HONDA
MBX50·MBX80

MBX50·MBX80

WORKSHOP MANUAL

HOW TO USE THIS MANUAL

This shop manual describes the service procedures for the HONDA MBX50 and MBX80 based on the MBX50 Standard model.

Section 1 throughs 3 apply to the whole motorcycle, while section 4 through 17 describe parts of the motorcycle, grouped according to location.

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

Most sections start with an assembly or system illustration, 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, 18, TROUBLESHOOTING.

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

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SERVICE PUBLICATIONS OFFICE

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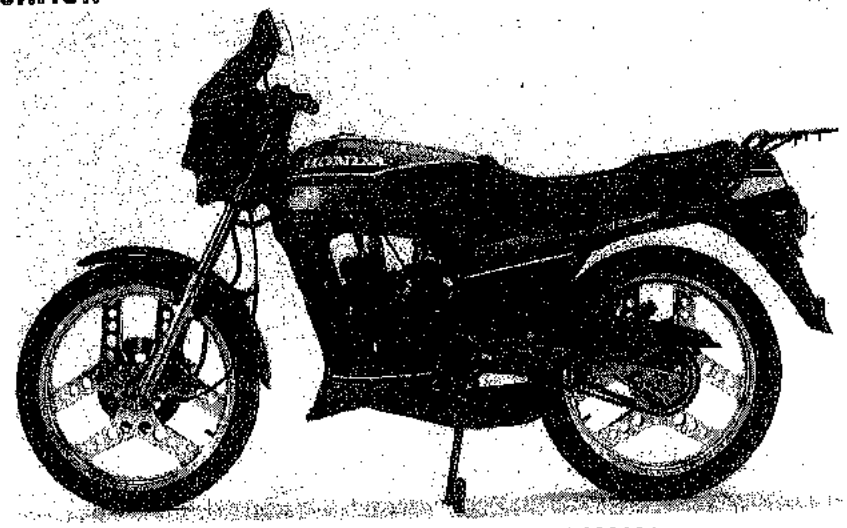
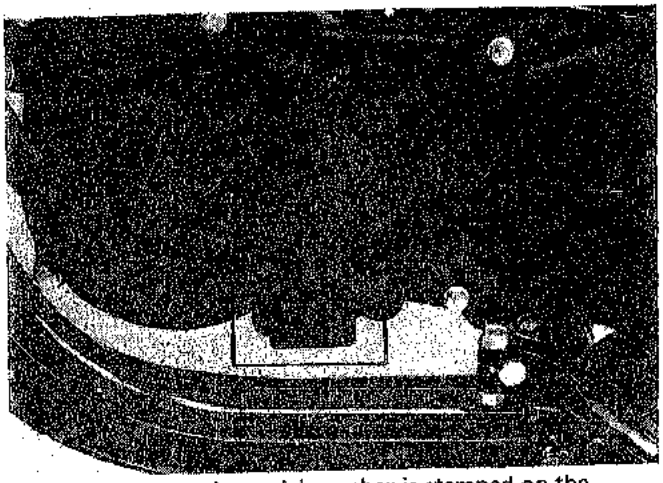
MODEL IDENTIFICATION

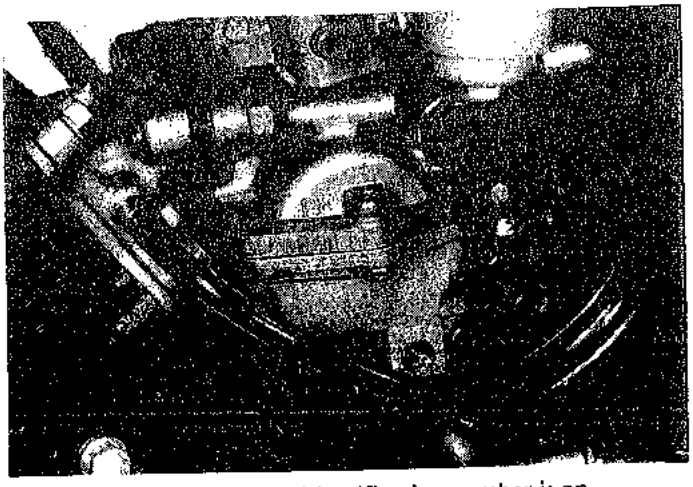


(1) BEGINNING WITH F No. AC03-5000001.

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



(3) The engine serial number is stamped on the left crankcase.



(4) The carburetor identification number is on the carburetor body left side.

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GENERAL INFORMATION 1.

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IMPORTANT SAFETY NOTICE

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

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

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

GENERAL SAFETY

WARNING

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

WARNING

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

WARNING

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

WARNING

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

SERVICE RULES

1. Use geniune HONDA or HONDA-recommended parts and lubricants or their equivalent. Parts that do not meet HONDA's design specifications may damage the motorcycle.
2. Use the special tools designed for this product.
3. Use only metric tools when servicing this motorcycle. Metric bolts, nuts, and screws are not interchangeable with English fasteners. The use of incorrect tools and fasteners may damage the motorcycle.
4. Install new gaskets, O-rings, cotter pins, lock plates, etc. when reassembling.
5. When tightening bolts or nuts, begin with larger-diameter or inner bolts first, and tighten to the specified torque diagonally, unless a particular sequence is specified.
6. Clean parts in cleaning solvent upon dissassembly. Lubricate any sliding surfaces before reassembly.
7. After reassembly, check all parts for proper installation and operation.

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SPECIFICATIONS

ITEM	MBX50	MBX80	AREA (Type)
DIMENSIONS			
Overall length	1,970 mm (77.5 in)	←	
Overall width	675 mm (26.6 in)	←	
Overall height Standard	1,005 mm (39.6 in)	←	
Deluxe	1,110 mm (43.7 in)	←	
Wheelbase	1,250 mm (49.2 in)	←	
Seat height	775 mm (30.5 in)	780 mm (30.7 in)	
Ground clearance	170 mm (6.7 in)	150 mm (5.9 in)	
Dry weight	89 kg (196 lb)	92 kg (203 lb)	
Curb weight	98 kg (216 lb)	101 kg (223 lb)	
Loaded weight	248 kg (547 lb)	251 kg (553 lb)	
Permissible maximum weight	268 kg (591 lb)	271 kg (597 lb)	
FRAME			
Type	Semi-double cradle	←	
Front suspension, travel	Telescopic, 115 mm (4.53 in)	←	
Rear suspension, travel	Swingarm/shock absorber, 85 mm 85 mm (3.35 in)	←	
Front tire size	2.50-18-4PR	2.75-18-4PR	
Rear tire size	2.75-18-6PR	3.00-18-6PR	
Cold tire pressure Up to 90 kg (198 lb) Front	175 kPa (1.75 kg/cm^2, 25 psi)	200 kPa (2.0 kg/cm^2, 28 psi)	
Rear	175 kPa (1.75 kg/cm^2, 25 psi)	200 kPa (2.0 kg/cm^2, 28 psi)	
Up to capacity load Front	175 kPa (1.75 kg/cm^2, 25 psi)	200 kPa (2.0 kg/cm^2, 28 psi)	
Rear	280 kPa (2.80 kg/cm^2, 40 psi)	280 kPa (2.8 kg/cm^2, 40 psi)	
Front brake	Single disc brake	←	
Rear brake	Internal expanding shoe	←	
Fuel capacity	1.2 liters (3.2 US gal, 2.6 Imp gal)	←	
Fuel reserve capacity	1.2 liters (0.3 US gal, 0.3 Imp gal)	←	
Caster angle	26°30'	←	
Trail	72 mm (2.8 in)	←	
Front fork oil capacity	149.5-154.5 cm^3 (5.3-5.5 oz)		
ENGINE			
Type	Water cooled 2-stroke, reed valve	←	
Cylinder arrangement	Single cylinder 15° incline from vertical	←	
Bore and stroke	39.0 x 41.4 mm (1.54 x 1.63 in)	49.5 x 41.4 mm (1.95 x 1.63 in)	
Displacement	49 cm^3 (2.98 cu in)	79 cm^3 (4.82 in)	
Compression ratio	7.3 : 1	←	

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ITEM	MBX50	MBX80	AREA (Type)
ENGINE			
Maximum horsepower	5.8 kw/7,000 min^{-1} (7.9 ps/7,000 rpm)	7.0 kw/5,750 min^{-1} (9.6 ps/5,750 rpm)	
Maximum torque	8.3 N.m (0.85 kg-m, 6.1 ft-lb)/ 6,500 min^{-1} (rpm)	11.7 N.m (1.2 kg-m, 8.7 ft-lb) 5,500 min^{-1} (rpm)	
Oil capacity Transmission	0.9 liters (1.0 US qt, 0.8 Imp qt)	←	
Oil tank	1.2 liters (1.3 US qt, 1.1 Imp qt)	←	
Coolant capacity	670 cm^3 (40.9 cu in)	←	
Lubrication system	Forced and wet sump	←	
Air filtration	Oiled polyurethane foam	←	
Cylinder compression	1,275 kPa (13.0 kg/cm^2, 185 psi)	←	
Idle speed	1,400 min^{-1} (rpm)	←	
CARBURETION			
Carburetor type	PF16, 16 mm (0.63 in) venturi bore	PF16, 18 mm (0.71 in) venturi bore	
Identification number	PF16A	PF26D	
Air screw initial setting	1½ turns out	1 turn out	
Float level	13.5 mm (0.53 in)	←	
DRIVE TRAIN			
Clutch	Wet, multi-plate	←	
Transmission	6-speed constant-mesh	←	
Primary reducation	4.117	←	
Final reducation	2.866 (43/15)	2.533 (38/15)	
Gear ratio I	3.545	←	
II	2.333	←	
III	1.722	←	
IV	1.380	←	
V	1.173	←	
VI	1.041	←	
Gear shift pattern	Left foot operated return system, 1-N-2-3-4-5-6	←	
ELECTRICAL			
Ignition	C.D.I.	←	
Ignition timing "F" mark	19°±3° BTDC at 3,000 min^{-1} (rpm)	←	
Full retard	10.5°±3.5° BTDC at 9,000 min^{-1} (rpm)	3°±3.5° BTDC at 9,000 min^{-1} (rpm)	
Starting system	Kickstarter	←	
Generator	90W/5,000 min^{-1} (rpm)	←	
Battery capacity	12V 3AH	←	
Spark plug Standard	NGK BR8ES, ND W24ESR-U	←	
Optional	NGK BR9ES, ND W27ESR-U	←	
	NGK BR7ES, ND W22ESR-U	←	
Standard		NGK BR9ES, ND W27ESR-U	G
Optional		NGK BR7ES, ND W22ESR-U	G
		NGK BR8ES, ND W24ESR-U	G
Spark plug gap	0.7-0.8 mm (0.028-0.031 in)	←	
Fuse	7A	←	
LIGHTS			
Headlight (high/low beam)	35/35W	←	
		36/36W	F
Tail/stoplight	5/21W	←	
Front turn signal	10W	←	
Rear turn signal	10W	←	
Speedometer light	3.4W	←	
Tachometer light	3.4W	←	
Neutral indicator	3.4W	←	
Turn signal indicator	3.4W	←	
High beam indicator	1.7W	←	

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TORQUE VALUES

• ENGINE

Item	Q'ty	Thread Dia (mm)	Torque N.m (kg-m, ft-lb)	Remarks
Cylinder head	4	8	18–22 (1.8–2.2, 13–16)	
Alternator rotor	1	12	50–60 (5.0–6.0, 36–43)	
Primary drive gear	1	12	45–55 (4.5–5.5, 33–40)	
Drain plug	1	12	20–25 (2.0–2.5, 14–18)	

• CHASSIS

Item	Q'ty	Thread Dia (mm)	Torque N.m (kg-m, ft-lb)	Remarks
Steering stem nut	1	22	60–90 (6.0–9.0, 43–65)	
Handlebar holder	4	6	10–14 (1.0–1.4, 7–10)	
Fork pinch bolts	2	8	24–30 (2.4–3.0, 17–22)	
Front fork bolt	2	12	40–50 (4.0–5.0, 29–36)	
Front fork inner bolt	2	22	15–30 (1.5–3.0, 11–22)	
Front axle nut	1	12	55–70 (5.5–7.0, 40–51)	Self-looking nut
	3	10	30–40 (3.0–4.0, 22–29)	
Rear axle nut	1	12	55–70 (5.5–7.0, 40–51)	Self-looking nut
Final driven sprocket	3	10	40–50 (4.0–5.0, 29–36)	
Rear brake torque link	2	8	18–25 (1.8–2.5, 13–18)	
Rear shock absorber	2	10	27–33 (2.7–3.3, 20–24)	Self-looking nut
Rear shock linkage	3	10	40–50 (4.0–5.0, 29–36)	
Swingarm pivot nut	1	14	70–85 (7.0–8.5, 51–62)	Self-locking nut
Front brake disc	3	8	27–33 (2.7–3.3, 20–24)	
Front brake master cylinder	2	6	10–14 (1.0–1.4, 7–10)	
Brake bleeder valve	1	–	4– 7 (0.4–0.7, 2.9–5.1)	
Brake hose bolt	2	10	25–35 (2.5–3.5, 18–25)	
Brake caliper bracket	2	8	24–30 (2.4–3.0, 17–22)	
Brake caliper bracket pin nut	2	8	20–25 (2.0–2.5, 15–18)	
Brake caliper pin bolt	3	6	15–20 (1.5–2.0, 11–15)	

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

• STANDARD TORQUE VALUES

Item	Torque N.m (kg-m, ft-lb)	Item	Torque N.m (kg-m, ft-lb)
5 mm bolt and nut	4– 6 (0.4–0.6, 3– 4)	5 mm screw	3– 5 (0.3–0.5, 3– 4)
6 mm bolt and nut	8–12 (0.8–1.2, 6– 9)	6 mm screw	7–11 (0.7–1.1, 5– 8)
8 mm bolt and nut	18–25 (1.8–2.5, 13–18)	6 mm flange bolt and nut	10–14 (1.0–1.4, 7–10)
10 mm bolt and nut	30–40 (3.0–4.0, 22–29)	8 mm flange bolt and nut	20–30 (2.0–3.0, 14–22)
12 mm bolt and nut	50–60 (5.0–6.0, 36–43)	10 mm flange bolt and nut	30–40 (3.0–4.0, 22–29)

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TOOLS

SPECIAL

Tool Name	Tool No.	Q'ty	Remarks
Crankshaft assembly tool	07965–1660100	1	Crankshaft installation
Balancer weight driver	07945–1660000	1	Balancer installation
Bearing remover set 12mm	07936–1660000	1	Removal of small balancer bearing, water pump bearing and mainshaft bearing
(Spindle assembly)	(07936–1660100)	(1)	
(Sliding weight)	(07936–3710200)	(1)	
Bearing puller (commercially available)	07631–0010000	1	Main bearing removal
Bearing driver 28 x 30 mm	07964–1870100	1	Small balancer bearing and mainshaft bearing installation
Hex wrench 6 mm (commercially available)	07917–3230000	1	
Ball rece driver	07944–1150001	1	
Snap ring pliers	07914–3230001	1	
Front fork oil seal driver attachment	07747–0010700	1	
Shock absorber compressor attachment	07967–GE20000	1	
Mechanical seal driver	07945–4150400	1	Water pump mechanical seal installtion

COMMON

Tool Name	Part No.	Q'ty	Remarks
Float level gauge	07401–0010000	1	Float level
Universal holder	07725–0030000	1	Flywheel removal
Flywheel puller	07733–0010000	1	Flywheel removal
Driver A	07749–0010000	1	Used with driver attachment
Attachment 52 x 55 mm	07746–0010400	1	
Attachment 42 x 47 mm	07746–0010300	1	
Attachment 37 x 40 mm	07746–0010200	1	Installation of front wheel bearing
Attachment 32 x 35 mm	07746–0010100	1	Installation of crankshaft oil seal
Pilot 12 mm	07746–0040200	1	Used with driver attachment
Pilot 17 mm	07746–0040400	1	Used with driver attachment
Pilot 25 mm	07746–0040600	1	Used with driver attachment
Pilot 24 mm	07746–0040600	1	Used with driver attachment
Driver C	07746–0030100	1	Installing crankshaft bearing
Attachment 25 mm I.D.	07746–0030200	1	Installing crankshaft bearing
Front fork oil seal driver body	07747–0010100	1	Installing fork seal in slider
Pin spanner	07702–0010000	1	Steering head bearing adjustment

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MEMO

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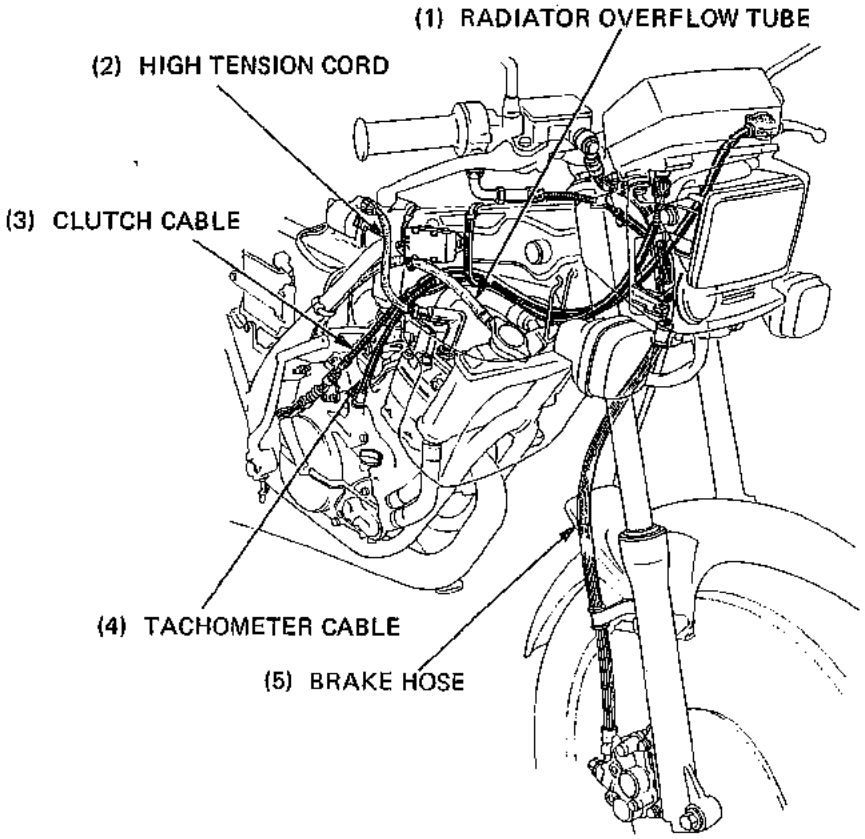
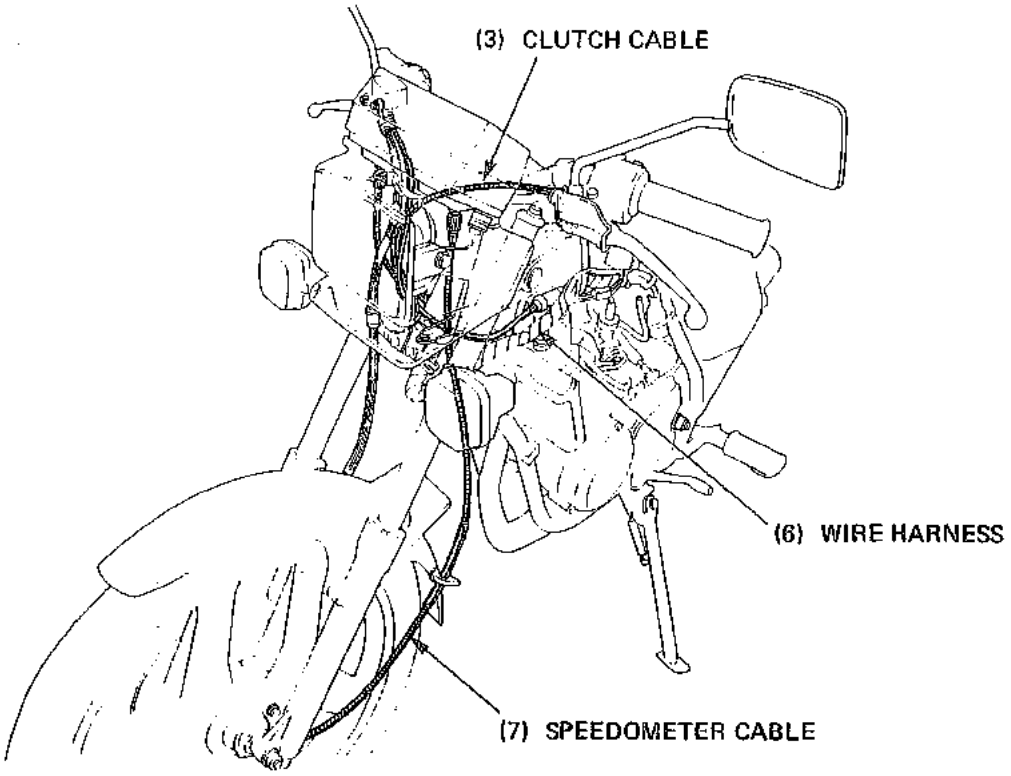
CABLE & HARNESS ROUTING





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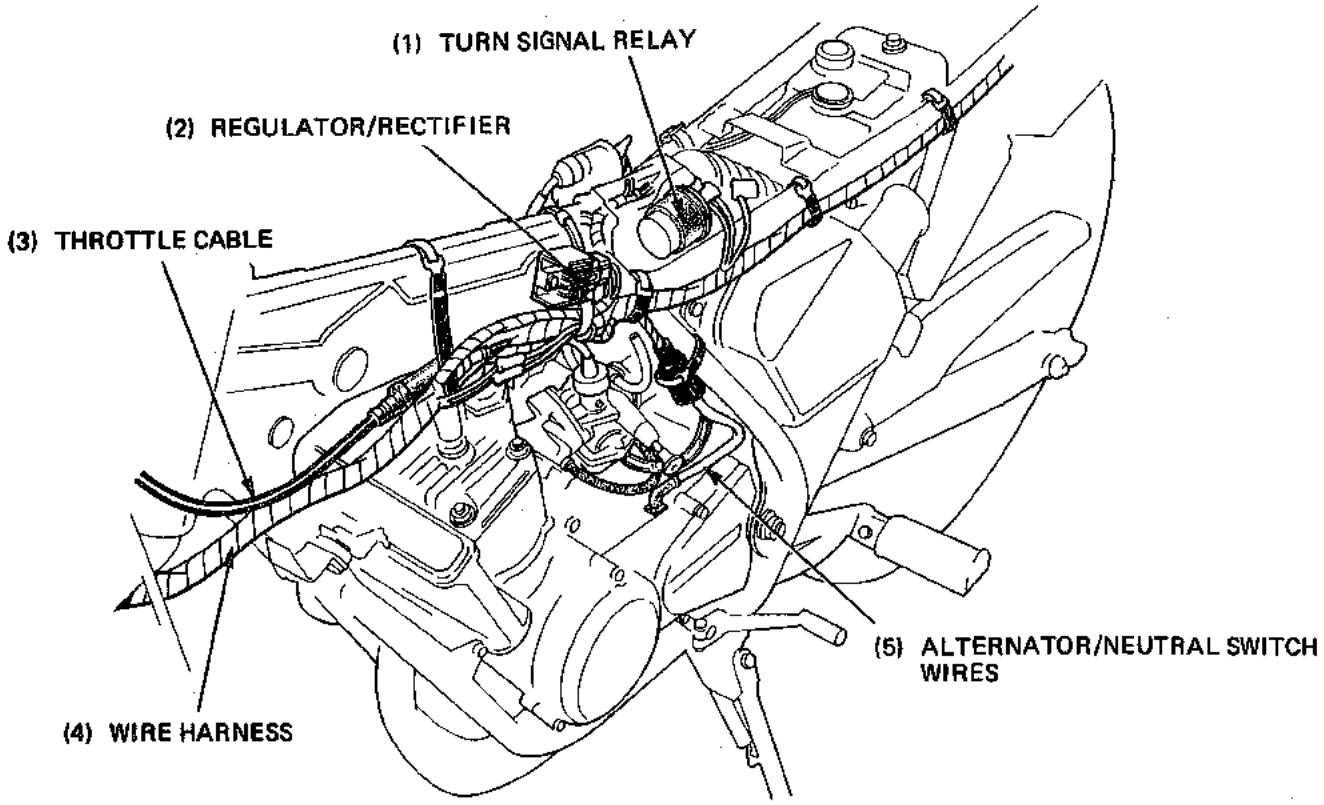

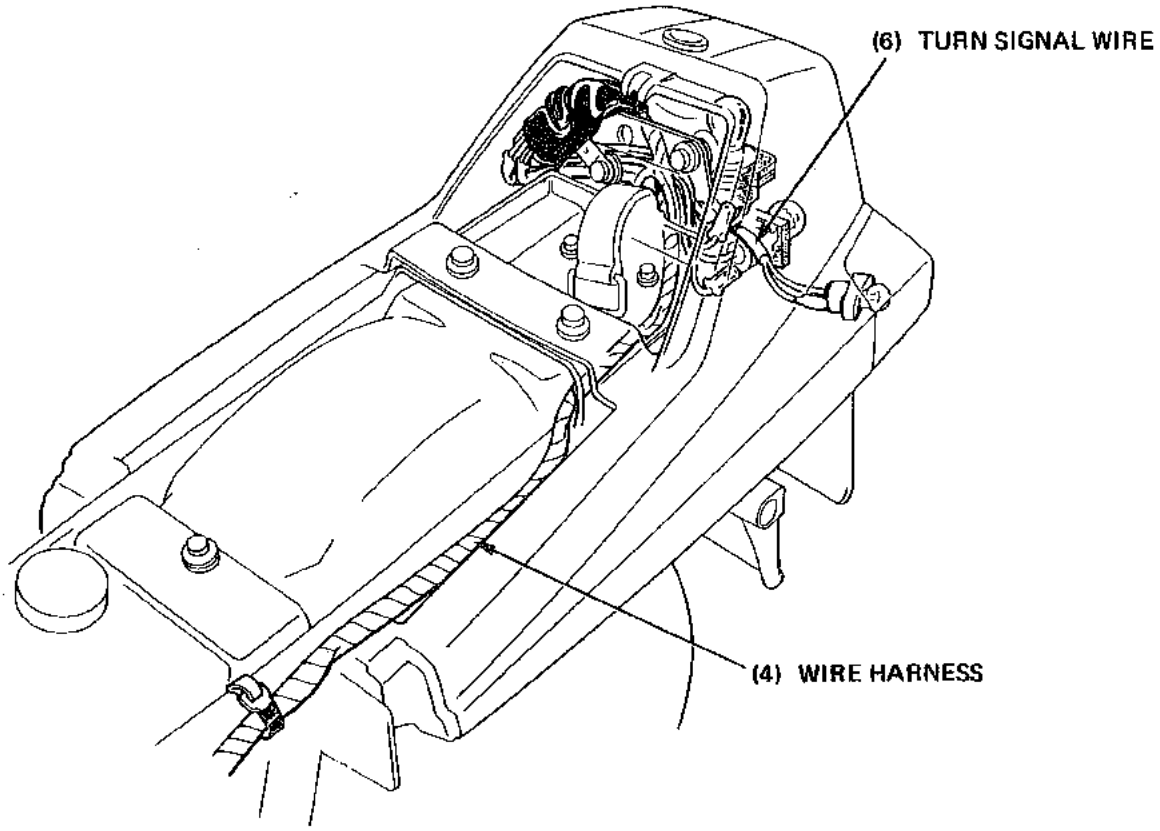

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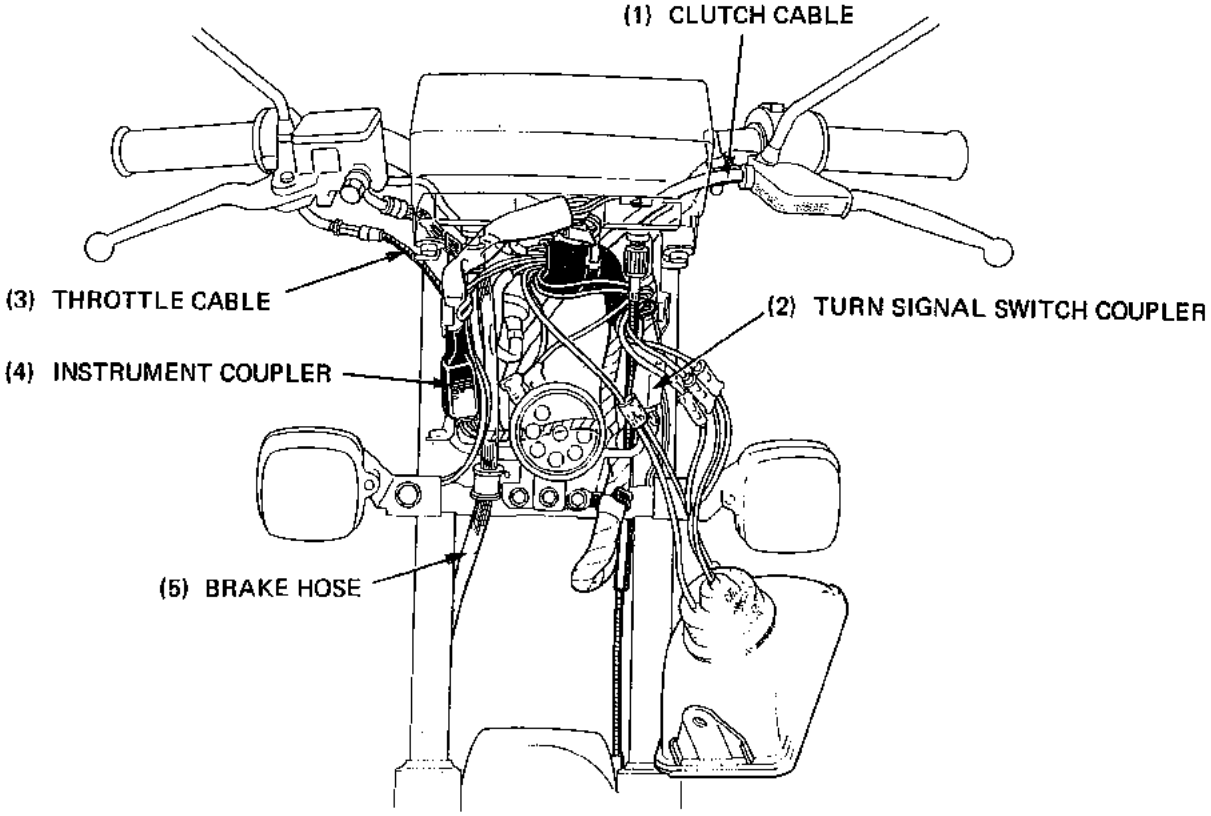
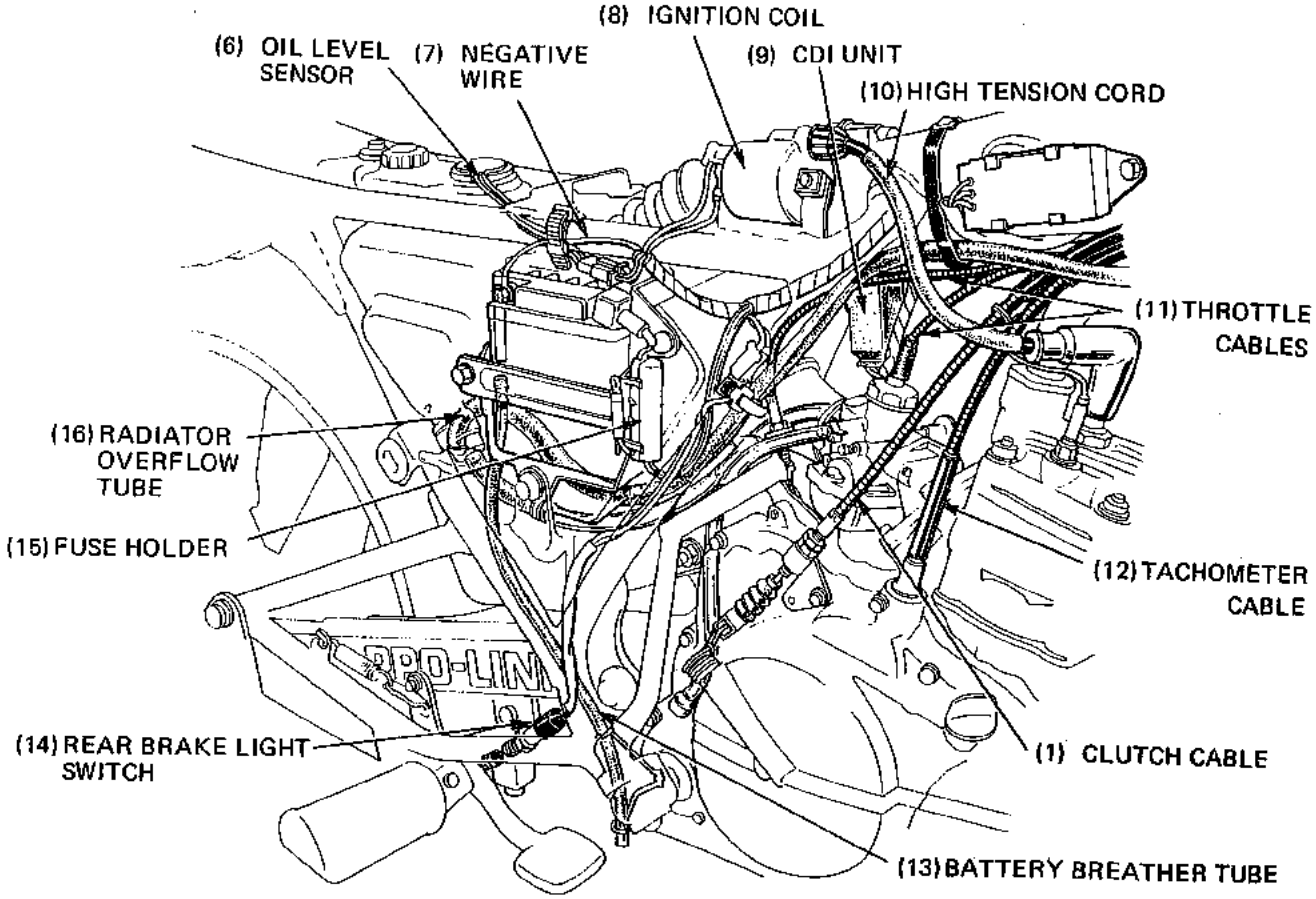

(1) CLUTCH CABLE
(3) THROTTLE CABLE
(2) TURN SIGNAL SWITCH COUPLER
(4) INSTRUMENT COUPLER
(5) BRAKE HOSE


(8) IGNITION COIL
(6) OIL LEVEL SENSOR
(7) NEGATIVE WIRE
(9) CDI UNIT
(10) HIGH TENSION CORD
(11) THROTTLE CABLES
(16) RADIATOR OVERFLOW TUBE
(15) FUSE HOLDER
(12) TACHOMETER CABLE
(14) REAR BRAKE LIGHT SWITCH
(1) CLUTCH CABLE
(13) BATTERY BREATHER TUBE

MAINTENANCE SCHEDULE

Perfrom the Pre-ride Inspection at each sheculed maintenance period.
I: Inspect and Clean, Adjust, Lubricate or Replace if necessary.
C: Clean R: replace A: Adjust L: Lubricate

	ITEM \ REQUENCY	WHICHEVER COMES FIRST EVERY	ODOMETER READING (NOTE 2) 300 mi (500 km)	1,800 mi (3,000 km)	3,600 mi (6,000 km)	5,400 mi (9,000 km)	Refer to
	TRANSMISSION OIL		R			R	Page 2-3
	SPARK PLUG		A	R	R	R	Page 3-4
	AIR FILTER ELEMENT	NOTE 1		C	C	C	Page 3-3
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**	STEERING HEAD BEARINGS					I	
	BATTERY		I	I	I	I	Page 3-9
	BRAKE FLUID	MONTH: I 2 YEARS: R	I	I	I	I	Page 3-9
*	BRAKE LIGHT SWITCH		I	I	I	I	Page 3-10
*	HEADLIGHT AIM		I	I	I	I	
	SIDE STAND			I	I	I	
*	LIGHTING EQUIPMENT		I	I	I	I	
*	ALL NUTS, BOLTS AND OTHER FASTENERS		I	I	I	I	Page 3-13
**	CYLINDER PISTON DECARBONIZATION				C		
**	CYLINDER EX. PORT DECARBONIZATION				C		
**	MUFFLER DECARBONIZATION					C	Page 3-13

* SHOULD BE SERVICED BY AN AUTHORIZED HONDA DEALER' UNLESS THE OWNER HAS THE PROPER TOOLS AND SERVICE DATA AND IS MECHANICALLY QUALIFIED. REFER TO THE OFFICAL HONDA SHOP MANUAL.

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

NOTES:
1. Service more frequently when riding in dusty areas.
2. For higher odometer readings, repeat at the frequency interval established here.
3. Every 300 miles (500 km)

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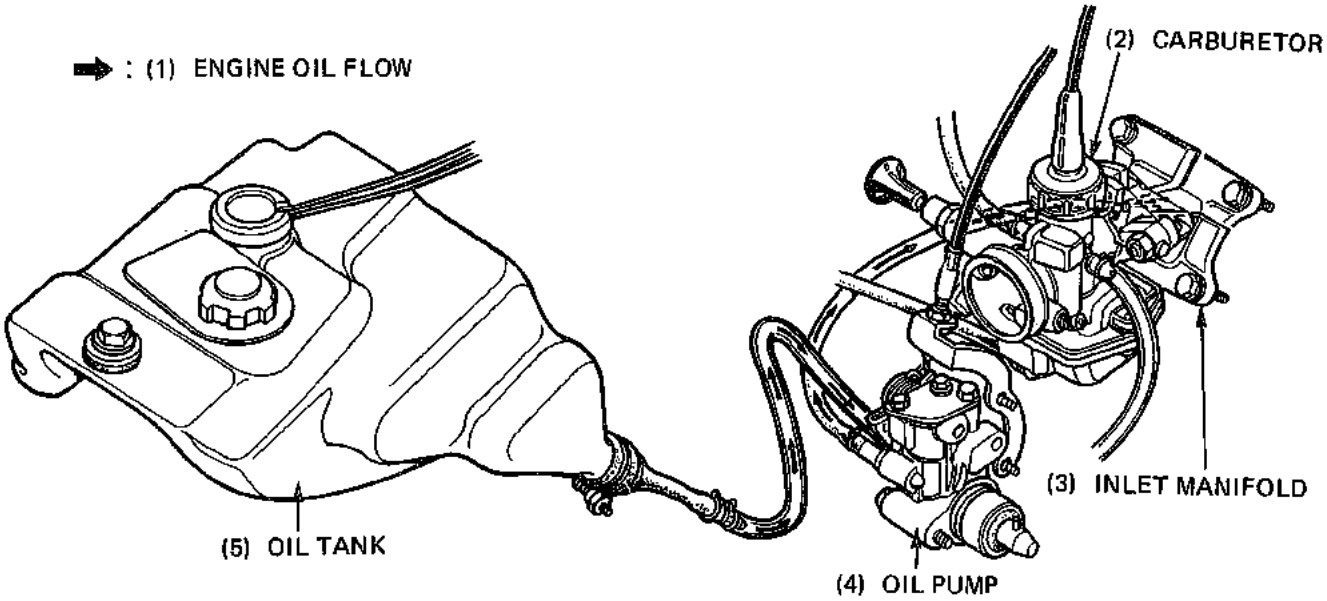
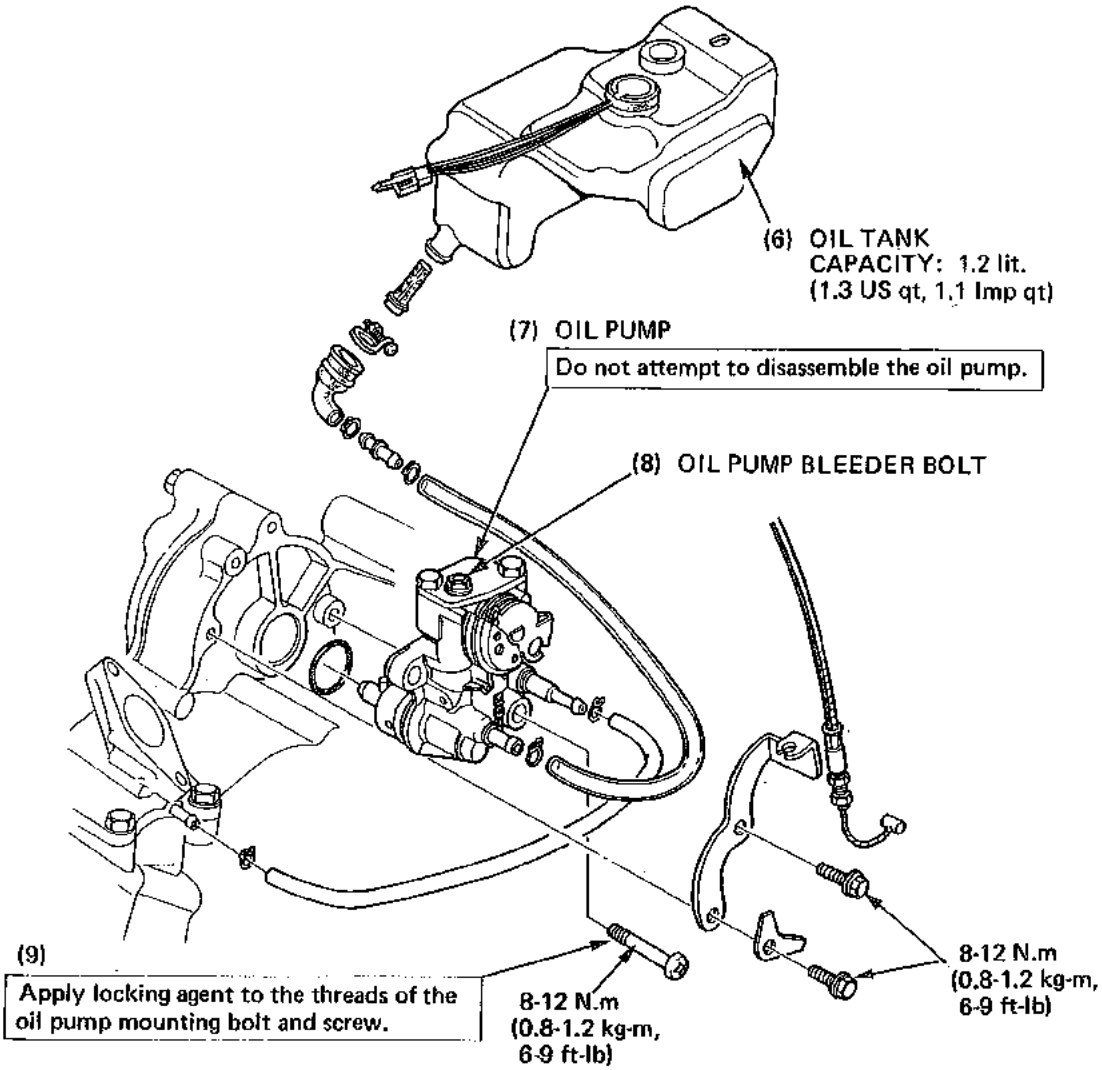
LUBRICATION 2.





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SERVICE INFORMATION

GENERAL INSTRUCTIONS

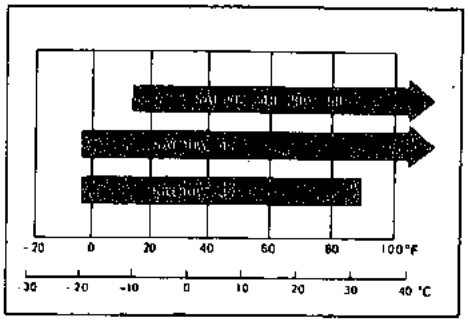
- Use utmost care when remvoing and installing the oil pump to keep dust and dirt from entering the engine.
- Do not attempt to disassemble the oil pump.
- Bleed air from the oil pump if there is air in the oil pipe from the oil tank to the oil pump or if the oil pipe has been disconnected.
- Bleed air from the oil pass tube (from the oil pump to the inlet pipe) if the tube has been disconnected.

SPECIFICATIONS

INJECTOR OIL

Oil capacity	1.2 lit. (1.3 US qt, 1.1 Imp qt)
Oil recommendation	Honda 2 Stroke Injector Oil or its equivalent

TRANSMISSION OIL

Oil capacity	0.9 lit. (1.0 US qt, 0.8 Imp qt) at disassembly 0.8 lit. (0.8 US qt, 0.7 Imp qt) at change
Oil recommendation	Use HONDA 4-STROKE OIL or equivalent. API SERVICE CLASIFICATION: SE or SF VISCOSITY: SAE 10W-40 OIL VISCOSITIES 

TORQUE VALUES

Oil pump mounting bolt	8-12 N.m (0.8-1.2 kg-m, 6-9 ft-lb)
Oil pump mounting screw	8-12 N.m (0.8-1.2 kg-m, 6-9 ft-lb)

TROUBLESHOOTING

Excessive smoke/excessive carbon buildup in plug
1. Pump not properly synchronized (excessive oil)
2. Low quality of engine oil

Overheating
1. Oil pump not synchronized properly (linsufficient oil)
2. Low quality of engine oil

Sized or burnt piston
1. No oil in tank or clogged oil pipe
2. Pumpt not properly synchronized (insufficient oil)
3. Air in oil pipe
4. Defective oil pump

Oil not flowing out from tank
1. Clogged oil tank cap breather hole
2. Clogged oil tank filter screen

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TRANSMISSION OIL

OIL LEVEL CHECK

Before checking the oil level run the engine and allow to idle for a few minutes.
Support the motorcylce upright on level ground.

Stop the engine and remove the oil level check bolt from the right crankcase cover.

A small amount of oil should flow out of the oil level bolt hole.

(1) OIL LEVEL CHECK BOLT

OIL CHANGE

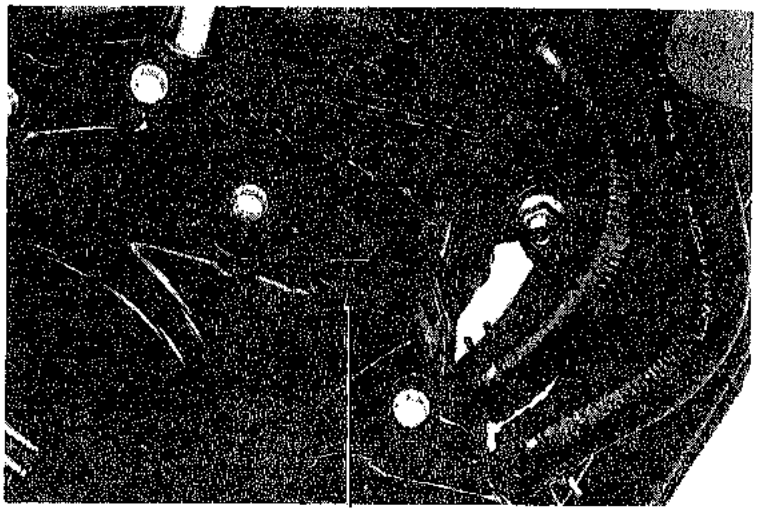
Warm the engine to normal operating temperature.

Remove the oil filler cap.
Remove the oil drain plug and drain the oil.

Reinstall the drain plug.
TORQUE: 20–25 N.m (2.0-2.5 kg-m, 14–18 ft-lb)

CAUTION

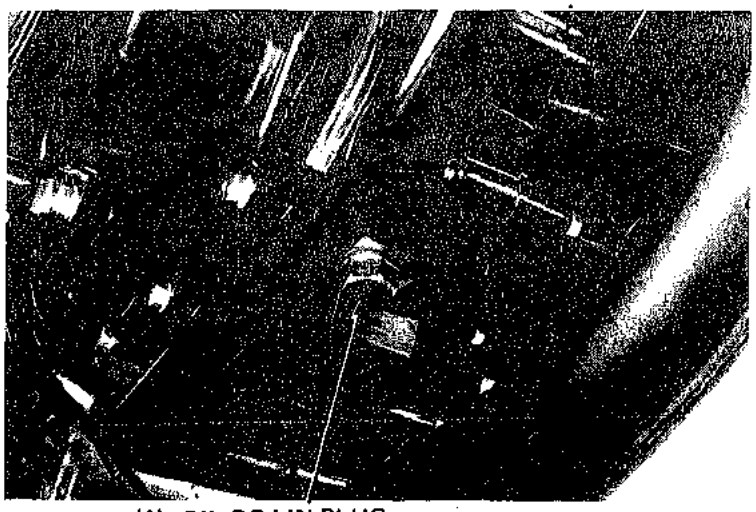
Make sure that the sealing washer on the drain plug is in good condition.



(1) OIL FILLER CAP

Refill the engine up to the proper level.
OIL CAPACITY: 0.8 lit. (0.8 US qt, 0.7 Imp qt)
SPECIFIED OIL: 10W–40 or equivalent

Start the engine and check for leaks. Stop the engine and recheck the oil level.



(1) OIL DRAIN PLUG
20–25 N.m (2.0–2.5 kg-m, 14–18 ft-lb)

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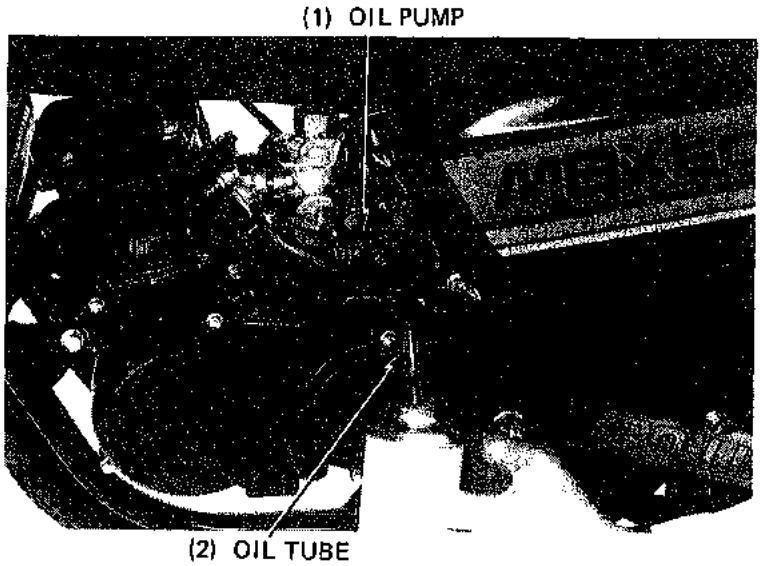
OIL STRAINER CLEANING

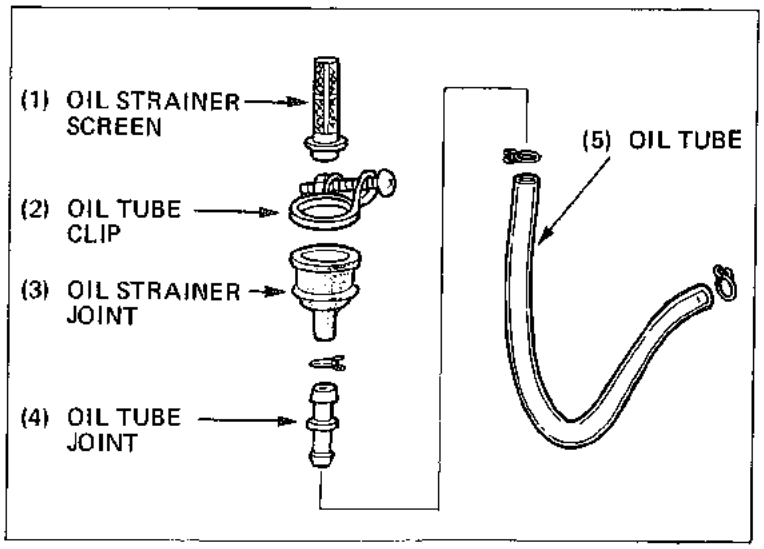
Disconnect the oil tube at the oil pump and allow the oil to drain into a clean container.



Remove the right side cover.

Loosen the tube clip and disconnect the oil tube joint under the oil tank.

Remove the oil strainer screen.



Clean the oil strainer screen with compressed air.

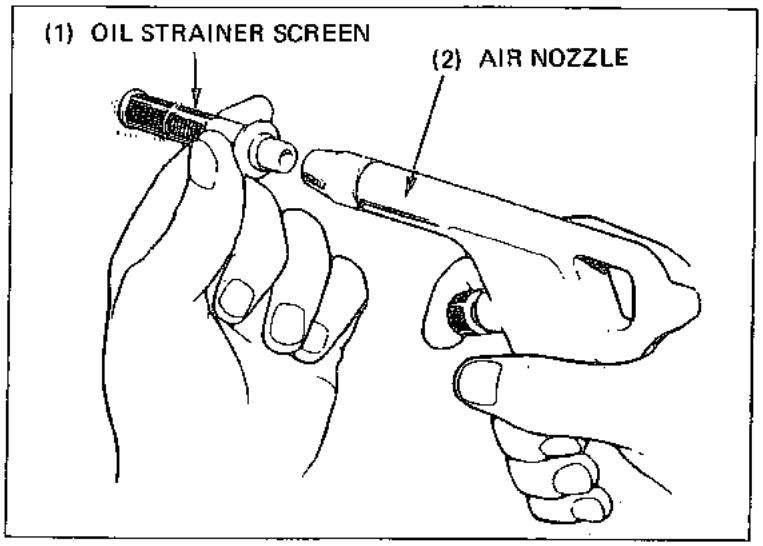
Installation of the oil strainer is the reverse order of removal.

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

Bleed air from the oil pump and oil pipe (Page 2-7)

CAUTION

- *Connect the oil pipe securely.*
- *Check for leaks.*

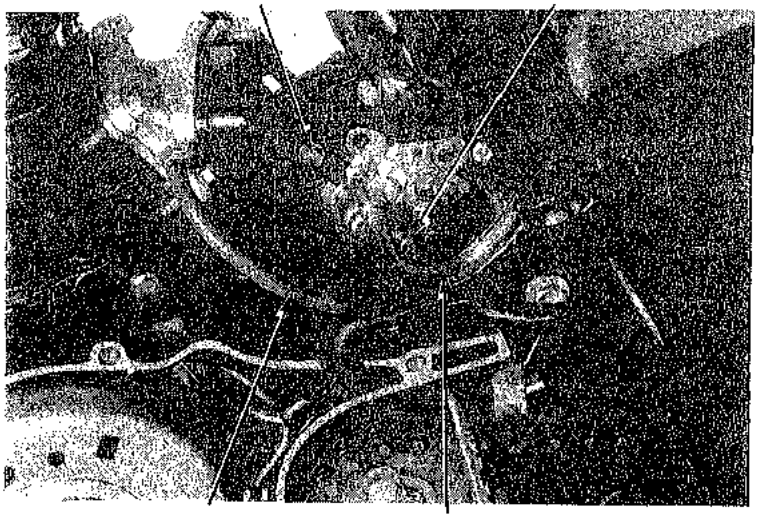


OIL PUMP REMOVAL

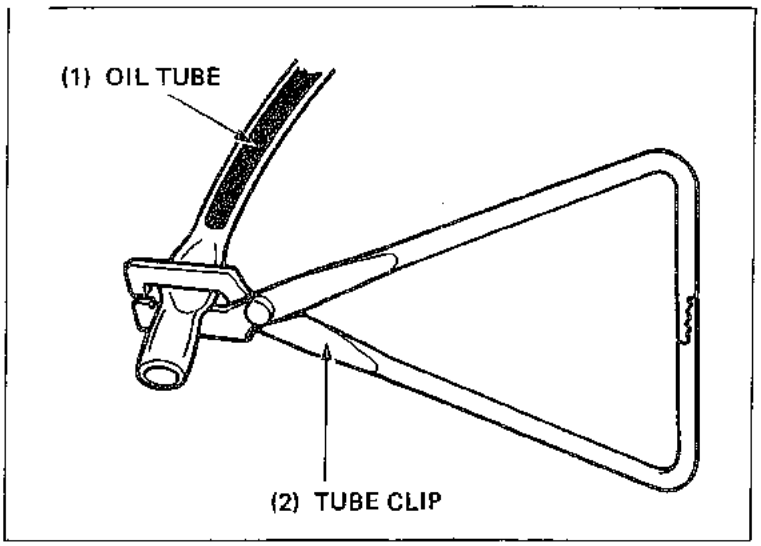
NOTE

> Before removing the oil pump, clean the oil pump and crankcase.

Remove the carburetor (Page 4-3).
Disconnect the oil pump control cable.
Remove the left crankcase cover. (Page 8-3).
Remove the bolt and screw attaching the oil pump.



Disconnect the oil tube from the oil pump, and pinch the end of the oil tube to prevent oil from flowing out.

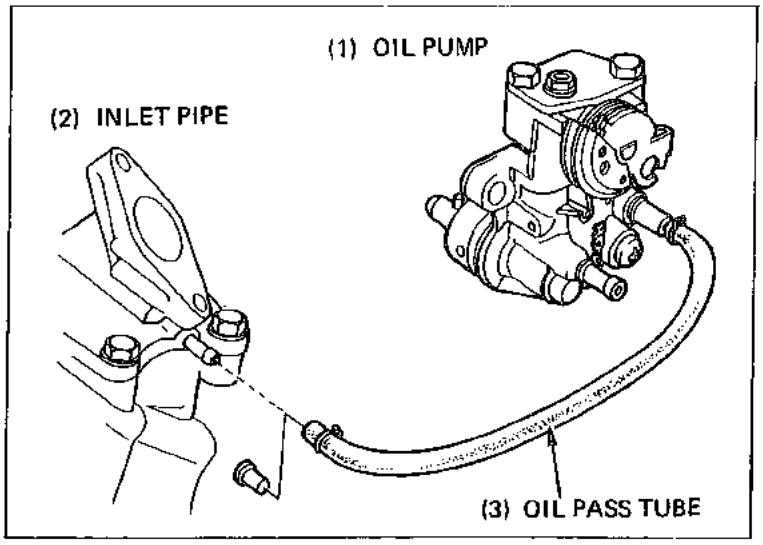


Disconnect the oil pass tube from the inlet pipe.

NOTE

> Use care not to allow oil to flow out of the oil pass tube.

Remove the oil pump from the crankcase.



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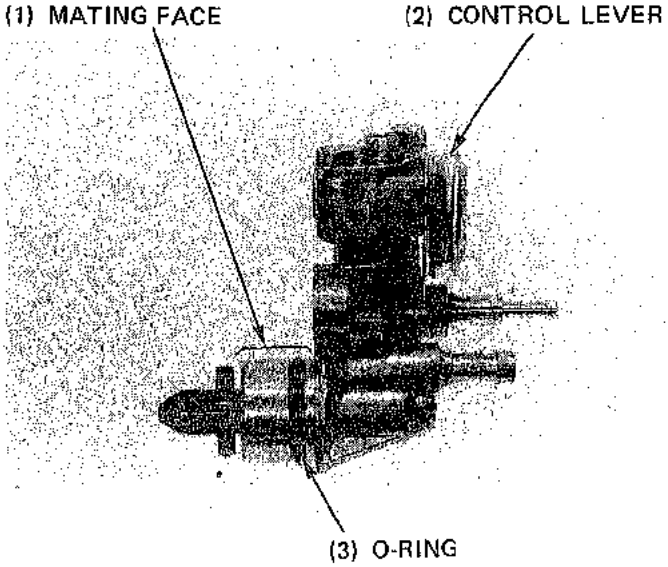
OIL PUMP INSPECTION

Remove the oil pump and inspect the following items:
Damaded or weakened O-rings.
Damage to crankcase mating face.
Damage to pump body.
Improper oil control lever.

CAUTION

Do not disassemble the oil pump.

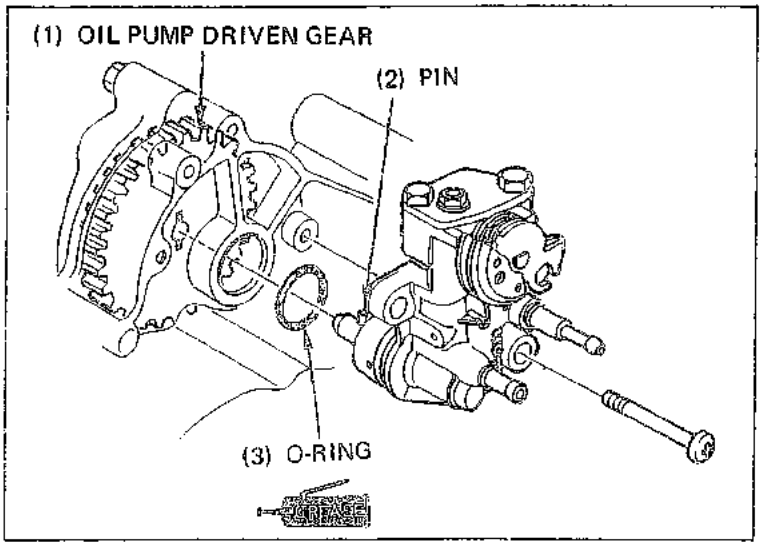


OIL PUMP INSTALLATION

Install the oil pump by aligning the pin on the pump drive shaft with the groove in the pump driven gear.

NOTE

- Lubricate the O-ring with clean grease before installation.
- Make sure that the oil pump is inserted into the crankcase properly.



Secure the oil pump using the oil pump set plate, bolt and screw.

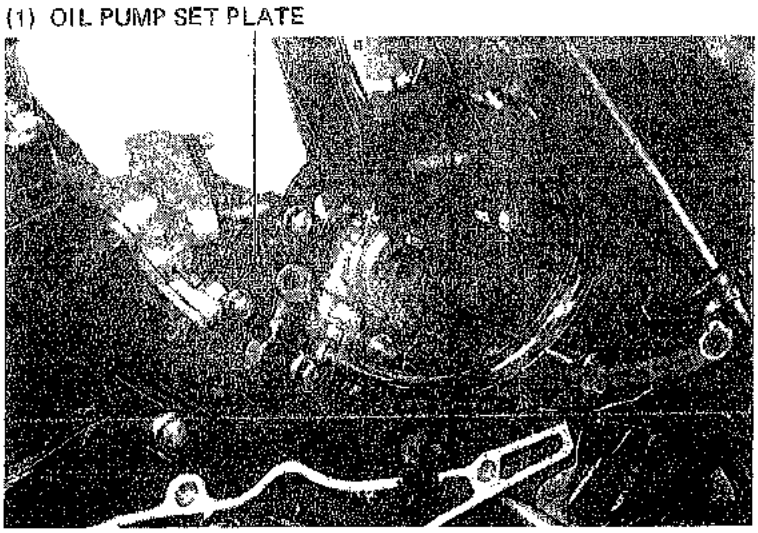
NOTE

Apply locking agent to the bolt and screw threads.

Reconnect the oil pump control cable.
Reinstall the oil tube and oil pass tube.
Install the carburetor. (Page 4-9).

NOTE

Perform the following inspections and adjustments:
- Control cable adjustment (Page 3-5).
- Oil pump air bleeding (Page 2-7).
- Oil pass tube air bleeding (Page 2-7).
- Oil leaks.



OIL PUMP BLEEDING

NOTE

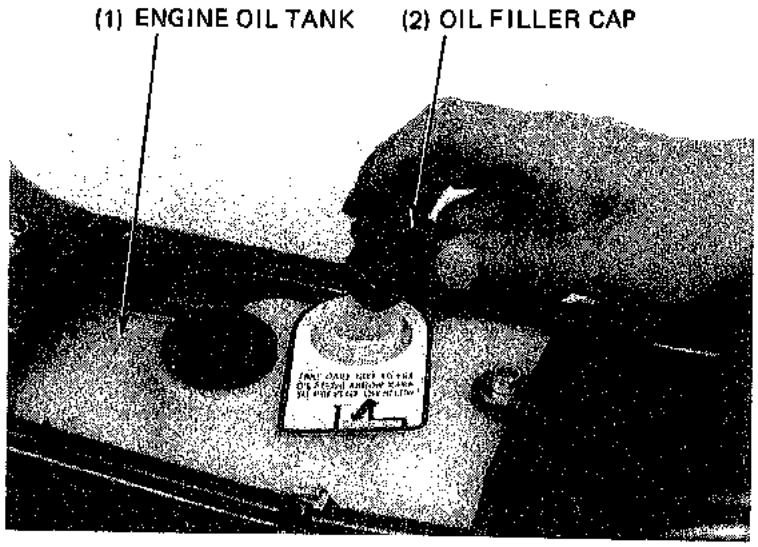
- Bleed air from the oil lines as it will block or restrict oil flow, resulting in severe engine damage.
- Bleed air from the oil tube and oil pump first, then bleed air from the oil pass tube.

OIL TUBE/OIL PUMP

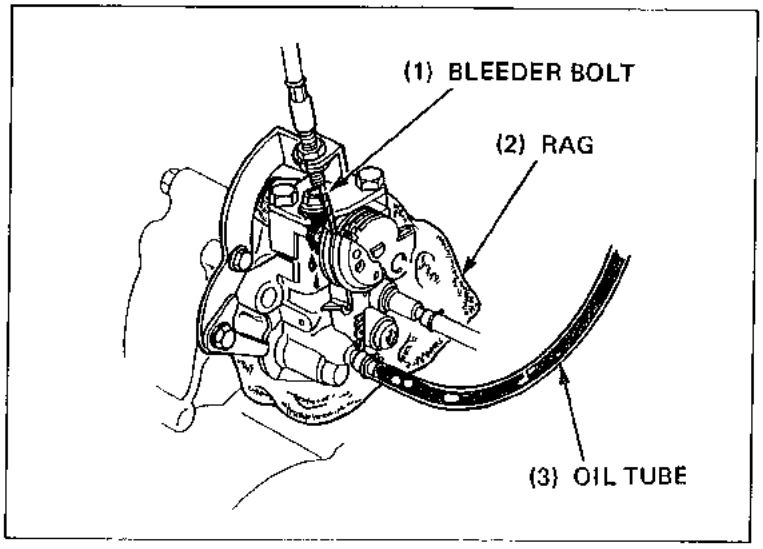
NOTE

Bleed air from the oil tube and oil pump when the oil tube has been disconnected or there is air in the oil tube.

Stop the engine.
Fill the oil tank with engine oil.
Place a rag around the oil pump as shown.



Unscrew the bleeder bolt at the top of the oil pump. Tighten the bleeder bolt when the oil is free of air bubbles.



OIL PASS TUBE

NOTE

Bleed air from the oil pass tube when the tube is disconnected or there is air in the oil tube and oil pump.

Made sure that there is fuel in the fuel tank (25–50 parts fuel to 1 part lubricant).

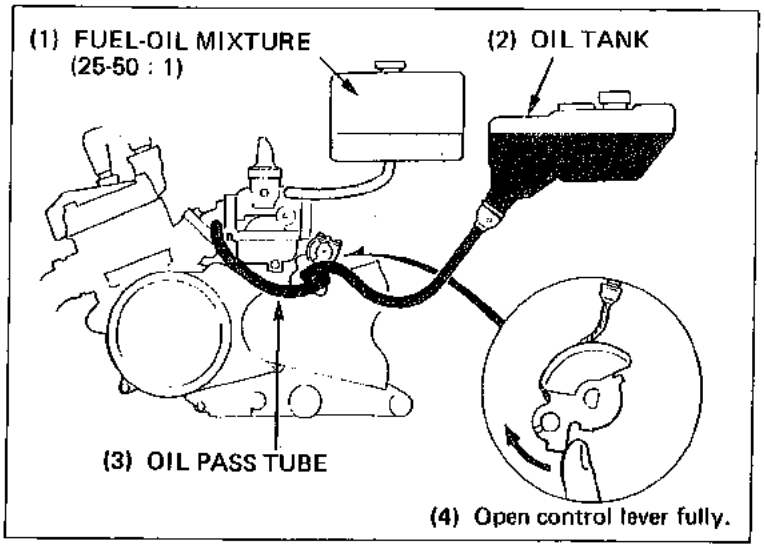
Start the engine and run it for about 10 minutes with the oil pump control lever in the fully open position so as to force air out of the oil pass tube with the oil.

WARNING

Perform this operation in a well ventilated area.

CAUTION

- *Use the recommended engine oil.*
- *Do not race the engine.*



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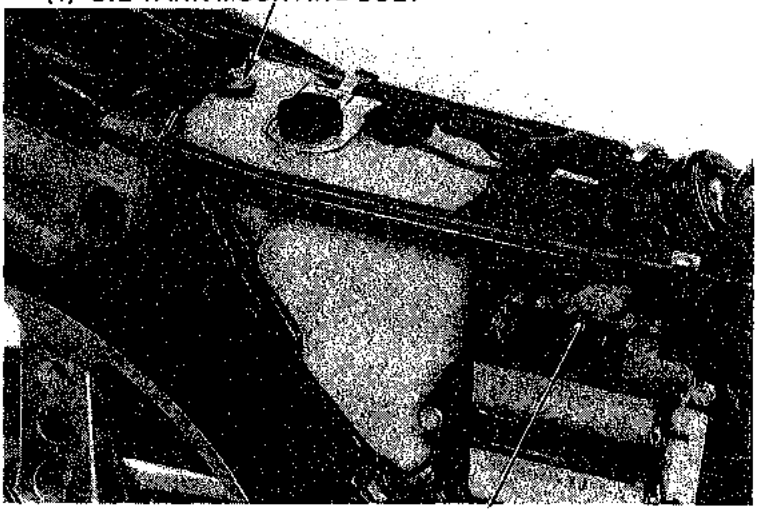
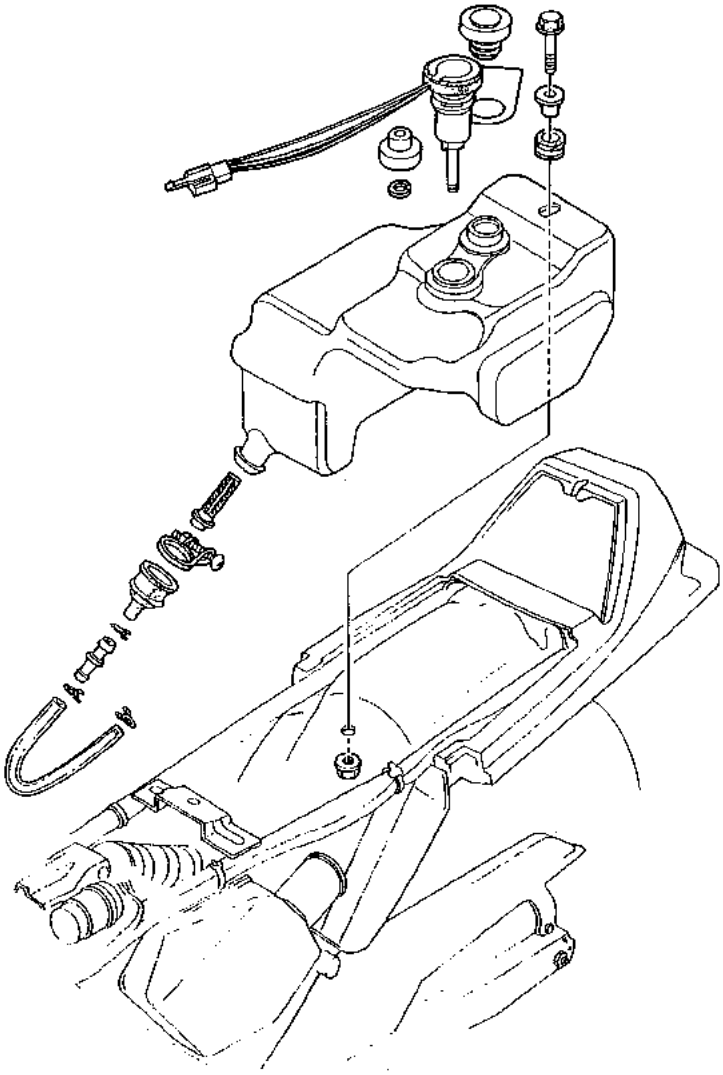
OIL TANK

REMOVAL/INSTALLATION

Remove the seat, right and left side covers.
Remove the fuel tank and air cleaner case (Page 4-10).
Remove the rear suspension linkage mudguard (Page 13-13).
Disconnecto the oil tube at the oil pump and drain the oil.
Disconnect the oil level warning unit coupler.
Remove the oil tank attaching bolt and tank.
Install the oil tank in the reverse order of removal.





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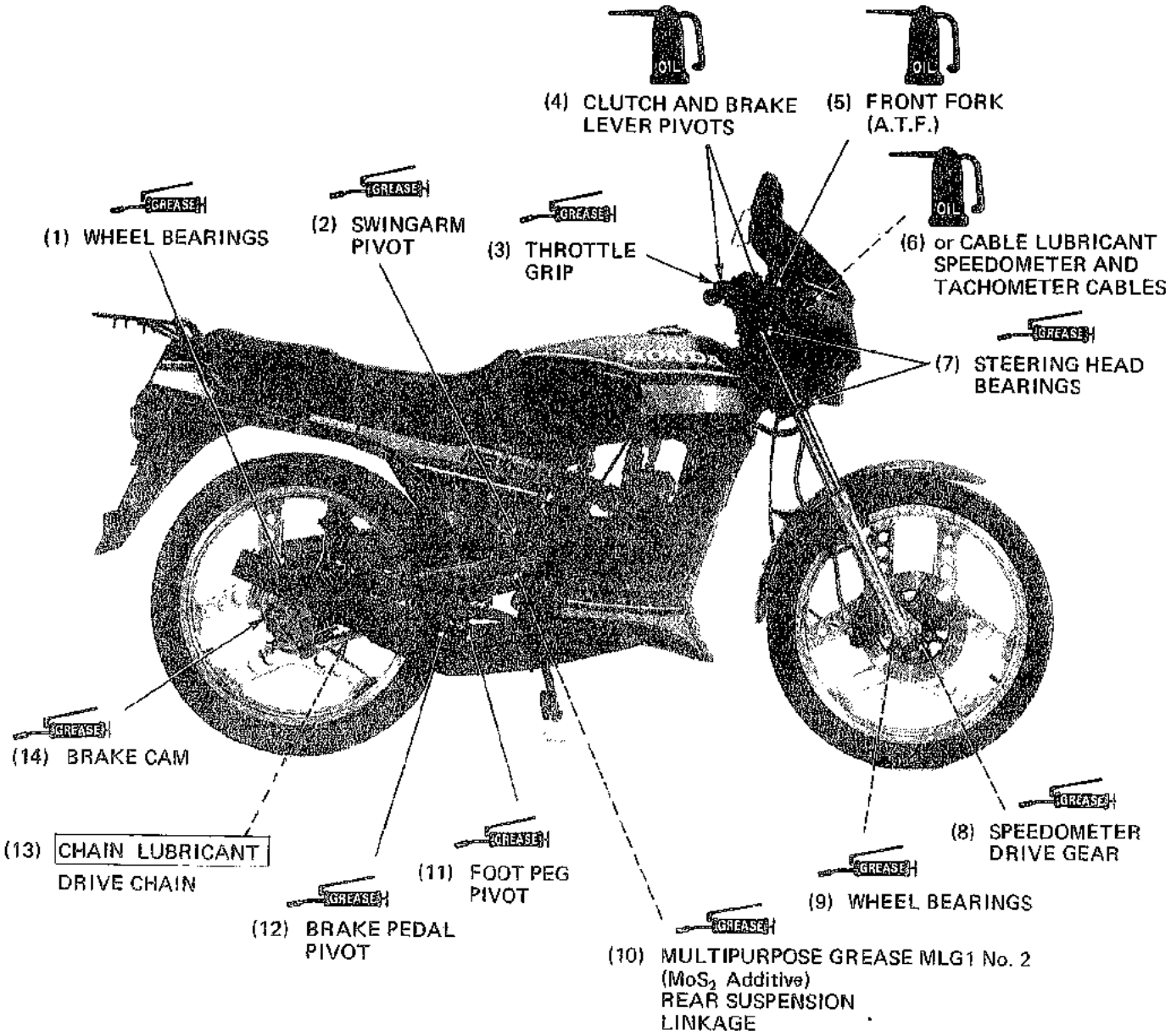
CHASSIS LUBRICATION POINTS



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INSPECTION AND ADJUSTMENT 3.

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SERVICE INFORMATION

GENERAL INSTRUCTIONS

- Transmission oil See page 2-3.
- Oil pump See page 2-4.
- Cylinder head and piston decarbonizing See page 6-4.
- Cylinder exhaust port decarbonizing See page 6-6.

SPECIFICARIONS

	MBX50	MBX80 E.F	MBX80 G
< Engine >			
Spark plug: Standard	NGK BR8ES, ND W24ESR-U	←	NGK BR9ES, ND W27ESR-U
Optional	NGK BR9ES, ND W27ESR-U	←	NGK BR7ES, ND W22ESR-U
	NGK BR7ES, ND W22ESR-U	←	NGK BR8ES, ND W24ESR-U
	Plug gap		
Ignition timing	0.7–0.8 mm (0.028–0.031 in)	←	
"F" mark	19° ± 3° BTDC at 3,000 min^{-1} (rpm)	←	
Retard start	4,400–5,600 min^{-1} (rpm)	←	
Full ratard	10.5° ± 3.5° BTDC at 9,000 min^{-1} (rpm)	3° ± 3.5°BTDC at 9,000 min^{-1} (rpm)	
Idle speed	1,400 min^{-1} (rpm)	←	
Air screw opening	1-½ turns out (SW, B, SA), 1¼ turns out (E)	1 turn out	
Cylinder compresssion	130 kPa (13.0 kg/cm^2, 185 psi)	←	
Throttle grip free play	2–6 mm (1/8–1/4 in)	←	
Coolant capacity	Approximately 670 cm^3 (1.4 US pt, (1.2 Imp pt.)	←	
< CHASSIS >			
Rear brake pedal free play	20–30 mm (3/4–1-1/4 in)	←	
Clutch lever free paly	10–20 mm (3/8–3/4 in)	←	
Drive chain slack	10–20 mm (3/8–3/4 in)	←	
Tire			
Tire size Front	2.50-18-4PR	2.75-18-4PR	
Rear	2.75-18-6PR	3.00-18-6PR	
Cold tire pressure Front	175 kPa (1.75 kg/cm^2, 25 psi)	200 kPa (2.0 kg/cm^2, 28 psi)	
Rear	175 kPa (1.75 kg/cm^2, 25 psi)	200 kPa (2.0 kg/cm^2, 28 psi)	
Minimum tread depth Front	0.8 mm (1/32 in)	←	
Rear	0.8 mm (1/32 in)	←	

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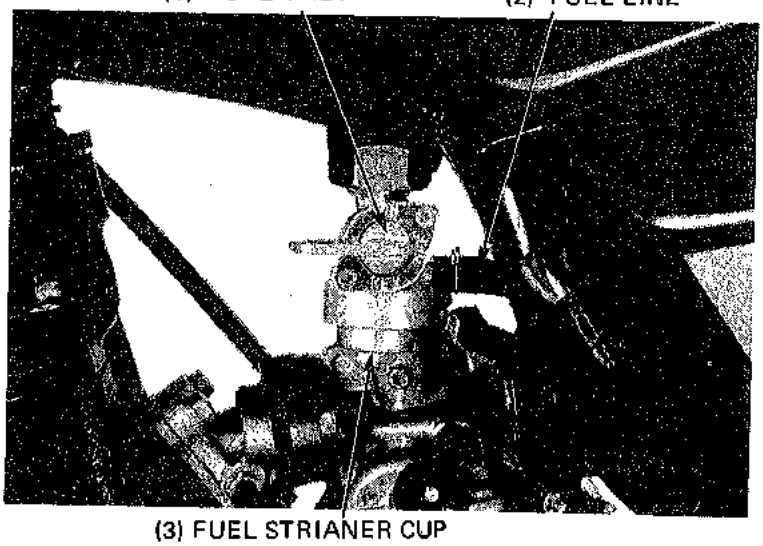
FUEL LINE AND FUEL STRAINER

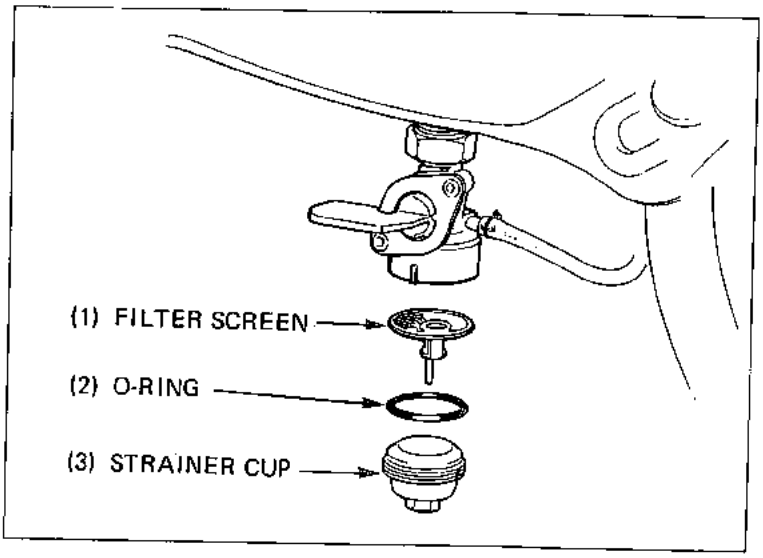
Turn the fuel valve OFF and remove the strainer cup, O-ring and filter screen from the fuel valve body.



Wash the strainer cup and filter screen in high flash point solvent.
Install the filter screen and O-ring and tighten the strainer cup.
TORQUE: 3–5 N.m (0.3–0.5 kg-m, 2.2–3.6 ft-lb)

Do not overtighten the strainer cup.

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



THROTTLE OPERATION

Check for smooth throttle grip full opening and automatic full closing in all steering positions. Check the throttle cables and replace if deteriorated, kinked or damaged.

Lubricate the throttle cable (Page 2-9) if throttle operation is not smooth.

Measure throttle grip free play at the throttle grip flange.
FREEPLAY: 2–6 mm (1/8–1/4 in)

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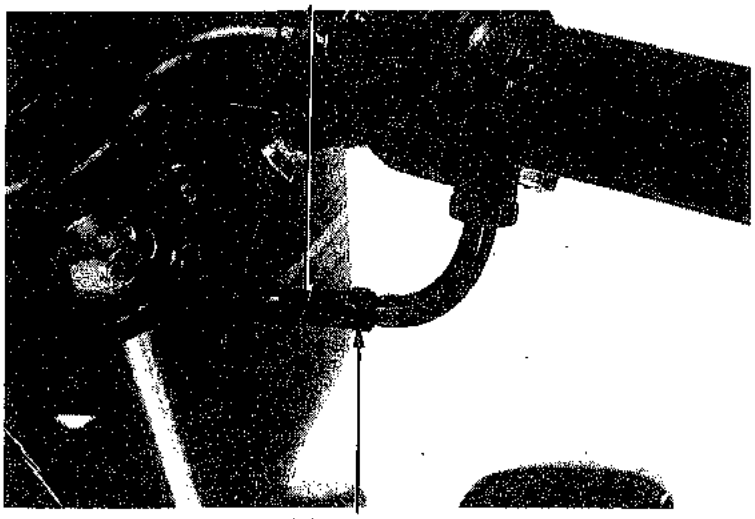
Adjust by loosening the lock nut and turning the adjuster.
Tighten the lock nut.
Recheck throttle operation.

