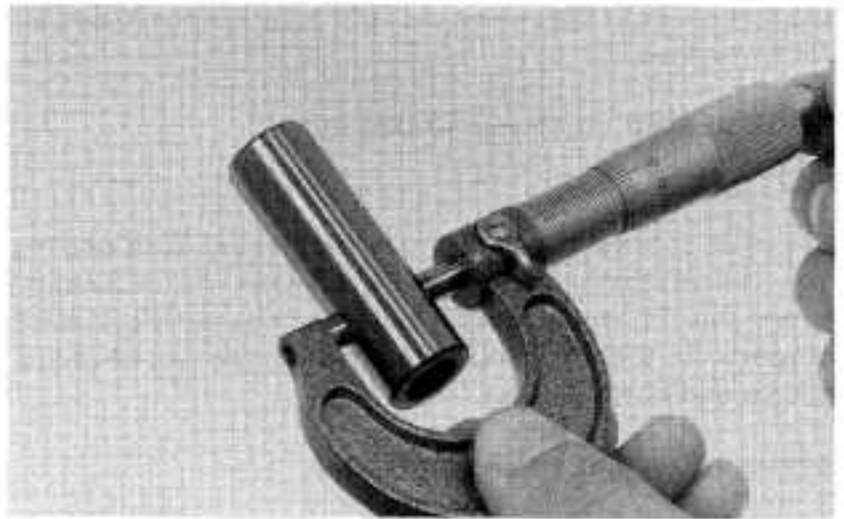


Measure the piston pin O.D..

SERVICE LIMIT: 17.98 mm (0.708 in)

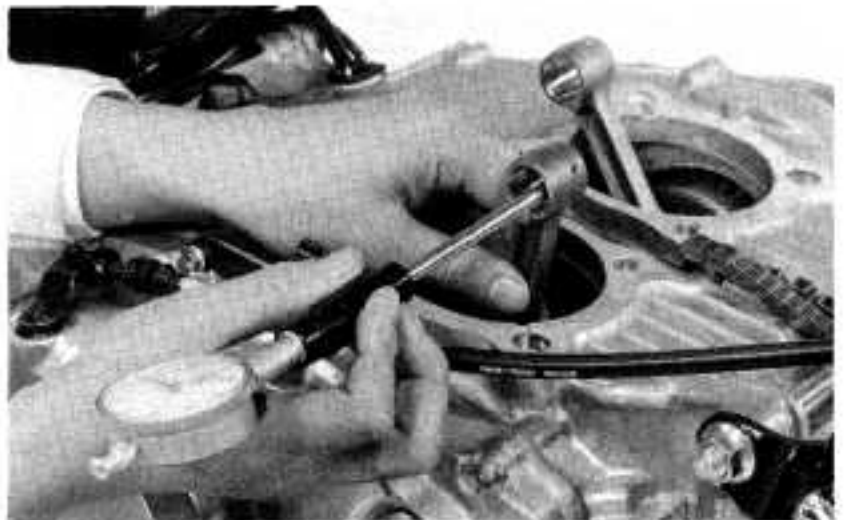
Determine the piston-to-piston pin clearance.

SERVICE LIMIT: 0.040 mm (0.0016 in.)



Measure the connecting rod small end I.D..

SERVICE LIMIT: 18.06 mm (0.711 in)



CYLINDER/PISTON

Measure and record the piston O.D. at a point 7 mm (0.28 in) from the bottom, and 90° to the piston pin bore.

SERVICE LIMIT: 74.90 mm (2.949 in)

Compare this measurement against the maximum cylinder measurement and calculate the piston-to-cylinder clearance.

CYLINDER INSPECTION

Inspect the cylinder walls for scratches and wear.

Measure and record the cylinder I.D. at three levels in both X and Y axis. Take the maximum reading to determine the cylinder wear.

SERVICE LIMIT: 75.10 mm (2.957 in)

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.

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 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 and Y axis measurements 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 middle and bottom levels.

SERVICE LIMIT: 0.10 mm (0.004 in)

The cylinder must be rebored, and oversize pistons fitted, if any of the service limits are exceeded.

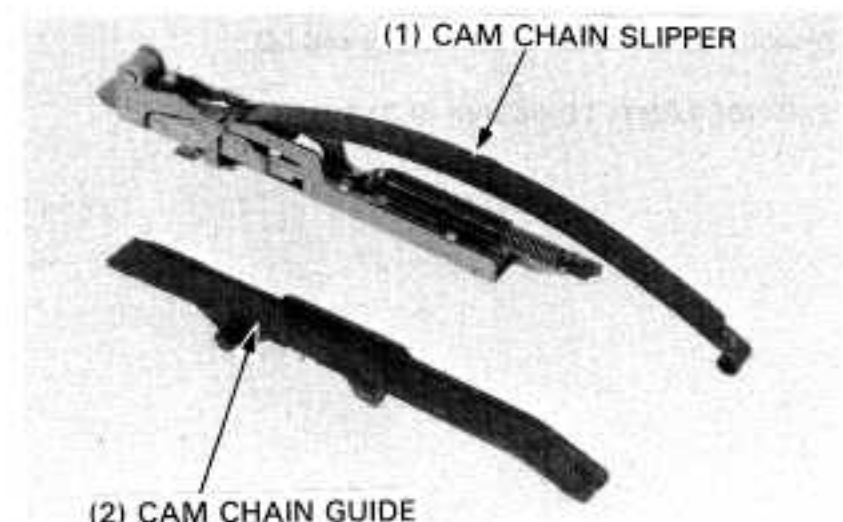
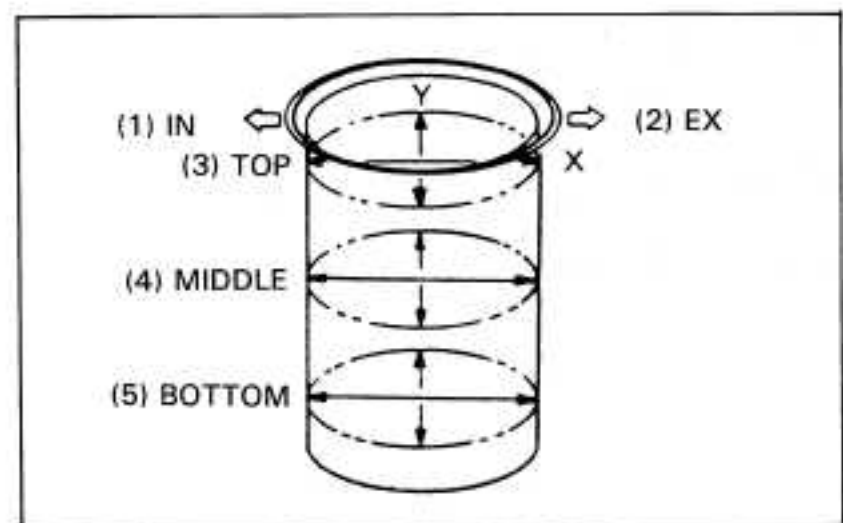
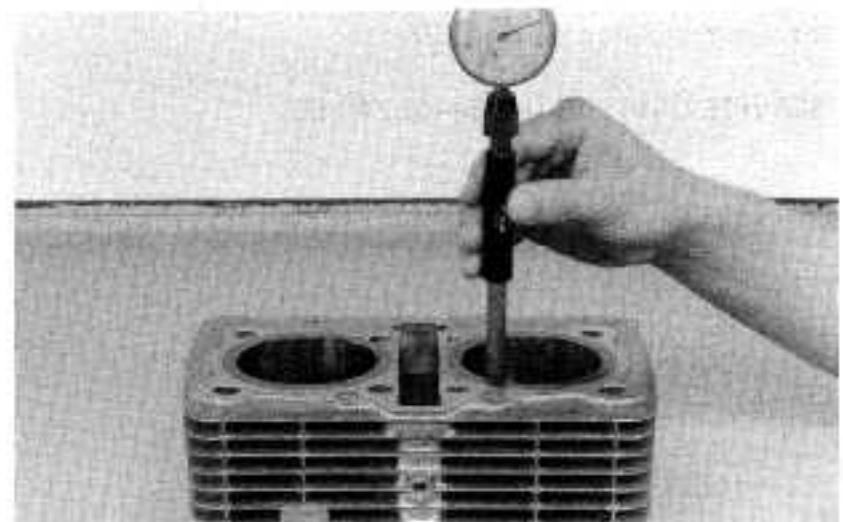
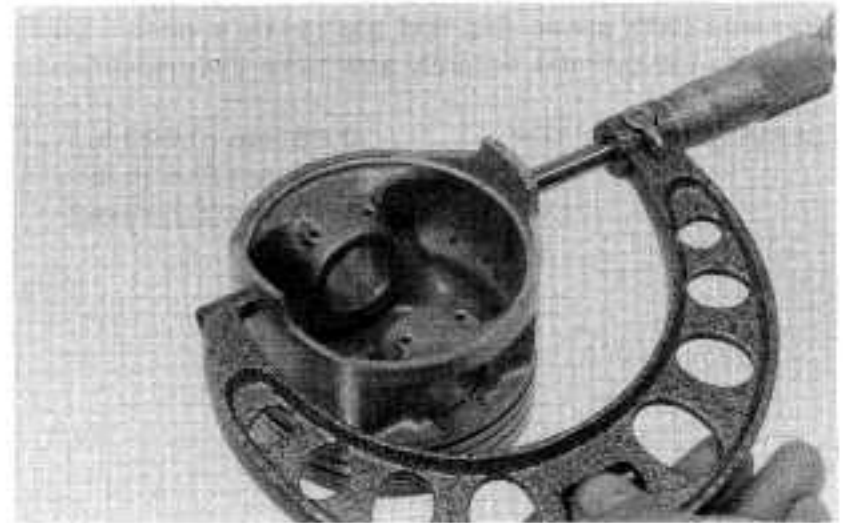
The following oversize pistons are available:
0.25 mm (0.010 in), 0.50 mm (0.020 in), 0.75 mm (0.030 in) and 1.00 mm (0.039 in)

The cylinder must be rebored so that the clearance to an oversize piston is 0.010–0.050 mm (0.0004–0.0020 in)

CAM CHAIN TENSIONER/GUIDE INSPECTION

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

Check the tensioner spring for damage or weakness.



PISTON INSTALLATION

PISTON RING INSTALLATION

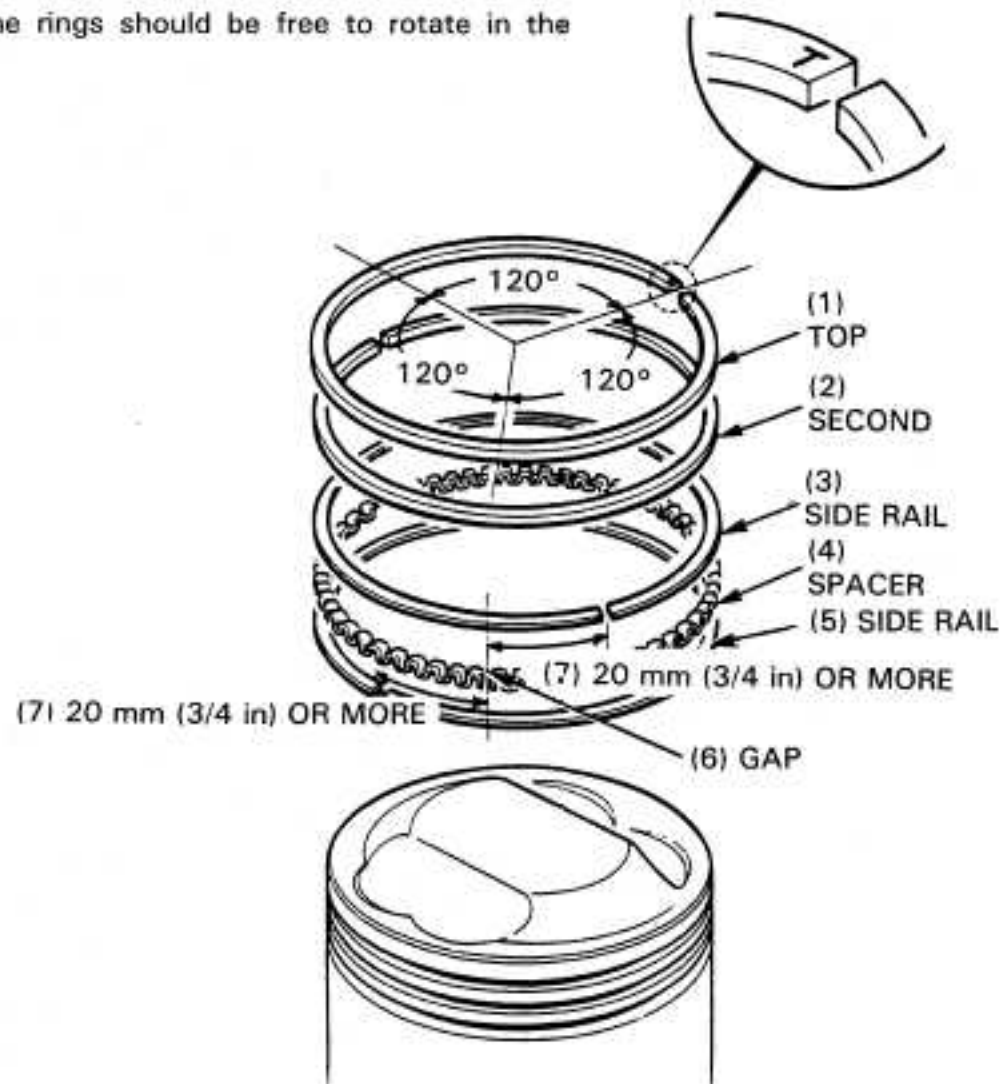
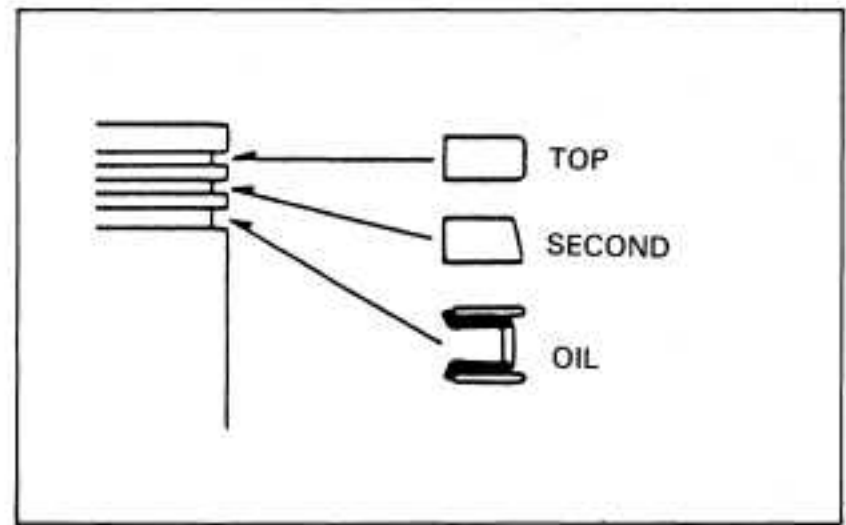
Clean the piston ring grooves thoroughly and install the piston rings.

NOTE

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

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

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

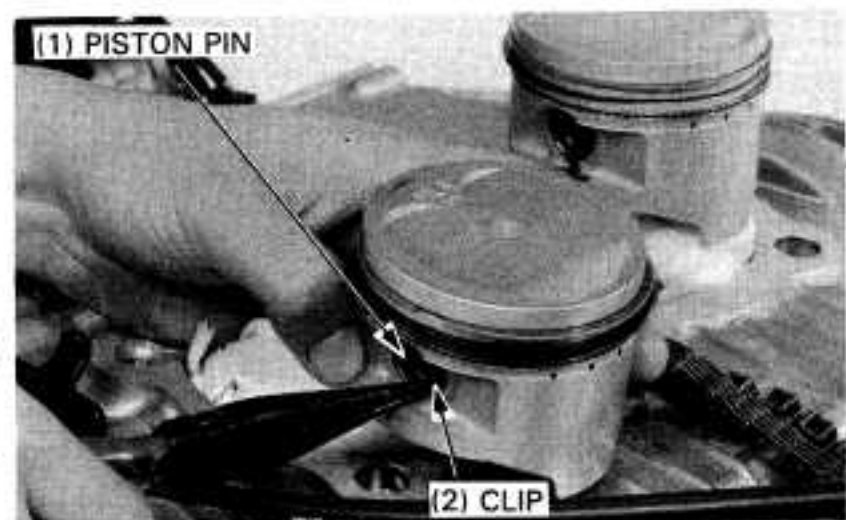


PISTON INSTALLATION

Position the piston "IN" mark toward the intake valve side, and install the piston and piston pin. Install new piston pin clips.

NOTE

- Do not align the piston pin clip end gap with the piston cut-out; piston the gap toward either the top or bottom of the piston.
- Do not let the clips fall into the crankcase.



CYLINDER INSTALLATION

Clean off any gasket material from the crankcase surface.

NOTE

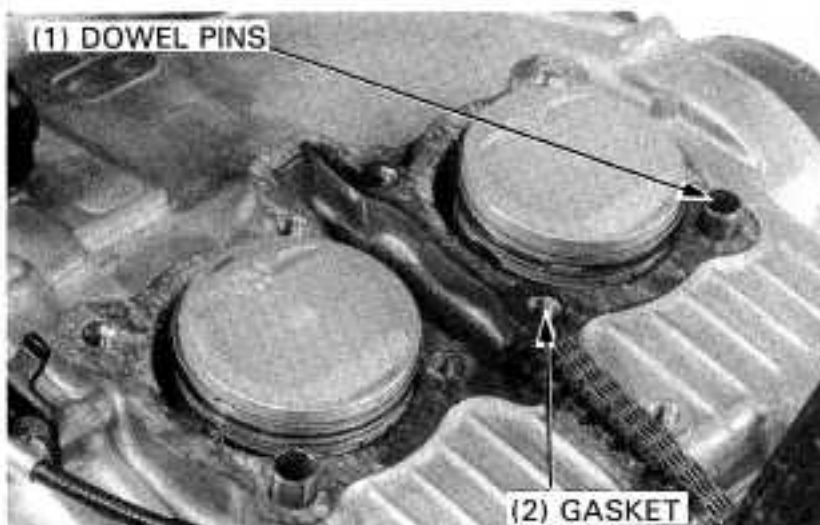
- Be careful not to damage the crankcase surface.



Install the dowel pins and cylinder base gasket.

NOTE

- Check that the oil control orifices are not clogged.



Coat the cylinder bores and piston rings with clean engine oil.

Place piston bases under the pistons, compress the piston rings with piston ring compressors and slide the cylinder over the pistons.

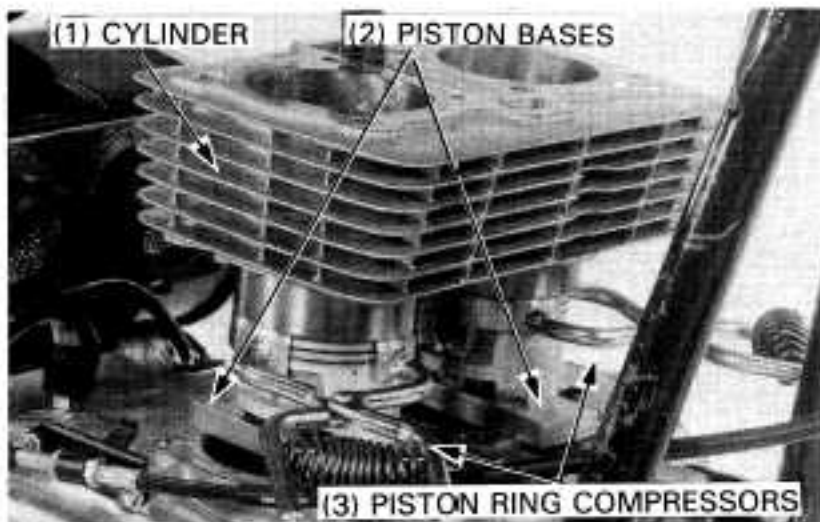
Remove the piston ring compressors and piston bases.

TOOLS:

Piston base	07958-2500001
Piston ring compressor	07954-5680000

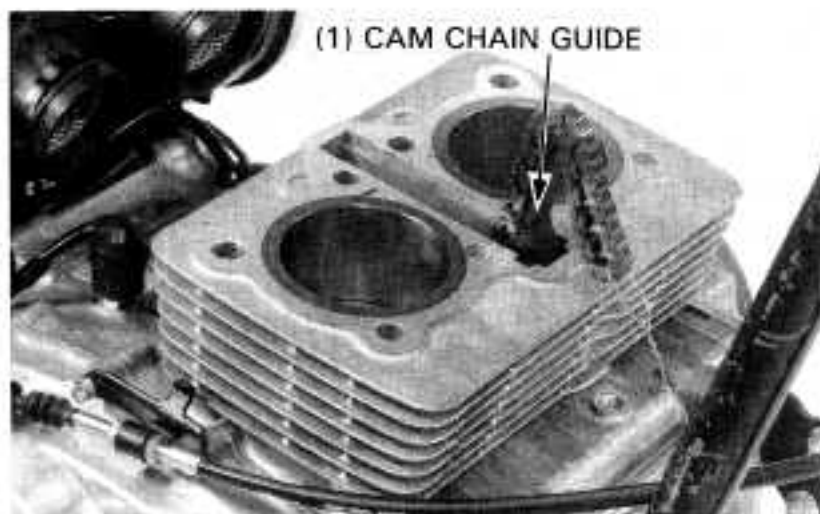
NOTE

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



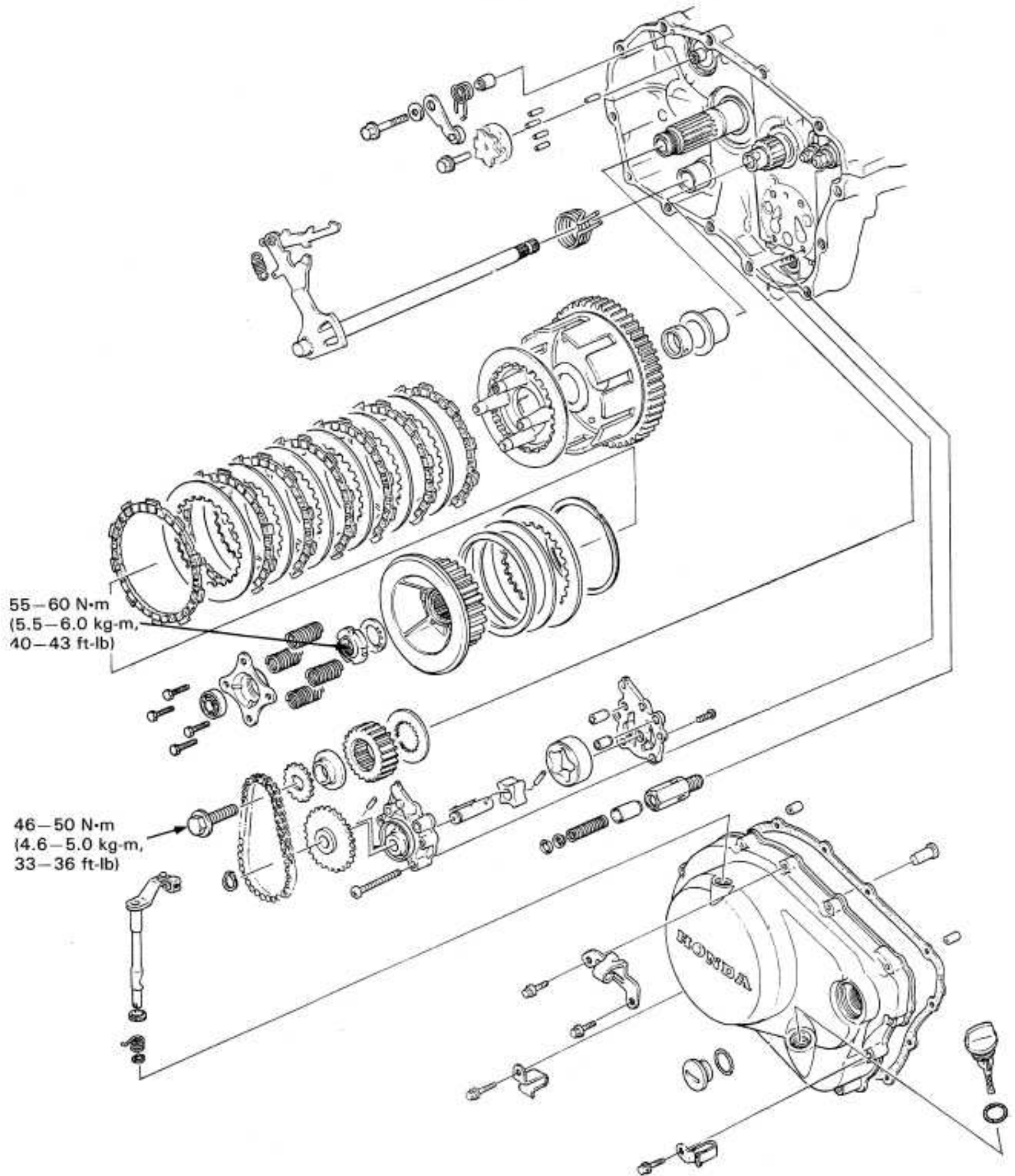
Install the cam chain guide.

Install the cylinder head (page 6-15).



MEMO

CLUTCH/GEARSHIFT LINKAGE/OIL PUMP



8. CLUTCH/GEARSHIFT LINKAGE/OIL PUMP

SERVICE INFORMATION	8-1	PRIMARY DRIVE GEAR	8-11
TROUBLESHOOTING	8-2	OIL PUMP	8-12
RIGHT CRANKCASE COVER REMOVAL	8-3	OIL PRESSURE RELIEF VALVE	8-15
CLUTCH	8-4	RIGHT CRANKCASE COVER	
GEARSHIFT LINKAGE	8-9	INSTALLATION	8-15

SERVICE INFORMATION

GENERAL

- This section covers the clutch, gearshift linkage and oil pump service. These parts can be serviced with the engine installed in the frame.
- If the shift forks, drum and transmission require servicing, remove the engine and separate the crankcase (Refer to section 10).

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Clutch	Disc spring-to-clutch center clearance	0.1–0.5 (0.004–0.020)	—	
	Spring free length	46.6 (1.83)	45.2 (1.79)	
	Disc thickness	A	2.62–2.78 (0.103–0.109)	2.30 (0.091)
		B	2.92–3.08 (0.115–0.121)	2.60 (0.102)
	Plate warpage	A	—	0.20 (0.008)
		B	—	0.20 (0.008)
	Clutch outer I.D.	32.000–32.025 (1.2598–1.2608)	32.07 (1.263)	
Clutch outer guide O.D.	31.959–31.975 (1.2582–1.2589)	31.90 (1.256)		
Oil pump	Pump tip clearance	0.15 (0.006)	0.20 (0.008)	
	Pump body clearance	0.15–0.21 (0.006–0.008)	0.35 (0.014)	
	Pump end clearance	0.04–0.09 (0.002–0.004)	0.12 (0.005)	
Oil pressure relief valve	Relief pressure	382–510 kPa (3.9–5.2 kg/cm ² , 55–74 psi)	—	

TORQUE VALUES

Clutch lock nut	55–60 N·m (5.5–6.0 kg-m, 40–43 ft-lb)
Primary drive gear bolt	46–50 N·m (4.6–5.0 kg-m, 33–36 ft-lb)
Brake pedal arm bolt	24–30 N·m (2.4–3.0 kg-m, 17–22 ft-lb)

TOOLS

Special

Clutch center holder 07923–KE10000 Not available in U.S.A.

Common

Lock nut wrench, 26 x 30 mm 07716–0020203 Equivalent commercially available in U.S.A.
 Extension bar 07716–0020500
 Gear holder 07724–0010100 Not available in U.S.A.

TROUBLESHOOTING

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

Clutch slips when accelerating

- No free play
- Discs worn
- Springs weak

Clutch will not disengage

- Too much free play
- Plates warped

Motorcycle creeps with clutch disengaged

- Too much free play
- Plates warped

Excessive lever pressure

- Clutch cable kinked, damaged or dirty
- Lifter mechanism damaged

Clutch operation feels rough

- Clutch outer slots rough

Hard to shift

- Improper clutch adjustment; too much free play
- Shift forks bent
- Bent gearshift spindle
- Shift claw bent
- Shift drum cam grooves damaged

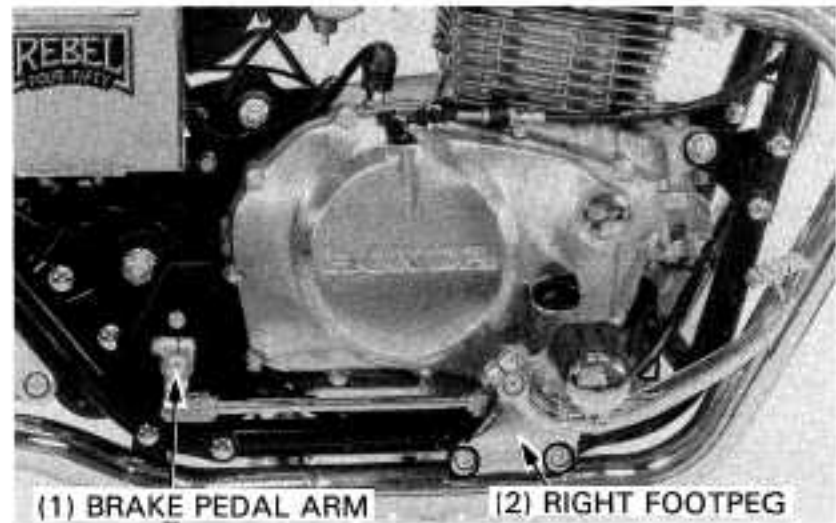
Transmission jumps out of gear

- Gear dogs worn
- Bent gearshift spindle
- Broken drum stopper arm
- Shift forks bent

RIGHT CRANKCASE COVER REMOVAL

Drain the engine oil (page 2-3).

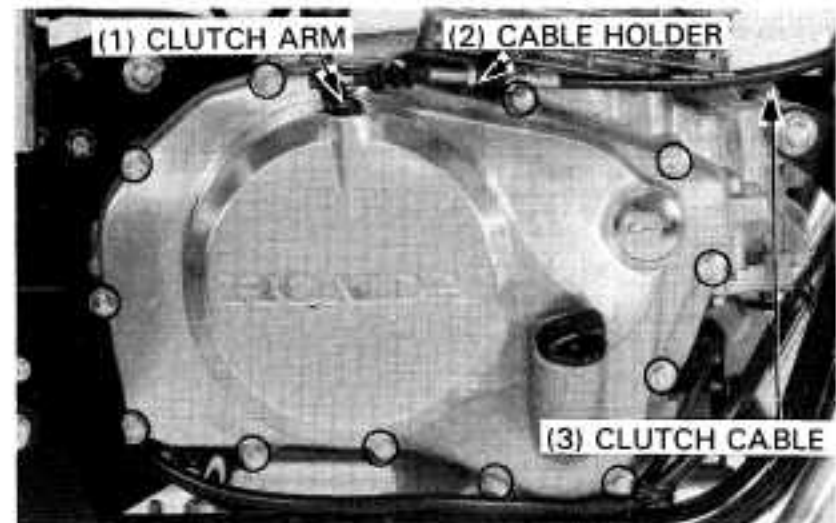
Remove the rear brake pedal arm bolt and the two socket bolts, and then remove the right footpeg and rear brake pedal assembly.



Loosen the clutch cable adjusting nut and lock nut, disconnect the cable from the clutch arm and remove the cable from the cable holder.

Remove the right crankcase cover.

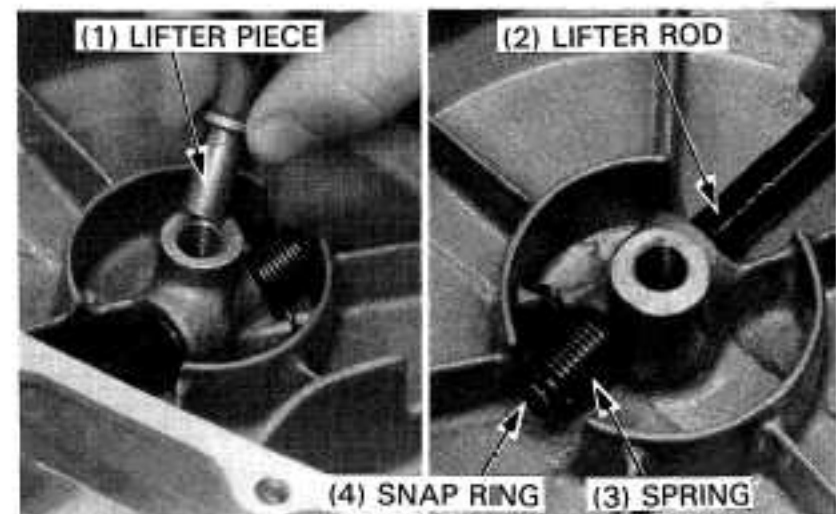
Remove the dowel pins and gasket.



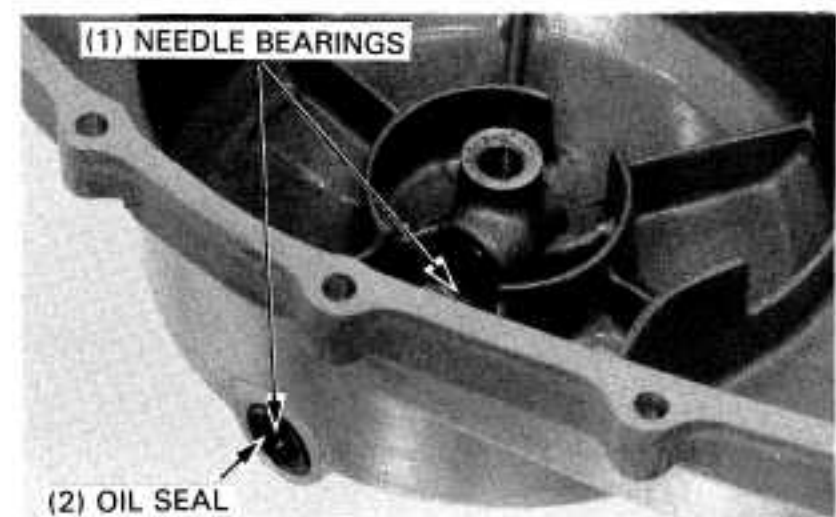
CLUTCH LIFTER REMOVAL

Remove the clutch lifter piece.

Remove the snap ring and return spring from the lifter shaft. Remove the clutch arm, lifter shaft from the right crankcase cover.



Check the lifter shaft oil seal and needle bearings for wear or damage.

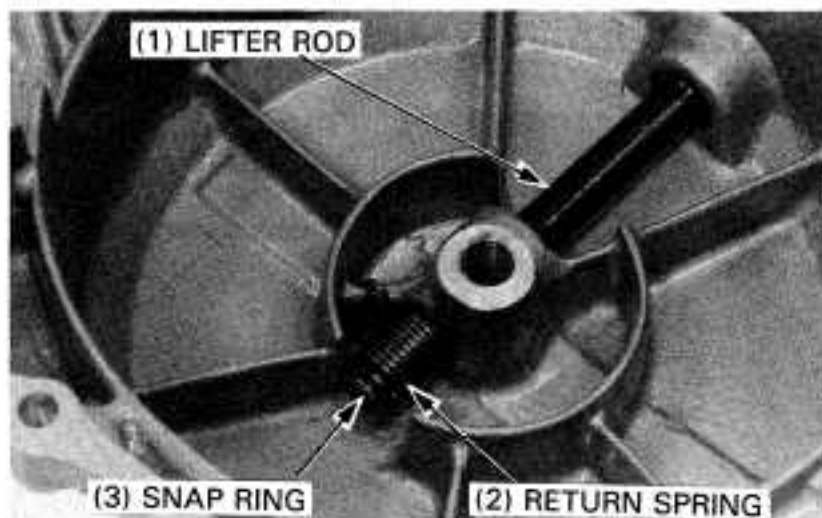


CLUTCH/GEARSHIFT LINKAGE/OIL PUMP

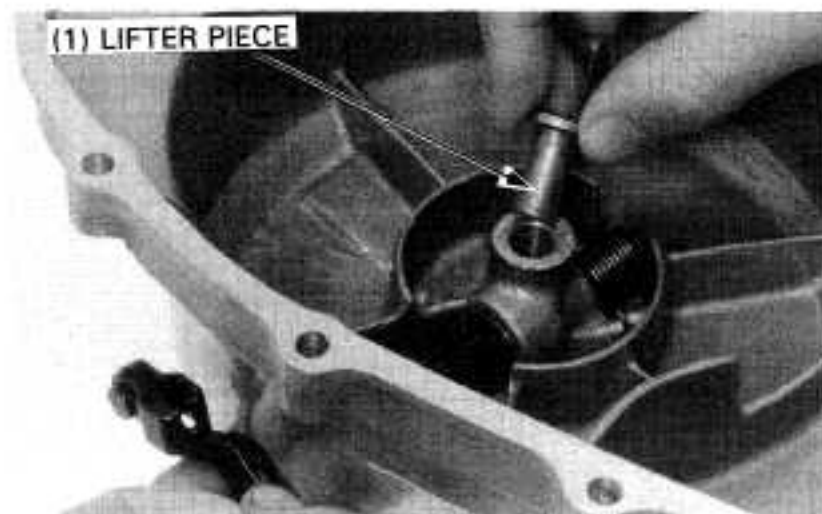
CLUTCH LIFTER INSTALLATION

Coat the lifter shaft with clean engine oil.
Install the lifter shaft into the right crankcase cover.

Install the return spring onto the end of the lifter shaft and secure it with the snap ring as shown.



Grease the clutch lifter piece.
Rotate the lifter shaft clockwise to align the cutout in the lifter shaft with the hole in the right crankcase cover and install the clutch lifter piece.



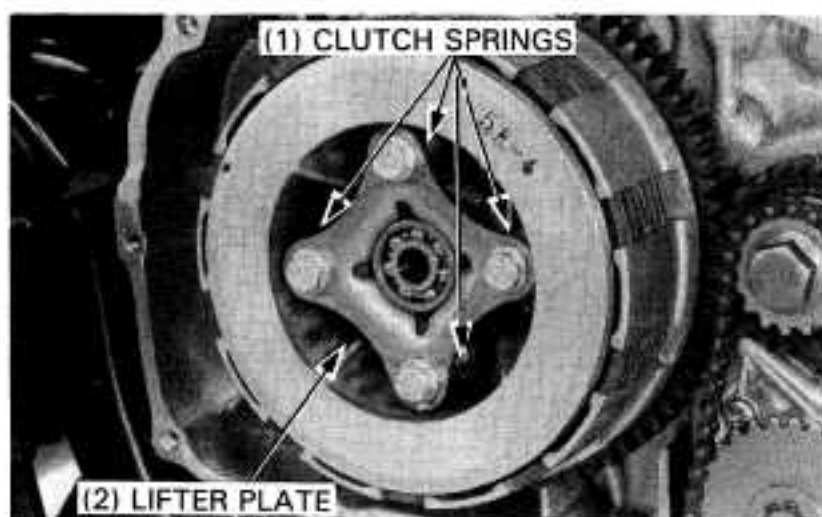
CLUTCH

DISASSEMBLY

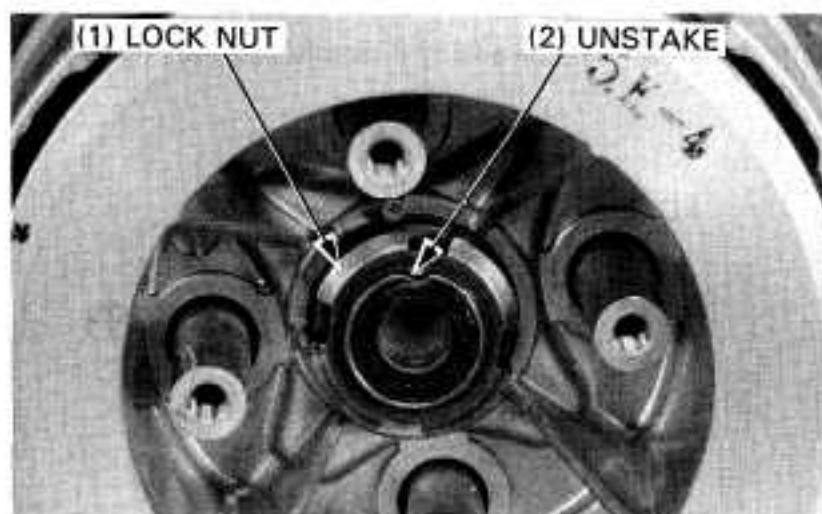
Remove the bolts, lifter plate and clutch springs.

NOTE

- Loosen the bolts in an X pattern in two or more steps.



Unstake the clutch lock nut with a drill or grinder, being careful not to damage the mainshaft threads.



Hold the clutch center with the clutch center holder and remove the clutch lock nut.

TOOLS:

Clutch center holder

07923—KE10000 Not available in U.S.A.

Extension bar

07716—0020500 Equivalent commercially available in U.S.A.

Lock nut wrench, 26 x 30 mm

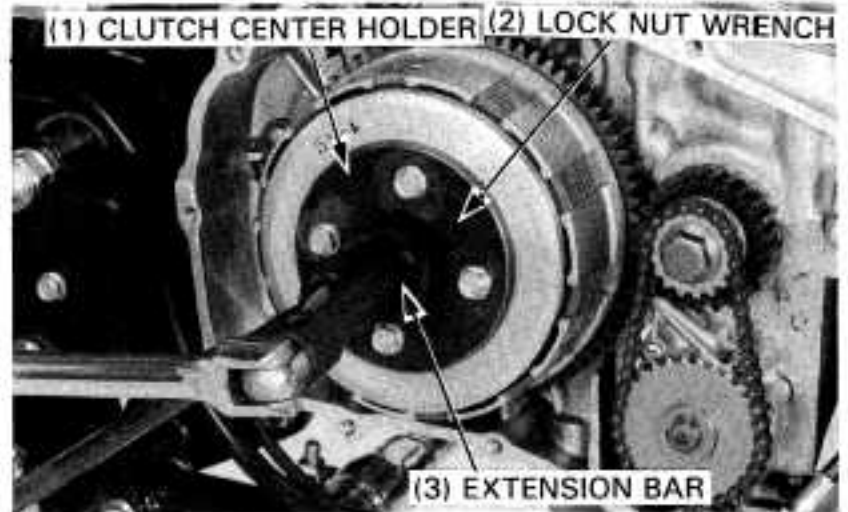
07716—0020203 Equivalent commercially available in U.S.A.

Remove the lock washer.

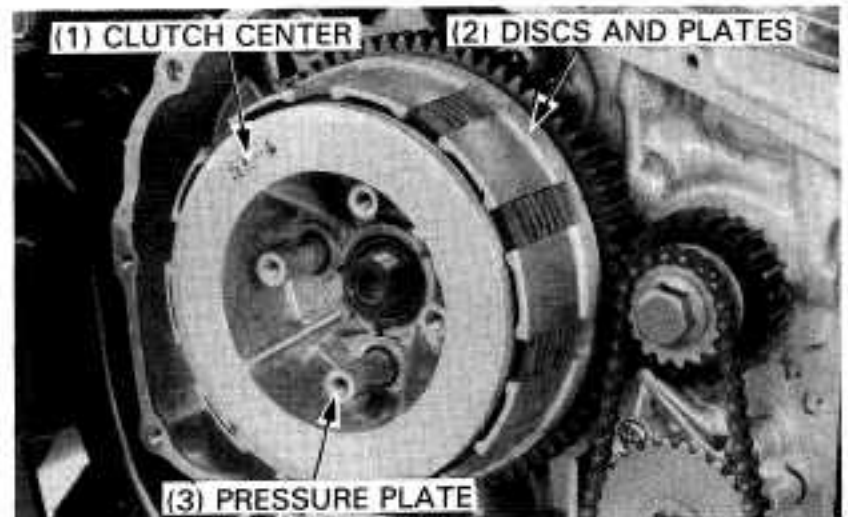
Remove the clutch center.

Remove discs A and B and plate A.

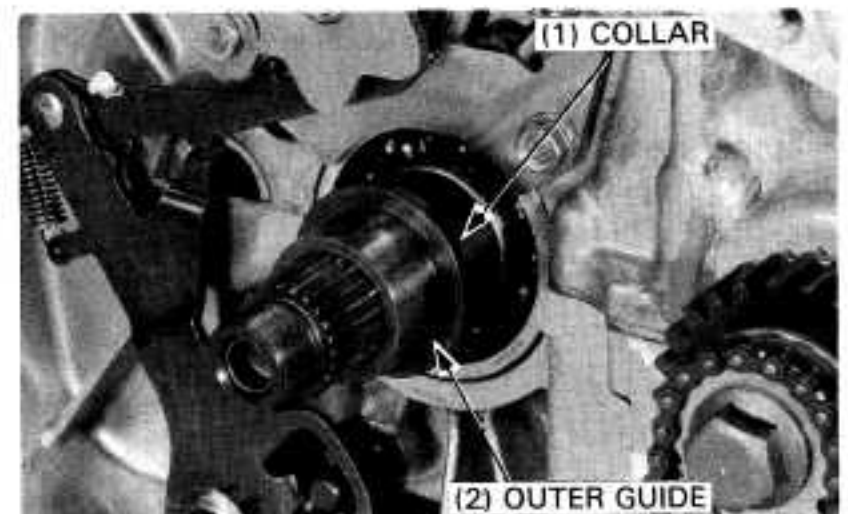
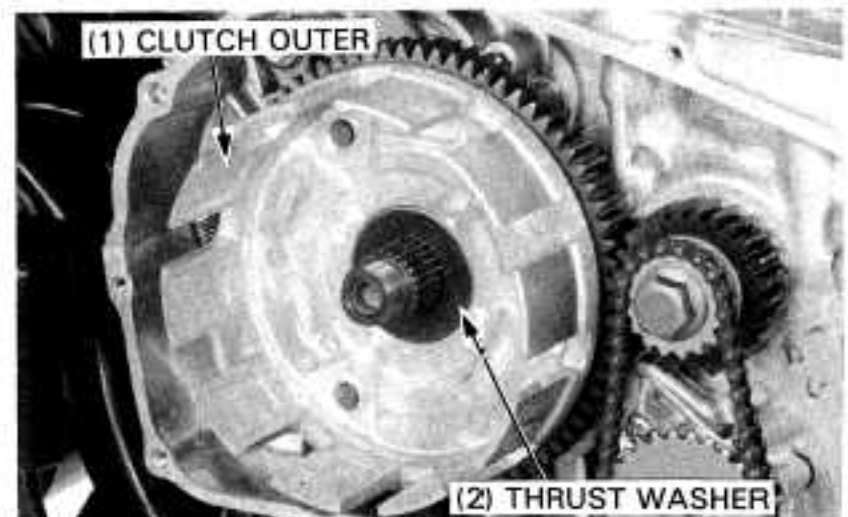
Remove the pressure plate.



Remove the thrust washer and clutch outer.



Remove the clutch outer guide and collar.



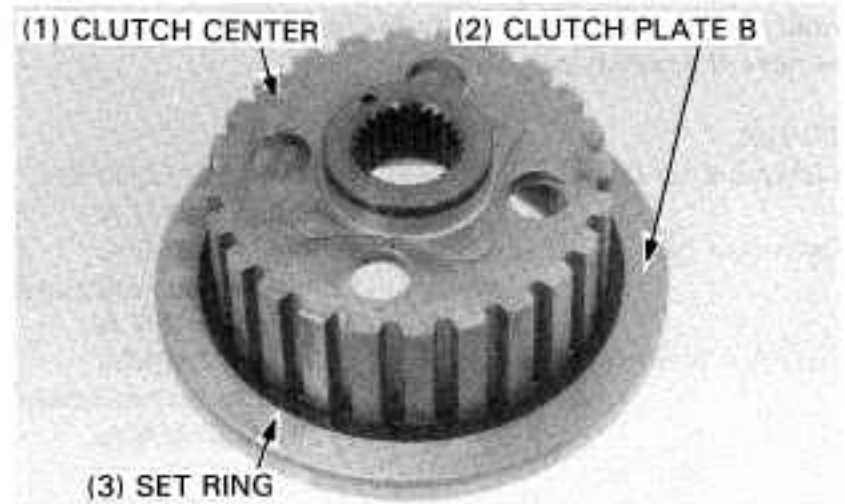
CLUTCH/GEARSHIFT LINKAGE/OIL PUMP

INSPECTION

Measure clearance between the clutch center and plate B.

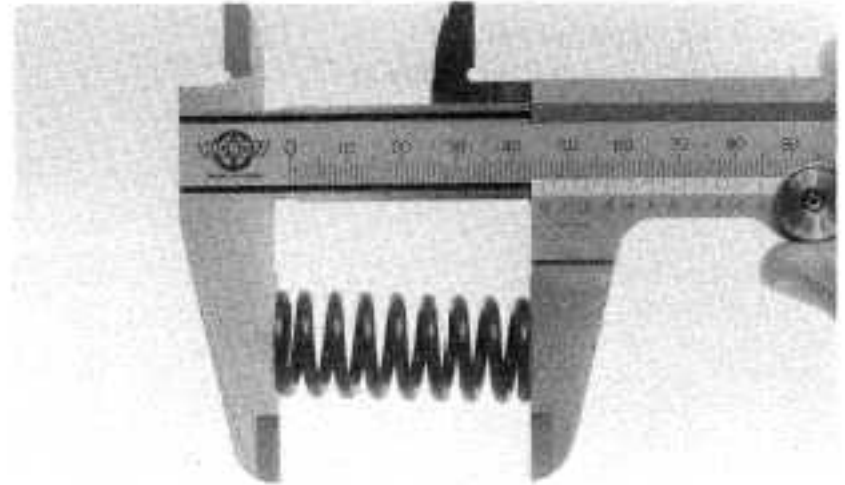
STANDARD: 0.1–0.5 mm (0.004–0.020 in)

After measuring, remove the set ring, clutch plate B, disc spring and spring seat.



Measure the clutch spring free length.

SERVICE LIMIT: 45.2 mm (1.79 in)



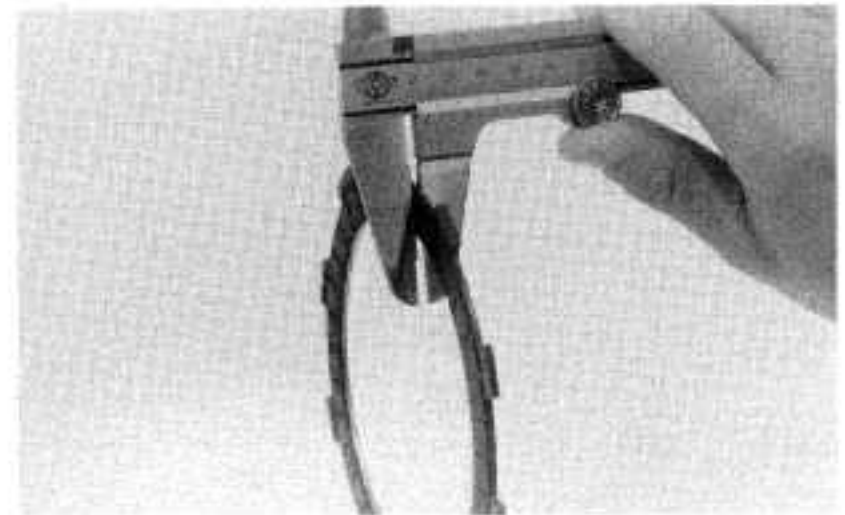
Replace the clutch discs if they show signs of scoring or discoloration.

Measure disc thickness.

SERVICE LIMITS:

DISC A: 2.30 mm (0.091 in)

DISC B: 2.60 mm (0.102 in)



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

SERVICE LIMITS:

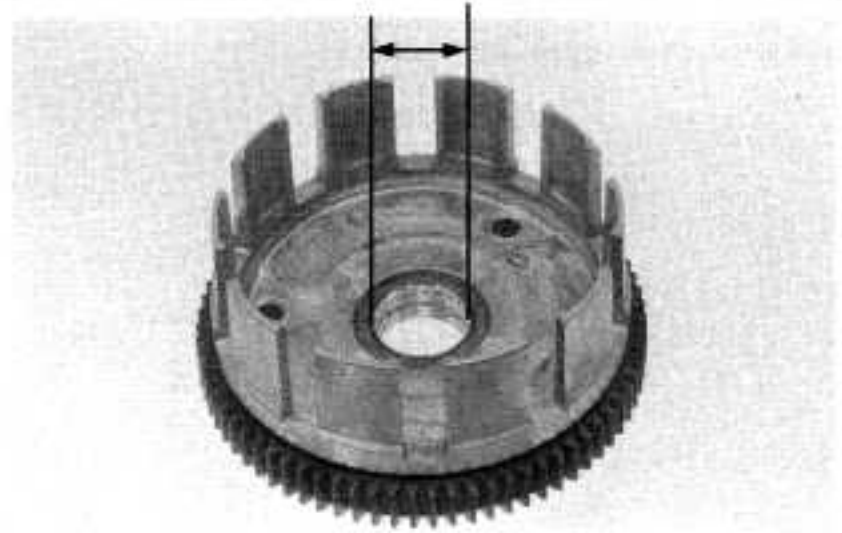
PLATE A: 0.20 mm (0.008 in)

PLATE B: 0.20 mm (0.008 in)



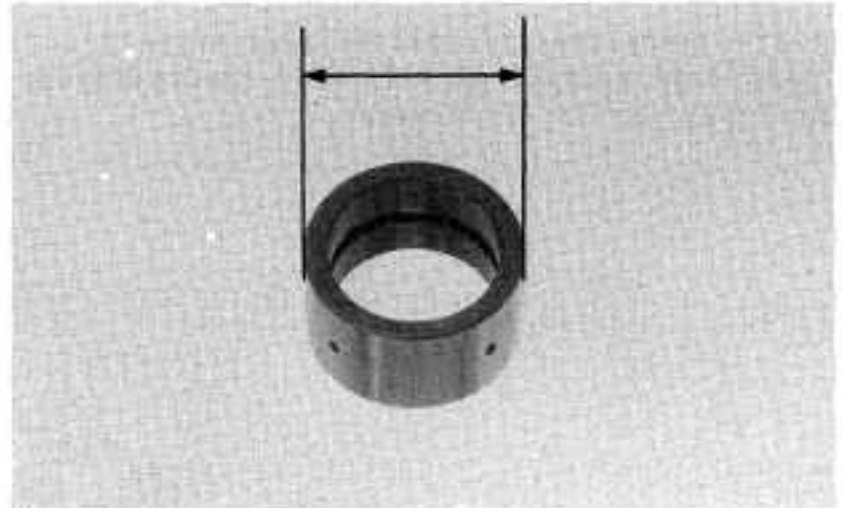
Check the slots in the clutch outer for nicks or indentations made by the friction discs.
Measure the clutch outer I.D.

SERVICE LIMIT: 32.07 mm (1.263 in)



Measure the clutch outer guide O.D.

SERVICE LIMIT: 31.90 mm (1.256 in)

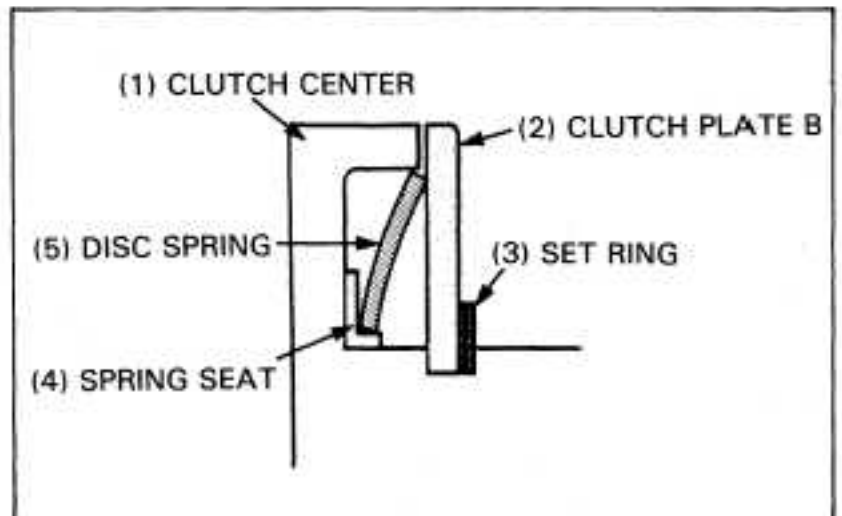


ASSEMBLY

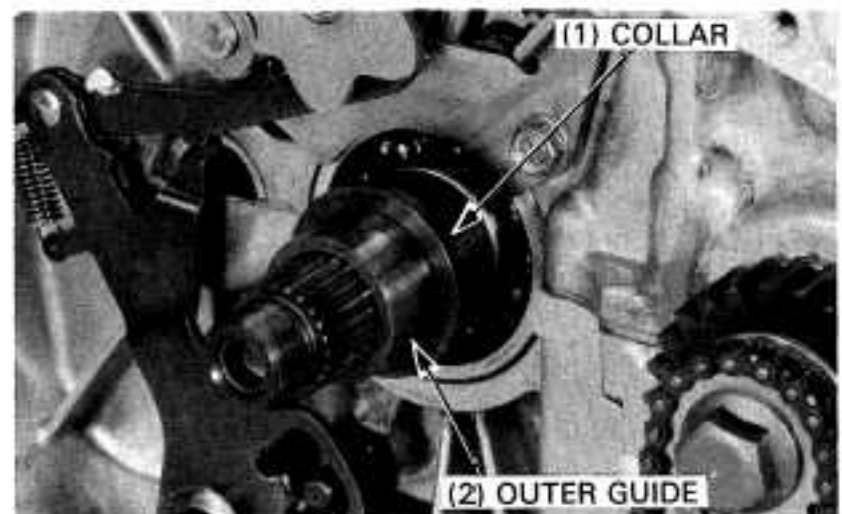
Install the spring seat, disc spring, clutch plate B and set ring in the clutch center.

NOTE

- Note direction of the spring seat, spring and plate B.
- Make sure that the set ring is securely seated in the clutch center groove.

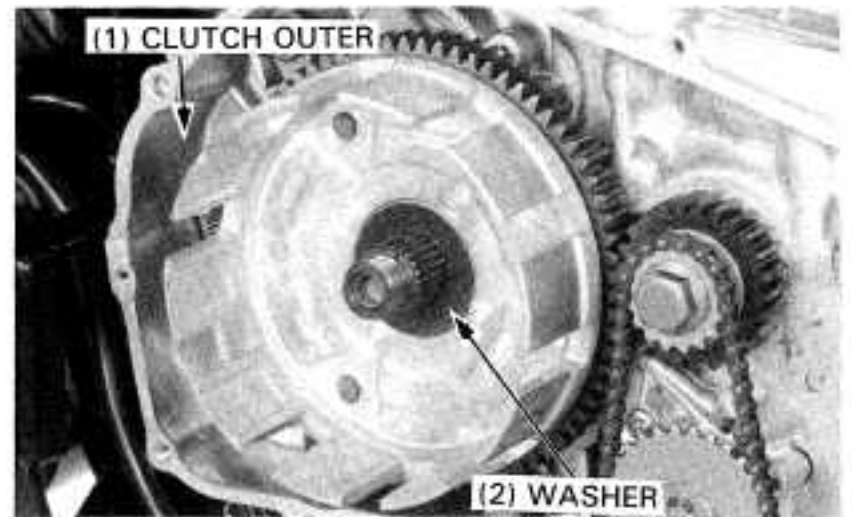


Install the collar and clutch outer guide onto the mainshaft.

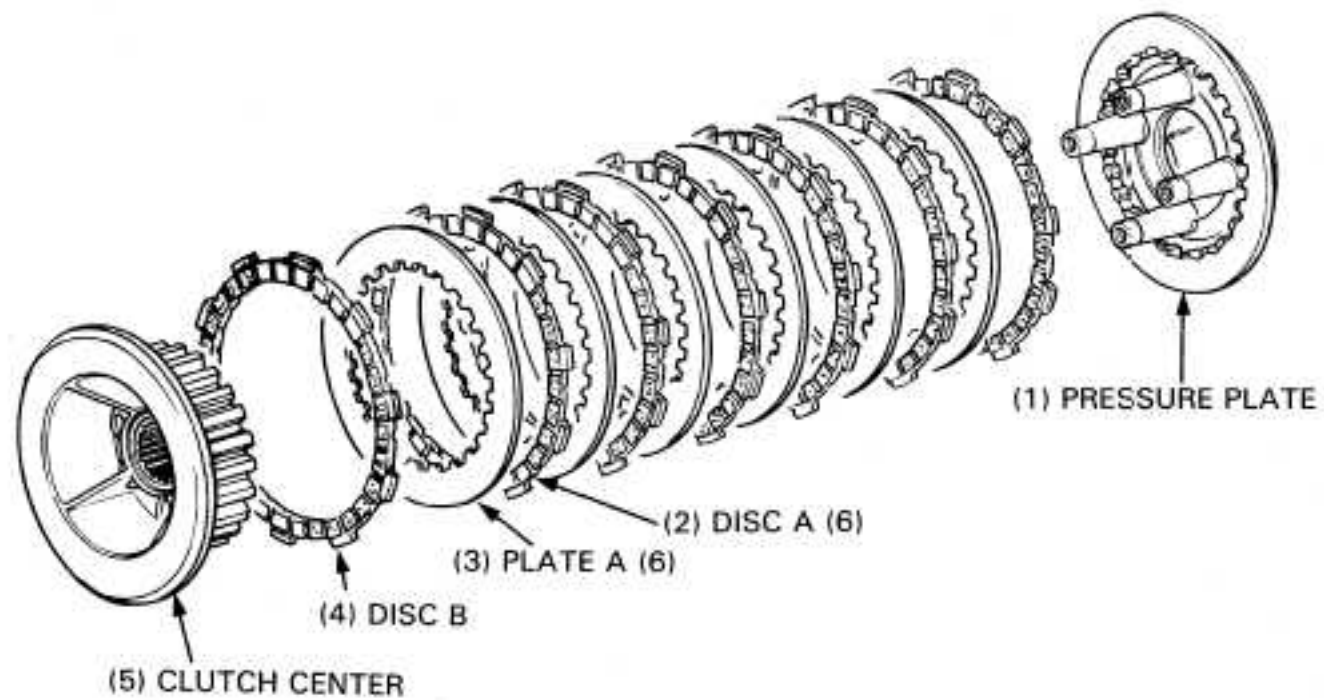


CLUTCH/GEARSHIFT LINKAGE/OIL PUMP

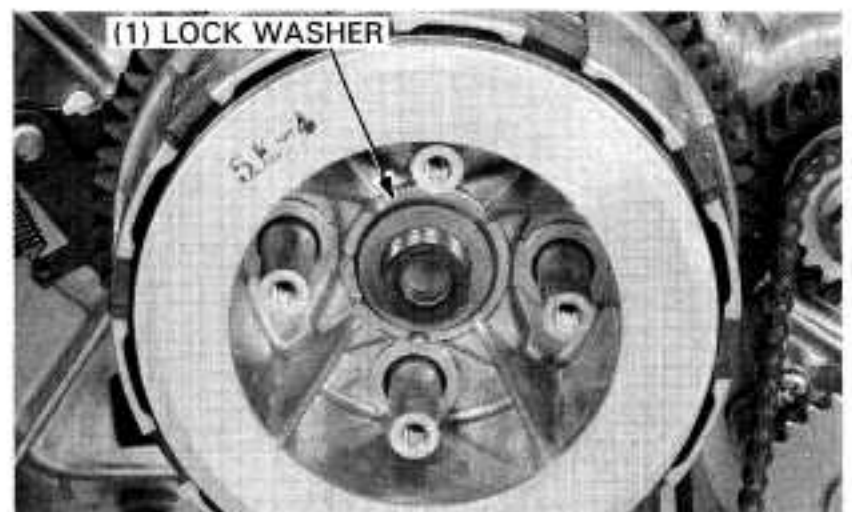
Install the clutch outer and washer.



Coat the clutch discs and plates with clean engine oil.
Install 6 discs A and 6 plates A alternately starting with disc A.
Install disc B and the clutch center.



Install the lock washer.

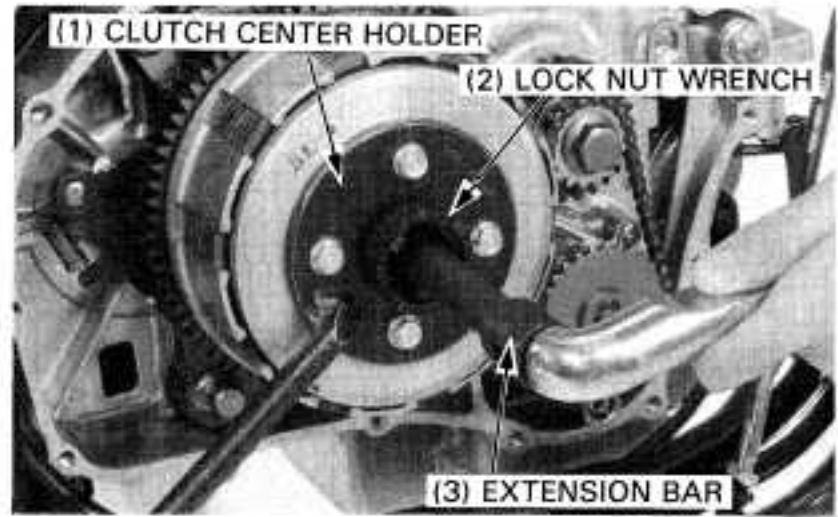


Install a new lock nut.
Set the clutch center holder to hold the clutch center and tighten the clutch lock nut.

TORQUE: 55–60 N·m (5.5–6.0 kg-m, 40–43 ft-lb)

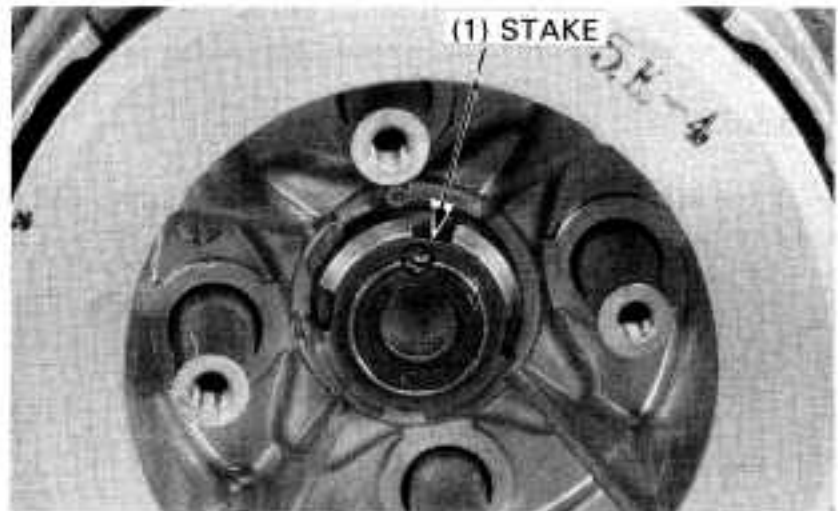
TOOLS:

Clutch center holder	07923-KE10000 Not available in U.S.A.
Extension	07716-0020500 Equivalent commercially available in U.S.A.
Lock nut wrench, 26 x 30 mm	07716-0020203 Equivalent commercially available in U.S.A.



Remove the clutch center holder.

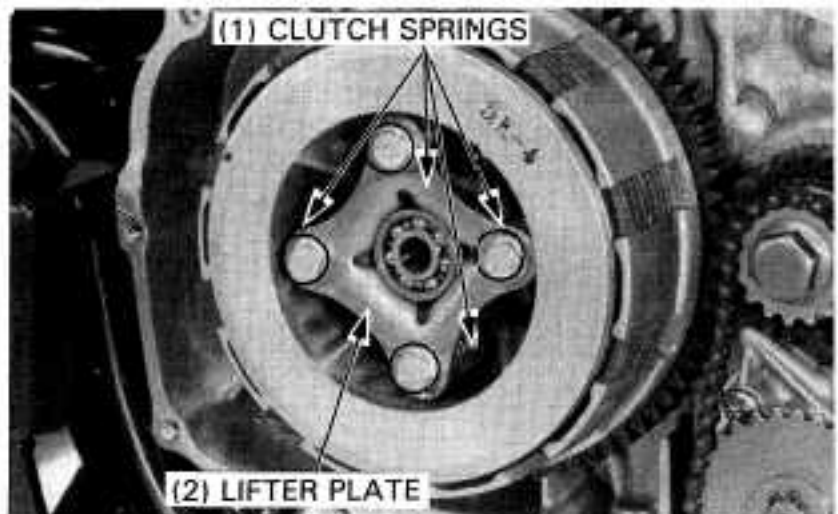
Stake the lock nut into the groove in the mainshaft, being careful not to damage the mainshaft threads.



Install the clutch springs, lifter plate and bolts.

NOTE

- Tighten the bolts in two or more steps and in criss-cross pattern.

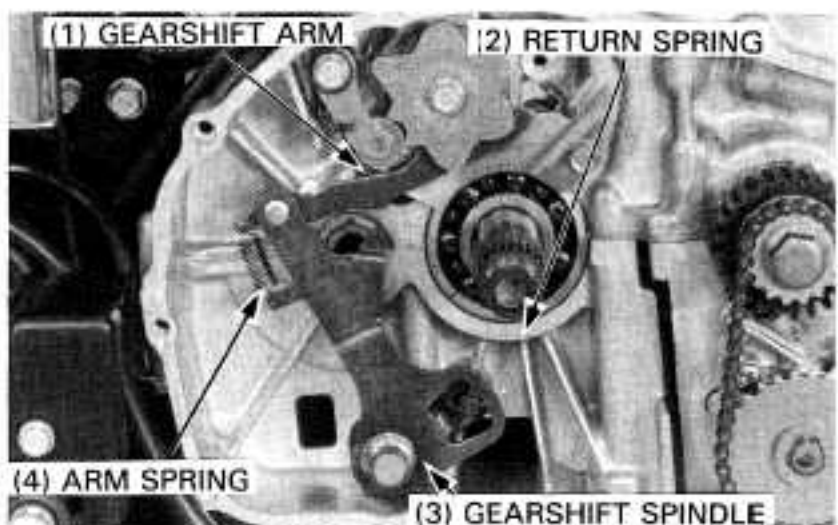


GEARSHIFT LINKAGE

DISASSEMBLY

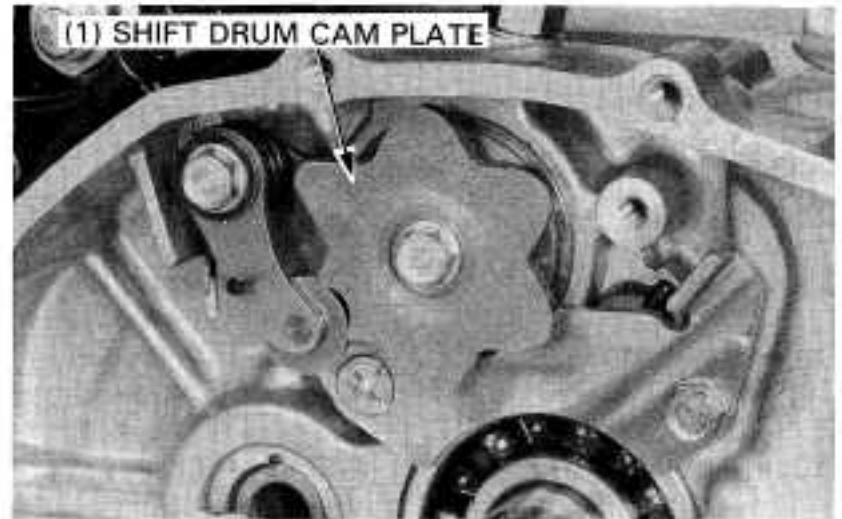
Remove the gearshift pedal from the gearshift spindle.
Remove the clutch (page 8-4).
Lower the gearshift arm and pull the gearshift spindle assembly out of the crankcase.

Remove the gearshift arm spring and return spring from the spindle.



CLUTCH/GEARSHIFT LINKAGE/OIL PUMP

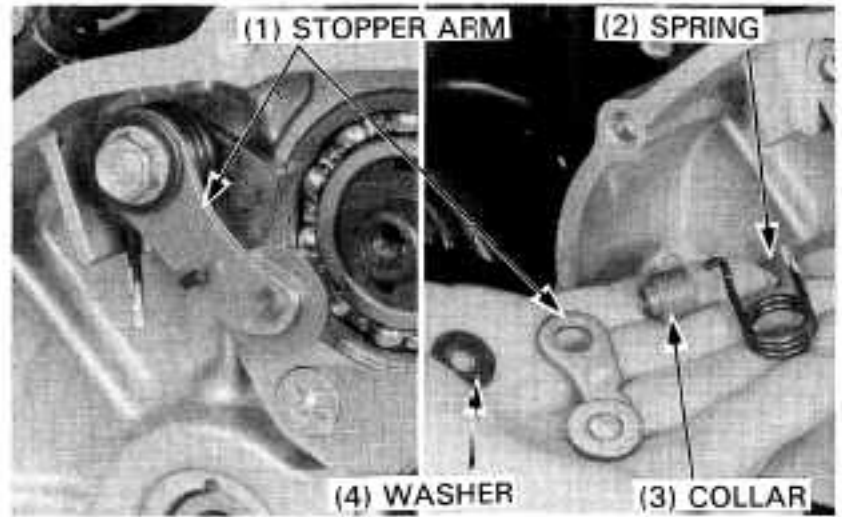
Remove the shift drum cam plate bolt, cam plate and dowel pin.



Remove the stopper arm bolt, washer, arm, collar and spring.

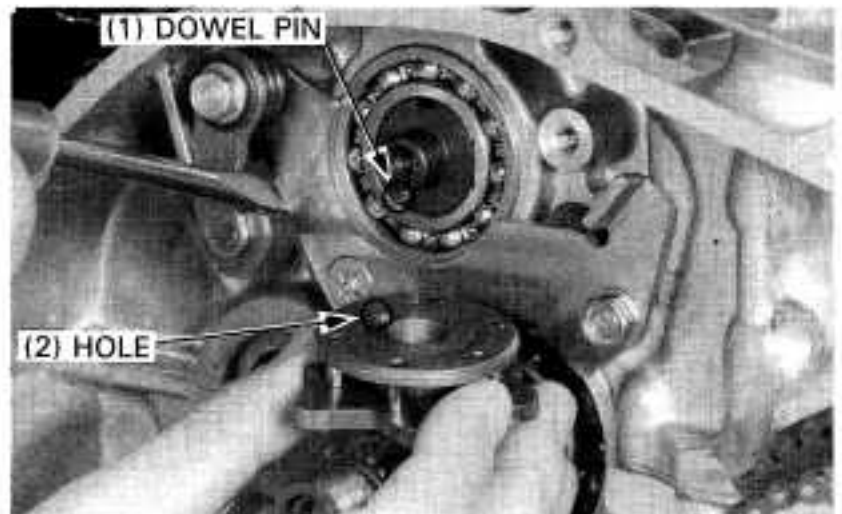
ASSEMBLY

Install the stopper arm spring, collar, arm and washer, and install and tighten the bolt.

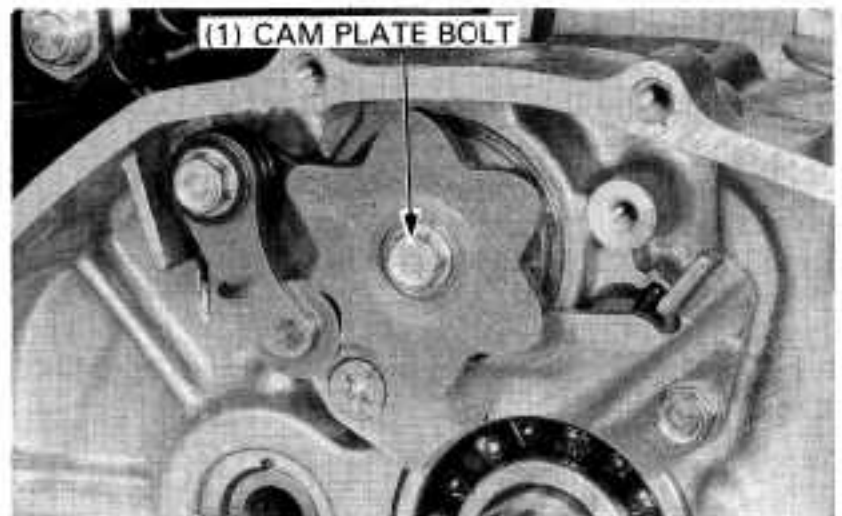


Install the dowel pin into the shift drum.

Move the stopper arm to the left and install the shift drum cam plate aligning the hole in the plate with the dowel pin in the drum.



Apply thread lock agent to the cam plate bolt threads and install the bolt.

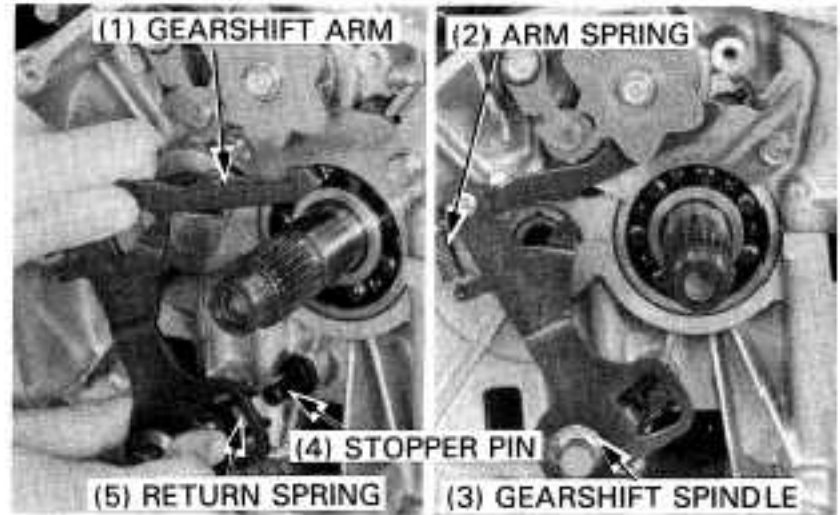


Install the gearshift arm spring and return spring onto the gearshift spindle.

Install the gearshift spindle assembly into the crankcase while pushing down the gearshift arm and aligning the return spring ends with the spring stopper pin.

Install the clutch (page 8-7).

Install the gearshift pedal arm onto the spindle (page 9-4).



PRIMARY DRIVE GEAR

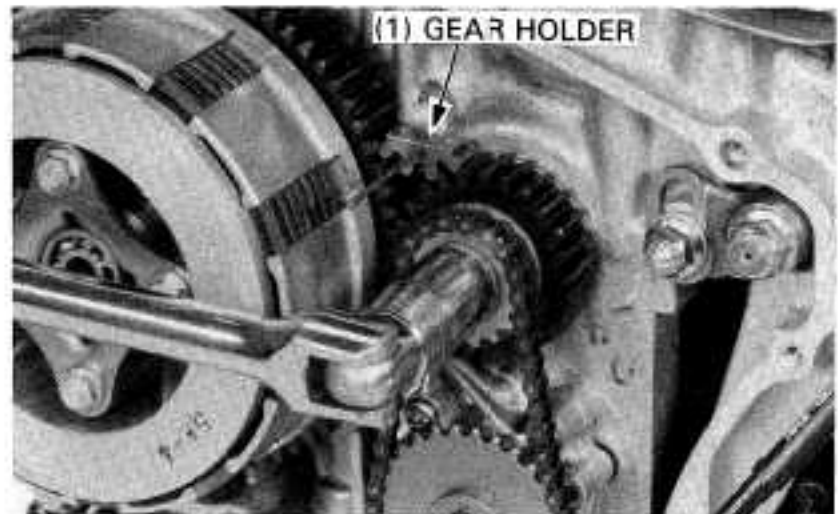
REMOVAL

Hold the primary drive gear by placing a gear holder between the primary drive and driven (clutch outer) gears, and remove the bolt.

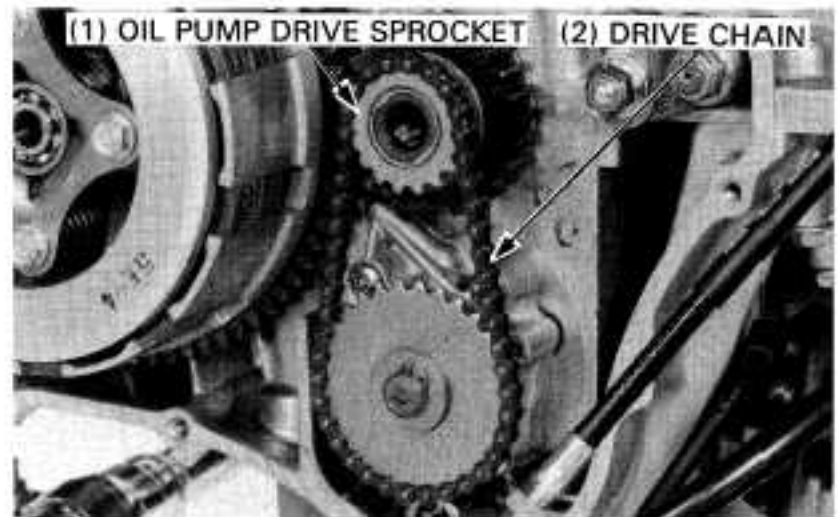
TOOL:

Gear holder

07724-0010100
Not available in U.S.A.



Remove the oil pump drive sprocket and drive chain from the crankshaft.

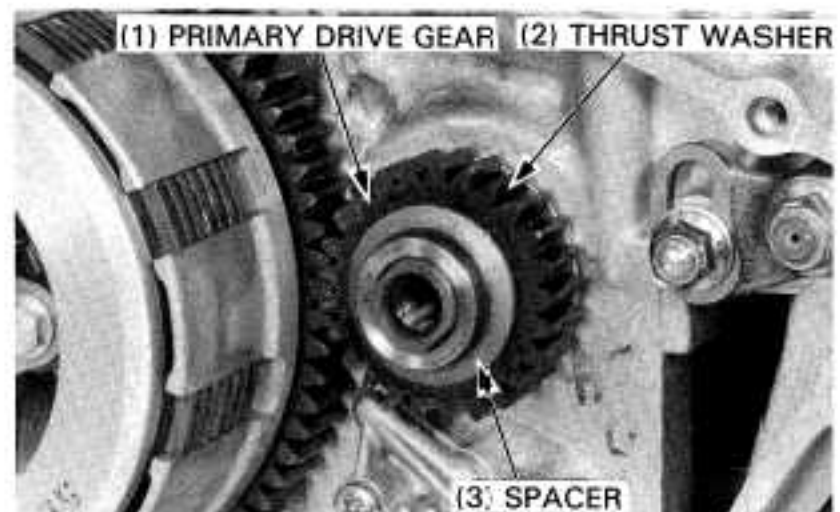


Remove the spacer and primary drive gear.

INSTALLATION

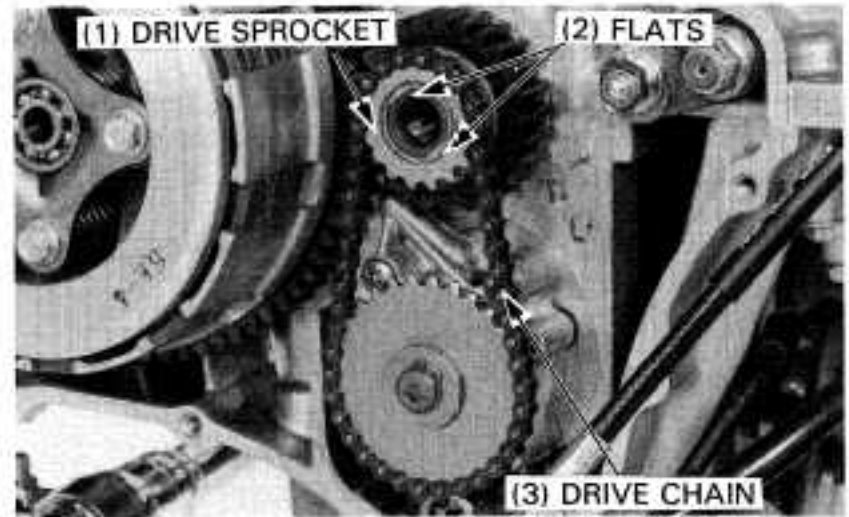
Make sure that the thrust washer is installed on the crankshaft.

Install the primary drive gear and spacer onto the crankshaft.



CLUTCH/GEARSHIFT LINKAGE/OIL PUMP

Install the oil pump drive chain over the drive and driven sprockets, and install the drive sprocket onto the crankshaft aligning the flats on the sprocket and crankshaft.



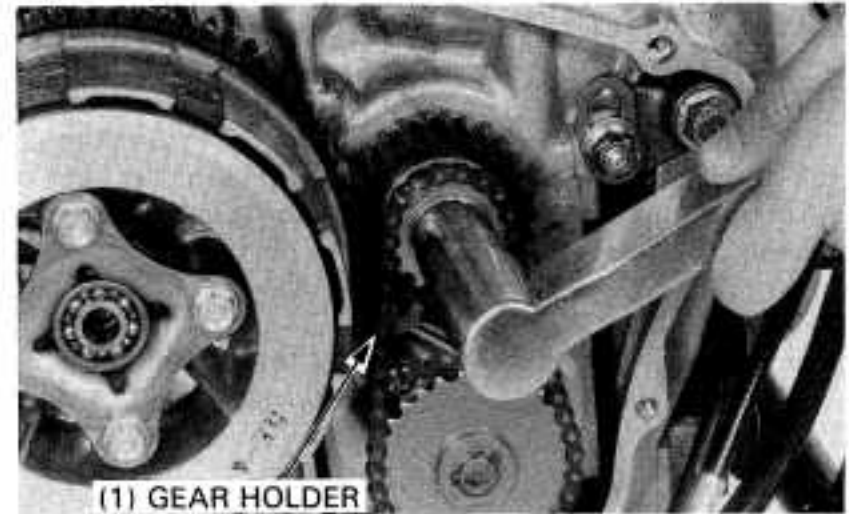
Install the primary drive gear bolt. Hold the primary drive gear by placing the gear holder between the primary drive and driven gears and tighten the bolt.

TORQUE: 46–50 N·m (4.6–5.0 kg-m, 33–36 ft-lb)

TOOL:

Gear holder

07724–0010100
Not available in U.S.A.

