HONDA

SERVICE MANUAL

86

CB450SC

IMPORTANT SAFETY NOTICE

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

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

NOTE: Gives helpful information.

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

HOW TO USE THIS MANUAL

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

Sections 1 through 3 apply to the whole motorcycle, while sections 4 through 20 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 the trouble, go to section 21, TROUBLESHOOTING.

HONDA MOTOR CO., LTD.
SERVICE PUBLICATIONS OFFICE

CONTENTS

Date of Issue: April, 1986

1. GENERAL INFORMATION

GENERAL SAFETY

WARNING

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

WARNING

Gasoline is extermely 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.

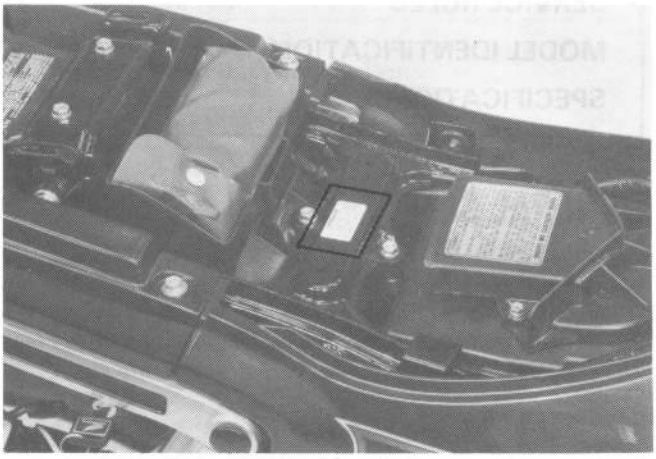
WARNING

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.

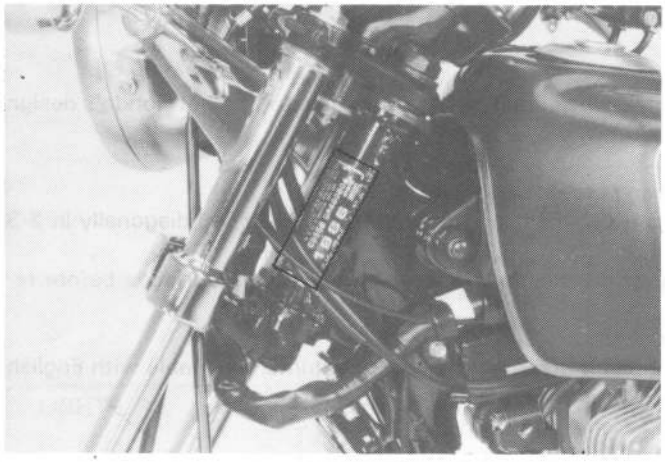
SERVICE RULES

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 bolts or nuts, begin with larger-diameter or inner bolt first, and tighten to the specified diagonally in 2-3 steps, unless aparticular sequence is specified.
5. Clean parts in non-flammable or high flash point solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
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 interchageable 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 1-11 Cable and Harness Routing.

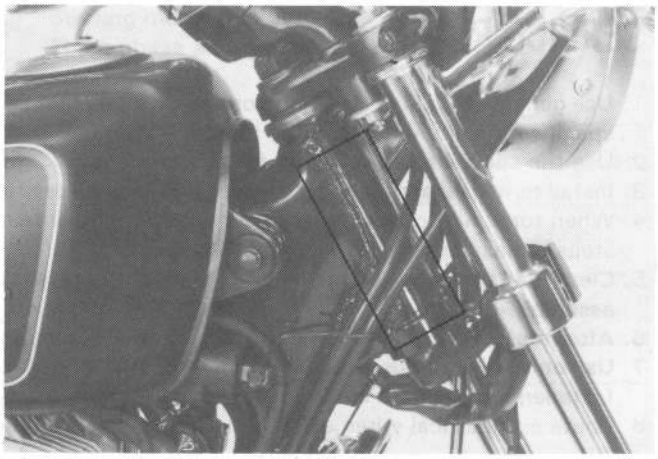
MODEL IDENTIFICATION



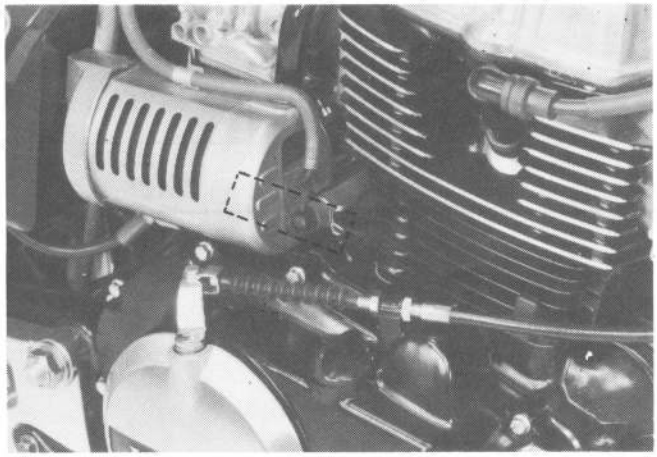
The color label is affixed to the frame under the seat.



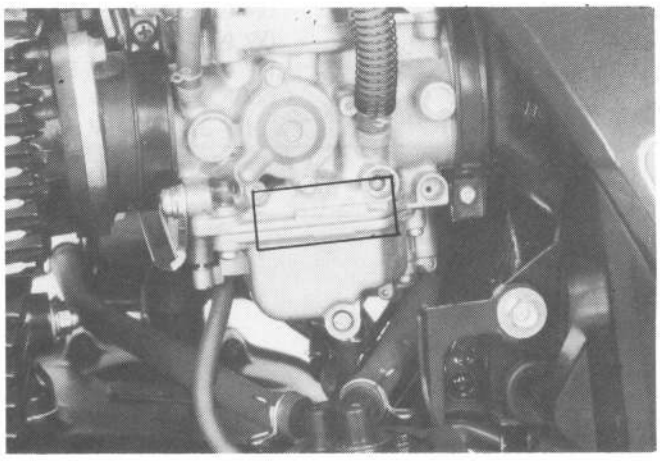
The vehicle identification number (VIN) is on the left side of the steering head.



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 numbers are stamped onto each carburetor body.

SPECIFICATIONS

[ ]: California model

ITEM			SPECIFICATIONS
DIMENSIONS	Overall length		2,160 mm (85.0 in)
	Overall width		785 mm (30.9 in)
	Overall height		1,140 mm (44.9 in)
	Wheelbase		1,450 mm(57.1 in)
	Seat height		785 mm (31.0 in)
	Ground clearance		170 mm (6.7 in)
	Dry weight		178 kg (392 lb),
FRAME	Type		Diamond
	Front suspension, travel		Telescopic fork, 140 mm (55 in)
	Rear suspension, travel		Swing arm-shock absorber, 100 mm (3.9 in)
	Front tire size		100/90-19 57S (Tubeless)
	Rear tire size		130/90-16 67S (Tubeless)
	Cold tire pressures	Up to vehicle load capacity	Front 200kPa (2.00 kg/cm², 28 psi) Rear 250 kPa (2.50 kg/cm², 36 psi)
		Up to 90 kg (200 lb) load	Front 200 kPa (2.00 kg/cm², 28 psi) Rear 200 kPa (2.00 kg/cm², 28 psi)
	Front brake, lining swept area		Disc brake, 434 cm² (67.3 sq in)
	Rear brake, lining swept area		Drum brake, 176 cm² (27.3 sq in)
	Fuel capacity		12.0 liters (3.2 US gal, 2.6 Imp gal)
	Fuel reserve capacity		2.0 liters (2.1 US qt, 1.8 Imp qt)
	Caster angle		60°
	Trail		130 mm (5.1 in)
	Front fork oil capacity		185 cc (6.260 z)
	Front fork air pressure		60—100 kPa (0.6—1.0 kg/cm², 8—14 psi)
ENGINE	Type		Air cooled 4-stroke O.H.C engine
	Cylinder arrangement		Vertical twin, paralled
	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 overhead camshaft
	Maximum horsepower		40.5 BHP/8500 rpm
	Maximum torque		3.7 kg-m/6500 rpm
	Oil capacity		2.5 ℓ (2.6 U.S. qt, 2.2 Imp qt) After draining 3.0 ℓ (3.2 U.S. qt, 2.6 Imp qt) After disassembly
	Lubrication system		Forced pressure and wet sump
	Air filtration		Paper
	Cylinder compression		1200 ± 200 kPa (12.0 ± 2.0 kg/cm², 175 ± 30 psi)
	Valve clearance (cold)	IN	0.10 mm (0.004 in)
		EX	0.14 mm (0.006 in)
	Intake valve	Opens	5° [0°] (BTDC) at 1 mm lift, 57° [51.5°] (BTDC) at 0 lift
		Closes	35° [35°] (ABDC) at 1 mm lift, 87° [86.5°] (ABDC) at 0 lift
	Exhaust valve	Opens	40° [40°] (BBDC) at 1 mm lift, 90° [86°] (BBDC) at 0 lift
		Closes	5° [0°] (ATDC) at 1 mm lift, 55° [46°] (ATDC) at 0 lift

ITEM		SPECIFICATIONS
ENGINE	Engine weight	59 kg (130 lb)
	Idle speed	1,200 ± 100 rpm
CARBURETION	Carburetor type, venture bore	CV type 30 mm (1.18 in)
	Identification number	VB 2EA, VB 2FB (California Type)
	Pilot screw	Refer to page 4-13
	Float level	15.5 mm (0.61 in)
DRIVE TRAIN	Clutch	Wet, multi-plate
	Transmission	5 speed + O.D. (6 speed)
	Primary reduction	2.960:1 (25/74)
	Gear ratio I	2.857:1 (14/40)
	Gear ratio II	1.947:1 (19/37)
	Gear ratio III	1.545:1 (22/34)
	Gear ratio IV	1.280:1 (25/32)
	Gear ratio V	1.074:1 (27/29)
	Gear ratio O.D.	0.867:1 (30/26)
	Final reduction	2.118:1 (17/36)
	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	15° BTDC at 1,200 rpm
	Full advance	43° BTDC at 4,500 to 5,350 rpm
	Starting system	Starting motor only
	Alternator	Three phase alternator 170 w/5,000 rpm
	Battery capacity	12 V–12 AH
	Spark plug	

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

	Spark plug gap	0.8–0.9 mm (0.031–0.035 in)
LIGHTS	Headlight (high/low beam)	12 V–50/35 W
	Tail/brakelight	12 V–3/32 CP SAE NO. 1157
	Turn signal light (front)	12 V–32 CP SAE NO. 1073
	(rear)	12 V–32 CP SAE NO. 1073
	Instrument	12 V–2 CP (3.4 W)
	Neutral indicator	12 V–2 CP (3.4 W)
	Turn signal indicator	12 V–2 CP (3.4 W)
	High beam indicator	12 V–2 CP (3.4 W)
	Oil pressure warning light	12 V–2 CP (3.4 W)
	Overdrive indicator	12 V–2 CP (3.4 W)
	Position light	12 V–3 CP (8 W)
FUSE		15 A Main 7 A

TORQUE VALUES

ENGINE

ITEM	Q'TY	THREAD DIA., mm	TORQUE, N·m (kg-m, ft-lb)
Cylinder head cover	2	6	9–11 (0.9–1.1, 7–8)
Cylinder head bolt	8	10	31–35 (3.1–3.5, 22–25)
Valve adjusting screw lock nut	6	6	21–25 (2.1–2.5, 15–18)
Cam sprocket	2	7	18–22 (1.8–2.2, 13–16)
Clutch center lock nut	1	20	46–60 (4.6–6.0, 33–43)
Primary drive gear	1	12	46–50 (4.6–5.0, 33–36)
Crankcase 8 mm bolt	1	8	23–27 (2.3–2.7, 17–20)
Oil filter center bolt	1	20	29–31 (2.9–3.1, 21–22)
Oil drain bolt	1	14	32–38 (3.2–3.8, 23–27)
Crankshaft bearing holder 10 mm bolt	6	10	31–37 (3.1–3.7, 22–27)
Balancer stopper plate 8 mm	1	8	20–25 (2.0–2.5, 15–18)
10 mm	1	10	30–35 (3.0–3.5, 22–25)
Connecting rod bearing cap	4	8	26–28 (2.6–2.8, 19–20)
Starter clutch	3		15–17 (1.5–1.7, 11–12)
Alternator rotor bolt	1	12	110–130 (11.0–13.0, 80–94)
Exhaust pipe flange nut	4	6	8–14 (0.8–1.4, 6–10)
Muffler chamber clamp bolt	4	8	20–24 (2.0–2.4, 14–17)
Gearshift pedal	1	6	9–14 (0.9–1.4, 7–10)

CHASSIS

ITEM	Q'TY	THREAD DIA., mm	TORQUE, N·m (kg-m, ft-lb)
Front fork air valve	2	8	6–7 (0.6–0.7, 4–5)
Front fork cap bolt	2	27	16–20 (1.6–2.0, 12–14)
Front axle holder	2	8	20–24 (2.0–2.4, 14–17)
Front axle nut	1	14	55–65 (5.5–6.5, 40–47)
Front fork top bridge pinch bolt	2	7	10–14 (1.0–1.4, 7–10)
Front brake caliper bracket	2	10	32–38 (3.2–3.8, 23–27)
Front brake caliper mounting bolt	1	8	20–24 (2.0–2.4, 14–17)
Front brake caliper pivot bolt	1	10	27–33 (2.7–3.3, 20–24)
Front brake disc	5	8	37–43 (3.7–4.3, 27–31)
Front brake pad pin retainer	1	6	9–11 (0.9–1.1, 7–8)
Handlebar upper holder	4	8	23–27 (2.3–2.7, 17–20)
Steering stem nut	1	24	100–110 (10.0–11.0, 72–80)
Steering stem pinch bolt	2	8	20–24 (2.0–2.4, 14–17)
Final driven sprocket	4	10	62–68 (6.2–6.8, 45–49)
Footpeg 10 mm bolt	2	10	35–45 (3.5–4.5, 25–33)
Rear axle nut	1	14	90–100 (9.0–10.0, 65–72)
Rear brake torque link	2	8	20–24 (2.0–2.4, 14–17)
Rear shock absorber	4	10	32–38 (3.2–3.8, 23–27)

STANDARD TORQUE VALUES

TYPE	TORQUE, N·m (kg-m, ft-lb)	TYPE	TORQUE, N·m (kg-m, ft-lb)
5 mm bolt, nut	4.9–5.7 (0.49–0.57, 3.5–4.1)	5mm screw	3.9–4.7 (0.39–0.47, 2.8–3.4)
6 mm bolt, nut	9–11 (0.9–1.1, 7–8)	6 mm screw	8–10 (0.8–1.0, 5.8–7.2)
8 mm bolt, nut	20–24 (2.0–2.4, 14–17)	6 mm flange bolt, nut	11–13 (1.1–1.3, 8.0–9.4)
10 mm bolt, nut	32–38 (3.2–3.8, 23–27)	8 mm flange bolt, nut	25–29 (2.5–2.9, 18–20)
12 mm bolt, nut	52–58 (5.2–5.8, 38–41)	10 mm flange bolt, nut	32–38 (3.2–3.8, 23–27)

TOOLS

SPECIAL

DESCRIPTION	TOOL NUMBER	ALTERNATE TOOL	TOOL NUMBER	REF. SECTION
Valve guide reamer (IN), 5.5 mm	07984–2000000			6
Valve guide reamer (EX), 6.6 mm	07984–5510000			6
Piston base (2 required)	07958–2500001	Piston base	07958–4130000	7
Piston ring compressor (2 required)	07954–2830000	Piston ring compressor	07955–4630000	7
Race remover attachment	07953–KM10100			13
Steering stem driver	07946–MB00000			13
Ball race remover	07953–3330000			13
Snap ring pliers	07914–3230001			15
Steering stem socket	07916–3710100			13
Clutch center holder	07923–KE10000			8
Driver shaft	07946–MJ00100			14
Carburetor adjust wrench	07GMA–MC90100			3
Oil pressure gauge	07506–3000000	Commercially available		2
Oil pressure gauge attachment	07510–MJ10100			2

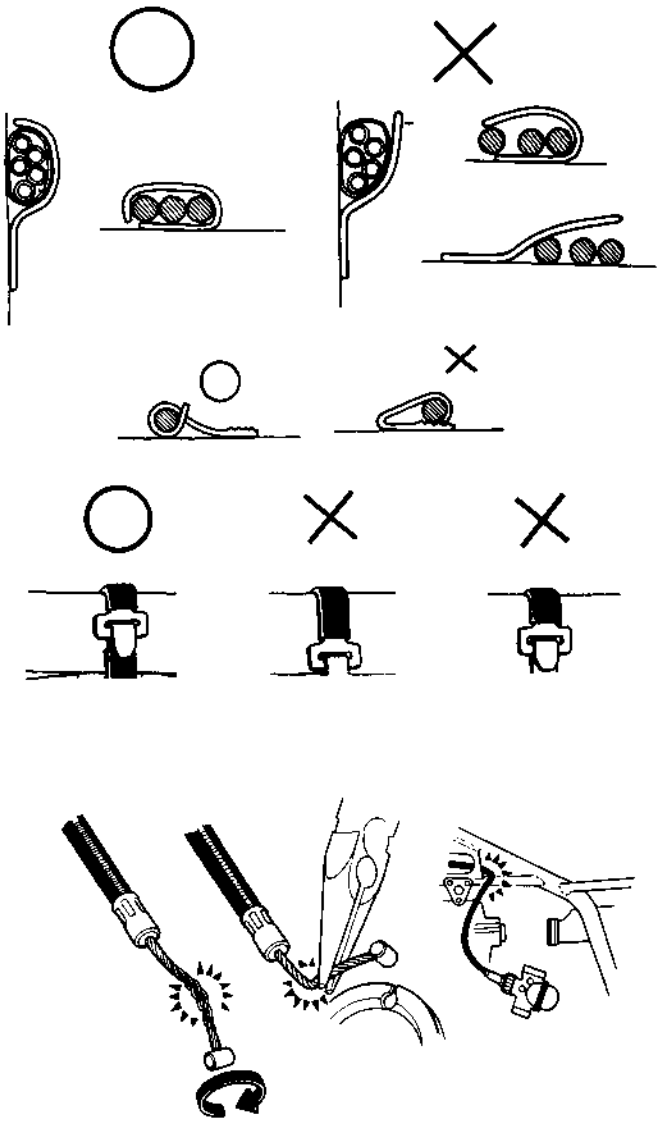
COMMON

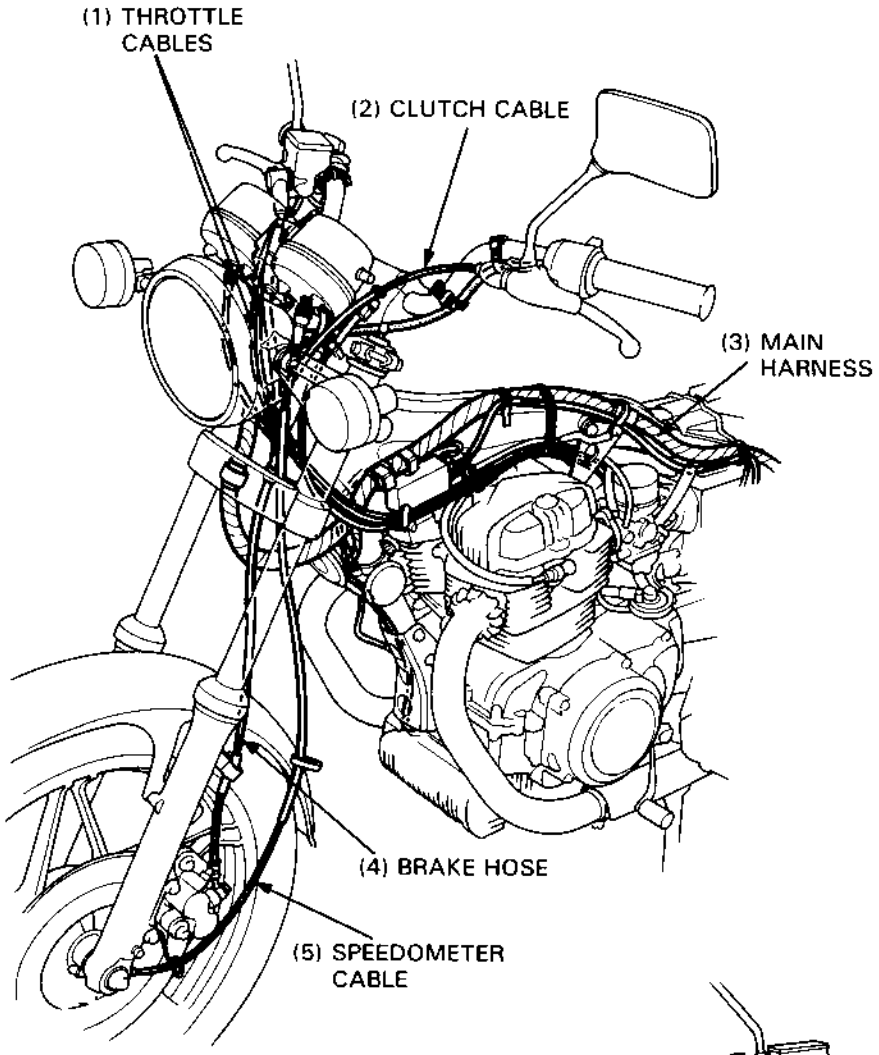
DESCRIPTION	TOOL NUMBER	ALTERNATE TOOL	TOOL NUMBER	REF. SECTION
Float level gauge	07401–0010000			4
Valve guide remover, 5.5 mm	07742–0010100		07942–3290100	6
Valve guide remover, 6.6 mm	07742–0010200		07942–6570100	6
Valve spring compressor	07757–0010000		07957–3290001	6
Lock nut wrench, 26 x 30 mm	07716–0020203	Equivalent Commercially		8
Universal holder	07725–0030000	available in USA		8, 9
Lock nut wrench, 30 x 32 mm	07716–0020400	Equivalent Commercially		13
Extension bar	07716–0020500	available in USA		13
Driver	07749–0010000		07949–6110000	13, 14
Attachment, 42 x 47 mm	07746–0010300			13, 14
Pilot, 15 mm	07746–0040300			13
Driver C	07746–0030100			11
Attachment, 25 mm	07746–0030200			11
Fork seal driver body	07747–0010100			13
Fork seal attachment D	07747–0010501		07947–3330000	13
Pilot, 17 mm	07746–0040400			14
Rear shock absorber compressor	07959–3290001			14
Rotor puller	07733–0020001		07933–3950000	9
Wrench, 10 x 12 mm	07708–0030200			
Valve adjuster	07708–0030300		07908–3230000	3
Remover head, 15 mm	07746–0050400			13
Remover head, 17 mm	07746–0050500	Equivalent Comercially		14
Remover shaft	07746–0050100	available in USA		13, 14
Torx driver bit	07703–0010100			11
Attachment, 32 x 35 mm	07746–0010100			14

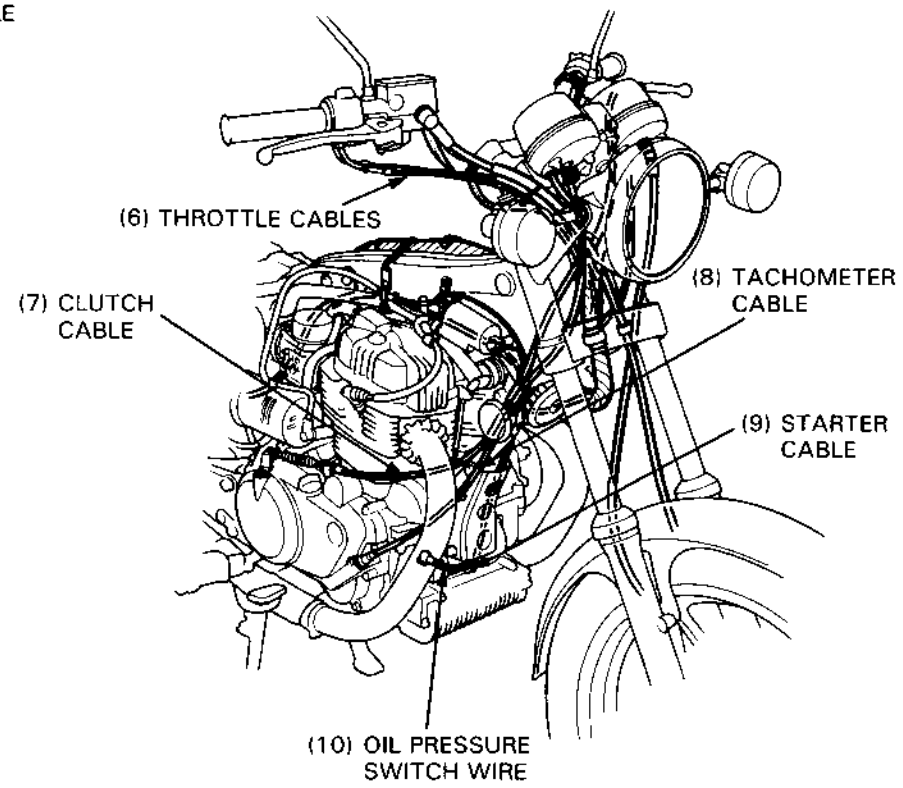
CABLE & HARNESS ROUTING

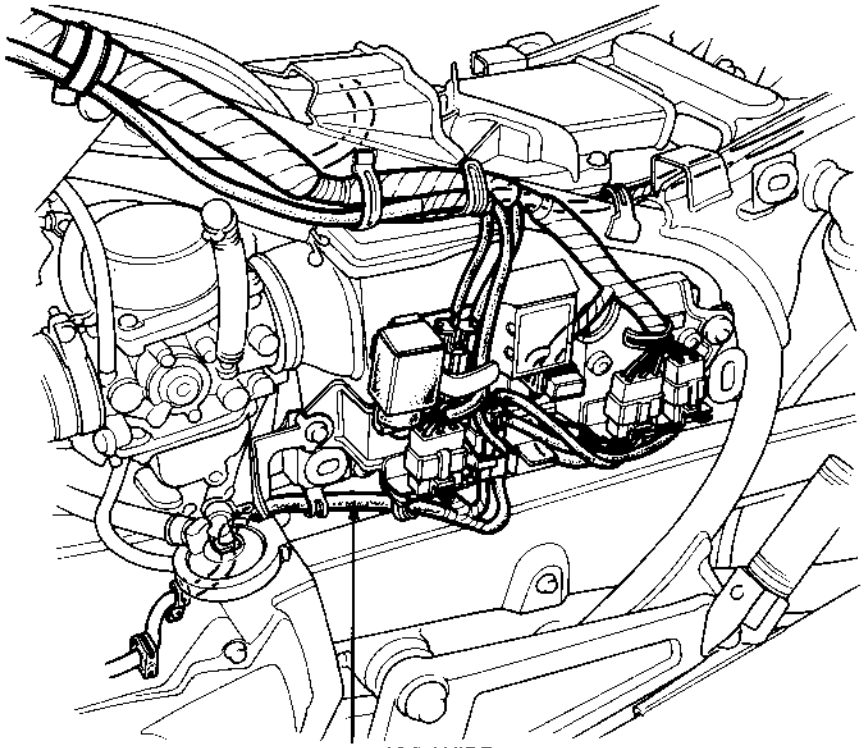
Note the following when routing cables and wire harnesses:

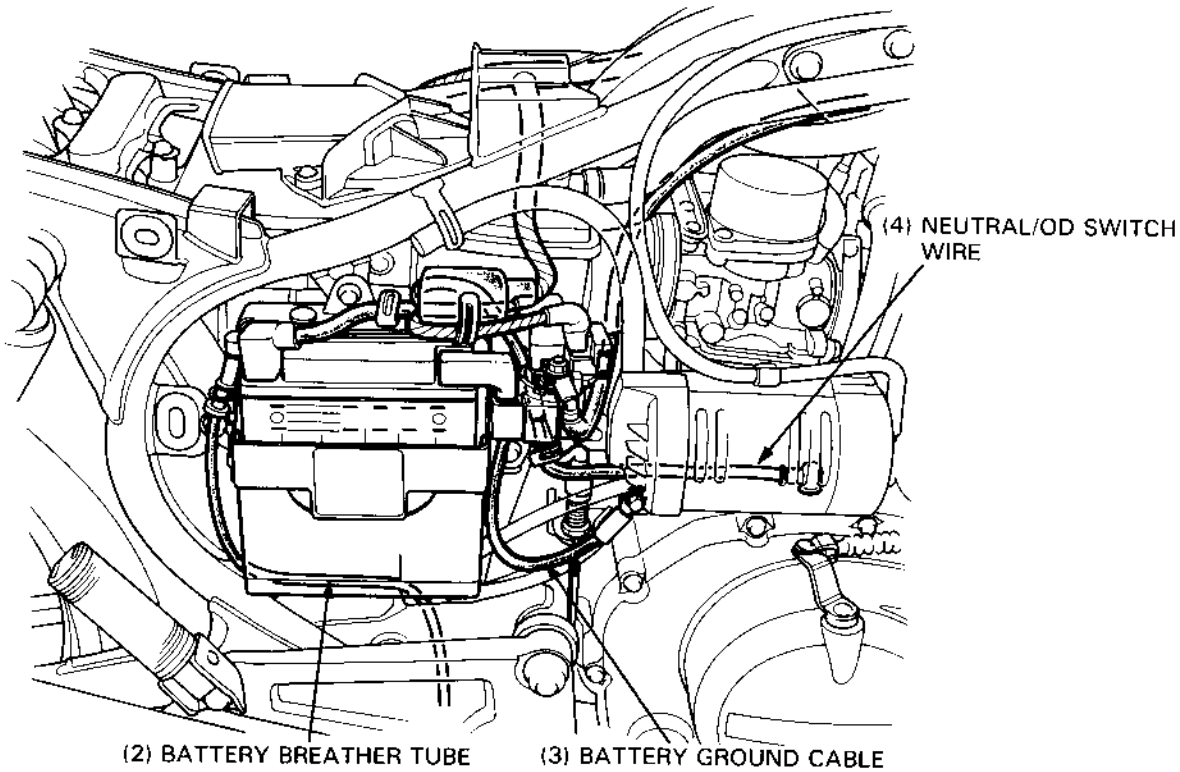
- A loose wire, harness or cable can be a safety hazard. After clamping, check each wire to be sure it is secure.
- Do not squeeze wires against the weld or its clamp.
- Secure wires and wire harnesses to the frame with their respective wire bands at the designated locations. Tighten the bands so that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

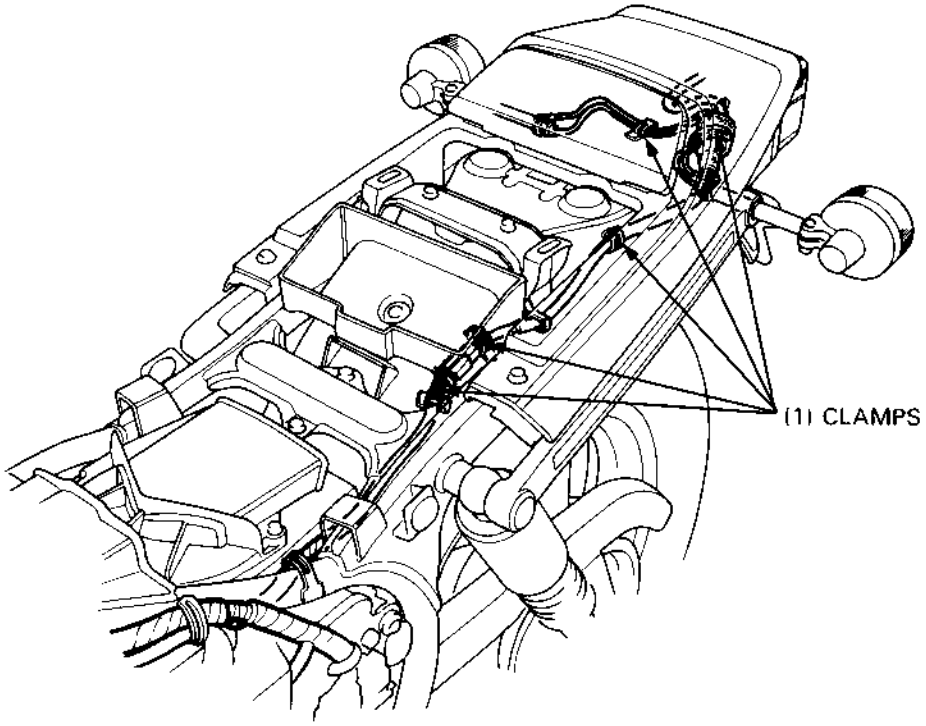



(1) THROTTLE CABLES
(2) CLUTCH CABLE
(3) MAIN HARNESS
(4) BRAKE HOSE
(5) SPEEDOMETER CABLE


(6) THROTTLE CABLES
(7) CLUTCH CABLE
(8) TACHOMETER CABLE
(9) STARTER CABLE
(10) OIL PRESSURE SWITCH WIRE


(1) ALTERNATOR WIRE


(4) NEUTRAL/OD SWITCH WIRE
(2) BATTERY BREATHER TUBE
(3) BATTERY GROUND CABLE


(1) CLAMPS

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 usuful 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 of Honda Motorcycle Emission Control Systems is necessary in order to keep the emissions system warranty in effect.

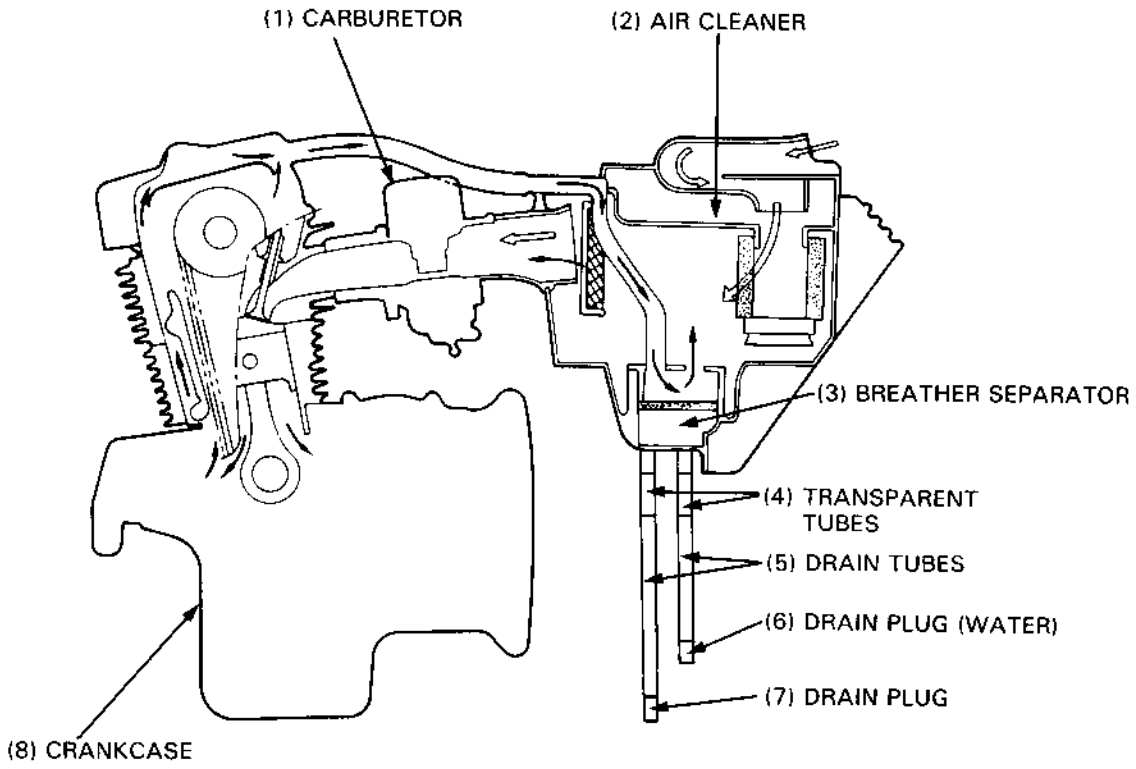
SOURCE OF EMISSIONS

The combustion process produces carbon monoxide and hydrocarbons. Control of hydrocarbons is very important because, under certain conditions, they react to from photochemical smog when subjected to sunlight. Carbon monoxide does not react in the same way, but it is toxic.

Honda Motor Co., Ltd. utilized lean carburetor settings on 49 state models, and an air injection valve system for california models to reduce carbon monoxide and hydrocarbons.

CRANKCASE EMISSION CONTROL SYSTEM

The engine is equipped with a closed crankcase system which routes crankcase emissions through the air cleaner and into the combustion chamber. Condensed crankcase vapors are accumulated in a storage tank which must be emptied periodically. See the Maintenance Schedule in section 3.



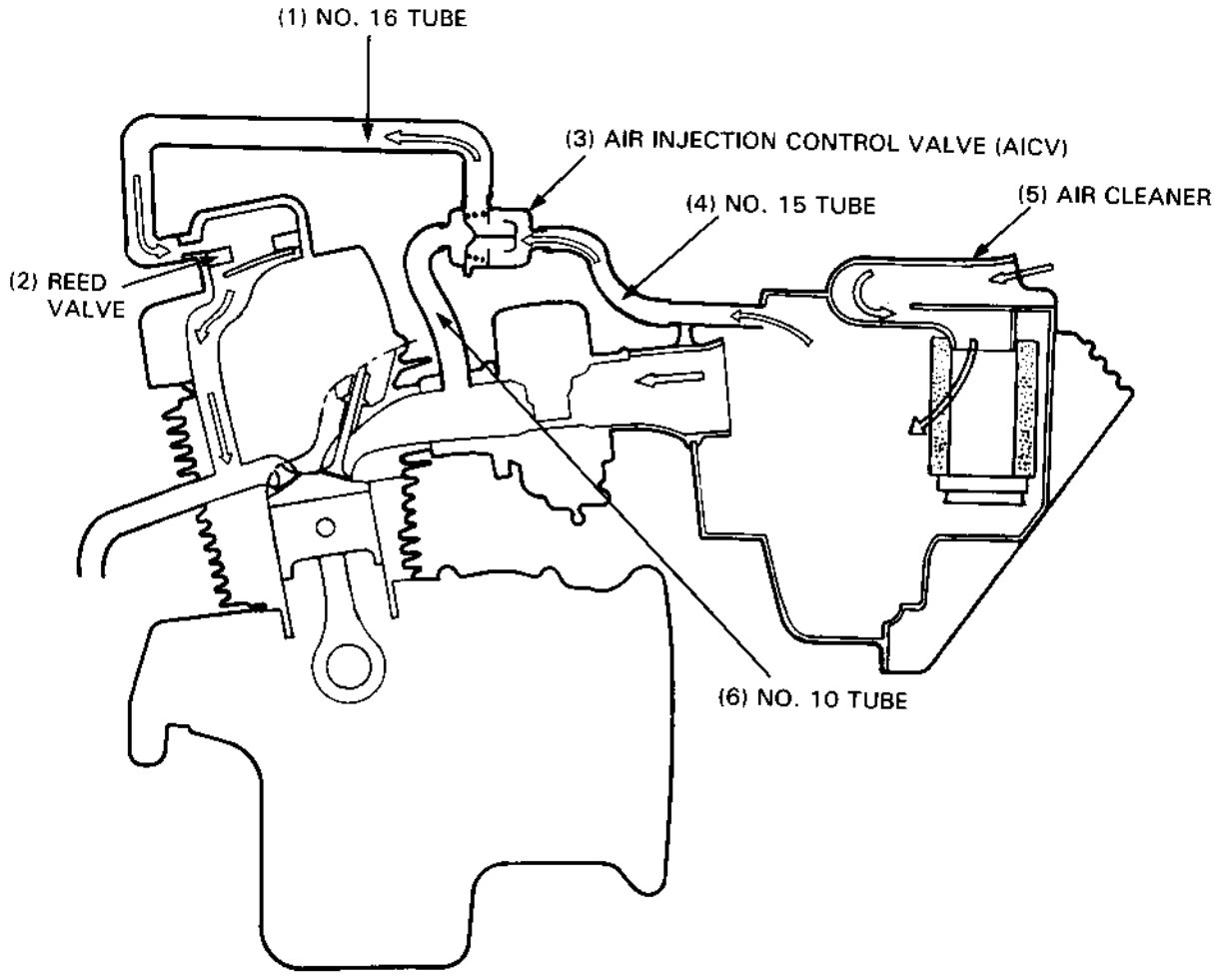
EXHAUST EMISSION CONTROL SYSTEM

The exhaust emission control system is composed of lean carburetor settings, and no adjustments should be made except to idle speed adjustment with the throttle stop screw.

California Only:
The exhaust emission control system consists of a secondary air supply system which introduces filtered air into the exhaust gases in the exhaust port. Fresh air is drawn into the exhaust port whenever there is a negative pressure pulse in the exhaust system. This charge of fresh air promotes burning of the unburned exhaust gases and changes a considerable amount of hydrocarbons and carbon monoxide into relatively harmless carbon dioxide and water.

The reed valve prevents reverse air flow through the system. The anti-afterburn valve reacts to high intake manifold vacuum and will cut off the supply of fresh air during engine deceleration, thereby preventing afterburn in the exhaust system.

No adjustments to the secondary air supply system should be made, although periodic inspection of the components is recommended.



NOISE EMISSION CONTROL SYSTEM

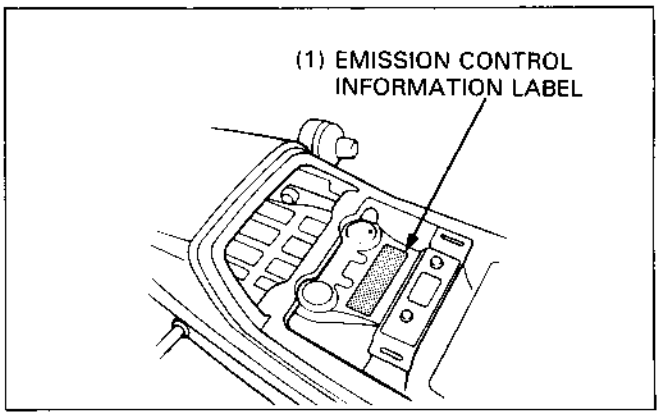
TAMPERING WITH THE NOISE CONTROL SYSTEM IS PROHIBITED: Federal law prohibits the following acts or the causing thereof: (1) The removal or rendering inoperative by any person, other than for purposes of maintenance, repair or replacement, of any device or element of design incorporated into any new vehicle 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.

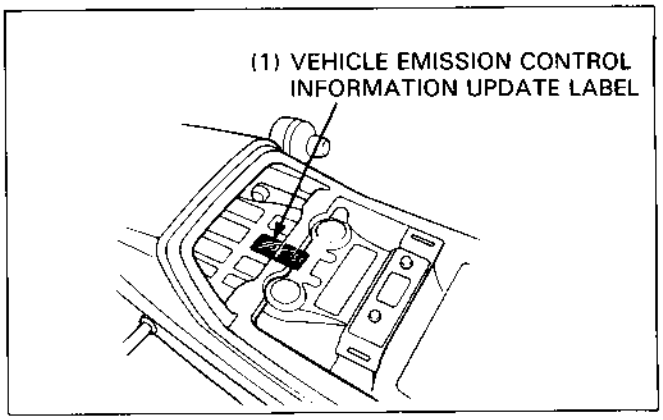
EMISSION CONTROL INFORMATION LABEL

An Emission Control Information Label is affixed to the frame below the seat.
It contains basic tune-up specifications.



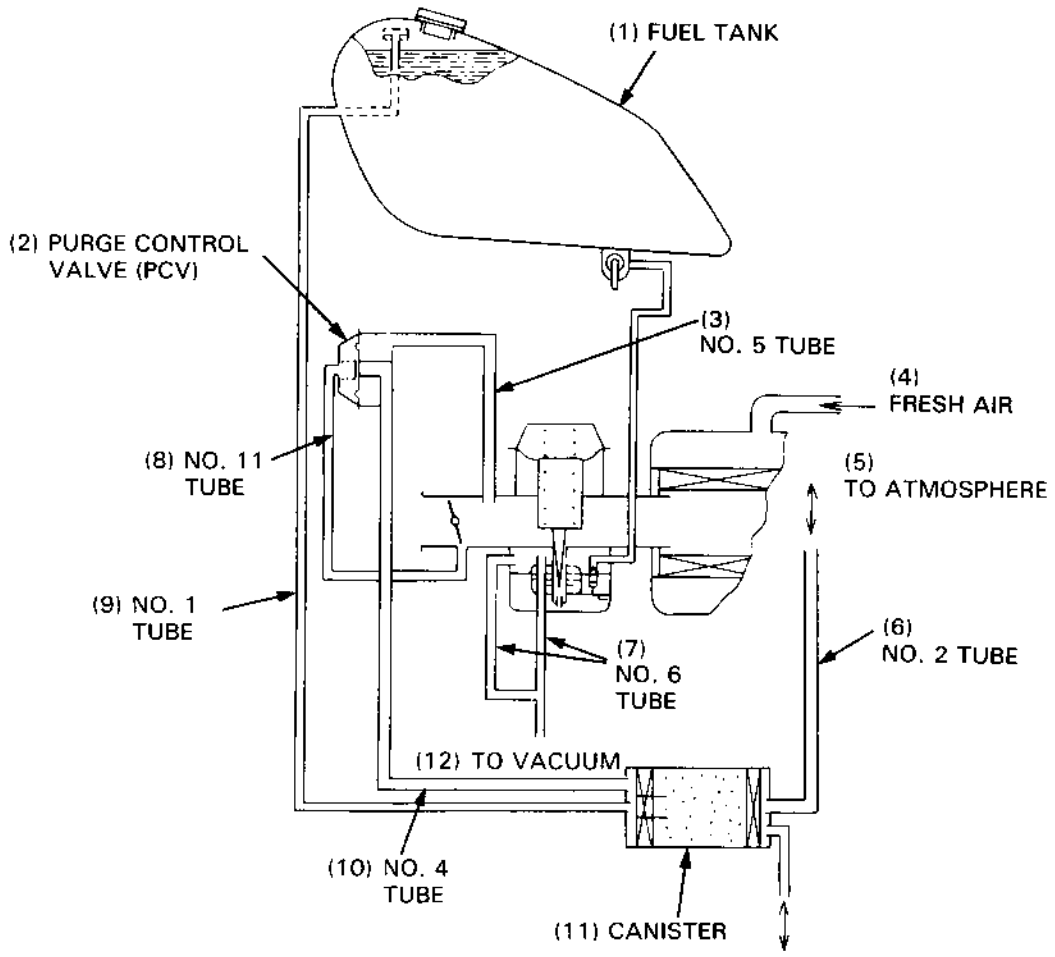
EMISSION CONTROL INFORMATION UPDATE LABEL

After making a high altitude carburetor adjustment (Page 4-14), attach an update label on the rear fender as shown.
Instructions for obtaining the update label are given in Service Letter No. 132.



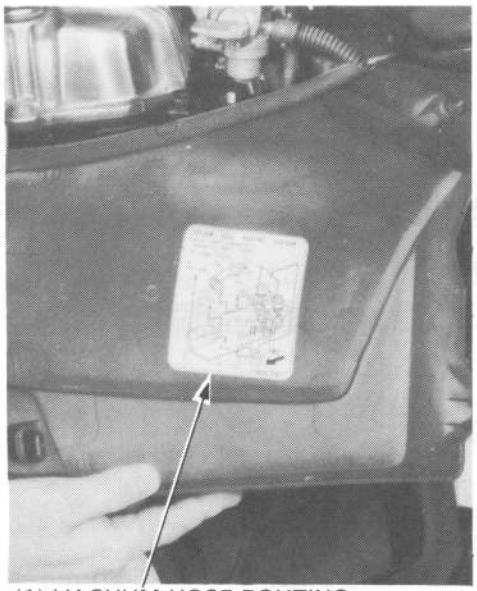
EVAPORATIVE EMISSION CONTROL SYSTEM (California Model)

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 absorbed and stored while the engine is stopped. When the motorcycle is running and the purge control diaphragm valve is open, fuel vapor in the charcoal canister is drawn into the engine through the carburetor.

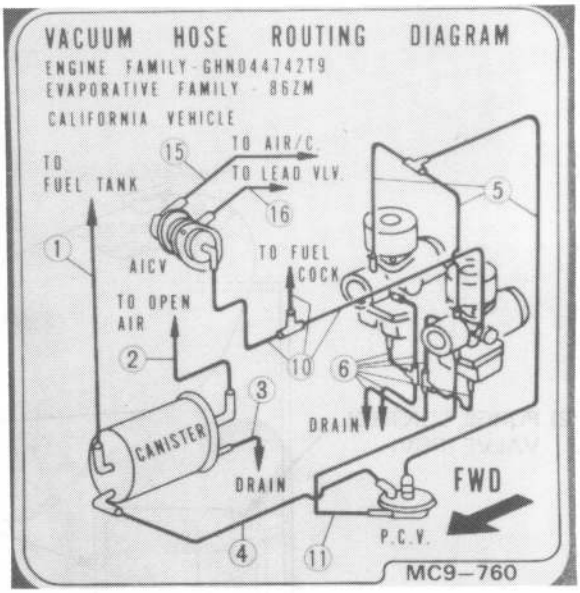


VACUUM HOSE ROUTING DIAGRAM LABEL (California model only)

The Vacuum Hose Routing Diagram Label is affixed to the inside of the left side cover.

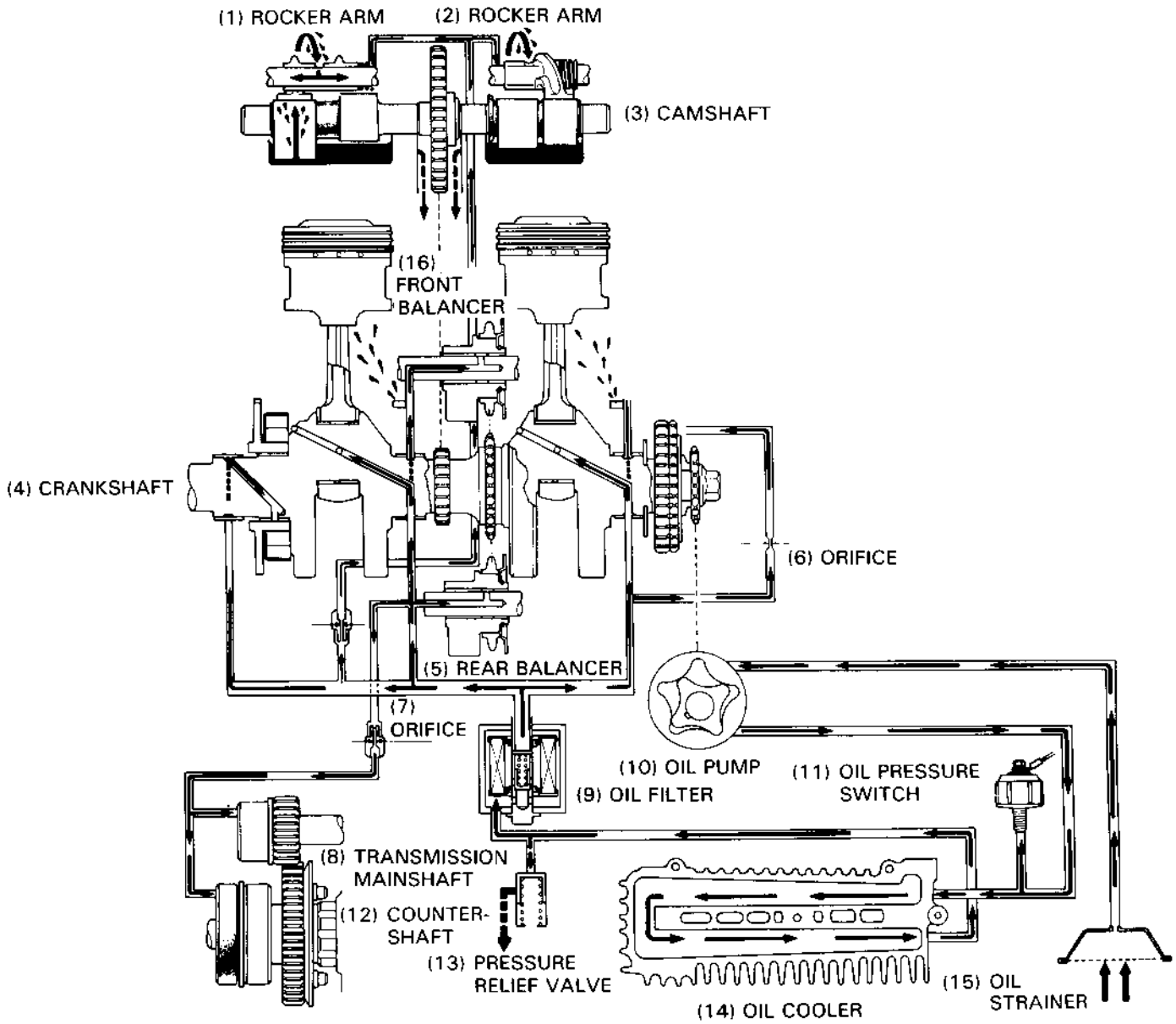


(1) VACUUM HOSE ROUTING DIAGRAM LABEL



MEMO

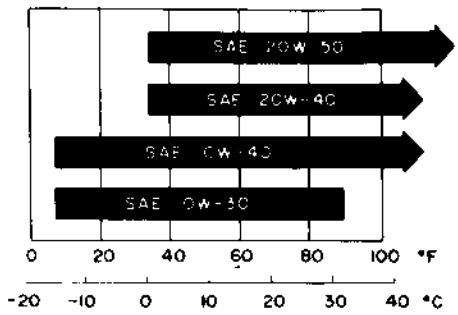
LUBRICATION DIAGRAM



SERVICE INFORMATION

SPECIFICATIONS

Engine oil

Oil capacity	3.0 liters (3.2 US qt, 2.7 Imp qt) at disassembly 2.5 liters (2.6 US qt, 2.7 Imp qt) at change
Oil recommendation	Use Honda 4-Stroke Oil or equivalent. API Service Classification: SE or SF. Viscosity: SAE 10W—40 Other viscosities shown in the chart may be used when the average temperature in your riding area is within the indicated range. 
Oil pump delivery	36.3 liter (38.4 US.qt)/min at 6000 rpm (80°C/176°F)
Oil pressure (at oil pressure switch)	390—520 kPa (3.9—5.2 kg/cm², 45.2—60.2 psi) at 6000 rpm (80°C/176°F)

Oil pump service data

ITEM		STANDARD	SERVICE LIMIT
Oil pump	Inner rotor-to-outer rotor clearance	0.02—0.07 mm (0.001—0.003 in)	0.10 mm (0.004 in)
	Outer rotor-to-body clearance	0.15—0.22 mm (0.006—0.009 in)	0.35 mm (0.014 in)
	Rotor-to-body clearance	0.02—0.07 mm (0.001—0.003 in)	0.10 mm (0.004 in)

TORQUE VALUES

Engine oil drain bolt	32—38 N·m (3.2—3.8 kg-m, 23—27 ft-lb)
Engine oil filter bolt	29—31 N·m (2.9—3.1 kg-m, 21—22 ft-lb)
Drive gear bolt	46—50 N·m (4.6—5.0 kg-m, 33—36 ft-lb)
Oil cooler side cover bolt	11—13 N·m (1.1—1.3 kg-m, 8.0—9.4 ft-lb)

TOOLS

Special

Oil pressure gauge	07506—3000000 or commercially available in U.S.A.
Oil pressure gauge attachment	07510—MJ10100

TROUBLESHOOTING

Oil level too low — high oil consumption
1. External oil leaks
2. Worn piston rings
3. Worn valve guide or seal

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

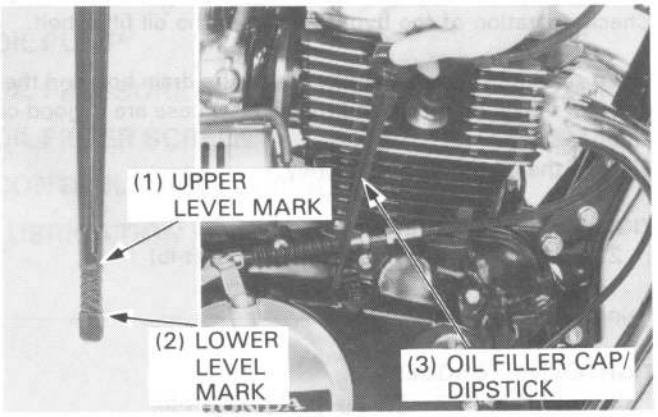
Low oil pressure
1. Oil level low
2. Pressure relief valve stuck open
3. Plugged oil pick-up screen
4. Oil pump worn
5. External oil leaks

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

No oil pressure
1. Oil level low
2. Oil pump drive gear broken
3. Oil pump faulty
4. Internal oil leakage

ENGINE OIL LEVEL

Run the engine and allow it to idle for few minutes.
Stop the engine and place the motorcycle on its center stand.
After 2—3 minutes, check the oil level with the filler cap/dipstick.
Do not screw it in when making this check.
If the oil level is below or near the lower level mark on the dispstick, add the recommended oil (Page 2-1) up to the upper level line.



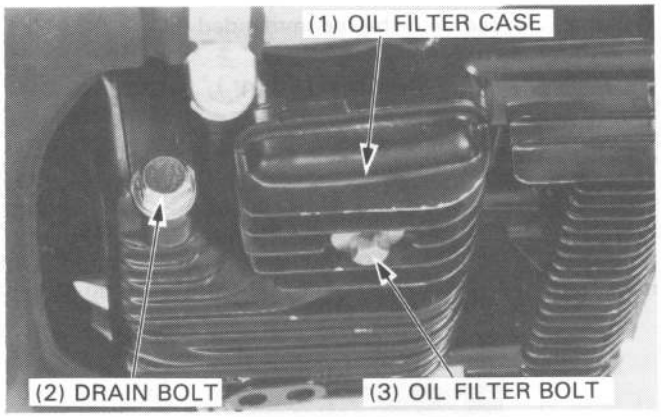
ENGINE OIL & FILTER CHANGE

NOTE

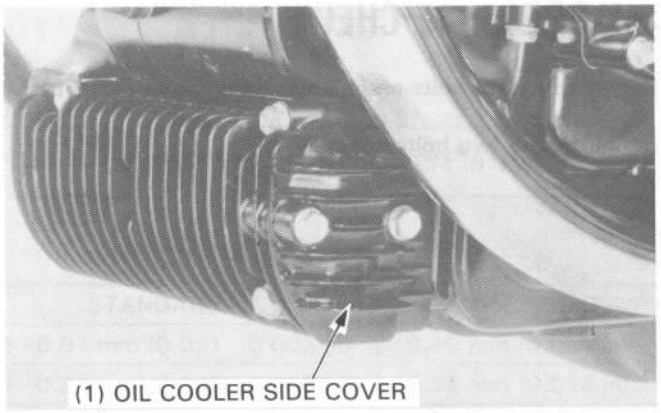
- Engine oil change is performed with engine at normal operating temperature and vehicle upright or on center stand to assure complete and rapid draining.

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

Remove and discard the oil filter element.

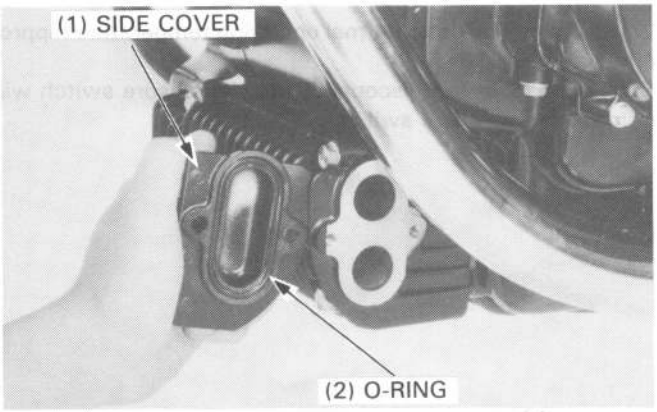


Place the oil pan under the engine.
Loosen the two oil cooler side cover bolts, and drain the oil in the oil cooler.



Make sure that the O-ring on the side cover is in good condition, and reinstall the side cover.

TORQUE: 11—13 N·m (1.1—1.3 kg-m, 8.0—9.4 ft-lb)



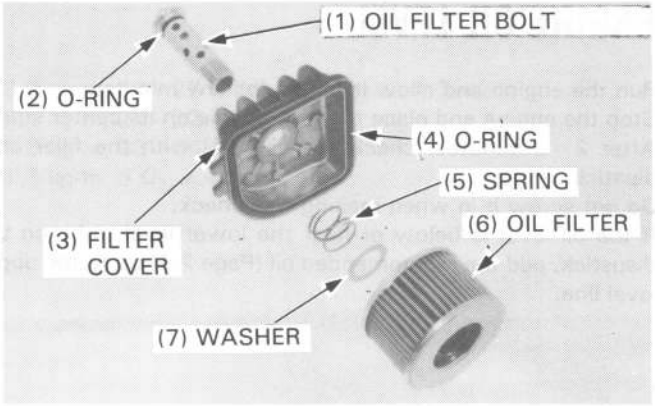
Check operation of the bypass valve in the oil filter bolt.

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.
Tighten the oil filter bolt securely.

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

Reinstall the drain bolt.

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



Fill the crankcase with the recommended oil.

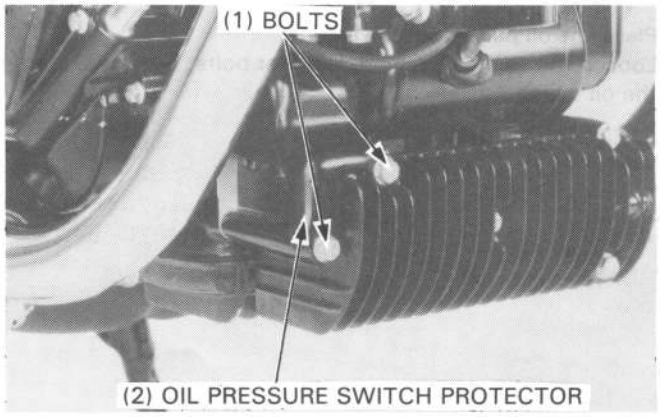
OIL CAPACITY: 2.5 liters (2.6 U.S. qt.)
SPECIFIED OIL: Honda 4-Stroke oil
or an equivalent

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.

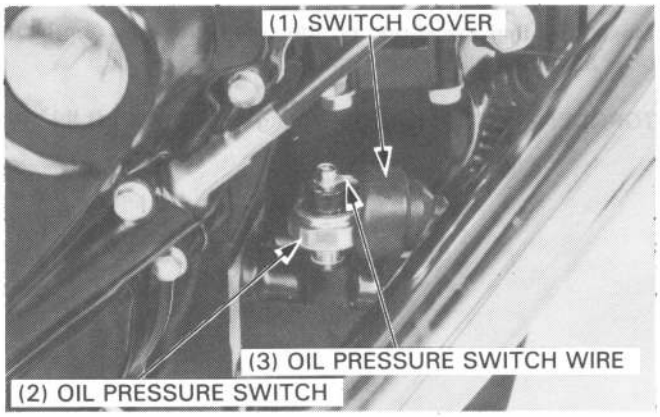
OIL PRESSURE CHECK

Remove the two bolts and oil pressure switch protector.

Retighten the two bolts securely.



Warm the engine up to normal operating temperature (approximately 80°C/176°F).
Stop the engine and disconnect the oil pressure switch wire.
Remove the pressure switch.

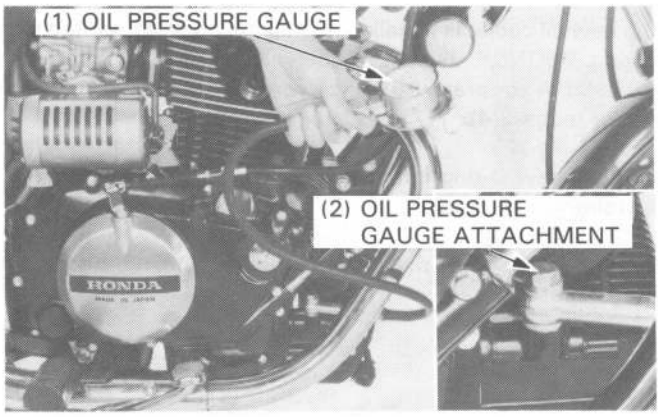


Connect the oil pressure gauge attachment to the oil pressure hole, and connect the oil pressure gauge.

Check the oil level.

Start the engine.
Check the oil pressure at 6,000 rpm.

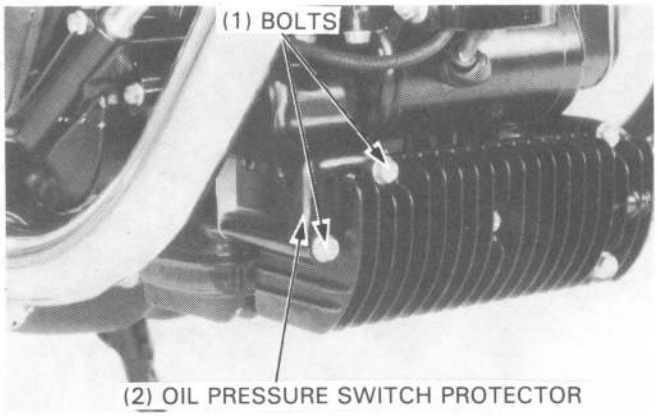
OIL PRESSURE:
390 – 520 kPa (3.9 – 5.2 kg/cm², 45.2 – 60.2 psi)
at 6,000 rpm (80°C/176°F)



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

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

Connect the oil pressure switch wire.
Start the engine.
Check 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.
Remove the two bolts and reinstall the pressure switch protector.

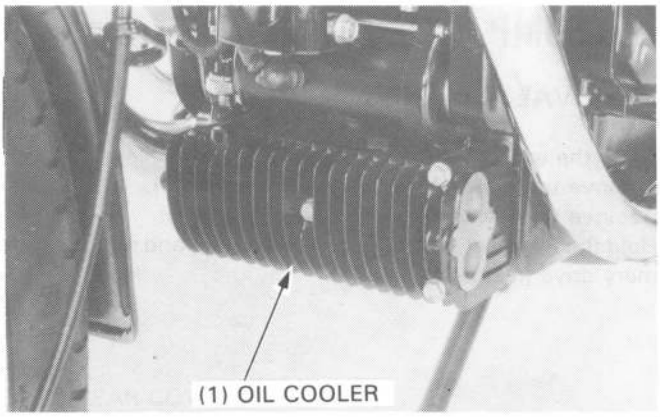


OIL COOLER

REMOVAL

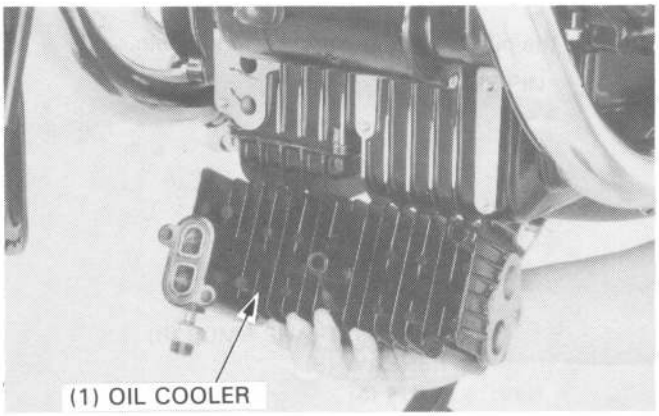
Drain the engine oil (page 2-3).
Remove the oil pressure switch protector and disconnect the switch wire (page 2-4).

Remove the three mounting bolts and oil cooler.



INSTALLATION

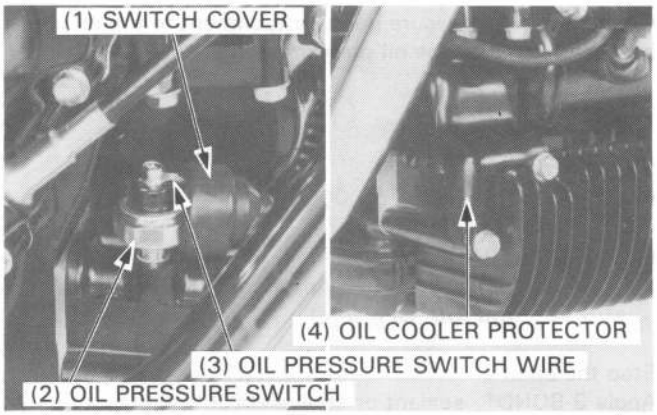
Install a new O-ring onto the oil cooler.
Install the oil cooler body and tighten the three mounting bolts.



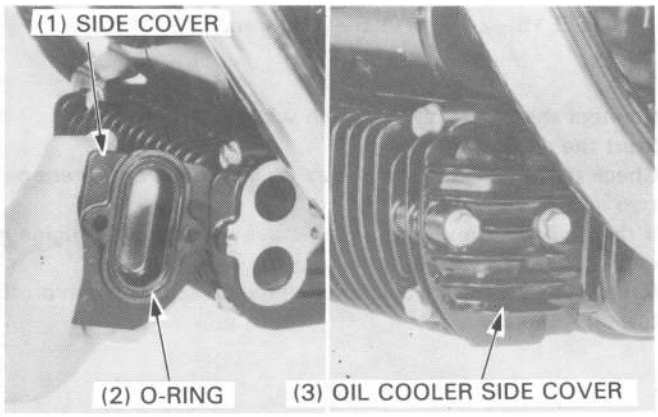
If a new oil cooler is installed, install the pressure switch by applying 3-BOND® sealant or equivalent to the switch threads. Connect the oil pressure switch wire and install the switch protector (page 2-4).

Install a new O-ring onto the side cover.
Install the side cover.

Fill the engine with the recommended oil to the proper level (page 2-3).



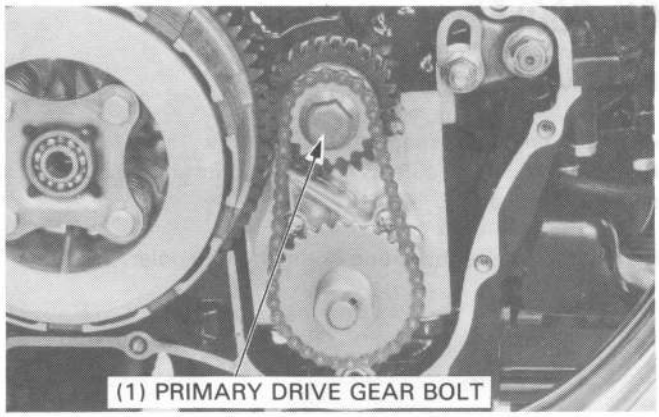
Make sure there are no oil leaks.



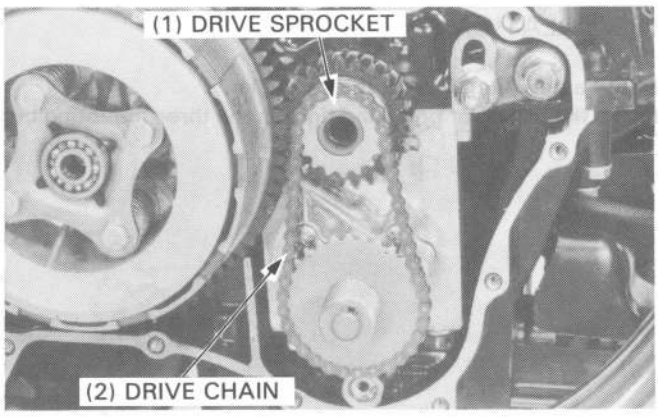
OIL PUMP

REMOVAL

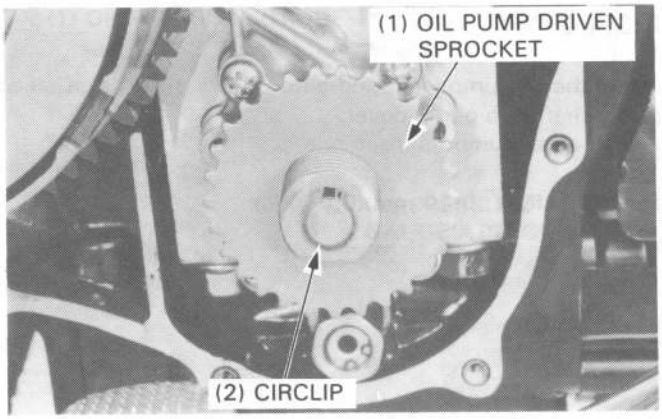
Drain the engine oil (page 2-3).
Remove the right crankcase cover (page 8-3).
Remove the left crankcase cover (page 9-2).
Hold the flywheel with the universal holder and remove the primary drive gear bolt.



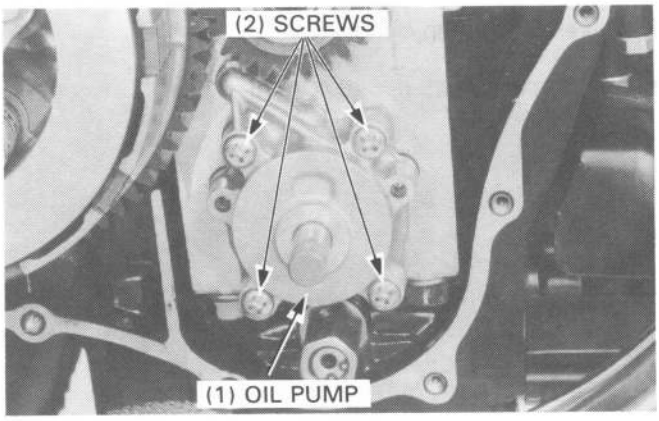
Remove the oil pump drive sprocket and chain.



Remove the circlip and oil pump driven sprocket.

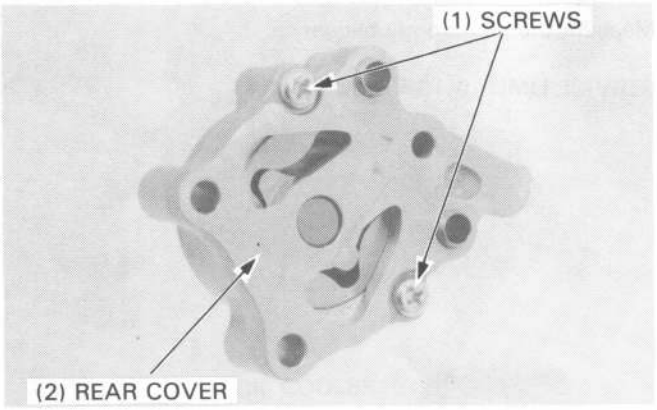


Remove the screws and oil pump.

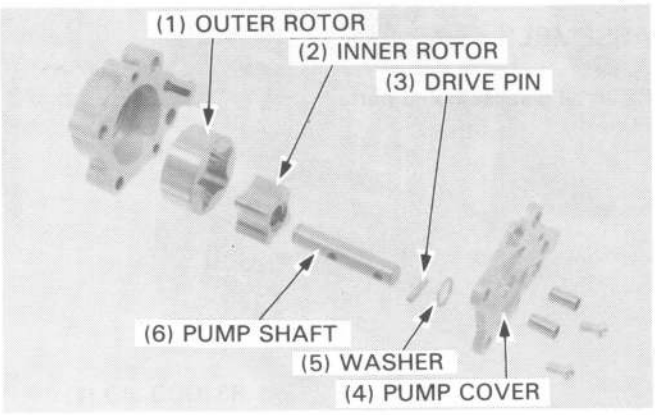


DISASSEMBLY

Remove the screws and dowel pins.
Remove the oil pump rear cover.



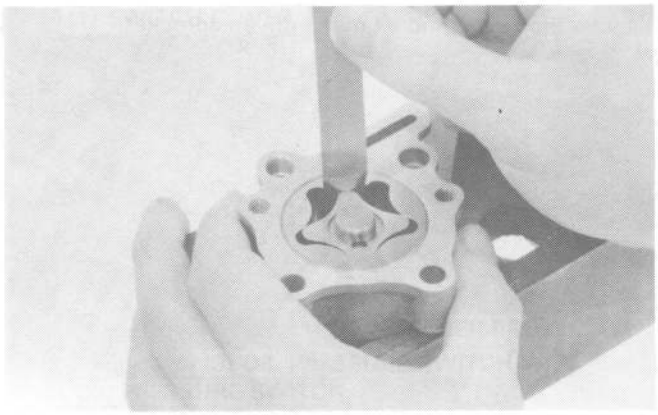
Remove the thrust washer and drive pin.
Disassemble the oil pump.



INSPECTION

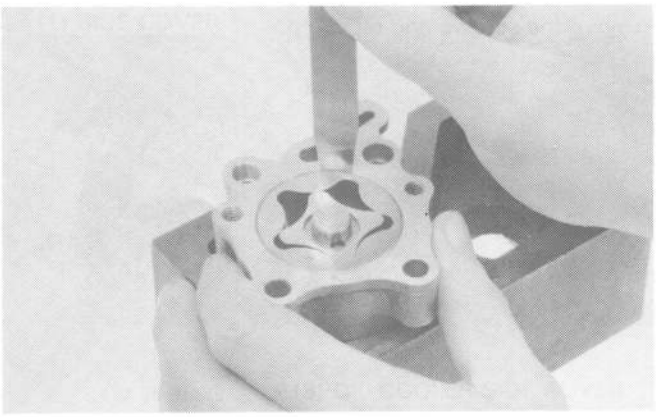
Install the oil pump inner and outer rotors, thrust washer and pump shaft into pump cover.
Measure the pump tip clearance.

SERVICE LIMIT: 0.10 mm (0.004 in)



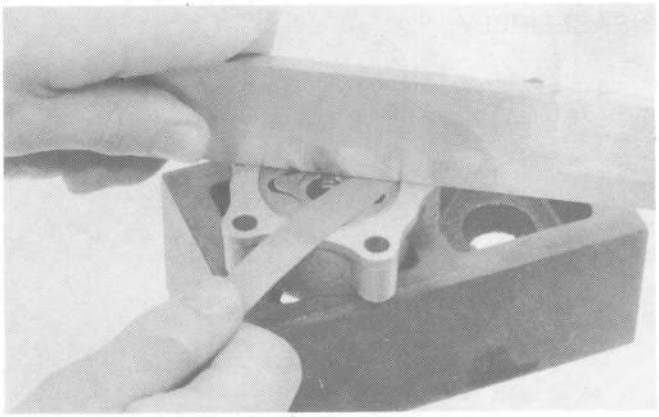
Measure the rotor tip clearance.

SERVICE LIMIT: 0.35 mm (0.014 in)



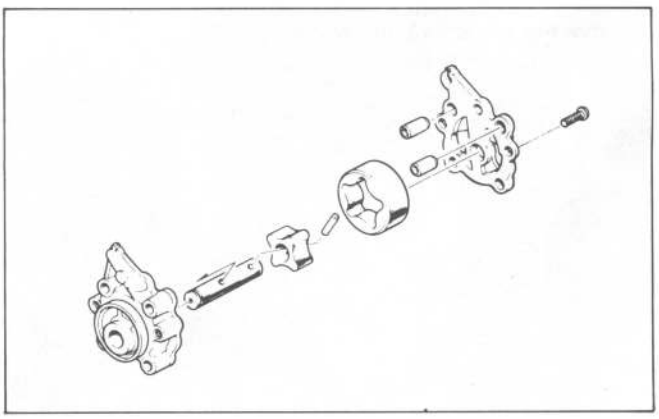
Measure the pump body clearance.

SERVICE LIMIT: 0.10 mm (0.004 in)



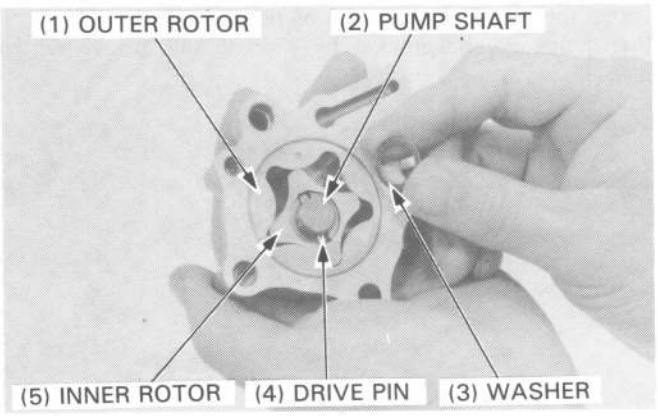
ASSEMBLY

Clean all disassembled parts.

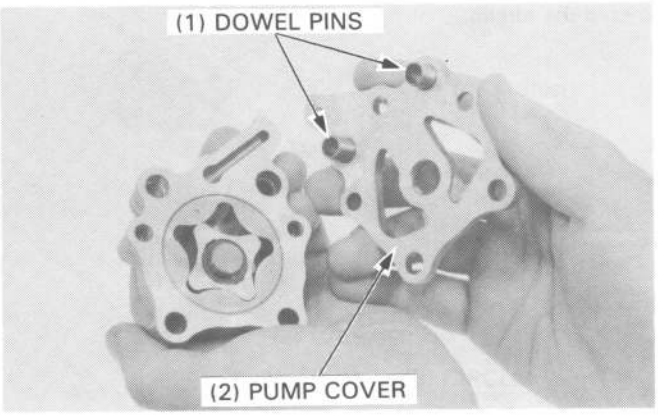


Install the inner and outer rotors into the body with the cut-out of the inner rotor facing out.

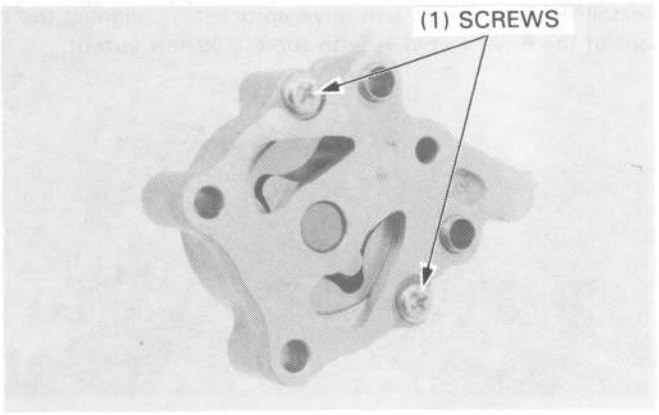
Insert the drive pin into the hole in the pump shaft and install the pump shaft into the pump aligning the drive pin with the cutout of the inner rotor.
Install the thrust washer over the pump shaft.



Install the dowel pins into the oil pump cover.
Attach the oil pump cover to the oil pump body.

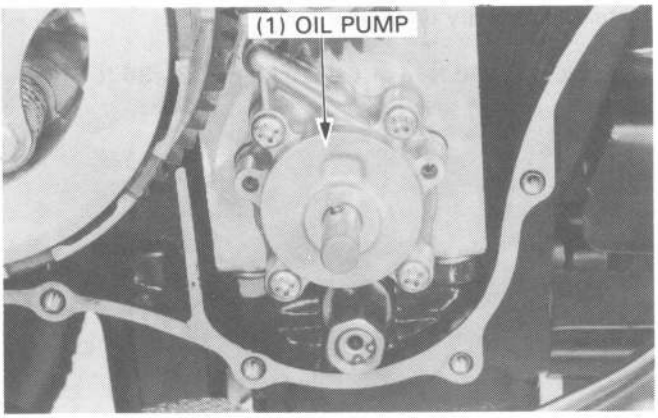


Install the oil pump cover and tighten the screws.

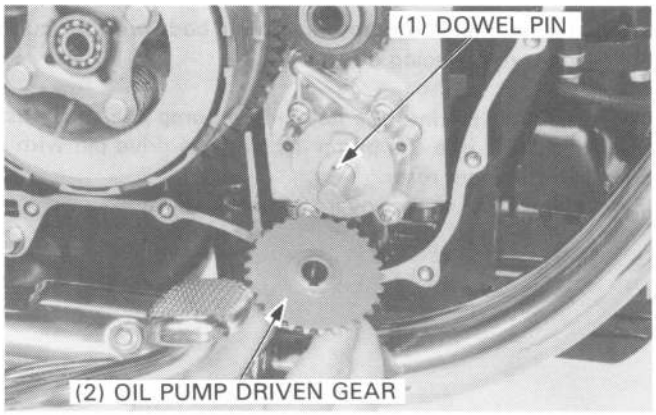


INSTALLATION

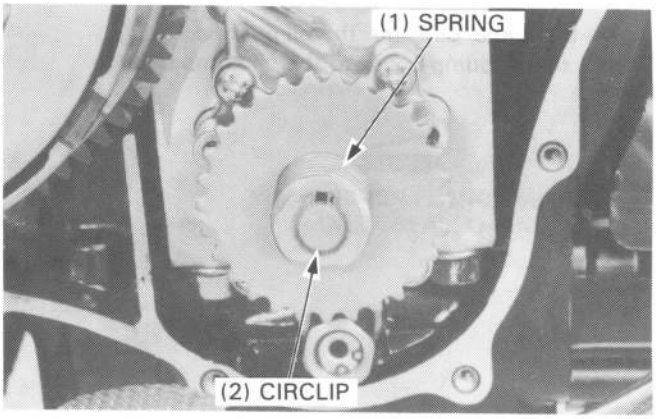
Install the oil pump and tighten the oil pump screws.



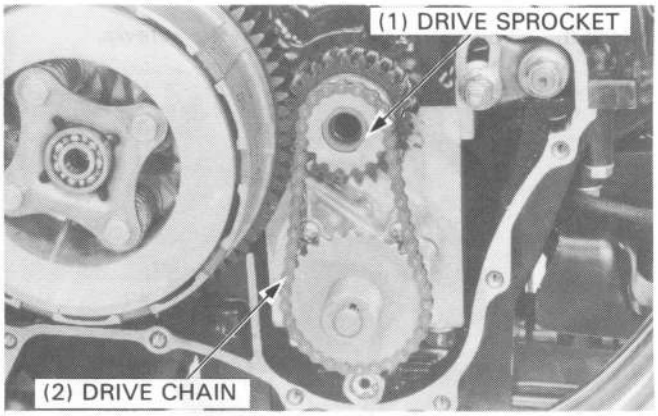
Install the dowel pin onto the oil pump shaft.
Install the driven sprocket by aligning the groove with the dowel pin.



Install the circlip.

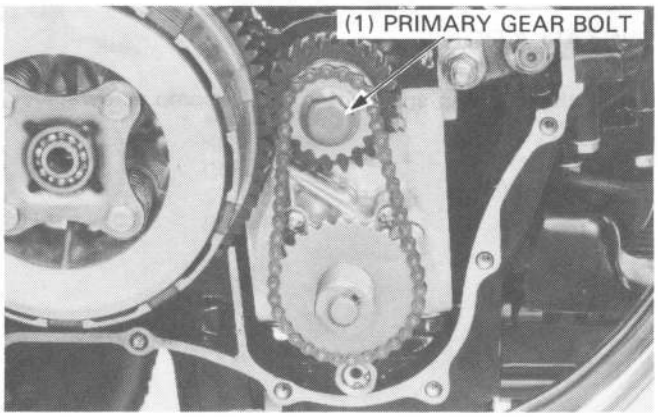


Install the drive chain and drive sprocket by aligning the cut-out of the drive sprocket with the crankshaft cutout.



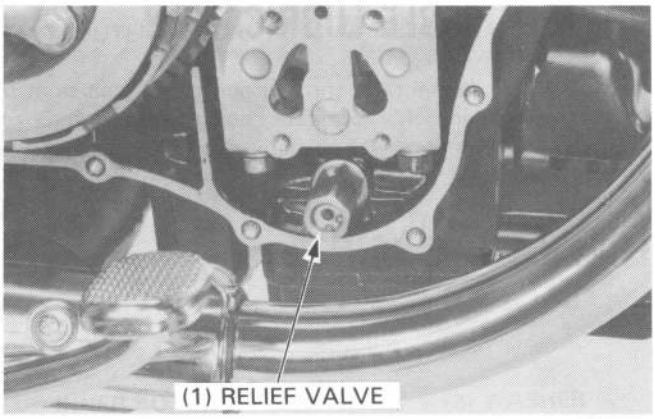
Tihten the primary drive gear bolt.

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

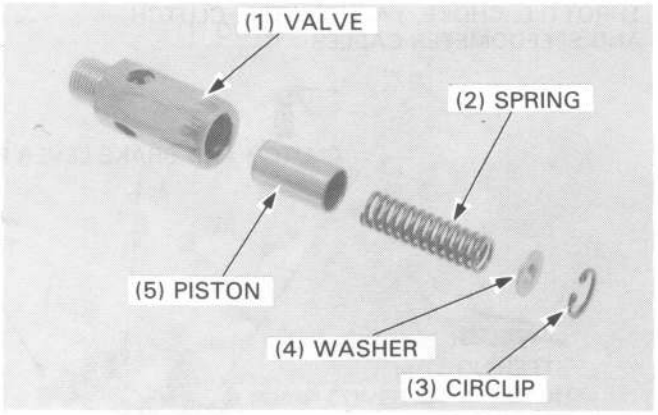


OIL PRESSURE RELIEF VALVE

Remove the valve as an assembly and check operation.



If the pump does not operate properly, disassemble it and check for a stuck valve or damaged or weak spring.
Replace the relief valve as a unit if the spring is broken.

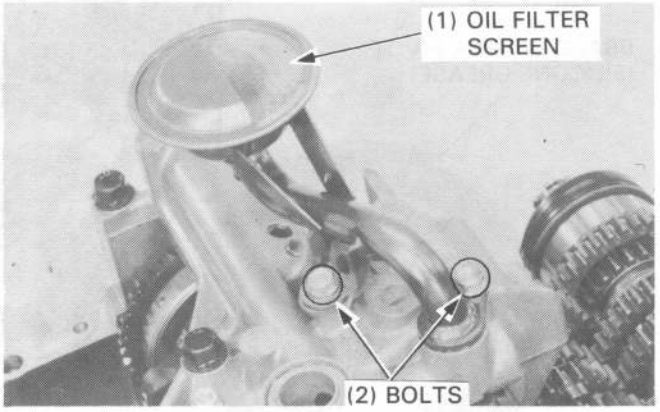


OIL FILTER SCREEN

REMOVAL

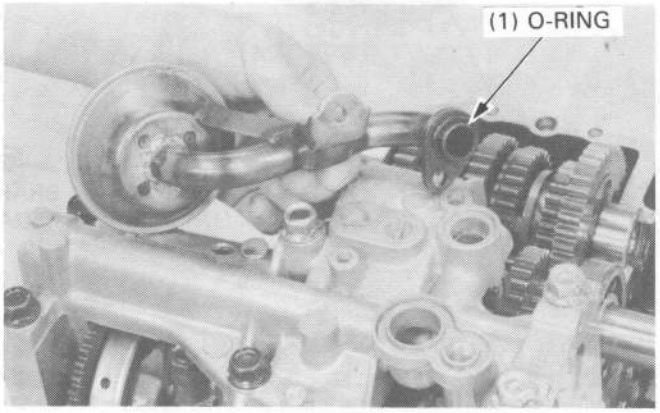
Separate the crankcase (section 10).

Remove the two bolts and the oil filter screen.
Clean it with nonflammable solvent.



INSTALLATION

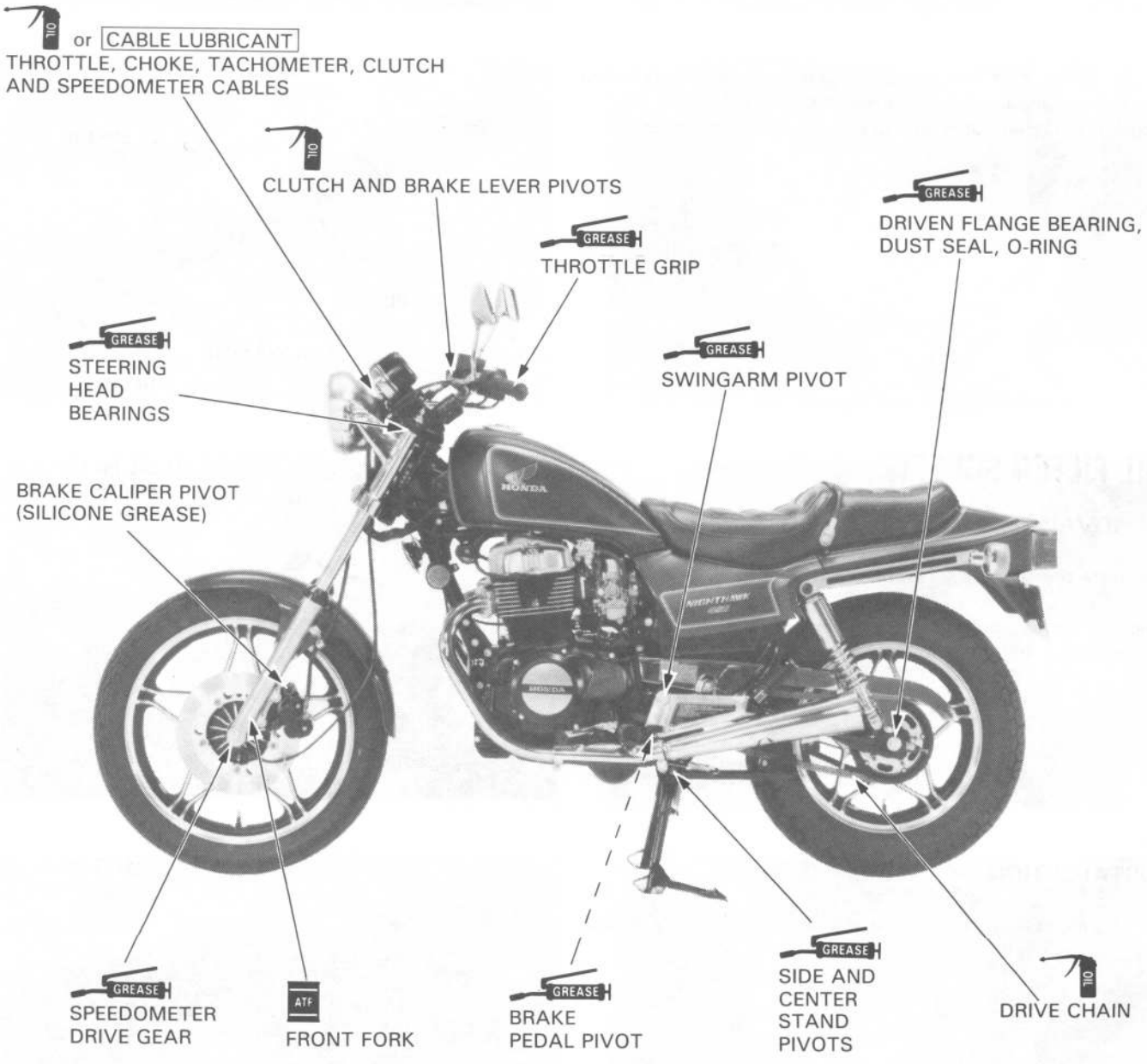
Install a new O-ring, then install the filter screen in the reverse order of removal.