(1) ADJUSTER

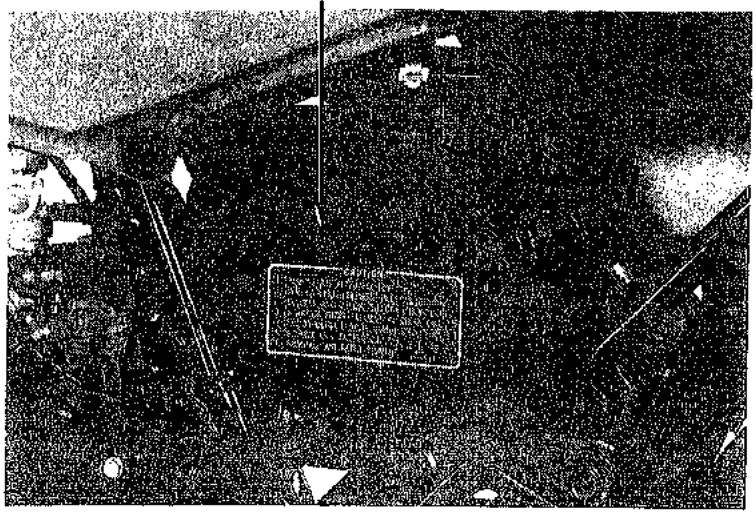


(2) LOCK NUT

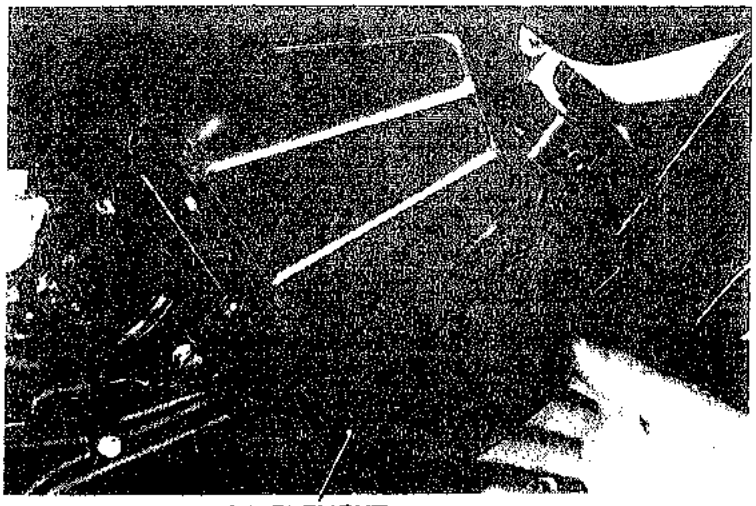
AIR CLEANER

Remove the left side cover.
Remove the three screws attaching the air cleaner cover and cover.

(1) AIR CLEANER COVER



Remove the element.



(1) ELEMENT

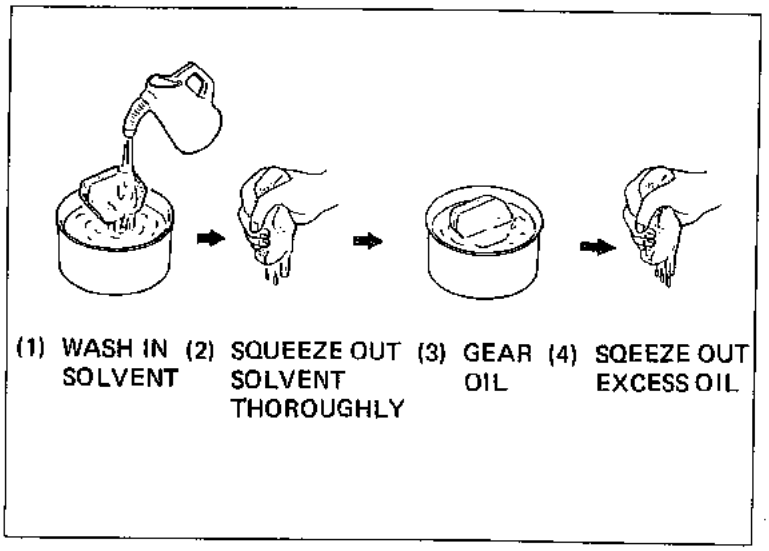
Wash the element in non-flammable or high flash point solvent and allow to dry.

NOTE

Do not wash the element in gasoline or vegetable oil.

Soak the element in clean engine oil or gear oil (SAE 80–90) and squeeze out any excess.

Install the element air cleaner cover.
Install the left side cover.



SPARK PLUG

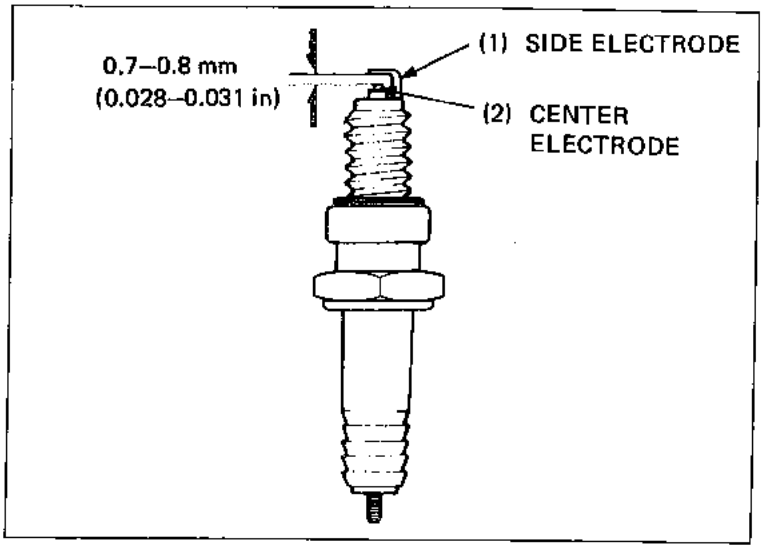
RECOMMENDED SPARK PLUG

		MBX50	MBX80	
			E,F	G
Standard	ND	W24 ESR-U	←	W27 ESR-U
	NGK	BR8 ES	←	BR9 ES
Optional	ND	W22 ESR-U	←	W22 ESR-U
	NGK	BR7 ES	←	BR7 ES
	ND	W27 ESR-U	←	W24 ESR-U
	NGK	BR9 ES	←	BR8 ES

Disconnect the spark plug cap.
Clean any dirt from around the spark plug base.
Remove and discard the spark plug.
Measure the new spark plug gap using a wire-type feeler gauge.

SPARK PLUG GAP: 0.7–0.8 mm (0.028–0.031 in)

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



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CARBURETOR IDLE SPEED

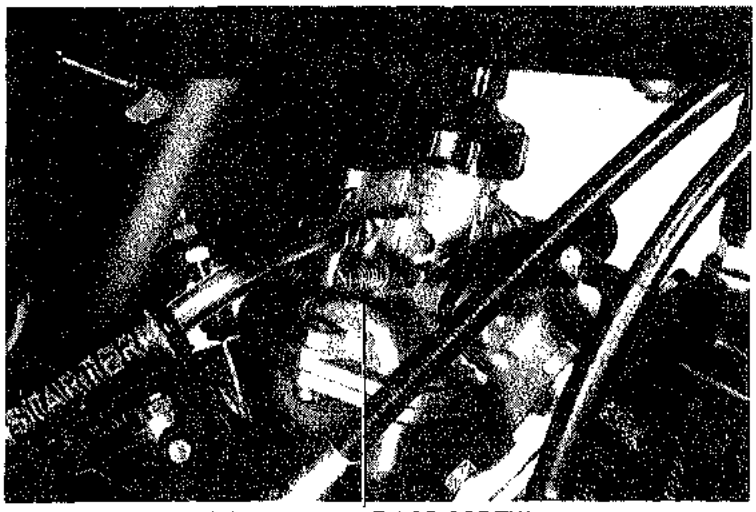
NOTE

> The engine must be warm for accurate idle adjustment.

Attach an engine tachometer.
Turn the throttle stop screw to obtain the specified idle speed.

IDLE SPEED: 1,400 min^{-1} (rpm)

When the engine misses or runs erratically, proceed as follows:

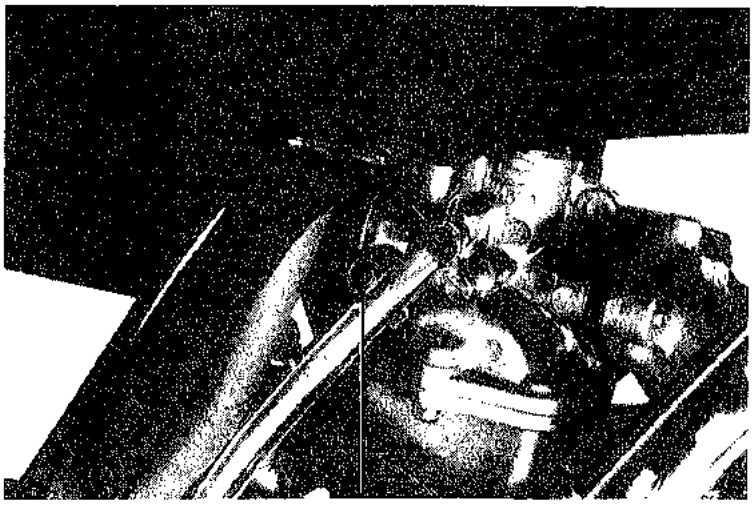


(1) THROTTLE SOP SCREW

Screw in the air screw until it lightly seats, then turn it out specified turns.

MBX50: 1½ turns (E type: 1¼ turns)
MBX80: 1 turn

Reset idle speed with the throttle stop screw.
Turn the air screw to find the highest idle speed.
Reset idle speed with the throttle stop screw.
Make sure that the engine does not miss or run erratically. If necessary, repeat the above steps.



(1) AIR SCREW

OIL PUMP CONTROL CABLE

NOTE

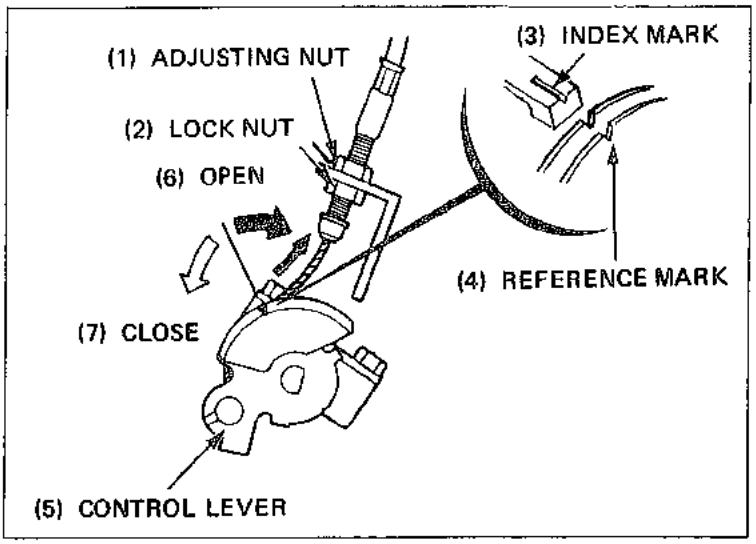
> The oil pump control cable should be adjusted after the throttle grip free play has been adjusted.

Loosen the lock nut. With the throttle fully open, align the index mark on the pump body with the reference mark on the control lever by turning the adjusting nut.
Tighten the lock nut.

CAUTION

> *The idex mark on the control lever must be in line with the reference mark on the pump body. Failure to do so reduces the pump delivery, resulting in serious engine damage. When adjusting the index mark, it may be within 1 mm (0.04 in) out of line with the reference mark toward the OPEN region.*

Excessive white smoke or hard starting:
Pump control lever excessively open
Burnt piston: Pump control lever not opened properly



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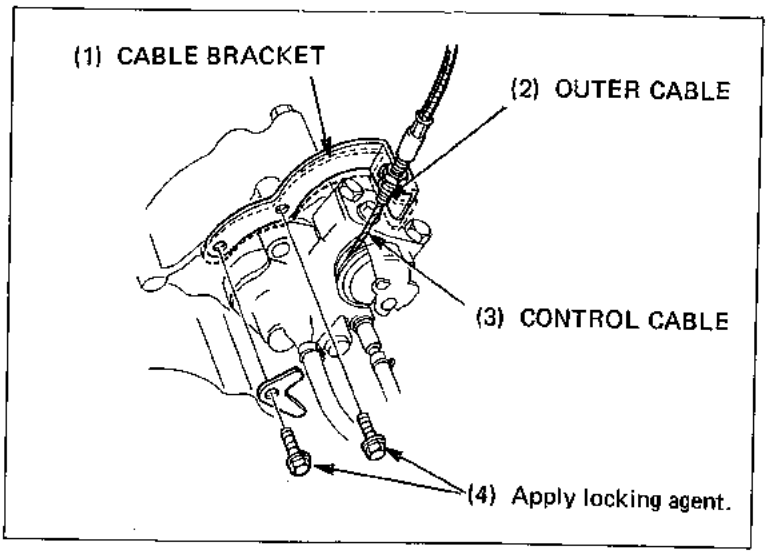
After adjustment, make sure that there is no interference between the control cable and the outer cable. Loosen the bolts attaching the cable bracket and adjust it if necessary.

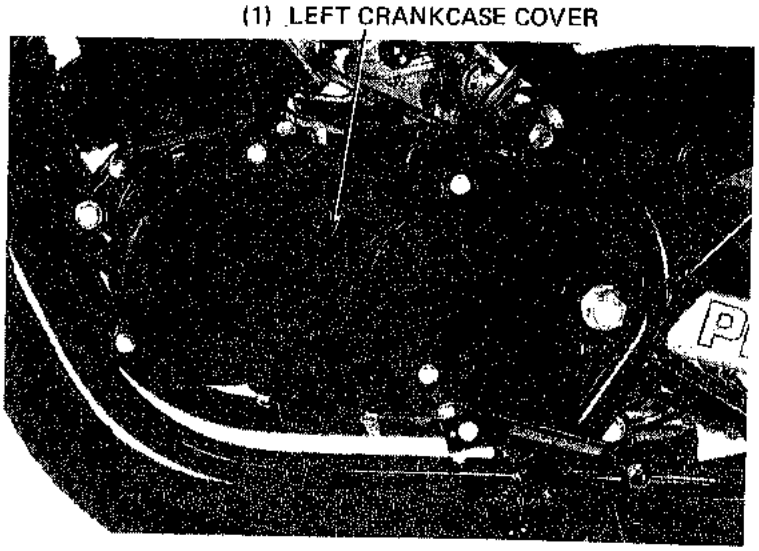


IGNITION TIMING

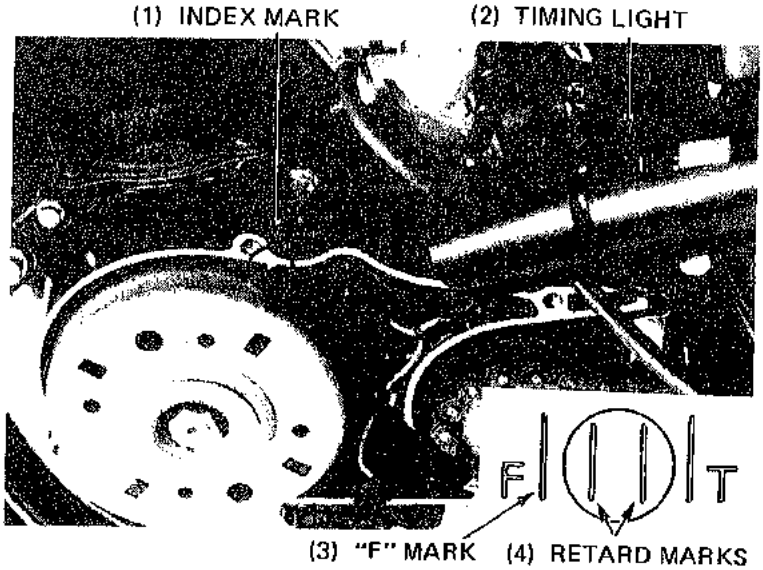
NOTE

> The CDI ignition timing is not adjustable. If the ignition timing is incorrect, check the CDI unit and alternator and replace any faulty parts.

On the Deluxe model, remove the under cowl (Page 14-3)
Remove the left crankcase cover.



Connect a stroboscopic timing light to the high tension wire.
Start the engine and bring engine speed to 3,000 min^{-1} (rpm).
Aim the time light at the timing mark.
The "F" mark should align with the index mark.
Bring engine speed to 9,000 min^{-1} (rpm) and check that the index mark is between the full retard marks.



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CYLINDER COMPRESSION

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

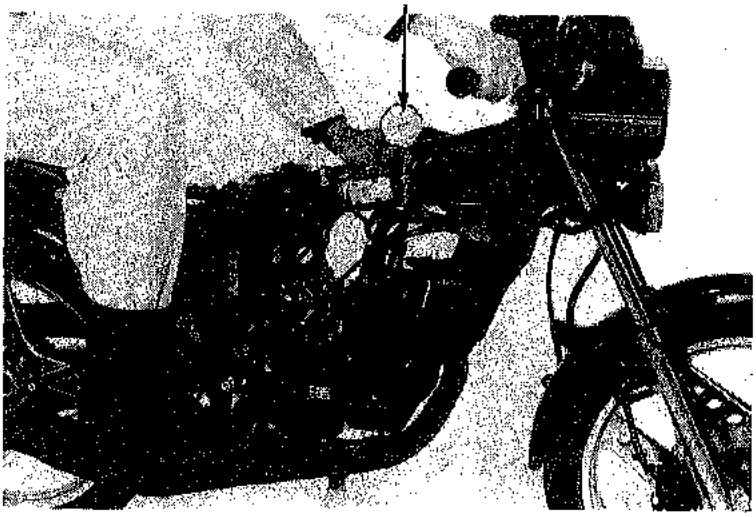
Open the choke and throttle grip fully and operate the starter pedal several times.

COMPRESSION: 130 kPa (13.0 kg/cm^2 185 psi)

Low compression can be caused by:
- Blown cylinder head gasket
- Worn piston rings
- Worn cylinder

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

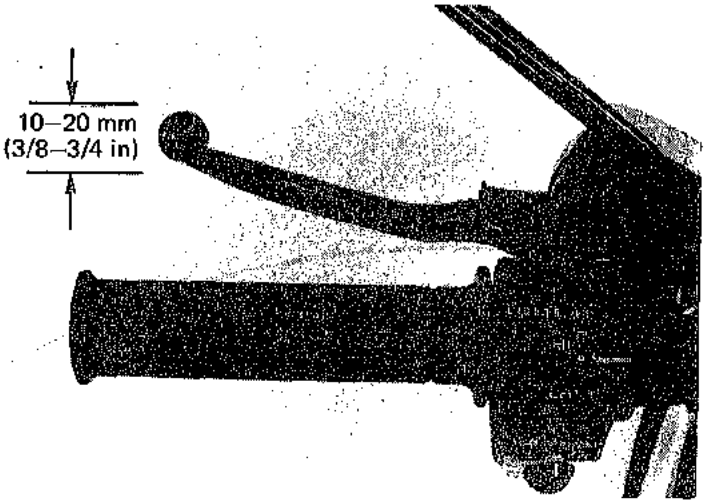
(1) COMPRESSION GAUGE



CLUTCH

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

FREE PLAY: 10–20 mm (3/8–3/4 in)



Adjust free play by loosening the lock nut and turning the adjusting nut until the free play is 10–20 mm (3/8–3/4 in).

(1) ADJUSTING NUT (2) LOCK NUT (3) CLUTCH CABLE

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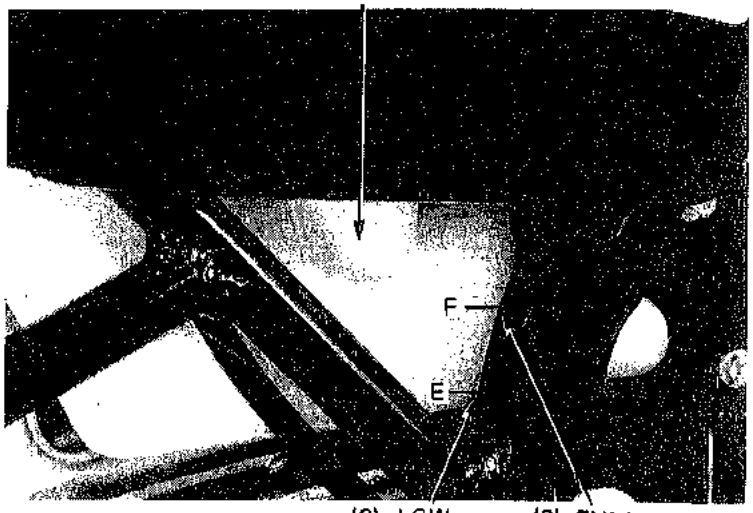
RADIATOR COOLANT

Check the coolant level of the reserve tank with the engine running at normal operating temperature.
The level should be between the "F" (FULL) and "L" (LOW) level lines.
If necessary, remove the radiator cap and fill to the "F" level line.

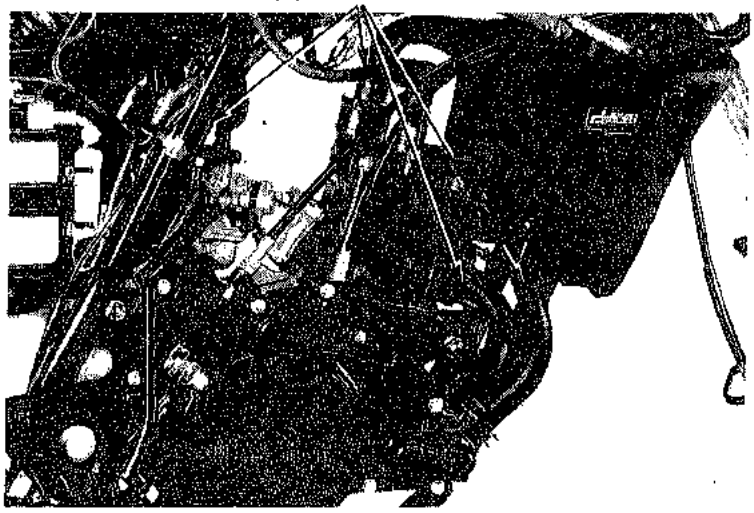
WARNING

Engine must be cool before removing the radiator cap, or severe scalding may result.



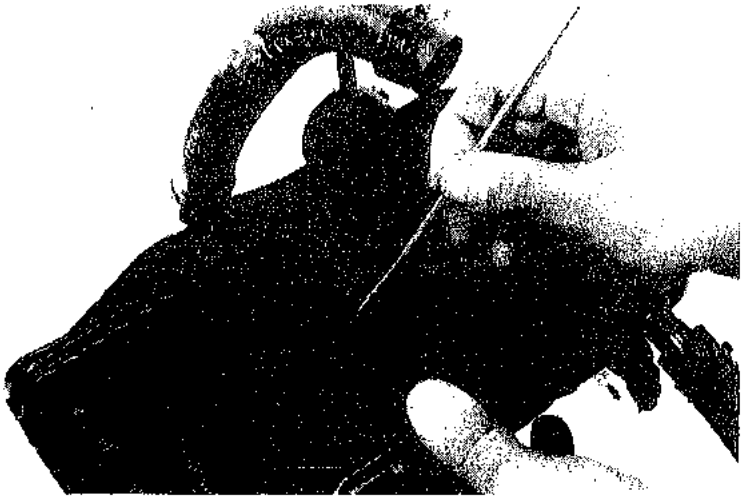
COOLING SYSTEM HOSES

Inspect the hoses for cracks or deterioration, and replace if necessary.
Check the hose clamps, and tighten if necessary.



RADIATOR CORE

Check the air passages for clogging or damage.
Straighten bent fins.
Remove insects, mud or any obstruction with compressed air or low water pressure.
Replace the radiator if the air flow is restricted over more than 20% of the radiating surface.



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<CHASSIS>

BATTERY

Remove the right side cover.
Inspect the battery fluid level.
When the fluid level nears the lower level, remove the battery and refill with distilled water to the upper level.

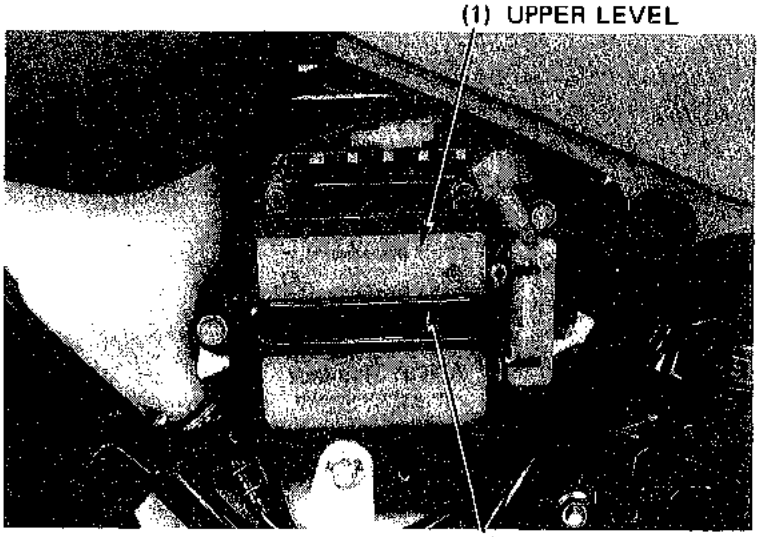
NOTE

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

WARNING

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

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



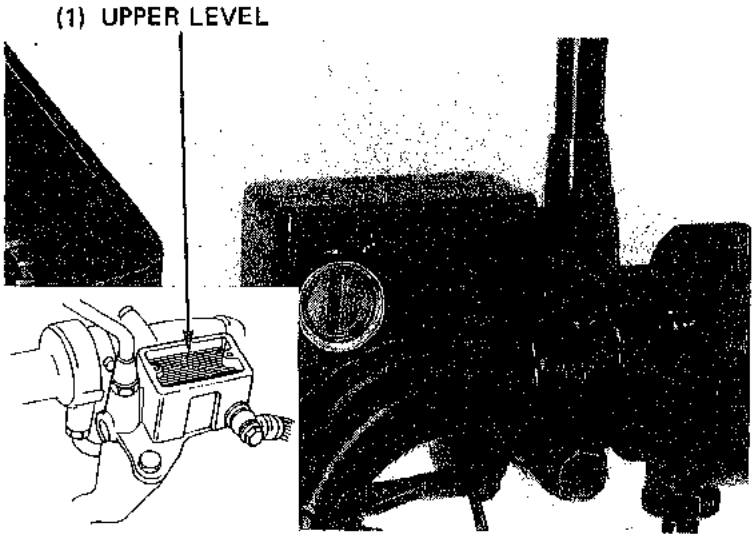
FRONT BRAKE

FLUID LEVEL

Check front brak fluid reservoir level.
If the level nears the lower level mark, fill the reservoir with SAE J1703 or DOT–3 BRAKE FLUID to the upper level mark.
Check the entire system for leaks, if the level is low.

CATUION

> - *Do not remove the cover until the handleber has been turned so that the reservoir is level.*
> - *Avoid operating the brake lever with the cap removed. Brake fluid will squirt out if the lever is pulled.*

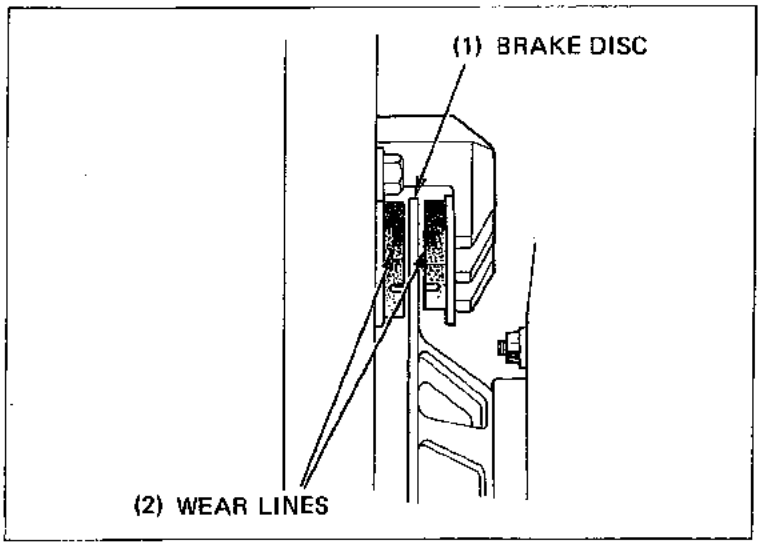


PAD WEAR

Check the brake pads for wear.
Replace the brake pads if the wear line on the top of the pads reaches the edge of the brake disc (Refer to Section 12).

CATUION

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



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REAR BRAKE

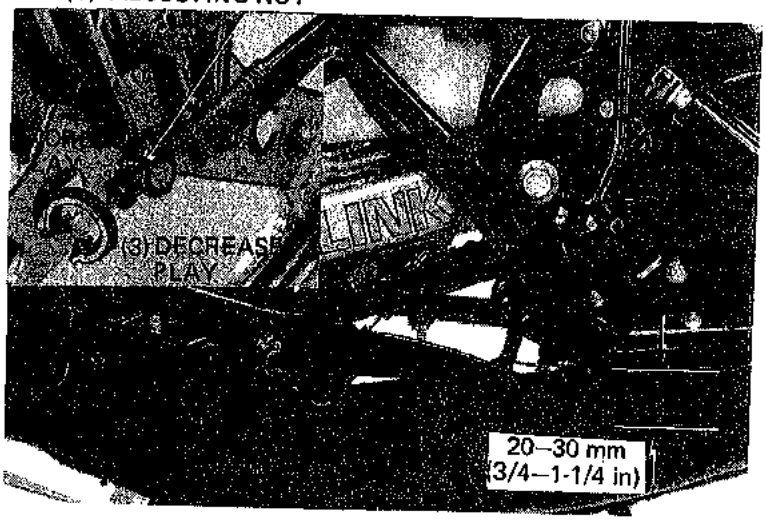
REAR BRAKE PEDAL PLAY

Measure the brake pedal free play.

FREE PLAY: 20–30 mm (3/4–1-1/4 in)

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

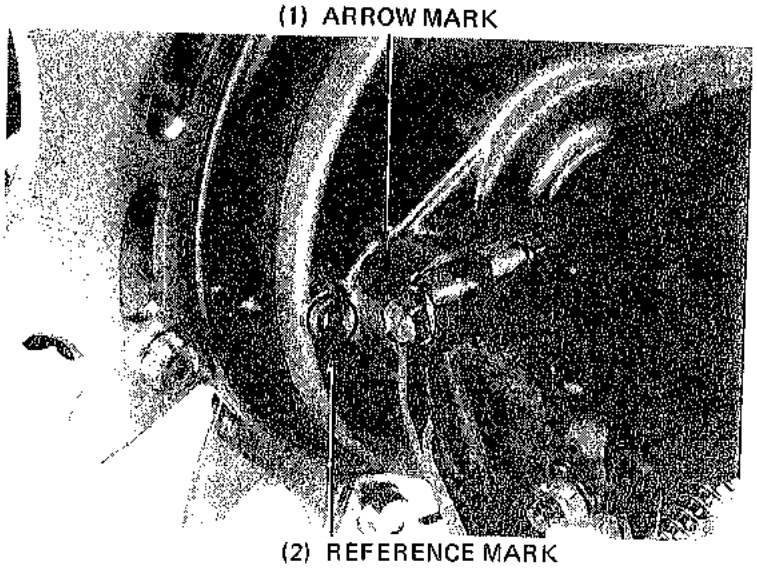
(1) ADJUSTING NUT



BRAKE SHOE INSPECTION

Replace the brake shoes if the arrow on the brake arm aligns with the reference mark "△" on full application of the rear brake (Page 13-6).

(1) ARROW MARK



(2) REFERENCE MARK

BRAKE LIGHT SWITCH

Adjust the brake light switch so that the brake light will light when the brake pedal is depressed and the brake begins engagement.

NOTE

- Do not turn the switch body.
- The fron brake light switch does not require adjustment.

Adjust by turning the switch adjusting nut as shown.

(1) ADJUSTING NUT

(2) REAR BRAKE LIGHT SWITCH

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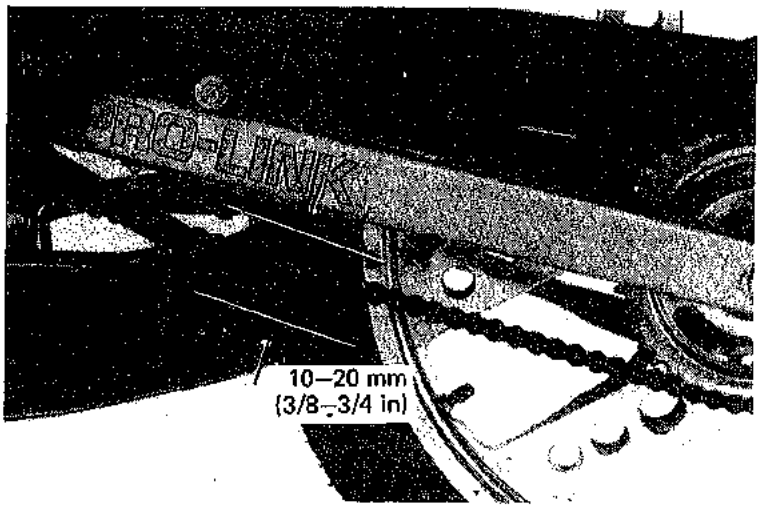
DRIVE CHAIN

INSPECTION

Shift the transmission into neutral.

Measure the drive chain slack between the sprockets.

CHAIN SLACK: 10–20 mm (3/8–3/4 in)



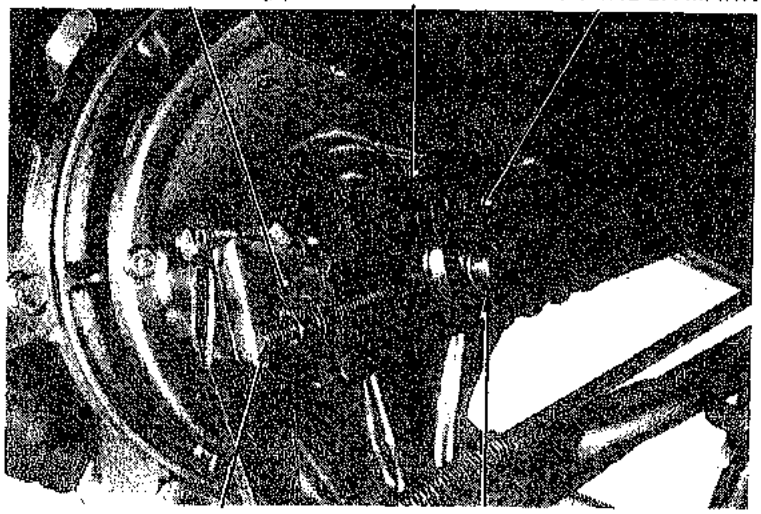
ADJUSTMENT

To adjust the drive chain tension, loosen the rear axle nut.
Tighten both adjusting nuts.

WARNING

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

(1) ADJUSTING NUT (2) GRADUATED SCALE (3) INDEX MARK



(4) CHAIN ADJUSTER (5) AXLE NUT

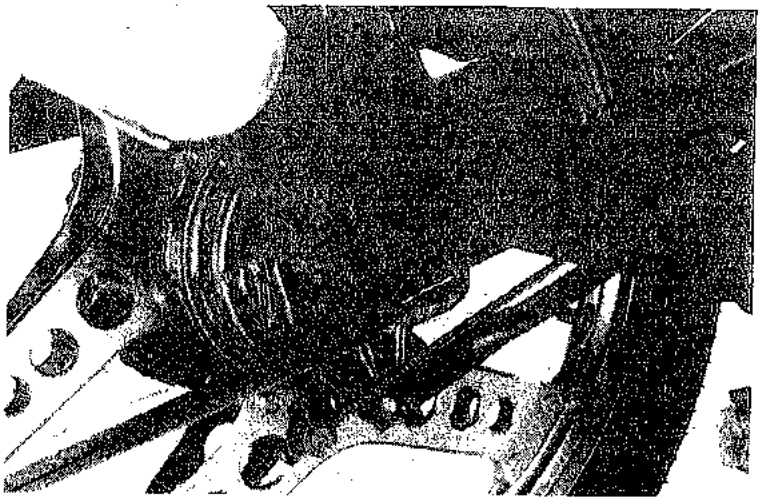
Tighten the rear axle nut.

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

Retighten both adjusting nuts.

WARNING

Check the rear brake pedal after the drive chain tension has been adjusted.



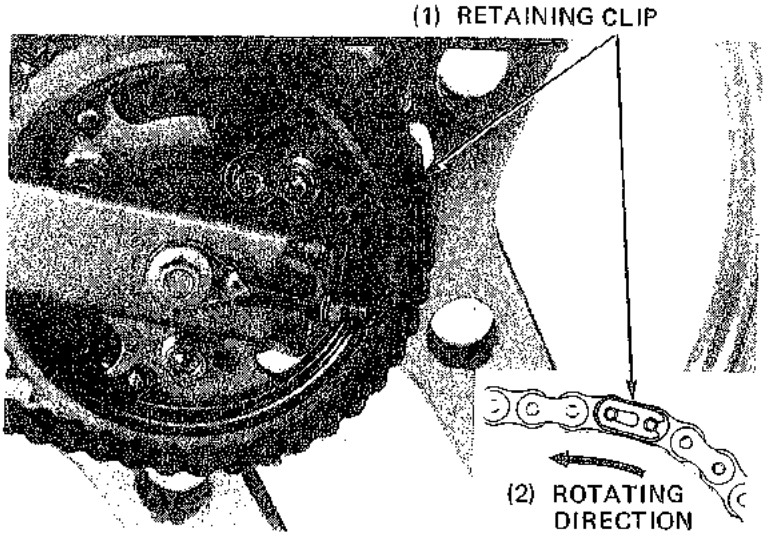
CLEANING/LUBRICATION

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

Remove the master link retaining clip with pliers.

NOTE

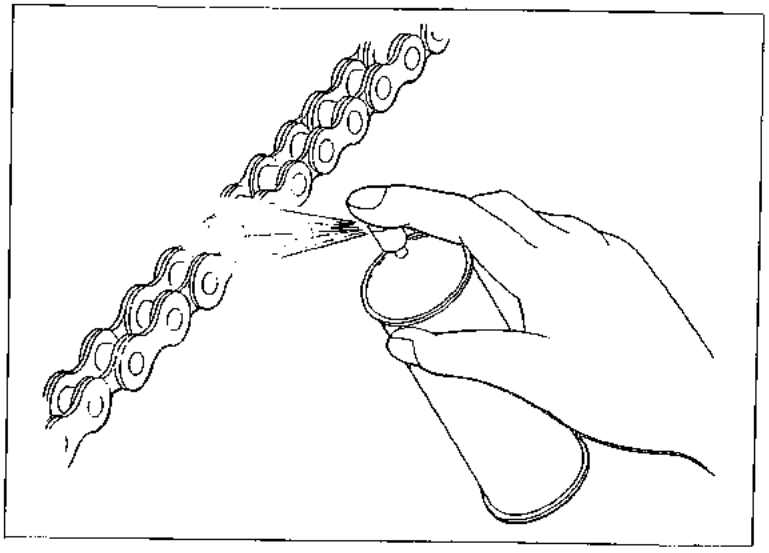
Do not bend or twist the clip.



Remove the master link and drive chain.
Clean the drive chain with non-flammable or high flash point solvent and brush and allow to dry.
Inspect the drive chain for possible wear or damge.
Replace any chain that is damaged or excessively worn.
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.



NOTE

Commercial aerosol type drive chain lubricants are recommended.

Lubricate the drive chain, saturating each chain link joint.
Install the drive chain and master link.
Install the master link retaining clip so that the closed end faces the direction of forward wheel rotation.
Master links are reusable if they remain in excellent condition, but it is recommended that a new master link be installed whenever the drive chain is reassembled.
Adjust the drive chain, and check rear brake adjustment.

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WHEELS

NOTE

> Tire pressure should be checked when tires are COLD.

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

RECOMMENDED TIRE PRESSURE AND TIRE SIZE:

		Tire size	Cold tire pressure kPa(kg/cm²,psi)	
			Up to 90kg (198lb)	Up to capacity load
MBX50	Front	2.50-18-4PR	175(1.75,25)	175(1.75,25)
	Rear	2.75-18-6PR	175(1.75,25)	280(2.8,40)
MBX80	Front	2.75-18-4PR	200(2.0,28)	200(2.0,28)
	Rear	3.00-18-6PR	200(2.0,28)	280(2.8,40)

Check the front and rear wheels for trueness.

Measure the tread depth at the center of the tires. Replace the tires if the tread depth reaches the folowing limit.

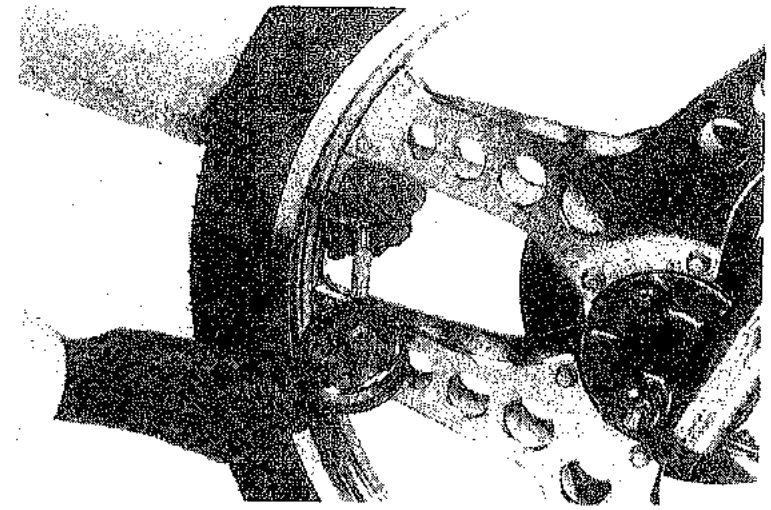
Minimum tread depth:
Front: 0.8 mm (1/32 in)
Rear: 0.8 mm (1/32 in)

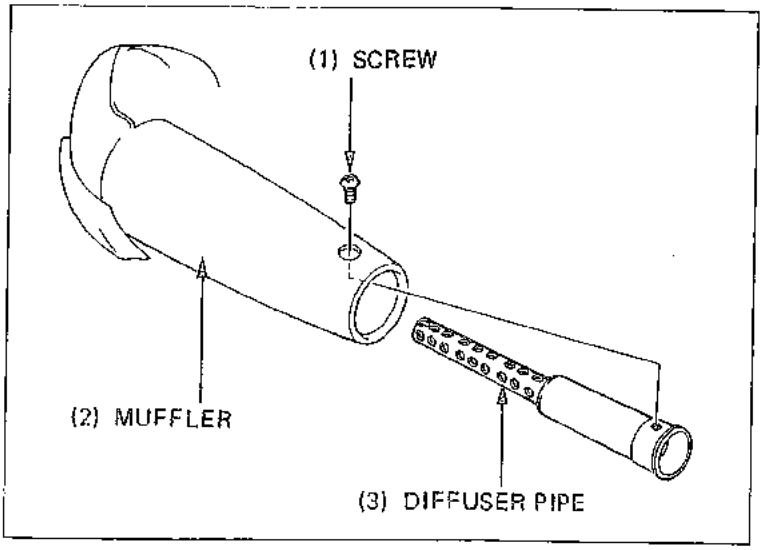
NUTS, BOLTS, FASTENERS

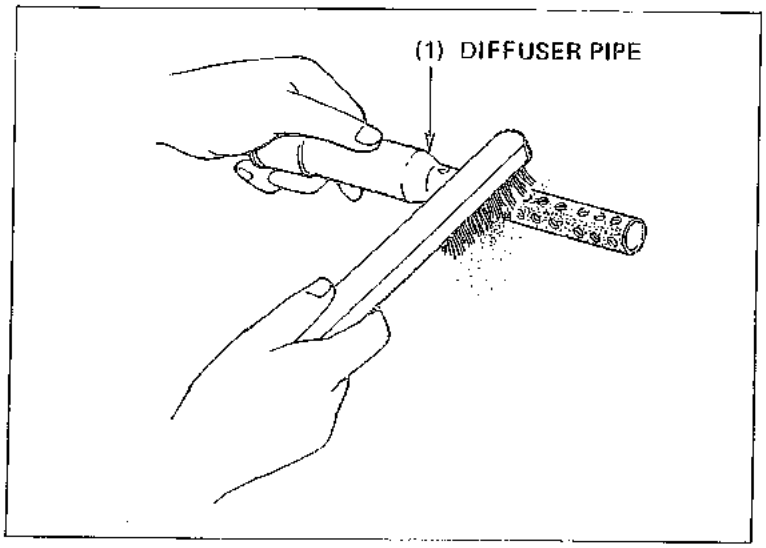
Check that all chassis nuts and bolts are tightened to correct torque values.
Check all cotter pins and safety clips.

MUFFLER DECARBONIZING

Remove the muffler (Page 5-3).
Remove the diffuser pipe attaching screw.
Remove the diffuser pipe from the muffler.





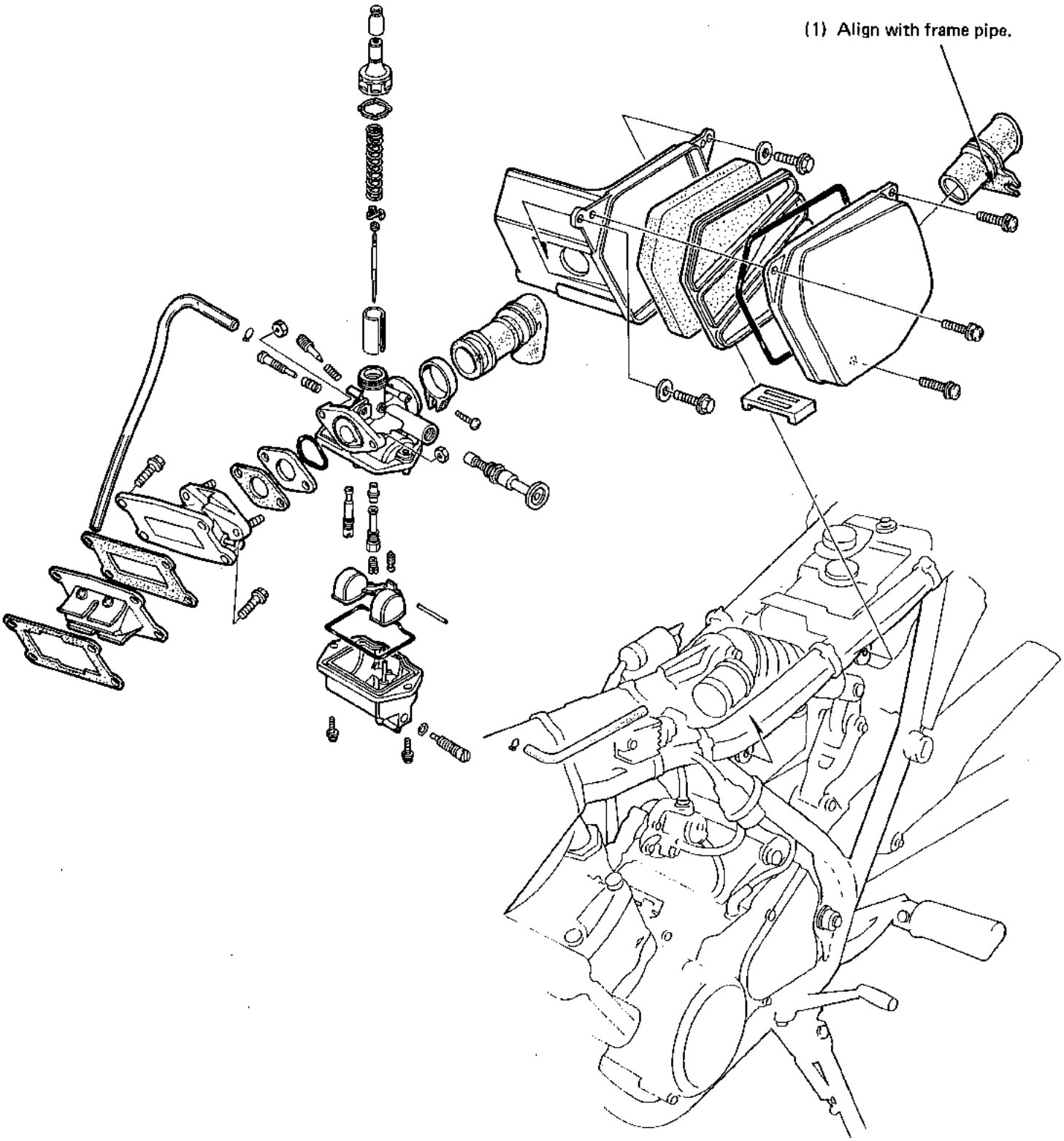


Clean the diffuser pipe with a bristle wire brush.
Remove carbon from inside the muffler.

CAUTION

> *Do not heat or clean with solvent in an attempt to remove carbon from the muffer.*

Install the diffuser pipe and screw.



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SERVICE INFORMATION

GENERAL INSTRUCTIONS

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

TOOL

Common
Float Level Gauge 07401–0010000

SPECIFICATIONS

	MBX50		MBX80		
	SW,B,SA(Free)	SW,B(Limited)	E	G	F	E
Venturi dia.	16mm(0.63in)	←	13mm(0.51in)	18mm(0.71in)	←	←
Setting mark	PF16A	PF16E	PF06D	PF26D	PF26F	PF26G
Main jet	#125		#60	#130	#90	#140
Main air jet	#210		#210	#210	←	←
Jet needle	37V-2nd groove		37F-2nd groove	37Y-2nd groove	←	←
Slow jet	#45		#42	#40	←	←
Float level	13.5mm(0.53in)		←	←	←	←
Air screw opening	1-1/2turns out	←	1-1/4turns out	1turn out	←	←
Idle speed	1,400min⁻¹(rpm)	←	←	←	←	←
Throttle grip free play	2-6mm(1/8-1/4in)	←	←	←	←	←

TROUBLESHOOTING

Engine cranks but won't start
1. No fuel in tank
2. No fuel to carburetor
3. Too juch fuel getting to cylinder
4. No spark at plug (ignition malfunction)
5. Air cleaner clogged

Engine idles roughly, stalls, or runs poorly
1. Idle speed incorrect
2. Igniton malfunction
3. Low compression
4. Rich mixture
5. Lean mixture
6. Air cleaner clogged
7. Air leaking into inlet pipe
8. Fuel contaminated

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

Rich mixture
1. Choke stuck closed
2. Faulty float valve
3. Float level too high
4. Carburetor air jets clogged

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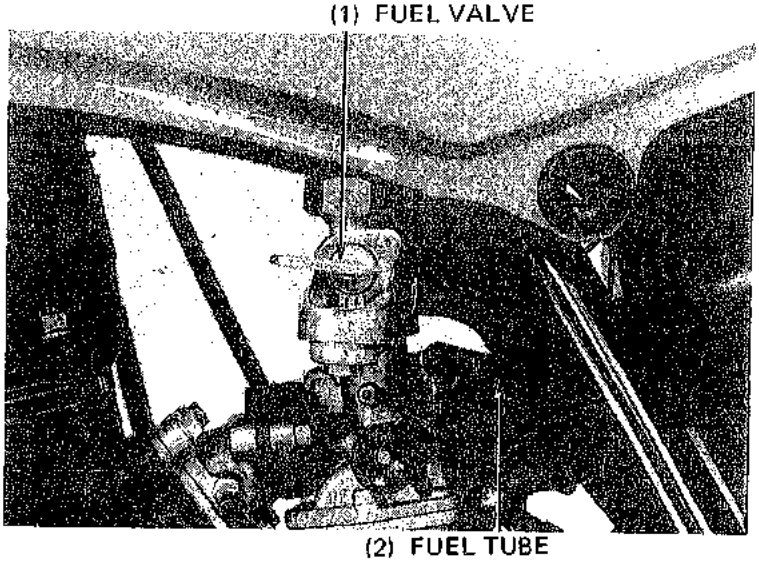
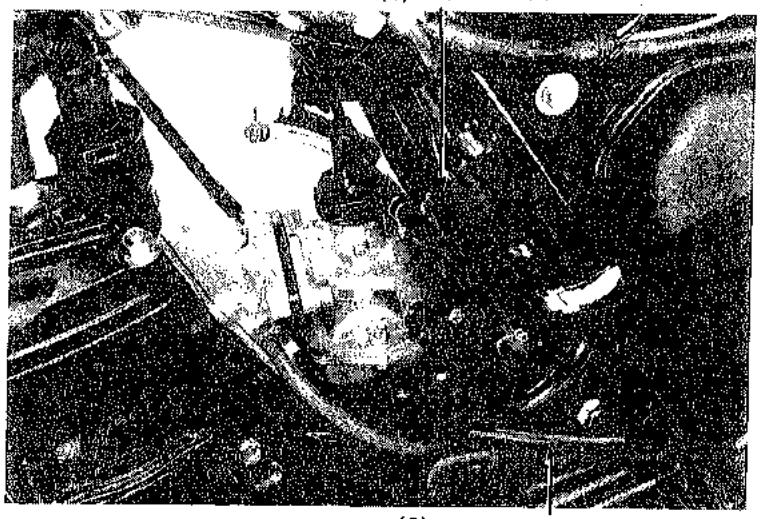
CARBURETOR REMOVAL

Clean the carburetor and its surrounding area thoroughly.
Turn the fuel valve to OFF and drain fuel from the tank through the drain tube.

Disconnect the fuel line.
Disconnect the drain tube.



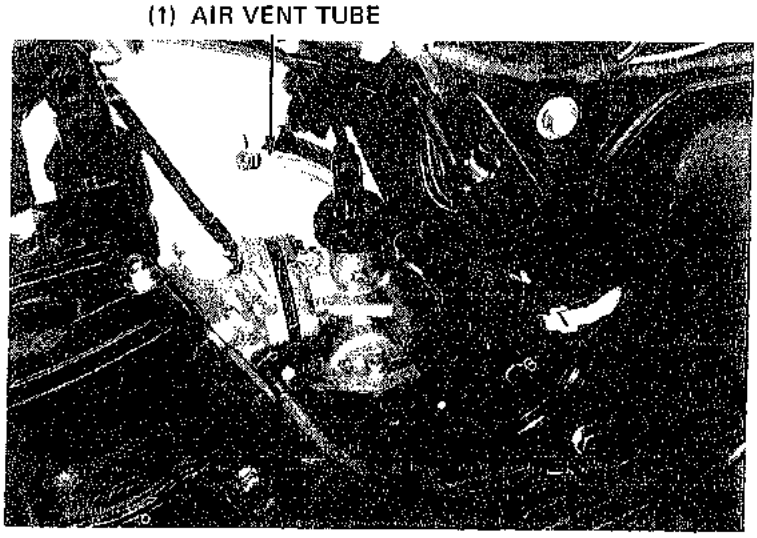
Loosen the tube band.
Remove the nuts attaching the carburetor to the engine inlet pipe.



Disconnect the air vent tube.
Remove the carburetor from the engine.

NOTE

Keep dust and dirt from entering the carburetor and cylinder.



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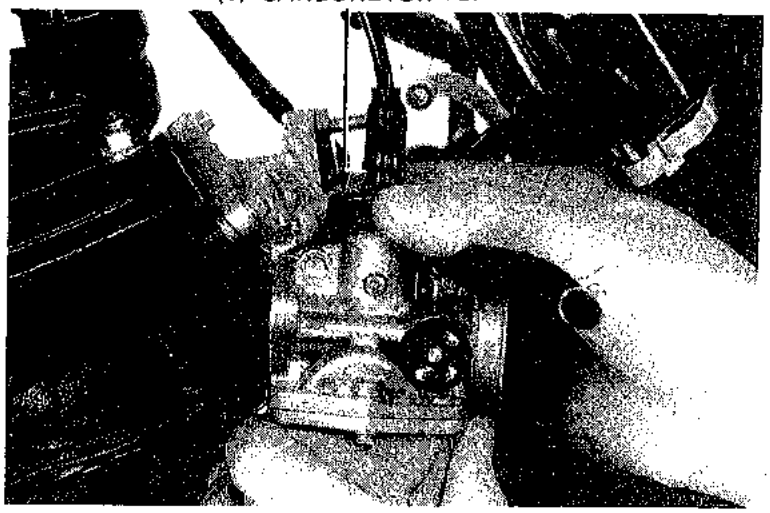
THROTTLE VALVE DISASSEMBLY

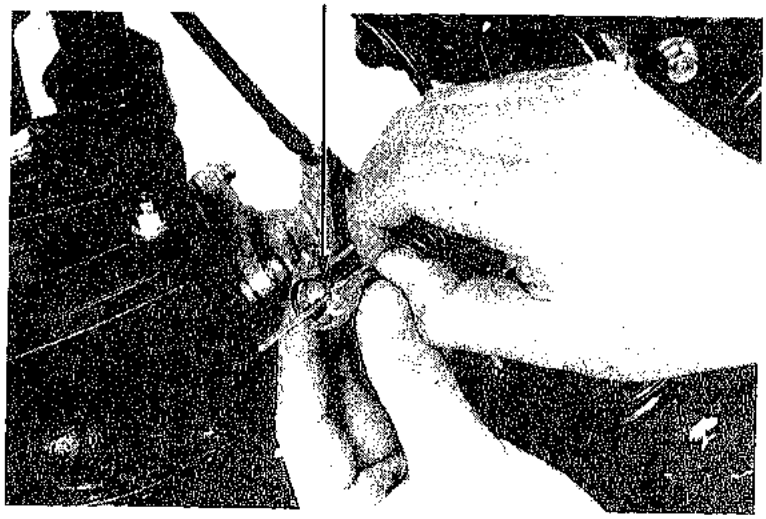
Remove the carburetor top and pull out the throttle valve.

(1) CARBURETOR TOP



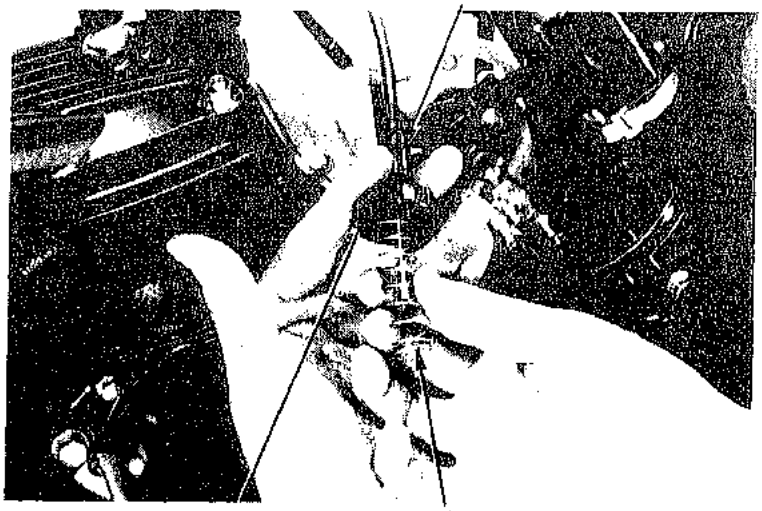
Disconnect the throttle cable from the throttle valve.

(1) THROTTLE VALVE



Remove the return spring, carburetor top and sealing cap.

(1) SEALING CAP



(2) CARBURETOR TOP (3) RETURN SPRING

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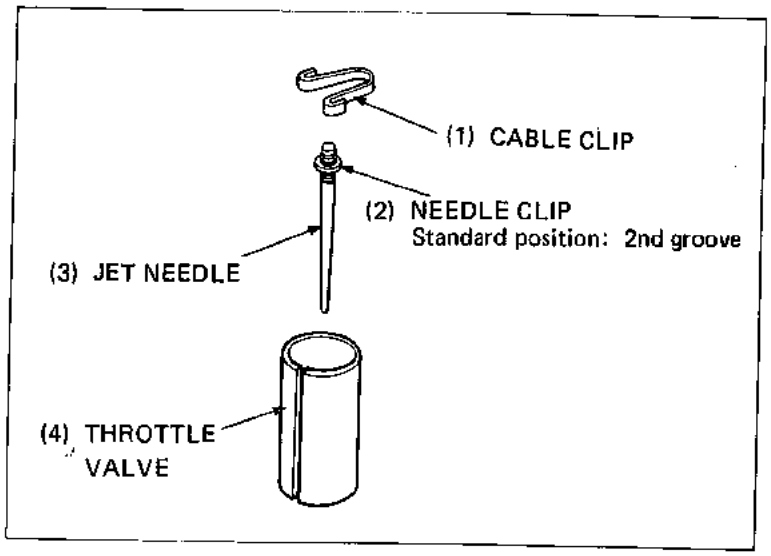
Pry off the cable clip and remove the jet needle.

Check the jet needle and throttle valve for wear to damage.



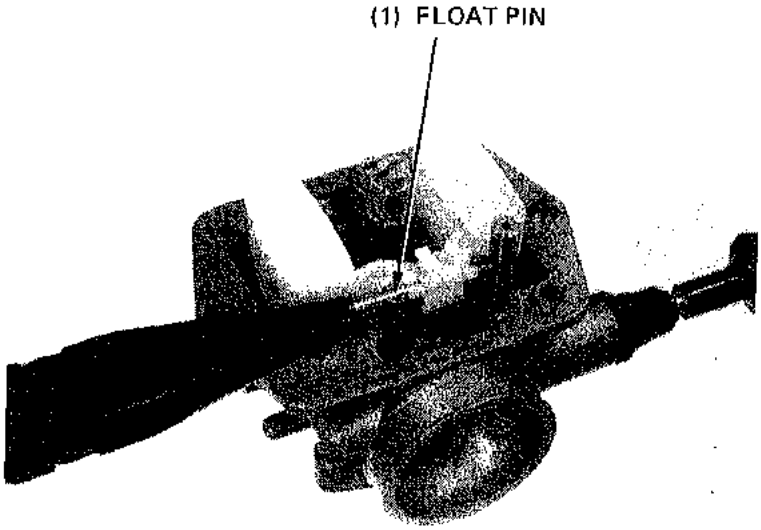
FLOAT/FLOAT VALVE/JET DISASSEMBLY

Remove the float chamber and pull the float pin off the chamber.

CAUTION

Remove the float pin in the arrow direction.

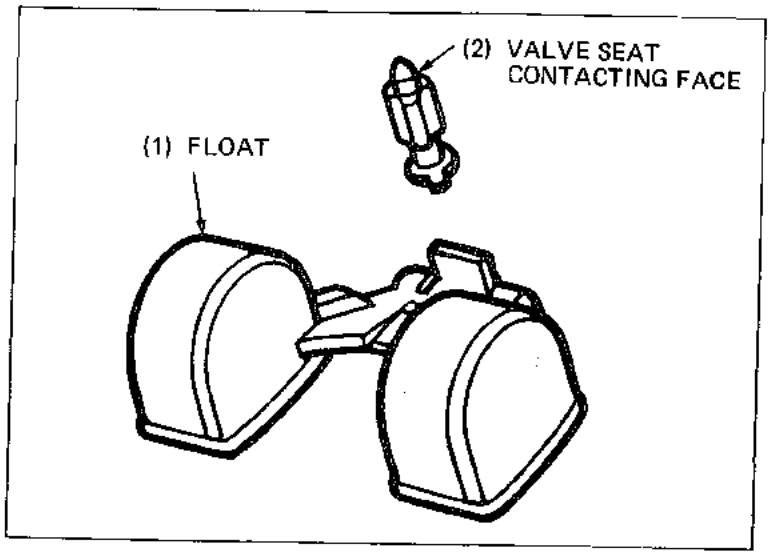
Remove the carburetor float and float valve.



FLOAT/FLOAT VALVE INSPECTION

Check the valve seat for wear or damage.

Check the float for deformation or presence of fuel.



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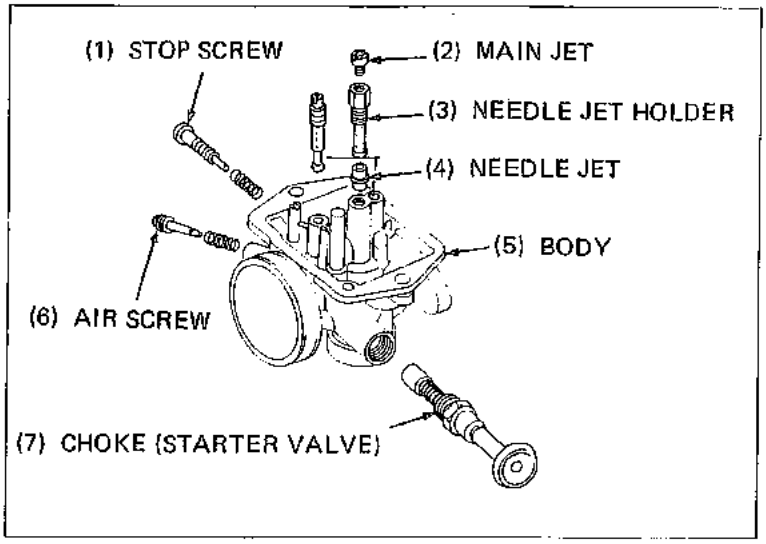
Remove the main jet, needle jet holder and needle jet.
Remove the stop screw and air screw.

NOTE

> Before removing either screw, record the number of turns until the screw lightly rests (bottoms). This allows the screw to be rest to its original position.

Remove the choke (starter) valve.



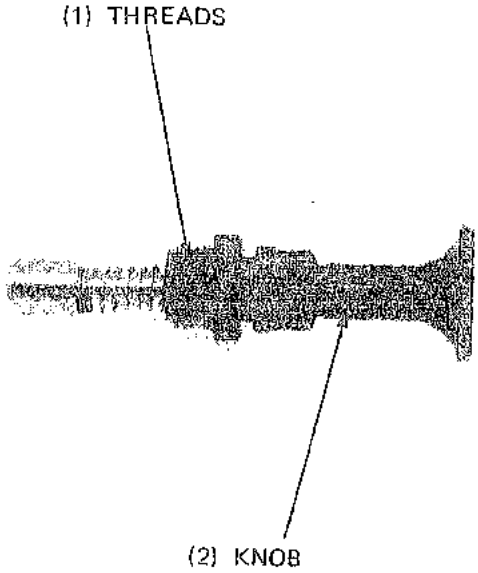
Blow open all jets and body openings with compressed air.

CAUTION

> *Never use compressed air to clean the body when the float assembly is installed. This could damage the floats.*

Check each part for wear or damage.
Inspect the choke (starter) valve.

The knob should be held securely when pulled out fully.



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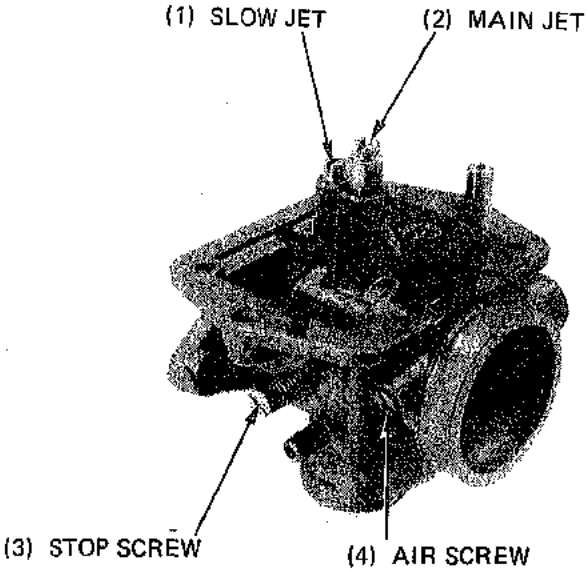
JETS/FLOAT VALVE/FLOAT ASSEMBLY

Install the needle jet, needle jet holder and main jet. Install the air and stop screws by turning them into their original positions.

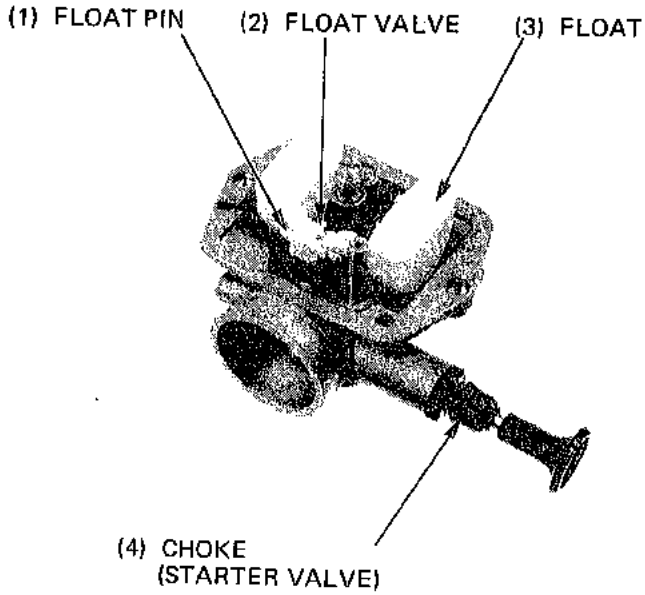


Install the choke (starter) valve.
Install the float valve, float and float pin.

CAUTION

Insert the float pin in the arrow direction.

Check the float for operation. Install the float chamber.

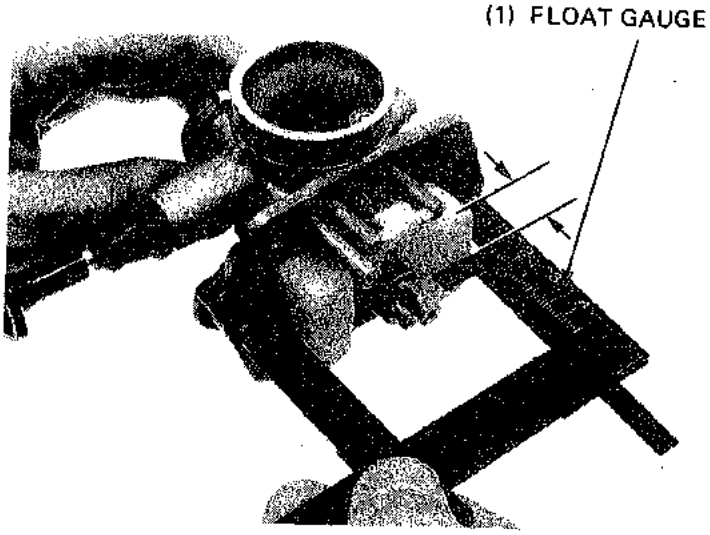


FLOAT LEVEL ADJUSTMENT

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

FLOAT LEVEL: 13.5 mm (0.53 in) ±1.0 mm

Replace the float assembly if not within specification.



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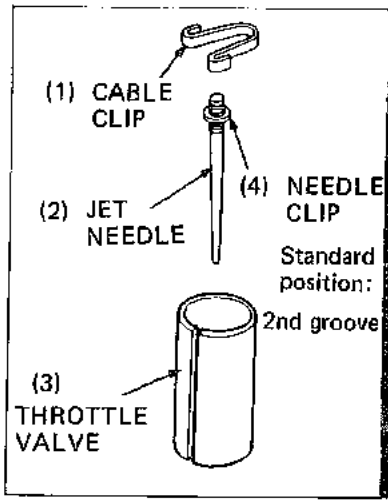
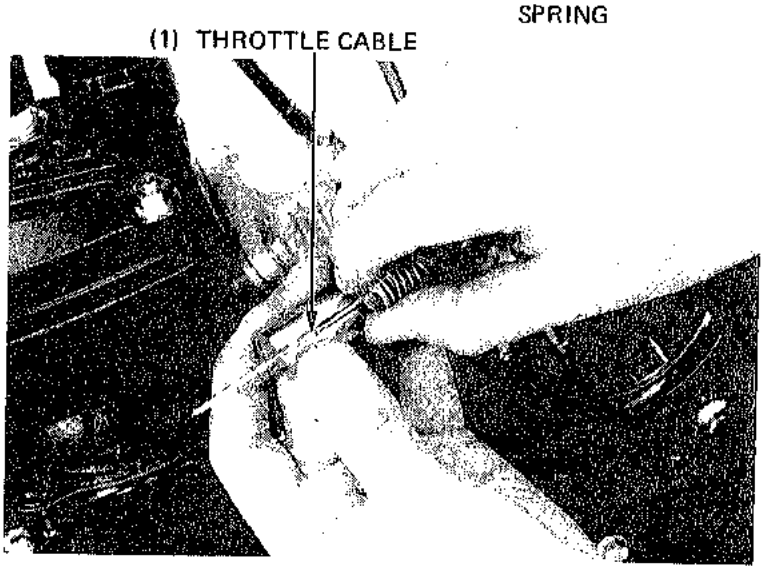
THROTTLE VALVE/CABLE INSTALLATION

Install the jet needle on the throttle valve and secure with the cable clip.

Install the sealing cap, carburetor top and return spring.



Connect the throttle cable to the throttle valve.



Slide the throttle valve into the carburetor body.

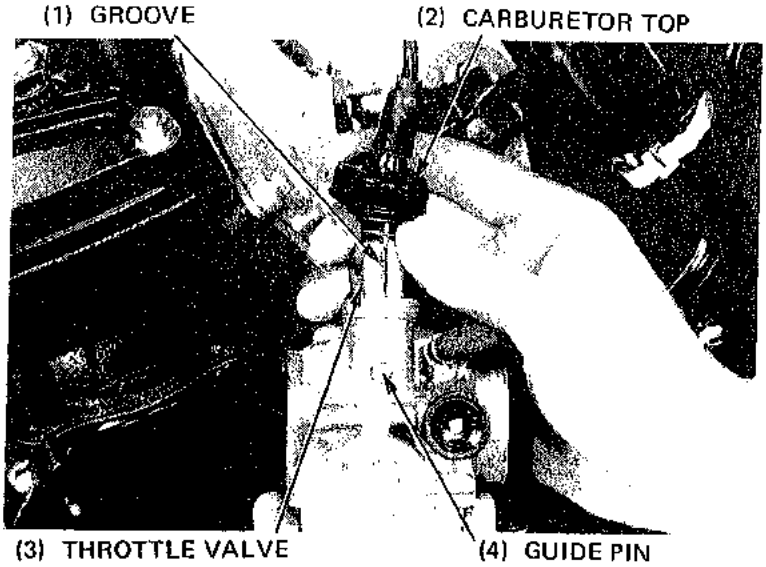
NOTE

> Align the groove in the valve with guide pin on the carburetor body.

Tighten the carburetor top.

CAUTION

> *Hand-tighten the carburetor top. Do not use tools to forcefully tighten the top. This could cause distortion and malfunction.*



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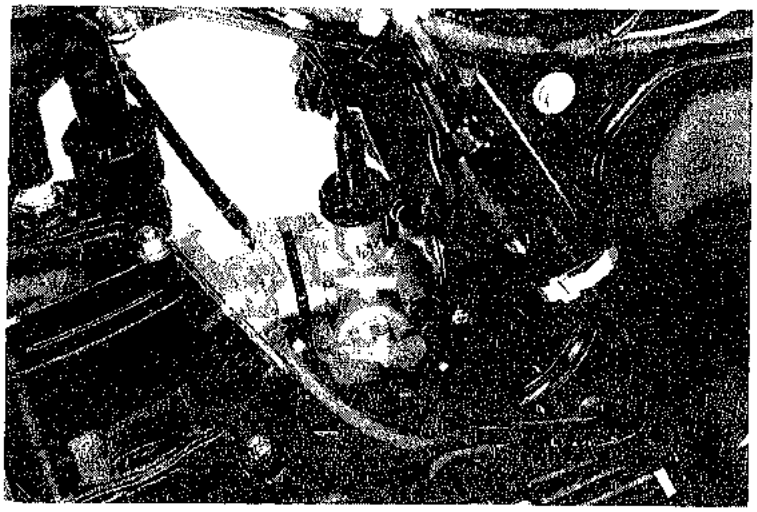
CARBURETOR INSTALLATION

Carburetor installation is essentially the reverse order of removal.
Perform the following after installing the carburetor:
Carburetor adjustment (page 3-5).
Oil pump control cable adjustment (page 3-5).



FUEL TANK

WARNING

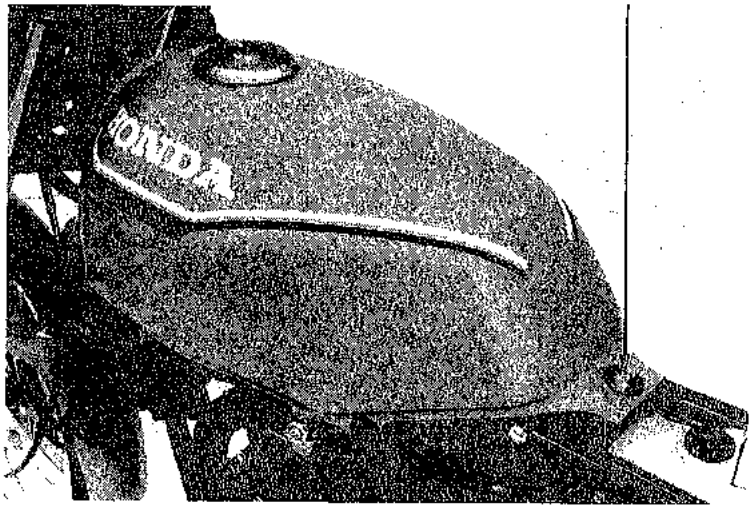
Do not allow flames or sparks near gasoline. Wipe up spilled gasoline at once.

REMOVAL

Remove the right and left side covers.
Remove the fuel tank mounting bolt.
Turn the fuel cock to OFF and disconnect the fuel line.
Remove the fuel tank.

INSPECTION

Check the vent hole of the filler cap for blockage.



FUEL STRAINER

WARNING

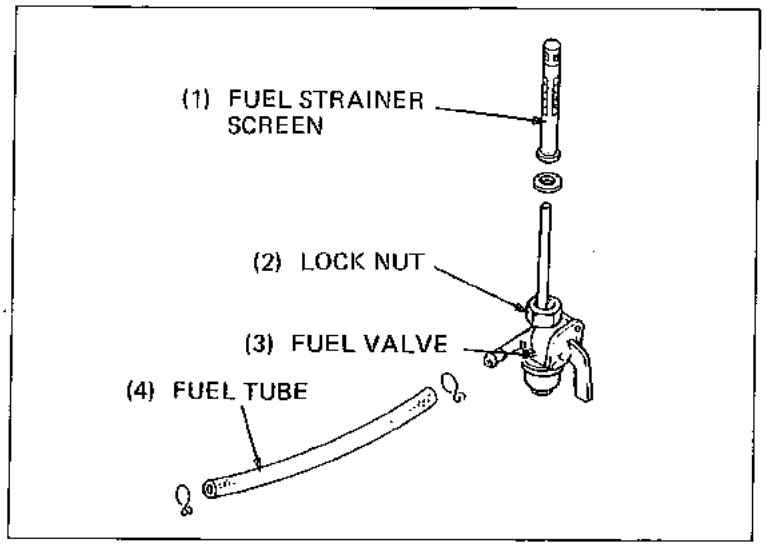
Keep gasoline away from flames or sparks. Wipe up spilled gasoline at once.

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

NOTE

Do not overtighten the fuel valve lock nut.

Make sure there are no fuel leaks



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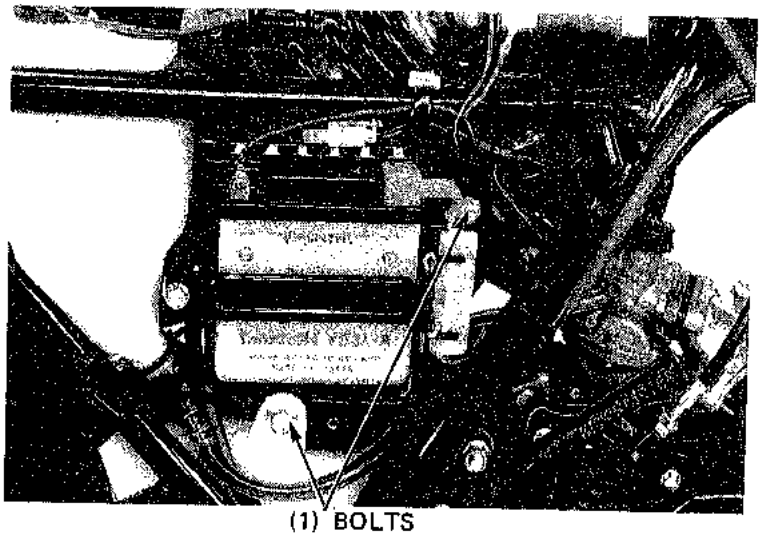
AIR CLEANER

AIR CLEANER CASE REMOVAL

Remove the seat and fuel tank.
Loosen the air cleaner tube band.
Remove the bolts tightening the battery holder and radiator reserve tank.

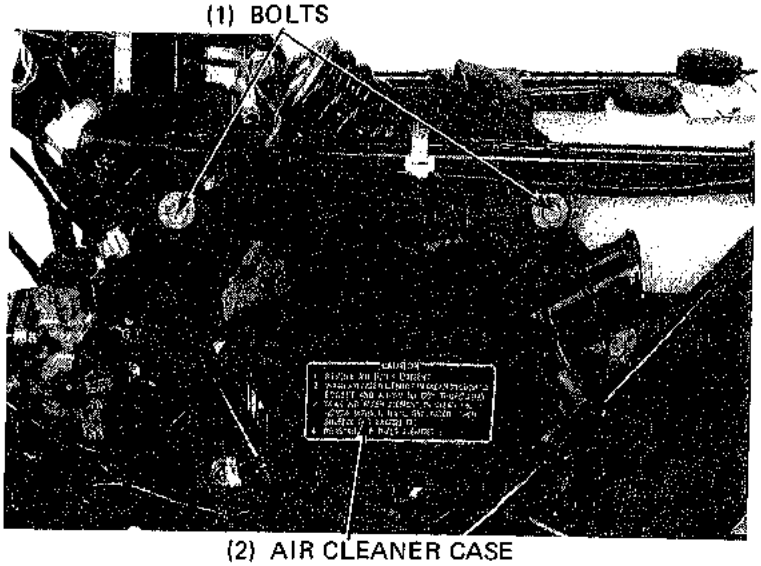


(1) BOLTS

Remove the bolts attaching the air cleaner case and case.

NOTE

> Do not attempt to remove the air inlet tube from the case.



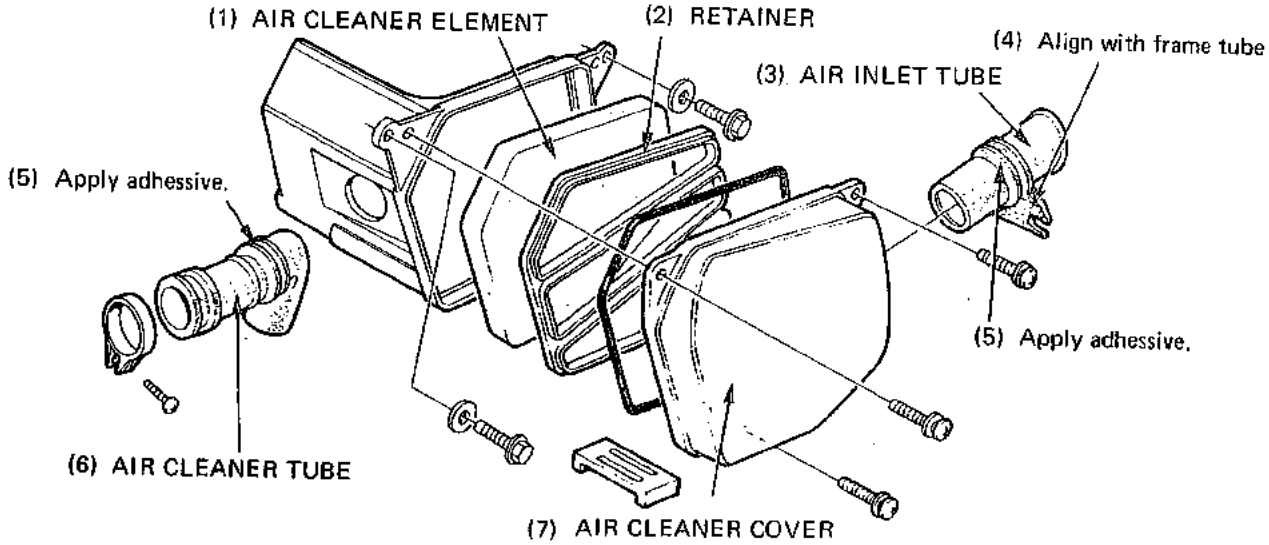
(2) AIR CLEANER CASE

AIR CLEANER CASE INSTALLATION

Clean the air cleaner element (Page 3-3).
Install the air cleaner case in the reverse order of removal.