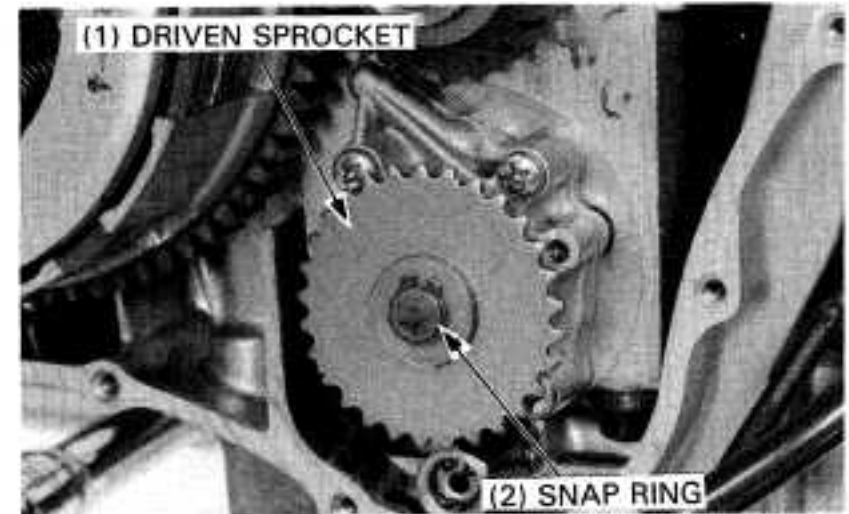


OIL PUMP

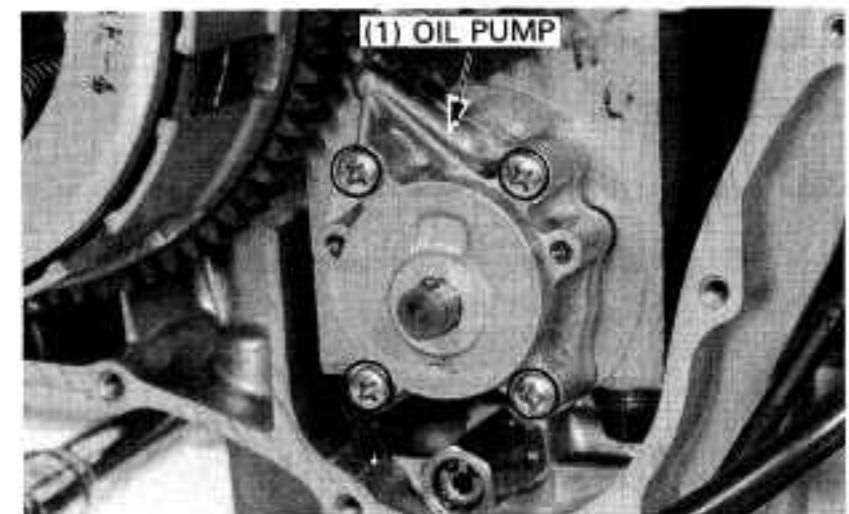
REMOVAL

Remove the oil pump drive chain (page 8-11).

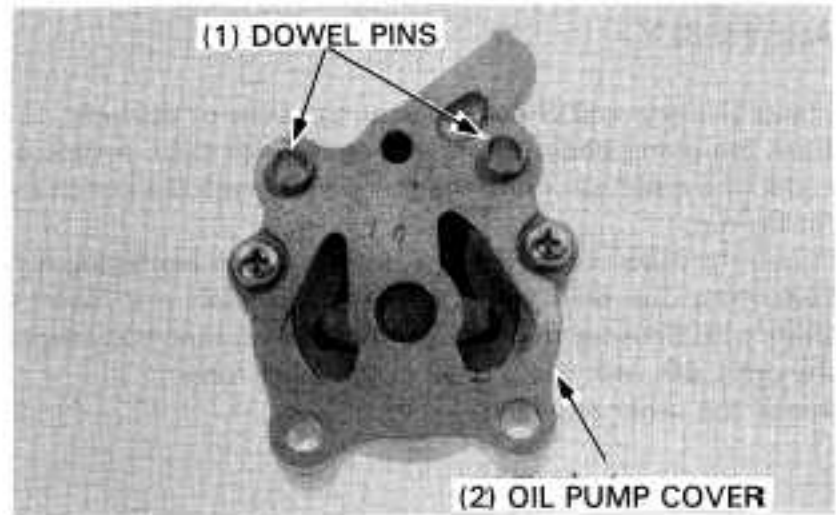
Remove the snap ring and oil pump driven sprocket.



Remove the oil pump mounting screws and the pump.



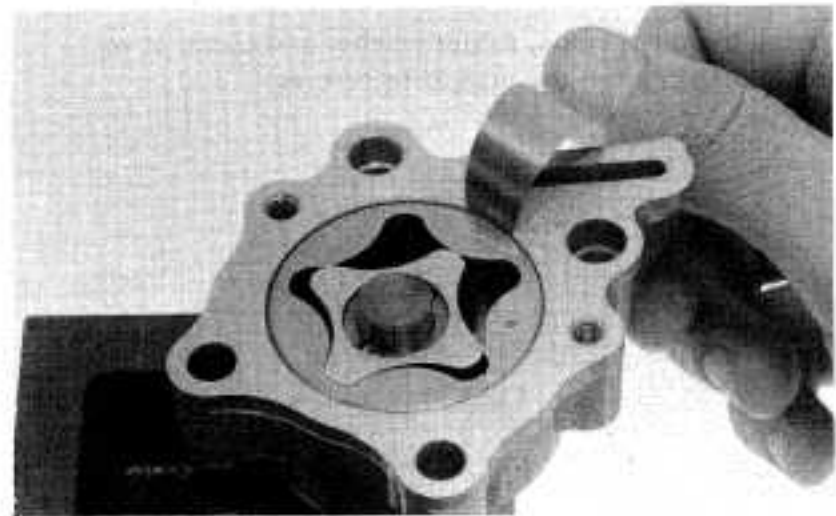
Remove the oil pump cover attaching screws and the cover. Remove the thrust washer and dowel pins.



INSPECTION

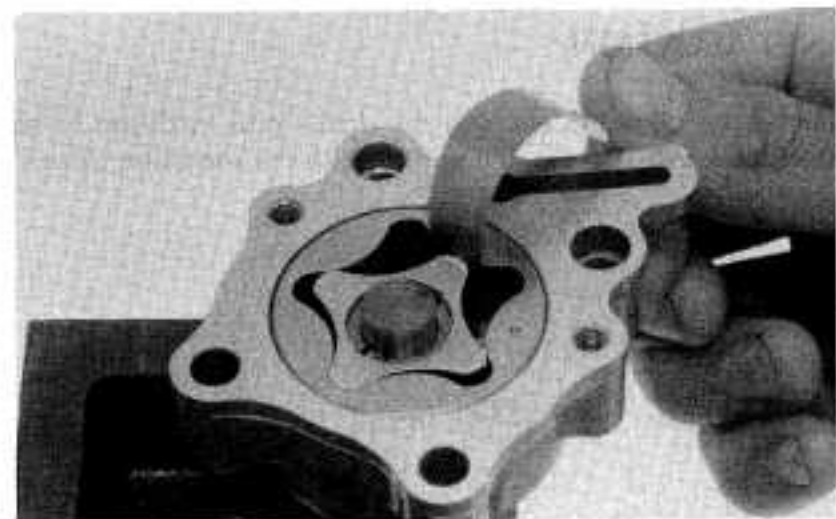
Measure the pump body clearance.

SERVICE LIMIT: 0.35 mm (0.014 in)



Measure the pump tip clearance.

SERVICE LIMIT: 0.20 mm (0.008 in)

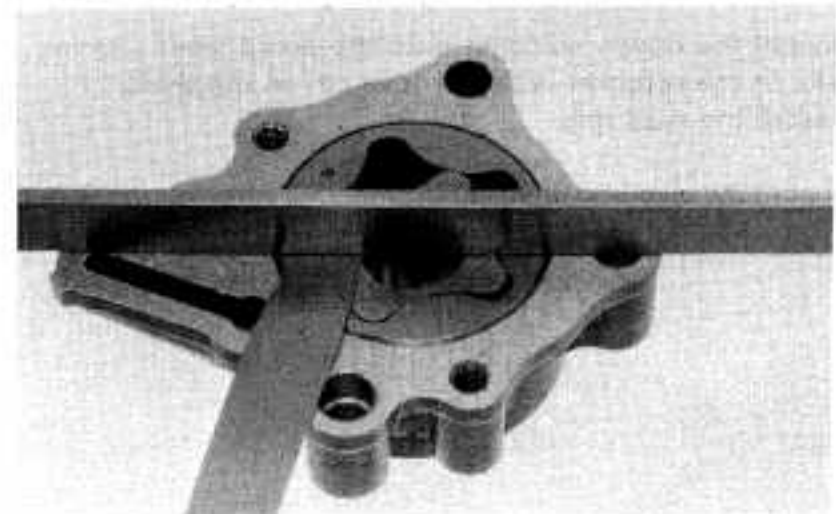


Remove the drive pins and pump shaft. Measure the pump end clearance.

SERVICE LIMIT: 0.12 mm (0.005 in)

NOTE

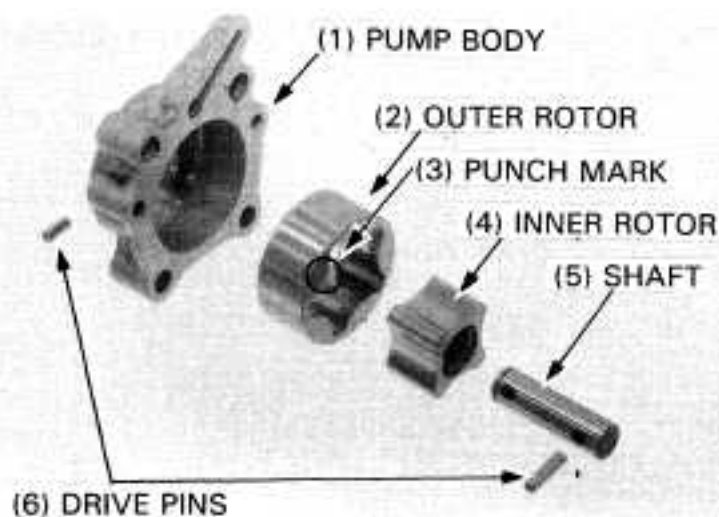
- The oil pump must be replaced as an assembly.



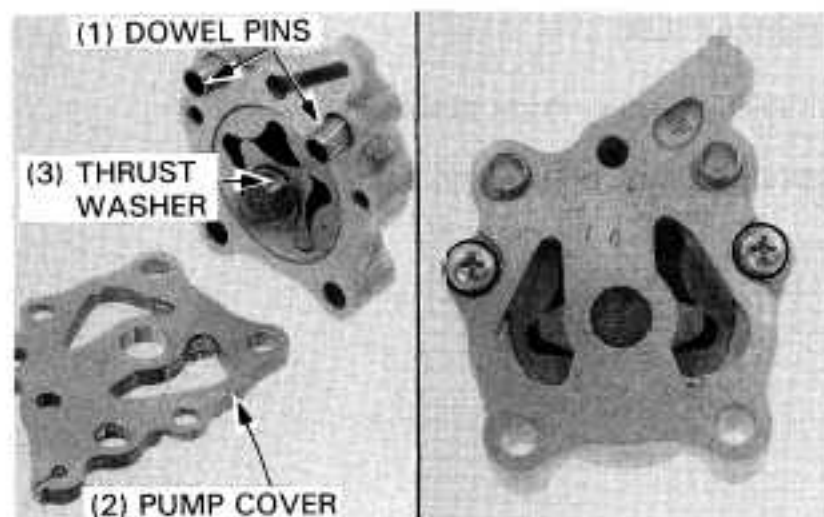
CLUTCH/GEARSHIFT LINKAGE/OIL PUMP

ASSEMBLY

Clean all parts and check for scoring, wear or damage.
Coat the pump body, rotors and shaft with clean engine oil.
Install the outer rotor into the pump body with the punch mark facing out.
Install the inner rotor with the drive pin grooves facing out.
Install the one drive pin into the pump shaft and insert the shaft with the snap ring groove toward the pump body aligning the drive pin with the groove in the inner rotor.
Install the other drive pin.

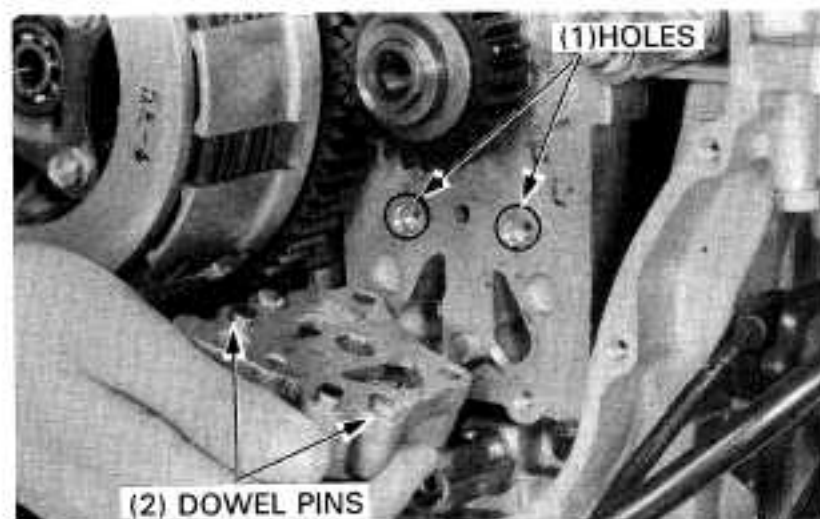


Install the dowel pins, thrust washer and pump cover.
Install and tighten the attaching screws.



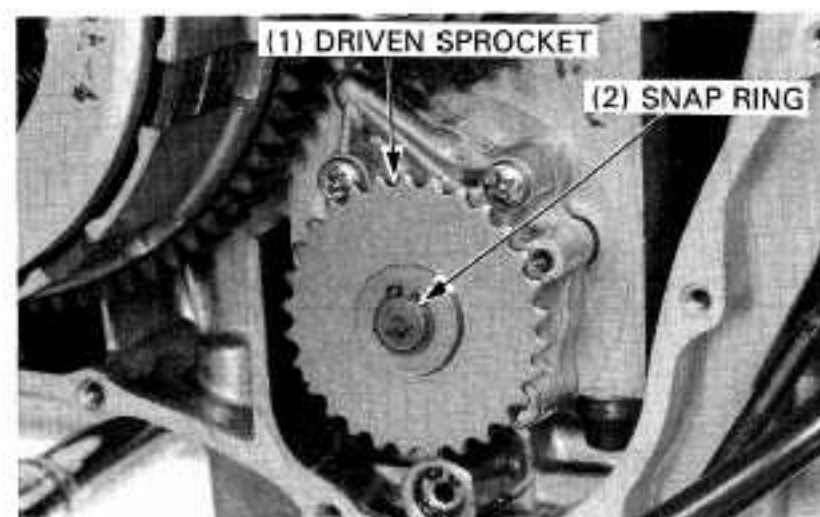
INSTALLATION

Install the oil pump aligning the dowel pins with the holes in the crankcase, and install and tighten the mounting screws.



Install the driven sprocket onto the pump shaft aligning the slot in the sprocket with the drive pin on the shaft.
Install the snap ring.

Install the oil pump drive chain and drive sprocket (page 8-12).

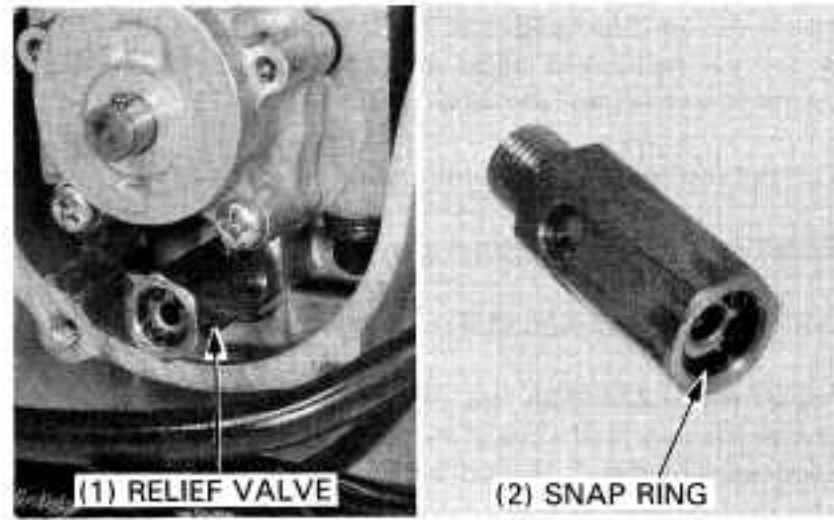


OIL PRESSURE RELIEF VALVE

Remove the oil pressure relief valve from the crankcase.

Check the operation of the relief valve.

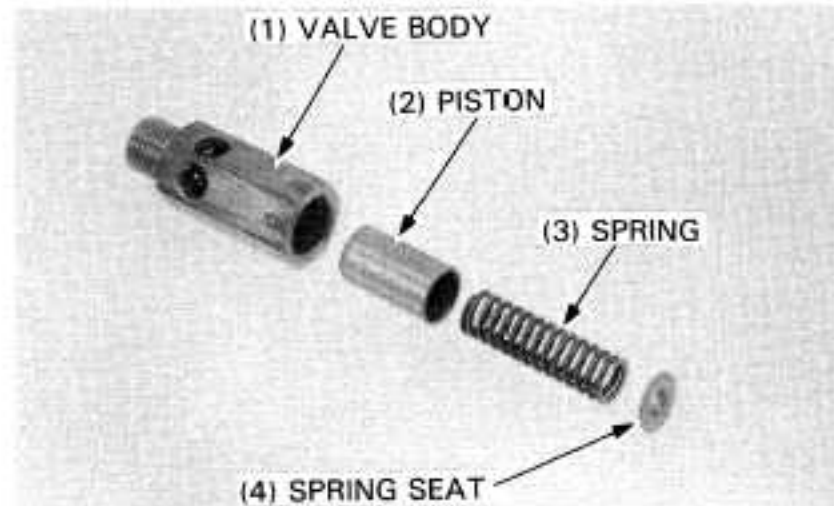
Remove the snap ring and disassemble the relief valve.



Check the piston and inside of the valve body for scoring, damage or excessive wear.
Check the spring and seat for damage.

Replace the valve as an assembly if any part is faulty.

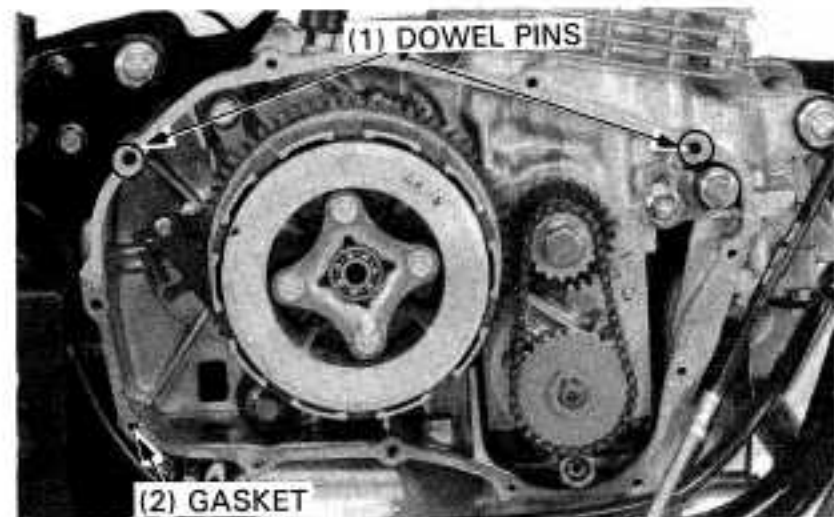
Assemble and install the relief valve.



RIGHT CRANKCASE COVER INSTALLATION

Clean the right crankcase cover mating surface of the crankcase.

Install the dowel pins and a new gasket.

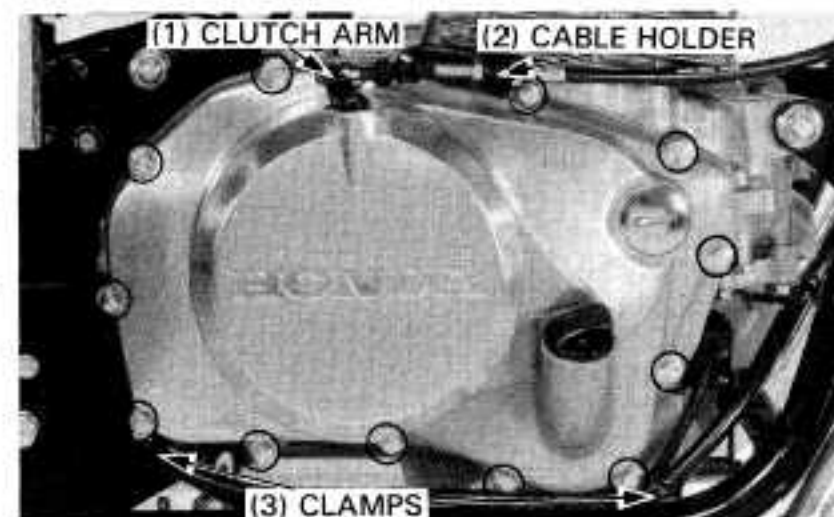


Clean the mating surface of the right crankcase cover.
Install the right crankcase cover and tighten the bolts securely.

NOTE

- Install the cable clamps and cable holder in the correct positions.

Install the clutch cable into the cable holder and connect the cable end to the clutch arm.



CLUTCH/GEARSHIFT LINKAGE/OIL PUMP

Install the right footpeg onto the frame.
Install the rear brake pedal arm onto the shaft, aligning the punch marks on the arm and shaft.

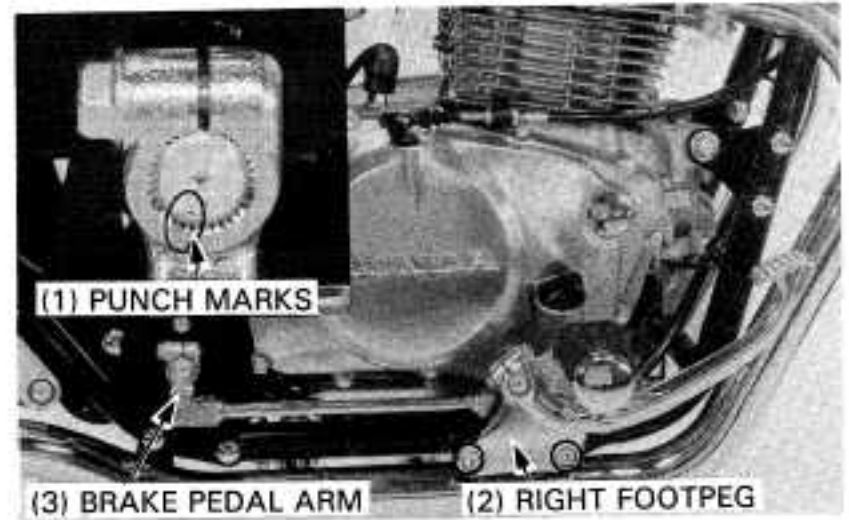
Tighten the footpeg mounting bolts securely.

Install and tighten the pedal arm bolt.

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

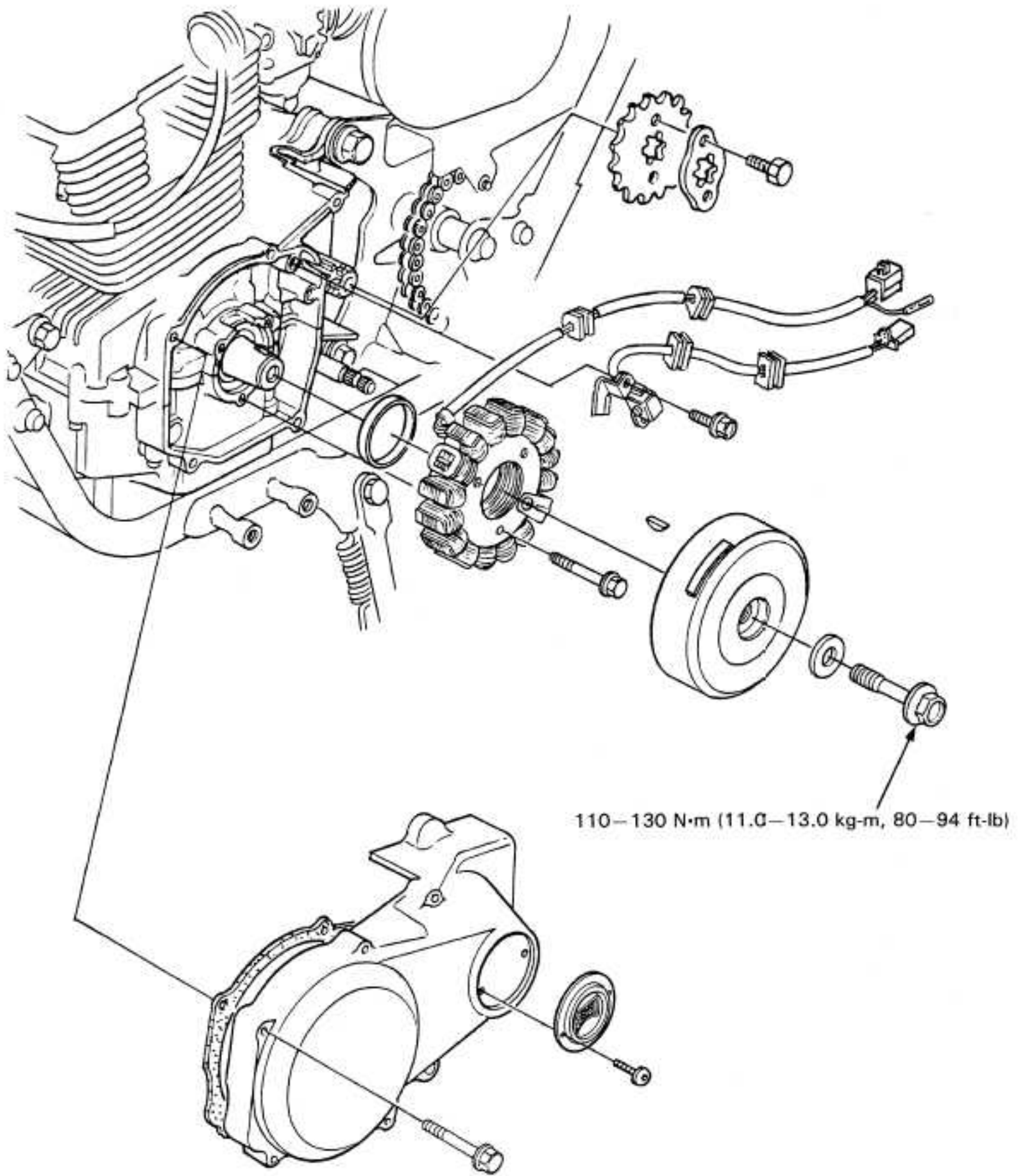
Adjust the clutch lever free play (page 3-16).
Check the rear brake pedal height and free play, and adjust if necessary (pages 3-14 and 3-15).

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



MEMO

ALTERNATOR



9. ALTERNATOR

SERVICE INFORMATION	9-1	FLYWHEEL INSTALLATION	9-3
LEFT CRANKCASE COVER REMOVAL	9-2	LEFT CRANKCASE COVER INSTALLATION	9-3
FLYWHEEL REMOVAL	9-2		
STATOR/PULSE GENERATOR REPLACEMENT	9-3		

SERVICE INFORMATION

GENERAL

- This section covers removal and installation of the alternator and pulse generator. These operations can be accomplished with the engine in the frame.
- Refer to Sections 14 and 15 for alternator and pulse generator inspection.

TORQUE VALUES

Flywheel bolt	110–130 N·m (11.0–13.0 kg-m, 80–94 ft-lb)
Gearshift pedal arm bolt	10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)

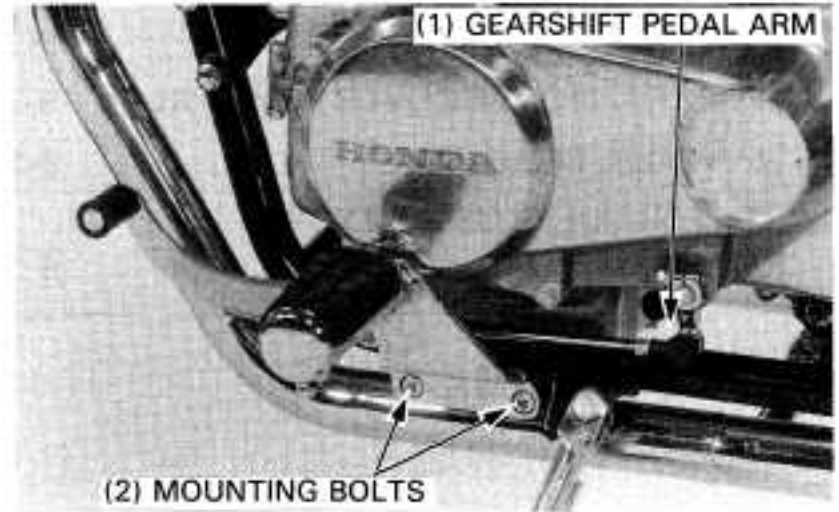
TOOLS

Common	
Universal holder	07725–0030000 Equivalent commercially available in U.S.A.
Rotor puller	07733–0020001 or 07933–3950000

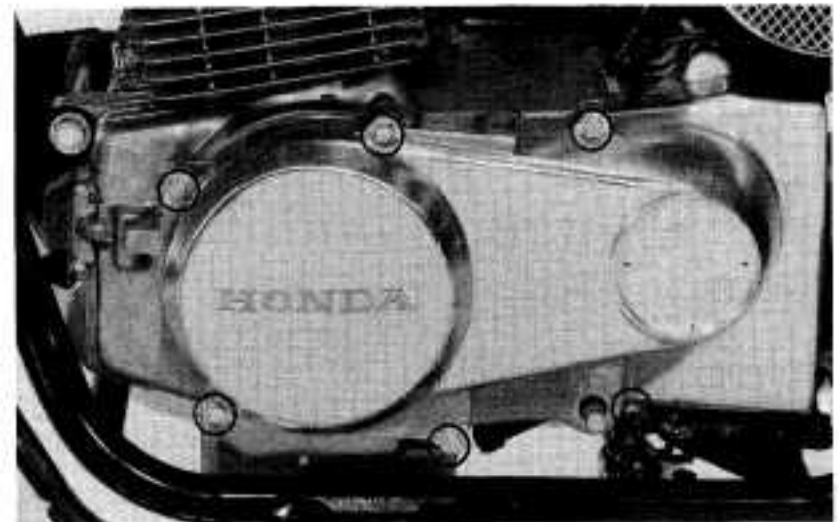
ALTERNATOR

LEFT CRANKCASE COVER REMOVAL

Remove the gearshift pedal arm.
Remove the footpeg mounting bolts and the footpeg.



Remove the left crankcase cover.

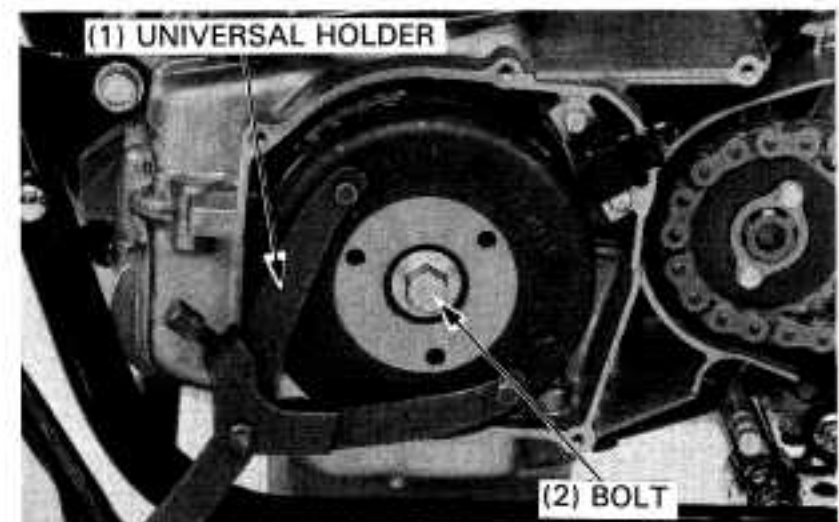


FLYWHEEL REMOVAL

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

TOOL:
Universal holder

07725-0030000
Equivalent commercially
available in U.S.A.

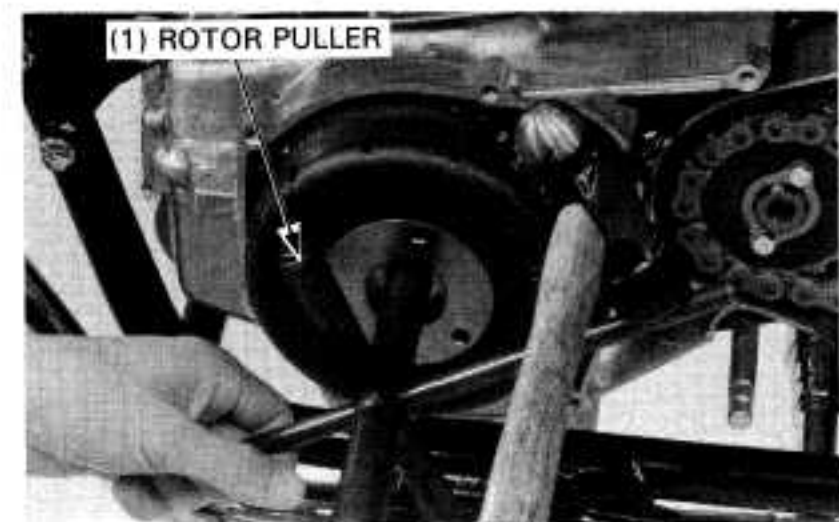


Remove the flywheel using a rotor puller.

TOOL:
Rotor puller

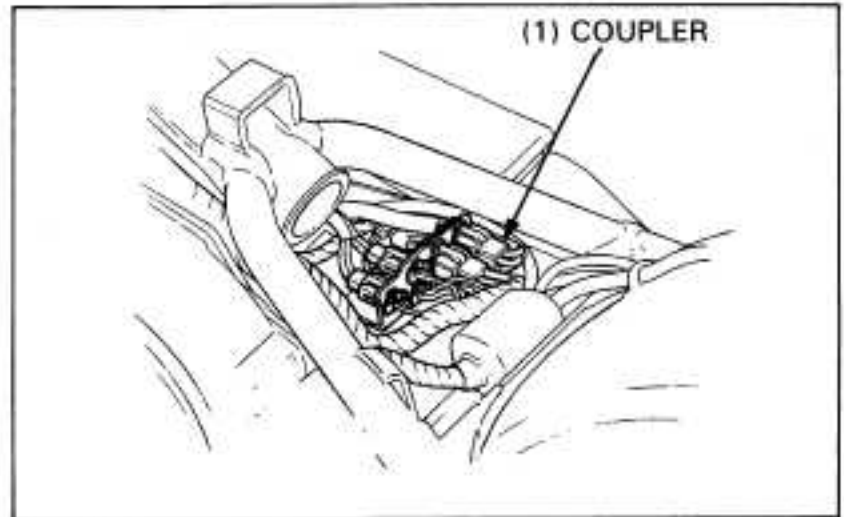
07733-0020001 or
07933-3950000

Remove the woodruff key from the crankshaft.



STATOR/PULSE GENERATOR REPLACEMENT

Disconnect the stator and pulse generator wire couplers and connector.



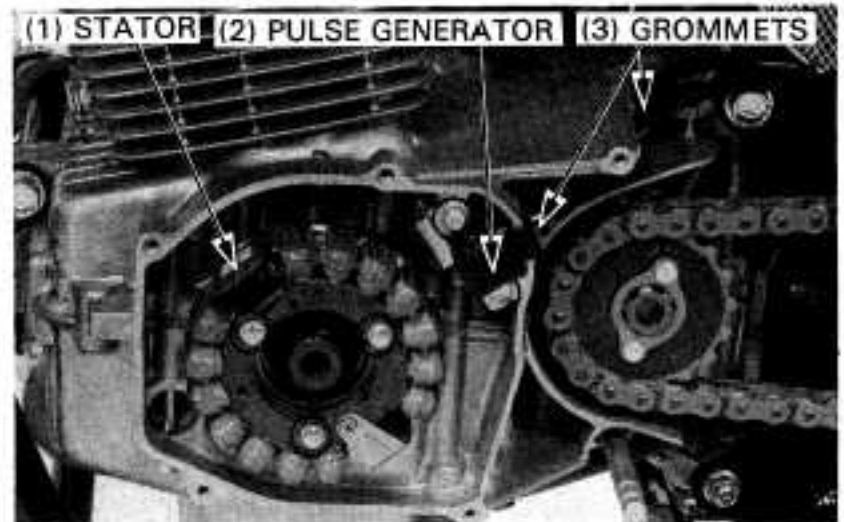
Remove the following:

- pulse generator attaching bolts and the pulse generator.
- stator attaching bolts and the stator.

Install the stator and pulse generator in the reverse order of removal.

NOTE

- Install the stator and pulse generator wire grommets securely into the left crankcase grooves.



FLYWHEEL INSTALLATION

Install the woodruff key into the keyway in the crankshaft. Clean the tapered hole in the flywheel of any burrs and other faults; repair if necessary. Install the flywheel by aligning the keyway in the flywheel with the key on the crankshaft.

NOTE

- Check for debris inside the flywheel before installation. The magnets tend to attract steel filings and other ferrous debris.

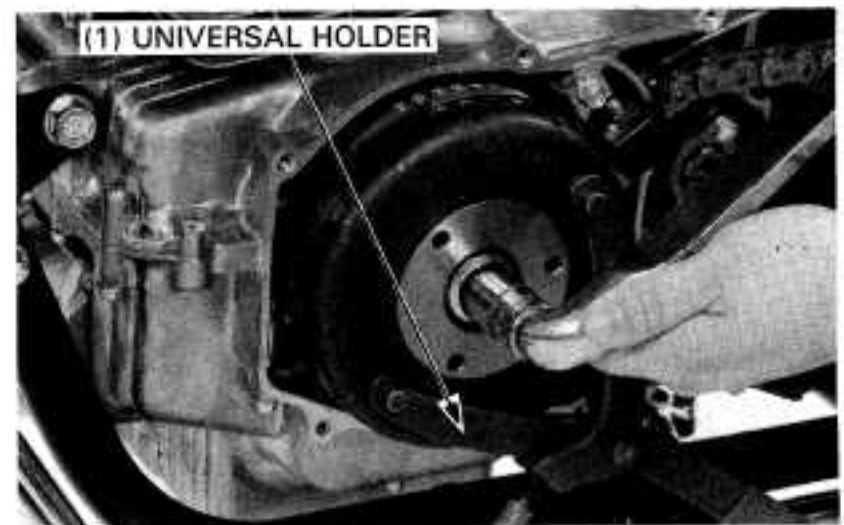
Hold the flywheel with the universal holder and tighten the flywheel bolt.

TORQUE: 110–130 N·m (11.0–13.0 kg·m, 80–94 ft·lb)

TOOL:

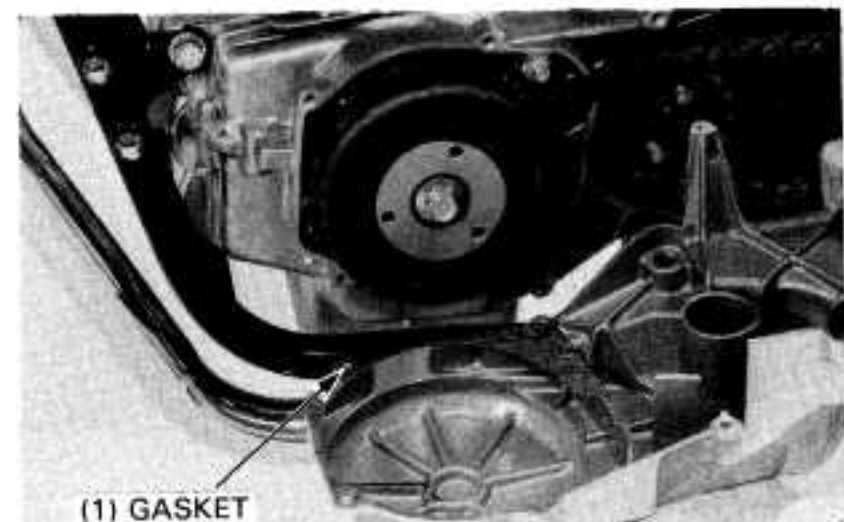
Universal holder

07725–0030000
Equivalent commercially
available in U.S.A.



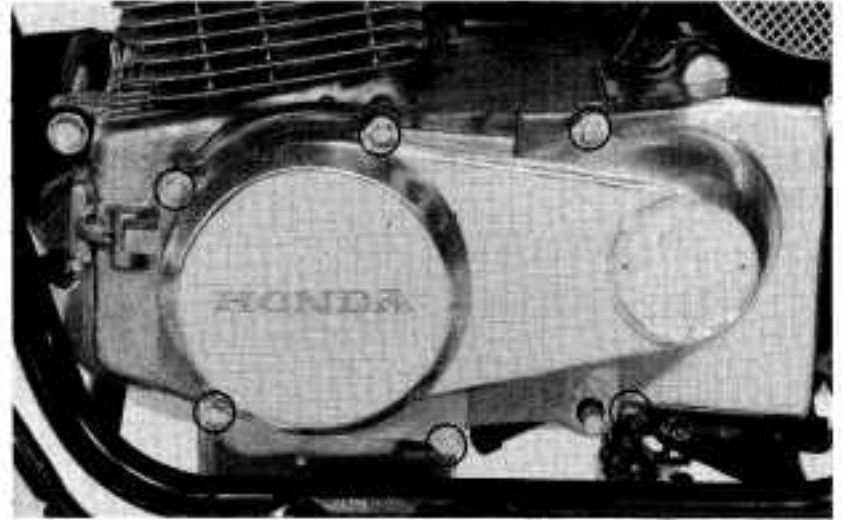
LEFT CRANKCASE COVER INSTALLATION

Install the gasket on the left crankcase cover and install the left crankcase cover.



ALTERNATOR

Install and tighten the left crankcase cover bolts.

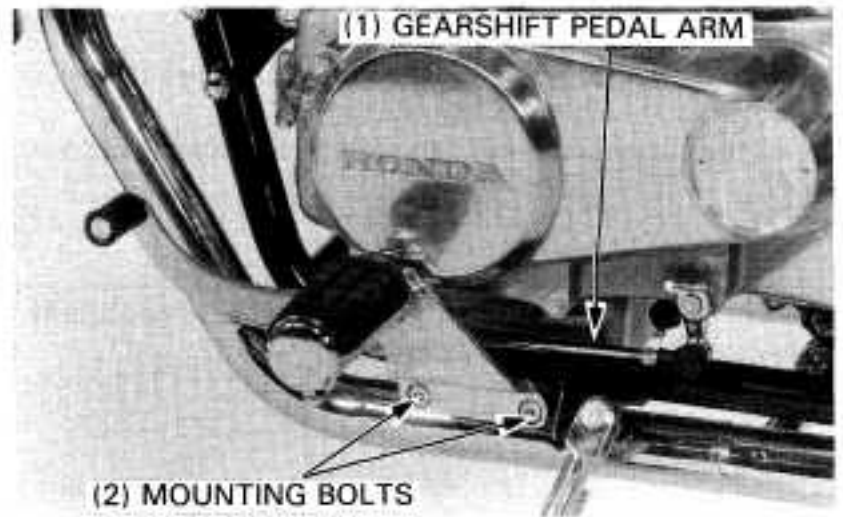


Install the footpeg and tighten the mounting bolts.

Install the gearshift pedal arm and tighten the bolt.

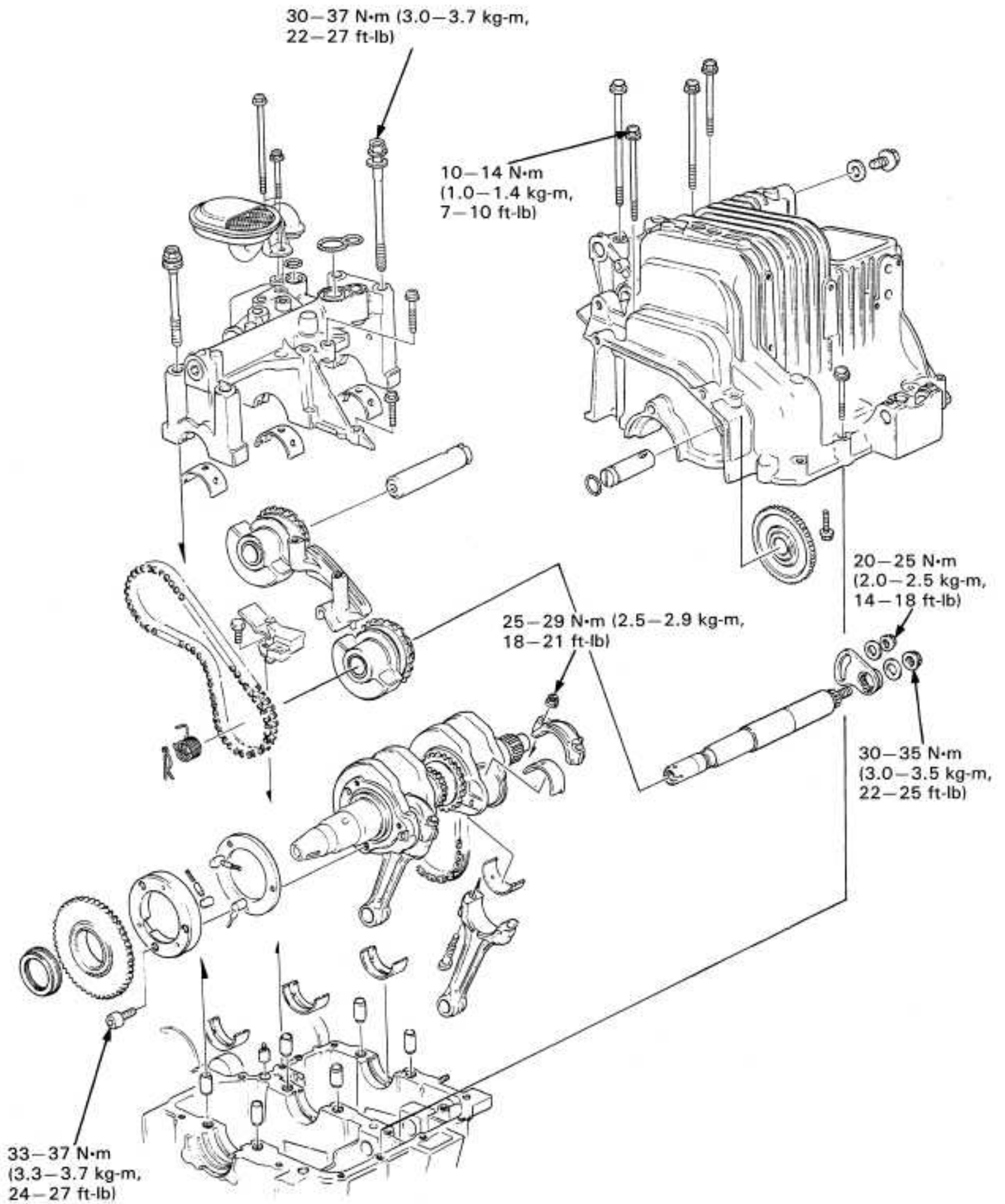
TORQUE: 10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)

Check the ignition timing (page 15-4).



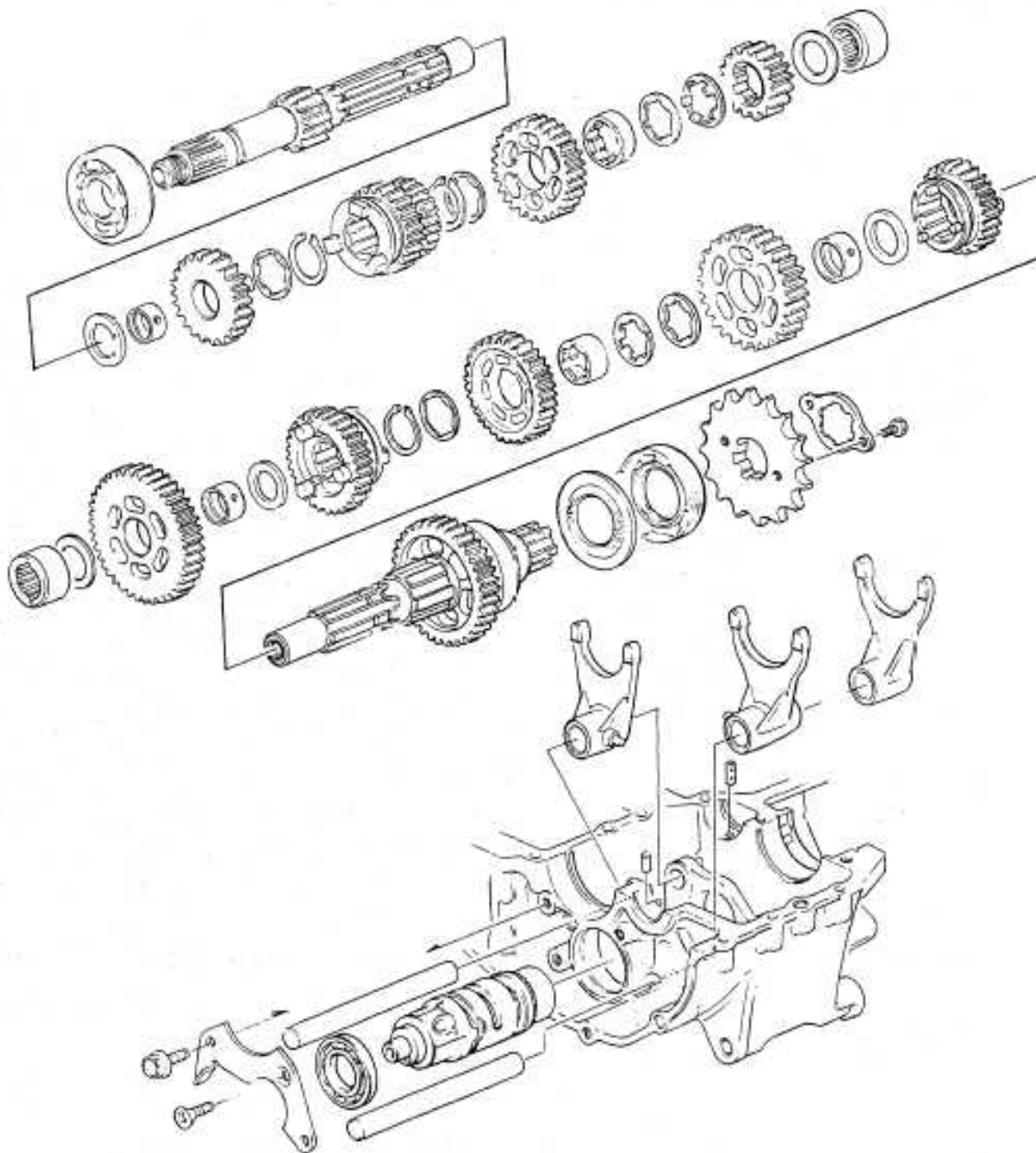
MEMO

CRANKCASE/CRANKSHAFT/TRANSMISSION



10. CRANKCASE/CRANKSHAFT/TRANSMISSION

SERVICE INFORMATION	10-2	STARTER CLUTCH/STARTER IDLE GEAR	10-10
TROUBLESHOOTING	10-3	CONNECTING ROD INSTALLATION	10-11
CRANKCASE SEPARATION	10-4	TRANSMISSION DISASSEMBLY	10-12
BALANCER REMOVAL	10-4	SHIFT FORK AND SHIFT DRUM	10-14
CRANKSHAFT/CONNECTING ROD REMOVAL	10-6	TRANSMISSION ASSEMBLY	10-16
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BEARING SELECTION	10-8	CRANKCASE ASSEMBLY	10-21



SERVICE INFORMATION

GENERAL

- To repair the crankshaft, connecting rods, balancers and transmission, including the shift fork and drum, it is necessary to separate the crankcase halves.
- The engine must be removed from the frame and the following parts removed before disassembling the crankcase.
 - Cylinder head Section 6
 - Cylinder/pistons Section 7
 - Clutch Section 8
 - Oil pump Section 8
 - Gearshift linkage Section 8
 - Alternator Section 9
 - Starter motor Section 16
- All bearing inserts are a select fit and are identified by color code. Select replacement bearings from the color code table.
- After installing new bearings, recheck them with plastigauge to verify clearance.
- After installing the balancer, check the timing and adjust balancer chain tension.
- Apply molybdenum disulfide grease to the main journals and crankpins during assembly.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Balancer	I.D.	18.010–18.028 (0.7091–0.7098)	18.04 (0.710)	
	Shaft O.D.	17.966–17.984 (0.7073–0.7080)	17.95 (0.707)	
	Balancer-to-shaft clearance	0.026–0.062 (0.0010–0.0024)	0.08 (0.003)	
Crankshaft	Connecting rod big end side clearance	0.05–0.25 (0.002–0.010)	0.35 (0.014)	
	Crankpin oil clearance	0.020–0.044 (0.0008–0.0017)	0.08 (0.003)	
	Main journal oil clearance	0.020–0.045 (0.0008–0.0018)	0.08 (0.003)	
	Runout	—	0.05 (0.002)	
Transmission	Backlash	LOW	0.021–0.110 (0.008–0.0043)	0.20 (0.008)
		2nd, 3rd	0.089–0.179 (0.0035–0.0070)	0.20 (0.008)
		4th, 5th, TOP	0.094–0.188 (0.0037–0.0074)	0.20 (0.008)
	Gear I.D.	M5	28.000–28.021 (1.1024–1.1032)	28.04 (1.104)
		M6	27.993–28.009 (1.1021–1.1027)	28.02 (1.103)
		C1	24.020–24.041 (0.9456–0.9465)	24.09 (0.948)
		C3, C4	28.000–28.021 (1.1024–1.1032)	28.04 (1.104)
	Gear bushing O.D.	M5, M6	27.959–27.980 (1.1007–1.1016)	27.94 (1.099)
		C1	23.984–24.005 (0.9443–0.9451)	24.03 (0.946)
		C3, C4	27.959–27.980 (1.1007–1.1016)	27.94 (1.099)
	Gear bushing I.D.	M5	24.985–25.006 (0.9837–0.9845)	25.03 (0.985)
		C1	20.020–20.041 (0.7882–0.7890)	20.09 (0.791)
		C3	24.985–25.006 (0.9837–0.9845)	25.03 (0.985)
	Mainshaft O.D.	at M5	24.967–24.980 (0.9829–0.9835)	24.95 (0.982)
	Countershaft O.D.	at C1	19.987–20.000 (0.7869–0.7874)	19.95 (0.785)
		at C3	24.959–24.980 (0.9828–0.9835)	24.98 (0.982)
	Gear-to- bushing clearance	M5	0.020–0.062 (0.0008–0.0024)	0.10 (0.004)
		M6	0.013–0.050 (0.0005–0.0019)	0.10 (0.004)
		C1	0.015–0.057 (0.0006–0.0022)	0.10 (0.004)
		C3	0.020–0.062 (0.0008–0.0024)	0.10 (0.004)
Bushing-to- shaft clearance	M5	0.005–0.039 (0.0002–0.0015)	0.08 (0.003)	
	C1	0.020–0.054 (0.0008–0.0021)	0.10 (0.004)	
	C3	0.005–0.047 (0.0002–0.0019)	0.10 (0.004)	

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Shift drum	O.D.	34.950–34.975 (1.3760–1.3770)	34.90 (1.374)
	Case I.D.	35.000–35.025 (1.3780–1.3789)	35.05 (1.380)
Shift fork	Claw thickness	M3, M4	5.93–6.00 (0.234–0.236)
		C5, C6	5.93–6.00 (0.234–0.236)
	Shift fork I.D.	13.000–13.018 (0.5118–0.5125)	13.05 (0.514)
Fork shaft	O.D.	12.966–12.984 (0.5105–0.5112)	12.95 (0.510)

TORQUE VALUES

Crankcase bolt	6 mm	10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)
	8 mm	22–28 N·m (2.2–2.8 kg-m, 16–20 ft-lb)
Connecting rod bearing cap nut		25–29 N·m (2.5–2.9 kg-m, 18–21 ft-lb)
Crankcase bearing holder bolt		30–37 N·m (3.0–3.7 kg-m, 22–27 ft-lb)
Balancer stopper plate nut	10 mm	30–35 N·m (3.0–3.5 kg-m, 22–25 ft-lb)
	8 mm	20–25 N·m (2.0–2.5 kg-m, 14–18 ft-lb)
Starter clutch socket bolt		33–37 N·m (3.3–3.7 kg-m, 24–27 ft-lb)
Balancer chain guide bolt		10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)
Oil strainer bolt		10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)

TOOLS

Common

Torx driver bit	07703–0010100 or Equivalent commercially available in U.S.A.
Inner driver	07746–0030100
Attachment, 25 mm I.D.	07746–0030200

TROUBLESHOOTING

Excessive noise

- Crankshaft
 - Worn main journal bearing
 - Worn crankpin bearing
- Balancer
 - Improper timing
 - Improper chain adjustment
 - Damaged chain

Hard so shift

- Improper clutch adjustment: too much free play
- Shift fork bent
- Fork shaft bent
- Shift fork claw bent
- Shift drum cam grooves damaged

Transmission jumps out of gear

- Gear dogs worn
- Fork shaft bent
- Shift drum stopper broken
- Shift fork bent

CRANKCASE SEPARATION

Refer to Service Information (page 10-2) for removal of necessary parts before disassembling the crankcase.

NOTE

- It is not necessary to remove the cylinder, piston and cylinder head related parts if the crankshaft removal is not required.

Remove the 8 mm bolt and the fifteen 6 mm bolts.

NOTE

- Remove the bolts in two or more steps and in a crisscross pattern to prevent warpage.

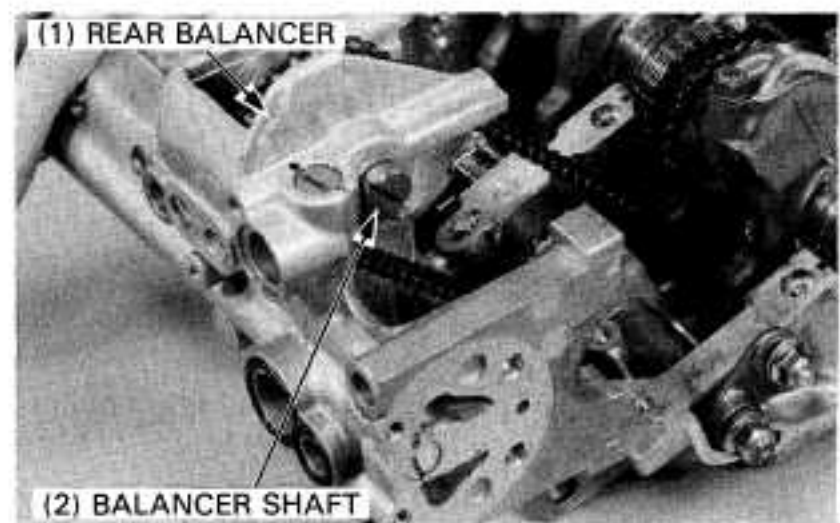
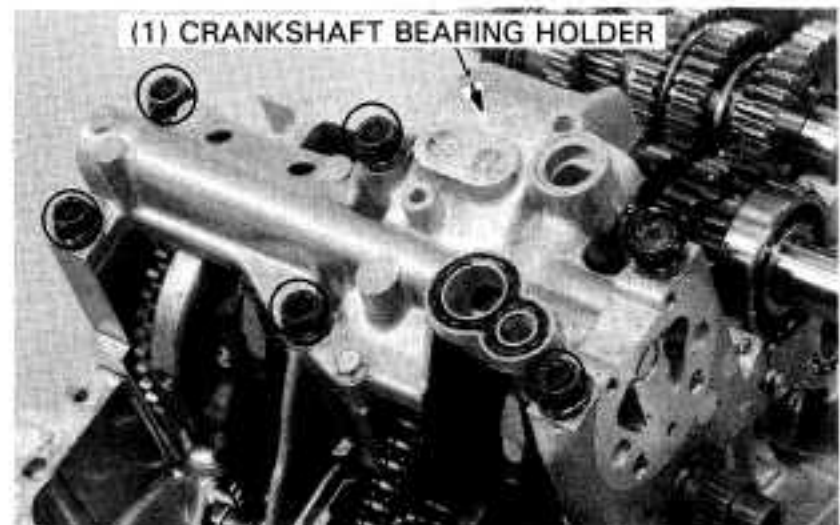
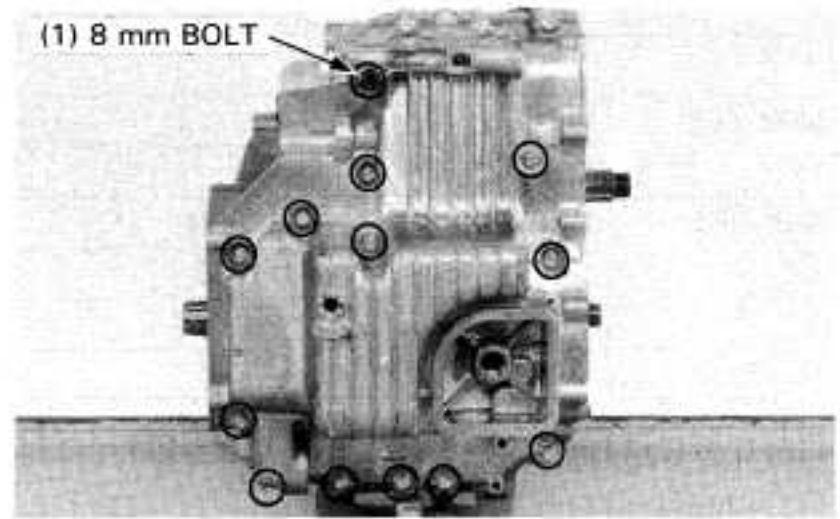
Remove the lower case.

BALANCER REMOVAL

Remove the oil strainer from the crankshaft bearing holder.

Remove the bearing holder bolts and front chain guide bolt. Remove the crankshaft bearing holder from the upper crankcase and remove the front chain guide.

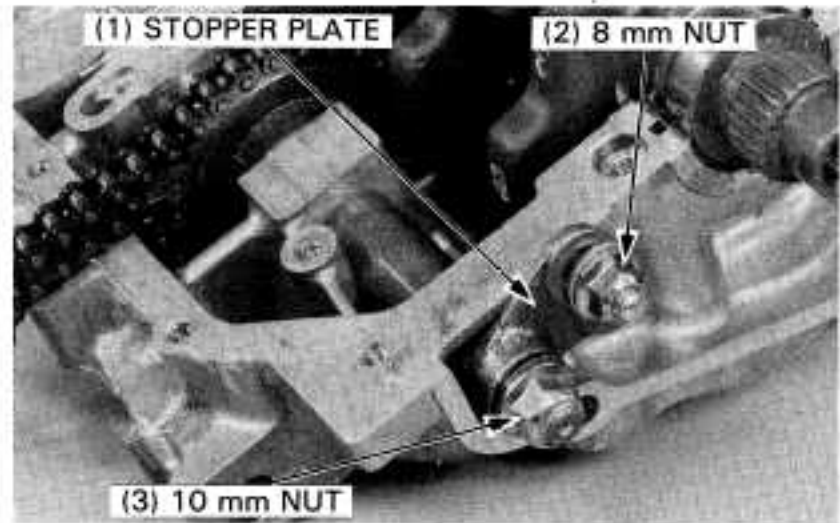
Pull out the rear balancer shaft and remove the rear balancer.



Remove the 10 mm nut, 8 mm nut and balancer stopper plate.

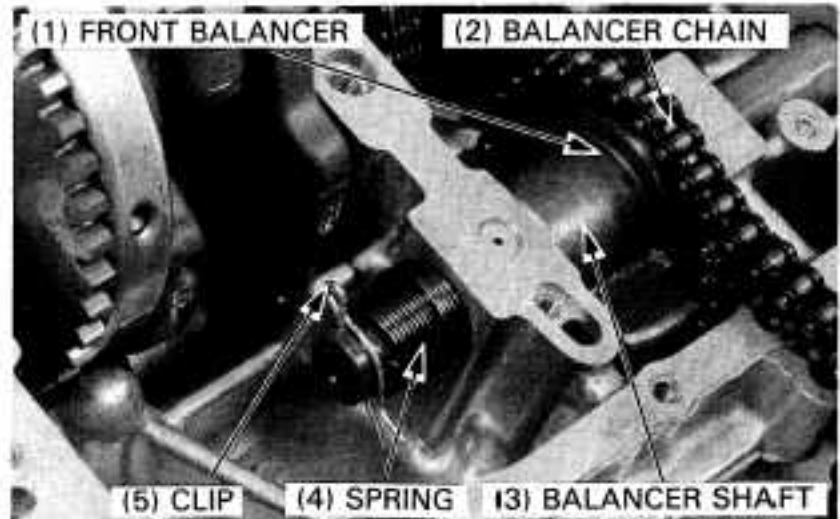
NOTE

- It is not necessary to remove the 10 mm nut if balancer or balancer shaft replacement is not required.



Remove the clip and spring.

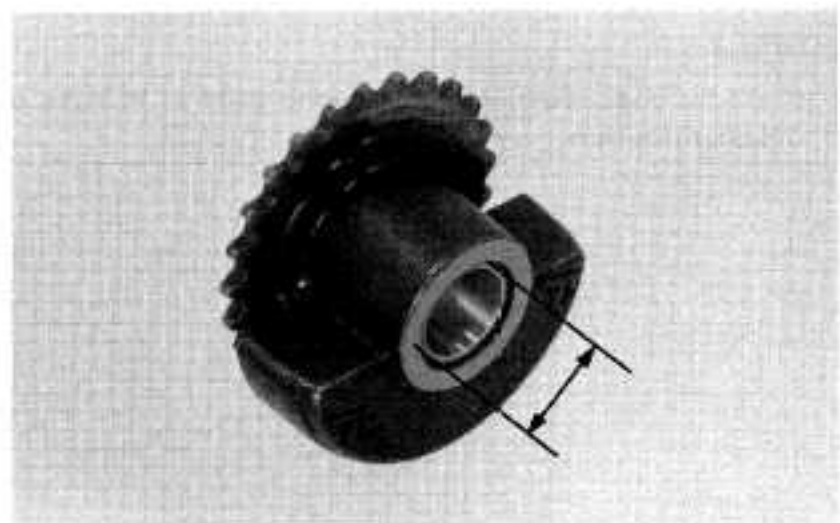
Pull the front balancer shaft out and remove the front balancer and chain.



INSPECTION

Measure the balancer I.D.

SERVICE LIMIT: 18.04 mm (0.710 in)



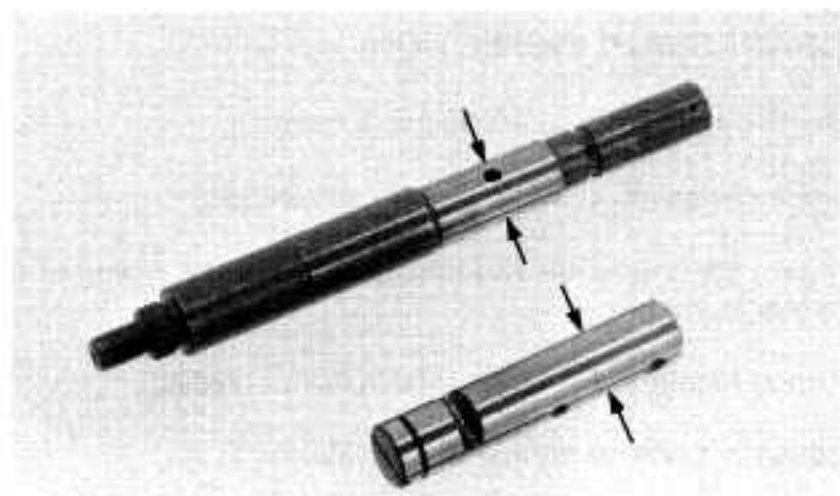
Measure the balancer shaft O.D.

SERVICE LIMIT: 17.95 mm (0.707 in)

Calculate the clearance between the balancer and balancer shaft.

SERVICE LIMIT: 0.08 mm (0.003 in)

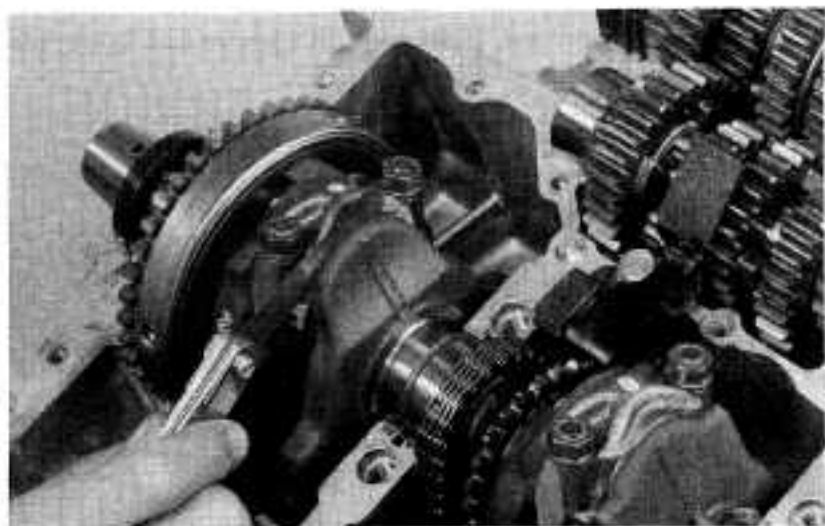
Replace the balancer and shaft if the service limit is exceeded.



CRANKSHAFT/CONNECTING ROD REMOVAL

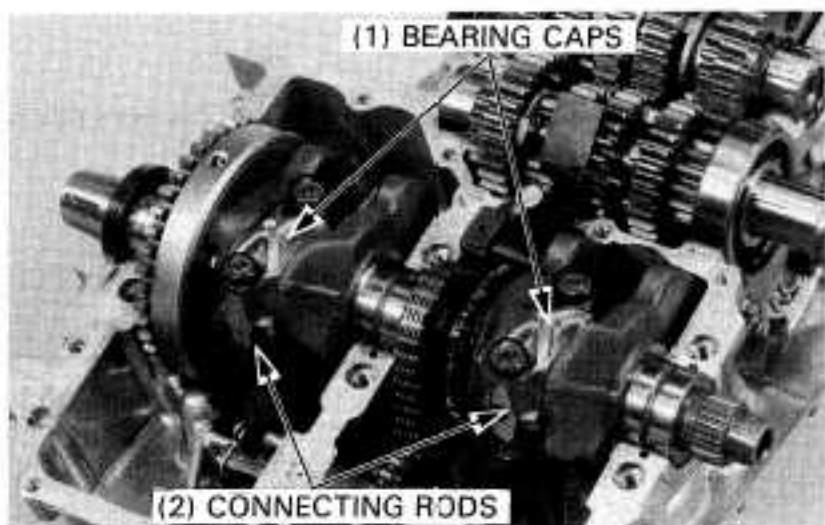
Check the connecting rod side clearance.

SERVICE LIMIT: 0.35 mm (0.014 in)



Remove the bearing caps and rods.

Remove the crankshaft.



NOTE

- Mark the rods, bearings and bearing caps to indicate the cylinder position.



CRANKSHAFT INSPECTION

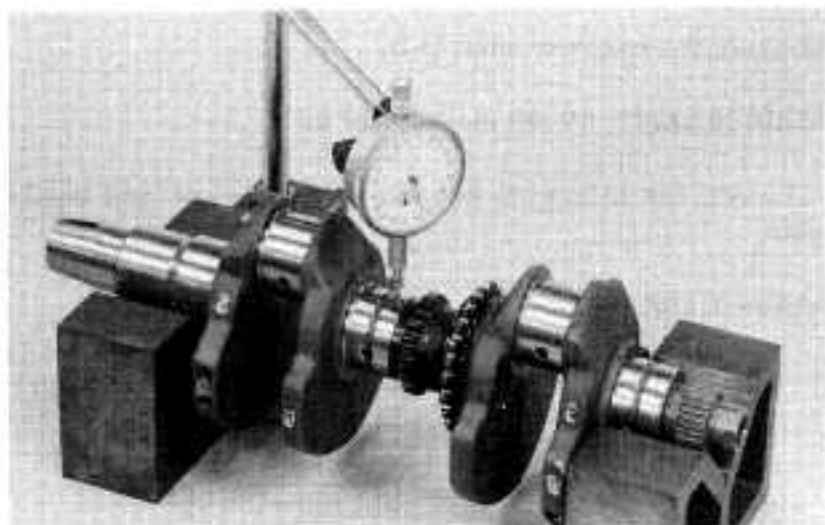
Set the crankshaft on a stand or V blocks.

Set a dial gauge onto the center main journal.

Rotate the crankshaft two revolutions and read runout at the center journal.

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

SERVICE LIMIT: 0.05 mm (0.002 in)

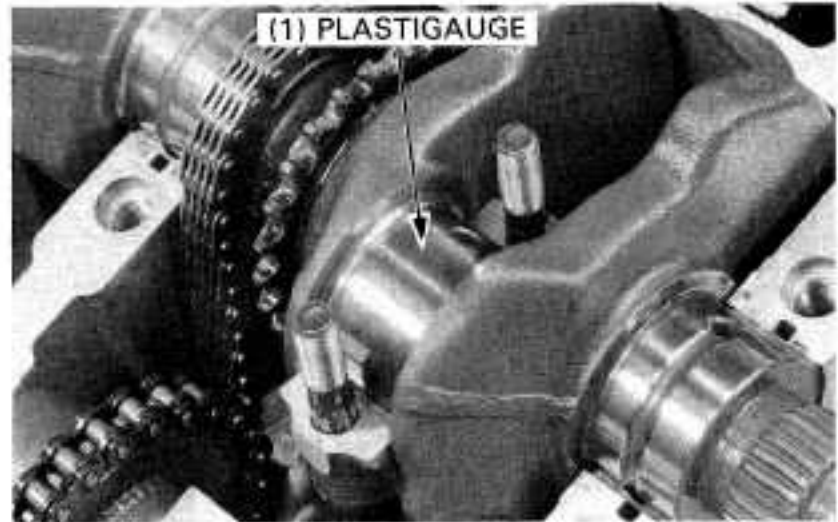


BEARING INSPECTION

CONNECTING RODS

Inspect the bearing inserts for damage, separation, or other defects.

Put a piece of plastigauge on each crankpin, avoiding the oil hole.



Install the bearing caps on the correct crankpins, and torque them evenly.

TORQUE: 25–29 N·m (2.5–2.9 kg-m, 18–21 ft-lb)

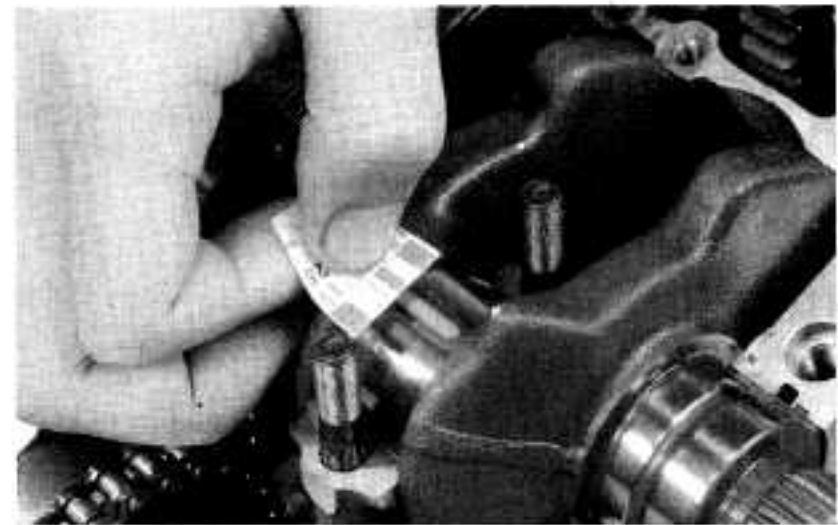
NOTE

- Do not rotate crankshaft during inspection.



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

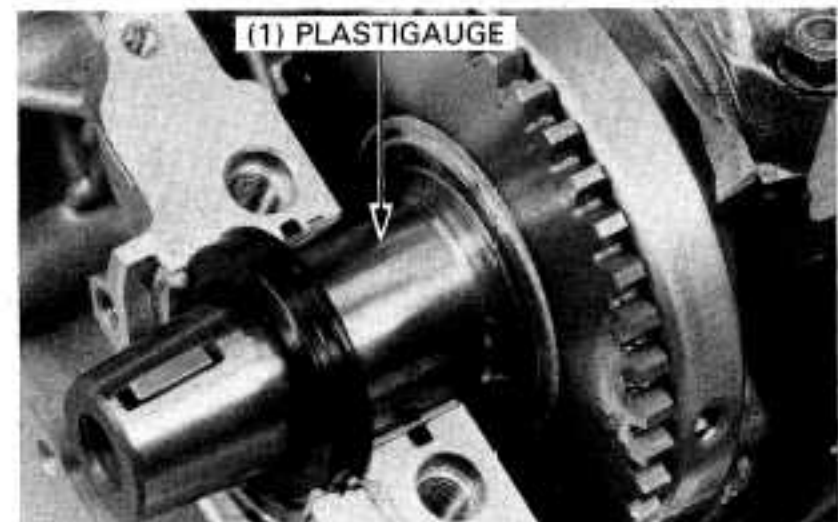
SERVICE LIMIT: 0.08 mm (0.003 in)



MAIN BEARINGS

Inspect the bearing inserts for damage, separation, or other faults.

Put a piece of plastigauge on each journal, avoiding the oil holes.



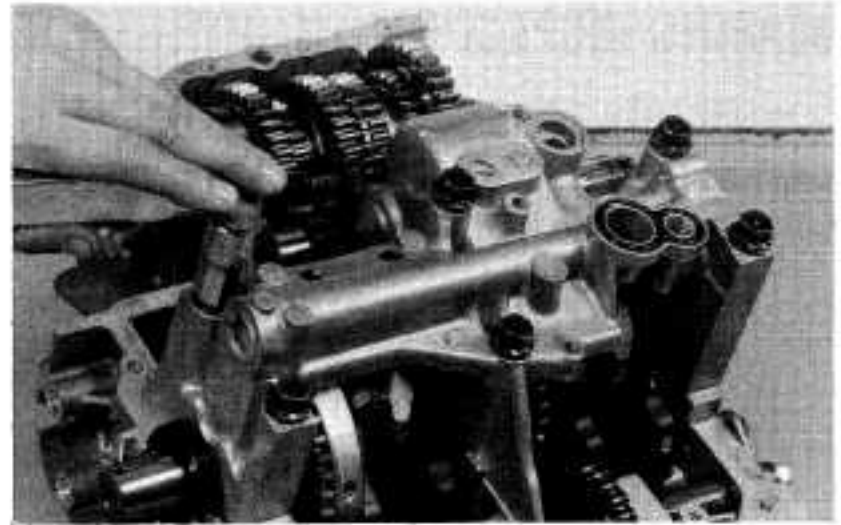
CRANKCASE/CRANKSHAFT/TRANSMISSION

Install the crankshaft bearing holder, and torque the bolts evenly in a crisscross pattern and in two or more steps.

TORQUE: 30–37 N·m (3.0–3.7 kg·m, 22–27 ft·lb)

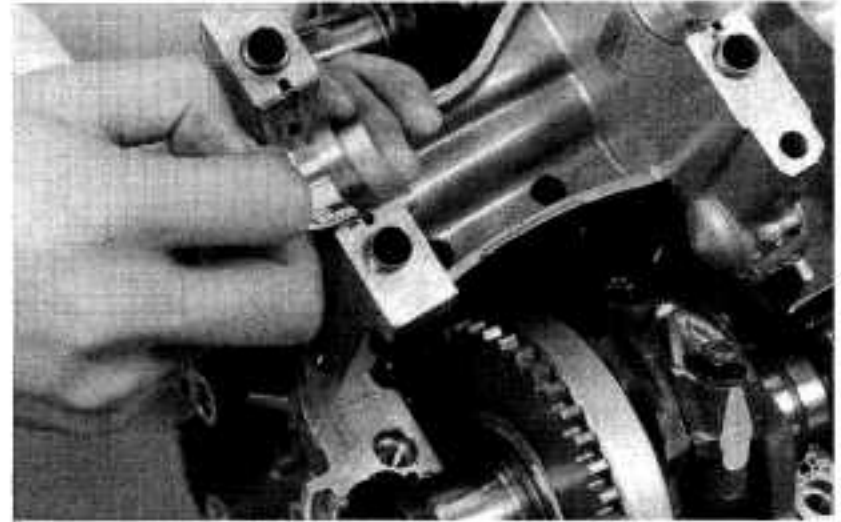
NOTE

- Do not rotate the crankshaft during inspection.



Remove the bearing holder and measure the compressed plastigauge on each journal.

SERVICE LIMIT: 0.08 mm (0.003 in)

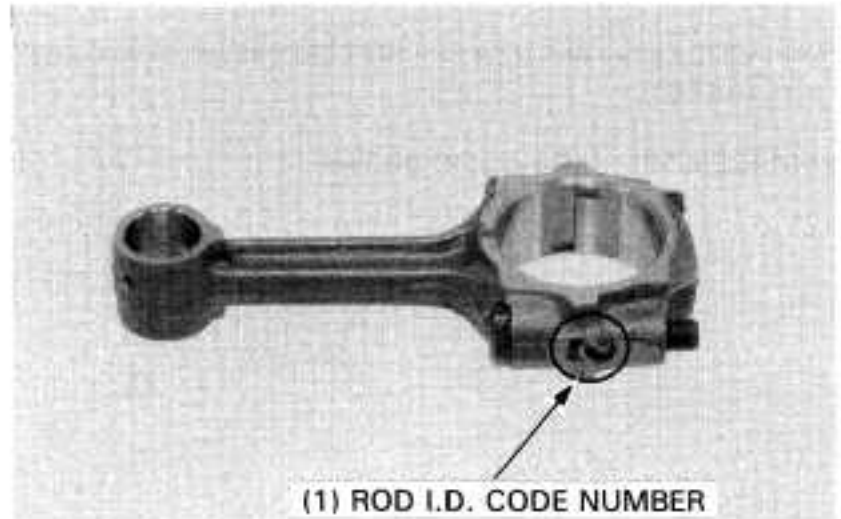


BEARING SELECTION

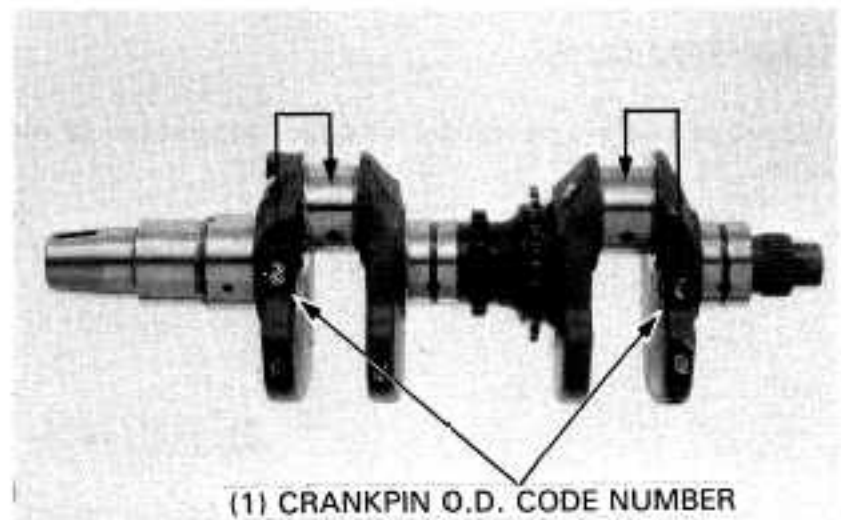
If the bearing oil clearance is beyond the service limit, select replacement bearings as follows:

CONNECTING ROD BEARING INSERTS

Determine and record the corresponding rod I.D. code number.

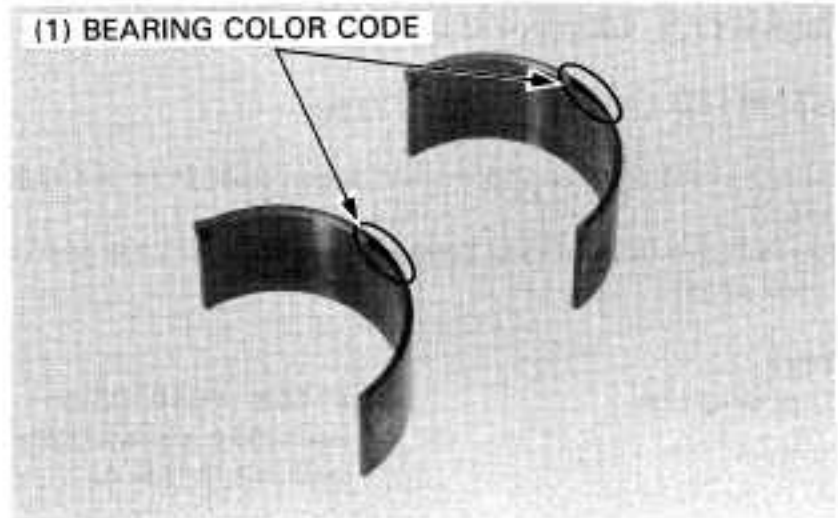


Determine and record the corresponding crankpin O.D. code number.



Cross reference the crankpin and rod codes to determine the replacement bearing color.

		CRANKPIN O.D. CODE NUMBERS			
		1	2	3	
CONNECTING ROD I.D. CODE NUMBERS	1	39.000— 39.008 mm (1.5354— 1.5357 in)	E (YELLOW)	D (GREEN)	C (BROWN)
	2	39.008— 39.016 mm (1.5357— 1.5361 in)	D (GREEN)	C (BROWN)	B (BLACK)
	3	39.016— 39.024 mm (1.5361— 1.5364 in)	C (BROWN)	B (BLACK)	A (BLUE)



MAIN BEARING

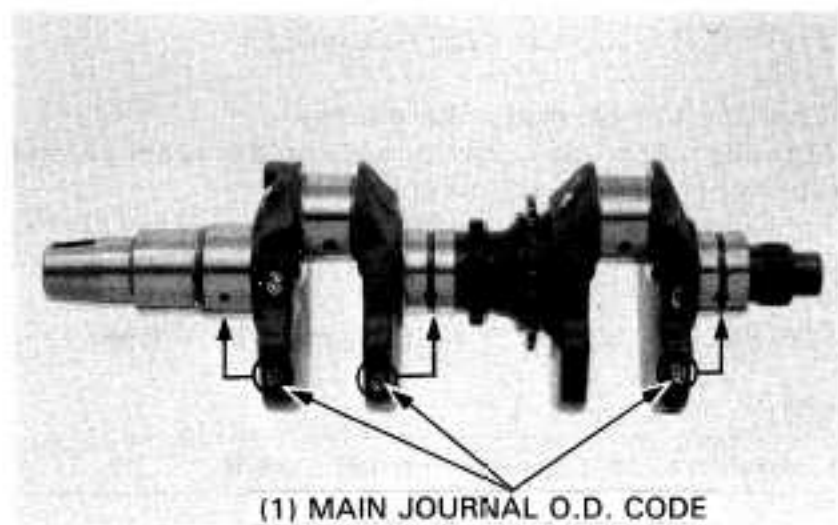
Determine and record each bearing holder and case I.D. code letter.



Determine and record the corresponding main journal O.D. code letters.

Cross reference the case and journal codes to determine the replacement bearing color.