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



SERVICE INFORMATION

GENERAL

- Engine oil — Page 2-3
- Engine oil filter — Page 2-3

SPECIFICATIONS

<ENGINE>	
Throttle grip free play	2—6 mm (1/8—1/4 in)
Spark plug gap	0.8—0.9 mm (0.031—0.035 in)
Recommended spark plug:	
Standard:	DPR8EA—9 (NGK)
	X24EPR—U9 (ND)
For cold climate:	DPR7EA—9 (NGK)
(Below 5°C/41°F)	X22EPR—U9 (ND)
For extended high	DPR9EA—9 (NGK)
speed riding	X27EPR—U9 (ND)
Valve clearance (cold) IN:	0.10 mm (0.004 in)
EX:	0.14 mm (0.006 in)
Idle speed:	1,200 ± 100 rpm
Carburetor synchronization	40 mm Hg (1.6 in Hg)
(Allowable vacuum difference between cylinders):	

<FRAME>		
Drive chain slack:		15—25 mm (5/8—1 in)
Rear brake pedal free play:		20—30 mm (3/4—1-1/4 in)
Clutch lever free play:		10—20 mm (3/8—3/4 in)
Side stand spring tension:		2—3 kg (4.4—4.6 lb)
Tire pressure (cold):		
Up to vehicle load capacity:	Front	200 kPa (2.00 kg/cm², 28 psi)
	Rear	250 kPa (2.50 kg/cm², 36 psi)
Up to 90 kg (200 lb) load:	Front	200 kPa (2.00 kg/cm², 28 psi)
	Rear	200 kPa (2.00 kg/cm², 28 psi)
Tire size	Front	100/90 —19 57S
	Rear	130/90 —16 67S
Min. tire tread depth	Front	1.5 mm (0.06 in)
	Rear	2.0 mm (0.08 in)
Front fork air pressure:		80 ± 20 kPa (0.8 ± 0.2 kg/cm², 11 ± 3 psi)

TORQUE VALUES

Balancer stopper plate	8 mm	21—25 N·m (2.1—2.5 kg-m, 15—18 ft-lb)
	10 mm	31—35 N·m (3.1—3.5 kg-m, 22—25 ft-lb)
Rear axle nut		90—100 N·m (9.0—10.0 kg-m, 65—72 ft-lb)

TOOLS

Special

Carburetor adjust wrench	07GMA—MC90100

Common

Valve adjusting wrench, 10 x 12 mm	07708—0030200
Valve adjuster	07708—0030300

MAINTENANCE SCHEDULE

Perform the Pre-ride Inspection (see Owner's manual) at each sheduled 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)] 600 mi (1,000 Km)	4000 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 (38,400 Km)	Refer page
EMISSION RELATED ITEMS	*	FUEL LINES				I		I		I	3-4
	*	FUEL STRAINER			C	C	C	C	C	C	3-4
	*	THROTTLE OPERATION				I		I		I	3-4
	*	CARBURETOR CHOKE				I		I		I	3-5
		AIR CLEANER	NOTE (1)				R			R	3-6
		CRANKCASE BREATHER	NOTE (2)		C	C	C	C	C	C	3-6
		SPARK PLUGS			R	R	R	R	R	R	3-6
	*	VALVE CLEARANCE		I	I	I	I	I	I	I	3-7
		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	3-7
	*	CAM CHAIN TENSION		A	A	A	A	A	A	A	3-8
	*	CARBURETOR-SYNCHRONIZATION				I		I		1	3-8
	*	CARBURETOR-IDLE SPEED		I	I	I	I	I	I	I	3-10
	*	SECONDARY AIR SUPPLY SYSTEM	NOTE 3			I		I		I	3-10
	*	EVAPORATIVE EMISSION CONTROL SYSTEM	NOTE (3)				I			I	3-10
NON-EMISSION RELATED ITEMS		DRIVE CHAIN		IL: EVERY 600 mi (1,000 km)							3-11
		BATTERY			I	I	I	I	I	I	3-12
		BRAKE FLUID (FRONT)	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	3-13
	*	BRAKELIGHT SWITCH				I		I		I	3-14
	*	HEADLIGHT AIM				I		I		I	3-14
		CLUTCH		I	I	I	I	I	I	I	3-15
		SIDE STAND				I		I		I	3-15
	*	SUSPENSION				I		I		I	3-16
	*	NUTS, BOLTS, FASTENERS		I		I		I		I	3-17
	**	WHEELS/TIRES				I		I		I	3-17
	**	STEERING HEAD BEARINGS		I		I		I		I	3-17

* SHOULD BE SERVICED BY AN AUTHORIZED HONDA DEALER, UNLESS THE OWNER HAS PROPER TOOLS AND SERCIVE DATA AND IS MECHANICALLY QUALIFIED.

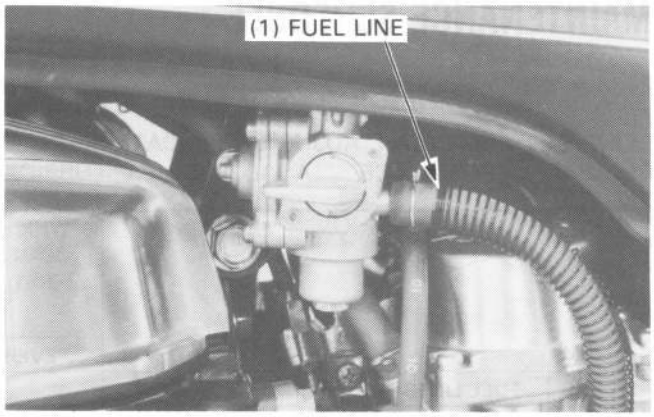
** IN THE INTEREST OF SAFETY, WE RECOMMEND THESE ITEMS BE SERVICED ONLY BY AN AUTHORIZED HONDA DEALER.

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.

FUEL LINES

Check the fuel lines for deterioration, damage or leakage.

Replace if necessary.



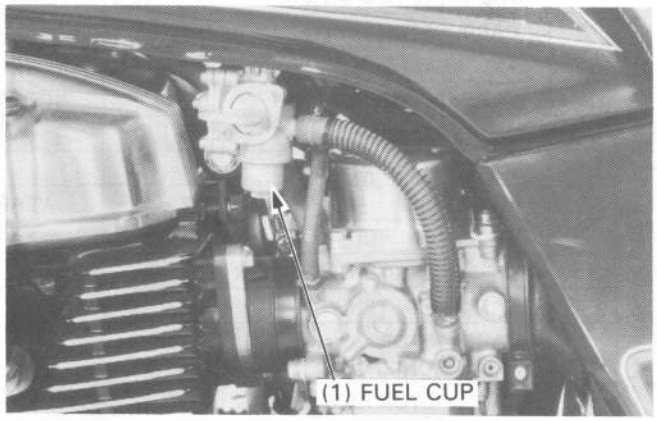
FUEL STRAINER

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.***

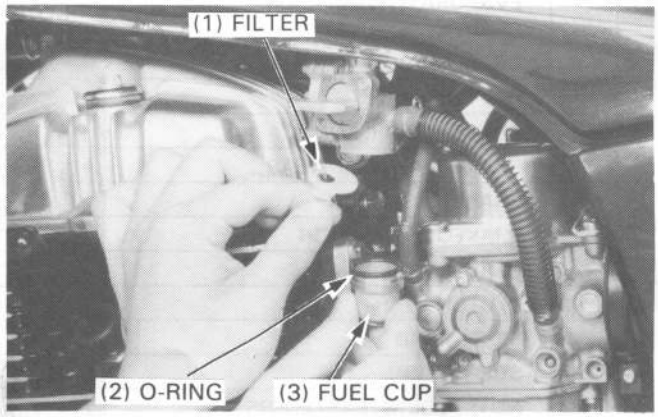
Wash the cup and filter screen in clean nonflammable or high flash point solvent.



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

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.



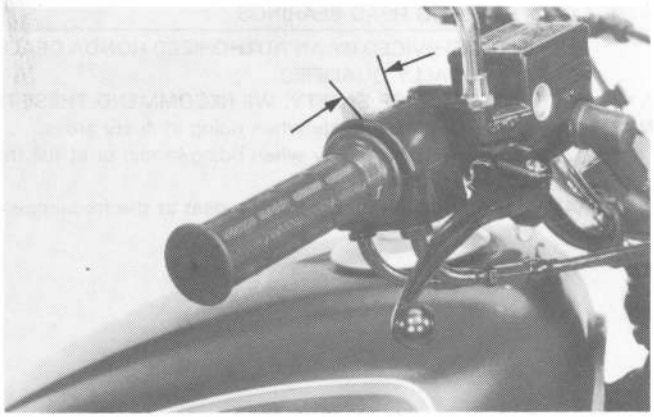
THROTTLE OPERATION

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

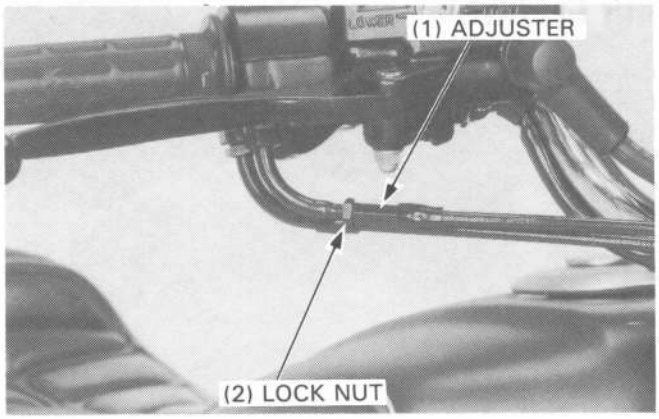
Make sure there is no deterioration, damage, or kinking in the throttle cables. Replace any damaged parts.
Lubricate the throttle cables (Page 2-12), if throttle operation is not smooth.

Measure the throttle grip free play at the throttle grip flange.

FREE PLAY: 2—6 mm (1/8—1/4 in)



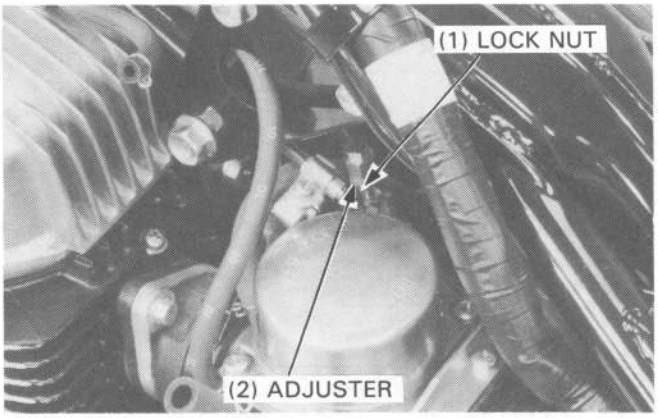
Throttle grip free play can be adjusted at either end of the throttle cable. Minor adjustments are made with the upper adjuster.



Major adjustments are made with the lower adjuster.

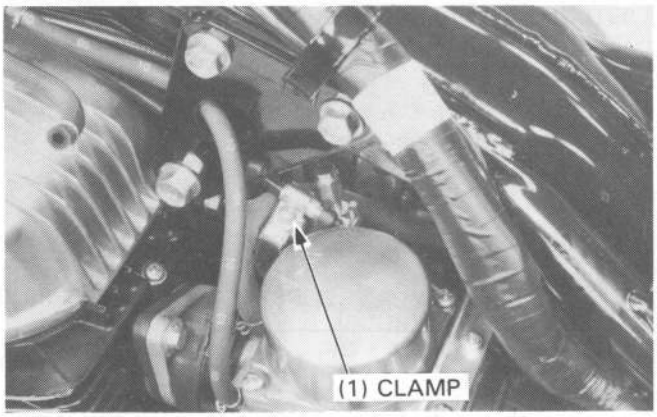
Adjust free play by loosening the lock nut and turning the adjuster. Tighten the lock nut.

Recheck throttle operation in all steering positions.

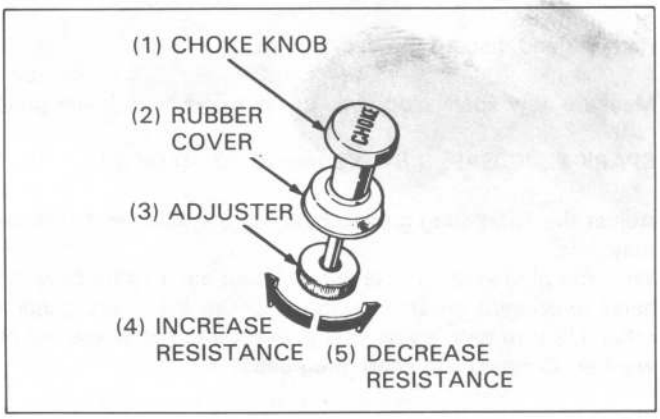


CARBURETOR-CHOKE

Check for smooth choke knob operation.
Pull the choke knob to "fully closed" and make sure that the choke is fully closed by moving the carburetor choke lever. When adjustment is necessary, loosen the choke wire clamp and adjust the choke wire. Retighten the clamp, holding the choke lever fully closed.

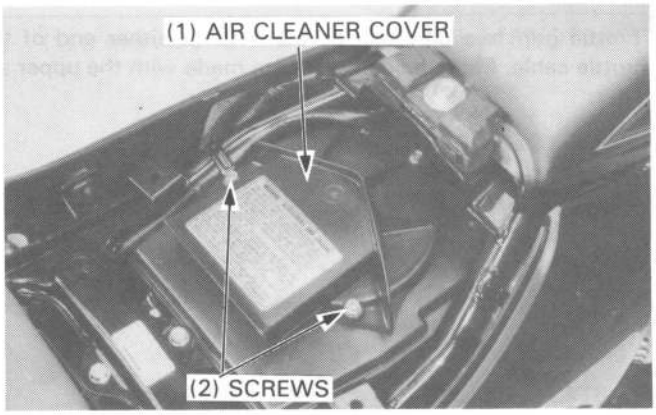


Adjust the choke operating function by turning the adjuster. The choke knob must move smoothly and stay where positioned.

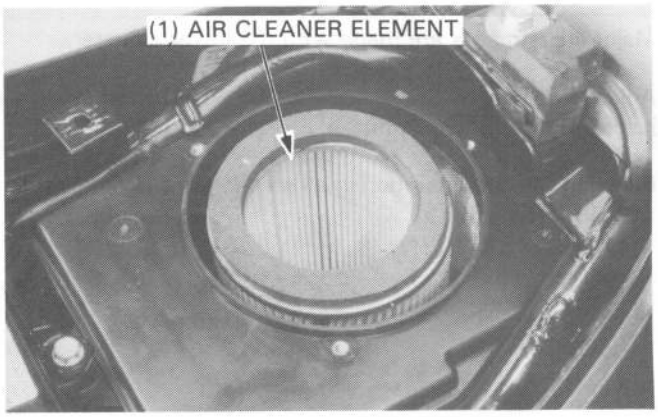


AIR CLEANER

Remove the seat.
Remove the air cleaner cover by removing the attaching screws.



Remove and discard the air cleaner element.
Install a new element and air cleaner cover.
Install the seat.



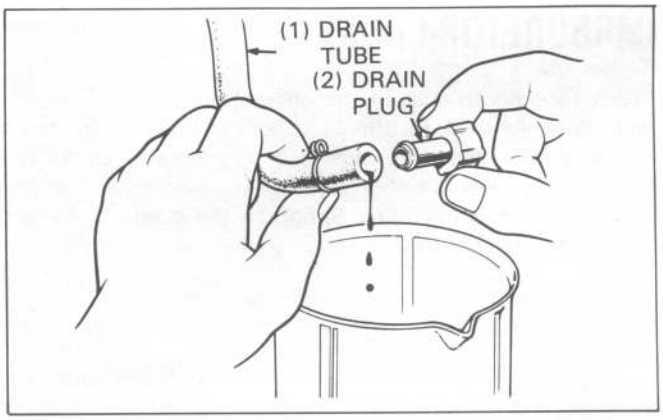
CRANKCASE BREATHER

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.



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

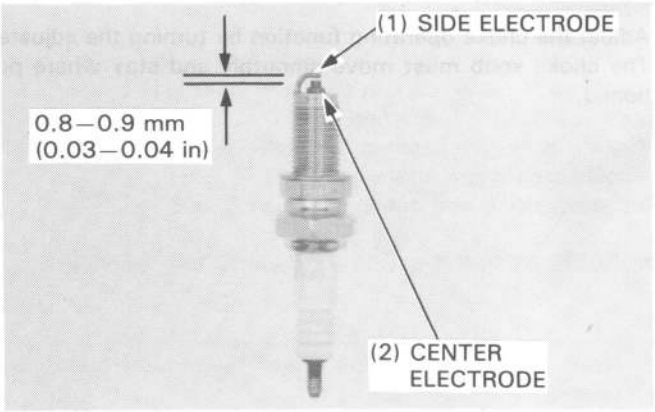
Disconnect the spark plug caps and clean any dirt from around the spark plug bases.

Remove and discard the spark plugs.

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

SPARK PLUG GAP: 0.8—0.9 mm (0.03—0.04 in)

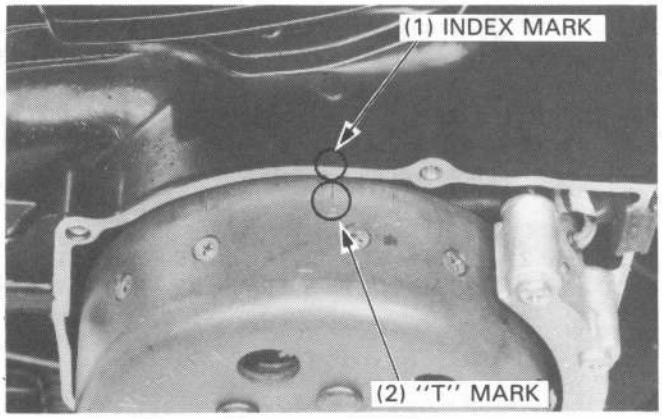
Adjust the spark plug gap by bending the side electrode carefully.
With the plug washer attached, thread each spark plug in by hand to prevent crossthreading. Tighten the spark plugs another 1/2 turn with a spark plug wrench to compress the plug washer. Connect the spark plug caps.



VALVE CLEARANCE

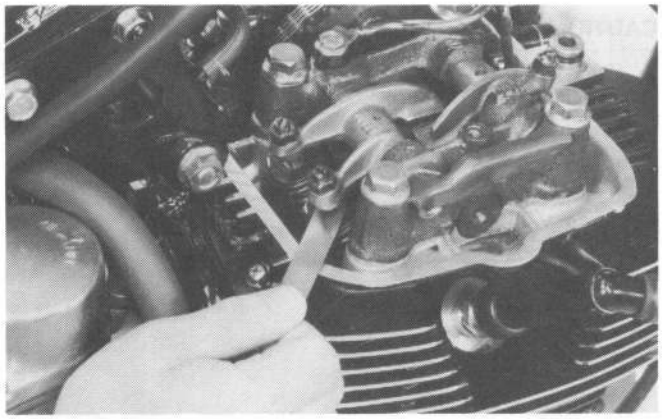
Remove the seat and fuel tank (page 4-15).
Remove the left crankcase cover (page 9-2).
Remove the cylinder head cover (page 6-4).

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

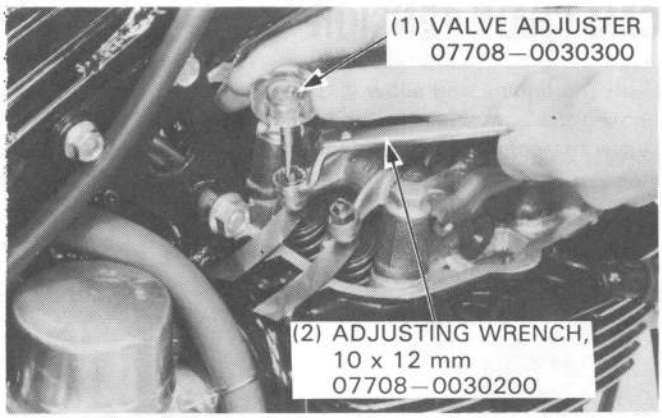


Check the intake and exhaust valve clearance by inserting the feeler gauge between the adjusting screw and the valve stem. Before checking, make sure that the piston is at TDC on the compression stroke. (The rockers should be loose.)

VALVE CLEARANCE:
IN: 0.10 ± 0.02 mm (0.004 ± 0.001 in.)
EX: 0.14 ± 0.02 mm (0.006 ± 0.001 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 and recheck clearance.
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.



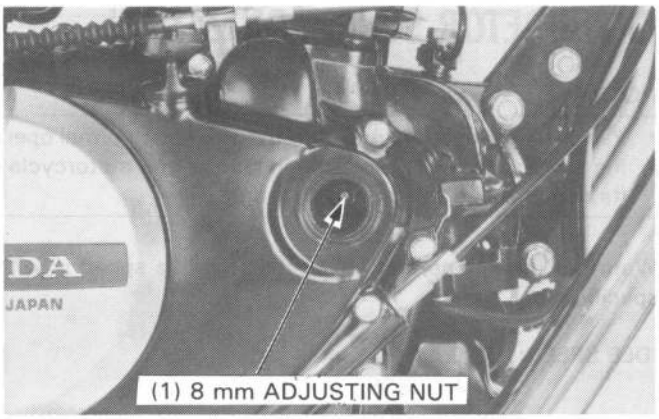
BALANCER CHAIN TENSION

Perform the following if the balancer chain is noisy.
Remove the adjust 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: 21—25 N·m (2.1—2.5 kg-m, 15—18 ft-lb)

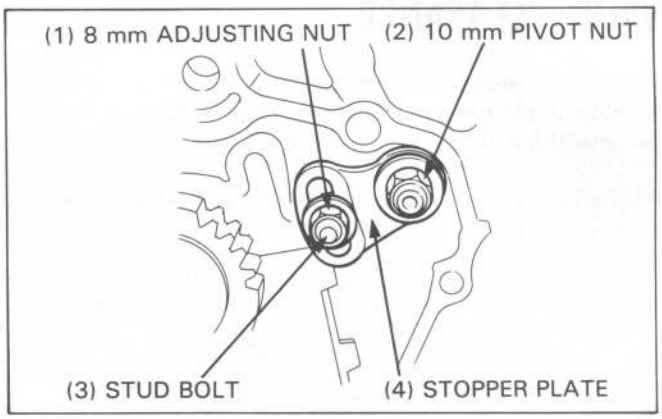
NOTE

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



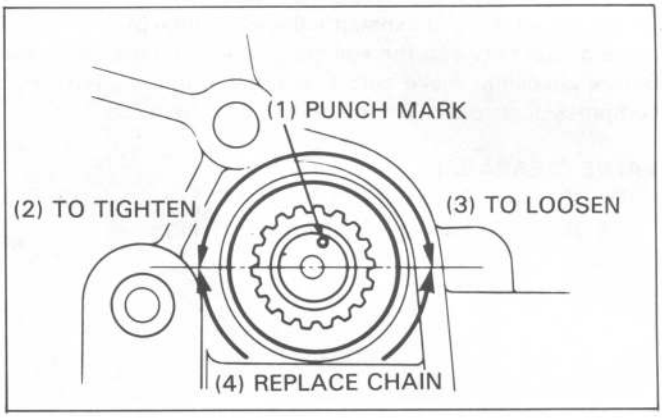
Remove the right crankcase cover.
Remove the 10 mm and 8 mm nuts; remove the stopper plate.
Install the stopper plate, moving it over one spline to move the end of the stopper plate groove away from the stud bolt.
Reinstall the 8 mm nut first and then the 10 mm nut and tighten to the specified torques.

TORQUE:
8 mm: 21—25 N·m (2.1—2.5 kg-m, 15—18 ft-lb)
10 mm: 31—35 N·m (3.1—3.5 kg-m, 22—25 ft-lb)



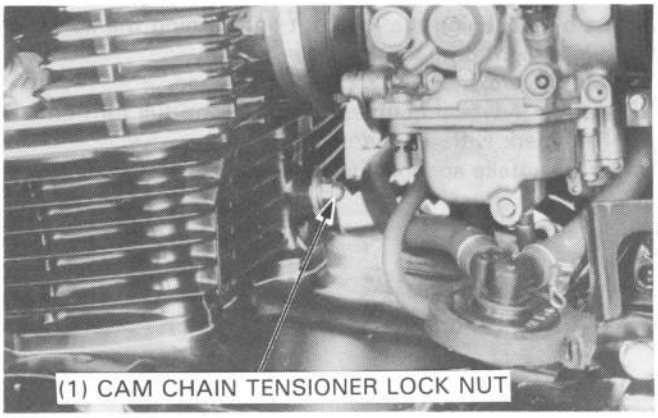
CAUTION

- *Replace the chain if the punch mark on the shaft is below the horizontal line.*
  (Refer to Section 11)



CAM CHAIN TENSION

Start the engine and allow it to idle.
Loosen the cam chain tensioner lock nut.
When the cam chain tensioner lock nut is loosened, the tensioner will automatically position itself to provide the correct tension.
Retighten the lock nut.



CARBURETOR SYNCHRONIZATION

NOTE

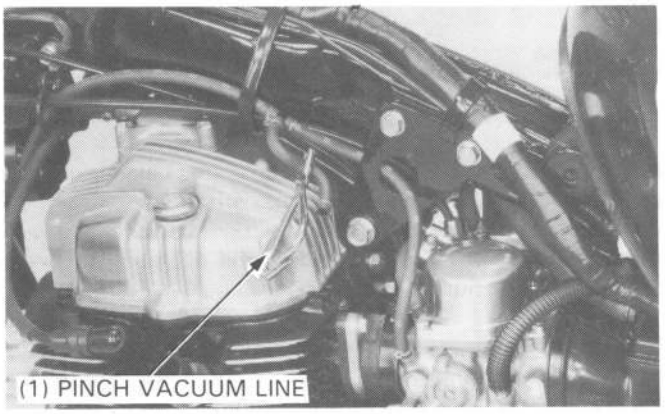
- Perform this maintenance with the engine at normal operating temperature, transmission in neutral and motorcycle on its center stand or supported upright.

Warm up the engine and check that the idle speed is within specification.

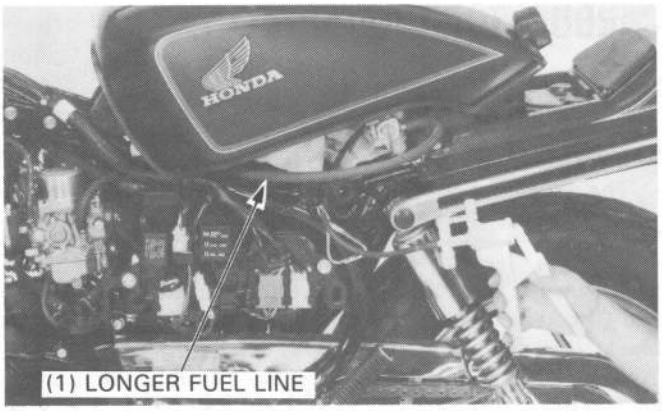
IDLE SPEED: 1200 ± 100 rpm

Turn the fuel valve off and remove the fuel tank (page 4-15).

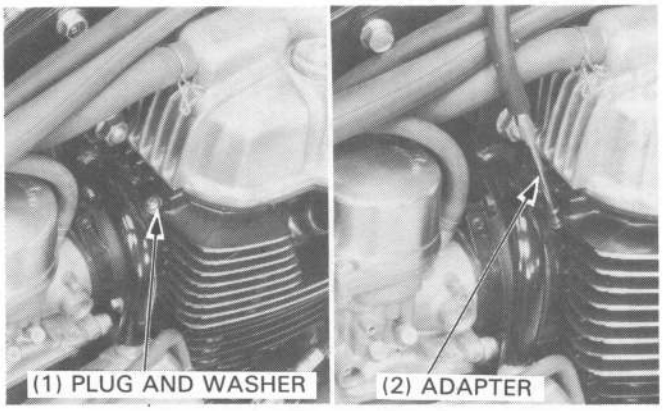
Pinch the vacuum line connected to the fuel valve as shown.



Set the fuel tank on the frame and hold it securely.
Connect a longer fuel line between the fuel tank and carburetor, apply vacuum to fuel valve and pinch to hold the fuel valve.



Remove the pluges and sealing washers.
Install the vacuum gauge adapters.



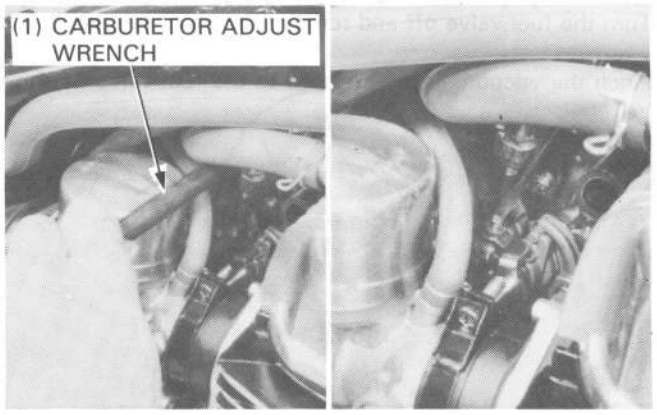
Start the engine. The vacuum gauge readings should be as close as possible to each other with a difference no greater than 40 mm (1.6 in) Hg.

NOTE

- The left carburetor is the base carburetor and cannot the adjusted.

Position the throttle adjusting wrench on the balance adjusting screw lock nut from under the right carburetor.
To adjust, loosen the lock nut on the right carburetor and turn the adjusting screw. While holding the adjusting screw, re-tighten the lock nut.

Readjust idle speed and synchronization.
Remove the vacuum gauge adaptors and install the removed parts in the reverse order of disassembly.



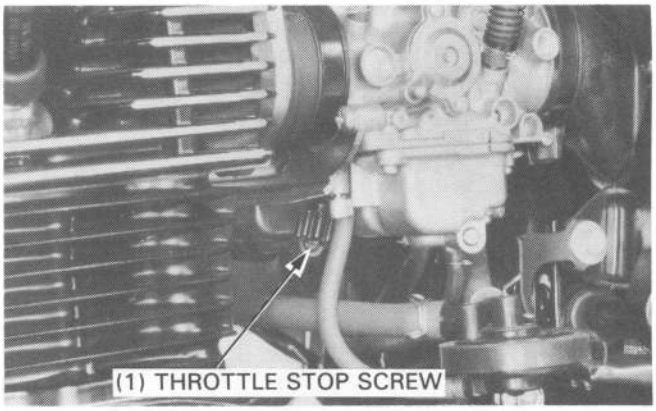
CARBURETOR-IDLE SPEED

NOTE

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

Warm up the engine, shift the transmission into NEUTRAL, and place the motorcycle on its center stand (or a support block).
Turn the throttle stop screw as required to obtain the specified idle speed.

IDLE SPEED: 1200 ± 100 rpm

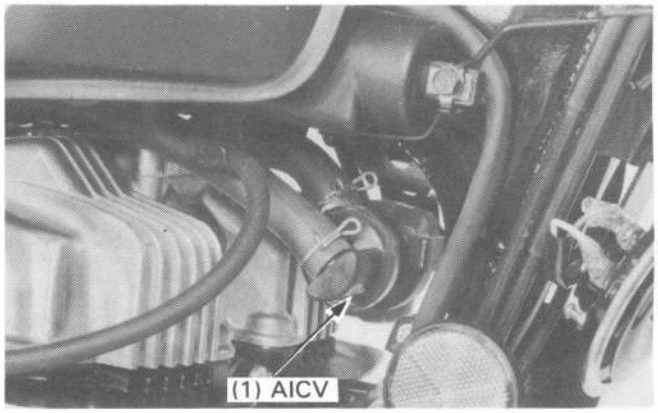


SECONDARY AIR SUPPLY SYSTEM (California model only)

Check all tubes to be sure they are securely connected and are not kinked or clogged.

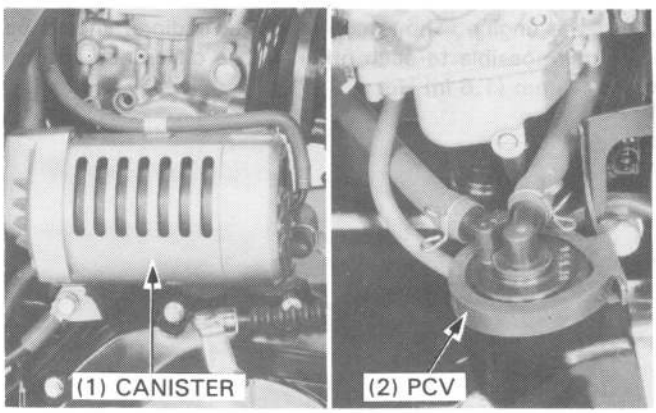
Replace any damaged or deteriorated tubes.

For AICV (Air Injection Control Valve) inspection, see page 4-20.
For reed valve inspection, see page 6-17.



EVAPORATIVE EMISSION CONTROL SYSTEM (California model only)

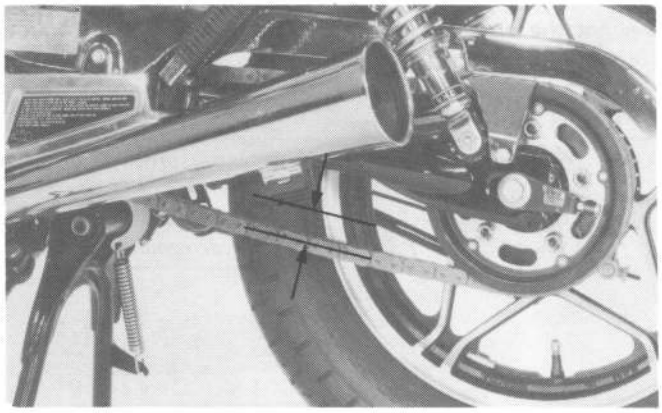
Check all tubes to be sure they are securely connected and are not kinked or clogged. Replace any damaged or deteriorated tubes.



DRIVE CHAIN

Place the motorcycle on its center stand (or a support block) 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)



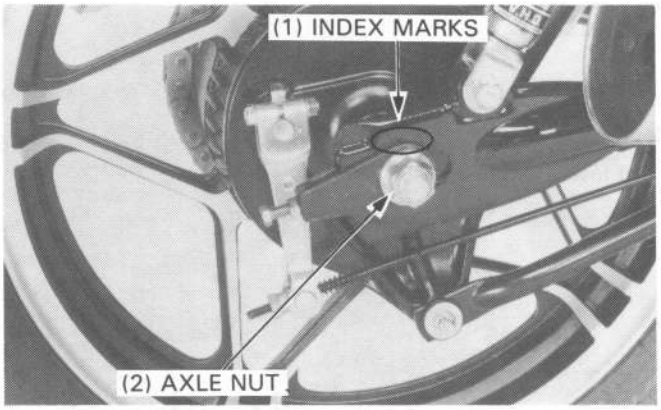
Adjust as follows:
Loosen the rear axle nut.
Loosen the lock nuts on both adjusting bolts.
Turn both adjusting bolts an equal number of turns until the correct drive chain slack is obtained.

NOTE

- Be sure that the index mark aligns with the same graduation on the scale on both side.

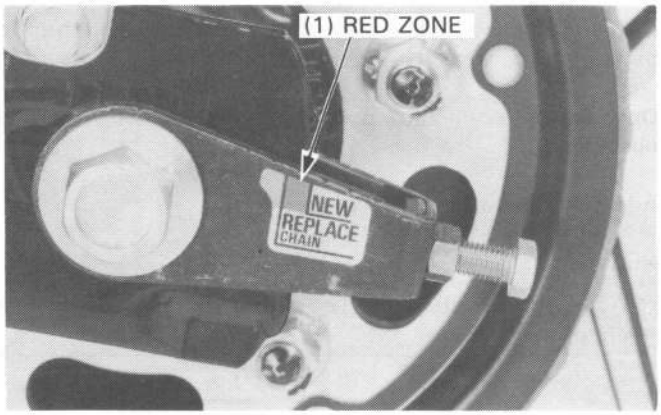
Tighten the rear axle nut to the specified torque.

TORQUE: 90—100 N·m (9—10 kg-m, 65—72 ft-lb)



If the red zone on the label aligns with the rear of the swingarm after the chain has been adjusted for proper slack, the drive chain is excessively worn and must be replaced.

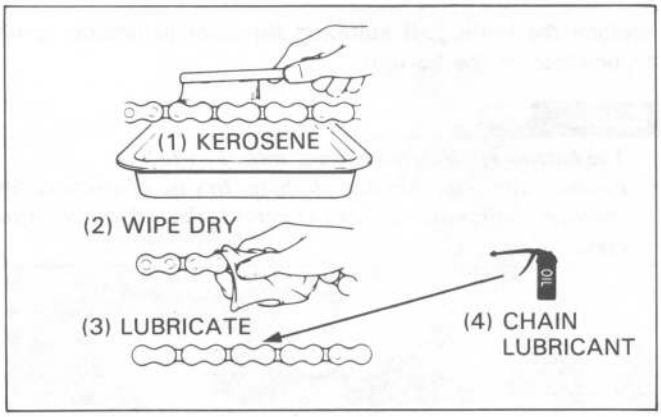
Tighten both adjusting bolt lock nuts.



Clean the drive chain with kerosene and wipe dry.
Lubricate the drive chain with SAE 80 or 90 gear oil.

NOTE

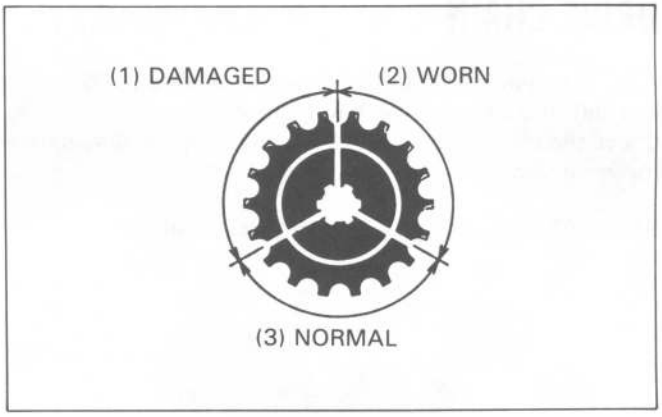
- Clean the chain with kerosene. Wipe dry and lubricate only with SAE 80 or 90 gear oil. Do not clean the chain with a steam cleaner or solvents.



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

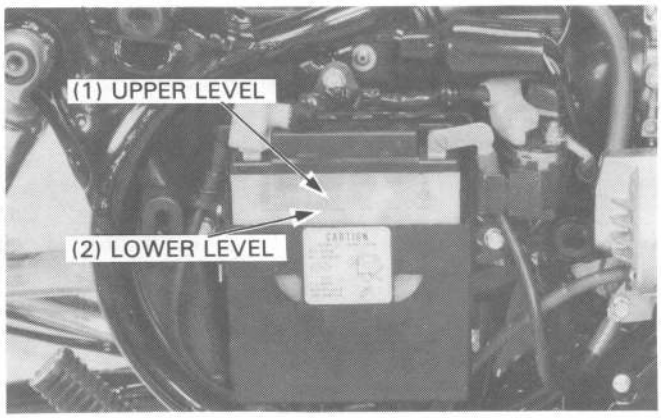
CAUTION

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



BATTERY

Remove the right side cover and check the battery electrolyte level.
The electrolyte level must be maintained between the upper and lower level marks.



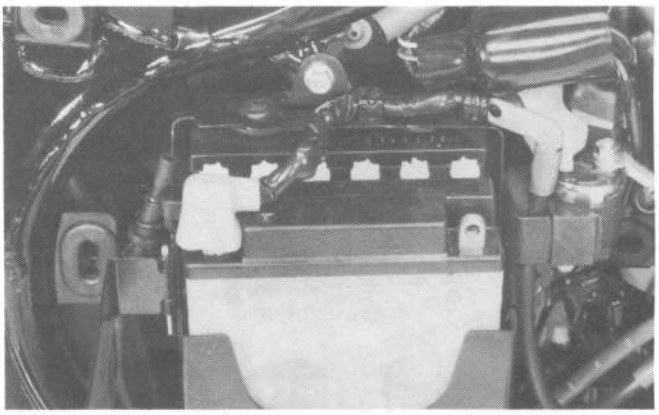
If the level is low, disconnect the negalive terminal from the battery. Disconnect the battery breather outlet.

Open the battery holder, pull out the battery and remove the filler caps.

Add distilled water to upper level.

NOTE

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



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

WARNING

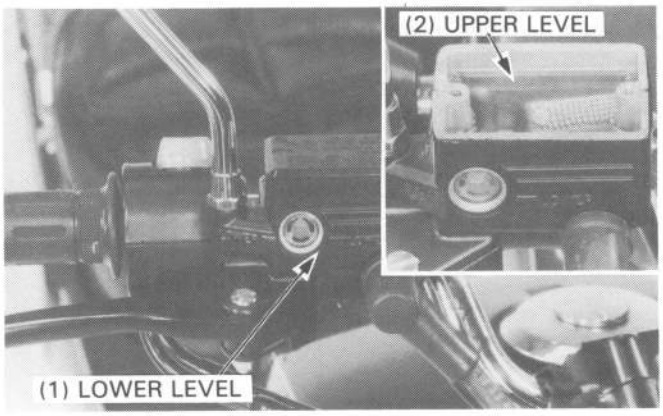
- ***The battery electrolyte contains sulfuric acid.***
- ***Protect your eyes, skin and clothing. In case of contact, flush thorougly with water and call a doctor if electrolyte gets in your eyes.***

BRAKE FLUID

Check that the brake fluid reservoir is filled to the upper level mark. If the level is near the lower level mark, remove the reservoir cap and diaphragm, then fill the reservoir up to the upper level mark.
Check the entire system for leaks if the level is low.

CAUTION

- *When adding brake fluid be sure the reservoir is horizontal before the cap is removed or brake fluid may spill out.*
- *Use only DOT 3 or DOT 4 brake fluid from a sealed container.*
- *Handle brake fluid with care because it can damage paint and instrument lenses.*
- *Never allow contaminants (dirt, water, etc.) to enter the brake fluid reservoir.*



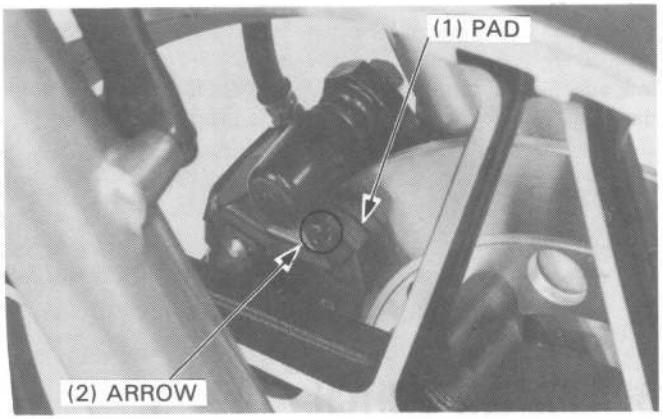
BRAKE SHOE/PAD WEAR

BRAKE PADS

Check the brake pad for wear by looking from the direction indicated by the raised cast arrow on the caliper assembly.
Replace the brake pads if they are worn to the wear line.

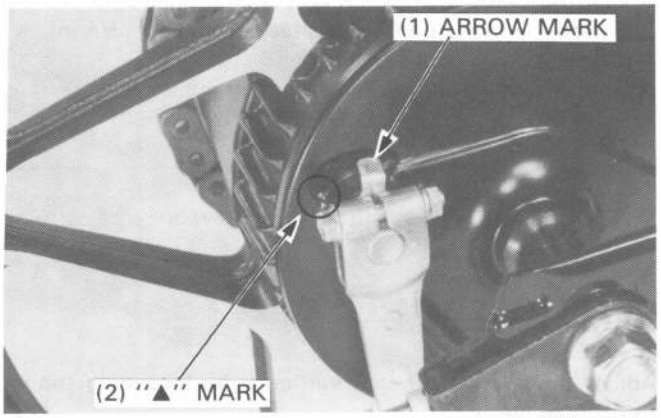
CAUTION

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



BRAKE SHOES

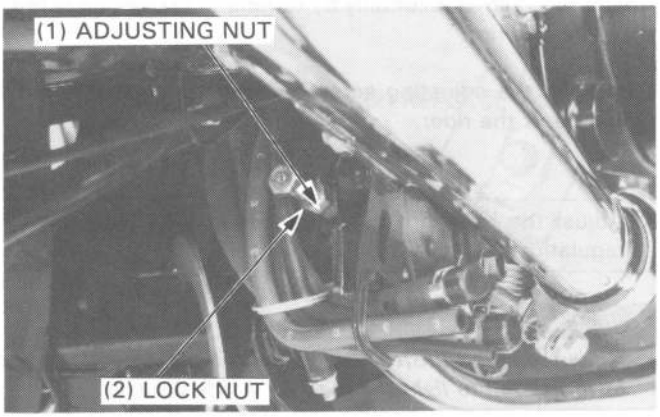
Replace the brake shoes if the arrow on the brake arm aligns with the reference mark "▲" when the brake is fully applied.



BRAKE SYSTEM

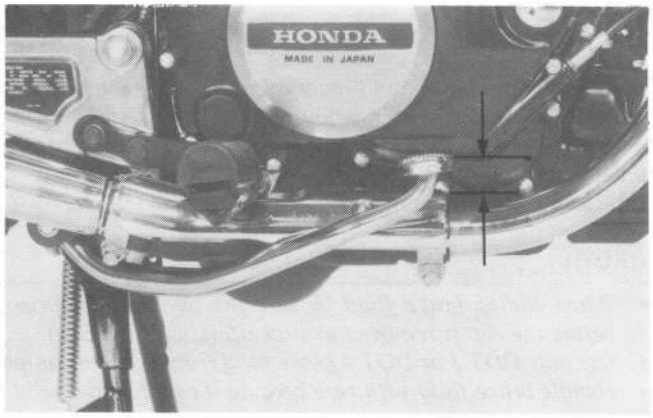
REAR BRAKE

Check the rear brake pedal height.
To adjust, loosen the lock nut and turn the stopper bolt.
Tighten the lock nut.



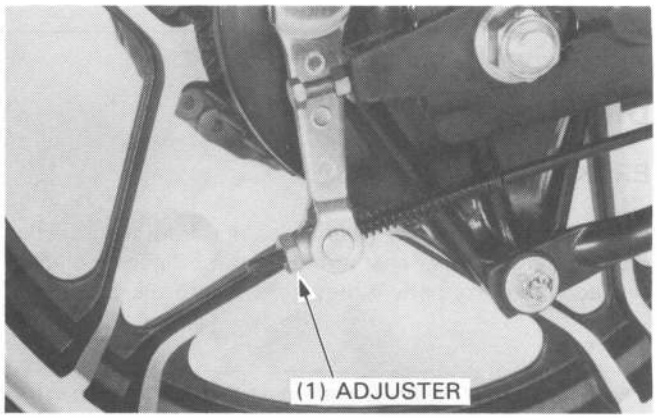
Measure the brake pedal free play.

FREE PLAY: 20—30 mm (3/4—1-1/4 in)



Adjust the brake pedal free play by turning the adjuster.

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

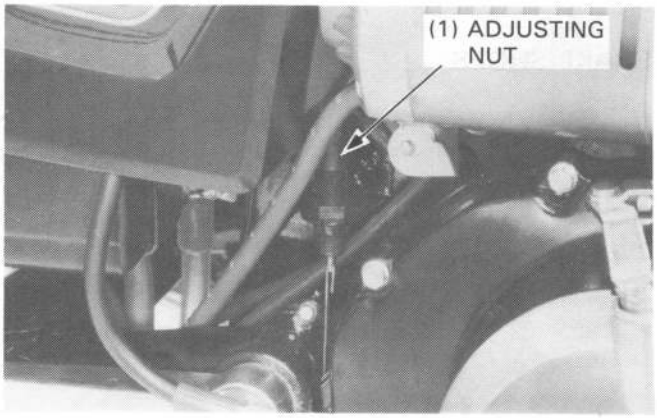


BRAKELIGHT SWITCH

Adjust the brakelight switch so that the brakelight will come on when the brake pedal is depressed 20 mm (3/4 in), when the brake begins engagement.
Adjust by turning the switch adjusting nut.

NOTE

- Do not turn the switch body.
- The front brakelight switch does not require adjustment.



HEADLIGHT AIM

Adjust the headlight beam vertically by loosening the front turn signal stays.

Adjust the beam horizontally by turning the adjusting screw on the headlight rim.

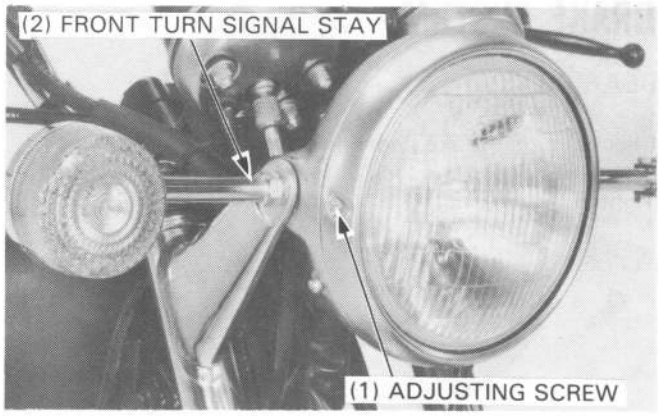
Turning in the adjusting screw directs the beam toward the right side of the rider.

NOTE

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

WARNING

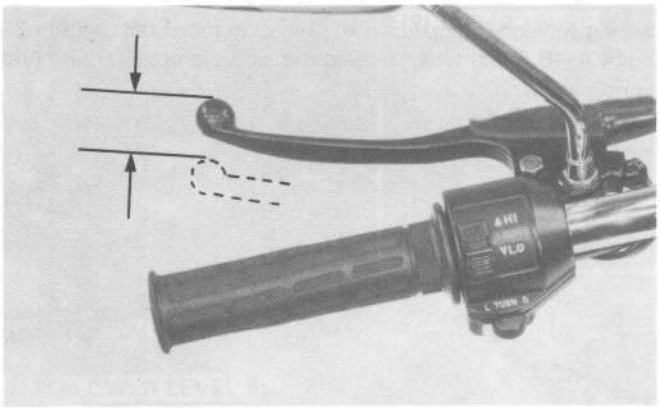
- ***An improperly adjusted headlight may blind oncoming drivers, or it may fail to light the road for a safe distance.***



CLUTCH

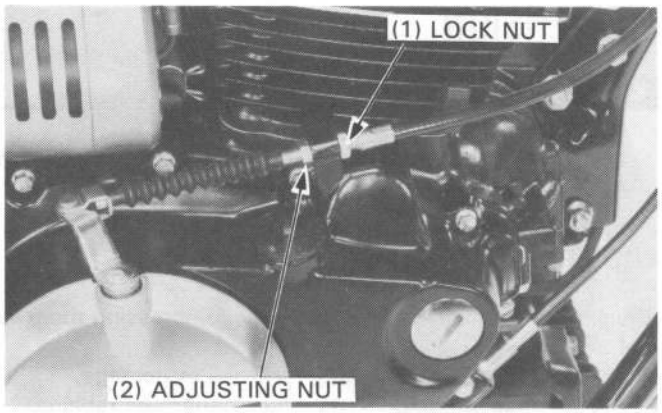
Measure the clutch lever free play at the end of the lever.

FREE PLAY: 10—20 mm (3/8—3/4 in)



Major adjustments should be made using the adjuster at the clutch housing. Loosen the lock nut and turn the clutch cable adjusting nut.

Tighten the lock nut.

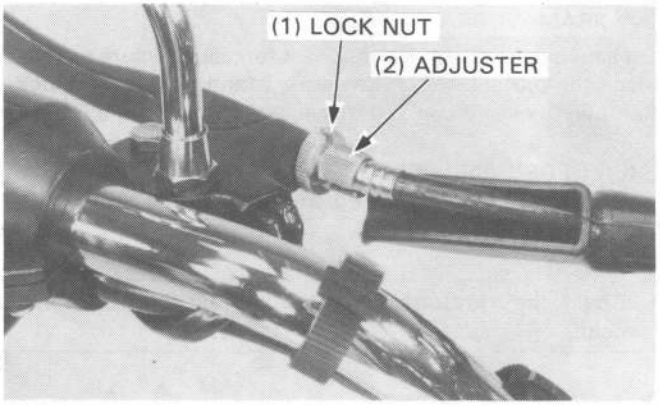


Minor adjustments can be made with the clutch cable adjuster on the clutch lever. Loosen the lock nut and turn the adjuster.

NOTE

- Do not expose the threads of the adjuster by more than 8 mm (3/8 in)

Recheck the clutch operation.



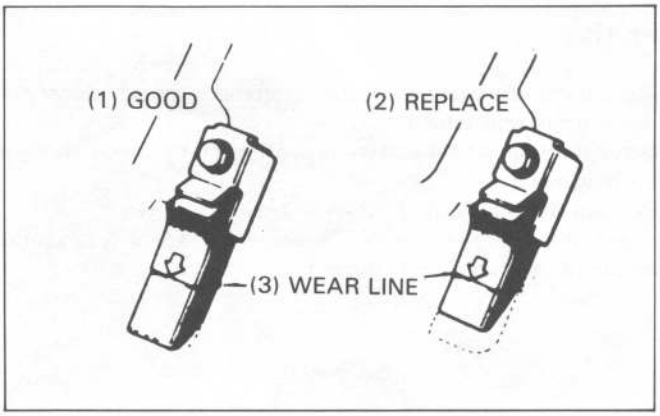
SIDE STAND

Check the rubber pad for deterioration or wear.
Replace if any wear extends to wear line as shown.

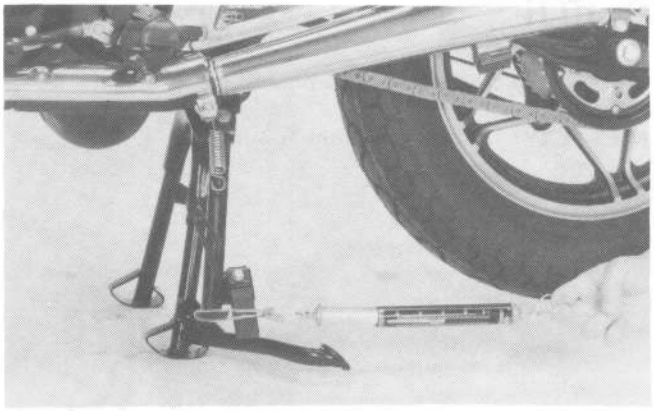
NOTE

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

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



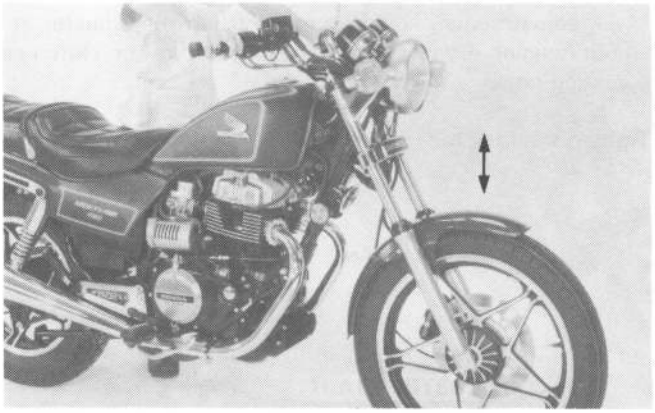
Spring tension is correct if the measurement falls within 2—3 kg (4.4—6.6 lbs) when pulling the side stand lower end with a spring scale.



SUSPENSION

WARNING

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

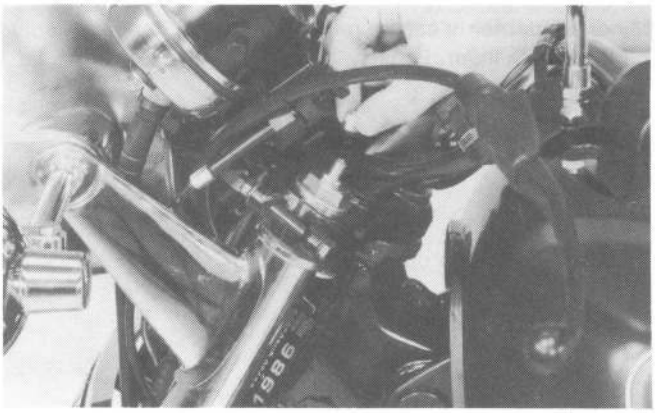


FRONT

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.

On air suspension, check the front fork air pressure as follows.
Place the motorcycle on its center stand or support block.
Remove the valve cap and measure the front fork air pressure.

FRONT FORK AIR PRESSURE:
80 ± 20 kPa (0.8 ± 0.2 kg/cm², 11 ± 3 psi)

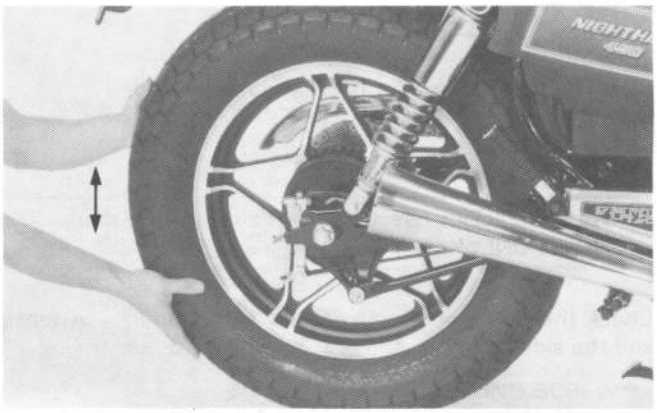


NOTE

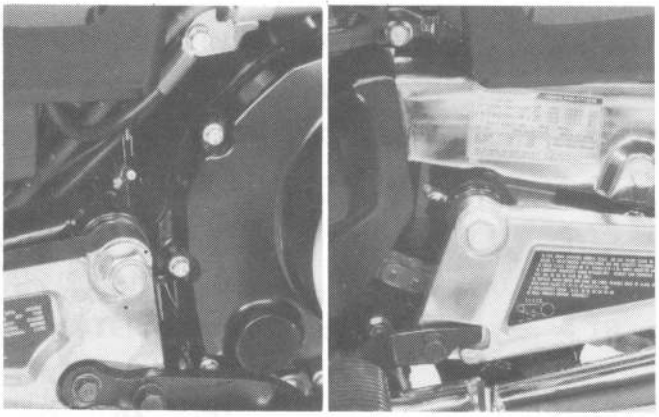
- Check the front fork air pressure when the front forks are cold.

REAR

Place the motorcycle on its center stand or on a support block to raise the rear wheel.
Move the rear wheel sideways with force to check swingarm bushing wear.
Replace the bushings if they are excessively worn.
Check the entire suspension assembly to see if it is securely mounted, damaged or distorted.



Two lubrication points are located as shown.
Use multipurpose grease, Type NLGI No. 2.



NUTS, BOLTS, FASTENERS

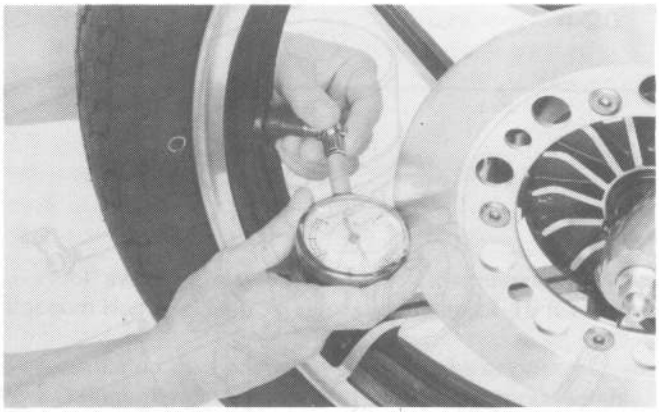
Check that all chassis nuts and bolts are tighened to correct torque values.
Check all cotter pins and safety clips.

WHEELS/TIRES

NOTE

- Tire pressure should be checked when tires are COLD.

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



		Front	Rear
Tire size		100/90-19 57S	130/90-16 67S
Cold tire pressures psi (kPa, kg/cm²)	Up to 90 kg (200 lbs) load	28 (200, 2.0)	28 (200, 2.0)
	90kg (200 lbs) load to vehicle load capacity	28 (200, 2.0)	36 (250, 2.5)
Tire brand		TUBELESS ONLY	
BRIDGESTONE		S303	G508
DUNLOP		F11	K627

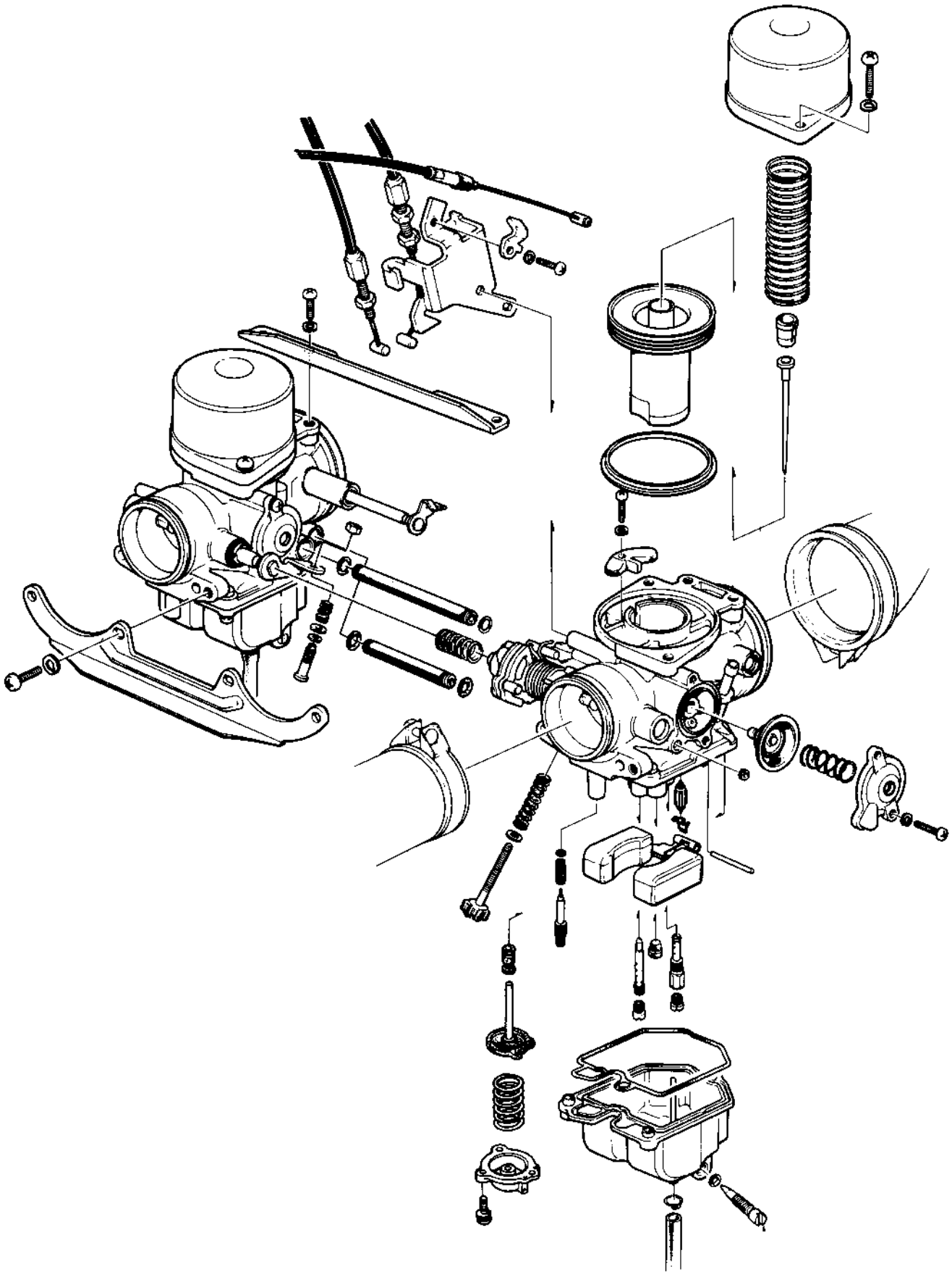
STEERING HEAD BEARINGS

NOTE

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

Raise the front wheel off the ground.
Check that the handlebar rotates freely.

If the handlebar moves unevenly, binds, or has vertical movement, adjust the steering head bearing by turning the steering head adjusting nut (page 13-20).



4. FUEL SYSTEM

SERVICE INFORMATION

GENERAL

- All hoses used in the evaporative and exhaust emission control systems are numbered for identification. When connectings are of these, compare the hose number with the Vacuum Hose Routing Diagram Label, page 1-16 (California model only) for its correct routing and 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.

CAUTION

- *Do not bend or twist control cables. Damaged control cables will not operate smoothly and stick or bind.*

SPECIFICATIONS

Venturi dia.	30 mm (1.2 in)
Setting mark	VB 2EA, VB 2FB (California Type)
Float level	15.5 mm (0.61 in)
Pilot screw opening	See page 4-13
Idle speed	1,200 ± 100 rpm
Fast idle	2,500 ± 500 rpm
Vacuum (at idle speed)	200 – 240 mm Hg
Throttle grip free play	2 – 6 mm (0.08 – 0.24 in)
Main jet	Pri:70 2nd:108

TOOLS

Common

Float gauge	07401–0010000

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

Hard starting or stalling after starting
- Improper choke operation
- Ignition malfuction
- Fast idle speed incorrect
- Carburetor malfunction
- Fuel contaminated
- Intake air leak
- Idle speed incorrect
- Faulty purge control valve

Rough idle
- Ignition malfunction
- Idle speed incorrect
- Incorrect carburetor synchronization
- Carburetor malfunction
- Fuel contaminated

Misfiring during acceleration
- Ignition malfunction
- Faulty air cut-off valve

Backfiring
- Ignition malfunction
- Carburetor malfunction
- Faulty air cut-off valve

Poor performance (driveability) and poor fuel economy
- Fuel system clogged
- Ignition malfunction
- Dirty air cleaner

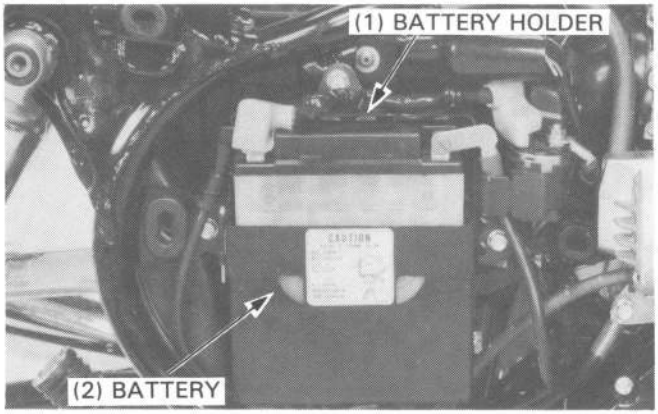
Lean mixture
- Clogged fuel jets
- Vacuum piston sticking
- Faulty float valve
- Float level low
- Fuel cap vent blocked
- Fuel strainer screen clogged
- Restricted fuel line
- Air vent tube clogged
- Intake air leak

Rich mixture
- Clogged air jets
- Faulty float valve
- Float valve too high
- Choke stuck closed
- Air cut-off valve sticking closed
- Dirty air cleaner

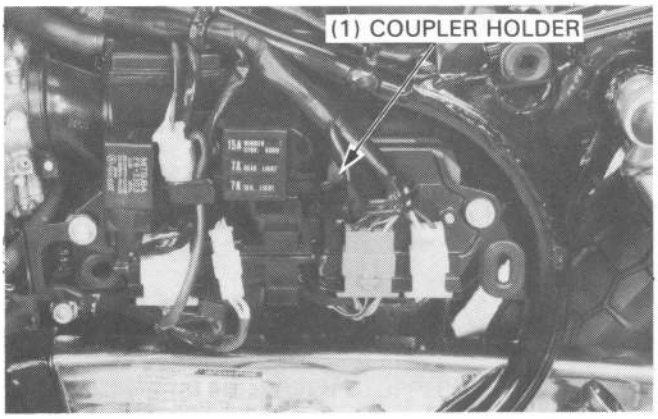
CARBURETOR REMOVAL

Remove the following
— seat and frame side covers.
— fuel tank (page 4-15).
— battery (page 16-3).

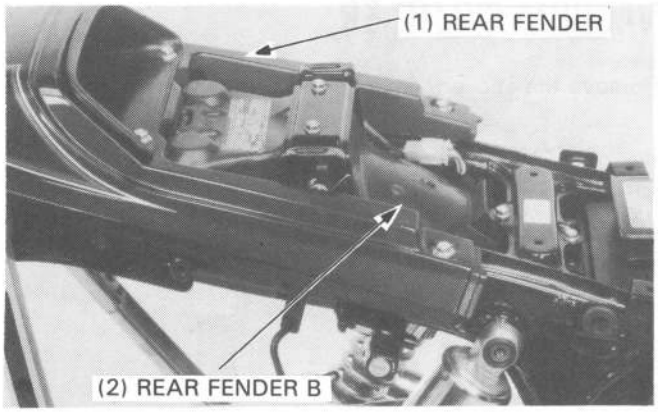
Disconnect the starter motor cable from the starter magnetic switch.
Remove the battery holder by removing the battery holder mounting bolts.



Disconnect the wire harness couplers, and remove the coupler holder with the regulator attachted.

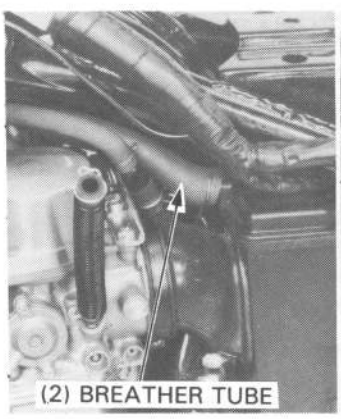


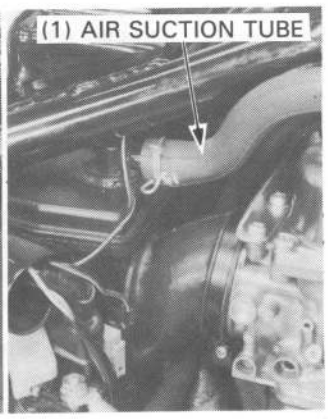
Remove the rear hand grips and rear fender as an assembly.
Remove the rear wheel (page 14-3).
Remove rear fender B.



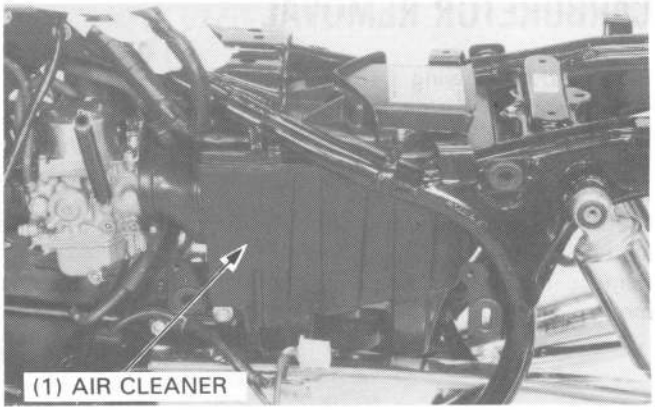
Loosen the air cleaner connecting tube bands.

On California model: Disconnect the breather tube and secondary air suction tube.



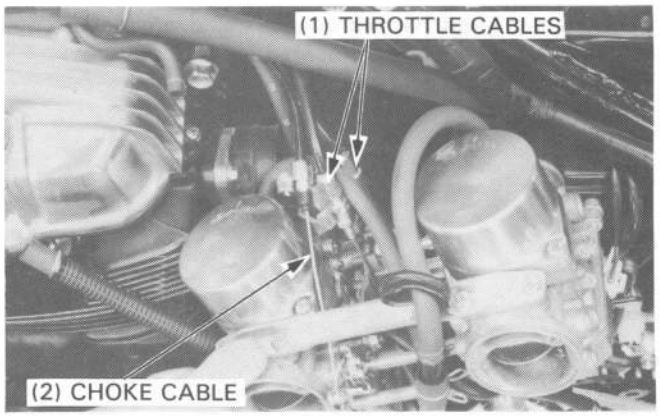


Remove the air cleaner case mounting bolts, and pull the case back.



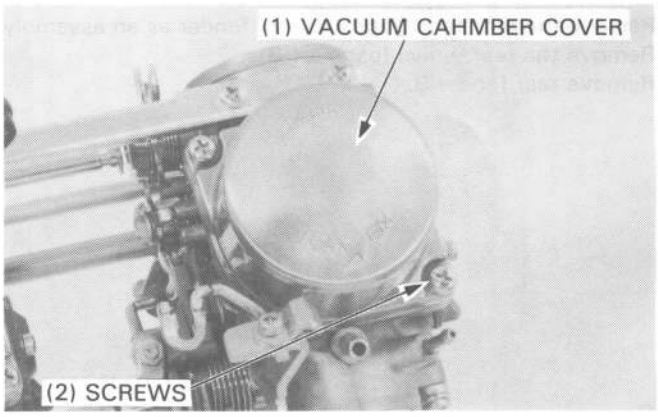
Loosen the carburetor bands and remove the carburetor to left side.

Unscrew the lock nuts and disconnect the throttle cables at the carburetors.
Remove the clamp holding the choke cable and disconnect the choke cable.



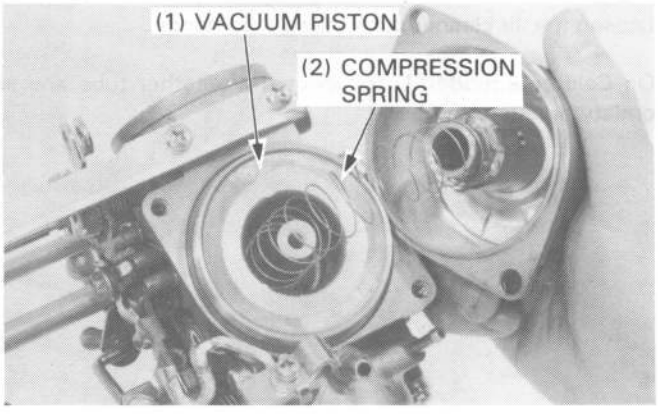
VACUUM CYLINDER

Remove the vacuum chamber cover mounting screws.

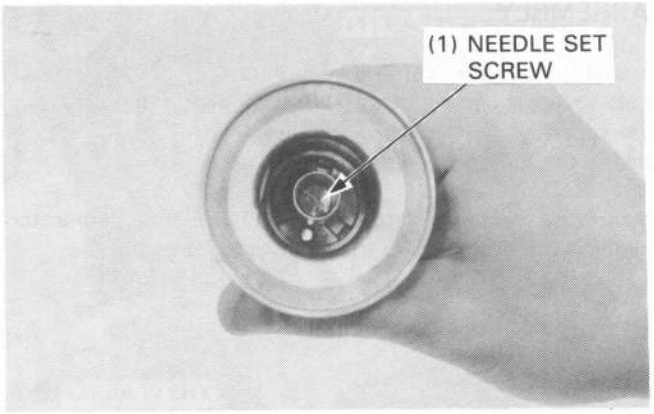


Remove the chamber cover and spring.
Remove the vacuum piston.

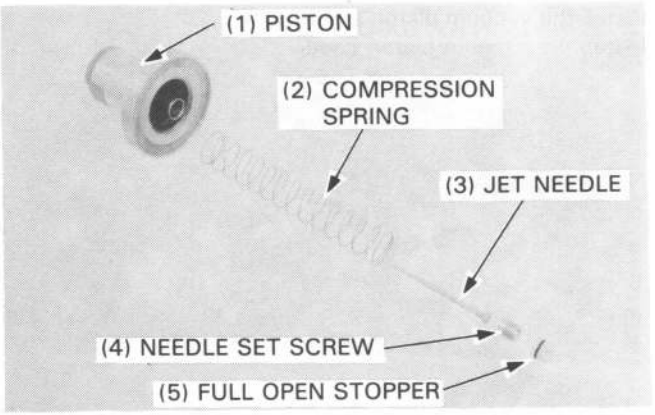
Inspect the vacuum piston for wear, nicks, scratches or other damage. Make sure the piston moves up and down freely in the chamber.



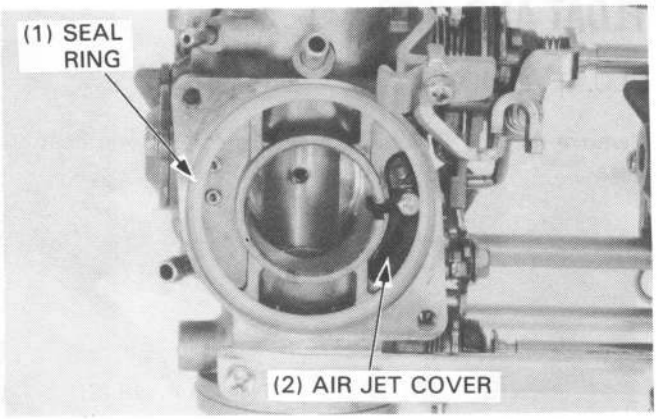
Remove the needle stopper and needle set screw.



Remove the jet needle from the vacuum piston.
Inspect the jet needle and seat for deposits, grooves or other damage.



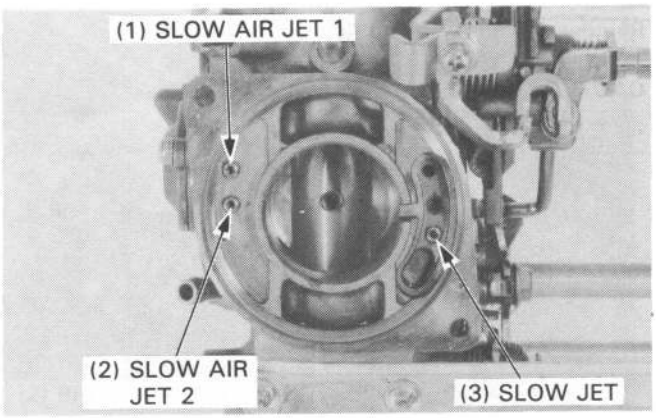
Carefully lift the seal ring off the carburetor body.
Remove the air jet cover.



Blow open the slow air jet 1, slow air jet 2 and slow air jet with compressed air.

NOTE

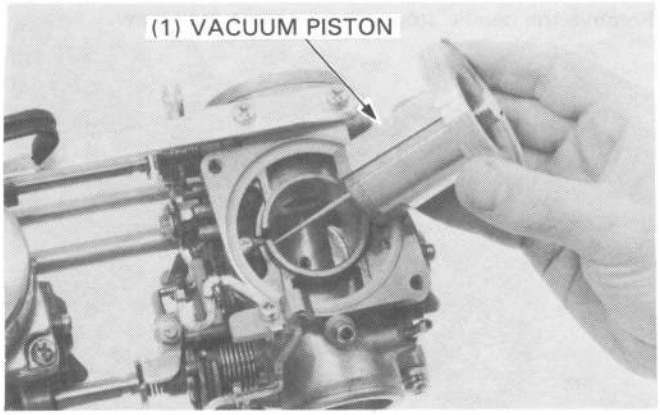
- Never clean carburetor jets with wire or drills. This will enlarge the openings and adversely affect the carburetor's performance.



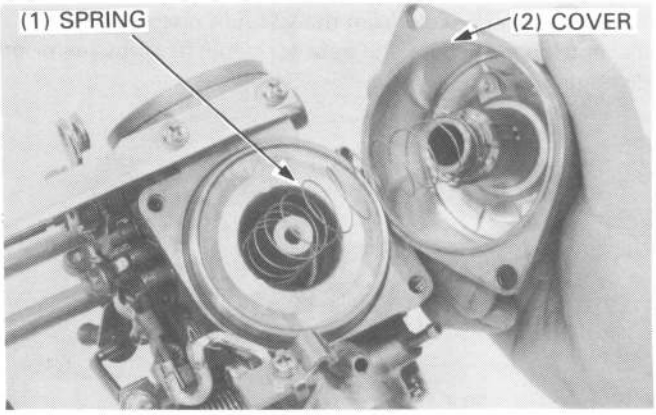
ASSEMBLY

Install the air jet cover and seal ring.
Install the jet needle into the vacuum piston and screw in the set screw.
Install the full open stopper.

Insert the vacuum piston assembly into the carburetor by aligning the groove with the tab of the jet cover.



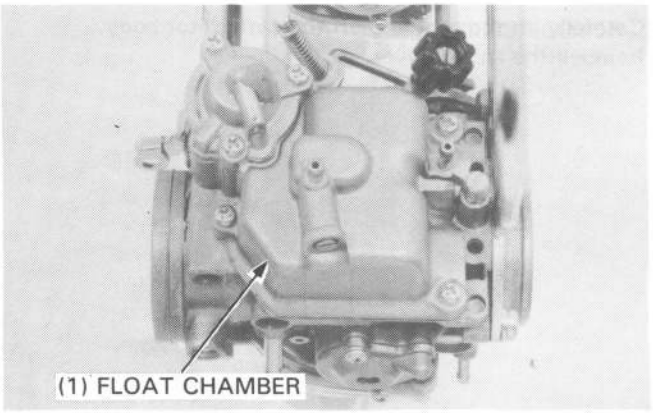
Install the vacuum piston spring.
Install the vacuum piston cover.



FLOAT AND JETS

FLOAT REMOVAL

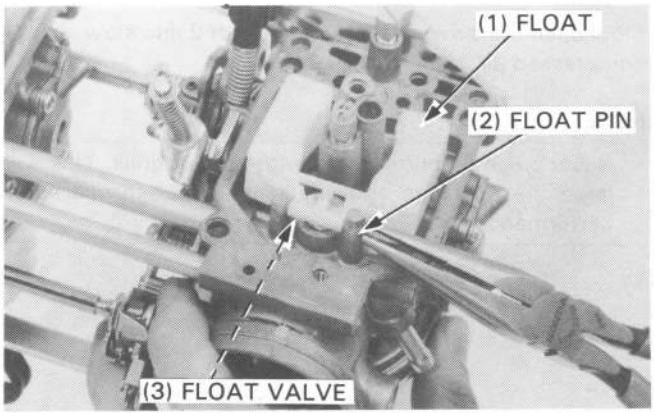
Remove the float chamber mounting screws and float chamber.



Remove the float pin and float.

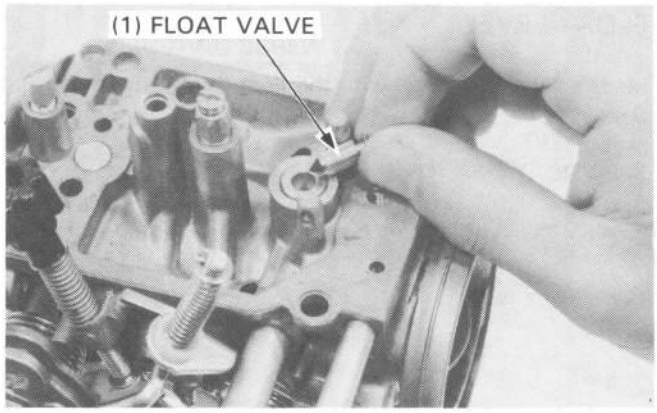
CAUTION

- *Take care not to damage the float pin.*



Remove the float valve.
Check the float for deformation or fuel inside the float.

Inspect the float valve for grooves and nicks.
Replace if necessary.



JETS REMOVAL

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

PILOT SCREW REMOVAL

NOTE

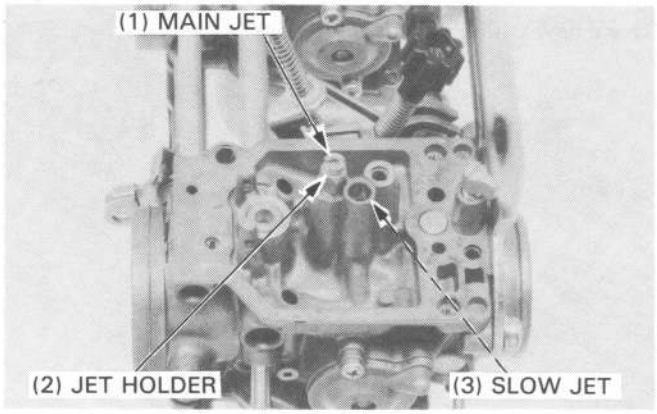
- The pilot screws are factory pre-set and should not be removed unless the carburetor is overhauled.

Turn the pilot screw in and carefully count the number of turns before it lightly seats.
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.
Inspect the pilot screw and replace if worn or damaged.
For pilot screw replacement, see page 4-13.

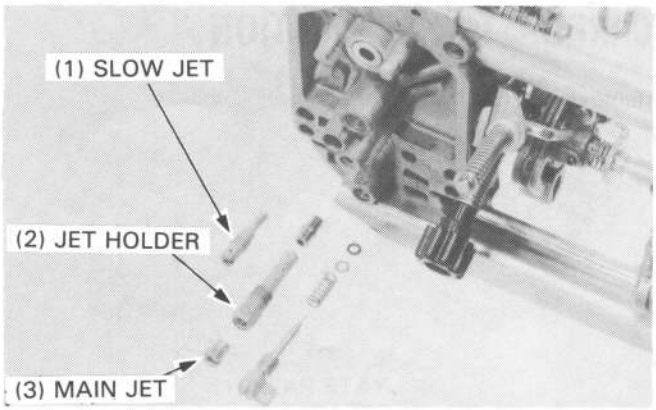


INSTALLATION

Blow all jets and body passages with compressed air.
Reassemble by reversing the disassembly steps.

NOTE

- Install the float valve with the float.

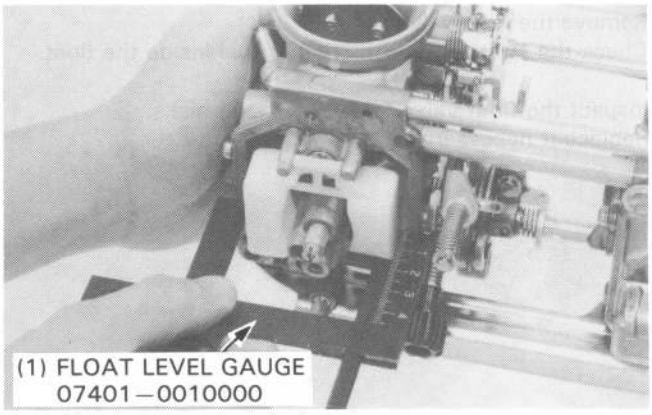


FLOAT LEVEL

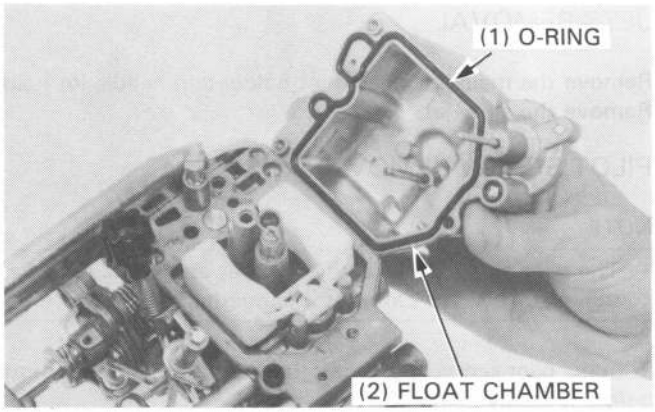
Measure the float level with the float tang just contacting the float valve.

SPECIFICATIONS: 15.5 mm (0.61 in)

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



Use a new O-ring and install the float chamber.



ACCELERATOR PUMP

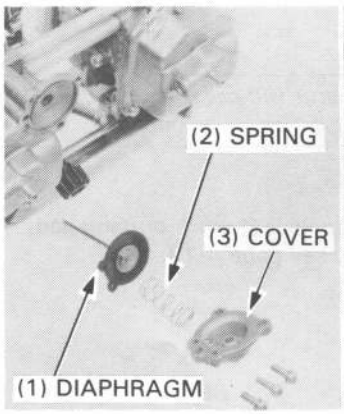
Remove the accelerator pump cover and spring.
Remove the diaphragm.

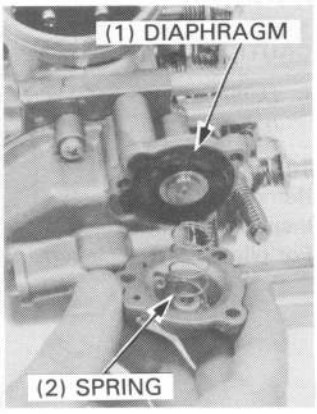
Inspect the diaphragm for cracks and brittleness.

NOTE

- Be sure the rod is not bent.

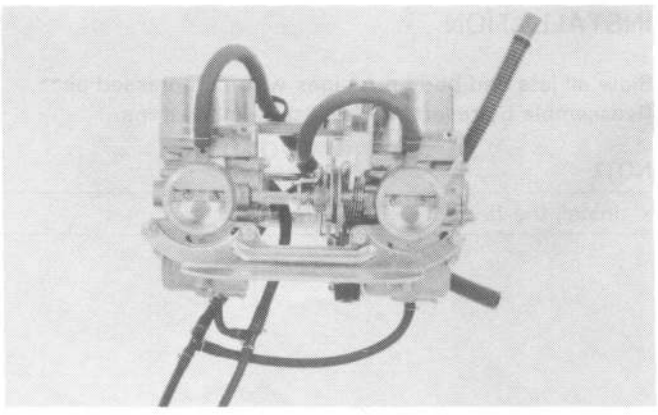
Assemble the accelerator pump.





CARBURETOR SEPARATION

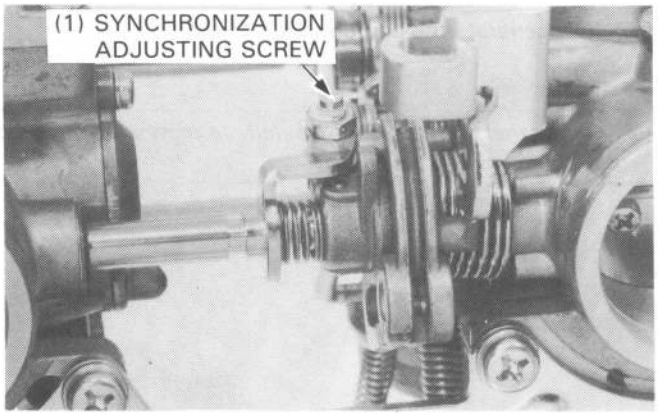
Remove the fuel, vacuum, and drain tubes.



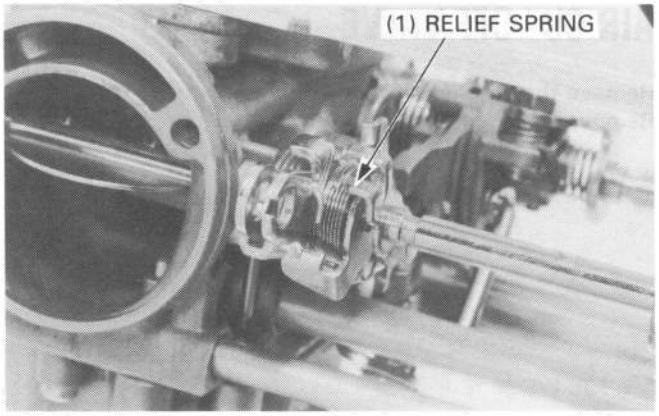
Loosen the synchronization adjusting screw lock nut and adjusting screw until there is no tention.

