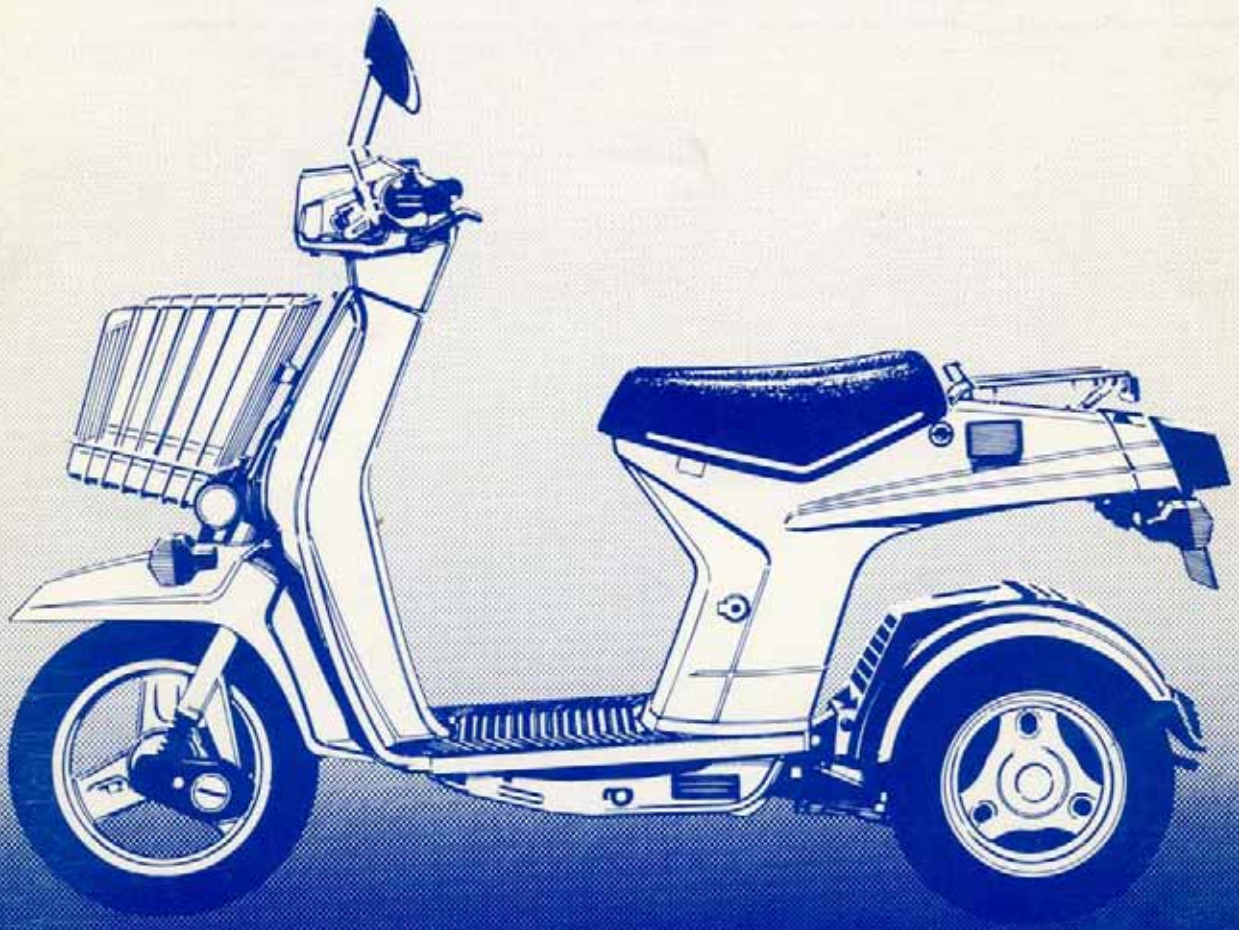
Official

HONDA

SHOP MANUAL

NN50MD GYRO



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IMPORTANT SAFETY NOTICE

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

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

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

HOW TO USE THIS MANUAL

Follow the Maintenance Schedule recommendations to ensure that the vehicle is in peak operating condition and the emission levels are within the standards set by the U.S. Environmental Protection Agency. 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 motor scooter, while sections 4 through 16 describe parts of the motor 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 motor scooter, read Technical Features in section 17.

If you don't know what the source of the trouble is, refer to section 18 Troubleshooting.

HONDA MOTOR CO., LTD.
Service Publications Office

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1. GENERAL INFORMATION

GENERAL SAFETY

WARNING

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

WARNING

Gasoline is 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 scooter.
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 in 2–3 steps, unless a particular sequence is specified.
6. Clean parts in non-flammable or high flash point 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 1-7, Cable and Harness Routing and always away from sharp edges and areas where they might be pinched between moving parts.

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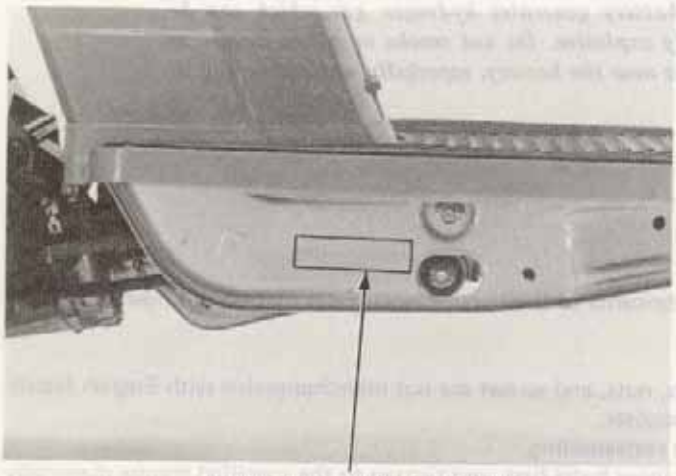
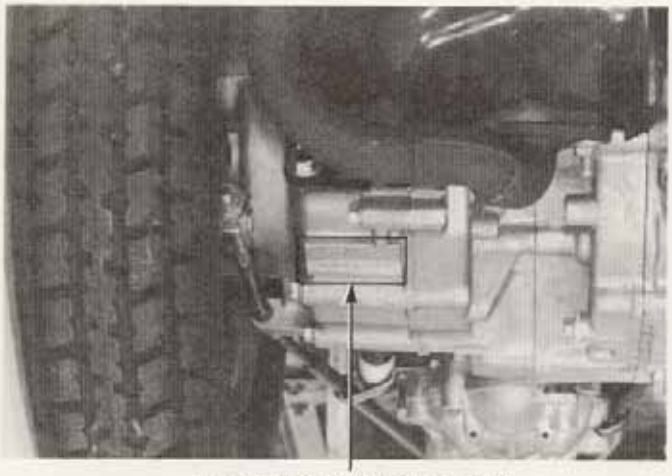
MODEL IDENTIFICATION

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



FRAME SERIAL NUMBER

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



ENGINE SERIAL NUMBER

The vehicle identification number is on the frame tube in front of the right front cover.

VEHICLE IDENTIFICATION NUMBER

The carburetor identification number is on the carburetor body.

CARBURETOR IDENTIFICATION NUMBER

The color code label is attached to the fuel tank under the seat. When ordering a color coded part, always specify its designated color.

COLOR CODE LABEL

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SPECIFICATIONS

ITEM		SPECIFICATION
DIMENSIONS	Overall length	1540 mm (60.6 in)
	Overall width	620 mm (24.4 in)
	Overall height	955 mm (37.6 in)
	Wheel base	1080 mm (42.5 in)
	Ground clearance	95 mm (3.7 in)
	Dry weight	58 kg (127.9 lb)
FRAME	Type	Back bone
	Front suspension, travel	Bottom link, 55 mm (2.16 in)
	Rear suspension, travel	Unit Swing, 60 mm (2.36 in)
	Vehicle capacity load	82 kg (180 lb)
	Front tire size, pressure	2.75-10-2PR, 125 kPa (1.25 kg/cm^2, 18 psi)
	Rear tire size, pressure	3.00-8-2PR, 100 kPa (1.00 kg/cm^2, 14 psi)
	Front brake	Internal expanding shoe
	Rear brake	Internal expanding shoe
	Fuel capacity	3.2 ℓ (0.85 U.S. gal., 0.71 imp. gal.)
	Caster angle	24°
	Trial	55 mm (2.2 in)
	Front fork grease	5 g (0.18 ozs)
ENGINE	Type	Air cooled 2-stroke
	Cylinder arrangement	Single cylinder
	Bore and stroke	41.0 x 37.4 mm (1.614 x 1.472 in)
	Displacement	49 cm^3 (3.0 cu. in)
	Compression ratio	7.2 : 1
	Transmission oil capacity	150 cc (5.0 U.S. oz, 4.2 Imp. oz)
	Oil tank capacity	1.3 lit. (1.4 U.S. qt, 1.02 Imp. qt)
	Lubrication system	Lubricated by mixing with fuel and oil
	Port timing	
	Intake Open	Reed valve controlled
	Close	Reed valve controlled
	Exhaust Open	72° (BBDC)
	Close	72° (ABDC)
	Scavenge Open	57° (BBDC)
	Close	57° (ABDC)
	Engine dry weight	12.0 kg (26.5 lb)
	Idle speed	1,800 ± 150 rpm
CARBURETION	Carburetor type	Piston valve
	Identification number	PA 27C
	Air screw initial setting	2 turn out
	Float level	12.2 mm (0.48 in)

ITEM		SPECIFICATIONS	
DRIVE TRAIN	Clutch type	Automatic centrifugal clutch	
	Primary reduction	2.636	
	Gear ratio	1st: 1.552, 2nd: 1.000	
	Final reduction	3.928	
ELECTRICAL	Ignition	Condenser capacitive discharge ignition (CDI)	
	Starting system	Starting motor	
	Generator	Alternator 12V 90W/5,000 rpm	
	Spark plug	NGK	ND
	Standard	BPR6HS	W20FPR
	For cold climate	BPR4HS	W14FPR–L
	For extended high speed riding	BPR8HS	W24FPR
	Spark plug gap	0.6–0.7 mm (0.024–0.028 in)	
	Ignition timing "F" mark	15° BTDC	
	Battery capacity	12V4AH	
	Fuse capacity	7A	
LIGHTS	Headlight Low/High	12V-25/25W	
	Tail/stoplight	12V–8/27W	3/32 cp
	Turn signal Front/Rear	12V–23W	32 cp
	Speedometer light	12V–3W	
	High beam indicator	12V–1.7 W	
	Turn signal indicator	12V–3.4 W	

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TORQUE VALUES

ENGINE

Item	Q'ty	Thread Dia (mm)	Torque N·m (kg-m, ft-lb)	Remarks
Cylinder head	4	6	8–12 (0.8–1.2, 6–9)	While the engine is cold. (Below 35°C, 95°F)
Flywheel	1	10	35–40 (3.5–4.0, 25–29)	
Crank case	5	6	8–12 (0.8–1.2, 6–9)	
Intake pipe	4	6	8–12 (0.8–1.2, 6–9)	While the engine is cold. (Below 35°C, 95°F)
Clutch outer	1	17	38–42 (3.8–4.2, 27–31)	
Carburetor	2	6	9–12 (0.9–1.2, 7–9)	While the engine is cold. (Below 35°C, 95°F)

CHASSIS

Item	Q'ty	Thread Dia (mm)	Torque N·m (kg-m, ft-lb)	Remarks
Steering handle set bolt	1	10	40–50 (4.0–5.0, 29–36)	
Steering stem lock nut	1	25.4	60–80 (6.0–8.0, 43–58)	
Front axle nut	1	10	40–50 (4.0–5.0, 29–36)	
Engine–Joint case	2	8	24–30 (2.4–3.0, 17–22)	
Rear axle nut	1	12	50–70 (5.0–7.0, 36–51)	
Rear shock absorber	2	10	30–45 (3.0–4.5, 22–32)	
Rear shock absorber damper lock nut	1	10	30–45 (3.0–4.5, 22–32)	
Front/Rear brake arm	2	5	4–7 (0.4–0.7, 3–5)	
Swing lock arm A	1	5	4–7 (0.4–0.7, 3–5)	
Joint shaft	1	12	55–65 (5.5–6.5, 40–47)	
Joint shaft pivot nut	2	10	40–50 (4.0–5.0, 29–36)	
Joint case	2	8	24–30 (2.4–3.0, 17–22)	
	4	6	10–14 (1.0–1.4, 7–10)	

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

STANDARD TORQUE VALUES

Item	Torque N·m (kg-m, ft-lb)	Item	Torque N·m (kg-m, ft-lb)
5 mm bolt and nut	4.5–6 (0.45–0.6, 3–4)	5 mm screw	3–5 (0.3–0.5, 3–4)
6 mm bolt and nut	8–12 (0.8–1.2, 6–9)	6 mm screw	7–11 (0.7–1.1, 5–8)
8 mm bolt and nut	18–25 (1.8–2.5, 13–18)	6 mm flange bolt and nut	10–14 (1.0–1.4, 7–10)
10 mm bolt and nut	30–40 (3.0–4.0, 22–29)	8 mm flange bolt and nut	20–30 (2.0–3.0, 14–22)
12 mm bolt and nut	50–60 (5.0–6.0, 36–43)	10 mm flange bolt and nut	30–40 (3.0–4.0, 22–29)

TOOLS

SPECIAL

Remarks * . Newly plovided tools.

Description	Tool Number	Alternate Tool	Tool Number	Ref. page
Rear shock absorber compressor attachment	07967-GA70001			13–2, 13–4
Rear shock absorber compressor	07959-3290001			13–2, 13–4
Bearing remover set, 12 mm	07936-1660001	· Bearing remover shaft	07936-1660100	8–8
		· Remover weight	07741-0010201	8–8
			07936-3710200	8–8
Attachment, 28 x 30 mm	07946-1870100	Not available in USA — use:		11–14
		· Pilot, 30 mm	07746-0040700	11–14
		· Driver	07749-0010000	11–14
* Case puller	07935-GJ50000	Case puller	07937-4300000	9–2
* Steering lock nut wrench	07916-GK00000			11–22, 11–25
Bearing remover	07936-KC10500	– USA only		8–6
Fork seal driver	07947-1180001			11–24
Spring attachment	07967-1180100			13–2, 13–4
Snap ring pliers	07914-3230001			11–19, 11–20
Ball race remover	07946-GA70000	Not available in USA		11–23
Hand vacuum pump	A937X-041-XXXXX		ST-AH-260-MC7 (USA only)	4–4
Digital multimeter	KS-AHM-32-003 (USA only)			15–7

COMMON

Description	Tool Number	Alternate Tool	Tool Number	Ref. page
Float level gauge	07401-0010000			4–7
Universal holder	07725-0030000			7–4, 7–5
Clutch holder	07724-0050000	Equivalent tool commercially availabe in USA		8–9, 8–14
Attachment, 24 x 26 mm	07746-0010700	Not available in USA		7–6
Attachment, 32 x 35 mm	07746-0010100			8–14
Attachment, 37 x 40 mm	07746-0010200			9–5
Attachment, 42 x 47 mm	07746-0010300			9–5, 11–23
Pilot, 10 mm	07746-0040100			7–6, 11–14
Pilot, 15 mm	07746-0040300			7–6, 8–14
Pilot, 17 mm	07746-0040400			9–5
Pilot, 20 mm	07746-0040500			9–5, 11–23
Driver	07749-0010000			7–6, 8–14
Driver	07746-0020100			9–5, 7–6
Flywheel puller	07733-0010000	Flywheel puller	07933-0010000	7–4
Clutch holder	07724-0050000	Equivalent tool com mercially available in U.S.A.		
Bearing remover expander	07746-0050100			11–13
Bearing remover coller, 10 mm	07746-0050200			
Pilot, 25 mm	07746-0040600			7–6

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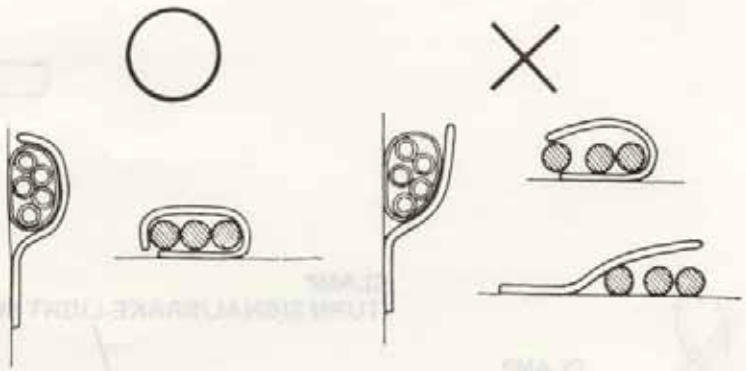
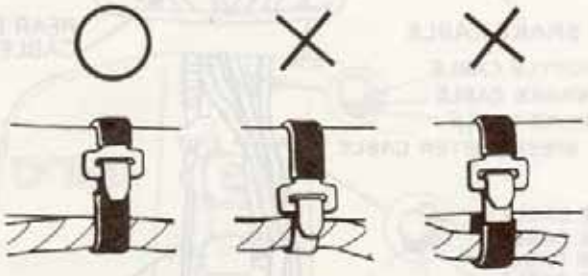
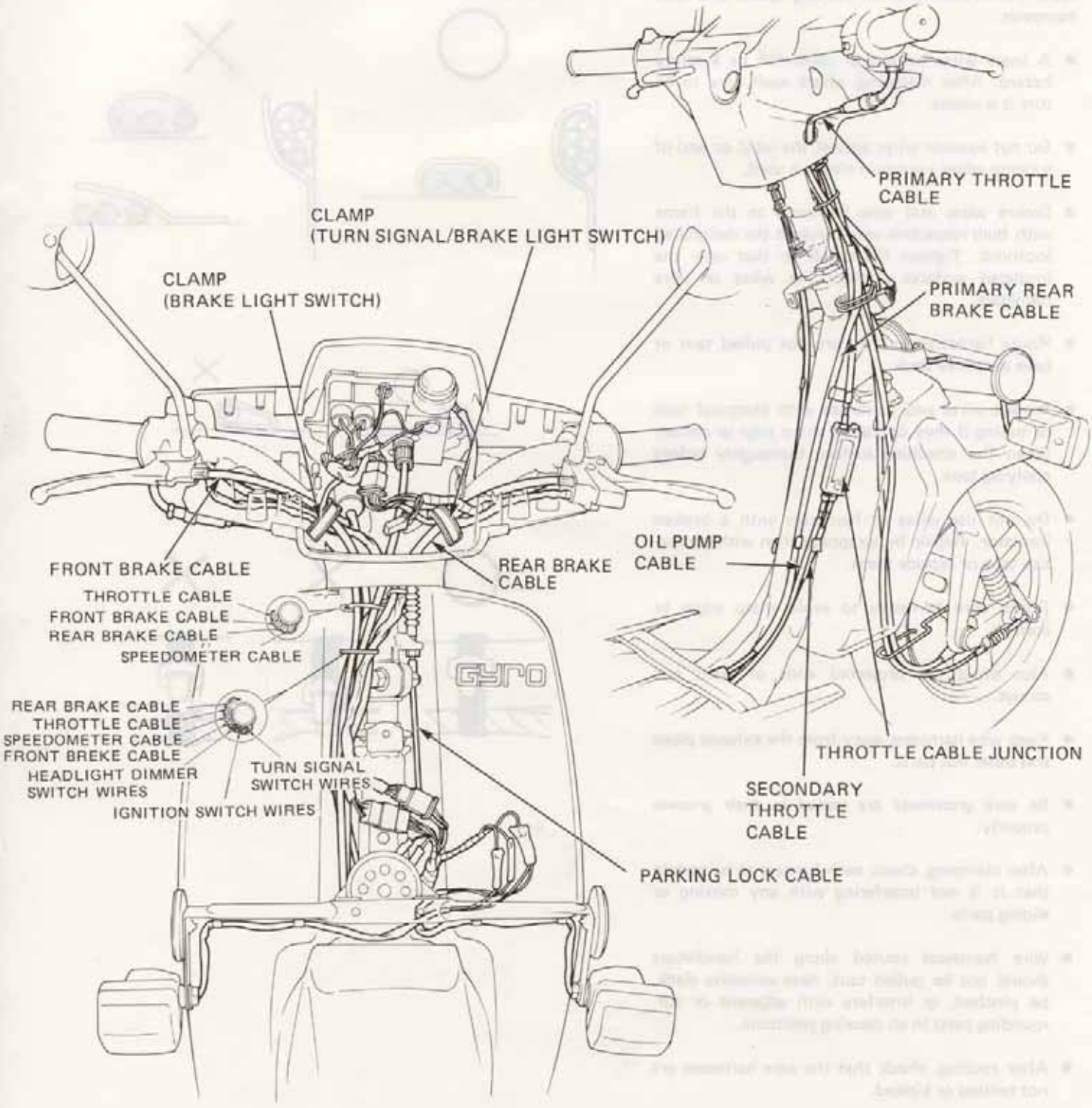
CABLE & HARNESS ROUTING

Note the following when routing cables and wire harnesses:

- A loose wire, harness or cable can be a safety hazard. After clamping, check each wire to be sure it is secure.
- Do not squeeze wires against the weld or end of a clamp when a weld-on clamp is used.
- 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.
- Protect wires and harnesses with electrical tape or tubing if they contact a sharp edge or corner. Clean the attaching surface thoroughly before applying tape.
- Do not use wires or harnesses with a broken insulator. Repair by wrapping then with protective tape or replace them.
- Route wire harnesses to avoid sharp edges or corners.
- Also avoid the projected ends of bolts and screws.
- Keep wire harnesses away from the exhaust pipes and other hot parts.
- Be sure grommets are seated in their grooves properly.
- After clamping, check each harness to be certain that it is not interfering with any moving or sliding parts.
- 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.







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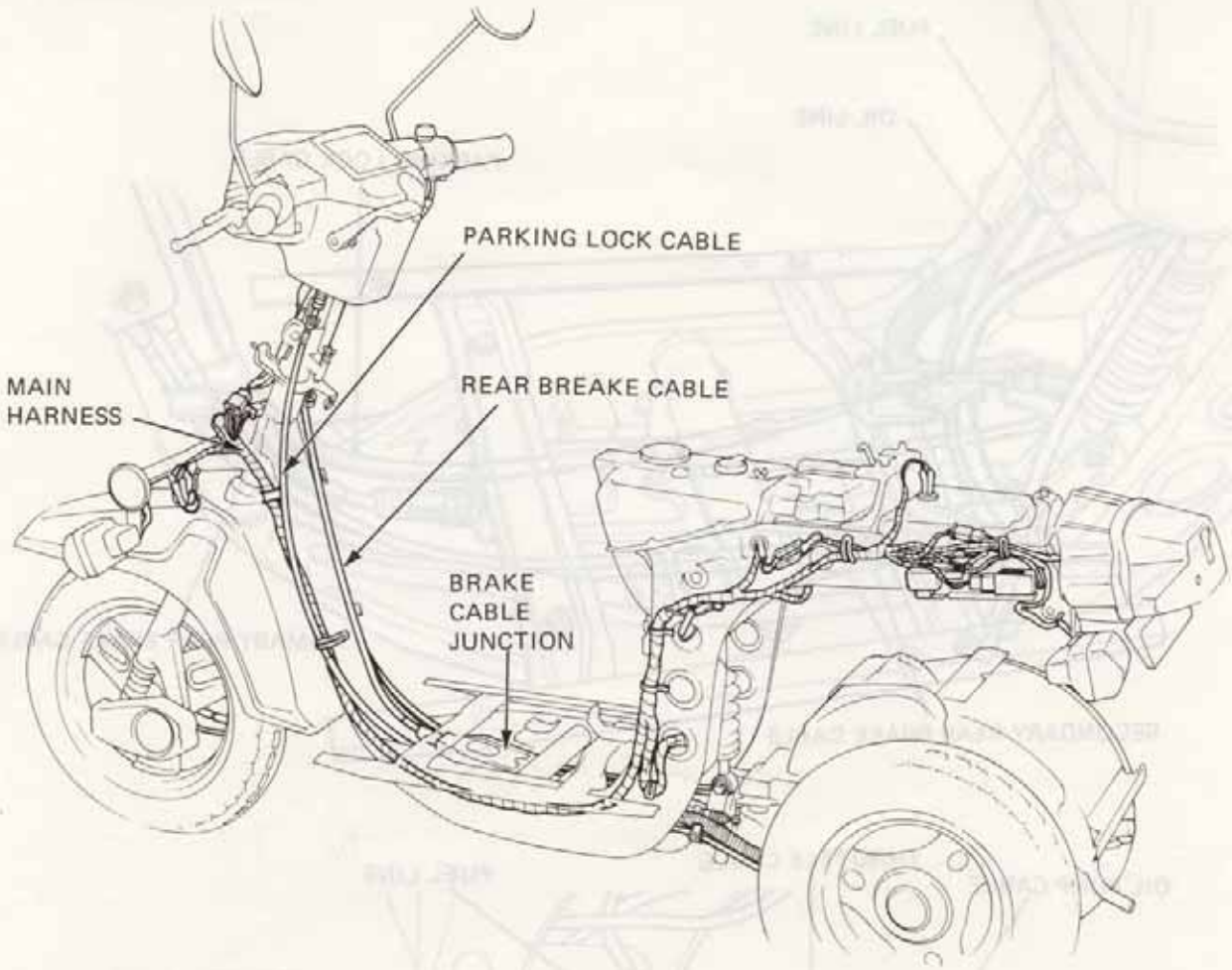

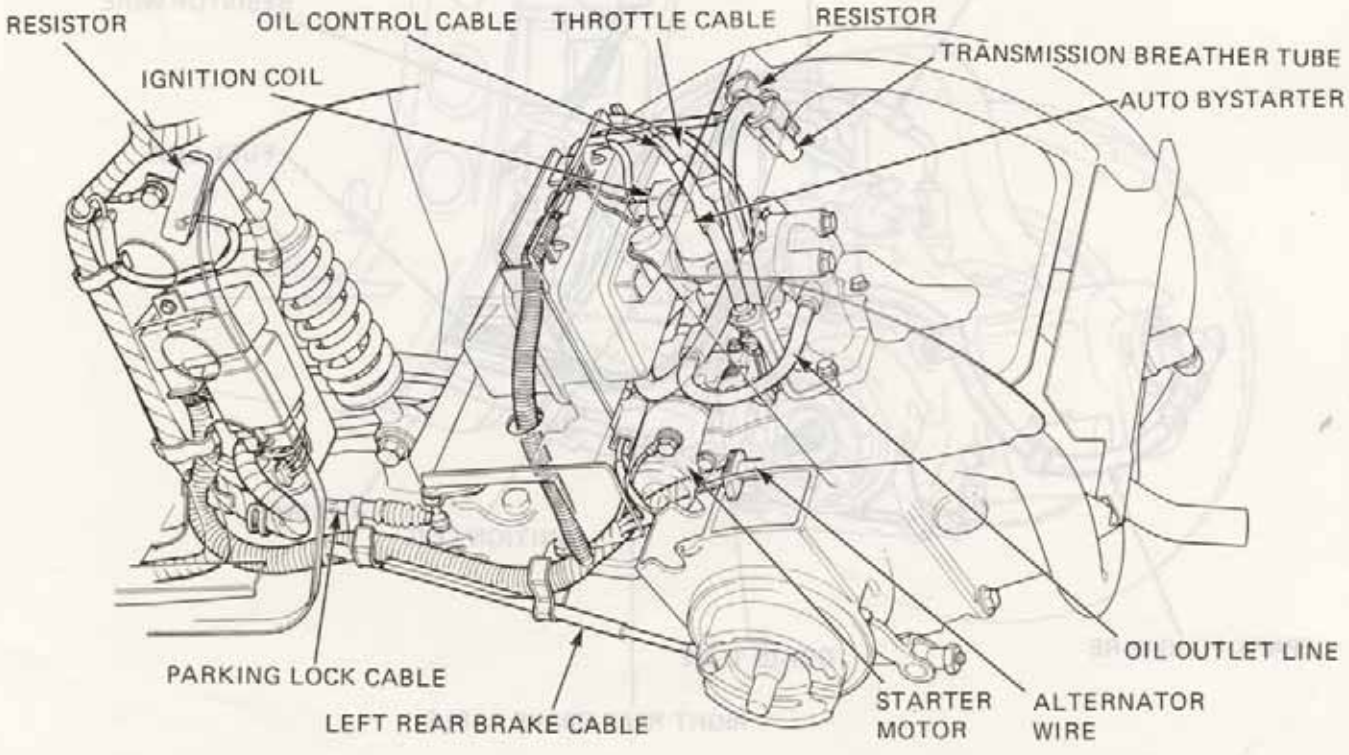

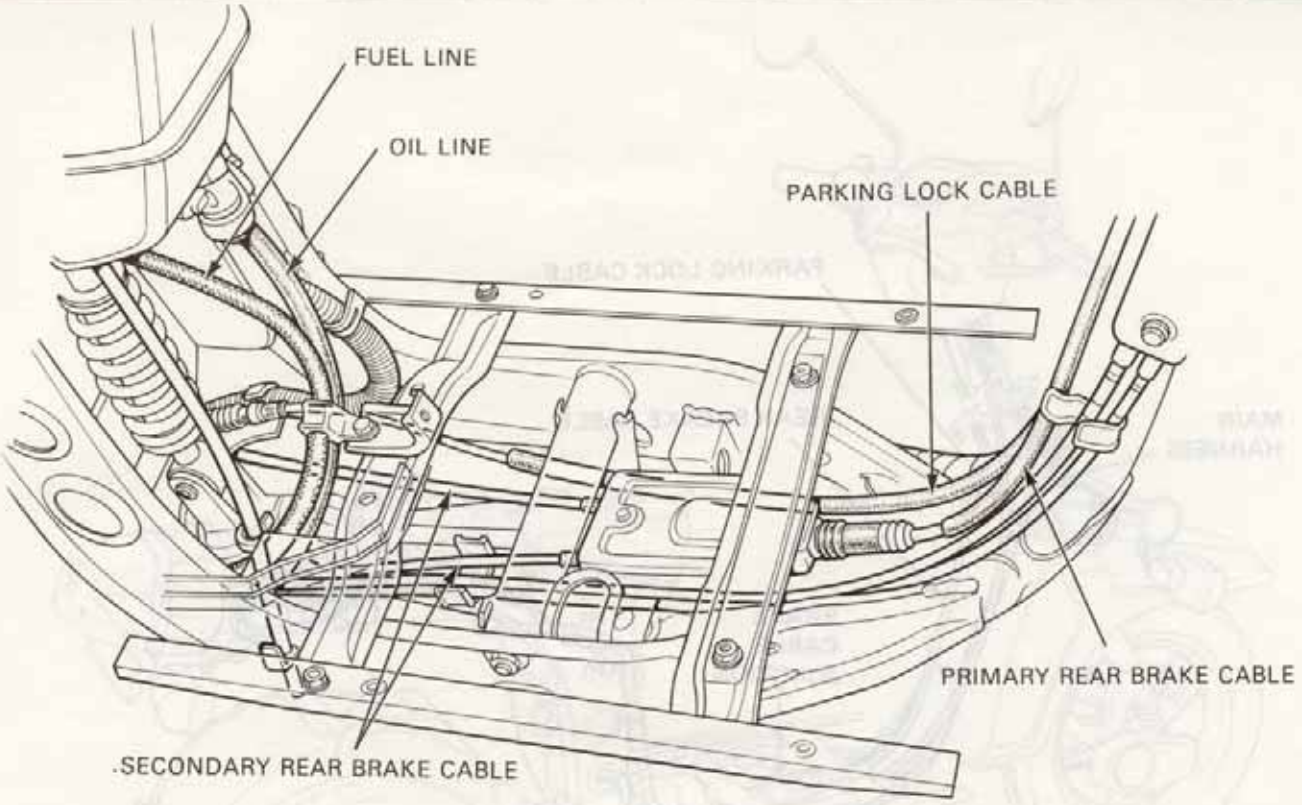

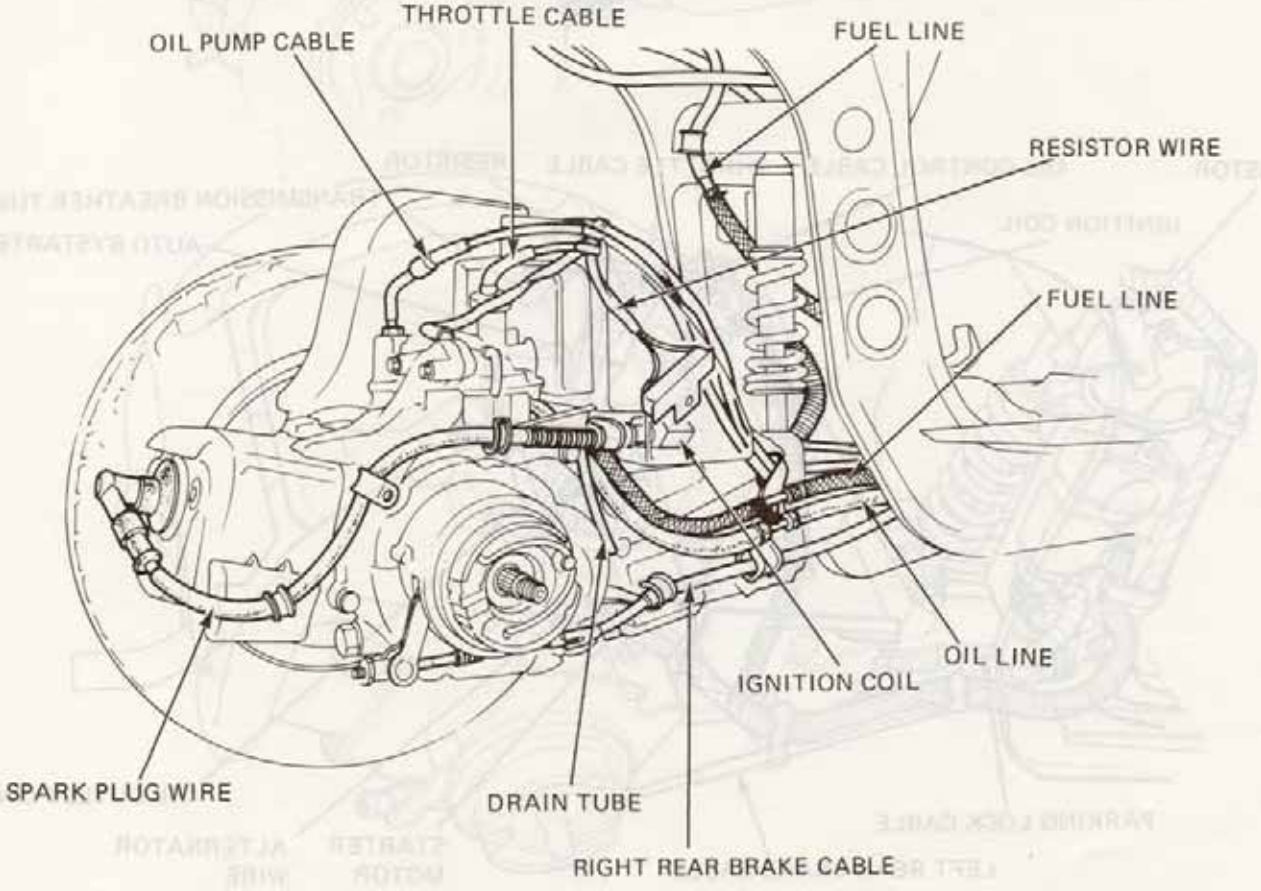

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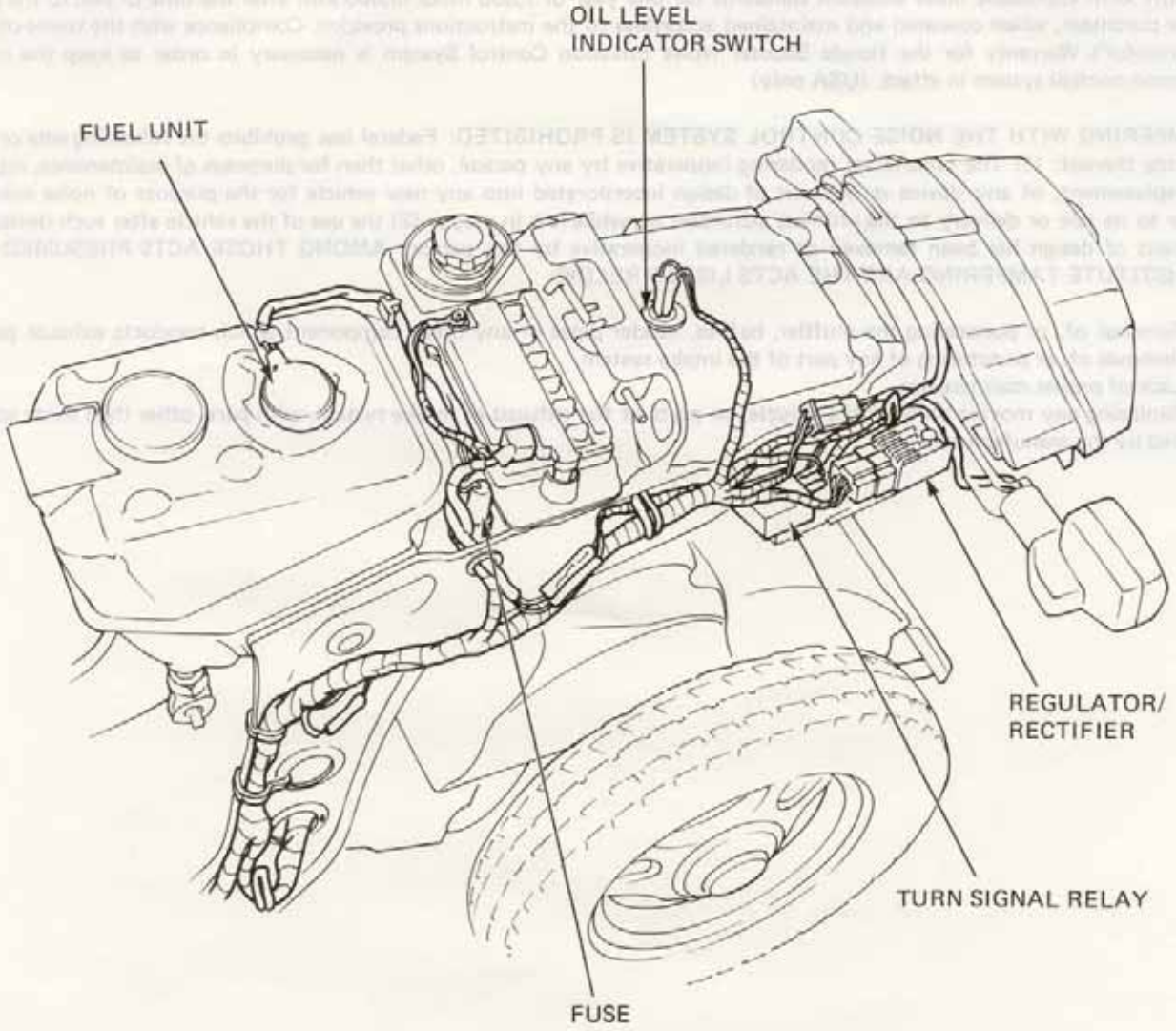

NOISE EMISSION CONTROL SYSTEM

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

  TEMPERING 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.

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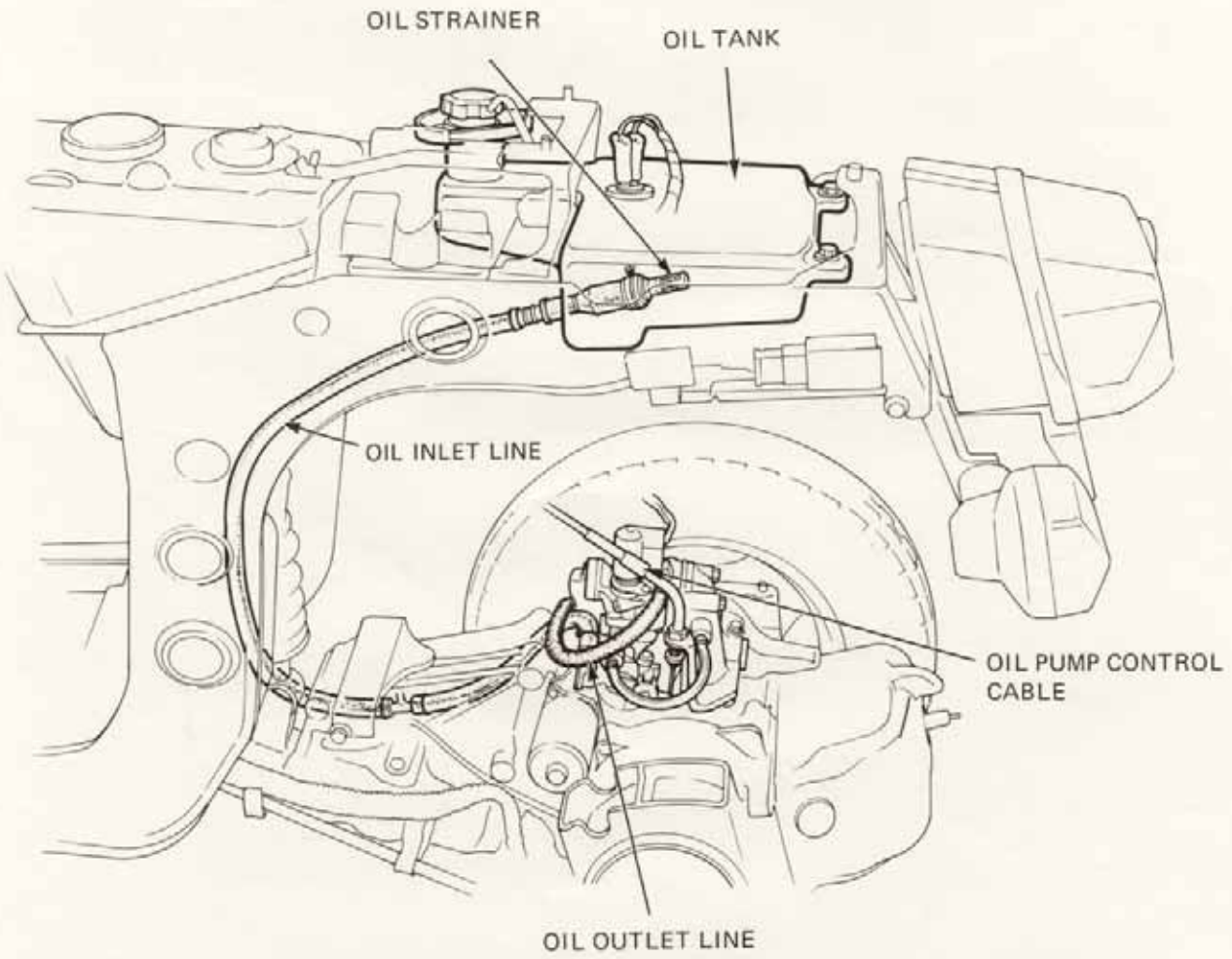

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SERVICE INFORMATION

GENERAL

- The oil pump can be serviced without removing the engine from the frame.
- When removing and installing the oil pump use care not to allow dust or dirt to enter the engine and oil line.
- Do not attempt to disassemble the oil pump.
- Bleed air from the oil pump if there is air in the oil inlet line (from the oil tank to the oil pump) or if the oil line is disconnected.
- Bleed air from the oil outlet line (from the oil pump to the carburetor) if the line is disconnected (Page 2-5).

SPECIFICATIONS

Piston/Crankshaft lubricant:
Honda 2-stroke injector oil or equivalent
Final reduction lubricant:
Honda 4-stroke oil SAE 10W-40 or equivalent

TROUBLESHOOTING

Excessive smoke and/or carbon on spark plug
1. Pump not properly synchronized (excessive oil)
2. Low quality engine oil

Overheating
1. Oil pump not adjusted properly (insufficient oiling)
2. Low quality oil

Seized piston
1. No oil in tank or clogged oil line
2. Pump not properly adjusted (insufficient oiling)
3. Air in oil lines
4. Faulty oil pump
5. Clogged oil strainer

Oil not flowing out of tank
1. Clogged oil tank cap breather hole
2. Clogged oil strainer

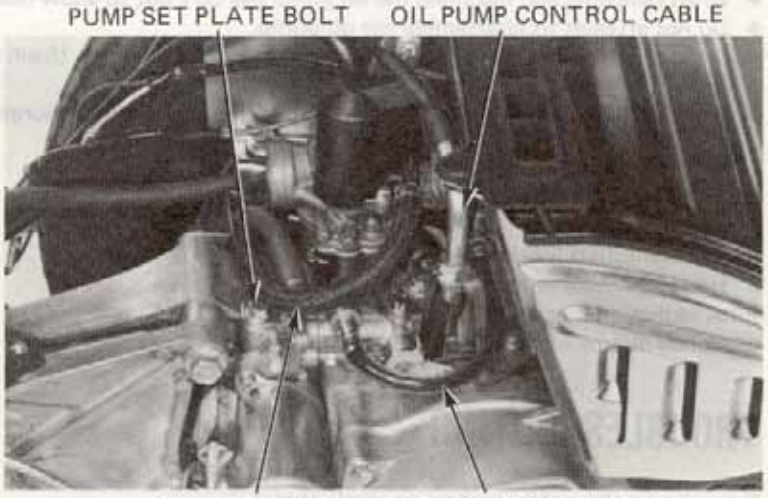
OIL PUMP REMOVAL

NOTE

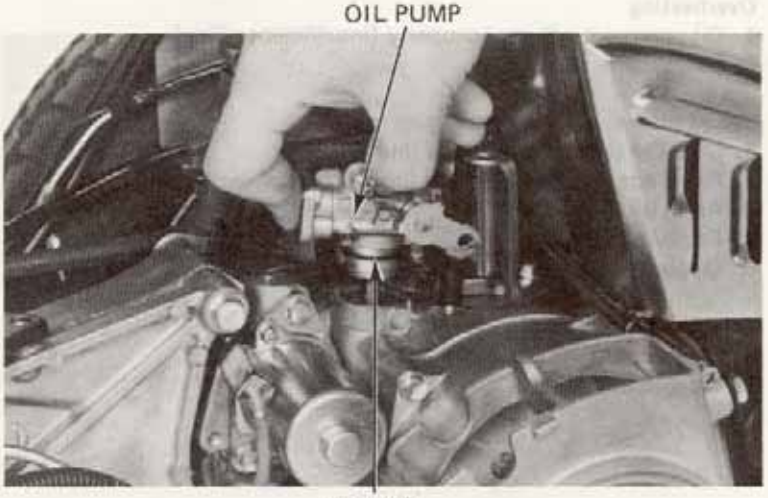
Clean the oil pump and its surrounding area throughly before removing the pump.

Remove the following parts:
- engine cover (page 10–2)
- left rear wheel
- air duct (page 3–8)
- air cleaner case

Disconnect the oil inlet line at the oil pump; pinch the end to prevent oil from flowing out.
Disconnect the oil outlet line and the oil pump control cable.
Remove the bolts attaching the oil pump set plate.



Remove the oil pump by pulling it straight up.
Remove the O-ring from the oil pump.



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OIL PUMP INSPECTION

NOTE:

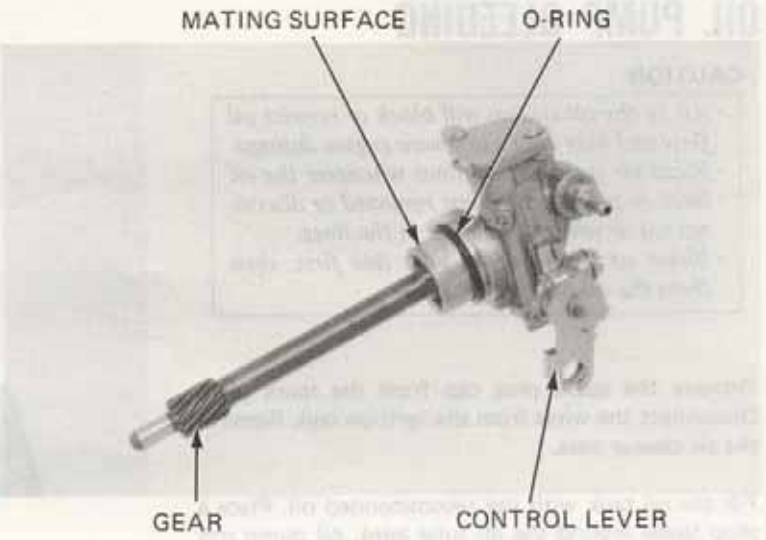
Before removing the oil pump, clean the oil pump and crankcase.

Remove the oil pump and check for:

- Deteriorated O-ring
- Damage to the crankcase mating surface
- Damage to the pump body
- Pump control lever operation
- Worn or damaged pump gear
- Oil leaks

CAUTION

Do not disassemble the oil pump.



OIL PUMP INSTALLATION

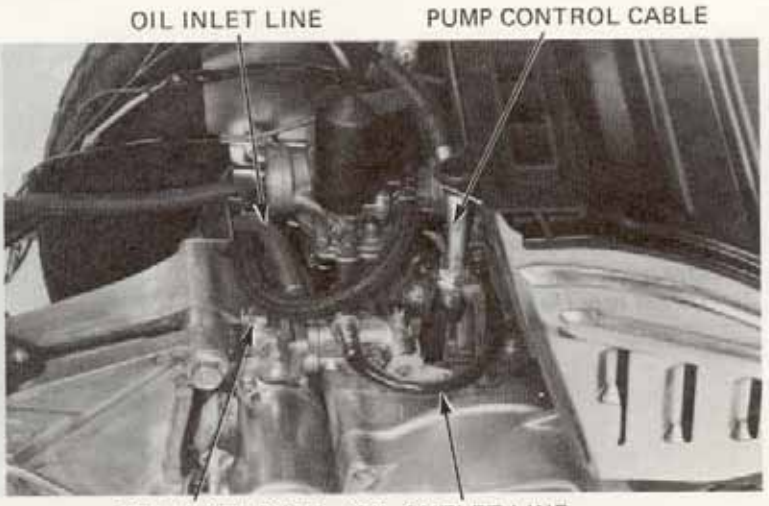
Coat a new O-ring with grease and slide it onto the oil pump.
Grease the gear with molybdenum disulfide then install the oil pump securely on the crankcase.

Install the set plate and attaching bolts and tighten securely.

Reconnect the oil inlet and outlet lines.
Connect the oil pump control cable.
Install the remaining parts in the reverse order of removal.

NOTE

After installation, perform the following inspections and adjustments:
- Control cable adjustment (Page 3-8)
- Oil pump bleeding (Page 2-4)
- Check for oil leaks.



OIL PUMP BLEEDING

CAUTION

- *Air in the oil system will block or restrict oil flow and may result in severe engine damage.*
- *Bleed air from the oil lines whenever the oil lines or pump have been removed or disconnected or when there is air in the lines.*
- *Bleed air from the oil inlet line first, then from the oil outlet line.*

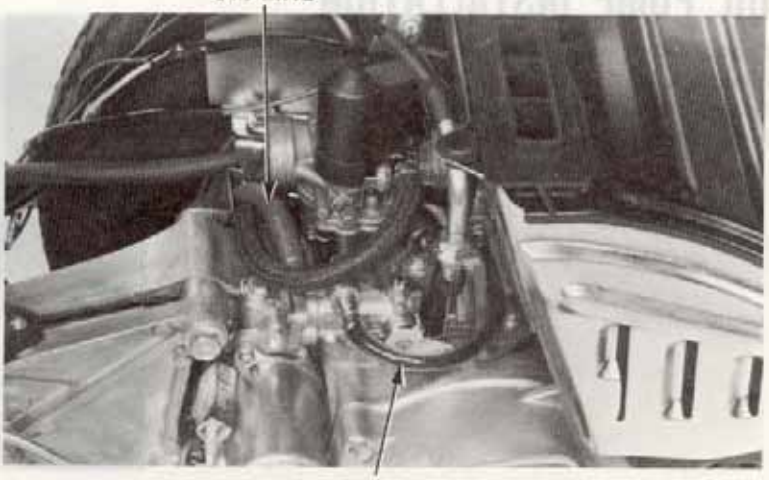
Remove the spark plug cap from the spark plug. Disconnect the wires from the ignition coil. Remove the air cleaner case.

Fill the oil tank with the recommended oil. Place a shop towel around the oil tube joint, oil pump and carburetor.

Disconnect the oil inlet line from the oil pump. Fill the oil pump with oil by squirting about 4 cc of clean oil through the joint.

Fill the oil line with oil and reconnect it to the oil pump. After installation, make sure there is no air in the oil inlet line.

Disconnect the oil outlet line from the pipe.
Fill the oil line with oil and reconnect it to the carburetor.



Install the air cleaner case.
Start the engine and allow it to idle. Bleed air from the system by loosening the bleeder bolt at the pump.

WARNING

- ***Perform this operation in a well-ventilated area.***
- ***Do not race the engine unnecessarily.***

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LUBRICATION POINTS

Apply clean engine oil or grease to cables and parts not called out.

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SERVICE INFORMATION

SPECIFICATIONS

SPARK PLUG

	NGK	ND
Standard	BPR6HS	W20FPR
For cold climate	BPR4HS	W14FPR-L
For extended high speed riding	BPR8HS	W24FPR

SPARK PLUG GAP		0.6–0.7 mm (0.024–0.028 in)
COMPRESSION		12.0 kg/cm² (170 psi)
IGNITION TIMING		15° BTDC/1800 rpm
THROTTLE FREE PLAY		2–6 mm (1/8–1/4 in)
IDLE SPEED		1,800 ± 150 rpm
AIR SCREW OPENING		2 turns out
BRAKE LEVER FREE PLAY		
	FRONT	10–20 mm (3/8–3/4 in)
	REAR	10–20 mm (3/8–3/4 in)
TIRE SIZE	FRONT	2.75–10–2PR
	REAR	3.00–8–2PR
TIRE PRESSURE	FRONT	125 kPa (1.25 kg/cm², 18 psi)
	REAR	100 kPa (1.00 kg/cm², 14 psi)
PARKING LOCK LEVER FREE PLAY		5–10 mm (1/4–3/8 in)

MAINTENANCE SCHEDULE

I – Inspect and clean, adjust, lubricate or replace if necessary R – Replace C – Clean

This maintenance schedule is based upon average riding condition. Scooters subjected to severe use, or ridden in unusually dusty areas, require more frequent servicing.	PRE-RIDE INSPECTION	INITIAL SAFETY INSPECTION	REGULAR SERVICE PERIOD Perform at every indicated month or mileage interval whichever occurs first		Refer to page
		1 month 200 miles (300 km)	12 months 1,000 miles (1,500 km)	24 months 2,000 miles (3,000 km)	
AIR CLEANER ELEMENT			(EVERY 6 MONTHS) C		3-3
CARBURETOR		I	I	I	3-8
*THROTTLE OPERATION	I	I	I	I	3-8
OIL PUMP		I	I	I	3-8
FUEL FILTER SCREEN		C	C	C	3-4
OIL LINE		I	I	I	3-5
FUEL LINE		I	I	R	3-4
*OIL AND FUEL LEVEL	I				
DECARBONIZE CYLINDER HEAD, CYLINDER, PISTON AND MUFFLER				C	3-13, 6-4, 6-5
TRANSMISSION OIL				R	3-6
*TRANSMISSION CASE FOR LEAKS	I				3-6
CLUTCH SHOE WEAR				I	8-10
TIRE: PRESSURES AND CONDITION	I				3-13
WHEEL TRUENESS		I	I	I	3-13
*BRAKE OPERATION AND FREE PLAY	I	I	I	I	3-9, 3-10
BRAKE LININGS			I	I	3-11
PARKING BRAKE OPERATION AND FREE PLAY		I			3-11, 3-12
STEERING HEAD BEARINGS		I		I	3-12
SUSPENSION OPERATION			I	I	3-12
NUTS, BOLTS (TIGHTEN)		I		I	3-13
*SPARK PLUG			R	R	3-6
*BATTERY FLUID LEVEL	I				3-3
BATTERY FLUID SPECIFIC GRAVITY			I	I	15-3
ALL LIGHTS AND HORN	I				

Items marked * are simple to perform and may be serviced by the owner. Other maintenance items should be serviced by an authorized Honda motor scooter dealer.

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BATTERY

Raise the seat.
Inspect the battery fluid level.
When the fluid level nears the lower level mark, refill with distilled water to the upper level line.

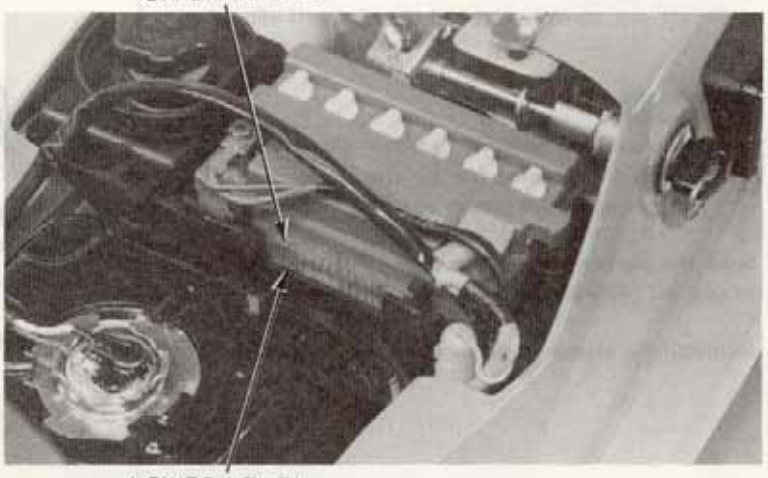
- Check the specific gravity of the battery electrolyte in each cell (Page 15-3).
- Recharge the battery if necessary (Page 15-4).

NOTE

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

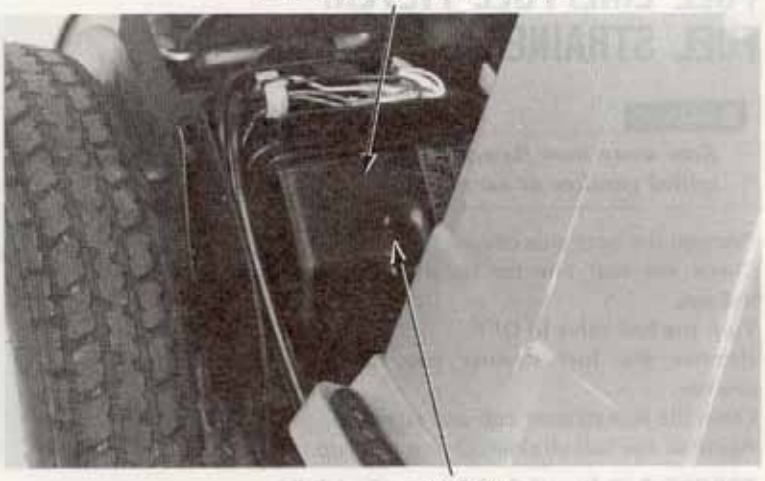
WARNING

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

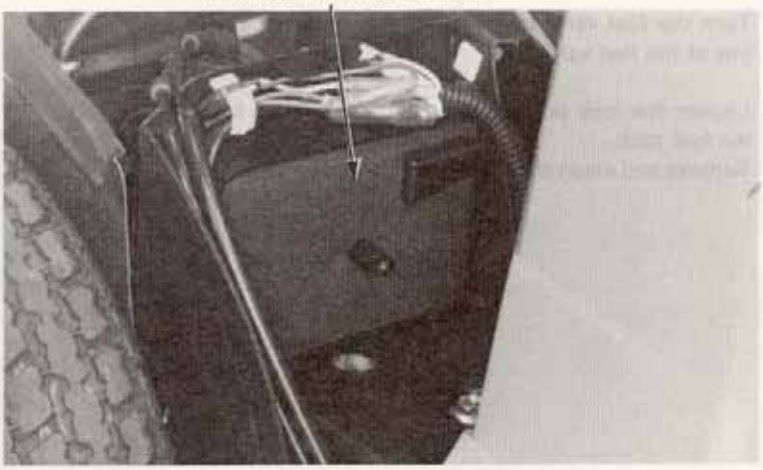


AIR CLEANER

Remove the engine cover.
Remove the screw attaching the air cleaner case cover and remove the air cleaner case cover.



Remove the air cleaner element.



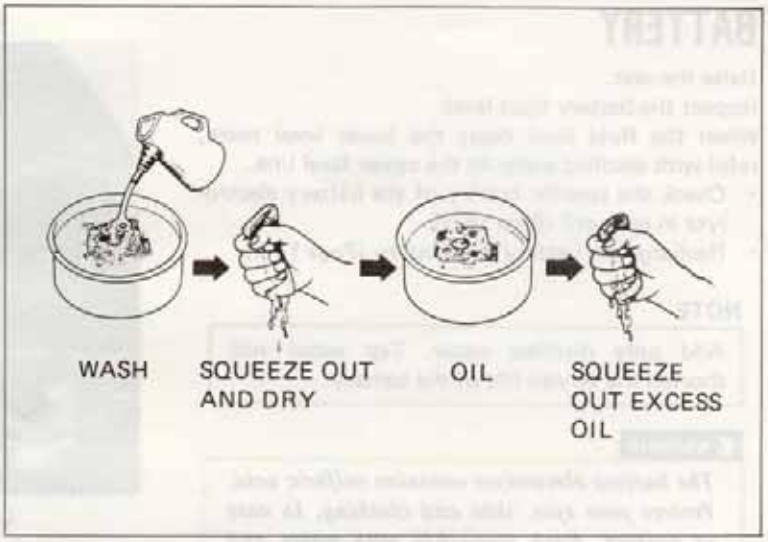
Wash the element in non-flammable or high flash point solvent, squeeze out and the element allow to dry.

WARNING

Never use the gasoline or low flash point solvents for cleaning the air cleaner element. A fire or explosion could result.

Soak the element in clean motor oil (SAE 10W-30) or gear oil (#80-90) and squeeze out the excess.

Reinstall the element and air cleaner case cover.



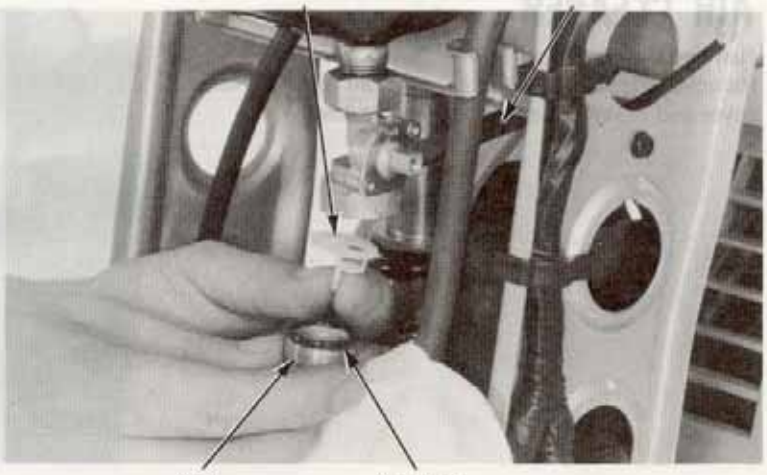
FUEL LINE/FUEL FILTER/ FUEL STRAINER

WARNING

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

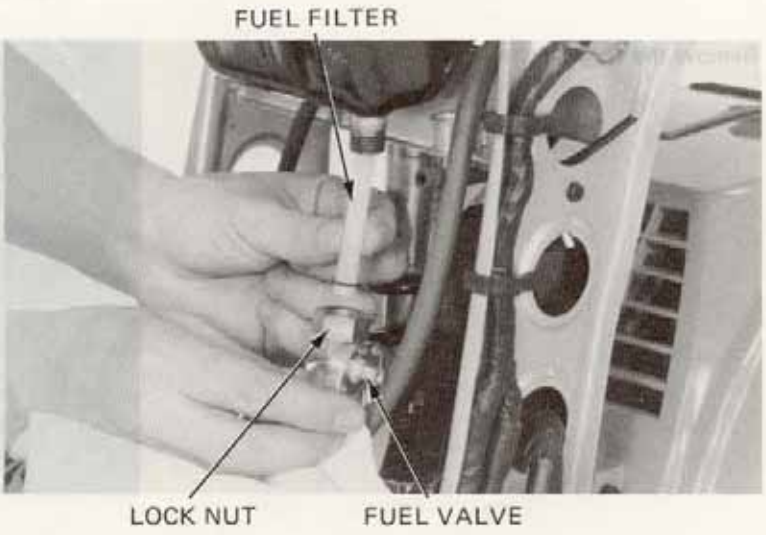
Remove the both side covers.
Check the fuel line for deterioration, damage, or leakage.
Turn the fuel valve to OFF.
Remove the fuel strainer cup, O-ring and fuel strainer.
Clean the fuel strainer cup and strainer.
Reinstall the fuel strainer, O-ring and cup.

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



Turn the fuel valve to OFF and disconnect the fuel line at the fuel valve.

Loosen the lock nut and remove the fuel valve from the fuel tank.
Remove and clean the fuel filter.



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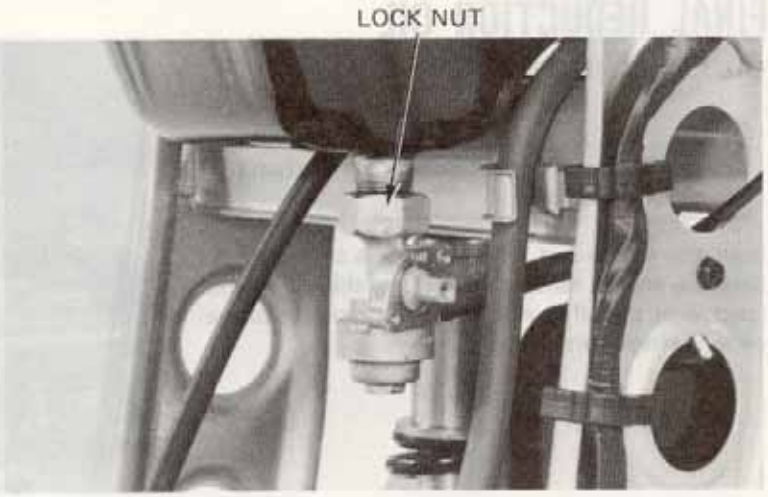
Reinstall the fuel filter, O-ring and fuel valve.

NOTE

Do not overtighten the fuel valve lock nut.

WARNING

- *Drain the gasoline into a safe container labeled for gasoline.*
- *After installing the fuel filter, check for leak.*

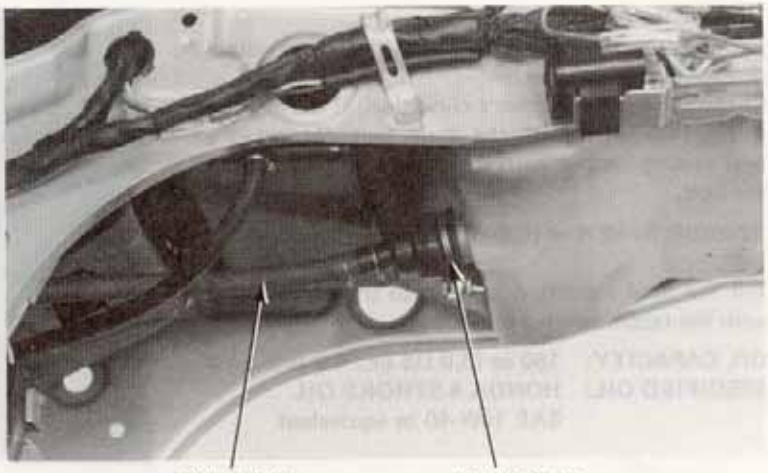


OIL STRAINER

Remove the both side covers (Section 10).
Disconnect the oil inlet line at the oil pump and allow the oil to drain into a clean container.