		MAIN JOURNAL O.D. CODES			
		A	B	C	
CASE I.D. CODE LETTERS	A	39.000— 39.008 mm (1.5354— 1.5357 in)	E (YELLOW)	D (GREEN)	C (BROWN)
	B	39.008— 39.016 mm (1.5357— 1.5361 in)	D (GREEN)	C (BROWN)	B (BLACK)
	C	39.016— 39.025 mm (1.5361— 1.5364 in)	C (BROWN)	B (BLACK)	A (BLUE)



STARTER CLUTCH/STARTER IDLE GEAR

STARTER CLUTCH REMOVAL

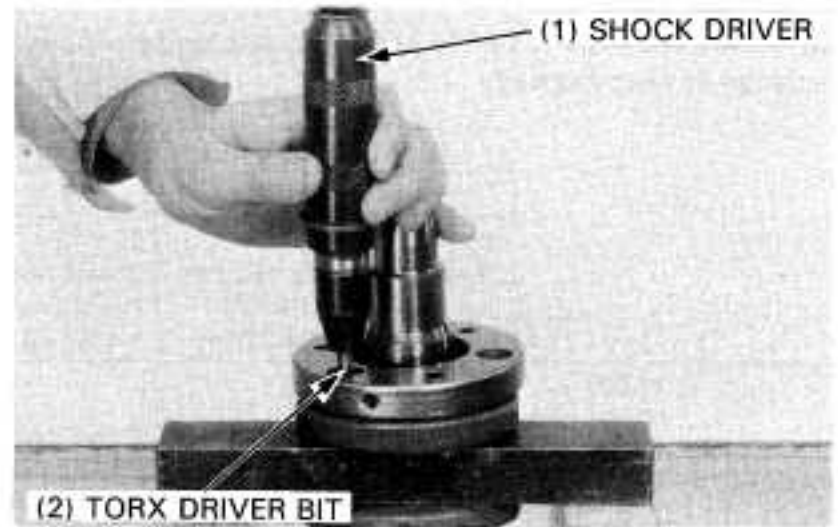
Remove the oil seal and starter driven gear from the crankshaft.

Remove the three socket bolts and the starter clutch from the crankweight.

TOOL:

Torx driver bit

07703-0010100 or
Equivalent commercially
available in U.S.A.

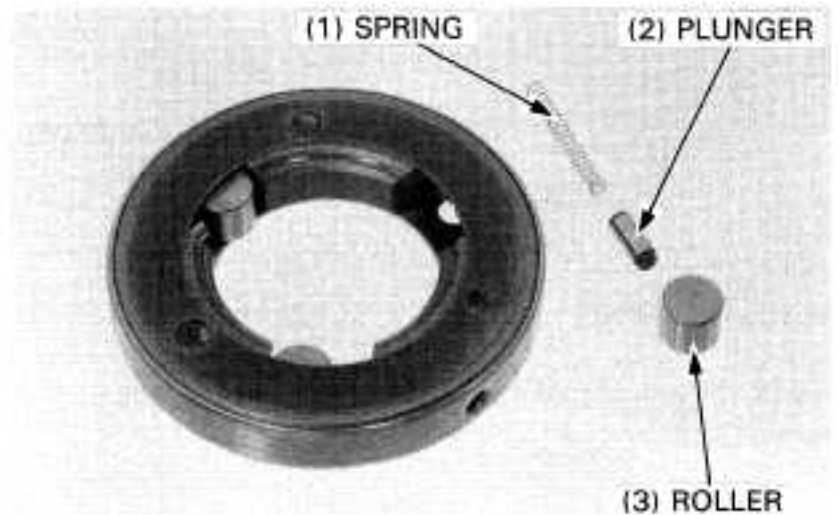


Remove the rollers, plungers and springs from the starter clutch.

Check the roller for damage or wear.

Check the springs and plungers for wear or damage.

Check the starter driven gear teeth, outside and inside diameter surface for wear or damage.



STARTER CLUTCH INSTALLATION

Install the springs, plungers and rollers.

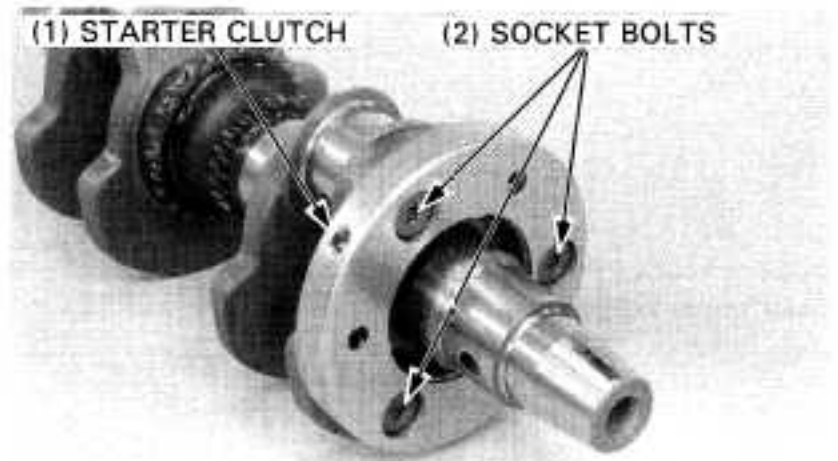
Align the hole in the starter clutch with the dowel pin on the crankweight, and install the starter clutch.

Tighten the socket bolts with the Torx driver bit (07703-0010100) equivalent commercially available in U.S.A.

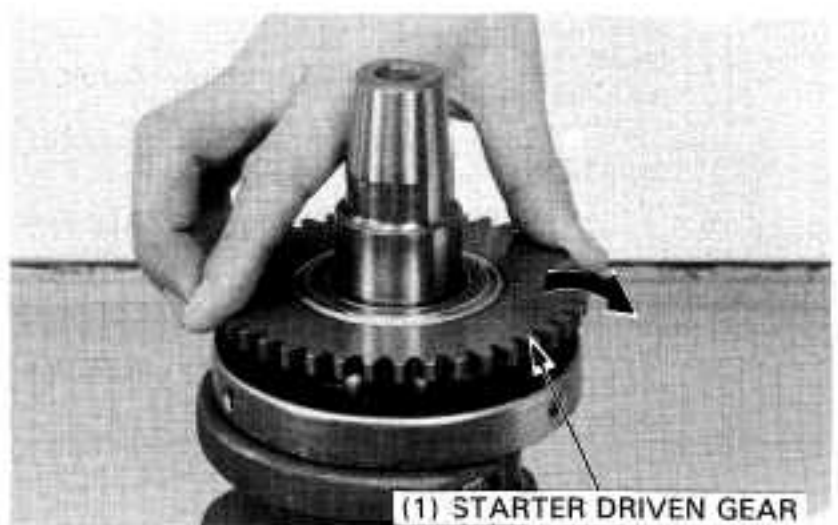
TORQUE: 33-37 N·m (3.3-3.7 kg-m, 24-27 ft-lb)

NOTE

- Apply a locking agent to the bolt threads.

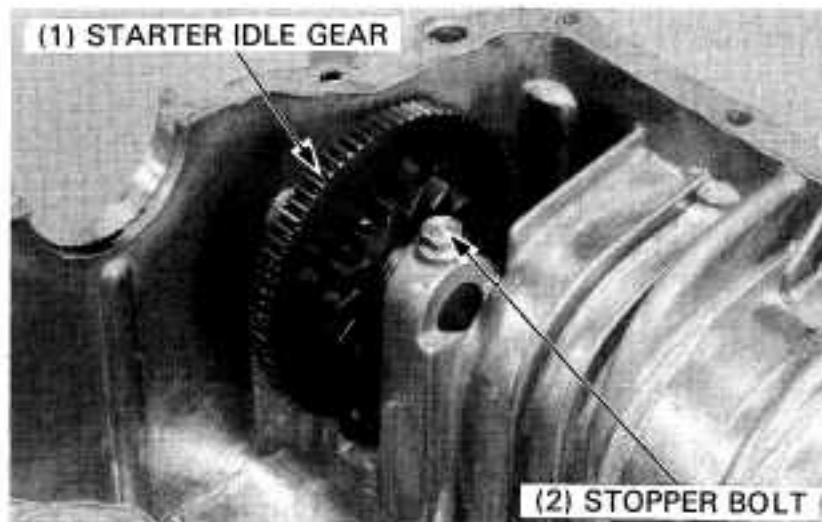


Install the starter driven gear while turning it clockwise.

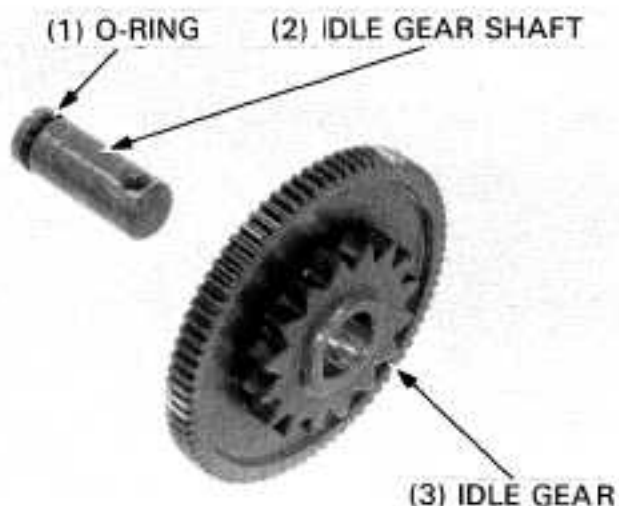


STARTER IDLE GEAR REMOVAL

Remove the starter idle gear shaft stopper bolt; pull the shaft out and remove the idler gear.

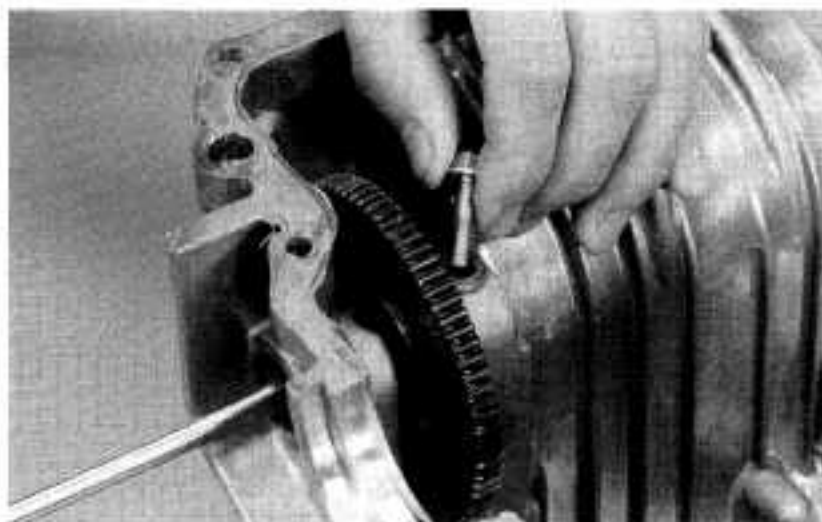


Check the idle gear teeth for wear or damage. Check the idle gear and shaft sliding surfaces for scoring, wear or damage.



STARTER IDLE GEAR INSTALLATION

Install a new O-ring onto the idle gear shaft. Coat the O-ring with engine oil. Install the idle gear and shaft in the lower crankcase. Align the stopper bolt holes in the shaft and crankcase by rotating the shaft with a screwdriver, and install and tighten the bolt.



CONNECTING ROD INSTALLATION

Align the notches on the connecting rod bearing inserts with the grooves in the connecting rod and cap, and install the inserts. Apply molybdenum disulfide grease to the crankpin bearings. Install the connecting rods and bearing caps.

NOTE

- Be sure connecting rods are installed in their correct position and the code numbers face the rear.
- Cross reference the rod and cap I.D. codes to ensure the original assembly.
- Do not interchange right and left components.

Torque the connecting rod bearing cap nuts.

TORQUE: 25–29 N·m (2.5–2.9 kg·m, 18–21 ft·lb)

NOTE

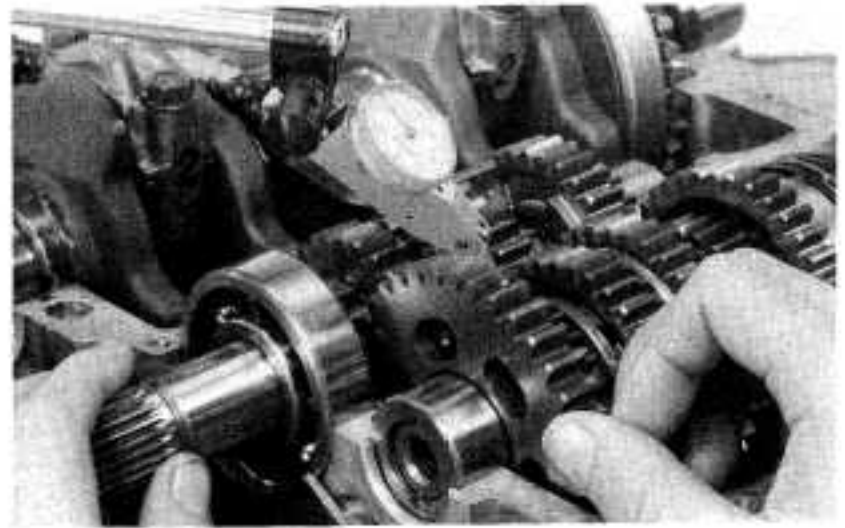
- Tighten the rod bearing cap nuts in two or more steps.
- After tightening the nuts, check that the rod moves freely without binding.



TRANSMISSION DISASSEMBLY

Inspect the backlash of each gear.

SERVICE LIMIT: 0.20 mm (0.008 in)



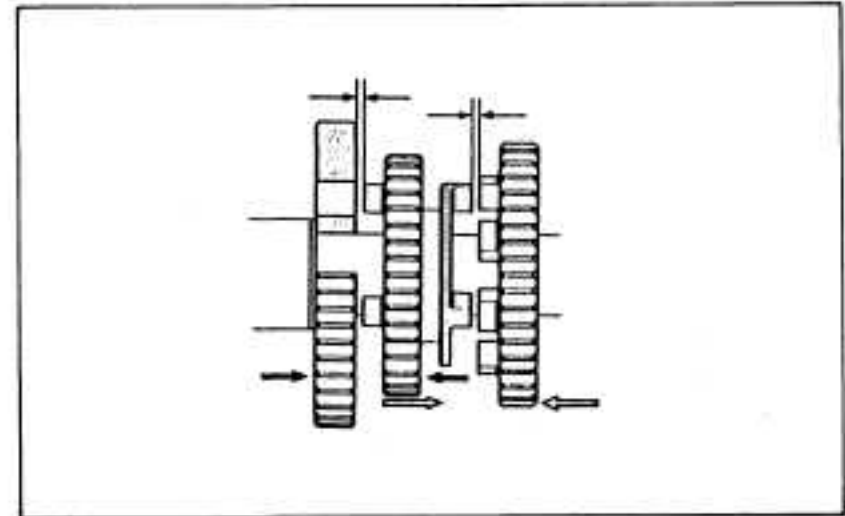
Remove the crankshaft bearing holder (page 10-4).

Remove the rear balancer chain guide.

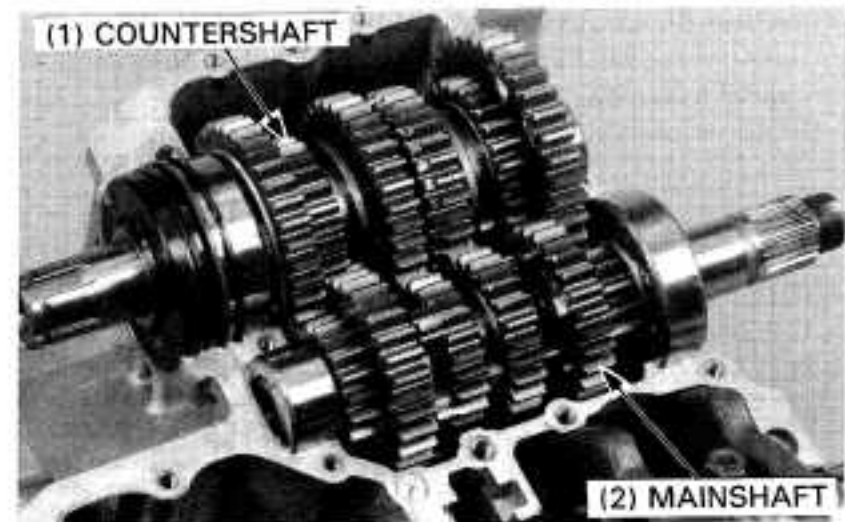


Place the gears into the neutral position, and check each gear dog for minimum clearance.

SERVICE LIMIT: 0.3 mm (0.01 in)



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



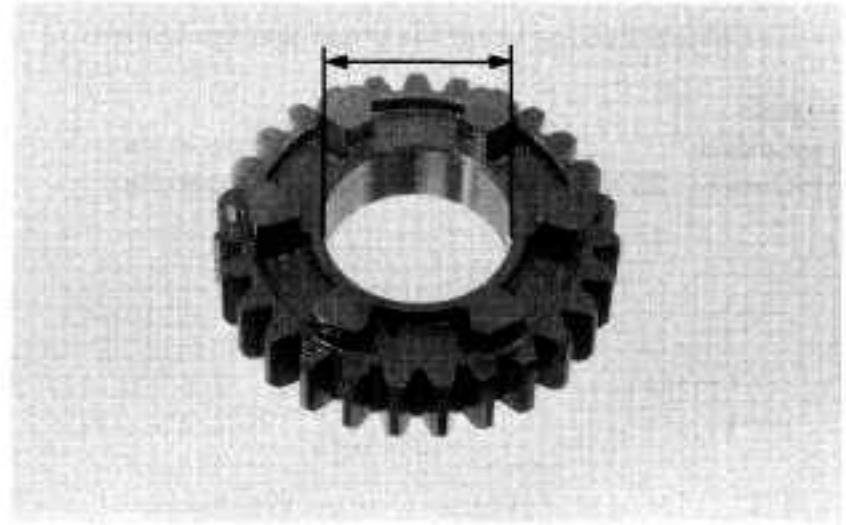
INSPECTION

Check gear dogs for excessive or abnormal wear.

Inspect the I.D. of each gear.

SERVICE LIMITS:

- M5 gear: 28.04 mm (1.104 in)
- M6 gear: 28.02 mm (1.103 in)
- C1 gear: 24.09 mm (0.948 in)
- C3, C4 gear: 28.04 mm (1.104 in)



Measure the O.D. of each gear bushing.

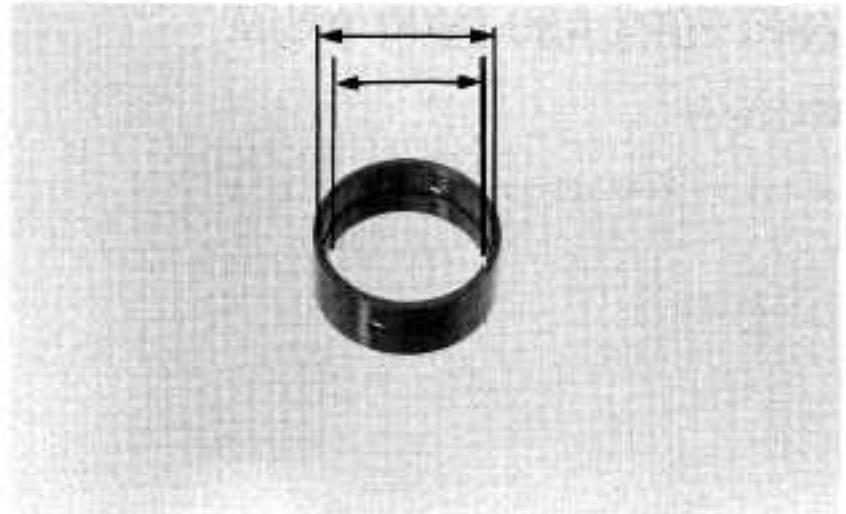
SERVICE LIMITS:

- M5, M6 gear bushing: 27.94 mm (1.099 in)
- C1 gear bushing: 24.03 mm (0.946 in)
- C3, C4 gear bushing: 27.94 mm (1.099 in)

Measure the I.D. of each gear bushing.

SERVICE LIMITS:

- M5 gear bushing: 25.03 mm (0.985 in)
- C1 gear bushing: 20.09 mm (0.791 in)
- C3 gear bushing: 25.03 mm (0.985 in)



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

SERVICE LIMITS:

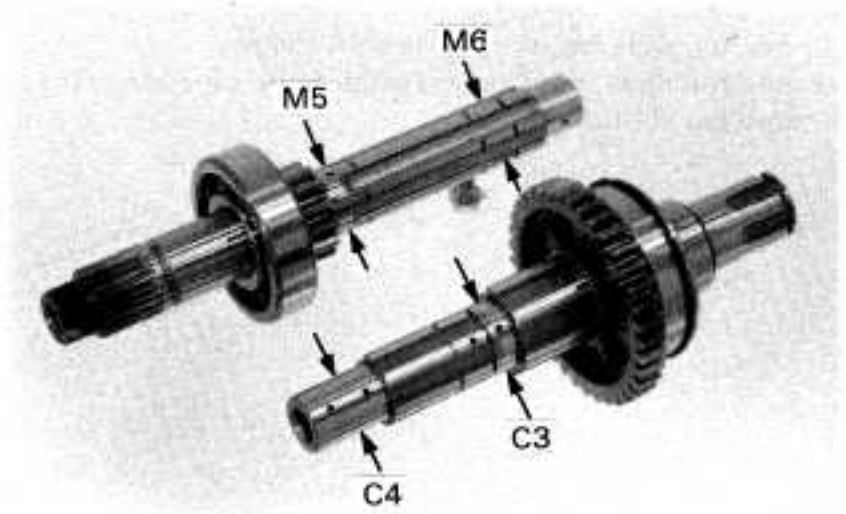
- Mainshaft: 24.95 mm (0.982 in) at M5
- Countershaft: 19.95 mm (0.785 in) at C1
- 24.98 mm (0.982 in) at C3

Calculate the gear-to-bushing clearance.

- SERVICE LIMITS:** M5, M6: 0.10 mm (0.004 in)
 C1, C3: 0.10 mm (0.004 in)

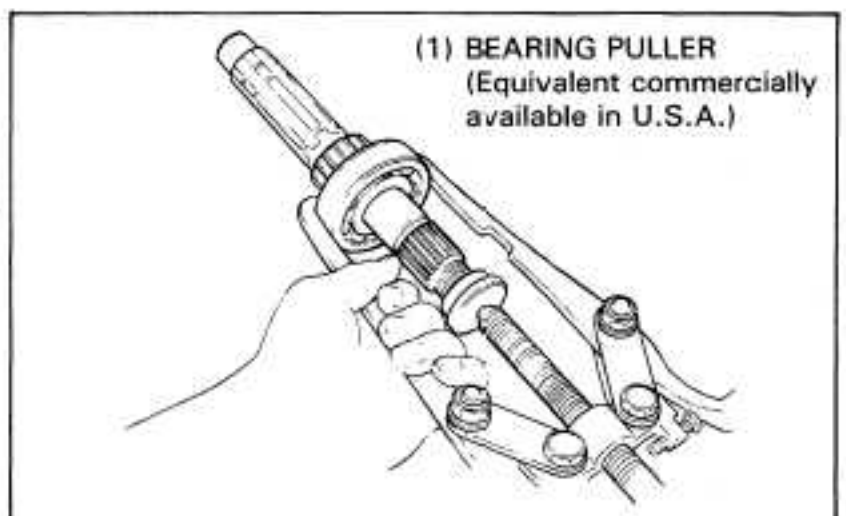
Calculate the bushing-to-shaft clearance.

- SERVICE LIMITS:** M5: 0.08 mm (0.003 in)
 C1, C3: 0.10 mm (0.004 in)



MAINSHAFT BEARING REPLACEMENT

Remove the mainshaft bearing with a bearing puller, and discard it.



CRANKCASE/CRANKSHAFT/TRANSMISSION

Drive on a new bearing using the driver and attachment.

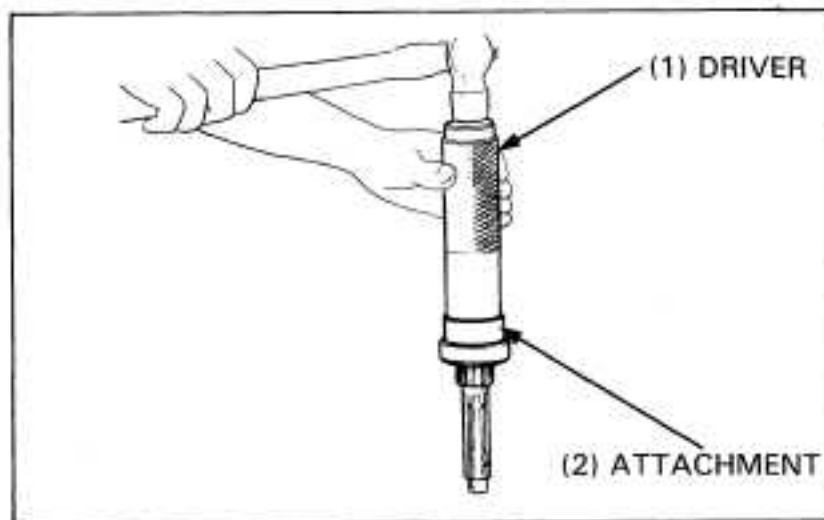
TOOLS:

Inner driver

07746-0030100

Attachment, 25 mm I.D.

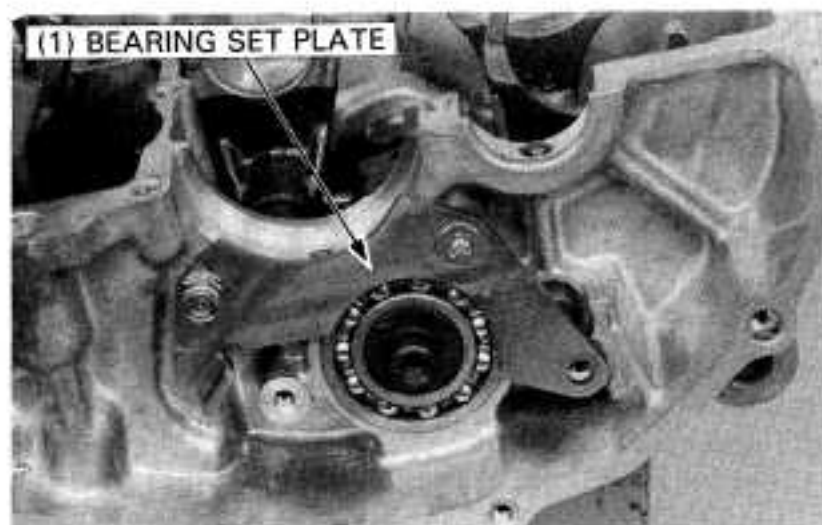
07746-0030200



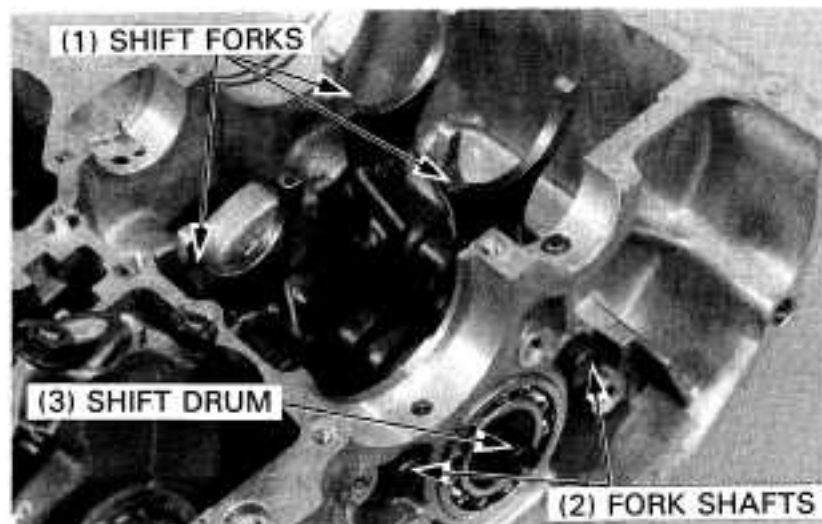
SHIFT FORK AND SHIFT DRUM

REMOVAL

Remove the bearing set plate.



Remove the shift fork shafts and shift forks.
Remove the neutral/overdrive switch from the crankcase.
Remove the shift drum.

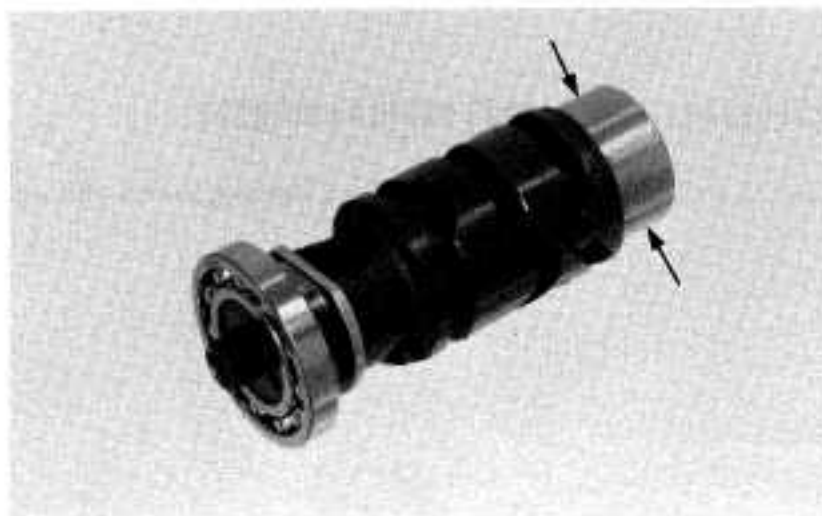


INSPECTION

Inspect the shift drum end for scoring, or evidence of insufficient lubrication. Check the shift drum grooves for damage.

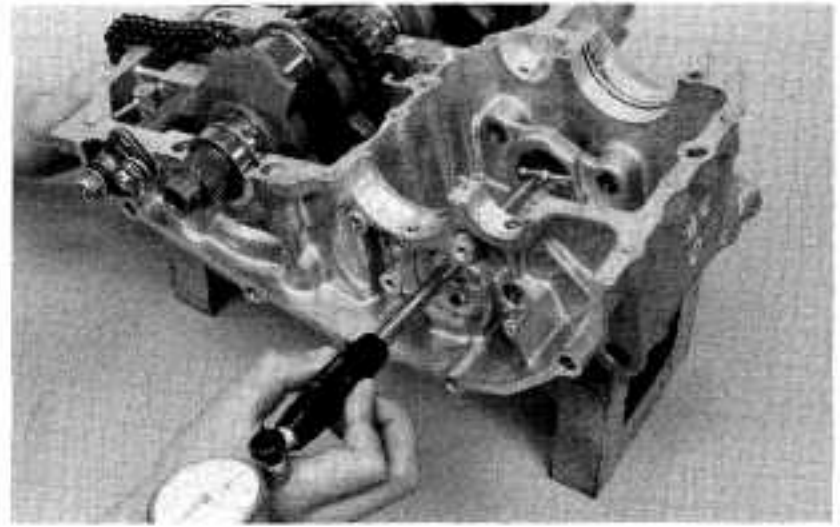
Measure the gearshift drum O.D. at the left end.

SERVICE LIMIT: 34.90 mm (1.374 in)



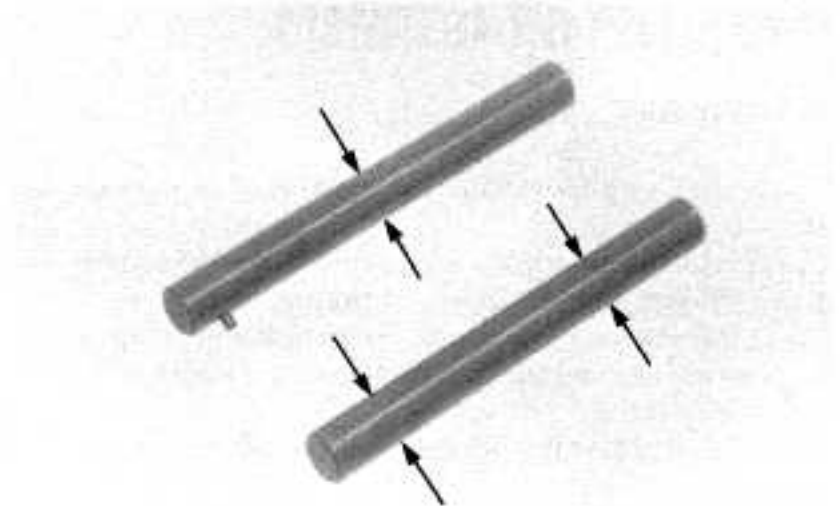
Measure the shift drum bearing I.D. of the upper crankcase.

SERVICE LIMIT: 35.05 mm (1.380 in)



Measure the shift fork shaft O.D.

SERVICE LIMIT: 12.95 mm (0.510 in)



Check the shift fork guide pins for excessive wear, damage or insufficient lubrication.

Measure the shift fork I.D. and claw thickness.

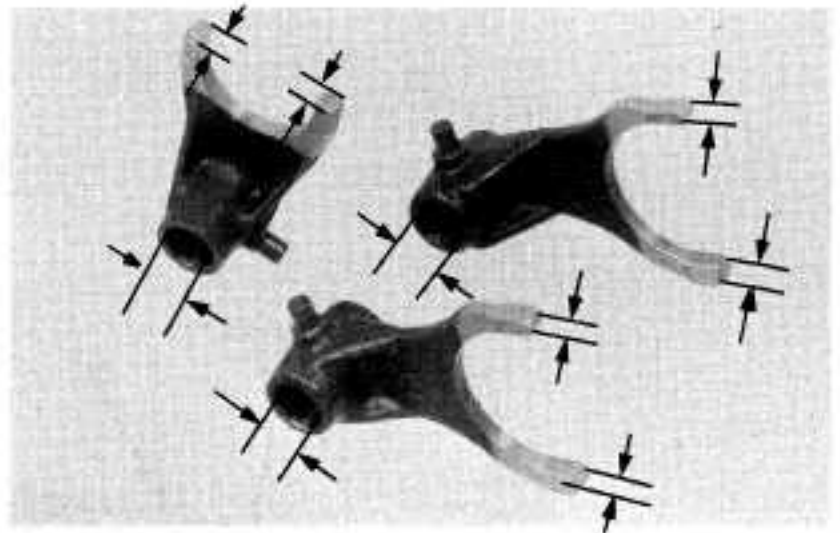
SERVICE LIMITS:

I.D.: 13.05 mm (0.514 in)

CLAW THICKNESS:

M3/M4 GEAR: 5.85 mm (0.230 in)

C5 and C6 GEARS: 5.85 mm (0.230 in)

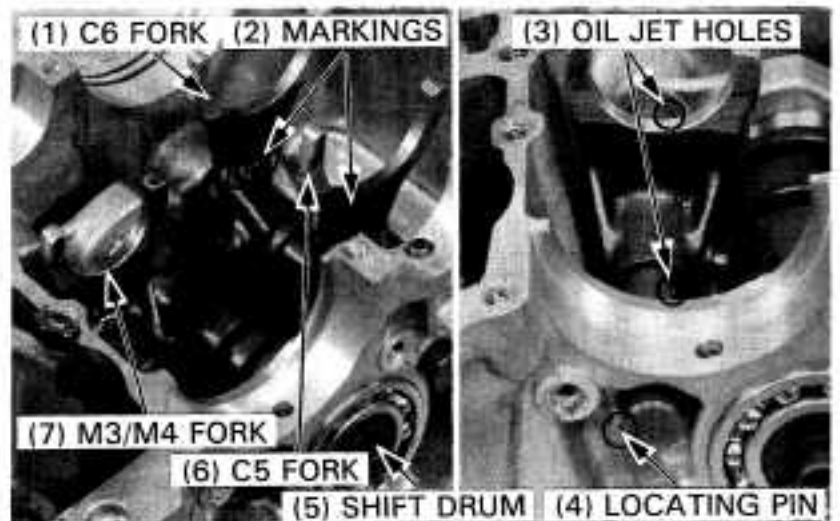


INSTALLATION

Install the C5 and C6 gear shift forks and shaft with the markings facing towards the right.

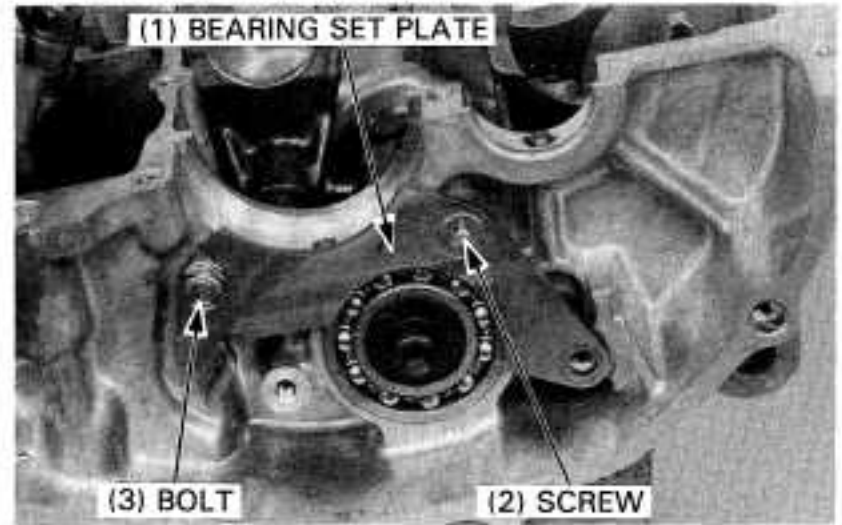
Install the M3/M4 gear shift fork and shaft with the marking facing towards the left. Align the locating pin of the shift fork shaft with the groove in the crankcase so that the oil jet holes in the shaft face the shift drum.

Install the neutral/overdrive switch.



CRANKCASE/CRANKSHAFT/TRANSMISSION

Apply thread lock agent to the bolt threads and install the bearing set plate with the bolt and screw.



TRANSMISSION ASSEMBLY

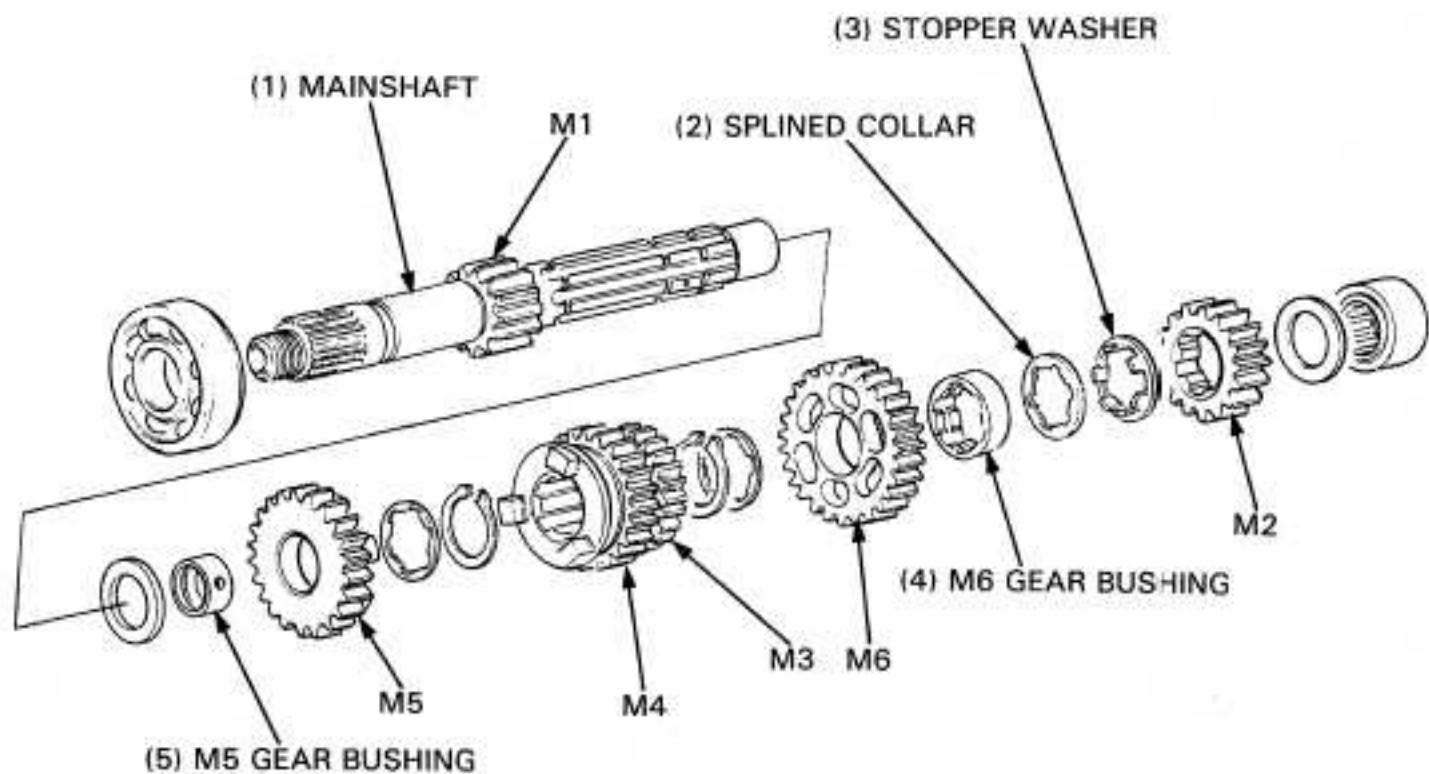
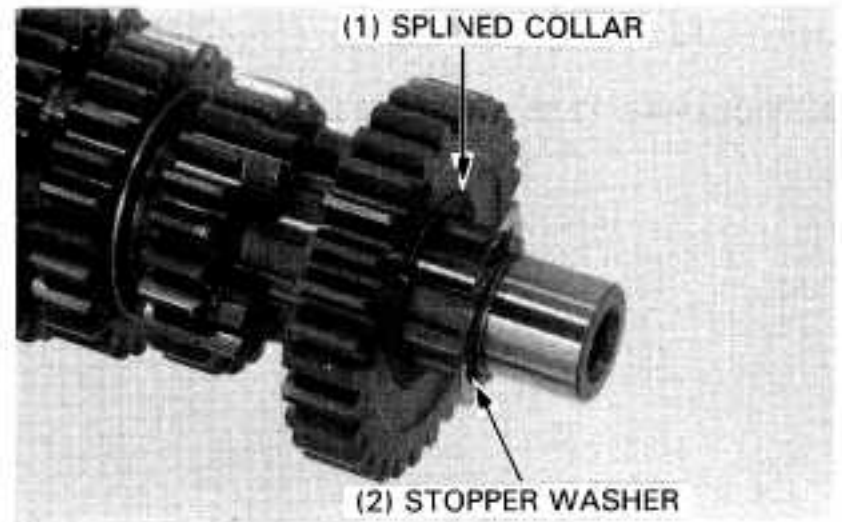
MAINSHAFT

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

Check that the snap rings are seated in the grooves and align their end gaps with the lands of the splines.

Install the splined collar on the mainshaft and install the stopper washer, aligning the tabs of the washer with the grooves in the splined collar.

Align the oil hole in the M6 gear bushing with the oil hole in the mainshaft.



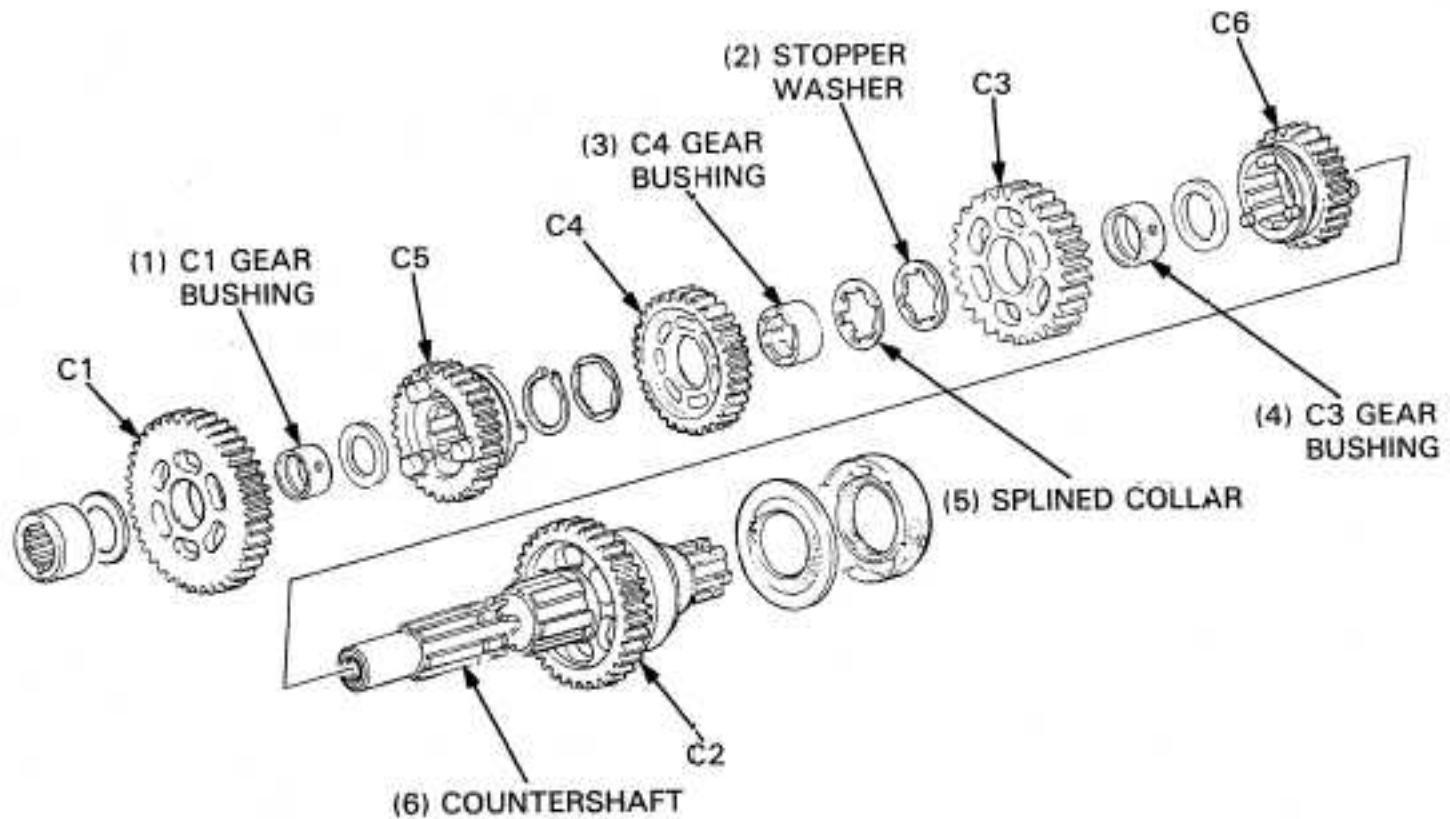
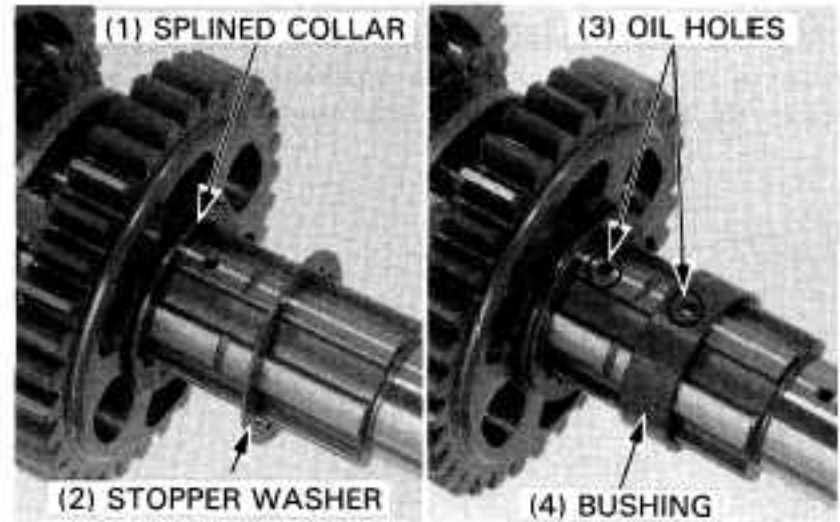
COUNTERSHAFT

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

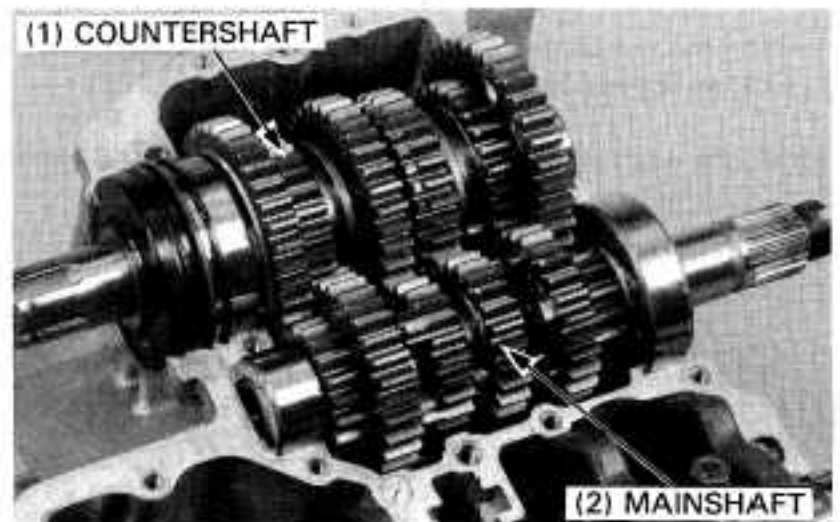
Check that the snap rings are seated on the grooves and align their end gaps with the lands of the splines.

Install the splined collar on the countershaft and install the stopper washer aligning the tabs with the grooves in the spline collar.

Align the oil hole in the C4 gear bushing with the oil hole in the countershaft.

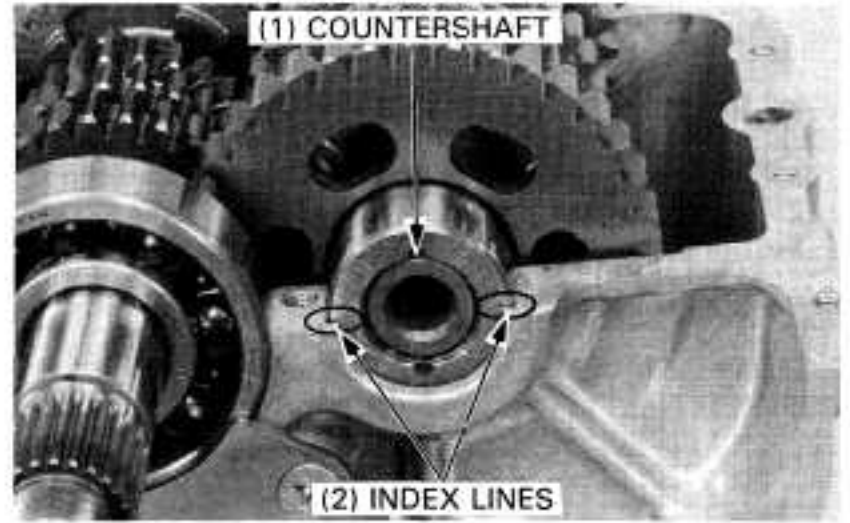


Install the mainshaft and countershaft, aligning the shift fork grooves with the forks.



CRANKCASE/CRANKSHAFT/TRANSMISSION

Align the index lines on the mainshaft and countershaft needle bearing outer races with the crankcase mating surface to insert the dowel pin into the outer race hole.



Install the rear balancer chain guide.



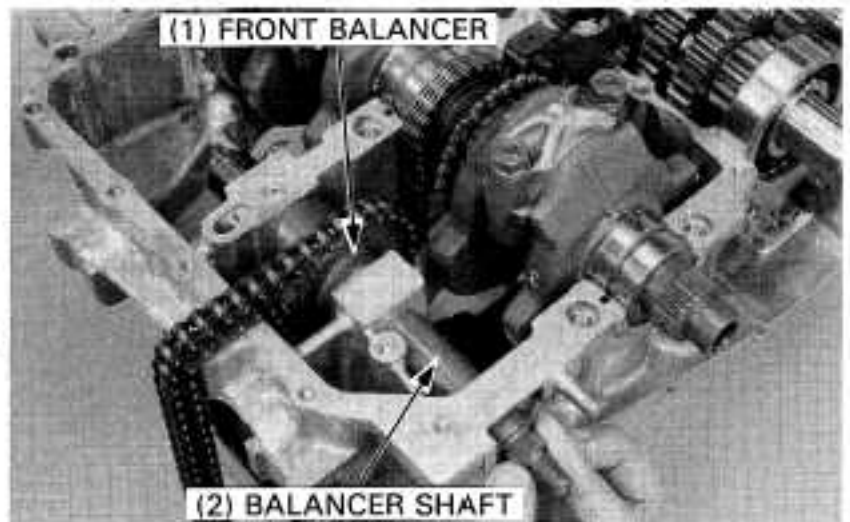
BALANCER INSTALLATION

Install the balancer chain onto the front balancer.

NOTE

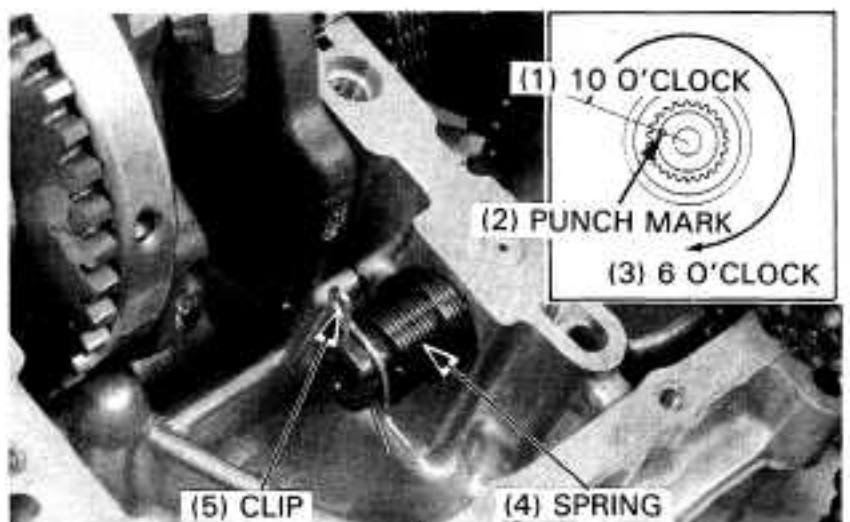
- The front and rear balancers are the same.

Set the front balancer and chain in place and insert the front balancer shaft.

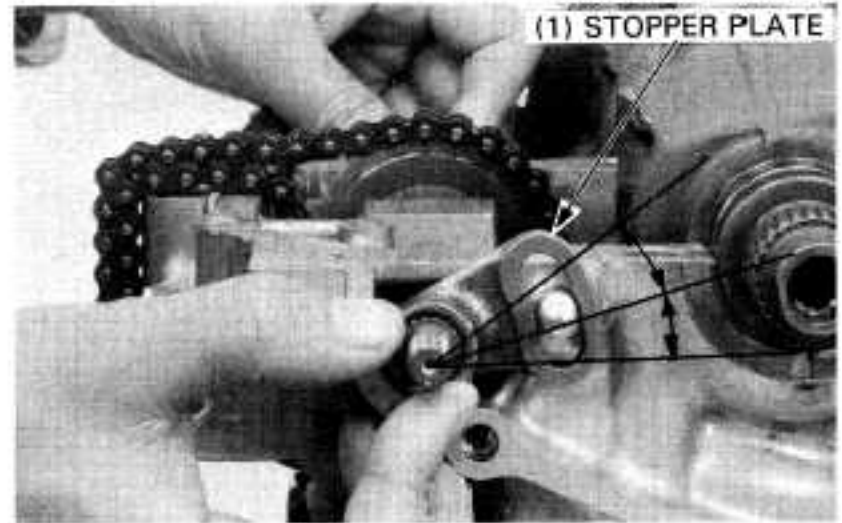


Position the punch mark on the end of the shaft at about 10 o'clock as shown, and install the spring and clip.

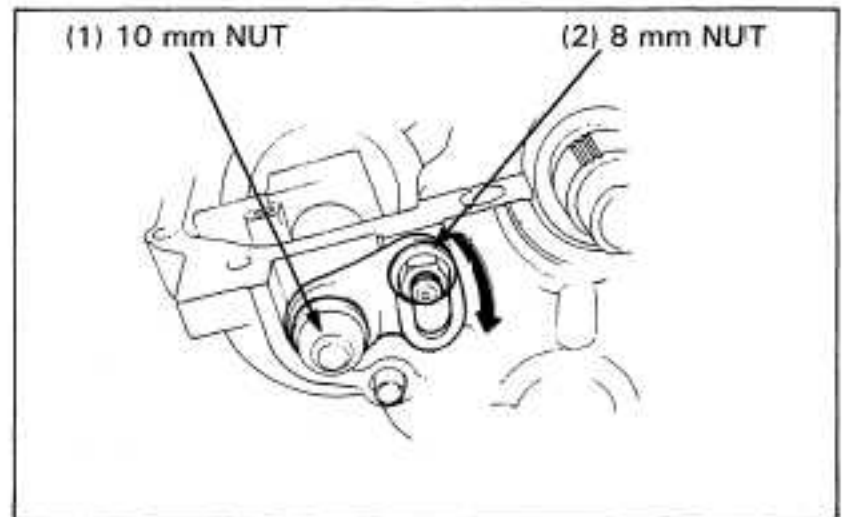
Rotate the shaft clockwise to put the punch mark at 6 o'clock.



Install the stopper plate with the stud bolt centered in the plate groove.



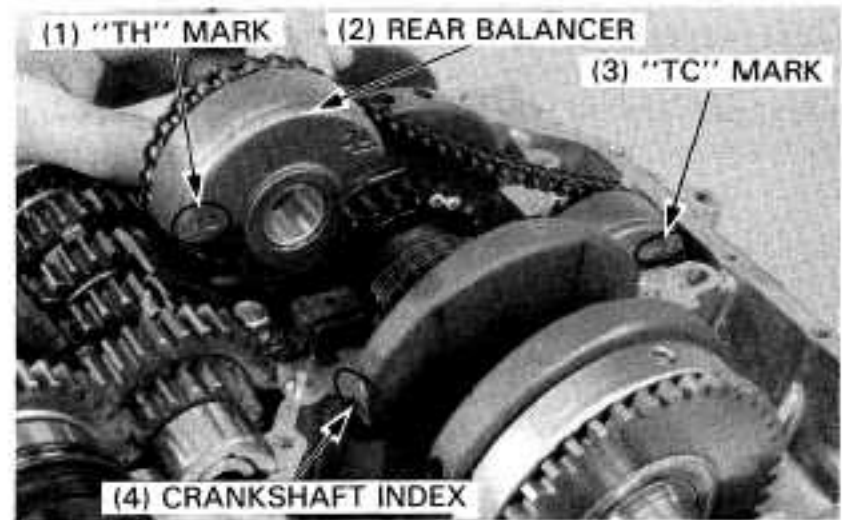
Loosely install the 10 mm nut.
Rotate the stopper plate clockwise fully.
Install and tighten the 8 mm nut.



Turn the crankshaft until the index mark on the crankshaft aligns with the crankcase mating surface.

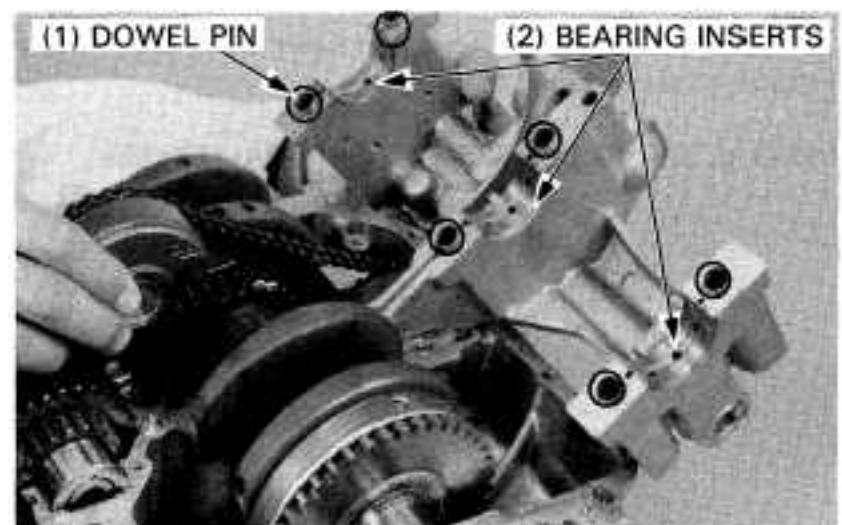
Align the front balance: "TC" mark with the crankcase matching surface.

Install the chain so that the rear balancer "TH" mark is also flush with the crankcase matching surface.



Be sure the dowel pins and bearing inserts are in place in the holder.

Lay the bearing holders over the crankshaft main journals.

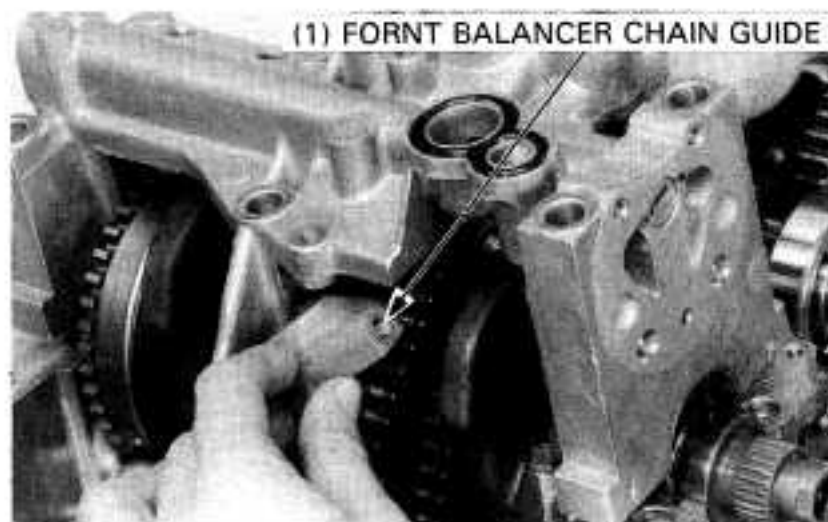


CRANKCASE/CRANKSHAFT/TRANSMISSION

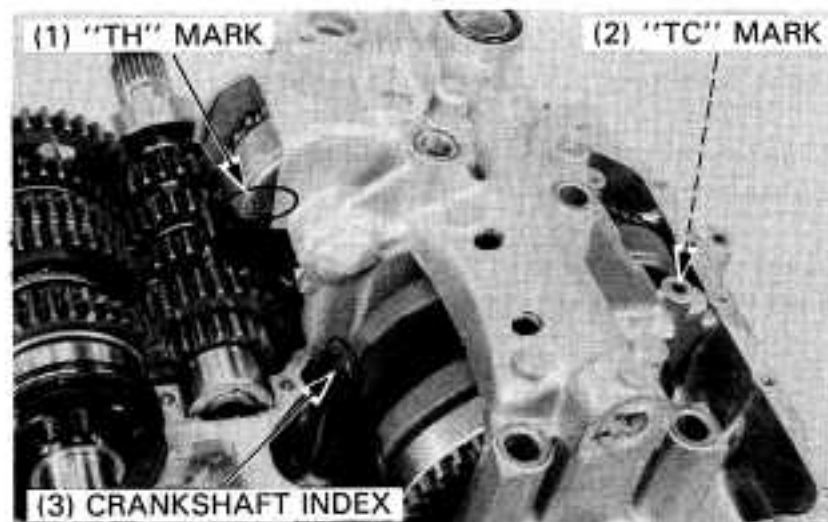
Set the rear balancer in the crankshaft bearing holder and insert the rear balancer shaft with the slit facing out.



Lift the bearing holder slightly, install the front balancer chain guide and temporarily install the front bolt.

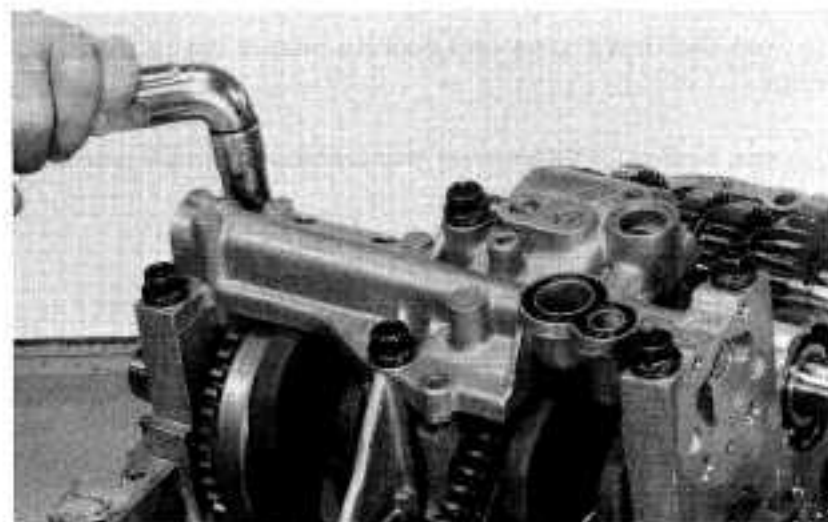


Install the bearing holder correctly onto the crankcase. Make sure that the front balancer "TC" mark, the crankshaft index mark and the rear cylinder balancer "TH" mark are all flush with crankcase mating surface.



Install the bearing holder bolts and tighten them in a crisscross pattern in two or more steps.

TORQUE: 33–37 N·m (3.3–3.7 kg·m, 24–27 ft·lb)



Temporarily install the balancer chain guide forward bolt.

NOTE

- Before installing the oil strainer screen, clean it thoroughly.

Install a new O-ring onto the oil strainer pipe and coat it with engine oil.
Install the oil strainer onto the bearing holder.

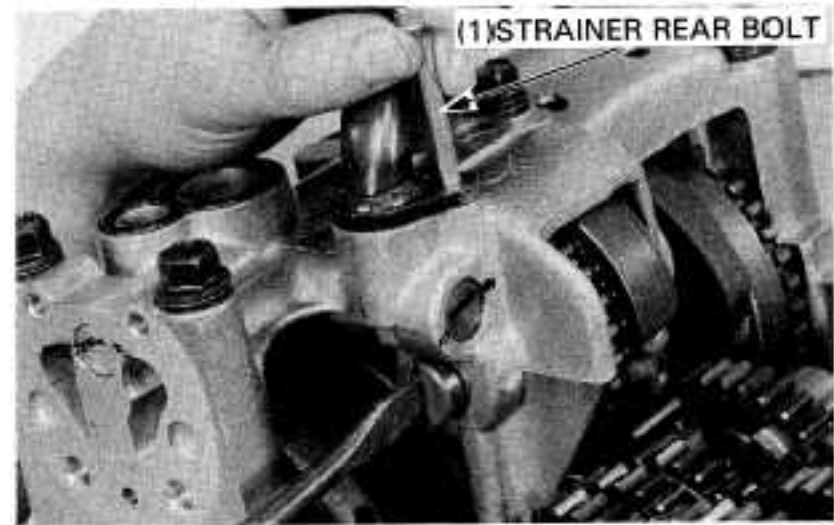
NOTE

- The balancer chain guide rear end is attached with the oil strainer forward bolt.



Align the bolt holes in the bearing holder and rear balancer shaft by rotating the shaft with a screwdriver.
Install the oil strainer rear bolt.
Tighten the balancer chain guide and oil strainer bolts.

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



Loosen the 8 mm nut.

NOTE

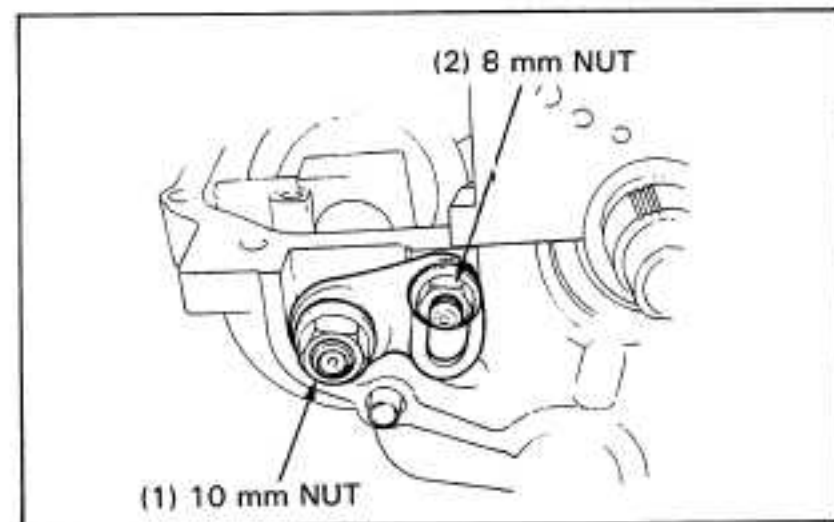
- The balancer chain tension will be adjusted automatically by loosening the 8 mm nut.
- If the balancer chain slack is excessive so that no further adjustment is possible, refer to page 3-8.

Tighten the 8 mm nut first.

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

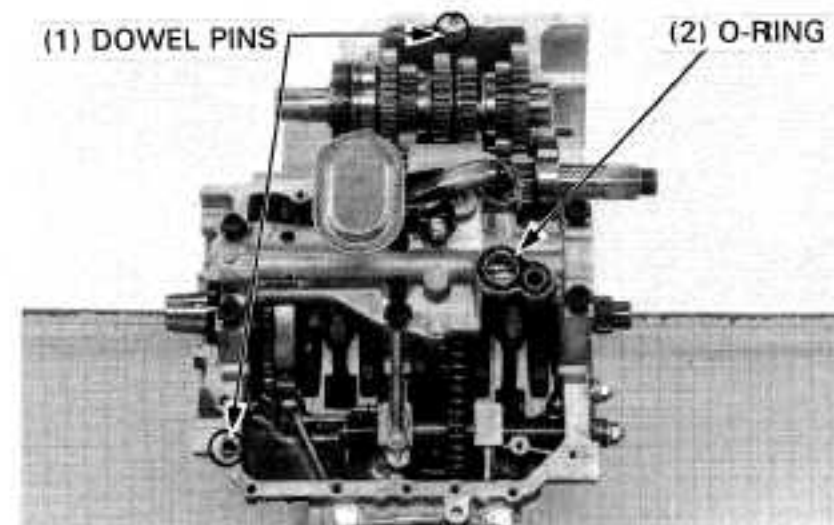
Tighten the 10 mm nut.

TORQUE: 30–35 N·m (3.0–3.5 kg·m, 22–25 ft·lb)



CRANKCASE ASSEMBLY

Clean the crankcase mating surfaces thoroughly being careful not to damage them.
Apply liquid sealant to the mating surfaces.
Install the dowel pins and a new O-ring.



CRANKCASE/CRANKSHAFT/TRANSMISSION

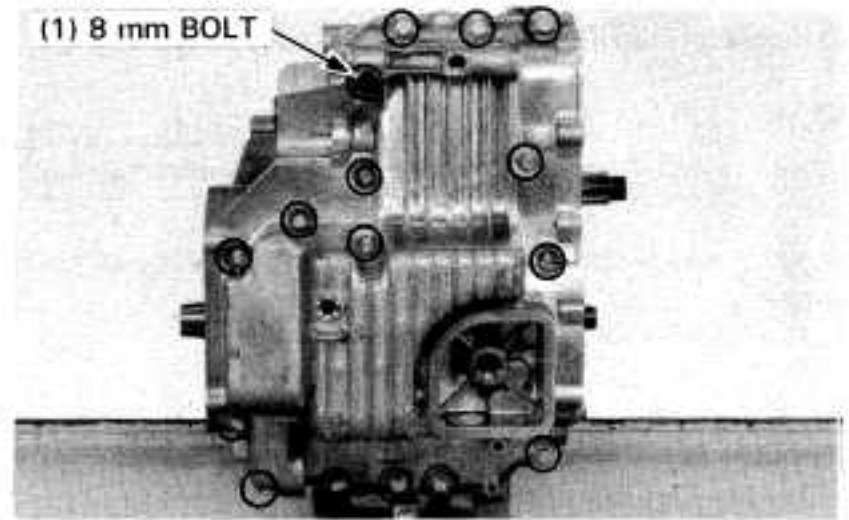
Position the lower case onto the upper case and tighten the bolts to the specified torques.

TORQUE:

- 6 mm BOLT: 10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)
- 8 mm BOLT: 22–28 N·m (2.2–2.8 kg-m, 16–20 ft-lb)

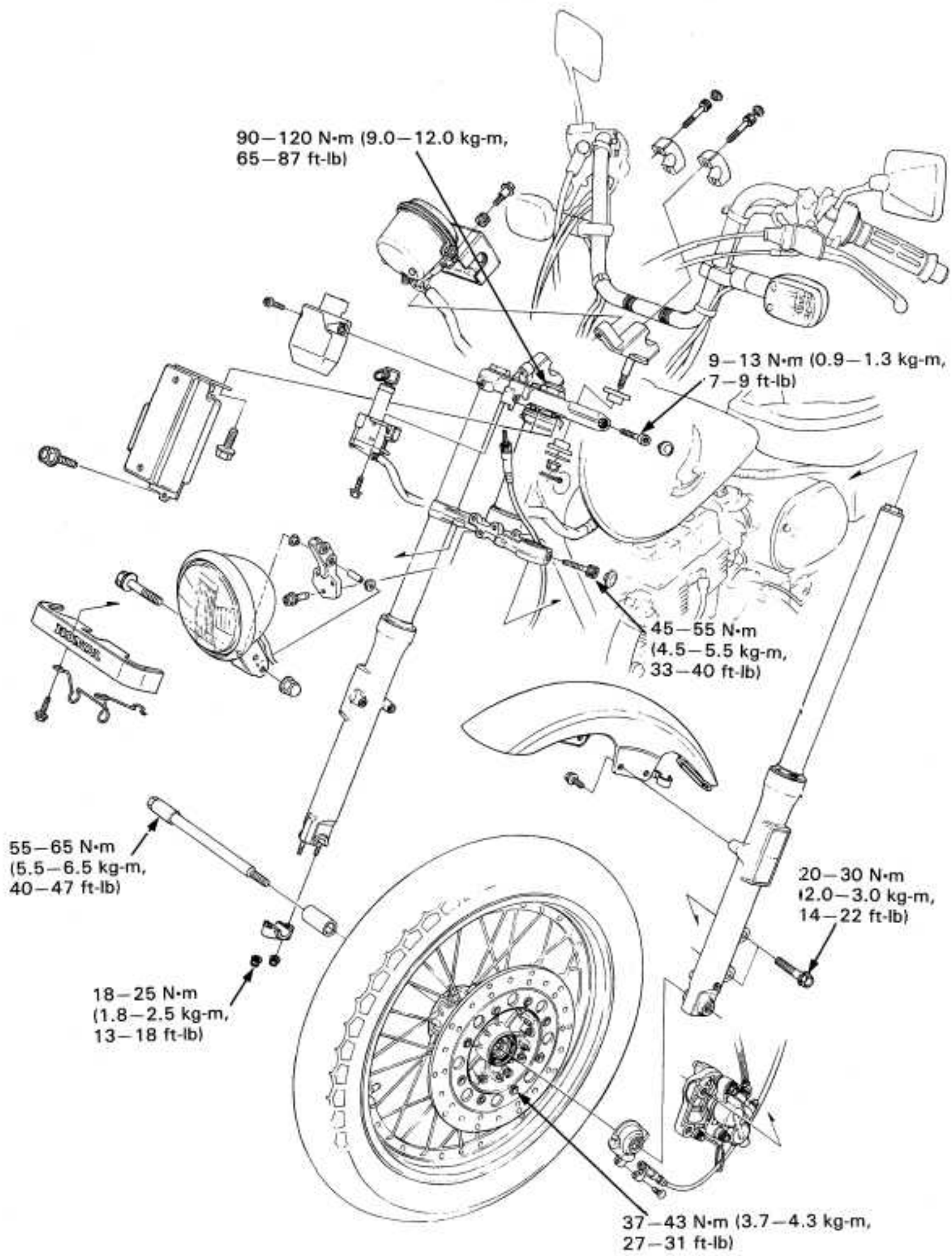
NOTE

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



MEMO

FRONT WHEEL/SUSPENSION/STEERING



11. FRONT WHEEL/SUSPENSION/STEERING

SERVICE INFORMATION	11-1	FRONT WHEEL	11-7
TROUBLESHOOTING	11-2	FRONT FORK	11-15
HANDLEBAR	11-3	STEERING STEM	11-21

SERVICE INFORMATION

GENERAL

- A jack or other support is required to support the front of the motorcycle when working on the front wheel or forks.
- For front brake service, refer to section 13.
- For headlight, instrument and ignition switch services and inspections, refer to section 17.
- The front wheel uses a tubeless tire. For tubeless tire repairs, refer to the Tubeless Tire Manual.

SPECIFICATIONS

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Front axle runout	—	0.2 (0.01)
Front wheel rim runout	Radial	2.0 (0.08)
	Axial	2.0 (0.08)
Fork spring free length	356.8 (14.05)	350 (13.8)
Fork tube runout	—	0.2 (0.01)
Fork fluid capacity	363.5–368.5 cc (12.3–12.5 US oz, 12.8–13.0 Imp oz)	—
Steering head bearing preload	1.0–1.4 kg (2.2–3.1 lb)	—

11

TORQUE VALUES

Front brake master cylinder holder bolt	10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)
Front axle nut	55–65 N·m (5.5–6.5 kg-m, 40–47 ft-lb)
Front axle holder nut	18–25 N·m (1.8–2.5 kg-m, 13–18 ft-lb)
Fork piston socket bolt	15–25 N·m (1.5–2.5 kg-m, 11–18 ft-lb) Apply a locking agent
Fork top pinch bolt	9–13 N·m (0.9–1.3 kg-m, 7–9 ft-lb)
Fork bottom pinch bolt	45–55 N·m (4.5–5.5 kg-m, 33–40 ft-lb)
Fork tube cap	15–30 N·m (1.5–3.0 kg-m, 11–22 ft-lb)
Steering bearing adjustment nut	23–27 N·m (2.3–2.7 kg-m, 17–20 ft-lb)
Steering stem nut	90–120 N·m (9.0–12.0 kg-m, 65–87 ft-lb)
Front brake caliper bracket bolt	20–30 N·m (2.0–3.0 kg-m, 14–22 ft-lb)
Front brake disc bolt	37–43 N·m (3.7–4.3 kg-m, 27–31 ft-lb) Apply a locking agent
Spoke nipple	7–11 N·m (0.7–1.1 kg-m, 5–8 ft-lb)

FRONT WHEEL/SUSPENSION/STEERING

TOOLS

Special

Steering stem socket	07916-3710100
Ball race remover	07953-KA50000 or
Ball race remover attachment	07953-MJ1000A
Bearing race remover	07946-3710500
Steering stem driver	07946-MB00000

Common

Bearing remover shaft	07746-0050100	} Equivalent commercially available in U.S.A.
Bearing remover head, 15 mm	07746-0050400	
Driver	07749-0010000	
Attachment, 42 x 47 mm	07746-0010300	
Pilot, 15 mm	07746-0040300	
Fork seal driver	07747-0010100	
Seal driver attachment	07747-0010600 or Fork seal driver 07947-3710101	
Attachment, 52 x 55 mm	07746-0010400	

TROUBLESHOOTING

Hard steering

- Steering bearing adjustment nut too tight
- Faulty steering bearings
- Damaged steering bearing inner and outer races
- Insufficient tire pressure

Steers to one side or does not track straight

- Bent forks
- Bent front axle
- Wheel installed incorrectly

Front wheel wobbling

- Bent rim
- Worn front wheel bearings
- Faulty tire
- Axle and holder tightened improperly
- Wheel out of balance

Soft suspension

- Weak fork springs
- Insufficient fluid in forks

Hard suspension

- Incorrect fluid weight in forks
- Bent fork tubes
- Clogged fluid passage

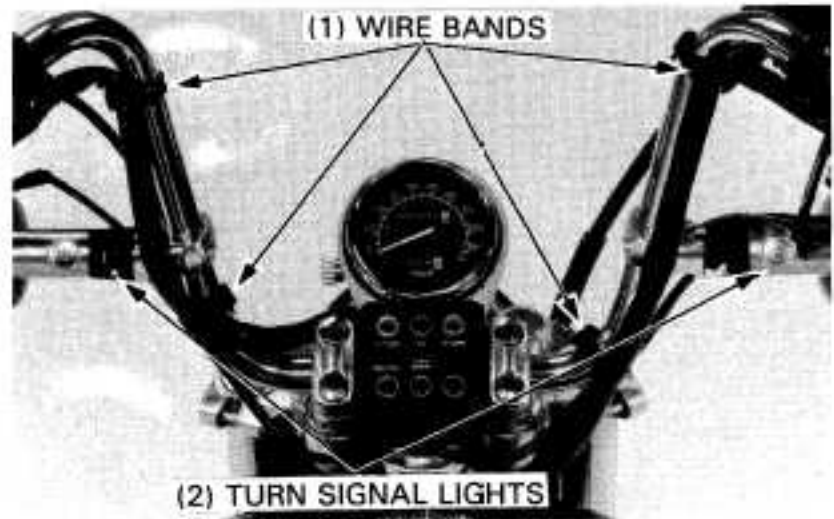
Front suspension noise

- Worn slider or guide bushings
- Insufficient fluid in forks
- Loose front fork fasteners
- Lack of grease in speedometer gearbox

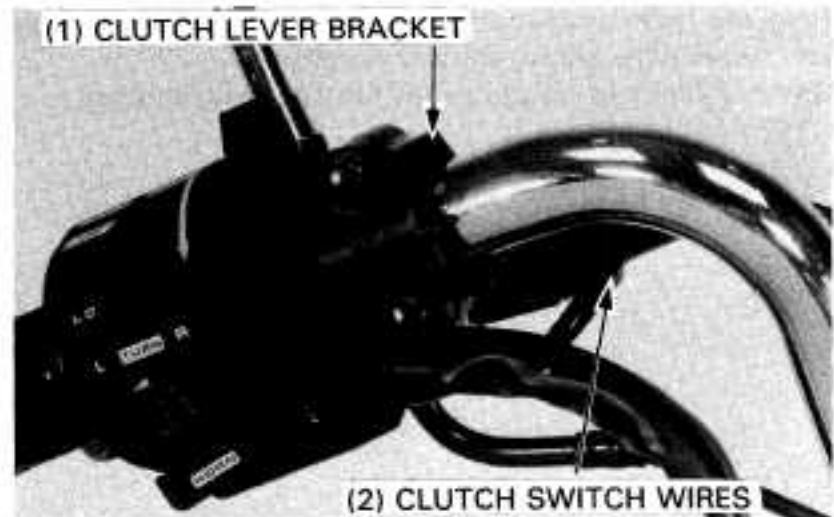
HANDLEBAR

REMOVAL

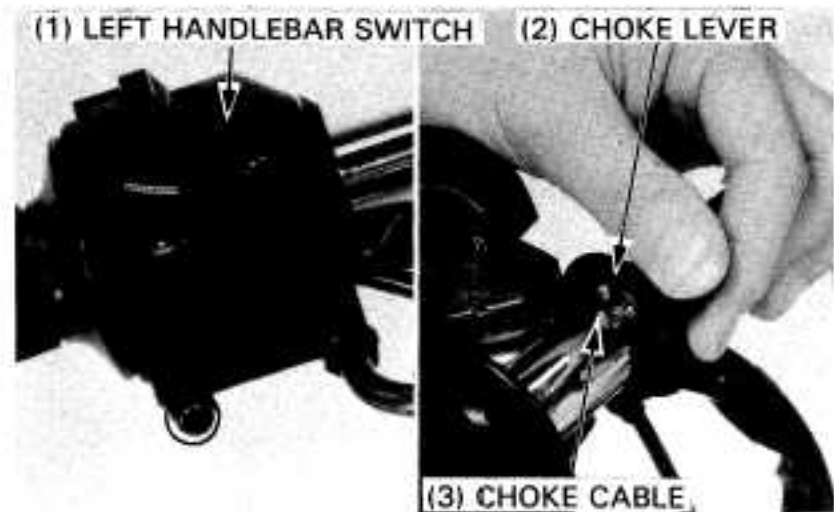
Remove the wire bands and turn signal lights from the handlebar.



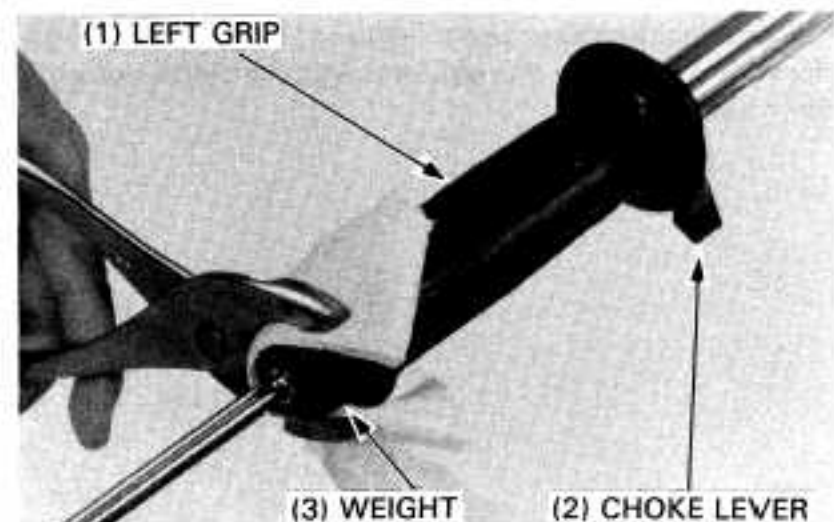
Disconnect the clutch switch wires from the switch and remove the clutch lever bracket.



Remove the two screws attaching the left handlebar switch. Disconnect the choke cable from the choke lever and remove the left handlebar switch.

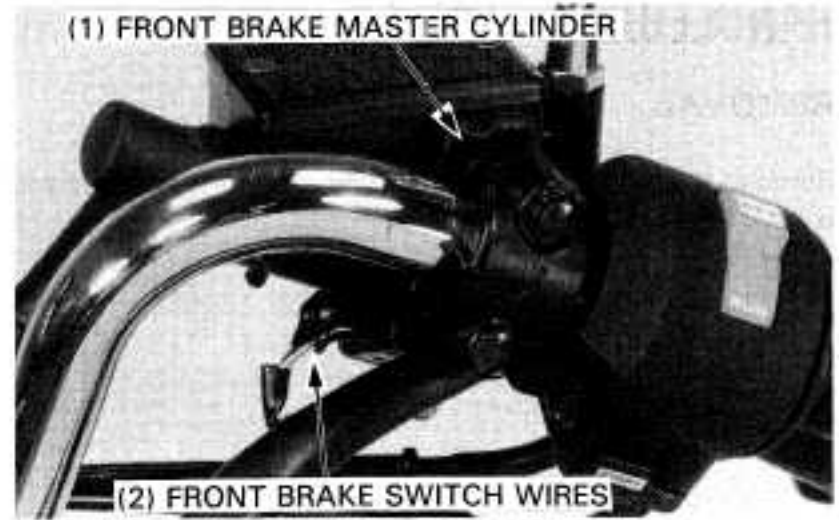


Hold the left handlebar weight with pliers and shop towel, and remove the screw and the weight. Remove the left handlebar grip and choke lever.