NOTE

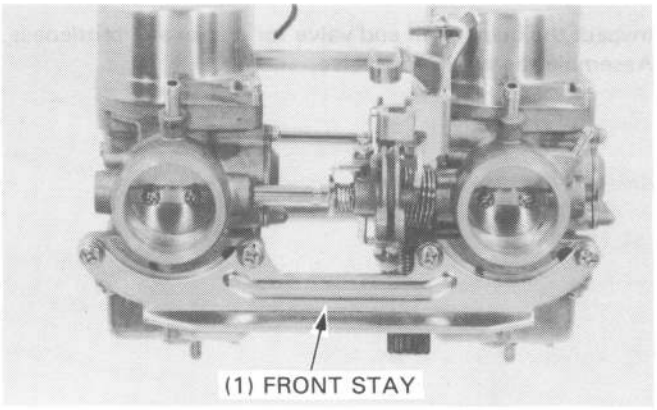
- Turn the synchronization screw in until it seats and note the number of turns for reference during assembly.



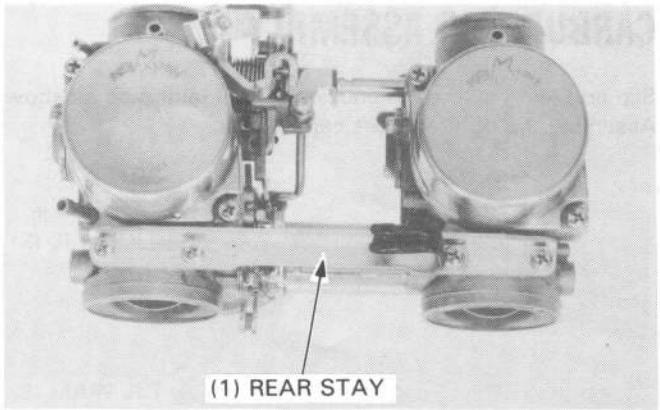
Disconnect the choke relief spring from the choke lever.



Remove the four screws attaching the front stay to the carburetors, and remove the front stay.



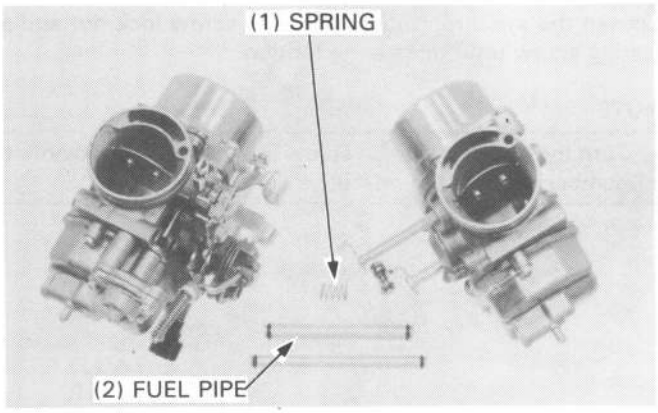
Unscrew the four screws attaching the rear stay to the carburetors, and remove the rear stay.



Carefully separate the carburetors.

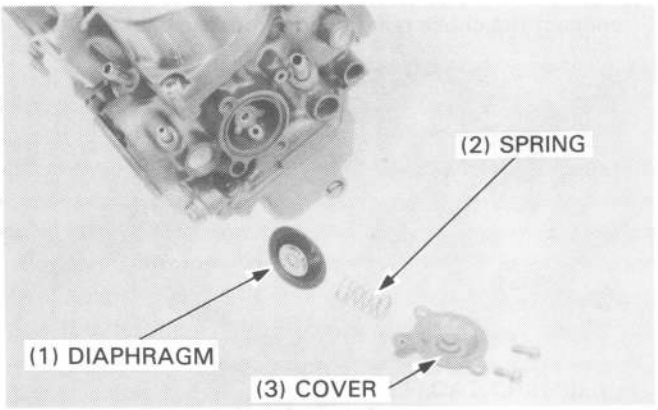
CAUTION

- *Separate the carburetors horizontally to prevent damage to the joint pipes and choke linkage.*

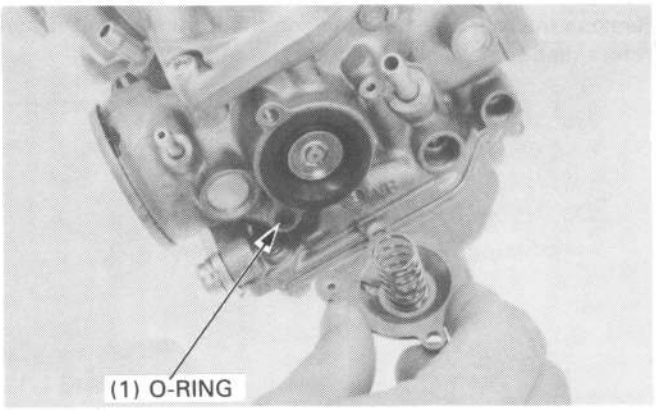


AIR CUT-OFF VALVE

Remove the air cut-off valve cover and spring.
Remove the diaphragm and O-ring.

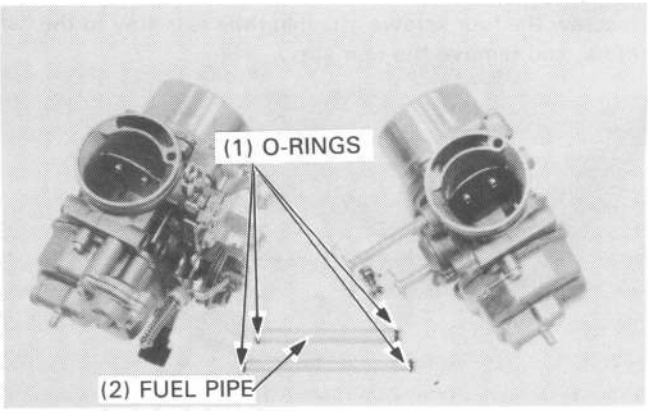


Inspect the diaphragm and valve for cracks and brittleness.
Assemble the air cut-off valve.

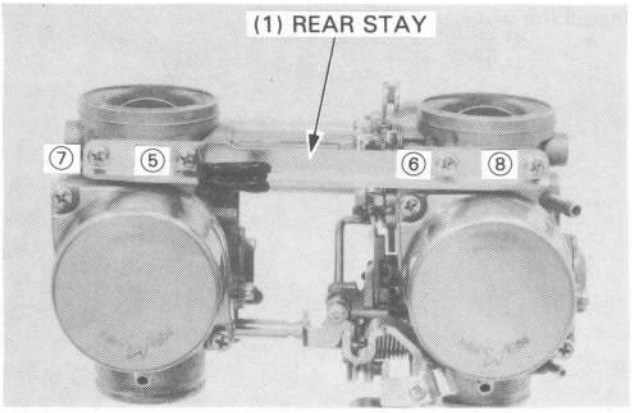


CARBURETOR ASSEMBLY

Slip an O-ring over each end of the fuel joint pipe as shown.
Assemble the right and left carburetors.

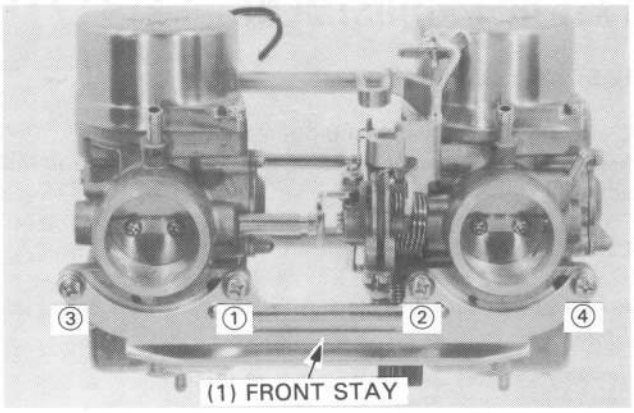


Attach the rear stay and tighten the screws loosely.

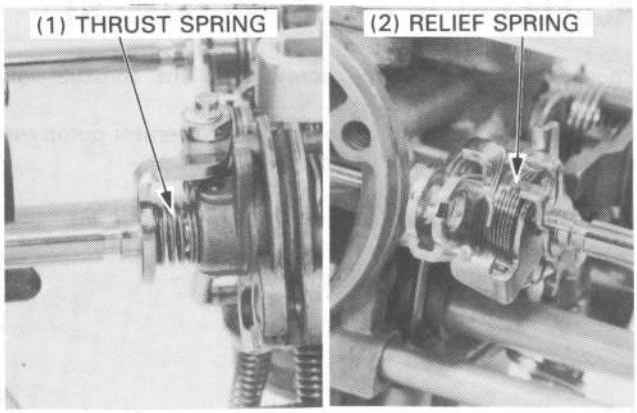


Attach the front stay and tighten the screw loosely.

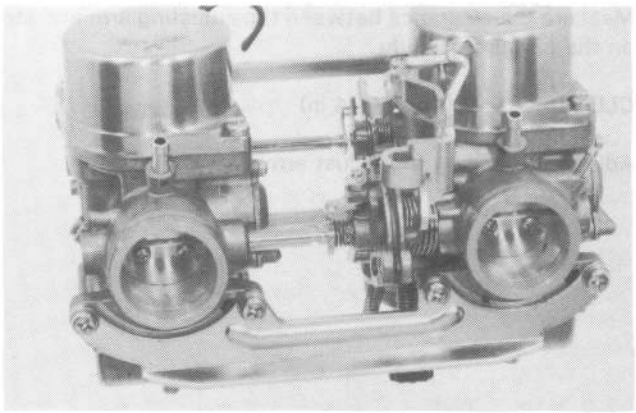
Tighten the screws in the sequence shown.



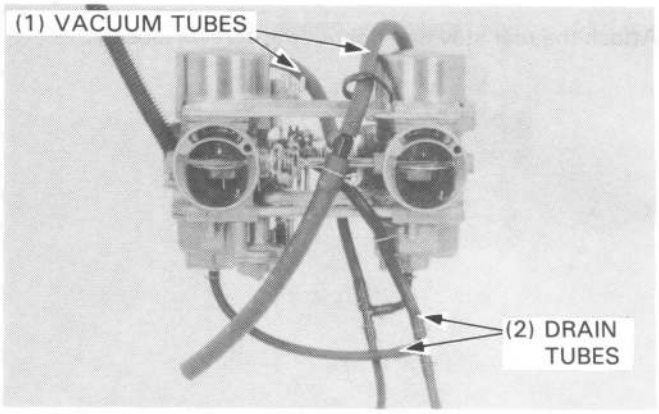
Install the thrust spring and hook the choke relief spring to the choke shaft arm.



Turn the throttle stop screw until the throttle valve edge aligns with the by-pass hole.
Turn the synchronization adjusting screw until the throttle valve aligns with the by-pass hole as shown.
Adjust the carburetor synchronization after the carburetors are installed (page 3-13).



Install the vacuum and drain tubes.



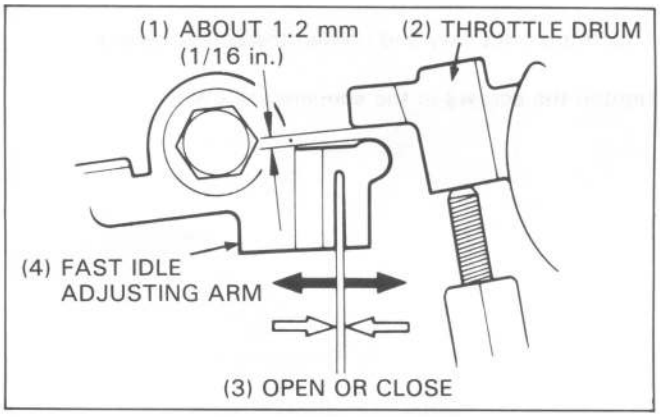
FAST IDEL ADJUSTMENT

FAST IDLE: 2,500 ± 500 rpm

Close the throttle valve and open the choke valve.
Measure the clearance between the throttle drum and fast idle adjusting arm.

CLEARANCE: 1.2 mm (1/16 in)

Adjust by opening and closing the fork end of the fast idle adjusting arm.

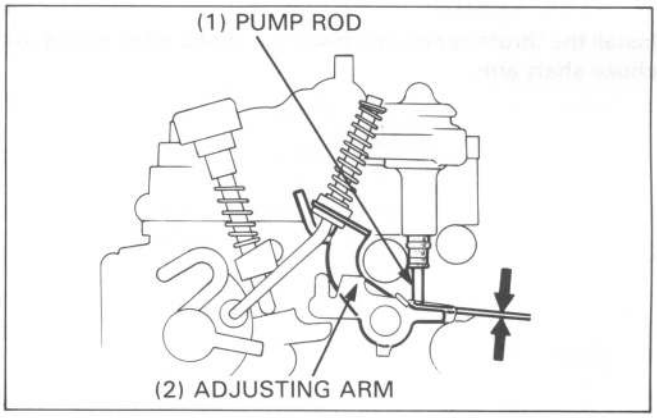


ACCELERATOR PUMP ADJUSTMENT

Loosen the throttle stop screw until the throttle valve is closed.
Measure the clearance between the accelerator pump rod and adjusting arm with the throttle valve closed.

CLEARANCE: 0.01—0.04 mm (0.0004—0.002 in)

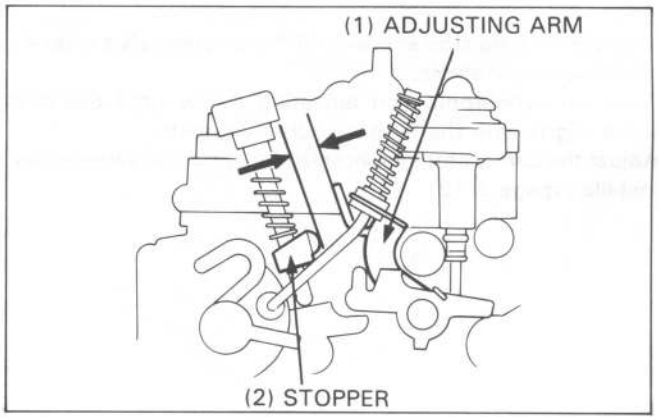
Adjust by bending the adjusting arm.



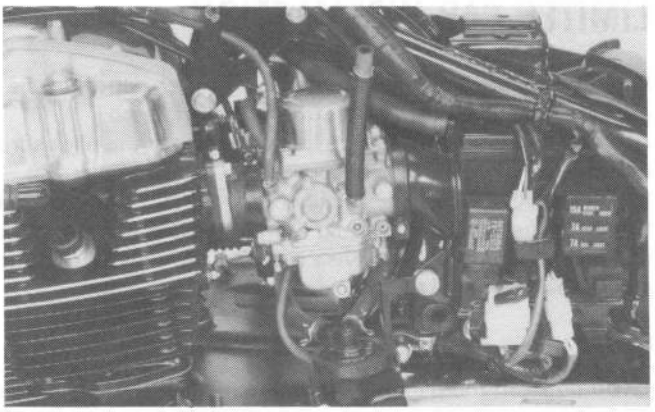
Measure the clearance between the adjusting arm and stopper on the carburetor body.

CLEARANCE: 7.0 mm (1/4 in)

Adjust by bending the adjust arm.



CARBURETOR INSTALLATION



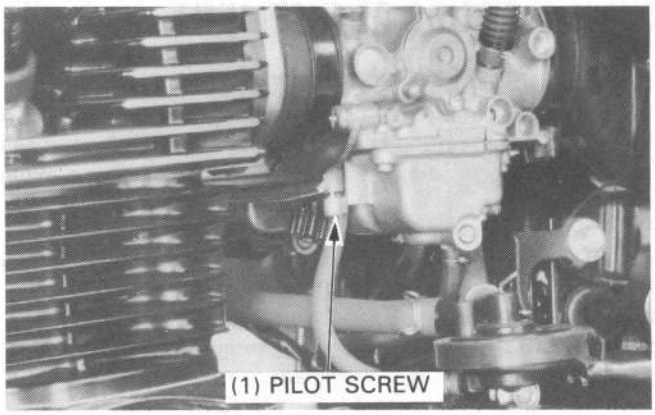
The installation sequence is essentially the reverse of removal.

NOTE

- Route the throttle and choke cables properly (pages 1-8 through 1-11).

Perform the following inspections and adjustments.
- Throttle operation (page 3-4)
- Carburetor choke (page 3-5)
- Carburetor idle speed (page 3-10)

PILOT SCREW ADJUSTMENT



IDLE DROP PROCEDURE

NOTE

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

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

   INITIAL OPENING: 2-1/4 turns out

CAUTION

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

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

   IDEL SPEED: 1,200 ± 100 rpm

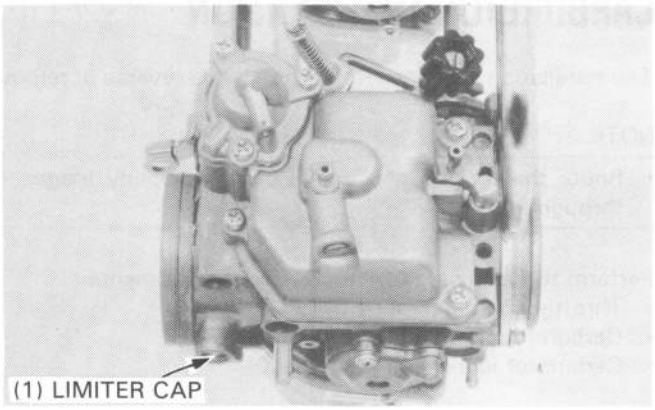
5. Turn each pilot screw in or out to obtain the highest engine speed.
6. Readjust the idle speed.
7. Turn one of the pilot screws in gradually until the engine speed is lowered by 100 rpm.
8. Turn the pilot screw 3/8 turn out from the above position.
9. Readjust the idle speed with the throttle stop screw.
10. Repeat steps 7 through 9 for the other carburetor.

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 cap over the pilot screw, using LOCTITE® 601 or equivalent.
The limiter cap should be placed against its stop, preventing further adjustment that would enrich the fuel mixture (limiter cap position permits clockwise rotation and prevents counterclockwise rotation).

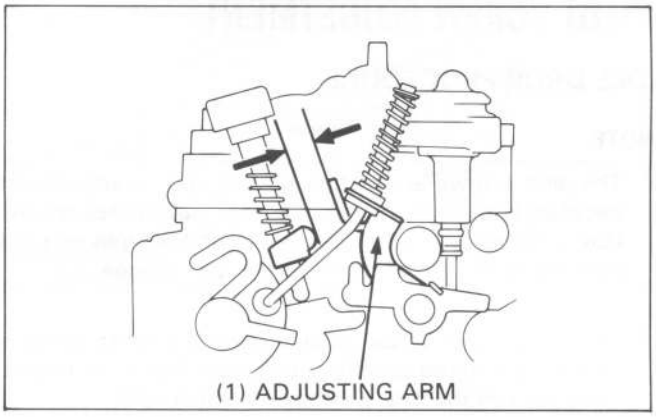
NOTE

- 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.
Remove the carburetors.
Adjust the clearance between the accelerator pump adjusting arm and stopper to 4 mm (1/8 in).
Install the carburetors.
Warm up the engine to operating temperature. Stop and go driving for 10 minutes is sufficient.
Turn each pilot screw clockwise 1/2 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.

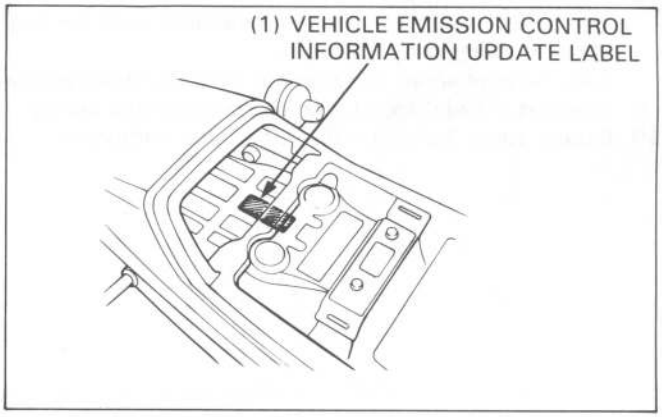
NOTE

- Instructions for obtaining Vehicle Emission Control Update label are given in Service News 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 altitude may cause the engine to idle roughly and stall.*

When the vehicle is to be operated continuously below 5,000 feet (1,500 meters);
Adjust the clearance between the accelerator pump adjusting arm and stopper.
CLEARANCE: 7 mm (1/4 in)
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.



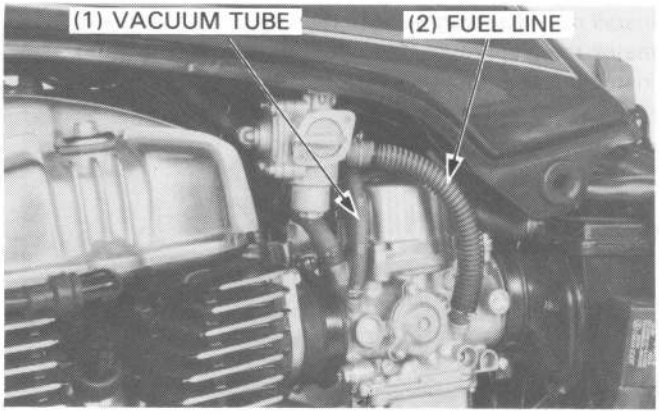
FUEL TANK

WARNING

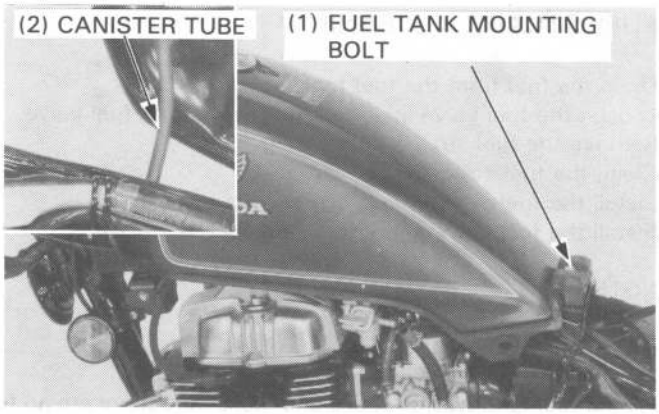
- ***Do not allow flames or sparks near gasoline. Wipe up spilled gasoline at once.***

FUEL TANK REMOVAL

Remove the seat.
Turn the fuel valve OFF.
Disconnect the fuel line at the fuel valve and vacuum line at the intake pipe.

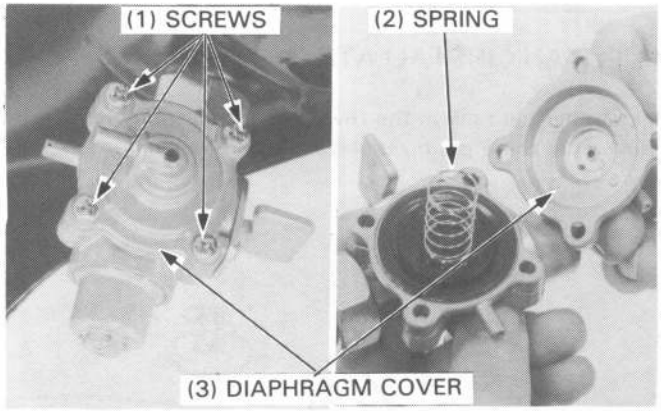


Remove the fuel tank mount bolt.
Disconnect the canister tube and remove the fuel tank.

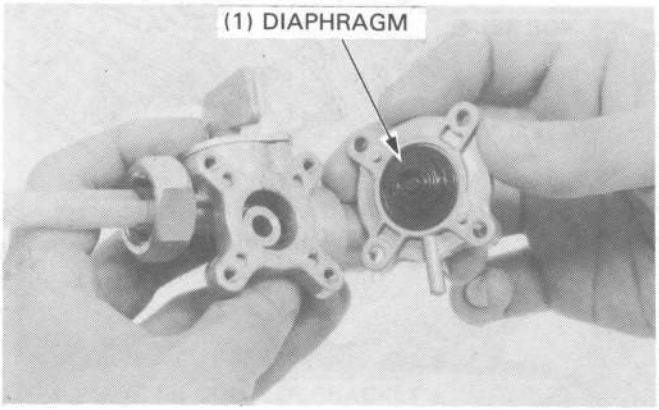


FUEL VALVE DIAPHRAGM REPLACEMENT

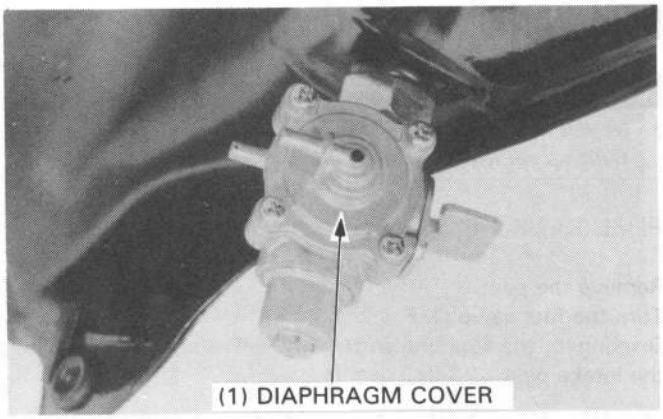
Drain the fuel from the fuel tank.
Remove the four diaphragm cover screws, cover and spring.



Remove the diaphragm base and remove the diaphragm.



Install new diaphragms onto the base.
Install the diaphragm base with its boss facing down.
Install the diaphragm cover.

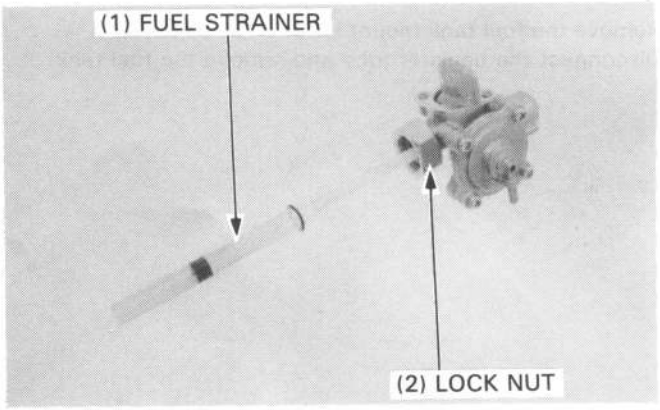


FUEL STRAINER CLEANING

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 O-ring onto the fuel valve.
Install the fuel valve and tighten the lock nut.

NOTE

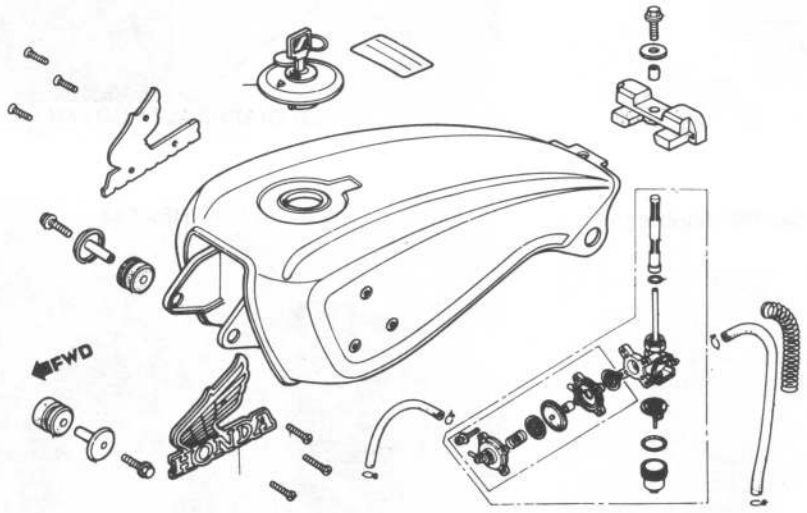
- Do not over-tighten the lock nut.



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

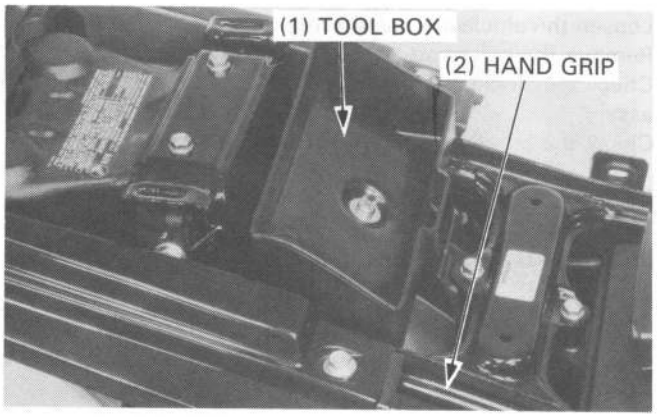
FUEL TANK INSTALLATION

Install the fuel tank in the reverse order of removal.
Make sure there are no fuel leaks after installation.

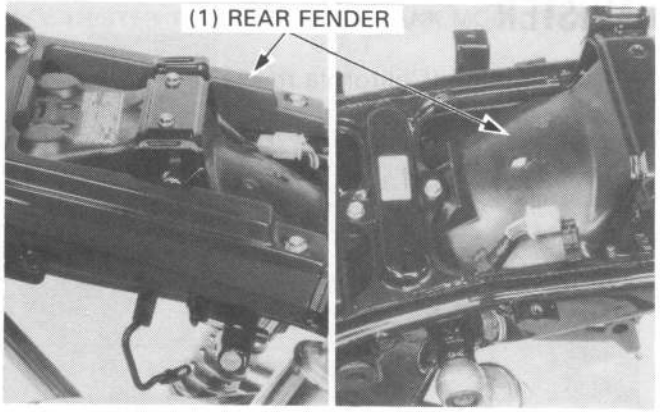


AIR CLEANER CASE

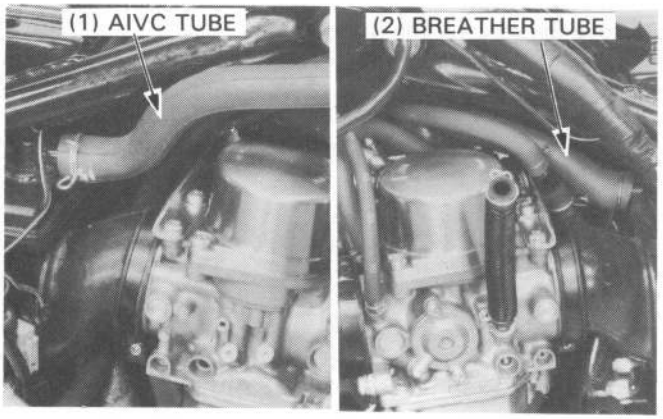
Remove the seat and both frame side covers.
Remove the tool box.
Remove the rear shock upper mount bolt and hand grip.
Remove the following parts:
– rear wheel.
– battery.



Remove the rear fender.

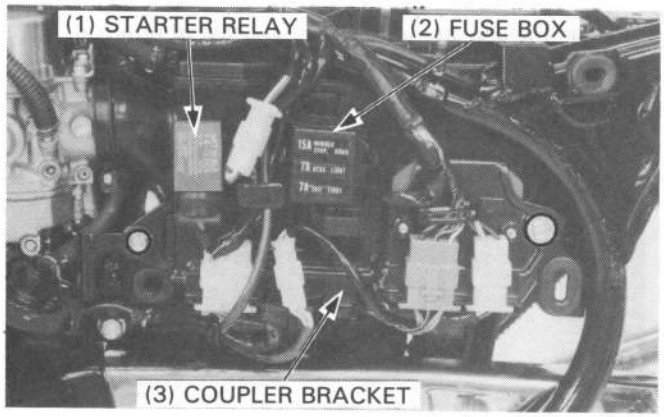


On California model: Disconnect the breather tube and AICV (Air Injection Control Valve) tube.



Remove the starter relays and fuse box from the coupler bracket.
Disconnect the wire harness coupler.

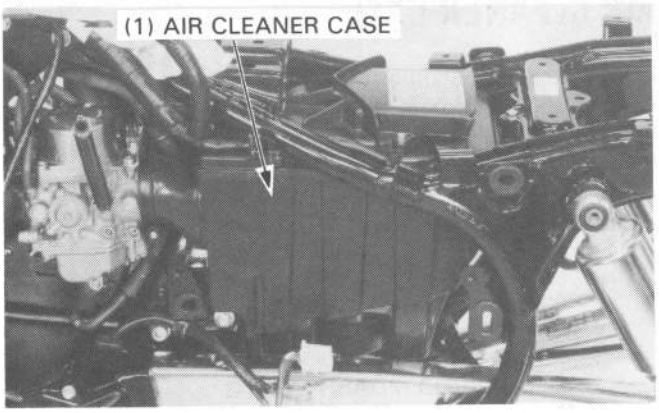
Remove the coupler bracket from the air cleaner.



Loosen the air cleaner band screw.
Remove the bolts and air cleaner case.
Check the air cleaner case for deterioration and replace if necessary.
Check the breather tube for restriction.

INSTALLATION

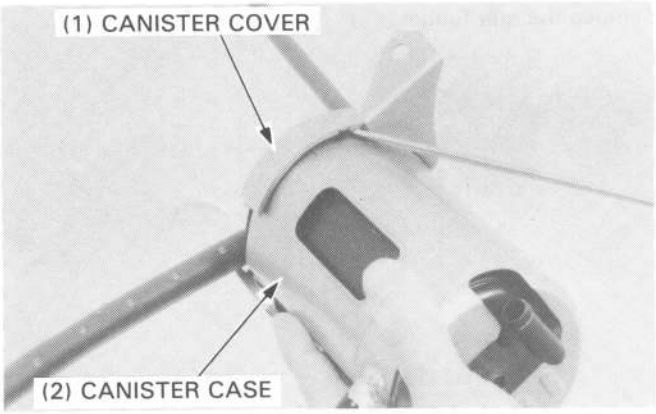
Install the air cleaner case in the reverse order of removal.



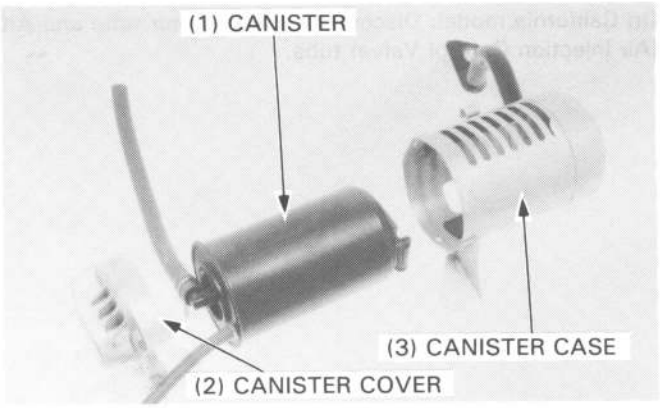
CANISTER

REPLACEMENT (California model)

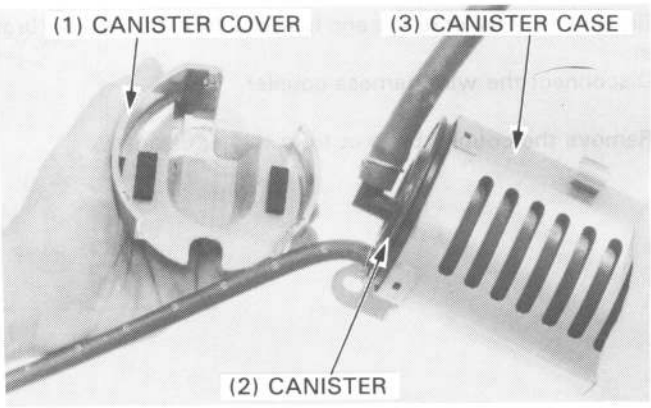
Remove the canister (section 5).
Push in the lugs, that are locked in the cover slots and remove the canister cover.



Remove the canister the from canister case.



Assemble the canister in the reverse order of removal.

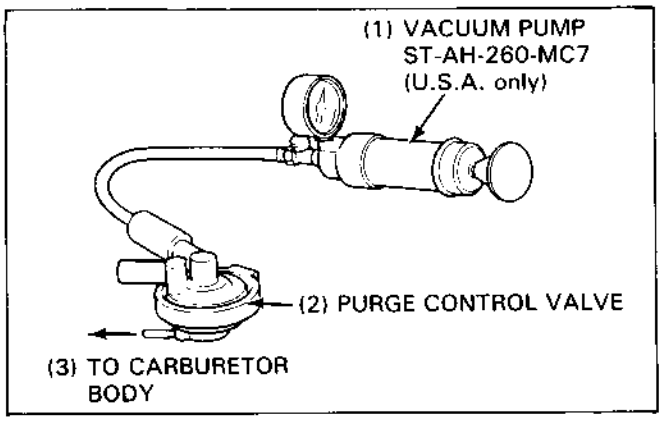


PURGE CONTROL VALVE INSPECTION (California model)

NOTE

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

Check all fuel tank, Purge Control Valve (PCV), and charcoal canister hoses to be sure they are not kinked and are securely connected.
Replace any hose that shows signs of damage or deterioration.



NOTE

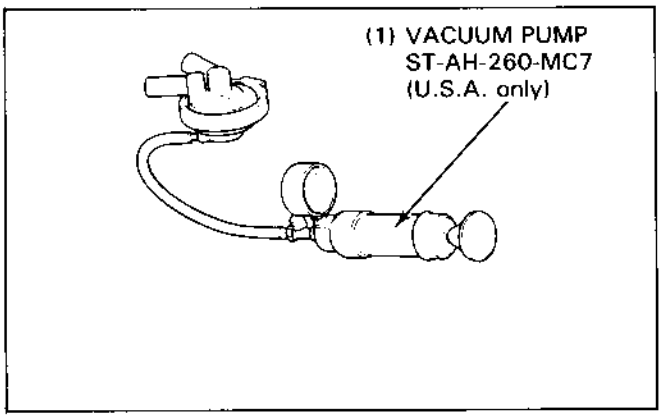
- The PCV is located under the carburetor.

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

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

SPECIFIED VACUUM: 250 mm (9.8 in) Hg

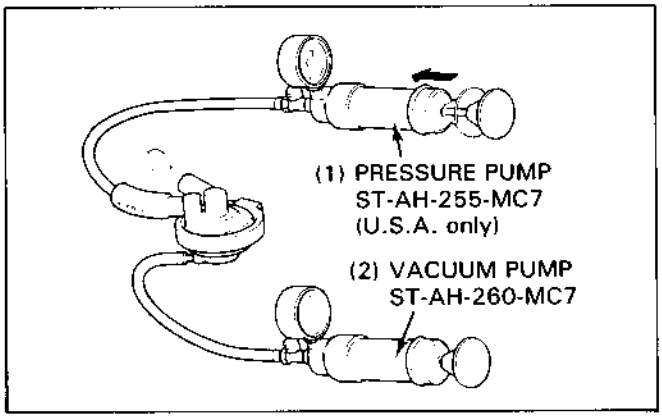
The specified vacuum should be maintained.
Replace the PCV if vacuum is not maintained.



Remove the vacuum pump and connect it to the hose that goes to the No. 3 carburetor. 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 No. 3 carburetor, pump air through the canister hose. Air should flow through the PCV and out of the hose that goes to the carburetor body. Replace the PCV if air does not flow out.

CAUTION

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

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

SECONDARY AIR SUPPLY SYSTEM (California model)

SYSTEM INSPECTION

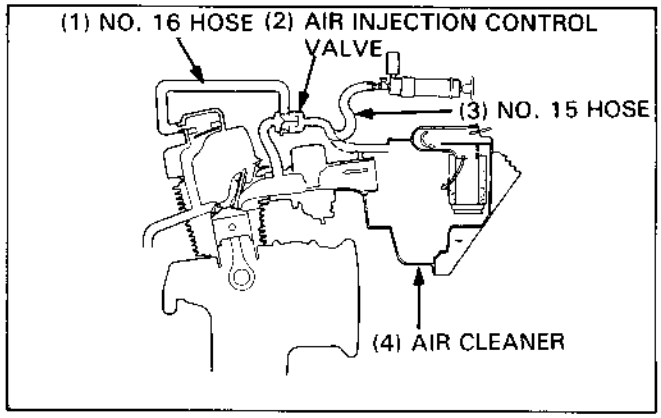
CAUTION

- *To prevent damage to the components, do not use high air pressure sources. Use a hand operated air pressure only.*

Inspect with the engine stopped.
Disconnect the air cleaner-to-AICV (Air Injection Control Valve) No. 15 hose from the air cleaner case.
Connect the No. 15 hose to the pressure pump and apply pressure.

Pressure shoud not be held.
If it is held or if the air flow is not smooth, inspect the No. 10, NO. 15, and No. 16 hoses for clogging and inspect AICV.

Connect the No. 15 hose to the vacuum pump and apply vacuum.
If it is not held, inspect No. 15 and No. 16 hoses for damage or disconnection, and inspect the reed valve (page 6-17).



AICV (Air Injection Control Valve) INSPECTION

CAUTION

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

Remove the AICV.
Connect the pressure pump to the No. 15 fitting and make sure that there is air flow between AICV No. 15 fitting and No. 16 fitting.

If there is no air flow, inspect the orifice in No. 10 fitting for clogging.
If it is not clogged, replace the AICV.

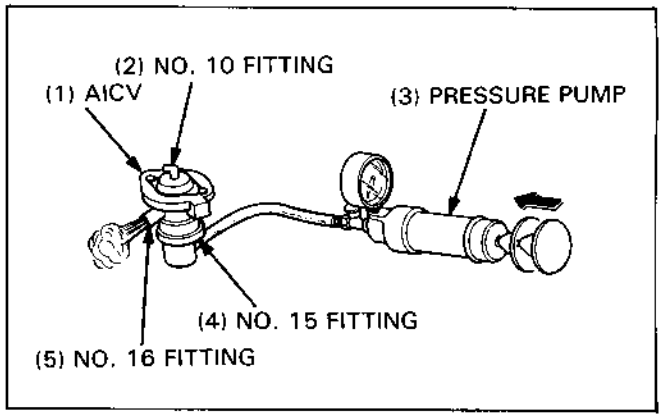
Connect the vacuum pump to the AICV No. 10 fitting and apply the specified vacuum to the AICV.

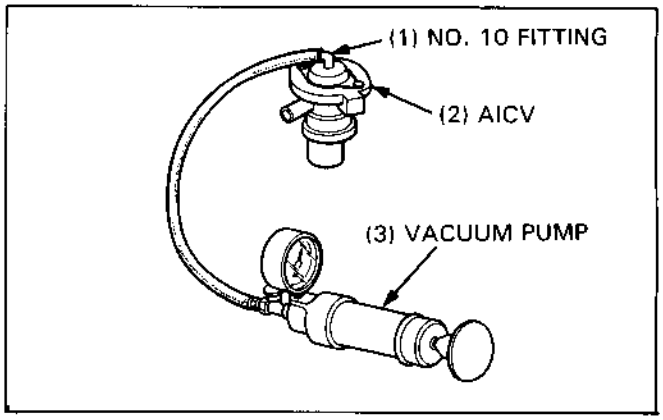
SPECIFIED VACUUM: 250 mm (9.8 in) Hg

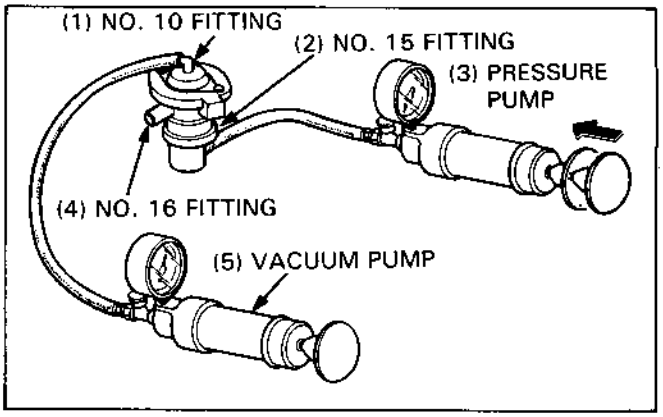
If the vacuum is not held, replace the AICV.

Connect the pressure pump to the AICV No. 15 fitting.
Connect the vacuum pump to the No. 10 fitting and apply pressure gradually.

When the pressure to the No. 15 fitting reaches to 300–360 mm (11.8–14.2 in) Hg, the valve should close and there should be no air flow between No. 15 fitting and the No. 16 fitting.



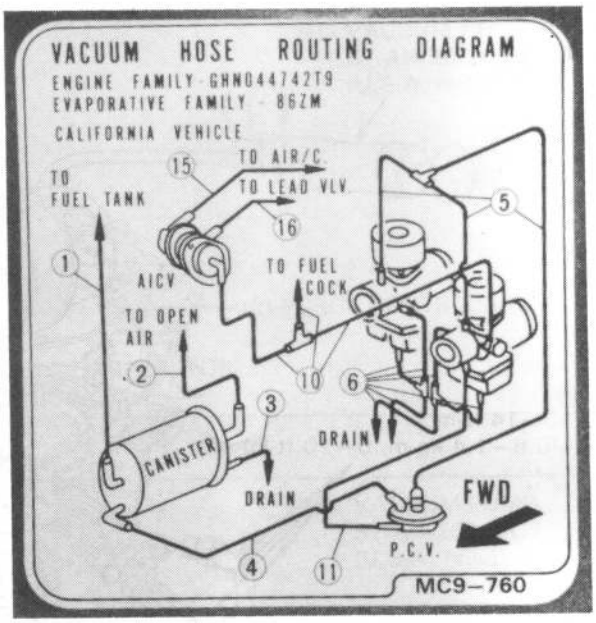


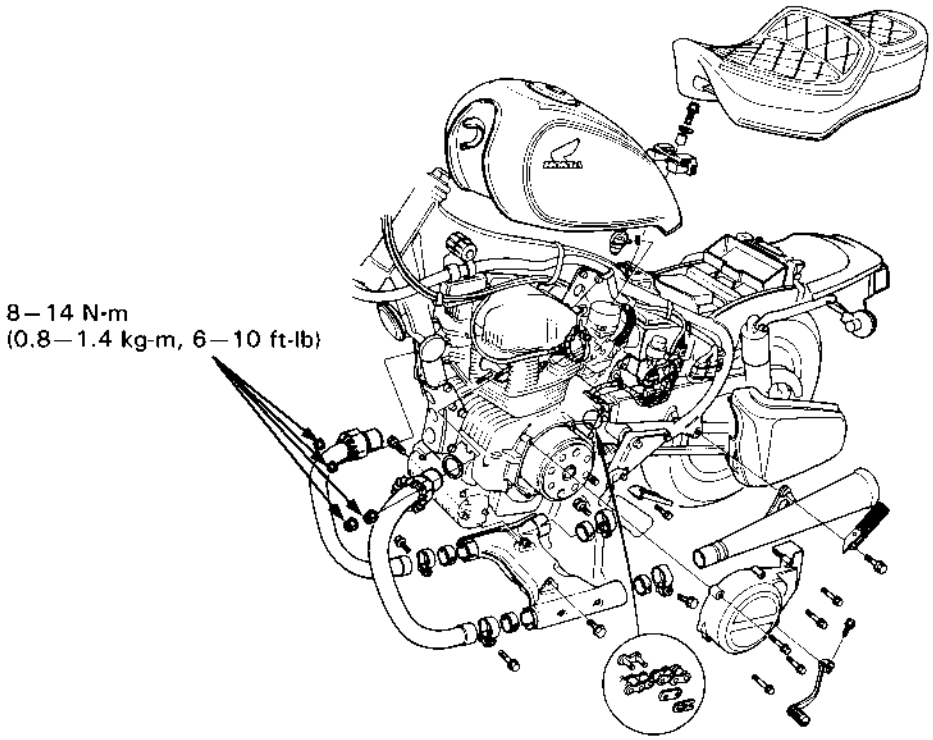


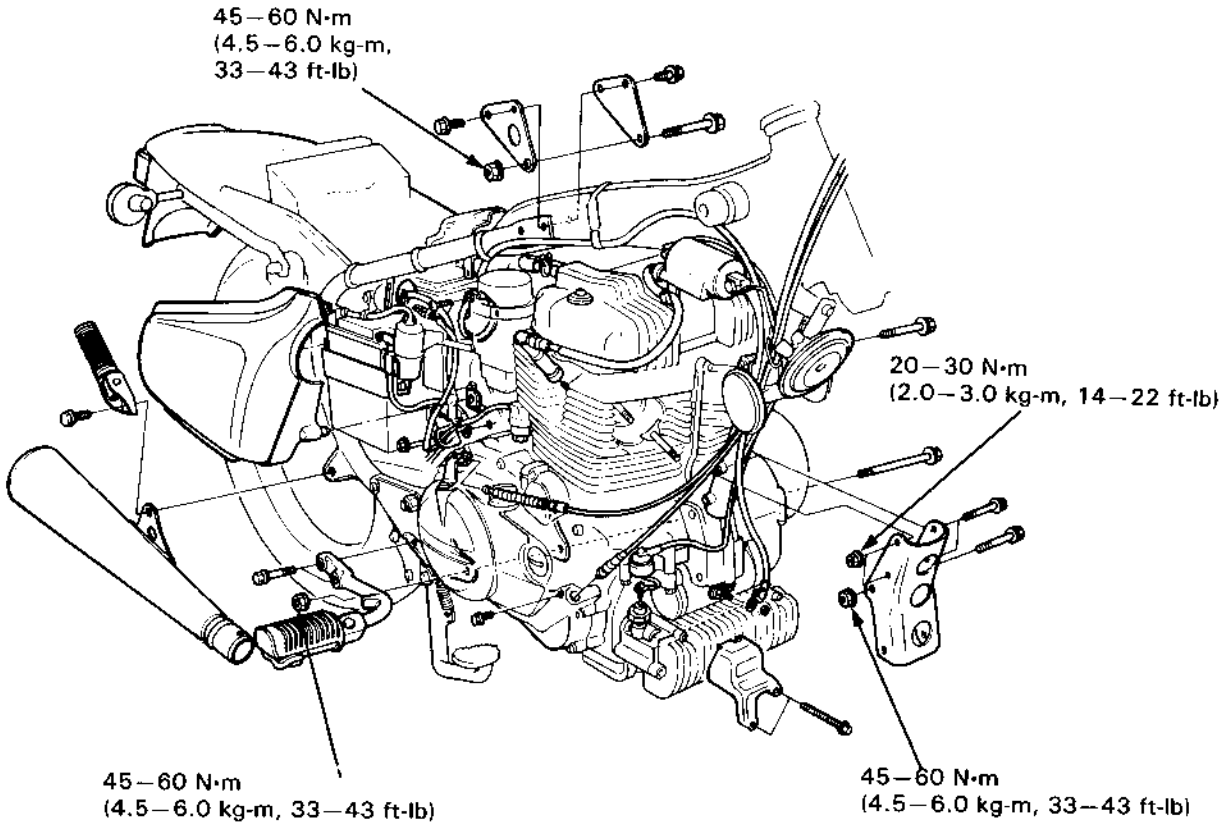
Route the vacuum tubes as described on the Vacuum Hose Routing Diagram Label.

NOTE

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




8–14 N·m
(0.8–1.4 kg-m, 6–10 ft-lb)


45–60 N·m
(4.5–6.0 kg-m,
33–43 ft-lb)
20–30 N·m
(2.0–3.0 kg-m, 14–22 ft-lb)
45–60 N·m
(4.5–6.0 kg-m, 33–43 ft-lb)
45–60 N·m
(4.5–6.0 kg-m, 33–43 ft-lb)

5. ENGINE REMOVAL/INSTALLATION

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	59.0 kg (130 lb)
OIL capacity	3.0ℓ (3.2 US qt, 2.6 Imp at) after assembly
	2.5ℓ (2.6 US qt, 2.2 Imp qt) after draining

TORQUE VALUES

Engine hanger bolts:	
8 mm bolt	18—25 N·m (1.8—2.5 kg-m, 13—18 ft-lb)
8 mm flange bolt	20—30 N·m (2.0—3.0 kg-m, 14—22 ft-lb)
10 mm flange bolt	45—60 N·m (4.5—6.0 kg-m, 33—43 ft-lb)
Exhaust pipe flange nut	8—14 N·m (0.8—1.4 kg-m, 6—10 ft-lb)

ENGINE REMOVAL

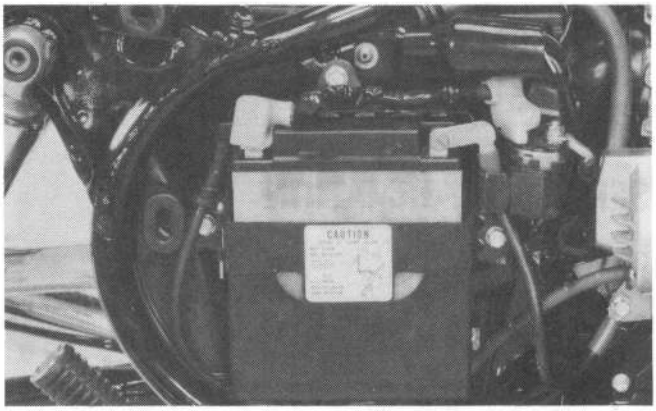
Remove the seat and turn off the fuel valve.

Remove the full tank (page 4-15).

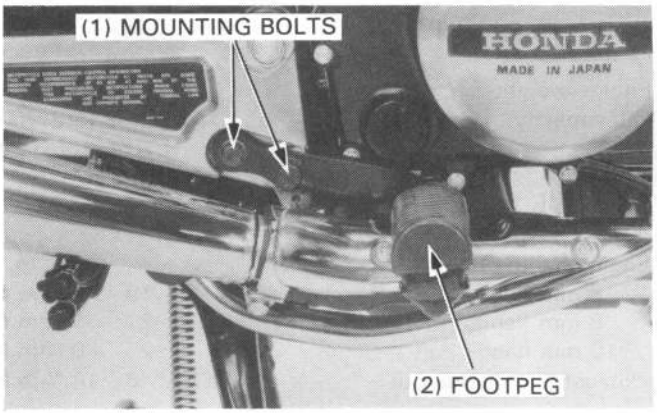
Remove the frame side covers.

Disconnect the battery negative terminal from the battery.

Drain the oil from the engine (page 2-3).

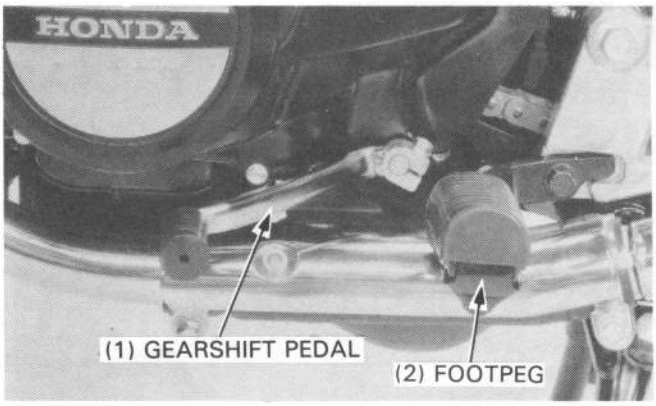


Remove the right footpeg.



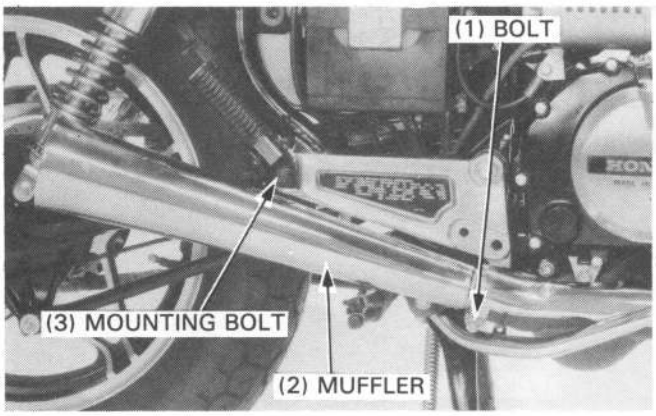
Remove the gearshift pedal and left footpeg.

Remove the left crankcase cover.

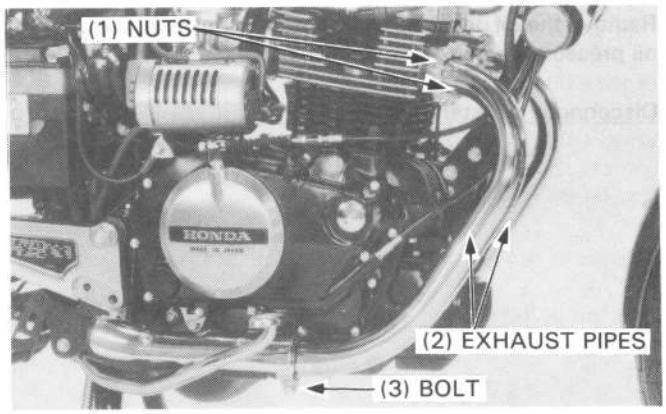


Loosen the muffler clamp bolts.

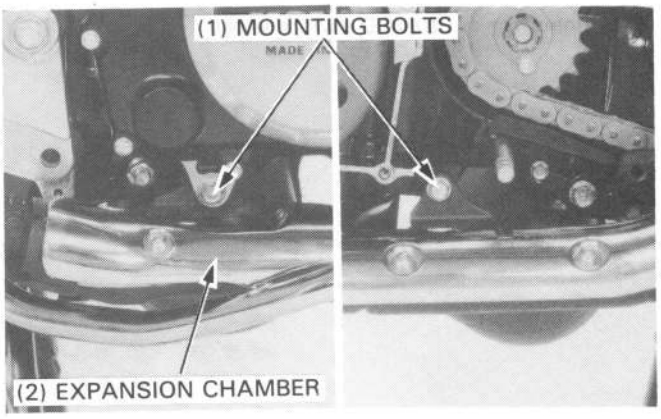
Remove the muffler mounting bolts and right mufflers.



Loosen the exhaust pipe clamp bolts.
Remove the exhaust pipe flange nuts and exhaust pipes.

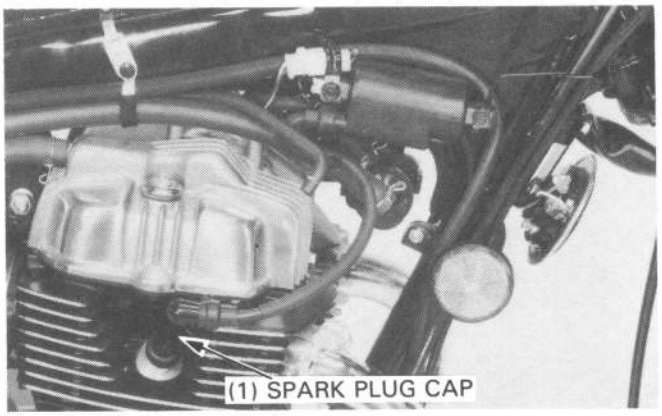


Remove the expansion chamber by removing the two mounting bolts.

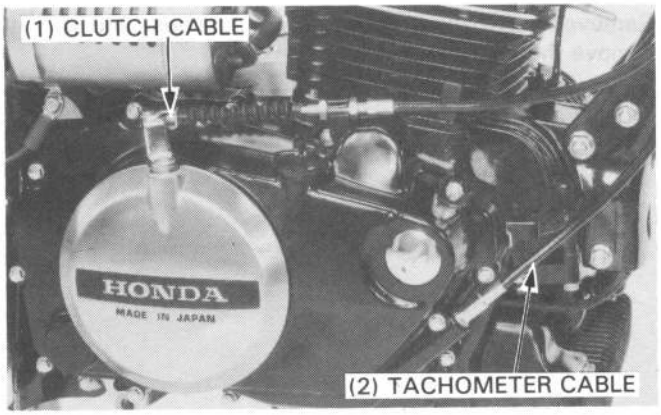


Remove the spark plug caps.

California model: disconnect the AICV (Air Injection Control Valve) hose No 15 from the rear valve.

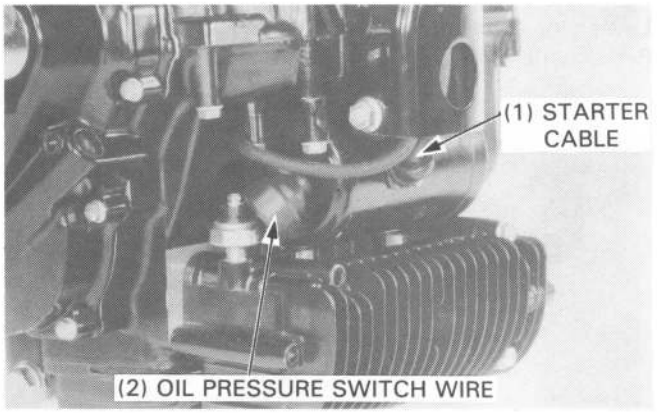


Disconnect the clutch cable and tachometer cable.

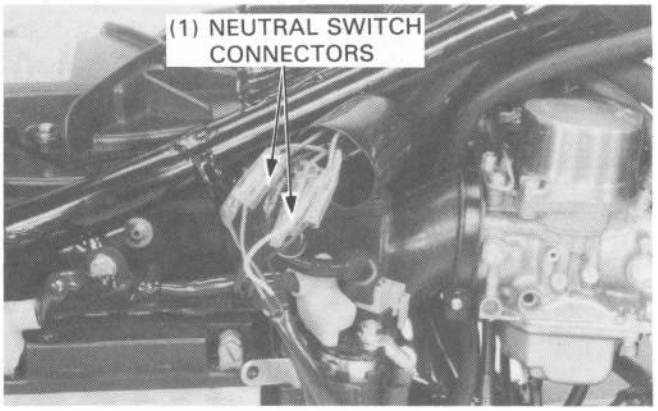


Remove the oil pressure switch protector, then disconnect the oil pressure switch wire.

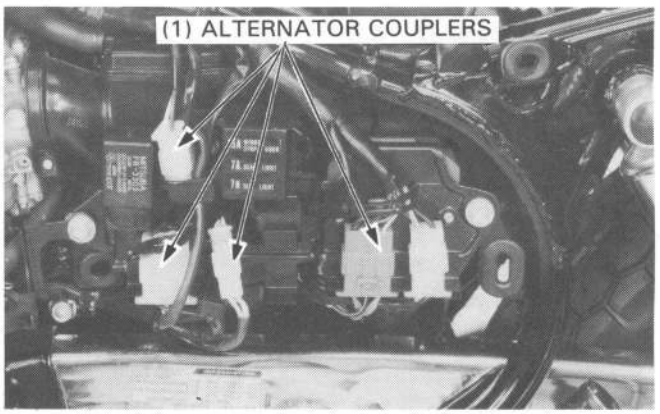
Disconnect the starter motor cable.



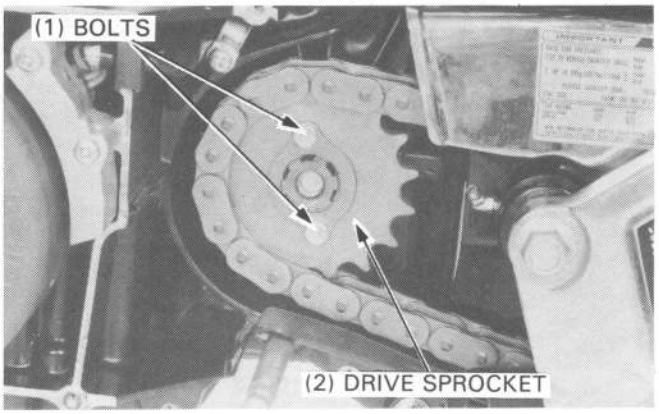
Disconnect the neutral/OD switch wires.



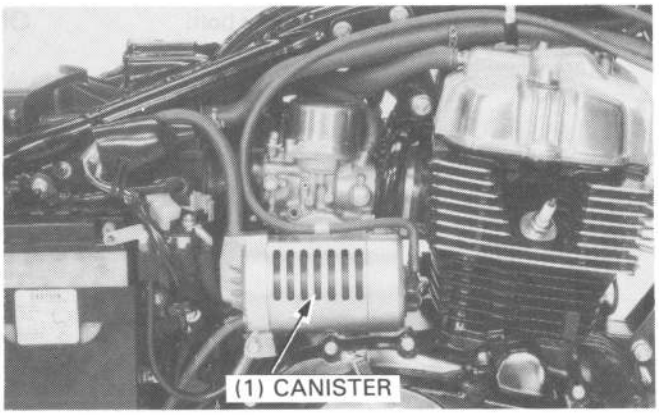
Disconnect the alternator/pulse generator wires.



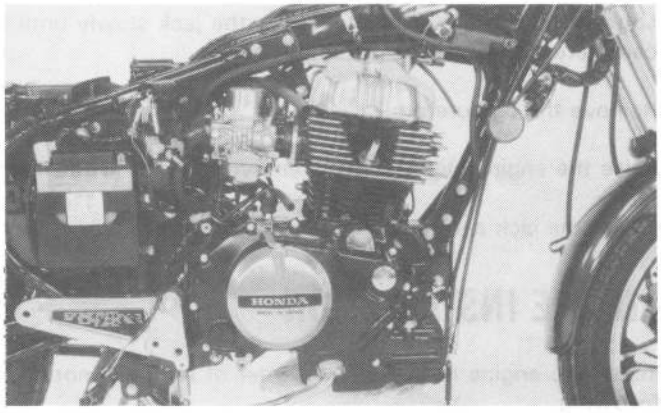
Remove the two drive sproket fixing plate bolts and plate, then remove the drive sprocket.



California model: remove the canister and PCV (Parge Control Valve).
Disconnect the breather tube at the cylinder head.

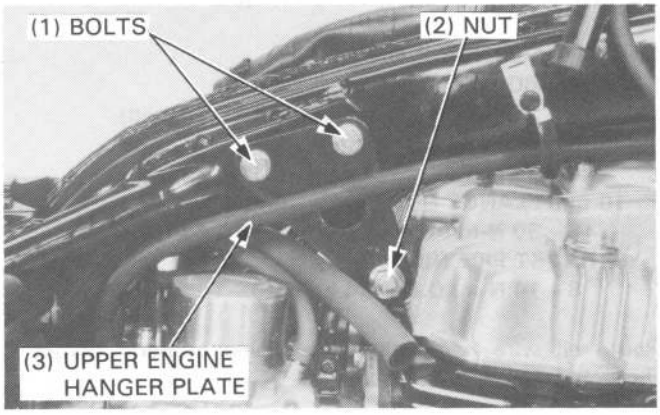


Place a jack under the engine.

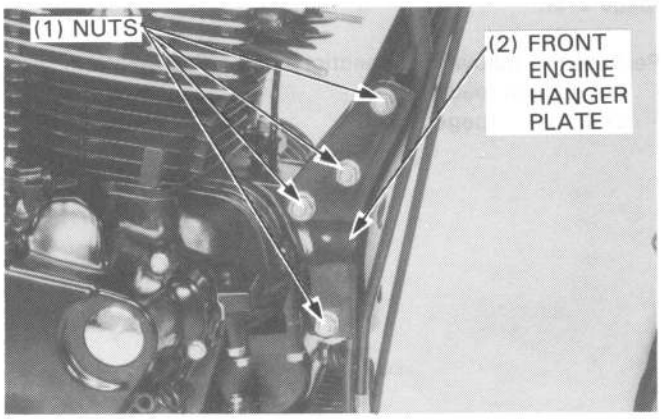


Loosen all engine mounting bolts.

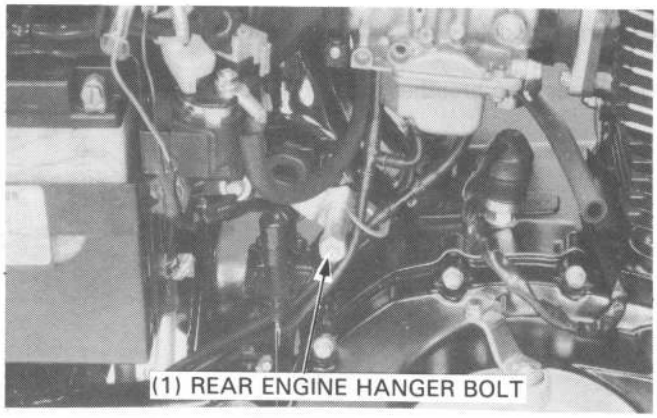
Remove the upper engine hanger bolts.



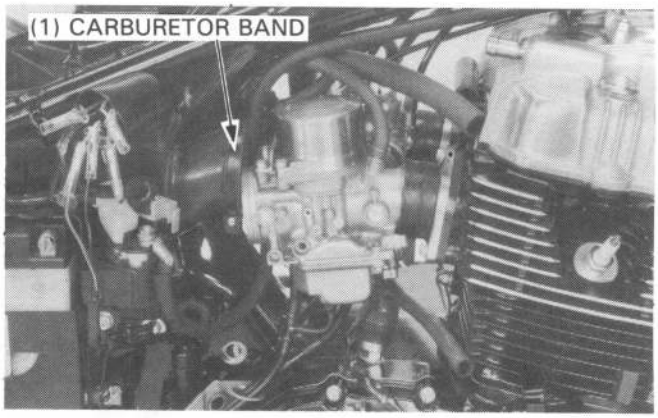
Remove the front engine hanger bolts.



Remove the rear upper engine hanger bolt.



Loosen the carburetor bands, lower the jack slowly until the carburetors clear the connecting tubes.



Remove the carburetors.

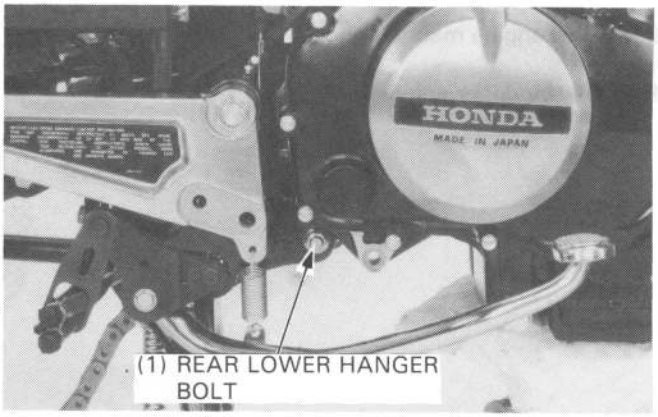
Raise the engine slightly, then remove the rear lower hanger bolts.
Lower the jack and remove the engine from the frame.

ENGINE INSTALLATION

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

Tighten all bolts to the specified torque.

ENGINE HANGER BOLTS:
8 mm BOLTS:
18—25 N·m (1.8—2.5 kg-m, 13—18 ft-lb)
8 mm FLANGE BOLT:
20—30 N·m (2.0—3.0 kg-m, 14—22 ft-lb)
10 mm FLANGE BOLT:
45—60 N·m (4.5—6.0 kg-m, 33—43 ft-lb)
EXHAUST PIPE NUT:
8—14 N·m (0.8—1.4 kg-m, 6—10 ft-lb)

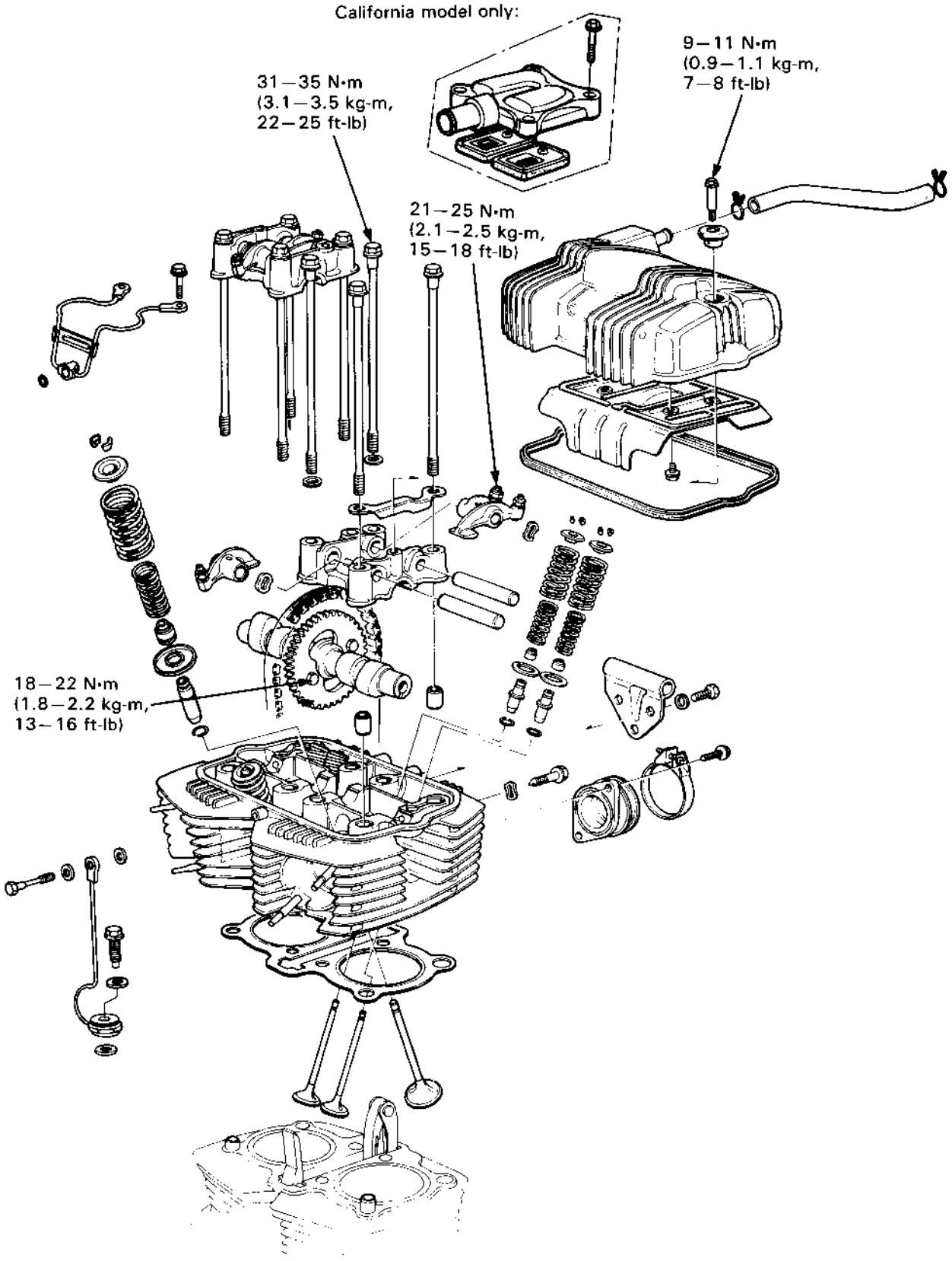


Route all wire harnesses and cables properly (pages 1-8 through 1-11).

Fill the crankcase to the proper level with the recommended oil (page 2-3).

Perform the following inspections and adjustments:
Drive chain (page 3-11)
Clutch (page 3-15)

MEMO


California model only:
31–35 N·m
(3.1–3.5 kg-m,
22–25 ft-lb)
9–11 N·m
(0.9–1.1 kg-m,
7–8 ft-lb)
21–25 N·m
(2.1–2.5 kg-m,
15–18 ft-lb)
18–22 N·m
(1.8–2.2 kg-m,
13–16 ft-lb)

6. CYLINDER HEAD/VALVES

SERVICE INFORMATION

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.

SPECIFICATIONS

ITEM			STANDARD	SERVICE LIMIT
Compression (cold)			1,200 ± 200 kPa (12.0 ± 2.0 kg/cm², 175 ± 30 psi)	—
Camshaft	Cam height	IN	37.008–37.208 mm (1.457–1.465 in)	36.7 mm (1.44 in)
		EX	37.040–37.240 mm (1.458–1.466 in)	36.7 mm (1.44 in)
	Oil clearance	Ends	0.040–0.141 mm (0.0016–0.0056 in)	0.20 mm (0.008 in)
		Center	0.090–0.191 mm (0.0035–0.0075 in)	0.23 mm (0.009 in)
	Runout		—	0.10 mm (0.004 in)
Rocker arm shaft	Arm I.D.		12.000–12.018 mm (0.4724–0.4731 in)	12.03 mm (0.474 in)
	Shaft O.D.		11.966–11.984 mm (0.4711–0.4618 in)	11.95 mm (0.470 in)
	Camshaft holder I.D.		11.984–12.016 mm (0.4718–0.4731 in)	12.04 mm (0.474 in)
Valve spring	Free length	IN-OUTER	50.6 mm (1.99 in)	49.0 mm (1.93 in)
		IN-INNER	36.6 mm (1.44 in)	35.5 mm (1.40 in)
		EX-OUTER	51.1 mm (2.01 in)	49.5 mm (1.95 in)
		EX-INNER	40.8 mm (1.61 in)	39.5 mm (1.56 in)
	Preload/length	IN-OUTER	33.0–37.0 kg/29.4 mm (72.8–81.6 lbs/1.16 in)	30 kg/29.4 mm (66.2 lbs/1.16 in)
		IN-INNER	19.0–22.0 kg/25.2 mm (41.9–46.3 lbs/0.99 in)	17 kg/25.2 mm (37.5 lbs/0.99 in)

ITEM			STANDARD	SERVICE LIMIT
Valve spring	Preload/length	EX-OUTER	57.5—64.5 kg/31.8 mm (126.8—142.2 lbs/1.25 in)	52 kg/31.8 mm (112.5 lbs/1.25 in)
		EX-INNER	33.0—37.0 kg/29.6 mm (72.8—81.6 lbs/1.17 in)	30 kg/29.6 mm (66.2 lbs/1.17 in)
Valve guide	Valve stem O.D.	IN	5.455—5.470 mm (0.2148—0.2154 in)	5.44 mm (0.214 in)
		EX	6.555—6.570 mm (0.2581—0.2587 in)	6.54 mm (0.257 in)
	Valve guide I.D.	IN	5.500—5.510 mm (0.2165—0.2169 in)	5.60 mm (0.220 in)
		EX	6.600—6.615 mm (0.2598—0.2604 in)	6.70 mm (0.264 in)
	Stem-to-guide clearance	IN	—	0.10 mm (0.004 in)
		EX	—	0.10 mm (0.004 in)
	Valve seat width		1.1—1.3 mm (0.04—0.05 in)	2.0 mm (0.08 in)
Cylinder head	Warpage		—	0.10 mm (0.004 in)

TOOLS

Special

Valve guide reamer (IN)	07984—2000000
Valve guide reamer (EX)	07984—5510000

Common

Valve guide remover (IN), 5.5 mm	07742—0010100 or 07942—3290100
Valve guide remover (EX), 6.6 mm	07742—0010200 or 07942—6570100
Valve spring compressor	07757—0010000 or 07957—3290001

TORQUE VALUES

Cylinder head cover bolt	9—11 N·m (0.9—1.1 kg-m, 7—8 ft-lb)
Cylinder head bolt	31—35 N·m (3.1—3.5 kg-m, 22—25 ft-lb)
Cam sprocket bolt	18—22 N·m (1.8—2.2 kg-m, 13—16 ft-lb)
Valve adjusting screw lock nut	21—25 N·m (2.1—2.5 kg-m, 15—18 ft-lb)

TROUBLESHOOTING

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

Low compression or uneven compression

1. Valve
   - Incorrect adjustment
   - Burned or bent valves
   - Incorrect valve timing
   - Broken valve spring

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

3. Cylinder and piston (Refer to Section 7)

Compression too high

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

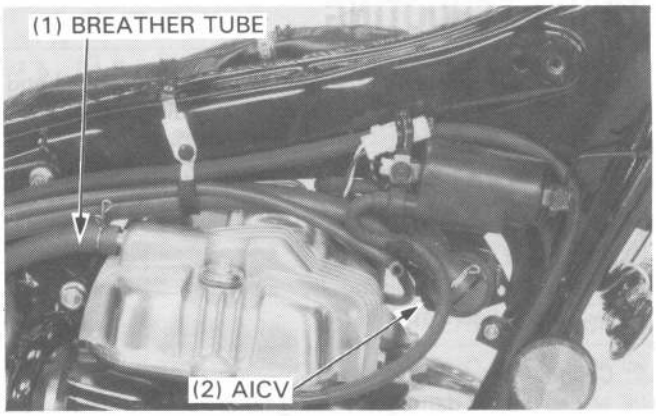
Excessive noise

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

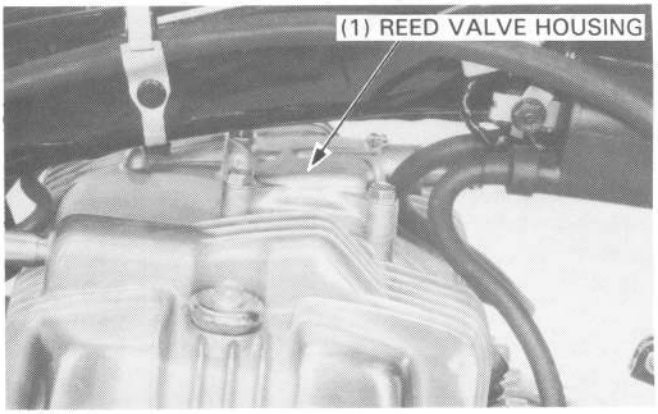
CYLINDER HEAD COVER REMOVAL

Remove the seat and fuel tank (page 4-15).

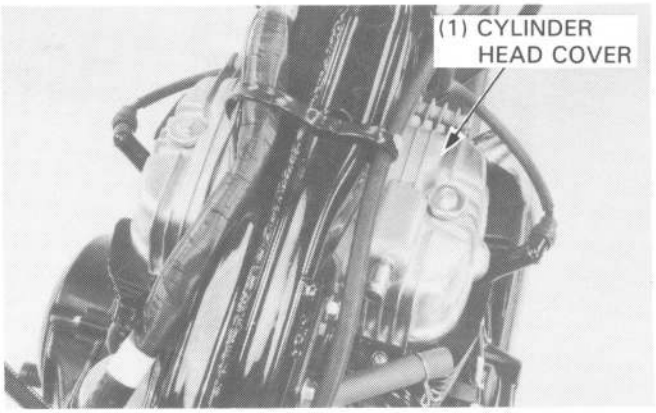
On California model: disconnect the AICV (Air Injection Control Valve) hoses, then remove the C.D.I. unit mounting bolt and AICV and reinstall the C.D.I. unit loosely.
Disconnect the breather tube.



Remove the reed valve housing mounting bolts and reed valve housing.



Remove the cylinder head cover bolts and cylinder head cover.

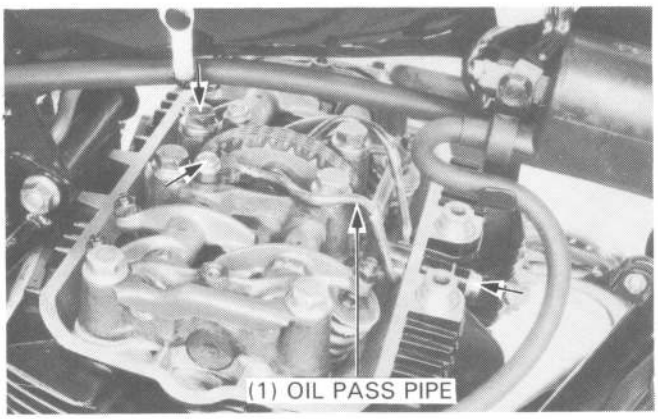


ROCKER ARM/CAMSHAFT REMOVAL

Remove the oil pipe.

CAUTION

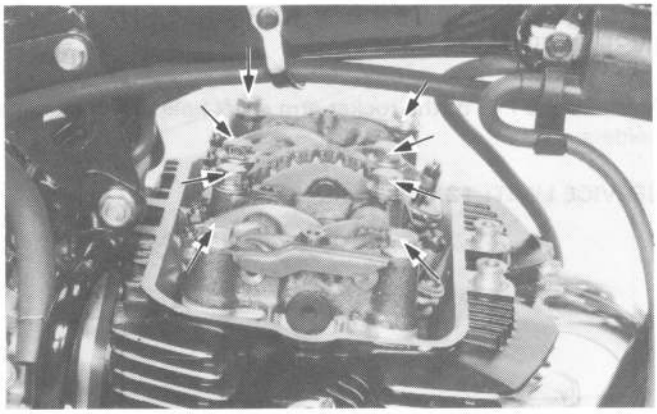
- *When loosening the oil pipe bolt, hold the flat portion of the oil pipe joint with a wrench or equivalent to prevent the joint from turning together.*



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.*



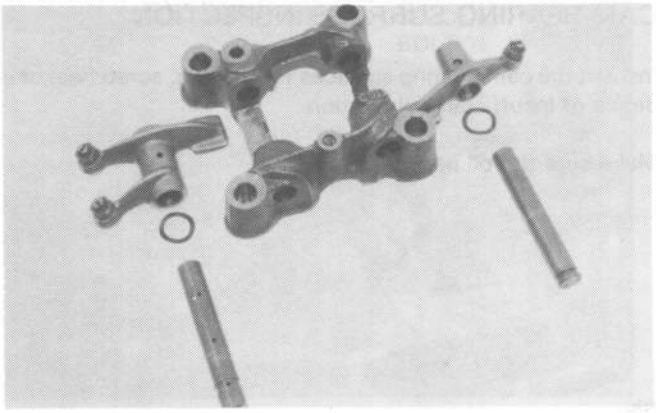
Remove the cylinder head bolts.

Remove the camshaft holders.

Remove the wave washers and rocker arms by pulling out the rocker arm shafts.

NOTE

- Mark each part as it is disassembled to ensure the part is re-assembled in its original position.



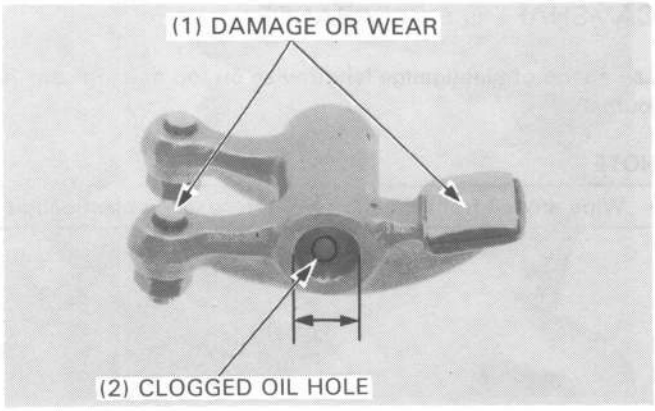
ROCKER ARM INSPECTION

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

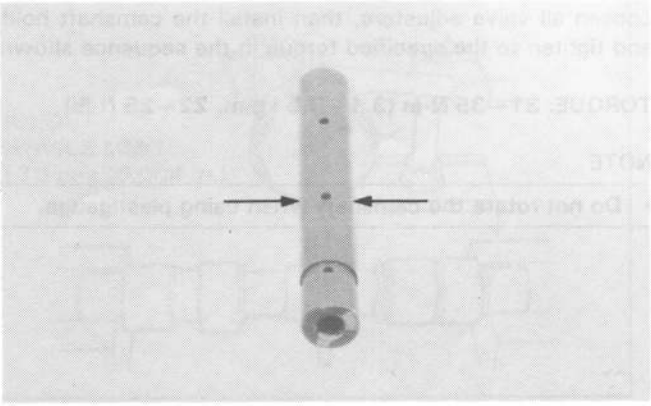
- If any rocker arms require servicing or replacement, inspect the camshaft lobes for scoring, chipping, or flat spots.



ROCKER ARM SHAFT INSPECTION

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

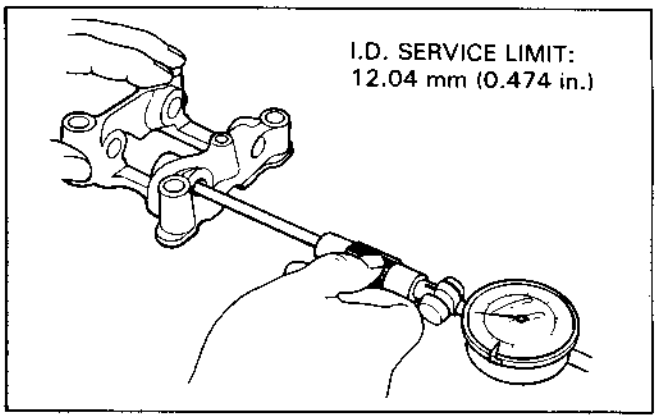
SERVICE LIMIT: 11.95 mm (0.470 in)



CAMSHAFT HOLDER ROCKER ARM SHAFT HOLE INSPECTION

Measure the I.D. of the rocker arm shaft hole of the camshaft holders.

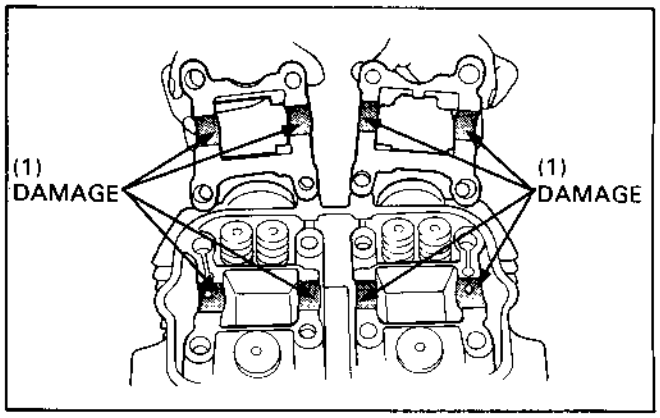
SERVICE LIMIT: 12.04 mm (0.474 in)



CAM BEARING SURFACE INSPECTION

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

Make sure the oil passages are clear.

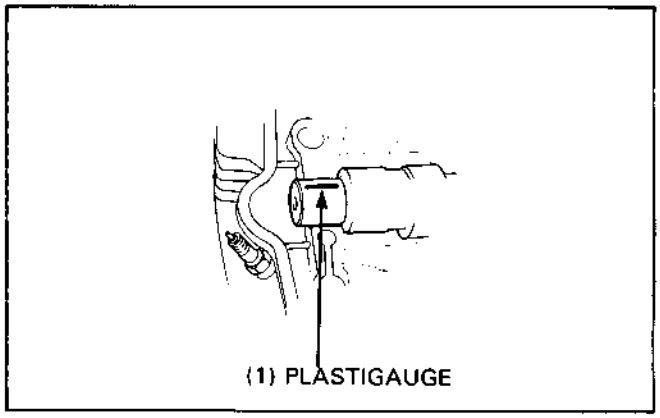


CAMSHAFT OIL CLEARANCE

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

NOTE

- Wipe any oil from the journals before using plastigauge.

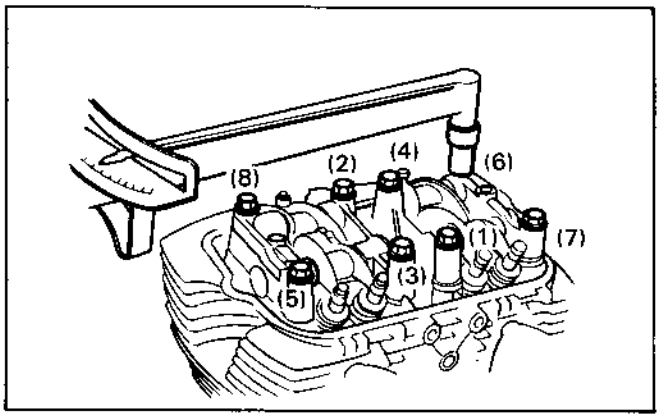


Loosen all valve adjusters, then install the camshaft holders and tighten to the specified torque in the sequence shown.

TORQUE: 31–35 N·m (3.1–3.5 kg-m, 22–25 ft-lb)

NOTE

- Do not rotate the camshaft when using plastigauge.

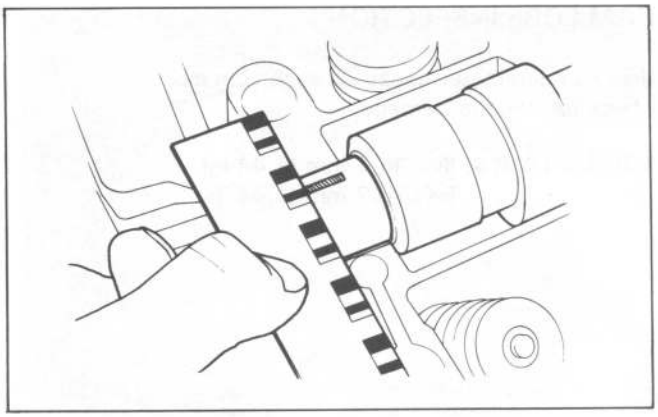


Remove the camshaft holders and measure the width of plastigauge. The widest thickness determines the oil clearance.

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

When the service limits are exceeded, check the camshaft O.D. (page 6-8).

Replace the cylinder head and camshaft holders if the camshaft O.D. is in limit.

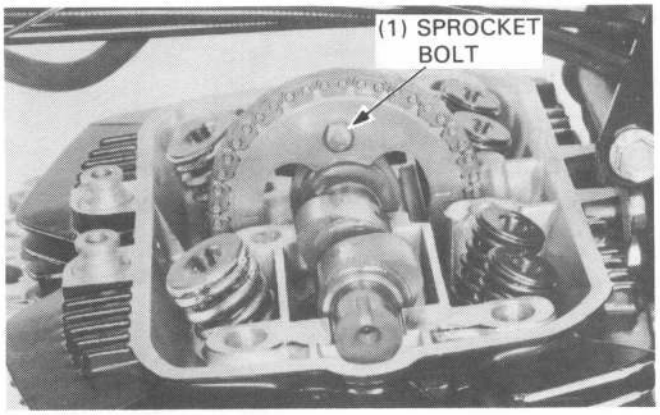


CAMSHAFT REMOVAL

Remove the cam sprocket from the camshaft.