Loosen the tube clip under the oil tank and disconnect the inlet line from the oil tube joint.

Remove the oil strainer.



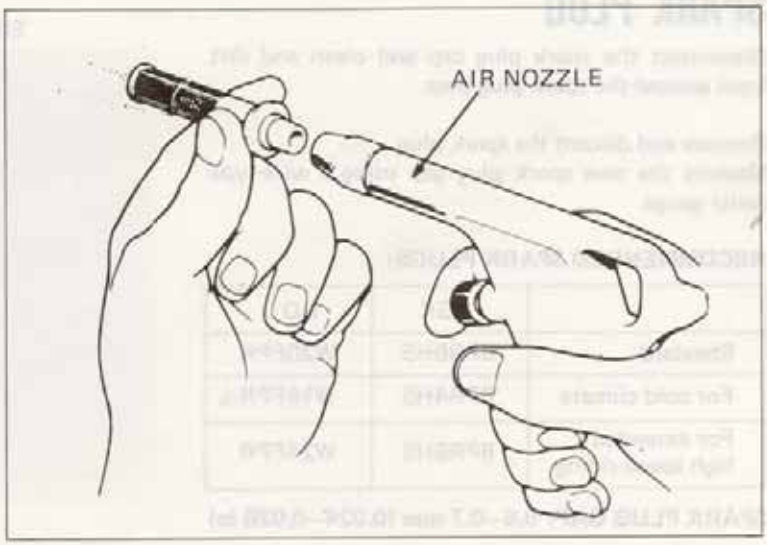
Clean the strainer with compressed air.

Installation of the oil strainer is the reverse order of removal.
Fill the oil tank with the recommended oil up to the proper level.

Bleed air from the oil pump and lines (Page 2-4).

NOTE

Connect the oil line securely and check for leaks.



FINAL REDUCTION OIL

OIL LEVEL INSPECTION

NOTE

Place the scooter upright on firm, level ground to check the oil level.

Start the engine and let it idle for a few minutes. Stop the engine, remove the oil level check bolt and check that the oil level is at the bottom edge of the oil level check bolt hole.

OIL CHANGE

Remove the oil level check bolt.
Remove the drain bolt to allow the oil to drain thoroughly.
Check the sealing washer's condition. If it's in good shape, reinstall it with the drain bolt. Or install a new sealing washer with the drain bolt and tighten the bolt.

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

Fill the final reduction case up to the proper level with the recommended oil.

OIL CAPACITY: 150 cc (5.0 US oz., 4.2 Imp. oz.)
SPECIFIED OIL: HONDA 4-STROKE OIL
SAE 10W-40 or equivalent

SPARK PLUG

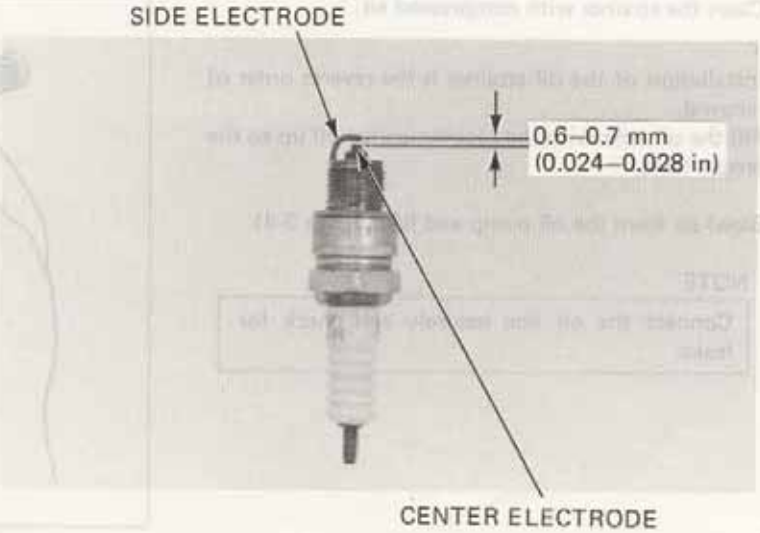
Disconnect the spark plug cap and clean and dirt from around the spark plug base.

Remove and discard the spark plug.
Measure the new spark plug gap using a wire-type feeler gauge.

RECOMMENDED SPARK PLUGS:

	NGK	ND
Standard	BPR6HS	W20FPR
For cold climate	BPR4HS	W14FPR-L
For extended high speed riding	BPR8HS	W24FPR

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



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COMPRESSION TEST

COMPRESSION GAUGE, COMMERCIAL AVAILABLE

Warm up the engine.
Stop the engine and remove the spark plug.
Insert a compression gauge.
Open the throttle grip fully and crank the engine by operating the starter.

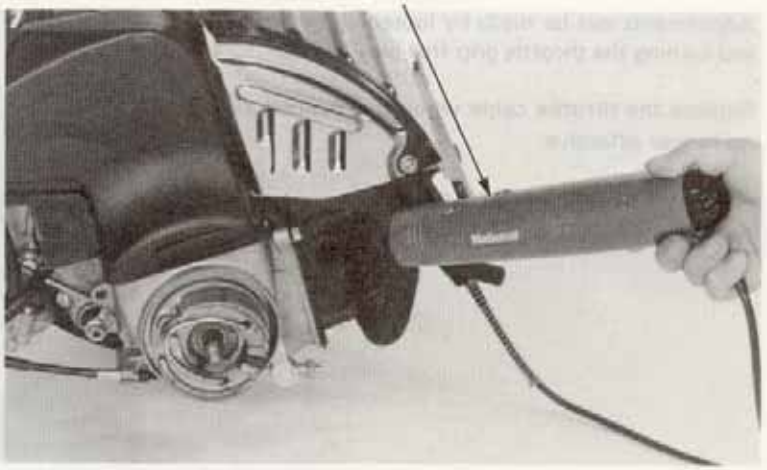
COMPRESSION: 12.0 kg/cm² –600 rpm
(170 psi–600 rpm)

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

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

IGNITION TIMING

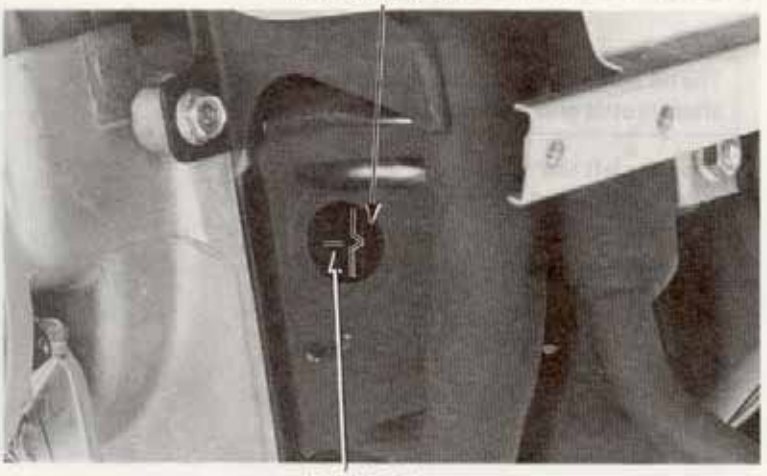
TIMING LIGHT



NOTE

- The CDI ignition timing is not adjustable. If the ignition timing is not correct, check the CDI unit and alternator and replace any faulty parts.
- Use the Honda Service Tester (07308-0070000 or 07308-0010000) to check the ignition timing.

INDEX MARK



"F" MARK

Remove the left rear wheel and the engine cover.

Remove the timing inspection rubber plug from the cylinder head shroud.

Check the ignition timing with a timing light.
The timing is correct if the index mark aligns with the "F" mark at 1,800 rpm.

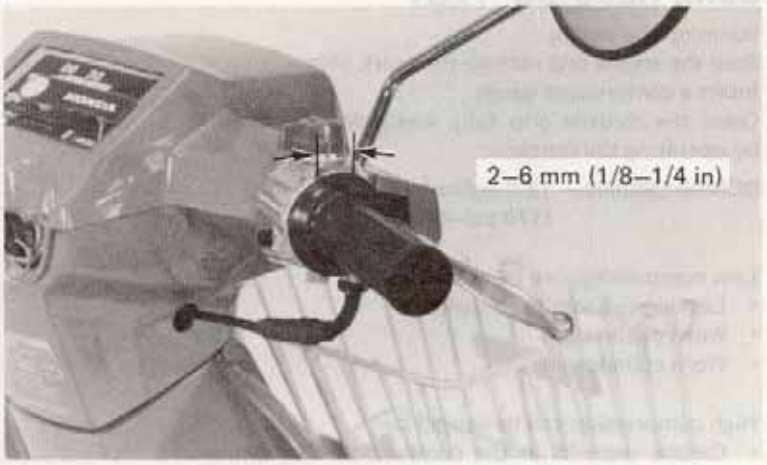
IGNITION TIMING: 15° BTDC/1,800 rpm within ±3°/1,800 rpm, fixed

CARBURETOR ADJUSTMENT

THROTTLE CABLE

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

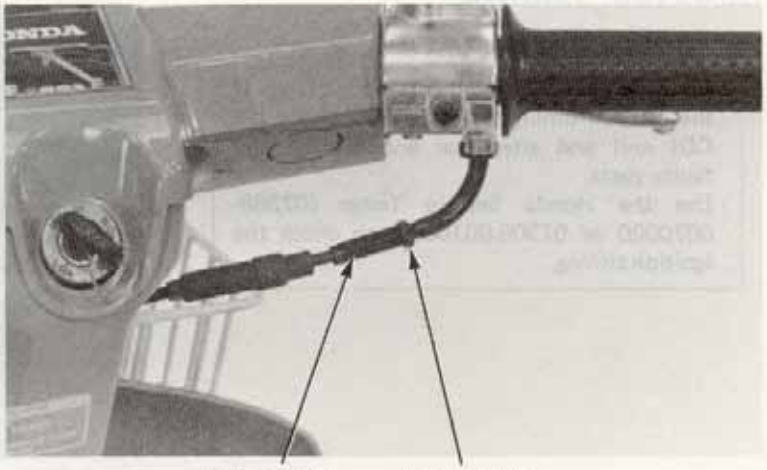
FREE PLAY: 2–6 mm (1/8-1/4 in)



Adjustments can be made by loosening the lock nut and turning the throttle grip free play adjuster.

Replace the throttle cable when this procedure is no longer effective.

Adjust the oil pump control cable.



OIL PUMP CONTROL CABLE

NOTE

> The oil pump control cable should be adjusted after throttle grip free play adjustment.

Remove the left rear wheel.
Remove the clip, and remove the air duct.

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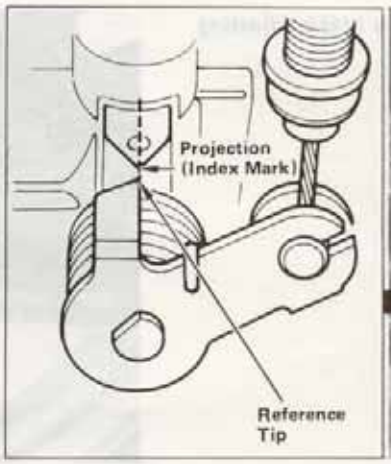
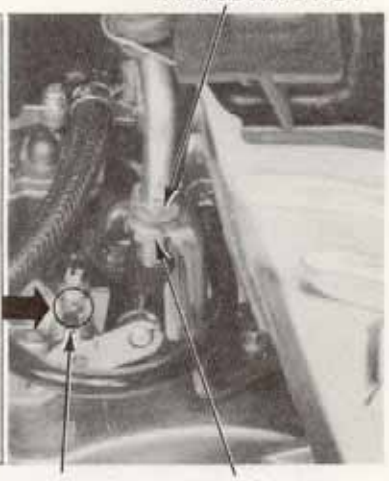
Loosen the oil pump control cable lock nut and open the throttle grip fully.
Check that the aligning mark on the oil pump control lever is aligned with the index mark on the pump body.
Adjust if necessary by turning the adjusting nut.

CAUTION

Reference tip adjustment within 1 mm (0.04 in) of the index mark on the open side is acceptable. However, the aligning mark must never be on the closed side of the index mark, otherwise engine damage will occur because of insufficient lubrication.





Excessive white smoke or hard starting:
- Pump control lever excessively open

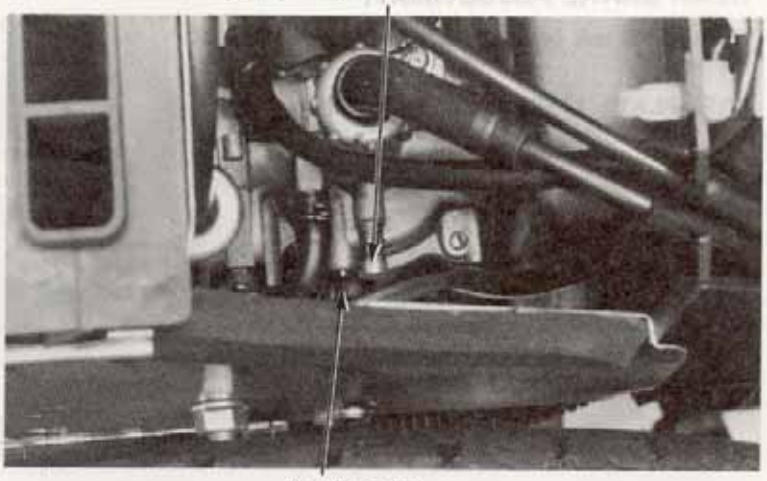
Seized position:
- Pump control lever not properly adjusted

IDLE SPEED ADJUSTMENT

NOTE

The engine must be warm for accurate adjustment.

Remove the left rear wheel.
Attach an engine tachometer.
Turn the throttle stop screw to obtain the specified idle speed of 1,800 ± 150 rpm.
When the engine misses or runs erratic, proceed as follows:
(1) Screw in the air screw until it lightly seats, then turn it out 2 turns.
(2) Reset the idle speed with the throttle stop screw.
(3) Turn the air screw in or out to find the highest idle speed.
(4) Reset the idle speed with the throttle stop screw.
(5) Make sure that the engine does not miss or run erratic. If necessary, repeat steps (2) through (4).

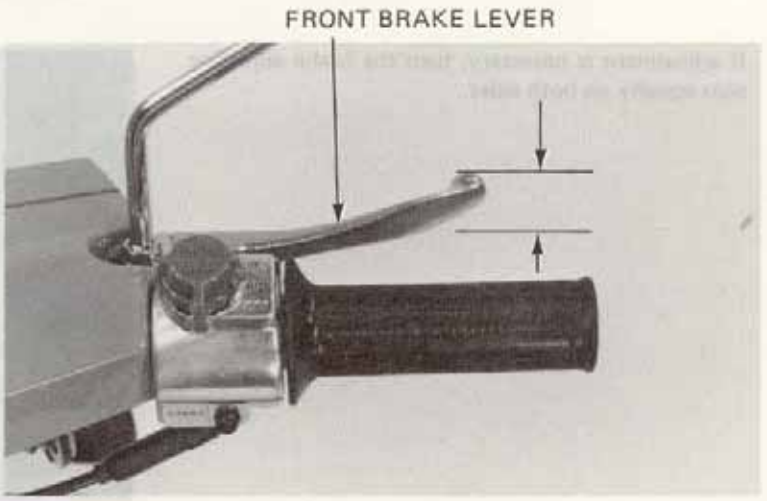


BRAKES

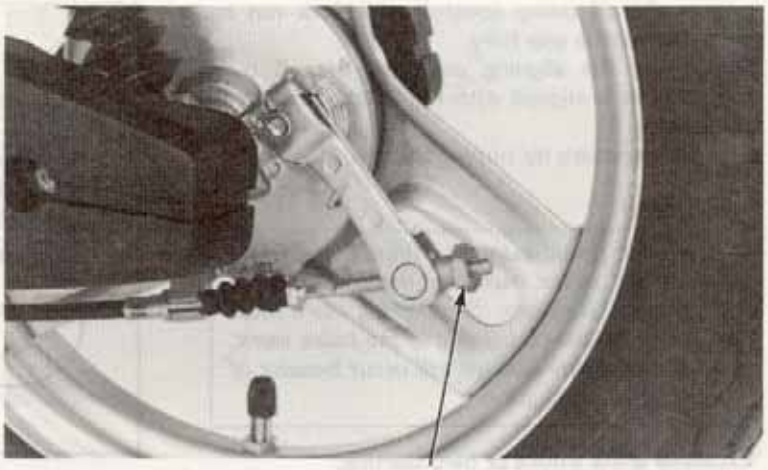
FRONT BRAKE ADJUSTMENT

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

FREE PLAY: 10–20 mm (3/8–3/4 in)



If adjustment is necessary, turn the brake adjusting nut.

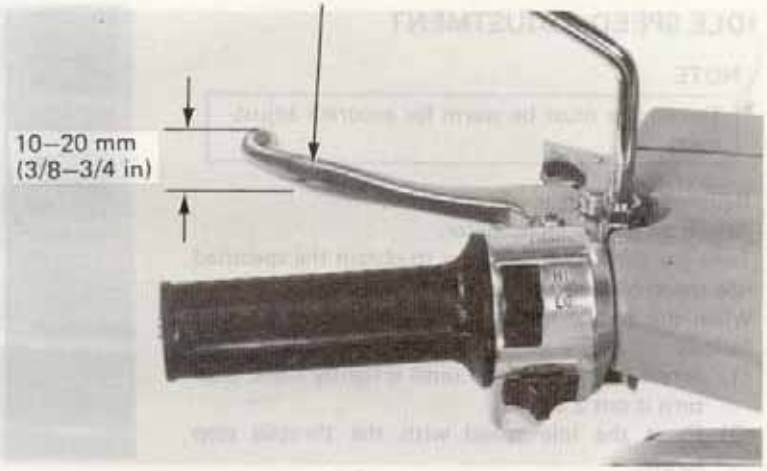


ADJUSTING NUT

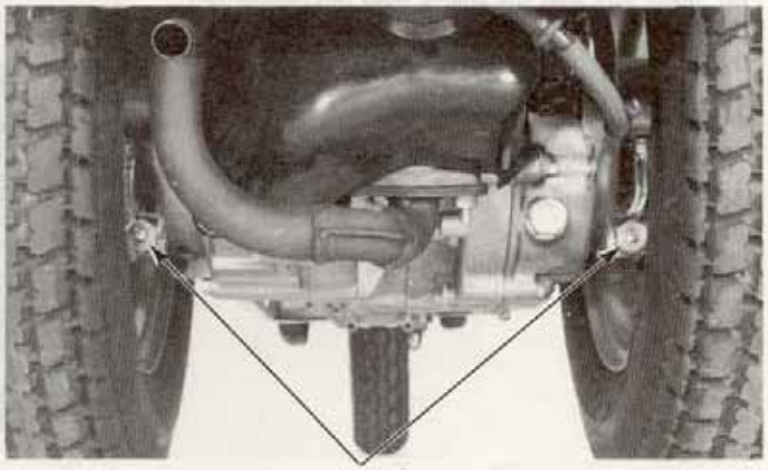
REAR BRAKE ADJUSTMENT

Measure the rear brake lever free play at the end of the lever.

FREE PLAY: 10–20 mm (3/8–3/4 in)



If adjustment is necessary, turn the brake adjusting nuts equally on both sides.



ADJUSTING NUTS

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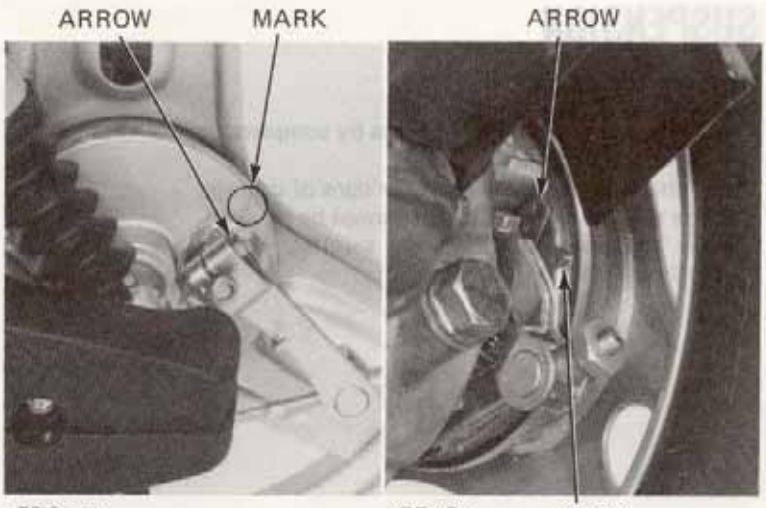
After adjustment, make sure that both brake arms have no play.

NOTE

If the rear brake lever has excessive play even when both brake arms have no play, the primary brake cable may be stretched. Replace the primary and secondary brake cables and adjust as necessary (See section 12).

BRAKE SHOE INSPECTION

Replace the brake shoes if the arrow on the brake arm aligns with the reference mark "△" on full application of the front or rear brake (Page 11–17, 12–4).



PARKING LOCK LEVER

Measure the swing/parking lock lever free play at the end of the lever.

FREE PLAY: 5–10 mm (1/4–3/8 in)

If adjustment is necessary, proceed as follows.

Remove the leg shield. (Page 10–4)
Loosen the lock nut and remove the parking lock cable from the cable holder.

Turn the adjusting nut in or out to obtain the correct free play. Reinstall the cable in the cable holder and rechedk the free play.

Tighten the lock nut securely. Install the leg shield.

NOTE

When the parking lever cannot be locked, it is an indication that the cable is broken. For cable removal and replacement see section 11.

SUSPENSION

FRONT

Check the action of the front forks by compressing them several times.
Check the entire fork assembly for signs of damage. Replace any components which cannot be repaired.
Tighten all nuts and bolts to the specified torque values (Page 1-5).

STEERING HEAD BEARINGS

Place the scooter on firm, level ground.
Raise the front wheel off the ground by placing a support under the frame.
Check that the handlebar rotates freely.

If the handlebar moves unevenly, binds, or has vertical movement, adjust the steering head by removing the leg shield, loosening the steering stem lock nut and turning the top cone race.

NOTE

- Screw in the top cone race until it is snug tight, then back it out 1/8 turn.
- Check that the handlebar rotates freely and has no vertical movement.

Retighten the steering stem lock nut securely.

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WHEELS/TIRES

Check the tire pressures.

NOTE

Tire pressures should be checked when the tires are cold.

TIRE PRESSURE:
Front: 1.25 kg/cm² (18 psi)
Rear: 1.00 kg/cm² (14 psi)

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

TIRE SIZES:
Front: 2.75-10-2PR
Rear: 3.00-8-2PR

NOTE

- Do not interchange the front and rear tires as they differ in shape from each other.
- Rotate the rear tires to equalize tire wear.

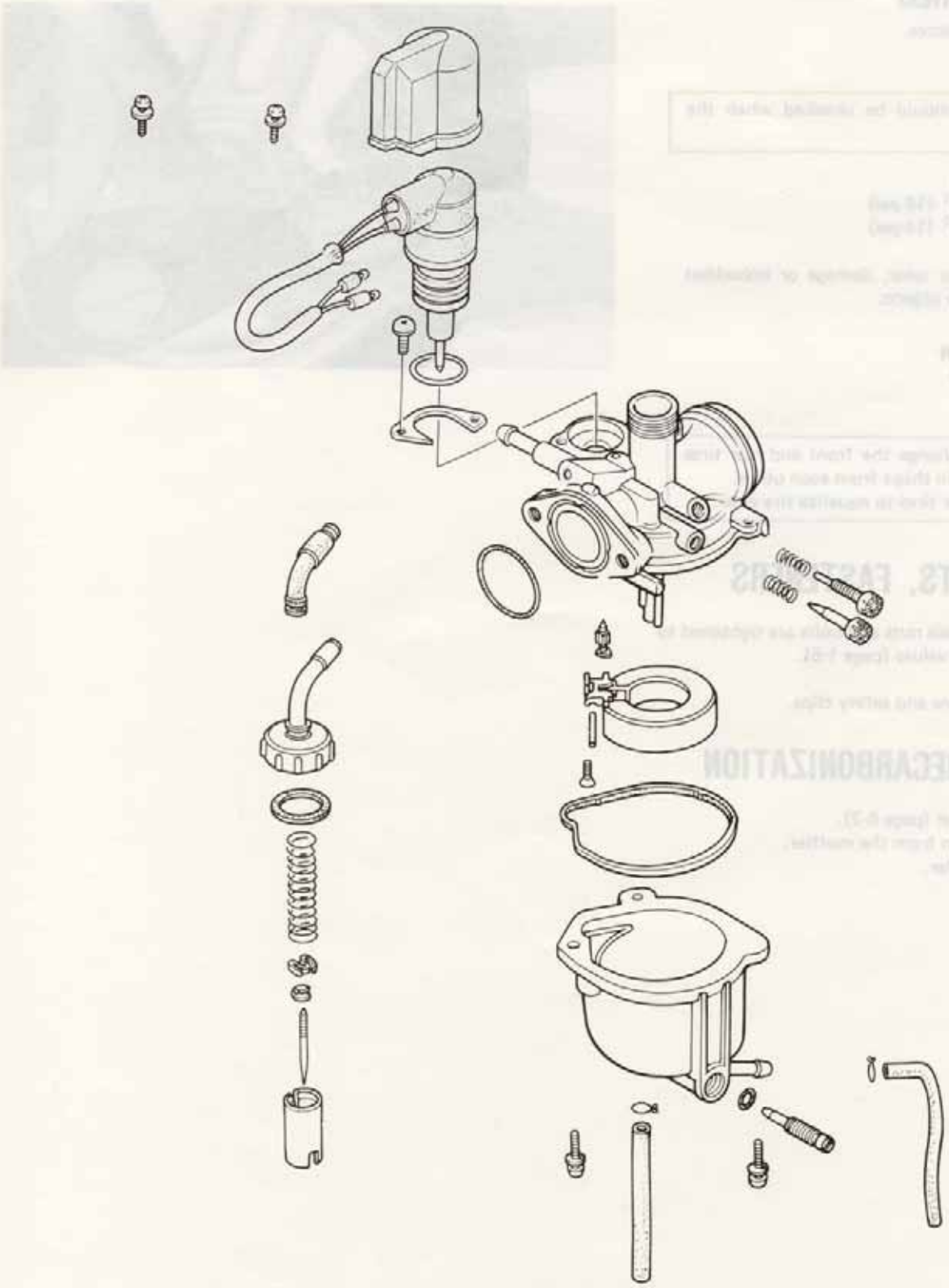
NUTS, BOLTS, FASTENERS

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

Check all cotter pins and safety clips.

MUFFLER DECARBONIZATION

Remove the muffler (page 6-2).
Remove the carbon from the muffler.
Reinstall the muffler.



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SERVICE INFORMATION

GENERAL

- Use caution when working with gasoline. Always work in a well-ventilated area and away from sparks or flames.
- When disassembling fuel system parts, note the locations of the O-rings. Replace them with new ones during assembly.
- Bleed air from the oil outlet line whenever it is disconnected.
- Route all tubes and cables properly.

SPECIFICATIONS

Venturi dia.	14 mm (0.59 in)
Identification number	PA27C
Float level	12.2 mm (0.48 in)
Air screw opening	2 turns out
Idle speed	1800 ± 150 rpm
Throttle grip free play	2–6 mm (1/8–1/4 in)

TOOLS

Special

Vacuum Pump	A937X-041-XXXXX or ST-AH-260-MC7 (U.S.A. only)

Common

Float Level Gauge	07401-0010000

TROUBLESHOOTING

Engine cranks but won't start
1. No fuel in tank
2. Too much fuel getting to cylinder
3. Clogged air cleaner
4. Faulty auto bystarter

Engine idles roughly, stalls or runs poorly
1. Idle speed incorrect
2. Rich mixture
3. Lean mixture
4. Clogged air cleaner
5. Intake pipe leaking
6. Fuel contaminated
7. Faulty ignition system
8. Low compression
9. Water in fuel strainer cup

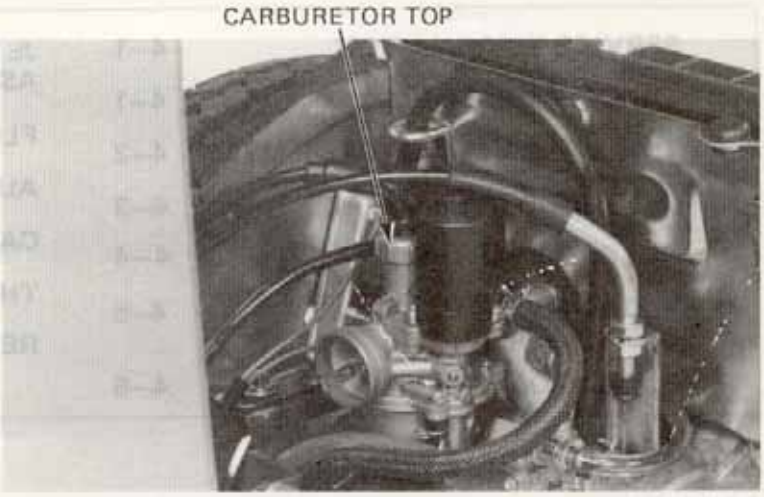
Lean mixture
1. Carburetor fuel jets clogged
2. Fuel cap vent clogged
3. Clogged fuel filter
4. Fuel line kinked or restricted
5. Float valve faulty
6. Float level too low
7. Air vent tube clogged

Rich mixture
1. Faulty float valve
2. Float level too high
3. Carburetor air jets clogged
4. Disconnected auto bystarter wires
5. Auto bystarter valve set plate not set properly

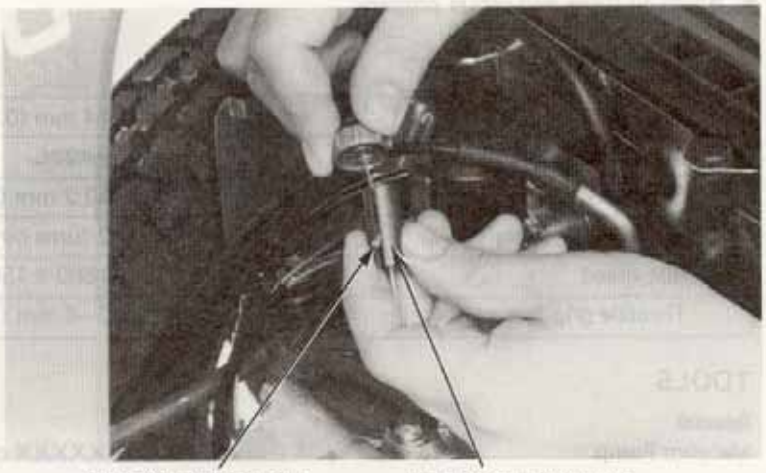
THROTTLE VALVE DISASSEMBLY

Remove the engine cover.
Remove the air duct and air cleaner case.

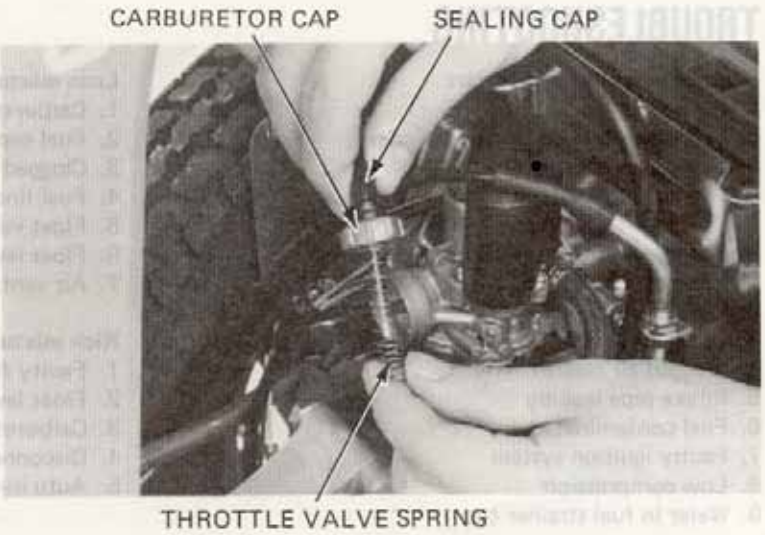
Remove the carburetor top and pull out the throttle valve.



Disconnect the throttle cable from the throttle valve.



Remove the throttle valve spring, carburetor cap and sealing cap from the throttle cable.



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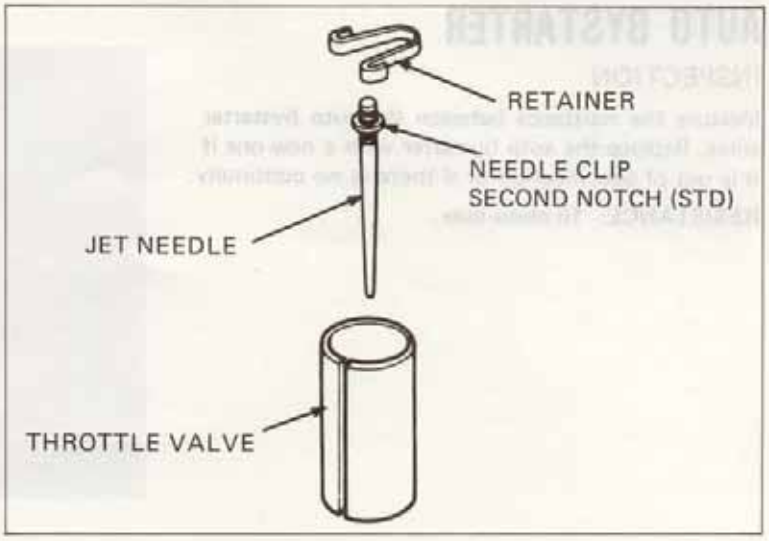
Pry off the retainer and remove the jet needle.

JET NEEDLE/THROTTLE VALVE INSPECTION

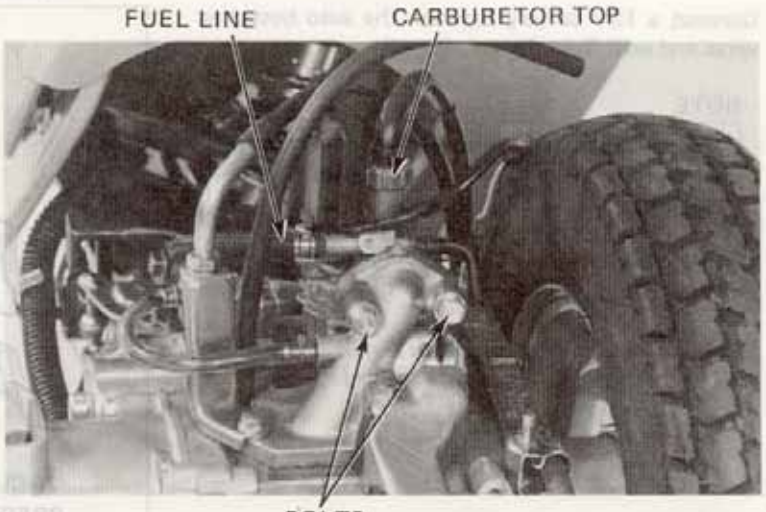
Check the jet needle and throttle valve for wear or damage. Replace them if they are worn or damaged.



CARBURETOR REMOVAL

Turn the fuel valve OFF.
Remove the engine cover.
Disconnect the wires from the ignition coil.
Remove the spark plug cap from the spark plug, and remove the air cleaner case.
Disconnect the auto bystarter wires and connectors.

Remove the throttle valve from the carburetor body by loosening the carburetor top.
Disconnect the fuel line from the carburetor, and remove the carburetor by unscrewing the attaching bolts.

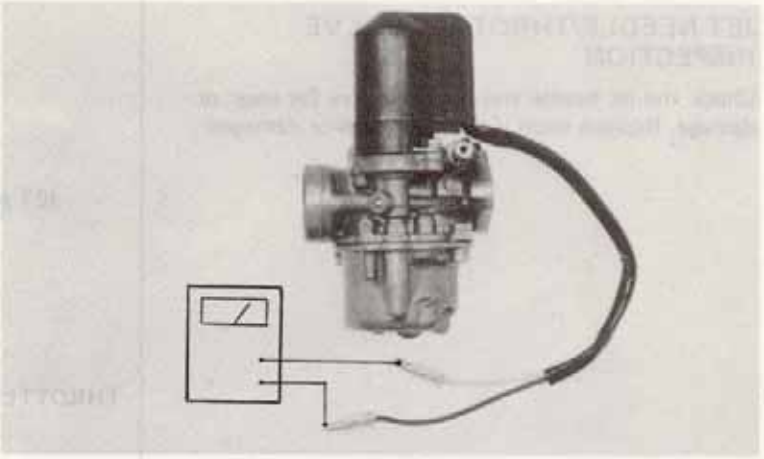


AUTO BYSTARTER

INSPECTION

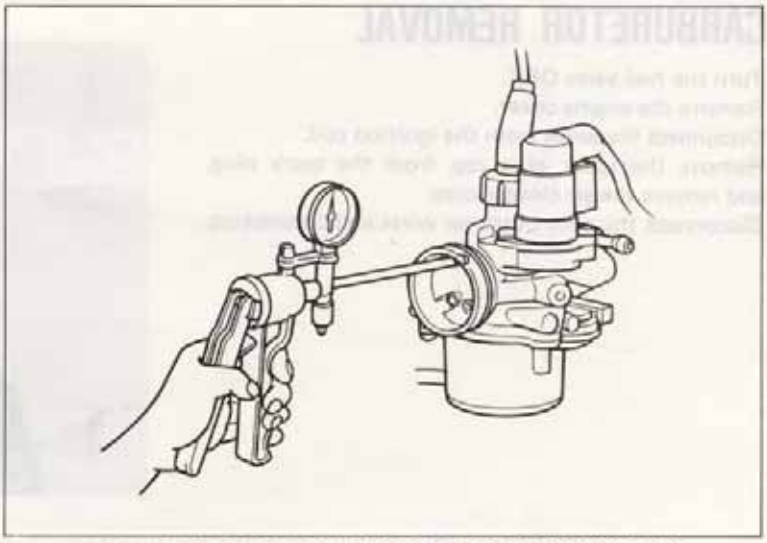
Measure the resistance between the auto bystarter wires. Replace the auto bystarter with a new one if it is out of specification or if there is no continuity.

RESISTANCE: 10 ohms max.



Let the carburetor sit for 30 munites.
Connect a pressure pump to the enriching circuit.
Apply pressure to the circuit.

If the passage is blocked, replace the auto bystarter with a new one.



VACUUM/PRESSURE PUMP A937X-041-XXXXX OR
PRESSURE PUMP ST-AH-260-MC7 (U.S.A. only)

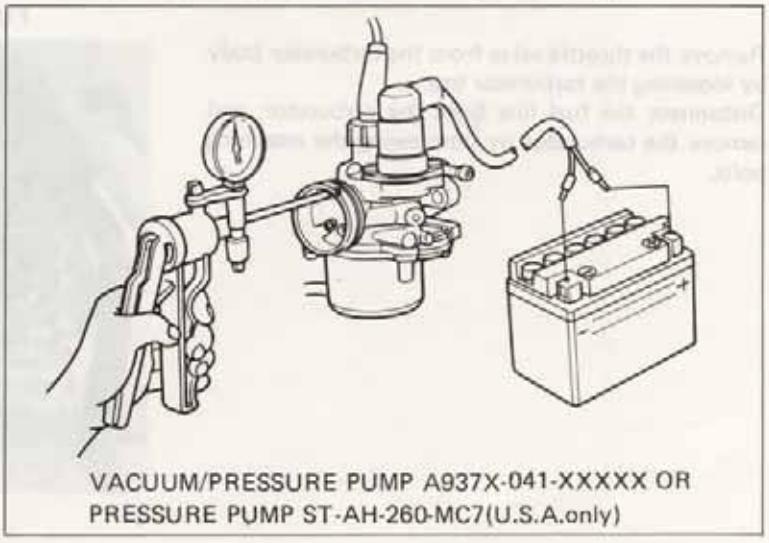
Connect a 12V battery between the auto bystarter wires and wait five minutes.

NOTE

> The auto bystarter wires can be connected to the battery terminals without regard to the porality.

Connect a pressure pump to the fuel enriching circuit and apply pressure to it.

Replace the auto bystarter with a new one if there is no restriction to the pressure applied.



VACUUM/PRESSURE PUMP A937X-041-XXXXX OR
PRESSURE PUMP ST-AH-260-MC7(U.S.A.only)

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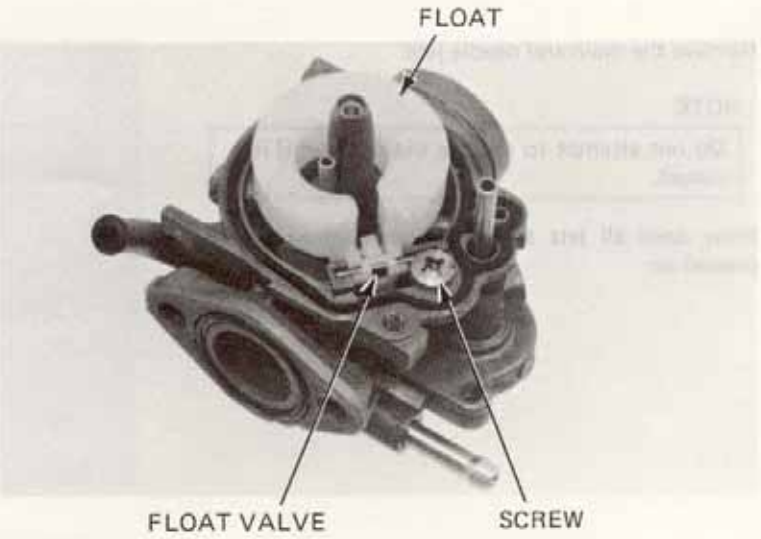
REMOVAL

Remove the two screws attaching the auto bystarter holder, and remove the auto bystarter from the carburetor body.

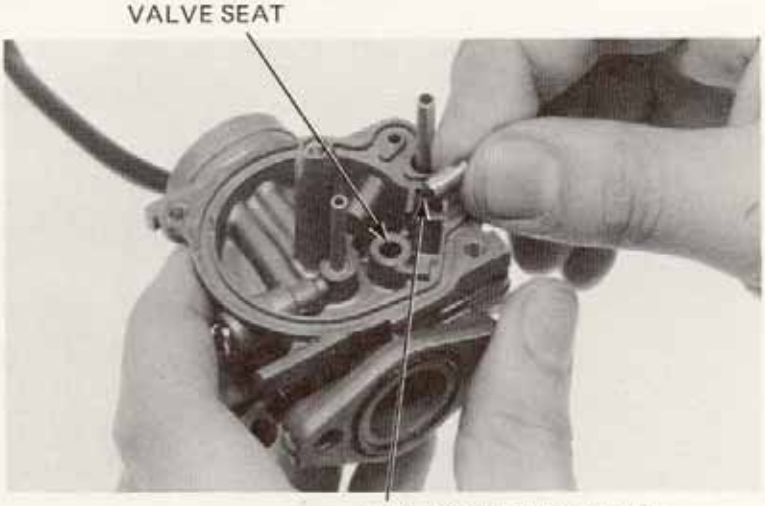
FLOAT/FLOAT VALVE/ JETS DISASSEMBLY

Place a drain pan under the carburetor and loosen the carburetor drain screw to drain the fuel.
Remove the float chamber from the carburetor body.
Remove the carburetor float and float valve by removing the attaching screw.



FLOAT/FLOAT VALVE INSPECTION

Check the valve seat for wear or damage.
Check the float for deformation or fuel inside the float.



Turn the air screw in and record the number of turns until it seats lightly, so can be returned to its original position during reassembly.
Remove the air and throttle stop screws.

CAUTION

Do not force the screws against their seats to prevent damage to the seats.

Remove the main and needle jets.

NOTE

Do not attempt to remove the main jet if it is staked.

Blow open all jets and body openings with compressed air.

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JETS/FLOAT VALVE/FLOAT ASSEMBLY

Install the throttle stop screw, main and needle jets.

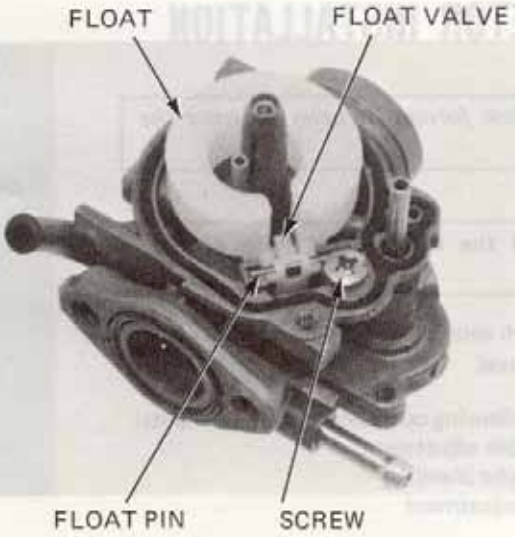
Install the air screw. Turn it in until it lightly seats and back it out the number of turns recorded before it was removed.

If the number of turns was not recorded, turn it out 2 turns.
Perform air screw adjustment after the carburetor is reinstalled (page 3-9).

Install the float valve, float and float pin.
Tighten the float screw securely.

NOTE

Install the float valve and float pin first, then install the float.



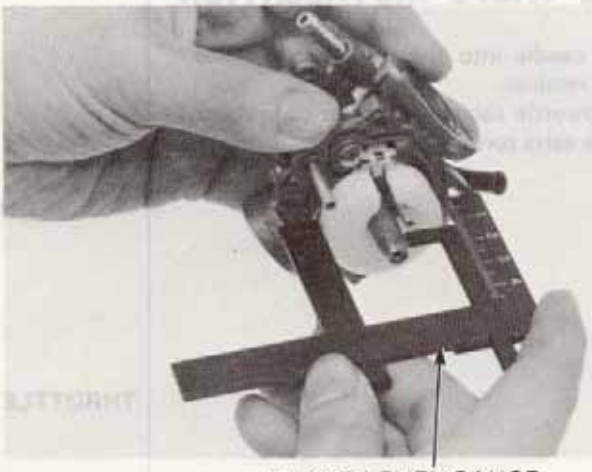
FLOAT LEVEL INSPECTION

Measure the float level at the main jet parallel with the float pin.

FLOAT LEVEL: 12.2 ± 1.0 mm (0.48 ± 0.04 in)

Replace the float if it is out of the specified level range.

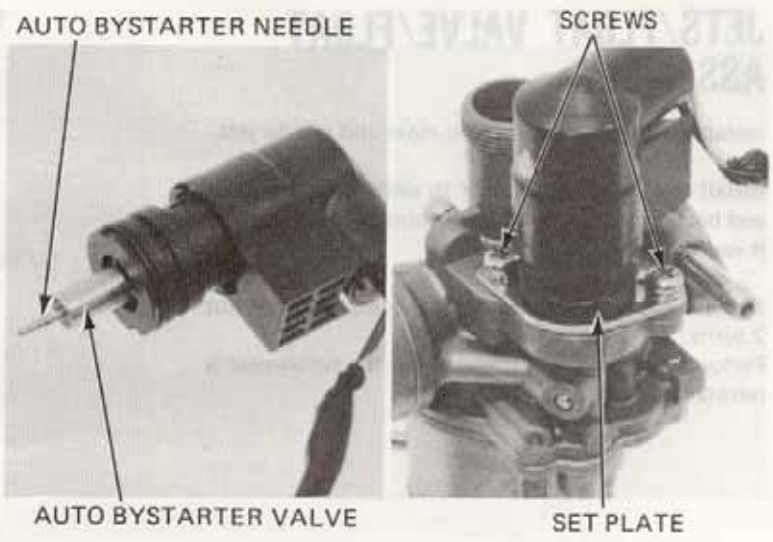
Check the operation of the float and install the float chamber.



AUTO BYSTARTER INSTALLATION

Before installing the bystarter on the carburetor, check the valve and needle. Replace the bystarter if the valve or needle show signs of wear or damage.

Position the auto bystarter on the carburetor body and install with the set plate and screws.



CARBURETOR INSTALLATION

CAUTION

Do not allow foreign particles to enter the carburetor.

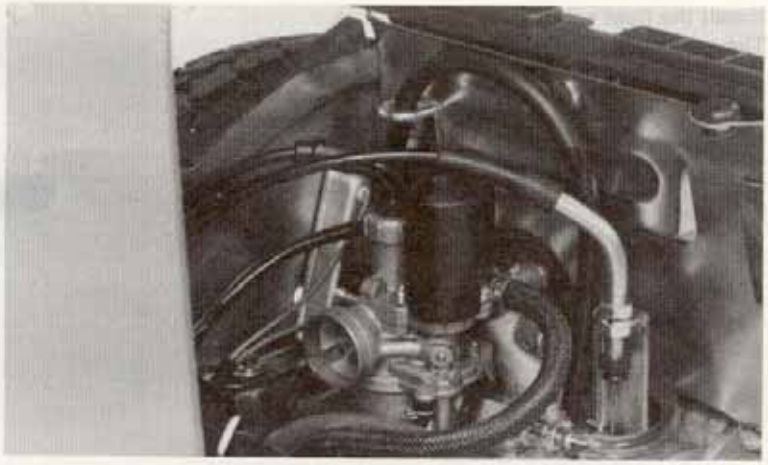
NOTE

Check that the fuel and oil tubes are not pinched.

The installation sequence is essentially the reverse order of removal.

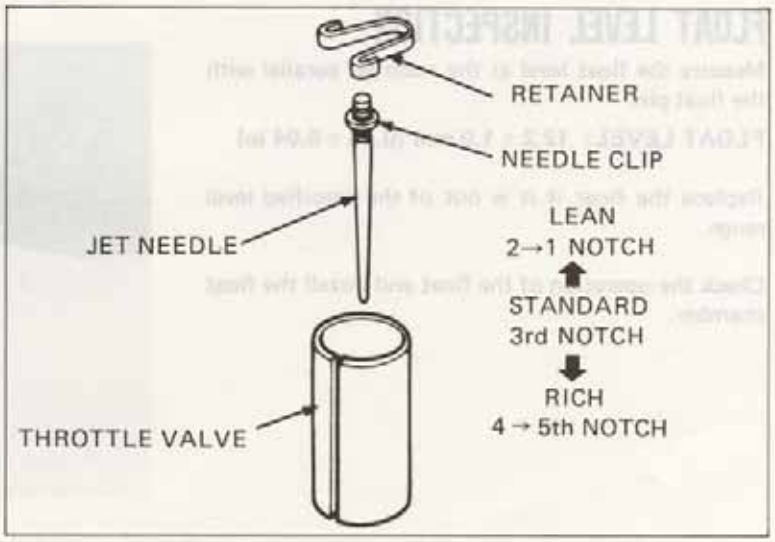
Perform the following operation and adjustments:

- Throttle cable adjustment
- Oil outlet tube bleeding
- Idle speed adjustment



THROTTLE VALVE INSTALLATION

Install the jet needle into the throttle valve and secure with the retainer.
Assemble the throttle cable, carburetor cap rubber seal and throttle valve spring.



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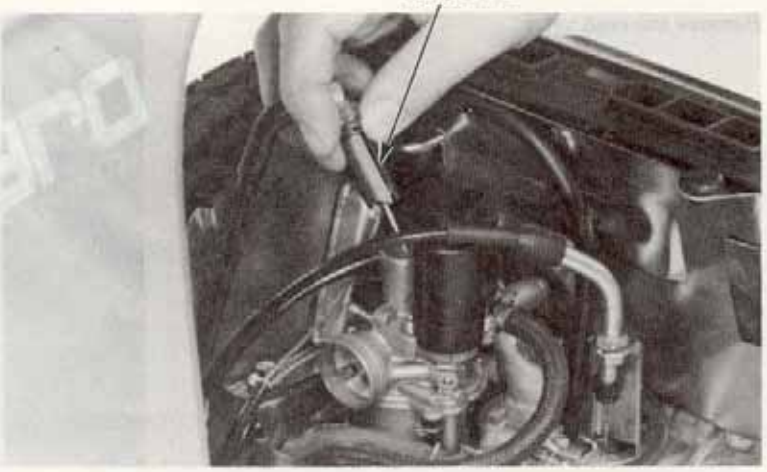
Connect the throttle cable to the throttle valve.
Slide the throttle valve into the carburetor body.

NOTE

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

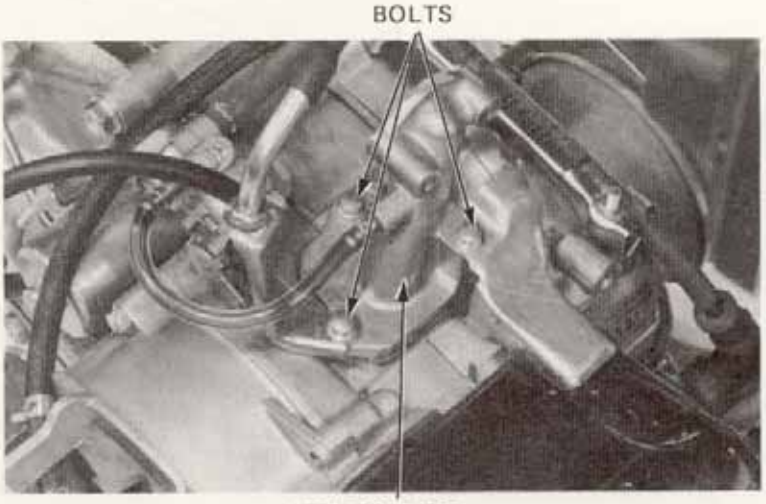


Tighten the carburetor top.
Install the air cleaner case and air duct.
Adjust throttle cable free play (page 3-8).

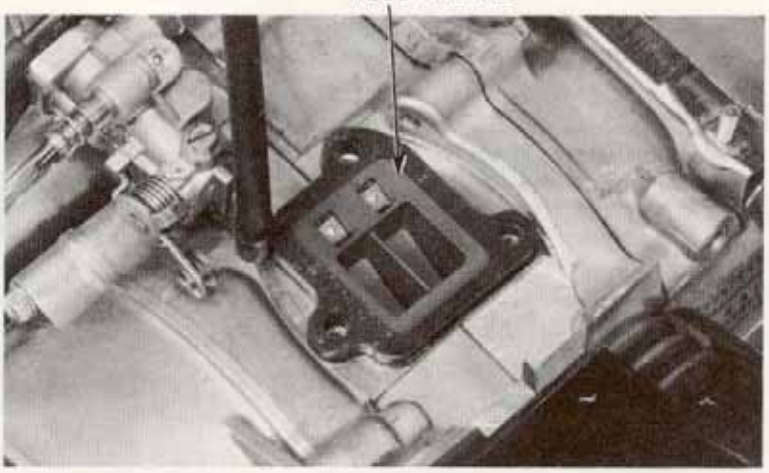
REED VALVE

REMOVAL

Remove the carburetor (page 4-3).
Remove the intake pipe by removing the three bolts.



Remove the reed valve.

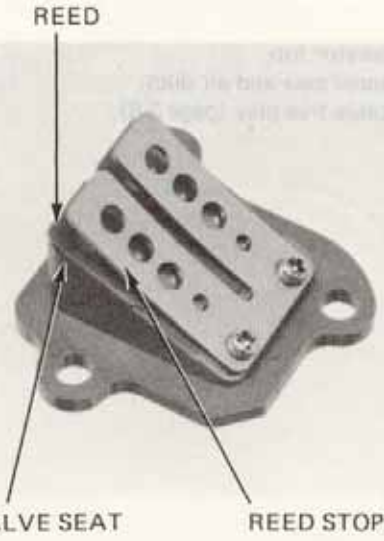


INSPECTION

Check the reed valve for damaged or weak reeds. Check the valve seat for cracks, damage or clearance between the seat and reed. Replace the valve if necessary.

CAUTION

Do not disassemble or bend the reed stopper. To do so can cause loss of power and engine damage. If the stopper, reed or valve seat is faulty, replace them as a unit.



INSTALLATION

The installation sequence is essentially the reverse order or removal.
After installation, check for secondary leaks.

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5. ENGINE REMOVAL/INSTALLATION

SERVICE INFORMATION

GENERAL

The engine must be removed to service the crankshaft.

SPECIFICATIONS

Engine weight	12 kg (26.5 lb)

TORQUE VALUES

Engine mounting bolts:	24–30 N·m (2.4–3.0 kg-m, 17–22 ft-lb)
Rear axle nut:	50–70 N·m (5.0–7.0 kg-m, 36–51 ft-lb)

ENGINE REMOVAL

Remove the rear skirt and engine cover (Section 10).
Remove the right and left body side cover (Section 10).

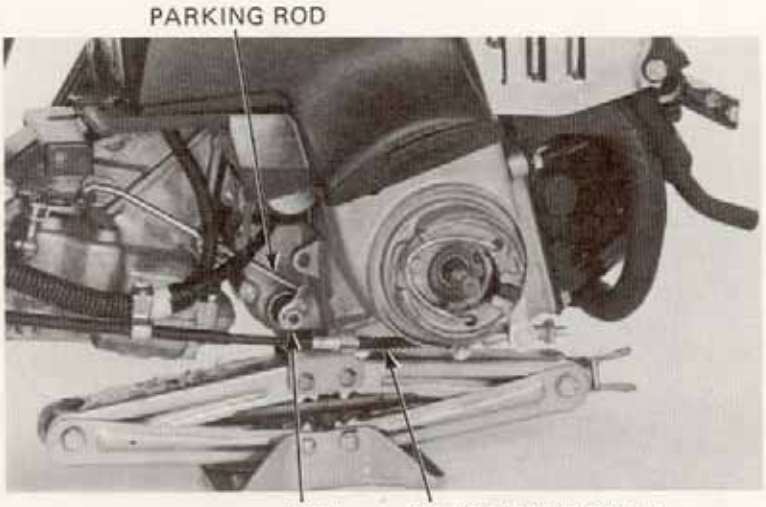
Raise the rear wheels by placing support blocks under the engine and the right and left frames rails.
Remove the rear wheels (Page 12-2).

Disconnect the battery ground cable from the battery negative terminal.

Remove the screw retaining the harness coupler box to the frame.
Disconnect the alternator, starter, and auto by-starter couplers and connectors.

Check that the parking lock lever is pressed down to the RELEASE position; disconnect the parking rod by removing the rod nut.

Disconnect the right and left rear brake cables.



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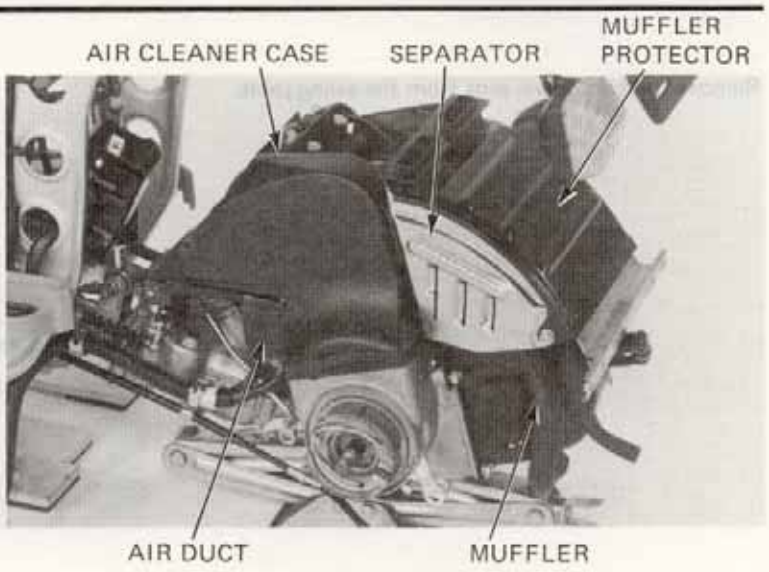
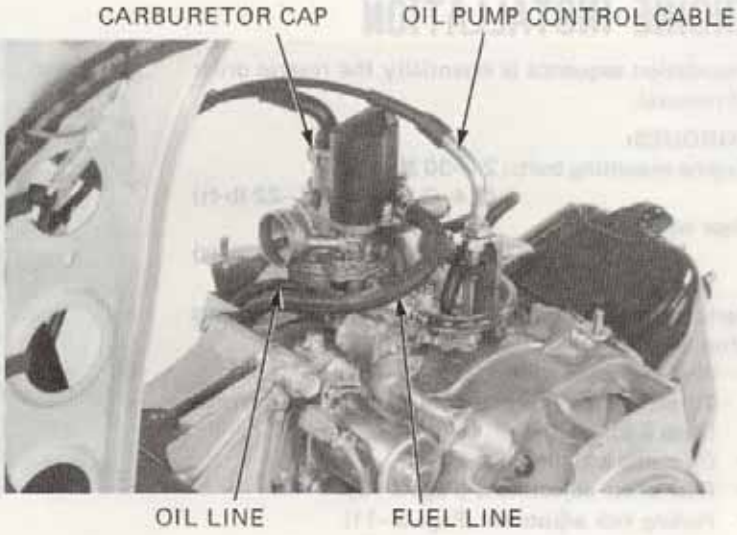
Remove the air duct.
Remove the muffler protector and muffler (Page 6-2).
Remove the air cleaner case (Page 2-2).
Remove the separator (Page 6-2).



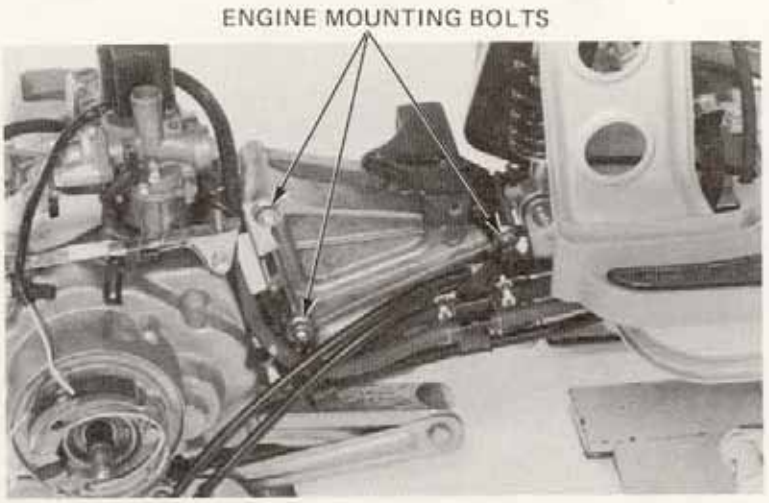
Turn the fuel valve OFF and disconnect the fuel line at the carburetor.

Disconnect the oil lines from the oil pump and allow the oil to drain into a clean container.

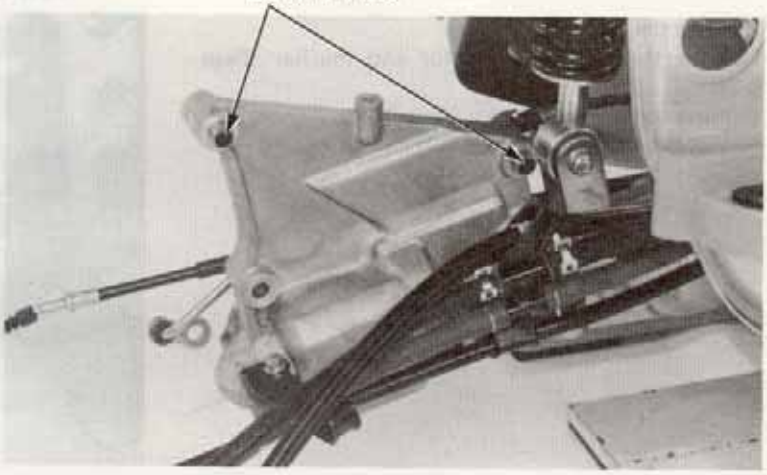
Disconnect the oil pump control cable from the oil pump.
Remove the carburetor cap.



Unscrew the three engine mounting bolts, and remove the engine from the frame.



Remove the two dowel pins from the swing joint.



ENGINE INSTALLATION

Installation sequence is essentially the reverse order of removal.

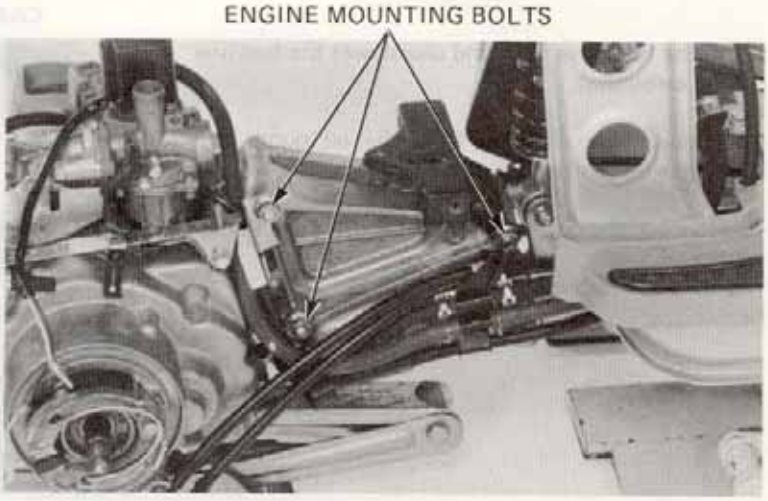
TORQUES:

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

Rear wheel nuts: 50–70 N·m (5.0–7.0 kg-m, 36–51 lb-ft)

Perform the following inspections and adjustments after installation:

- Wire and cable routing (Page 1-7).
- Throttle and oil pump control cable adjustments (Page 3-8).
- Oil pump bleeding (Page 2-4).
- Rear brake adjustment (Page 3-10).
- Parking lock adjustment (Page 3–11).