NOTE

> - Apply adhesive (Cemedain No. 540 or its equivalent to the air cleaner tubes if they are disconnected.
> - Align the air inlet tube with the frame tube when installing the air cleaner case.



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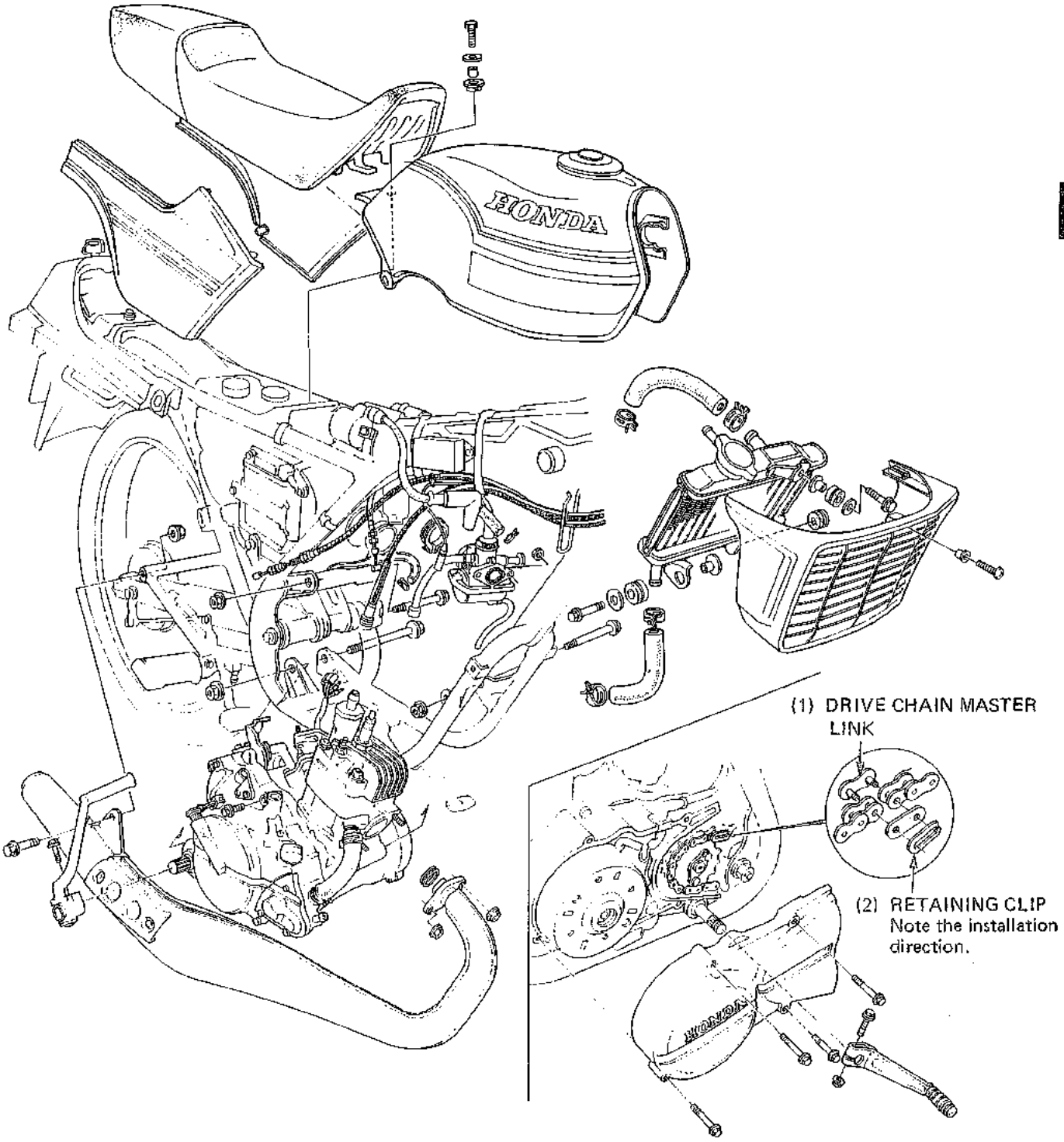
ENGINE REMOVAL/INSTALLATION 5.



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SERVICE INFORMATION	5-2
ENGINE REMOVAL	5-3
ENGINE INSTALLATION	5-7

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SERVICE INFORMATION

GENERAL INSTRUCTION

The following parts or components can be serviced with the engine installed in the frame:

- Clutch
- Gearshift linkage
- Kickstarter
- Alternator
- Carburetor
- Cooling system

SPECIFICATIONS

Engine dry weight	MBX50: Approximately 17.5 kg (38.6 lb) MBX80: Approximately 18.9 kg (41.7 lb)
Transmission oil capacity	0.9 lit. (1.0 US qt, 0.8 Imp qt) at engine assembly 0.8 lit. (0.8 US qt, 0.7 Imp qt) at change

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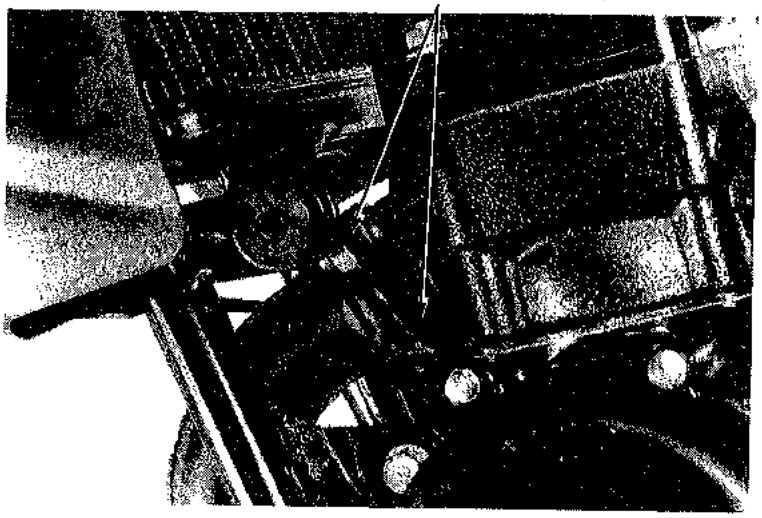
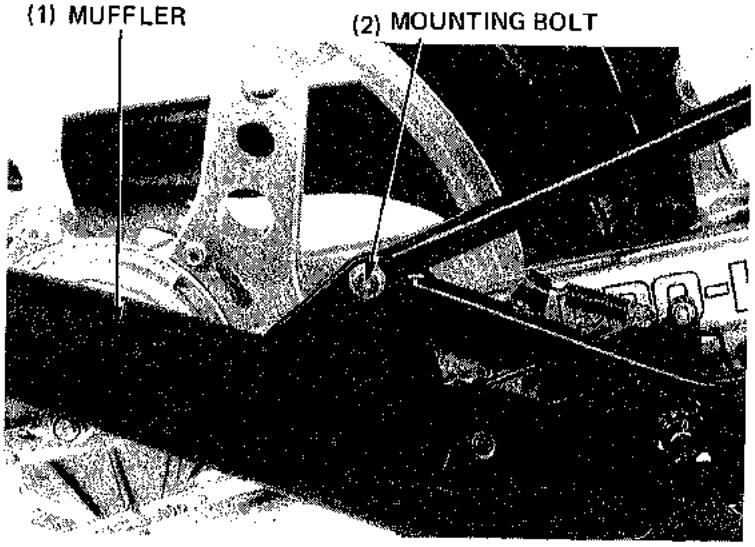
ENGINE REMOVAL

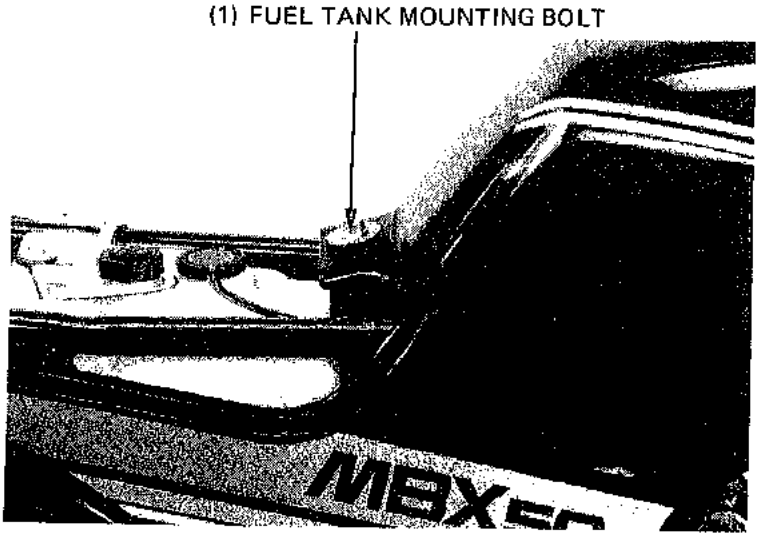
On the Deluxe model, remove the under cowl (Page 14-3)
Drain the transmission oil (Page 2-3).
Remove the two exhaust pipe flange nuts.



Remove the muffler mounting nut and remove the muffler.



Remove the seat and both side covers.
Turn the fuel valve OFF and disconnect the fuel tube at the fuel valve.
Remove the fuel tank mounting bolt and tank.



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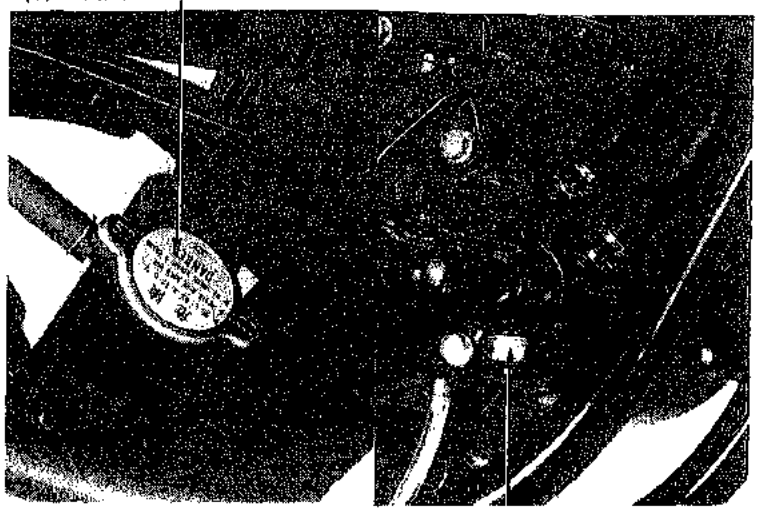
Remove the radiator cap.

WARNING

Engine must be cool before removing the radiator cap, or severe scalding may result.

Remove the drain bolt and drain the coolant.

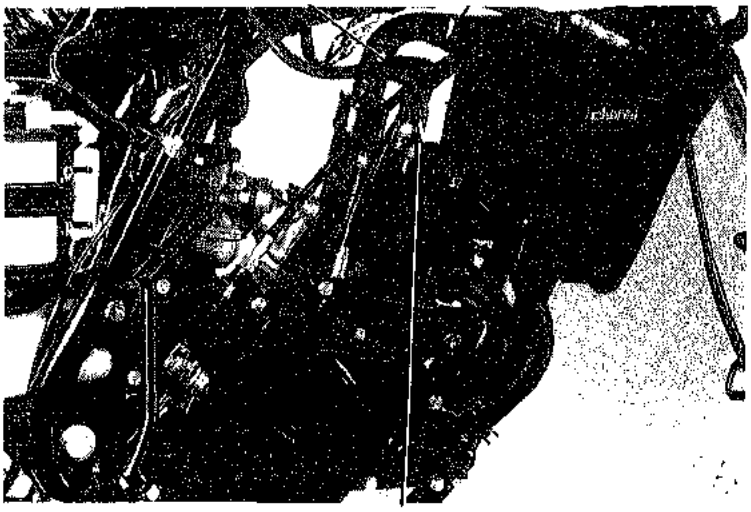
(1) RADIATOR CAP



(2) DRAIN BOLT

Disconnect the radiator hose at the cylinder head.
Remove the radiator (Page 10-4).
Remove the spark plug cap.
Disconnect the temperature sensor wire connector.

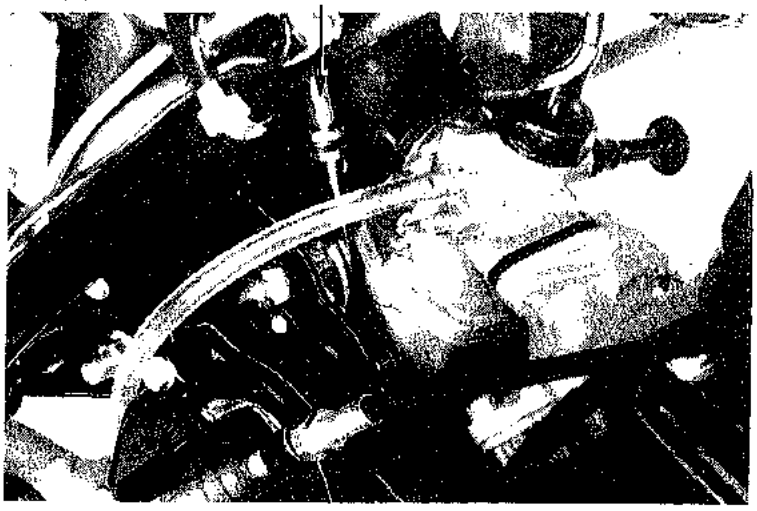
(1) SPARK PLUG CAP (2) RADIATOR HOSE



(3) TEMPERATURES SENSOR CONNECTOR

Disconnect the oil pump control cable.
Disconnect the oil tube at the oil pump (Page 2-4).

(1) OIL PUMP CONTROL CABLE



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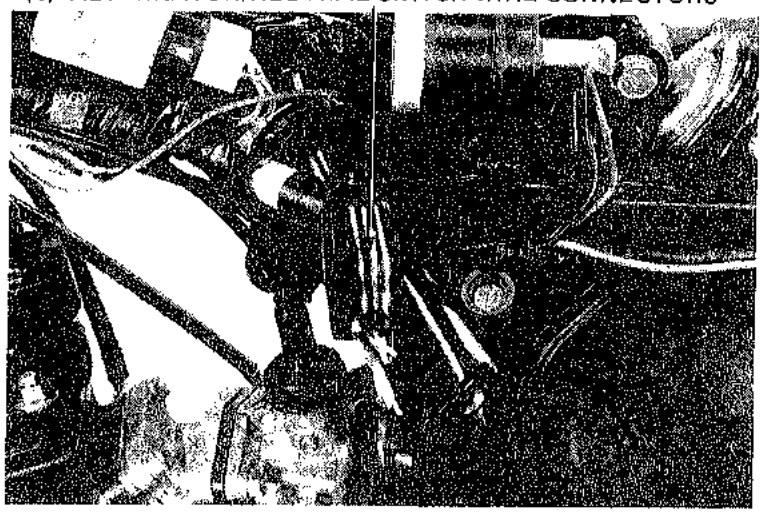
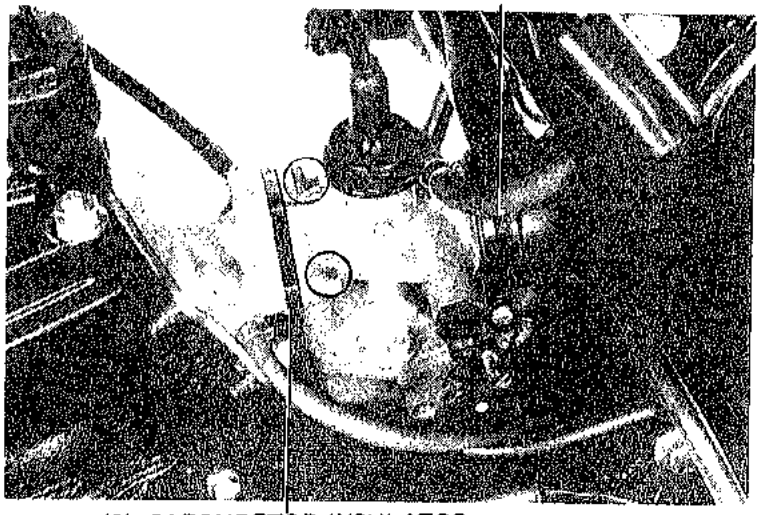
Disconnect the alternator and neutral switch wire connectors.

(1) ALTERNATOR/NEUTRAL SWITCH WIRE CONNECTORS



Loosen the air cleaner tube band.
Remove the two carburetor mounting nuts, carburetor and insulator.

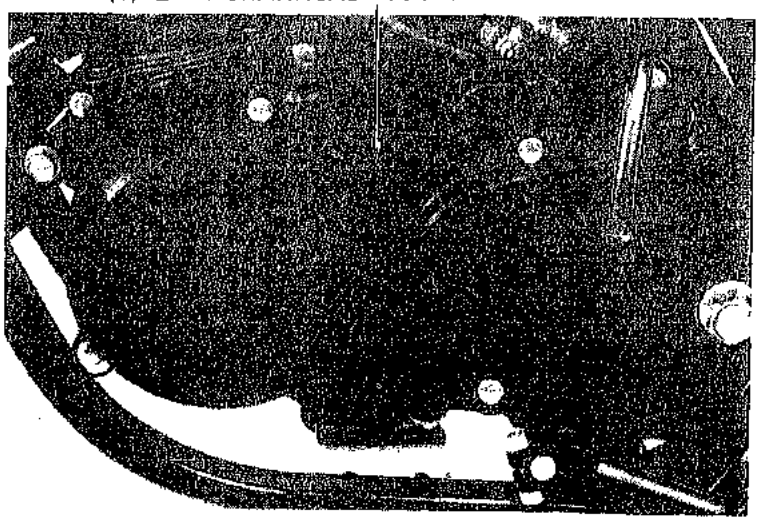
(1) AIR CLEANER TUBE BAND



(2) CARBURETOR INSULATOR

Remove the four bolts attaching the left crankcase cover and cover.

(1) LEFT CRANKCASE COVER



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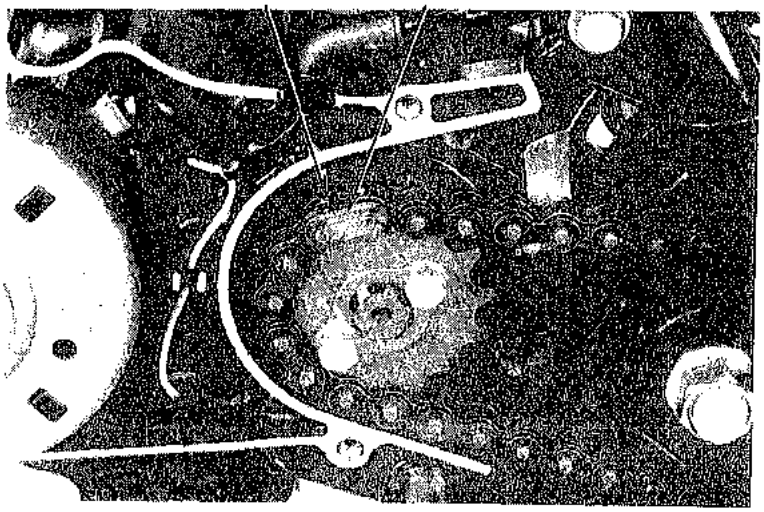
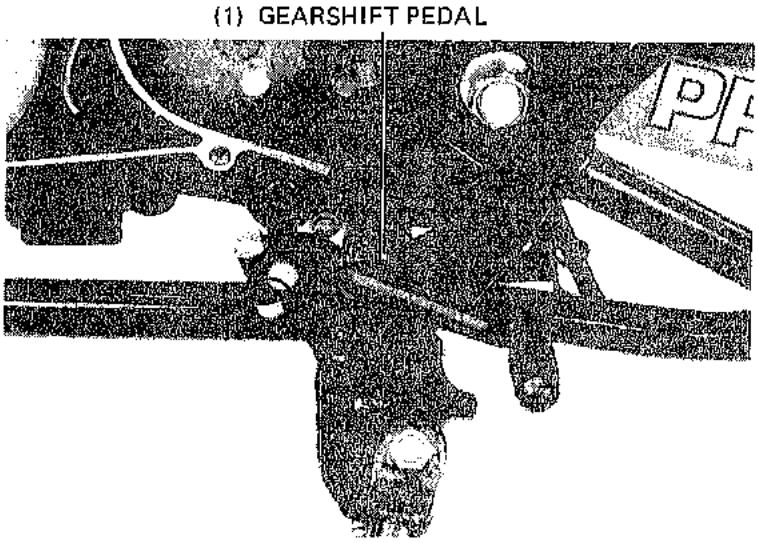
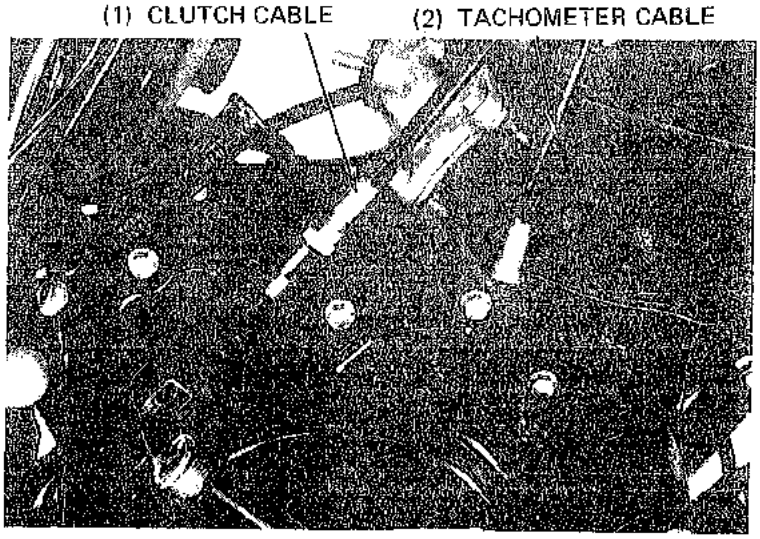
Loosen the drive chain adjusting nuts and rear axle nut.
Move the rear wheel forward, carefully remove the drive chain master link retaining clip and remove the drive chain.



Remove the gearshift pedal pinch bolt and gearshift pedal.



Disconnect the clutch and techometer cables.



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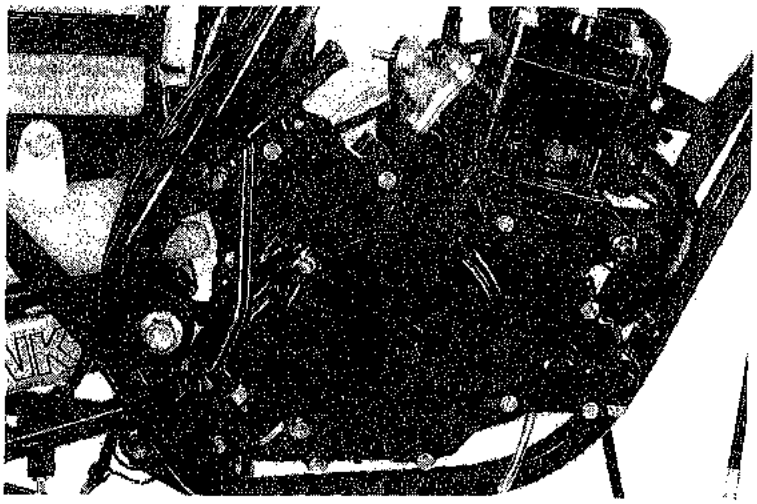
Place a jack under the engine.
Remove the engine mounting bolts and remove the engine.



ENGINE INSTALLATION

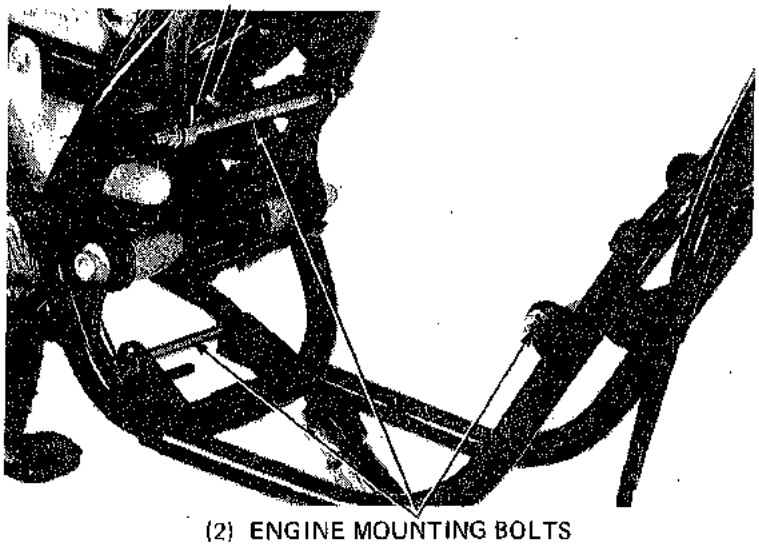
Install the engine in the reverse order of removal.

NOTE

- Fill the transmission with the recommended oil (Page 2-3).
- Fill the cooling system with the recommended coolant (Page 10-3).
- Check the locations of the cables and pipes (Page 1-7).
- Bleed air from the oil pump (Page 2-7).
- Adjust the oil pump control cable (Page 3-5).
- Adjust the clutch lever free play (Page 3-7).
- Install the drive chain master link properly (Page 3-12).
- Adjust the drive chain tension (Page 3-11).

REAR AXLE NUT TORQUE:
55–65 N.m (5.5–6.5 kg-m, 40–48 ft-lb)

(1) SPACER



(2) ENGINE MOUNTING BOLTS

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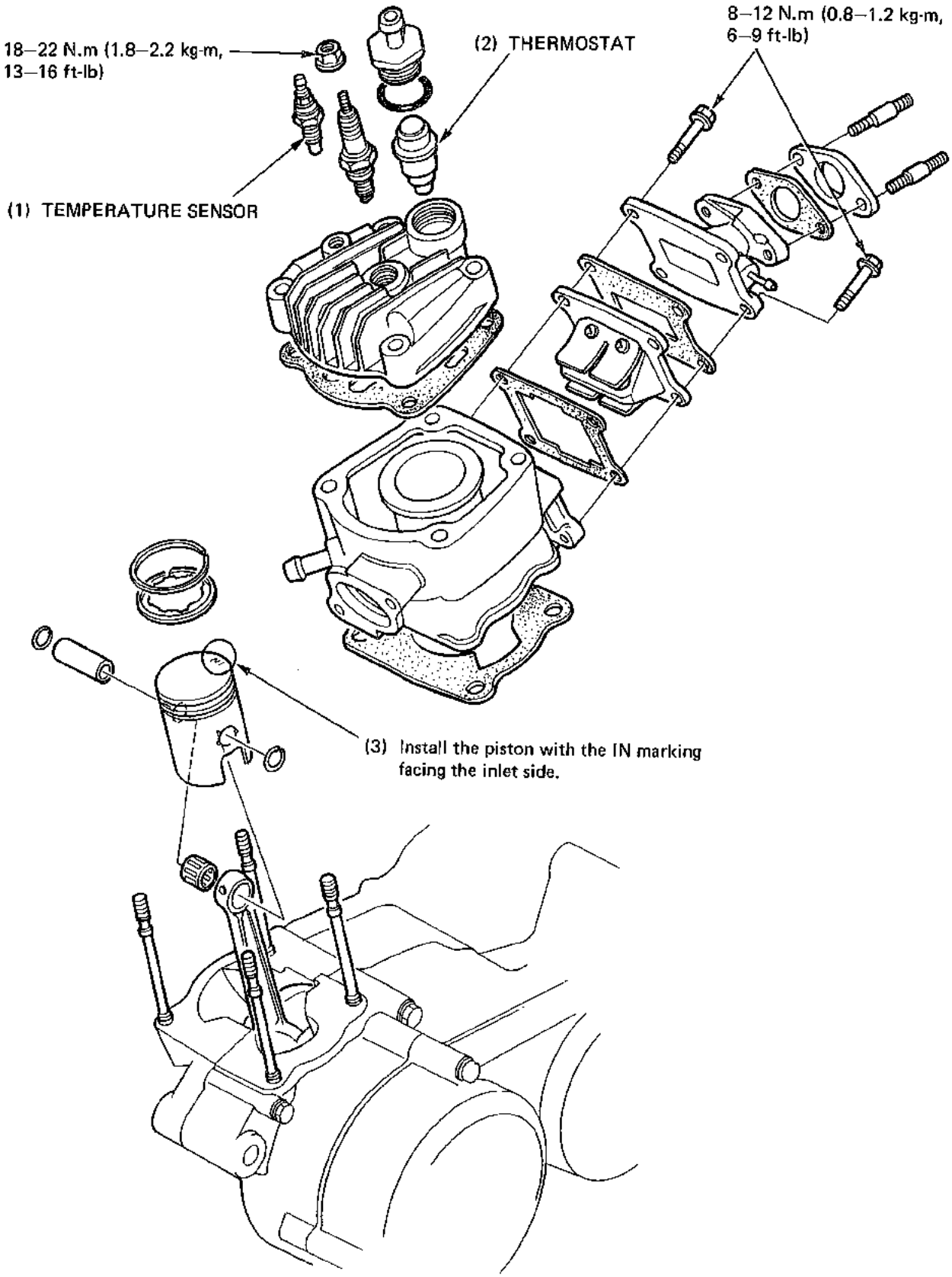
CYLINDER HEAD/CYLINDER/PISTON



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CYLINDER HEAD	6-3
CYLINDER/PISTON	6-5
REED VALVE	6-10

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SERVICE INFORMATION

GENERAL INSTRUCTIONS

- All cylinder head maintenance and inspection can be accomplished with the engine installed.
- Before disassembling the engine, clean the engine thoroughly to prevent dirt and dust to fall into the cylinder and crankcase.
- Remove all traces of gasket material from the mating surfaces of the cylinder head, cylinder and crankcase.
- Use caution when servicing the cylinder and piston to prevent damage to them.
- Before assembling, apply clean engine oil to all sliding surfaces of parts.

TORQUE VALUE

Cylinder head nut	18–22 N.m (1.8–2.2 kg-m, 13–16 ft-lb)
Intake pipe bolt	8–12 N.m (0.8–1.2 kg-m, 6–9 ft-lb)

SPECIFICATIONS

ITEM		STANDARD mm (in)	SERVICE LIMIT mm (in)
Cylinder head warpage			0.10 (0.004)
Cylinder bore MBX50		38.998–39.013 mm (1.5354–1.5359 in)	39.062 mm (1.5379 in)
MBX80		49.407–49.523 mm (1.9452–1.9497 in)	49.572 mm (1.9516 in)
Piston O.D. (10 mm (3/8 in) from piston skart)	MBX50	38.955–38.970 mm (1.5337–1.5343 in)	38.920 mm (1.5323 in)
	MBX80	49.455–49.470 mm (1.9470–1.9476 in)	49.420 mm (1.9457 in)
Cylinder-to-piston clearance		0.035–0.050 mm (0.0014–0.0020 in)	0.090 mm (0.0035 in)
Piston pin bore		12.002–12.008 (0.4725–0.4728)	12.030 (0.4736)
Piston pin O.D.		11.994–12.000 (0.4722–0.4724)	11.980 (0.4717)
Piston-to-piston pin clearance		0.002–0.014 (0.0001–0.0006)	0.040 (0.0016)
Piston ring end gap (top/second)		0.10–0.25 (0.004–0.010)	0.35 (0.014)
Connecting rod small end I.D.		17.005–17.017 (0.6695–0.6700)	17.030 (0.6705)

TROUBLESHOOTING

Compression too low, hard starting or poor performance at low speed
1. Blown cylinder head gasket
2. Loose spark plug
3. Worn, stuck or broken piston rings
4. Worn or dmaged cylinder and piston
5. Faulty reed valve

Compression too high, overheating or knocking
1. Excessive carbon buildup in cylinder head or on piston top

Abnormal noise—piston
1. Worn cylinder and piston
2. Worn piston pin or piston pin hole
3. Worn connecting rod small end bearing

Abnormal noise—piston rings
1. Worn, stuck or broken piston rings
2. Worn or damaged cylinder

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CYLINDER HEAD

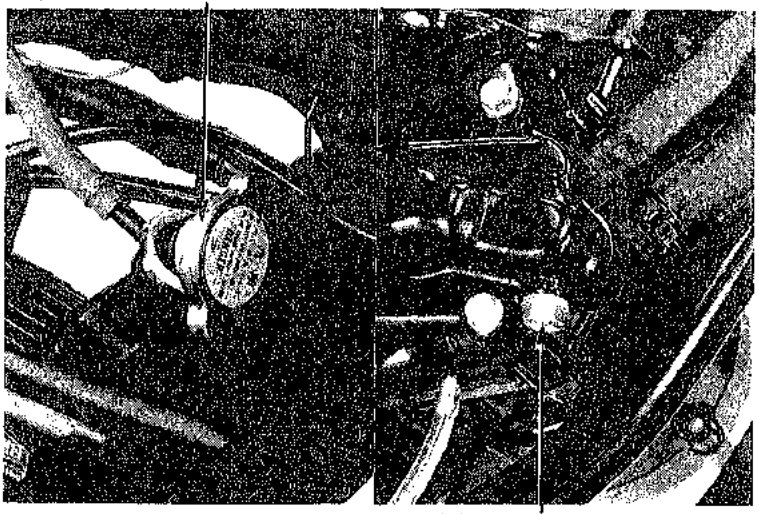
REMOVAL

On the Deluxe model, remove the under cowl (Page 5-3).
Remove the seat, both side covers and fuel tank.
Remove the radiator cap.

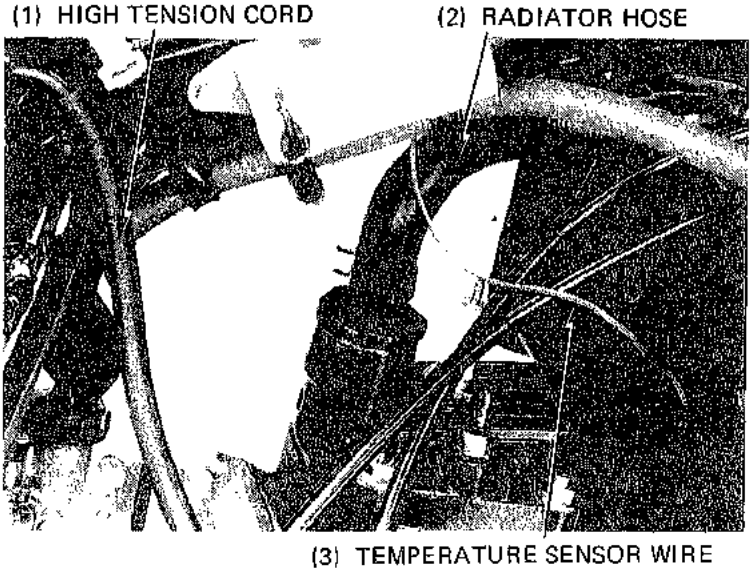
WARNING

Engine must be cool before removing the radiator cap, or severe scalding may result.

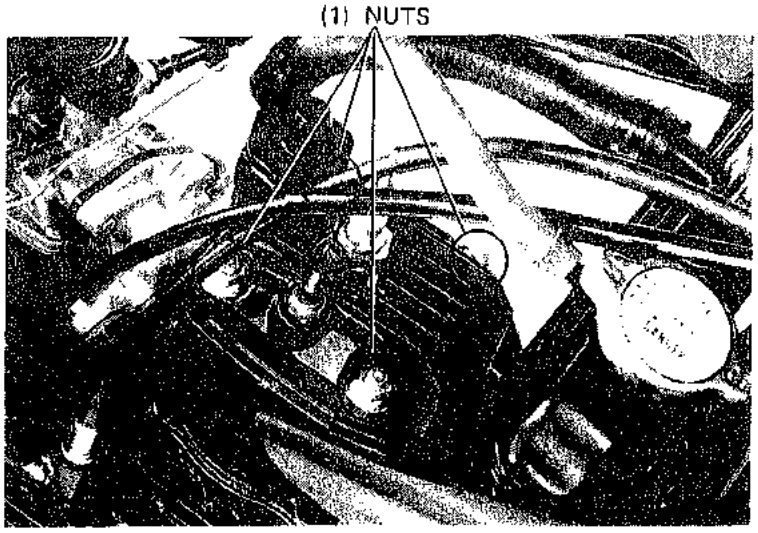
Remove the coolant drain bolt and drain the coolant.



Disconnect the radiator hose from the cylinder head.
Remove the spark plug cap.
Disconnect the temperature sensor wire connector.



Remove the four flange nuts attaching the cylinder head to the cylinder.



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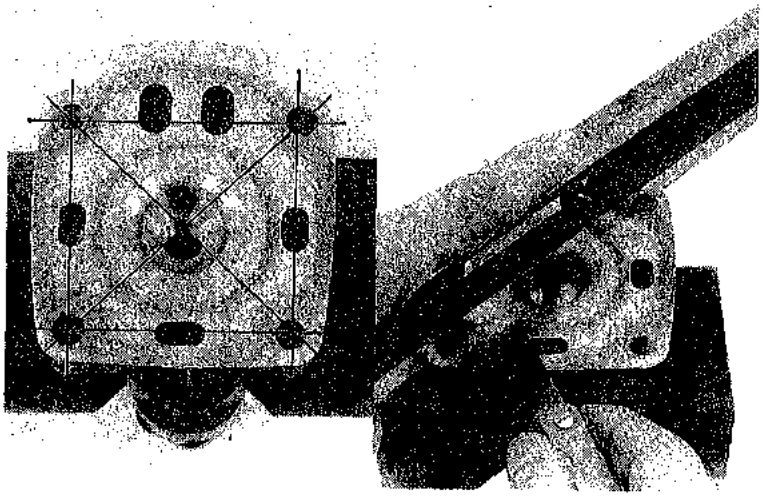
INSPECTION

Check the cylinder head for warpage with a straight edge and freeler gauge in the directions shown.

SERVICE LIMIT: 0.10 mm (0.004 in)



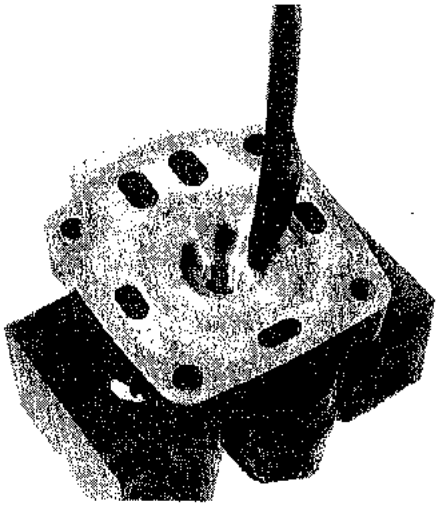
DECARBONIZING

Remove the carbon deposits from the combustion chamber.

Clean the head gasket surface of any gasket material.

NOTE

Avoid damaging the gasket surfaces.



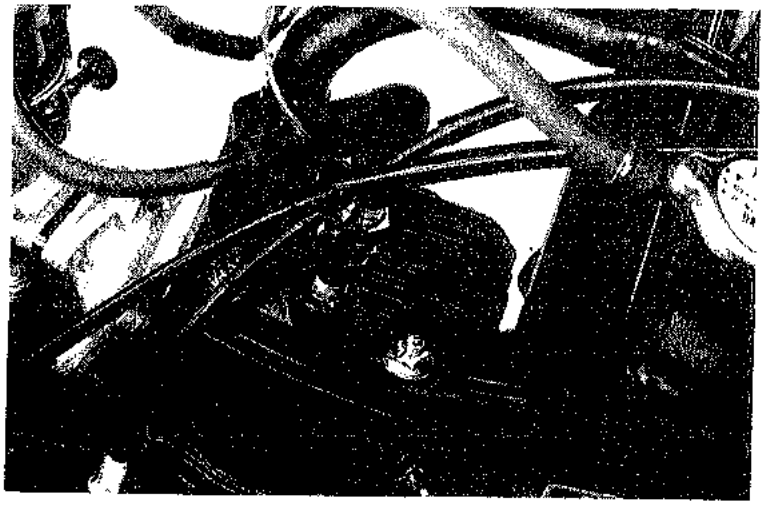
INSTALLATION

Install the cylinder head using a new cylinder head gasket.

Install the four flange nuts and tighten to the specified torque in the sequence shown.

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

Fill the cooling system with the recommended coolant (Page 10-3).



CYLINDER/PISTON

CYLINDER REMOVAL

Remove the exhaust pipe (Page 5 - 3).

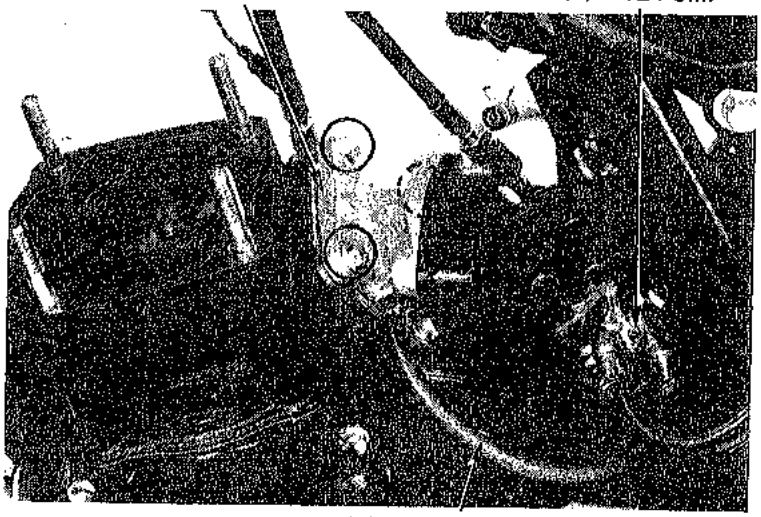
Remove the cylinder head (Page 6-3).

(1) MUFFLER

Remove the carburetor (Page 4-3).
Remove the four flange bolts attaching the intake pipe to the cylinder and remove the intake pipe.

NOTE

> Do not remove the oil pass tube or locate the end of the tube lower than the oil pump. Bleed air from the oil pass tube when it has been disconnected or the end has been located lower than the oil pump.



(1) INTAKE PIPE (2) OIL PUMP (3) OIL PASS TUBE

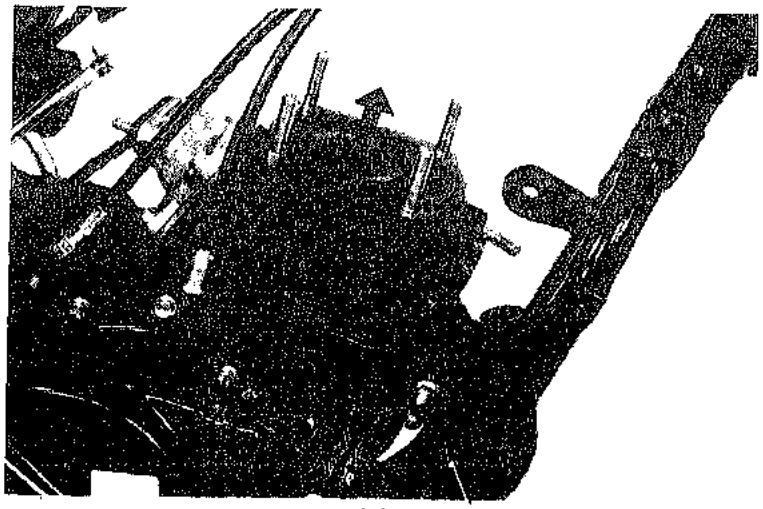
Remove the radiator (Page 10-4).
Disconnect the radiator hose from the cylinder.

Remove the cylinder.

CAUTION

> *Do not pry strike the cylinder or cooling fins.*

Place a clean shop towel into the crankcase to keep debris from falling in.



(1) RADIATOR HOSE

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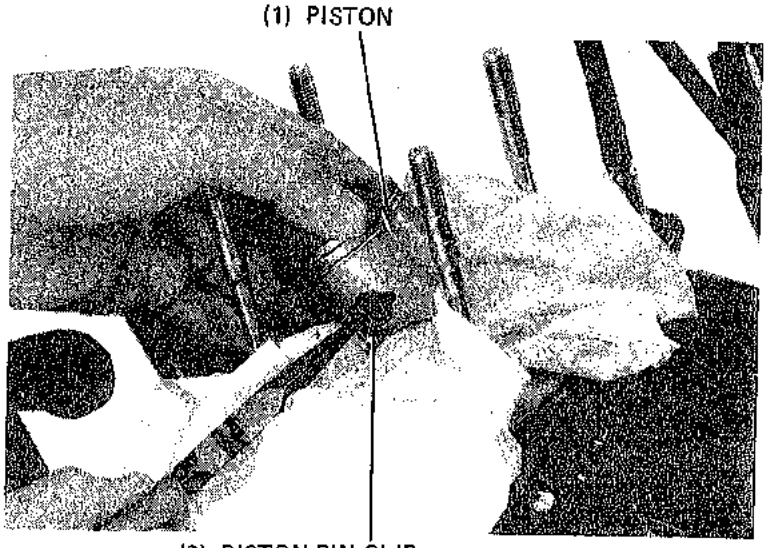
PISTON REMOVAL

Remove the piston pin clip using a pair of long-nose pliers.
Press the piston pin free of the piston.

NOTE

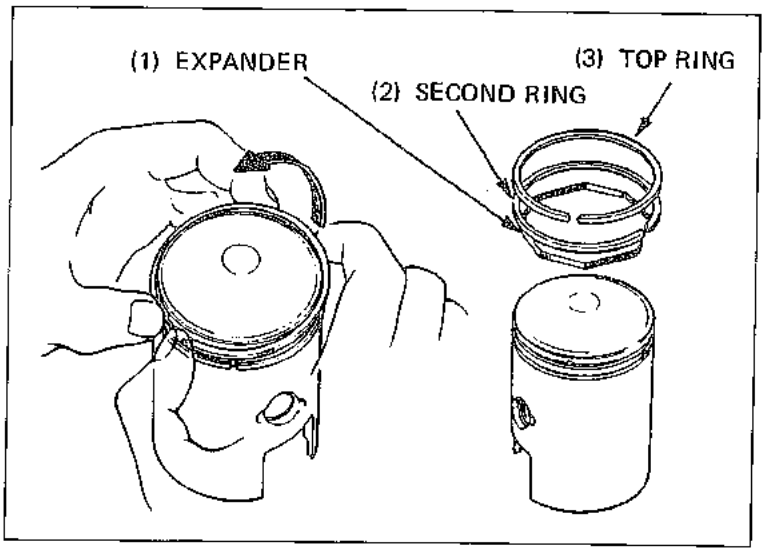
- Do not damage or scratch the piston.
- Do not apply force in the piston pin direction.
- Do not let the clip fall into the crankcase.
- Do not re-use the piston pin clips.



PISTON RING/EXPANDER REMOVAL

Spread each piston ring and remove by lifting it up at a point just opposite the gap.

Remove the expander.



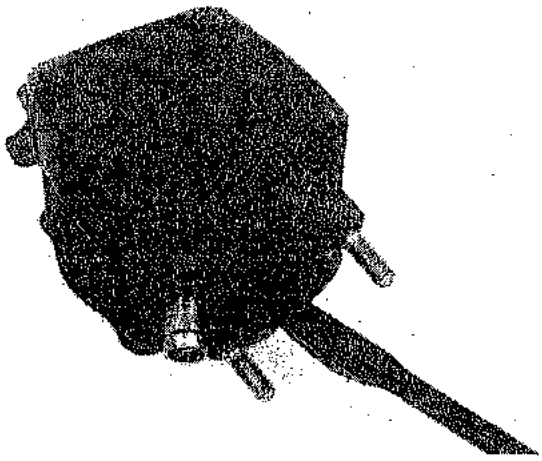
CYLINDER/PISTON INSPECTION

Check the cylinder and piston for wear or damage.

Clean carbon deposits from the exhaust port area.

CAUTION

Do not damage the cylinder.



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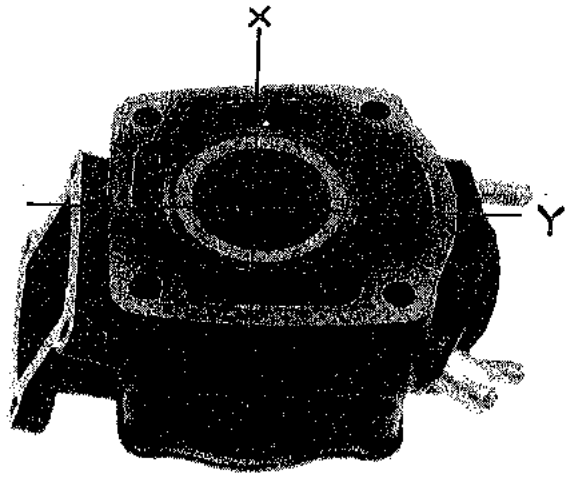
Inspect the cylinder bores for wear at three levels in X and Y directions. Take the minimum figure measured to determine the cylinder wear. Avoid the port area.

SERVICE LIMIT:

MBX50 39.062 mm (1.5379 in)
MBX80 49.572 mm (1.9516 in)



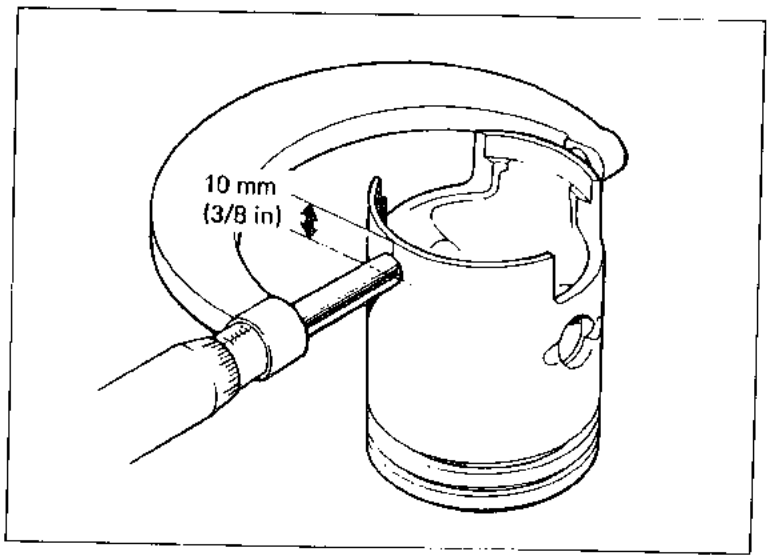
Measure the O.D. of the piston at a point 10 mm (3/8 in) from the end of the skirt.

SERVICE LIMIT:

MBX50 38.920 mm (1.5323 in)
MBX80 49.420 mm (1.9457 in)

Calculated the piston-to-cylinder clearance.

SERVICE LIMIT: 0.090 mm (0.0035 in)



Measure the I.D. of the piston pin bore.

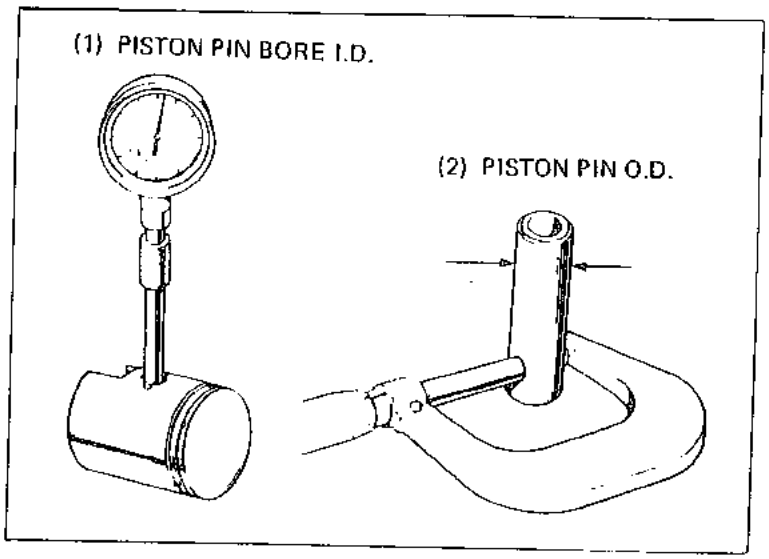
SERVICE LIMIT: 12.030 mm (0.4736 in)

Measure the O.D. of the piston pin.

SERVICE LIMIT: 11.980 mm (0.4717 in)

Calculate the piston pin-to-piston clearance.

SERVICE LIMIT: 0.040 mm (0.0016 in)



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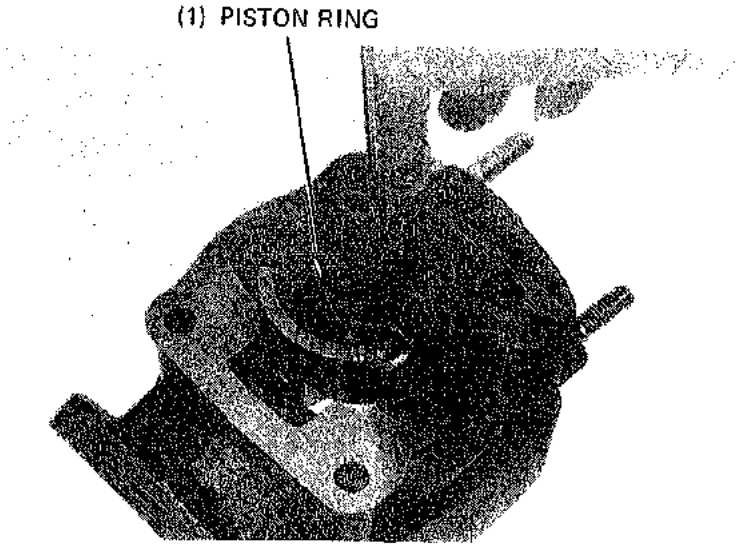
PISTON RING INSPECTION

Set each piston ring squarely into the cylinder from the bottom using the piston and measure the end gap.

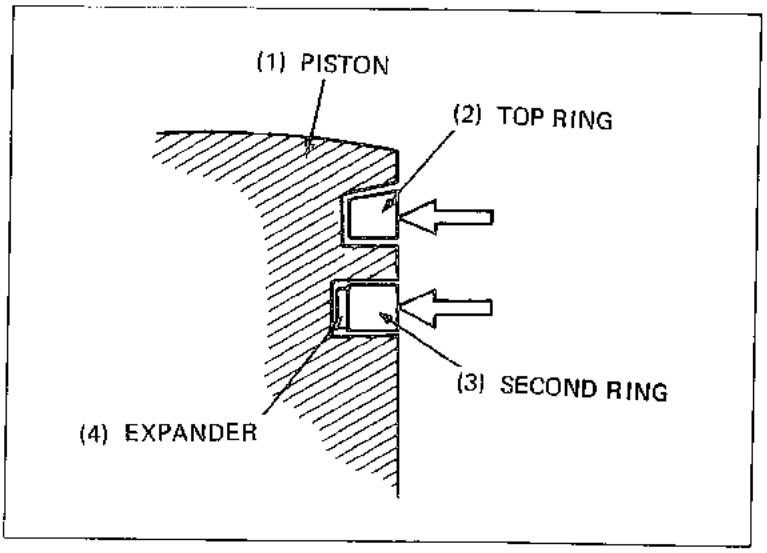
SERVICE LIMITS:
TOP: 0.35 mm (0.014 in)
SECOND: 0.35 mm (0.014 in)



Install the expander in the second groove of the piston. Install the top and second rings (Page 6-9).

NOTE

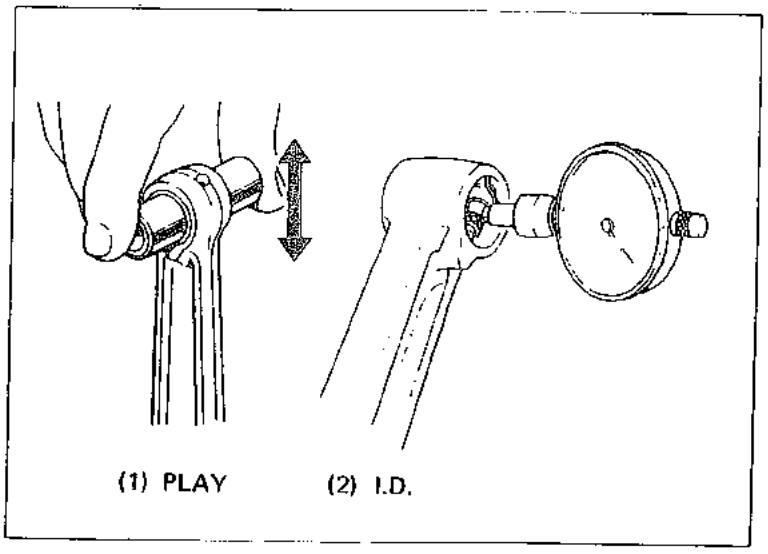
Press each piston ring into place at several points to make sure that it is flush with the piston surface.
If not, clean carbon deposits from the ring groove. They should be free engough to be rotated in the ring lands.



CONNECTING ROD INSPECTION

Install the bearing and piston pin in the connecting rod small end and check for excessive play.

Measure the connecting rod small end I.D.
SERVICE LIMIT: 17.030 mm (0.6705 in)



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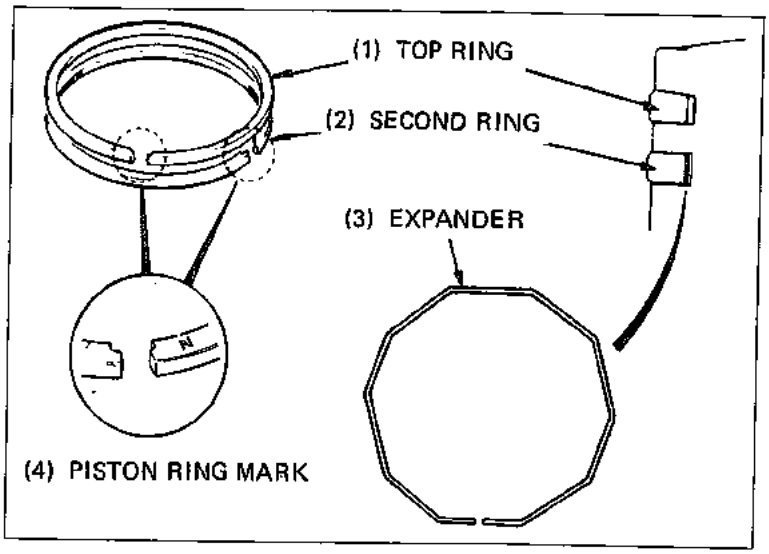
PISTON/CYLINDER INSTALLATION

Install the expander and piston rings.

NOTE

- Install the rings with the marking facing up.
- The top and second rings are interchangeable with each other.
- Do not mix different brands of rings in an engine. Do not replace one without replacing another.



Install the connecting rod small end bearing, piston and piston pin.

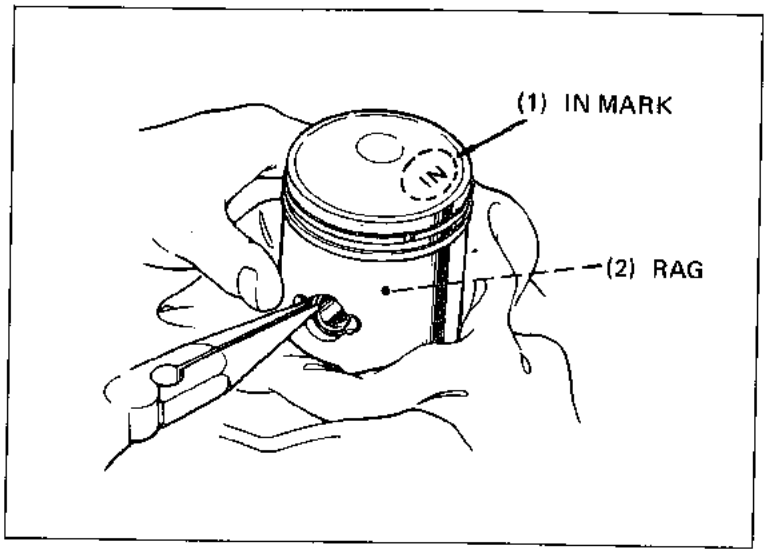
NOTE

- Install the piston with the "IN" marking facing the inlet side.
- Dip the small end bearing and piston pin in clean oil before installation.

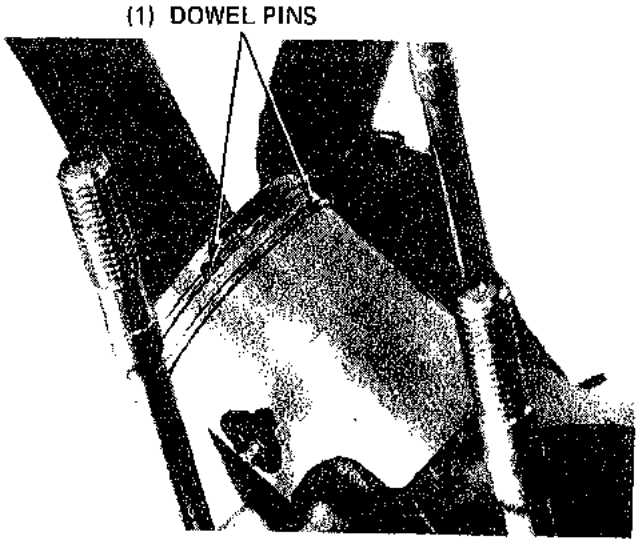
Install new piston pin clips.

NOTE

Do not let the clip fall into the crankcase.



Align each ring end gap with the dowel pin in the ring land.



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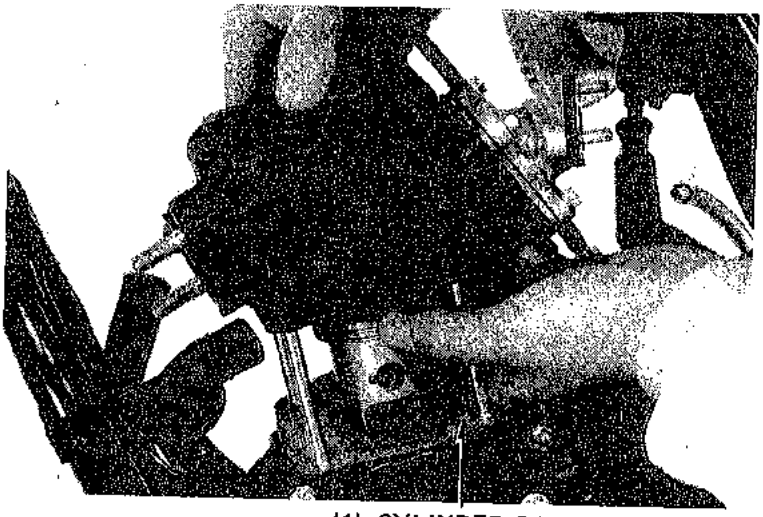
Place the cylinder gasket on the crankcase.

Lubricate the piston with engine oil and install the cylinder over the piston while compressing the piston rings.

NOTE

Do not damage the piston.



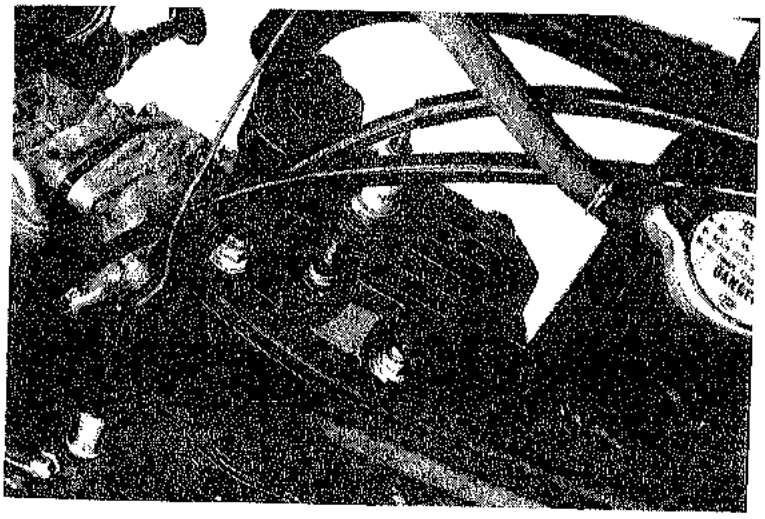
(1) CYLINDER GASKET

Install the cylinder head and new cylinder head gasket (Page 6-4).
Install thereed valve and intake pipe.
Install the exhaust muffler.
Install thecarburetor (Page 4-9).
Install the radiator (Page 10-5).

Fill the cooling system with the recommended coolant (Page 10-3).

Perform the following inspections and operation:

Cylinder compression (Page 3-7); compression leaks.
Engine noise.
Secondary air leaks.
Air bleeding from oil pass tube (Page 2-7).



(1) INTAKE PIPE

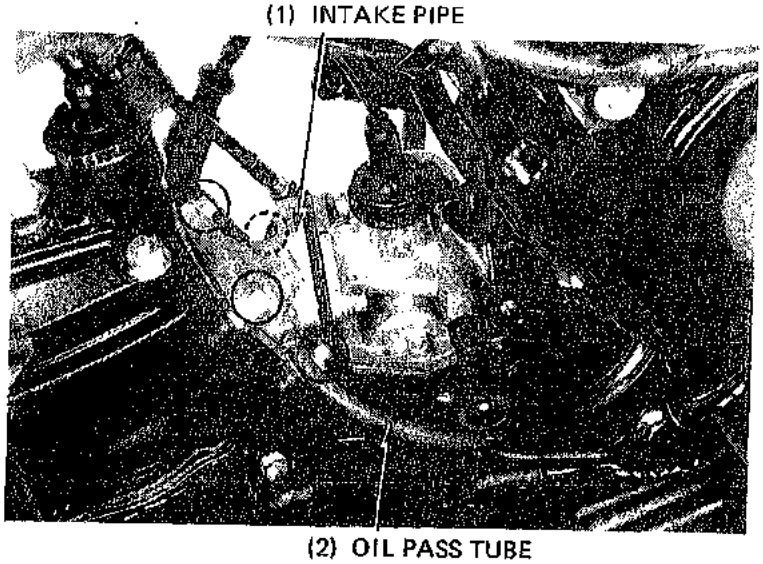
REED VALVE

REMOVAL

Remove the craburetor (Page 4-9).
Remove the intake pipe (Page 6-5).

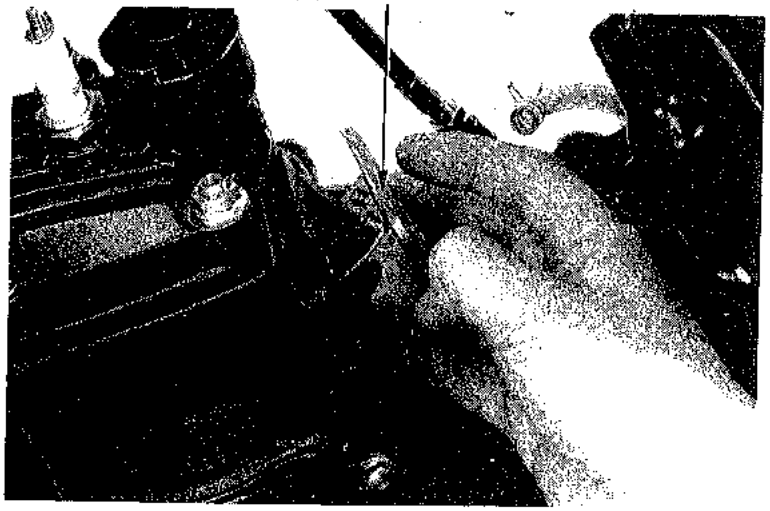
NOTE

Do not remove the oil pass tube or locate the end of the tube lower than the oil pump. Bleed air from the oil pass tube when it has been disconnected or the end has been located lower than the oil pump.



(2) OIL PASS TUBE

Remove the reed valve.

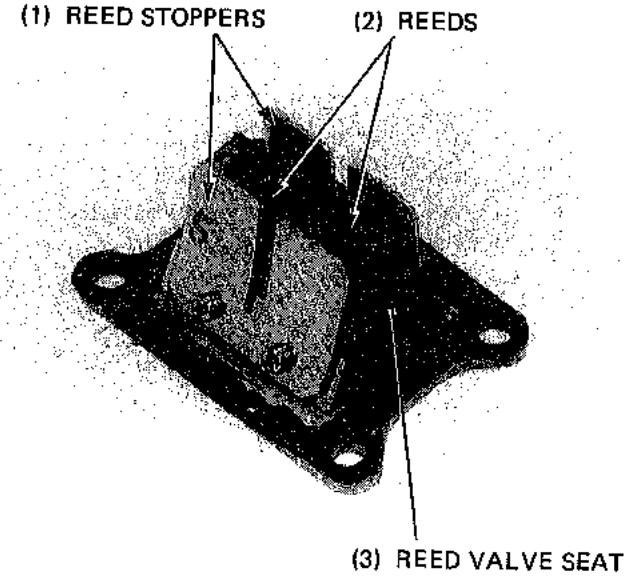


INSPECTION

Check the reeds for damage of fatigue and replace if necessary. Replace the valve with a new one if the seat rubber is cracked or damaged, or if there is clearance between the reed and seat.

CAUTION

Do not disassemble or bend the reed stopper as this may cause improper engine performance. The reed valve must not be disassembled. If the stopper, reed or seat is defective, replace all as a unit.



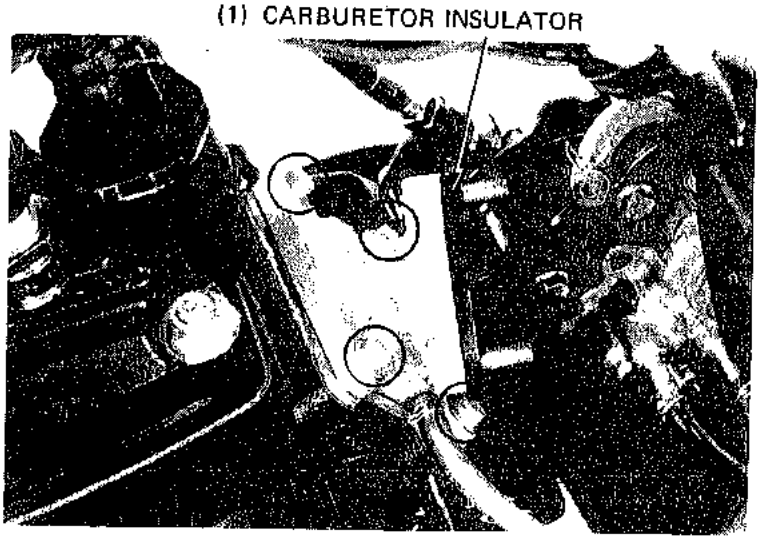
INSTALLATION

Installation of the reed valve is essentially the reverse order of removal.

CAUTION

Bleed air from the oil pass tube (Page 2-7).

After installation, check for secondary air leaks.



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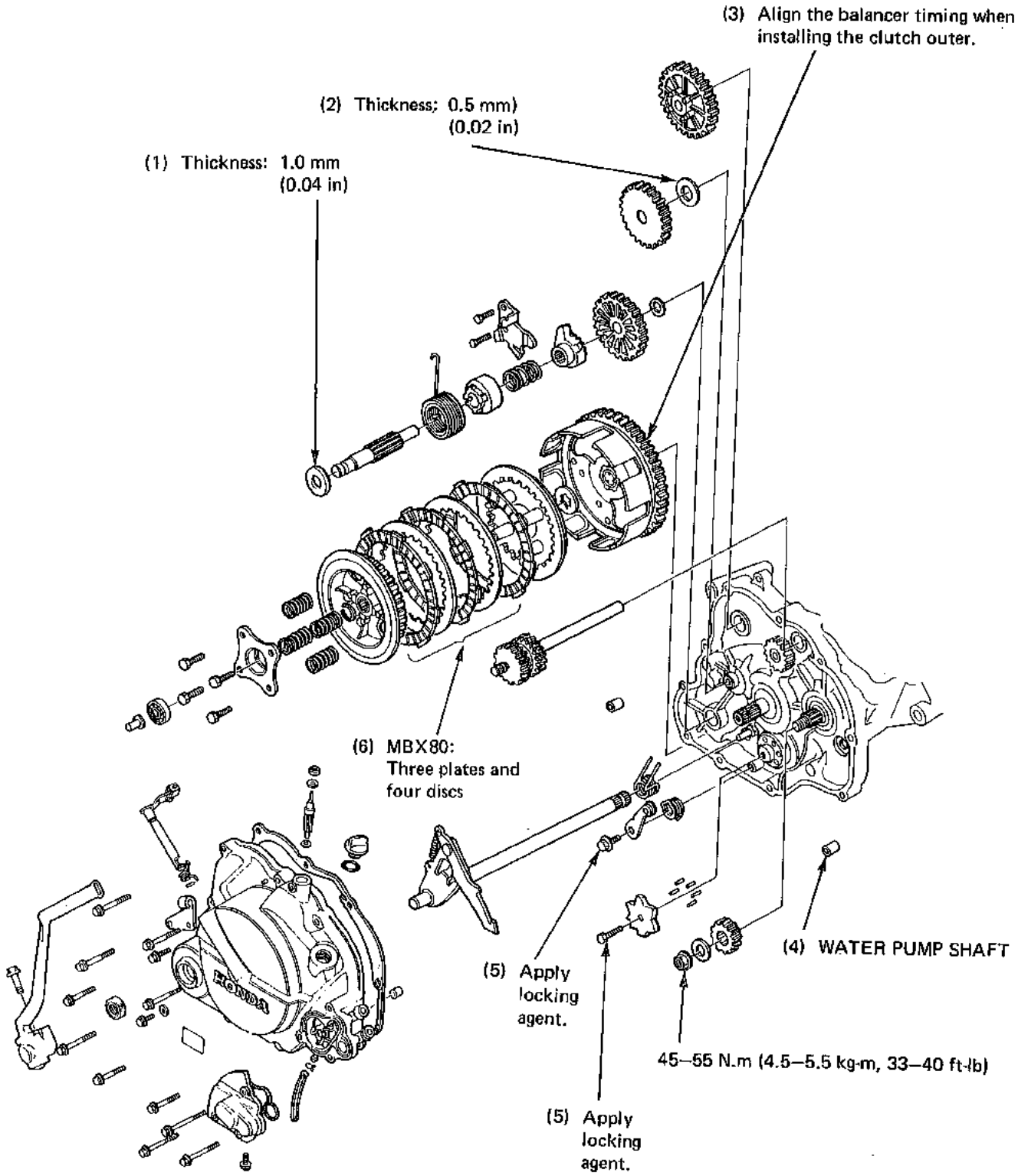
CLUTCH/KICKSTARTER/ GEARSHIFT LINKAGE



SERVICE INFORMATION	7-2	CLUTCH INSTALLATION/ BALANCER TIMING	7-10
TROUBLESHOOTING	7-2	KICKSTARTER	7-11
RIGHT CRANKCASE COVER	7-3	SHIFT LINKAGE	7-14
CLUTCH/IDLER GEAR	7-5		

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SERVICE INFORMATION

GENERAL INSTRUCTIONS

- All clutch and kickstarter maintenance and inspections can be accomplished with the engine installed.
- Make balancer timing adjustment when the clutch outer and primary drive gear are removed.
- Use the UNIVERSAL HOLDER to remove and install the primary drive gear.
- Remove all gasket materials from the mating faces of the cases.
- Do not allow dust and dirt to enter into the cylinder and crankcase.
- Avoid damaging or scratching the case mating surfaces.
- Before inspecting, clean all removed parts in solvent; dip the parts in clean transmission oil before installation.

TOOL

Common
Universal Holder 07725–0030000

TORQUE VALUE

Primary drive gear 45–55 N.m (4.5–5.5 kg-m, 33–40 ft-lb)

SPECIFICATIONS

ITEM	STANDARD mm (in)		SERVICE LIMIT mm (in)	
Clutch spring free length/preload	30.2/19–21 kg	(1.19/41.9–4.3 lb)	28.5/17 kg	(1.12/37.5 lb)
Clutch disc thickness	2.9–3.0	(0.114–0.118)	2.5	(0.098)
Clutch plate warpage	—		0.2	(0.008)
Clutch outer I.D.	17.000–17.018	(0.6693–0.6700)	17.060	(0.6717)
Kickstarter spindle O.D.	11.966–11.984	(0.4711–0.4718)	11.950	(0.4704)
Kickstarter pinion I.D.	12.016–12.034	(0.4731–0.4738)	12.070	(0.4752)
Kickstarter idle gear Contershaft O.D.	15.000–15.018	(0.5906–0.5913)	14.940	(0.5882)
Gear I.D.	15.032–15.050	(0.5918–0.5925)	15.100	(0.5945)
Balancer idle gear shaft O.D.	9.972–9.987	(0.3926–0.3932)	9.930	(0.3909)

TROUBLESHOOTING

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

Clutch operation feels rough
1. Outer drum slots rough

Abnormal engine vibration
1. Balancer out of time

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
3. Clutch cable not routed properly

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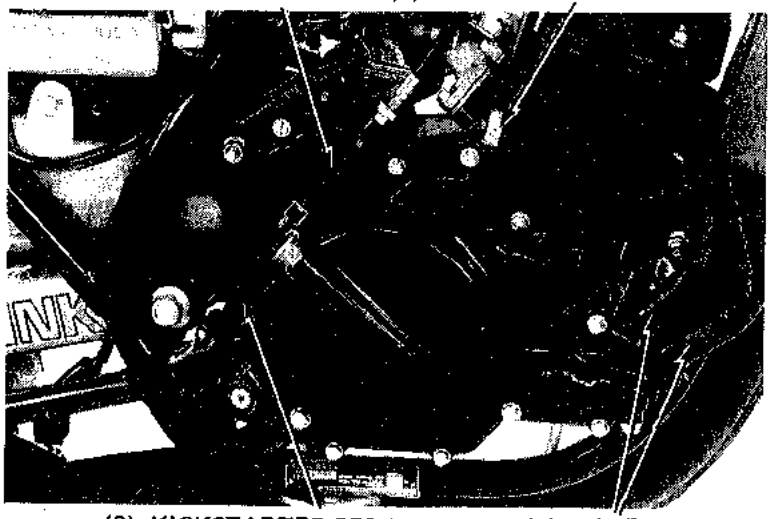
RIGHT CRANKCASE COVER

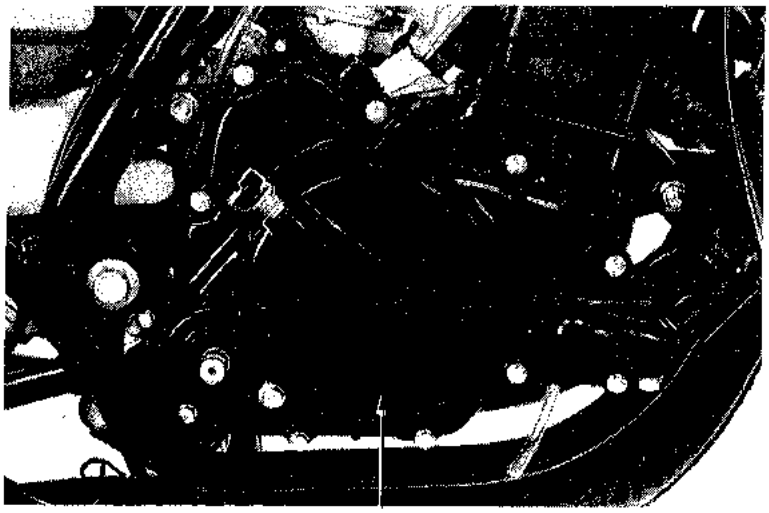
REMOVAL

On the Deluxe model, remove the under cowl (Page 14-3).
Drain the coolant (Page 10-3).

Drain oil from the transmission.
Remove the kickstarter pedal.
Disconnect the clutch cable from the clutch arm.
Disconnect the tachometer cable.
Disconnect the repiator hoses at the right crankcase cover.

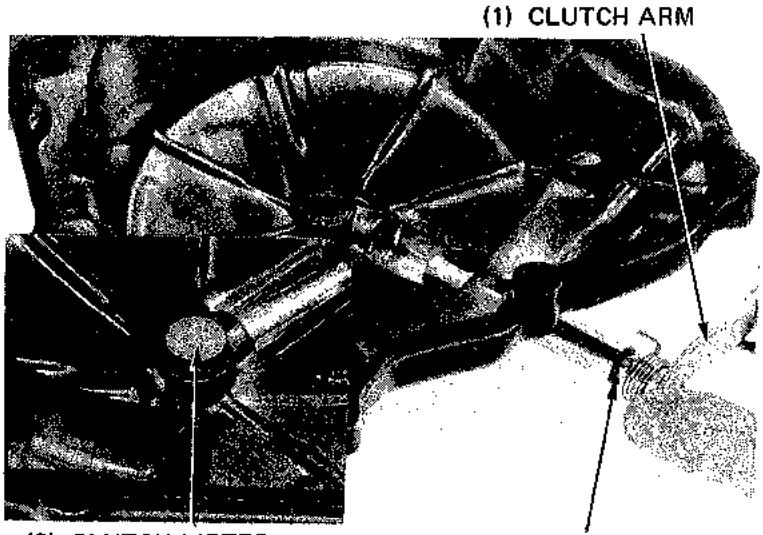


Remove the bolts attaching the right crankcase cover, and remove the right crankcase cover.



DISASSEMBLY

Remove the clutch lifter rod, then remove the clutch arm.
Check the O-ring for damage, fatigue or other faults. Check the clutch arm for bending.



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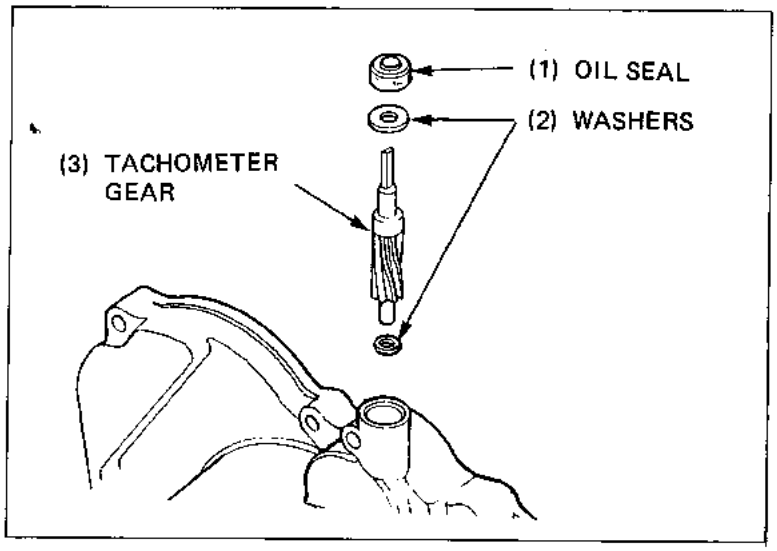
Remove the tachometer gear.