NOTE

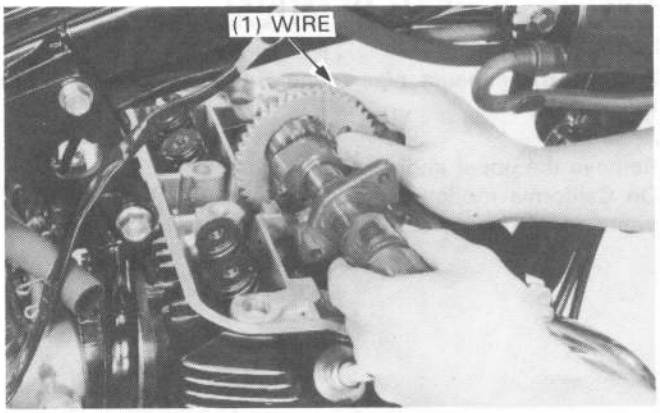
- Do not drop the mounting bolts into the cylinder.



Remove the cam chain from the sprocket.
Remove the camshaft from the right side.

NOTE

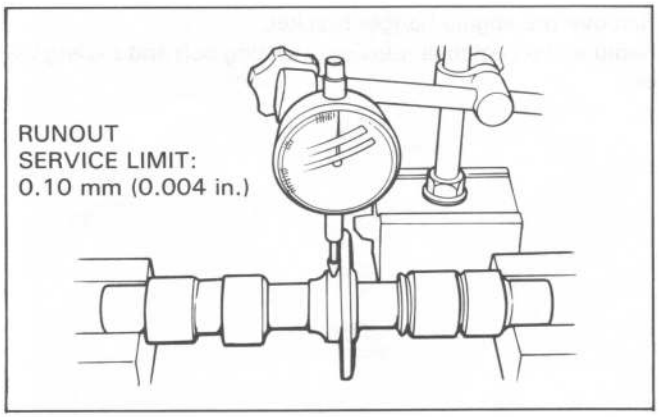
- Suspend the cam chain with a wire to keep it from falling into the cylinder.



INSPECTION

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

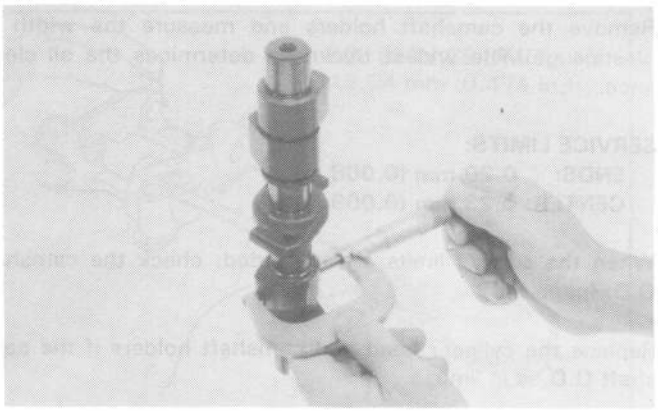
SERVICE LIMIT: 0.10 mm (0.004 in)



CAM LOBE INSPECTION

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

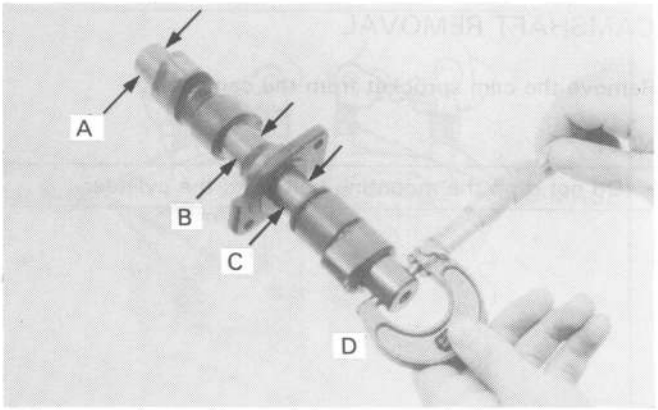
SERVICE LIMITS: IN: 36.7 mm (1.44 in)
EX: 36.7 mm (1.44 in)



CAMSHAFT O.D.

Measure the camshaft O.D.

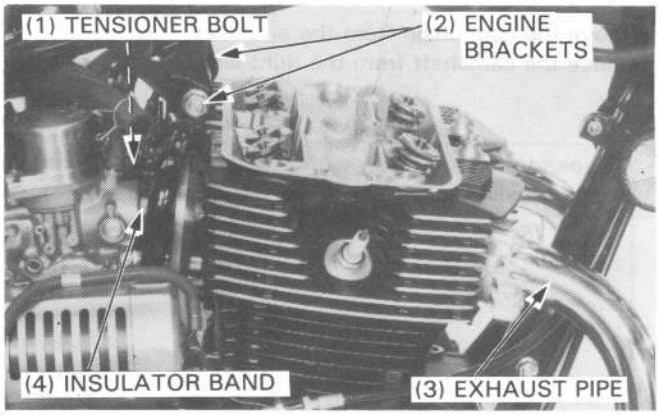
STANDARDS:
A, D: 21.939—21.960 mm (0.8637—0.8646 in)
B, C: 21.877—21.910 mm (0.8613—0.8626 in)



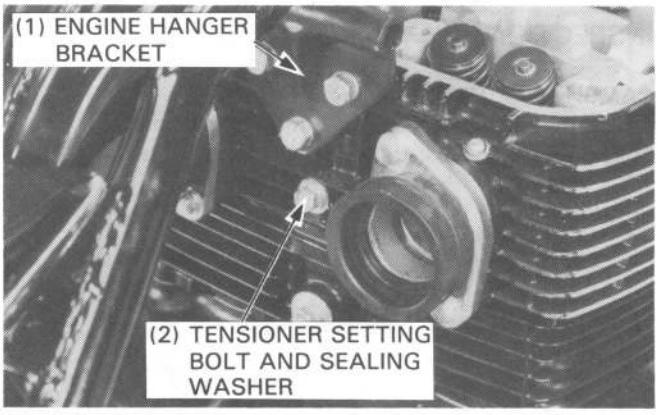
CYLINDER HEAD REMOVAL

Remove the exhaust pipe (page 5-2) and carburetor (page 4-3).

Remove the upper engine hanger plate.
On California model: remove the canister then remove the upper engine hanger.



Remove the engine hanger bracket.
Remove the camchain tensioner setting bolt and sealing washer.

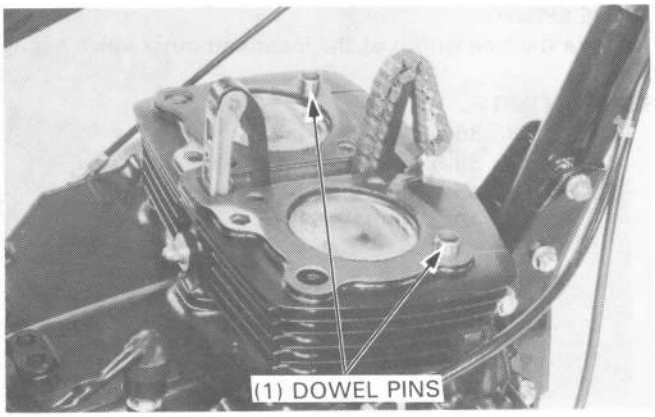


Remove the cylinder head.

CAUTION

- *To prevent damage to cooling fins, pry the cylinder and cylinder head apart only at the reinforced ribbed areas.*

Remove the cylinder head gasket and dowel pins.

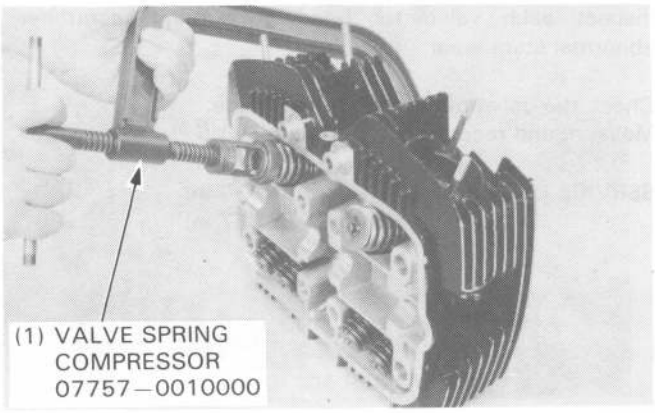


CYLINDER HEAD DISASSEMBLY

Remove the intake tubes.
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.

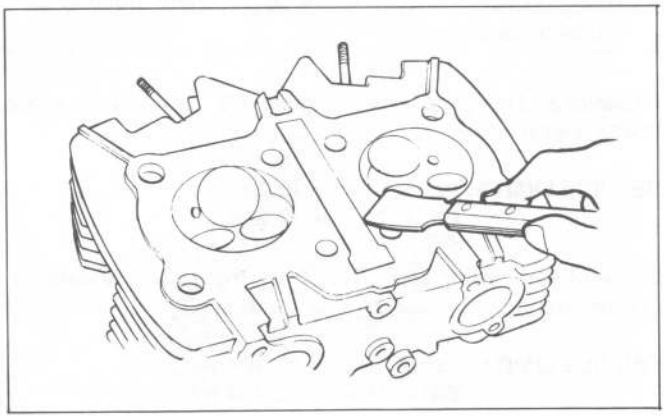


Remove the carbon deposits from the combustion chamber.

Clean off the head gasket surface.

NOTE

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

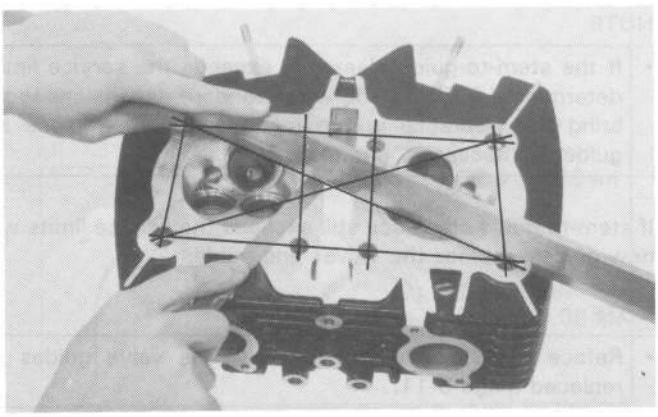


INSPECTION

CYLINDER HEAD
Check the spark plug holes and valve areas for cracks.

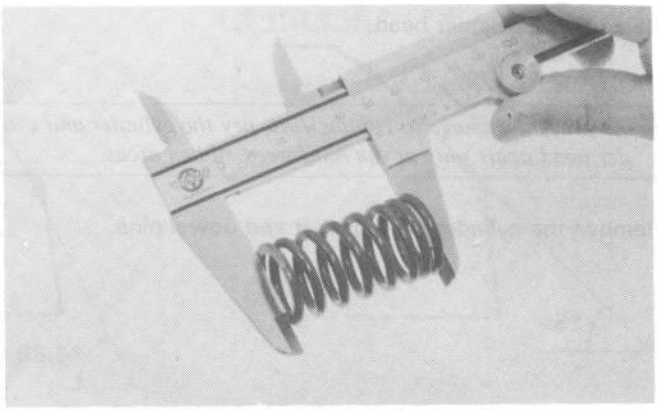
Check the cylinder head for warpage with a straight edge and a feeler gauge.

SERCIVE LIMIT: 0.10 mm (0.004 in)



VALVE SPRING

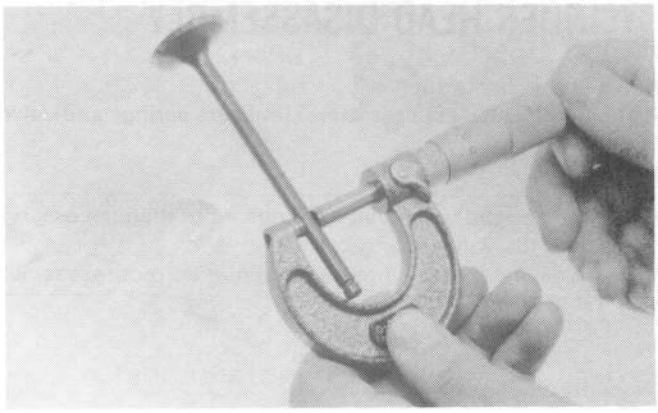
Measure the free length of the inner and outer valve springs.



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.



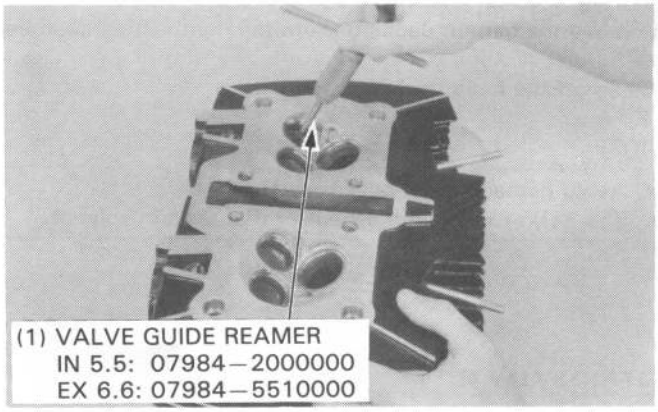
Check the valve movement in the guide.
Measure and record each valve stem O.D.

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

NOTE

- Ream the quides to remove any carbon buildup before checking clearance.

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



(1) VALVE GUIDE REAMER
IN 5.5: 07984—2000000
EX 6.6: 07984—5510000

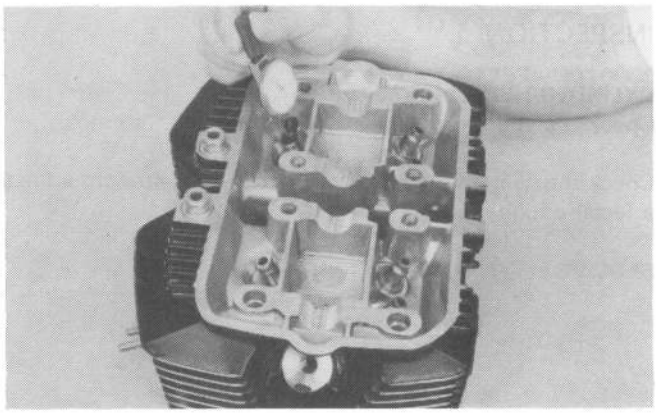
SERVICE LIMITS: IN: 5.60 mm (0.220 in)
EX: 6.70 mm (0.264 in)

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

SERVICE LIMIT: 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 and guides.

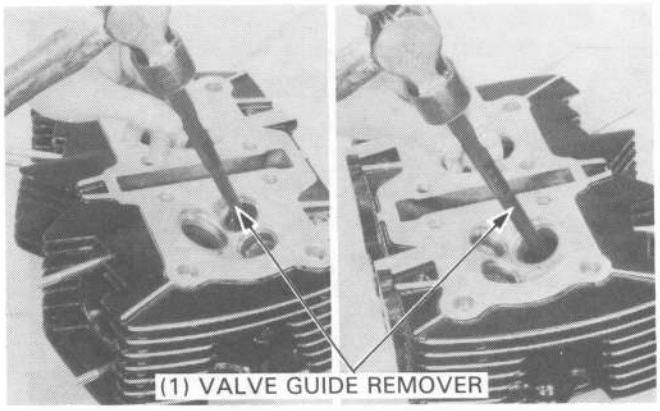
NOTE

- Reface the valve seats whenever the valve guides are replaced (page 6-11).

VALVE GUIDE REPLACEMENT

Support the cylinder head and drive out the guide from the valve port being careful not to damage the head.

VALVE GUIDE REMOVER
IN 5.5: 07742–0010100 or 07942–3290100
EX 6.6: 07742–0010200 or 07942–6570100



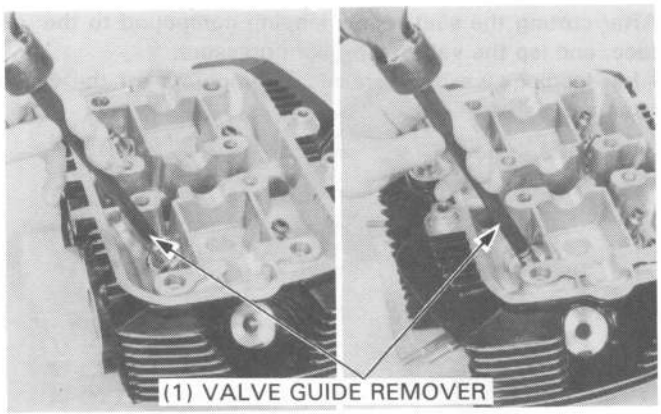
Install a new oversize valve guide from the top of the head.

Ream the new valve guide after installation.

NOTE

- Use cutting oil on the reamer during this operation.

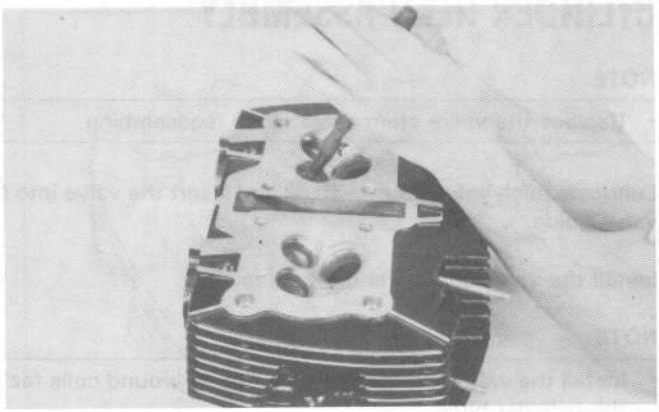
Clean the cylinder head thoroughly to remove any metal particles.



VALVE SEAT INSPECTION AND GRINDING

Clean all intake and exhaust valve thorougly 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

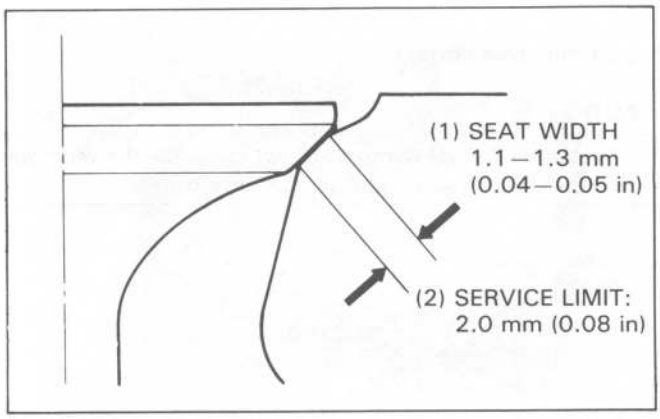
- The valves cannot be ground. If the valve face is rough, worn unevenly, or contacts the seat improperly, the valve must be replaced.

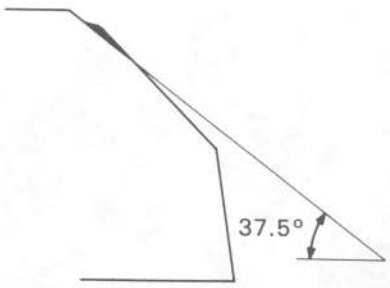
Inspect the valve seats.

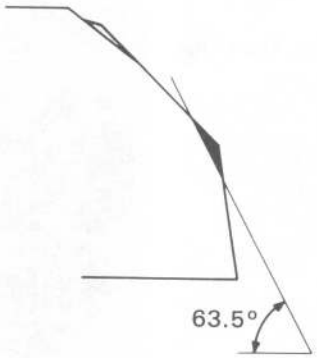
If the seat is too wide, too narrow, or has low spots, the seat must be ground. A power grinder is recommended for good valve sealing.

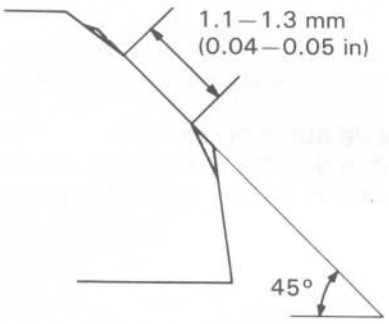
NOTE

- Follow the refacer manufacturer's operating instructions.
- Hand valve seat cutters are not available in U.S.A.

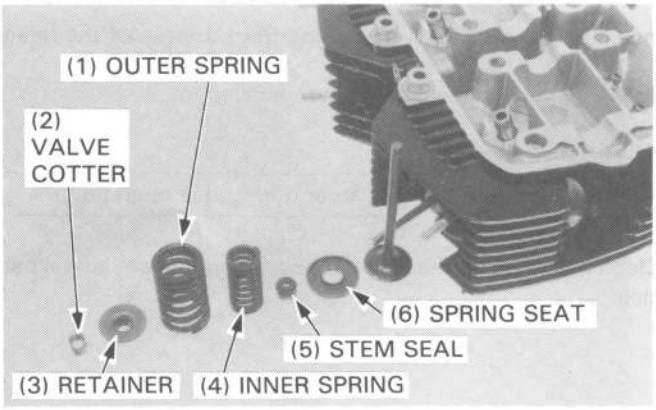








After cutting the seat, apply lapping compound to the valve face, and lap the valve using light pressure.
After lapping, wash any residual compound off the cylinder head and valve.



CYLINDER HEAD ASSEMBLY

NOTE

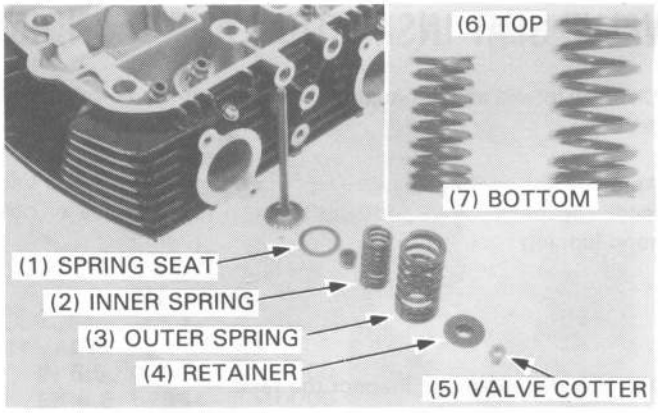
- Replace the valve stem seals when reassembing.

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

Install the valve springs and retainers.

NOTE

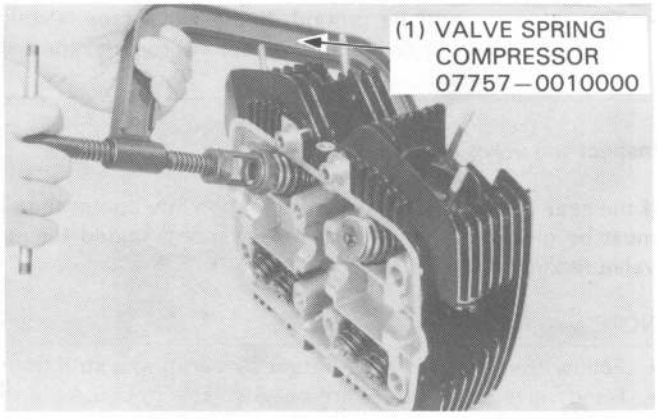
- Install the valve springs with the tightly wound coils facing the cylinder head.



Install the valve cotters.

CAUTION

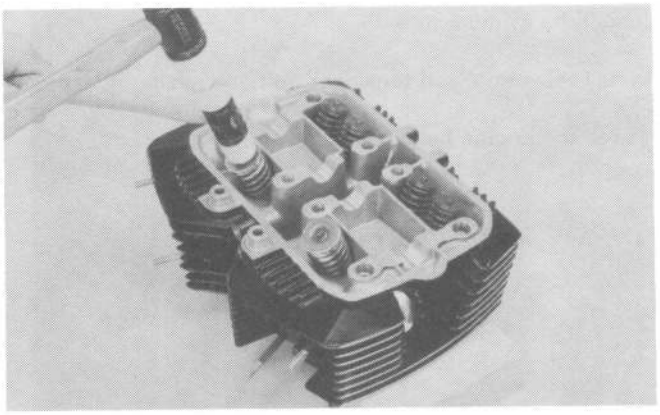
- *To prevent loss of tension, do not compress the valve spring more than necessary to install the valve cotters.*



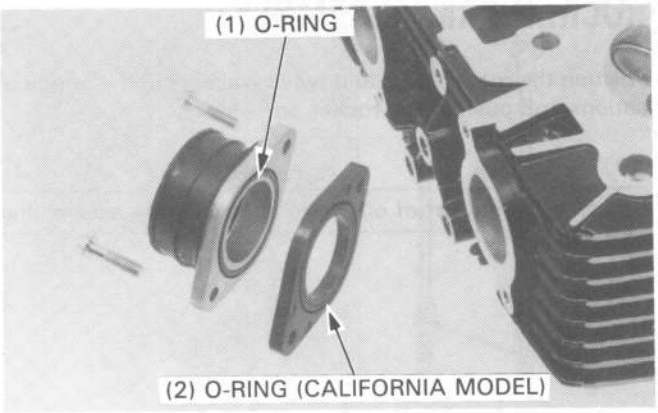
Tap the valve stems gently with a soft hammer to firmly seat the keepers.

NOTE

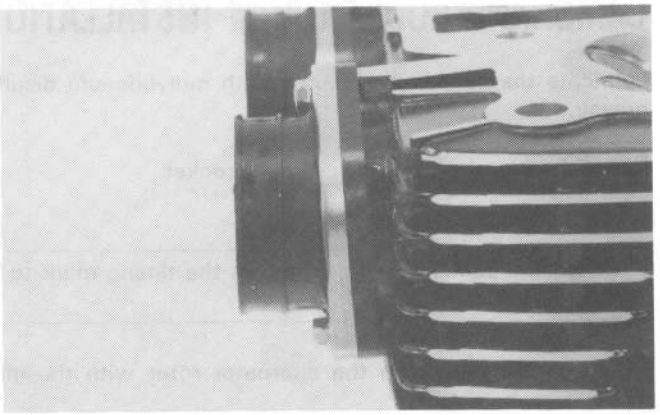
- Support the cylinder head above the work bench surface to prevent possible valve damage.



Install new O-rings



Install the carburetor insulator with the narrow end down.

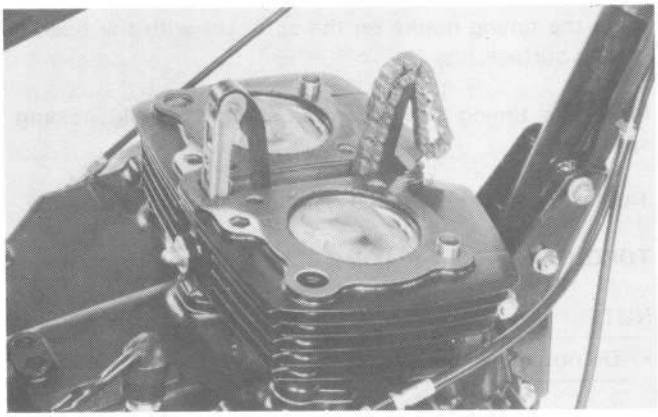


CYLINDER HEAD INSTALLATION

Clean the cylinder head gasket surfaces of any gasket material.

Install the dowel pins and a new gasket.

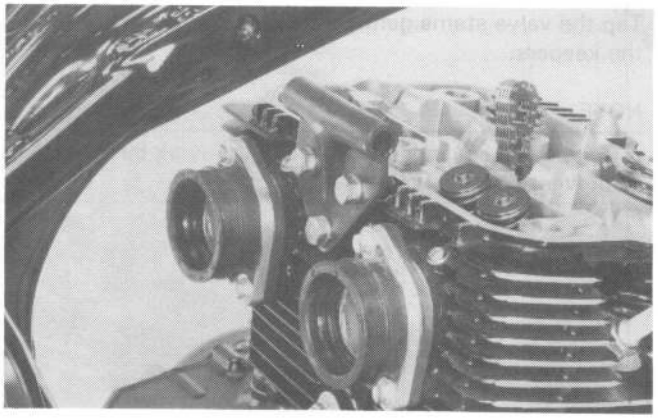
Loosen the cam chain tensioner lock nut and retighten it with the tensioner pulled up fully.



Install the cylinder head.

Install the cam chain tensioner bolt and sealing washer.

Install the engine hanger bracket.

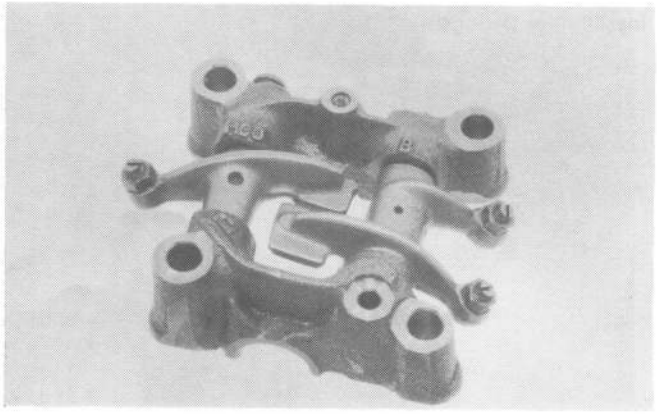


ROCKER ARM ASSEMBLY

Position the rocker arms and wave washers in their original locations and push in the rocker arm shafts.

NOTE

- Apply a thin coat of oil to the shafts before assembling.



CAMSHAFT/ROCKER ARM INSTALLATION

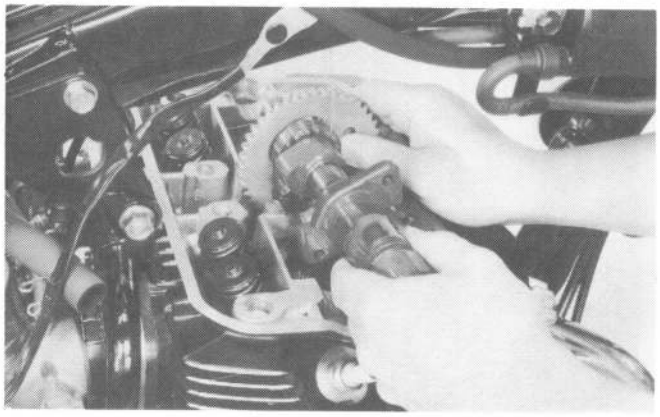
Lubricate the camshaft bearings with molybdenum disulfide grease.

Install the camshaft and camshaft sprocket.

NOTE

- Install the camshaft sprocket with the timing mark to the left side on the engine.

Align the "T" mark on the alternator rotor with the index mark.



Align the timing marks on the sprocket with the head cover mating surface.

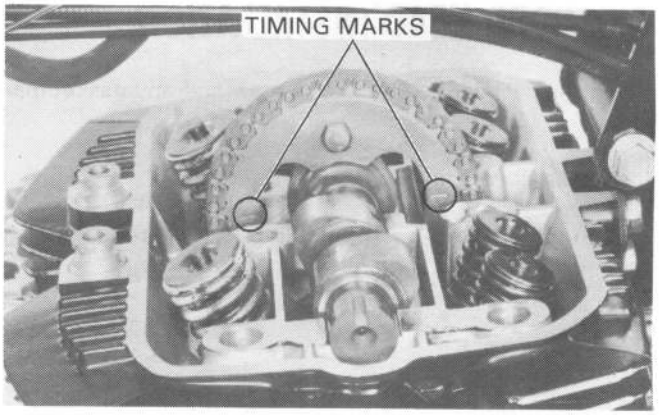
Place the timing chain on the sprocket while holding the sprocket.

Tighten the sprocket mounting bolts to specified torque.

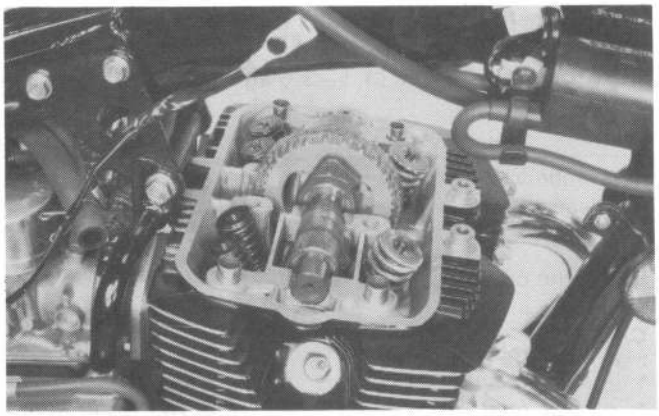
TORQUE: 18–22 N·m (1.8–2.2 kg-m, 13–16 ft-lb)

NOTE

- Do not allow the bolts to fall into the crankcase.



Install the dowel pins in position.
Install the camshaft holders.

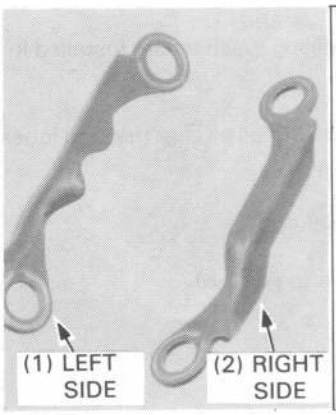


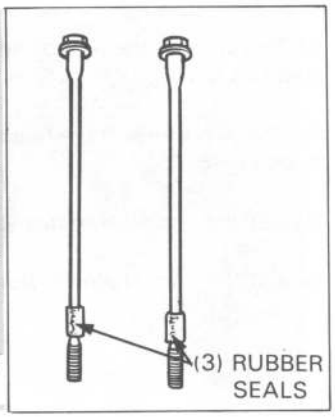
Place the rocker arm shaft stopper plate, into position.

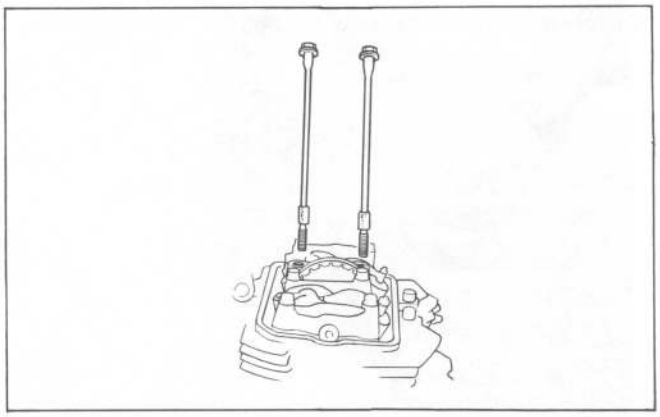
Install the cylinder head bolts.

NOTE

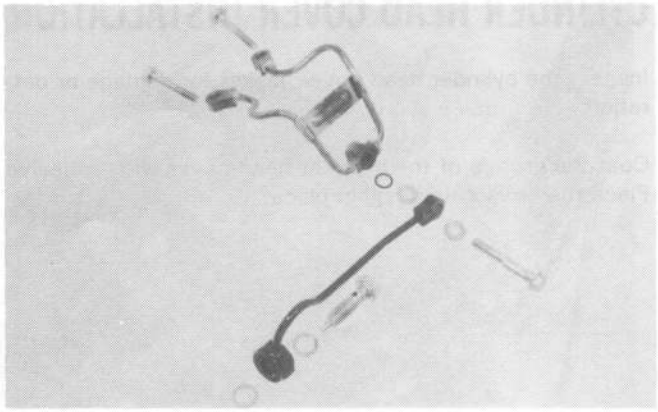
- Each of the four inside cylinder head bolts has a copper washer. The left two inside cylinder head bolts are rubber-sealed.







Make sure oil pipe is not clogged.

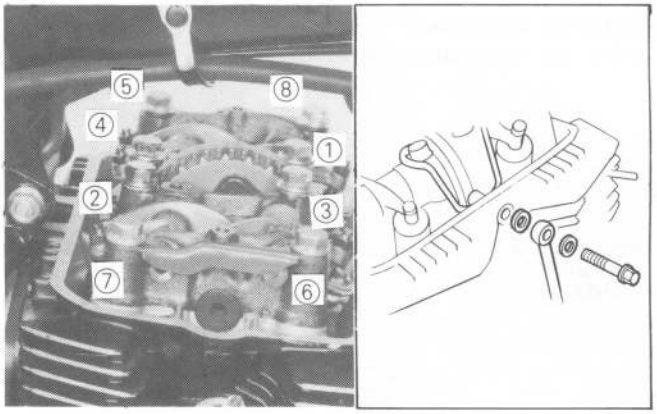


Tighten the cylinder head bolts in the sequence shown.

TORQUE: 31—35 N·m (3.1—3.5 kg-m, 22—25 ft-lb)

NOTE

- Torque in 2—3 steps.
- Clean excessive sealant from the head.



Install the oil pipe.

CAUTION

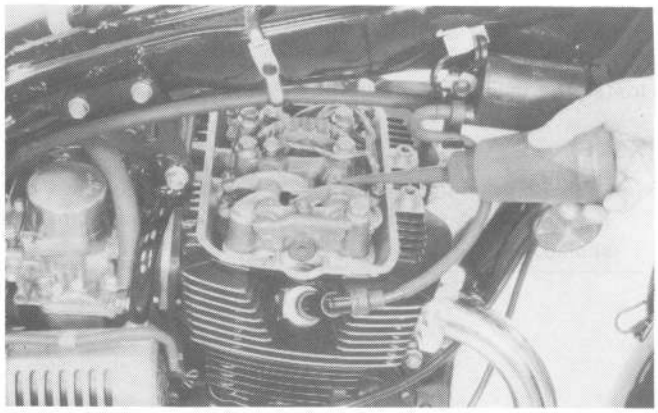
- *When tightening the oil pipe bolt, hold the flat portion of the oil pipe joint with a universal wrench or equivalent to prevent the joint from turning.*

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

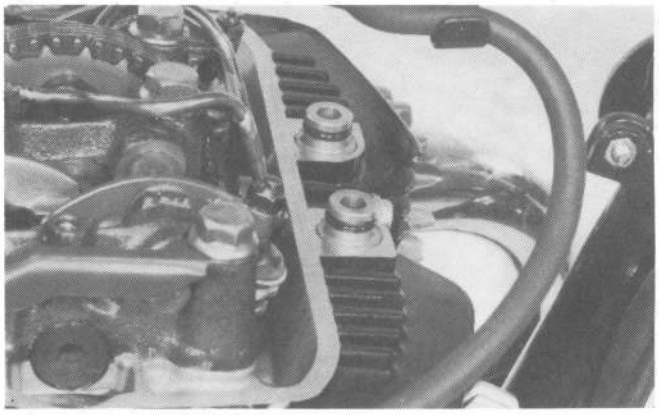
Fill the oil pockets in the head with oil so that the cam lobes are submerged.

Adjust the valve clearance (page 3-7).

Adjust the cam chain tension (page 3-8).



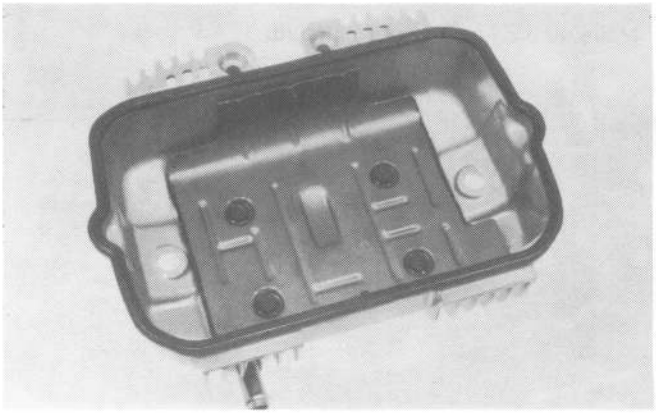
California model: install new O-rings.



CYLINDER HEAD COVER INSTALLATION

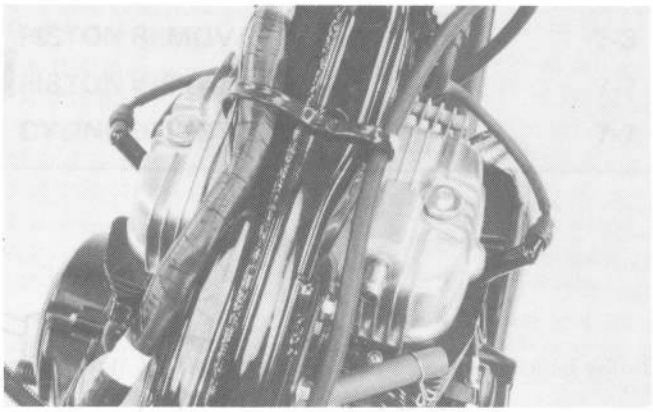
Inspect the cylinder head cover gasket for damage or deterioration.

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



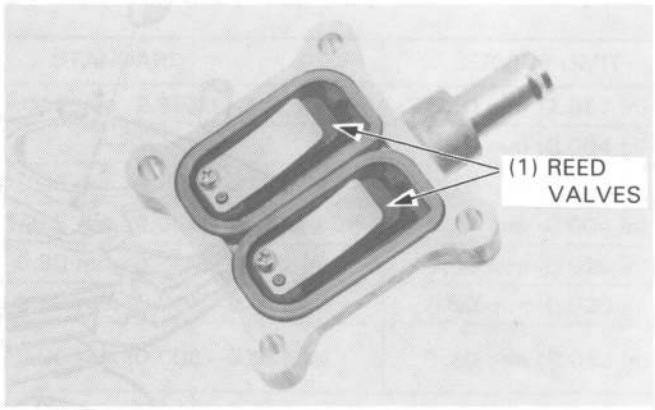
Install the cylinder head cover and tighten the bolts.

TORQUE: 9—11 N·m (0.9—1.1 kg-m, 7—8 ft-lb)



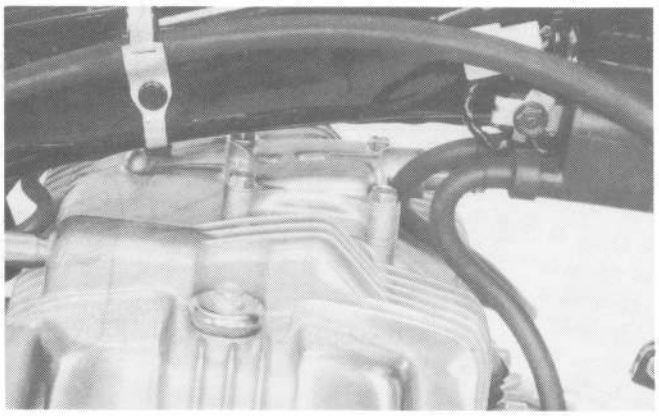
Check the reed valve for damage or fatigue and replace if necessary.
Check the reed valve stopper for damage and replace if necessary.

California model: install the reed valves in the reed valve housing.



California model: install the reed valve and housing on the cylinder head cover.

California model: install the AICV (Air Injection Control Valve).
Install the parts in the reverse order of removal.



CYLINDER COMPRESSION

Warm up the engine.
Stop the engine.
Disconnect the spark plug caps and remove the spark plugs.
Insert the compression gauge.
Open the choke and throttle valves fully.
Crank the engine with the starter motor.

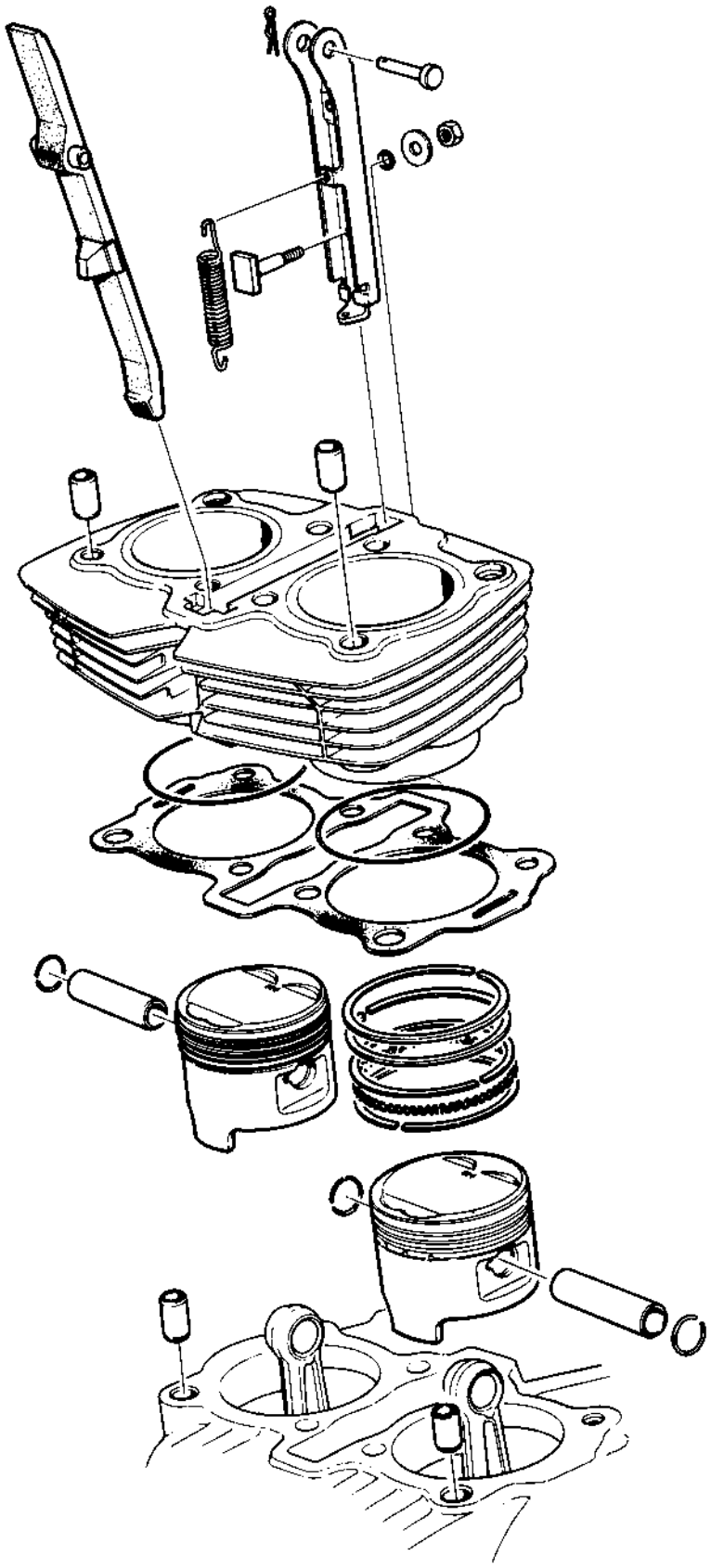
NOTE

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

COMPRESSION PRESSURE:
1,200 ± 200 kpa (12.0 ± 20 kg/cm², 175 ± 30 psi)

If compression is low, check 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.



7. CYLINDER/PISTON

SERVICE INFORMATION

GENERAL

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

SPECIFICATIONS

ITEM			STANDARD	SERVICE LIMIT
Cylinder	I.D.		75.000—75.010 mm (2.9528—2.9531 in)	75.10 mm (2.957 in)
	Warpage		—	0.10 mm (0.004 in)
Piston, piston rings and piston pin	Piston ring-to-ring groove clearance	TOP	0.03—0.06 mm (0.001—0.002 in)	0.10 mm (0.004 in)
		SECOND	0.025—0.055 mm (0.0009—0.0022 in)	0.10 mm (0.004 in)
	Ring end gap	TOP	0.10—0.30 mm (0.004—0.012 in)	0.50 mm (0.020 in)
		SECOND	0.10—0.30 mm (0.004—0.012 in)	0.50 mm (0.020 in)
		OIL (SIDE RAIL)	0.20—0.90 mm (0.008—0.035 in)	1.10 mm (0.043 in)
	Piston O.D.		74.73—74.74 mm (2.942—2.943 in)	74.65 mm (2.939 in)
	Piston pin bore		18.002—18.008 mm (0.7087—0.7090 in)	18.04 mm (0.710 in)
	Connecting rod small end I.D.		18.016—18.034 mm (0.7093—0.7100 in)	18.06 mm (0.732 in)
	Piston pin O.D.		17.994—18.000 mm (0.7084—0.7087 in)	17.98 mm (0.708 in)
	Piston-to-piston pin clearance		—	0.040 mm (0.0016 in)
	Cylinder-to-piston clearance		—	0.10 mm (0.004 in)

TOOLS

Special

Piston base	07958—2500001 (2 Required)
Piston ring compressor	07954—2830000 or 07955—4630000 (2 Required)

TROUBLESHOOTING

Compression too low or unstable
1. Worn cylinder or piston rings

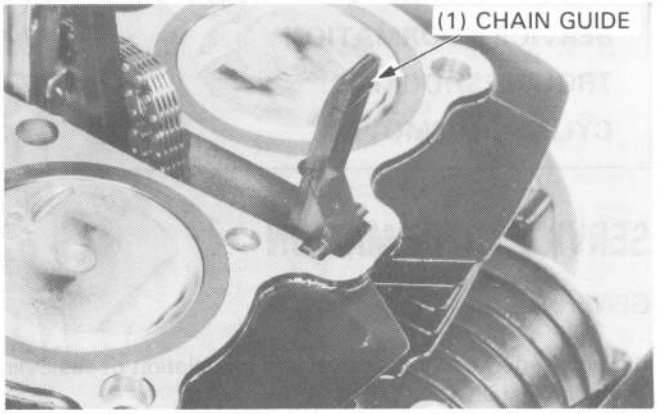
Excessive smoke
1. Worn cylinder or piston
2. Improper installation of piston rings
3. Scored or scratched piston or cylinder wall

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

Knocking or abnormal noise
1. Worn piston and cylinder
2. Excessive carbon build-up

CYLINDER REMOVAL

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

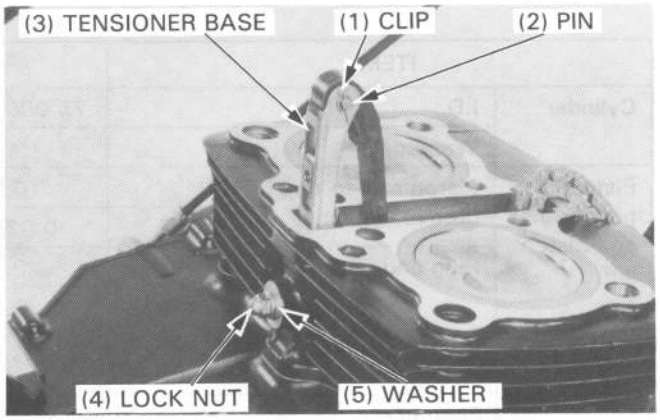


Remove the cam chain tensioner clip and pin.

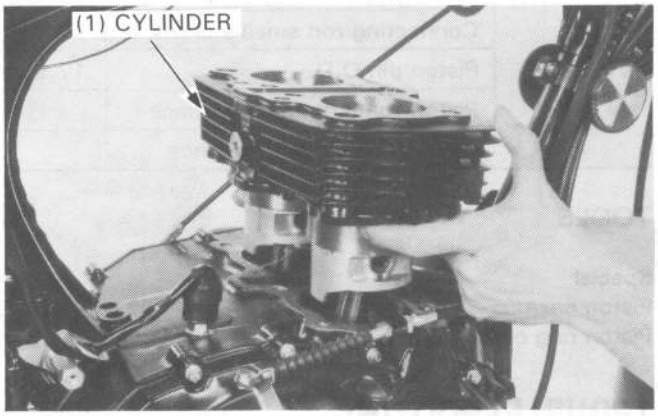
NOTE

- Do not drop the clip and pin into the crankcase.

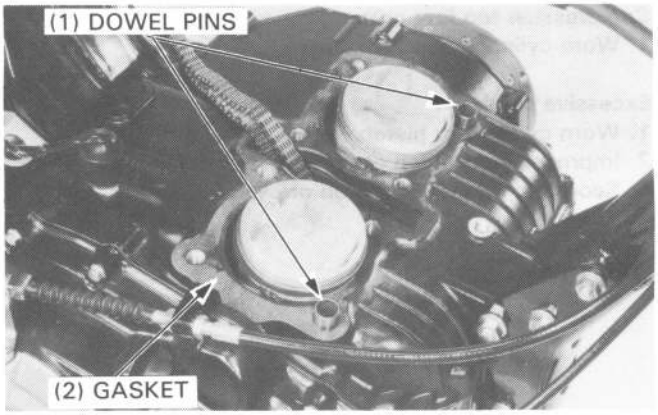
Remove the tensioner lock nut, washer and O-ring.
Remove the tensioner base.



Remove the cylinder.
Clean the base of the cylinder.



Remove the cylinder gasket and dowel pins from the crankcase.



PISTON REMOVAL

Stuff a rag or shop towel into the crankcase.
Remove each piston pin clip with pliers.

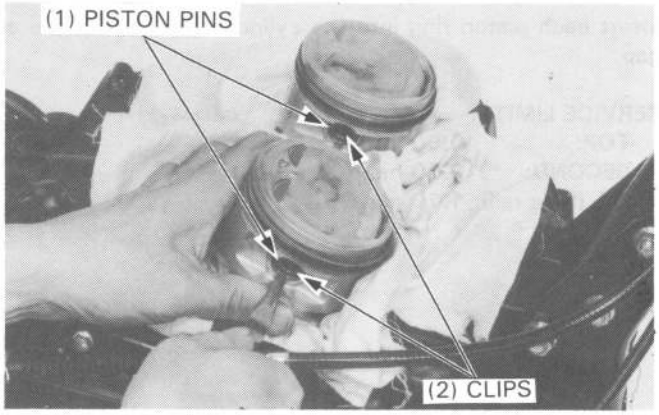
NOTE

- 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 right and left to indicate their cylinder positions.

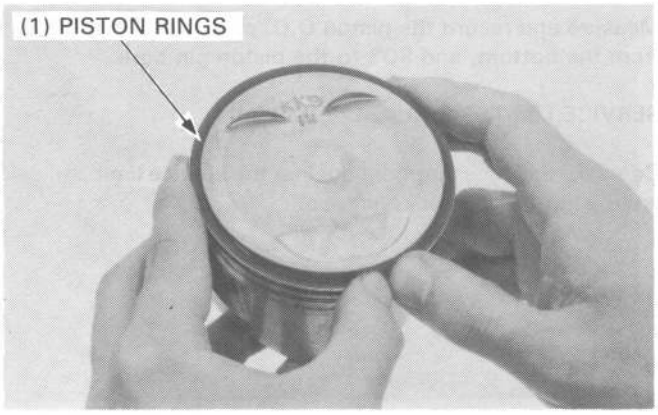


PISTON, CYLINDER, PISTON RING INSPECTION
Remove the piston rings.

NOTE

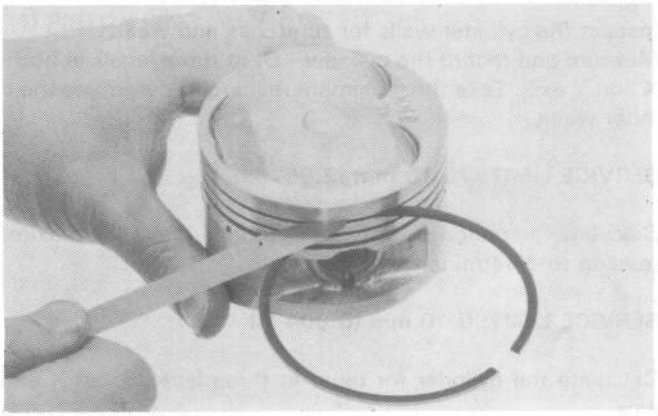
- Mark the rings so that they can be returned to their original locations.

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



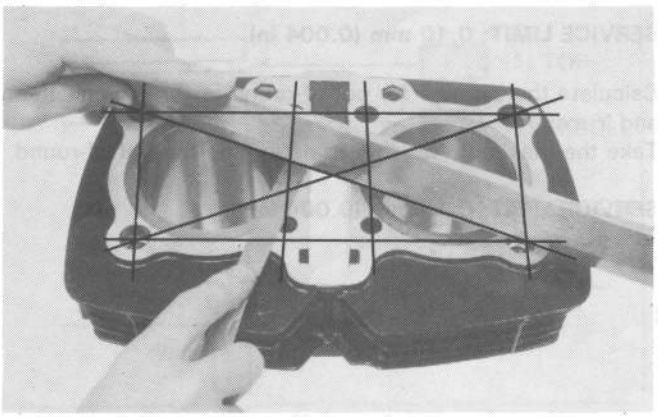
Inspect the piston ring-to groove clearance.

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



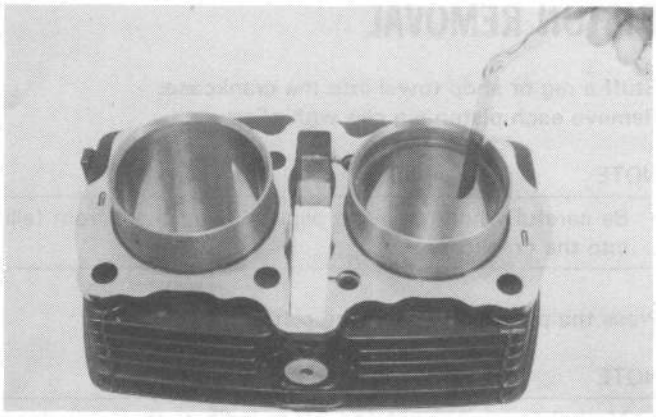
Inspect the top of the cylinders for warpage.
Check in an X patten as shown.

SERVICE LIMIT: 0.10 mm (0.004 in)



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

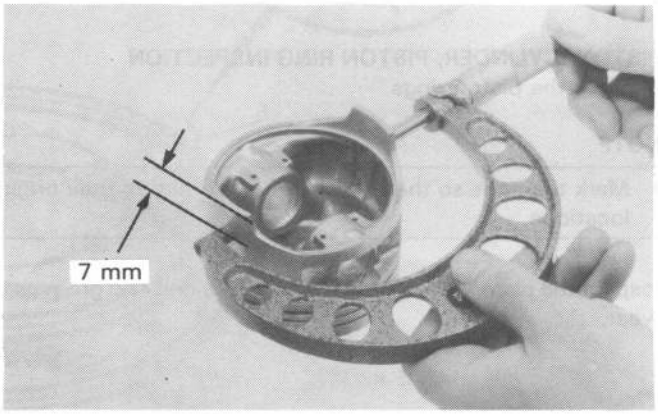
SERVICE LIMITS:
TOP: 0.50 mm (0.020 in.)
SECOND: 0.50 mm (0.020 in.)
OIL (Side rail): 1.10 mm (0.043 in.)



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: 74.65 mm (2.939 in)

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



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

SERVICE LIMIT: 75.10 mm (2.957 in)

Calculate the piston-to-cylinder clearance. Take the maximum reading to determine the clearance.

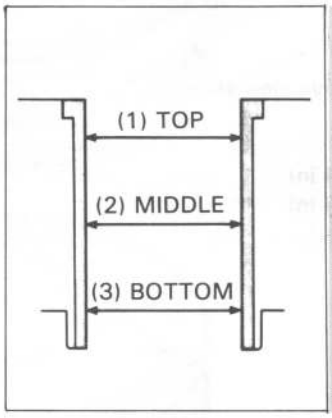
SERVICE LIMIT: 0.10 mm (0.004 in)

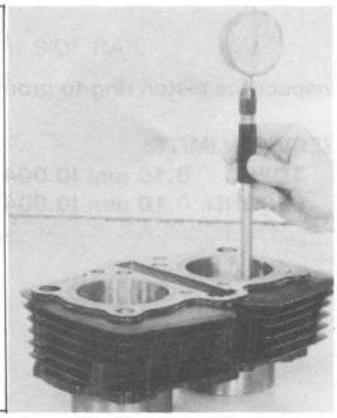
Calculate the cylinder for taper at three levels in an X and Y axis.
Take the maximum reading to determine the taper.

SERVICE LIMIT: 0.10 mm (0.004 in)

Calculate the cylinder for out-of-round at three levels in an X and Y axis.
Take the maximum reading to determine the out-of-round.

SERVICE LIMIT: 0.10 mm (0.004 in)





Measure the piston pin hole I.D.

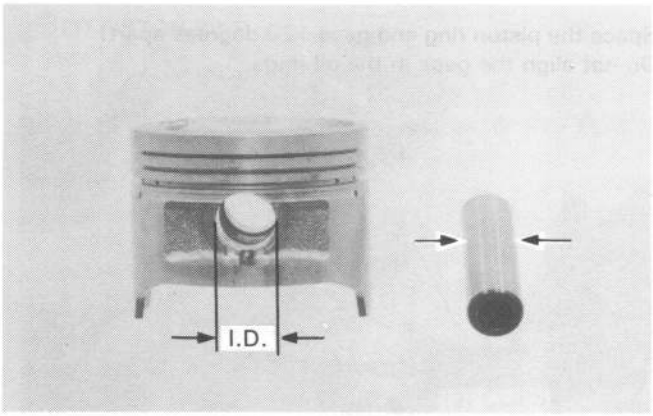
SERVICE LIMIT: 18.04 mm (0.710 in)

Measure the piston pin O.D..

SERVICE LIMIT: 17.98 mm (0.708 in)

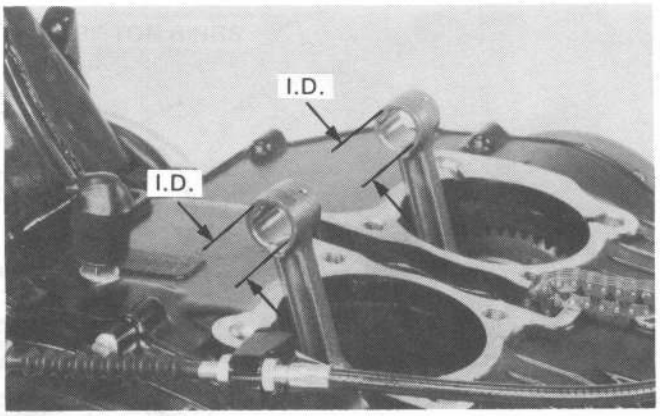
Determine the piston-to-piston pin clearance.

SERVICE LIMIT: 0.040 mm (0.0016 in.)



Measure the connecting rod small end I.D..
(See Section 11 for replacement procedure)

SERVICE LIMIT: 18.06 mm (0.732 in)

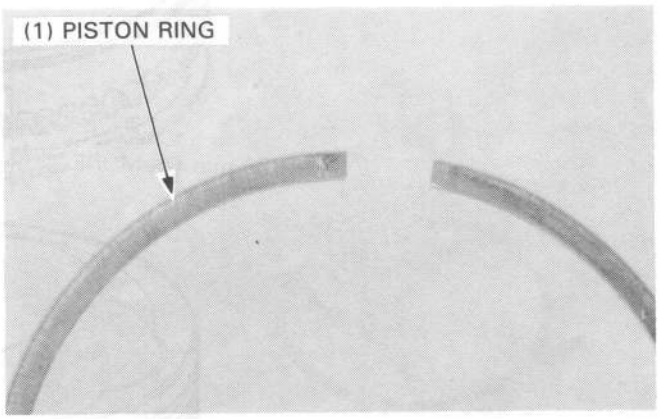


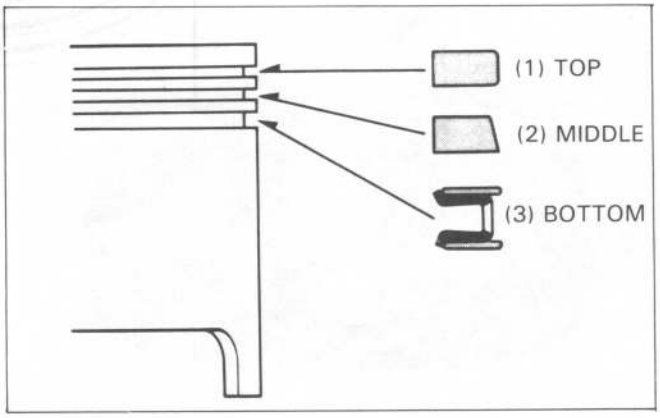
PISTON RING INSTALLATION

Install the piston rings.

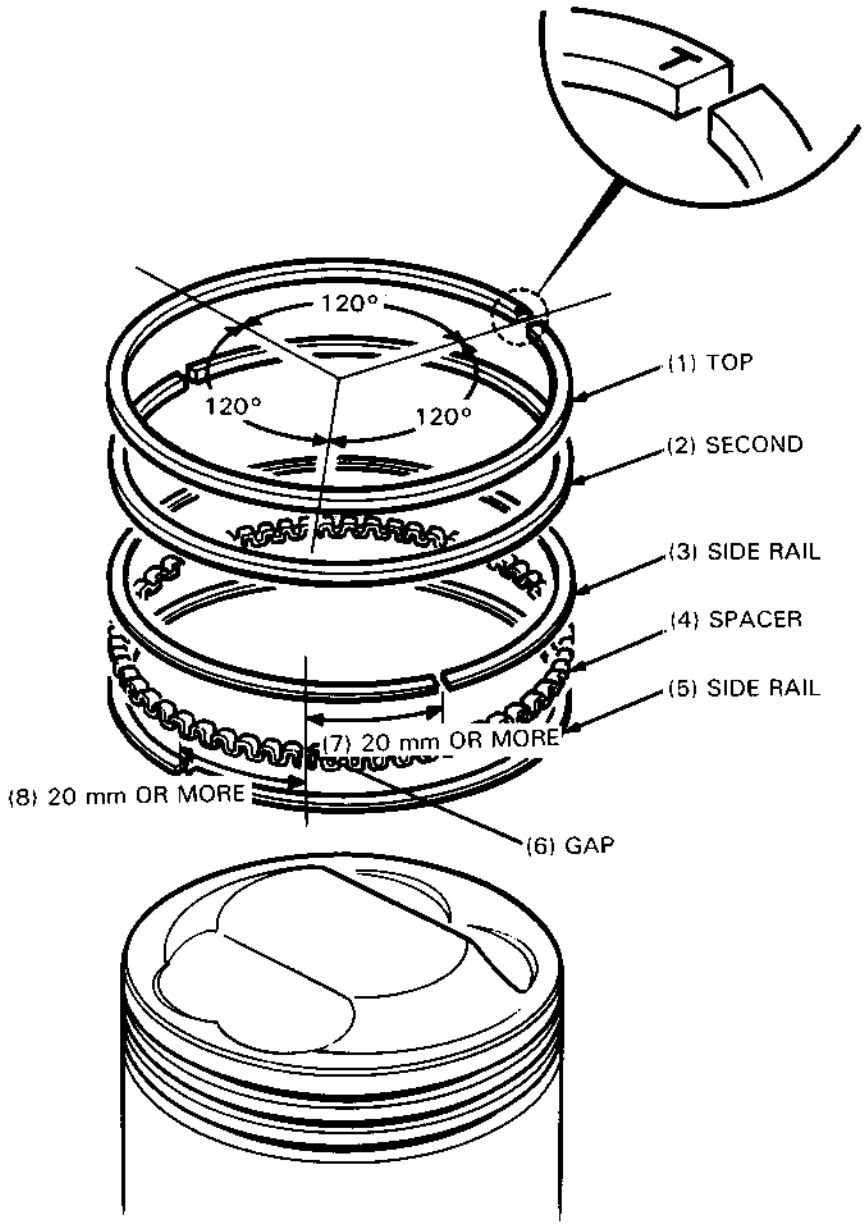
NOTE

- Avoid piston and piston ring damage during installation.
- All rings should be installed with the markings facing up.
- Aftr installation the rings should be free to rotate in the lands.





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

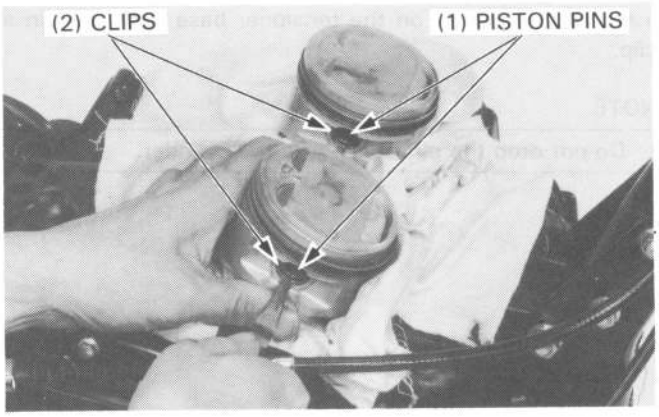


PISTON INSTALLATION

Install the pistons, piston pins and clips.

NOTE

- Position the mark "IN" on the piston on the intake valve side as for the piston marked with "IN".
- Install the pistons in their original locations.

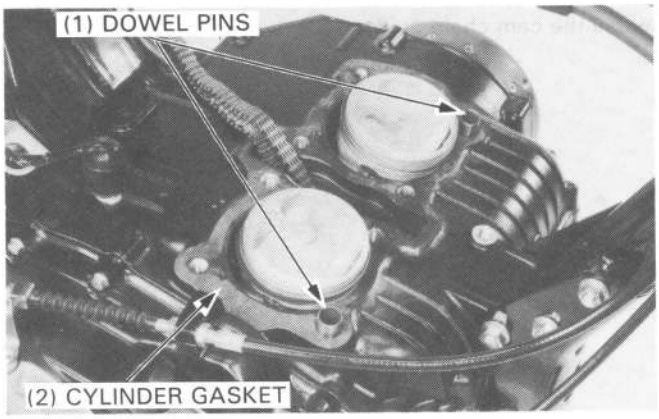


CYLINDER INSTALLATION

Install the dowel pins and cylinder gasket.

NOTE

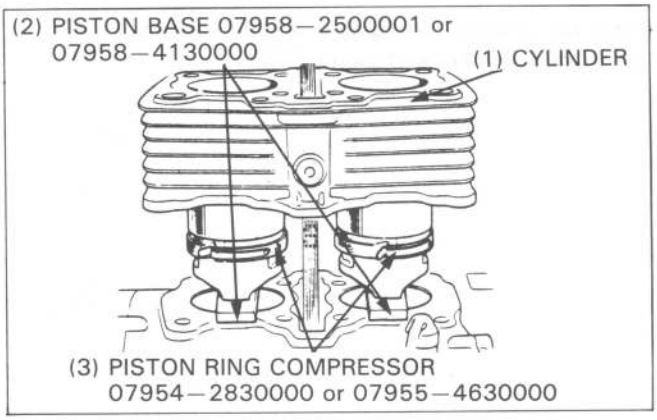
- Check that the oil control orifices are not clogged.



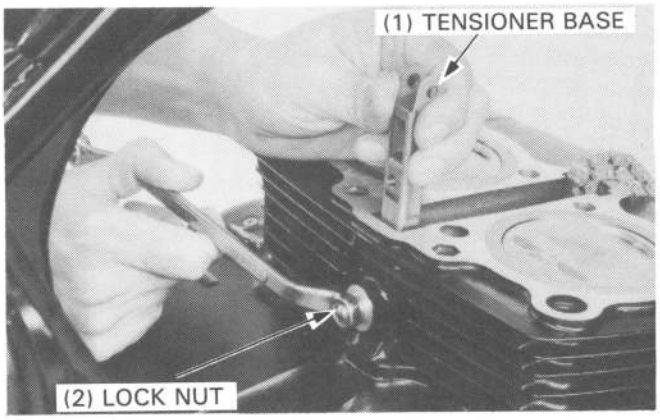
Install the cylinder.

NOTE

- Avoid damaging the pistons and piston rings when installing the cylinder.



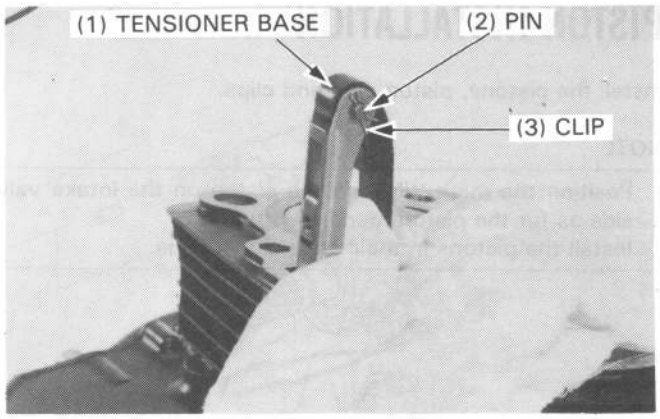
Install the tensioner.
Slide the O-ring over the tensioner base bolt and install the base on the cylinder with plain washer and lock nut.
Tighten the lock nut with the tensioner base pulled up fully.



Install the tensioner on the tensioner base with the pin and clip.

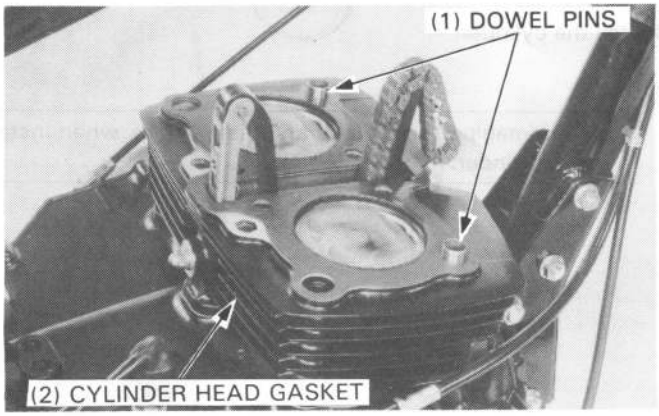
NOTE

- Do not drop the pin or clip into the cylinder.

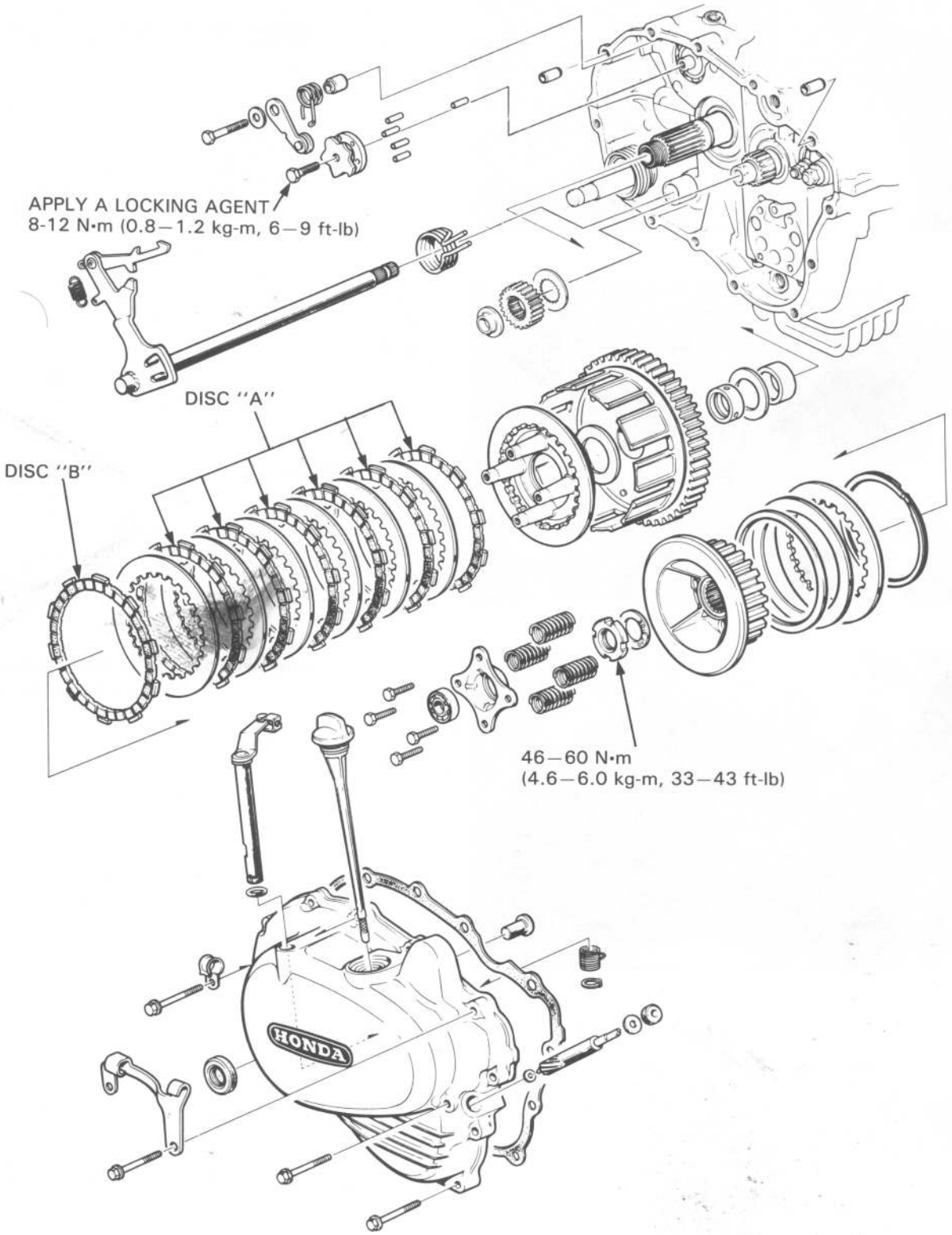


Install the cam chain guide.

Install the cylinder head gasket and dowel pins.
Install the cylinder head (page 6-13).



MEMO


APPLY A LOCKING AGENT
8-12 N·m (0.8—1.2 kg-m, 6—9 ft-lb)
DISC "A"
DISC "B"
46—60 N·m
(4.6—6.0 kg-m, 33—43 ft-lb)
HONDA

8. CLUTCH/GEARSHIFT LINKAGE

SERVICE INFORMATION

GENERAL

- This section covers the removal and installation of the right crankcase cover, clutch and gearshift linkage. All these operations can be accomplished with the engine in the frame.

SPECIFICATIONS

ITEM			STANDARD	SERVICE LIMIT
Clutch	Lever free play (at lever end)		10–20 mm (3/8–3/4 in)	—
	Disc spring-to-clutch center clearance		0.1–0.5 mm (0.004–0.020 in)	—
	Spring free length		42.5 mm (1.67 in)	41.0 mm (1.61 in)
	Spring preload/length		23.6–26.4 kg/29 mm (52.0–58.2 lbs/1.14 in)	22 kg/29 mm (49 lbs/1.14 in)
	Disc thickness	A	2.7 mm (0.106 in)	2.30 mm (0.090 in)
		B	3.0 mm (0.118 in)	2.60 mm (0.102 in)
	Plate warpage	A	—	0.20 mm (0.008 in)
		B	—	0.20 mm (0.008 in)
	Clutch outer I.D.		32.000–32.025 mm (1.2598–1.2608 in)	32.07 mm (1.263 in)
	Clutch outer guide O.D.		31.959–31.975 mm (1.2582–1.2589 in)	31.90 mm (1.256 in)

TORQUE VALUES

Clutch lock nut	46–60 N·m (4.6–6.0 kg-m, 33–43 ft-lb)
Drive gear bolt	46–50 N·m (4.6–5.0 kg-m, 33–36 ft-lb)
Shift cam plate	8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)

TOOLS

Special

Clutch center holder	07923–KE10000

Common

Universal holder	07725–0030000	Equivalent commercially available in U.S.A.
Lock nut wrench, 26 x 30 mm	07716–0020203	

TROUBLESHOOTING

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

Clutch slips when accelerating
1. No free play
2. Discs worn
3. Springs weak

Clutch will not disengage
1. Too much free play
2. Plates warped

Motorcycle creeps with clutch disengaged
1. Too much free play
2. Plates warped

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

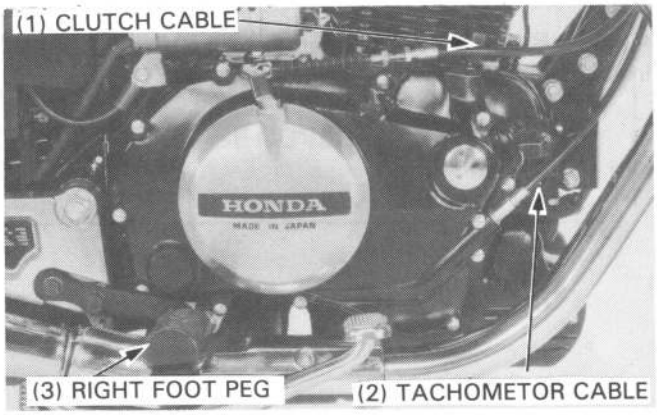
Clutch operation feels rough
1. Outer drum slots rough

Hard to shift
1. Improper clutch adjustment; too much free play
2. Shift forks bent
3. Shift shaft bent
4. Shift claw bent
5. Shift drum cam grooves damaged

Transmission jumps out of gear
1. Gear dogs worn
2. Shift shaft bent
3. Shift drum stopper broken
4. Shift forks bent

RIGHT CRANKCASE COVER REMOVAL

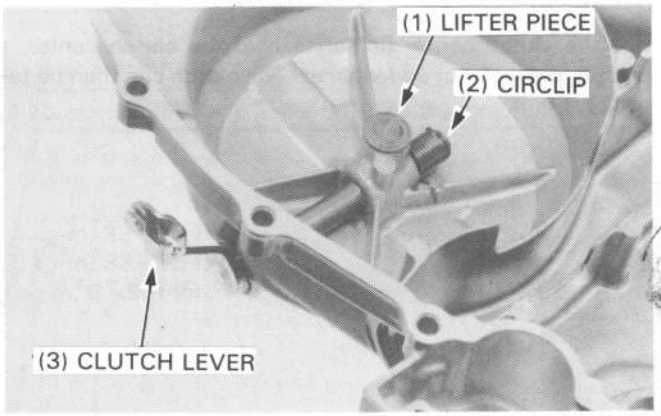
Drain all oil from the engine.
Disconnect the tachometer at the engine.
Free the clutch cable at the lower adjuster.
Remove the right foot peg.



Remove the right crankcase cover.
Remove the gasket and dowel pins.

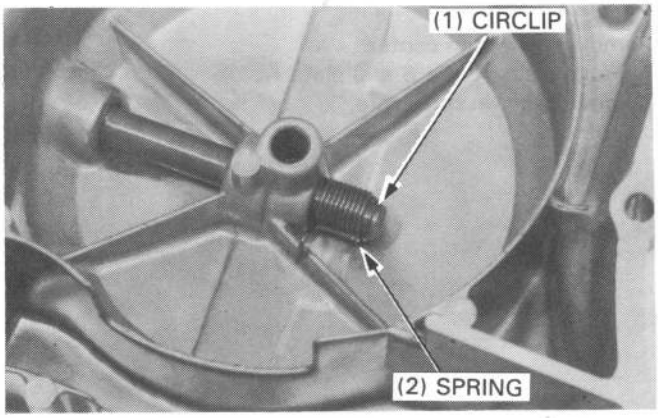
CLUTCH LIFTER REMOVAL

Remove the lifter piece, circlip, spring, clutch lever and O-ring.

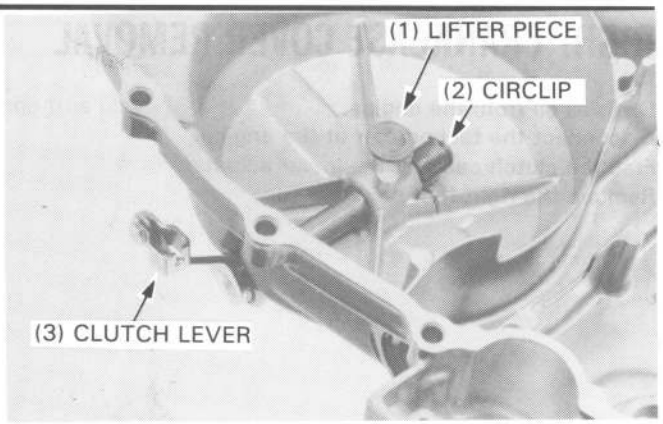


CLUTCH LIFTER INSTALLATION

Install the O-ring on the clutch lever.
Secure the lever with the spring and circlip.



Rotate the lever about 120 degrees.
Install the lifter piece by aligning the holes.



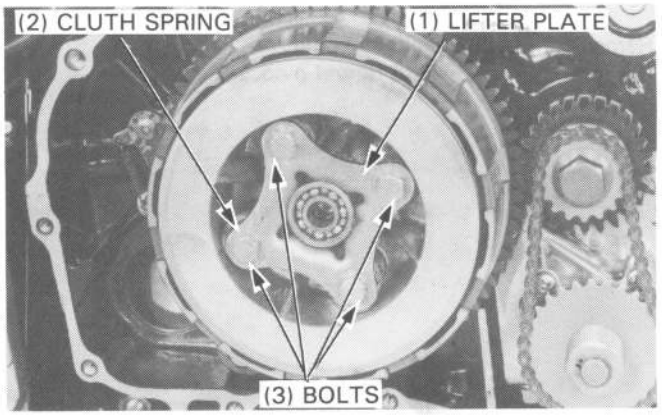
CLUTCH

REMOVAL

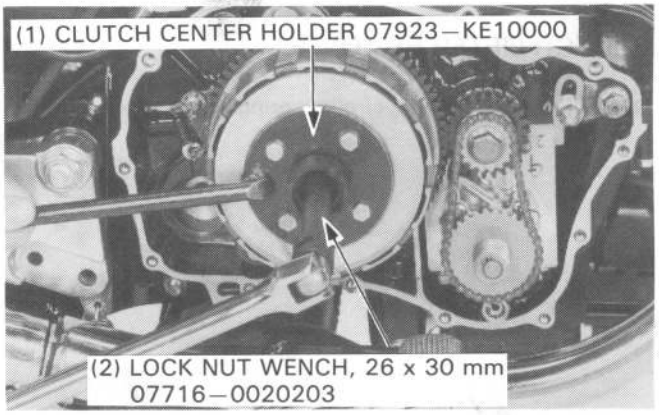
Remove the bolts, lifter plate and clutch springs.

NOTE

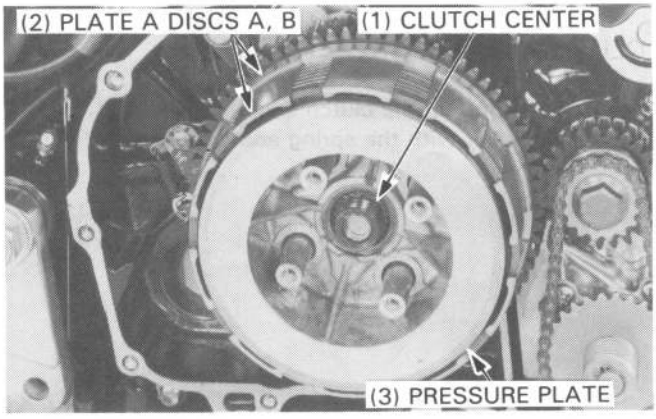
- Loosen the bolts in an X pattern in two or more steps.



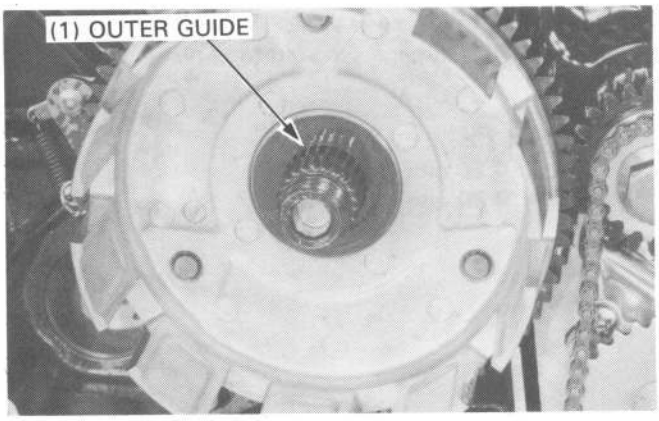
Use the clutch center holder to hold the clutch center, and remove the lock nut and washer. The clutch can then be taken out as a unit.



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, thrust washer and collar.

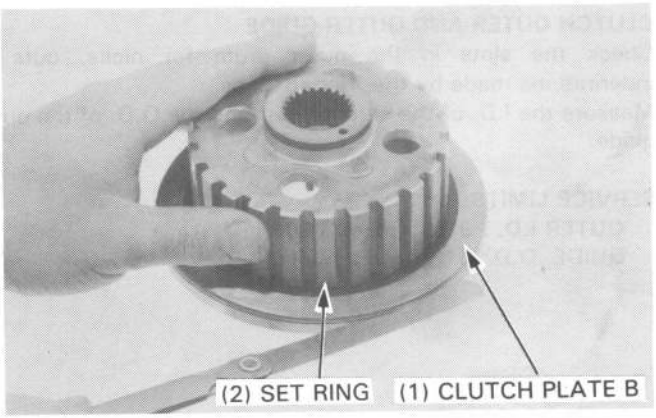


INSPECTION

DISC SPRING
Measure clearance between the clutch center and plate B.

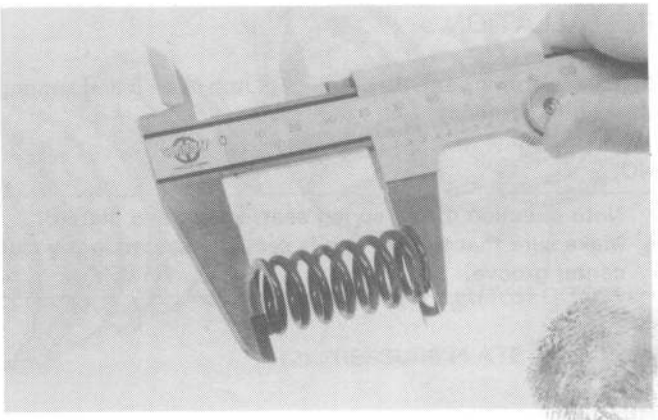
After measuring, remove the set ring, clutch plate B, clutch disc spring and spring seats.

STANDARD: 0.1—0.5 mm (0.004—0.020 in)



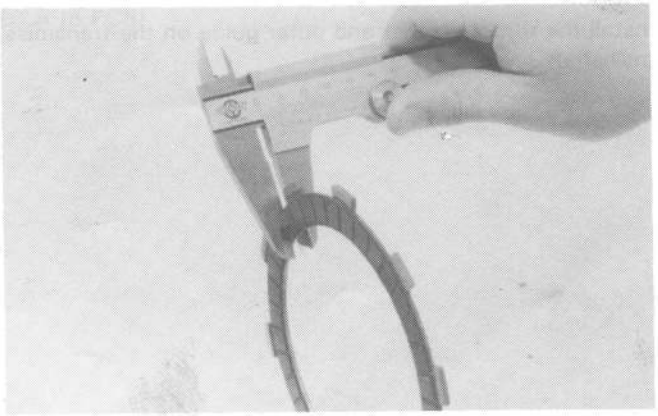
CLUTCH SPRING
Check spring free length.

SERVICE LIMIT: 41.0 mm (1.61 in)



CLUTCH DISC
Replace the clutch discs if they show signs of scoring or discoloration.
Measure disc thickness.
Replace the disks as a set if they are less than the service limit.

SERVICE LIMITS:
DISC A: 2.30 mm (0.90 in)
DISC B: 2.60 mm (0.102 in)

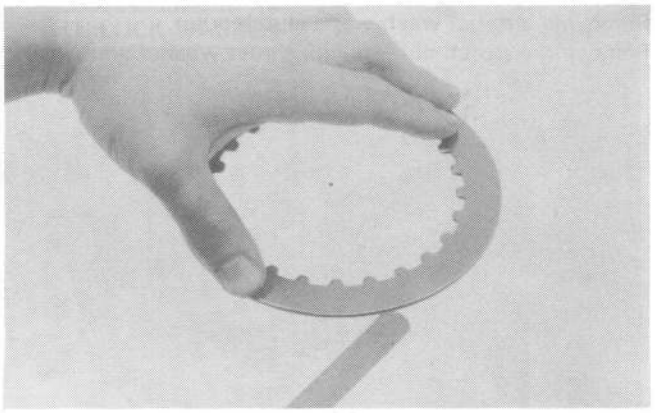


PLATE

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)

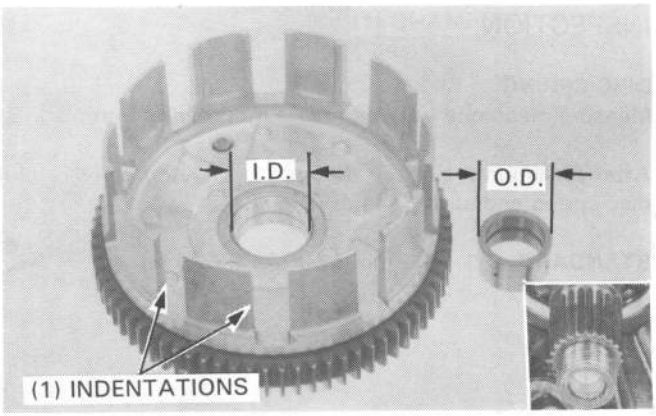


CLUTCH OUTER AND OUTER GUIDE

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

SERVICE LIMITS:

OUTER I.D. : 32.07 mm (1.263 in)
GUIDE O.D.: 31.90 mm (1.256 in)

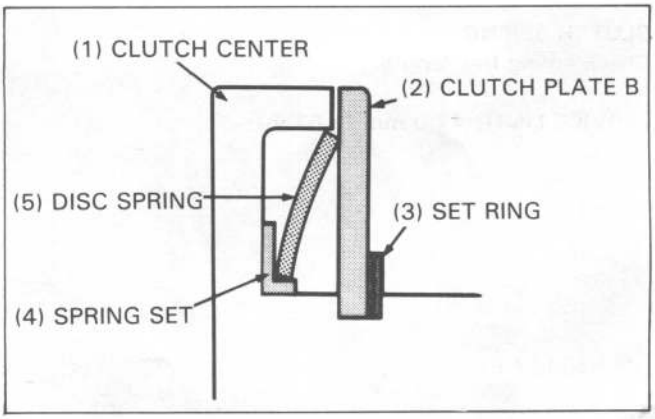


INSTALLATION

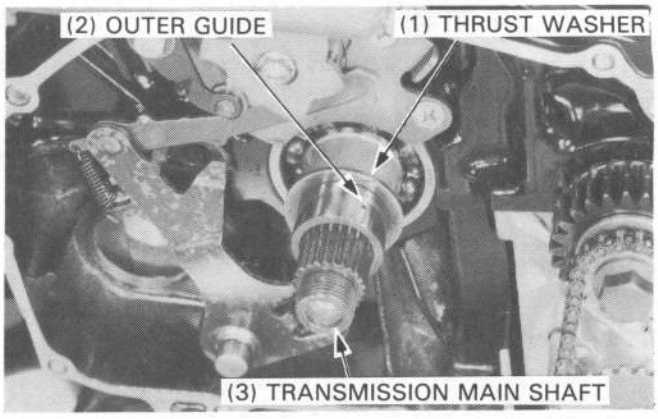
Install the spring seat, disc spring, clutch plate B and set ring in the clutch center.