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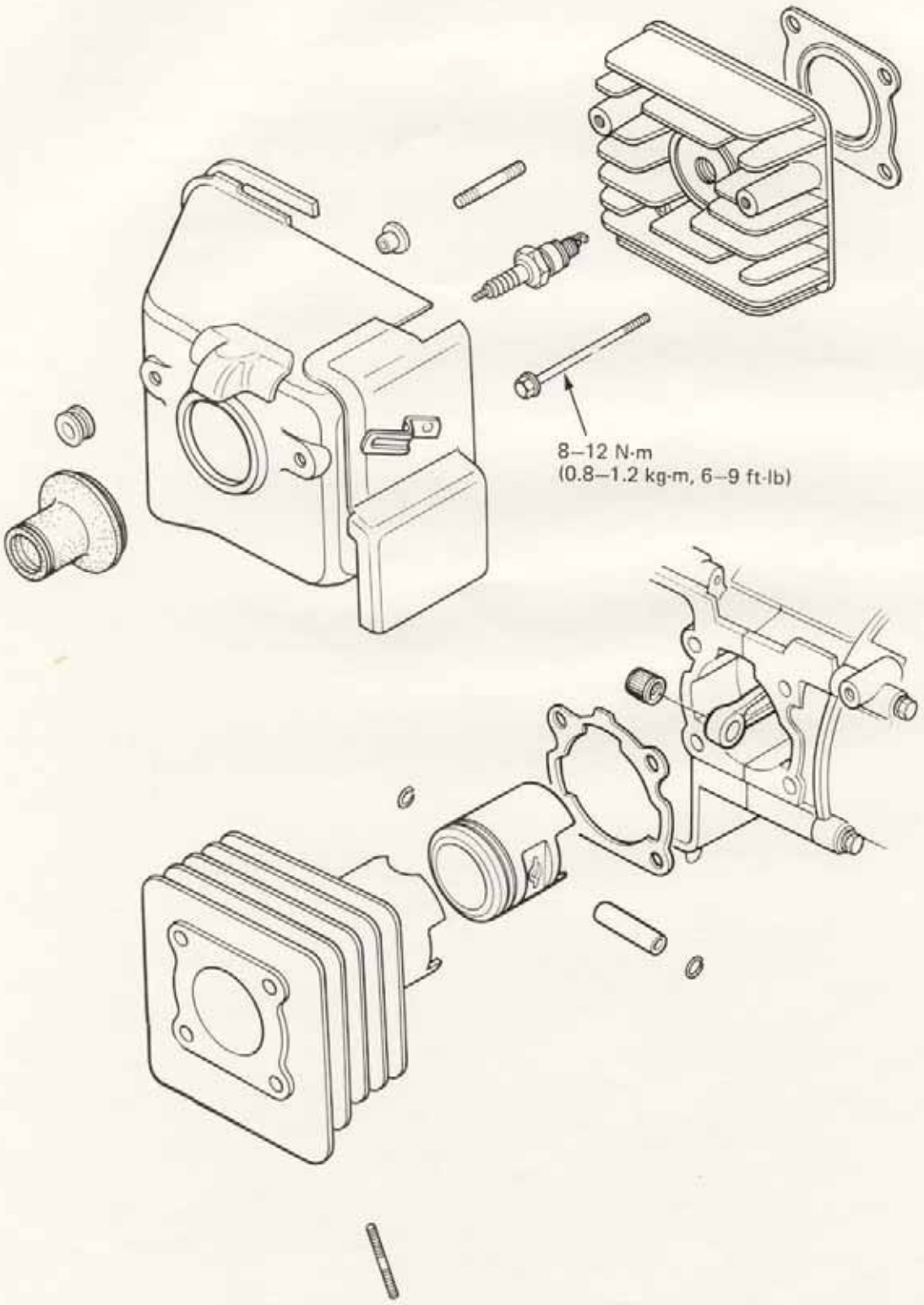

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6. CYLINDER HEAD/CYLINDER/PISTON

SERVICE INFORMATION

GENERAL

- All cylinder head, cylinder and piston service can be done with the engine installed in the frame.
- Before disassembly, clean the engine to prevent dirt and dust from entering the cylinder and crankcase.
- Remove all gasket material from the mating surfaces of the cylinder head, cylinder and crankcase.
- Use caution when disassembling and assembling the cylinder head, cylinder and piston to avoid damaging them.
- Clean all disassembled parts thoroughly before inspection. Coat all sliding surfaces with clean 2-stroke injector oil before assembly.

SPECIFICATIONS

ITEM	STANDARD mm (in)	SERVICE LIMIT mm (in)
Cylinder head warpage	–	0.10 (0.004)
Cylinder bore	41.000–41.020 (1.6142–1.6150)	41.050 (1.6161)
Piston O.D. (4 mm from bottom of piston skirt)	40.955–40.970 (1.6124–1.6130)	40.900 (1.6102)
Cylinder-to-piston clearance	0.035–0.050 (0.0013–0.0019)	0.10 (0.004)
Piston pin hole I.D.	10.002–10.008 (0.3938–0.3940)	10.025 (0.3947)
Piston pin O.D.	9.994–10.000 (0.3935–0.3937)	9.980 (0.3929)
Piston-to-piston pin clearance	0.002–0.014 (0.0001–0.0006)	0.030 (0.0012)
Piston ring end gap (top, second)	0.10–0.25 (0.004–0.01)	0.50 (0.02)
Connecting rod small end I.D.	14.005–14.015 (0.5514–0.5518)	14.025 (0.552)

TORQUE VALUE

Cylinder head bolt 8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)

TROUBLESHOOTING

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

Compression too high, overheating or knocking
1. Excessive carbon build-up in cylinder head or on top of piston

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

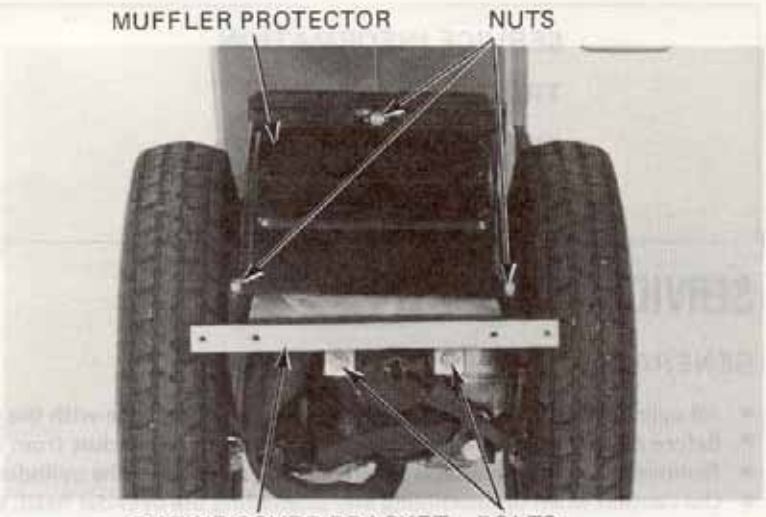
Abnormal noise
1. Worn, stuck or broken piston rings
2. Worn or damaged cylinder

CYLINDER HEAD

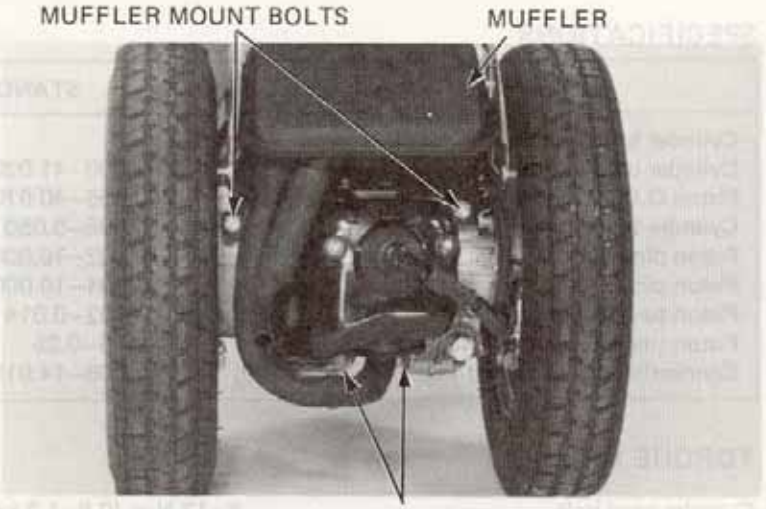
MUFFLER/SEPARATOR REMOVAL

Remove the two bolts and a nut attaching the muffler protector, and remove the muffler protector.

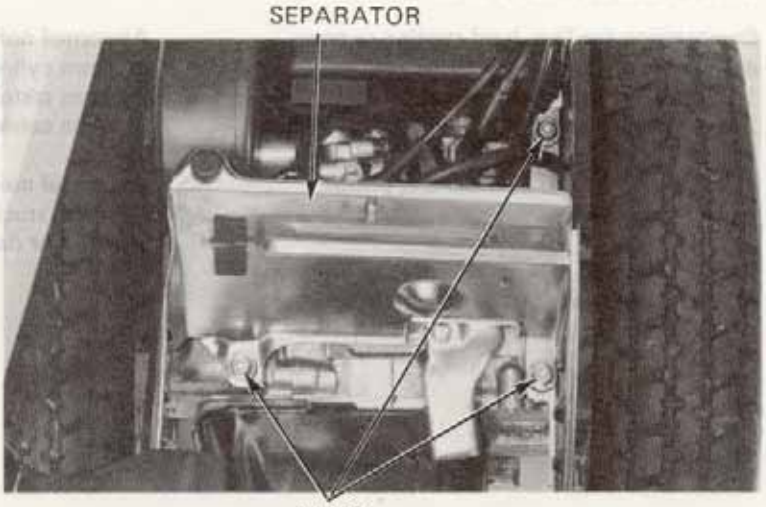
Remove the two nuts attaching the engine cover bracket, and remove the engine cover bracket.



Remove the two bolts and two exhaust pipe joint nuts and remove the muffler.



Remove the separator by removing the three attaching nuts.



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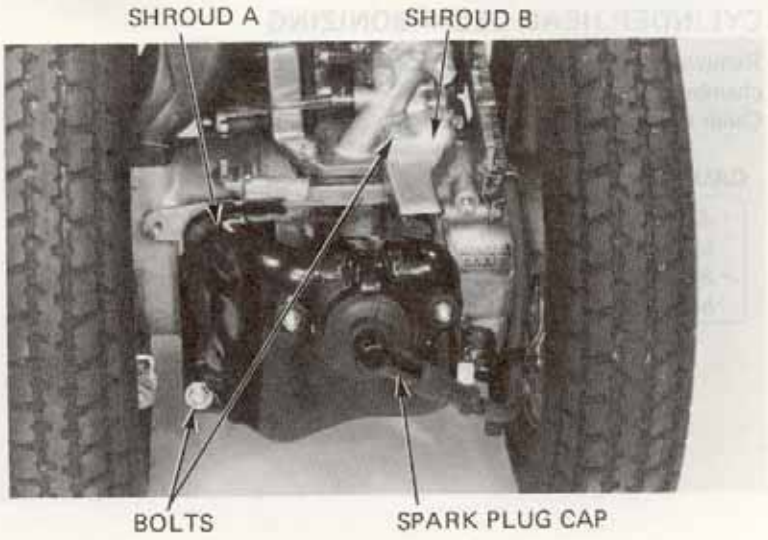
CYLINDER HEAD REMOVAL

Remove the following:
- right rear wheel.
- muffler and separator (Page 6-2).
- spark plug.
- shroud B by removing a mounting bolt.
- shroud A by removing a mounting bolt.

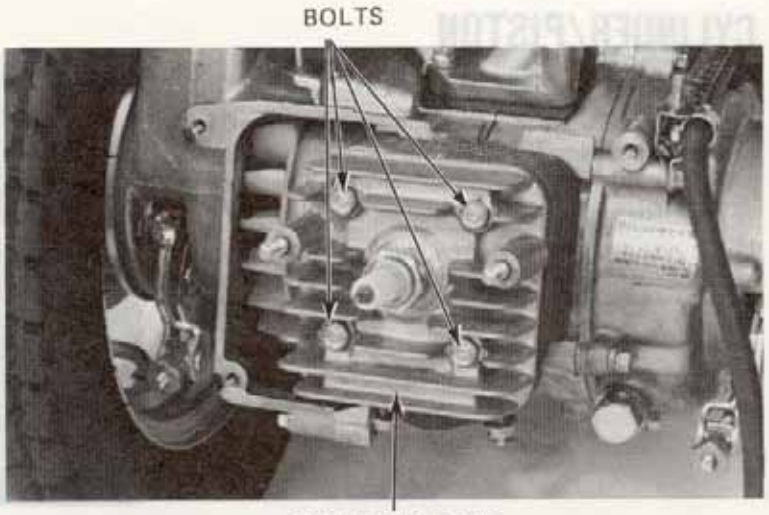


Remove the four cylinder head attaching bolts and remove the cylinder head.

Remove the cylinder gasket.

NOTE

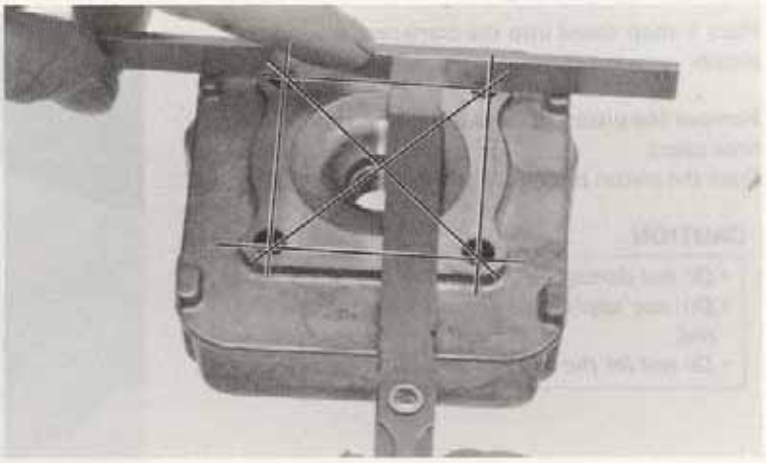
Loosen the cylinder head bolts in a crisscross pattern in 2-3 steps.



CYLINDER HEAD INSPECTION

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

SERVICE LIMIT: 0.10 mm (0.004 in)

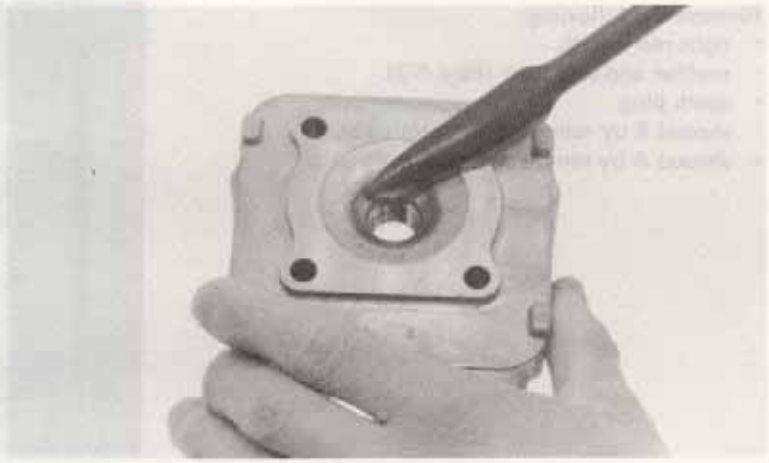


CYLINDER HEAD DECARBONIZING

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

CAUTION

- *Avoid damaging the combustion chamber wall and gasket surfaces.*
- *Remove carbon deposits from the piston head.*



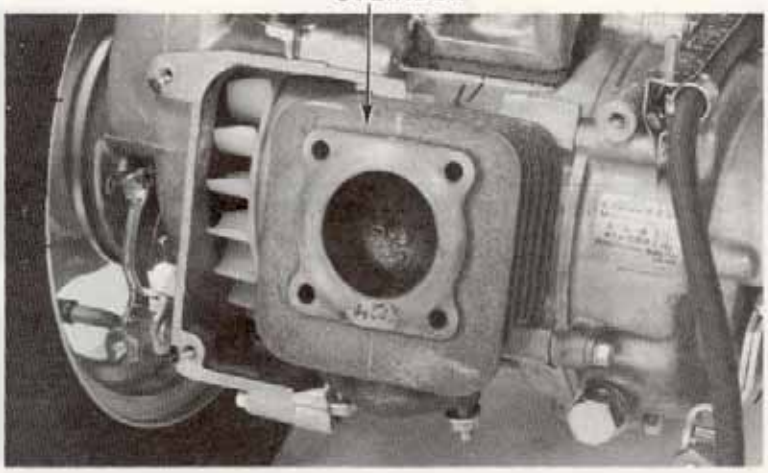
CYLINDER/PISTON

CYLINDER REMOVAL

Remove the cylinder and cylinder gasket, being careful not to damage the piston.

CAUTION

Do not pry between the cylinder and crankcase or strike the fins.



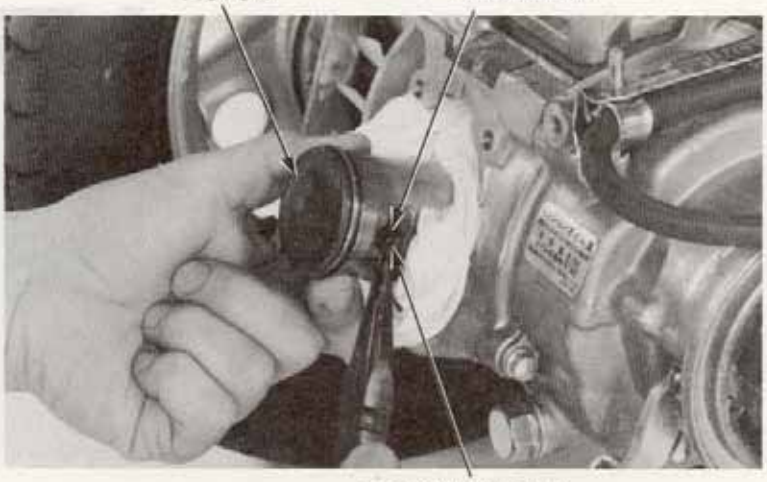
PISTON REMOVAL

Place a shop towel into the crankcase around the piston.

Remove the piston pin clip using a pair of needle-nose pliers.
Press the piston pin out of the piston.

CAUTION

- *Do not damage or scratch the piston.*
- *Do not apply side force to the connecting rod.*
- *Do not let the clip fall into the crankcase.*



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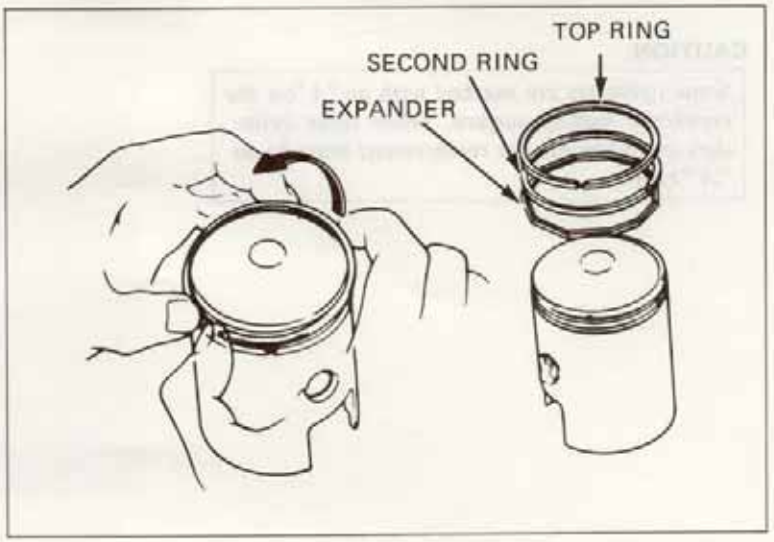
PISTON RING/EXPANDER REMOVAL

Remove the piston rings.

NOTE

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

Remove the expander.



CYLINDER/PISTON INSPECTION

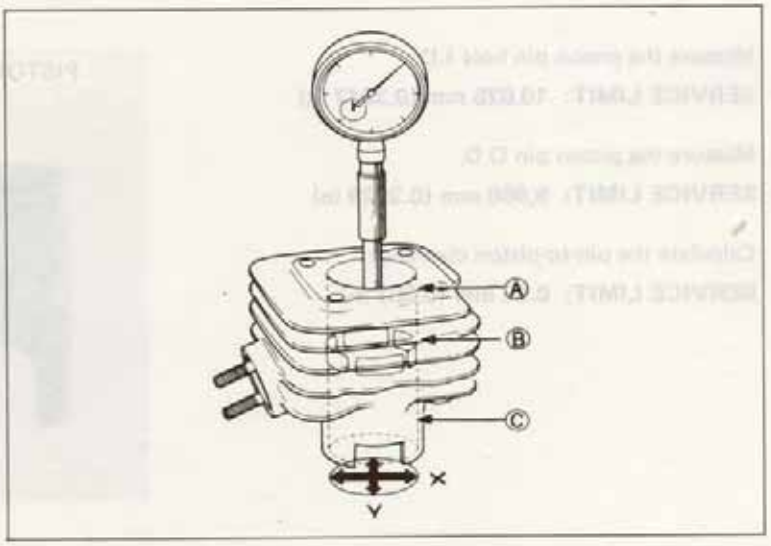
Check the cylinder and piston for wear or damage. Clean carbon deposits from the exhaust port area.

CAUTION

Do not scratch or score the cylinder liner.

Inspect the cylinder bore for wear at three levels in X and Y directions. Use the largest measurement to determine the amount of cylinder wear.

SERVICE LIMIT: 41.050 mm (1.616 in)



CAUTION

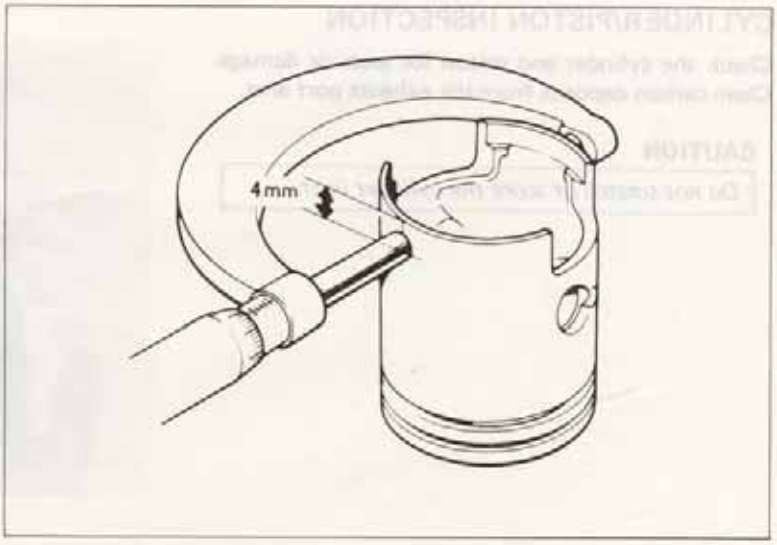
Some cylinders are marked with an "A" on the crankcase mating surface. When these cylinders are replaced, the replacement must be an "A" type.

Measure the piston O.D. at a point 4 mm (0.16 in) from the bottom of the skirt.

SERVICE LIMIT: 40.90 mm (1.610 in)

Calculate the piston-to-cylinder clearance.

SERVICE LIMIT: 0.10 mm (0.004 in)



Measure the piston pin hole I.D.

SERVICE LIMIT: 10.025 mm (0.3947 in)

Measure the piston pin O.D.

SERVICE LIMIT: 9,980 mm (0.3929 in)

Calculate the pin-to-piston clearance.

SERVICE LIMIT: 0.03 mm (0.001 in)

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PISTON RING INSPECTION

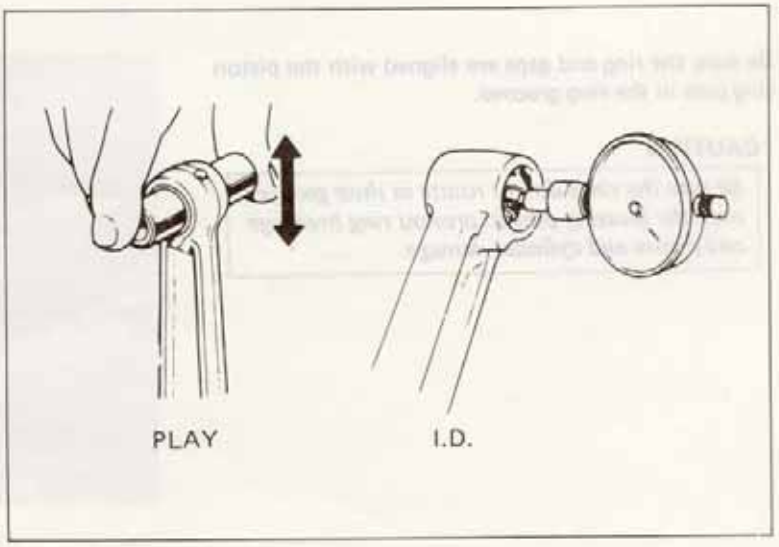
Measure each piston ring end gap with a feeler gauge.

SERVICE LIMITS:
Top/Second: 0.50 mm (0.020 in)

CONNECTING ROD INSPECTION

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

SERVICE LIMIT: 14.025 mm (0.5522 in)



PISTON/CYLINDER INSTALLATION

Clean the gasket surfaces of the cylinder and crankcase.

Install the expander in the second ring groove.
Align the ring ends with the locating pins in the ring grooves.

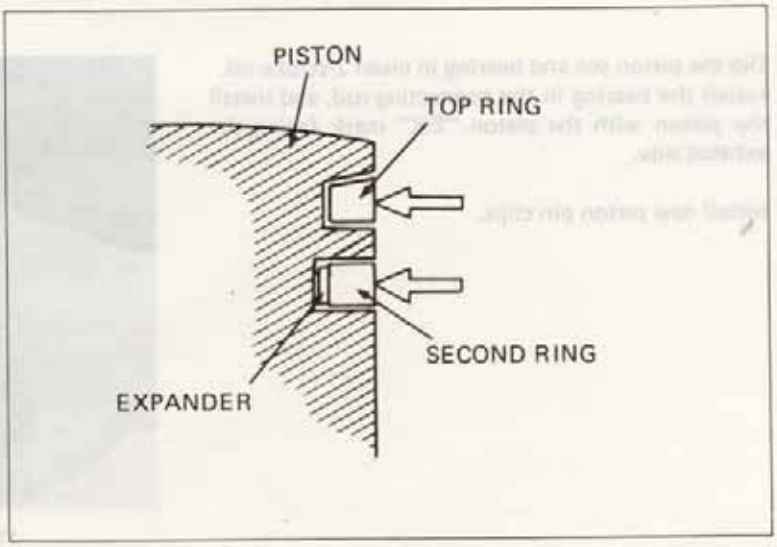
Install the top and second rings in their respective ring grooves with the marking facing up.

NOTE

The top ring is a keystone ring and is not interchangeable with the square second ring.

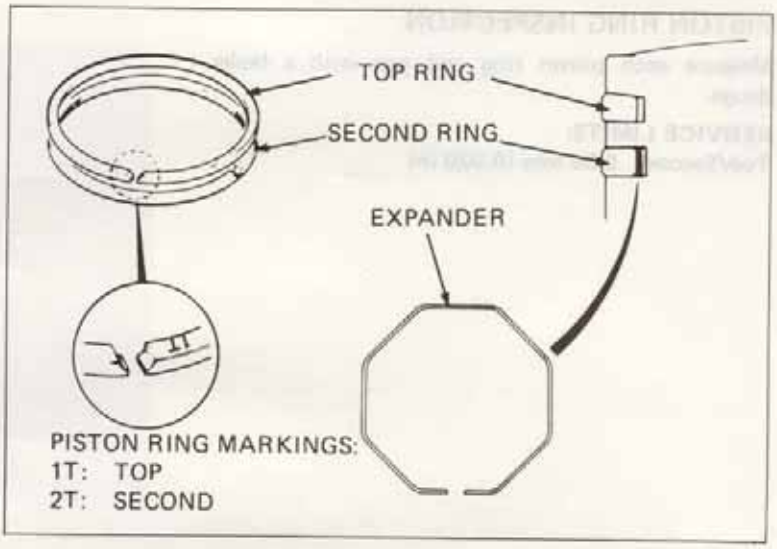
Check the fit of each ring in the ring groove by pressing the ring into the groove to make sure that it is flush with the piston at several points around the ring.

A ring that will not compress means that the ring groove is dirty and should be cleaned or that the wrong ring is in the groove.



NOTE

Do not replace one ring without replacing the other.



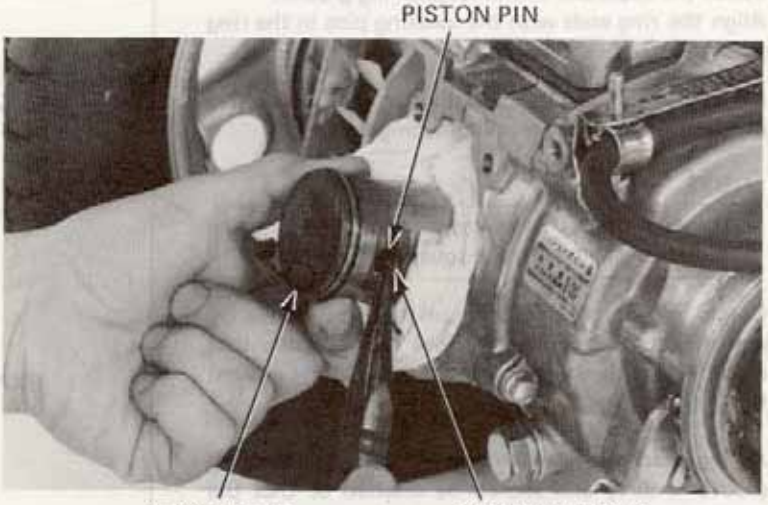
Be sure the ring end gaps are aligned with the piston ring pins in the ring grooves.

CAUTION

Be sure the rings do not rotate in their grooves over the locating pins to prevent ring breakage and piston and cylinder damage.

Dip the piston pin and bearing in clean 2-stroke oil. Install the bearing in the connecting rod, and install the piston with the piston "EX" mark facing the exhaust side.

Install new piston pin clips.



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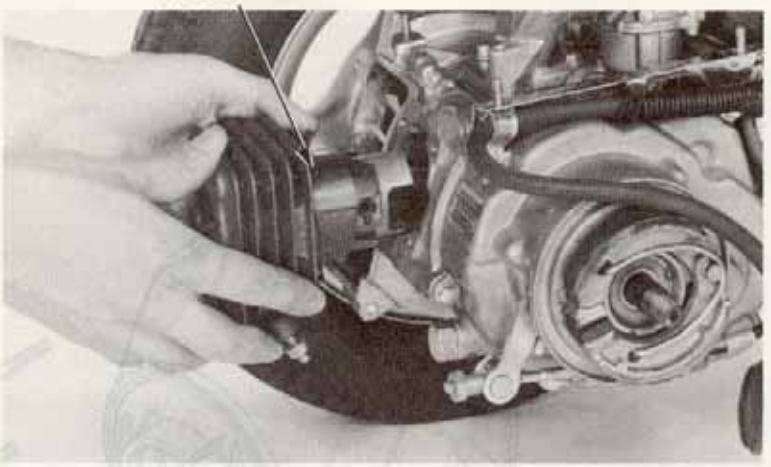
Remove the shop towel from the crankcase.
Install a new cylinder gasket on the crankcase.

Lubricate the piston and cylinder with 2-stroke oil and install the cylinder over the piston while compressing the piston rings.

CAUTION

Be careful not to scratch the piston sliding surface.



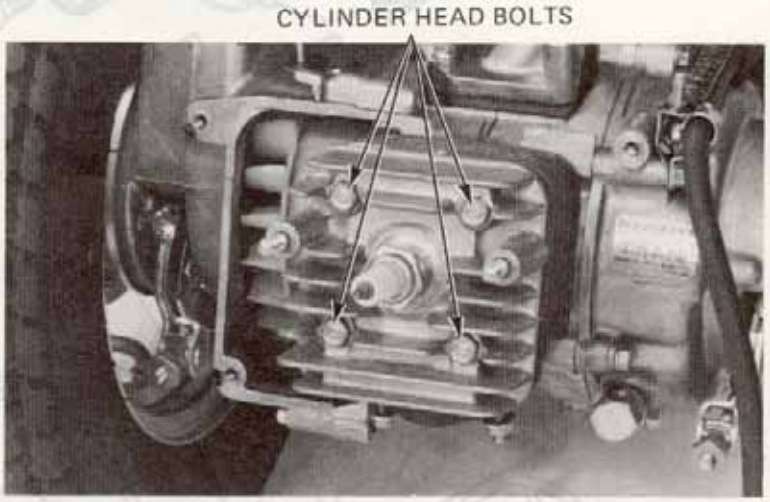
CYLINDER HEAD INSTALLATION

Install the cylinder head on the cylinder with a new cylinder head gasket.
Install and tighten the four cylinder head bolts.

TORQUE: 4–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)

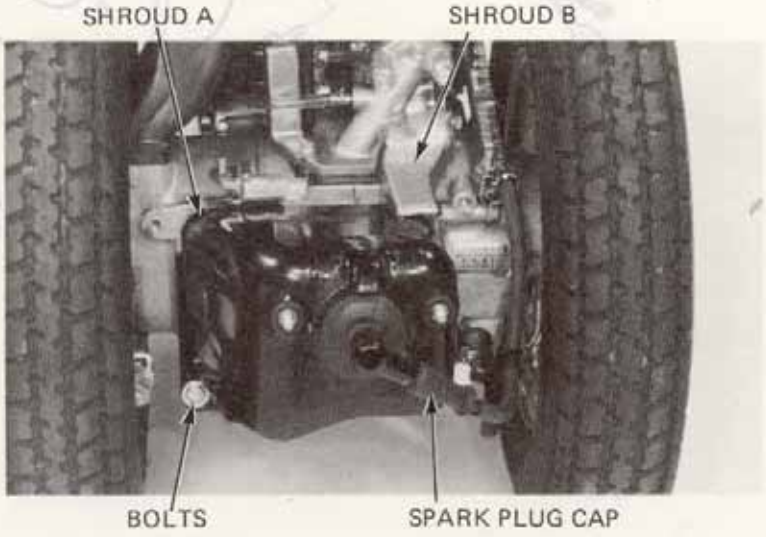
NOTE

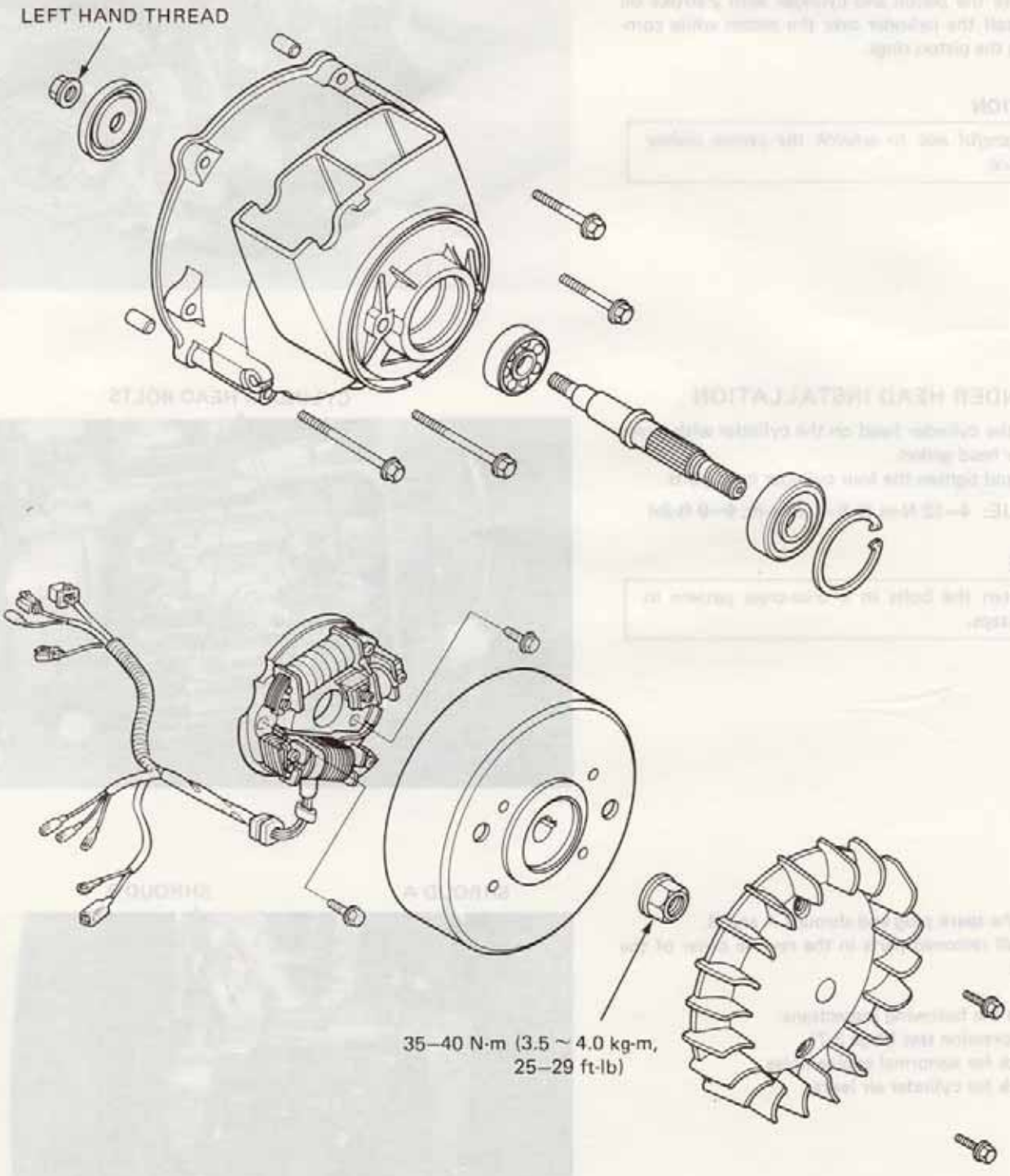
Tighten the bolts in a criss-cross pattern in 2-3 steps.



Install the spark plug and shrouds A and B.
Install all removed parts in the reverse order of the removal.

Perform the following inspections:
- Compression test (Page 3-7).
- Check for abnormal engine noise.
- Check for cylinder air leaks.





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SERVICE INFORMATION

GENERAL

- Do not remove the pulse generator from the stator base.
- See Chapter 15 for alternator inspection.

TORQUE VALUE

Flywheel nut	35–40 N·m (3.5–4.0 kg-m, 25–29 ft-lb)

TOOLS

Common

Flywheel Puller	07733–0010000 or 07933–0010000
Universal Holder	07725–0030000
Driver	07749–0010000
Attachment 24 x 26 mm	07746–0010700 or Pilot, 25 mm 007746–0040600 (U.S.A. only)
Pilot, 10 mm	07746–0040100
Driver	07746–0020100

LEFT CRANKCASE REMOVAL

Remove the engine cover, the left rear wheel, and the air duct.

Remove the muffler, separator, and shrouds (Page 6-2).
Disconnect the left rear brake cable.
Remove the five bolts and the left crankcase cover.

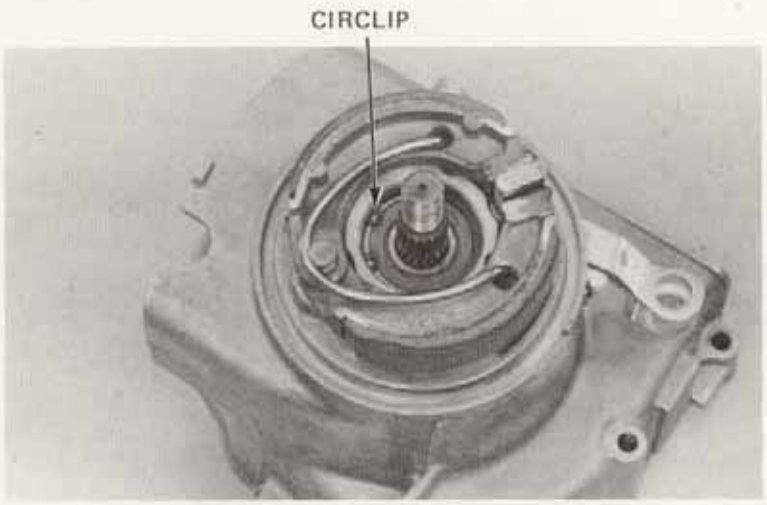
LEFT CRANKCASE COVER DISASSEMBLY

Install the left crankcase cover on the rear wheel; remove the nut and bearing cap.

NOTE

The nut has left-hand threads.

Pry off the circlip.



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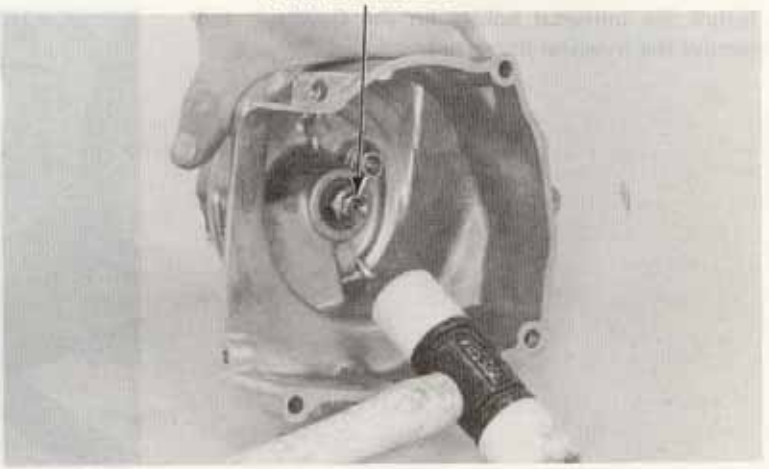
Heat the case around the bearing.

CAUTION

Wear gloves to protect your hands when handling the heated case.

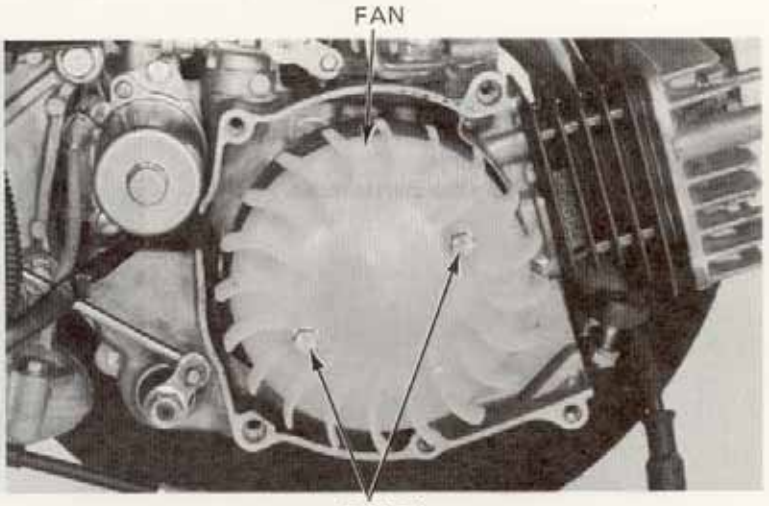
Thread the nut onto the final drive shaft just enough to cover the end of the shaft, and carefully drive the shaft and bearing out of the crankcase cover using a plastic hammer.



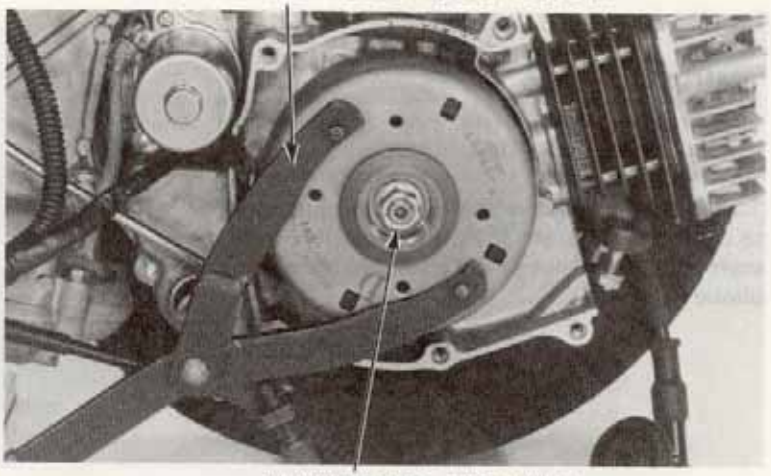
Remove the inner bearing.

ALTERNATOR REMOVAL

Remove the left crankcase cover (Page 7-2).
Remove the cooling fan.



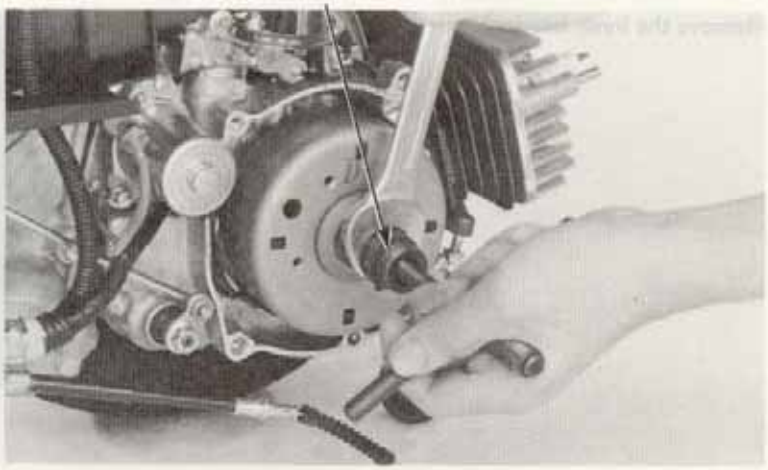
Install the universal holder on the flywheel, and remove the flywheel flange nut.



Remove the flywheel.

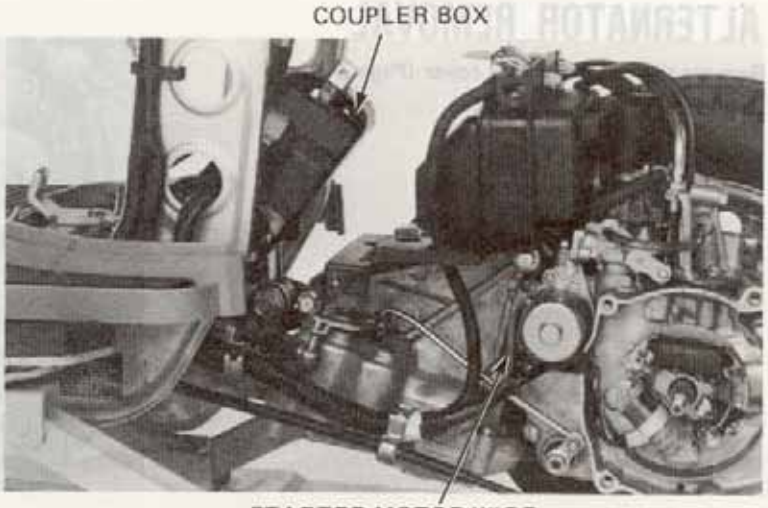
NOTE

Be careful not to misplace the woodruff key.



Remove the left body side cover.

Unscrew the screw attaching the coupler box, and disconnect the alternator, auto bystarter and ignition coil couplers and wires.
Disconnect the cables from the starter motor.



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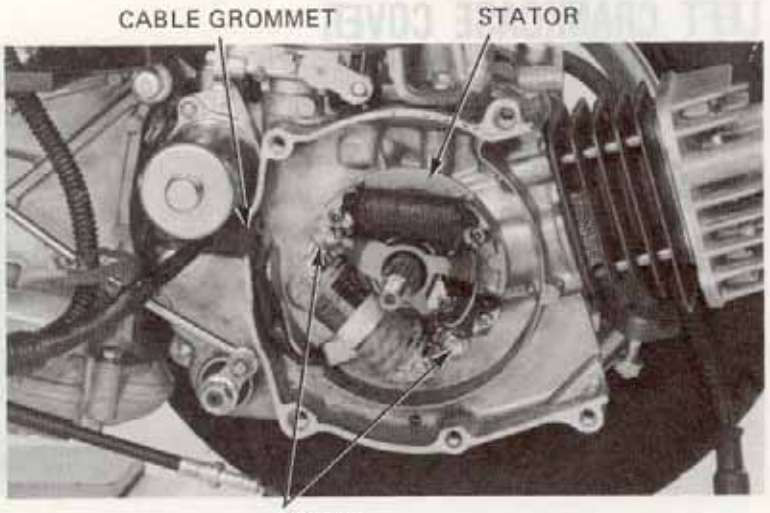
Remove the two bolts attaching the stator to the crankcase and remove the stator.

NOTE

- Do not remove the pulse generator from the stator base.
- Avoid damaging the stator coils.

Inspect the alternator (Section 15).



ALTERNATOR INSTALLATION

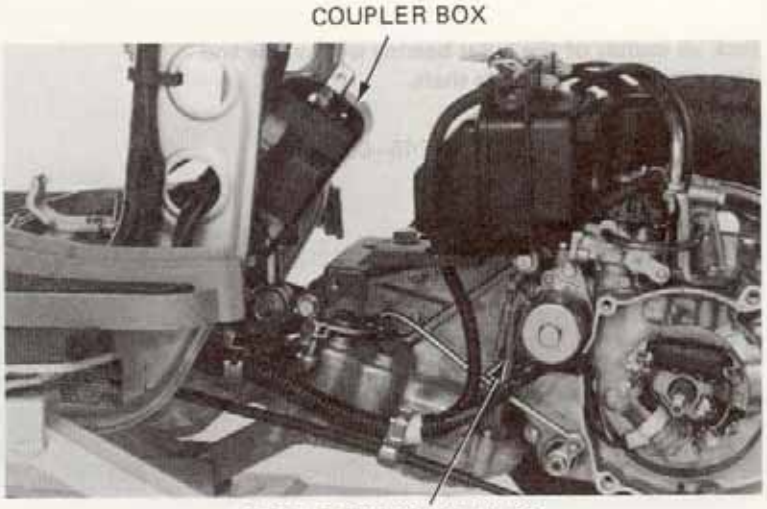
Install the stator in the crankcase aligning the cable grommet with the groove in the crankcase.

Install and tighten the two stator bolts.

Connect the alternator, auto bystarter and ignition coil couplers and connectors.
Connect the starter cables to the starter motor.

NOTE

Route and secure the cables and wires properly (Page 1-7).



Install the woodruff key in the crankshaft keyway.

NOTE

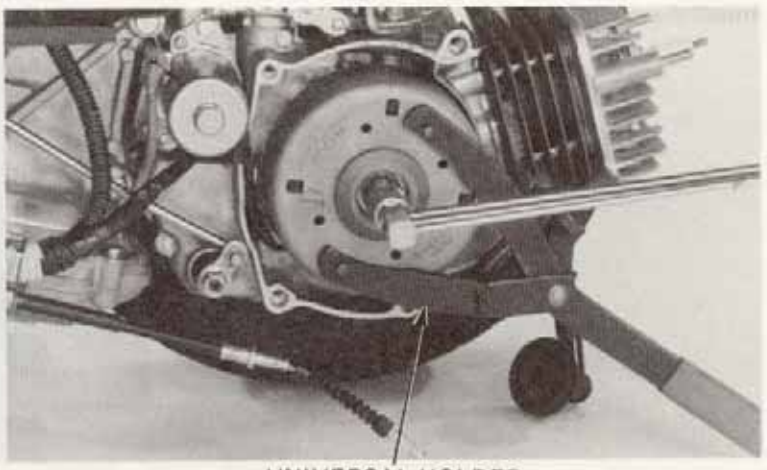
Clean the inside and taper hole of the flywheel of any burrs and foreign particles.

Install the flywheel on the crankshaft.

Hold the flywheel with the universal holder and torque the nut.

TORQUE: 35–40 N·m (3.5–4.0 kg·m, 25–29 ft·lb)

Install the fan and tighten the two fan bolts.

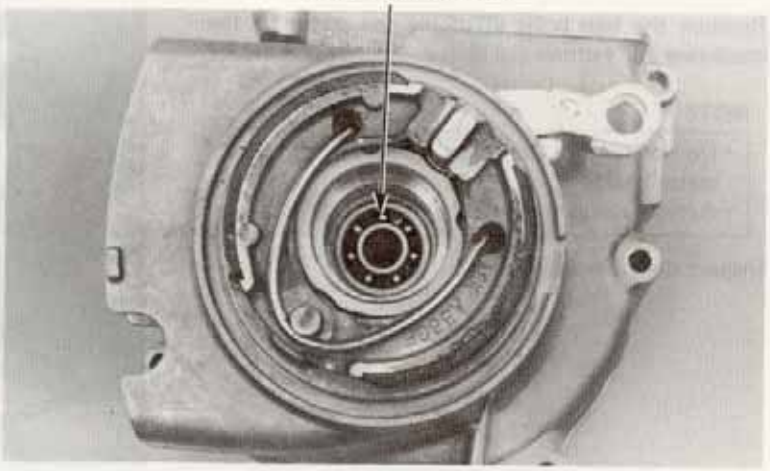


LEFT CRANKCASE COVER ASSEMBLY

Pack all cavities of the inner bearing with grease, and drive it into the left crankcase cover.

TOOLS:

Driver	07749–0010000
Pilot, 10 mm	07746–0040100
Attachment, 24 x 26 mm	07746–0010700
or	
Driver	07749–0010000 and
Pilot, 25 mm	00746–0040600 (U.S.A. only)

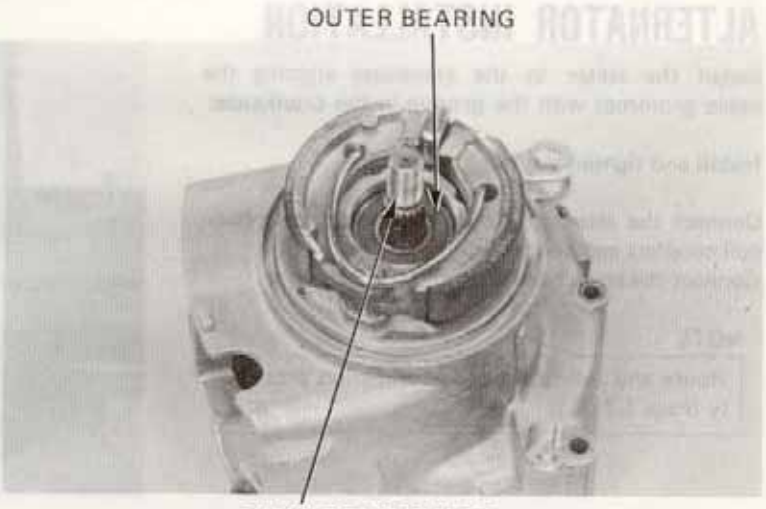


Pack all cavites of the outer bearing with grease and drive it onto the final drive shaft.

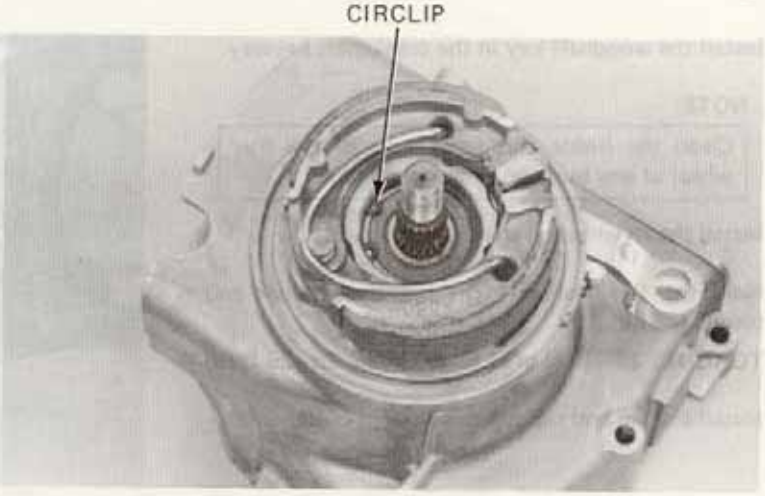
TOOL:

Driver	07746–0020100

Install the final drive shaft.



Install the circlip.



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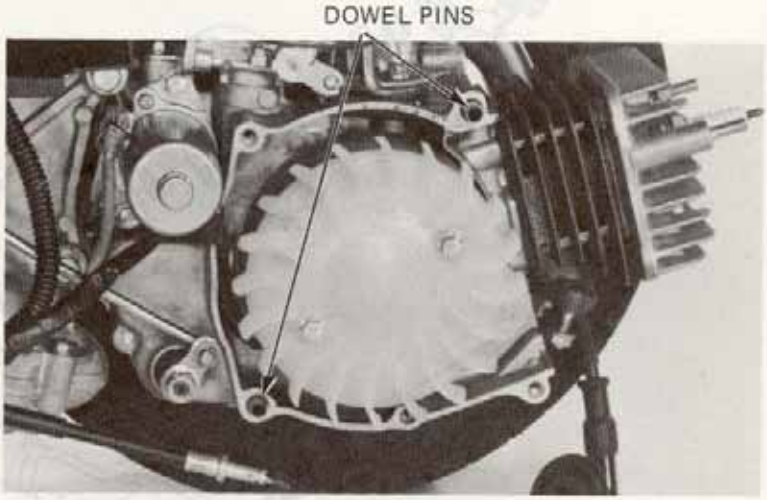
Install the bearing cap.
Install the rear wheel on the left crankcase cover and tighten the nut.

NOTE

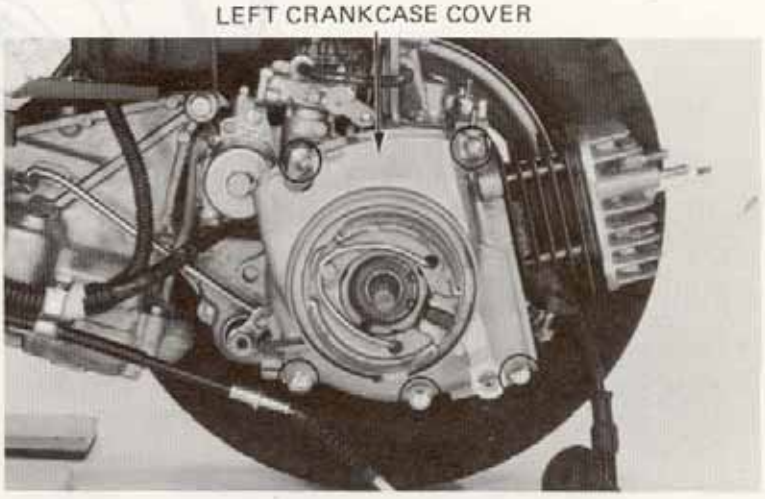
The nut has left hand threads.

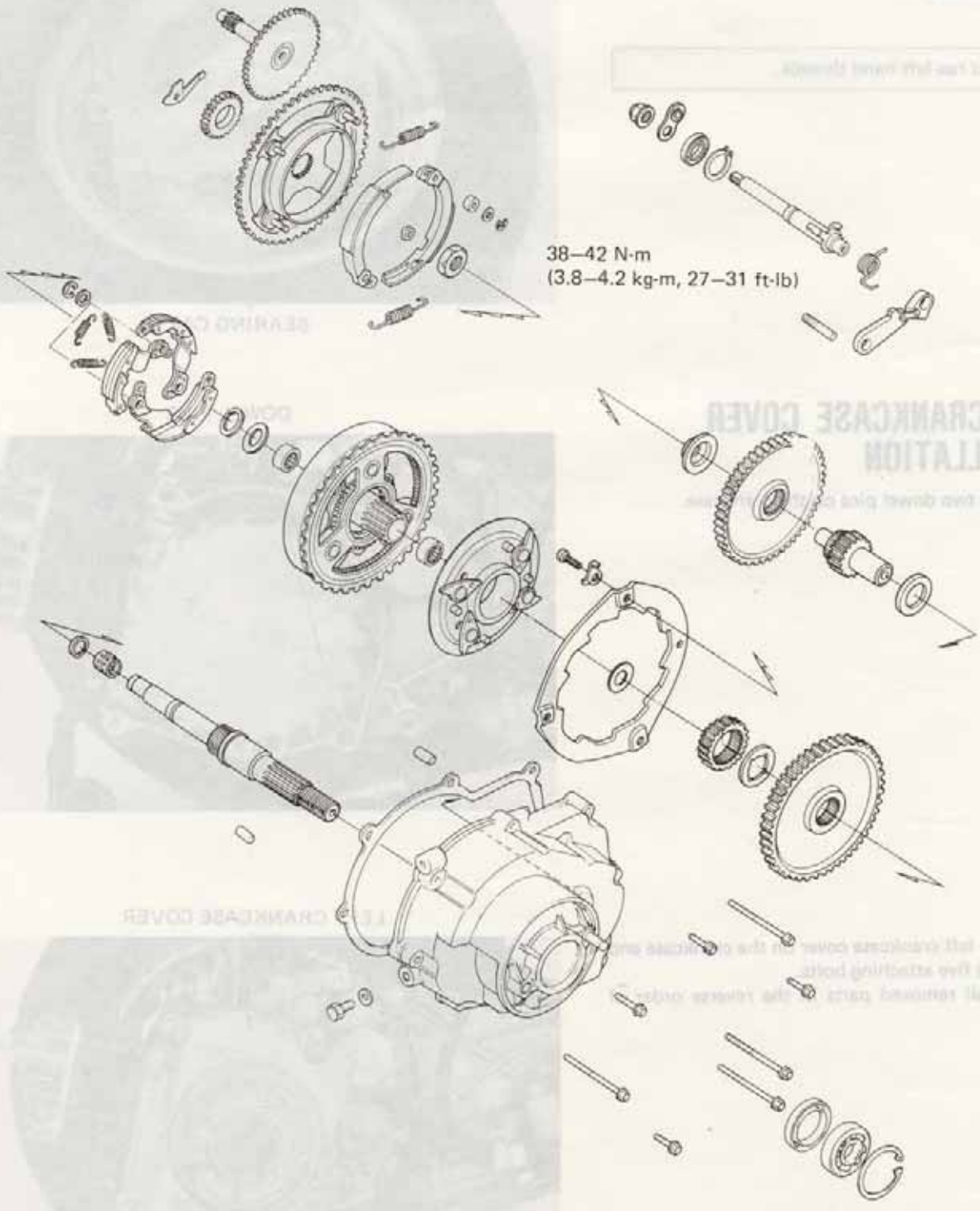
LEFT CRANKCASE COVER INSTALLATION

Install the two dowel pins on the crankcase.



Install the left crankcase cover on the crankcase and tighten the five attaching bolts.
Reinstall all removed parts in the reverse order of removal.





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8. CLUTCH/FINAL REDUCTION

SERVICE INFORMATION

GENERAL

- All clutch/final reduction service can be done with the engine installed.

SPECIFICATIONS

ITEM		STANDARD mm (in)	SERVICE LIMIT mm (in)
Low clutch	Clutch outer I.D.	110.00–110.20 (4.331–4.339)	110.5 (4.35)
	Sun gear plate I.D.	23.00–23.03 (0.906–0.907)	23.1 (0.91)
	Clutch shoe thickness	1.5 (0.06)	1.0 (0.04)
	Clutch spring free length	43.1 (1.7)	44.1 (1.736)
Second clutch	Clutch shoe thickness	1.5 (0.06)	1.0 (0.04)
	Clutch spring free length	19.3 (0.76)	20.3 (0.78)
	Clutch outer I.D.	76.00–76.10 (2.992–2.996)	76.20 (3.0)
	Second drive plate I.D.	22.93–22.98 (0.903–0.905)	22.80 (0.898)

Specified oil	Honda 4-stroke oil SAE 10W-40 or equivalent
Oil quantity	150 cc (5.1 oz)

TORQUE VALUES

Oil drain bolt	8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)
Clutch	38–42 N·m (3.8–4.2 kg-m, 27–31 ft-lb)

TOOLS

Common

Clutch holder	07724–0050000 or Equivalent commercially available in U.S.A.
Driver	07749–0010000
Attachment, 32 x 35 mm	07746–0010100
Pilot, 15 mm	07746–0040300

Special

Bearing remover set, 12 mm	07936–1660001	Bearing remover, 12 mm	07936–1660100
		Remover weight	07741–0010201
		Remover weight	07936–3710200 (U.S.A. only)
Bearing remover, 15 mm	07936–KC10500 (U.S.A. only)		

TROUBLESHOOTING

Engine starts, but scooter won't move
1. Worn clutch lining
2. Worn clutch outer
3. Damaged clutch
4. Damaged or seized gear

Abnormal noise
1. Worn or seized gear
2. Worn bearing

Oil leaks
1. Oil level too high
2. Worn or damaged oil seal

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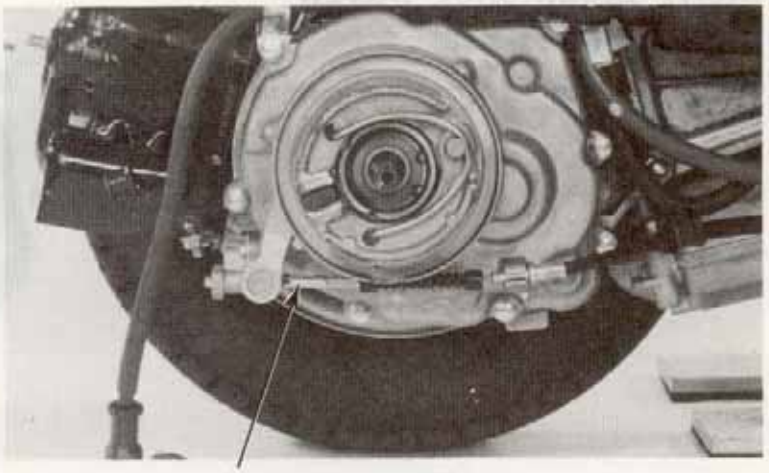
RIGHT CRANKCASE COVER REMOVAL

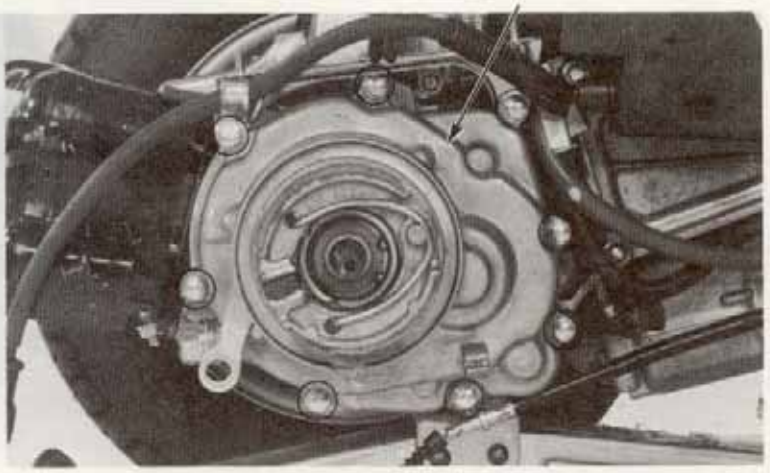
Remove the engine cover.
Remove the muffler and separator (Page 6-2).
Drain oil from the final reduction gear case (Page 3-6).
Remove the right rear brake cable.



RIGHT REAR BRAKE CABLE

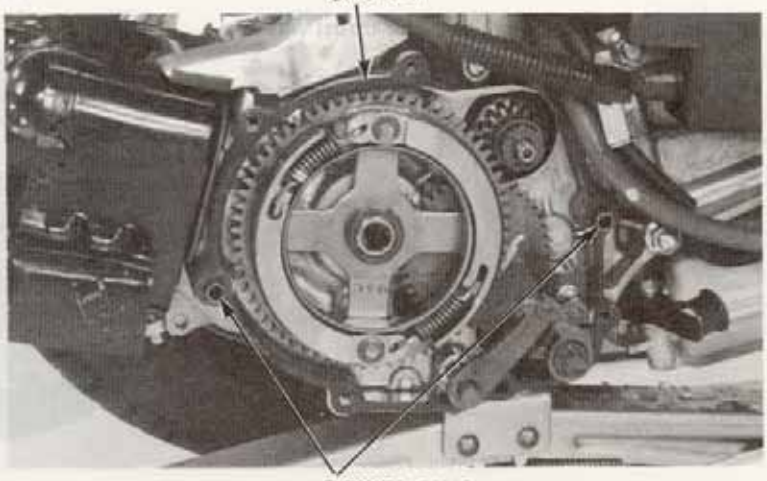
Support the motorcycle by placing supports or blocks under the engine and frame; lower the parking lock lever.