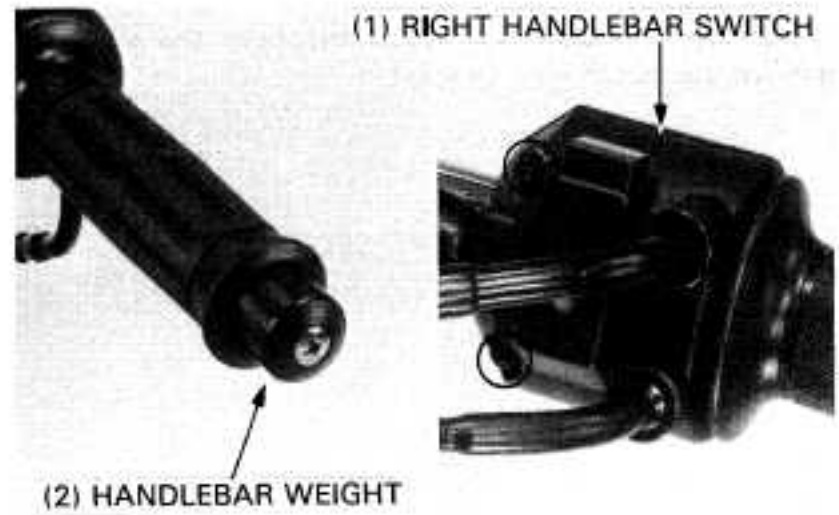


FRONT WHEEL/SUSPENSION/STEERING

Disconnect the front brake light switch wires from the switch and remove the front brake master cylinder from the handlebar.

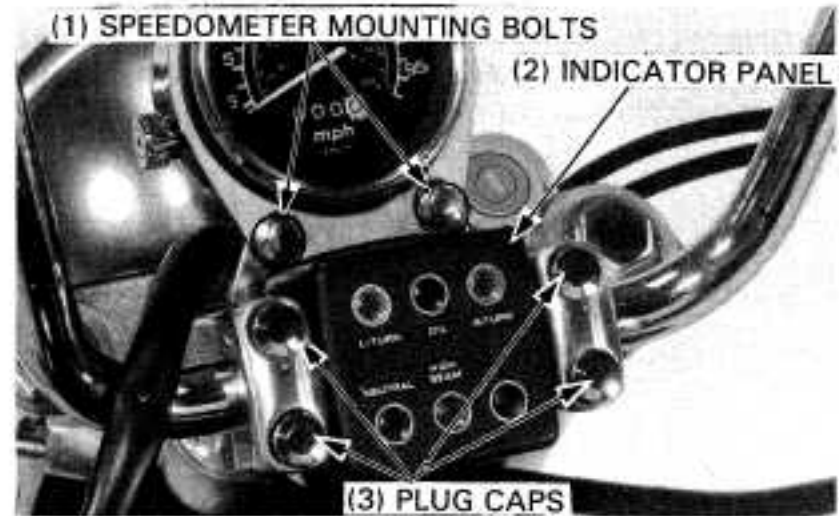


Hold the right handlebar weight with pliers and shop towel, and remove the screw and the weight. Remove the right handlebar switch attaching screws.



Remove the speedometer mounting bolts and remove the indicator panel from the handlebar.

Remove the upper holder bolt plug caps.



Remove the handlebar upper holders. Remove the throttle grip pipe and right handlebar switch from the handlebar.



INSTALLATION

Install the choke lever onto the handlebar.
 Clean the inside of the grips, the left handlebar and the throttle pipe.
 Apply Honda Bond A or Honda Hand Grip Cement (U.S.A. only) to the inside surfaces of the grips and to the outside surfaces 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

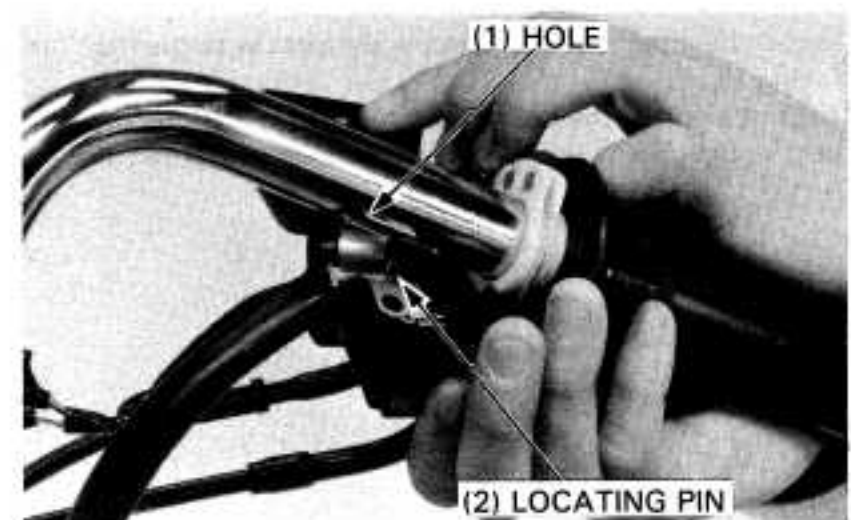
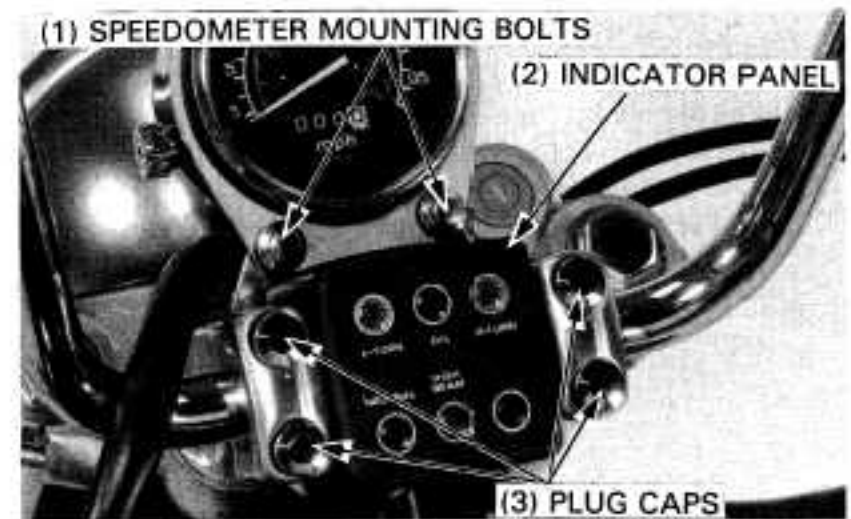
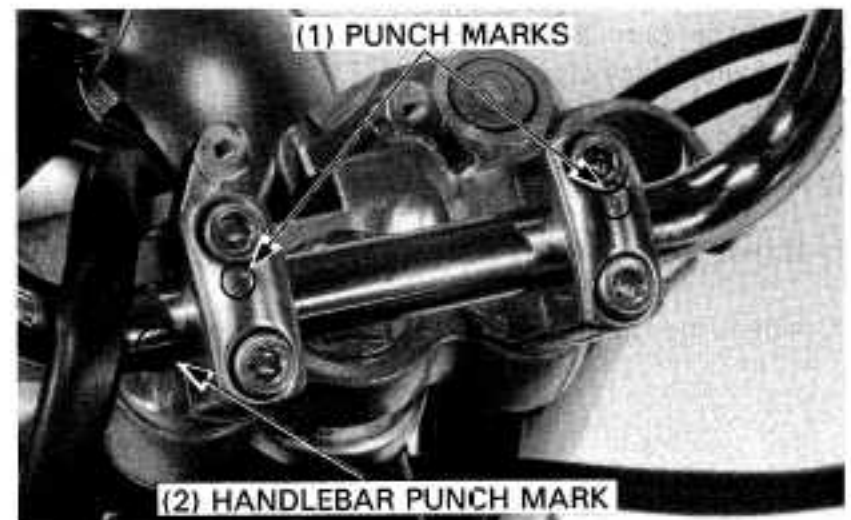
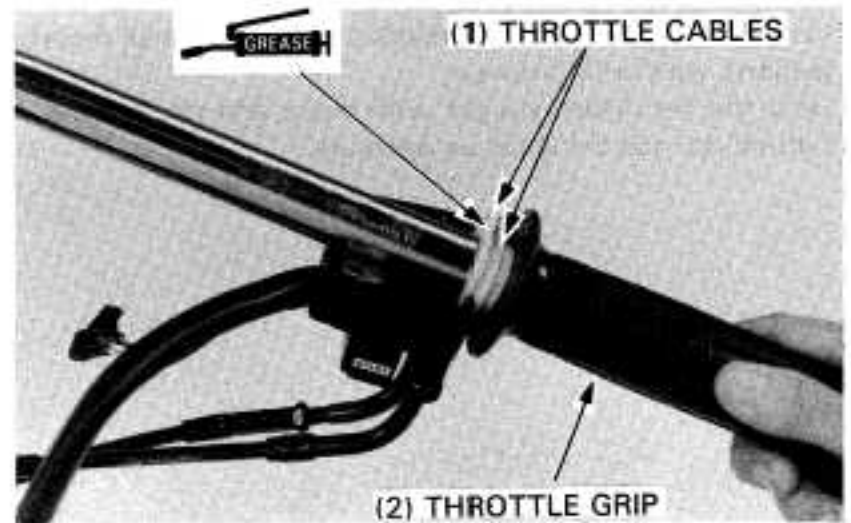
- Allow the adhesive to dry for an hour before using.

Connect the throttle cables to the throttle grip flange.
 Grease the throttle grip sliding surface and install the throttle grip pipe onto the handlebar.

Place the handlebar onto the handlebar lower holders.
 Align the punch mark on the handlebar with the top of the handlebar lower holders.
 Install the handlebar upper holders on the handlebar with the punch mark on the holder forward.
 Tighten the forward bolts first, then tighten the rear bolts.

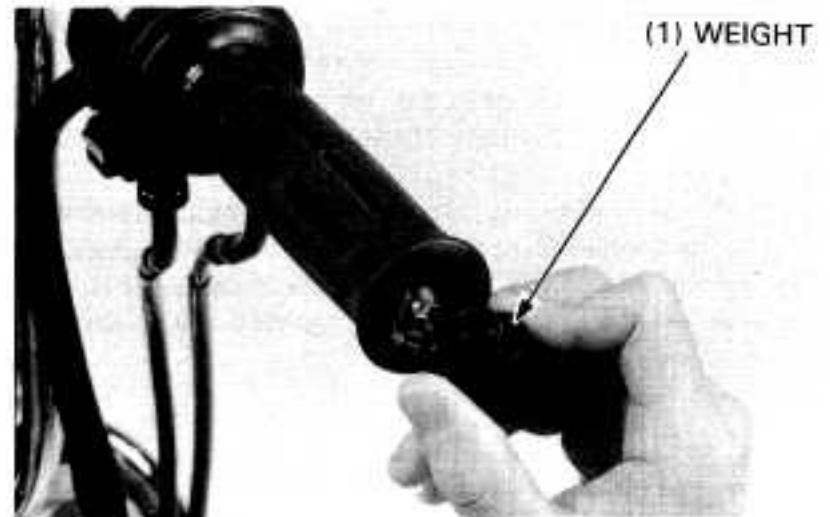
Install the upper holder bolt plug caps.
 Place the indicator panel over the handlebar, between the handlebar holders, and install the speedometer mounting bolts.

Align the right handlebar switch locating pin with the hole in the handlebar and install the right handlebar switch.
 Tighten the forward screw first, then tighten the rear screw.



FRONT WHEEL/SUSPENSION/STEERING

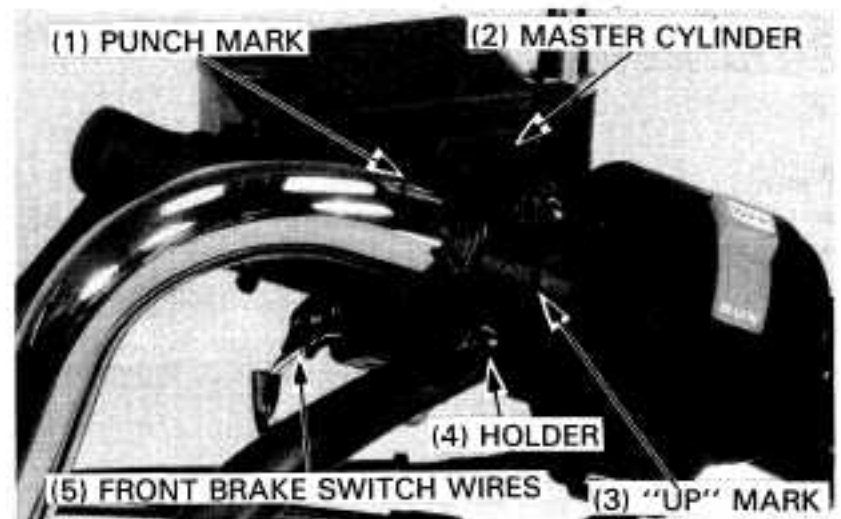
Install the right handlebar weight aligning their half moon projections with their grooves.
Hold the handlebar weight with pliers and shop towel, and tighten the attaching screw securely.



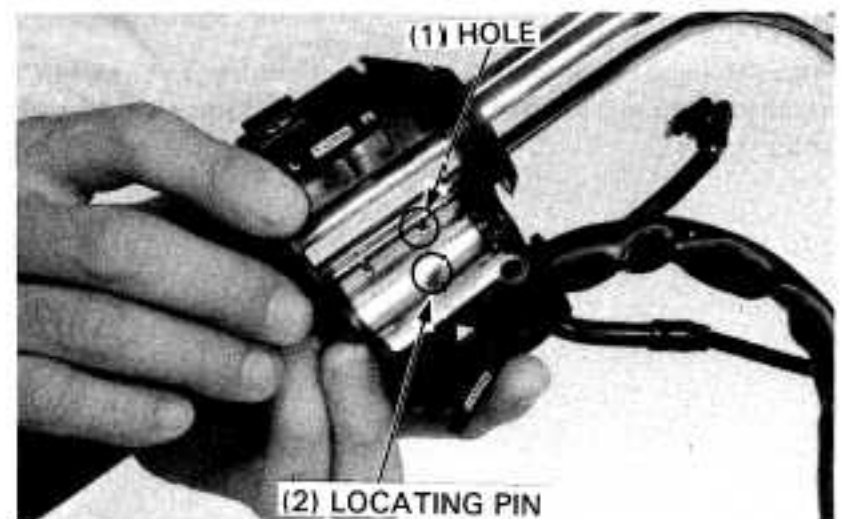
Install the front brake master cylinder and holder with the "UP" mark facing up.
Align the end of the holder with the punch mark on the handlebar, and tighten the upper bolt first, then tighten the lower bolt.

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

Connect the front brake switch wires.

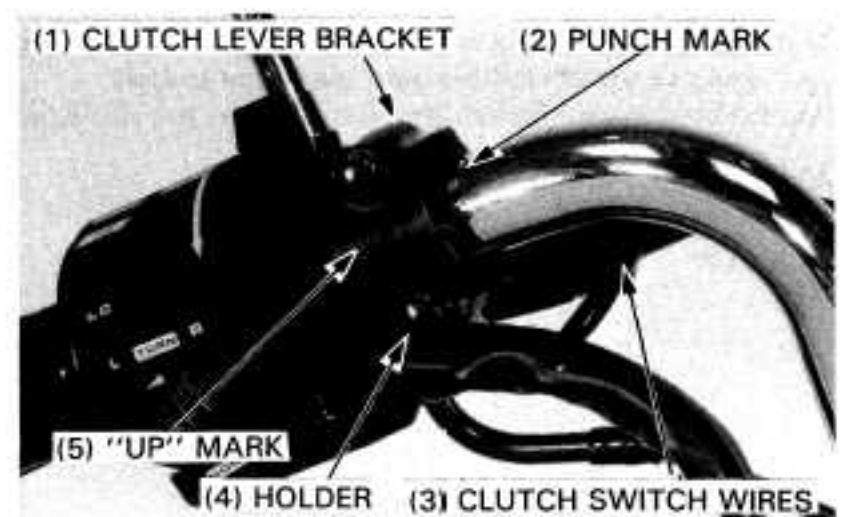


Install the left handlebar weight in the same manner as the right handlebar weight.
Connect the choke cable to the choke lever.
Align the left handlebar switch locating pin with the hole in the handlebar and install the left handlebar switch.
Tighten the front screw first, then tighten the rear screw.

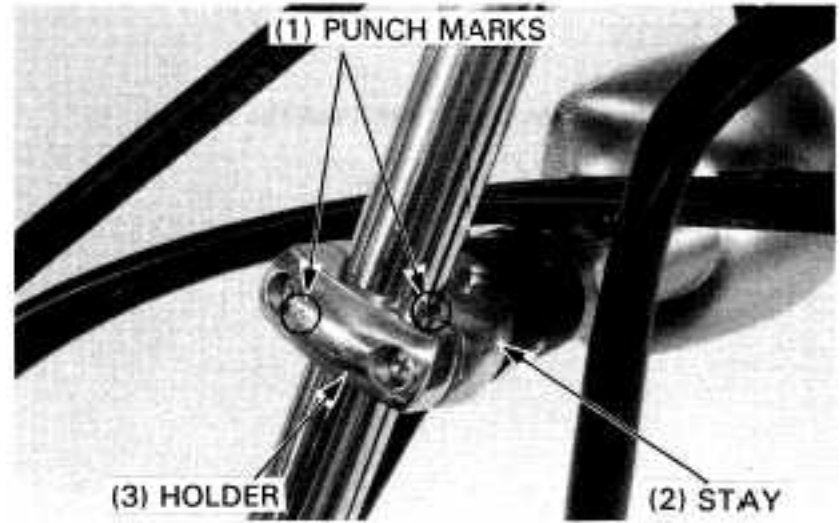


Install the clutch lever bracket and holder with the "UP" mark facing up.
Align the end of the holder with the punch mark on the handlebar, and tighten the upper bolt first, then tighten the lower bolt.

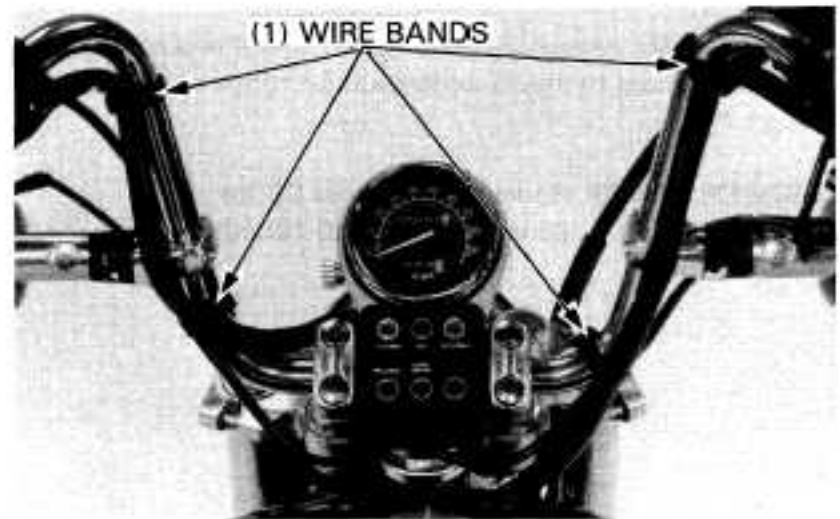
Connect the clutch switch wires.



Place the right turn signal light on the handlebar and install the holder with the punch mark facing forward. Align the end of the turn signal stay with the punch mark on the handlebar and tighten the forward bolt first, then tighten the rear bolt.



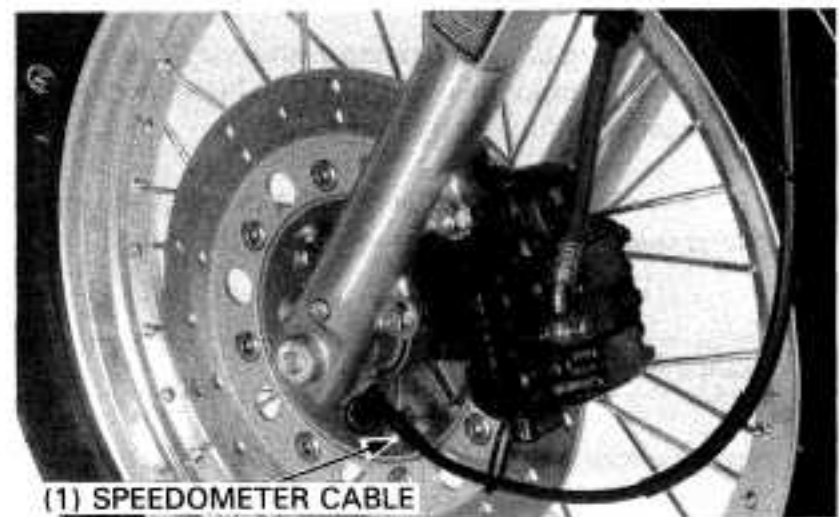
Install the wire bands.



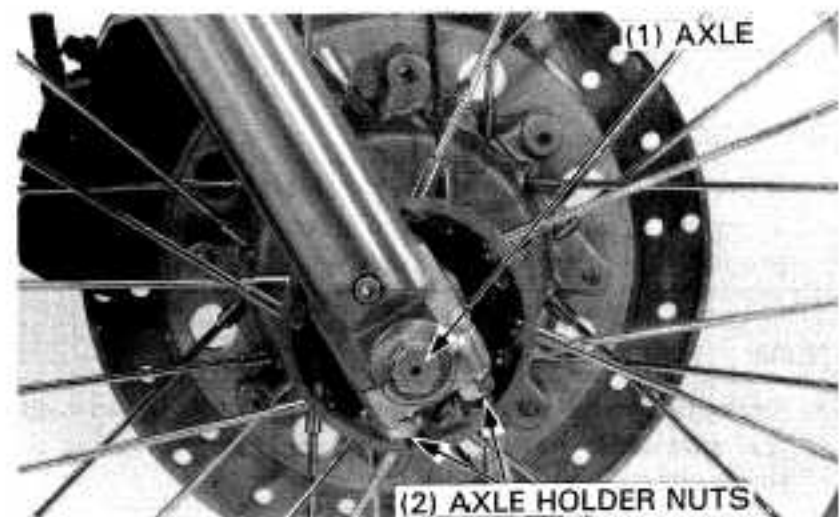
FRONT WHEEL

REMOVAL

Disconnect the speedometer cable from the gear box.



Loosen the axle holder nuts and the axle. Raise the front wheel off the ground by placing a block or work stand under the engine. Remove the axle and the front wheel. Remove the spacer from the right side and speedometer gear box from the left side.

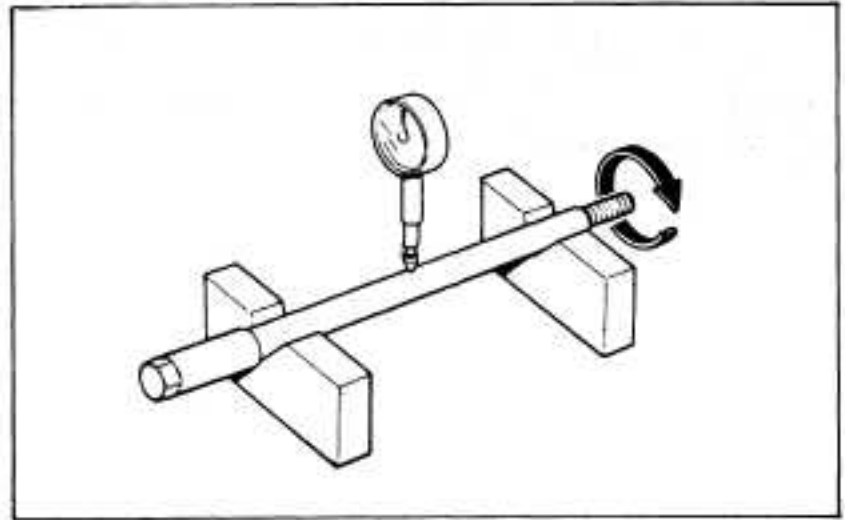


FRONT WHEEL/SUSPENSION/STEERING

INSPECTION

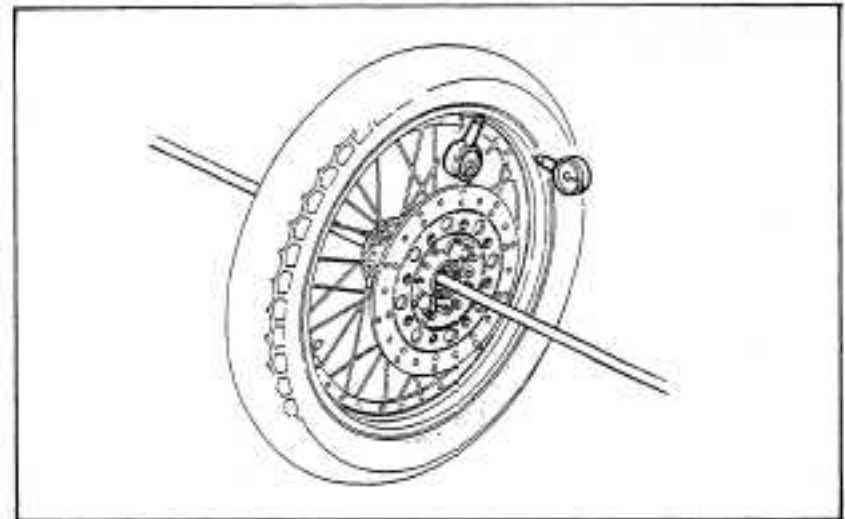
Set the axle in V blocks and measure the runout.

SERVICE LIMIT: 0.2 mm (0.01 in)



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

**SERVICE LIMITS: Radial: 2.0 mm (0.08 in)
Axial: 2.0 mm (0.08 in)**



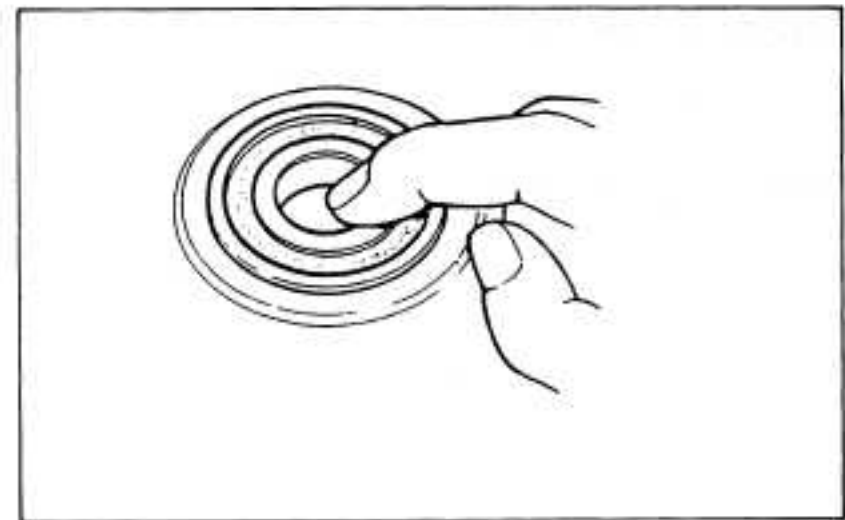
Turn the inner race of each bearing with your finger. The bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the hub.

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

NOTE

- Replace hub bearings in pairs.

For bearing replacement, see pages 11-12 and 13.



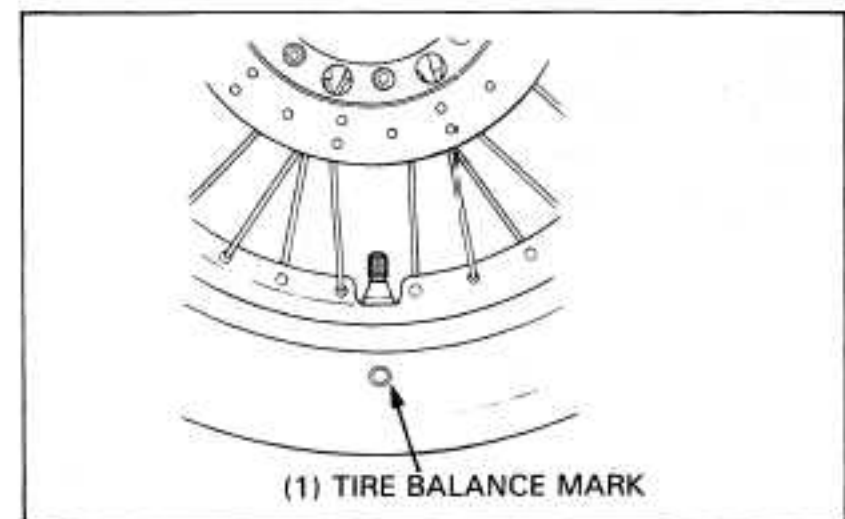
WHEEL BALANCE

CAUTION

- *Wheel balance directly affects the stability, handling and overall safety of the motorcycle. Always check balance when the tire has been removed from the rim.*

NOTE

- For optimum balance, the tire balance mark (a paint dot on the side wall) must be located next to the valve stem.
- Remount the tire if necessary.

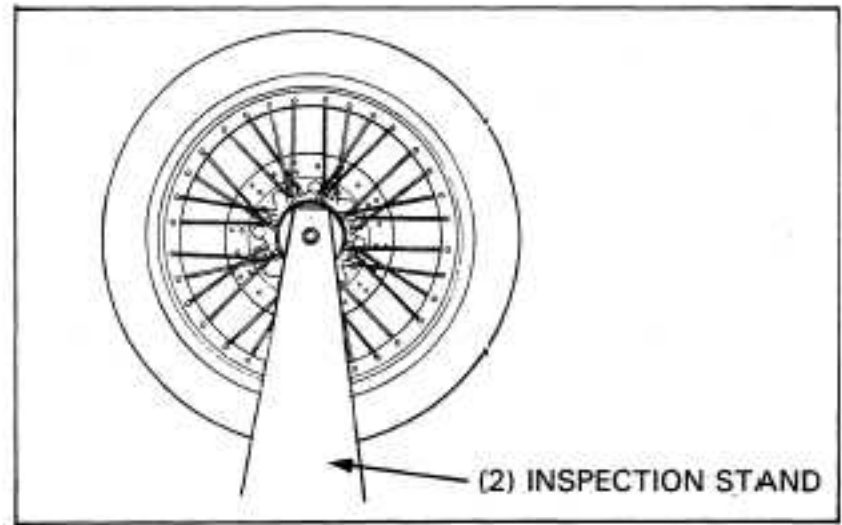


Remove the dust seal and speedometer gearbox from the wheel.

Mount the wheel, tire and brake disc assembly in an inspection stand.

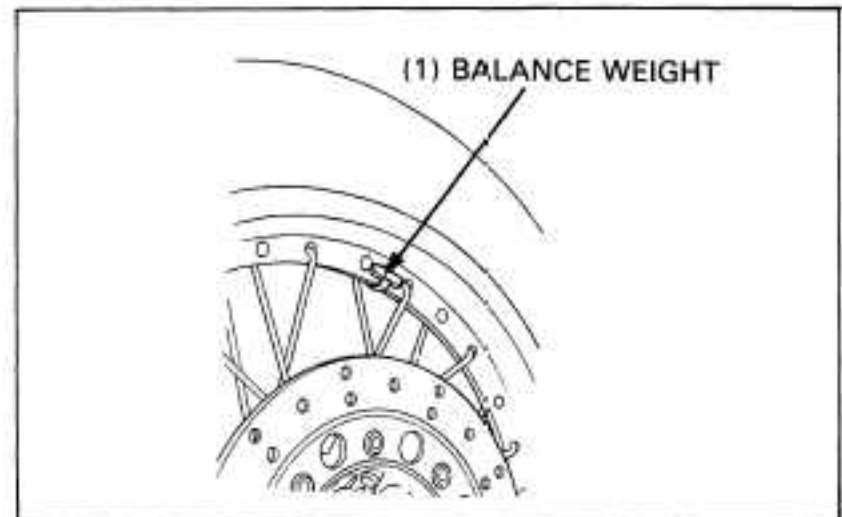
Spin the wheel, allow it to stop, and mark the lowest (heaviest) part of the wheel with chalk.

Do this two or three times to verify the heaviest area. If the wheel is balanced, it will not stop consistently in the same position.



To balance the wheel, install wheel weights on the highest side of the rim, the side opposite the chalk marks. Add just enough weight so the wheel will no longer stop in the same position when it's spun.

Do not add more than 60 grams to the front wheel.



SPOKE REPLACEMENT

NOTE

- The spoke(s) can be replaced with the wheel installed.
- Tighten the spoke nipples to the specified torque after replacing the spoke(s).
- Check the spokes for looseness by tapping them after tightening the spoke nipples.

Raise the front wheel off the ground by placing a jack or support block under the engine.

NOTE

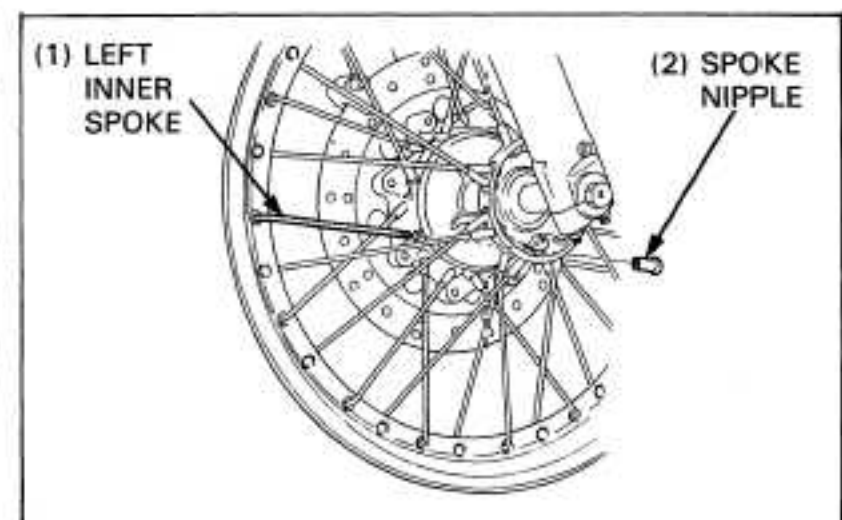
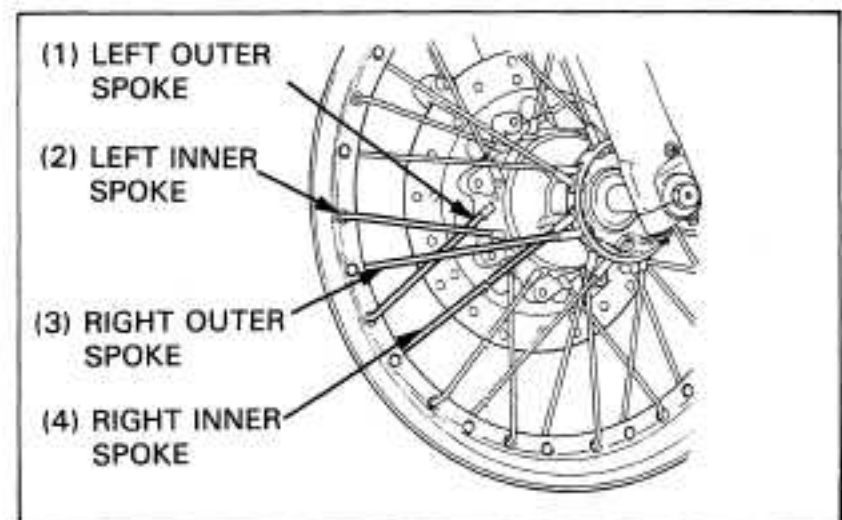
- The replacement procedures are different among the left inner, left outer, right inner and right outer spokes.
- Follow the procedures below.

Left inner spoke (short spoke)

Remove the left inner spoke nipple from the hub and remove the left inner spoke from the rim.

Install a new left (short) spoke into the spoke hole in the rim from the left side, set the spoke properly and tighten the nipple.

TORQUE: 7–11 N·m (0.7–1.1 kg·m, 5–8 ft·lb)



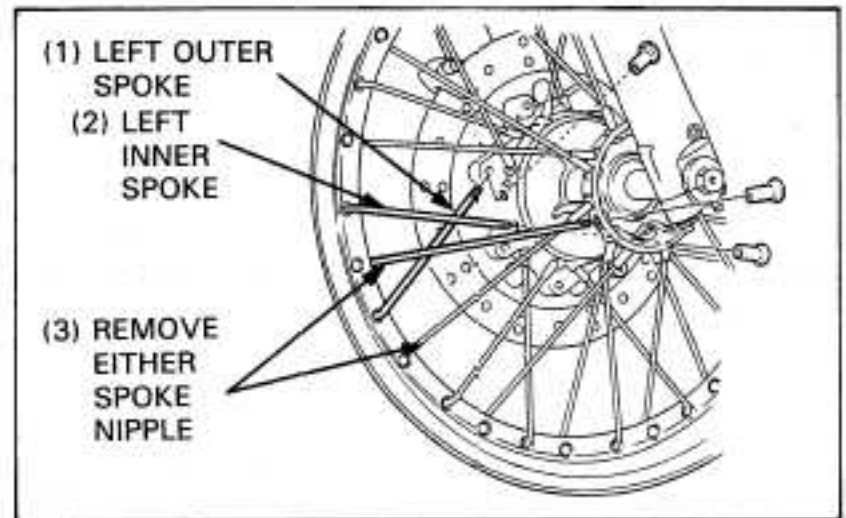
FRONT WHEEL/SUSPENSION/STEERING

Left outer spoke (short spoke)

Remove the left inner spoke nipple and either right spoke nipple positioned on either sides of the spoke to be replaced at the rim.

Remove the left outer spoke nipple and replace the spoke. Install and tighten the removed spoke nipples.

TORQUE: 7–11 N·m (0.7–1.1 kg-m, 5–8 ft-lb)

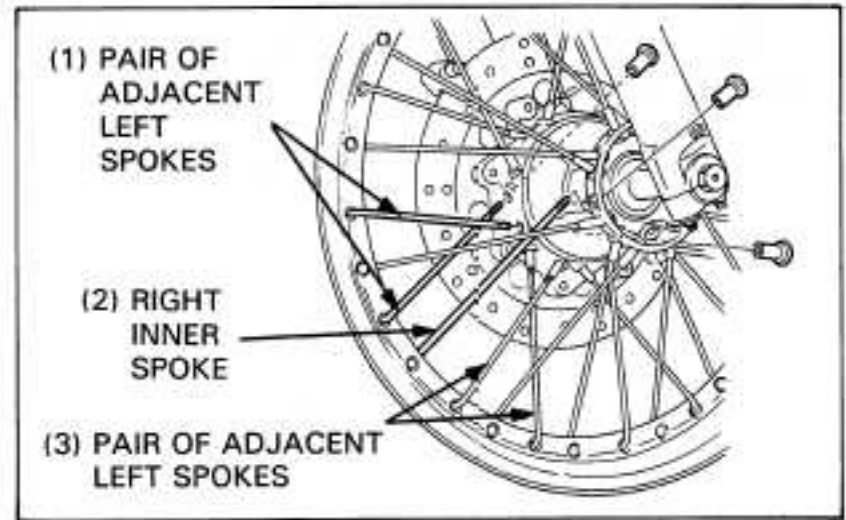


Right inner spoke (long spoke)

Remove either pair of left inner and outer spoke nipples which are adjacent to the spoke to be replaced at the rim.

Remove the right inner spoke nipple and replace the spoke. Install and tighten the removed spoke nipples.

TORQUE: 7–11 N·m (0.7–1.1 kg-m, 5–8 ft-lb)

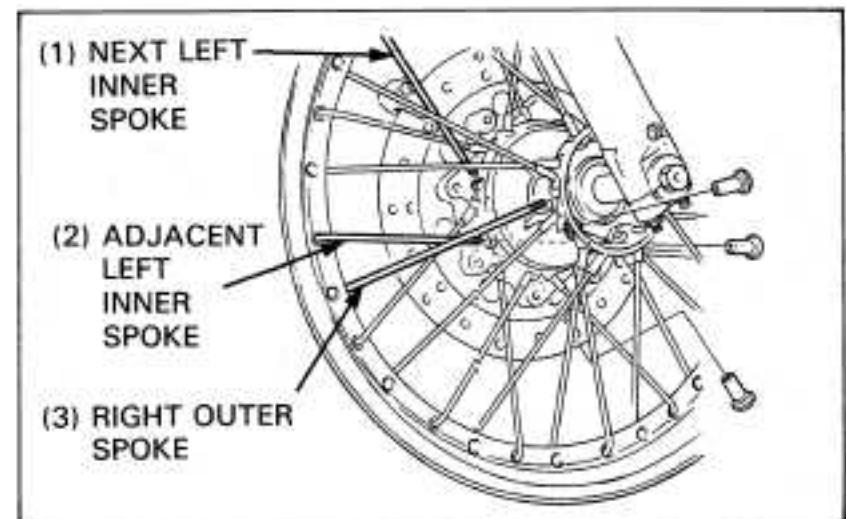


Right outer spoke (long spoke)

Remove the adjacent left inner spoke nipple at the rim and next left inner spoke nipple as shown.

Remove the right outer spoke nipple and replace the spoke. Install and tighten the removed spoke nipples.

TORQUE: 7–11 N·m (0.7–1.1 kg-m, 5–8 ft-lb)



All spokes

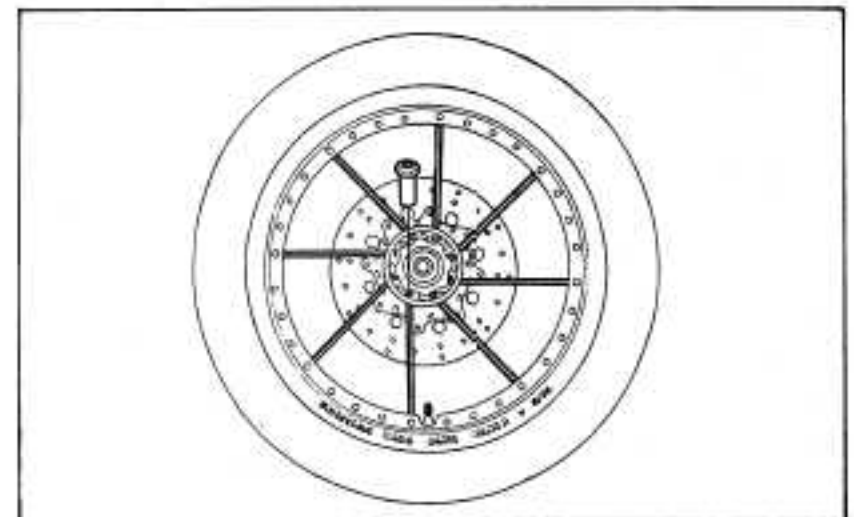
Remove the front wheel (page 11-7).
Remove all spoke nipples and spokes.

NOTE

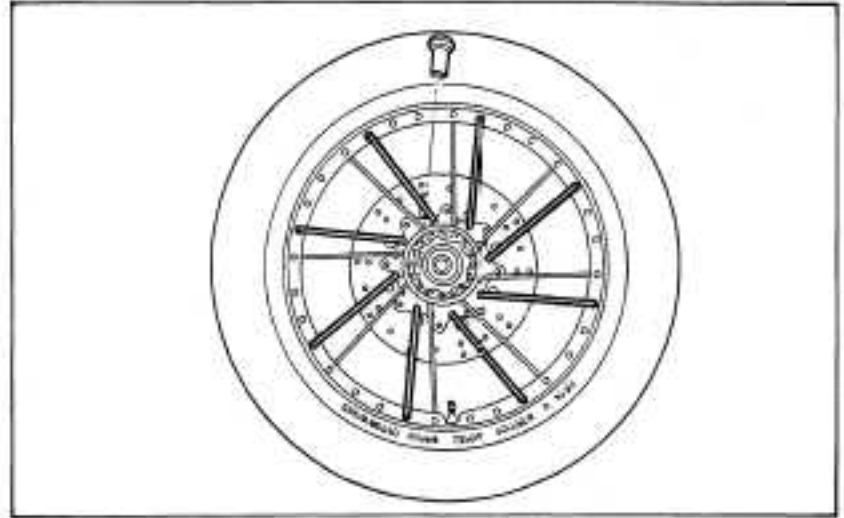
- The front wheel has 16 long spokes and 16 short spokes.

Place the rim with the stamped side facing up.
Install a long spoke into the hole next to the tire valve stem, then install a long spoke into every 4th hole; 8 long spokes should now be installed.

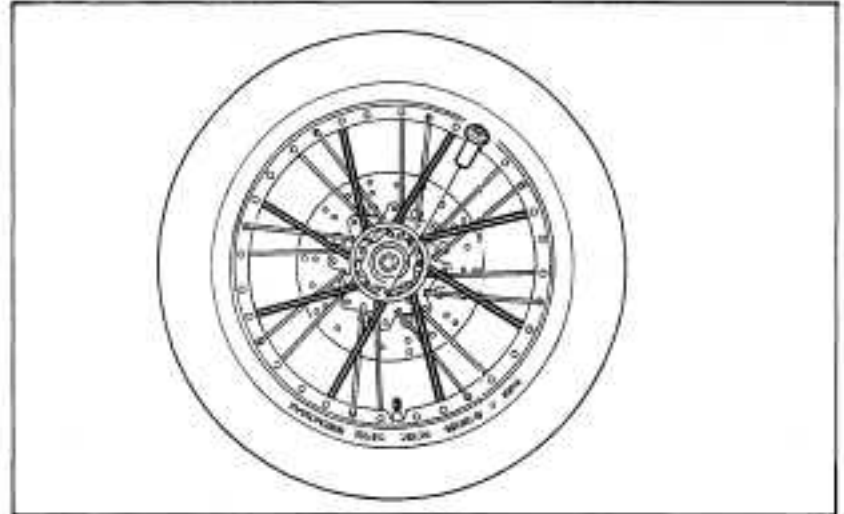
Place the wheel hub with the disc side facing down and install the spoke nipples into the right inner spoke holes to set the right inner spokes as shown.



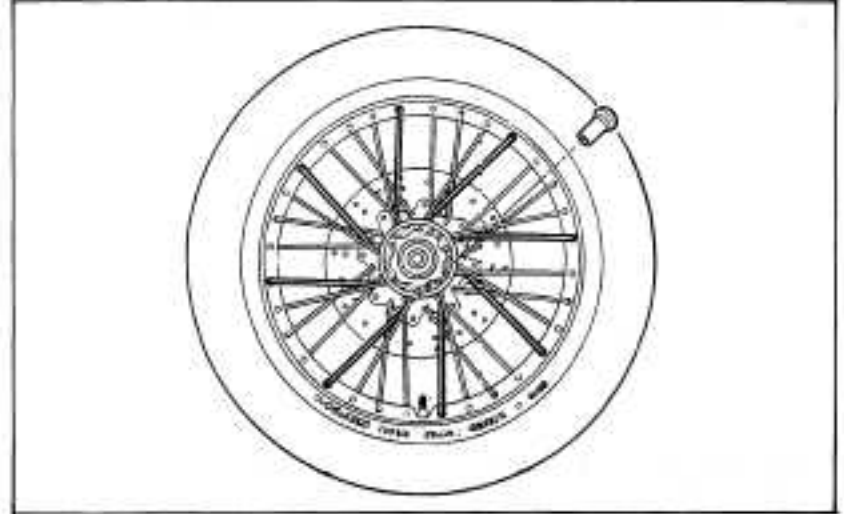
Install 8 short spokes into the holes next to the right inner rim holes from the left side.
Install the spoke nipples into the left inner holes in the hub to set the left inner spokes.



Install 8 long spokes into the holes next to the left inner rim holes from the right side.
Install the spoke nipples into the right outer holes in the hub to set the right outer spokes.

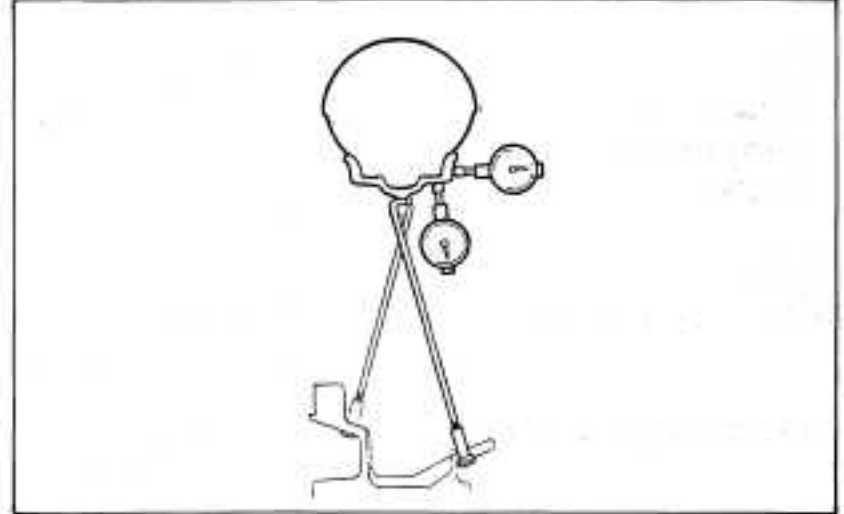


Install 8 short spokes into the remaining holes from the left side and set the spokes to the left inner holes in the hub with the nipples.



Place the front wheel in a truing stand and tighten the spoke nipples to the specific torque while checking the rim runout.

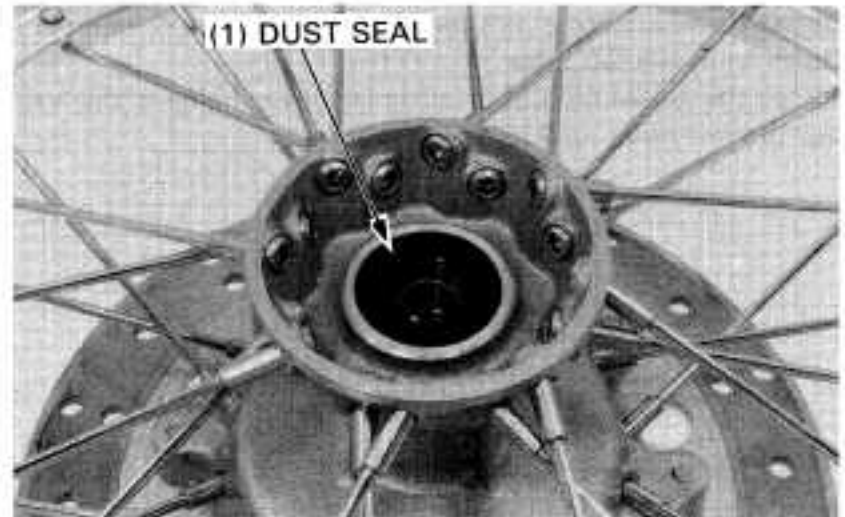
Install the front wheel (page 11-15).



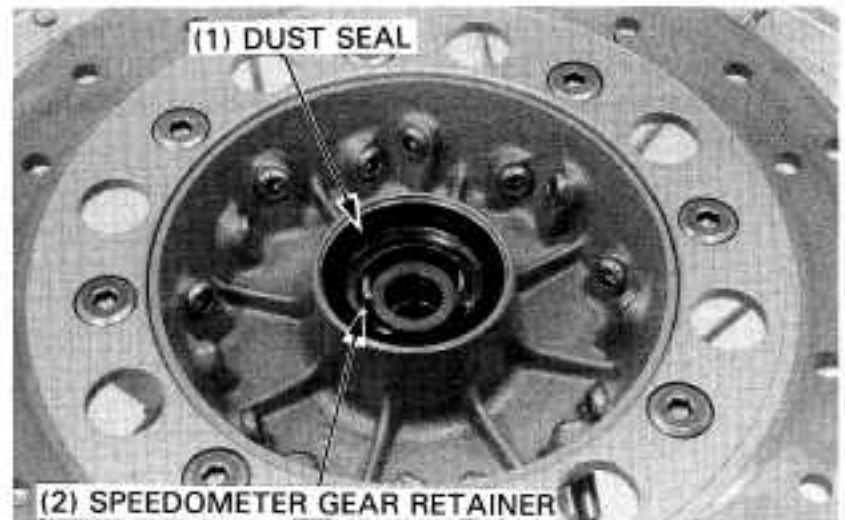
FRONT WHEEL/SUSPENSION/STEERING

DISASSEMBLY

Remove the dust seal from the right side.



Remove the dust seal and speedometer gear retainer from the left side.



Remove the front brake disc mounting bolts and the disc.



Insert the bearing remover head into the bearing.
From the opposite side, install the bearing remover shaft and drive the bearing out of the wheel hub.
Remove the distance collar and drive out the other bearing.

NOTE

- If the wheel bearings are removed, they must be replaced with new ones.
- The wheel bearings must be replaced as a set.

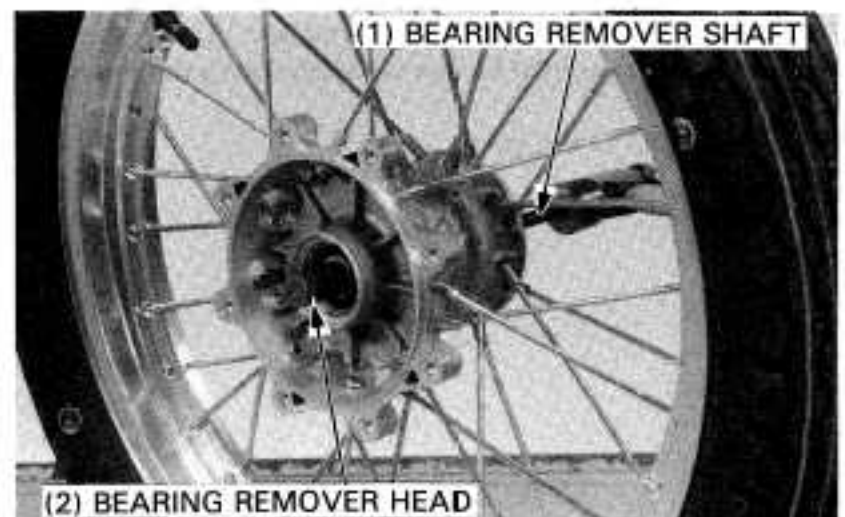
TOOLS:

Bearing remover shaft

07746-0050100 or
Equivalent commercially
available in U.S.A.

Bearing remover head, 15 mm

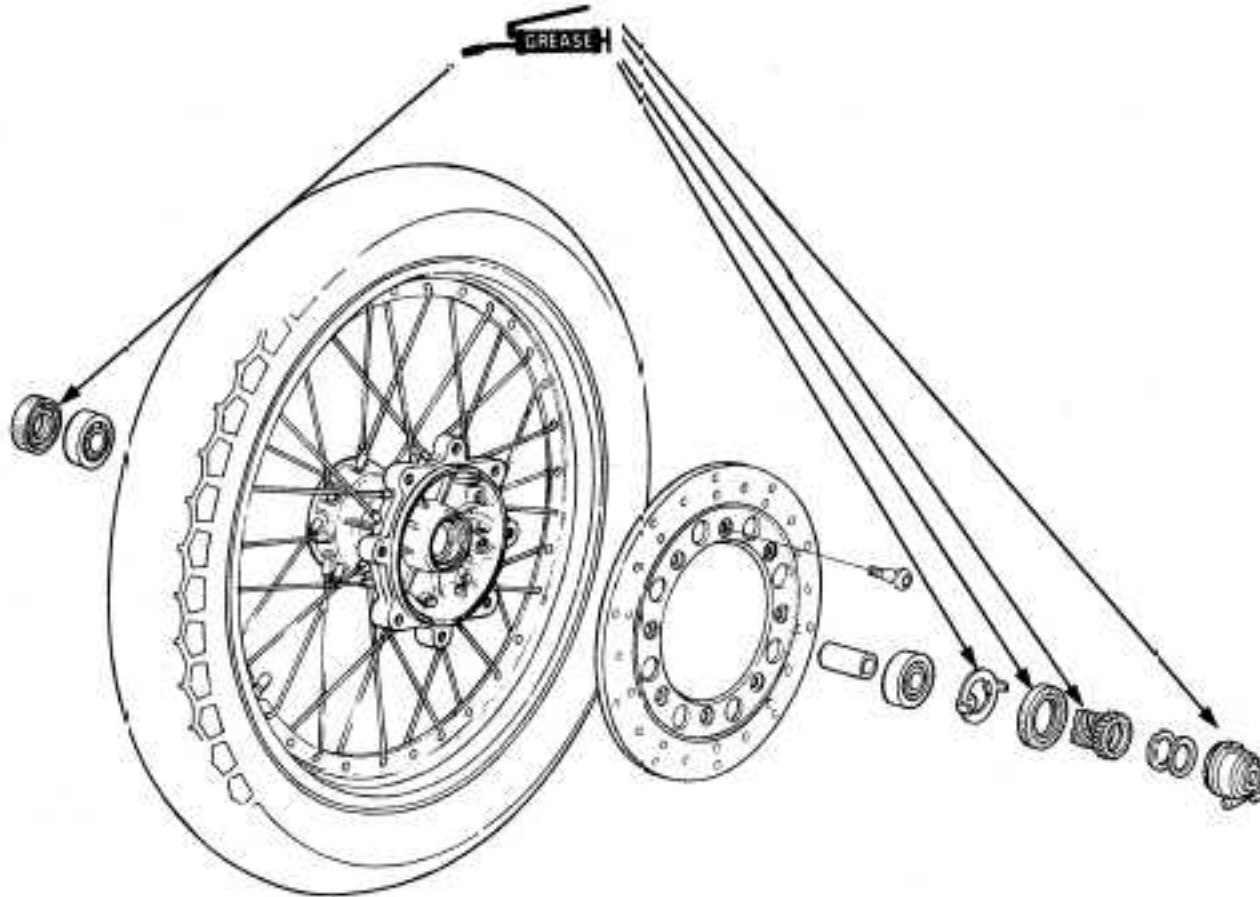
07746-0050400 or
Equivalent commercially
available in U.S.A.



ASSEMBLY

WARNING

- Do not get grease on the brake disc or stopping power will be reduced.



NOTE

- The front wheel uses a tubeless tire. For tubeless tire repair, refer to the Honda Tubeless Tire Manual.

Drive in a new right bearing first with the markings facing up until it is fully seated.
 Install the distance collar.
 Drive in a new left bearing with the markings facing up until it is fully seated.

TOOLS:

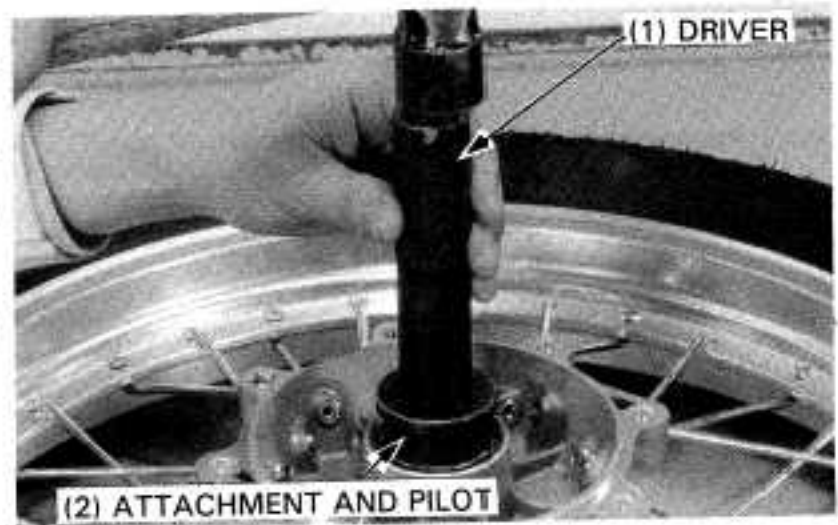
Driver	07749-0010000
Attachment, 42 x 47 mm	07746-0010300
Pilot, 15 mm	07746-0040300

Apply a thread lock agent to the disc mounting bolt threads.
 Install the front brake disc and tighten the bolts.

TORQUE: 37 – 43 N·m (3.7 – 4.3 kg·m, 27 – 31 ft·lb)

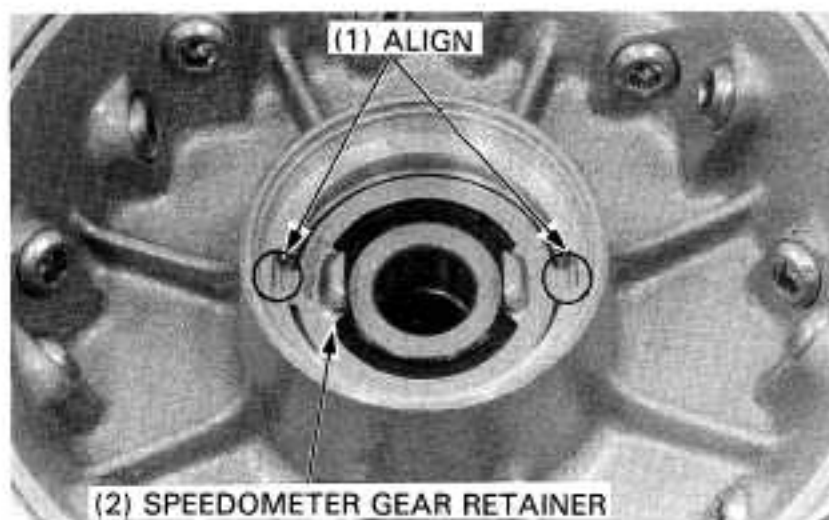
WARNING

- Do not get grease on the brake disc or stopping power will be reduced.

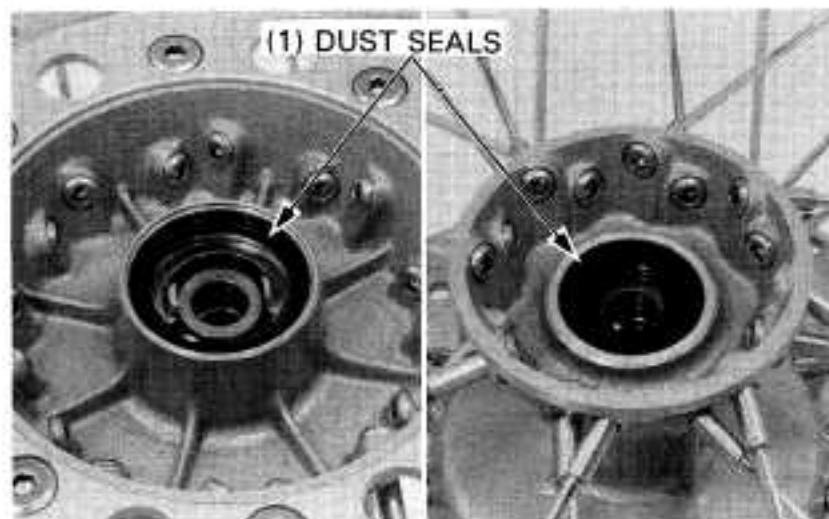


FRONT WHEEL/SUSPENSION/STEERING

Coat the speedometer gear retainer with grease and install the retainer into the wheel hub, aligning the tangs with the slots in the hub.

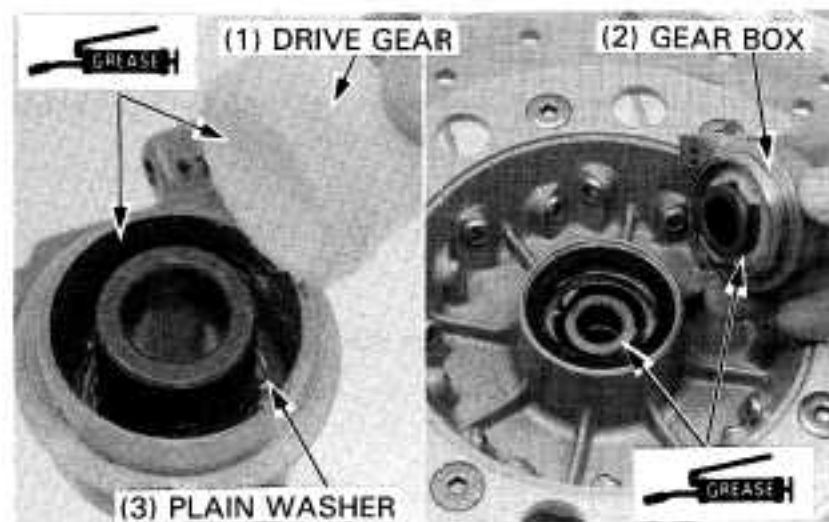


Apply grease to the dust seal lips and install the left and right dust seals.

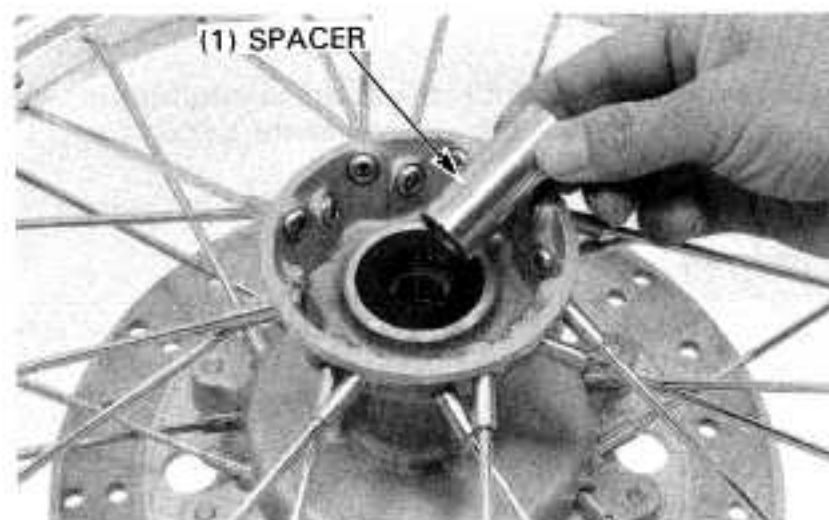


Fill the speedometer gear box with grease and install the plain washer and drive gear.

Install the speedometer gear box into the wheel hub.



Install the spacer into the right side of the wheel hub.



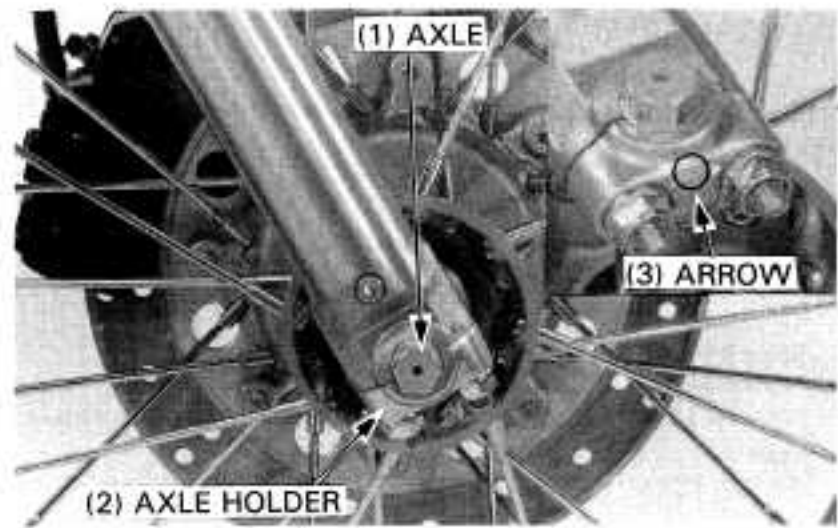
INSTALLATION

Install the front wheel between the fork legs so that the brake disc is positioned between the pads, and install the axle.

NOTE

- Install the axle holder with the arrow pointing forward if it was removed.

Position the tang of the speedometer gear box against back the of the lug on the left fork.



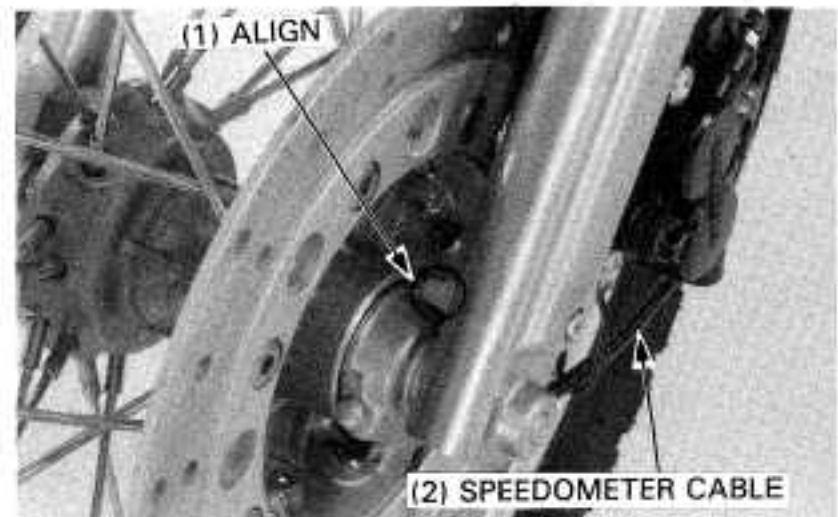
Lower the front wheel and tighten the axle.

TORQUE: 55–65 N·m (5.5–6.5 kg-m, 40–47 ft-lb)

Tighten the axle holder nuts, starting with the forward nut.

TORQUE: 18–25 N·m (1.8–2.5 kg-m, 13–18 ft-lb)

Connect the speedometer cable and secure it with the set screw.

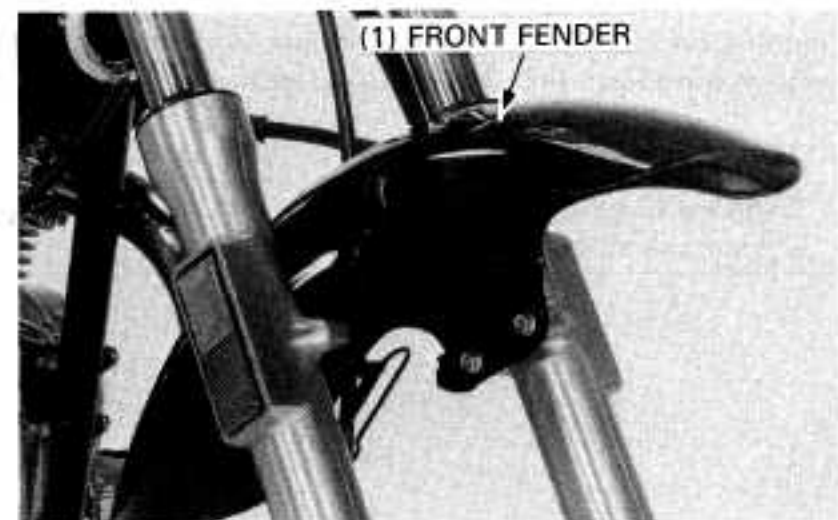


FRONT FORK

REMOVAL

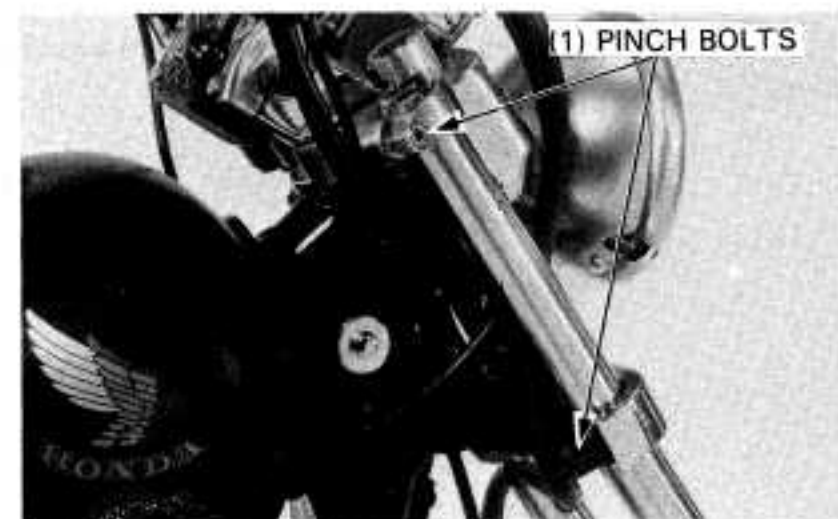
Remove the following:

- front wheel (page 11-7).
- brake caliper from the left fork.
- brake hose from the clamp of the fender.
- front fender.



Loosen the fork tube cap if it is to be removed.

Loosen the fork top and bottom pinch bolts and pull the fork tubes out.



FRONT WHEEL/SUSPENSION/STEERING

DISASSEMBLY

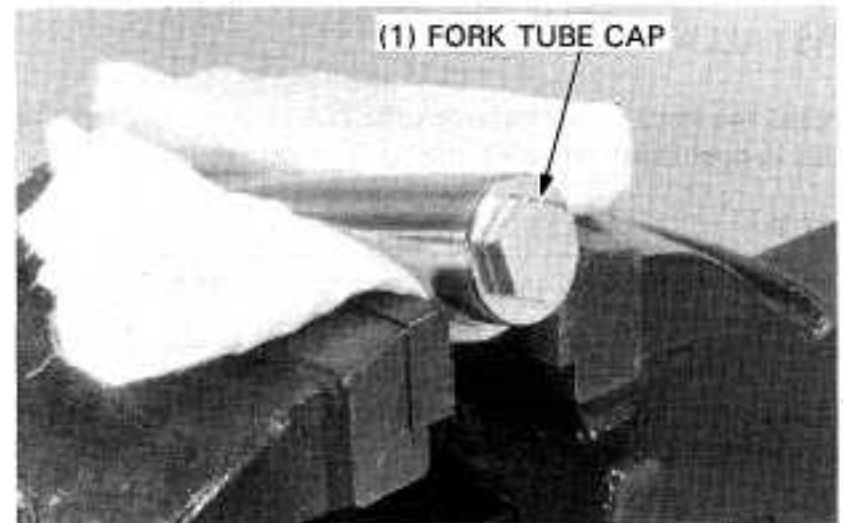
Hold the fork tube in a vise, with soft jaws or a shop towel, and remove the fork tube cap.

CAUTION

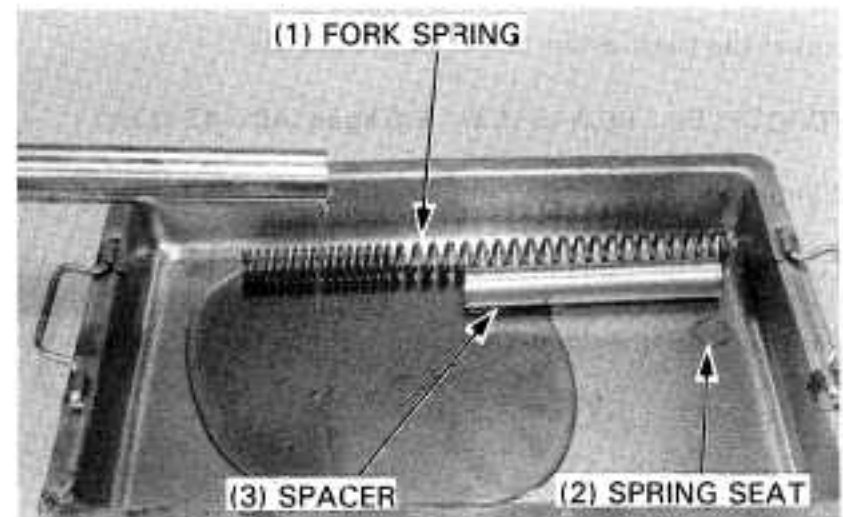
- *Be careful not to damage the fork tube's sliding surface.*

WARNING

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



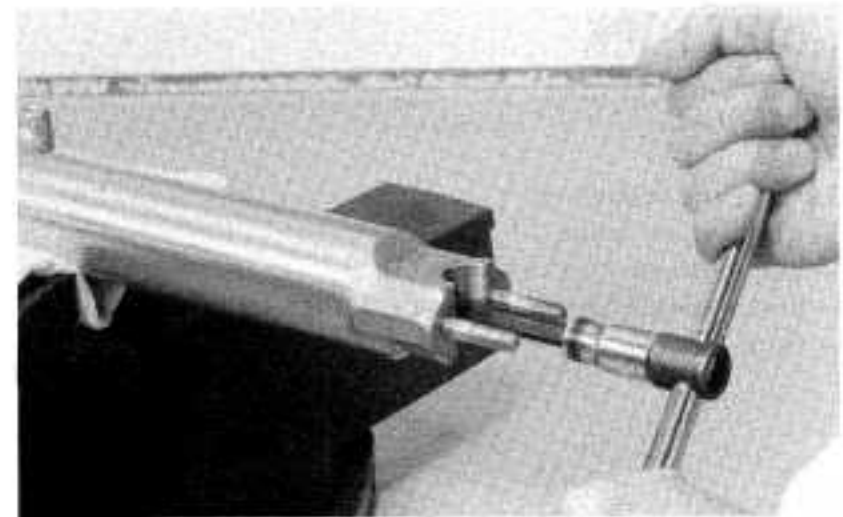
Remove the spacer, spring seat and fork spring, and drain the fork fluid by pumping the fork tube back and forth several times.



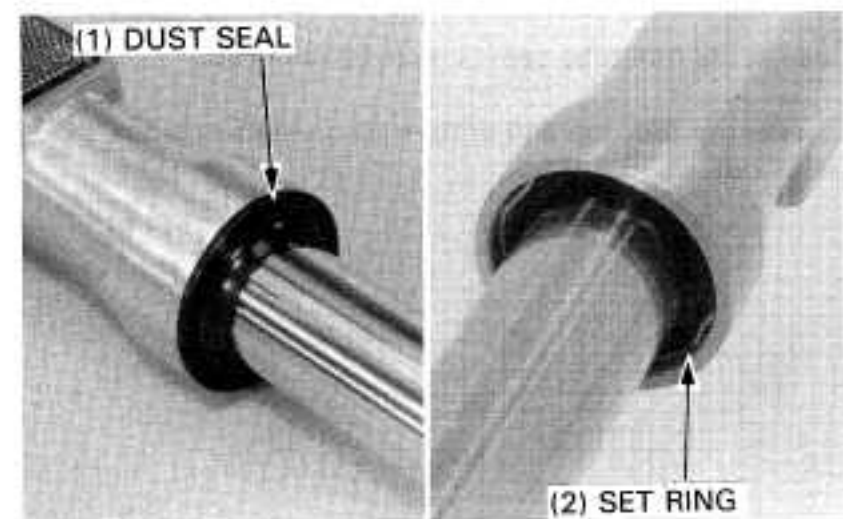
Hold the fork slider in a vise with soft jaws or a shop towel. Remove the socket bolt with a hex wrench.

NOTE

- *Temporarily install the spring and fork tube cap if difficulty is encountered in removing the socket bolt.*

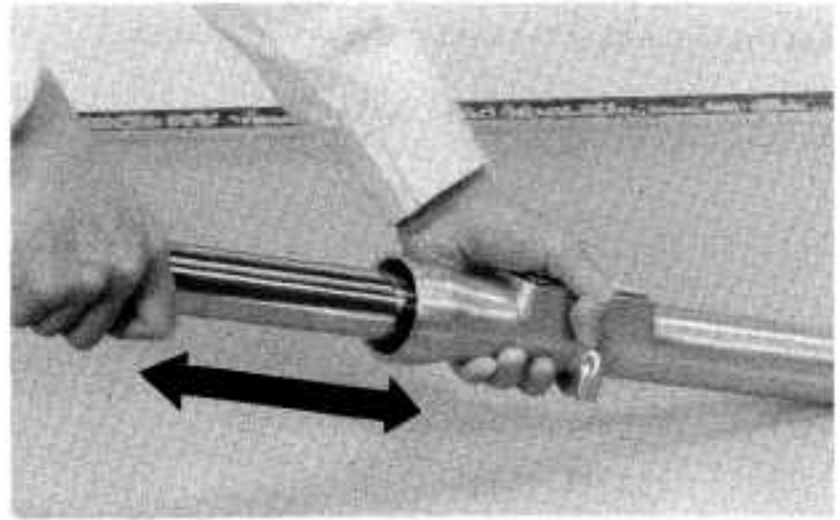


Remove the dust seal and pry out the set ring with a screwdriver.



Pull the fork tube out until resistance from the slider bushing is felt. Then move it in and out, tapping the bushing lightly until the fork tube separates from the slider. The slider bushing will be forced out by the fork tube bushing.

Remove the oil lock piece from inside the slider.

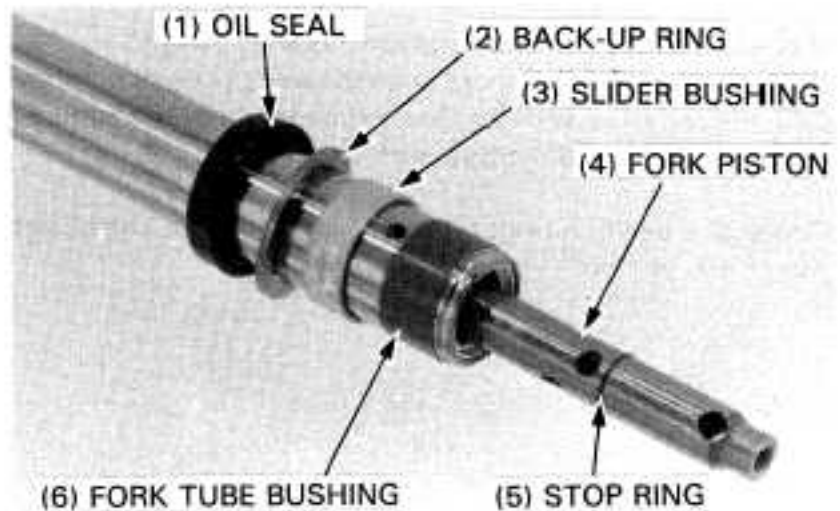


Remove the oil seal, back-up ring and slider bushing from the fork tube.

NOTE

- Do not remove the fork tube bushing unless it is necessary to replace it with a new one. See bushing inspection, page 11-18.

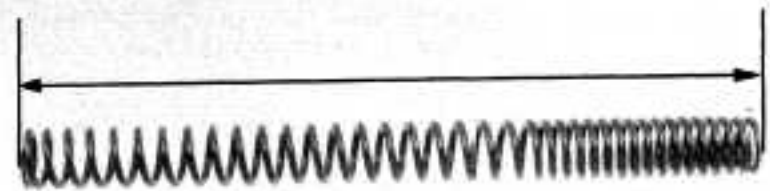
Remove the stop ring from the fork piston, and then remove the piston and rebound spring from the fork tube.



INSPECTION

Measure the fork spring free length.

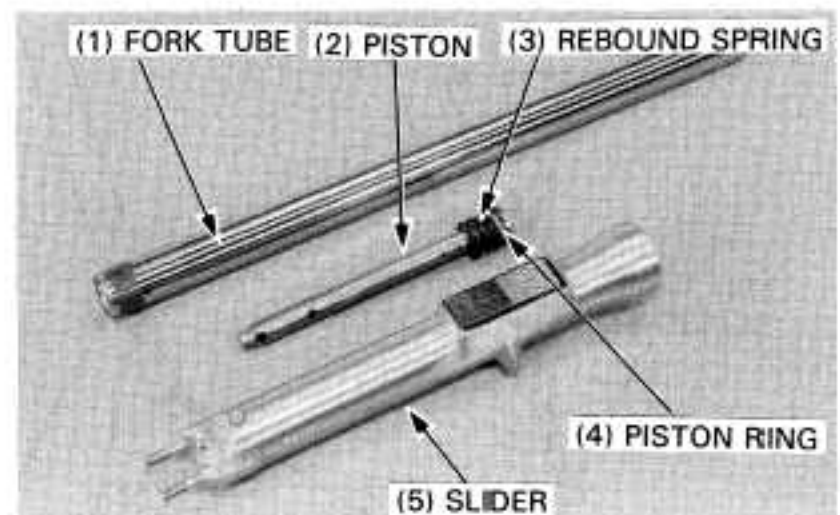
SERVICE LIMIT: 350 mm (13.8 in)



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

Check the piston ring for wear or damage.

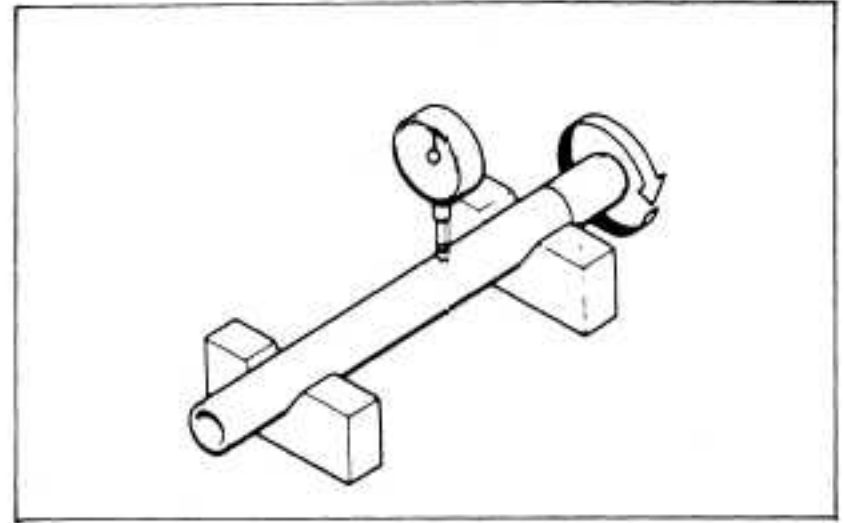
Check the rebound spring for damage.



FRONT WHEEL/SUSPENSION/STEERING

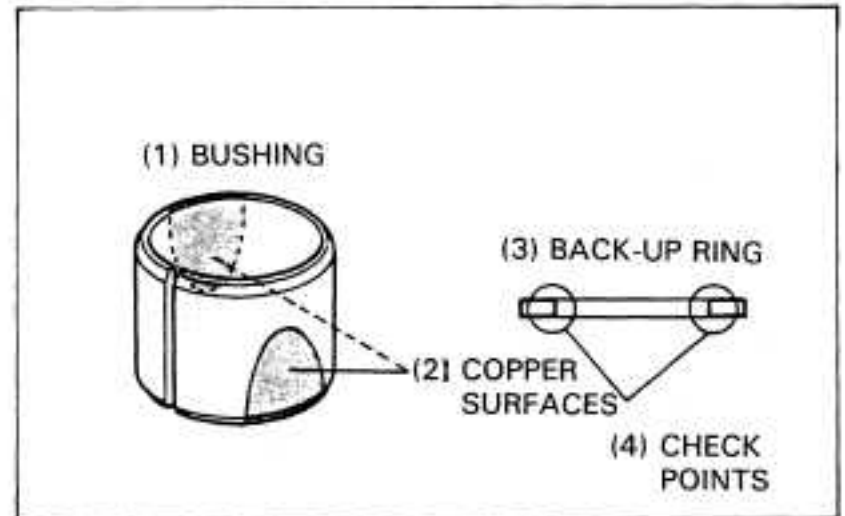
Set the fork tube in V blocks and check the runout.