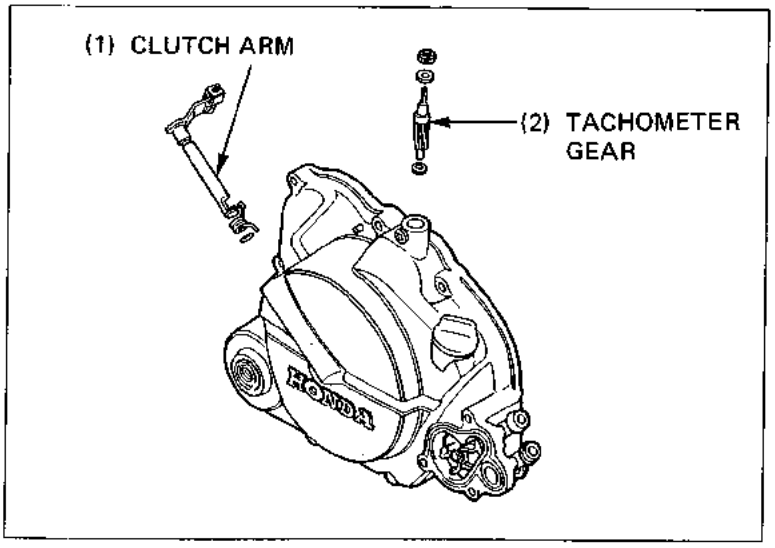
NOTE

Do not forget to install the washer.

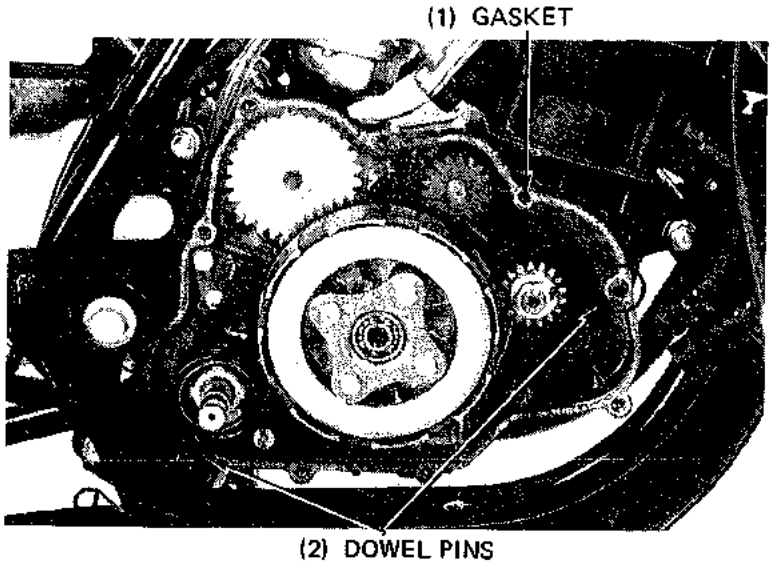


INSTALLATION

Install the clutch arm and clutch lifter rod.
Install the tachometer gear on the right crankcase cover.



Install the dowel pins and gasket on the crankcase.



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Install the right crankcase cover on the crankcase.
Install the clutch cable bracket and tighten with the flange bolt.

NOTE

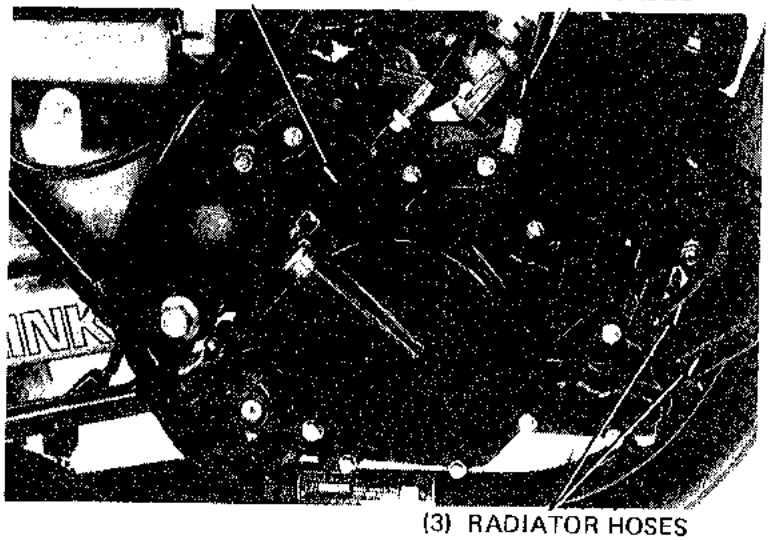
Tighten the bolts in a crisscross pattern and in two or three steps.

Install the kickstarter pedal.

(1) KICKSTARTER PEDAL (2) RIGHT CRANKCASE COVER

Connect the tachometer and clutch cables.
Connect the radiator hoses to the water pump.
Fill the transmission with recommended oil (Page 2-3).
Fill the cooling system with recommended coolant (Page 10-3).
Adjust the clutch lever free play (Page 3-7).

(1) CLUTCH CABLE (2) TACHOMETER CABLE



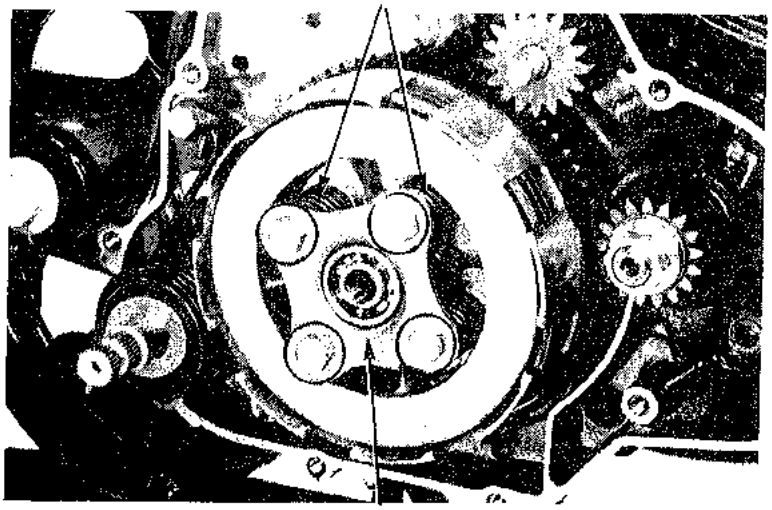
(3) RADIATOR HOSES

CLUTCH/IDLER GEAR

CLUTCH REMOVAL

Remove the right crankcase cover (Page 7-3).
Remove the clutch lifter plate and clutch springs by removing the bolts.

(1) CLUTCH SPRINGS



(2) LIFTER PLATE

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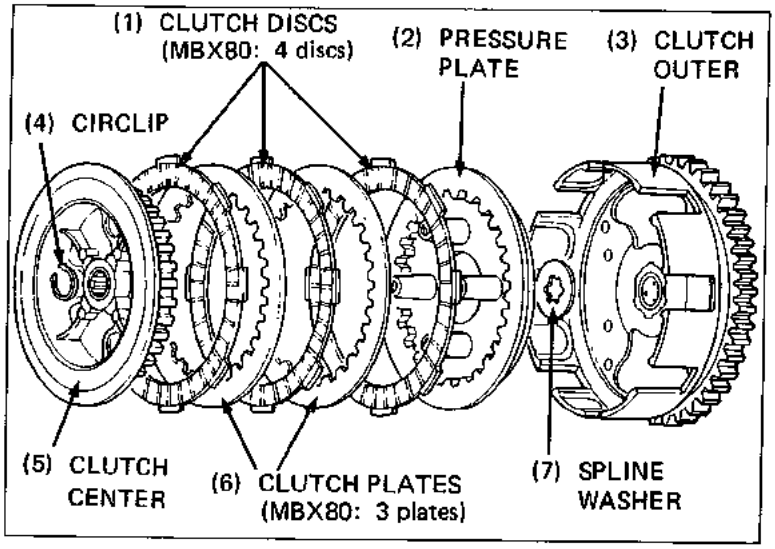
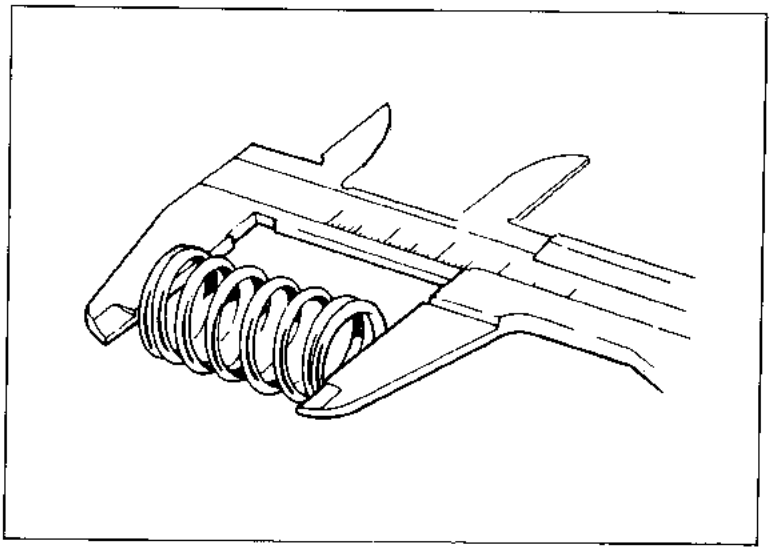
Remove the circlip.
Remove the clutch center, clutch discs, clutch plates, and clutch pressure plate.
Remove the spline washer and remove the clutch outer.



CLUTCH SPRING INSPECTION

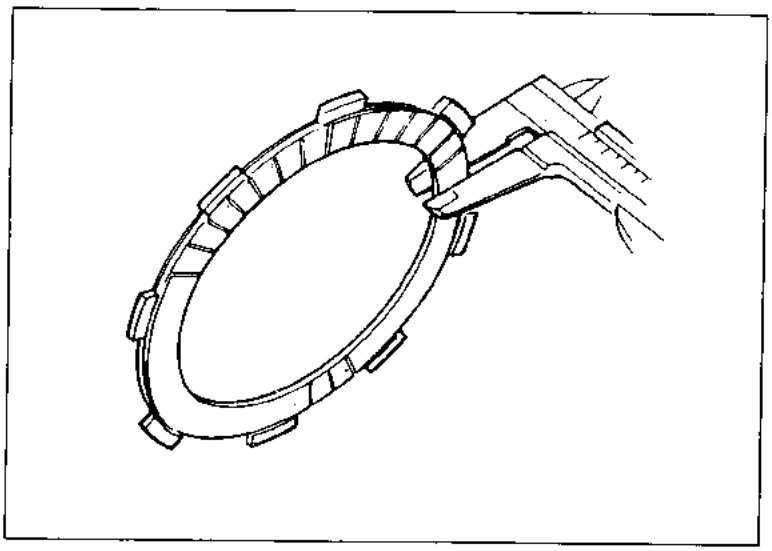
Measure each clutch spring free length.
SERVICE LIMIT: 28.5 mm (1.12 in)



CLUTCH DISC INSPECTION

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

Measure each clutch disc thickness.
SERVICE LIMIT: 2.50 mm (0.098 in)



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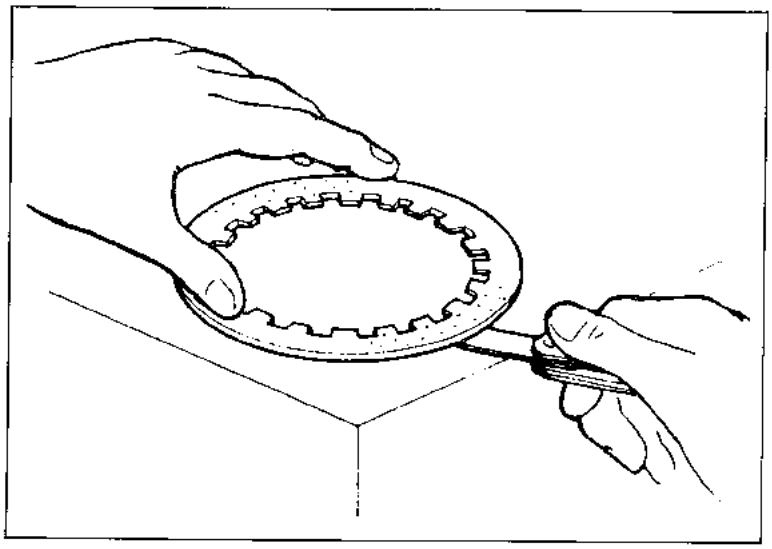
CLUTCH PLATE INSPECTION

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

SERVICE LIMIT: 0.20 mm (0.008 in)

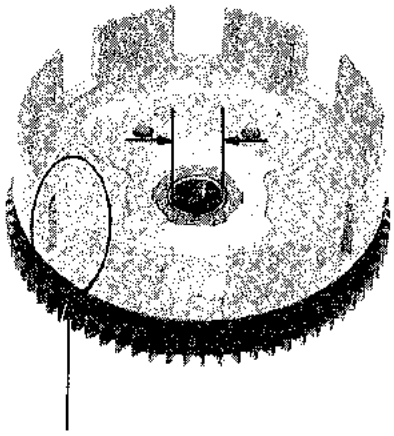


CLUTCH OUTER INSPECTION

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

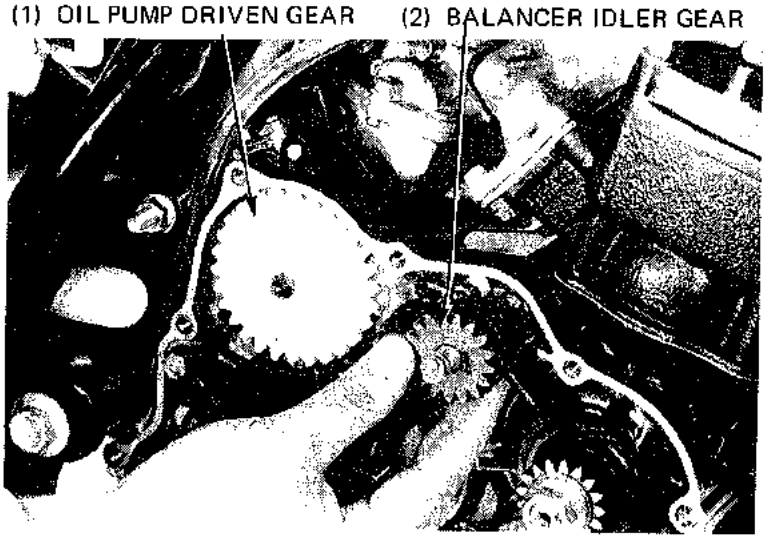
Measure the clutch outer I.D.

SERVICE LIMIT: 17.060 mm (0.6717 in)



BALANCER IDLER GEAR/OIL PUMP DRIVEN GEAR REMOVAL

Remove the clutch, then remove the balncer idler gear and oil pump driven gear.



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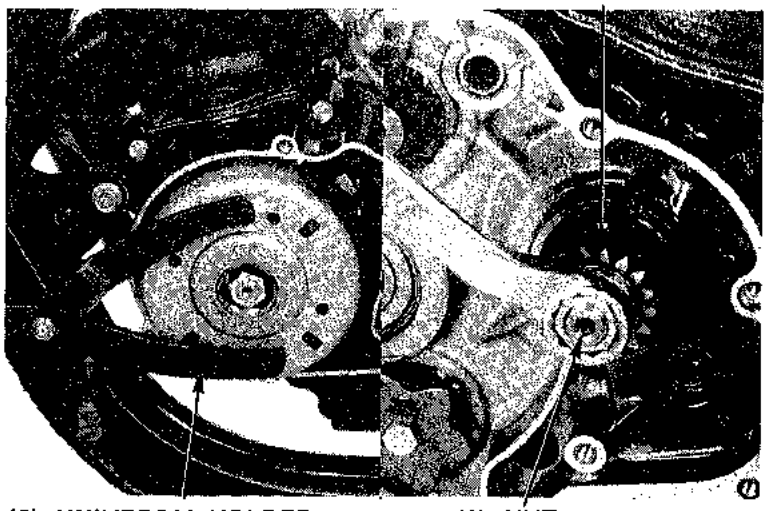
PRIMARY DRIVE GEAR REMOVAL

Remove the left crankcase cover.

Hold the flyweel with the UNIVERSAL HOLDER and remove the 12 mm nut, drive gear, and collar.

NOTE

> Use the UNIVERSAL HOLDER to prevent the crankshaft from being turned during operation.



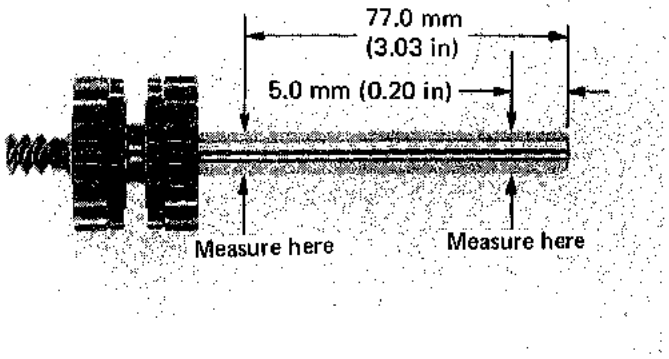
BALANCER IDLER GEAR INSPECTION

Check the balancer idler gear for wear or damage.

Check the idler gear shaft for bending, wear or damage.

Measure the balancer idler gear shaft O.D. at two places as shown.

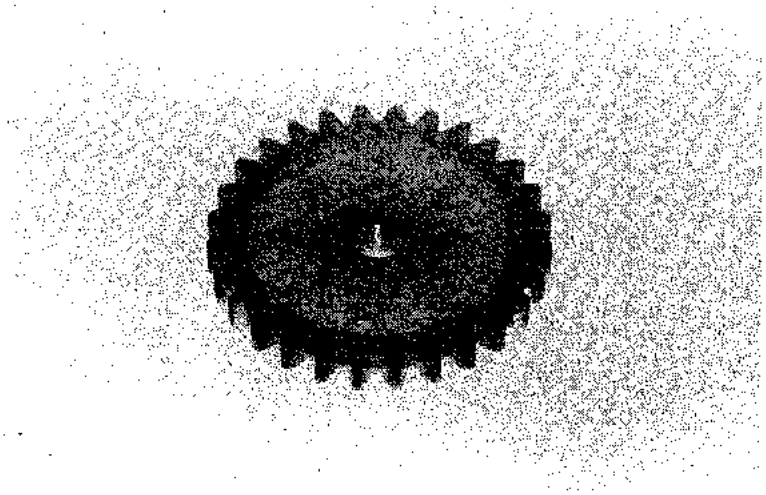
SERVICE LIMIT: 9.930 mm (0.3909 in)



Check the oil pump driven gear for wear or damage.

Check the oil pump driven gear shaft for cracks or other defects.

Replace the shaft and gear with new ones if cracked.



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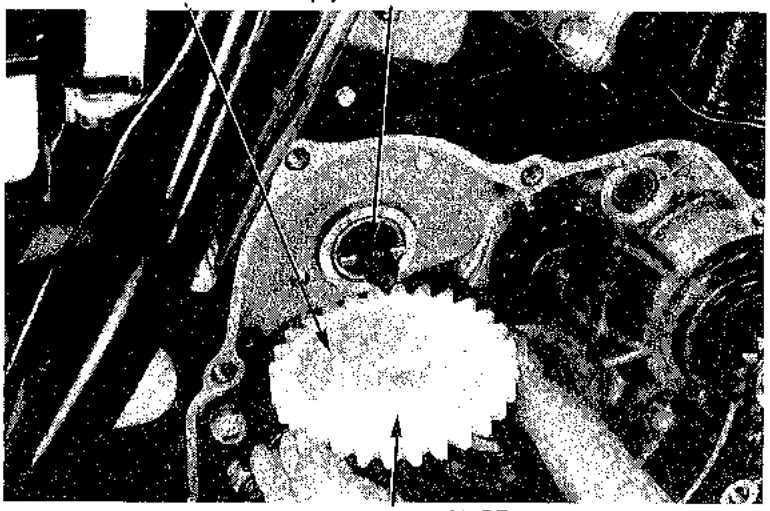
OIL PUMP DRIVEN GEAR INSTALLATION

Install the oil pump driven gear aligning the slot in the gear with the pin on the drive shaft.

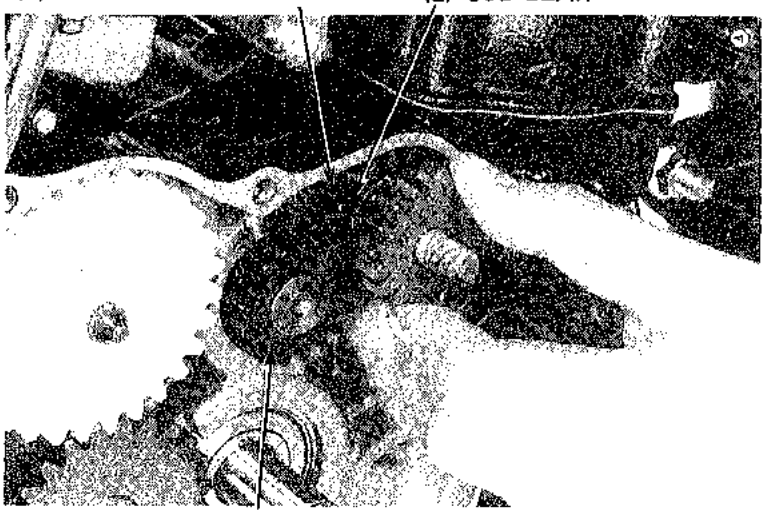


BALANCER IDLER GEAR INSTALLATION

Install the balancer idle gear in the crankcase.

CAUTION

> *Install the idler gear while rotating the gear by hand until the sub gear engages the balancer gear.*



PRIMARY DRIVE GEAR INSTALLATION

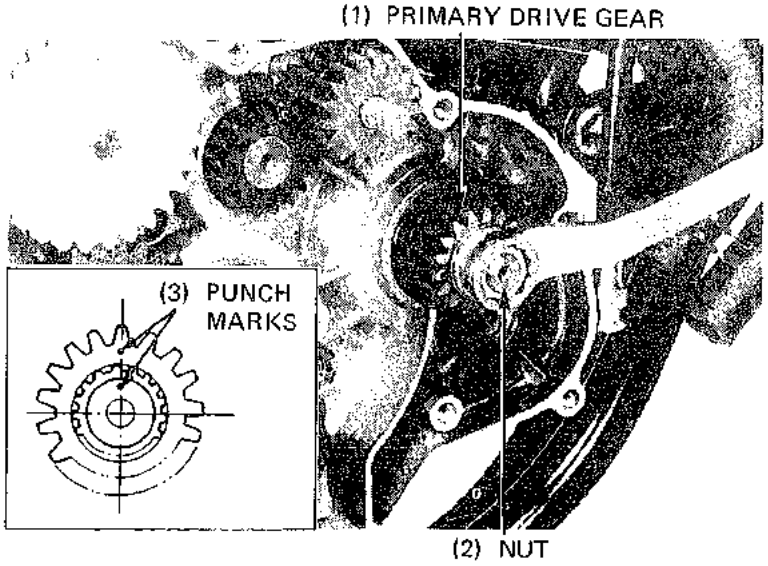
Install the collar on the crankshaft, then install the primary drive gear.

NOTE

> Align the punch mark on the end of the crankshaft with the punch mark on the gear.

Install the washer and 12 mm nut on the end of the crankshaft. Hold the flywheel with the UNIVERSAL HOLDER and tighten the 12 mm nut to the specified otrque.

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



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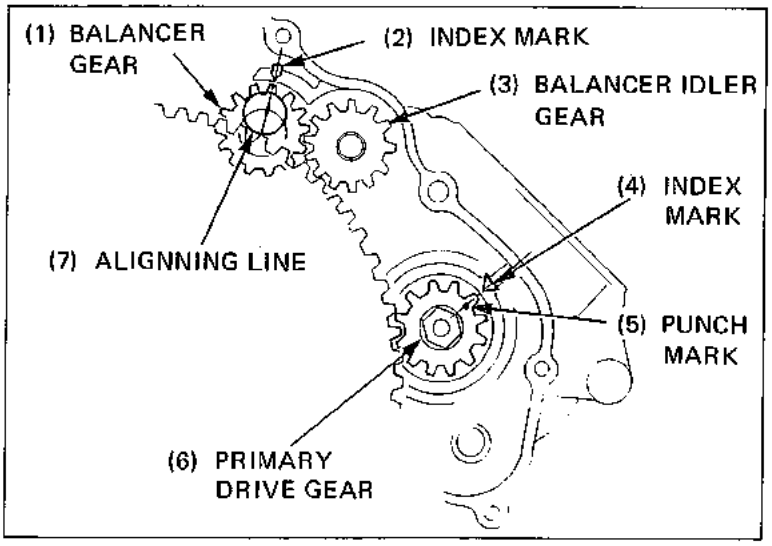
BALANCER TIMING/ CLUTCH INSTALLATION

(1) Align the punch mark on the primary drive gear with the index mark on the crankcase.

(2) Align the line on the balancer gear with the index mark on the crankcase.

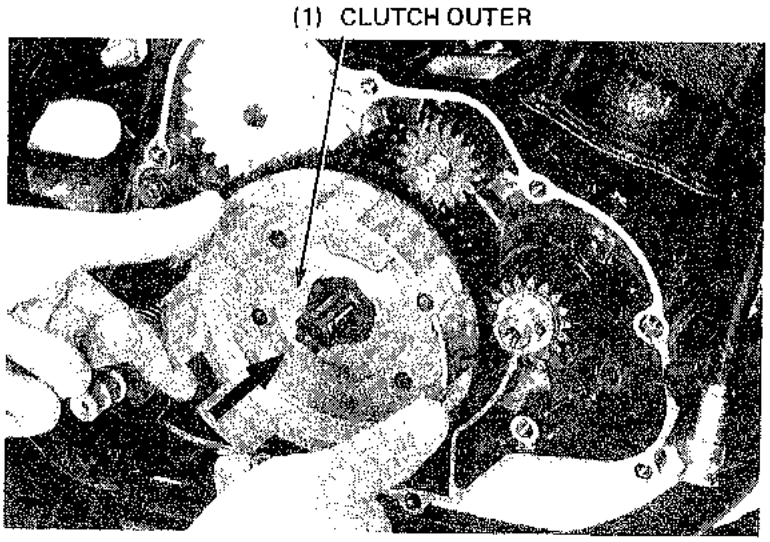


CAUTION

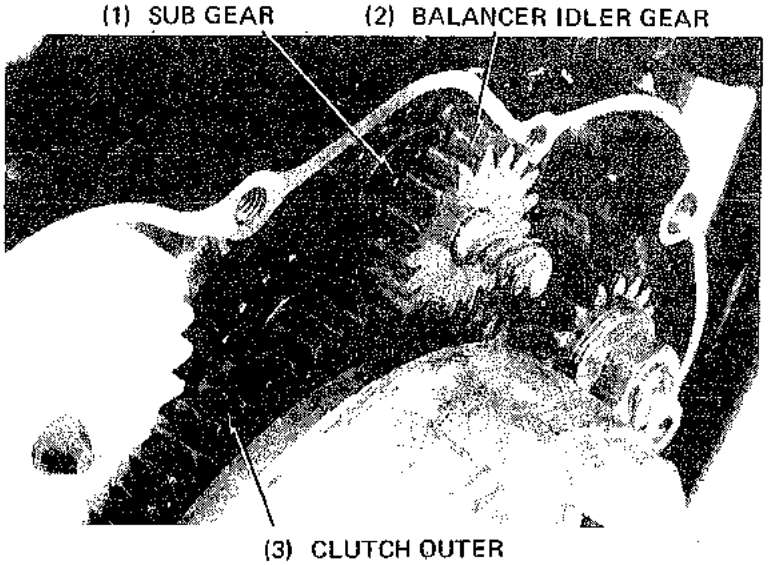
Make sure that the aligning line on the balancer gear is in line with the mating line on the shaft.

Install the clutch outer without disturbing the setups in steps (1) and (2).

Rotate the clutch outer right or left until the gear engages the sub gear, then push it in the crankcase.



Make sure that the sub gear engages the clutch outer gear properly.



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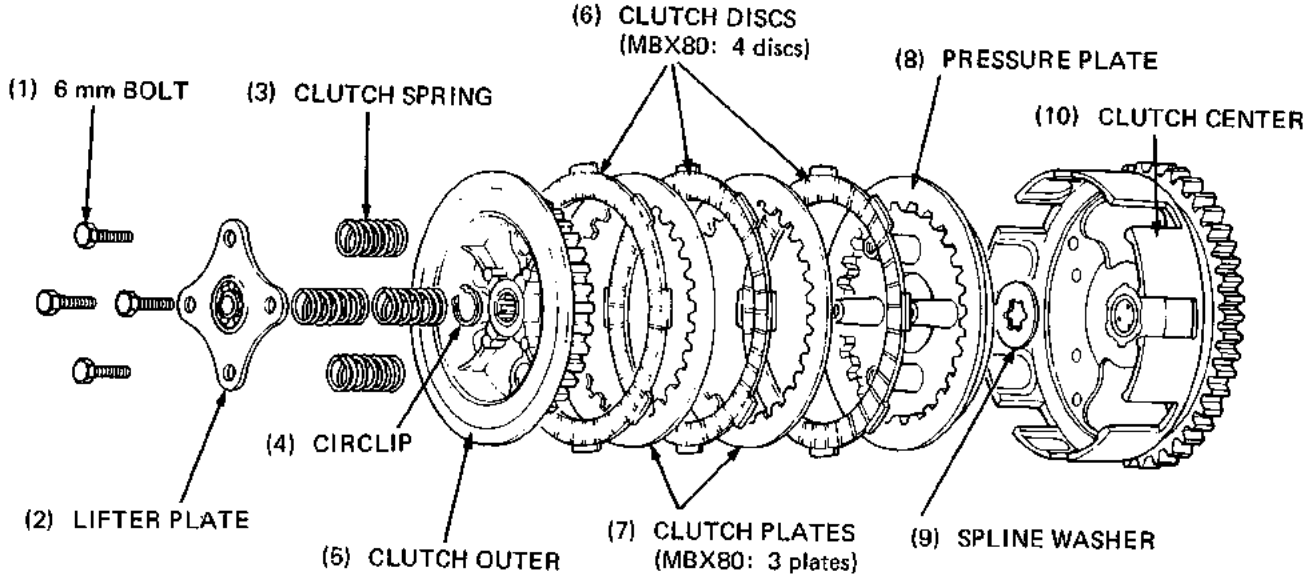
Install the following parts in the clutch outer:
- Spline washer
- Pressure plate
- Clutch discs and clutch plates
- Clutch center
- Circlip
- Clutch springs
- Clutch lifter plate
- 6 mm bolts

After assembling, install the right crankcase cover (Page 7-4).

Pour in the recommended transmission oil (Page 2-3).



KICKSTARTER

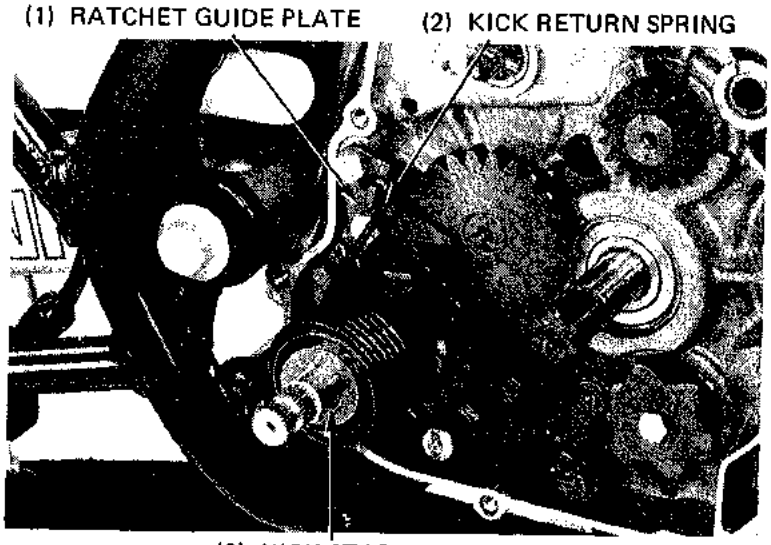
SPINDLE REMOVAL

Remove the right crankcase cover (Page 7-3).
Remove the clutch assembly (Page 7-5).

NOTE

> It is not necessary to remove the clutch to remove the kickstarter spindle.

Remove the kick return spring from the ratchet guide plate, then remove the kickstarter spindle.



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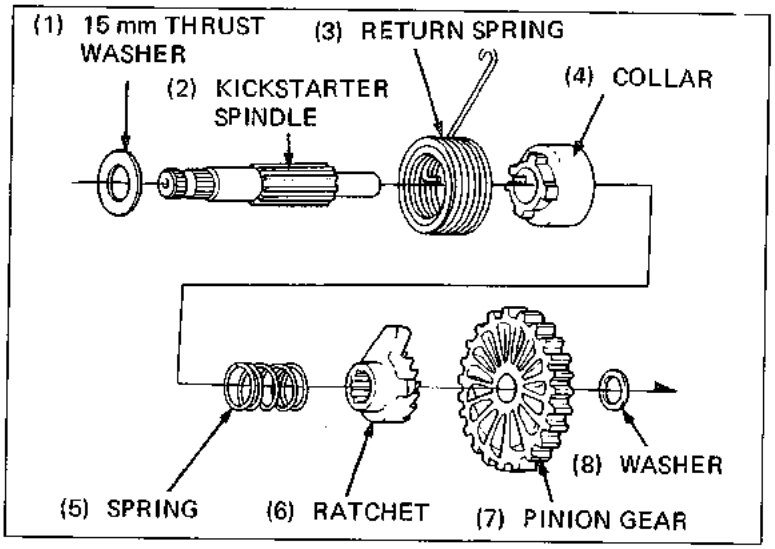
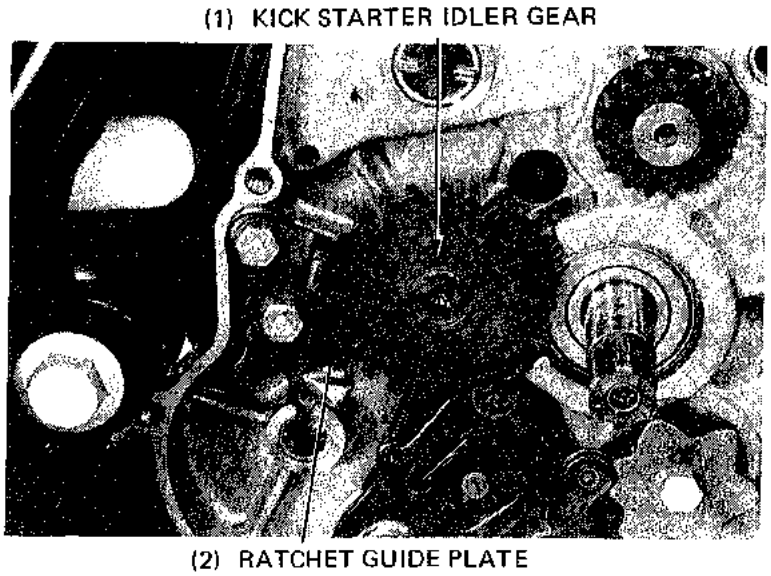
Dissemble the kickstarter.



IDLER GEAR REMOVAL

Remove the two attaching bolts and remove the ratchet guide plate.

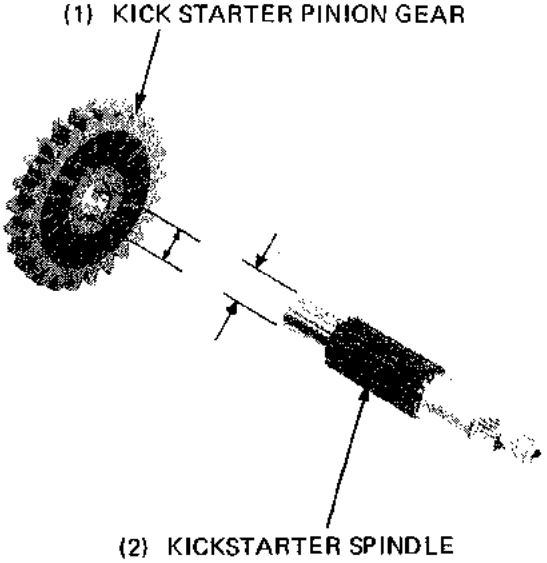
Remove the kickstarter idler gear and 15 mm thrust washer.



INSPECTION

Measure the kickstarter spindle O.D.
SERVICE LIMIT: 11.950 mm (0.4704 in)

Measure the kick pinion gear I.D.
SERVICE LIMIT: 12.070 mm (0.4752 in)



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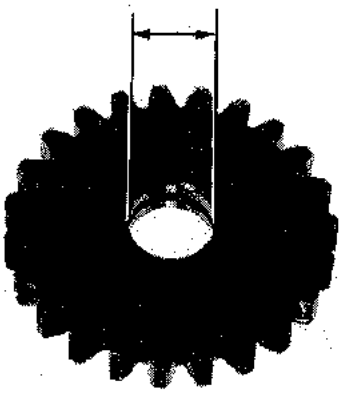
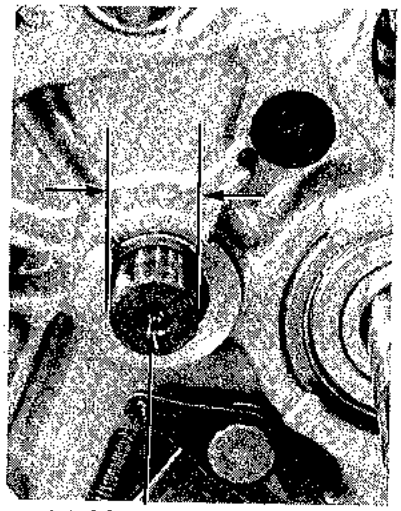
Measure the kick idler gear I.D.
SERVICE LIMIT: 15.100 mm (0.5945 in)

Measure the countershaft O.D.
SERVICE LIMIT: 14.940 mm (0.5882 in)

Calculate the clearance between the gear and shaft.
SERVICE LIMITE: 0.100 mm (0.0039 in)





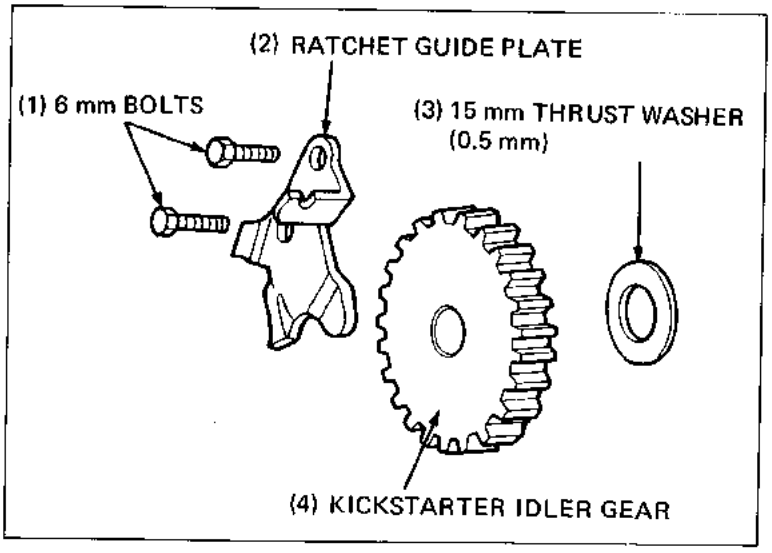
KICKSTARTER INSTALLATION

Install the 15 mm thrust washer and kickstarter idler gear and ratchet guide plate.

Tighten the ratchet guide plate with the two bolts. Tighten to the specified torque.
TORQUE: 8–12 N.m (0.8–1.2 kg-m, 6–9 ft-lb)

CAUTION

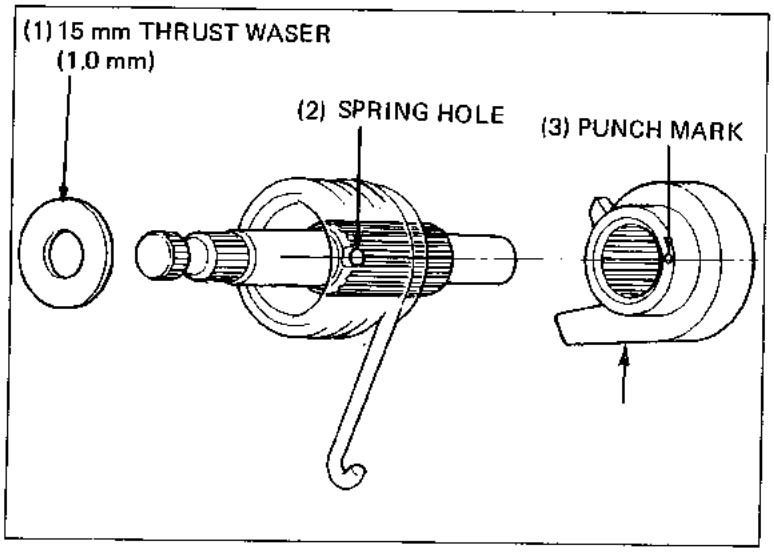
Do not mix the 15 mm thrust washer (0.5 mm thick and kick spindle 15 mm thrust washer (1.0 mm thick).



Install the kickstarter in the reverse order of disassembly.

CAUTION

- *Slide the ratchet over the kickstarter spindle with the punch mark on the ratchet aligned with the spring hole in the spindle.*
- *Do not confuse the 15 mm washer (1.0 mm thick) with the 0.5 mm thickness washer.*



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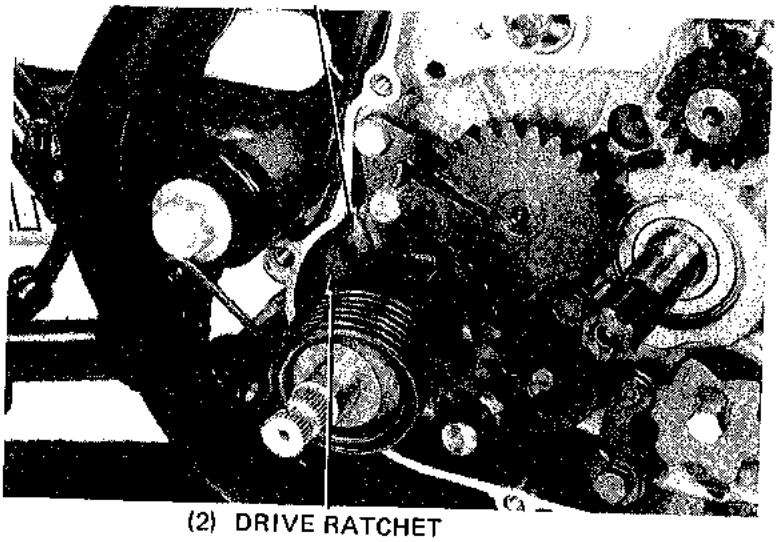
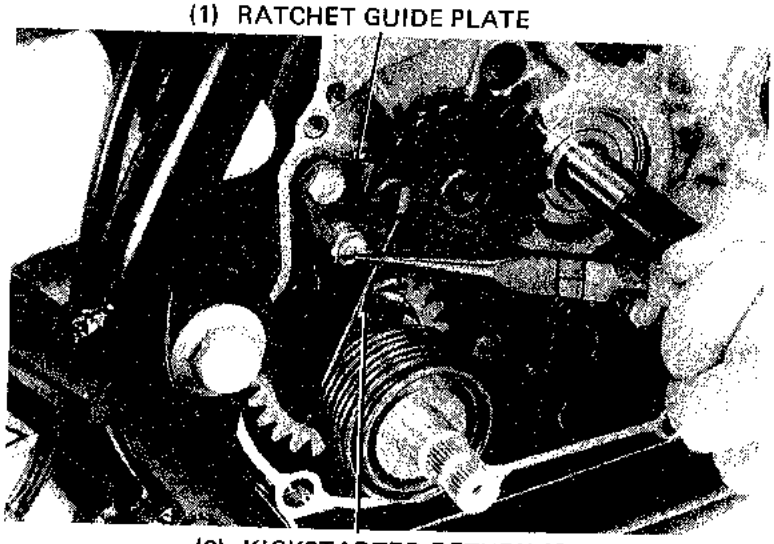
Install the kickstarter in the crankcase with the drive ratchet resting against the guide plate stopper as shown.



Install the kick return spring.
With the balancer properly timed, install the clutch (Page 7-10).

Install the right crankcase cover (Page 7-4).

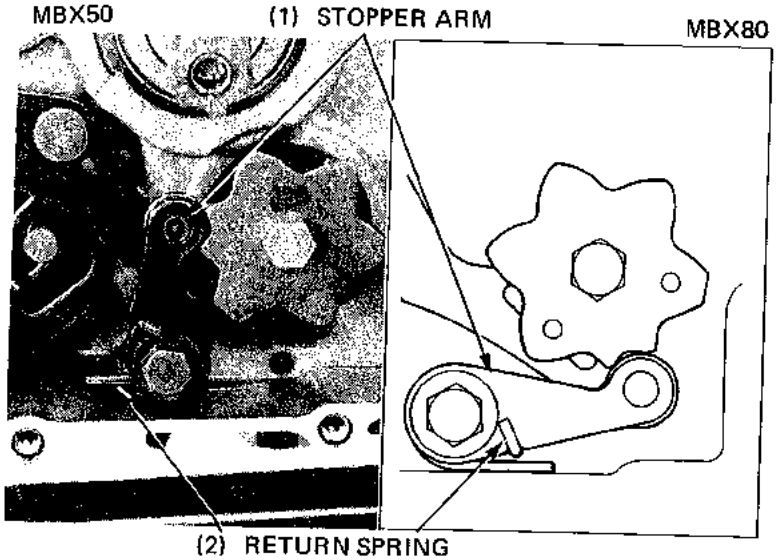
Check the operation of the kickstarter.



SHIFT LINKAGE

REMOVAL

Remove the clutch (Page 7-5).
Remove the kickstarter idler gear (Page 7-11).
Remove the bolt attaching the clutch stopper arm and remove the stopper arm and spring.



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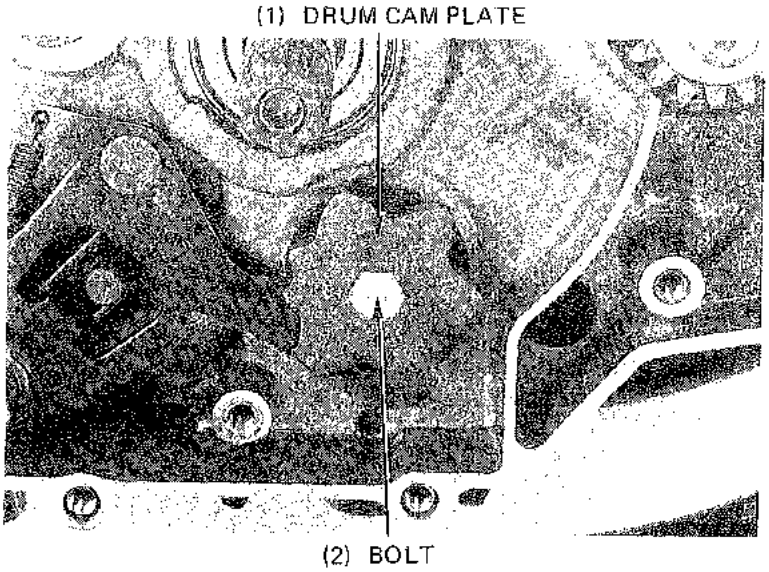
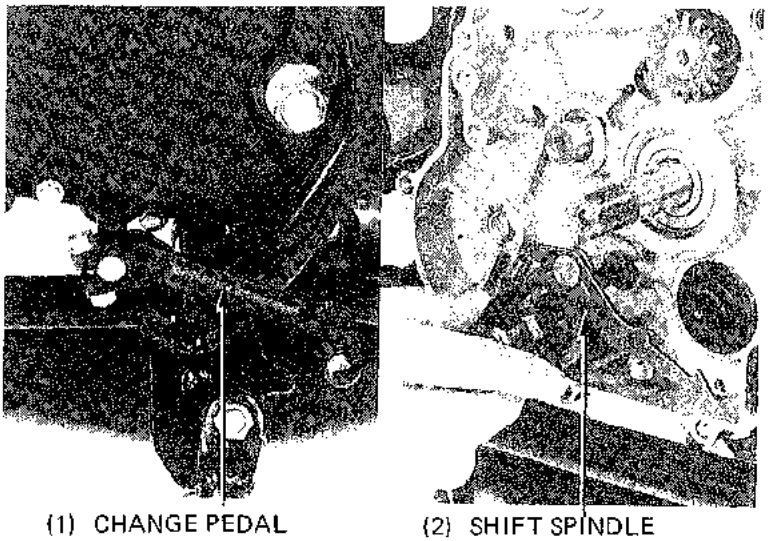
Remove the bolt attaching the drum cam plate and remove the plate and roller pins.



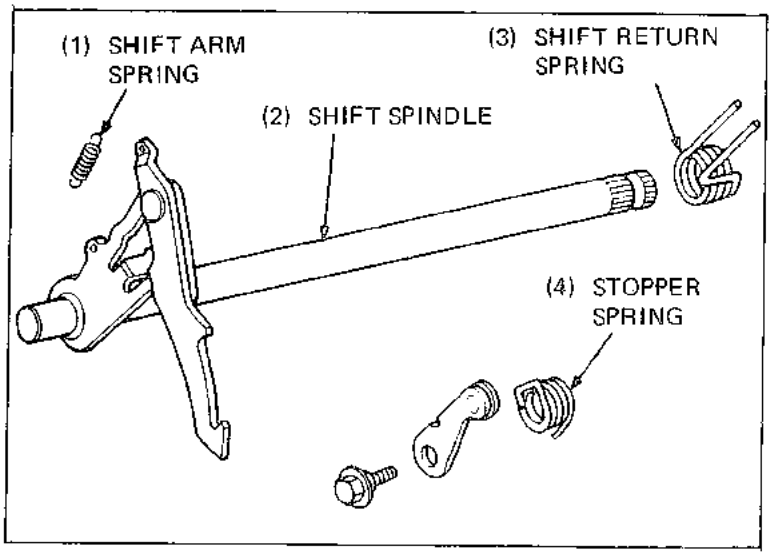
Remove the change pedal and withdraw the shift spindle



INSPECTION

Perform the following operations:

- Check the shift arm spring for weakness.
- Check the shift return spring for weakness.
- Check the stopper spring for weakness.
- Check the shift spindle for wear or bending.



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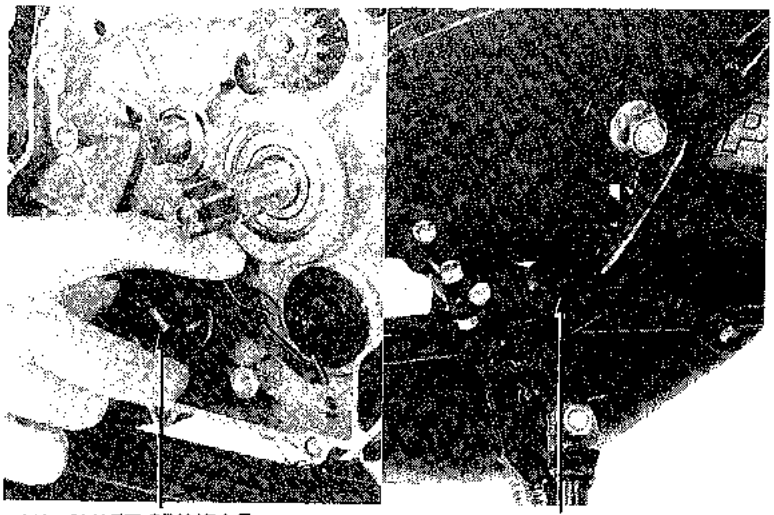
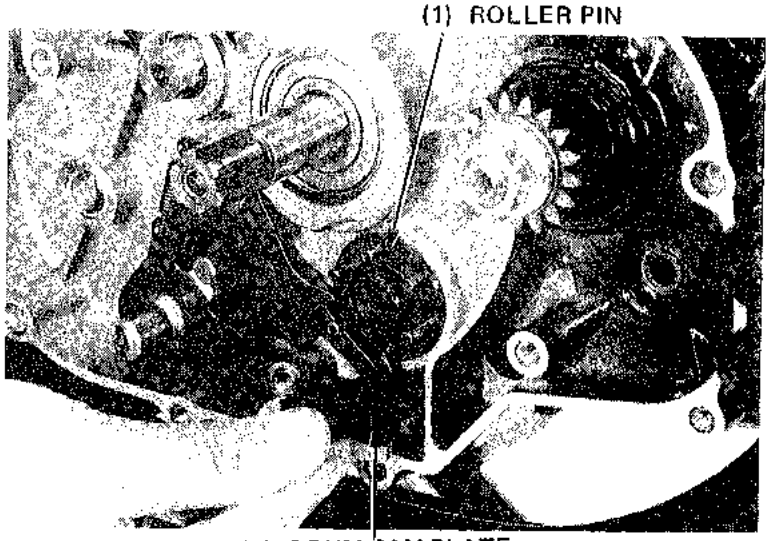
INSTALLATION

Installation of the shift linkage is the reverse order of removal.

Install the shift spindle and change pedal.
Tighten the change pedal bolt to the specified torque.
TORQUE: 8–12 N.m (0.8–1.2 kg-m, 6–9 ft-lb)



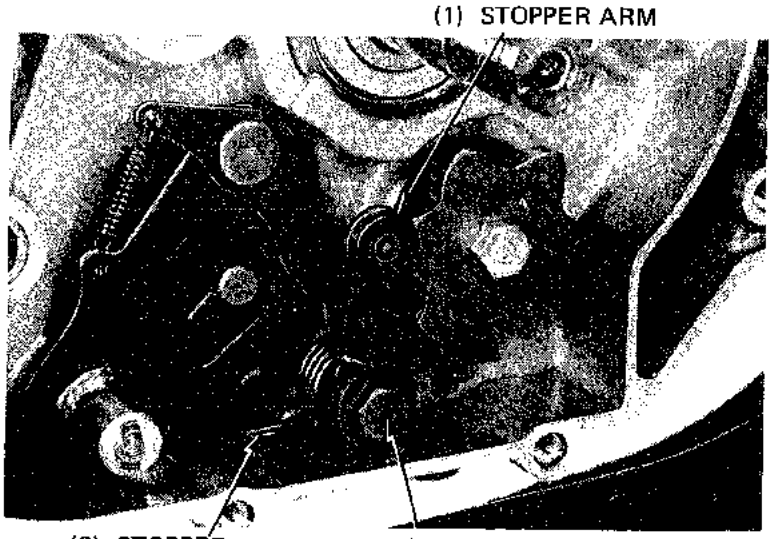
Insert the roller pins into holes in the shift drum.
Position the drum cam plate on the pins with the concaves in the plate with the higher pins.
Apply locking agent to the bolt threads and undersides of the bolt and install the plate with the bolt.
Tighten the bolt to the specified torque.
TORQUE: 8–10 N.m (0.8–1.2 kg-m, 6–9 ft-lb)



Install the stopper arm and stopper spring in the crankcase and tighten the attaching bolt to the specified torque.
TORQUE: 8–12 N.m (0.8–1.2 kg-m, 6–9 ft-lb)

Check the operation of the shift linkage.
With the balancer properly timed, install the clutch (Page 7-9).

Install the right crankcase cover (Page 7-4).



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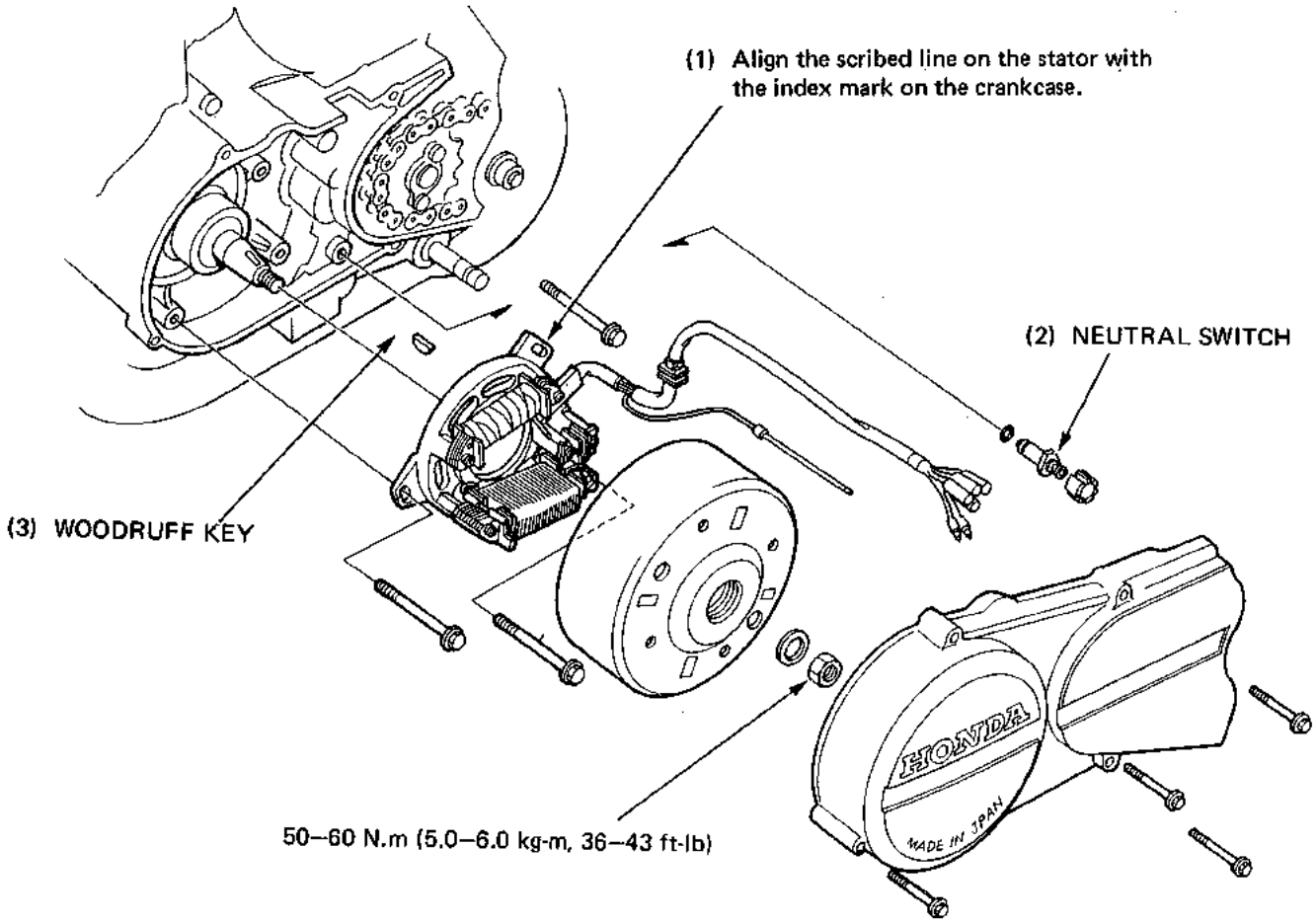

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SERVICE INFORMATION	8-1
ALTERNATOR REMOVAL	8-2
ALTERNATOR INSTALLATION	8-4

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SERVICE INFORMATION

GENERAL INSTRUCTIONS

- The alternator can be serviced without removing it from the motorcycle. Do not remove the pulse generator from the stator base.
- For alternator inspection, refer to Section 15.

TOOLS

Common

Universal Holder	07725–0030000
Flywheel Puller	07733–0010000

TORQUE VALUE

Alternator rotor nut	50–60 n.m (5.0–6.0 kg-m, 36–43 ft-lb)

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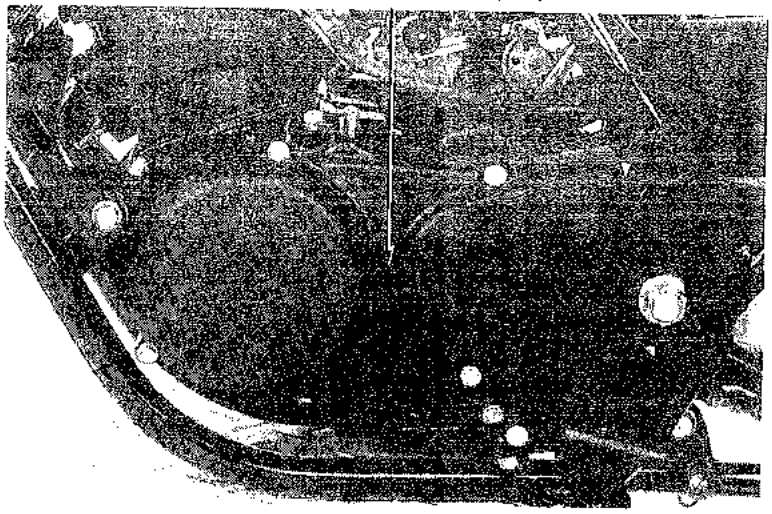
ALTERNATOR REMOVAL

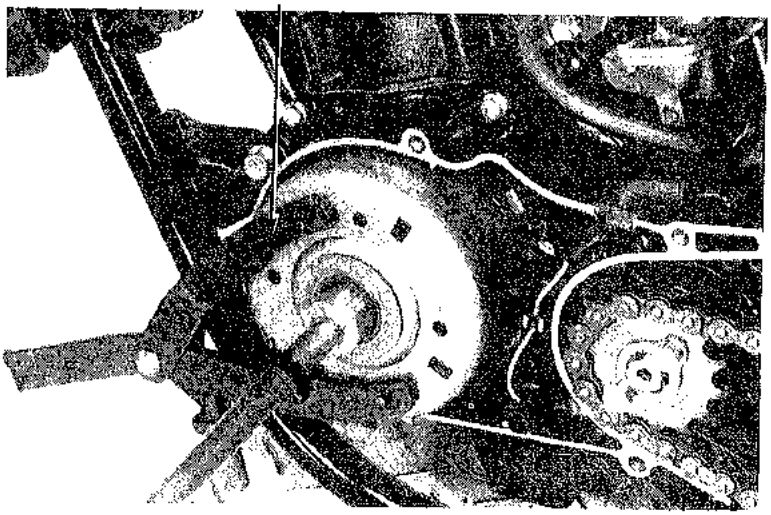
On the Deluxe model, remove the under cowl (Page 14-3).
Remove the flange bolts and remove the left crankcase cover.

(1) LEFT CRANKCASE COVER



Remove the 12 mm nut attaching the flywheel.

(1) UNIVERSAL HOLDER

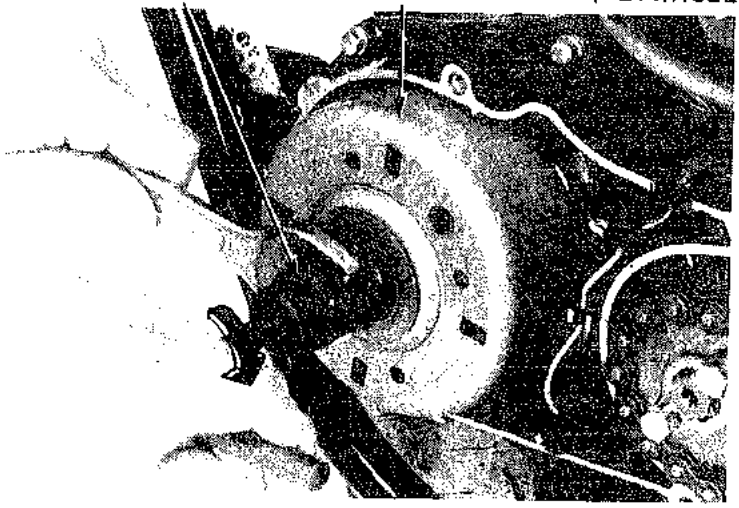


Remove the flywheel.

NOTE

Keep the woodruff key in a parts rack so it is not lost.

(1) ROTOR PULLER (2) ALTERNATIOR ROTOR (FLYWHEEL)



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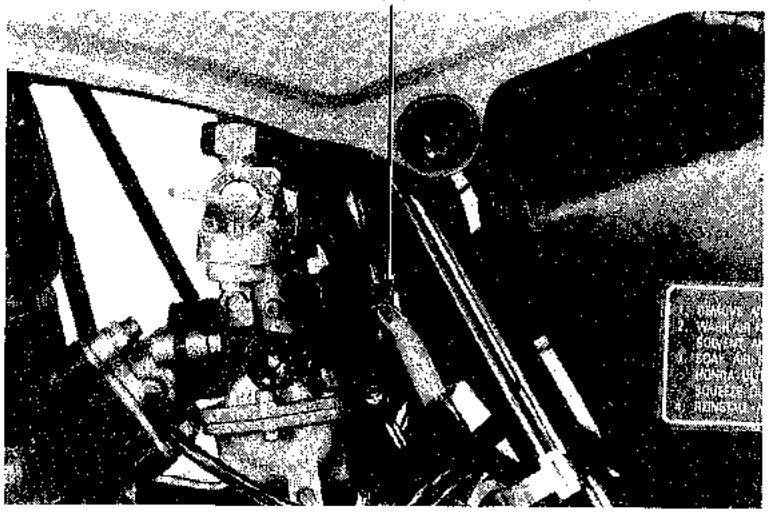
Disconnect the alternator wire connectors and neutral switch wire.



Disconnect the netural switch wire from the switch.

NOTE

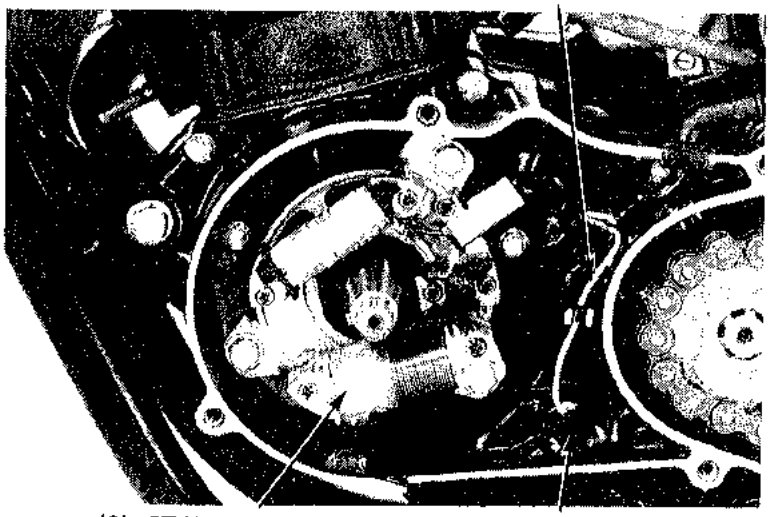
Do not remove the netural switch. Oil will flow out when the switch is removed.

Remove the alternator.

CATUION

• *Do not separate the pulse generator from the stator base.* • *Keep the coils in a parts rack to prevent damaging the coil.*

For alternator inspection, refer to page 15-6 and 16-4.



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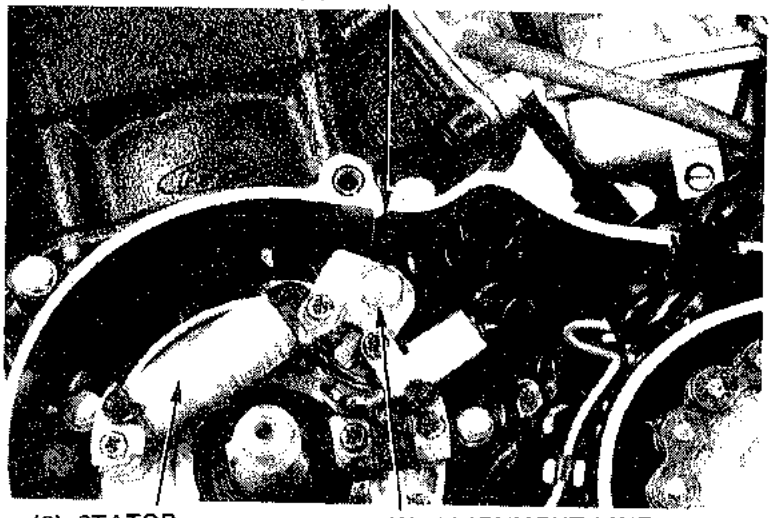
ALTERNATOR INSTALLATION

Install the stator.

NOTE

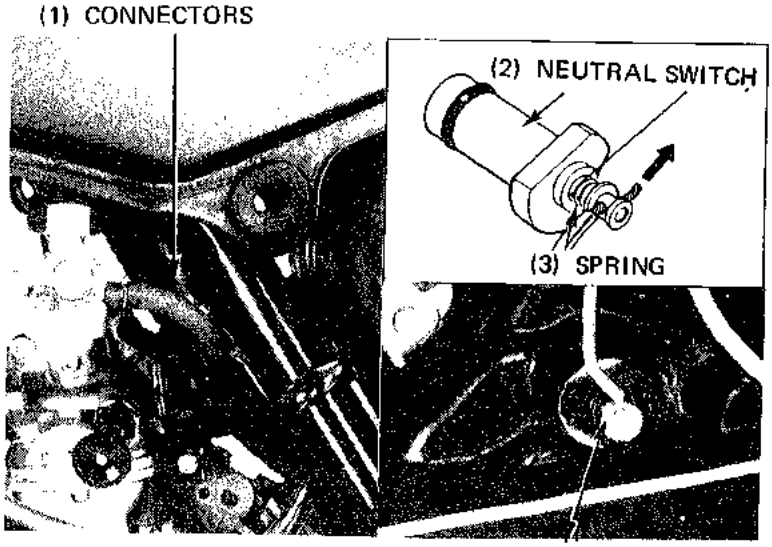
> Install the stator with the line aligned with the index mark on the crankcase.



Connect the alternator and neutral switch wires.

NOTE

> Secure the alternator wires to the frame. Press down on the neutral switch terminal to install the wire.

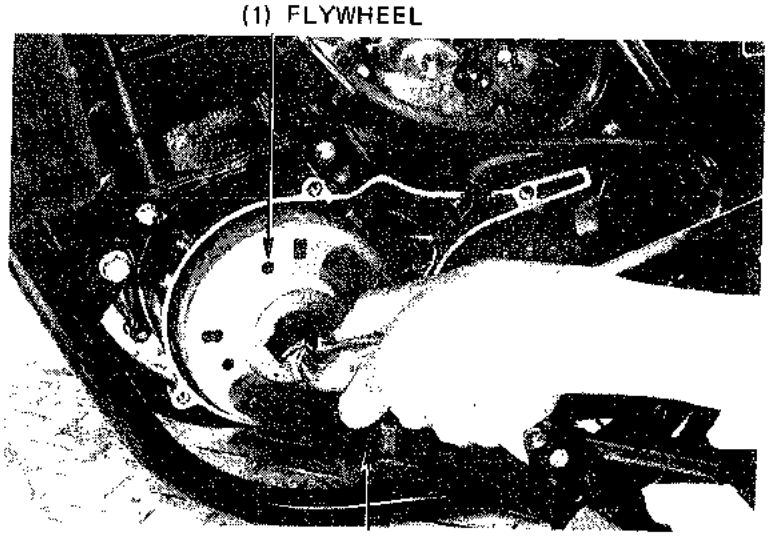


Install the woodruff key in the crankshaft keyway, then install the flywheel on the crankshaft.

NOTE

> - Check that there are no foreign materials inside the flywheel before installation.
> - Clean the taper hole in the flywheel of burrs and other damage and repair if necessary.

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



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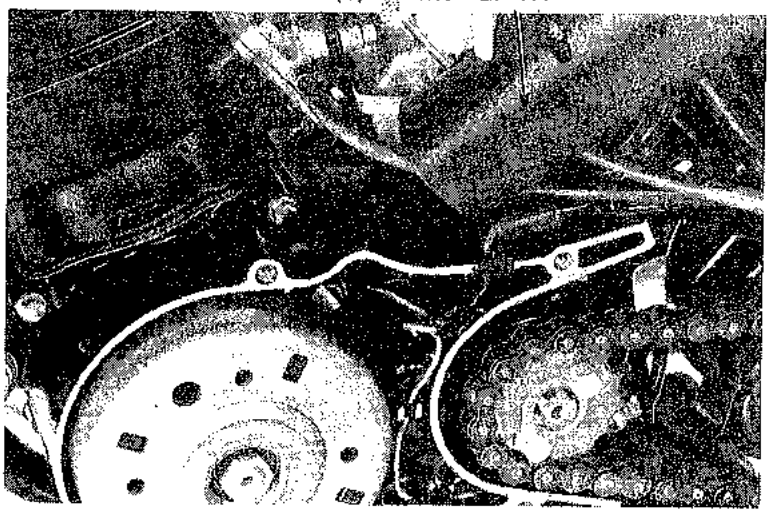
After installing the flywheel, start the engine and inspect the ignition timing (Page 3-6).

(1) TIMING LIGHT

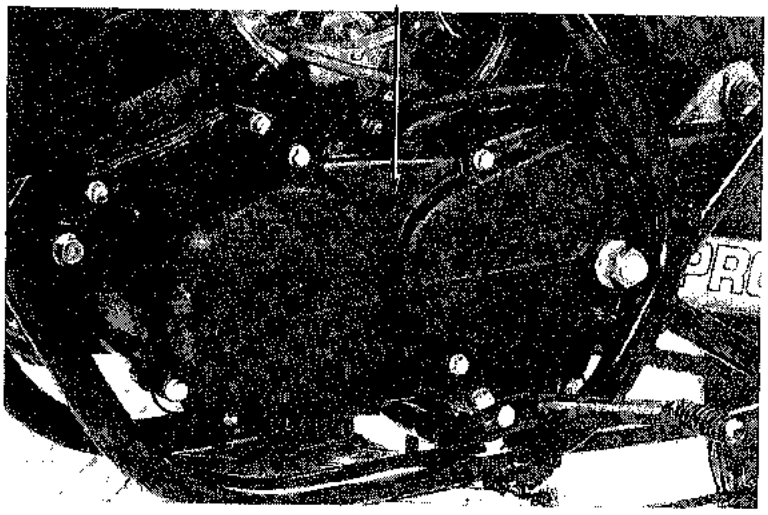


Install the left crankcase cover.

NOTE

- Make sure that the alternator and neutral switch wires are not interfering with the flywheel.
- Do not pinch the wires between the left crankcase cover and case.

(1) LEFT CRANKCASE COVER



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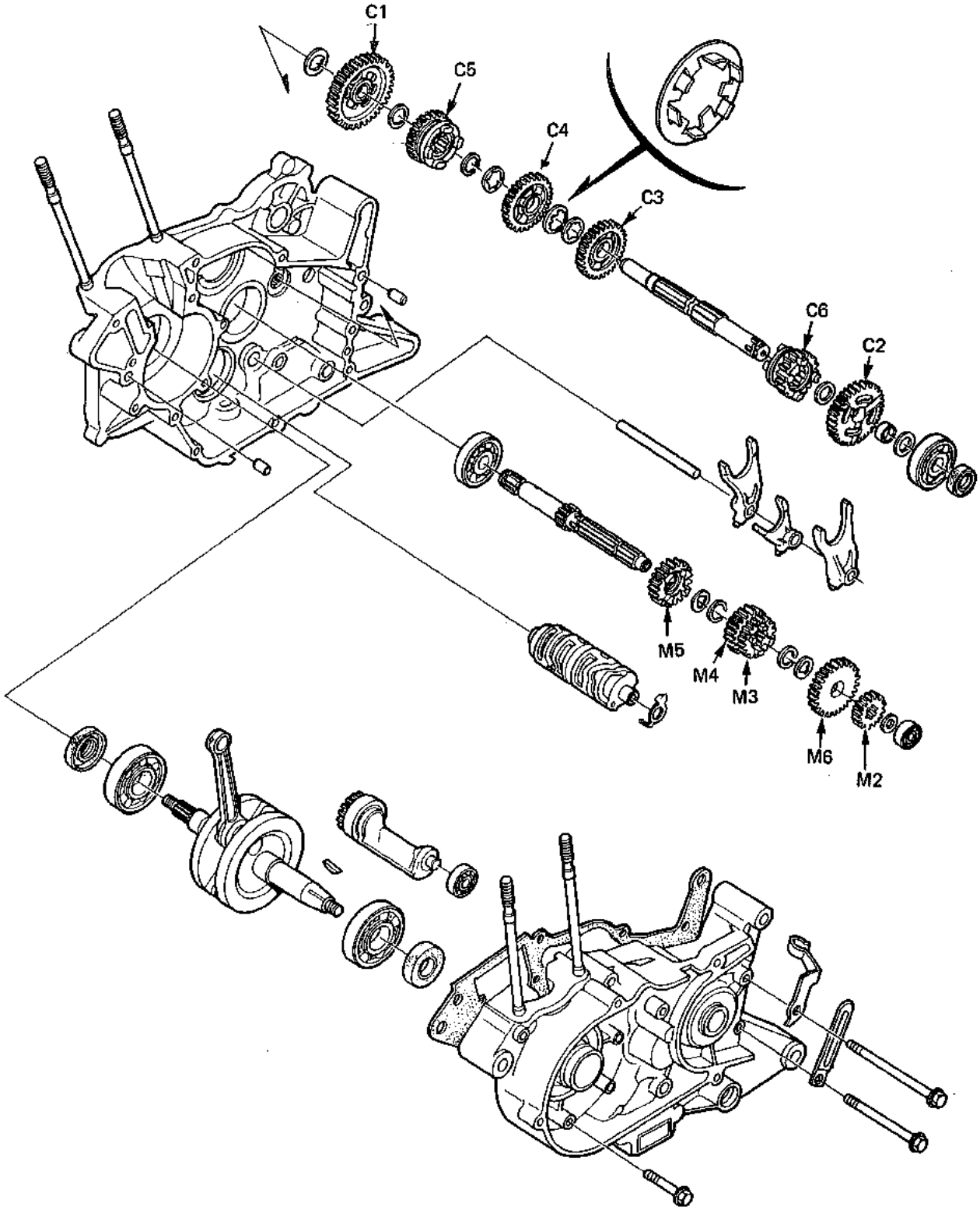
C1
C5
C4
C3
C6
C2
M5
M4
M3
M6
M2

SERVICE INFORMATION	9-2
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SERVICE INFORMATION

GENERAL INSTRUCTIONS

- This section includes transmission and crankshaft repairs which require crankcase separation.
- The following parts must be removed before disassembling the crankcase.

• Oil pump	See section 2
• Cylinder head/cylinder/piston	See section 6
• Clutch/kickstarter/gearshift linkage	See section 7
• Alternator	See section 8

TOOLS

Special	
Crankshaft Assembly Tool	07965–1660100
Balancer Weight Driver	07945–1660000
Bearing Remover Set 12 mm	07936–1660000
Bearing Puller	07631–0010000 (Commercially available)
Attachment 28 x 30 mm	07746–1870100
Common	
Driver A	07794–0010000
Attachment 32 x 35 mm	07746–0010100
Attachment 42 x 47 mm	07746–0010300
Attachment 52 x 55 mm	07746–0010400
Pilot 12 mm	07746–0040200
Pilot 17 mm	07746–0040400
Pilot 25 mm	07746–0040600
Driver C	07746–0030100
Attachment 25 mm	07746–0030200

SPECIFICATIONS

ITEM		STANDARD mm (in)		SERVICE LIMIT mm (in)	
Shift fork I.D.		10.00–10.018	(0.3937–03944)	10.05	(0.396)
Shift fork end thickness		4.93–5.00	(0.194–0.197)	4.50	(0.177)
Shift fork shaft O.D.		9.972–9.987	(0.3926–0.3932)	9.95	(0.392)
Gasrshift drum O.D.	At 13 mm	12.934–12.984	(0.5092–0.5112)	12.85	(0.506)
	At 36 mm	35.950–35.975	(1.4154–1.4163)	35.90	(1.413)
Gear I.D.	M5 gear	17.016–17.034	(0.6699–0.6706)	17.10	(0.673)
	M6 gear	17.016–17.034	(0.6699–0.6706)	17.10	(0.673)
	C1 gear	16.516–16.534	(0.6502–0.6509)	16.60	(0.654)
	C2 gear	20.020–20.041	(0.7882–0.7890)	20.10	(0.791)
	C3, C4 gear	19.020–19.041	(0.7488–0.7496)	19.10	(0.752)
C2 gear bushing	I.D.	17.016–17.034	(0.6699–0.6706)	17.10	(0.673)
	O.D	19.995–19.984	(0.7872–0.7868)	19.90	(0.783)
Mainshaft O.D.		16.966–16.984	(0.6680–0.6687)	16.93	(0.667)
Countershaft O.D.	At 16.5 mm	16.466–16.484	(0.6483–0.6490)	16.44	(0.647)
	At 19 mm	18.959–18.980	(0.7464–0.7472)	18.93	(0.745)
	At 17 mm	16.978–16.989	(0.6684–0.6689)	16.94	(0.667)
Connecting rod big end side clearance		0.15–0.55	(0.006–0.022)	0.85	(0.033)
Connecting rod big end radial play		—		0.05	(0.002)
Crankshaft runout at journals		—		0.10	(0.004)

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TROUBLESHOOTING

Engine noise
1. Main journal bearing worn
2. Crankpin bearing worn
3. Transmission bearing worn

Jumps out of gear
1. Gear dogs worn
2. Shift fork bent
3. Shift shaft bent
4. Shift drum stopper damaged

Hard shifting
1. Incorrect clutch adjustment
2. Shift forks bent
3. Shift shaft bent
4. Shift spindle pawl bent or damged
5. Shift drum cam slot damaged

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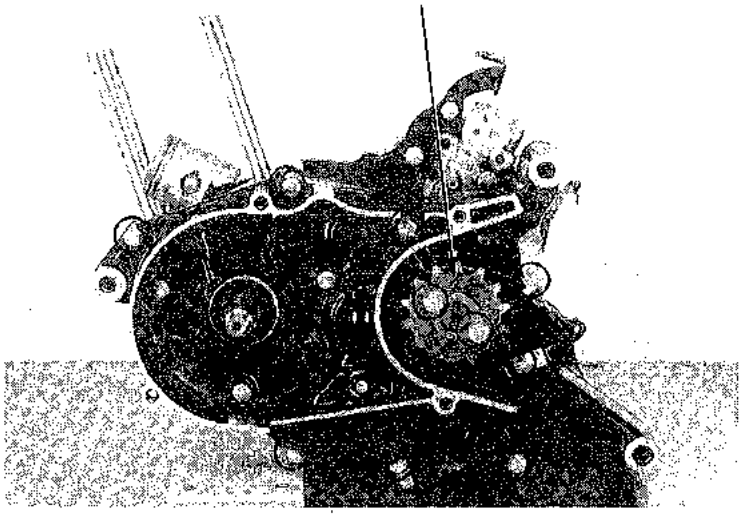
CRANKCASE SEPARATION

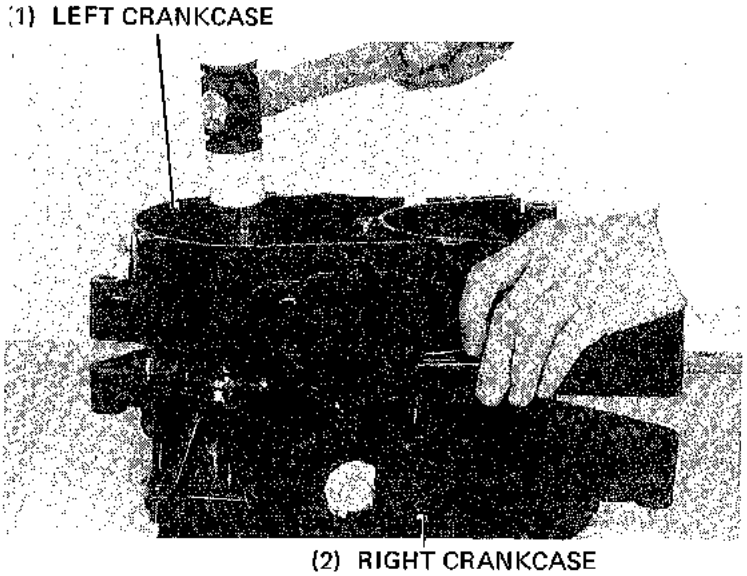
Remove the drive sprocket.
Remove the crankcase bolts.