Remove the eight bolts attaching the right crankcase cover to the crankcase and remove the cover.



RIGHT CRANKCASE COVER

Remove the two dowel pins and the gasket.

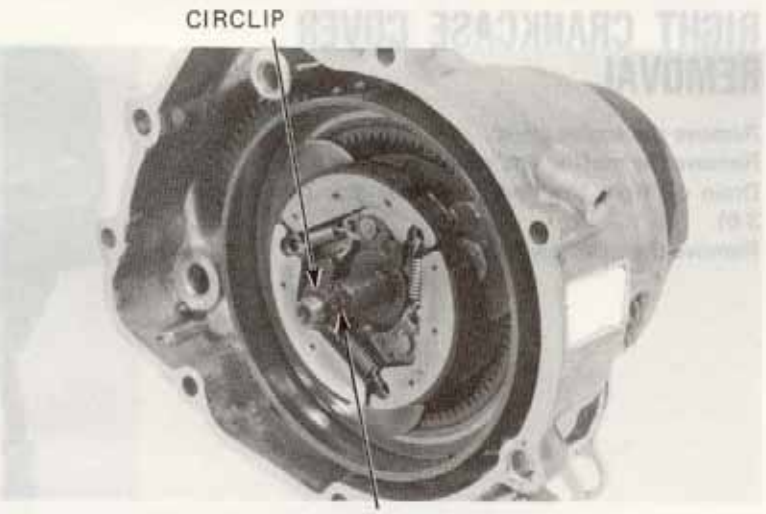


GASKET

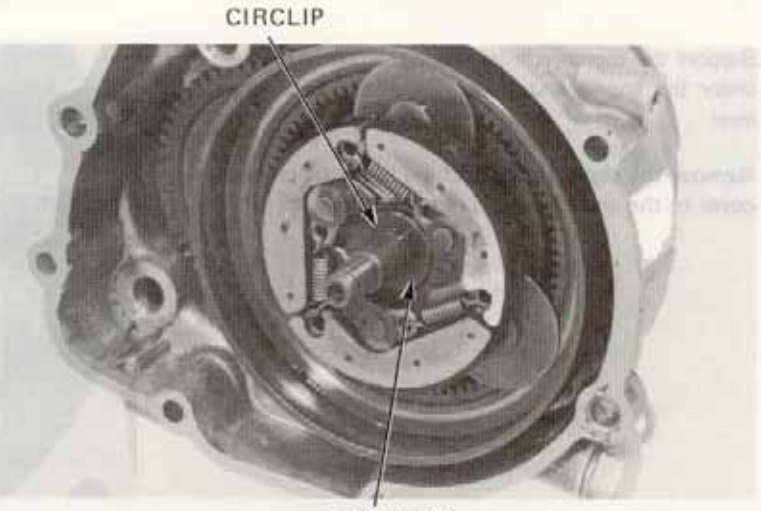
DOWEL PINS

RIGHT CRANKCASE COVER DISASSEMBLY

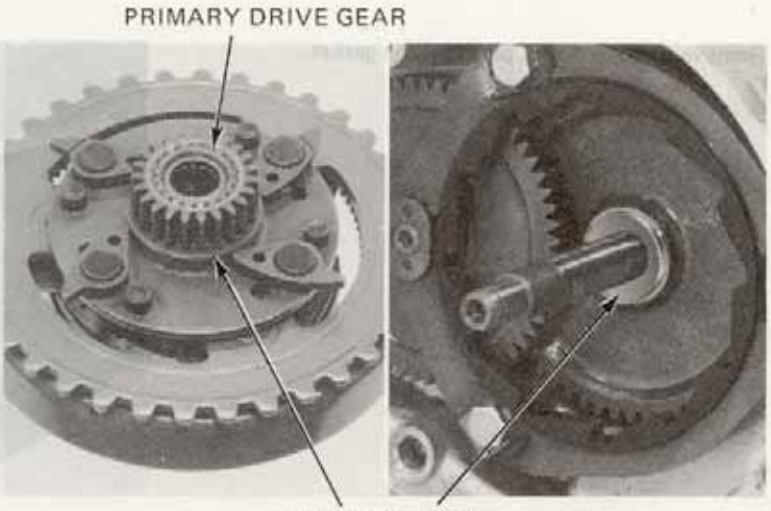
Pry off the circlip and remove the needle bearing and washer.



Remove the circlip and washer and take out the second clutch and low clutch outer as an assembly.



Remove the primary drive gear and thrust washer.



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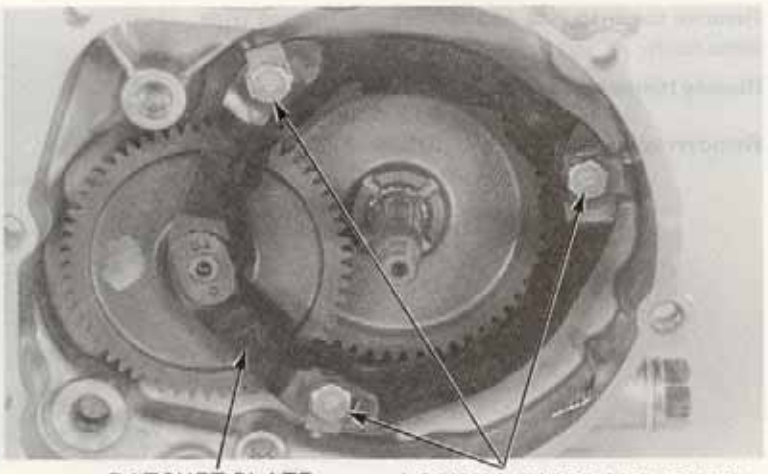
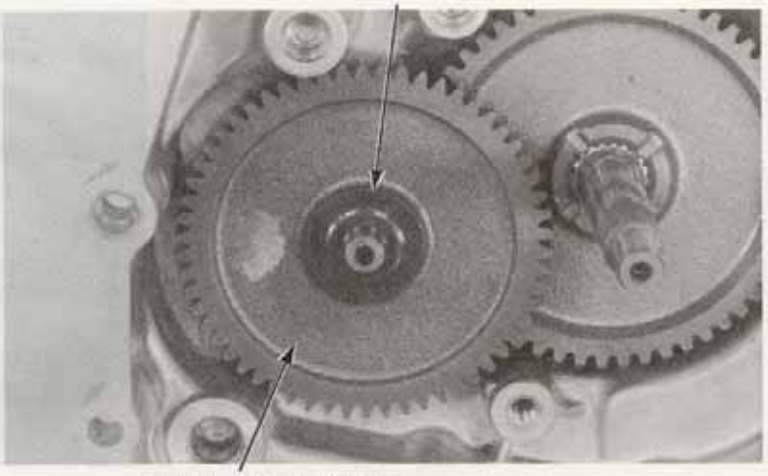
Straighten the tabs of the lock washers and remove the three bolts attaching the ratchet plate.
Remove the ratchet plate.



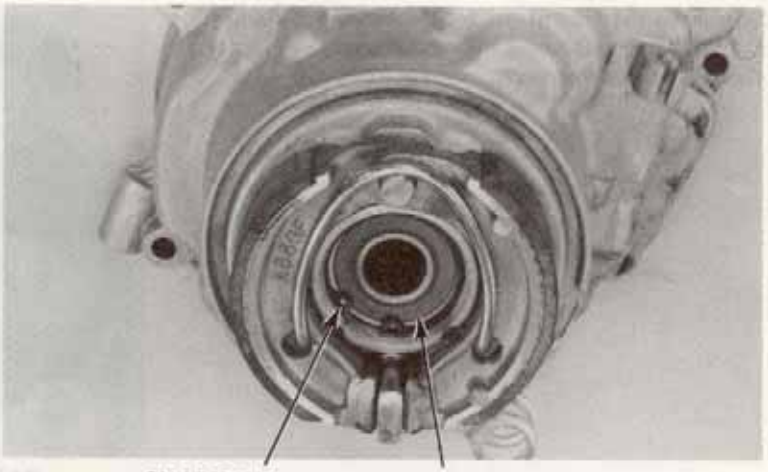
Remove the washer and primary driven gear.
Remove the final drive gear and thrust washer.



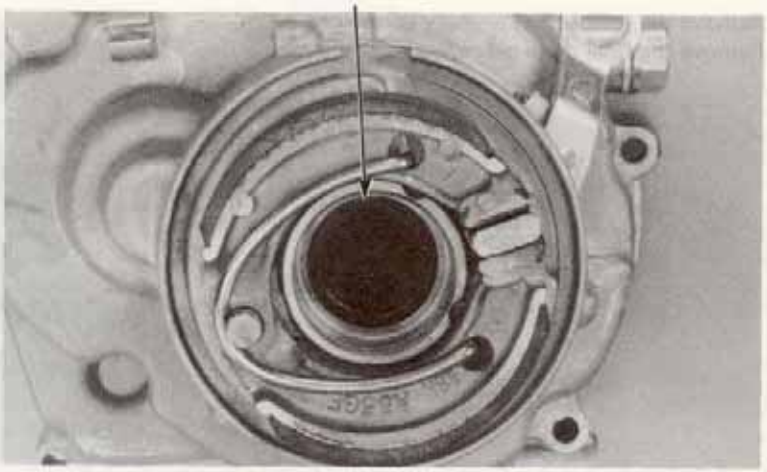
Remove the final driven gear and final drive shaft.

Remove the snap ring and remove the bearing with these tools:

Bearing remover, 15 mm	07936–KC10500 (U.S.A. only)
Remover weight	07936–3710200

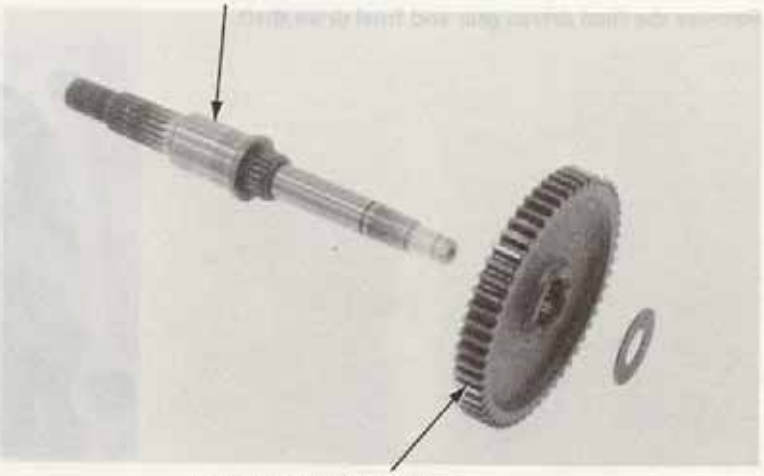


Remove the oil seal.



GEAR/GEAR SHAFT INSPECTION

Inspect the gears and gear shafts for signs of wear or damage.



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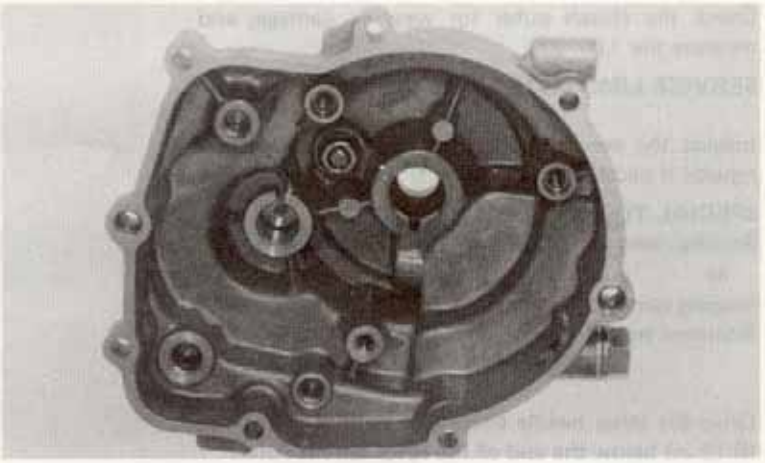
Inspect the final drive and primary driven gears for signs of wear or damage.

Inspect the right crankcase cover for wear or damage to the bearing bores.

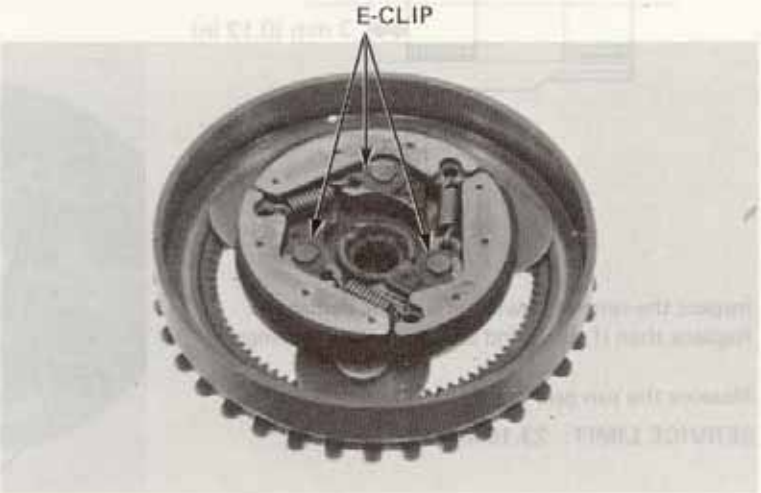


SECOND CLUTCH INSPECTION

Measure the clutch lining thickness.

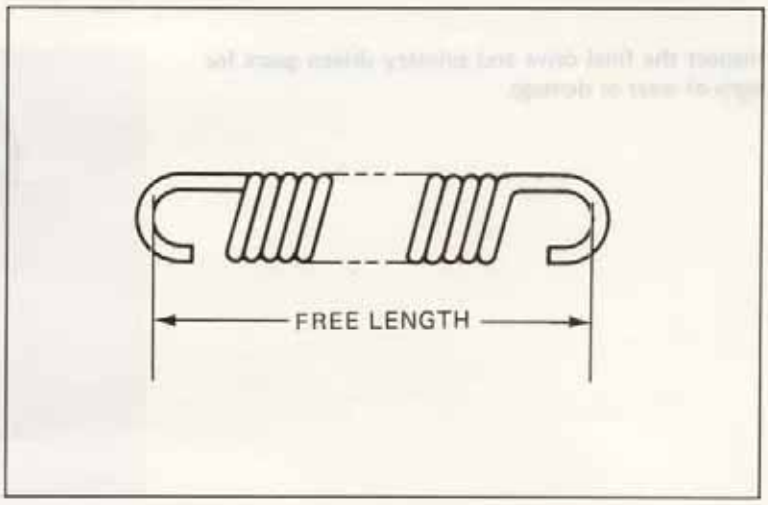
SERVICE LIMIT: 1.0 mm (0.04 in)

Check each clutch shoe spring for wear or damage. To replace the springs, remove the E-clips, washers and clutch shoes.



Measure the clutch spring free length.

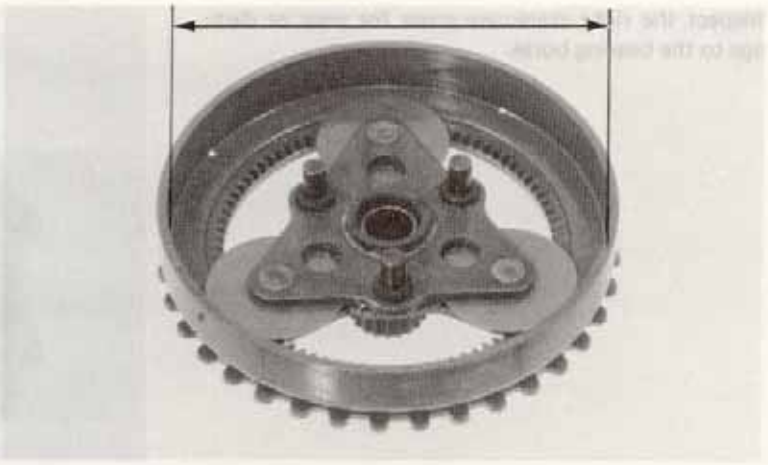
SERVICE LIMIT: 20.3 mm (0.80 in)



LOW CLUTCH OUTER INSPECTION

Check the clutch outer for wear or damage, and measure the I.D.

SERVICE LIMIT: 110.50 mm (4.35 in)

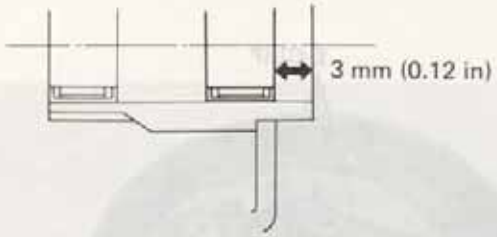


Inspect the needle bearing for wear or damage and replace if necessary.

SPECIAL TOOLS:

Bearing remover set, 12 mm	**07936–166001**
or	
Bearing remover, 12 mm	**07936–1660100**
Remover weight	**07936–3710200 (U.S.A. only)**

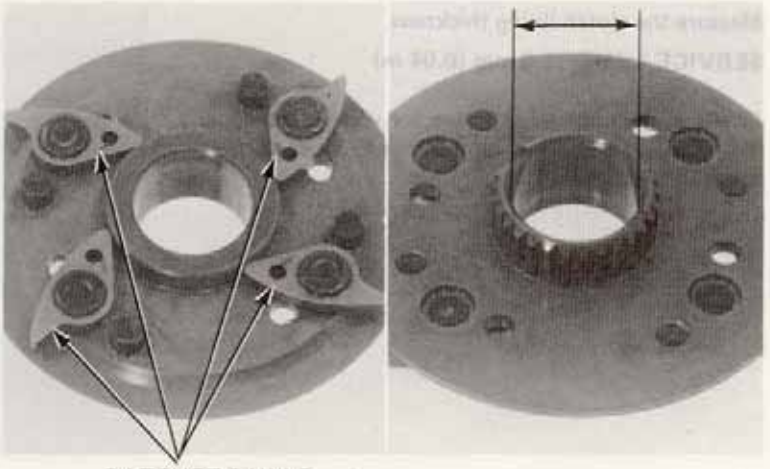
Drive the inner needle bearing in so that it is 3 mm (0.12 in) below the end of the rotor clutch outer.



Inspect the ratchet pawls for wear or damage. Replace then if they bind or have broken springs.

Measure the sun gear plate I.D.

SERVICE LIMIT: 23.10 mm (0.91 in)



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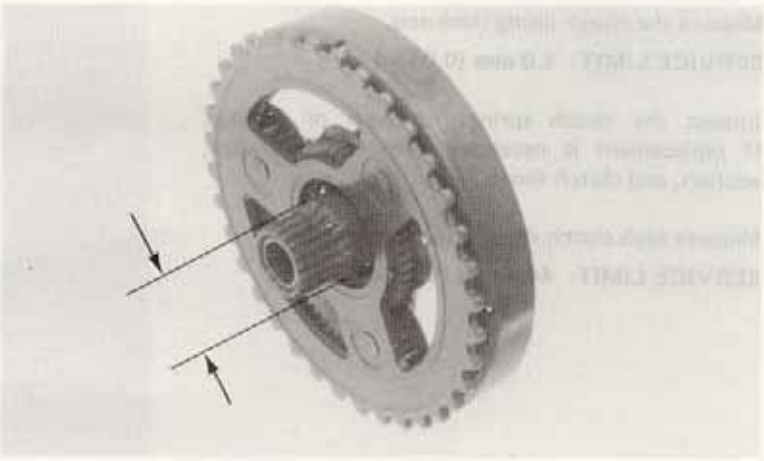
Measure the second drive plate I.D.

SERVICE LIMIT: 22.80 mm (0.898 in)



Inspect each planetary gear for wear or damage. Replace if necessary.

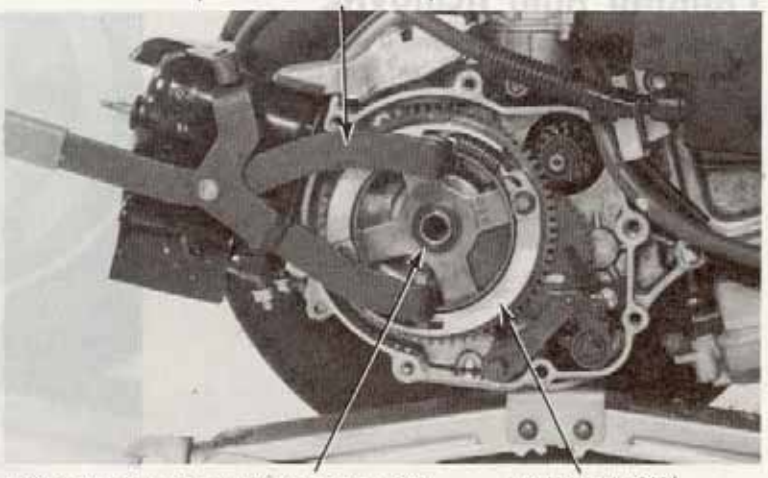
LOW CLUTCH/DRIVE PLATE REMOVAL

Remove the right crankcase cover (Page 8-3).
Hold the drive plate with the clutch holder and remove the clutch lock nut.

NOTE

The clutch lock nut has left-hand threads.

Remove the low clutch/drive plate.



LOW CLUTCH INSPECTION

Measure the clutch lining thickness.

SERVICE LIMIT: 1.0 mm (0.04 in)

Inspect the clutch springs for wear or damage. If replacement is necessary, remove the E-clips, washers, and clutch shoes.

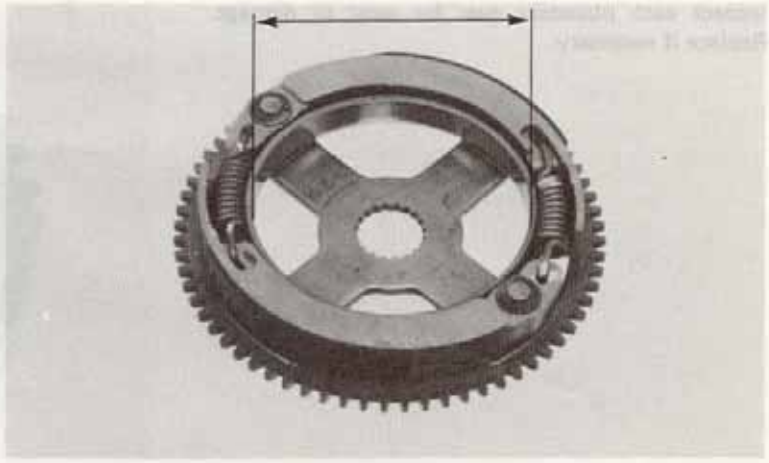
Measure each clutch shoe spring free length.

SERVICE LIMIT: 44.1 mm (1.74 in)

SECOND CLUTCH OUTER INSPECTION

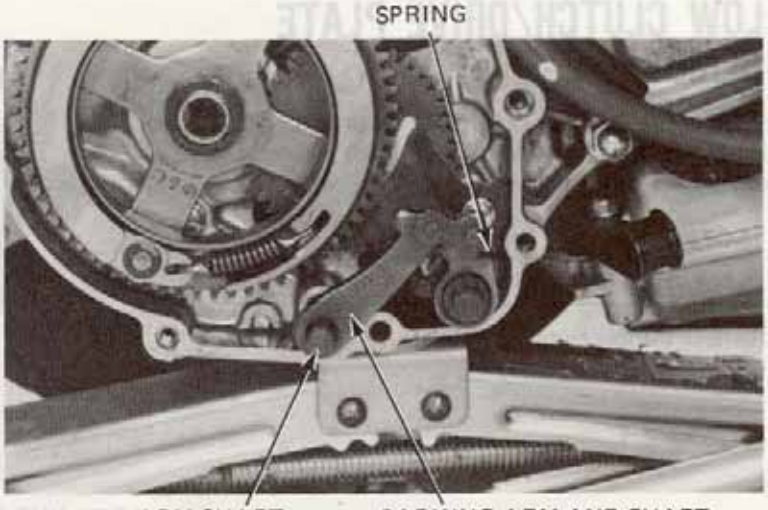
Check the second clutch outer for wear or damage. Measure the I.D.

SERVICE LIMIT: 76.20 mm (3.0 in)



PARKING ARM REMOVAL

Remove the right crankcase cover (Page 8-3).
Release the spring hook from the arm and remove the parking arm and arm shaft.



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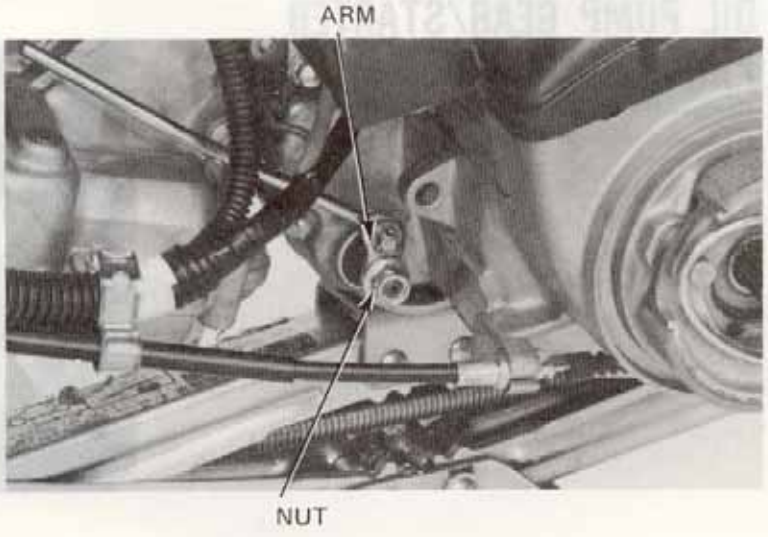
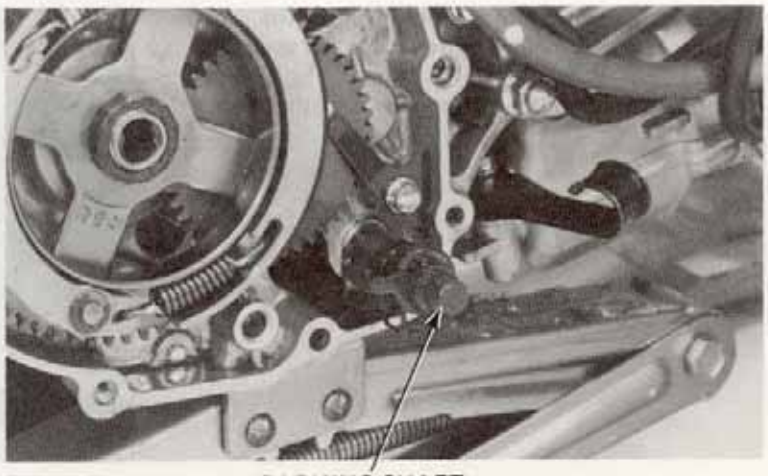
Remove the nut from the left end of the parking shaft.



Remove the parking shaft.

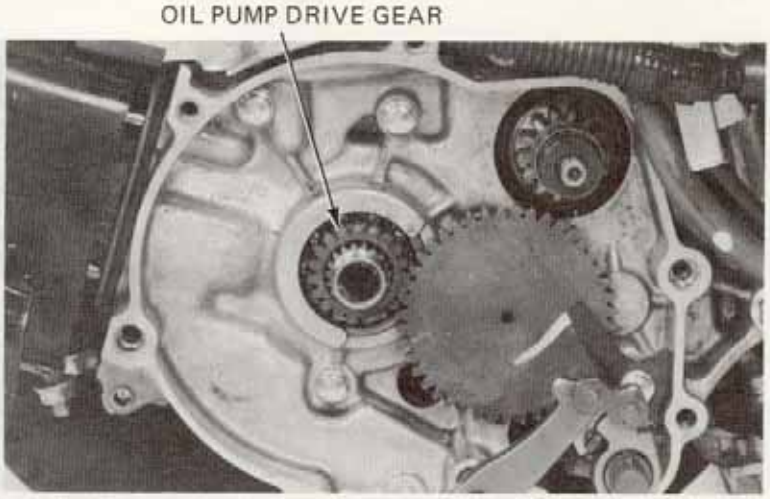


PARKING ARM/SHAFT INSPECTION

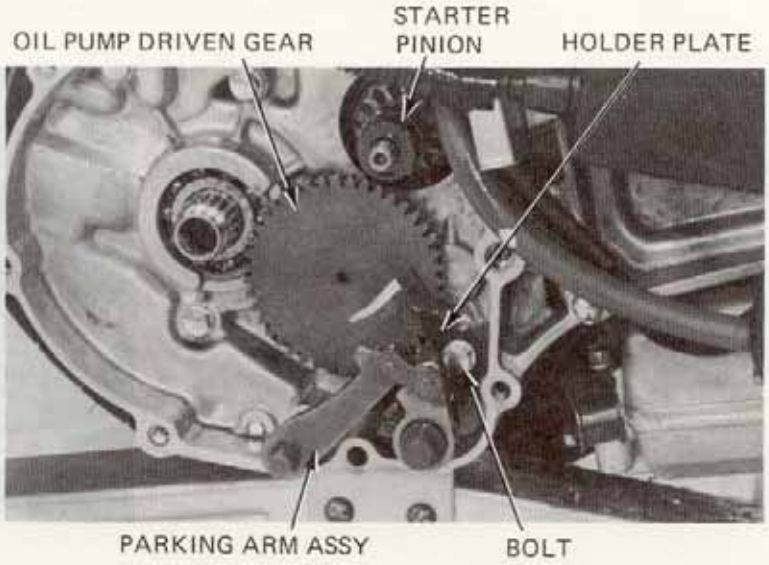
Inspect the parking arm, shafts and spring for wear or damage.

OIL PUMP GEAR/STARTER PINION REMOVAL

Remove the low clutch/drive plate (Page 8-9).
Remove the oil pump drive gear.

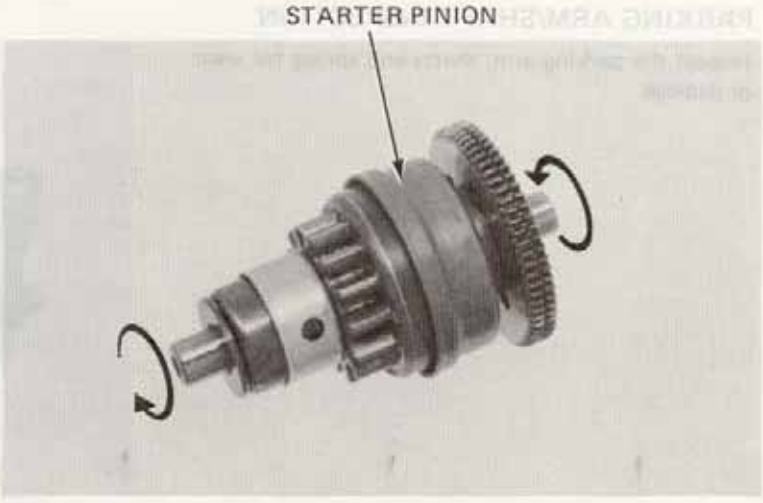


Remove the parking arm assembly (Page 8-10).
Remove the gear holder by removing the attaching bolt.
Remove the oil pump driven gear and the starter pinion.



STARTER PINION INSPECTION

Check that the starter pinion rotates only in one direction. Also check that the gear returns freely.



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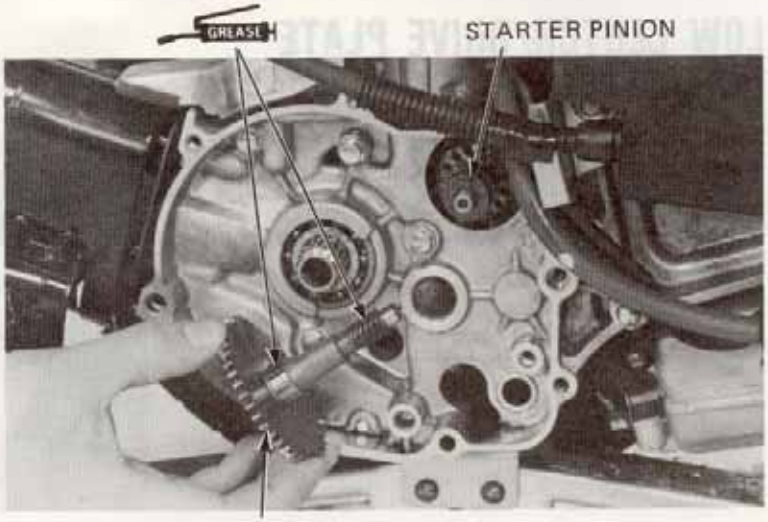
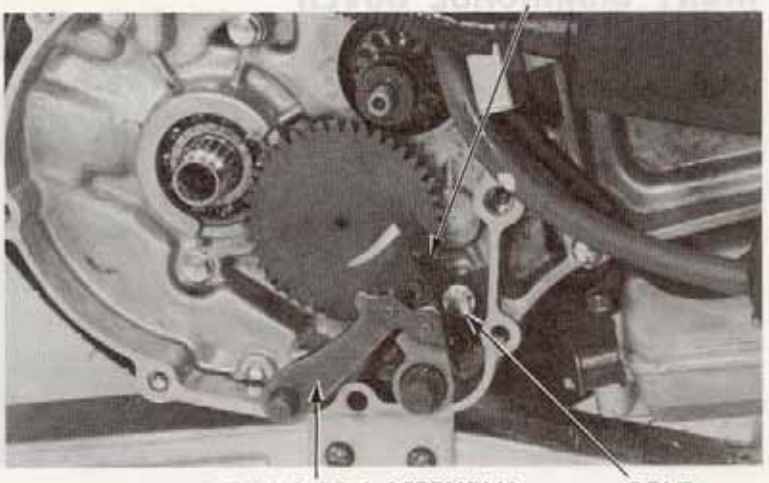
OIL PUMP GEAR/STARTER PINION INSTALLATION

Install the starter pinion.

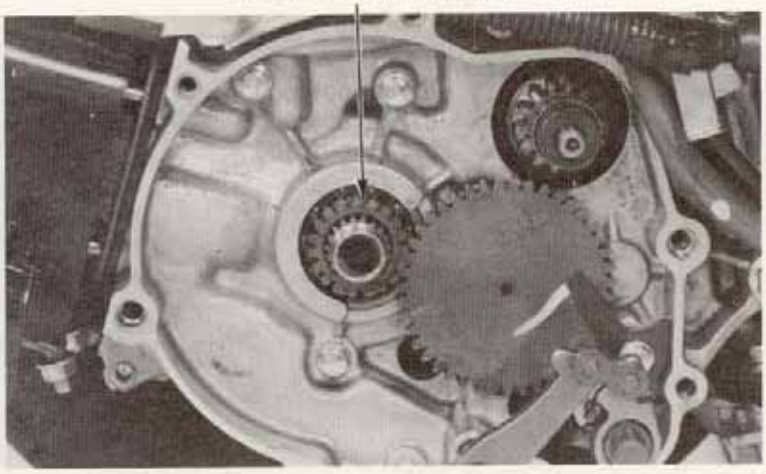
Grease the oil pump driven gear teeth and mating surfaces and install the gear.



Install the driven gear holder plate and tighten the bolt.
Install the parking arm assembly in the reverse order of removal.



Install the oil pump drive gear.



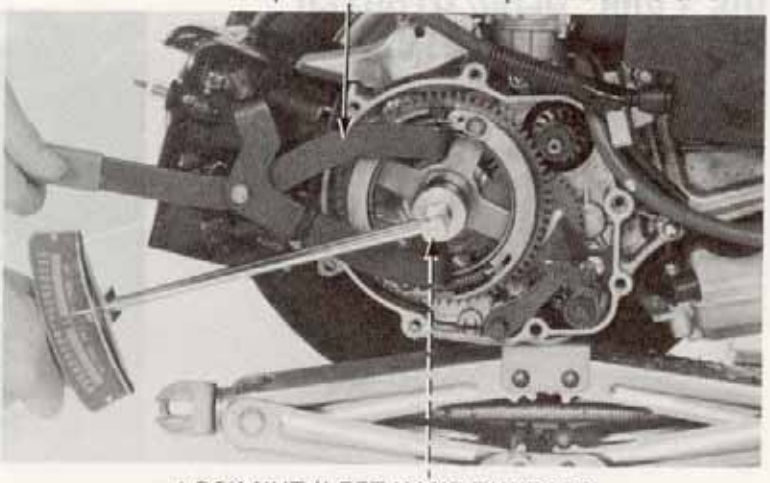
LOW CLUTCH/DRIVE PLATE INSTALLATION

Install the low clutch/drive plate on the crankshaft. Hold the drive plate with the clutch holder and tighten the lock nut.

TORQUE: 38–42 N·m (3.8–4.2 kg-m, 27–31 ft-lb)

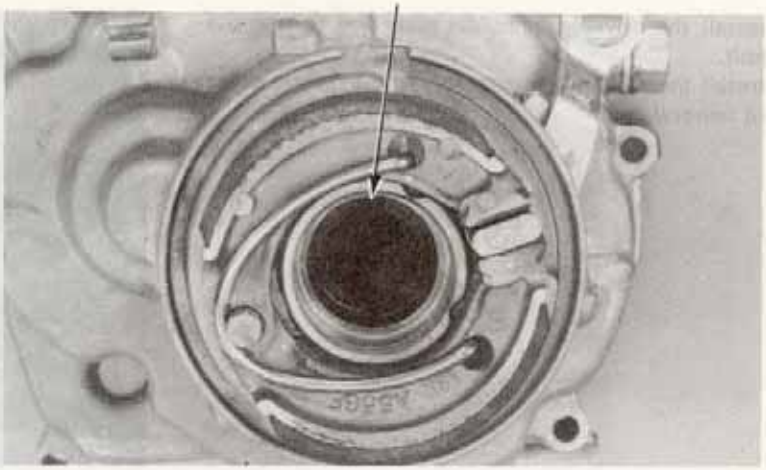
NOTE

The lock nut has left hand threads.



RIGHT CRANKCASE COVER ASSEMBLY

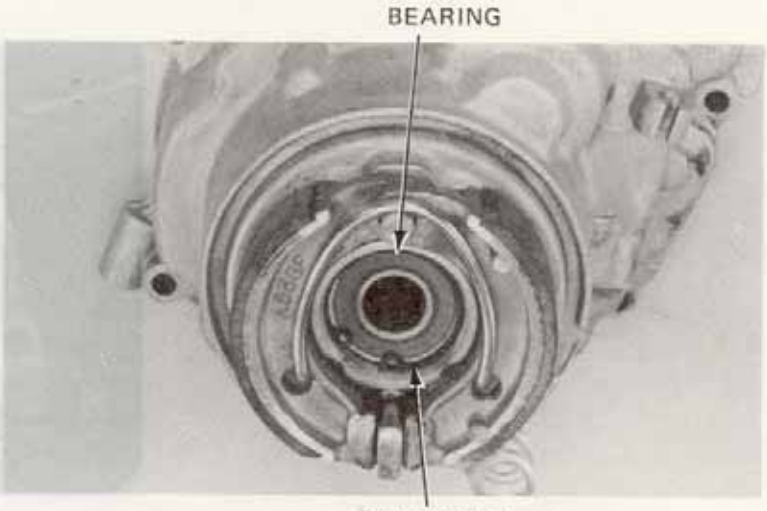
Install a new oil seal.



Drive the bearing in and install the snap ring.

TOOLS:

Driver	**07749–0010000**
Pilot, 15 mm	**07746–0040300**
Attachment, 32 x 35 mm	**07746–0010100**



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Install the final drive shaft and final driven gear.

Install the final drive gear through the thrust washer.
Install the primary driven gear and thrust washer as shown.

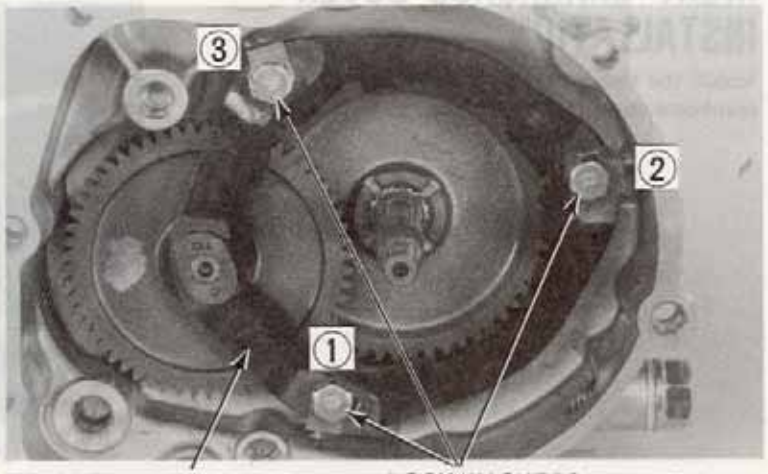
NOTE

Install the thrust washer with the raised end facing toward the outside (crankcase).

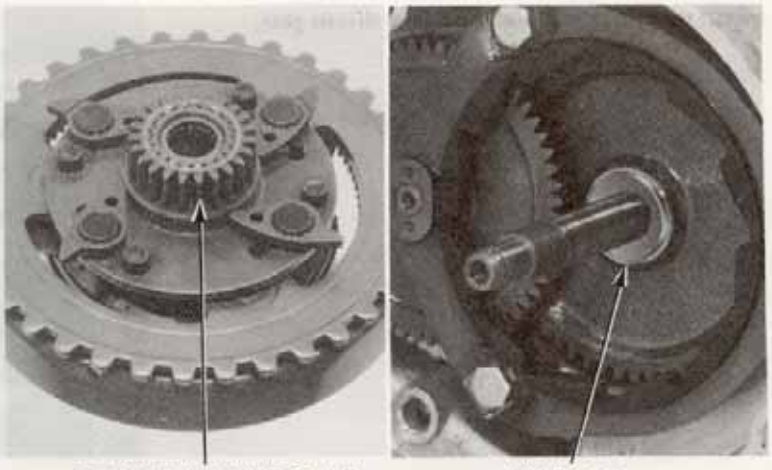
Install the ratchet plate using three bolts and new lock washers.
Bend-up the tabs of the lock washers.

NOTE

- Tighten the bolts in the sequence shown.
- After installing the ratchet plate, check that the primary driven gear rotates freely.



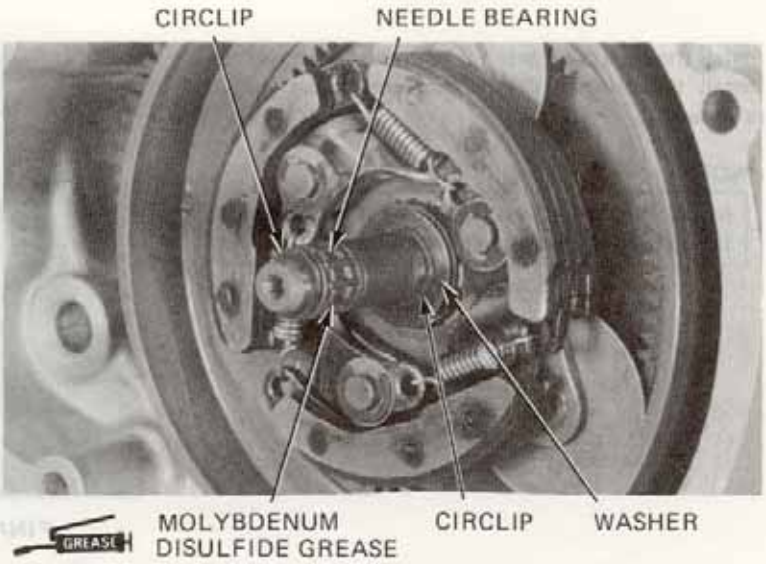
Install the sun gear plate and primary drive gear in the low clutch outer.
Slide the thrust washer onto the final shaft.



Install the low clutch outer.
Install the thrust washer and circlip.
Install the needle bearing, washer and circlip.

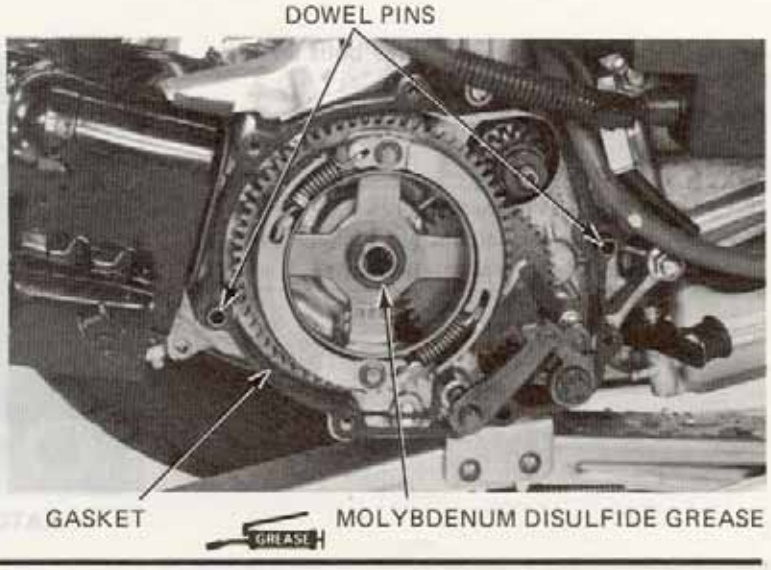
NOTE

- Use new circlips.
- Pack the needle bearing with molybdenum disulfide grease.



RIGHT CRANKCASE COVER INSTALLATION

Install the two dowel pins and a new gasket on the crankcase cover mating surface.



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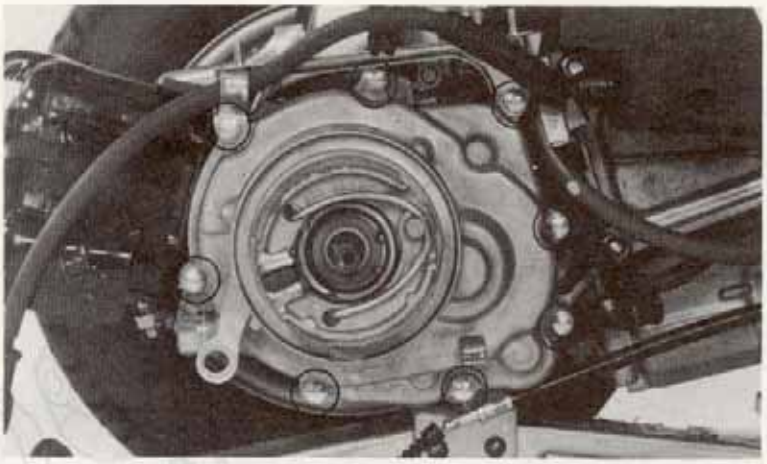
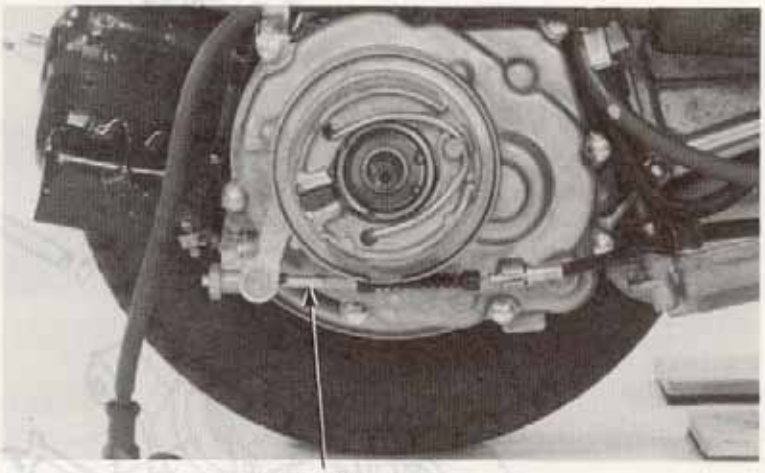
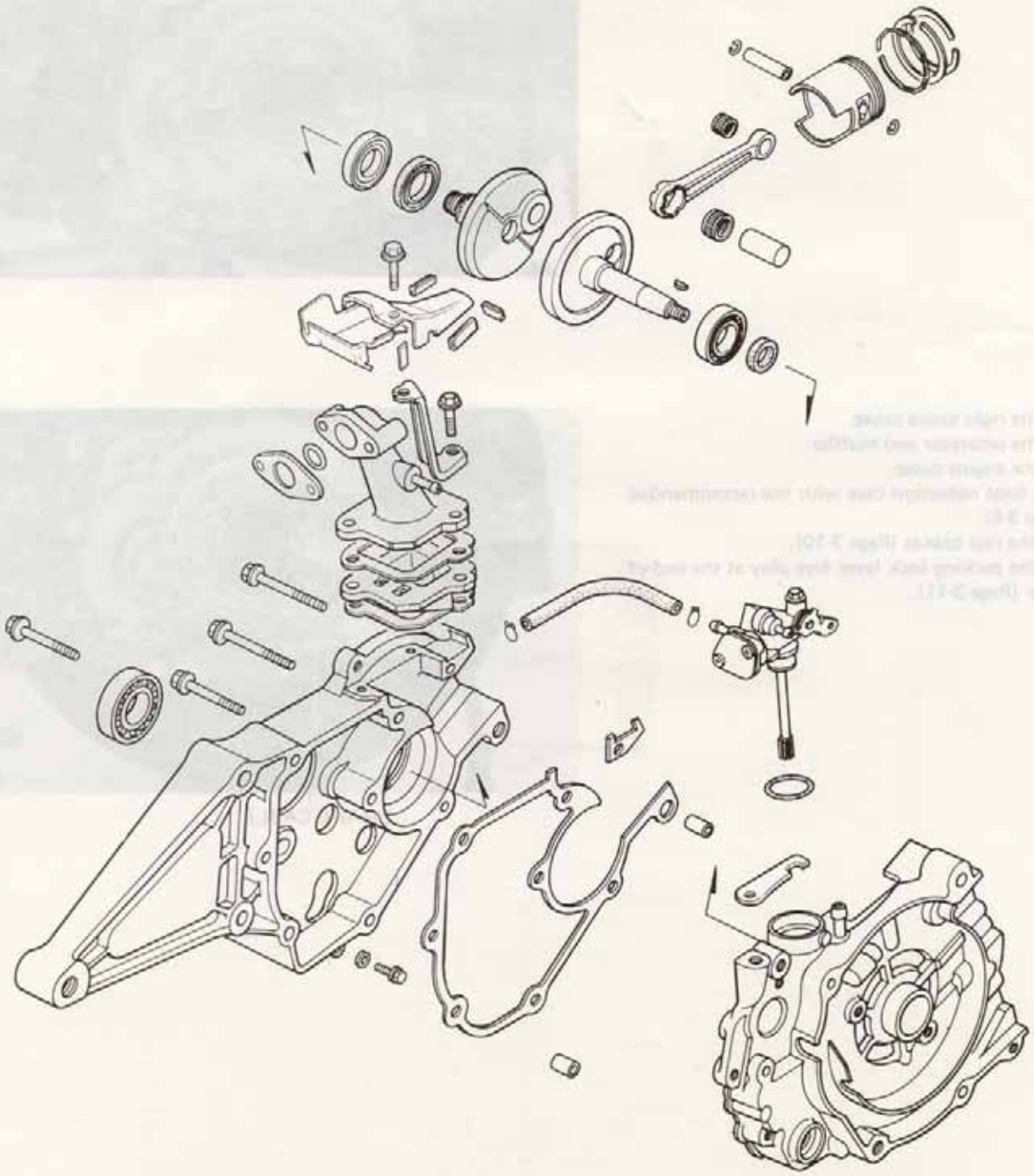
Install the right crankcase cover and tighten the eight bolts.



Install the right brake cable.
Install the separator and muffler.
Install the engine cover.
Fill the final reduction case with the recommended oil (Page 3-6).
Adjust the rear brakes (Page 3-10).
Check the parking lock lever free play at the end of the lever (Page 3-11).



BRAKE CABLE



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9. CRANKCASE/CRANKSHAFT

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
· Carburetor	Section 4
· Oil pump	Section 2
· Reed valve	Section 4
· Starter motor	Section 15
· Alternator	Section 7
· Cylinder head and cylinder	Section 6
· Clutch	Section 8

SPECIFICATIONS

ITEM	STANDARD mm (in)	SERVICE LIMIT mm (in)
Connecting rod big end side clearance	—	0.50 (0.02)
Connecting rod big end radial clearance	—	0.04 (0.0016)
Crankshaft runout	—	0.15 (0.006)

TORQUE VALUES

Link stopper bolt	20–30 N·m (2.0–3.0 kg-m, 14–22 ft-lb)
Engine mounting bolt	35–40 N·m (3.5–4.0 kg-m, 25–29 ft-lb)

TOOLS

Special	
Crankcase Puller	07935–GJ50000 (Not available in U.S.A.). or 07937–4300000
Common	
Driver	07749–0010000
Attachment, 42 x 47 mm	07746–0010300
Pilot, 20 mm	07746–0040500
Attachment, 37 x 40 mm	07746–0010200
Pilot, 17 mm	07746–0040400

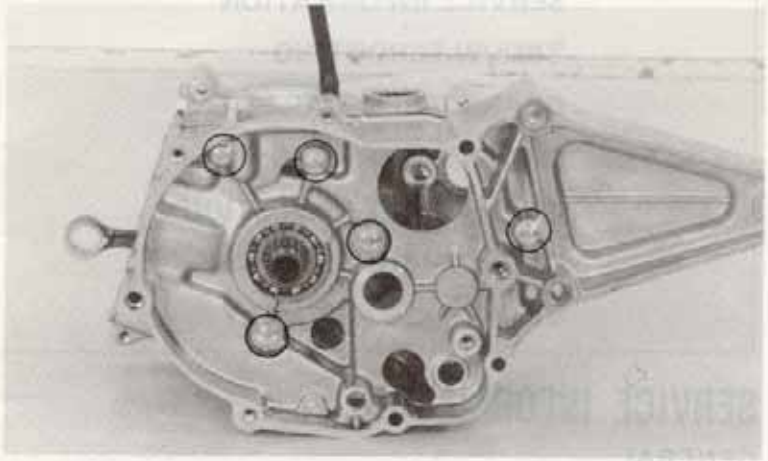
TROUBLESHOOTING

Abnormal engine noise

1. Worn main journal bearing
2. Worn crankpin bearing
3. Worn final reduction bearing

CRANKCASE SEPARATION

Remove the crankcase attaching bolts.

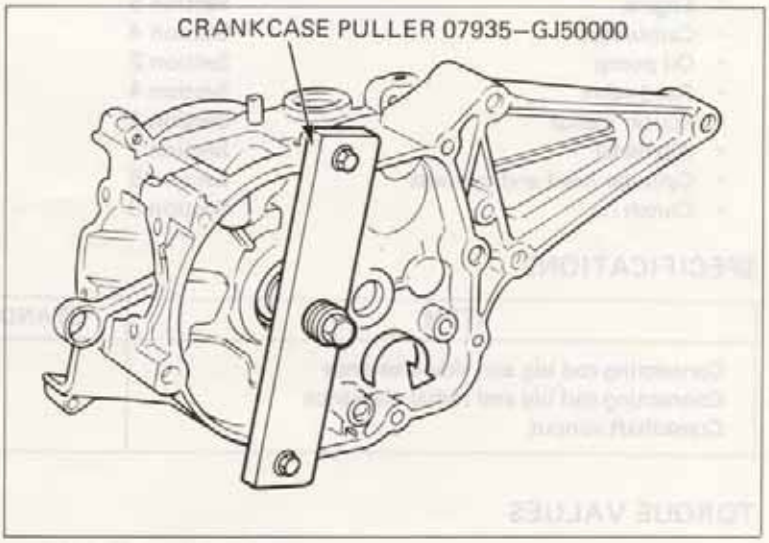


Separate the right crankcase half from the left crankcase half.

SPECIAL TOOL
Crankcase puller
07935–GJ50000 (Not available in U.S.A.) or
07937–4300000

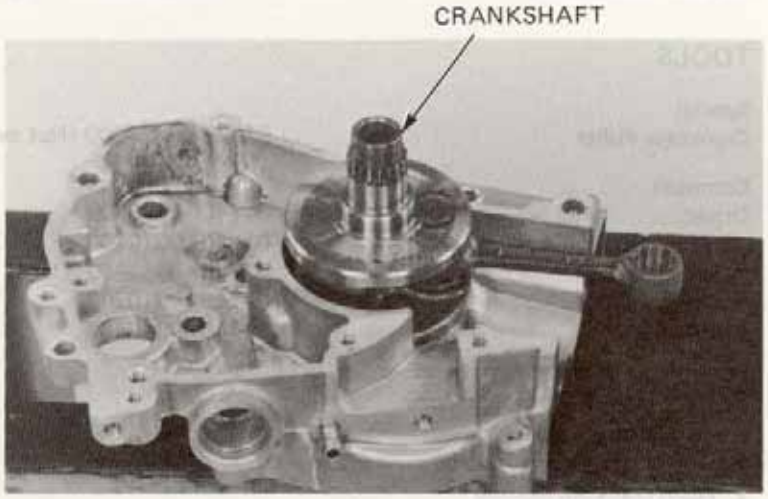
NOTE

Use the special tool "CRANKCASE PULLER" if difficulty is encountered in separating the crankcase halves.



CRANKSHAFT REMOVAL

Remove the crankshaft from the left crankcase.



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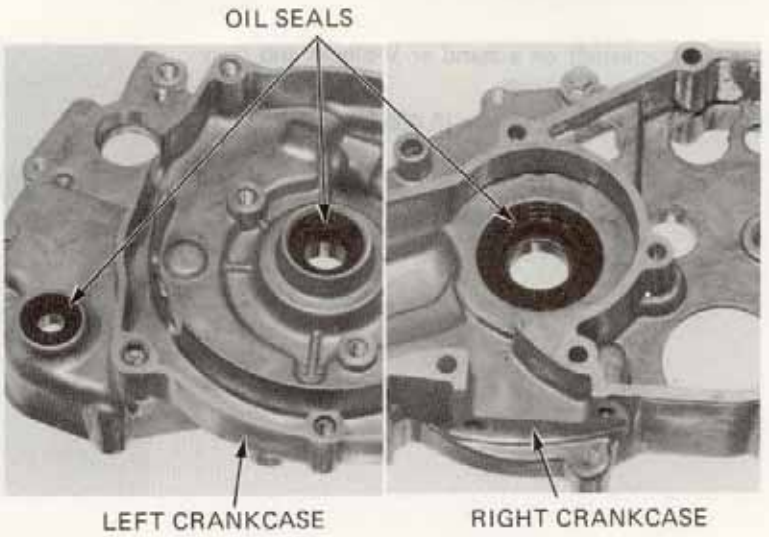
Remove the oil seals from the right and left crankcase halves.



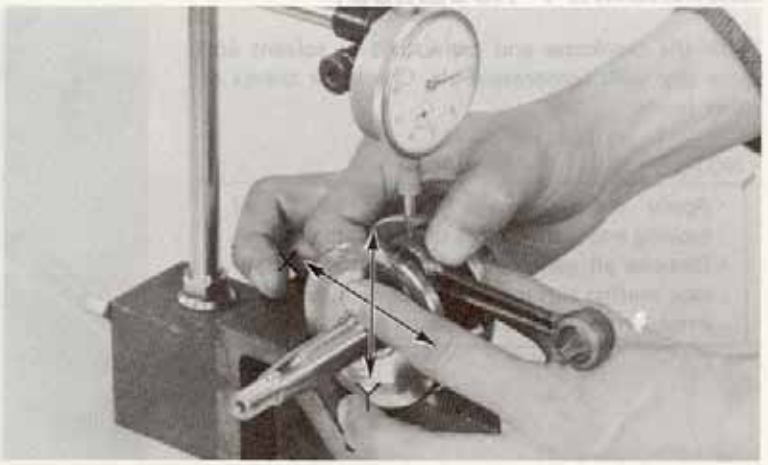
CRANKSHAFT INSPECTION

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

SERVICE LIMIT: 0.5 mm (0.02 in)

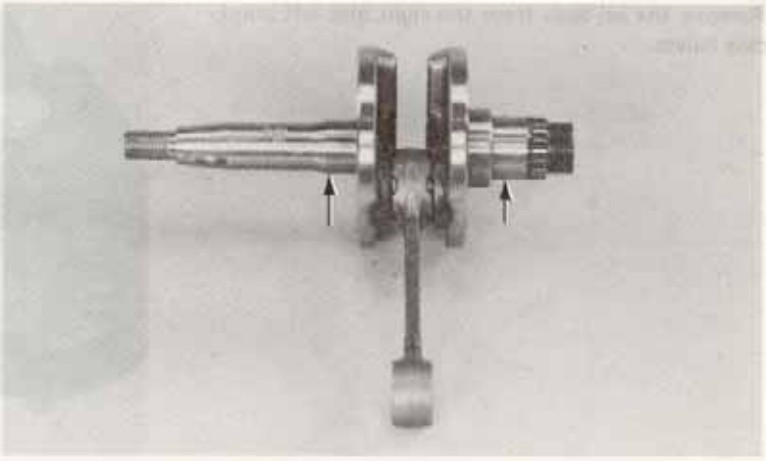
Measure the connecting rod big end radial clearance at two points in the X and Y directions.

SERVICE LIMIT: 0.040 mm (0.0016 in)

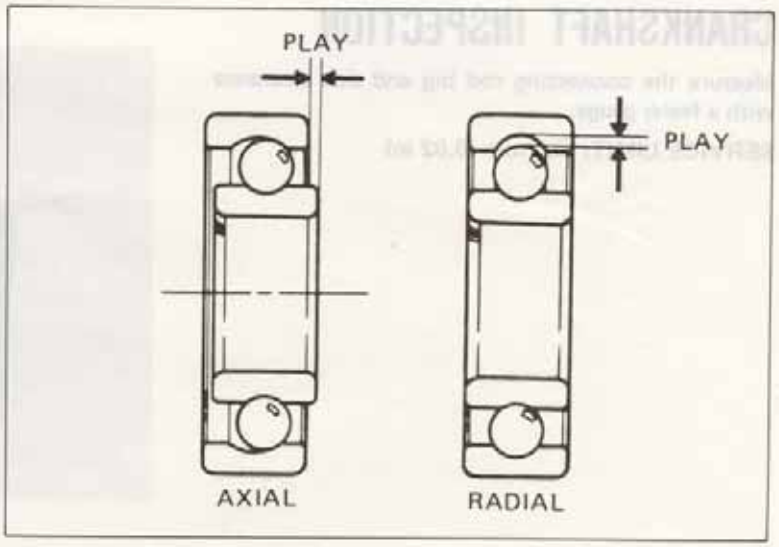


Set the crankshaft on a stand or V-blocks and read runout using a dial gauge.

SERVICE LIMIT: 0.15 mm (0.006 in)



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

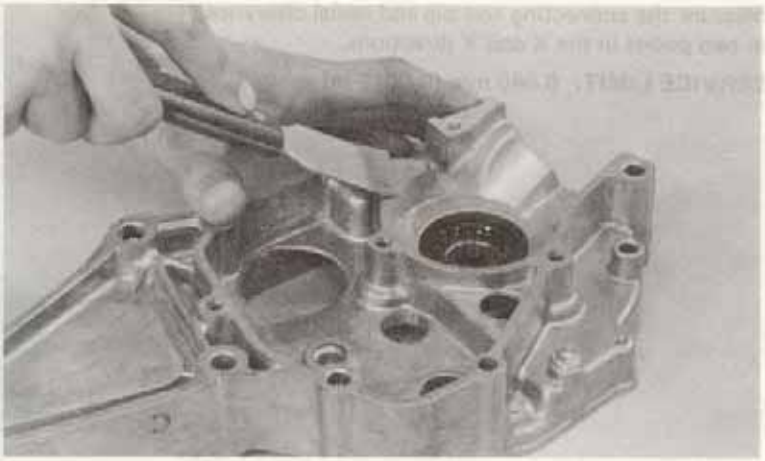


CRANKSHAFT ASSEMBLY

Wash the crankcase and crankshaft in solvent and blow dry with compressed air. Check for cracks or other faults.

NOTE

- Apply clean 2-stroke injector oil to all moving and sliding faces of the crankcase.
- Remove all gasket material from the crankcase mating surfaces. Dress any roughness or irregularities with an oil stone.



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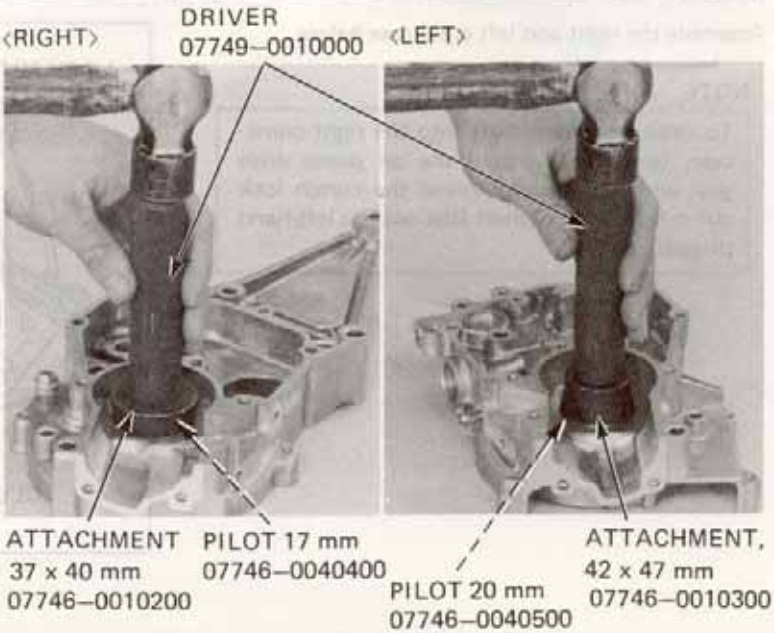
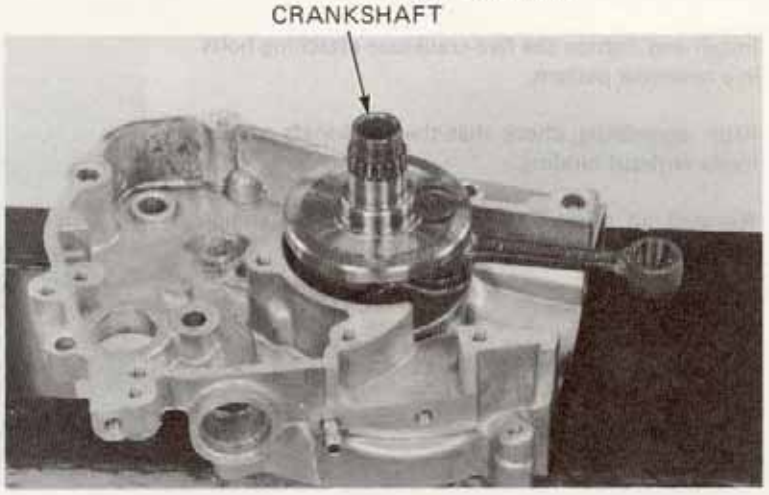
Drive a new journal bearing into the right and left crankcase halves.



Press the crankshaft into the left crankcase.