SERVICE LIMIT: 0.20 mm (0.008 in)



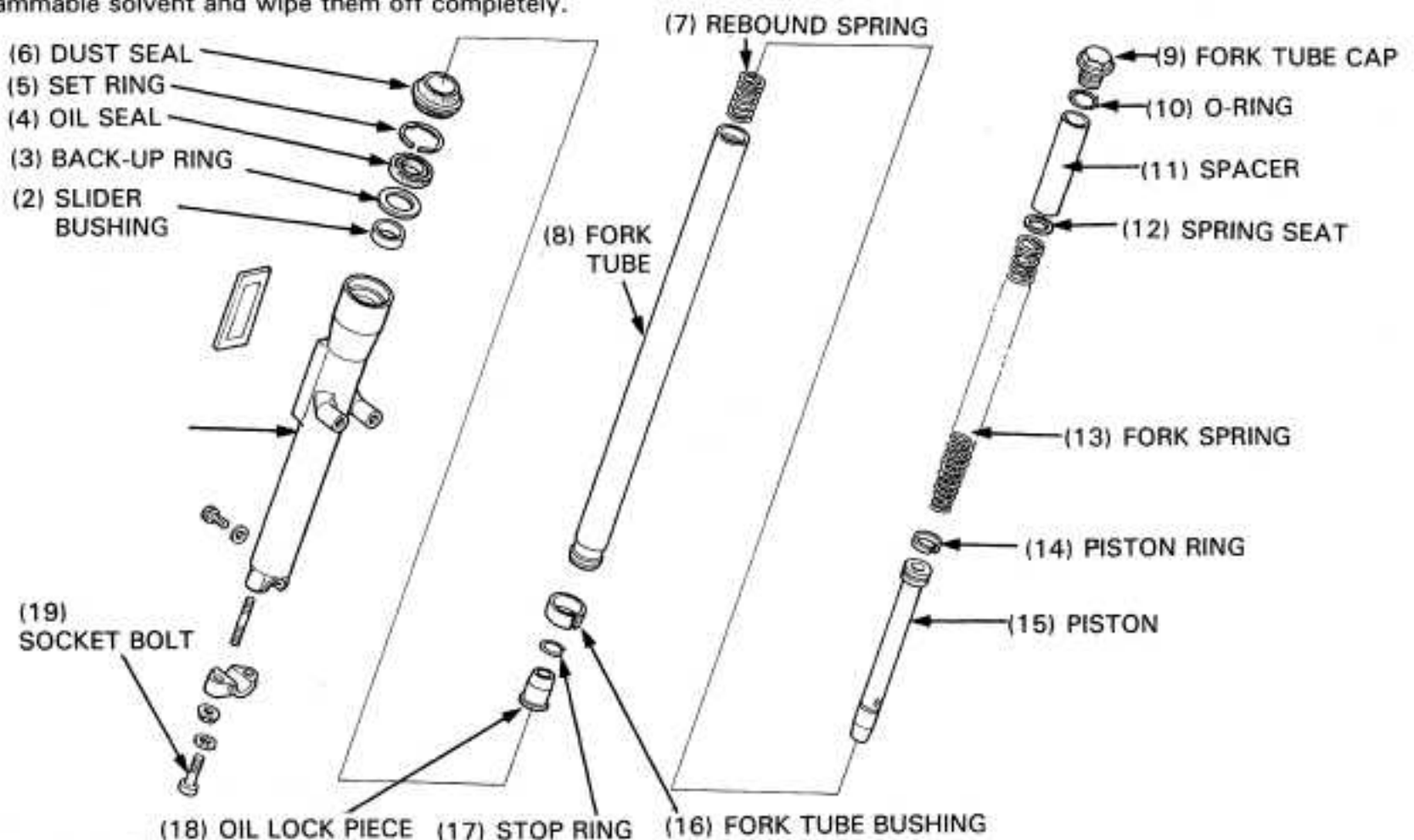
Visually inspect the slider and fork tube bushings. Replace the bushing if there is excessive scoring or scratching, or if the teflon is worn so that the copper surface appears on more than 3/4 of the entire surface.

Check the back-up ring; replace it if there is any distortion at the points shown.



ASSEMBLY

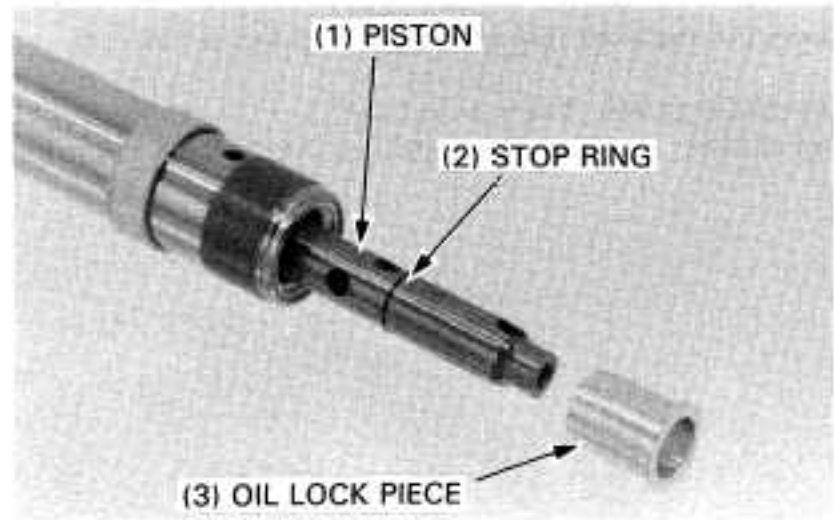
Before assembly, wash all parts with a high flash point or non-flammable solvent and wipe them off completely.



Insert the rebound spring and piston into the fork tube.

Install a new stop ring onto the piston groove.

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

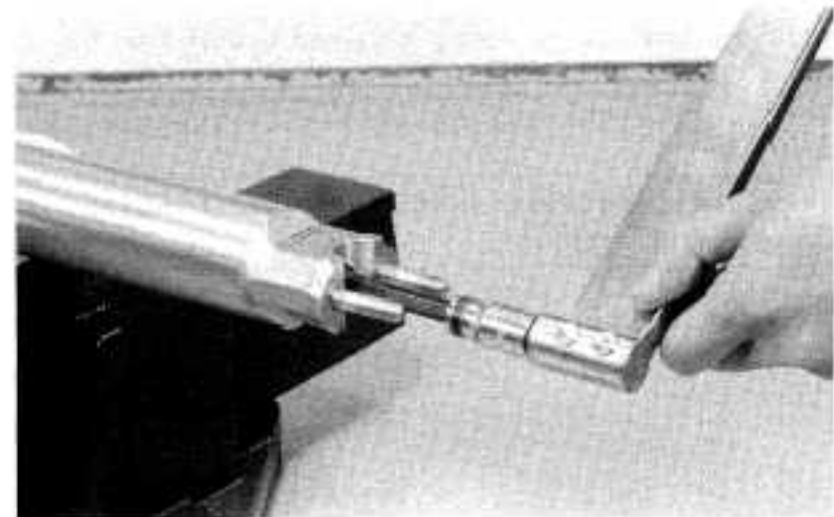


Place the fork slider in a vise with soft jaws or a shop towel. Apply a locking agent to the socket bolt and thread it into the piston. Tighten with a 6 mm hex wrench.

NOTE

- Temporarily install the fork spring and fork tube cap to tighten the socket bolt.

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



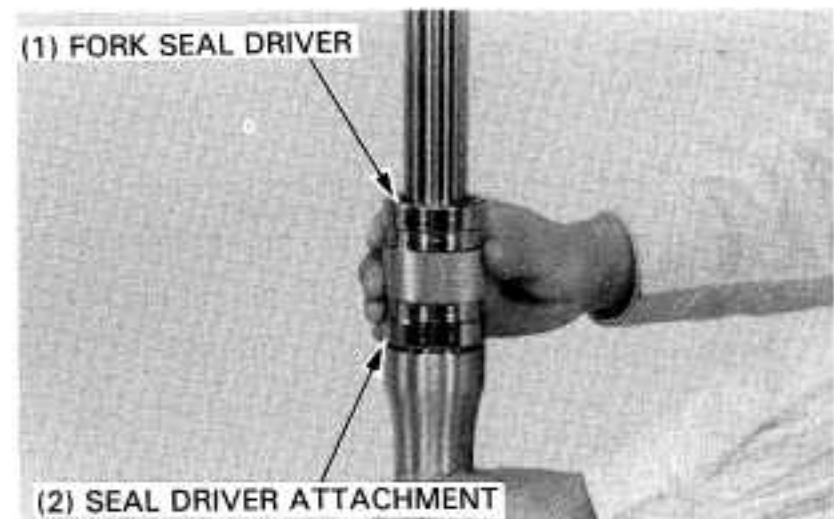
Place the slider bushing over the fork tube and rest it on the slider. Put the back-up ring and an old bushing or equivalent tool on top.

Drive the bushing into place with the seal driver and remove the old bushing or equivalent tool.

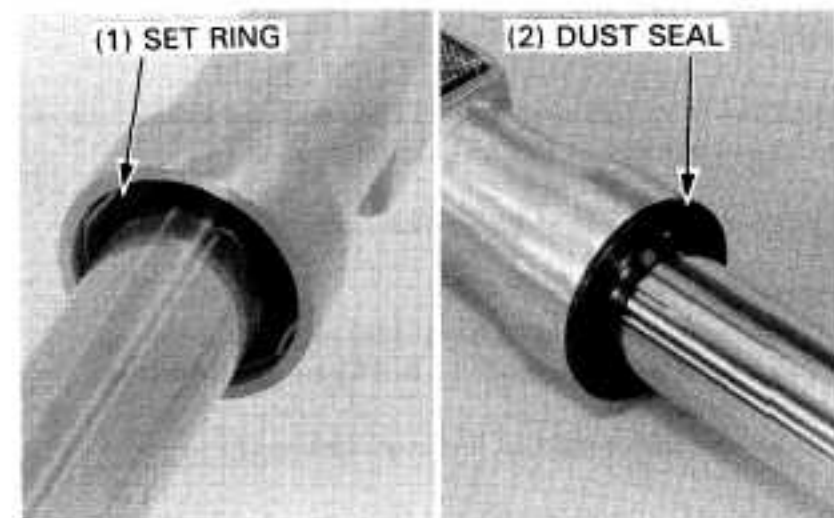
Coat a new oil seal with ATF and install it with the seal markings facing up. Drive the seal in with the seal driver.

TOOLS:

- | | |
|------------------------|------------------|
| Fork seal driver | 07747–0010100 |
| Seal driver attachment | 07747–0010600 or |
| Fork seal driver | 07947–3710101 |



Install the set ring and dust seal.

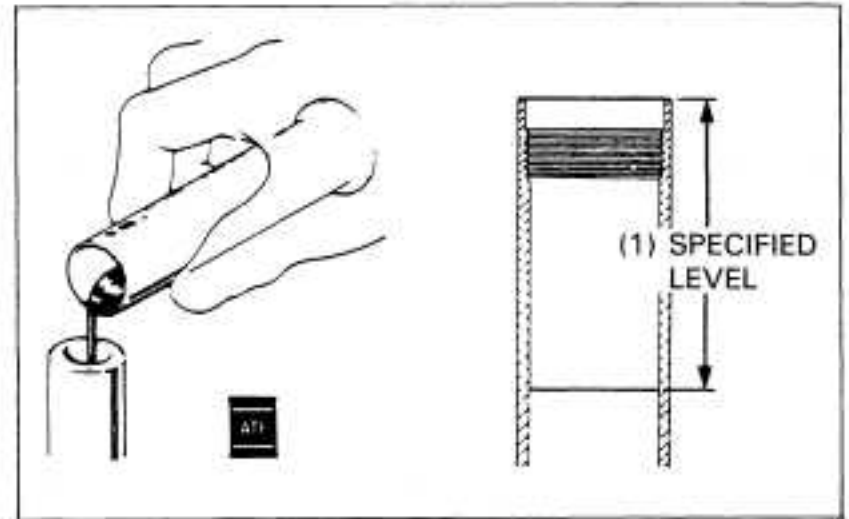


FRONT WHEEL/SUSPENSION/STEERING

Compress the front fork and pour ATF into the fork tube.

SPECIFIED LEVEL: 114 mm (4.5 in)

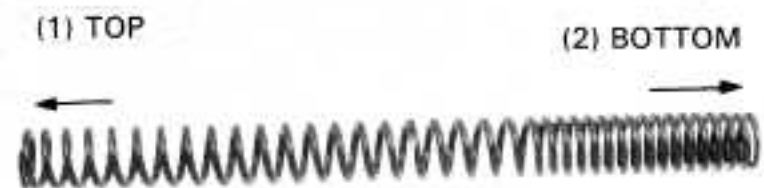
CAPACITY: 363.5–368.5 cc (12.3–12.5 US oz)



Install the fork spring, spring seat and spacer into the fork tube.

NOTE

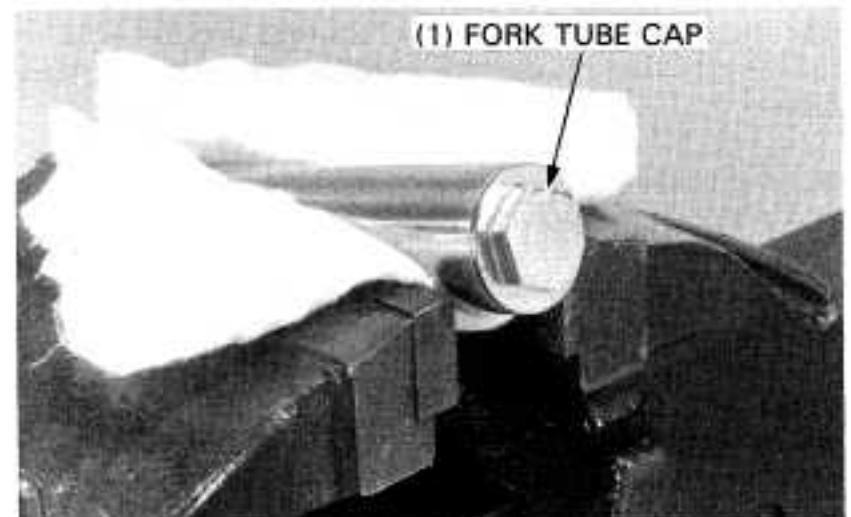
- Note the spring direction; the closely wound coils must face toward the bottom.



Hold the fork tube in a vise with soft jaws or a shop towel and loosely install the fork tube cap.

CAUTION

- Do not damage the fork tube sliding surface.



INSTALLATION

Install the front fork and align the top end of the fork tube with the upper surface of the fork top bridge.

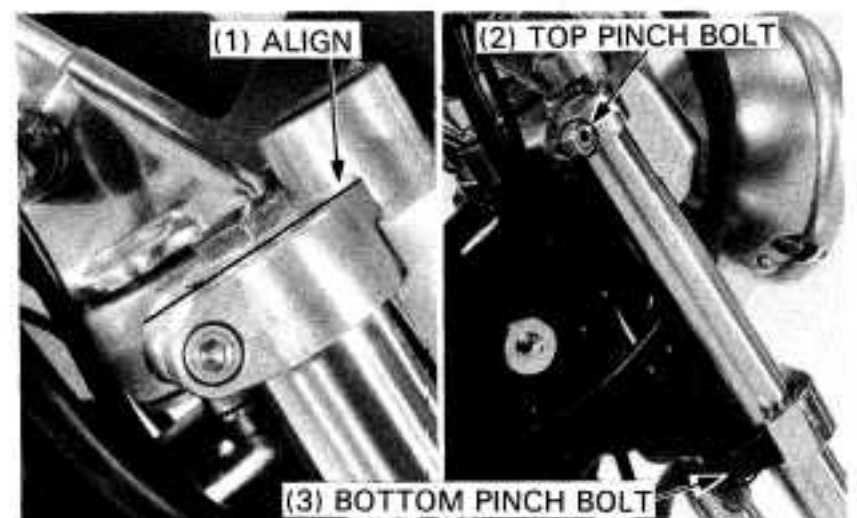
Tighten the top and bottom pinch bolts.

TORQUE:

TOP: 9–13 N·m (0.9–1.3 kg·m, 7–9 ft·lb)
Bottom: 45–55 N·m (4.5–5.5 kg·m, 33–40 ft·lb)

Tighten the fork tube cap if it was removed.

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

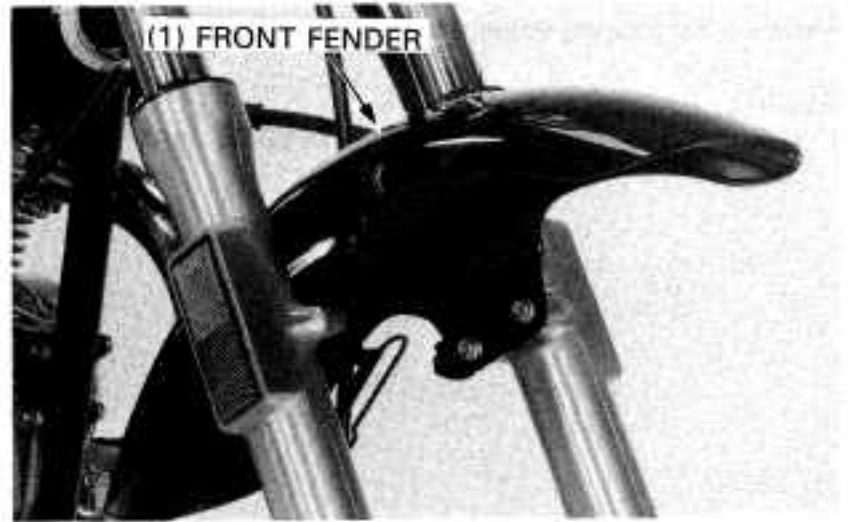


Install the following:

- front fender.
- front brake hose into the clamp of the fender.
- brake caliper onto the left fork.
- front wheel (page 11-15).

Tighten the front brake caliper bracket bolts.

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

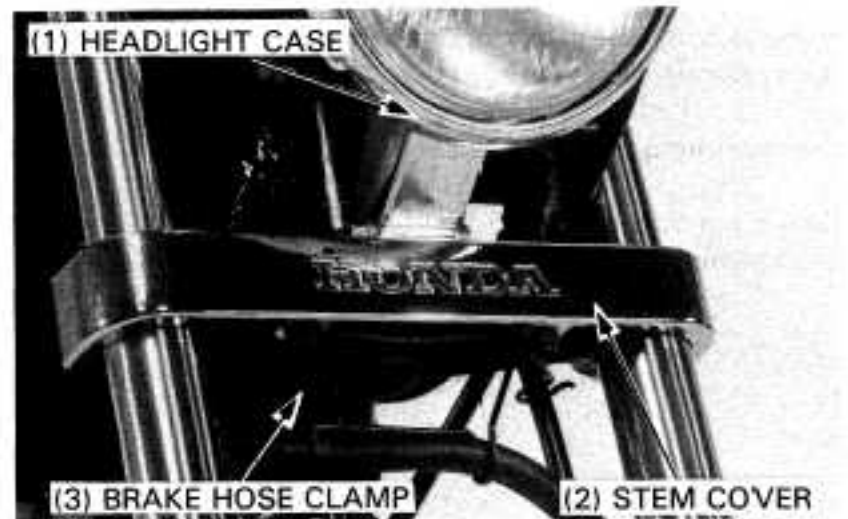


STEERING STEM

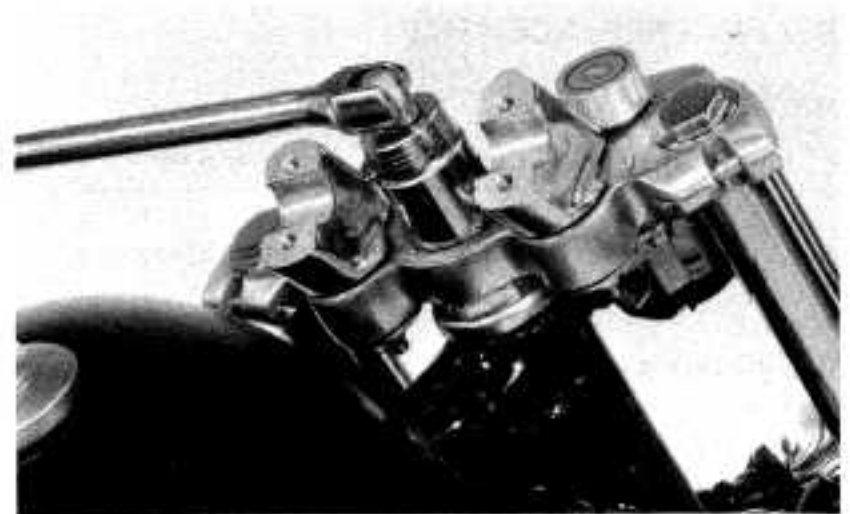
REMOVAL

Remove the following:

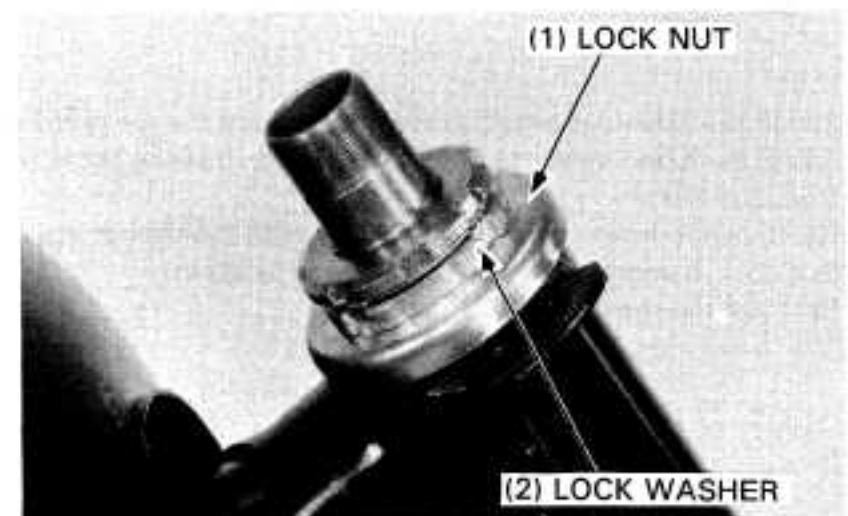
- handlebar (page 11-3).
- front wheel (page 11-7).
- front brake hose clamp and stem cover.
- headlight case.



Remove the steering stem nut.
Remove the front forks (page 11-15).
Remove the fork bridge.



Straighten the lock washer tabs and remove the lock nut and lock washer.

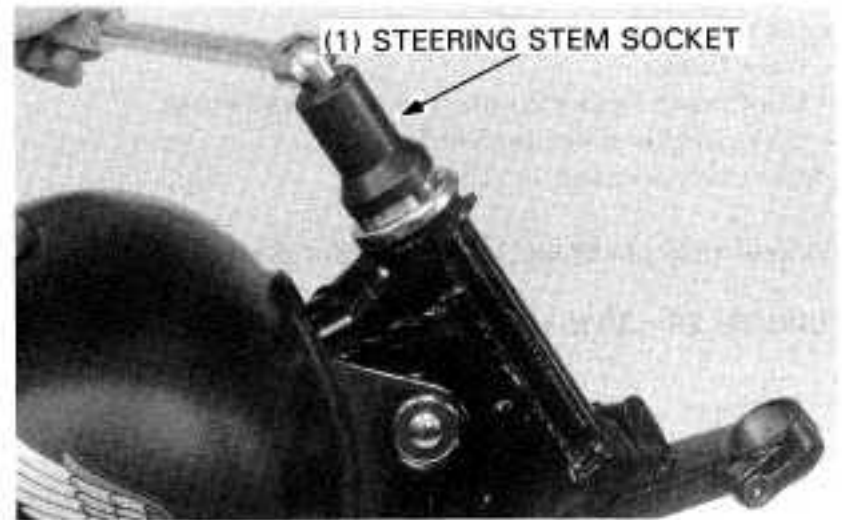


FRONT WHEEL/SUSPENSION/STEERING

Remove the bearing adjustment nut.

TOOL:

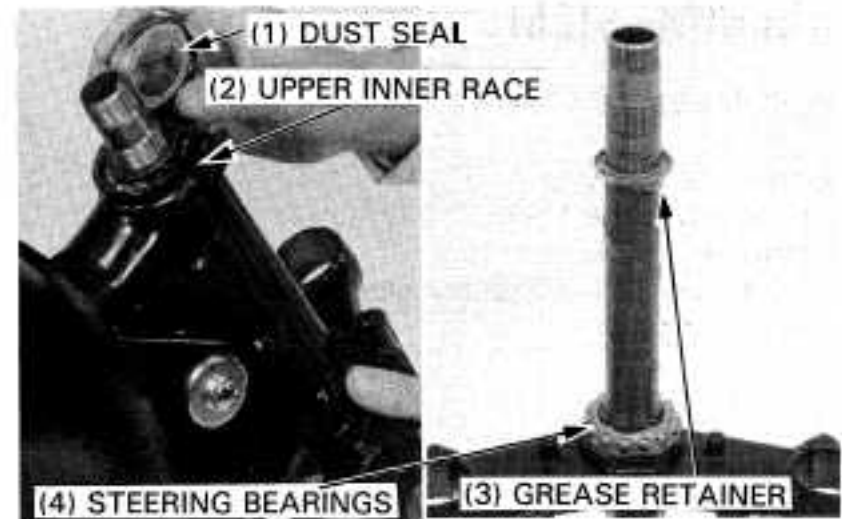
Steering stem socket 07916-3710100



Remove the dust seal, upper bearing inner race and bearing, then remove the steering stem.

Remove the grease retainer and lower bearing from the stem.

Check the bearings, inner and outer races for wear or damage and replace if necessary.



BEARING REPLACEMENT

NOTE

- Always replace the bearing and races as a set.

Remove the upper and lower bearing outer races.

TOOLS:

Upper bearing outer race:

Ball race remover 07953-KA50000 or

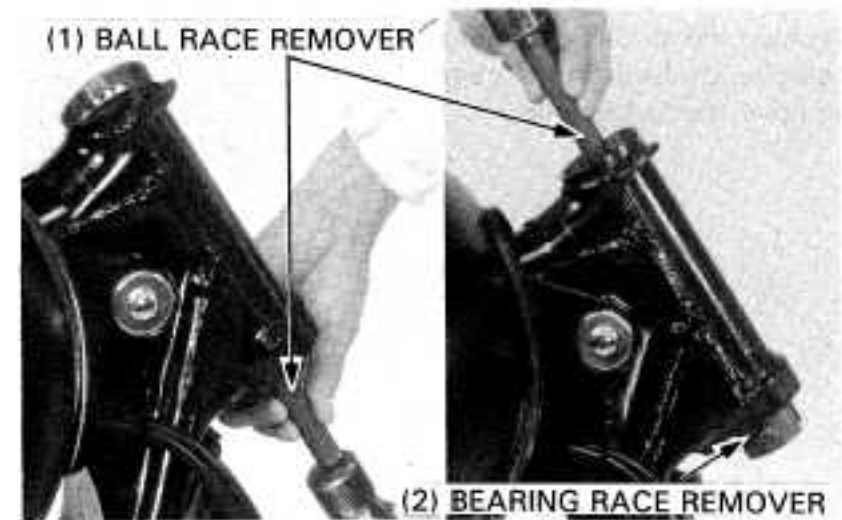
Bearing remover attachment 07953-MJ1000A

Lower bearing outer race:

Ball race remover 07953-KA50000 or

Bearing race remover 07953-MJ1000A

Bearing race remover 07946-3710500

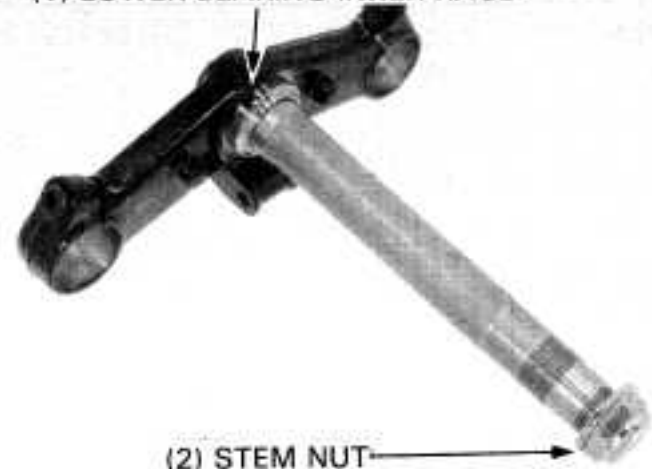


Install the stem nut onto the stem to prevent the threads from being damaged when removing the lower bearing inner race from the stem.

Remove the lower bearing inner race with a chisel or equivalent tool, being careful not to damage the stem.

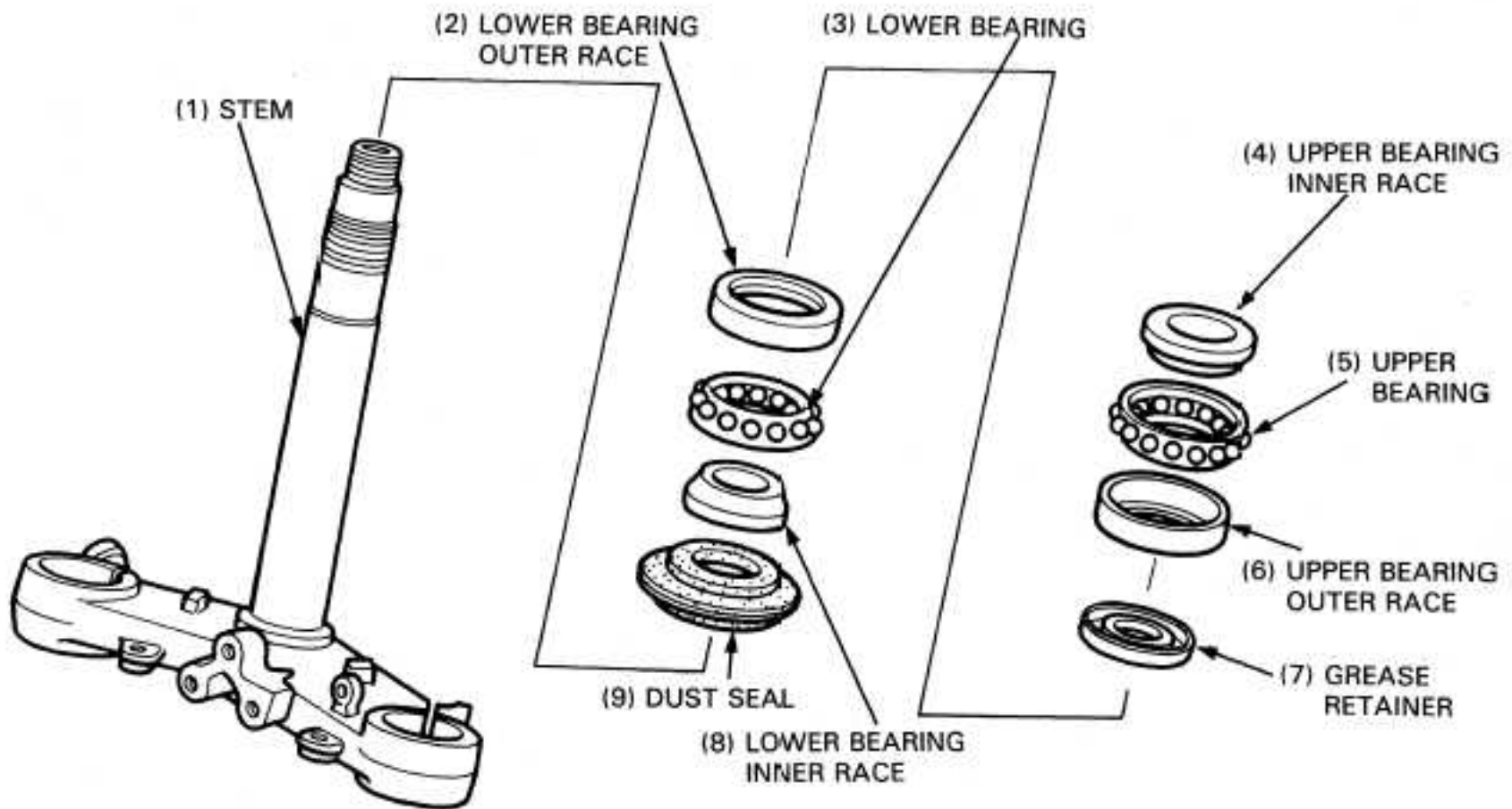
Remove the dust seal.

(1) LOWER BEARING INNER RACE



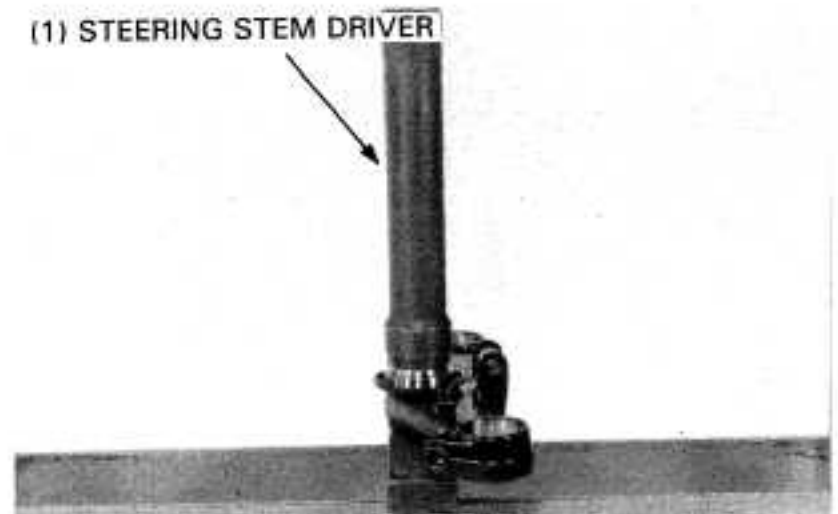
NOTE

- If the motorcycle has been involved in an accident, examine the area around the steering head for cracks or deformation.



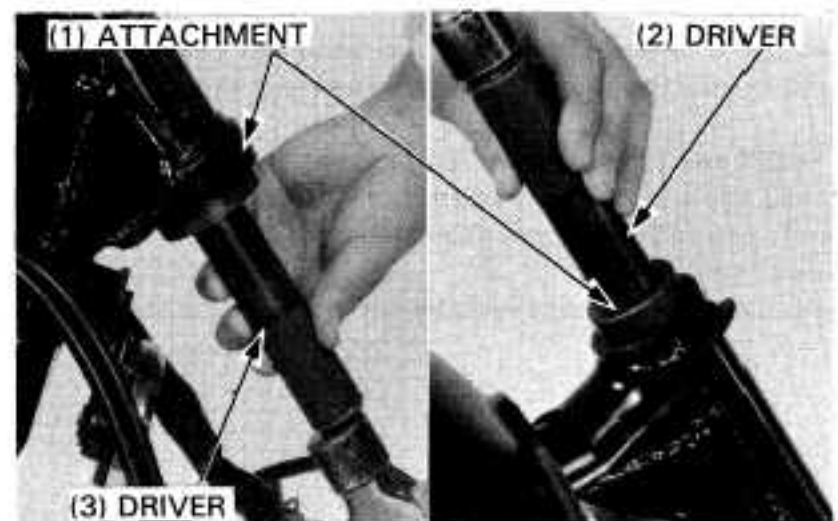
Install a new dust seal over the steering stem.
Press a new lower bearing inner race onto the stem.

TOOL:
Steering stem driver 07946-MB00000



Drive new upper and lower bearing outer races into the steering head pipe.

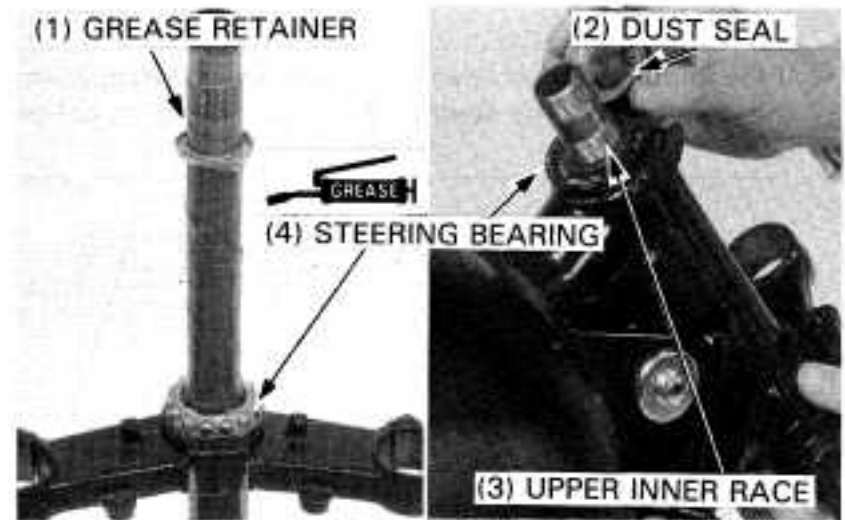
TOOLS:
Upper bearing outer race:
Driver 07749-0010000
Attachment, 42 x 47 mm 07746-0010300
Lower bearing outer race:
Driver 07749-0010000
Attachment, 52 x 55 mm 07746-0010400



FRONT WHEEL/SUSPENSION/STEERING

INSTALLATION

Pack the bearing cavities with grease.
Install the lower bearing and grease retainer onto the stem.
Insert the stem into the steering head pipe and install the upper bearing, inner race, dust seal and steering bearing adjustment nut.

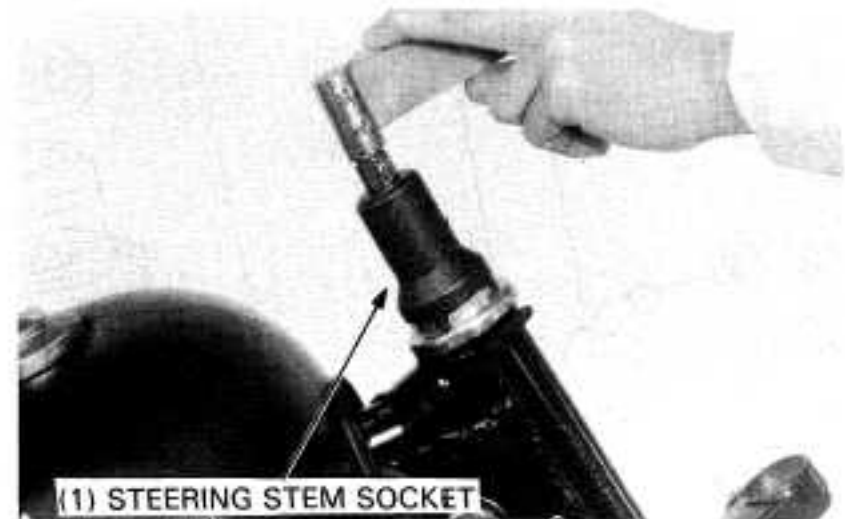


Tighten the steering bearing adjustment nut to the specified torque.

TORQUE: 23–27 N·m (2.3–2.7 kg-m, 17–20 ft-lb)

TOOL:

Steering stem socket 07916–3710100



Turn the steering stem back and forth four or five times to seat the bearings.

Retighten the adjustment nut to the same torque.

Turn the steering stem to seat the bearings.



Install a new lock washer and bend the two opposite tabs down into the grooves in the adjustment nut.

Install and finger tighten the lock nut.

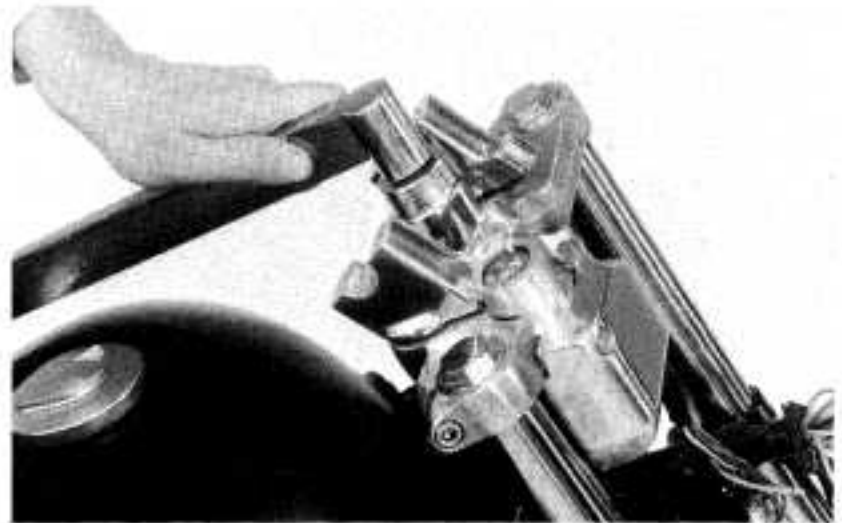
Hold the bearing adjustment nut and further tighten the lock nut, within 90 degrees, to align its grooves with the tabs of the lock washer.

Bend up the lock washer tabs into the grooves of the lock nut.



Install the fork bridge and stem nut.
Temporarily install the front forks.
Tighten the stem nut.

TORQUE: 90 – 120 N·m (9.0 – 12.0 kg·m, 65 – 87 ft·lb)



STEERING HEAD BEARING PRELOAD

Install the front forks (page 11-20).
Install the front wheel (page 11-15).
Place a stand under the engine and raise the front wheel off the ground.
Position the steering stem to the straight ahead position.
Hook a spring scale to the fork tube and measure the steering head bearing preload.

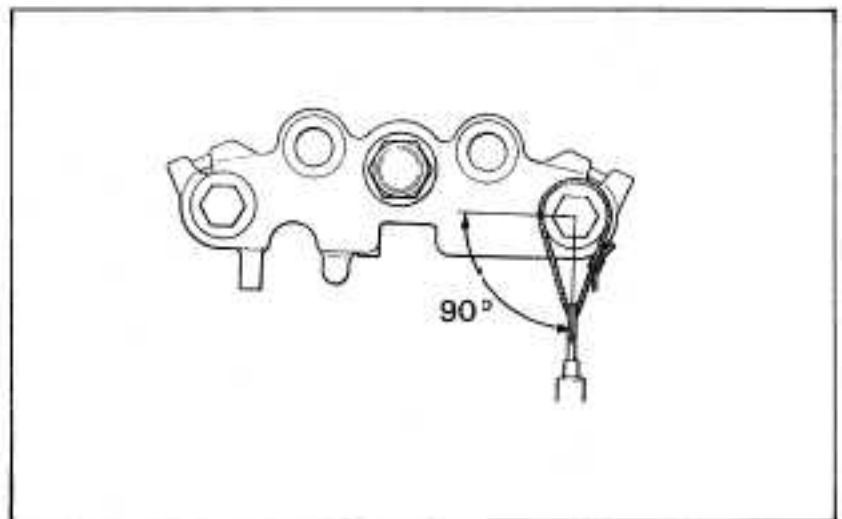
NOTE

- Make sure that there is no cable or wire harness interference.

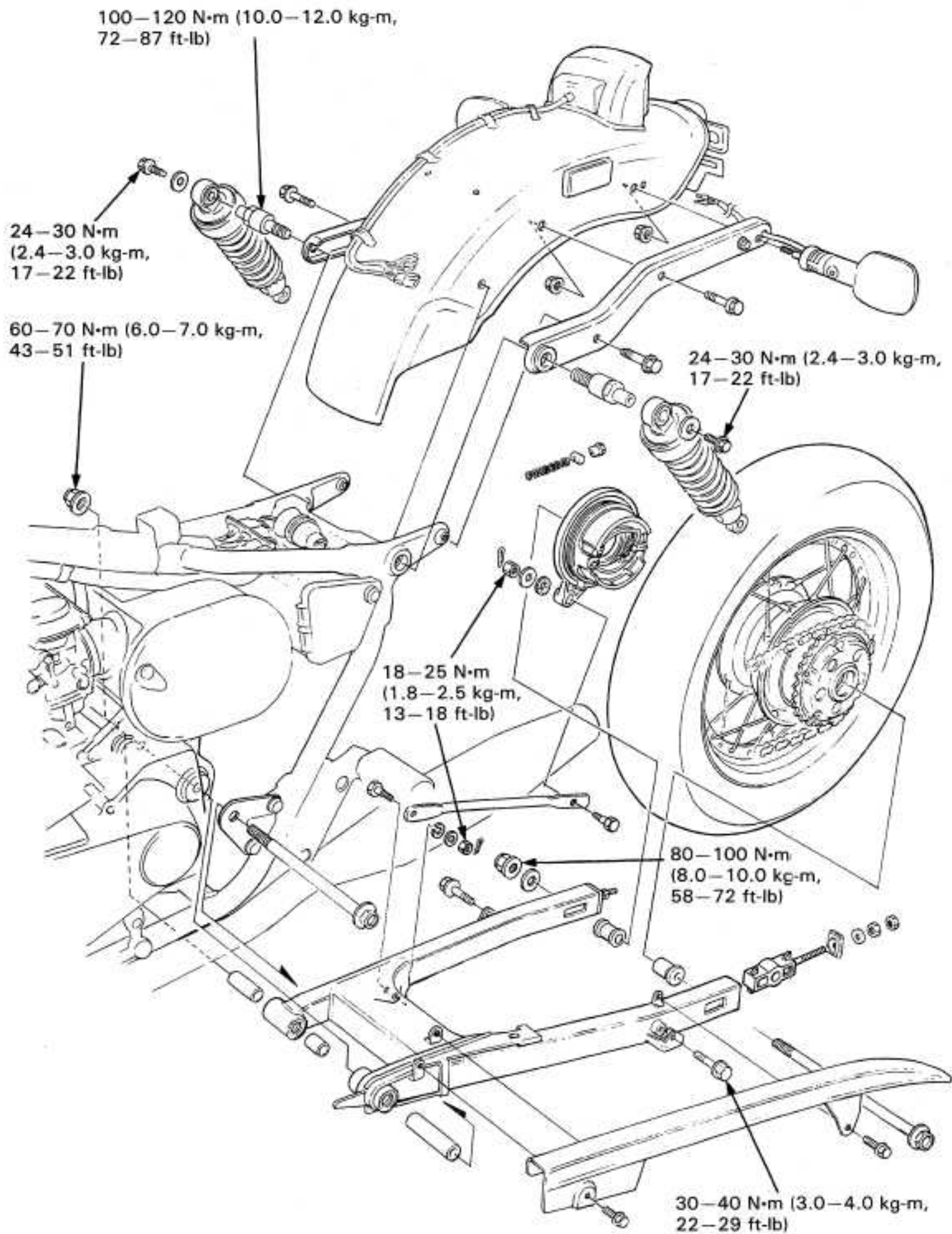


The preload should be within 1.0–1.4 kg (2.2–3.1 lb) for right and left turns.
If the readings do not fall within the limits, lower the front wheel on the ground and adjust the steering bearing adjustment nut.

After making sure the bearing preload is within specification, install the removed parts in the reverse order of removal.



REAR WHEEL/BRAKE/SUSPENSION



12. REAR WHEEL/BRAKE/SUSPENSION

SERVICE INFORMATION	12-1	SHOCK ABSORBER	12-11
TROUBLESHOOTING	12-2	SWINGARM	12-13
REAR WHEEL	12-3	REAR FENDER AND SEATS	12-16
REAR BRAKE	12-9		

SERVICE INFORMATION

GENERAL

- A jack or other support is required to support the motorcycle.
- The rear wheel uses a tubeless tire. For tubeless tire repairs, refer to the Tubeless Tire Manual.

WARNING

- *Brake dust may contain asbestos which can be harmful to your health. Do not use compressed air to clean brake drums or brake panels. Use a vacuum cleaner with a sealed dust collector. Wear a protective face mask and thoroughly wash hands when finished.*

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Axle runout		—	0.2 (0.008)
Rear wheel rim runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Rear brake drum I.D.		140.00–140.03 (5.512–5.513)	141.0 (5.55)
Rear brake lining thickness		5.0–5.2 (0.19–0.20)	2.0 (0.08)
Rear shock absorber spring free length		238.8 (9.40)	234 (9.2)

12

TORQUE VALUES

Spoke nipple		7–11 N·m (0.7–1.1 kg-m, 5–8 ft-lb)
Rear brake torque link nut		18–25 N·m (1.8–2.5 kg-m, 13–18 ft-lb)
Rear axle nut		80–100 N·m (8.0–10.0 kg-m, 58–72 ft-lb)
Rear shock absorber damper lock nut		30–45 N·m (3.0–4.5 kg-m, 22–33 ft-lb)
Rear shock absorber mounting bolt	Upper	24–30 N·m (2.4–3.0 kg-m, 17–22 ft-lb)
	Lower	30–40 N·m (3.0–4.0 kg-m, 22–29 ft-lb)
Swingarm pivot bolt		60–70 N·m (6.0–7.0 kg-m, 43–51 ft-lb)
Final driven sprocket nut		60–70 N·m (6.0–7.0 kg-m, 43–51 ft-lb)
Rear shock absorber upper mount		100–120 N·m (10.0–12.0 kg-m, 72–87 ft-lb)

REAR WHEEL/BRAKE/SUSPENSION

TOOLS

Special

Bearing remover set	07946-MJ00000	Not available in U.S.A. or Bearing remover/installer 07946-KA50000
– Bearing driver shaft	07946-MJ00100	
– Bearing driver head	07946-MJ00200	
Attachment, 28 x 30 mm	07946-1870100	

Common

Bearing remover shaft	07746-0050100	Equivalent commercially available in U.S.A.
Bearing remover head, 17 mm	07746-0050500	
Driver	07749-0010000	
Attachment, 42 x 47 mm	07746-0010300	
Pilot, 17 mm	07746-0040400	
Attachment, 37 x 40 mm	07746-0010200	
Shock absorber compressor	07959-3290001	
Pilot, 22 mm	07746-0041100	
Attachment, 32 x 35 mm	07746-0010100	
Pilot, 15 mm	07746-0040300	
Shock absorber compressor attachment	07959-MB10000	

TROUBLESHOOTING

Oscillation

- Bent rim
- Loose wheel bearings
- Faulty tire
- Loose axle
- Incorrect tire pressure
- Worn swingarm bearings
- Worn tire
- Wheel out of balance

Soft suspension

- Weak spring
- Weak shock absorber damper

Hard suspension

- Bent shock absorber
- Insufficiently lubricated swingarm bearings
- Faulty swingarm pivot bearings

Suspension noise

- Binding shock absorber
- Loose fasteners
- Insufficiently lubricated swingarm pivot

REAR WHEEL

REMOVAL

Loosen the drive chain lock and adjusting nuts and the rear axle nut.

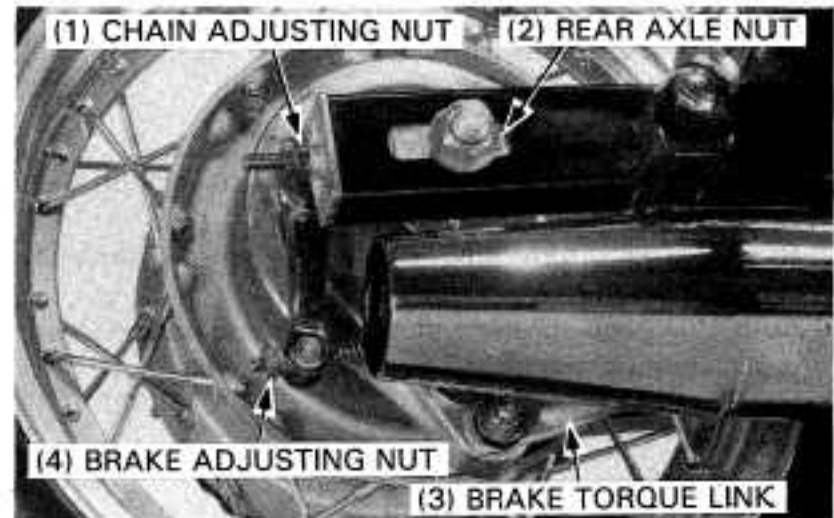
Raise the rear wheel off the ground by placing jacks or support blocks under both exhaust pipes with shop towels.

Remove the rear brake torque link from the brake panel.

Remove the rear brake adjusting nut and brake rod from the brake arm.

Remove the rear axle nut and pull the axle out.

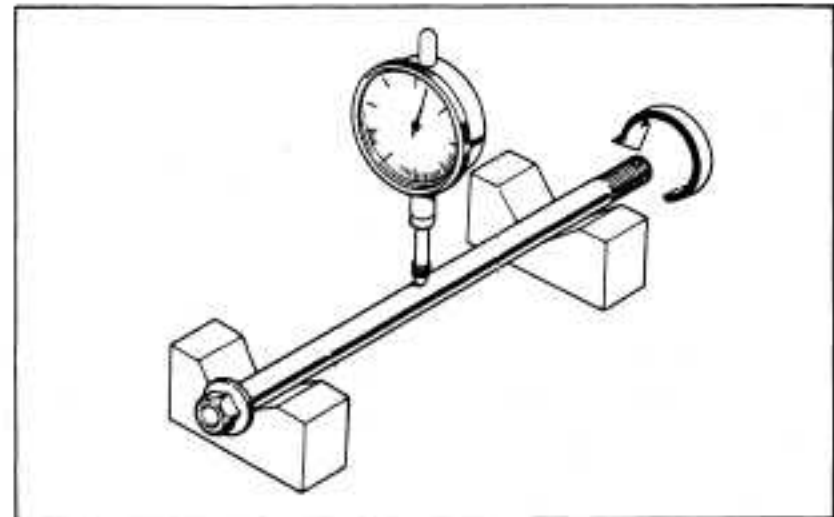
Move the rear wheel forward and derail the drive chain from the driven sprocket, then remove the rear wheel.



INSPECTION

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

SERVICE LIMIT: 0.20 mm (0.008 in)

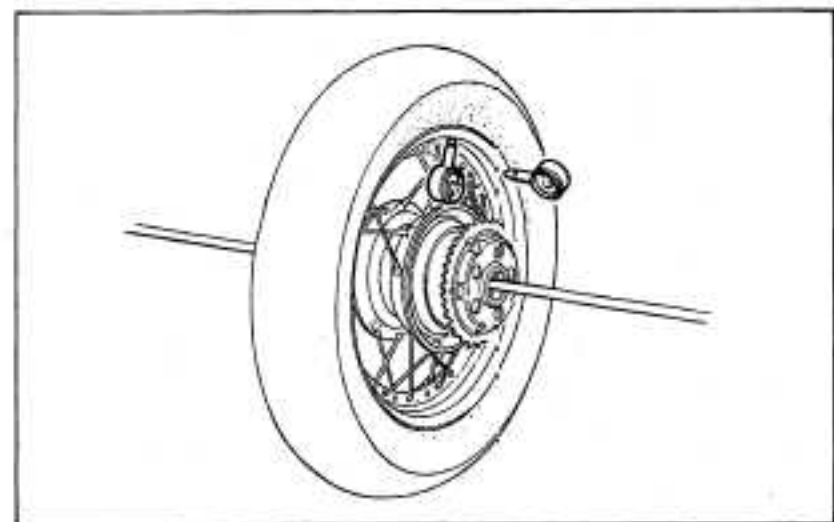


Check the rim runout by placing the wheel on a truing stand. Turn the wheel by hand and measure the runout using a dial indicator.

SERVICE LIMITS:

Radial: 2.0 mm (0.08 in)

Axial: 2.0 mm (0.08 in)



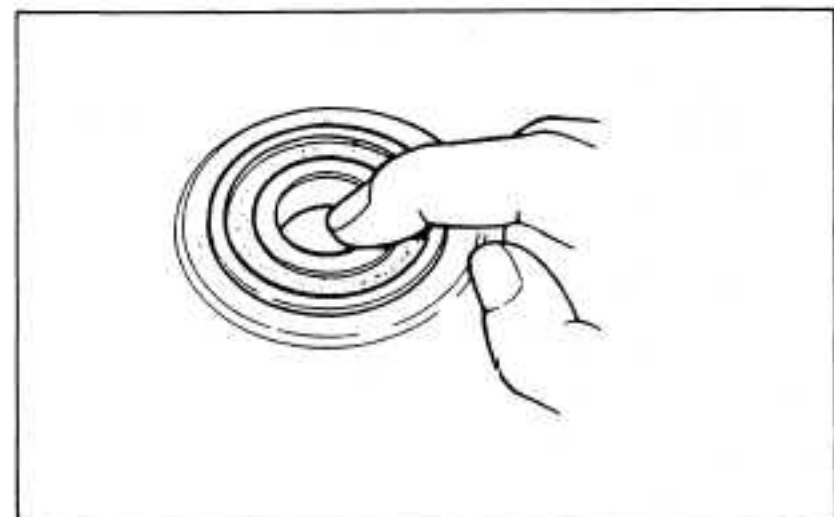
Turn the inner race of each wheel bearing with your finger. The bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the hub.

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

NOTE

- Replace hub bearings in pairs.

For bearing replacement, see page 12-6 and 7.

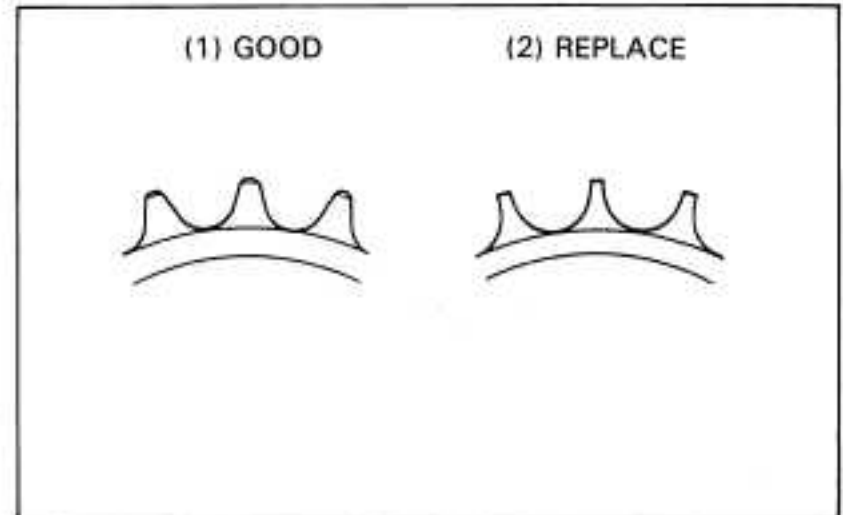


REAR WHEEL/BRAKE/SUSPENSION

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

NOTE

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



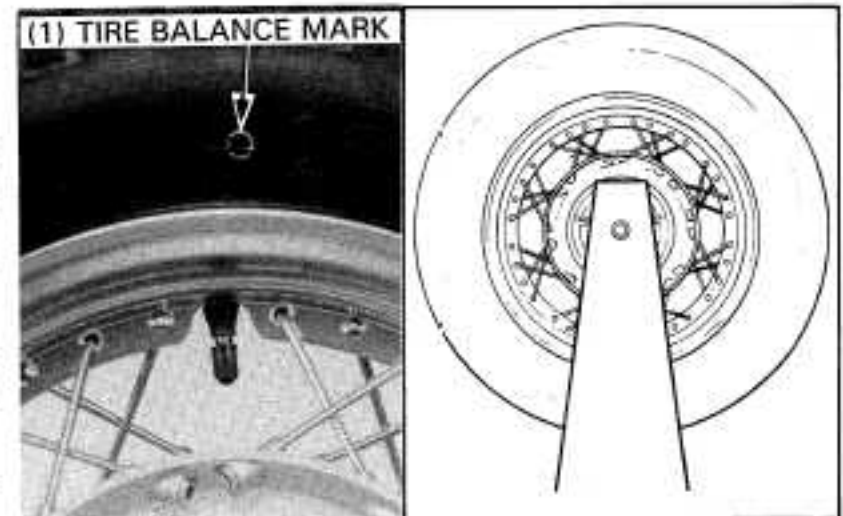
WHEEL BALANCE

CAUTION

- *Wheel balance directly affects the stability, handling and overall safety of the motorcycle. Always check balance when the tire has been removed from the rim.*

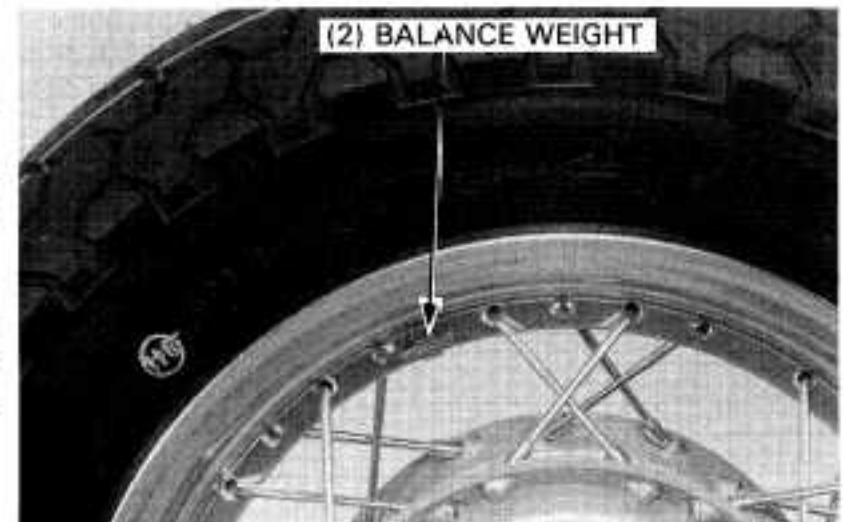
NOTE

- For optimum balance, the tire balance mark (a paint dot on the side wall) must be located next to the valve stem. Remount the tire if necessary.



Remove the dust seal from the wheel.
Mount the wheel assembly in an inspection stand.
Spin the wheel, allow it to stop, and mark the lowest (heaviest) part of the wheel with chalk.
Do this two or three times to verify the heaviest area. If the wheel is balanced, it will not stop consistently in the same position.

To balance the wheel, install wheel weights on the highest side of the rim, the side opposite the chalk marks. Add just enough weight so the wheel will no longer stop in the same position when it is spun.
Do not add more than 70 grams to the rear wheel.



SPOKE REPLACEMENT

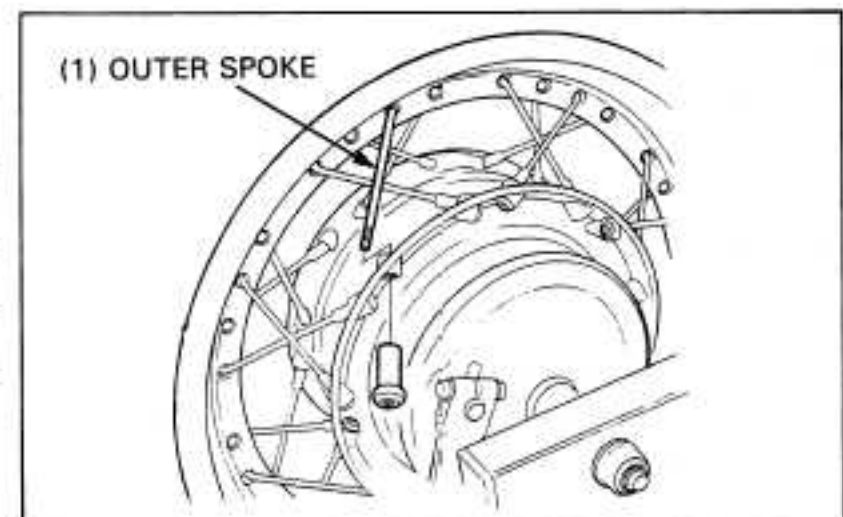
NOTE

- The spoke(s) can be replaced with the wheel installed.
- Tighten the spoke nipple to the specified torque after replacing the spoke.
- Check the spokes for looseness by tapping them after tightening the spoke nipples.

Raise the rear wheel off the ground by placing jacks or support blocks under both exhaust pipes with shop towels.

Outer spoke

Remove the spoke nipple and replace the spoke.



Set the outer spoke properly and tighten the spoke nipple.

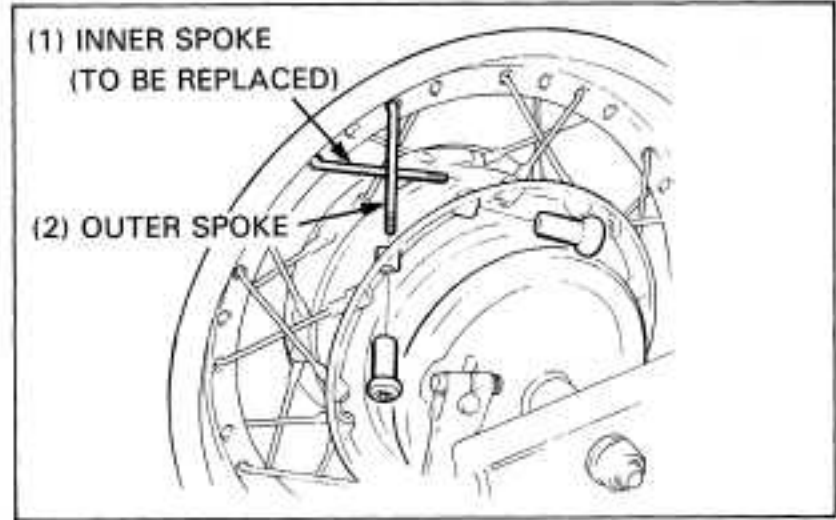
TORQUE: 7–11 N·m (0.7–1.1 kg-m, 5–8 ft-lb)

Inner spoke

Remove the outer spoke nipple of the spoke which crosses the one to be replaced, and then remove the inner spoke nipple and the spoke.

Install new a inner spoke and install and tighten the removed spoke nipples.

TORQUE: 7–11 N·m (0.7–1.1 kg-m, 5–8 ft-lb)



All spokes

Remove the rear wheel (page 12-3).
Remove all spokes.

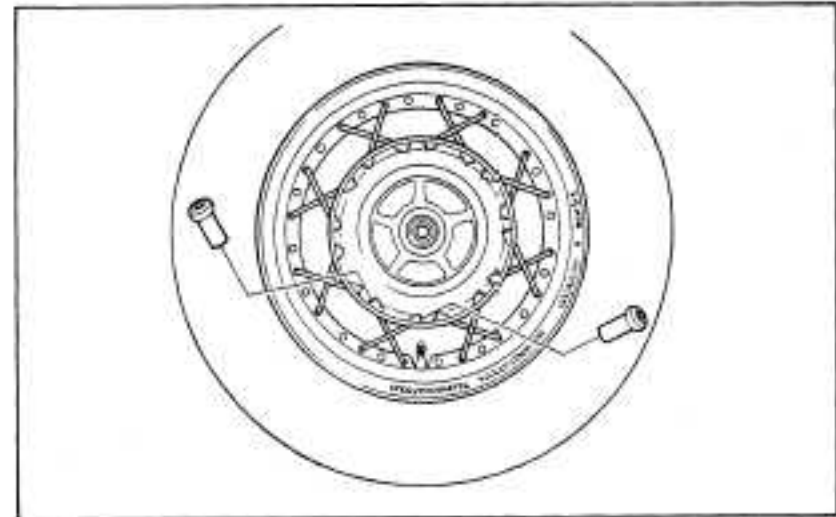
NOTE

- The rear wheel has 32 spokes which are all the same length.

Place the rim with the stamped side facing up. From the opposite side of the rim, install a spoke into the hole next to the tire valve stem, then install a spoke into every other hole; 16 spokes should now be installed. Place the hub with the drum side facing up.

Take the spoke next to the valve stem and move it in a direction away from the stem; then install it into the inner hole in the hub using a spoke nipple.

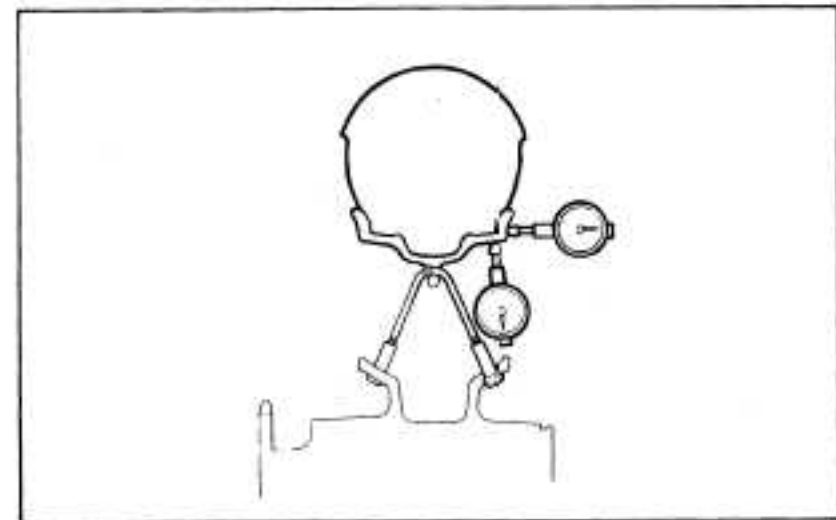
Take the next spoke and cross it over the inner spoke just installed, and install it into the outer hole in the hub. Repeat these steps to install the remaining 14 spokes.



Place the rear wheel in a truing stand and tighten the spoke nipples to the specified torque while chicking the rim runout.

TORQUE: 7–11 N·m (0.7–1.1 kg-m, 5–8 ft-lb)

Install the rear wheel (page 12-8).

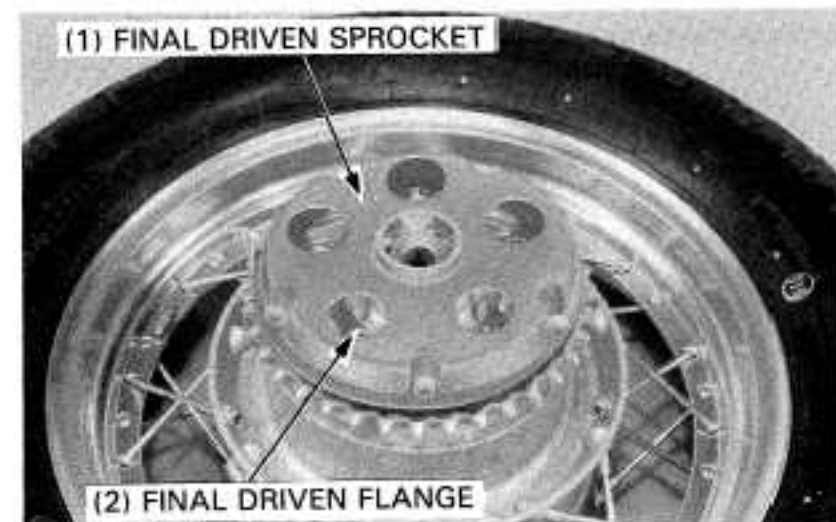


DISASSEMBLY

Remove the final driven sprocket and flange together.

NOTE

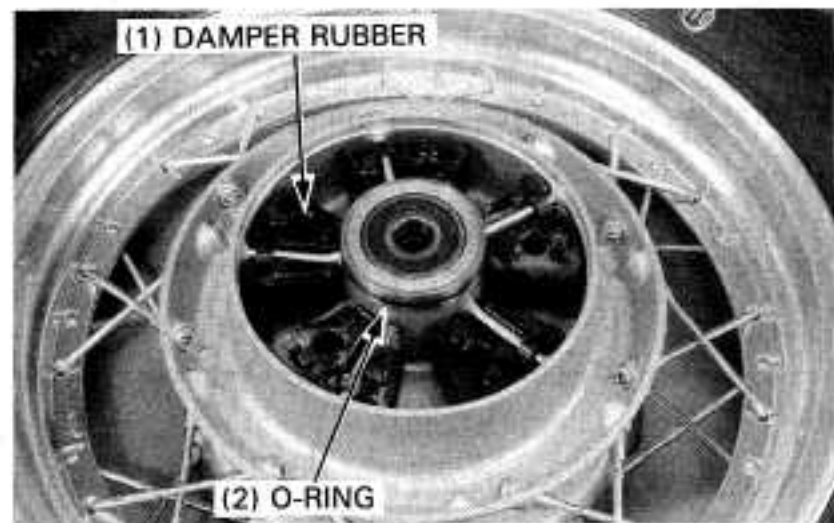
- Do not separate the driven sprocket and flange, unless replacement of the driven sprocket or flange is necessary.



REAR WHEEL/BRAKE/SUSPENSION

Remove the rubber dampers and O-ring.

Replace the rubber dampers if they are damaged or worn.



Insert the bearing remover head into the bearing.
From the opposite side install the bearing remover shaft and drive the bearing out of the wheel.
Remove the distance collar and drive out the other bearing.

NOTE

- If the wheel bearings are removed, they must be replaced with new ones.

TOOLS:

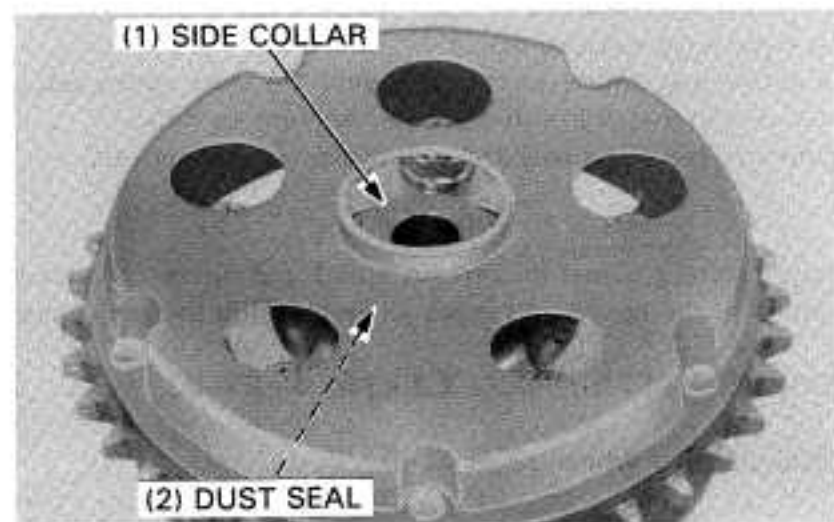
Bearing remover shaft

07746-0050100 or
Equivalent commercially
available in U.S.A.

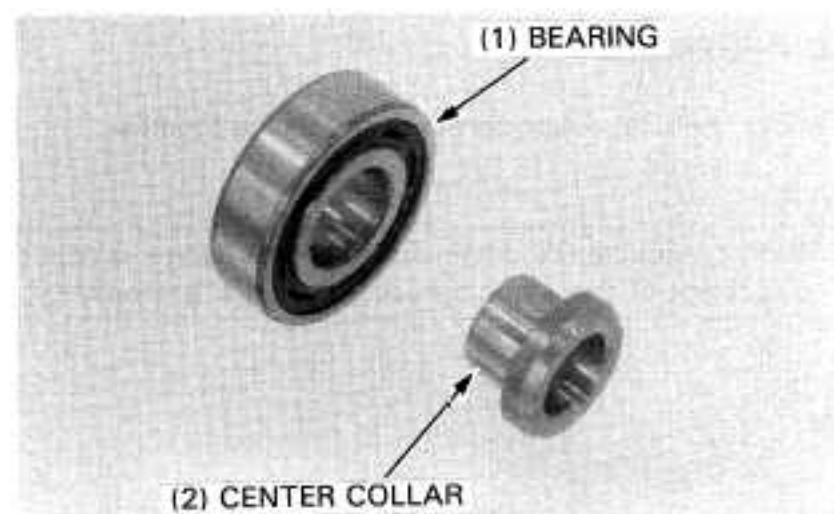
Bearing remover head, 17 mm

07746-0050500 or
Equivalent commercially
available in U.S.A.

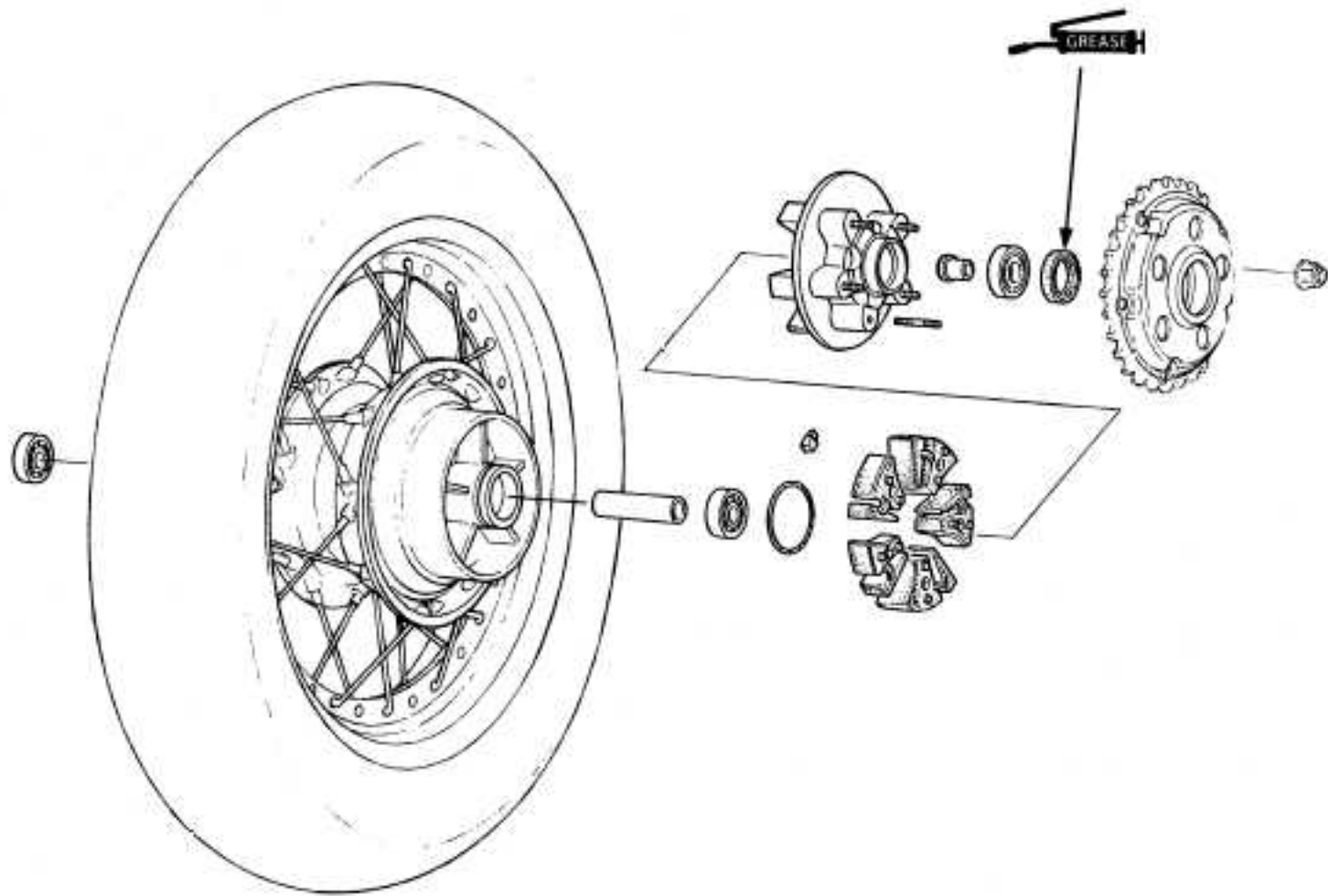
Remove the side collar and dust seal from the final driven flange.
Drive the bearing out of the final driven flange.



Remove the center collar from the bearing.



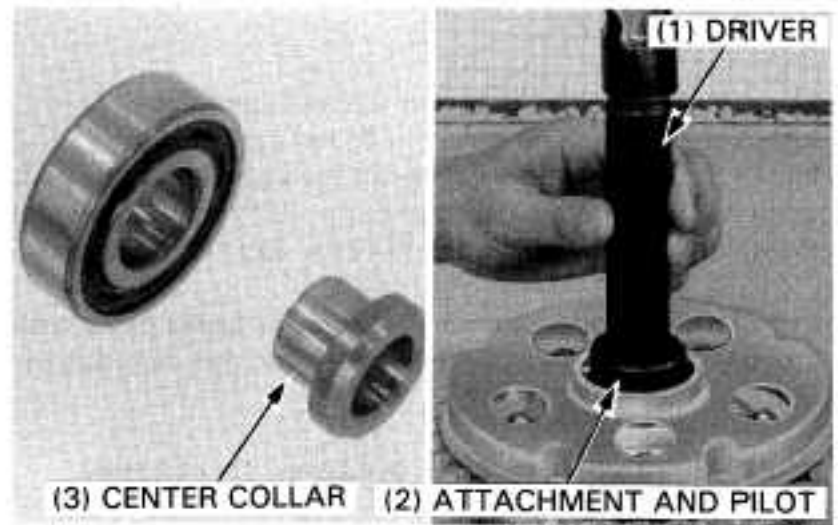
ASSEMBLY



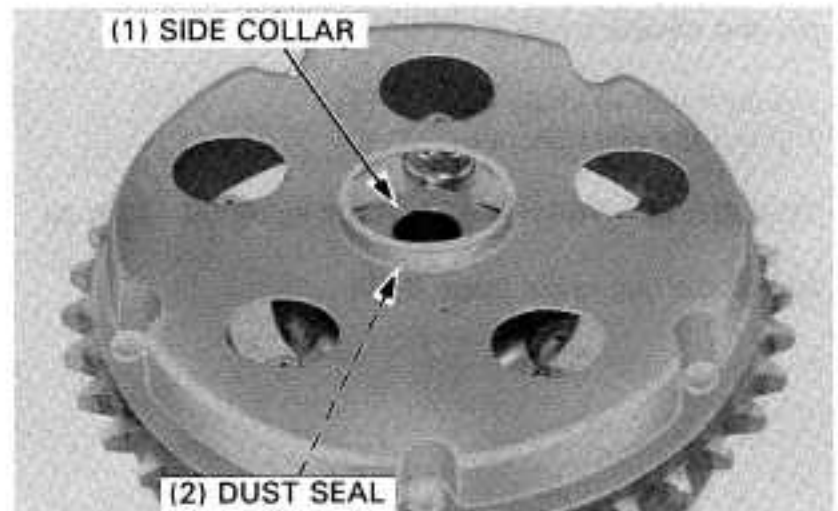
Install the center collar into a new bearing.
 Drive the bearing in the final driven flange squarely with the markings facing up until it is fully seated.

TOOLS:

- | | |
|------------------------|---------------|
| Driver | 07749-0010000 |
| Attachment, 42 x 47 mm | 07746-0010300 |
| Pilot, 17 mm | 07746-0040400 |



Grease the dust seal lip and install the seal into the final driven flange.
 Install the side collar.



REAR WHEEL/BRAKE/SUSPENSION

Drive in a new right bearing first, with the markings facing up, until it is fully seated. Install the distance collar, and drive in a new left bearing.

TOOLS:

Left bearing:

Driver	07749-0010000
Attachment, 42 x 47 mm	07746-0010300
Pilot, 17 mm	07746-0040400

Right bearing:

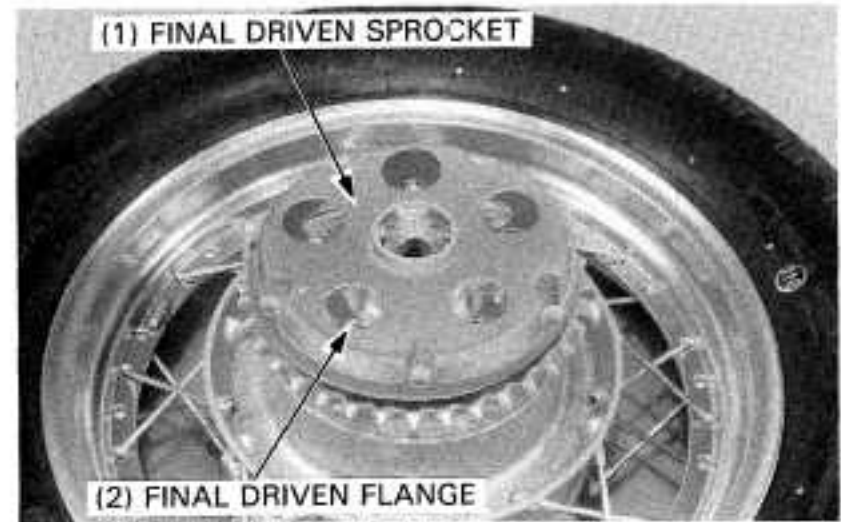
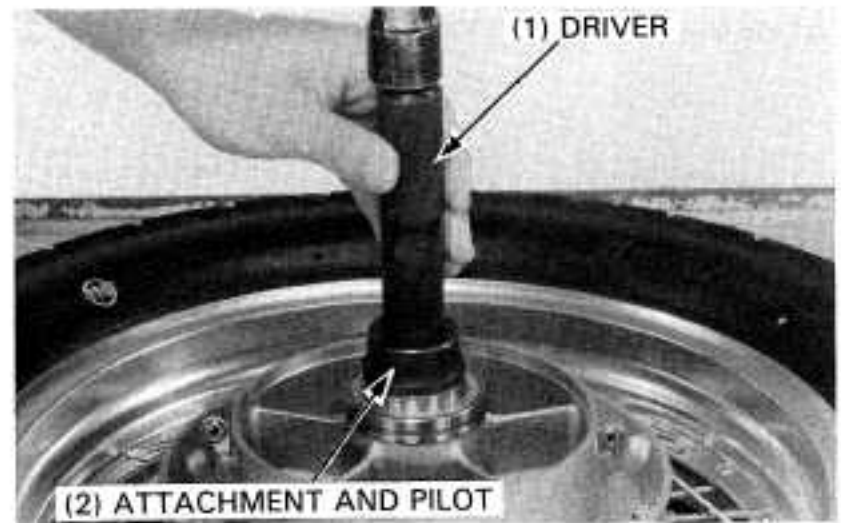
Driver	07749-0010000
Attachment, 37 x 40 mm	07746-0010200
Pilot, 17 mm	07746-0040400

Install the rubber dampers and O-ring into the hub.
Install the final driven flange into the hub.

If the driven sprocket has been removed from the final driven flange, tighten five driven sprocket nuts in a criss-cross pattern in 2-3 steps.

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

Install the brake panel into the rear wheel.



INSTALLATION

Place the rear wheel between the swingarm legs.
Install the drive chain onto the driven sprocket.
Install the drive chain adjusters in the swingarm ends with the graduation scale facing out and the "UP" mark facing up.
Insert the rear axle from the left side and install the axle nut.

Install the rear brake torque link onto the brake panel with the stopper bolt, rubber spacer, washer and nut, and tighten the nut.

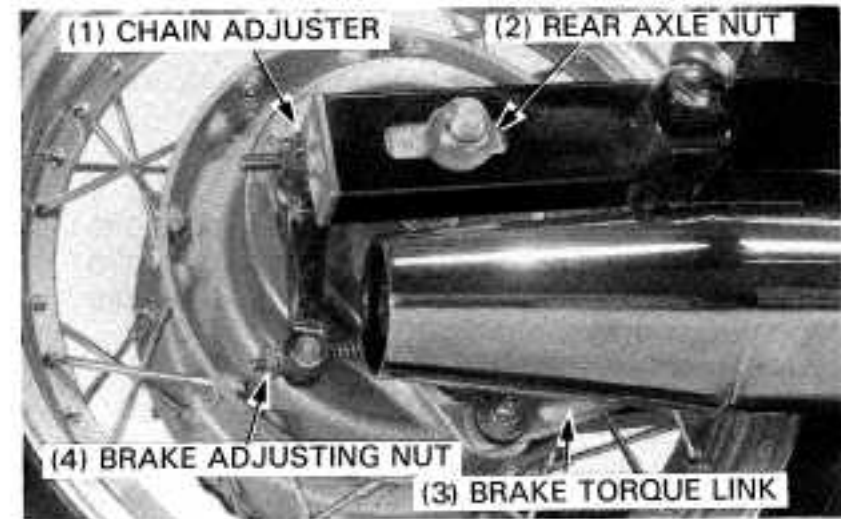
TORQUE: 18–25 N·m (1.8–2.5 kg·m, 13–18 ft·lb)

Secure the nut with a new cotter pin.
Connect the rear brake rod to the brake arm with the brake arm pin and adjusting nut.

Adjust the drive chain (page 3-11).
Tighten the rear axle nut.

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

Adjust the rear brake (page 3-15).



