

## HOW TO USE THIS MANUAL

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

Sections 1 through 3 apply to the whole scooter, while sections 4 through 17 describe parts of the scooter, 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 are not familiar with this scooter, read the TECHNICAL FEATURES in section 18.

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

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Service Publications Office

## CONTENTS

	<b>GENERAL INFORMATION</b>	<b>1</b>
	<b>LUBRICATION</b>	<b>2</b>
	<b>MAINTENANCE</b>	<b>3</b>
<b>ENGINE</b>	<b>FUEL SYSTEM</b>	<b>4</b>
	<b>ENGINE REMOVAL/INSTALLATION</b>	<b>5</b>
	<b>CYLINDER HEAD/VALVES</b>	<b>6</b>
	<b>CYLINDER/PISTON</b>	<b>7</b>
	<b>DRIVE PULLEY/CLUTCH/ DRIVEN PULLEY</b>	<b>8</b>
	<b>FINAL REDUCTION</b>	<b>9</b>
	<b>ALTERNATOR/STARTER CLUTCH</b>	<b>10</b>
	<b>CRANKCASE/CRANKSHAFT</b>	<b>11</b>
	<b>COOLING SYSTEM</b>	<b>12</b>
	<b>FRAME COVERS</b>	<b>13</b>
<b>CHASSIS</b>	<b>STEERING/FRONT WHEEL/BRAKE/ SUSPENSION</b>	<b>14</b>
	<b>REAR WHEEL/BRAKE/SUSPENSION</b>	<b>15</b>
<b>ELEC- TRICAL</b>	<b>ELECTRICAL EQUIPMENT</b>	<b>16</b>
	<b>WIRING DIAGRAMS</b>	<b>17</b>
	<b>TECHNICAL FEATURES</b>	<b>18</b>
	<b>TROUBLESHOOTING</b>	<b>19</b>
	<b>INDEX</b>	<b>20</b>

# 1. GENERAL INFORMATION

1

GENERAL SAFETY	1-1	TOOLS	1-6
SERVICE RULES	1-1	CABLE & HARNESS ROUTING	1-8
MODEL IDENTIFICATION	1-2	EMISSION CONTROL SYSTEMS	1-15
SPECIFICATIONS	1-3	EMISSION CONTROL INFORMATION LABEL	1-17
TORQUE VALUES	1-5		

## 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 electrolyte gets in your eyes.*

### WARNING

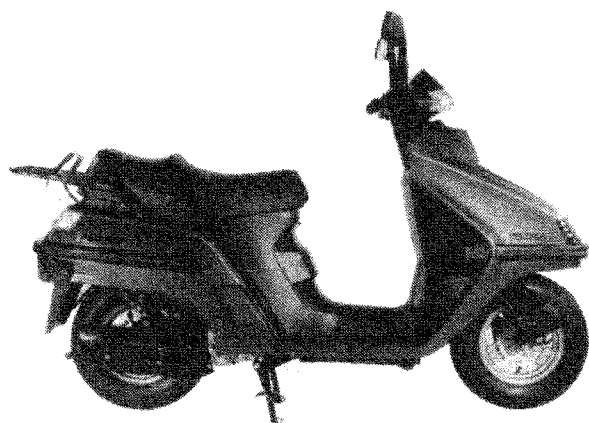
*The battery generates hydrogen gas which can be highly explosive. Do not smoke or allow flames or sparks near the battery, especially while charging it.*

## SERVICE RULES

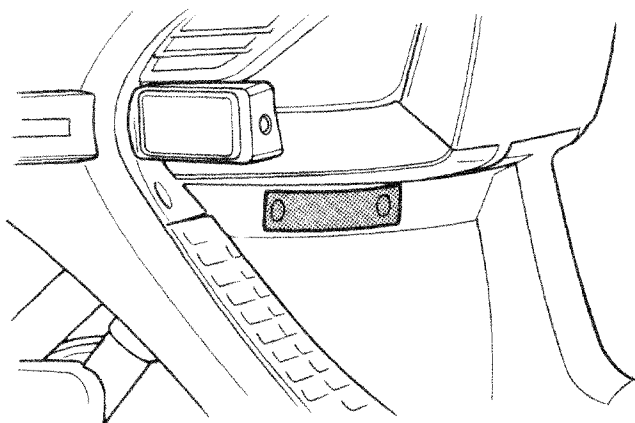
1. Use genuine Honda or Honda-recommended parts and lubricants or their equivalents. Parts that do not meet Honda's design specifications may damage the scooter.
2. Use the special tools designed for this product.
3. Use only metric tools when servicing this scooter. Metric bolts, nuts, and screws are not interchangeable with English fasteners. The use of incorrect tools and fasteners may damage the scooter.
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 clean solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
7. After reassembly, check all parts for proper installation and operation.
8. Route all electrical wires as shown on page 1-8, Cable & Harness Routing.

## GENERAL INFORMATION

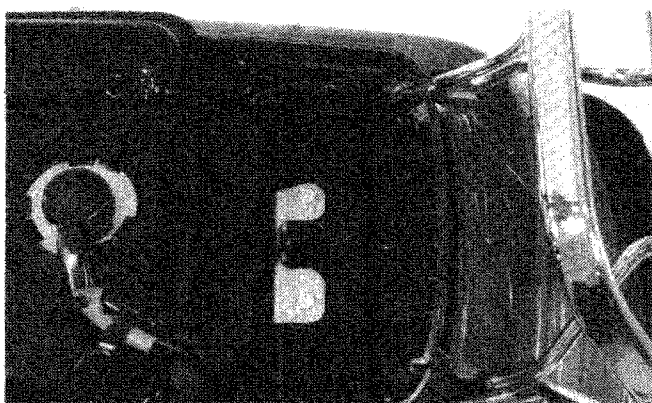
### MODEL IDENTIFICATION



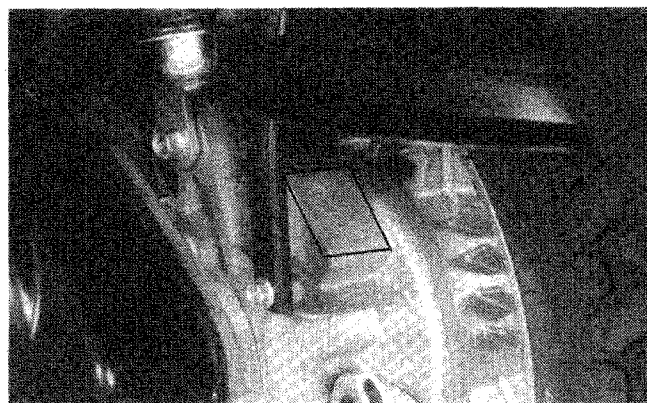
Beginning Frame No. JH2MF010-FK000001~  
No. JH2MF011-FK000001~  
Engine No. ME01E-5000001~



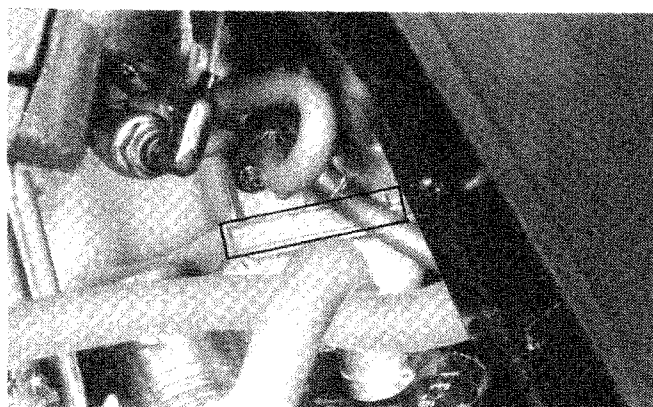
The VIN (Vehicle Identification Number) is attached to the left side of the inner box.



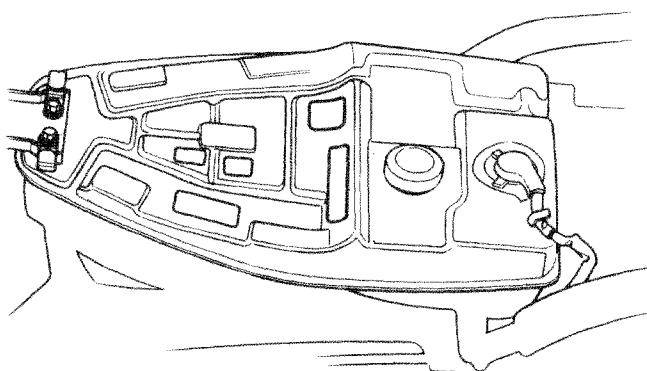
The frame serial number is stamped on the frame below the seat.



The engine serial number is stamped on the back of the crankcase near the rear wheel.



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



The color label is attached to the fuel tank below the seat.

## SPECIFICATIONS

Item		Specification	
DIMENSIONS	Overall length	1,920 mm (75.6 in)	
	Overall width	715 mm (28.1 in)	
	Overall height	1,115 mm (43.9 in)	
	Wheel base	1,255 mm (49.4 in)	
	Ground clearance	125 mm (4.9 in)	
	Dry weight	'85: 122 kg (269 lb) After '85: 126 kg (278 lb)	
	Curb weight	'85: 133 kg (293 lb) After '85: 135 kg (298 lb)	
FRAME	Type	Back bone	
	Front suspension, travel	Bottom link, 100.0 mm (3.94 in)	
	Rear suspension, travel	Power unit swing arm, 97.5 mm (3.85 in)	
	Vehicle capacity load	150 kg (330 lb)	
	Front tire size	4.00—10—4PR	
	Rear tire size	4.00—10—4PR	
	Tire air pressure	Front	Rear
	Driver only	175 kpa (1.75 kg/cm, 24 psi)	200 kpa (2.00 kg/cm, 28 psi)
	Driver and one passenger	175 kpa (1.75 kg/cm, 24 psi)	250 kpa (2.50 kg/cm, 36 psi)
	Front brake	Internal expanding shoes	
ENGINE	Rear brake	Internal expanding shoes	
	Fuel capacity	8.0 liter (2.1 US gal, 1.8 Imp gal)	
	Caster angle	27° 00'	
	Trail length	79.0 mm (3.11 in)	
	Type	Water cooled 4-stroke, OHC engine	
	Cylinder arrangement	Single cylinder	
	Bore and stroke	72.0 x 60.0 mm (2.83 x 2.36 in)	
	Displacement	244.3 cc (15.0 cu in)	
	Compression ratio	9.8 : 1	
	Engine oil capacity at disassembly after change	1.0 liter (1.06 US qt, 0.88 Imp qt) 0.8 liter (0.85 US qt, 0.70 Imp qt)	
	Lubrication system	Forced pressure and wet sump	
	Coolant capacity (Reserve tank) at disassembly after change	0.35 liter (0.37 US qt, 0.31 Imp qt) 1.35 liter (1.43 US qt, 1.19 Imp qt) 1.15 liter (1.22 US qt, 1.01 Imp qt)	
	Air filtration	Paper filter	
	Cylinder compression at 600 rpm	1,300 kpa (13.0 kg/cm, 185 psi)	
	Valve timing Intake opens closes Exhaust opens closes	5° BTDC 30° ABDC 40° BBDC 0° TDC } at 1 mm lift	
CARBURETION	Valve clearance (cold) IN/EX	0.08 — 0.12 mm (0.003—0.005 in)	
	Engine weight	32 kg (70.5 lbs)	
	Idle speed	1,500 ± 100 rpm	
	Identification number	'85: VE06A After '85: VE06D '85: VE13A After '85: VE13B (California model only)	
	Main jet number	'85: #115 After '85: #112	
DRIVE TRAIN	Slow jet number	#38	
	Pilot screw initial opening	Refer to page 4-12	
	Float level	18.5 mm (0.73 in)	
	Clutch type	Dry, automatic centrifugal clutch	
	Primary reduction	1.000 : 1	
	Gear ratio	V-matic 2.100 : 1—0.880 : 1	
	Final Reduction Primary	2.642 : 1	
	Secondary	2.500 : 1	



## GENERAL INFORMATION

Item		Specification	
ELECTRICAL	Ignition system	Condenser capacitive discharge ignition (CDI)	
	Starting system	Starting motor	
	Alternator	12V 240 W/5,000 rpm	
	Spark plug	ND	NGK
	Standard	X20EPR—U9	DPR6EA—9
	For cold climate (Below 5°C, 41°F)	X16EPR—U9	DPR5EA—9
	For extended high speed riding	X22EPR—U9	DPR7EA—9
	Spark plug gap	0.8—0.9 mm (0.031—0.035 in)	
LIGHTS	Ignition timing ("F" mark)	12° BTDC at idle	
	Battery capacity	12 V—12 AH	
	Fuse capacity		
	Main	20 A	
	Cooling fan motor	5 A	
	Headlight, taillight	10 A	
	Key illumination	5 A	
	Horn	5 A	
	Turn signal	10 A	
	Brakelight		
	Instrument panel		
	Headlight	12 V 60/55 W	
	Tail/brake light	12 V 27/8 W x 2	
	Front turn signal/position light	12 V 23/8 W x 2	
	Rear turn signal light	12 V 23 W x 2	
	Instrument light	12 V 3.4 W x 4	
	High beam indicator	12 V 1.7 W	
	Turn signal indicator	12 V 3 W x 2	
	Ignition switch light	12 V 3 W	

## TORQUE VALUES

## ENGINE

Item	Q'ty	Thread dia (mm)	Torque N·m (kg-m, ft-lb)	Remarks
Cylinder head cap nut	4	8	22-26 (2.2-2.6, 16-19)	
Cam chain tensioner sealing bolt	1	6	8-12 (0.8-1.2, 6-9)	
Oil filter screen cap	1	—	18-22 (1.8-2.2, 13-16)	
Drive face nut	1	14	80-100 (8.0-10.0, 58-72)	
Drive face seal cover bolt	3	4	2.5-4 (0.25-0.4, 1.8-2.9)	Apply locking agent
Clutch outer nut	1	12	50-60 (5.0-6.0, 36-43)	
Movable driven face nut	1	30	50-60 (5.0-6.0, 36-43)	
One way clutch bolt	3	—	28-32 (2.8-3.2, 21-24)	Apply locking agent
Flywheel nut	1	14	90-100 (9.0-10.0, 65-72)	
Oil pipe bolt(black)	1	8	8-12 (0.8-1.2, 6-9)	
Oil pipe bolt(silver)	1	8	8-12 (0.8-1.2, 6-9)	
Oil pipe bolt(gold)	1	12	18-22 (1.8-2.2, 13-16)	
Water pump impeller	1	7	10-14 (1.0-1.4, 7-10)	Left hand threads

## FRAME

Item	Q'ty	Thread dia. (mm)	Torque N·m(kg-m, ft-lb)	Remarks
Steering stem nut	1	25.4	130-150 (13.0-15.0, 94-108)	
Front wheel hub nut	3	8	28-32 (2.8-3.2, 20-23)	Apply oil
Front axle nut	1	12	50-70 (5.0-7.0, 36-51)	U-nut
Pivot arm mount bolt	2	10	35-45 (3.5-4.5, 25-33)	U-nut
Front shock clevis lock nut	2	8	15-25 (1.5-2.5, 11-18)	Apply locking agent
Front shock absorber lower screw	2	8	0.8-1.2 (0.08-0.12, 0.6-0.9)	
Front shock absorber lower nut	2	8	15-20 (1.5-2.0, 11-14)	
Front shock absorber upper bolt	2	10	35-45 (3.5-4.5, 25-33)	U-nut
Steering stem lock nut	1	25.4	5-13 (0.5-1.3, 4-9)	'85
	1	25.4	10-20 (1.0-2.0, 7-14)	After '85
Top cone race	1	25.4	2-3 (0.2-0.3, 1.4-2.2)	After '85 only
Rear wheel hub nut	3	8	28-32 (2.8-3.2, 20-23)	Apply oil
Rear axle nut	1	14	80-100 (8.0-10.0, 58-72)	U-nut
Front/Rear brake arm bolt	2	6	8-12 (0.8-1.2, 6-9)	
Rear damper lock nut	2	8	15-25 (1.5-2.5, 11-18)	Apply locking agent
Rear shock absorber mounting bolt	4	8	24-30 (2.4-3.0, 17-22)	
Torque link bolt (Fork side)	1	10	35-45 (3.5-4.5, 25-33)	U-nut
(Panel side)	1	8	24-30 (2.4-3.0, 17-22)	U-nut
Engine hanger bolt	1	12	100-120 (10.0-12.0, 72-87)	
Engine hanger stopper rubber bolt	1	8	24-30 (2.4-3.0, 17-22)	
Engine hanger joint bolt	1	10	40-55 (4.0-5.5, 29-40)	After '85 only
Engine mounting bolt	1	10	40-55 (4.0-5.5, 29-40)	
Exhaust pipe joint nut	2	8	27-33 (2.7-3.3, 20-24)	Apply oil
Exhaust muffler mounting bolt	3	8	32-38 (3.2-3.8, 23-27)	

Torque specifications listed above are for specific tightening points. If a specification is not listed, follow the standard torque values below.

## STANDARD TORQUE VALUES

TYPE	TORQUE N·m (kg-m, ft-lb)	TYPE	TORQUE N·m (kg-m, ft-lb)
5 mm bolt, nut	4.5-6.0 (0.45-0.6, 3.3-4.3)	5 mm screw	3.5-5 (0.35-0.5, 2.5-3.6)
6 mm bolt, nut	8-12 (0.8-1.2, 6-9)	6 mm screw, 6 mm	
8 mm bolt, nut	18-25 (1.8-2.5, 13-18)	bolt with 8 mm head	7-11 (0.7-1.1, 5-8)
10 mm bolt, nut	30-40 (3.0-4.0, 22-29)	6 mm flange bolt, nut	10-14 (1.0-1.4, 7-10)
12 mm bolt, nut	50-60 (5.0-6.0, 36-43)	8 mm flange bolt, nut	24-30 (2.4-3.0, 17-22)
		10 mm flange bolt, nut	35-45 (3.5-4.5, 25-33)

## GENERAL INFORMATION

### TOOLS

#### SPECIAL

Description	Tool number	Alternative	Tool number	Ref. sec.
*Flywheel puller	07933—KM10000			10
*Clutch spring compressor	07960—KM10000			8
*Ball race remover attachment	07953—KM10100			14
*Spring holder attachment	07967—KM10100			14
*Drive pulley holder	07923—KM10000			8
Lock nut wrench, 46 mm	07916—1870100			14
Lock nut wrench, 41 mm	07916—9580300			8
*Steering stem lock nut wrench	07916—KM10000			14
Pilot screw wrench	07908—4730000			4
Shaft protector	07931—1870000			9
Bearing remover set, 12 mm	07936—1660001			9
(Bearing remover, 12 mm)	(07936—1660100)			9
(Remover weight)	(07741—0010201)	Remover weight	07936—3710200	9
Bearing remover set, 20 mm	07936—3710001			9
(Bearing remover, 20 mm)	(07936—3710600)			9
(Remover handle)	(07936—3710100)			9
(Remover weight)	(07741—0010201)	Remover weight	07936—3710200	9
Bearing remover, 15 mm	07936—KC10500			12
Remover weight	07741—0010201	Remover weight	07936—3710200	12
Valve guide remover	07942—MA60000			6
Attachment	07945—3330300			14
Mechanical seal driver attachment	07945—4150400	Mechanical seal driver attachment (Not available in U.S.A.)	GN—AH—065—415	12
Ball race remover	07946—GA70000			14
Driver	07949—3710001			8
Crankshaft assembly tool	07965—1660100			9
(Assembly bolt)	(07965—1660200)			9
(Assembly collar) 2 pieces	(07965—1660300)			9
Spring holder attachment	07967—VM50100			15
Rear shock absorber attachment	07967—GA70101			14
Valve guide reamer, 5.0 mm	07984—MA60000			6
Vacuum/pressure pump	A937X—041—XXXXX	Vacuum pump (USA only) Pressure pump (USA only)	SH—AH—260—MC7 SH—AH—255—MC7	4 4

## COMMON

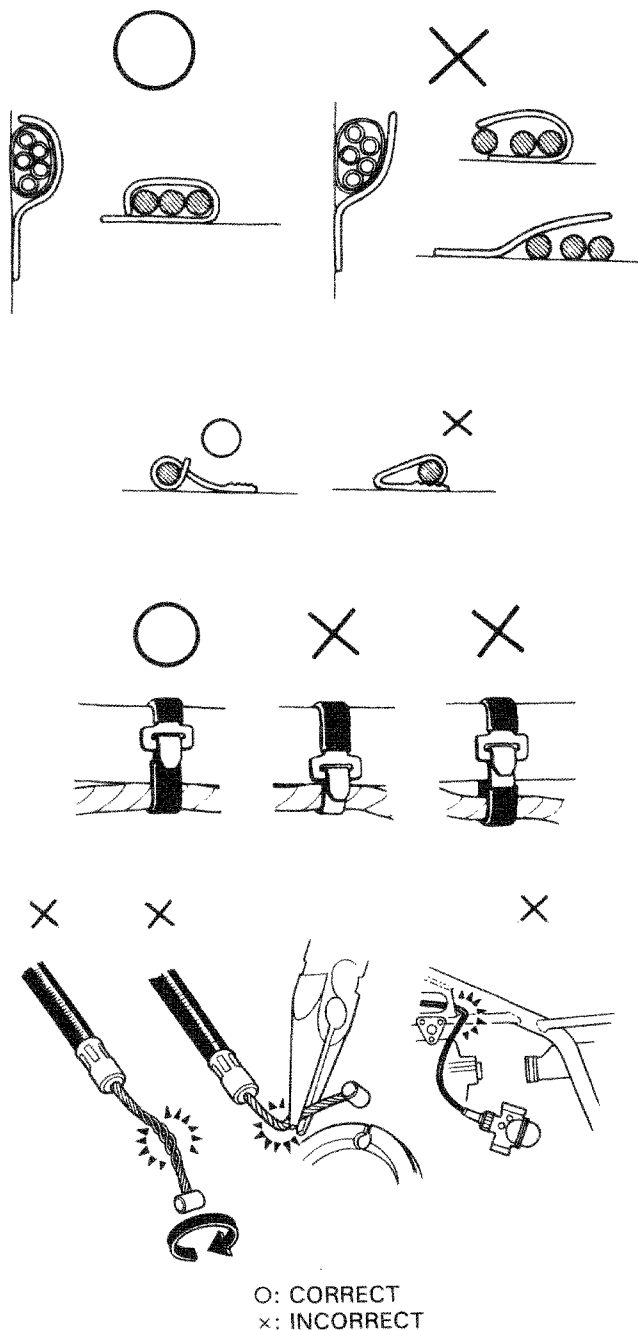
Description	Tool number	Alternative	Tool number	Ref. sec.
Float level gauge	07401—0010000	Equivalent tool commercially available in U.S.A.	07949—3710001	4
Lock nut wrench, 30 x 32 mm	07716—0020400			14
Extension	07716—0020500			14
Universal holder	07725—0030000	Band strap wrench commercially available in U.S.A.		8
Flywheel holder	07725—0040000			10
Valve guide driver	07743—0020000			6
Attachment, 32 x 35 mm	07746—0010100	Equivalent tool commercially available in U.S.A.		8, 14
Attachment, 37 x 40 mm	07746—0010200			9
Attachment, 42 x 47 mm	07746—0010300			9, 14, 15
Attachment, 52 x 55 mm	07746—0010400			9
Attachment, 24 x 26 mm	07746—0010700			8, 14
Pilot, 10 mm	07746—0040100			14
Pilot, 12 mm	07746—0040200			9, 14
Pilot, 15 mm	07746—0040300			8
Pilot, 17 mm	07746—0040400			15
Pilot, 25 mm	07746—0040600			9
Pilot, 22 mm	07746—0041000			8, 9
Bearing remover shaft	07746—0050100	Equivalent tool commercially available in U.S.A. Driver	14	
Bearing remover head, 10 mm	07746—0050200		14	
Bearing remover head, 12 mm	07746—0050300		14	
Driver	07749—0010000		8, 9, 12, 14, 15	
Valve spring compressor	07757—0010000		5	
Shock absorber compressor	07959—3290001		14, 15	

## GENERAL INFORMATION

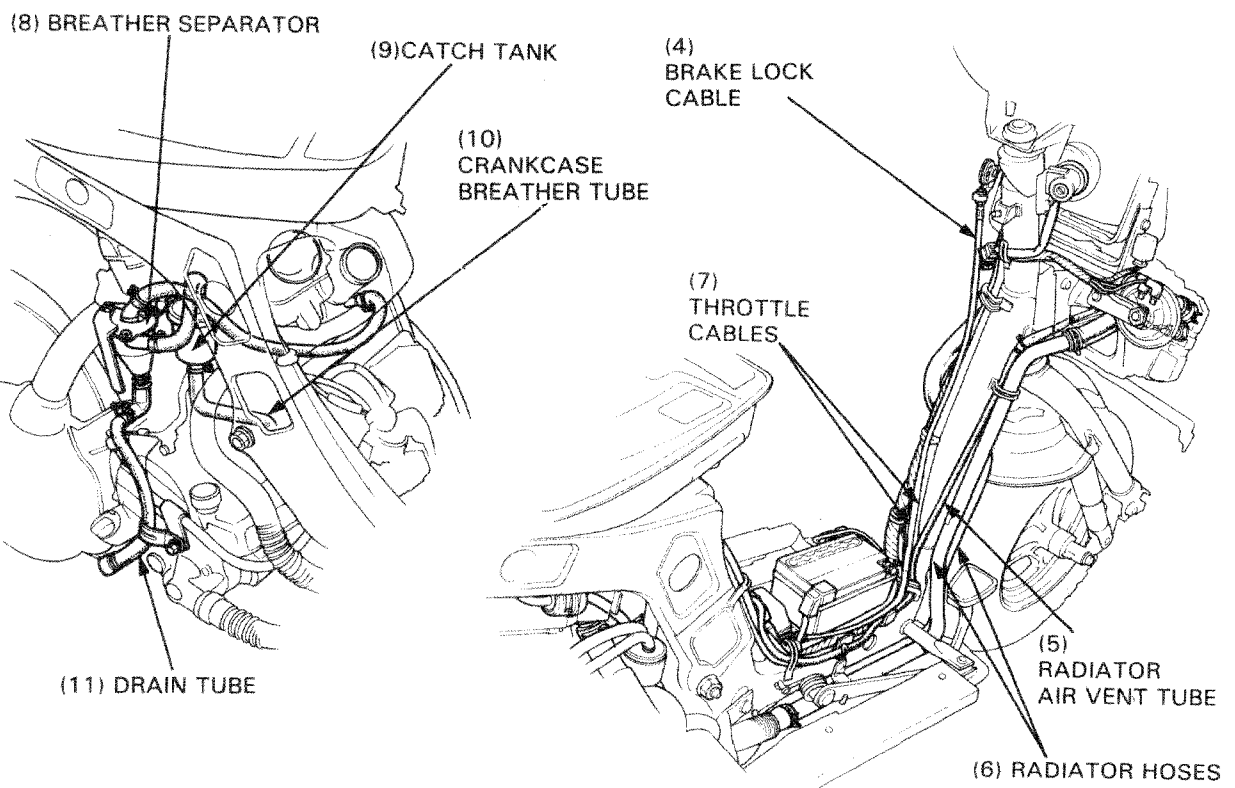
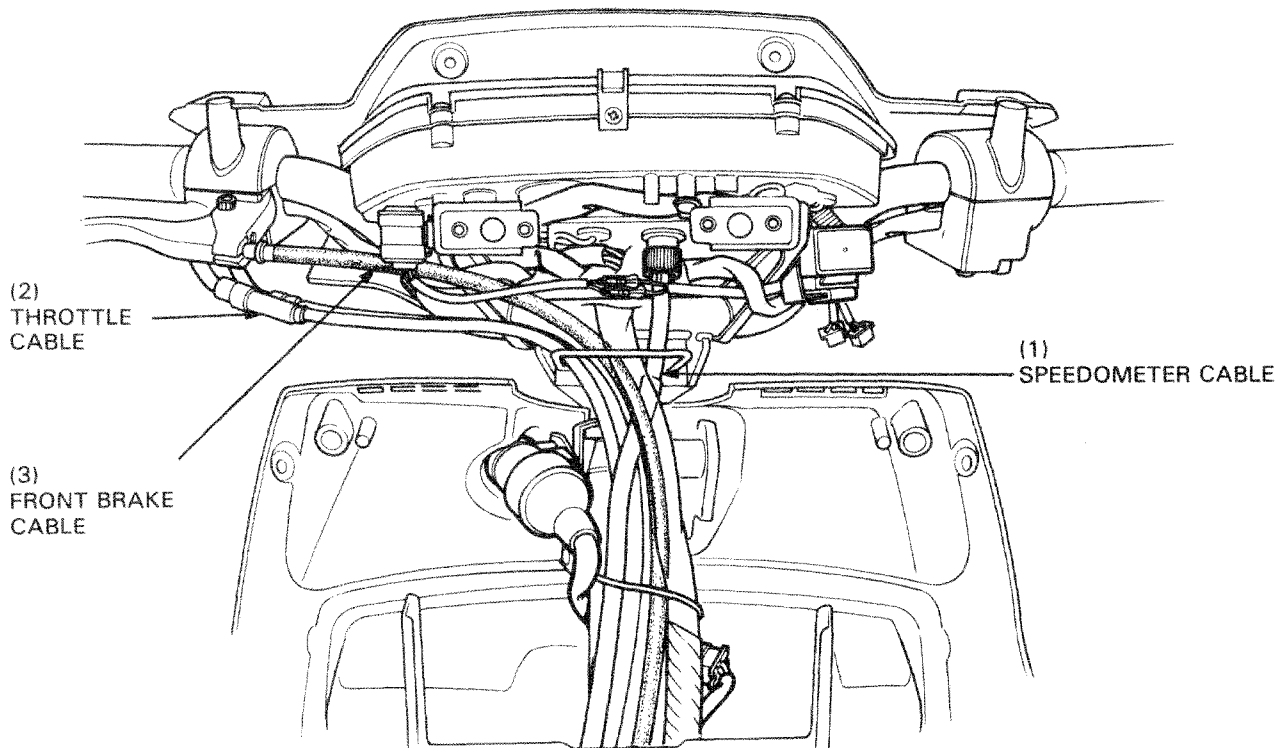
### CABLE AND HARNESS ROUTING

Note the following when routing cables and wire harnesses.

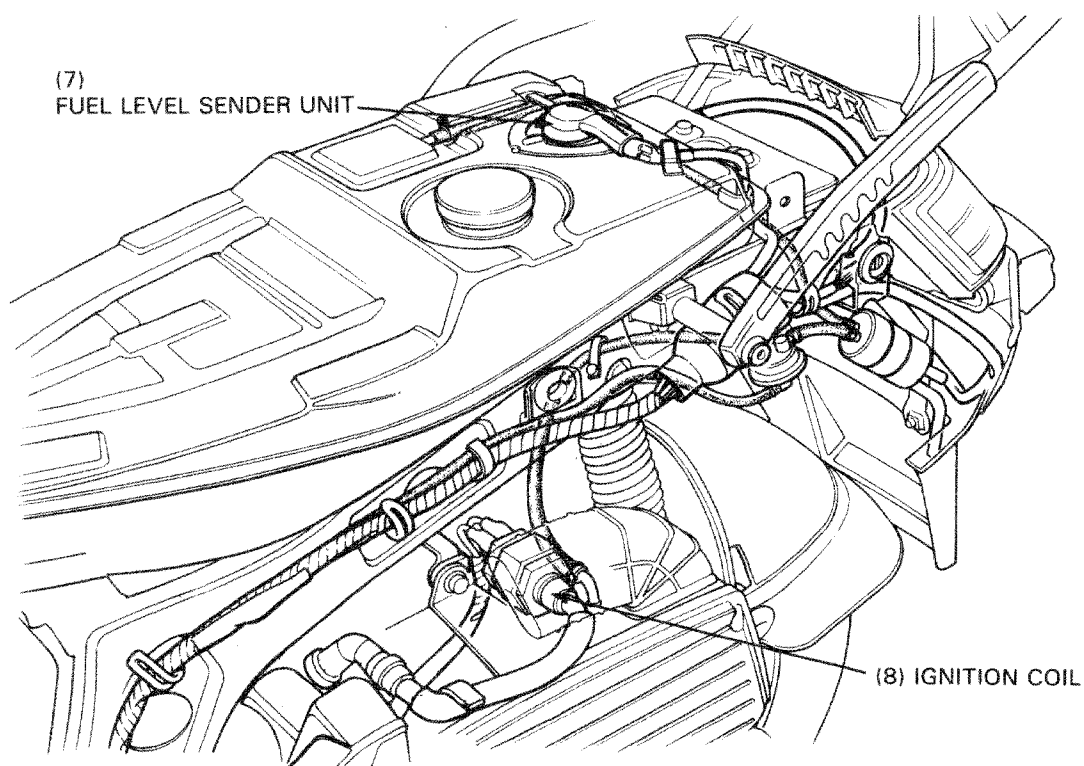
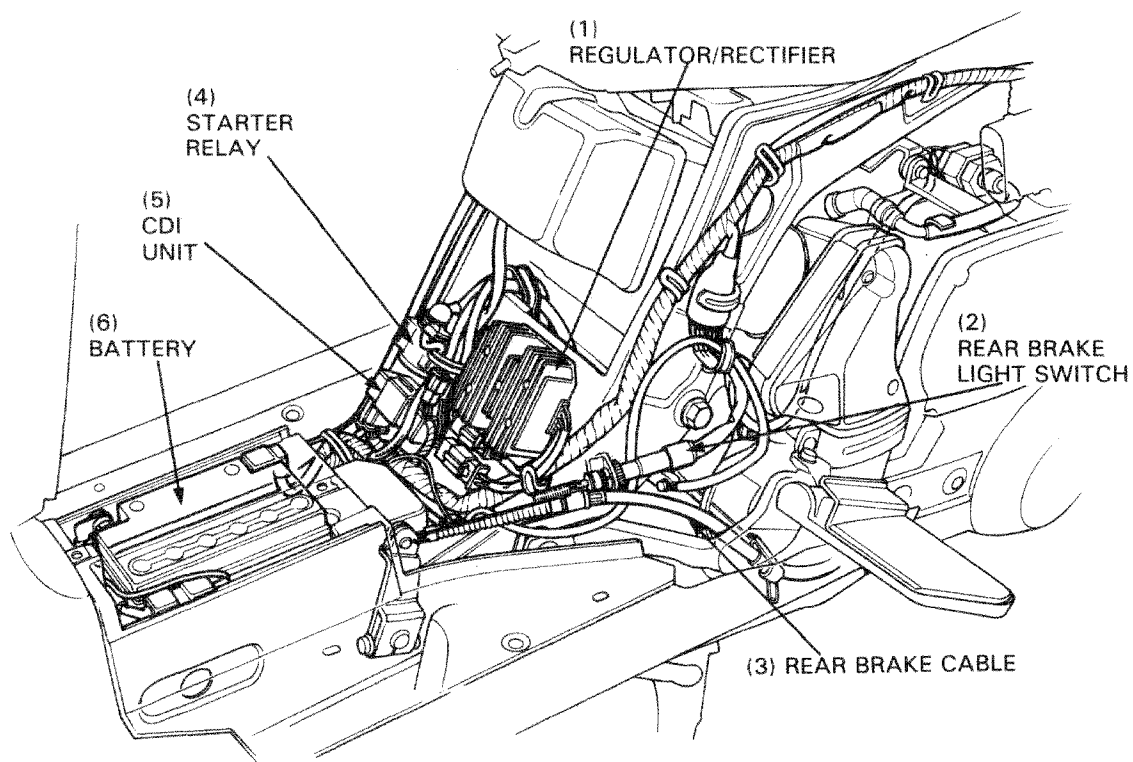
- A loose wire, harness or cable can be a safety hazard. After clamping, check each wire to be sure it is secure.
- Do not squeeze wires against the weld or end of its clamp.
- Secure wires and wire harnesses to the frame with their respective wire bands at the designated locations. Tighten the bands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



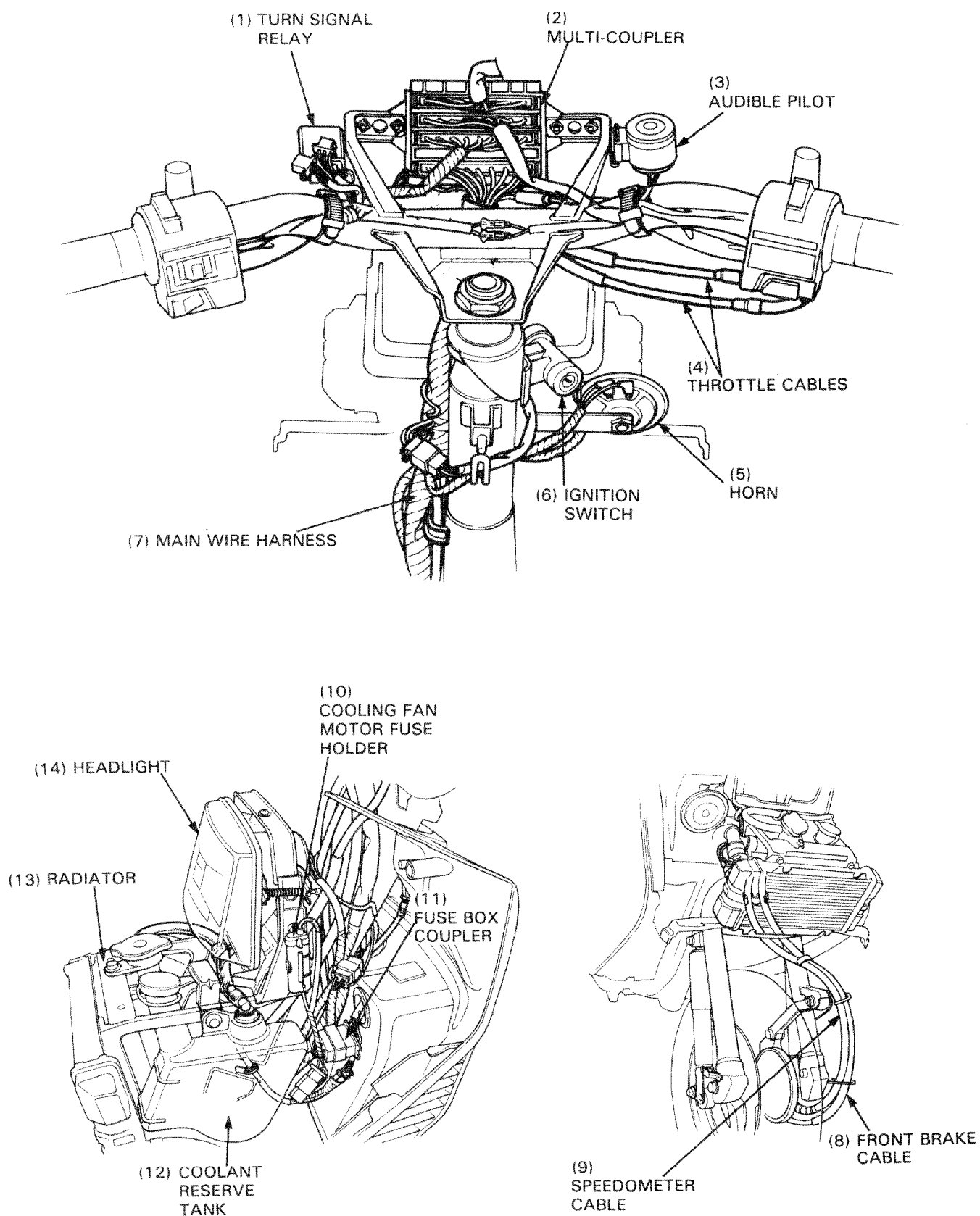
'85:



## GENERAL INFORMATION

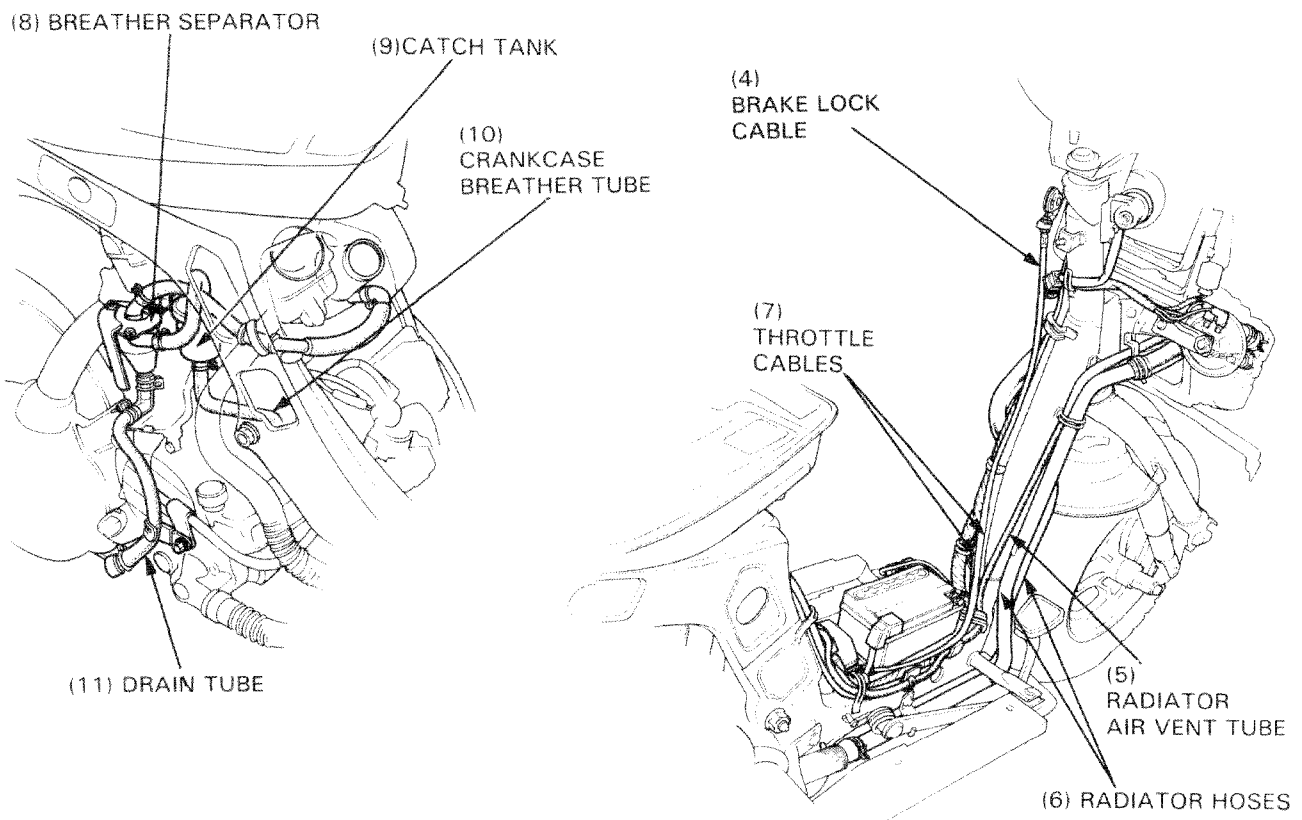
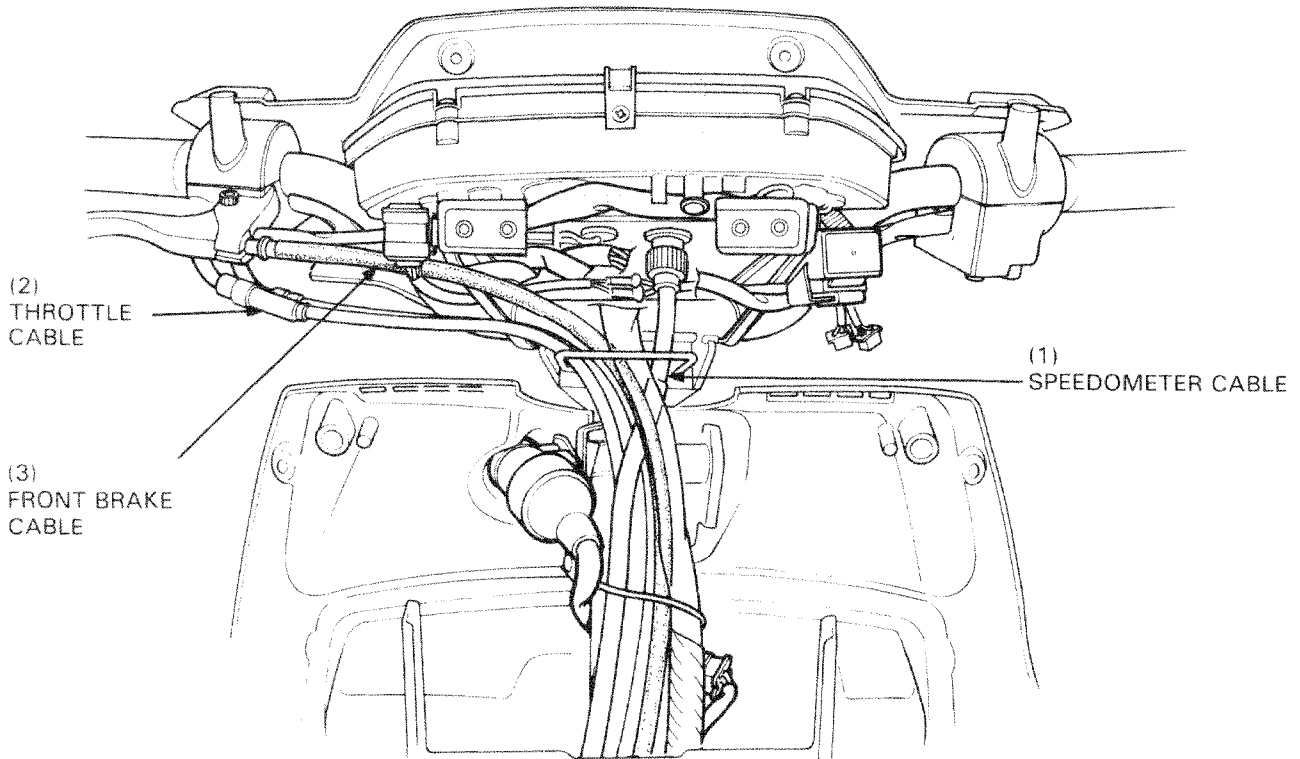


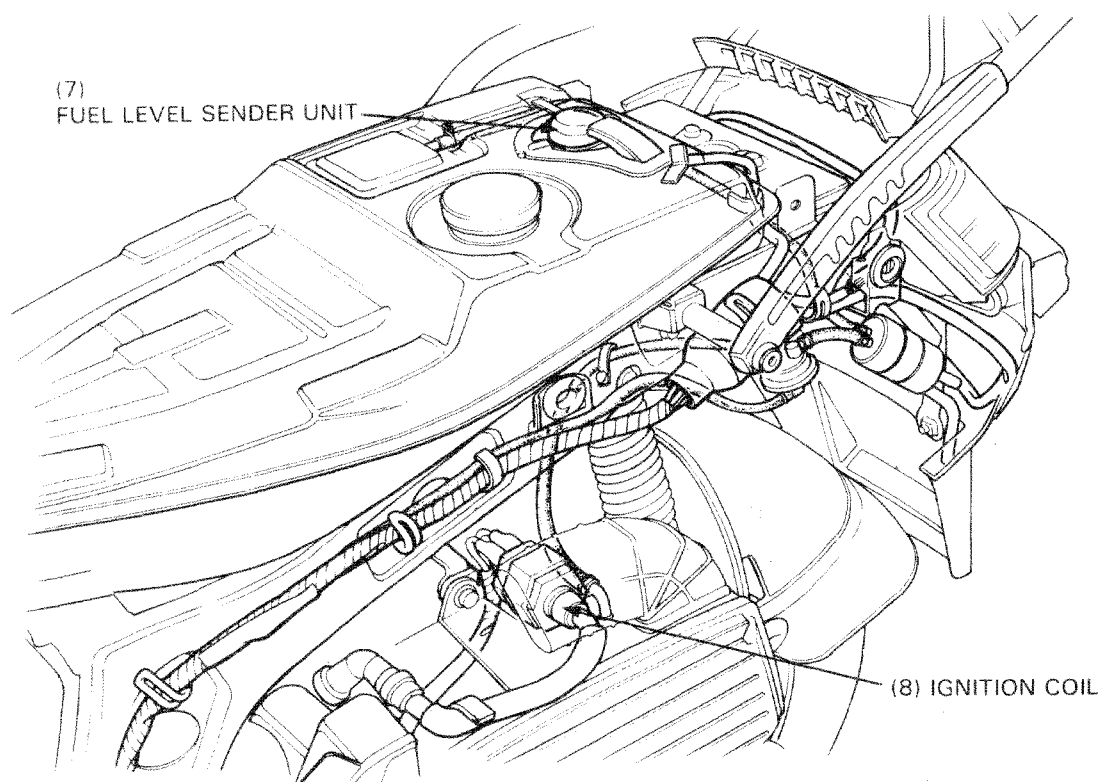
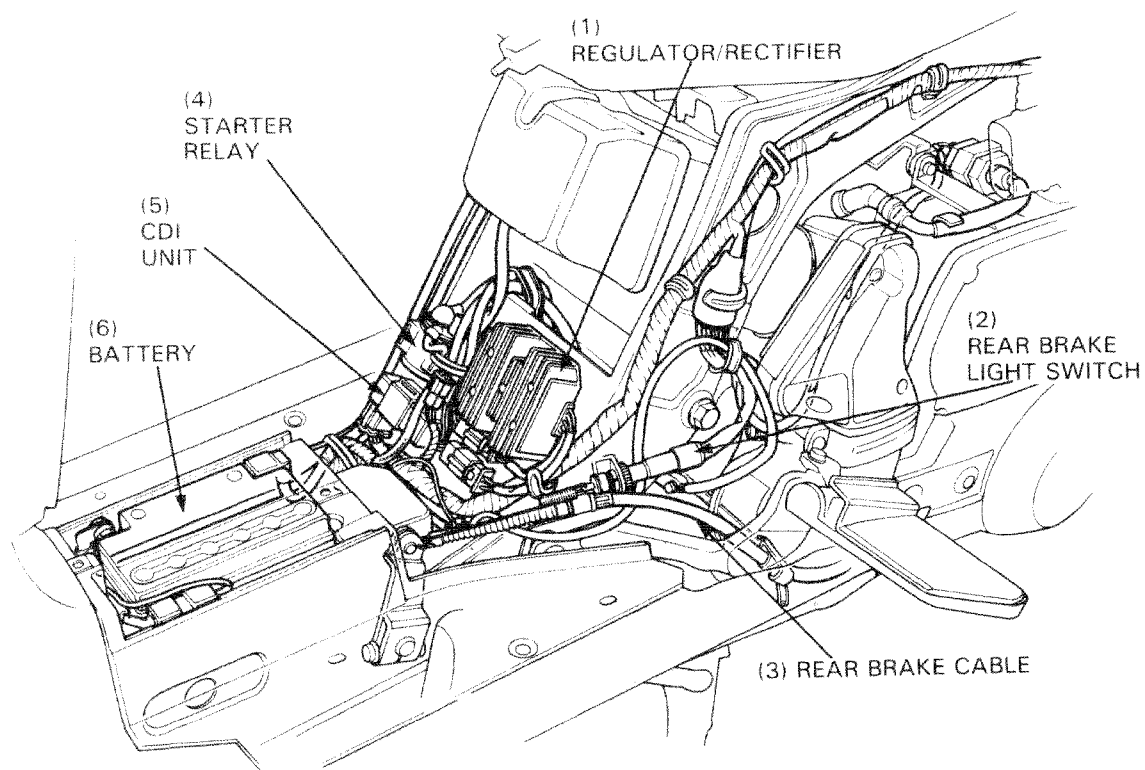




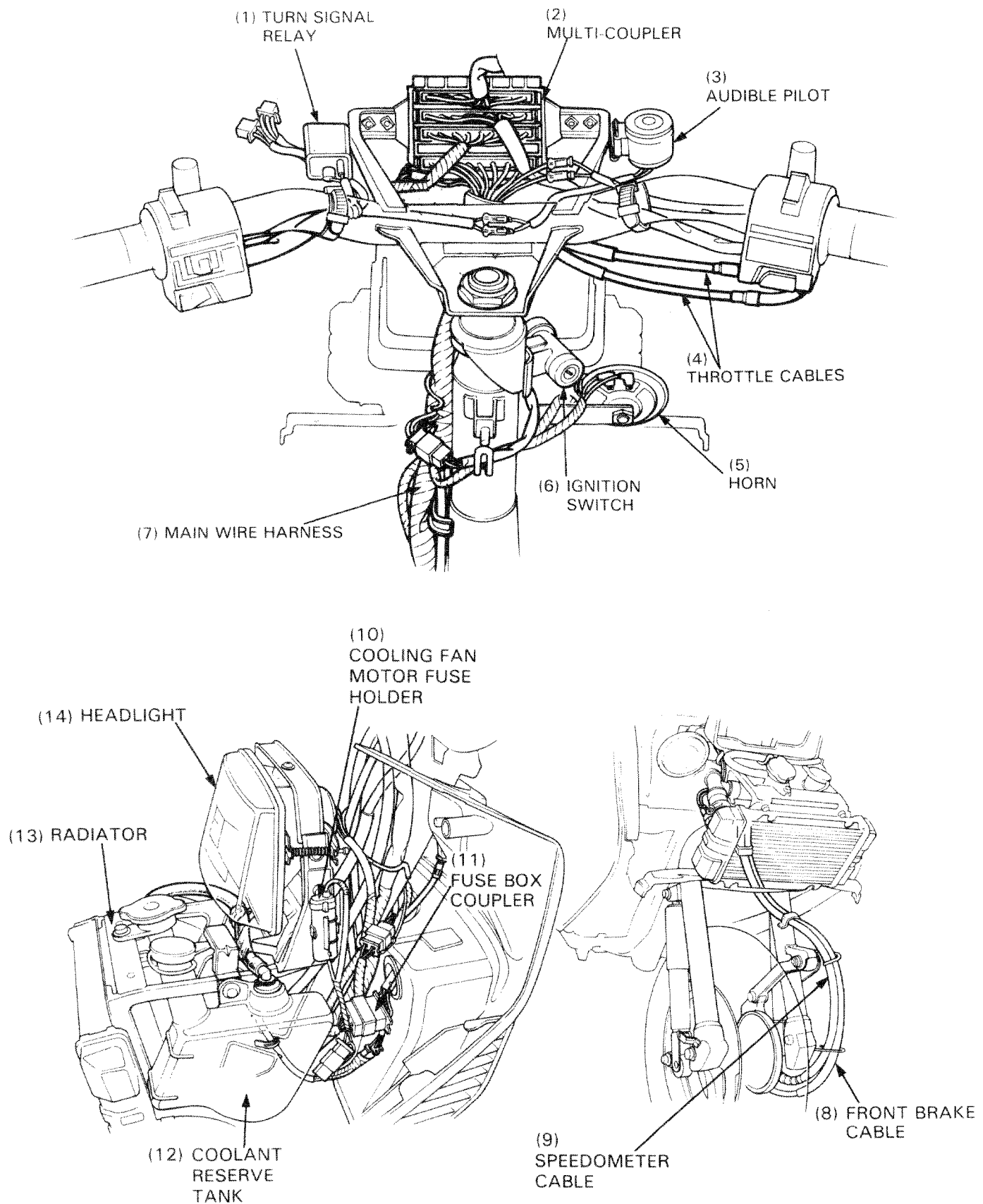
## GENERAL INFORMATION

After '85:





## GENERAL INFORMATION



## EMISSION CONTROL SYSTEMS

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

### SOURCE OF EMISSIONS

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

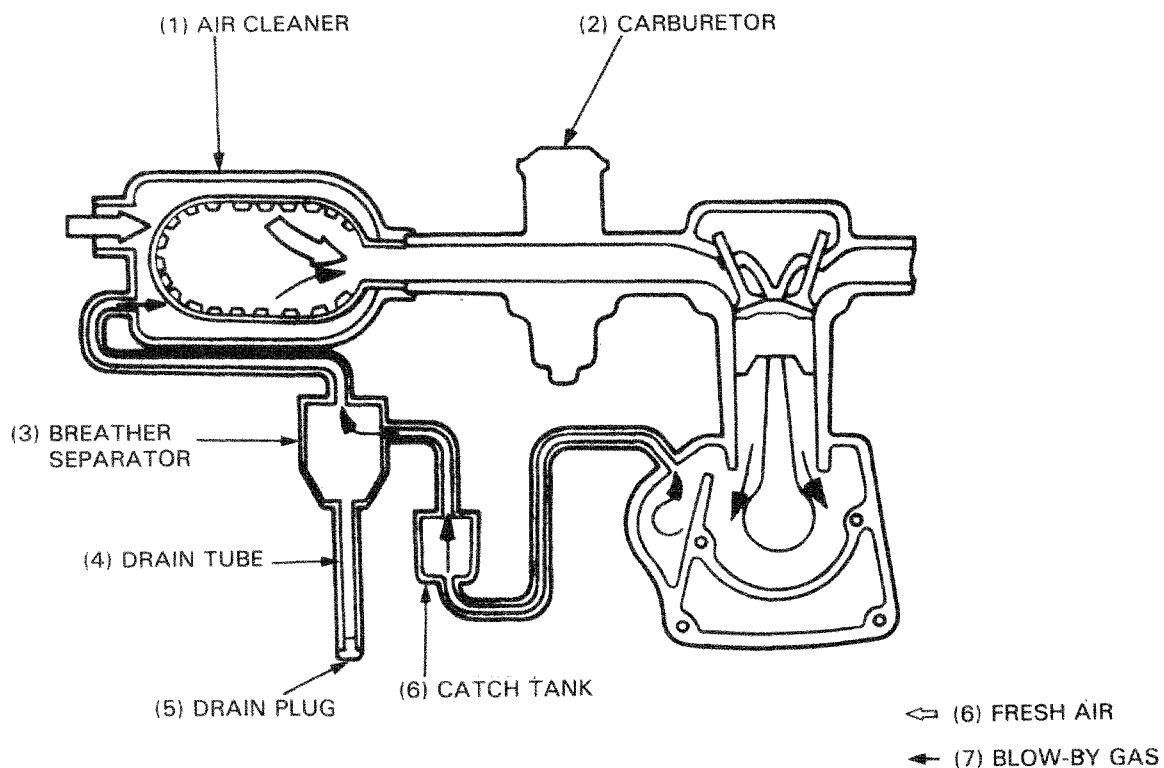
Honda Motor Co., Ltd. utilizes lean carburetor settings as well as other systems to reduce carbon monoxide and hydrocarbons.

### EXHAUST EMISSION CONTROL SYSTEM

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

### CRANKCASE EMISSION CONTROL SYSTEM

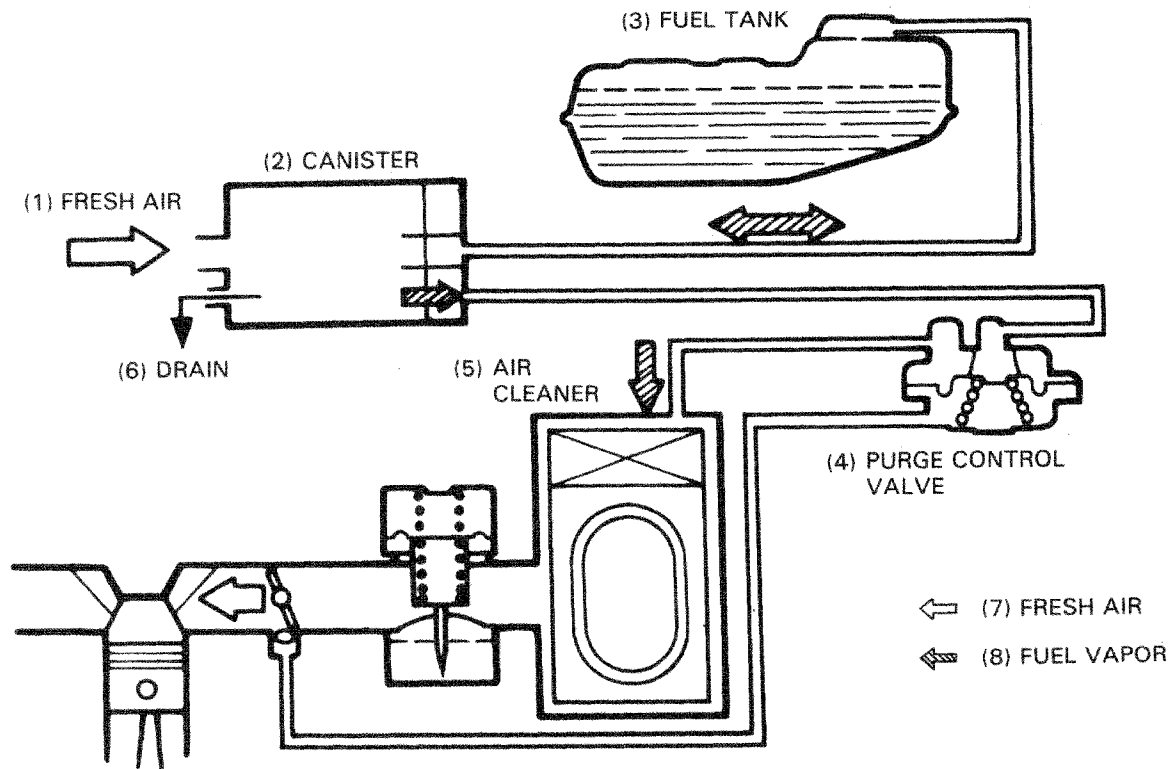
The engine is equipped with a closed crankcase system which routes crankcase emissions through the air cleaner and into the combustion chamber. Condensed crankcase vapors are accumulated in a storage tank which must be emptied periodically. See the Maintenance Schedule in section 3.



## GENERAL INFORMATION

### EVAPORATIVE EMISSION CONTROL SYSTEM (California model only)

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



### NOISE EMISSION CONTROL SYSTEM

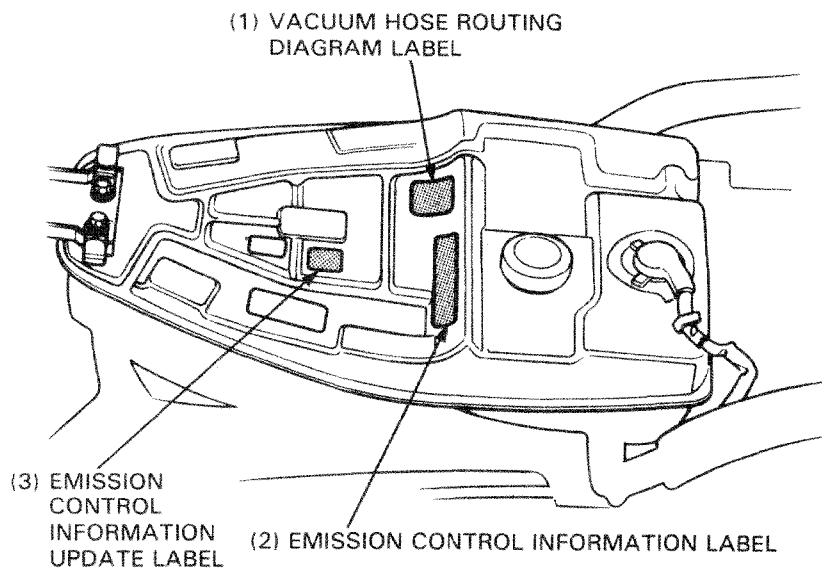
**TAMPERING WITH THE NOISE CONTROL SYSTEM IS PROHIBITED:** Federal law prohibits the following acts or the causing thereof: (1) The removal or rendering inoperative by any person, other than for purposes of maintenance, repair or replacement, of any device or element of design incorporated into any new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

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

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

## EMISSION CONTROL INFORMATION LABEL

An Emission Control Information Label is located on the fuel tank as shown. It contains basic tune-up specifications.



### EMISSION CONTROL INFORMATION UPDATE LABEL

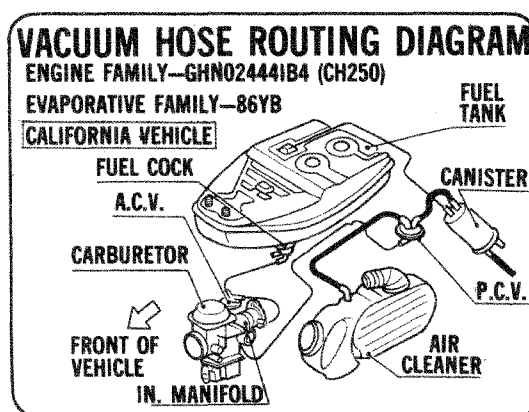
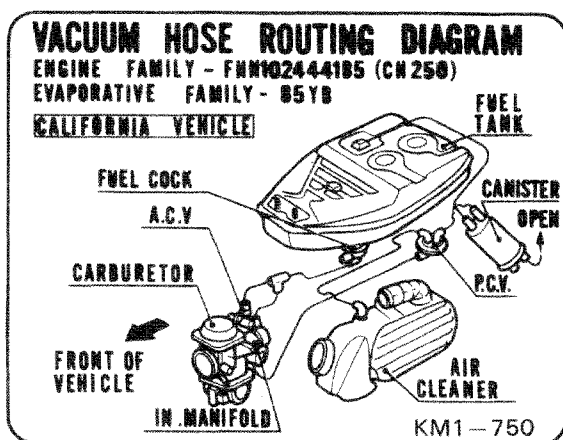
After making a high altitude carburetor adjustment (page 4-13), attach an update label on the fuel tank as shown. Instructions for obtaining the update label are given in Service Letter No. 132.

### VACUUM HOSE ROUTING DIAGRAM LABEL (California model only)

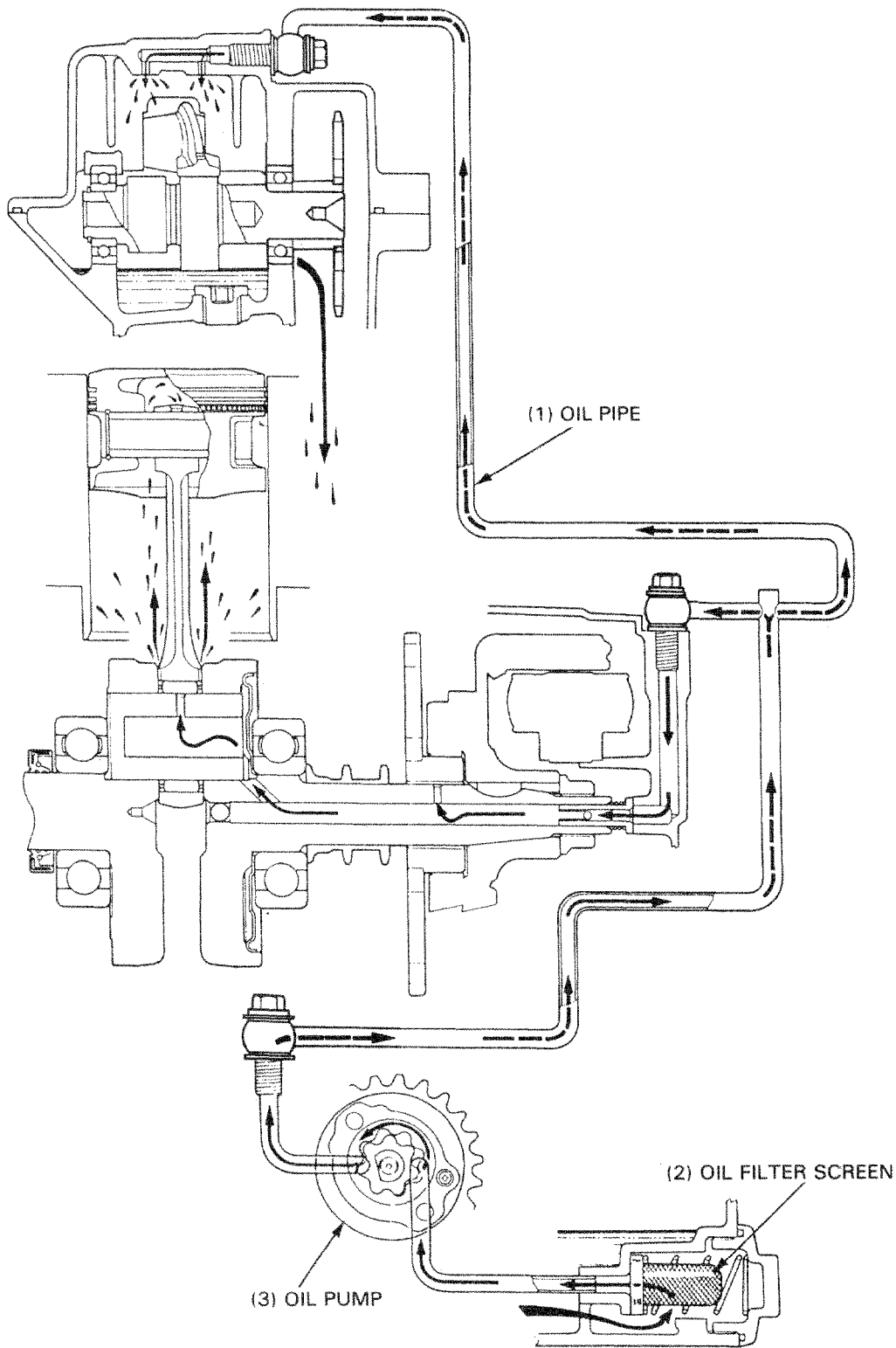
The Vacuum Hose Routing Diagram Label is attached to the fuel tank. Route the vacuum hoses as shown on this label.

'85:

After '85:







## 2. LUBRICATION

2

<b>SERVICE INFORMATION</b>	<b>2-1</b>	<b>OIL PUMP INSPECTION</b>	<b>2-4</b>
<b>TROUBLESHOOTING</b>	<b>2-1</b>	<b>OIL PUMP ASSEMBLY</b>	<b>2-4</b>
<b>ENGINE OIL</b>	<b>2-2</b>	<b>OIL PUMP INSTALLATION</b>	<b>2-5</b>
<b>ENGINE OIL FILTER SCREEN CLEANING</b>	<b>2-2</b>	<b>TRANSMISSION OIL</b>	<b>2-6</b>
<b>OIL PUMP REMOVAL</b>	<b>2-3</b>	<b>LUBRICATION POINTS</b>	<b>2-7</b>
<b>OIL PUMP DISASSEMBLY</b>	<b>2-3</b>		

### SERVICE INFORMATION

#### GENERAL

- This section covers maintenance of the oil pump and engine oil. This service can be done with the engine installed in the frame.
- When removing and installing the oil pump use care not to allow dust or dirt to enter the engine and oil line.
- When the oil pump clearances are not within specification, replace the oil pump as an assembly.

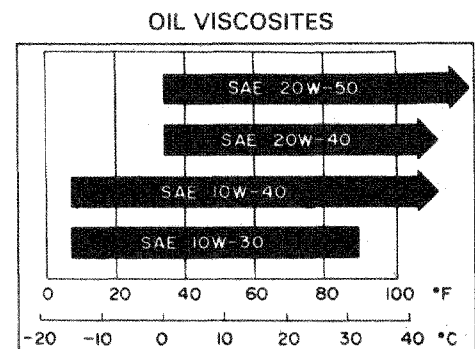
#### SPECIFICATIONS

Engine oil capacity 1.0 liter (1.06 US qt, 0.88 Imp qt) at disassembly  
0.8 liter (0.85 US qt, 0.70 Imp qt) at change

Transmission oil capacity 0.2 liter (0.21 US qt, 0.18 Imp qt) at disassembly  
0.15 liter (0.16 US qt, 0.13 Imp qt) at change

Recommended oil Use Honda 4-Stroke Oil or equivalent.  
API Service Classification: SE or SF  
VISCOSITY: SAE 10W-30

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



ITEM		STANDARD mm (in)	SERVICE LIMIT mm (in)
Oil pump	Rotor tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15—0.20 (0.006—0.008)	0.25 (0.010)
	Rotor end clearance	0.04—0.09 (0.002—0.004)	0.12 (0.005)

#### TORQUE VALUES

Oil filter screen cap 18—22 N·m (1.8—2.2 kg-m, 13—16 ft-lb)  
Transmission oil drain bolt 10—14 N·m (1.0—1.4 kg-m, 7—10 ft-lb)

### TROUBLESHOOTING

#### Oil level too low

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

#### Low oil pressure

- Oil level too low.
- Clogged oil filter, oil passage, and or oil pipe.
- Faulty oil pump.

#### Oil contamination

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

## LUBRICATION

### ENGINE OIL

#### OIL LEVEL

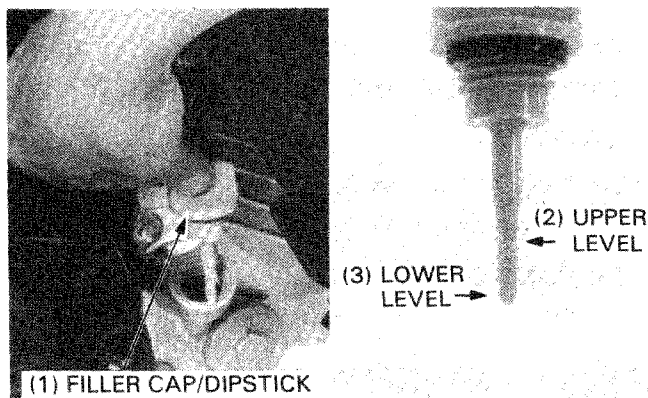
Warm up the engine.

Stop the engine and support the scooter upright on level ground.

Check the oil level with the filler cap/dipstick.

Do not screw in the dipstick when making this check.

If the level is near the lower level, fill to the upper level with the recommended engine oil.



#### OIL CHANGE

##### NOTE

- Drain the oil from the crankcase while the engine is warm. This ensures complete and rapid draining.

Place the oil pan under the engine.

Remove the oil filler cap/dipstick and oil filter screen cap and drain the engine oil.

After the oil has been completely drained, be sure the O-ring is in good condition and install the filter screen and cap.

**TORQUE: 10—35 N·m (1.0—3.5 kg·m, 7—25 ft·lb)**

Pour the recommended engine oil (page 2-1) through the oil filler hole.

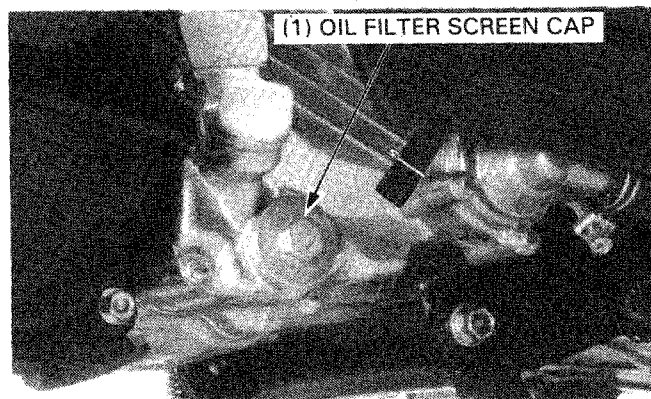
##### ENGINE OIL CAPACITY:

**0.8 liter (0.85 US qt, 0.70 Imp qt ) at change**

Reinstall the oil filler cap/dipstick and start the engine and let it idle for few minutes.

Recheck the oil level.

Check that there are no oil leaks.



### ENGINE OIL FILTER SCREEN CLEANING

Drain the engine oil.

Remove the spring and filter screen.

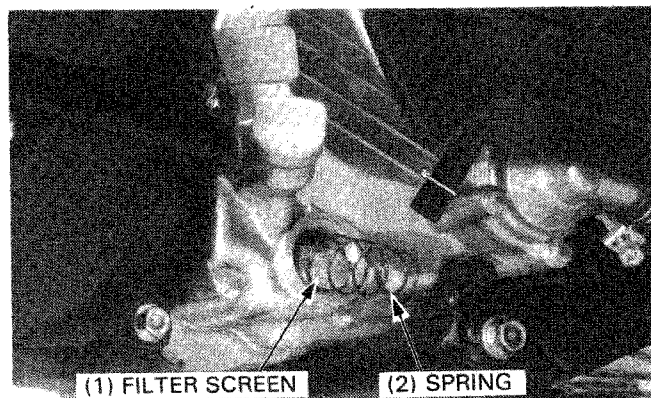
Clean the oil filter screen.

Make sure that the O-ring is good condition and install the filter screen and spring.

Install and tighten the oil filter screen cap.

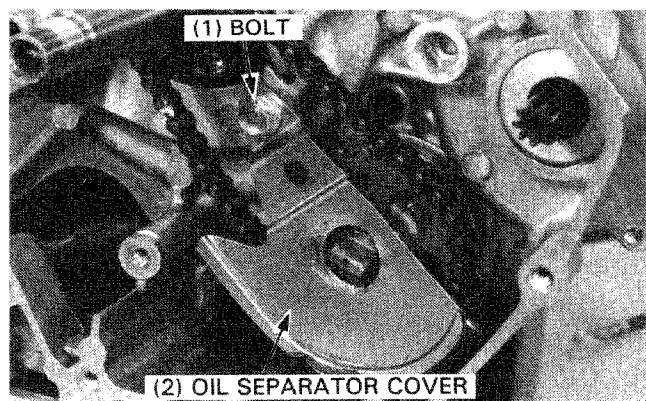
**TORQUE: 18—22 N·m (1.8—2.2 kg·m, 13—16 ft·lb)**

Pour the recommended engine oil (page 2-1) through the oil filler cap.

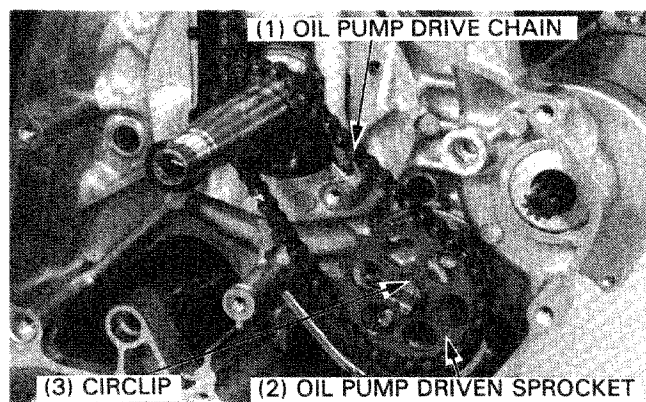


## OIL PUMP REMOVAL

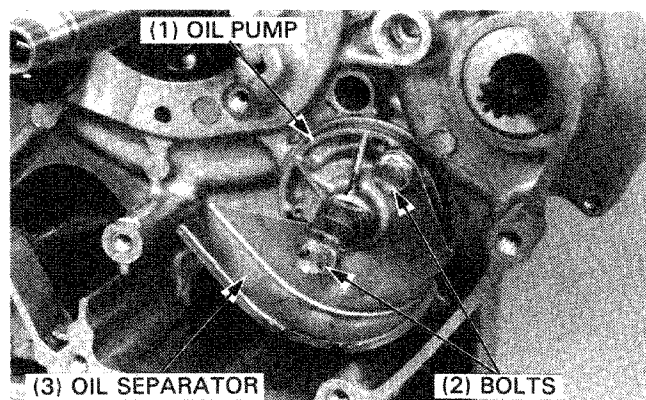
Remove the right crankcase cover (page 10-2).  
Remove the flywheel and starter idle and driven gears (page 10-3).  
Remove the attaching bolt and oil separator cover.



Remove the circlip and remove the oil pump drive chain and driven sprocket.

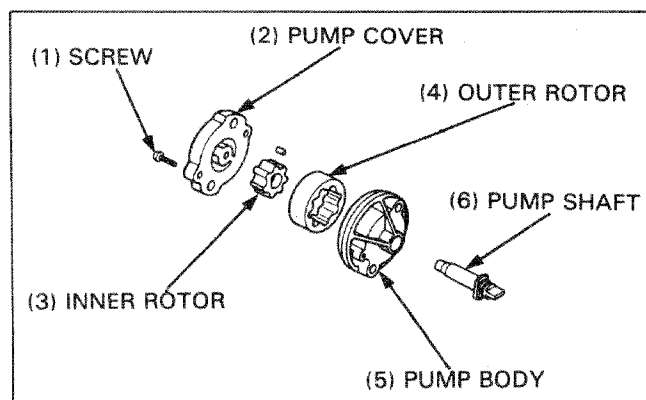


Remove the two oil pump mounting bolts, and remove the oil separator and oil pump.



## OIL PUMP DISASSEMBLY

Unscrew the pump cover attaching screw and disassemble the oil pump as shown.

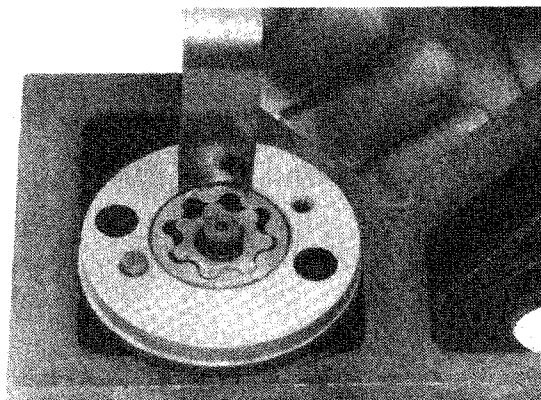


## LUBRICATION

### OIL PUMP INSPECTION

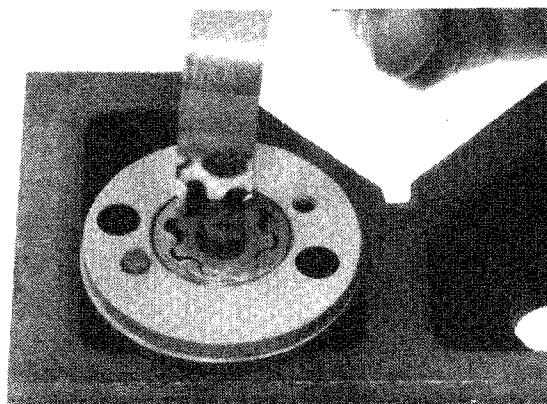
Measure the pump body-to-outer rotor clearance.

**SERVICE LIMIT: 0.25 mm (0.010 in)**



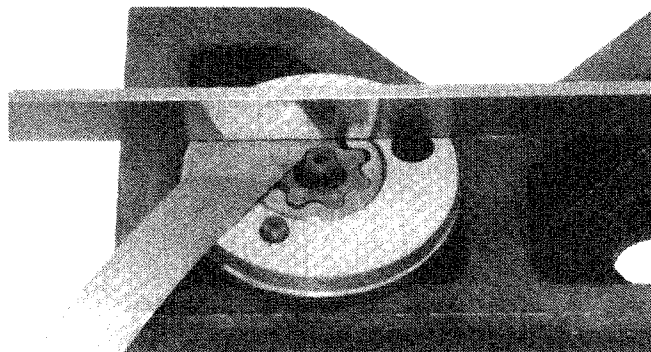
Measure the outer rotor-to-inner rotor tip clearance.

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



Check the rotor-to-pump body clearance.

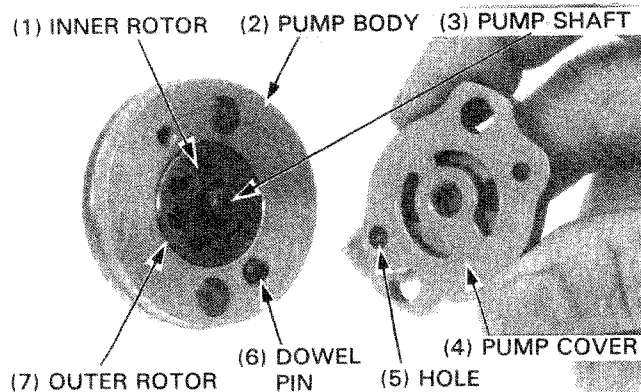
**SERVICE LIMIT: 0.12 mm (0.005 in)**



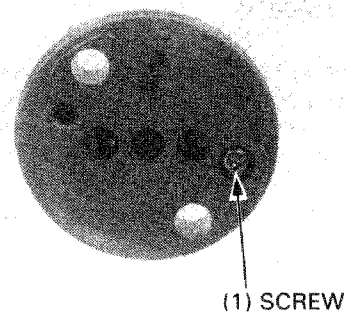
### OIL PUMP ASSEMBLY

Install the outer and inner rotor into the pump body.  
Insert the pump shaft by aligning the flat on the shaft with the flat in the inner rotor.  
Install the dowel pin.

Install the pump cover by aligning the hole of the cover with the dowel pin.

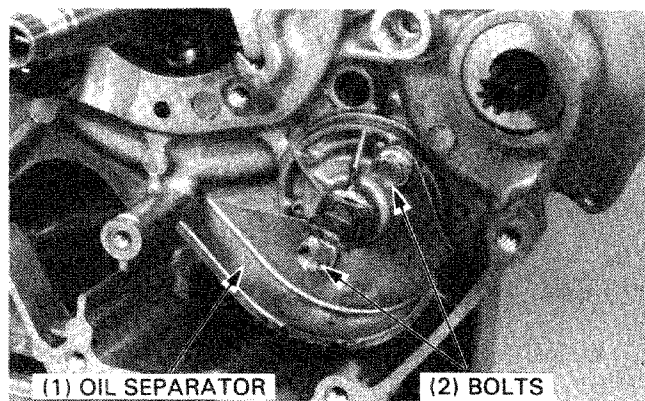


Tighten the screw.  
Make sure that the pump shaft rotates freely without binding.

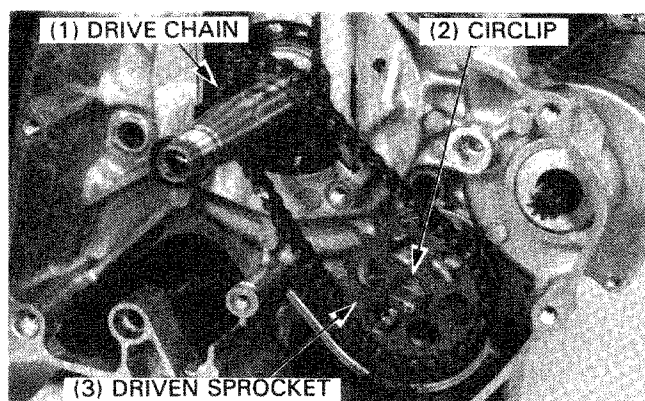


## OIL PUMP INSTALLATION

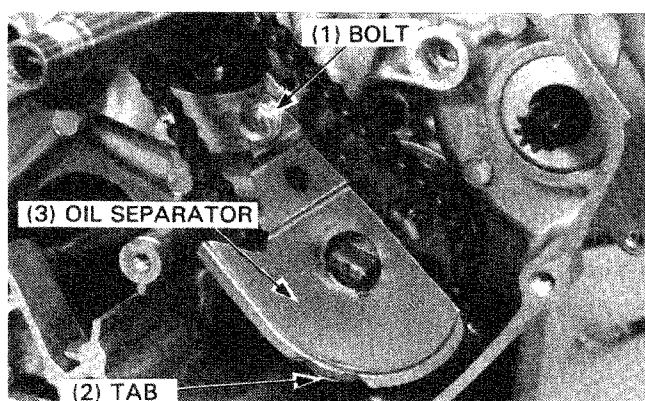
Install the oil pump and oil separator.  
Make sure that the pump shaft rotates freely.



Install the pump driven sprocket and drive chain, then set the circlip on the pump shaft securely.



Install the oil separator by fitting the tab of the separator into the slit of the separator.  
Install the starter gear and alternator (section 10).



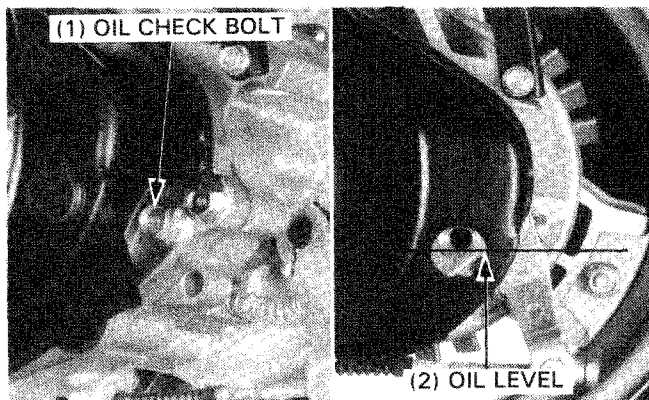


## LUBRICATION

### TRANSMISSION OIL

#### OIL LEVEL CHECK

Place the scooter on its center stand on level ground.  
Stop the engine and remove the transmission oil check bolt.  
The oil level should be at the oil check bolt hole.  
If the level is low, fill the final reduction with the recommended oil (page 2-1).  
Check that the sealing washer is in good condition and replace if necessary.  
Install the oil check bolt.



#### OIL CHANGE

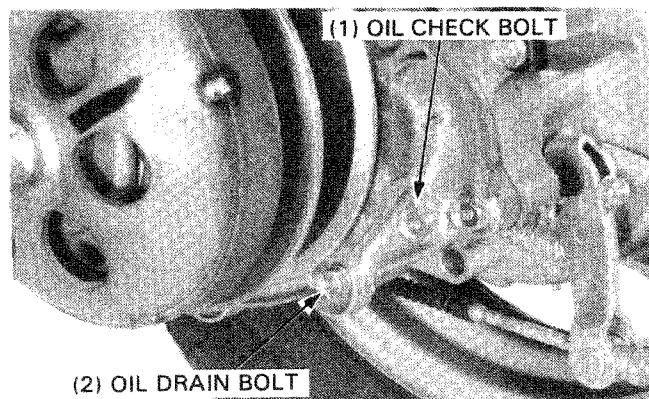
Remove the oil check bolt.  
Remove the oil drain bolt and drain the oil thoroughly.  
Reinstall the drain bolt.

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

Make sure that the drain bolt sealing washer is in good condition.  
Fill the final reduction with the recommended oil (page 2-1) through the oil check bolt hole up to the bolt hole.

**CAPACITY: 0.15 liter**  
(0.16 US qt, 0.13 Imp qt)

Make sure that the oil check bolt sealing washer is in good condition and reinstall the oil check bolt.  
Start the engine and test ride for 2–3 minutes.  
Stop the engine and make sure that the oil level is correct.  
Make sure that there are no oil leaks.



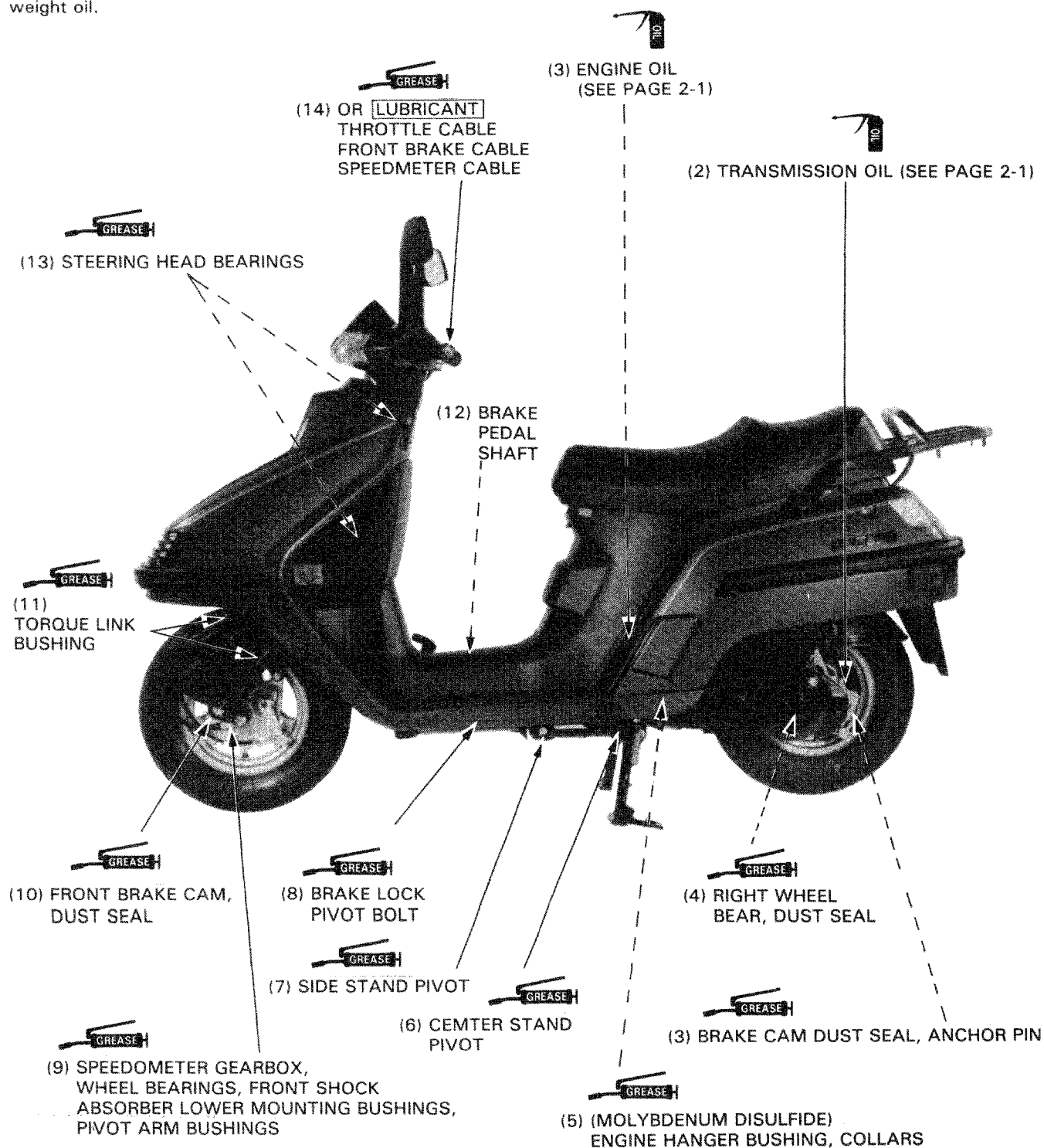


## LUBRICATION POINTS

Use general purpose grease when not specified here.  
Apply oil or grease to sliding surfaces not shown here.

### CONTROL CABLES

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



# 3. MAINTENANCE

3

SERVICE INFORMATION	3-1	EVAPORATIVE EMISSION CONTROL SYSTEM (California model only)	3-10
MAINTENANCE SCHEDULES	3-2	DRIVE BELT	3-10
FUEL LINES	3-4	BELT CASE AIR CLEANER	3-10
FUEL FILTER ('85 only)	3-4	BRAKE SHOE WEAR	3-11
THROTTLE OPERATION	3-4	BRAKE SYSTEM	3-11
AIR CLEANER	3-5	BRAKE LOCK LEVER	3-12
CRANKCASE BREATHER	3-6	BRAKE LIGHT SWITCH/ STARTER LIMITER SWITCH	3-12
SPARK PLUG	3-6	HEADLIGHT ADJUSTMENT	3-13
VALVE CLEARANCE	3-7	CLUTCH SHOE WEAR	3-13
RADIATOR COOLANT	3-8	SIDE STAND	3-13
RADIATOR CORE	3-8	SUSPENSION	3-14
COOLING SYSTEM HOSES AND CONNECTIONS	3-8	NUTS, BOLTS, FASTENERS	3-14
CARBURETOR IDLE SPEED	3-8	WHEELS/TIRES	3-14
IGNITION TIMING	3-9	STEERING HEAD BEARINGS	3-15
CYLINDER COMPRESSION	3-9		

## SERVICE INFORMATION

### GENERAL

Engine oil	See page 2-2
Oil filter screen	See page 2-2
Transmission oil	See page 2-6

### SPECIFICATIONS

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

Standard		For cold climate (below 5°C, 41°F)		For extended high speed riding	
NGK	ND	NGK	ND	NGK	ND
DPR6EA-9	X20EPR-U9	DPR5EA-9	X16EPR-U9	DPR7EA-9	X22EPR-U9

Spark plug gap	0.8—0.9 mm (0.031—0.035 in)
Valve clearance	0.08—0.12 mm (0.003—0.005 in)
Idle speed	1,500 ± 100 rpm
Ignition timing	12° BTDC ("F" mark) at 1,500 ± 100 rpm 27° BTDC (Advance mark) at 6,700 ± 100 rpm
Compression pressure	1,300 ± 200 kpa (13 ± 2 kg/cm <sup>2</sup> , 184 ± 28 psi)
Front brake lever free play	10—20 mm (3/8—3/4 in)
Rear brake pedal free play	20—30 mm (3/4—1-1/8 in)
Tire pressures	

	Front	Rear
Driver only	175 kpa (1.75 kg/cm, 24 psi)	200 kpa (2.00 kg/cm, 28 psi)
Driver and one passenger	175 kpa (1.75 kg/cm, 24 psi)	250 kpa (2.50 kg/cm, 36 psi)

## MAINTENANCE

### MAINTENANCE SCHEDULES

'85:

Perform the Pre-ride Inspection in the Owner's Manual at each scheduled maintenance period.

I : INSPECT AND CLEAN, ADJUST, LUBRICATE, OR REPLACE IF NECESSARY.