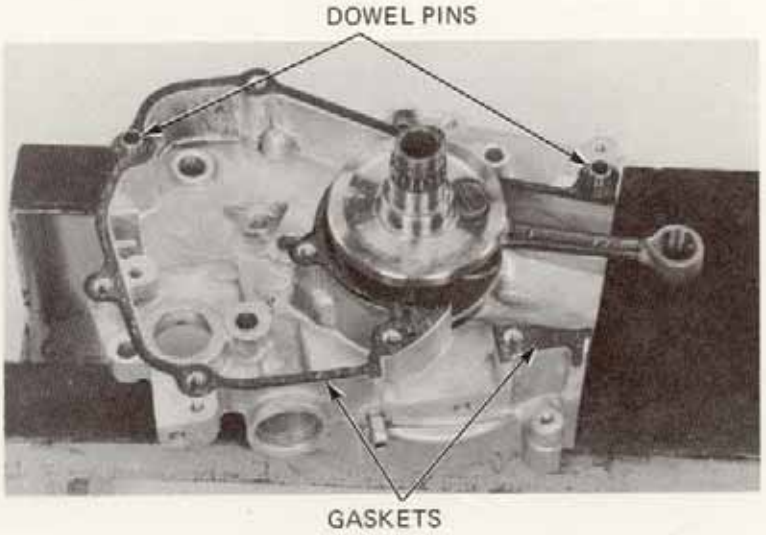
NOTE

Lubricate the journal bearing and connecting rod big end with Honda 2-stroke oil or equivalent.



CRANKCASE ASSEMBLY

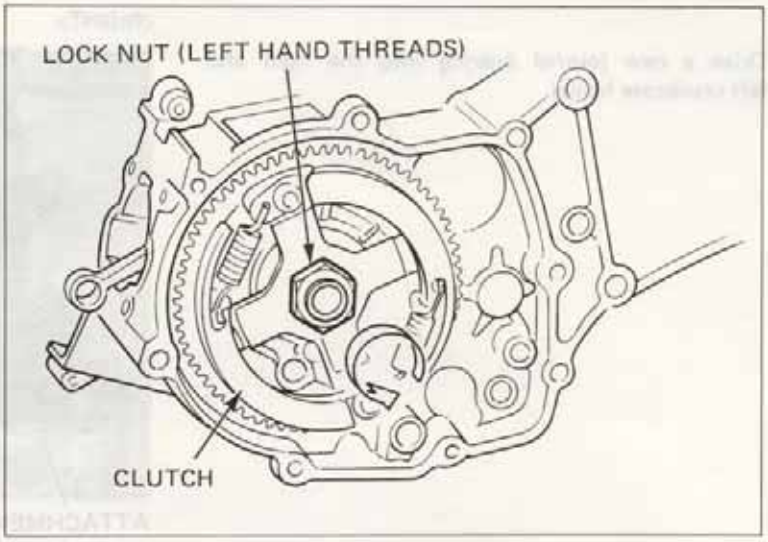
Install and dowel pins onto the crankcase mating surface.



Assemble the right and left crankcase halves.

NOTE

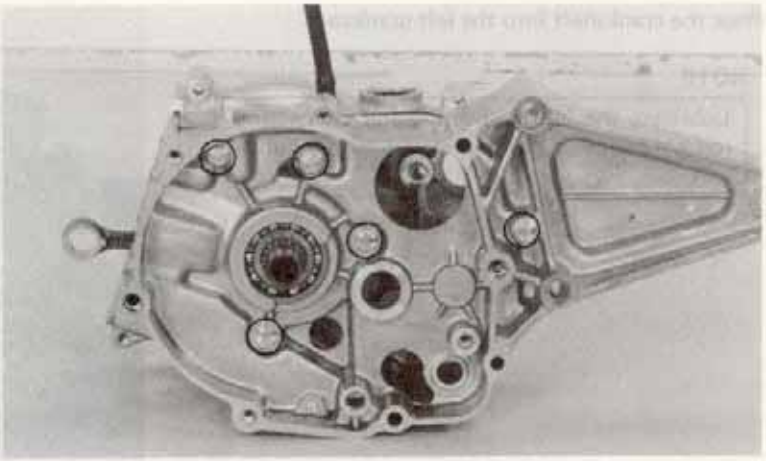
To draw the crankshaft into the right crankcase, temporarily install the oil pump drive gear and clutch, and thread the clutch lock nut onto the crankshaft (the nut has left-hand threads).



Install and tighten the five crankcase attaching bolts in a crisscross pattern.

After assembling, check that the crankshaft rotates freely without binding.

Reinstall all removed parts and mount the engine in the frame.



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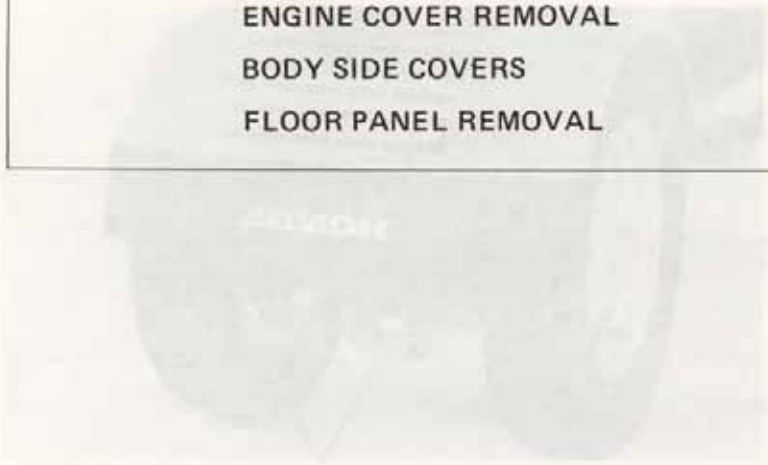
10. FRAME COVERS



ENGINE COVER REMOVAL

Remove the two bolts and remove the rear skirt.

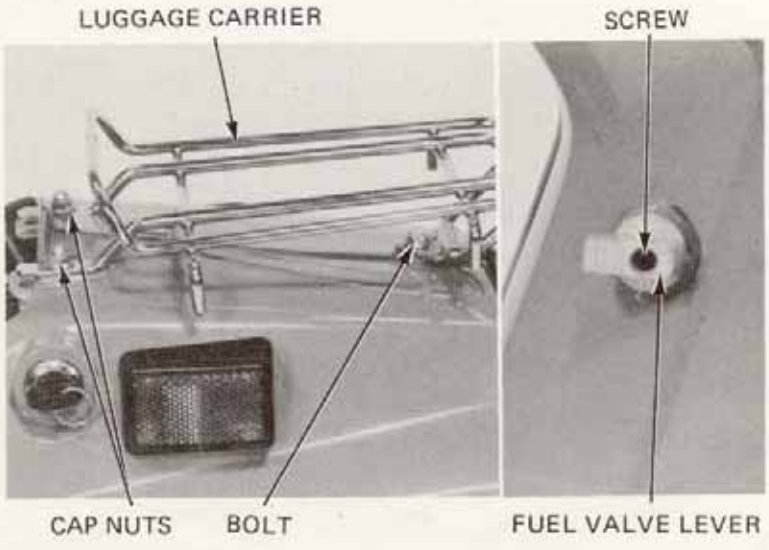
Remove the four bolts and remove the engine cover.

BODY SIDE COVER

Raise the seat and remove the luggage carrier nuts and bolt.

Remove the luggage carrier.

Remove the screw and remove the fuel valve lever.



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Remove the body side covers by removing the two attaching nut and bolts.

NOTE

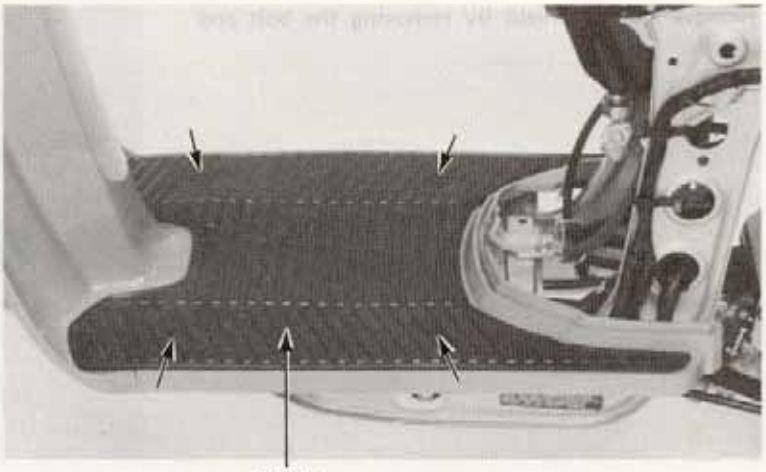
The side covers are retained with a nuts and two retaining tabs which are pressed into the frame grommets.

BODY SIDE COVERS

FLOOR PANEL REMOVAL

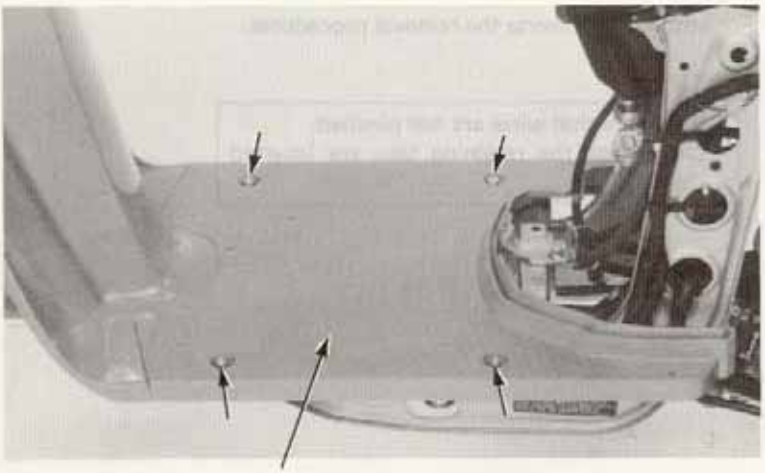
Remove the body side covers.

Remove the floor mat by removing the four screws.



MAT

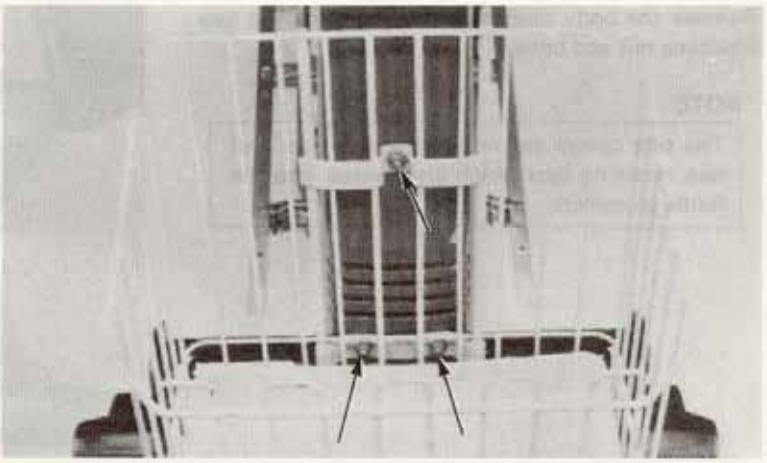
Remove the floor panel by removing the four bolts.



FLOOR PANEL

LEG SHIELD REMOVAL

Remove the three cap nuts attaching the turn signal stay and the leg shield and front basket.



Remove the leg shield by removing the bolt and screws.

COVER INSTALLATION

For installation, reverse the removal procedures.

NOTE

- Make sure that wires are not pinched.
- Check that the retaining tabs are inserted securely.

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MEMO

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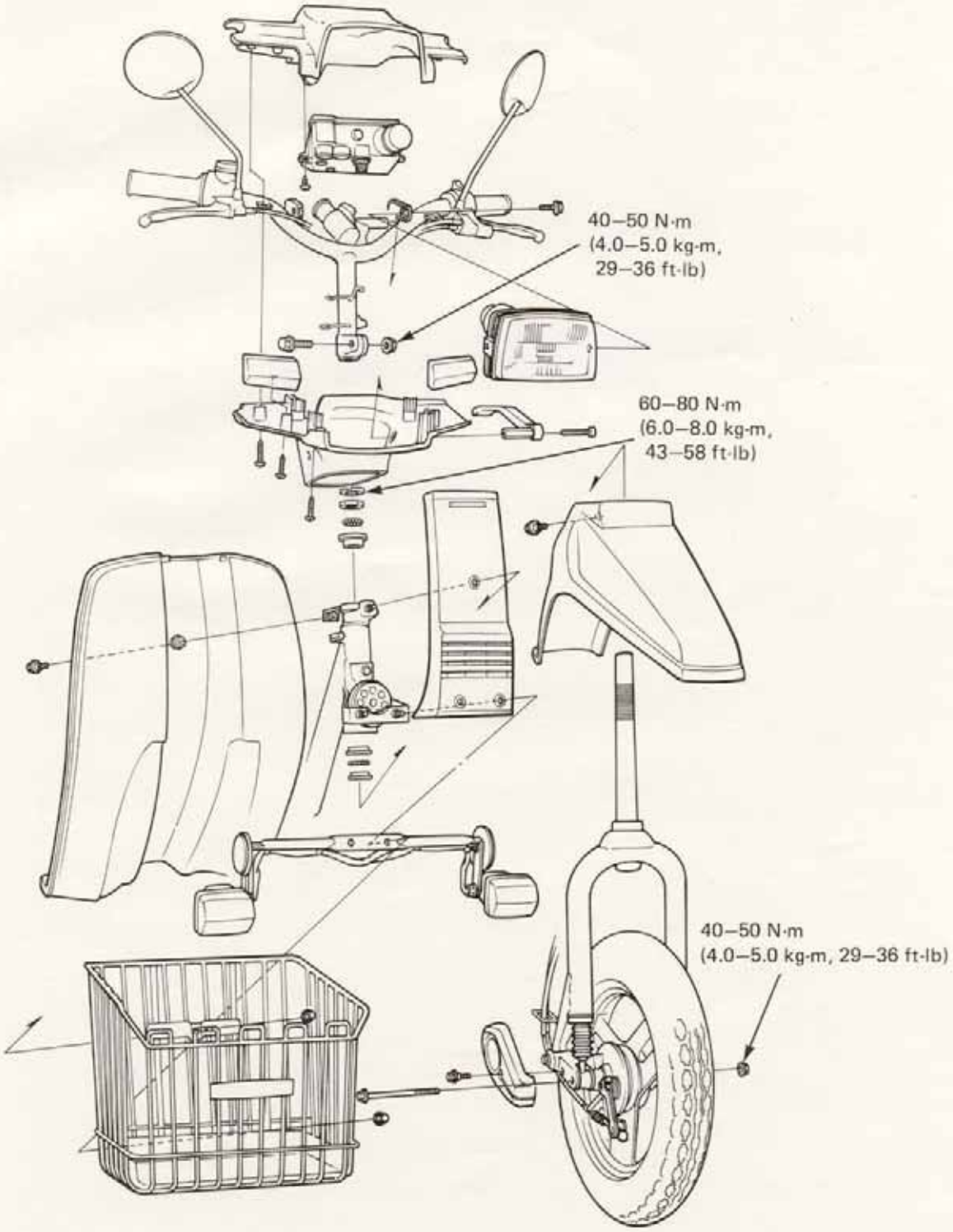

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11. STEERING/FRONT/WHEEL/BRAKE/SUSPENSION

SERVICE INFORMATION

GENERAL

- Brake dust contains asbestos which can be harmful to your health.
- Do not use compressed air to clean brake drums or brake panels. Use a vacuum with a sealed collector. Wear a protective face mask and thoroughly wash your hands when finished.

SPECIFICATIONS

ITEM		STANDARD mm (in)	SERVICE LIMIT mm (in)
Axle shaft runout		–	0.2 (0.01)
Rim runout	Radial	–	2.0 (0.08)
	Axial	–	2.0 (0.08)
Fork spring free length		101.1 (3.98 in)	121.3 (4.78)
Fork tube runout		–	0.2 (0.01)

TORQUE VALUES

Steering handle set bolt	40–50 N·m (4.0–5.0 kg-m, 29–36 ft-lb)
Steering stem lock nut	60–80 N·m (6.0–8.0 kg-m, 43–58 ft-lb)
Front axle nut	40–50 N·m (4.0–5.0 kg-m, 29–36 ft-lb)

TOOLS

Special		
Ball race remover	07946–GA70000	(equivalent commercially available in U.S.A.)
Lock nut wrench	07916–GK00000	
Fork seal driver	07947–1180001	
Snapring pliers	07914–3230001	
Common		
Attachment 42 x 47 mm	07746–0010300	
Driver	07749–0010000	
Extension bar	07716–0020500	(equivalent commercially available in U.S.A.)
Pilot, 10 mm	07746–0040100	
Bearing remover shaft	07746–0050100	—equivalents commercially available in U.S.A.
Bearing remover, 10 mm	07746–0050200	
Pilot, 30 mm	07914–3230001	
Attachment, 28 x 30 mm	07946–1870100	not available in U.S.A.

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TROUBLESHOOTING

Hard Steering
1. Steering top cone race/nut too tight
2. Damaged steering balls and races
3. Insufficient tire pressure

Steers to one side or does not track straight
1. Bent front fork
2. Bend front axle or spoke plate

Parking lever not locked
1. Cable not adjusted properly
2. Damaged or elongated cable
3. Damaged engine side parking return spring

Parking lever does not return or is heavy
1. Insufficient cable play
2. Damaged parking lever spring
3. Cable E-ring disengaged from swing lock lever

Swing mechanism is locked, but parking lock lever is not engaged
1. Improperly adjusted cable
2. Swing-to-parking lock rod disconnected
3. Parking lock arm pawl damaged or chipped
4. Parking disc teeth damaged or chipped

Parking lock lever is engaged, but swing lock is not applied
1. Cable not adjusted properly
2. Swing lock pawl damaged
3. Swing lock pawl linkage damaged

Parking lever returned with ignition switch in LOCK
1. Deformed or damaged lever stopper
2. Twisted or damaged parking lever shaft
3. Worn or damaged parking lever shaft-to-stopper faces

Front Wheel Wobbling
1. Bent rim
2. Axle not tightened properly
3. Bent spoke plate
4. Excessive wheel bearing play
5. Faulty or unevenly worn tire

Soft Suspension
Weak fork springs

Front Suspension Noise
1. Slider binding
2. Loose front fork fasteners

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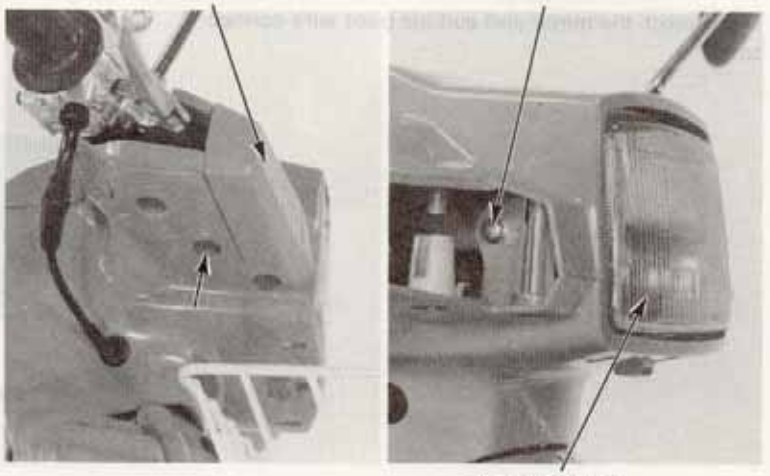
HEADLIGHT

REMOVAL/INSTALLATION

Remove the right and left front handlebar covers by removing the attaching screws.

Remove the mounting bolts on both sides of the headlight.

Disconnect the wires and remove the headlight.



Remove the sealed beam from the head light bracket.

Install the headlight in the reverse order of removal.

After installation, adjust the headlight beam by turning the adjusting screws.

CAUTION:

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

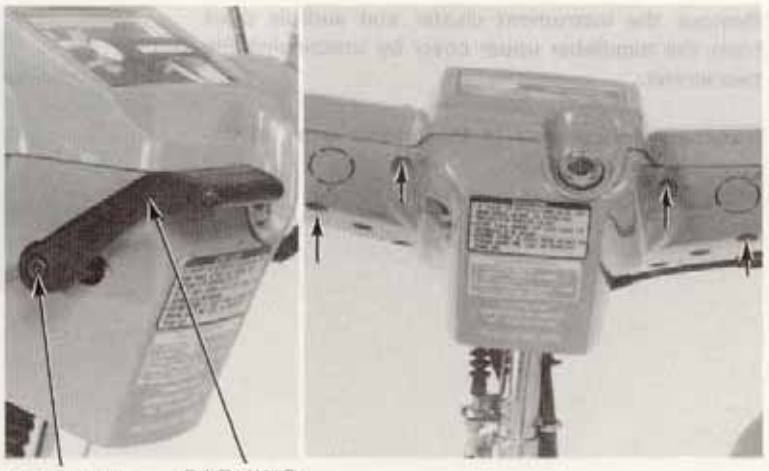
INSTRUMENTS

REMOVAL/INSTALLATION

Remove the hex bolt and remove the packing lock lever.

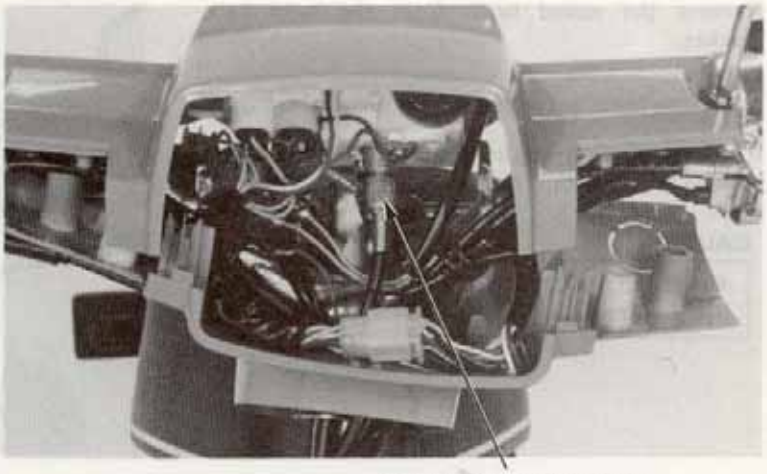
Remove the right and left front handlebar cover and the headlight.

Remove the four screws attaching the lower handlebar cover.



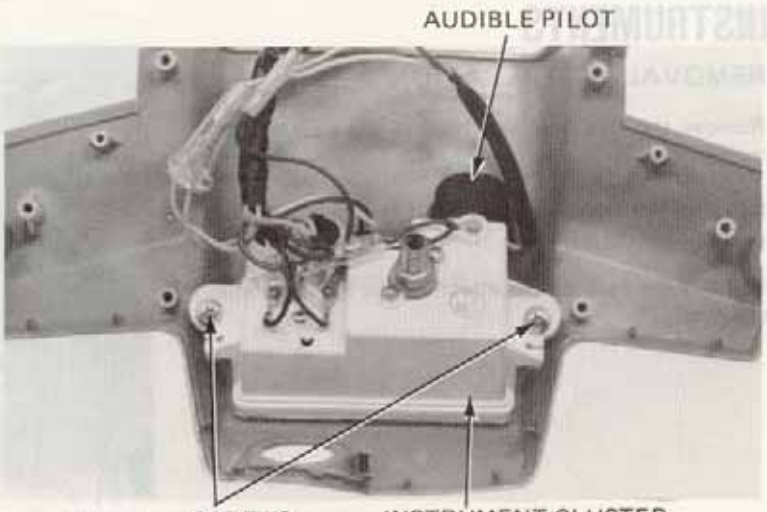
Disconnect the meter and audible pilot wire connectors.

Disconnect the speedometer cable from the speedometer.



Remove the instrument cluster and audible pilot from the handlebar upper cover by unscrewing the two screws.

Install the instruments in the reverse order of disassembly and removal.



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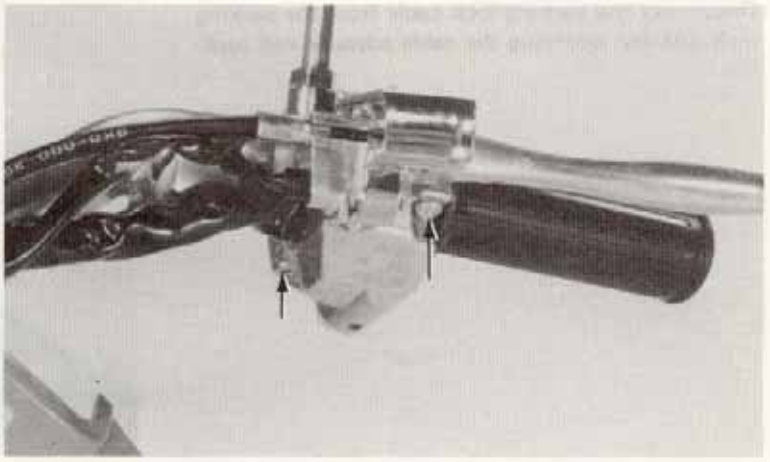
HANDLEBAR

REMOVAL

Support the scooter by placing a block under the frame.
Remove the instruments (page 11–3).

Remove the basket and front cover. Remove the leg shield.

Remove the two screws attaching the left handlebar switch assembly.
Remove the switch assembly.



Loosen the throttle cable adjuster.

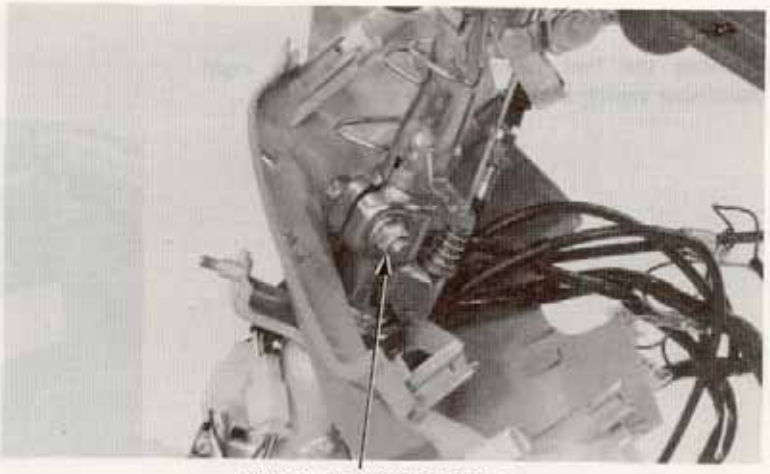
Remove the two screws and remove the right handlebar switch and the throttle grip.

THROTTLE CABLE

Disconnect the brake cable, throttle cable, turn signal wire and ignition switch wire coupler.

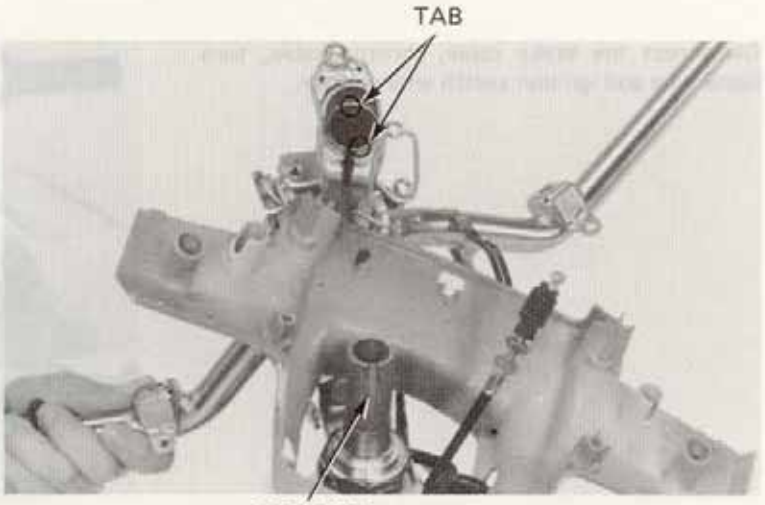
Disconnect the parking lock cable from the parking lock link by loosening the cable adjuster and locknut.

Remove the handlebar set bolt and nut, and pull off the handlebar.



INSTALLATION

Slide the handlebar onto the steering head alighing the locating tab with the groove in the steering head.



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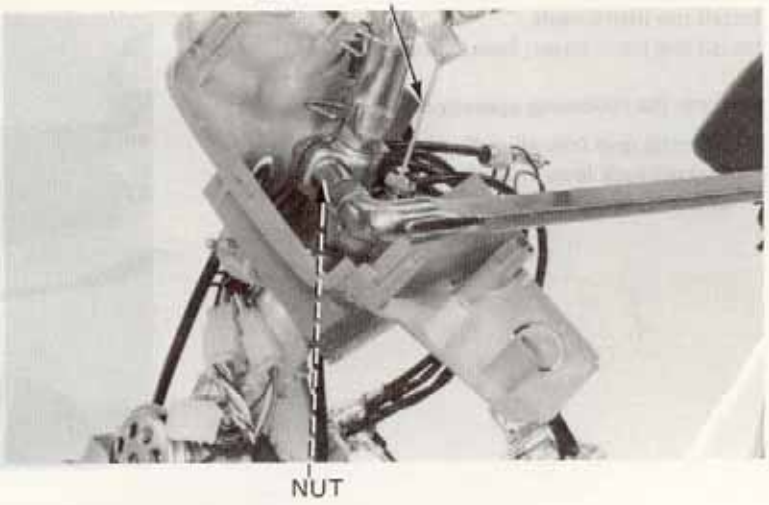
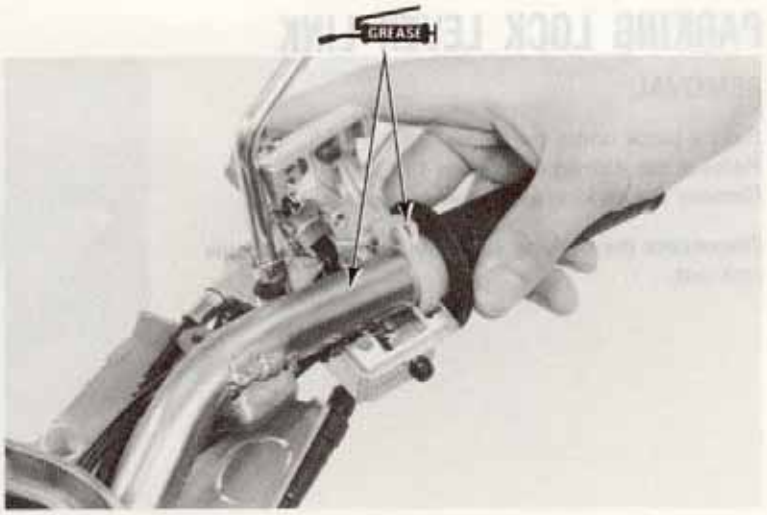
Install the handlebar set bolt and nut and tighten to the specified torque.

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

Press the rubber cap onto the nut.
Reconnect the parking lock cable.
Reconnect the ignition switch wire coupler.



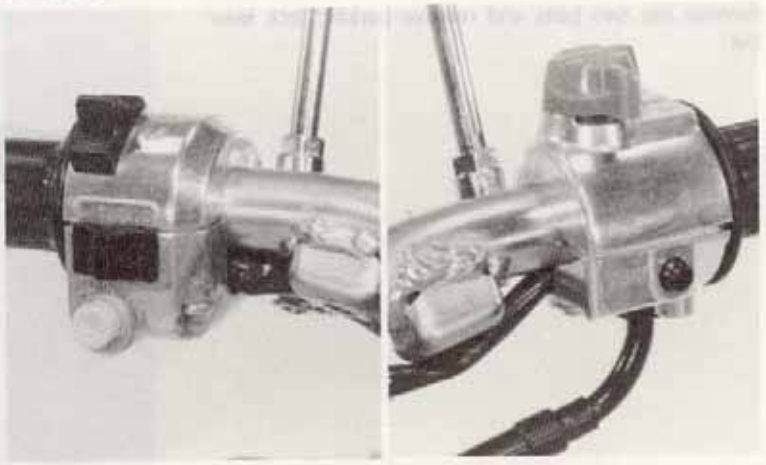
Coat the throttle grip area of the handlebar with clean grease and slide the grip onto the handlebar.



Install the right and left handlebar switch housings on the handlebar.

NOTE:

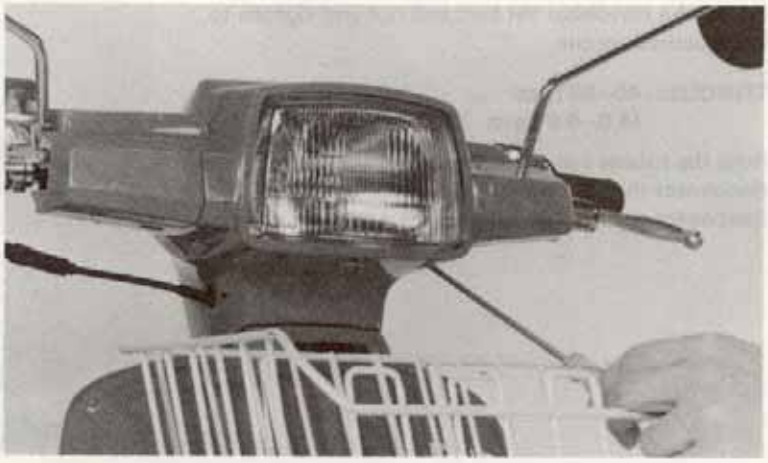
- Aligh the handle covers with the split in the housing.
- Tighten the forward screw first, then tighten the rear screw.
- After tightening the screws, check that the throttle grip rotates freely.



Install the instrument.
Install the front cover, basket and leg shield.

Perform the following operation and adjustments:

- Throttle grip free play (Page 3–8).
- Parking lock lever free play (Page 3–11).
- Brake lever free play (Page 3–9, 3–10).



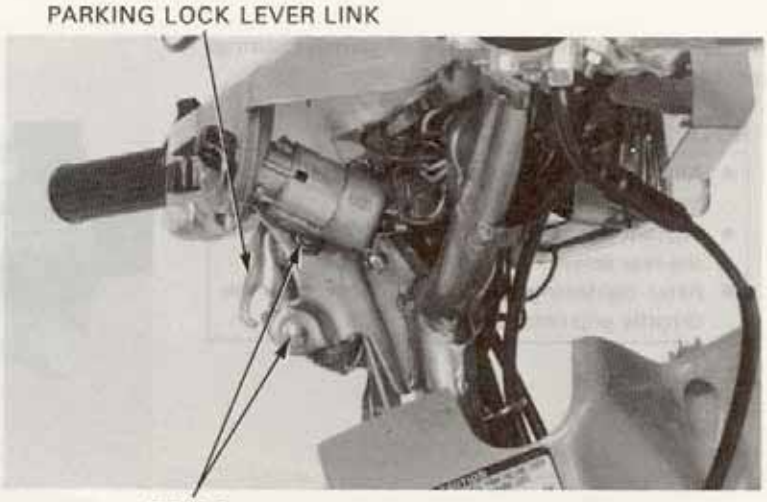
PARKING LOCK LEVER LINK

REMOVAL

Place a block under the frame.
Remove the instruments (page 11–3).
Remove the parking lock lever (page 11–3).

Disconnect the parking cable by loosening the cable lock nut.

Remove the two bolts and remove parking lock lever link.



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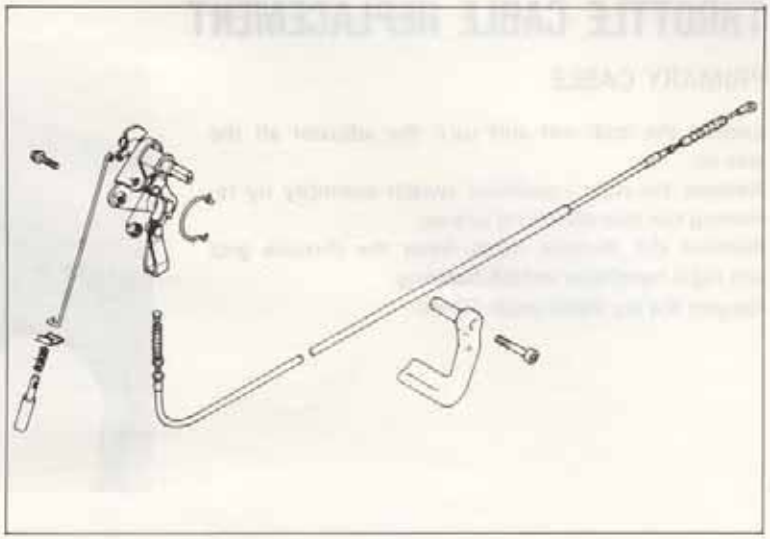
Check each part for wear or damage, and replace parts as necessary.



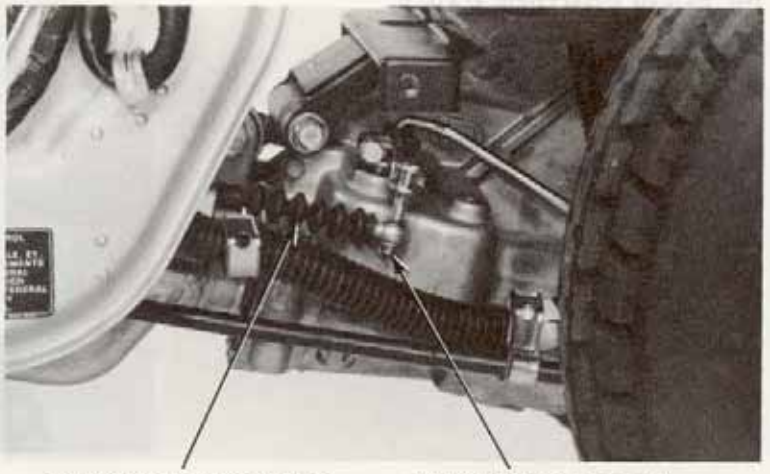
INSTALLATION

The installation sequence is essentially the reverse order of removal.
Adjust the parking lock lever free play (page 3–11).

PARKING LOCK CABLE REPLACEMENT

Place a block under the frame.
Remove the leg shield (page 10–4).
Remove the floor panel (page 10–3).
Lower the parking lock lever and disconnect the parking lock cable by loosening the cable lock nut.

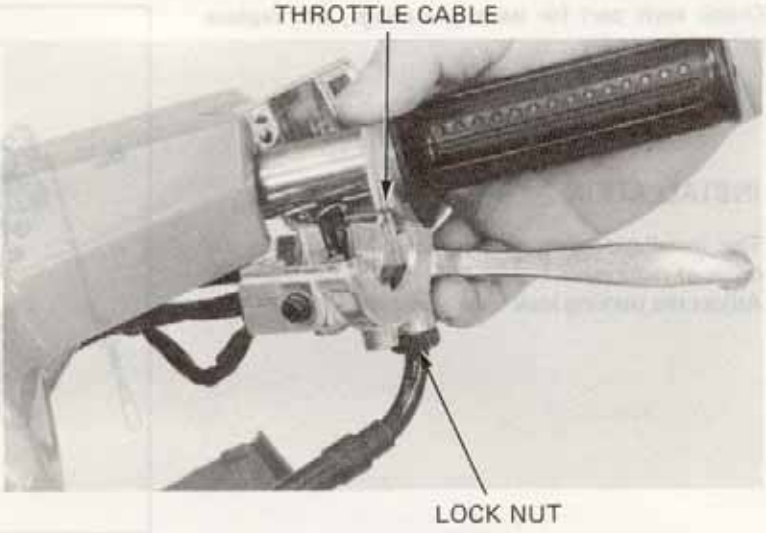
Remove the washer and cotter pin, then remove the parking lock cable from the cable guide.



THROTTLE CABLE REPLACEMENT

PRIMARY CABLE

Loosen the lock nut and turn the adjuster all the way in.
Remove the right handlebar switch assembly by removing the two attaching screws.
Remove the throttle cable from the throttle grip and right handlebar switch housing.
Remove the leg shield (page 10–4).

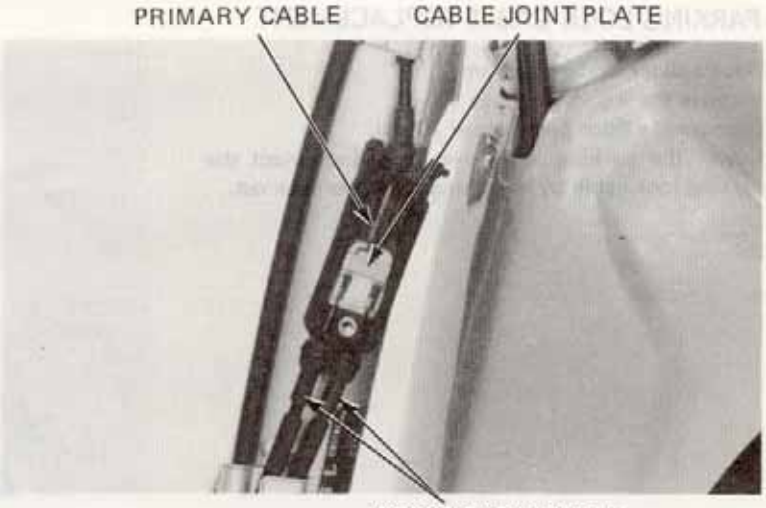


Remove the junction box cover.
Remove the cable joint plate and pull the primary cable out from the junction box.
Reinstall the cable in the reverse order of removal.

NOTE:

Route the primary cable properly.

Adjust throttle cable free play (page 3–8).



SECONDARY THROTTLE CABLE/ OIL PUMP CONTROL CABLE

Remove the rear skirt and engine cover.
Remove the air duct and air cleaner case.
Remove the junction box cover.

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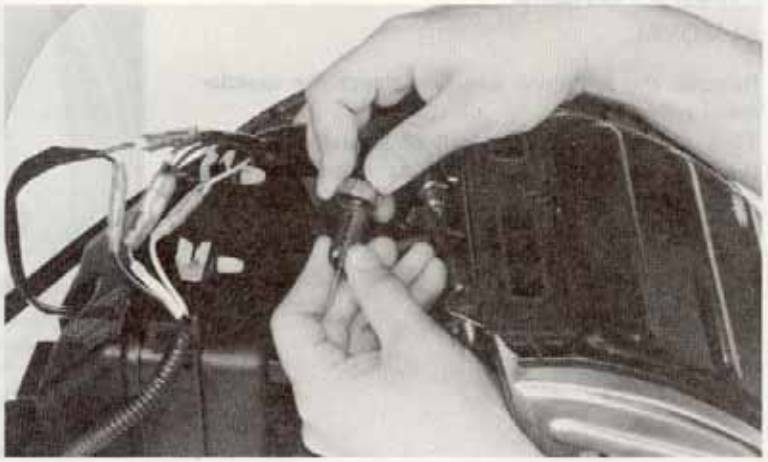
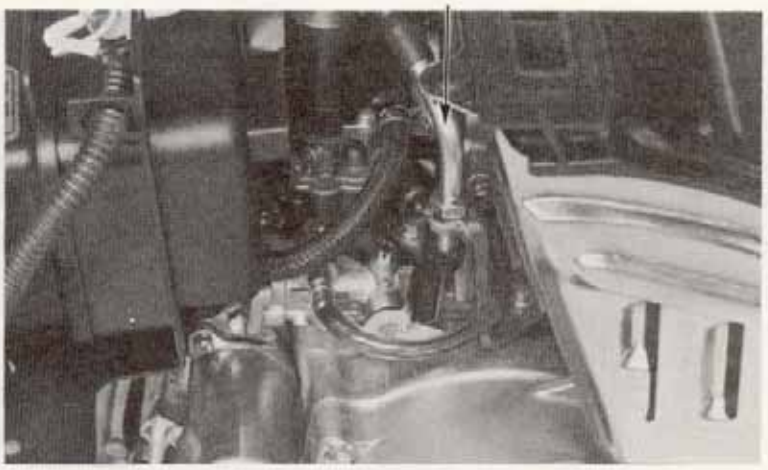
Remove the carburetor cap and pull the throttle valve out of the carburetor body.





Loosen the oil pump control cable lock nut and disconnect the cable from the oil pump.
Disconnect the secondary throttle cable and oil pump control cable from the cable joint.
Install new cables in the reverse order of removal.

NOTE:

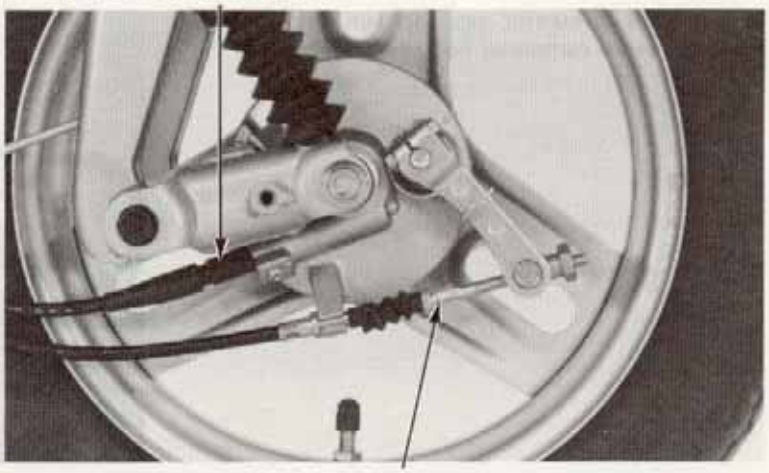
Route the cables properly.

Adjust the throttle cable and oil pump control cable free play (page 3–8).

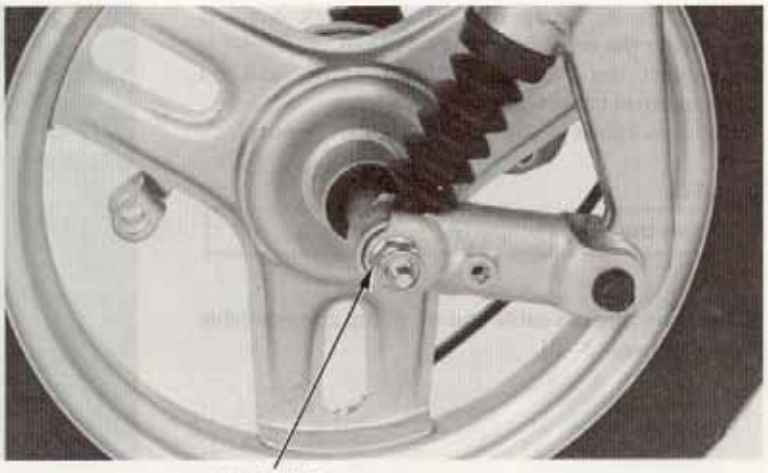
FRONT WHEEL

REMOVAL

Remove the set screw and disconnect the speedometer cable.
Turn the brake adjusting nut counterclockwise all the way, and disconnect the front brake cable from the brake arm.



Remove the axle nut.
Rise the front wheel off the ground by placing a support or jack under the frame.
Remove the front wheel by pulling out the axle shaft.



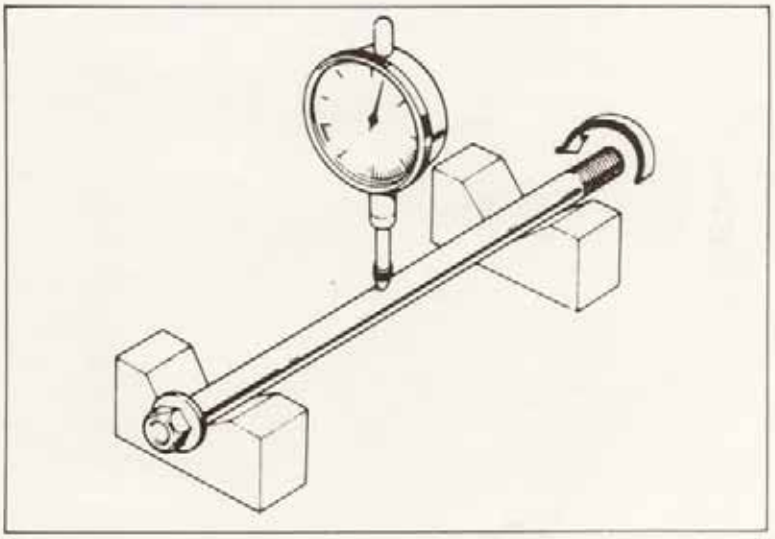
INSPECTION

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

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

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

SERVICE LIMIT: 0.2 mm (0.01 in)



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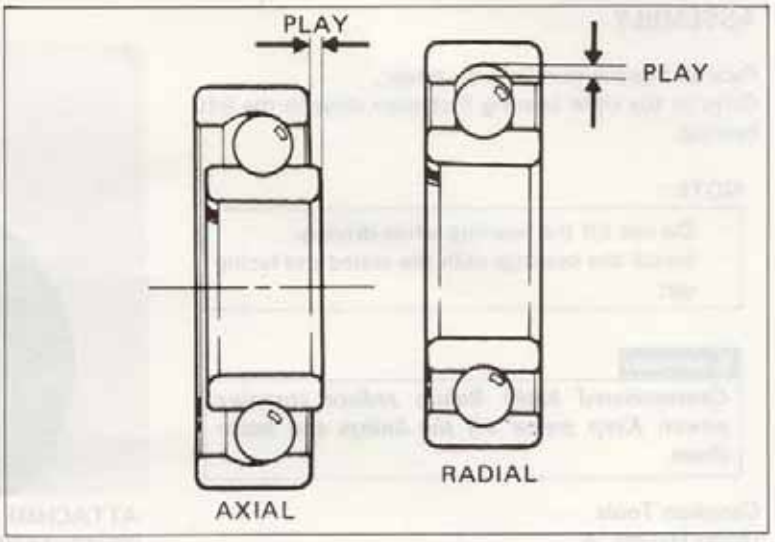
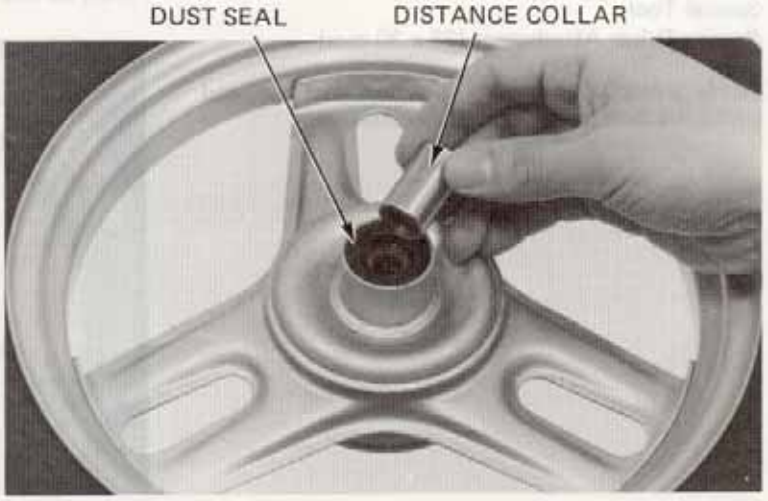
Wheel Bearing

Check the wheel bearing play by placing the wheel in a truing stand and spinning the wheel by hand. Replace the bearings if they are noisy or have excessive play.



BEARING REPLACEMENT

Remove the distance collar and dust seal.



Drive out the bearings using the special tools "Bearing Remover Shaft" and "Bearing Remover Head" as shown.

NOTE:

The bearings must be replaced with new ones whenever removed.

ASSEMBLY

Pack all bearing cavities with grease.
Drive in the right bearing first then drive in the left bearing.

NOTE:

- Do not tilt the bearings while driving.
- Install the bearings with the sealed end facing out.

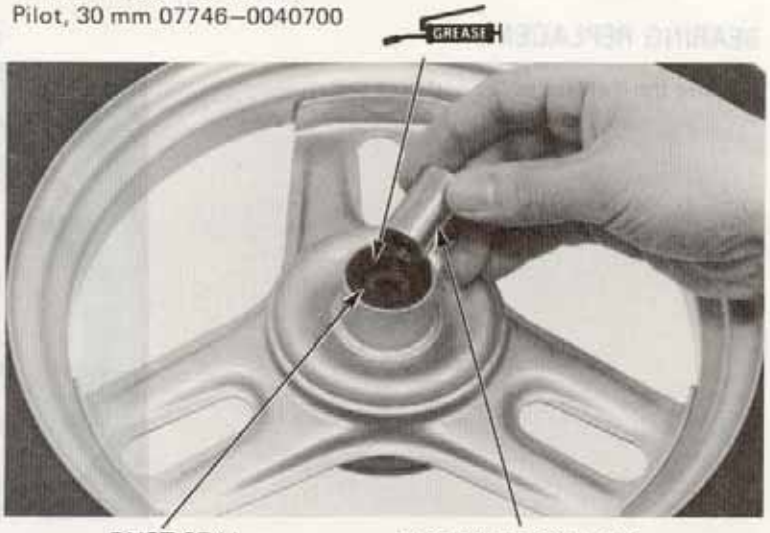
WARNING

Contaminated brake linings reduce stopping power. Keep grease off the linings and brake drum.

Common Tools
Driver Handle A
Driver Pilot (10 mm)

Special Tool
Bearing Driver Attachment (28 x 30 mm)

Apply grease to the inside of a new dust seal, and install the dust seal and distance collar.

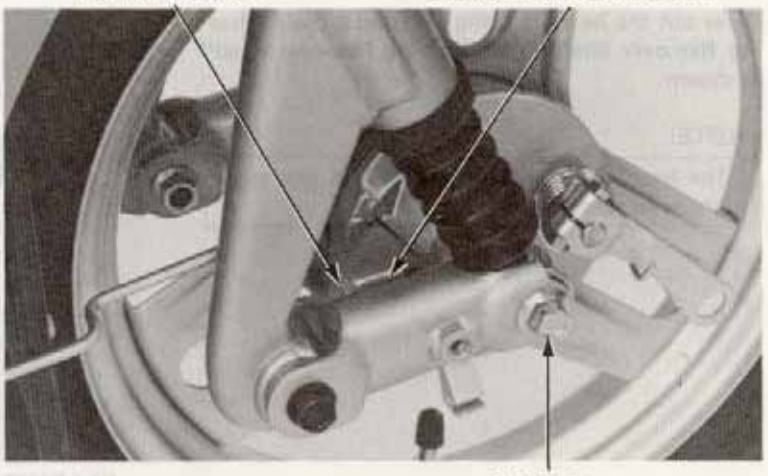


INSTALLATION

Install the brake panel into the wheel hub.
Position the front wheel between the front forks and insert the axle shaft through the wheel hub from the right side.

NOTE:

Be sure to fit the tongue of the right fork leg into the groove in the brake panel.



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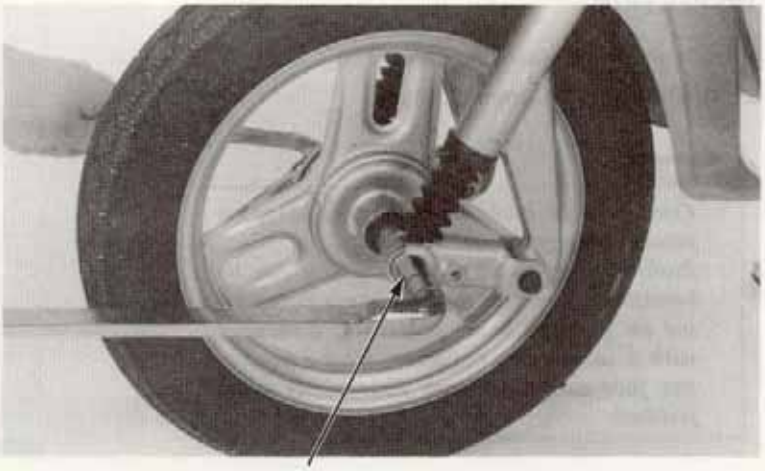
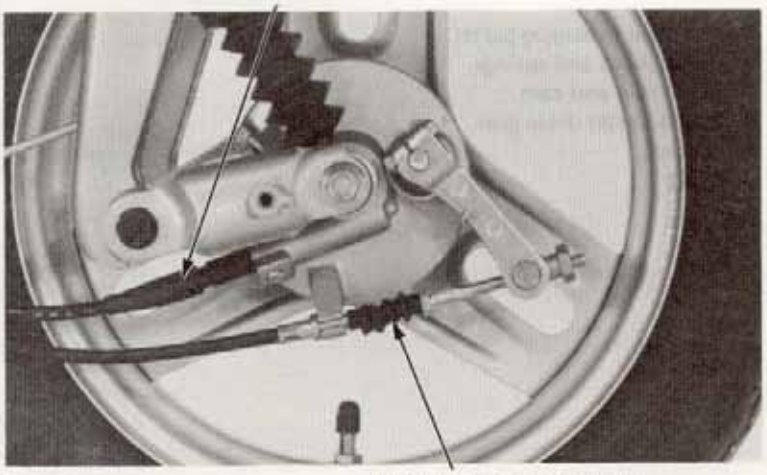
Install and tighten the axle nut to the specified torque.

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



AXLE NUT

Reconnect the speedometer and brake cables.
Adjust the front brake lever free play (Page 3–9).
Install the pivot arm cover.

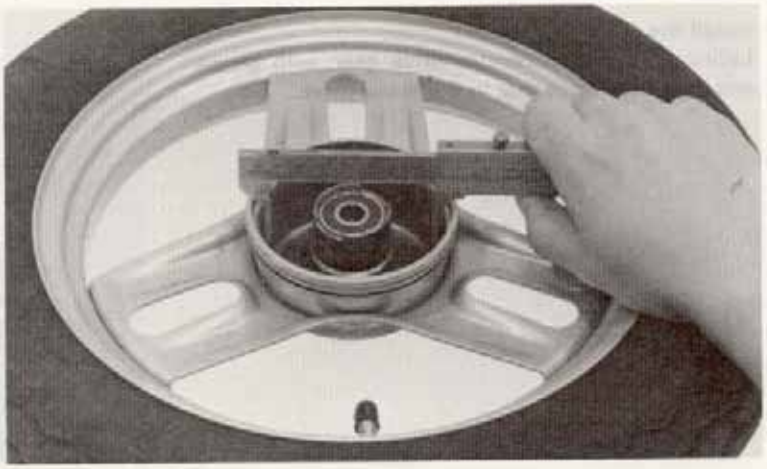


FRONT BRAKE

BRAKE DRUM INSPECTION

Remove the front wheel (page 11–12).
Measure the front brake drum I.D.

SERVICE LIMIT: 80.5 mm (3.17 in)



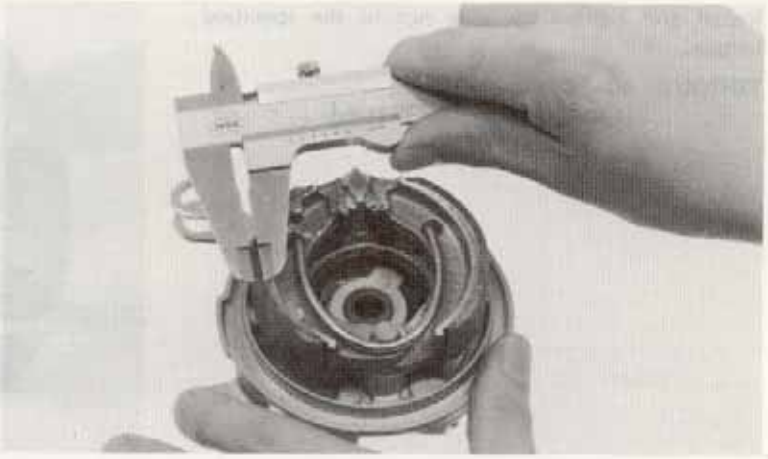
BRAKE LINING THICKNESS INSPECTION

Measure the front brake lining thickness.

SERVICE LIMIT: 1.5mm (0.06 in)

WARNING

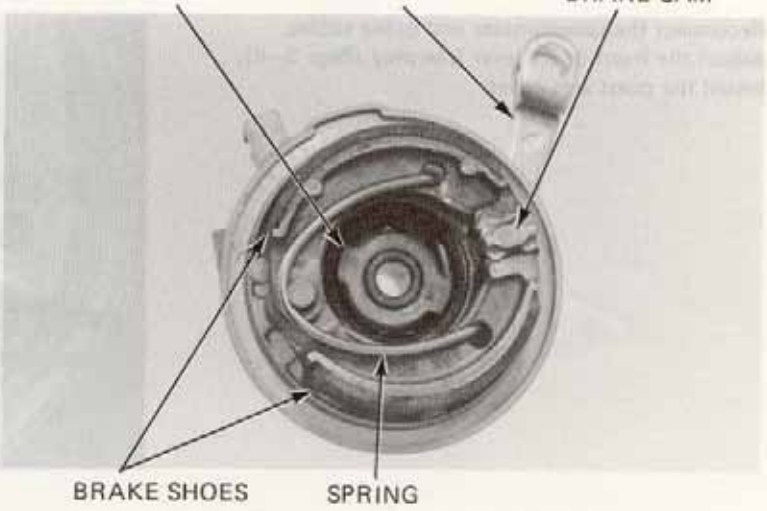
- *Contaminated brake linings reduce stopping power. Keep grease off the linings.*
- *Brake dust contains asbestos which can be harmful to your health. Do not use compressed air to clean brake parts. Use a vacuum with a sealed dust collector. Wear a protective face mask and wash your hands when finished.*



BRAKE PANEL DISASSEMBLY

Remove the following parts:

- Brake shoes and springs.
- Brake arm and cam.
- Speedometer drive gear.
- Oil seal.



BRAKE PANEL ASSEMBLY

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

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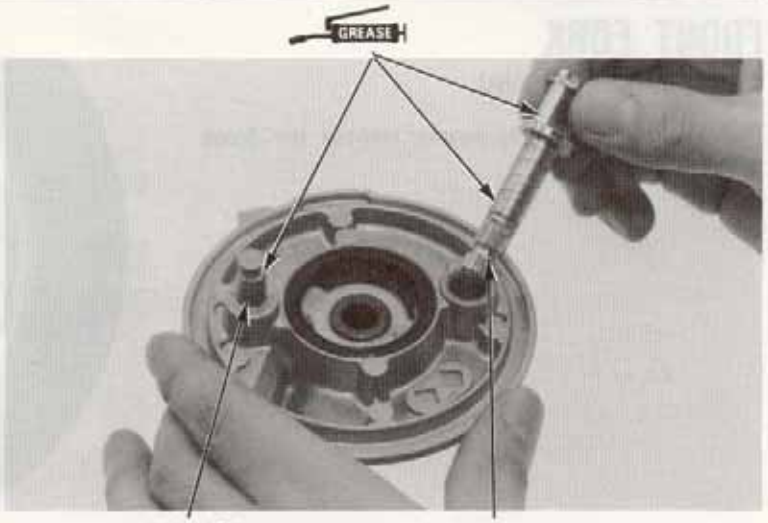
Apply silicone grease to the anchor contacting area of each shoe and to the brake shoe contacting area of the brake cam.
Install the brake cam in the brake panel.

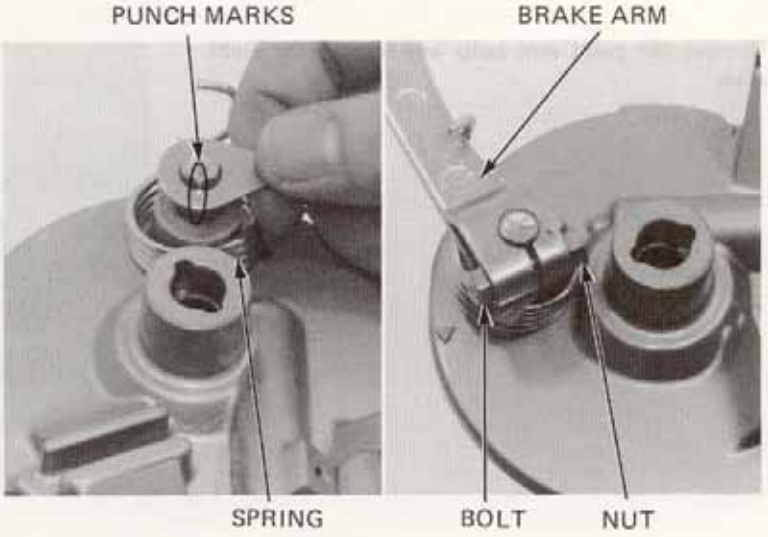


Install the felt seal on the brake arm.
Install the brake shoe return springs.
Align the punch marks and install the wear indicator and brake arm.
Install and tighten the brake arm bolt to the spcified torque.

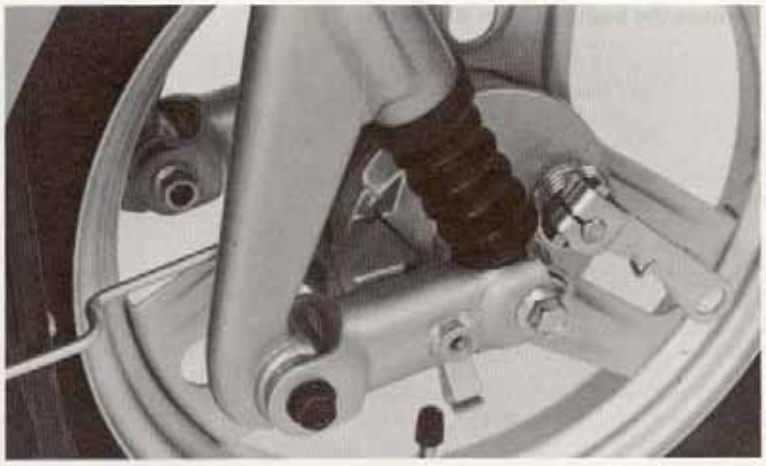
TORQUE: 4–7 N·m
(0.4–0.7 kg-m, 3–5 ft-lb)

WARNING

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



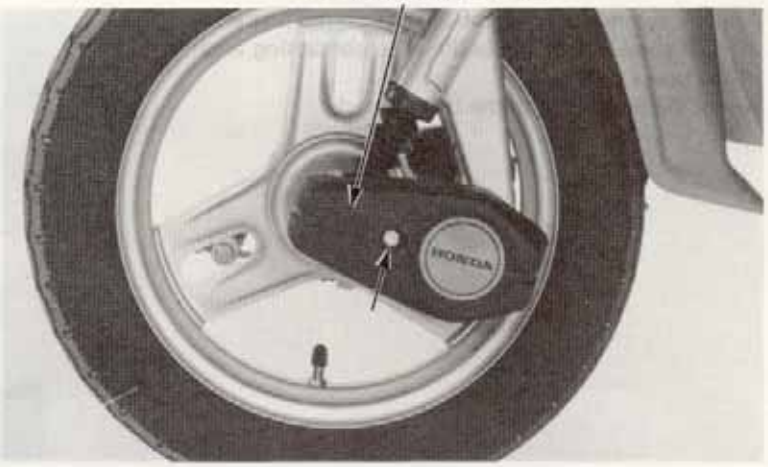
Install the brake panel and front wheel (page 11–14).