Separate the left crankcase from the right crankcase.

CAUTION

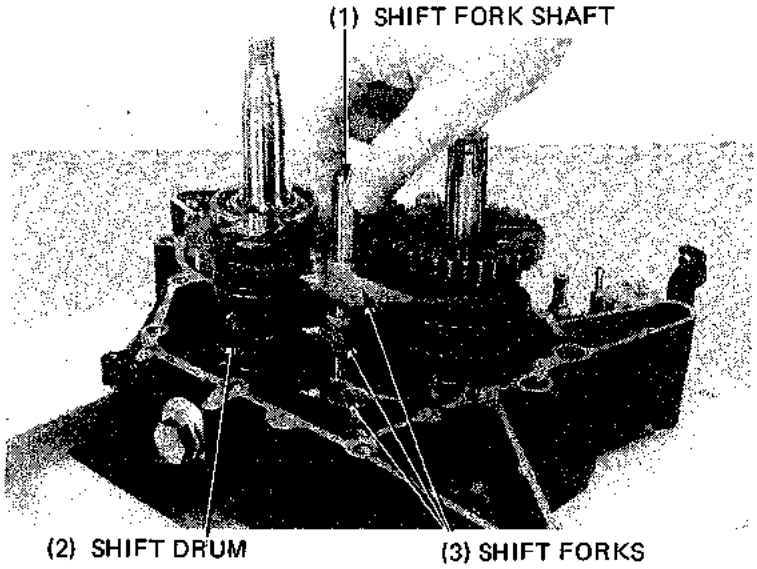
Do not pry between the right and left cases.



TRANSMISSION DISASSEMBLY

GEARSHIFT FORK/SHIFT DRUM

Remove the shift fork shaft from the right crankcase. Remove the shift drum and shift forks.



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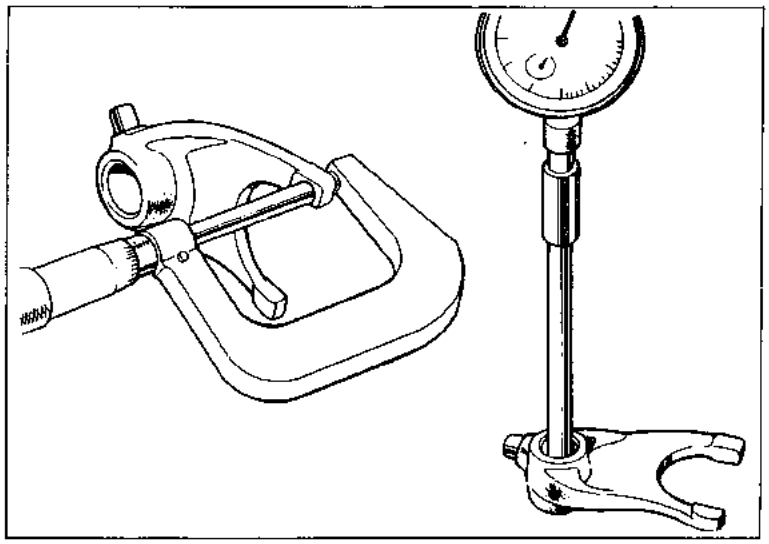
SHIFT FORK/SHIFT FORK SHAFT/ SHIFT DRUM INSPECTION

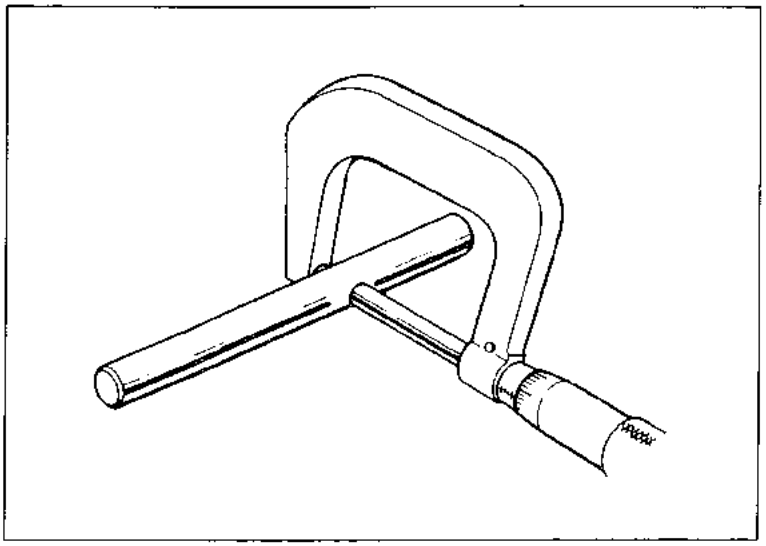
Check each shift fork for wear, bending or any other faults. Measure the I.D. and shift claw thickness.

SERVICE LIMITS:
Claw thickness: 4.50 mm (0.177 in)
I.D.: 10.50 mm (0.396 in)



Check the shift fork shaft for wear, damage or bending.

Measure the O.D.
SERVICE LIMIT: 9.95 mm (0.392 in)



Inspect the shift drum grooves and replace the drum if they are damged or show excessive wear.

Measure the shift drum O.D.
SERIVCE LIMITS:
A: 12.85 mm (0.506 in)
B: 35.90 mm (1.413 in)

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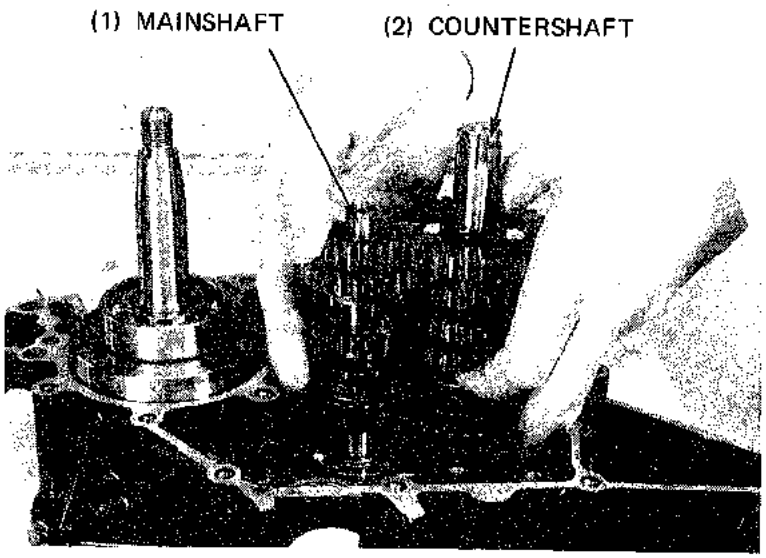
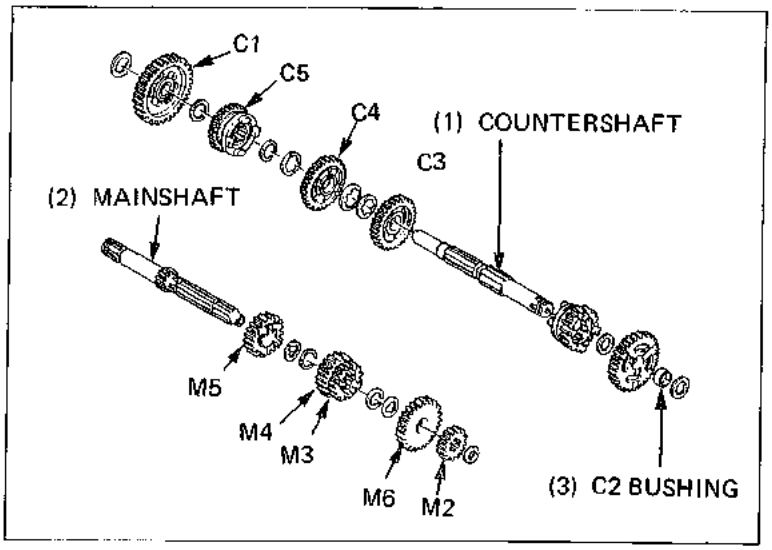
TRANSMISSION REMOVAL

Remove the mainshaft and countershaft.



TRANSMISSION INSPECTION

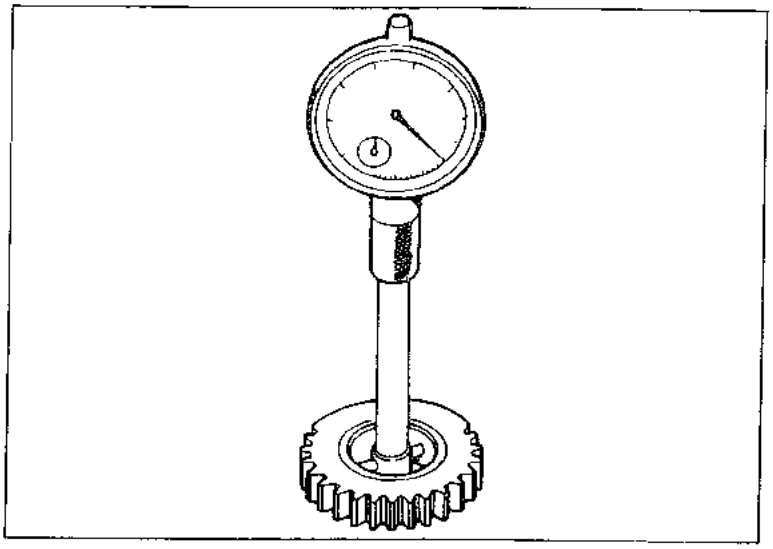
Check gear dogs, dog holes and teeth for excessive or abnormal wear, or evidence of insufficient lubrication.



Measure the I.D. of each gear and I.D. and O.D of the C2 bushing.

SERVICE LIMITS:

M5, M6 gears	:	17.10 mm (0.673 in)
C1 gear	:	16.60 mm (0.654 in)
C2 gear	:	20.10 mm (0.791 in)
C3 gear	:	19.10 mm (0.752 in)
C4 gear	:	19.10 mm (0.752 in)
C2 bushing O.D.	:	19.90 mm (0.783 in)
I.D.	:	17.10 mm (0.673 in)



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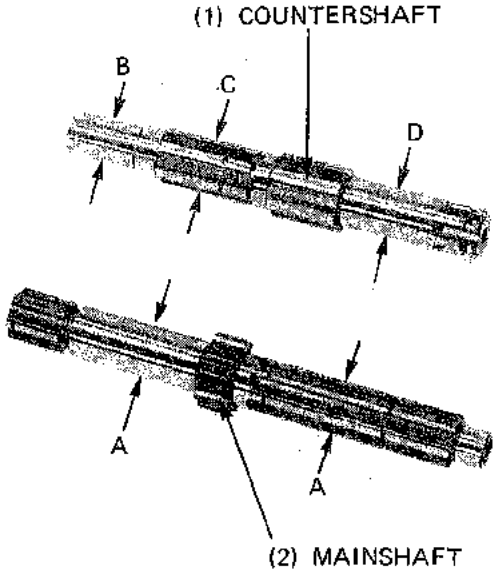
Measure the O.D. of the mainshaft and countershaft.

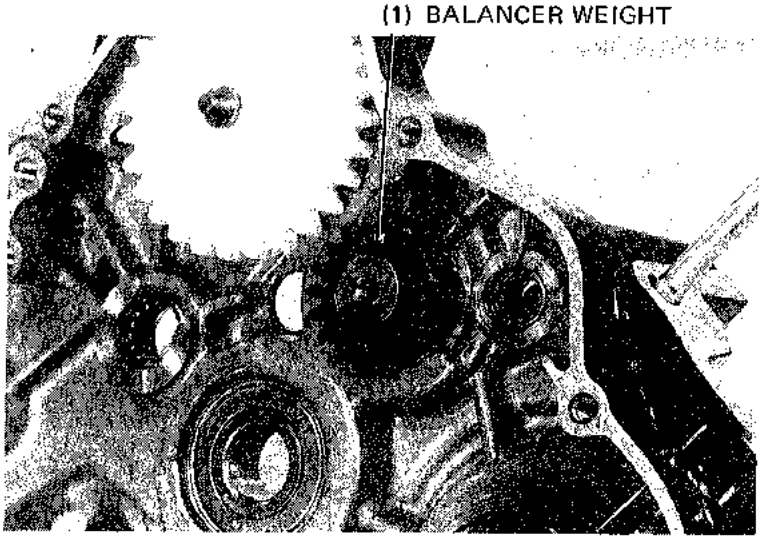
SERVICE LIMITS:

A: 16.93 mm (0.667 in)
B: 16.44 mm (0.647 in)
C: 18.93 mm (0.745 in)
D: 19.43 mm (0.765 in)



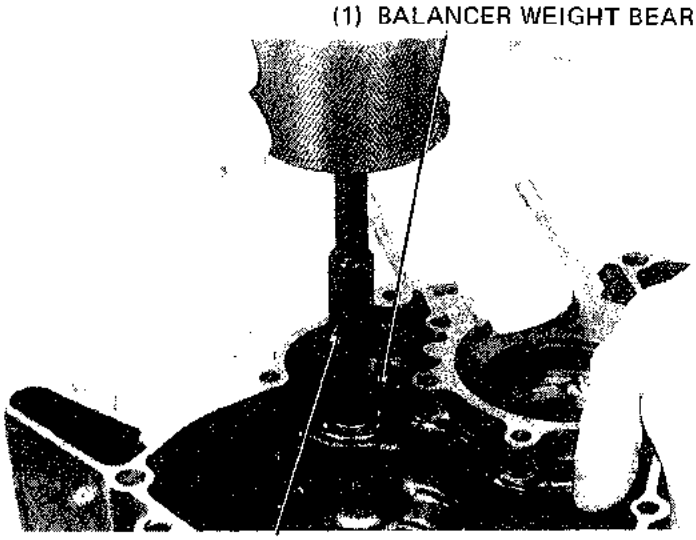
BALANCER WEIGHT REMOVAL

Drive the balancer wight out from the right crankcase.



BEARING REPLACEMENT

Remove the balancer weight left bearing and mainshaft left bearing from the left crankcase with the special tools as shown.
Remove the countershaft left bearing from the left crankcase.
Remove the mainshaft right bearing from the right crankcase.



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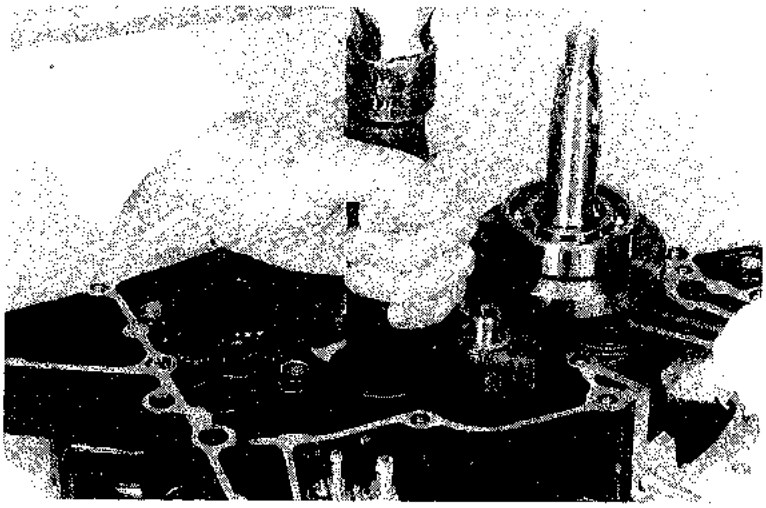
Drive in the bearings with the following common and special tools.

Balancer weight left bearing:
- Driver A
- Attachment 32 x 35 mm
- Pilot 12 mm

Mainshaft right and countershaft left bearings:
- Driver A
- Attachment 42 x 47 mm
- Pilot 17 mm

Mainshaft left bearing:
- Driver A
- Attachment 28 x 30 mm (07746–1870100)

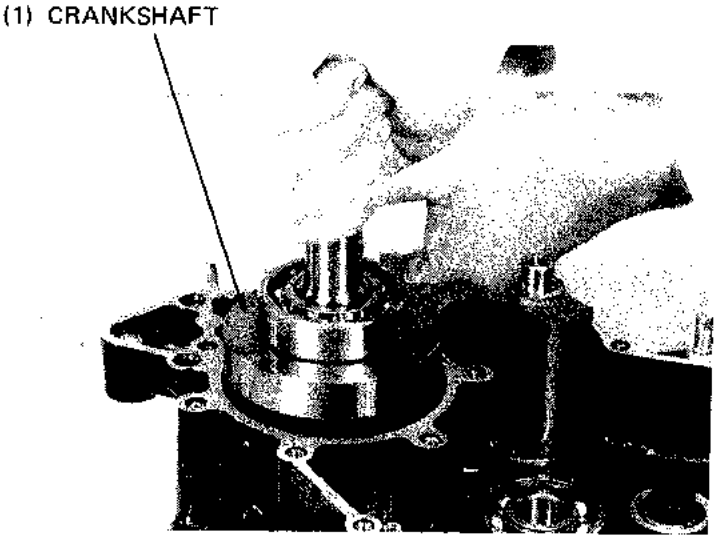


CRANKSHAFT REMOVAL

Remove the crankshaft from the right crankcase. Drive the crankshaft out of the right crankcase if it is difficult to remove by hands.

NOTE

- Use a plastic or brass hammer.
- Screw a nut onto the crankshaft end to prevent damage.
- Protect the crankcase mating surface by resting it on a wooden block.



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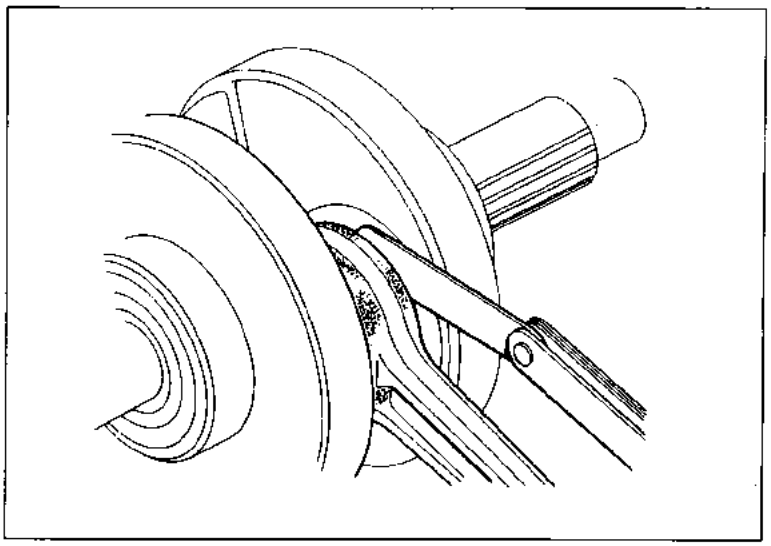
CRANKSHAFT INSPECTION

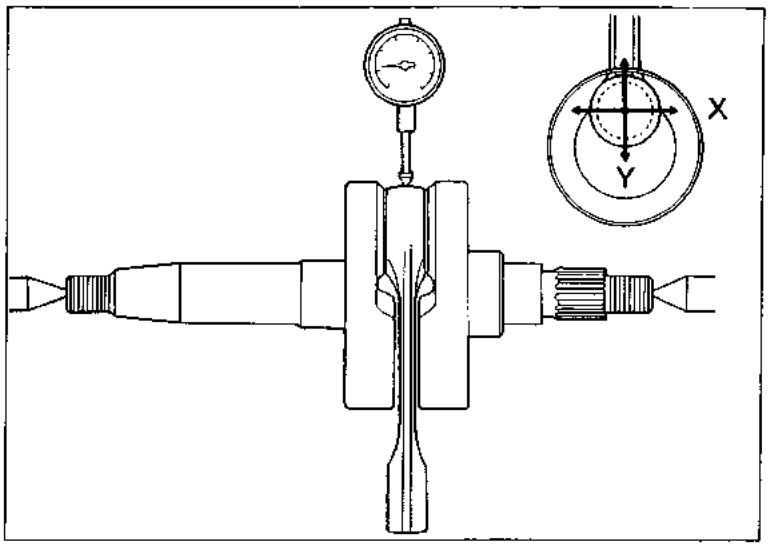
Measure the connecting rod big end side clearance with a feeler gauge.

SERVICE LIMIT: 0.85 mm (0.033 in)



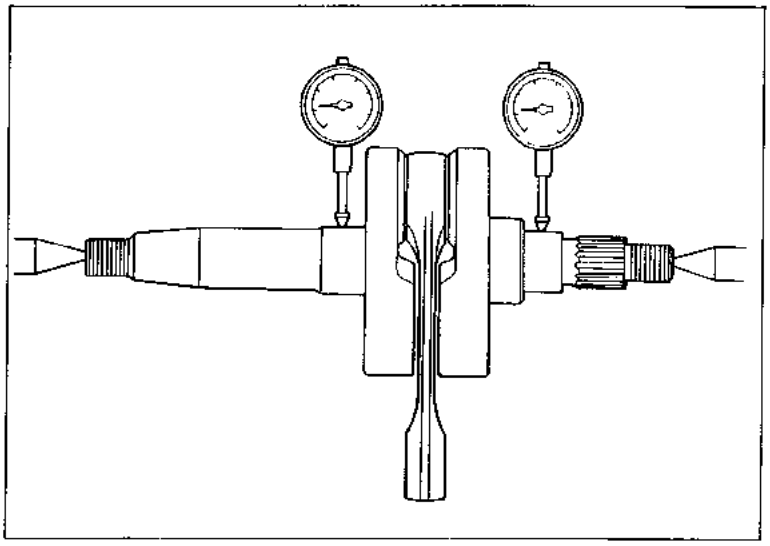
Measure the connecting rod big end radial clearance at two points in the X and Y directions.

SERVICE LIMIT: 0.05 mm (0.002 in)



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

SERVICE LIMIT: 0.10 mm (0.004 in)



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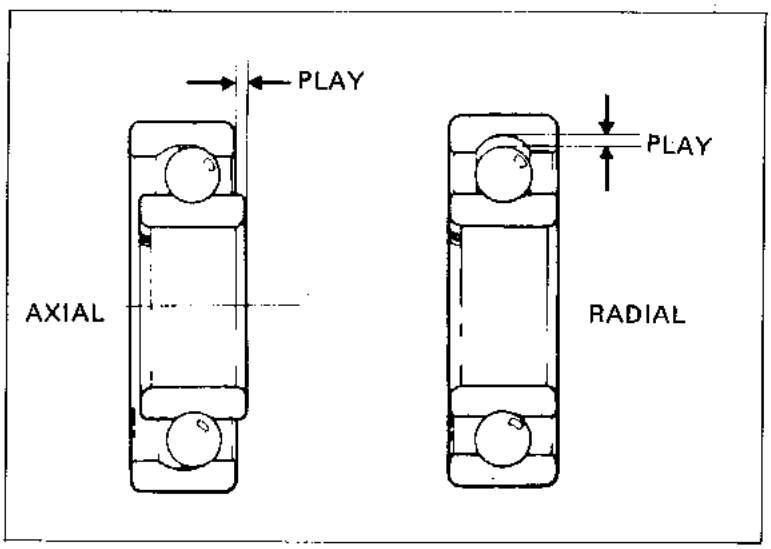
CRANKSHAFT BEARING INSPECTION

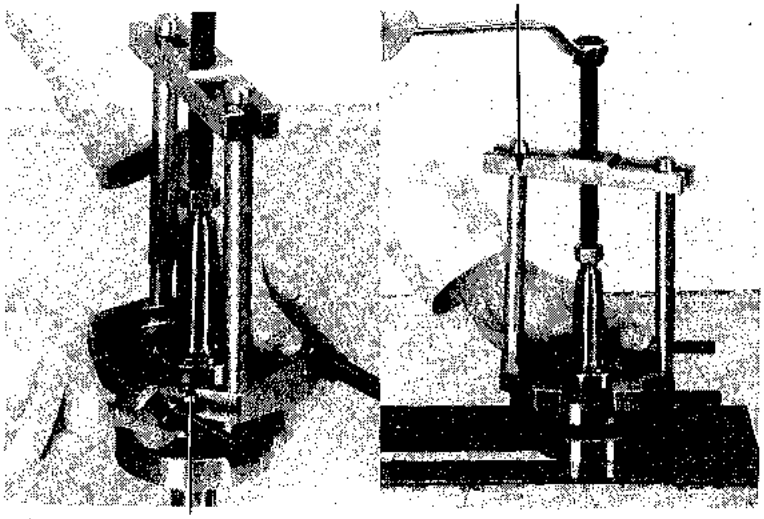
Spin the crankshaft bearing by hand and check for play.
The bearing must be replaced if it is noisy or has excessive play.



CRANKSHAFT BEARING REPLACEMENT

Remove the left crankshaft bearing with the UNIVERSAL BEARING PULLER.

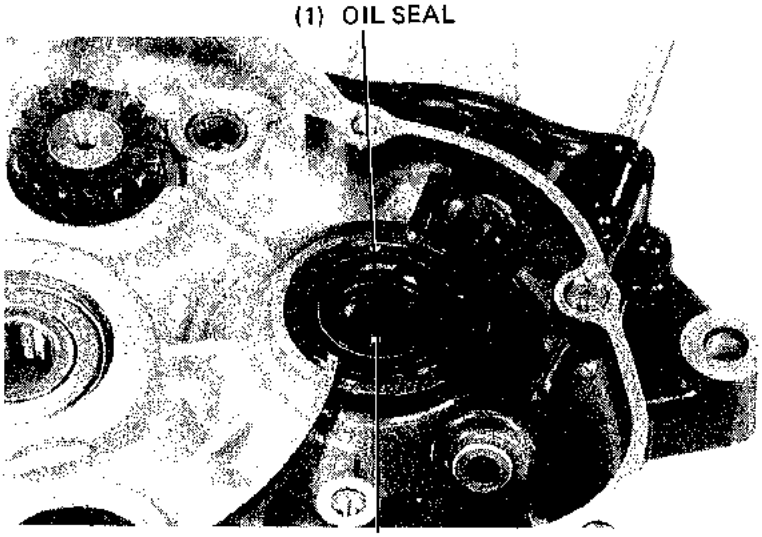
(1) UNIVERSAL BEARING PULLER (07631–0010000)



(2) LEFT CRANKSHAFT BEARING

Remove the oil seal from the right crankcase.
Remove the right crankshaft bearing.

(1) OIL SEAL



(2) RIGHT CRANKSHAFT BEARING

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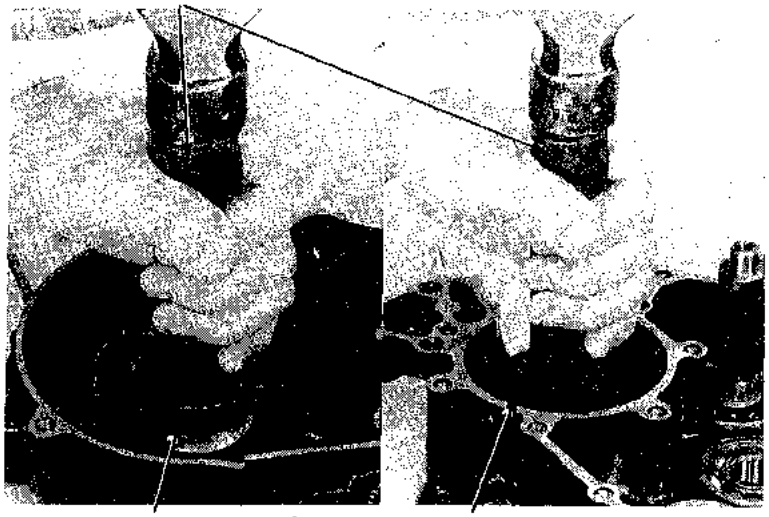
Drive new right crankshaft bearing and oil seal with the following common tools.

Right crankshaft bearing:
- Drive A
- Attachment 52 x 55 mm
- Pilot 25 mm

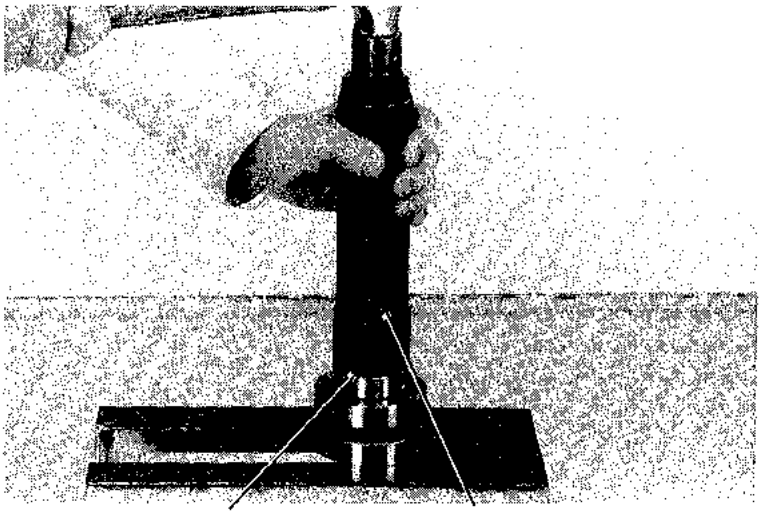
Right crankshaft oil seal
- Driver A
- Attachment 32 x 35 mm



Drive a new left crankshaft bearing over the crankshaft.

CAUTION

Hold the left crank weight when driving the bearing.

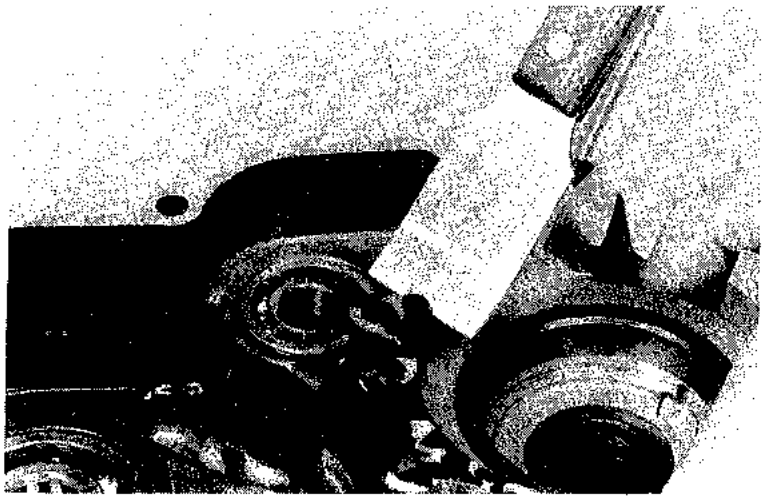


CRANKSHAFT INSTALLATION

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

NOTE

- If there is minor roughness or irregularities on the crankcase mating surfaces, dress them with an oil stone.
- After cleaning, lubricate the crankshaft bearings and other contacting surfaces with clean 2-stroke oil.



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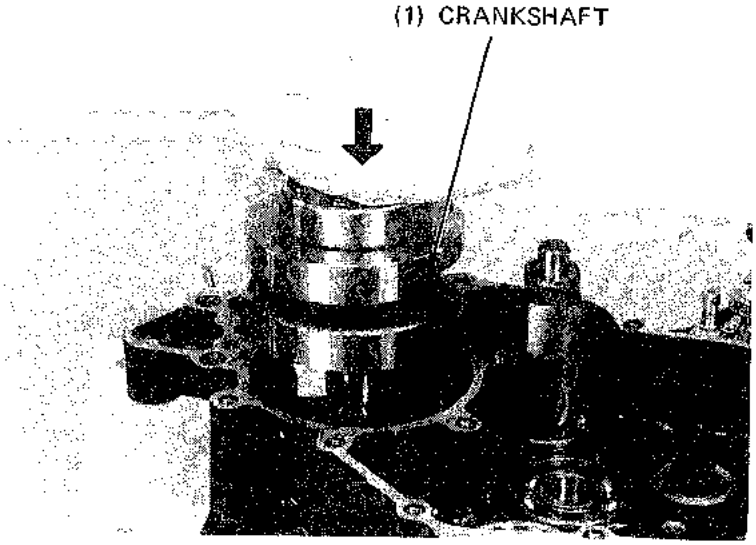
Install the crankshaft in the right crankcase.
Use a special tool "CRANKSHAFT ASSEMBLY TOOL (07965–1660100)" if it is hard to install the crankshaft to the right crankcase.

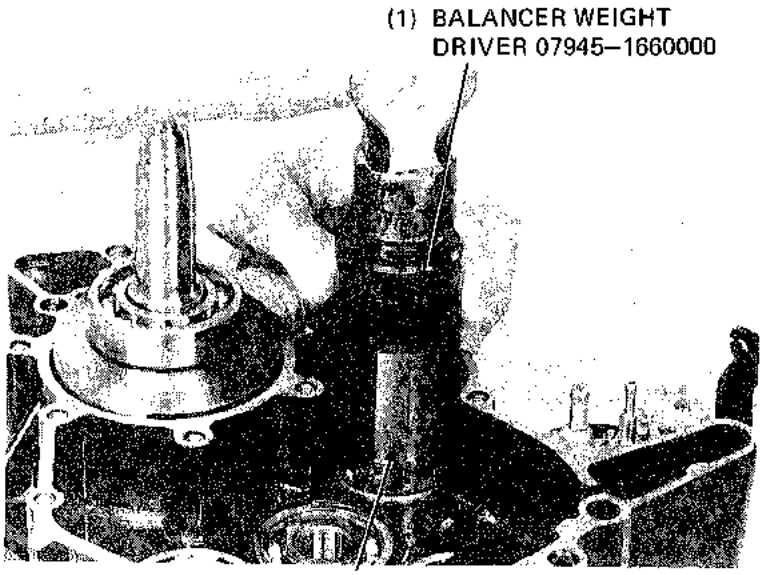
NOTE

- Apply clean 2-cycle engine oil to the journal and crankpin bearings.
- Coat the sealing lips of each oil seal with grease.

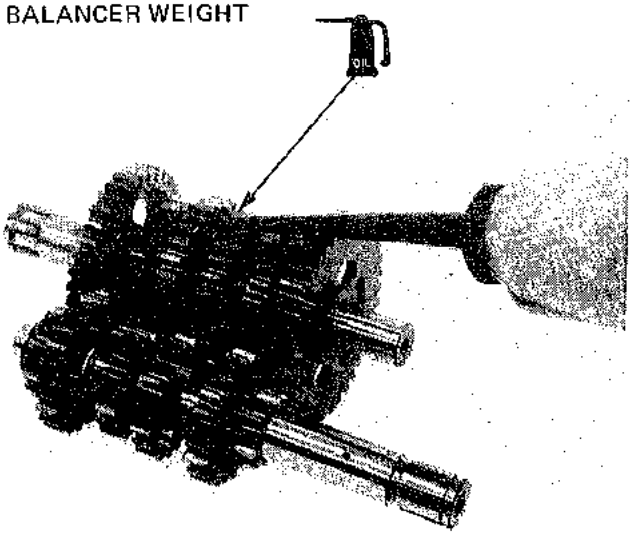


TRANSMISSION ASSEMBLY

Drive the balancer weight in the right crankcase while rotating the driver tool to prevent tilting the balancer bearing.



Apply oil to the gears before installing the mainshaft and countershaft.
Make sure the gears rotate freely.



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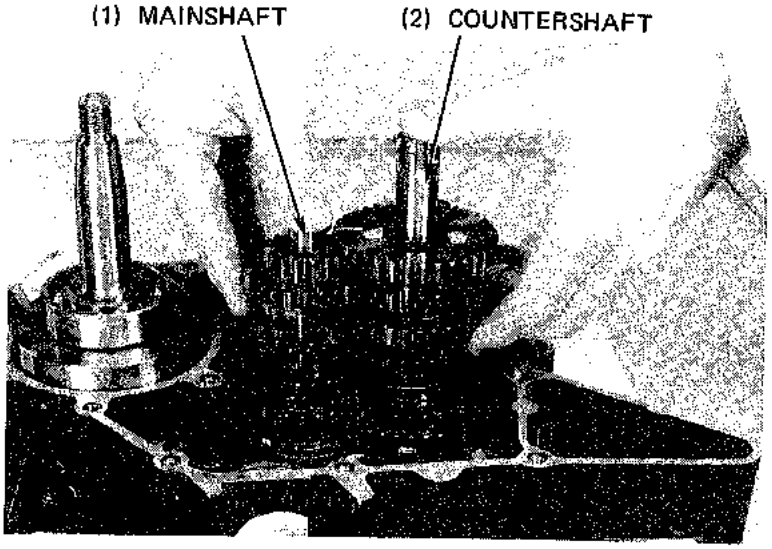
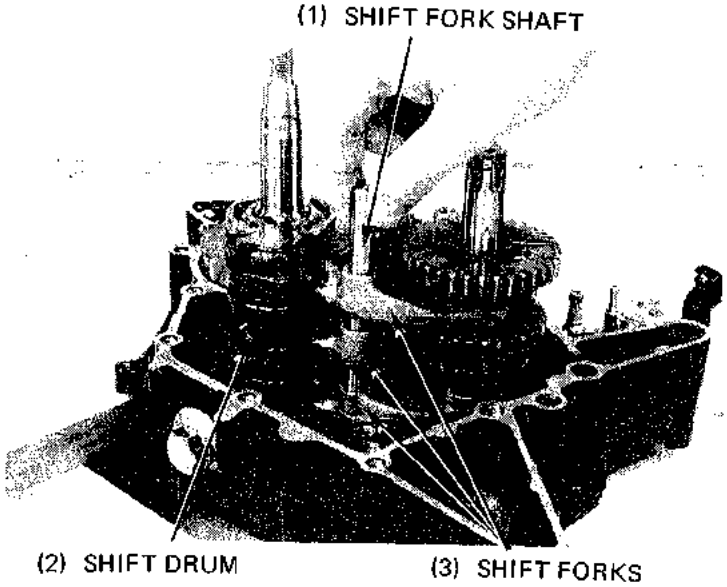
Install the mainshaft and countershaft in the right crankcase.



Install the shift drum, shift froks and shift fork shaft.

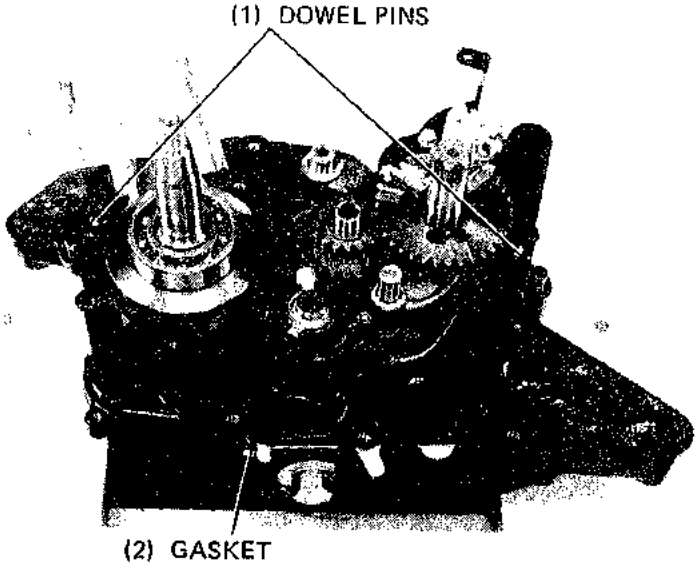
Position the shift drum in neutral as shown.

Make sure that the mainshaft and countershaft rotate freely.



CRANKCASE ASSEMBLY

Install a new gasket and two dowel pins.



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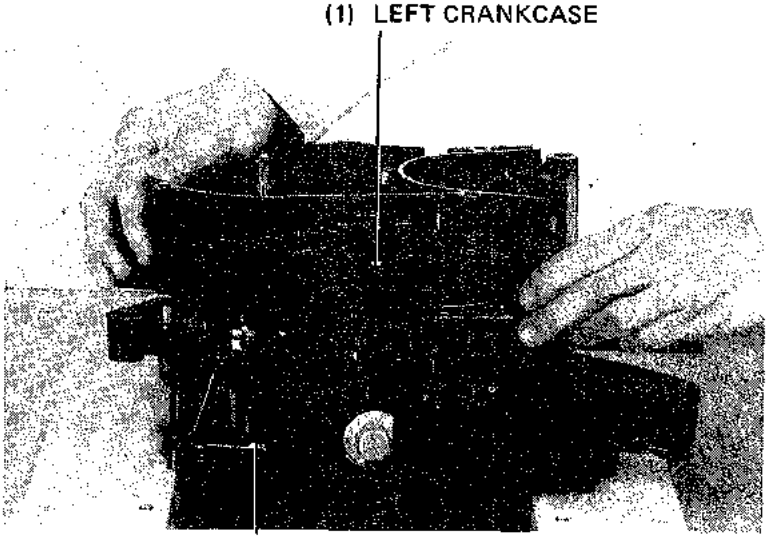
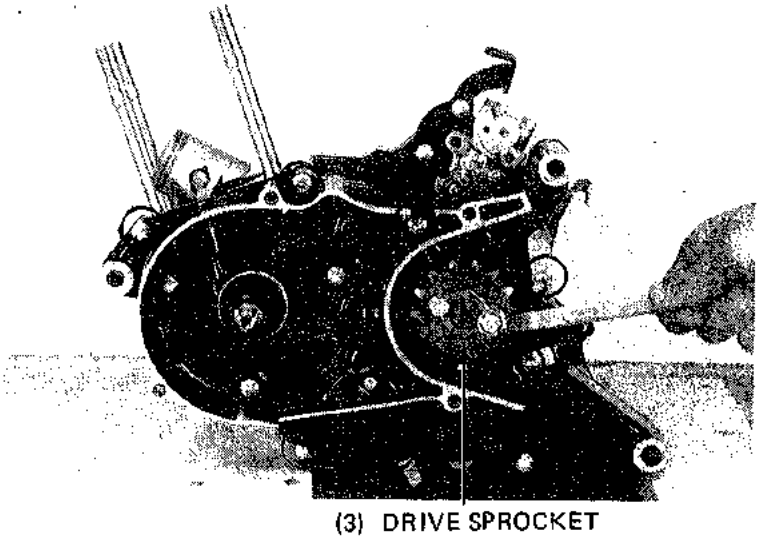
Place the left crankcase onto the right crankcase.



Tighten the crankcase bolts in a crisscross pattern.
Install the drive sprocket.



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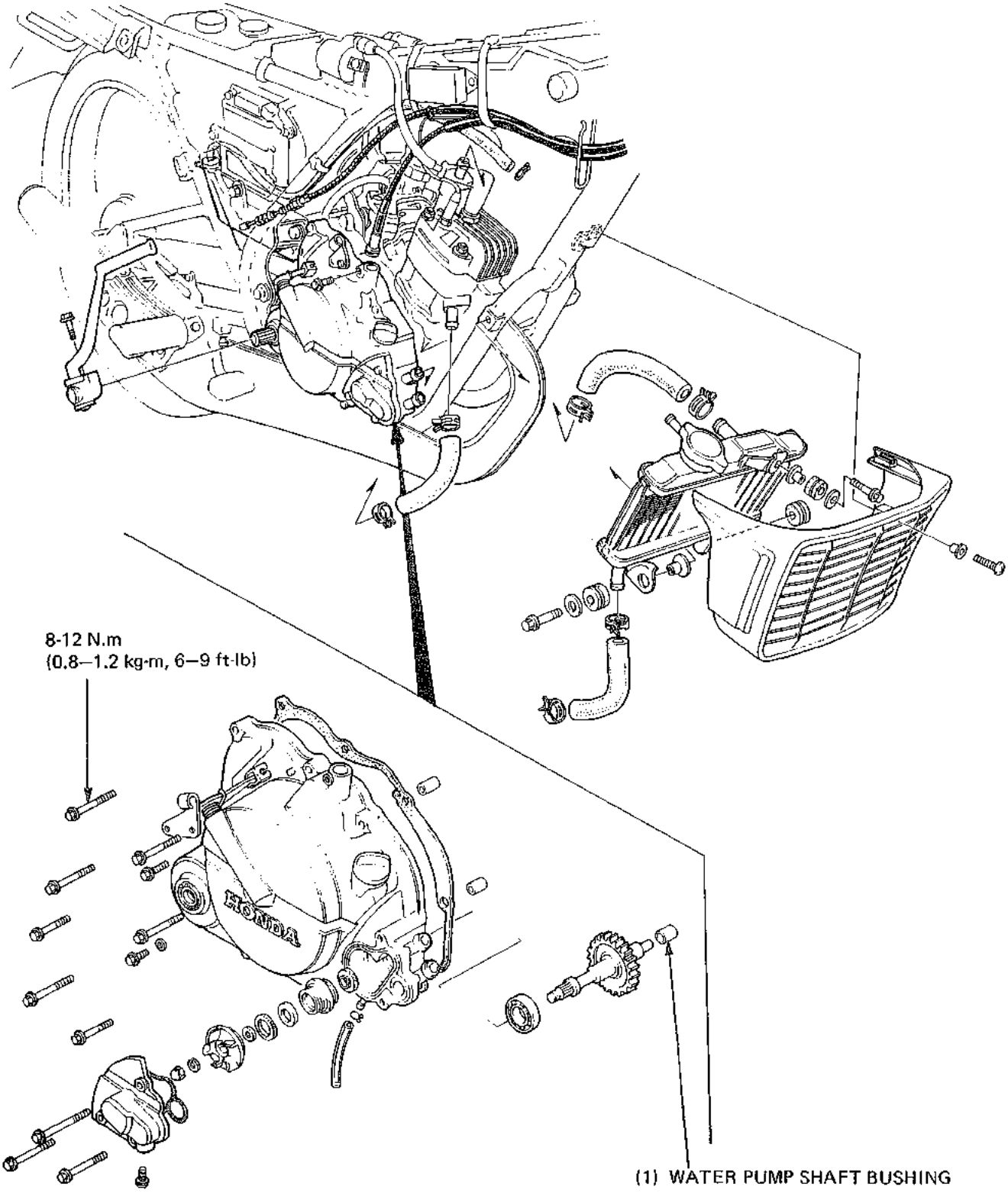

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SERVICE INFORMATION	10-2
TROUBLESHOOTING	10-2
RADIATOR COOLANT	10-3
RADIATOR	10-4
WATER PUMP	10-6
THERMOSTAT/TEMPERATURE SENSOR	10-9

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SERVICE INFORMATION

GENERAL INSTRUCTIONS

- To service the master pump mechanical seal, remove the left crankcase cover.
- All cooling system services can be done with the engine in the frame.
- Do not remove the radiator cap when the engine is hot. The coolant is under pressure and it could result in scaling. The engine must be cool before sevicing the cooling sytem.
- Avodi spilling coolant on painted surfaces. After servicing the system, check for leaks.

TOOLS

Special	
Bearing Remover Set 12 mm	07936–1660000
Mechanical Seal Driver Attachment	07954–4150400
Attachment 28 x 30 mm	07946–1870100
Common	
Driver A	07749–0010000
Pilot 12 mm	07746–0040200

SPECIFICATIONS

ITEM	STANDARD mm (in)	SERVICE LIMIT mm (in)
Radiator cap reliefe pressure	75–105 kPa (0.75–1.05 kg/cm^2, 10.7–14.9 psi)	
Recommended coolant	Use only a high quality ethylene glycol based anti-freeze containing corrosion protection inhibitors specifically recommended for use in aluminum engines. A 50/50 mixture of anti-freeze and water is recommended for most operating conditions. (See anti-freeze container label for other mixutre ratios).	
Coolant capacity: Radiator and engine Reserve tank Total system	 520 cm^3 (31.7 cu in) 150 cm^3 (9.2 cu in) 670 cm^3 (40.9 cu in)	
Thermostat	Begins to open: 60–64°C (140–147°F) Fully open: 70°C (158°F) Valve lift: 3–4 mm (0.12–0.16 in)	
Water pump shaft O.D.	6.972–6.987 mm (0.2745–0.2751 in)	6.90 mm (0.272 in)

TORQUE VALUES

Right crankcase cover bolt	8–12 N.m (0.8–1.2 kg-m, 6–9 ft-lb)

TROUBLESHOOTING

Engine Temperature Too High
1. Thermostat stuck closed
2. Faulty radiator cap
3. Insufficient coolant
4. Passages blocked in radiator, hoses, or water jacket

Engine Temperature Too Low
1. Thermostat stuck open

Coolant Leaks
1. Fulty pump mechanical seal
2. Deteriorated O-ring

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RADIATOR COOLANT

COOLANT CHANGE

WARNING

Engine must be cool before servicing the cooling system, or severe scalding may result.

On the Deluxe model, remove the under cowl (Page 14-3).
Remove the seat, side covers and fuel tank.
Remove the radiator cap.
Remove the coolant drain bolt and drain the coolant.
Lean the machine right to drain the coolant, trapped in the engine.
Remove the reserve tank mounting bolt and reserve tank.
Drain the coolant from the reserve tank.
Check that the drain bolt sealing washer is in good condition, then install the drain bolt and reserve tank.
Fill the system with the recommended coolant up (Page 9-2) to the radiator filler neck.
Install the radiator cap.
Fill the reserve tank with the coolnant up to the "F" mark .

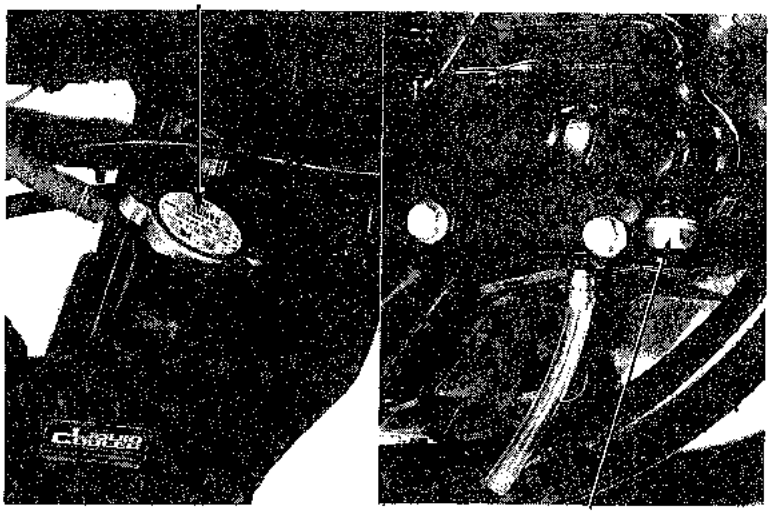
CAPACITY:
RADIATOR AND ENGINE:
520 cm³ (31.7 cu in)
RESERVE TANK : 150 cm³ (9.2 cu in)

Bleed air from the radiator.

- Start the engine and run until there are no air bubbles in the coolant, and the level stabilizes.
- Stop the engine and add coolant up to the filler neck if necesssary.
- Check the level of coolant in the reserve tank and fill to the correct level if the level is low.

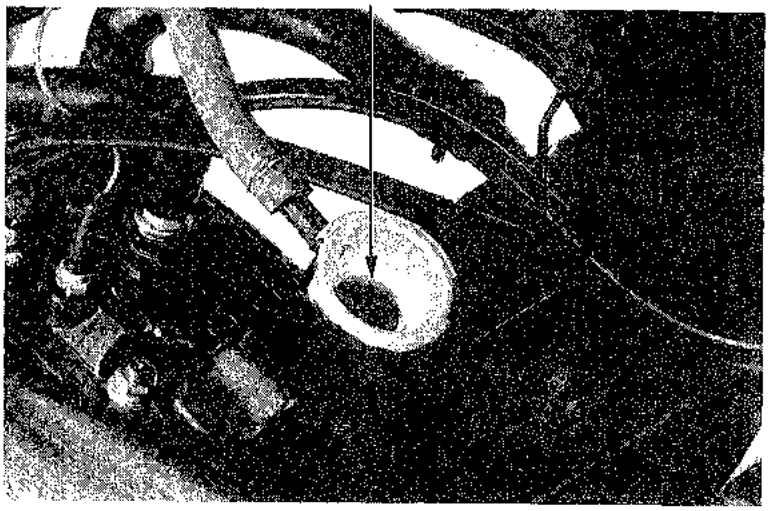
Install the radiator cap securely.

(1) RADIATOR CAP

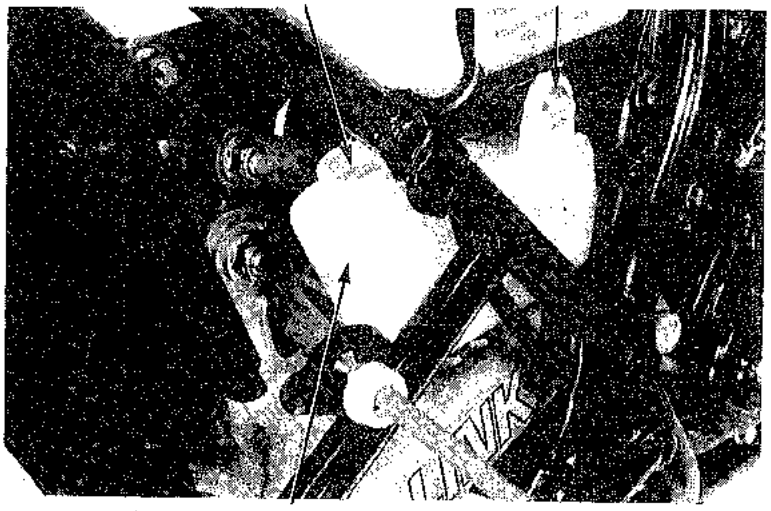


(2) DRAIN BOLT

(1) RADIATOR FILLER NECK



(1) COOLANT FILLER OPENING (2) MOUNTING BOLT



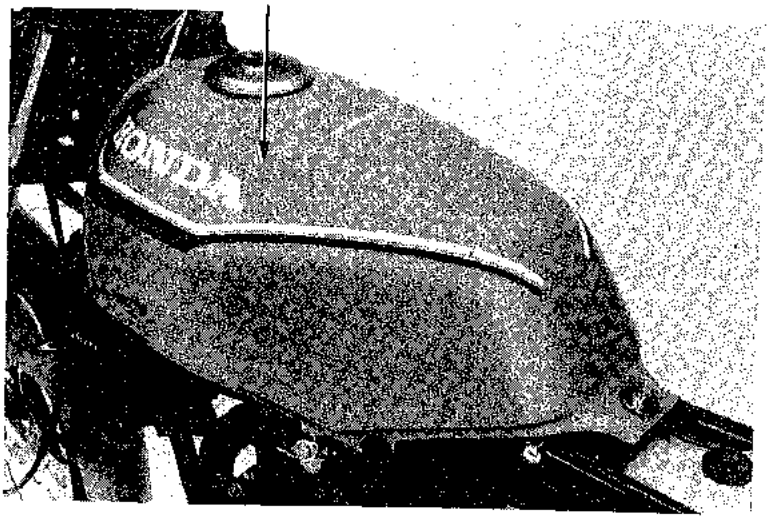
(2) RESERVE TANK

RADIATOR

REMOVAL

Remove the seat, side covers and fuel tank.
On the Deluxe model, remove the under cowl (Page 14-3).

(1) FUEL TANK



Remove the radiator cap.
Remove the coolant drain bolt and rain the coolant.

(1) COOLANT DRAIN BOLT

Disconnect the radiator hoses and overflow tube at the radiator.
Remove the screw attaching the radiator cowl and cowl.
Remove the radiator mounting bolts and radiator.

NOTE

Take care not to damage the radiator fins.

(1) OVERFLOW TUBE (2) RADIATOR

(3) RADIATOR COWL (4) RADIATOR FINS

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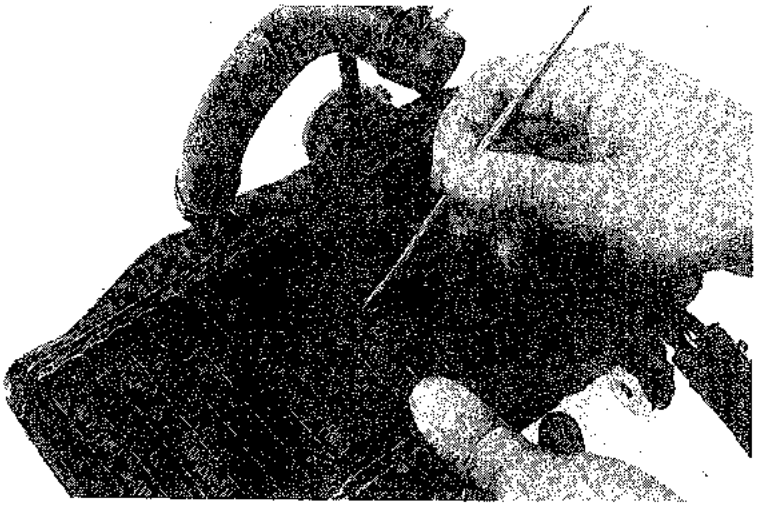
INSPECTION

Inspect the radiator soldered joints and seams for leaks.
Blow dirat out from between core fins with compressed air. If insects, etc., are clogged the radiator, wash them off with low pressure water.

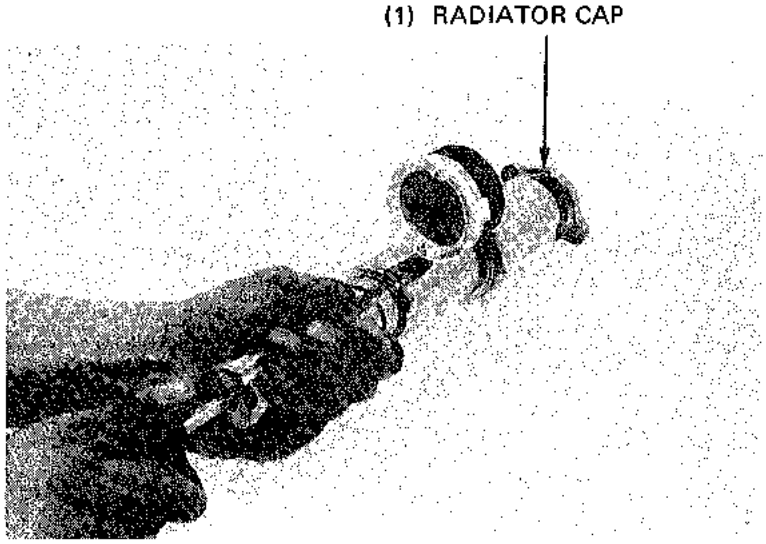


Pressure test the radiator cap. Replace the radiator cap if it does not hold pressure, or if relief pressure is too high or too low. It must hold specified pressure for at least six seconds.

NOTE

Before installing the cap on the tester, apply water to sealing surfaces.

RADIATOR CAP RELIFT PRESSURE:
0.9 ± 0.15 kg/cm^2 (12.8 ± 2.1 psi)



INSTALLATION

Install the radiator in the reverse order of removl.
Fill the cooling system with the recommended coolant (Page 10-3).
After installation, check the radiator and radiator hoses for leaks.

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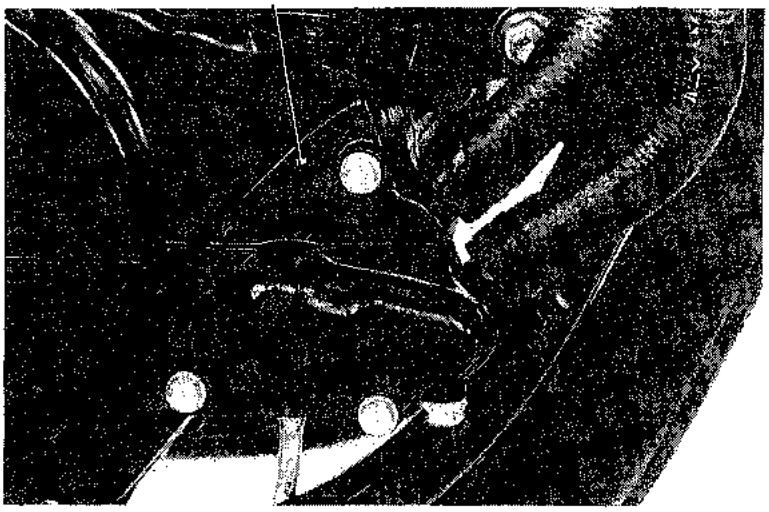
WATER PUMP

REMOVAL

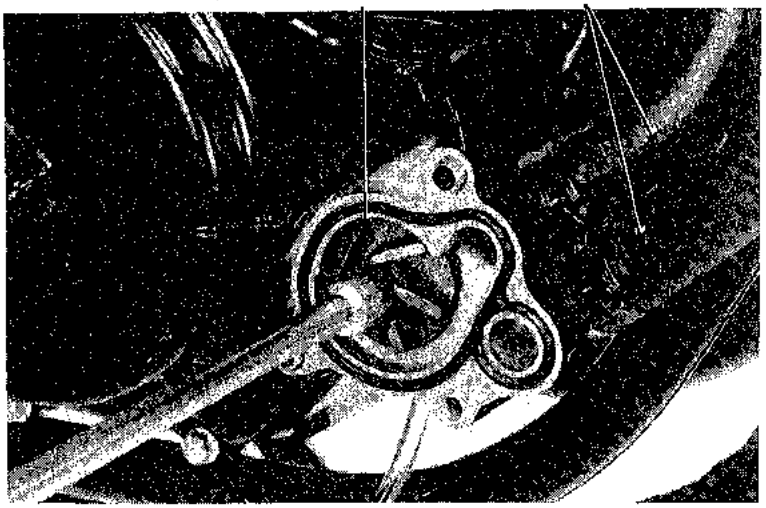
Drain the radiator coolant (Page 10-3).
Remove the water pump cover bolts and cover.

(1) WATER PUMP COVER



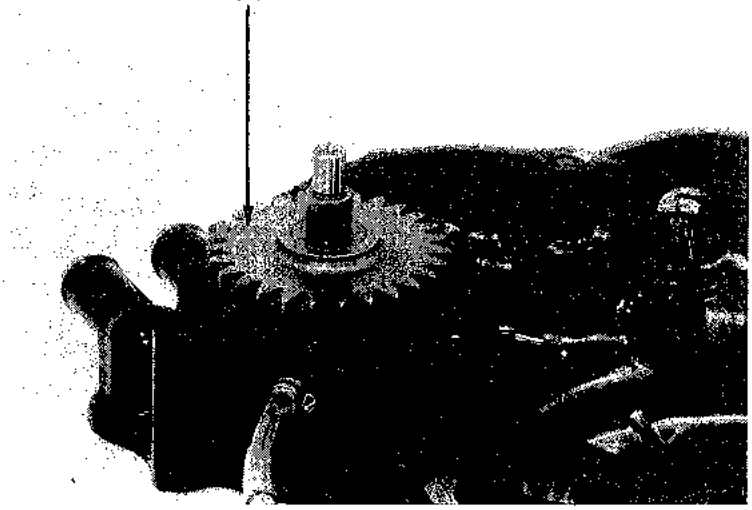
Remove the cap nut, copper washer, impeller and plain washer from the water pump shaft.
Disconnect the radiator hoses from the water pump.
Remove the right crankcase cover (Page 7-3).

(1) IMPELLER (2) RADIATOR HOSES



Remove the water pump shaft from the right crankcase cover.

(1) WATER PUMP SHAFT



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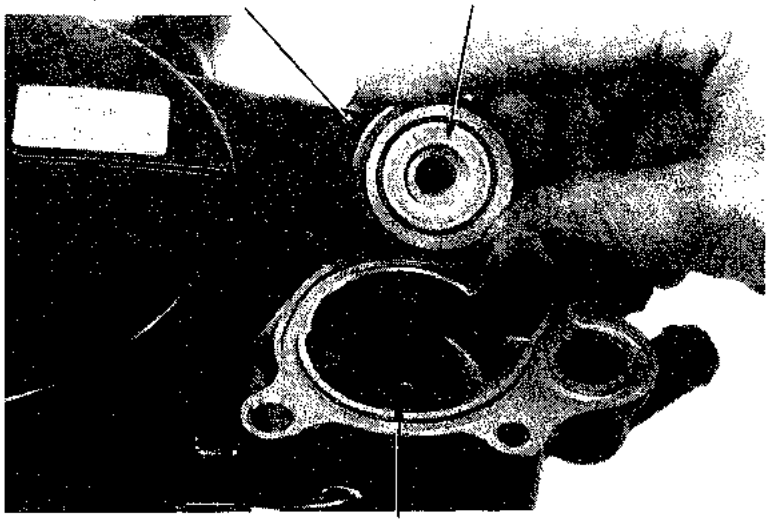
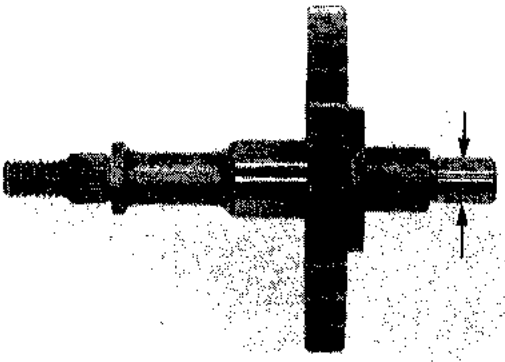
INSPECTION

Check the mechanical seal for damage or deterioration.
Check the water pump shaft bearing in the right crankcase cover for excessive play or damage.

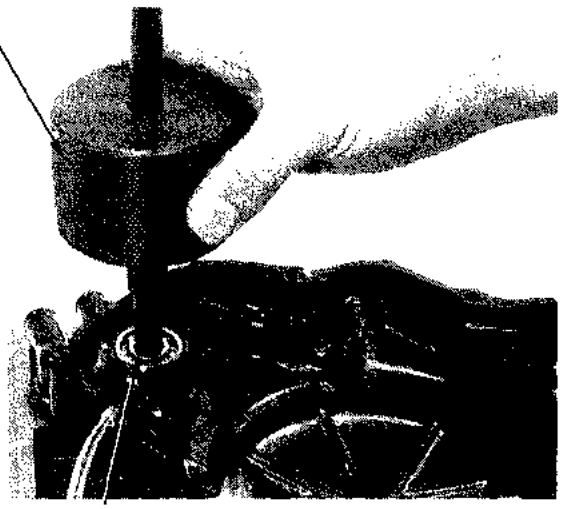


Check the water pump shaft for bent or other damage.
Measure the shaft O.D.
SERVICE LIMIT: 6.90 mm (0.272 in)



BEARING/MECHANICAL SEAL REPLACEMENT

Remove the water pump shaft bearing with the special tool.
Remove the oil seal and mechanical seal from the right crankcase cover.



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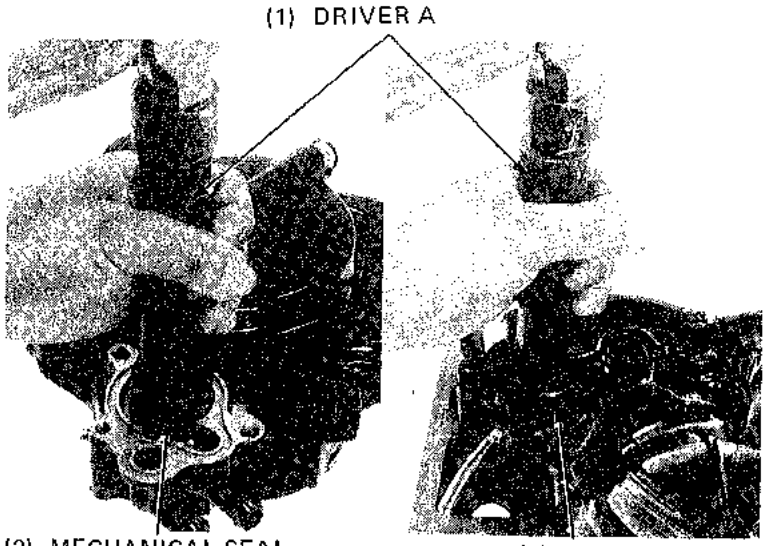
Drive a new mechanical seal with the following special and common tools.
- Driver A
- Mechanical seal driver 07945–4150400

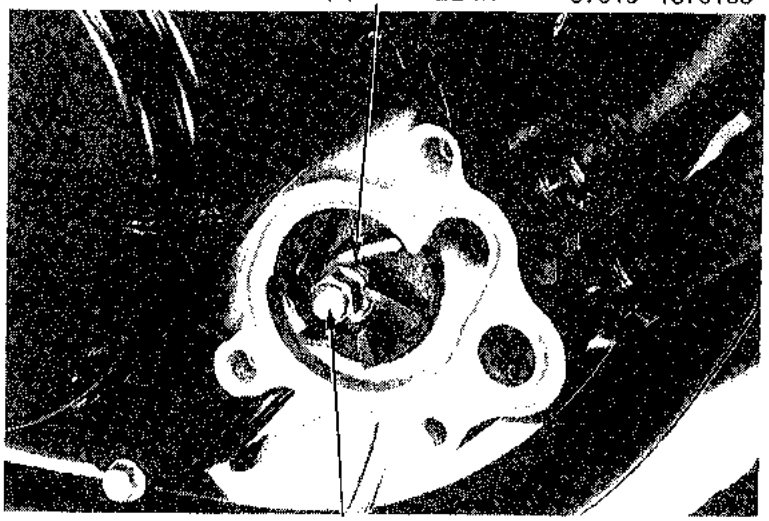
Install a new oil seal.
Drive a new bearing into the right crankcase cover with the following special and common tools.
- Driver A
- Attachment 28 x 30 mm 07946–1870100
- Pilot 12 mm

Replace the imeller seal plate with a new one.

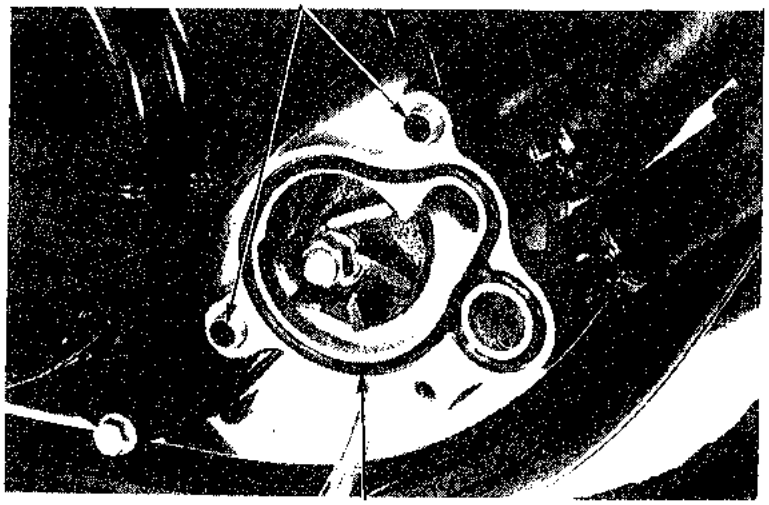


INSTALLATION

Install the water pump shaft in the right crankcase cover.
Install the right crankcase cover (Page 7-4).
Install the plain washer and imeller over the pump shaft.
Install the copper washer and cap nut and tighten the cap nut.
Connect the radiator hoses to the water pump.



Install the two dowel pins and new gasket.



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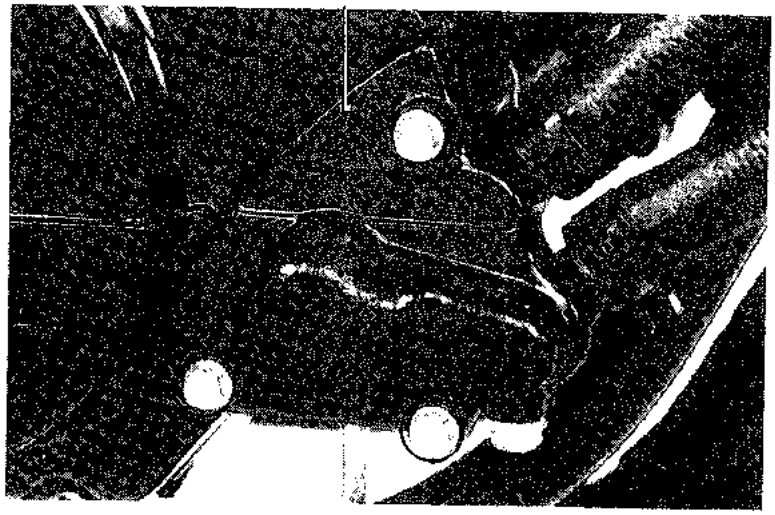
Install the water pump cover with the three bolts.

Pour the recommeded coolant mixture up to the correct lever (Page 10-3).

After installation, start the engine and check for leaks.

(1) WATER PUMP COVER

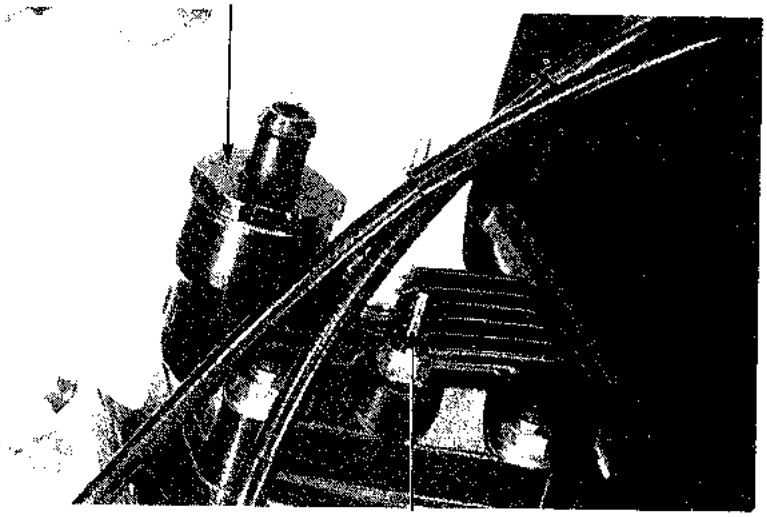


THERMOSTAT/TEMPERATURE SENSOR

REMOVAL

Drain the coolant (Page 10-3).
Disconnect the radiator hose at the cylinder head.
Remove the thermostat cover and thermostat.
Remove the temperature sensor from the cylinder head.

(1) THERMOSTAT COVER



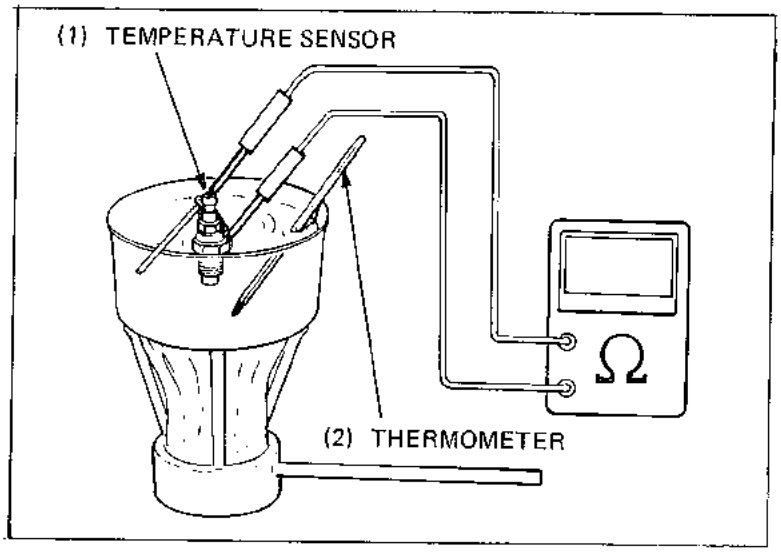
(2) TEMPERATURE SENSOR

TEMPRETURE SENSOR INSPECTION

Suspend the temperature sensor in heated water to check its resistance.
Do not let the temperature sensor touch the pan or false readings will result.
Replace the temperature sensor if its resistance does not meet the specifications.

TEMPERATURE SENSOR RESISTANCE:

Temperature °C(°F)	50(122)	80(176)	100(212)	120(250)
Resistance Ohm	154	52	27	16



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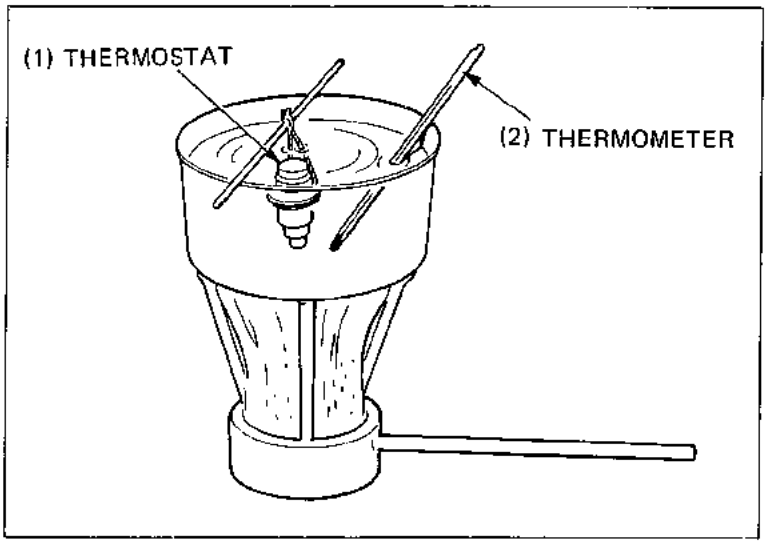
THERMOSTAT INSPECTION

Inspect the thermostat visually for damage.
Suspend the thermostat in heated water to check its operation.
Do not let the thermostat or thermometer touch the pan or false readings will result.
Replace thermostat if valve stays open at room temperature, or if it responds at temperatures other than those specified.



TECHNICAL DATA:

Start to open	60–64°C (140–147°F)
Valve lift	3 mm (0.12 in) mimimum when heated to 70°C (158°F) for five minutes.

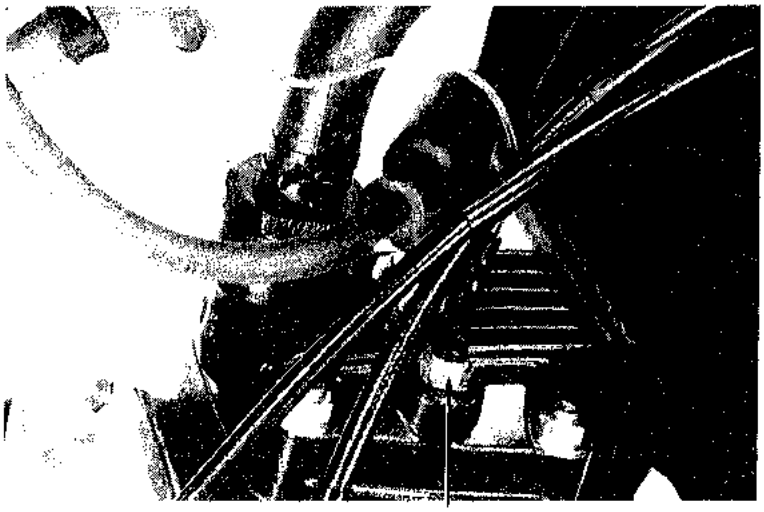
INSTALLATION

Install the temperature sensor and thermostat in the reverse order of removal.

NOTE

Apply liquid sealant to the threads of the temperature sensor before installation.

Fill the cooling system with the recommended coolant (Page 10-3).



(1) TEMPERATURE SENSOR

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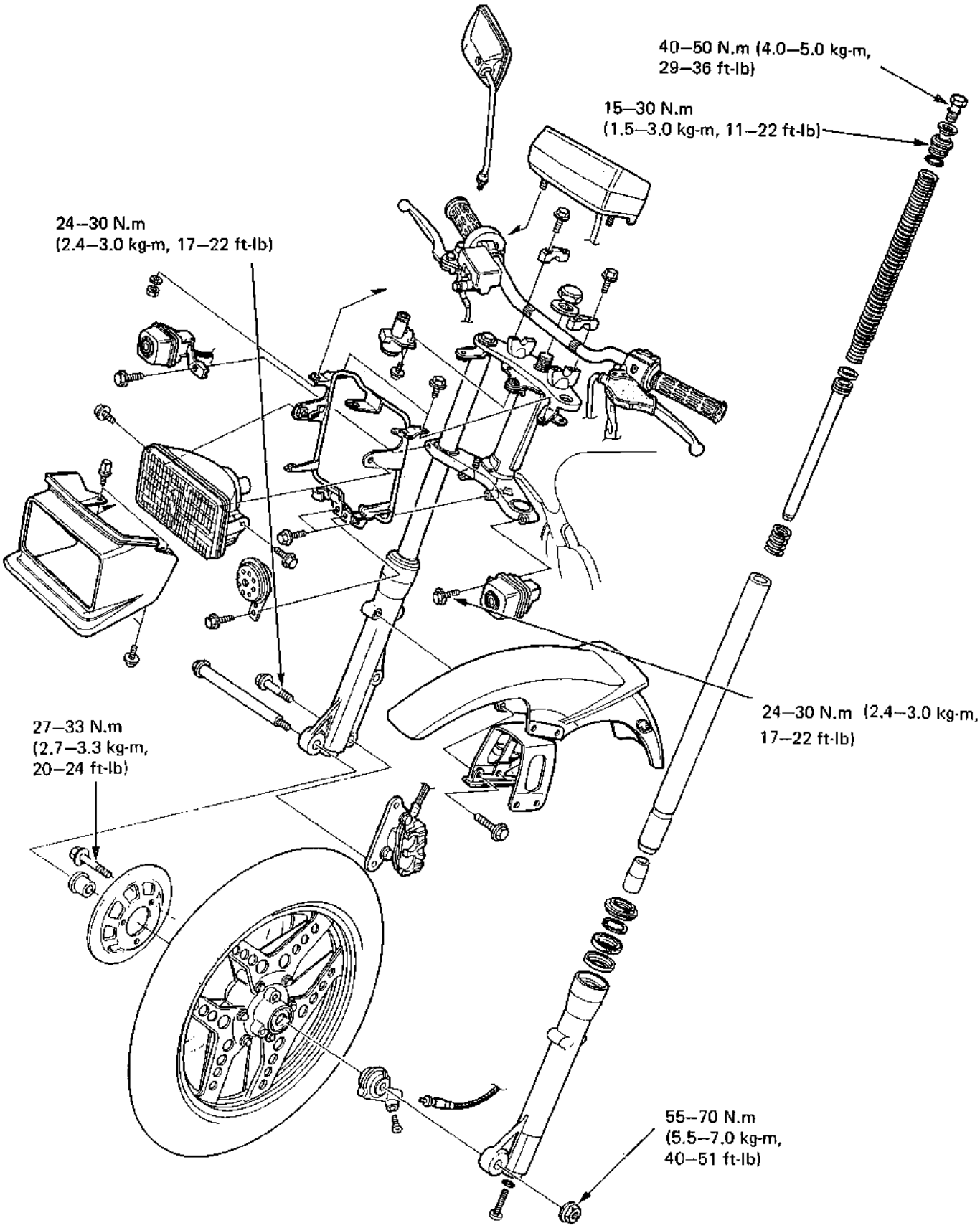
FRONT WHEEL/SUSPENSION 11.