C : CLEAN

A : ADJUST

R : REPLACE

L : LUBRICATE

ITEM	FREQUENCY	WHICHEVER COMES FIRST ↓	ODOMETER READING (NOTE 4)				Refer to page
			600 mi (1,000 km)	4,000 mi (6,400 km)	8,000 mi (12,800 km)	12,000 mi (19,200 km)	
EMISSION RELATED ITEMS	* FUEL LINES		I	I	I		3-4
	* FUEL FILTER				R		3-4
	* THROTTLE OPERATION		I	I	I		3-4
	AIR CLEANER	NOTE 1			R		3-5
	CRANKCASE BREATHER	NOTE 2	C	C	C		3-6
	SPARK PLUG		R	R	R		3-6
	* VALVE CLEARANCE		A	A	A	A	3-7
	ENGINE OIL	YEAR	R	Replace every 1,250 mi (2,000 km)			2-2
	ENGINE OIL FILTER SCREEN			Clean every 1,250 mi (2,000 km)			2-2
	RADIATOR COOLANT			I	Replace every 16,000 mi (25,600 km)		3-8
	* RADIATOR CORE			I			3-8
	* COOLING SYSTEM HOSES & CONNECTIONS			I			3-8
	* CARBURETOR-IDLE SPEED		I	I	I	I	3-8
	* EVAPORATIVE EMISSION CONTROL SYSTEM	NOTE 3			I		3-10
NON-EMISSION RELATED ITEMS	* TRANSMISSION OIL	2 YEARS R*					2-6
	* DRIVE BELT	NOTE 5		I	R		3-10
	BELT CASE AIR CLEANER		C	C	C		3-10
	BRAKE SHOE		I	I	I		3-11
	BRAKE SYSTEM		I	I	I	I	3-11
	* BRAKE LOCK LEVER		I	I	I	I	3-12
	* BRAKE LIGHT SWITCH		I	I	I	I	3-12
	* STARTER LIMITER SWITCH		I	I	I	I	3-12
	* HEADLIGHT AIM		I	I	I	I	3-13
	** CLUTCH SHOE WEAR		I	I	I	I	3-13
	SIDE STAND		I	I	I	I	3-13
	* SUSPENSION		I	I	I	I	3-14
	* NUTS, BOLTS, FASTENERS		I	I	I	I	3-14
	** WHEELS/TIRES		I	I	I	I	3-14
	** STEERING HEAD BEARINGS		I	I	I	I	3-15

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

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

NOTES 1. Service more frequently when riding in dusty areas.

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

3. California type only.

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

5. Inspect every 8,000 mi (12,800 km) after replacement.

After '85:

Perform the Pre-ride Inspection in the Owner's Manual at each scheduled maintenance period.

I : INSPECT AND CLEAN, ADJUST, LUBRICATE, OR REPLACE IF NECESSARY.

C : CLEAN

A : ADJUST

R : REPLACE

L : LUBRICATE

ITEM	FREQUENCY	WHICHEVER COMES FIRST ↓	ODOMETER READING (NOTE 4)								Refer to page
			EVERY	600 mi (1,000 km)	4,000 mi (6,400 km)	8,000 mi (12,800 km)	12,000 mi (19,200 km)	16,000 mi (25,600 km)	20,000 mi (32,000 km)	24,000 mi (38,400 km)	
EMISSION RELATED ITEMS	* FUEL LINE				I		I		I		3-4
	* THROTTLE OPERATION				I		I		I		3-4
	AIR CLEANER	NOTE 1				R			R		3-5
	CRANKCASE BREATHER	NOTE 2		C	C	C	C	C	C		3-6
	SPARK PLUG			R	R	R	R	R	R		3-6
	* VALVE CLEARANCE		I	I	I	I	I	I	I		3-7
	ENGINE OIL		R	Replace Every 1,250 mi (2,000 km)							2-2
	* ENGINE OIL FILTER SCREEN				C		C		C		2-2
	* CARBURETOR IDLE SPEED		I	I	I	I	I	I	I		3-8
	* RADIATOR COOLANT	2 YEARS *R			I		I		I		3-8
NON-EMISSION RELATED ITEMS	COOLING SYSTEM				I		I		I		3-8
	* EVAPORATIVE EMISSION CONTROL SYSTEM	NOTE 3			I	I	I		I		3-10
	* TRANSMISSION OIL					R			R		2-6
	* DRIVE BELT				I	R	I	I	R		3-10
	BELT CASE AIR CLEANER	NOTE 1		C	C	C	C	C	C		3-10
	BRAKE SHOE WEAR			I	I	I	I	I	I		3-11
	BRAKE SYSTEM		I		I		I		I		3-11
	* BRAKE LOCK LEVER			I	I	I	I	I	I		3-12
	* BRAKE LIGHT SWITCH				I		I		I		3-12
	* STARTER LIMIT SWITCH			I	I	I	I	I	I		3-12
	* HEADLIGHT AIM				I		I		I		3-13
	** CLUTCH SHOE WEAR			I	I	I	I	I	I		3-13
	SIDE STAND				I		I		I		3-13
	* SUSPENSION				I		I		I		3-14
	* NUT, BOLT, FASTENER		I		I		I		I		3-14
	** WHEEL				I		I		I		3-14
	** STEERING HEAD BEARINGS		I		I		I		I		3-15

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

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

NOTE 1. Service more frequently when riding in dusty areas.

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

3. California type only.

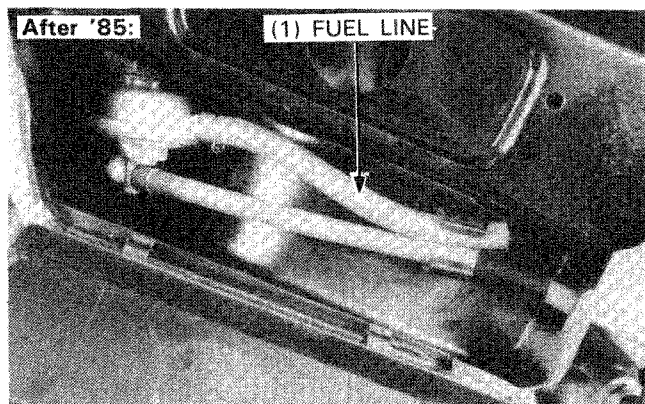
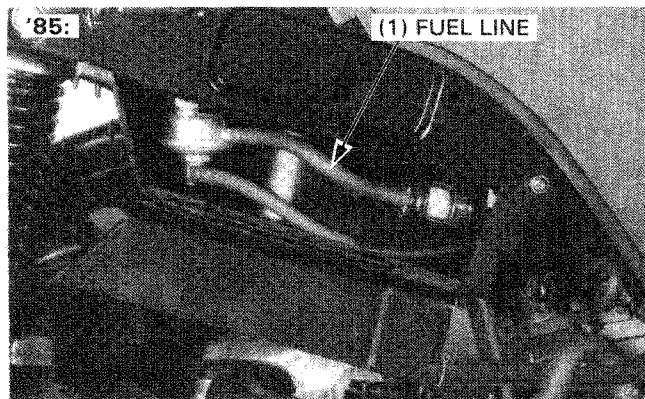
4. For higher odometer readings, repeat at the frequency interval established here.

## MAINTENANCE

### FUEL LINES

Remove the right rear cover (page 13-2).

Check the fuel lines and replace any parts which show signs of deterioration, damage or leakage.



### FUEL FILTER

'85 only:

#### WARNING

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

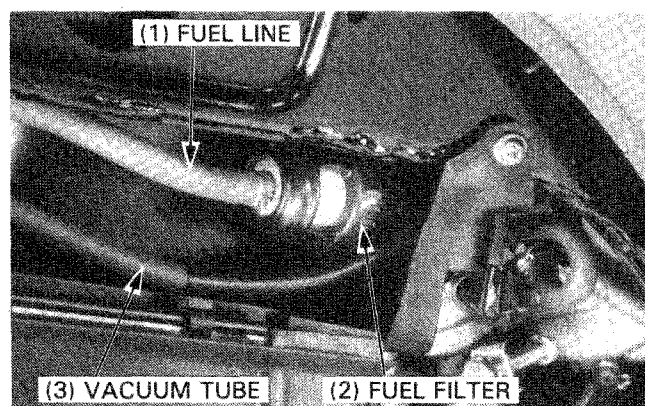
Replace the fuel filter with a new one when indicated by the maintenance schedule (page 3-2).

Remove the right rear cover (page 13-2).

Disconnect the fuel lines from the fuel filter and replace with a new one.

Install the fuel filter with the arrow in the normal direction of fuel flow.

After installing the fuel filter, check for fuel leaks.



### THROTTLE OPERATION

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

Check the throttle cable and replace it, if it is deteriorated, or damaged.

Lubricate the throttle cable (page 2-7), if throttle operation is not smooth.

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

**FREE PLAY : 2–6 mm (1/8–1/4 in)**



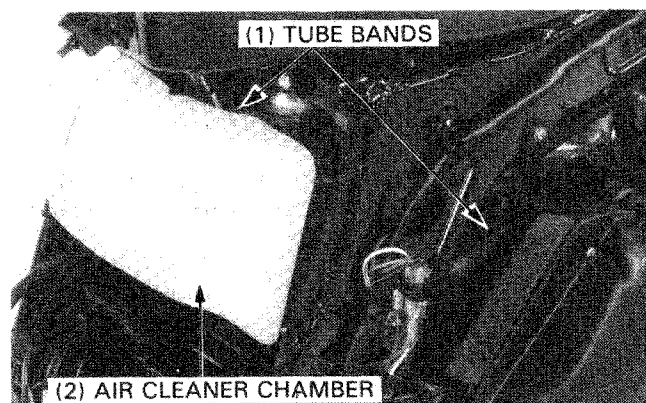


Adjustment can be made at either end of the throttle cable. Minor adjustments are made with the upper adjuster. Slide the rubber cover off and adjust by loosening the lock nut and turning the adjuster.



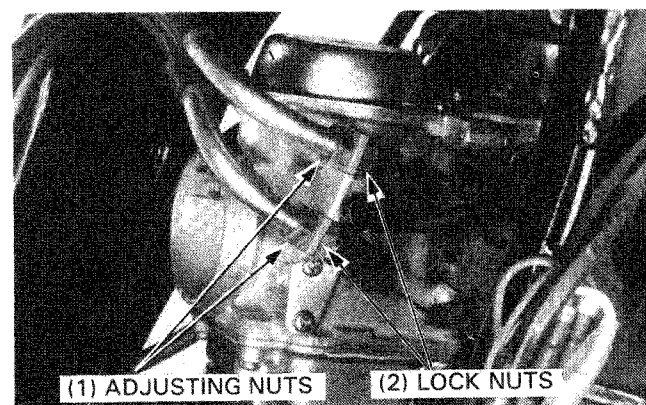
Major adjustments are made with the lower adjusting nuts. Remove the left rear cover and the body center cover (page 13-2).

Remove the air cleaner chamber by removing the tube bands.



Adjust the throttle cable by loosening the lock nuts and turning the adjusting nuts.

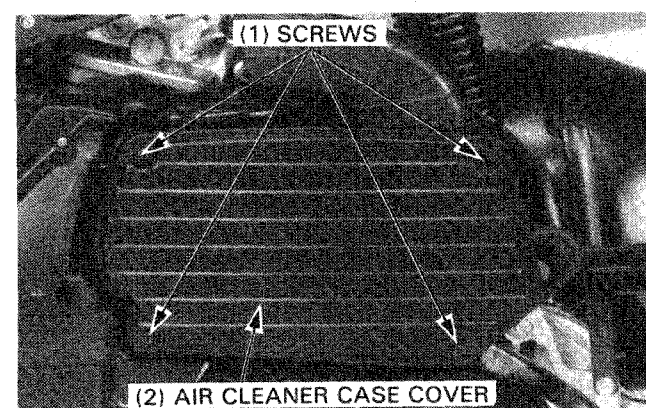
Tighten the lock nuts and recheck the throttle operation.



## AIR CLEANER

Remove the left rear cover (page 13-2).

Remove the four air cleaner case cover screws and the cover.



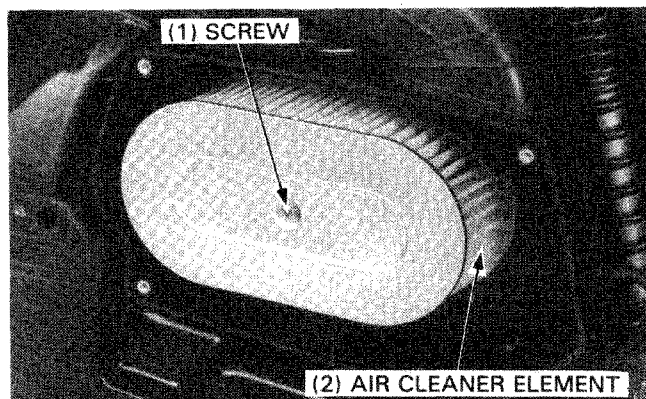
## MAINTENANCE

Remove the screw and air cleaner element and discard the element in accordance with the maintenance schedule. Also replace the element any time it becomes excessively dirty or damaged.

### NOTE

- The air cleaner element is of a viscous type paper element. Do not try to clean it.

Install the element, screw, air cleaner case cover and install the four screws.  
Install the left rear cover.

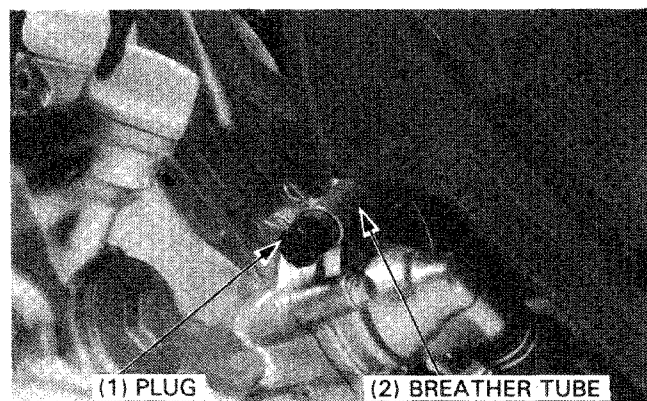


## CRANKCASE BREATHER

Remove the plug from the breather tube to drain any residue.

### NOTE

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



## SPARK PLUG

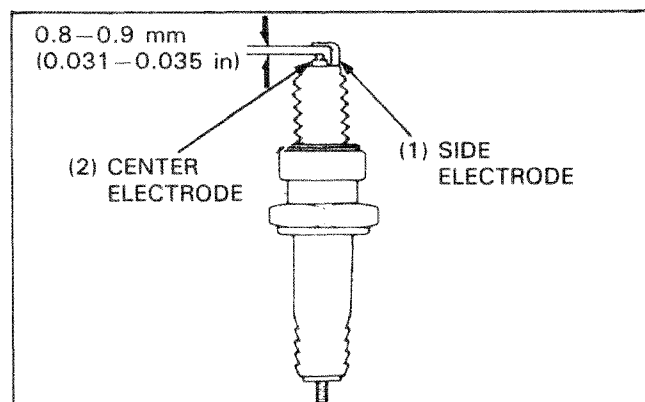
Remove the left rear cover (page 13-2).  
Disconnect the spark plug cap.  
Clean any dirt from around the spark plug base.  
Remove and discard the spark plug.  
Measure the new spark plug gap using a wire-type feeler gauge.

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

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

### SPECIFIED SPARK PLUGS:

	NGK	ND
Standard	DPR6EA-9	X20EPR-U9
For cold climate (below 5°C, 41°F)	DPR5EA-9	X16EPR-U9
For extended high speed riding	DPR7EA-9	X22EPR-U9





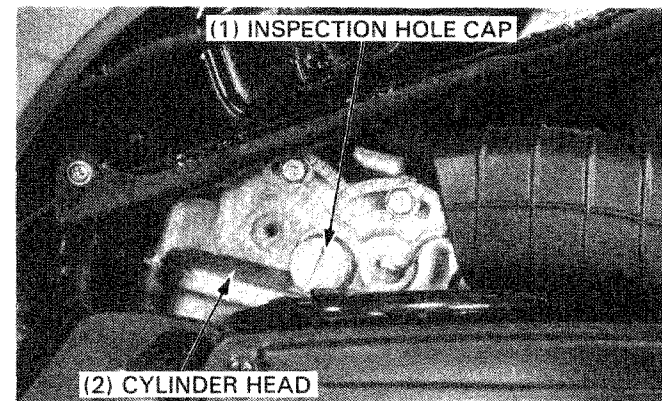
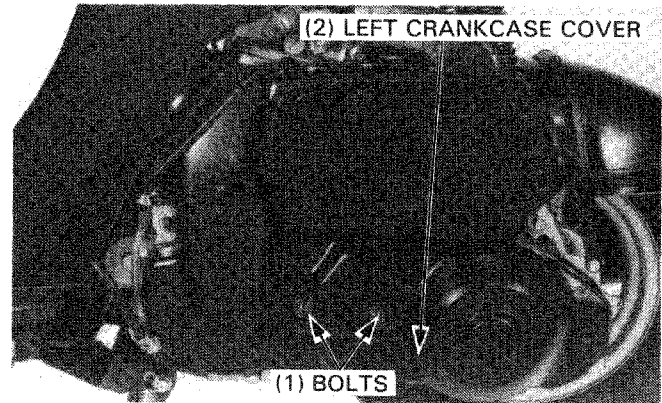
# VALVE CLEARANCE

## NOTE

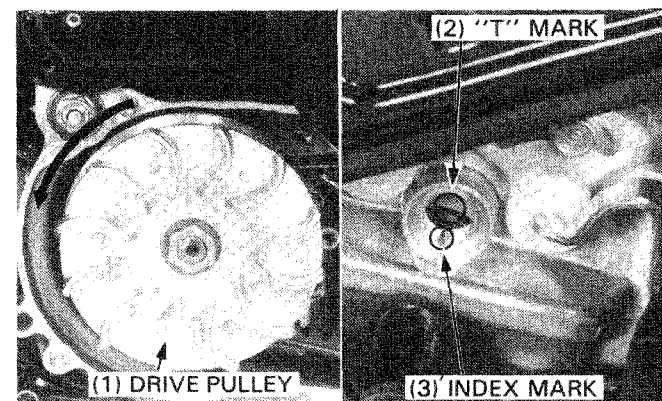
- Inspect and adjust valve clearance while the engine is cold (below 35°C/95°F).

Remove the left rear covers (page 13-2).  
Remove the frame left side rail. (page 13-3).  
Remove the left crankcase cover (page 8-3).

Remove the inspection hole cap from the left side of the cylinder head.



Remove the left crankcase cover (page 8-3).  
Rotate the drive pulley counterclockwise and align the "T" mark on the camshaft with the index mark on the cylinder head cover to bring the piston to TDC (Top Dead Center) on the compression stroke.

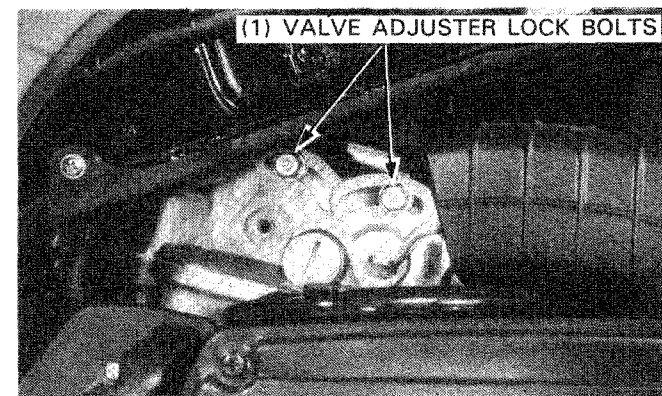


Loosen the valve adjuster lock bolts, which are located on the left side of the cylinder head.  
Move the intake and exhaust adjusters outward (away from each other) fully, until resistance is felt.  
Then move them inward (toward each other) one graduation.  
Tighten the lock bolts.

## NOTE

- One graduation on the adjusters equals 0.10 mm (0.004 in), which is the specified valve clearance.

Install the removed parts in the reverse order of removal.



## MAINTENANCE

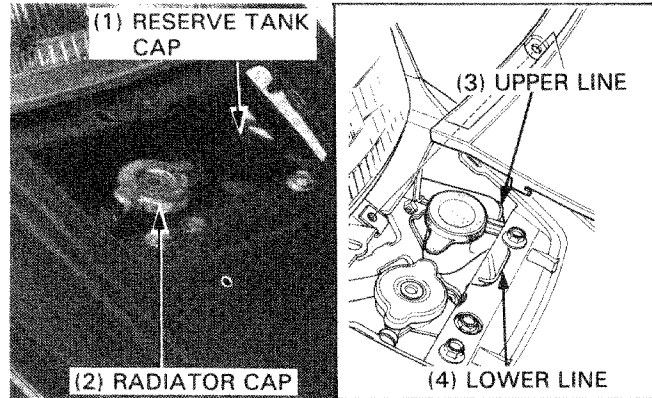
### RADIATOR COOLANT

Place the scooter on its center stand.  
Remove the front cover lid (page 12-2).  
Start the engine.

Check the radiator coolant level of the reserve tank with the engine running at normal operating temperature. The level should be between the "UPPER" and "LOWER" line with a 50/50 mixture of water and anti-freeze.

Reinstall the reserve tank cap.

Reinstall the front cover lid (page 12-3).



### RADIATOR CORE

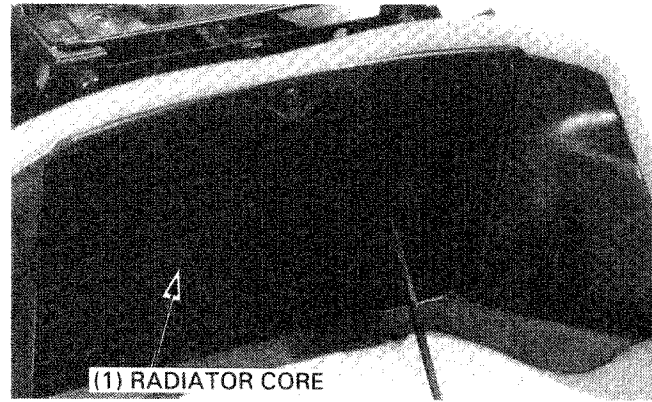
Remove the front upper cover (page 13-5).

Check the air passages for clogging or damage.

Straighten bent fins.

Remove any obstructions with compressed air or low water pressure.

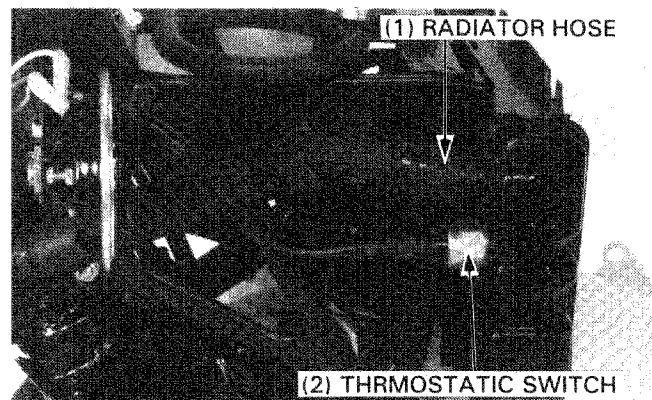
Replace the radiator if the air flow is restricted over more than 20% of the radiating surface.



### COOLING SYSTEM HOSES & CONNECTIONS

Inspect the hoses for cracks or deterioration, and replace if necessary.

Secure all hose clamps.



### CARBURETOR-IDLE SPEED

#### NOTE

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

#### '85:

Remove the body center cover (page 13-2).

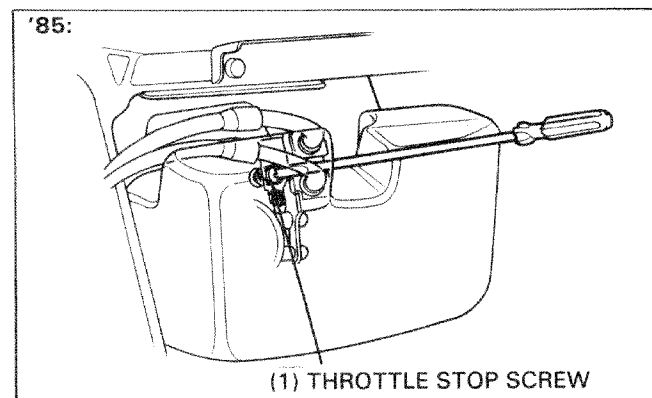
#### After '85:

Remove the adjustment hole cap from the body center cover.

Place the scooter on its center stand and warm up the engine.  
Connect a tachometer.

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

**IDLE SPEED: 1,500 ± 100 rpm**



## IGNITION TIMING

### NOTE

- The Capacitive Discharge Ignition system is factory pre-set and cannot be adjusted. Ignition timing inspection procedures are given to inspect the function of the CDI components.

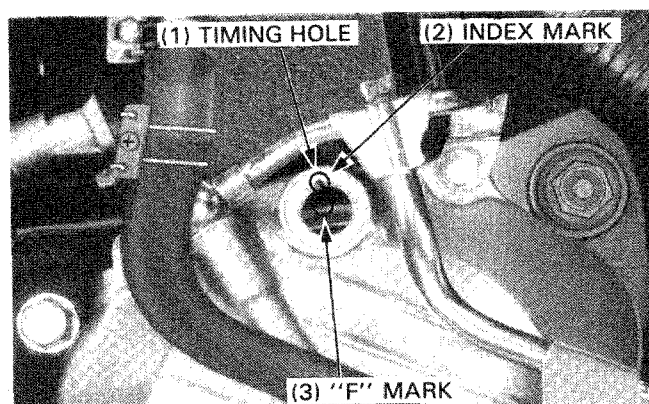
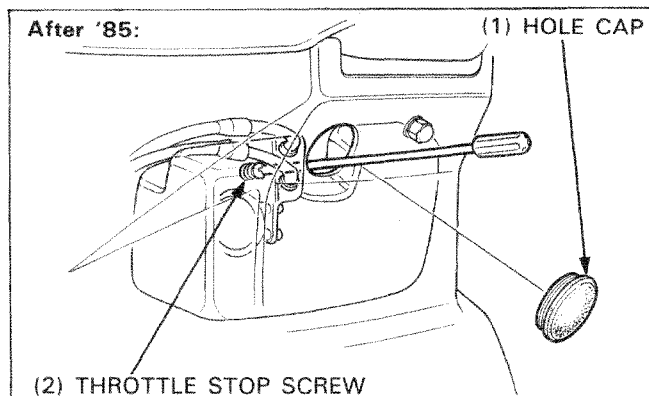
Remove the right rear cover (page 13-2).  
Remove the timing hole cap.

Connect a tachometer and timing light to the engine.  
Start the engine.

The ignition timing at idle is correct if the index notch aligns with the "F" mark at 1,500 rpm.

To check the advance, raise the engine speed to 7,000 rpm; the index notch should be between the advance marks.

If the ignition timing is incorrect, check the CDI unit, pulse rotor and pulse generator, and replace faulty parts. Refer to Section 16 Electrical Equipment.



## CYLINDER COMPRESSION

Remove the left rear cover (page 13-2).

Warm up the engine.

Stop the engine and remove the left rear cover. Disconnect the spark plug cap and remove the spark plug.

Insert the compression gauge.

Open the throttle fully and crank the engine.

### NOTE

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

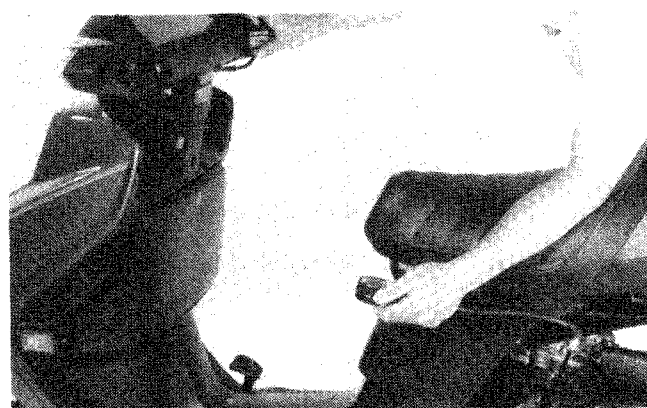
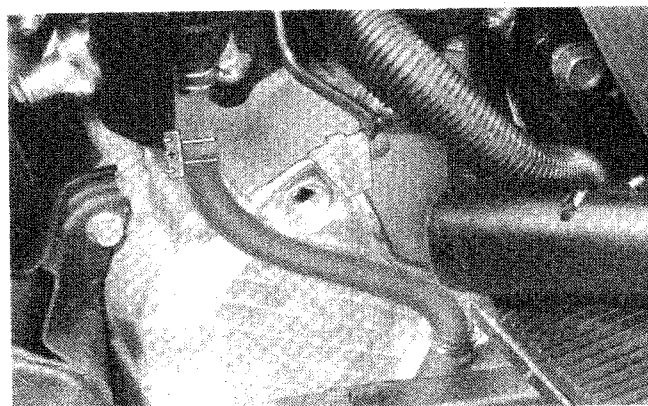
### COMPRESSION PRESSURE:

1,300 ± 200 kPa (13 ± 2 kg/cm<sup>2</sup>, 185 ± 28 psi)

If compression is low, check for the following:

- Improper valve clearance
- Leaky valves
- Leaking cylinder head gasket
- Worn piston/ring/cylinder

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

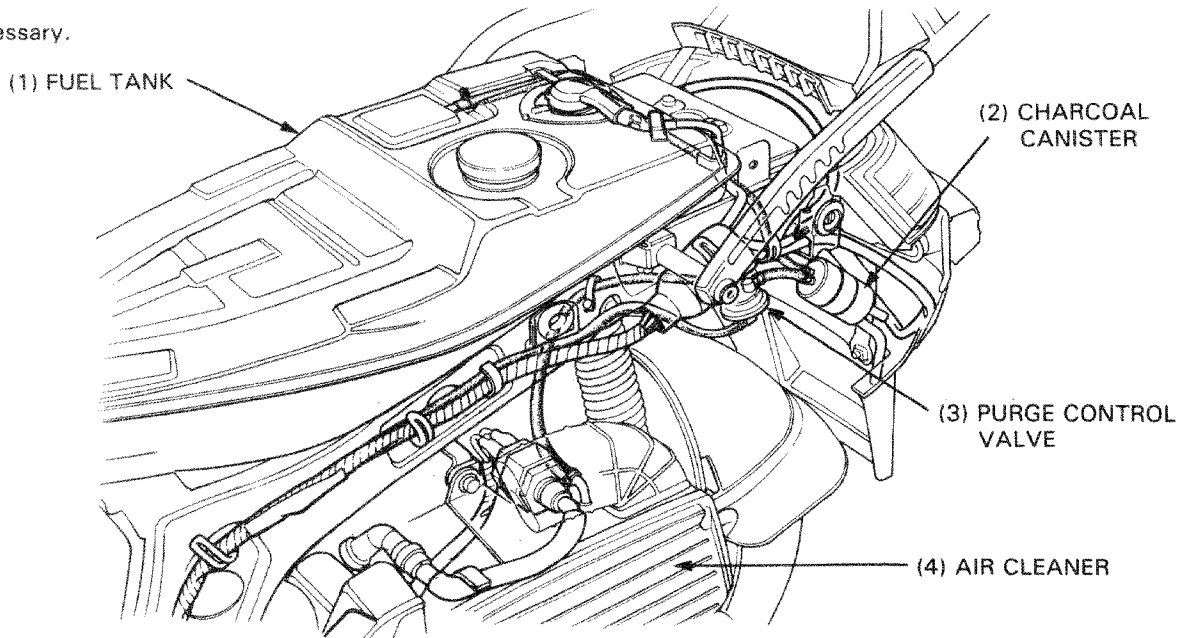


## EVAPORATIVE EMISSION CONTROL SYSTEM

(California model only)

Check the hoses between the breather separator, fuel tank, charcoal canister, and air cleaner for damage or loose connections.

Replace as necessary.

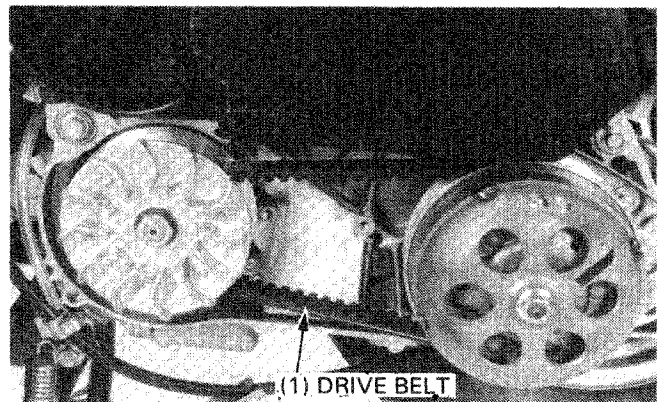


## DRIVE BELT

Remove the left side rail (page 13-3).

Remove the left crankcase cover (page 8-3).

Inspect the drive belt for cracks, abnormal, or excessive wear and replace the drive belt, if necessary.



## BELT CASE AIR CLEANER

Remove the following:

- the left rear cover (page 13-2).
- the element cover connecting tube band.
- the three element cover screws and element cover.

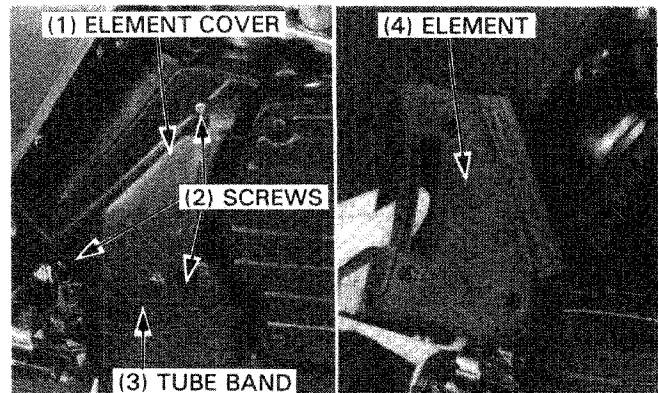
Remove the element from the cover and wash the element in non-flammable or high flash point solvent, squeeze out the solvent thoroughly, and let it dry.

### CAUTION

- *Do not oil the element.*  
*Dry the element completely before reinstalling it.*

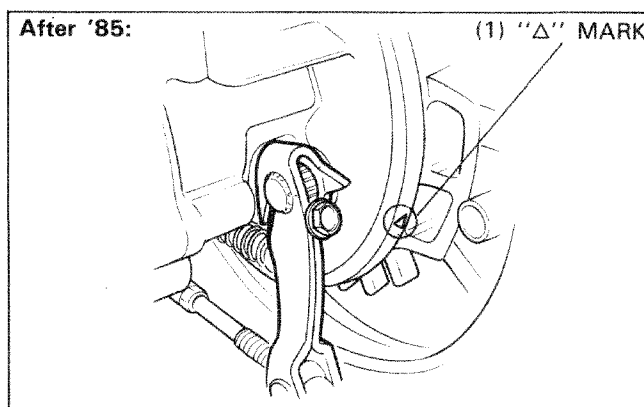
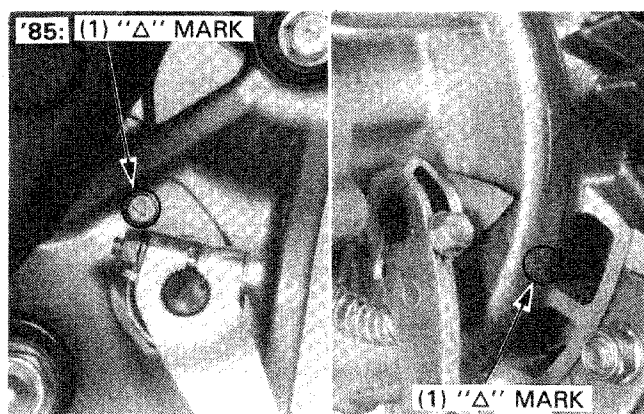
Install the following:

- the element to the cover.
- the element cover using the three screws.
- the left rear cover.



## BRAKE SHOE WEAR

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

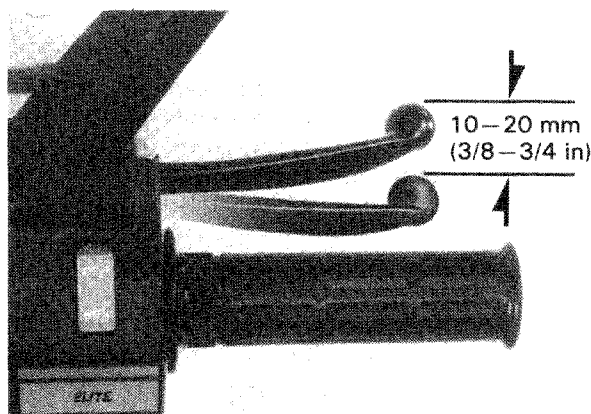


## BRAKE SYSTEM

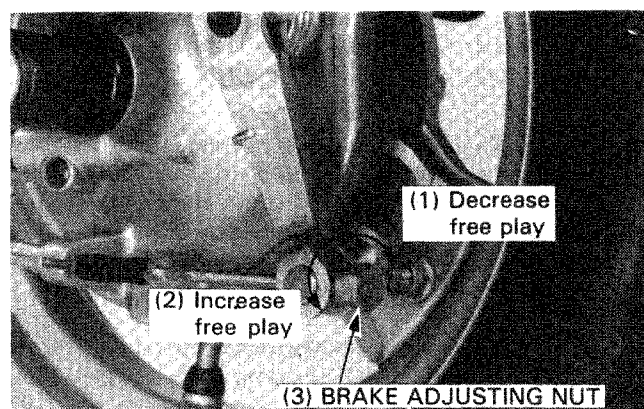
### FRONT BRAKE

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

**FREE PLAY : 10–20 mm (3/8–3/4 in)**



Adjust the front brake by turning the front brake adjusting nut.





## MAINTENANCE

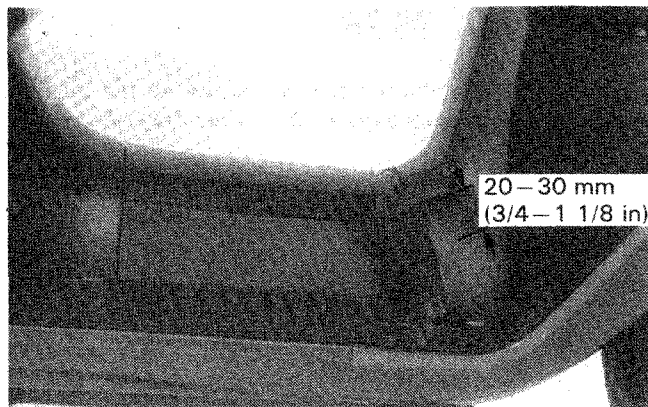
### REAR BRAKE

Measure the rear brake pedal free play at the top of the pedal.

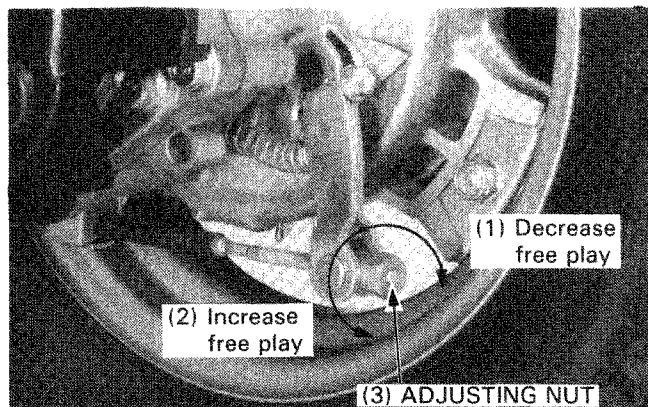
**FREE PLAY : 20–30 mm (3/4–1-1/8 in)**

#### NOTE

- Normal distance between the top of the brake pedal and the floor board is 30–40 mm (1-1/8–1-1/2 in) with the pedal depressed.



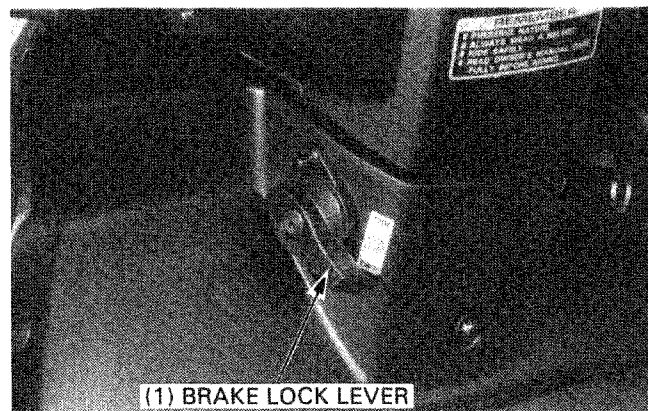
Adjust the rear brake by turning the rear brake adjusting nut.



### BRAKE LOCK LEVER

Check the brake lock lever for smooth operation.

If the lock lever does not return smoothly when released, remove the brake lock cover and apply grease to the brake lock pin, sliding surface of the cam and brake lock cam pivot. Refer to page 15-8 for brake lock adjustment.



### BRAKE LIGHT SWITCH/ STARTER LIMITER SWITCH

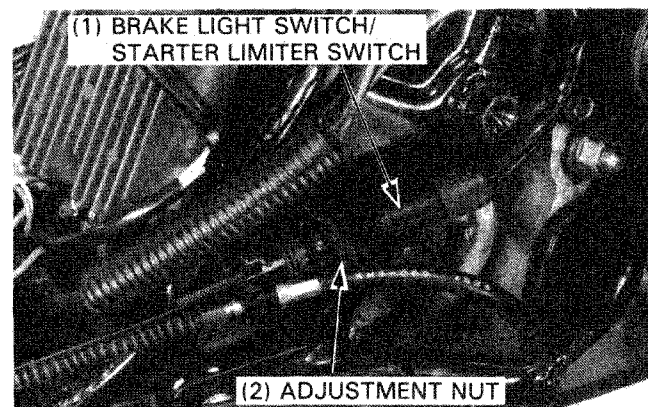
#### NOTE

- Perform the brake light switch adjustment after adjusting the brake pedal play.

Adjust the brake light/starter limiter switch as follows.

- Depress the brake pedal about 45–50 mm (13/4–2.0 in).
- Move the adjustment nut so that the starter will engage at that point.
- The rear brake adjustment should be such that the rear wheel is locked when the starter engages.

After adjustment, check the brake switch operation. The brake light should come on when depressing the brake pedal 5–20 mm (0.2–0.8 in).

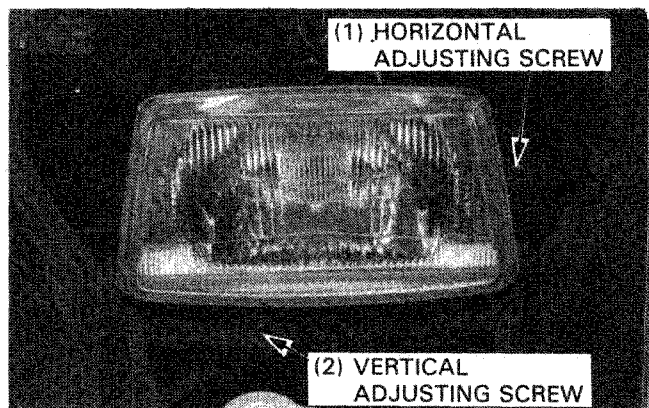


## HEADLIGHT ADJUSTMENT

Adjust horizontally by turning the horizontal adjusting screw. Adjust vertically by turning the vertical adjusting screw.

### NOTE

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



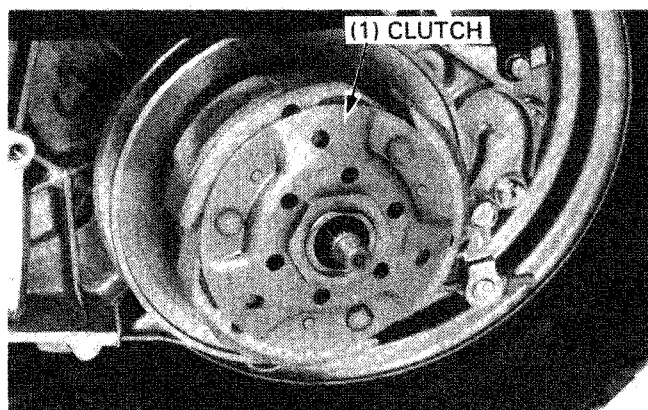
### WARNING

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

## CLUTCH SHOE WEAR

Start the engine and check the clutch operation by bringing up the engine speed gradually.

If the scooter tends to creep, or the engine stalls, check the clutch shoes for wear and replace if necessary (page 8-9).

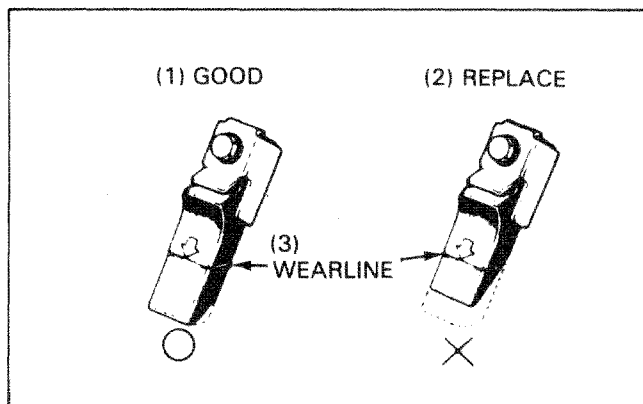


## SIDE STAND

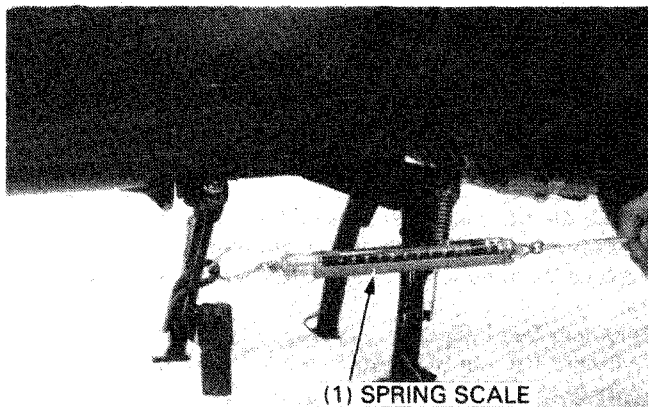
Place the scooter on its center stand.

Check the rubber pad for deterioration and wear.

Replace the rubber pad if wear extends to the wear line.



Check the side stand spring for damage and loss of tension, and side stand assembly for freedom of movement. Measure the amount of force required to retract the side stand. It should be within 2–3 kg (4.5–6.5 lb).



## MAINTENANCE

# SUSPENSION

### WARNING

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

### FRONT

Check the action of the front fork/shocks by compressing them several times.

Check the entire fork assembly for damage.

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

### REAR

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

Check the entire shock absorber assembly for damage.

Replace damaged components which cannot be repaired.

Place the scooter on its center stand.

Move the rear wheel sideways with force to see if the engine hanger bushings are worn.

Replace the hanger bushings if there is any looseness.

Tighten all rear suspension nuts and bolts.

## NUTS, BOLTS, FASTENERS

Check that all chassis nuts and bolts are tightened to their correct torque values (section 1) at the intervals shown in the Maintenance Schedule (page 3-2).

Check all cotter pins, safety clips, hose clamps and cable stays.

## WHEELS/TIRES

### NOTE

- Tire pressure should be checked when tires are COLD.

Check the tires for cuts or imbedded objects.

### RECOMMENDED TIRE AND PRESSURE

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

		FRONT	REAR
Tire size		4.00-10-4PR	4.00-10-4PR
Cold tire pressure kPa (kg cm <sup>2</sup> , psi)	Driver only	175 (1.75, 24)	200 (2.00, 28)
	Driver and one passenger	175 (1.75, 24)	250 (2.50, 36)

Check the front and rear wheels for trueness.

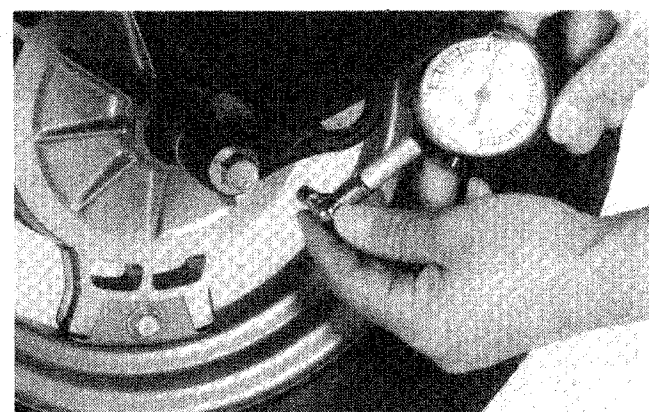
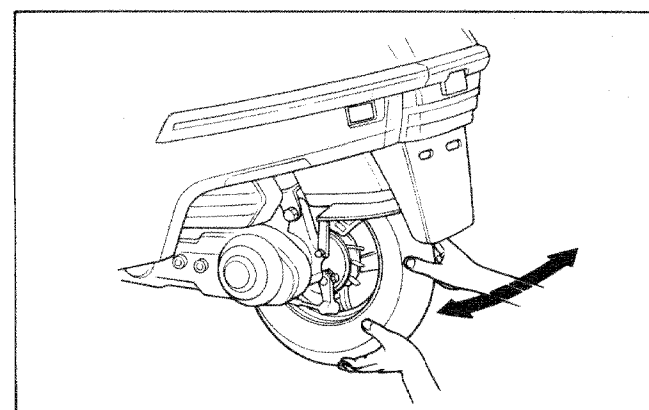
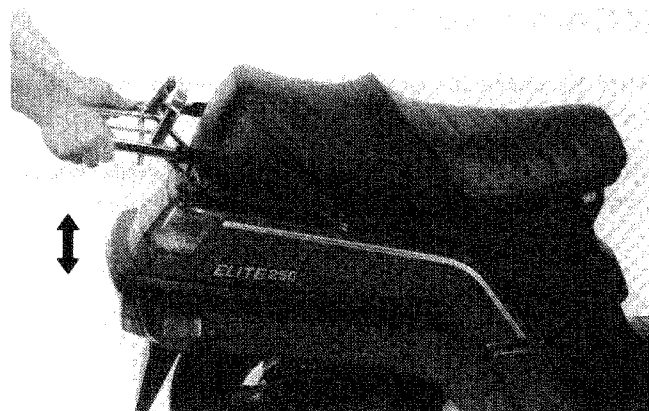
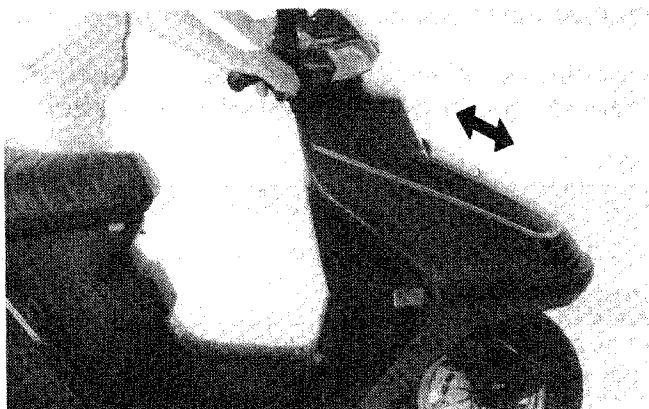
Measure the tread depth at the center of the tires.

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

**Minimum tread depth:**

Front: 1.5 mm (0.06 in)

Rear: 2.0 mm (0.08 in).





## STEERING HEAD BEARINGS

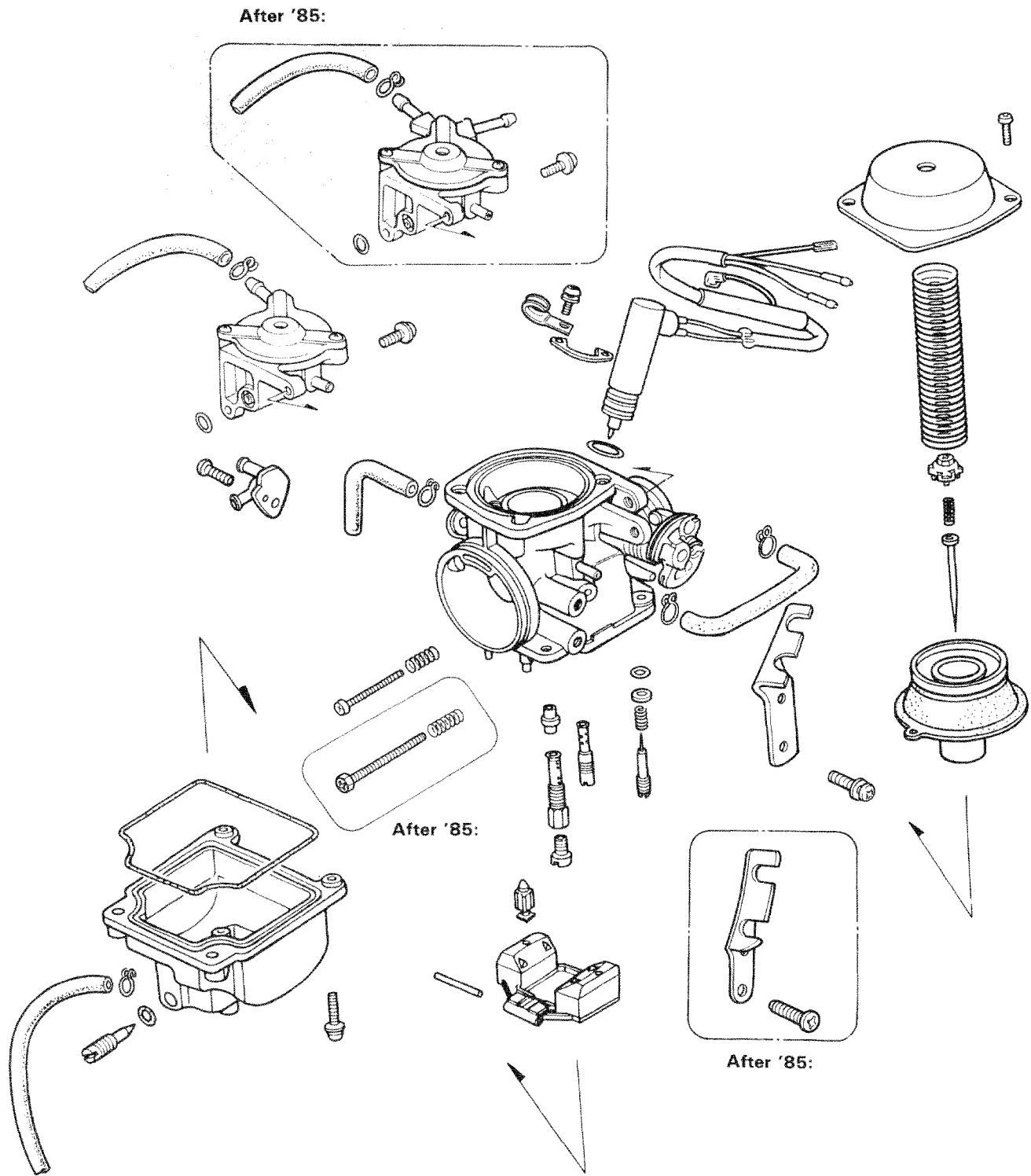
### NOTE

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

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

If the handlebar moves unevenly, binds, or has vertical movement, adjust the steering head bearing (page 14-19).





# 4. FUEL SYSTEM

4

SERVICE INFORMATION	4-1	CARBURETOR INSTALLATION	4-11
TROUBLESHOOTING	4-2	PILOT SCREW ADJUSTMENT	4-12
CARBURETOR REMOVAL	4-3	LIMITER CAP INSTALLATION	4-12
AUTO-BYSTARTER	4-4	HIGH ALTITUDE ADJUSTMENT	4-13
VACUUM CHAMBER	4-5	AUTOMATIC FUEL VALVE	4-14
AIR CUT-OFF VALVE	4-7	FUEL TANK	4-15
PILOT SCREW	4-8	AIR CLEANER CASE	4-18
FLOAT/FLOAT LEVEL/JETS	4-9	PURGE CONTROL VALVE INSPECTION (CALIFORNIA MODEL)	4-19
FLOAT LEVEL INSPECTION	4-10		

## SERVICE INFORMATION

### GENERAL

#### CAUTION

- Do not bent or twist control cables. Damaged control cables will not operate smoothly and may stick or bind.

#### WARNING

- Gasoline is extremely flammable and is explosive under certain conditions. Work in a well ventilated area. Do not smoke or allow flames or sparks in the work area.

- For access to the float chamber to drain fuel, remove the carburetor maintenance lid on the body center cover.
- When disassembling the fuel system parts, note the location of the O-rings. Replace them with new ones on reassembly.
- Before disassembling the carburetor drain the fuel in the float chamber by turning the drain screw.
- Do not try to disassemble the auto bystarter.

### SPECIFICATIONS

ITEM	49 state model	California model
Identification number	'85: VE06A After'85: VE06D	'85: VE13A After'85: VE13B
Venturi diameter	26.8 mm (1.06 in)	26.8 mm (1.06 in)
Float level	18.5 ± 1.0 mm (0.73 ± 0.04 in)	18.5 ± 1.0 mm (0.73 ± 0.04 in)
Main jet	'85: # 115 After'85: # 112	'85: # 115 After'85: # 112
Slow jet	# 38	# 38
Idle speed	1500 ± 100 rpm	1500 ± 100 rpm
Pilot screw opening (initial)	Refer to page 4-12	
Throttle grip free play	2—6 mm (1/8—1/4 in)	2—6 mm (1/8—1/4 in)

### TOOL

#### Special

Vacuum/pressure pump	A937X—041—XXXXX
or	
Vacuum pump	ST—AH—260—MC7 (U.S.A. only)
Pressure pump	ST—AH—255—MC7 (U.S.A. only)
Pilot screw wrench	07908—4730000

#### Common

Float level gauge	07401—0010000
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## FUEL SYSTEM

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### TROUBLESHOOTING

#### Engine cranks but won't start

- No fuel in tank
- No fuel to carburetor
- Engine flooded with fuel
- No spark at plug (faulty ignition system)
- Clogged air cleaner
- Intake air leak
- Improper auto bystarter operation
- Improper throttle operation

#### Hard starting or stalling after starting

- Improper auto bystarter operation
- Ignition malfunction
- Faulty carburetor
- Contaminated fuel
- Intake air leak
- Incorrect idle speed

#### Rough idle

- Faulty ignition system
- Incorrect idle speed
- Faulty carburetor
- Contaminated fuel

#### Misfiring during acceleration

- Faulty ignition system

#### Backfiring

- Faulty ignition system
- Faulty carburetor

#### Poor performance (drivability) and poor fuel economy

- Clogged fuel system
- Faulty ignition system

#### Lean mixture

- Clogged fuel jets
- Stuck vacuum piston
- Faulty float valve
- Low float level
- Blocked fuel cap vent
- Clogged fuel strainer screen
- Restricted fuel line
- Clogged air vent tube
- Intake air leak

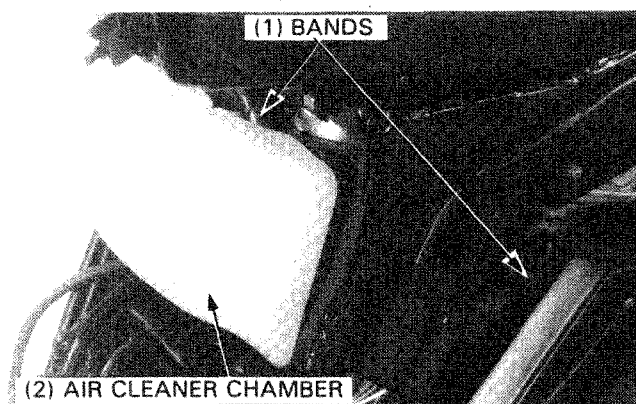
#### Rich mixture

- Clogged air jets
- Faulty float valve
- Float level too high
- Faulty auto bystarter
- Dirty air cleaner

## CARBURETOR REMOVAL

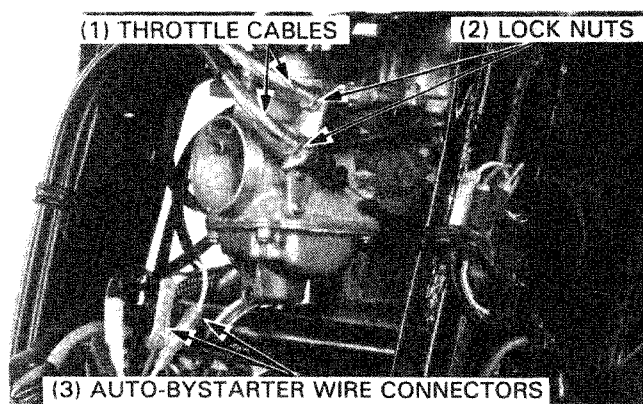
Remove the right and left rear cover and body center cover (section 13).

Loosen the air cleaner connecting tube bands and remove the air cleaner chamber from the air cleaner case and carburetor.



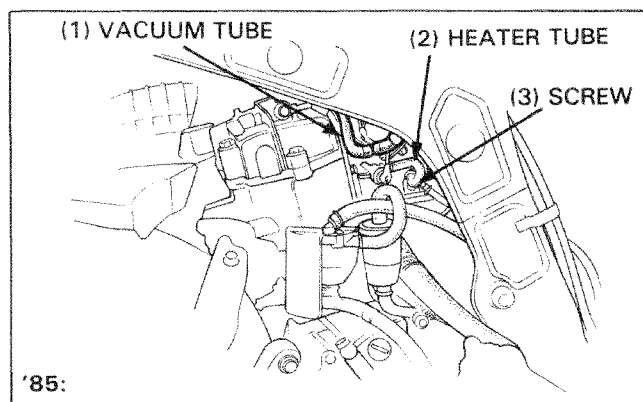
Loosen the throttle cable lock nut, adjuster nut and disconnect the throttle cable from the carburetor.

Disconnect the auto bystarter wire connectors.

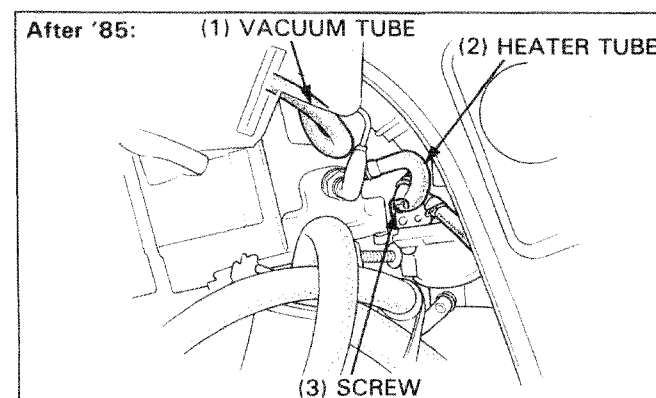


Remove the heater tube joint from the carburetor by removing the screw.

Disconnect the vacuum tube from the air cut-off valve.

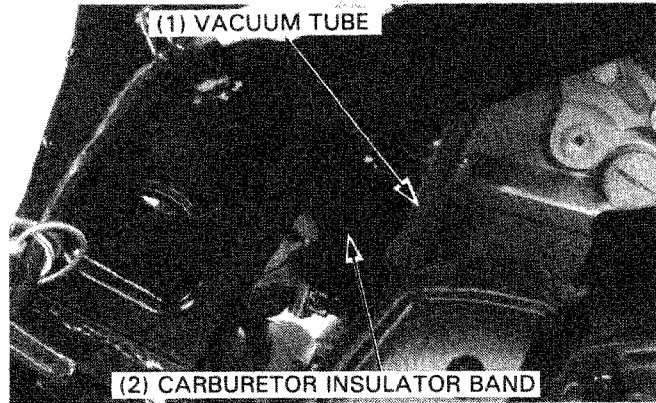


'85:



## FUEL SYSTEM

Disconnect the vacuum tube from the carburetor insulator. Loosen the carburetor insulator band and remove the carburetor.



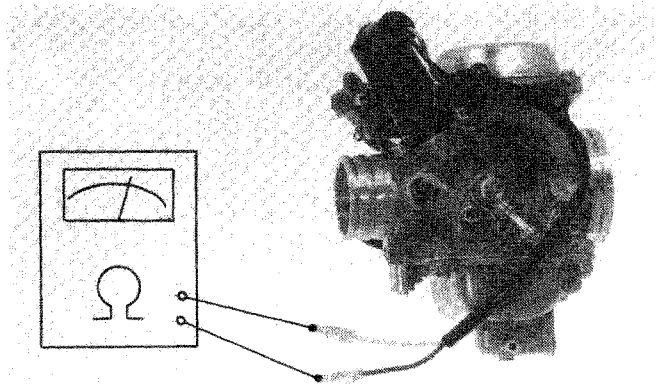
## AUTO-BYSTARTER

### INSPECTION

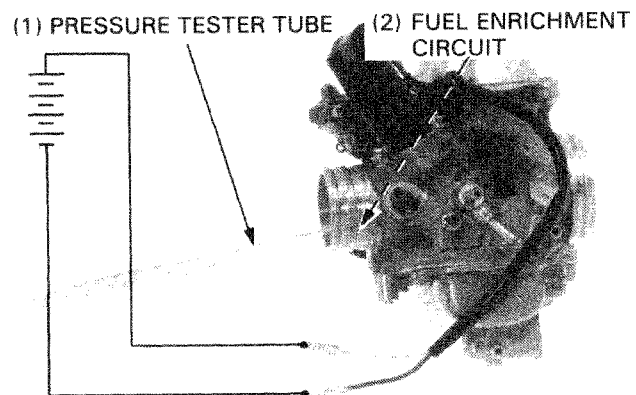
Stop the engine and wait at least 10 minutes, then measure the resistance between the wire terminals.

**RESISTANCE:** Aprox.  $10 \Omega$

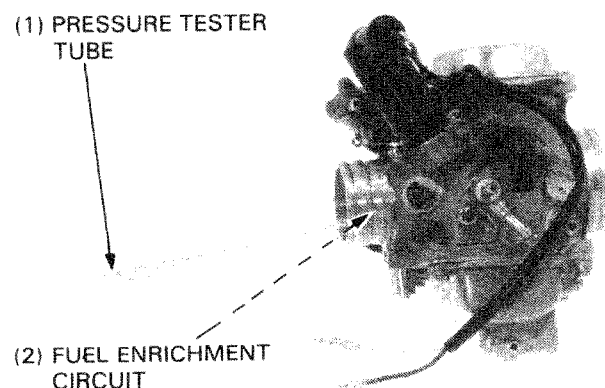
If the reading is not within the limit, replace the auto bystarter with a new one.



Connect a 12V battery to the auto bystarter wires and wait about 5 minutes. Connect a pressure tester to the fuel enrichment circuit and apply a light pressure. Replace the auto-bystarter if there is no restriction to the applied pressure.

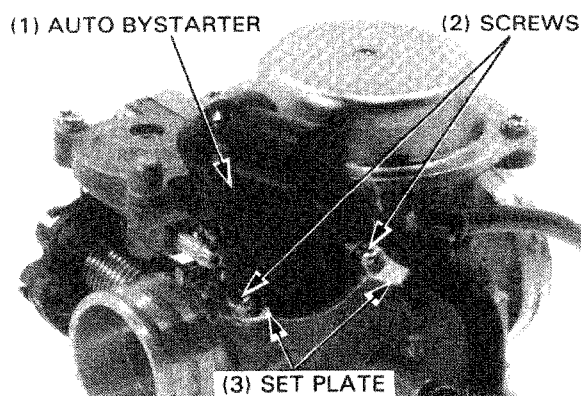


Disconnect the battery and wait 30 minutes. Connect the pressure tester to the enrichment circuit. Apply pressure to the circuit. If the passage is blocked, replace the auto-bystarter.



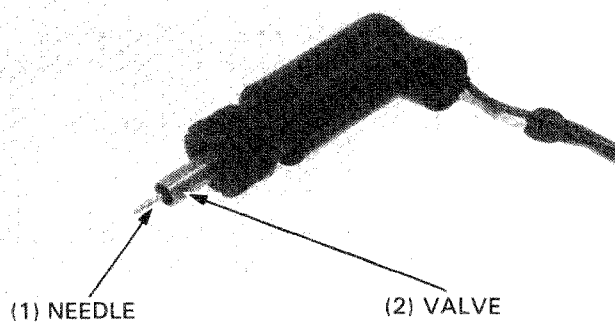
## REMOVAL

Remove the set plate screws, set plate and auto bystarter from the carburetor.



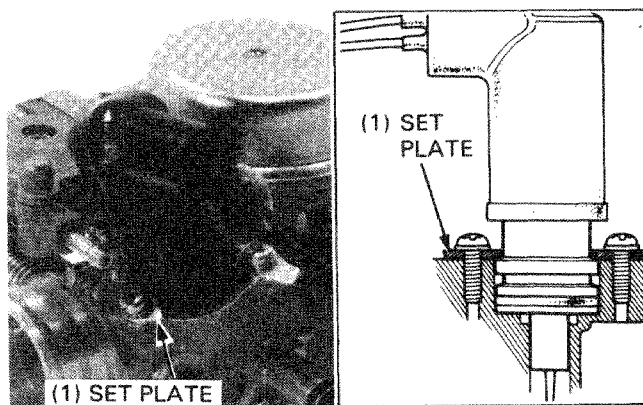
## AUTO BYSTARTER VALVE INSPECTION

Check the auto bystarter valve and needle for wear, or other damage.



## INSTALLATION

Insert the auto bystarter into the carburetor body until it bottoms. Position the set plate into the upper groove in the bystarter with its closed side toward the carburetor body. Install and tighten the two screws.

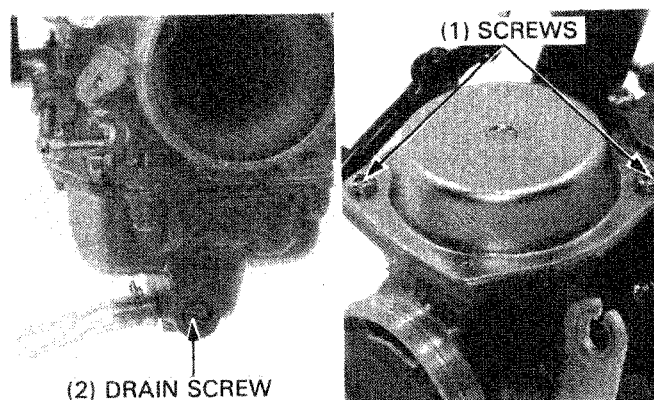


## VACUUM CHAMBER

### DISASSEMBLY

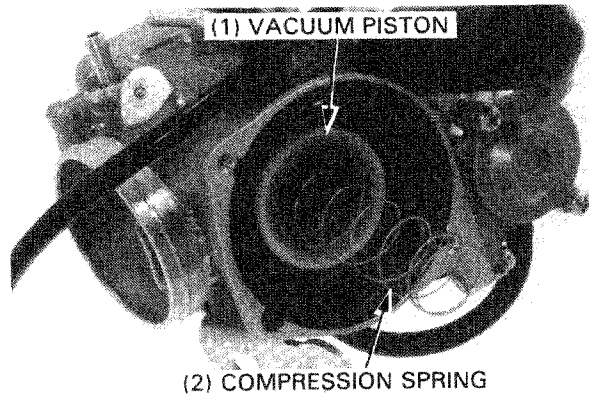
Loosen the drain screw and drain the fuel from the float chamber.

Remove the two vacuum chamber cover screws and cover.



## FUEL SYSTEM

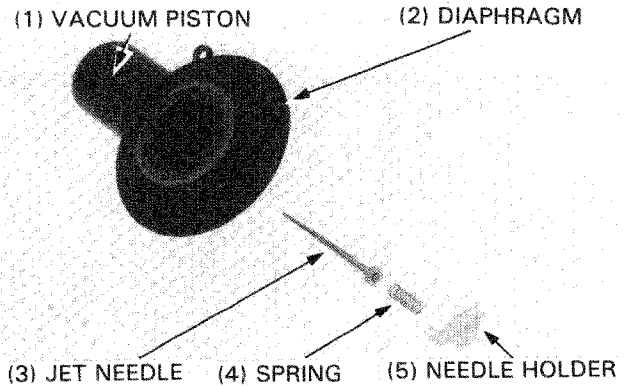
Remove the compression spring and the vacuum piston.



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

Inspect the vacuum piston for wear, or other damage. Inspect the needle for excessive wear, bending, or other damage.

Check the diaphragm for deterioration and tears.

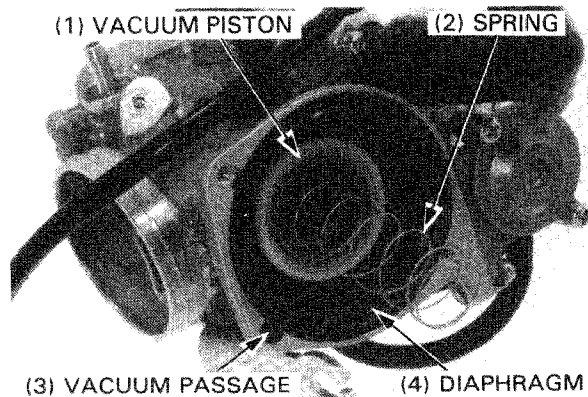


### ASSEMBLY

Install the jet needle, spring and needle holder into the vacuum piston, push the needle holder in and turn it 60°.

Install the vacuum piston into the carburetor body and align the tab on the diaphragm with the vacuum passage in the carburetor body.

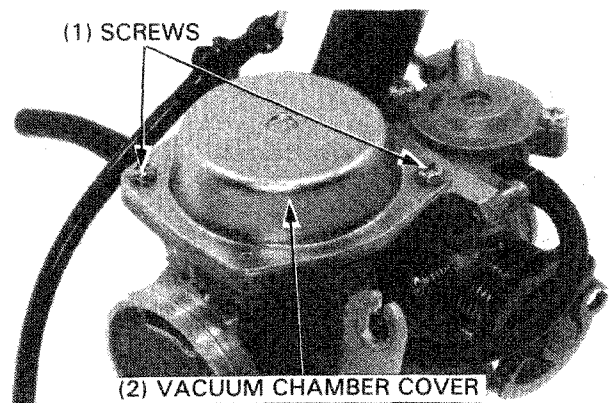
Install the compression spring.



Install the vacuum chamber cover and tighten it with the two screws.

### NOTE

- Be careful not to move the diaphragm.
- If the diaphragm can not be positioned correctly because of its expansion, dry the diaphragm before installation.





## AIR CUT-OFF VALVE

### INSPECTION

Disconnect the vacuum and air vent tubes from the air cut-off valve.

'85

Connect the vacuum pump to the vacuum tube connector.  
Connect the pressure pump to the air vent tube connector.

After '85

Cap one vacuum tube connector and connect the vacuum pump to the other vacuum tube connector, and then connect the pressure pump to the air vent tube connector.

Apply the specified vacuum to the air cut-off valve.

### VACUUM:

49 state model:  $360 \pm 30$  mm Hg ( $14.2 \pm 1.2$  in Hg)

California model:  $380 \pm 30$  mm Hg ( $15.0 \pm 1.2$  in Hg)

While maintaining the specified vacuum, apply light pressure to the air cut-off valve with the pressure pump.

### CAUTION

- Do not exceed 500 mm Hg (19.7 in Hg) during this test or the air cut-off valve may be damaged.

The air cut-off valve is normal if the air does not flow through the air cut-off valve.

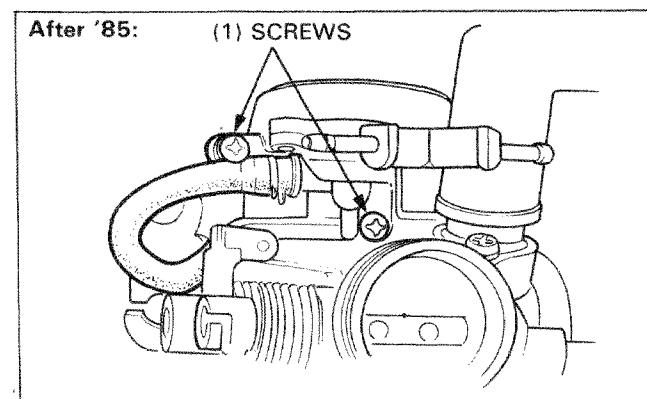
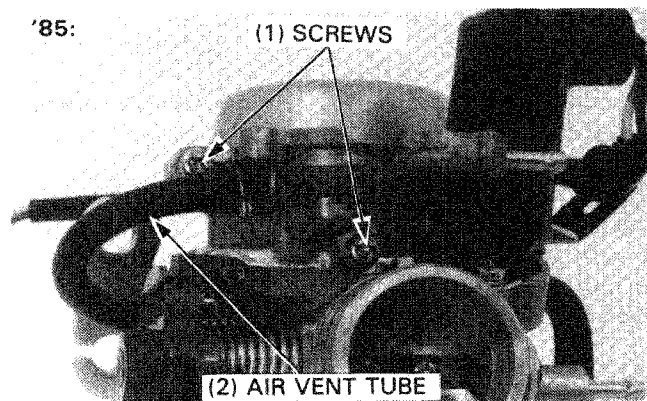
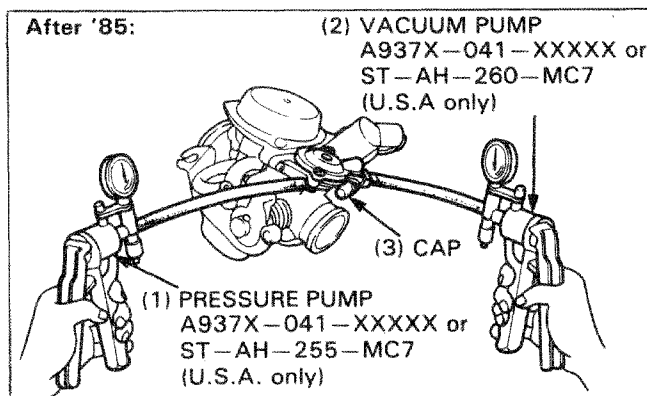
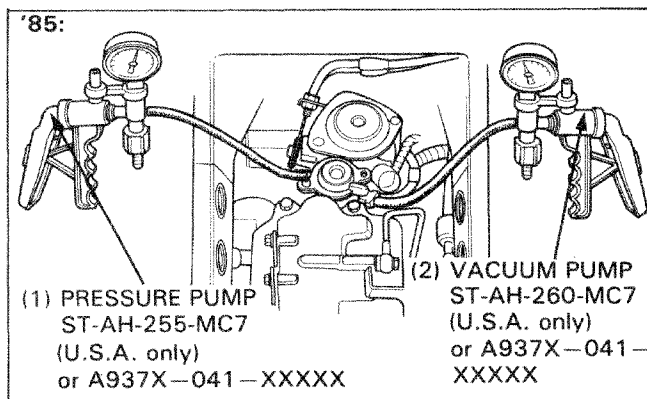
If the air flows out of the air cut-off valve, replace the air cut-off valve.

### REPLACEMENT

Remove the carburetor.

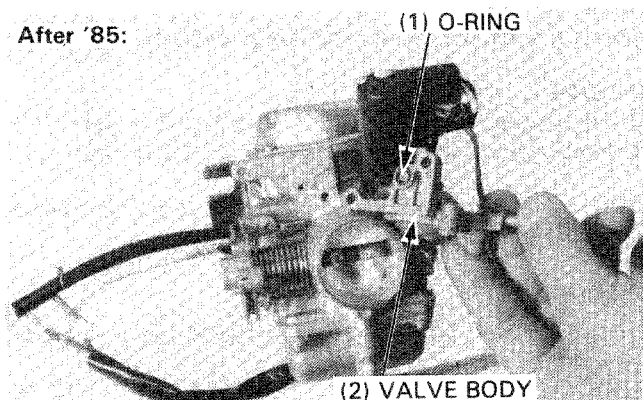
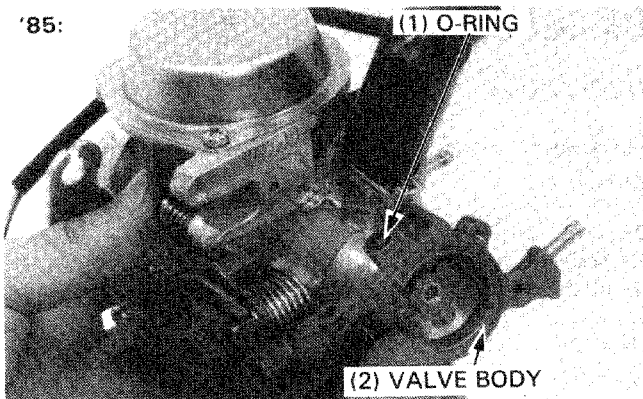
Disconnect the air vent tube from the valve body.

Remove the valve body screws and valve body.



## FUEL SYSTEM

Install the O-ring onto the new valve body with its flat face toward the valve body side.  
Install the valve body to the carburetor using the two screws.



## PILOT SCREW

### REMOVAL

#### NOTE

- The pilot screw is factory pre-set and should not be removed unless the carburetor is overhauled.
- The pilot screw limiter cap is factory installed and cemented in place to prevent pilot screw misadjustment.

Remove the carburetor (page 4-3).  
Remove the pilot screw limiter cap.  
Turn the pilot screw in and carefully count the number of turns before it seats lightly. Make a note of this to use as a reference when reinstalling the pilot screw.

#### CAUTION

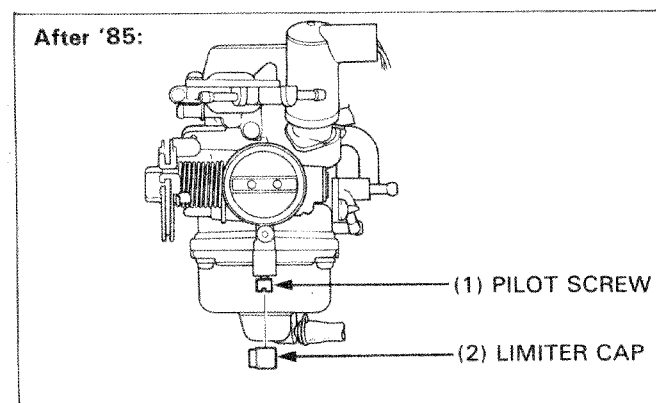
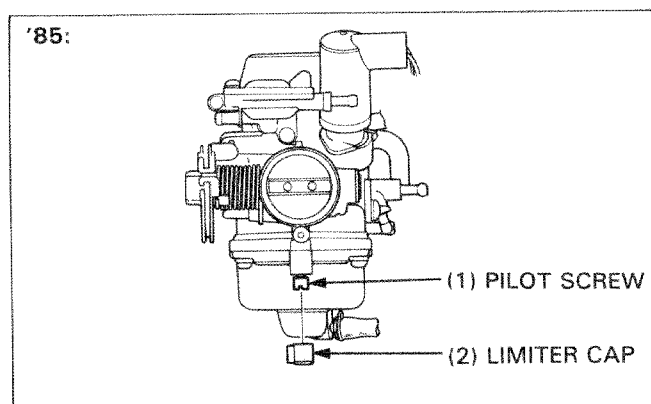
- *Damage to the pilot screw seat will occur if the pilot screw is tightened against the seat.*

Remove the pilot screw and inspect it.  
Replace the screw if it is worn or damaged.  
Install the pilot screw and return it to its original position as noted during removal.  
Perform the pilot screw adjustment if a new pilot screw is installed (page 4-12).

#### NOTE

- Do not install the limiter cap on a new pilot screw until after adjustment has been made (page 4-12).

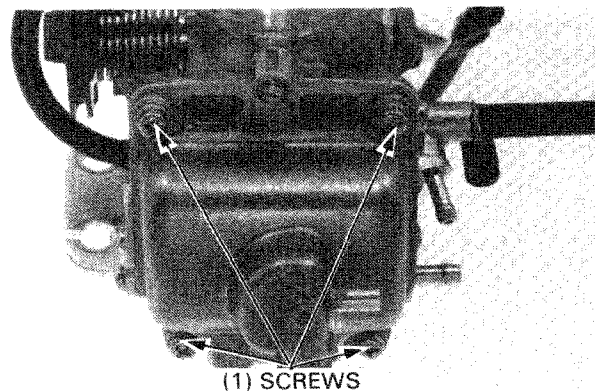
Install the carburetor.



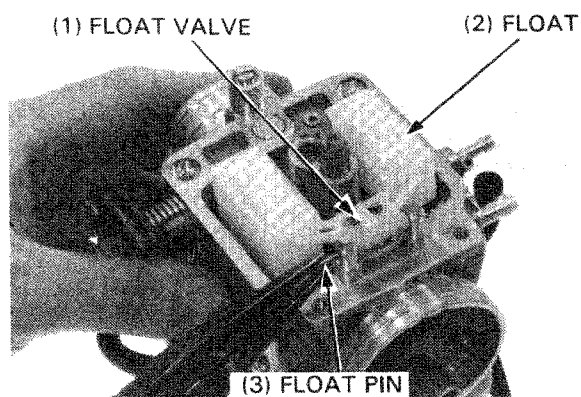
## FLOAT/FLOAT VALVE/JETS

### DISASSEMBLY

Remove the four float chamber screws and the float chamber.

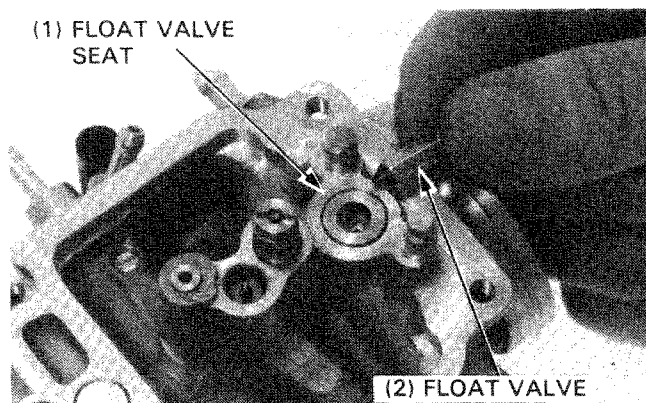


Remove the float pin, float and float valve.

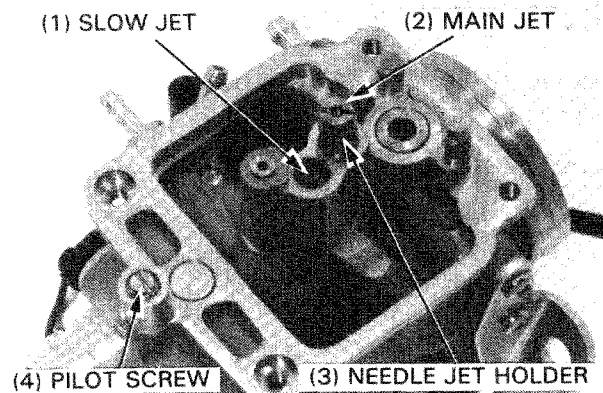


### FLOAT VALVE INSPECTION

Inspect the float valve for grooves and nicks.  
Inspect the operation of the float valve.

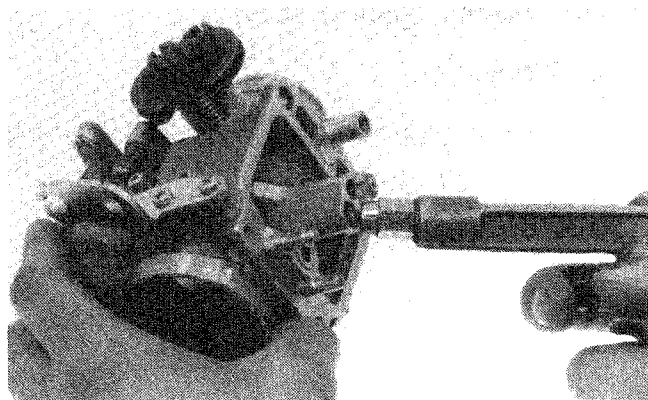


Remove the main jet, needle jet holder and needle jet.  
Remove the slow jet.



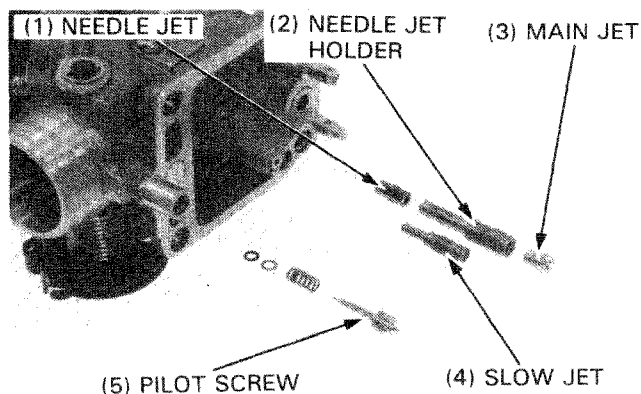
## FUEL SYSTEM

Blow open all passages with compressed air before assembling.

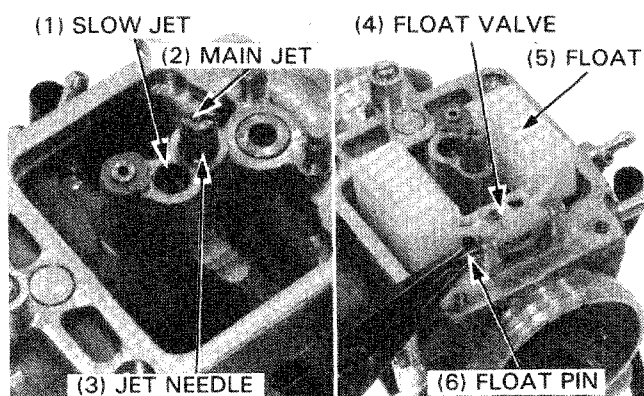


### ASSEMBLY

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



Install the float valve, float and float pin.

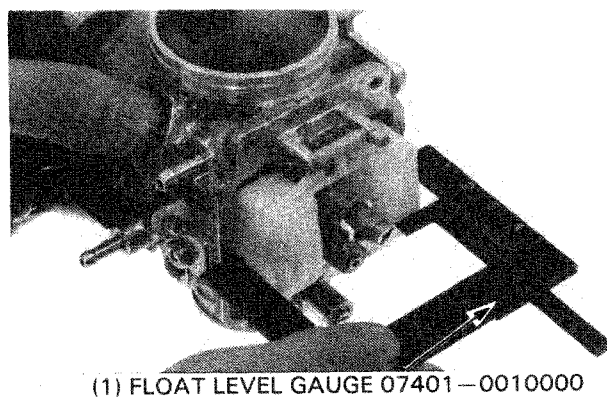


### FLOAT LEVEL INSPECTION

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

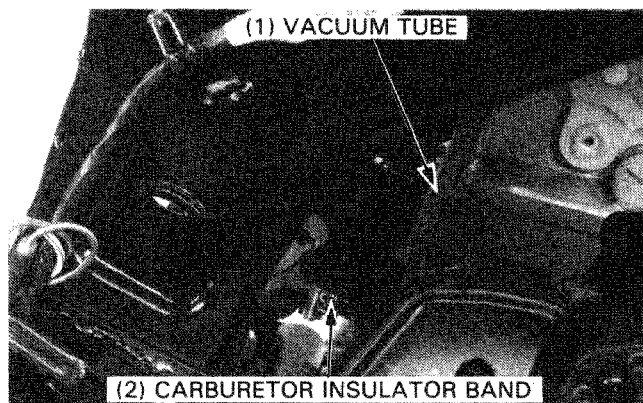
**FLOAT LEVEL:**  $18.5 \pm 1.0$  mm  
( $0.73 \pm 0.04$  in)

\* Replace the float if the level is not within the limit.  
Reinstall the float chamber.

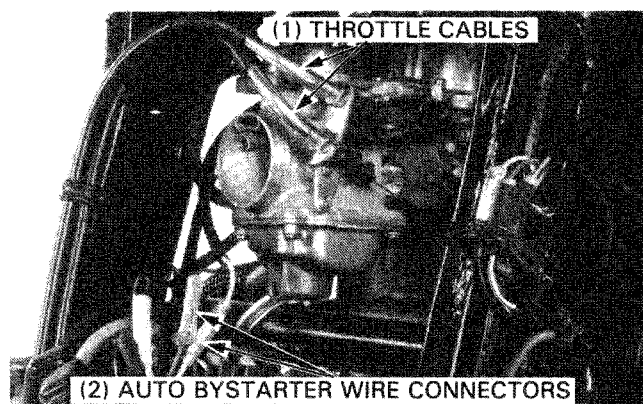


## CARBURETOR INSTALLATION

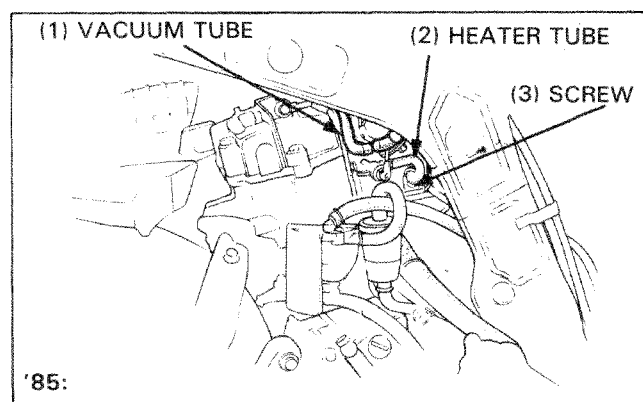
Tighten the drain screw.  
Install the insulator and connecting tube to the carburetor.  
Connect the vacuum tube to the insulator.



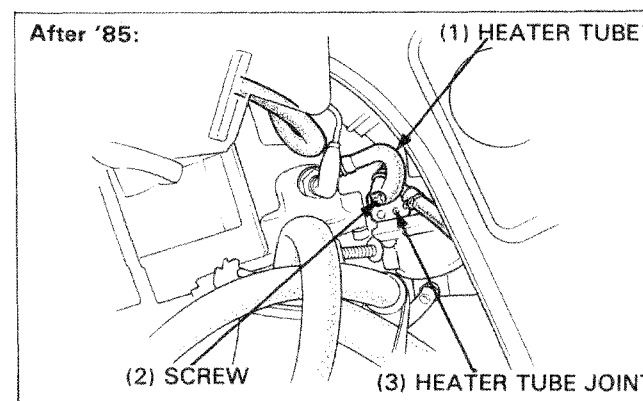
Install the throttle cable to the carburetor.  
Connect the auto bystarter wire connectors to the wire harness.



Connect the air tube to the air cut-off valve.  
Connect the fuel line to the carburetor.  
Install the heater tube joint to the carburetor.



'85:



## FUEL SYSTEM

Install the air cleaner chamber and air cleaner case to the carburetor and tighten the air cleaner connecting tube band. Perform the following inspections and adjustment.

- Harness and cable routing (page 1-8).
- Throttle operation (page 3-4).
- Carburetor idle speed (page 3-8).
- Fuel leaks.

Install the center cover, right and left rear cover (section 13).

## PILOT SCREW ADJUSTMENT

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

#### NOTE

- The pilot screw is factory pre-set and no adjustment is necessary unless the pilot screw is replaced (page 4-8).
- Use a tachometer with graduations of 100 rpm or smaller that will accurately indicate a 100 rpm change.

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

**INITIAL OPENING: 2 turns out**

#### CAUTION

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

3. Warm up the engine to operating temperature. Stop and go driving for 10 minutes is sufficient.
4. Attach a tachometer according to the manufacturer's instructions.
5. Adjust the idle speed with the throttle stop screw.  
**IDLE SPEED: 1500 ± 100 rpm**
6. Turn the pilot screw in or out slowly to obtain the highest engine speed.
7. Readjust the idle speed with the throttle stop screw.
8. Turn the pilot screw in gradually until the engine speed drops 100 rpm.
9. Turn the pilot screw 1 turn out from the position obtained in step 7.
10. Readjust the idle speed with the throttle stop screw.
11. Install a new limiter cap.

## LIMITER CAP INSTALLATION

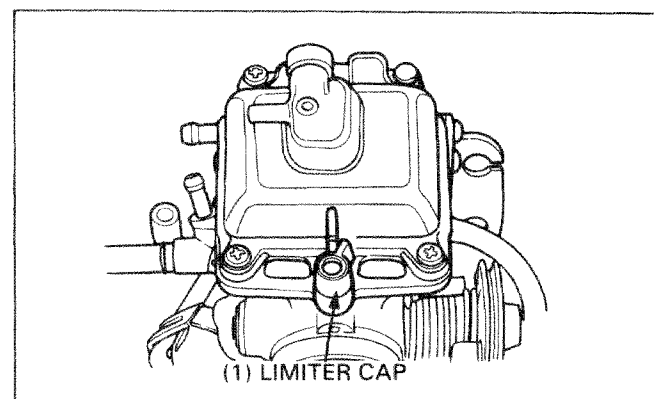
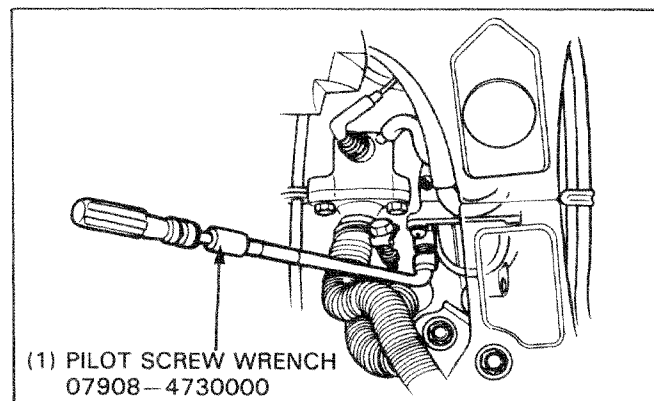
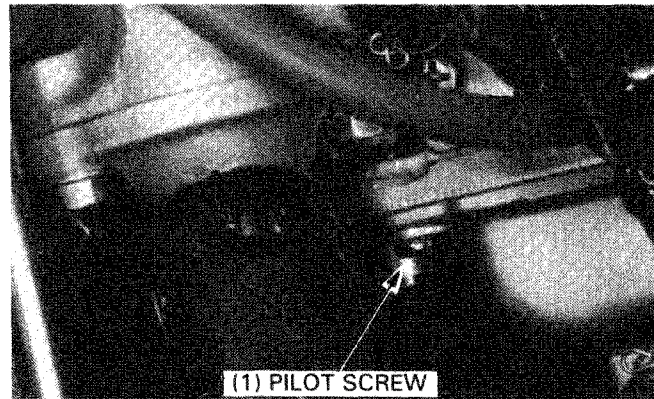
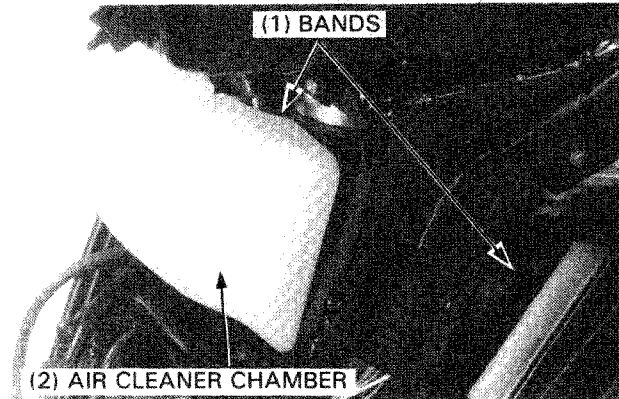
If the pilot screw is replaced, a new limiter cap must be installed after pilot screw adjustment is completed.