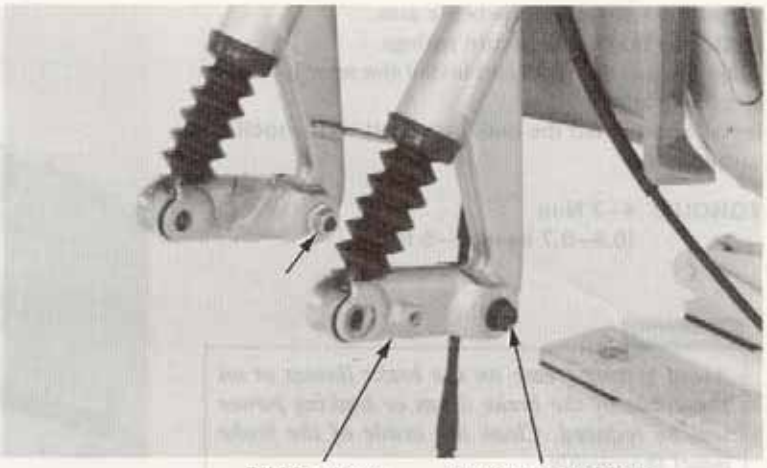
FRONT FORK

PIVOT ARM REMOVAL

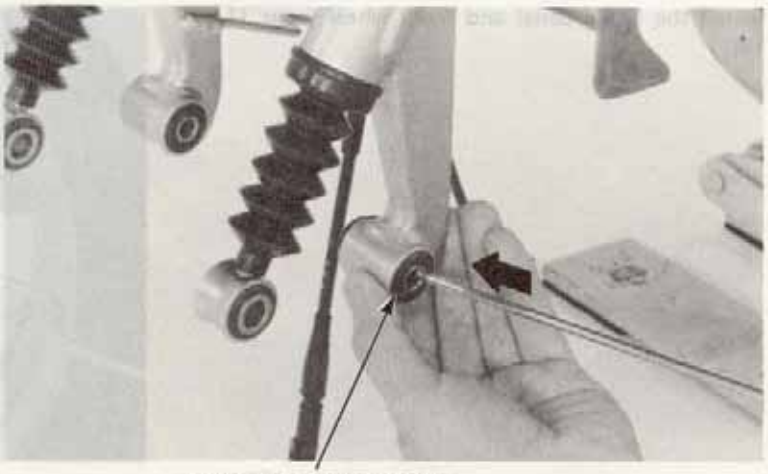
Remove the pivot arm covers; remove the front wheel (page 11–12).



Remove the pivot arm bolts and remove the pivot arms.



Remove the bushings from the pivots.



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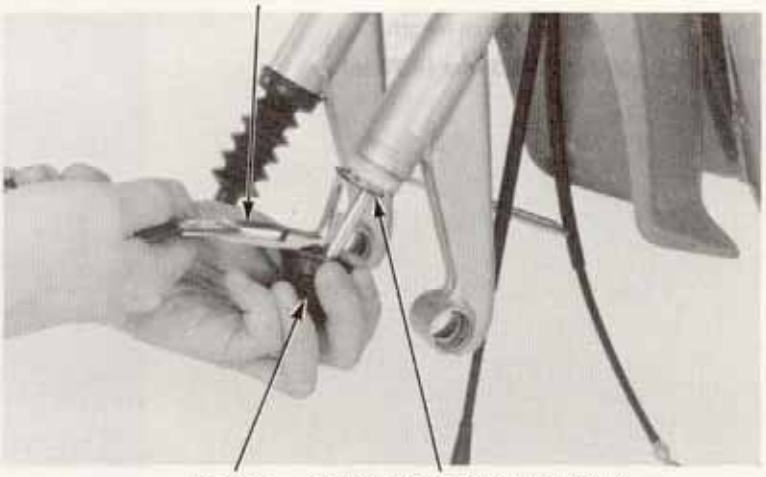
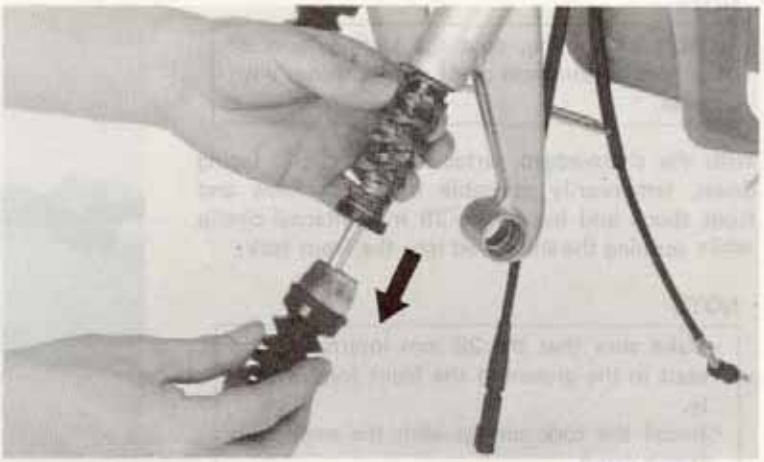
Check the pivot arm bushings for wear or damage.

FRONT SHOCK REMOVAL

Remove the pivot arms.
Slide the boot down to expose the 28 mm internal circlip and remove the circlip.



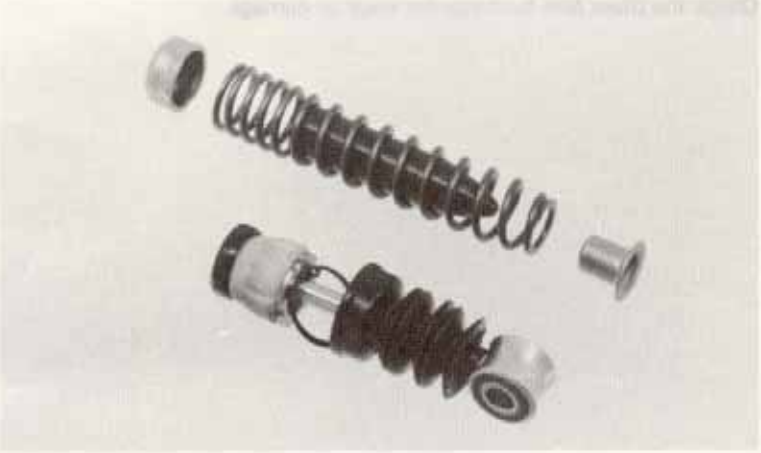
Remove the front shock rod assembly.



FRONT SHOCK DISASSEMBLY/ INSPECTION

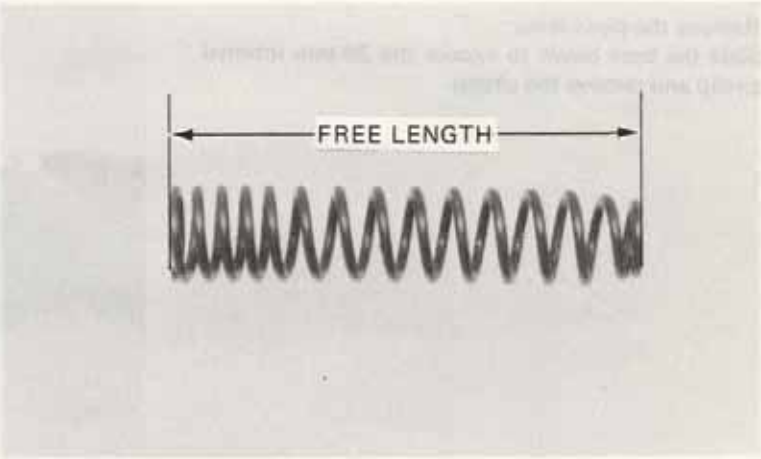
Check the front shock rod assembly for runout.
Check each part for abnormal wear or damage.

Repair or replace the front shock rod if it is to bent.



Measure the fork spring free length.

SERVICE LIMIT: 121.3 mm (4.78 in)



FRONT SHOCK ASSEMBLY

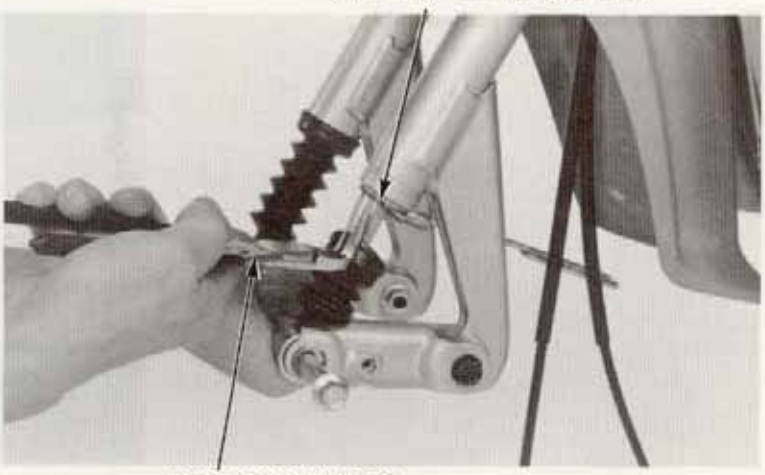
NOTE

Before assembling, coat the sliding faces of the fork pistons and pivot arm bushings with grease.

With the sharp-edged surface of the circlip facing down, temporarily assemble the pivot arms and front shock and install the 28 mm internal circlip while pushing the shock rod into the front fork.

NOTE

- Make sure that the 28 mm internal circlip seats in the groove in the front fork properly.
- Install the fork springs with the small ends facing down.



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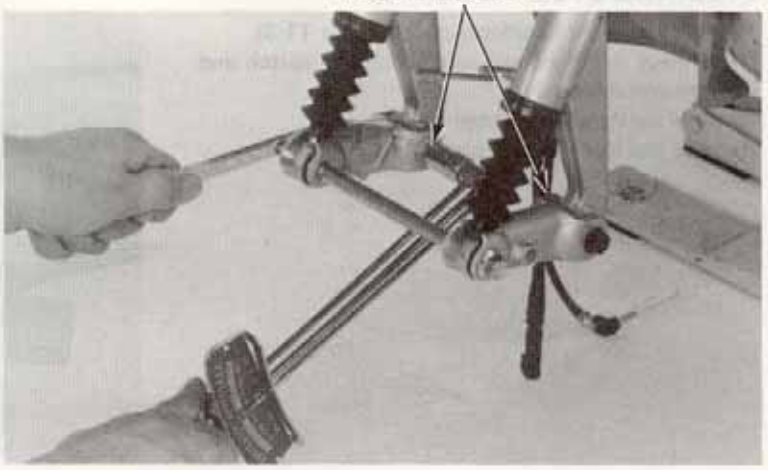
Torque the front fork pivot arm nuts.

TORQUE: 20–30 N·m (2.0–3.0 kg-m (14–22 ft-lb)

The assembly sequence is essentially the reverse order of disassembly.

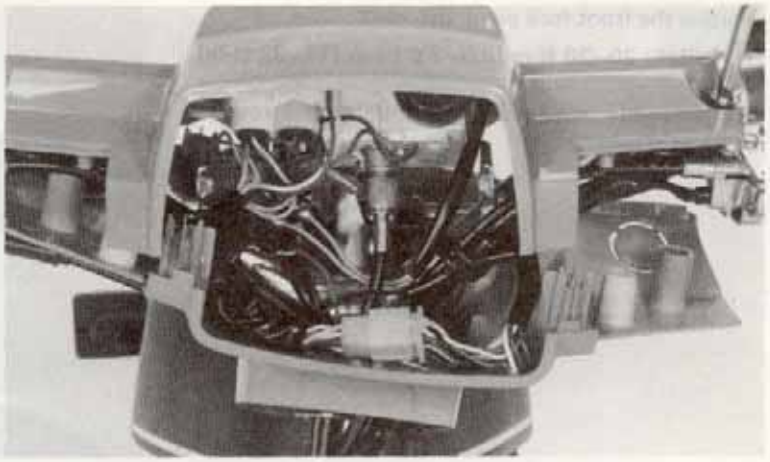


Torque the front axle nut.

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

STEERING STEM REMOVAL

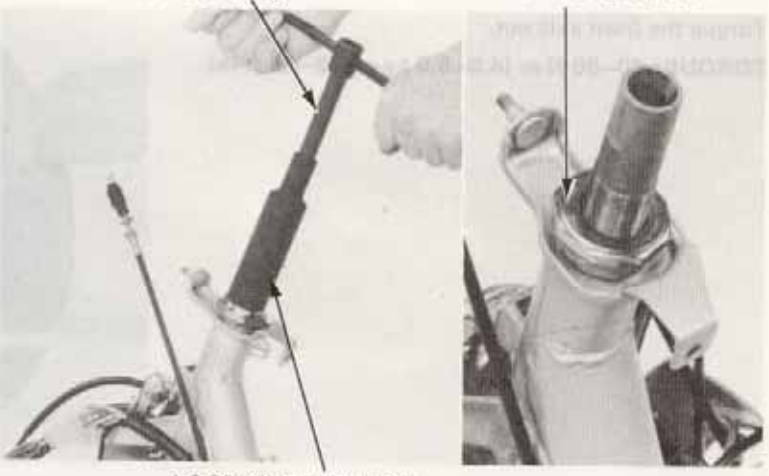
Remove the front handlebar covers (page 11-3).
Disconnect the right and left handlebar switch and ignition switch couplers.
Remove the handlebar (page 11-5).
Remove the front wheel (page 11–12).



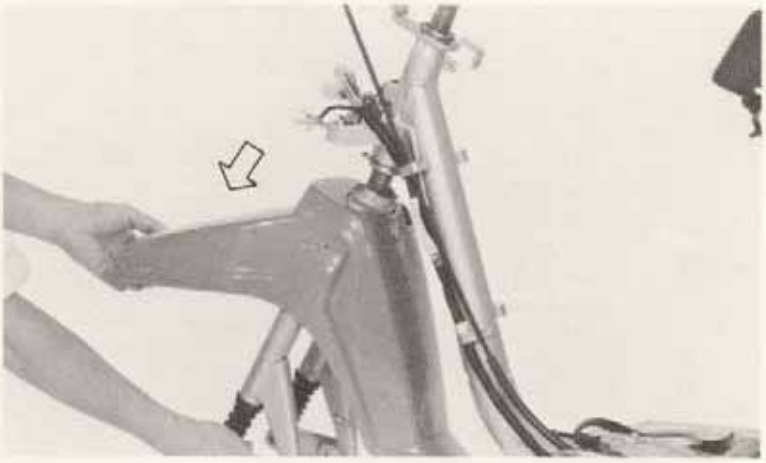
Remove the steering stem lock nut and top cone race.

NOTE

Do not left the steel balls fall out.



Pull the front fork assembly down and out of the steering head.



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Remove the front shock absorbers from the front fork.
Remove the front fender bolt and remove the front fender.

BALL RACE DISASSEMBLY/ASSEMBLY

Remove both ball races with the following tool.

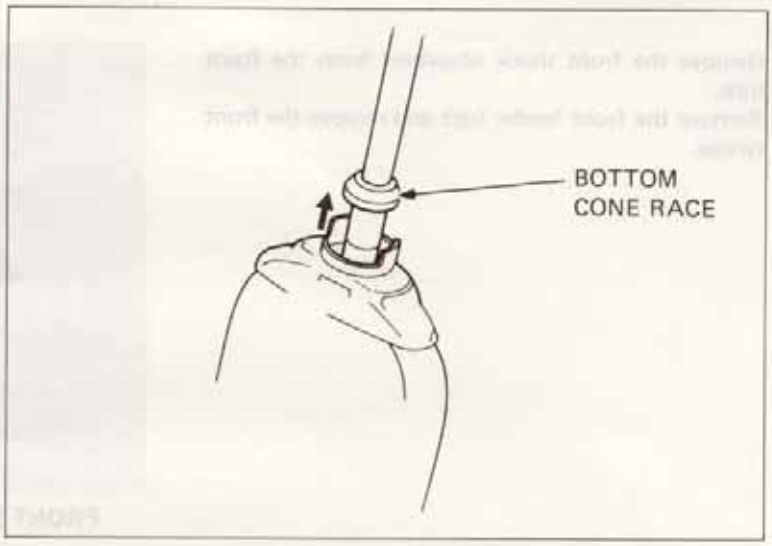
Install the top and bottom ball races with the following tools.

NOTE

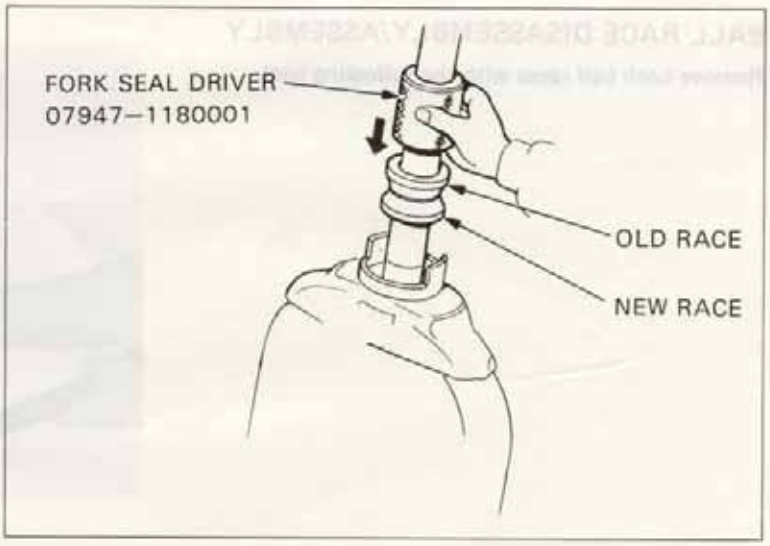
- Do not allow the ball races to tilt when installing.
- Drive in the races until they are fully seated.
- Take care not to damage the ball contacting surfaces.

BOTTOM CONE RACE REPLACEMENT

Remove the bottom cone race with a cold chisel, being careful not to damage the steering stem.

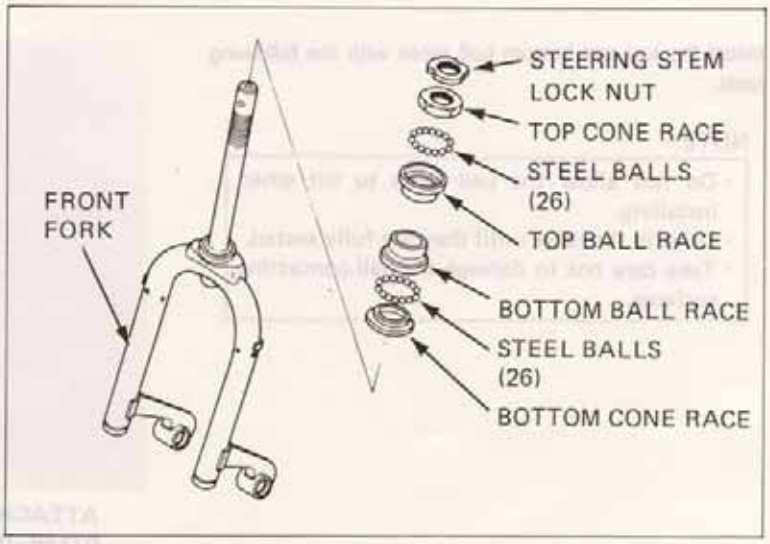


Install a new bottom cone race cover the steering stem.
Install the old bottom cone race cover the new bottom cone race upside down.
Drive the bottom cone race with special tools until it seats in place, then remove the old bottom cone race.



STEERING STEM INSTALLATION

Coat the ball races and cone races with clean grease.
Install 26 steel balls on both races.



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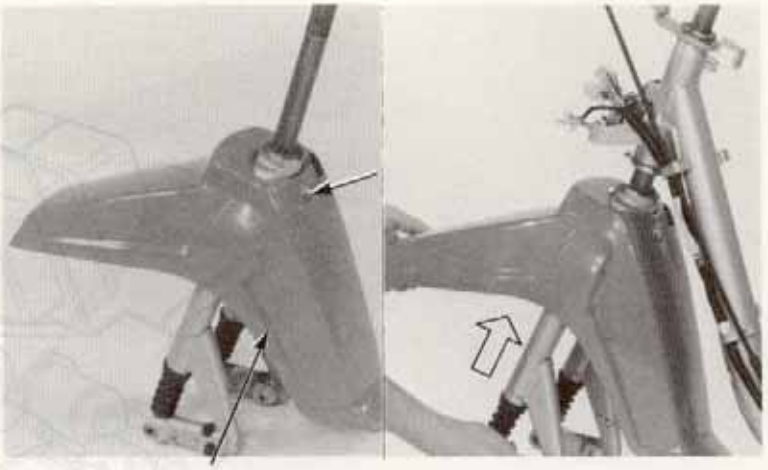
Install the front fender and tighten the fender bolt. Install the front fork by pushing it up into the steering head.



Thread the top cone race onto the steering stem until it is snug against the steel balls; then back it out 1/8 turn.

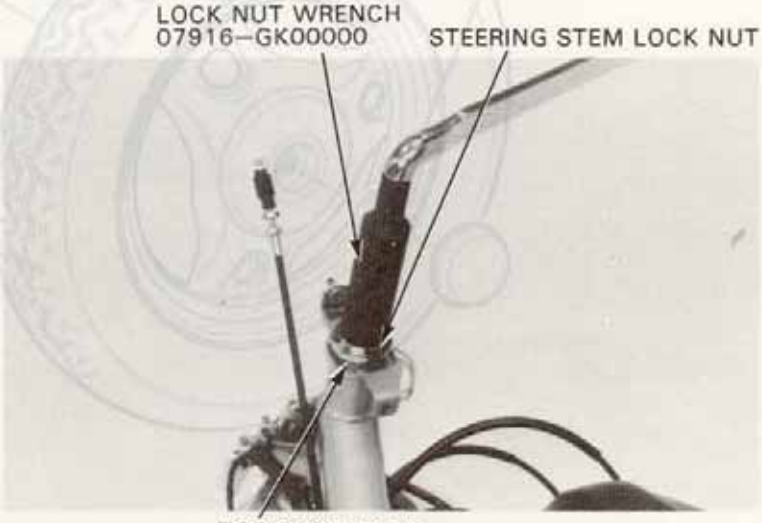
Install the steering stem lock nut and tighten it while holding the top cone race.

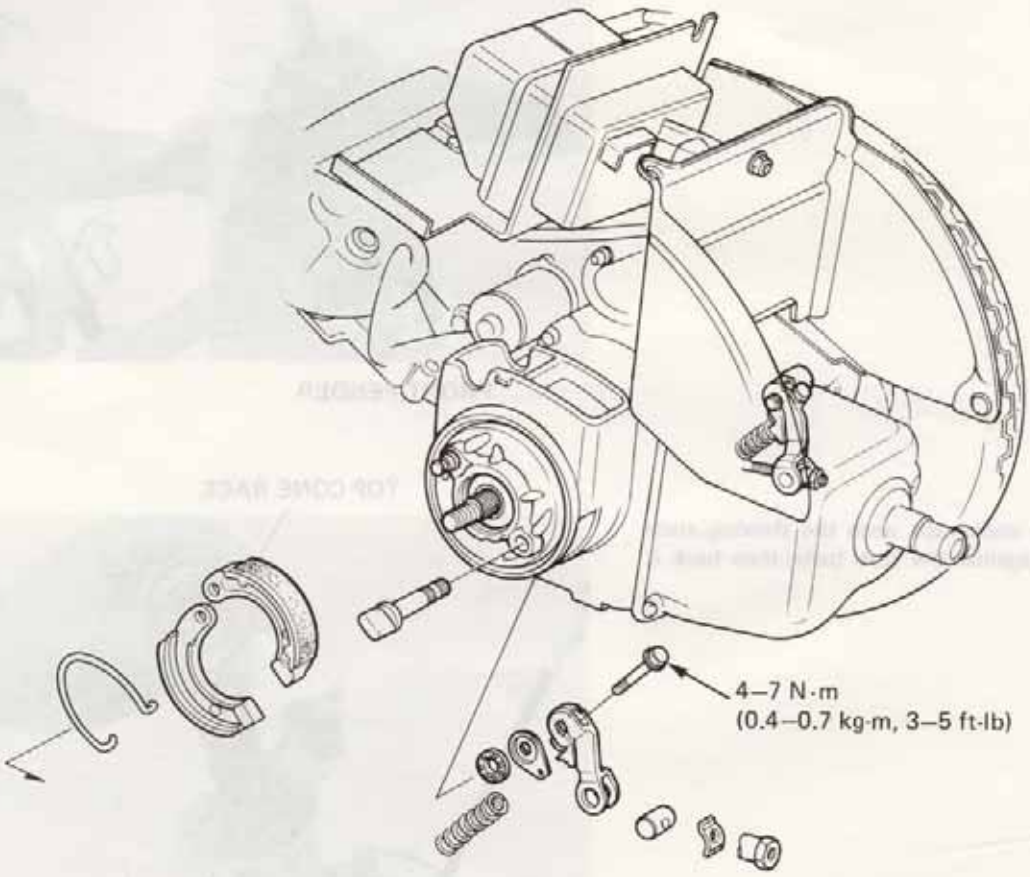
TORQUE: 60–80 N·m (6.0–8.0 kg-m, 43–58 ft-lb)

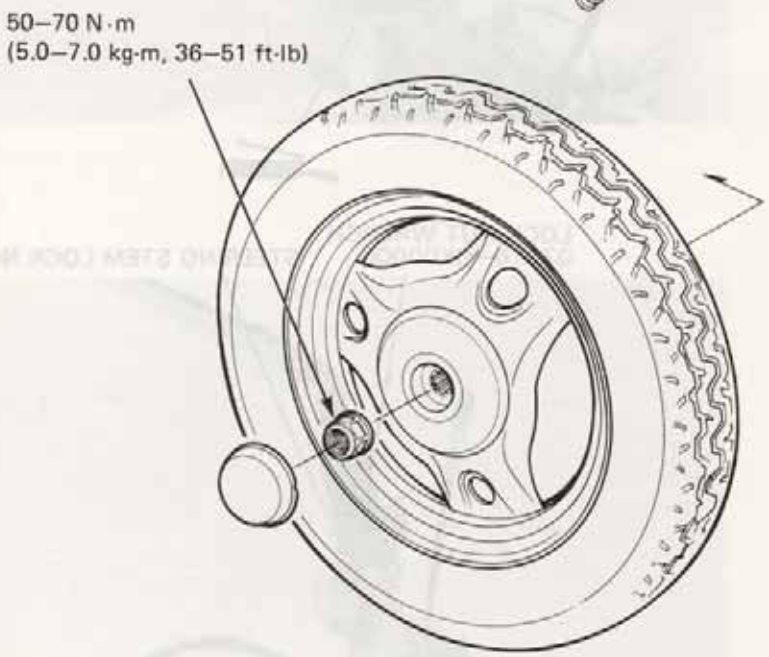
NOTE

Check that the steering stem rotates freely without vertical play.

Install the removed parts in the reverse order of removal.







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12. REAR WHEEL/BRAKE

SERVICE INFORMATION

GENERAL

- Brake dust contains asbestos which can be harmful to your health.
- Do not use compressed air to clean brake drums or brake panels. Use a vacuum with a sealed dust collector. Wear a protective face mask and thoroughly wash your hands when finished.

SPECIFICATIONS

ITEM	STANDARD mm (in)	SERVICE LIMIT mm (in)
Rear wheel rim runout	—	2.0 (0.08)
Rear brake drum I.D.	80.0–80.2 (3.15–3.16)	80.5 (3.17)
Rear brake lining thickness	4.0 (0.16)	2.0 (0.08)

TORQUE VALUES

Rear axle nut	50–70 N·m (5.0–7.0 kg-m, 36–51 ft-lb)
Breake arm	4–7 N·m (0.4–0.7 kg-m, 3–5 ft-lb)

TROUBLESHOOTING

Rear wheel wobbling

1. Bent rim
2. Faulty or unevenly worn tires
3. Axle nut tightened properly

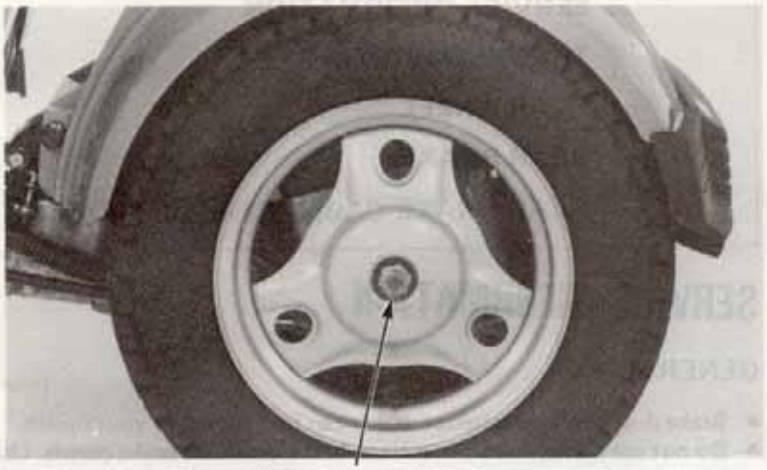
Poor brake performance

1. Brakes not adjusted properly
2. Contaminated brake shoes
3. Worn brake shoes
4. Worn brake shoes at cam contacting area
5. Worn brake cam
6. Worn brake drum
7. Improper engagement between brake arm and camshaft serrations

REAR WHEEL

REMOVAL

Apply the rear brake.
Support the motorcycle by placing a block under the engine.
Remove the wheel cap, axle nut and rear wheel.

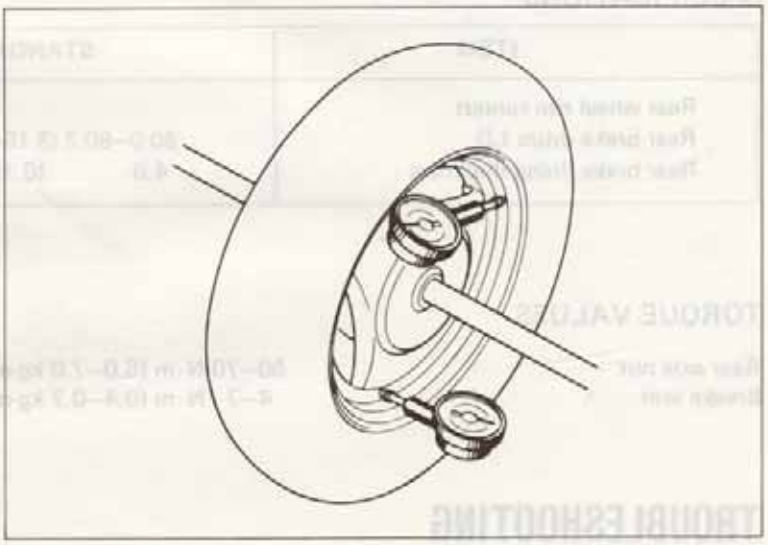


REAR AXLE NUT

INSPECTION

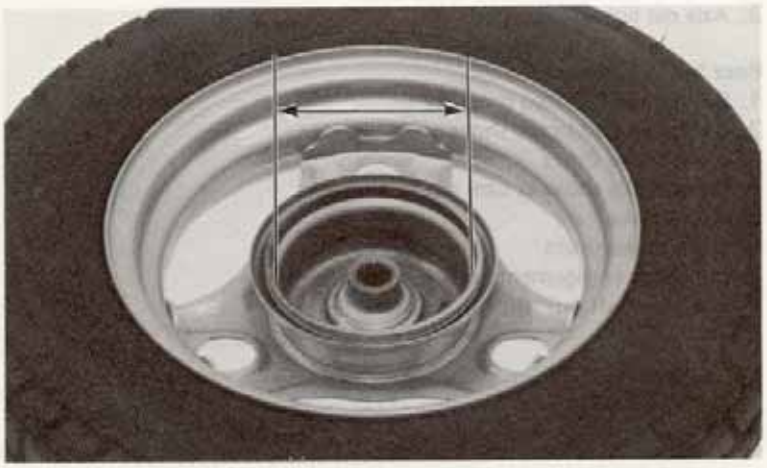
Check the rim for runout using dial gauges as shown.

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



Measure the rear brake drum I.D.

SERVICE LIMIT: 80.5 mm (3.17 in)



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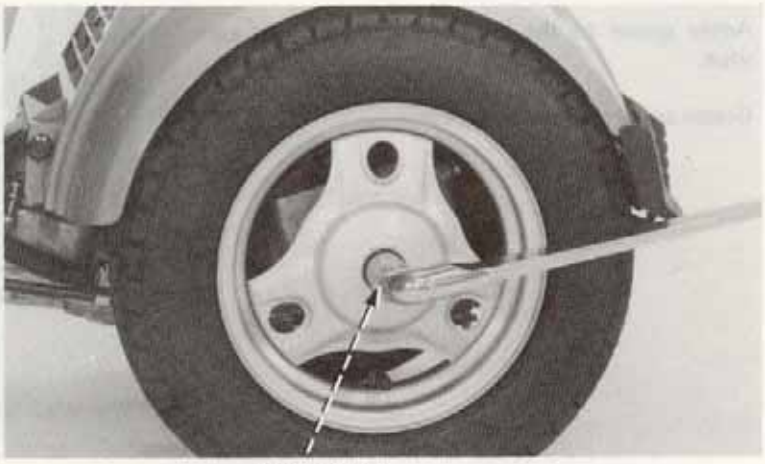
REAR WHEEL INSTALLATION

Install the rear wheels and torque the axle nuts.

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



AXLE NUT

REAR BRAKE

BRAKE SHOE INSPECTION

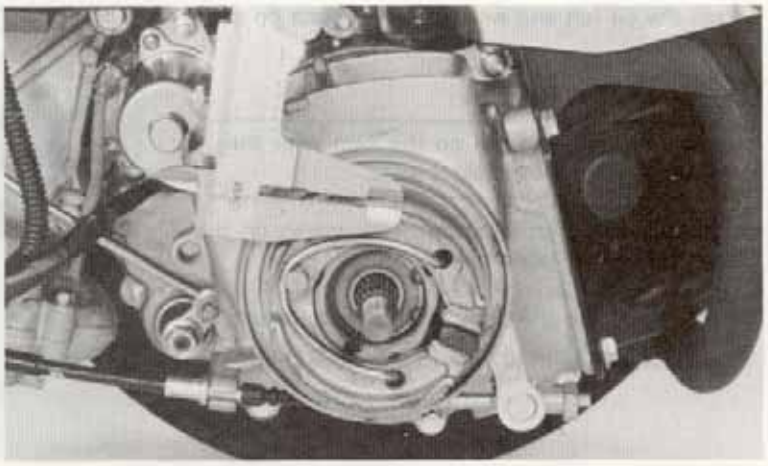
Remove the rear wheels (page 12–2).
Measure the brake lining thickness.

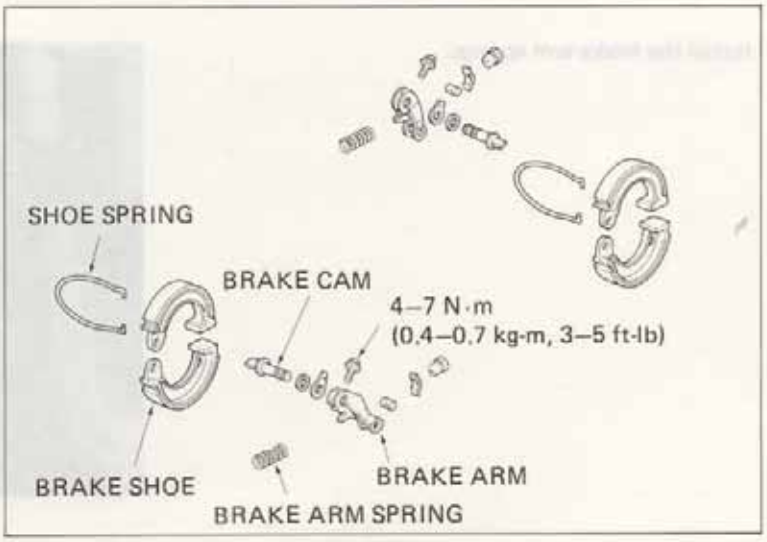
SERVICE LIMIT: 2.0 mm (0.08 in)

WARNING

Keep grease off the brake linings. Wipe off any excess grease.

Replace the shoes if they are worn beyond the service limit.

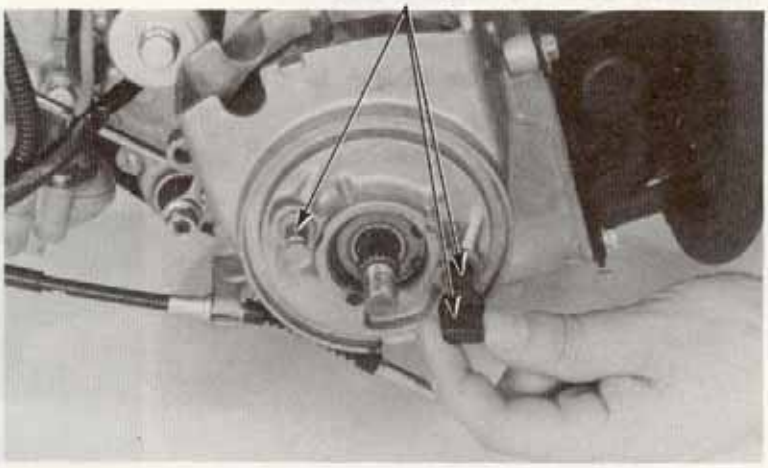




ASSEMBLY/INSTALLATION

Apply grease to the cam contacting area of each shoe.

Grease and install the brake cams.



Install the oil felt and wear indicator plate on each cam.

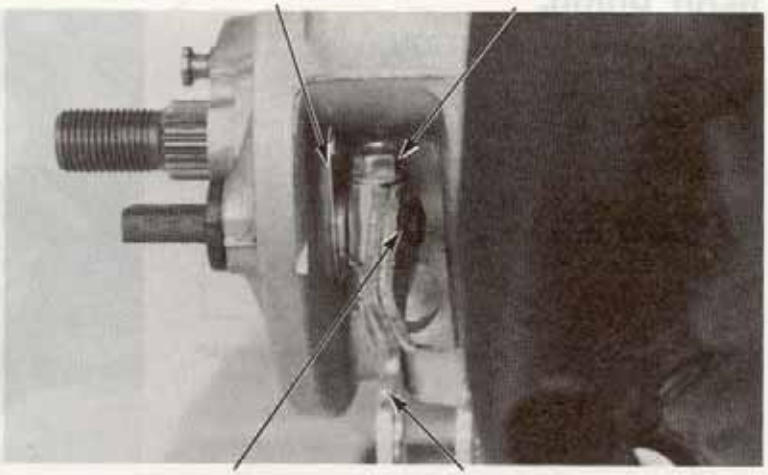
NOTE:

> Align the wide groove on the cam with the wide tooth on the indicator plate.

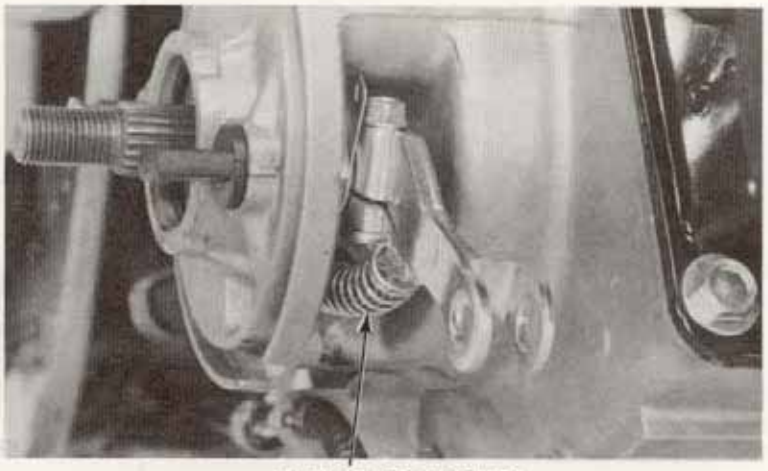
Install the brake arms, aligning the marks on the brake arm and the brake cam.

Tighten the brake arm bolts to the specified torque.

TORQUE: 4–7 N·m (0.4–0.7 kg-m, 3–5 ft-lb)



Install the brake arm springs.



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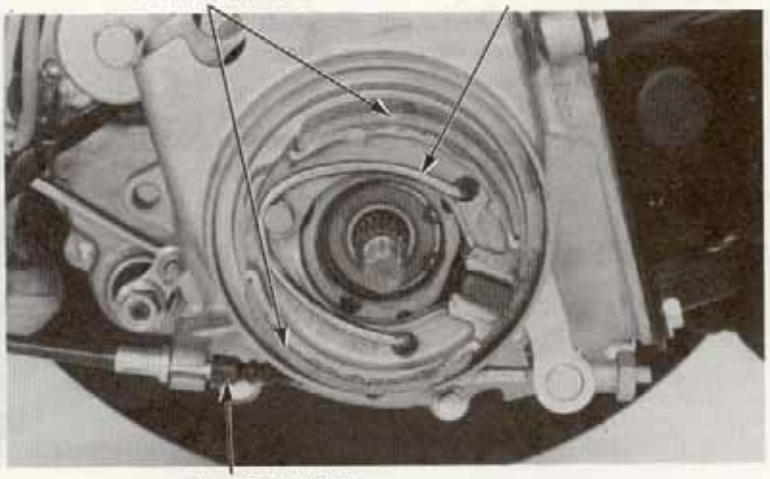
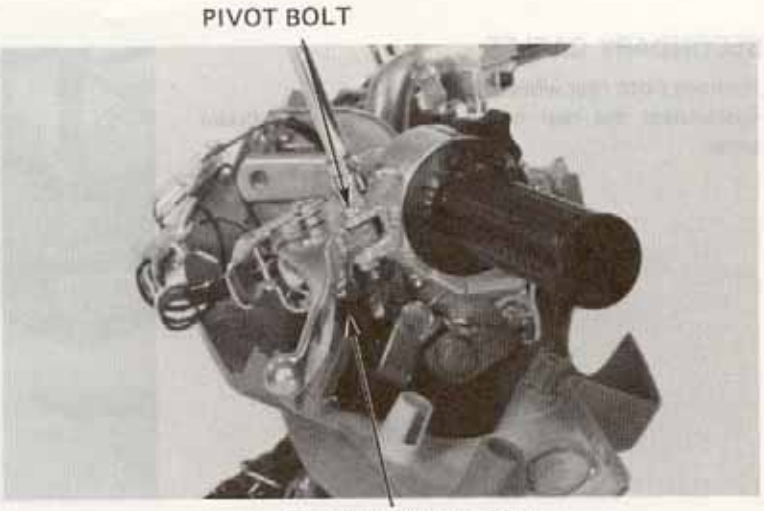
Install the brake shoes and shoe spring.
Connect the brake cables.
Install the rear wheels (page 12-3).
Adjust the rear brake (page 3-10).



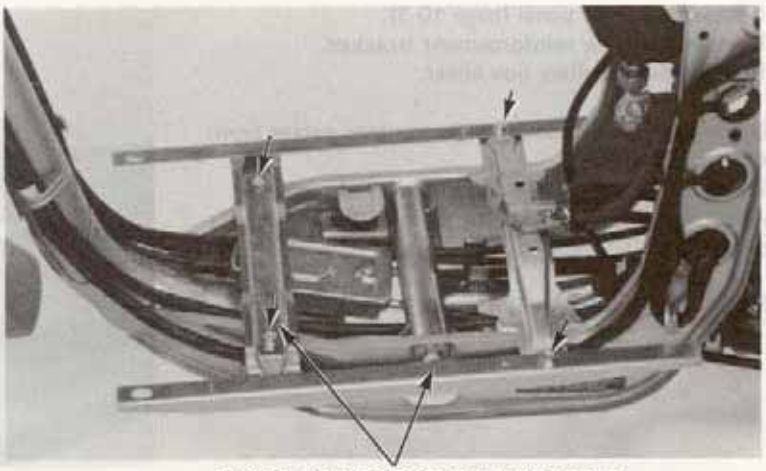
REAR BRAKE CABLE REPLACEMENT

PRIMARY CABLE

Remove the handlebar upper cover (page 11-3).
Disconnect the primary brake cable from the rear brake lever by removing the pivot bolt and nut.



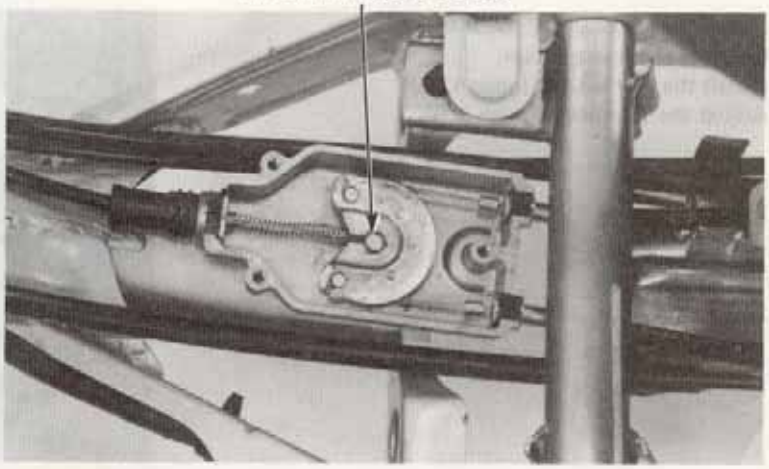
Remove the floor panel (page 10-3).
Remove the floor reinforcement bracket by removing the four bolts.



Remove the equalizer box cover, and disconnect the primary rear brake cable from the equalizer plate.
Pull the cable out of the equalizer box.

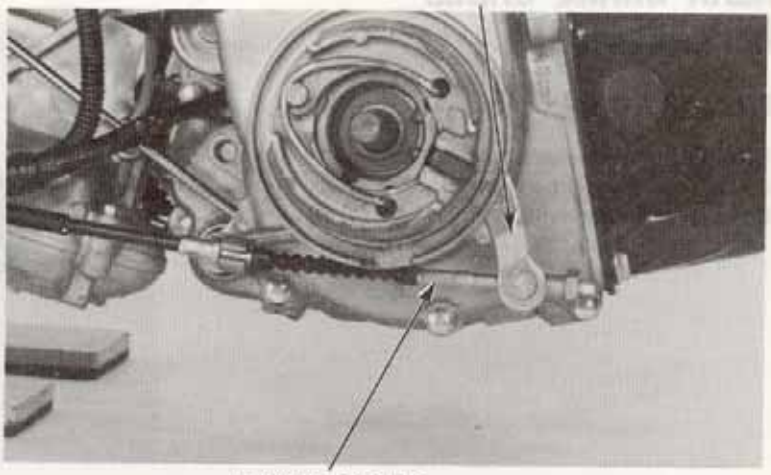
Install a new cable in the reverse order of removal.
After installation, check to be sure the routing is correct.

Perform an equalizer adjustment (page 12–7).



SECONDARY CABLES

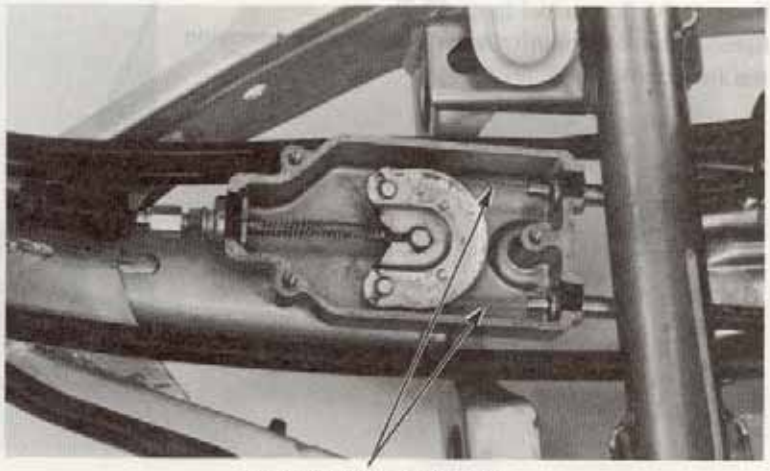
Remove both rear wheels (page 12-2).
Disconnect the rear brake cables from the brake arms.



Remove the floor panel (page 10-3).
Remove the floor reinforcement bracket.
Remove the equalizer box cover.

Disconnect and remove the secondary cables from the equalizer.
Install new calbes in the reverse order of removal.
After installation, check to be sure the routing is correct.

Perform an equalizer adjustment.



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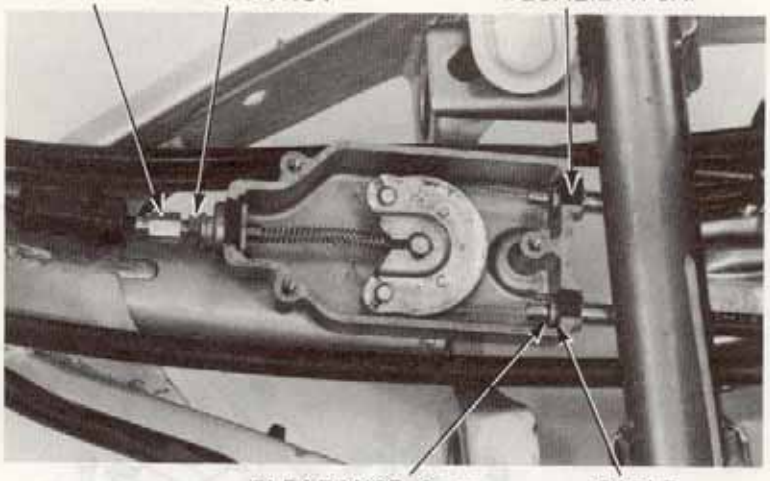
EQUALIZER ADJUSTMENT

NOTE

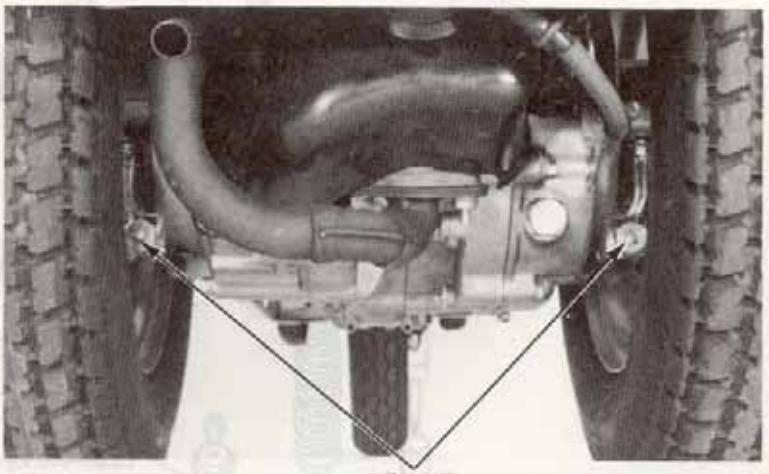
Make the following adjustment whenever any of the rear brake cables have been replaced, or when a standard rear brake adjustment is no longer effective.

Remove the cover from the cable equalizer.
Loosen the primary adjuster lock nut and turn the adjuster in fully for maximum lever free play.



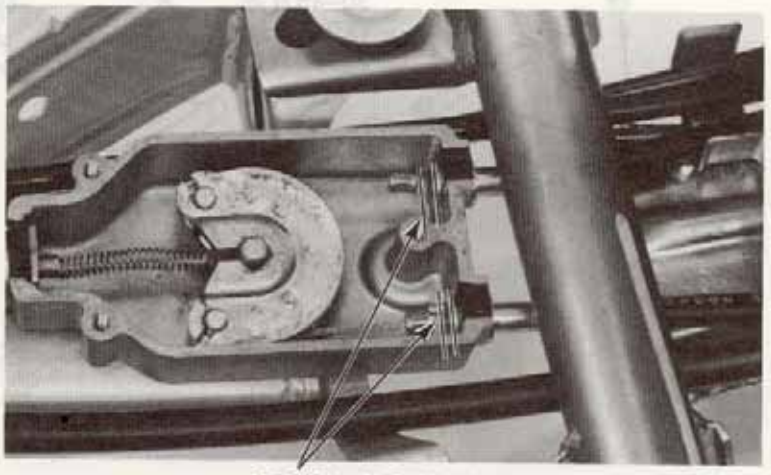
Turn the brake adjusters in until there is no clearance between the secondary cable stoppers and equalizer caps. Next, turn the primary adjuster out until there is no free play at the lever and tighten the lock nut.

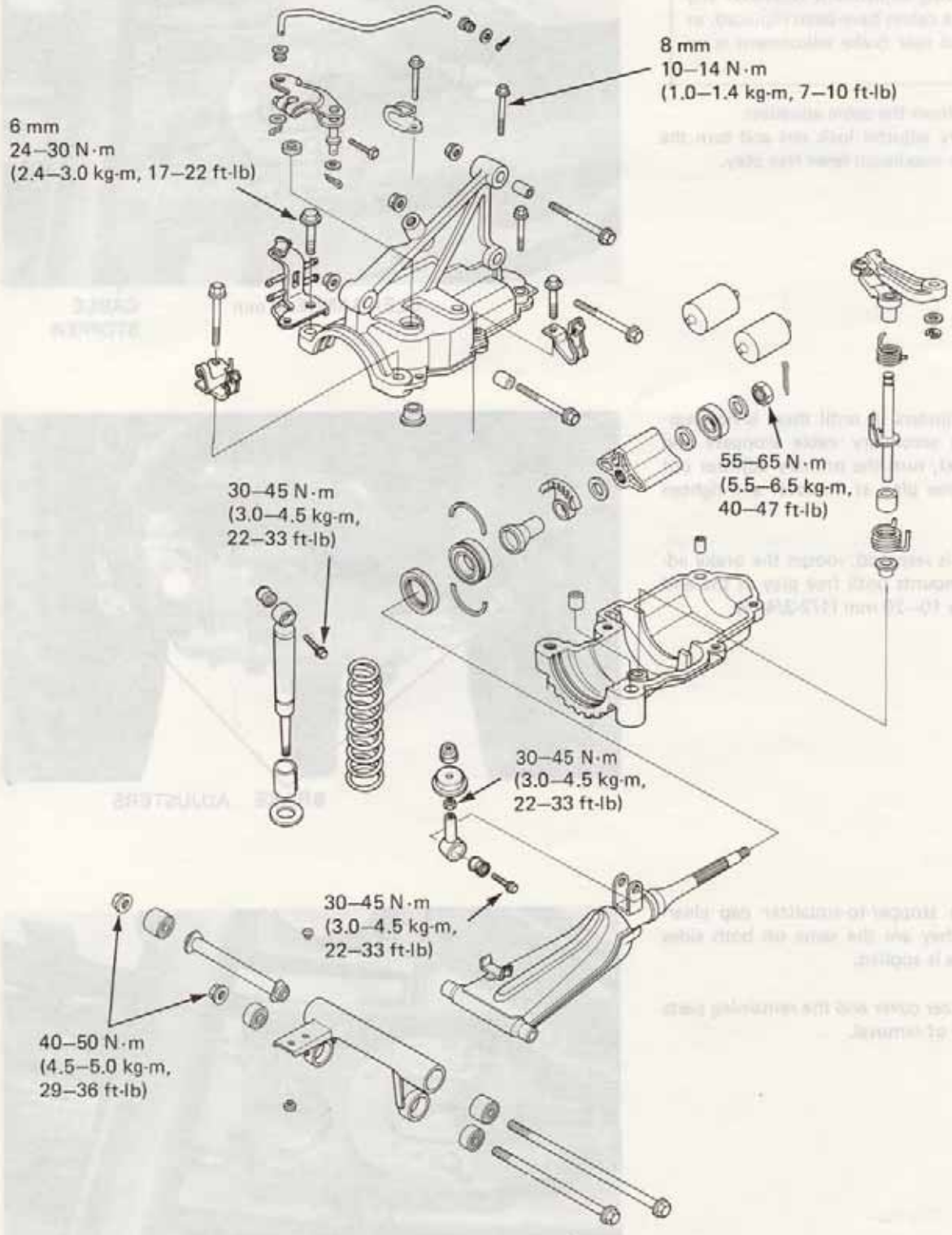
Once all clearance is removed, loosen the brake adjusters by ecual amounts until free play at the end of the brake lever is 10–20 mm (1/2-3/4 in).



Measure the cable stopper-to-equalizer cap clearances to be sure they are the same on both sides when the rear brake is applied.

Reinstall the equalizer cover and the remaining parts in the reverse order of removal.





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13. REAR SHOCK ABSORBER/ SWING JOINT UNIT

SERVICE INFORMATION

GENERAL

The compression rubbers are made of natural rubber and will detriorate if they contact oil or grease.

SPECIFICATION

ITEM	STANDARD mm (in)	SERVICE LIMIT mm (in)
Rear shock absorber spring free length	122.6 (4.83)	119 (4.69)

TORQUE VALUES

Rear shock absorber (upper/lower)		30–45 N·m (3.0–4.5 kg-m, 22–33 ft-lb)
Joint shaft		55–65 N·m (5.5–6.5 kg-m, 40–47 ft-lb)
Joint shaft pivot nut		40–50 N·m (4.0–5.0 kg-m, 29–36 ft-lb)
Joint case	8 mm bolt	24–30 N·m (2.4–3.0 kg-m, 17–22 ft-lb)
	6 mm bolt	10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)

TOOLS

Special

Rear shock absorber attachment	07967–GA70001
Spring attachments	07967–1180100
Rear shock absorber compressor	07959–3290001

TROUBLESHOOTING

Soft suspension

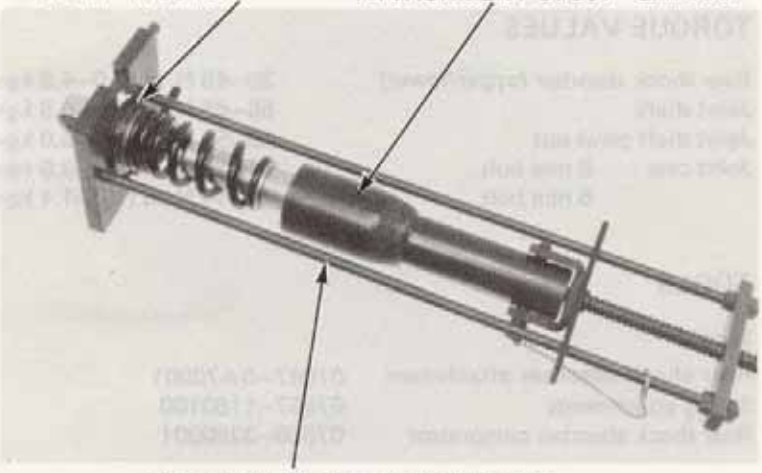
. Weak shock aborber spring

REAR SHOCK ABSORBER

REMOVAL/DISASSEMBLY

Remove the both body side covers.
Support the scooter by placing a block under the frame.
Remove the rear shock absorber by removing the upper and lower mount bolts.

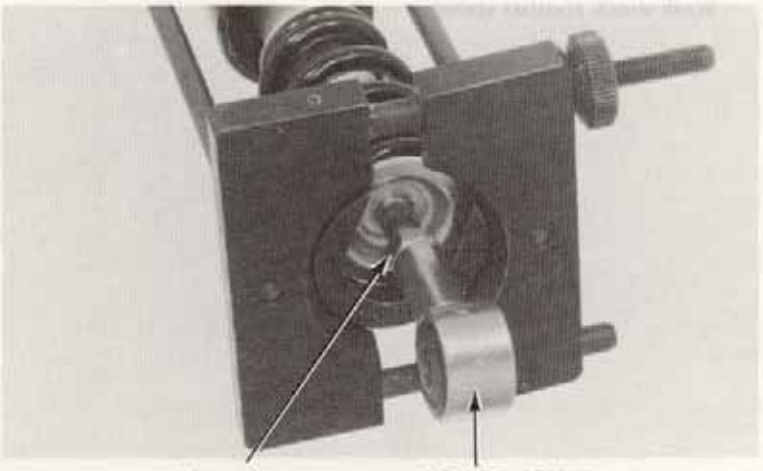
Compress the rear shock aborober.



Remove the lower joint.
Remove the lower joint lock nut and disassemble the rear shock absorber.

NOTE:

- Avoid damaging the sliding surface of the shock absorber rod.
- Use a double nut if difficulty is encountered in removing the lock nut.



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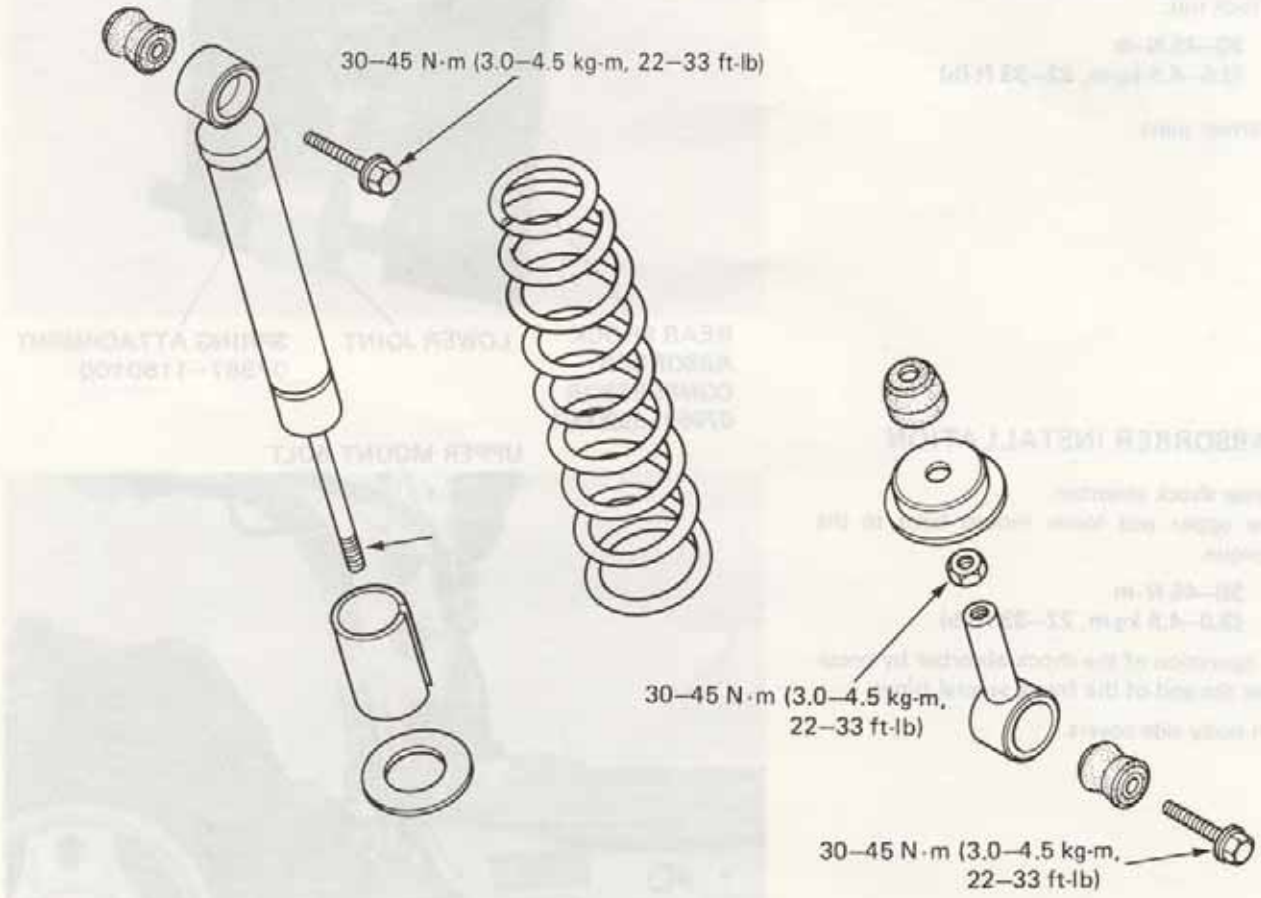
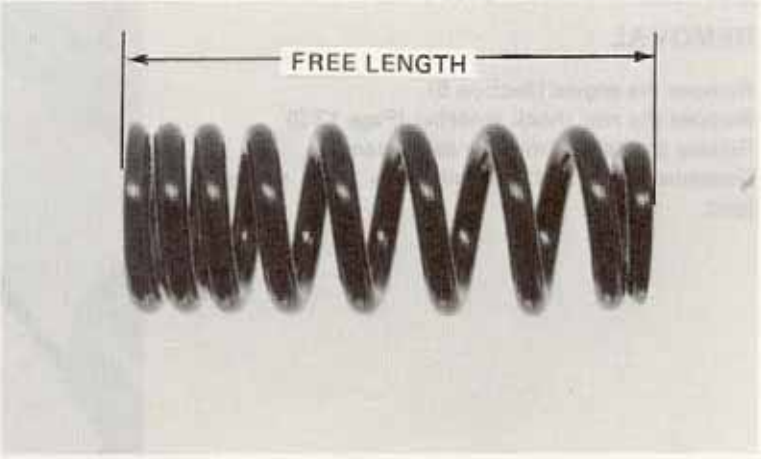


REAR SHOCK ABSORBER SPRING FREE LENGTH

Measure the rear shock absorber spring free length.

SERVICE LIMIT: 119mm (4.7 in)

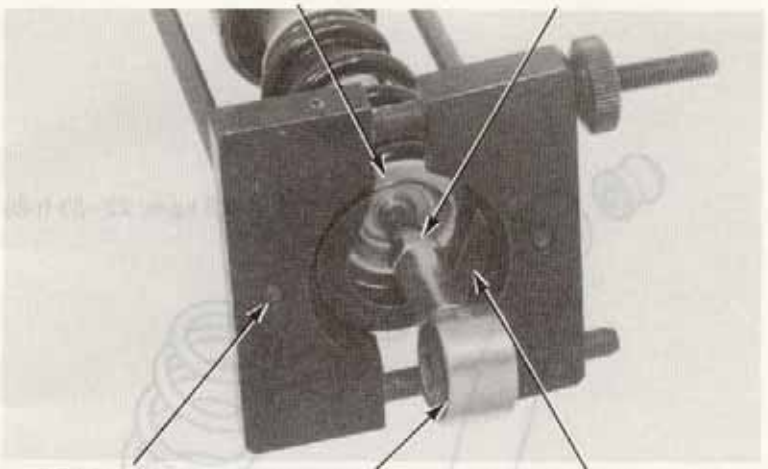


SHOCK ABSORBER ASSEMBLY

Install the lower spring seat. Install the spring with the tightly wound coils facing down. Compress the spring and install the lower joint lock nut.
Apply a locking agent to the lock nut threads and torque the lock nut.

TORQUE: 30–45 N·m
(3.0–4.5 kg-m, 22–33 ft-lb)

Install the lower joint.



SHOCK ABSORBER INSTALLATION

Install the rear shock absorber.
Tighten the upper and lower mount bolts to the specified torque.

TORQUE: 30–45 N·m
(3.0–4.5 kg-m, 22–33 ft-lb)

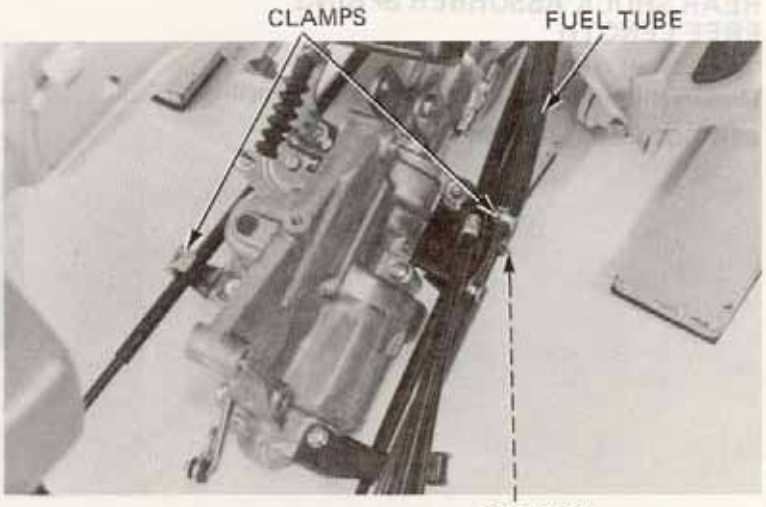
Check the operation of the shock absorber by pressing down on the end of the frame several times.