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SERVICE INFORMATION	11-2
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INSTRUMENTS	11-5
HEADLEBAR	11-7
FRONT WHEEL	11-9
FRONT FORK	11-13
STEERING STEM	11-19

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SERVICE INFORMATION

- A jack or other support is required to support the motorcycle.
- Never ride on the rim or try to bend the wheel.

TOOLS

Special	
HEX Wrench 6 mm	07917–3230000
Ball Race Driver	07944–1150001
Front Fork Oil Seal Driver Attachment	07747–0010700
Snap Ring Pliers	07914–3230001
Common	
Driver A	07749–0010000
Attachment 32 x 35 mm	07746–0010100
Pilot 12 mm	07746–0040200
Front Fork Oil Seal Driver Body	07747–0010100
Pin Spanner	07702–0010000

TORQUE VALUES

Handlebar upper holder bolts	8–12 N.m (0.8–1.2 kg-m, 6– 9 ft-lb)
Steering stem nut	60–90 N.m (6.0–9.0 kg-m, 43–65 ft-lb)
Front fork bolt	40–50 N.m (4.0–5.0 kg-m, 29–36 ft-lb)
Front fork inner bolt	15–30 N.m (1.5–3.0 kg-m, 11–22 ft-lb)
Bottom bridge pinch bolts	24–30 N.m (2.4–3.0 kg-m, 17–22 ft-lb)
Front axle nut	55–70 N.m (5.5–7.0 kg-m, 40–51 ft-lb)
Front brake caliper bracket	24–30 N.m (2.4–3.0 kg-m, 17–22 ft-lb)

SPECIFICATIONS

Front fork oil capacity: 131.5–136.5 cm^3 (4.7–4.9 oz)

ITEM	STANDARD mm (in)	SERVICE LIMIT mm (in)
Front axle shaft ben	—	0.20 (0.008)
Front wheel rim runout Rdial	—	2.0 (0.08)
Axial	—	2.0 (0.08)
Front shock absorber spring free length	497.3 (19.58)	482.5 (19.00)
Front fork pipe bend	—	0.20 (0.008)

TROUBLESHOOTING

Hard steering
1. Insufficient tire pressure
2. Steering adjustment nut too tight
3. Damaged steering stem bearings
4. Damaged steering ball races or cone races

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

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

Soft suspension
1. Weak fork spring
2. Insufficient fluid in front forks

Hard suspension
1. Incorrect fluid weight in front forks

Front suspension noise
1. Slider binding
2. Loose fron fork fasteners
3. Insufficient fluid in forks

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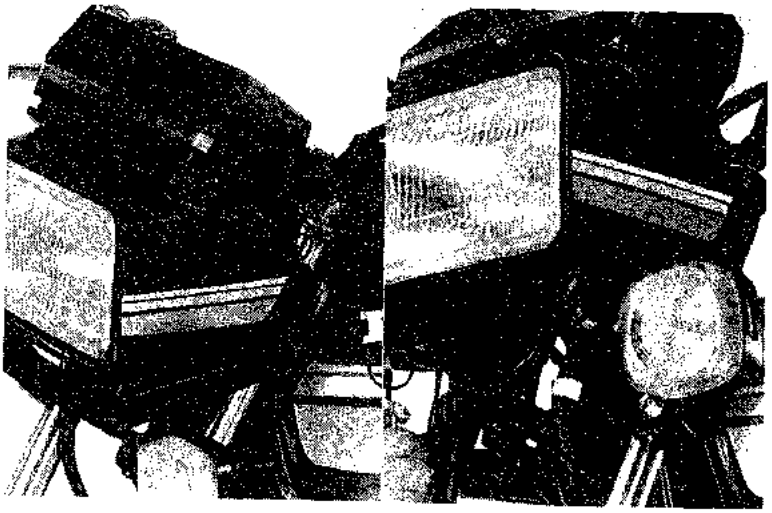
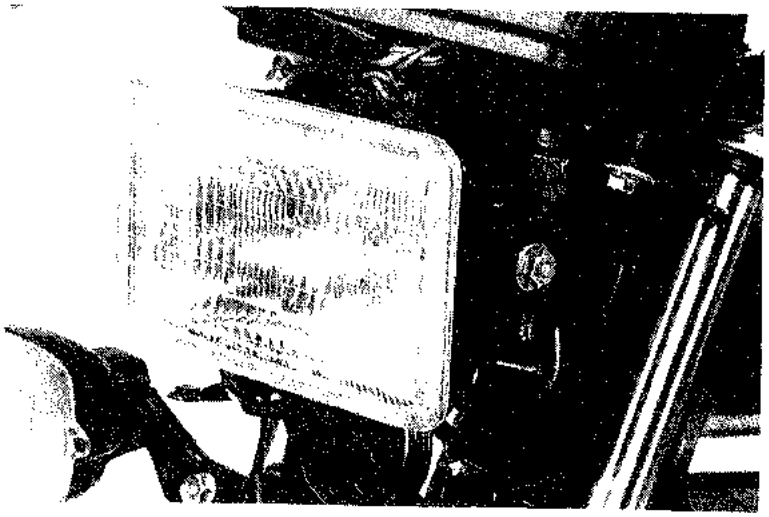
HEADLIGHT

REMOVAL

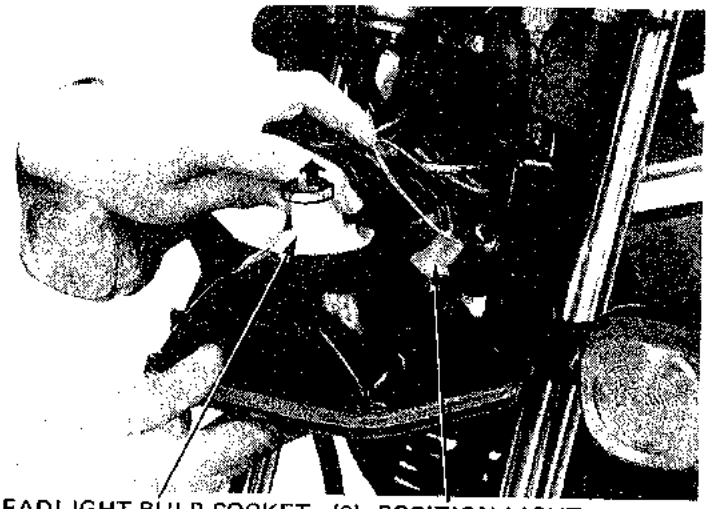
On the Deluxe model, remove the fairing (Page 14-2).
On the Standard model, remove the four headlight case mounting bolts and headlight case.



Remove the headlight mounting bolts and headlight.



Disconnect the headlight coupler and position light connectors.



(1) HEADLIGHT BULB SOCKET (2) POSITION LIGHT BULB SOCKET

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INSTALLATION

Align the alignment marks on the headlight with the index marks on the bracket.

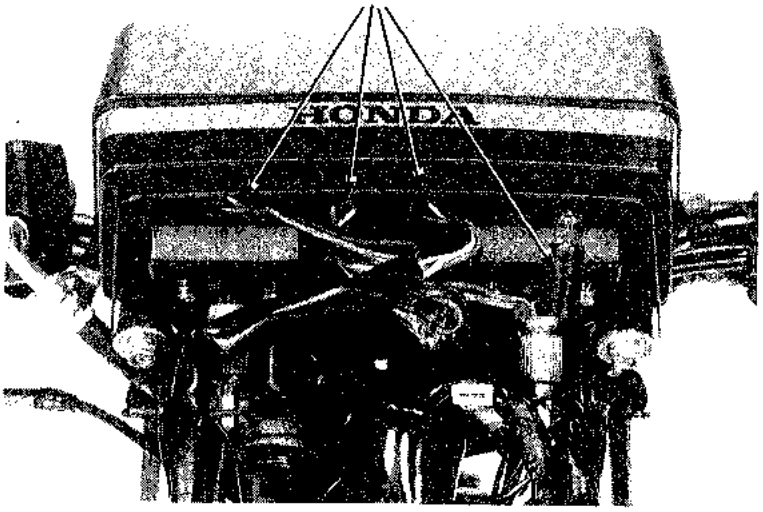
(1) Align

INSTRUMENTS

INDICATOR AND METER BULB REPLACEMENT

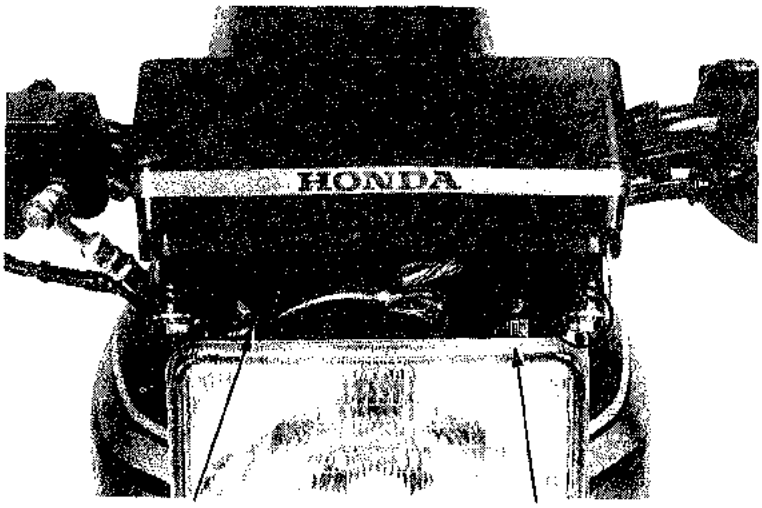
Remove the headlight.

(1) BULB HOLDERS



REMOVAL/INSTALLATION

Remove the headlight (Page 11-4).
Disconnect the instrument wire coupler.
Remove the instrument mounting nuts and remove the instruments.
Install the instruments in the reverse order of removal.



(1) TACHOMETER CABLE (2) SPEEDOMETER CABLE

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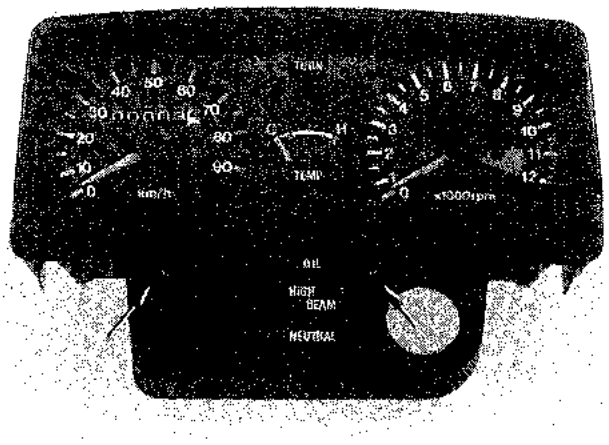
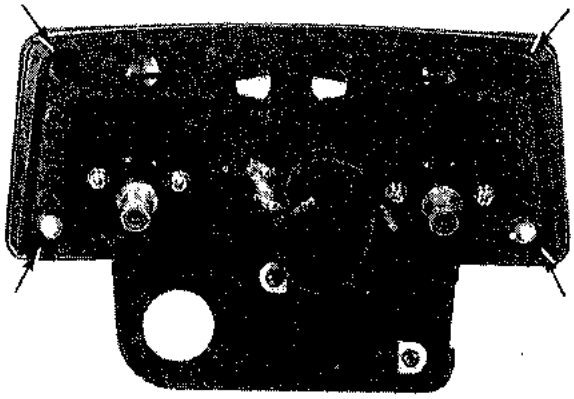
DISASSEMBLY

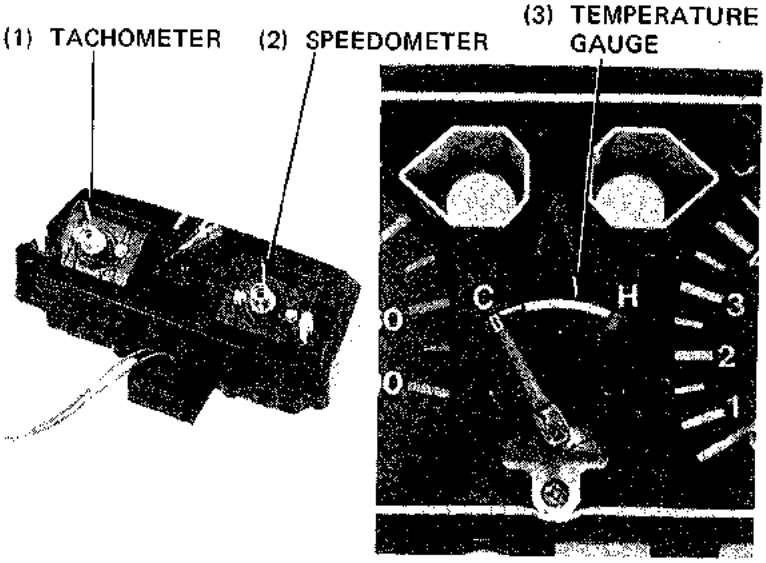
Remove the two instrument cover screws.



Remove the four instrument lower cover screws and separate the instruments.



Remove the screws attaching each instrument and remove the tachometer, speedometer and temperature gauge.



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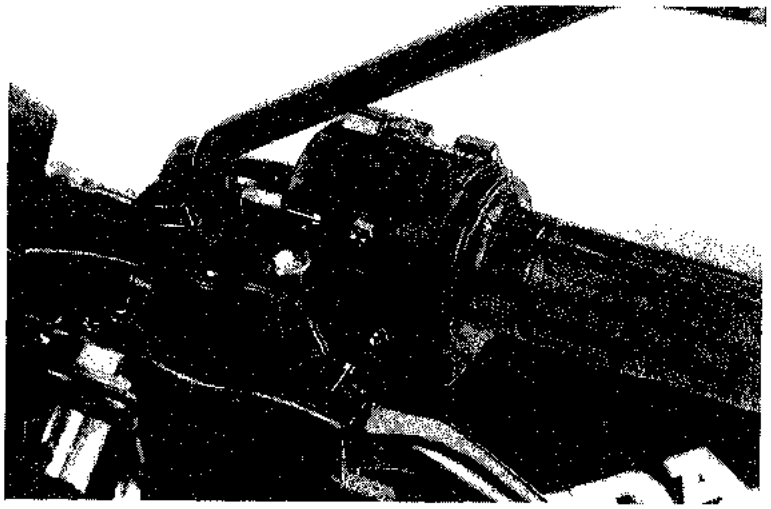
HANDLEBAR

REMOVAL

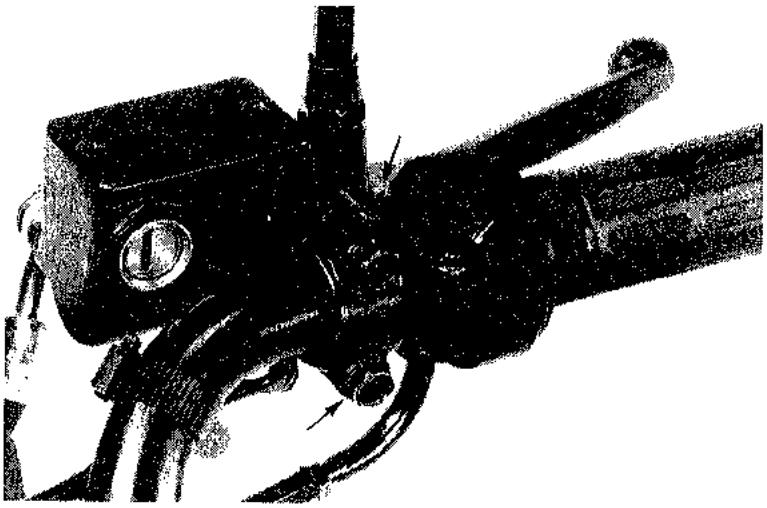
Remove the headlight (Page 11-4).
Disconnect the handlebar switch wires.

Remove the left handlebar switch.
Disconnect the clutch cable.

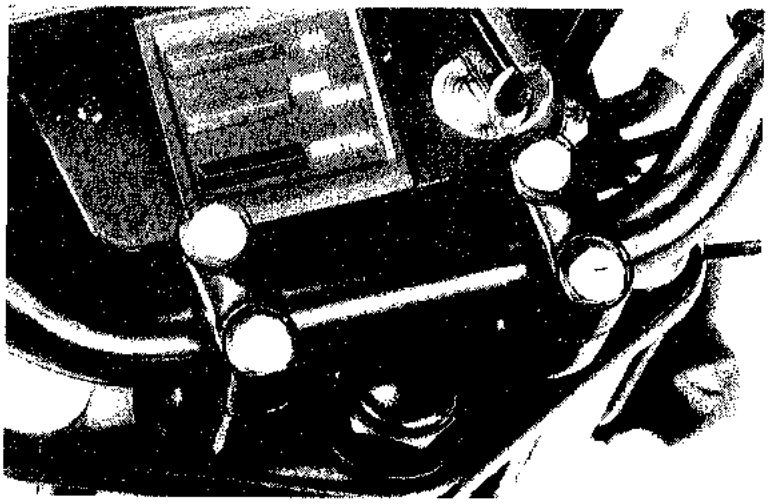


Remove the brake master cylinder.

Remove the throttle grip.



Remove the handlebar upper holders and handlebar.



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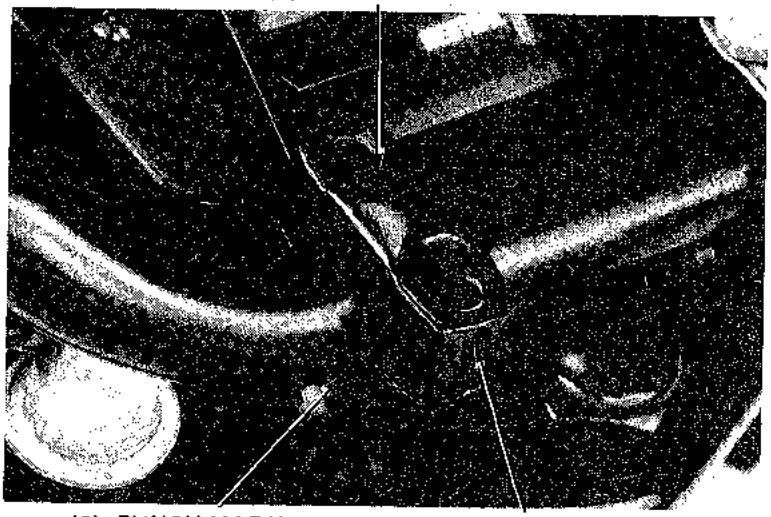
INSTALLATION

Place the handlebar onto the lower holder by aligning the punch mark with the upper face of the lower holder.
Place the upper holders on the hndlebar with the punch marks facing the front.
Tighten the forward bolts first, then tighten the rear bolts.

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

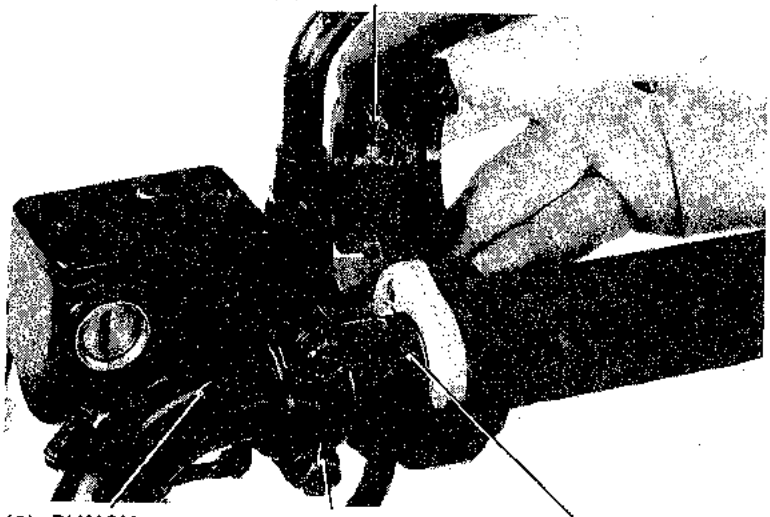


Install the front master cylinder with the "△" mark facing up.
Align the end of the holder with the handlebar puch mark.

Tighten the upper bolt first, then the lower.

TORQUE: 10–14 N.m (1.0–1.4 kg-m, 7–9 ft-lb)

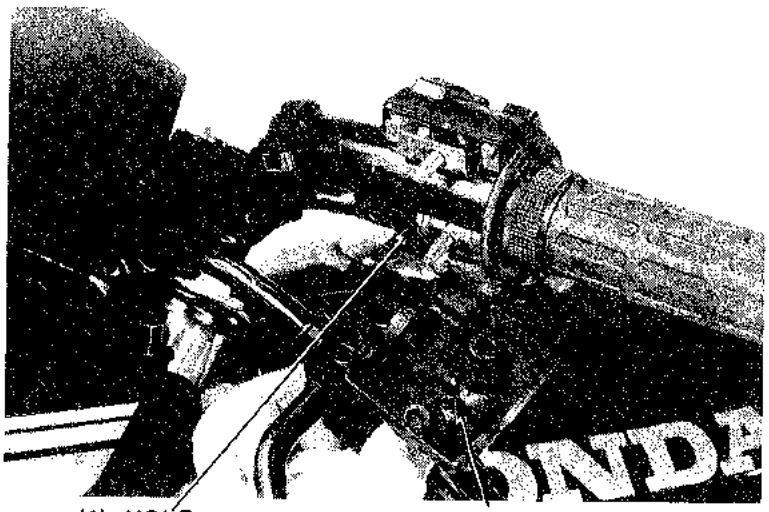
Apply grease to the throttle grip sliding surface.
Align the locating pin on the throttle grip housing with the hole in the handlebar and install the throttle grip.



Connect the clutch cable.
Align the locating pin on the left handlebar switch with the hole in the handlebar and install the switch.

Tighten the upper nut first, then tighten the lower nut.

Route the switch wires (Page 1-7).
Connect the switch wires.
Install the headlight (Page 11-5).



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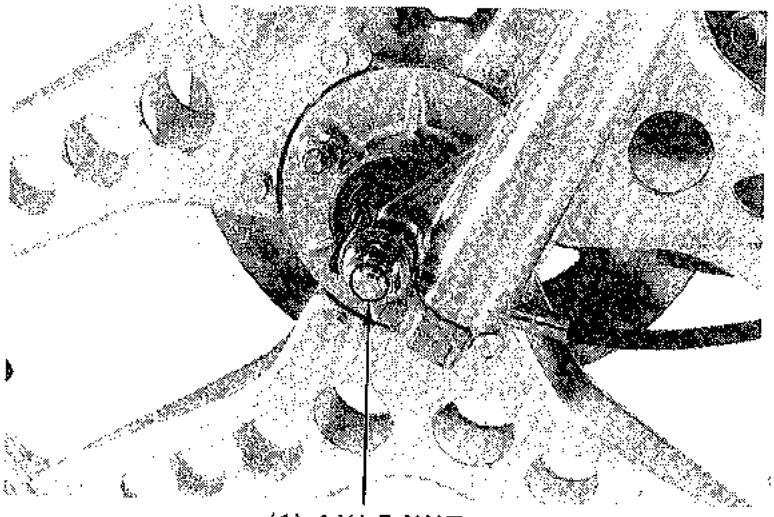
FRONT WHEEL

REMOVAL

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

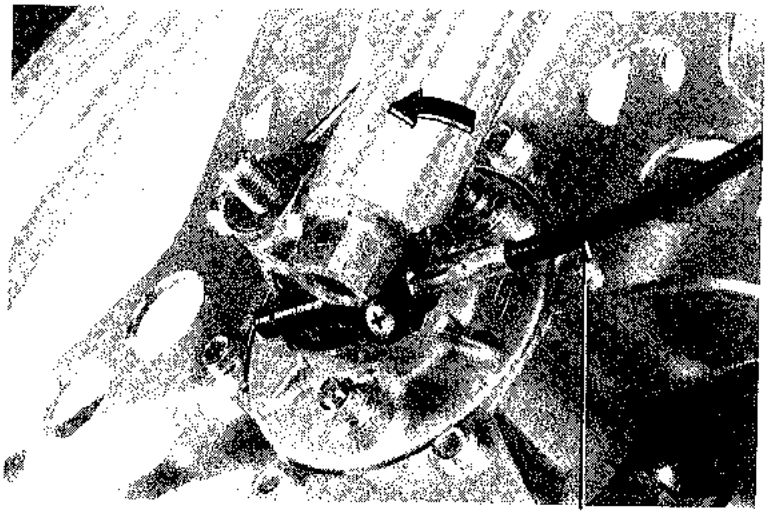


(1) AXLE NUT

Disconnect the speedometer cable.
Remove the axle shaft and front wheel.

NOTE

> Do not operate the front brake lever after removing the front wheel. To do so will cause difficulty in fitting the brake disc between the brake pads.

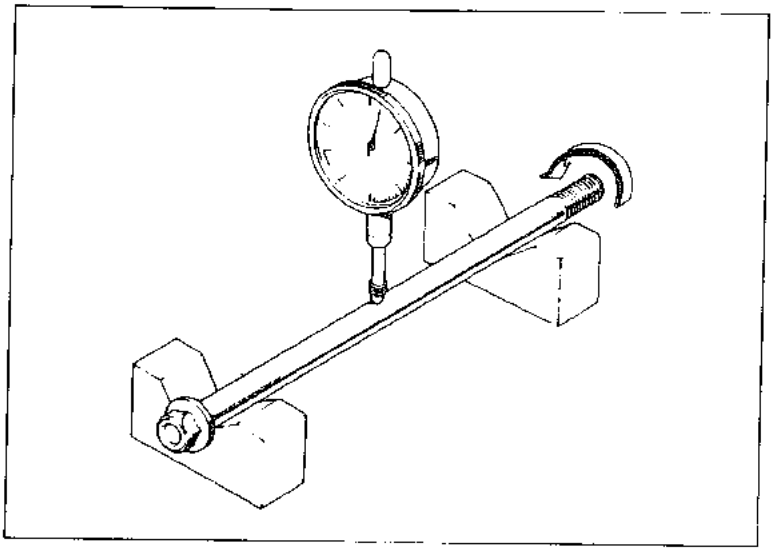


(1) SPEEDOMETER CABLE

AXLE INSPECTION

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

Actual runout is 1/2 of the total indicator reading.
SERVICE LIMIT: 0.20 mm (0.008 in)



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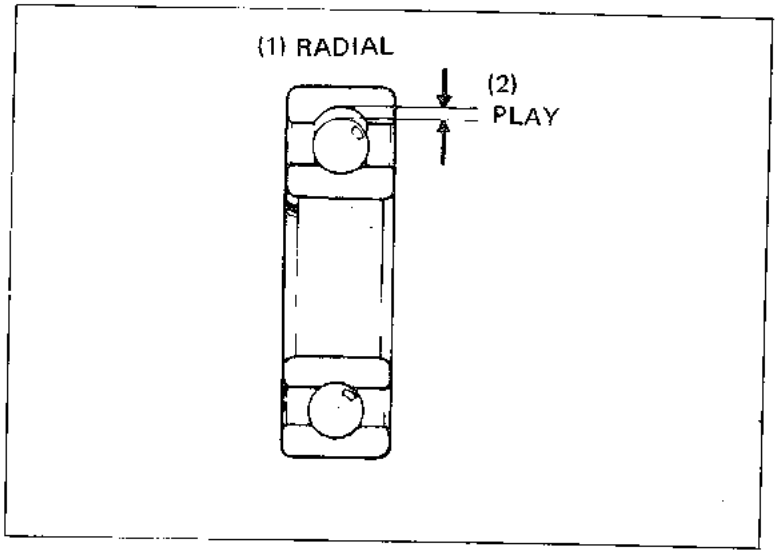
WHEEL BEARING INSPECTION

Check the wheel bearing by placing the wheel on a truing stand and spinning the wheel by hand.

Replace the bearing with a new one if it is noisy or shows excessive play.
SERVICE LIMIT: 0.027 mm (0.0010 in)

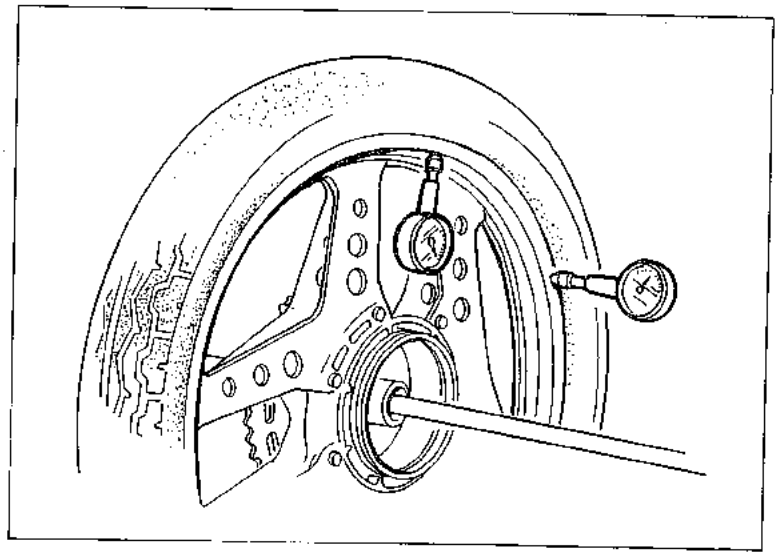


WHEEL RIM RUNOUT

Check the wheel rim for runout by placing the wheel in a truing stand. Spin the wheel by hand and read the rim runout using a dial indicator gauge.
SERVICE LIMIT:
Radial: 2.0 mm (0.08 in)
Axial: 2.0 mm (0.08 in)

NOTE

> The COMSTAR TM WHEEL cannot be repaired and must be replaced with a new one if the service limits are exceeded.

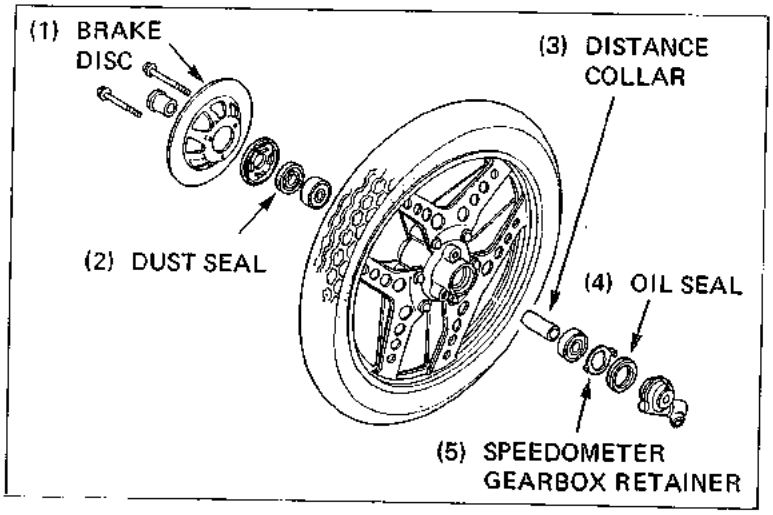


DISASSSMBLY

Remove the dust steal, bearing and distance collar.

NOTE

> Do not forget to install the rim band when replacing the tire or tube.

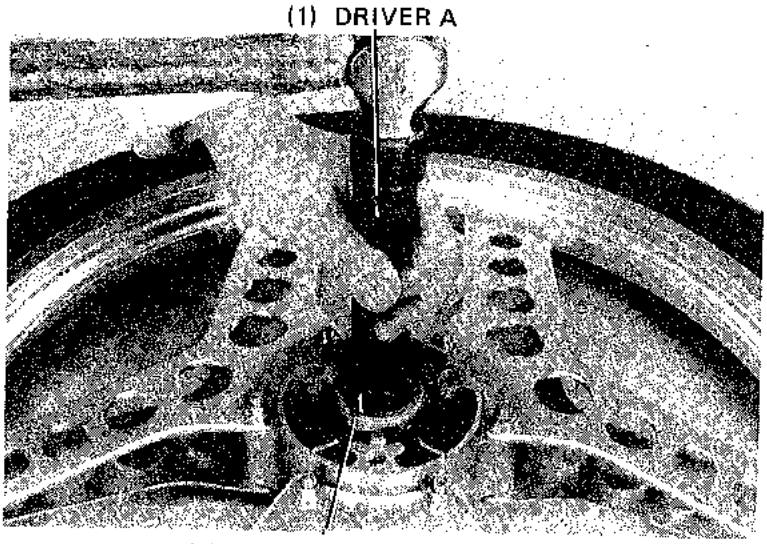


ASSEMBLY

Pack all bearing cavities with grease.
Drive in the right bearing.
Install the distance collar.
Drive in the left bearing.

NOTE

- Do not allow the bearing to tilt while driving it in.
- Install the bearing with the sealed end facing the outside.

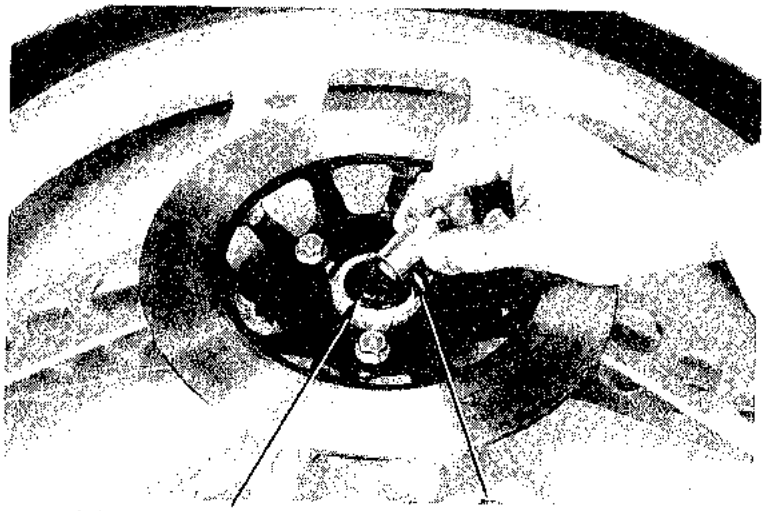


Install the brake disc.
TORQUE: 27–33 N.m (2.7–3.3 kg-m, 20–24 ft-lb)

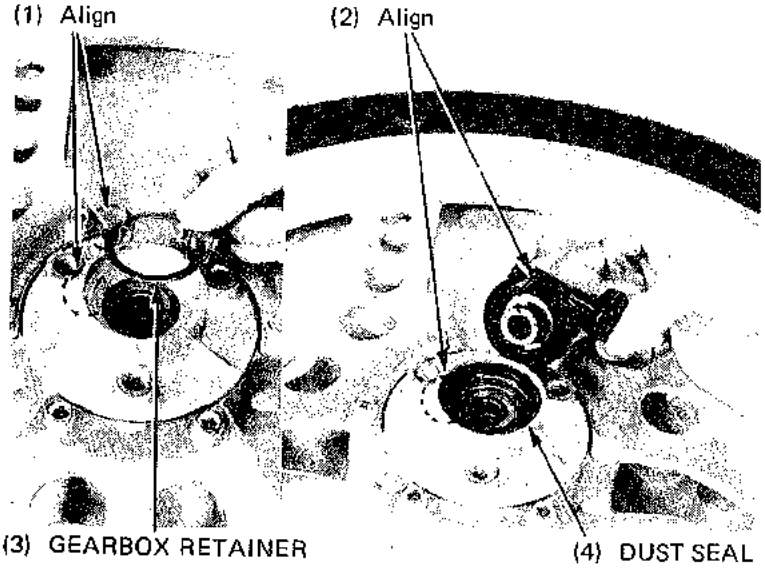
Apply grease to the inside of the dust seal.
Install the dust seal and distance collar in the right side of the wheel hub.

WARNING

Wipe off the excess grease. Grease on the disc will cause reduced braking efficiency and may lead to an accident.



Install the speedometer gearbox retainer, aligning the tabs with the grooves in the hub.
Apply grease to the inside of the dust seal and install.
Apply grease to the speedometer gearbox and hub retainer.
Install the speedometer gearbox, aligning the tabs on the gearbox with the grooves in the retainer.



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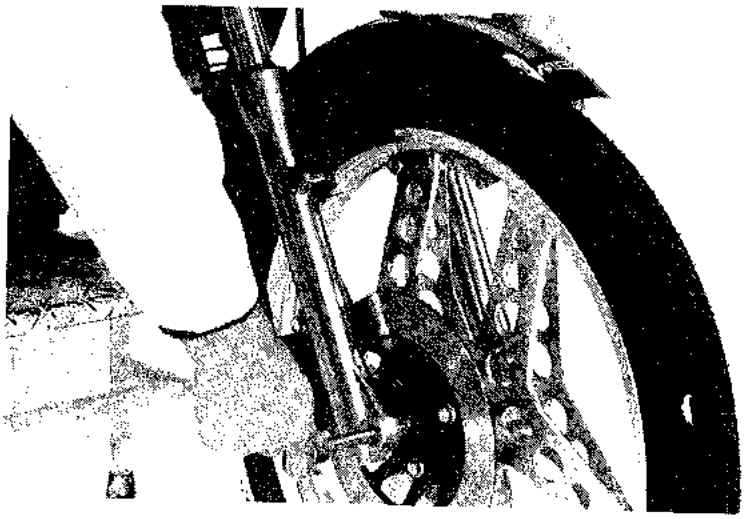
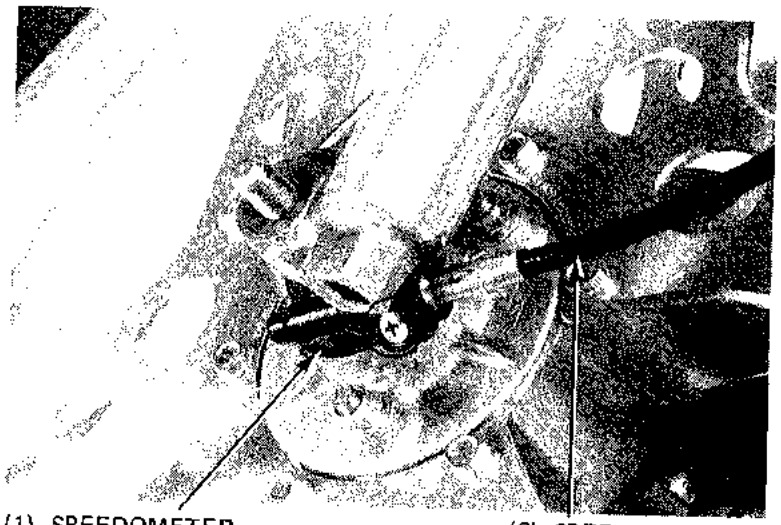
FRONT WHEEL INSTALLATION

Position the front wheel between the fork legs and insert the axle from the right side.



Position the speedometer gearbox as shown. Connect the speedometer cable to the speedometer gearbox.



(1) SPEEDOMETER GEARBOX

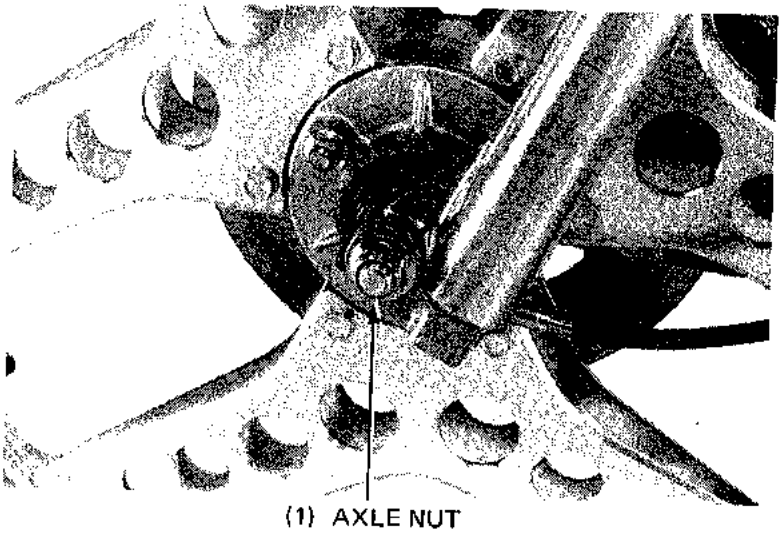
(2) SPEEDOMETER CABLE

Install the axle nut and tighten to the specified torque.

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

NOTE

Pump the brake lever after the front wheel is installed to ensure full braking efficiency.



(1) AXLE NUT

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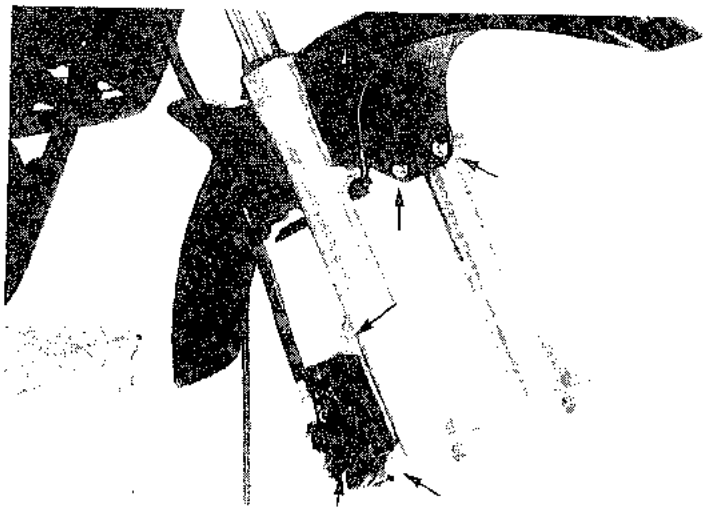
FRONT FORK

REMOVAL

Remove the front wheel (Page 11-9).
Remove the brake caliper.
Remove the fron fender.

NOTE

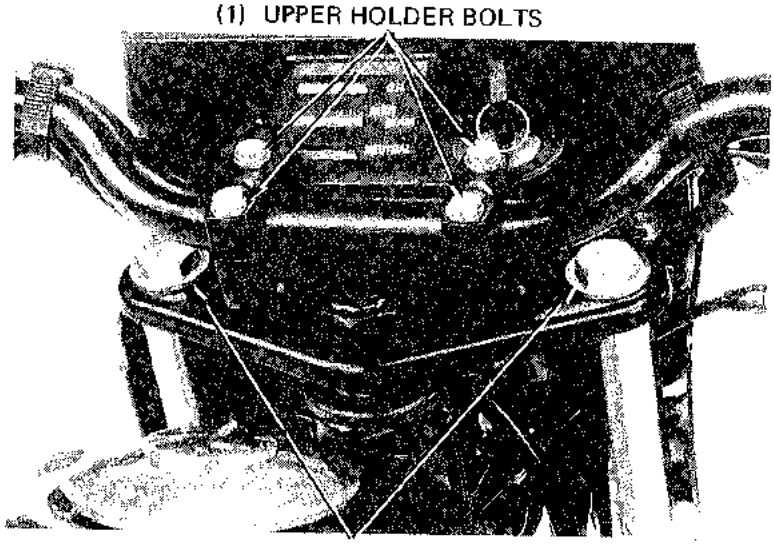
> Do not loosen the brake hose unless it is absolutely necessary. If the hose is loosened or disconnected, the brake system must be bled.



(1) BRAKE CALIPER

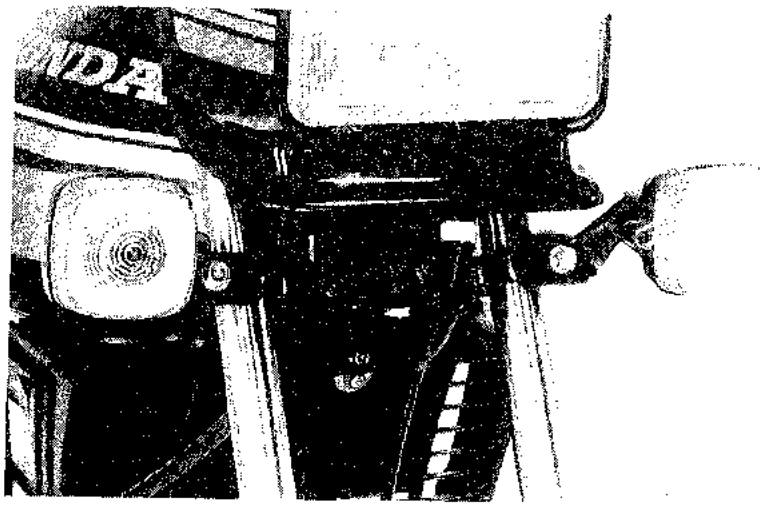
Loosen the handlebar upper holder bolts.
Loosen the fork bolts and remove them by shifting the handlebar right and left.

(1) UPPER HOLDER BOLTS



(2) FORK BOLTS

Loosen the fork pinch bolts.
Remove the front forks.



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DISASSEMBLY

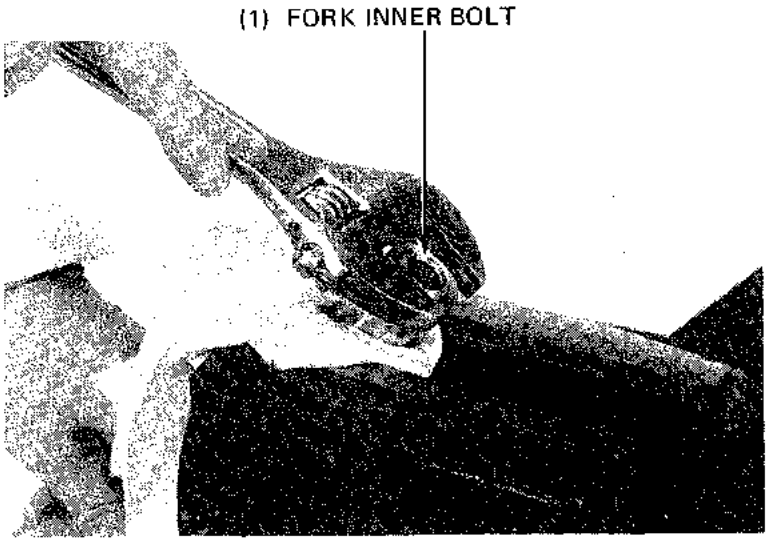
Remove the inner bolt.

NOTE

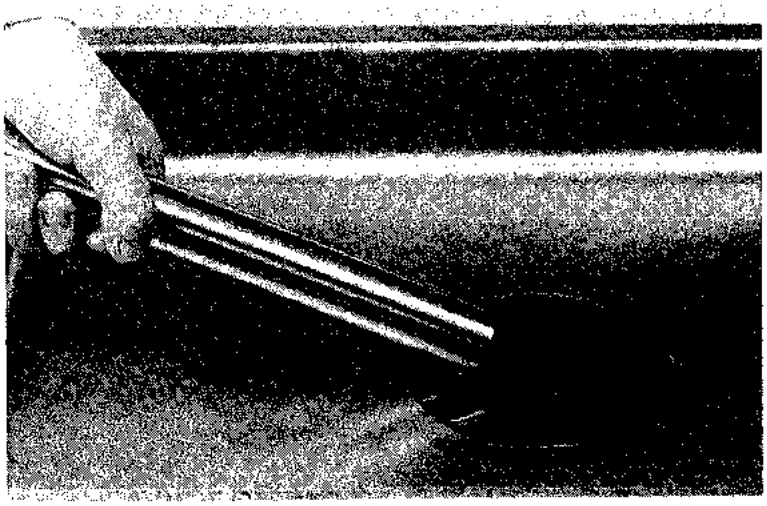
- Hold the fork tube in a vise with rag or soft jaws avoiding the sliding surface as shown.

CAUTION

The inner bolt is under spring pressure. Cover the inner bolt and wrench during removal to prevent injury caused by the bolt, wrench, or spring flying upwards.

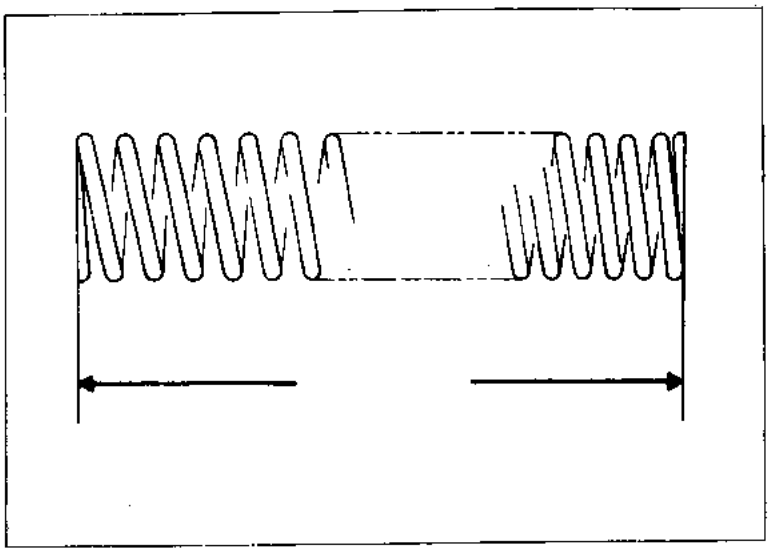


Drain the ATF (Automatic Transmission Fluid) from the fork by pumping it up and down slowly.



FORK SPRING INSPECTION

Measure the fork spring free length.
SERVICE LIMITS: 482.5 mm (19.00 in)



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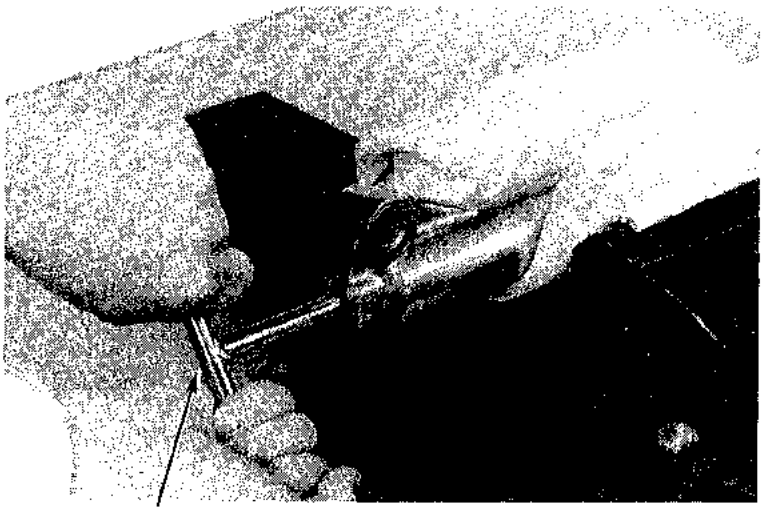
Remove the socket bolt.
Remove the fork tube, piston, rebound spring and oil lock piece.

CAUTION

Do not distort the slider in a vise.



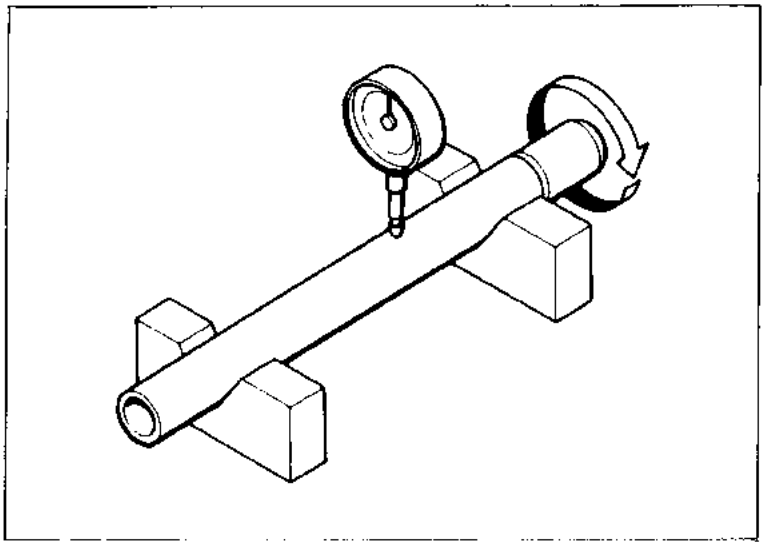
(1) 6 mm HEX WRENCH
07917–3230000

FORK TUBE RUNOUT

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

Take 1/2 of the total indicator reading to determine the actual wear.

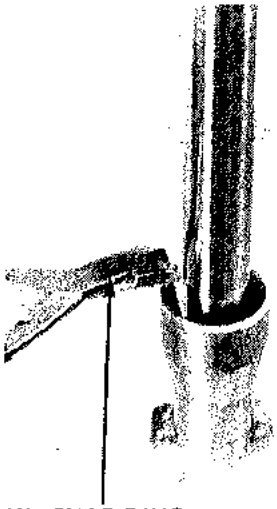
SERVICE LIMIT: 0.20 mm (0.008 in)



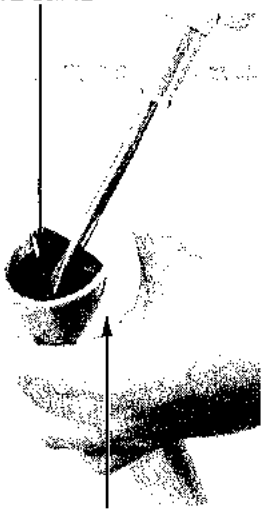
Remove the dust seal.
Remove the set ring with the snap ring pliers.
Remove the oil seal using the dull end of a screwdriver as shown.

NOTE

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



(2) SNAP RING PLIERS



(1) OIL SEAL

(3) RAG

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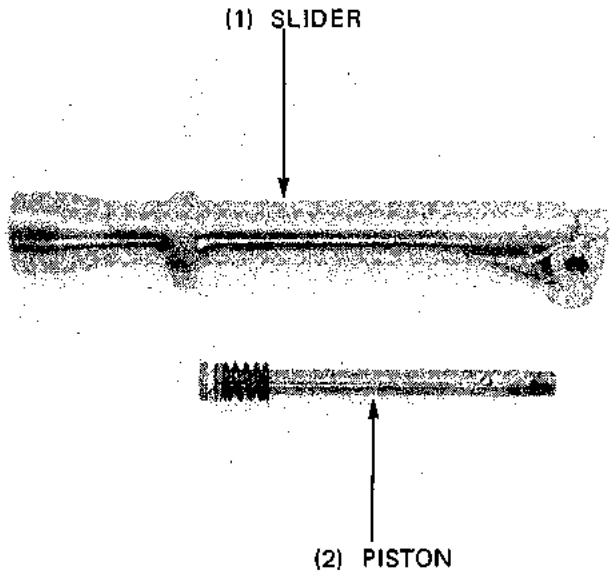
SLIDER/PISTON INSPECTION

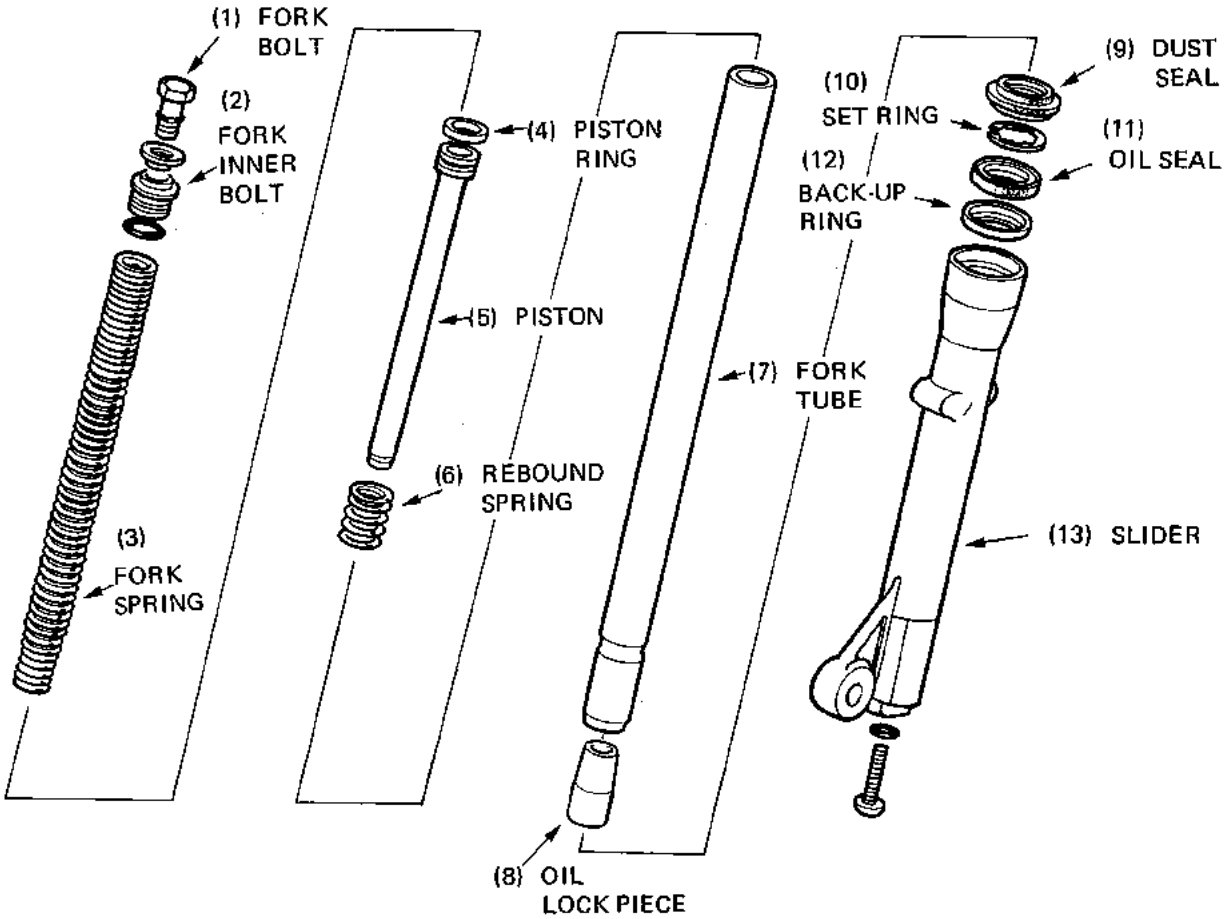
Check the slider for score marks, scratches or abnormal wear.



ASSEMBLY

NOTE

Wash all removed parts in solvent and wipe them off thoroughly before assembly.



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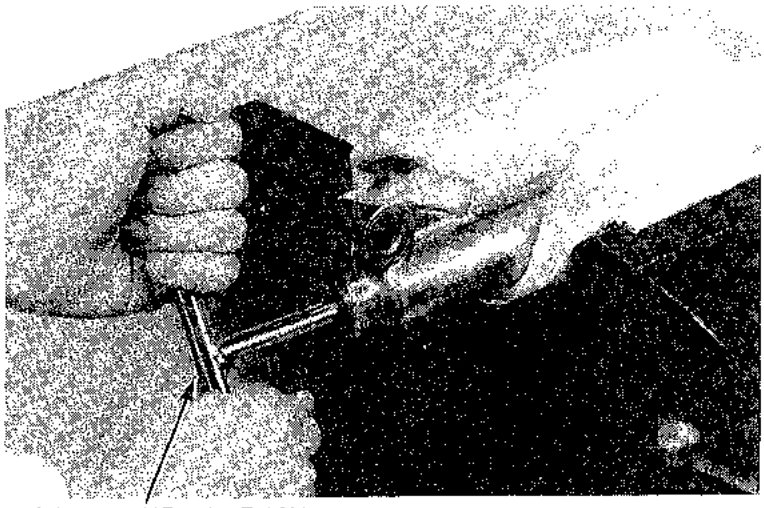
Install the piston ring on the piston.
Install the frok tube rebound spring and piston.

Install the oil lock piece.

Apply locking agent to the socket bolt threads and underside on the bolt.

NOTE

- To tighten the socket bolt, it may be necessary to install the fork spring and tighten the fork bolt provisionally.
- Do not distort the slider in a vise.



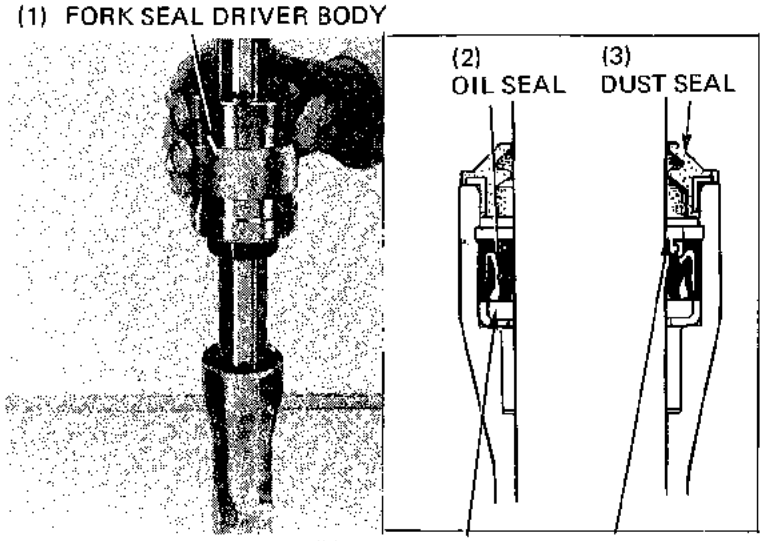
(1) 6mm HEX WRENCH
07917–3230000

Install the back-up ring.
Install the oil seal into the top of the fork slider.

NOTE

Apply ATF to the oil seal and drive it in with the fork seal driver.
The oil seal is seated when the groove in the slider is seen at top of the seal.

Install the set ring and dust seal.



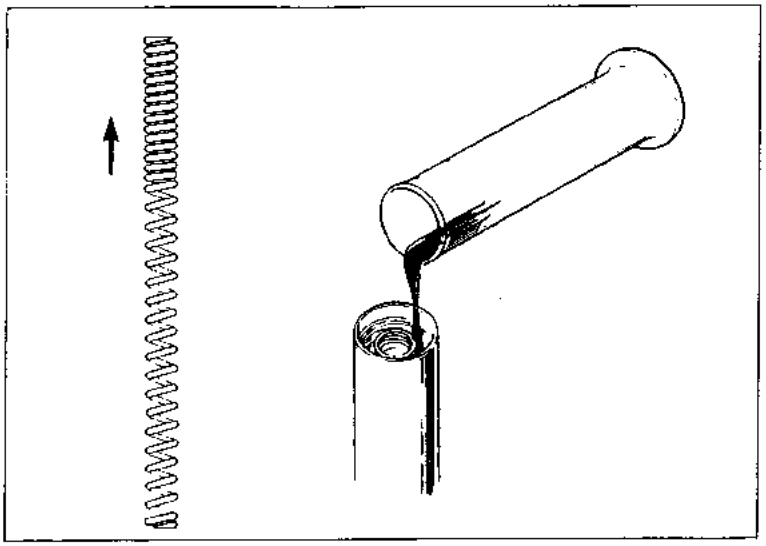
(4) DRIVER ATTACHMENT
07747–0010700
(5) BACK-UP RING
(6) SET RING

Fill the forks with the specified amount of ATF.
SPECIFIED FLUID: ATF
CAPACITIES: 149.5–154.5 cm^2 (5.3–5.5 oz)

Install the fork spring.

NOTE

Install the spring with the narrow pitch end facing up.



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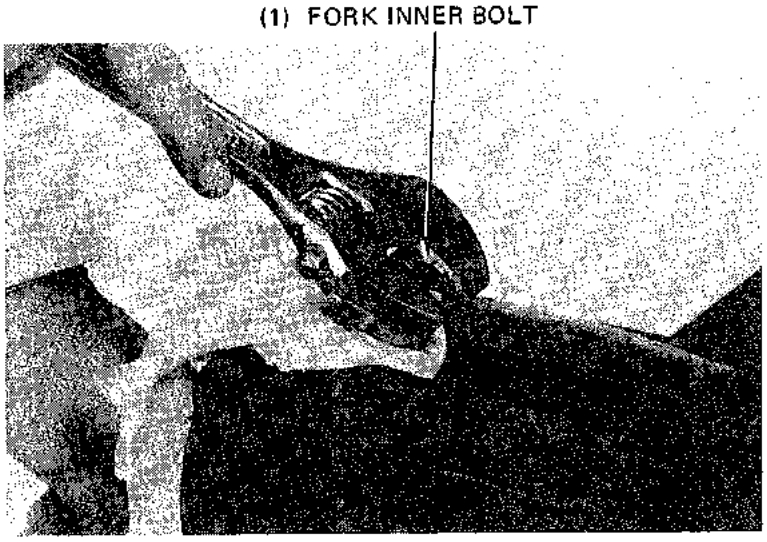
Install and torque the fork inner bolt.
TORQUE: 15–30 N.m (1.5–3.0 kg-m, 11–22 ft-lb)

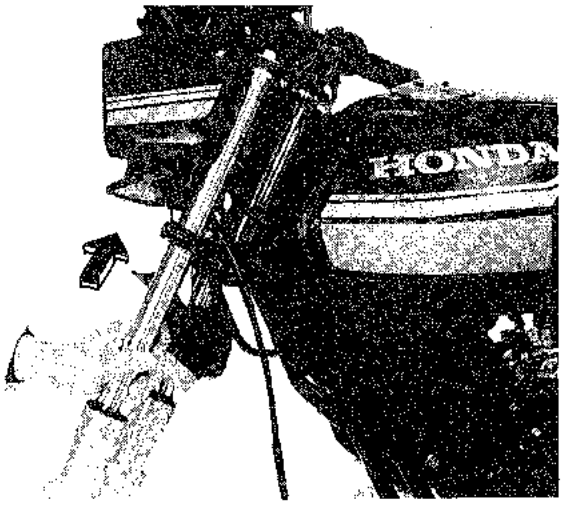
NOTE

Hold the fork tube in a vise, avoiding the sliding surface.



INSTALLATION

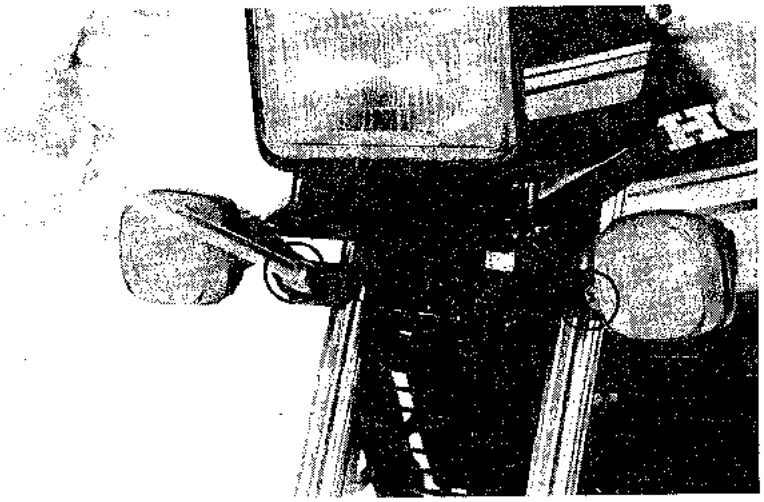
Install the front forks.



Install and torque the fork bolts.
TORQUE: 40–50 N.m (4.0–5.0 kg-m, 29–36 ft-lb)

Tighten the fork pinch bolts.
TORQUE: 24–30 N.m (2.4–3.0 kg-m, 17–22 ft-lb)

Install the handlebar upper holders (Page 11-8).
Install the fron wheel (Page 11-12).
Install the brake caliper (Page 12-9).



STEERING STEM

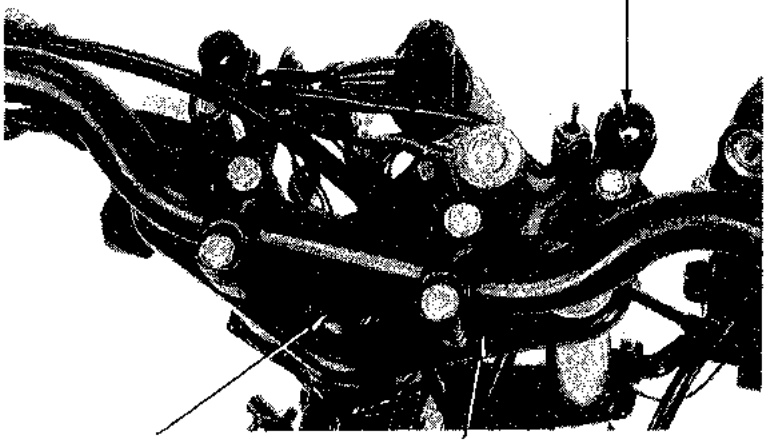
REMOVAL

Remove the headlight (Page 11-4).
Remove the instruments (Page 11-5).
Remove the front wheel (Page 11-9).
Remove the headlight case bracket.

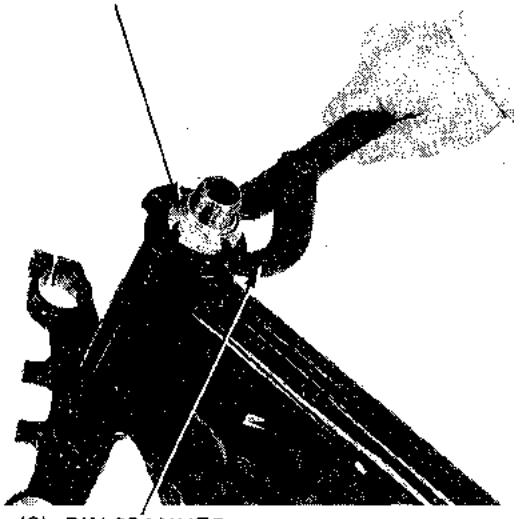
Remove the handlebar (Page 11-7).

Remove the steering stem nut.

Remove the front forks (Page 11-13).
Remove the fork bridge.



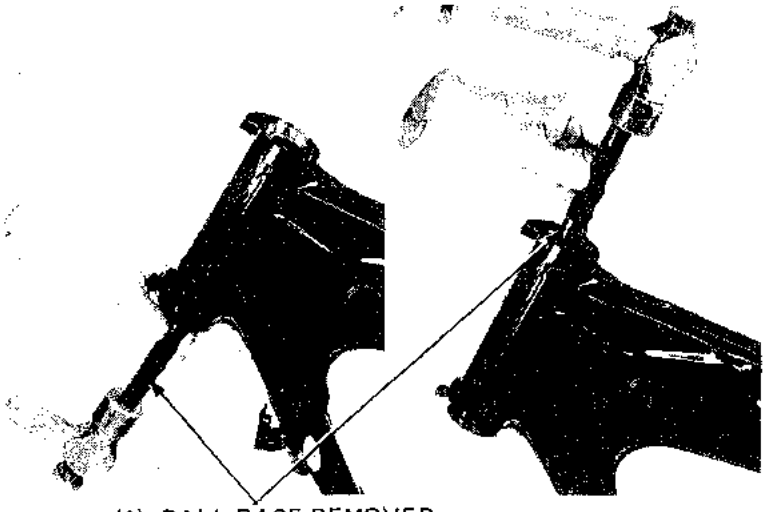
Remove the bearing adjustment nut.
Remove the steering stem, top cone race, steel balls and bottom cone race.



Remove the ball races with the special tool.

NOTE

> If the motorcycle has been involved in an accident, examine the area around the steering head for cracks.



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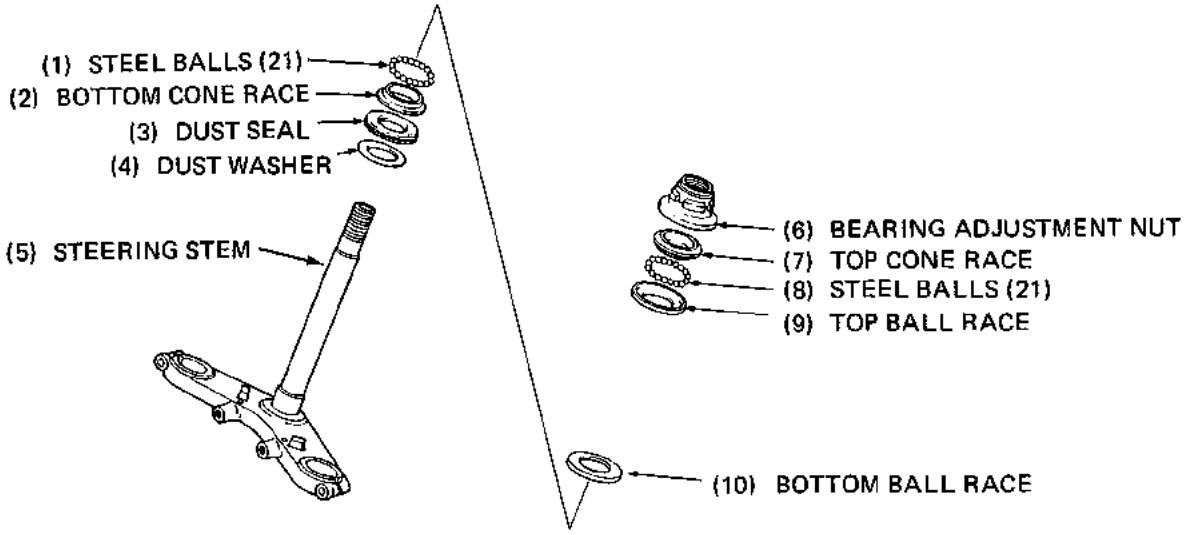
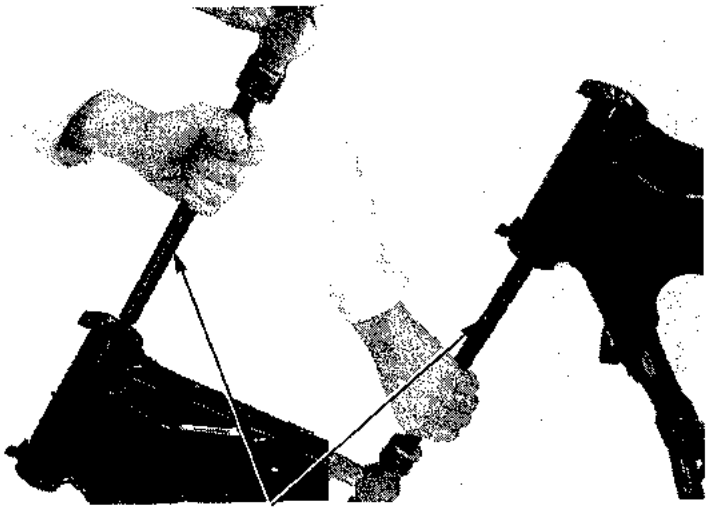
STEERING STEM INSTALLATION

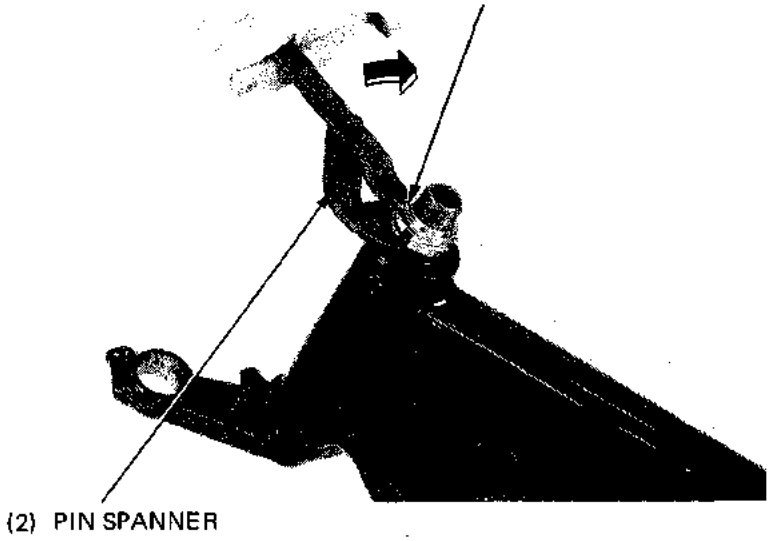


Drive the top and bootom ball races into the head pipe with the same tool.



Install the washer and dust seal.
Grease the ball race, steel balls and cone race.
Install the steering stem.
Install the bearing adjustment nut in the frame neck and tighten it until snug against the top cone race, then back it out 1/8 turn.

Check that the stem rotates freely.



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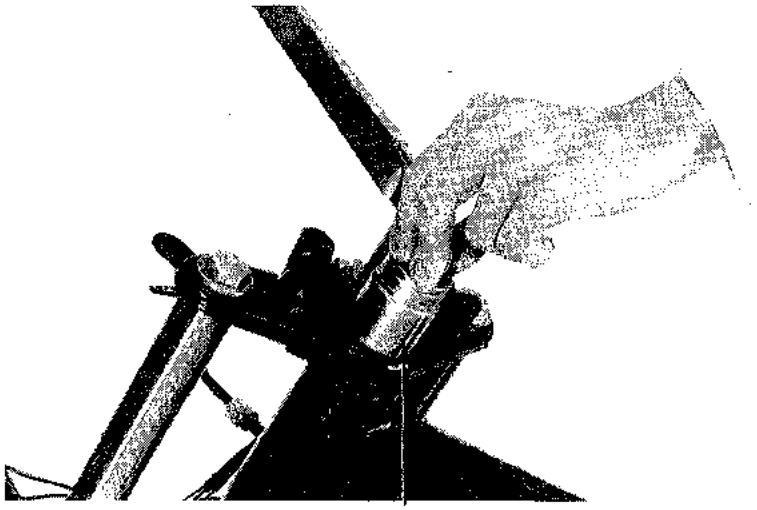
Install the top bridge.
Install the fron forks (Page 11-18).
Tighten the stem nut.
TORQUE: 60–90 N.m (6.0–9.0 kg-m, 43–65 ft-lb)

Install the removed parts in the reverse order of removal.



(1) STEM NUT

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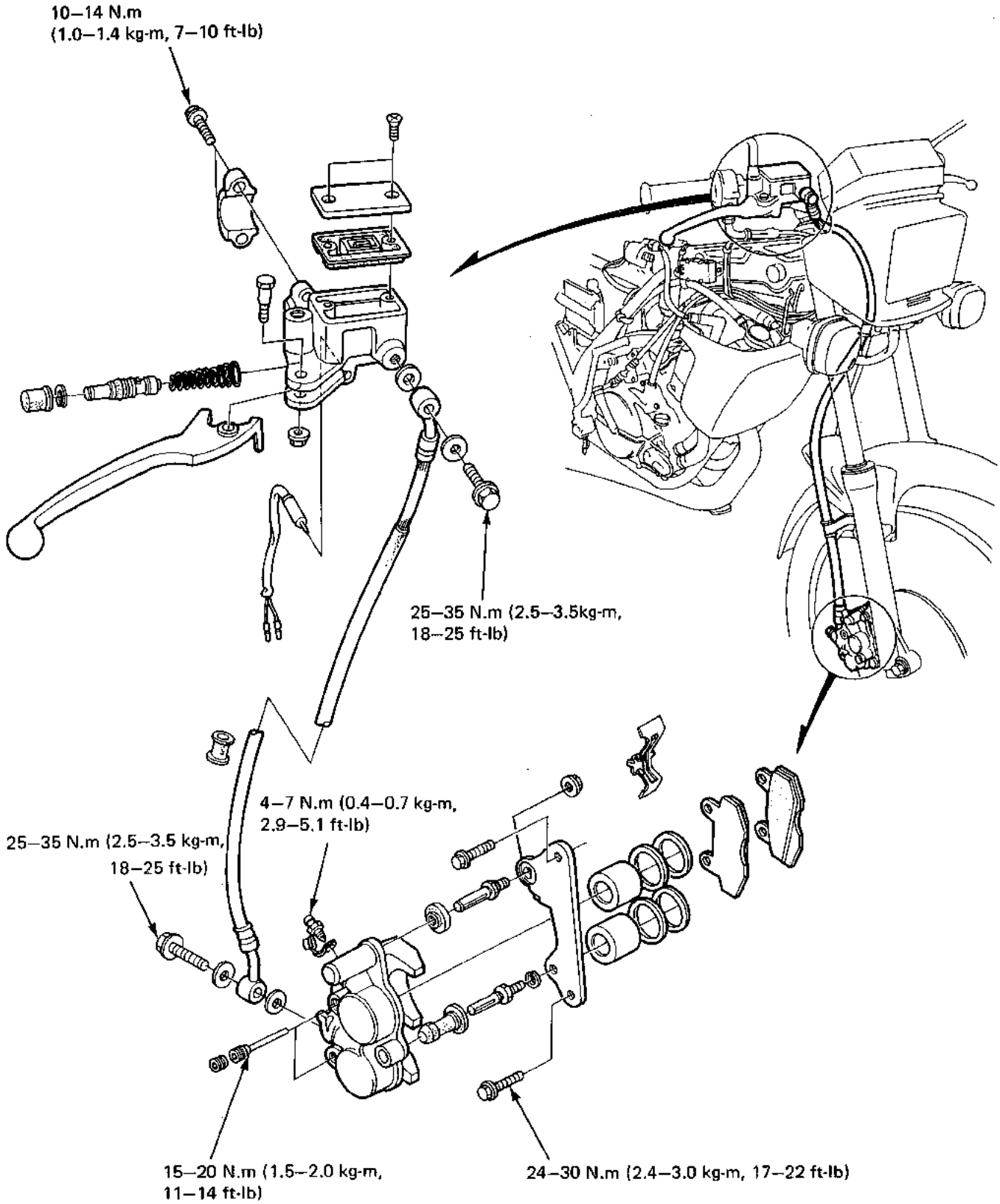
HYDRAULIC BRAKE 12.



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SERVICE INFORMATION	12-2
GROUBLESHOOTING	12-2
BRAKE FLUID/AIR BLEEDING	12-3
BRAKE PAD/DISC	12-4
BRAKE CALIPER	12-6
BRAKE MASTER CYLINDER	12-9

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SERVICE INFORMATION

GENERAL INSTRUCTIONS

- The front brake pads can be replaced without disconnecting the brake hose. Once the hydraulic system has been opened, or if the brake feels spongy, the system must be bled.
- The brake caliper should be disassembled before the master cylinder is disassembled.
- Do not allow foreign material to enter the system when filling the reservoir.
- Avoid spilling brake fluid on painted surfaces or instrument lenses, as severe damage will result.

TOOL

Special
Snap Ring Pliers — 07914–3230001

TORQUE VALUES

Master cylinder mounting bolts	10–14 N.m (1.0–1.4 kg-m, 7–10 ft-lb)
Brake hose bolts	25–35 N.m (2.5–3.5 kg-m, 18–25 ft-lb)
Bleeder valve	4– 7 N.m (0.4–0.7 kg-m, 2.9–5.1 ft-lb)
Brake pad pin bolts	15–20 N.m (1.5–2.0 kg-m, 11–14 ft-lb)
Brake caliper bracket bolts	24–30 N.m (2.4–3.0 kg-m, 17–22 ft-lb)

SPECIFICATIONS

ITEM	STANDARD mm (in)		SERVICE LIMIT mm (in)	
Disc thickness	3.80–4.20	(0.15–0.165)	3.0	(0.12)
Dis runout	0–0.15	(0–0.006)	0.3	(0.01)
Master cylinder I.D.	12.700–12.743	(0.5000–0.5017)	12.755	(0.5022)
Master piston O.D.	12.657–12.684	(0.4983–0.4994)	12.640	(0.4976)
Caliper cylinder I.D.	25.400–25.405	(1.0000–1.0002)	25.450	(1.0020)
Caliper piston O.D.	25.318–25.368	(0.9968–0.9987)	25.300	(0.9961)

TROUBLESHOOTING

Brake lever soft or spongy
1. Air bubbles in hydraulic system
2. Low fluid level
3. Hydraulic system leaking

Brake lever too hard
1. Sticking piston (s)
2. Clogged hydraulic system
3. Pads glazed or worn excessively

Brake drag
1. Hydraulic system sticking
2. Sticking piston (s)

Brake chatter or squeal
1. Pads contaminated
2. Excessive disc runout
3. Caliper installed incorrectly
4. Disc or wheel misaligned

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BRAKE FLUID/AIR BLEEDING

Check the front brake lever free play. If the paly is excessive, check the brake pad for wear and bleed air from the brake hydraulic system.