After adjustment, cement the limiter cap over the pilot screw, using LOCTITE® 601 or equivalent.

The limiter cap should be placed against its stop, preventing further adjustment that would enrich the fuel mixture (limiter cap position permits clockwise rotation and prevents counter-clockwise rotation).

#### NOTE

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



## HIGH ALTITUDE ADJUSTMENT

When the vehicle is to be operated continuously above 2,000 m (6,500 feet), the carburetor main jet must be replaced with high altitude type main jet as follows to improve drivability and decrease exhaust emissions.

Remove the carburetor (page 4-3).

### WARNING

- *Do not smoke or allow flames or sparks in the work area.*

Drain the fuel from the float chamber.

Remove the float chamber.

Replace the main jet with the high altitude type main jet.

Adjust the pilot screw using the initial setting shown in the chart.

Reinstall the float chamber, tighten the drain screw, and install the carburetor (page 4-11).

Attach a Vehicle Emission Control Information Update Label onto the fuel tank as shown.

Refer to Service Bulletin No. SL 132 for information on obtaining the label.

### NOTE

- Do not attach the label to any part that can be easily removed from the vehicle.

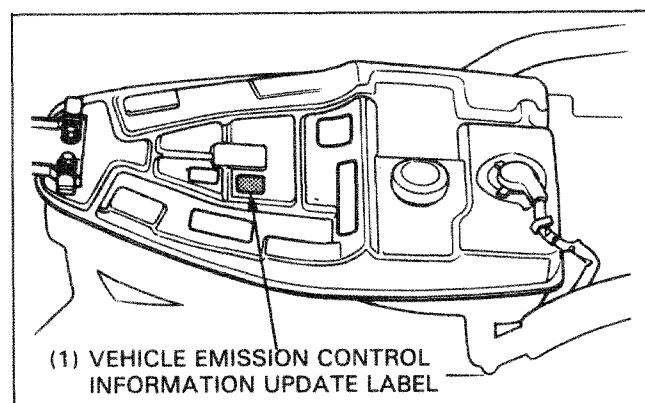
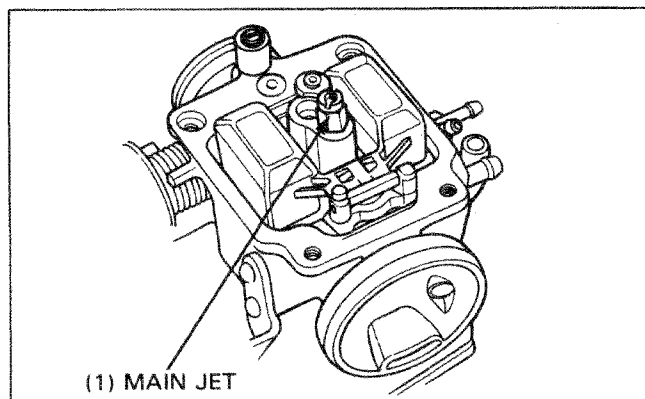
### WARNING

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

When the vehicle is to be operated continuously below 1,500 m (5,000 feet), remove the carburetor and replace the main jet with standard type.

Adjust the pilot screw.

Be sure these procedures are followed.



	STANDARD (BELOW 1500 m, 5,000 ft)	HIGH ALTITUDE (ABOVE 2,000 m, 6,500 ft)
MAIN JET No.	'85: No. 115 After '85: No. 112	'85: No. 112 After '85: No. 110
PILOT SCREW INITIAL OPENING	2	1-3/4
Idle speed	1500±100 rpm	1500±100 rpm



## FUEL SYSTEM

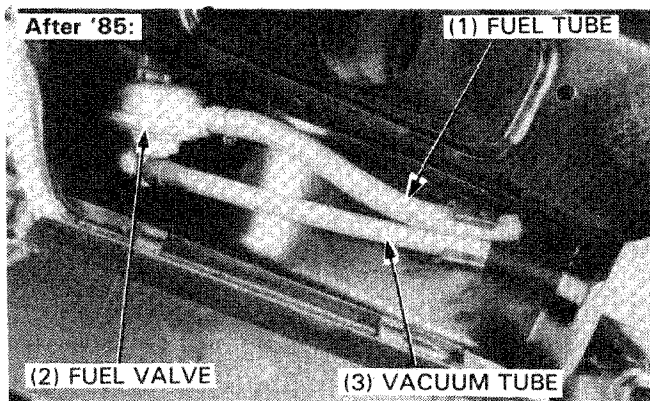
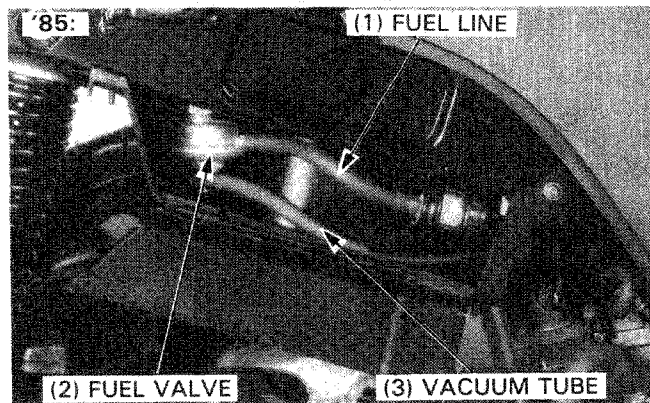
### AUTOMATIC FUEL VALVE

#### INSPECTION

##### WARNING

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

Remove the right rear cover (page 13-2).  
Stop the engine and place a container under the fuel line.  
Disconnect the fuel tube from the carburetor and drain the remaining fuel in the fuel valve and fuel tube (approx. 5—10 cc).  
Fuel flow should stop after the residual quantity drains.



If the fuel flow does not stop, clean the vacuum tube and re-check it.

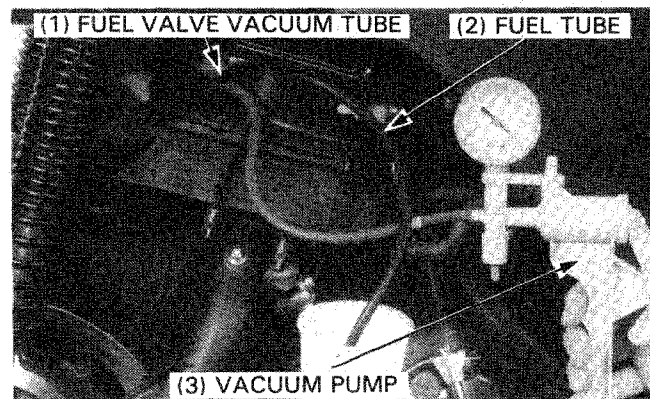
Disconnect the vacuum tube from the carburetor insulator and apply vacuum with a vacuum pump.

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

If the valve does not operate normally;

- Inspect for clogging and clean the valve.
- Blow low pressure air through the fuel valve from the inlet side to see the flat diaphragm in its original position.

Replace the fuel valve if it continues to malfunction.





## FUEL TANK

### FUEL STRAINER CLEANING

#### WARNING

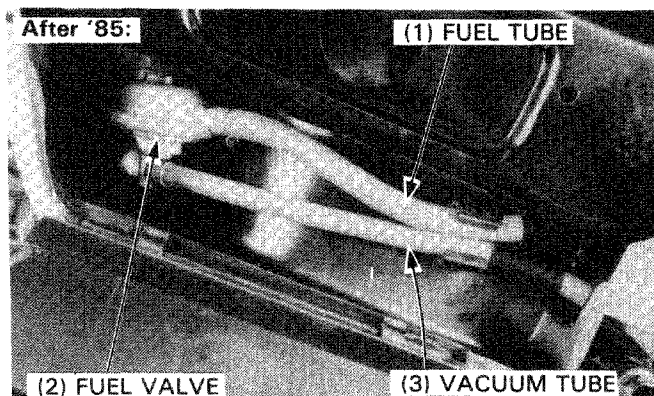
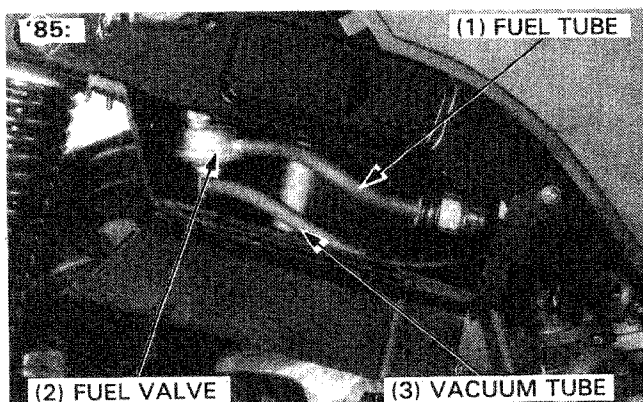
- Do not allow flames or sparks near gasoline.
- Wipe up spilled gasoline at once.

Remove the right rear cover (page 13-2).

Stop the engine and place a clean container under the fuel tube and disconnect the fuel tube and vacuum tube from the carburetor.

Apply vacuum with a vacuum pump at the disconnected vacuum tube end and drain the fuel from the fuel tank.

Disconnect the fuel tube and vacuum tube from the fuel valve. Loosen the lock nut and remove the fuel valve from the fuel tank.



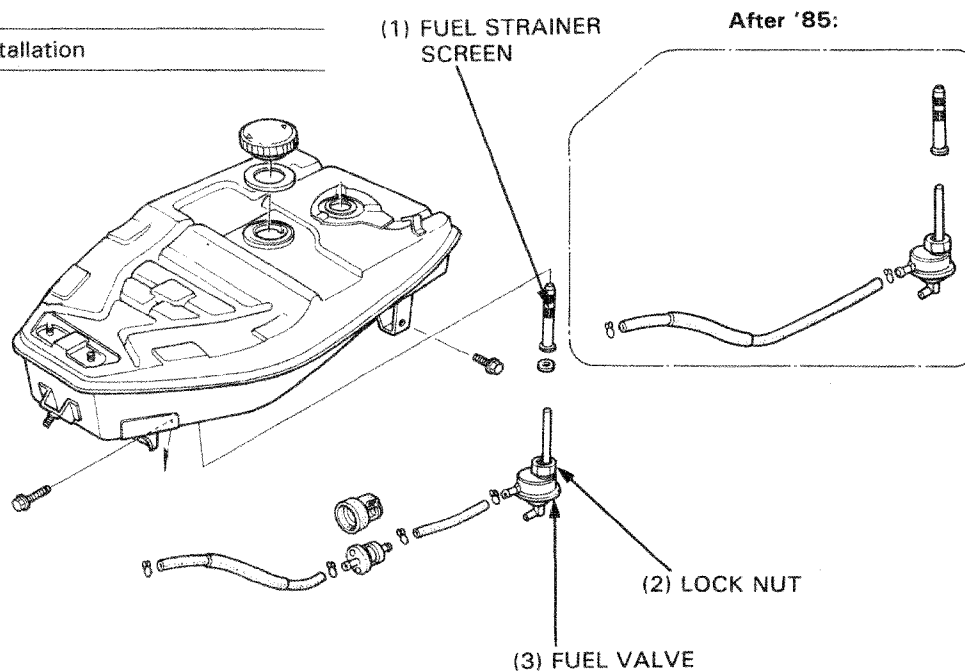
Remove the fuel strainer screen and clean it.

If the fuel strainer screen is damaged, replace it with a new one.

Install the fuel strainer and fuel valve in the reverse order of removal.

#### NOTE

- Check for fuel leaks after installation



## FUEL SYSTEM

### FUEL UNIT

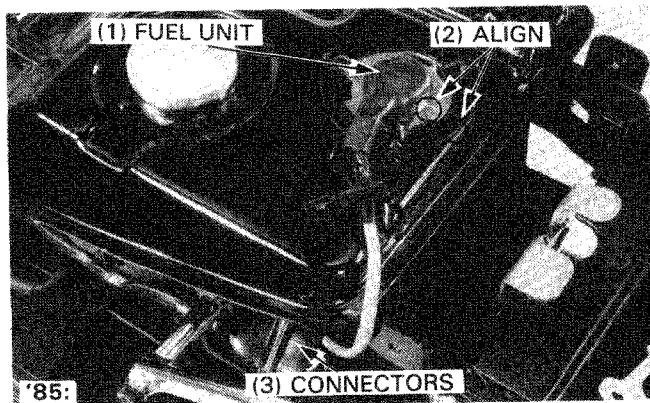
#### REMOVAL

Remove the left side cover and lift the seat up. Disconnect the fuel unit wire connectors. Turn the fuel unit retainer counterclockwise and remove the fuel unit.

#### CAUTION

- Do not bend the fuel unit arm.

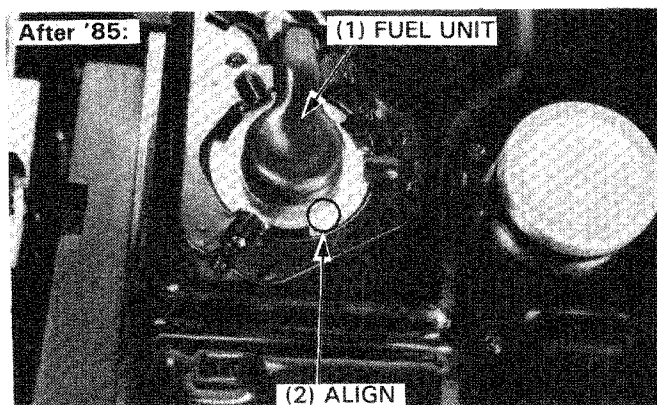
For fuel unit inspection, see page 16-19.



#### INSTALLATION

Set the fuel unit gasket onto the fuel tank and align the groove on the fuel unit base with the tab on the fuel tank. Install the fuel unit retainer by turning it clockwise. Make sure that the arrows are aligned.

Reconnect the wires and reinstall the left rear cover.



### FUEL TANK

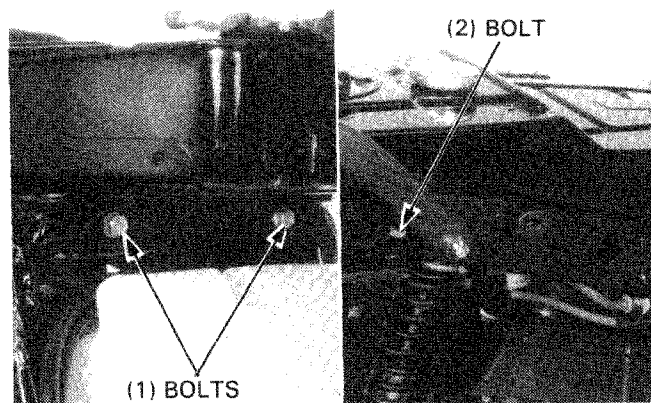
#### REMOVAL

Remove the right and left rear covers and body center cover (section 13). Disconnect the fuel tube and vacuum tube from the fuel valve.

Remove the seat. Disconnect the fuel unit wire connectors. Remove the four fuel tank mounting bolts and fuel tank.

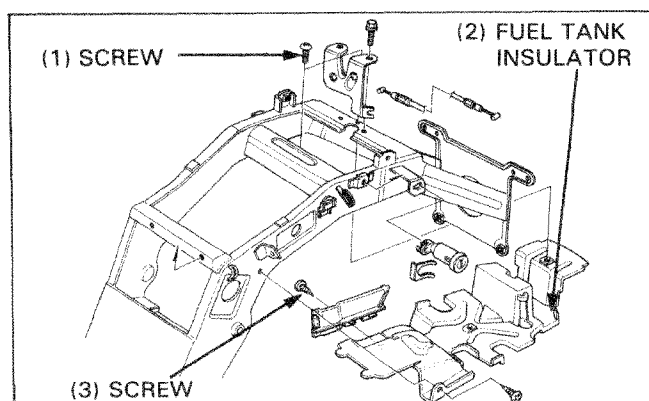
#### INSTALLATION

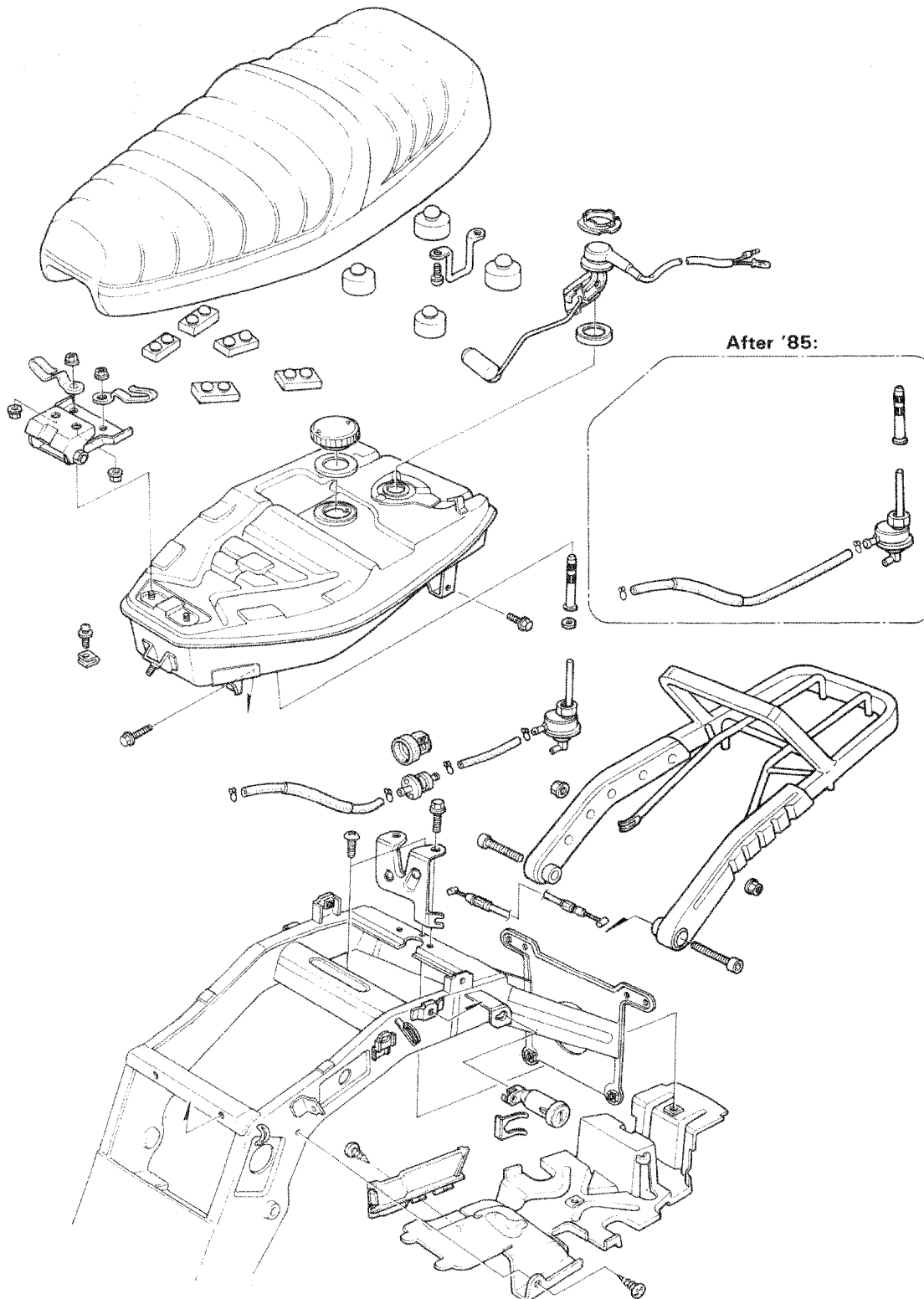
Install the fuel tank in the reverse order of removal.



### FUEL TANK INSULATOR

Remove the fuel tank. Remove the right or left rear shock absorber (page 15-8). Remove the screws mounting the fuel tank insulator and the insulator.





## FUEL SYSTEM

### AIR CLEANER CASE

Remove the left rear cover (section 13).

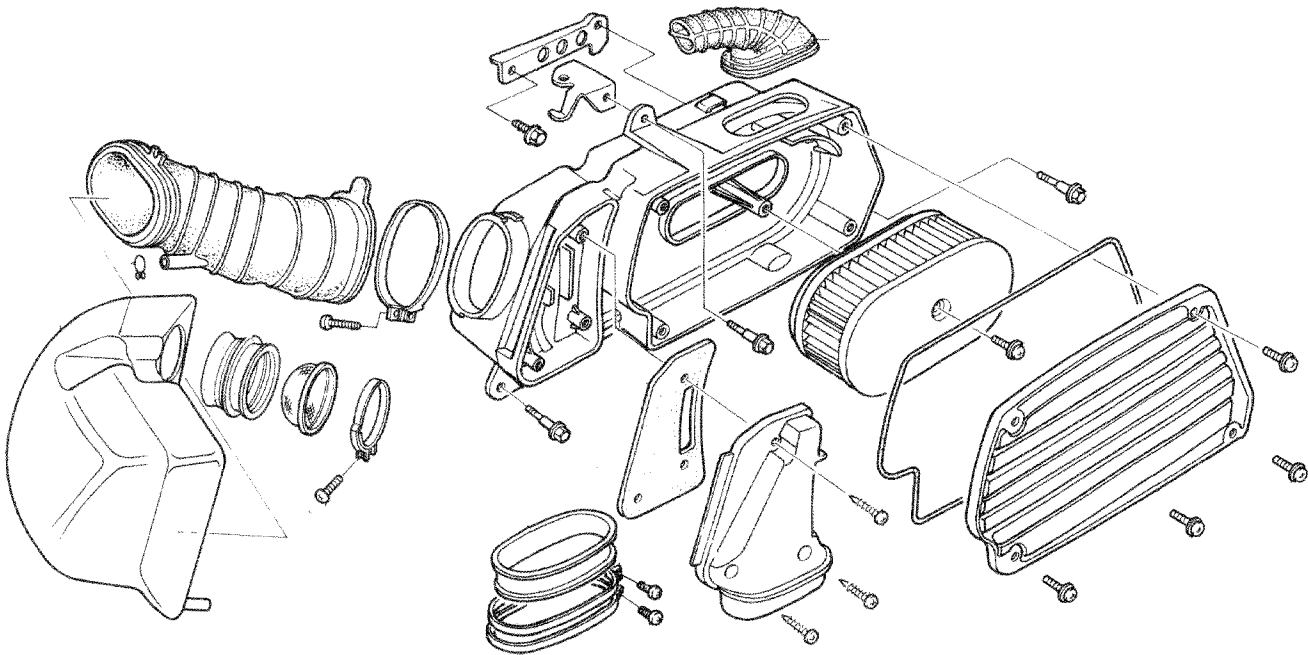
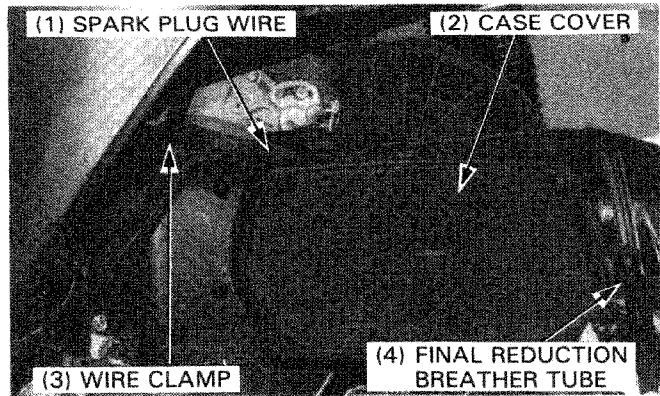
Remove the spark plug cap, then remove the spark plug wire from the air cleaner case.

Disconnect the final reduction breather tube from the air cleaner case.

Loosen the two connecting tube bands and three air cleaner case mount bolts.

Remove the air cleaner case.

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



## PURGE CONTROL VALVE INSPECTION (CALIFORNIA MODEL)

### NOTE

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

Check all fuel tank, Purge Control Valve (PCV), and charcoal canister hoses to be sure they are not kinked and are securely connected.

Replace any hose that shows signs of damage or deterioration.

### NOTE

- The PCV is located left side of the rear shock absorber.

Disconnect the PCV hoses from their connections and remove the PCV from its mount. Refer to the routing label on the fuel tank for hose connections.

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

**SPECIFIED VACUUM: 250 mm (9.8 in) Hg**

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

Remove the vacuum pump and connect it to the hose that goes to the carburetor.

Apply the specified vacuum to the PCV.

**SPECIFIED VACUUM: 250 mm (9.8 in) Hg**

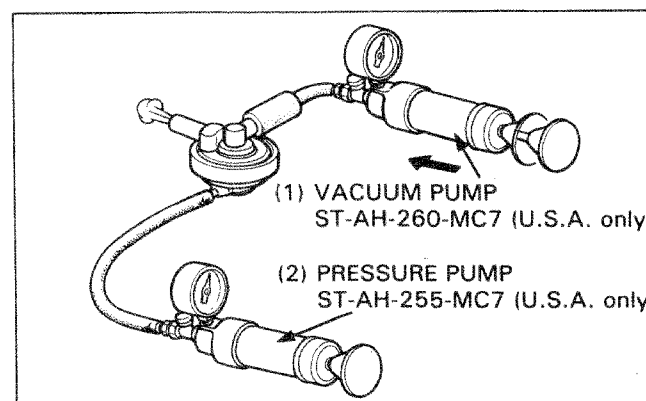
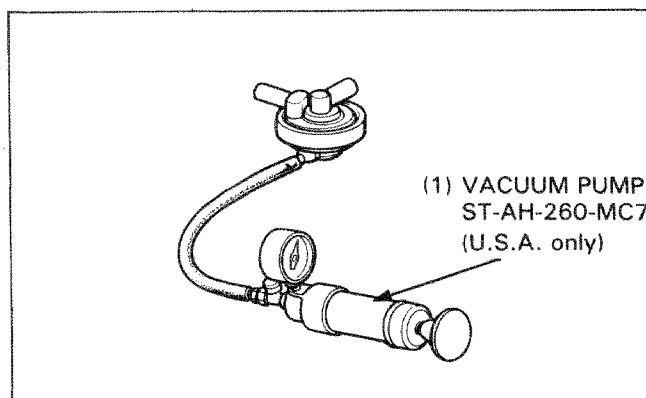
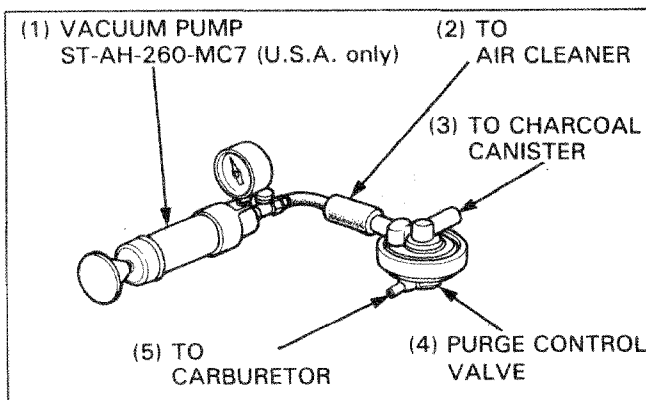
The specified vacuum should be maintained.  
Replace the PCV if vacuum is not maintained.

Connect a pressure pump to the 8 mm I.D. hose that goes to the charcoal canister. While applying the specified vacuum to the PCV hose that goes to the carburetor, pump air through the canister hose. Air should flow through the PCV and out the hose that goes to the air cleaner. Replace the PCV if air does not flow out.

### CAUTION

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

Remove the pumps, install the PCV on its mount, route and re-connect the hoses according to the Vacuum Hose Routing Label.

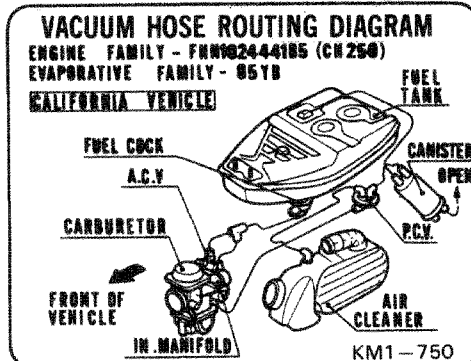


## FUEL SYSTEM

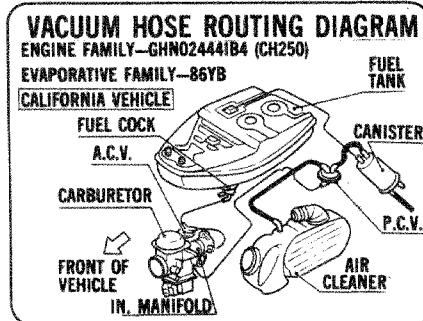
### NOTE

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

'85:



After '85:



## ENGINE REMOVAL/INSTALLATION

100–120 N·m  
(10.0–12.0 kg-m,  
72–87 ft-lb)

After '85:

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

After '85:

40–55 N·m  
(4.0–5.5 kg-m, 29–40 ft-lb)

# 5. ENGINE REMOVAL/INSTALLATION

## SERVICE INFORMATION ENGINE REMOVAL

## 5-1 ENGINE INSTALLATION 5-2

5-5

## SERVICE INFORMATION

### GENERAL

- A floor jack or other adjustable support is required to support and maneuver the engine.

### SPECIFICATIONS

Engine dry weight		32 kg (70,5 lb)
Oil capacity	Engine	1.0 liter (1.06 US qt, 0.88 Imp qt) at disassembly
	Transmission	0.8 liter (0.85 US qt, 0.70 Imp qt) at change
Coolant capacity		0.2 liter (0.21 US qt, 0.18 Imp qt) at disassembly
		0.15 liter (0.16 US qt, 0.13 Imp qt) at change
	Engine and radiator	1.0 liter (1.06 US qt, 0.88 Imp qt) at disassembly
	Reserve tank	0.8 liter (0.85 US qt, 0.70 Imp qt) at change
		0.35 liter (0.37 US qt, 0.31 Imp qt)

### TORQUE VALUES

Engine hanger bolt	100—120 N·m (10.0—12.0 kg-m, 72—87 ft-lb)
Engine hanger joint bolt: After '85:	40—55 N·m (4.0—5.5 kg-m, 29—40 ft-lb)
Engine hanger stopper rubber bolt	24—30 N·m (2.4—3.0 kg-m, 17—22 ft-lb)
Engine mounting bolt	40—55 N·m (4.0—5.5 kg-m, 29—40 ft-lb)
Rear shock absorber mounting bolt	24—30 N·m (2.4—3.0 kg-m, 17—22 ft-lb)



## ENGINE REMOVAL/INSTALLATION

### ENGINE REMOVAL

Disconnect the battery negative cable.

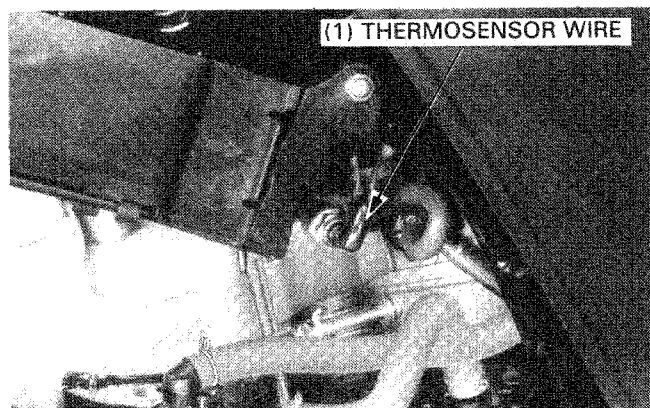
Remove the right and left rear cover and center cover (section 13).

Drain the engine oil (page 2-2).

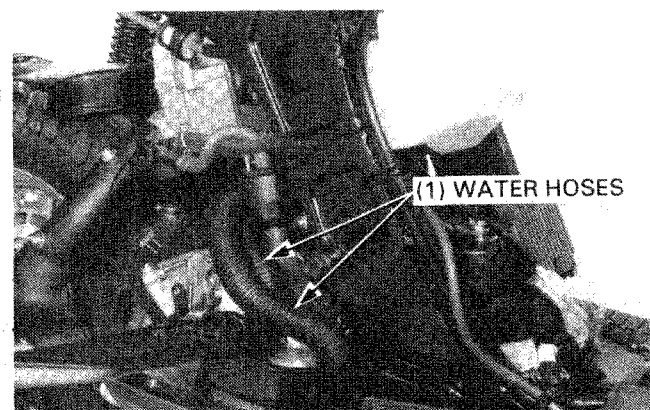
Drain the coolant (page 12-3).

Disconnect the fuel tube from the carburetor.

Disconnect the thermosensor wire.



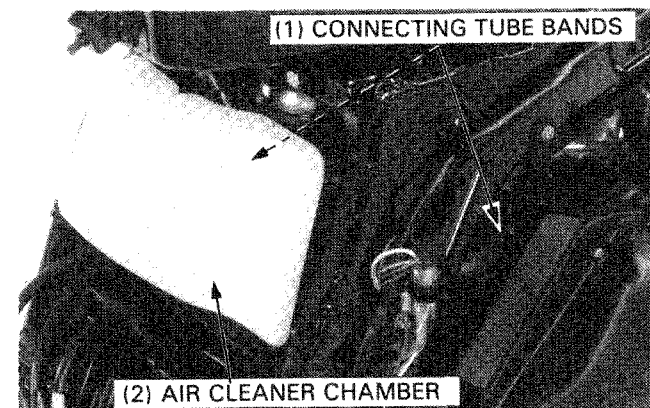
Disconnect the water hoses from the thermostat case and water pump.



Remove the right foot peg step by removing the two bolts.

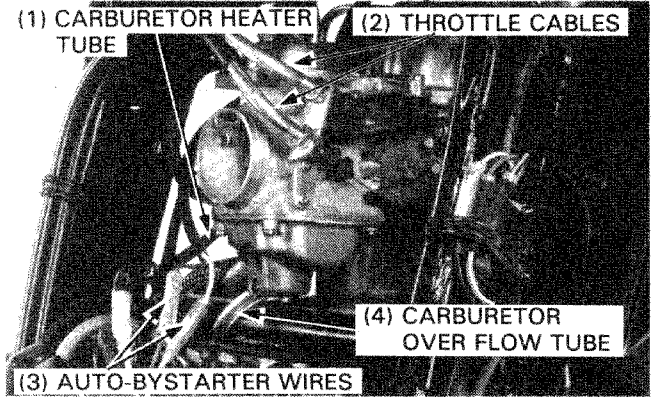


Loosen the connecting tube bands and remove the air cleaner chamber.

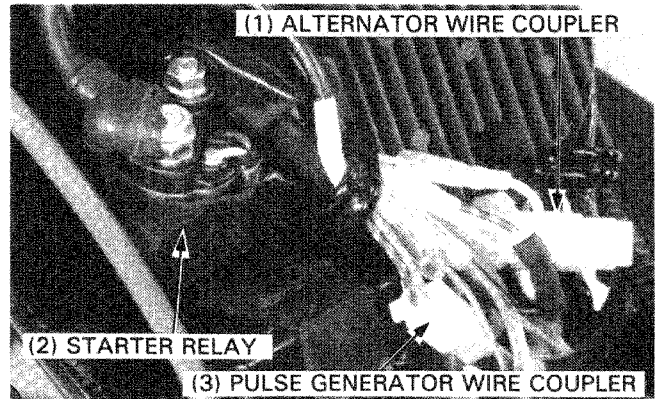


## ENGINE REMOVAL/INSTALLATION

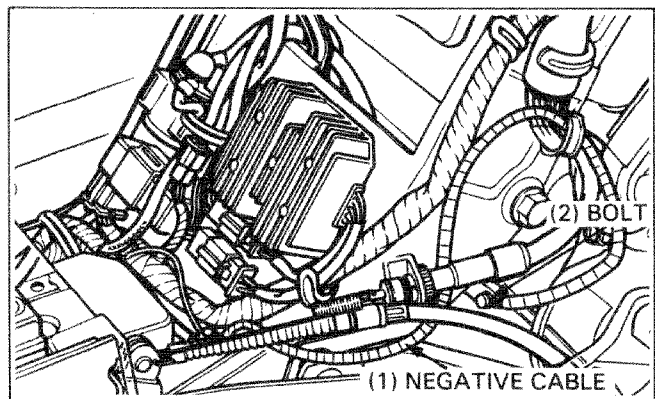
Disconnect the throttle cables from the carburetor.  
Disconnect the auto-bystarter wire connectors.  
Disconnect the carburetor over flow tube from the carburetor.  
Disconnect the carburetor heater tubes from the carburetor heater.



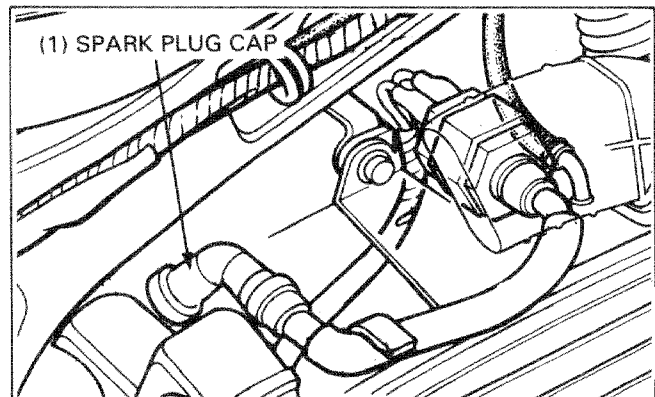
Disconnect the starter cable from the starter relay.  
Disconnect the alternator and pulse generator wire connectors and coupler.



Disconnect the battery negative cable from the engine.



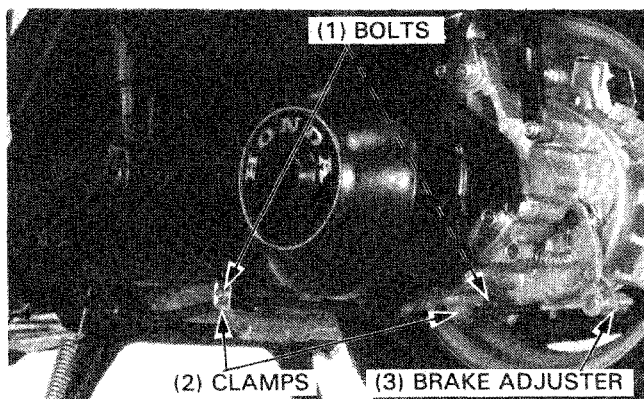
Disconnect the vacuum tubes to the auto fuel valve from the air cut-off valve and carburetor insulator.  
Disconnect the spark plug cap from the spark plug.



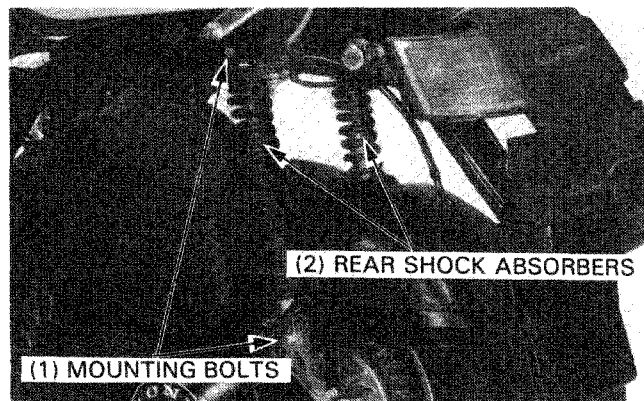
## ENGINE REMOVAL/INSTALLATION

Remove the brake cable clamps.

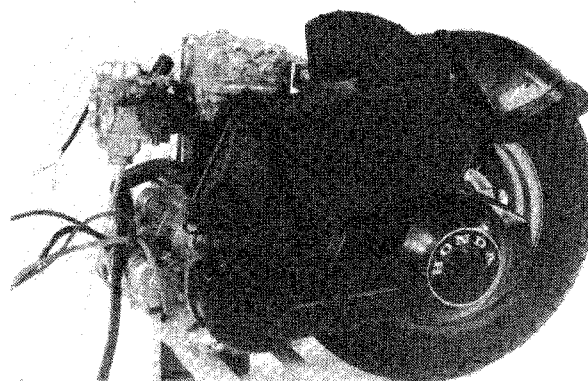
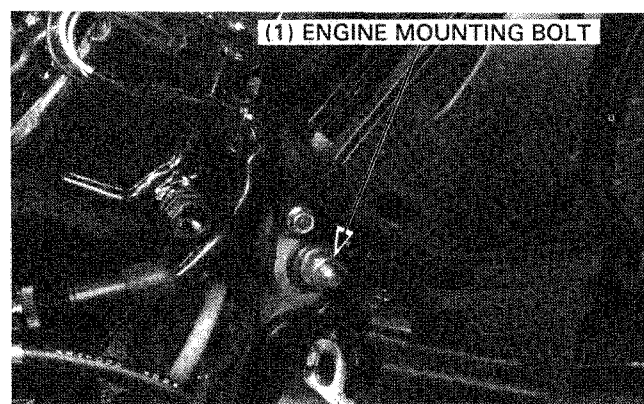
Remove the rear brake cable from the brake arm by removing the rear brake adjuster.



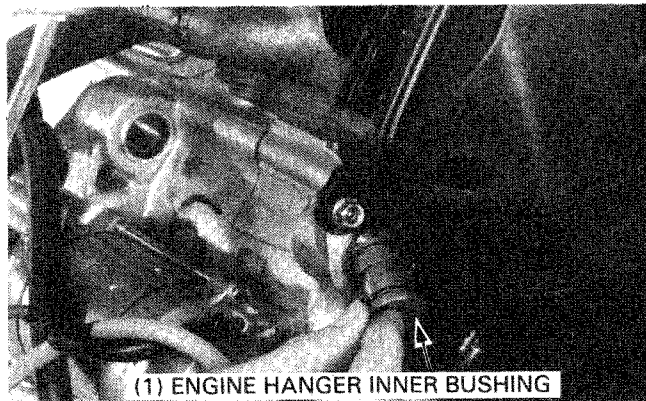
Remove the rear shock absorber mounting bolts and shock absorbers.



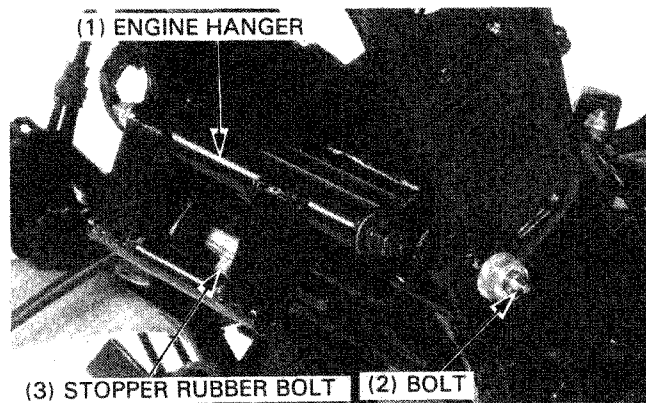
Remove the engine mounting nut and bolt, and remove the engine.



Inspect the engine hanger inner bushings for wear or damage.



Remove the engine hanger bolt, stopper rubber bolt and hanger.

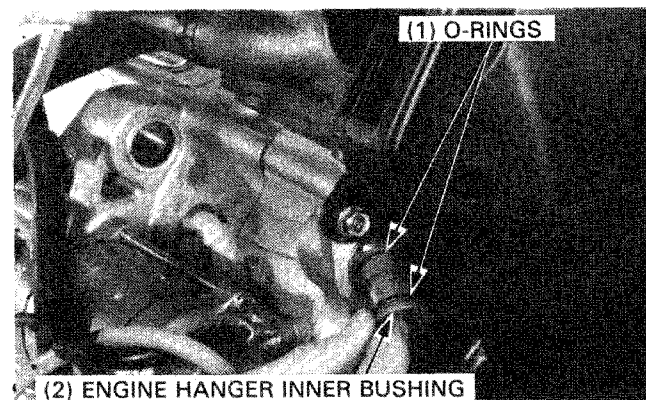


## ENGINE INSTALLATION

Install the engine in the reverse order of removal. Apply molybdenum disulfide grease to the new O-rings and install them the engine hanger inner bushings.

### NOTE

- Route the wire and cables properly (page 1-8).
- Fill the crankcase and final reduction to the proper level with the recommended oil (page 2-1).
- Fill the cooling system (page 12-2).
- Perform the following inspection and adjustment.
  - Throttle operation (page 3-4).
  - Rear brake pedal free play (page 3-12).



### TORQUE VALUES:

Engine hanger bolt:

100—120 N·m (10.0—12.0 kg-m, 72—87 ft-lb)

Engine hanger joint bolt: After '85:

40—55 N·m (4.0—5.5 kg-m, 29—40 ft-lb)

Engine mounting bolt:

40—55 N·m (4.0—5.5 kg-m, 29—40 ft-lb)

Rear shock absorber mounting bolt:

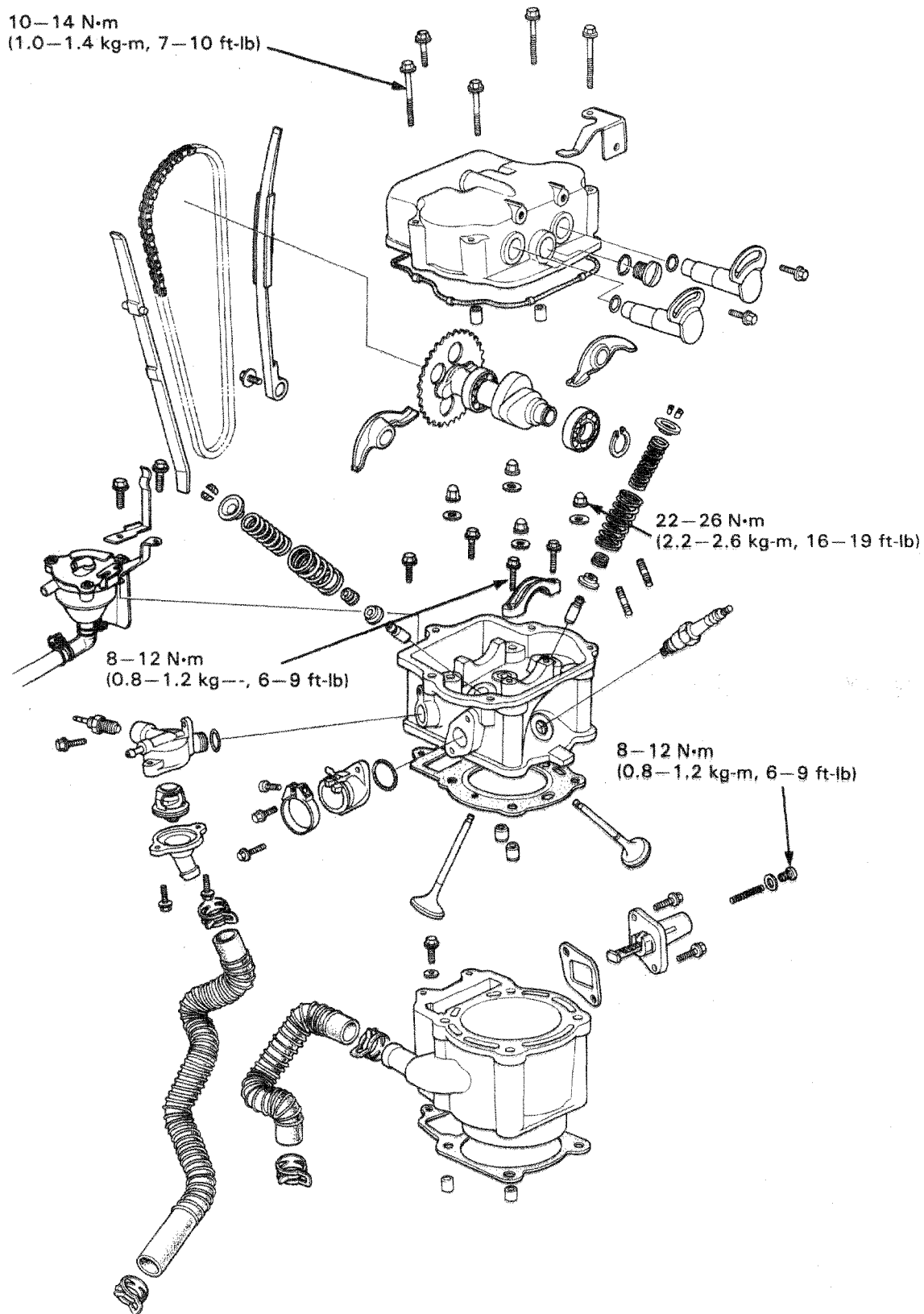
24—30 N·m (2.4—3.0 kg-m, 17—22 ft-lb)

Engine hanger stopper rubber bolt:

24—30 N·m (2.4—3.0 kg-m, 17—22 ft-lb)

## CYLINDER HEAD/VALVES

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# 6. CYLINDER HEAD/VALVES

<b>SERVICE INFORMATION</b>	<b>6-1</b>	<b>VALVE GUIDE REPLACEMENT</b>	<b>6-8</b>
<b>TROUBLESHOOTING</b>	<b>6-2</b>	<b>VALVE SEAT INSPECTION AND REFACING</b>	<b>6-9</b>
<b>CYLINDER HEAD COVER REMOVAL</b>	<b>6-3</b>	<b>CYLINDER HEAD ASSEMBLY</b>	<b>6-11</b>
<b>CYLINDER HEAD COVER DISASSEMBLY</b>	<b>6-3</b>	<b>CYLINDER HEAD INSTALLATION</b>	<b>6-12</b>
<b>CAMSHAFT REMOVAL</b>	<b>6-4</b>	<b>CAMSHAFT INSTALLATION</b>	<b>6-13</b>
<b>CYLINDER HEAD REMOVAL</b>	<b>6-5</b>	<b>CYLINDER HEAD COVER ASSEMBLY</b>	<b>6-14</b>
<b>CYLINDER HEAD DISASSEMBLY</b>	<b>6-6</b>	<b>CYLINDER HEAD COVER INSTALLATION</b>	<b>6-14</b>

## SERVICE INFORMATION

### GENERAL

- This section covers maintenance of the cylinder head, valves, camshaft and rocker arms.
- The fuel tank and heat insulator must be removed for service the cylinder head with the engine installed in the frame.

### SPECIFICATIONS

ITEM			STANDARD mm (in)	SERVICE LIMIT mm (in)
Compression pressure			1,300±200 kPa (13±2 kg/cm², 184±28 psi)	——
Camshaft	Cam height	IN	31.570—31.690 (1.2429—1.2476)	31.52 (1.241)
		EX	31.570—31.690 (1.2429—1.2476)	31.52 (1.241)
Rocker arm	Rocker arm I.D.		12.000—12.018 (0.4725—0.4732)	12.10 (0.476)
	Shaft O.D.		11.966—11.985 (0.4711—0.4719)	11.91 (0.469)
Valve	Valve stem O.D.	IN	4.975—4.990 (0.1959—0.1965)	4.90 (0.193)
		EX	4.955—4.970 (0.1951—0.1957)	4.90 (0.193)
	Valve guide I.D.		5.00—5.012 (0.1969—0.1973)	5.03 (0.198)
	Stem-to-guide clearance	IN	0.010—0.037 (0.0004—0.0015)	0.08 (0.003)
		EX	0.030—0.057 (0.0012—0.0023)	0.10 (0.004)
	Valve spring	Inner	30.7 (1.21)	27.6 (1.09)
	free length	Outer	40.1 (1.58)	36.1 (1.42)
Valve seat width		1.1 (0.04)	1.8 (0.07)	
Cylinder head warpage			——	0.05 (0.002)

### TORQUE VALUES

Cylinder head cover bolt	10—14 N·m (1.0—1.4 kg-m, 7—10 ft-lb)
Cylinder head cap nut	22—26 N·m (2.2—2.6 kg-m, 16—19 ft-lb)
Camshaft holder bolt	8—12 N·m (0.8—1.2 kg-m, 6—9 ft-lb)
Cam chain tensioner sealing bolt	8—12 N·m (0.8—1.2 kg-m, 6—9 ft-lb)
Oil pipe bolt	8—12 N·m (0.8—1.2 kg-m, 6—9 ft-lb)
8 mm	8—22 N·m (1.8—2.2 kg-m, 13—16 ft-lb)
12 mm	

### TOOLS

#### Special

Valve guide reamer, 5.0 mm	07984—MA60000
Valve guide remover	07942—MA60000

#### Common

Valve spring compressor	07757—0010000
Valve guide driver	07743—0020000

## CYLINDER HEAD/VALVES

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### TROUBLESHOOTING

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

#### Low compression

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

#### Compression too high

- Excessive carbon build-up on piston or combustion chamber

#### Excessive noise

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



## CYLINDER HEAD COVER REMOVAL

Remove the following:

- fuel tank (page 4-16)
- fuel tank insulator (page 4-16)

Remove the two oil bolts on the cylinder head cover and right crankcase cover, and remove the oil pipe attaching bolt.

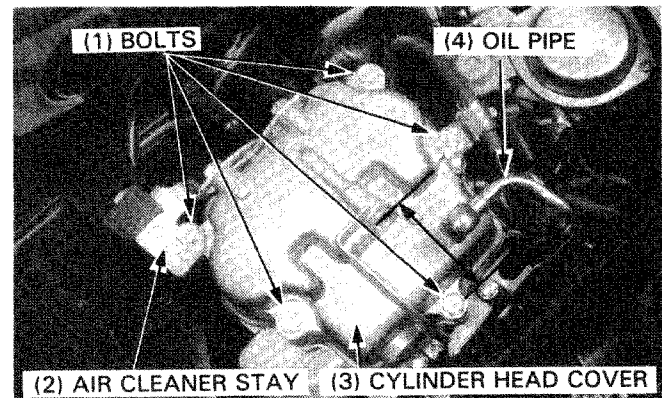
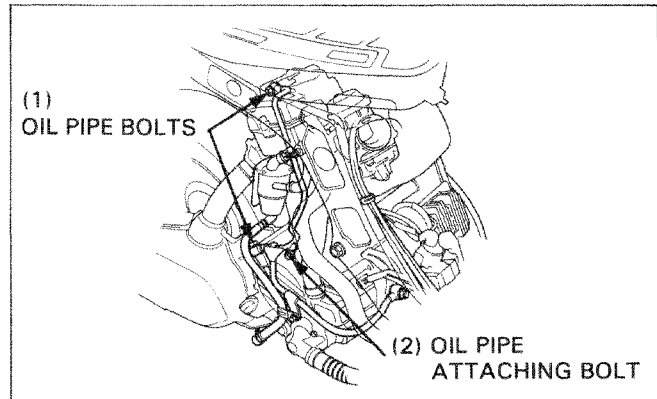
Slide the oil pipe to the right side to obtain clearance for removal of the cylinder head cover.

### CAUTION

- *Be careful not to bent and damage the oil pipe when sliding the oil pipe.*
- *Slide the oil pipe within the distance shown, or oil pipe will be bent.*

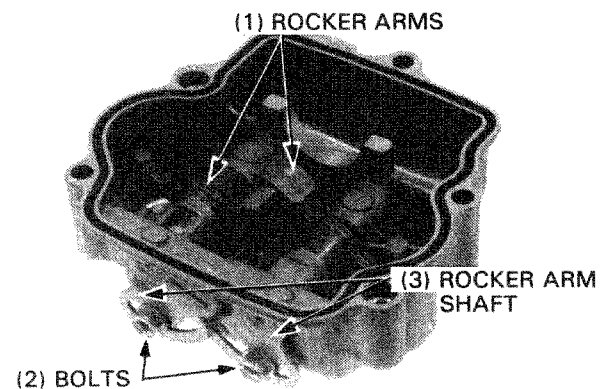
Remove the air cleaner case mount bolt.

Remove the five cylinder head cover bolts, air cleaner stay and cylinder head.



## CYLINDER HEAD COVER DISASSEMBLY

Remove the valve adjuster lock bolts, and the rocker arm by removing the rocker arm shaft.



### INSPECTION

#### ROCKER ARM

Inspect the rocker arm for wear or damage.

Measure the rocker arm I.D.

**SERVICE LIMIT: 12.10 mm (0.476 in)**

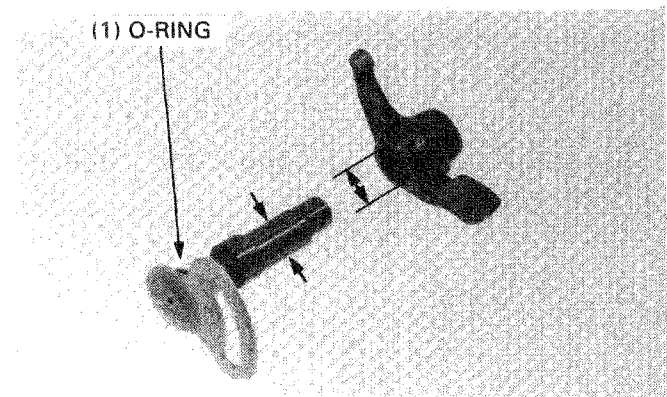
#### ROCKER ARM SHAFT

Inspect the rocker arm shaft for wear or damage.

Measure the rocker arm shaft O.D.

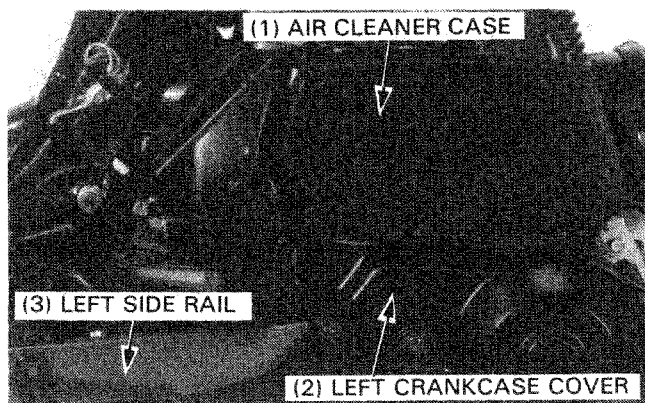
**SERVICE LIMIT: 11.91 mm (0.469 in)**

Inspect the O-ring for damage and replace if necessary.

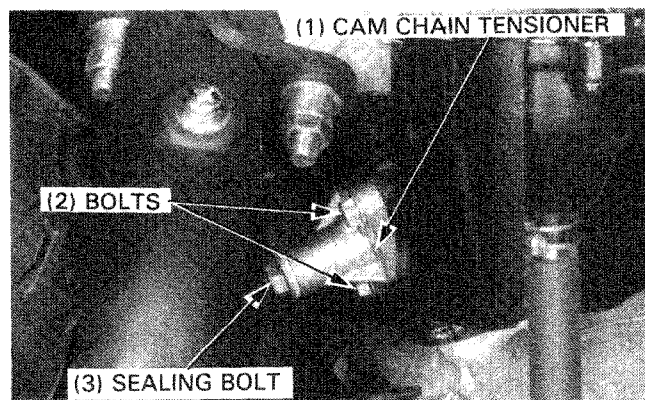


### CAMSHAFT REMOVAL

Remove the left side rail (page 13-3).  
Remove the left foot peg.  
Remove the air cleaner case mount bolts.  
Disconnect the breather tube from the air cleaner case.  
Remove the left side rail (page 13-3).  
Remove the left crankcase cover with the air cleaner case.



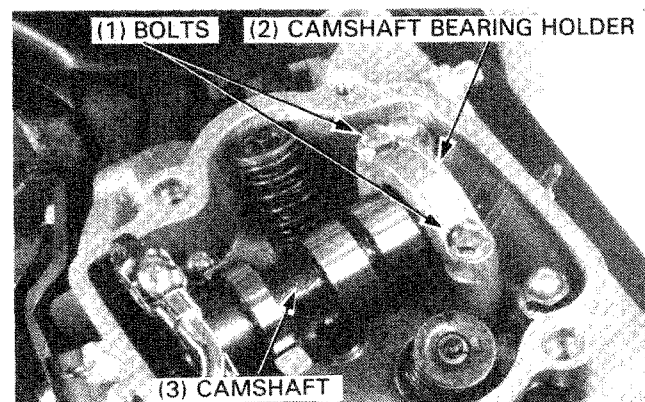
Remove the cam chain tensioner sealing bolt and spring.  
Remove the cam chain tensioner by removing the two bolts.



Remove the two camshaft bearing holder bolts and bearing holder.

#### NOTE

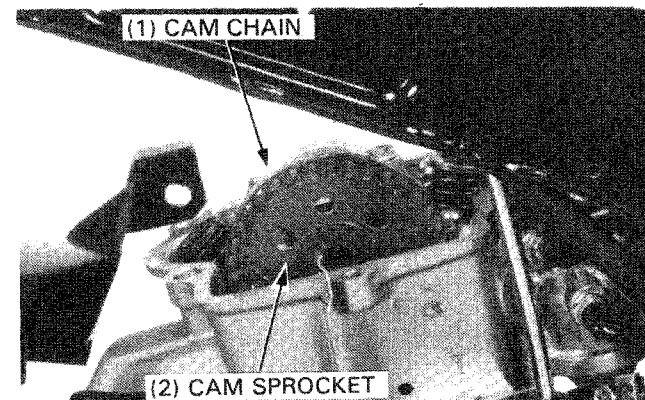
- Be careful not to drop the bolts into the crankcase.



Derail the cam chain from the cam sprocket teeth and remove the camshaft.

#### NOTE

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



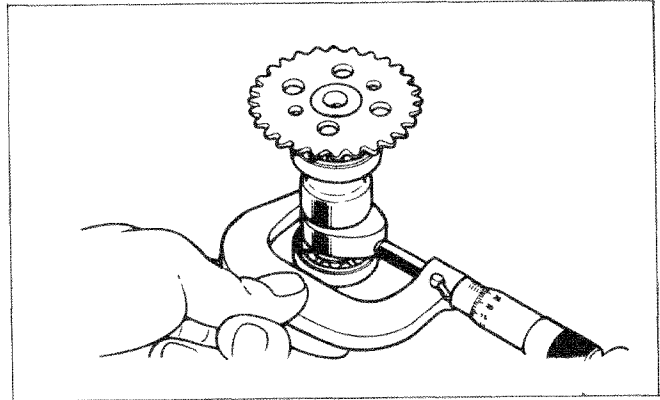
## CAMSHAFT INSPECTION

Check each cam lobe for wear or damage.  
Measure the cam lobe height.

### SERVICE LIMITS:

**INTAKE : 31.52 mm (1.241 in)**

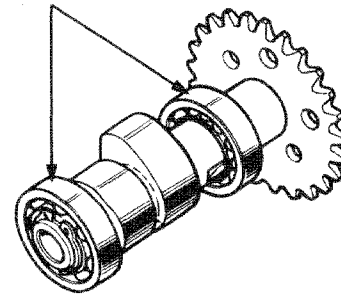
**EXHAUST: 31.52 mm (1.241 in)**



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

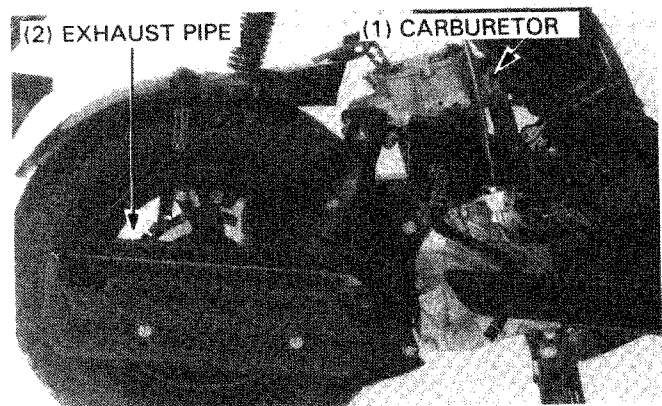
Replace the camshaft assembly if the races do not turn smoothly, quietly, or if they fit loosely on the shaft.

(1) CAMSHAFT BEARINGS

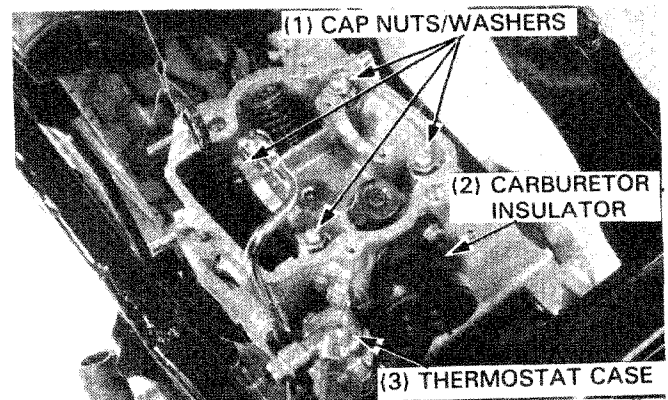


## CYLINDER HEAD REMOVAL

Remove the carburetor (page 4-3).  
Remove the exhaust pipe (page 15-2).

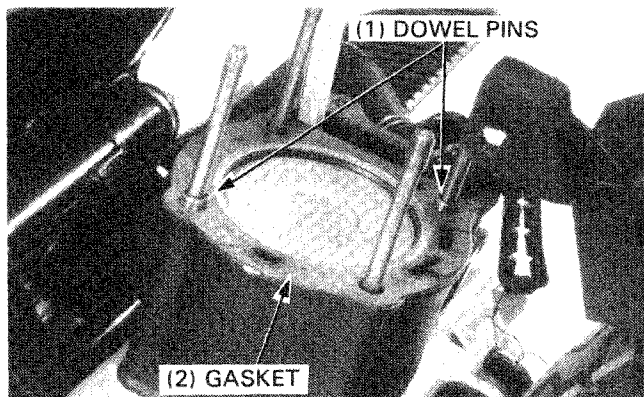


Remove the thermostat case.  
Remove the carburetor insulator by removing the two bolts.  
Remove the cylinder head base bolts and breather separator.  
Remove the cylinder head cap nuts, washers and cylinder head.



## CYLINDER HEAD/VALVES

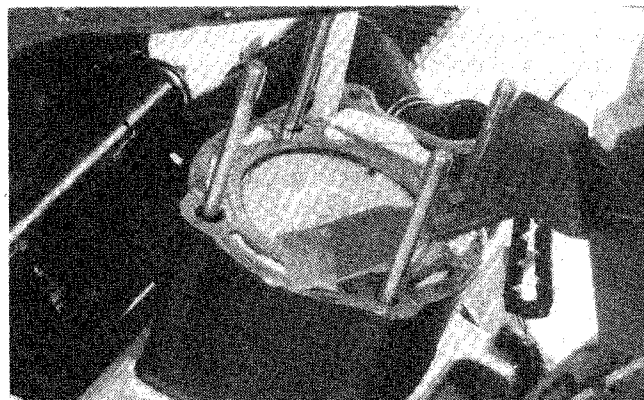
Remove the cylinder head gasket and two dowel pins.



Remove all gasket material from the cylinder head mating surface.

### NOTE

- Avoid damaging the gasket surface.
- Be careful not to drop gasket material into the crankcase.



## CYLINDER HEAD DISASSEMBLY

Compress the valve spring and remove the valve cotters, retainers, springs, spring seats and valves.

### CAUTION

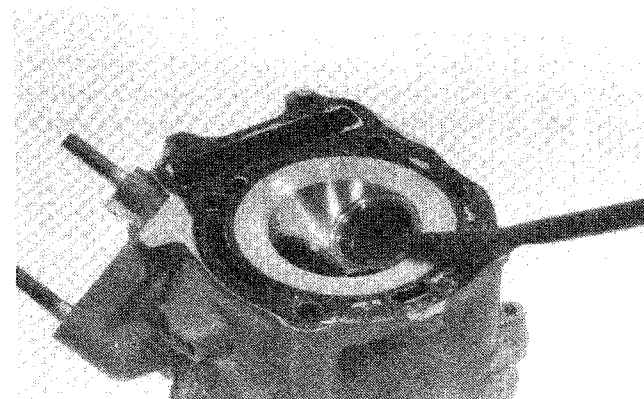
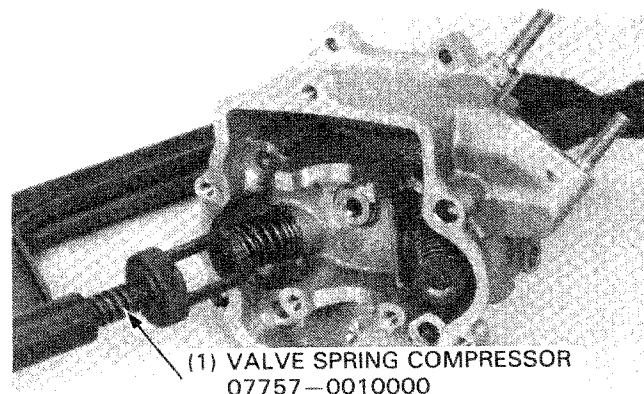
- *To prevent loss of tension, do not compress the valve springs more than necessary to remove the cotters.*

### NOTE

- Mark all disassembled parts to ensure correct reassembly.

Remove the valve stem seals.

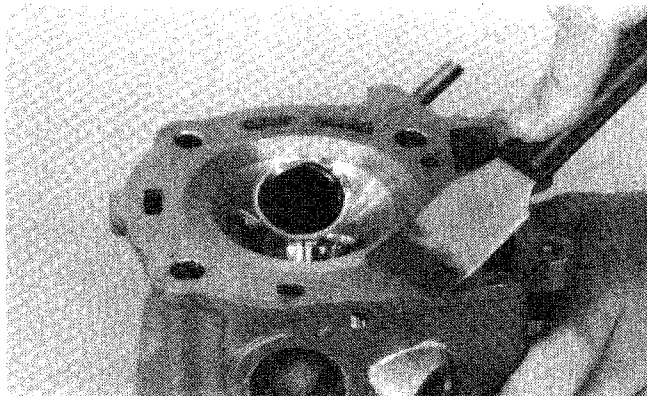
Remove carbon deposits from the combustion chamber.



Clean off any gasket material from the cylinder head gasket surface.

#### NOTE

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

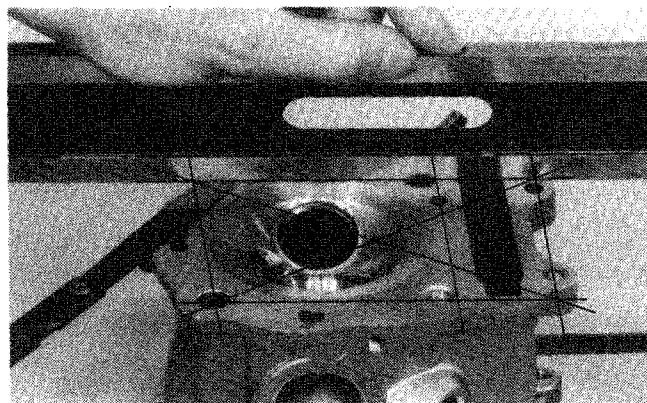


## INSPECTION

### CYLINDER HEAD

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

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



### VALVE SPRING FREE LENGTH

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

#### SERVICE LIMITS:

INNER (IN, EX): 27.6 mm (1.09 in)

OUTER (IN, EX): 36.1 mm (1.42 in)



### VALVE STEM

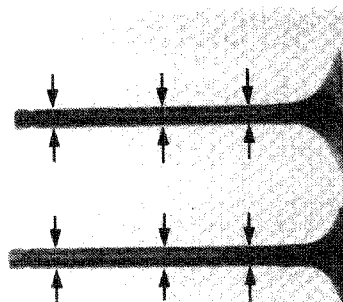
Inspect each valve for bending, burning, or abnormal stem wear.

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

#### SERVICE LIMITS:

IN : 4.90 mm (0.193 in)

EX: 4.90 mm (0.193 in)





## CYLINDER HEAD/VALVES

### VALVE GUIDES

#### NOTE

- Ream the guides to remove any carbon build-up before checking clearances.

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

**SERVICE LIMIT: 5.03 mm (0.198 in)**

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

#### SERVICE LIMITS:

**IN : 0.08 mm (0.003 in)**  
**EX: 0.10 mm (0.004 in)**

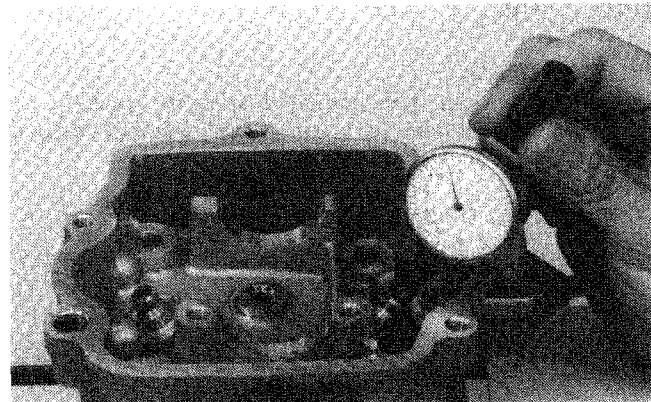
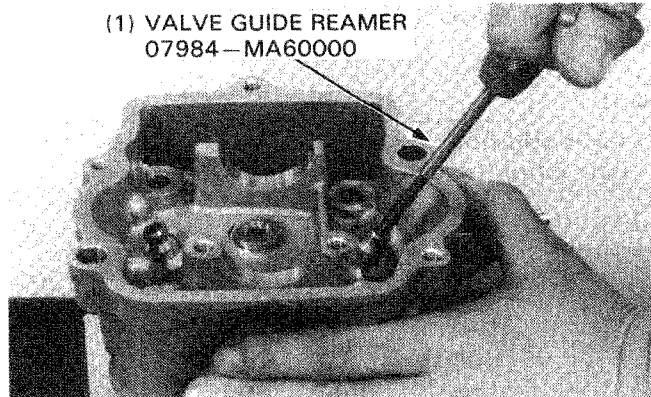
#### NOTE

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

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

#### NOTE

- Reface the valve seats whenever the valve guides are replaced (page 6-10).



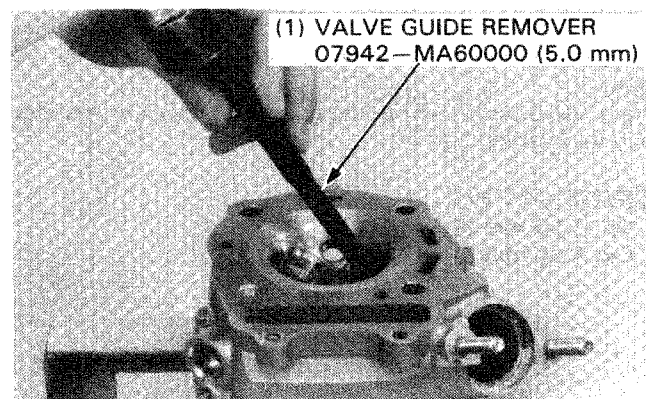
## VALVE GUIDE REPLACEMENT

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

#### CAUTION

- *Do not use a torch to heat the cylinder head; it may cause warping.*
- *To avoid burns, wear heavy gloves when handling the heated cylinder head.*

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

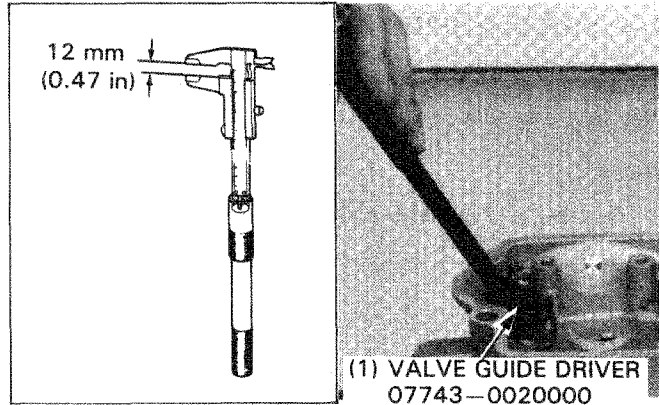


**NOTE**

- After driving the guides in, check the guides for damage.
- Cylinder head heat should still be at 100°C (212°F) for installation of the new guide.

Adjust the valve guide driver so that the valve guide height is 12 mm (0.47 in).

Drive a new guides into the cylinder head from the rocker arm side.

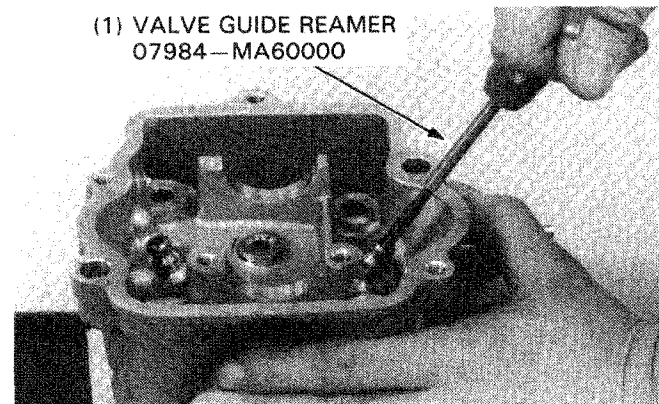


Let the cylinder head cool to room temperature and ream the new valve guides.

**NOTE**

- Use cutting oil on the reamer during this operation.
- Rotate the reamer in the same direction when inserting and removing it.

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

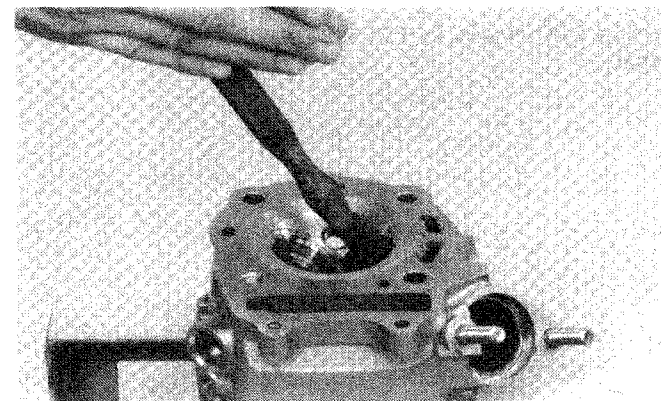
**VALVE SEAT INSPECTION AND REFACING**

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

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

**NOTE**

- Do not allow the compound to enter between the valve stem and guide. After lapping, wash out the compound completely and apply a coat of engine oil to the valve face and set.



Remove the valve and inspect the face.

**CAUTION**

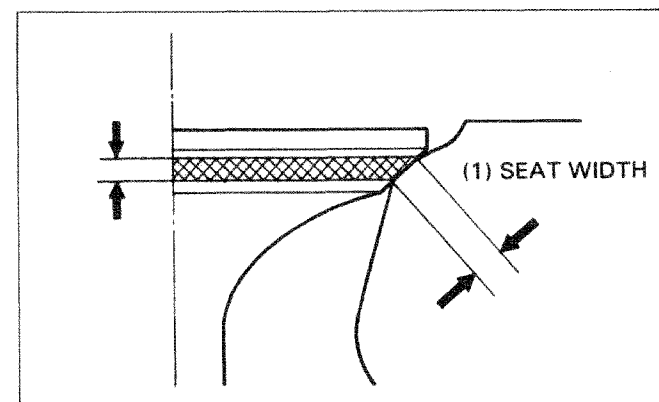
- *The valves cannot be ground. If the valve face is burned, worn unevenly, or if it contacts the seat improperly, the valve must be replaced.*

Inspect the valve seat.

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

**SEAT WIDTH:**

Service limit: 1.8 mm (0.07 in)





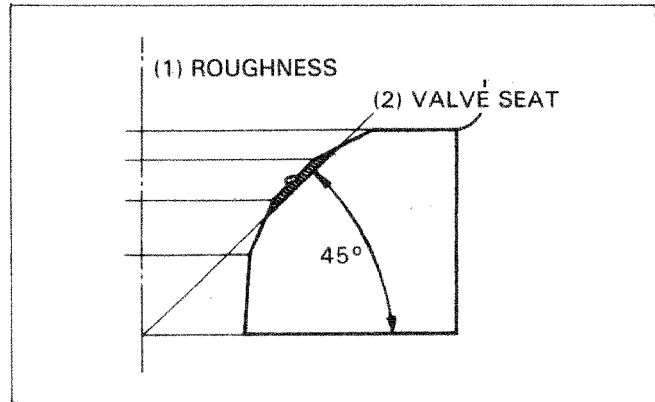
## CYLINDER HEAD/VALVES

### VALVE SEAT GRINDING

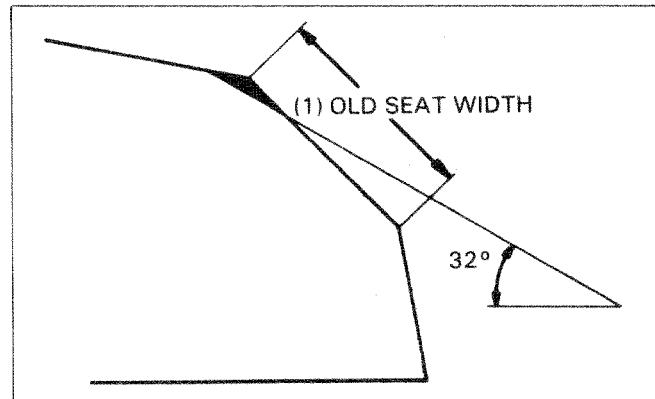
Using a 45 degree cutter, remove any roughness or irregularities from the seat.

#### NOTE

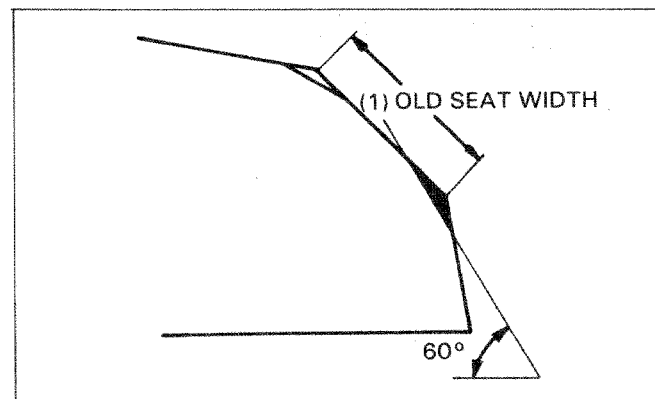
- Reface the seat with a 45 degree cutter when the valve guide is replaced.



Using a 32 degree cutter, remove 1/4 of the existing valve seat material.



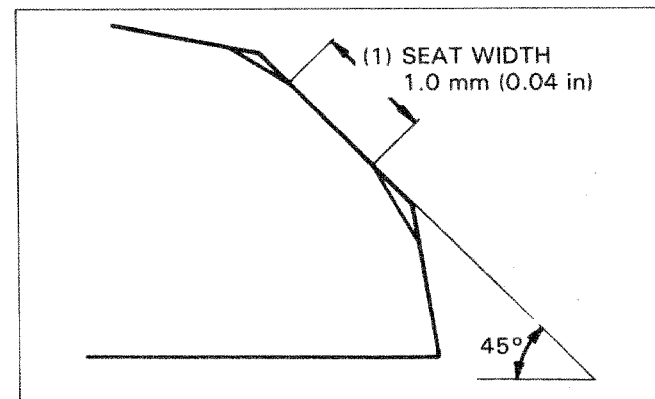
Using a 60 degree cutter, remove the bottom 1/4 of the old seat.



Using a 45 degree finish cutter, cut the seat to the proper width.

#### NOTE

- Make sure that all pitting and irregularities are removed. Refinish if necessary.



## NOTE

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

Apply a thin coating of Prussian Blue to the valve seat. Press the valve through the valve guide and onto the seat to make a clear pattern.

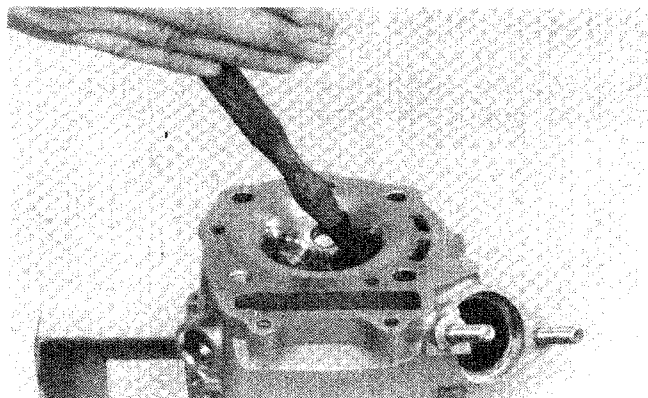
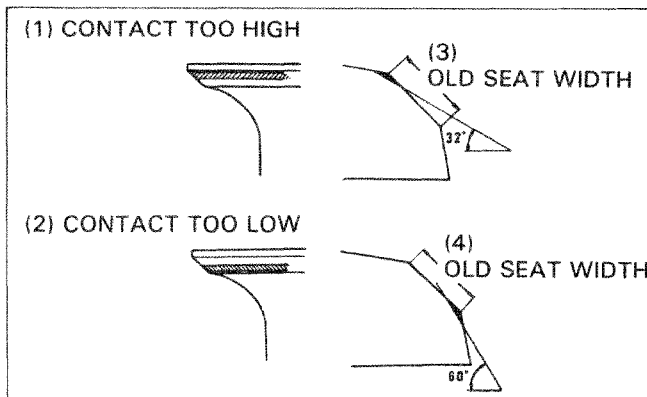
Remove to inspect the valve.

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

Refinish the seat to the correct width using a 45 degree finish cutter.

If the contact area is too low on the valve, the seat must be raised using a 60 degree inner cutter. Refinish the seat to the correct width, using a 45 degree finish cutter.

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



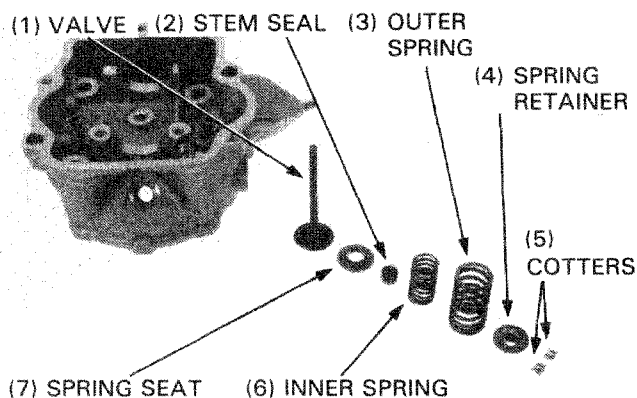
## CYLINDER HEAD ASSEMBLY

Lubricate each valve stem with oil, then insert the valves into the valve guides.

Install new valve stem seals.

Install the valve spring seat, springs and retainers.

The springs tightly wound coils should face in toward the combustion chamber.

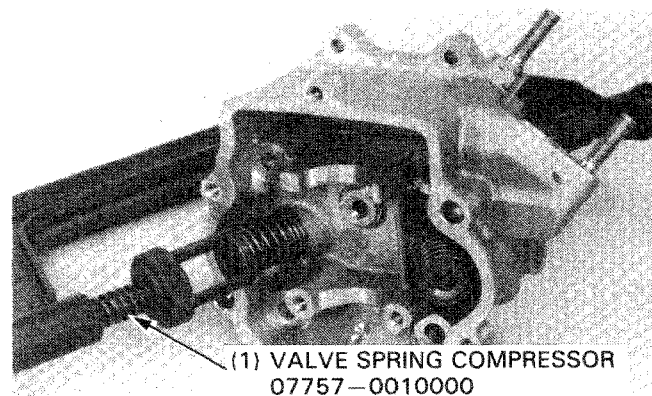


The spring tightly wound coils should face in toward the combustion chamber.

Compress the valve springs using the valve spring compressor, then install the valve cotters.

## CAUTION

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

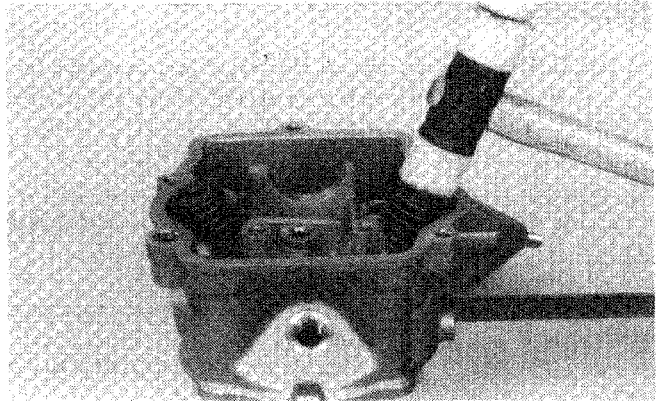


## CYLINDER HEAD/VALVES

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

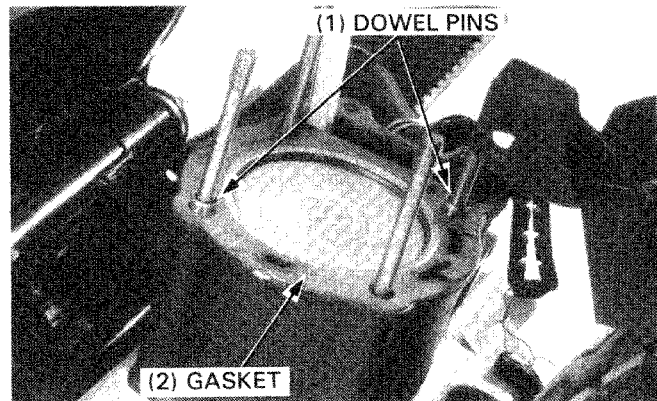
### CAUTION

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



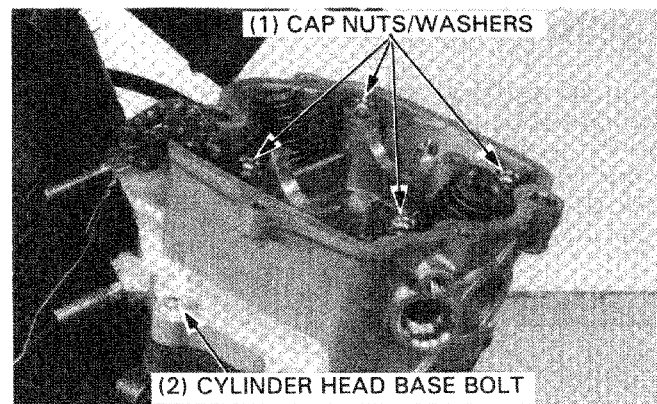
## CYLINDER HEAD INSTALLATION

Clean any gasket material from the cylinder surface. Install the dowel pins and new gasket.

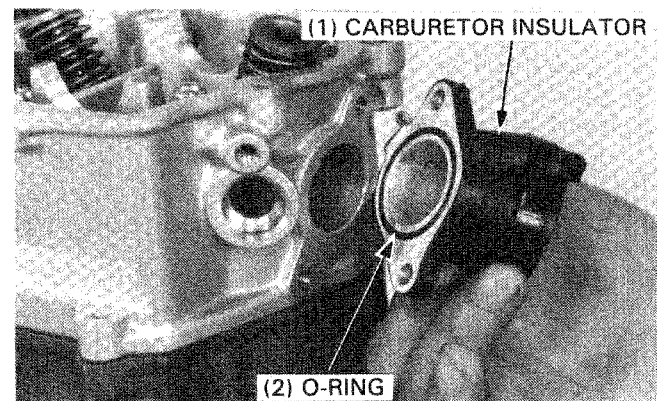


Install the cylinder head, the washers and cap nuts and tighten them in a crisscross pattern in two or more steps.

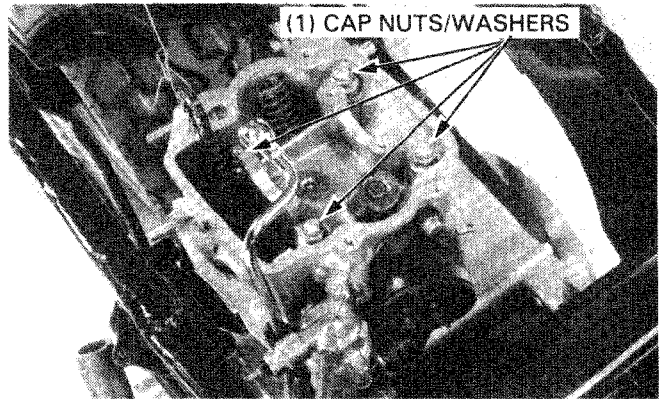
**TORQUE: 22–26 N·m**  
(2.2–2.6 kg·m, 16–19 ft·lb)



Install the O-ring into the groove of the carburetor insulator. Install the insulator onto the cylinder head using the two bolts. Make sure that the vacuum tube fitting faces up.

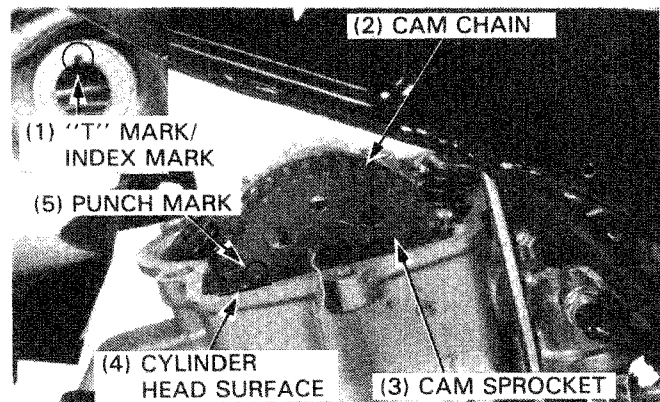


Install the carburetor and tighten the insulator and connecting tube bands.  
Install the thermostat housing onto the cylinder head with the bolt.  
Install the exhaust pipe using the two nuts.



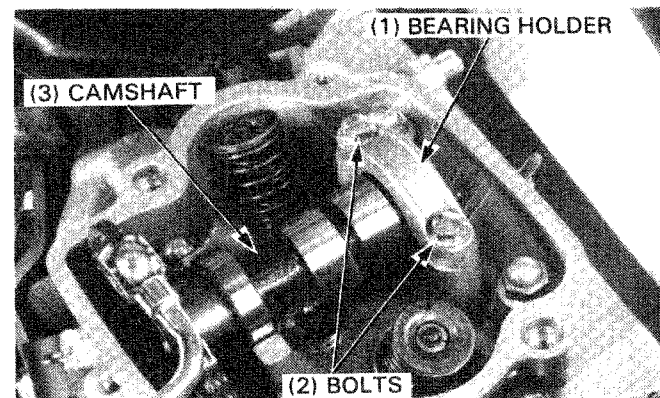
## CAMSHAFT INSTALLATION

Remove the timing mark hole cap.  
Turn the drive pulley and align the "T" mark on the flywheel with the index notch on the right crankcase.  
Position the intake and exhaust cam lobes down.  
Align the punch mark on the cam sprocket with the cylinder head surface and install the cam chain over the cam sprocket.



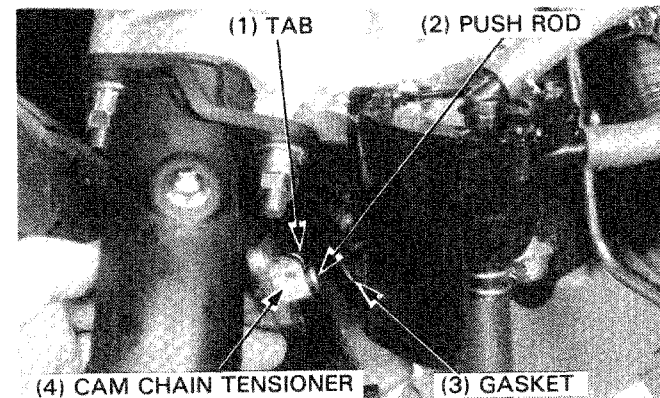
Install the camshaft bearing holder onto the cylinder head and tighten the two bolts.

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



Align the "T" mark on the flywheel with the index mark and make sure that the punch mark on the cam sprocket is aligned with the rear side of the cylinder head matting surface.

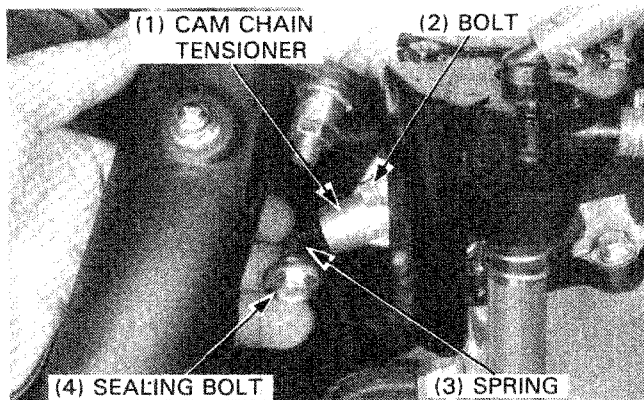
Install the new cam chain tensioner gasket.  
Press down on the tab to release the push rod.  
Push the rod back into the tensioner body, and release the tab to secure the rod.



## CYLINDER HEAD/VALVES

Install the tensioner with the two bolts.  
Install the tensioner spring and tighten the sealing bolt.