REAR BRAKE

REMOVAL

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

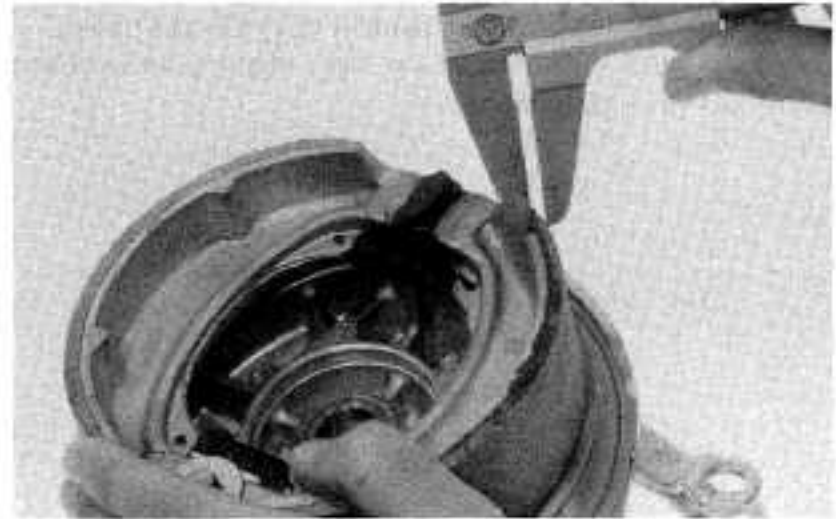
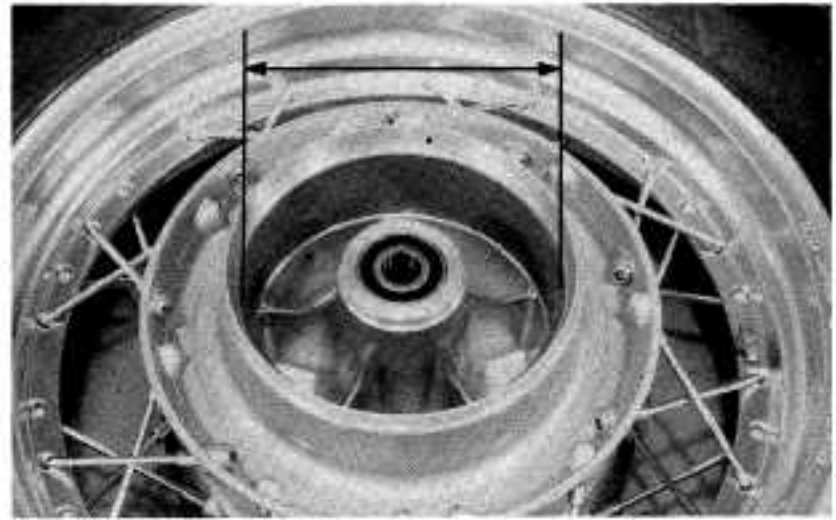
INSPECTION

Measure the rear brake drum I.D.

SERVICE LIMIT: 141.0 mm (5.55 in)

Measure the rear brake lining thickness.

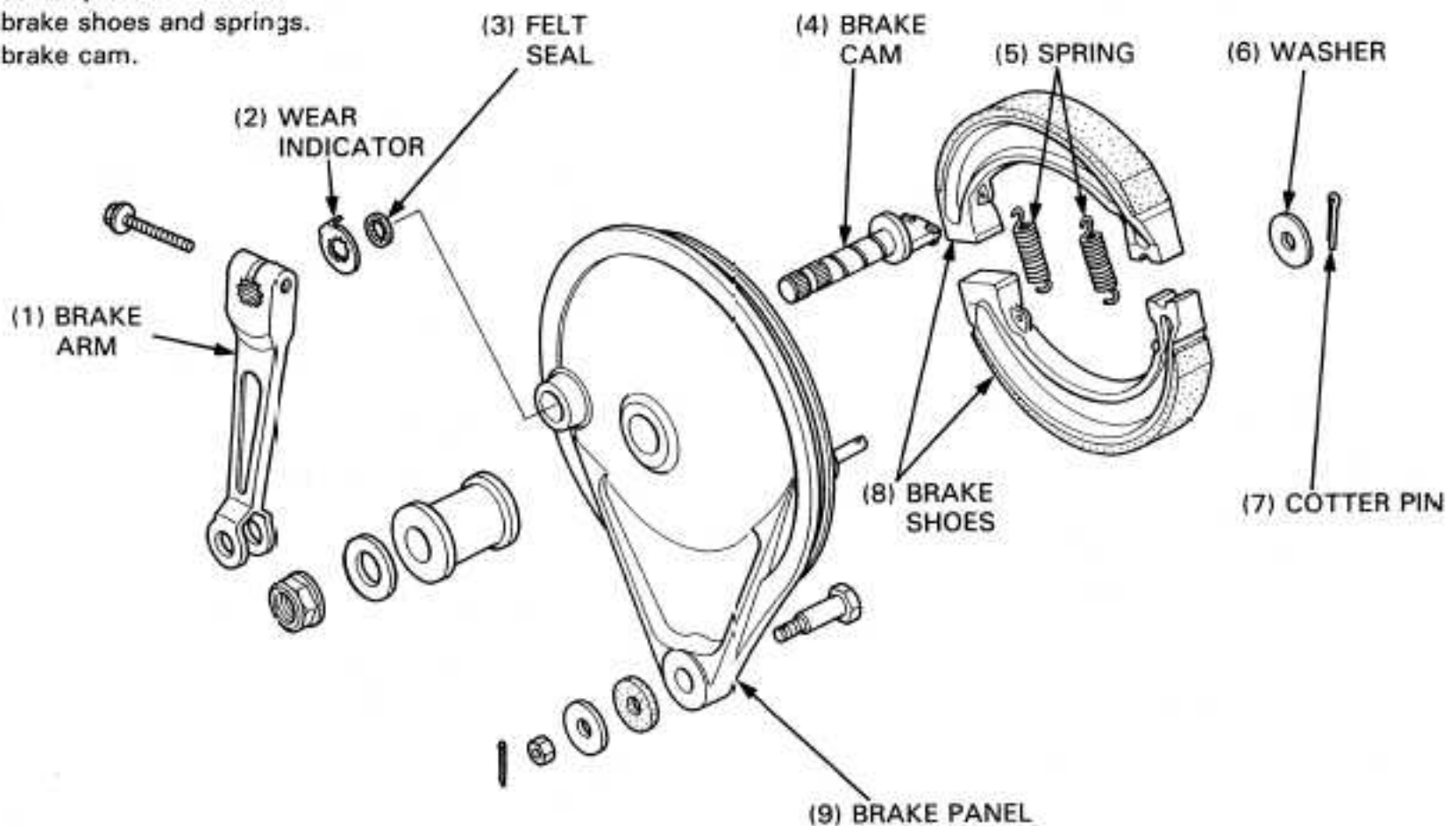
SERVICE LIMIT: 2.0 mm (0.08 in)



DISASSEMBLY

Remove the following:

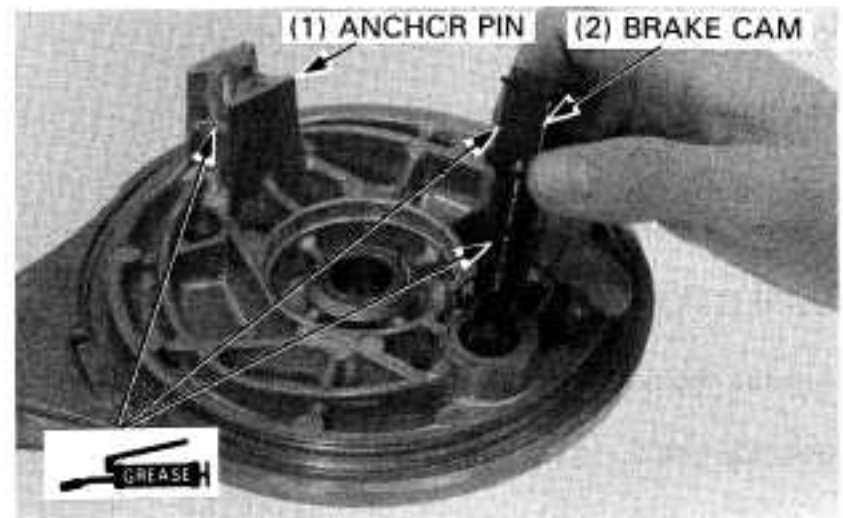
- brake arm and wear indicator.
- cotter pin and washer.
- brake shoes and springs.
- brake cam.



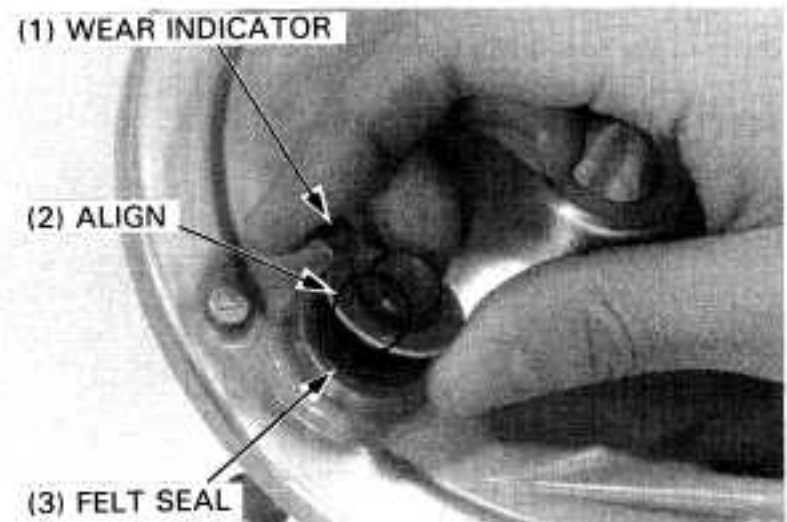
REAR WHEEL/BRAKE/SUSPENSION

ASSEMBLY

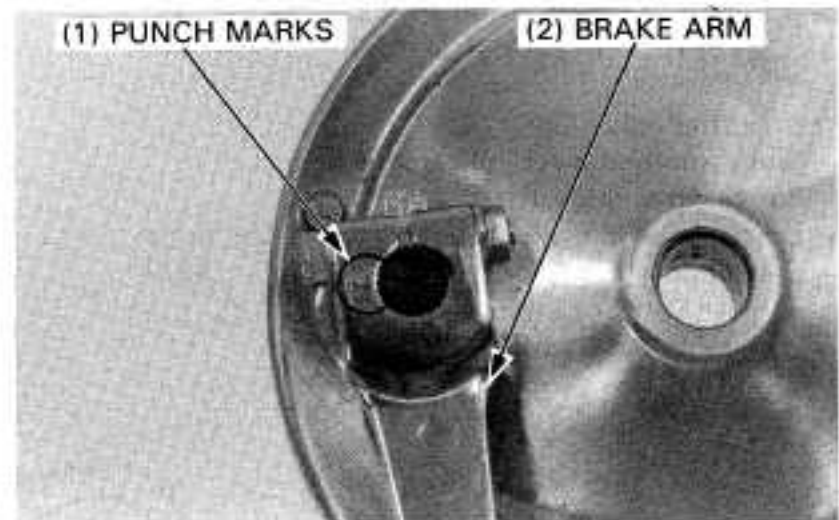
Apply grease to the anchor pin and brake cam.
Install the brake cam.



Apply oil to the felt seal and install it on the brake panel.
Install the wear indicator on the cam, aligning its wide tooth with the cam's wide groove.



Install the brake arm, aligning the punch marks on the cam and the brake arm and tighten the brake arm bolt.

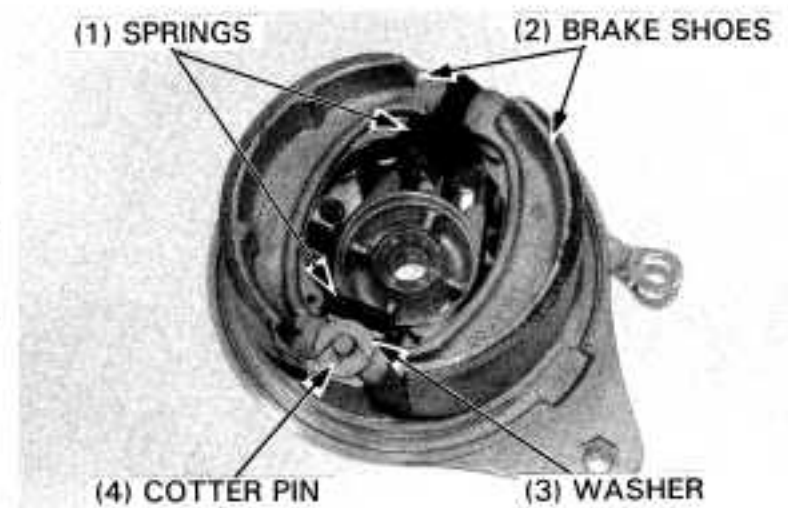


Install the brake shoes and springs.
Install the washer and a new cotter pin.

WARNING

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

Install the brake panel onto the rear wheel.
Install the rear wheel (page 12-8).



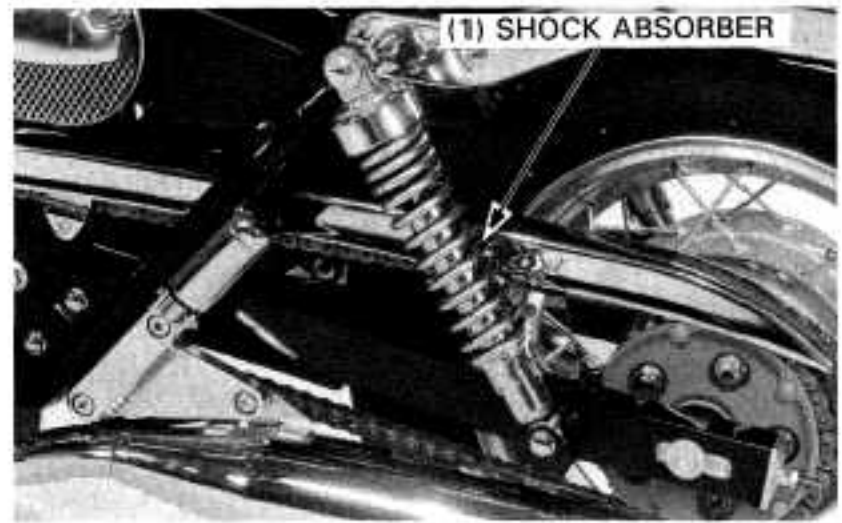
SHOCK ABSORBER

REMOVAL

Raise the rear wheel off the ground with a jack or workstand under the engine.

Adjust the shock absorber to the softest position.

Remove the rear shock absorber upper and lower mounting bolts.

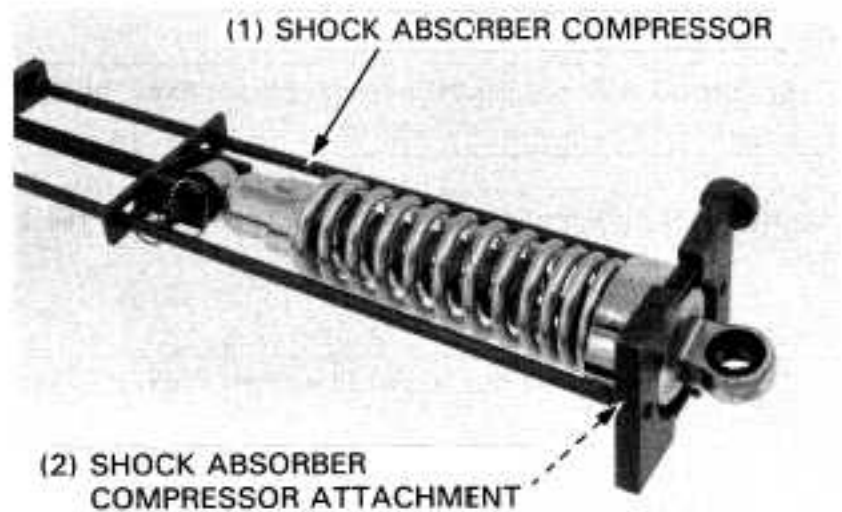


DISASSEMBLY

Set the shock absorber in the shock absorber compressor and compress the spring.

TOOLS:

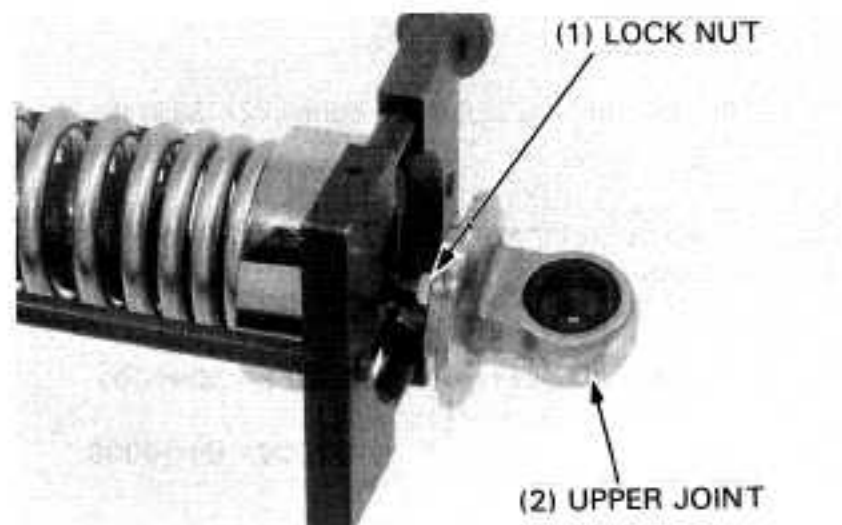
Shock absorber compressor	07959-3290001
Shock absorber compressor attachment	07959-MB10000



Place the upper joint in a vise.

Loosen the lock nut and remove the upper joint.

Loosen the compressor and remove the shock absorber from the compressor.



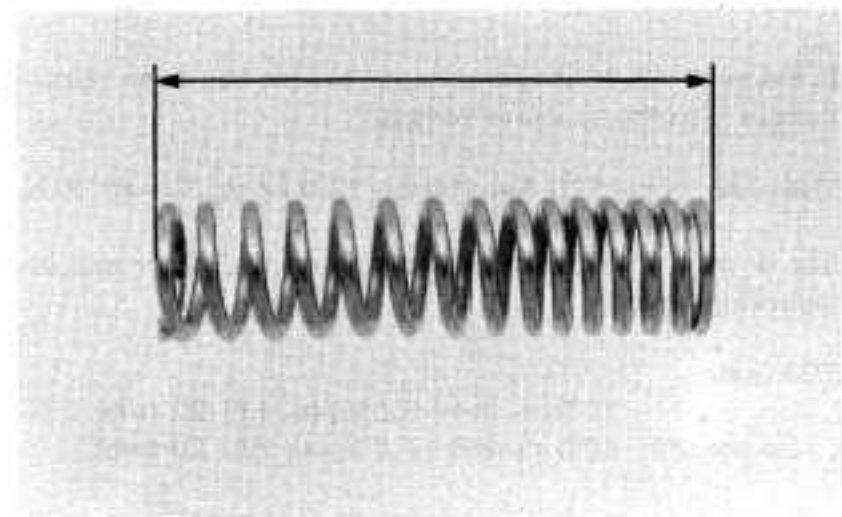
INSPECTION

Check the following:

- damper rod for damage.
- damper unit for oil leaks.
- damper rubber for damage.

Measure the rear shock absorber spring free length.

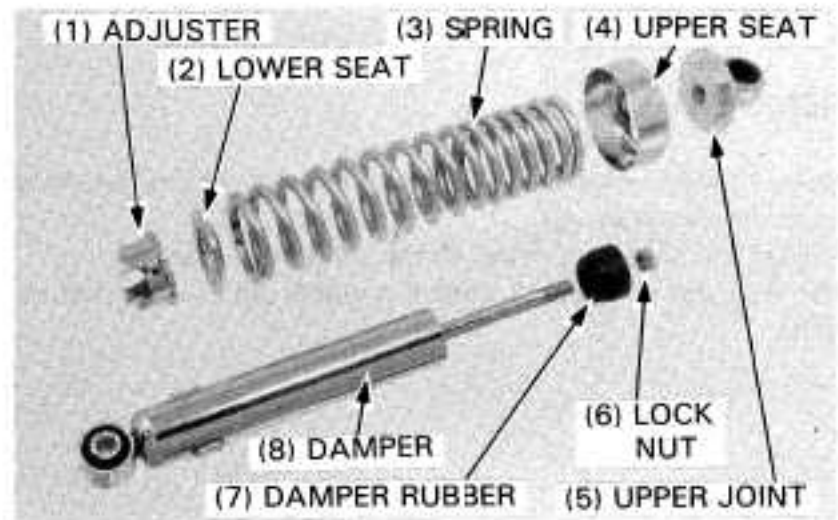
SERVICE LIMIT: 234 mm (9.2 in)



REAR WHEEL/BRAKE/SUSPENSION

ASSEMBLY

Place the adjuster, lower seat, spring, upper seat and damper rubber on the damper.
Install the spring with the tightly wound coils facing up.



CAUTION

- Be sure the base is adjusted correctly for the shock spring seat and the clevis pin is all the way in.

Apply a locking agent to the rod threads and install the lock nut.

NOTE

- Check that the lock nut is seated against the rod's bottom thread.

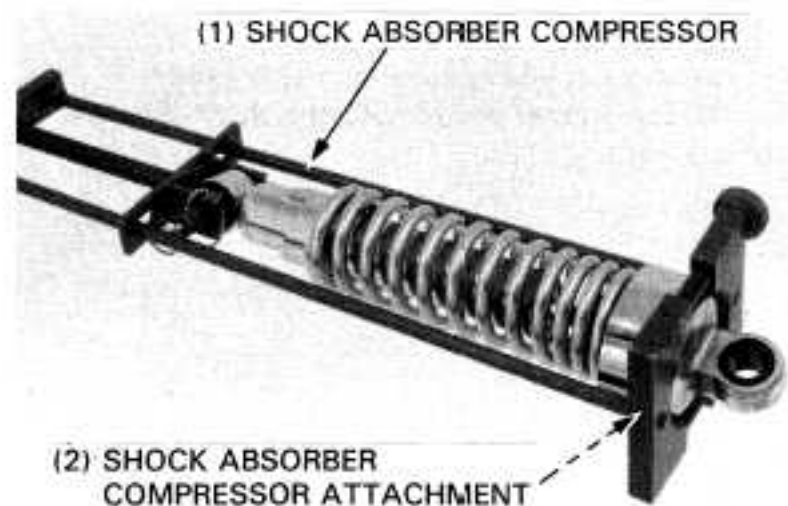
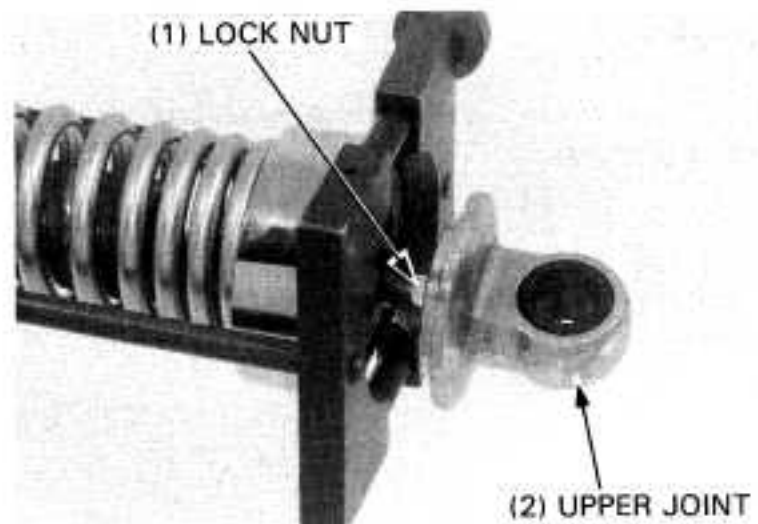
Place the shock absorber into the compressor and screw the upper joint on. Pull the damper rod fully out and apply a locking agent to the damper rod threads. Hold the upper joint in a vise and tighten the lock nut securely.

TORQUE: 30–45 N·m (3.0–4.5 kg·m, 22–33 ft·lb)

Align the spring upper seat with the upper joint while releasing the compressor.

TOOLS:

Shock absorber compressor	07959–3290001
Shock absorber compressor attachment	07959–MB10000



INSTALLATION

If the rear shock absorber upper mount has been removed, tighten it to the specified torque.

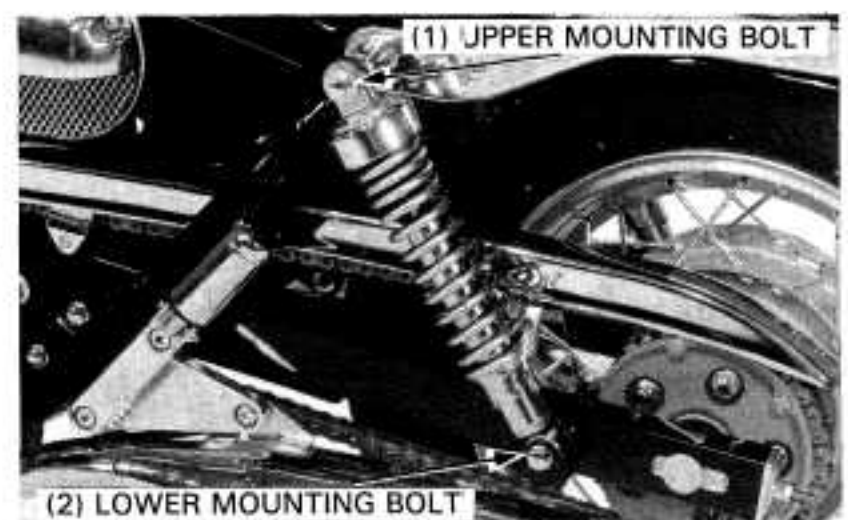
TORQUE: 100–120 N·m (10.0–12.0 kg·m, 72–87 ft·lb)

Install the shock absorber and tighten the upper and lower mounting bolts.

TORQUE:

Upper:	24–30 N·m (2.4–3.0 kg·m, 17–22 ft·lb)
Lower:	30–40 N·m (3.0–4.0 kg·m, 22–29 ft·lb)

Adjust the shock absorber to the desired position.

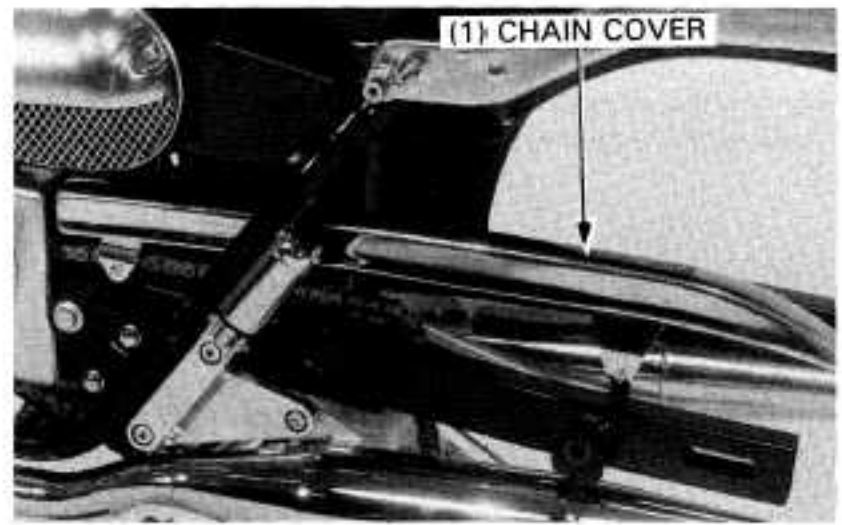


SWINGARM

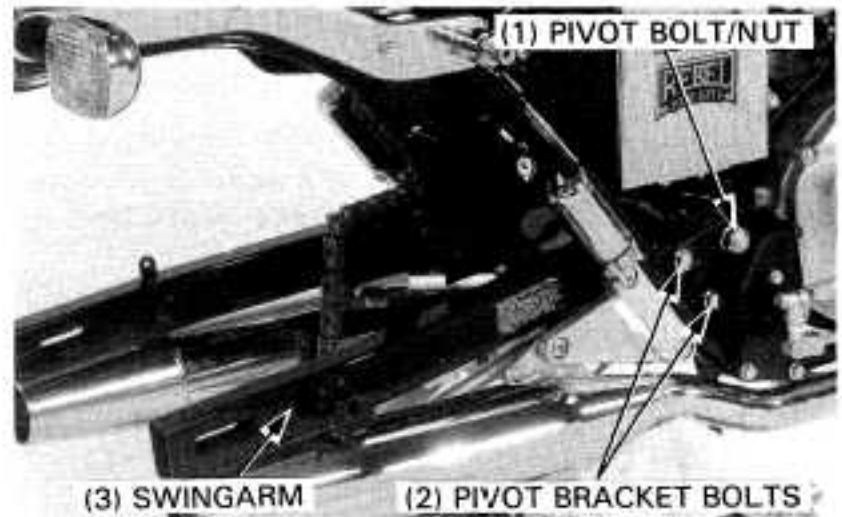
REMOVAL

Remove the following:

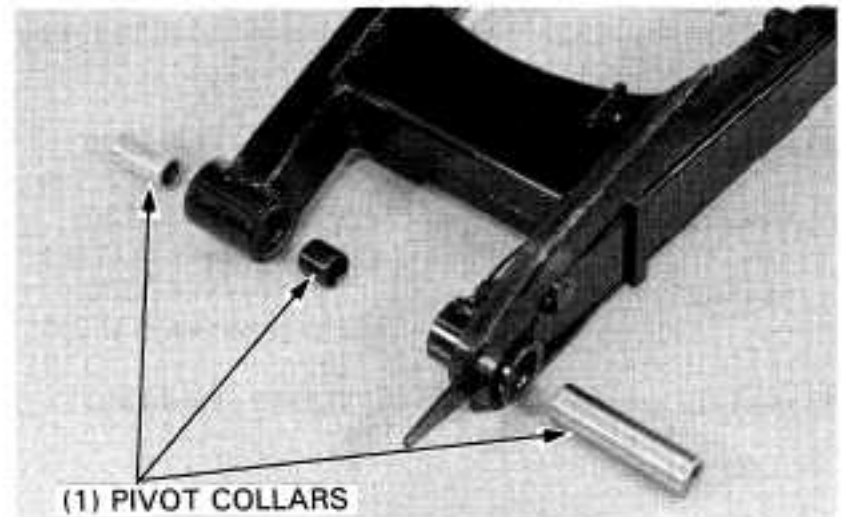
- rear wheel (page 12-3).
- rear shock absorbers (page 12-11).
- drive chain cover.



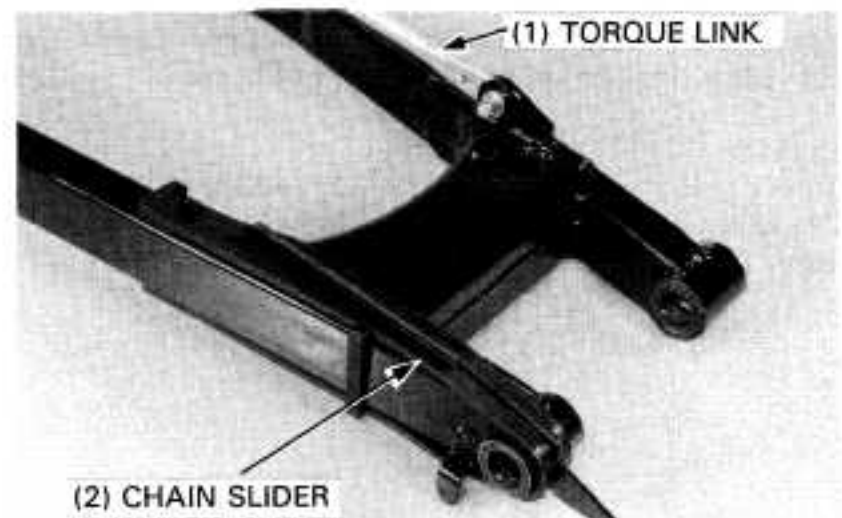
Loosen the swingarm pivot bolt/nut, and the left and right pivot bracket bolts. Remove the pivot bolt and the swingarm from the frame.



Remove the pivot collars from the swingarm pivots.



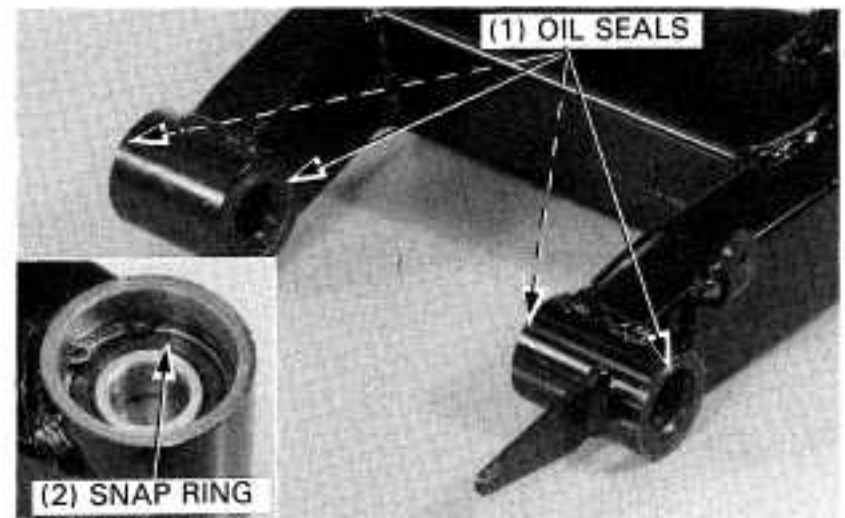
Remove the chain slider and brake torque link from the swingarm.



REAR WHEEL/BRAKE/SUSPENSION

PIVOT BEARING REPLACEMENT

Remove the oil seals from both sides of the pivots.
Remove the snap ring from the right swingarm pivot.



Press the right pivot bearings out of the pivot from the inside.

TOOLS:

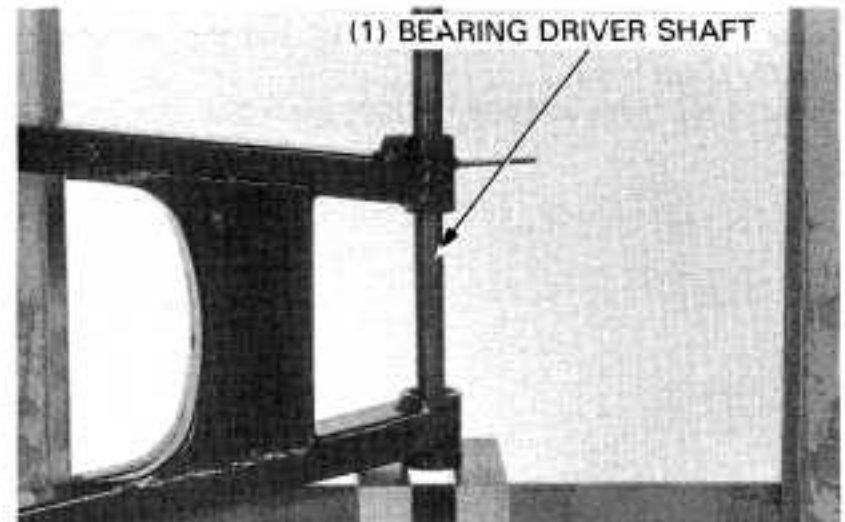
Bearing driver shaft

07946-MJ00100

Not available in U.S.A. or

Bearing remover/installer

07946-KA50000



Press the left pivot bearing out of the pivot from the inside.

TOOLS:

Bearing remover set

07946-MJ00000

Not available in U.S.A.

— Bearing driver shaft

07946-MJ00100

Not available in U.S.A.

— Bearing driver head

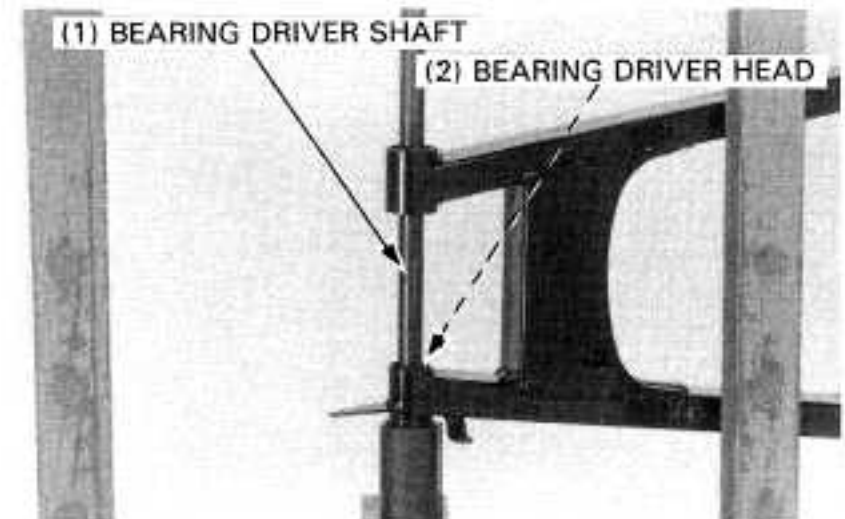
07946-MJ00200

Not available in U.S.A.

or

Bearing remover/installer

07946-KA50000



Grease a new needle bearing and press it into the left swing-arm pivot until the driver attachment bottoms.

TOOLS:

Driver

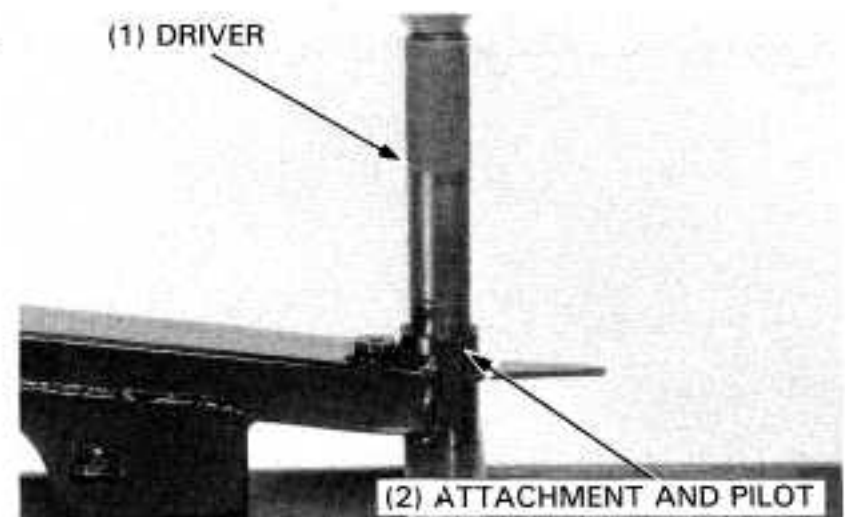
07749-0010000

Attachment, 28 X 30 mm

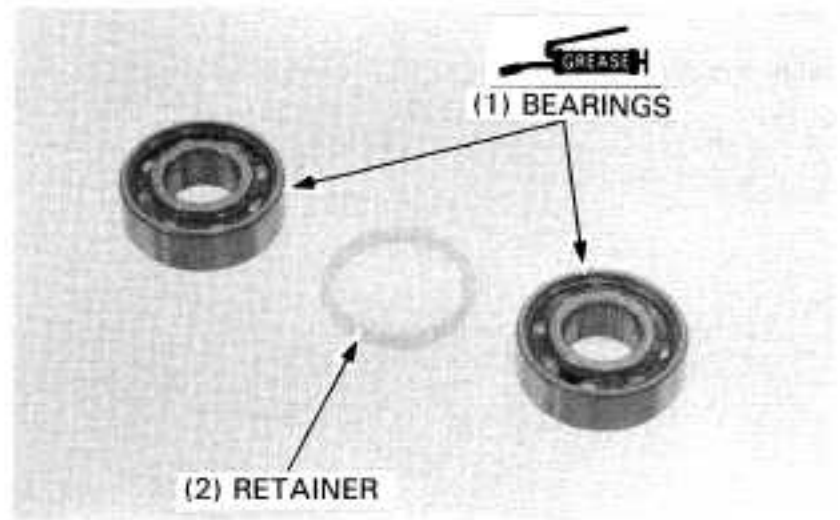
07946-1870100

Pilot, 22 mm

07746-0041100



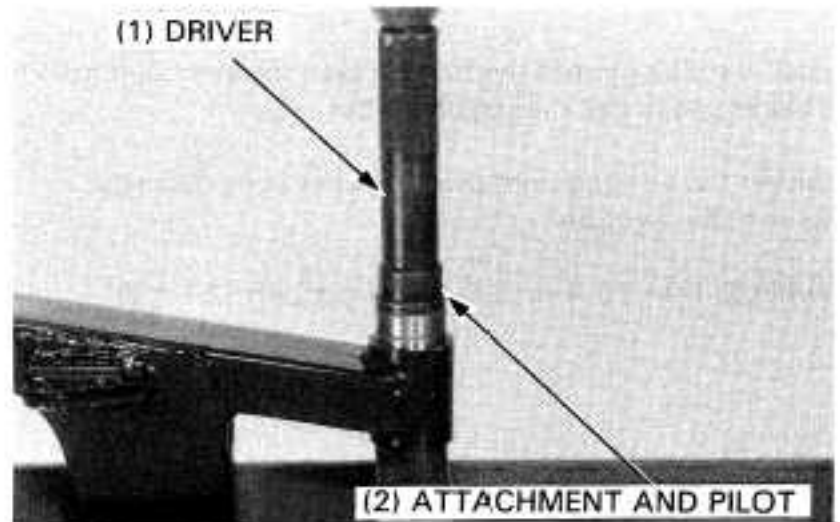
Pack all bearing cavities with grease and assemble the bearings and retainer.



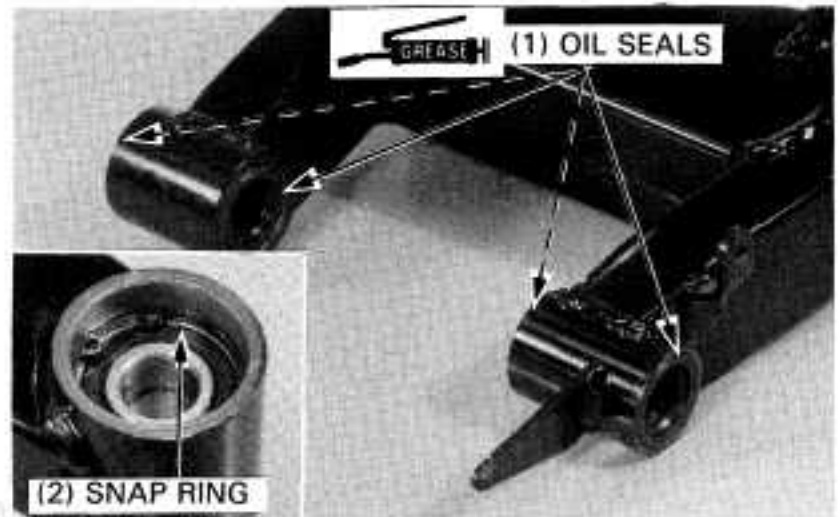
Press the two ball bearings into the right swingarm pivot until they are fully seated.

TOOLS:

- | | |
|------------------------|---------------|
| Driver | 07749-0010000 |
| Attachment, 32 X 35 mm | 07746-0010100 |
| Pilot, 15 mm | 07746-0040300 |



Install the snap ring into the right swingarm pivot. Grease new oil seal lips and install them into the swingarm pivots.



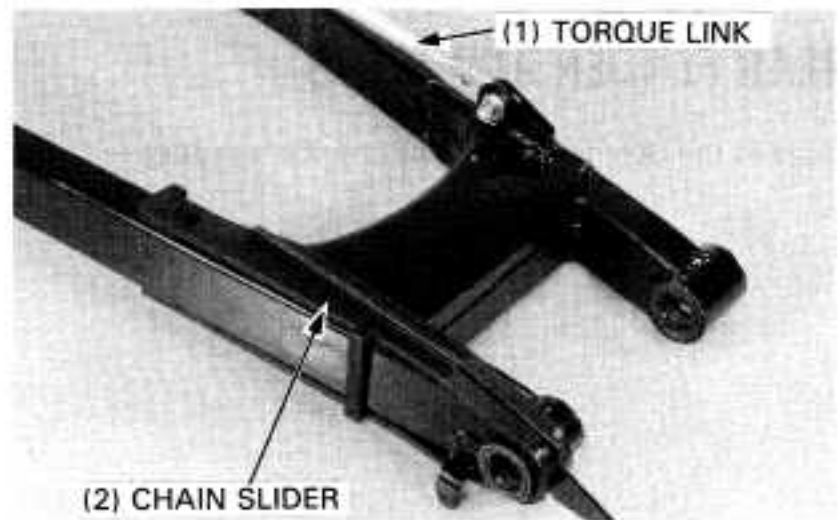
INSTALLATION

Install the brake torque link to the swingarm with the bolt, spring washer, plain washer and nut, and tighten the nut.

TORQUE: 18-25 N·m (1.8-2.5 kg·m, 13-18 ft·lb)

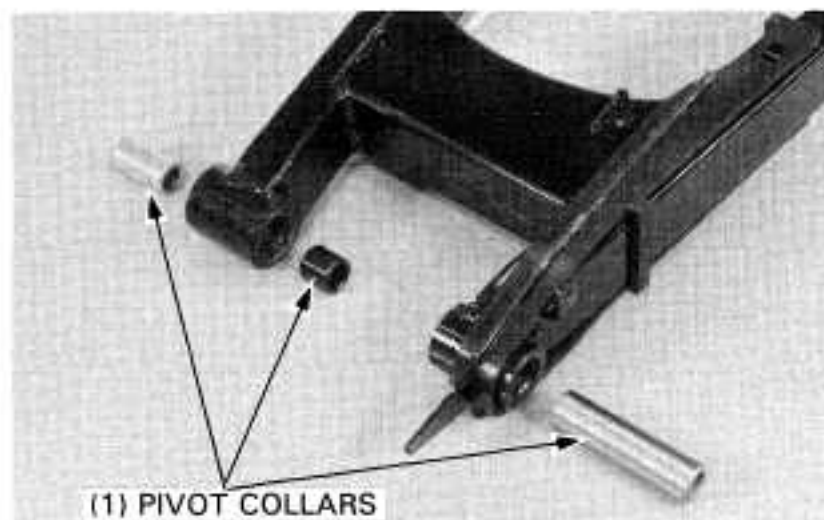
Secure the nut with a new cotter pin.

Install the chain slider onto the swingarm.



REAR WHEEL/BRAKE/SUSPENSION

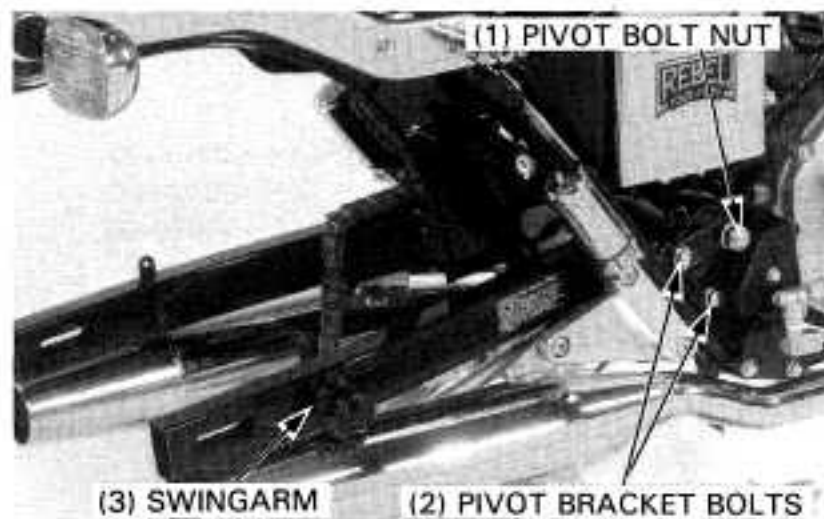
Install the pivot collars.



Install the swingarm in the frame, insert the pivot bolt from the left side and install the pivot bolt nut.

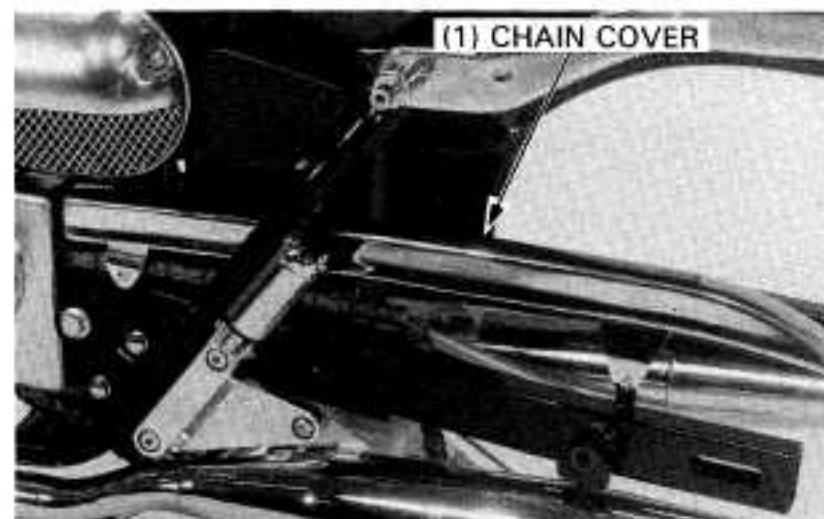
Tighten the left and right pivot bracket bolts securely.
Tighten the pivot bolt.

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



Install the following:

- chain cover
- rear shock absorbers
- rear wheel (page 12-8).

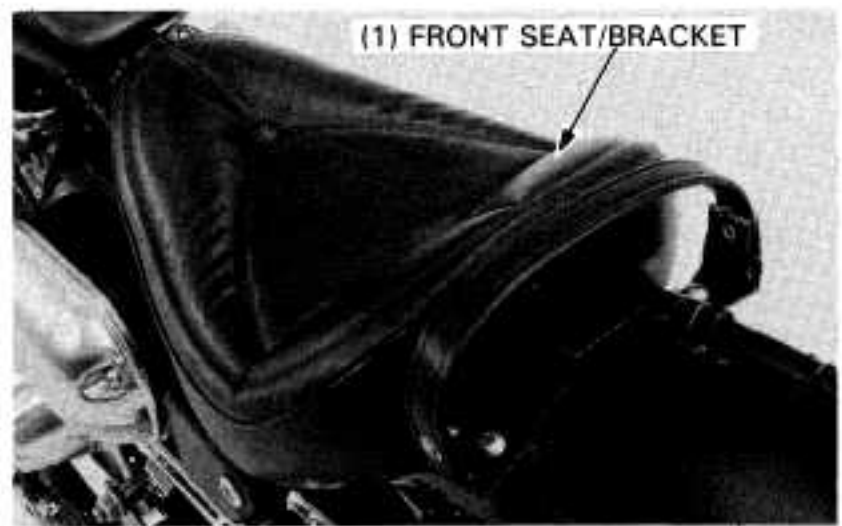


REAR FENDER AND SEATS

Remove the two mounting bolts and the rear seat.



Remove the two socket bolts and the front seat/bracket.



Raise the rear wheel off the ground by placing jacks or support blocks under both exhaust pipes with shop towels.
 Remove the shock absorbers (page 12-11).
 Remove the rear shock absorber upper mounts.
 Disconnect the rear turn signal wire connectors and remove the turn signal lights by removing the mounting nuts.
 Disconnect the taillight, brake light and license light wire coupler and connectors.
 Remove the four mounting bolts and the rear fender.

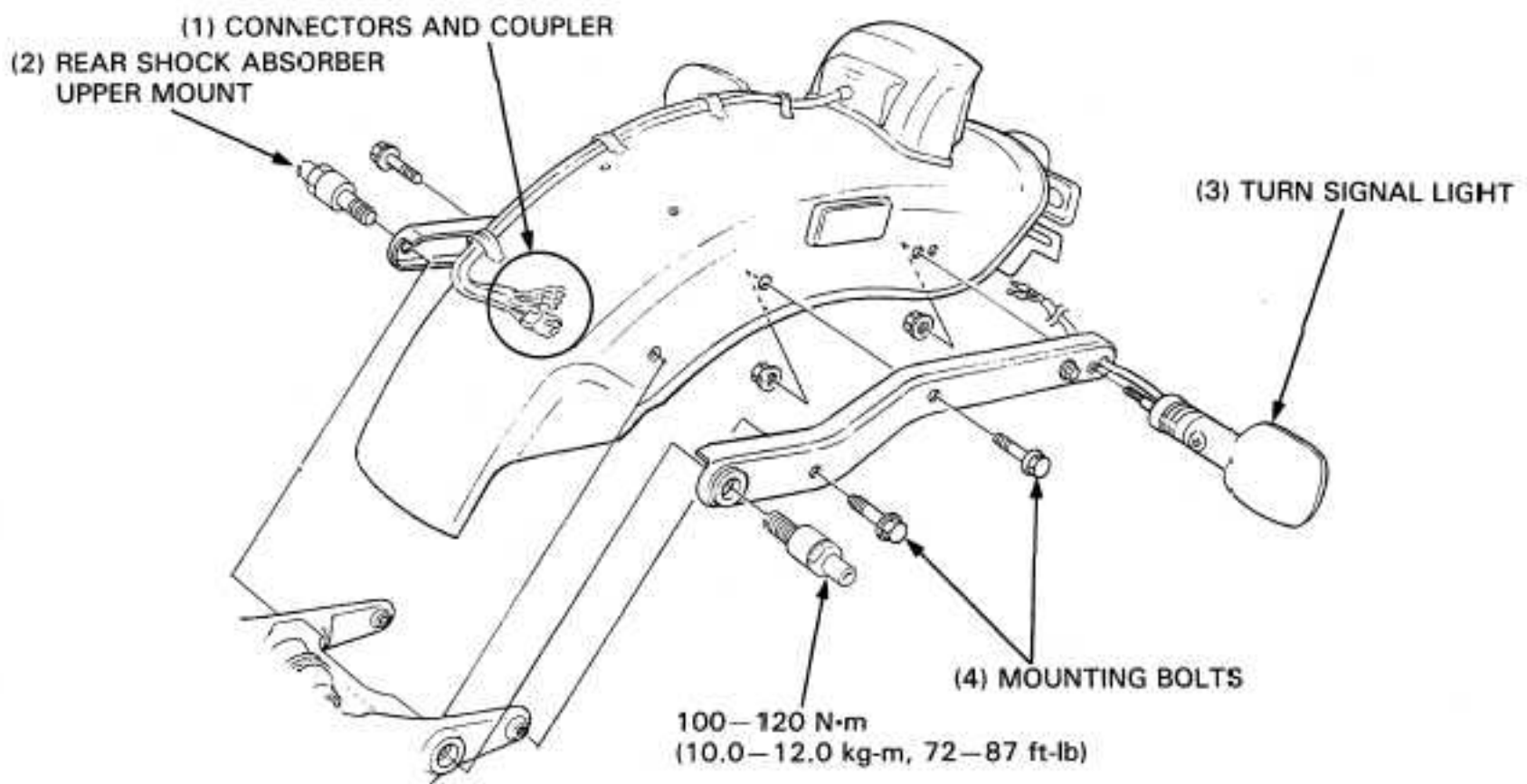
Remove the tail/brake light and license light from the rear fender.

Install the rear fender in the reverse order of removal.
 Tighten the rear shock absorber upper mounts.

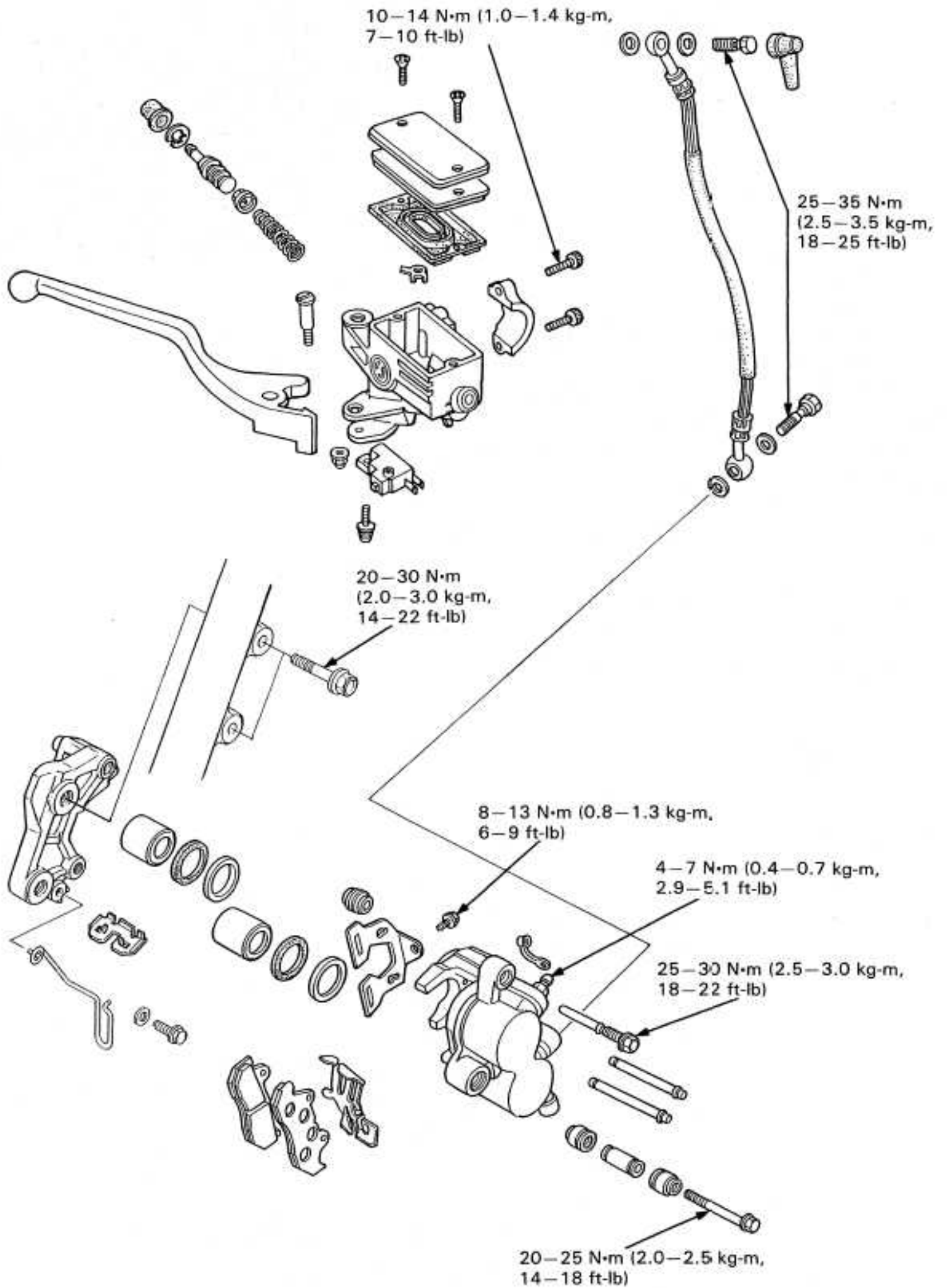
TORQUE: 100–120 N·m (10.0–12.0 kg·m, 72–87 ft·lb)

NOTE

- Route the wire and harness properly (page 1-13).



HYDRAULIC BRAKE



13. HYDRAULIC BRAKE

SERVICE INFORMATION	13-1	BRAKE DISC	13-5
TROUBLESHOOTING	13-1	BRAKE CALIPER	13-6
BRAKE FLUID REPLACEMENT/BLEEDING	13-2	BRAKE MASTER CYLINDER	13-8
BRAKE PAD REPLACEMENT	13-3		

SERVICE INFORMATION

GENERAL

- The front wheel can be removed without disconnecting the hydraulic brake system.
- Once the hydraulic brake system has been opened, or if the brake feels spongy, the system must be bled.
- Do not allow foreign material to enter the system when filling the reservoir.
- Brake fluid will damage painted, plastic, and rubber parts. Whenever handling brake fluid, protect the painted, plastic, and rubber parts by covering them with a rag. If fluid does get on these parts, wipe it off with a clean cloth immediately.
- Always check brake operation before riding the motorcycle.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Disc	thickness	4.8–5.2 (0.19–0.20)	4.0 (0.16)
	runout	0–0.1 (0–0.004)	0.3 (0.01)
Caliper	piston O.D.	30.148–30.198 (1.1869–1.1889)	30.14 (1.187)
	cylinder I.D.	30.230–30.280 (1.1902–1.1921)	30.29 (1.193)
Master cylinder	piston O.D.	12.657–12.684 (0.4983–0.4994)	12.64 (0.498)
	cylinder I.D.	12.700–12.743 (0.5000–0.5017)	12.76 (0.502)

13

TORQUE VALUES

Bleed valve	4–7 N·m (0.4–0.7 kg-m, 2.9–5.1 ft-lb)
Oil bolt	25–35 N·m (2.5–3.5 kg-m, 18–25 ft-lb)
Master cylinder holder bolt	10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)
Pad pin retainer bolt	8–13 N·m (0.8–1.3 kg-m, 6–9 ft-lb)
Caliper mounting bolt	20–25 N·m (2.0–2.5 kg-m, 14–18 ft-lb)
Caliper pin bolt	25–30 N·m (2.5–3.0 kg-m, 18–22 ft-lb)

TOOL

Special	
Snap ring pliers	07914–3230001

TROUBLESHOOTING

Brake lever soft or spongy

- Air bubbles in hydraulic system
- Low fluid level
- Hydraulic system leaking

Brake lever too hard

- Sticking piston(s)
- Clogged hydraulic system
- Pads glazed or worn excessively

Brake drags

- Hydraulic system sticking
- Sticking piston(s)

Brake grabs

- Pads contaminated
- Disc or wheel misaligned

Brake chatters or squeals

- Pads contaminated
- Excessive disc runout
- Caliper installed incorrectly
- Disc or wheel misaligned

HYDRAULIC BRAKE

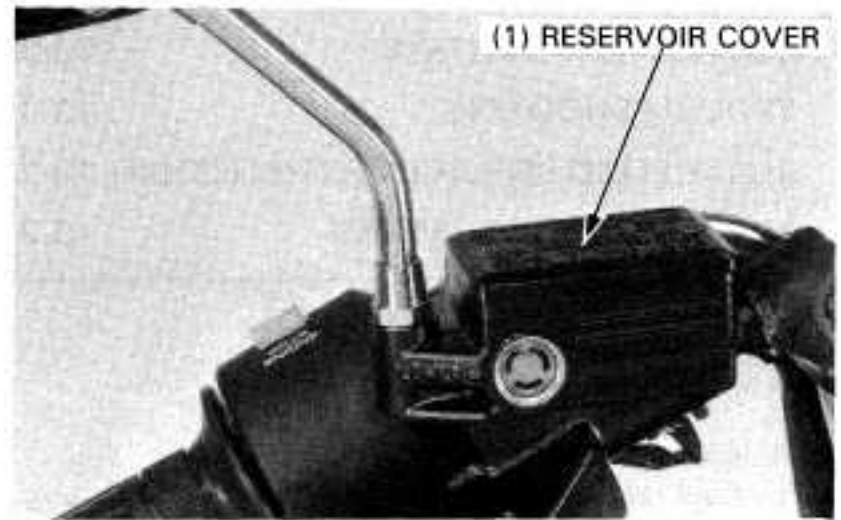
BRAKE FLUID REPLACEMENT/BLEEDING

WARNING

- *A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.*

CAUTION

- *Do not allow foreign material to enter the system when filling the reservoir.*
- *Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.*

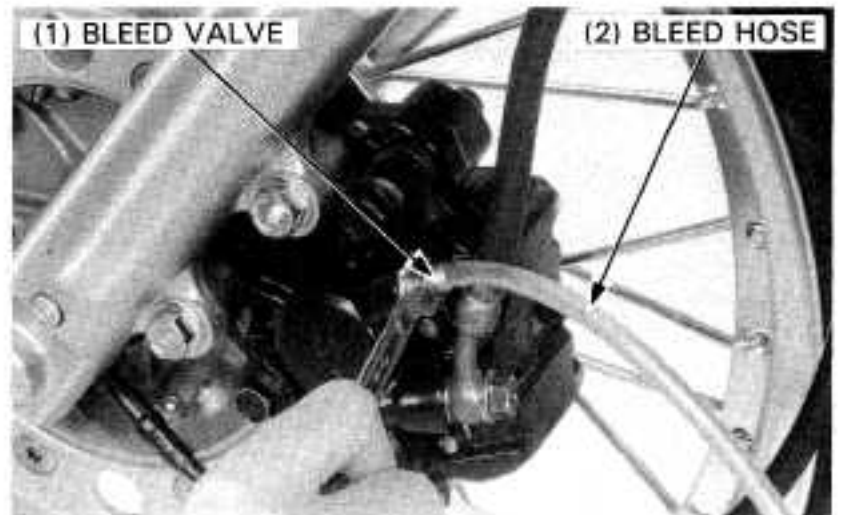


BRAKE FLUID DRAINING

With the fluid reservoir parallel to the ground, remove the reservoir cover, set plate and diaphragm. Connect a hose to the bleed valve.

Loosen the caliper bleed valve and pump the brake lever until no more fluid flows out of the bleed valve.

Close the bleed valve.



BRAKE FLUID FILLING/BLEEDING

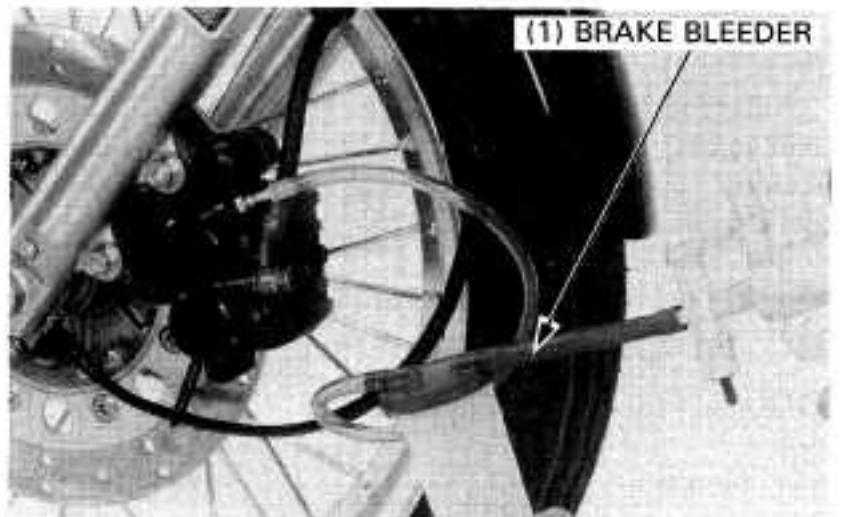
Fill the reservoir with DOT 3 or DOT 4 brake fluid from a sealed container.

CAUTION

- *Do not mix different types of fluid. They are not compatible.*

Connect a commercially available brake bleeder to the bleed valve.

Pump the brake bleeder and loosen the bleed valve. Add fluid when the fluid level in the master cylinder reservoir is low.



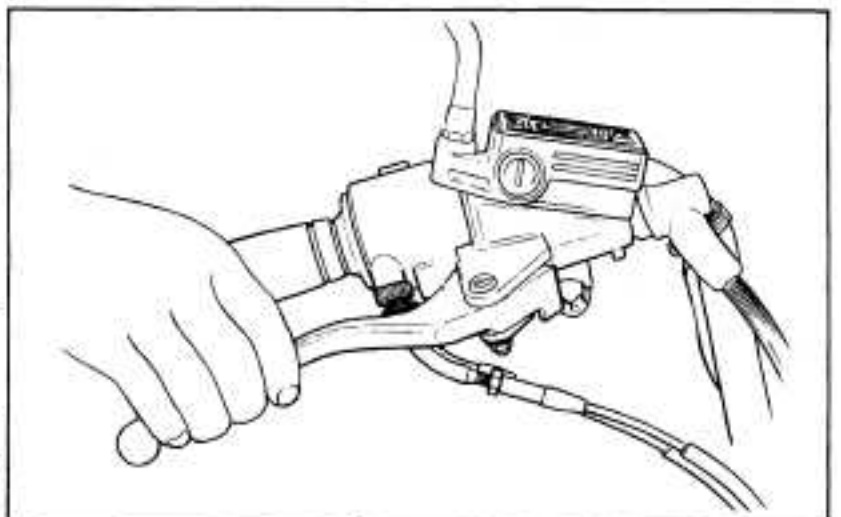
NOTE

- Check the fluid level often while bleeding the brakes to prevent air from being pumped into the system.
- When using a brake bleeding tool, follow the manufacturer's operating instructions.
- If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.

Repeat the above procedures until air bubbles do not appear in the plastic hose.

Close the bleed valve and operate the brake lever. If it still feels spongy, repeat the above procedure.

If a brake bleeder is not available, perform the following procedure: Pump up the system pressure with the lever until there are no air bubbles in the fluid flowing out of the reservoir small hole and lever resistance is felt.



Connect the bleed hose to the bleed valve and bleed the system as follows:

1. Squeeze the brake lever and hold it down, then open the bleed valve 1/2 turn and then close the valve.

NOTE

- Do not release the brake lever until the bleed valve has been closed.

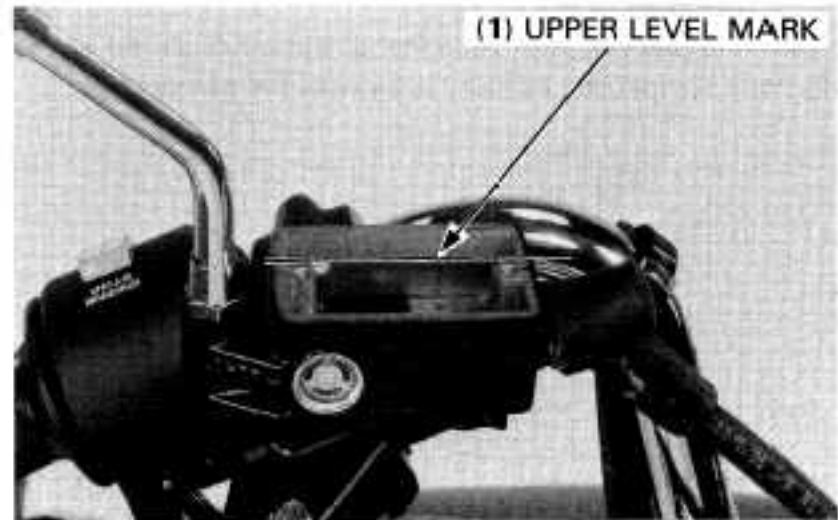
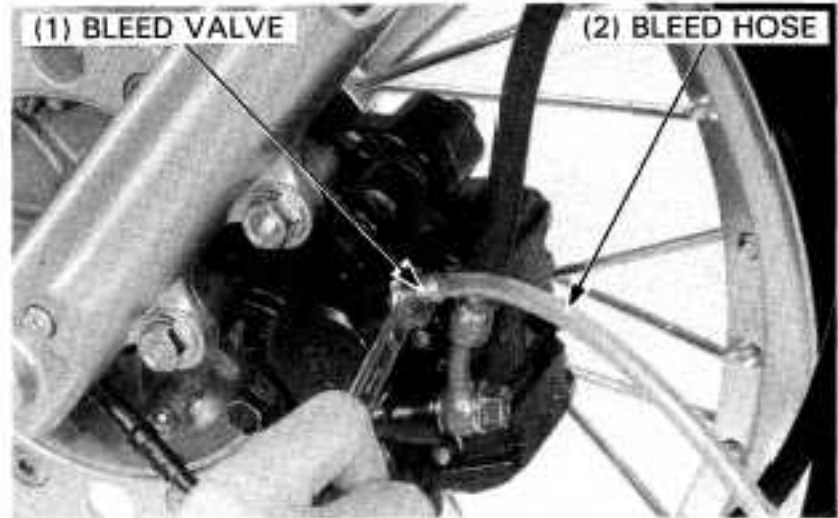
2. Release the brake lever slowly and wait several seconds after it reaches the end of its travel.

Repeat steps 1 and 2 until bubbles cease to appear in the fluid coming out of the bleeder valve.

Tighten the bleed valve.

TORQUE: 4–7 N·m (0.4–0.7 kg·m, 2.9–5.1 ft·lb)

Fill the master cylinder reservoir to the upper level mark with DOT 3 or DOT 4 brake fluid from a sealed container. Install the diaphragm, set plate and reservoir cover.

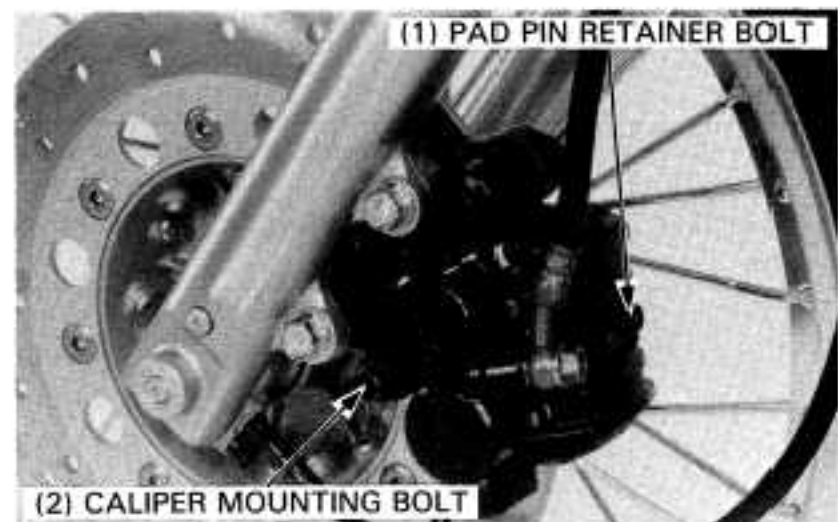


BRAKE PAD REPLACEMENT

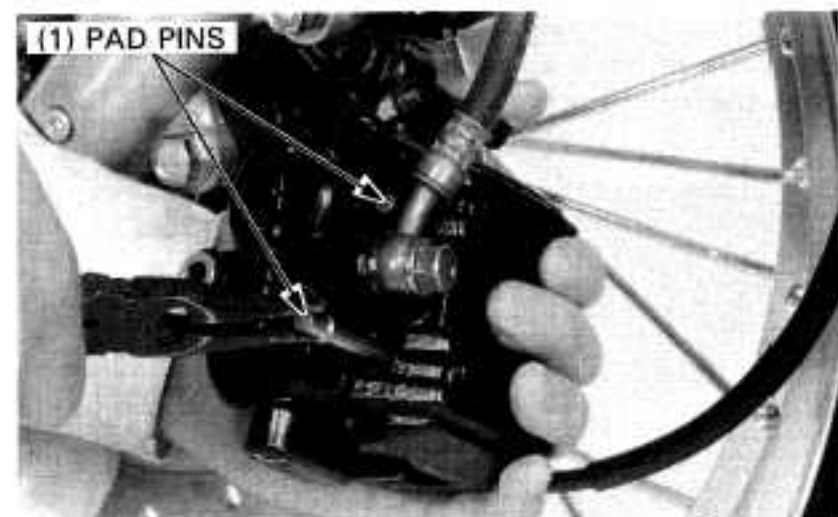
NOTE

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

Loosen the pad pin retainer bolt.
Remove the caliper mounting bolt.
Pivot the caliper up out of the way and remove the caliper from the bracket.

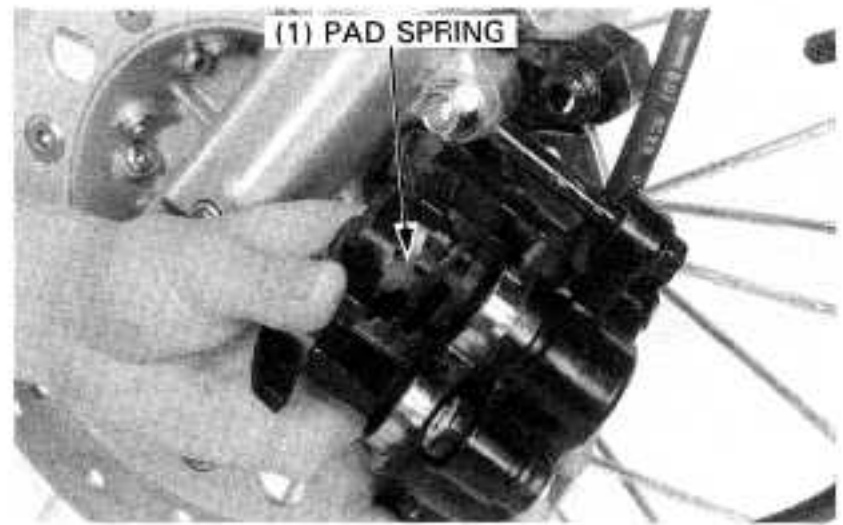


Remove the pad pin retainer bolt and retainer and pull the pad pins out of the caliper.
Remove the brake pads.

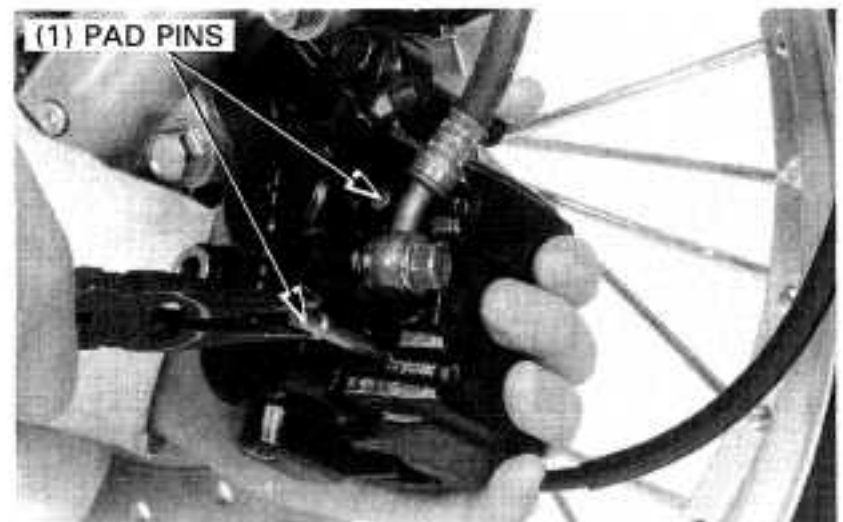


HYDRAULIC BRAKE

Make sure that the pad spring is installed in the position shown.



Install new pads in the caliper.
Install one pad pin first, then install the other pin by pushing the pads against the caliper to depress the pad spring.



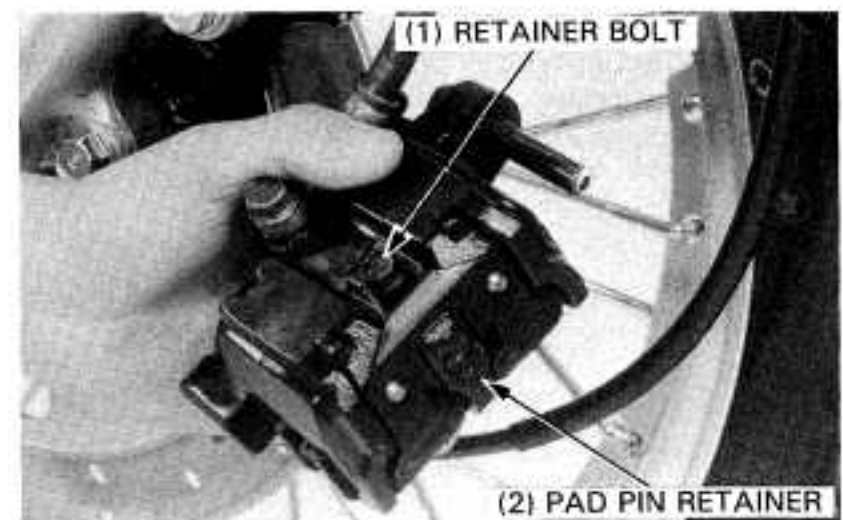
Push the caliper pistons in all the way.

CAUTION

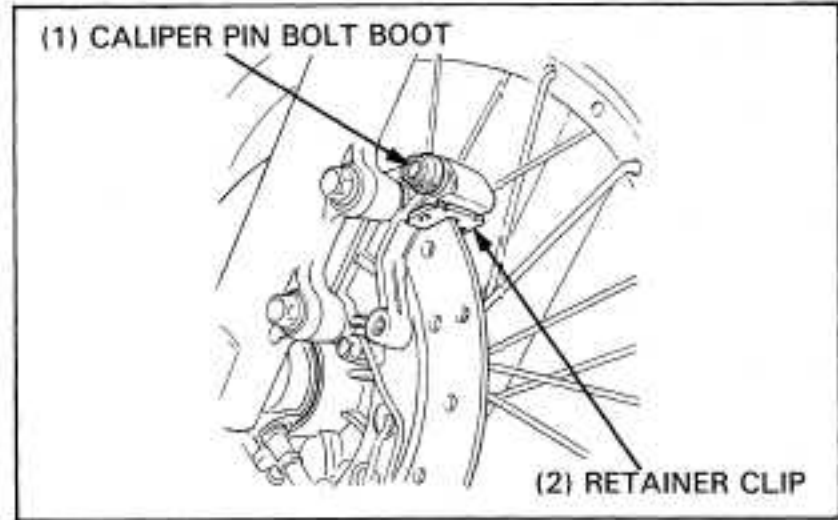
- *Be careful that the master cylinder does not overflow when the caliper pistons are compressed.*
- *Brake fluid can cause damage to painted, plastic or rubber surfaces.*



Place the pad pin retainer over the pad pins.
Push the retainer down to secure the pins.
Install the pad pin retainer bolt.



Apply silicone grease to the caliper pin bolt boot and caliper pin bolt.
 Make sure that the retainer clip is in position on the caliper bracket.



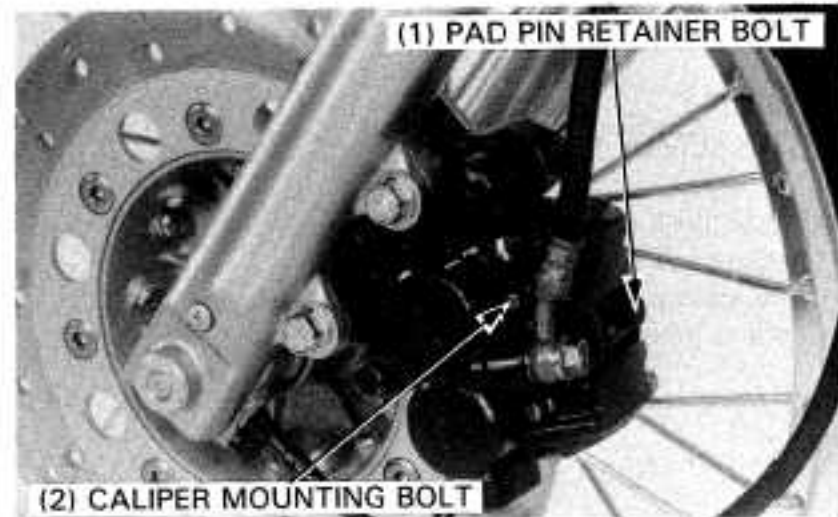
Insert the caliper pin bolt into the caliper bracket and pivot the caliper down so that the brake disc is positioned between the pads, being careful not to damage the pads.

Install the caliper mounting bolt and tighten it.

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

Tighten the pad pin retainer bolt.

TORQUE: 8–13 N·m (0.8–1.3 kg-m, 6–9 ft-lb)

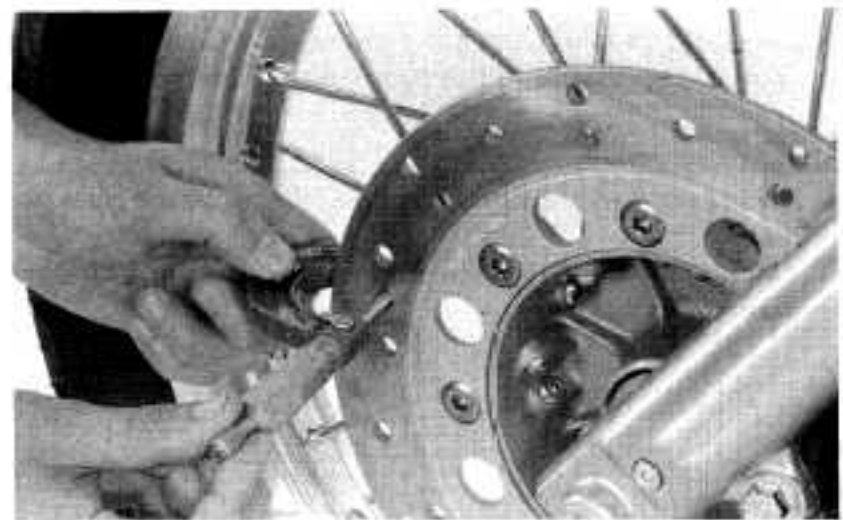


BRAKE DISC

INSPECTION

Measure the thickness of the disc.

SERVICE LIMIT: 4.0 mm (0.16 in)

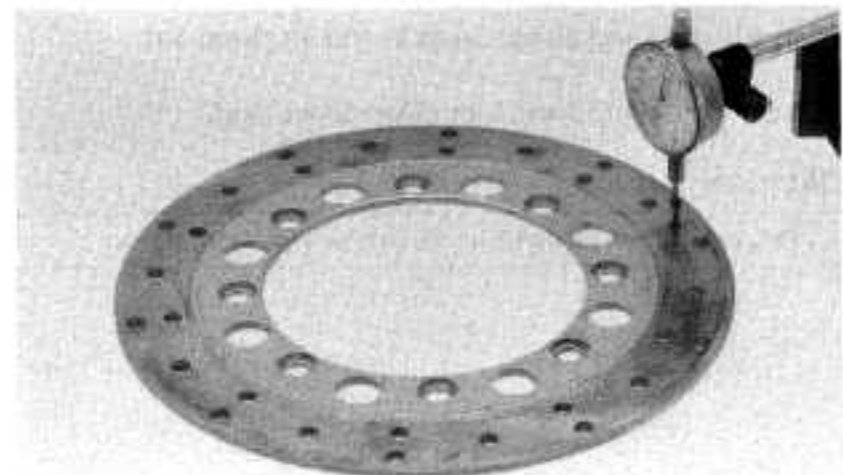


Remove the front wheel (page 11-7).

Remove the brake disc from the front wheel (page 11-12).
 Measure the brake disc for warpage.

SERVICE LIMIT: 0.3 mm (0.01 in)

Replace the brake disc if either measurement is not within the specified service limit.
 Install the brake disc (page 11-13) and front wheel (page 11-15).



BRAKE CALIPER

REMOVAL

Drain the brake fluid from the front brake hydraulic system (page 13-2).

Remove the front brake hose from the caliper.

CAUTION

- *Avoid spilling brake fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.*

Loosen the pad pin retainer bolt.
Remove the caliper mounting bolt and caliper pin bolt, and remove the caliper from the bracket.

DISASSEMBLY

Remove the following:

- brake pads (page 13-3).
- pad spring
- caliper pivot collar and boots

Position the caliper with the pistons down and apply small squirts of air pressure to the fluid inlet to remove the pistons.