Remove the cap from the reservoir by remvoing the attaching screws. Remove the diaphragm.

CAUTION

Avoid spilling fluid on painted surfaces, plastic lenses or rubber parts as it can cause damage to them.

Fill the brake fluid reservoir up to the UPPER LEVEL mark.

CAUTION

Do not mix different brands of fluid since they are not compatible.
SPECIFIED BRAKE FLUID:
DISC BRAKE FLUID DOT 3

Connect an extension tube to the bleeder valve with the open end submerged in a glass jar.
With the brake lever pulled all the way back to the handlebar grip, turn the bleeder valve about 1/2 rotation out, then retighten.

NOTE

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

Release the brake lever gradually and wait several seconds after it reaches the end ot its travel.
Repeat the above steps until there are no air bubbles in the fluid flowing out of the bleeder valve.

NOTE

- Keep the reservoir filled while bleeding the system.
- Do not reuse brake fluid.

Close the bleeder valve.
TORQUE: 4–7 N.m (0.4–0.7 kg-m, 2.9–5.1 ft-lb)

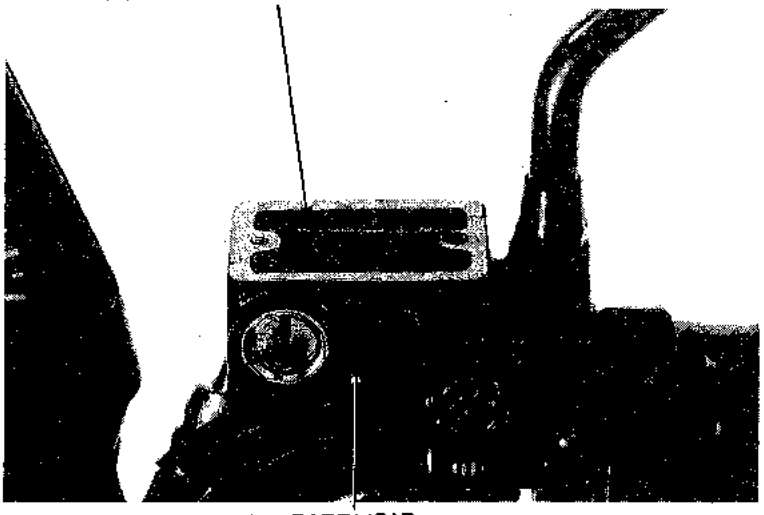
Fill the reservoir up to the UPPER FLUID LEVEL.

Check the entire system for leaks by operating the lever.

WARNING

A contaminated brake disc or pads reduces stopping power. Replace contaminated pads, and clean a contaminated disc with a good quality degreasing agent.

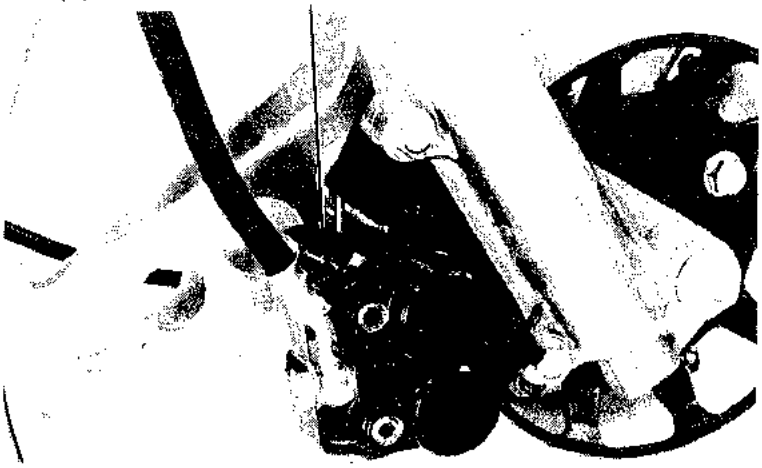
(1) UPPER LEVEL



(2) RESERVOIR

(1) BLEEDER VALVE

(1) BLEEDER VALVE CAP



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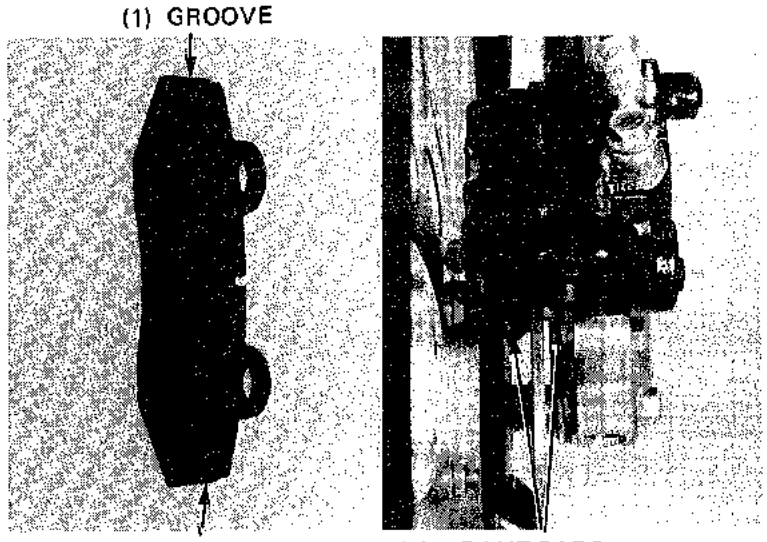
BRAKE PAD/DISC

BRAKE PAD INSPECTION

The front brake pads require replacement if the groove in the sides of the pads reaches the edges of the brake disc.

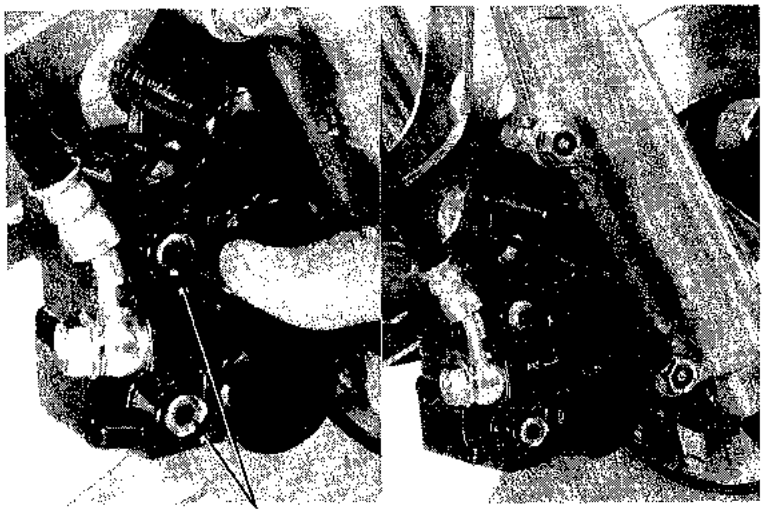


BRAKE PAD REPLACEMENT

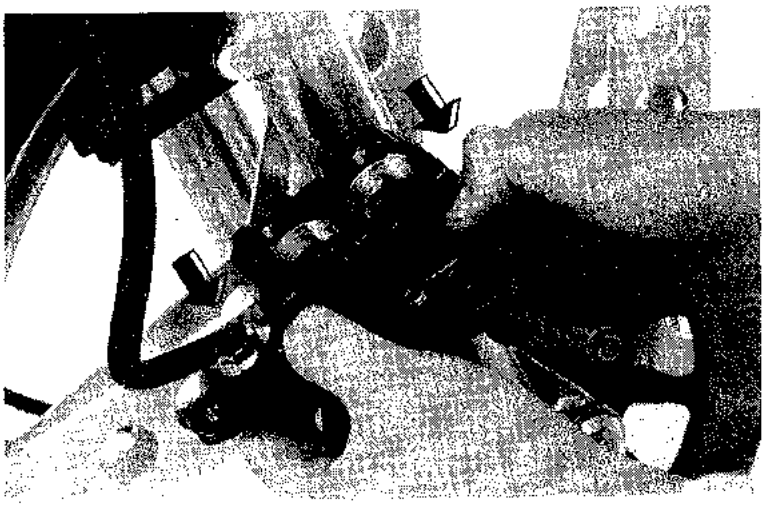
NOTE

> Do not disconnect the brake hose when replacing the brake pads.

Remove the pin bolt caps and loosen the pin bolts. Remove the caliper bracket bolts and remove the caliper from the fork leg.



Push the pistons all the way in to allow installation of new brake pads.
Remove the two pin bolts, then the brake pads.



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Clean the brake caliper.
Apply silicone grease to the pin bolts and pins on the caliper bracket.
Install new brake pads and pad spring and loosely install the pin bolts.

CAUTION

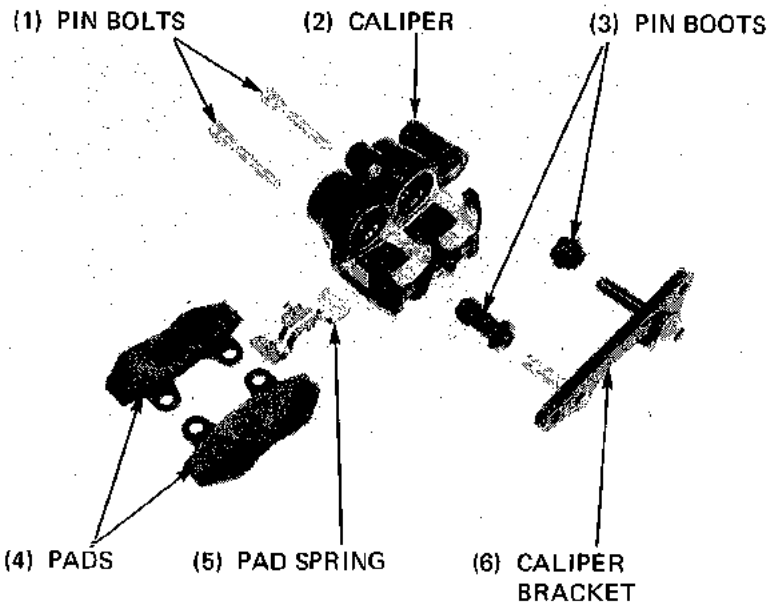
Replace both pads as a set. Do not replace one without replacing another.

Ensure that the pin bolts are inserted through the holes in the brake pads.

Assemble the caliper bracket and caliper and install the caliper on the fork leg.
TORQUE: 24–30 N.m (2.4–3.0 kg-m, 17–22 ft-lb)

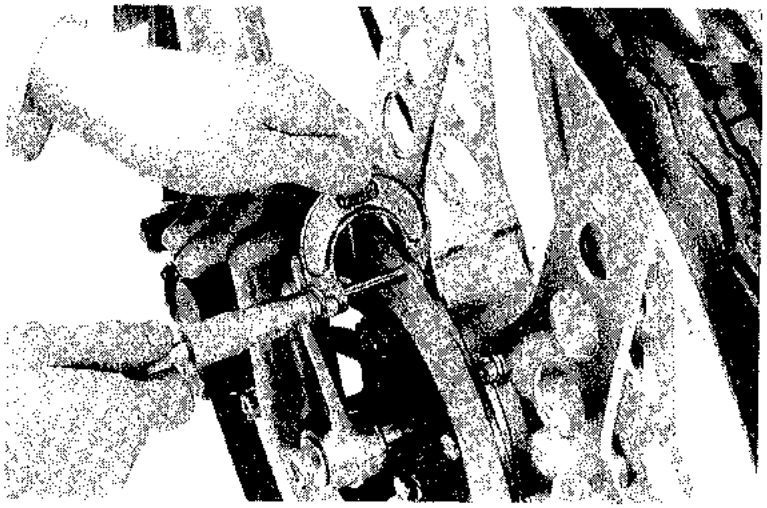
Tighten the pin bolts to the specified torque and bend the tabs of the lock washer against the side of each bolt.
TORQUE: 15–20 N.m (1.5–2.0 kg-m, 11–14 ft-lb)

Install the pin bolt caps.

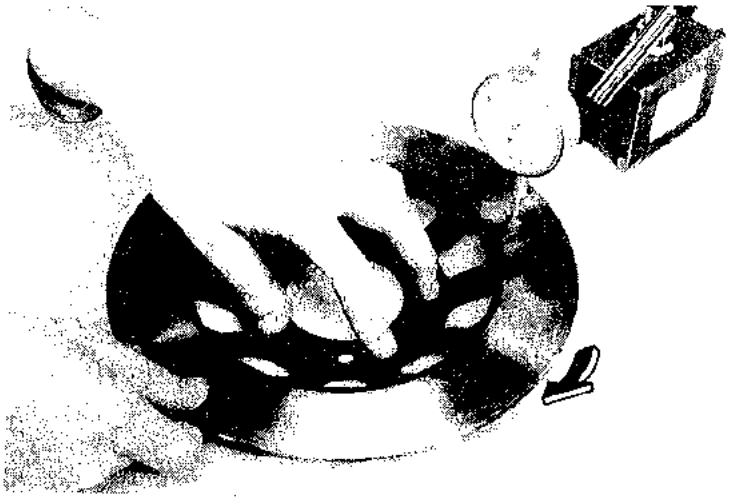


BRAKE DISC INSPECTION

Measure the brake disc thickness.
SERVICE LIMIT: 3.0 mm (0.12 in)



Measure the brake disc warpage.
SERVICE LIMIT: 0.3 mm (0.01 in)



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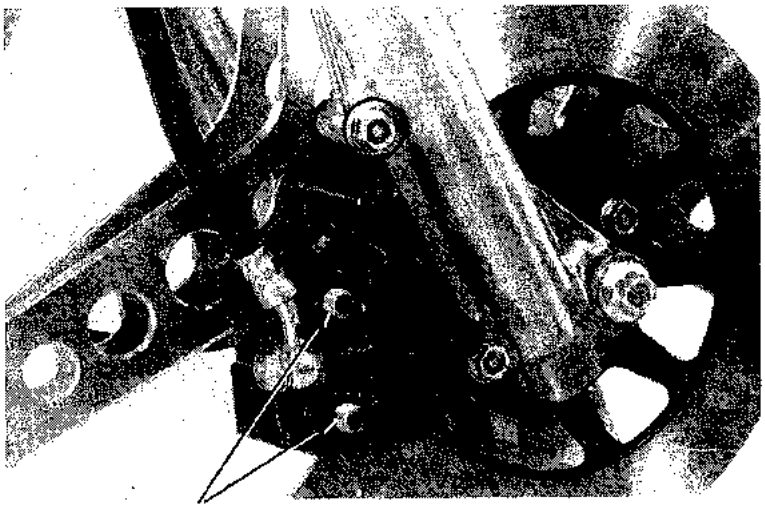
BRAKE CALIPER

REMOVAL

Remove the pin bolt cap and loosen the pin bolts.
Remove the two bolts attaching the caliper and remove the caliper from the fork leg.
Remove the bracket from the cliper.


(1) PIN BOLTS

DISASSEMBLY

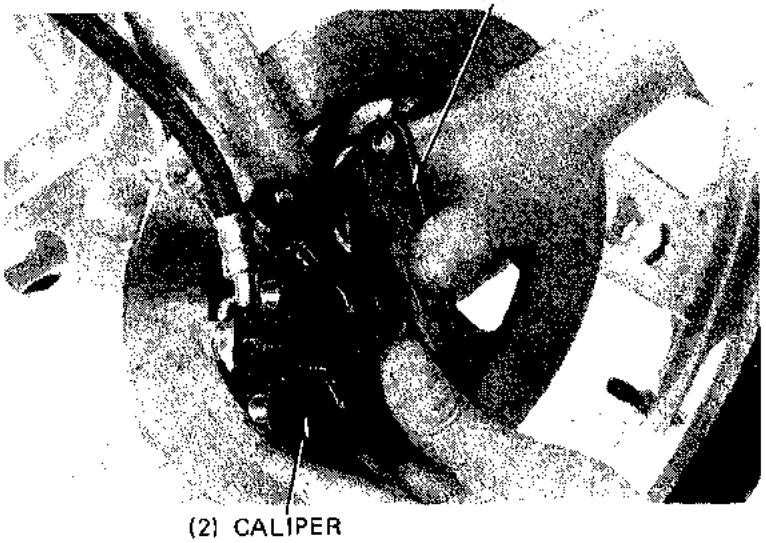
Remove the pads, and spring by removing the pin bolts.

Operate the brake lever to force the piston out of the cylinder.

NOTE

- Place an oil pan under the caliper to receive brake fluid drained.
- Avoid spilling brake fluid on painted surfaces, plastic lenses or rubber parts.

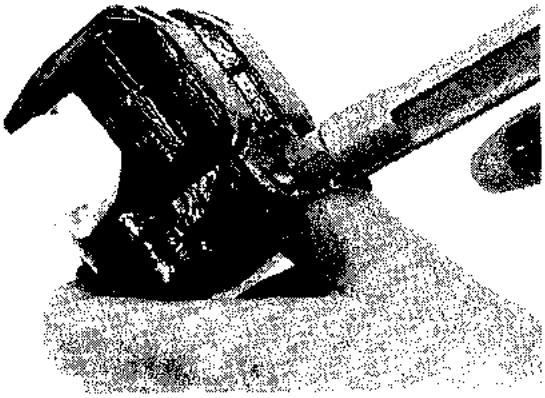
Disconnect the brake hose from the caliper.
If the piston is seized in the caliper, observe the following steps.


(1) CALIPER BRACKET
(2) CALIPER

Place a shop towel or rag over the pistons to prevent the pistons and brake fluid from coming out, and apply a small amount of air pressure to the fluid inlet.

WARNING

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



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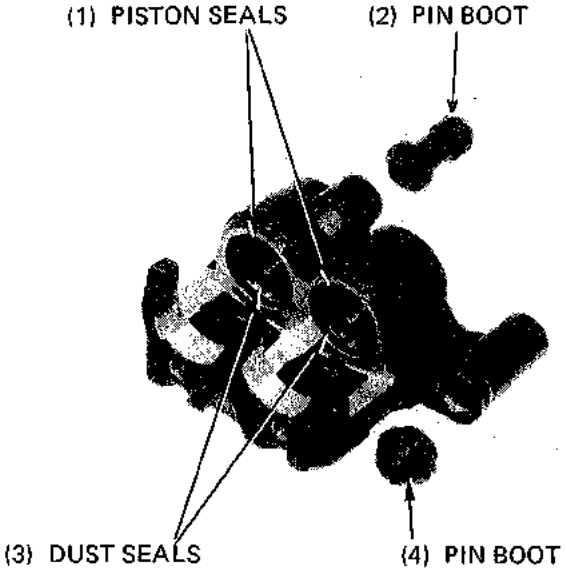
Remove the pin boots.

Lift out the piston and dust seals by first pushing them into the cylinder.

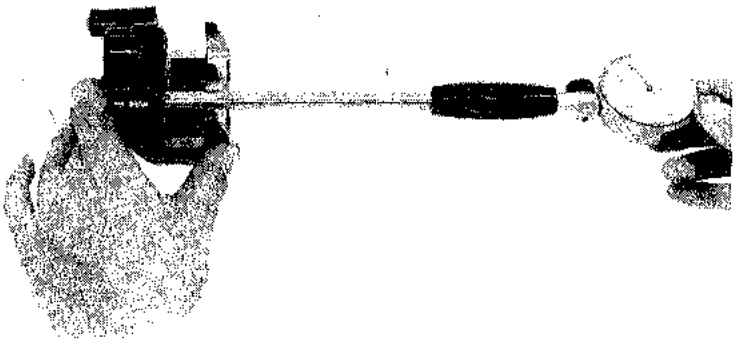
Clean the caliper grooves with brake fluid.
Replace the piston and dust seals with new ones.



INSPECTION

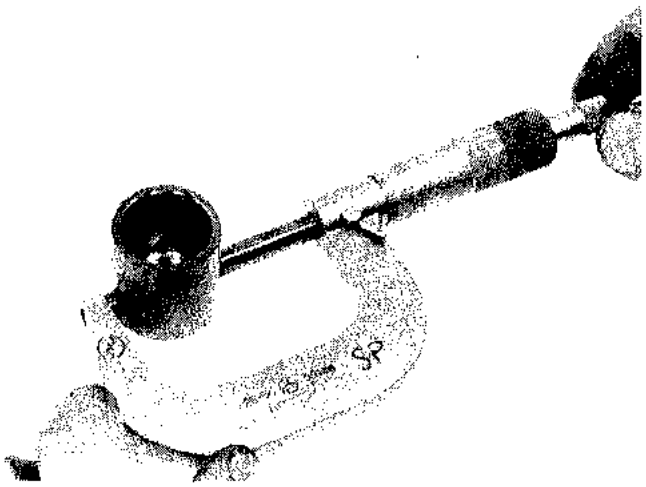
Check the caliper cylinders for scoring, scratches or other damage.

Measure the caliper cylinder I.D.
SERVICE LIMIT: 25.450 mm (1.0020 in)



Check the pistons for scoring, scratches or other defects.

Measure the caliper piston O.D.
SERVICE LIMIT: 25.300 mm (0.9961)



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ASSEMBLY

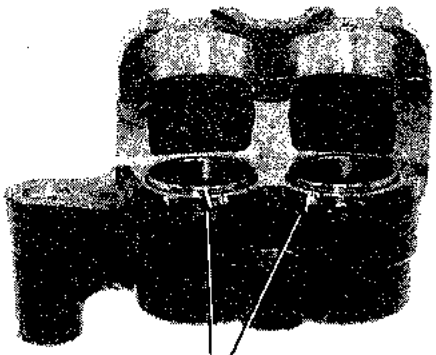
Wash all the removed parts. Coat the piston and dust seals with silicone grease.

Lubricate the inside diameter of the caliper cylinders with brake fluid and install the pistons with the concave end on the brake pad side.

NOTE

> Install the pistons with the end 3–5 mm (1/8–1/5 in) projecting above the caliper.

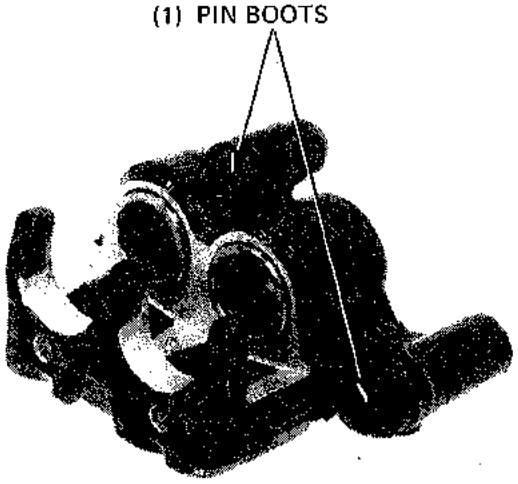
Wipe excess brake fluid off the caliper with a clean cloth.



(1) PISTONS

Lubricate the inside of the pin boots with silicone grease and install them in the caliper.

(1) PIN BOOTS



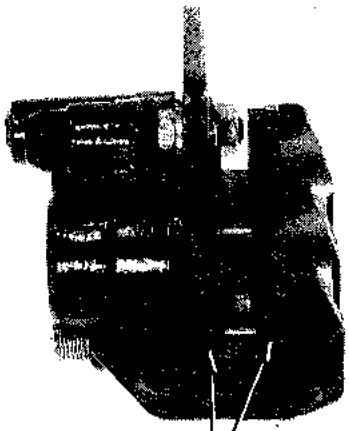
Install the pad spring and pads with the pin bolts.

NOTE

> If the brake pad is dirty, clean with sand paper.

Loosely tighten the pin bolts.

Make sure that the pin bolts are inserted through the holes in the brake pad.



(1) PADS

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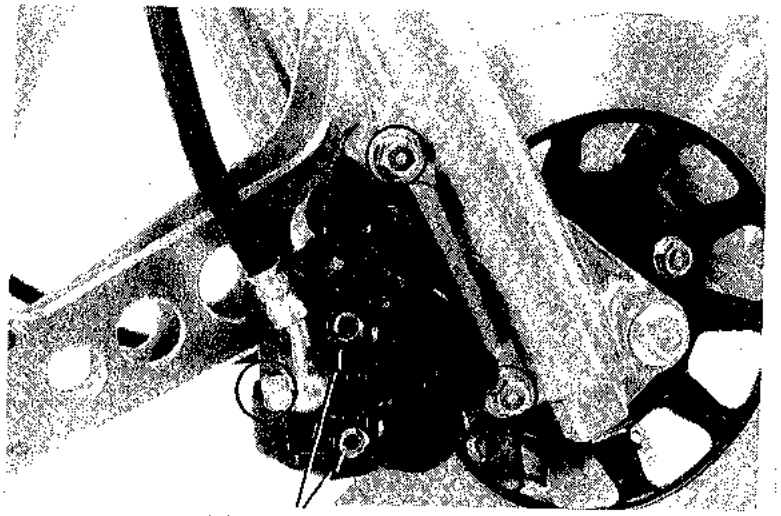
INSTALLATION

Install the brake hose and seal washer.
TORQUE: 25–35 N.m (2.5–3.5 kg-m, 18–25 ft-lb)

Install the bracket to the caliper.
Install and tighten the caliper bracket to the front fork to the specified torque.
TORQUE: 24–30 N.m (2.4–3.0 kg-m, 17–22 ft-lb)

Tighten the pin bolts and install the pin bolt caps.
TORQUE: 15–20 N.m (1.5–2.0 kg-m, 11–14 ft-lb)
After the front brake has been installed, bleed air from the system (Page 12-3).



(1) PIN BOLTS

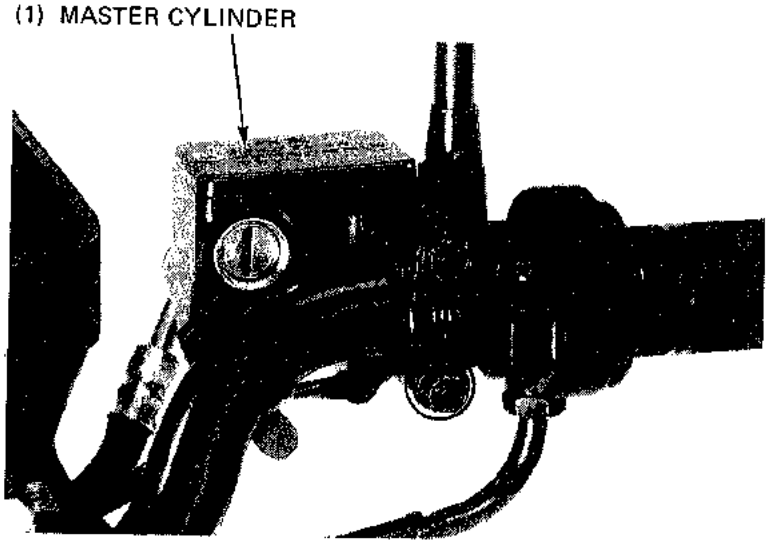
BRAKE MASTER CYLINDER

REMOVAL

Drain brake fluid from the bleeder valve by operating the brake lever.

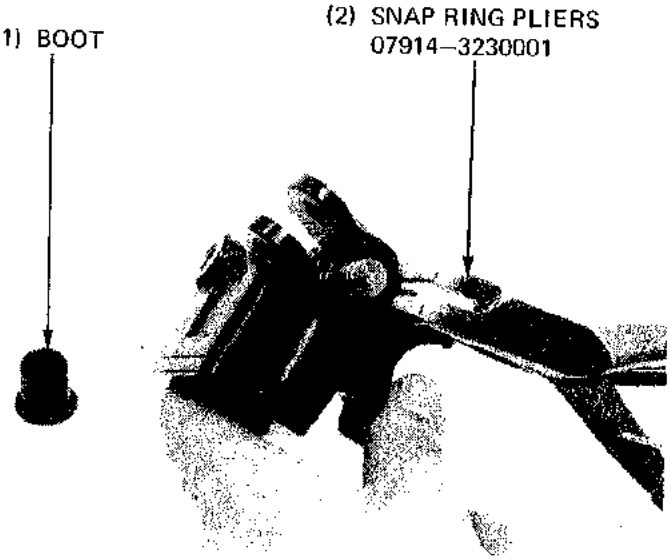
Remove the brake lever, front stoplight switch, rear view mirror and brake hose.

Remove the master cylinder from the handlebar.



DISASSEMBLY

Remove the reservoir cap and diaphragm.
Remove the boot.
Remove the snap ring.
Remove the master cylinder piston and spring.



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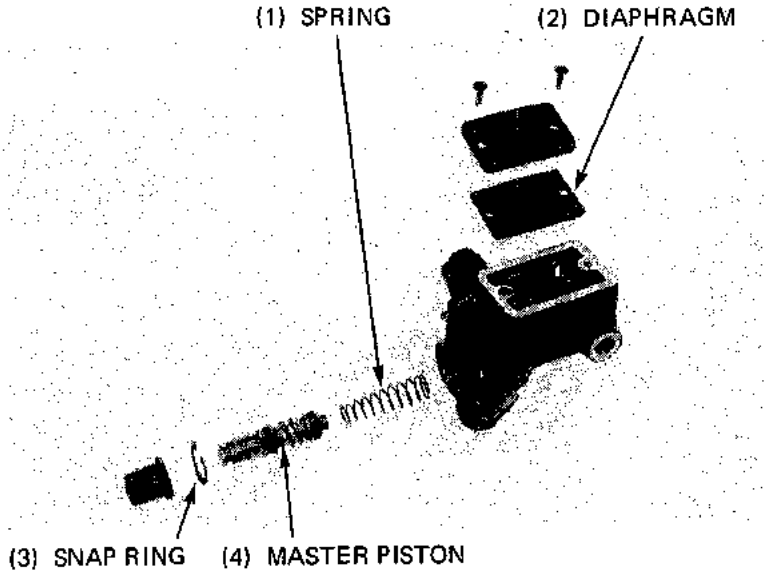
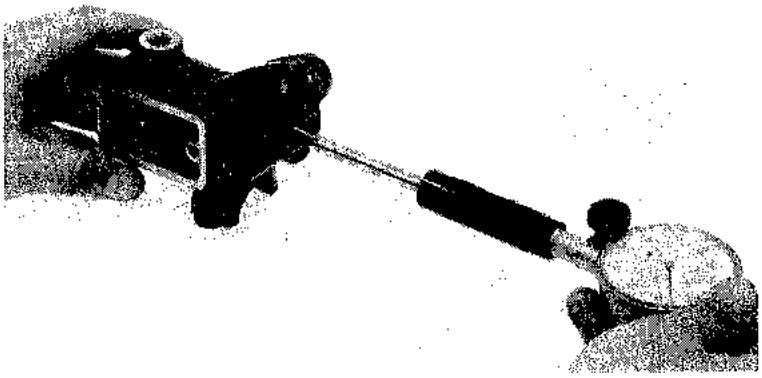
Remove the reservoir from the master cylinder. Clean the master cylinder and reservoir in brake fluid.



INSPECTION

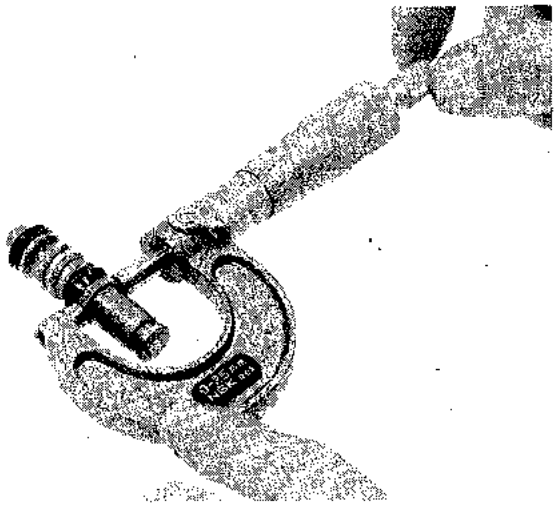
Check the master cylinder for score marks, scratches or other defects.

Measure the master cylinder I.D.
SERVICE LIMIT: 12.755 mm (0.5022 in)



Check the master piston for score marks, scratches or other damage.

Measure the master piston O.D.
SERVICE LIMIT: 12.640 mm (0.4976 in)



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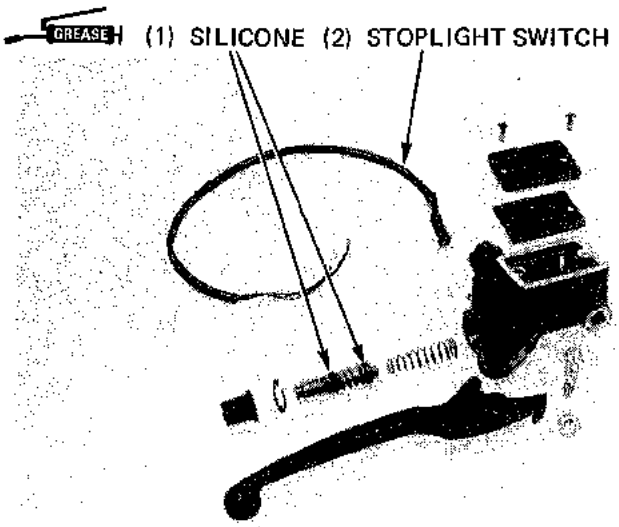
ASSEMBLY

Apply silicone grease to the piston cup and pour a small amount of brake fluid into the cylinder.

NOTE

- Replace the master piston and spring as a set. Do not replace one without replacing the other.
- Check that the snap ring is seated in the groove properly.

Install the front stoplight switch.



INSTALLATION

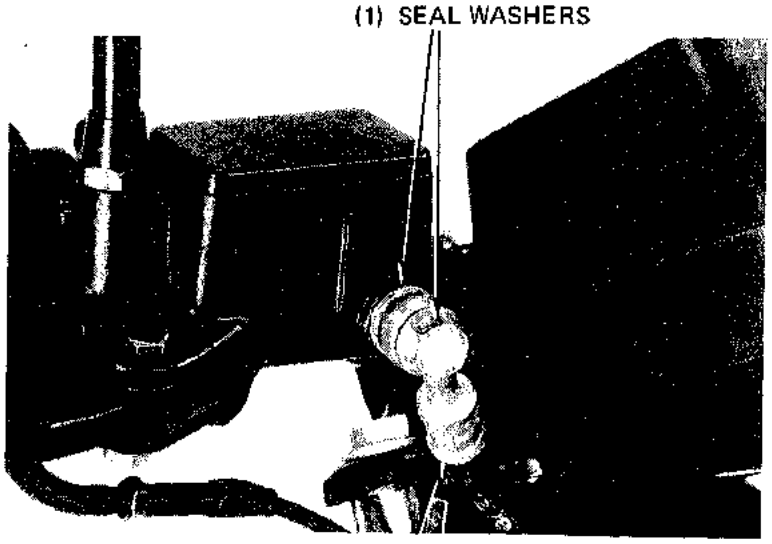
Install the master cylinder on the handlebar (Page 11-8).

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

Install the brake hose and seal washer.

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

After the front brake has been installed, bleed air from the brake hydraulic system (Page 12-3).



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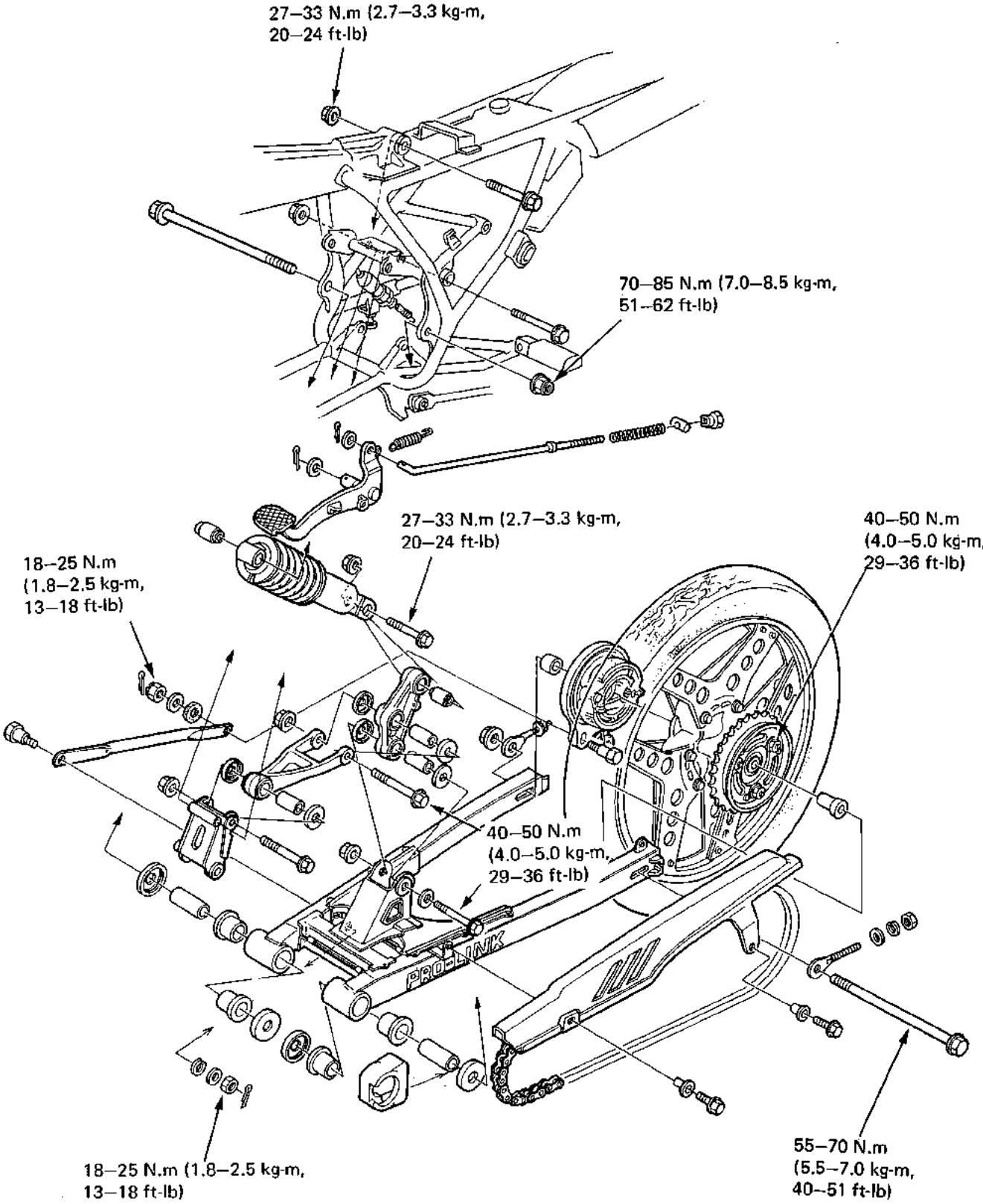

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SERVICE INFORMATION	13-2
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REAR BRAKE	13-6
REAR SHOCK ABSORBER	13-9
REAR SHOCK ABSORBER LINKAGE	13-11
SWINGARM	13-13

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SERVICE INFORMATION

GENERAL INSTRUCTIONS

- Do not remove rivets, nuts and pins from the rim, spoke plate and hub.
- Never ridte on the rim or try to bend wheel.

TOOLS

Special	
Shock Compressor Attachment	07967–GE20000
Common	
Shock Compressor	07959–3290001
Attachment 37 x 40 mm	07746–0010200
Driver A	07749–0010000
Pilot 12 mm	07746–0040200

TORQUE VALUES

Final driven sprocket nuts	40–50 N.m (4.0–5.0 kg-m, 29–36 ft-lb)
Rear brake torque link nuts	18–25 N.m (1.8–2.5 kg-m, 13–18 ft-lb)
Rear axle nut	55–70 N.m (5.5–7.0 kg-m, 40–51 ft-lb)
Rear brake arm bolt	8–12 N.m (0.8–1.2 kg-m, 6– 9 ft-lb)
Rear shock absorber mounting bolts and nuts	27–33 N.m (2.7–3.3 kg-m, 20–24 ft-lb)
Swingarm pivot bolt	70–85 N.m (7.0–8.5 kg-m, 51–62 ft-lb)
Rear shock absorber linkage pivot bolt	40–50 N.m (4.0–5.0 kg-m, 29–36 ft-lb)

SPECIFICATIONS

ITEM		STANDARD mm (in)		SERVICE LIMIT mm (in)	
Axle runout		—		0.20	(0.008)
Rear wheel rim runout	Radial	—		2.0	(0.08)
	Axial	—		2.0	(0.08)
Rear brake drum I.D.		110.0	(4.33)	111.0	(4.37)
Rear brake lining thickness		4.0	(0.16)	2.0	(0.08)
Rear shock absorber spring free length		137.5	(5.41)	135	(5.3)

TROUBLESHOOTING

Wobble or vibration
1. Distorted rim
2. Loose wheel bearing
3. Distorted spoke
4. Faulty tire
5. Loose axle
6. Worn swingarm bushing
7. Loose swingarm pivot bolt

Soft suspension
1. Weak spring
2. Shock absorbers fluid leaks

Hard suspension
1. Bent shock absorber

Suspension noise
1. Shock case binding
2. Loose fasteners

Poor brake performance
1. Brake not adjusted properly
2. Worn brake linings
3. Contaminated brake linings
4. Worn brake cam
5. Worn brake drum
6. Brake arm not properly installed
7. Worn brake shoes at cam contacting faces

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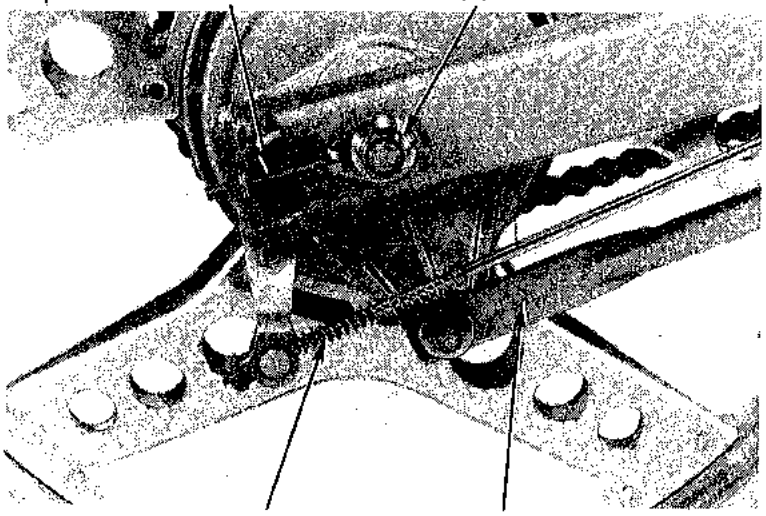
REAR WHEEL

REMOVAL

Remove the brake rod.
Remove the cotter pin and disconnect the torque link.

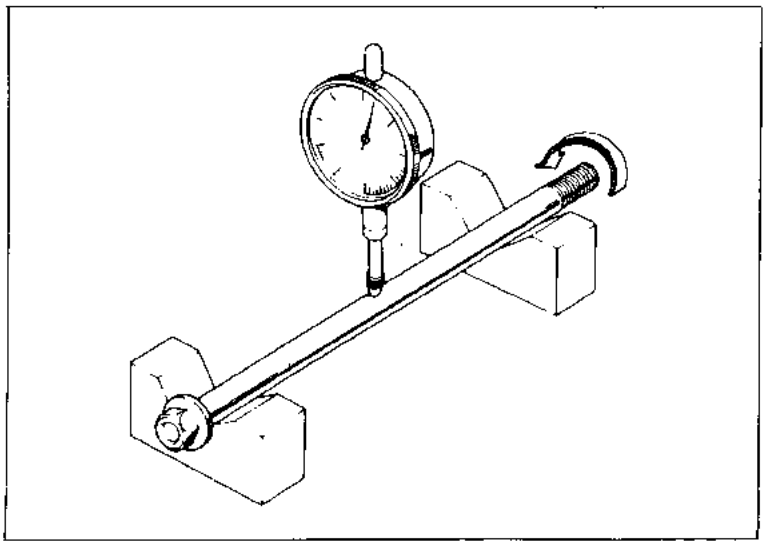
Remove the axle nut.
Loosen the lock nut and chain adjusting nut.
Withdraw the axle and remove the rear wheel.



AXLE INSPECTION

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

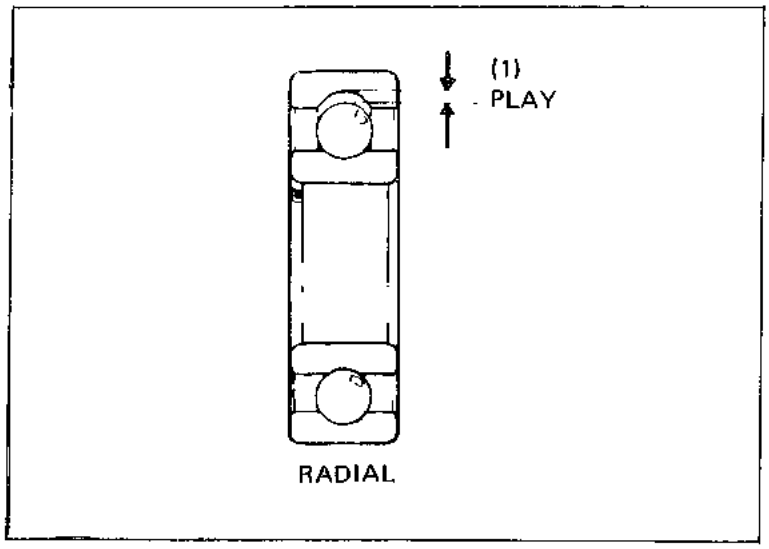
SERVICE LIMITE: 0.20 mm (0.008 in)



REAR WHEEL BEARING PLAY INSPECTION

Check the wheel bearing play by rotating the wheel by hand. Replace the bearings with new ones if they are noisy or have excessive play.

SERVICE LIMIT: 0.027 mm (0.0010 in)



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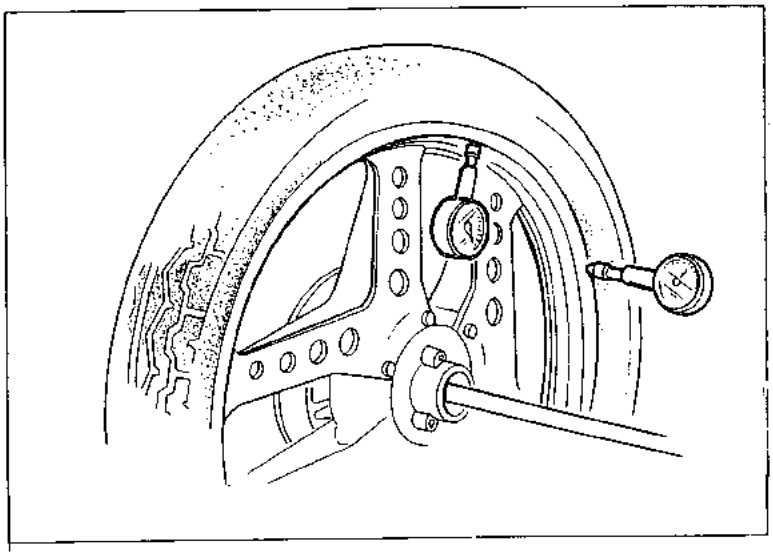
REAR WHEEL RIM RUNOUT INSPECTION

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)

NOTE

Do not attempt to repair the spokes.

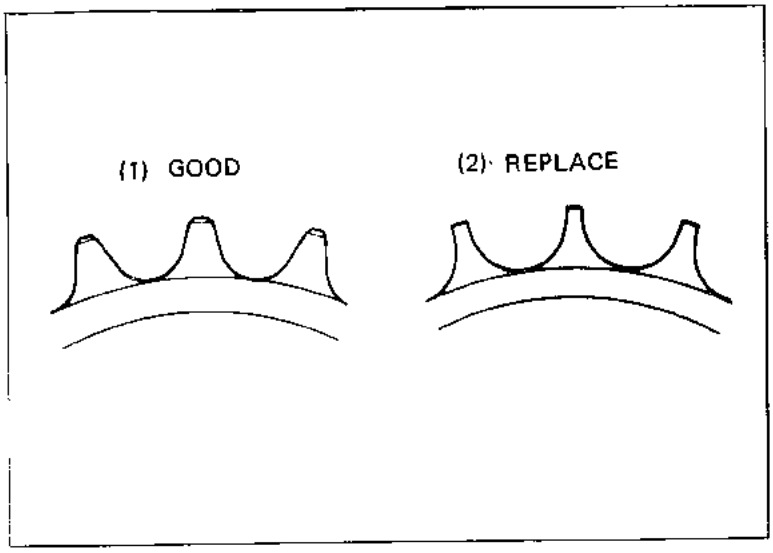


FINAL DRIVEN SPROCKET INSPECTION

Check the final driven sprocket for worn or damaged gear teeth.

NOTE

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

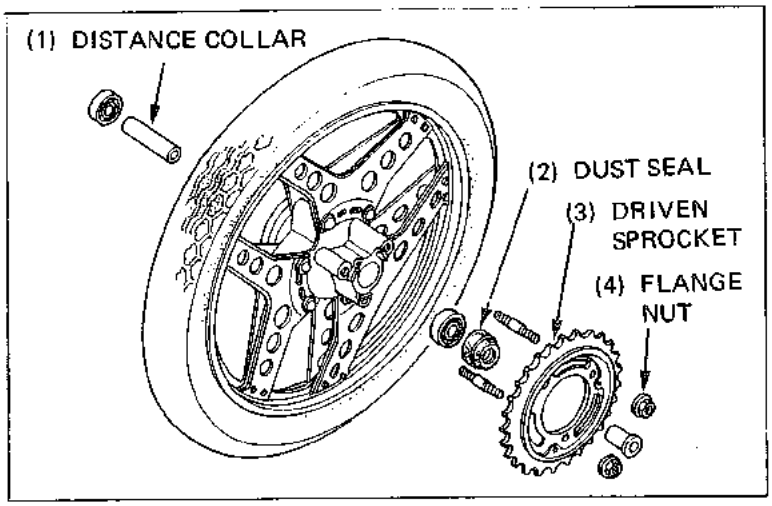


REAR WHEEL DISASSEMBLY

Remove the dust seal, bearings and distance collar.

NOTE

Do not forget to install the rim band when the tire and tube are replaced.



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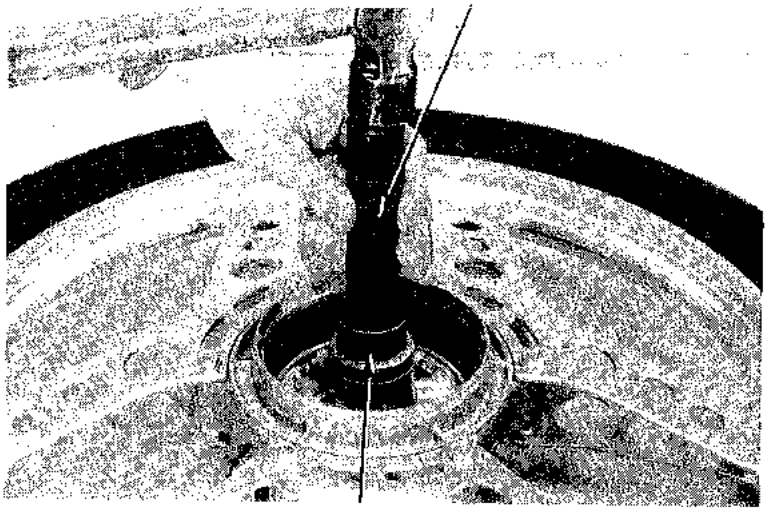
REAR WHEEL BEARING INSTALLATION

Pack all bearing cavities with grease.
Drive in the right bearing.
Insert the distance collar.
Drive in the left bearing.
Coat the inside of the dust seal with grease and install.

NOTE

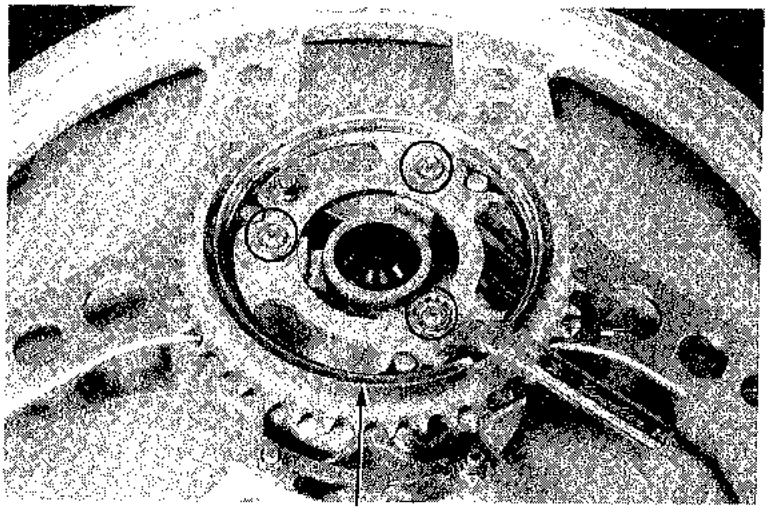
- Drive in the bearings squarely.
- Install the bearings with the sealed end facing outside.



FINAL DRIVEN SPROCKET INSTALLATION

Install the final driven sprocket with the protector ring end outside.

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

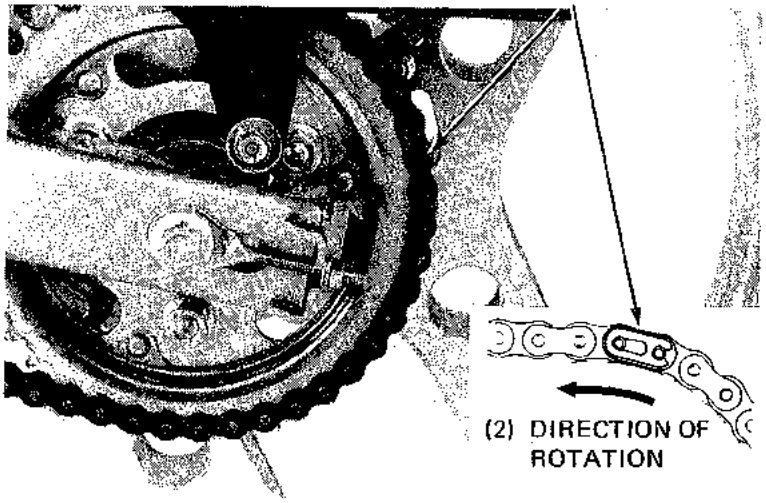


REAR WHEEL INSTALLATION

Install the rear wheel and axle shaft.
Install the driven chain.

CAUTION

Note the direction of the drive chain master link retaining clip.



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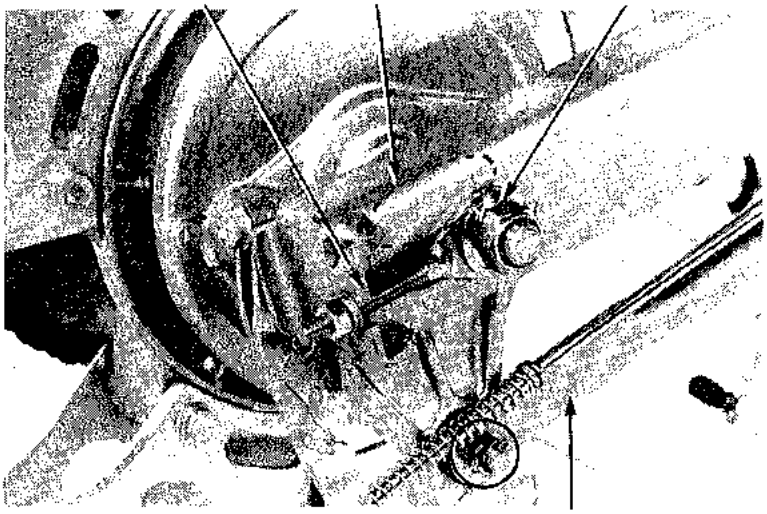
Install the brake rod and brake torque link.
TORQUE: 18–25 N.m (1.8–2.5 kg-m, 40–51 ft-lb)
Adjust the drive chain tension (Page 3-11).
CHAIN SLACK: 10–20 mm (3/8–3/4 in)

CAUTION

Rotate the adjusters so that thte index marks are aligned with the same scale number on both sides.

Torque the axle nut.
TORQUE: 55–70 N.m (5.5–7.0 kg-m, 40–51 ft-lb)

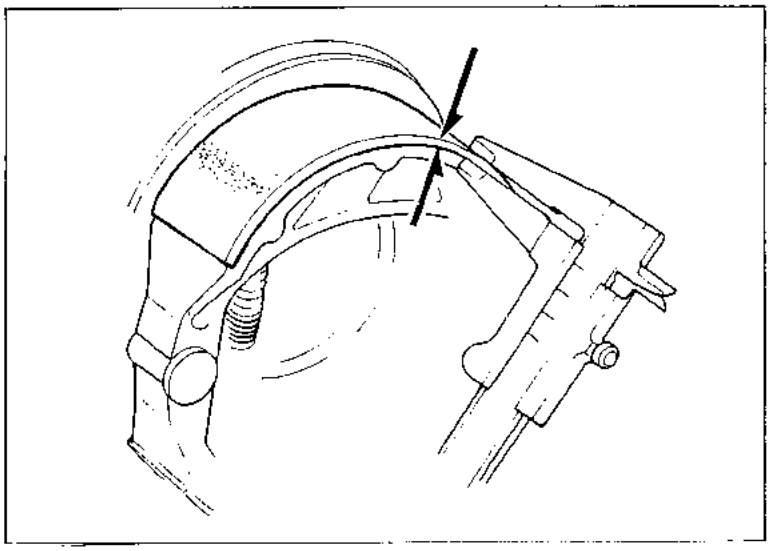
Lubricate the drive chain (Page 3-12).



REAR BRAKE

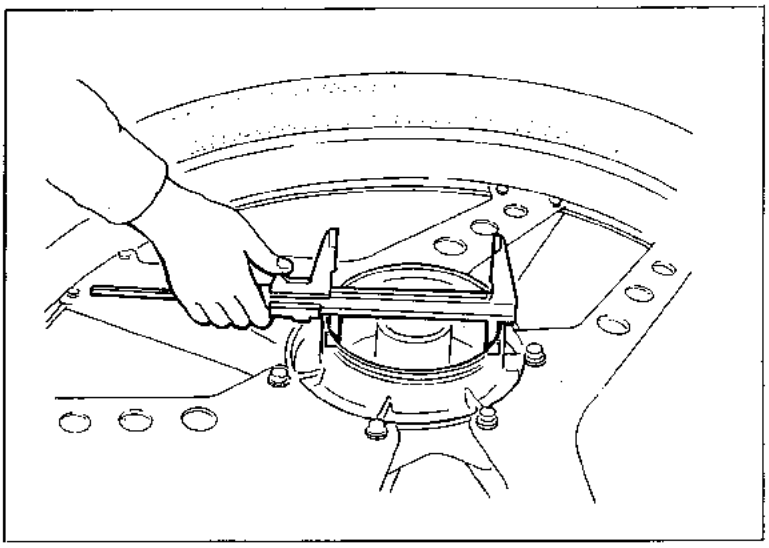
REAR BRAKE LINING THICKNESS

Measure the brake lining thickness.
SERVICE LIMIT: 2.0 mm (0.08 in)



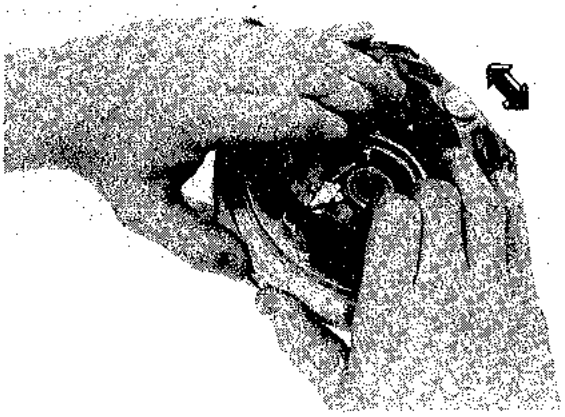
REAR BRAKE DRUM INSPECTION

Measure the rear brake drum I.D.
SERVICE LIMIT: 111.0 mm (4.37 in)



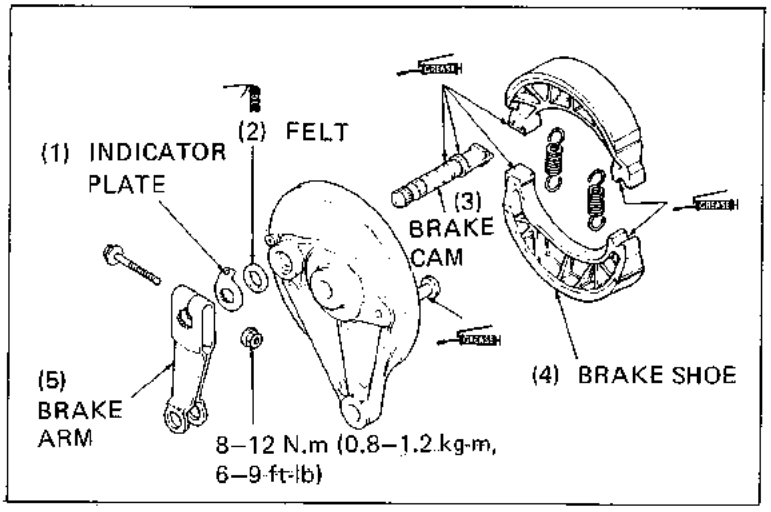
REAR BRAKE SHOE REPLACEMENT

Remove the brake shoes.
Replace the brake shoes with new ones.



BRAKE CAM DISASSEMBLY

Remove the brake arm.
Remove the indicator plate.
Remove the brake cam.
Remove the felt ring.
Clean the shoe contacting faces of the brake cam.



BRAKE PANEL ASSEMBLY

Install the felt ring and wear indicator plate.

NOTE

> Align the flat on the cam with the flat on the wear indicator plate.

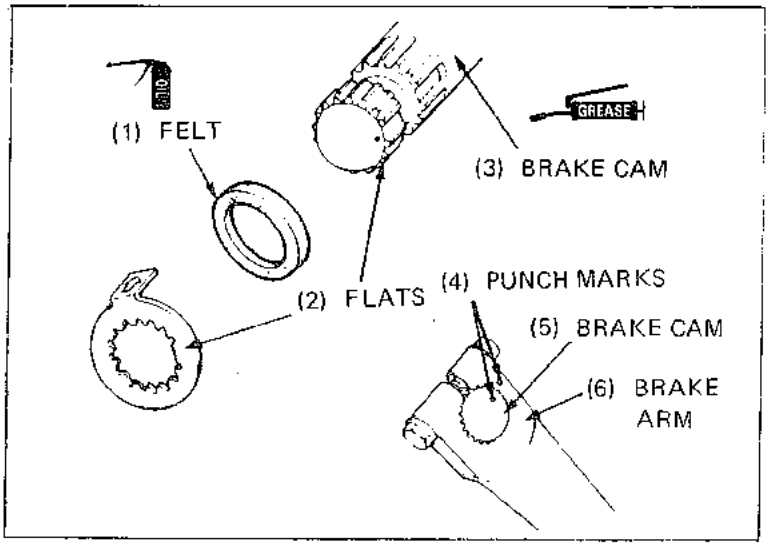
Install the brake arm.

NOTE

> Align the punch mark on the brake cam with the punch mark on the brake arm.

Tighten the brake arm bolt to the specified torque.
TORQUE: 8–12 N.m (0.8–1.2 kg-m, 6–9 ft-lb)

Install the brake panel on the rear wheel.



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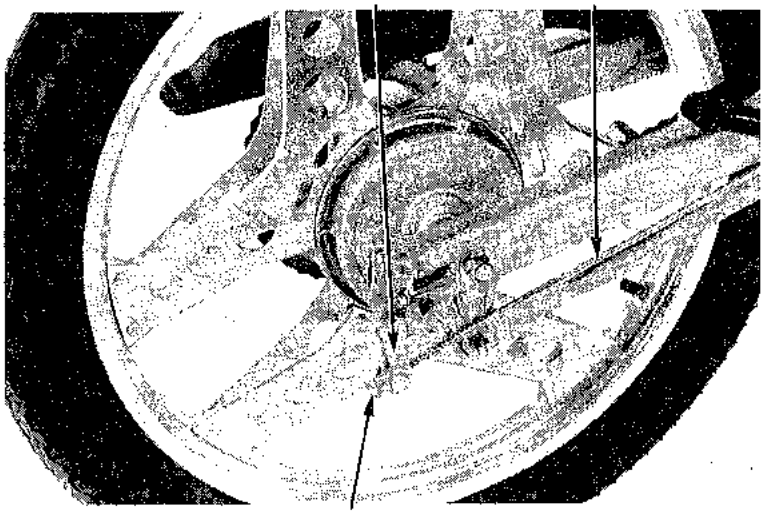
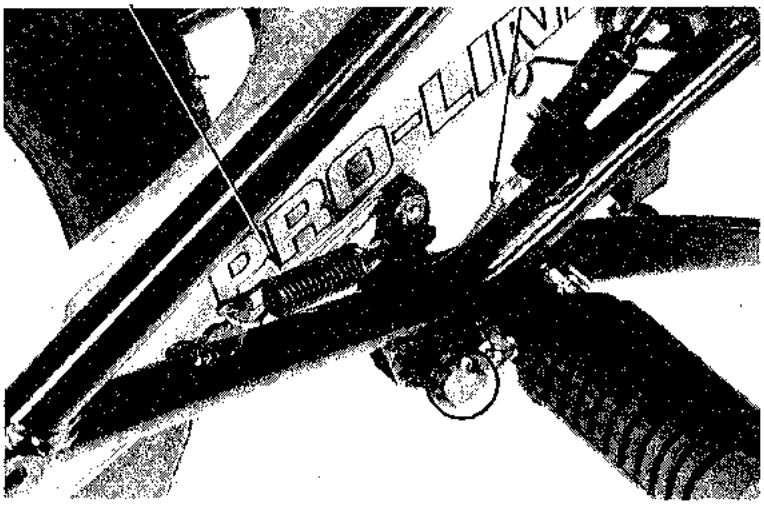
BRAKE PEDAL

Remove the exhaust pipe.
Remove the brake rod.



Remove the brakelight switch spring.
Remove the return spring.
Remove the cotter pin, plain washer, then remove the brake pedal.

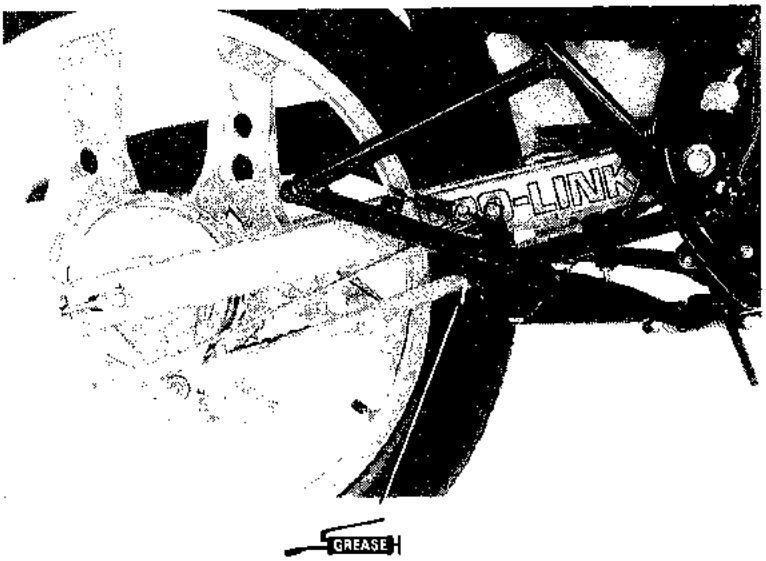


Assembly of the brake pedal is essentially the reverse order of removal.

CAUTION

Before installing the brake pedal, apply grease to the sliding surface.

Adjust the brake pedal free play (Page 3-10).



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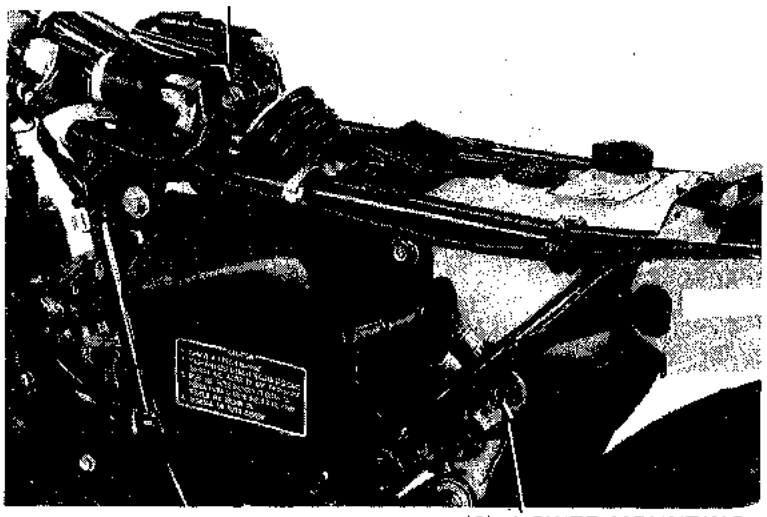
REAR SHOCK ABSORBER

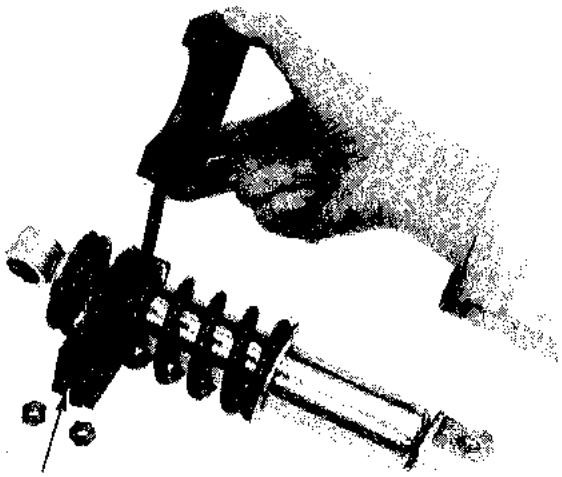
REMOVAL

Remove the seat, side covers and fuel tank.
Raise the wheel off the ground by placing a block under the engine.
Remove the shock absorber upper and lower mounting bolts and remove the shock absorber from the frame.

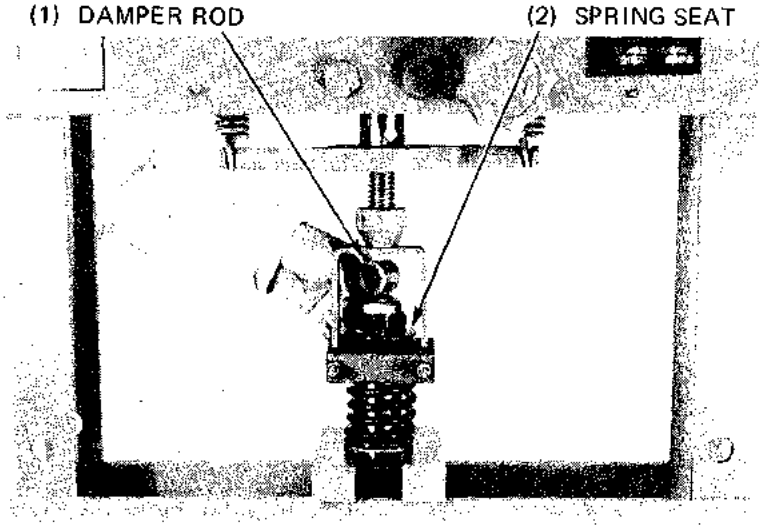


DISASSEMBLY

Install the special tool over the shock absorber spring as shown and tighten the nuts securely.



Place the shcok absorber in a press and compress the shock absorber spring.
Pull the damper rod up and remove the upper spring seat.
Release the press and remove the special tool and spring from the shock absorber.



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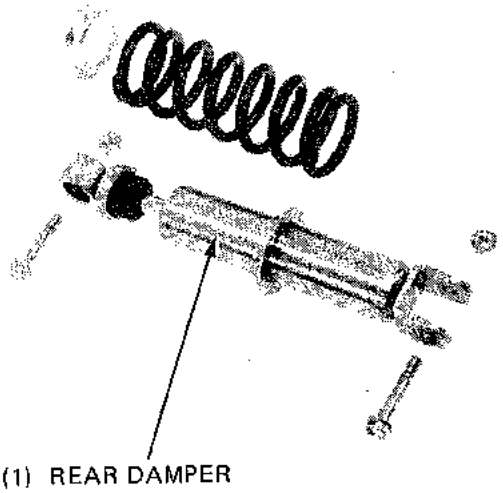
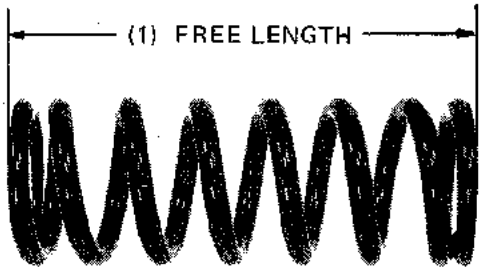
REAR DAMPER INSPECTION

Check the rear damper for damage or fluid leaks.



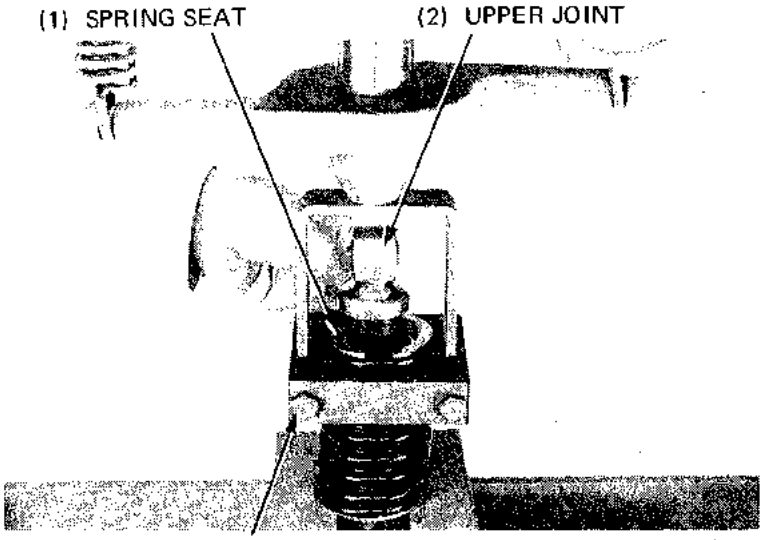
SPRING FREE LENGTH

Measure the spring free lenght.
SERVICE LIMIT: 135 mm (5.3 in)



ASSEMBLY

Install the special tool over the spring and tighten the tool nuts securely.
Compress the spring with the press, pull the damper rod up and place the upper spring seat on the spring.
Release the press while aligning the spring seat and upper joint.
Remove the special tool from the shock absorber.



(3) REAR SHOCK ABSORBER COMPRESSOR ATTACHMENT
07967-GE20000

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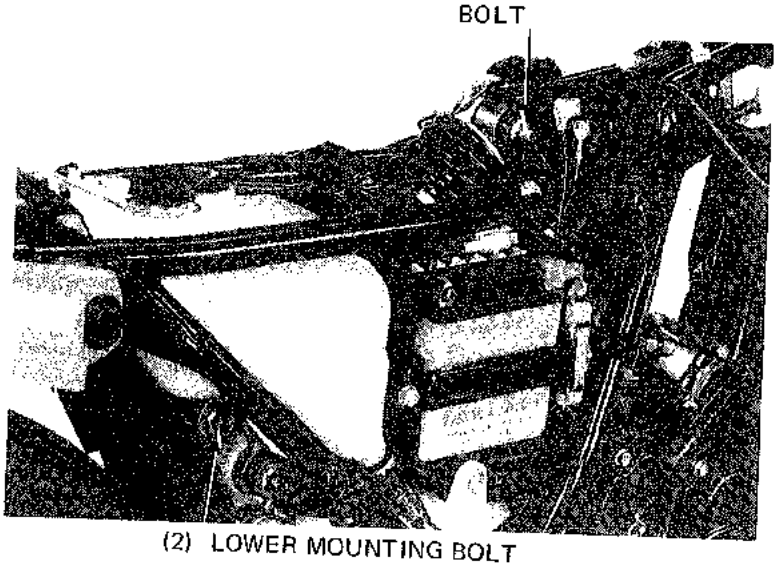
INSTALLATION

Install the shock absorber lower mount on the shock absorber linkage.
Align the shock absorber upper mount with the frame while moving the rear wheel up and down and install the upper monting bolt.

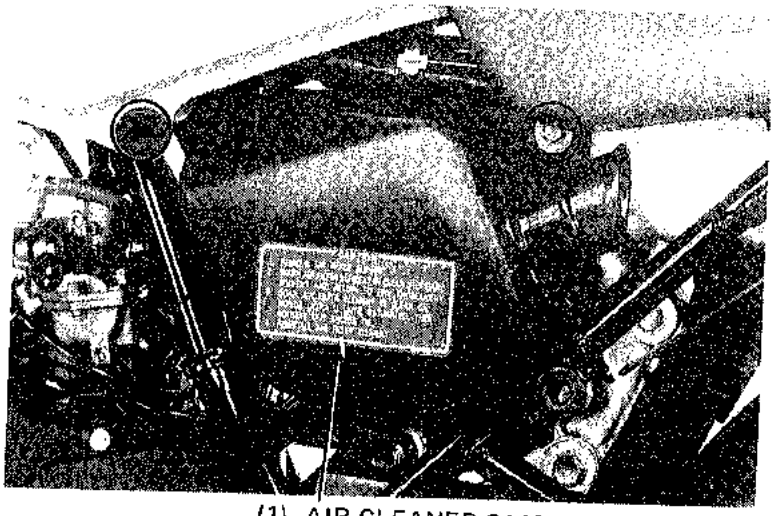
TORQUE: 27–33 N.m (2.7–3.3 kg-m, 20–24 ft-lb)



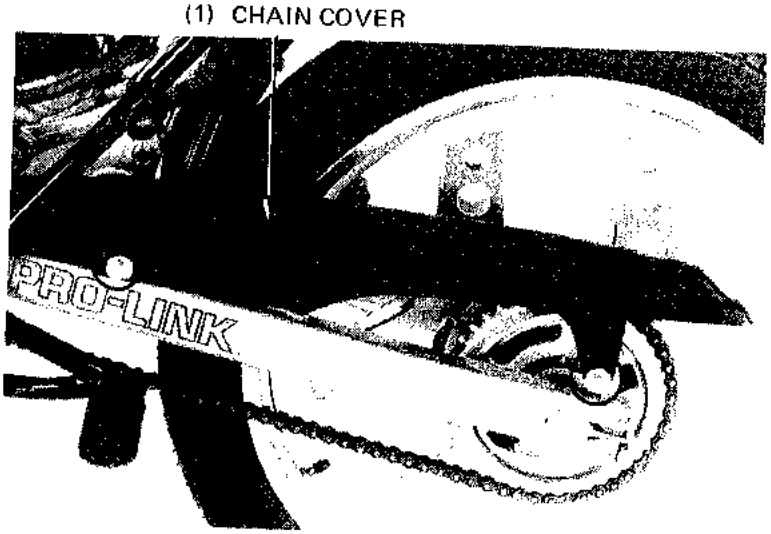
REAR SHOCK ABSORBER LINKAGE

REMOVAL

Remove the air cleaner case (Page 4-10).



Remove the drive chain cover.



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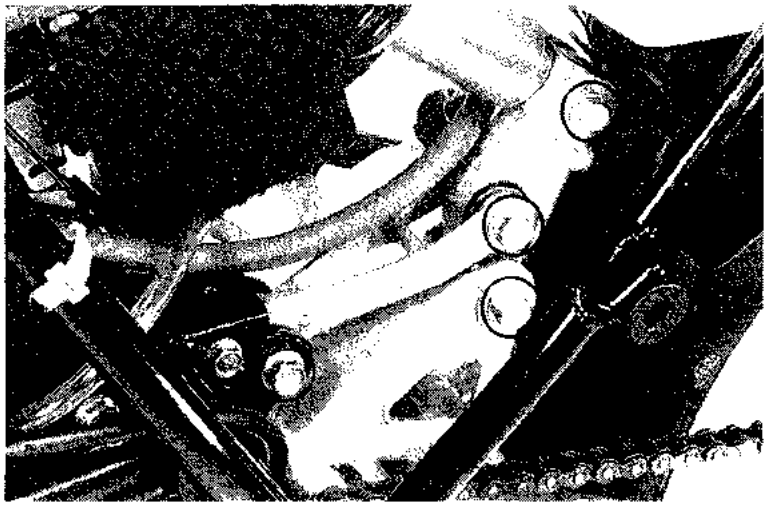
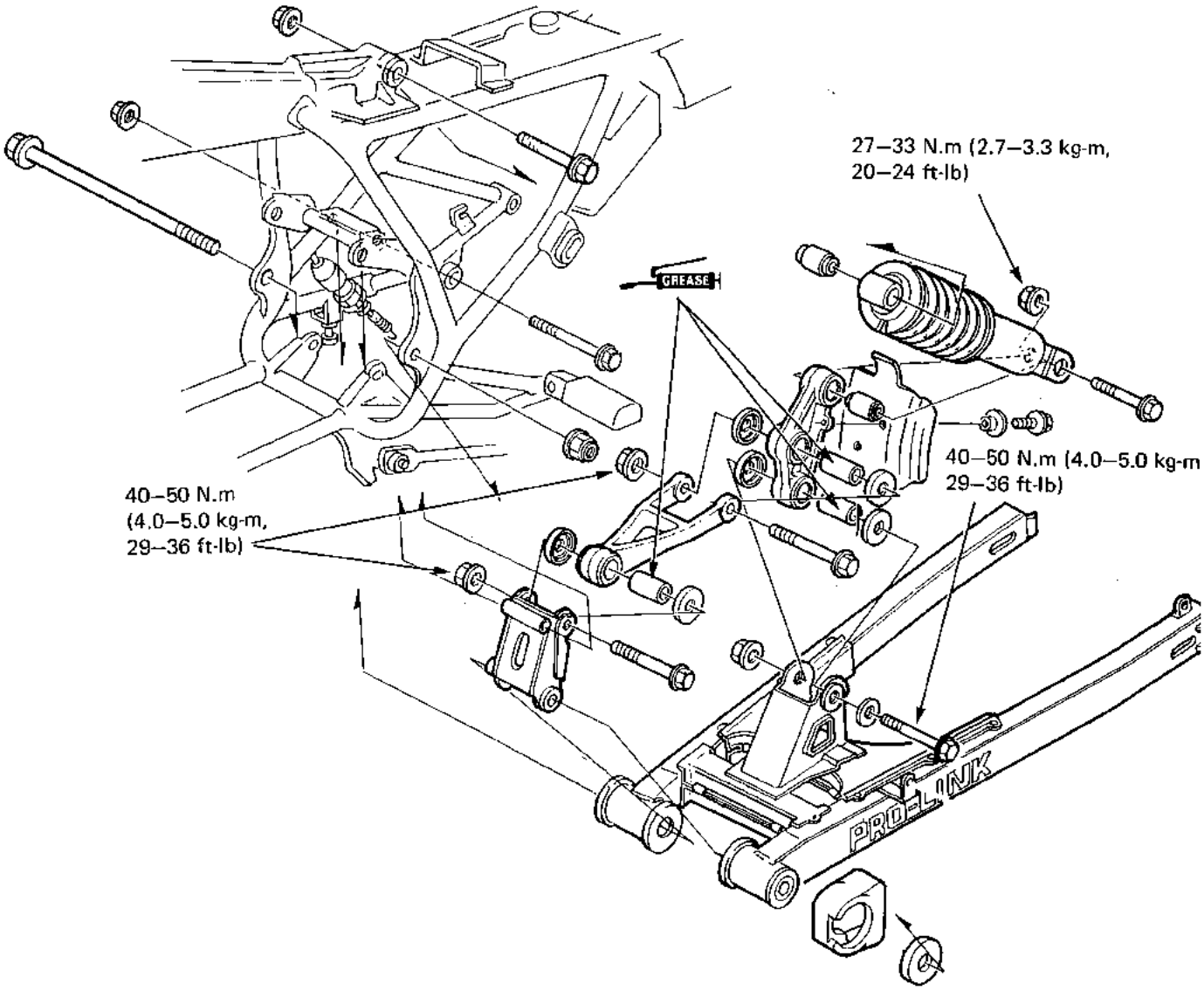
Raise the rear wheel off the ground by placing a block under the engine.
Remove the rear shock absorber lingage pivot bolts and nuts and remove the linkage.
Check the linkage bushings and collar for wear or damge.