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

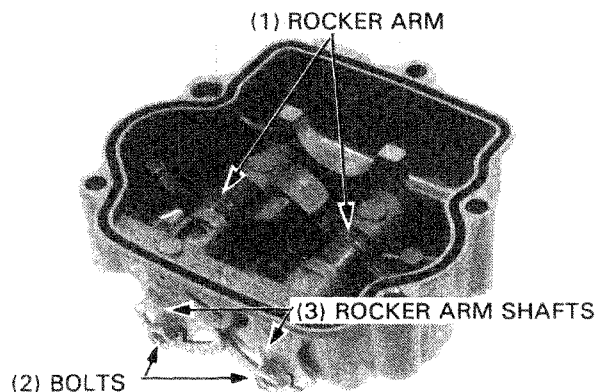


Install the left crankcase and air cleaner using the four bolts.  
Connect the breather tube to the air cleaner case.  
Tighten the two air cleaner case mounting bolts.  
Install the left pillion step.  
Install the left floor panel (page 13-3).



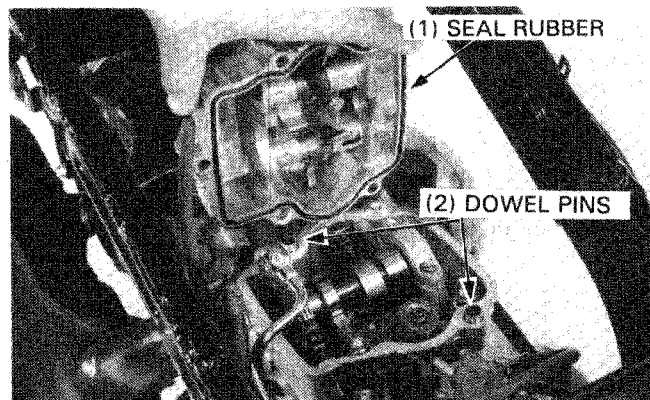
## CYLINDER HEAD COVER ASSEMBLY

Install new O-rings onto each rocker arm shaft.  
Apply engine oil to the rocker arm shafts.  
Install the rocker arms and shafts into the cylinder head cover.  
Install the valve adjuster lock bolts loosely.



## CYLINDER HEAD COVER INSTALLATION

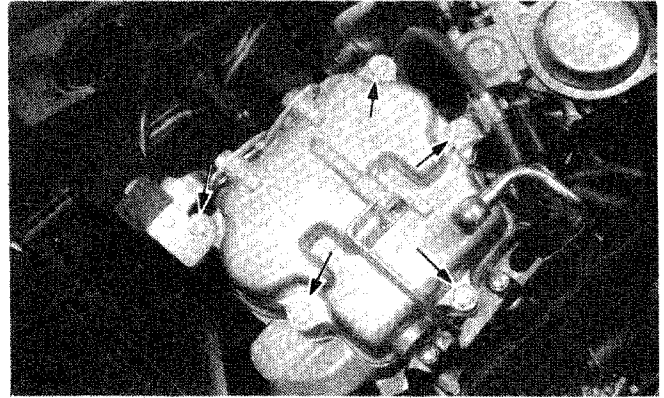
Fill the oil pocket in the cylinder head with clean engine oil to provide initial lubrication for the cam shaft when the engine is started.  
Install two dowel pins onto the cylinder head.  
Install the seal rubber into the groove of the cylinder head cover.  
Install the cylinder head cover.



Install the air cleaner stay and five 6 mm flange bolts.  
Tighten the 6 mm flange bolts in crisscross pattern in two or more steps.

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

Tighten the air cleaner case to the stay with the bolt.



Make sure that the oil line is not clogged.  
Install the oil line using the oil pipe bolts socket head bolts and sealing washers.

#### CAUTION

- The 8 mm oil pipe bolt for the cylinder head cover side is black because its oil hole differs from the oil pipe bolt for the right crankcase cover side.
- Install the oil pipe bolts to the correct positions.
- If the 8 mm oil pipe bolts are interchanged with each other, engine damage may result.

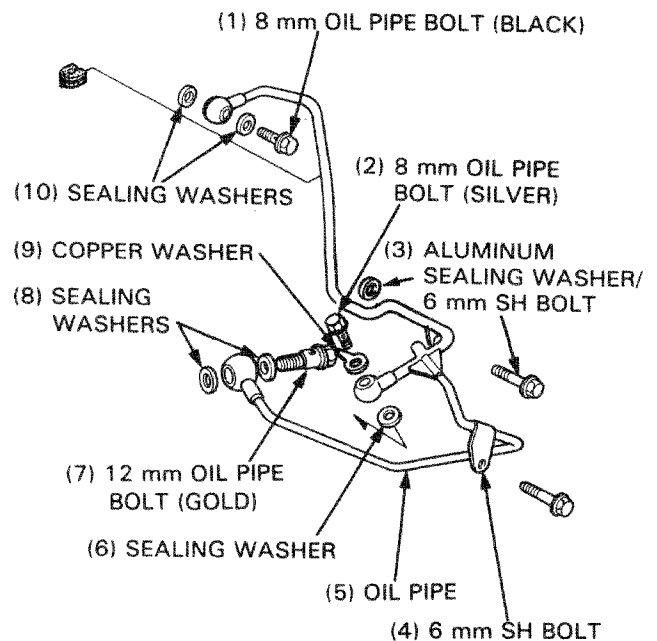
Tighten the oil pipe bolts.

**TORQUE VALUES:**  
8 mm: 8–12 N·m  
(0.8–1.2 kg-m, 6–9 ft-lb)  
12 mm: 18–22 N·m  
(1.8–2.2 kg-m, 13–16 ft-lb)

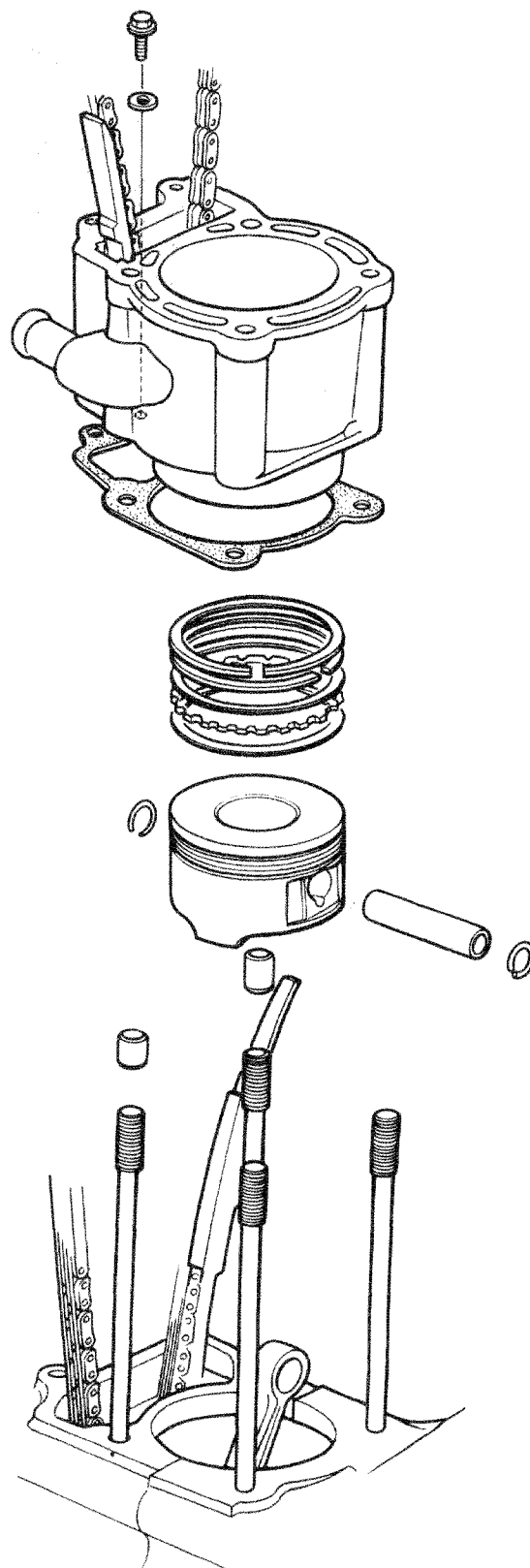
Tighten the three oil pipe attaching bolts at the oil pipe bracket.

Adjust the valve clearance (page 3-7).

Install the heat insulator and fuel tank (page 4-16).









# 7. CYLINDER/PISTON

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

## SERVICE INFORMATION

### GENERAL

- The cylinder and piston can be serviced with the engine in the frame.

### SPECIFICATIONS

ITEM			STANDARD mm (in)	SERVICE LIMIT mm (in)
Cylinder	I.D.		72.000—72.010 (2.8346—2.8350)	72.10 (2.839)
	Warpage		—	0.05 (0.002)
Piston, Piston ring	Ring-to-groove clearance	Top	0.015—0.050 (0.0006—0.0020)	0.09 (0.004)
		Second	0.015—0.050 (0.0006—0.0020)	0.09 (0.004)
	Ring end gap	Top	10.15—0.35 (0.006—0.014)	0.50 (0.020)
		Second	0.15—0.35 (0.006—0.014)	0.50 (0.020)
		Oil (Side rail)	0.2—0.7 (0.01—0.03)	—
	Piston O.D.		71.970—71.990 (2.8338—2.8342)	71.90 (2.831)
	Piston-to-cylinder clearance		0.010—0.040 (0.0004—0.0016)	0.10 (0.004)
	Piston pin bore		17.002—17.008 (0.6694—0.6696)	17.04 (0.671)
Piston pin O.D.			16.994—17.000 (0.6691—0.6693)	16.96 (0.668)
Piston-to-piston pin clearance			0.002—0.014 (0.0001—0.0006)	0.02 (0.001)
Connecting rod small end I.D.			17.016—17.034 (0.6699—0.6706)	17.06 (0.672)

**7**

## TROUBLESHOOTING

### Low compression or uneven compression

- Worn cylinder or piston rings

### Excessive smoke

- Worn cylinder, piston or piston rings
- Improperly installed piston rings
- Damaged piston or cylinder

### Overheating

- Excessive carbon build-up on piston head
- Blocked or restricted flow of coolant
- Sticking thermostat

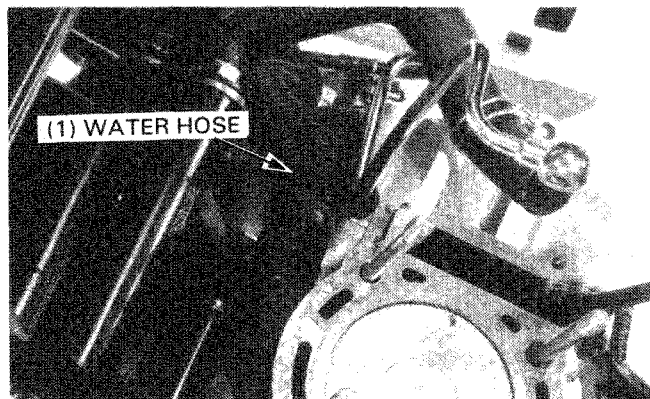
### Knocking or abnormal noise

- Worn piston and cylinder
- Excessive carbon build-up on piston head

## CYLINDER REMOVAL

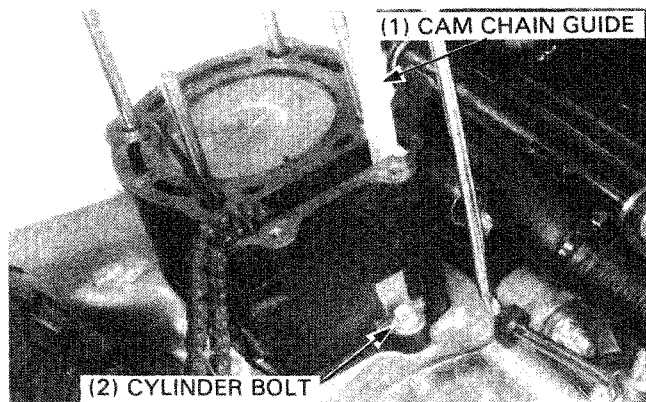
Remove the cylinder head (section 6).

Disconnect the water hose from the cylinder.

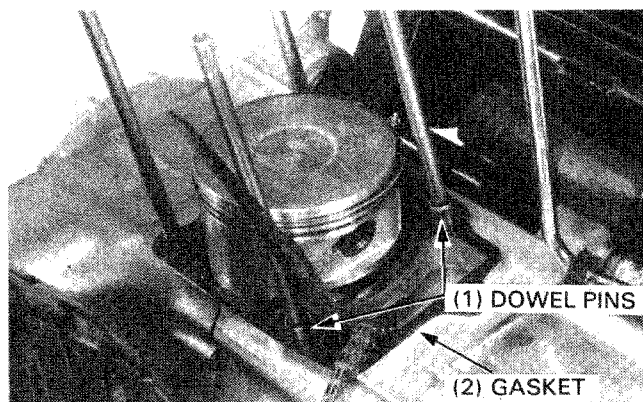


Remove the cylinder base bolt and cylinder.

Remove the cam chain guide.



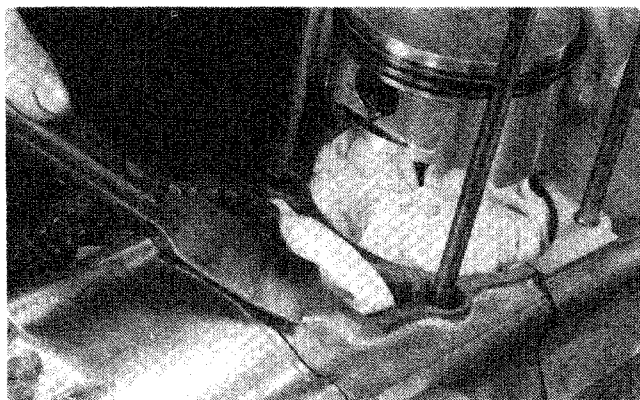
Remove the cylinder gasket and dowel pins.



Place the rags in the crankcase openings.  
Clean off any gasket material from the cylinder surface of the crankcase.

### NOTE

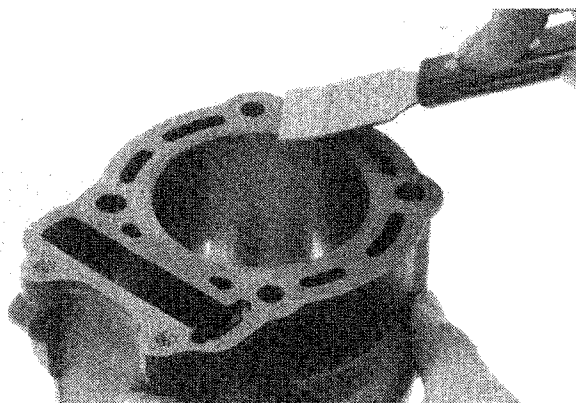
- Gasket material will come off easier if it is soaked in solvent.



Clean any gasket material from the cylinder surface.

#### NOTE

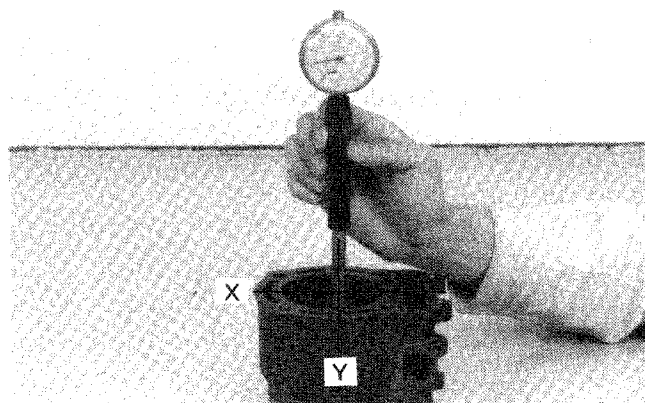
- Gasket material will come off easier if it is soaked in solvent.



#### INSPECTION

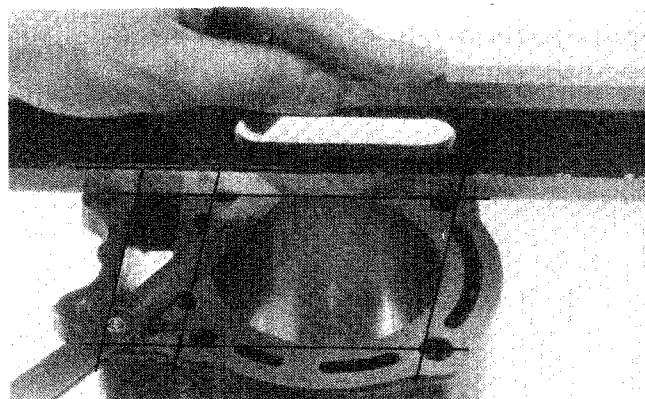
Inspect the cylinder bore for wear or damage.  
Measure the cylinder I.D. at three levels in X and Y axis.

**SERVICE LIMIT: 72.10 mm (2.839 in)**



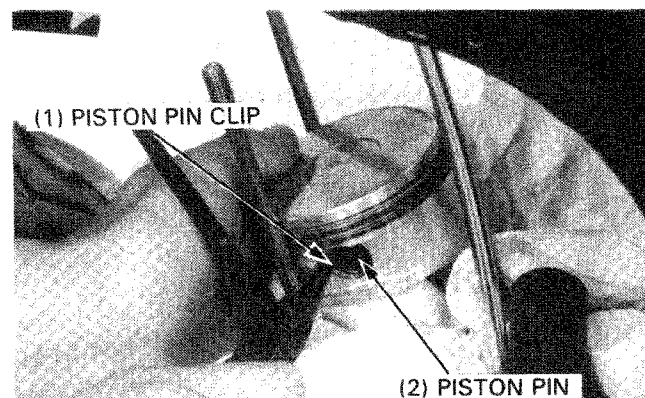
Inspect the top of the cylinder for warpage.

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



#### PISTON REMOVAL

Place clean shop towels in the crankcase opening to keep the piston pin clips, or other parts from falling into the crankcase.  
Remove the piston pin clips with pliers.  
Pull the piston pin out of the piston.



## CYLINDER/PISTON

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### INSPECTION

Measure the piston O.D.

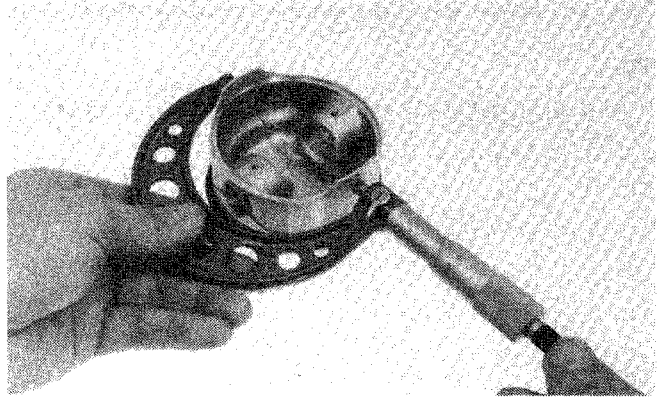
#### NOTE

- Take measurements at 10 mm (0.4 in) from the bottom, and 90° to the piston pin hole.

**SERVICE LIMIT: 71.90 mm (2.831 in)**

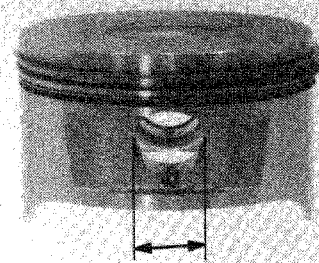
Calculate the piston-to cylinder clearance.

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



Measure the piston pin hole I.D.

**SERVICE LIMIT: 17.04 mm (0.6709 in)**

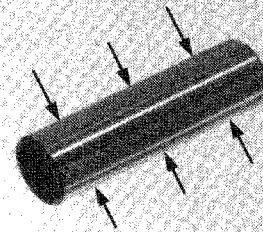


Measure piston pin O.D.

**SERVICE LIMIT: 16.96 mm (0.668 in)**

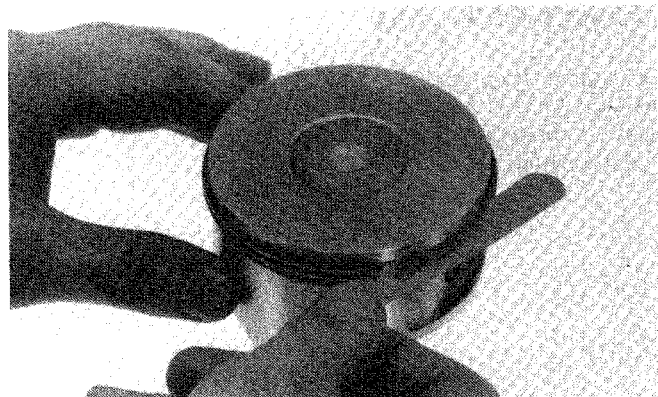
Calculate the piston pin-to piston clearance.

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



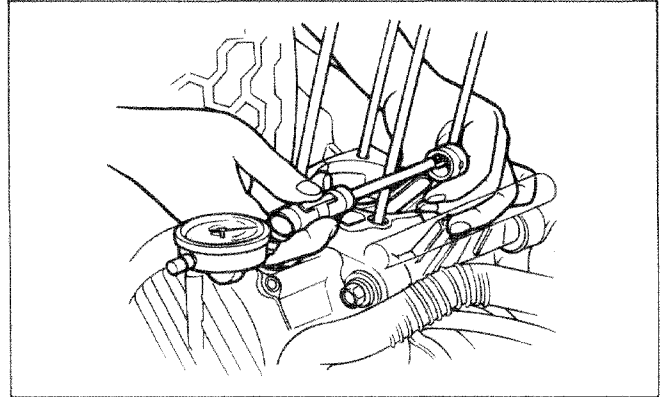
Measure the piston ring-to-groove clearance.

**SERVICE LIMITS: TOP 0.09 mm (0.004 in)**  
**2nd 0.09 mm (0.004 in)**



Measure the connecting rod small end I.D.

**SERVICE LIMIT: 17.06 mm (0.672 in)**



Remove the piston rings.

Inspect the piston for damage and the ring grooves for wear.

### CAUTION

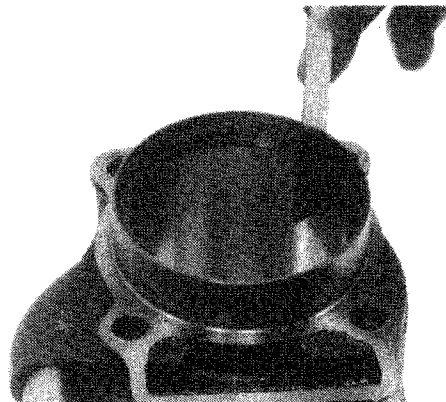
- *Piston rings are easily broken; take care not to damage them during removal.*



Insert each piston ring into the cylinder 20 mm (0.75 in) in from the bottom. To ensure that it's square in the bore, use a piston to push it in.

Measure the ring end gap.

**SERVICE LIMITS: TOP 0.50 mm (0.020 in)**  
**2nd 0.50 mm (0.020 in)**



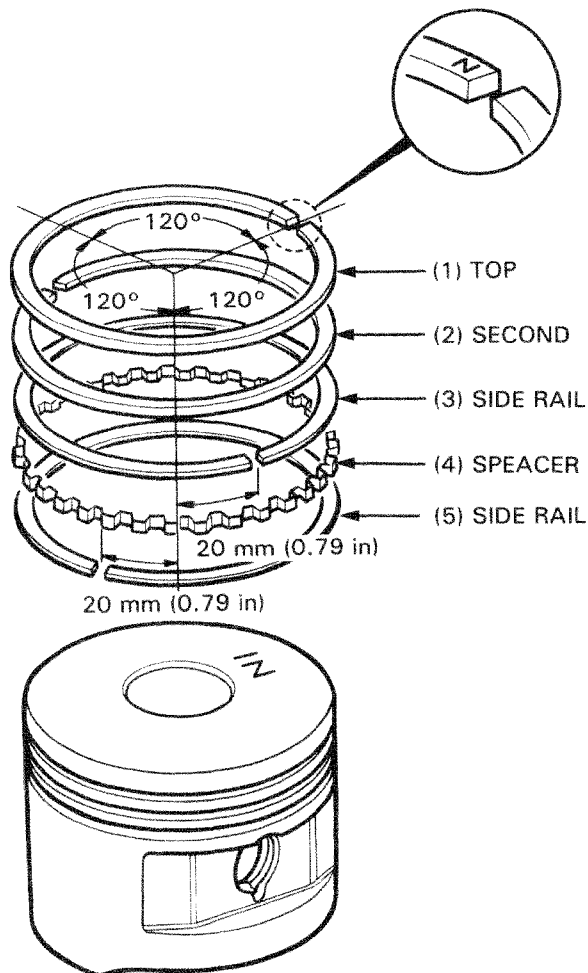
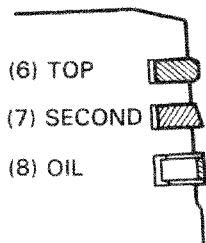
## CYLINDER/PISTON

### PISTON RING INSTALLATION

Clean the piston head, ring lands, and skirts.  
Carefully install the piston rings onto the piston.  
Stagger the ring end gaps as shown.

#### NOTE

- Be careful not to damage the piston and piston rings during assembly.
- All rings should be installed with the markings facing up.
- After installing the rings they should rotate freely, without sticking.

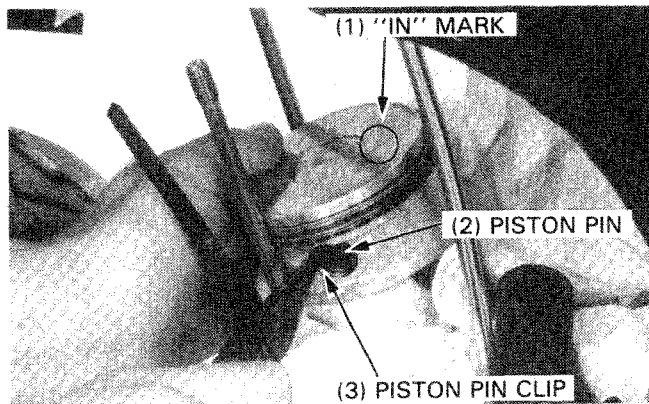


### PISTON INSTALLATION

Install the piston and piston pin. Position the piston "IN" mark on the intake valve side.  
Install a new piston pin clips.

#### NOTE

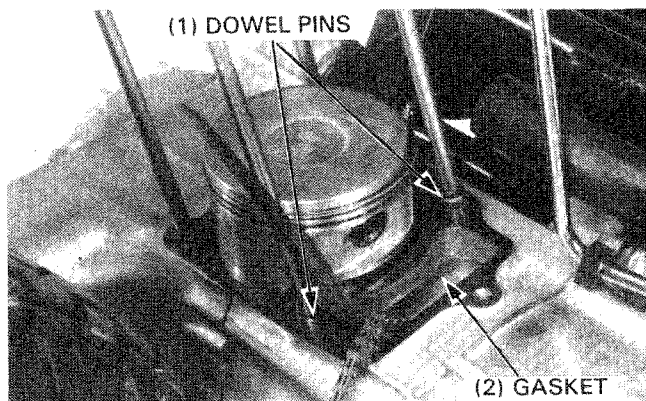
- Do not align the piston pin clip end gap with the piston cut-out.
- Place a shop towel around the piston skirt and in the crankcase to prevent the piston pin clips from falling into the crankcase.





## CYLINDER INSTALLATION

Install the two dowel pins and a new cylinder gasket.



Coat the cylinder bore, piston and piston rings with fresh engine oil.  
Carefully lower the cylinder over the piston by compressing the piston rings, one at a time.

### CAUTION

- *Do not force the cylinder over a ring; you may damage the piston and piston rings.*

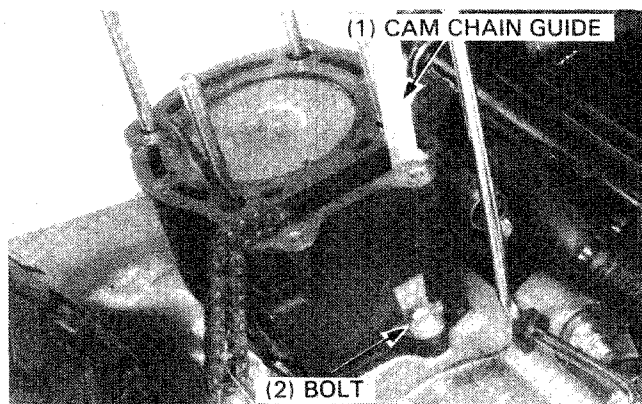


Loosely install the cylinder base bolt and seal washer.

Install the cam chain guide.

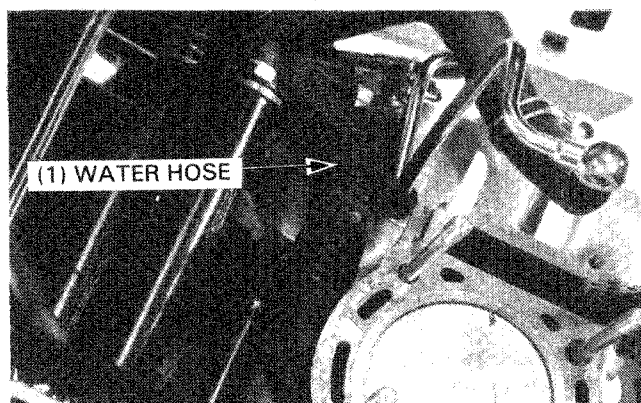
### NOTE

- Push the guide in until it bottoms in the crankcase guide hole.



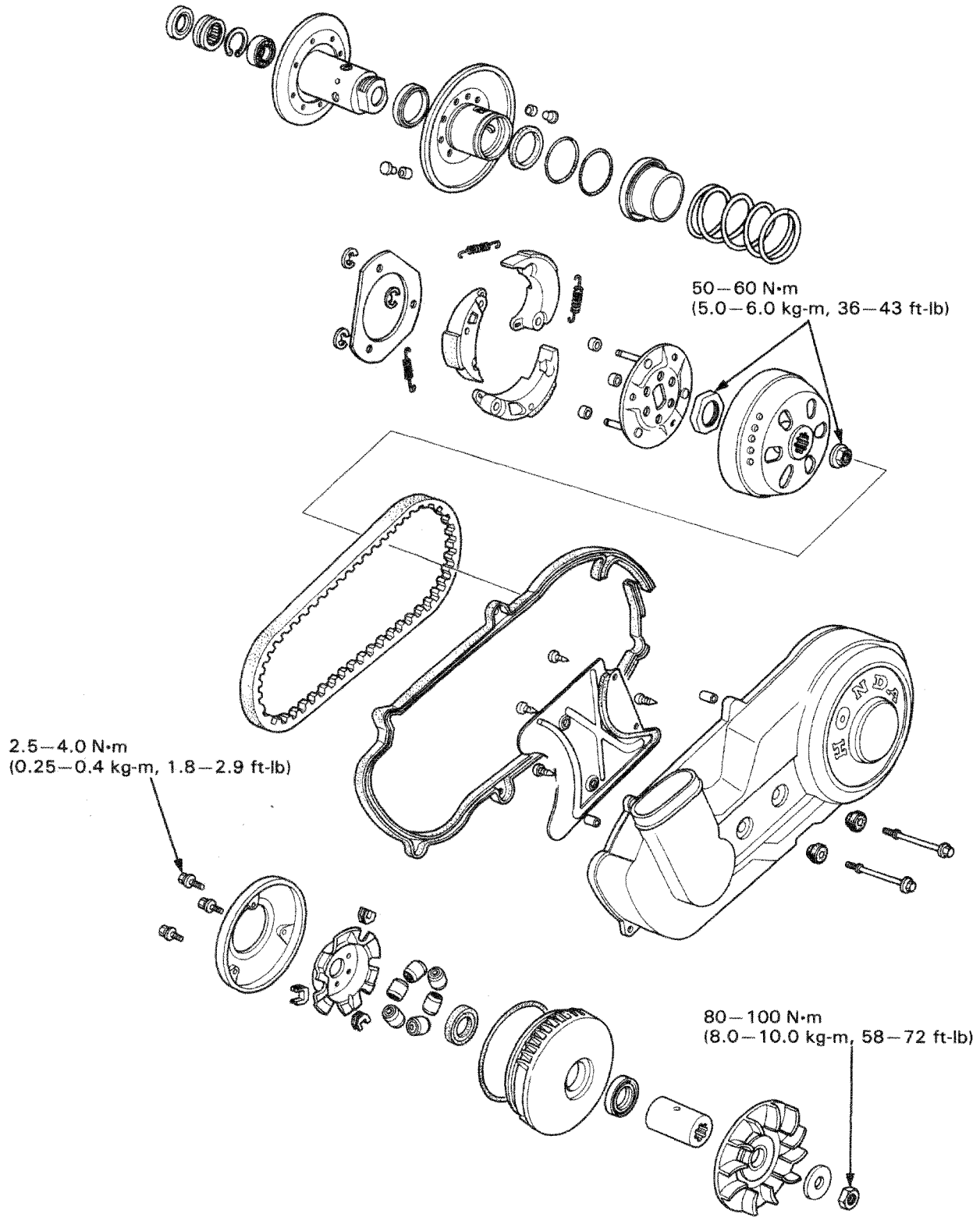
Install the water hose to the cylinder.

Install the cylinder head (section 6).  
Tighten the cylinder base bolt.





DRIVE PULLEY/CLUTCH/DRIVEN PULLEY



# 8. DRIVE PULLEY/CLUTCH/DRIVEN PULLEY

SERVICE INFORMATION	8-1	DRIVE BELT	8-4
TROUBLESHOOTING	8-2	DRIVE PULLEY	8-5
LEFT CRANKCASE COVER	8-3	CLUTCH/DRIVEN PULLEY	8-9

## SERVICE INFORMATION

### GENERAL

- The drive pulley, clutch and driven pulley can be serviced with the engine installed.
- Avoid getting grease and oil on the drive belt and pulley faces.

### SPECIFICATIONS

ITEM	STANDARD mm (in)	SERVICE LIMIT mm (in)
Movable drive face bushing I.D.	27.000—27.021 (1.0630—1.0638)	27.06 (1.065)
Drive face boss O.D.	26.970—26.990 (1.0618—1.0626)	26.94 (1.061)
Drive belt width	22.0—23.0 (0.87—0.91)	21.7 (0.85)
Clutch lining thickness	—	2.0 (0.08)
Clutch outer I.D.	135.0—135.2 (5.31—5.32)	135.5 (5.33)
Driven face spring free length	98.8 (3.89)	94.0 (3.70)
Driven face O.D.	39.965—39.985 (1.5734—1.5742)	39.94 (1.572)
Movable driven face I.D.	40.000—40.025 (1.5748—1.5758)	40.06 (1.577)

### TORQUE VALUES

Drive face nut	80—100 N·m (3.0—10.0 kg-m, 58—72 ft-lb)
Drive face seal cover bolt	2.5—4.0 N·m (0.25—0.4 kg-m, 1.8—2.9 ft-lb)
Clutch outer nut	50—60 N·m (5.0—6.0 kg-m, 36—43 ft-lb)
Movable driven face nut	50—60 N·m (5.0—6.0 kg-m, 36—43 ft-lb)

### TOOLS

#### Special

Lock nut wrench, 41 mm	07916—9580300
Drive pulley holder	07923—KM10000
Clutch spring compressor	07960—KM10000
Driver	07949—3710001

#### Common

Universal holder	07725—0030000
Driver	07749—0010000 or 07949—3710001
Pilot, 15 mm	07746—0040300
Pilot, 22 mm	07746—0041000
Attachment, 24 x 26 mm	07746—0010700
Attachment, 32 x 35 mm	07746—0010100

## **TROUBLESHOOTING**

**Engine starts but scooter won't move**

- Worn drive belt
- Damaged ramp plate
- Worn or damaged clutch lining

**Engine stalls or scooter creeps**

- Broken clutch weight spring

**Poor performance at high speed or lack of power**

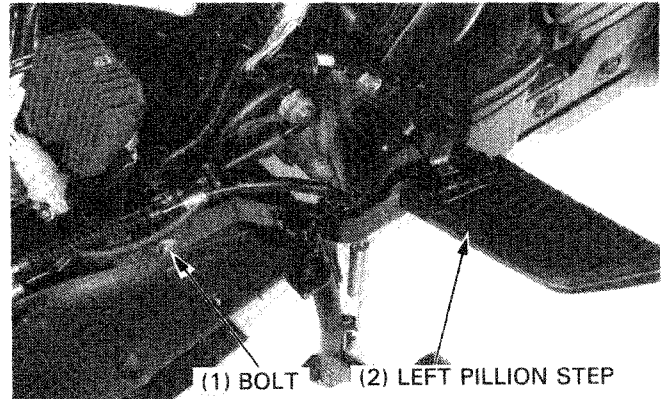
- Worn drive belt
- Weak driven face spring
- Faulty driven face

## LEFT CRANKCASE COVER

### REMOVAL

Remove the body center cover and the left side rail (page 13-3).

Remove the bolt and left pillion step.



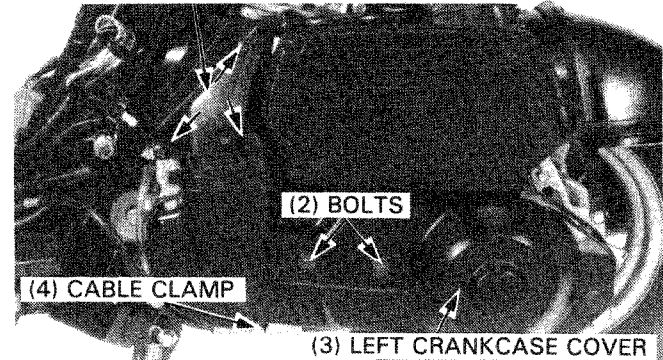
Remove the brake cable clamp from the left crankcase.

Remove the three drive belt air cleaner case cover screws.

Remove the two left crankcase cover bolts and left crankcase cover with the drive belt air cleaner case cover.

Remove the drive belt air cleaner case cover from the left crankcase cover by loosening the band screw.

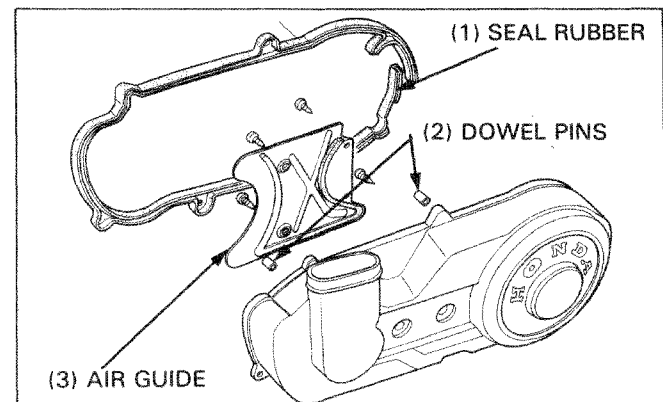
(1) DRIVE BELT AIR CLEANER CASE COVER



Remove the dowel pins and seal rubber from the left crankcase cover.

Inspect the seal rubber for cracks, deterioration or other damage and replace if necessary.

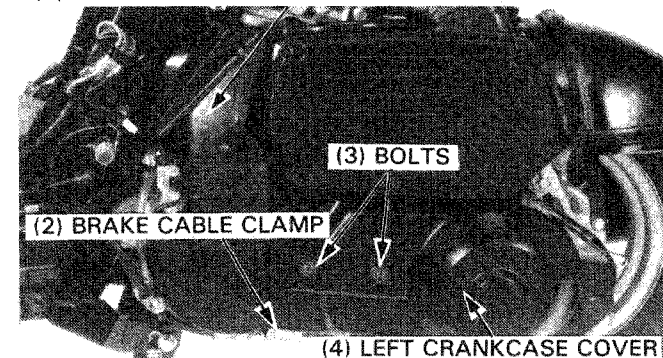
Remove the four screws and air guide.



### INSTALLATION

Install the left crankcase cover in the reverse order of removal.

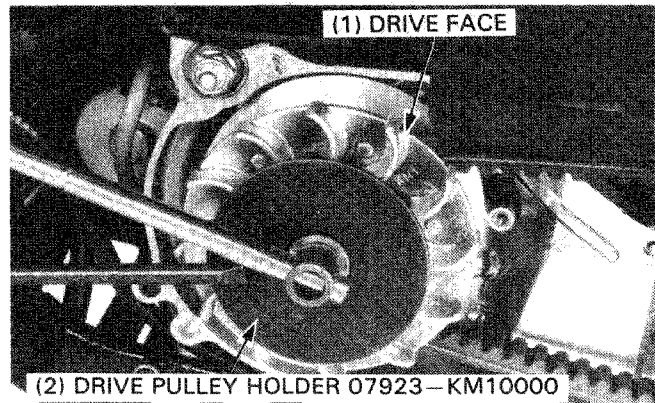
(1) DRIVE BELT AIR CLEANER CASE COVER



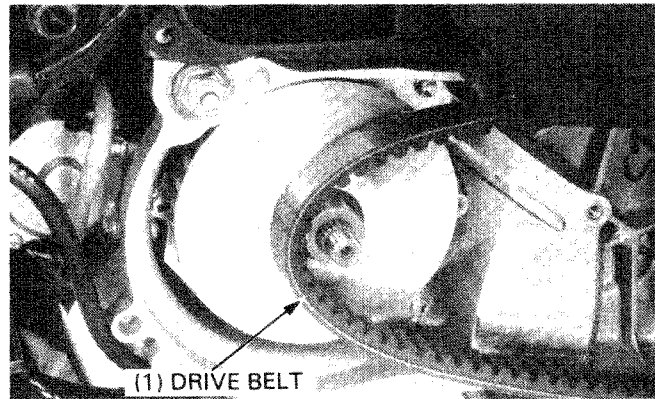
### DRIVE BELT

#### REMOVAL

Remove the left crankcase cover (page 8-3).  
Hold the drive pulley with the drive pulley holder and remove the drive pulley nut, washer and drive face.



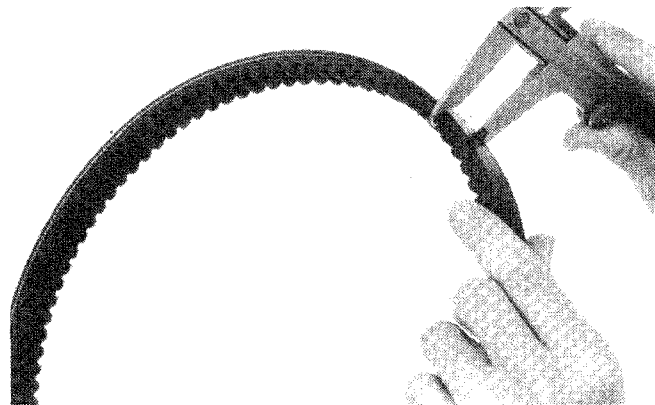
Remove tire drive belt.



#### INSPECTION

Check the drive belt for cracks, separation or abnormal or excessive wear.  
Measure the drive belt width.

**SERVICE LIMIT: 21.7 mm (0.85 in)**

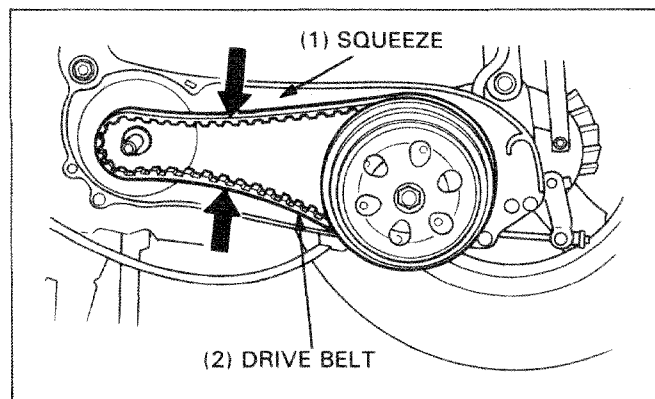


#### INSTALLATION

Lay the drive belt on the driven pulley.  
Squeeze the drive belt to widen the driven pulley faces then set the drive belt on the drive pulley face collar.  
Reinstall the drive pulley face and washer, hold the drive pulley and tighten the nut.

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

Reinstall the left crankcase cover (page 8-3).



## DRIVE PULLEY

### REMOVAL

Remove the left crankcase cover (page 8-3).  
Remove the drive belt (page 8-4).

Remove the movable drive face assembly.

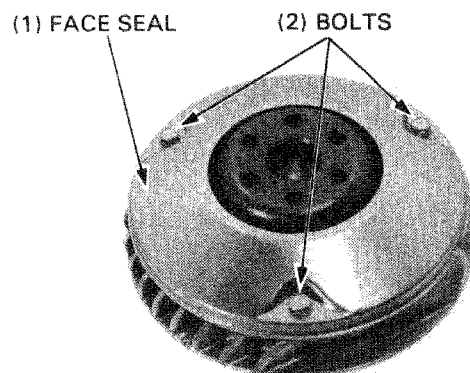
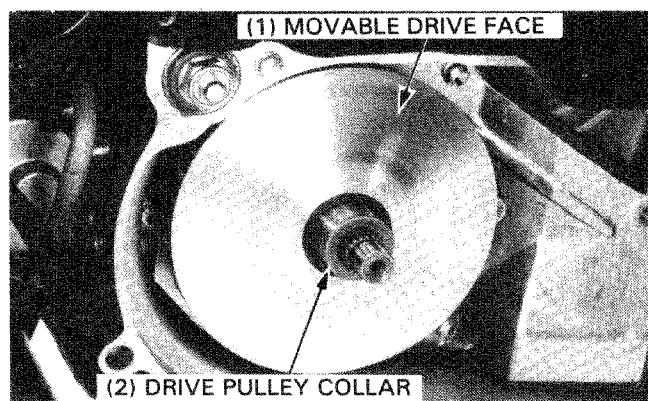
### NOTE

- If the spline fitting is tight, use a commercially available bearing puller.

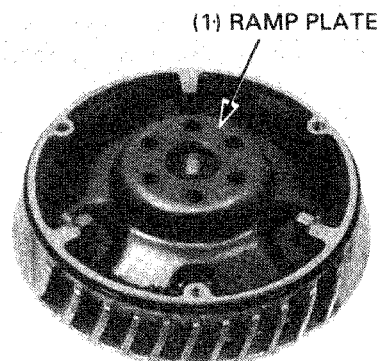
Remove the drive pulley collar.

### DISASSEMBLY

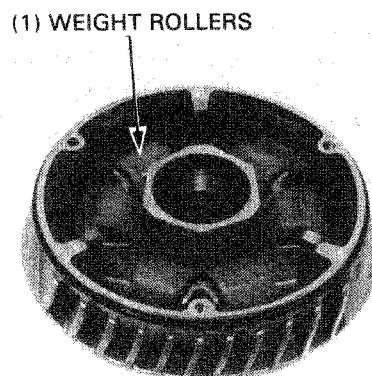
Remove the three bolts and the drive face seal cover.



Remove the ramp plate.



Remove the weight rollers.



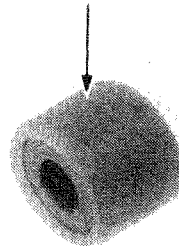
## DRIVE PULLEY/CLUTCH/DRIVEN PULLEY

---

### INSPECTION

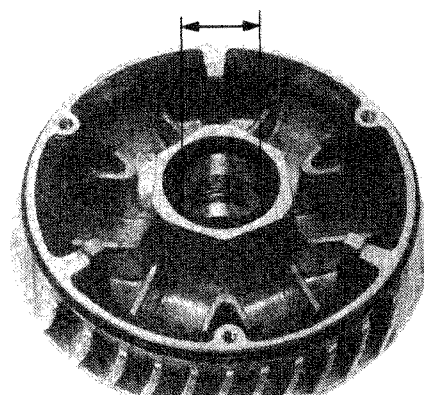
Check each roller for wear or damage.

(1) WEIGHT ROLLER



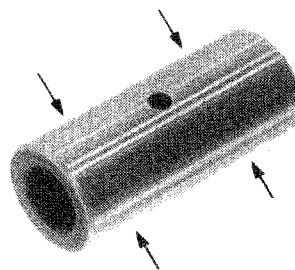
Measure the movable drive face bushing I.D.

**SERVICE LIMIT: 27.06 mm (1.065 in)**



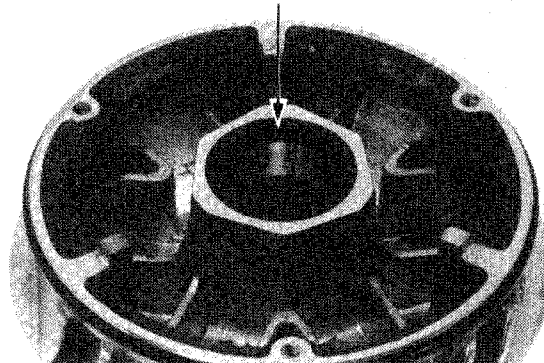
Check the drive face boss for wear or damage.  
Measure the O.D. at the drive face sliding surface.

**SERVICE LIMIT: 26.94 mm (1.061 in)**



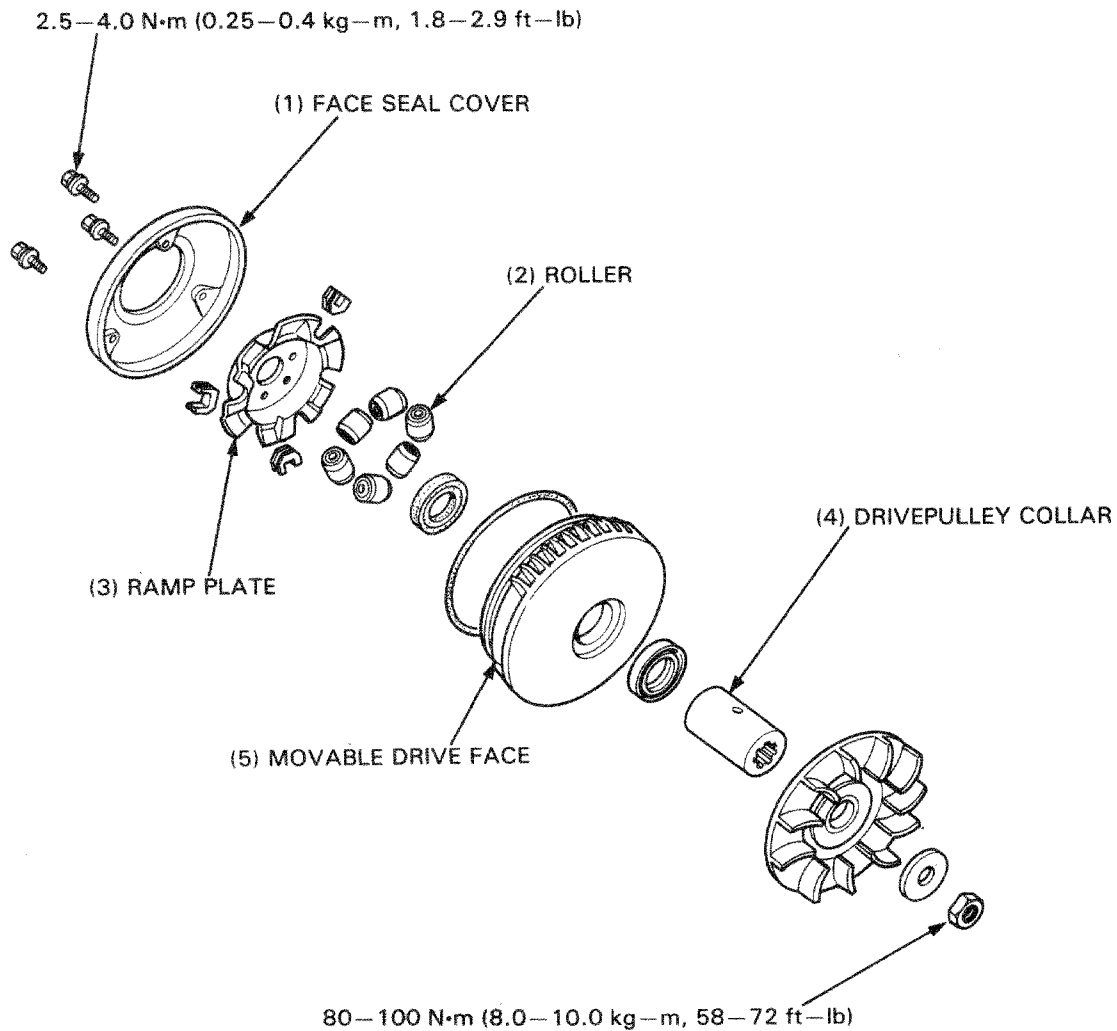
Check the face seal for wear or damage.  
Replace the face seal with a new one if necessary.

(1) FACE SEAL





ASSEMBLY



Lubricate the inside of the drive face with grease, then install the weight rollers.

NOTE

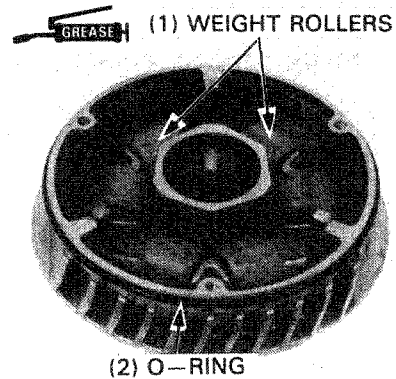
Use 25—30 g of grease and apply to the inside evenly.

Specified grease:

Lithium based grease

- Mitsubishi: HD—3
- Nippon Sekiyu: Lipanox Deluxe 3
- Idemitsu: Autolex B
- Bel-Ray: Moly Lube 124
- Sta-Lube: MP 3141

Apply grease to the O-ring and install it.



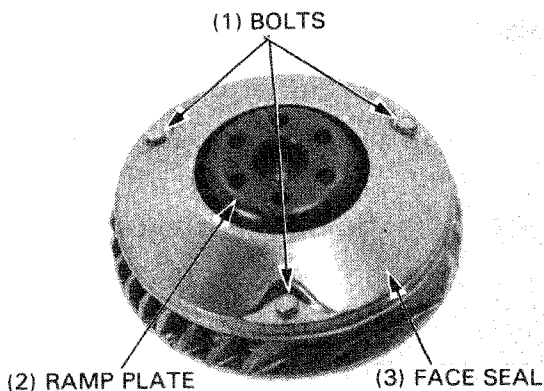
## DRIVE PULLEY/CLUTCH/DRIVEN PULLEY

Install the ramp plate, face seal cover, and tighten the cover attaching bolts.

**TORQUE:** 2.5—4.0 N·m (0.25—0.4 kg-m, 1.8—2.9 ft-lb)

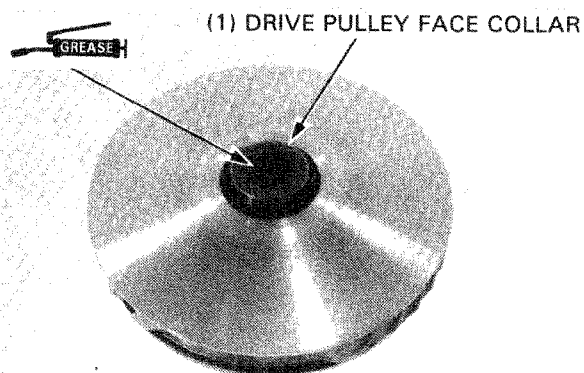
### NOTE

- Make sure that the O-ring is in position.



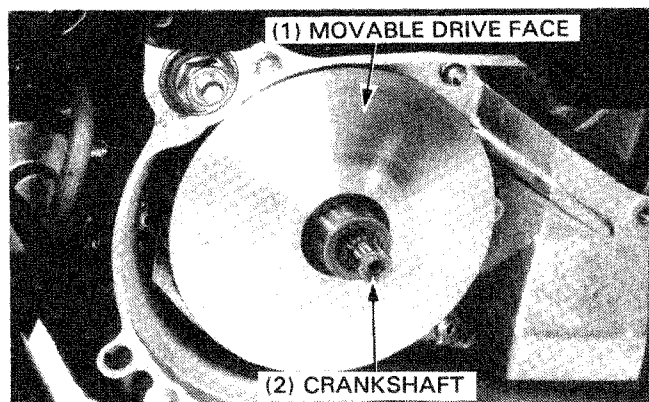
Apply grease (4—5 g) to the inside of the drive pulley collar. Install the drive pulley face collar with the spline side facing out.

Clean off any grease or oil from the drive pulley faces.



## INSTALLATION

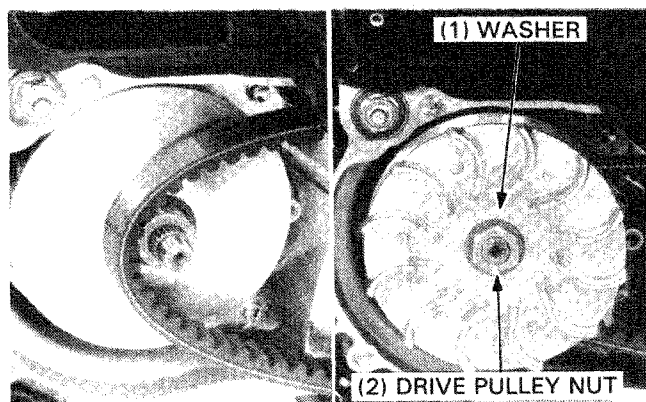
Install the movable drive face onto the crankshaft.



Install the drive belt (page 8-4).

Clean the drive pulley face and install it.

Set the washer onto the crankshaft and loosely install the drive pulley nut.



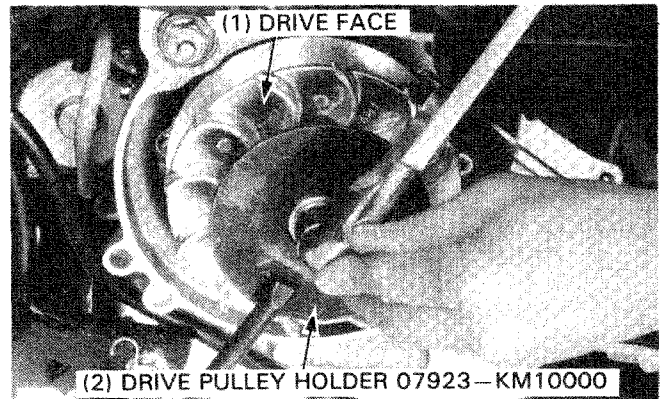
Hold the drive pulley and tighten the drive pulley nut.

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

### CAUTION

- Do not oil allow or grease on the drive belt or pulley faces.

Reinstall the removed parts in the reverse order of removal.

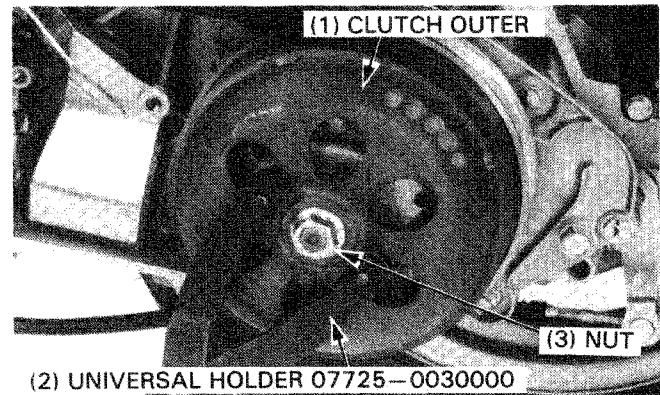


## CLUTCH/DRIVEN PULLEY

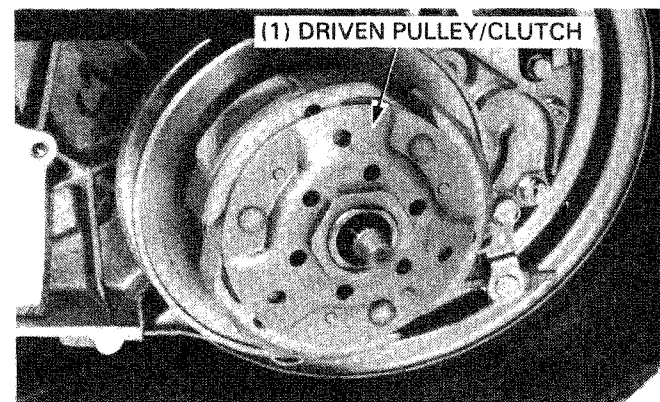
### REMOVAL

Remove the left crankcase cover (page 8-3), drive pulley face and drive belt (page 8-4).

Hold the clutch outer with universal holder and remove the driven pulley nut and clutch outer.



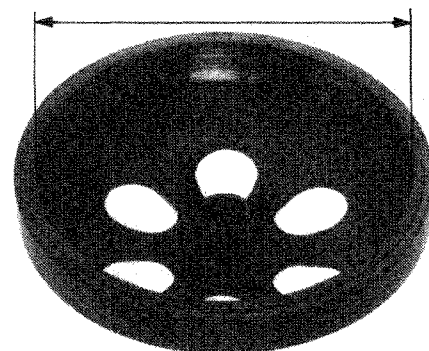
Remove the driven pulley/clutch assembly.



### INSPECTION

Check the clutch outer for wear or damage.  
Measure the clutch outer I.D.

**SERVICE LIMIT:** 135.5 mm (5.33 in)



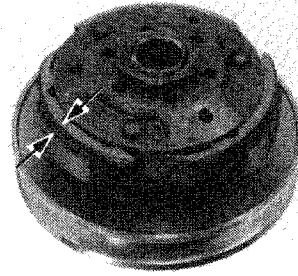
## DRIVE PULLEY/CLUTCH/DRIVEN PULLEY

Check the clutch shoes for wear or damage.  
Measure the clutch lining thickness.

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

### NOTE

- Replace the clutch shoes as a set.



## DISASSEMBLY

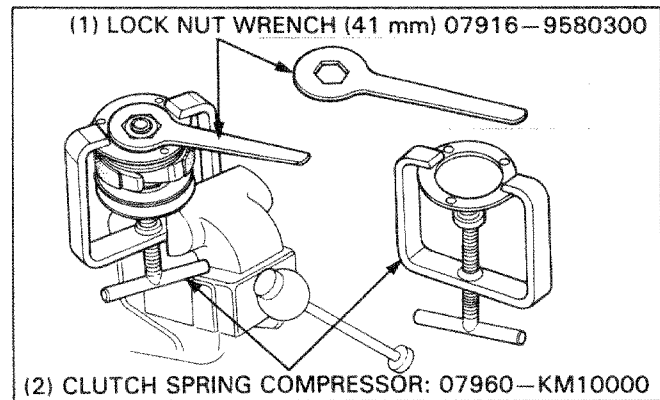
Hold and compress the driven pulley/clutch assembly with the clutch spring compressor.

### NOTE

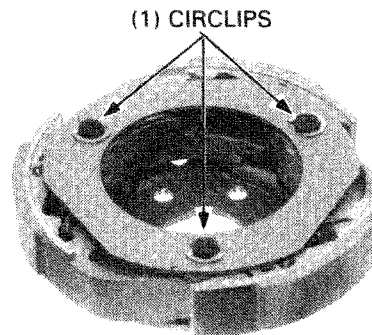
- Do not tighten the tool more than necessary to avoid damaging the drive plate.

Set the tool in a vise and remove the lock nut.

Loosen the tool and disassemble the driven pulley/clutch assembly.

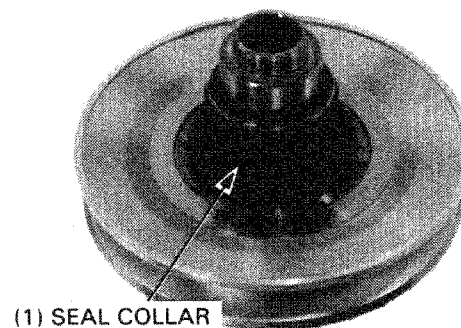


Remove the circlips and disassemble the clutch.



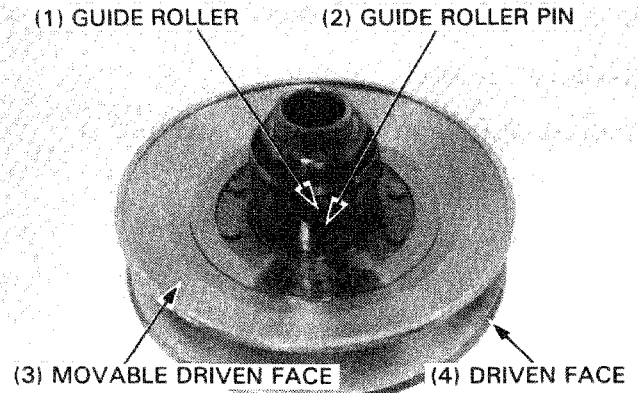
## DRIVEN PULLEY DISASSEMBLY

Remove the seal collar.



## DRIVE PULLEY/CLUTCH/DRIVEN PULLEY

Pull out the guide roller pins and guide rollers.  
Remove the movable driven face from the driven face.

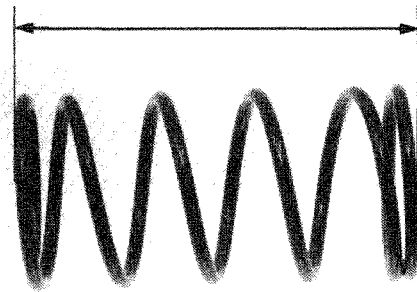


### INSPECTION

Measure the driven face spring free length.

**SERVICE LIMIT: 94.0 mm (3.70 in)**

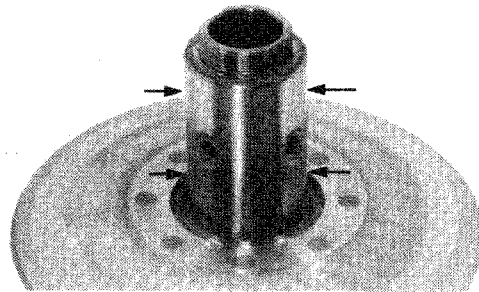
Check the clutch spring for damage or loss of tension, and replace if necessary.



Check the driven face assembly for wear or damage.  
Measure the driven face O.D.

**SERVICE LIMIT: 39.94 mm (1.572 in)**

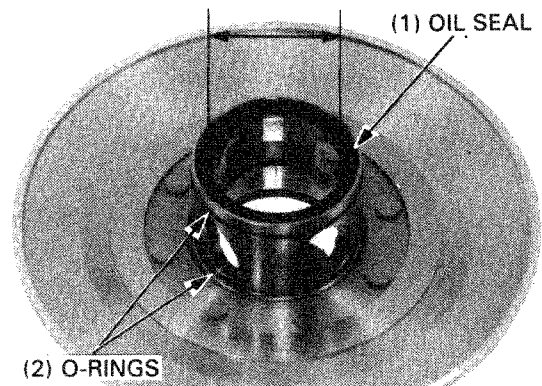
Check the bearings for play.  
Replace the bearing if they are noisy or have excessive play (page 8-12).



Check the movable driven face for wear or scoring.  
Measure the movable driven face I.D.

**SERVICE LIMIT: 40.06 mm (1.577 in)**

Check the guide groove for stepped wear.  
Check the oil seal and O-ring for damage or wear.  
Replace if necessary.

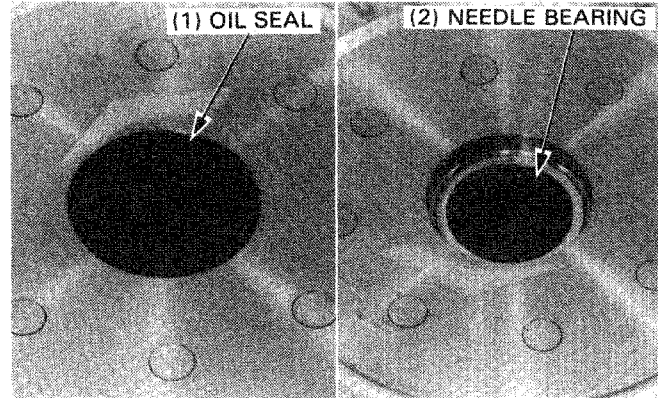


## DRIVE PULLEY/CLUTCH/DRIVEN PULLEY

### DRIVEN PULLEY FACE BEARING REPLACEMENT

Remove the oil seal.

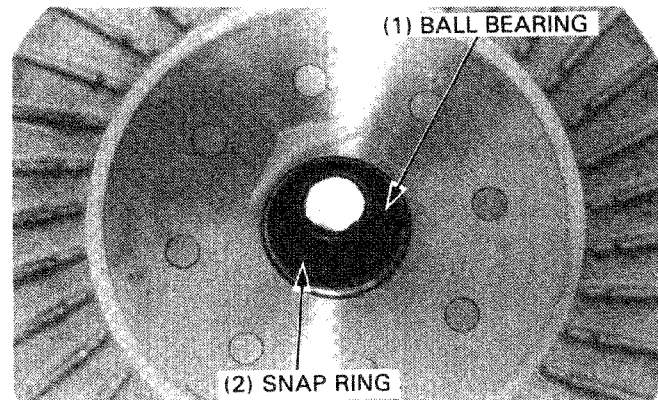
Drive the needle bearing out of the driven face.



Remove the snap ring and drive the outer bearing out of the driven face.

#### NOTE

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

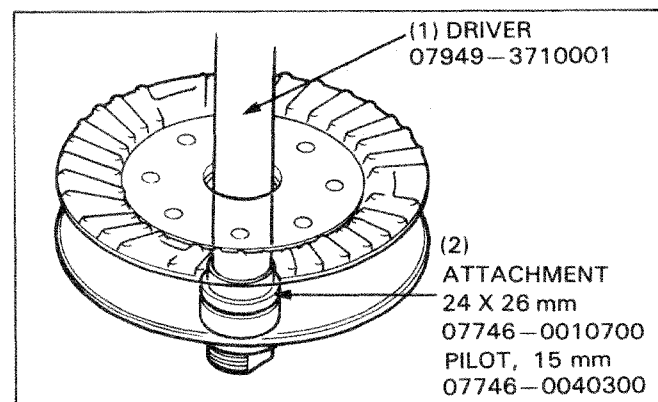


Pack the bearing cavities with grease.  
Drive a new outer bearing into the driven face with the sealed end facing out.  
Install the snap ring.

Apply 11 – 13 g of grease to the inside of the driven face.

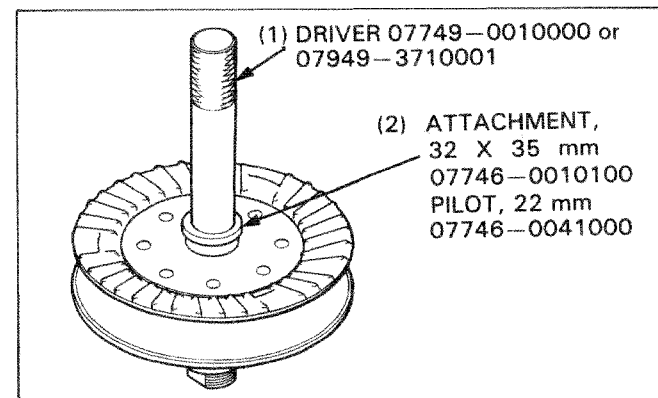
#### NOTE

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

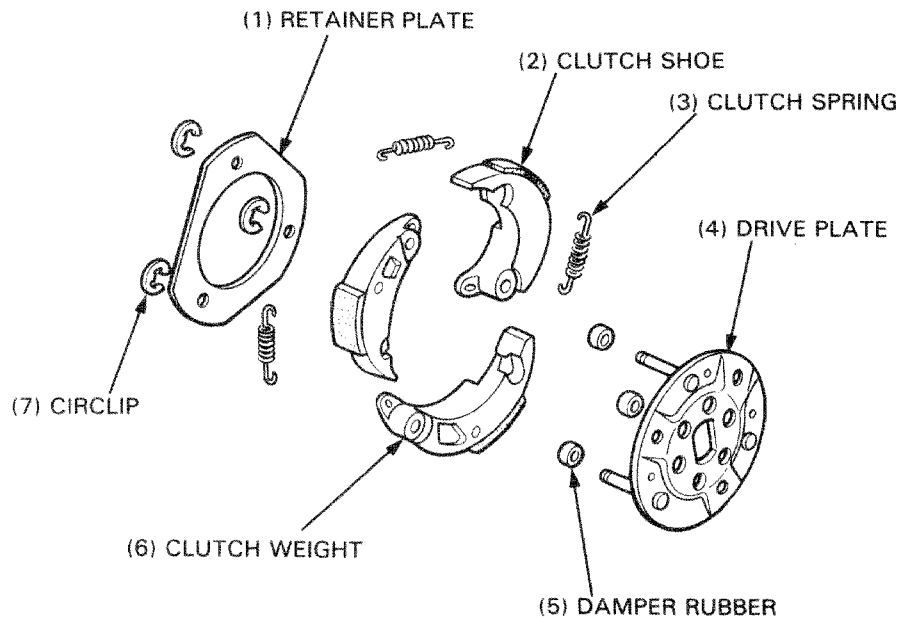


Press a new needle bearing into the driven face.

Apply grease to the lip of the oil seal and install it over the bearing.

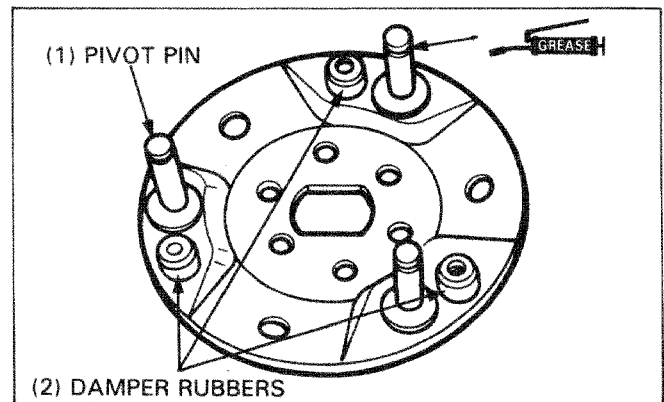


## CLUTCH ASSEMBLY

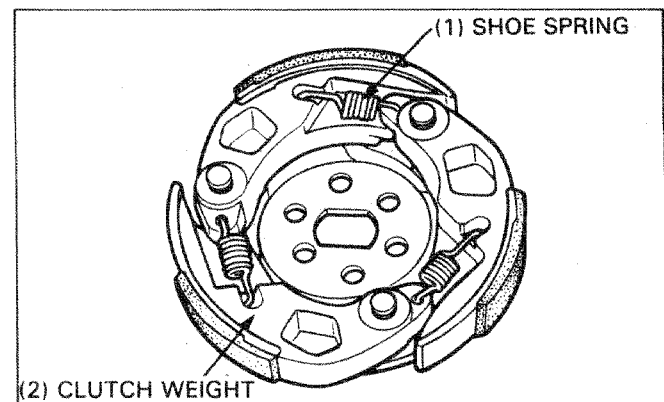


Install the damper rubbers on the drive plate pivot pins.

Apply a small amount of grease to the clutch weight pivot pins.



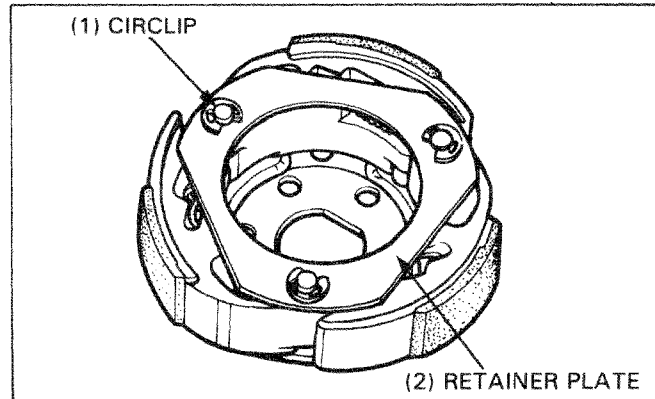
Attach the clutch weights and the clutch springs, and install them onto the drive plate.



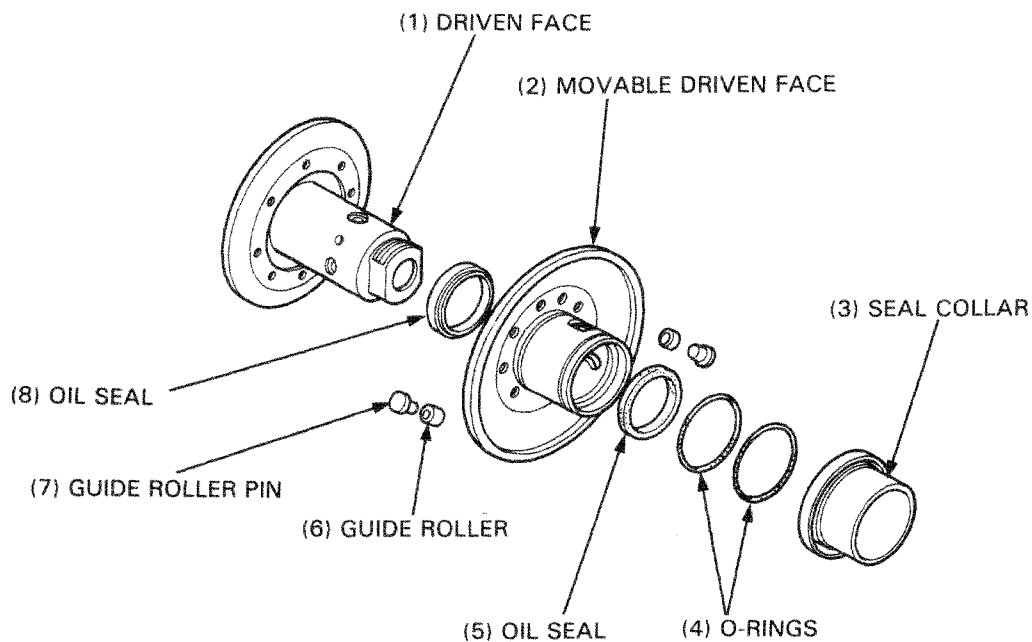


## DRIVE PULLEY/CLUTCH/DRIVEN PULLEY

Secure the retainer plate with the circlips.



## DRIVEN PULLEY ASSEMBLY



Clean the pulley faces.

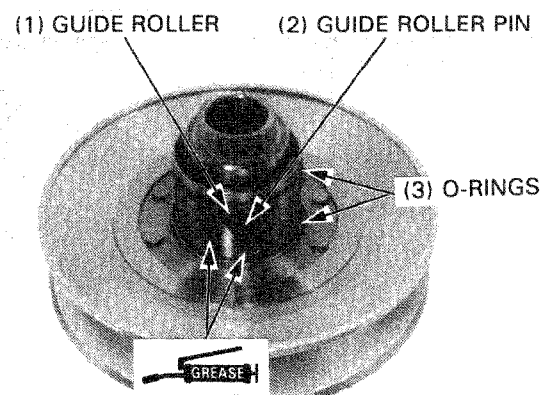
Install the oil seals onto the movable driven face.

Coat the O-rings with grease and install them onto the movable driven face.

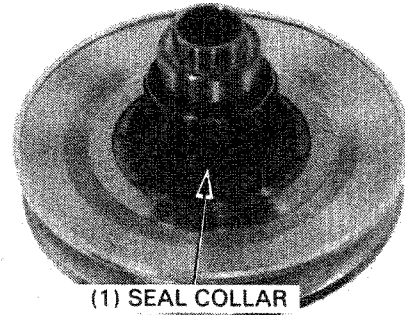
Apply 4—5 g of grease to the inside of the movable driven face.

Install the movable driven face onto the driven face.

Apply grease to the guide rollers and pins and install them into the hole of the driven face.



Install the seal collar.



(1) SEAL COLLAR

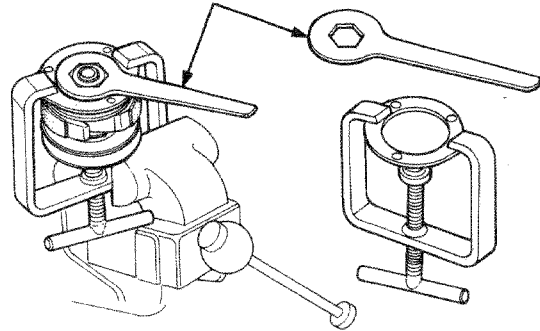
Set the driven pulley assembly, driven face spring and clutch assembly onto the clutch compressor. Align the flat surface of the driven face with the flat on the clutch drive plate.

Compress the tool and install the lock nut loosely. Set the tool in a vice and tighten the lock nut to the specified torque.

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

Remove the driven pulley/clutch assembly from the tool.

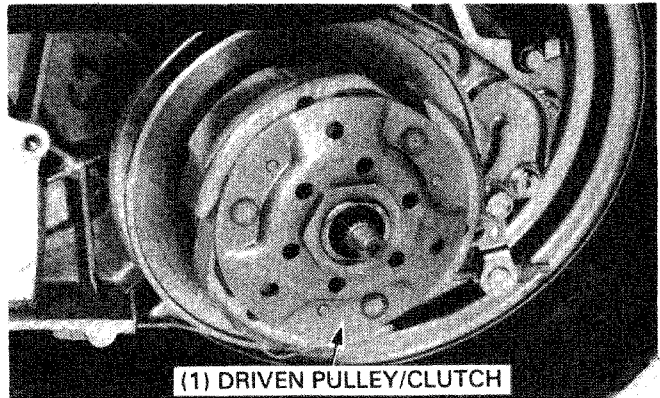
(1) CLUTCH SPRING COMPRESSOR 07960—KM10000



(2) LOCK NUT WRENCH (41 mm) 07916—9580300

## INSTALLATION

Install the driven pulley/clutch assembly onto the drive shaft.

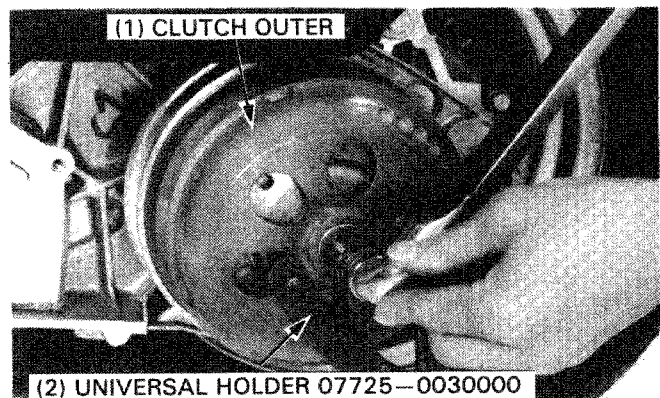


(1) DRIVEN PULLEY/CLUTCH

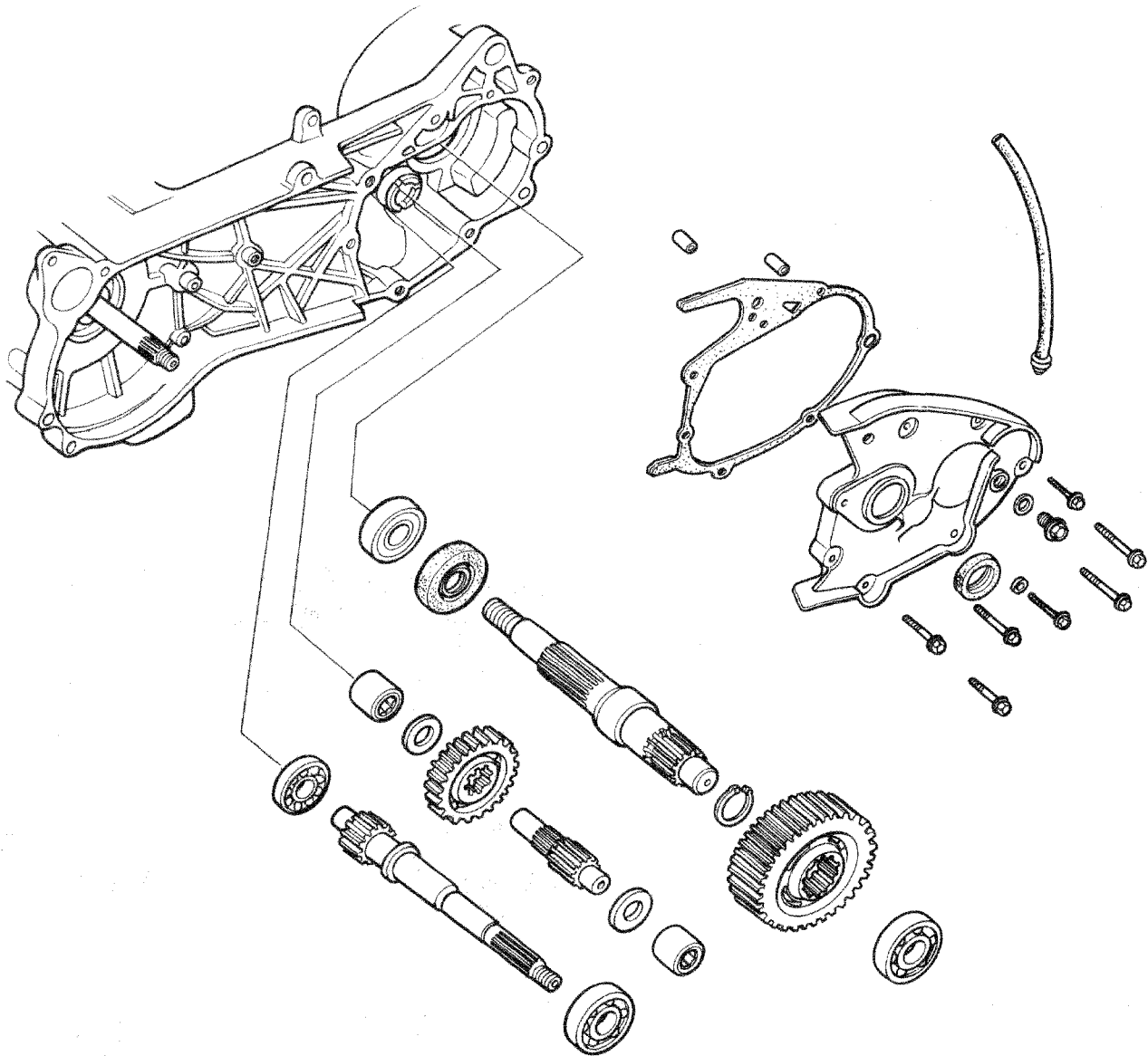
Install the clutch outer and tighten the nut while holding the clutch outer with the universal holder.

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

Install the drive belt (page 8-4).  
Install the left crankcase cover (page 8-3).  
Install the removed parts in reverse order of the removal.



(2) UNIVERSAL HOLDER 07725—0030000



# 9. FINAL REDUCTION

SERVICE INFORMATION	9-1	FINAL REDUCTION INSPECTION	9-2
TROUBLESHOOTING	9-1	FINAL REDUCTION ASSEMBLY	9-4
FINAL REDUCTION DISASSEMBLY	9-2		

## SERVICE INFORMATION

### SPECIFICATIONS

Specified oil: Honda 4-stroke engine oil, SAE 10W—30 or equivalent (page 2-1)  
Oil capacity: 0.15 liter (0.16 US qt, 0.13 Imp qt) at change  
0.2 liter (0.21 US qt, 0.18 Imp qt) at disassembly

### TOOLS

#### Special

Bearing remover set, 12 mm	07936—1660001
(Bearing remover, 12 mm)	(07936—1660100)
(Remover weight)	(07741—0010201) or 07936—3710200
Bearing remover set, 20 mm	07936—3710001
(Bearing remover, 20 mm)	(07936—3710600)
(Remover handle)	(07936—3710600)
(Remover weight)	(07941—0010201) or 07936—3710200
Assembly bolt	07965—1660200
Assembly collar (2 pieces)	07965—1660300

#### Common

Attachment, 37 × 40mm	07746—0010200
Attachment, 52 × 55mm	07746—0010400
Pilot, 12mm	07746—0040200
Pilot, 22mm	07746—0041000
Pilot, 25mm	07746—0040600
Driver	07749—0010000 or 07949—3710001

## TROUBLESHOOTING

#### Engine starts but scooter won't move

- Damaged or seized transmission

#### Abnormal noise

- Worn, seized or chipped gears
- Worn bearing

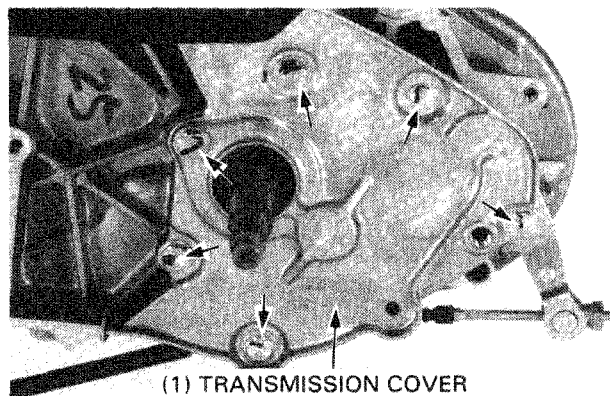
#### Oil leaks

- Oil level too high
- Worn or damaged oil seal

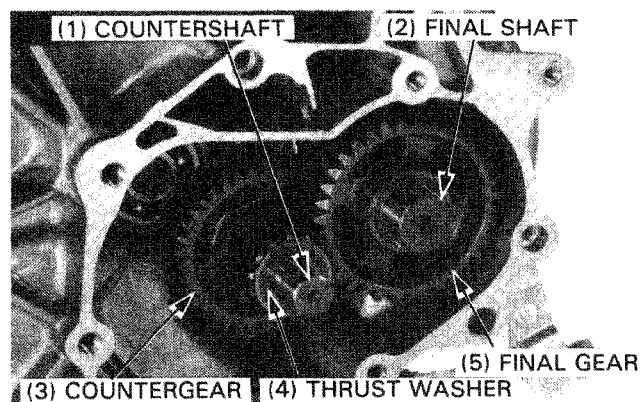
## FINAL REDUCTION

### FINAL REDUCTION DISASSEMBLY

Remove the driven pulley (Page 8-9).  
Drain the transmission oil (Page 2-6).  
Remove the rear wheel (Page 15-2).  
Remove the transmission case cover by removing the attaching bolts.  
Remove the gasket and dowel pins.



Remove the thrust washers.  
Remove the final gear and final shaft.  
Remove the countershaft and washer.



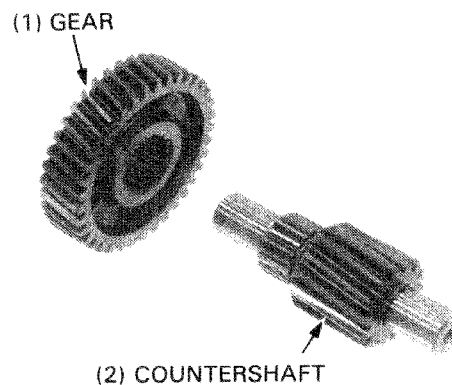
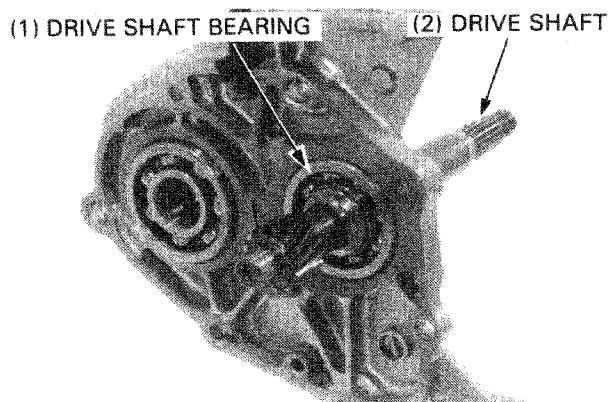
### FINAL REDUCTION INSPECTION

Inspect the drive shaft and gear for wear or damage.  
Inspect the bearing for excessive play or damage.  
If it is necessary to replace the shaft or bearing, drive the drive shaft out of the transmission cover with the bearing attached, then remove the bearing from the drive shaft using the commercial bearing puller and Shaft Protector (07931-1870000).  
Remove the drive shaft oil seal from the transmission cover.

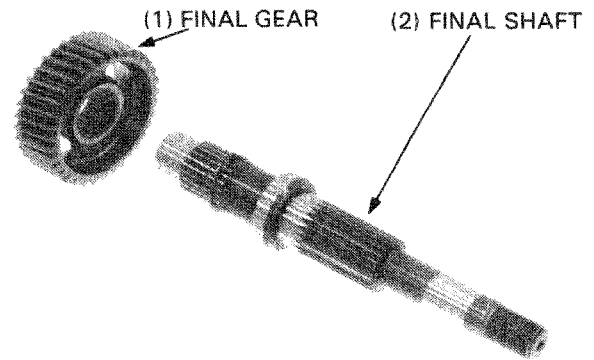
#### NOTE

- If the drive shaft is removed from the transmission cover, the bearing must be replaced with a new one.

Inspect the countershaft and gear for wear or damage.



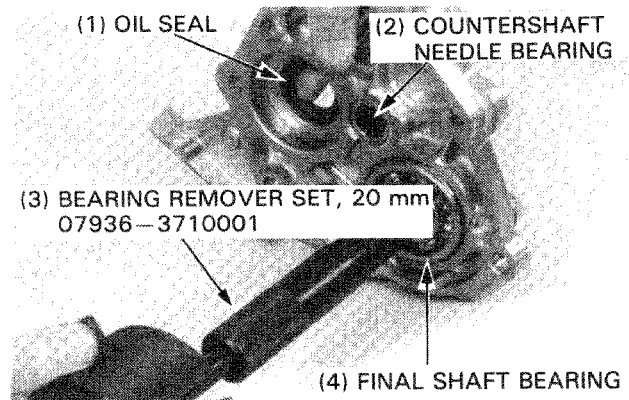
Inspect the final gear and final shaft for seizure, wear or damage.



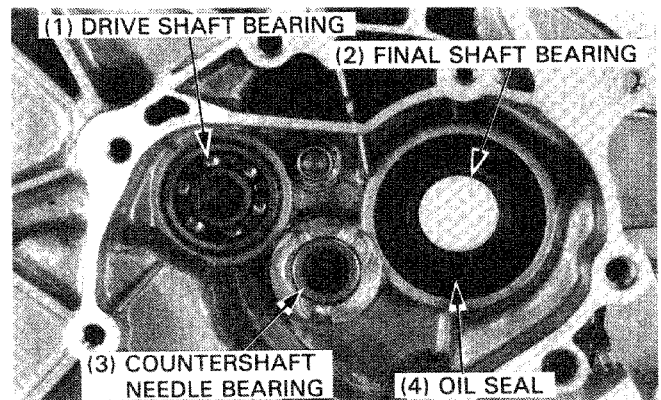
Inspect the final shaft bearing and oil seal for wear or damage. If the final shaft bearing is noisy or has excessive play, remove the final shaft bearing using a Bearing Remover, 20 mm (07936-3710001)

## NOTE

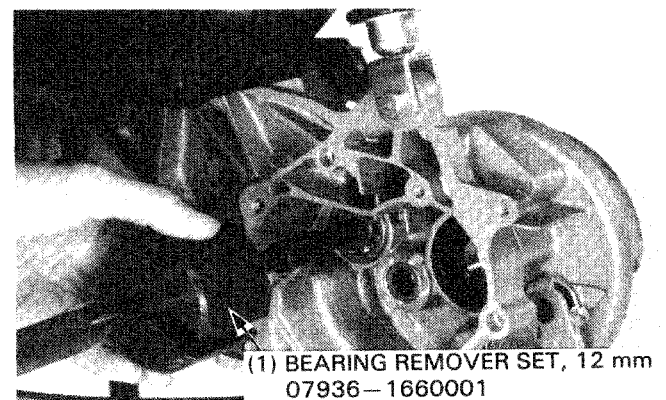
- The countershaft needle bearing must be replaced with the transmission case cover as a set.



Inspect the drive shaft bearing and oil seal on the left crankcase for wear or damage.



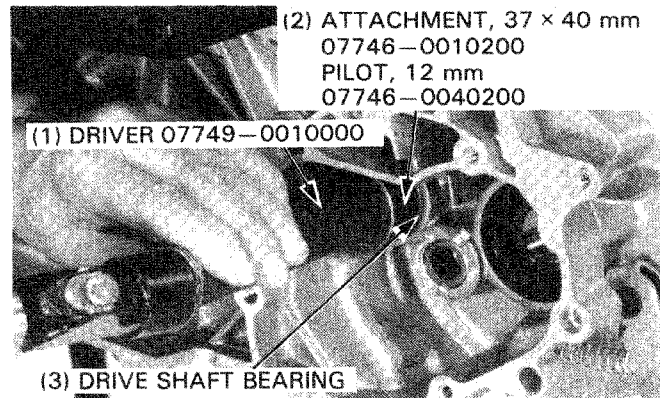
Remove the drive shaft bearing using a Bearing Remover, 12 mm (07936-1660001).



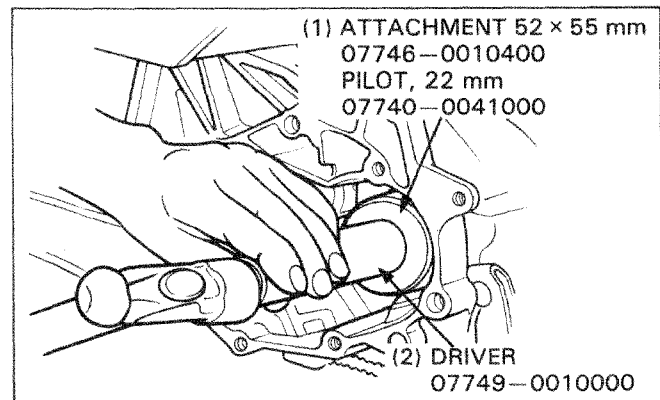
## FINAL REDUCTION

### FINAL REDUCTION ASSEMBLY

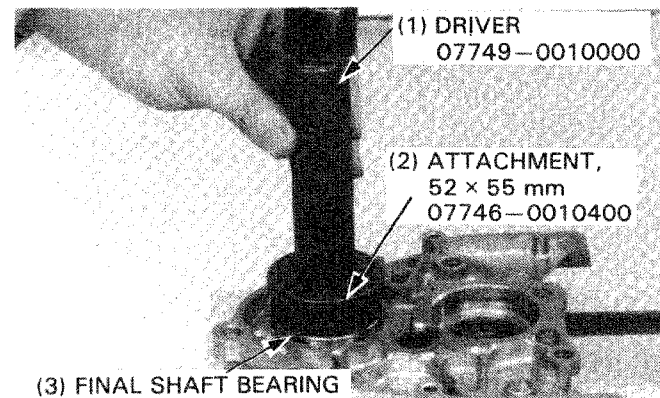
Drive a new drive shaft bearing into the left crankcase.