Install both body side covers.

SWING JOINT UNIT

REMOVAL

Remove the engine (Section 5).
Remove the rear shock absorber (Page 13-2).
Release the cables from the cable clamps.
Disconnect the fuel and oil tubes from the tube joint.



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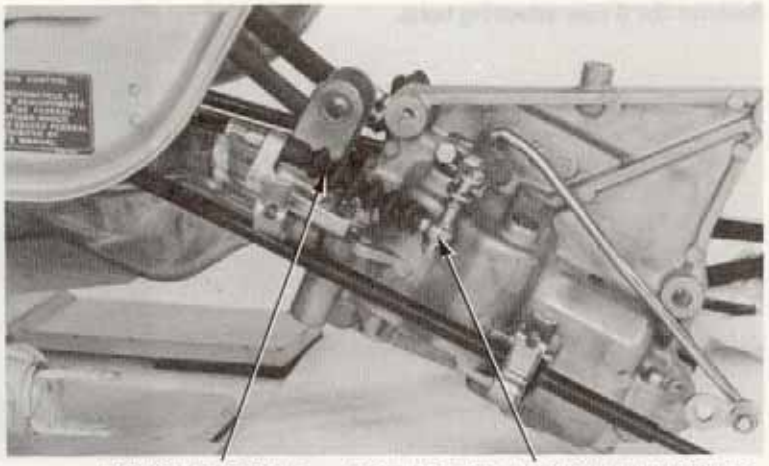
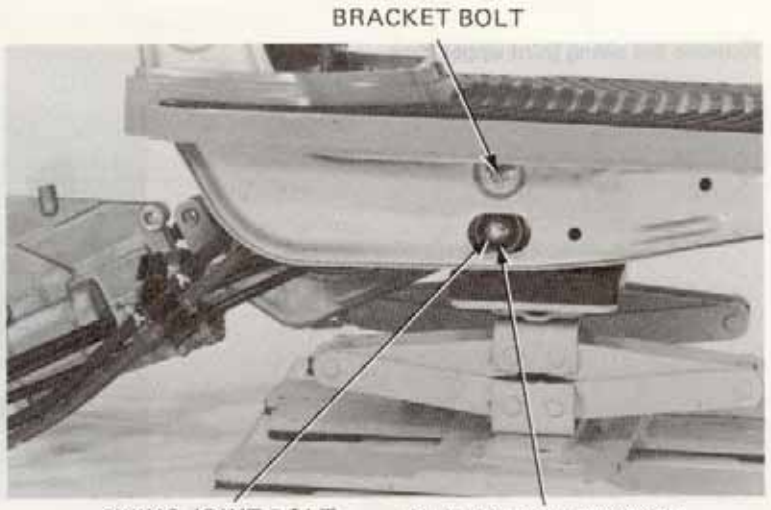
Disconnect the parking cable from the parking arm by removing the cotter pin and plain washer.



Remove the swing joint unit by removing the joint shaft bolt and nut.
Remove the joint shaft bracket bolt and remove the bracket.

Check the joint shaft bracket and mount rubber for cracks, deformation or other faults.

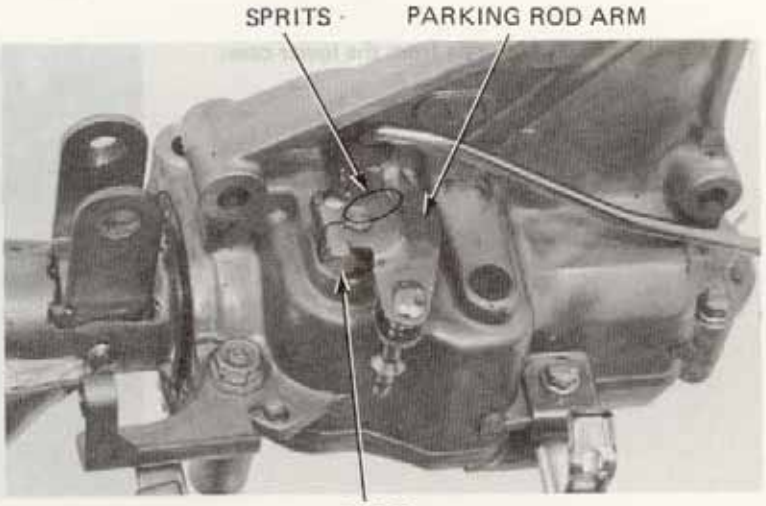


DISASSEMBLY

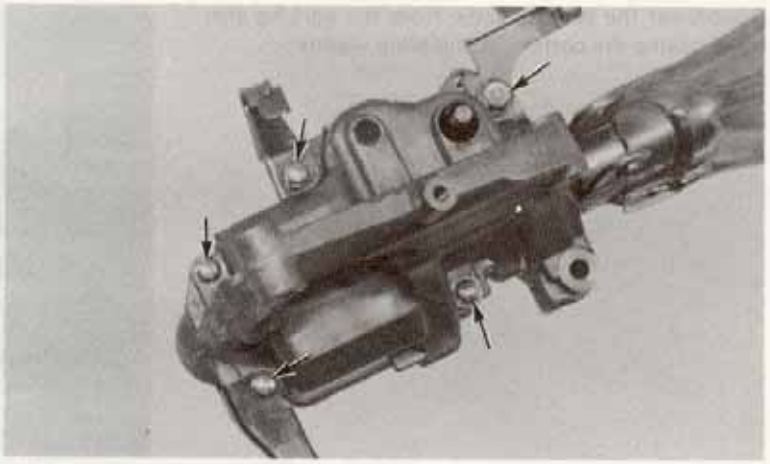
Remove the parking rod arm.

NOTE

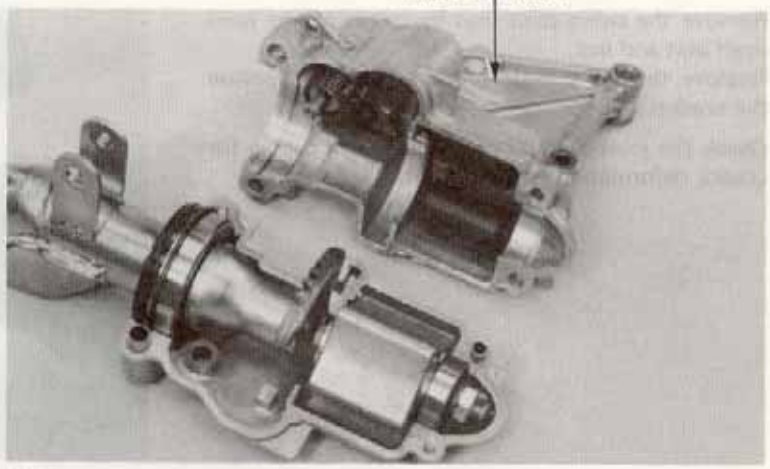
Align the splits before removing the arm.



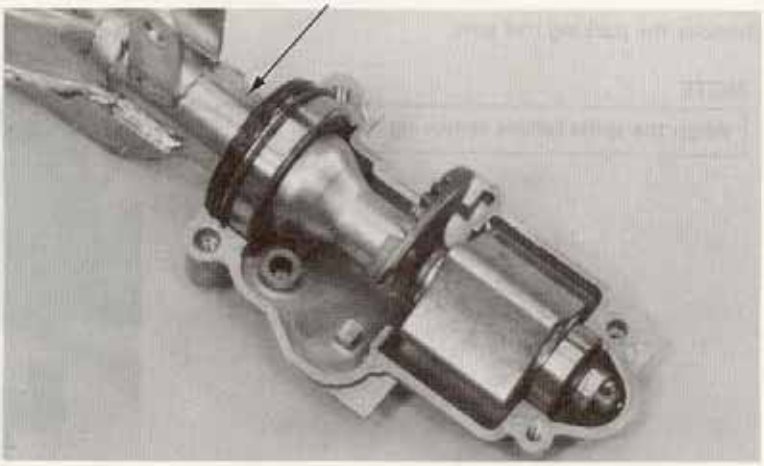
Remove the 6 case attaching bolts.



Remove the swing joint upper case.



Remove the swing joint shaft from the lower case.



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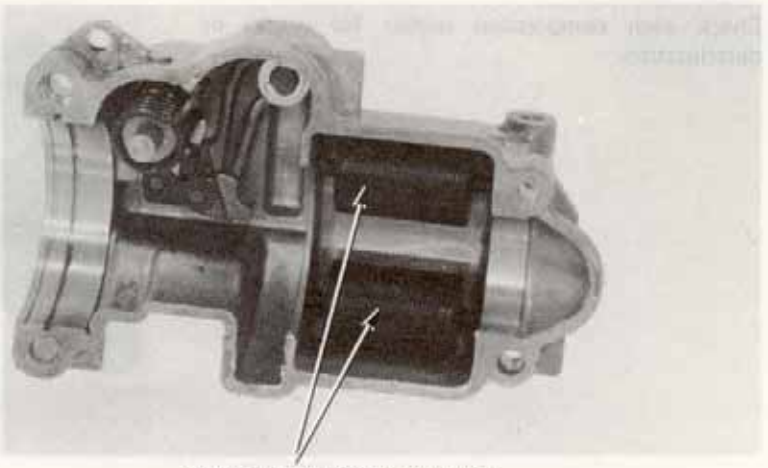
Remove the compression rubbers from the upper case.

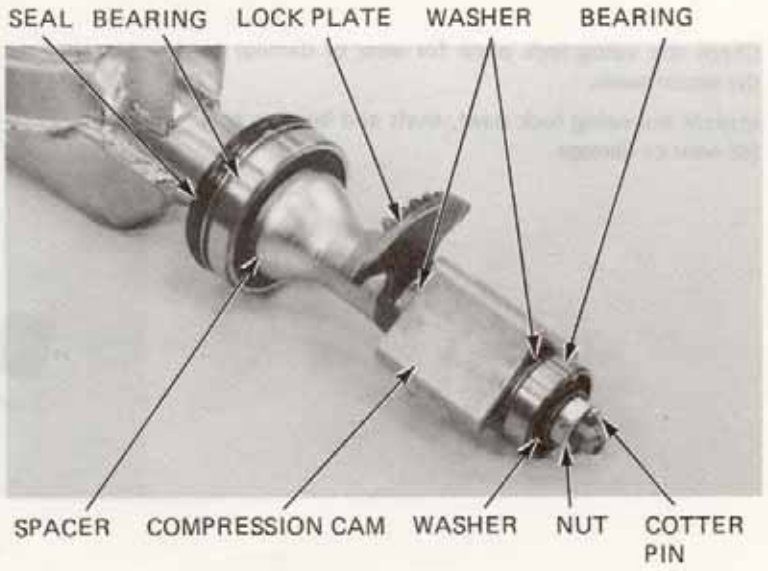
NOTE:

> The compression rubbers are made of natural rubber and will deteriorate, if they contact oil or grease.

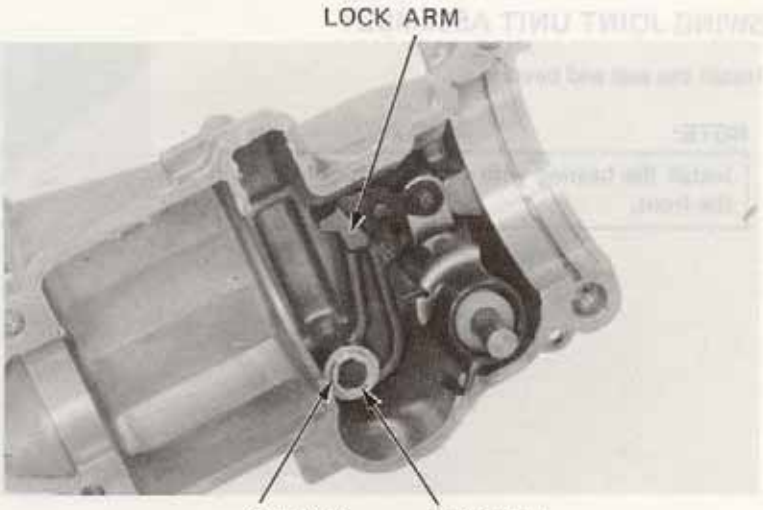


Pry the cotter pin off of the end of the swing joint shaft, and remove the nut and washer.

Remove the bearing, washer, compression cam, washer, swing lock plate, spacer, bearing and seal from the shaft in he order listed.

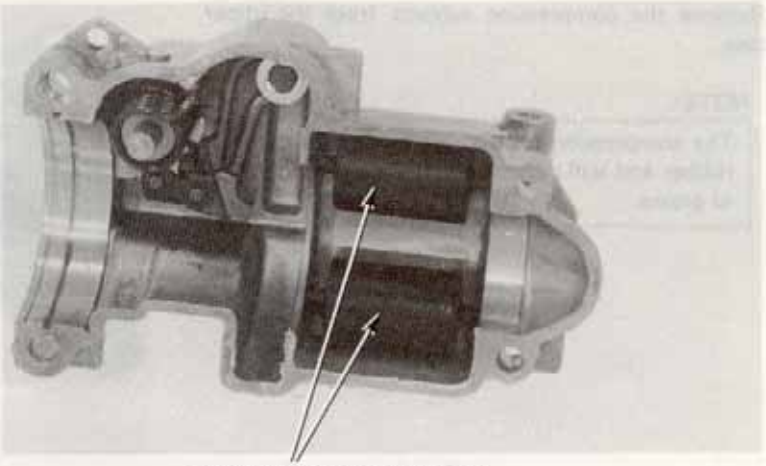


Pry the circlip out of place, and remove the swing lock arm from the upper case.



SWING JOINT UNIT INSPECTION

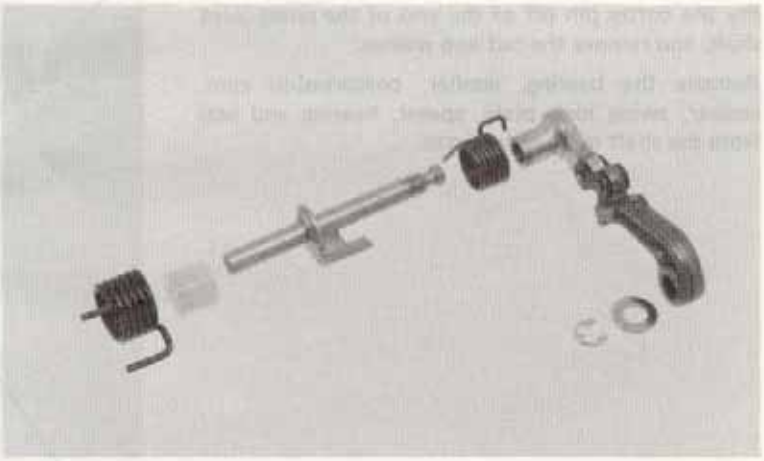
Check each compression rubber for cracks or deterioration.



COMPRESSION RUBBERS

Check the swing lock plate for wear or damage to the sector teeth.

Inspect the swing lock pawl, shaft and bearing area for wear or damage.

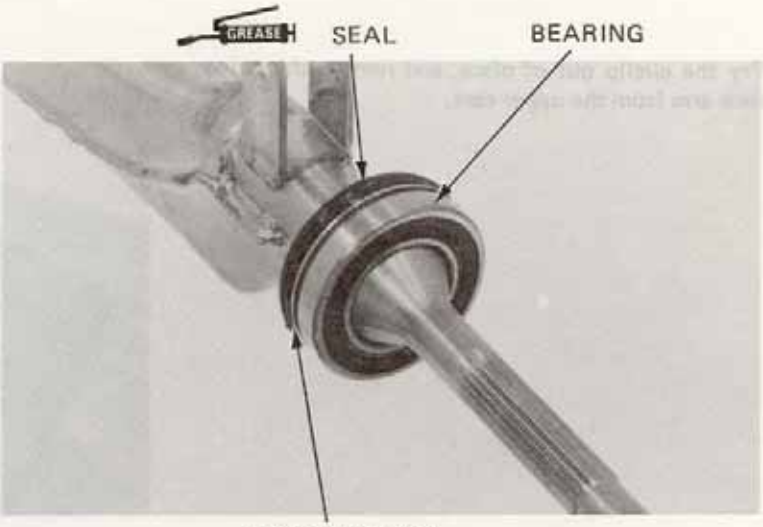


SWING JOINT UNIT ASSEMBLY

Install the seal and bearing.

NOTE:

> Install the bearing with the ring groove facing the front.



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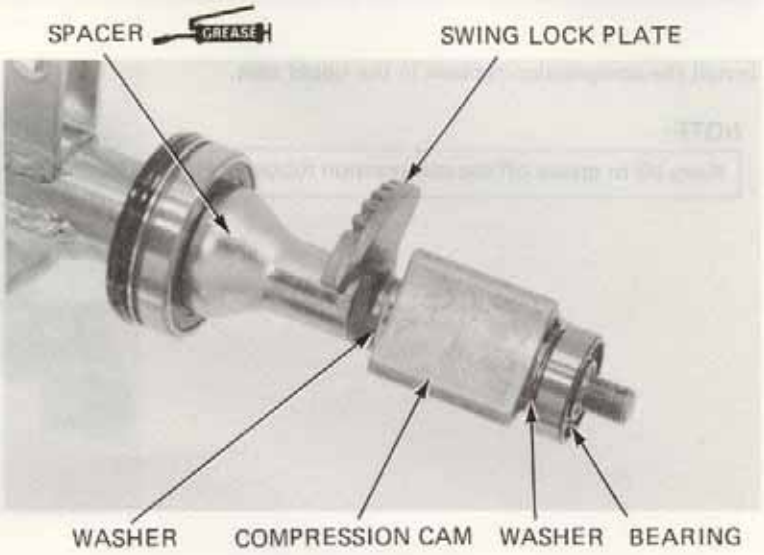
Install the spacer, swing lock plate, washer, compression cam, washer and bearing in that order.

NOTE:

- Align the shaft, lock plate and compression cam as shown.
- Note the direction of the swing lock plate.



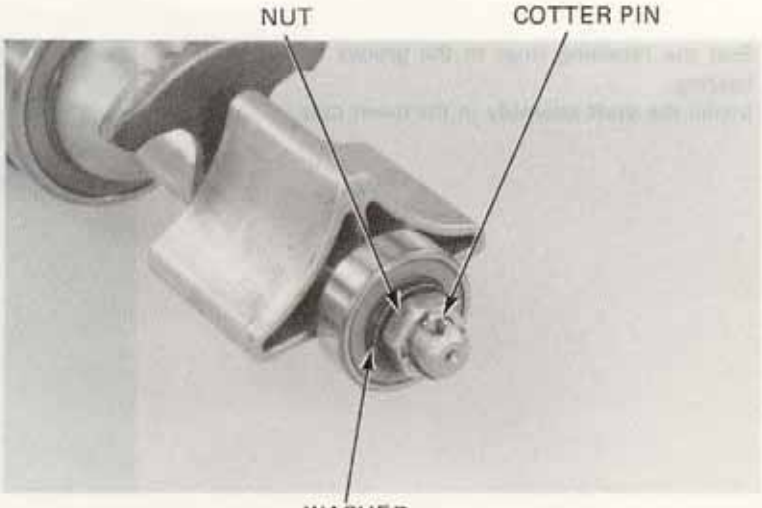
Slide the washer onto the swing joint shaft and torque the nut.

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

Insert a new cotter pin and spread the ends.

NOTE:

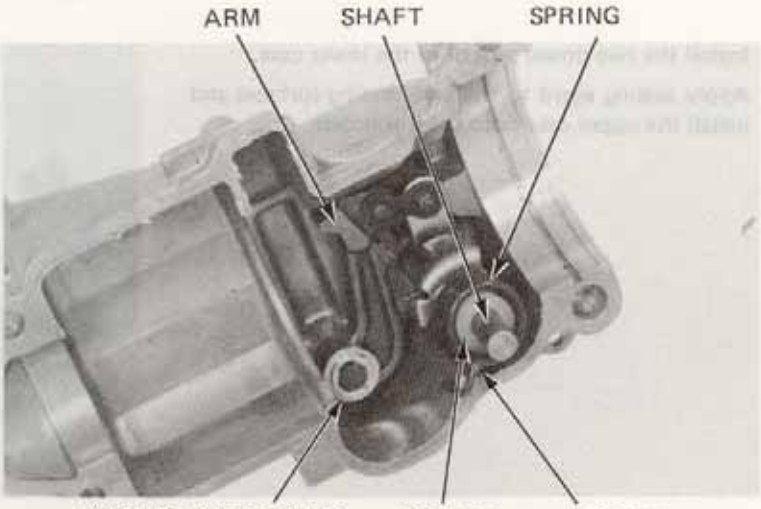
Spread the ends of the cotter pin so they will not interfere with the swing joint upper and lower cases.



Grease all sliding surfaces, then install the swing lock arm, spring, shaft and collar. Secure the parts with the washer and circlip.

NOTE:

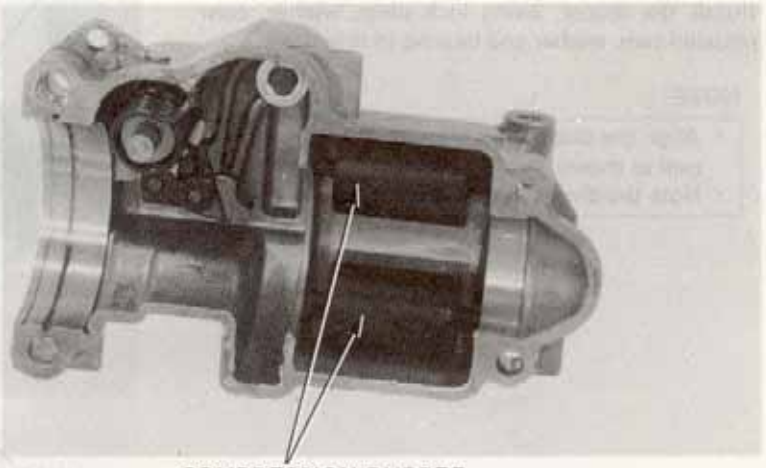
- Install the spring as shown



Install the compression rubbers in the upper case.

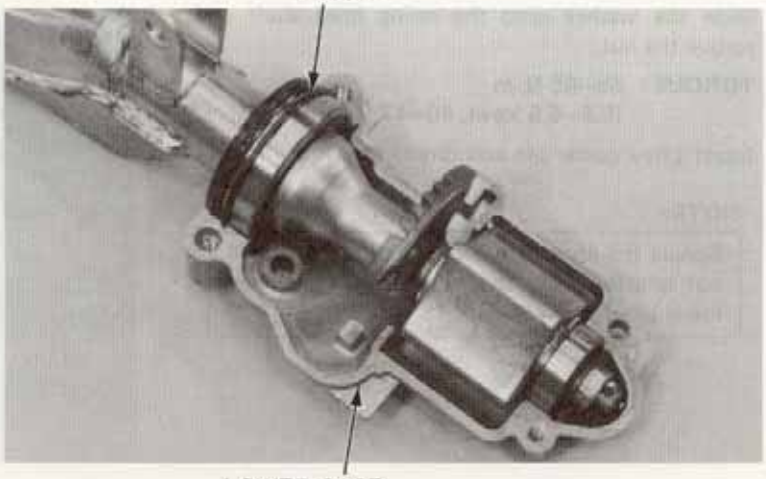
NOTE:

Keep oil or grease off the compression rubbers.



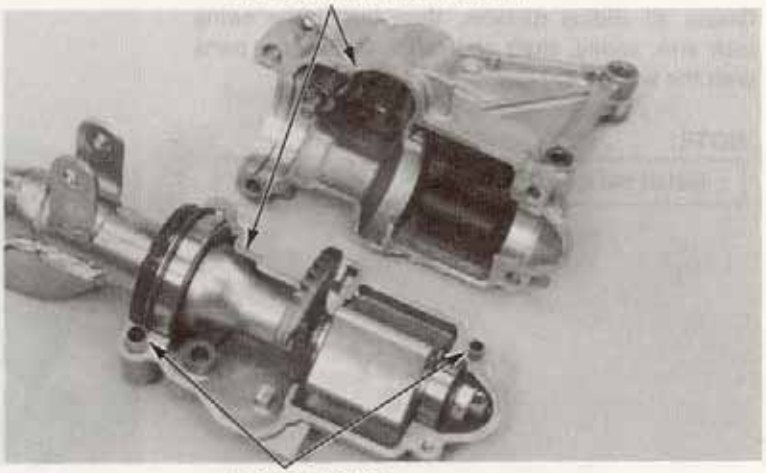
COMPRESSION RUBBER

Seat the rataining rings in the groove of the shaft bearing.
Install the shaft assembly in the lower case.



Install the two dowel pins onto the lower case.

Apply sealing agent to the case mating surfaces and install the upper case onto the lower case.



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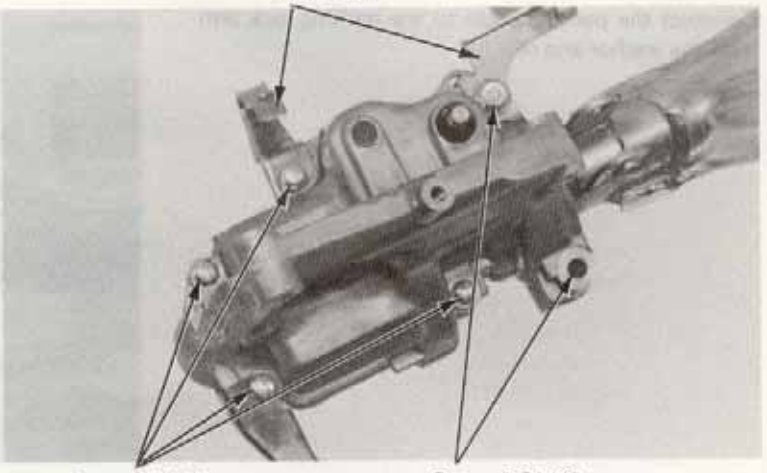
Install the two 8 mm and four 6 mm case bolts and torque them to the specified values.

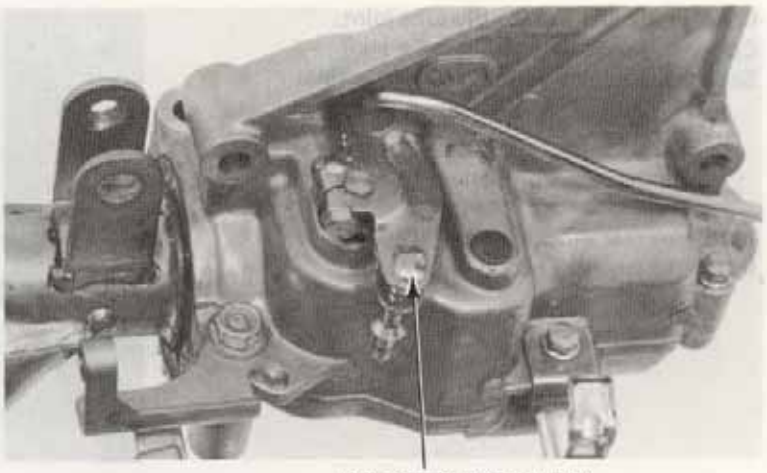
TORQUES:
8 mm bolts: 24–30N·m
(2.4–3.0 kg-m, 17–22 ft-lb)
6 mm bolts: 10–14 N·m
(1.0–1.4 kg-m, 7–10 ft-lb)

NOTE:

Do not forget to install the clamps as shown.



Install the parking lock arm.



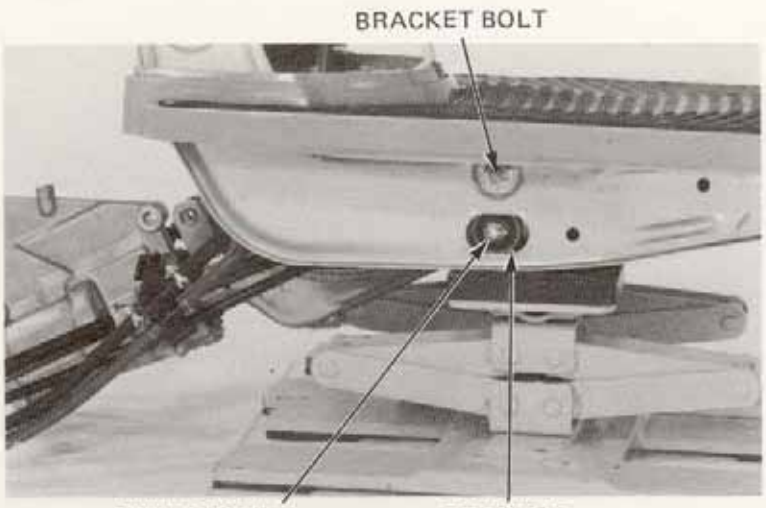
SWING JOINT UNIT INSTALLATION

Install the swing joint bracket with the mount bolt and nut.

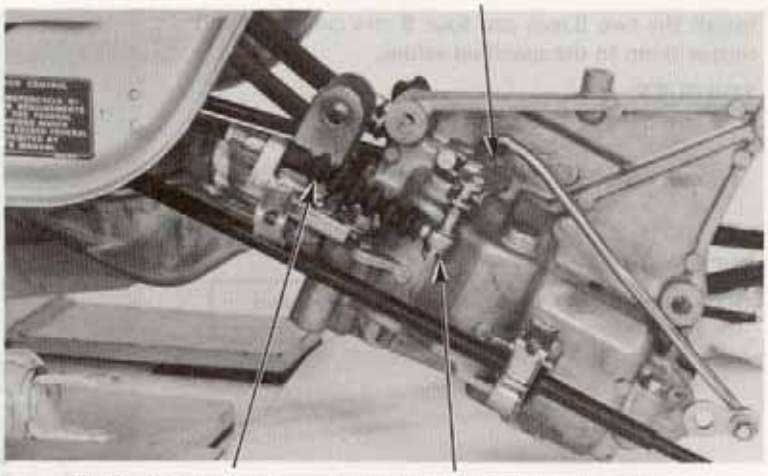
TORQUE: 40–50 N·m
(4.0–5.0 kg-m, 29–36 ft-lb)

Install the swing joint unit with the mount bolt and nut.

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



Conntect the parking cable to the parking lock arm with the washer and clip.

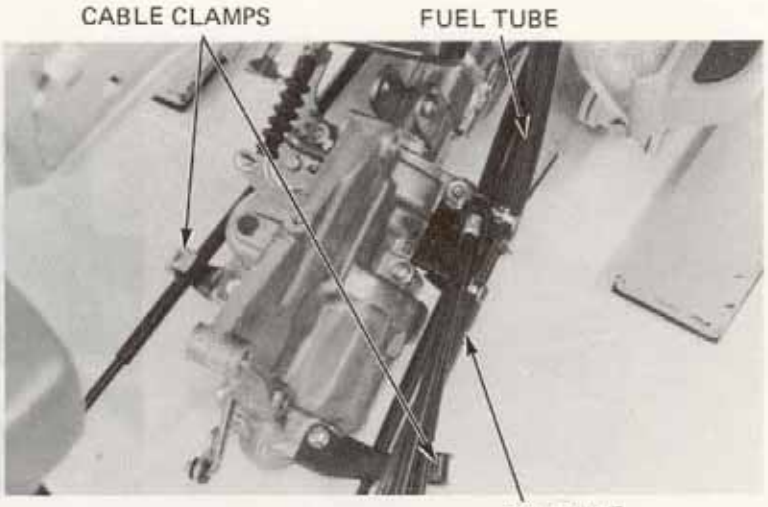


Connect the fuel tube to the tube joint.
Connect the oil tube to the tube joint.
Secure the cables with the cable clamps.

NOTE:

Route the cables properly.

Install the rear shock absorber (Page 13-4).
Install the engine (Section 5).



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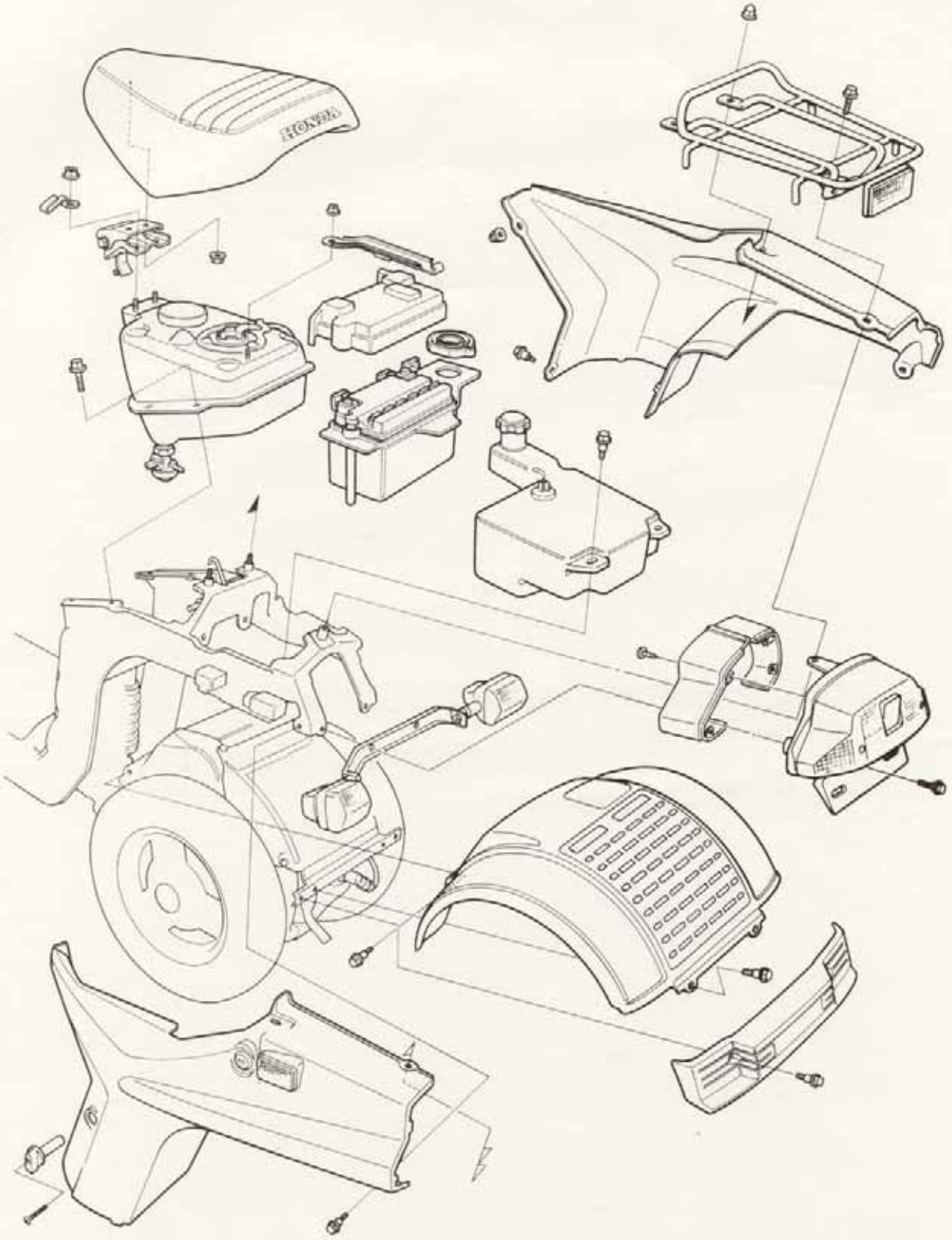

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14. FUEL TANK/OIL TANK

SERVICE INFORMATION

GENERAL

- Gasoline is flammable and is explosive under certain conditions. Always stop the engine and do not smoke or allow sparks near the scooter when working with gasoline.
- Bleed air from oil pump if there is air in the oil inlet line (oil tank to oil pump, page 2–4).
- Route the wire harnesses and cables properly.

TROUBLESHOOTING

Engine fails to start

1. No fuel in tank
2. Clogged fuel line
3. Clogged fuel strainer
4. Stuck fuel valve diaphragm

Mixture too lean

1. Clogged fuel tank cap breather hole
2. Clogged or collapsed fuel line
3. Clogged fuel strainer

FUEL TANK

REMOVAL

WARNING

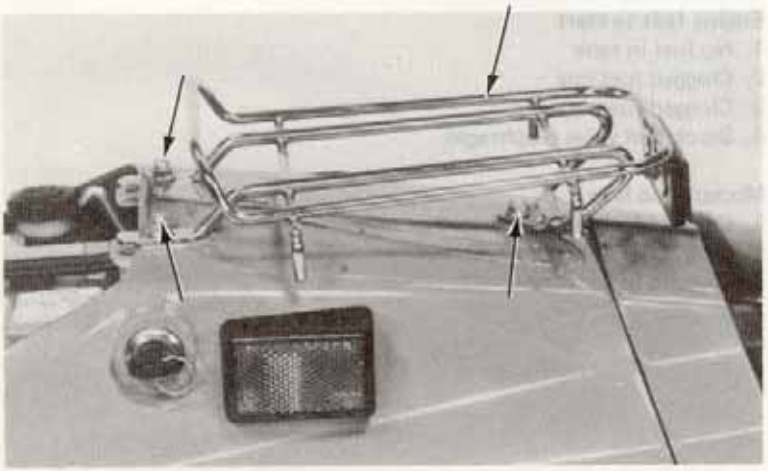
Gasoline is extremely flammable and is explosive under cartain conditions. Perform this operation in a well-ventilated area and do not smoke or allow sparks in the area.

Turn the fuel valve OFF and remove the fuel valve lever.

FUEL VALVE LEVER

Raise the seat and remove the luggage carrier cap nuts and bolt.

Remove the luggage carrier.



REAR CARRIER

Remove the body side covers by removing the two attaching cap nuts and bolt.

NOTE:

The body side covers are retained with the nuts and two retaining tabs which are pressed into the frame grommets.

BODY SIDE COVER

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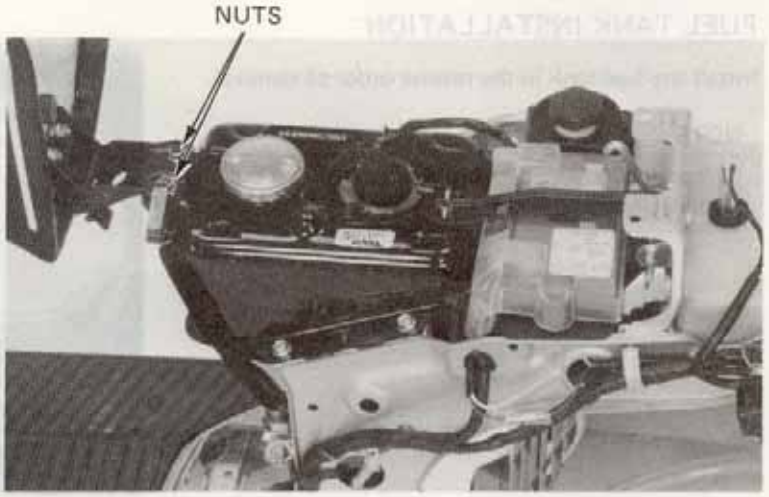
Remove the seat hings nuts and seat.



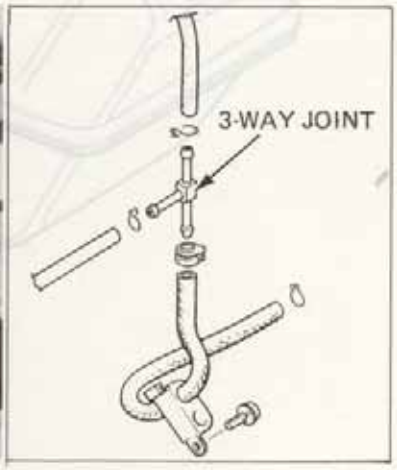
Disconnect the fuel unit wires at the connectors.

Disconnect the fuel line from the three-way joint, and allow fuel to drain into a clean container.

WARNING

Drain gasoline in to a safe container labeled for gasoline.

Remove the four bolts and remove the fuel tank.

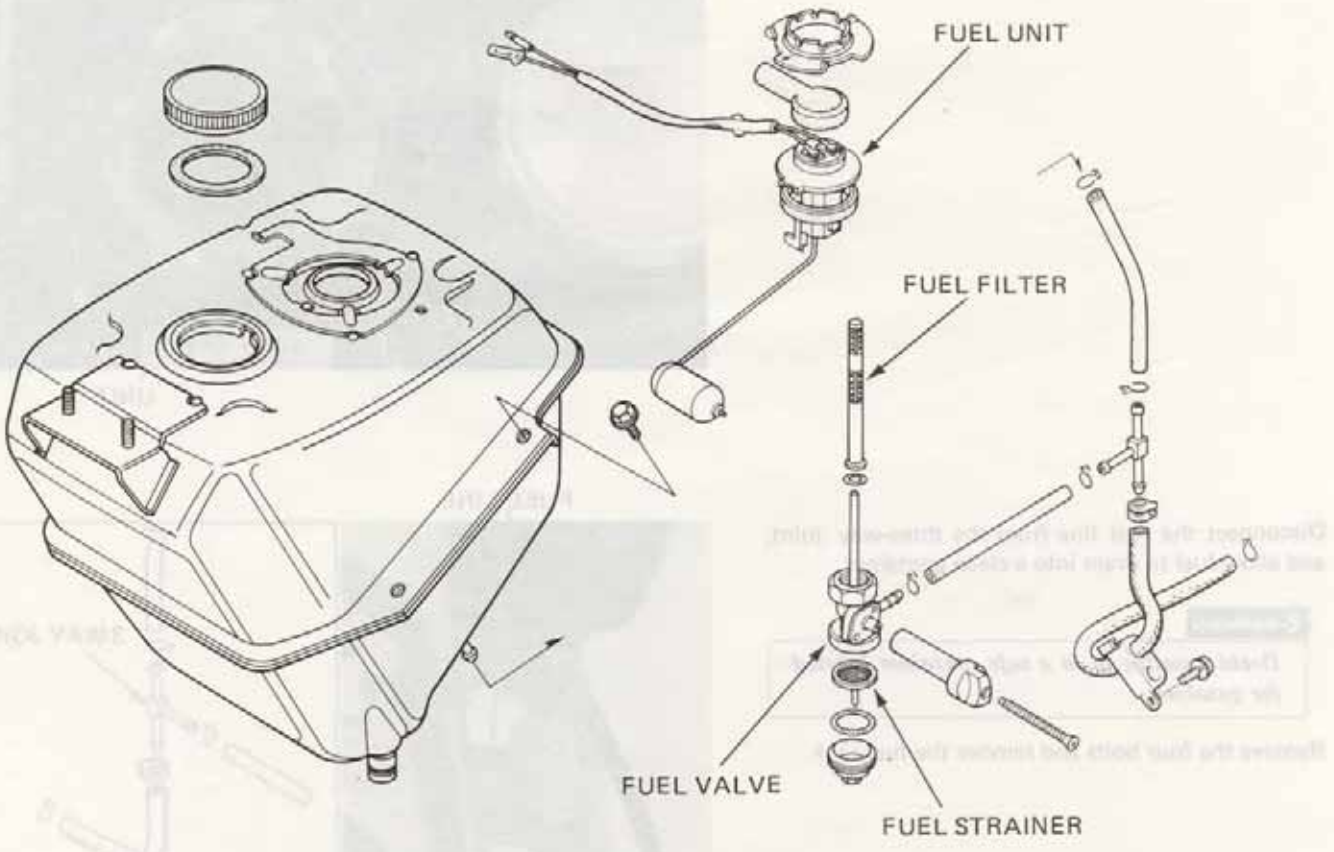


FUEL TANK INSTALLATION

Install the fuel tank in the reverse order of removal.

NOTE:

When install the fuel unit, align the tab on the unit with the arrow on the tank.



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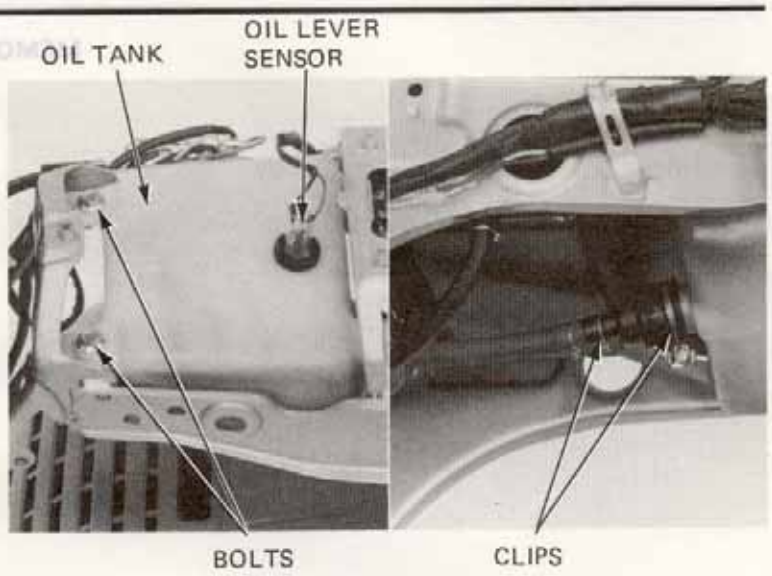
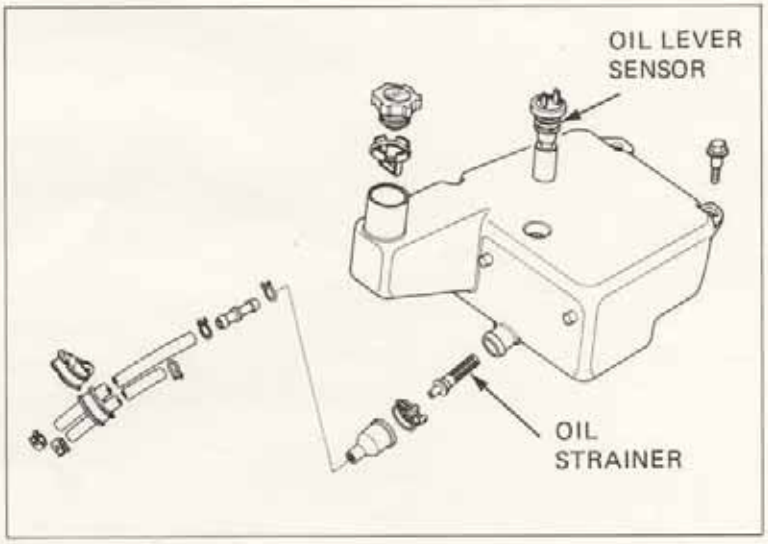
OIL TANK

REMOVAL/INSTALLATION

Remove both frame covers (Page 10-2).
Disconnect the oil line at the joint and allow oil to drain into a clean container.
Disconnect the oil level sensor wires from the switch.
Remove the two bolts and oil tank.



Install the oil tank in the reverse order of removal



MEMO

15. ELECTRICAL EQUIPMENT

SERVICE INFORMATION

GENERAL

- Do not quick charge the battery. Quick charging may damage the battery.
- Remove the battery from the scooter for charging. Remove the cell caps before charging the battery.
- Do not smoke or have flames near a charging battery. The gas produced by a battery is very flammable and can explode.
- Ignition timing cannot be adjusted. If the timing is incorrect, inspect the CDI unit and alternator and replace any faulty parts.

SPECIFICATIONS

ITEM				
Battery	Capacity	12V4AH		
	Specific gravity	1.270–1.290 at 20°C (68°F)		
	Charging rate	0.4A maximum		
Alternator	Charging rpm	2,300 rpm max. (14.2V)		
	Capacity	0.5A min. (18V)/4,000 rpm 1.0A max. (18.3V)/6,000 rpm		
Spark plug			NGK	ND
	Standard		BPR6HS	W20FPR
	For cold climate		BPR4HS	W14FPR-L
	For extended high speed riding		BPR8HS	W24FPR
Spark plug gap		0.6–0.7 mm (0.024–0.028 in)		
Ignition timing		15° BTDC at 1,800 rpm		

TOOLS

Common

Sanwa Electrical Tester	07308–0020000 or KS-AHM-32-003 (U.S.A. only)

TROUBLESHOOTING

CHARGING SYSTEM

No power
1. Dead battery
   - Low fluid level
   - Battery sulfation
   - Internally shorted battery
   - Charging system failure
   - Faulty regulator/rectifier
2. Disconnected battery cable
3. Fuse burned out
4. Faulty ignition switch

Low power
1. Weak battery
2. Loose battery connection
3. Charging system failure
4. Faulty regulator/rectifier

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

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

IGNITION SYSTEM

No spark at plug
1. Faulty spark plug
2. Poorly connected, broken or shorted wire
   - Between alternator and CDI unit
   - Between CDI unit and ignition coil
   - Between CDI unit and ignition switch
   - Between ignition coil and spark plug
3. Faulty ignition switch
4. Faulty ignition coil
5. Faulty CDI unit
6. Faulty alternator

Engine starts but runs poorly
1. Ignition primary circuit
   - Faulty ignition coil
   - Loose or bare wire or connector
   - Poorly connected ignition switch
2. Ignition secondary circuit
   - Faulty ignition coil
   - Faulty spark plug
   - Faulty spark plu wire
   - Poorly insulated plug cap
3. Improper ignition timing
   - Faulty alternator
   - Startor not installed properly
   - Faulty CDI unit

STARTING SYSTEM

Starter won't run
1. Fuse burned out
2. Weak battery
3. Faulty ignition switch
4. Faulty starter switch
5. Faulty front or rear stop switch
6. Faulty starter relay
7. Poorly connected, broken or shorted wire
8. Faulty starter motor

Lack of power
1. Weak battery
2. Bare wire or loose connection
3. Foreign matter stuck in starter or starter gear

Engine does not crank-starter rotates
1. Faulty starter pinion
2. Reverse rotation of starter
3. Low battery

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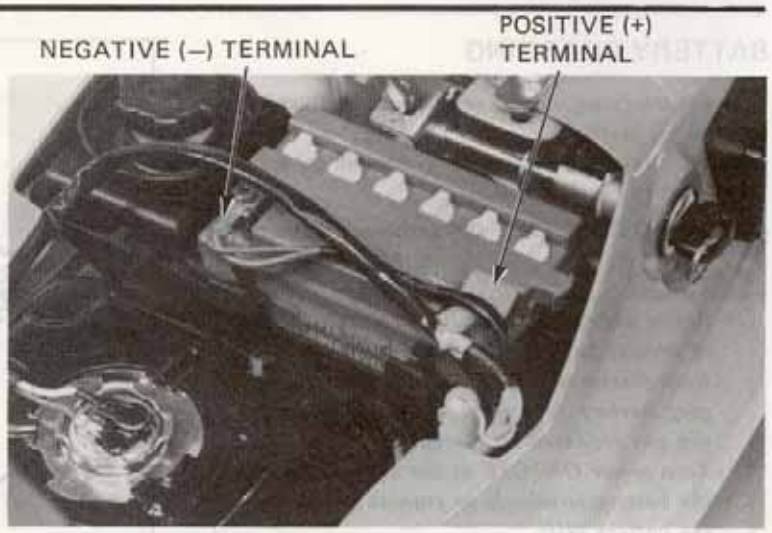
BATTERY

REMOVAL

Remove the battery holder by removing the attaching bolt.
Remove the battery cover.
Disconnect the negative cable, then disconnect the positive cable.
Remove the battery.
Installation of the battery is the reverse of removal.

NOTE:

Connect the breather tube to the battery outlet securely.

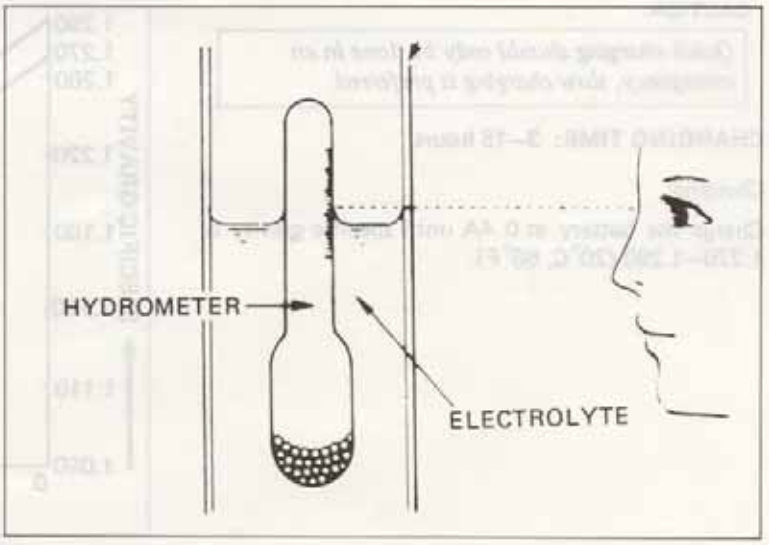


SPECIFIC GRAVITY TEST

Test each cell by drawing electrolyte into a hydrometer.

SPECIFIC GRAVITY (20°C, 68°F)

1.270–1.290	Fully charged
1.230 or below	Undercharged

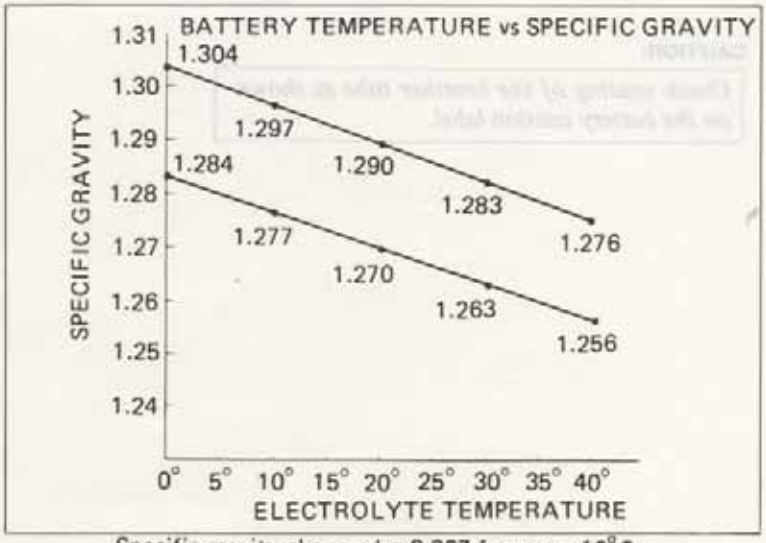


NOTE:

- The battery must be charged if the specific gravity falls below 1.230.
- The specific gravity varies with the temperature as shown. (Specific gravity changes by 0.007 for every 10°C).
- Replace the battery if sulfation has formed, or if the space below the cell plates is filled with sediment.

WARNING

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

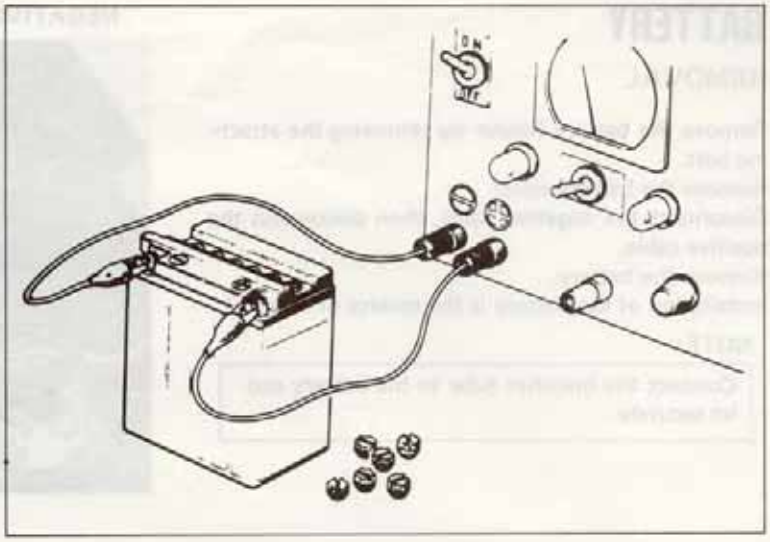


Specific gravity changes by 0.007 for every 10°C

BATTERY CHARGING

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

CHARGING CURRENT: 0.4 amperes maximum



WARNING

- *Before charging a battery, remove all caps to prevent battery case damage.*
- *Keep flames and sparks aways from a charging battery to prevent igniting the hydrogen gas produced by the battery.*
- *Turn power ON/OFF at the charger, not at the battery terminals to prevent sparks near the battery cells.*
- *Discontinue charging if the electrolyte temperature exceeds 45°C (117°F).*

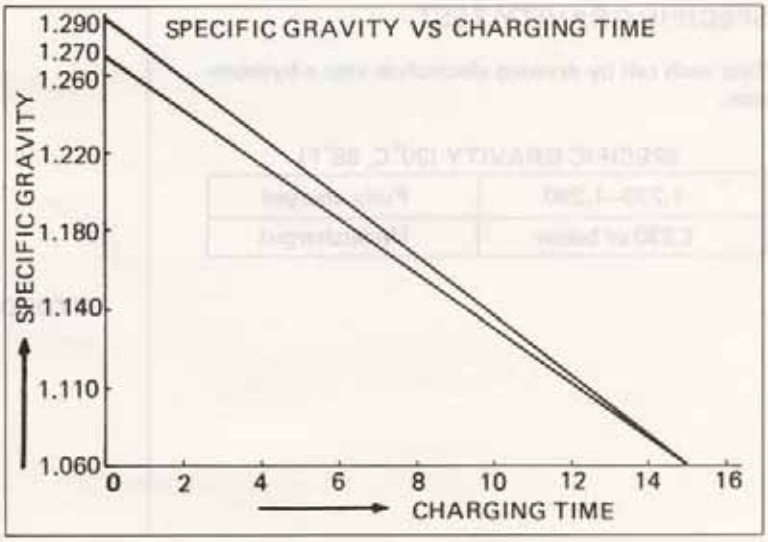
CAUTION:

Quick charging should only be done in an emergency, slow charging is preferred.

CHARGING TIME: 3–15 hours

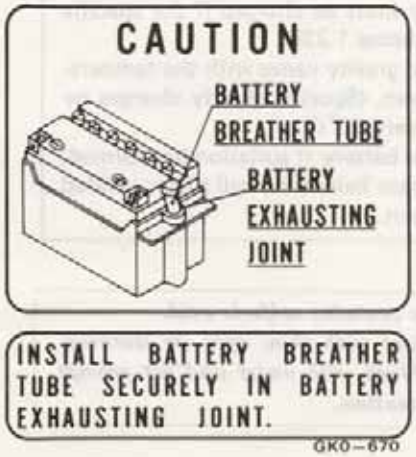
Charging:

Charge the battery at 0.4A until specific gravity is 1.270–1.290 (20°C, 68°F).



CAUTION:

Check routing of the breather tube as shown on the battery caution label.



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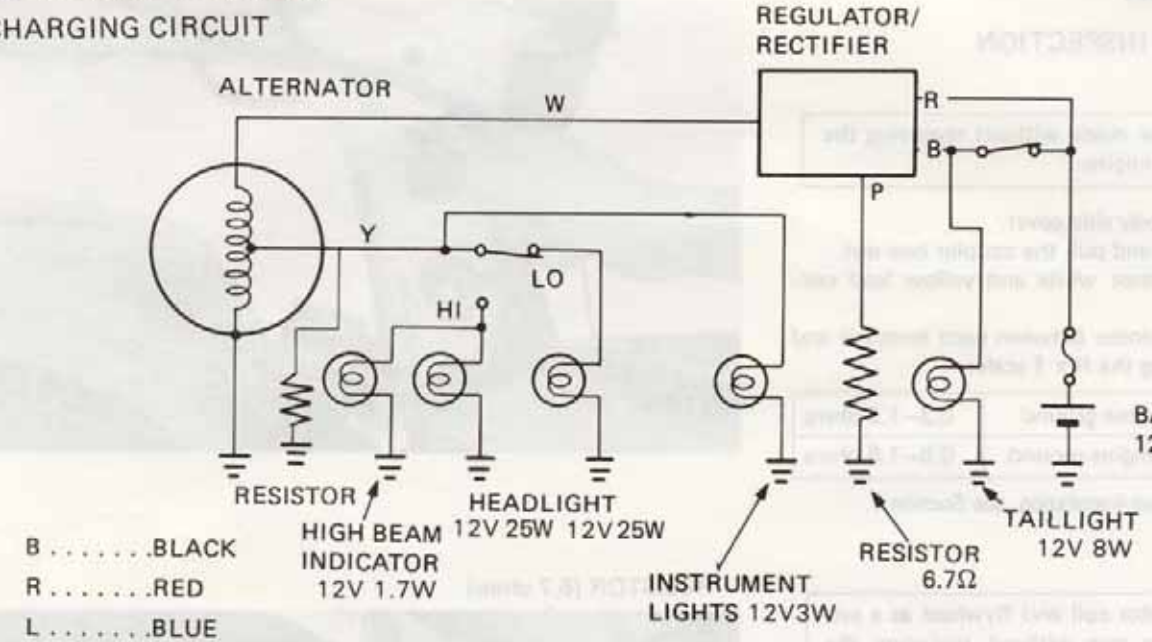
CHARGING SYSTEM

CHARGING CIRCUIT



B . . . . . .BLACK
R . . . . . .RED
L . . . . . .BLUE
Y . . . . . .YELLOW
W. . . . . .WHITE
P . . . . . .PINK

PERFORMANCE TEST

Warm up the engine before taking readings.
Raise the seat.

NOTE:

Use a fully charged 12V battery to check the charging system output.

Stop the engine and open the fuse holder. Disconnect one end of the fuse at the terminal, and connect an ammeter between the fuse and terminal as shown.

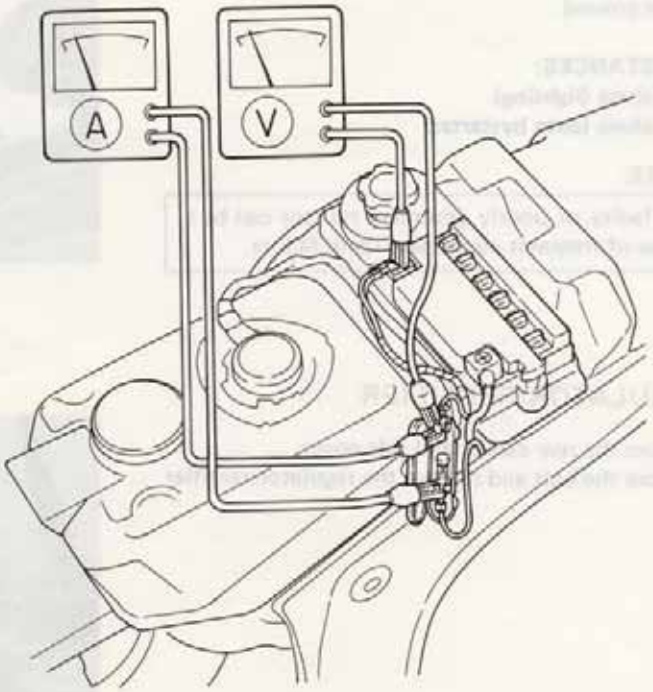
NOTE:

Do not allow the fuse holder lead (red) and tester probes to touch any metal parts.

Connect a voltmeter between the positive (+) and negative (–) terminals of the battery.

Start the engine and take readings while increasing the engine speed gradually.

Inspect the stator and regulator/rectifier if the readings do not fall within the limits shown below, and replace any faulty parts.



TECHNICAL DATA

Charging rpm (initial)	4,000 rpm	6,000 rpm
2,300 rpm max. (14.2V)	0.5A min. (18V)	1.0A max. (18.3V)

ALTERNATOR

STATOR COIL INSPECTION

NOTE:

This test can be made without removing the stator from the engine.

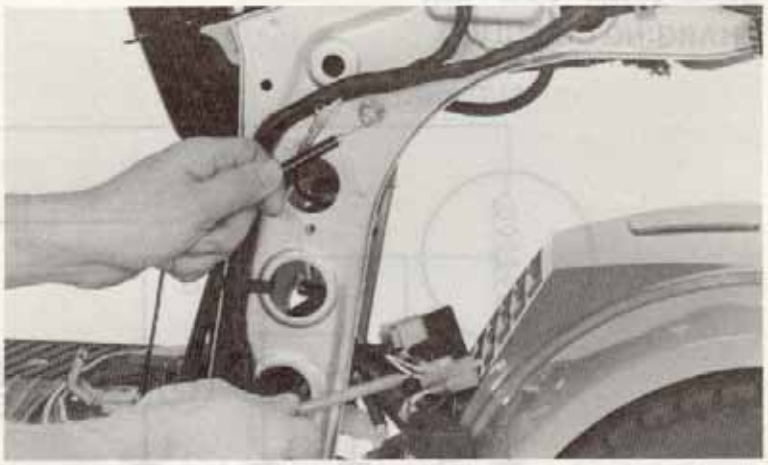
Remove the left body side cover.
Remove the screw and pull the coupler box out.
Disconnect the stator white and yellow lead connectors.
Measure the resistances between each terminal and engine ground using the R x 1 scale:

White lead and engine ground	0.3–1.5 ohms
Yellow lead and engine ground	0.5–1.5 ohms

For alternator removal/installation, see Section 7.
tion 7.

NOTE:

Replace the stator coil and flywheel as a set. Do not replace one without replacing the other.



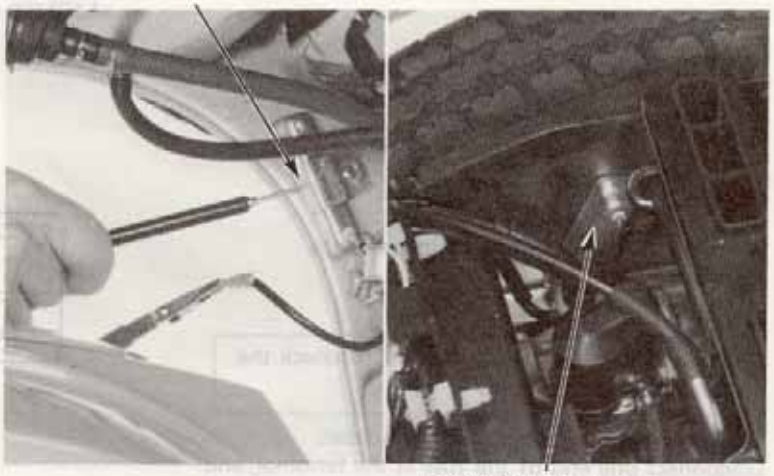
RESISTOR INSPECTION

Measure the resistance between the resistor lead and engine ground.

RESISTANCES:
6.7 ohms (lighting)
5 ohms (auto bystarter)

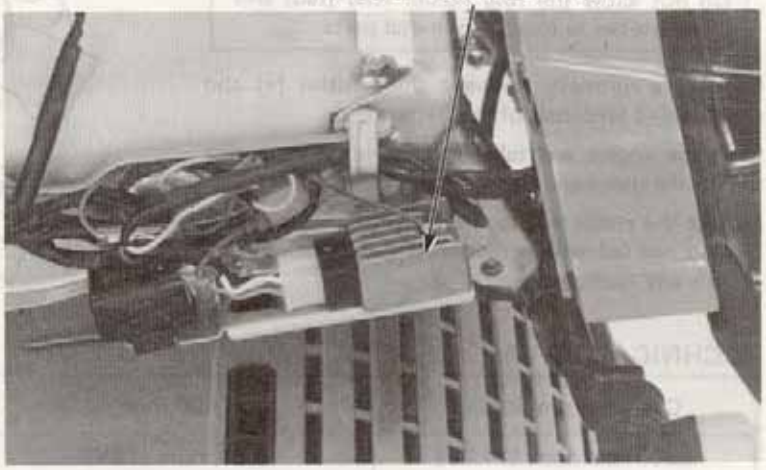
NOTE:

A faulty or poorly grounded resistor can be a case of frequent instrument lamp failure.