WARNING

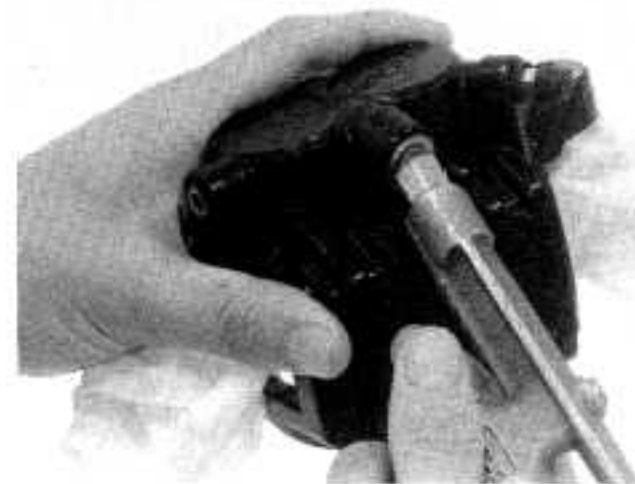
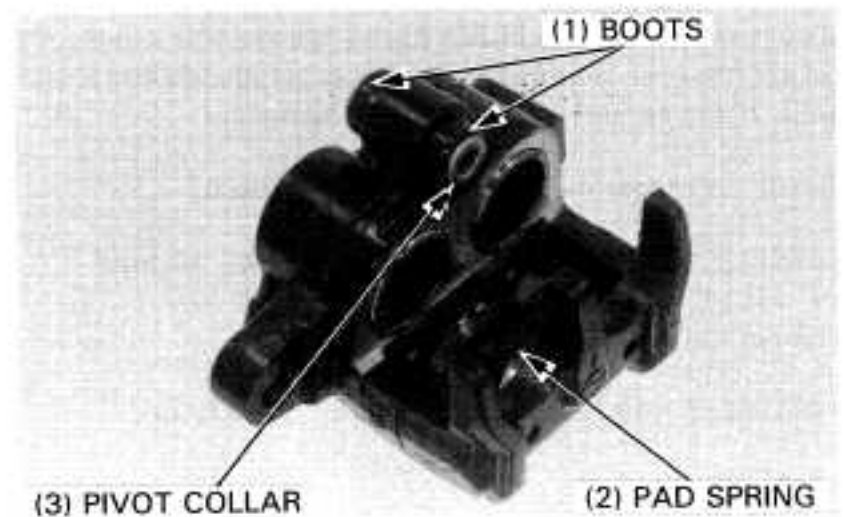
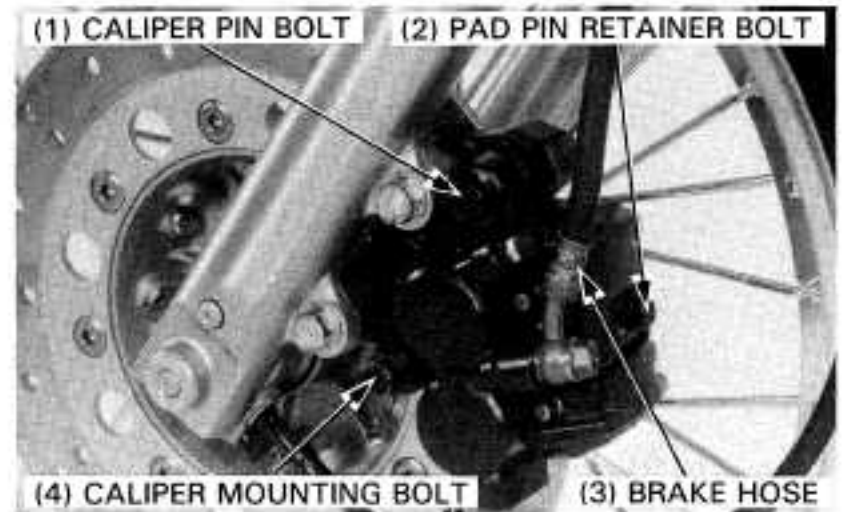
- *Do not use high pressure air or bring the nozzle too close to the inlet.*
- *Place a shop towel over the pistons to prevent the pistons from becoming projectiles.*

Push the dust and piston seals in and lift them out.

Clean the seal grooves with clean brake fluid.

CAUTION

- *Be careful not to damage the piston sliding surfaces.*

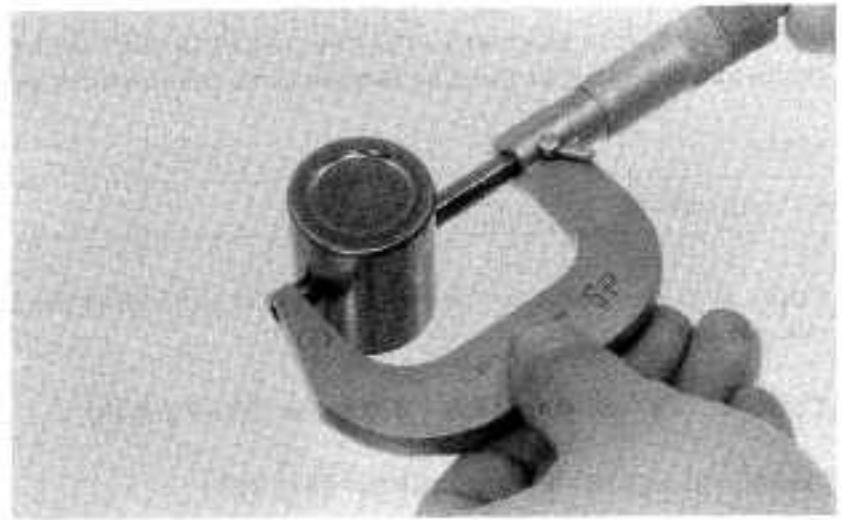


INSPECTION

Check the caliper pistons for scoring or other damage.

Measure the caliper piston outside diameters.

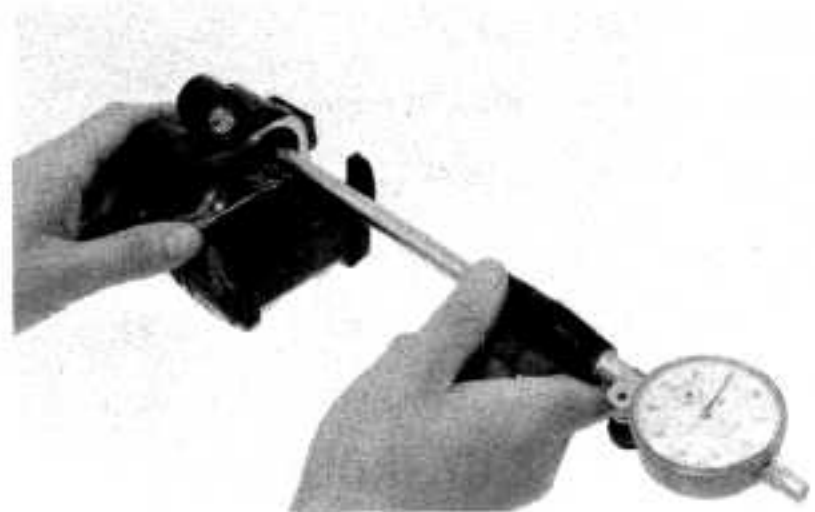
SERVICE LIMIT: 30.14 mm (1.187 in)



Check the caliper cylinder bores for scoring or other damage.

Measure the caliper cylinder inside diameters.

SERVICE LIMIT: 30.29 mm (1.193 in)



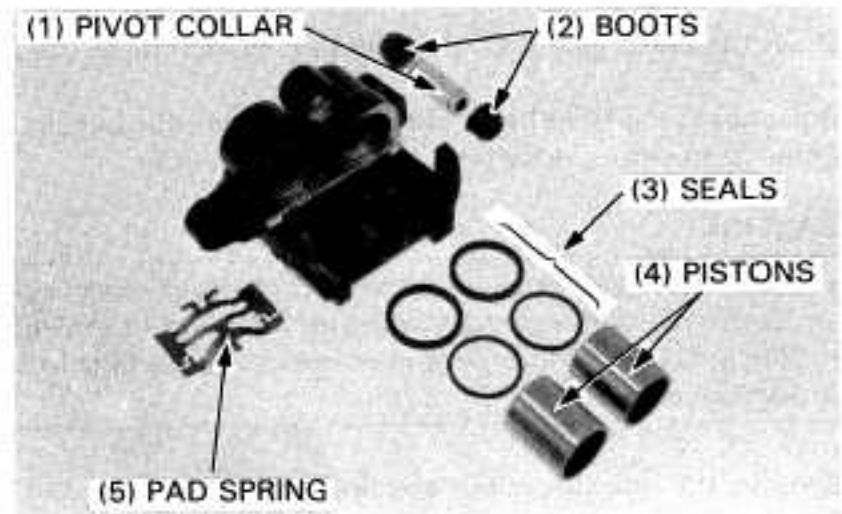
ASSEMBLY

If the pivot collar boots are hard or have deteriorated, replace them with new ones. The dust and piston seals must be replaced with new ones whenever they are removed.

Coat the dust and piston seals with clean brake fluid and install them in the seal grooves in the caliper.

Lubricate the caliper cylinders and pistons with clean brake fluid and install the pistons into the caliper with the piston hollow ends facing the pads.

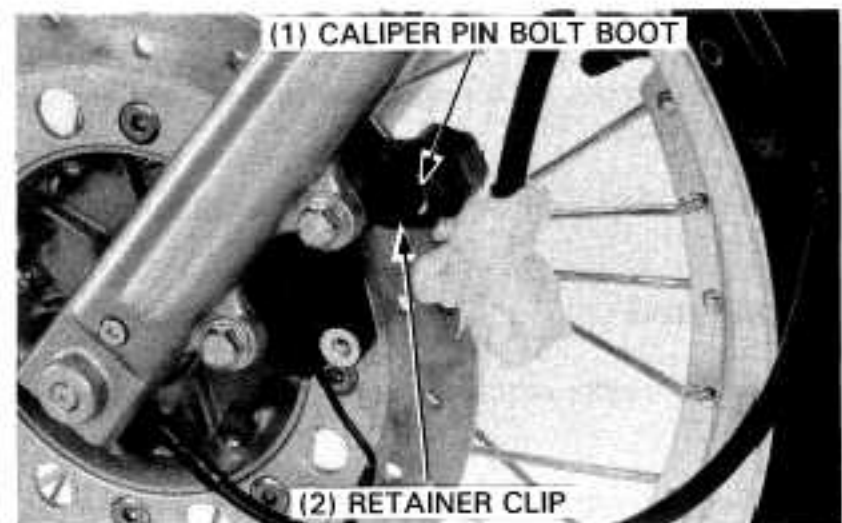
Apply silicone grease to the pivot collar and boots. Install the collar and boots, making sure that the boots are seated in the grooves properly. Install the pad spring and pads (page 13-4).



INSTALLATION

Make sure that the retainer clip is in position on the caliper bracket and that the caliper pin bolt boot is in good condition.

Apply silicone grease to the caliper pin bolt boot.



HYDRAULIC BRAKE

Install the caliper assembly onto the caliper bracket and over the brake disc so that the disc is positioned between the pads.

NOTE

- Use care not to damage the pads.

Apply silicone grease to the caliper pin bolt and install the caliper pin bolt.

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

Install and tighten the caliper mounting bolt.

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

Tighten the pad pin retainer bolt.

TORQUE: 8–13 N·m (0.8–1.3 kg-m, 6–9 ft-lb)

Connect the brake hose to the caliper with the oil bolt and two sealing washers.

Tighten the oil bolt.

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

Fill and bleed the front hydraulic brake system (page 13-2).

BRAKE MASTER CYLINDER

REMOVAL

Drain the brake fluid from the hydraulic system (page 13-2).

Disconnect the front brake switch wires from the switch.
Remove the brake hose from the master cylinder.

CAUTION

- *Avoid spilling brake fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.*
- *When removing the oil bolt, cover the end of the hose to prevent contamination.*

Remove the rearview mirror and brake lever.
Remove the master cylinder and holder.

DISASSEMBLY

Remove the brake light switch and piston boot from the master cylinder.

Remove the snap ring from the master cylinder body.

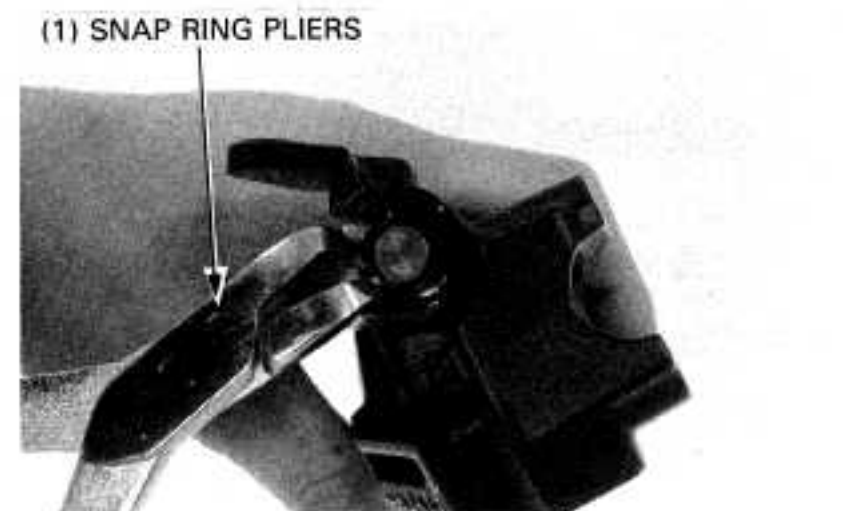
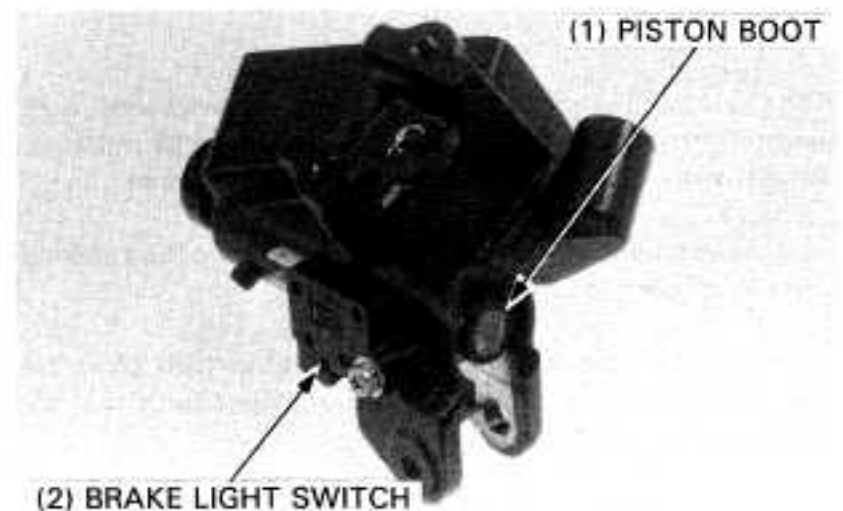
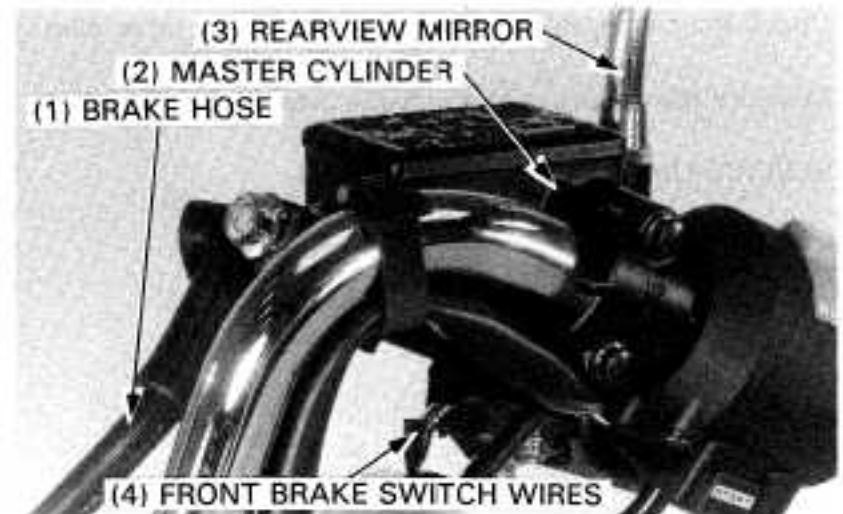
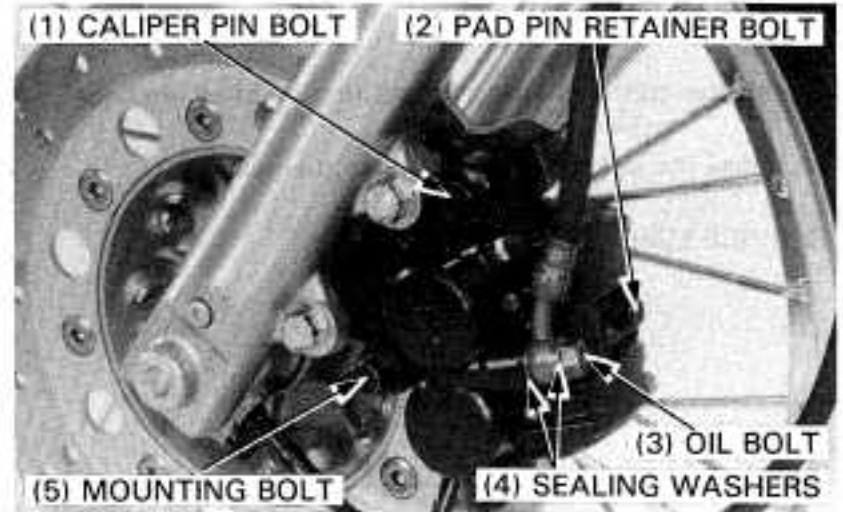
TOOL:

Snap ring pliers

07914–3230001

Remove the master piston and spring from the master cylinder.

Clean the master cylinder, reservoir and master piston in clean brake fluid.



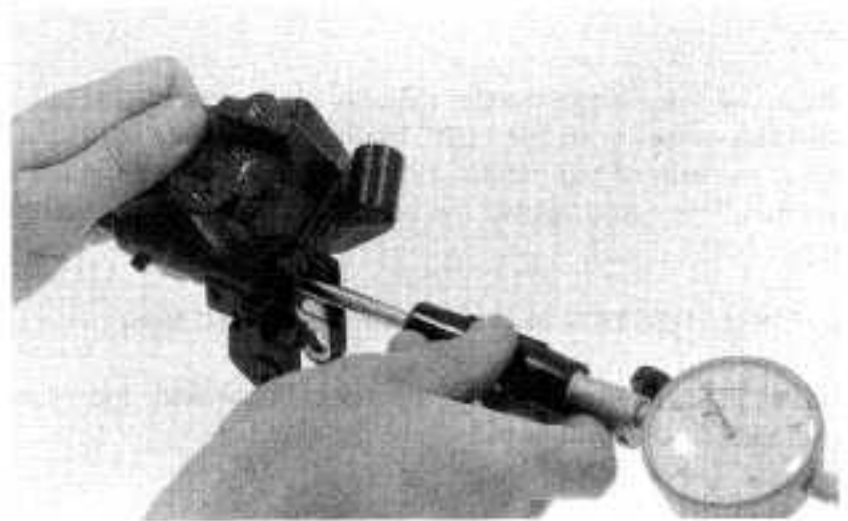
INSPECTION

Check the primary and secondary cups for wear, deterioration or damage.

Check the master cylinder and piston for scoring or other damage.

Measure the master cylinder inside diameter.

SERVICE LIMIT: 12.76 mm (0.502 in)



Measure the master piston outside diameter.

SERVICE LIMIT: 12.64 mm (0.498 in)

NOTE

- The master piston, piston cups and spring must be replaced as a set.



ASSEMBLY

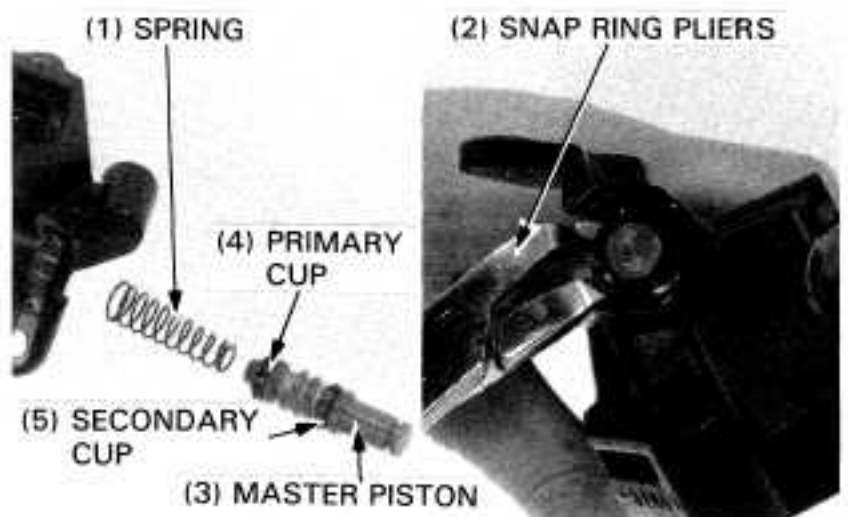
Coat the master piston and primary and secondary cups with clean brake fluid, then install the piston spring and piston into the master cylinder. Install the snap ring.

CAUTION

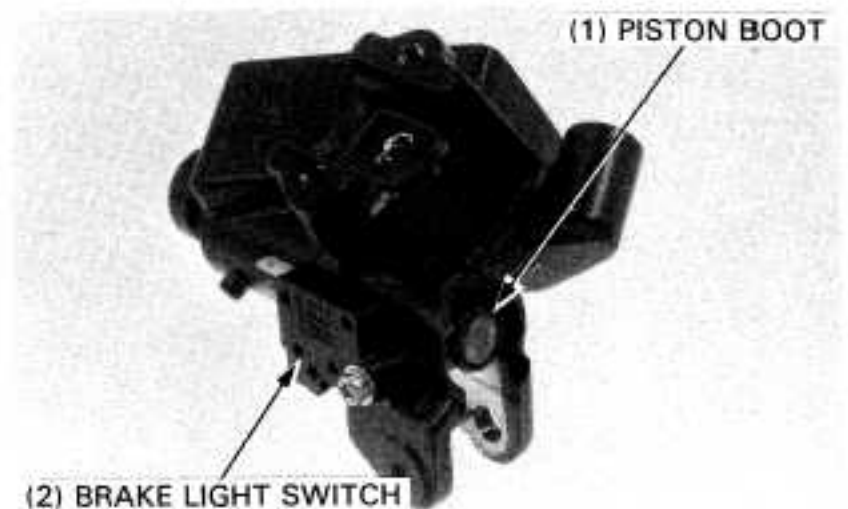
- Do not allow the lips of the cups to turn inside out and be certain the snap ring is firmly seated in the groove.

TOOL:

Snap ring pliers **07914-3230001**



Install the piston boot and brake light switch.



HYDRAULIC BRAKE

INSTALLATION

Place the front brake master cylinder on the handlebar and install the holder with the "UP" mark facing up. Align the end of the master cylinder with the punch mark on the handlebar, and tighten the upper bolt first, then tighten the lower bolt.

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

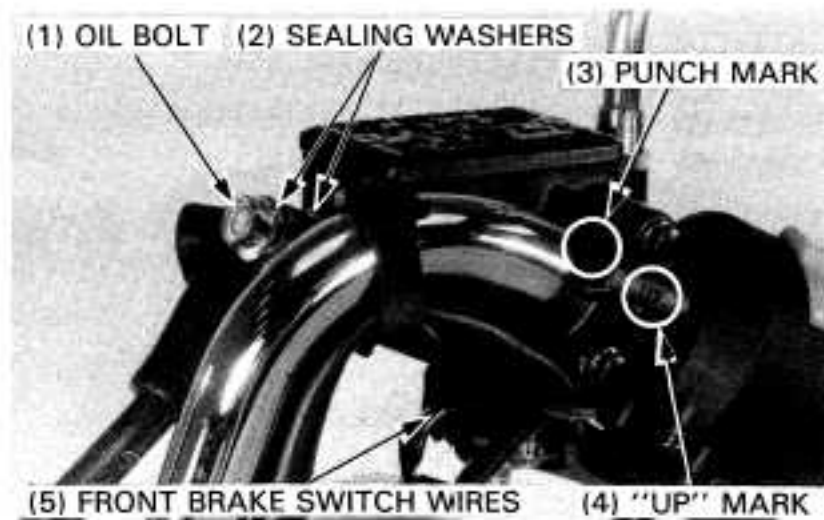
Install the brake hose to the master cylinder with the oil bolt and two sealing washers. Tighten the oil bolt.

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

Connect the front brake switch wires to the switch.

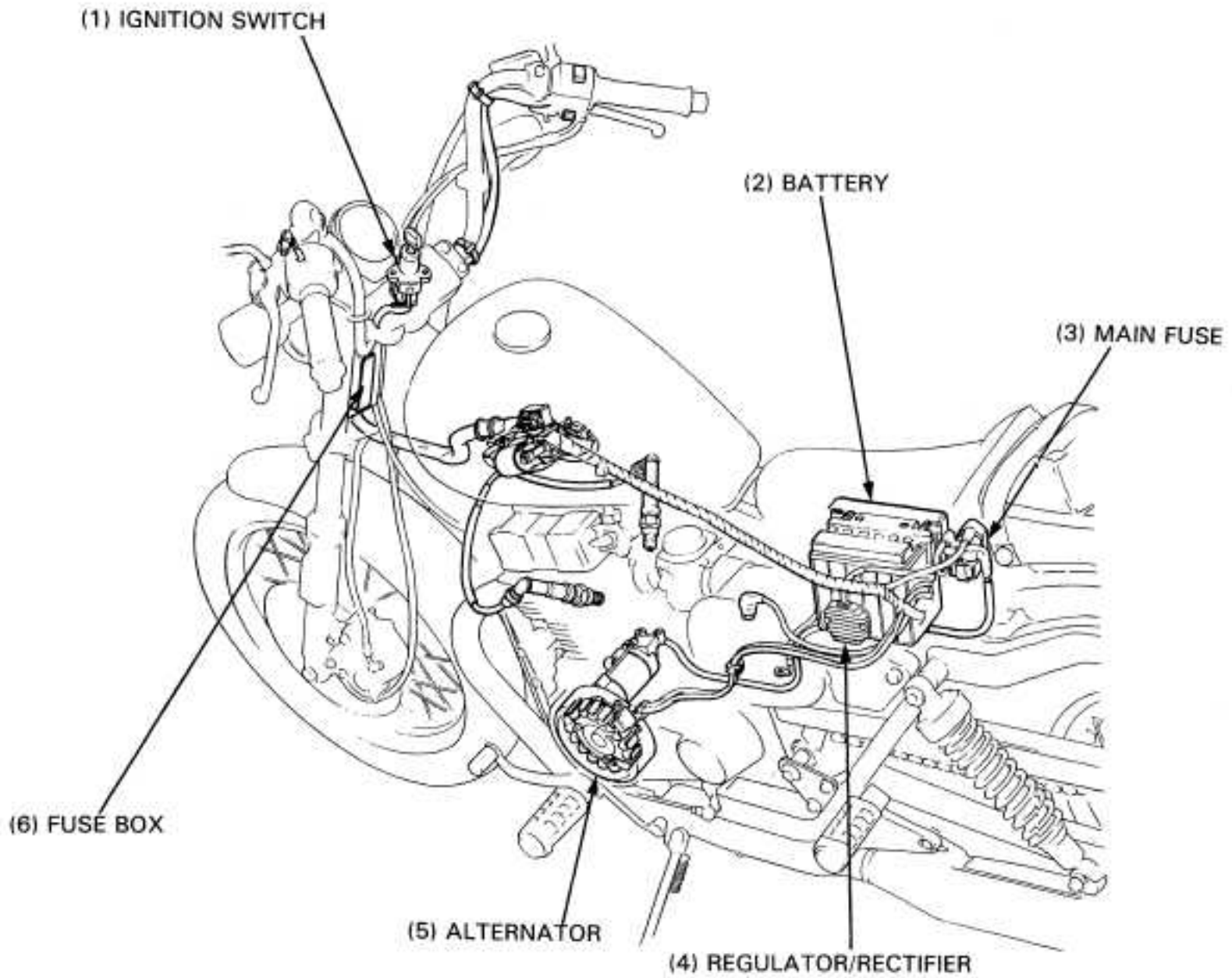
Install the brake lever and rearview mirror.

Fill and bleed the front brake hydraulic system (page 13-2).

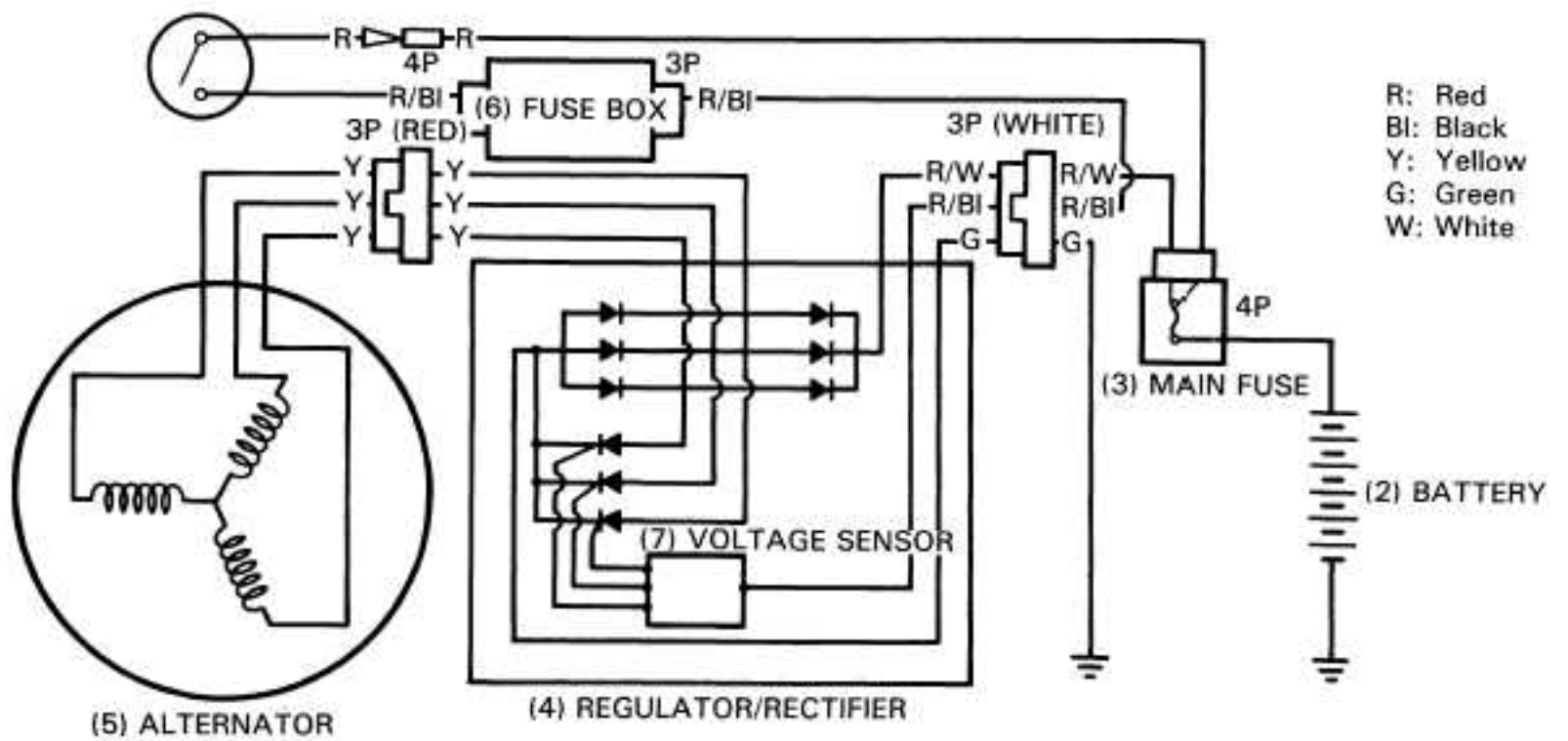


MEMO

BATTERY/CHARGING SYSTEM



(1) IGNITION SWITCH



14. BATTERY/CHARGING SYSTEM

SERVICE INFORMATION	14-1	CHARGING SYSTEM	14-3
TROUBLESHOOTING	14-1	REGULATOR/RECTIFIER	14-4
BATTERY	14-2	CHARGING COIL	14-5

SERVICE INFORMATION

GENERAL

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

WARNING

- *Do not smoke, and keep flames away from a charging battery. The gas produced by a battery will explode if a flame or spark is brought near.*
- All charging system components can be tested on the motorcycle.
- Refer to section 9 for alternator removal.
- Inspection should be made in sequence referring to page 19-5 for troubleshooting of the system.

SPECIFICATIONS

ITEM		SPECIFICATION
Battery	Capacity	12 V-12 AH
	Specific gravity	1.270–1.290 at 20°C (68°F)
	Charging rate	1.2 amperes maximum
Alternator capacity		0.170 kw/5,000 rpm
Voltage regulator	Type	Transistorized non-adjustable regulator
	Regulated voltage	14.0–15.0 V/5000 rpm
Charging coil resistance at 20°C (68°F)		0.6–1.1Ω

TOOL

- Circuit tester (SANWA) 07308–0020000
or
Circuit tester (KOWA) TH–5H–1 or TH–5H–2

TROUBLESHOOTING

No power—key turned on

- Dead battery
 - Low fluid level
 - Low specific gravity
 - Charging system failure
- Disconnected battery cable
- Main fuse burned out
- Faulty ignition switch

Low power—key turned on

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

Low power—engine running

- Battery undercharged
 - Low fluid level
 - One or more dead cells
- Charging system failure

Intermittent power

- Loose battery connection
- Loose charging system connection
- Loose starting system connection
- Loose connection or short circuit in ignition system

Charging system failure

- Loose, broken, or shorted wire or connection
- Faulty voltage regulator/rectifier
- Faulty alternator

BATTERY/CHARGING SYSTEM

BATTERY

REMOVAL

Remove the battery cover bolt and swing the cover down.

Open the battery cover.

Remove the battery negative cable from the battery first, then remove the positive cable.

Disconnect the battery breather tube from the battery and remove the battery.



TESTING SPECIFIC GRAVITY

Test each cell with a hydrometer.

SPECIFIC GRAVITY: (20°C, 68°F)

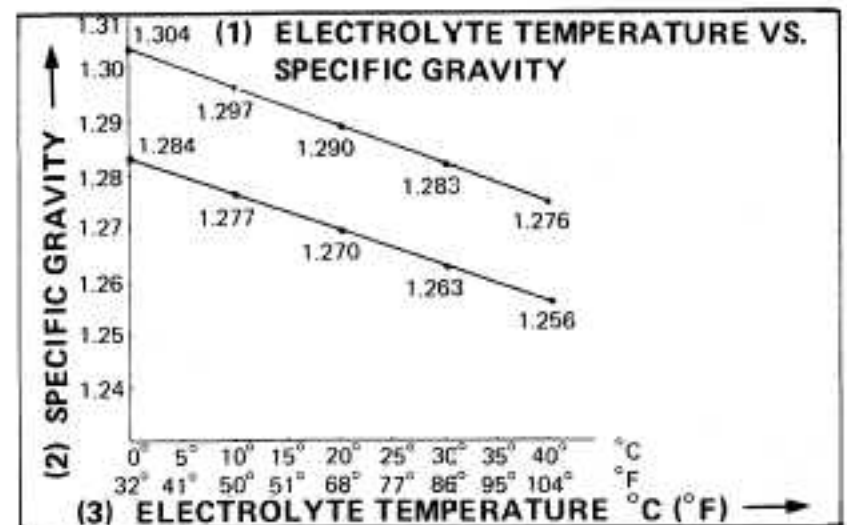
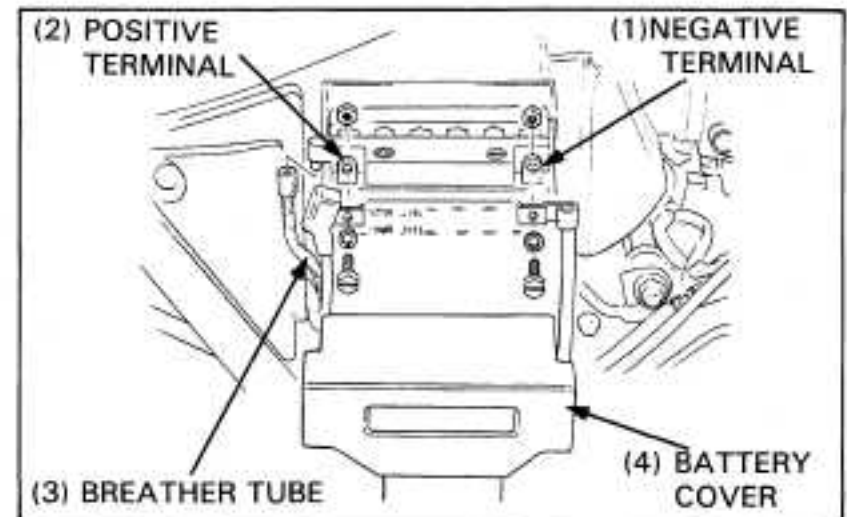
1.270–1.290	Fully charged
Below 1.260	Undercharged

NOTE

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

WARNING

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



CHARGING

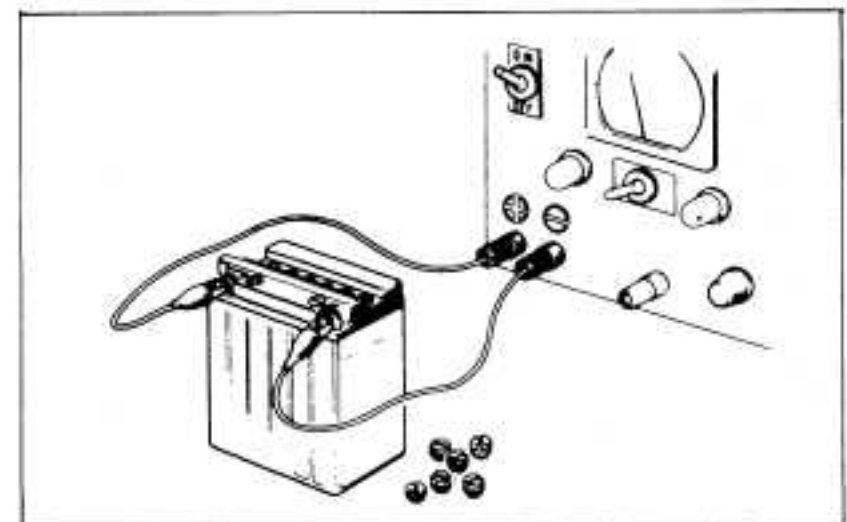
Remove the battery cell cap and fill the battery cell with distilled water to the upper level, if necessary.

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

Charging current: 1.2 Amperes max.

Charging:

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

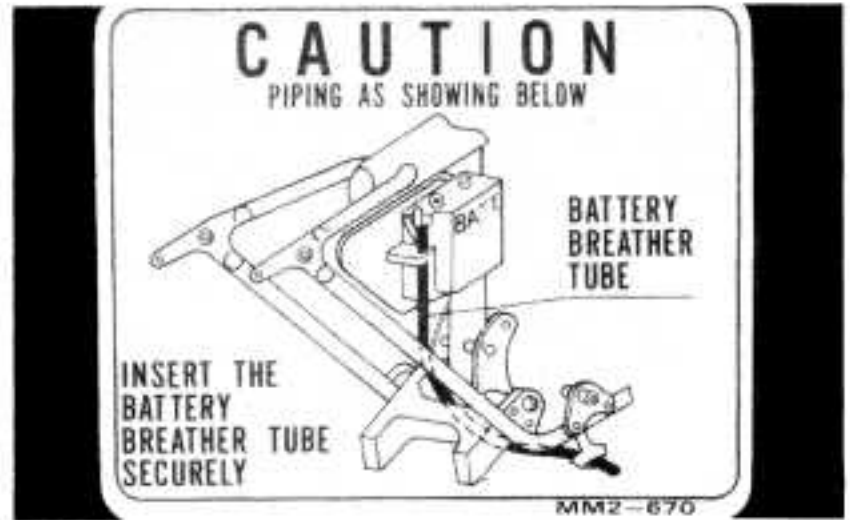


WARNING

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

CAUTION

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



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

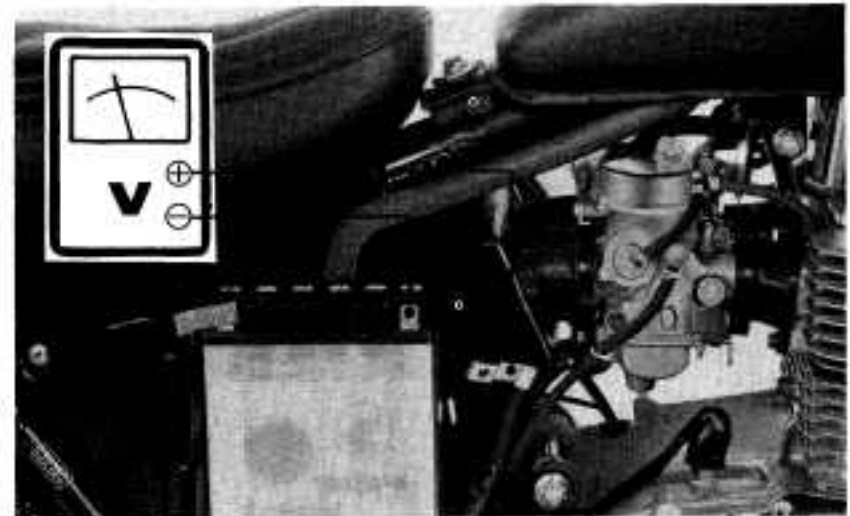
CHARGING SYSTEM

VOLTAGE LEAK TEST

Turn the ignition switch off and disconnect the negative cable from the battery.

Measure the voltage between the battery negative terminal and negative (ground) cable.

There should be no voltage with the ignition switch off.



CHARGING VOLTAGE INSPECTION

NOTE

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

Warm up the engine.

Connect a voltmeter between the battery terminals.

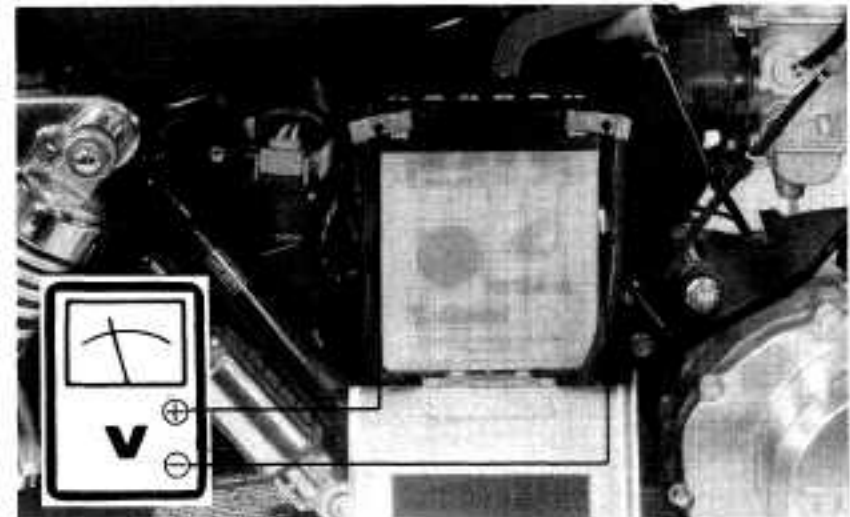
CAUTION

- Be careful not to let the battery positive cable touch the frame while testing.

Start the engine and read the voltmeter.

Gradually increase the engine speed and check that the voltage is regulated.

REGULATED VOLTAGE: 14.0–15.0 V at 5,000 rpm



BATTERY/CHARGING SYSTEM

REGULATOR/RECTIFIER

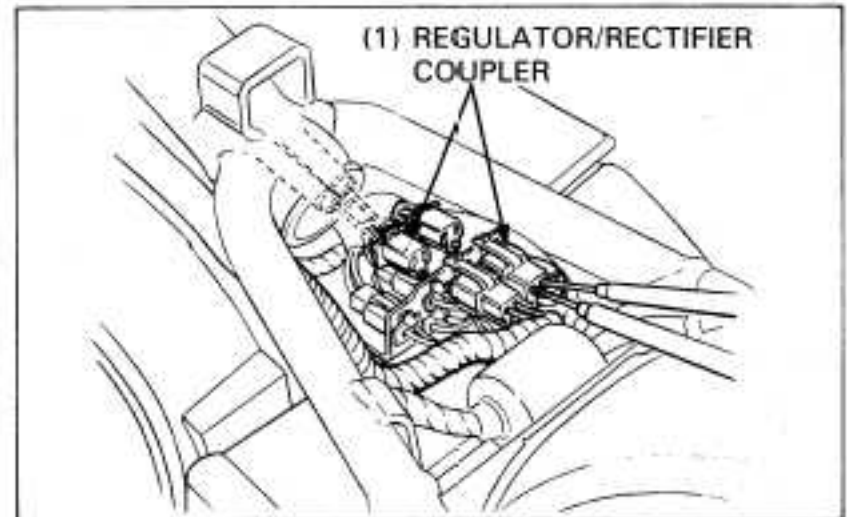
INSPECTION

Remove the seats (page 12-16).

Disconnect the regulator/rectifier coupler.

Make following inspection at each terminal of the harness side coupler.

Item	Measure at:	Standard
Battery wire	Red/White-Green	Battery voltage
Charging coil	Between the each yellow terminal.	0.6–1.1Ω
Ignition switch (Ignition switch ON)	Red/Black-Green	Battery voltage



REPLACEMENT

Remove the battery (page 14-2).

Disconnect the regulator/rectifier couplers.

Remove the battery tray from the frame by removing the three bolts.



Remove the two mounting bolts and the regulator/rectifier from the battery tray.

Install the regulator/rectifier in the reverse order of removal.

NOTE

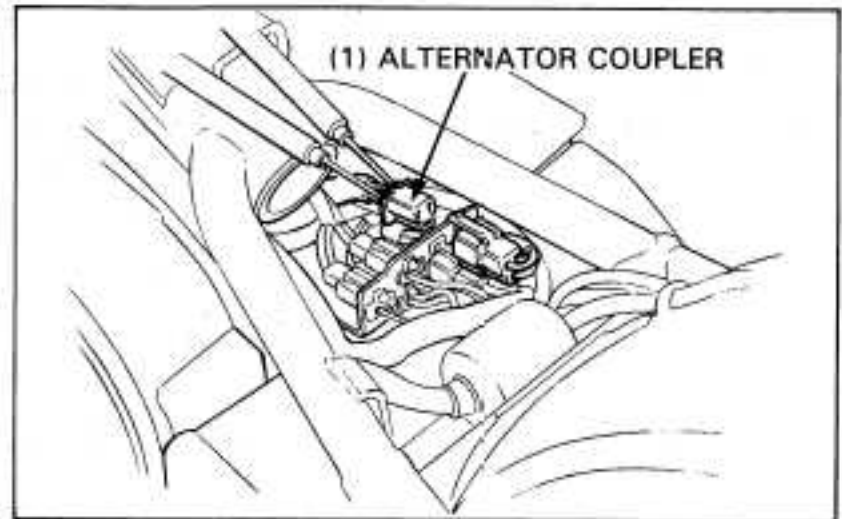
- Route the wire harnesses properly (page 1-8).



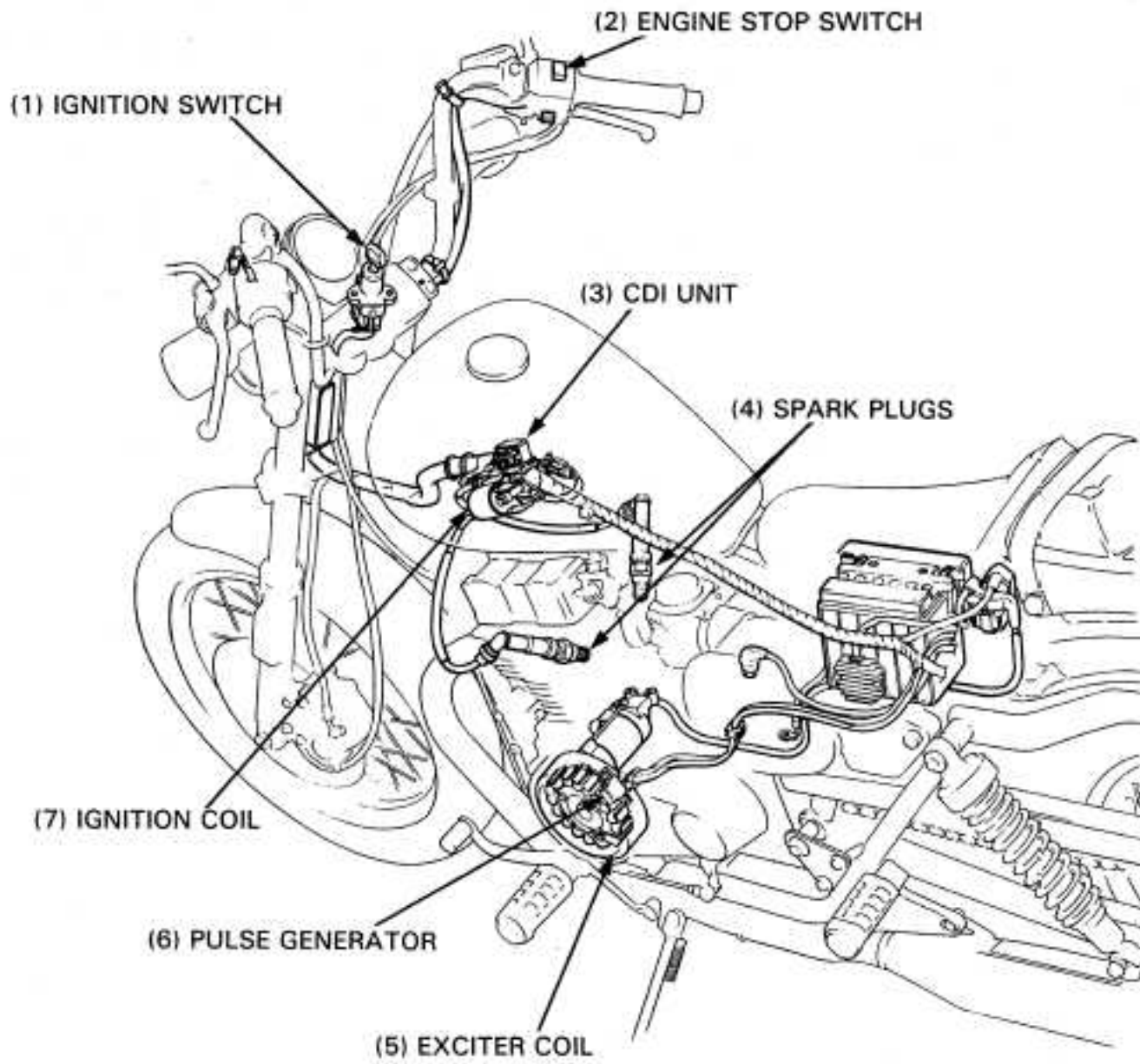
CHARGING COIL

Remove the seats (page 12-16).
Disconnect the alternator coupler.
Check the continuity between the each yellow wire terminals.

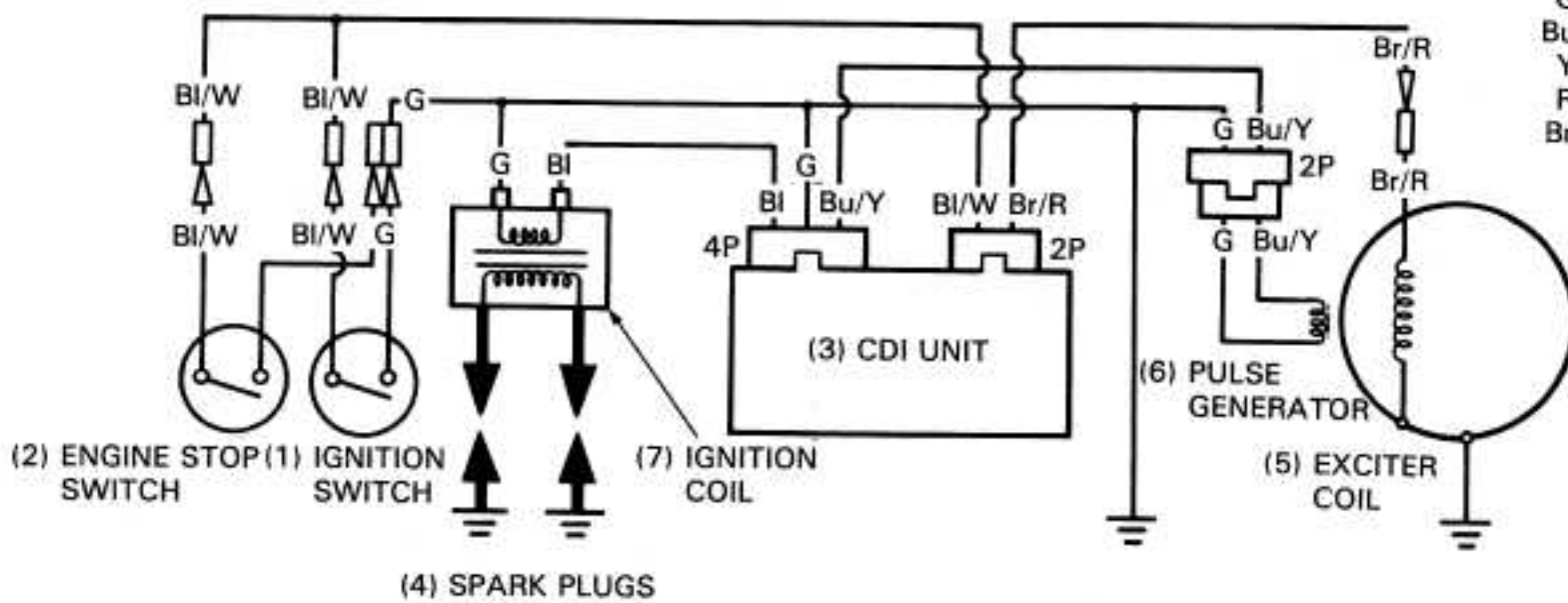
STANDARD: 0.6–1.1 Ω



IGNITION SYSTEM



Bl:Black
 W:White
 G:Green
 Bu:Blue
 Y:Yellow
 R:Red
 Br:Brown



15. IGNITION SYSTEM

SERVICE INFORMATION	15-1	EXCITER COIL	15-4
TROUBLESHOOTING	15-2	PULSE GENERATOR	15-4
CDI UNIT	15-3	IGNITION TIMING	15-4
IGNITION COIL	15-3		

SERVICE INFORMATION

GENERAL

- A CDI (Capacitive Discharge Ignition) is used and it cannot be adjusted. If the ignition timing is incorrect, inspect the CDI unit and pulse generator and replace any faulty parts.
- For spark plug inspection, refer to page 3-8.
- For alternator and pulse generator removal, refer to section 9.
- A continuity check can usually be made without removing the parts from the motorcycle by simply disconnecting the wires and using a continuity tester or ohmmeter at the terminals.
- Inspection should be made in sequence referring to page 19-6 for troubleshooting of the system.

SPECIFICATIONS

ITEM		SPECIFICATIONS	
Spark plug		NGK	ND
	Standard	DPR8EA-9	X24EPR-U9
	For extended high speed riding	DPR9EA-9	X27EPR-U9
	For cold climate (below 5°C, 41°F)	DPR7EA-9	X22EPR-U9
Spark plug gap		0.8–0.9 mm (0.031–0.035 in)	
Ignition coil resistance at 20°C (68°F)	Primary coil	0.1–0.3 Ω	
	Secondary coil	with plug cap	7.4–11 kΩ
		without plug cap	3.7–4.5 kΩ
Exciter coil resistance at 20°C (68°F)		50–250 Ω	
Pulse generator resistance at 20°C (68°F)		50–170 Ω	
Ignition timing	'F' mark	10° BTDC at 1,200 rpm	
	Full advance	43° BTDC at 4,800 ± 500 rpm	

15

TOOL

Circuit tester (SANWA)	07308–0020000
or	
Circuit tester (KOWA)	TH–5H–1 or TH–5H–2
or	
Digital multimeter	KS–AHM–32–003 (U.S.A. only)

TROUBLESHOOTING

Engine cranks but will not start

- Engine stop switch OFF
- No spark at plugs
- Faulty CDI unit
- Faulty pulse generator

No spark at plug

- Engine stop switch OFF
- Poorly connected, broken or shorted wires
 - Between ignition switch and CDI unit
 - Between ignition coil and spark plug
 - Between engine stop switch and CDI unit
 - Between CDI unit and ignition coil
 - Between CDI unit and alternator
 - Between CDI unit and pulse generator
- Faulty ignition coil
- Faulty ignition or engine stop switch
- Faulty CDI unit
- Faulty pulse generator
- Faulty exciter coil

Engine starts but runs poorly

- Ignition primary circuit
 - Faulty ignition coil
 - Loose or bare wire
 - Intermittent short circuit
- Secondary circuit
 - Faulty plug
 - Faulty spark plug wire

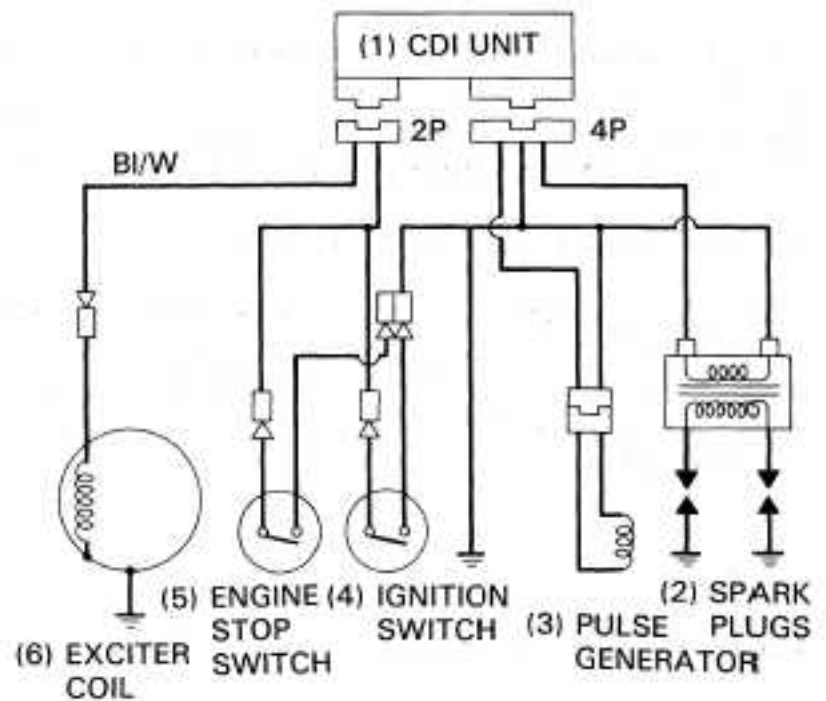
Timing advance incorrect

- Faulty CDI unit

CDI UNIT

Remove the fuel tank (page 4-14).
 Disconnect the 2P and 4P couplers from the CDI unit.
 Make the following inspection at each terminal of the harness side coupler.

Item	Measure at:	Standard
Ignition switch and engine stop switch	Black/White—Green	There should be no continuity with the ignition switch ON and the engine stop switch at OFF.
Exciter coil at 20°C (68°F)	Black/Red—Green	50—250 Ω
Pulse generator at 20°C (68°F)	Blue/Yellow—Green	50—170 Ω
Ignition coil (primary) at 20°C (68°F)	Black—Green	0.1—0.3 Ω



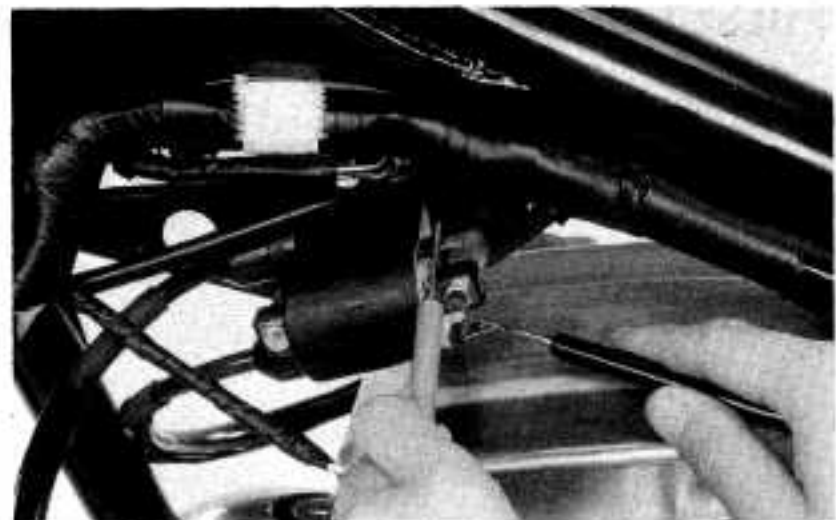
IGNITION COIL

Remove the fuel tank (page 4-14).
 Disconnect the ignition coil leads.

PRIMARY

Measure the resistance of the primary coil.

STANDARD: 0.1—0.3 Ω at 20°C (68°F)



SECONDARY

Remove the spark plug caps from the plugs and measure the secondary coil resistance between the plug caps.

STANDARD: 7.4—11 kΩ at 20°C (68°F)



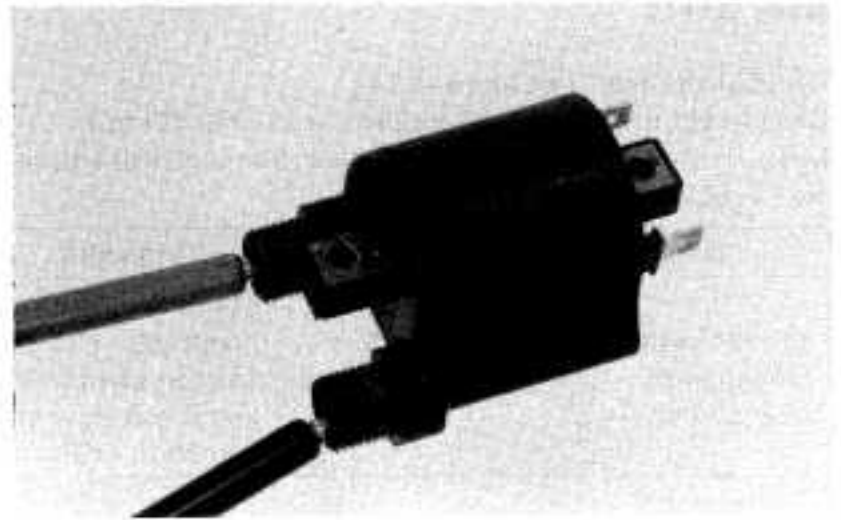
IGNITION SYSTEM

If the measurement is out of the standard resistance, remove the ignition coil from the bracket.

Remove the spark plug wires from the ignition coil and measure the secondary coil resistance between their terminals.

STANDARD: 3.7–4.5 k Ω at 20°C (68°F)

- If the measurement does not fall within the standard resistance, replace the ignition coil and re-test.
- If the measurement is within the standard resistance, check the spark plug wires for open circuit, and repair or replace faulty parts.



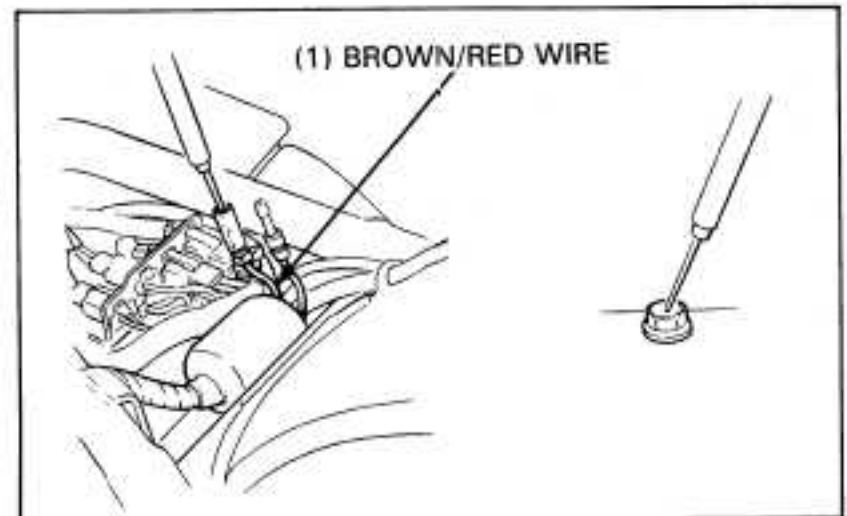
EXCITER COIL

Remove the fuel tank (page 4-14).

Disconnect the alternator wire connector.

Measure the resistance between the brown/red wire and ground.

STANDARD: 50–250 Ω at 20°C (68°F)



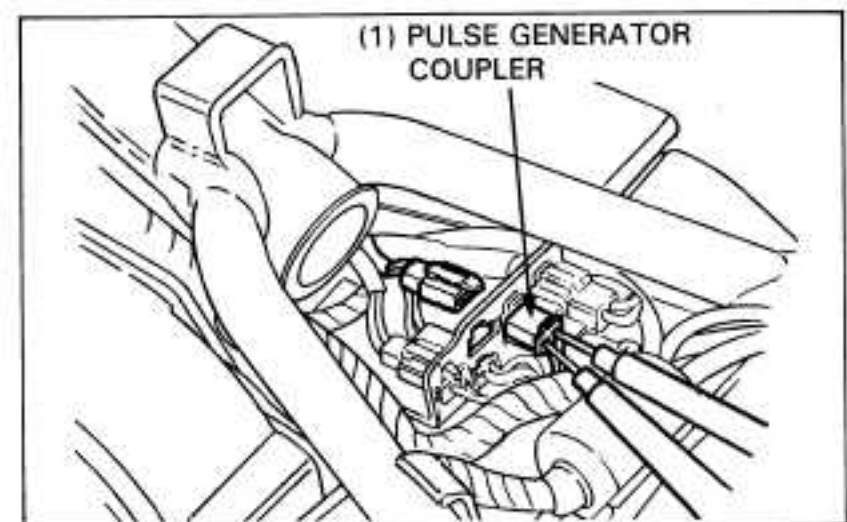
PULSE GENERATOR

Remove the fuel tank (page 4-14).

Disconnect the pulse generator wire coupler.

Measure the resistance between the blue/yellow and green wires.

STANDARD: 50–170 Ω at 20°C (68°F)



IGNITION TIMING

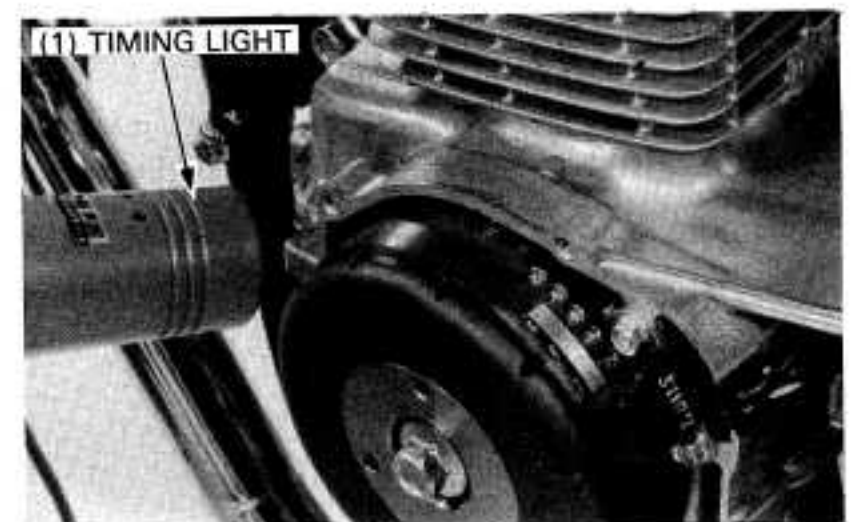
NOTE

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

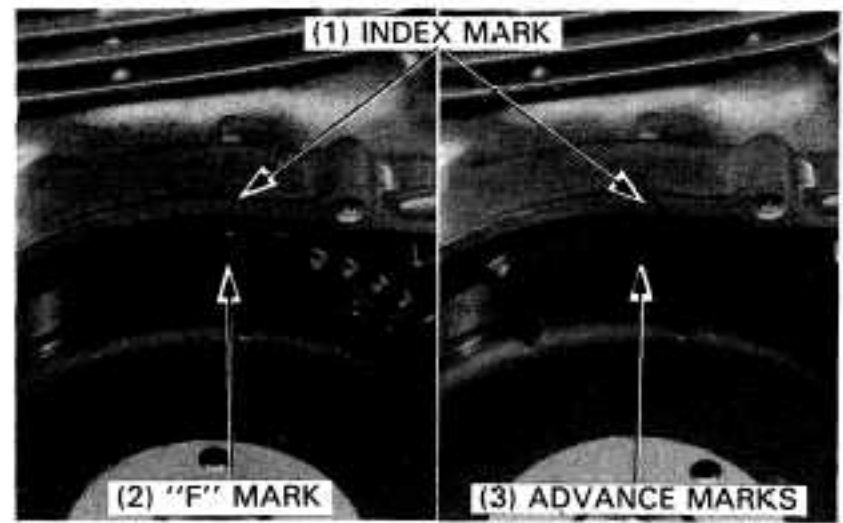
Remove the left crankcase cover (page 9-2).

Connect the tachometer and timing light to the engine.
Start the engine.

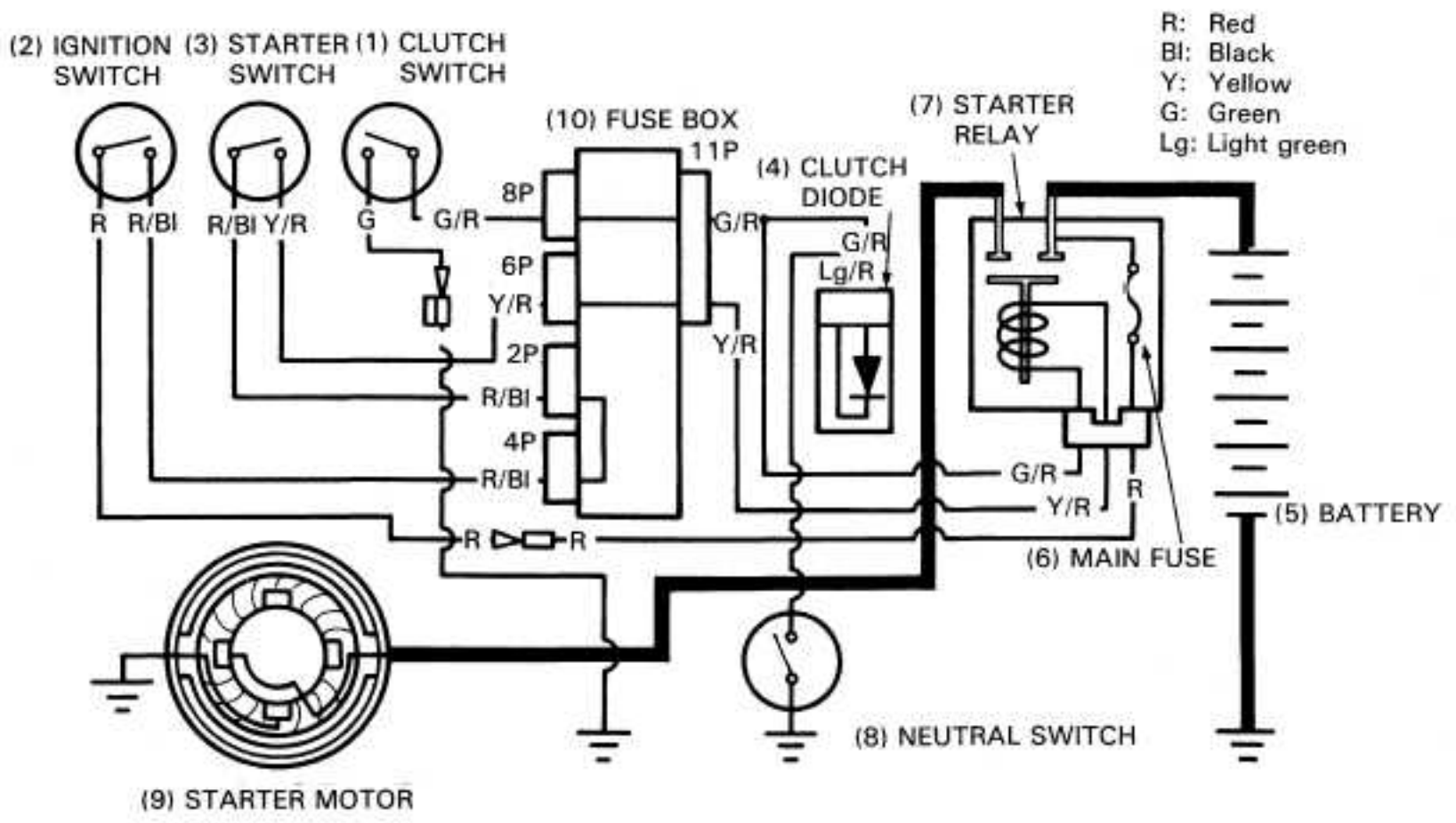
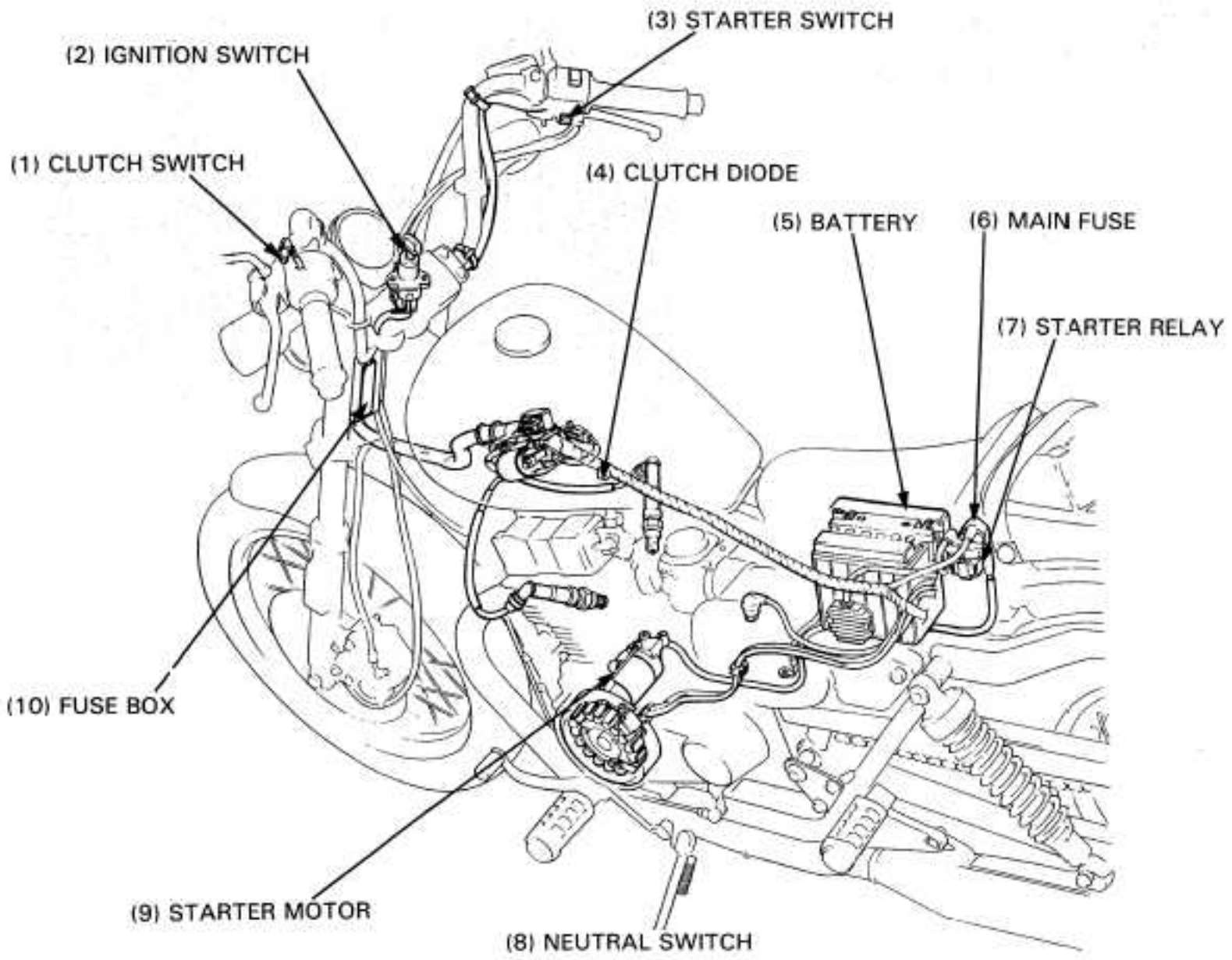
The timing at idle is correct if the index mark aligns with the "F" mark at idle of 1,200 rpm.



To check the advance, raise the engine speed to $4,800 \pm 500$ rpm; the index mark should be between advance marks. If the ignition timing is incorrect, check the CDI unit, pulse generator, and replace faulty parts.



ELECTRIC STARTER



16. ELECTRIC STARTER

SERVICE INFORMATION	16-1	STARTER RELAY	16-5
TROUBLESHOOTING	16-1	CLUTCH DIODE	16-6
STARTER MOTOR	16-2		

SERVICE INFORMATION

GENERAL

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

SPECIFICATIONS

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	11.0—12.5 (0.43—0.49)	5.5 (0.22)
Starter motor brush spring tension	495—605 g (17.5—21.3 oz)	400 g (14.1 oz)

TROUBLESHOOTING

Starter motor will not rotate

- Dead battery
- Loose or disconnected wire or cable
- Burned out fuse
- Faulty:
 - ignition switch
 - starter relay
 - starter switch
 - neutral switch
 - clutch switch
 - clutch diode
 - starter motor

Starter motor turns slowly

- Weak battery
- Excessive resistance in circuit
- Binding in starter motor

Starter motor rotates, but engine does not rotate

- Faulty:
 - starter clutch
 - starter motor, idle and/or driven gear

Starter rotates, engine rotates, but does not start

- Faulty ignition system

ELECTRIC STARTER

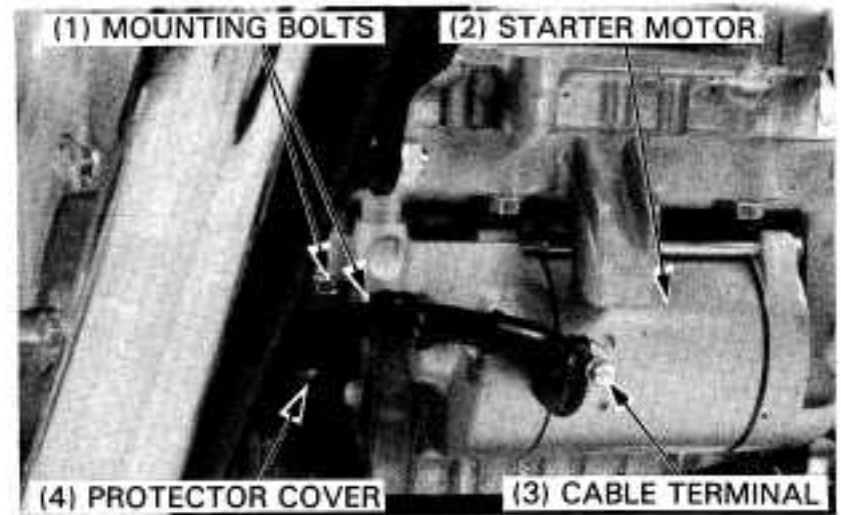
STARTER MOTOR

REMOVAL

WARNING

- *With the ignition switch OFF, remove the negative cable at the battery before servicing the starter motor.*

Remove the two socket bolts, oil pressure switch protector cover, collars and case (page 2-4).
Disconnect the starter motor cable from the starter motor.
Remove the two mounting bolts and the starter motor.

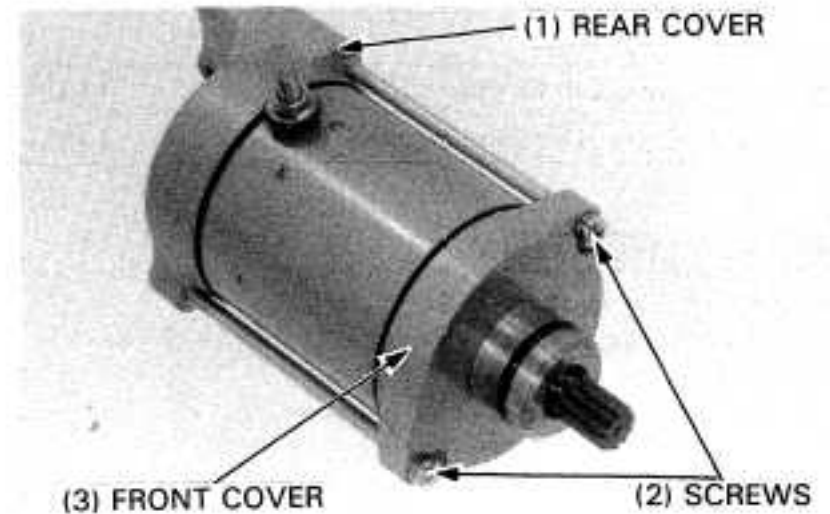


BRUSH INSPECTION

Remove the two starter motor case screws and the front and rear covers.
Remove the armature and the brushes.

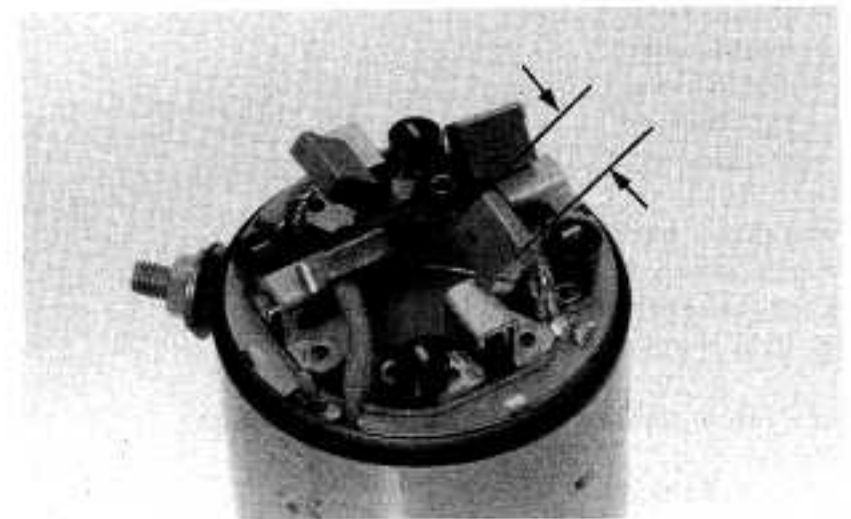
NOTE

- Record the location and number of thrust washers for correct assembly.



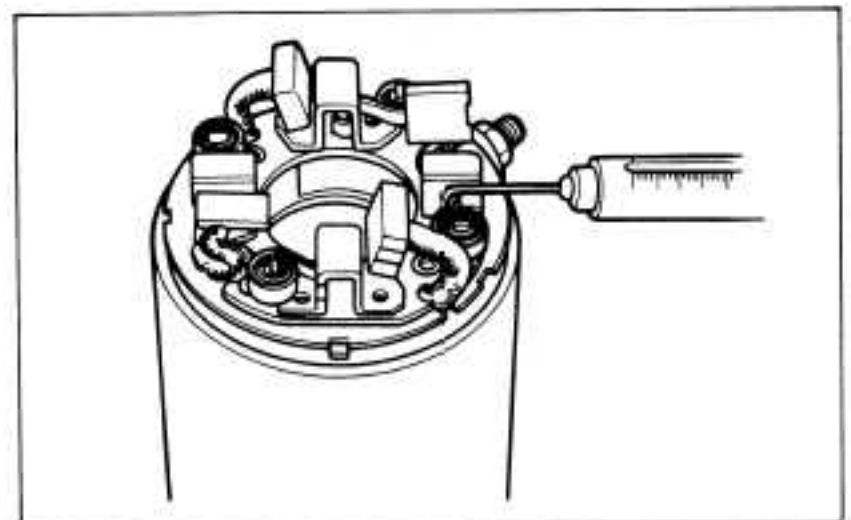
Inspect the brushes and measure the brush length.

SERVICE LIMIT: 5.5 mm (0.22 in)



Measure each brush spring tension with a spring scale.

SERVICE LIMIT: 400g (14.1 oz)

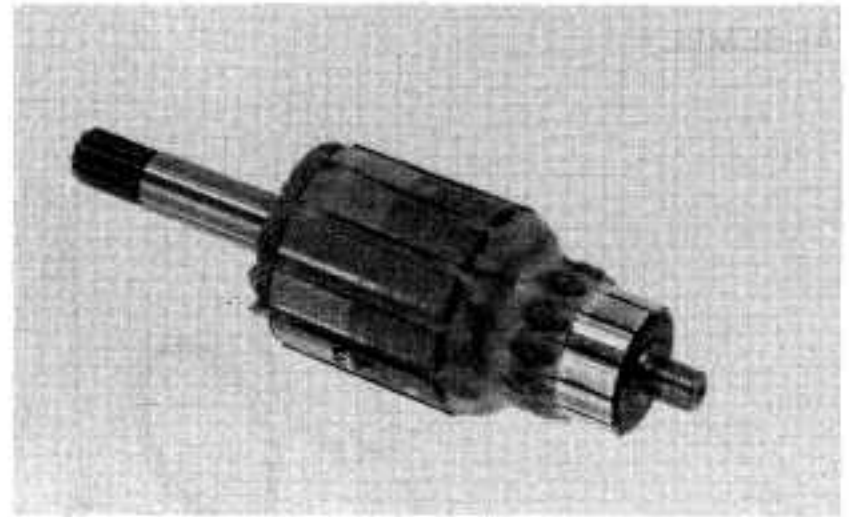


COMMUTATOR INSPECTION

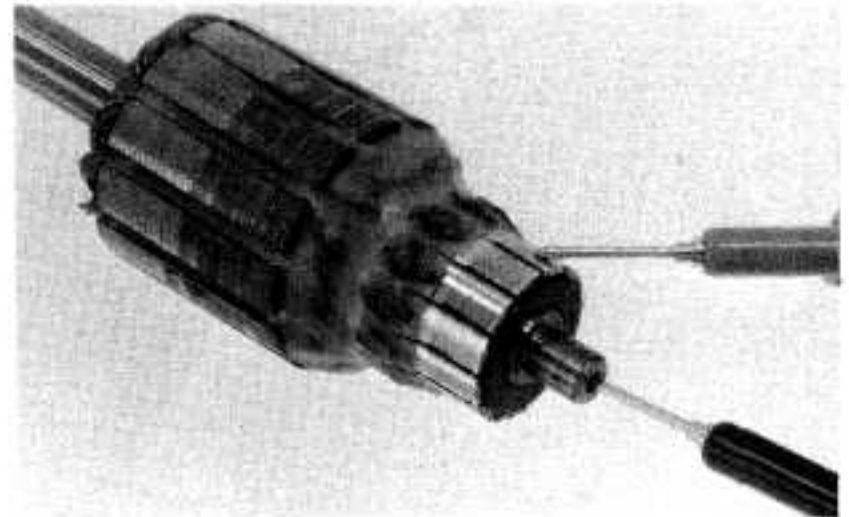
Inspect the commutator bars for discoloration. Bars discolored in pairs indicate grounded armature coils, in which case the starter motor must be replaced.

NOTE

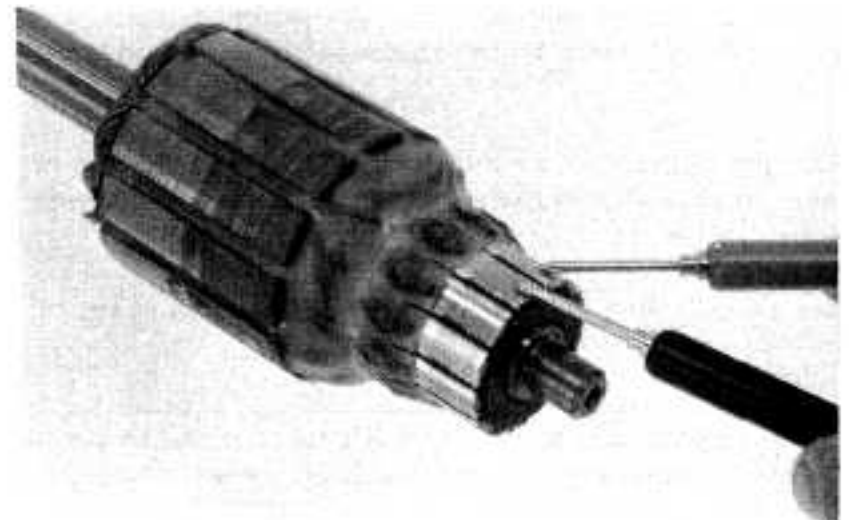
- Do not use emery or sand paper on the commutator.