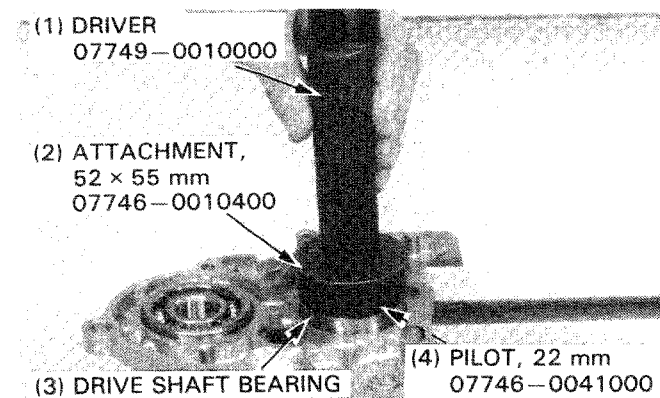
Drive a new final shaft bearing into the left crankcase.  
Install the final shaft oil seal.



Drive a new final shaft bearing into the transmission cover.



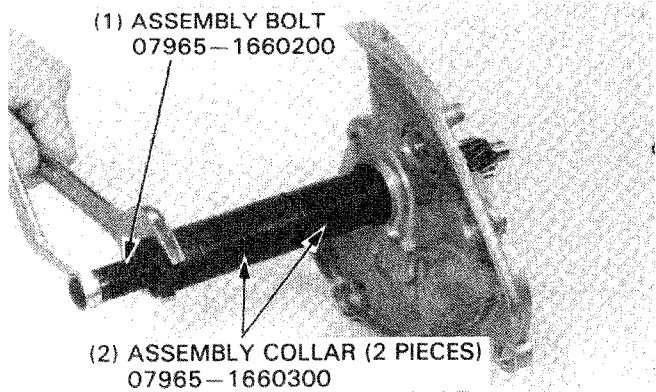
Drive a new drive shaft bearing into the transmission cover.



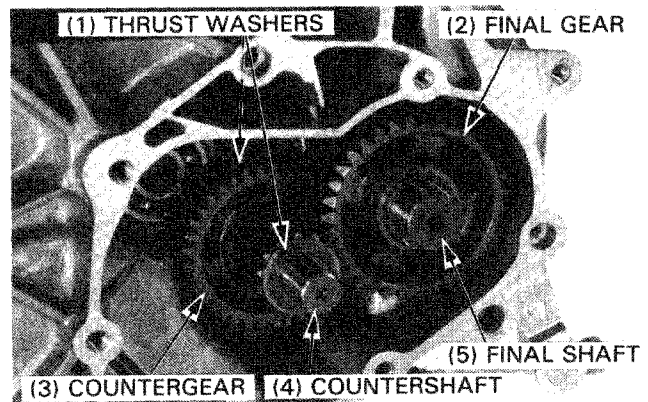


Set the assembly collars and bolt as shown and pull in the drive shaft into the transmission cover.

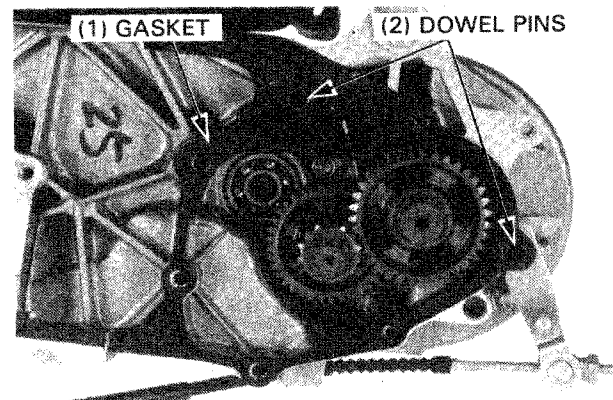
Install the oil seal onto the drive shaft.



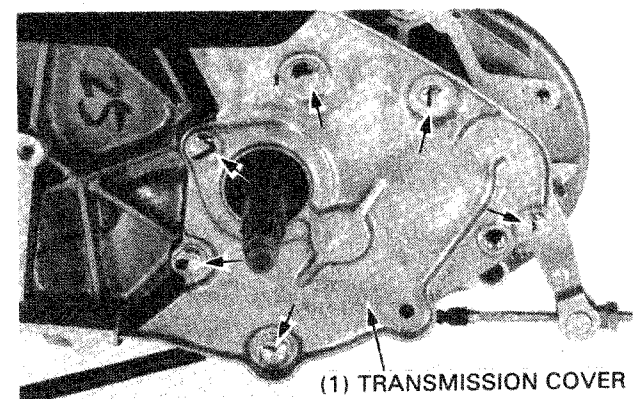
Install the countershaft, countergear, final shaft, final gear and thrust washers.



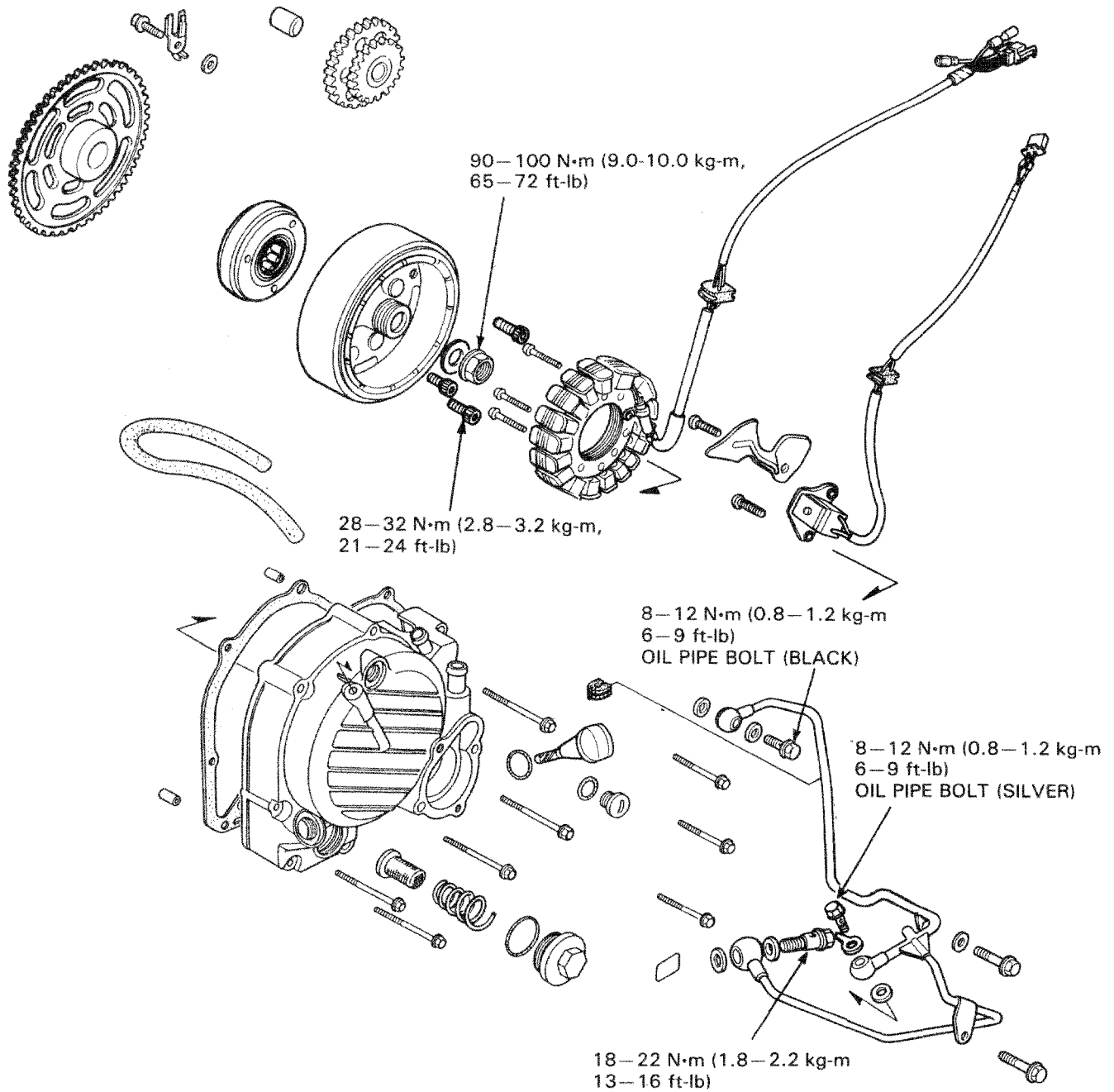
Install the dowel pins and a new gasket.



Install the transmission case cover.  
Install the movable driven face/clutch (page 8-15).  
Install the drive pulley, drive belt and left crankcase cover (pages 8-4 and 8-8).  
Install the rear wheel (page 15-4).  
Fill the final reduction case with the specified oil (page 2-1).



## ALTERNATOR/STARTER CLUTCH



# 10. ALTERNATOR/STARTER CLUTCH

SERVICE INFORMATION	10-1	STARTER CLUTCH	10-3
RIGHT CRANKCASE COVER REMOVAL	10-2	FLYWHEEL INSTALLATION	10-6
STATOR REMOVAL	10-2	STATOR INSTALLATION	10-7
FLYWHEEL REMOVAL	10-3	RIGHT CRANKCASE COVER INSTALLATION	10-7

## SERVICE INFORMATION

### GENERAL

- Refer to section 16 for troubleshooting and inspection of the alternator.
- Refer to section 16 for service procedures and information of the starter motor.
- The alternator and starter clutch can be serviced with the engine installed in the frame.

### SPECIFICATIONS

ITEM	STANDARD mm (in)	SERVICE LIMIT mm (in)
Starter driven gear I.D.	22.026—22.045 (0.8672—0.8679)	22.10 (0.870)

### TORQUE VALUES

Flywheel nut		90—100 N·m (9.0—10.0 kg-m, 65—72 ft-lb)
Oil pipe bolt	8 mm	8—12 N·m (0.8—1.2 kg-m, 6—9 ft-lb)
	12 mm	18—22 N·m (1.8—2.2 kg-m, 13—16 ft-lb)
One way clutch bolt		28—32 N·m (2.8—3.2 kg-m, 21—24 ft-lb) Apply locking agent

### TOOLS

#### Special

Flywheel puller 07933—KM10000

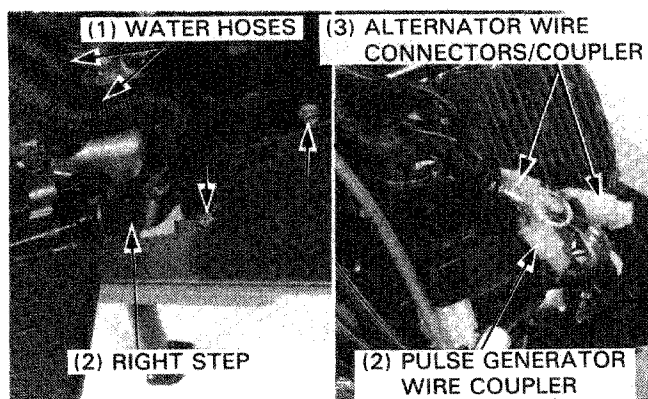
#### Common

Flywheel holder 07725—0040000 or Band strap wrench (commercially available)

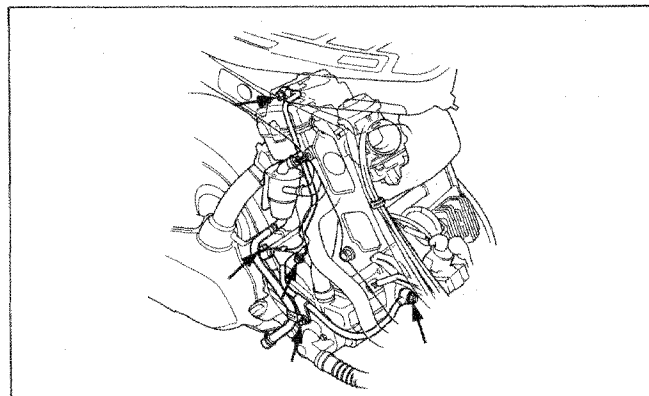
## ALTERNATOR/STARTER CLUTCH

### RIGHT CRANKCASE COVER REMOVAL

Remove the right side rail (page13-3).  
Remove the right step.  
Drain the coolant (page12-2) and engine oil (page2-2).  
Disconnect the water hoses from the water pump.  
Disconnect the pulse generator and alternator wire coupler and connectors.

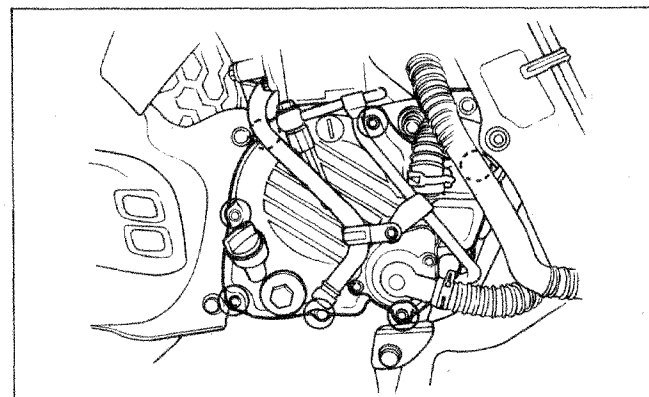


Remove the 6 mm SH bolts, three oil bolts and oil pipe.



Disconnect the water hose from the right crankcase cover.

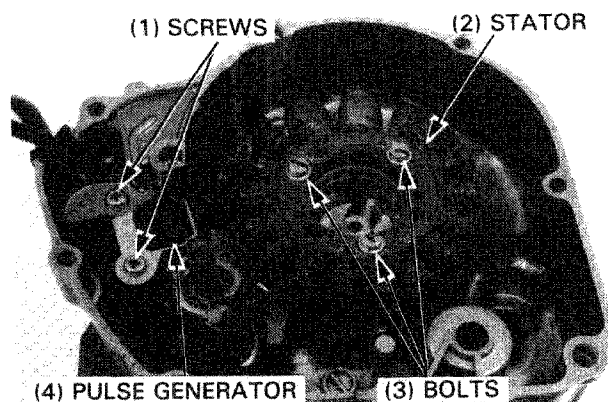
Remove the right crankcase cover attaching bolts and right crankcase cover.  
Remove the dowel pins and gasket.



### STATOR REMOVAL

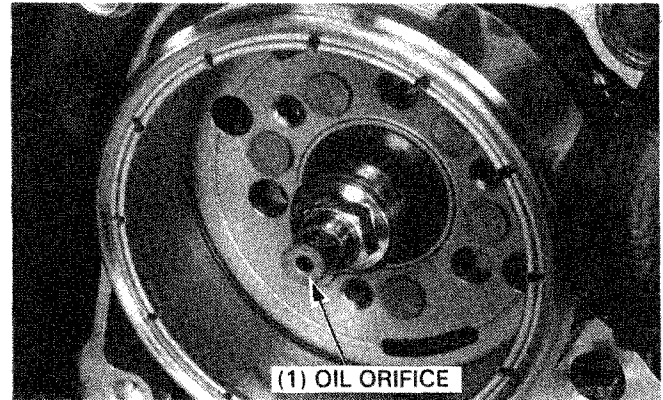
Remove the two screws attaching the pulse generator and pulse generator.

Remove the three stator attaching bolts and stator.



## FLYWHEEL REMOVAL

Remove the oil orifice from the end of the crankshaft.

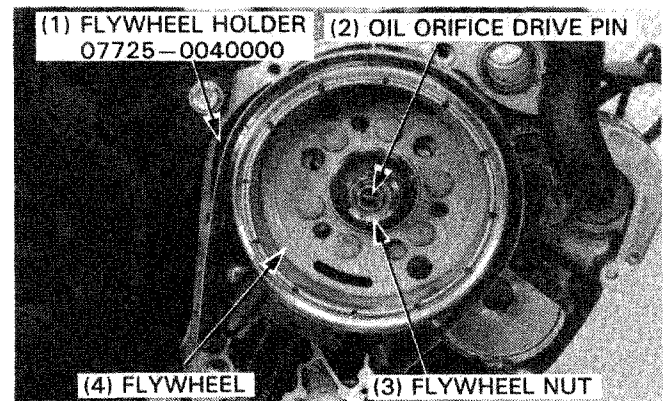


Hold the flywheel with a flywheel holder and loosen the flywheel nut.

Remove the oil orifice drive pin.

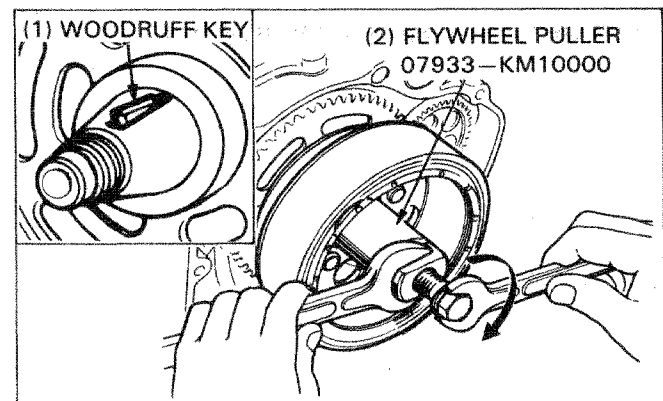
### NOTE

- Be careful not to drop the drive pin into the crankcase.



Remove the flywheel with a flywheel puller.

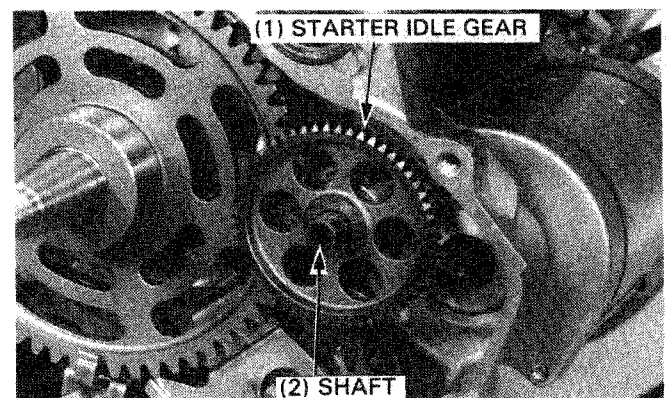
Remove the woodruff key.



## STARTER CLUTCH

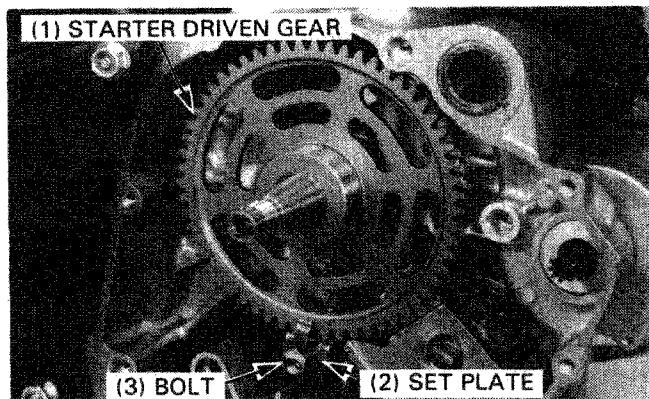
### STARTER IDLE GEAR/ DRIVEN GEAR REMOVAL

Remove the starter idle gear and shaft.



## ALTERNATOR/STARTER CLUTCH

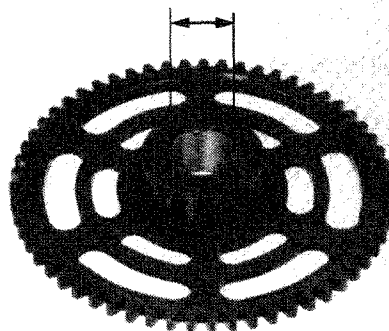
Remove the set plate.  
Remove the starter driven gear.



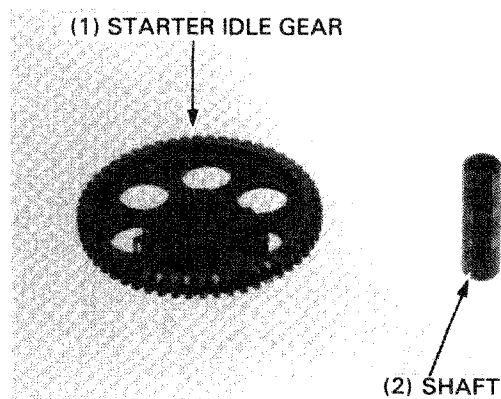
### STARTER CLUTCH INSPECTION

Inspect the starter driven gear for wear or damage.  
Measure the starter driven gear I.D.

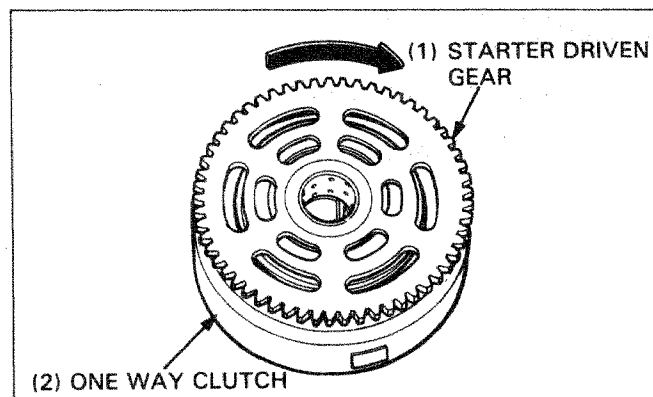
**SERVICE LIMIT: 22.10 mm (0.870 in)**



Inspect the starter idle gear and shaft for wear or damage.

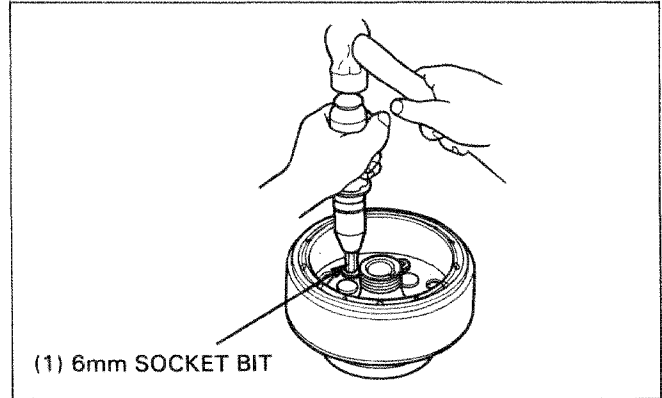


Install the starter driven gear onto the one way clutch and check for operation by turning the starter driven gear.  
The starter driven gear should only turn in one direction.



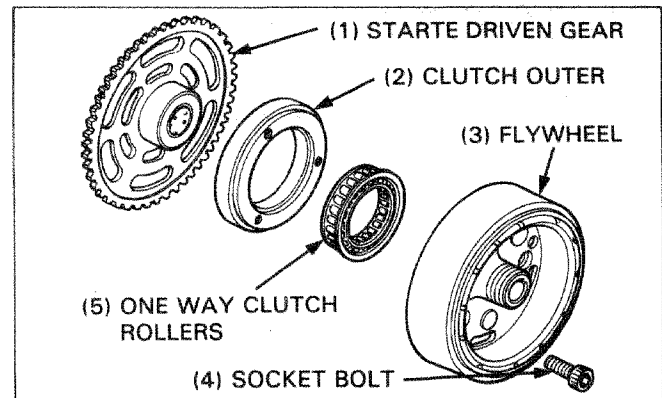
## DISASSEMBLY

Remove the three hex socket bolts using a impact driver and 6 mm socket bit.



Remove the one way clutch from the one way clutch outer.

Inspect the one way clutch rollers for wear or damage and replace if necessary.



## ASSEMBLY

Install the one way clutch into the one way clutch outer. Install the one way clutch assembly to the flywheel and tighten with the 6 mm socket bolts.

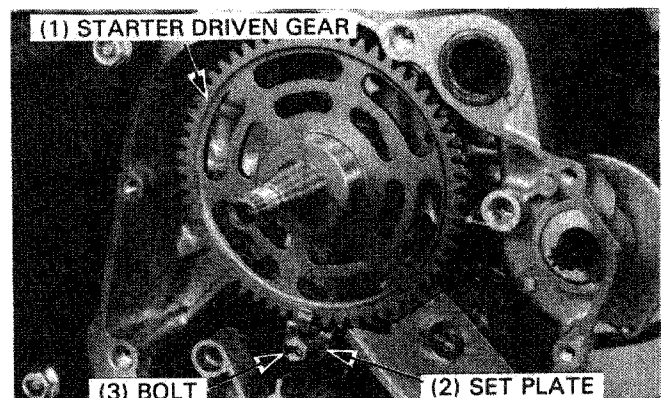
**TORQUE: 28—32 N·m (2.8—3.2 kg-m, 21—24 ft-lb)**

### NOTE

- Apply locking agent to the thread of the socket bolts

## INSTALLATION

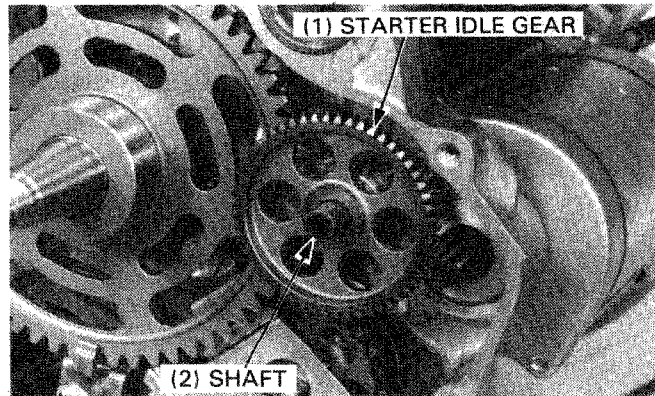
Install the starter driven gear onto the crankshaft. Install the set plate and set plate bolt.





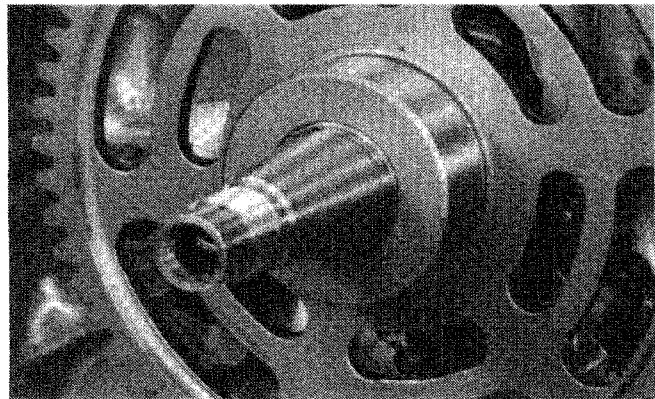
## ALTERNATOR/STARTER CLUTCH

Install the starter idle gear by inserting the shaft through the idle gear and into the case.



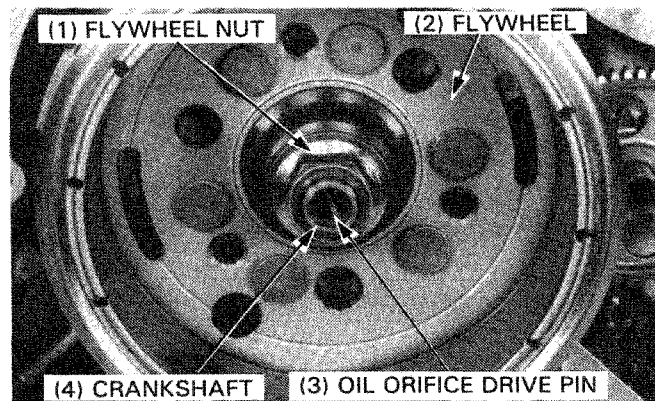
## FLYWHEEL INSTALLATION

Install the oil orifice drive pin onto the crankshaft. Make sure that the inside of the flywheel is clean.



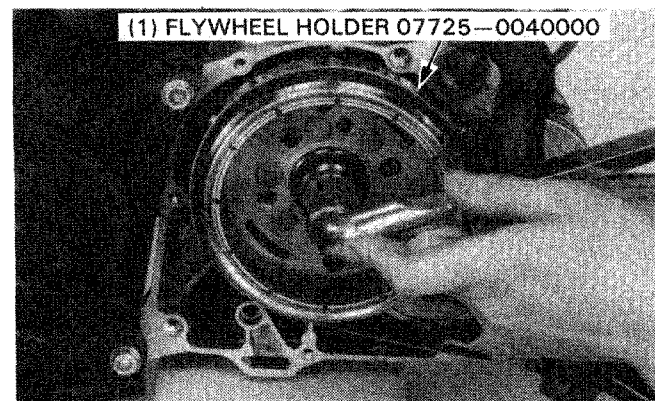
Install the woodruff key into the crankshaft slot.

Install the flywheel onto the crankshaft, aligning the key on the crankshaft with the groove in the flywheel.

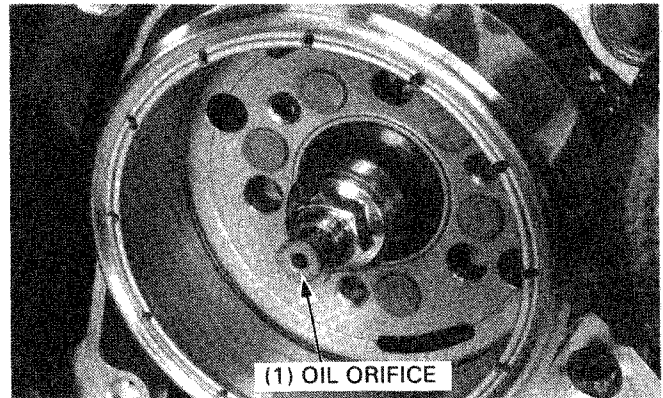


Hold the flywheel with the flywheel holder and tighten the flywheel nut.

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



Install the spring and oil orifice.



## STATOR INSTALLATION

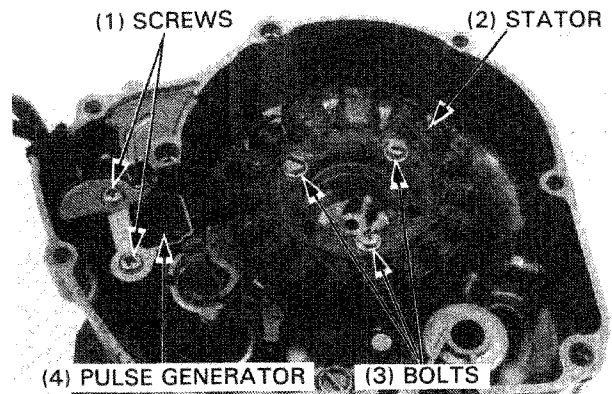
Install the stator on the right crankcase cover with the three bolts.

Install the pulse generator with the two screws.

Install the wire grommet in its groove in the cover securely.

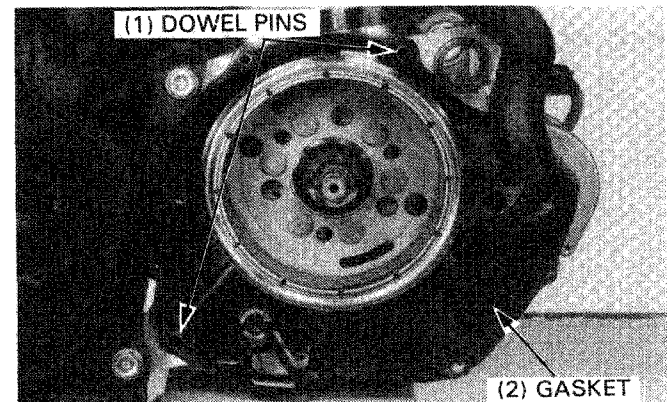
### NOTE

- Be sure to route the stator wire under the pulse generator.

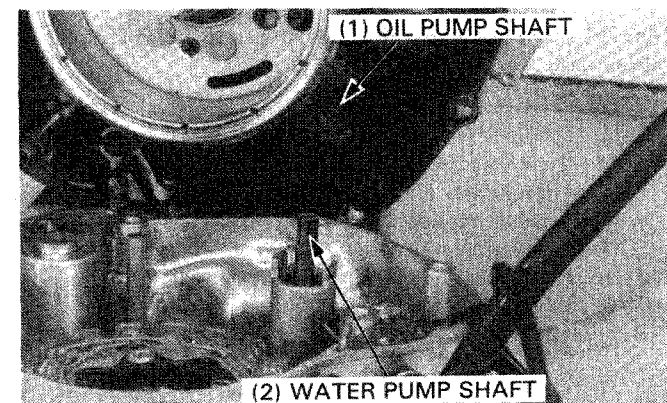


## RIGHT CRANKCASE COVER INSTALLATION

Install the dowel pins and a new gasket.

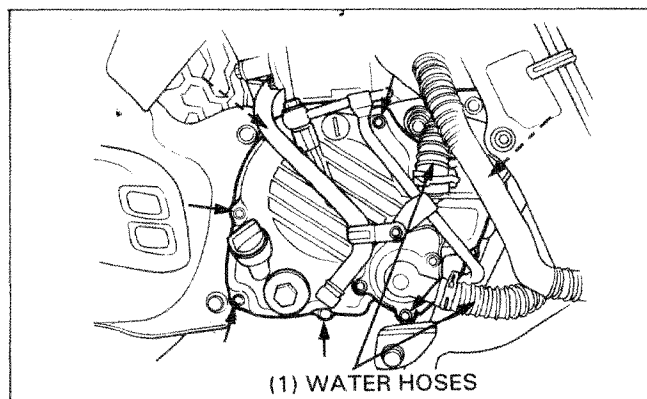


Install the right crankcase cover over the crankcase, aligning the water pump shaft groove with the oil pump shaft.



## ALTERNATOR/STARTER CLUTCH

Install the seven bolts and tighten them.  
Connect the water hoses to the right crankcase cover.

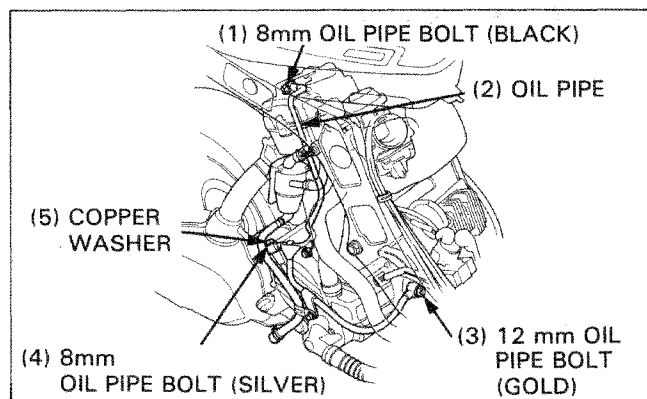


Install the oil pipe with the oil bolts and sealing washers.

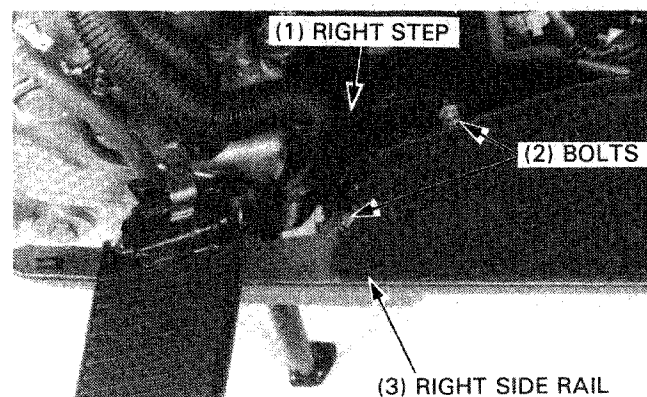
### NOTE

- Install the black oil bolt to the cylinder head side and silver oil bolt to the right crankcase side.  
Do not interchange the black and silver oil bolt.

Install the three bolts to the oil pipe stay on the right crankcase, water pump cover and cylinder head.



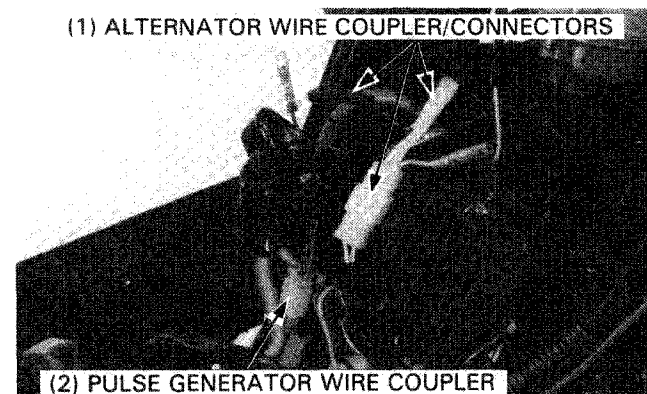
Install the right step and the right side rail (page 13-3).

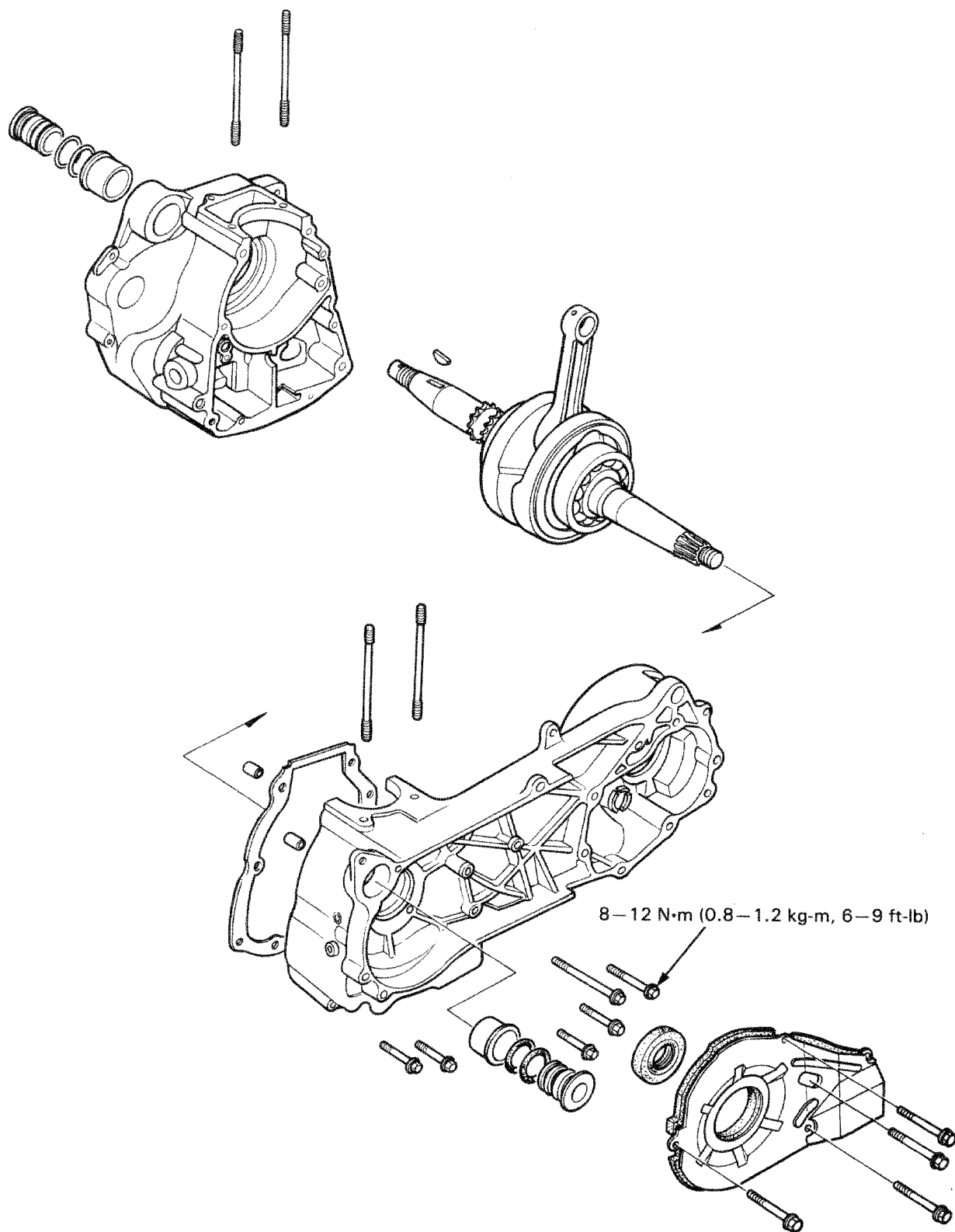


Connect the pulse generator and alternator wire coupler and connectors.

### NOTE

- Route the wires properly (page 1-8).
- Fill the crankcase and final reduction to the proper level with the recommended oil (page 2-1).
- Fill the cooling system (page 12-2).
- Perform the following inspections and adjustments:
  - oil leaks
  - coolant leaks





# 11. CRANKCASE/CRANKSHAFT

SERVICE INFORMATION	11-1	CRANKSHAFT INSPECTION	11-3
TROUBLESHOOTING	11-1	CRANKCASE ASSEMBLY	11-4
CRANKCASE SEPARATION	11-2		

## SERVICE INFORMATION

### GENERAL

- This section covers crankcase separation to service the crankshaft.
- The following parts must be removed before separating the crankcase.

Engine	Section 5
Cylinder head	Section 6
Cylinder/piston	Section 7
Drive and driven pulleys	Section 8
Alternator/starter driven gear	Section 10
Starter motor	Section 16
- If the crankshaft bearings, oil pump driven sprocket or timing sprocket need replacement, the crankshaft assembly must be replaced.

### SPECIFICATIONS

ITEM	STANDARD mm (in)	SERVICE LIMIT mm (in)
Connecting rod big end side clearance	0.05—0.4 (0.002—0.016)	0.6 (0.02)
Connecting rod big end radial clearance	0—0.008 (0—0.0004)	0.05 (0.002)
Crankshaft runout	—	0.10 (0.004)

**11**

### TORQUE VALUE

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

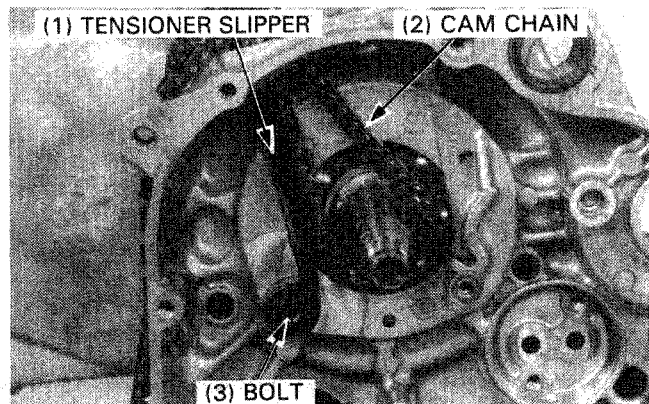
## TROUBLESHOOTING

#### Excessive engine noise

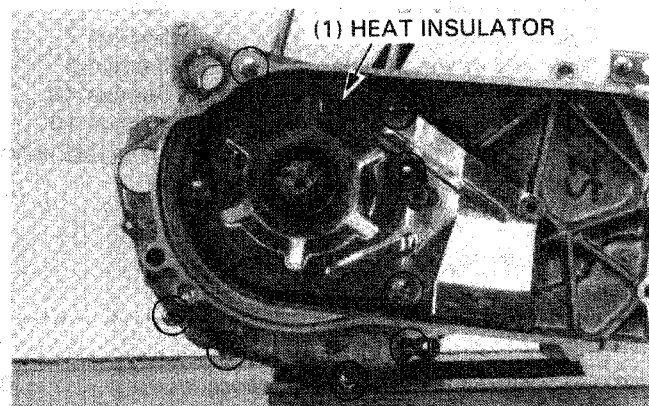
- Excessive bearing play
- Excessive crankpin bearing play
- Worn piston pin and piston pin hole

### CRANKCASE SEPARATION

Remove the cam chain tensioner slipper by removing the bolt. Remove the cam chain.



Remove the nine crankcase attaching bolts and heat insulator.

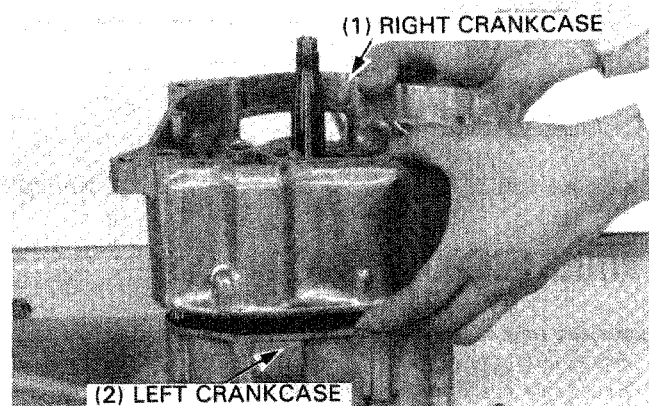


Place the crankcase with the left crankcase down and remove the right crankcase.

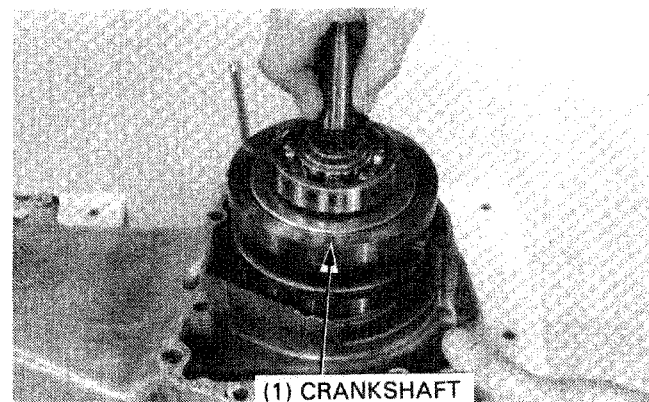
#### CAUTION

- *Never pry the crankcase mating surfaces apart.*

Remove the gasket and dowel pins.

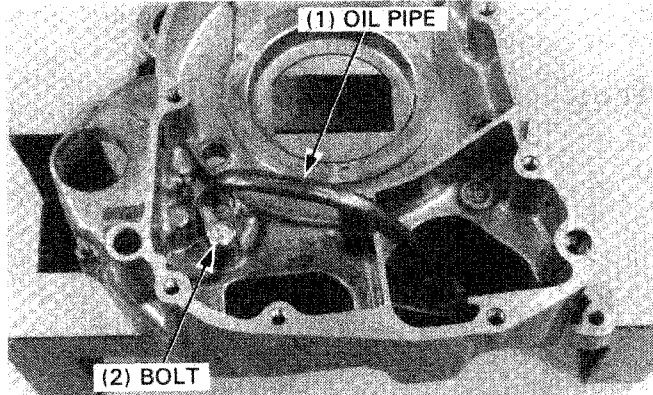


Remove the crankshaft from the left crankcase.

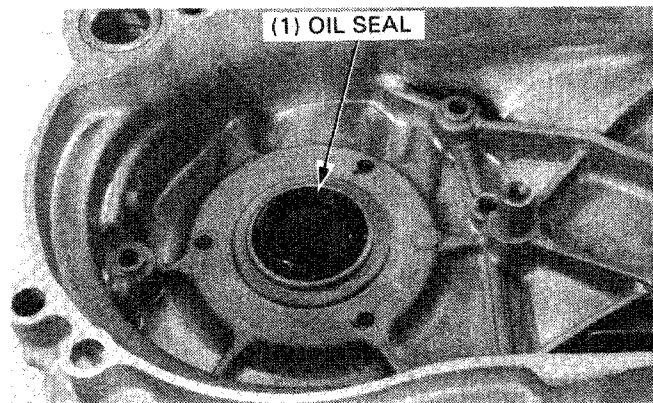




Remove the oil pipe from the right crankcase by removing the bolt.



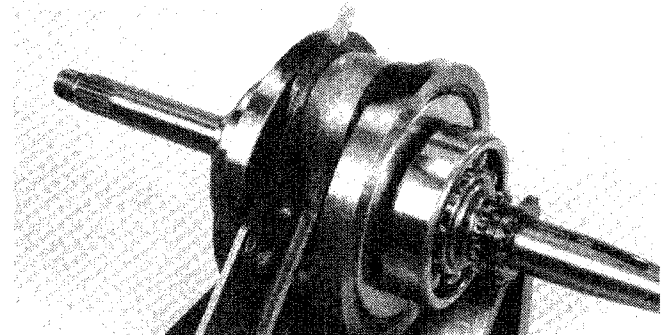
Check the oil seal for wear or damage.  
Replace the oil seal if necessary.



## CRANKSHAFT INSPECTION

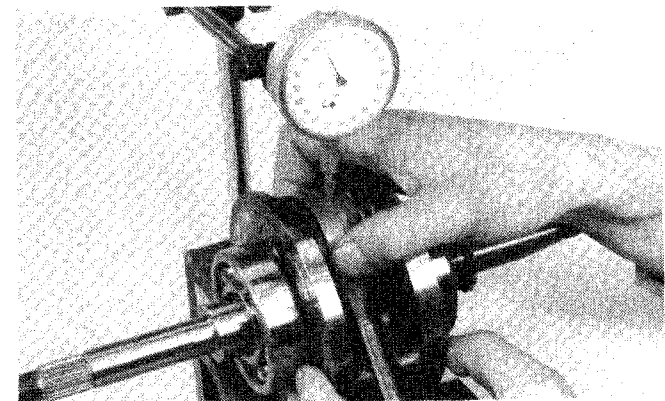
Measure the connecting rod big end side clearance with a feeler gauge.

**SERVICE LIMIT: 0.6 mm (0.02 in)**



Measure the connecting rod big end radial clearance in two places at right angles to the crankshaft.

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

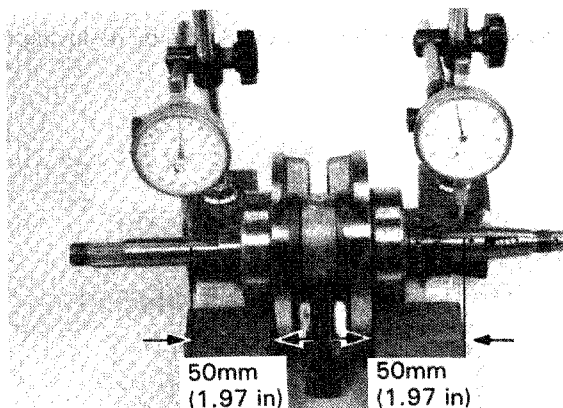




## CRANKCASE/CRANKSHAFT

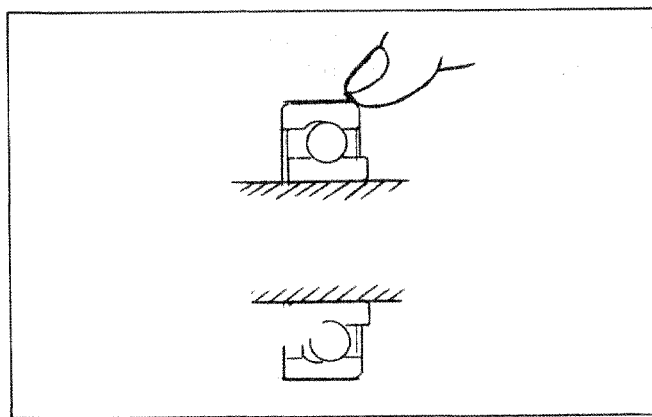
Set the crankshaft on a stand or in V blocks and read runout at the points shown, using a dial indicator

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



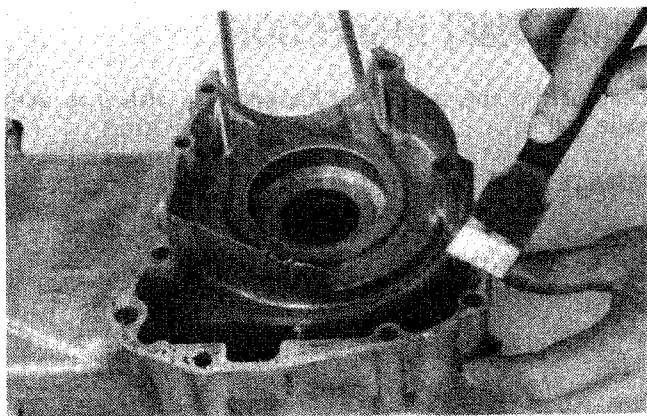
Turn the outer race of each crankshaft bearings with your finger. The bearings should turn smoothly and quietly. Also check that the bearing inner race fits tightly on the shaft.

Replace the crankshaft assembly if the races do not turn smoothly, quietly, or if they fit loosely on the shaft.

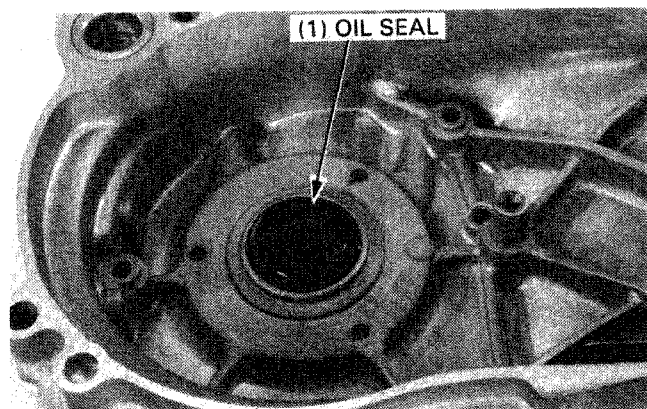


## CRANKCASE ASSEMBLY

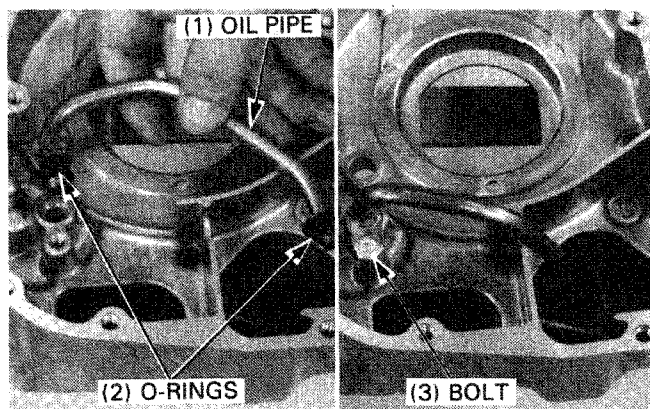
Remove all gasket materials from the crankcase being careful not to damage the mating surfaces.



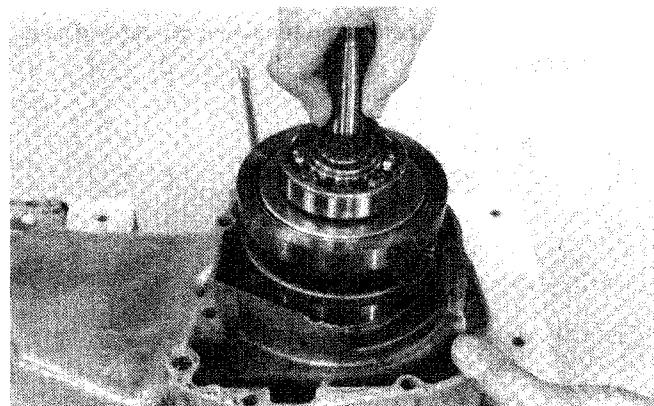
Apply grease to the lip of a new oil seal and install it into the left crankcase.



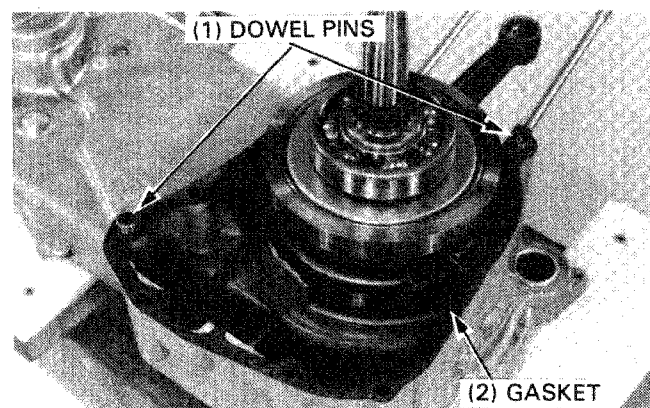
Wash the oil pipe in clean solvent and install new O-rings on both ends of the pipe.  
Install the oil pipe into the right crankcase and secure it with the bolt.



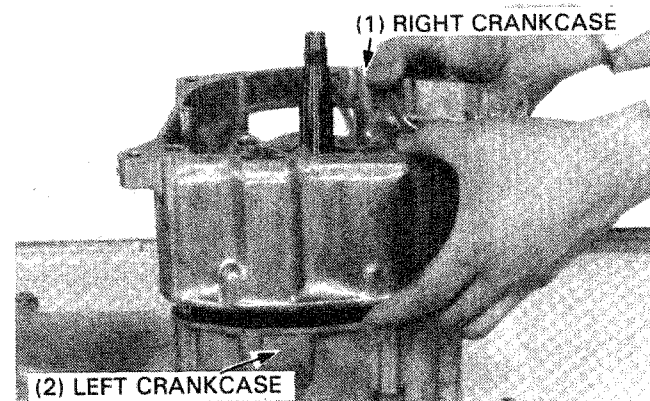
Install the crankshaft into the left crankcase being careful not to damage the oil seal.



Install the dowel pins and a new gasket.



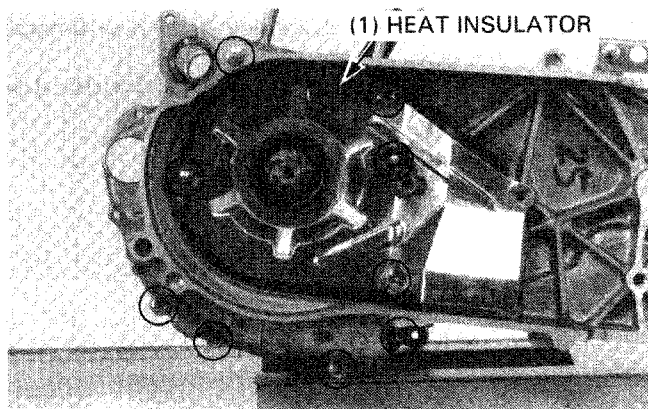
Place the right crankcase over the crankshaft and onto the left crankcase.



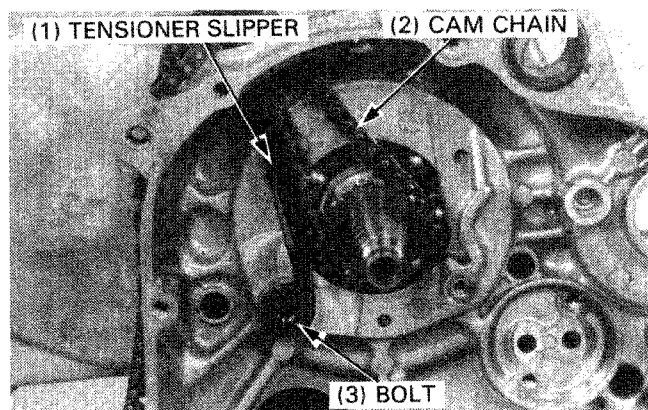
## CRANKCASE/CRANKSHAFT

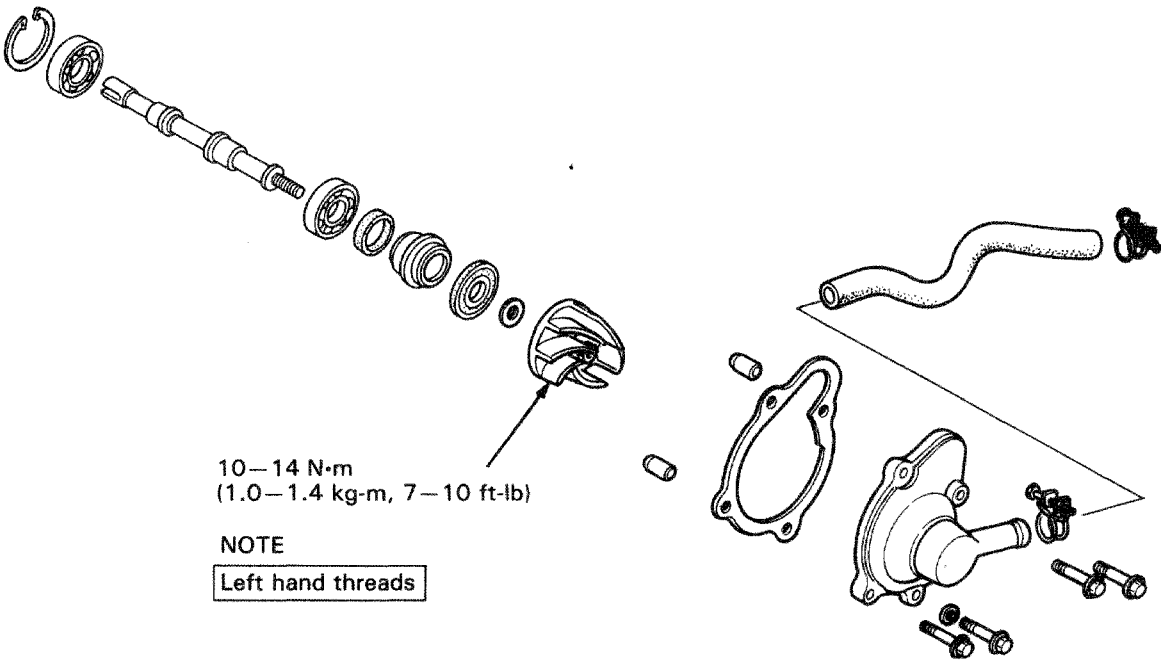
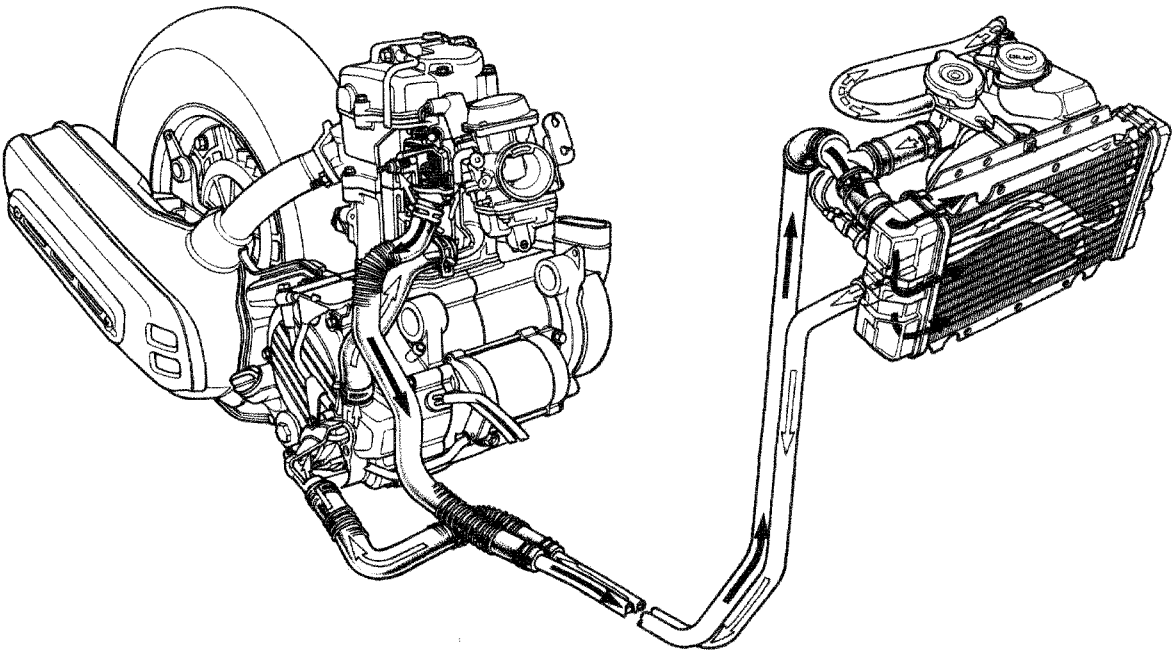
Install the heat insulator and the nine crankcase attaching bolts.

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



Install the cam chain, cam chain tensioner slipper and secure it with the bolt.





10—14 N·m  
(1.0—1.4 kg-m, 7—10 ft-lb)

NOTE  
Left hand threads

# 12. COOLING SYSTEM

SERVICE INFORMATION	12-1	RADIATOR	12-3
TROUBLESHOOTING	12-1	WATER PUMP	12-6
SYSTEM TESTING	12-2	THERMOSENSOR	12-10
COOLANT REPLACEMENT	12-2	THERMOSTAT	12-10

## SERVICE INFORMATION

### GENERAL

#### WARNING

- *Do not remove the radiator cap when the engine is hot. The coolant is under pressure and severe scalding could result. The engine must be cool before servicing the cooling system.*
- Use only distilled water and ethylene glycol in the cooling system. A50—50 mixture is recommended for maximum corrosion protection. Do not use alcohol-based antifreeze.
- Add coolant at the reserve tank. Do not remove the radiator cap except to refill or drain the system.
- The cooling system service can be done with the engine in the frame.
- Avoid spilling coolant on painted surfaces.
- After servicing the system, check for leaks with a cooling system tester.
- Refer to section 17 for fan motor thermostatic switch and temperature gauge inspections.

### SPECIFICATIONS

Radiator cap relief pressure	75—105 kPa (0.75—1.05 kg/cm <sup>2</sup> , 10.7—14.9 psi)
Freezing point (Hydrometer test)	55 % distilled water + 45 % ethylene glycol: - 32°C (- 26°F) 50 % distilled water + 50 % ethylene glycol: - 37°C (- 35°F) 45 % distilled water + 55 % ethylene glycol: - 44.5°C (- 48°F)
Coolant capacity: Radiator and engine Reserve tank Total system	1.0 lit (1.1 US qt, 0.9 Imp qt) 0.35 lit (0.37 US qt, 0.31 Imp qt) 1.35 lit (1.47 US qt, 1.21 Imp qt)
Thermostat	Begins to open: 69.5°C to 72.5°C (157°F to 162°F) Valve lift: 3.5—4.5 mm (0.14—0.18 in) at 80°C (176°F)
Boiling point (with 50—50 mixture)	Unpressurized: 107.7°C (226°F) Cap on, pressurized: 125.6°C (258°F)

### TORQUE VALUE

Water pump impeller (left hand threads) 10—14 N·m (1.0—1.4 kg·m, 7—10 ft·lb)

### TOOLS

#### Special

Mechanical seal 07945—4150400 or  
driver attachment GN—AH—065—415 (U.S.A. only)

Bearing remover, 15 mm  
07936—KC10500

#### Common

Remover weight 07741—0010200 or  
07936—3710200  
Driver 07749—0010000

## TROUBLESHOOTING

#### Engine temperature too high

- Faulty temperature gauge or gauge sensor
- Faulty radiator cap
- Thermostat stuck closed
- Insufficient coolant
- Passages blocked in radiator, hoses or water jacket
- Faulty water pump
- Faulty fan motor

#### Engine temperature too low

- Faulty temperature gauge or gauge sensor
- Thermostat stuck open

#### Coolant leaks

- Faulty pump mechanical seal
- Deteriorated O-rings
- Damaged or deteriorated hoses

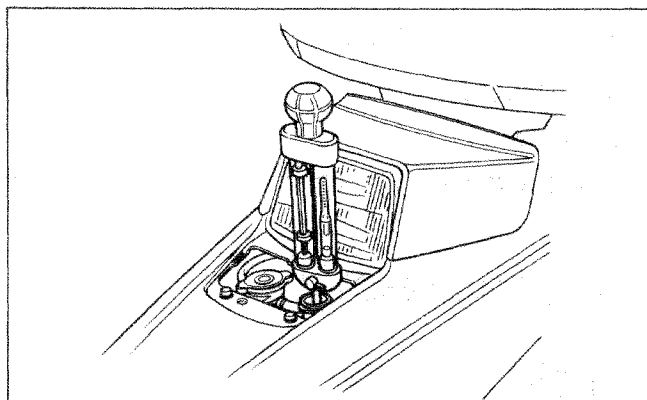
## COOLING SYSTEM

### SYSTEM TESTING

#### COOLANT

Remove the front cover lid by removing the trim clip screw.

Test the coolant mixture with an antifreeze tester. For maximum corrosion protection, a 50–50% solution of ethylene glycol and distilled water is recommended.

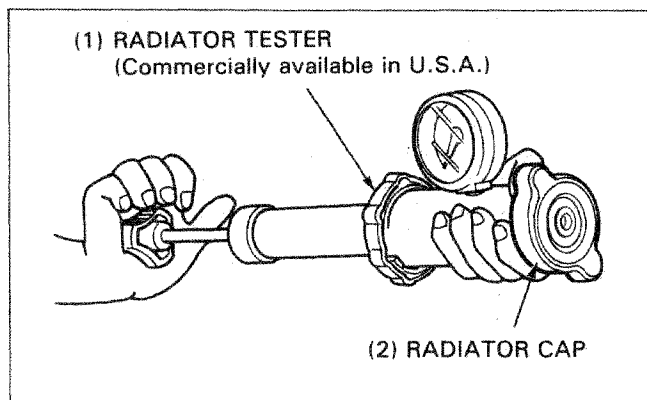


#### RADIATOR CAP INSPECTION

Wet the cap sealing surface and 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.

##### RADIATOR CAP RELIEF PRESSURE:

75–105 kPa (0.75–1.05 kg/cm<sup>2</sup>, 10.7–14.9 psi)

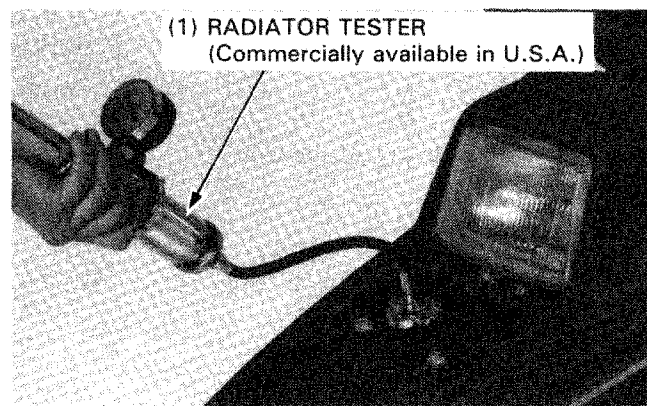


Pressurize the radiator, engine and hoses, and check for leaks.

#### CAUTION

- Excessive pressure can damage the radiator. Do not exceed 1.05 kg/cm<sup>2</sup> (14.9 Psi).

Repair or replace components if the system will not hold the specified pressure for at least six seconds.

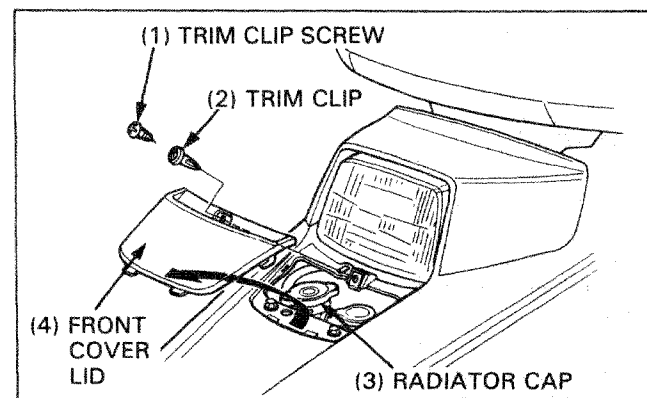


### COOLANT REPLACEMENT

#### WARNING

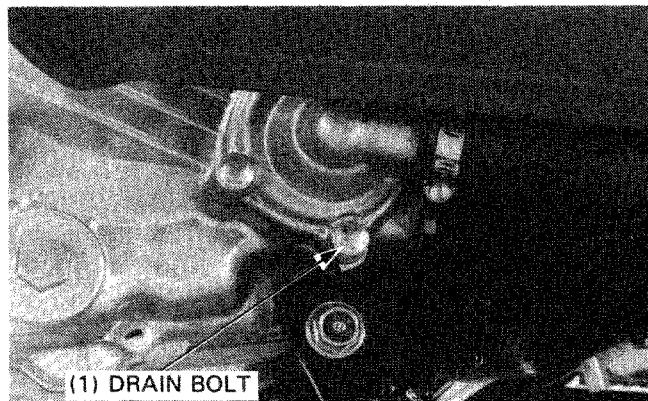
- The engine must be cool before servicing the cooling system, or severe scalding may result.

Unscrew the trim clip screw and remove the trim clip. Slide the front cover lid to the headlight side and remove the front cover lid. Remove the radiator cap.



Place a drain pan under the water pump and drain the coolant from the system by removing the drain bolt.

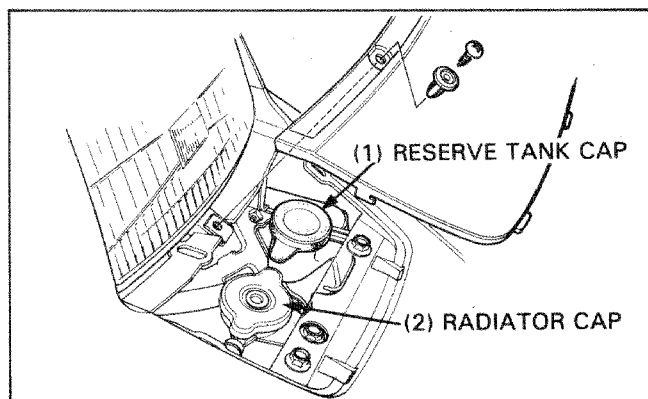
Reinstall the drain bolt.



Fill the system with a 50—50 mixture of distilled water and ethylene glycol.

Bleed air from the system.

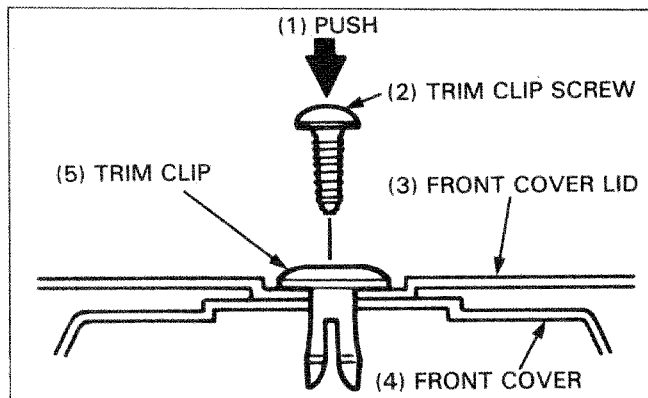
- Start the engine and run until there are no air bubbles in the coolant, and the level stabilizes.
- Stop the engine and add coolant up to the proper level if necessary.
- Reinstall the radiator cap.
- Check the level of coolant in the reserve tank and fill to the correct level if the level is low.
- Close the front cover.



Install the trim clip through the front cover lid and front cover. Push the trim clip screw into the trim clip securely.

## NOTE

- Do not turn in the trim clip screw.

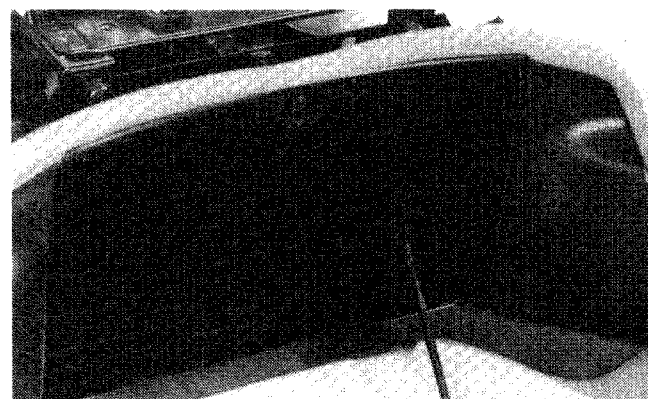


## RADIATOR

### INSPECTION

Inspect the radiator soldered joints and seams for leaks.

Blow dirt out from between core fins with low pressure air. If insects etc., are clogging the radiator, wash them off with low pressure water.





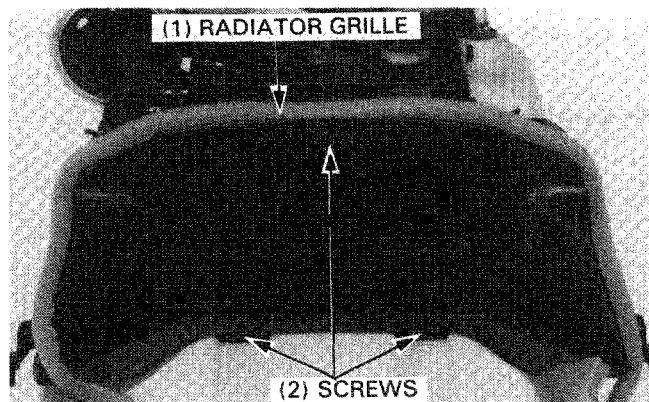
## COOLING SYSTEM

### REMOVAL/INSTALLATION

Drain the coolant (page 12-2).

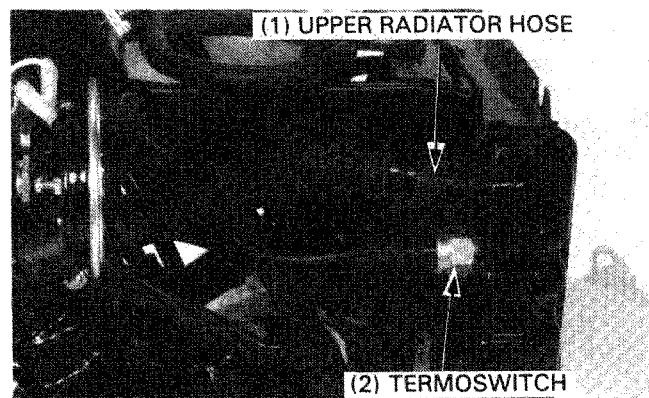
Remove the headlight cover and front upper cover (page 13-5).

Remove the radiator grille by removing the three screws.



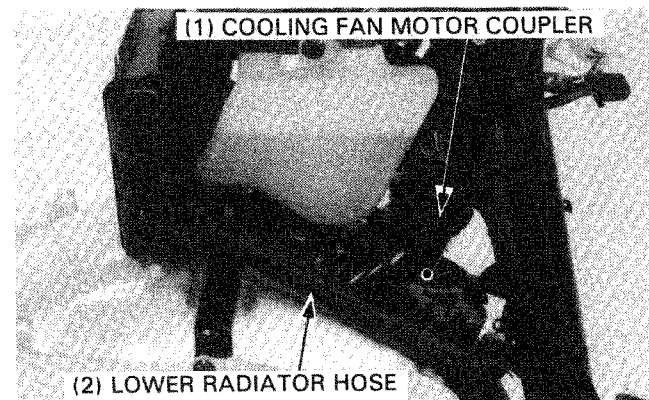
Disconnect the thermoswitch wire.

Disconnect the upper radiator hose.



Disconnect the cooling fan motor coupler.

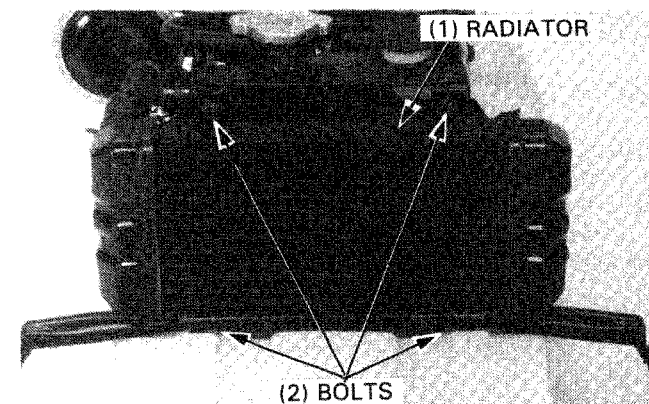
Disconnect the lower radiator hose.



Remove the radiator by removing the four bolts.

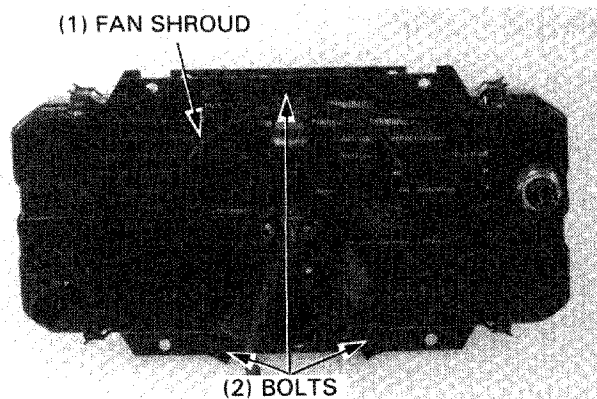
Install the radiator in the reverse order of removal.

After installation check the cooling system (page 12-2).



## DISASSEMBLY/ASSEMBLY

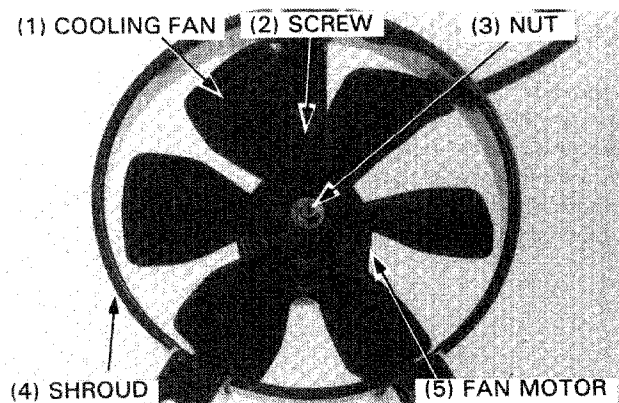
Remove the fan shroud with the fan motor by removing the three bolts.



Remove the cooling fan from the fan motor by removing the nut.

Remove the fan motor from the shroud by removing the bolts.

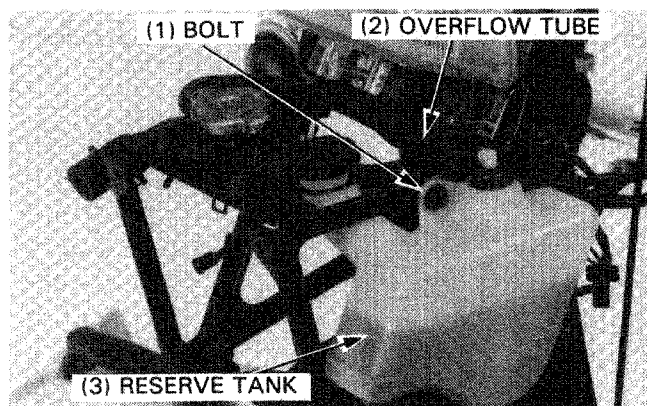
Assemble in the reverse order of removal.



## BRACKET REMOVAL/INSTALLATION

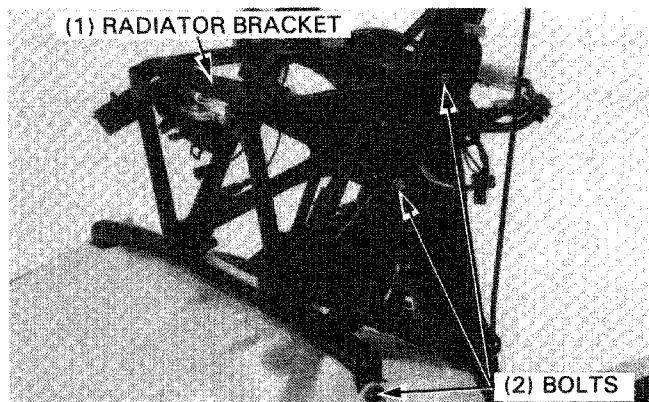
Remove the radiator (page 12-4).

Disconnect the radiator overflow tube from the reserve tank.  
Remove the bolts and reserve tank.



Remove the six bolts and radiator bracket.

Install the radiator bracket and reserve tank in the reverse order of removal.

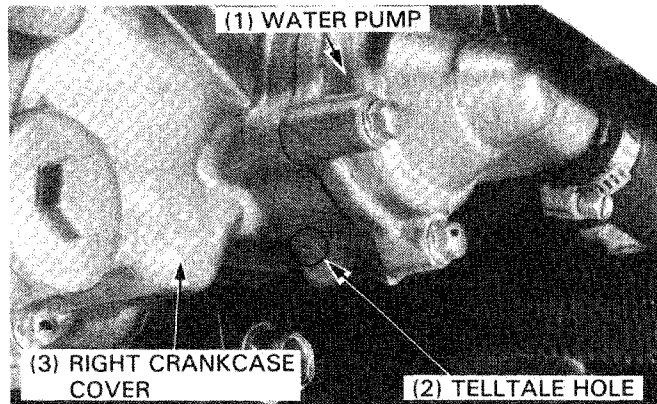


## COOLING SYSTEM

### WATER PUMP

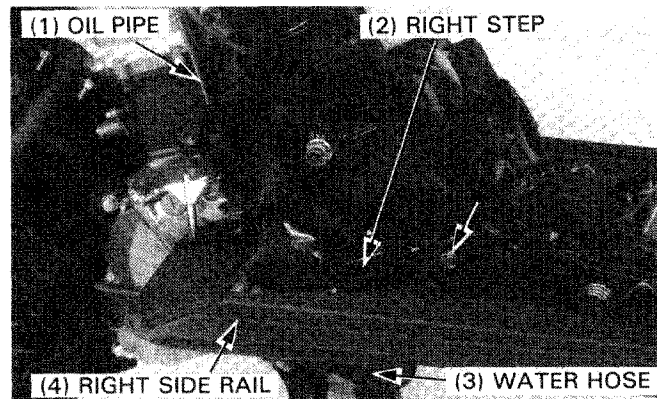
#### MECHANICAL SEAL INSPECTION

Inspect the telltale hole for signs of coolant leakage.  
If the mechanical seal is leaking, remove the right crankcase cover and replace the mechanical seal.



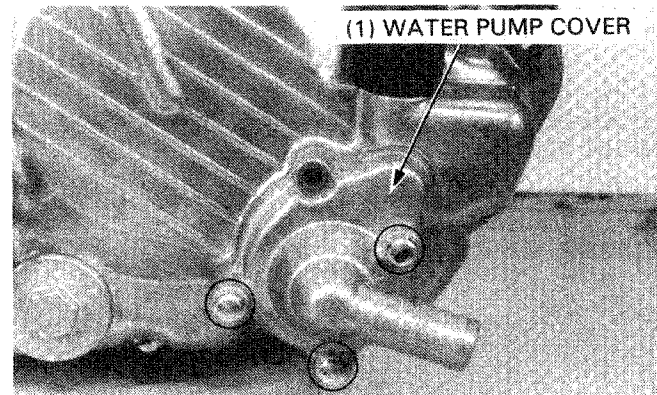
#### WATER PUMP REMOVAL

Remove the right side rail (page 13-3).  
Remove the right step.  
Drain the coolant (page 12-2).  
Drain the engine oil (page 2-2).  
Remove the oil pipe (page 10-2).  
Disconnect the water hose from the water pump.



Remove the water pump cover by removing the two bolts.

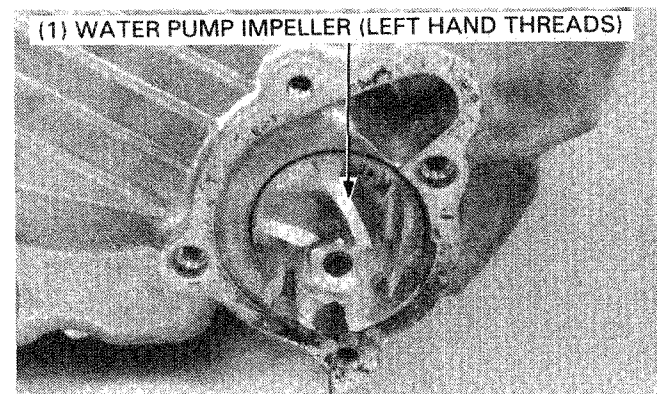
Remove the dowel pins and gasket.



Remove the water pump impeller by turning it clockwise.

#### NOTE

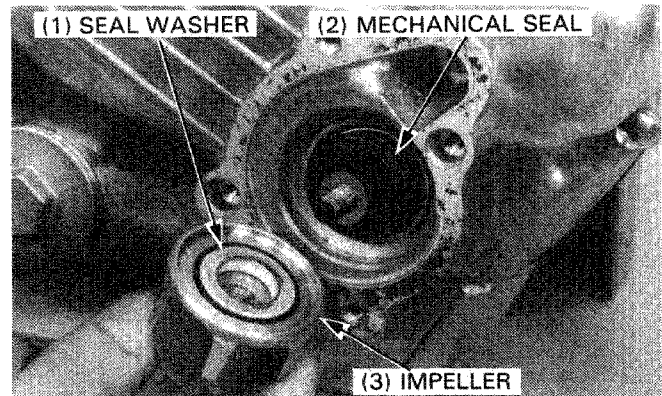
- The impeller has left hand threads.



Inspect the mechanical seal and seal washer for wear or damage.

### NOTE

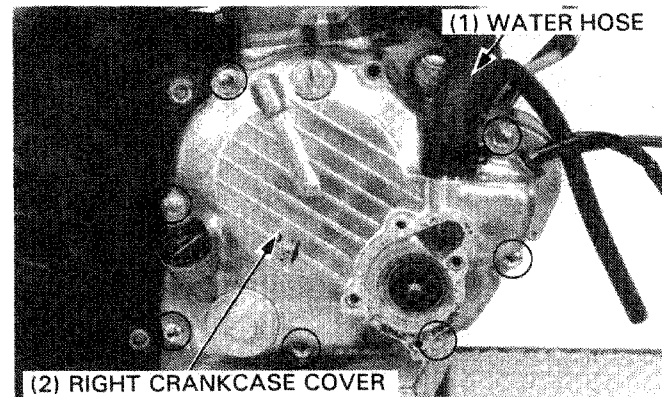
- The mechanical seal and seal washer must be replaced as a set.



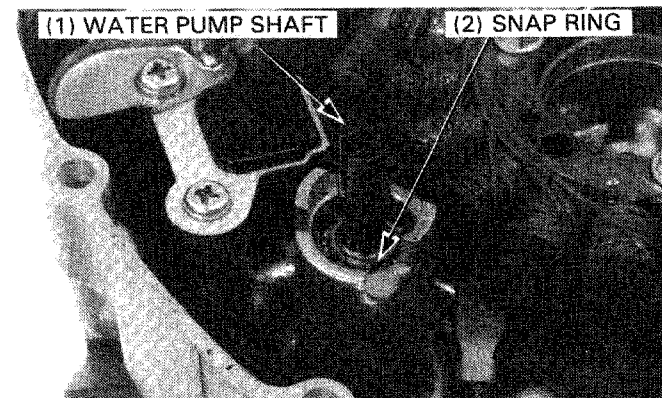
### WATER PUMP SHAFT REMOVAL

Disconnect the pulse generator and alternator wire coupler and connector.

Disconnect the water hose from the right crankcase cover. Remove the right crankcase cover, gasket and dowel pins.

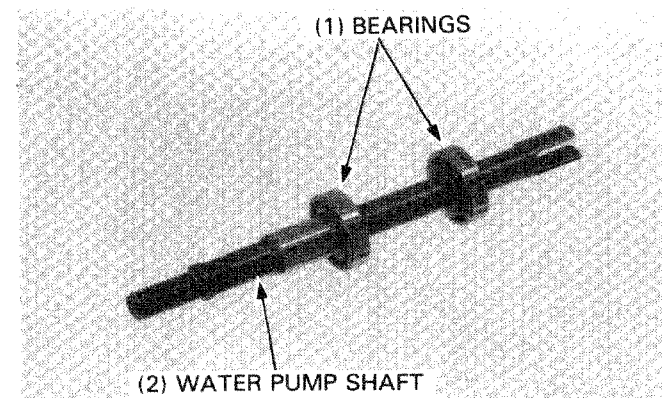


Remove the snap ring from the right crankcase cover. Remove the water pump shaft.



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

Replace the bearings if the races do not turn smoothly, quietly, or if they fit loosely on the shaft.





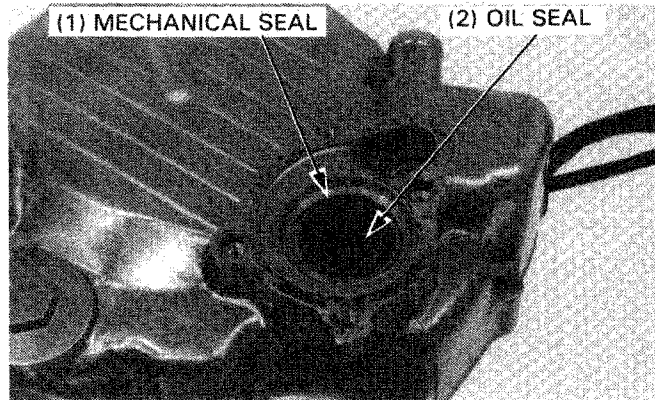
## COOLING SYSTEM

### MECHANICAL SEAL REPLACEMENT

Remove the mechanical seal and oil seal out of the right crankcase cover using a bearing remover.

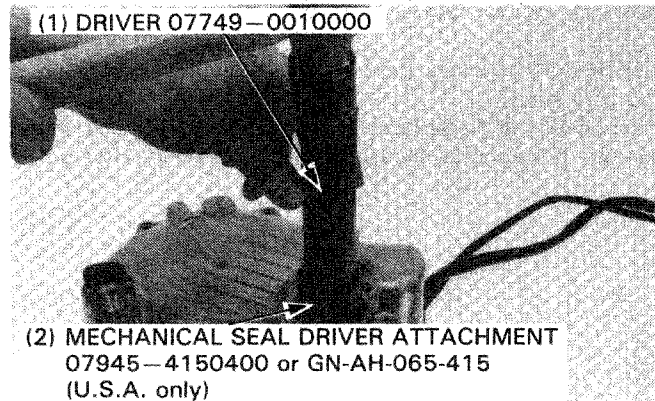
**Tools:**

Bearing remover, 15 mm 07936—KC10500  
Remover weight 07741—0010200 or  
07936—3710200



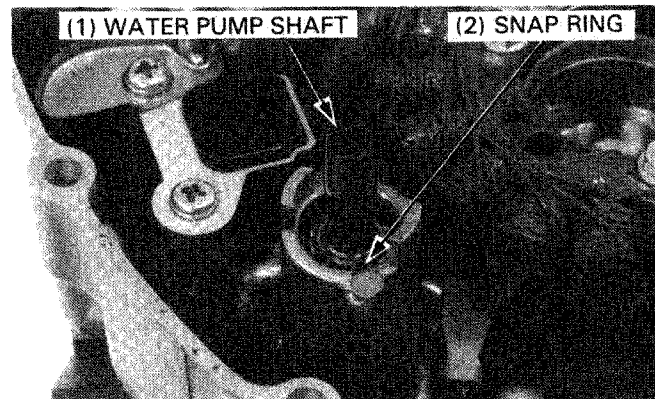
Drive a new oil seal into the cover with the oil seal marks facing out.

Apply sealant to the surface of a new mechanical seal.  
Install the mechanical seal into the cover.

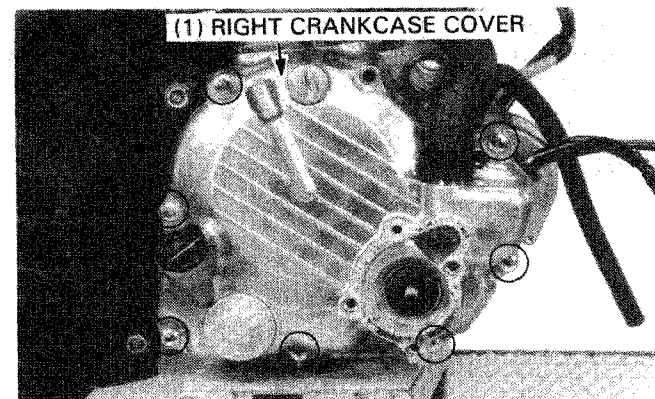


### WATER PUMP SHAFT INSTALLATION

Install the water pump shaft into the right crankcase.  
Install the snap ring into the ring groove to secure the bearing.



Install the right crankcase cover.

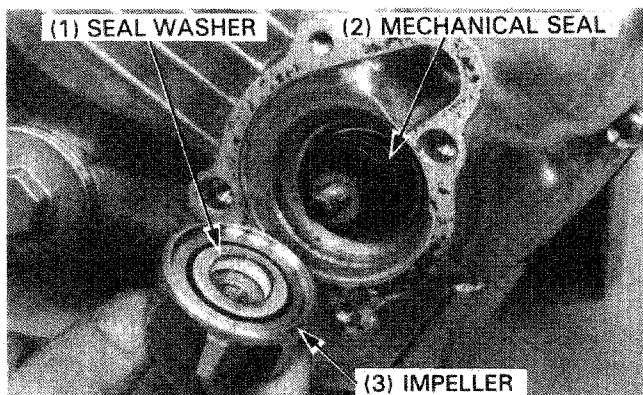


## WATER PUMP IMPELLER INSTALLATION

Install the seal washer into the impeller.

### NOTE

- When the mechanical seal is replaced, a new seal washer must be used.