NOTE

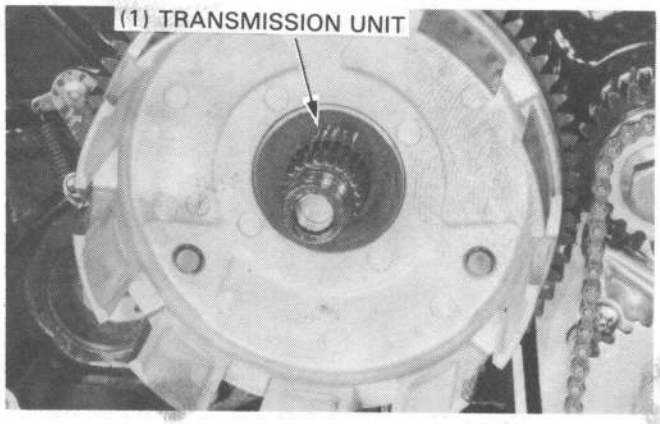
- Note direction of the spring seat, spring and plate B.
- Make sure that the set ring is securely seated in the clutch center groove.



Install the thrust washer and outer guide on the transmission mainshaft.



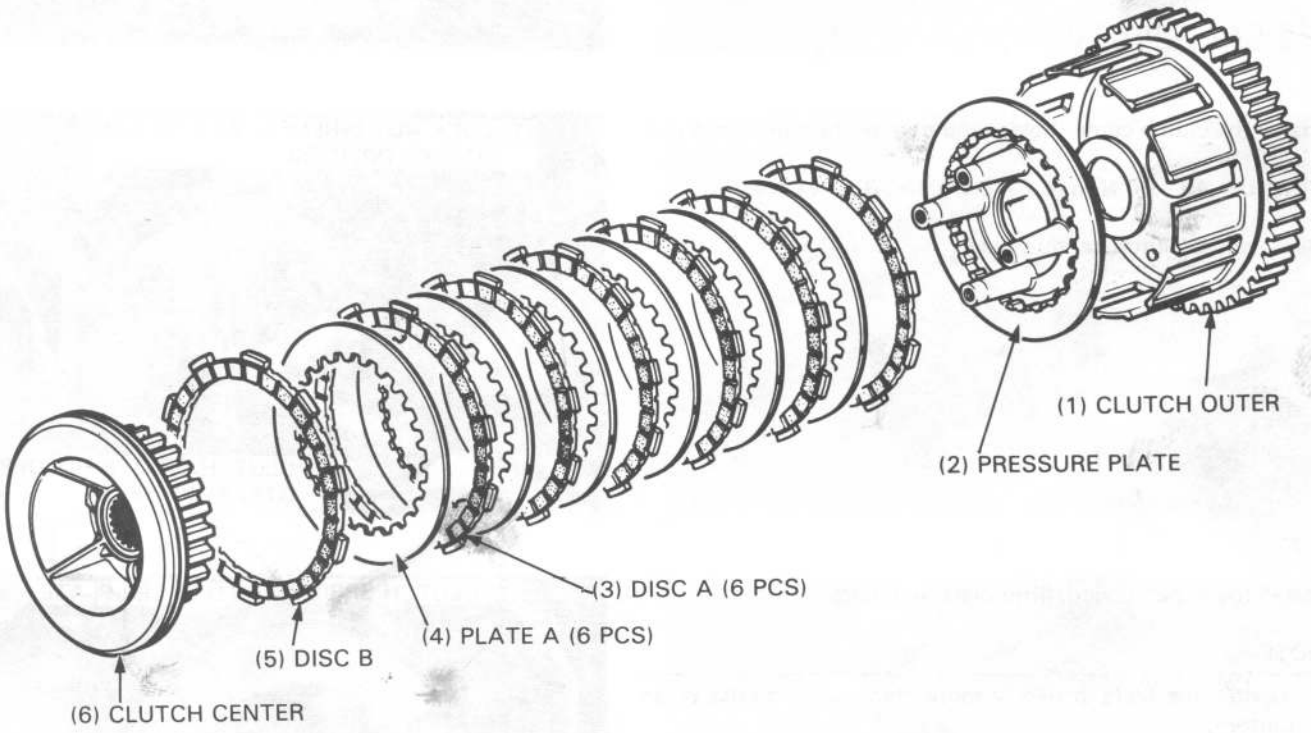
Install the clutch outer and thrust washer.



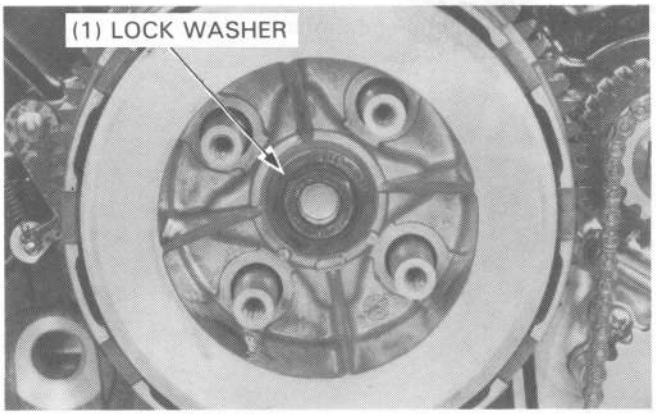
Install the following parts in the clutch outer in the order listed.

- Pressure plate
- Disc A and plate A (6 each) alternately one after the other
- Disc B
- Clutch center

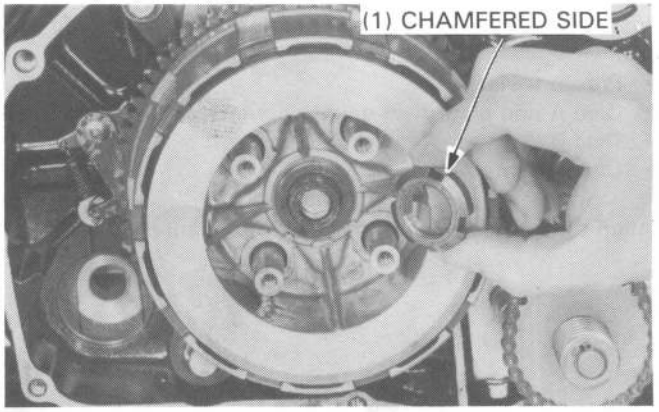
Align the splines by rotating the clutch center.



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



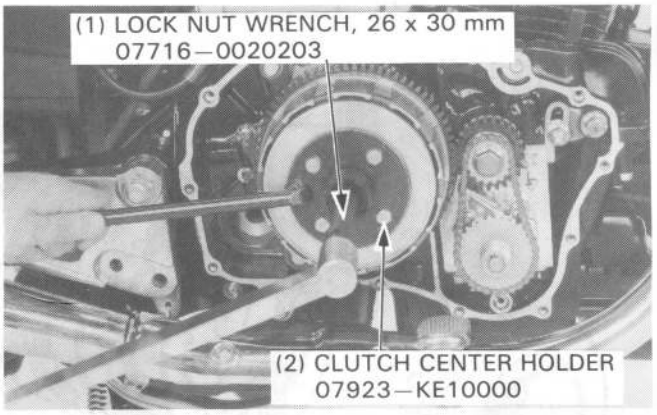
Loosely install the clutch lock nut with the chamfered side facing in.



Install the clutch center holder and tighten the clutch lock nut.

TORQUE: 46–60 N·m (4.6–6.0 kg-m, 33–43 ft-lb)

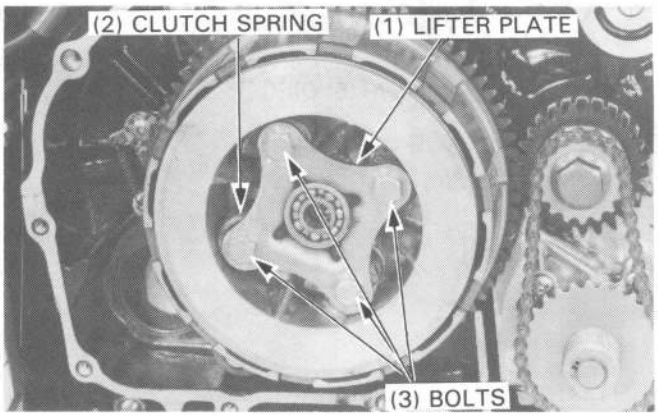
Remove the clutch center holder.



Install the clutch spring, lifter plate and bolts.

NOTE

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

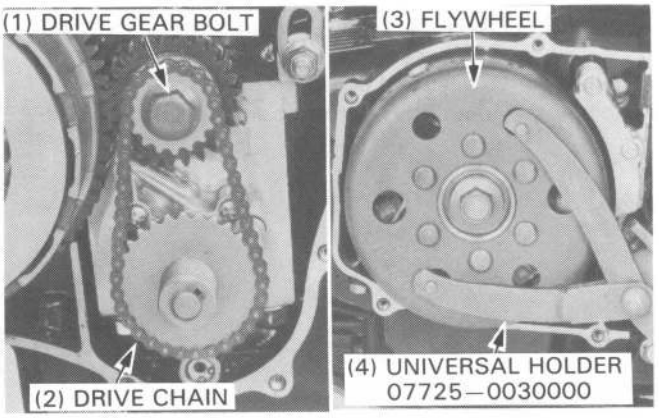


PRIMARY DRIVE GEAR

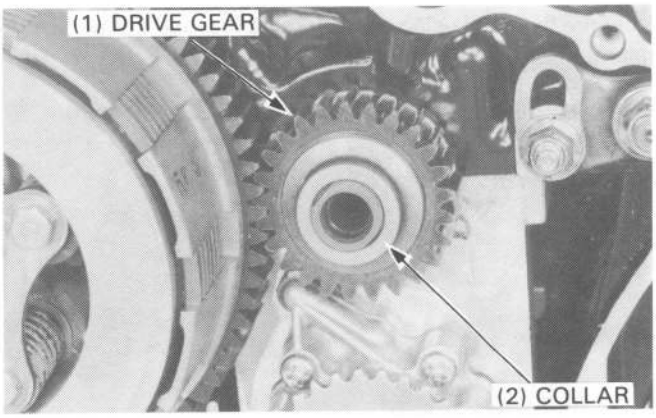
REMOVAL

Remove the left crankcase cover.
Hold the flywheel with the universal holder and remove the primary drive gear bolt.

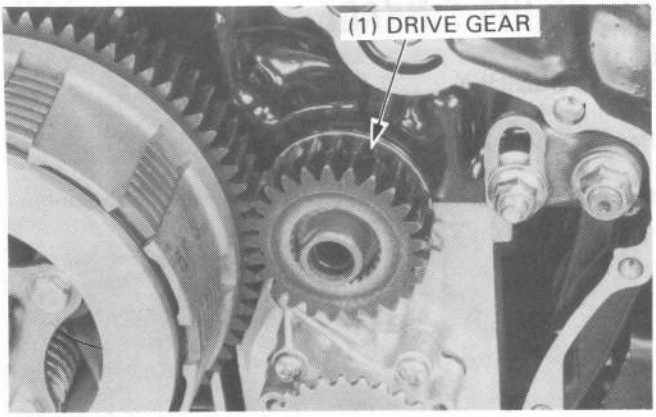
Remove the oil pump drive sprocket and chain.



Remove the collar.

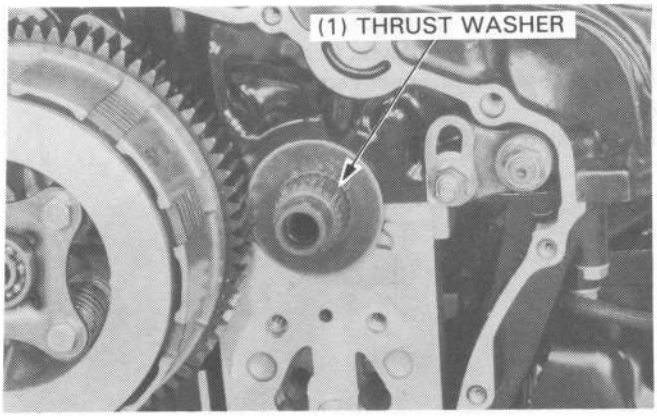


Remove the drive gear.



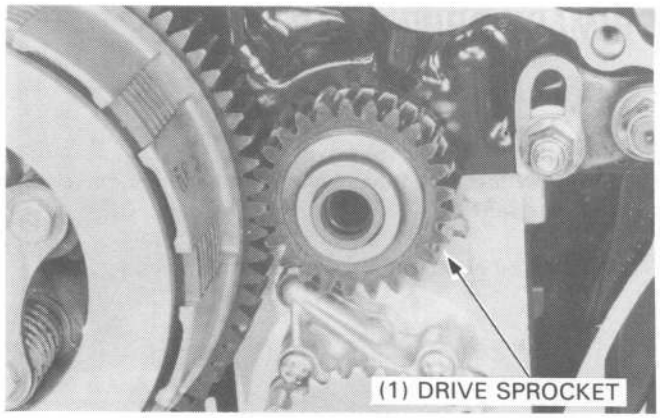
Check the thrust washer for damage.

Remove the clutch, then replace the thrust washer, if necessary.



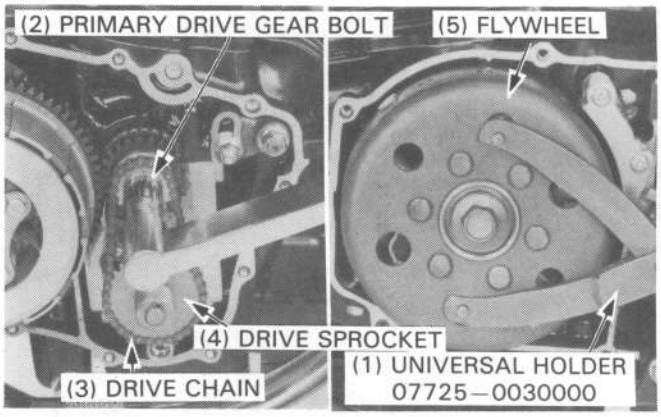
INSTALLATION

Install the drive gear and collar.
Install the oil pump drive sprocket and chain (page 2-9).



Hold the flywheel using a universal holder and tighten the drive gear bolt.

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

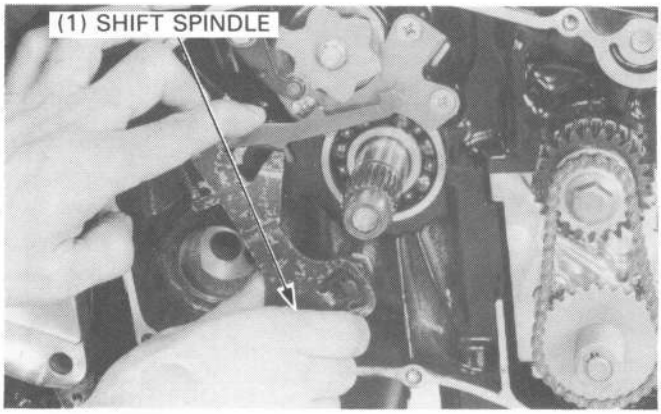


GEARSHIFT LINKAGE

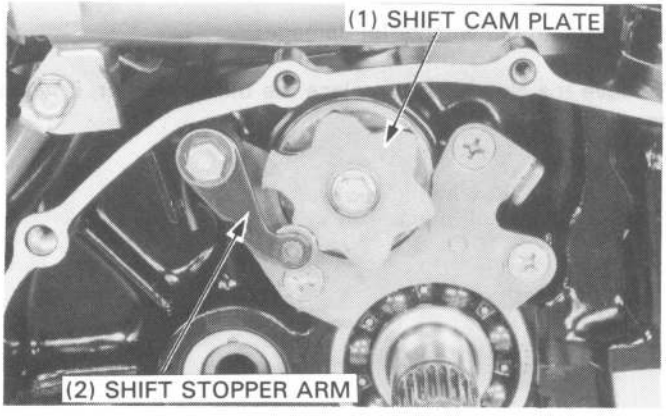
DISASSEMBLY

Remove the clutch.

Remove the gearshift spindle and gearshift return spring.



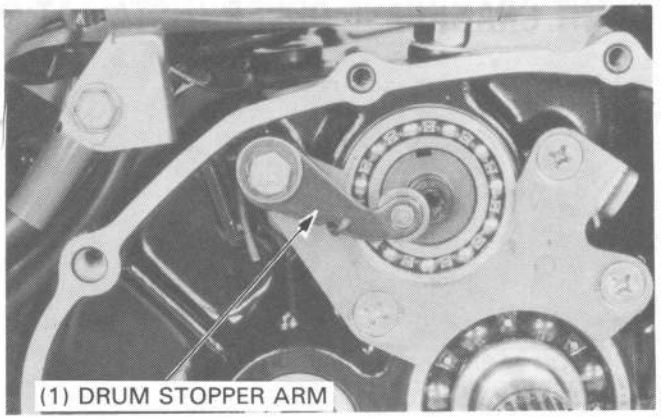
Remove the drum spopper arm and spring.
Remove the shift cam plate bolt.
Remove the drum stopper cam plate, gearshift drum pins and collar.
Inspect all parts for wear or damage.



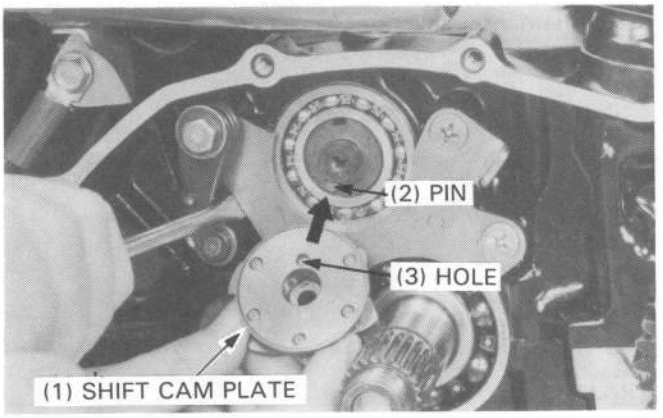
ASSEMBLY

Install the drum stopper arm and spring, noting the spring position.

After installing the drum stopper arm, check the stopper arm for smooth operation.

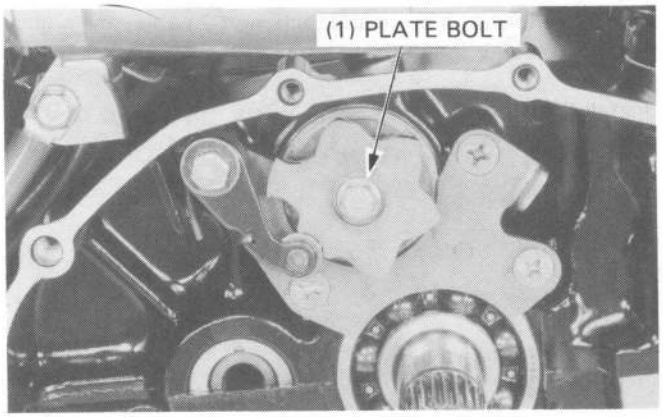


Assemble the drum pins and shift cam plate.
Align the hole in the shift drum collar with the pin on the shift drum and install.



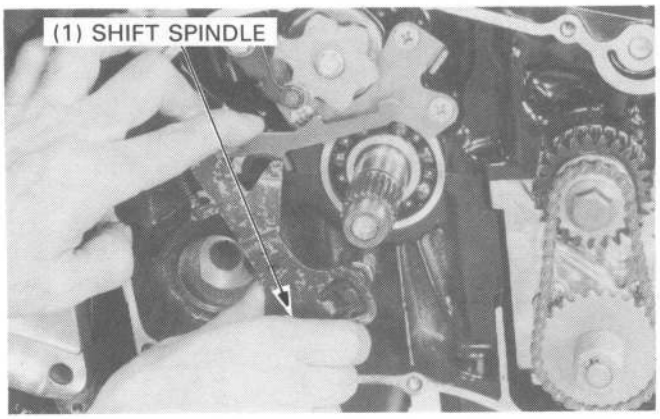
Apply a locking agent to the bolt threads and underside of bolt heads during assembly.
Tighten the plate bolt.

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



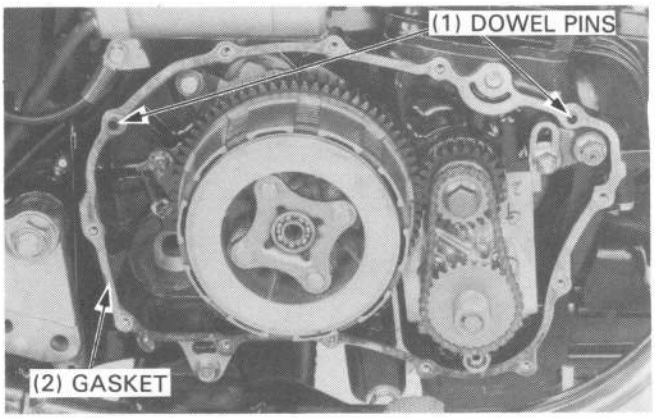
Assemble the gearshift spindle and gearshift return spring.
Install the gearshift spindle and return spring as shown.

After installing, check the linkage for smooth operation by rotating the gearshift spindle.
Install the clutch assembly.
Install the gearshift pedal.

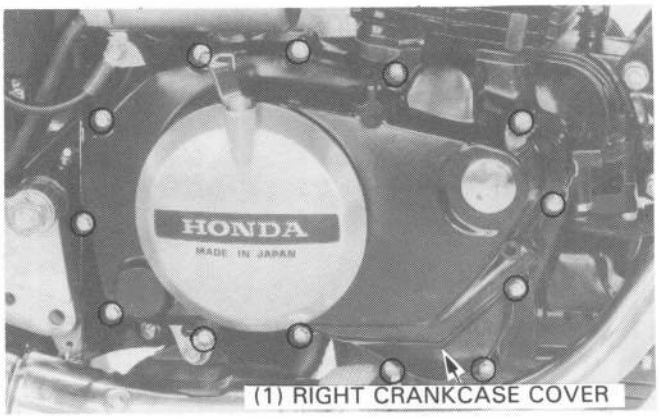


RIGHT CRANKCASE COVER INSTALLATION

Install the dowel pins and a new gasket.

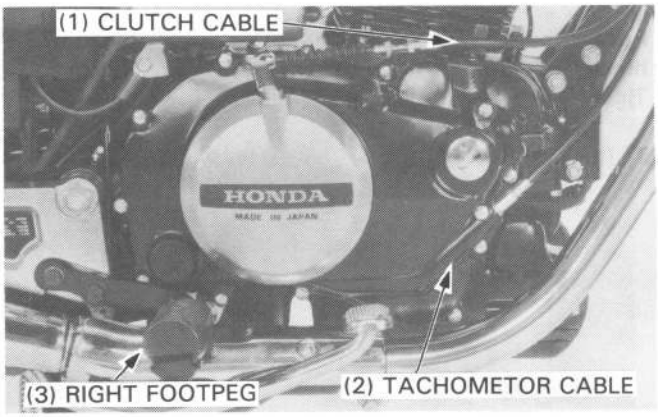


Install the right crankcase cover and tighten the cover bolts.

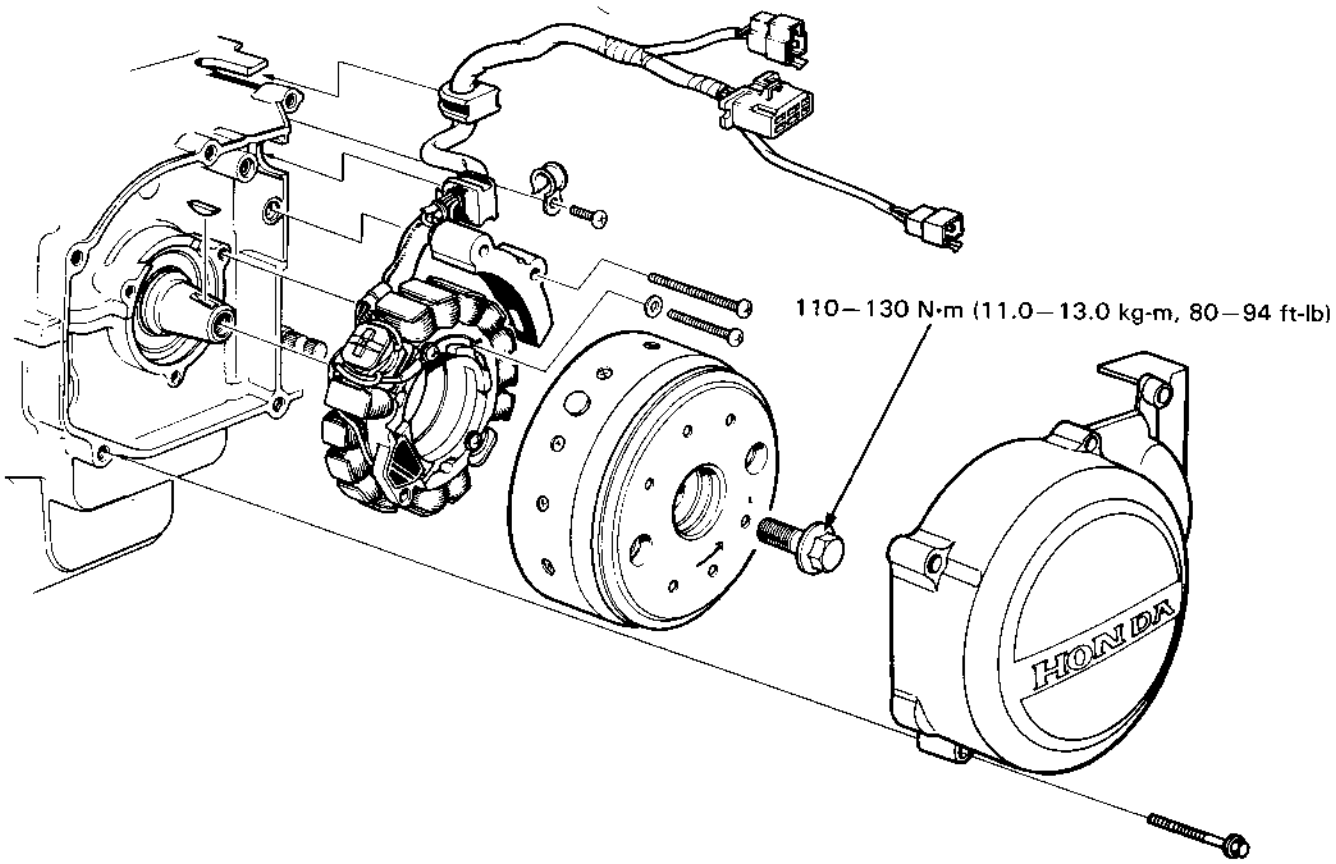


Connect the clutch cable and tachometer cable, and adjust the clutch free play (page 3-15).

Install the right footpeg.



MEMO


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

9. ALTERNATOR

SERVICE INFORMATION

GENERAL

- This section covers removal and installation of the alternator. All these operation can be done with the engine in the frame.
- For inspection and troubleshooting of the alternator, see sections 16 and 17.

TORQUE VALUES

Flywheel bolt	110—130 N·m (11.0—13.0 kg-m, 80—94 ft-lb)
Gearshift pedal pinch bolt	9—14 N·m (0.9—1.4 kg-m, 7—10 ft-lb)

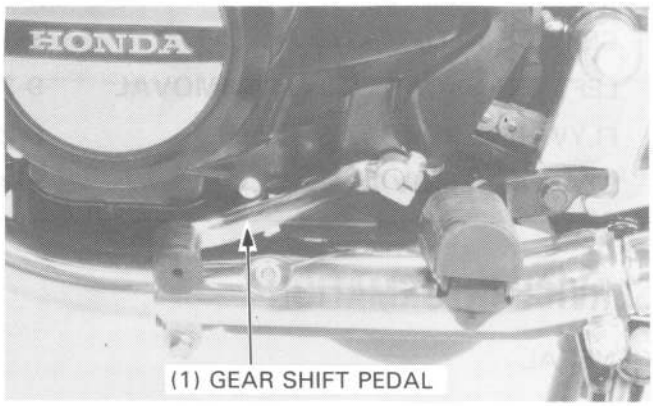
TOOLS

Common

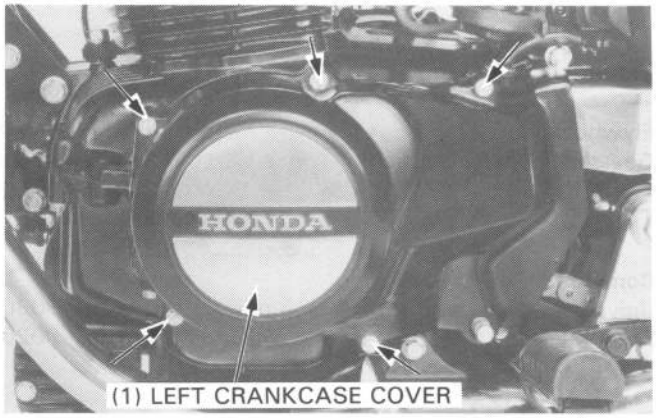
Universal holder	07725—0030000 Equivalent commercially available in U.S.A.
Rotor puller	07733—0020001 or 07933—3950000

LEFT CRANKCASE COVER REMOVAL

Remove the gearshift pedal.

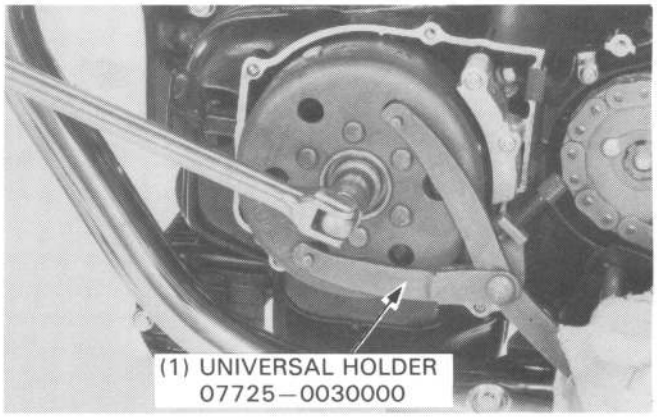


Remove the left crankcase cover.



FLYWHEEL REMOVAL

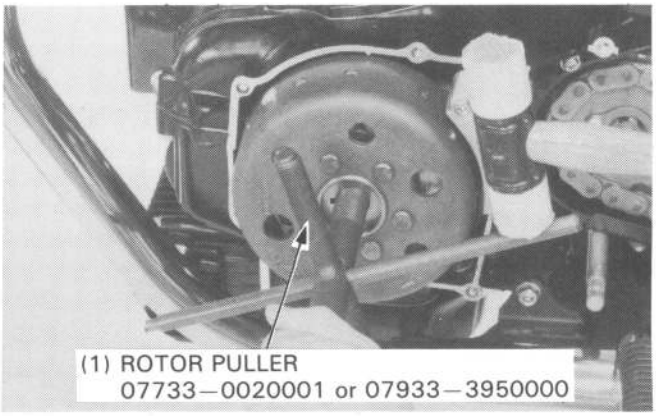
Hold the flywheel with a universal holder and remove the rotor bolt.



Remove the flywheel using a rotor puller.

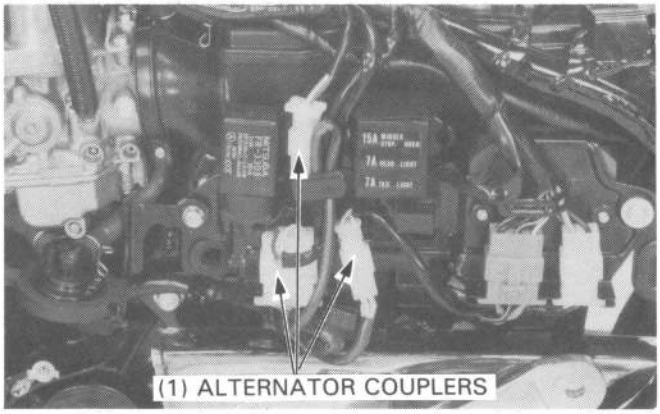
NOTE

- Do not lose woodruff key.

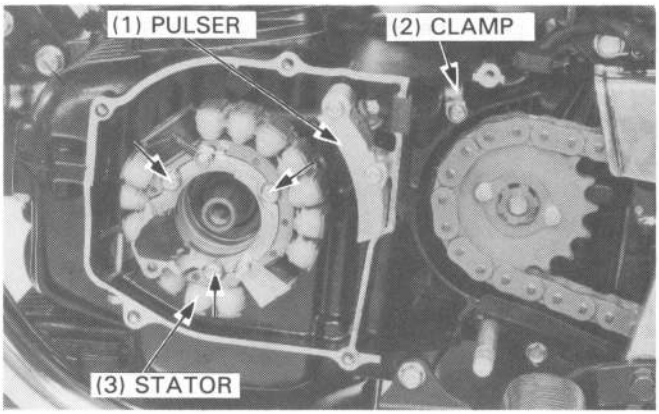


STATOR REMOVAL

Remove the left side cover and disconnect the alternator couplers.

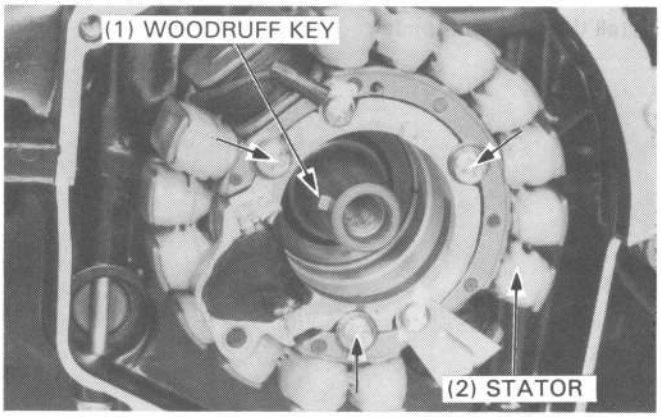


Remove the clamp.
Remove the stator and pulser.



STATOR INSTALLATION

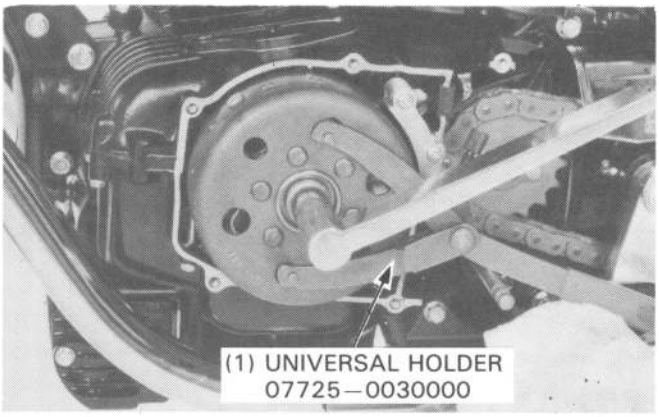
Install the stator and pulser in the reverse order of removal.
Install the woodruff key on the crankshaft.



FLYWHEEL INSTALLATION

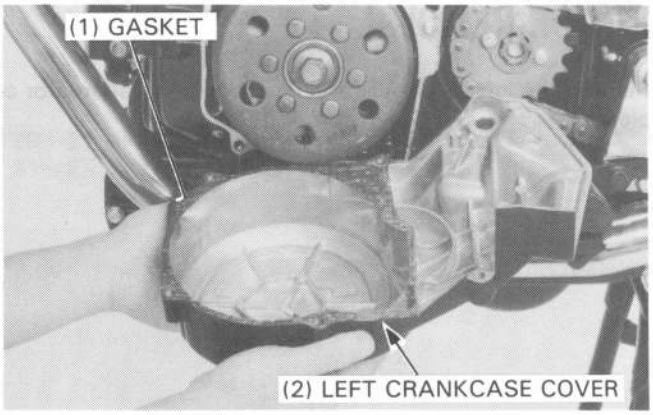
Install the flywheel, hold it with a universal holder and tighten the bolt.

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

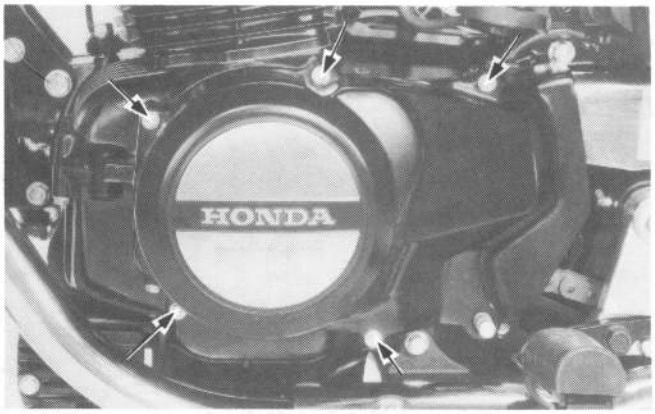


LEFT CRANKCASE COVER INSTALLATION

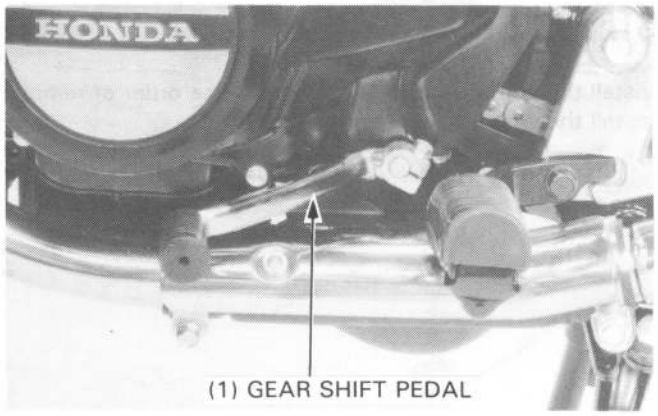
Install the gasket on the left crankcase cover and install the left crankcase cover.



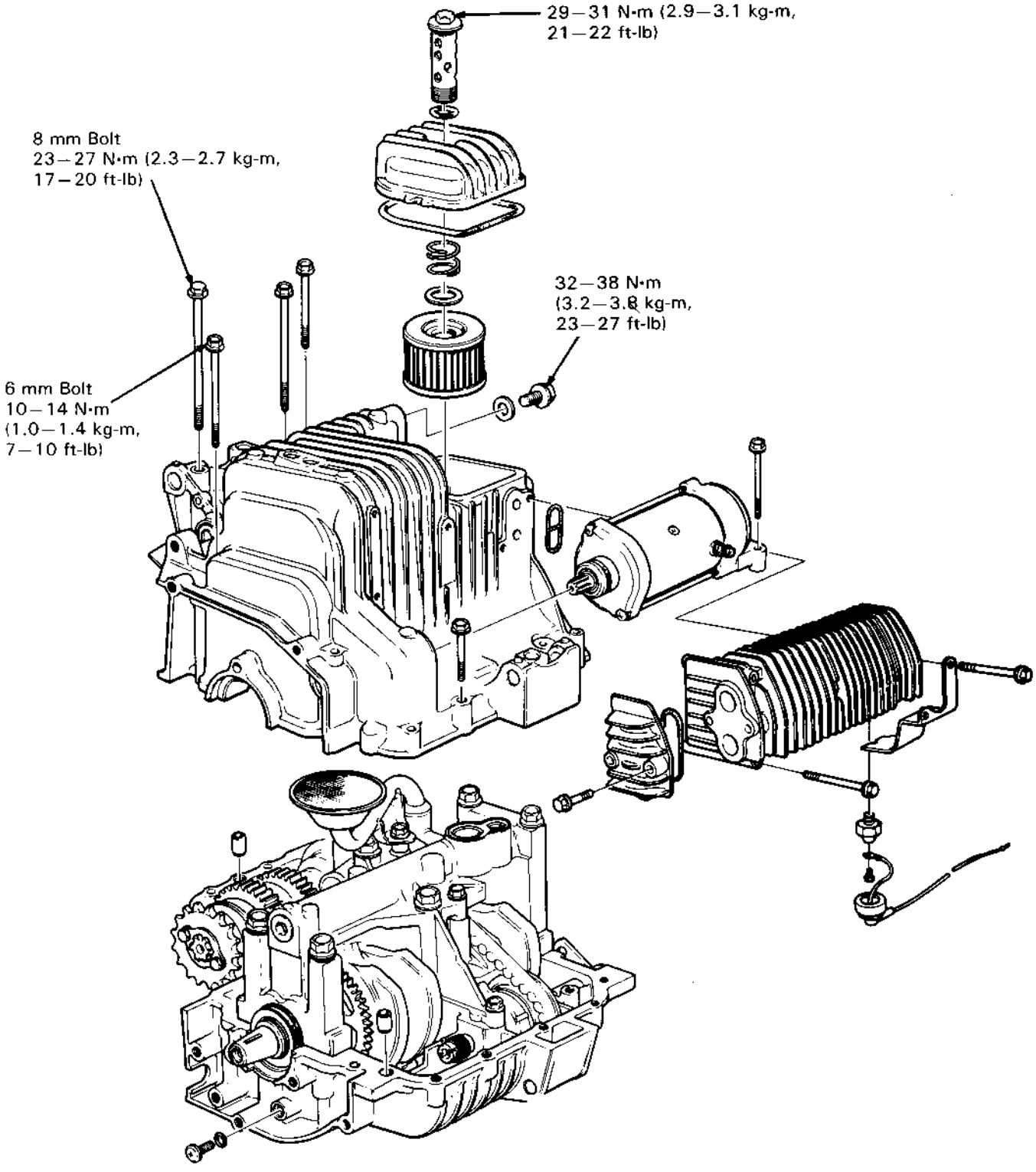
Install and tighten the left crankcase cover bolts.



Install the gear shift pedal.



MEMO


29–31 N·m (2.9–3.1 kg-m, 21–22 ft-lb)
8 mm Bolt
23–27 N·m (2.3–2.7 kg-m, 17–20 ft-lb)
32–38 N·m (3.2–3.8 kg-m, 23–27 ft-lb)
6 mm Bolt
10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)

10. CRANKCASE

SERVICE INFORMATION

GENERAL

- To repair the crankshaft, connecting rods, balancer 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 be removed before disassembling the crankcase.

• Cylinder head	Section 6
• Cylinders/pistons	Section 7
• Clutch	Section 8
• Oil cooler	Section 2
• Oil pump	Section 2
• Gearshift linkage	Section 8
• Alternator	Section 9
• Starter motor	Section 18

TORQUE VALUES

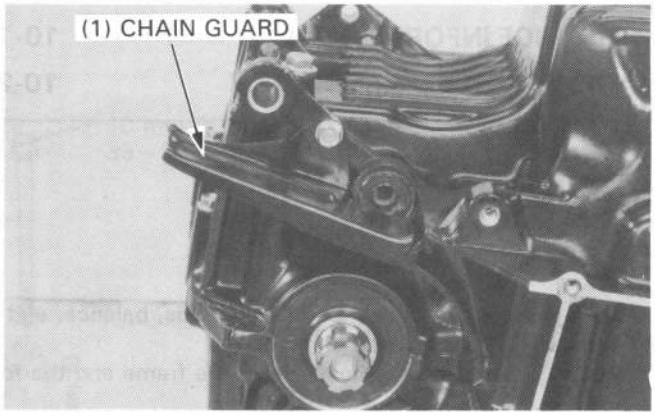
6 mm bolt (crankcase)	10—14 N·m (1.0—1.4 kg-m, 7—10 ft-lb)
8 mm bolt (crankcase)	23—27 N·m (2.3—2.7 kg-m, 17—20 ft-lb)

CRANKCASE DISASSEMBLY

Remove the engine from the frame (section 5).
Then remove the following:
- Cylinder head (section 6)
- Cylinder and piston (section 7)
- Clutch and gearshift linkage (section 8)
- Alternator (section 9)
- Oil pump and oil cooler (section 2)
- Starter motor (section 18)

NOTE

- It is not necessary to remove the cylinder head, cylinder, pistons and related parts when crankshaft removal is not required, or replament of lower crankcase transmission only is required.

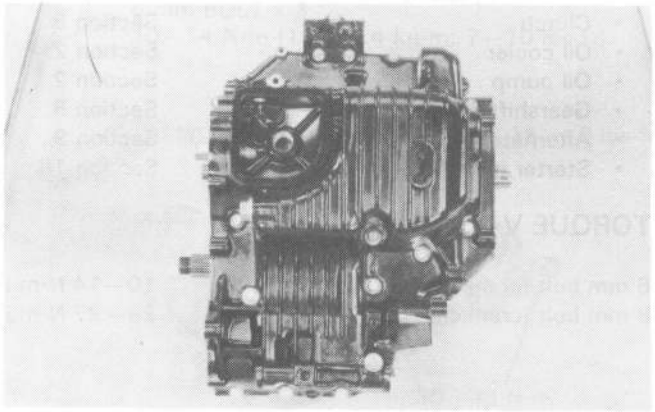


Remove the chain guard.
Turn the engine upside down.

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.

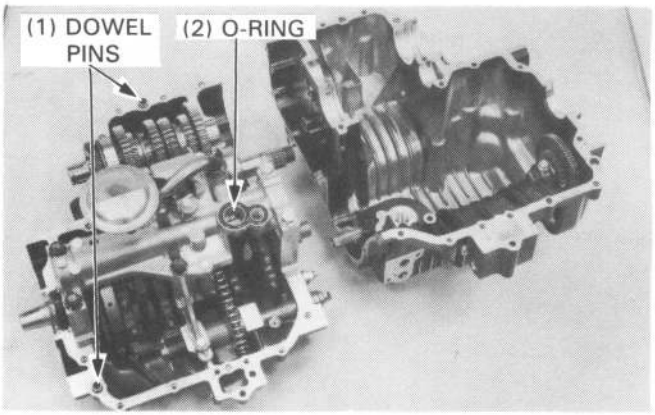


Remove the lower case.

CRANKCASE ASSEMBLY

Before assembling, apply liquid sealant to the mating surfaces.

Install the O-ring and dowel pins.

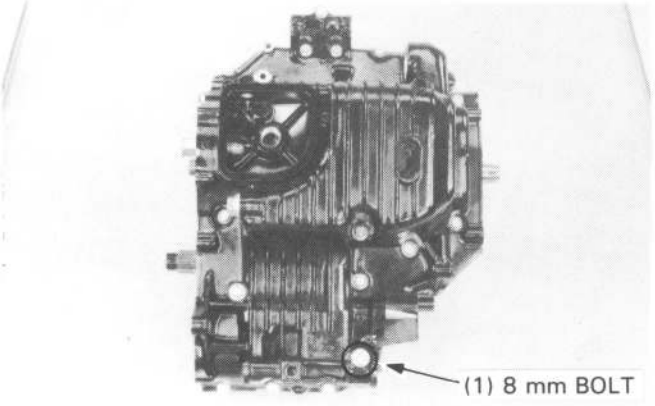


Position the lower case onto the upper case and tighten the bolts to the specified torques.

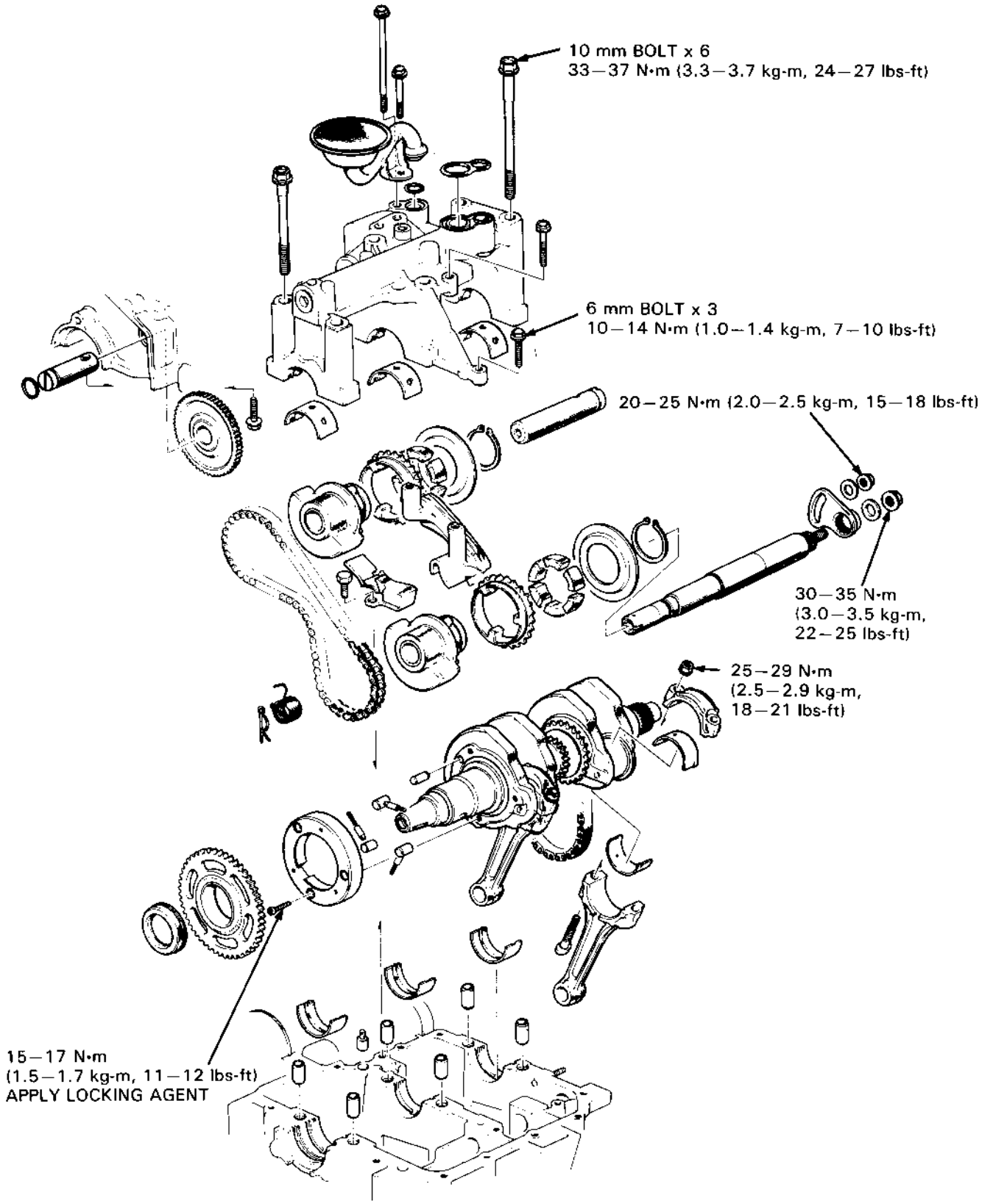
TORQUE VALUES:
6 mm BOLT: 10—14 N·m (1.0—1.4 kg-m, 7—10 ft-lb)
8 mm BOLT: 23—27 N·m (2.3—2.7 kg-m, 17—20 ft-lb)

NOTE

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



MEMO


10 mm BOLT x 6
33—37 N·m (3.3—3.7 kg-m, 24—27 lbs-ft)
6 mm BOLT x 3
10—14 N·m (1.0—1.4 kg-m, 7—10 lbs-ft)
20—25 N·m (2.0—2.5 kg-m, 15—18 lbs-ft)
30—35 N·m
(3.0—3.5 kg-m,
22—25 lbs-ft)
25—29 N·m
(2.5—2.9 kg-m,
18—21 lbs-ft)
15—17 N·m
(1.5—1.7 kg-m, 11—12 lbs-ft)
APPLY LOCKING AGENT

11. CRANKSHAFT/BALANCER

SERVICE INFORMATION

GENERAL

- 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 disulfied grease to the main journals and crankpins during assembly.

SPECIFICATIONS

ITEM		STANDARD	SERVICE LIMIT
Balancer	I.D.	18.010–18.028 mm (0.7090–0.7098 in)	18.04 mm (0.710 in)
	Shaft O.D.	17.966–17.984 mm (0.7073–0.7080 in)	17.95 mm (0.707 in)
	Balancer-to-shaft clearance	0.026–0.062 mm (0.0010–0.0024 in)	0.08 mm (0.003 in)
Crankshaft	Connecting rod big end side clearance	0.05–0.25 mm (0.002–0.010 in)	0.35 mm (0.014 in)
	Crankpin oil clearance	0.020–0.044 mm (0.0008–0.0017 in)	0.08 mm (0.003 in)
	Main journal oil clearance	0.020–0.044 mm (0.0008–0.0017 in)	0.08 mm (0.003 in)
	Runout	—	0.05 mm (0.002 in)
Electric starter gear	Drive gear O.D.	54.170–54.200 mm (2.1327–2.1339 in)	54.15 mm (2.132 in)
	Idler gear I.D.	16.00–16.05 mm (0.630–0.632 in)	16.06 mm (0.632 in)
	Idler gear shaft O.D.	15.966–15.984 mm (0.6286–0.6293 in)	15.95 mm (0.628 in)
	Idle gear-to-shaft clearance	0.028–0.084 mm (0.0010–0.0033 in)	0.10 mm (0.004 in)

TORQUE VALUES

Crankpin	25–29 N·m (2.5–2.9 kg-m, 18–21 ft-lb)
Bearing holder	
6 mm bolt	10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)
10 mm bolt	33–37 N·m (3.3–3.7 kg-m, 24–27 ft-lb)
Stopper plate	30–35 N·m (3.0–3.5 kg-m, 22–25 ft-lb)
Stopper plate lock nut	20–25 N·m (2.0–2.5 kg-m, 14–18 ft-lb)
Starter clutch	15–17 N·m (1.5–1.7 kg-m, 11–12 ft-lb)

TOOL

Common

Torx driver bit	07746–0010100	Equivalent commercially available in U.S.A.

TROUBLESHOOTING

Excessive noise

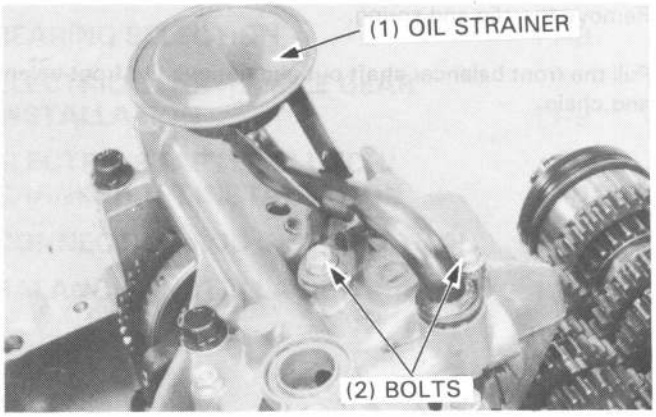
1. Crankshaft
   - Worn main journal bearing
   - Worn crankpin bearing
2. Balancer
   - Improper timing adjustment
   - Improper chain adjustment
   - Damaged chain

BALANCER REMOVAL

Separate the crankcase (Section 10).

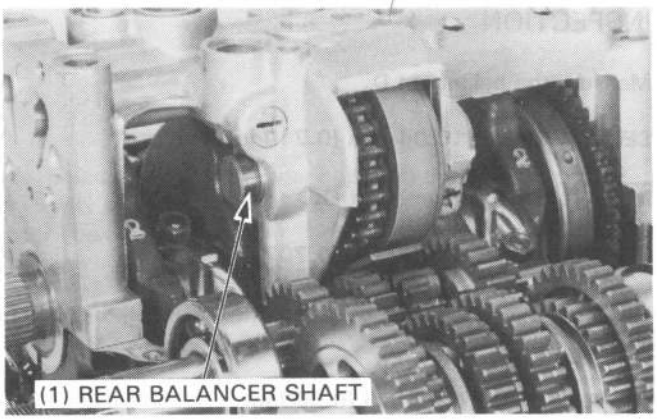
Remove the oil strainer.

Remove the bearing holder bolts and front chain guide bolts.

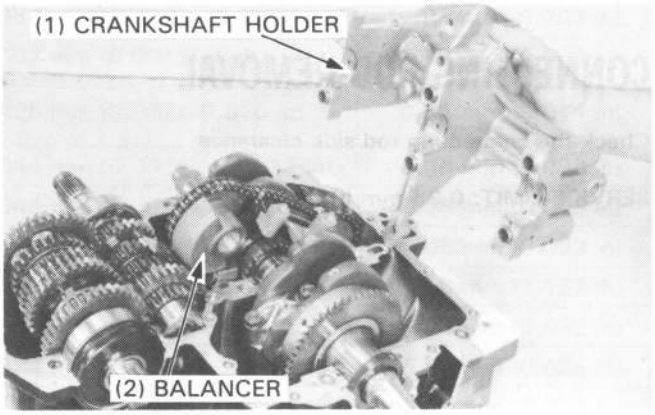


Remove the rear balancer shaft.

Remove the balancer chain slides bolt.



Remove the crankshaft holder.
Remove the rear balancer.

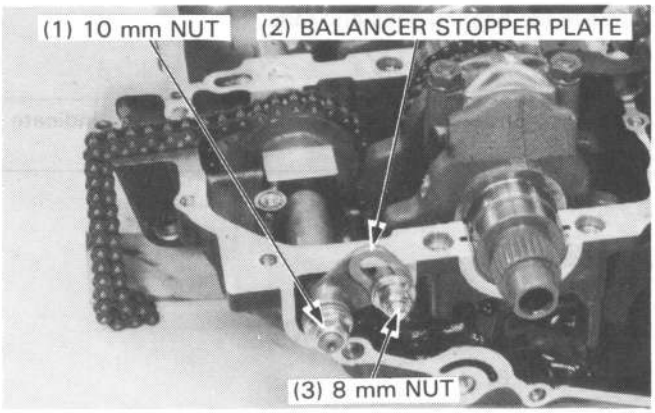


REAR BLANCER REMOVAL

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

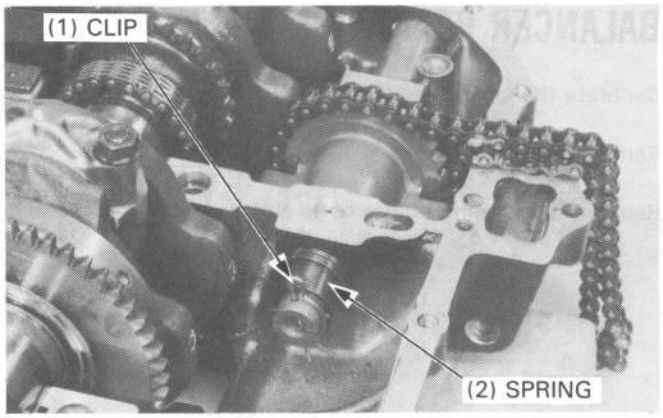
NOTE

- It is not necessary to remove the 10 mm nut when balancer and/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)

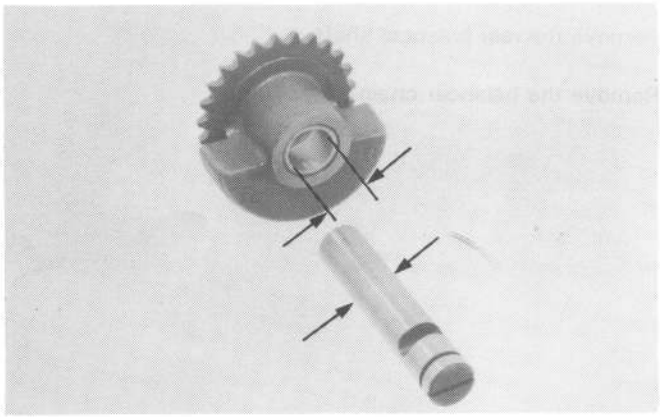
Measure the balancer shaft O.D.

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)

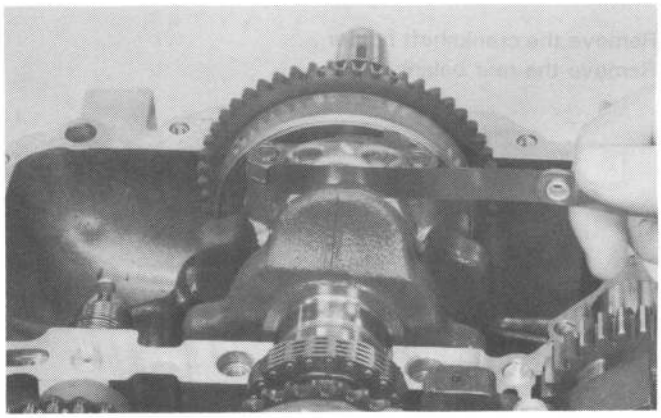
Replace the balancer and shaft if the service limit is exceeded.



CONNECTING ROD REMOVAL

Check the connecting rod side clearance.

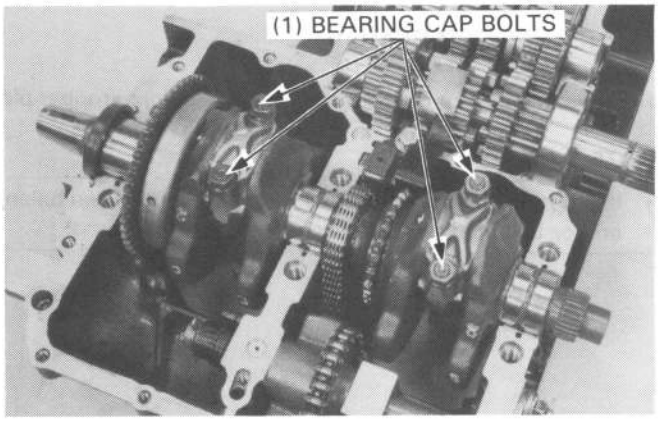
SERVICE LIMIT: 0.35 mm (0.014 in)



Remove the bearing caps and rods.

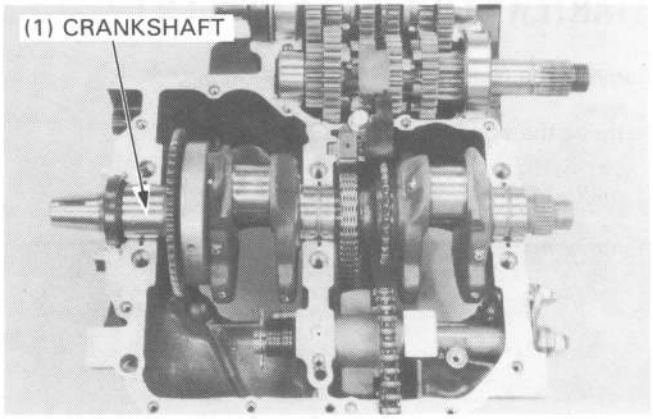
NOTE

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



CRANKSHAFT REMOVAL

Remove the crankshaft.



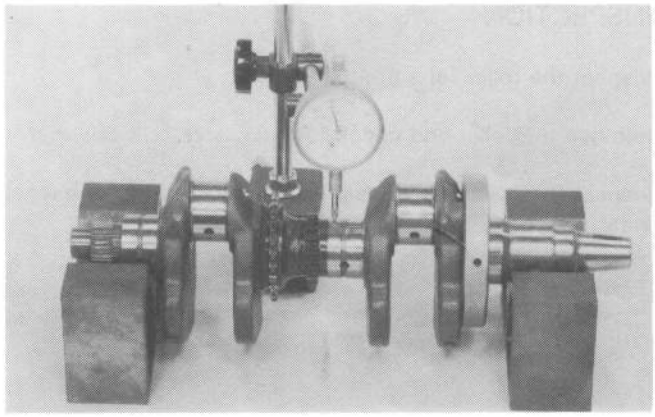
Set the crankshaft on a stand or V blocks.

Set a dial gauge into the center main journal.

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

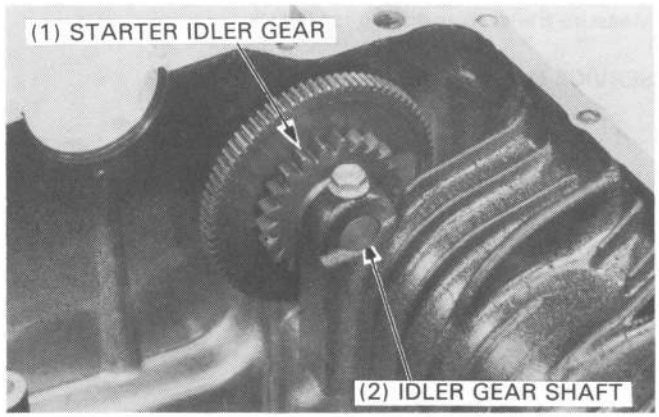
Actual runout is 1/2 of the total indicator reading.

SERVICE LIMIT: 0.05 mm (0.002 in)



ELECTRIC STARTER IDLER GEAR REMOVAL

Remove the bolt, pull out the idler gear shaft, and take out the idler gear.



INSPECTION

Inspect the idler gear for tooth damage and measure the idler gear I.D.

SERVICE LIMT: 16.06 mm (0.632 in)

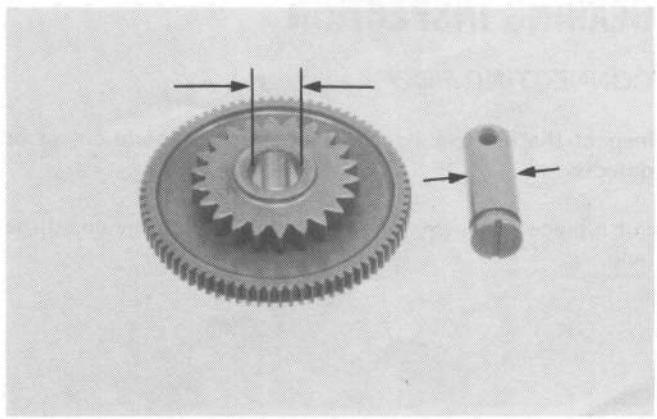
Measure the idler gear shaft O.D.

SERVICE LIMT: 15.95 mm (0.628 in)

Calculate the idler gear-to-shaft clearance.

SERVICE LIMT: 0.10 mm (0.004 in)

Replace the idler gear and shaft if the service limit is exceeded.



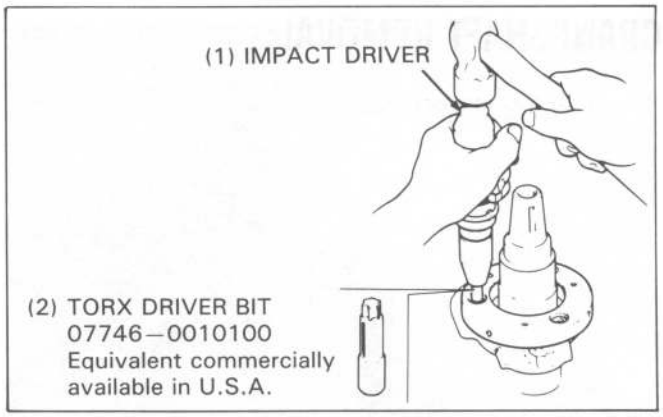
STARTER CLUTCH REMOVAL

Remove the oil seal.

Remove the starter drive gear.

Remove the "socket" bolts.

Remove the starter clutch.

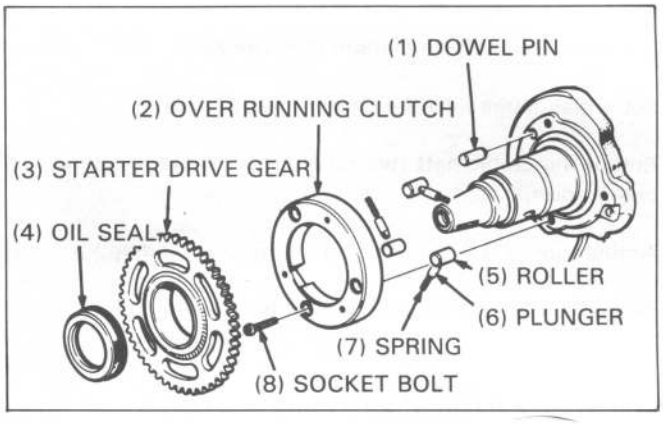


INSPECTION

Inspect the roller for smooth rotation.

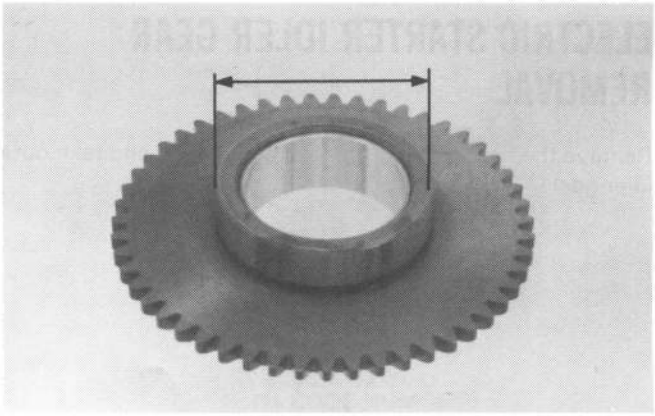
Remove the roller and check for excessive or local wear.

Inspect the starter drive gear for damage or local or excessive wear.



Measure the starter drive gear O.D.

SERVICE LIMIT: 54.15 mm (2.132 in)

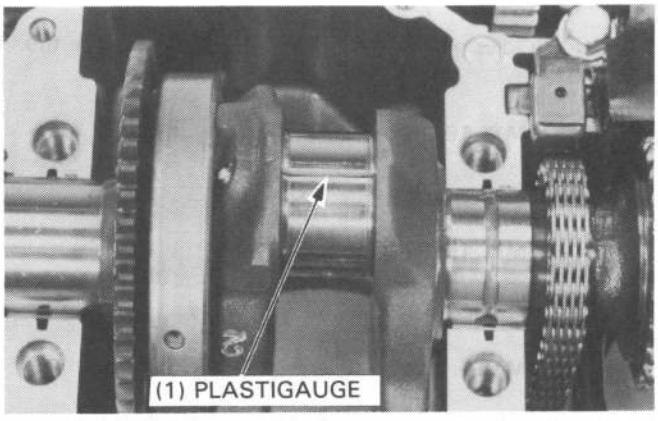


BEARING INSPECTION

CONNECTING RODS

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

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

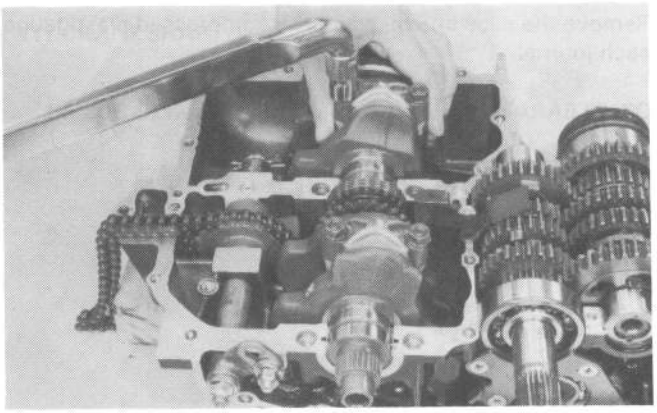


Install the bearing caps on the correct crankpins, and torque them evenly.

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

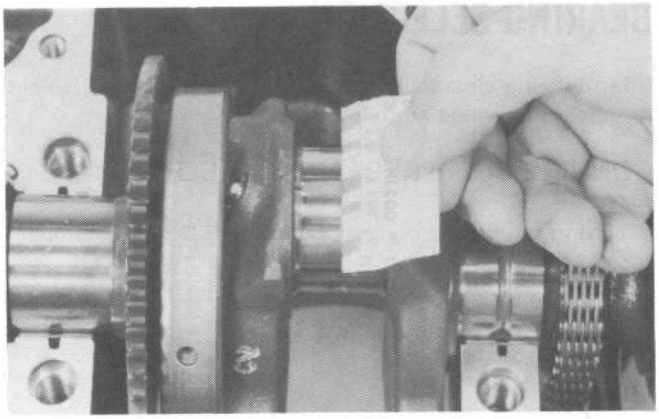
NOTE

- Do not rotate crankshaft during inspection.



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

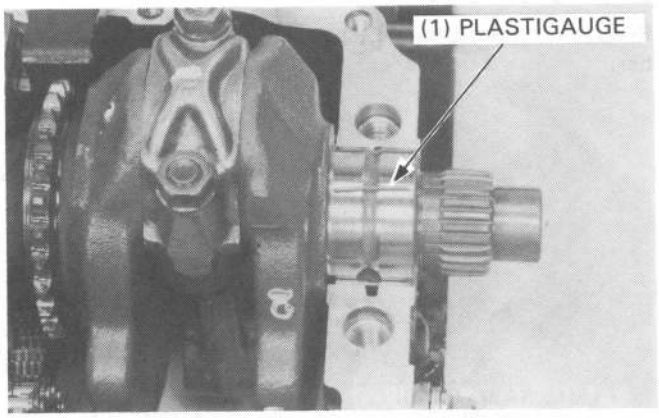
OIL CLEARANCE SERVICE LIMIT: 0.08 mm (0.003 in)



MAIN BEARINGS

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

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

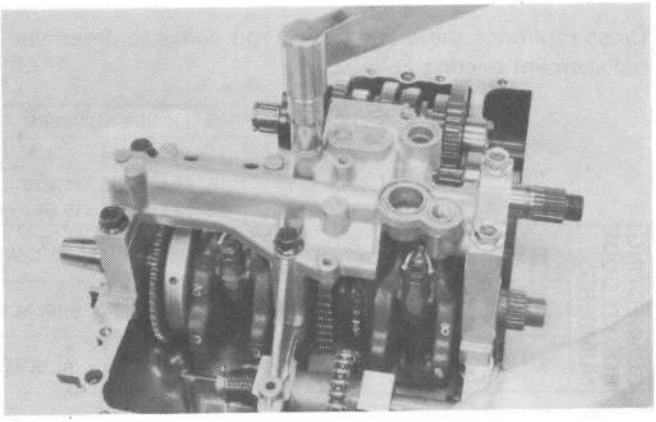


Install the main bearings on the correct journals, and torque them evenly in a crisscross pattern and in two or more steps.

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

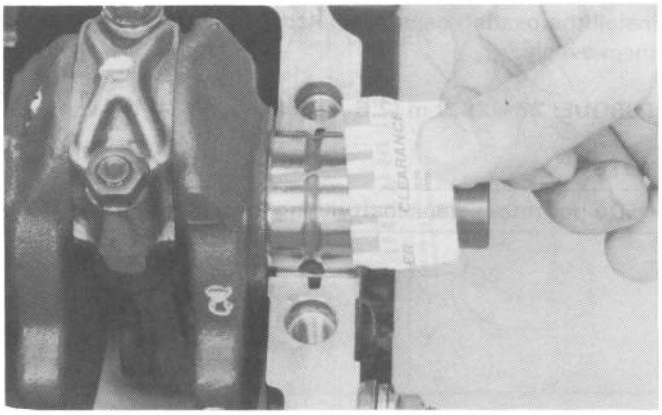
NOTE

- Do not rotate the crankshaft during inspection.



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

OIL CLEARANCE SERVICE LIMIT: 0.08 mm (0.003 in)

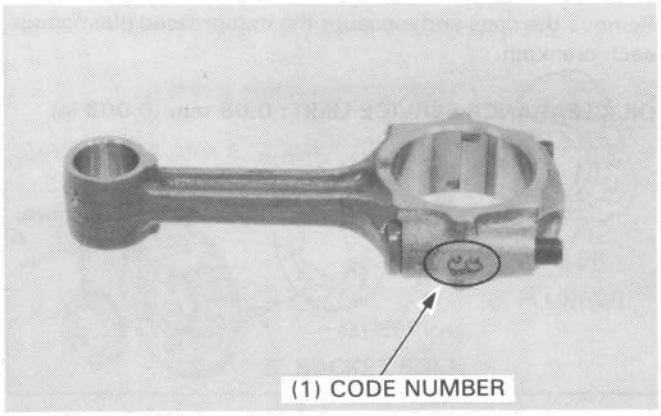


BEARING SELECTION

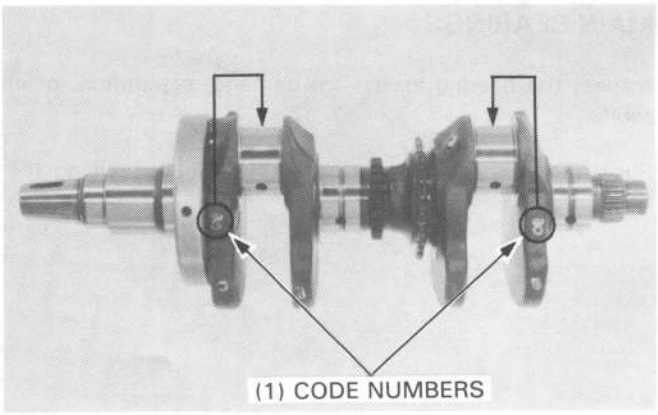
If rod bearing clearance is beyond the service limit, select replacement bearings as follows:

CONNECTING ROD BEARING INSERTS

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

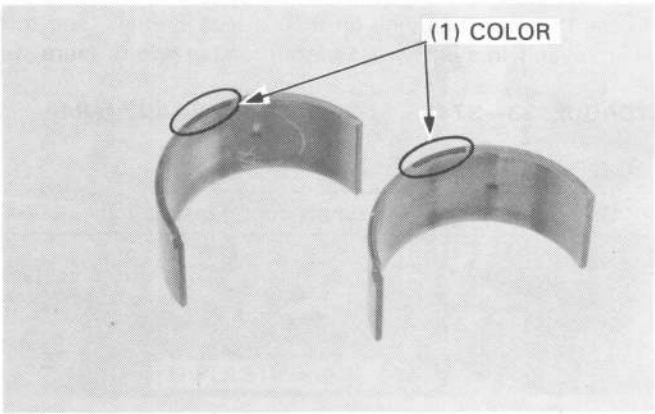


Read and record the corresponding crankpin O.D. code number.



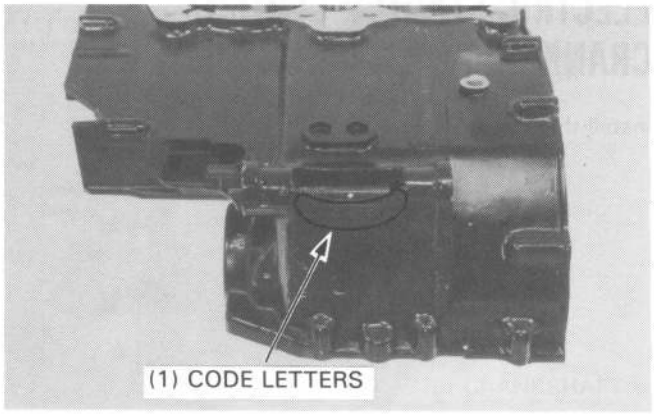
Cross reference the crankpin and rod codes to determine the replacement bearing color.

			CRANKPIN O.D. CODE NUMBERS		
			1	2	3
			35.992–36.000 mm	35.984–35.992 mm	35.976–35.984 mm
CONNECTING ROD I.D. CODE NUMBERS	1	39.000–39.008 mm	E (YELLOW)	D (GREEN)	C (BROWN)
	2	39.008–39.016 mm	D (GREEN)	C (BROWN)	B (BLACK)
	3	39.016–39.024 mm	C (BROWN)	B (BLACK)	A (BLUE)

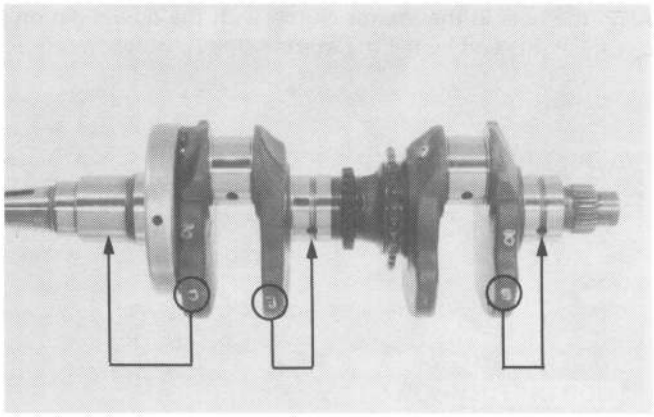


MAIN BEARING

Read and record each bearing holder and case I.D. code number.

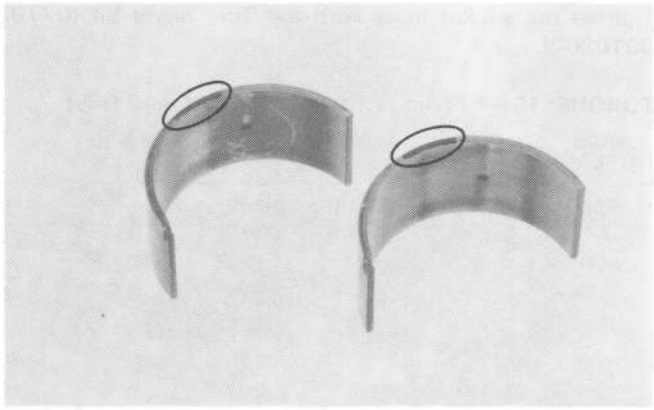


Read and record the corresponding main journal O.D. code letters.



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

			MAIN JOURNAL O.D. CODES		
			A	B	C
			35.992–36.000 mm	35.984–35.992 mm	35.976–35.984 mm
CASE I.D. CODE NUMBERS	A	39.000–39.008 mm	E (YELLOW)	D (GREEN)	C (BROWN)
	B	39.008–39.016 mm	D (GREEN)	C (BROWN)	B (BLACK)
	C	39.016–39.025 mm	C (BROWN)	B (BLACK)	A (BLUE)



ELECTRIC STARTER IDLER GEAR INSTALLATION

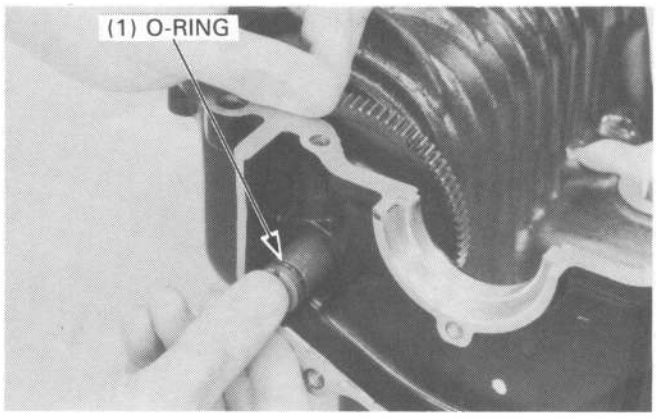
Install the O-ring on the idler gear shaft.

Install the shaft and gear in the case.

NOTE

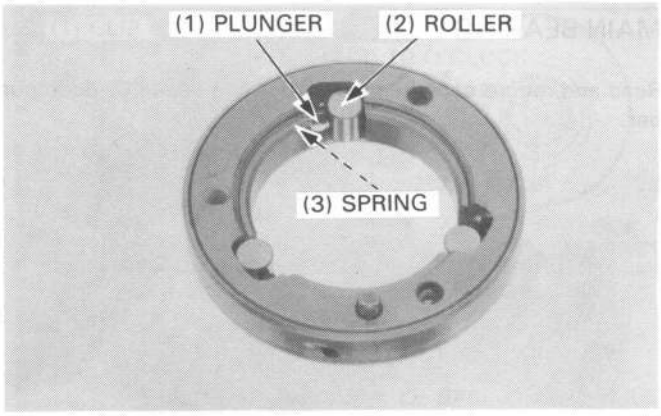
- Align the bolt hole in the shaft with the hole in the case by rotating the shaft with a screwdriver.

Install the bolt and tighten securely.

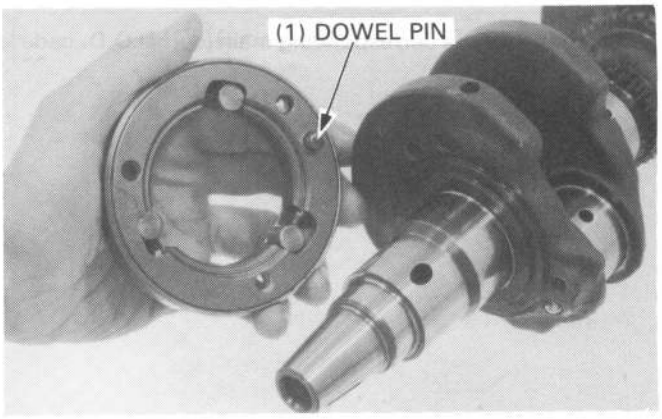


ELECTRIC STARTER CLUTCH/ CRANKSHAFT INSTALLATION

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.

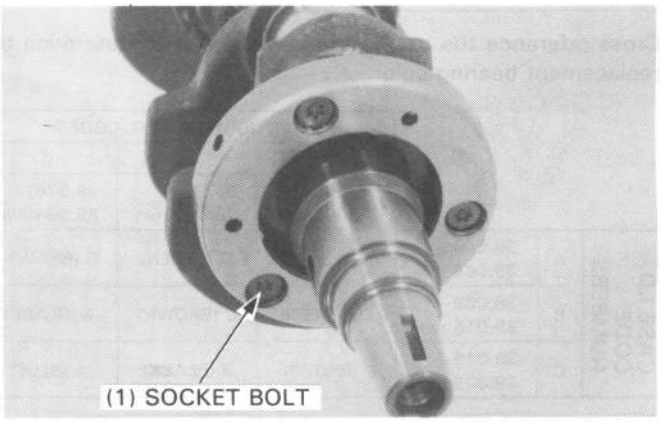


Tighten the socket bolts with the Torx driver bit (07703—0010200).

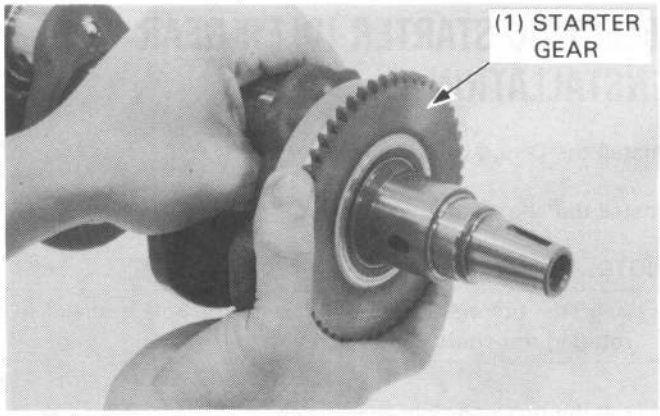
TORQUE: 15—17 N·m (1.5—1.7 kg-m, 11—12 ft-lb)

NOTE

- Apply a locking agent to the bolt threads.



Install the starter gear while rotating it by hand.

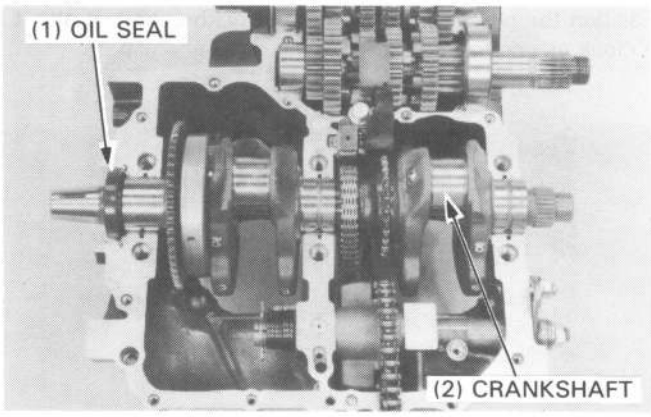


Install the oil seal on the crankshaft.

Install the cam chain on the crankshaft.
Lay the crankshaft in the crankcase.

NOTE

- Lubricate each journal and crankpin with molybdenum disulfide grease.

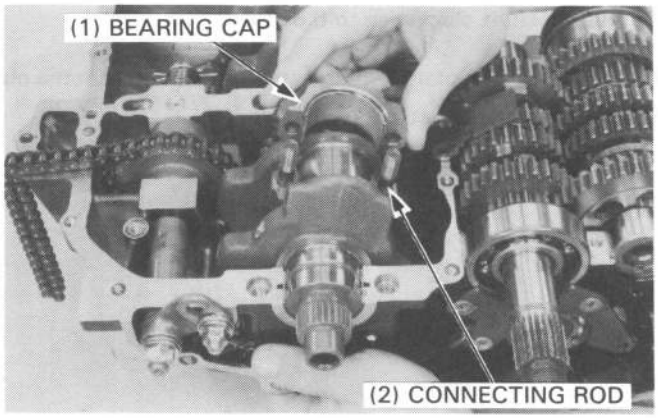


CONNECTING ROD INSTALLATION

Install the connecting rods and bearing caps.

NOTE

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

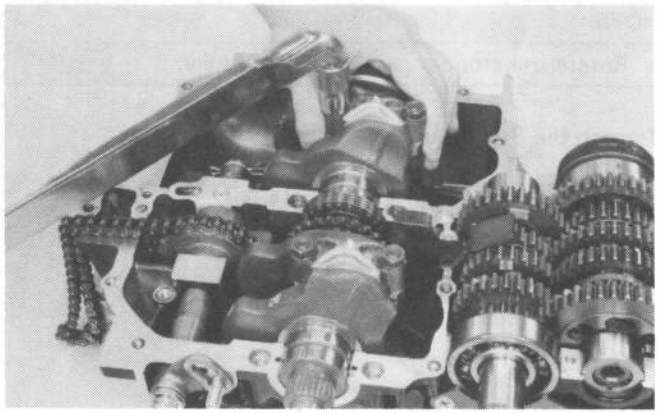


Torque the connecting rod bearing cap bolts.

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

NOTE

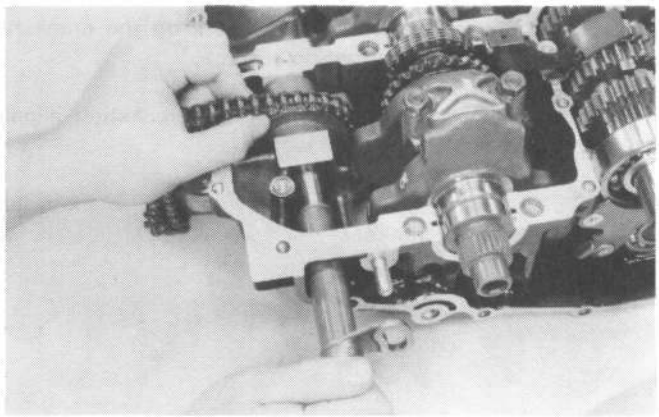
- Tighten the rod bearing cap bolts in two or more steps.
- After tightening the bolts, check that the rod moves freely without binding.



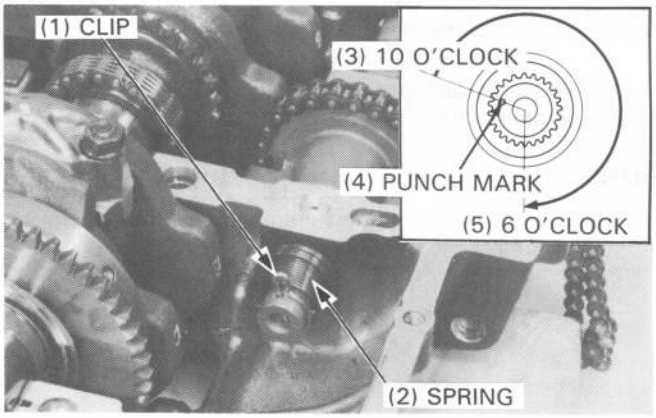
BALANCER INSTALLATION

Install the balancer chain onto the balancer.

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



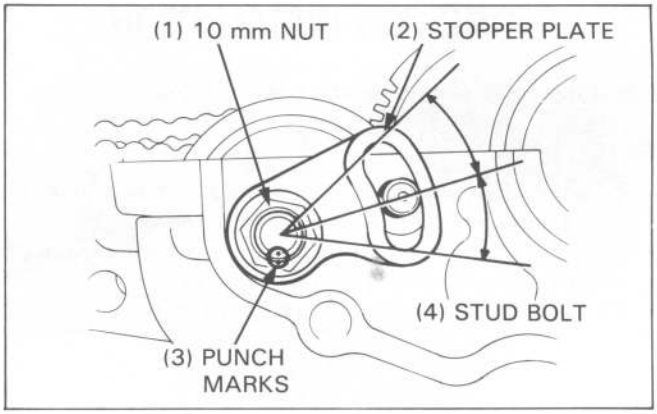
Position the punch mark on the end of the shaft at about 10 o'clock as shown, and install the spring and clip.