Check for continuity between pairs of commutator bars; there should be continuity.



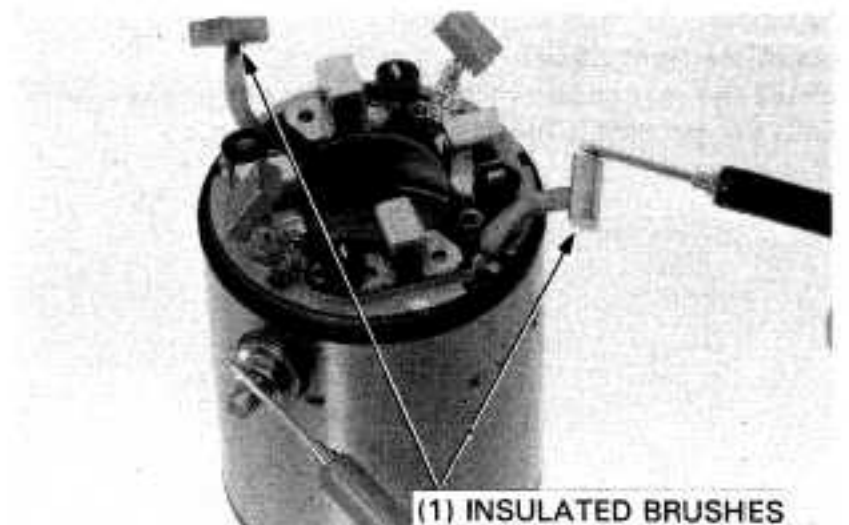
Also, check for continuity between individual commutator bars and the armature shaft; there should be no continuity.



CASE INSPECTION

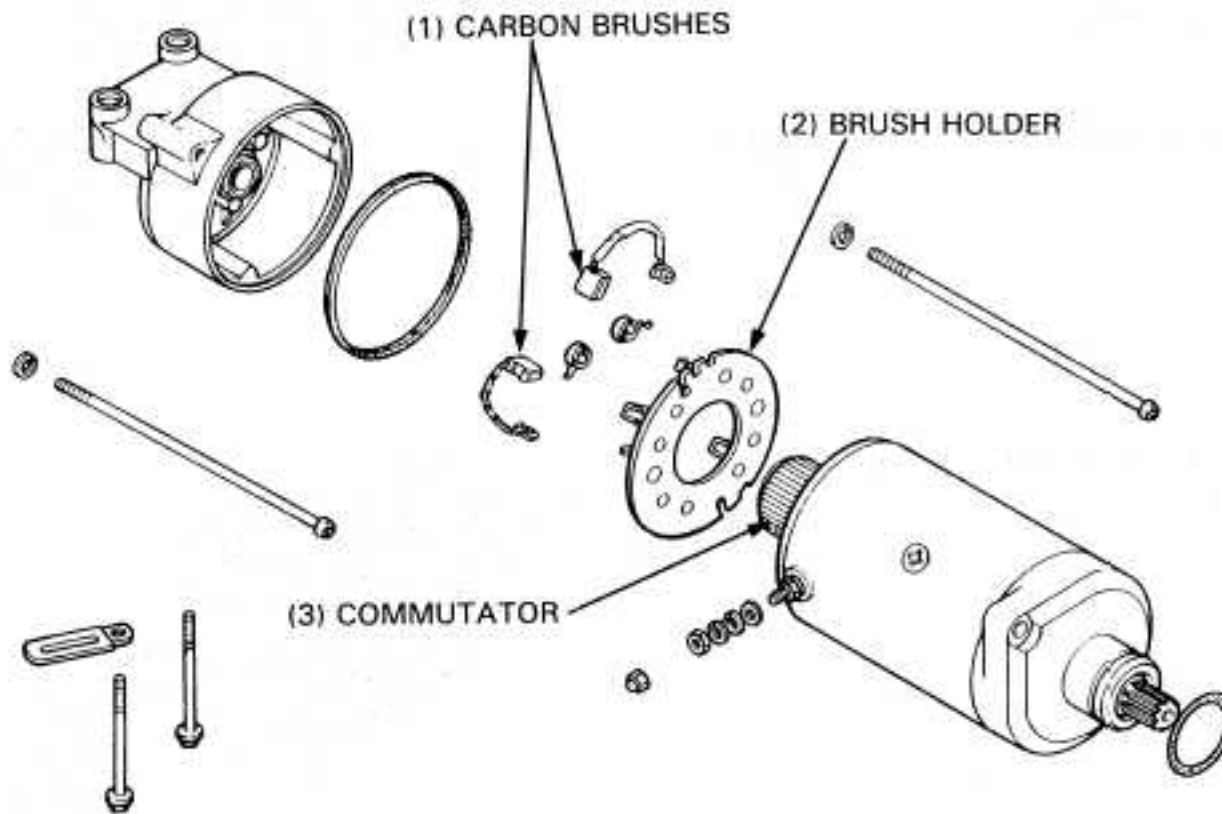
Check for continuity between the cable terminal and the motor case. There should be no continuity.

Check for continuity between the cable terminal and the insulated brushes. There should be continuity.



ELECTRIC STARTER

ASSEMBLY



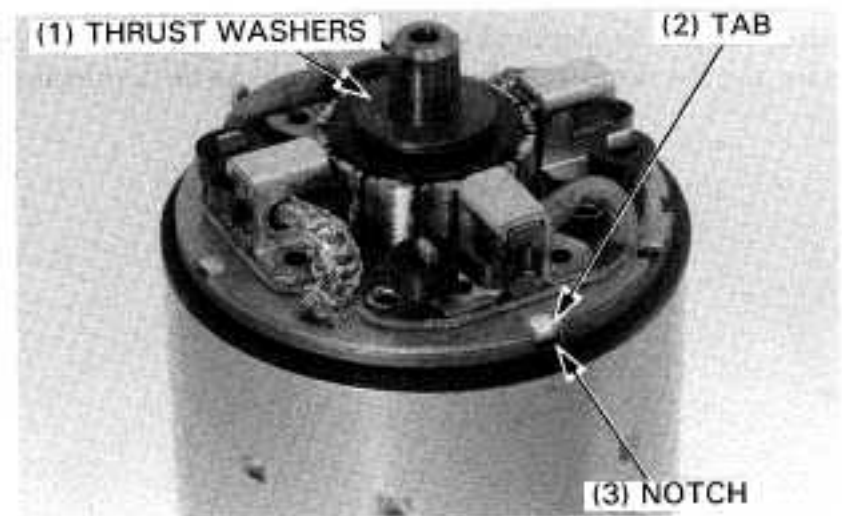
Install a new O-ring on the starter motor case, and insert the commutator.

Compress the brushes into their holders and slip the holder over the commutator while aligning the case notch with the brush holder tab.

Install the thrust washers onto the commutator shaft.

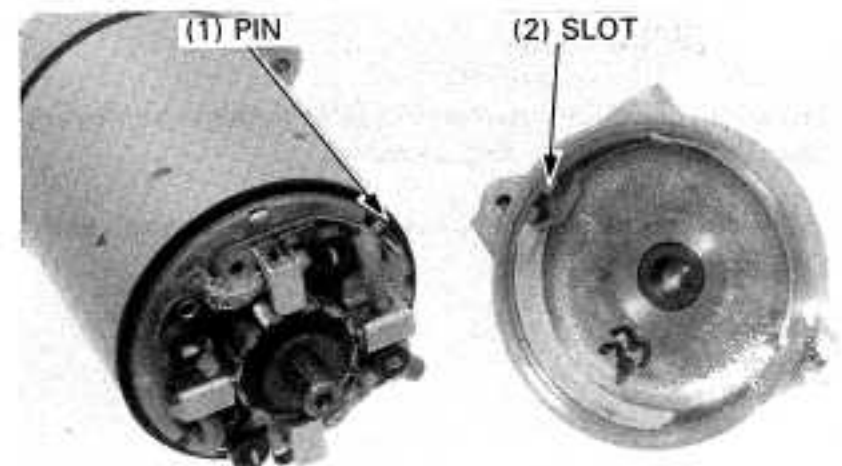
NOTE

- Be sure the proper number and location of the thrust washers, as previously noted, have been placed on the shaft.

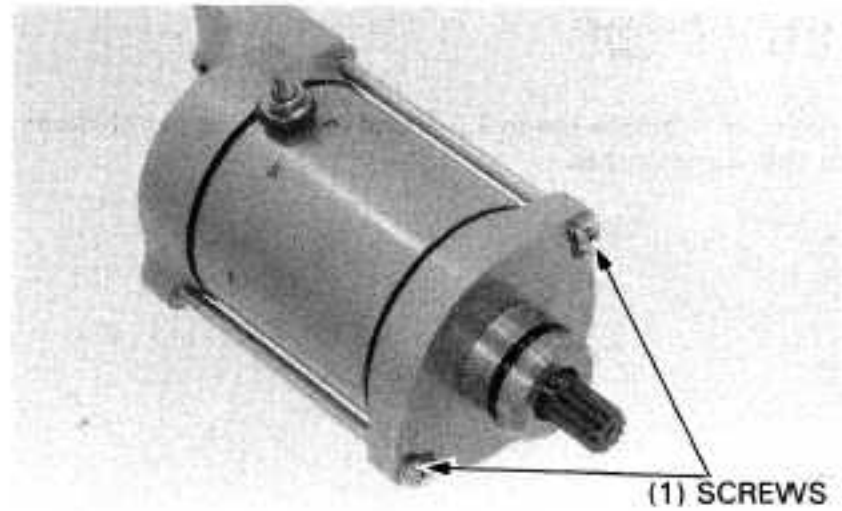


Install the front cover.

Install the rear cover while aligning the slot on the rear cover with the pin on the brush holder.



Install and tighten the starter motor screws.



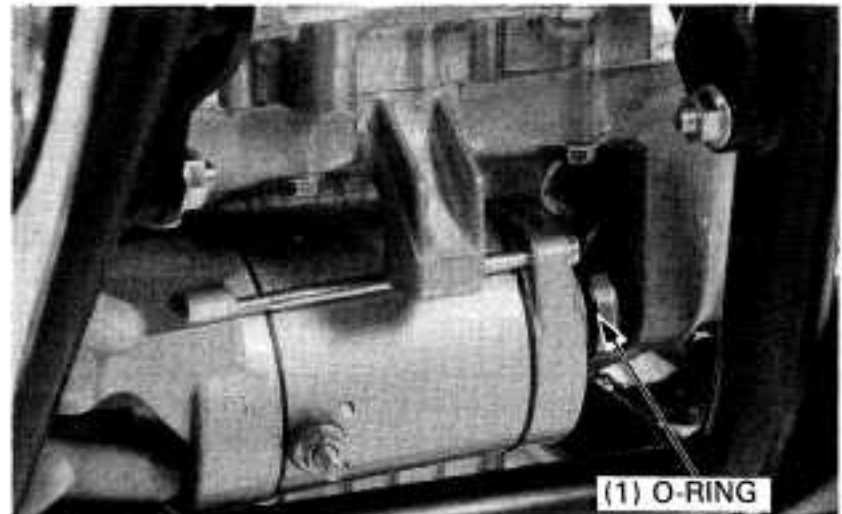
INSTALLATION

Grease a new O-ring and install it onto the starter motor front cover.

Install the starter motor and tighten the two mounting bolts. Connect the starter cable to the motor terminal and place the rubber cap properly.

Install the oil pressure switch case and protector cover with the two collars and socket bolts (page 2-4).

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



STARTER RELAY

Shift the transmission into neutral.

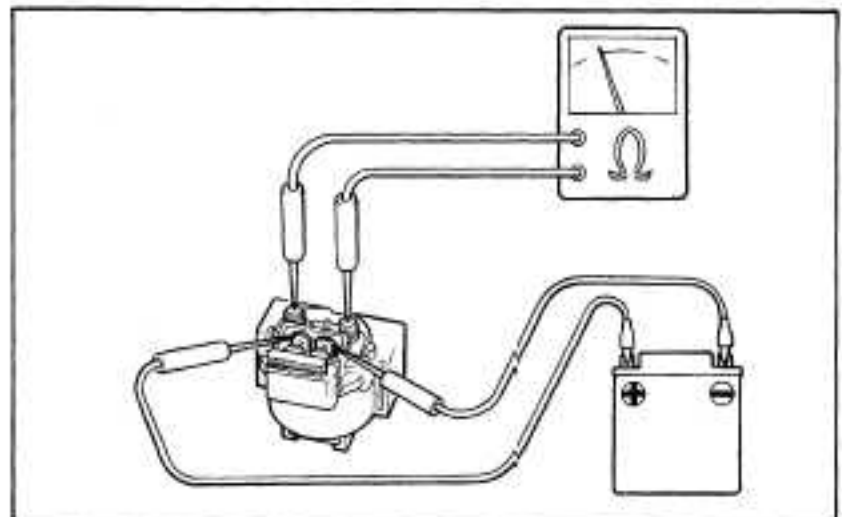
Remove the right side cover.

Depress the starter switch button with the ignition switch ON. The coil is normal if the starter relay clicks.

Disconnect the connector and cables from the starter relay.

Connect an ohmmeter to the starter cable terminals. Connect the yellow/red wire terminal to a 12V battery positive (+) terminal, and the green/red wire terminal to the negative (-) terminal using jumper wires.

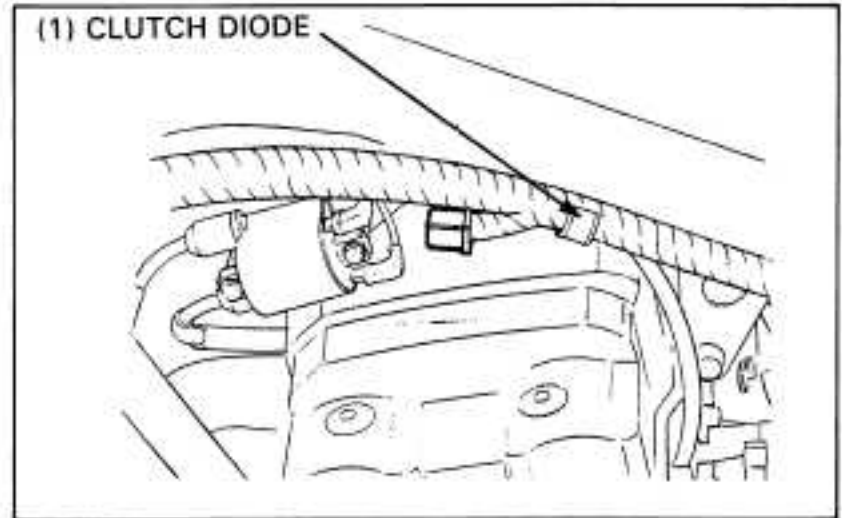
The relay switch is normal if there is continuity with the battery connected and no continuity with the battery disconnected.



ELECTRIC STARTER

CLUTCH DIODE

Remove the fuel tank (page 4-14) and remove the clutch diode from the wire harness.



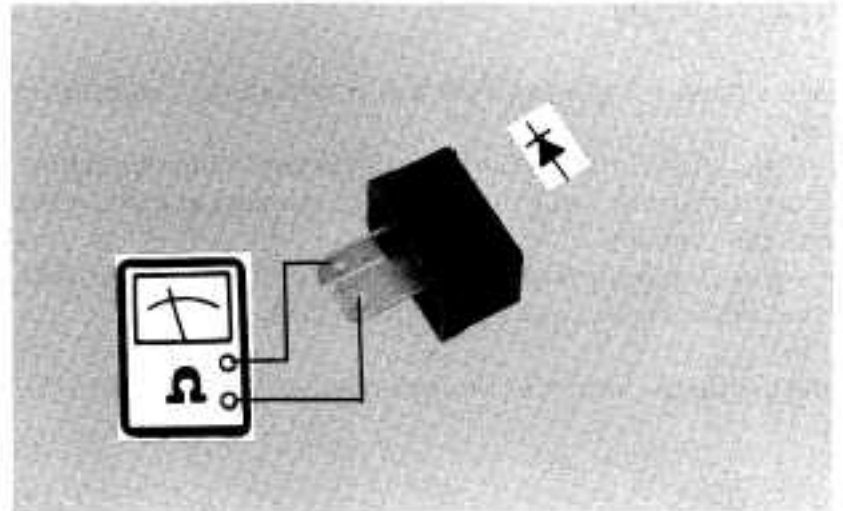
Check for continuity with an ohmmeter.

Connect the positive probe to the \oplus terminal and the negative probe to the \ominus terminal of the diode.

There should be continuity, then with the probes reversed, there should be no continuity.

NOTE

- The test results shown are for a positive ground ohmmeter and the opposite results will be obtained when a negative ground ohmmeter is used.



17. LIGHTS/SWITCHES/HORN

SERVICE INFORMATION	17-1	NEUTRAL/OVERDRIVE SWITCH	17-6
HEADLIGHT	17-2	REAR BRAKE LIGHT SWITCH	17-6
TURN SIGNAL LIGHT	17-2	FRONT BRAKE LIGHT SWITCH	17-7
TAIL/BRAKE LIGHT	17-3	CLUTCH SWITCH	17-7
LICENSE LIGHT	17-3	HANDLEBAR SWITCH	17-7
INSTRUMENT	17-4	IGNITION SWITCH	17-8
OIL PRESSURE SWITCH	17-6	HORN	17-9

SERVICE INFORMATION

GENERAL

- Some wires have different colored bands around them near the connector. These are connected to other wires which have the same color band.
- All plastic plugs have locking tabs that must be released before disconnecting, and must be aligned when reconnecting.
- The following color codes used are indicated throughout this section and on the wiring diagram.

Bu = Blue	G = Green	Lg = Light Green	R = Red
Bl = Black	Gr = Grey	O = Orange	W = White
Br = Brown	Lb = Light Blue	Y = Yellow	

- To isolate an electrical failure, check the continuity of the electrical path through the part. A continuity check can usually be made without removing the part from the motorcycle. Simply disconnect the wires and connect a continuity tester or volt-ohmmeter to the terminals or connections.
- A continuity tester is useful when checking to find out whether or not there is an electrical connection between the two points. An ohmmeter is needed to measure the resistance of a circuit, such as when there is a specific coil resistance involved, or when checking for high resistance caused by corroded connections.

HEADLIGHT

BULB REPLACEMENT

Remove the two screws and headlight.



Disconnect the headlight coupler and remove the rubber boot.



Remove the clip and replace the headlight bulb.

CAUTION

- Do not put finger prints on the headlight bulb, they may create hot spots on the bulb.
- If you touch the bulb with your bare hands, clean it with a cloth moistened with alcohol to prevent its early failure.
- Do not try to replace the bulb with light ON.
- After replacing the bulb, install the rubber boot tightly against the unit.

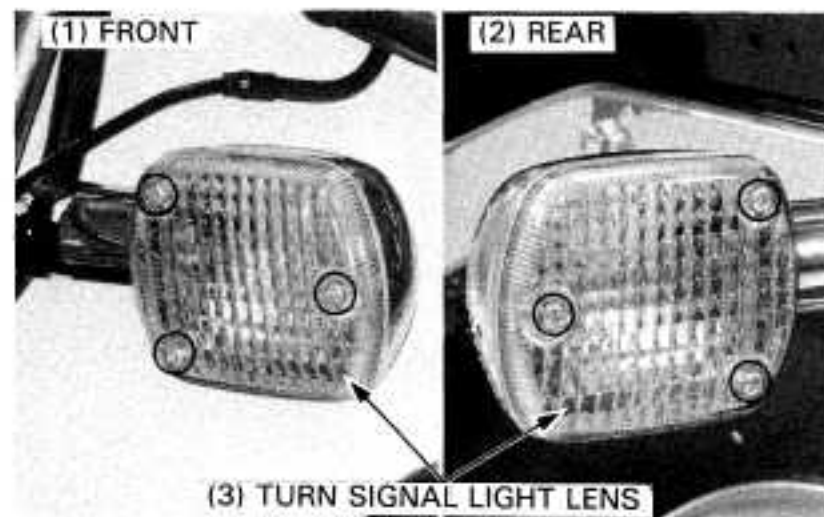


Install the headlight in the reverse order of removal.

TURN SIGNAL LIGHT

BULB REPLACEMENT

Remove the three screws and the turn signal light lens.

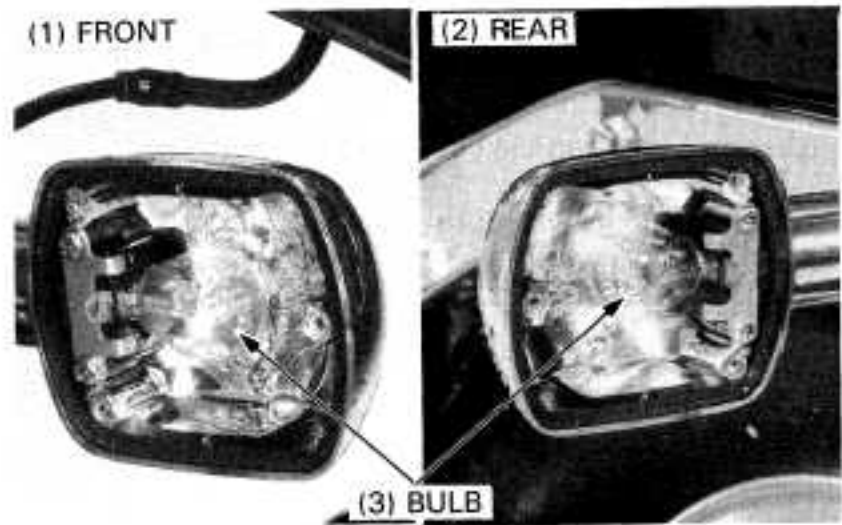


Remove the turn signal light bulb by pushing it in and turning it counterclockwise.

Install a new bulb in the reverse order of removal.

Install the lens and tighten the screws securely.

After installation, check turn signal light operation.



TAIL/BRAKE LIGHT

BULB REPLACEMENT

Remove the two screws and the tail/brake light lens.



Push the bulb in, turn it counterclockwise and remove it.

Install a new bulb and the lens, and tighten the two screws securely.

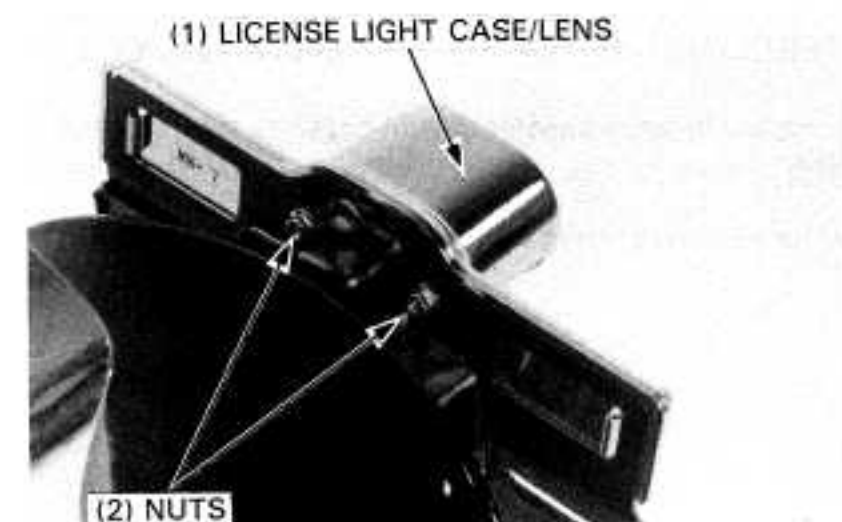
After installation, check that the brake light and taillight operate properly.



LICENSE LIGHT

BULB REPLACEMENT

Remove the two nuts and the license light case/lens.

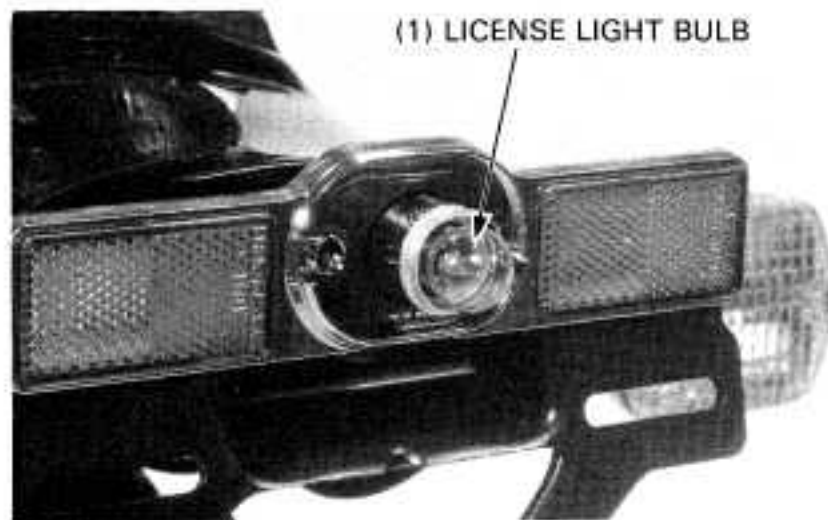


LIGHTS/SWITCHES/HORN

Push the license light bulb in, turn it counterclockwise and remove it.

Install a new bulb and the case/lens with two nuts.

After installation, check license light operation.



INSTRUMENT

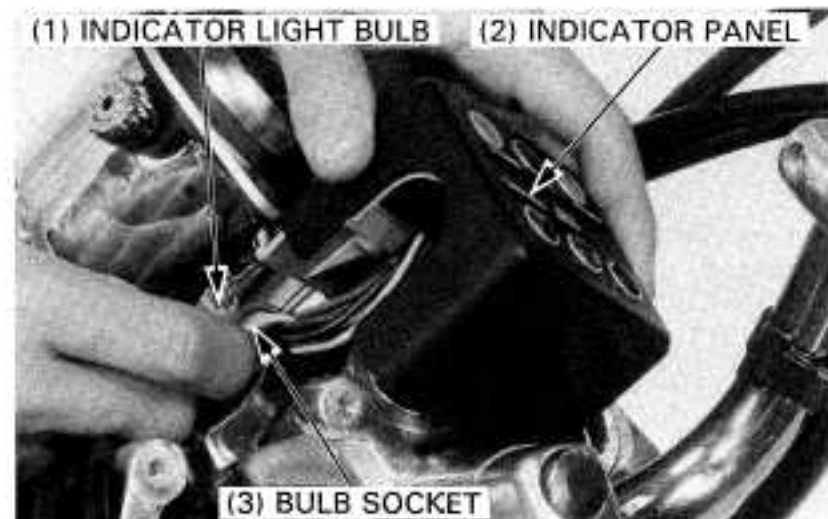
INDICATOR LIGHT BULB REPLACEMENT

Remove the speedometer mounting bolts and pull up the meter with the indicator panel.



Pull the indicator light bulb socket out of the panel and remove the bulb by pulling it out of the socket.

Install a new bulb and the removed parts in the reverse order of removal.



SPEEDOMETER LIGHT BULB REPLACEMENT

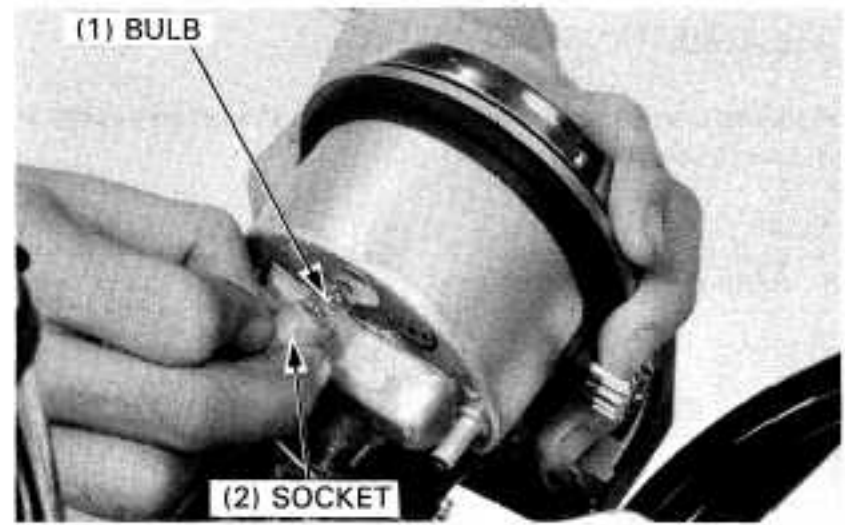
Remove the speedometer mounting bolts and pull up the meter.

Remove the two attaching screws and the meter lower cover.



Pull the bulb socket out of the speedometer case and remove the bulb by pulling it out.

Install a new bulb and the removed parts in the reverse order of removal.



REMOVAL/DISASSEMBLY

Disconnect the speedometer cable.

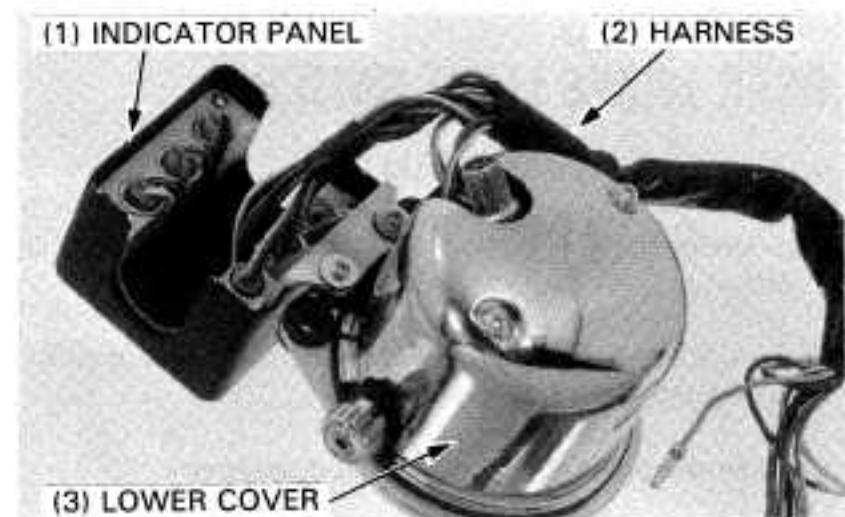
Remove the junction box cover and disconnect the instrument wire coupler and connectors.



Remove the speedometer mounting bolts and remove the meter with the indicator panel.



Remove the meter lower cover and indicator panel from the case.
Remove the bulb sockets and the wire harness.



ASSEMBLY/INSTALLATION

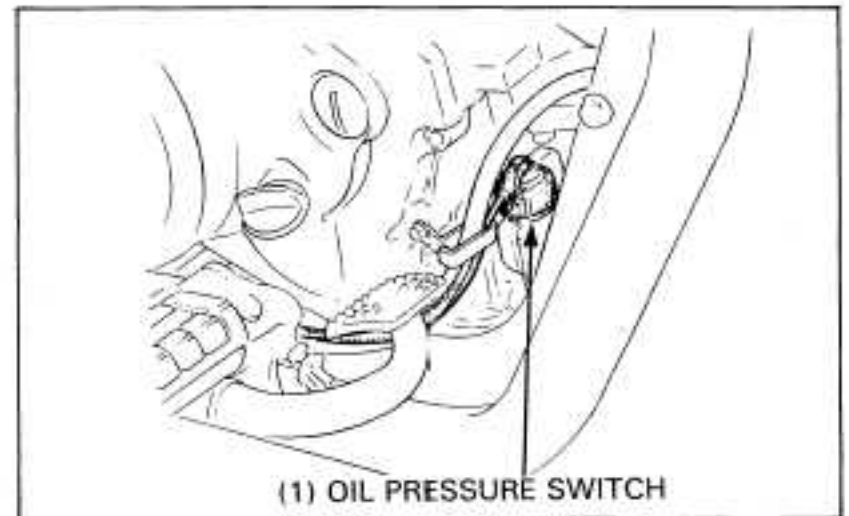
Assemble and install the instruments in the reverse order of removal/disassembly.

NOTE

- Route the wire harness and cables properly (page 1-8).

OIL PRESSURE SWITCH

Remove the oil pressure switch wire from the switch. Ground the switch wire and turn the ignition switch on and make sure that the oil pressure warning indicator will come on. If the indicator does not come on, check the wire harness for open circuit on loose connection. Check for continuity between the oil pressure switch wire terminal and switch body. There should be continuity with the engine stopped and no continuity with the engine running.



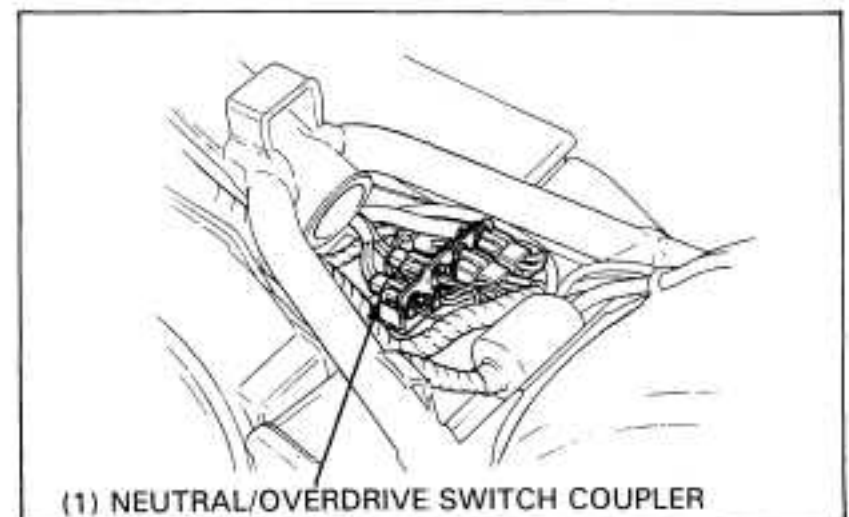
NEUTRAL/OVERDRIVE SWITCH

Remove the seats (page 12-16) and disconnect the neutral/overdrive switch wire coupler.

Check continuity between the light green/red lead and ground at the switch wire coupler. There should be continuity when the transmission is in neutral and no continuity in any other position.

Also, make a continuity check between the green/orange lead and ground.

There should be continuity when the transmission is in overdrive and no continuity in any other position.



REAR BRAKE LIGHT SWITCH

Remove the seats (page 12-16).

Disconnect the rear brake light switch coupler and check for continuity.

The switch should have continuity with the rear brake applied and no continuity with free.

Replace the rear brake light switch if necessary.



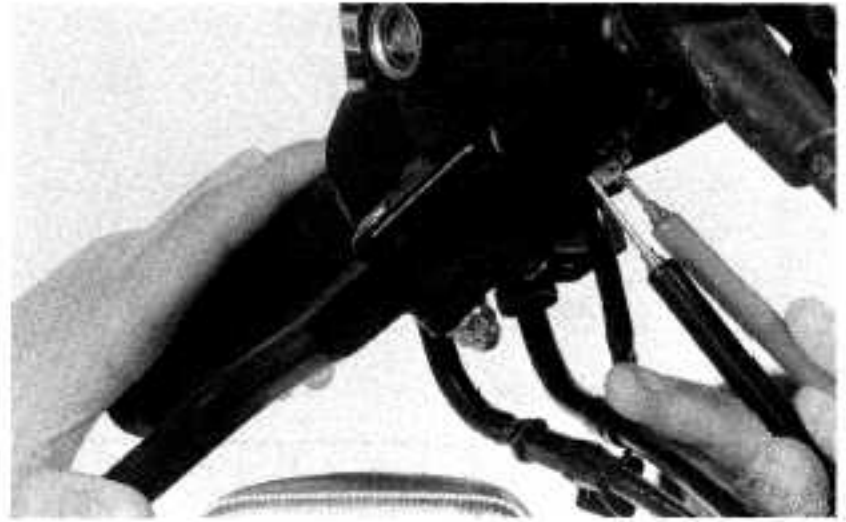
FRONT BRAKE LIGHT SWITCH

Disconnect the front brake light switch connectors and check for continuity.

The switch should have continuity with the front brake applied.

There should be no continuity when the front brake lever is released.

Replace the switch if necessary.



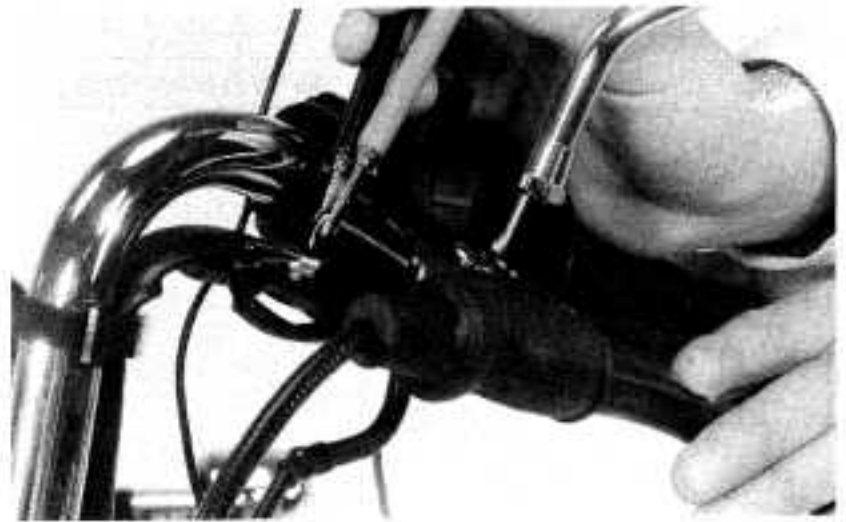
CLUTCH SWITCH

Disconnect the clutch (safety) switch connectors and check for continuity.

The switch should have continuity with the clutch lever applied.

There should be no continuity when the clutch lever is released.

Replace the clutch (safety) switch if necessary.



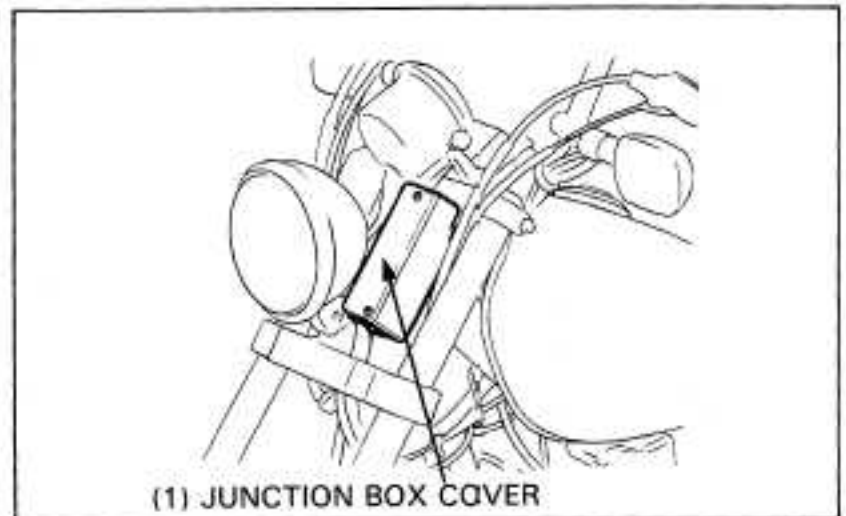
HANDLEBAR SWITCH

The handlebar switch (dimmer, turn signals, horn, starter, engine stop, etc.) must be replaced as an assembly.

Remove the two screws and the junction box cover, and disconnect the handlebar switch couplers and connectors.

Check continuity for the components of the handlebar switch.

Continuity should exist between the color coded wires in each chart.

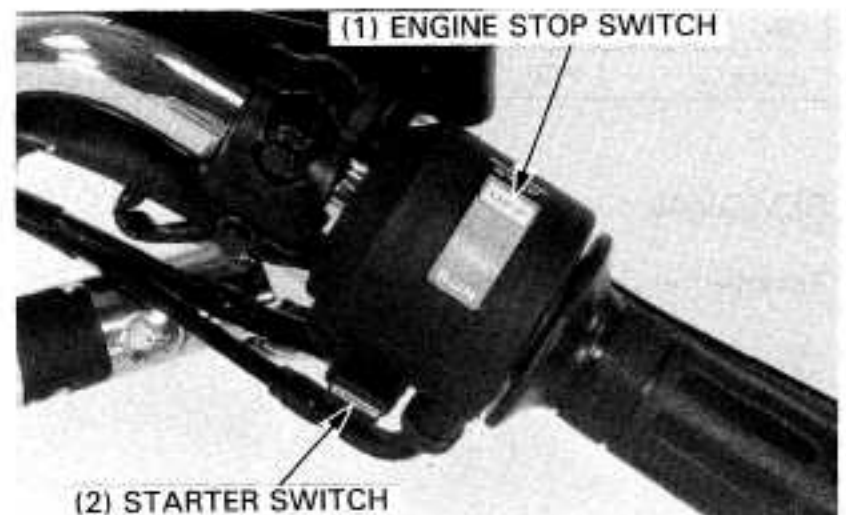


ENGINE STOP SWITCH

Terminal	IG	E
OFF	○—○	
RUN		
Color	BI/W	G

STARTER SWITCH

Terminal	ST	BAT ₂	HL ₁	HL ₂
RELEASED			○—○	
DEPRESSED	○—○			
Color	Y/R	R/BI	Bu/W	BI/R



LIGHTS/SWITCHES/HORN

DIMMER SWITCH

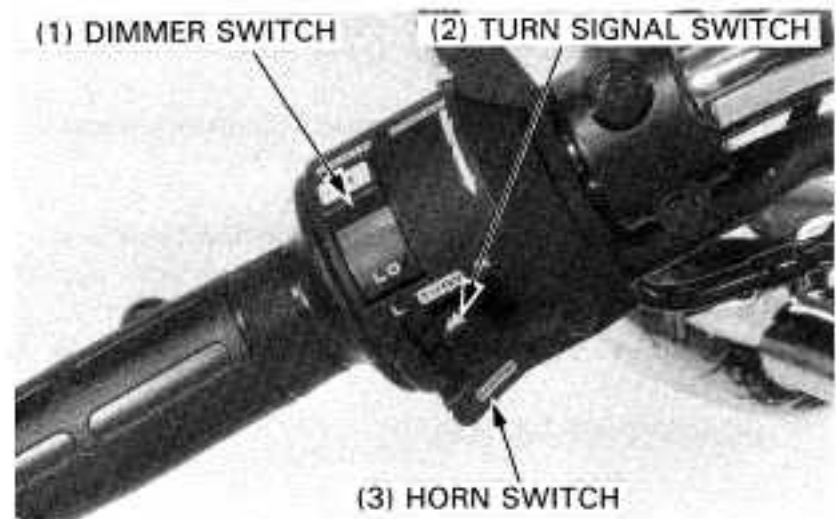
Terminal	HL ₁	Lo	Hi
Hi	○—○		
(N)	○—○	○—○	
Lo		○—○	
Color	Bu/W	W	Bu

TURN SIGNAL SWITCH

Terminal	W	L	R	TL	PR	PL
LEFT	○—○			○—○		○—○
OFF				○—○	○—○	○—○
RIGHT	○—○		○—○	○—○		
Color	Gr	O	Lb	Br/W	Lb/W	O/W

HORN SWITCH

Terminal	Ho	BAT ₅
Depressed	○—○	
Released		
Color	W/G	Lg



IGNITION SWITCH

INSPECTION

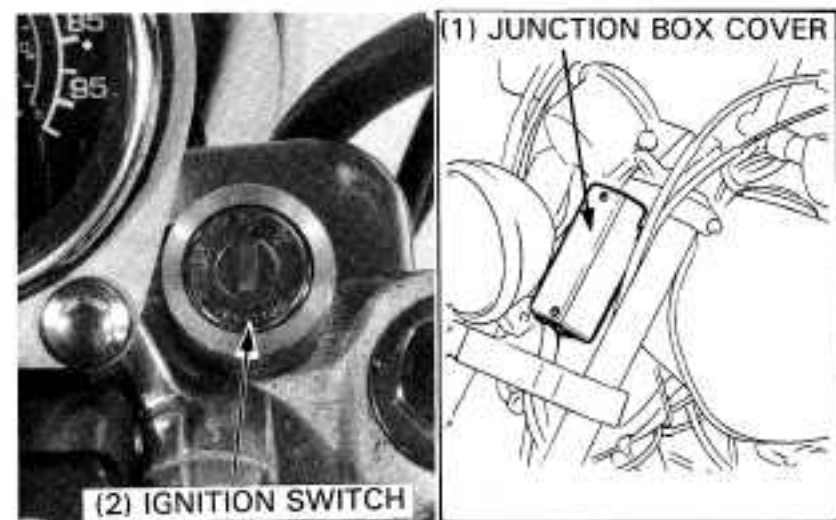
Remove the two screws and the junction box cover, disconnect the ignition switch connectors.

Check for continuity between the terminals of the connectors in each switch position.

Terminal	PA	BAT ₁	BAT ₂	TL ₁	TL ₂	IG	E
LOCK						○—○	○—○
P	○—○					○—○	○—○
OFF						○—○	○—○
ON		○—○	○—○	○—○			
Color	Y/Bl	R	R/Bl	Br/W	Br	Bl/W	G

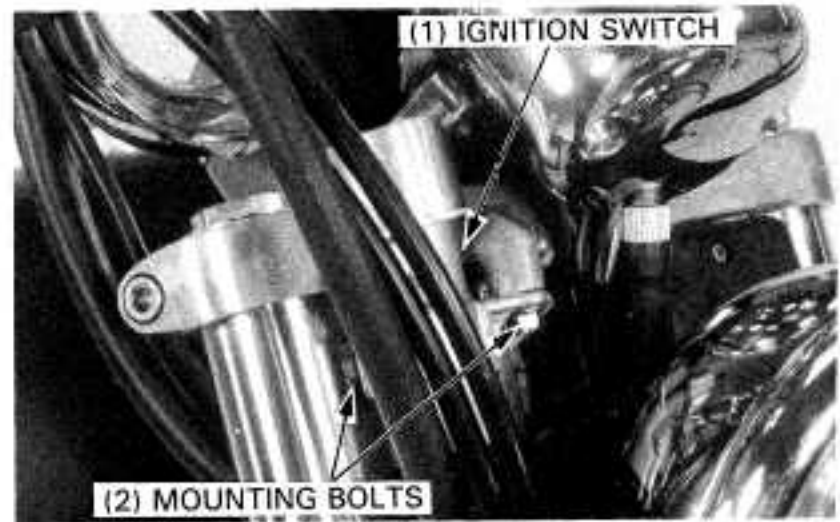
REMOVAL

Remove the ignition switch cover.



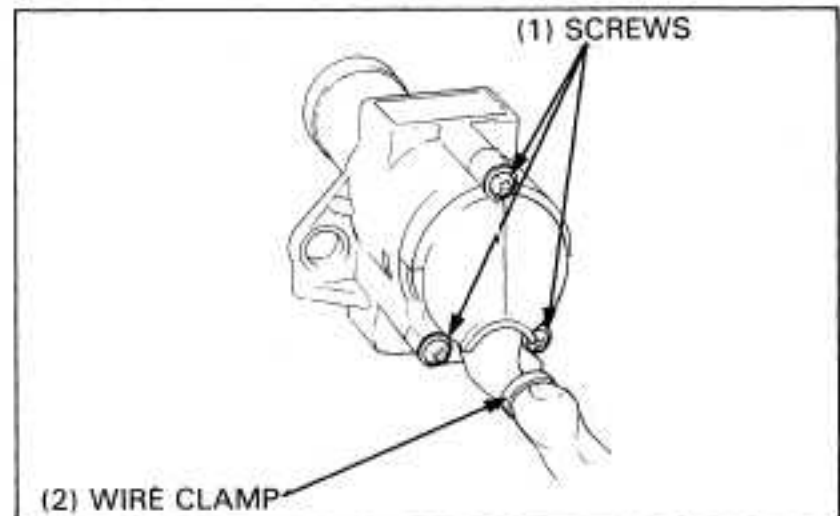
Remove the junction box cover and disconnect the ignition switch connectors.

Remove the two mounting bolts and the ignition switch from the fork bridge.



DISASSEMBLY/ASSEMBLY

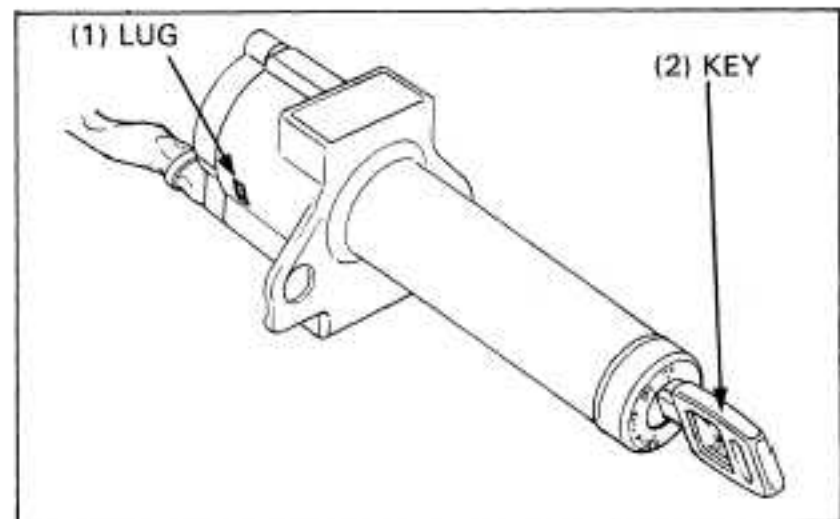
Remove the wire clamp and the three screws.



Insert the key into the ignition switch and position it between the ON and OFF positions.

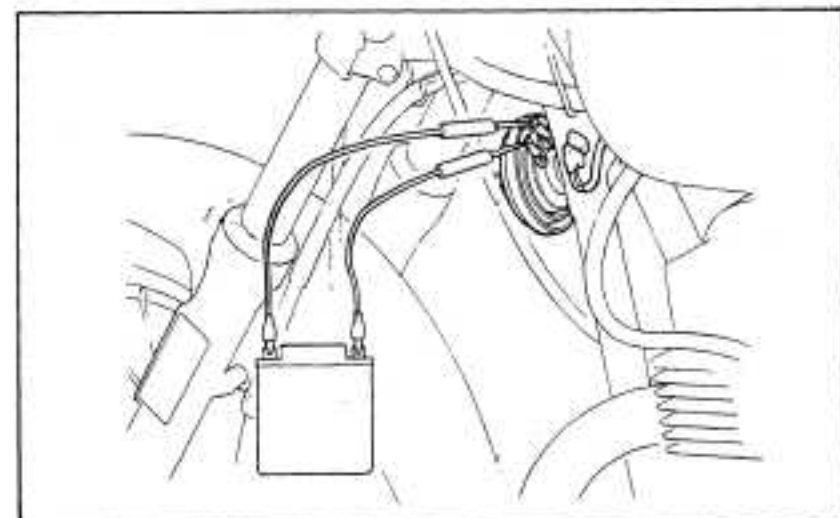
Push in the lugs in the slots and pull out the contact base from the switch.

Assemble the ignition switch in the reverse order of disassembly.



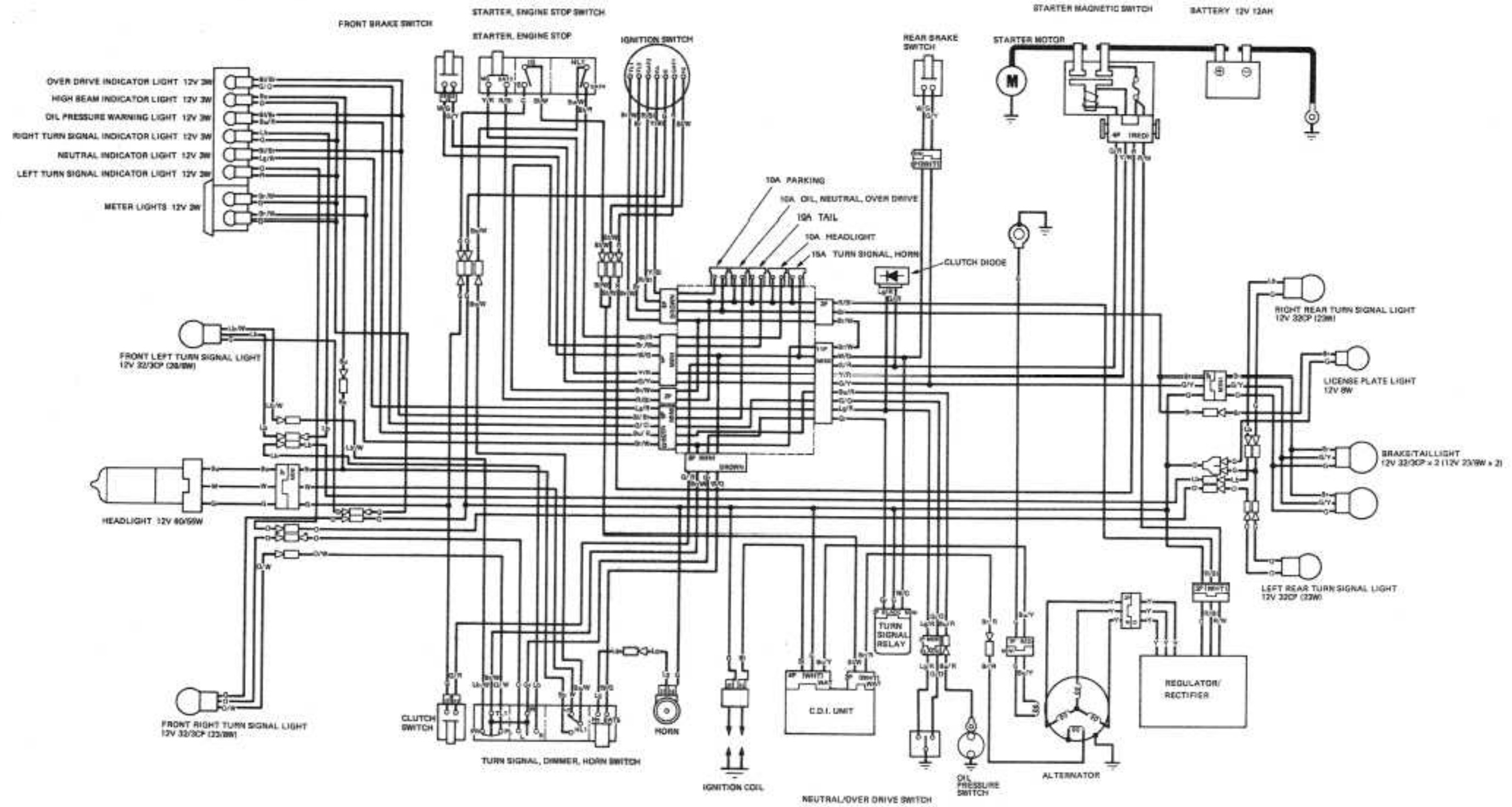
HORN

Disconnect the wire connectors from the horns and connect 12 V battery to the horn wire terminals. The horn is normal if it sounds when the 12V battery is connected across the horn terminals.



MEMO

18. WIRING DIAGRAM



IGNITION SWITCH						
	PA	BAT1	BAT2	TL1	TL2	E
OFF						○
ON	○	○	○	○		○
F	○					○

ENGINE STOP SWITCH		
	IG	E
OFF	○	○
RUN		

STARTER SWITCH		
	BAT2	MG
FREE		
PUSH	○	○

TURN SIGNAL SWITCH					
	W	R	L	TL1	PL
R	○	○		○	○
N				○	○
L			○	○	○

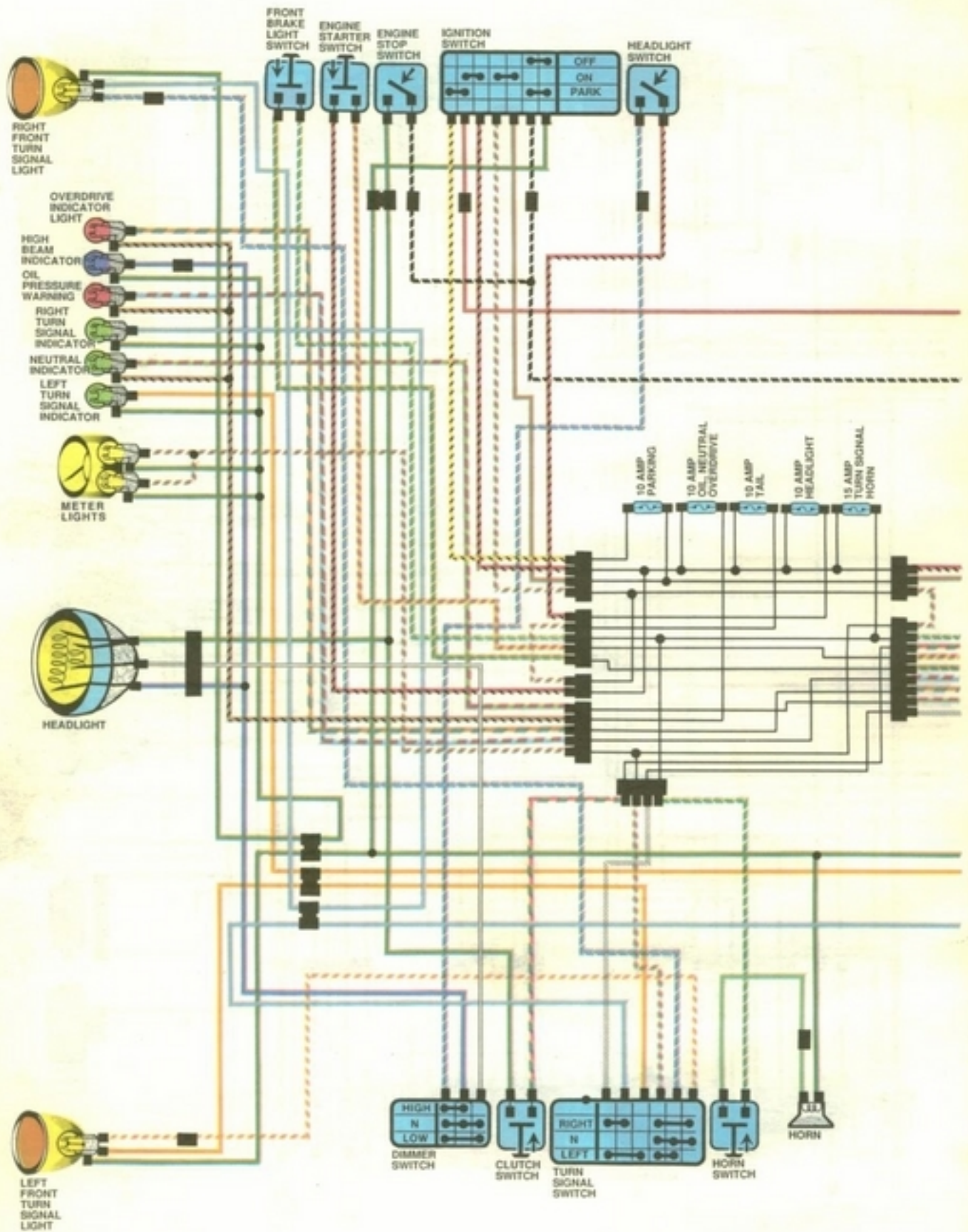
HORN SWITCH		
	BAT1	Hs
FREE		
PUSH	○	○

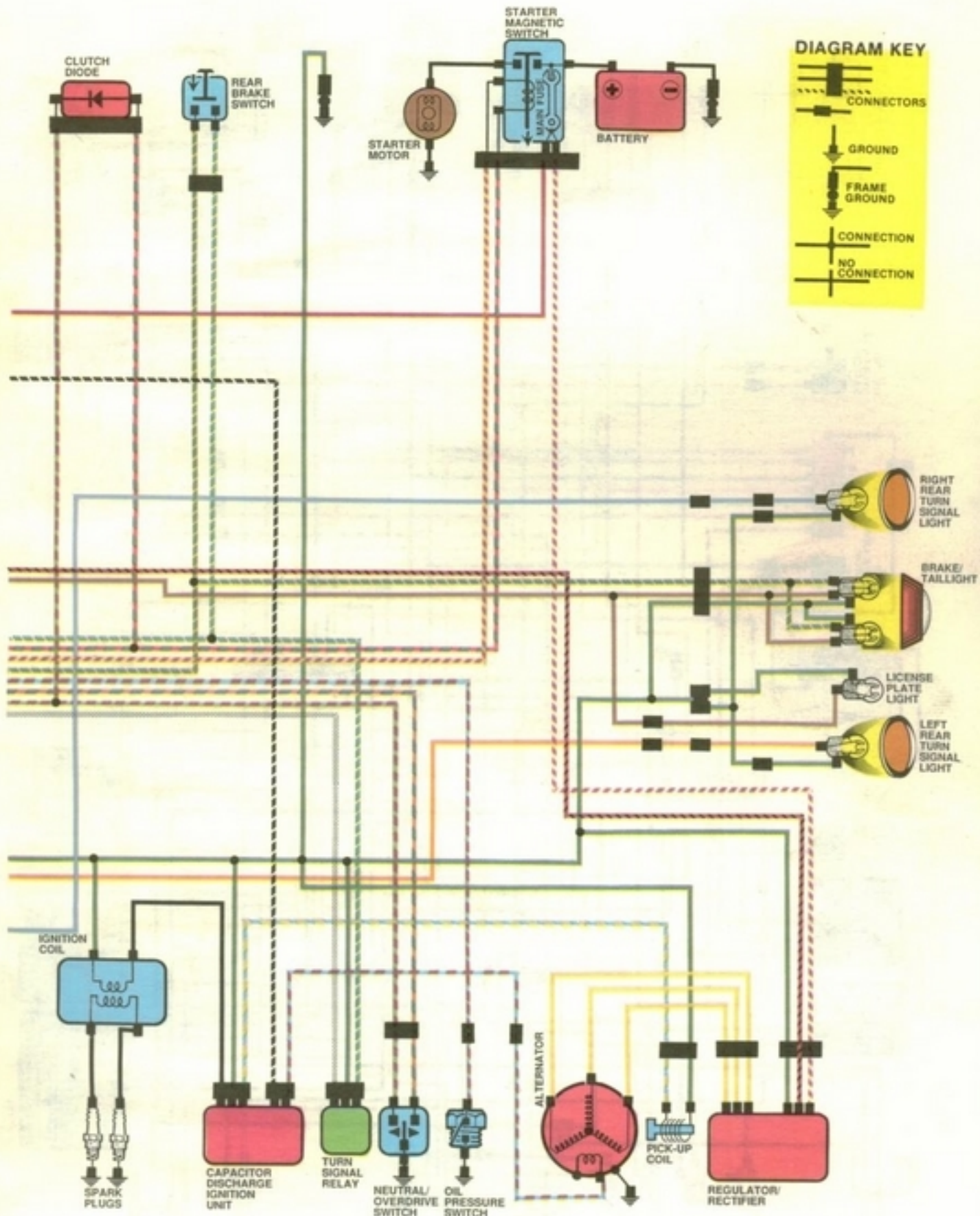
DIMMER SWITCH			
	HL1	Hs	H
Lo	○	○	○
IN	○	○	○
Hi			○

0030Z-MM2-6710

B	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

1986-1987 CMX450C

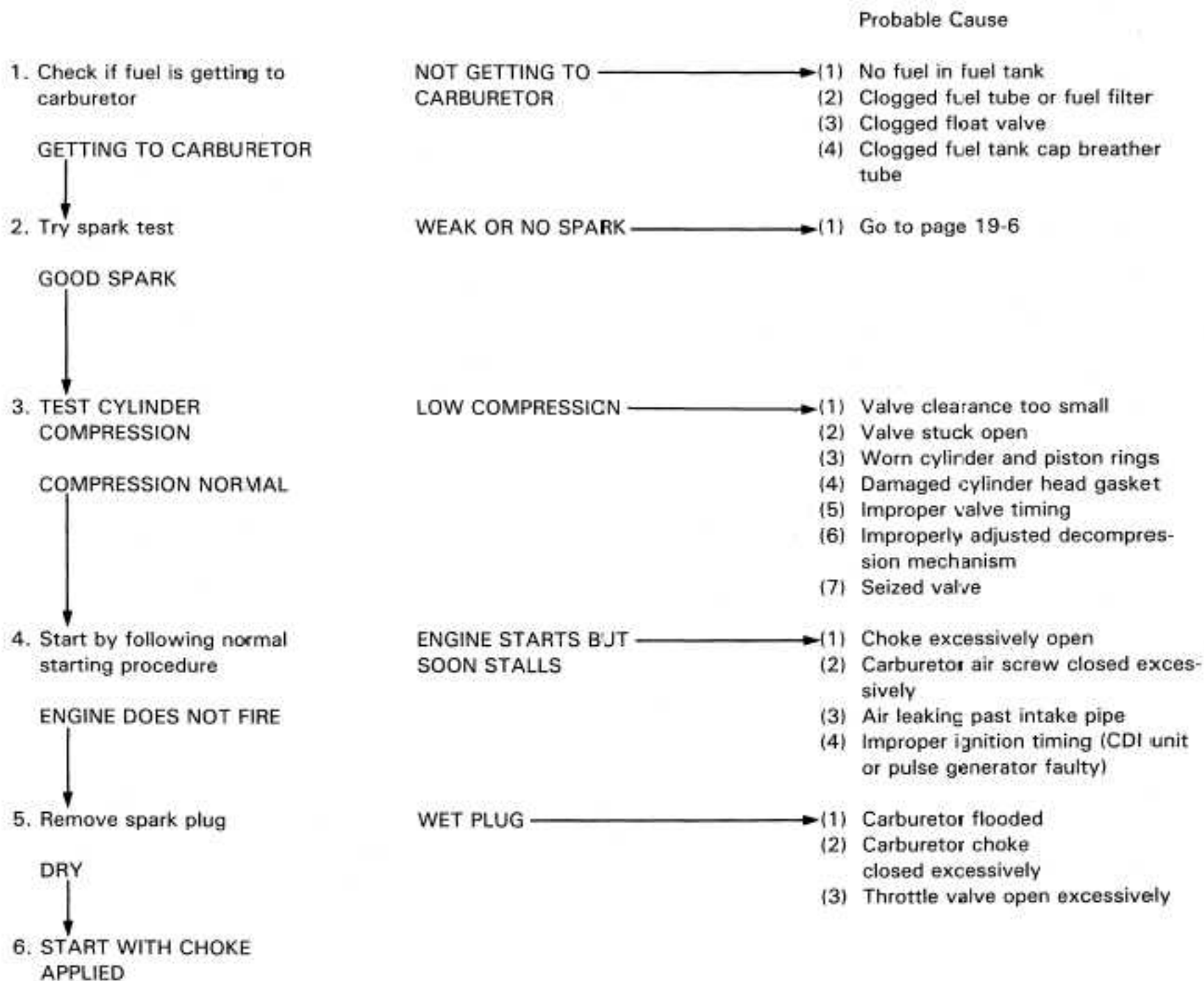




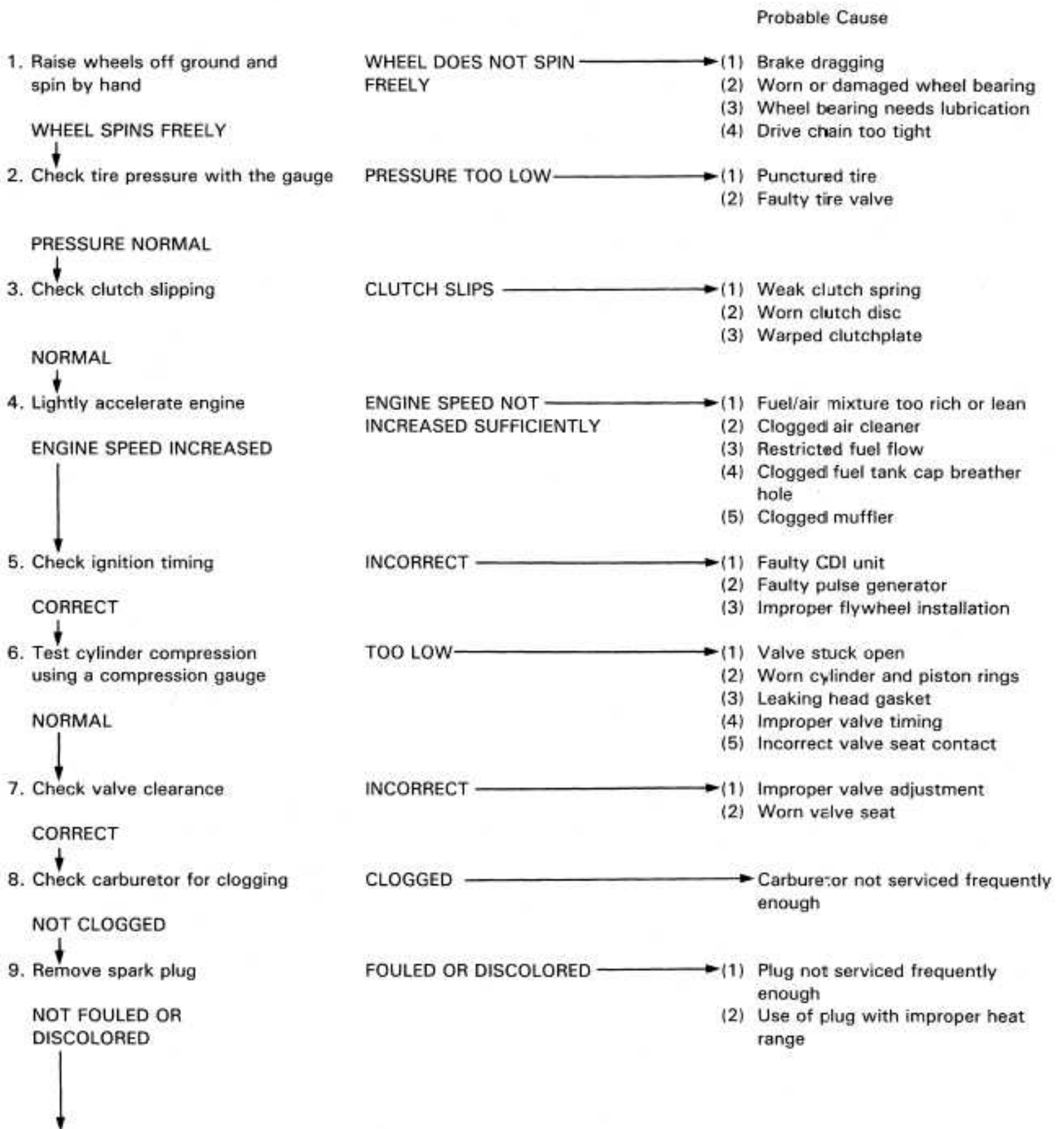
19. TROUBLESHOOTING

ENGINE DOES NOT START OR IS HARD TO START	19-1	POOR HANDLING	19-4
ENGINE LACKS POWER	19-2	UNDERCHARGED/OVERCHARGED BATTERY	19-5
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POOR PERFORMANCE AT HIGH SPEED	19-4		

ENGINE DOES NOT START OR IS HARD TO START



ENGINE LACKS POWER



10. Remove oil filler cap/dipstick and check oil level

CORRECT

11. Remove cylinder head cover and inspect lubrication

VALVE TRAIN LUBRICATED PROPERLY

12. Check if engine overheats

NOT OVERHEATED

13. Accelerate or run at high speed

ENGINE DOES NOT KNOCK

OIL LEVEL INCORRECT

- (1) Oil level too high
- (2) Oil level too low
- (3) Contaminated oil

VALVE TRAIN NOT LUBRICATED PROPERLY

- (1) Clogged oil passage
- (2) Clogged oil control orifice

OVERHEATED

- (1) Excessive carbon build-up in combustion chamber
- (2) Use of improper quality of fuel
- (3) Clutch slipping
- (4) Fuel-air mixture too lean

ENGINE KNOCKS

- (1) Worn piston and cylinder
- (2) Fuel-air mixture too lean
- (3) Use of improper grade of fuel
- (4) Excessive carbon build-up in combustion chamber
- (5) Ignition timing too advanced (Faulty CDI unit or pulse generator)

POOR PERFORMANCE AT LOW AND IDLE SPEEDS

Probable Cause

1. Check ignition timing and valve clearance

CORRECT

2. Check carburetor adjustment

CORRECT

3. Check for air leaking past carburetor insulator

NOT LEAKING

4. Try spark test

GOOD SPARK

INCORRECT

- (1) Improper valve clearance
- (2) Improper ignition timing (Faulty CDI unit or pulse generator)

INCORRECT

Fuel/air mixture too rich or too lean.

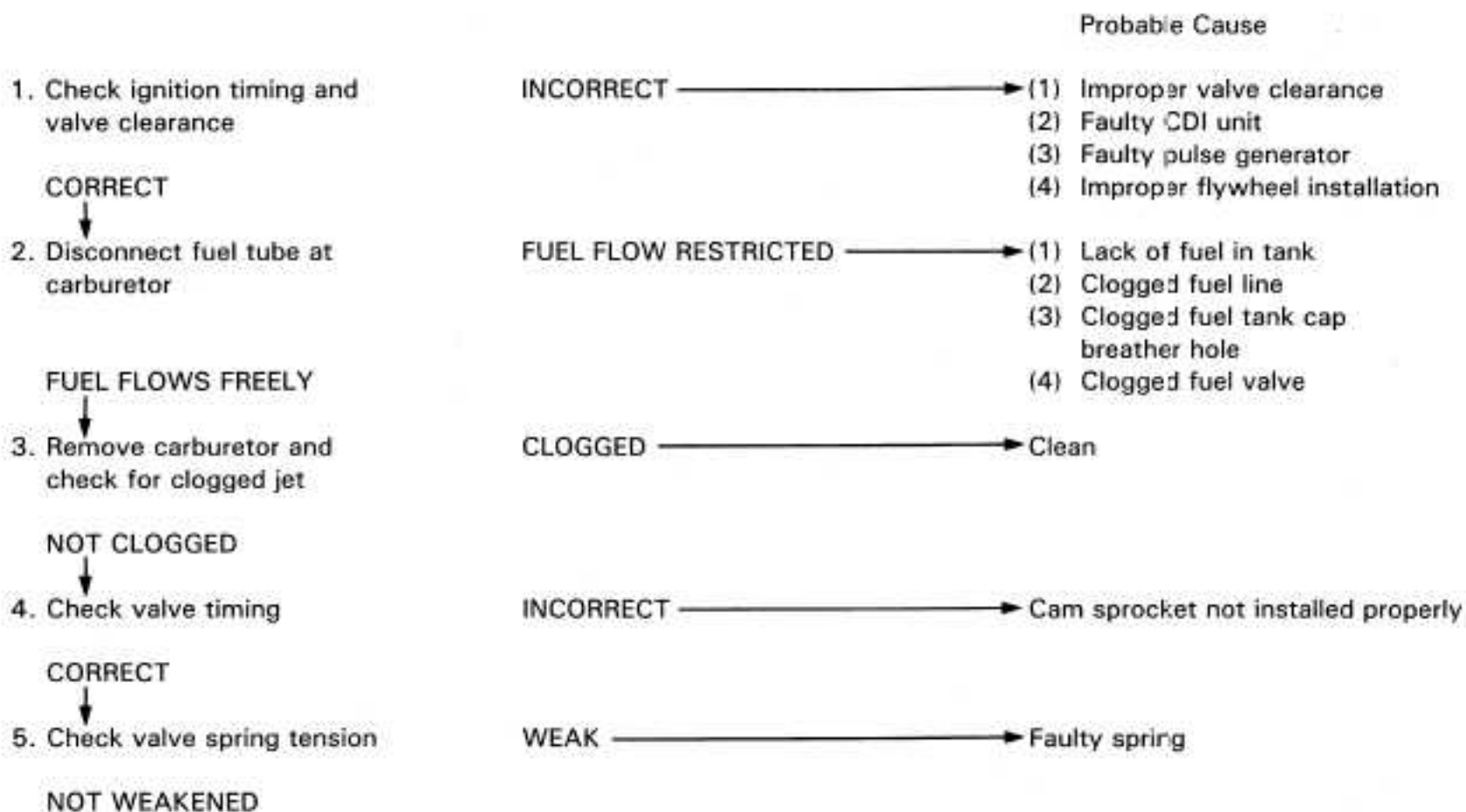
LEAKING

- (1) Deteriorated insulator O-ring
- (2) Loose carburetor

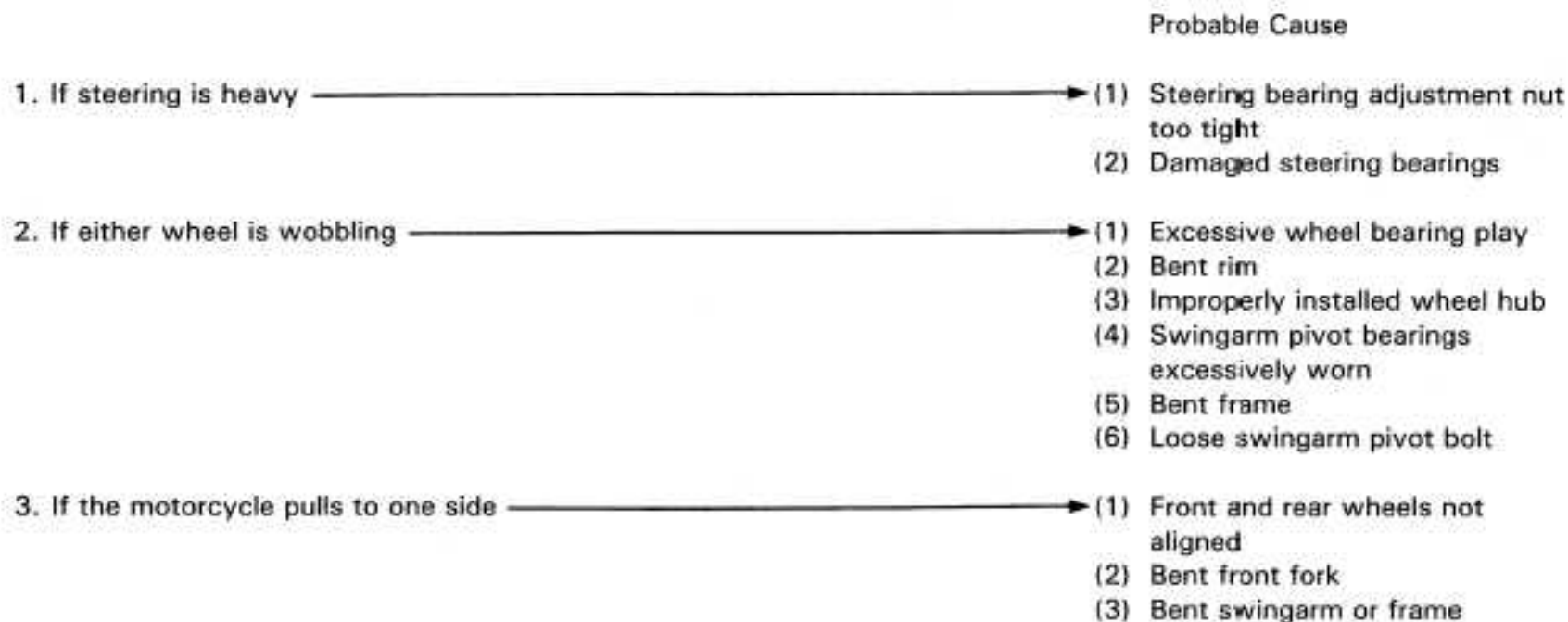
WEAK OR INTERMITTENT SPARK

- (1) Faulty, carbon or wet fouled spark plug
- (2) Faulty CDI unit
- (3) Alternator faulty
- (4) Faulty ignition coil
- (5) Faulty pulse generator

POOR PERFORMANCE AT HIGH SPEEDS

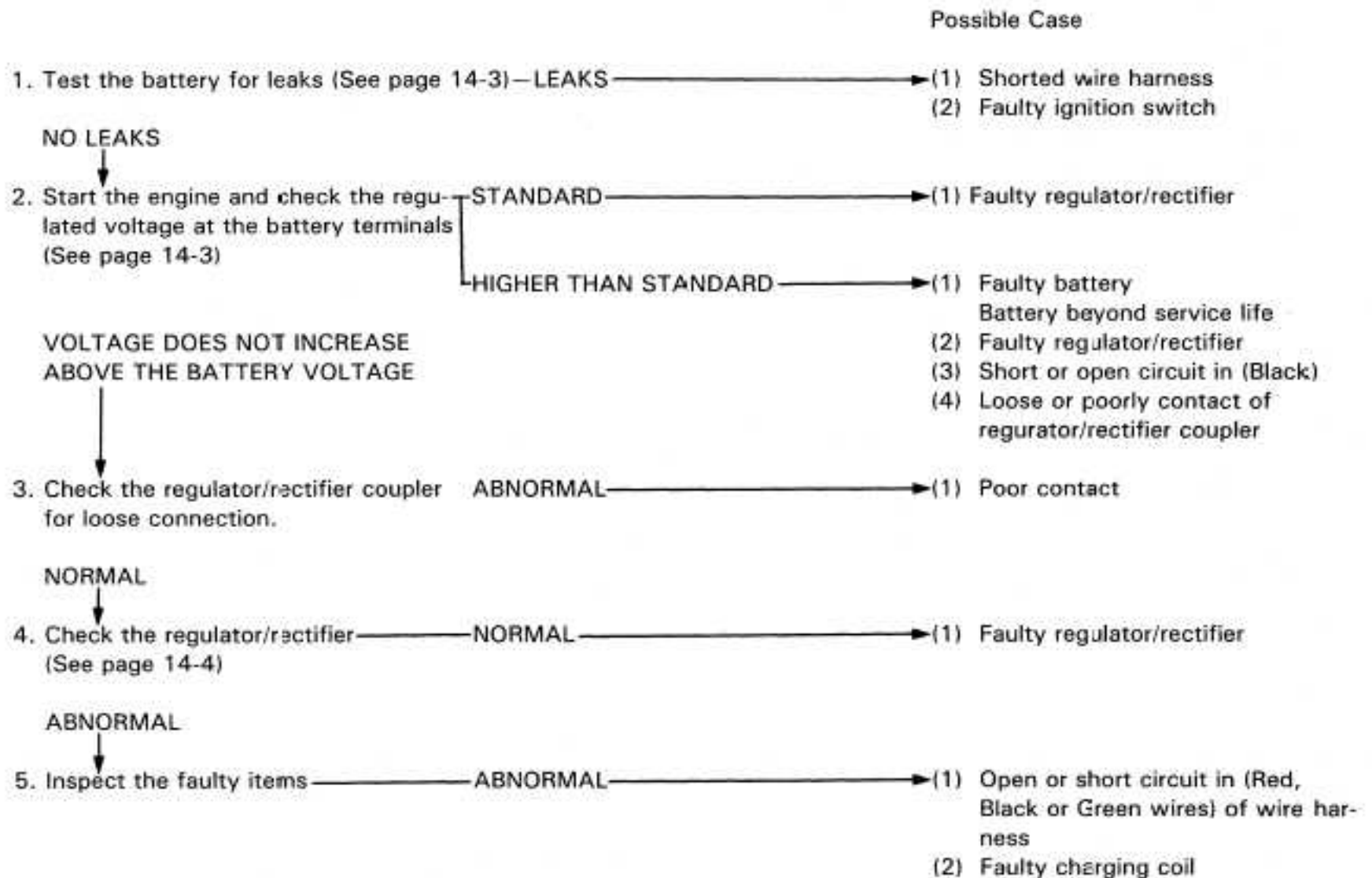


POOR HANDLING ————— Check tire pressure

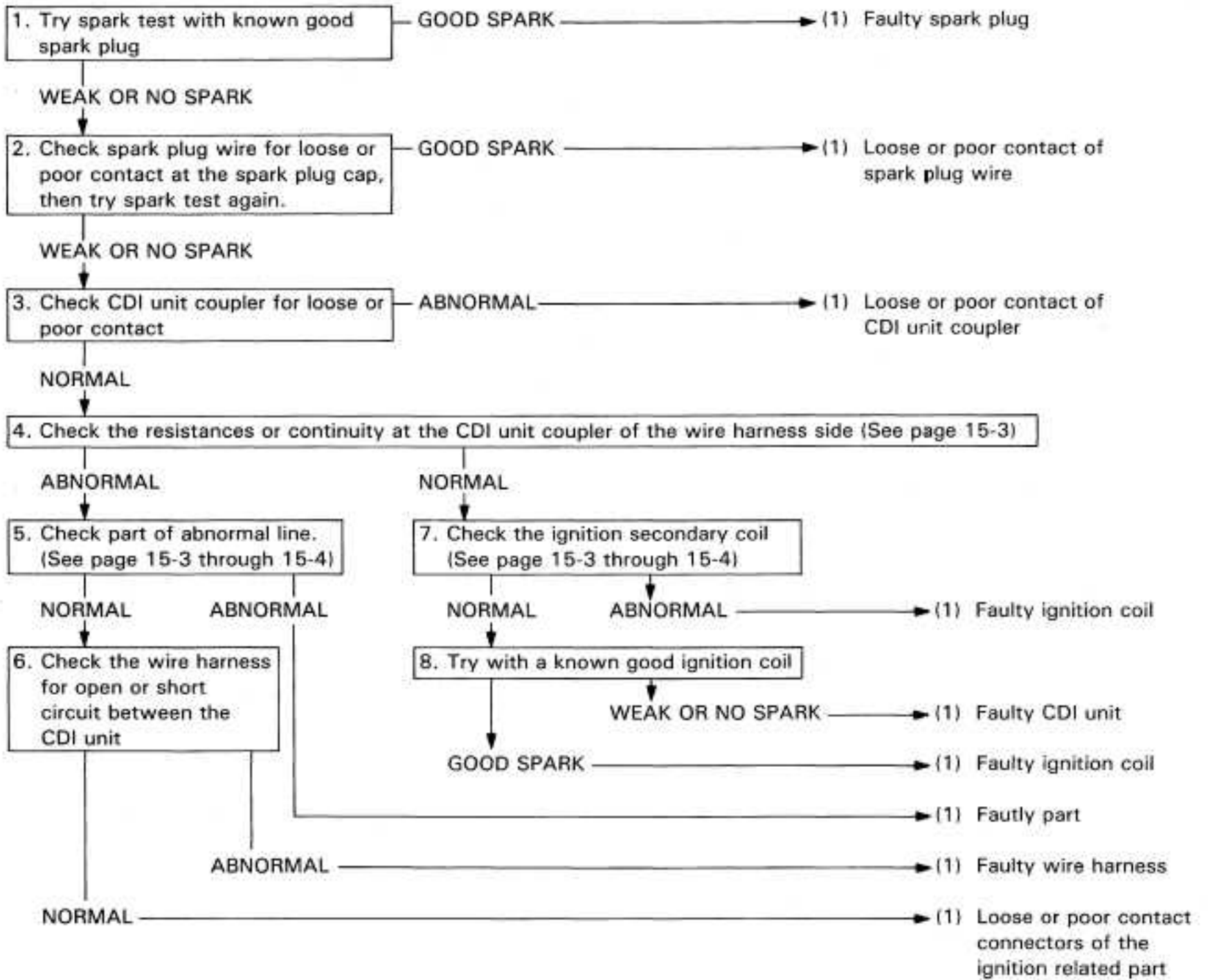


UNDERCHARGED/OVERCHARGED BATTERY

NOTE: Make sure that the battery is in good condition, use a known-good battery if necessary.



WEAR OR NO SPARK



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