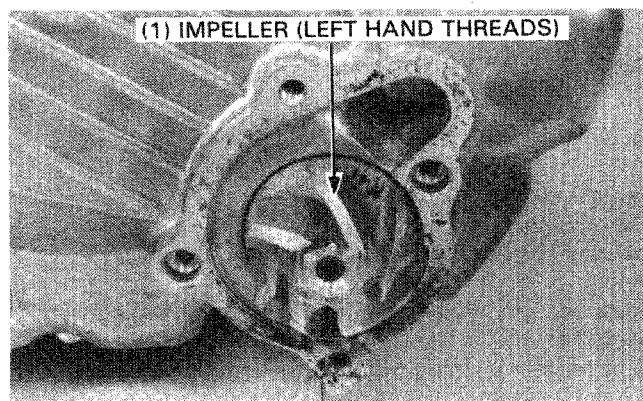


Install the impeller onto the pump shaft and tighten it.

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

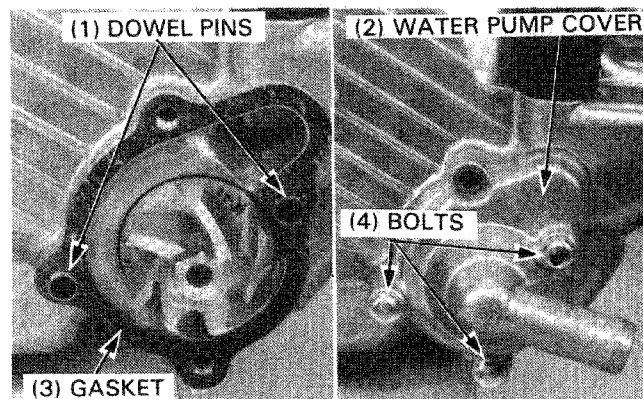
### NOTE

- The impeller has left hand threads.



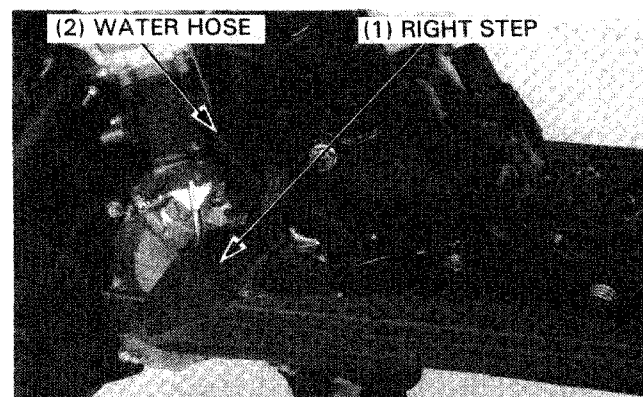
Install the dowel pins and new gasket.

Install the water pump cover with the three bolts.



Install the oil pipe (page 6-15).  
Install the right step and side rail.

Connect the water hose to the water pump.  
Fill the crankcase with the recommended oil (page 2-1).  
Fill the cooling system (page 12-2).



## COOLING SYSTEM

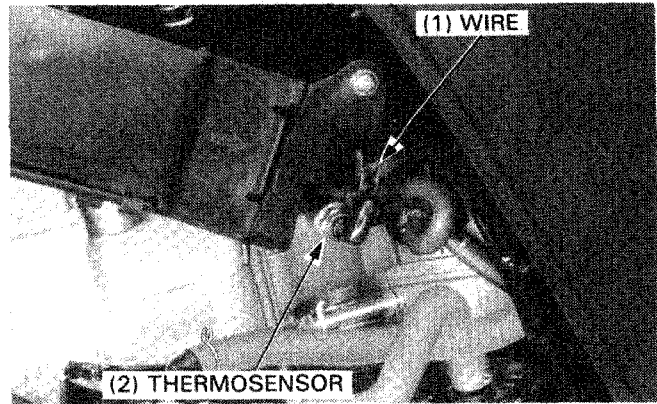
### THERMOSENSOR

#### REMOVAL

Remove the right rear cover.  
Drain the coolant (page 12-2).  
Disconnect the thermosensor wire.  
Remove the thermosensor.

#### INSTALLATION

Apply 3-BOND No. 1212 sealant or equivalent to the thermosensor threads and install it into the thermostat housing.  
Connect the thermosensor wire.  
Fill and bleed the cooling system (page 12-2).  
Install the right rear cover.

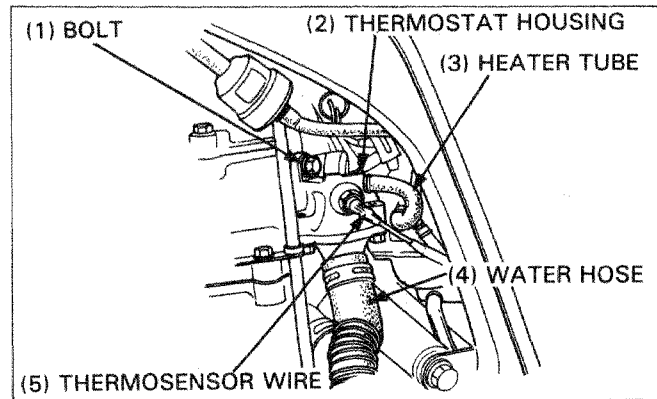


### THERMOSTAT

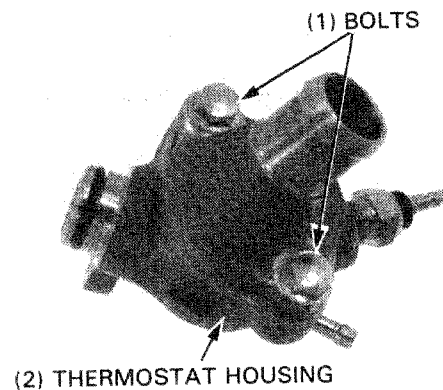
#### REMOVAL

Remove the right rear cover.  
Drain the coolant (page 12-2).  
Disconnect the thermosensor wire from the sensor.

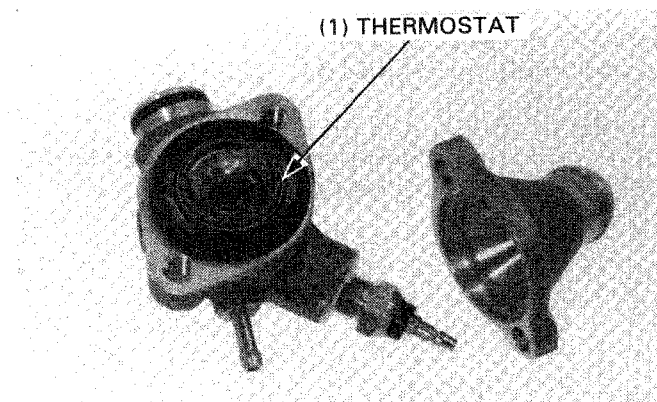
Disconnect the water hose from the thermostat housing.  
Disconnect the heater tube from the housing.  
Remove the mounting bolt and thermostat housing from the cylinder head.



Remove the two bolts and separate the thermostat housing halves.



Remove the thermostat from the housing.





## INSPECTION

Inspect the thermostat visually for damage.  
Suspend the thermostat in heated water to check its operation.

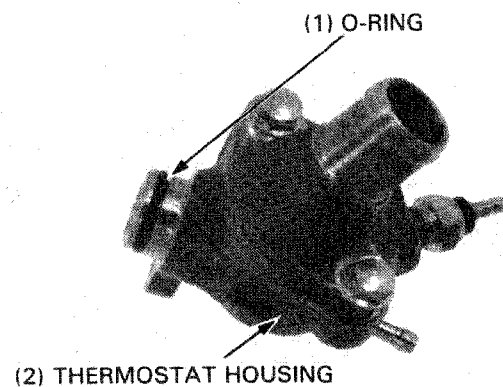
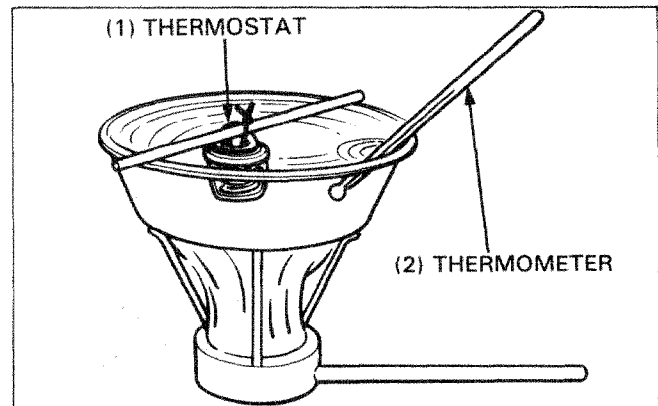
### NOTE

- If the thermostat or thermometer touches the pan, you'll get a false reading.

Replace the thermostat if the valve stays open at room temperature, or if it responds at temperatures other than those specified.

### Technical Data

Start to open	80° to 90°C (176° to 194°F)
Fully open	3.5—4.5 mm (0.14—0.18 in) when heated to 90°C (194°F) for 5 minutes.



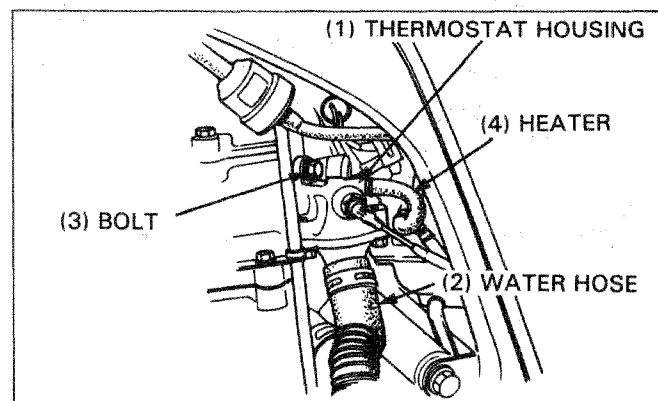
## INSTALLATION

Install in the reverse order of removal.

### NOTE

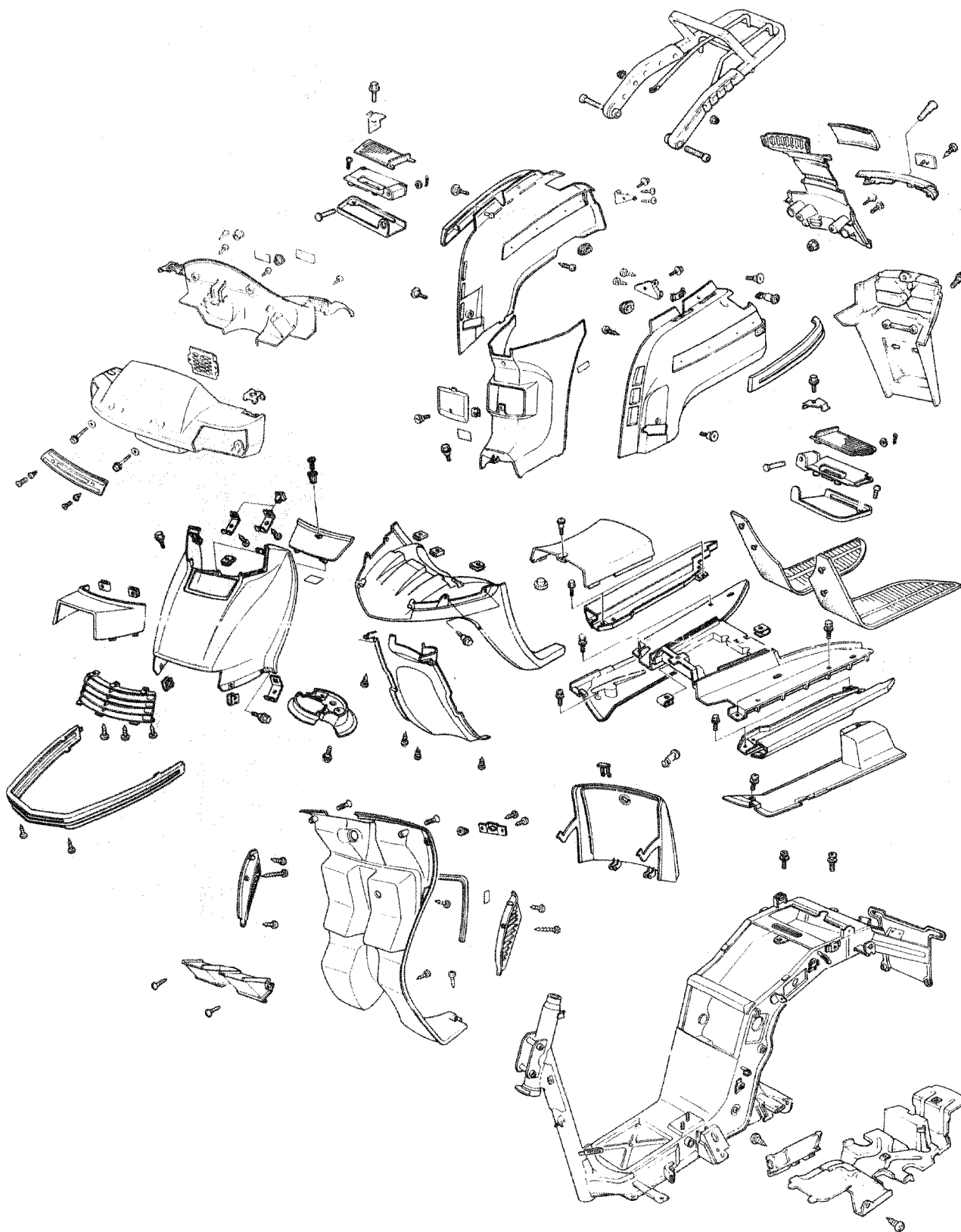
- Replace the O-ring with a new one and apply grease to it.

Fill the cooling system with the specified coolant (Page 12-3).



## FRAME COVERS

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# 13. FRAME COVERS

SERVICE INFORMATION	13-1	INNER BOX	13-4
REAR COVER	13-2	FRONT UPPER COVER	13-5
BODY CENTER COVER	13-2	FRONT LOWER COVER	13-6
FLOOR PANEL, SIDE RAIL, FLOOR LOWER COVER	13-3	REAR CARRIER	13-6

## SERVICE INFORMATION

### GENERAL

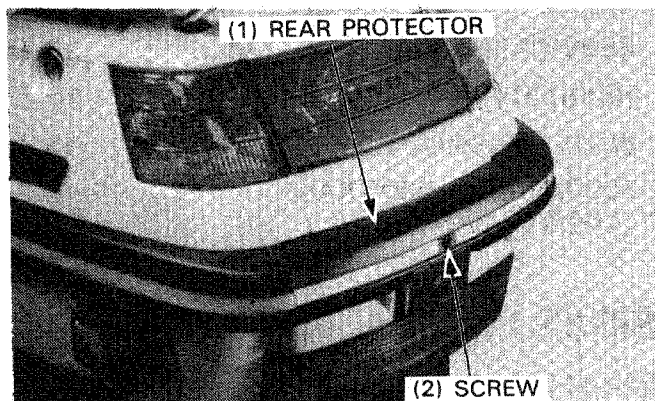
- This section includes the frame covers (right and left rear cover, floor panel, side rail, floor lower cover, inner box, front upper cover, front lower cover and rear carrier) maintenance.
- Frame Cover Removal Sequence:

- REAR COVER ————— REAR PROTECTOR
- FLOOR PANEL ————— RIGHT AND LEFT REAR COVERS  
↓  
BODY CENTER COVER
- FLOOR LOWER COVER ————— RIGHT AND LEFT REAR COVERS  
↓  
RIGHT AND LEFT SIDE RAILS  
↓  
BODY CENTER COVER  
↓  
FLOOR PANEL
- INNER BOX ————— RIGHT AND LEFT REAR COVERS  
↓  
BODY CENTER COVER  
↓  
FLOOR PANEL
- FRONT UPPER COVER ————— FRONT PROTECTOR  
↓  
FRONT COVER LID
- FRONT LOWER COVER ————— FRONT PROTECTOR

## FRAME COVERS

### REAR COVER

Remove the rear protector by removing the screw and releasing the tabs.



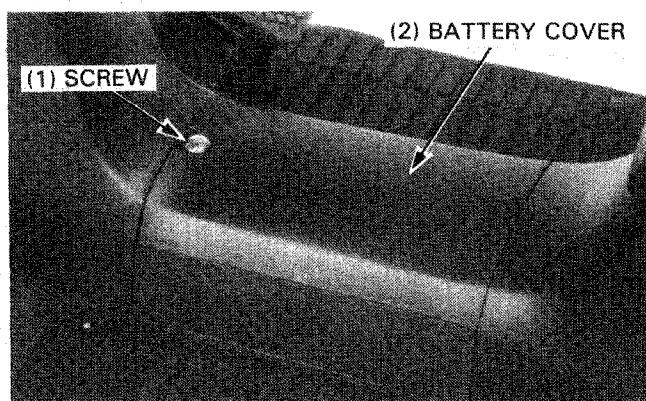
Open the seat and remove the right and left rear cover by removing the screws and bolt.

Install the rear covers in the reverse order of removal.



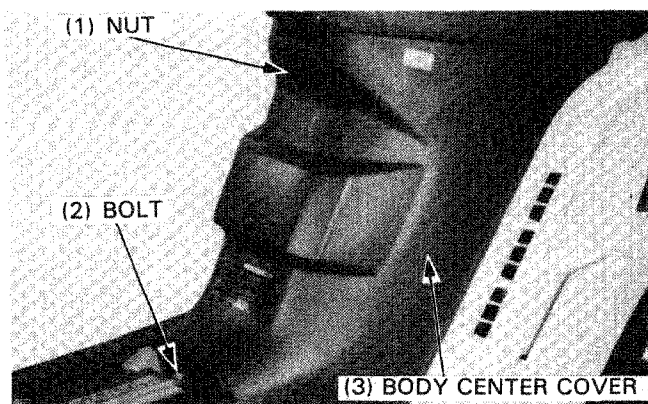
### BODY CENTER COVER

Remove the battery cover by removing the screw.  
Remove the floor mat.



Remove the body center cover by removing the bolt and nut.

Install the body center cover in the reverse order of removal.



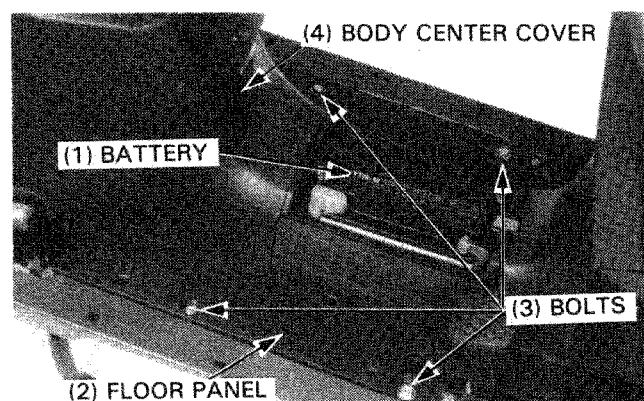
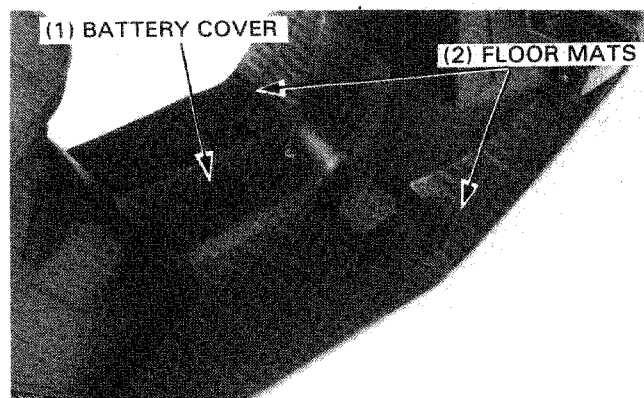
## FLOOR PANEL, SIDE RAIL, FLOOR LOWER COVER

Remove the battery cover, and floor mats.

Remove the battery (page 16-3).

Remove the body center cover (page 13-2).

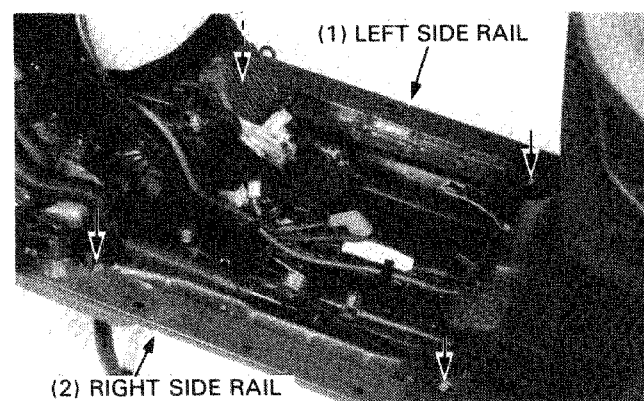
Remove the floor panel by removing the four bolts.



Remove the right and left side rail by removing the two bolts from each side.

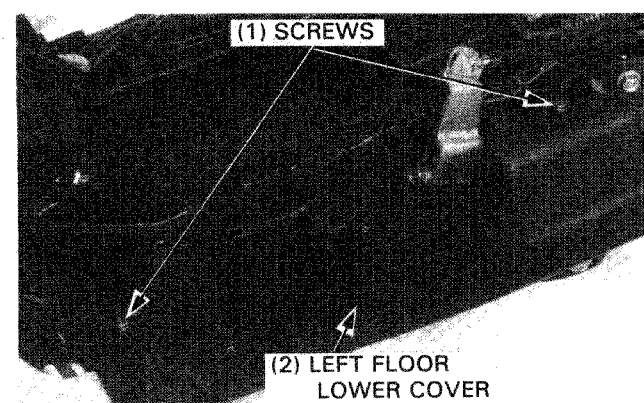
### NOTE

- The side rails can be removed by simply removing four bolts each side located under the floor mats.



Remove the right and left floor lower cover by removing the two screws from each side.

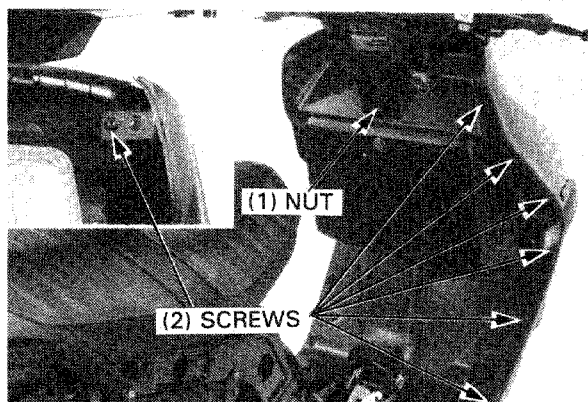
Install in the reverse order of removal.



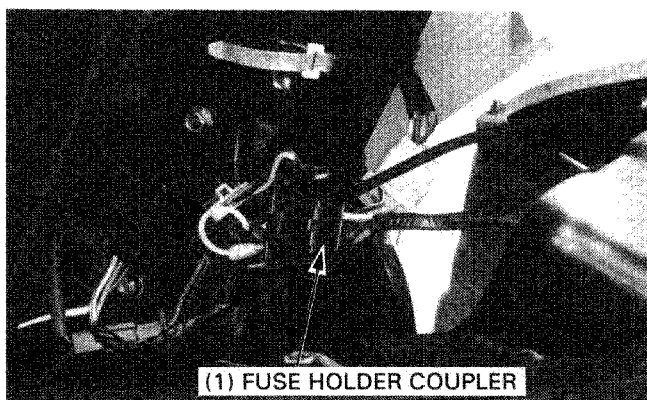
## FRAME COVERS

### INNER BOX

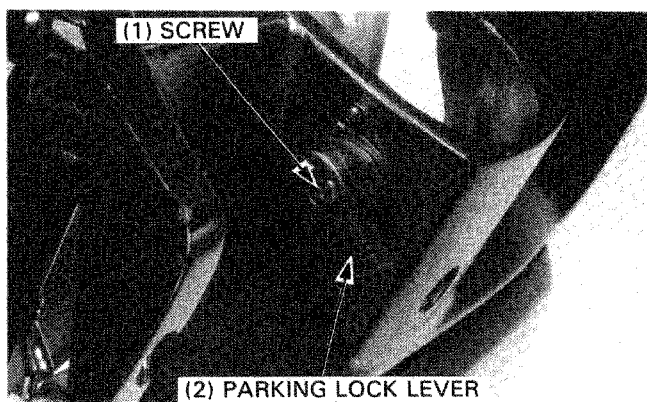
Remove the floor panel (page 13-3).  
Remove the 14 screws and nut.



Disconnect the fuse holder coupler.



Remove the screw and parking lock lever.

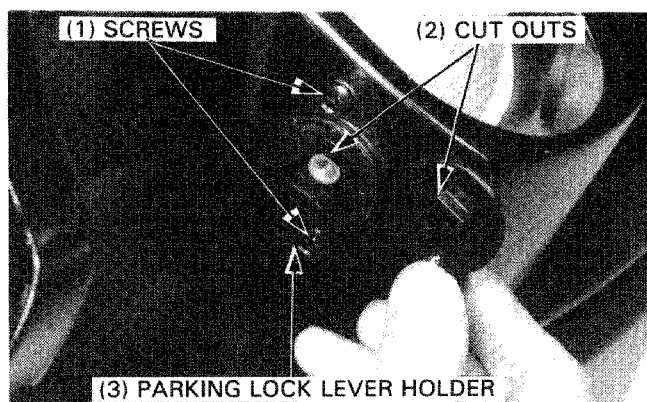


Remove the two screws and parking lock lever holder and remove the parking lock cable from the inner box.

Install the inner box in the reverse order of removal.

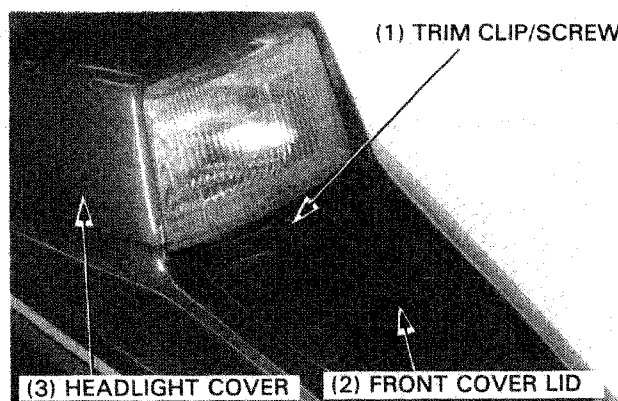
#### NOTE

- Install the parking lock lever aligning the cut-out of the lever with the cut-out of the holder.

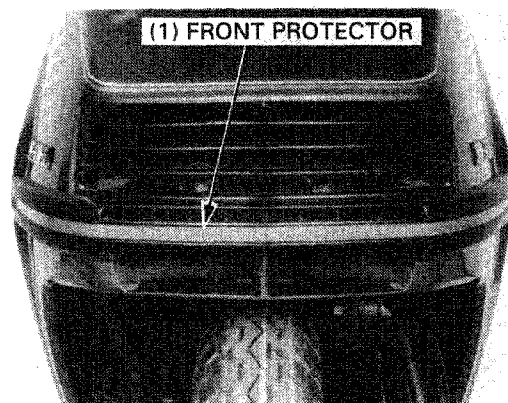


## FRONT UPPER COVER

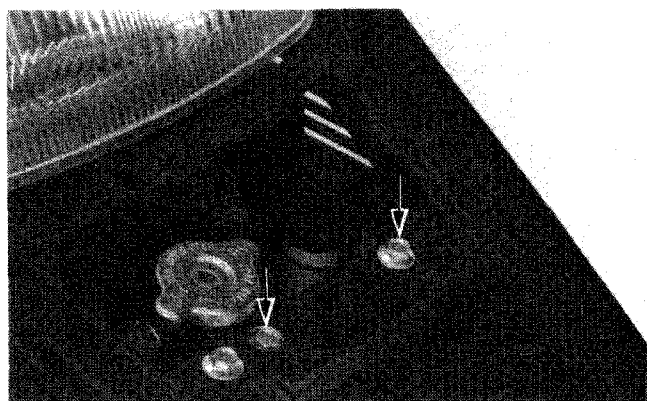
Remove the front cover lid by removing the trim clip/screw.  
Remove the headlight cover by removing the two screws on the inner box upper side.



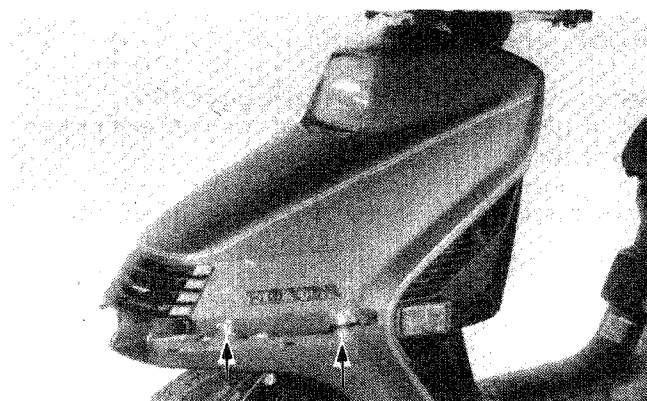
Remove the inner box screws (page 13-4).  
Remove the front protector by loosening the tabs.



Remove the two upper bolts.



Remove the four lower bolts and remove the front upper cover.

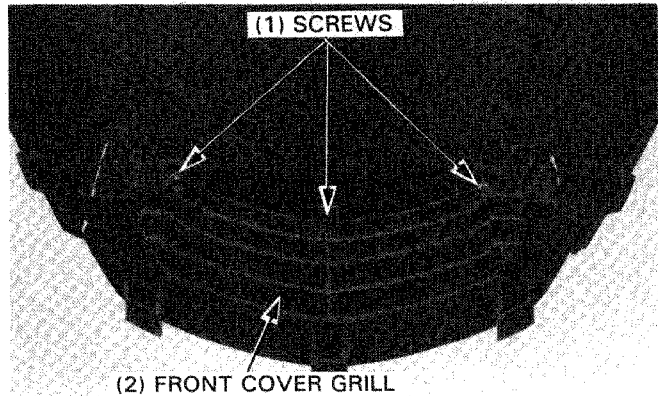




## FRAME COVERS

Remove the three screws and front cover grill from the front upper cover.

Install the front upper cover in the reverse order of removal.

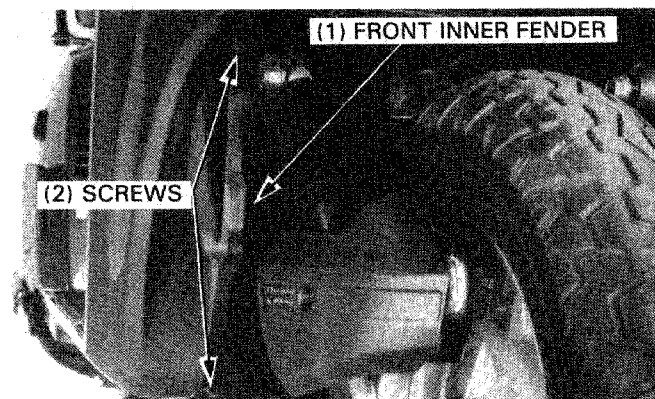


## FRONT LOWER COVER

Remove the front fork inner fender by removing the two bolts (page 14-16).

Remove the inner box (page 13-4).

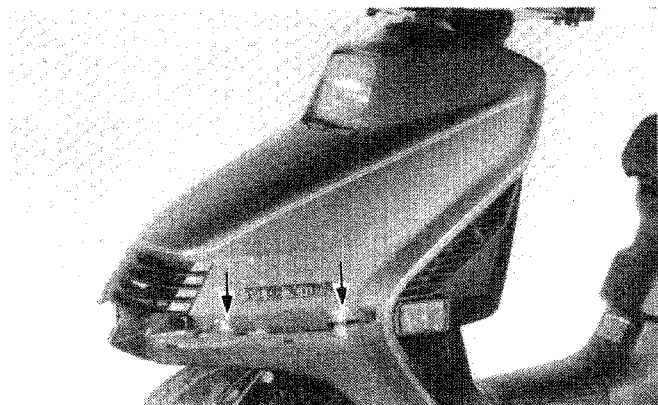
Remove the front inner fender by removing the four screws.



Remove the front protector (page 13-5).

Remove the two bolts and two screws, and slide the front lower cover off.

Install the front lower cover in the reverse order of removal.

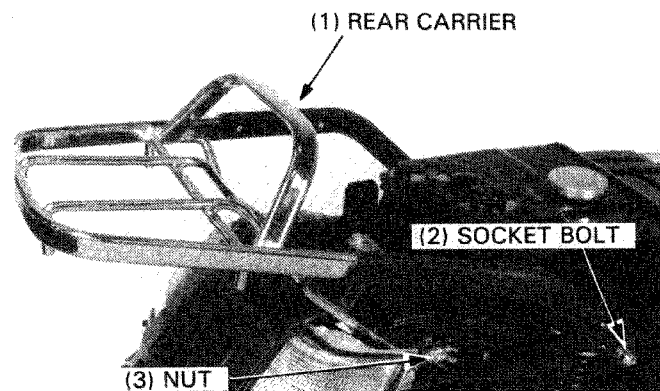


## REAR CARRIER

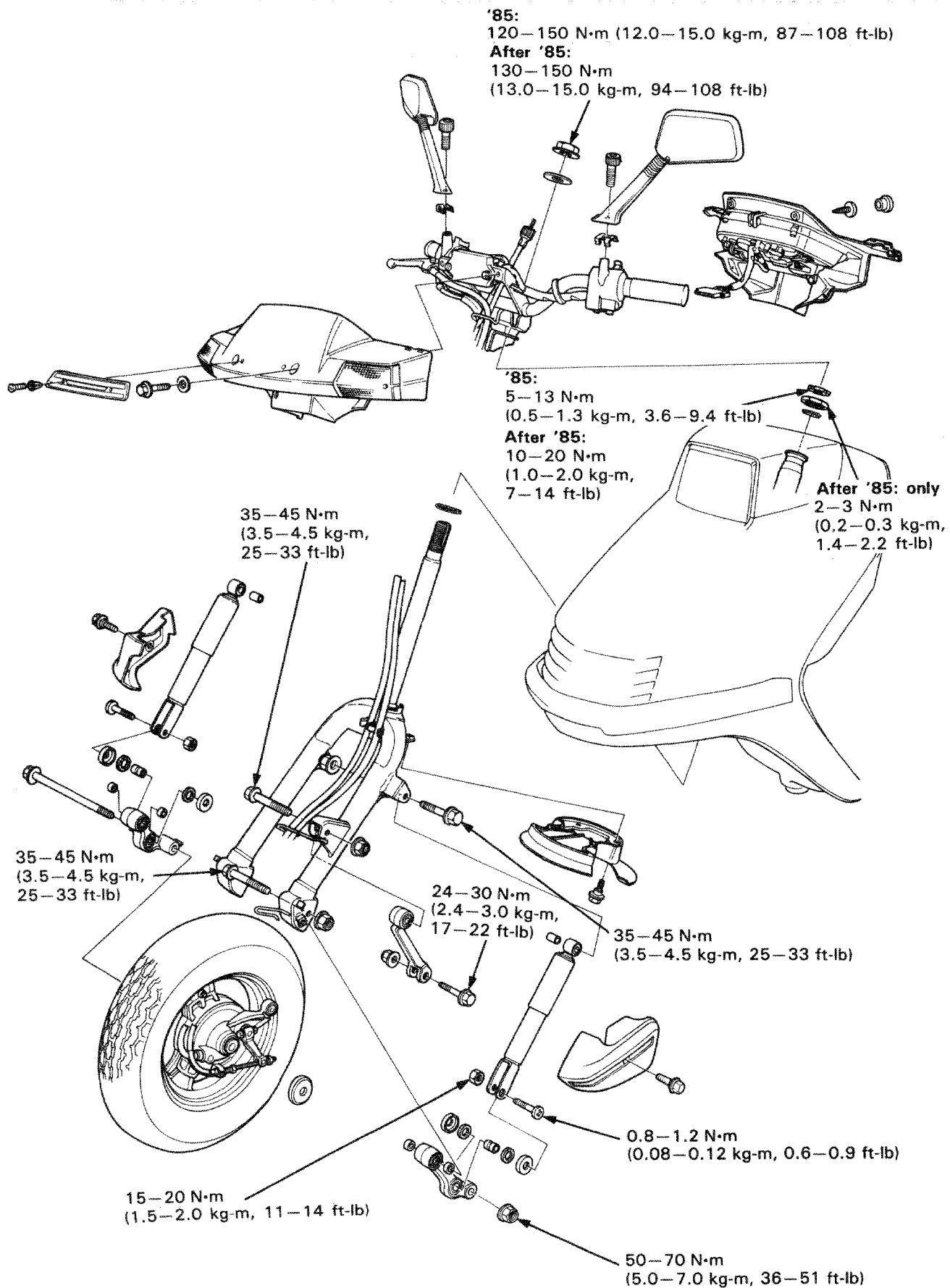
Remove the right and left rear cover (page 13-2).

Remove the two socket bolts and two nuts and remove the rear carrier.

Install the rear carrier in the reverse order of removal.



## STEERING/FRONT WHEEL/BRAKE/SUSPENSION



# 14. STEERING/FRONT WHEEL/BRAKE/SUSPENSION

SERVICE INFORMATION	14-1	FRONT BRAKE	14-9
TROUBLESHOOTING	14-2	FRONT SUSPENSION	14-12
HANDLEBAR	14-3	FRONT FORK/STEERING	14-16
FRONT WHEEL	14-6		

## SERVICE INFORMATION

### GENERAL

Refer to the Tubeless Tire Repair Manual for tire removal, repair, and remounting procedures.

### SPECIFICATIONS

ITEM		STANDARD mm (in)	SERVICE LIMIT mm (in)
Axle runout		—	0.2 (0.008)
Wheel rim runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Shock absorber spring free length		222.0 (8.74)	217.6 (8.57)
Front brake drum I.D.		130.0 (5.12)	131.0 (5.16)
Brake lining thickness		4.0 (0.16)	2.0 (0.08)

### TORQUE VALUES

Steering stem lock nut	'85: 5—13 N·m (0.5—1.3 kg-m, 3.6—9.4 ft-lb) After '85: 10—20 N·m (1.0—2.0 kg-m, 7—14 ft-lb)
Steering stem nut	'85: 120—150 N·m (12.0—15.0 kg-m, 87—108 ft-lb) After '85: 130—150 N·m (13.0—15.0 kg-m, 94—108 ft-lb)
Front wheel hub nut	28—32 N·m (2.8—3.2 kg-m, 20—23 ft-lb) — Apply oil
Front axle nut	50—70 N·m (5.0—7.0 kg-m, 36—51 ft-lb)
Torque link bolt (Panel side)	24—30 N·m (2.4—3.0 kg-m, 17—22 ft-lb)
(Fork side)	35—45 N·m (3.5—4.5 kg-m, 25—33 ft-lb)
Brake arm bolt	8—12 N·m (0.8—1.2 kg-m, 6—9 ft-lb)
Shock absorber clevis lock nut	15—25 N·m (1.5—2.5 kg-m, 11—18 ft-lb) — Apply locking agent
Shock absorber upper mount bolt	35—45 N·m (3.5—4.5 kg-m, 25—33 ft-lb)
Pivot arm mount bolt	35—45 N·m (3.5—4.5 kg-m, 25—33 ft-lb)
Shock absorber lower mount screw	0.8—1.2 N·m (0.08—0.12 kg-m, 0.6—0.9 ft-lb)
Shock absorber lower nut	15—20 N·m (1.5—2.0 kg-m, 11—14 ft-lb)
Top cone race	2—3 N·m (0.2—0.3 kg-m, 1.4—2.2 ft-lb) — After '85 only

### TOOLS

#### Special

Rear shock absorber Attachment	07967—GA70101
Ball race remover	07946—GA70000
Spring holder attachment	07967—KM10100
Steering stem lock nut wrench	07916—KM10000
Ball race remover attachment	07953—KM10100
Lock nut wrench, 46 mm	07916—1870100
Attachment	07945—3330300

#### Common

Bearing remover shaft	07746—0050100
Bearing remover head, 10 mm	07746—0050200
Bearing remover head, 12 mm	07746—0050300
Attachment, 32 x 35 mm	07746—0010100
Attachment, 42 x 47 mm	07746—0010300
Attachment, 24 x 26 mm	07746—0010700
Pilot, 10 mm	07746—0040100
Pilot, 12 mm	07746—0040200
Lock nut wrench, 30 x 32 mm	07716—0020400
Extension	07716—0020500
Shock absorber compressor	07959—3290001
Driver	07749—0010000 or 07949—3710000

### TROUBLESHOOTING

#### Hard steering

- Steering stem nut too tight
- Steering stem bearings damaged
- Steering ball and cone races damaged
- Insufficient tire pressure

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

- Uneven front shocks
- Bent front fork
- Bent front axle

#### Front wheel wobbling

- Bent rim
- Axle nut tightened improperly
- Bent spoke plate
- Faulty or unevenly worn tire
- Excessive wheel bearing play

#### Soft suspension

- Weak fork springs
- Damper oil leaks

#### Front suspension noise

- Fork link binding
- Loose front fork fasteners

## HANDLEBAR

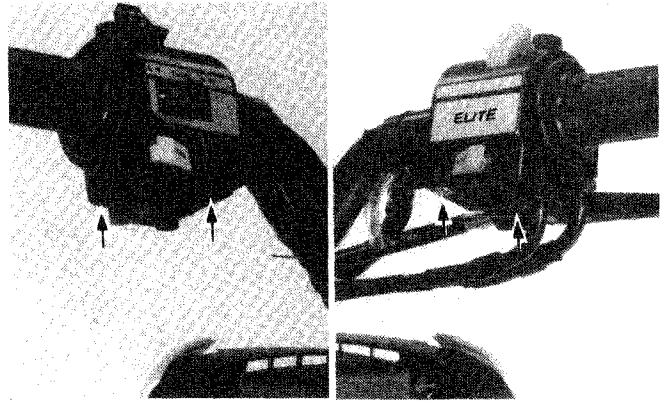
### REMOVAL

Remove the instruments (page 16-12).

Remove the wire band.

Disconnect the left handlebar switch wire coupler and connectors.

Remove the two screws from the lower side of the left handlebar switch housing and remove the housing from the handlebar.



Remove the wire band.

Disconnect the right handlebar switch wire coupler and connectors.

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

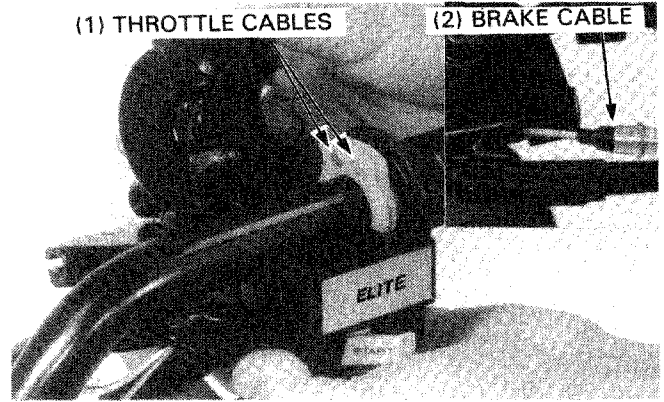
Loosen the throttle cable adjuster.

Disconnect the front brake cable from the brake lever.

Remove the throttle cable from the throttle grip and remove the grip.

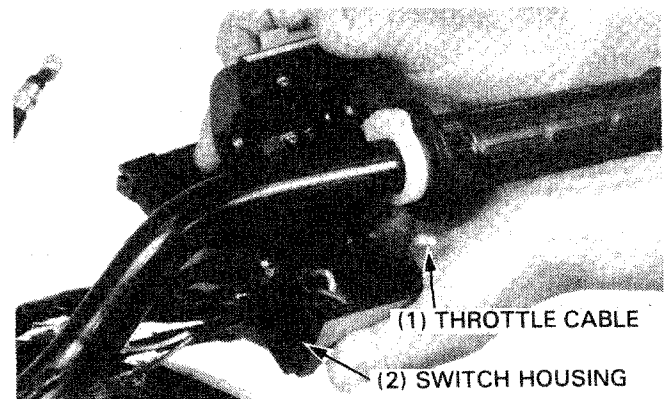
(1) THROTTLE CABLES

(2) BRAKE CABLE



Remove the right handlebar switch housing.

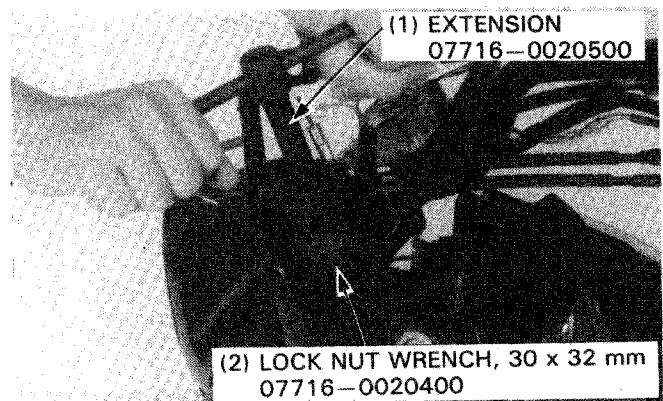
Loosen the lock nuts on the right handlebar switch housing and remove the throttle cables from the switch housing.



(1) THROTTLE CABLE

(2) SWITCH HOUSING

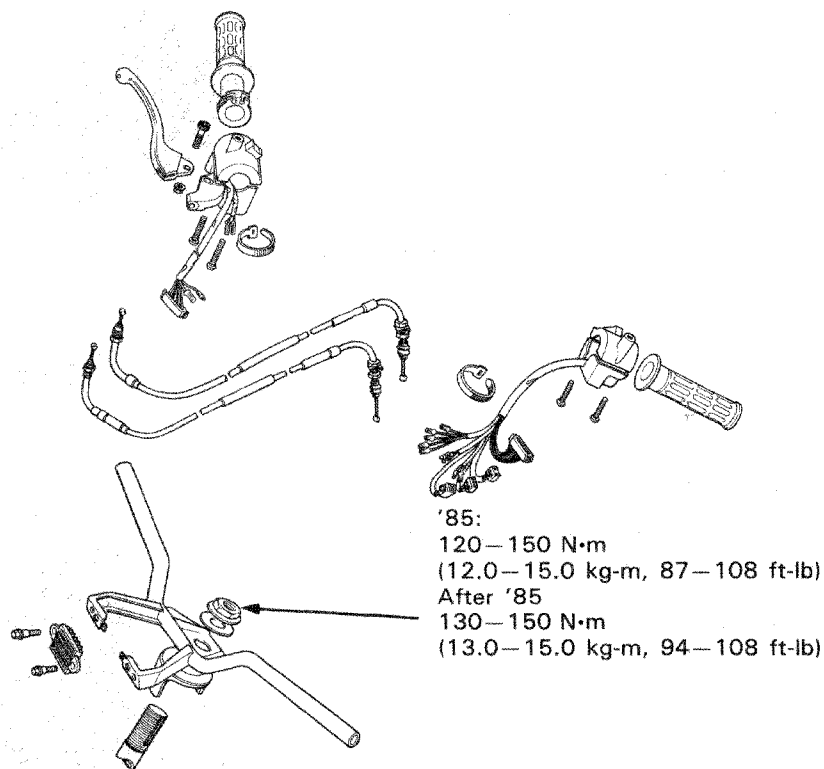
Remove the steering stem nut, then remove the handlebar.



(1) EXTENSION  
07716-0020500

(2) LOCK NUT WRENCH, 30 x 32 mm  
07716-0020400

## INSTALLATION

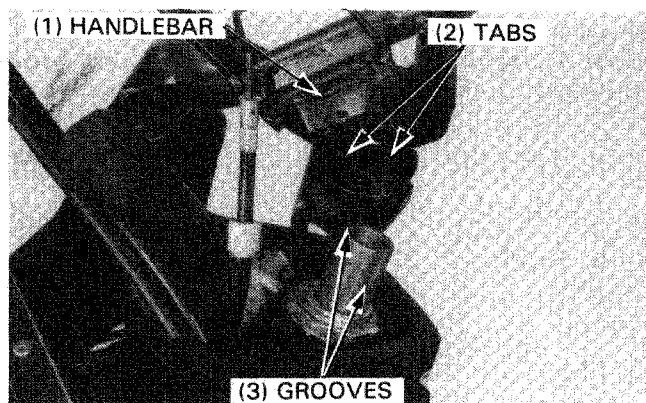


Apply Honda Bond A or Honda Hand Grip Cement (U.S.A. only) to the inside surfaces of the grips and to the clean surfaces of the left handlebar and throttle grip pipe. Wait 3-5 minutes and install the grips. Rotate the grips for even application of the adhesive.

### NOTE

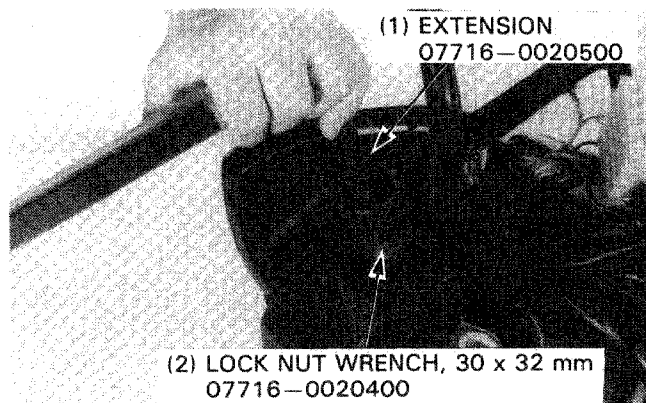
- Allow the adhesive to dry for an hour before using.

Install the handlebar, aligning the tabs of the handlebar with the grooves in the steering stem.



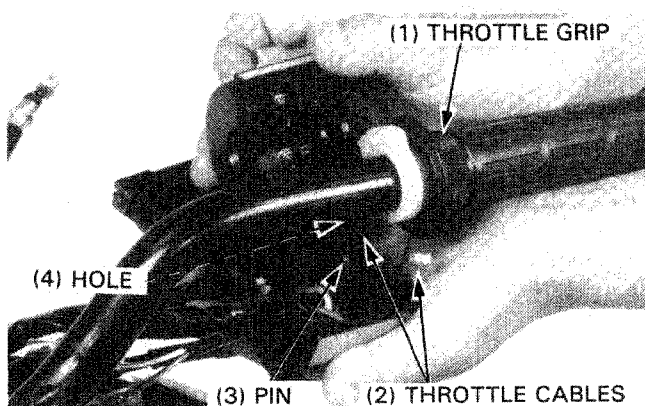
Install and tighten the steering stem nut.

**TORQUE:** '85: 120—150 N·m  
(12.0—15.0 kg-m, 87—108 ft-lb)  
After '85: 130—150 N·m  
(13.0—15.0 kg-m, 94—108 ft-lb)



Install the throttle cables to the right handlebar switch housing and tighten the lock nuts.

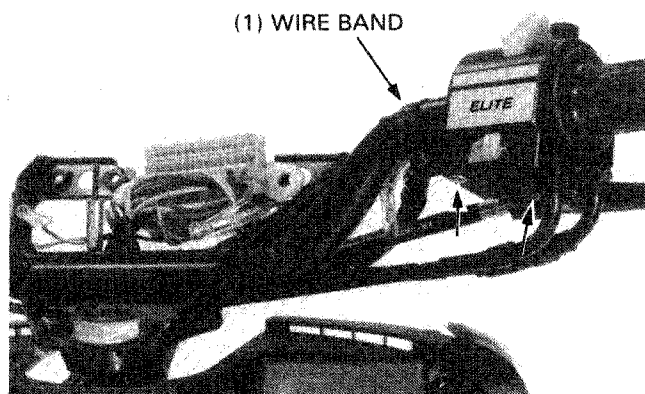
Connect the throttle cables to the grip, grip pipe flange. Install the right handlebar switch housing on to the handlebar aligning the pin on the housing with the hole in the handlebar.



Apply grease to the end of the throttle cables. Install the two housing attaching screws and tighten the forward screw first, then tighten the rear screw.

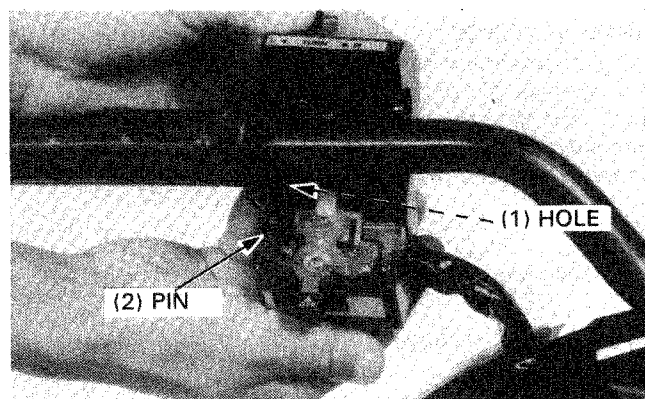


Connect the wire coupler and connectors. Install the wire band.



Install the left handlebar switch housing aligning the pin on the housing with the hole in the handlebar. Install the two housing attaching screws and tighten forward screw first, then tighten the rear screw. Install the removed parts in the reverse order of removal and check the following;

- throttle operation (page 3-4)
- brake lever free play (page 3-11)
- operation of all electrical equipment (section 16).





### FRONT WHEEL

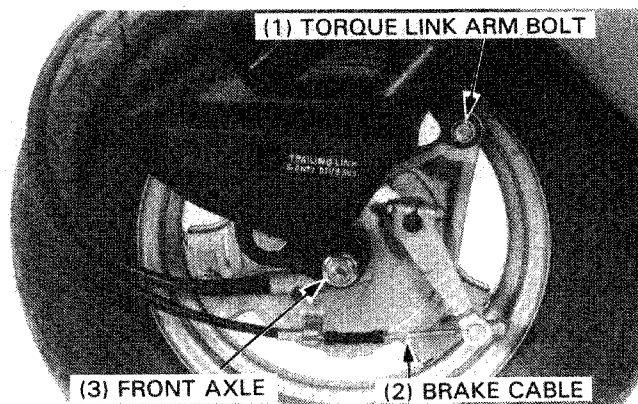
#### REMOVAL

Loosen the brake adjuster and remove the brake cable from the brake arm.

Disconnect the speedometer cable from the front brake panel by removing the set screw.

Remove the front brake torque link arm bolt and axle nut.

Remove the front axle from the right side and remove the front wheel.



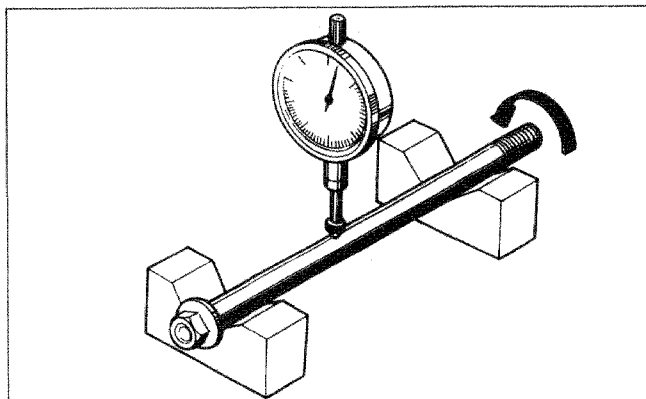
#### INSPECTION

##### AXLE SHAFT

Set the axle shaft in V blocks and measure the runout using a dial indicator.

**SERVICE LIMIT: 0.2 mm (0.01 in)**

Replace if the reading exceeds the service limit.



##### WHEEL RIM

Place the wheel in a truing stand.

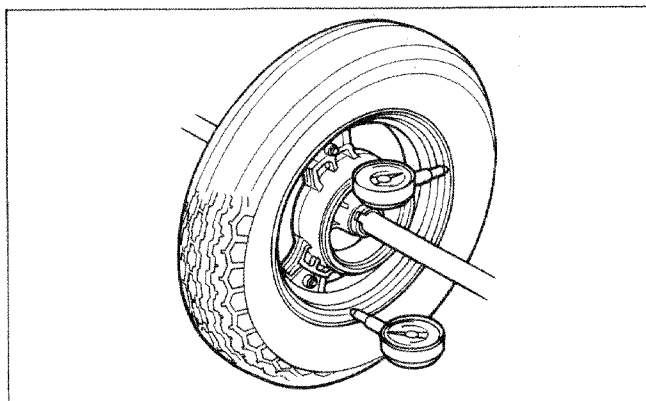
Spin the wheel by hand and measure the rim runout using a dial gauge.

##### SERVICE LIMITS:

**RADIAL: 2.0 mm (0.08 in)**

**AXIAL: 2.0 mm (0.08 in)**

Replace if the reading exceeds the service limit.



##### WHEEL BEARINGS

Turn the inner race of each bearing with your finger.

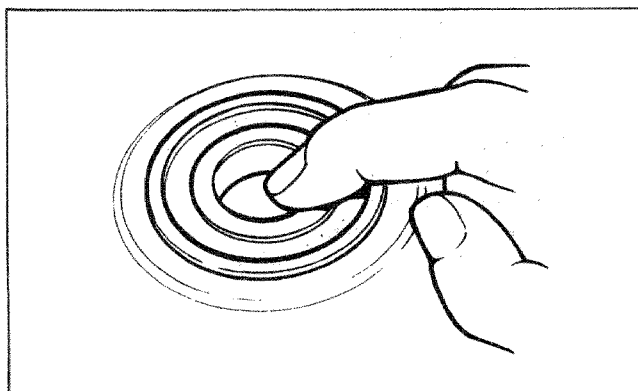
The bearings should turn smoothly and quietly.

Also check that the bearing outer race fits tightly in the hub. Remove and discard the bearings if the races do not turn smoothly, quietly, or if they fit loosely in the hub.

##### NOTE

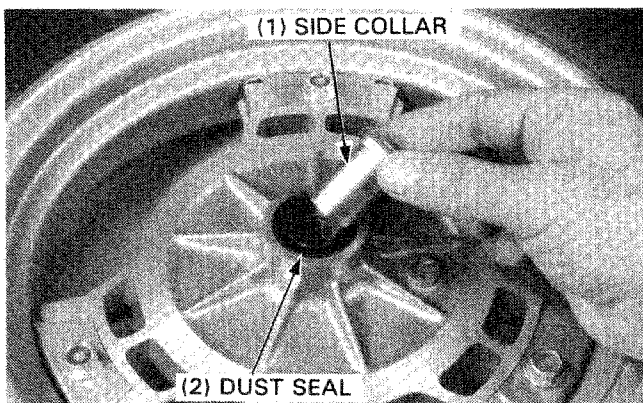
- Replace hub bearing in pairs.

For bearing replacement, see page 14-7.



## BEARING REPLACEMENT

Remove the side collar and dust seal.



Install the bearing remover head into the bearing.  
From the opposite side install the bearing remover shaft and drive the bearing out of the wheel.  
Remove the spacer and drive out other bearing.

### NOTE

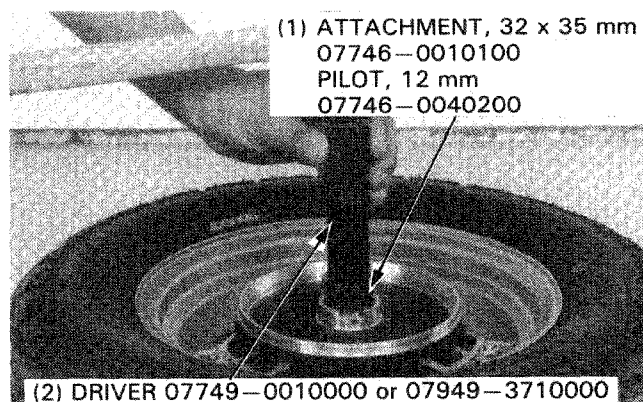
- If the bearings are removed, they must be replaced with new ones.



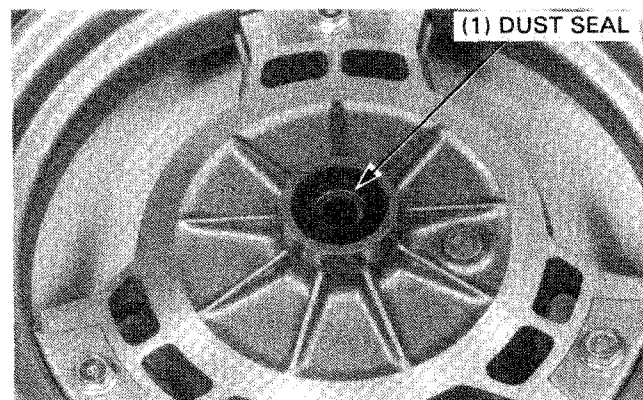
Pack the bearing cavities with grease.  
Drive the left bearing in squarely, until its seated.  
Install the spacer and drive the right bearing in squarely, until its seated.

### NOTE

- Do not allow the bearings to tilt while driving them in.
- Drive in the bearings with the sealed side facing out.
- Never reinstall an old bearing, once a bearing is removed, it must be replaced with a new one.



Install the dust seal.



## STEERING/FRONT WHEEL/BRAKE/SUSPENSION

### DISASSEMBLY

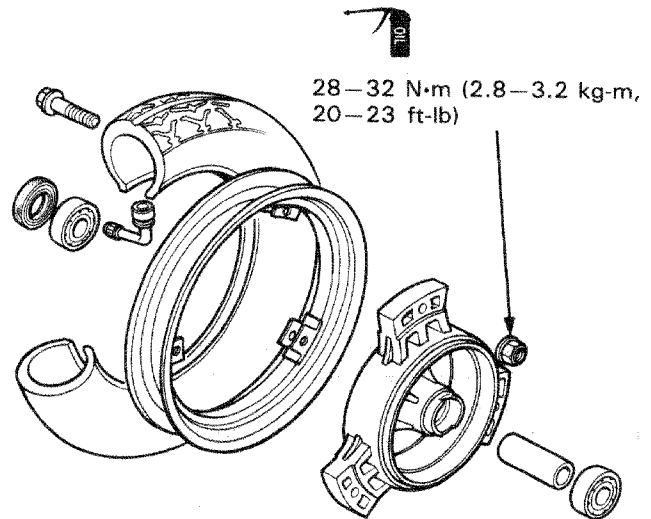
Remove the flange nuts and remove the spoke plate from the wheel rim.

### ASSEMBLY

Install the spoke plate onto the rim.

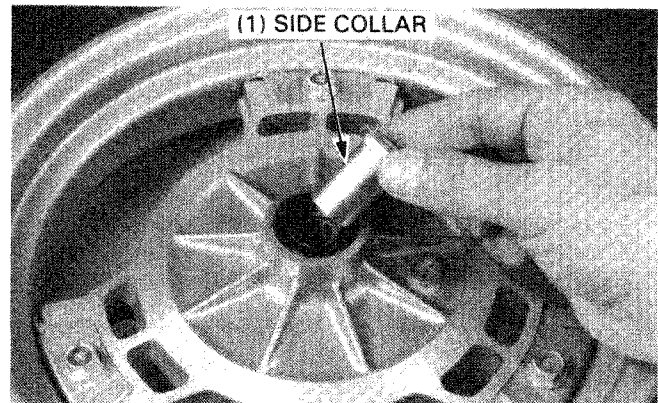
Coat the threads of the flange nuts with oil, and install and tighten the flange nuts.

**TORQUE:** 28–32 N·m (2.8–3.2 kg-m, 20–23 ft-lb)

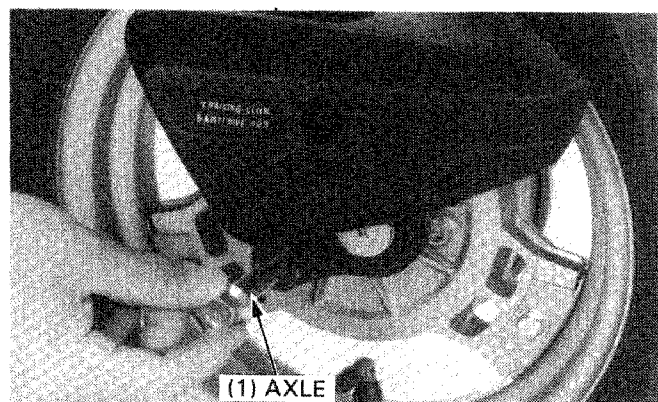


### INSTALLATION

Install the side collar into the right side of the wheel.



Position the front wheel between the front forks.  
Insert the axle through the wheel hub from the right side.



Install the axle nut and tighten it.

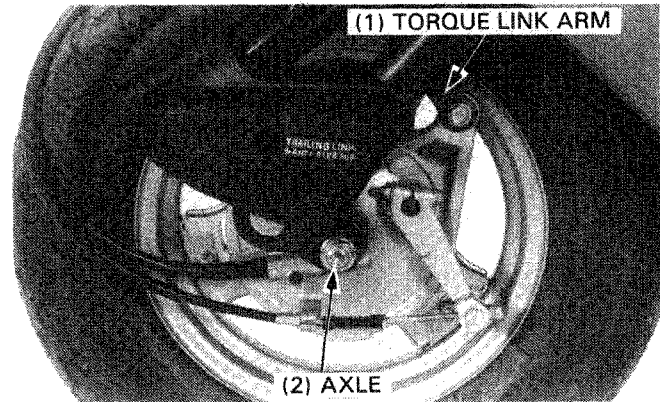
**TORQUE: 50–70 N·m (5.0–7.0 kg-m, 36–51 ft-lb)**

Install the front brake torque link arm bolt and tighten it.

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

Install the speedometer cable and secure it with the set screw.  
Install the brake cable.

Adjust the front brake lever free play.



## FRONT BRAKE

### REMOVAL

Remove the front wheel (page 14-6).  
Remove the brake panel from the front wheel.

### INSPECTION

Measure the front brake drum I.D.

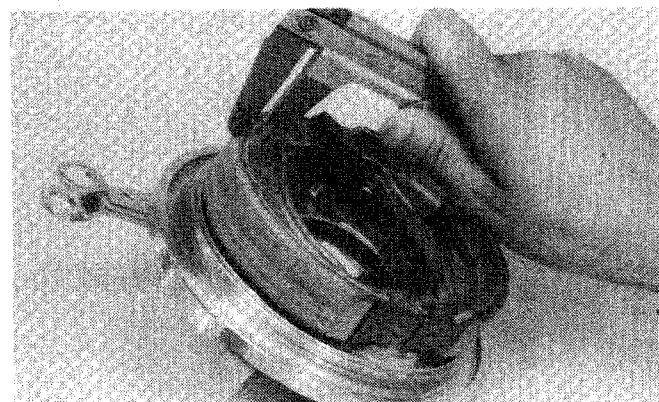
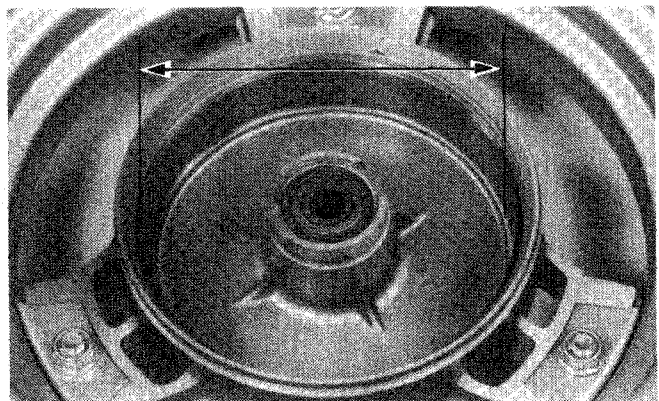
**SERVICE LIMIT: 131.0 mm (5.16 in)**

Replace the brake drum if the measurement exceeds the service limit.

Measure the brake lining thickness.

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

Replace the brake linings if the thickness is less than service limit.

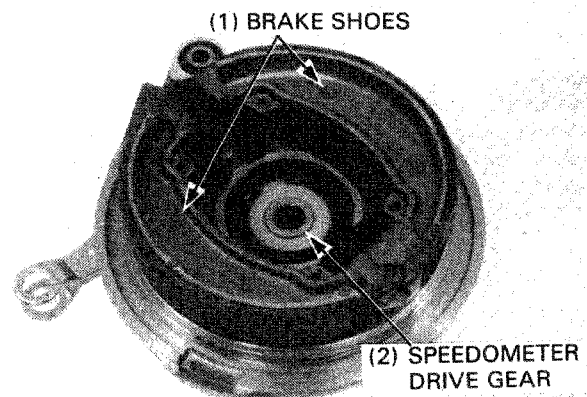


### WARNING

- Contaminated brake linings reduce stopping power. Keep grease off the linings.
- Brake dust contains asbestos which can be harmful to your health. Do not use compressed air to clean brake parts. Use vacuum with a sealed dust collector. Wear a protective face mask and wash your hands when finished.

### DISASSEMBLY

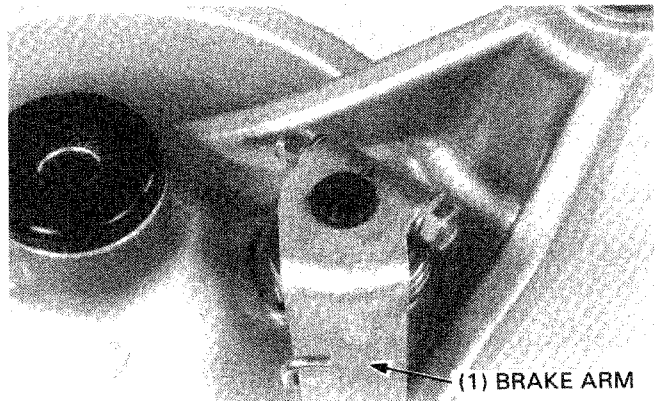
Remove the brake shoes by spreading the shoes apart and slipping them off the anchor pin and brake cam.  
Remove the speedometer drive gear.



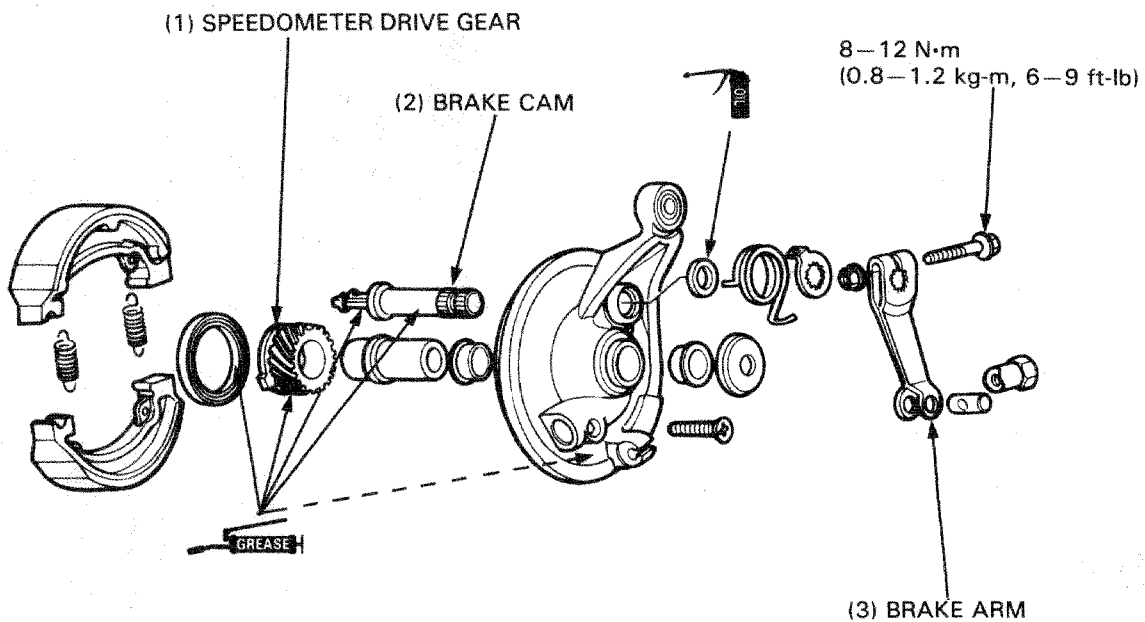
## STEERING/FRONT WHEEL/BRAKE/SUSPENSION

Remove the following:

- the brake arm by removing the nut and bolt.
- the wear indicator plate.
- the brake arm return spring and felt seal.
- the brake cam from the brake panel.



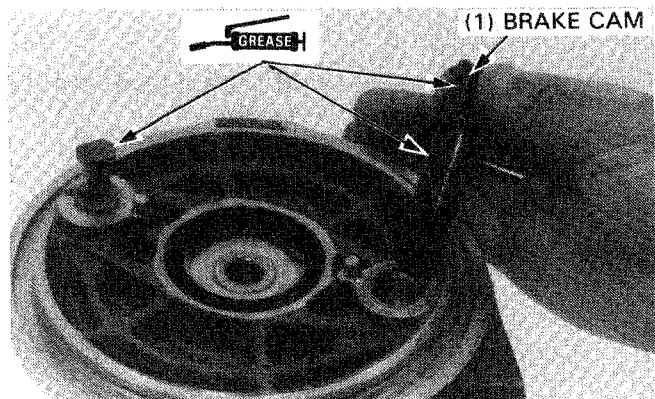
## ASSEMBLY



Apply silicone grease to the brake cam and anchor pin and install the brake cam into the brake panel.

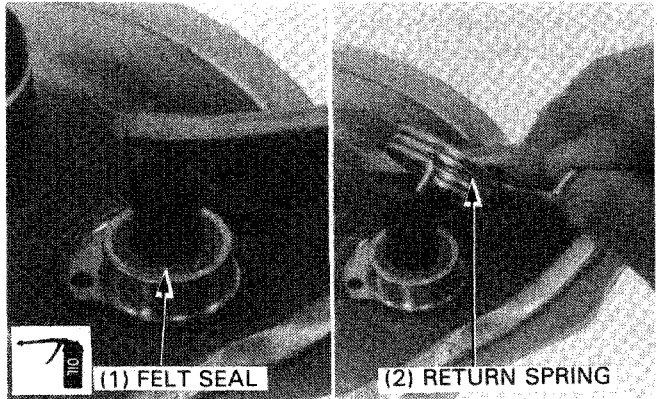
### WARNING

- Avoid getting grease on the inside of the brake drum or braking power will be reduced. Clean the inside of the brake panel thoroughly.

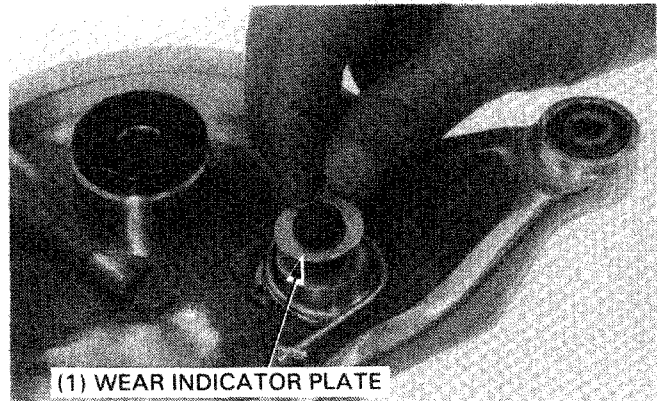




Apply clean engine oil to the felt seal and install it. Install the brake arm return spring.

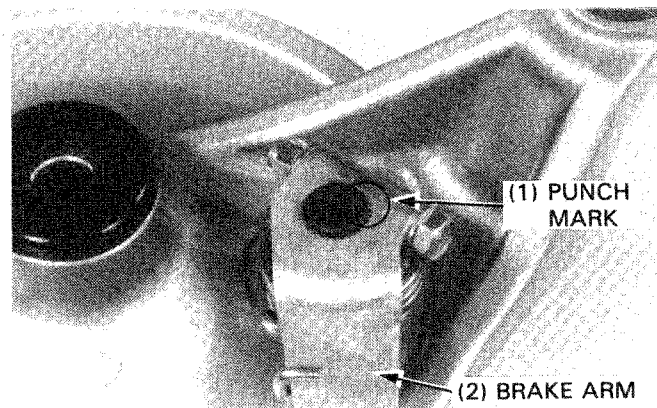


Install the wear indicator plate onto the brake cam aligning the wide tooth on the plate with the groove in the brake cam.

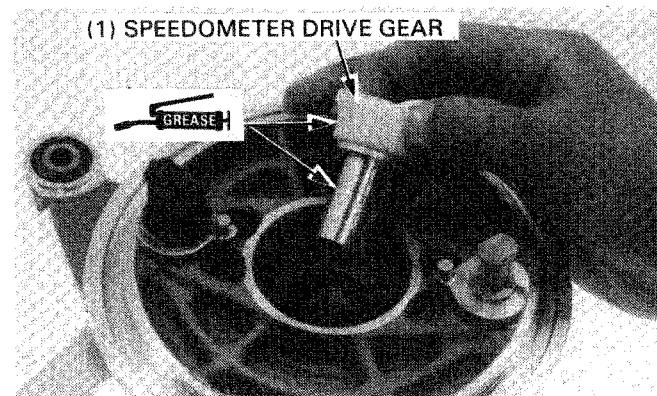


Install the brake arm by aligning the punch marks on the brake cam and brake arm. Tighten the brake arm bolt.

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



Lubricate the speedometer drive gear with grease and install the drive gear in the brake panel.



## STEERING/FRONT WHEEL/BRAKE/SUSPENSION

Install the brake shoes and springs.

Install the brake panel into the front wheel and install the front wheel.

### WARNING

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

## FRONT SUSPENSION

### REMOVAL

Remove the front wheel (page 14-6)

Remove the pivot arm cover by removing the bolt.

Remove the front shock absorber lower mounting nut and screw.

Remove the pivot arm mounting nut and bolt from the front fork and remove the pivot arm.

Remove the front shock absorber upper mounting nut and bolt and remove the shock absorbers.

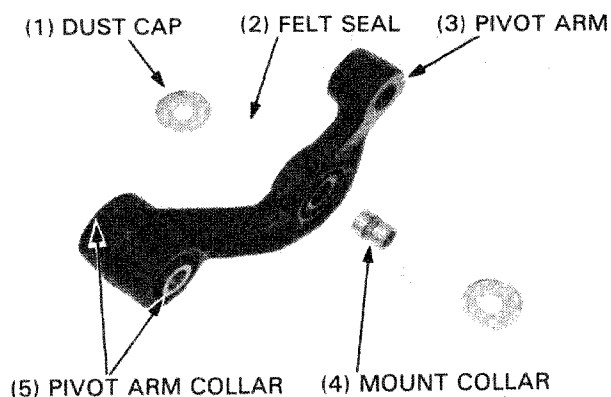
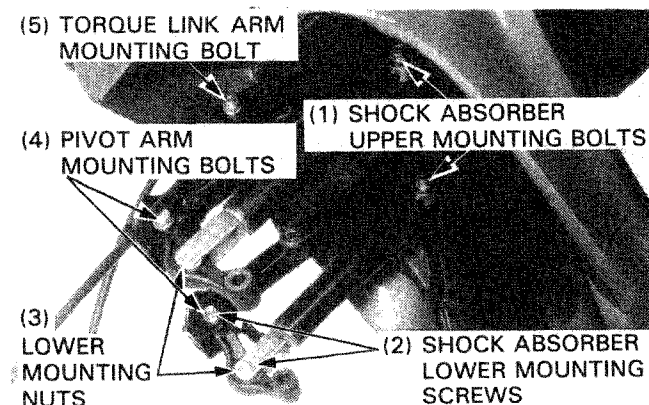
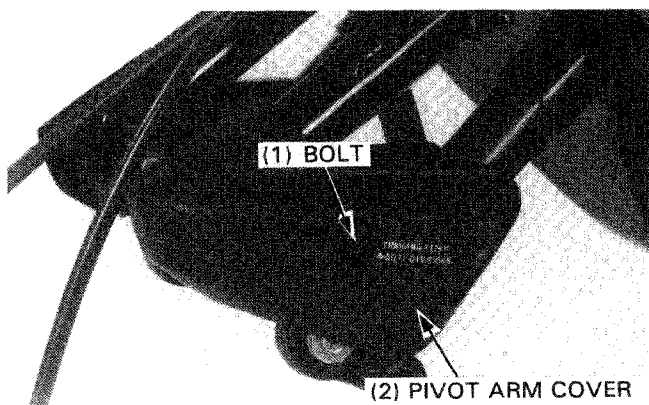
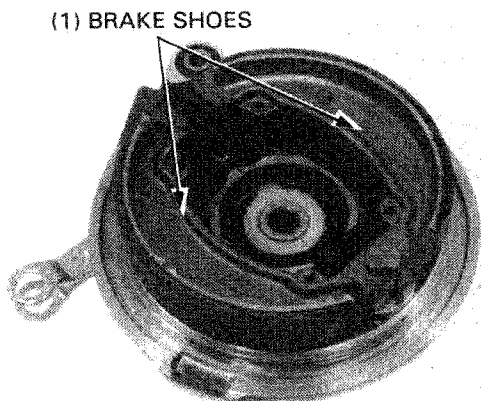
Remove the front brake torque link arm mounting bolt from the front fork and remove the torque link arm.

### PIVOT ARM DISASSEMBLY

Remove the dust cap, felt seal and collar.

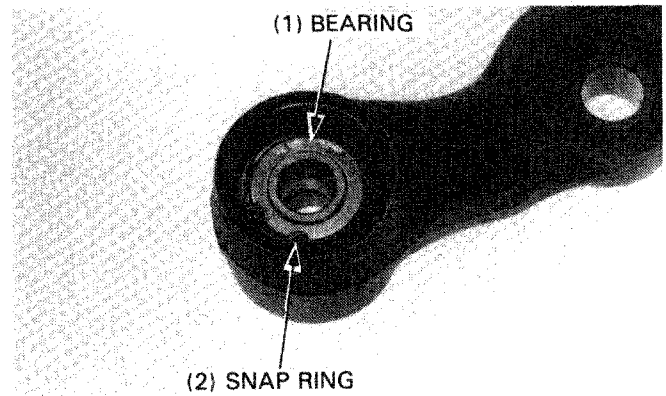
Inspect the bushing and collar for wear or damage.

Remove the pivot arm collar and dust seal.





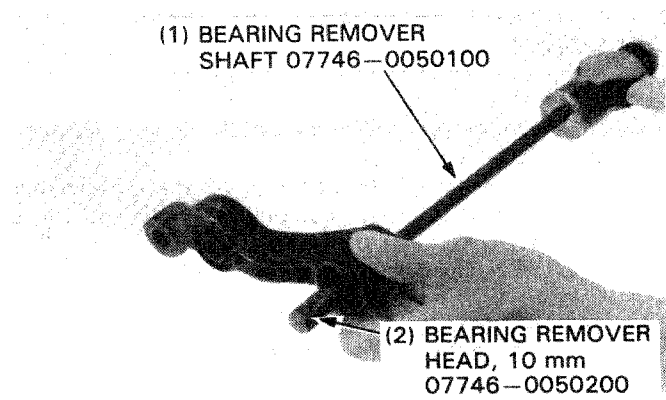
Inspect the bearing for damage or excessive play.  
Remove the snap ring.



Remove the bearing using a bearing remover shaft and bearing remover head.  
Remove the spacer and the other bearing.

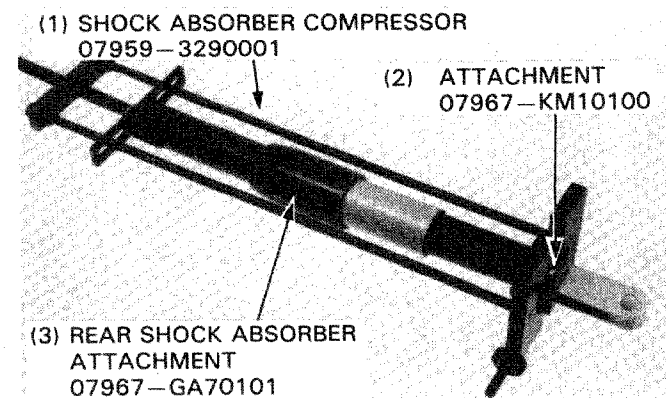
### NOTE

- Never reinstall an old bearing, once a bearing is removed, it must be replaced with a new one.

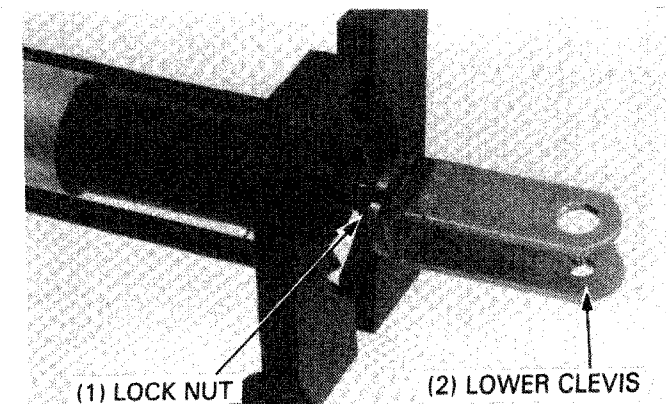


## FRONT SHOCK ABSORBER DISASSEMBLY

Compress the shock absorber.



Loosen the lower clevis lock nut and remove the lower clevis.  
Remove the shock absorber spring.

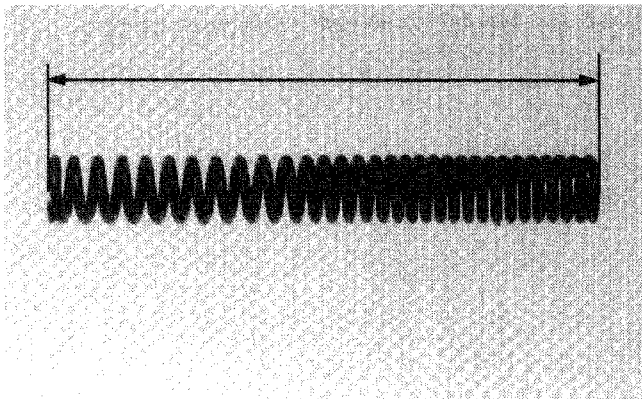


## STEERING/FRONT WHEEL/BRAKE/SUSPENSION

### SHOCK ABSORBER INSPECTION

Measure the shock absorber spring free length.

**SERVICE LIMIT: 217.6 mm (8.57 in)**



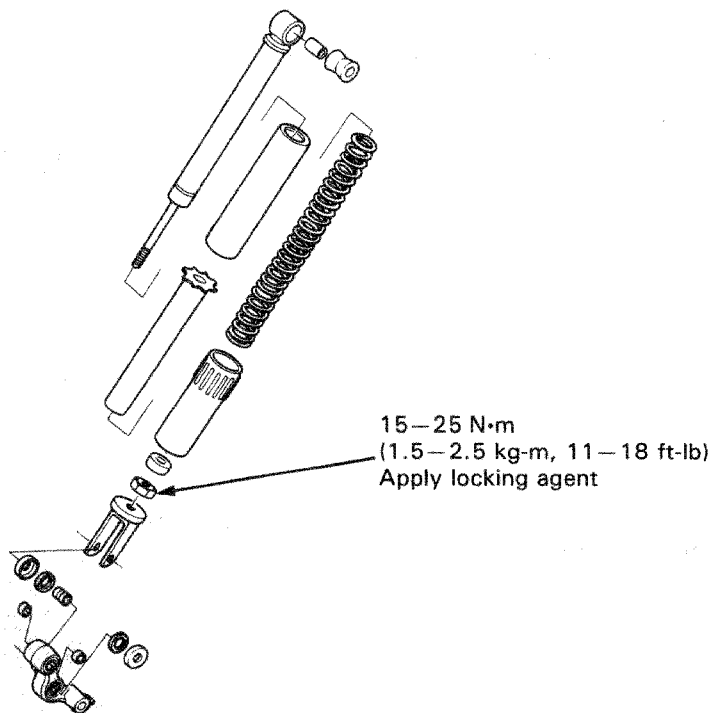
### FRONT SHOCK ABSORBER PIVOT ARM ASSEMBLY

Install the absorber spring with the closely wound coils toward the top.

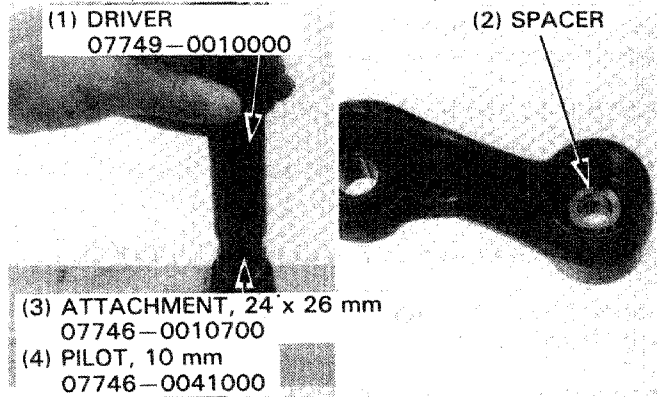
Compress the absorber with the compressor and attachment. Extend the damper rod fully and apply a locking agent to the threaded portion of the damper rod.

Install the lower clevis and tighten the lock nut.

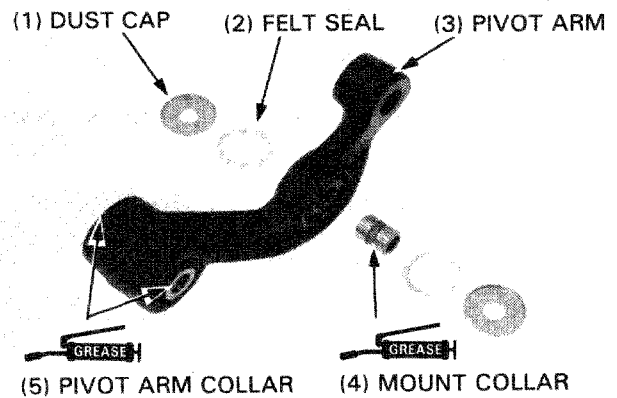
**TORQUE: 15–25 N·m**  
**(1.5–2.5 kg-m, 11–18 ft-lb)**



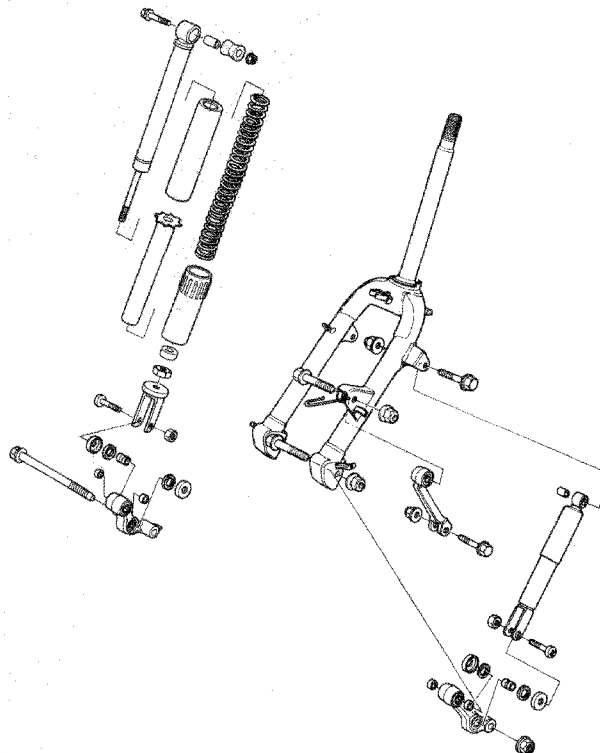
Apply grease into the all bearing cavities.  
Drive in the right bearing.  
Install the spacer then drive in the left bearing.  
Install the snap ring.  
Apply grease to the lip of the dust seals and install them.



Apply grease to the collars and install into the pivot arm dust seals.  
Apply oil to the felt seals and install the felt seals with the dust caps over the collar.



## INSTALLATION



## STEERING/FRONT WHEEL/BRAKE/SUSPENSION

Install the front shock absorbers to the front fork and tighten upper mounting nuts and bolts.

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

Install the pivot arm to the front fork and tighten the bolt and nut.

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

Connect the front shock absorber lower mount to the pivot arm. Tighten the screw.

**TORQUE: 0.8–1.2 N·m (0.08–0.12 kg-m, 0.6–0.9 ft-lb)**

Install and tighten the shock absorber lower nut.

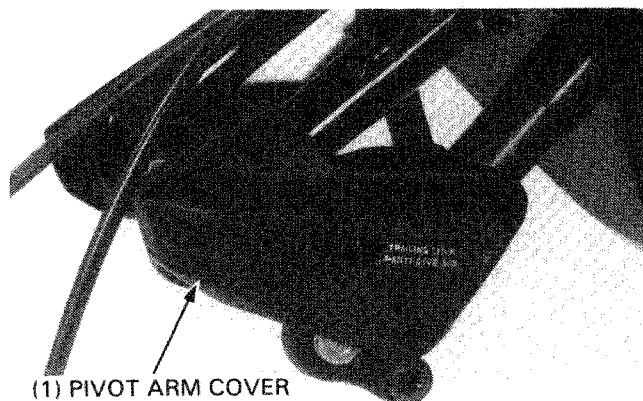
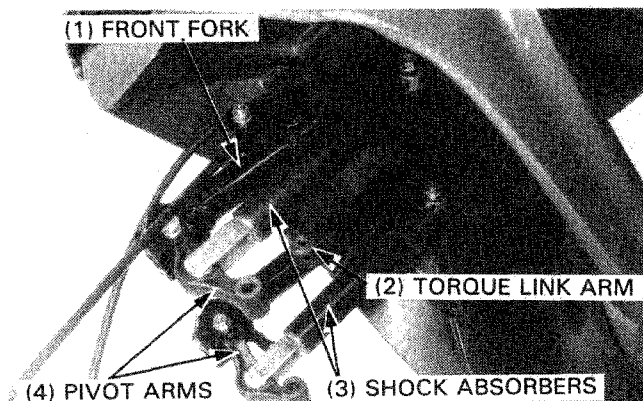
**TORQUE: 15–20 N·m (1.5–2.0 kg-m, 11–14 ft-lb)**

Install the front brake torque link arm to the front fork and tighten the bolt and nut.

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

Install the pivot arm cover and bolt.

Install the front wheel (page 14-8).



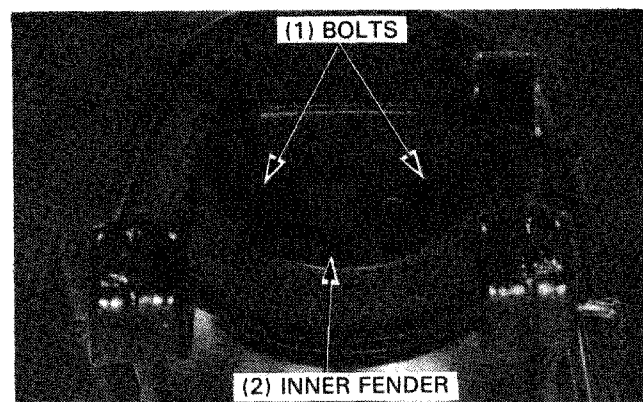
## FRONT FORK/STEERING

### REMOVAL

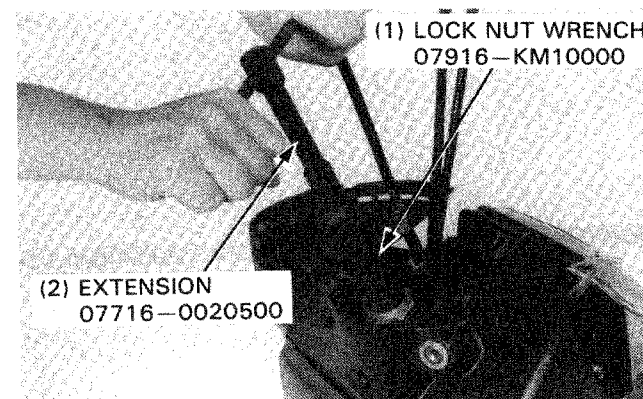
Remove the following;

- instruments(page 16-12).
- front wheel(page 14-6).
- front shock absorber and pivot link(page 14-12).

Remove the front fork inner fender by removing the two bolts.



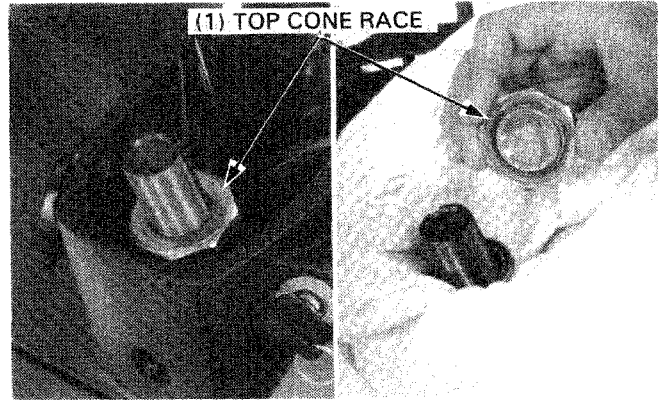
Remove the steering stem lock nut.



Place a shop towel over the frame cover opening.  
Remove the top cone race and remove the front fork.  
Remove the 26 steel balls from the top race and 19 from the bottom

## NOTE

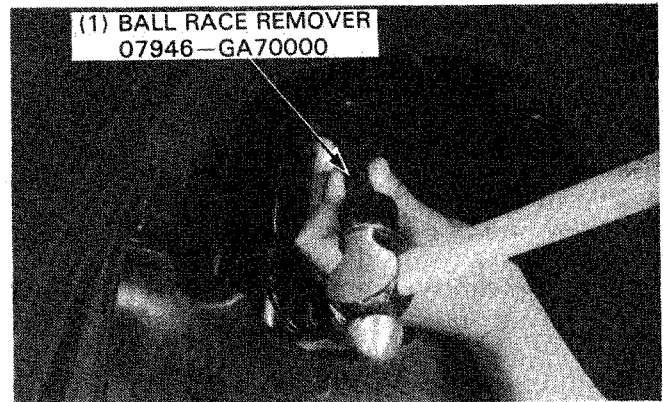
- Place the steel balls in a parts tray so they are not lost.