Rotate the shaft clockwise to 6 o'clock.

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

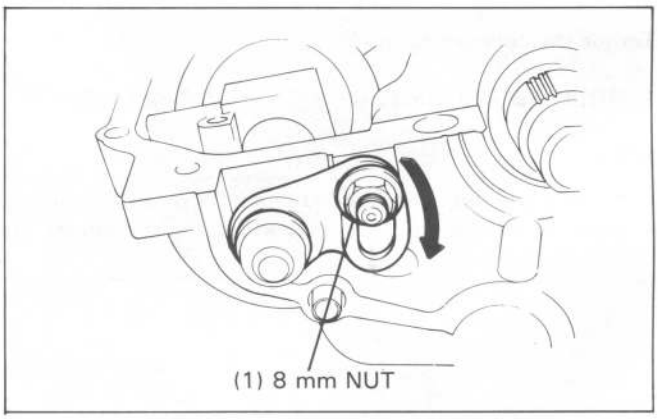
Temporarily tighten the 10 mm nut.



NOTE

- Rotate the stopper plate clockwise fully.

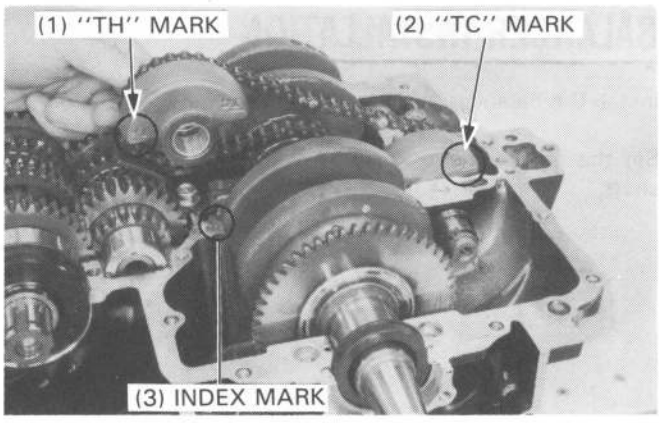
Tighten the 8 mm nut.



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

Align the front balancer "TC" mark and crankshaft aligning mark with the end of the crankcase.

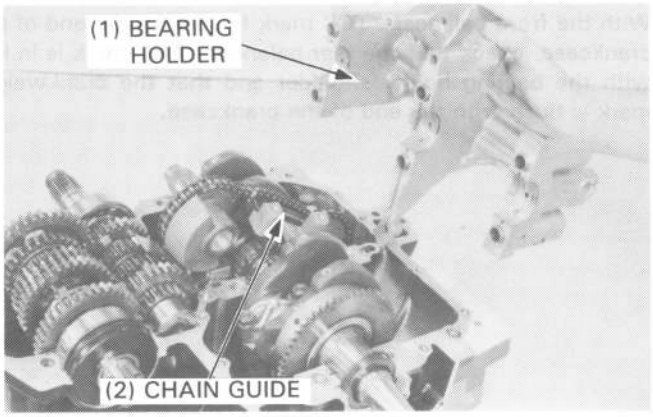
Install the chain so that the rear balancer "TH" mark in flush with the end of the crankcase.



Install the front chain guide.

Lay the bearing holders over the crankshaft main journals.

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

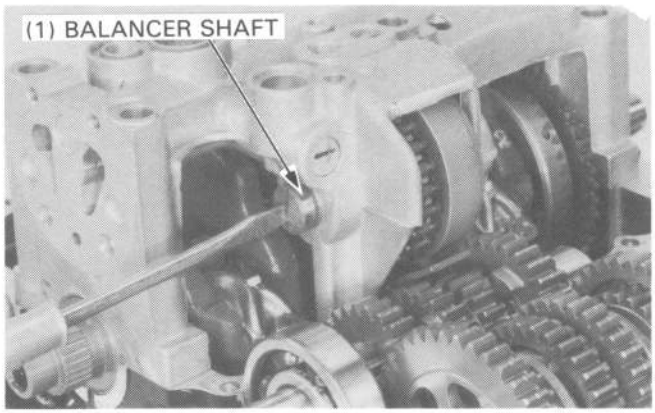


Slide the O-ring over the balancer shaft.

Align the bolt hole in the rear balancer shaft with the hole in the case by rotating the shaft.

NOTE

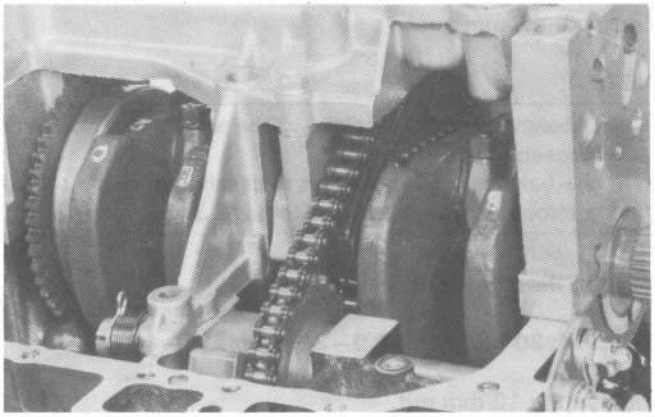
- Do not disturb the installation of the balancer chain on the sprocket during this operation.



Torque the front chain guide bolts.

NOTE

- The rear bolt should be tightened with the oil strainer installed.

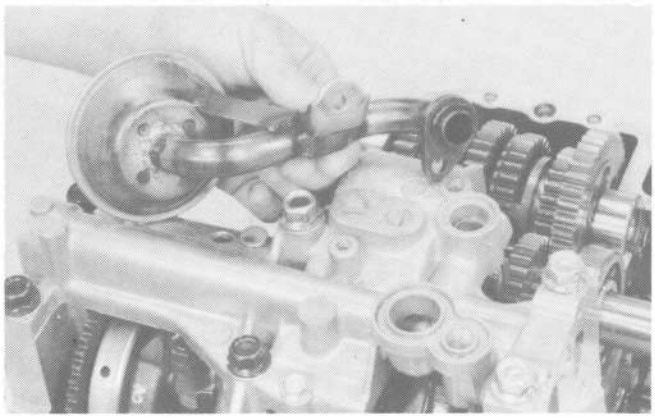


Tighten the bearing holder.

TORQUES:
10 mm BOLT: 33–37 N·m (3.3–3.7 kg-m, 24–27 ft-lb)
6 mm BOLT: 10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)

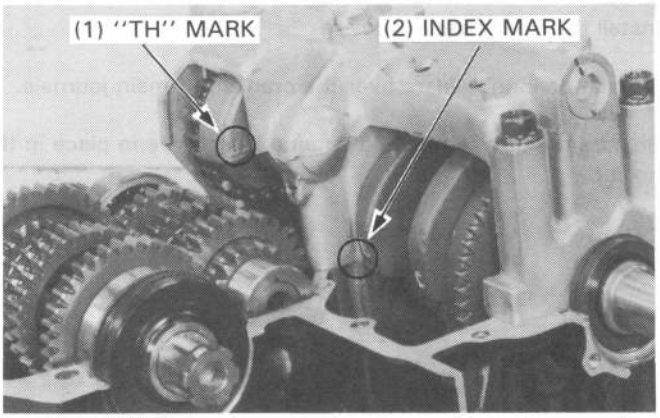
NOTE

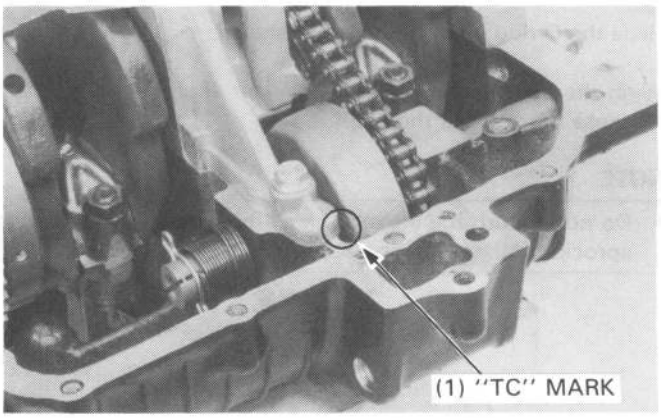
- Torque the holder bolts in two or more steps and in a crisscross pattern shown.
- Make sure the crankshaft rotates freely without binding.



Slide the O-ring over the oil strainer pipe.

With the front balancer "TC" mark flush with the end of the crankcase, check that the rear balancer "TH" mark is in line with the bearing holder shoulder and that the crankweight mark is flush with the end of the crankcase.





Loosen the 8 mm nut.

NOTE

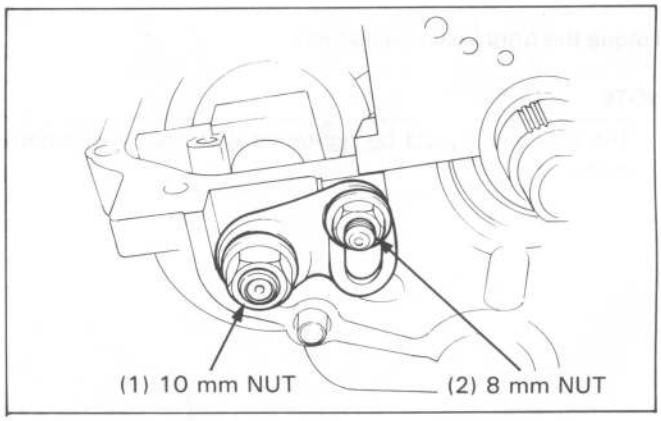
- The balancer chain tension will be adjusted automatically by loosening the 8 mm nut.
- If the balancer chain slack is excessive so that no further adjustment is possible, refer to page 3-7.

Tighten the 8 mm nut first.

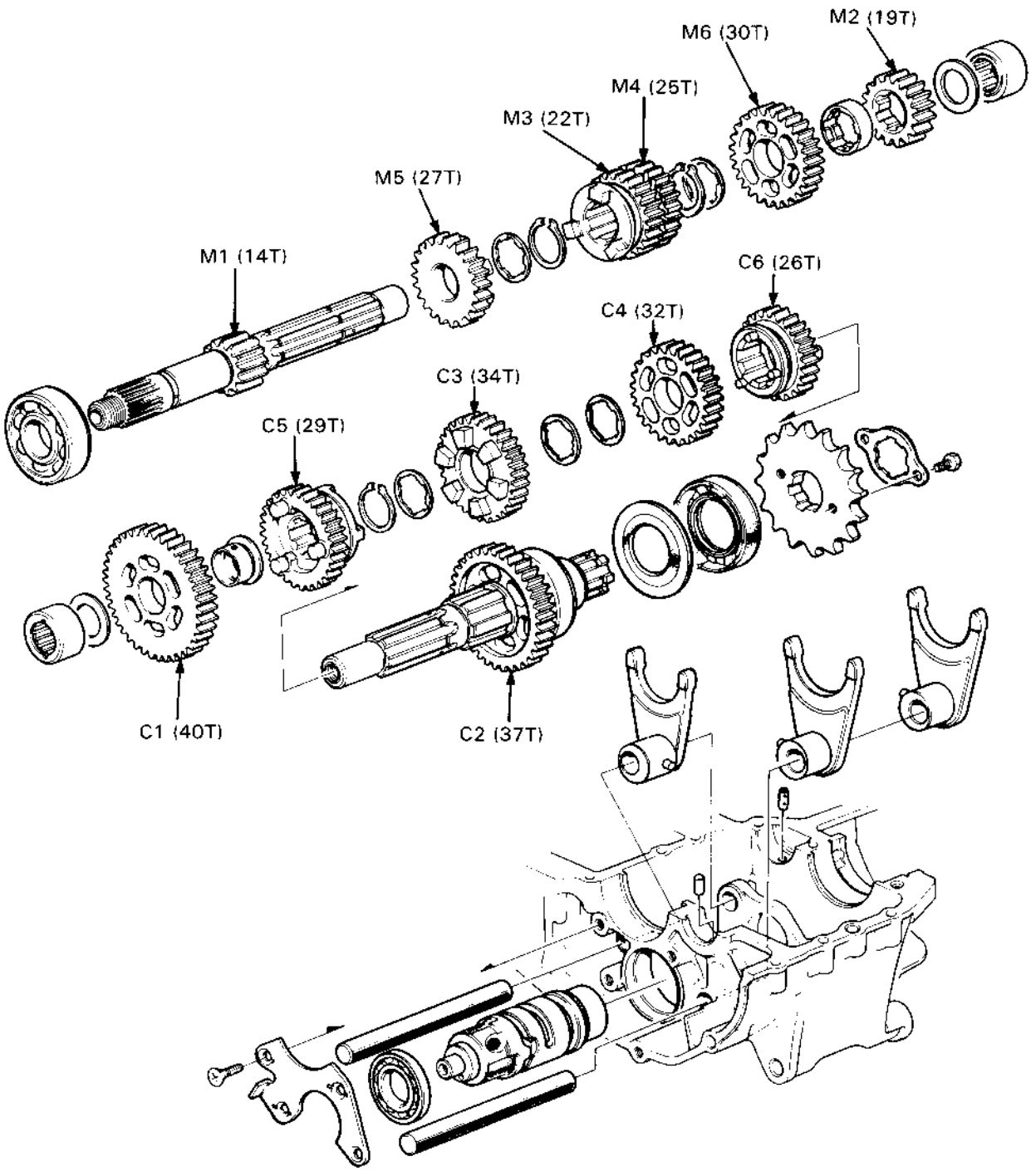
TORQUE: 20–25 N·m (2.0–2.5 kg-m, 14–18 ft-lb)

Tighten the 10 mm nut.

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



MEMO


M2 (19T)
M6 (30T)
M4 (25T)
M3 (22T)
M5 (27T)
M1 (14T)
C6 (26T)
C4 (32T)
C3 (34T)
C5 (29T)
C1 (40T)
C2 (37T)

SERVICE INFORMATION

GENERAL

- For internal transmission repairs, the crankcase must be separated (Section 10).

SPECIFICATIONS

ITEM			STANDARD	SERVICE LIMIT
Transmission	Backlash	Low, 2nd, 3rd, 4th	0.047–0.142 mm (0.0019–0.0056 in)	0.20 mm (0.008 in)
		5th, Top	0.050–0.150 mm (0.0020–0.0059 in)	0.20 mm (0.008 in)
	Gear I.D.	M5, C3, C4	25.020–25.041 mm (0.9850–0.9859 in)	25.10 mm (0.988 in)
		M6	28.020–28.041 mm (1.1031–1.1040 in)	28.10 mm (1.106 in)
		C1	24.020–24.041 mm (0.9457–0.9465 in)	24.10 mm (0.949 in)
	Gear bushing O.D.	M6	27.959–27.980 mm (1.1007–1.1016 in)	27.93 mm (1.100 in)
		C1	23.984–24.005 mm (0.9443–0.9451 in)	23.95 mm (0.943 in)
	Gear bushing I.D.	C1	20.020–20.041 mm (0.7882–0.7890 in)	20.10 mm (0.791 in)
	Mainshaft O.D.		24.959–24.980 mm (0.9826–0.9835 in)	24.93 mm (0.981 in)
	Countershaft O.D.	C4	24.959–24.980 mm (0.9826–0.9835 in)	24.93 mm (0.981 in)
		C1	19.987–20.000 mm (0.7869–0.7874 in)	19.95 mm (0.785 in)
	Gear-to-shaft clearance	M5, C3, C4	0.040–0.0082 mm (0.0016–0.0032 in)	0.10 mm (0.004 in)
	Gear-to-bushing clearance	M6	0.040–0.082 mm (0.0016–0.0032 in)	0.10 mm (0.004 in)
		C1	0.015–0.047 mm (0.0006–0.0019 in)	0.07 mm (0.003 in)
	Shaft-to-bushing clearance	C1	0.020–0.054 mm (0.0007–0.0021 in)	0.07 mm (0.003 in)
Shift drum	O.D.		34.950–34.975 mm (1.3760–1.3770 in)	34.90 mm (1.374 in)
	Case I.D.		35.000–35.025 mm (1.3780–1.3789 in)	35.05 mm (1.380 in)
Shift fork	Claw thickness	M3	5.93–6.00 mm (0.234–0.236 in)	5.85 mm (0.230 in)
		C5, C6	4.93–5.00 mm (0.194–0.197 in)	4.85 mm (0.191 in)
	Shift fork I.D.		13.000–13.018 mm (0.5118–0.5125 in)	13.05 mm (0.514 in)
Fork shaft	O.D.		12.966–12.984 mm (0.5105–0.5112 in)	12.95 mm (0.510 in)

TROUBLESHOOTING

Hard to shift
1. Improper clutch adjustment: to much free play
2. Shift fork bent
3. Shift shaft bent
4. Shift claw bent
5. Shift drum cam grooves damaged

Transmission jumps out of gear
1. Gear dogs worn
2. Shift shaft bent
3. Shift drum stopper broken
4. Shift forks bent

TRANSMISSION DISASSEMBLY

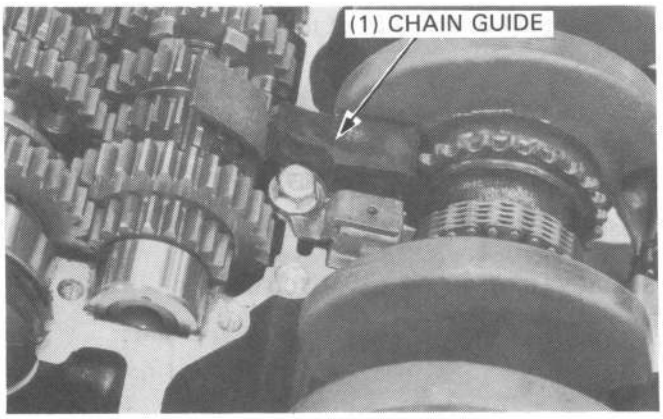
Separate the crankcases (Section 10).

Inspect each gear for backlash.

SERVICE LIMIT: 0.20 mm (0.008 in)

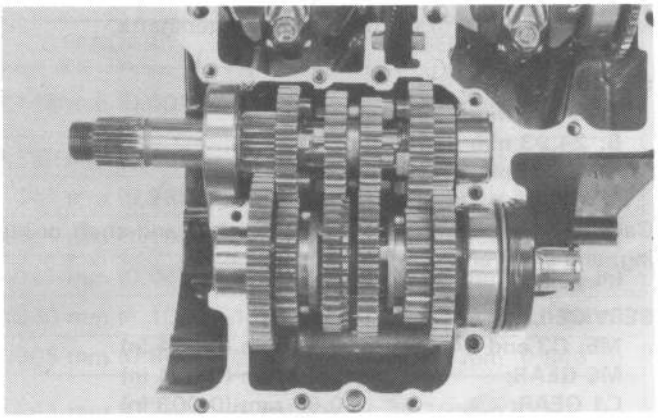
Remove the crankshaft bearing holders (Section 11).

Remove the rear balancer chain guide.



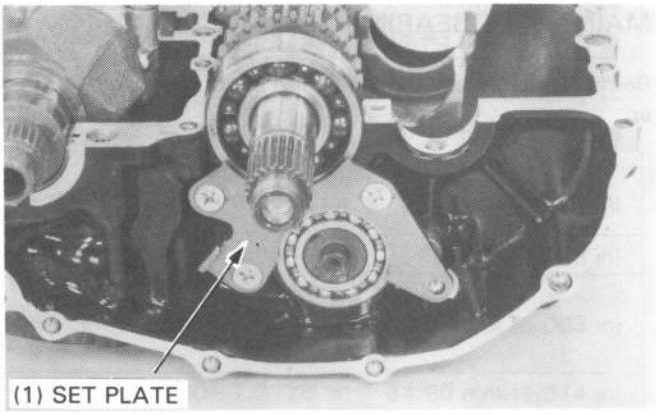
Place the gears into neutral, and check each gear dog for minimum clearance.

SERVICE LIMIT: 0.30 mm (0.012 in)



Remove the countershaft assembly.
Loosen the shift drum bearing set plate screws.
Remove the mainshaft assembly.

Disassemble the transmission.



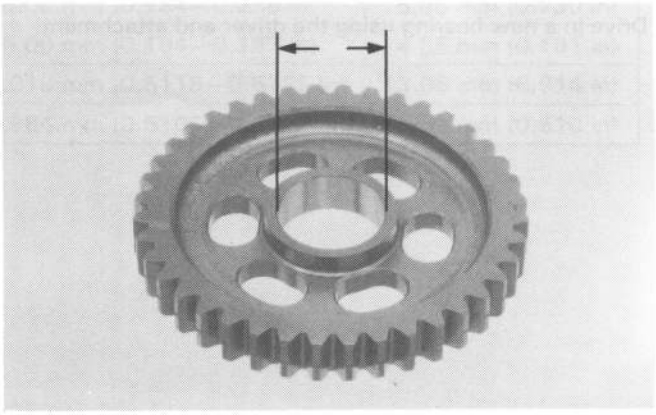
INSPECTION

Check gear dogs for excessive or abnormal wear.

Inspect the I.D. of each gear.

SERVICE LIMITS:

M5, C3 and C4 GEARS:	**25.10 mm (0.988 in)**
M6 GEAR:	**28.10 mm (1.106 in)**
C1 GEAR:	**24.10 mm (0.949 in)**

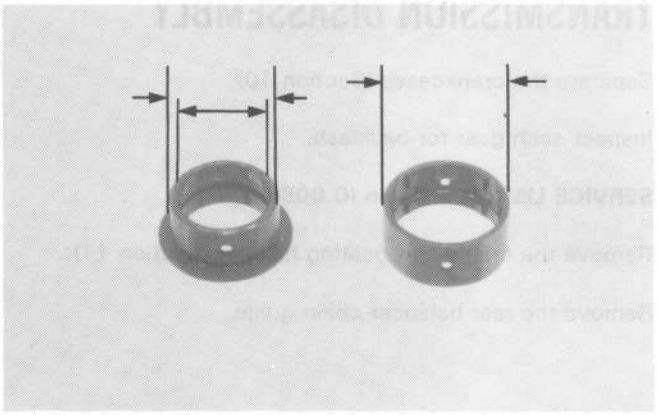


Measure the I.D. and O.D. of the countershaft low gear (C1) bushing.

SERVICE LIMITS:
I.D.: 20.10 mm (0.791 in)
O.D.: 23.95 mm (0.943 in)

Measure the O.D. of the mainshaft sixth gear (M6) bushing.

SERVICE LIMIT: 27.93 mm (1.100 in)



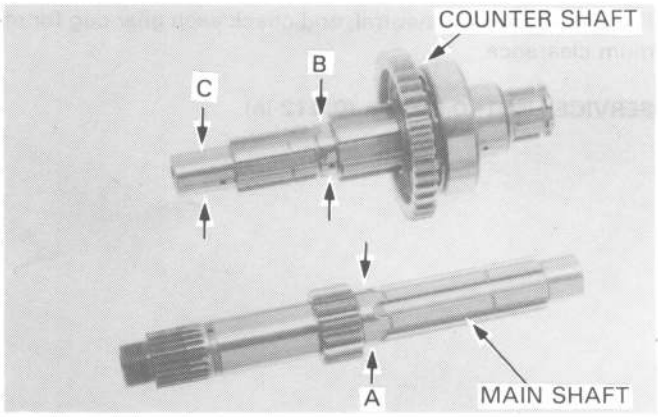
Measure the O.D. of the main and countershafts.

SERVICE LIMITS:
A: 24.93 mm (0.981 in)
B: 24.93 mm (0.981 in)
C: 19.95 mm (0.786 in)

Calculate the clearance between the gear and shaft or bushing, and shaft and bushing.

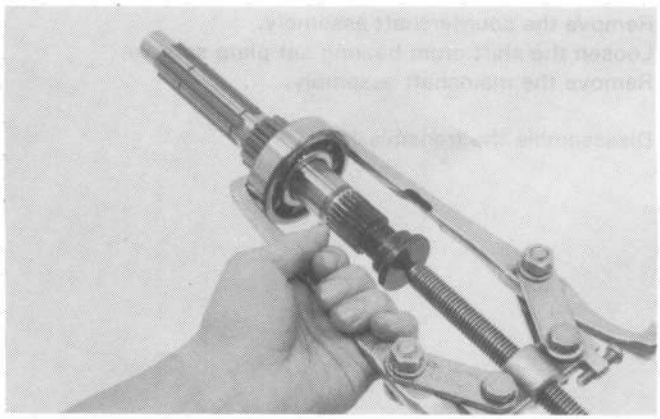
SERVICE LIMITS:

M5, C3 and C4 GEARS:	**0.10 mm (0.004 in)**
M6 GEAR:	**0.10 mm (0.004 in)**
C1 GEAR:	**0.07 mm (0.003 in)**

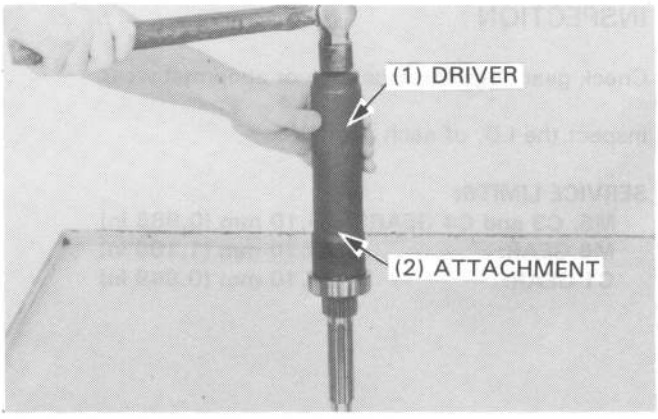


MAINSHAFT BEARING REPLACEMENT

Remove and discard the mainshaft bearing with a bearing puller.



Drive in a new bearing using the driver and attachment.



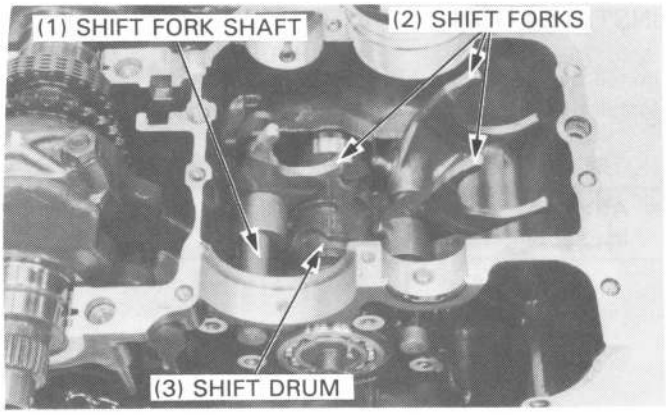
SHIFT FORK AND SHIFT DRUM

REMOVAL

Remove the bearing stopper plate.
Remove the neutral/O.D. switch.

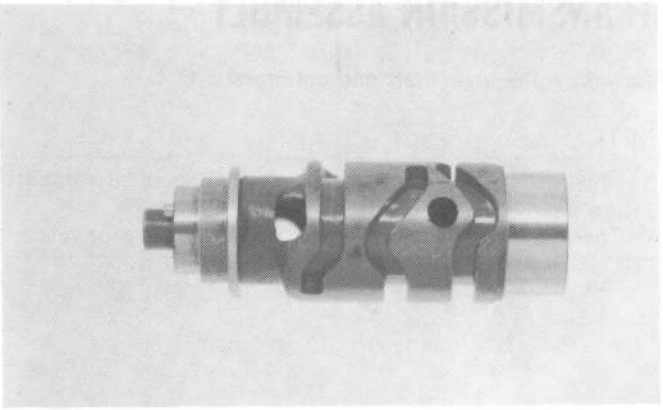
Remove the shift fork shafts and shift forks.

Remove the shift drum.



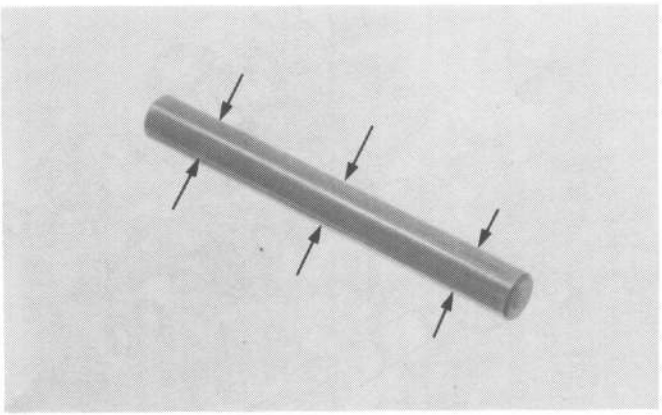
INSPECTION

Check the shift drum grooves for damage.



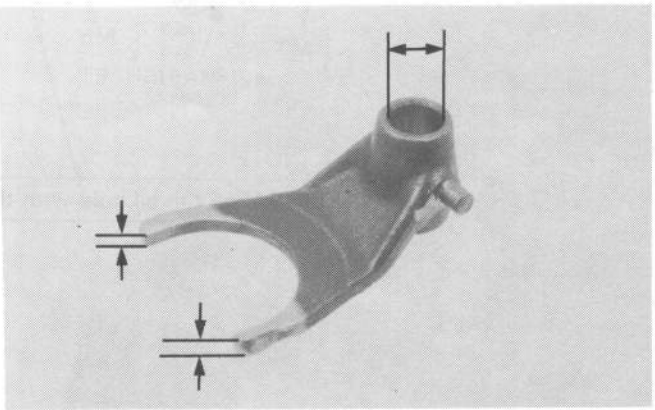
Measure the shift fork shaft O.D.

SERVICE LIMIT: 12.95 mm (0.510 in)



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

SERVICE LIMITS:
SHIFT FORK I.D.: 13.05 mm (0.514 in)
CLAW THICKNESS:
M3 GEAR: 5.85 mm (0.230 in)
C5 and C6 GEARS: 4.85 mm (0.191 in)

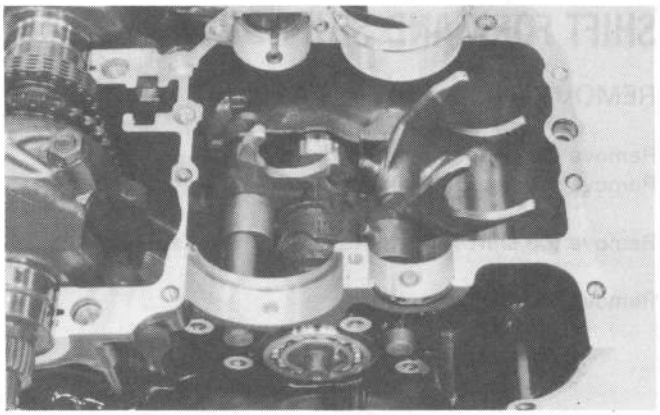


INSTALLATION

Install the shift drum.
Install the shift forks and shafts.

NOTE

- After installing the countershaft, install the shift drum bearing set plate.

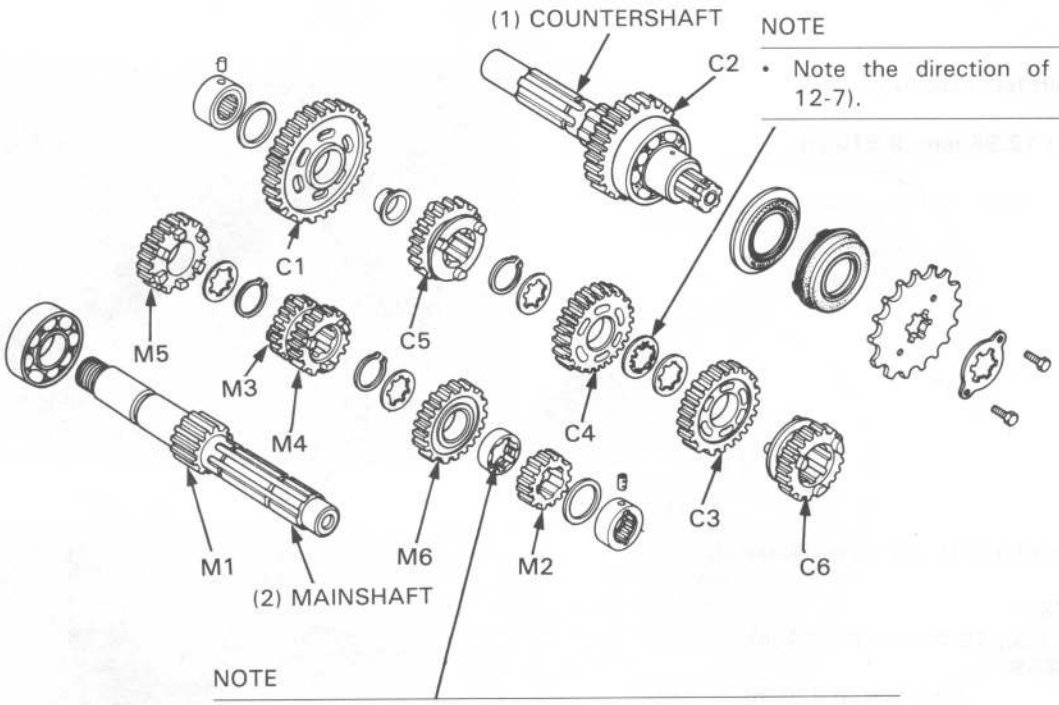


TRANSMISSION ASSEMBLY

Assemble the mainshaft and countershaft.

NOTE

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



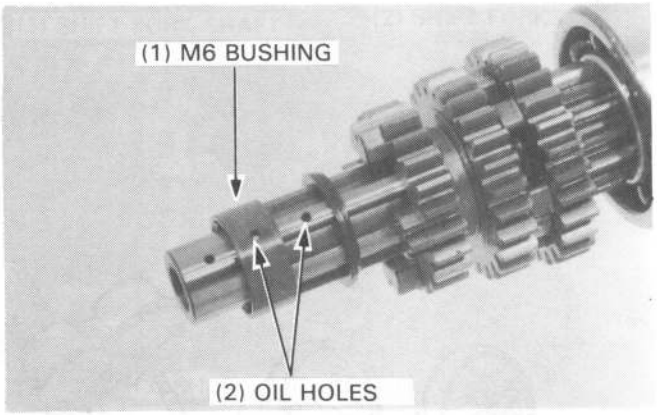
NOTE

- Note the direction of installation. (page 12-7).

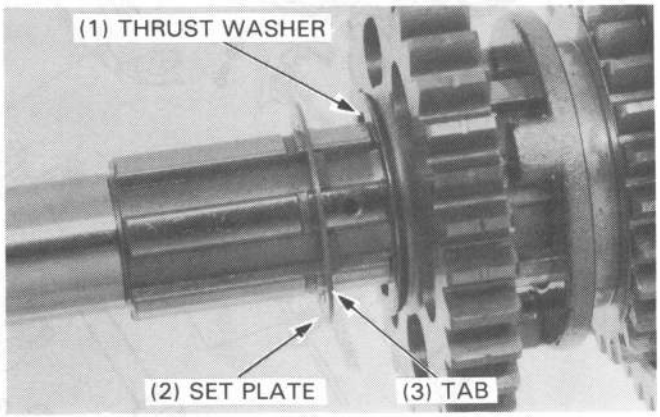
NOTE

- Align the oil hole with the mainshaft oil hole (page 12-7).

Align the M6 bushing oil hole with mainshaft oil hole.



Rotate the thrust washer until the set plate tabs fit into the thrust washer.



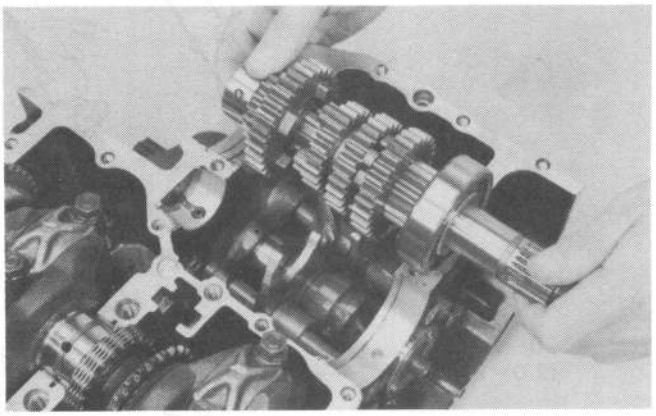
Install the dowel pin and oil control orifice.

Assemble the mainshaft.

Install the shaft with the needle bearing hole facing down.

NOTE

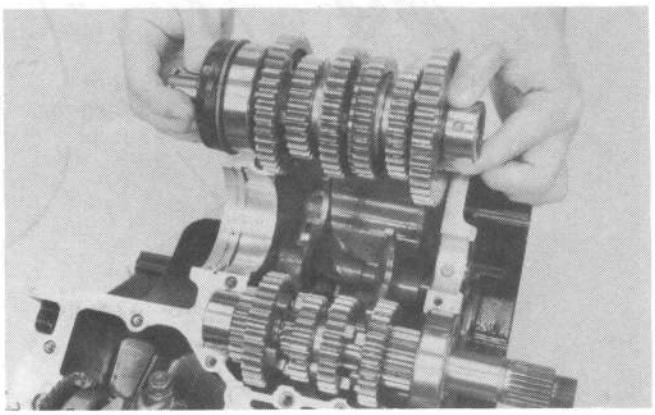
- Check that the aligning marks on the bearing are flush with the end of the crankcase.

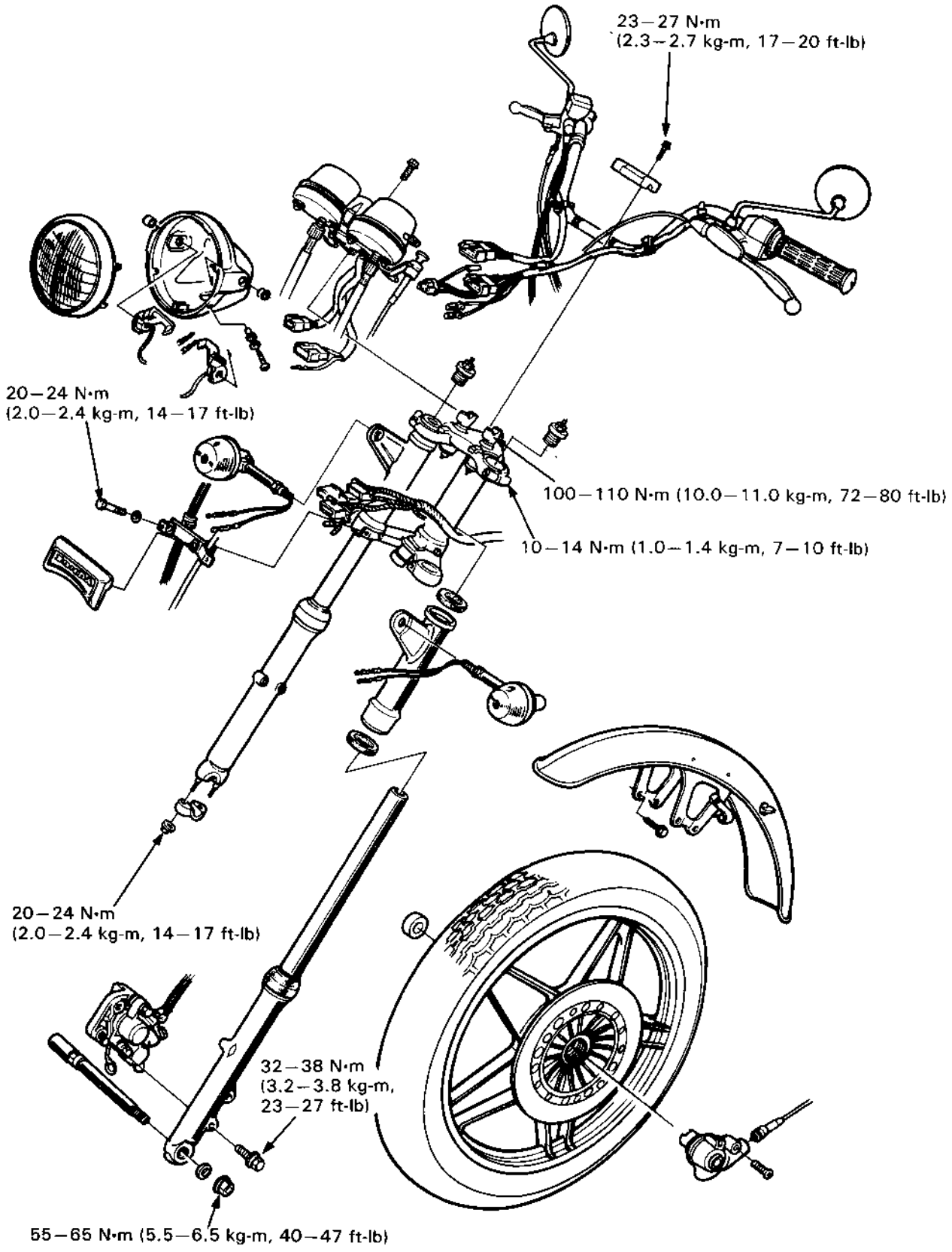


Install the countershaft.

Align the marks on the needle roller bearing with the end of the case, and then fit the hole in the bearing over the dowel pin.
Install the shift drum bearing set plate.
Install the rear balancer chain guide and bearing holder (Section 11).

Install the lower crankcase (Section 11).




23–27 N·m
(2.3–2.7 kg-m, 17–20 ft-lb)
20–24 N·m
(2.0–2.4 kg-m, 14–17 ft-lb)
100–110 N·m (10.0–11.0 kg-m, 72–80 ft-lb)
10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)
20–24 N·m
(2.0–2.4 kg-m, 14–17 ft-lb)
32–38 N·m
(3.2–3.8 kg-m,
23–27 ft-lb)
55–65 N·m (5.5–6.5 kg-m, 40–47 ft-lb)

13. FRONT WHEEL/SUSPENSION/STEERING

SERVICE INFORMATION

GENERAL

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

SPECIFICATIONS

ITEM		STANDARD	SERVICE LIMIT
Axle shaft runout		—	0.2 mm (0.01 in)
Front wheel runout	Radial	—	2.0 mm (0.08 in)
	Axial	—	2.0 mm (0.08 in)
Fork spring free length	Spring A	240.4 mm (9.47 in)	235 mm (9.25 in)
	Spring B	341.9 mm (13.46 in)	335 mm (13.2 in)
Fork tube runout		—	0.2 mm (0.01 in)
Fork slider bushing O.D.		33.95–33.98 mm (1.337–1.338 in)	33.86 mm (1.333 in)
Fork tube O.D.		32.950–32.975 mm (1.297–1.298 in)	32.90 mm (1.295 in)
Fork fluid capacity		187 cc (6.3 oz)	—
Fork air pressure		80 ± 20 kPa (0.8 ± 0.2 kg-cm², 11 ± 3 psi)	—

TORQUE VALUES

Axle holder	20–24 N·m (2.0–2.4 kg-m, 14–17 ft-lb)
Fork cap bolt	16–20 N·m (1.6–2.0 kg-m, 12–14 ft-lb)
Fork socket bolt	15–25 N·m (1.5–2.5 kg-m, 11–18 ft-lb)
Fork bridge pinch 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 brake caliper	20–24 N·m (2.0–2.4 kg-m, 14–17 ft-lb)
Front caliper bracket	32–38 N·m (3.2–3.8 kg-m, 23–27 ft-lb)
Front brake disc	37–43 N·m (3.7–4.3 kg-m, 27–31 ft-lb)
Handlebar upper holder	23–27 N·m (2.3–2.7 kg-m, 17–20 ft-lb)
Steering stem nut	100–110 N·m (10.0–11.0 kg-m, 72–80 ft-lb)
Steering stem pinch bolt	20–24 N·m (2.0–2.4 kg-m, 14–17 ft-lb)
Fork air valve	6–7 N·m (0.6–0.7 kg-m, 4–5 ft-lb)
Steering stem adjusting nut	14–16 N·m (1.4–1.6 kg-m, 10–12 ft-lb)

TOOLS

Special	
Steering stem socket	07916-3710100
Ball race remover	07953-3330000
Steering stem driver	07946-MB00000
Ball race remover attachment	07953-KM10100
Common	
Lock nut wrench, 30 x 32 mm	07716-0020400 ┐
Extension bar	07716-0020500 ┘ or commercially available in USA
Driver	07749-0010000 or 07949-6110000
Attachment, 42 x 47 mm	07746-0010300
Pilot, 15 mm	07746-0040300
Front fork oil seal driver body	07747-0010100 ┐
Front fork oil seal attachment D	07747-0010501 ┘ or 07947-3330000
Bearing remover shaft	07746-0050100 ┐
Remover head, 15 mm	07746-0050400 ┘ or commercially available in USA

TROBLESHOOTING

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

Steers to one side or does not track straight
1. Unevenly adjusted right and left shock absorbers
2. Bent front forks
3. Bent front axle; wheel installed incorrectly

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

Soft suspension
1. Weak fork spring
2. Insufficient fluid in front forks
3. Front fork air pressure incorrect

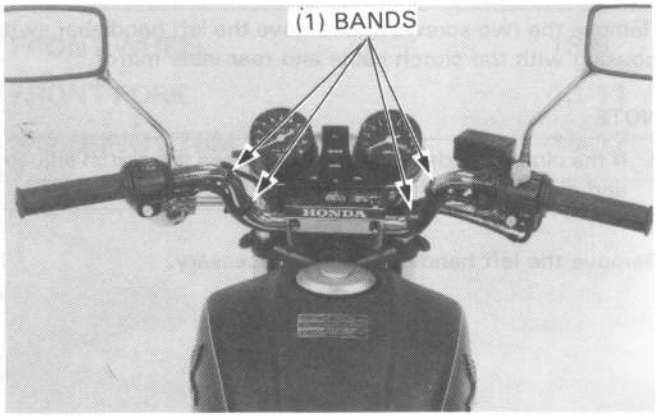
Head suspension
1. Incorrect fluid weight in front forks
2. Fork air pressure incorrect

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

HANDLEBAR

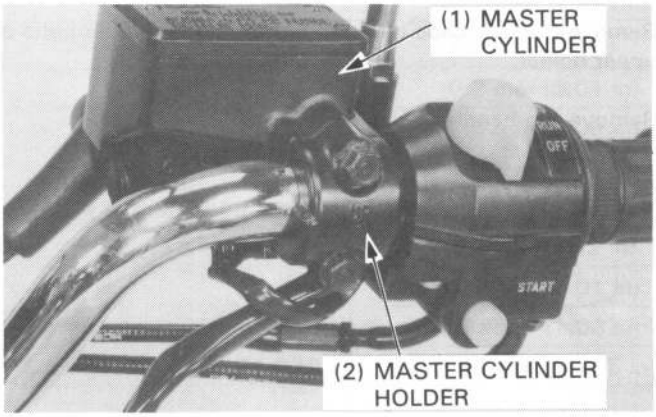
REMOVAL

Remove the bands holing the wires against the handlebars.

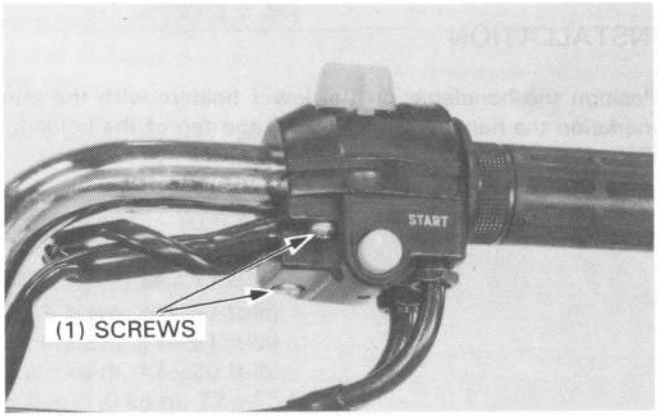


Disconnect the front brake switch wires.

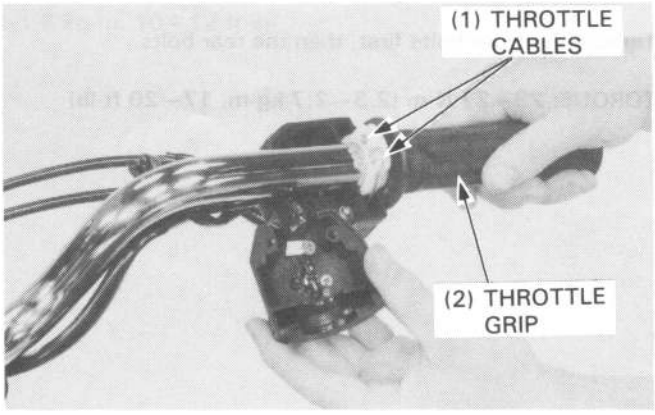
Remove the front brake master cylinder by removing the master cylinder holder bolts and holder.



Remove the two screws and separate the right handlebar switch housing.



Disconnect the throttle cable from the throttle grip and remove the throttle grip and switch housing.

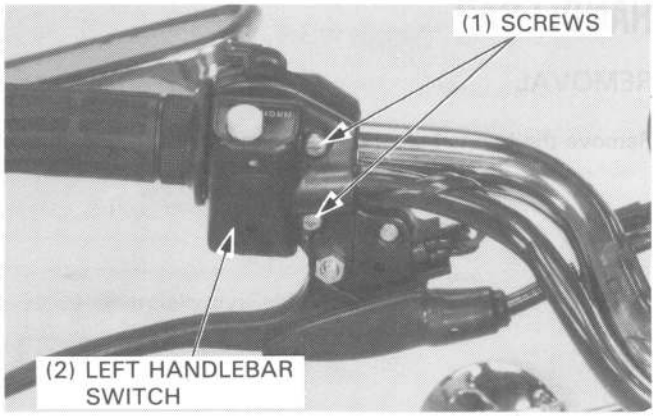


Remove the two screws and remove the left handlebar switch housing with the clutch cable and rear view mirror.

NOTE

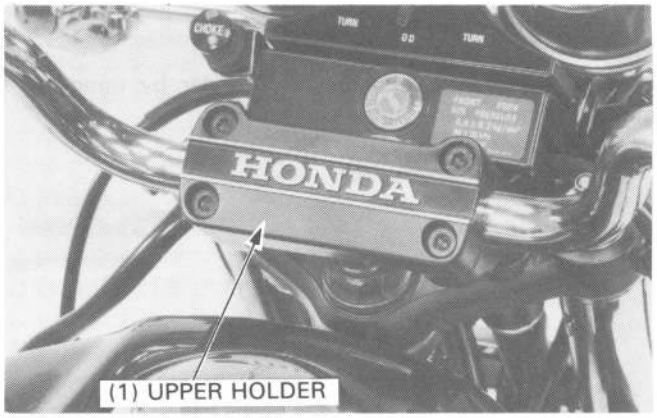
- If the clutch needs replacement, loosen the clutch adjusters and disconnect it from the clutch lever.

Remove the left handlebar grip if necessary.



Remove the bolt caps and remove the upper holder bolts and upper holder.

Remove the handlebar.



INSTALLATION

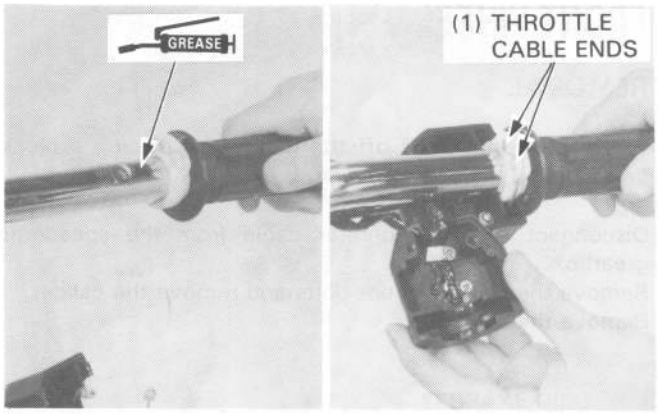
Position the handlebar on the lower holders with the punch marks on the handlebar in line with the top of the holders. Place the upper holders on the handlebar.

Tighten the front bolts first, then the rear bolts.

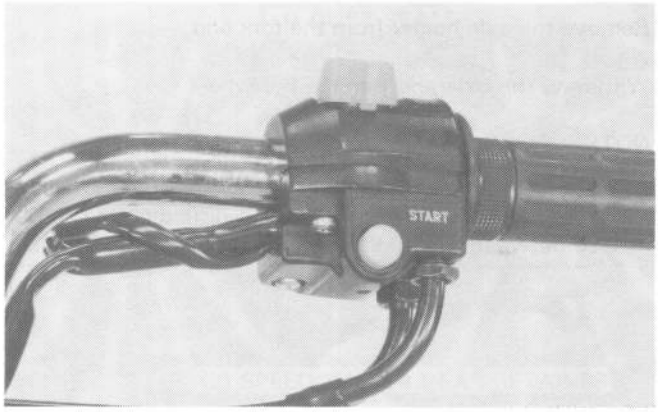
TORQUE: 23–27 N·m (2.3–2.7 kg-m, 17–20 ft-lb)

Apply grease to the sliding surface of the throttle pipe and throttle cable ends.

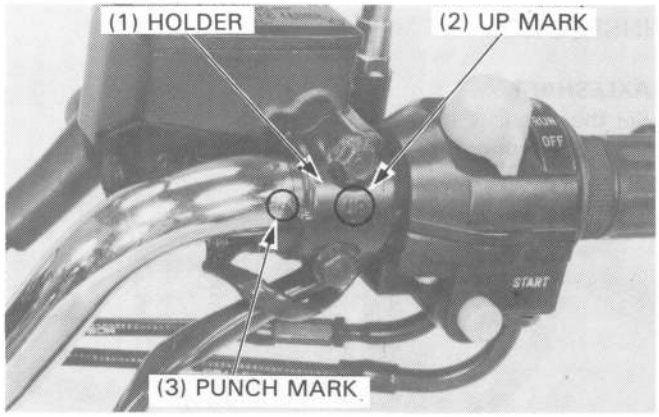
Install the throttle grip to the handlebar and connect the throttle cables.
If a new throttle grip is installed, use the instructions given below for the left grip.



Align the edge split of the switch housing with the punch mark and tighten the front screw first then the rear screw.



Place the master cylinder on the handlebar, install the holder with the "UP" mark up and install the mounting bolts.
Align the projection of the holder with the punch mark on the handlebar and tighten the top bolt first.



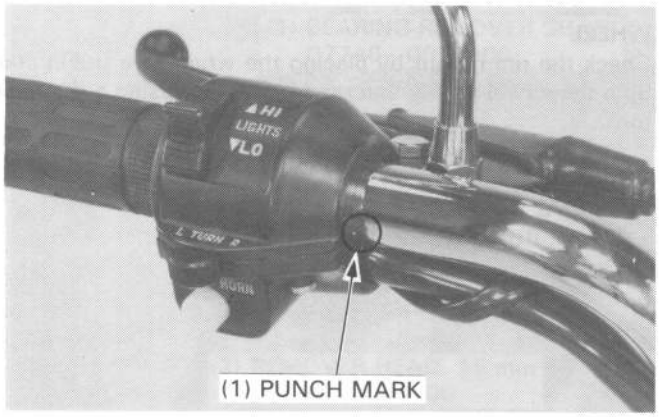
Apply Honda Bond A or Honda Hand Grip Cement (U.S.A. only) to the inside surfaces of the grips and to the clean surface of the left handlebar and throttle grip pipe. Wait 3-5 minutes and install the grips.
Rotate the grips for even application of the adhesive.

NOTE

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

Install the left handlebar switch by aligning the edge of the switch housing with the punch mark.
Tighten the front screw first then rear screw.

Install the wire bands.

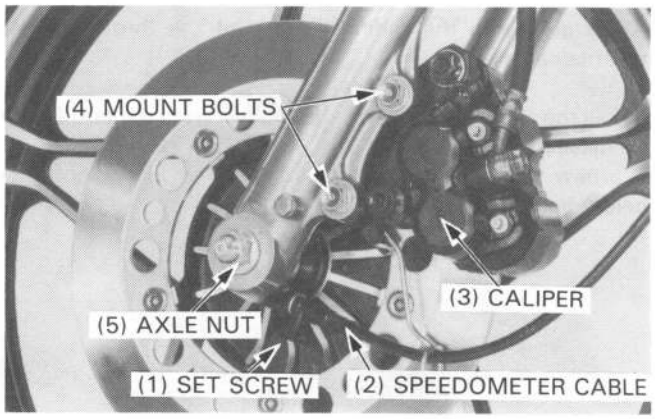


FRONT WHEEL

REMOVAL

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

Disconnect the speedometer cable from the speedometer grearbox.
Remove the caliper mount bolts and remove the caliper.
Remove the axle nut.

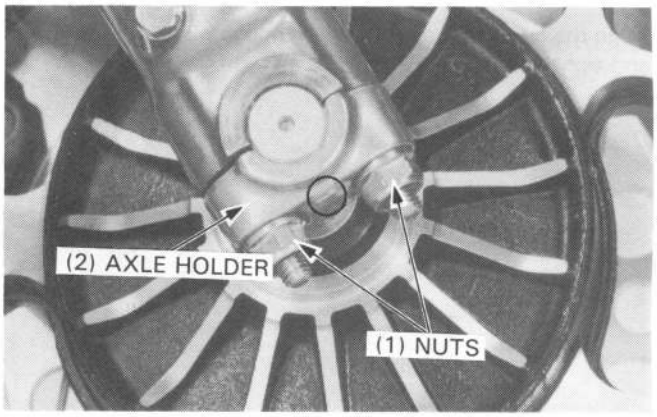


Remove the axle holder from the fork end.

Withdraw the axle and remove the wheel.

NOTE

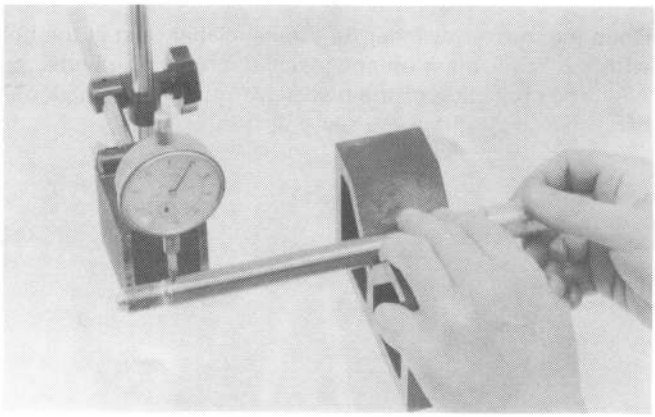
- Do not operate the front brake lever after removing the front wheel. To do so will make it difficult to fit the brake disc between the brake pads during installation.



INSPECTION

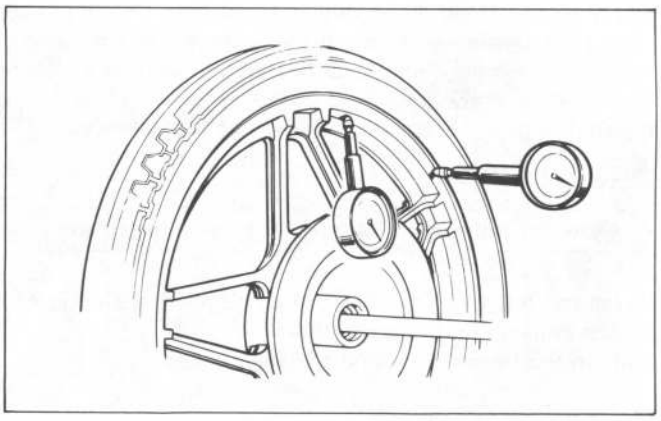
AXLESHAFT
Set the axle in V blocks and measure the runout.
The actual runout is 1/2 of the total indicator reading.

SERVICE LIMIT: 0.2 mm (0.01 in)



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

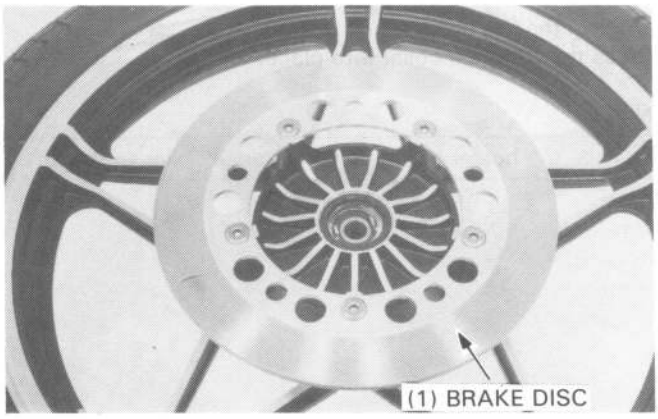
SERVICE LIMITS:
RADIAL RUNOUT: 2.0 mm (0.08 in)
AXIAL RUNOUT: 2.0 mm (0.08 in)



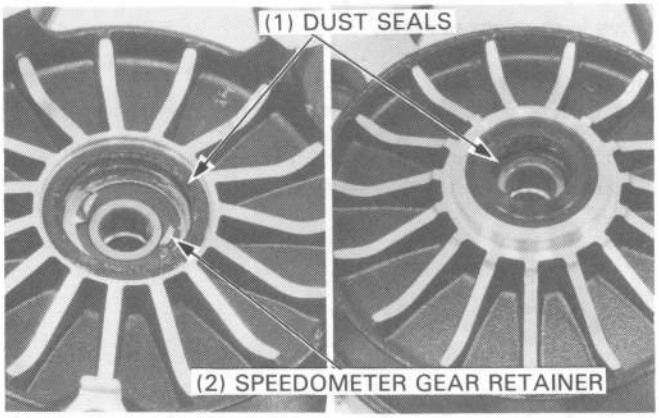
DISASSEMBLY

Remove the right side collar and speedometer gear.

Remove the brake disc.



Remove the dust seals and speedometer gear retainer.



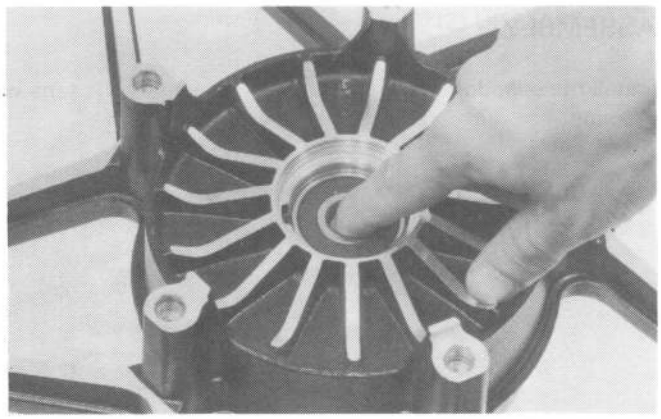
BEARING INSPECTION

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

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

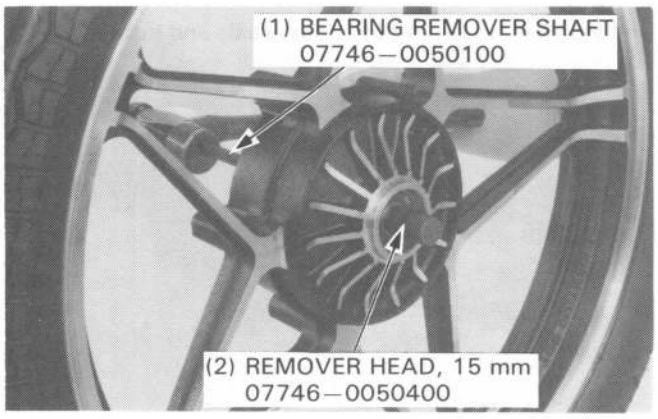
NOTE

- Replace hub bearings in pairs.



BEARING REPLACEMENT

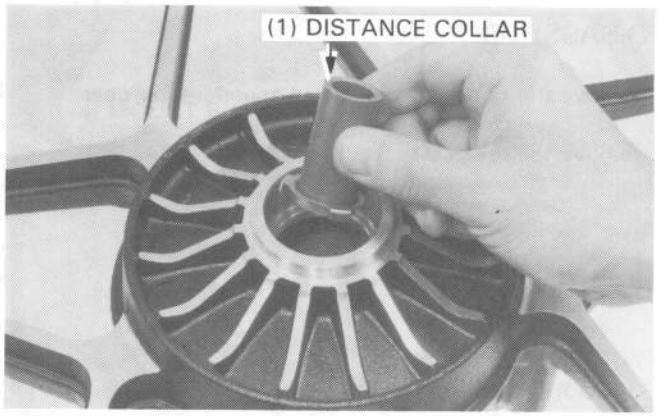
Remove the bearings and distance collar.



Drive in the left bearing first
Press the distance collar into place.

NOTE

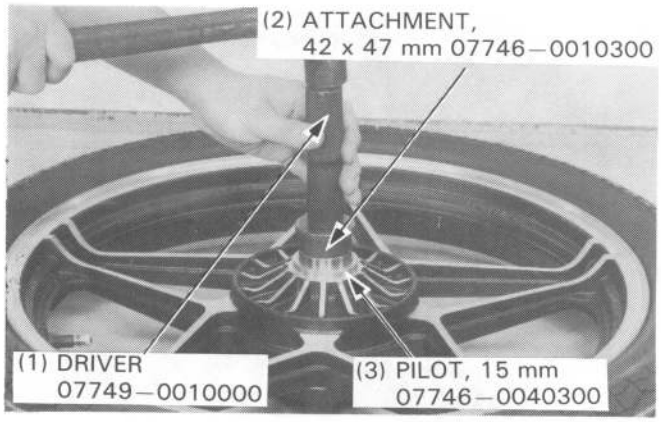
- Face the holder plate of the distance collar to the left.



Drive in the right bearing.

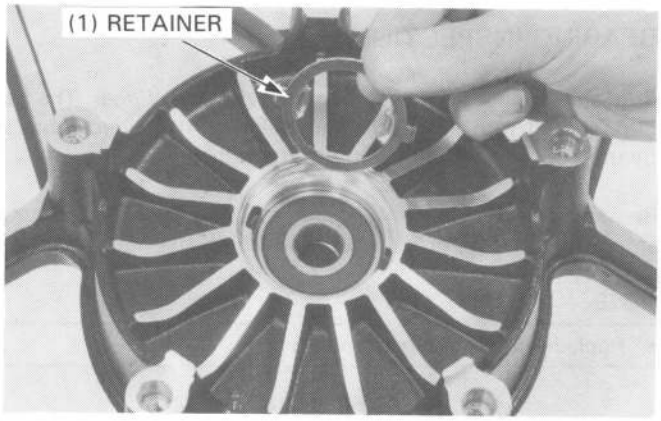
NOTE

- Drive the bearing squarely.
- Drive the bearing into position, making sure that it is fully seated and that the sealed side is facing out.

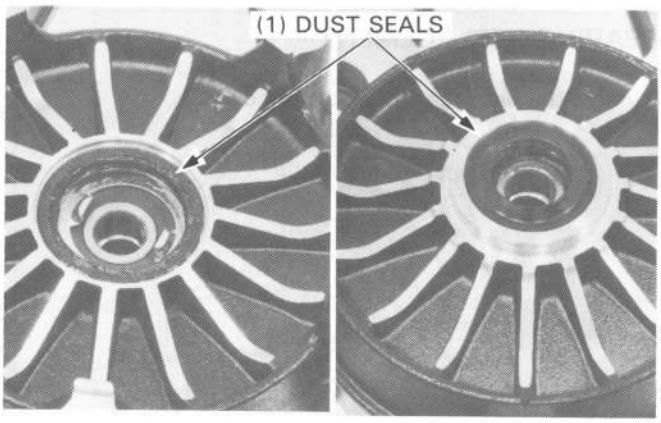


ASSEMBLY

Install the speedometer gear retainer by aligning the tabs with grooves.



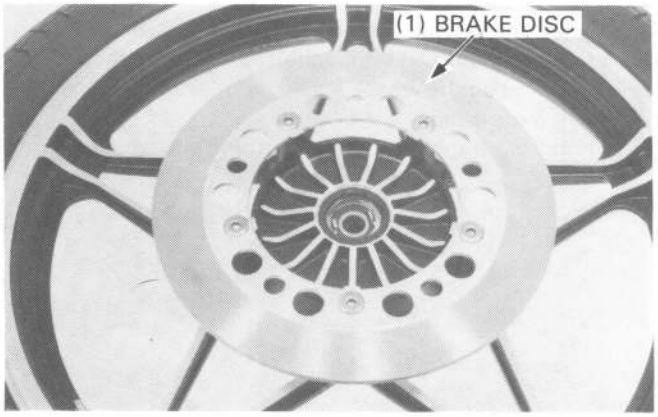
Apply grease to the lip of the dust seals and install them.



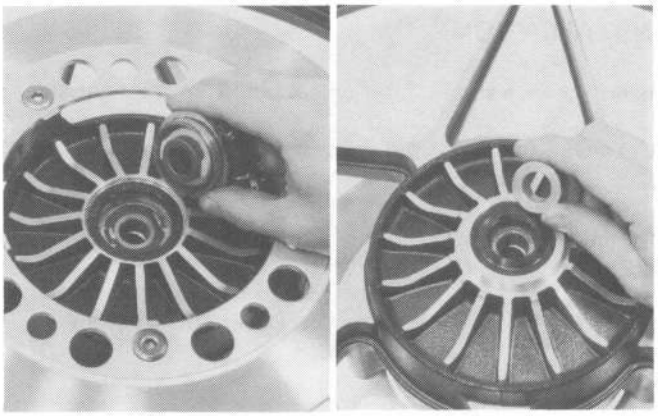
Install the brake disc.

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

Clean the brake disc of any grease or oil.



Install the right side collar.
Apply grease to the speedometer gear and install it by aligning the retainer tabs with the groove of the speedometer gear.



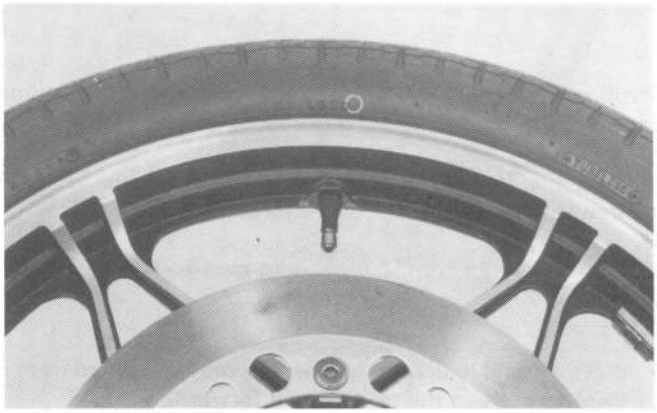
WHEEL BALANCING

CAUTION

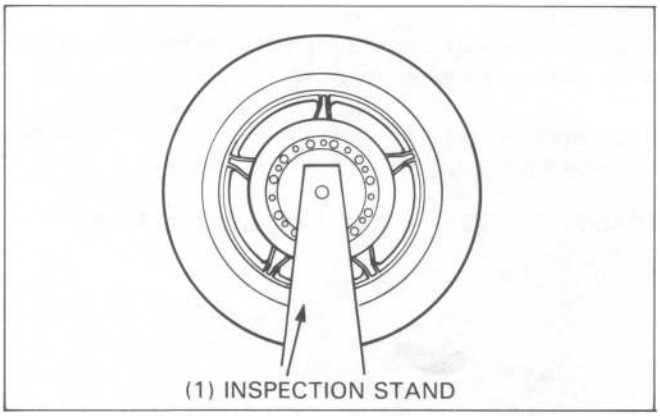
- *Wheel balance directly affects the stability, handling and overall safety of the motorcycle. Always check balance when the tire has been removed from the rim.*

NOTE

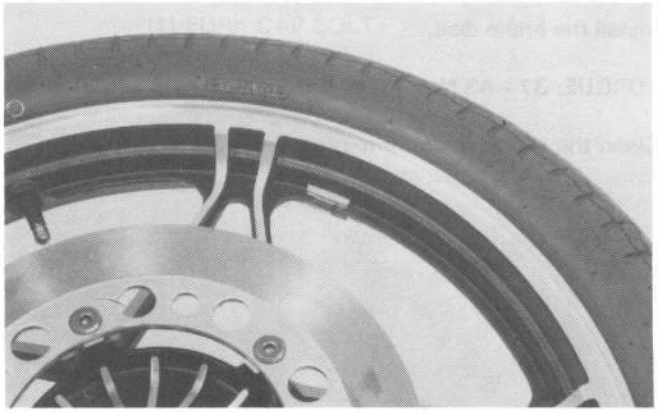
- For optimum balance, the tire balance mark (a paint dot on the side wall) must be located next to the valve stem. Remount the tire if necessary.



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 sotp, 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.



INSTALLATION

Insert the axle through the wheel hub from the right side.

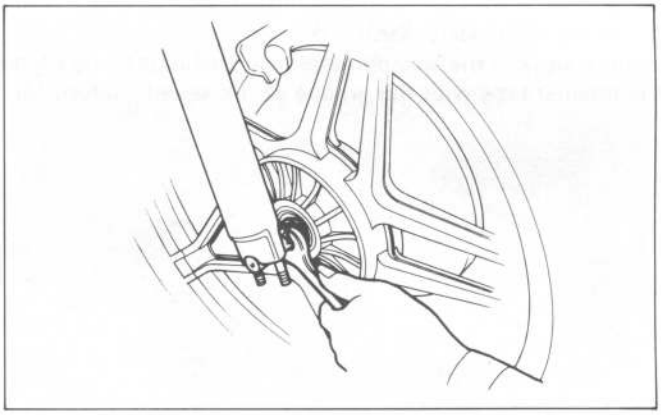
Make sure the lug of the speedometer gearbox is against the back of the tang on the fork leg.

Torque the axle nut, noting the installation direction of the speedometer gearbox.

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

NOTE

- Install the speedometer gearbox horizontally, being careful not to bend the speedometer cable.



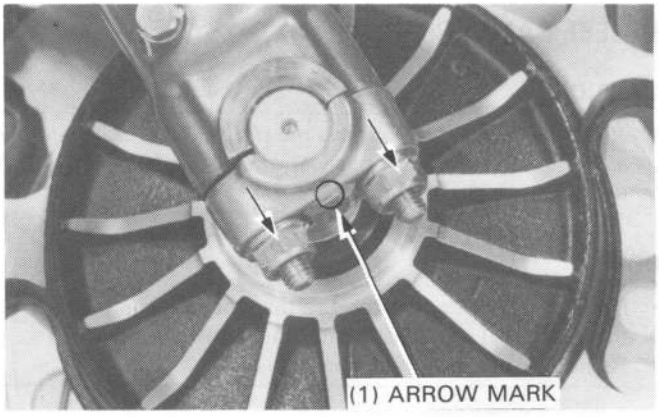
Position the axle holder on the fork end with the arrow mark facing the front.

Tighten the forward nut to the specified torque first, then tighten the rear nut to the same torque.

TORQUE: 20–24 N·m (2.0–2.4 kg-m, 14–17 ft-lb)

NOTE

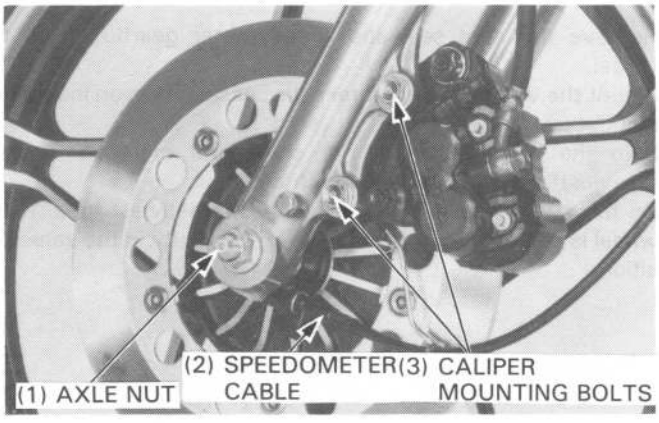
- Place a stand under the engine to remove any load from the front fork. Keep the front wheel forward.



Connect the speedometer cable to the speedometer gearbox while rotating the wheel by hand.

Install the brake caliper so that the disc is positioned between the pads and tighten the mounting bolts.

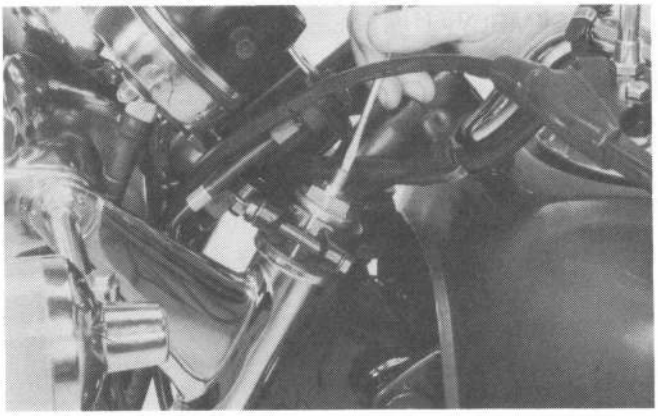
TORQUE: 32–38 N·m (3.2–3.8kg-m, 23–27 ft-lb)



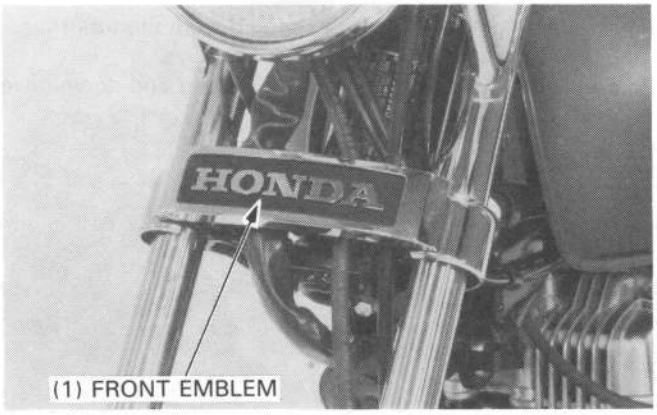
FRONT FORK

REMOVAL

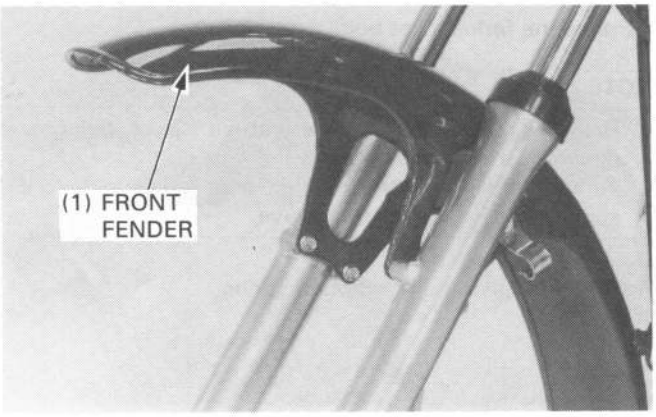
Remove the air valve cap, release air pressure.
Loosen the fork cap bolt if the front fork is required to be disassembled.



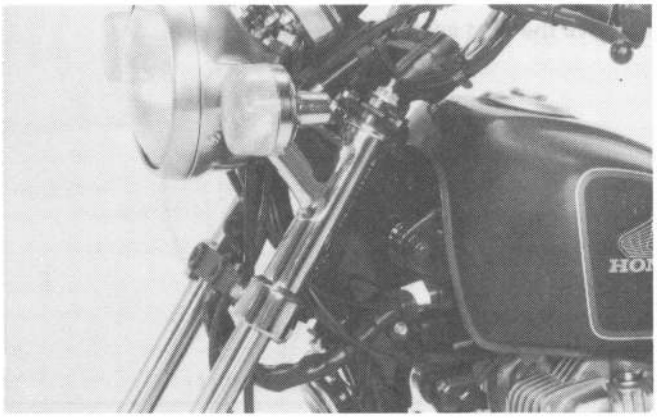
Remove the front emblem.
Remove the front wheel (page 13-6).
Remove the front brake caliper (page 15-3).



Remove the front fender.



Loosen the fork pinch bolts.

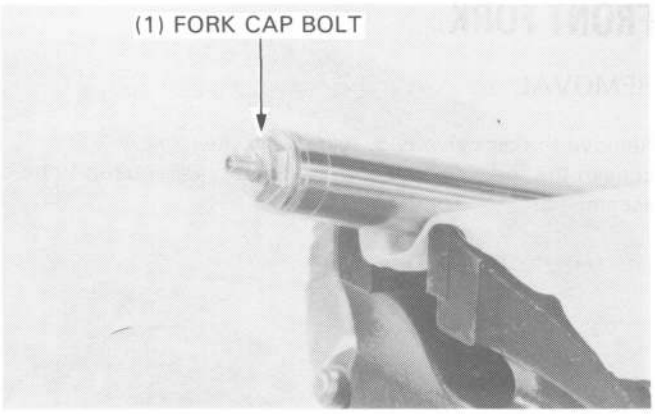


DISASSEMBLY

WARNING

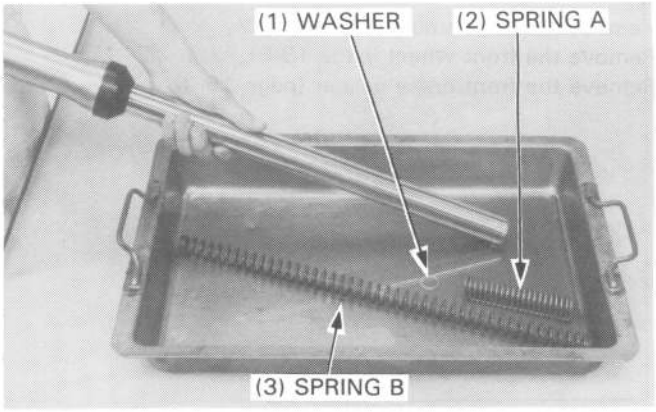
- ***The fork tube caps are under spring pressure.***
- ***Use care when removing the fork tube caps to prevent them from becoming projectiles. Wear eye and face protection.***

Remove the fork cap bolt.



Remove spring A, washer and spring B from the fork tube.

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

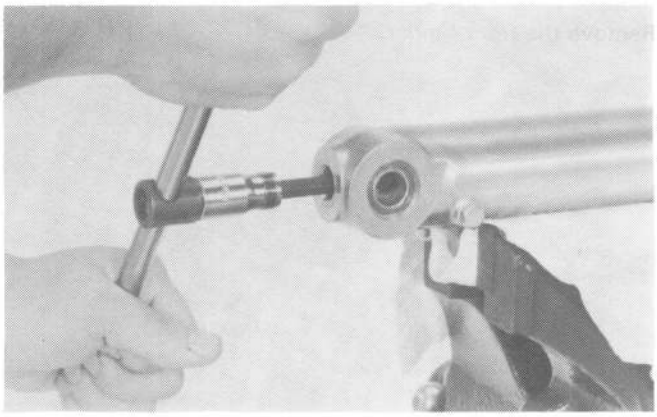


Remove the fork socket bolt.

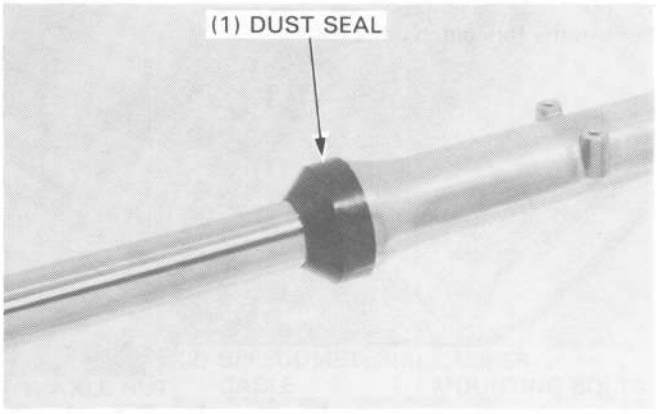
NOTE

- Hold the fork slider in a vise with soft jaws, being careful not to overtighten it.
- Temporarily install the springs and fork cap bolt if the socket bolt is difficult to remove.

Remove the piston and rebound spring.

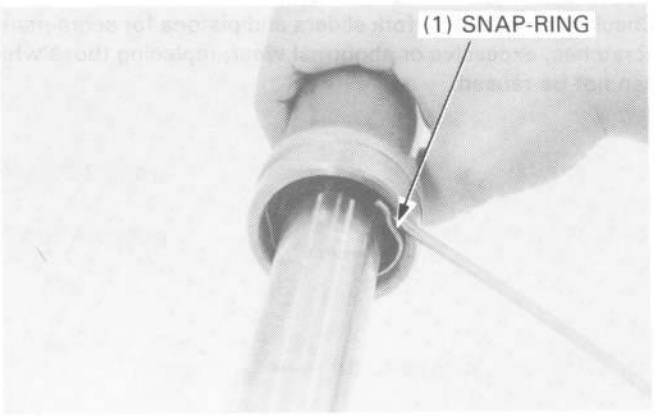


Remove the dust seal.



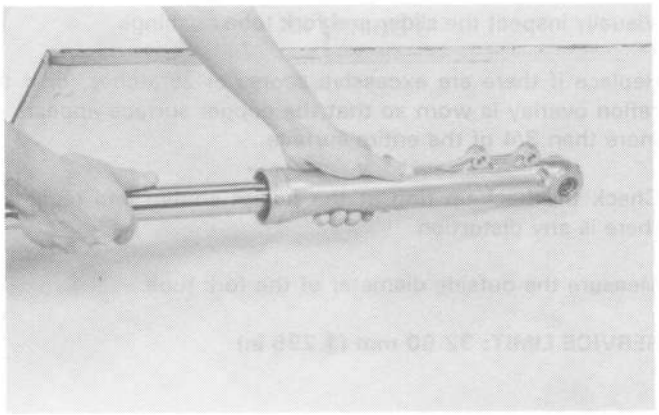
Remove the snap-ring.

Remove the back-up plate with a magnet.



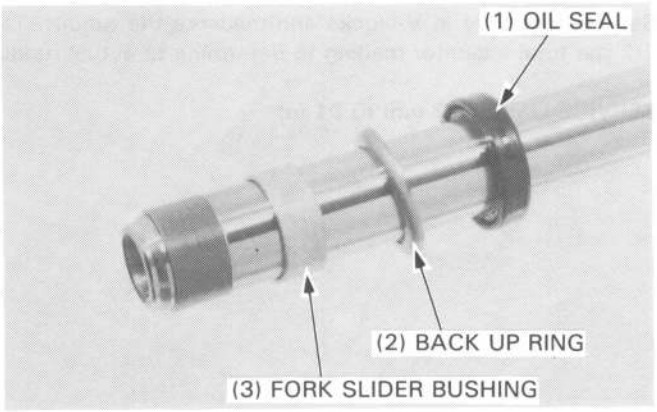
Pull the fork tube out until resistance from the slider bushing is felt.

Then move it in and out, tapping the bushing lightly until the fork tube separates from the slider. The slider bushing, seal and back-up ring will come out with the fork tube.



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

Remove the oil lock piece from inside the slider.

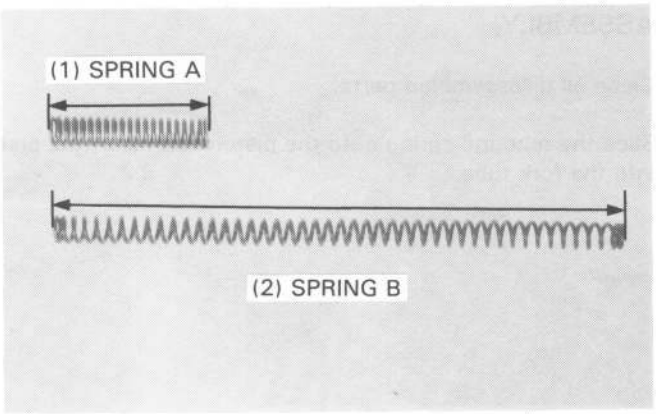


INSPECTION

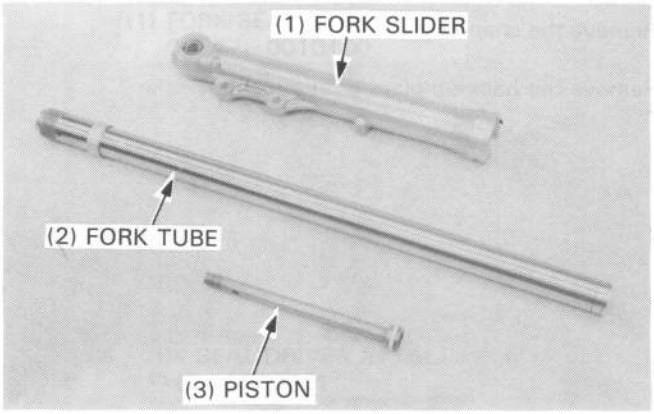
Check the free length of the fork springs.

Replace the springs if they are shorter than the service limit.

SERVICE LIMITS:
SPRING A: 235 mm (9.25 in)
SPRING B: 335 mm (13.2 in)



Check the fork tubes, fork sliders and pistons for score marks, scratches, excessive or abnormal wear, replacing those which can not be reused.



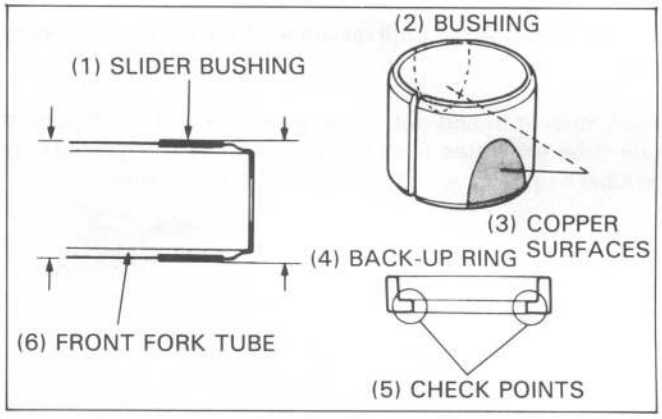
Visually inspect the slider and fork tube bushings.

Replace if there are excessive scores or scratches, or if the teflon overlay is worn so that the copper surface appears on more than 3/4 of the entire surface.

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

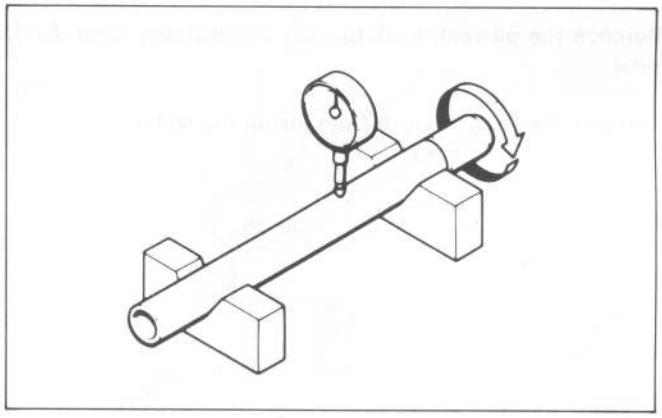
Measure the outside diameter of the fork tube.

SERVICE LIMIT: 32.90 mm (1.295 in)



Set the fork tube in V-blocks and measure the runout. Take 1/2 the total indicator reading to determine to actual runout.

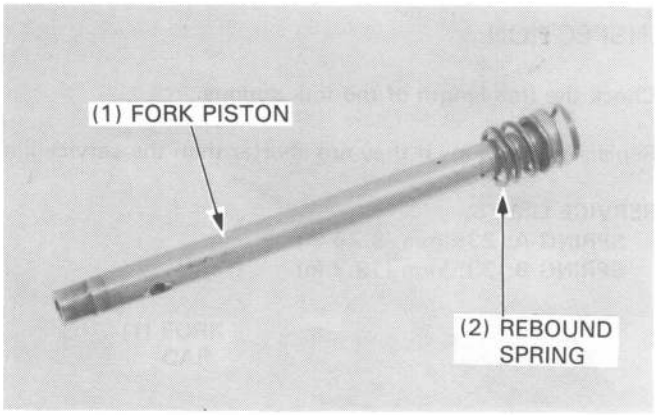
SERVICE LIMIT: 0.2 mm (0.01 in)

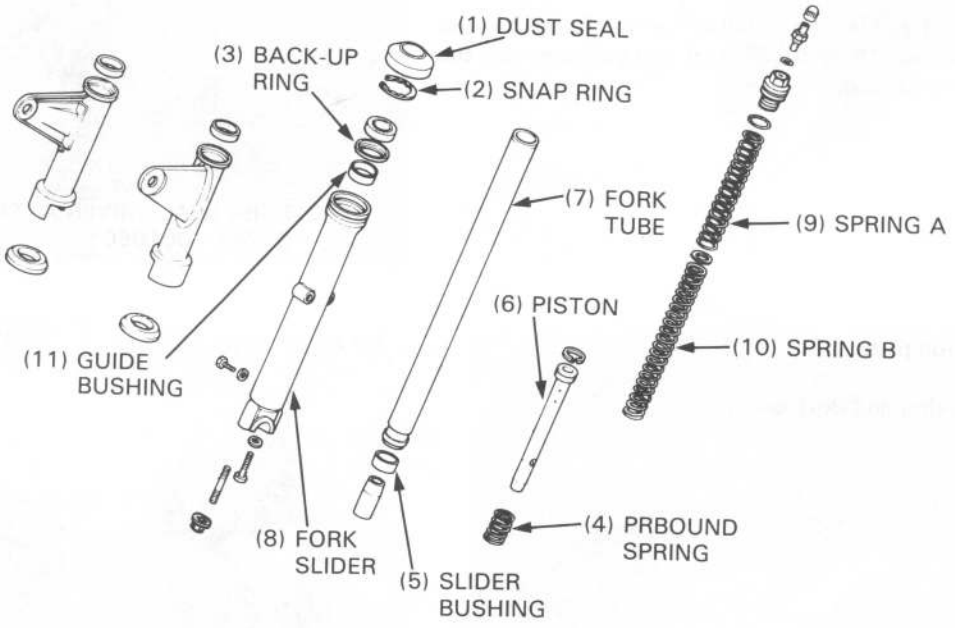


ASSEMBLY

Clean all disassembled parts.