INSTALLATION

Apply paste grease (containing more than 45% of molyodenum) to each bushings and install the linkage.



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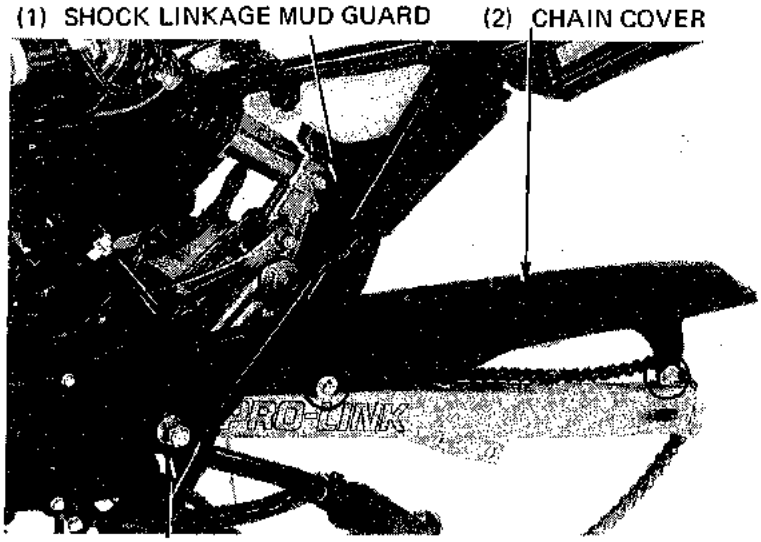
SWINGARM

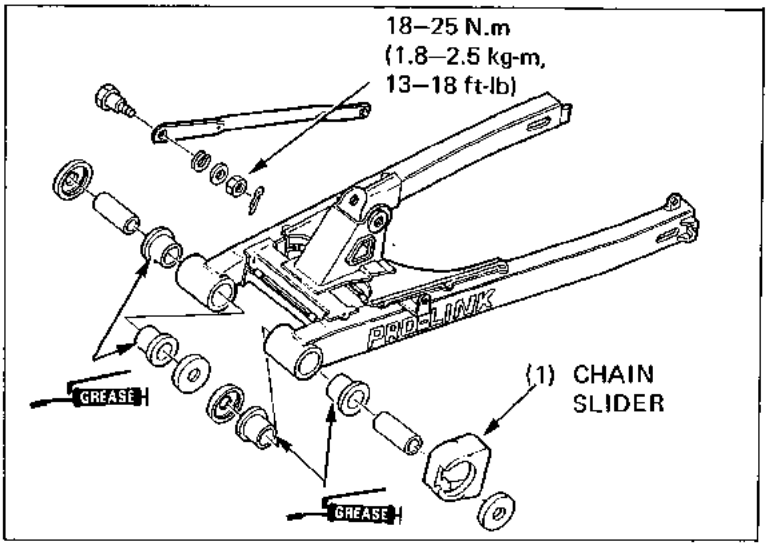
REMOVAL

Remove the rear wheel (Page 13-3).
Remove the drive chain cover.
Remove the shock linkage mud guard from the linkage.
Remove the swingarm-to-shock absorber linkage bolt.
Remove the swingarm pivot bolt and the swingarm.



INSPECTION

Check the seingarm for cracks or damage.
Check the bushings for damage or other defects.
Check the chain slider for wear or damage.



INSTALLATION

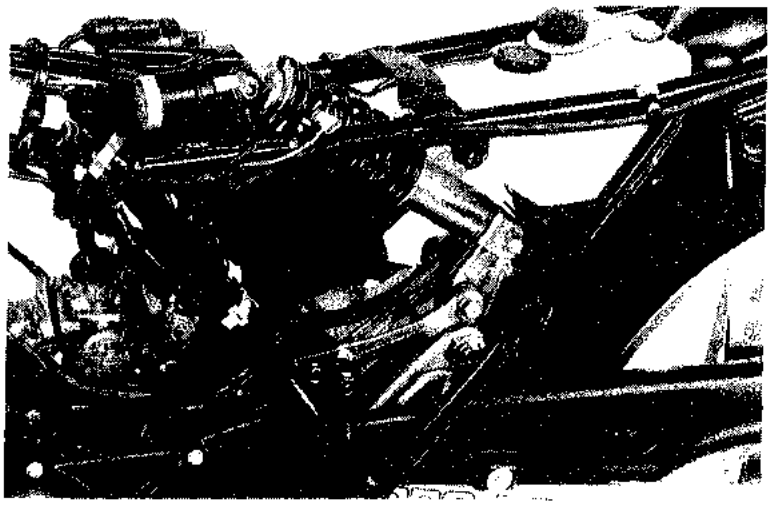
Install the torque link and chain slider on the swingarm.
Install the swingarm.

TORQUE: 70–85 N.m (7.0–8.5 kg-m, 51–62 ft-lb)

Install and torque the swingarm-to-shock linkage bolt.

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

Install the shock link mud guard.
Install the rear wheel (Page 13-5).



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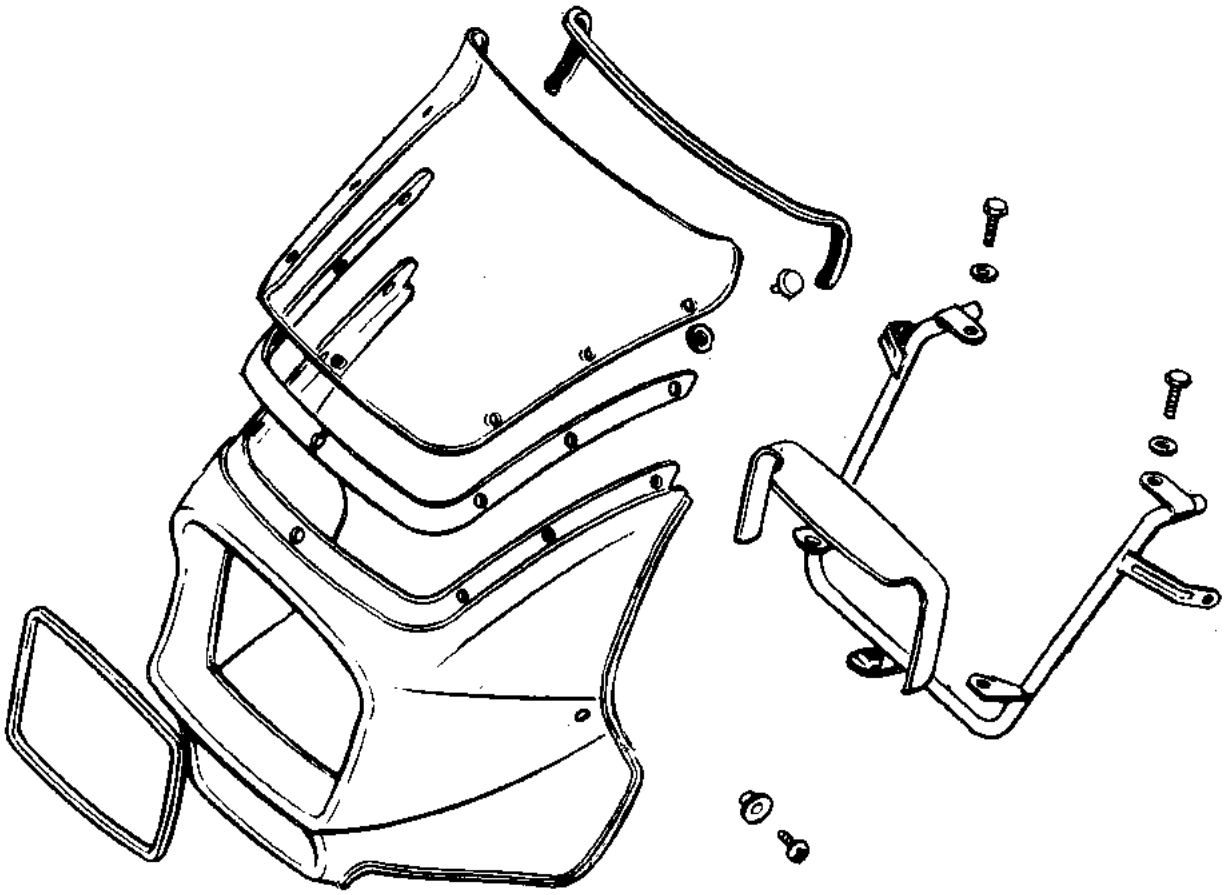
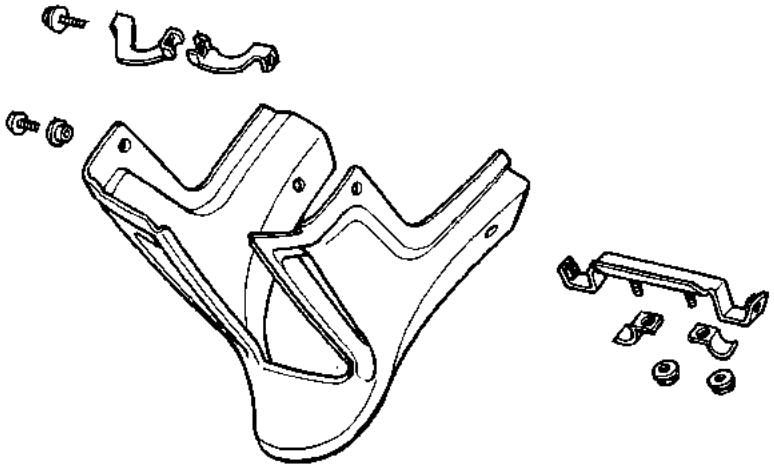
FAIRING/UNDER COWL 14.





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FAIRING	14-2
UNDER COWL	14-3

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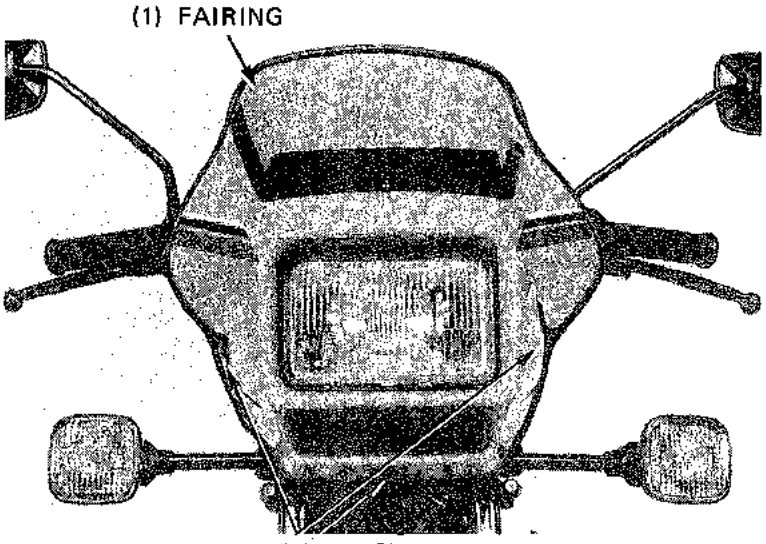
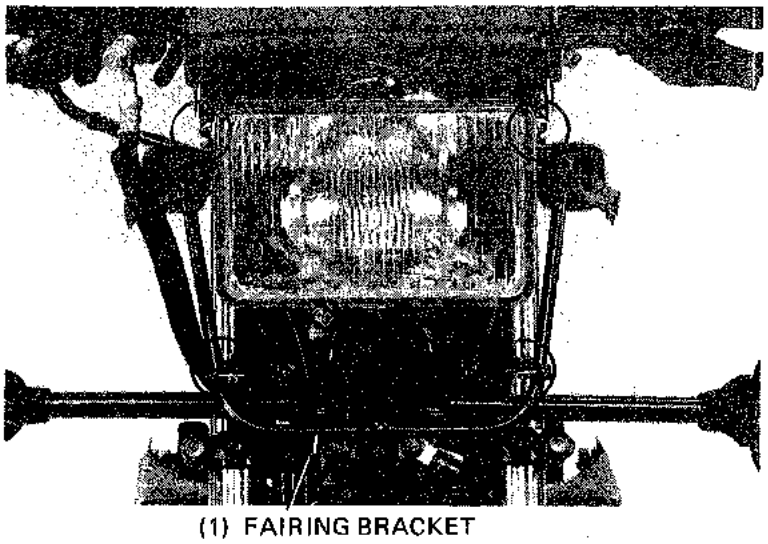
FAIRING

Remove the three fairing mounting screws and the fairing.



Remove the four bolts attaching the fairing bracket and bracket.



Install the fairing in the reverse order of removal.

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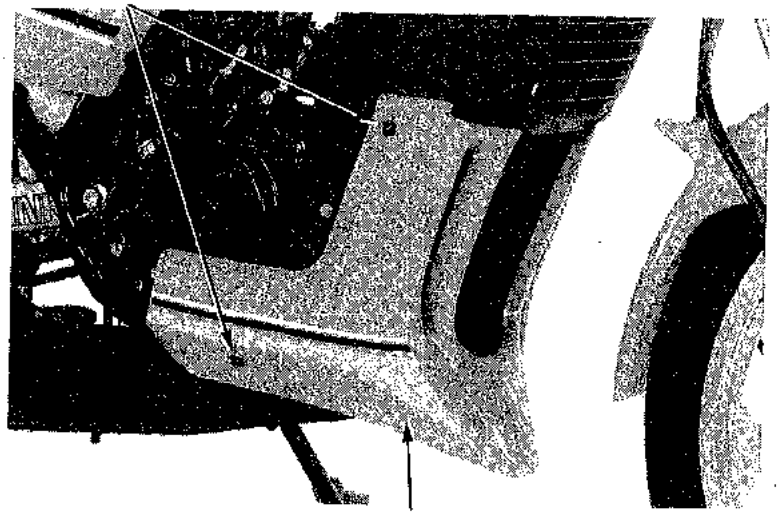
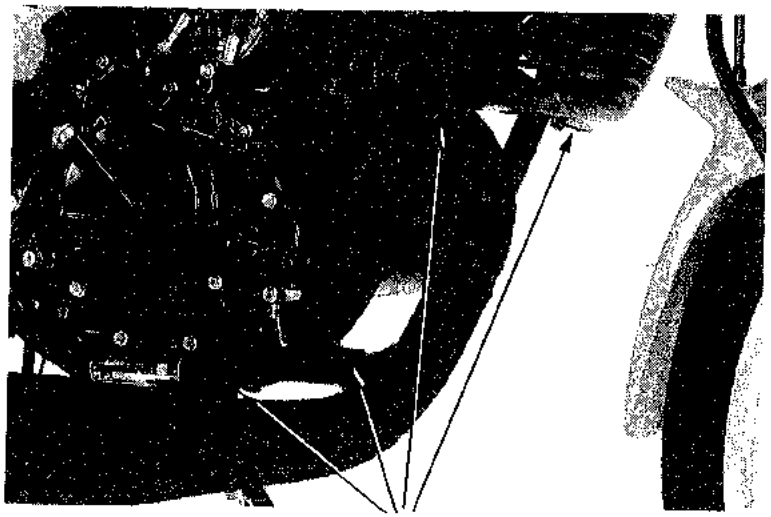
UNDER COWL

Remove the four screws mounting the under cowl and the under cowl.



Remove the bolts attaching the under cowl brackets, and brackets.



Install the under cowl in the reverse order of removal.

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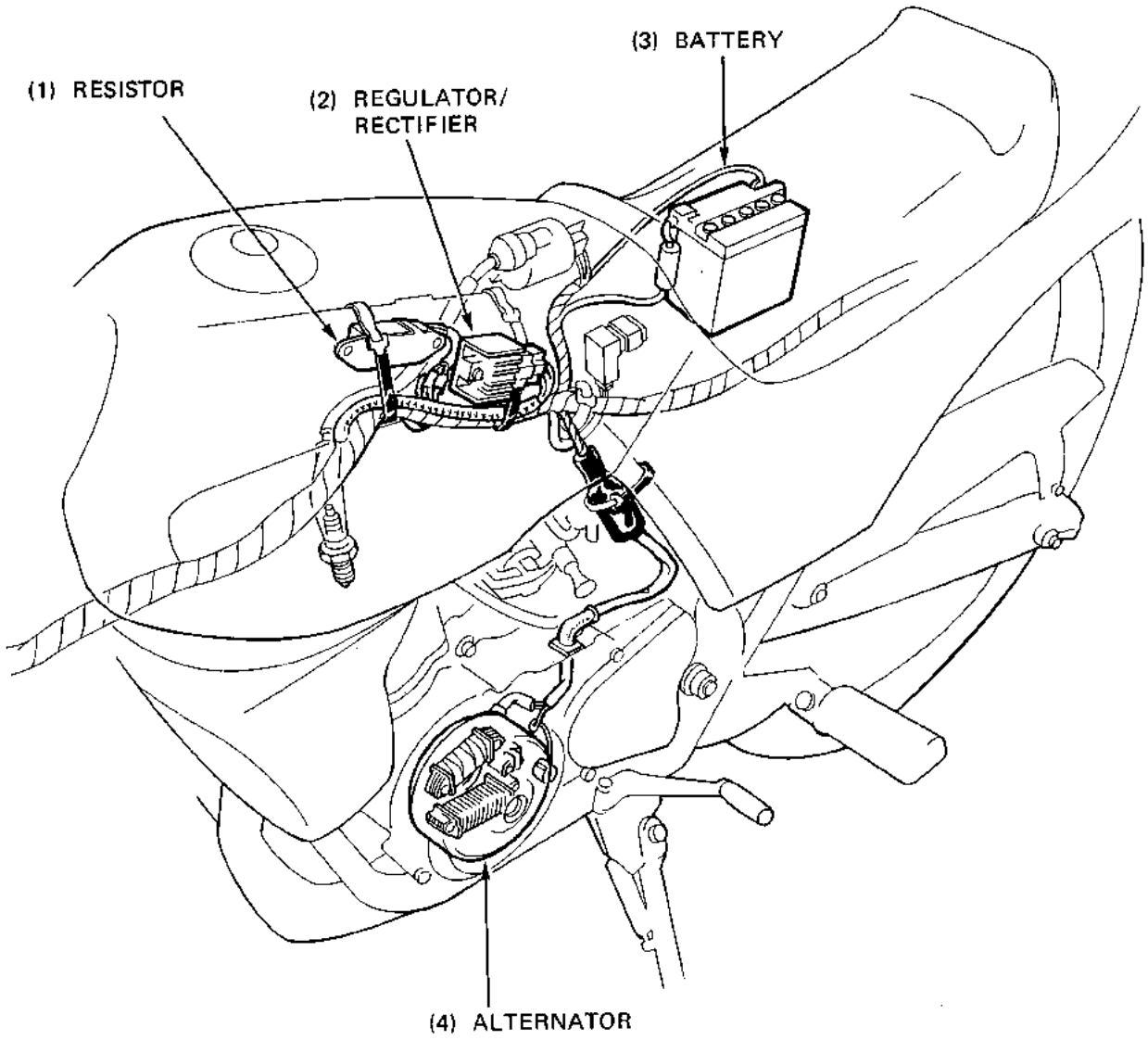

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SERVICE INFORMATION	15-2
TROUBLESHOOTING	15-2
BATTERY	15-3
CHARGING SYSTEM	15-5

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SERVICE INFORMATION

GENERAL INSTRUCTIONS

- Battery fluid level should be checked regularly. Fill with distilled water when necessary.
- Do not quick charge a battery, except 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.
- Alternator removal, see section 8.

SPECIFICATIONS

Battery	Capacity		12V 3AH	
	Specific gravity		1.280/20°C (68°F)	
	Charging rate		0.3 amperes maximum	
Alternator	MBX50:	Charging speed	2,000 min^{-1} (rpm) maximum	
		Capacity	4,000 min^{-1} (rpm)	8,000 min^{-1} (rpm)
		Lighting switch OFF	0.8A min. (17.7V)	2.5A max. (18.2V)
		Lighting switch ON	0.5A min. (17.7V)	2.5A max. (18.2V)
	MBX80:	Charging speed	2,000 min^{-1} (rpm) maximum	
		Capacity	4,000 min^{-1} (rpm)	8,000 min^{-1} (rpm)
		Lighting switch OFF	0.8A min. (17.7V)	2.5A max. (18.2V)
		Lighting switch ON	0.5A min. (17.7V)	2.5A max. (18.2V)
Regulator			Transistorized non-adjustable	

TROUBLESHOOTING

No power—key turned on:
1. Dead battery
   - Low fluid level
   - Low specific gravity
2. Disconnected battery cable
3. 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 battery 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

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

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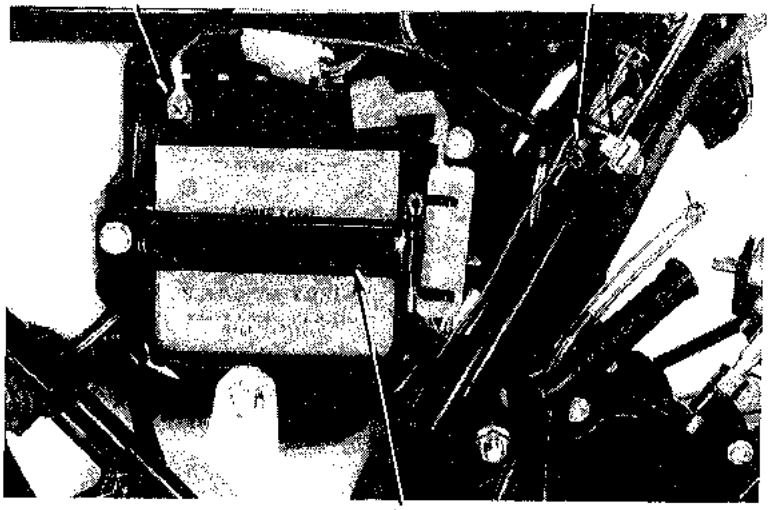
BATTERY

REMOVAL

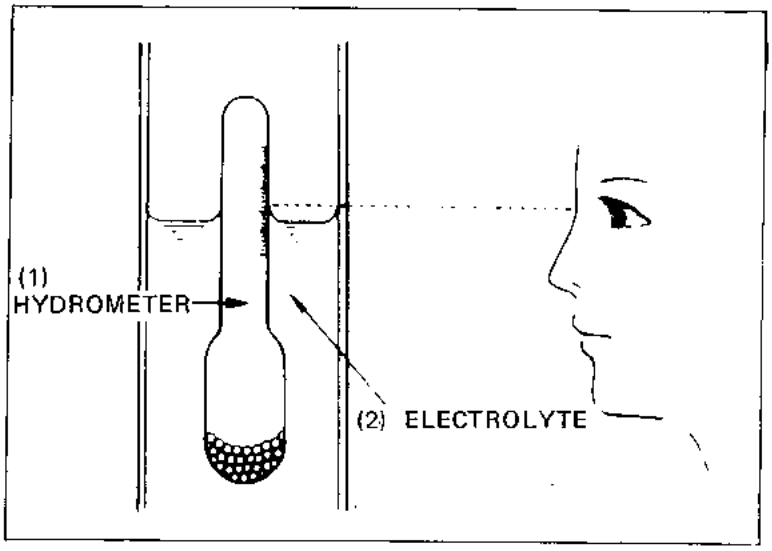
Remove the right side cover.
Open the battery holder.
Disconnect the negative and positive wires at the connectors.
Remove the battery.



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

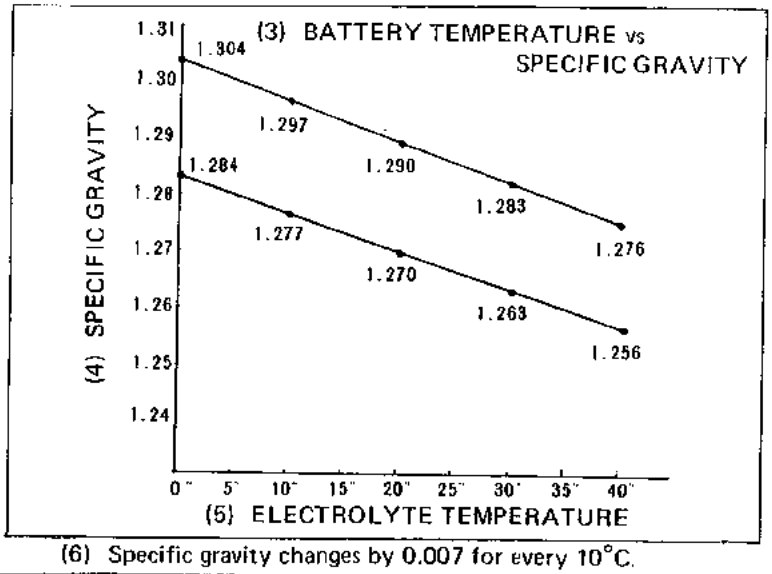


NOTE

- The battery must be charged if the specific gravity is below 1.260.
- 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.



(6) Specific gravity changes by 0.007 for every 10°C.

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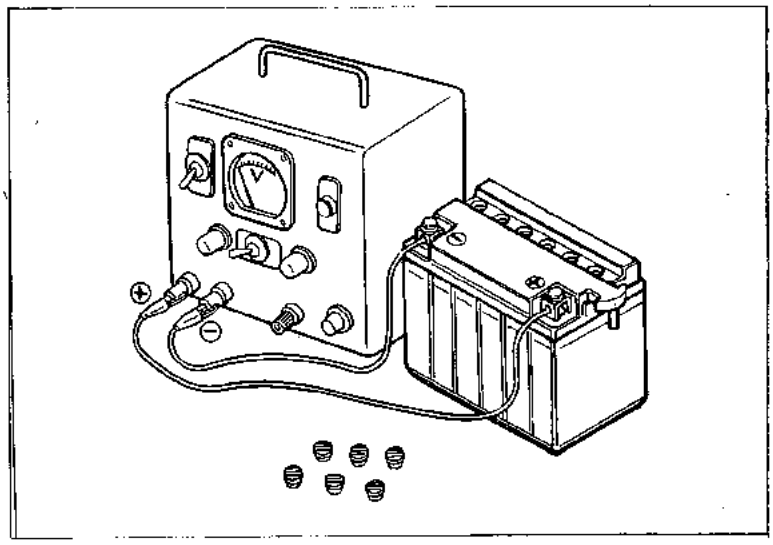
CHARGING

Connect the charger positive (+) cable to the battery positive (+) terminal.
Connect the carger negative (−) cable to the battery nagative (−) terminal.
Charging current:
1.4 amperes max.
Charging:
Charge the battery until specific gravity is 1.270–1.290 at 20°C (68°F).

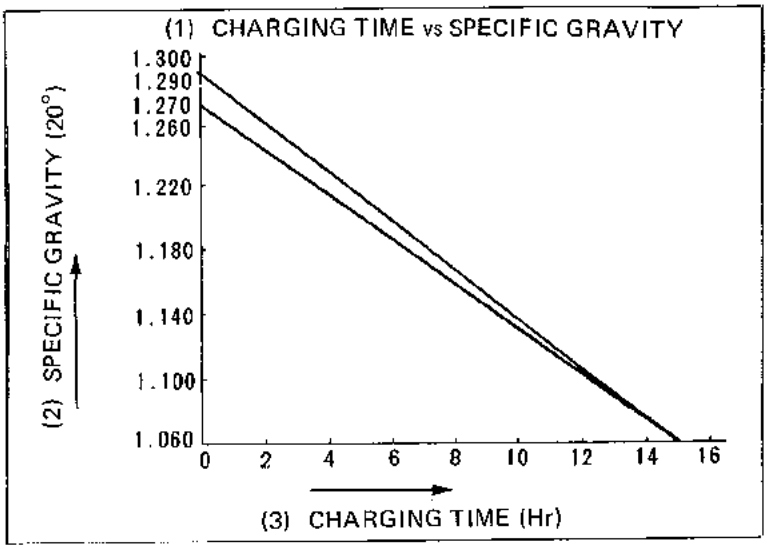


WARNING

- *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).*

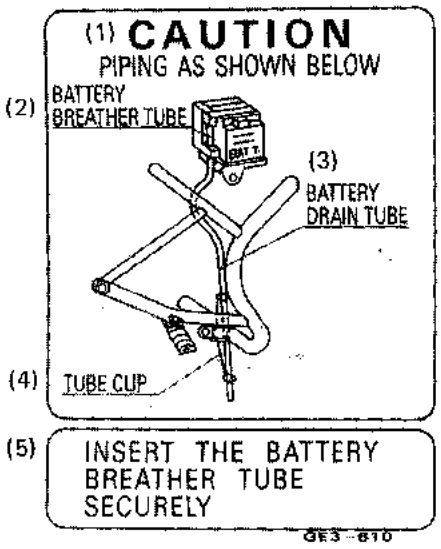
CAUTION

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.



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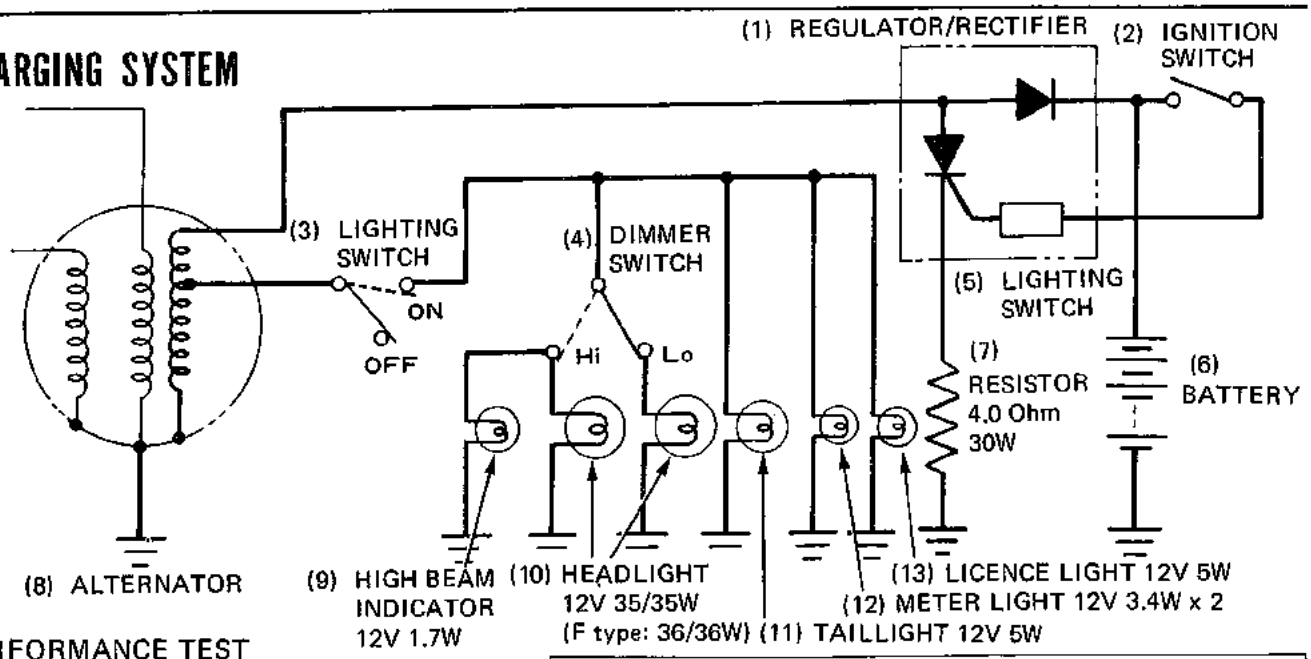
CHARGING SYSTEM



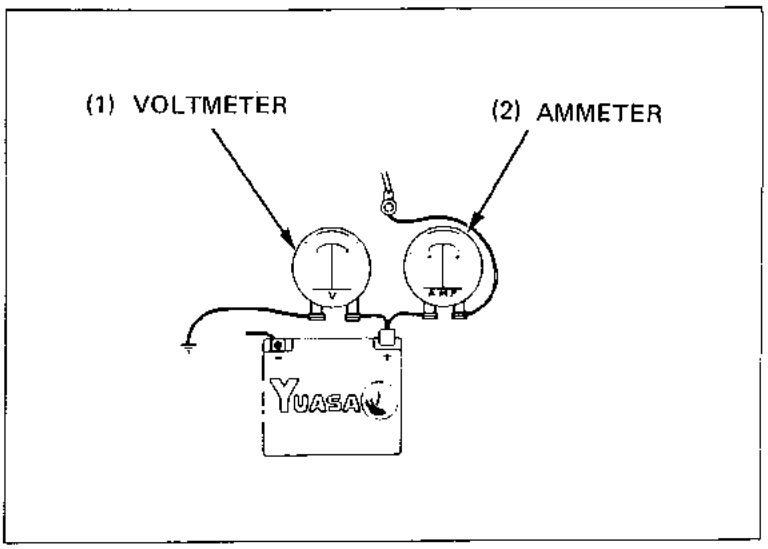
PERFORMANCE TEST

NOTE

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

Warm up the engine.
Remove the frame right side cover.
Disconnect the black wire at the regulator/ rectifier coupler.

Connect an ammeter and voltmeter as shown.
Start the engine.



MODEL	LIGHTING SWITCH	CHARGEING RPM	4,00 min^{-1} (rpm)	8,000 min^{-1} (rpm)
MBX50	OFF	2,000 min^{-1} (rpm) max. (14.2V)	0.8A min. (17.7V)	2.5A max. (18.2V)
	ON	2,000 min^{-1} (rpm) max. (14.2V)	0.5A min. (17.7V)	2.5A max. (18.2V)
MBX80	OFF	2,000 min^{-1} (rpm) max. (14.2V)	0.8A min. (17.7V)	2.5A max. (18.2V)
	ON	2,000 min^{-1} (rpm) max. (14.2V)	0.5A min. (17.7V)	2.5A max. (18.2V)

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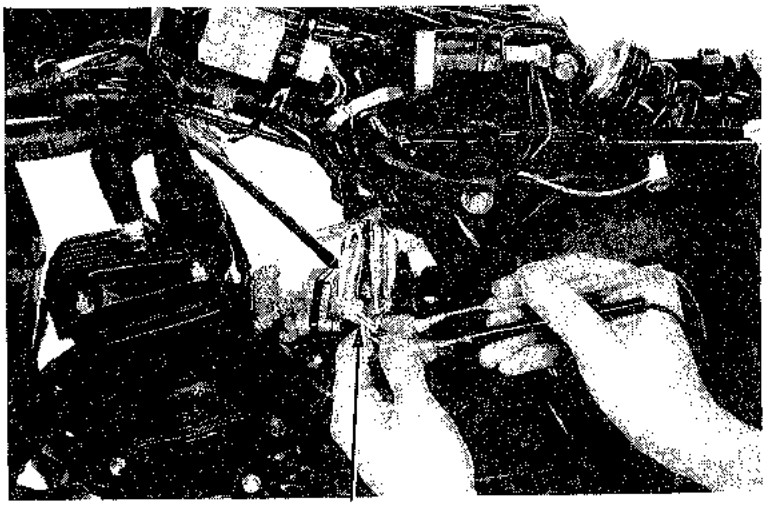
ALTERNATOR INSEPCTION

Warm up the engine.
Stop the engine.
Disconnect the alternator connectors.
Check the resistances betweeen the connectors.
Yellow – Green: 0.1–1.0 Ohms
White – Green: 0.3–1.5 Ohms

Replace the stator and flywheel as a set if not within the specifications.



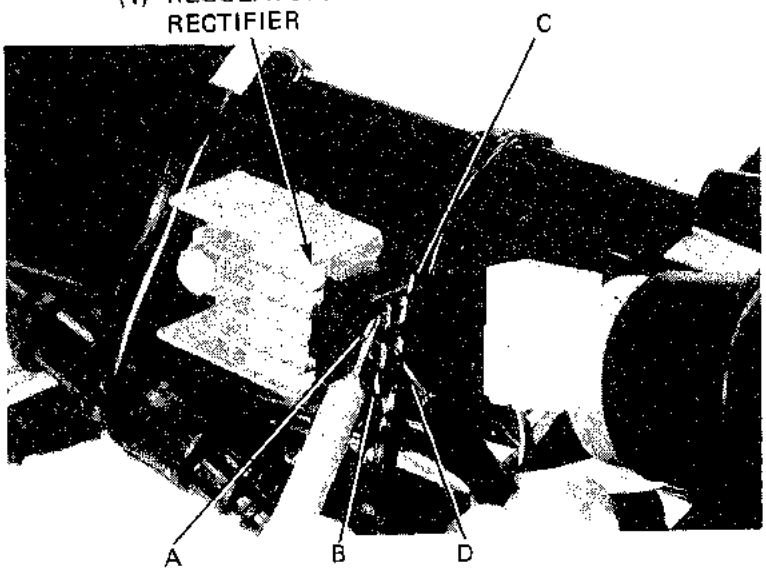
REGULATOR/RECTIFIER INSPECTION

Remove the fuel tank.
Disconnect the regulator/rectifier coupler.
Measure the resistance between the terminals.
Replace the regulator/rectifier with a new one if the readings do not fall within the limits shown in the table.

NOTE

- The regulator/rectifier is fully transistorized.
- For accurate testing, it is necessary to use a specified electric tester. Use of an improper tester or measurement in improper range may give a false reading.
- Use SANWA ELECTRIC TESTER (P/N 07308–0020000) or KOWA ELECTRIC TESTER (TH–5H).

Measuring ranges:
SANWA: x kΩ
KOWA: x 100Ω



Unit: KΩ

⊕ probe / ⊖ probe	A	B	C	D
A		1–5	∞	∞
B	1–5		∞	∞
C	∞	∞		∞
D	∞	∞	0.5–1.0	

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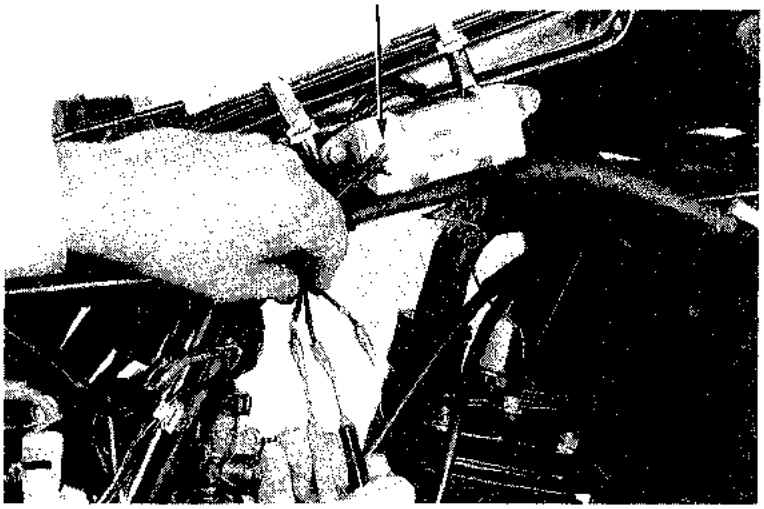
RESISTOR INSPECTION

Remove the fuel tank.
Disconnect the resistor connectors.
Measure the resistance between the connectors.

Pink – Green:	**4 ohms**
Green/White – Green:	**6.7 ohms**

(1) RESISTOR



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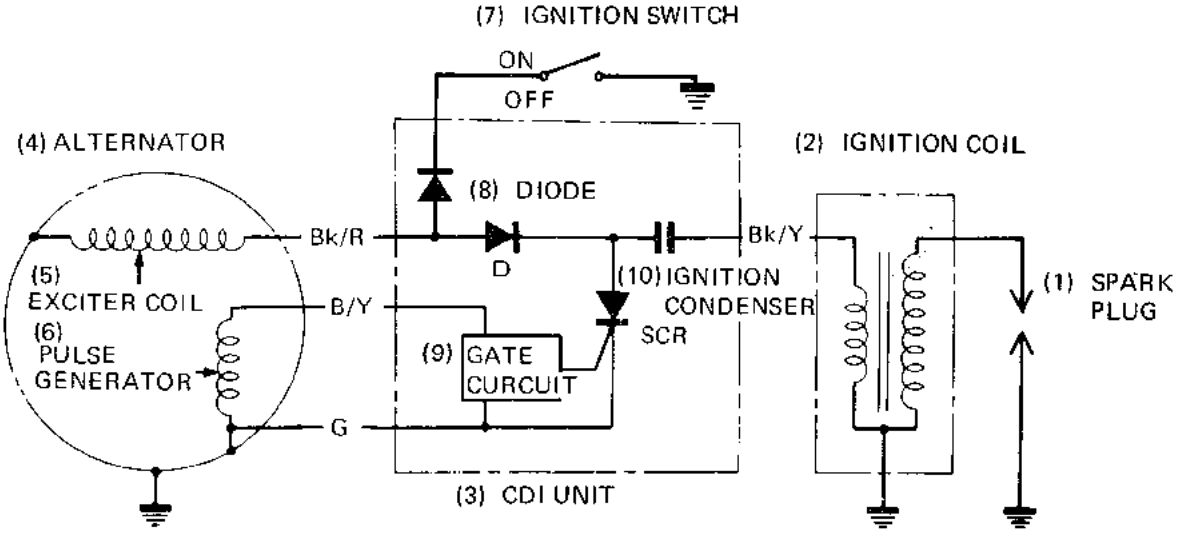
IGNITION SYSTEM 16.

(2) IGNITION COIL
(3) CDI UNIT
(1) SPARK PLUG
(4) ALTERNATOR



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CID UNIT	16-4
ALTERNATOR EXCITOR COIL/PULSE GENERATOR	16-4

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SERVICE INFORMATION

GENERAL

- A CDI IGNITION SYSTEM is used and no adjustments are to be made. If the timing is incorrect, inspect the CDI unit and alternator and replace any defective parts.
- For spark plug information, see page 3-5.

SPECIFICATIONS

			ND	NGK
Spark plug	Standard		W24ESR-U (W27ESR-U)	BR8ES (BR9ES)
	Optional		W22ESR-U (W22ESR-U) W27ESR-U (W24ESR-U)	BR7ES (BR7ES) BR9ES (BR8ES)
Spark plug gap			0.7–0.8 mm (0.028–0.030 in)	
Ignition timing	"F" mark		19° ± 3° BTDC at 3,00 min^{-1} (rpm)	
	Retard start	MBX50	4,400–5,600 min^{-1} (rpm)	
		MBX80	3,200–4,900 min^{-1} (rpm)	
	Full retard	MBX50	10° ± 3.5° BTDC at 9,000 min^{-1} (rpm)	
		MBX80	3° ± 3.5° BTDC at 9,000 min^{-1} (rpm)	

( ): MBX80 – G type

TROUBLESHOOTING

No spark at plug

1. Faulty spark plug
2. Poorly connected, broken or shorted wires
   - Between alternator and CDI unit
   - Between CDI unit and ignition coil
   - Between CDI unit and ignition switch
   - Between CDI unit and spark plug
3. Faulty ignition switch
4. Faulty ignition coil
5. Faulty CDI unit
6. Faulty alternator

Engine starts but runs poorly

1. Ignition primary circuit
   - Faulty ignition coil
   - Loose or bare wire or connector
   - Poor contact in ignition switch
2. Ignition secondary circuit
   - Faulty ignition coil
   - Faulty spark plug
   - Faulty high tension cord
   - Faulty plug cap
3. Improper ignition timing
   - Faulty alternator
   - Stator not installed properly
   - Faulty CDI unit

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IGNITION COIL

REMOVAL

Remove the seat and fuel tank.
Disconnect the wire leads.

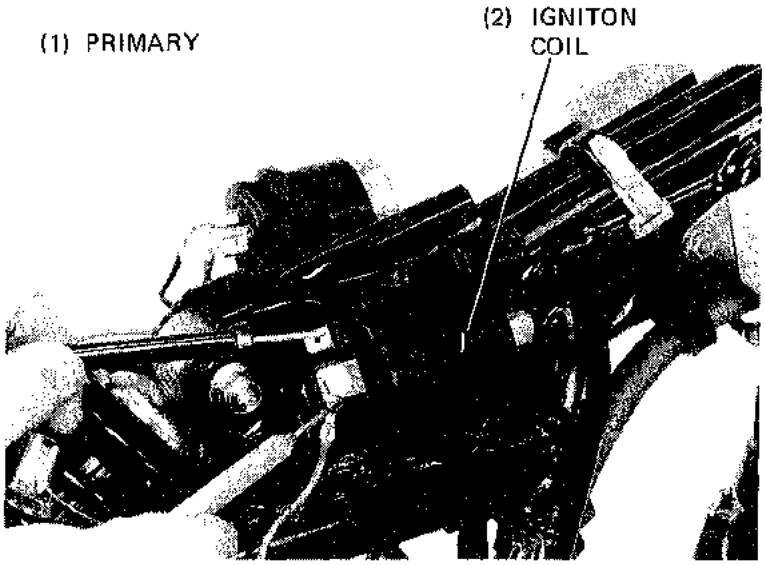
Remove the coil by removing the attaching bolts.
Remove the spark plug cap by rotating it by hand.

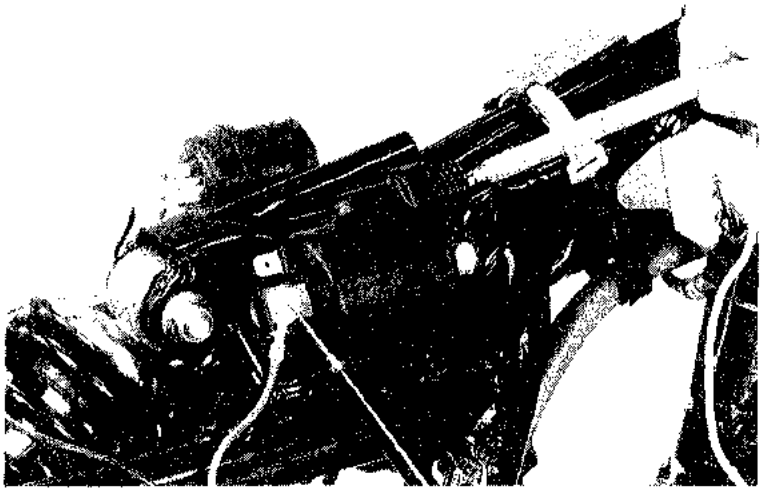
CONTINUITY TEST

Measure the resistances of the primary and secondary coils.

Resistances:

Primary coil:	**0.2–0.3 Ohms**
Secondary coil:	**3.4–4.2 Ohms**





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CDI UNIT

REMOVAL

Remove the fuel tank.
Remove the CDI unit from the coupler.

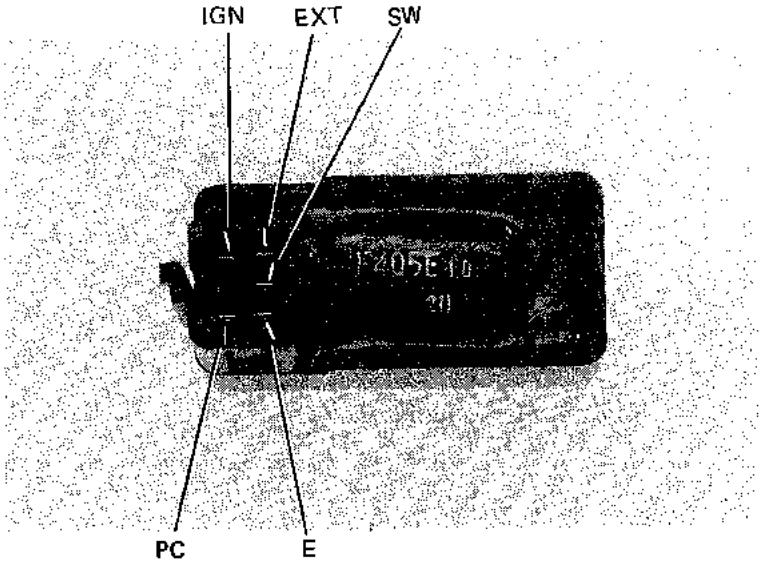
INSPECTION

Measure the resistances between the terminals.
Replace the CDI unit with a new one if the readings do not fall within the limits shown in the table.

NOTE

- The CDI is fully transistorized.
- For accurate testing, it is necessary to use a specified electric tester. Use of an improper tester or measurements in improper range may give a false reading.
- Use SANWA ELECTRIC TESTER (P/N 07308–0020000) or KOWA ELECTRIC TESTER (TH-5H).
- In the table, "Needle swings the returns" indicates that there is a charging current in the condenser for the first time. The needle will then remain fixed unless the condenser is discharged.

Measuring ranges:
SANWA: x KΩ
KOWA: x 100Ω



Unit : kΩ

Tester positive (+)probe / Tester negative(−)probe	SW	EXT	PC	E	IGN
SW		∞	∞	∞	∞
EXT	0.1-20		∞	∞	Needle swings, then returns
PC	0.5-200	0.5-100		0.5-30	∞
E	0.2-60	0.1-20	∞		∞
IGN	∞	∞	∞	∞	

ALTERNATOR EXCITOR COIL/ PULSE GENERATOR

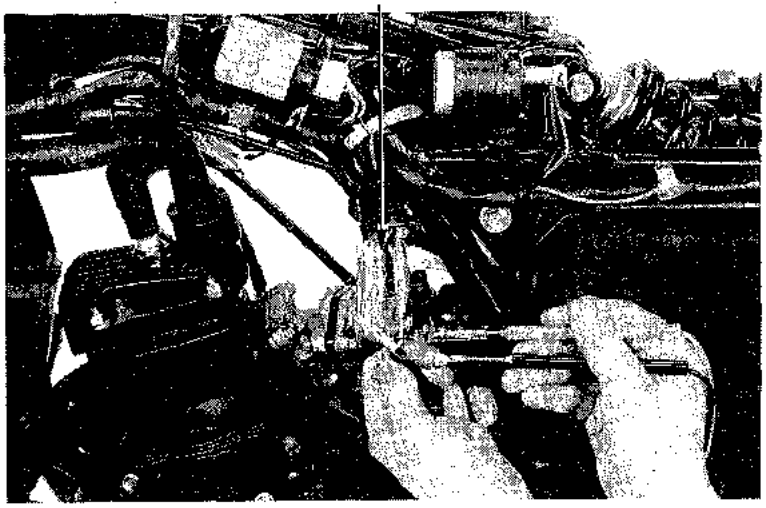
INSPECTION

Warm up the engine.
Stop the engine.
Disconnect the alternator connectors.
Measure the exciter coil and pulse generator resistances.

Black/Red — Green (Exciter coil):
50 — 300 Ohms
Blue/Yellow — Green (Pulse generator):
10 — 100 Ohms

Replace the stator and flywheel as a set if not within the specifications.

(1) ALTERNATOR CONNECTORS



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17. SWITCHES

HONDA
MBX50·MBX80

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17

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SERVICE INFORMATION

GENERAL

- Some wires have different colored bands around them near the connector. These are connected to other wires which respond 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 and on the wiring diagram.

B = Blue	G = Green	Lg = Light Green	R = Red
Bk = 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 part. A continuity check can usually be made without removing the part from the motorcycle. Simply disconnect the wires and connect a continuity tester or volt-ohmmeter to the terminals or connections.
- A continuity tester is useful when checking to find out whether or not there is an electrical connection between the two points. An ohmmeter is needed to measure the resistance of a circuit, such as when there is a specific coil resistance involved, or when checking for high resistance caused by corroded connections.

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IGNITION SWITCH

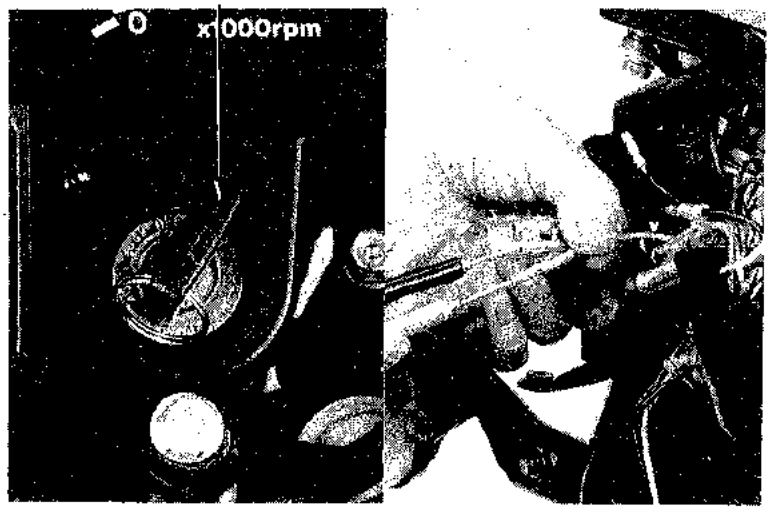
Remove the headlight.
Disconnect the ignition switch connectors.
Check continuity of terminals on the coupler in each switch position.

SWITCH POSTION

OFF: B/W to G
ON: R to B

Terminal / Postions	IG	E	Ho	BAT
OFF	○——	——○		
ON			○——	——○
Color code	Bk/W	G	Bk	R

(1) IGNITION SWITCH



HANDLEBAR SWITCHES

The handlebar cluster switches (lights, dimmer, turn signals, horn) must be replaced as assemblies.
Continuity tests for the components of the handlebar cluster switches follow:
Remove the headlight.
Continuity should exist between the color coded wires on each chart.

LIGHTING SWITCH

Terminal / Position	(HL)	C_1	RE	TL	P
•		○——	——○		
N		○——	——○		
P		○——	○——	○——	——○
N	○——	○——	○——	——○	
H	○——	○——	———	——○	
Color colde	–	Y	P	Br	Br/W

DIMMER SWITCH

Terminal / Position	Hi	(HL)	Lo
Hi	○——	——○	
(N)	○——	○——	——○
Lo		○——	——○
Color code	B	–	W

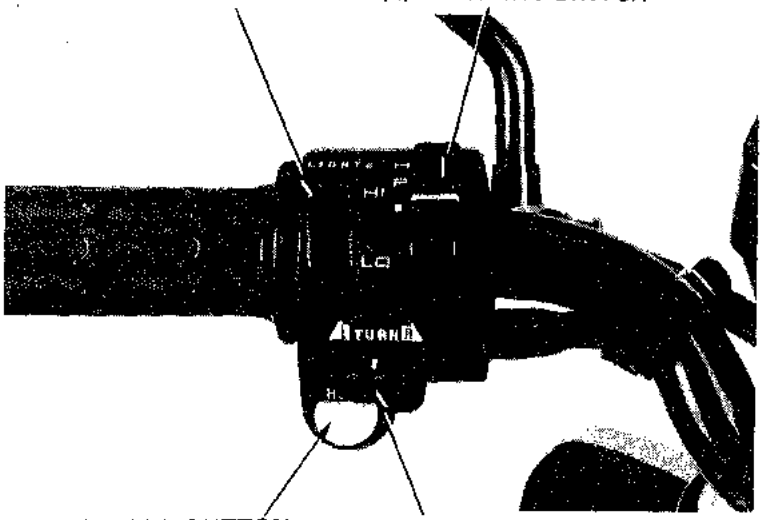
TRUN SIGNAL SWITCH

Terminal / Position	R	W	L
R	○——	——○	
N			
L		○——	——○
Color code	Lb	Gr	O

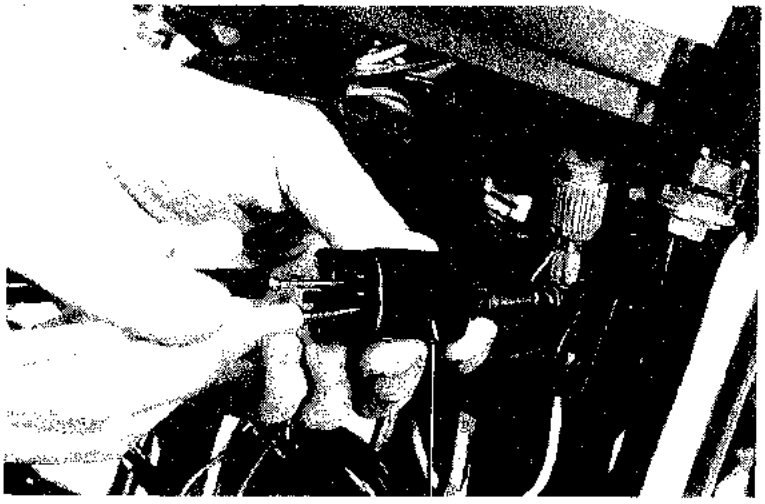
HORN BUTTON

Terminal / Position	HO	B
Free		
Push	○——	——○
Color code	Lg	Bk

(1) DIMMER SWITCH (2) LIGHTING SWITCH



(3) HORN BUTTON (4) TURN SIGNAL SWITCH



(1) HANDLEBAR SWITCH COUPLER

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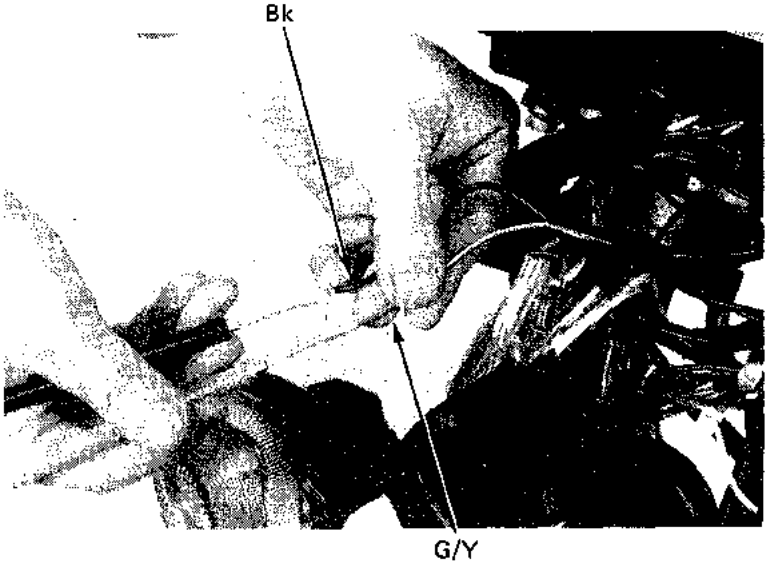
BRAKE SWITCHES

FRONT BRAKE

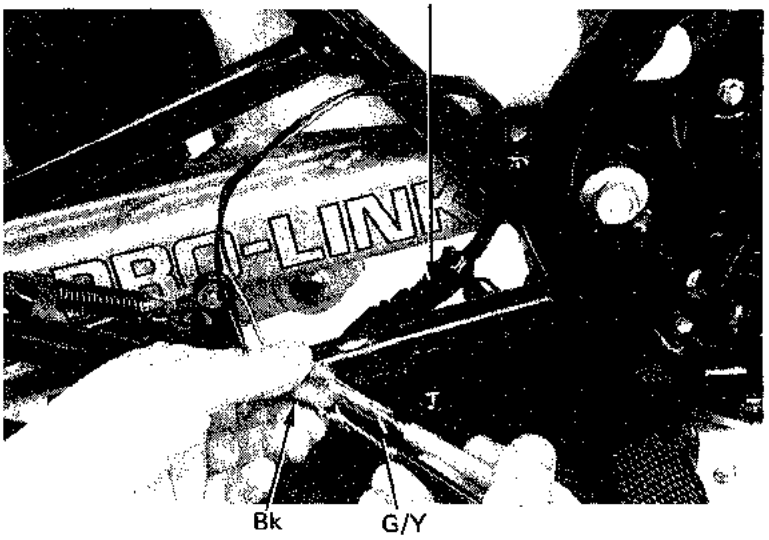
Remove the headlight.
Disconnect the front brakelight switchf wires at the connectors.
Check the brakelight switch for continuity with the fron brake applied.
Replace the seitch if necessary.



REAR BRAKE

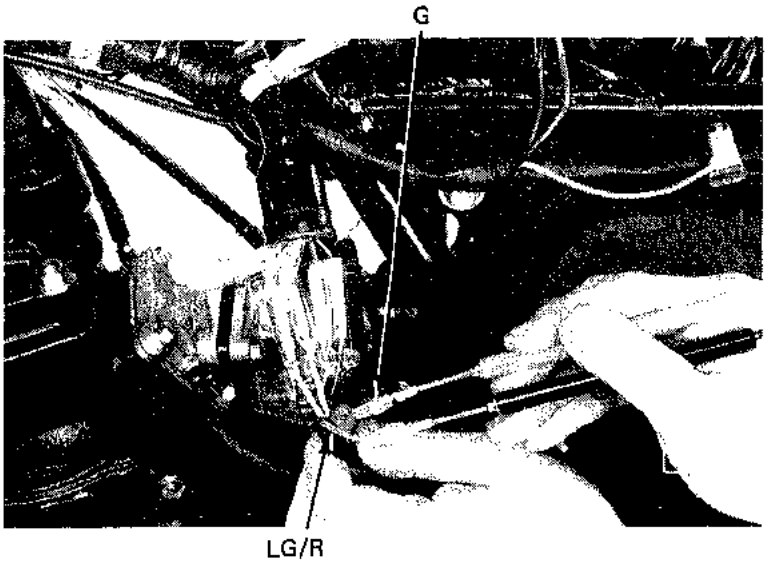
Disconnect the brakelight switch wire leads at the connectors.
Check the switch for continuity with the rear brake applied.
Replace the switch if necessary.

(1) REAR BRAKELIGHT SWITCH



NEUTRAL SWITCH

Disconnect the nuetral switch wire (Light Green/Red) and ground wire (Green) at the connector.
Check the switch for continuity between the wires with the transmission in neutral and with the transmission in any gear.
Replace the neutral switch if necessary.



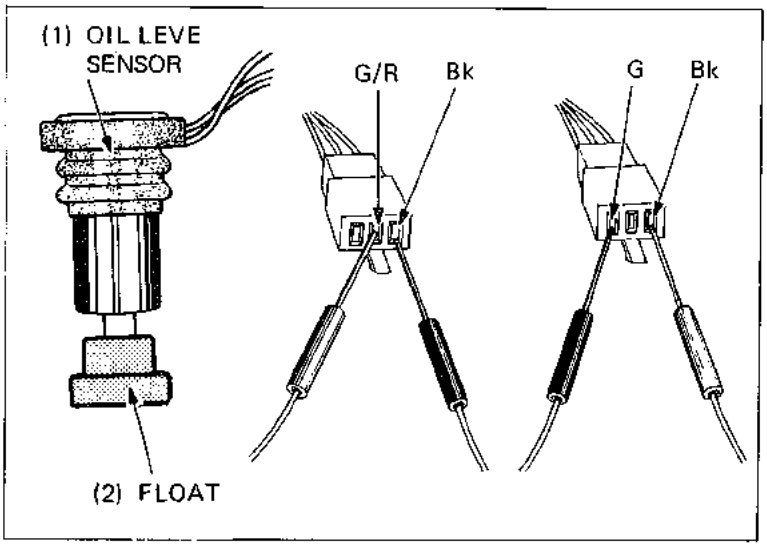
OIL LEVEL SENSOR

INSPECTION

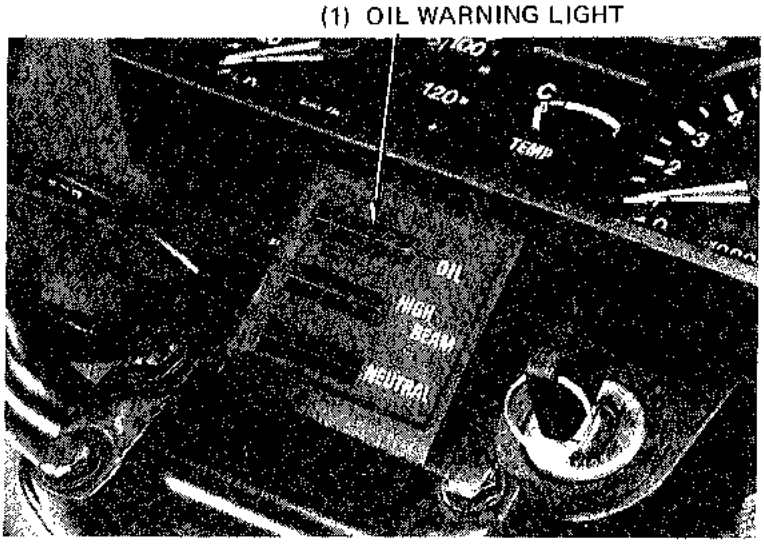
Remove the fuel tank.
Disconnect the oil level sensor coupler and remove the sensor from the oil tank.
Measure the oil level sensor resistance with empty float position.

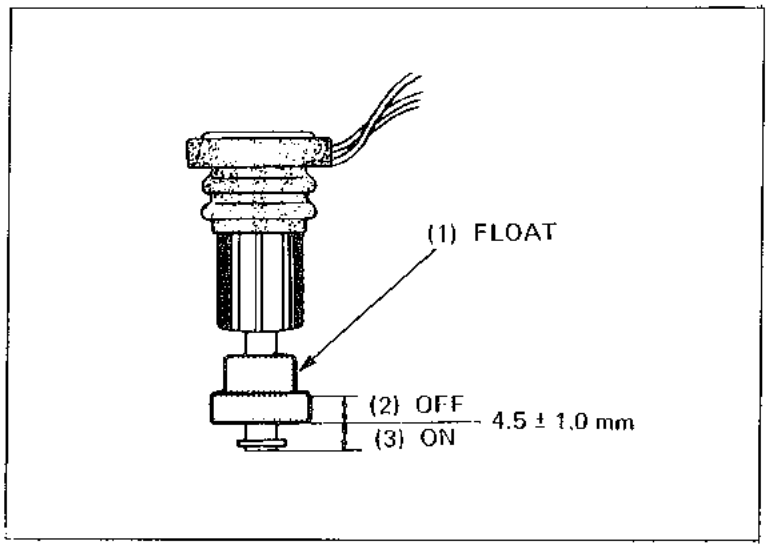
RESISTANCE: G/R to Bk: 5–15 ohm
G to Bk: ∞

Measure the resistance between the green/red and the black wire terminals with full float position.
RESISTANCE: G/R to Bk Approximately 340 ohm



Turn the ignition switch ON.
Connect the oil level sensor coupler to the wire harness. Move the float from full to empty and check that the oil warning light comes on.
If the light does not go on, check for blown fuse or bulb, loose connection or open circuit in the wire harness. Replace the sensor if all of these parameters check out good.





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TROUBLESHOOTING 18.

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ENGINE DOES NOT START OR IS HARD TO START

CHECK		PROBABLE CAUSE
1. Check if fuel is reaching carburetor	NOT REACHING CARBURETOR →	(1) No fuel in fuel tank (2) Clogged fuel pipe from tank to carburetor (3) Clogged float valve in carburetor (4) Breather hole in fuel tank cap clogged
REACHING CARBURETOR ↓		
2. Remove spark plug and try spark test	SPARKS ARE WEAK OR DO NOT JUMP AT ALL →	(1) Faulty spark plug (2) Fouled spark plug (3) Faulty CDI unit (4) Broken or shorted high tension cord (5) Broken or shorted ignition coil (6) Faulty ignition switch
SPARK JUMPS ↓		
3. Test cylinder compression by operating kick pedal	LOSS OF COMPRESSION →	(1) Piston rings stuck in ring lands (2) Flaw in casting (3) Compression leak past crankcase (4) Faulty or clogged reed valve (5) Worn cylinder and piston rings (6) Blown cylinder head gasket
COMPRESSION IS NORMAL ↓		
4. Start by following normal starting procedure	ENGINE FIRES BUT STOPS SOON →	(1) Excessively open choke (2) Choke stuck closed (3) Air leaking past manifold (4) Ignition timing out of proper adjustment
ENGINE DOES NOT FIRE ↓		
5. Remove spark plug	WET →	(1) Carburetor flooded (2) Carburetor choke excessively closed (3) Throttle valve excessively opened
DRY ↓		
6. Restart with choke applied		

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ENGINE LACKS POWER

CHECK		PROBABLE CAUSE
1. Raise wheel off ground WHEEL SPINS FREELY	WHEEL DOES NOT SPIN FREELY →	(1) Brake dragging (2) Worn or damaged wheel bearing (3) Wheel bearing not lubricated properly (4) Drive chain too tight
2. Check tire pressure with tire gauge TIRE PRESSURE IS NORMAL	TIRE PRESSURE IS TOO LOW →	(1) Punctured tire (2) Faulty tire valve
3. Try rapid acceleration from low to high ENGINE SPEED LOWERED WHEN CLUTCH IS RELEASED	ENGINE SPEED NOT CHANGED WHEN CLUTCH IS RELEASED →	(1) Clutch slipping (2) Worn clutch disc (3) Clutch disc warped
4. Lightly accelerate engine ENGINE SPEED INCREASES	ENGINE SPEED DOES NOT INCREASE SUFFICIENTLY →	(1) Carburetor choke closed (2) Restricted fuel flow (3) Air cleaner clogged (4) Clogged fuel tank breather (5) Clogged muffler
5. Check ignition timing using timing light IGNITION TIMINGS IS CORRECT	IGNITION TIMING IS INCORRECT →	(1) Improper ignition timing
6. Test cylinder compression by operating kick pedal using compression gauge COMPRESSION IS NORMAL	COMPRESSION IS LOW →	(1) Worn cylinder and piston rings (2) Blown cylinder head gasket (3) Flaws in compression parts (4) Faulty or deteriorated reed valve
7. Check for clogged carburetor CARBURETOR IS NOT CLOGGED	CARBURETOR IS CLOGGED →	(1) Damaged fuel strainer (2) Caburetor not serviced frequently enough
8. Remove spark plug PLUG IS NOT FOULED OR DISCOLORED	PLUG IS FOULED OR DISCOLORED →	(1) Plug fouled (2) Use of plug with improper heat range

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CHECK		PROBABLE CAUSE
9. Check oil level. Also check oil for contamination	LEVEL IS TOO LOW OR TOO HIGH →	(1) Transmissio oil level too high, resulting in lack of power (2) Transmission oil level too low (3) No engine oil in oil tank (4) Oil deteriorated or contaminated
CRANKCASE IS FILLED TO PROPER LEVEL		
10. Check if engine overheats	ENGINE OVERHEATS →	(1) Improperly adjusted oil pump (2) Excessive carbon build-up in combustion chamber (3) Use of improper quality fuel (4) Mixture too lean (5) Clutch slipping
ENGINE IS NOT OVERHEATED		
11. Accelerate or run at high speed	ENGINE KNOCKS →	(1) Worn piston rings and cylinder (2) Fuel air mixture too lean (3) Excessive carbon build-up in combustion chamber (4) Ignition timing too early (advanced)
ENGINE DOES NOT KNOCK		

POOR PERFORMANCE AT LOW AND IDLE SPEEDS

CHECK		PROBABLE CAUSE
1. Check ignition timing	INCORRECT →	(1) Faulty CDI unit (2) Faulty alternator
NORMAL		
2. Check carburetor air screw adjustment	INCORRECT →	(1) Fuel air mixture too lean (To correct, screw in) (2) Fuel air mixture too rich (To correct, screw out)
NORMAL		
3. Air is leaking past carburetor packing	LEAKING →	(1) Deteriorated insulator O-ring (2) Loose carburetor (3) Deteriorated carburetor packing
NOT LEAKING		
4. Remove spark plug and try spark test	WEAK OR INTERMITTENT SPARK →	(1) Defective, or carbon or wet fouled spark plug (2) Faulty alternator (3) Faulty ignition coil (4) Faulty CDI unit
GOOD SPARKS		

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POOR PERFORMANCE AT HIGH SPEED

CHECK		PROBABLE CAUSE
1. Check ignition timing	IMPROPER →	(1) Faulty alternator (2) Faulty CDI
PROPER ↓		
2. Disconnect fuel tube at carburetor	FUEL FLOW IS RESTRICTED →	(1) Lack of fuel in tank (2) Clogged fuel tank cap breather hole (3) Clogged fuel line (4) Clogged fuel valve
FUEL FLOWS OUT FREELY ↓		
3. Remove carburetor and check	CLOGGED →	(1) Damaged fuel strainer
NOT CLOGGED		

POOR HANDLING

Check tire pressure

	PROBABLE CAUSE
1. Steering heavy →	(1) Steering cone races excessively tightened (2) Damaged steering steel balls
2. Front or rear wheel is excessively wobbling →	(1) Excessive play in wheel bearing (2) Distorted rim (3) Improperly installed wheel hub (4) Rear fork pivot bushing excessively worn (5) Distorted frame (6) Improper drive chain adjustment
3. Pulls to one side →	(1) Unbalanced shock absorbers (right and left/front and rear) (2) Front and rear wheels not aligned (3) Bent front fork (4) Bent rear fork

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MEMO

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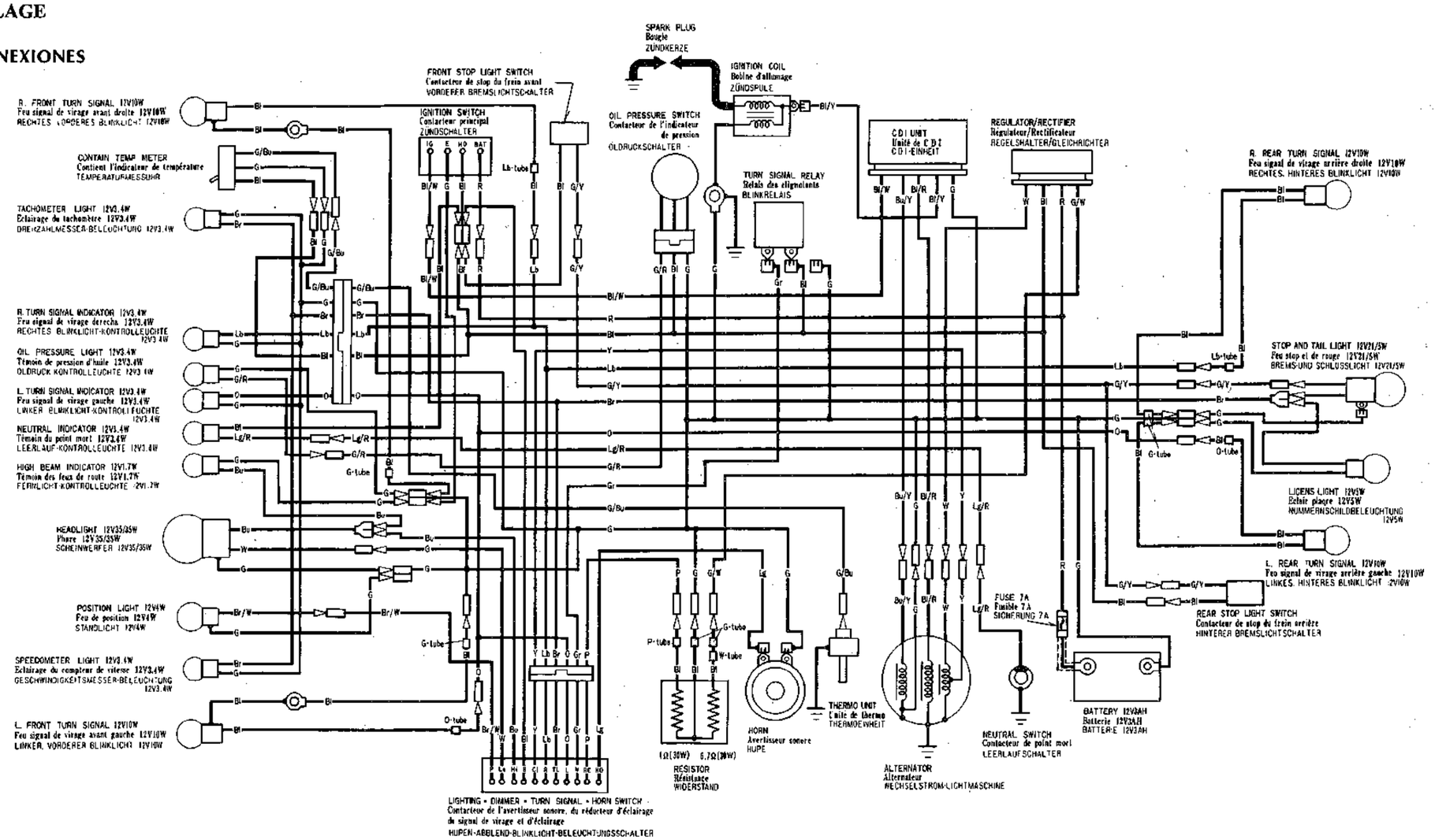
WIRING DIAGRAM

SCHEMA DE CABLAGE
SCHALTPLAN
DIAGRAMA DE CONEXIONES

MBX50



Bl ····· BLACK	Br ····· BROWN	Bl ····· Noir	Br ····· Brun
Y ····· YELLOW	O ····· ORANGE	Y ····· Jaune	O ····· Orange
Bu ····· BLUE	Lb ····· LIGHT BLUE	Bu ····· Bleu	Lb ····· Bleu clair
G ····· GREEN	Lg ····· LIGHT GREEN	G ····· Vert	Lg ····· Vert clair
R ····· RED	P ····· PINK	R ····· Rouge	P ····· Rose
W ····· WHITE	Gr ····· GRAY	W ····· Blanc	Gr ····· Gris

Bl ····· SCHWARZ	Br ····· BRAUN		
Y ····· GELB	O ····· ORANGE		
Bu ····· BLAU	Lb ····· HELLBLAU		
G ····· GRÜN	Lg ····· HELLGRÜN		
R ····· ROT	P ····· ROSA		
W ····· WEIß	Gr ····· GRAU		

SWITCH CONTINUITY
Raccordement des contacteurs
ANORDNUNG DER SCHALTER

LIGHTING SWITCH
Contacteur d'éclairage
BELEUCHTUNGSSCHALTER

	(HL)	CI	RE	TL	P
●		O—O			
(N)		O—O			
P		O—O	O—O	O—O	
(N)	O—O				
H	O—O			O—O	

DIMMER SWITCH
Réducteur d'éclairage
ABBLENDSCHALTER

	Hi	(HL)	Lo
Hi	O—O		
(N)	O—O	O—O	O—O
Lo		O—O	O—O

TURN SIGNAL SWITCH
Contacteur de clignotant
BLINKLICHTSCHALTER

	R	W	L
R	O—O		
N			
L		O—O	O—O

HORN SWITCH
Bouton d'avertisseur
HUPENSCHALTER

	HO	B
FREE		
PUSH	O—O	O—O

IGNITION SWITCH
Contacteur principal
ZÜNDSCHALTER

	IG	E	HO	BAT
OFF	O—O			
ON			O—O	O—O

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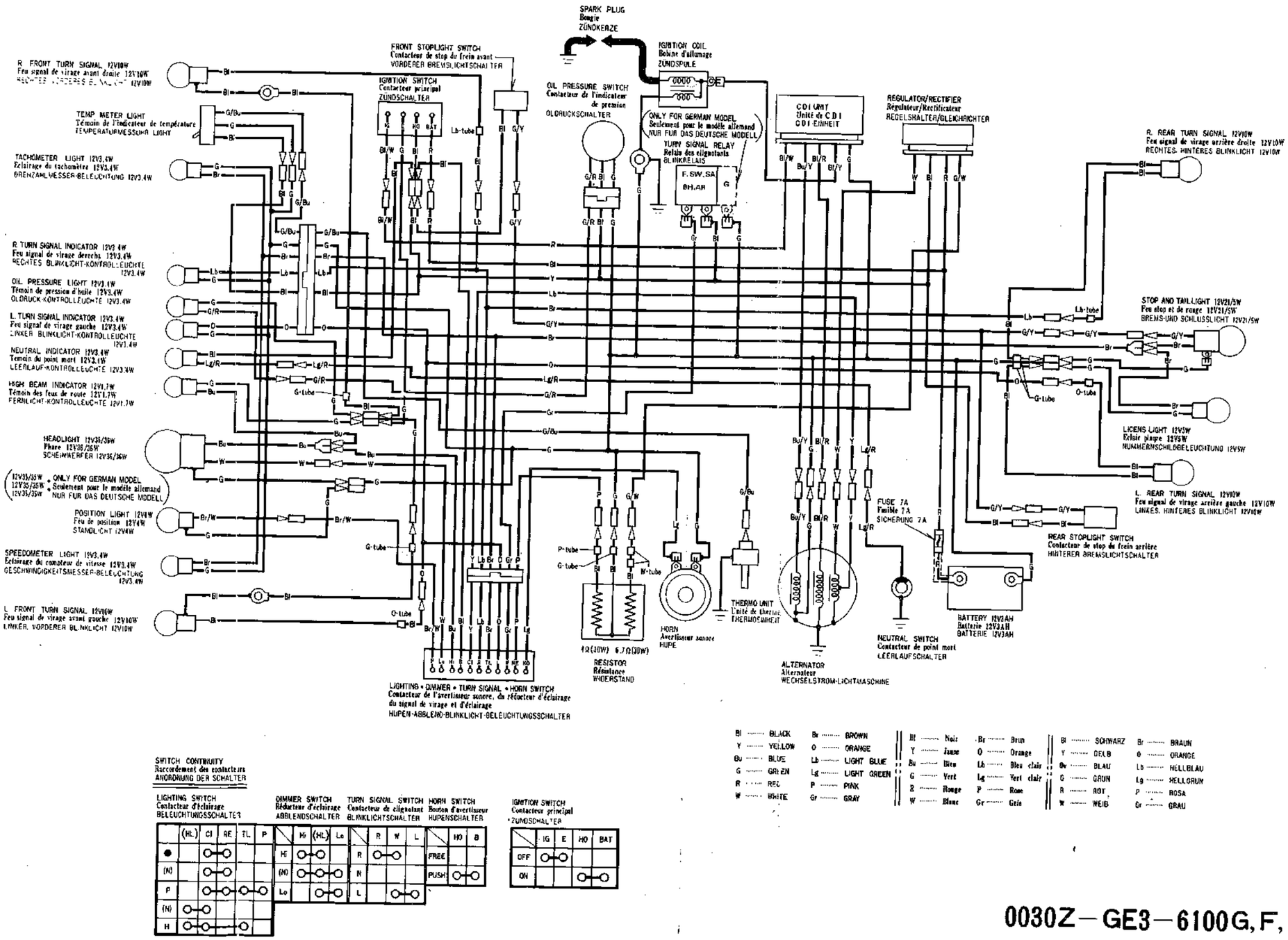
MBX80



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