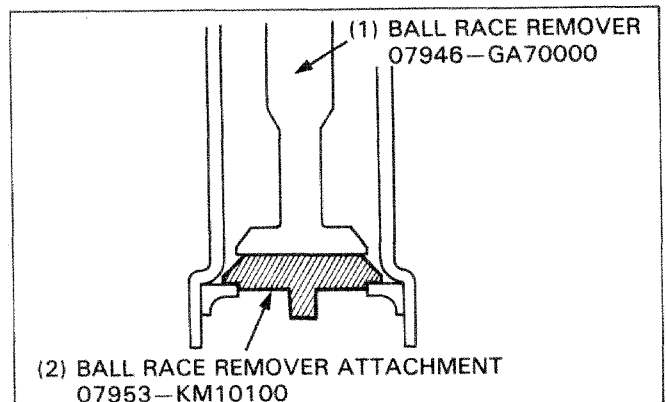
Inspect the top and bottom ball races for wear or damage and replace if necessary.

## BALL RACE REPLACEMENT

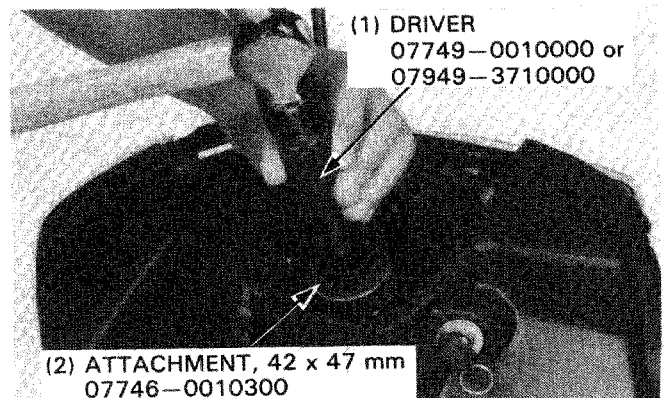
Drive the top ball race out using the ball race remover.



Drive out the bottom ball race using the ball race remover and attachment as shown.

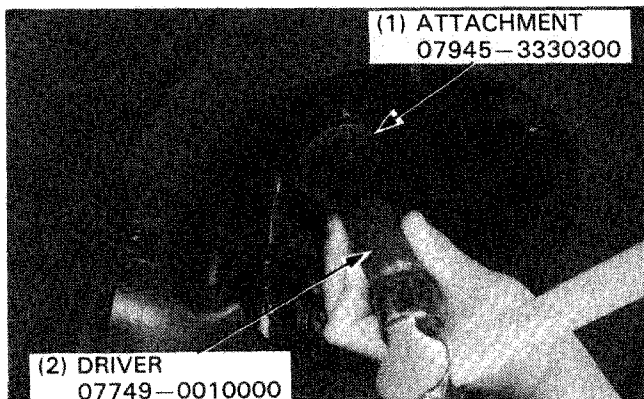


Drive a new top ball race into the steering head using the driver and attachment, 42 x 47 mm.



## STEERING/FRONT WHEEL/BRAKE/SUSPENSION

Drive a new bottom ball race into the steering head using the driver and attachment.



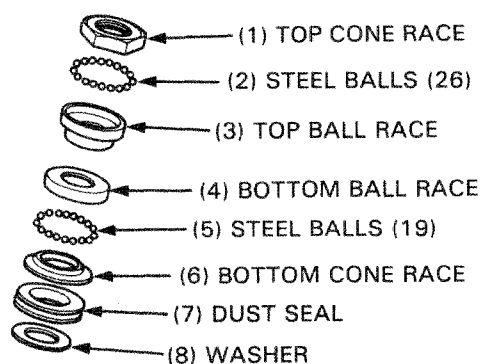
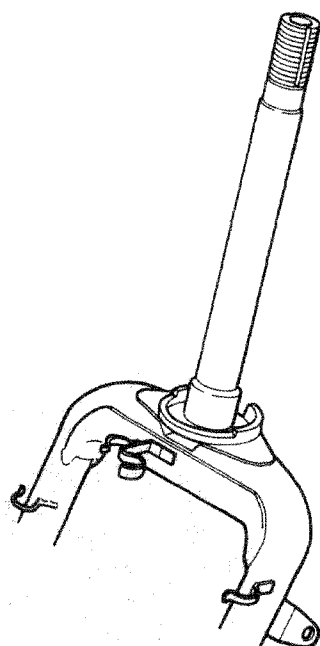
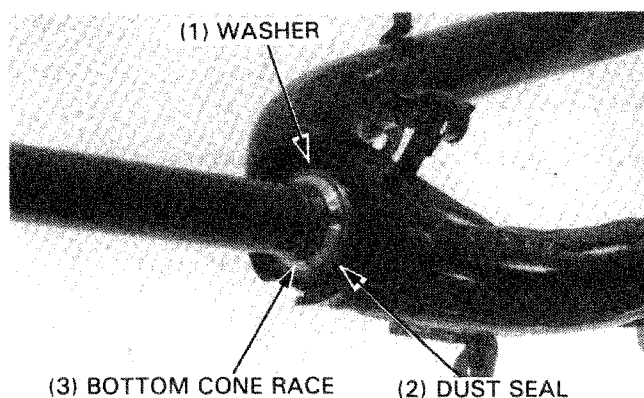
Inspect the bottom cone race for wear or damage and replace if necessary.

### BOTTOM CONE RACE REPLACEMENT

Remove the bottom cone race, dust seal and washer using a punch, and discard the parts.

Place new washer, dust seal and bottom cone race onto the steering stem.

Place the old cone race, inverted, on top of the new race, and drive it into place.

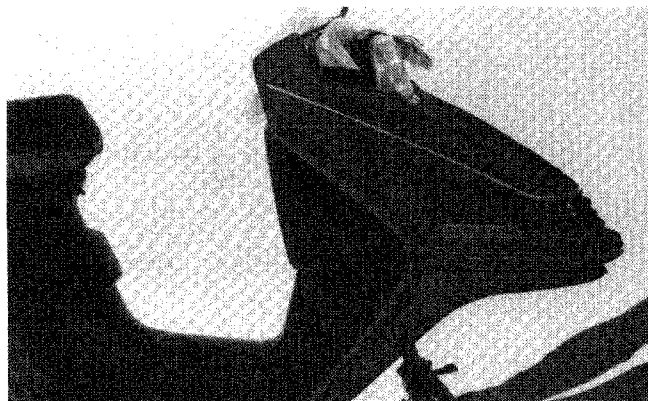


## INSTALLATION

Apply grease to the upper and lower ball races and install the 26 steel balls onto the upper ball race and 19 steel balls onto the lower ball race.

Insert the front fork into the steering head being careful not to drop the steel balls.

Remove the shop towel.



### '85:

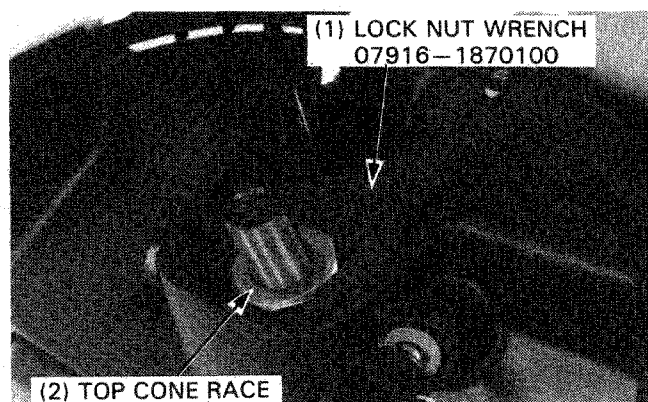
Apply grease to the top cone race and screw in the race until snug against the top ball race, then back it out 1/8 turn.

### After '85:

Lubricate the top cone race with grease.

Install and tighten the top cone race.

**TORQUE:** 2–3 N·m (0.2–0.3 kg-m, 1.4–2.2 ft-lb)



### '85 and after

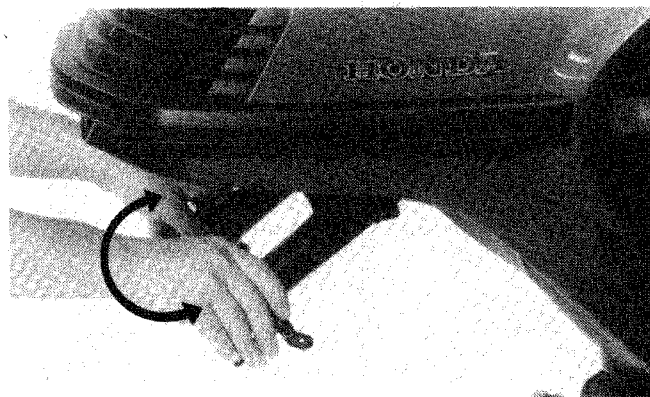
Turn the front fork lock-to-lock 4–5 times to seat the bearings.

Check that the steering stem rotates freely and that there is no vertical play.

### After '85

Retighten the top cone race.

**TORQUE:** 2–3 N·m (0.2–0.3 kg-m, 1.4–2.2 ft-lb)



Hold the top cone race and install and tighten the steering stem lock nut.

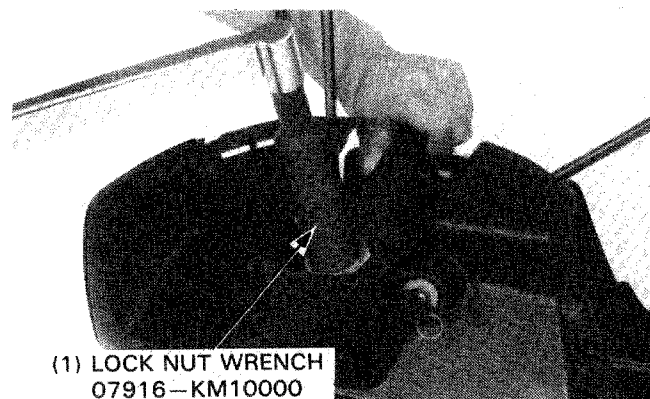
### '85:

**TORQUE:** 5–13 N·m (0.5–1.3 kg-m, 3.6–9.4 ft-lb)

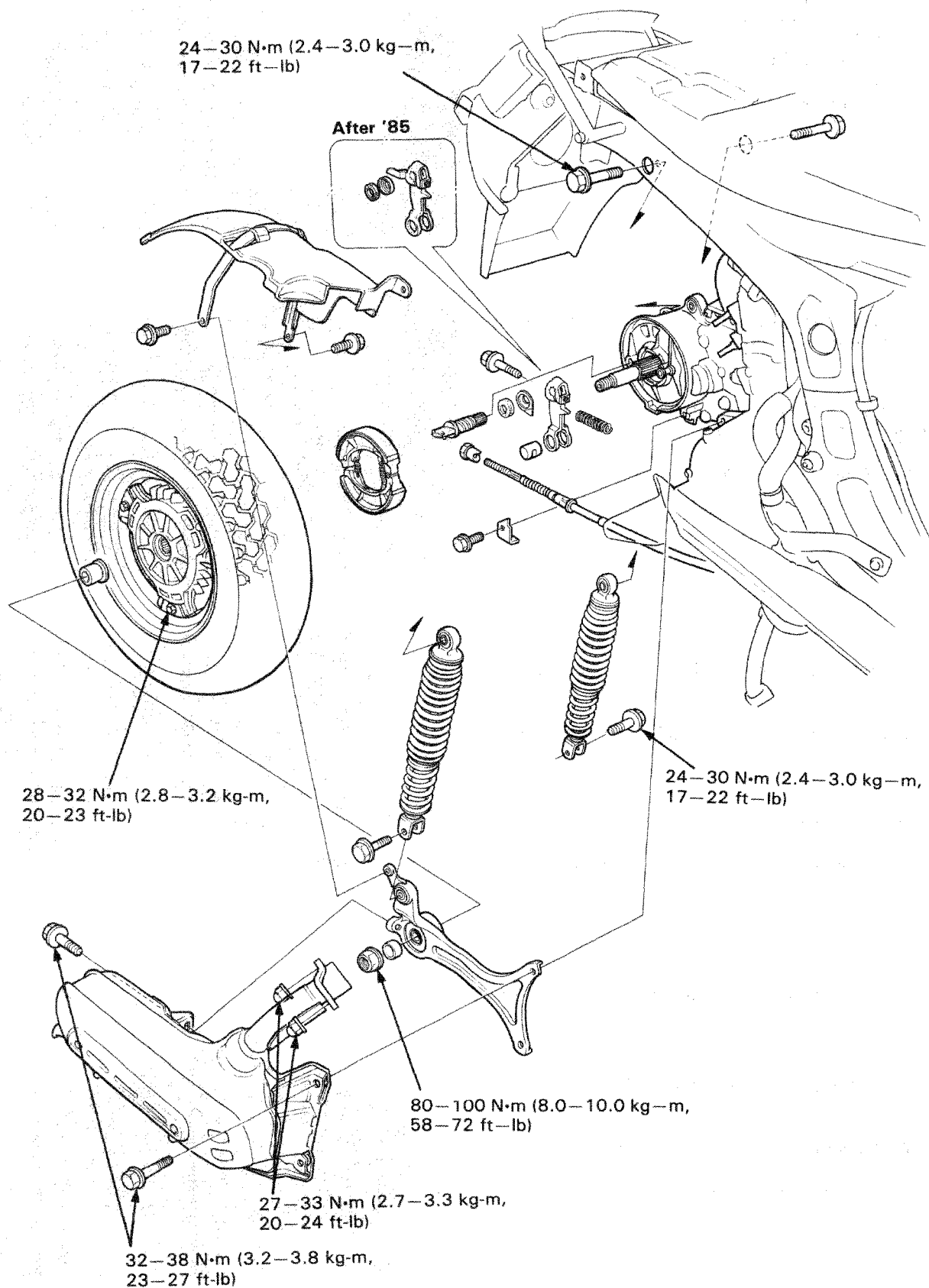
### After '85:

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

Install the parts in the reverse order of removal.







# 15. REAR WHEEL/BRAKE/SUSPENSION

SERVICE INFORMATION	15-1	REAR BRAKE	15-5
TROUBLESHOOTING	15-1	REAR BRAKE PEDAL/BRAKE LOCK SYSTEM	15-7
EXHAUST MUFFLER	15-2		
REAR WHEEL	15-2	REAR SHOCK ABSORBER	15-8

## SERVICE INFORMATION

### GENERAL

Refer to the Tubeless Tire Repair Manual for tire removal, repair, and remounting procedures.

### SPECIFICATIONS

ITEM		STANDARD mm (in)	SERVICE LIMIT mm (in)
Rear wheel rim runout		—	2.0 (0.08)
Rear brake drum I.D.		130.0 (5.12)	131.0 (5.16)
Rear brake lining thickness		4.0 (0.16)	2.0 (0.08)
Rear shock absorber spring free length	A	164.0 (6.46)	160.7 (6.33)
	B	97.9 (3.85)	95.9 (3.77)

### TORQUE VALUES

Exhaust pipe joint nut	27–33 N·m (2.7–3.3 kg-m, 20–24 ft-lb)
Exhaust muffler rear mounting bolt	32–38 N·m (3.2–3.8 kg-m, 23–27 ft-lb)
Exhaust muffler mounting bolt	32–38 N·m (3.2–3.8 kg-m, 23–27 ft-lb)
Rear axle nut	80–100 N·m (8.0–10.0 kg-m, 58–72 ft-lb)
Rear brake arm bolt	8–12 N·m (0.8–1.2 kg-m, 8–9 ft-lb)
Rear shock absorber mounting bolt	24–30 N·m (2.4–3.0 kg-m, 17–22 ft-lb)
Damper lock nut	15–25 N·m (1.5–2.5 kg-m, 11–18 ft-lb) — Apply a locking agent to the nut threads.
Wheel hub nut	28–32 N·m (2.8–3.2 kg-m, 20–23 ft-lb) — Apply oil to the nut thread.

### TOOLS

#### Special

Spring attachments 07967–VM50100

#### Common

Shock absorber compressor 07959–3290001  
Driver 07749–0010000 or 07949–3710001  
Attachment, 42 x 47 mm 07746–0010300  
Pilot, 17 mm 07746–0040400

## TROUBLESHOOTING

### Rear wheel wobbling

- Bent rim
- Faulty tire
- Axle not tightened properly

### Soft suspension

- Weak shock absorber spring

### Brake squeaks

- Worn brake linings
- Foreign matter on linings
- Rough brake drum

### Poor brake performance

- Brake not adjusted properly
- Contaminated brake linings
- Worn brake linings
- Worn brake shoes at cam
- Worn brake cam
- Worn brake drum
- Improper engagement between brake arm and cam-shaft serrations

### EXHAUST MUFFLER

#### REMOVAL

Remove the right and left side covers (page 13-2).  
Remove the rear muffler mounting bolt.

Remove the two exhaust muffler mounting bolts and two joint nuts.  
Remove the exhaust muffler.

#### INSTALLATION

Loosely install the exhaust muffler with two joint nuts, two mounting bolts and rear mounting bolt.  
Tighten the joint nuts, mounting bolts and rear mounting bolt in the sequence below.

#### TORQUE:

JOINT NUT: 27–33 N·m (2.7–3.3 kg-m, 20–24 ft-lb)

REAR MOUNTING BOLT:

32–38 N·m (3.2–3.8 kg-m, 23–27 ft-lb)

MOUNTING BOLT (up side first):

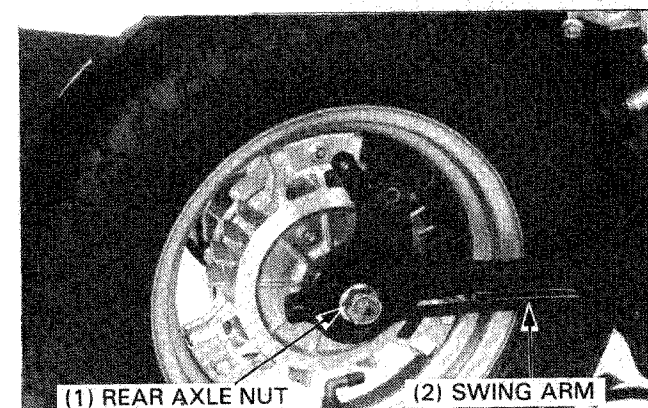
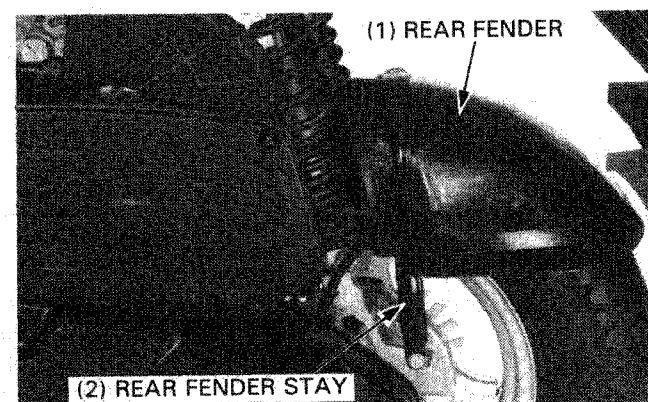
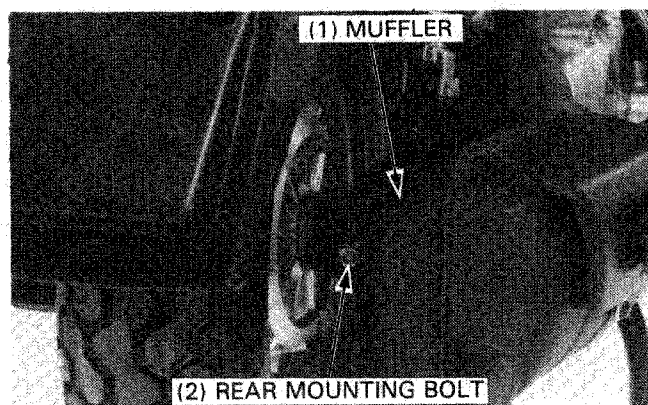
32–38 N·m (3.2–3.8 kg-m, 23–27 ft-lb)

MOUNTING BOLT (lower side):

32–38 N·m (3.2–3.8 kg-m, 23–27 ft-lb)

Retighten the joint nuts.

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



### REAR WHEEL

#### REMOVAL

Remove the exhaust muffler.  
Remove the three bolts, the rear fender stay and rear fender.  
Remove the right rear shock absorber (page 15-8).

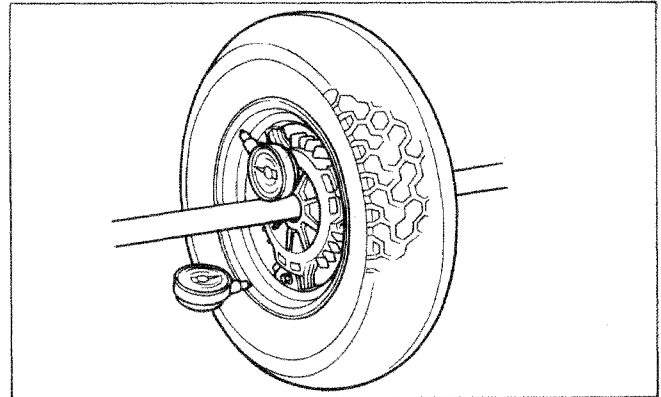
Remove the rear axle nut, collar B, swing arm and collar A.

## INSPECTION

### WHEEL RIM

Place the rear wheel in a truing stand. Spin the rear wheel by hand and measure the rim runout using a dial indicator.

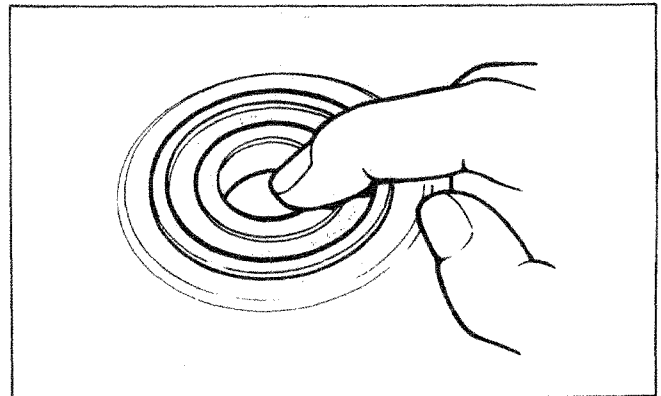
**SERVICE LIMIT: AXIAL/RADIAL: 2.0 mm (0.08 in)**



## SWING ARM BEARING

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

Remove and discard the bearing if it does not turn smoothly, quietly, or if outer race fits loosely in the swingarm.

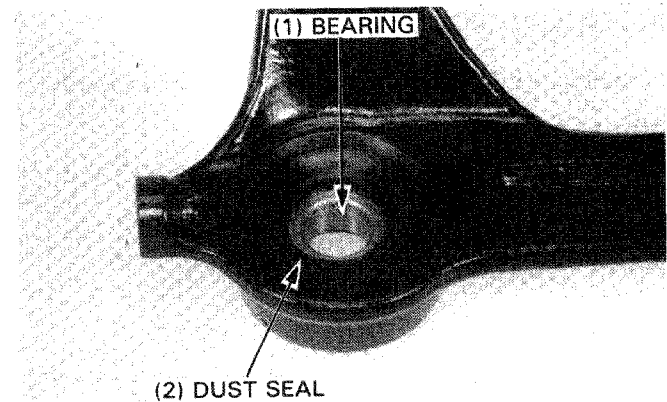


## BEARING REPLACEMENT

Remove the oil seal from the swingarm and drive the bearing out.

### TOOLS

**Driver** 07749-0010000 or 07949-3710001  
**Attachment, 42 x 47 mm** 07746-0010300

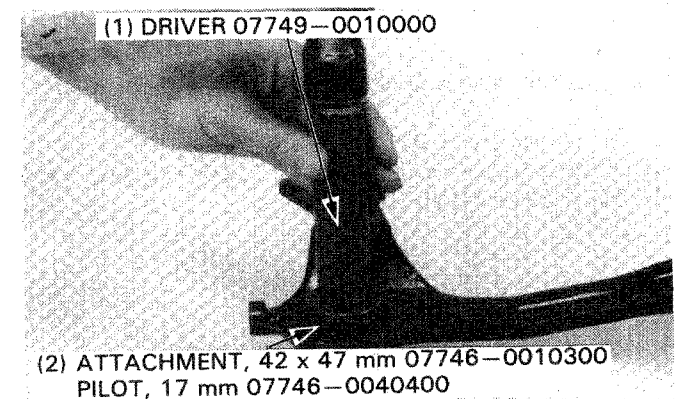


Pack the new bearing cavities with grease and drive it into the swingarm using the same tools, as used to remove the old bearing.

### NOTE

- Do not allow the bearing to tilt while driving it in.
- Never reinstall an old bearing. Once a bearing is removed, it must be replaced with a new one.

Apply grease to the new dust seal lips and install it over the bearing.



## REAR WHEEL/BRAKE/SUSPENSION

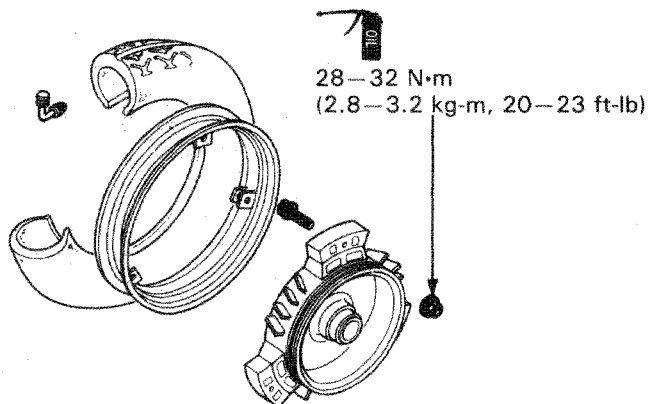
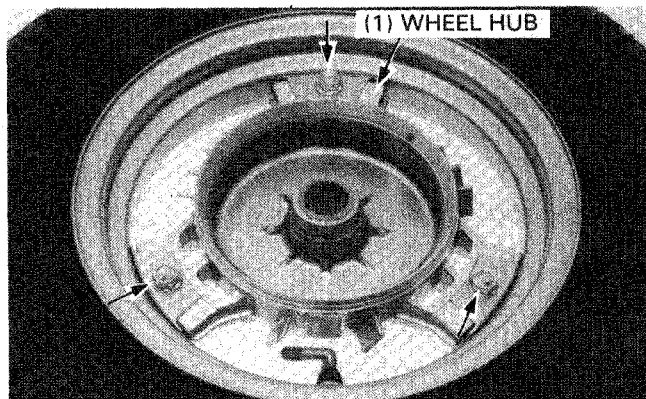
### WHEEL HUB REMOVAL/INSTALLATION

Remove the flange nuts and bolts and remove the wheel hub from the wheel rim.

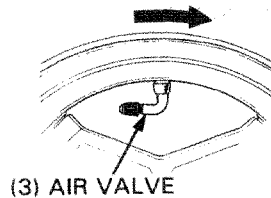
Install the air valve as shown in the illustration below.

Coat the threads of the flange nuts with oil, and install the wheel hub on the wheel rim.  
Tighten the flange nuts.

**TORQUE: 28—32 N·m (2.8—3.2 kg-m, 20—23 ft-lb)**

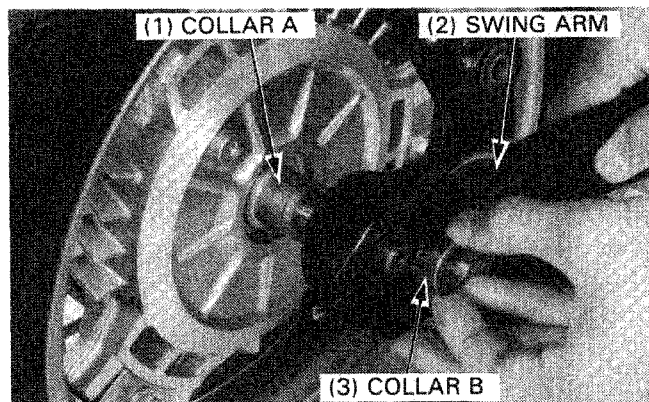


(2) DIRECTION OF ROTATION



### INSTALLATION

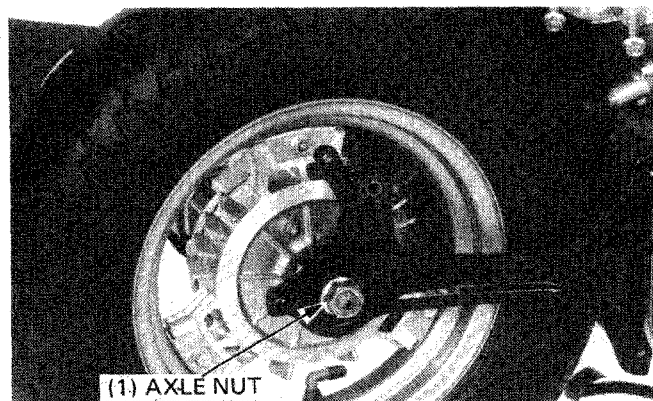
Install the rear wheel, collar A, swing arm, and collar B.



Install and tighten the rear axle nut.

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

Install the rear shock absorber (page 15-10).  
Install the exhaust muffler (page 15-2) and the right and left rear cover (page 13-2).



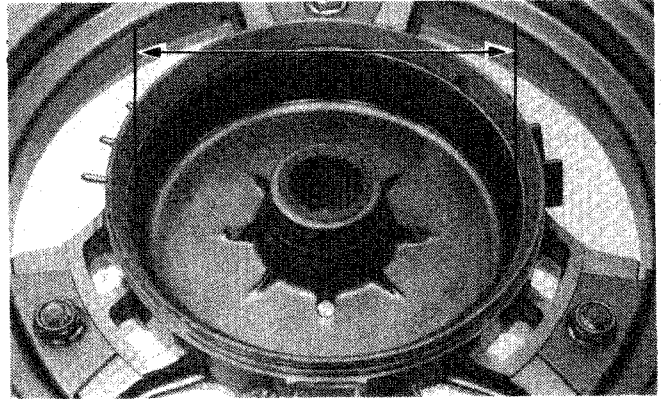
## REAR BRAKE

Remove the rear wheel (page 15-2).

### DRUM INSPECTION

Measure the rear brake drum I.D.

**SERVICE LIMIT: 131.0 mm (5.16 in)**



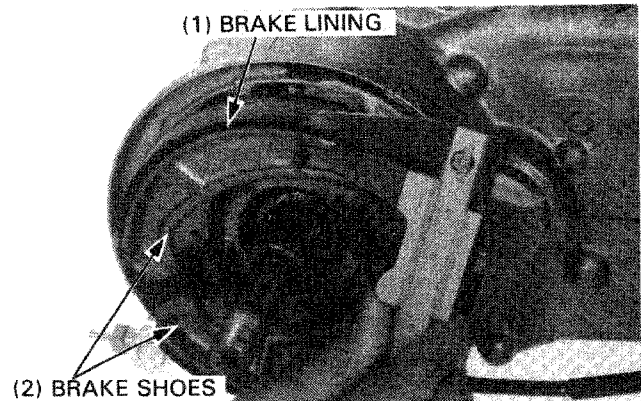
### LINING INSPECTION

Measure the rear brake lining thickness.

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

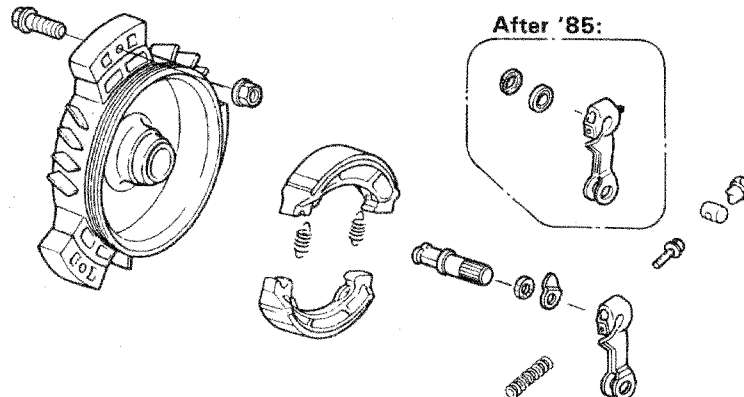
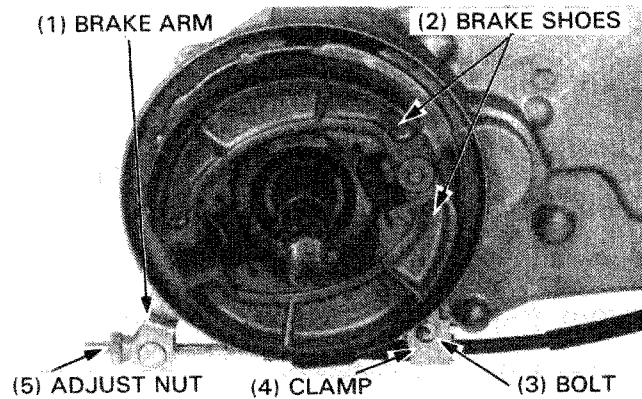
#### WARNING

- *Keep grease off the brake linings. Wipe off excess grease.*



### DISASSEMBLY

- Remove the rear brake cable clamp bolt and clamp.
- Remove the brake cable from the brake arm by removing the brake adjuster.
- Remove the brake shoes.
- Remove the brake arm bolt and remove the brake arm from the brake cam.
- Remove the brake cam.



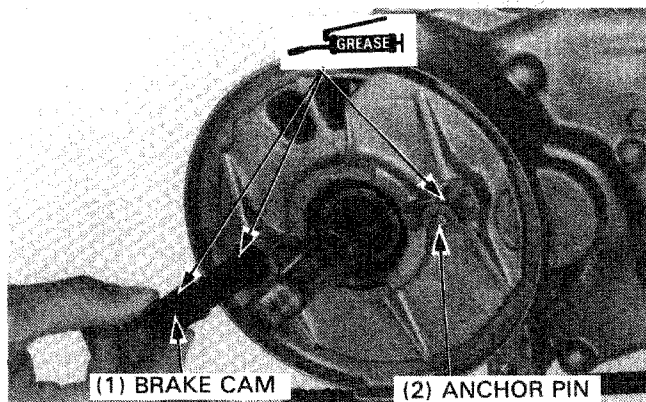


## REAR WHEEL/BRAKE/SUSPENSION

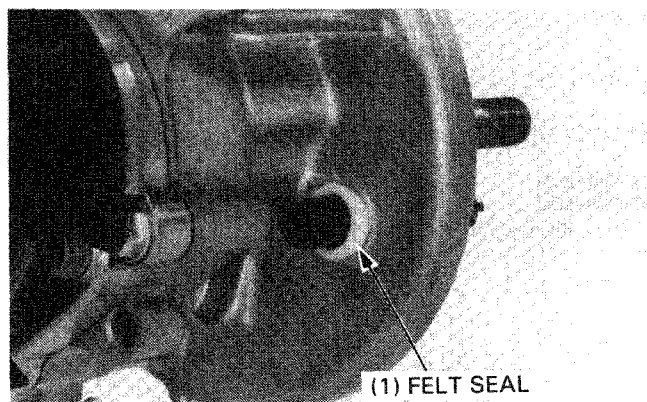
### ASSEMBLY

Apply grease sparingly at the point where the brake shoes will contact the anchor pin.

Apply grease to the brake cam and install it.



Apply oil to the felt seal and install it.



'85:

Install the wear indicator plate aligning the wide tooth of the plate with the wide groove on the brake cam.

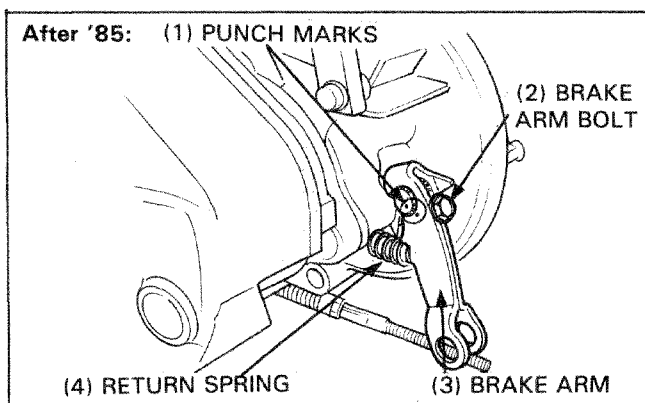
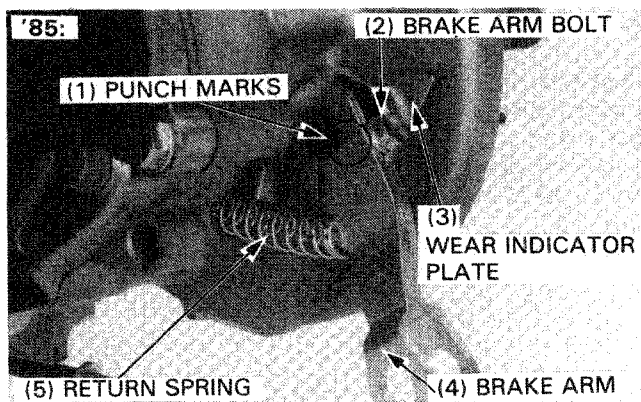
After '85:

Install the brake arm onto the brake cam aligning the punch marks on the brake cam and brake arm.

Tighten the brake arm bolt.

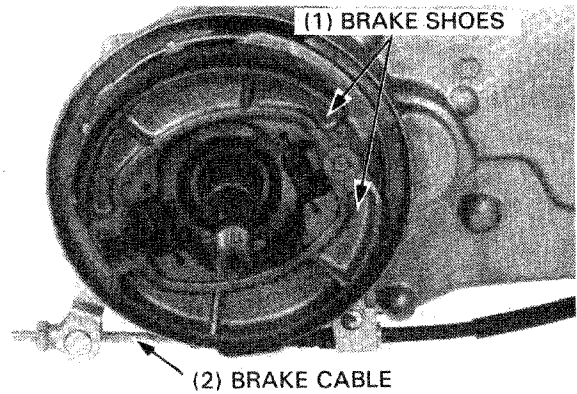
**TORQUE: 8—12 N·m (0.8—1.2 kg-m, 6—9 ft-lb)**

Install the brake arm return spring.





Install the brake shoes.  
Connect the brake cable to the brake arm.  
Install the rear wheel (page 15-4).  
Adjust the rear brake free play (page 3-12).

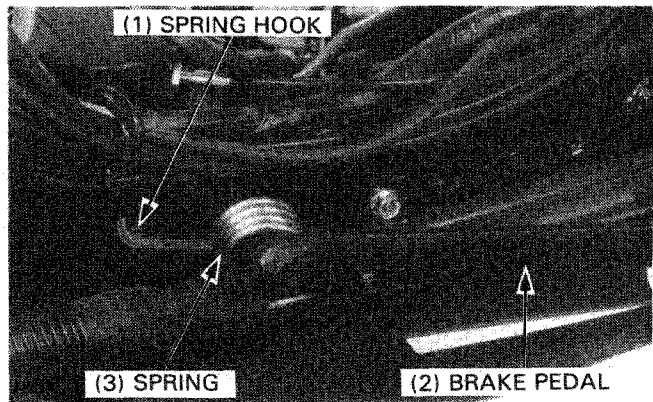


## REAR BRAKE PEDAL/ BRAKE LOCK SYSTEM

### REAR BRAKE PEDAL REMOVAL/INSTALLATION

Remove the following:

- the body center cover (page 13-2).
- the floor panel (page 13-3).
- the right floor board (page 13-3).
- the brake pedal spring from the brake pedal and spring hook.

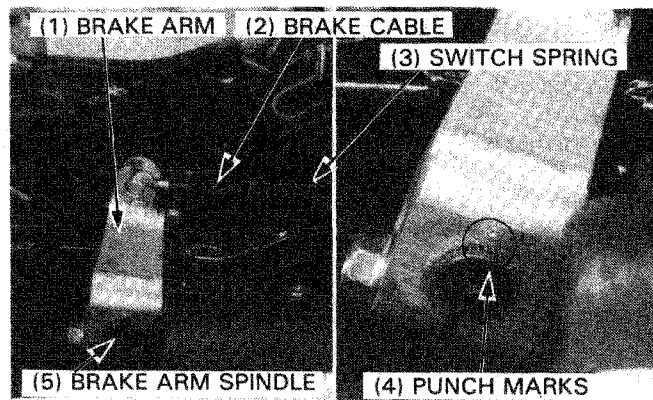


Disconnect the brake cable and switch spring from the brake arm.  
Remove the brake pedal from the brake arm by removing the bolt and nut.

Install the brake pedal in the reverse order of removal.

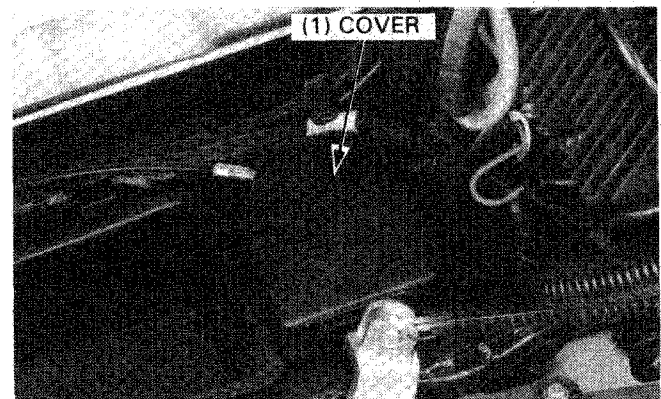
#### NOTE

- Apply grease to each sliding surface.
- Align the punch mark on the brake arm with the punch mark on the brake pedal spindle.



### PARKING BRAKE LOCK INSPECTION/ ADJUSTMENT

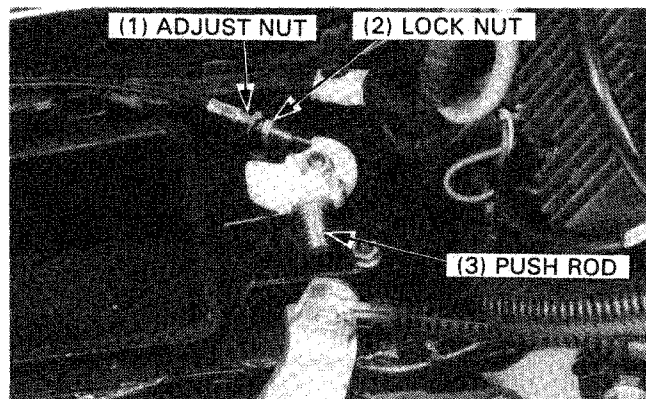
Remove the body center cover (page 13-2).  
Remove the floor panel (page 13-3).  
Remove the parking brake lock cover.



## REAR WHEEL/BRAKE/SUSPENSION

Press the brake pedal and turn the parking brake lever and measure the push rod stroke.

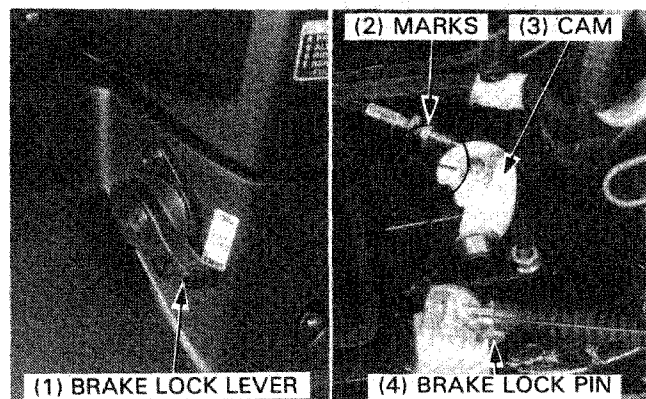
**STANDARD STROKE:** 11–12 mm (7/16–1/2 in)



### PARKING BRAKE ADJUSTMENT

Loosen the rear brake adjuster at the rear wheel to obtain more than 60 mm (2-3/8 in) of brake pedal free play.

Then pull the brake lock lever up to the "ON" position; depress the brake pedal and adjust by aligning the index mark on the base plate with the one on the cam. Tighten the adjuster lock nut.



### PARKING BRAKE LOCK REMOVAL/INSTALLATION

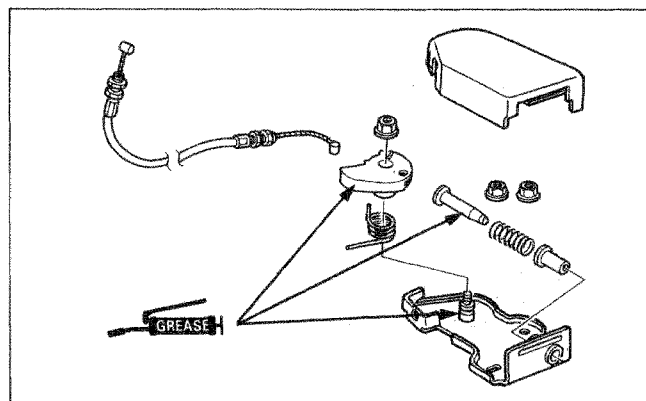
Loosen the lock nut and adjuster nut and remove the brake lock cable.

Remove the parking brake lock by removing the two mounting nuts.

Assemble in the reverse order of disassembly.

#### NOTE

- Apply grease to the push rod, cam and pin.

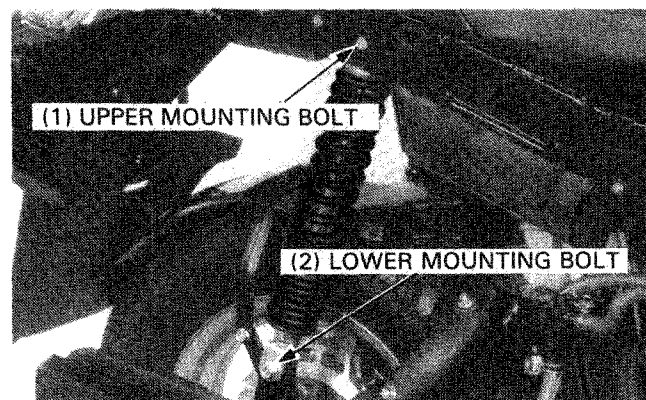


## REAR SHOCK ABSORBER

### REMOVAL

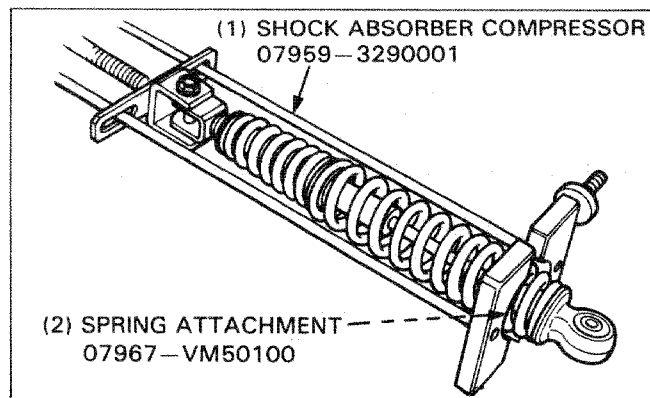
Remove the following:

- the right and left rear covers (page 13-2).
- the upper and lower mounting bolts and the rear shock absorber.



## DISASSEMBLY

Compress the rear shock absorber spring and loosen the upper joint lock nut, then remove the upper joint. Disassemble the rear shock absorber.



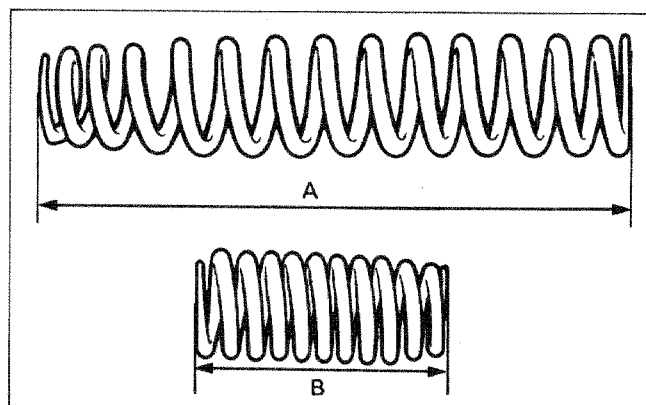
## INSPECTION

Measure the rear shock absorber spring free length.

### SERVICE LIMIT:

A: 160.7 mm (6.33 in)

B: 95.9 mm (3.77 in)



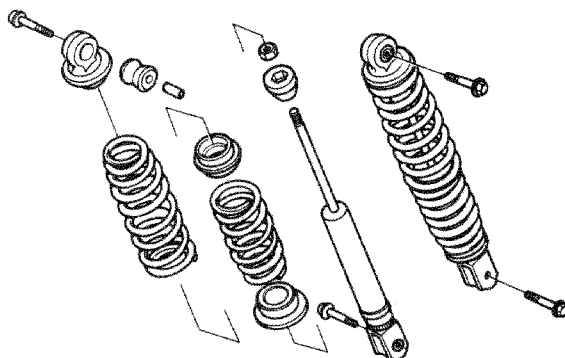
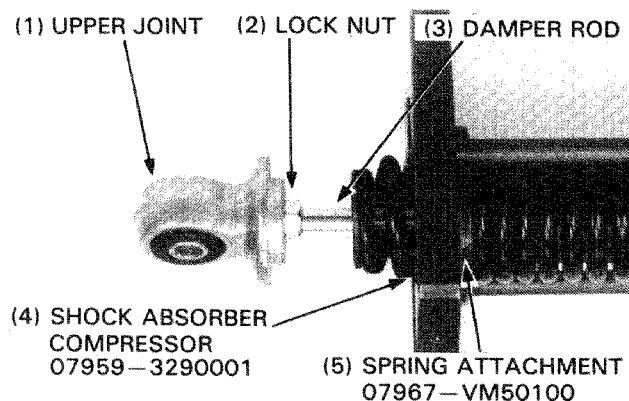
## ASSEMBLY

### NOTE

- Install the spring on the shock absorber with the tightly wound coils up.
- Apply locking agent to the lock nut threads before installation.

Install the lock nut and upper joint and tighten the lock nut.

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



## REAR WHEEL/BRAKE/SUSPENSION

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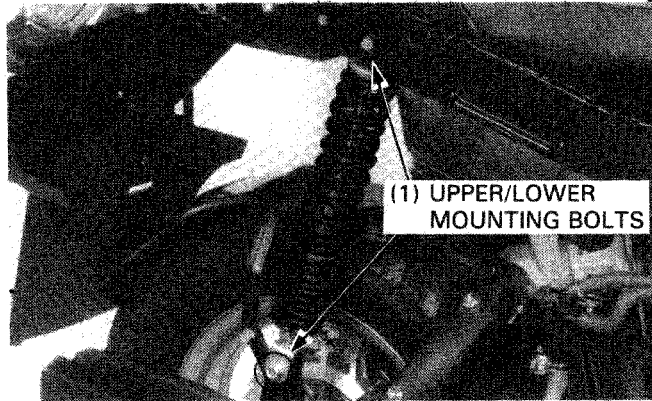
### INSTALLATION

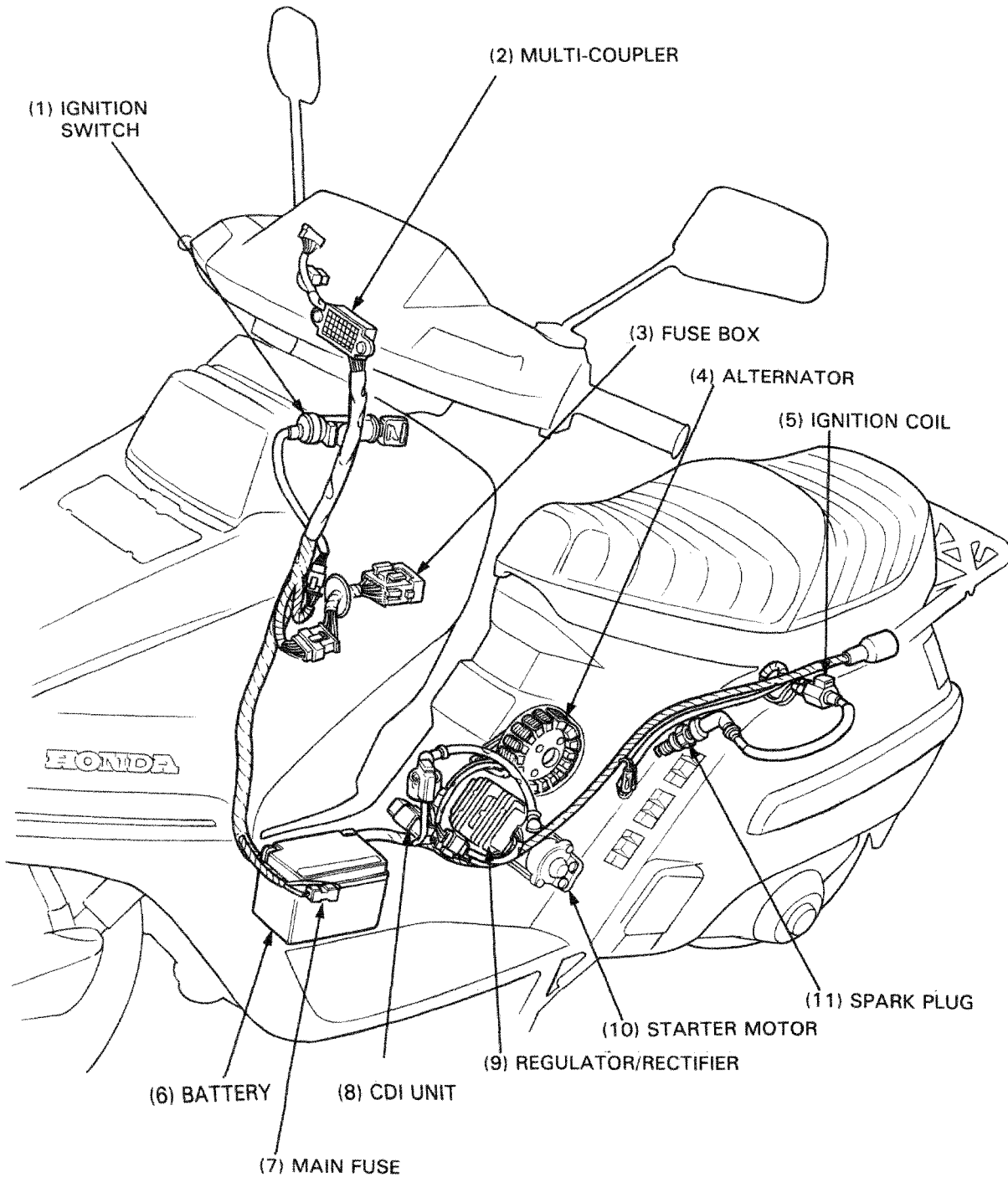
Install the right and left rear shock absorbers and tighten the upper and lower mounting bolts.

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

Check the operation of the shock absorbers by using your weight to compress them a few times.

Install the right and left rear covers (page 13-2).





# 16. ELECTRICAL EQUIPMENT

SERVICE INFORMATION	16-1	TAILLIGHT/LICENCE PLATE LIGHT	16-16
TROUBLESHOOTING	16-2	IGNITION SWITCH	16-17
BATTERY	16-3	HANDLEBAR SWITCH	16-18
CHARGING SYSTEM	16-4	REAR BRAKE LIGHT SWITCH	16-19
IGNITION SYSTEM	16-6	HORN	16-19
STARTER SYSTEM	16-8	FUEL UNIT/GAUGE	16-19
INSTRUMENTS	16-12	THERMOSTATIC SWITCH	16-20
HEADLIGHT	16-15	THERMOSENSOR	16-20
TURN SIGNAL LIGHT	16-16	TEMPERATURE GAUGE	16-21

## SERVICE INFORMATION

### GENERAL

#### 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.

#### CAUTION

- For battery charging, do not exceed the charging current and time specified on the battery cover (and shown below). Use of excessive current or charging time may damage the battery.
- Slow charge the battery whenever possible, quick charging is an emergency procedure only.
- Remove the battery from the scooter for charging.
- The battery on this scooter is a sealed type. Do not try to remove the filler hole caps even during charging. Do not use a non-sealed battery as a replacement.
- All charging system components can be checked on the scooter.
- Ignition timing can not be adjusted since the CDI (Capacitive Discharge Ignition) unit is factory preset.
- For spark plug inspection, refer to page 3-6.
- For alternator and pulse generator removal, refer to section 10.
- A continuity check can usually be made without removing the parts from the scooter by simply disconnecting the wires and using a continuity tester or ohmmeter at the terminals.

## SPECIFICATIONS

ITEM		STANDARD mm (in)		SERVICE LIMIT mm (in)
Battery	Capacity	12 V—12 AH		
	Charging current	1.2 A		
	Charging time	5 hours		
Alternator capacity		12V 240W/5,000 rpm		
Voltage regulator		Transistorized non adjustable regulator		
Spark plug		Standard	For cold climate (below 5°C, 41°F)	For extended high speed riding
	NGK	DPR6EA—9	DPR5EA—9	DPR7EA—9
	ND	X20EPR—U9	X16EPR—U9	X22EPR—U9
Spark plug gap		0.8—0.9 (0.032—0.035)		
Ignition coil resistance	Primary	0.16—0.20 Ω		
	Secondary	3.6—4.6 kΩ		
Ignition timing		12° BTDC at 1500 rpm		
Pulse generator resistance		50—170 Ω		
Exiter coil resistance		50—350 Ω		
Starter motor	Brush length	12.0—12.5 (0.47—0.49)	6.5 (0.26)	
	Brush spring tension	680—920 g (1.49—2.03 lb)	680 g (1.49 lb)	

## ELECTRICAL EQUIPMENT

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### TROUBLESHOOTING

#### CHARGING SYSTEM

##### No current

- Dead battery
  - Low fluid level
  - Battery sulfation
  - Internally shorted battery
  - Charging system failure
- Disconnected battery cable
- Burned out fuse
- Faulty ignition switch

##### Low current

- Weak battery
- Loose battery connection
- Charging system failure
- Faulty regulator/rectifier

##### Intermittent current

- Loose
  - Battery cable
  - Charging system connection
  - Connection or short circuit in lighting system
  - Ignition system connection

##### Charging system failure

- Loose, broken or shorted wire or connection
- Faulty regulator/rectifier
- Faulty alternator

#### IGNITION SYSTEM

##### No spark at plug

- Poorly connected, broken or shorted wire
  - Between pulse generator and CDI unit
  - Between CDI unit and ignition coil
  - Between CDI unit and ignition switch
  - Between ignition coil and spark plug
- Faulty:
  - Ignition switch
  - Ignition coil
  - CDI unit
  - Pulse generator
  - Spark plug

##### Engine starts but runs poorly

- Ignition primary circuit
  - Faulty ignition coil
  - Loose or bare wire
  - Poor connection at ignition switch
- Ignition secondary circuit
  - Faulty ignition coil
  - Faulty spark plug
  - Faulty spark plug wire
  - Poorly insulated plug cap
- Improper ignition timing
  - Faulty pulse generator
  - Stator not installed properly
  - Faulty CDI unit

#### STARTING SYSTEM

##### Starter won't turn

- Burned out fuse
- Weak battery
- Poorly connected, broken or shorted wire
- Faulty:
  - Ignition switch
  - Starter switch
  - Rear brake light switch
  - Starter relay
  - Starter motor

##### Lack of power

- Weak battery
- Loose or bare wire
- Faulty starter or starter gear

##### Starter rotates, but engine does not start

- Faulty starter pinion
- Low battery

#### DIGITAL SPEEDOMETER

##### Meter does not indicate properly

- Dead battery
- Burned out fuse
- Broken or disconnected speedometer cable
- Poorly connected, open or shorted wire
- Faulty:
  - Meter unit
  - Speedometer gear
  - Ignition switch
  - Speed sensor (reed switch)

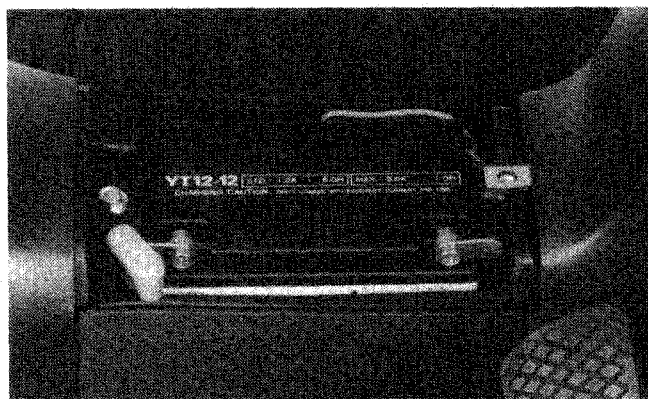


## BATTERY

### REMOVAL/INSTALLATION

Remove the battery cover.  
Disconnect the battery negative cable, then positive cable.  
Remove the battery.

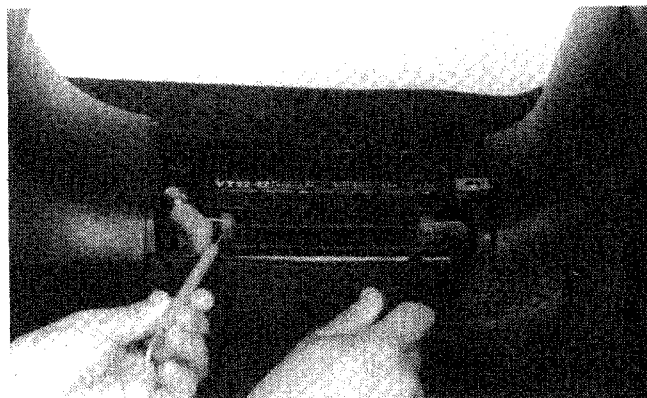
Install the battery in the reverse order of removal.



### VOLTAGE CHECK

Remove the battery cover and remove the battery positive terminal cover.  
Measure the battery voltage using a digital voltmeter.

**VOLTAGE:** Fully charged 13.0–13.2 V  
Under charged Below 12.3 V



### CHARGING

Remove the battery cables and the battery.  
Connect the charger positive (+) cable to the battery positive (+) terminal.  
Connect the charger negative (–) cable to the battery negative (–) terminal.

Charging current: 1.2 A (standard)  
Charging time: 5 hours (standard)

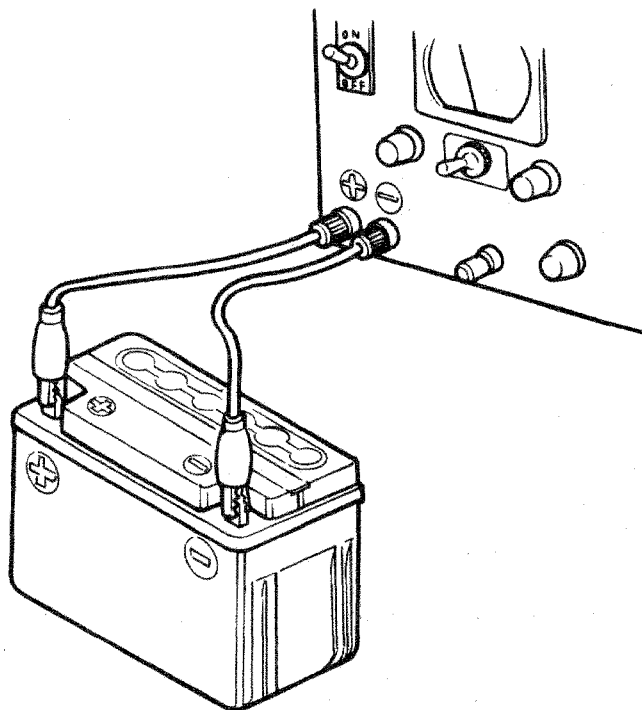
#### WARNING

- Keep flames and sparks away from a charging battery.
- Turn power ON/OFF at the charger, not at the battery terminals.

#### CAUTION

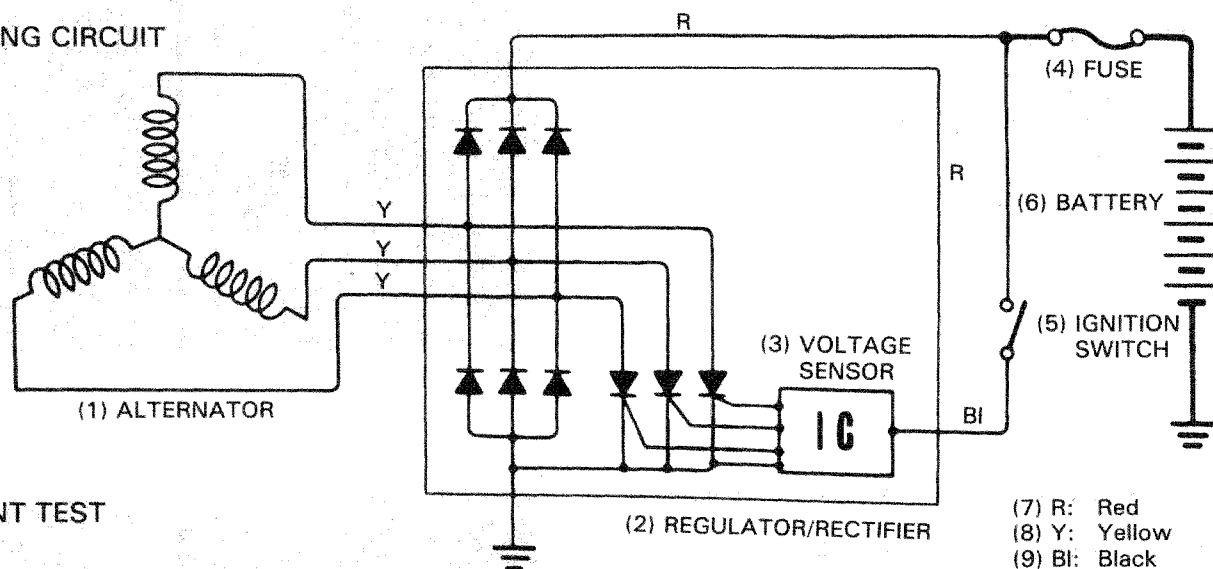
- Quick-charging should only be done in an emergency; slow charging is preferred.
- For battery charging, do not exceed the charging current and time specified on the battery. Using excessive current or extending the charging time may damage the battery.

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



## CHARGING SYSTEM

## CHARGING CIRCUIT



## CURRENT TEST

## NOTE

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

Warm up the engine.

Stop the engine and remove the battery cover.

Remove the battery (page 16-3) and remove the main fuse holder.

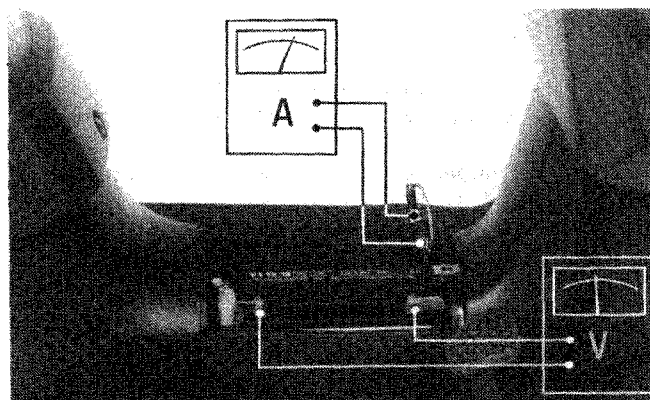
Remove the main fuse and connect the ammeter positive wire to the fuse holder main wire harness side and negative wire to the battery side as shown.

Connect the voltmeter between the battery positive and negative terminals.

Start the engine and read the voltmeter and ammeter reading. The ammeter and voltmeter reading should be 0 A and 14–15 V.

If the readings do not meet the specifications, check the wires for loose connection and repair if necessary. If the wires are good condition, replace the regulator/rectifier with new one and recheck.

If the readings still do not meet the specifications, perform the alternator output test.



## ALTERNATOR OUTPUT TEST

Place the scooter on its center stand to raise the rear wheel off the ground.

Warm up the engine.

Disconnect the black wire from the regulator/rectifier wire coupler (3P).

Connect the ammeter and voltmeter the same as for the current test.

Start the engine and gradually increase the engine speed and read the voltmeter and ammeter.

Charging start: 1,300 rpm

Charging rate: 14 V at 5,000 rpm 17A min.

## ALTERNATOR INSPECTION

## NOTE

- This test can be made without removing the stator from the engine.

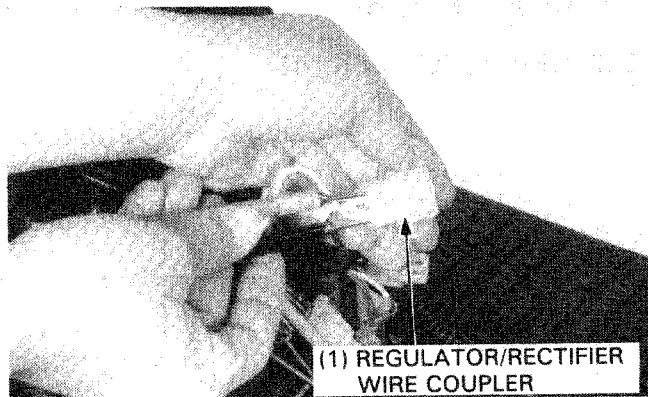
Remove the frame center cover (section 13).

Disconnect the stator wire coupler.

Check the continuity between the yellow wires and ground.

There should be continuity between the yellow wires, and no continuity between each yellow wire and ground.

Refer to section 10 for stator removal.



## REGULATOR/RECTIFIER INSPECTION

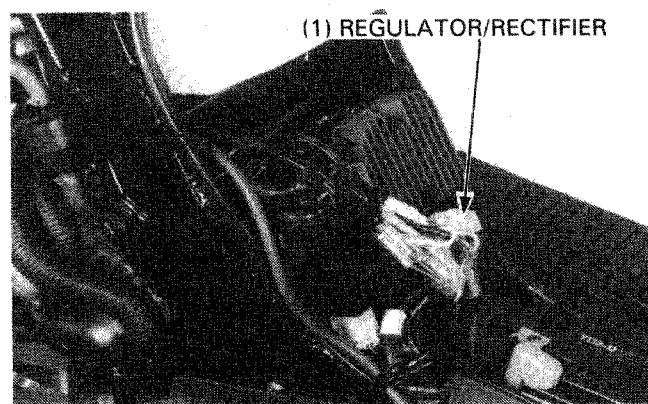
Remove the frame center cover (section 13).

Disconnect the regulator/rectifier wire coupler.

Check the continuity between the wire terminals.

## NOTE

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

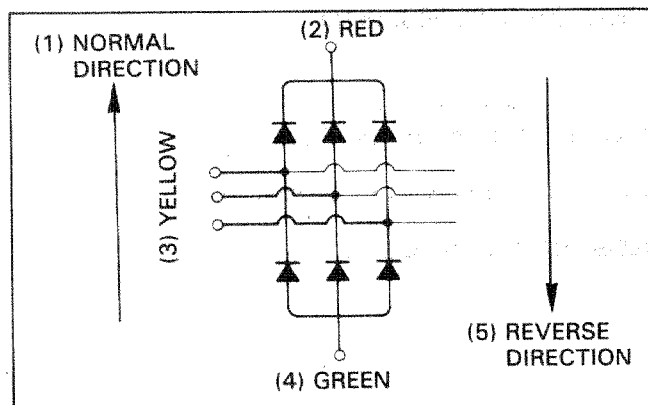


Normal direction: Continuity

	⊕ PROBE	⊖ PROBE
I	Yellow	Green
II	Red	Yellow

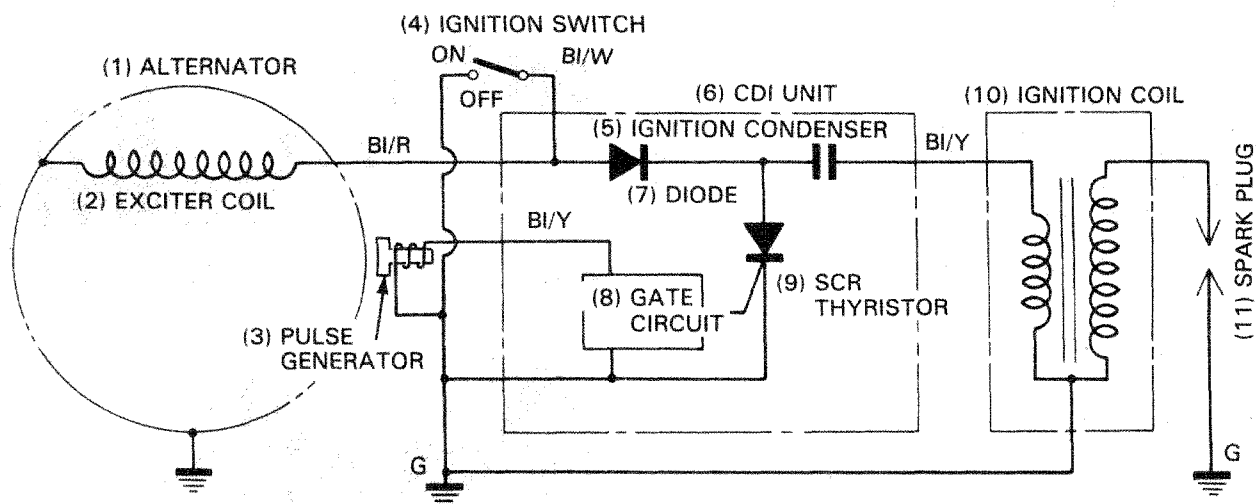
Reverse direction: No continuity

	⊕ PROBE	⊖ PROBE
I	Green	Yellow
II	Yellow	Red



## IGNITION SYSTEM

## IGNITION SYSTEM CIRCUIT



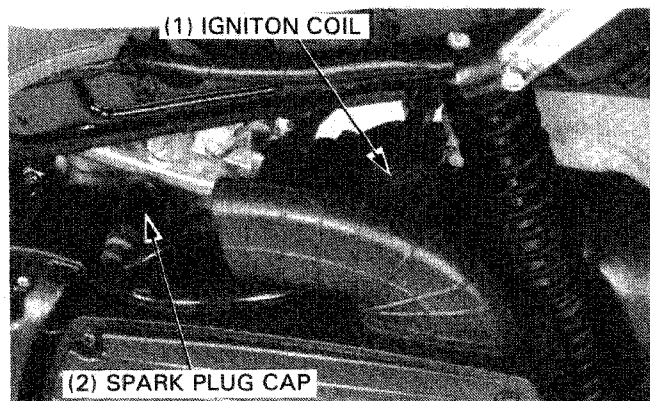
- (12) BI: Black  
(13) R: Red  
(14) W: White  
(15) Y: Yellow  
(16) G: Green

## IGNITION COIL INSPECTION

Remove the left rear cover.  
Disconnect the ignition coil wires.

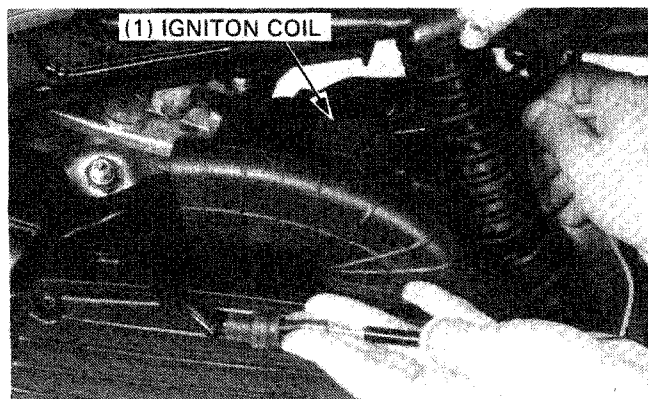
Measure the resistance of the primary coil.

**RESISTANCE: 0.16—0.20  $\Omega$**



Disconnect the spark plug cap from the spark plug.  
Remove the spark plug cap from the spark plug wire and measure the resistance of secondary coil.

**RESISTANCE: 3.6—4.6 k $\Omega$**



## EXCITER COIL INSPECTION

## NOTE

- This test can be performed with the stator installed in the engine.

Remove the frame center cover (section 13).  
Disconnect the stator wire connector.  
Measure the resistance between the black/red wire terminal and ground.

**RESISTANCE: 50—350  $\Omega$**

## NOTE

- Measure the resistance in x 1  $\Omega$  range.

Refer to section 10 for stator removal.

## CDI UNIT INSPECTION

Remove the frame center cover.  
Disconnect the couplers and remove the CDI unit.

Measure the resistance between the terminals.  
Replace the CDI unit if the readings are not within the specifications in the table below.

## NOTE

- For accurate testing, it is necessary to use a specified tester. Use of an improper tester or measurements in an improper range may give false readings.
- Use a Sanwa Electric Tester 07308—0020000 or Kowa Electric Tester TH—5H, or Digital multimeter, KS—AHM—32—003 (U.S.A. only).

Use the x k $\Omega$  range Sanwa Tester.  
Use the x 100 $\Omega$  range for Kowa Tester.

⊕ PROBE	SW	EXT	PC	E	IGN
⊖ PROBE					
SW		$\infty$	$\infty$	$\infty$	$\infty$
EXT	0.1—50		100— $\infty$	100— $\infty$	$\infty$
PC	100— $\infty$	20—500		10—200	$\infty$
E	0.5—100	0.1—50	5—50		$\infty$
IGN	$\infty$	$\infty$	$\infty$	$\infty$	

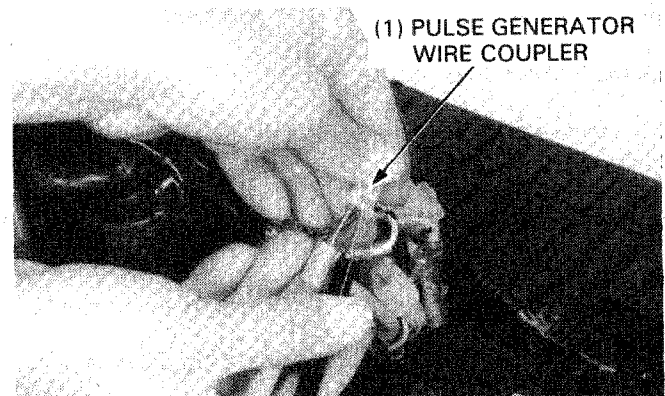
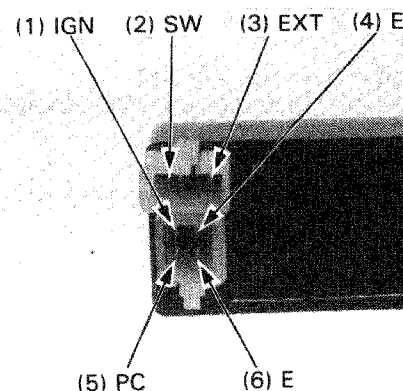
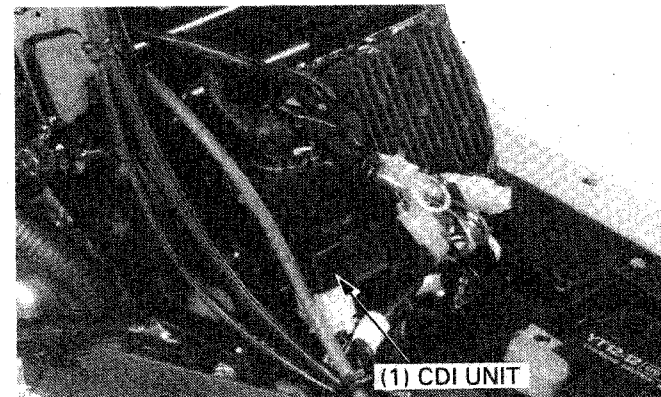
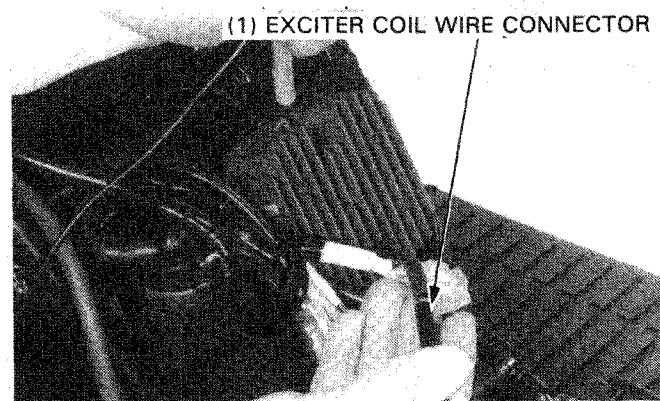
Reinstall the parts in the reverse order of removal.

## PULSE GENERATOR INSPECTION

Remove the frame center cover (section 13).  
Disconnect the pulse generator coupler and measure the resistance between the green/white and blue/yellow wire terminals.

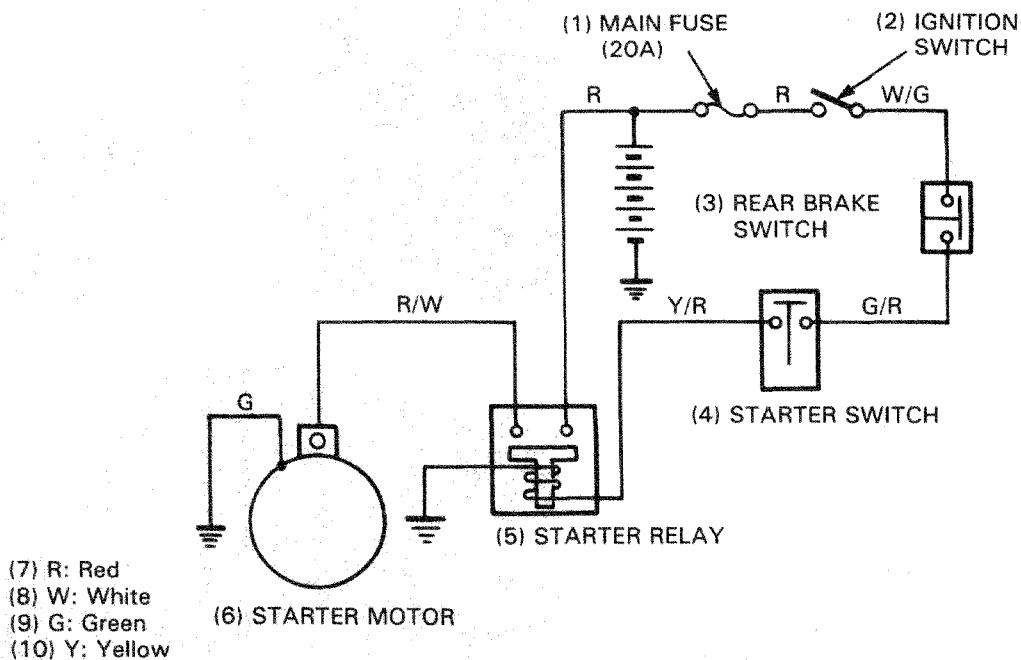
**RESISTANCE: 50—170  $\Omega$**

See section 10 for pulse generator replacement.



## STARTING SYSTEM

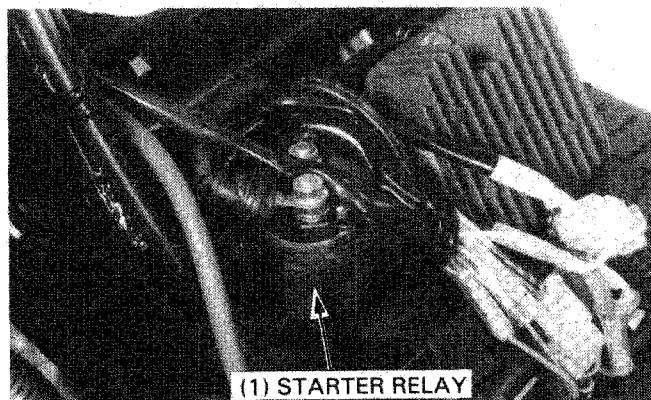
## STARTING CIRCUIT



## STARTER RELAY INSPECTION

Remove the frame center cover (section 13).  
Depress the rear brake pedal and turn the brake lock lever to the "LOCK" position.

The relay coil is normal if you hear a click when starter button is depressed with the ignition switch ON.



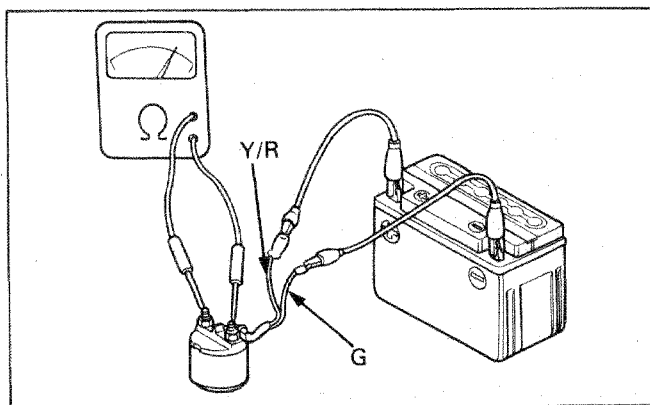
Disconnect the battery negative cable from the battery.  
Disconnect the battery positive cable and starter motor cable from the starter relay.

Remove the starter relay.

Connect an ohmmeter between the large starter relay terminals.  
Connect the yellow/red wire to the battery positive terminal and green wire to the battery negative terminal using jumper wires.

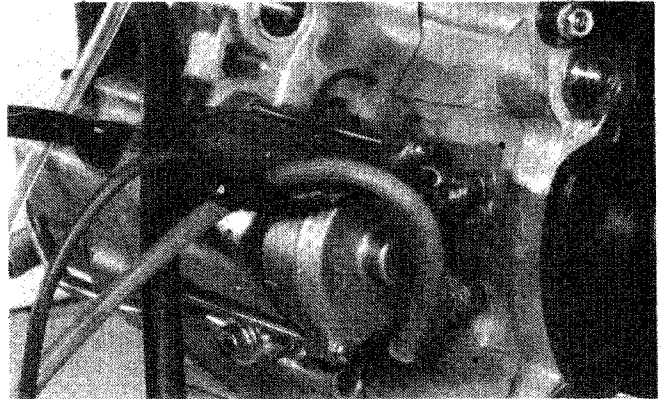
Check for continuity between the starter relay terminals.

Replace the starter relay with a new one if there is no continuity.



### STARTER MOTOR REMOVAL

Remove the engine from the frame (section 5).  
Remove the two mounting bolts and the starter motor.

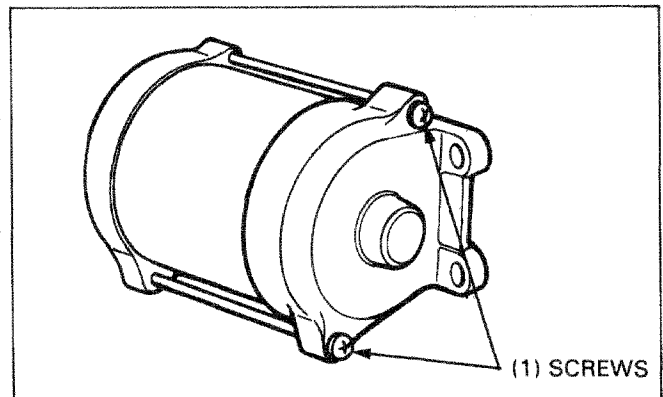


### DISASSEMBLY

Remove the starter motor case screws and the rear cover.

Remove the front cover.  
Pull the commutator out of the motor case.

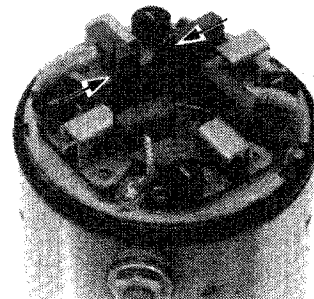
Remove the brush holder.



### MOTOR INSPECTION

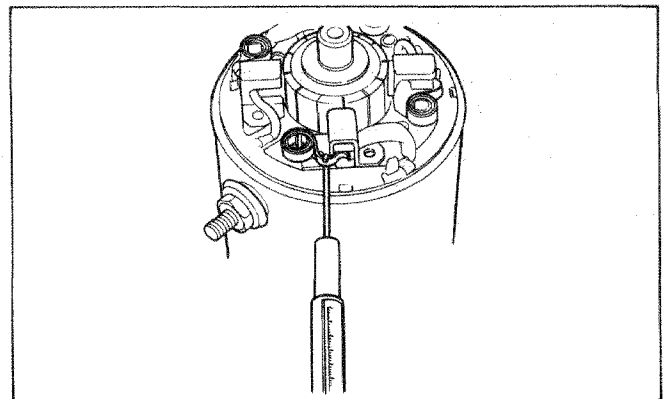
Measure the length of each brush.

**SERVICE LIMIT: 6.5 mm (0.26 in)**



Measure each brush spring tension with a spring scale.

**SERVICE LIMIT: 680 g (1.49 lbs)**





## ELECTRICAL EQUIPMENT

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### COMMUTATOR INSPECTION

Remove the commutator from the starter motor case.

#### NOTE

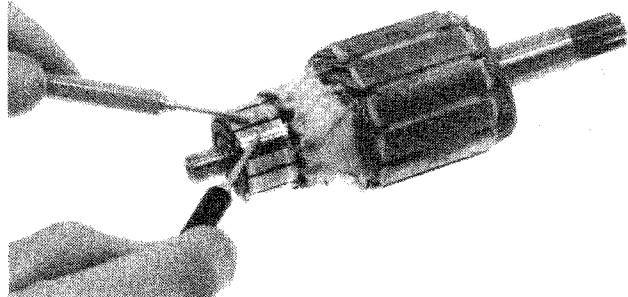
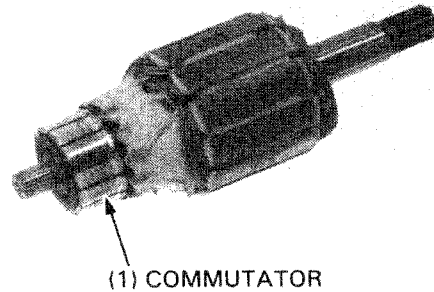
- Note the number and location of the thrust washers.

Check the commutator bars for discoloration and other visual faults. Bars discolored in pairs indicate shorted coils.

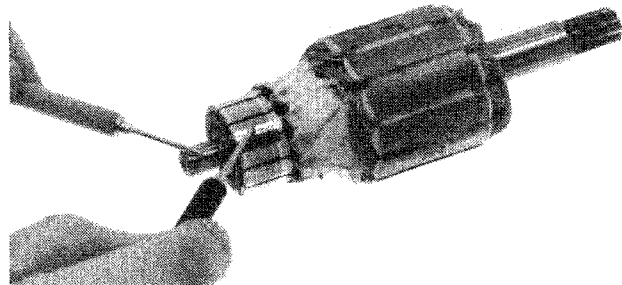
#### NOTE

- Do not use emery or sand paper on the commutator.

Check for continuity between pairs of commutator bars. There should be continuity.

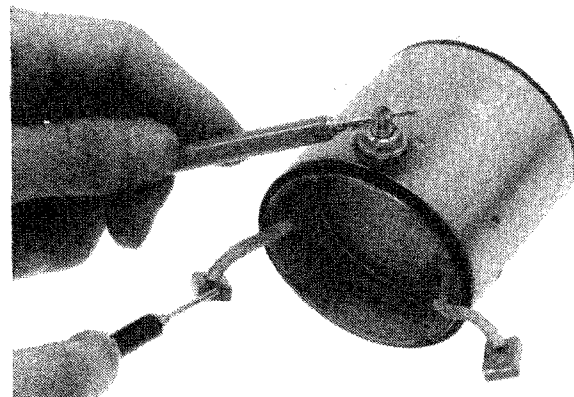


Also, make a continuity check between individual commutator bars and the armature shaft. There should be no continuity.

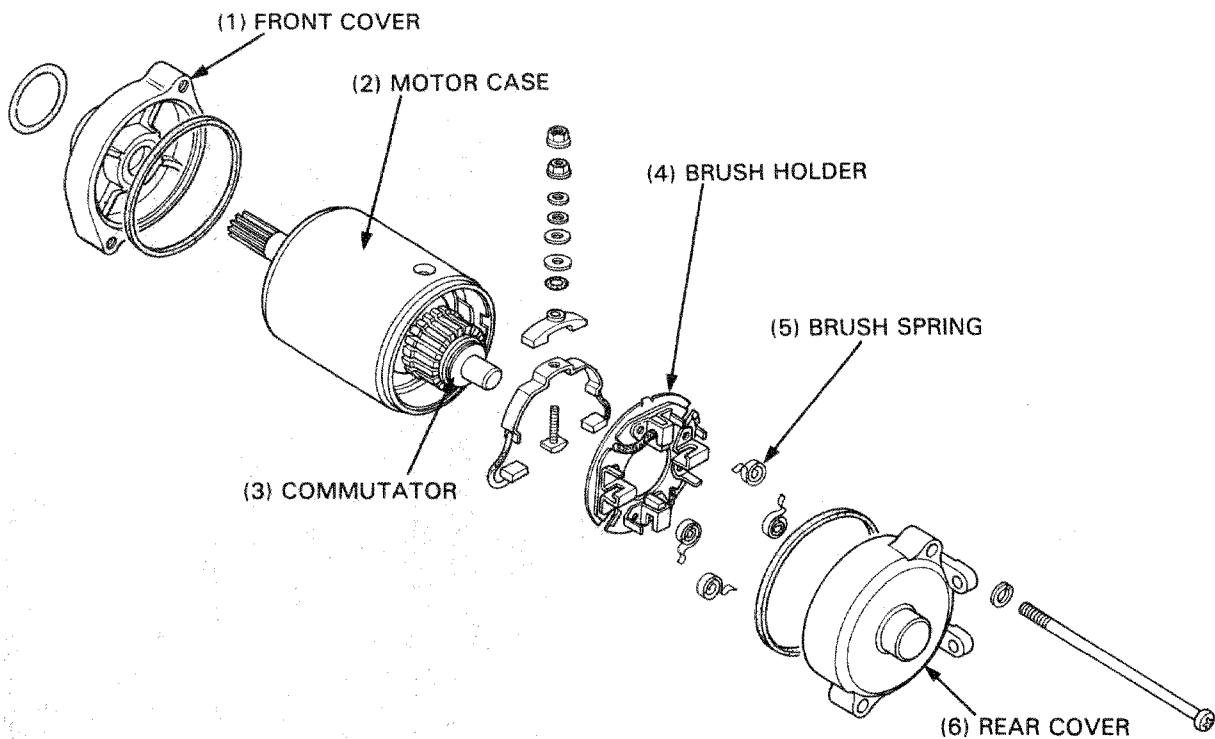


### CASE INSPECTION

Check for continuity between the cable terminal and the motor case. There should be no continuity. Then check for continuity between the cable terminal and the brush. There should be continuity.



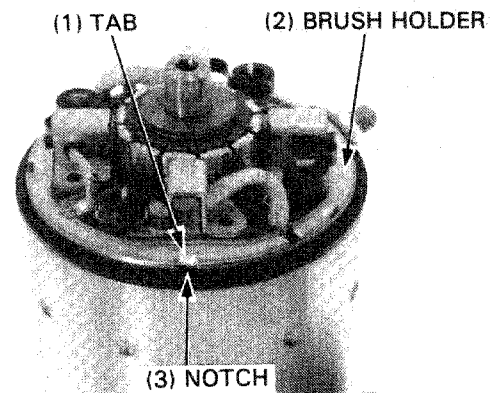
## ASSEMBLY



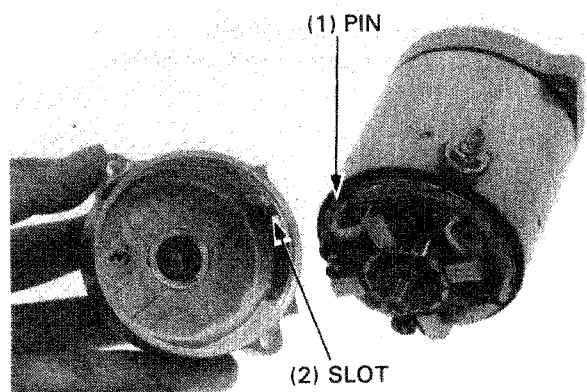
Assemble the starter motor.  
 Compress the brushes into their holders, and slip the brush holder over the commutator.  
 Slide the commutator / brush holder into the motor case.  
 Align the case notch with the brush holder tab.

## NOTE

- Be sure the proper number of thrust washers, as previously noted, have been placed on the shaft before installation of the rear cover

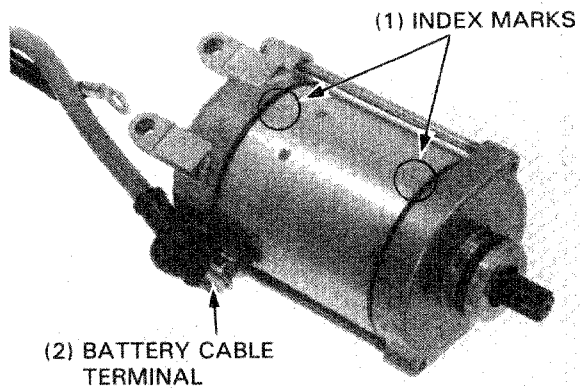


Install the rear cover aligning its slot with the brush holder pin.



## ELECTRICAL EQUIPMENT

Align the index marks on the front and rear covers and install the starter motor case screws.

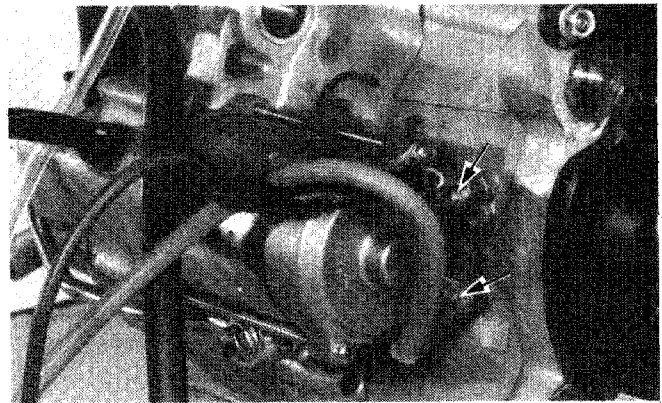


### STARTER MOTOR INSTALLATION

#### NOTE

- Before installing the starter motor, check the operation by connecting the starter motor wires to the starter relay.