Slide the rebound spring onto the piston and insert the piston into the fork tube.

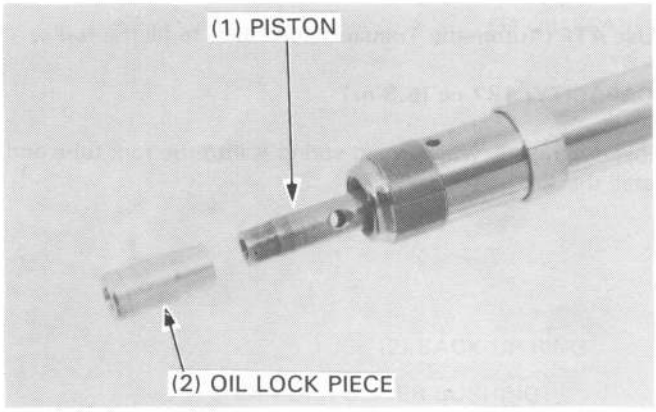




Install the fork bushing onto the fork tube.

Install the oil lock piece onto the end of the piston.

Insert the fork tube into the slider.

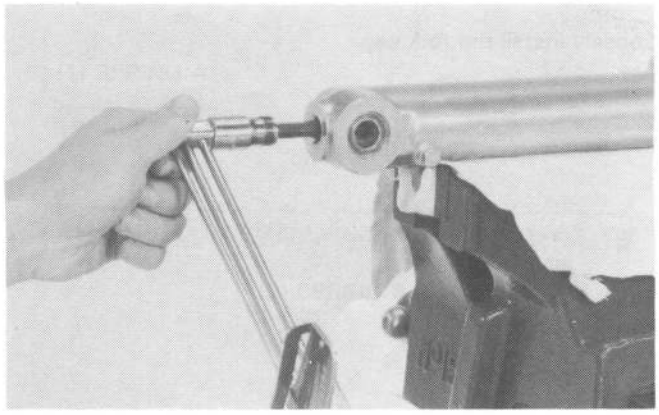


Apply a locking agent to the socket bolt and thread it into the piston. Tighten with a hex wrench.

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

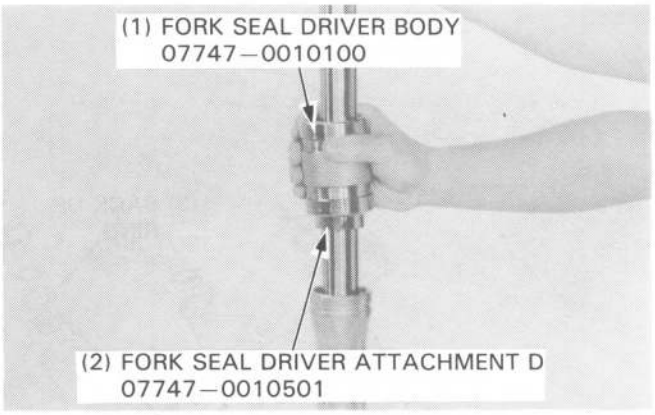
CAUTION

- *Do not overtighten the fork slider in the vise.*



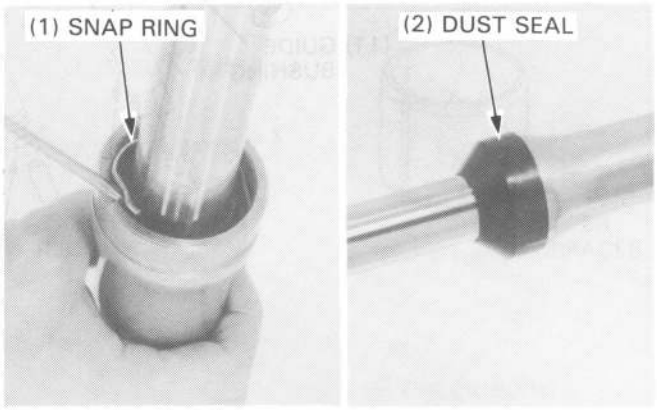
Place the slider bushing over the fork tube and rest it on the slider. Put the back-up ring and old bushing or equivalent tool on top of the new bushing. Drive the bushing into place with the fork seal driver.

Dip a new oil seal In ATF and install it over the fork tube with the marks facing up. Drive the oil seal into position until the snap-ring groove appears.



Install the back-up plate.

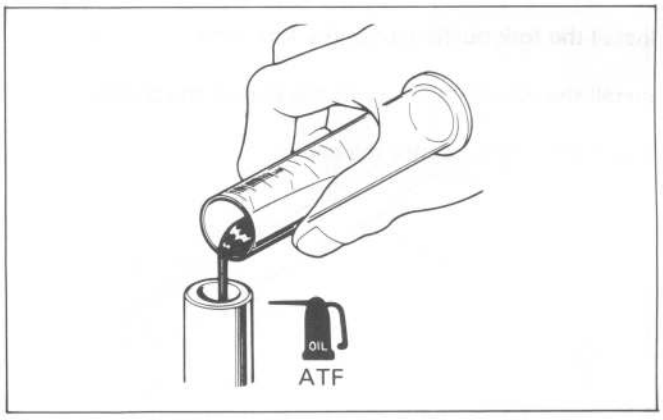
Install the snap-ring and dust cover.



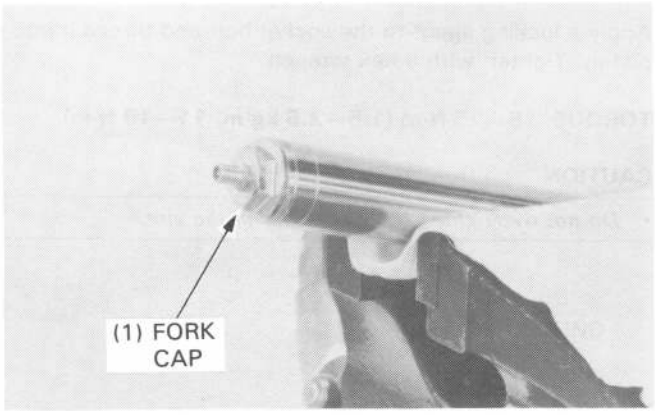
Use ATF (Automatic Transmission Fluid) to fill the forks.

CAPACITY: 187 cc (6.3 oz)

Insert spring B, washer and spring A into the fork tube and install the fork cap bolt.



Loosely install the fork cap.

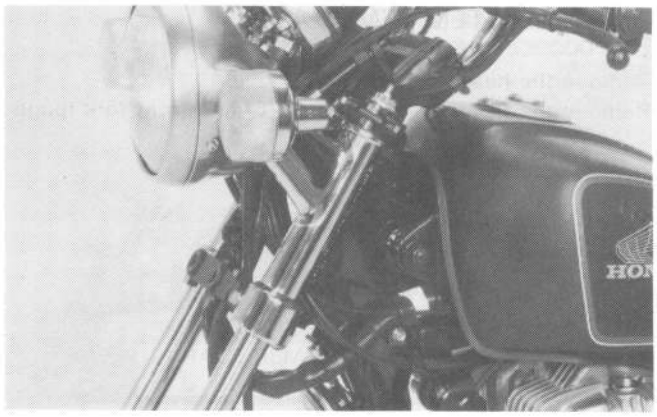


INSTALLATION

Install the front fork by aligning the groove of the fork tube with the upper surface of the fork bridge.

Tighten the upper and lower pinch bolts.

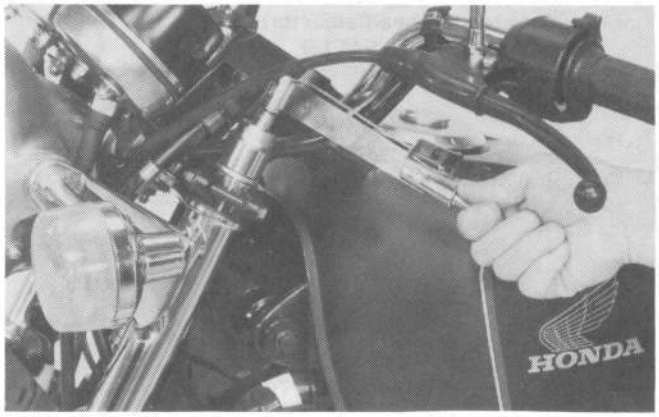
TORQUE:
UPPER 10—14 N·m (1.0—1.4 kg-m, 7—10 ft-lb)
LOWER 20—24 N·m (2.0—2.4 kg-m, 14—17 ft-lb)



Tighten the fork cap bolts.

TORQUE: 16—20 N·m (1.6—2.0 kg-m, 12—14 ft-lb)

Install the front wheel and front fender.
Install the front emblem.

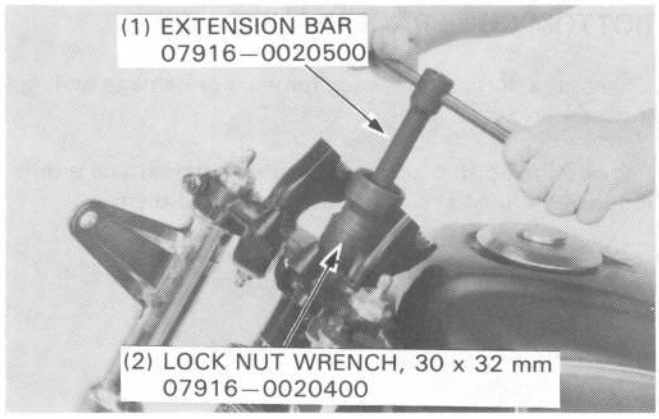


STEERING STEM

FORK BRIDGE REMOVAL

Remove the following:
— handlebar (page 13-3).
— headlight (page 19-2).
— instrument (page 19-3).

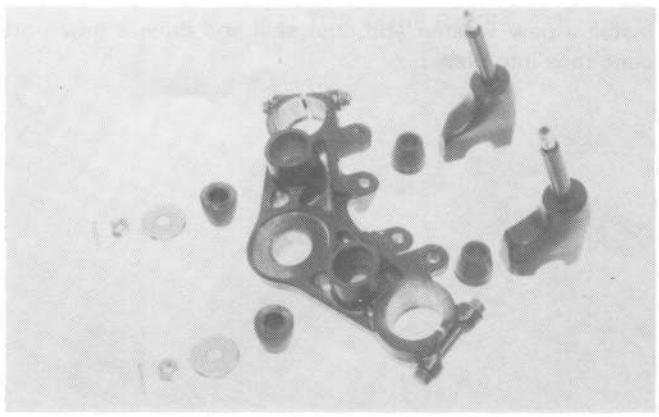
Remove the steering stem nut.
Loosen the fork bridge, pinch bolts and remove the fork bridge.



Remove the cotter pins.
Remove the nuts and washers.
Remove the handlebar lower holders and mount rubbers.

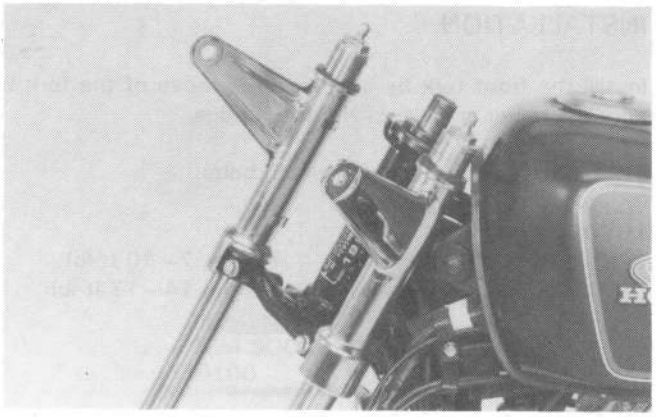
Check the mount rubber for wear or damage and replace if necessary.

Install the fork bridge in the reverse order of removal.



STEERING STEM REMOVAL

Remove the headlight brackets.
Remove the front wheel (page 13-6) and front fork (page 13-11).

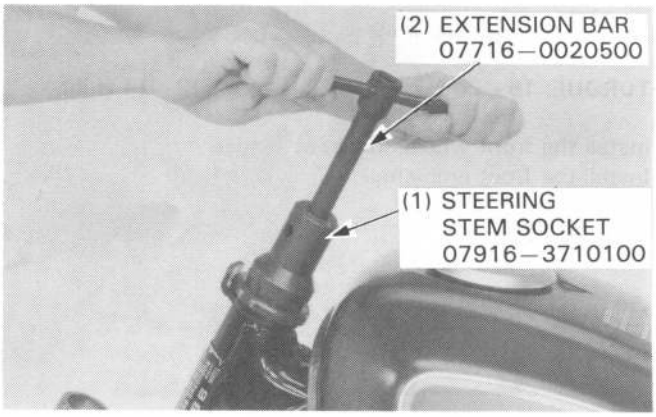


Remove the steering head adjuster.

Remove the steering stem.

NOTE

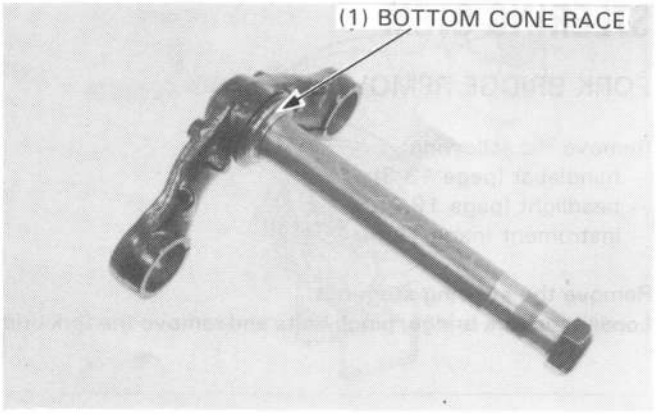
- Do not allow the steel balls to fall.



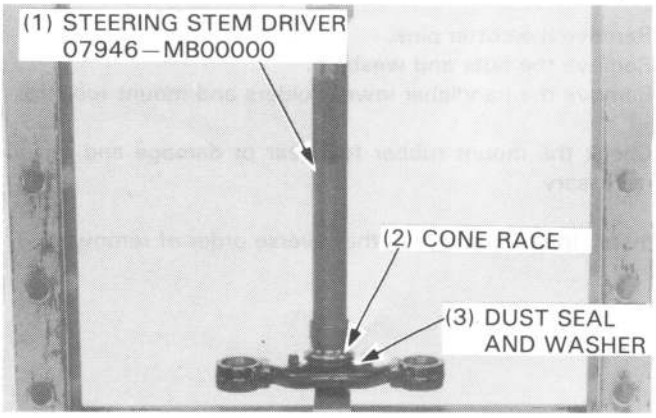
BOTTOM CONE RACE REPLACEMENT

Inspect the bottom cone race for wear or damage and replace if necessary.

Remove the bottom cone race with a hammer and a drift.
Remove the dust seal and washer, discard them.



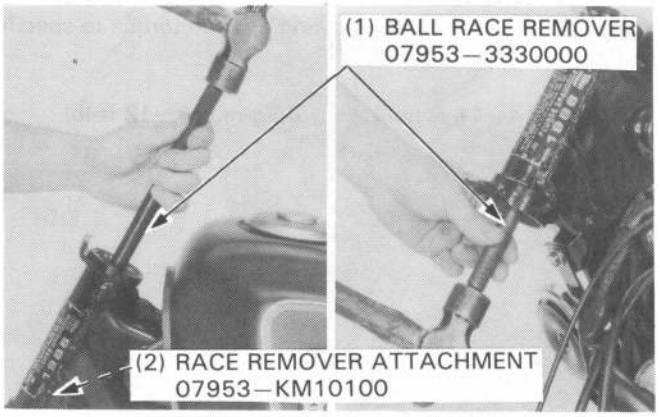
Install a new washer and dust seal and drive a new bottom cone race into place.



BALL RACE REPLACEMENT

Inspect the top and bottom ball races and replace if worn or damaged.

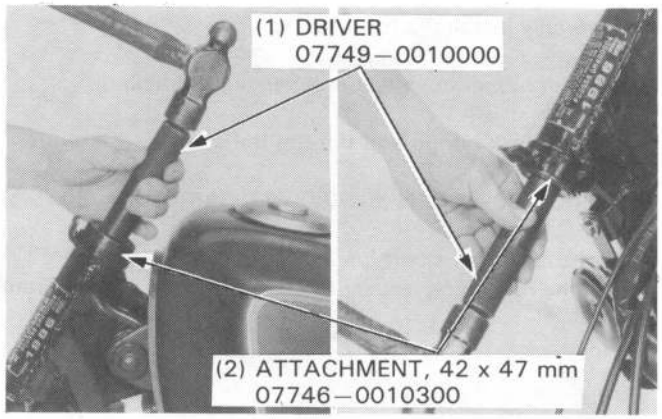
Drive out the top and bottom ball races.



Install new top and bottom ball races.

NOTE

- Drive in the ball races squarely.
- Drive in the ball races until they seat.



INSTALLATION

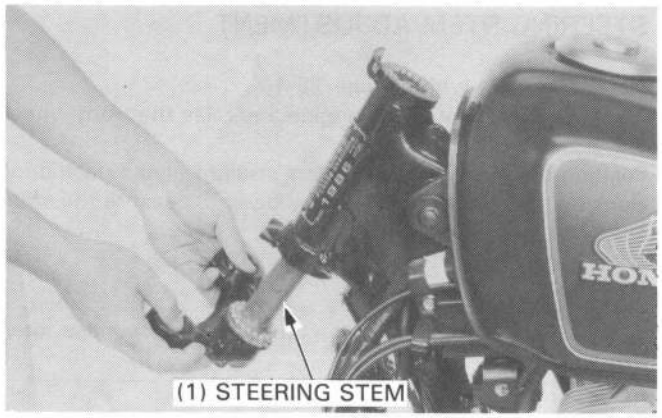
Grease the top race and install 18 ball bearings.

Grease the lower cone race and install 19 ball bearings.

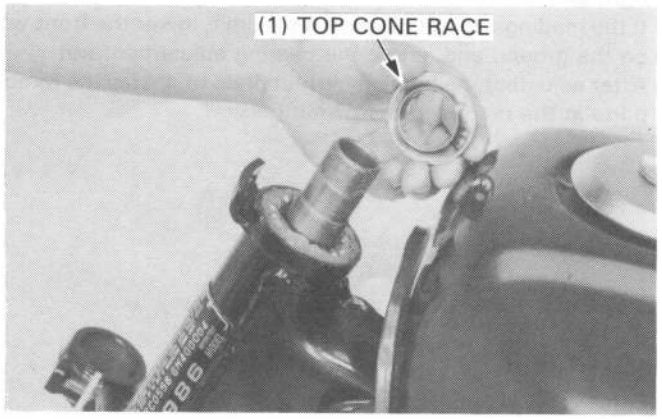
NOTE

- Do not allow the balls to fall.

Install the steering stem into the frame.

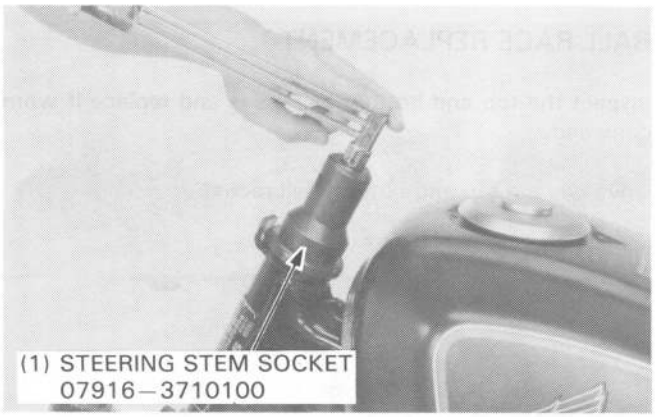


Install the top cone race.



Install the steering stem adjusting nut and torque to specification.

TORQUE: 14—16 N·m (1.4—1.6 kg-m, 10—12 ft-lb)



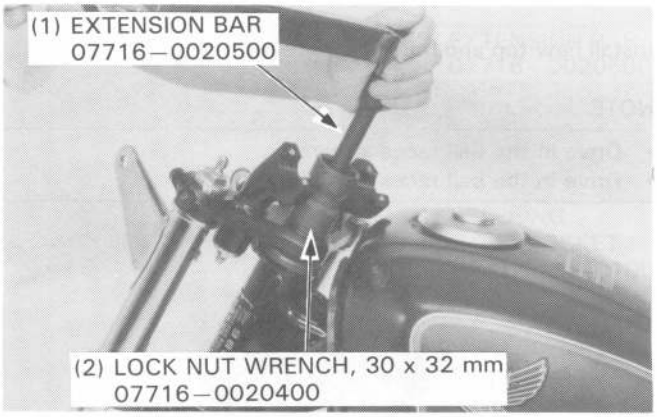
Temporarily install the front forks.

Install the rubber cushions and headlight brackets.

Install the fork bridge and tighten the steering stem nut.

TORQUE: 100—110 N·m (10.0—11.0 kg-m, 72—80 ft-lb)

Adjust the fork position (page 13-17).
Install the remaining assemblies in the reverse order of removal.

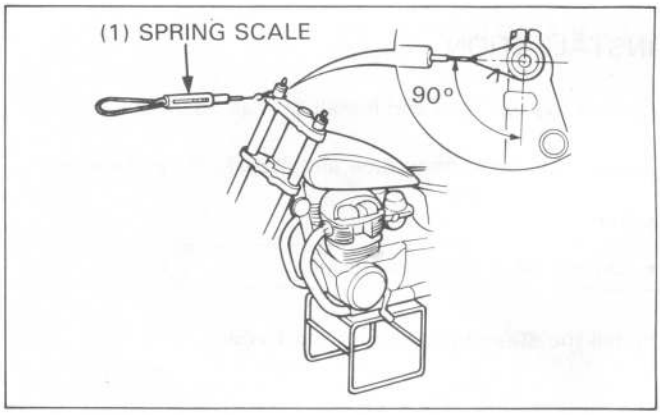


STEERING STEM ADJUSTMENT

Install the front wheel (page 13-10).
Place the stand under the engine and raise the front wheel off the ground.
Position the steering stem in the straight ahead position.
Hook a spring scale to the fork tube and measure the steering head bearing preload.

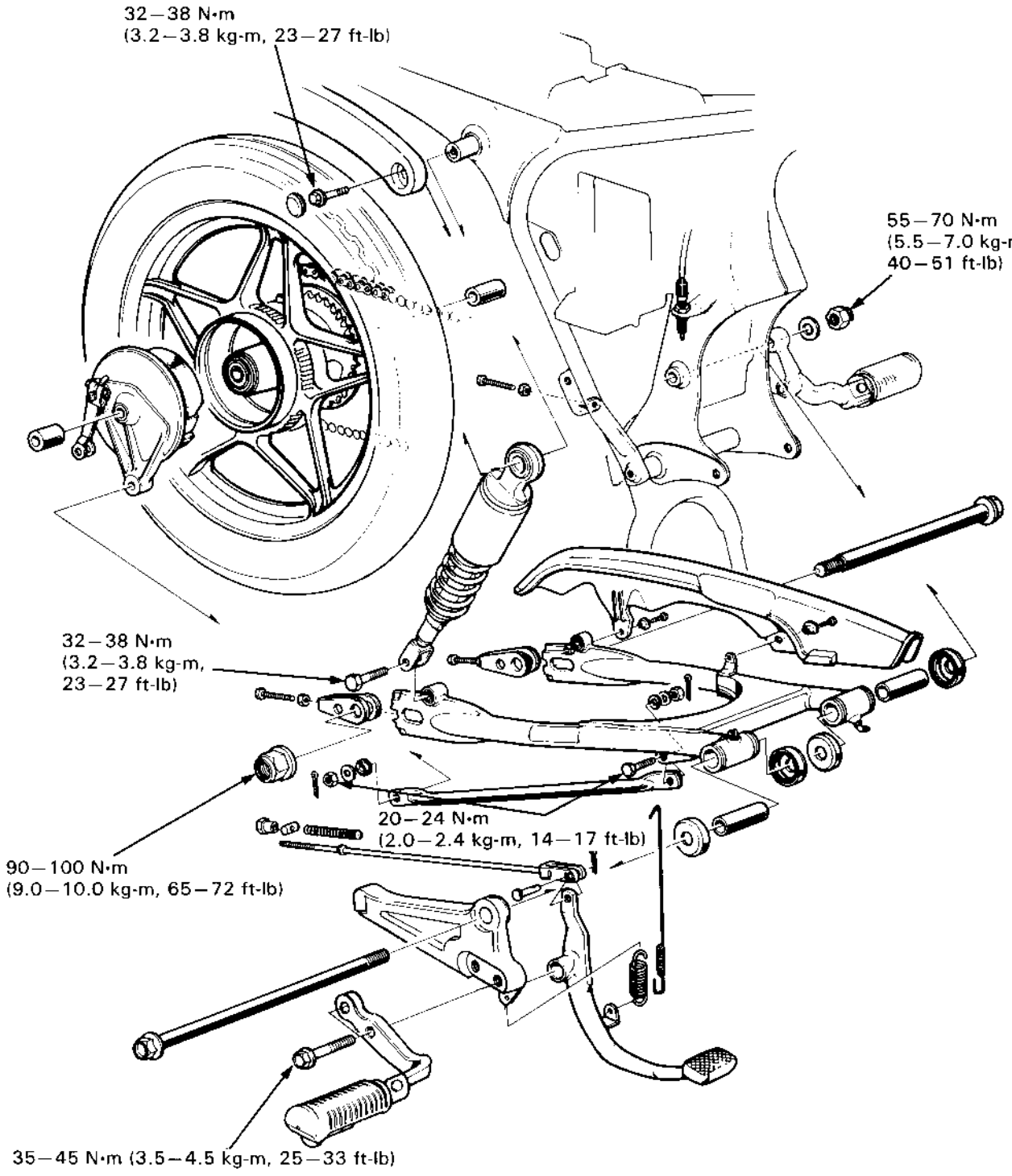
NOTE

- Make sure that there is no cable or wire harness interference.



The preload should be within 1.0—1.6 kg (2.21—3.53 lb) right and left turns.
If the readings do not fall within the limit, lower the front wheel on the ground and adjust the bearing adjustment nut.
After adjusting the bearing correct preload, install the removed parts in the reverse order of removal.

MEMO


32–38 N·m
(3.2–3.8 kg-m, 23–27 ft-lb)
55–70 N·m
(5.5–7.0 kg-m,
40–51 ft-lb)
32–38 N·m
(3.2–3.8 kg-m,
23–27 ft-lb)
20–24 N·m
(2.0–2.4 kg-m, 14–17 ft-lb)
90–100 N·m
(9.0–10.0 kg-m, 65–72 ft-lb)
35–45 N·m (3.5–4.5 kg-m, 25–33 ft-lb)

14. REAR WHEEL/BRAKE/SUSPENSION

SERVICE INFORMATION

GENERAL

- The rear wheel uses a tubeless tire. For tubeless tire repairs, refer to the Tubeless Tire Manual.
- Do not remove rivets, nuts and pins from the rim, spoke plate and hub.
- Never ride on the rim or try to bend the wheel.
- Avoid damaging the aluminum alloy rim during tire removal.

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 with a sealed dust collector.
  Wear a protective face mask and throughly wash your hands when finished.

SPECIFICATIONS

ITEM		STANDARD	SERVICE LIMIT
Axle bend		—	0.2 mm (0.008 in)
Rear wheel runout	Radial	—	2.0 mm (0.08 in)
	Axial	—	2.0 mm (0.08 in)
Final driven sprocket I.D.		65.00–65.09 mm (2.560–2.563 in)	65.16 mm (2.565 in)
Rear wheel hub O.D.(L)		64.94–64.97 mm (2.557–2.558 in)	64.87 mm (2.554 in)
Brake lining thickness		4.9–5.0 mm (0.19–0.20 in)	2.0 mm (0.08 in)
Rear brake drum I.D.		140.0–140.3 mm (5.51–5.52 in)	141.0 mm (5.55 in)
Rear cushion spring free length		208.3 mm (8.20 in)	198.0 mm (7.80 in)

TORQUE VALUES

Final driven sprocket	62–68 N·m (6.2–6.8 kg-m, 45–49 ft-lb)
Footpeg	35–45 N·m (3.5–4.5 kg-m, 25–33 ft-lb)
Rear axle nut	90–100 N·m (9.0–10.0 kg-m, 65–72 ft-lb)
Rear brake torque link	20–24 N·m (2.0–2.4 kg-m, 14–17 ft-lb)
Rear shock absorber	32–38 N·m (3.2–3.8 kg-m, 23–27 ft-lb)
Swingarm pivot bolt	55–70 N·m (5.5–7.0 kg-m, 40–51 ft-lb)

TOOLS

Special

Needle bearing remover	07946–KA50000
Driver shaft	07946–MJ00100

Common

Driver	07749–0010000
Attachment, 42 x 47 mm	07746–0010300
Pilot, 17 mm	07746–0040400
Rear shock absorber compressor	07959–3290001
Bearing remover shaft	07746–0050100
Remover head, 17 mm	07746–0050500
Attachment, 32 x 35 mm	07746–0010100

TROUBLESHOOTING

Wobble or vibration in motorcycle
1. Distorted rim
2. Loose wheel bearings
3. Loose or distorted spokes
4. Faulty tire
5. Loose axle

Soft suspension
1. Weak spring
2. Shock absorbers improperly adjusted
3. Weak rear damper

Hard suspension
1. Shock absorbers imporperly adjusted

Suspension noise
1. Shock case binding
2. Loose fasteners

Poor brake performance
1. Improper brake adjustment
2. Fouled brake linings
3. Worn brake shoes
4. Worn brake shoe cam contacting faces
5. Worn brake drum
6. Improper engagement between brake arm and shaft serrations

REAR WHEEL

REMOVAL

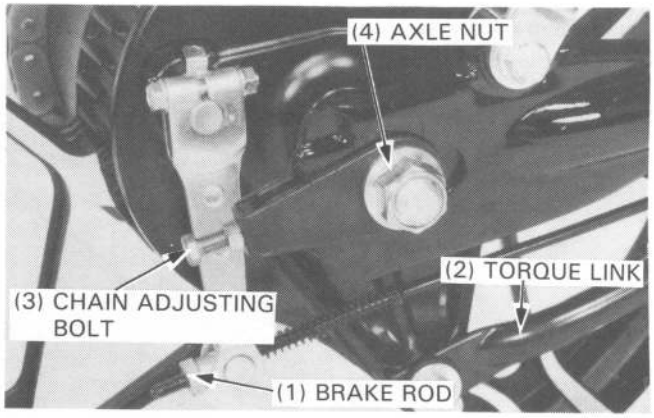
Place the motorcycle on its center stand or a support block.

Disconnect the torque link by removing the cotter pin, nut, washer and rubber gromment.

Disconnect the brake rod from the brake arm.

Loosen the drive chain adjusting bolts.

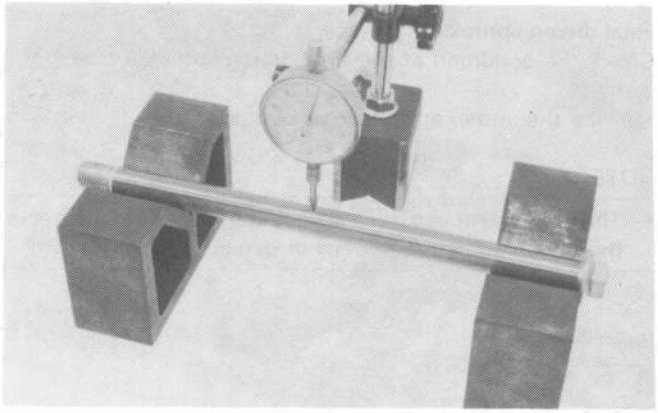
Remove the axle nut, pull the axle out and remove the rear wheel.



INSPECTION

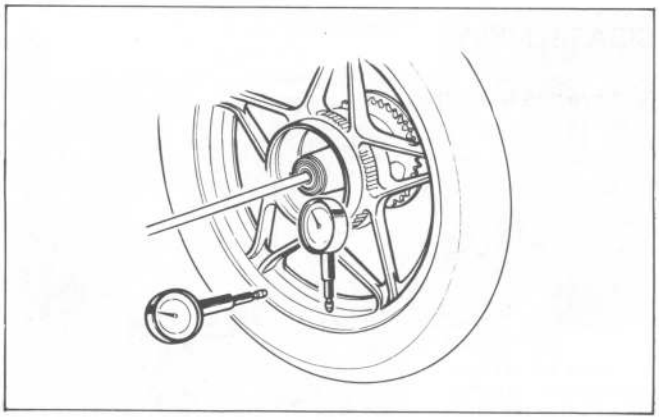
Axleshaft
Set the axle in V blocks and check the axle runout. The actual axle runout is 1/2 of the total indicator reading.

SERVICE LIMIT: 0.2 mm (0.01 in)



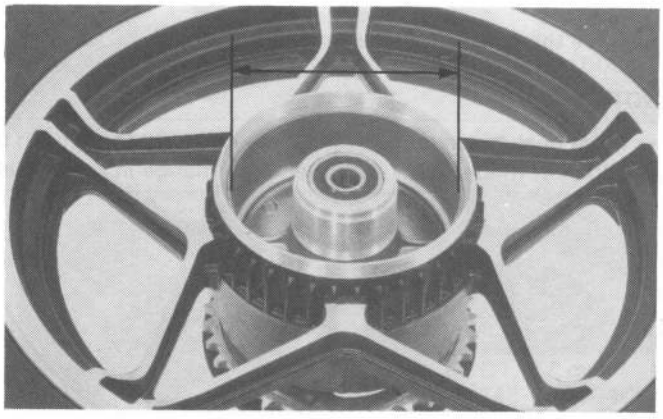
Wheel rim runout
Check the rim for runout by placing the wheel in a truing stand. Spin the wheel by hand, and read the runout using a dial indicator gauge.

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



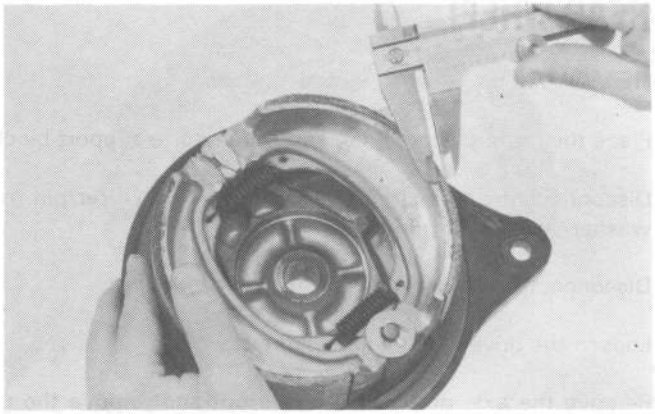
Rear brake drum I.D.
Measure the rear brake drum I.D.

SERVICE LIMIT: 141.0 mm (5.55 in)



Brake lining thickness
Measure the rear brake lining thickness.

SERVICE LIMIT: 2.0 mm (0.10 in)

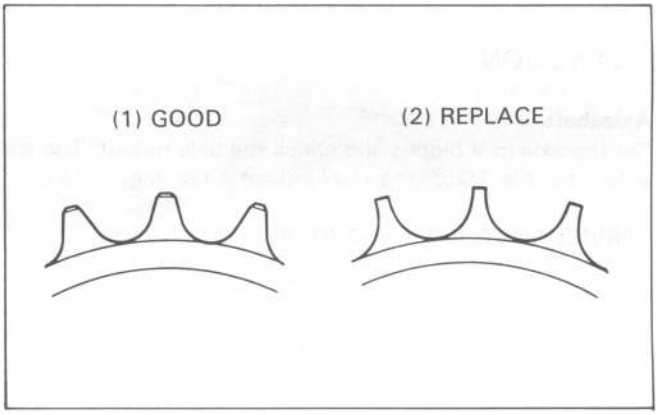


Final driven sprocket
Check the condition of the final driven sprocket teeth.

Replace the sprocket if worn or damaged.

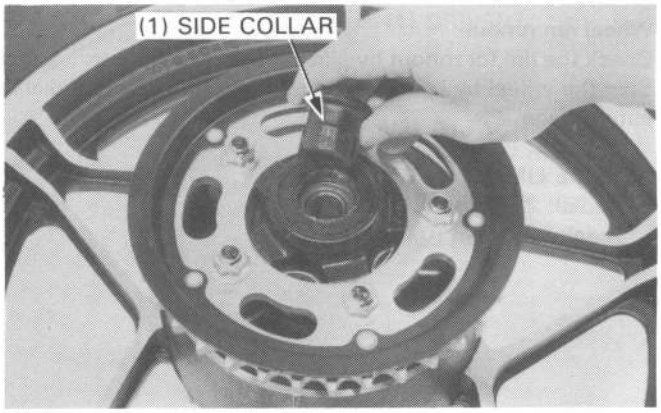
NOTE

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



DISASSEMBLY

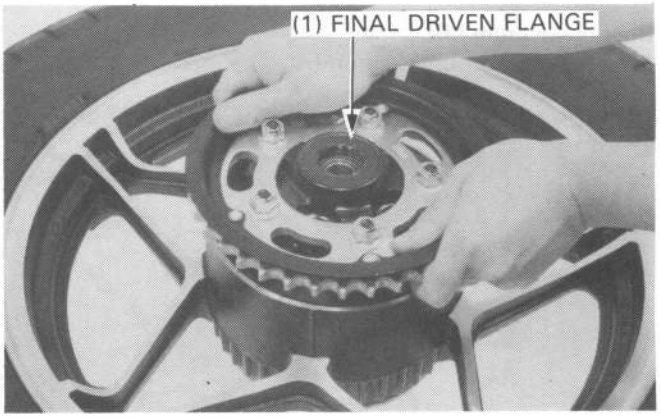
Remove the left collar.



Remove the final driven flange.

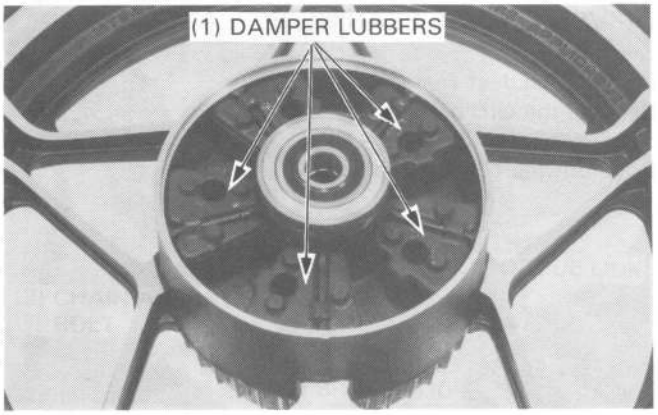
NOTE

- If the final driven sprocket requires replacement, loosen the sprocket mount nuts with the driven flange in the wheel.



DAMPER RUBBER INSPECTION

Replace the damper rubbers if they are damaged or deteriorated.



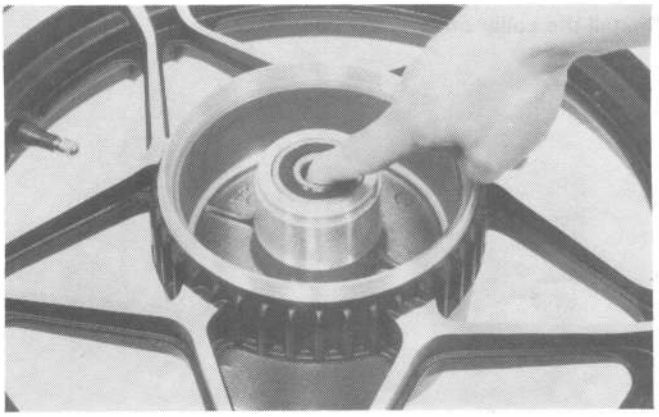
BEARING INSPECTION

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

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

NOTE

- Replace hub bearings in pairs.



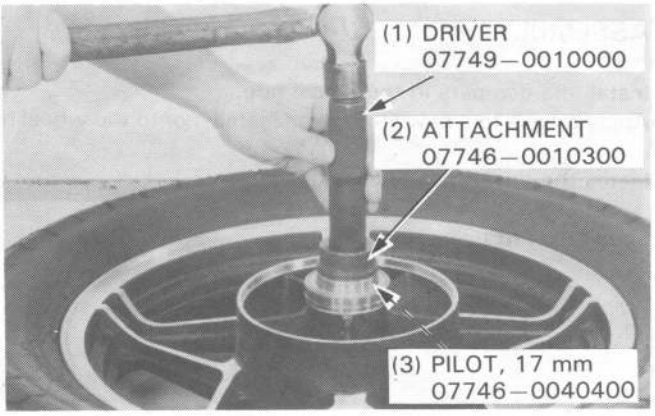
WHEEL BEARING REPLACEMENT

Remove the bearing and discard it.

Drive in the right bearing first.
Install the distance collar and drive in the left bearing.

NOTE

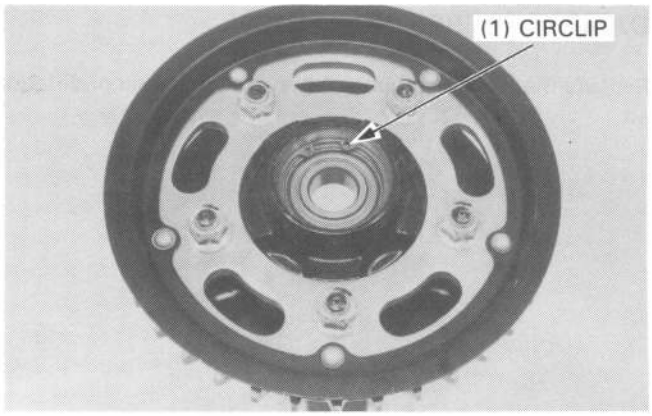
- Drive in the bearings squarely.



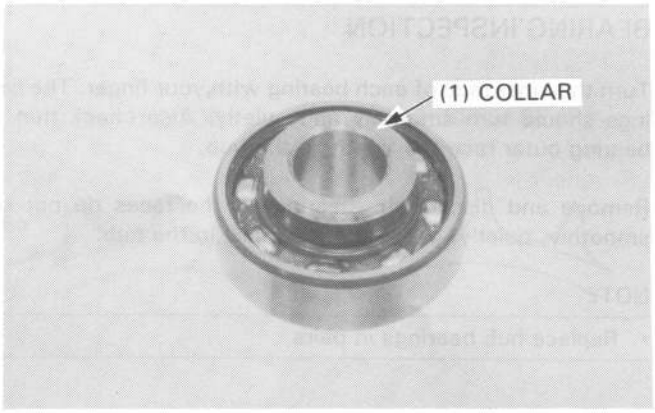
DRIVEN FLANGE BEARING REPLACEMENT

Remove the dust seal.
Remove the circlip.

Drive out the bearing and collar.

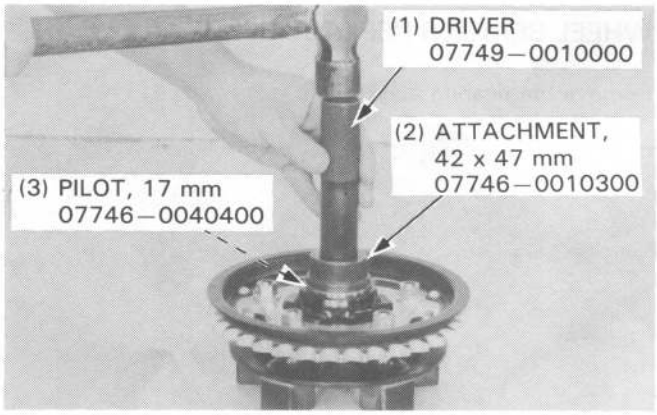


Install the collar onto a new bearing.



Pack the bearing with grease and drive it in the driven flange.

Install the circlip and dust seal.

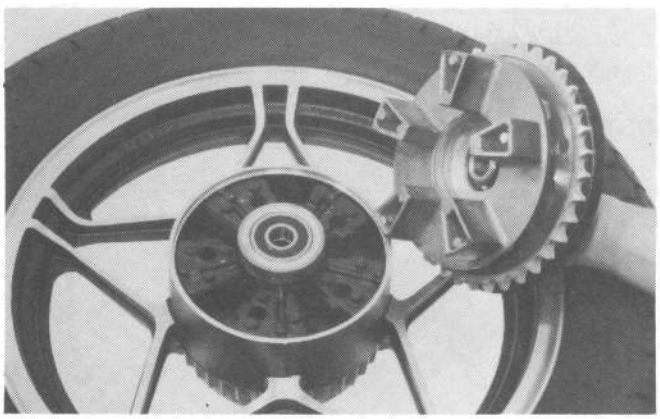


ASSEMBLY

Install the dampers in the wheel hub.
Apply grease to a new O-ring and install it onto the wheel hub.

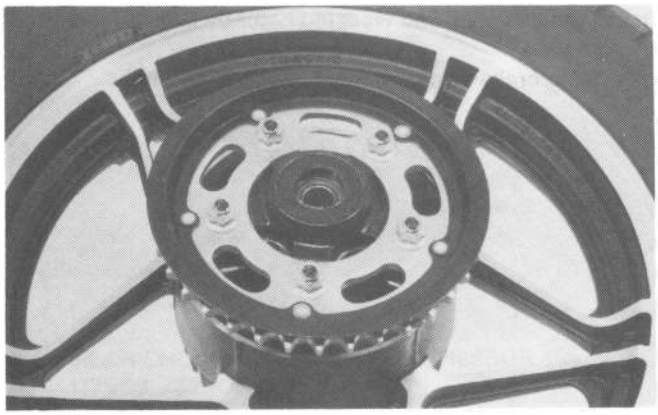
Install the driven flange.

Install the left collar.



Tighten the final driven sprocket if it was replaced.

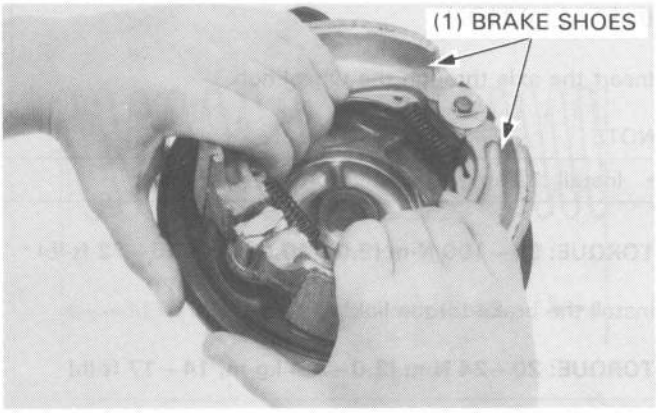
TORQUE: 62–68 N·m (6.2–6.8 kg-m, 45–49 ft-lb)



BRAKE PANEL DISASSEMBLY

Remove the brake shoes and shoe springs.

Remove the brake arm and brake cam.

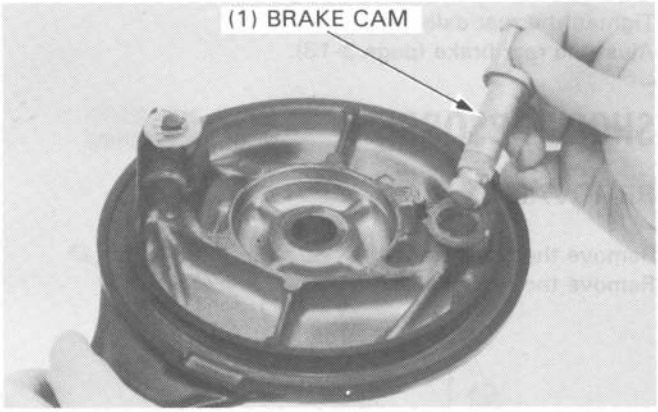


ASSEMBLY

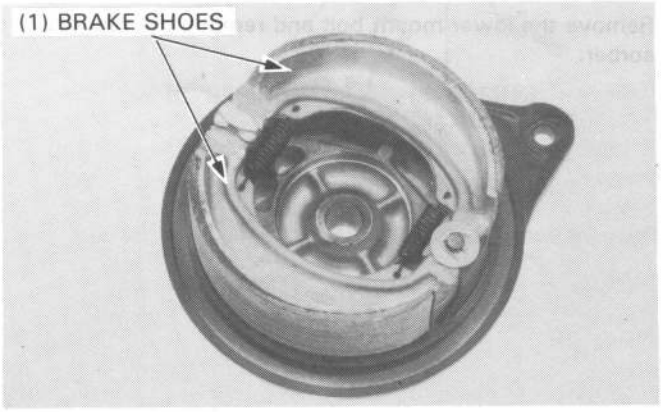
WARNING

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

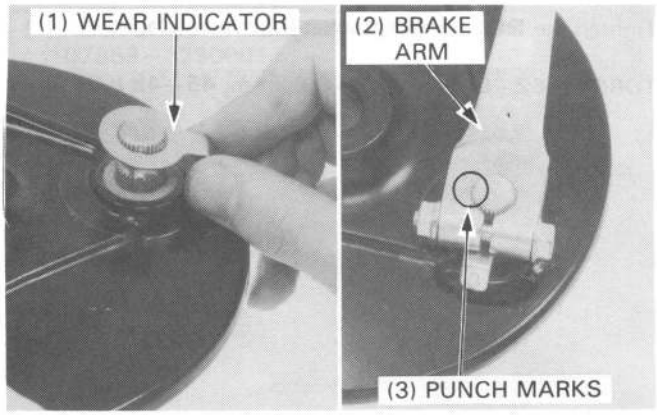
Apply grease to the cam and install it into the brake panel.



Apply grease to the brake shoe sliding surfaces.
Install the shoe springs and brake shoes.



Install the dust seal and wear indicator by aligning the tab with the groove.
Install the brake arm by aligning the punch marks.



INSTALLATION

Insert the axle through the wheel hub.

NOTE

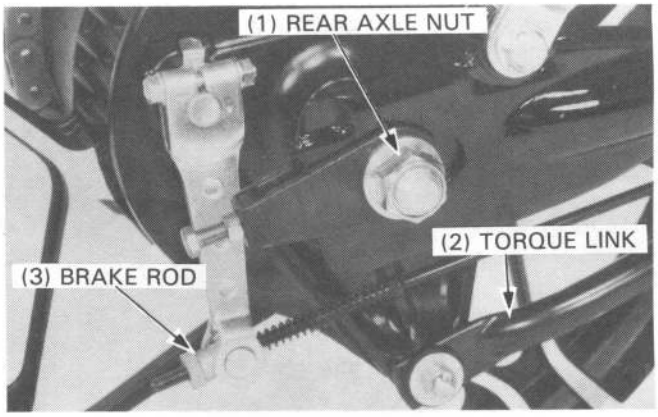
- Install the long axle collar on the right side.

TORQUE: 90—100 N·m (9.0—10.0 kg-m, 65—72 ft-lb)

Install the brake torque link.

TORQUE: 20—24 N·m (2.0—2.4 kg-m, 14—17 ft-lb)

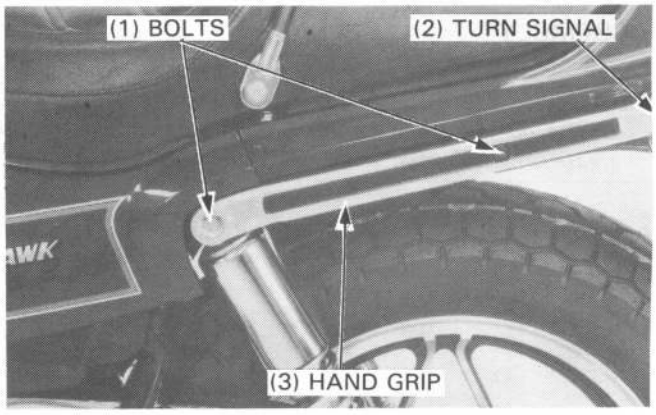
Connect the brake rod.
Adjust the drive chain slack (page 3-11).
Tighten the rear axle nut.
Ajust the rear brake (page 3-13).



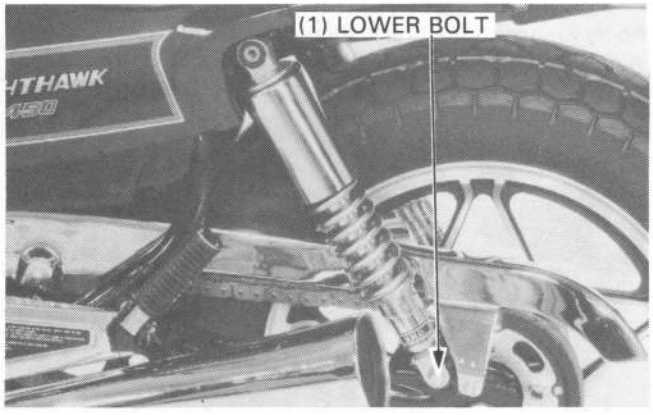
SHOCK ABSORBER

REMOVAL

Remove the bolt hole cap.
Remove the rear handle.



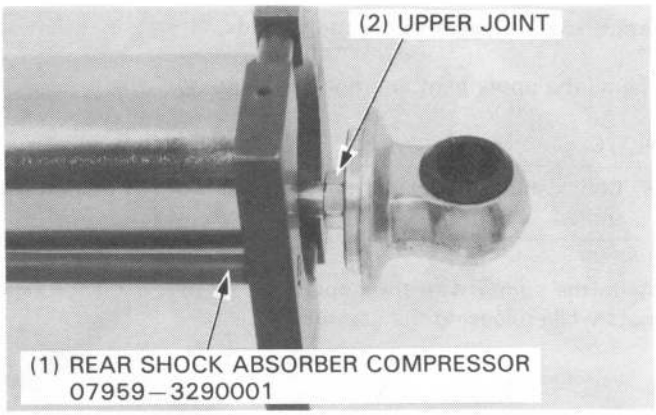
Remove the lower mount bolt and remove the rear shock absorber.



DISASSEMBLY

Compress the spring.

Remove the upper joint and disassemble the shock absorber.

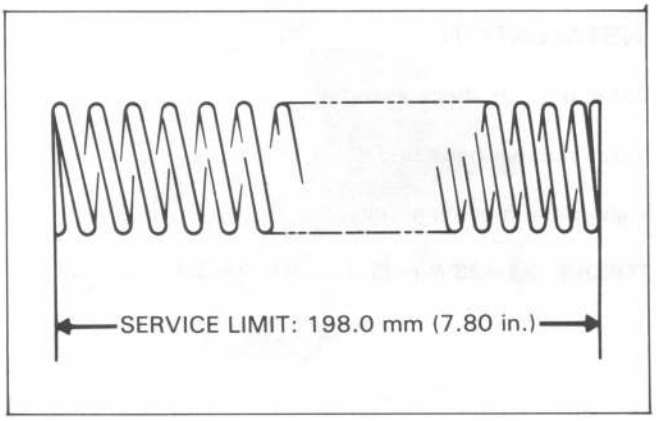


INSPECTION

Check the shock absorber spring free length and replace the spring if shorter than the service limit.

SERVICE LIMIT: 198.0 mm (7.80 in)

Inspect the shock absorber damper for damage or oil leaks. Replace the damper if it is damaged or leaking.



ASSEMBLY

Install the spring adjuster, the spring seat, spring and stopper rubber on the damper.

NOTE

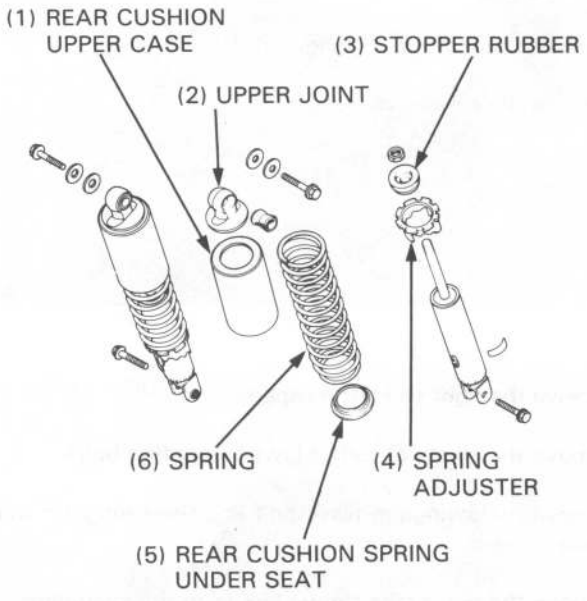
- Install the spring with the tightly wound end facing up.

Apply a locking agent to the rod threads and tighten the lock nut securely.

Attach the shock absorber compressor.

WARNING

- ***Screw in the holder nut to prevent the spring from coming out of position.***



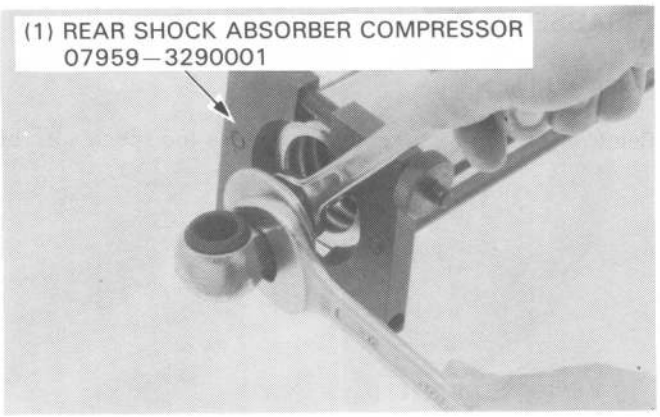
Apply locking agent to the rod threads.

Install the upper joint and tighten securely.

NOTE

- Check that the lock nut is seated against the rod's bottom thread.

Align the spring with the upper joint by loosening the holder nuts while releasing the compressor.



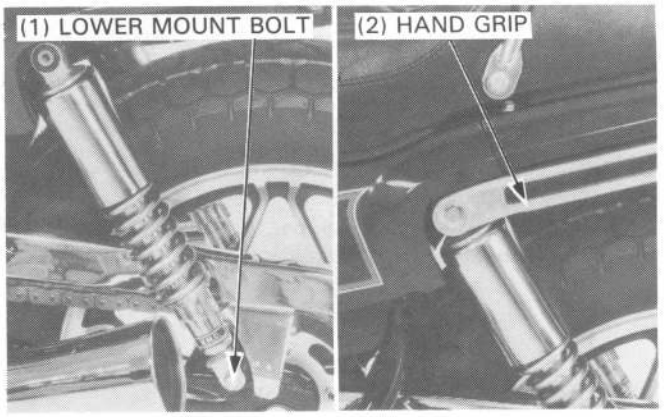
INSTALLATION

Install the rear shock absorber.

Install the rear hand grip.

Tighten the mounting bolts.

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

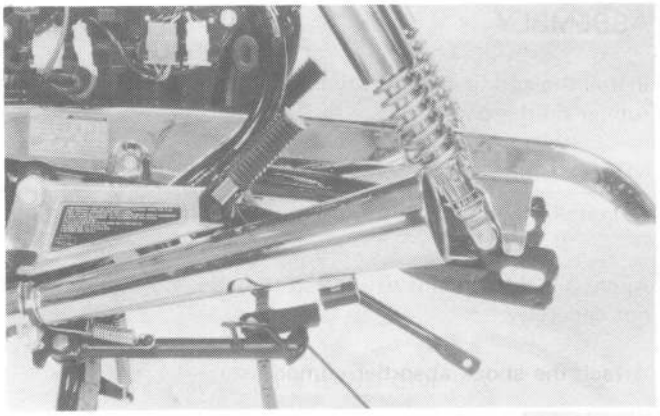


SWINGARM

REMOVAL

Remove the rear wheel (page 14-3).

Remove the drive chain cover.

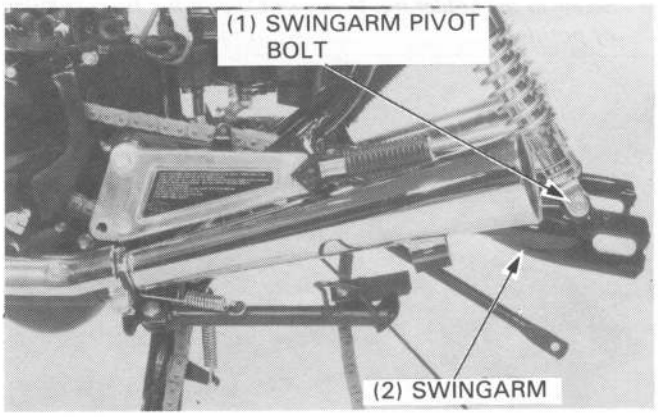


Remove the right and left footpegs.

Remove the shock absorber lower mounting bolts.

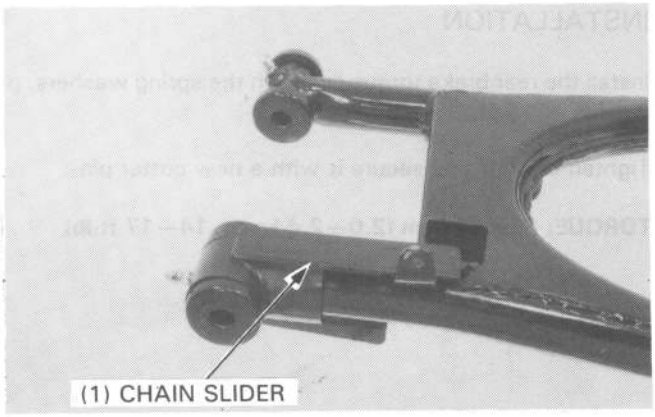
Remove the swingarm pivot bolt and the swingarm from the frame.

Remove the rear brake torque link from the swingarm.



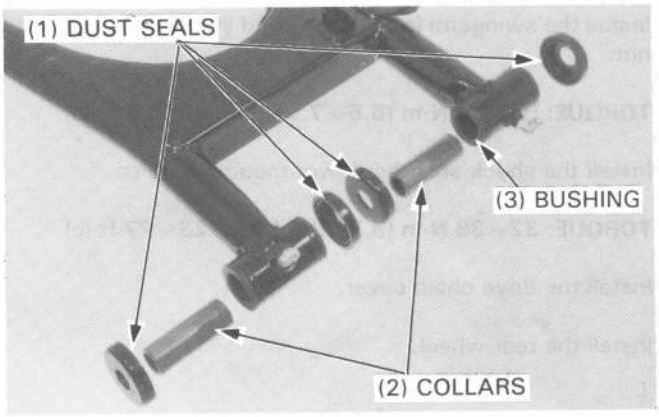
DISASSEMBLY

Remove the brake torque link.
Remove the chain slider.



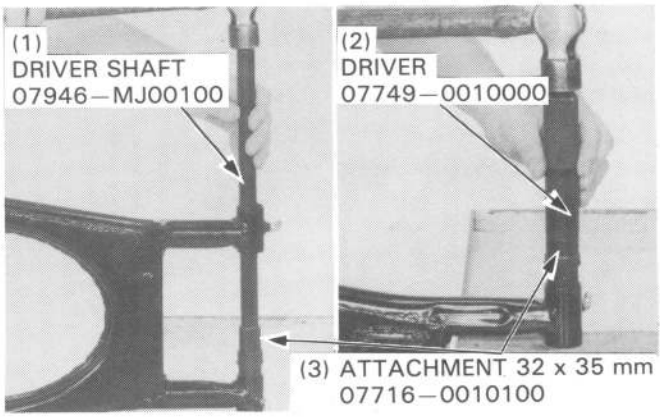
INSPECTION

Remove the dust seals.
Check the bushings for wear or damage.
Check the swingarm for cracks or damage.



BUSHING REPLACEMENT

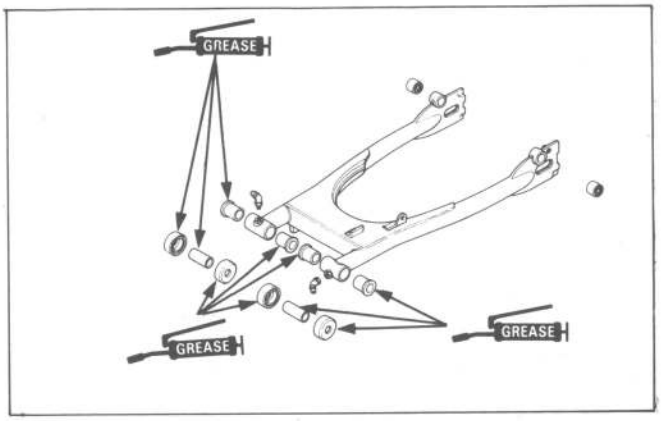
Remove the bushing with a drift and discard it.
Install a new bushing using or driver.



ASSEMBLY

NOTE

- Drive the bushings into place through a pad making sure that they are not damaged.
- Lubricate the bushing with grease after installation.

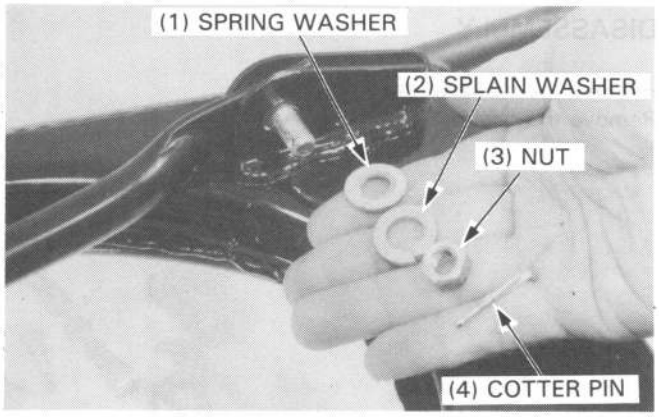


INSTALLATION

Install the rear brake torque link with the spring washers, plain washer and nut.

Tighten the nut and secure it with a new cotter pin.

TORQUE: 20—24 N·m (2.0—2.4 kg-m, 14—17 ft-lb)



Install the swingarm in the frame and install the pivot bolt and nut.

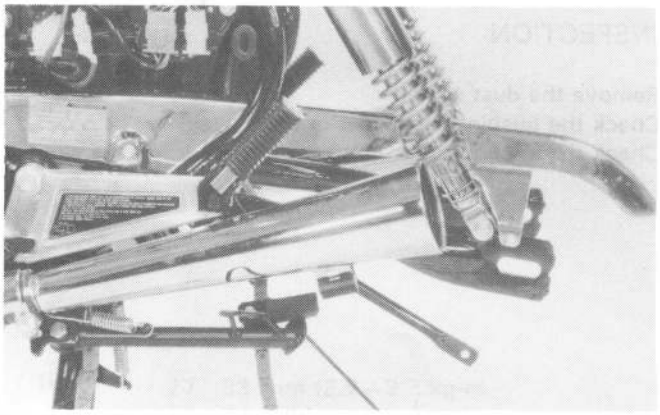
TORQUE: 55—70 N·m (5.5—7.0 kg-m, 40—51 ft-lb)

Install the shock absorber lower mounting bolts.

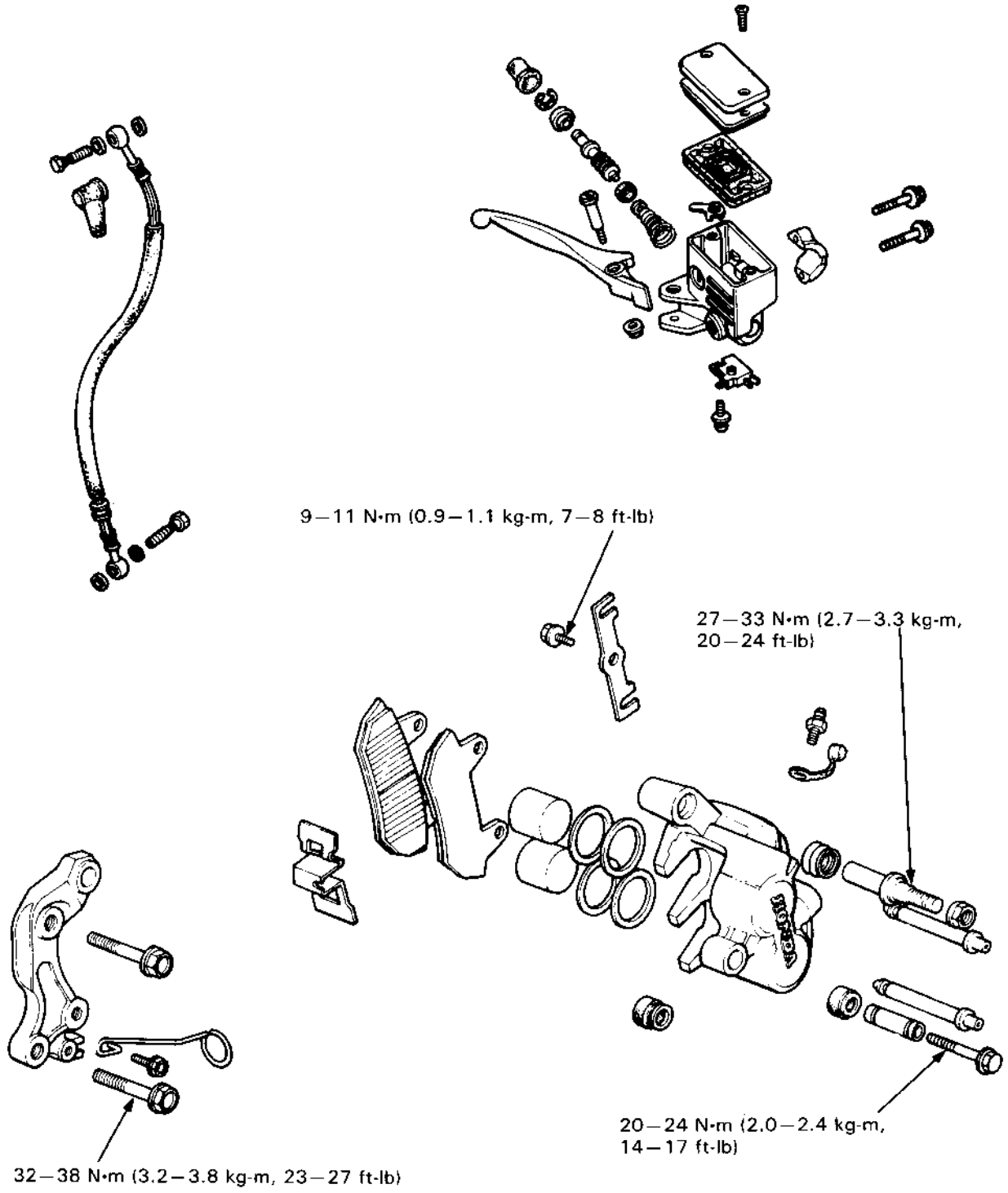
TORQUE: 32—38 N·m (3.2—3.8 kg-m, 23—27 ft-lb)

Install the drive chain cover.

Install the rear wheel.



MEMO


9—11 N·m (0.9—1.1 kg-m, 7—8 ft-lb)
27—33 N·m (2.7—3.3 kg-m, 20—24 ft-lb)
20—24 N·m (2.0—2.4 kg-m, 14—17 ft-lb)
32—38 N·m (3.2—3.8 kg-m, 23—27 ft-lb)

15. HYDRAULIC BRAKE

SERVICE INFORMATION

GENERAL

- The front hydraulic brake can be removed without disconnecting the hydraulic system.
- Once hydraulic system has been opened, or brake feels spongy, the system must be bled.
- Do not allow foreign material to enter the system when filling the reservoirs.
- Avoid spilling brake fluid on painted surfaces or instrument lenses, as severe damage will result.
- Always check brake operation before riding the motorcycle.

SPECIFICATIONS

ITEM	STANDARDS	SERVICE LIMIT
Disc thickness	4.8–5.2 mm (0.19–0.20 in)	4.0 mm (0.16 in)
Disc runout	—	0.30 mm (0.012 in)
Master cylinder I.D.	14.000–14.043 mm (0.5512–0.5592 in)	14.055 mm (0.5533 in)
Master piston O.D.	13.957–13.984 mm (0.5141–0.5151 in)	13.945 mm (0.5490 in)
Caliper piston O.D.	30.150–30.200 mm (1.1870–1.1890 in)	30.142 mm (1.1867 in)
Caliper cylinder I.D.	30.230–30.306 mm (1.1902–1.1931 in)	30.136 mm (1.1865 in)

TORQUE VALUES

Pad pin retainer	9–11 N·m (0.9–1.1 kg-m, 7–8 ft-lb)
Caliper bracket	32–38 N·m (3.2–3.8 kg-m, 23–27 ft-lb)
Caliper bolt	20–24 N·m (2.0–2.4 kg-m, 14–17 ft-lb)
Caliper pivot bolt	27–33 N·m (2.7–3.3 kg-m, 20–24 ft-lb)

TOOL

Special

Snap ring pliers	07914–3230001–Equivalent Commercially available in U.S.A.
Myty vac brake bleeder (U.S.A. only.)	

TROUBLESHOOTING

Poor brake performance

1. Air bubbles in hydraulic system
2. Worn brake pads
3. Pads fouled or glazed
4. Hydraulic system leaking

BRAKE FLUID REPLACEMENT/ AIR BLEEDING

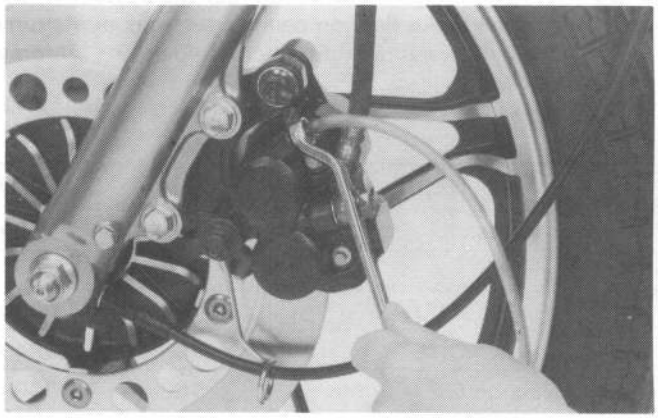
BRAKE FLUID DRAINING

Remove the reservoir cap and diaphragm.

CAUTION

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

Connect a bleed hose to the bleed valve.
Loosen the caliper bleed valve and pump the brake lever.
Stop operating the lever when no fluid flows out of the bleed valve.



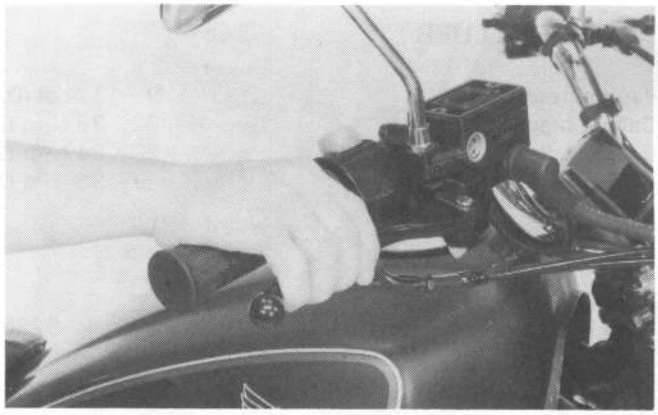
WARNING

- ***A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake cleaning agent.***

BRAKE FLUID FILLING

NOTE

- Do not mix different types of fluid. They are not compatible.



If a brake bleed is not available, perform the following procedure.
Close the bleed valve, fill the reservoir, and install the diaphragm.
Pump up the system pressure with the lever until there are no air bubbles in the fluid flowing out of the reservoir small hole and lever resistance is felt. Bleed the system as described on the next page.

NOTE

- Check the fluid level often while bleeding the system to prevent air from being pumped into the system.
- Use only DOT 3 or 4 brake fluid from a sealed container.
- Do not mix brake fluid types and never reuse the contaminated fluid which has been pumped out during brake bleeding, because that would impair the efficiency of the brake system.
- When using a brake bleeding tool, follow the manufacturer's operating instructions.

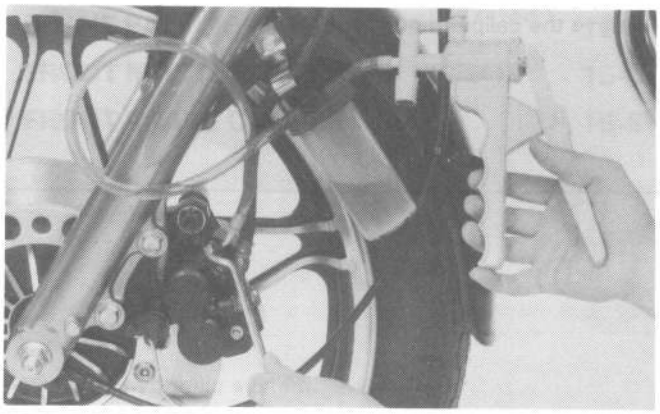
BRAKE FLUID FILLING WITH BRAKE BLEEDER

Fill the reservoir to near full with the recommended brake fluid.
Connect the Mytyvac Brake Bleeder or equivalent to the bleed valve.
Pump the brake bleeder and loosen the bleeder valve.
Add fluid when the level in the master cylinder reservoir is low.

NOTE

- If air is entering the bleeder hose from around the bleeder valve threads, seal the threads with teflon tape.

Check brake lever operation.
If the brake feels spongy, bleed the air from the system.



AIR BLEEDING

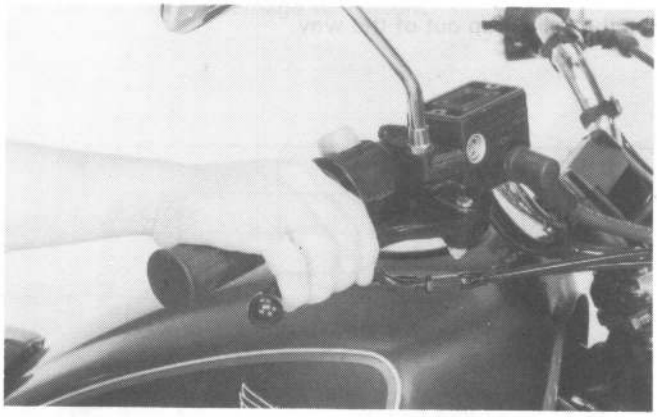
1. Squeeze the brake lever, then open the bleed valve 1/2 turn and close the valve.

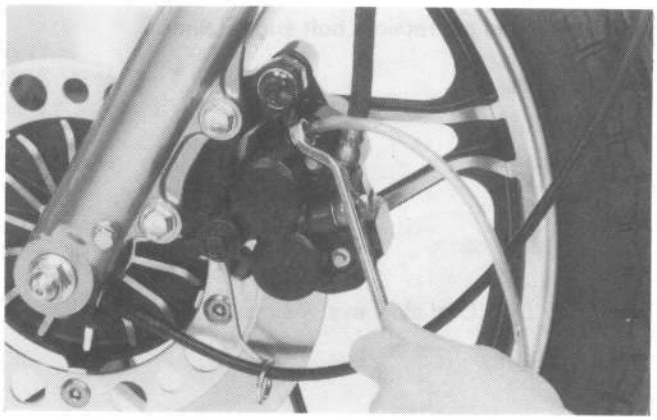
NOTE

- Do not release the brake lever until the bleed valve has been closed.

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 at the end of the hose.





BRAKE PAD/DISC

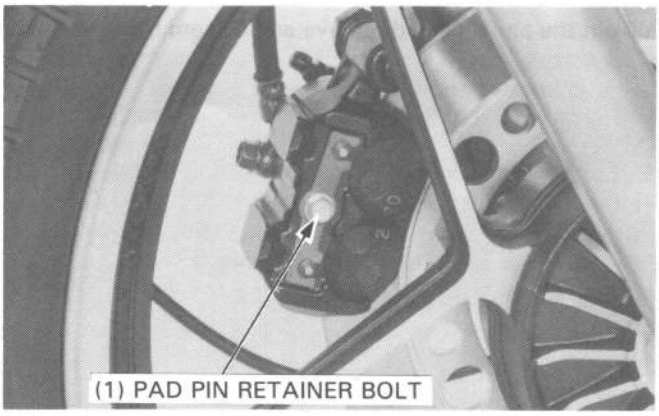
PAD REPLACEMENT

Replace the brake pads if the wear line on the top of each pad reaches the edge of the brake disc.

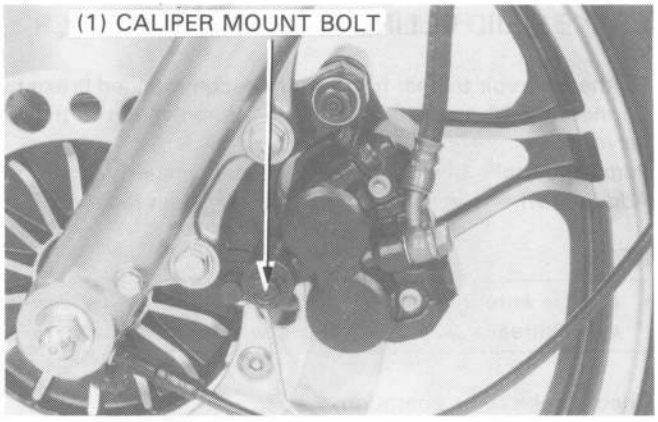
NOTE

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

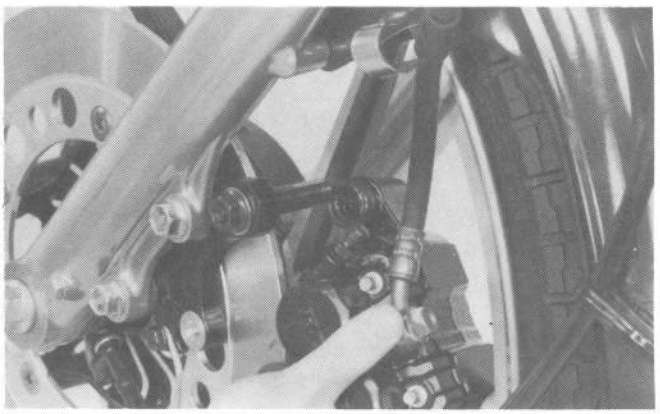
Loosen the pad pin retainer bolt.



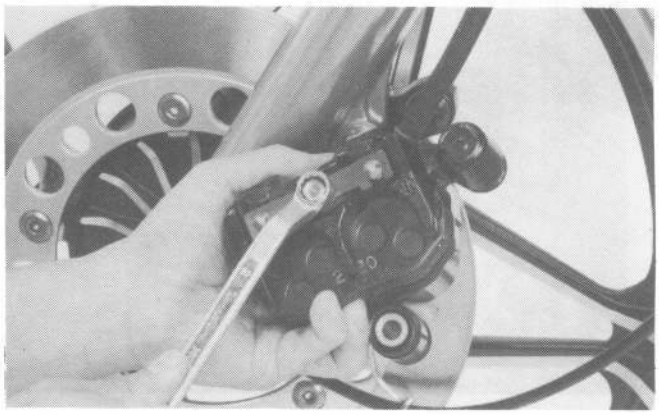
Remove the caliper mount bolt.



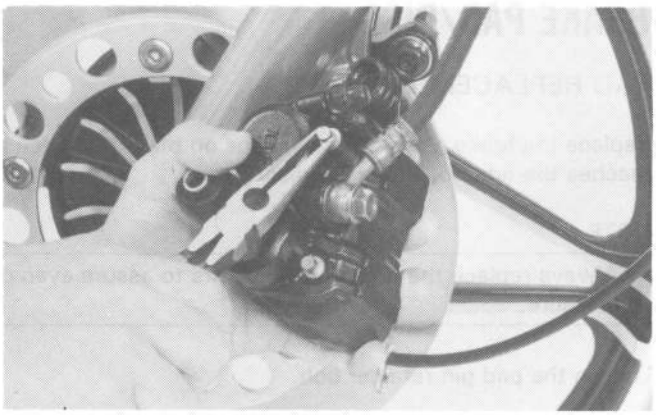
Pull the caliper up out of the way.



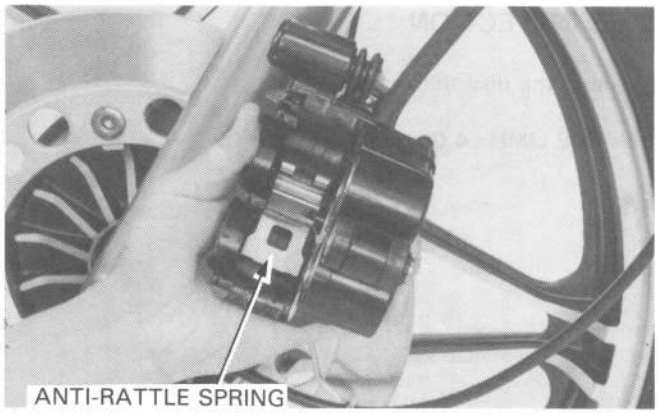
Remove the pad pin retainer bolt and retainer.



Pull out the pad pins and remove and discard the brake pads.



Position the anti-rattle spring in the caliper as shown.
Push the caliper piston all the way in.

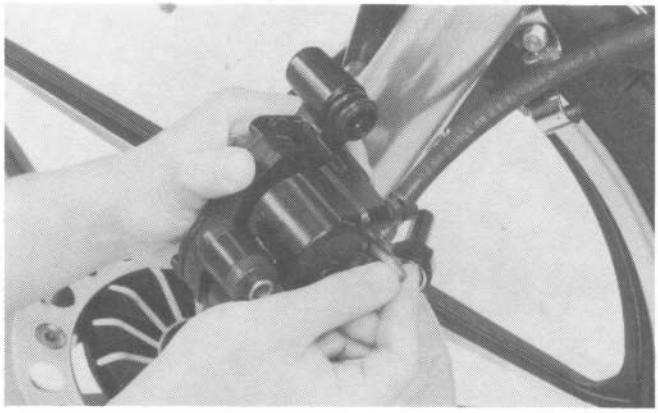


Install new pads in the caliper.

Install the pad pins.

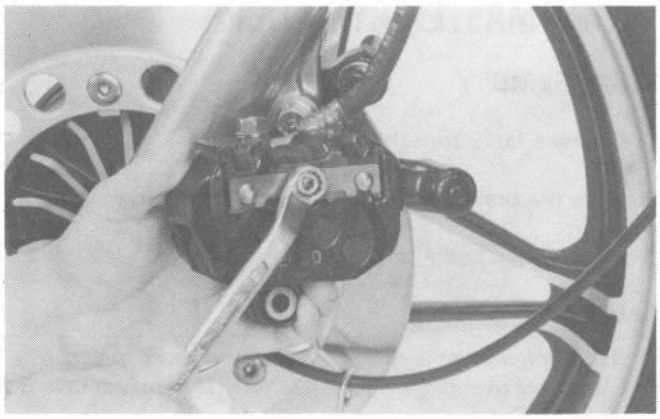
NOTE

- Install one pad pin first, then install the other pin by pushing the pads against the caliper to depress the anti-rattle spring.



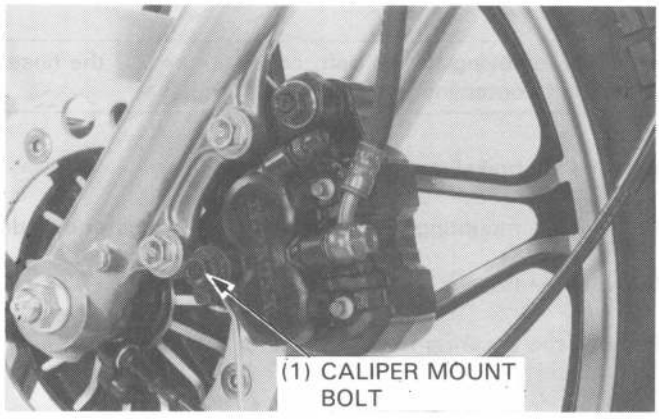
Install the pad pin retainer and tighten the bolt.

Torque: 9—11 N·m (0.9—1.1 kg-m, 7—8 ft-lb)



Install the caliper.
Tighten the caliper mount bolt.

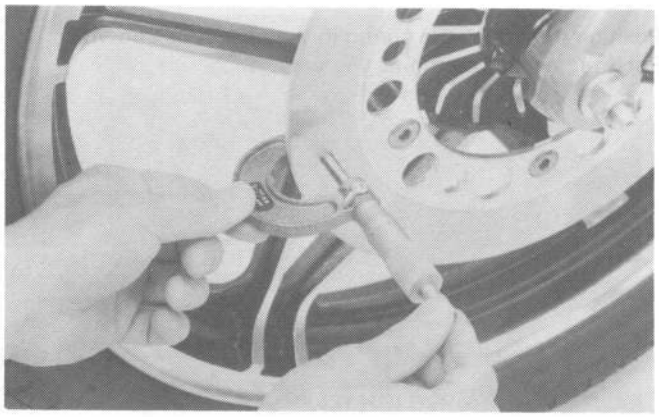
TORQUE: 20—24 N·m (2.0—2.4 kg-m, 14—17 ft-lb)



DISC INSPECTION

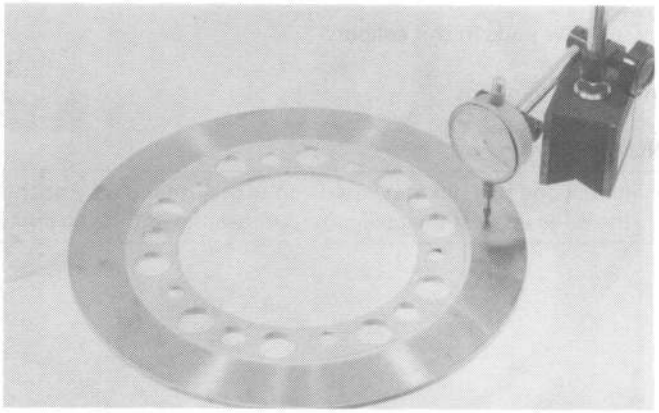
Measure the disc thickness.

SERVICE LIMIT: 4.0 mm (0.16 in)



Measure the disc warpage.

SERVICE LIMIT: 0.30 mm (0.012 in)

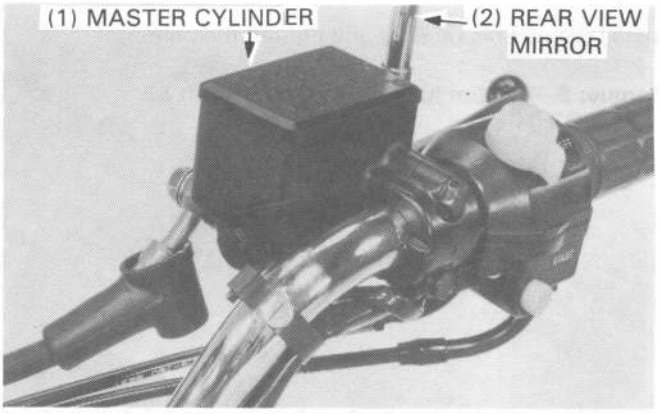


FRONT MASTER CYLINDER

DISASSEMBLY

Drain brake fluid from the hydraulic system.

Remove the brake lever and rear view mirror from the master cylinder.
Disconnect the brake hose.

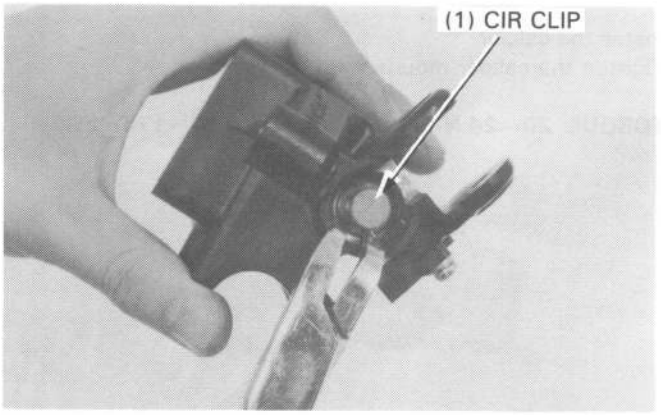


CAUTION

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

NOTE

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



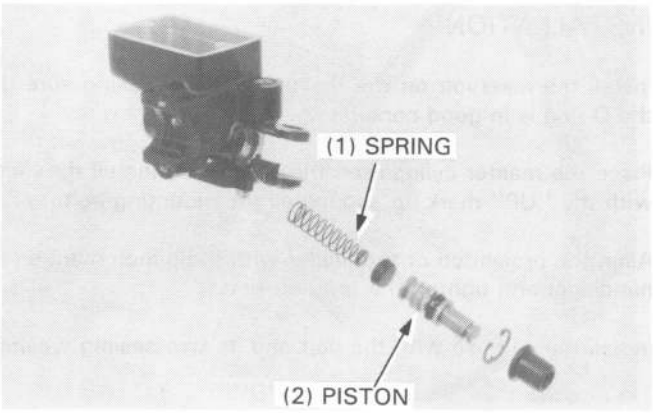
Remove the brakelight switch.

Remove the mounting bolts and remove the master cylinder.

Remove the boot.

Remove the snapring from the master cylinder body.

Remove the piston and spring.