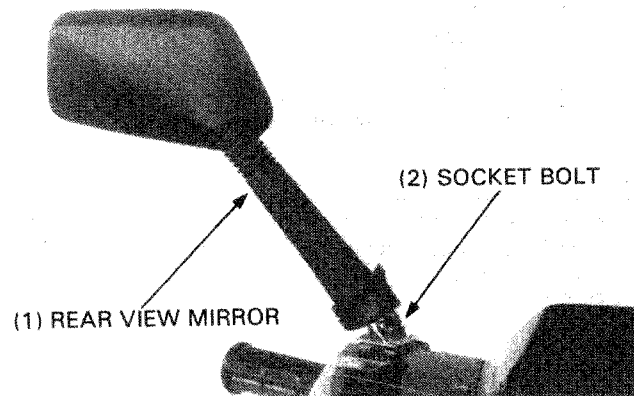
Install the starter motor in the reverse order of removal.



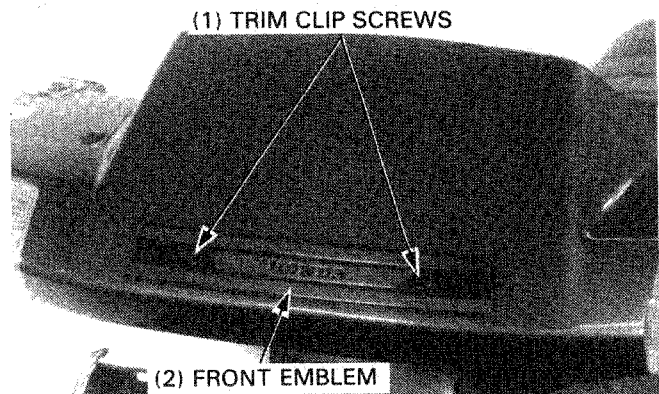
## INSTRUMENTS

### REMOVAL

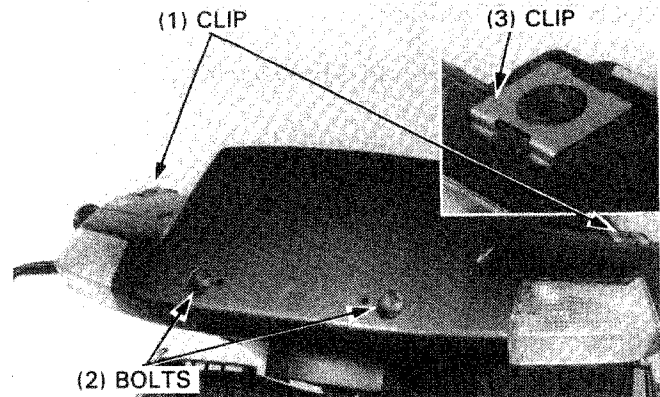
Remove the right and left rear view mirrors.



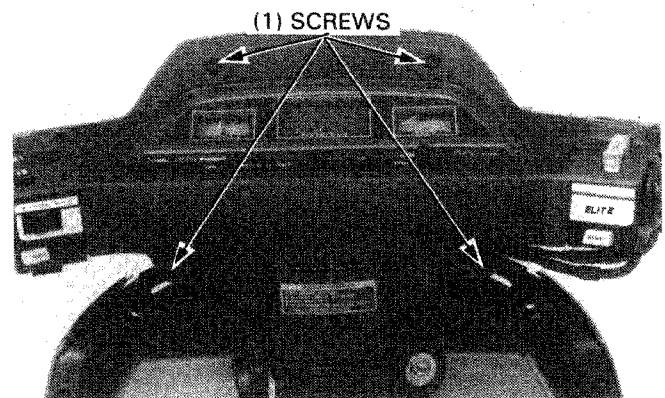
Remove the head light cover (page 13-5).  
Remove the two trim clip screws and front emblem.



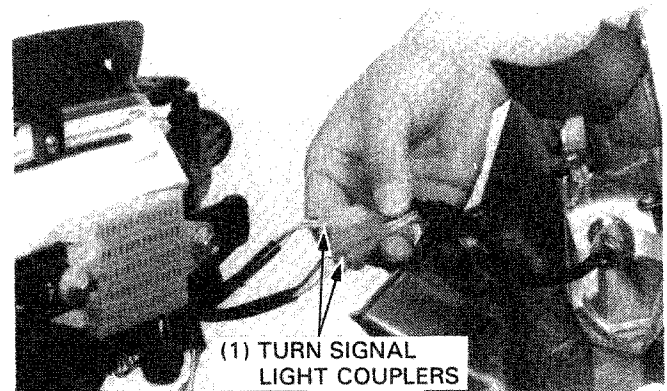
Remove the two clips and two upper handle bar cover attaching bolts.



Remove the four screws attaching the instruments.

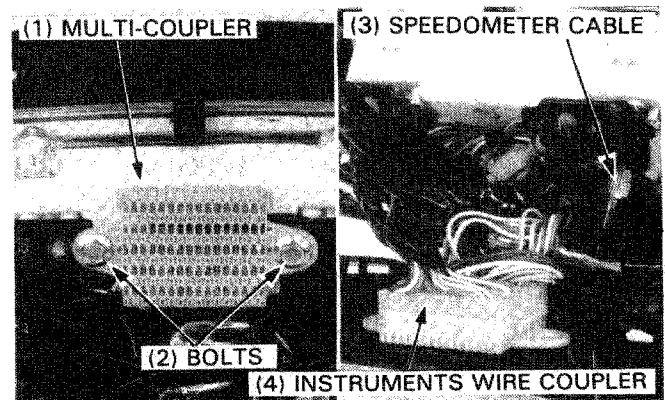


Disconnect the right and left turn signal light couplers and remove the upper handlebar cover.



Remove the two multi-coupler mounting bolts and disconnect the speedometer cable. Disconnect the instruments wire coupler and connectors.

Remove the instruments.

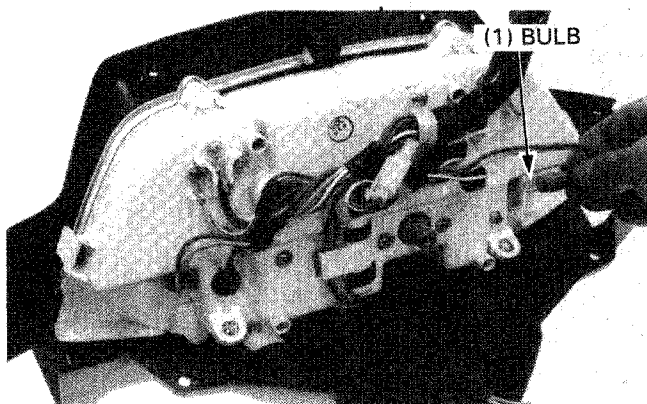


## ELECTRICAL EQUIPMENT

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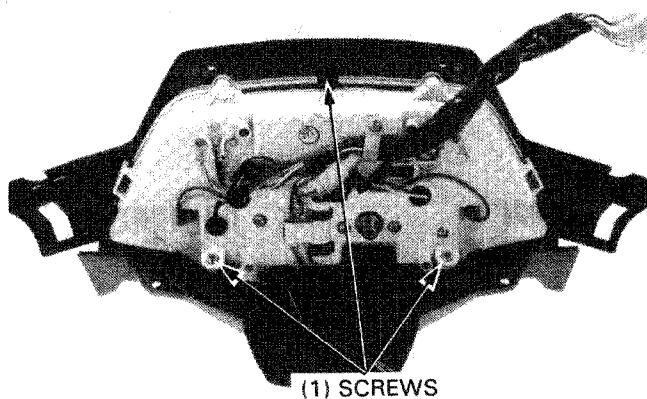
### BULB REPLACEMENT

Remove the bulb socket to replace the bulb.

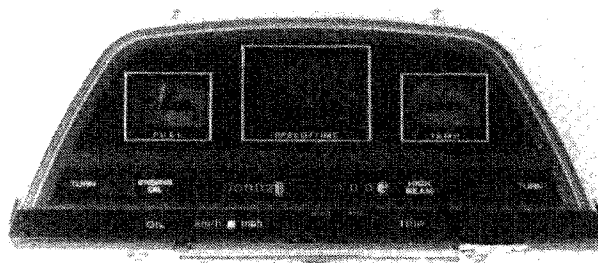


### DISASSEMBLY

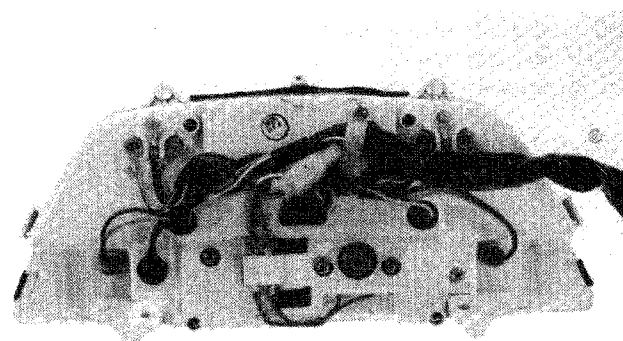
Remove the three screws and lower instruments cover.



Remove the four screws and trip meter knob, then remove the instrument lens.

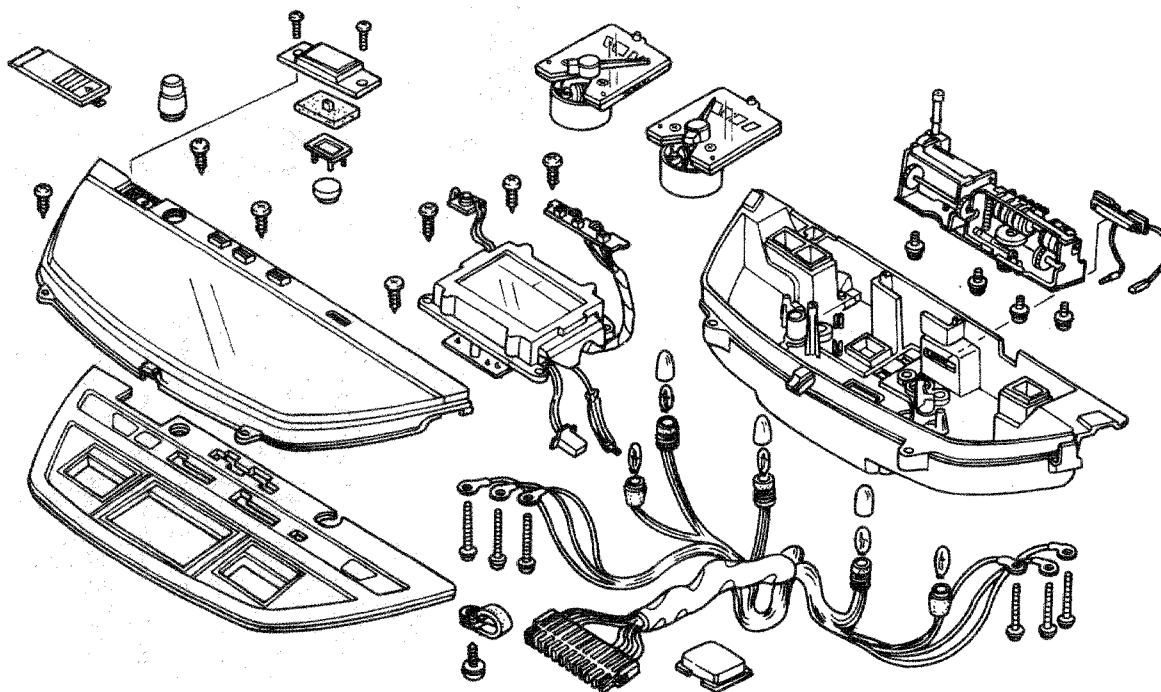


Remove the screws and disassemble the instruments.



## ASSEMBLY/INSTALLATION

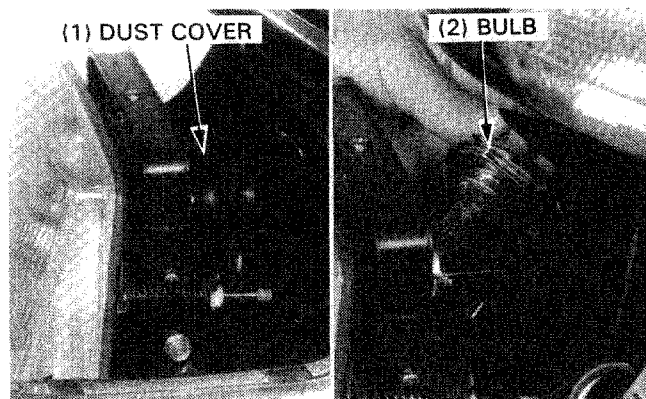
Assemble and install the instruments in the reverse order of disassembly/removal.



## HEADLIGHT

### BULB REPLACEMENT

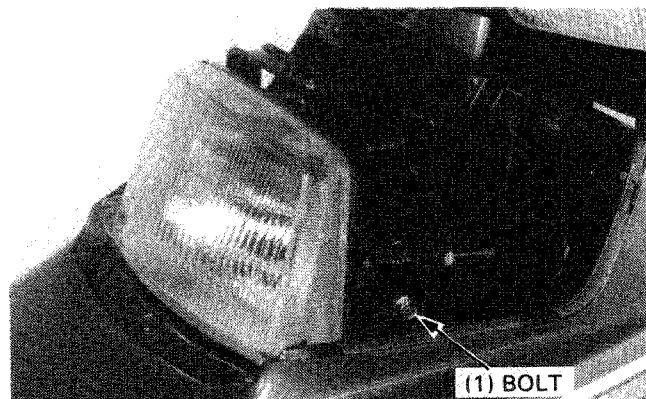
Remove the headlight cover (page 13-5).  
Remove the dust cap, headlight coupler and clip, then replace the headlight bulb.



### REMOVAL/INSTALLATION

Remove the headlight cover (page 13-5).  
Disconnect the headlight coupler.  
Remove the two headlight stay mounting bolts and remove the headlight with the stay.

Install the headlight in the reverse order of removal.



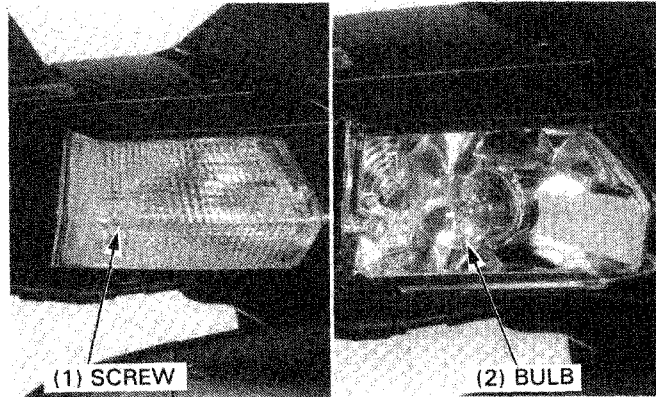


## ELECTRICAL EQUIPMENT

### TURN SIGNAL LIGHT

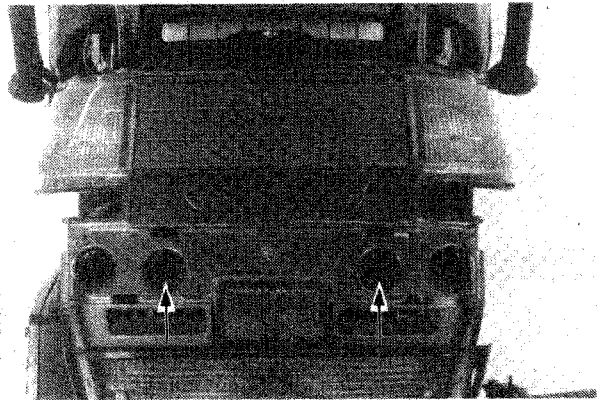
#### FRONT TURN SIGNAL LIGHT BULB REPLACEMENT

Remove the screw and lens to replace the bulb.



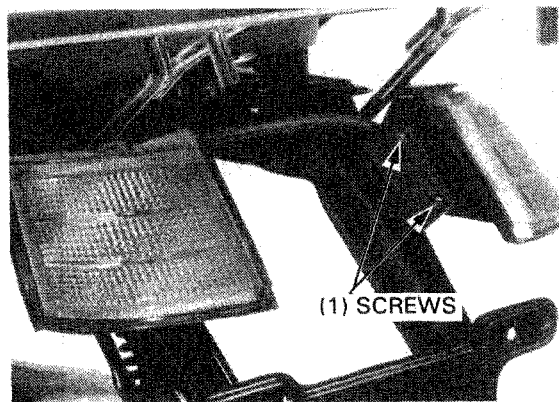
#### REAR TURN SIGNAL LIGHT BULB REPLACEMENT

Remove the right and left rear covers (section 13).  
Remove the two bolts and rear body cover.



Remove the four screws and the left and right rear turn signal light cases.  
Turn the left rear turn signal light bulb socket to replace the bulb.

Install the turn signals in the reverse order of removal.



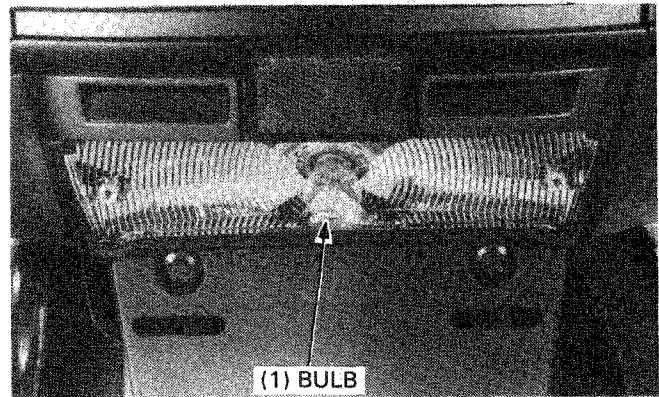
### TAILLIGHT/LICENCE PLATE LIGHT

Remove the taillight/licence plate light lens by removing the two screws.





Replace the taillight/licence plate light bulb.  
Install the taillight lens with the two screws.

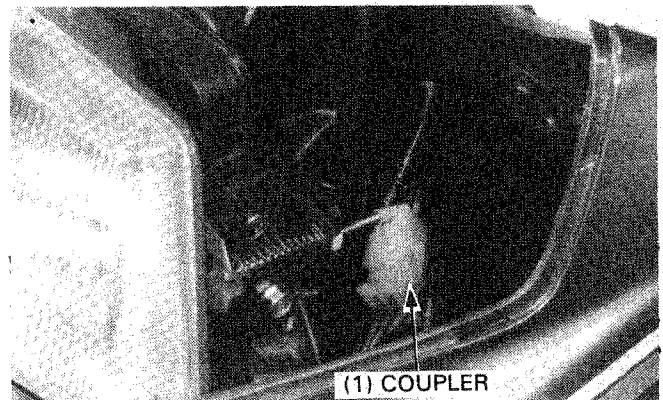


## IGNITION SWITCH

### INSPECTION

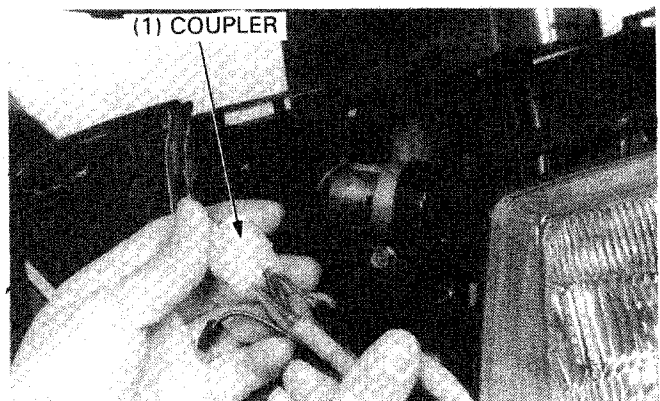
Remove the headlight cover (page 13-5).

Disconnect the ignition switch wire coupler and check for continuity at each terminal.



Continuity should exist between the color coded wires indicated below.

	BAT <sub>1</sub>	BAT <sub>2</sub>	BAT <sub>3</sub>	IG	E
ON	○	○	○		
OFF				○	○
LOCK				○	○
COLOR	R	Bl	Bl/Br	Bl/W	G



### REMOVAL

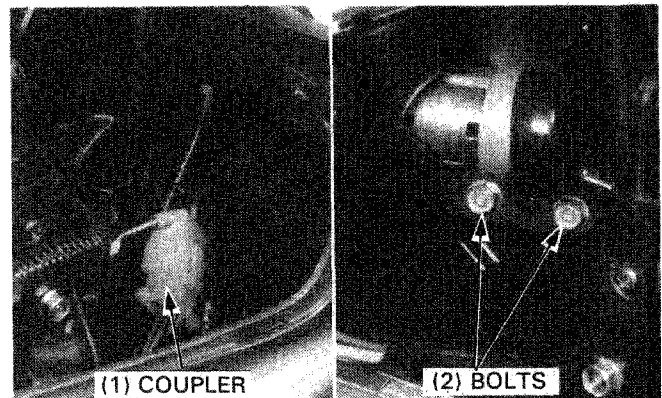
Disconnect the ignition switch coupler.

Remove the two ignition switch mounting bolts and remove the ignition switch.

### INSTALLATION

Install the ignition switch aligning the pin with the hole in the switch stay.

Connect the wire coupler.  
After installation, check the switch for proper operation.



## HANDLEBAR SWITCHES

Remove the upper handlebar cover (page 16-13).

Disconnect the handlebar switch coupler from the multi-coupler.

Continuity should exist between the color coded wires indicated on each chart.

## • ENGINE STOP SWITCH

Terminal	IG	E
OFF	○—○	
RUN		
Color	Bl/W	G

## • STARTER SWITCH

Terminal	HL1	BAT4	ST1	ST2
FREE	○—○			
PUSH			○—○	
Color	Bu/W	Br/Bu	Y/R	G/R

## • FRONT BRAKE SWITCH

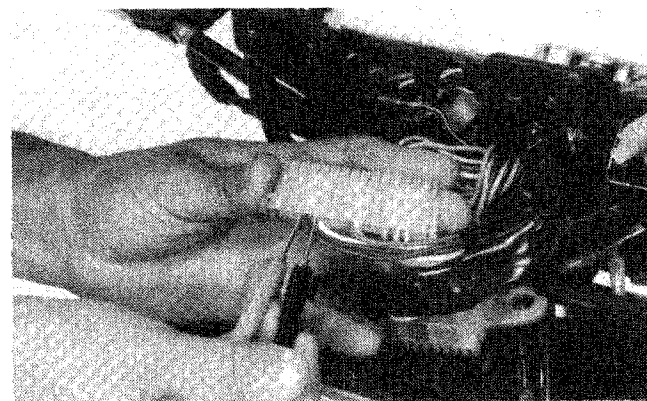
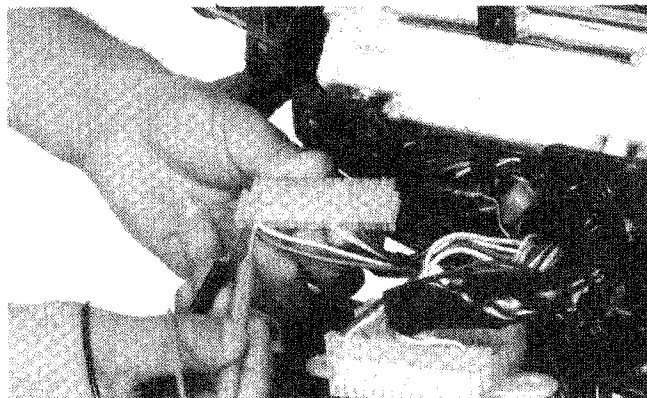
Terminal	BAT6	STOP
FREE	○—○	
PUSH		
Color	W/G	G/Y

## • TURN SIGNAL SWITCH

	W	R	L	Po	RPo	LPo
R	○—○			○—○		○—○
PUSH (N)				○—○	○—○	○—○
(N)				○—○	○—○	○—○
L	○—○		○—○	○—○		
Color	Gr	Lb	O	Br/Bu	Lb/W	O/W

## • DIMMER SWITCH

	HL	Hi	Lo
Hi	○—○	○—○	○—○
(N)	○—○	○—○	○—○
Lo	○—○	○—○	○—○
Color	Bu/W	Bu	W



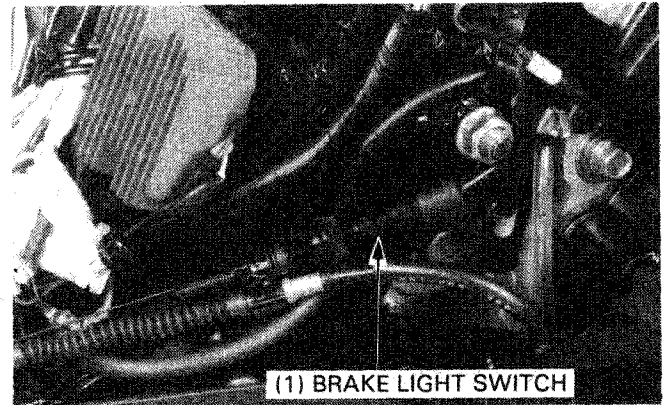
## REAR BRAKE LIGHT SWITCH

Remove the frame center cover.

Disconnect the rear brake switch wire connectors from the harness.

Check for continuity with the rear brake applied.

There should be continuity between W/G and G/Y, and W/G and G/R terminals.



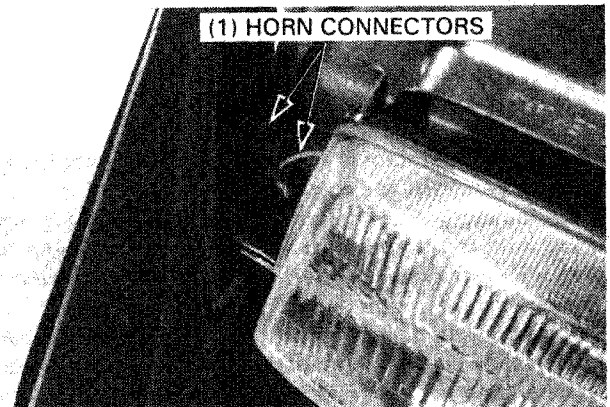
## HORN

Remove the headlight cover (page 13-5).

Disconnect the horn wire connectors.

The horn is normal if it sounds when a 12 V battery is connected across the terminals.

Replace the horn if it does not sound with the application of 12 volts.



## FUEL UNIT/GAUGE

### FUEL UNIT INSPECTION

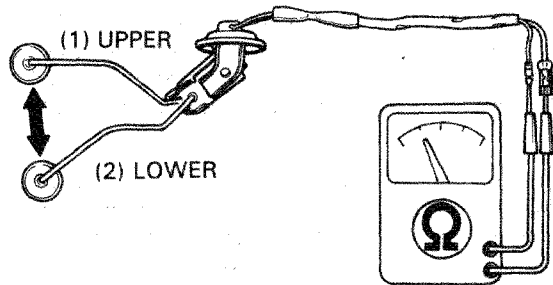
'85:

Remove the fuel unit (page 4-16).

Measure the resistance between the fuel unit wire terminals with the float at the upper (FULL) and lower (EMPTY) positions.

FLOAT POSITION	RESISTANCE
UPPER (FULL)	4–10 $\Omega$
LOWER (EMPTY)	90–100 $\Omega$

'85:



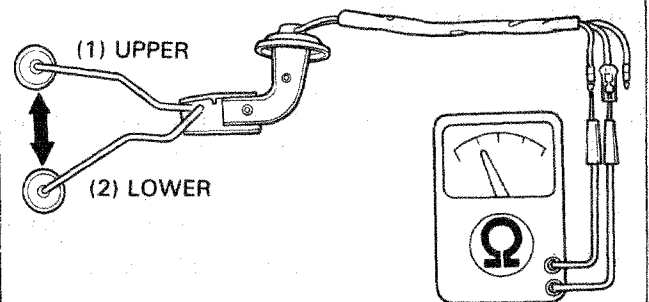
After '85:

Remove the fuel unit (page 4-16).

Measure the resistance between the fuel unit wire terminals with the float at the upper (FULL) and lower (EMPTY) positions.

	UPPER (FULL)	LOWER (EMPTY)
Green and Yellow/White	24–42 $\Omega$	409–725 $\Omega$
Green and Blue/White	409–725 $\Omega$	24–42 $\Omega$
Yellow/White and Blue/White	450–750 $\Omega$	450–750 $\Omega$

After '85:



## ELECTRICAL EQUIPMENT

### FUEL GAUGE INSPECTION

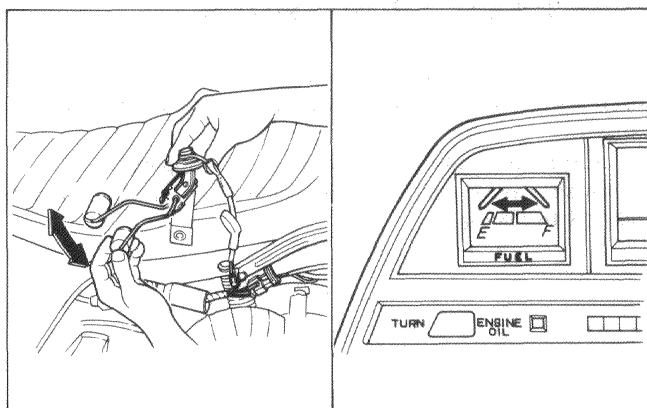
Connect the fuel unit wire connectors and turn the ignition switch ON.

#### NOTE

- Before performing the following test, operate the turn signals to determine that the battery circuit is normal.

Check the gauge needle for correct indication by moving the float up and down.

FLOAT POSITION	NEEDLE POSITION
UPPER (FULL)	"F" (FULL)
LOWER (EMPTY)	"E" (EMPTY)



### THERMOSTATIC SWITCH

The cooling fan motor is actuated by a thermostatic switch located in lower the radiator.

If the fan motor does not run, disconnect the black and green leads from the thermostatic switch and short them together with a jumper wire as show. Turn the ignition switch on.

The cooling fan motor should start running.

If it does not run, check for battery voltage from the black lead (positive) to black/blue (negative) of the fan motor coupler.

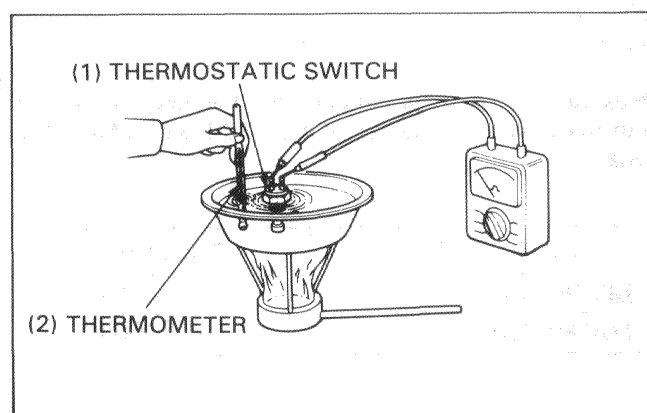
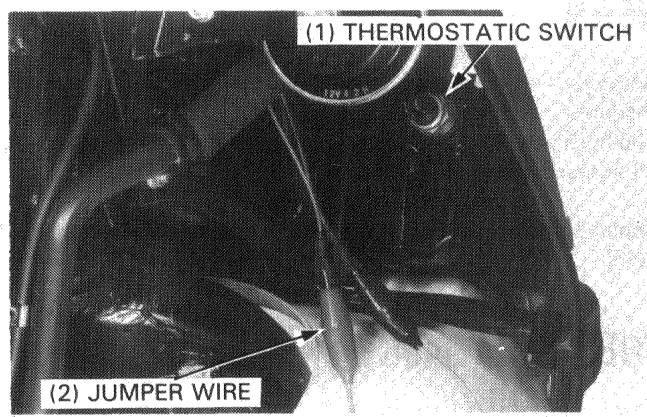
If there is no voltage, check for a blown or faulty fuse, loose terminals or connectors, or an open circuit.

If it starts, inspect the fan thermostatic switch as follows:

Suspend the switch in a pan of coolant (50–50 mixture) and check the temperatures at which the switch opens and closes. Make sure that there is no switch continuity with room temperature and gradually raise the coolant temperature. The switch should have continuity (close) at 98–102°C (208–215°F) and show no continuity below 91°C (195°F).

#### NOTE

- Keep the temperature stable for 3 minutes before testing continuity. A sudden change of temperature will cause an error in the temperature reading between the thermometer and the switch.
- Do not let the thermometer or switch touch the pan as it will give a false reading.
- Soak the switch in coolant up to its threads.



### THERMOSENSOR

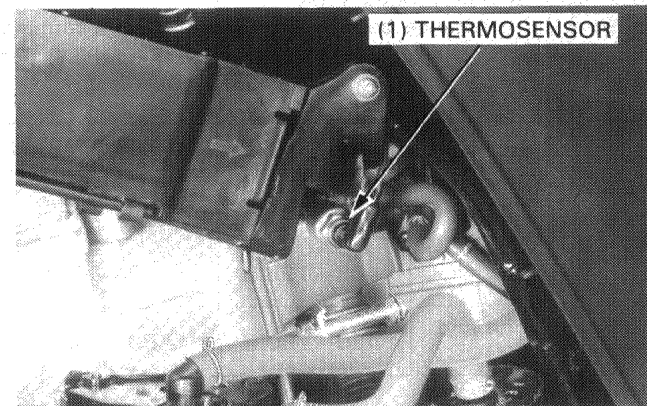
Remove the thermosensor.

Suspend the sensor in oil over hot plate and measure the resistance through the sensor as the oil heats up.

Temperature	50°C (122°F)	80°C (176°F)	100°C (212°F)	120°C (248°F)
Resistance (Ω)	144–179	47.5–57	26–29	14.8–17.2

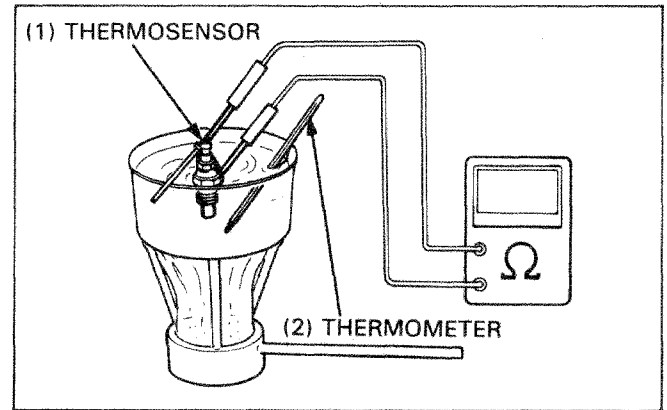
#### WARNING

- Wear gloves and eye protection.



## NOTE

- Oil must be used as the heated liquid to check the function above 100°C (212°F).
- You'll get false readings if either the thermometer, or thermosensor touches the pan.



## TEMPERATURE GAUGE

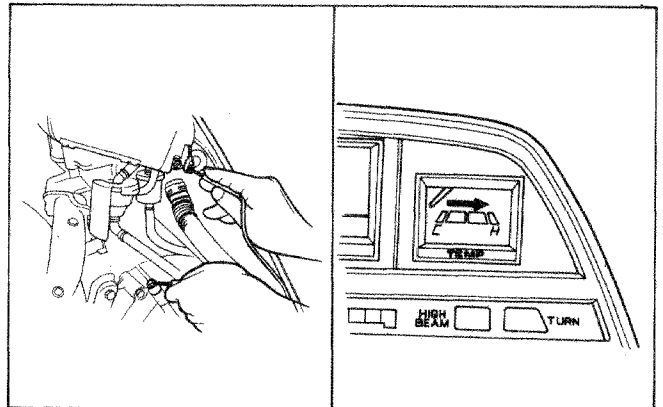
Disconnect the wire from the thermosensor and ground it to the engine.

Turn the ignition switch ON.

The temperature gauge needle should move all the way to the H (right).

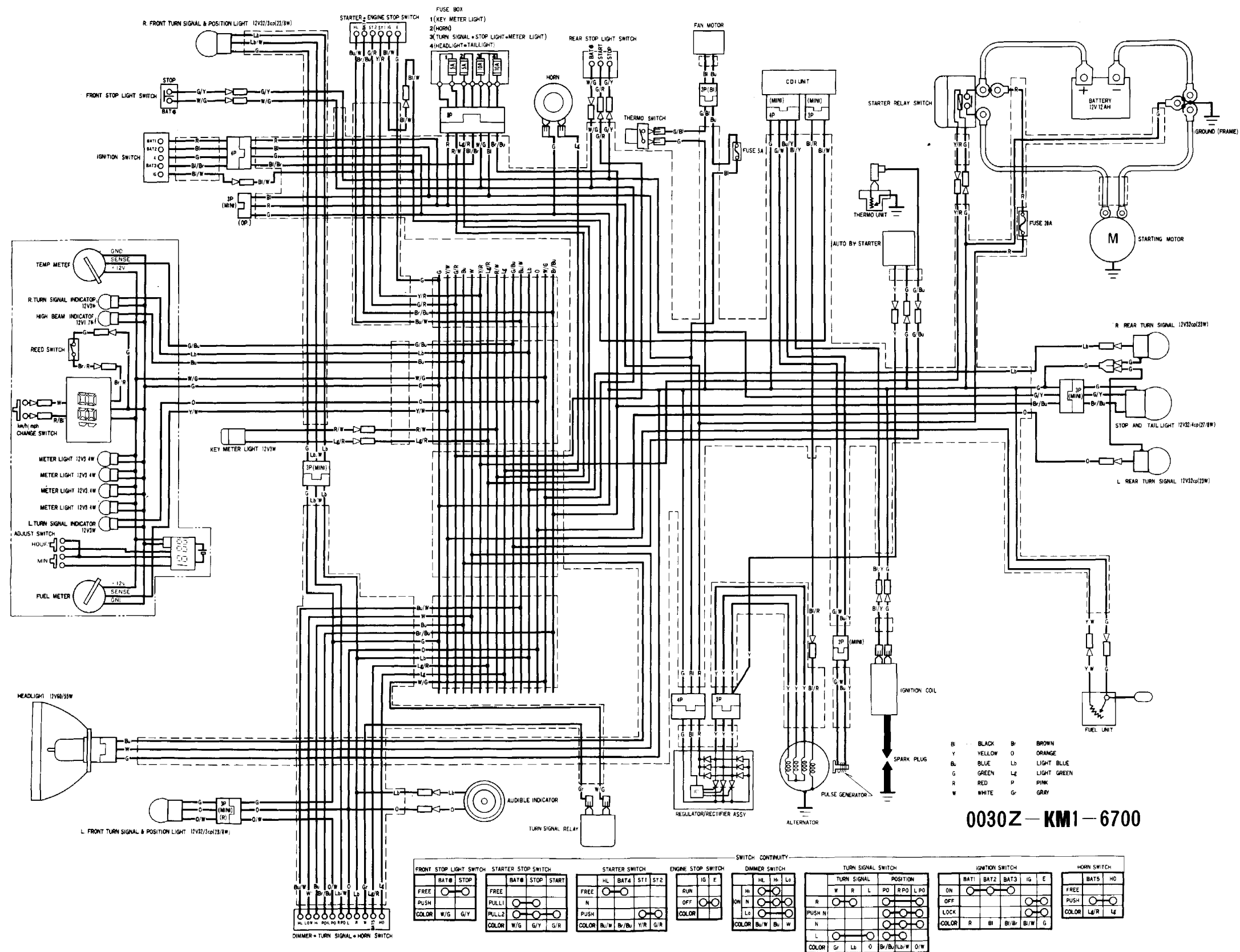
## CAUTION

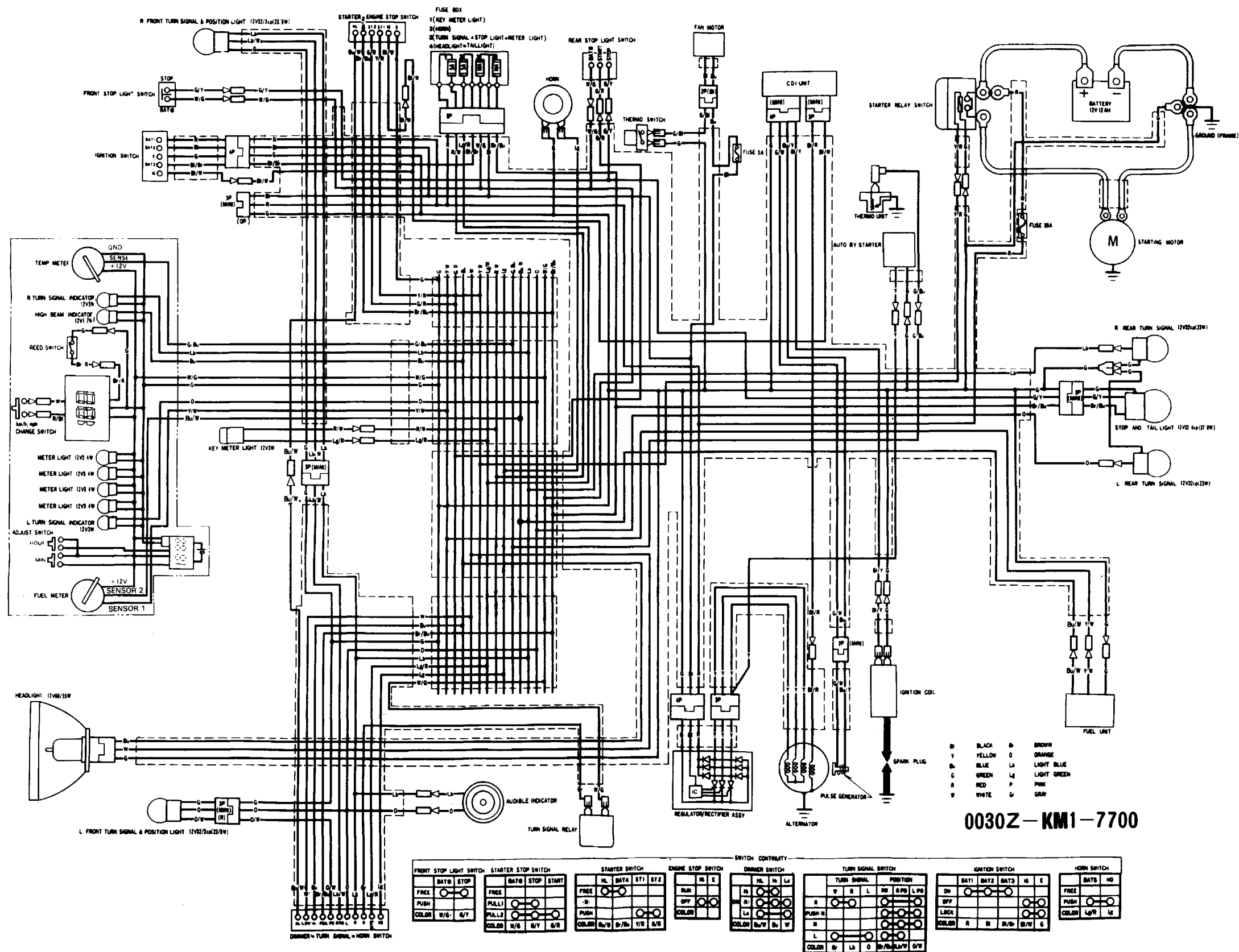
- *Do not leave the thermosensor wire grounded for longer than 5 seconds or the temperature gauge will be damaged.*



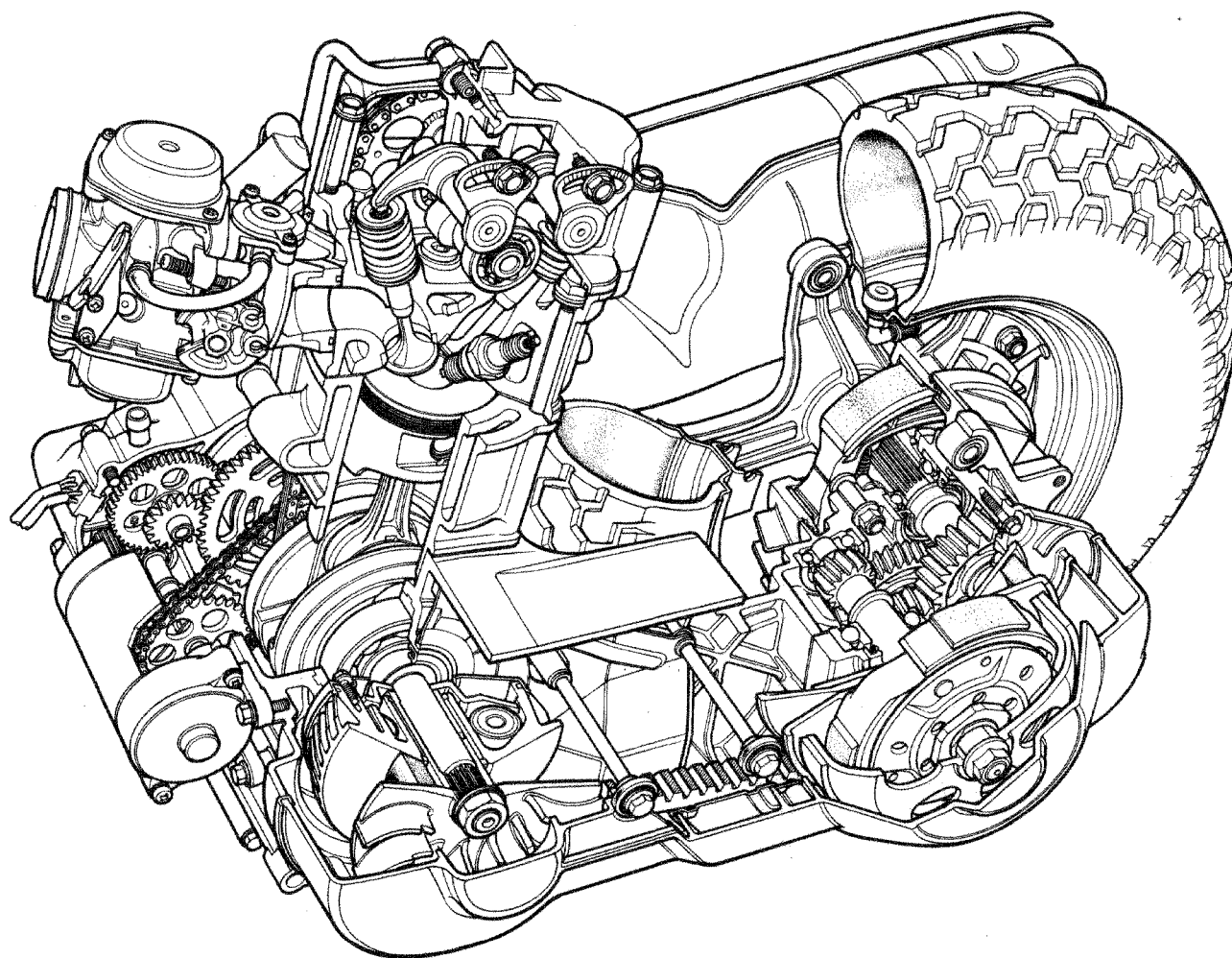
# 17. WIRING DIAGRAMS

'85:







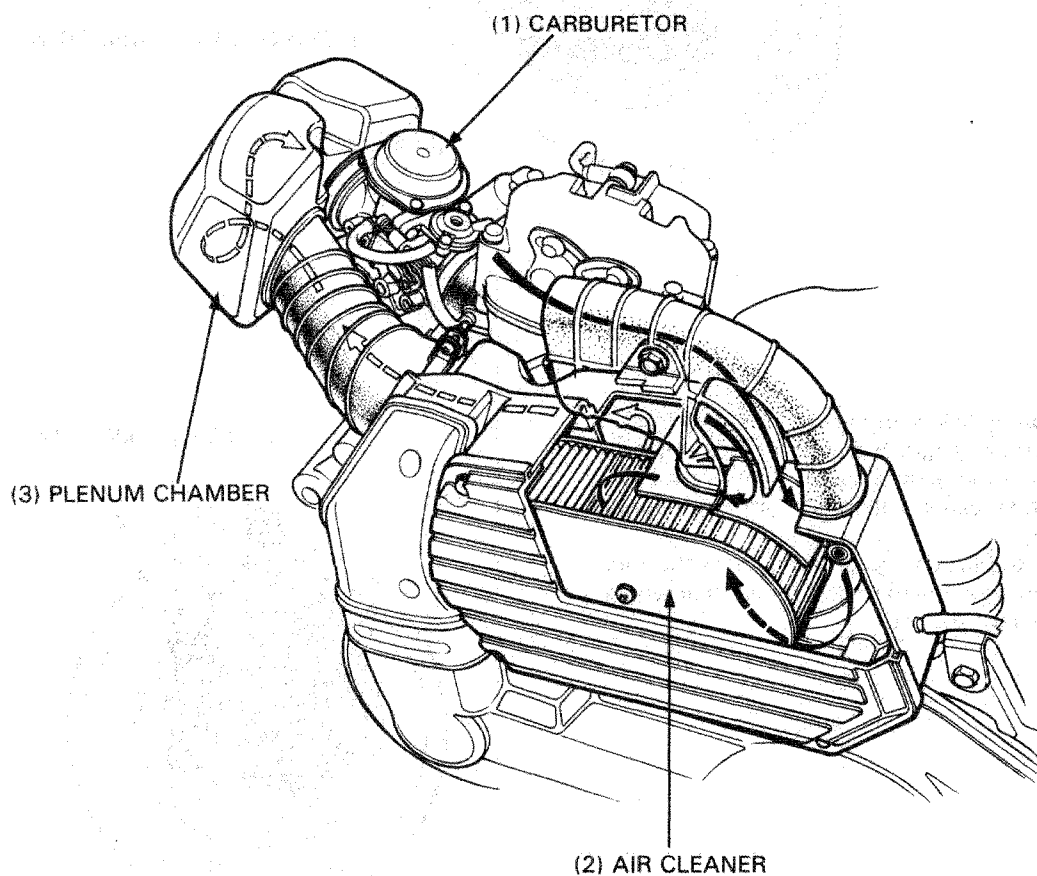


# 18. TECHNICAL FEATURES

PLENUM CHAMBER	18-1	DAMPER-LINK TYPE ENGINE MOUNT	18-3
TORQUE LINK TYPE ANTI-DIVE FRONT		IGNITION SWITCH LIGHT	18-4
SUSPENSION	18-2	CARBURETOR	18-5

## PLENUM CHAMBER

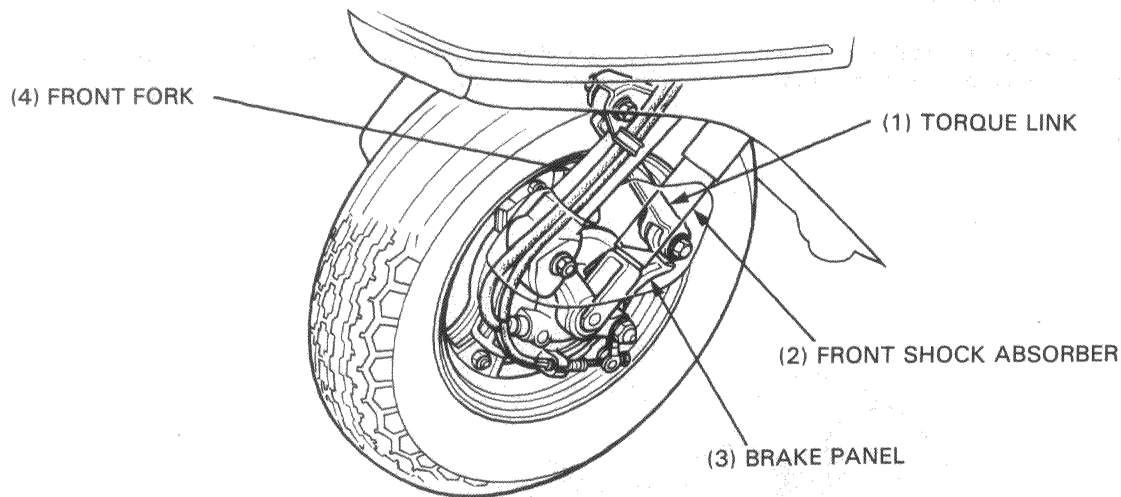
The plenum chamber is installed between the air cleaner and the carburetor to match intake pulsations with all levels of engine RPM allowing the engine to produce a smoothly power output.



## TECHNICAL FEATURES

### TORQUE LINK TYPE ANTI-DIVE FRONT SUSPENSION

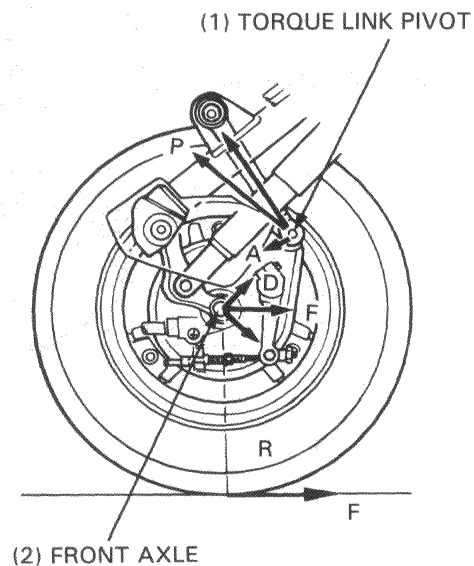
The front suspension of this scooter incorporates a hydraulic dampened, trailing link type fork, with a torque rod, anti-dive feature.



### OPERATION

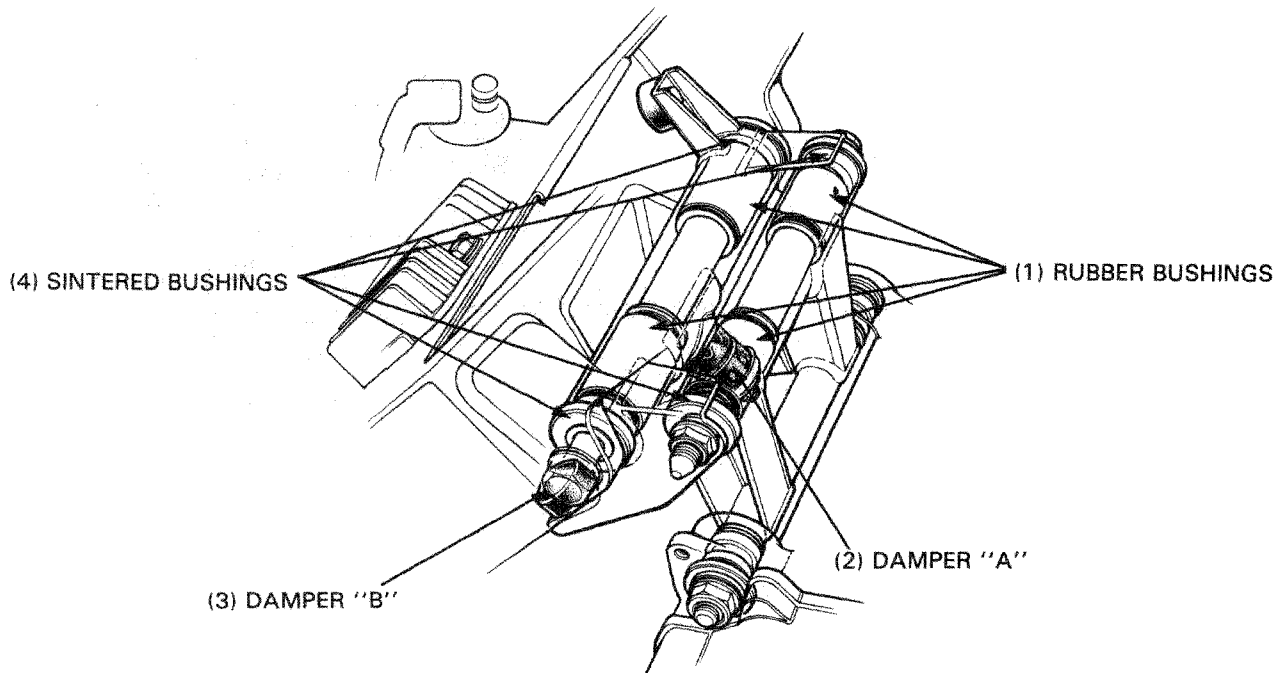
The purpose of the torque link is to cancel the "dive force" normally associated with trailing link type front suspensions. This is done by allowing the brake panel to "float" or pivot about the axle. The brake panel is then anchored to the fork tube using a torque link.

This system transfers the braking force (torque) to the fork tube which in effect, counteracts the "dive force" that would normally compress the fork shocks.



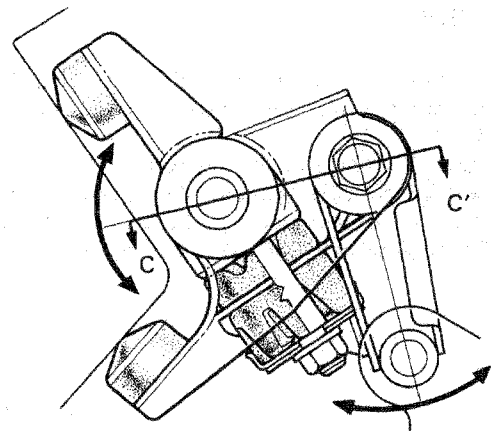
## DAMPER-LINK TYPE ENGINE MOUNT

This scooter uses a damper-link type, anti-variation engine mount system which provides the rider with a smooth, almost vibration-free ride.

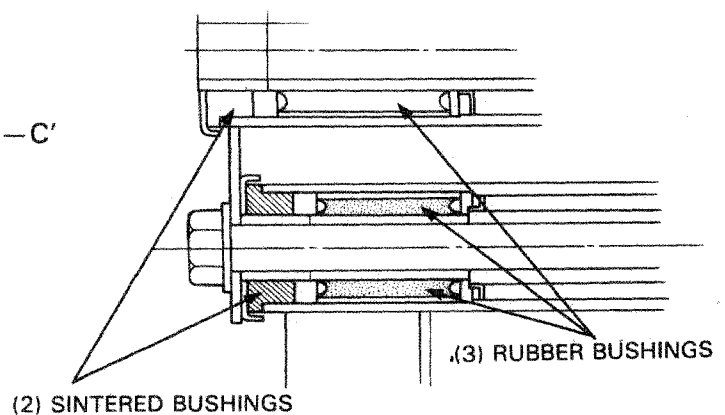


### OPERATION

This engine mounting system is designed to absorb vibrations in 3 planes; up and down, front to rear, and side to side. The up and down vibrations are absorbed by the damper "B", the front to rear, by the dampers "A", and the side to side by the internal rubber bushing and sintered bushing.



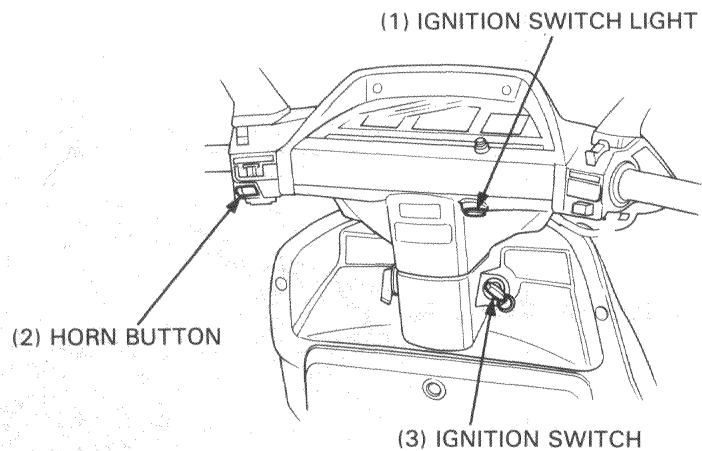
(1) SECTION C—C'



## TECHNICAL FEATURES

### IGNITION SWITCH LIGHT

This scooter is equipped with an ignition switch light. This convenience may be used at any time by simply pressing the horn button with the ignition switch in the "OFF" or "LOCK" position.

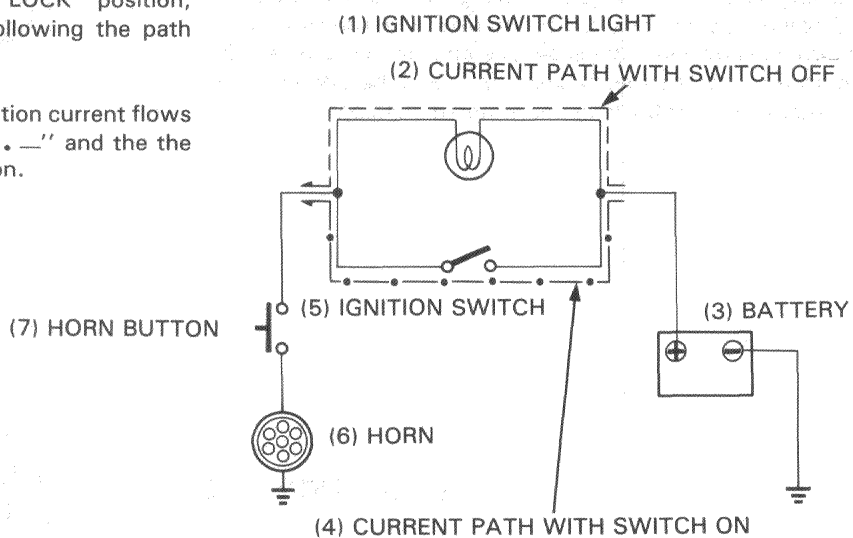


## OPERATION

With the ignition switch in the "OFF" or "LOCK" position, push the horn button; current will flow following the path defined by "-----".

This operates the light, but not the horn.

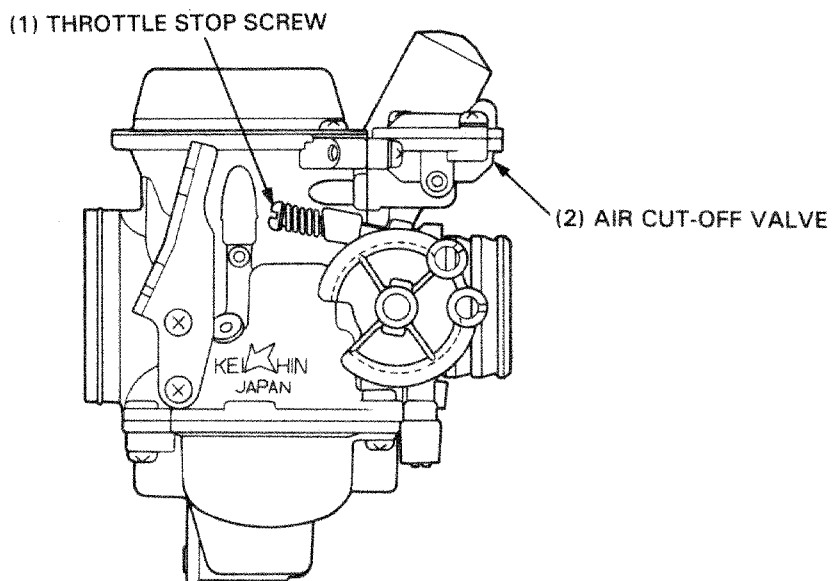
When the ignition switch is in the "ON" position current flows through the circuit defined by "—•—•—•—" and the horn will blow, but the light will not come on.



## CARBURETOR

### AIR CUT-OFF VALVE

Air cut-off valve actuates by intake manifold vacuum. When the vacuum increases, air cut-off valve shuts off auxiliary slow air passage. It allows fuel air mixture to become rich, and prevents after-burn.

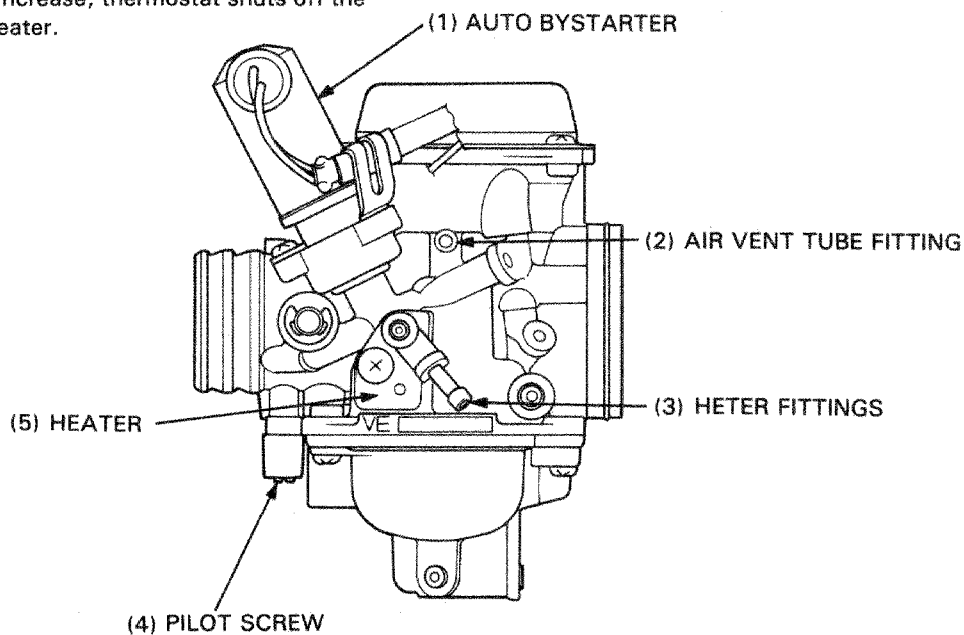


### CARBURETOR HEATER

Engine coolant flows through heater and warm up the carburetor.

This improves carburetion and prevents icing.

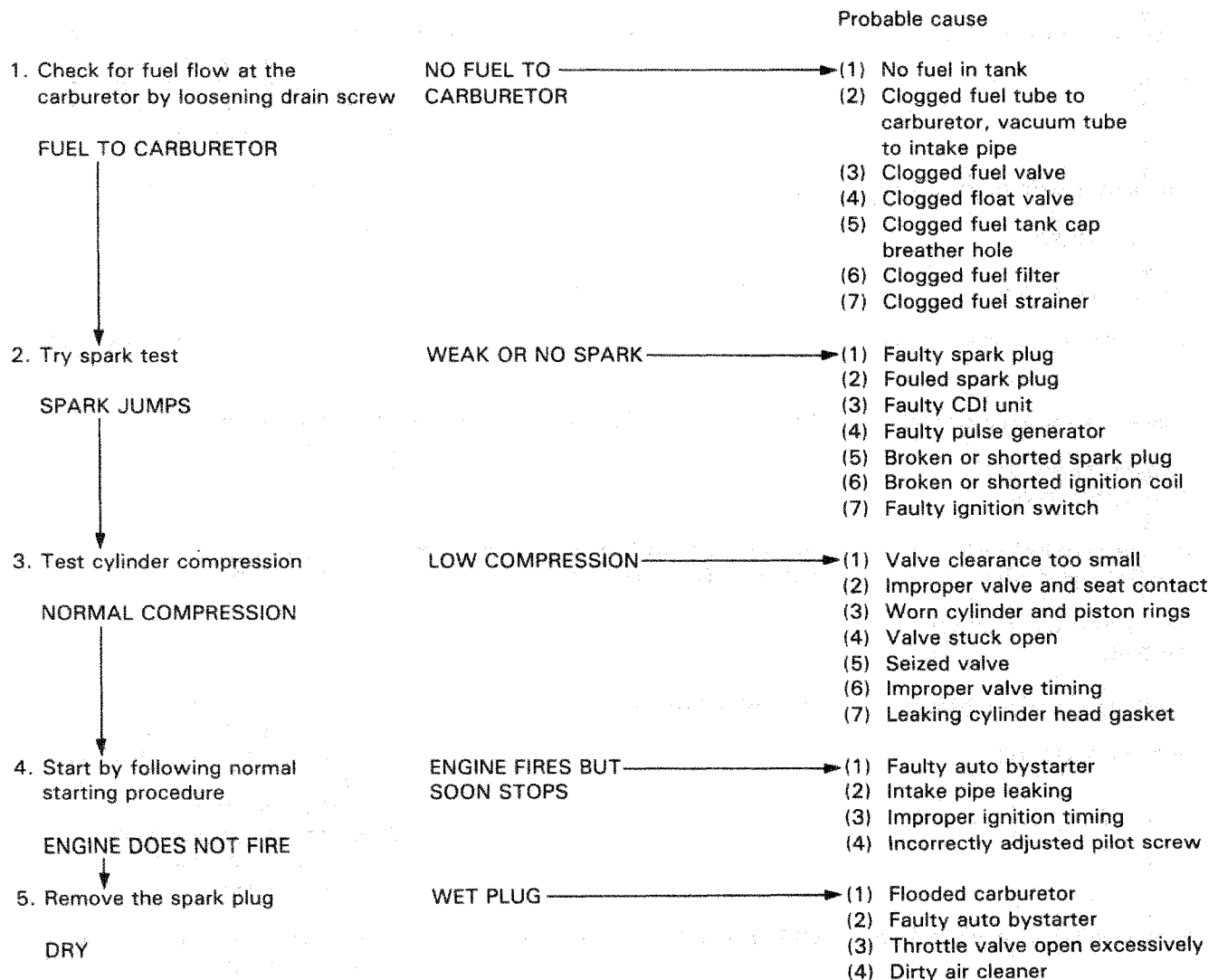
As the coolant temperature increase, thermostat shuts off the passage to the carburetor heater.



# 19. TROUBLESHOOTING

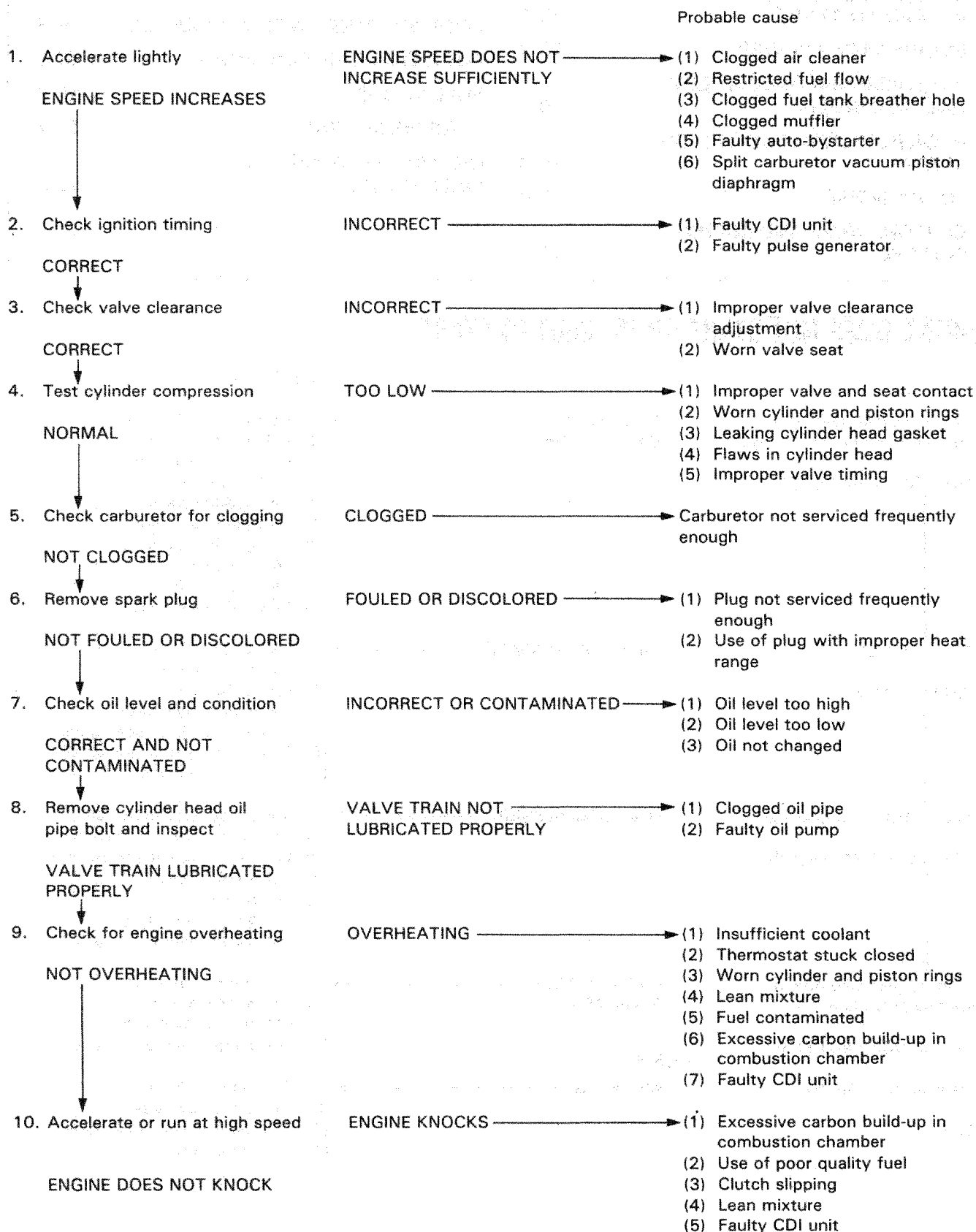
ENGINE DOES NOT START OR IS HARD TO START	19-1	HANDLING	19-5
ENGINE LACKS POWER	19-2	POOR SUSPENSION PERFORMANCE	19-5
POOR PERFORMANCE AT LOW AND IDLE SPEEDS	19-3	POOR BRAKE PERFORMANCE	19-5
POOR PERFORMANCE AT HIGH SPEED	19-3	FUEL GAUGE	19-6
ENGINE NOISE	19-4	STARTER MOTOR	19-7
CLUTCH, DRIVE AND DRIVEN PULLEYS	19-4	DIGITAL SPEEDOMETER MALFUNCTIONS	19-8

## ENGINE DOES NOT START OR IS HARD TO START





## ENGINE LACKS POWER



## POOR PERFORMANCE AT LOW AND IDLE SPEEDS

	Probable cause
1. Check ignition timing (page 3-8)	INCORRECT → (1) Faulty CDI unit (2) Faulty pulse generator
CORRECT ↓	
2. Check carburetor pilot screw adjustment	INCORRECT → (1) Fuel air mixture too rich (Turn screw in) (2) Fuel air mixture too lean (Turn screw out)
CORRECT ↓	
3. Check for leaking intake pipe	LEAKING → (1) Deteriorated O-ring (2) Loose carburetor (3) Damaged insulator rubber (4) Air leaking past intake pipe vacuum joint
NOT LEAKING ↓	
4. Perform spark test	WEAK OR INTERMITTENT SPARK → (1) Faulty, carbon or wet fouled spark plug (2) Faulty CDI unit (3) Faulty pulse generator (4) Faulty ignition coil (5) Broken or shorted spark plug wire (6) Faulty ignition switch
GOOD SPARK ↓	
5. Check the air cut-off valve (page 4-6)	INCORRECT → Faulty air cut-off valve
CORRECT	

## POOR PERFORMANCE AT HIGH SPEED

	Probable cause
1. Check ignition timing (page 3-8)	INCORRECT → (1) Faulty CDI unit (2) Faulty pulse generator
CORRECT ↓	
2. Check valve clearance	INCORRECT → (1) Improper valve clearance adjustment (2) Worn valve seat
CORRECT ↓	
3. Disconnect fuel tube at auto fuel valve	FUEL FLOW RESTRICTED → (1) No fuel in fuel tank (2) Clogged fuel tube or filter (3) Clogged fuel tank cap breather hole (4) Faulty auto fuel valve
FUEL FLOWS FREELY ↓	
4. Remove carburetor and check for clogged jet	CLOGGED → Clean
NOT CLOGGED ↓	
5. Check valve timing	INCORRECT → Cam sprocket aligning marks not aligned
CORRECT ↓	
6. Check valve spring tension	WEAK → Faulty spring
NOT WEAKENED	

### ENGINE NOISE

	Probable cause
1. Valve noise	(1) Valve clearance too large (2) Worn rocker arm and/or camshaft
2. Piston noise	(1) Worn piston and cylinder (2) Worn piston pin and connecting rod small end (3) Excessive carbon build-up in combustion chamber
3. Cam chain noise	(1) Damaged cam chain tensioner (2) Worn cam sprocket teeth (3) Worn or damaged cam chain
4. Crankshaft noise	(1) Worn main journal bearing (2) Worn crank pin bearing
5. Gear noise	(1) Worn or damaged final reduction gears (2) Worn final reduction gear shaft splines

### CLUTCH, DRIVE AND DRIVEN PULLEYS

	Probable cause
1. Engine starts, but scooter does not move	(1) Worn or slipping drive belt (2) Broken ramp plate (3) Broken drive face spring (4) Separated clutch lining (5) Damaged driven pulley shaft splines (6) Damaged transmission (7) Seized transmission
2. Scooter creeps or engine starts but soon stops	(1) Broken shoe spring (2) Clutch outer and clutch weight stuck (3) Seized pivot
3. Engine lacks power at start of a grade	(1) Worn or slipping drive belt (2) Worn weight rollers (3) Seized drive pulley bearings (4) Weak driven face spring (5) Worn or seized driven pulley bearings
4. Engine lacks power at high speed	(1) Worn or slipping drive belt (2) Worn weight rollers (3) Worn driven pulley bearings
5. There is abnormal noise or smell while running	(1) Fouled drive belt with oil or grease (2) Worn drive belt (3) Weak driven face spring (4) Worn or seized driven pulley bearings

## HANDLING

Probable cause

Check tire pressure (page 3-13)

INCORRECT → Adjust tire pressure

CORRECT

1. Steering is heavy → (1) Top cone race too tight  
(2) Damaged steering steel balls
2. Either wheel is wobbling → (1) Excessive wheel bearing play  
(2) Bent rim  
(3) Loose axle nut  
(4) Engine mount bushing excessively worn
3. Scooter pulls to one side → (1) Misaligned front and rear wheels  
(2) Bent front fork or frame

## POOR SUSPENSION PERFORMANCE

Probable cause

Check tire pressure (page 3-13)

INCORRECT → Adjust tire pressure

CORRECT

1. Suspension is too soft → (1) Weak shock spring  
(2) Excessive load  
(3) Shock absorber damper oil leaking
2. Suspension is too hard → Bent shock absorber damper rod
3. Suspension is noisy → (1) Damaged shock stopper rubber  
(2) Loose steering stem nut

## POOR BRAKE PERFORMANCE

Probable cause

Check brake free play (page 3-10)

INCORRECT → Adjust brake

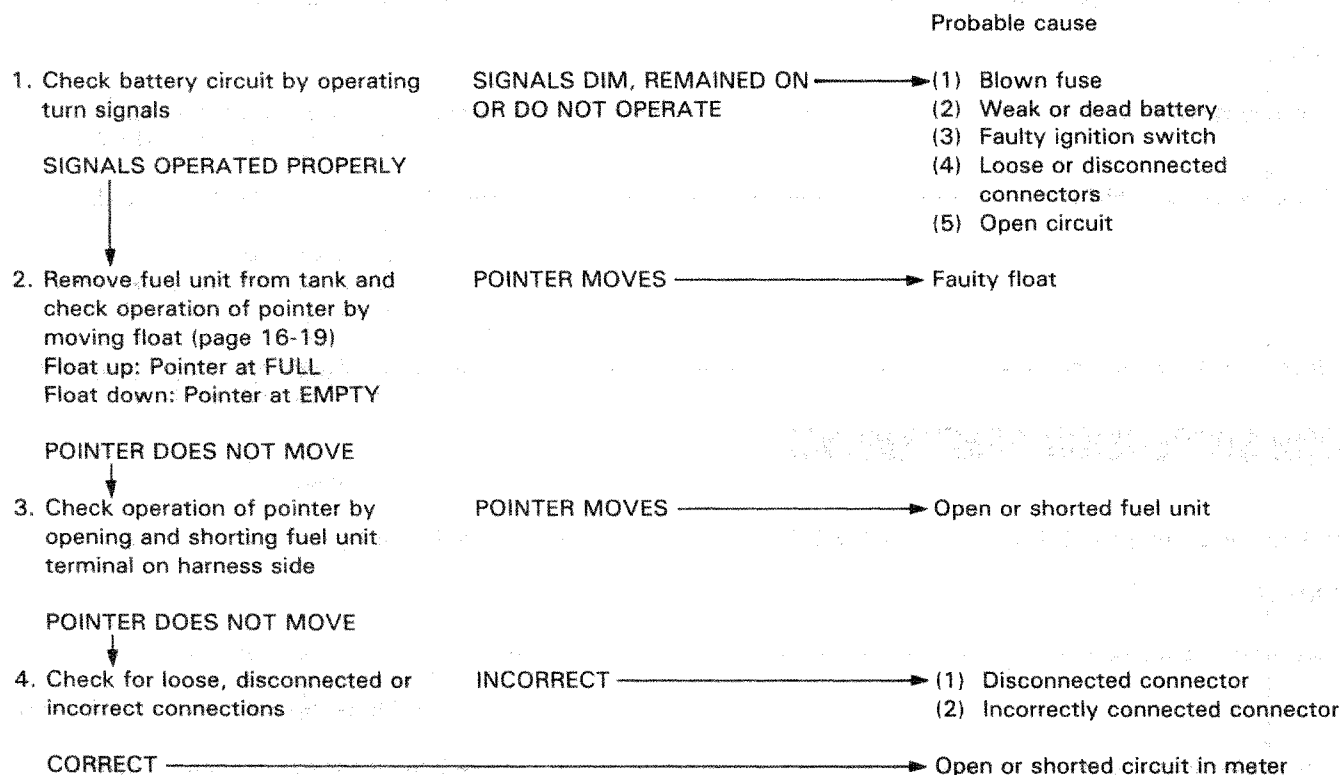
CORRECT

1. Wear indicator arrow aligns with index mark on brake panel → (1) Worn brake linings  
(2) Worn brake cam  
(3) Worn brake cam contacting area of brake shoes  
(4) Worn brake drum
2. Brake squeaks → (1) Worn brake linings  
(2) Foreign matter on brake linings  
(3) Rough shoe contacting face of brake drum
3. Brake performance is poor → (1) Faulty or elongated brake cables  
(2) Brake shoes improperly contact brake drum  
(3) Mud or water in brake drum  
(4) Brake linings fouled with grease or oil

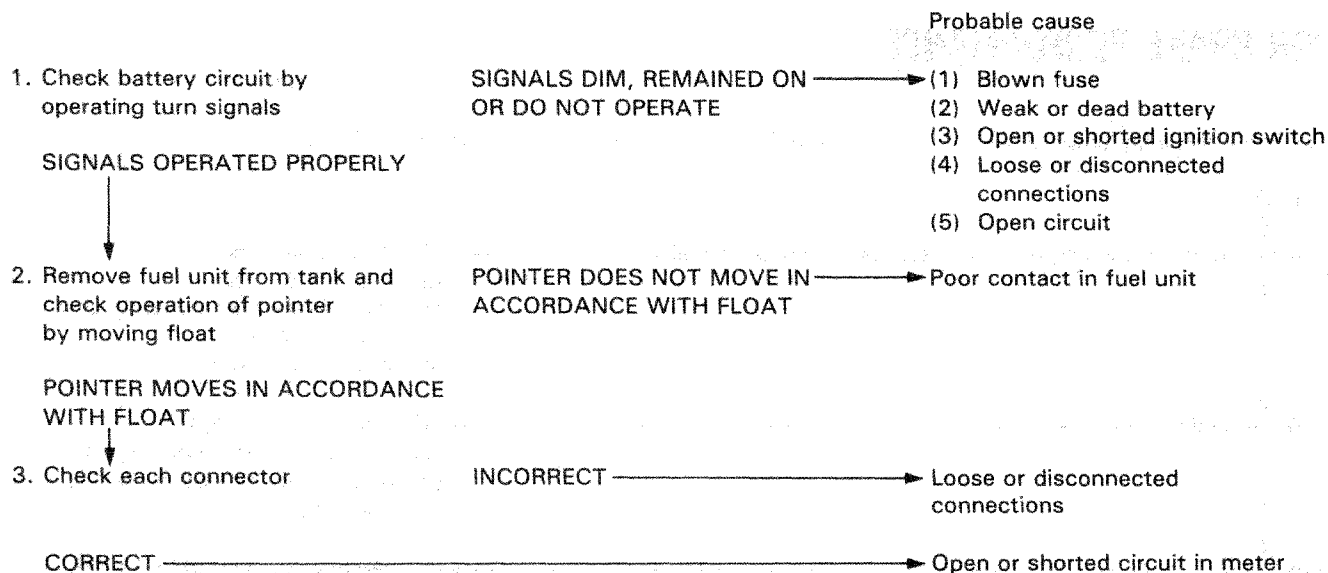
## TROUBLESHOOTING

### FUEL GAUGE

#### POINTER DOES NOT REGISTER CORRECTLY (IGNITION SWITCH ON)

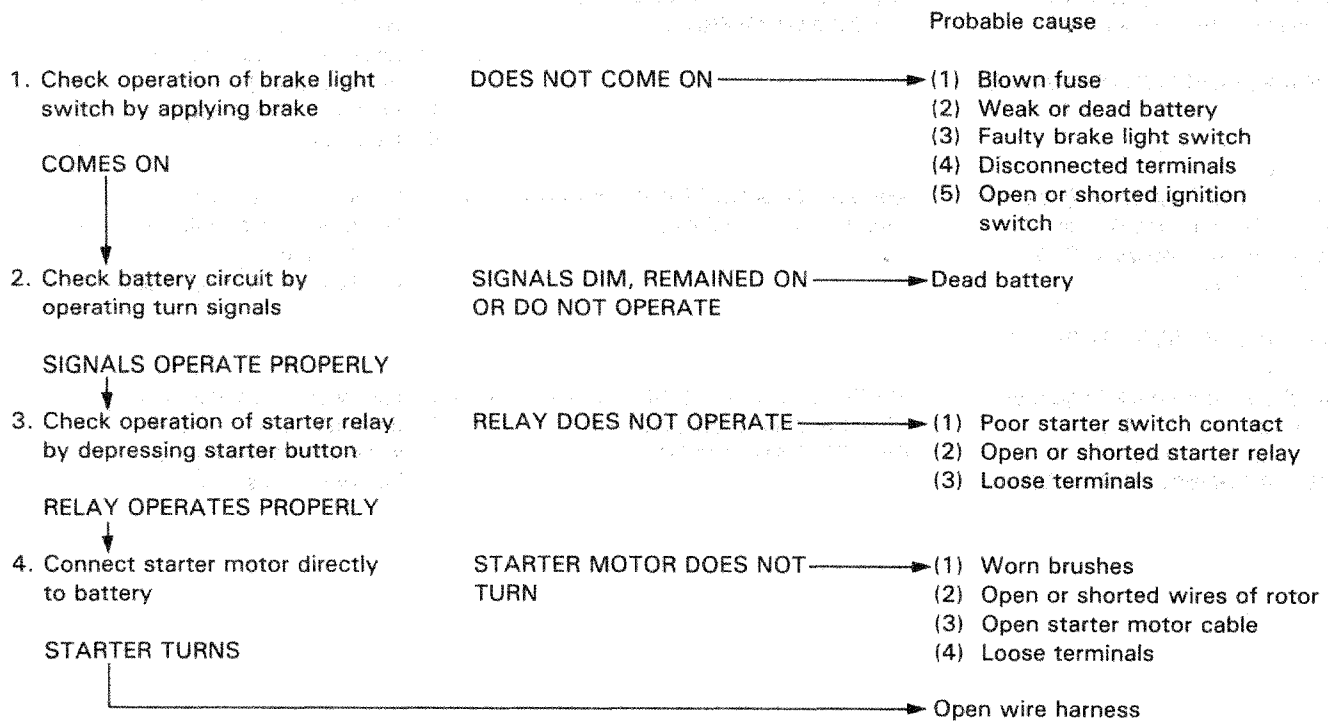


#### POINTER FLUCTUATES OR SWINGS (IGNITION SWITCH ON)

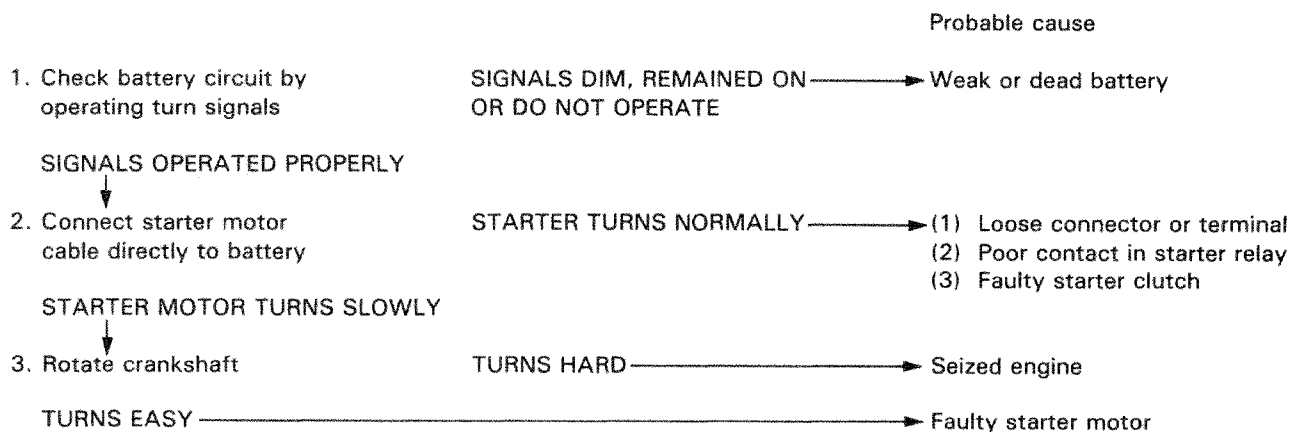


## STARTER MOTOR

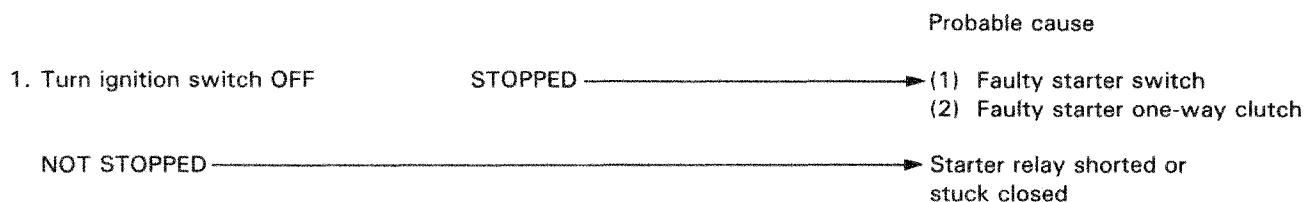
### STARTER MOTOR WILL NOT TURN



### STARTER MOTOR TURNS SLOWLY



### STARTER MOTOR WON'T STOP TURNING



### DIGITAL SPEEDOMETER MALFUNCTION

1. Check the battery circuit by operating the turn signals

SIGNALS OPERATED PROPERLY



2. Turn ignition switch OFF then turn it ON and check that speedometer shows 100, 111, 122,.....199.

METER DISPLAYS PROPERLY



3. Read test and check indication of meter

METER SHOWS PROPER SPEED

SIGNALS DIM, REMAIND ON  
OR DO NOT OPERATE

Probable cause

- (1) Weak or dead battery
- (2) Blown fuse
- (3) Loose or disconnected connections
- (4) Faulty ignition switch
- (5) Open circuit

METER DOES NOT DISPLAY  
PROPERLY OR AT ALL

- (1) Disconnected meter
- (2) Open or shorted wire harness
- (3) Faulty meter unit
- (4) Faulty liquid crystal display

METER DOES NOT DISPLAY  
PROPER SPEED OR DOES NOT  
REGISTER ANY SPEED

- (1) Faulty speedometer gear
- (2) Broken or disconnected speedometer cable
- (3) Faulty speed sensor



# 20. INDEX

Air Cleaner Case .....	3-5, 4-8	Float Level Inspection .....	4-10
Air Cut-off valve .....	4-7	Float/Float Level/Jets .....	4-9
Alternator/Starter Clutch .....	10-1	Floor Panel, Side Rail, Floor Lower Cover .....	13-3
Battery .....	16-3	Flywheel Installation .....	10-6
Auto Bystarter .....	4-4	Removal .....	10-3
Automatic Fuel Valve .....	4-14	Frame Covers .....	13-1
Belt Case Air Cleaner .....	3-10	Front Brake .....	14-9
Body Center Cover .....	13-2	Front Fork/Steering .....	14-16
Brake Light Switch/Starter Limiter Switch .....	3-12	Lower Cover .....	13-6
Lock Lever .....	3-12	Suspension .....	14-12
Shoe Wear .....	3-11	Upper Cover .....	13-5
System .....	3-11	Wheel .....	14-6
Cable & Harness Routing .....	1-8	Fuel System .....	4-1
Camshaft Installation .....	6-13	Filter ('85 only) .....	3-4
Removal .....	6-4	Lines .....	3-4
Carburetor .....	18-5	Tank .....	4-15
Idle Speed .....	3-8	Unit/Gauge .....	16-19
Installation .....	4-11	General Information .....	1-1
Removal .....	4-3	Safety .....	1-1
Charging System .....	16-4	Handlebar .....	14-3
Clutch Shoe Wear .....	3-13	Switch .....	16-18
Clutch/Driven Pulley .....	8-9	Headlight .....	16-15
Coolant Replacement .....	12-2	Adjustment .....	3-13
Cooling System .....	12-1	High Altitude Adjustment .....	4-13
Hoses and Connections .....	3-8	Horn .....	16-19
Crankcase/Crankshaft .....	11-1	Ignition Switch .....	16-17
Assembly .....	11-4	Light .....	18-4
Breather .....	3-6	System .....	16-6
Separation .....	11-2	Timing .....	3-9
Crankshaft Inspection .....	11-3	Inner Box .....	13-4
Cylinder Compression .....	3-9	Instruments .....	16-12
Head/Valves .....	6-1	Left Crankcase Cover .....	8-3
Assembly .....	6-11	Limited Cap Installation .....	4-12
Cover Assembly .....	6-14	Lubrication .....	2-1
Cover Disassembly .....	6-3	Points .....	2-7
Cover Installation .....	6-14	Maintenance .....	3-1
Cover Removal .....	6-3	Schedules .....	3-2
Disassembly .....	6-6	Model Identification .....	1-2
Installation .....	6-12	Nuts, Bolts, Fasteners .....	3-14
Removal .....	6-5	Oil Pump Assembly .....	2-4
Cylinder/Piston .....	7-1	Disassembly .....	2-3
Installation .....	7-7	Inspection .....	2-4
Removal .....	7-2	Installation .....	2-5
Damper-Link Type Engine Mount .....	18-3	Removal .....	2-3
Drive Pulley/Clutch/Driven Pulley .....	8-1	Pilot Screw .....	4-8
Drive Belt .....	3-10, 8-4	Adjustment .....	4-12
Pulley .....	8-5	Piston Installation .....	7-6
Electrical Equipment .....	16-1	Removal .....	7-3
Emission Control Information Label .....	1-17	Plenum Chamber .....	18-1
Systems .....	1-15	Purge Control Valve Inspection (California Model) .....	4-19
Engine Removal/Installation .....	5-1	Radiator .....	12-3
Installation .....	5-5	Coolant .....	3-8
Oil .....	2-2	Core .....	3-8
Oil Filter Screen Cleaning .....	2-2	Rear Brake .....	15-5
Removal .....	5-2	Light Switch .....	16-19
Evaporative Emission Control System (California Model Only) .....	3-10	Pedal/Brake Lock System .....	15-7
Exhaust Muffler .....	15-2	Carrier .....	13-6
Final Reduction .....	9-1	Cover .....	13-2
Assembly .....	9-4	Shock Absorber .....	15-8
Disassembly .....	9-2	Wheel .....	15-2
Inspection .....	9-2	Wheel/Brake/Suspension .....	15-5

## INDEX

Right Crankcase Cover Installation .....	10-7
Removal .....	10-2
Service Information .....	
Alternator/Starter Clutch .....	10-1
Cooling System .....	12-1
Crankcase/Crankshaft .....	11-1
Cylinder Head/Valves .....	6-1
Cylinder/Piston .....	7-1
Drive Pulley/Clutch/Driven Pulley .....	8-1
Electrical Equipment .....	16-1
Engine Removal/Installation .....	5-1
Final Reduction .....	9-1
Frame Covers .....	13-1
Fuel System .....	4-1
Lubrication .....	2-1
Maintenance .....	3-1
Rear Wheel/Brake/Suspension .....	15-5
Steering/Front Wheel/Brake/Suspension .....	14-1
Technical Features .....	18-1
Wiring Diagram .....	17-1
Service Rules .....	1-1
Side Stand .....	3-13
Spark Plug .....	3-6
Specifications .....	1-3
Starter Clutch .....	10-3
System .....	16-8
Stator Installation .....	10-7
Removal .....	10-2
Steering Head Bearings .....	3-15
Steering/Front Wheel/Brake/Suspension .....	14-1
Suspension .....	3-14
System Testing .....	12-2
Taillight/Licence Plate Light .....	16-16
Technical Features .....	18-1
Temperature Gauge .....	16-21
Thermosensor .....	12-10, 16-20
Thermostat .....	12-10
Thermostatic Switch .....	16-20
Throttle Operation .....	3-4
Tools .....	1-6
Torque Link Type Anti-Dive Front Suspension .....	18-2
Torque Values .....	1-5
Transmission Oil .....	2-6
Troubleshooting .....	
Cooling System .....	12-1
Crankcase/Crankshaft .....	11-1
Cylinder Head/Valves .....	6-1
Cylinder/Piston .....	7-1
Drive Pulley/Clutch/Driven Pulley .....	8-2
Electrical Equipment .....	16-2
Final Reduction .....	9-1
Fuel System .....	4-2
Lubrication .....	2-1
Rear Wheel/Brake/Suspension .....	15-1
Steering/Front Wheel/Brake/Suspension .....	14-2
Wheels/Tires .....	3-14
Wiring Diagrams .....	17-1