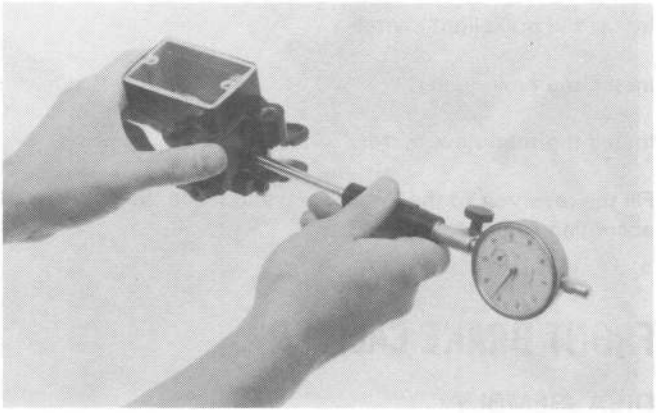


INSPECTION

Measure the master cylinder I.D.

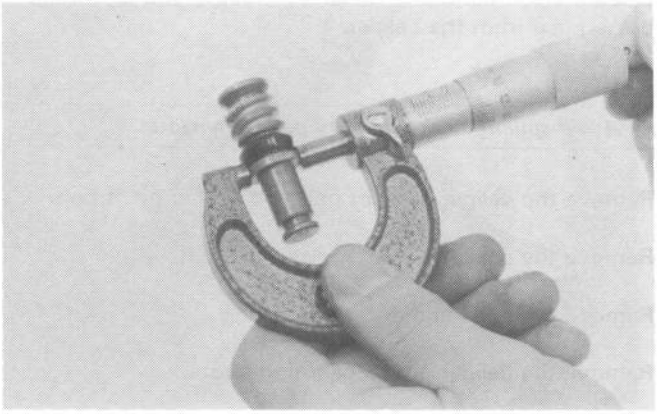
Check the cylinder for scores, scratches, nicks or other damage.

SERVICE LIMIT: 14.055 mm (0.5533 in)



Measure the master cylinder piston O.D.

SERVICE LIMIT: 13.945 mm (0.5490 in)



ASSEMBLY

CAUTION

- *Handle the master cylinder piston, cylinder and spring as a set.*

Coat all parts with clean brake fluid before assembly.

Install the spring and valve together.

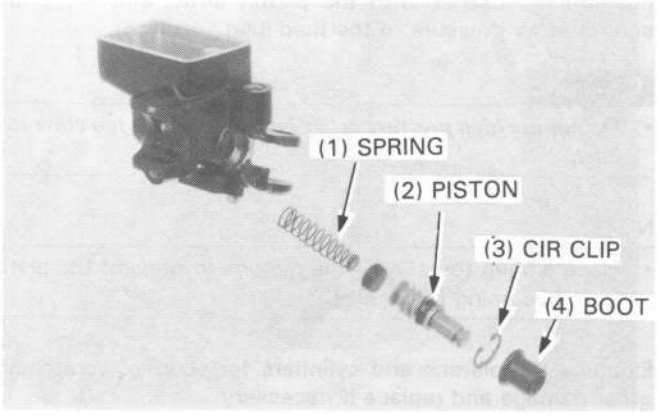
Check the primary cup and secondary cup for damage before assembly.

Dip the piston cup in brake fluid before assembly.

CAUTION

- *When installing the cups, do not allow the lips to turn inside out. Be certain the snapring is seated firmly in the groove.*

Install the boot.



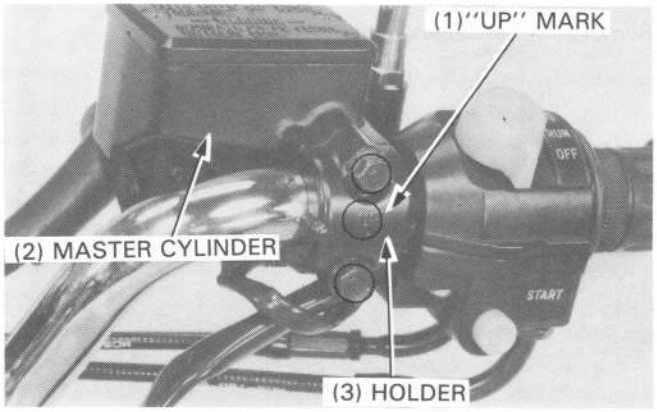
INSTALLATION

Install the reservoir on the master cylinder making sure that the O-ring is in good condition.

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

Align the projection of the holder with the punch mark on the handlebar and tighten the top bolt first.

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

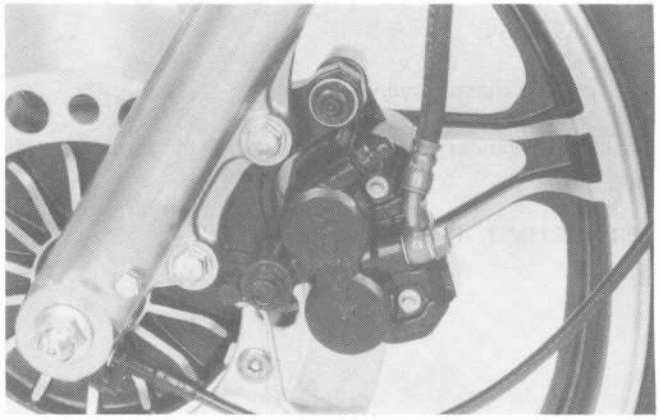


Install the brakelight switch.

Install the brake lever.

Install the rear view mirror.

Fill the reservoir to the upper level and bleed the brake system according to page 15-2.



FRONT BRAKE CALIPER

DISASSEMBLY

Place a clean container under the caliper and disconnect the brake hose from the caliper.

CAUTION

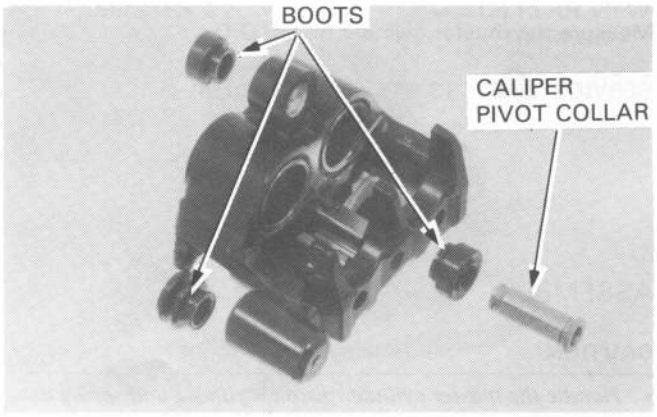
- *Avoid spilling brake fluid on painted surfaces.*

Remove the caliper bracket bolt and caliper pivot bolt.

Remove the caliper.

Remove the pads and anti-rattle spring.

Remove the caliper pivot collar and boots.



Position the caliper with the piston down and apply small squirts of air pressure to the fluid inlet.

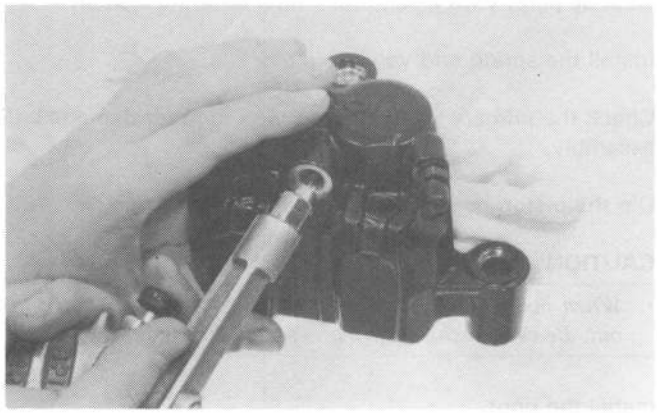
WARNING

- ***Do not use high pressure air or bring the nozzle too close to the inlet.***

NOTE

- Place a shop towel over the pistons to prevent the pistons from becoming projectiles.

Examine the pistons and cylinders for scoring, scratches or other damage and replace if necessary.

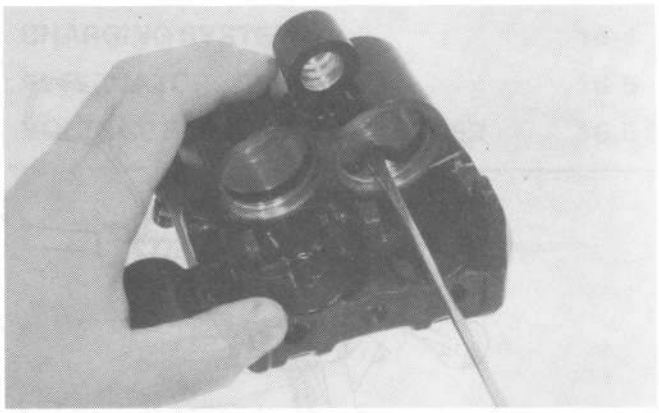


Push the oil seals in and then lift them out.

Clean the oil seal grooves with brake fluid.

CAUTION

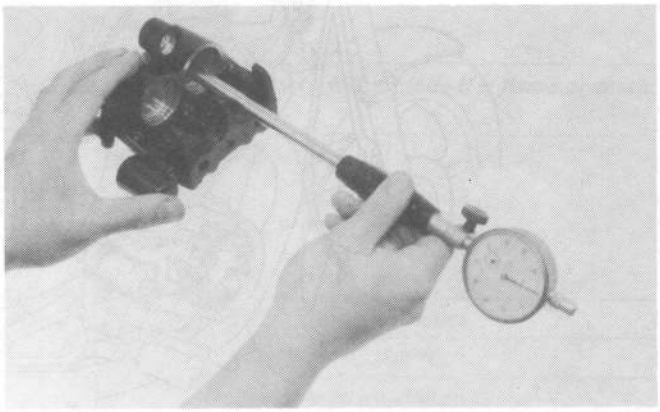
- *Do not damage the piston sliding surfaces.*



CALIPER CYLINDER I.D. INSPECTION

Check the caliper cylinder for scoring, scratches or other faults. Measure the caliper cylinder bore.

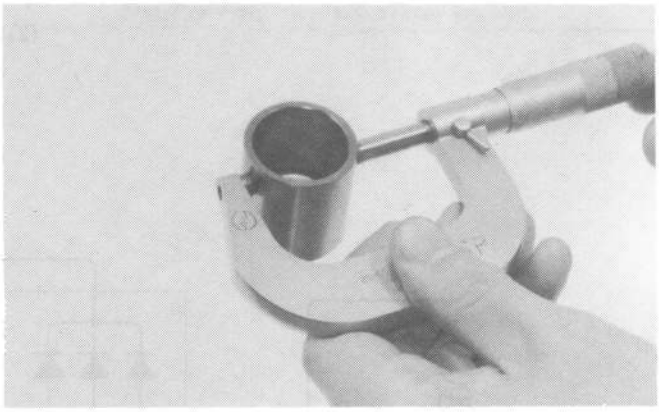
SERVICE LIMIT: 30.136 mm (1.1865 in)



CALIPER PISTON O.D. INSPECTION

Check the piston for scoring, scratches or other faults. Measure the piston diameter.

SERVICE LIMIT: 30.142 mm (1.1867 in)



ASSEMBLY

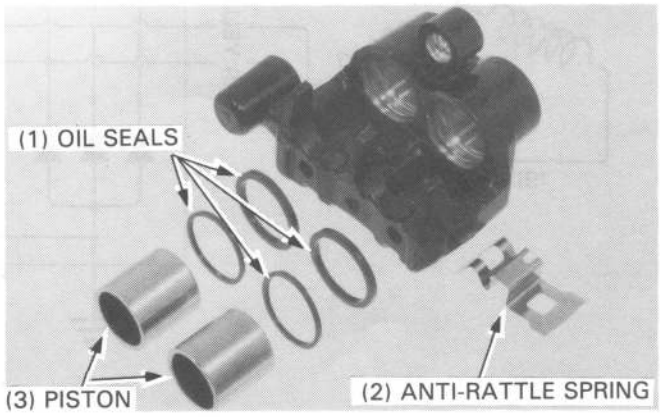
The oil seals must be replaced with new ones whenever they are removed.

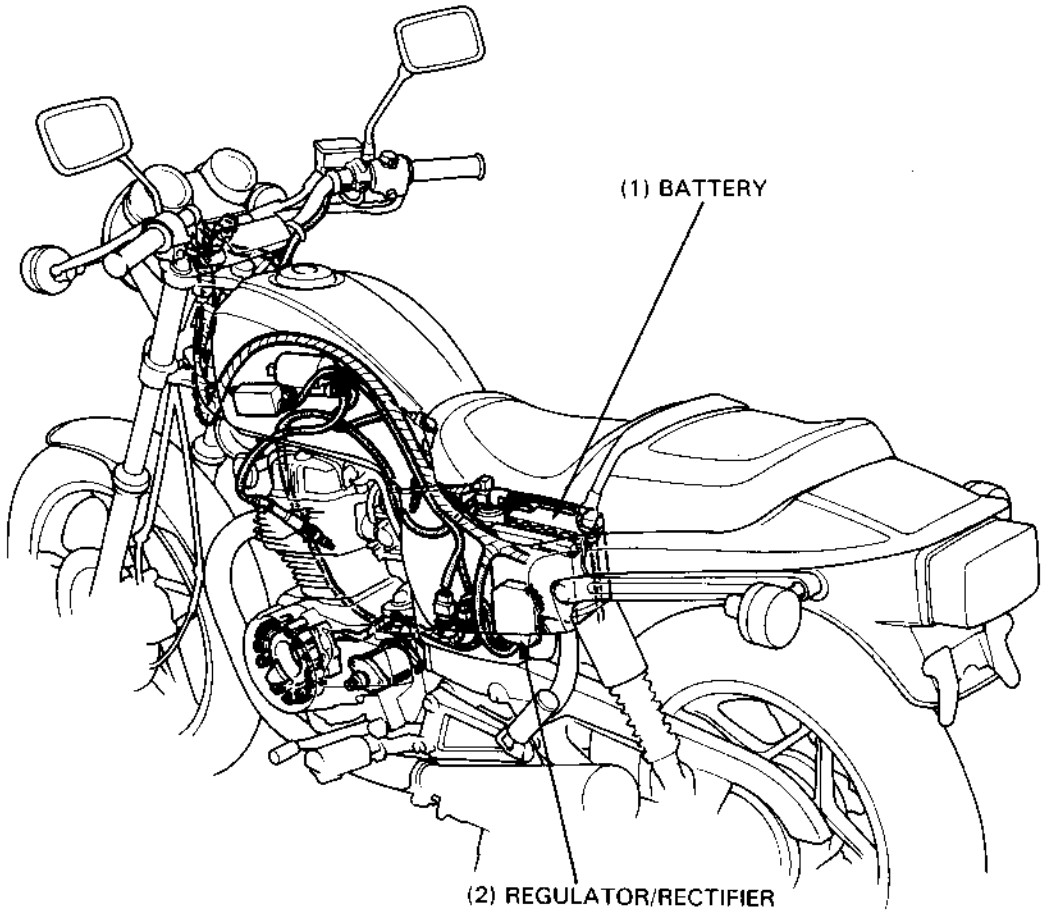
Coat the oil seals with silicone grease or brake fluid and install them with the smaller diameter facing in.

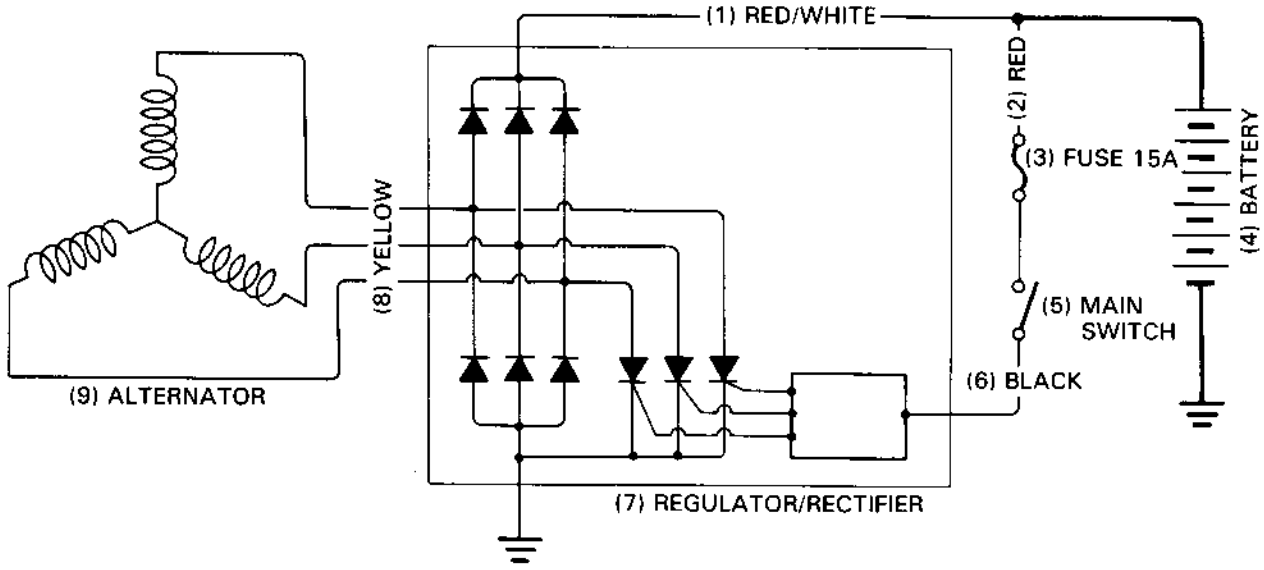
Install the pistons with the dished ends toward the pads.

Install the boots and collar making sure that the boots are correctly seated in the collar and caliper grooves.

Install the anti-rattle spring and pads.




(1) BATTERY
(2) REGULATOR/RECTIFIER


(1) RED/WHITE
(2) RED
(3) FUSE 15A
(4) BATTERY
(5) MAIN SWITCH
(6) BLACK
(7) REGULATOR/RECTIFIER
(8) YELLOW
(9) ALTERNATOR

16. BATTERY/CHARGING SYSTEM

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.

SPECIFICATIONS

Battery	Capacity	12 V, 12 ampere-hours
	Specific gravity	1.280/20°C (68°F)
	Charging rate	1.2 amperes maximum
Alternator	Capacity	NIGHT: 5 amperes minimum/5,000 rpm (14.5 volts)
Voltage regulator		Transistorized non-adjustable regulator

16

TROUBLESHOOTING

No power – key turned on:
1. Dead battery
   – Low fluid level
   – Low specific gravity
   – Charging system failure
2. Disconnected battery cable
3. Main fuse burned out
4. Faulty ignition switch

Low power – key turned on:
1. Weak battery
   – Low fluid level
   – Low specific gravity
   – Charging system failure
2. Loose batery connection

Low power – engine running:
1. Battery undercharged
   – Low fluid level
   – One or more dead cells
2. Charging system failure

Intermittent power:
1. Loose battery connection
2. Loose charging system connection
3. Loose starting system connection
4. Loose connection or short circuit in ignition system
5. Loose connection or short circuit in lighting system

Charging system failure:
1. Loose, broken, or shorted wire or connection
2. Faulty voltage regulator/rectifier
3. Faulty alternator

BATTERY

REMOVAL

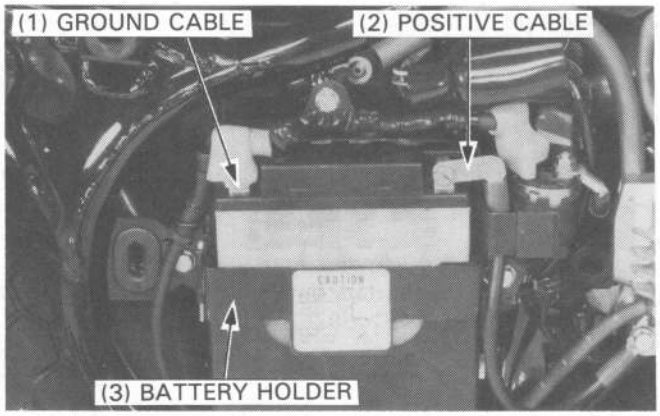
Remove the right side cover.

Disconnect the ground cable at the battery.

Disconnect the positive cable at the battery.

Remove the battery holder.

Remove the battery.



TESTING SPECIFIC GRAVITY

Test each cell with a hydrometer.

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

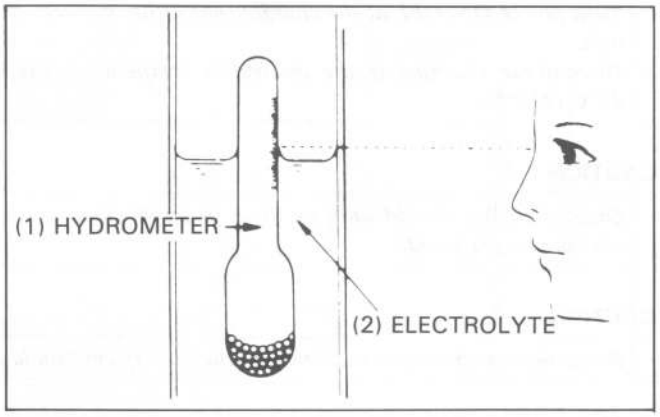
1.270—1.290	Fully charged
Below 1.260	Undercharged

NOTE

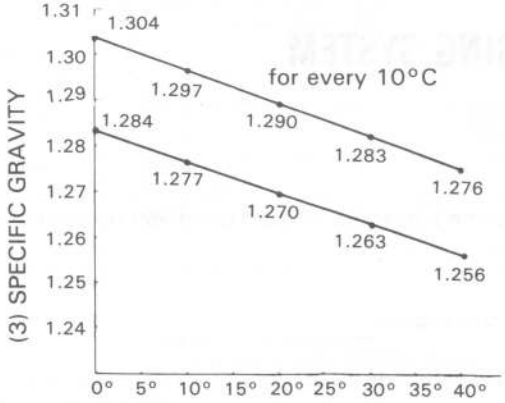
- The battery must be recharged if the specific gravity is below 1.230.
- The specific gravity varies with the temperature as shown in the accompanying table.
- Replace the battery if sulfation is evident or if the space below the cell plates is filled with sediment.

WARNING

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



(1) BATTERY TEMPERATURE vs SPECIFIC GRAVITY



(2) ELECTROLYTE TEMPERATURE
Specific gravity changes by 0.007 for every 10°C

CHARGING

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

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

Charging current: 1.4 amperes max.
Charging: Charge the battery until specific gravity is 1.270–1.290 at 20°C (68°F)

WARNING

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

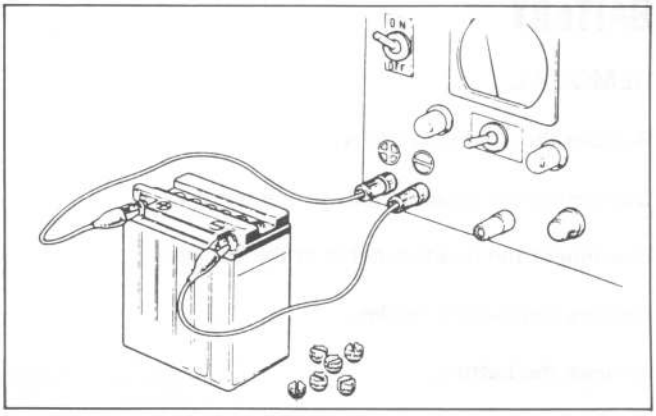
CAUTION

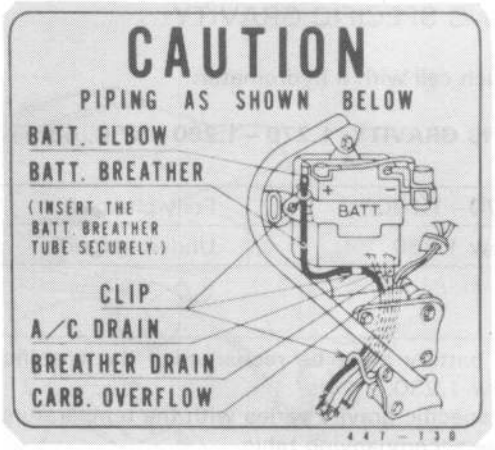
- *Quick-charging should only be done in an emergency; slow-charging is preferred.*

CAUTION

- *Route the breather tube as shown on the battery caution label.*

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





CHARGING SYSTEM

Current Test

NOTE

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

Warm up the engine.

Remove the right side cover.

Disconnect the battery positive cable at the battery and connect an ammeter between the battery cable and the terminal.

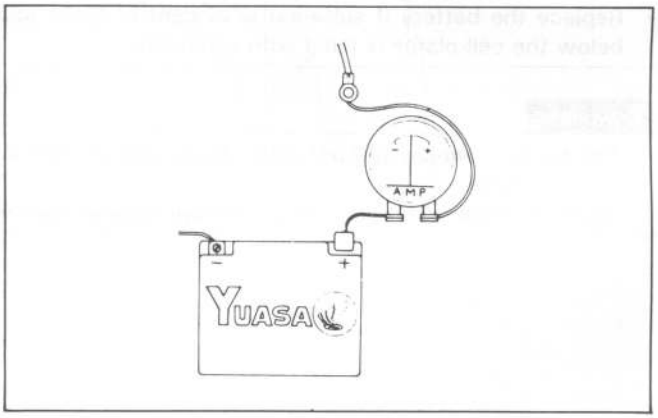
Turn the headlight high beam on.

Run the engine above 2,000 rpm.

Allow the engine to idle.
Slowly increase engine speed.

Charging amperage should begin at 1,200 rpm and should be a minimum of 5 amperes at 5,000 rpm.

Check the stator and then the regulator/rectifier, if charging specifications are not met.

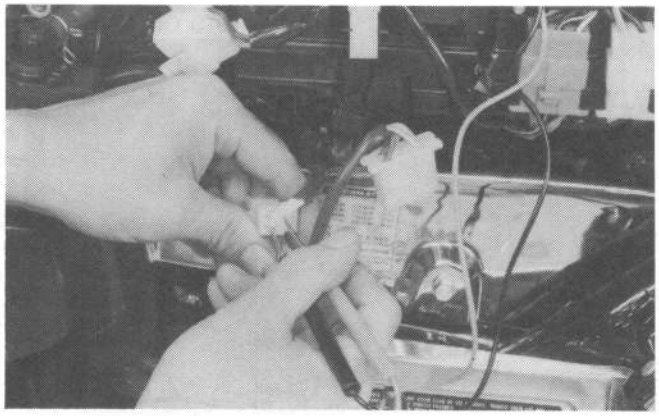


ALTERNATOR

STATOR COIL INSPECTION

Check the yellow leads to the alternator for continuity with each other.

Replace the stator if any yellow lead is not continuous with the other, or if any lead has continuity to ground.

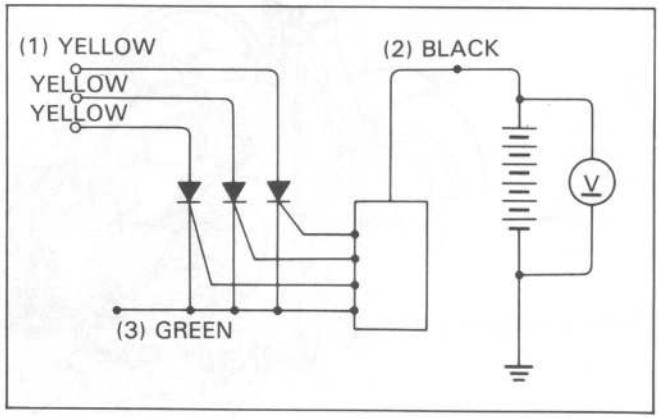


VOLTAGE REGULATOR/RECTIFIER

VOLTAGE REGULATOR TEST

Test with a voltmeter;
Connect a voltmeter across the battery.
Check regulator performance with the engine running.

The regulator must dirert current to ground when battery voltage reaches 14.0–15.0 V.

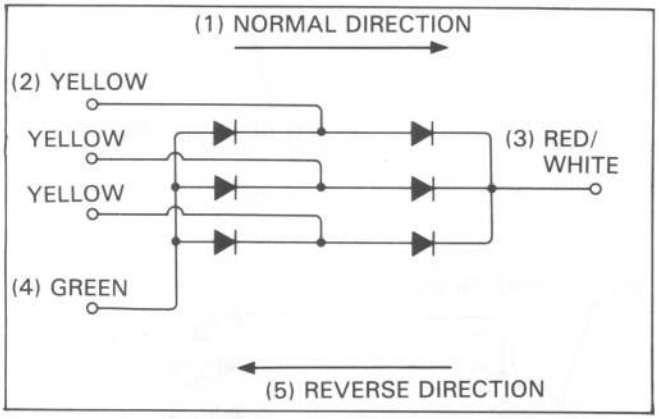


RECTIFIER TEST

Check the resistance between the regulator/rectifier leads at the couplers with an ohmmeter.

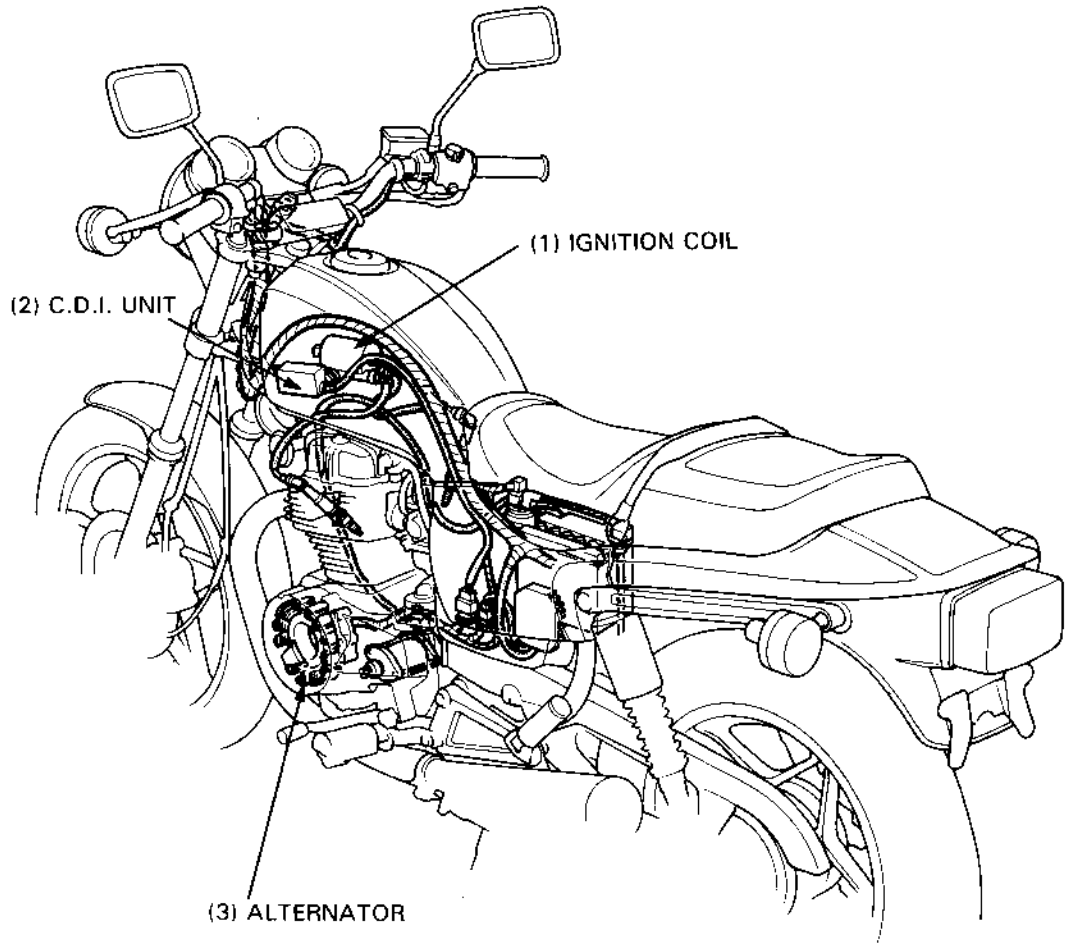
RESISTANCE IN NORMAL DIRECTION:
Green and any yellow: 5–40 Ω
Red/white and any yellow: 5–40 Ω

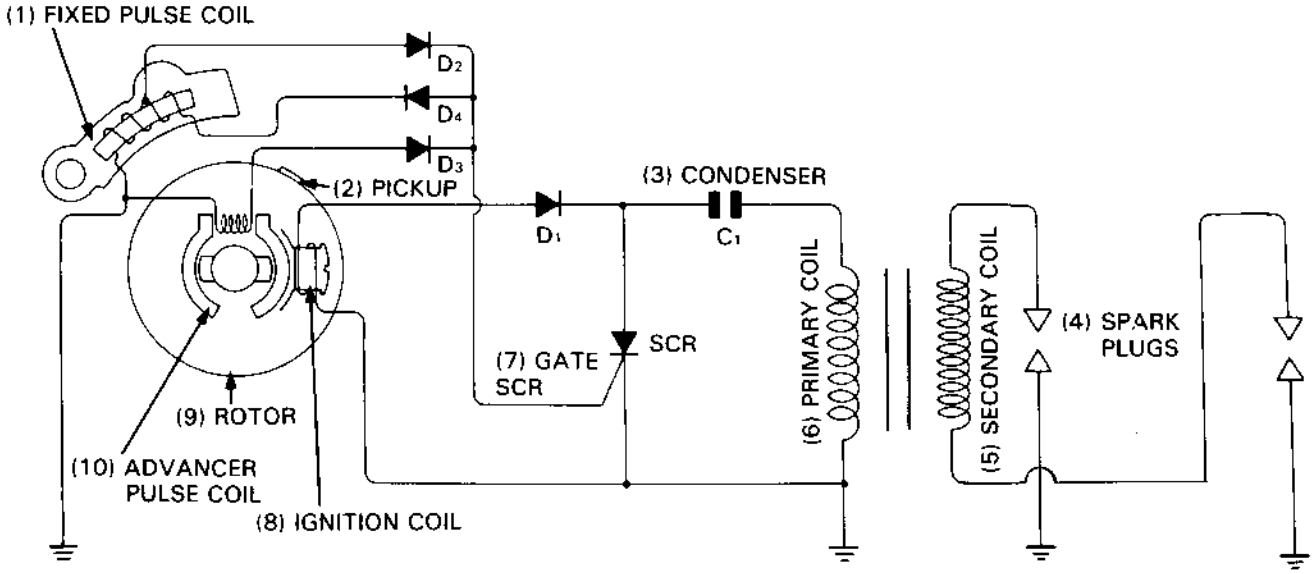
RESISTANCE IN REVERSE DIRECTION:
Red/white and any yellow: 2000 Ω min.
Green and any yellow: 2000 Ω min.



NOTE

- The test results shown are for a positive ground ohmmeter and opposite results will be obtained when a negative ground ohmmeter is used.


(1) IGNITION COIL
(2) C.D.I. UNIT
(3) ALTERNATOR


(1) FIXED PULSE COIL
D2
D4
D3
(2) PICKUP
(3) CONDENSER
D1
C1
(7) GATE SCR
SCR
(6) PRIMARY COIL
(5) SECONDARY COIL
(4) SPARK PLUGS
(9) ROTOR
(10) ADVANCER PULSE COIL
(8) IGNITION COIL

17. IGNITION SYSTEM

SERVICE INFORMATION

GENERAL

- Ignition timing cannot be adjusted since the CDI (Capacitive Dischange Ignition) unit is non-adjustable.
- If ignition timing is incorrect, check the CDI unit and alternator and replace any faulty part.
- For spark plug information, see page 3-6.

SPECIFICATION

Spark Plug			ND: X24EPR–U9, NGK: DPR8EA–9
Spark Plug Gap			0.8–0.9 mm (0.031–0.035 in)
Ignition timing	Initial	"F" mark	15° BTDC
	Full advance		43° BTDC
	Engine speed (initial)		1,200 rpm
	Engine speed (full advance)		4,500–5,350 rpm

TROUBLESHOOTING

Engine cranks but will not start

1. Engine stop switch OFF
2. No spark at plugs
3. Faulty CDI unit
4. Alternator faulty
5. Poorly connected, broken or shorted wires between spark plugs and alternator, CDI unit and ignition coil

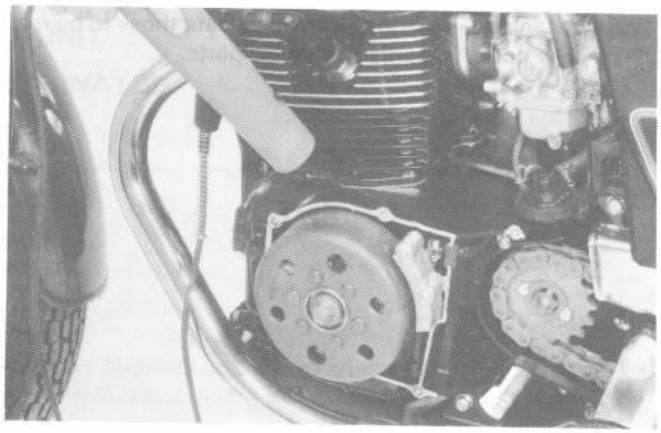
No spark at plugs

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

Engine starts but runs poorly

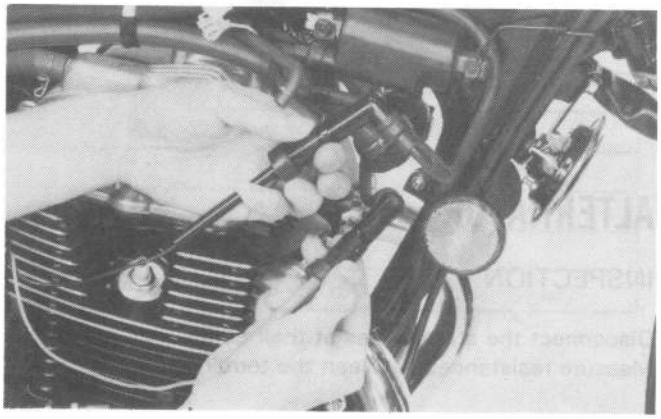
1. Ignition primary circuit
   - Faulty ignition coil
   - Loose or bare wire
   - Intermittent short-circuit in a switch
2. Secondary circuit
   - Faulty plug
   - Faulty high tension cord
3. Ignition timing
   - Faulty alternator
   - Faulty CDI unit

IGNITION TIMING



Place the motorcycle on its center stand.
Remove the left crankcase cover.
Connect a tachometer.
Check the ignition timing using a timing light.
The timing is correct if the "FN" mark aligns with the index mark with the engine idling in neutral.
The "F" mark should also be aligned with the index mark with the engine idling in "1" or "2" range.
Also check that the index mark is between the advance marks at 4,500~5,350 rpm.
If the ignition timing is incorrect, check the CDI unit and alternator and replace any faulty parts.

IGNITION COIL



REMOVAL

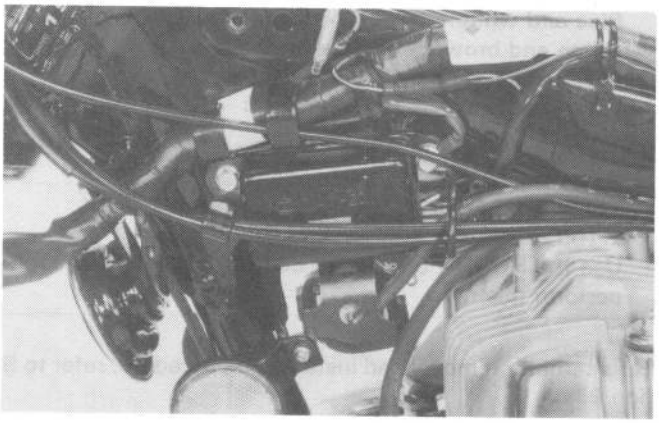
Remove the fuel tank.
Disconnect the wire leads.
Remove the coil attaching bolts and coil.

INSPECTION

Measure the coil resistance.

PRIMARY: **0.55 ± 0.055 Ω**
SECONDARY: **8 ± 0.8 kΩ**

CDI UNIT

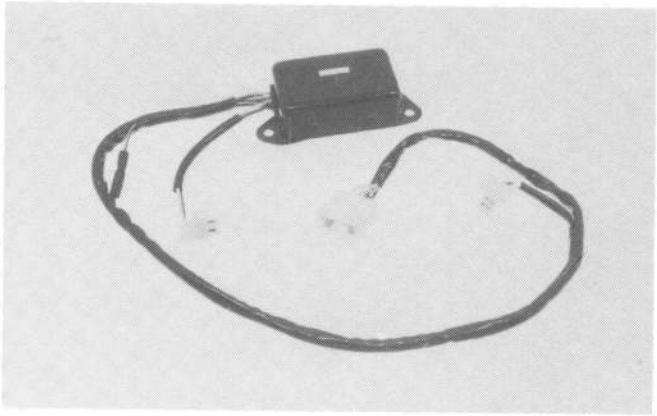


INSPECTION

Disconnect the wiring. Set the tester at xkΩ or x100Ω and check continuity of CDI terminals. Replace the CDI unit if the readings do not fall within the limits shown in the table.

NOTE

- The CDI unit is fully transistorized. For accurate testing, it is necessary to use a specified electrical tester.
- Use of an improper tester or measurements in improper range may give false readings.
- Use SANWA ELECTRICAL TESTER (SP10D) P/N 07308–0020000 or KOWA ELECTRICAL TESTER (TH5H).
- Discharge the capacitor before testing.
  "NEEDLE SWINGS AND RETURNS" indicates that a capacitor is being charged with the tester. The tester needle will stay at infinity in subsequent tests unless the capacitor is discharged.



The resistances shown in the table indicate those to be read on the tester, not of specific circuits or parts.

UPPER ROW: MEASURING RANGE (SANWA TESTER) xkΩ
LOWER ROW: MEASURING RANGE (KOWA TESTER) x100Ω

Probe (+) \ Probe (−)	Brown	Light Blue	White	Green	Pink	Blue	Black/ White	Yellow
Brown		10 – 20 30 – 80	500 – ∞ 1K – ∞	3 – 8 10 – 20	4 – 11 15 – 50	500 – ∞ 1K – ∞	1M – ∞ 1K – ∞	500 – ∞ 1K – ∞
Light Blue	1M – ∞ 1K – ∞		1M – ∞ 1K – ∞	1M – ∞ 1K – ∞	1M – ∞ 1K – ∞	1M – ∞ 1K – ∞	1M – ∞ 1K – ∞	1M – ∞ 1K – ∞
White	1M – ∞ 1K – ∞	10 – 20 20 – 60		3 – 7 5 – 20	2 – 20 15 – 40	1M – ∞ 1K – ∞	1M – ∞ 1K – ∞	1M – ∞ 1K – ∞
Green	1M – ∞ 1K – ∞	3 – 8 5 – 20	500 – ∞ 1K – ∞		0.5 – 3 5 – 20	500 – ∞ 1K – 10	1M – ∞ 1K – ∞	500 – ∞ 1K – ∞
Pink	1M – ∞ 1K – ∞	3 – 12 10 – 40	500 – ∞ 1K – ∞	0.5 – 3 5 – 20		500 – ∞ 1K – ∞	1M – ∞ 1K – ∞	500 – ∞ 1K – ∞
Blue	1M – ∞ 1K – ∞	1M – ∞ 1K – ∞	1M – ∞ 1K – ∞	1M – ∞ 1K – ∞	1M – ∞ 1K – ∞		1M – ∞ 1K – ∞	1M – ∞ 1K – ∞
Black/ White	1M – ∞ 1K – ∞	1M – ∞ 1K – ∞	1M – ∞ 1K – ∞	1M – ∞ 1K – ∞	1M – ∞ 1K – ∞	20 – 100 100 – 500		1M – ∞ 1K – ∞
Yellow	1M – ∞ 1K – ∞	*	1M – ∞ 1K – ∞	*	*	*	1M – ∞ 1K – ∞	

* : Needle swings and back to ∞.

ALTERNATOR

INSPECTION

Disconnect the stator wires at their connections.
Measure resistances between the terminals.

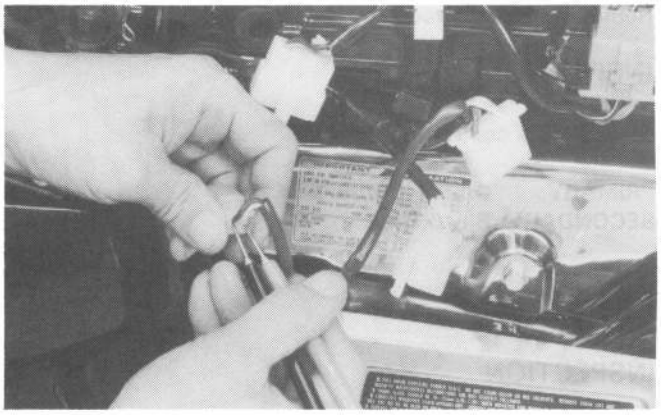
RESISTANCES:

Green and white:	**315 – 385 Ω**
Blue and white:	**77 – 95 Ω**
Green and brown:	**76 – 92 Ω**
Green and light blue:	**95 – 116 Ω**
Green and pink:	**126 – 154 Ω**

NOTE

- TESTER MEASURING RANGE: x 10Ω
- Use the HONDA SERVICE TESTER (07308 – 0020000) to perform this test.

For alternator removal and installation procedure, refer to Section 9.



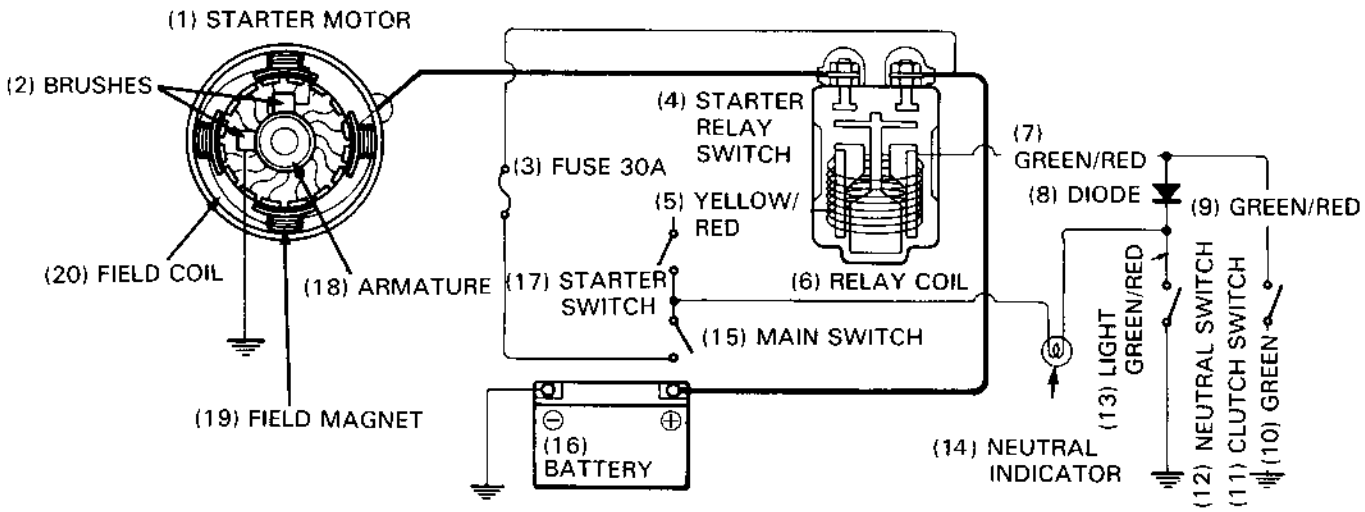
SERVICE INFORMATION

GENERAL

- The starter motor can be removed with the engine in the frame.
- See Section 13 for the starter clutch.

SPECIFICATIONS

ITEM		STANDARD	SERVICE LIMIT
Starter motor	Brush spring tension	495–605 g	400 g
	Brush length	11.0–12.5 mm (0.43–0.49 in)	5.5 mm (0.21 in)



TROUBLESHOOTING

Starter motor will not turn:
1. Battery discharged
2. Faulty ignition switch
3. Faulty starter switch
4. Faulty neutral switch
5. Faulty starter relay switch
6. Loose or disconnected wire or cable
7. Neutral diode open

Starter motor turns engine slowly
1. Low specific gravity
2. Excessive resistance in circuit
3. Binding in starter motor

Starter motor turns, but engine does not turn:
1. Faulty starter clutch
2. Faulty starter motor gears
3. Faulty starter motor or idle gear

Starter motor and engine turns, but engine does not start
1. Faulty ignition system
2. Engine problems

STARTER MOTOR

REMOVAL

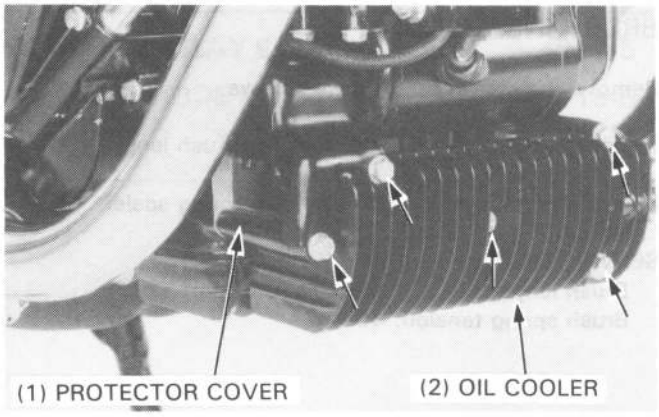
WARNING

- ***With the ignition switch OFF, remove the negative cable at the battery before servicing the starter motor.***

Drain the engine oil.

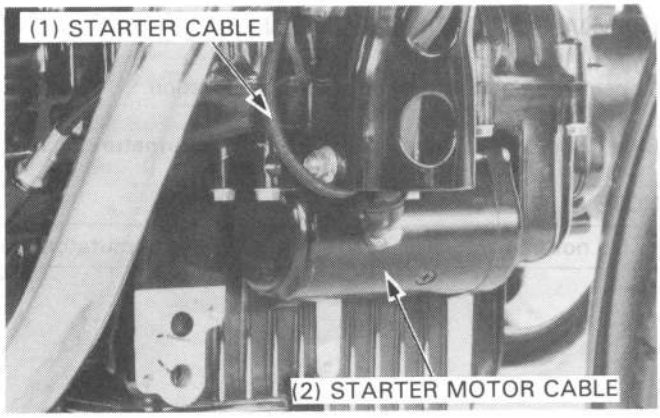
Remove the oil pressure switch protector cover and disconnect the oil pressure switch wire.

Remove the oil cooler.

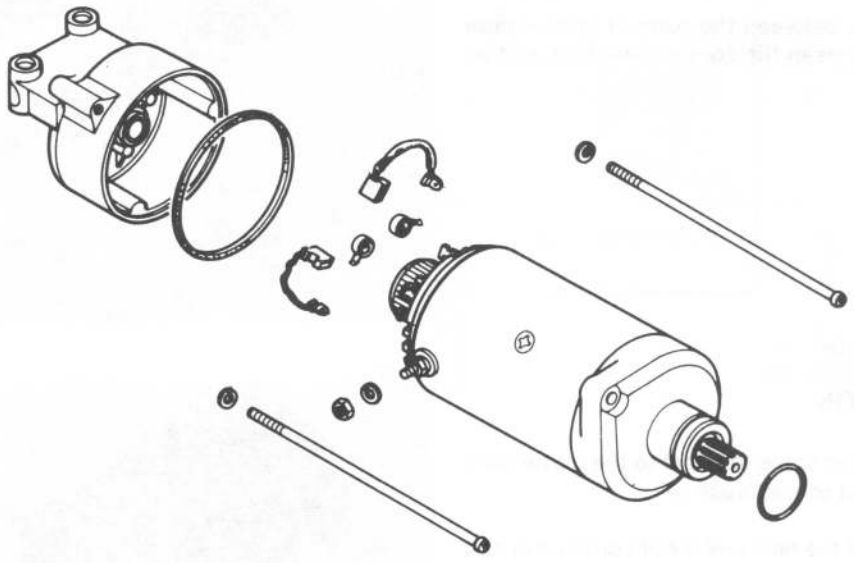


Disconnect the starter cable.

Remove the two mounting bolts and remove the starter motor.



DISASSEMBLY



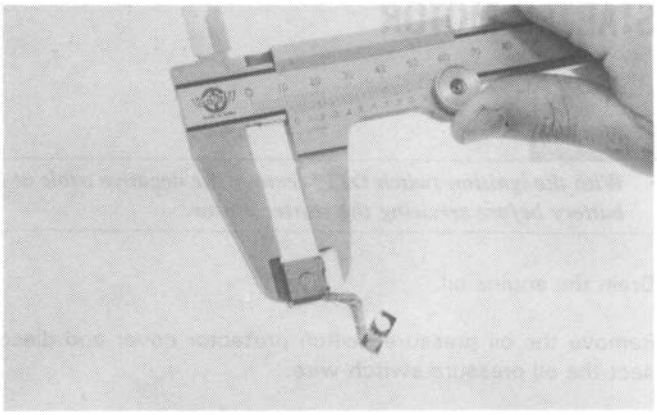
BRUSH INSPECTION

Remove the starter motor case screws.

Inspect the brushes and measure the brush length.

Measure brush spring tension with a spring scale.

SERVICE LIMITS:
Brush length: 5.5 mm (0.22 in)
Brush spring tension: 400 g



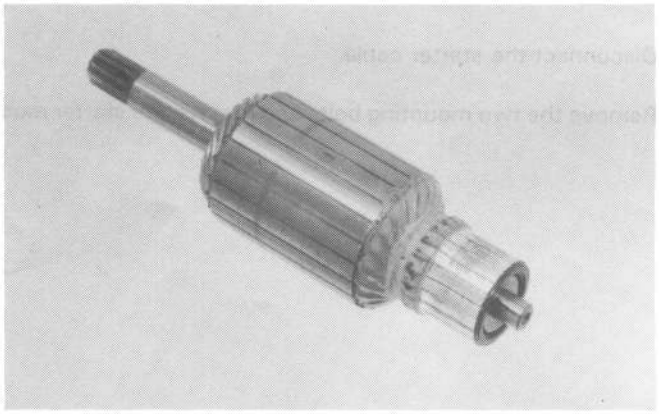
COMMUTATOR INSPECTION

Inspect the commutator bars for discoloration.

Bars discolored in pairs indicate grounded armature coils.

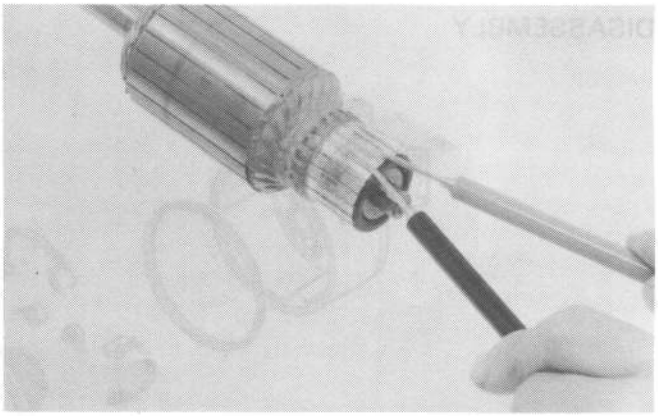
NOTE

- Do not use emery or sand paper on the commutator.



Check for continuity between pairs of commutator bars, and also between commutator bars and armature shaft.

There should be continuity between the pairs of commutator bars, and no continuity between the commutator bars and armature shaft.

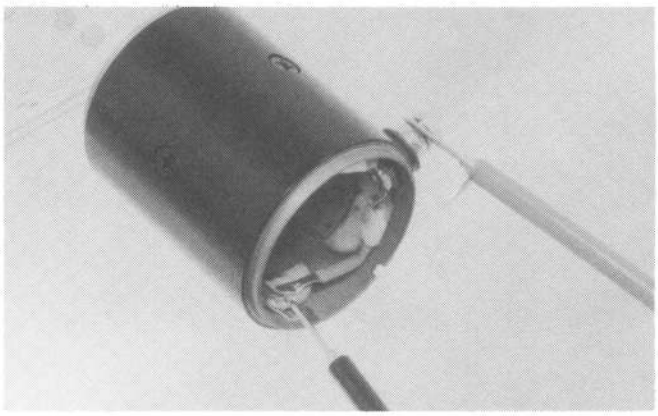


FIELD COIL INSPECTION

Check for continuity from the cable terminal to the motor case and from the cable terminal to the brush wire.

Replace the starter motor if the field coil is not continuous or if it is shorted to the motor case.

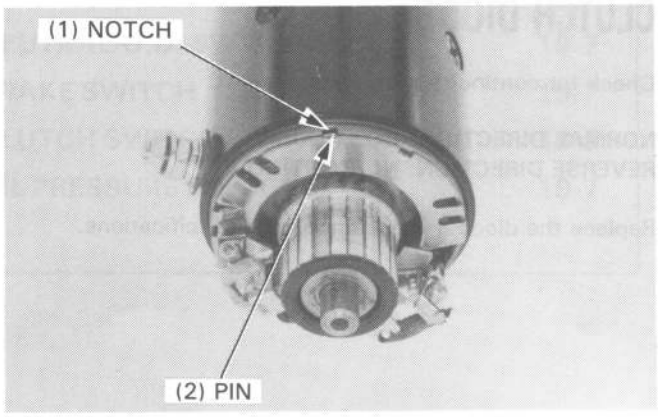
There should be continuity between the cable terminal and brush wires and no continuity between the cable terminal and case.



ASSEMBLY/INSTALLATION

Assemble the starter motor.

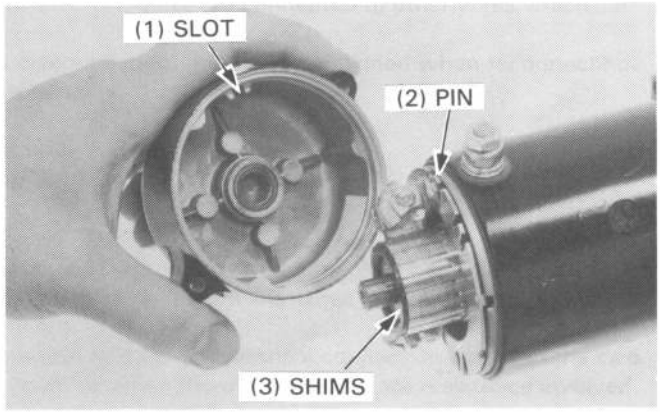
Align the case notch with the bruch holder pin.



Install the rear cover aligning its slot with the brush holder pin.

Be sure to install the original number of shims.

Position the tongued washer on the front cover and install the front cover.

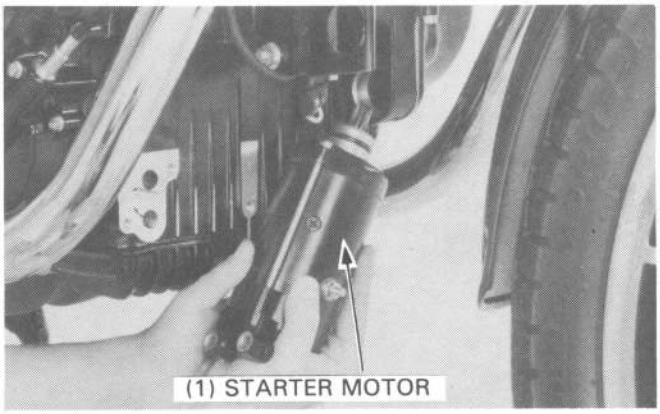


INSTALLATION

Apply grease to the O-ring.

Install the starter motor in the reverse order of removal.

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



STARTER RELAY SWITCH

INSPECTION

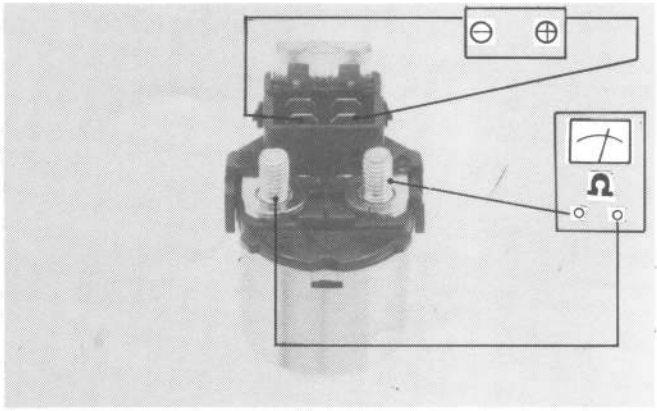
Depress the starter switch button with the ignition ON.

The coil is normal if the starter relay switch clicks.

Connect an ohmmeter to the starter relay switch terminals.

Connect a 12 V battery to the switch cable terminals.

The switch is normal if there is continuity.



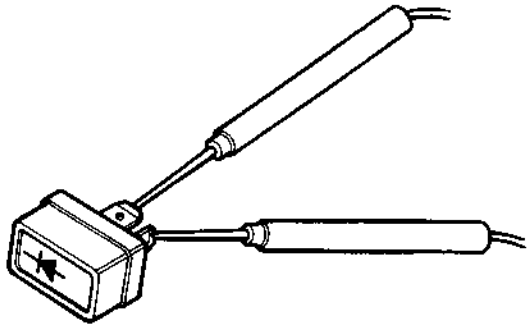
CLUTCH DIODE

Check for continuity with an ohmmeter.

NORMAL DIRECTION: CONTINUITY
REVERSE DIRECTION: NO CONTINUITY

Replace the diode if it does not meet specifications.

(1) NORMAL DIRECTION: CONTINUITY
(2) REVERSE DIRECTION: NO CONTINUITY



19. SWITCHES/HORN/LIGHTS

SERVICE INFORMATION

GENERAL

- Some wires have different colored bands around them near the connector. These are connected to other wires which correspond with the band color.
- 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.

Bu = Blue	G = Green	Lg = Light Green	R = Red
Bl = Black	Gr = Grey	O = Orange	W = White
Br = Brown	Lb = Light Blue	P = Pink	Y = Yellow

- To isolate an electrical failure, check the continuity of the electrical path through the component. 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, as when there is a specific coil resistance involved, or when checking for high resistance by corroded connections.

SPECIFICATIONS

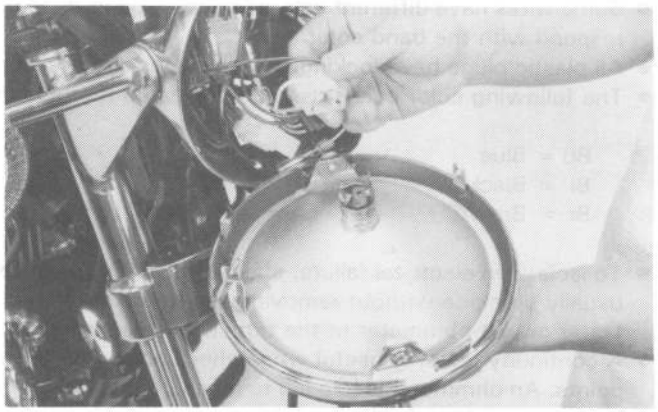
LIGHTS	Headlight (high/low beam)	12 V–50/35 W
	Tail/brakelight	12 V–3/32 CP SAE NO. 1157
	Turn signal light (front)	12 V–32 CP SAE NO. 1073
	(rear)	12 V–32 CP SAE NO. 1073
	Instrument	12 V–2 CP (3.4 W)
	Neutral indicator	12 V–2 CP (3.4 W)
	Turn signal indicator	12 V–2 CP (3.4 W)
	High beam indicator	12 V–2 CP (3.4 W)
	Oil pressure warning light	12 V–2 CP (3.4 W)
	Over drive indicator	12 V–2 CP (3.4 W)
	Position light	12 V–3 CP (8 W)
FUSE		15 A Main
		7 A

HEADLIGHT

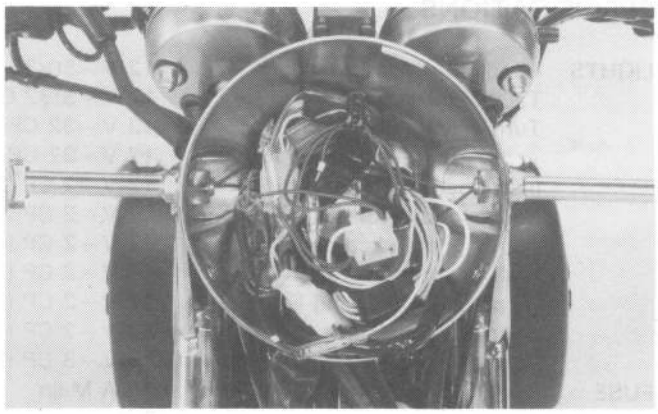
HEADLIGHT REMOVAL

Remove the screws and headlight.

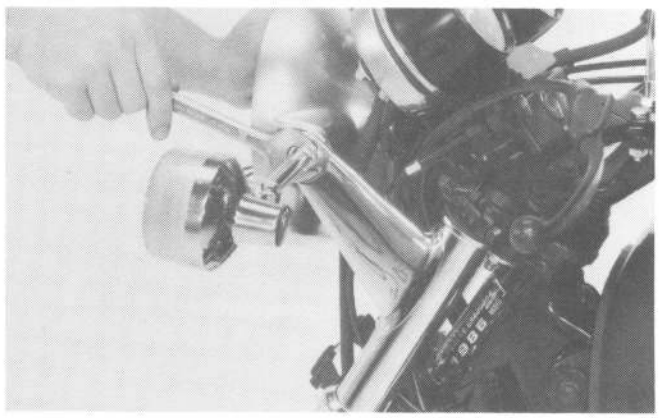
Disconnect all wires at their couplers and connectors.



Pull the wires out of the headlight case through the headlight case hole.
Pull the wire harness out of the headlight case through the headlight case lower hole.



Remove the right and left turn signal mounts.

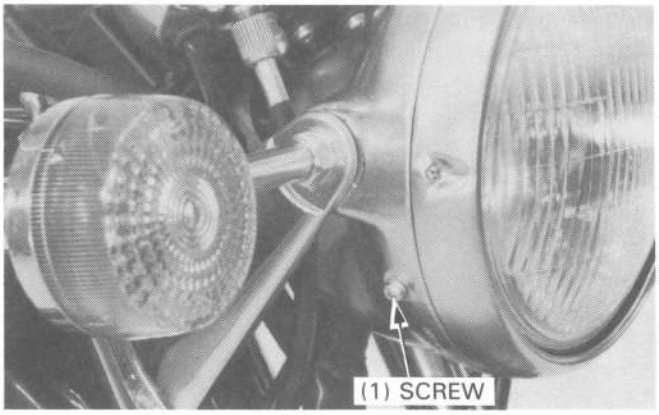


HEADLIGHT INSTALLATION

Align the punch marks on the headlight case with the punch marks on the headlight case brackets.
Position the turn signals parallel to the ground.
Assemble headlight in the reverse order of disassembly.

NOTE

- Connect the wires color-to-color. Set each coupler in its connect holder in the headlight case. For winding procedure see page 1-9 to 1-11.
  After installation, check each component for proper operation.

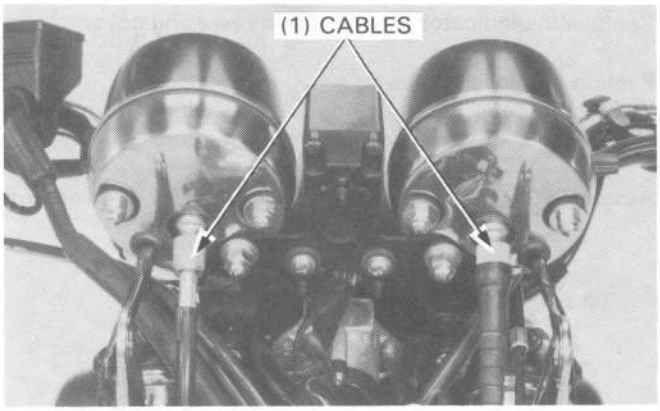


Install the removed parts in the reverse order of removal.

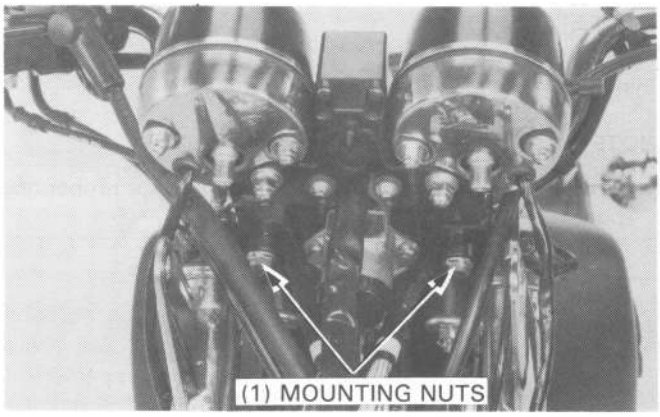
INSTRUMENT

REMOVAL

Remove the headlight and headlight case.
Disconnect the speedometer and tachometer cables.



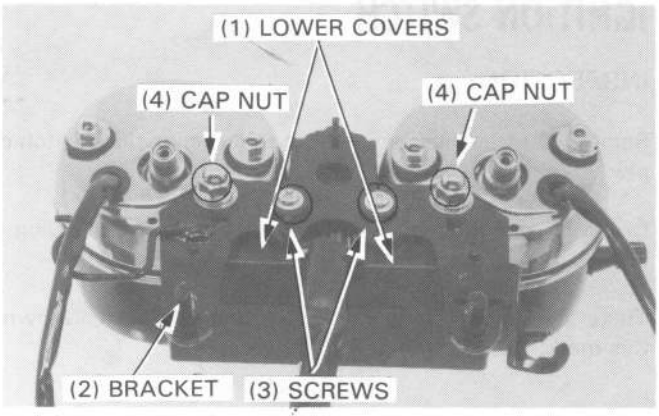
Remove the mounting nuts and instruments.



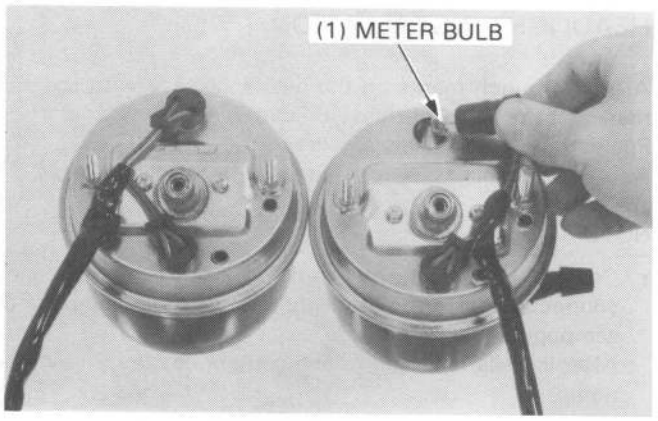
BULB REPLACEMENT

Remove the screws attaching the indicator panel and indicator panel assembly.

Remove the cap nuts and remove the meter mounting bracket and meter lower covers.



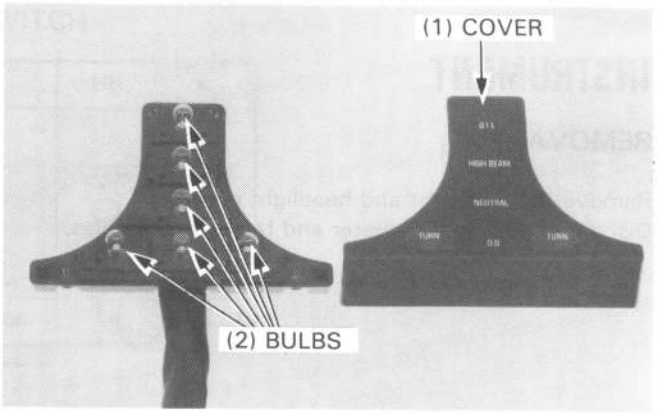
Replace the bulb.
If the bulb does not light, inspect the wiring for an open or short circuit, or check for loose connections.



Remove the indicator panel cover screws and cover.

Replace the failed bulb.
If the bulb does not light, inspect the wiring for on open or short circuit, or check for loose connections.

Assemble the instruments in the reverse order of disassembly.

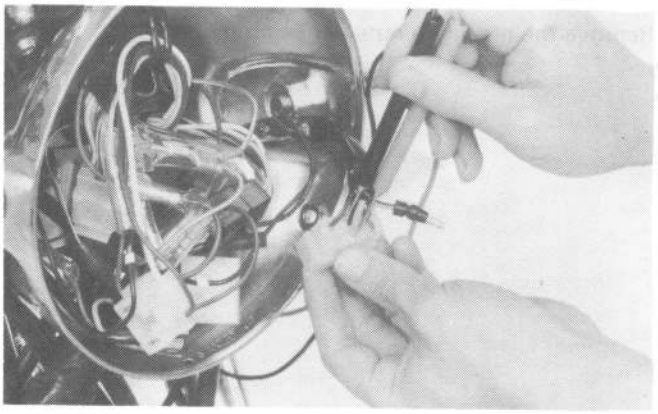


INSTALLATION

Installation is the reverse order of removal.

NOTE

- After installation, check each component for proper operation.



IGNITION SWITCH

INSPECTION

Remove the headlight and disconnect the ignition switch coupler.

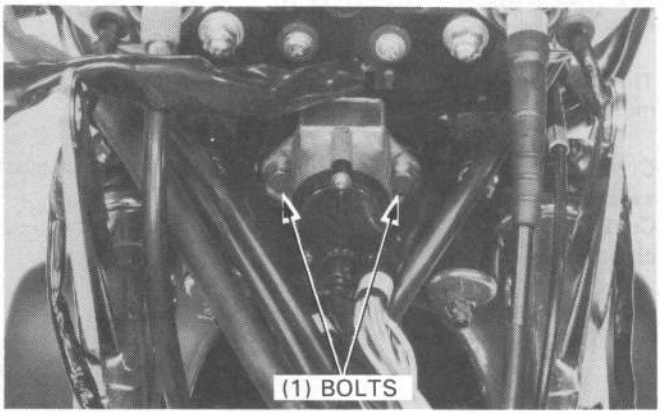
Check for continuity between the terminals following the table.

There should be continuity between terminals as shown by this mark: O–O.

	IG	E	BAT_1	BAT_2	TL_1	TL_2
LOCK	O	O				
P	O	O	O			O
OFF	O	O				
ON			O	O	O	O
color	Bl/W	G	R	Bl	Br/W	Br

REMOVAL

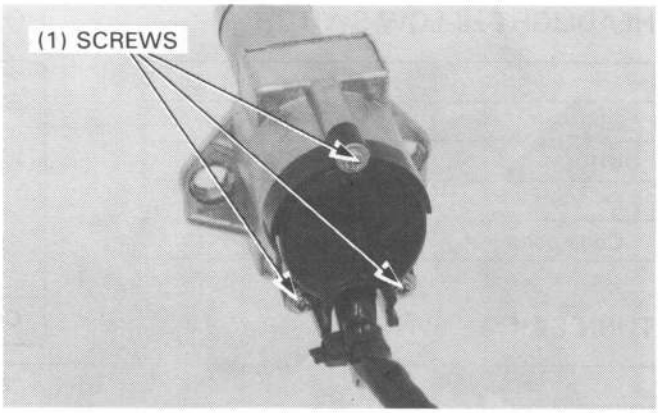
Remove the headlight and headlight case.
Remove the ignition switch by removing the two mounting bolts.



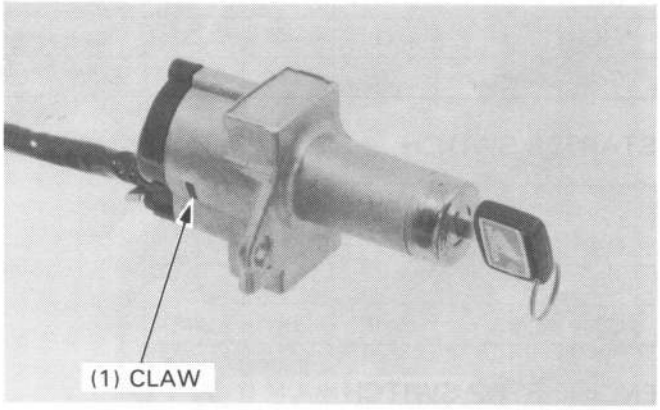
CONTACT BASE REPLACEMENT

Cut and discard the wire band.

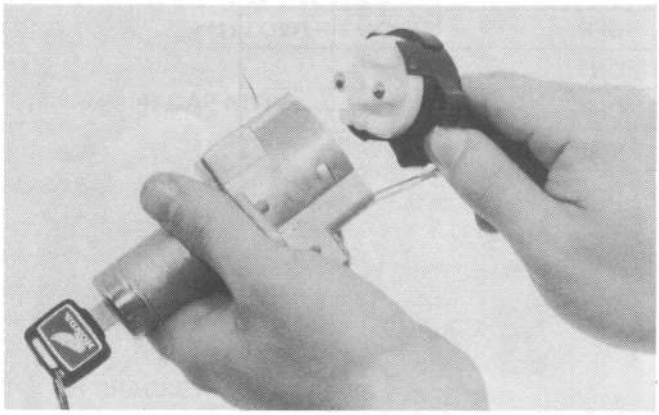
Remove the cover screws.



Insert the key and turn it to between the ON and OFF positions.
Push the lugs in with the screw driver and pull the contact base and cover from the steering lock body.



Assemble the ignition switch in the reverse order of removal and install it.

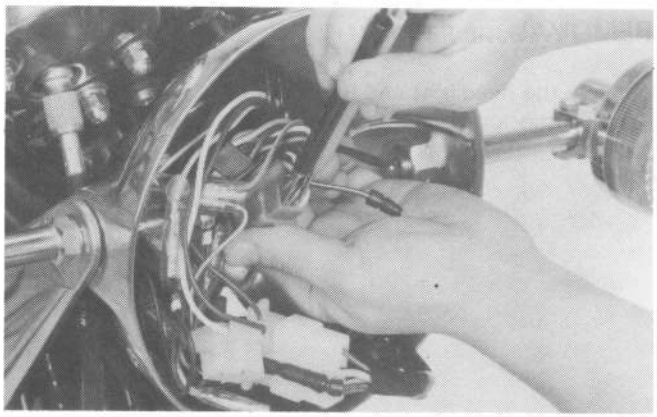


HANDLEBAR SWITCHES

The handlebar cluster switches (lights, turn signals, horn) must be replaced as assemblies.

Continuity tests for the components of the handlebar cluster switches follow:
Continuity should exist between the color coded wires on each chart.

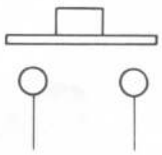
Remove the headlight and disconnect each switch coupler and test.



HEADLIGHT HI-LOW SWITCH

	HL	Hi	Lo
Hi	O	O	
(N)	O	O	O
Lo	O		O
Code color	Bl/Y	B	W

HORN SWITCH

	Ho	E
		
Code color	Lg	G

TURN SIGNAL SWITCH

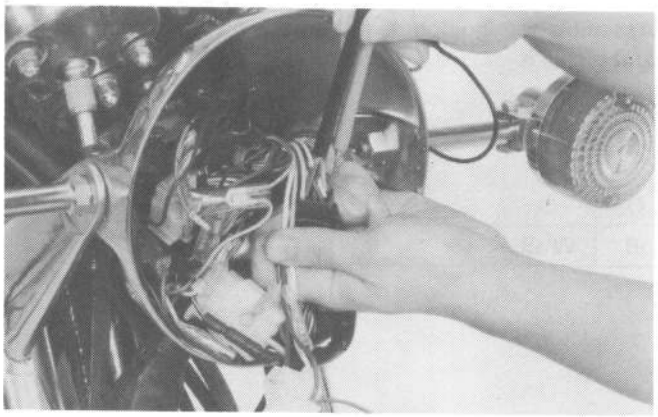
	W	L	R	T_L	P_R	P_L
LEFT	O	O		O	O	
OFF				O	O	O
RIGHT	O		O	O		O
Code color	Gr	O	Lb	Br/W	Lb/W	O/W

STARTER SWITCH

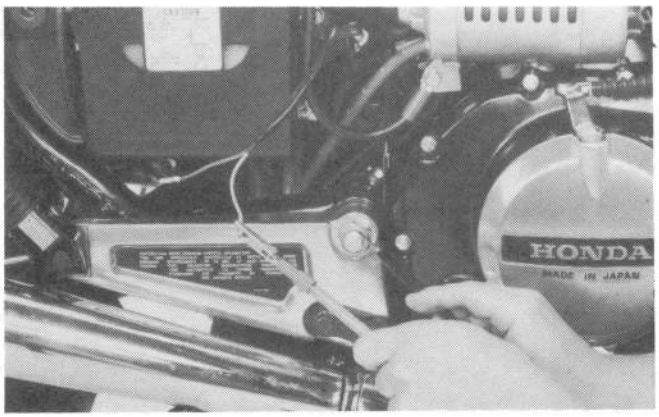
	Mg	BAT_2	HL_1
ON	O	O	
OFF		O	O
Code color	Y/R	Bl	Bl/R

ENGINE STOP SWITCH

	IG	E
OFF	O	O
ON		
OFF	O	O
Code color	Bl/W	G



NEUTRAL/O.D. SWITCH

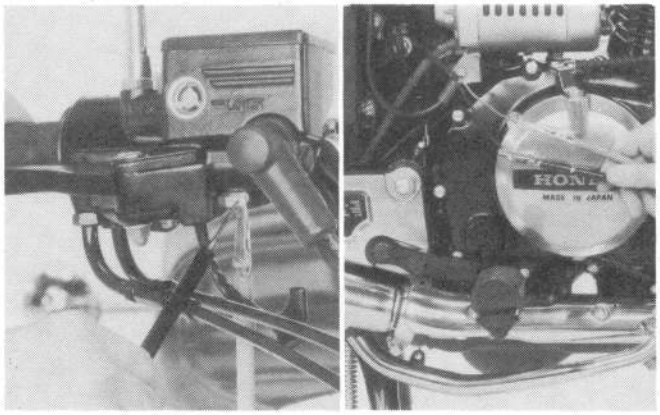


Remove the right side cover and disconnet the neutral/over drive switch wire connectors.

Check for continuity between each wire connector and ground with the transmission in neutral or over drive.

NEUTRAL: Continuity between Lg/R and ground
OVER DRIVE: Continuity between G/O and ground

BRAKE SWITCH

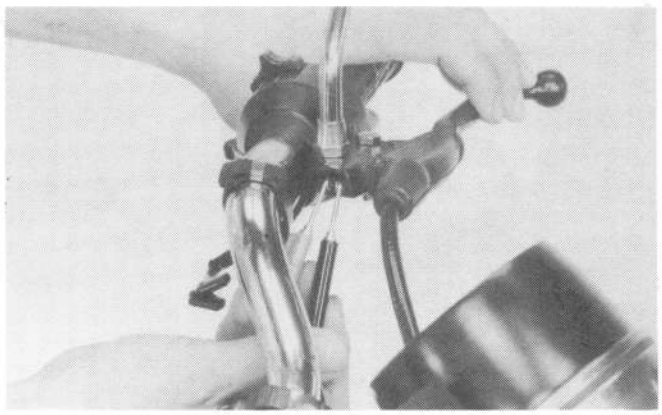


Check the rear brakelight switch for continuity with the rear brake applied.

Check the front brakelight switch for continuity with the front brake applied.

Replace the switches if necessary.

CLUTCH SWITCH



Check continuity of the clutch lever (safety) switch with the clutch released and applied.

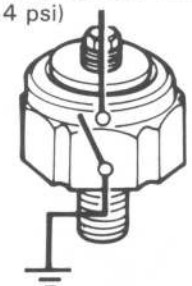
OIL PRESSURE WARNING SWITCH

Check for continuity while applying pressure to the switch.

Replace the switch if necessary.

Apply a liquid sealant to the switch threads.

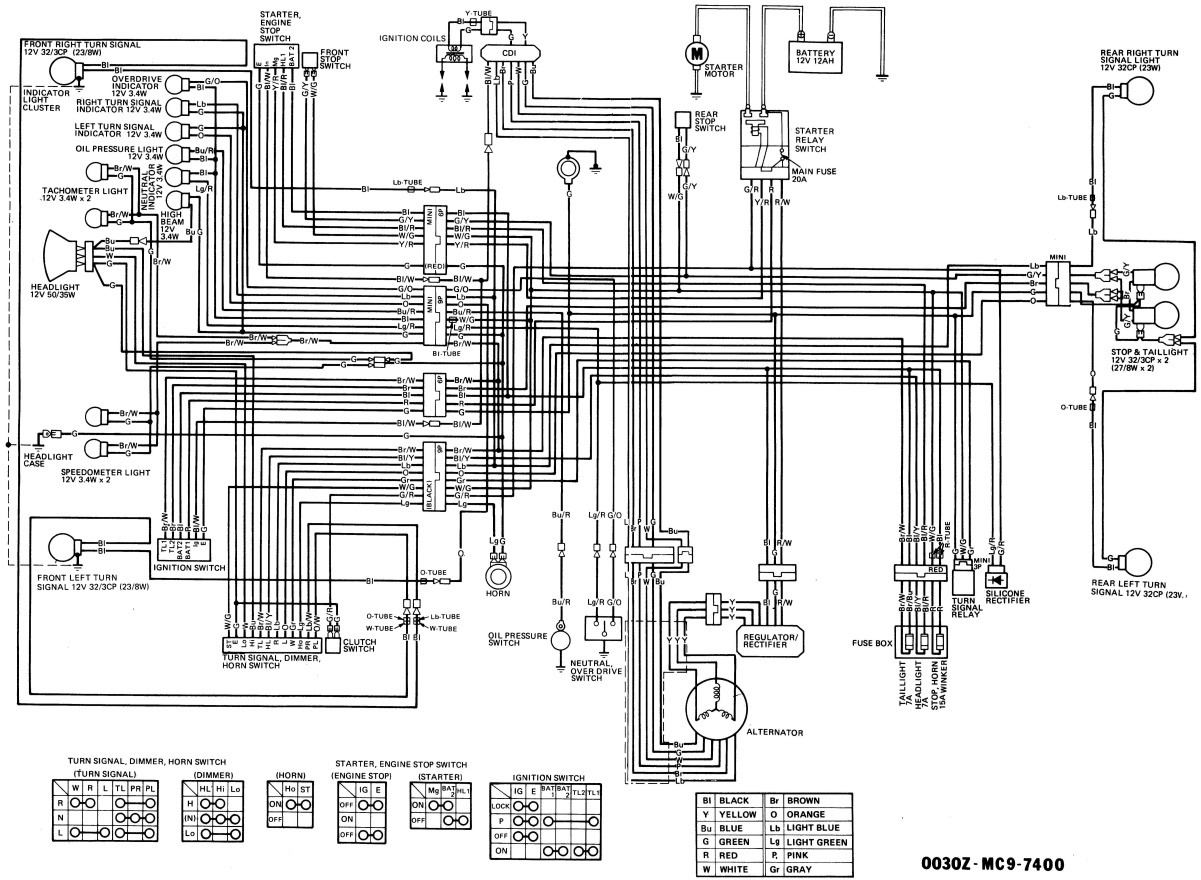
(1) CONTINUITY: BELOW 0.3 ± 0.1 kg/cm² (4.3 ± 1.4 psi)



(2) NO CONTINUITY: ABOVE 0.3 ± 0.1 kg/cm² (4.3 ± 1.4 psi)

MEMO

WIRING DIAGRAM



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

0030Z-MC9-7400

21. TROUBLESHOOTING

ENGINE DOES NOT START OR IS HARD TO START

		Possible Cause
1. Loosen drain screw and check for fuel at the carburetor.	NO FUEL AT CARBURETOR →	(1) Fuel tank empty (2) Clogged fuel tube or fuel filter (3) Clogged fuel inlet (4) Clogged fuel tank cap breather hole
FUEL REACHING CARBURETOR ↓		
2. Remove spark plugs and try spark test.	WEAK OR NO SPARK →	(1) Faulty spark plug (2) Fouled spark plug (3) Faulty CDI Unit (4) Broken or shotred high tension cord (5) Faulty alternator (6) Broken or shorted ignition coil (7) Faulty ignition switch
GOOD SPARK ↓		
3. Test cylinder compression	COMPRESSION LOW →	(1) Inadequate valve clearance (2) Valve stuck open (3) Worn cylinder and piston rings (4) Damaged cylinder head gasket (5) Valve timing incorrect
COMPRESSION NORMAL ↓		
4. Try to start following normal procedure.	ENGINE FIRES BUT STOPS →	(1) Misuse of choke (2) Carburetor pilot screw setting incorrect (3) Air leaking past intake pipes (4) Ignition timing incorrect (CDI unit or alternator faulty)
ENGINE DOES NOT FIRE ↓		
5. Remove and inspect spark plug.	WET PLUG →	(1) Carburetor flooded (2) Carburetor choke closed (3) Throttle valve stock open
DRY PLUG ↓		
6. Restart with choke applied.		

ENGINE LACKS POWER

		Possible Cause
1. Raise wheels and spin them by hand. WHEELS SPIN FREELY ↓	WHEELS DO NOT SPIN FREELY →	(1) Brake dragging (2) Worn or damaged wheel bearing (3) Wheel bearing dry (4) Drive chain too tight
2. Check tire pressure. PRESSURE NORMAL ↓	PRESSURE LOW →	(1) Punctured tire (2) Faulty tire valve
3. Accelerate repidly from low to second. ENGINE SLOWS WHEN CLUTCH RELEASED ↓	ENGINE SPEED NOT CHANGED WHEN CLUTCH RELEASED →	(1) Clutch slipping (2) Worn clutch disc (3) Clutch disc warped
4. Accelerate lightly ↓	NO SIGNIFICANT INCREASE IN ENGINE SPEED →	(1) Carburetor choke closed (2) Clogged air cleaner (3) Restricted fuel flow (4) Clogged fuel tank breather cap hole (5) Clogged muffler
5. Check ignition timing TIMING CORRECT ↓	TIMING INCORRECT →	(1) Faulty CDI unit (2) Faulty alternator
6. Check valve clearance ↓	CLEARANCE INCORRECT →	(1) Improper adjustment (2) Worn valve seat
7. Test cylinder compression COMPRESSION NORMAL ↓	COMPRESSION LOW →	(1) Valve stuck open (2) Worn cylinder and piston (3) Blown cylinder head gasket (4) Valve timing incorrect
8. Check carburetor for clogging CARBURETOR CLEAN ↓	CARBURETOR CLOGGED →	(1) Carburetor not cleaned frequently enough
9. Remove spark plug PLUG IS NOT FOULED OR DISCOLORED ↓	PLUG IS FOULED OR DISCOLORED →	(1) Plugs not replaced on schedule (2) Spark plug heat range incorrect (3) Wrong type of fuel
10. Check oil level and condition. OIL LEVEL CORRECT ↓	OIL LEVEL INCORRECT →	(1) Oil level too high (2) Oil level too low (3) Contaminated oil

11. Remove cylinder head cover and check lubrication. VALVE TRAIN SUFFICIENTLY LUBRICATED ↓	VALVE TRAIN INSUFFICIENTLY LUBRICATED →	(1) Clogged oil passage (2) Clogged oil control orifice
12. Check for engine overheating ENGINE DOES NOT OVERHEAT ↓	ENGINE OVERHEATS →	(1) Excessive carbon build-up on combustion chamber wall (2) Wrong type of fuel (3) Clutch slipping (4) Fuel-air mixture too rich
13. Accelerate or run at high speed.	ENGINE KNOCKS →	(1) Worn piston and cylinder (2) Fuel-air mixture too lean (3) Wrong type of fuel (4) Excessive carbon build-up in combustion chamber (5) Ignition timing too early (Faulty CDI unit or alternator)

POOR PERFORMANCE AT LOW AND IDLE SPEEDS

		Possible Cause
1. Check ignition timing CORRECT ↓	INCORRECT →	(1) Valve clearance incorrect (2) Ignition timing incorrect (Faulty CDI unit or alternator)
2. Check for air leaking NO LEAK ↓	LEAKING →	(1) Deteriorated insulator O-ring (2) Loose carburetor
3. Try spark test.	WEAK OR INTERMITTENT SPARK →	(1) Faulty or fouled spark plug (2) Faulty CDI unit (3) Alternator faulty (4) Ignition coil out of order

POOR PERFORMANCE AT HIGH SPEED

		Possible Cause
1. Check ignition timing and valve clearance.	INCORRECT →	(1) Valve clearance incorrect (2) CDI unit out of order (3) Alternator faulty
CORRECT ↓		
2. Disconnect fuel tube at carburetor.	FUEL FLOW →	(1) Fuel tank empty (2) Clogged fuel line (3) Clogged fuel tank cap breather hole (4) Clogged fuel valve
FUEL FLOWS FREELY ↓		
3. Remove carburetor and check for clogged jet.	JET CLOGGED →	(1) Clean
NO CLOG ↓		
4. Check valve timing.	INCORRECT →	(1) Cam sprocket is not installed properly
CORRECT ↓		
5. Check valve spring tension	WEAK →	(1) Faulty spring

POOR HANDLING

Check tire pressures.

	Probable Cause
1. If steering is heavy →	(1) Steering cone races too tight (2) Damaged steering steel balls
2. If either wheel is wobbling →	(1) Excessive wheel bearing play. (2) Bent rim (3) Improperly installed wheel hub (4) Swingarm pivot bushing excessively worn (5) Bent frame (6) Improper drive chain tension or adjustment
3. If the motorcycle pulls to one side →	(1) Unbalanced shock absorbers (2) Front and rear wheels not aligned (3) Bent front fork (4) Bent swingarm

22. INDEX

HONDA

HONDA MOTOR CO., LTD. TOKYO, JAPAN

61MC900

英 SM A30508604G
PRINTED IN JAPAN