REGULATOR/RECTIFIER

Remove the rear carrier and side cover.
Remove the bolt and remove the regulator/rectifier.



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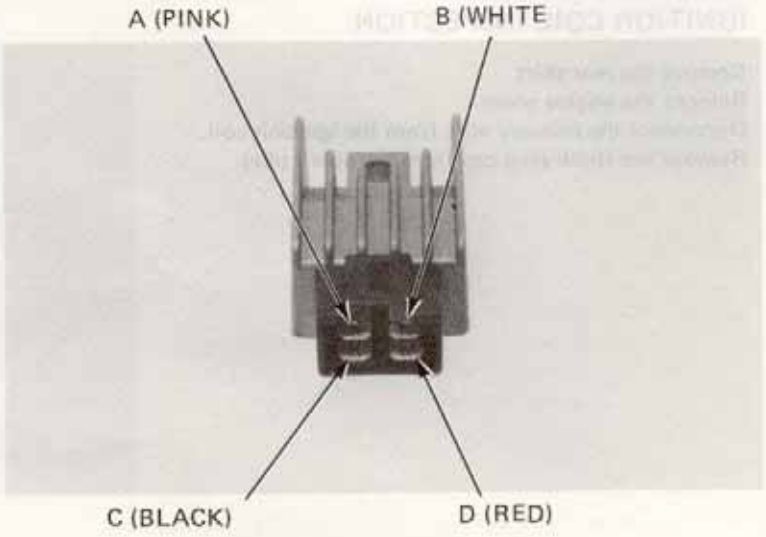
Check for continuity between the terminals with an ohmmeter. Replace the regulator/rectifier with a new one if the reading do not fall within the limits shown in the table below.

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 inaccurate readings.
- Use sanwa Electric Tester 07308-0020000, Kowa Electric Tester TH-5H or Digital multimeter, KS-AHM-32-003 (U.S.A. only).

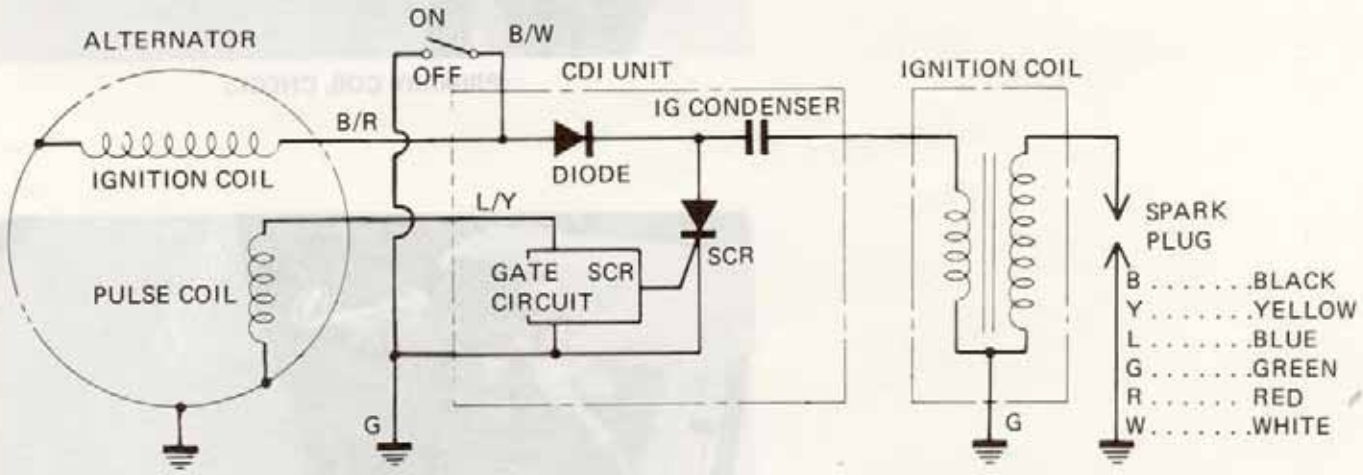
Ranges: Sanwa Electric Tester: R x KΩ
Kowa Electric Tester: R x 100 Ω

TESTER ⊕ / TESTER ⊖	A	B	C	D
A		∞	1-5KΩ	∞
B	∞		∞	0.5-10KΩ
C	1-5KΩ	∞		
D	∞	∞	∞	



IGNITION SYSTEM

IGNITION CIRCUIT



SPARK PLUG

For inspection and adjustment, see page 3-6.

IGNITION COIL INSPECTION

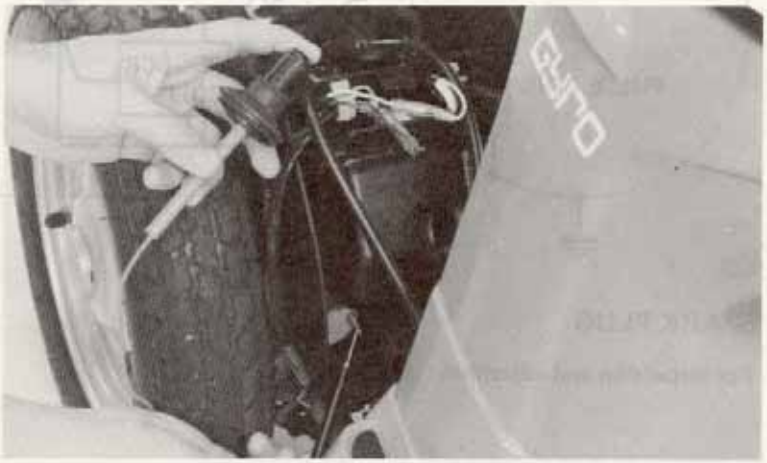
Remove the rear skirt.
Remove the engine cover.
Disconnect the primary wire from the ignition coil.
Remove the spark plug cap from the spark plug.

CONTINUITY TEST

Measure the resistances of the primary and secondary coils.

RESISTANCES:
Primary coil : 0.2–0.3 ohms
Secondary coil : 8.0–8.5 ohhoms

〈PRIMARY COIL CHECK〉



〈SECONDARY COIL〉

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IGNITION COIL (ALTERNATOR)/PULSE COIL INSPECTION

NOTE:

> It is not necessary to remove the stator to make this test.

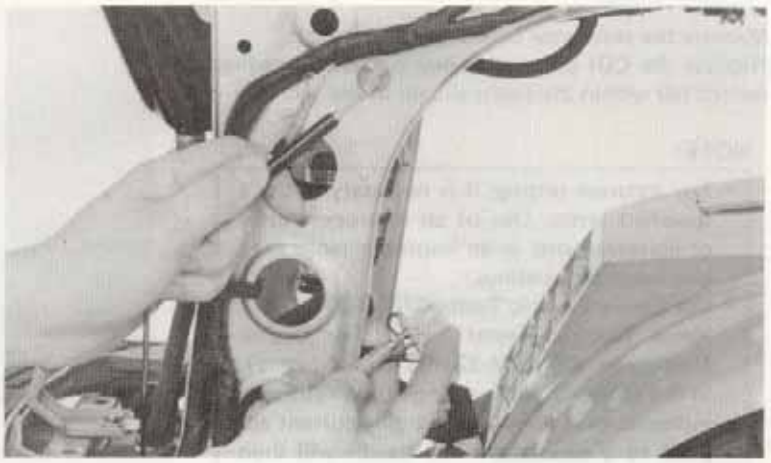
Remove the left body side cover.
Remove the screw and pull out the coupler box.
Disconnect the CDI unit coupler.
Measure the resistances between the terminals with an ohmmeter in the R x 1 range.

Black/red and engine ground	50–300 ohms
Blue/yellow and engine ground	10–100 ohms

For alternator removal/installation, see Section 7.

NOTE:

> Replace the stator and flywheel as a set, if either one needs replacement.

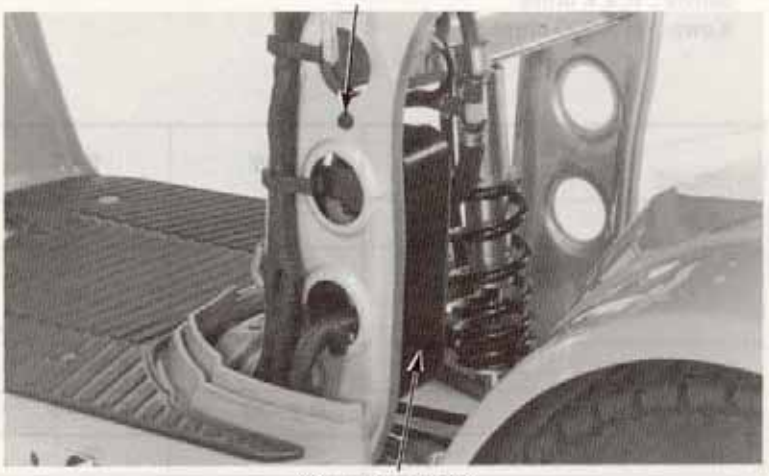


CDI UNIT

REROVAL

Remove the left body side cover.

Remove the screw and open the coupler box.



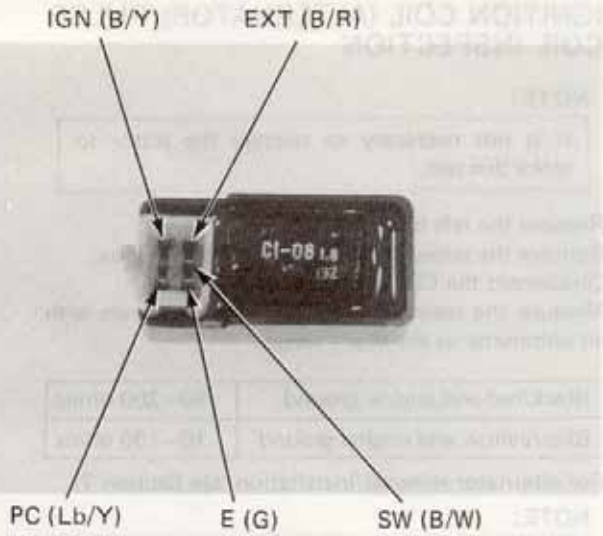
Remove the CDI unit.

INSPECTION

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

NOTE:

- For accurate testing, it is necessary to use a specified tester. Use of an improper tester or measurements in an improper range may give incorrect readings.
- Use Sanwa Electric Tester 07308-0020000, Kowa Electric Tester TH-5H, or Digital Multimeter KS-AHM-32-003 (U.S.A. only).
- In the table, "Needle swings then returns" indicates that there is a charging current applied to a condenser. The needle will then remain at "∞" unless the condenser is discharged.



Range:
Sanwa : R x k ohms
Kowa : R x 100 ohms

⊖PROBE \ ⊕PROBE	SW	EXT	PC	E	IGN
SW		∞	∞	∞	∞
EXT	0.1–10		∞	∞	Needle swings then returns or ∞
PC	0.5–200	0.5–50		1–50	∞
E	0.2–30	0.1–10	∞		∞
IGN	∞	∞	∞	∞	

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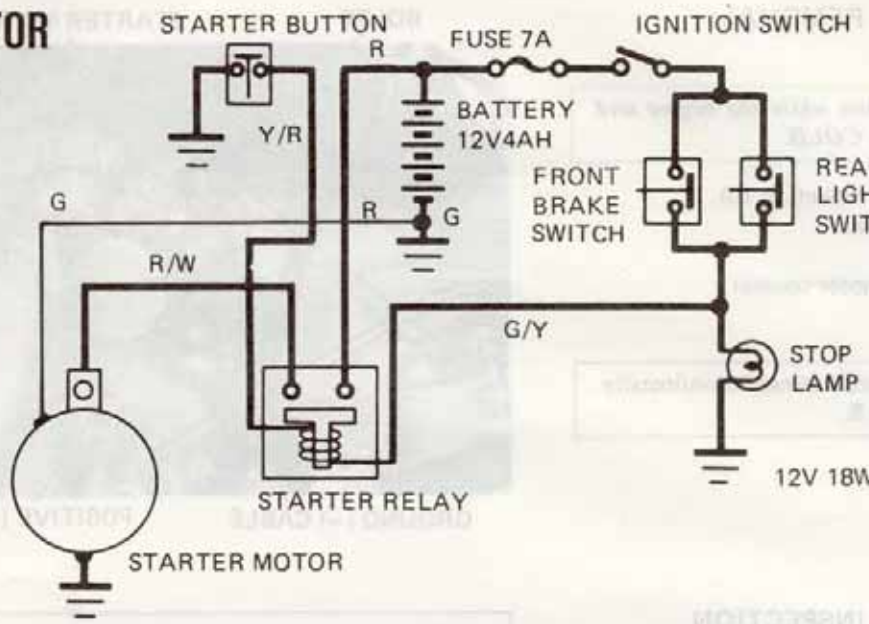
STARTER MOTOR

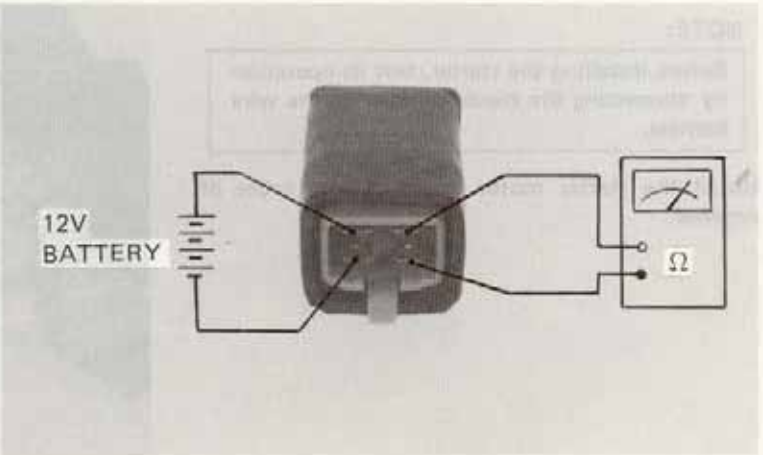
STATER CIRCUIT



STARTER RELAY INSPECTION

Remove the left body side cover.
Pull out the coupler box and remove the starter relay.

There should be continuity between the red and red/white terminals when 12 bolts is applied to the green/yellow (+) and yellow/red (–) terminals.



STARTER MOTOR REMOVAL

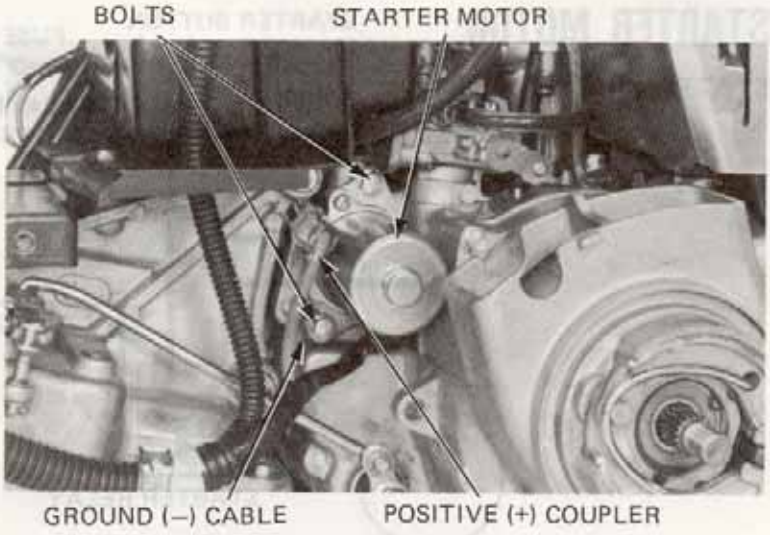
WARNING

Perform this operation while the engine and exhaust muffler are COLD.

Remove the engine cover (Section 10).
Remove the left rear wheel.
Remove the air duct.
Disconnect the starter motor coupler.

NOTE:

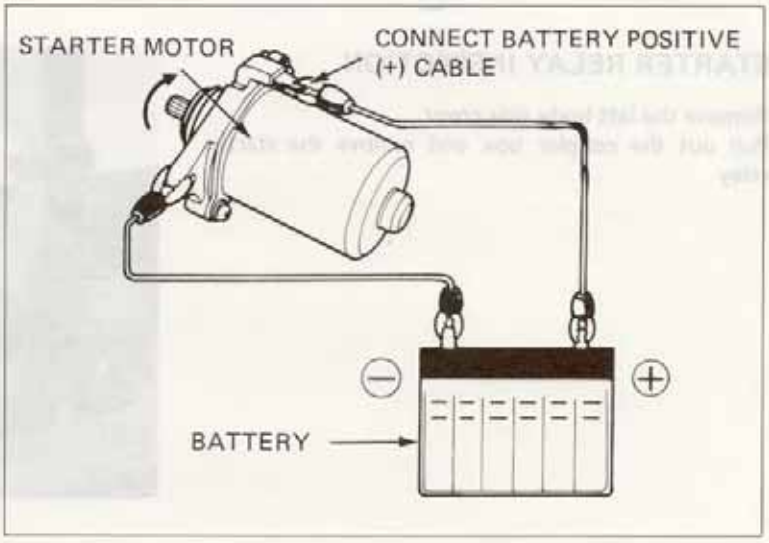
For starter pinion removal/inspection/installation, refer to Section 8.



STARTER MOTOR INSPECTION

Check the starter motor operation by connecting a 12 V battery as shown.

The motor should rotate in a counterclockwise direction as viewed from the shaft end.

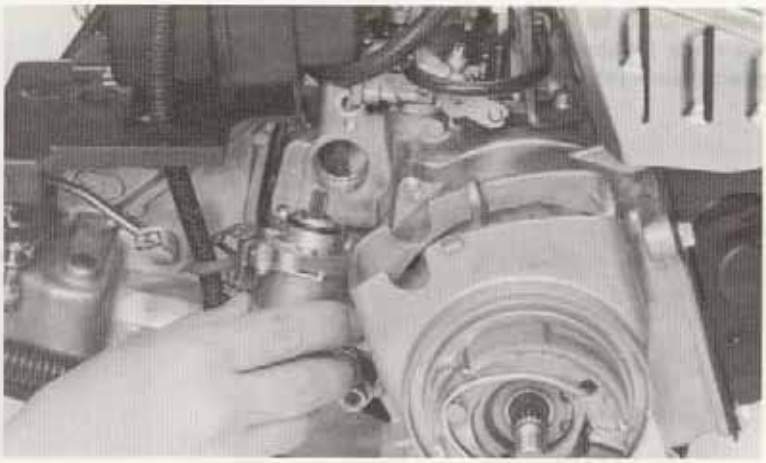


STARTER MOTOR INSTALLATION

NOTE:

Before installing the starter, test its operation by connecting the starter coupler to the wire harness.

Install the starter motor in the reverse order of removal.



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SWITCHES/HORN

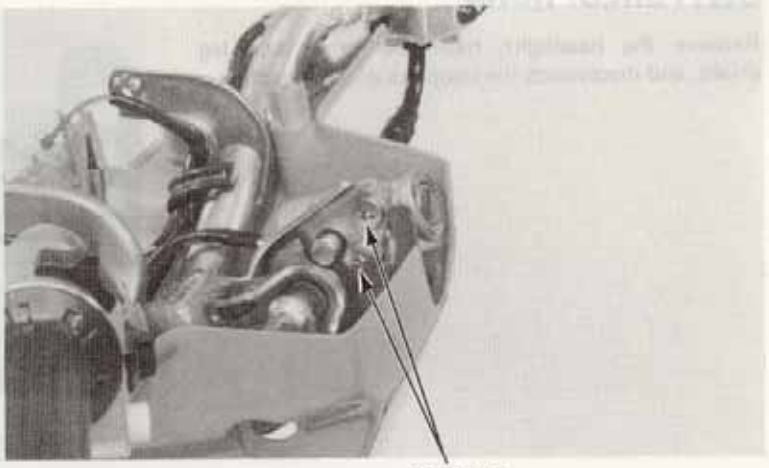
Remove the headlight, handlebar cover and leg shield, and disconnect the couplers and connectors.

Check the continuity of each switch.
Continuity should exist between color coder wires indicated by interconnected fircles on each chart.

IGNITION SWITCH

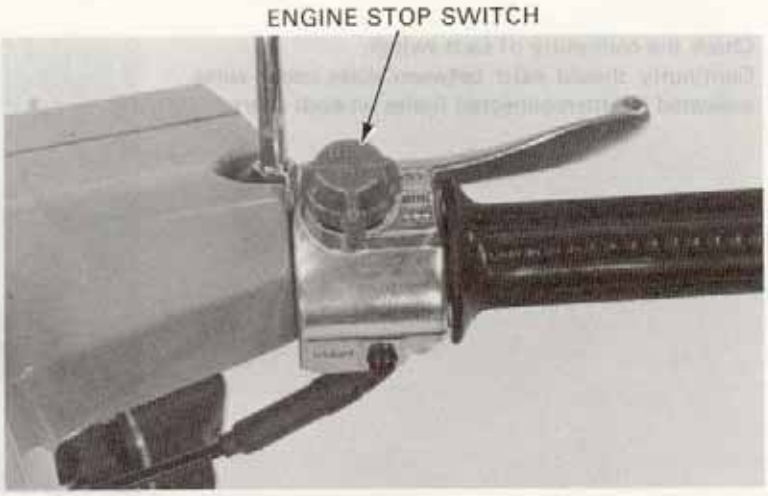
CODE COLOR	RED	BLACK	BLACK/ WHITE	GREEN
	BAT1	BAT2	IG	E
ON	o	o		
OFF			o	o

To remove the ignition switch, remove the handlebar upper cover (Page 11-3) and unscrew the two attaching screws.



ENGINE STOP SWITCH

CODE COLOR	BALCK/ WHITE	GREEN
	IG	E
OFF		
RUN	○	○
OFF		



DIMMER SWITCH

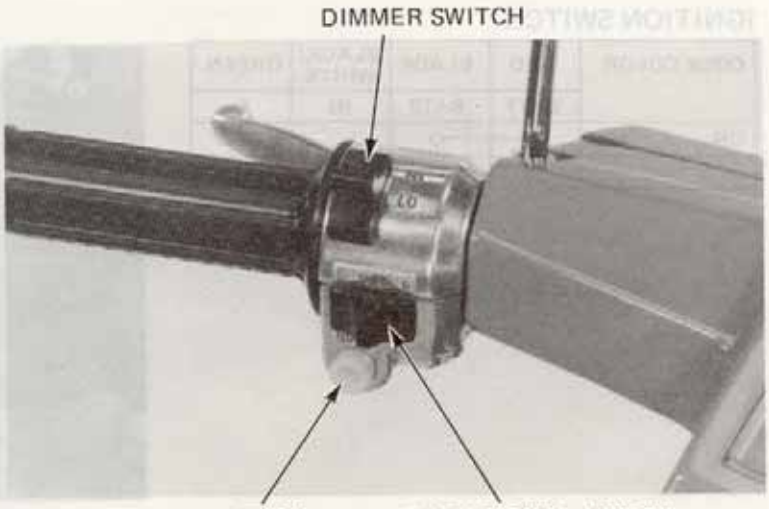
CODE COLOR	BROWN	BLUE	WHITE
	HL	Hi	Lo
Hi	○	○	
(N)	○	○	○
Lo	○		○

TURN SIGNAL SWITCH

CODE COLOR	GREY	LIGHT BLUE	ORANGE
	W	R	L
R	○	○	
N			
L	○		○

HORN BUTTON

CODE COLOR	LIGHT BLUE	GREEEN
	Ho	E
FREE		
PUSH	○	○



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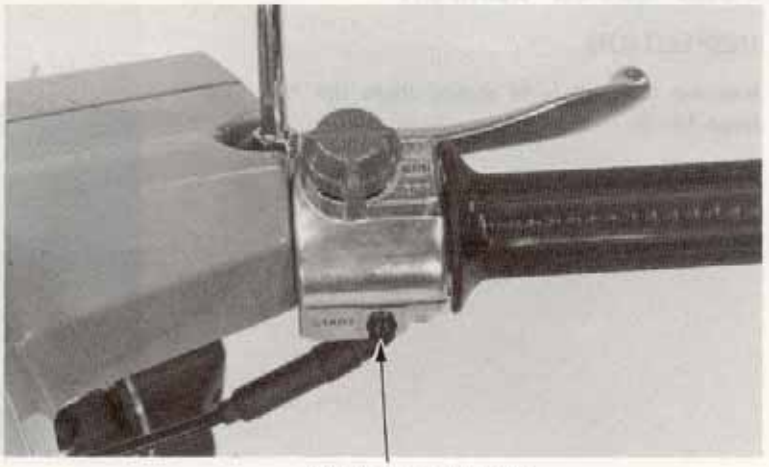
STARTER BUTTON

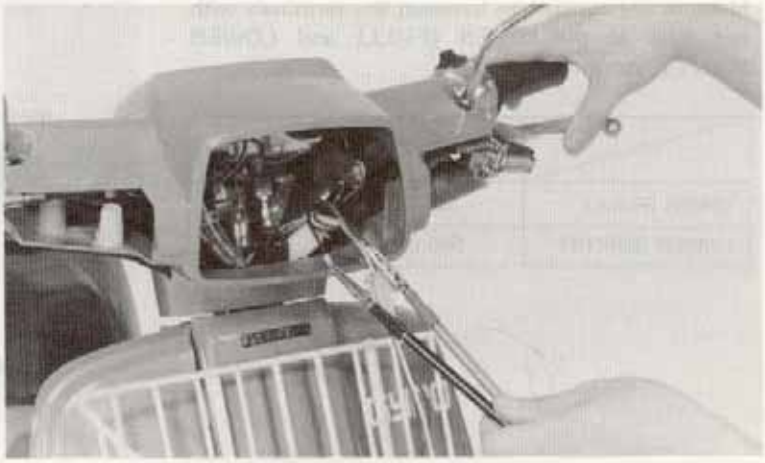
CODE COLOR	YELLOW/RED	GREE
	ST	E
FREE		
PUSH	○	○



STARTER BUTTON

FRONT/REAR BRAKE LIGHT

The switch is normal if there is continuity when the brake lever is pulled in.



HORN

The horn is correct if it sounds when a 12V battery is connected to the terminals.

HORN

FUEL LEVEL SENSOR

INSPECTION

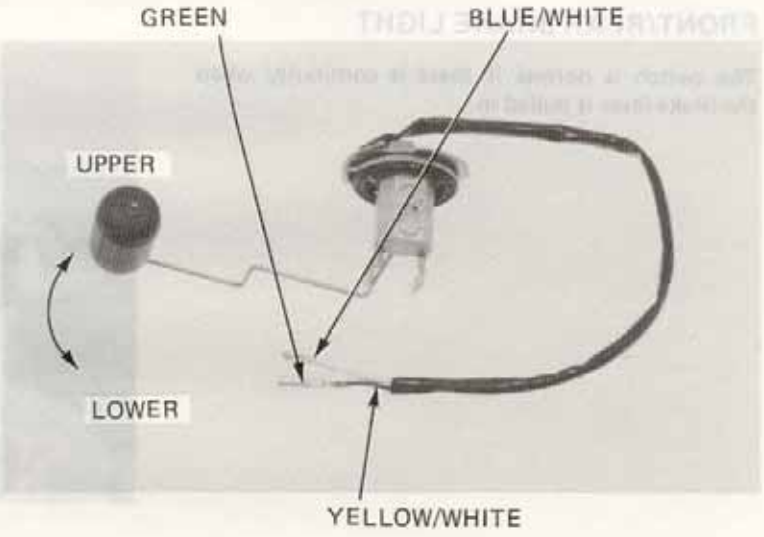
Remove the fuel level sensor from the fuel tank (page 14–3).

NOTE:

Do not bend the float arm.

Measure the resistances between the terminals with the float at the UPPER (FULL) and LOWER (EMPTY) positions.

	Blue/White-Green	Yellow/white-Green
UPPER (FULL)	33 Ω	566 Ω
LOWER (EMPTY)	566 Ω	33 Ω



FUEL GAUGE INSPECTION

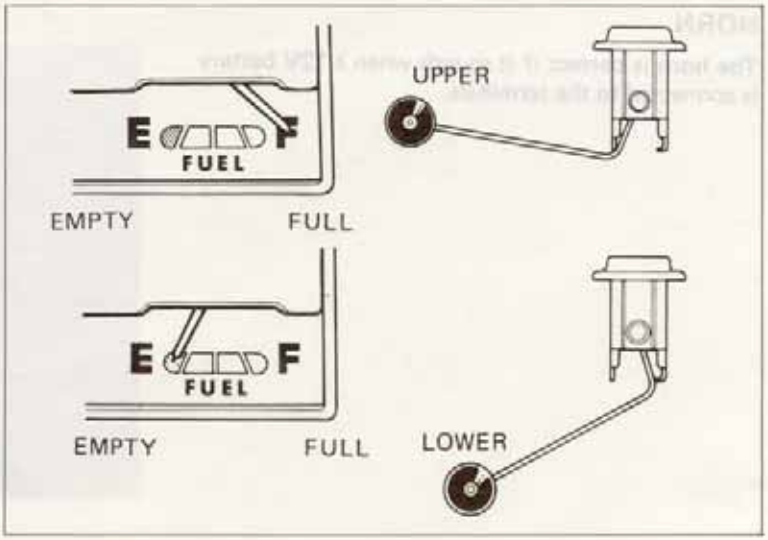
Connect the wires and turn the ignition switch ON.

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.

	Needle position
Float at UPPER position	"FULL"
Float at LOWER position	"EMPTY"



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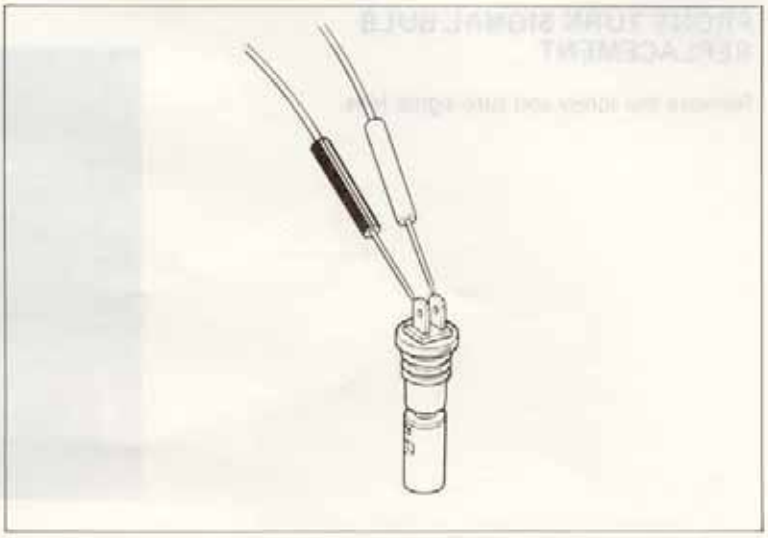
OIL LEVEL SENSOR



INSPECTION

Disconnect the wires and remove the sensor.

Lower the float fully until it will no longer go.
Measure the resistances between the terminals as shown.

	Resistance
Green/Red + Grenn –	0 ohm

With the float raised fully, measure the resistance between the terminals.

	Resistance
Gree/Red + Green –	∞

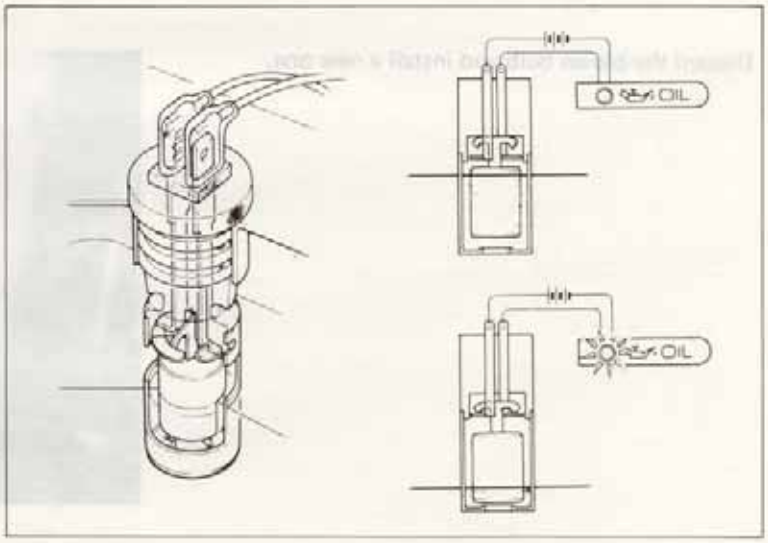
Operate the turn signals to see that the battery circuit is normal, then perform the following inspection.

Connect the wires and turn the ignition switch ON.

Raise and lower the float to make sure that the oil level indicator blinks on and off.

NOTE:

Should the indicator fail to go on and out as the float is moved up and down, check for a loose connection and repeat the above procedure.



HEADLIGHT/FRONT TURN SIGNAL

HEADLIGHT ADJUSTMENT

Adjust the headlight beam vertically by turning the adjusting screws on the lower side of the rim.
Turn the adjusting screws clockwise to direct the beam down.

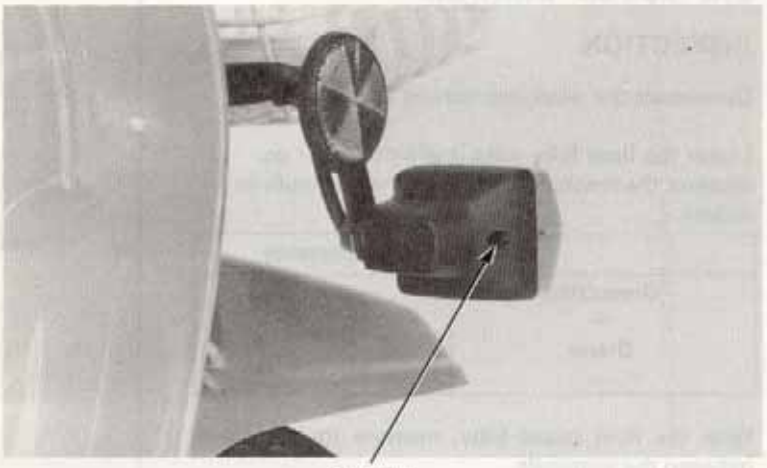
CAUTION:

Adjust the headlight beam as specified by local lows and regulations.

ADJUSTING SCREWS

FRONT TURN SIGNAL BULB REPLACEMENT

Remove the screw and turn signal lens.

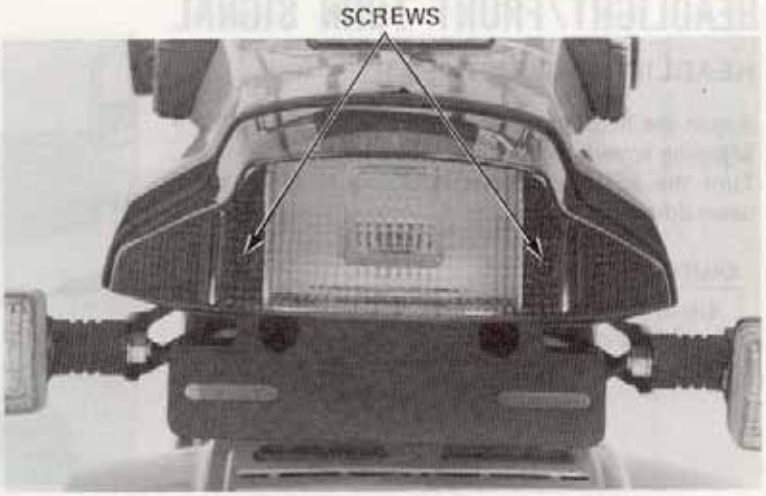


Discard the blown bulb and install a new one.

TAILLIGHT/REAR TURN SIGNAL

BULB REPLACEMENT

Unscrew the two screws and remove the rear turn signal and turn signal lenses.



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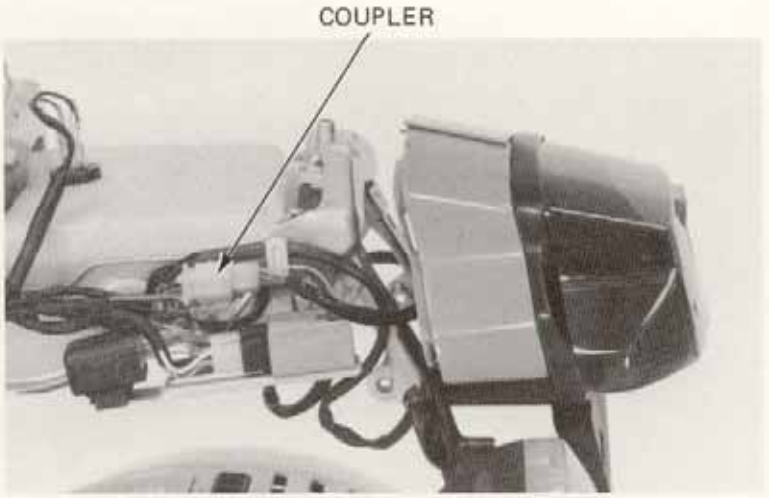
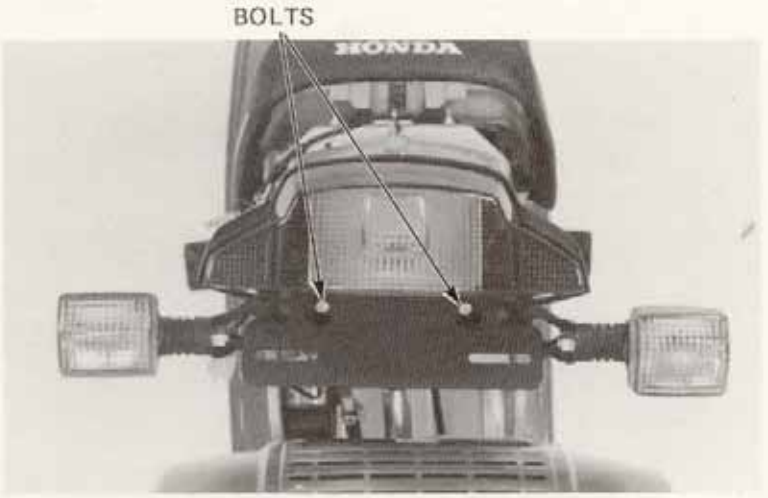
Replace the bulb with new ones.

TAILLIGHT/REAR TURN SIGNAL REMOVAL/INSTALLATION

Remove both side cover (Page 11-4).
Remove the two bolts and taillight/turn signal assembly.





MEMO

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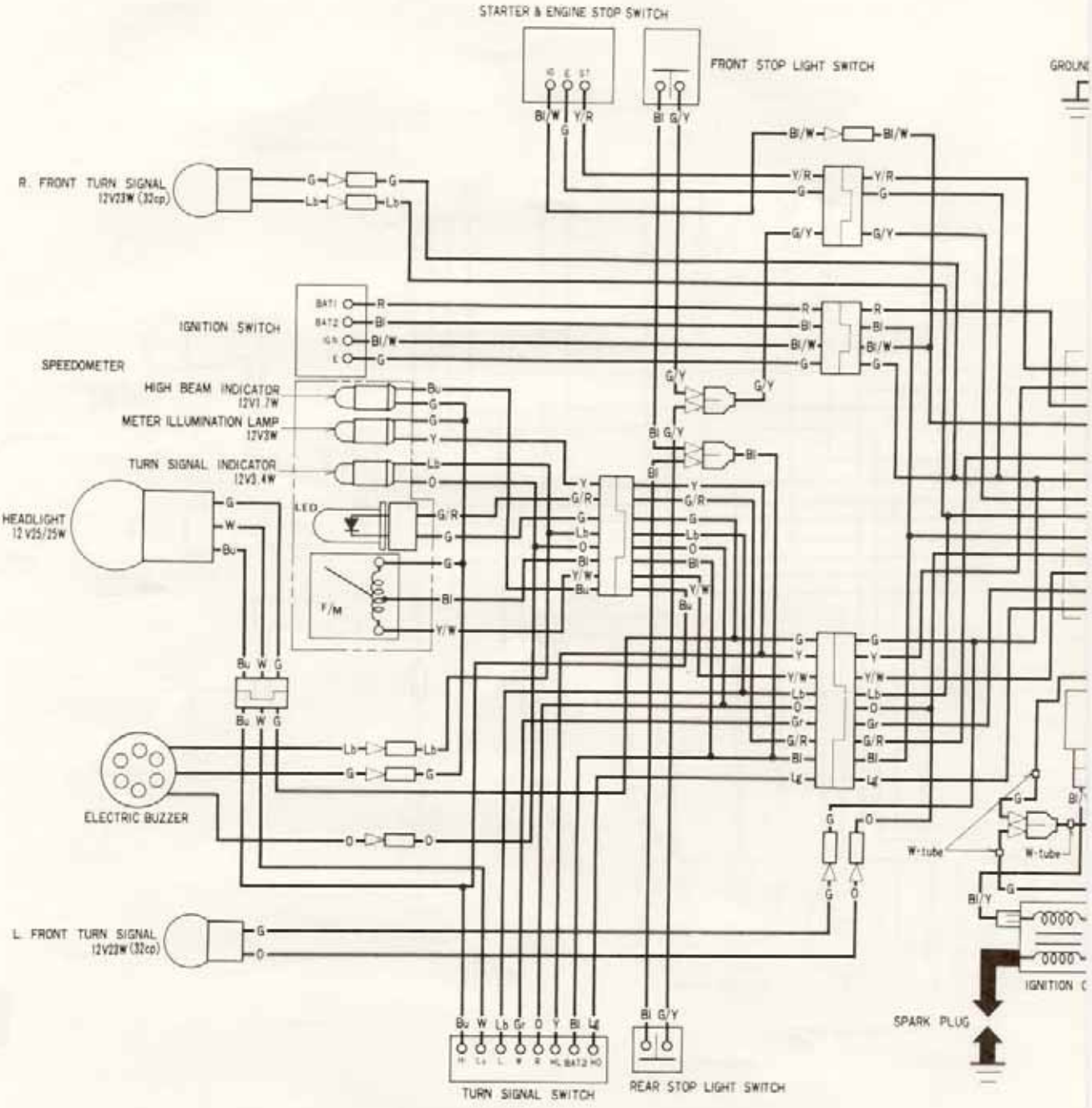

SWITCH CONTINUITY

IGNITION SWITCH

	BAT1	BAT2	IGN	E
ON	○	○		
OFF			○	○
COLOR	R	Bl	Bl/W	G

STARTER SWITCH

	ST	E
FREE		
PUSH	○	○
COLOR	Y/R	G

ENGINE STOP SWITCH

	IG	E
OFF	○	○
RUN		
OFF	○	○
COLOR	Bl/W	G

TURN SIGNAL SWITCH

	W	R	L
R	○	○	
N			
L	○		○
COLOR	Gr	Lb	O

DIMMER SWITCH

	HL
Hi	○
N	○
Lo	○
COLOR	Y

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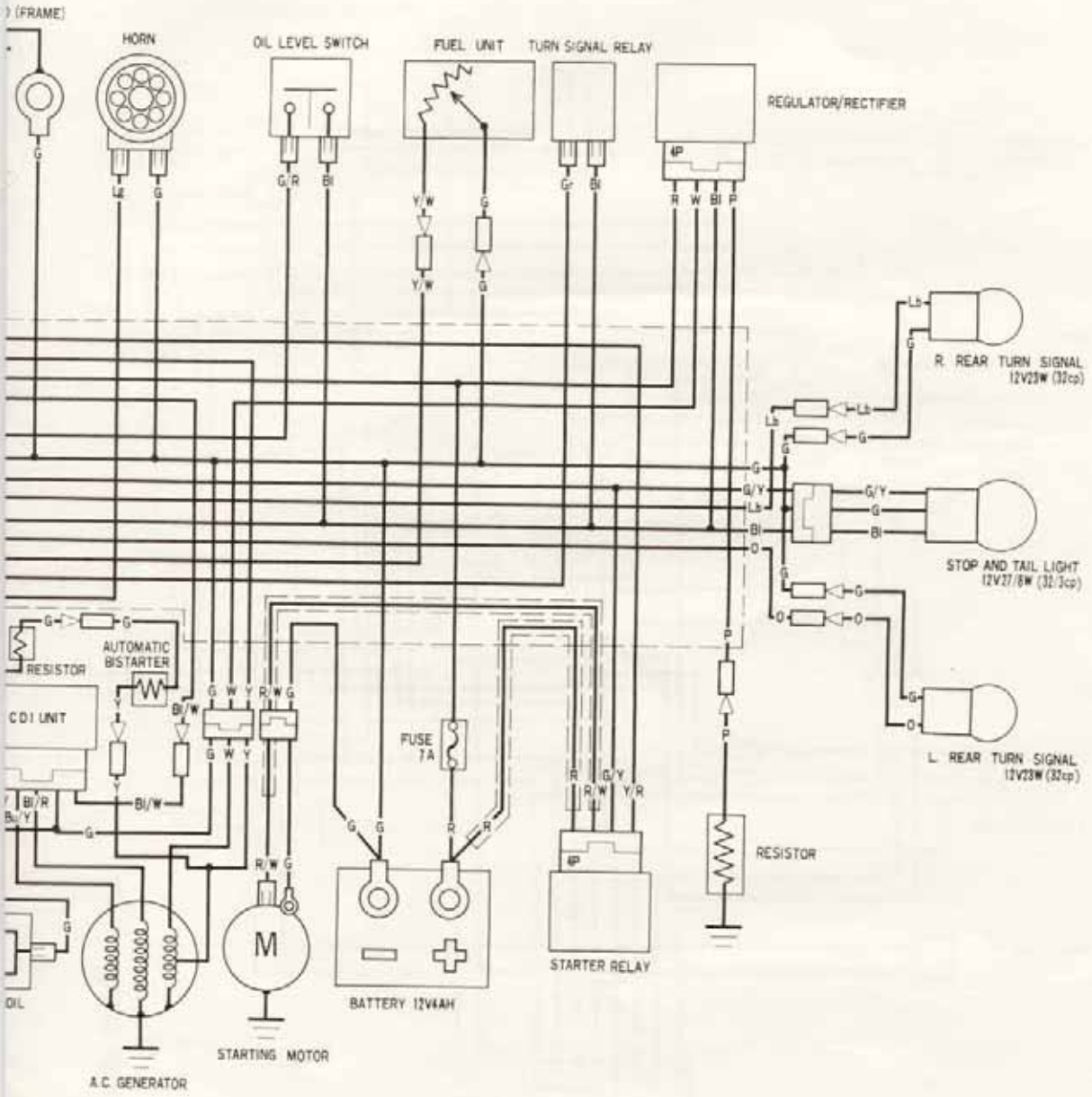
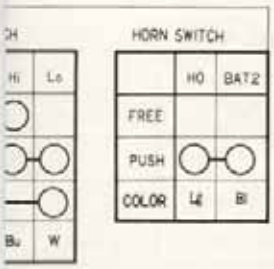


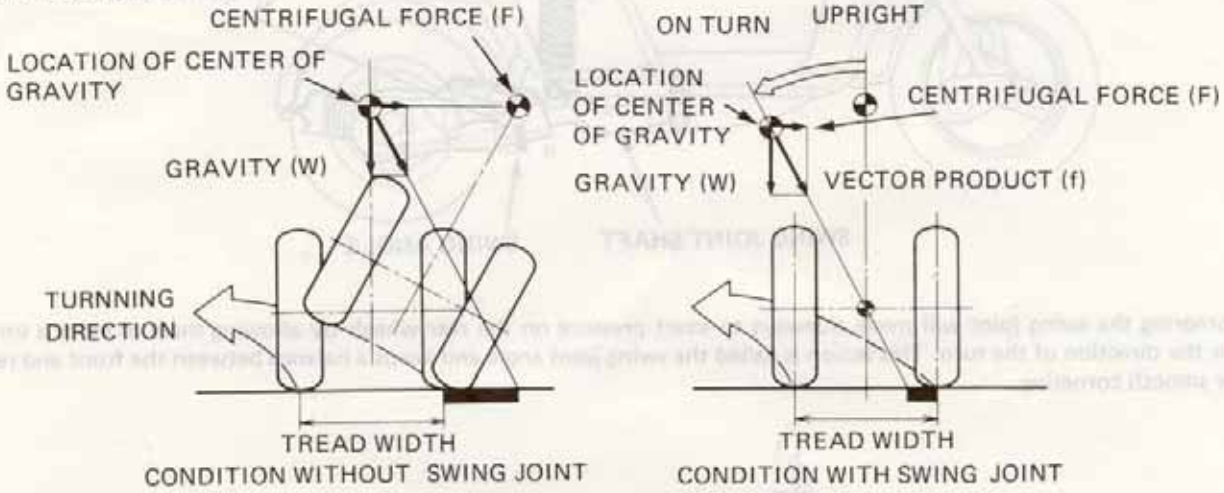


0030Z—GK0—6700

SWING JOINT

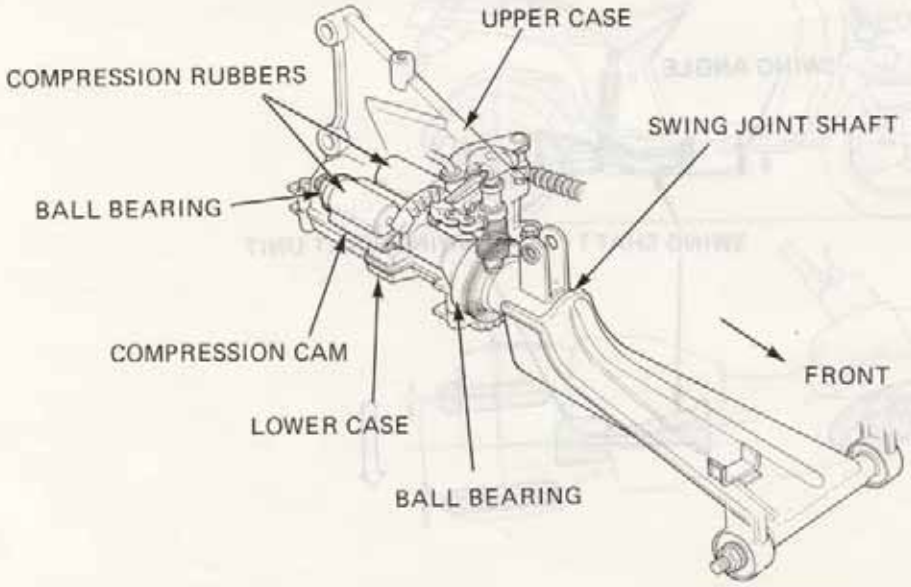
GENERAL

The "Gyro" has a front frame section and a swing joint for the rear frame section. The swing joint has a pivot that allows the front and rear of the scooter to move independently of each other. This design lets the front frame section lean from side-to-side while the rear section can remain flat, not being as affected by centrifugal force during turns, because of the swing joint pivot. If the swing joint and its pivot were not used, the outside rear wheel would be lifted during normal turns by the effects of centrifugal force.

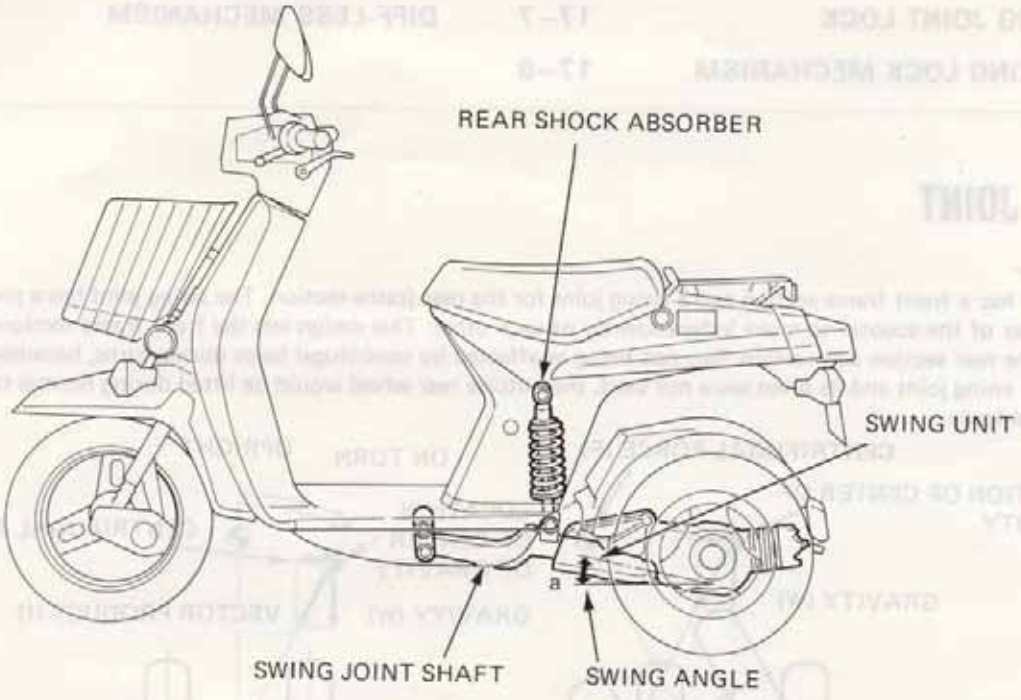


CONSTRUCTION

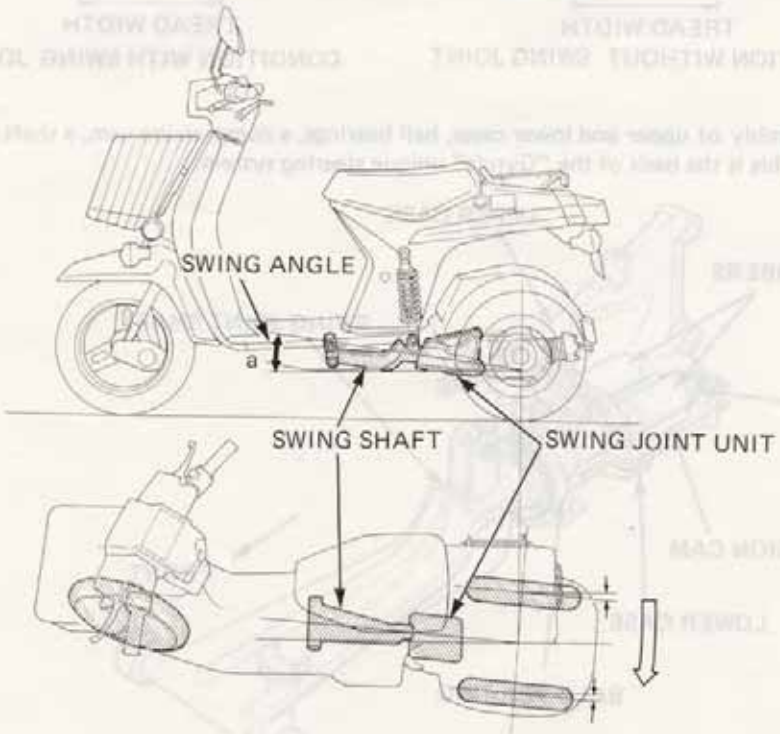
The swing joint is an assembly of upper and lower cases, ball bearings, a compression cam, a shaft, and a pair of compression rubbers around the cam. This is the basis of the "Gyro's" unique steering system.



One end of the swing joint is attached rigidly to the engine and the other end of the swing joint is attached to the front frame section and to the rear shock absorber.



During cornering the swing joint will move sideways to exert pressure on the rear wheels by allowing them to move a small amount in the direction of the turn. This action is called the swing joint angle and keeps a balance between the front and rear wheels for smooth cornering.



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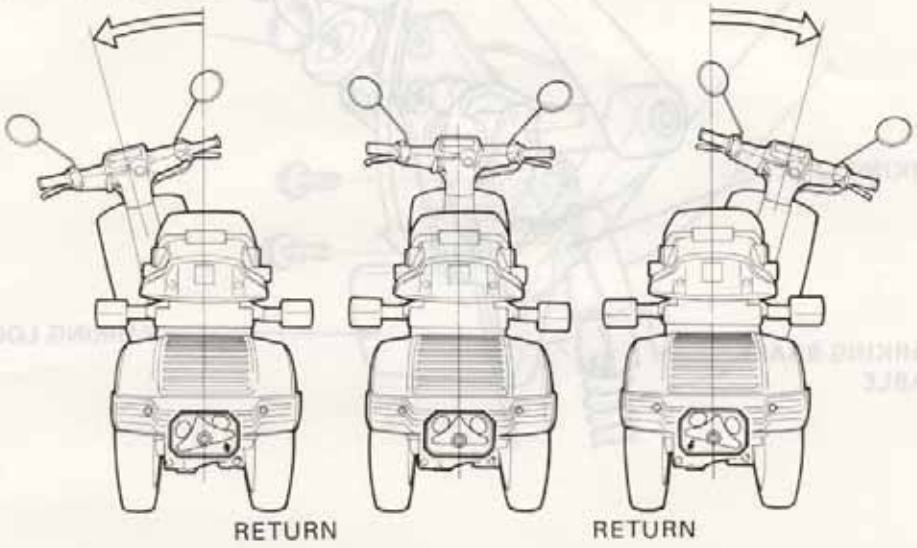
OPERATION

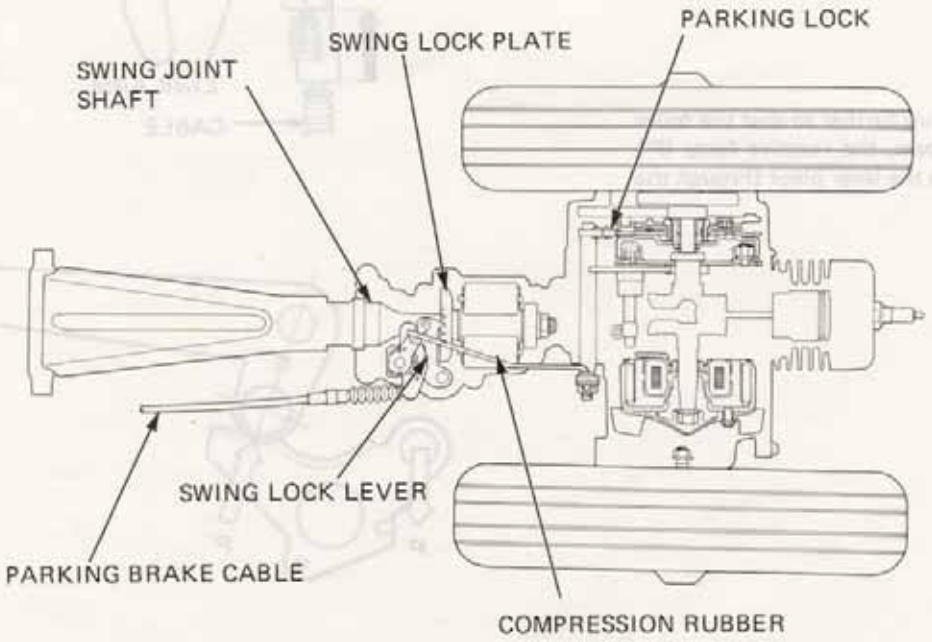
When the scooter corners so that the swing joint is rotated, the compression rubbers are compressed by the cam. The compression rubbers then try to return to their original shape. The smaller the compression, the smaller the reaction, resulting in the desired steering under all riding conditions, particularly at very slow speed, or when braking or stopping.



SWING JOINT/PARKING LOCK

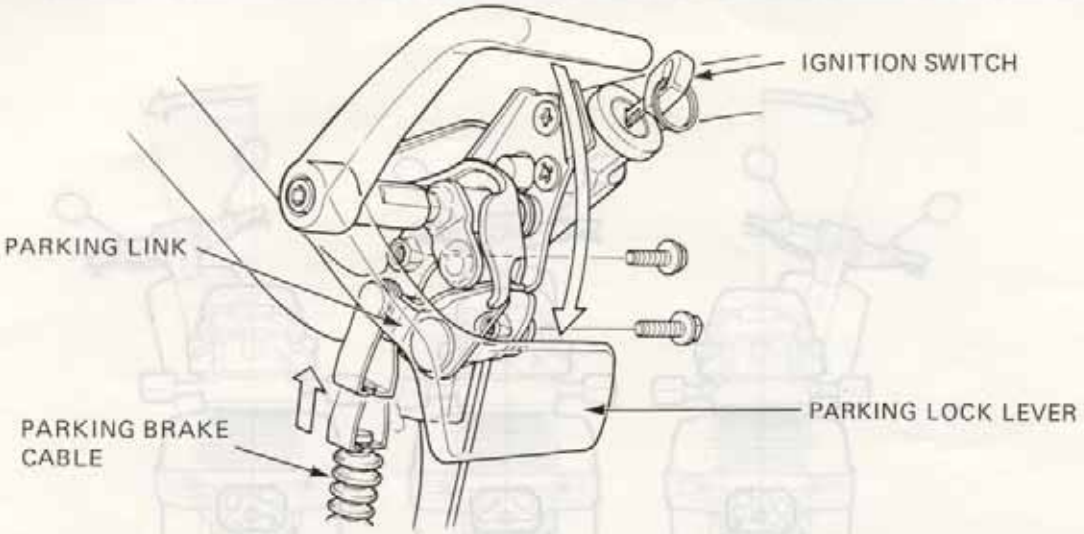
GENERAL

This system locks the swing joint shaft and rear wheel drive shaft to keep the scooter upright and from rolling down grades.



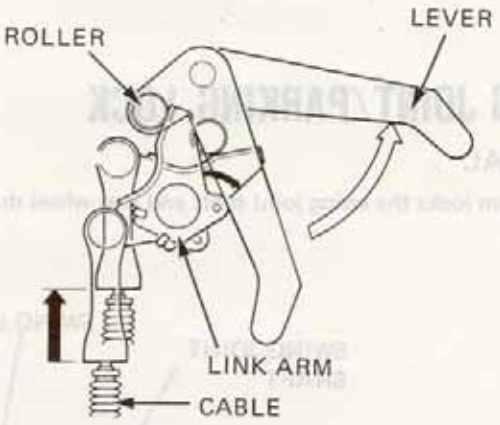
LOCK LEVER

The parking lock lever is attached to a bracket with two mount bolts at the center of the steering handlebar. Pulling this lever causes the swing and parking locks. To release the locks, press down on the lever.

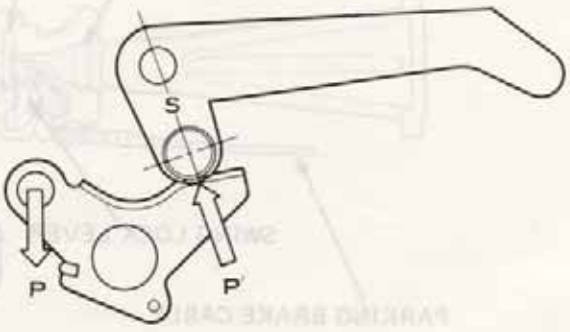


LOCK LEVER OPERATION

As the lever is pulled up, a roller rotates the link arm and pulls up parking cable.



When the lever is pulled up further so that the roller reaches the position shown, the reactive force (P') of the arm just works on the lever pivot through the roller (S).



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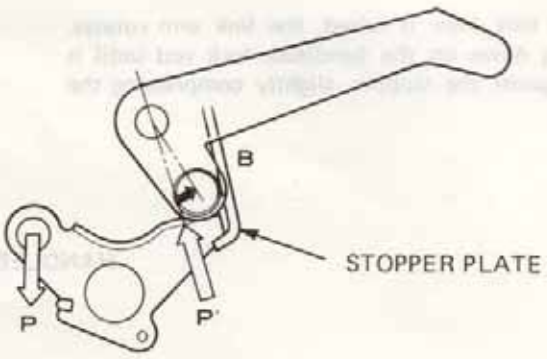
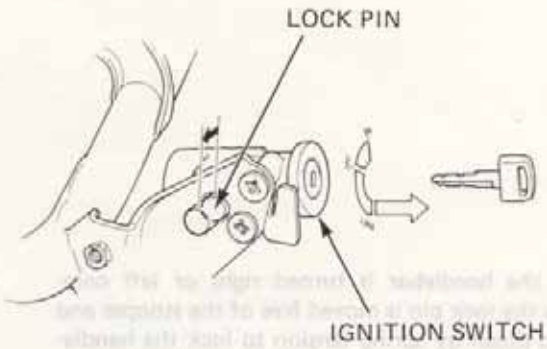
As the lever reaches point B, it is automatically head in position by force P'.

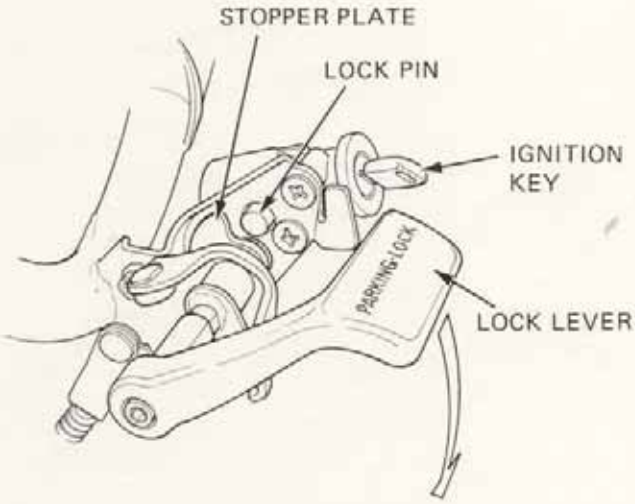


IGNITION SWITCH LOCK

The ignition switch uses a lock pin that works with the ignition key.

Before the ignition switch can be turned to the "lock" position with the key, the lock lever must be pulled up. Likewise, the parking lock lever must be pushed down before the ignition switch can be turned to the "on" position.

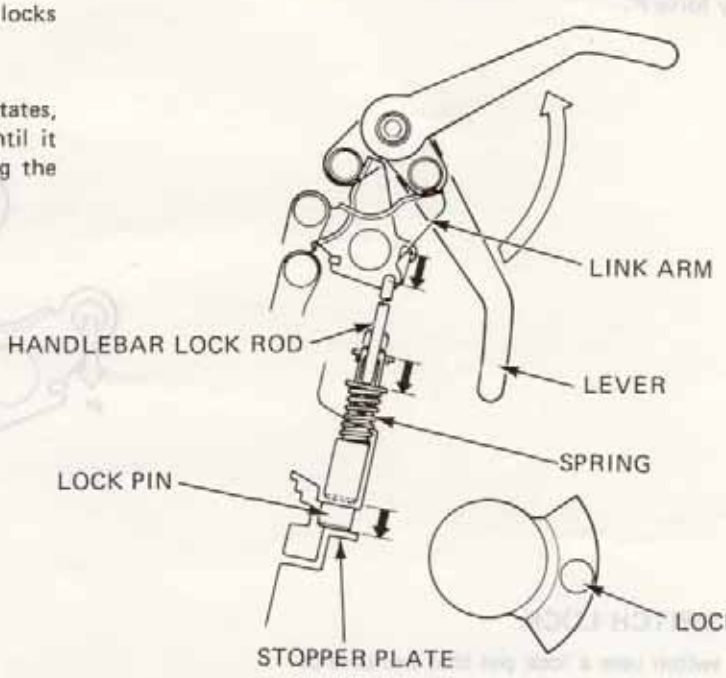




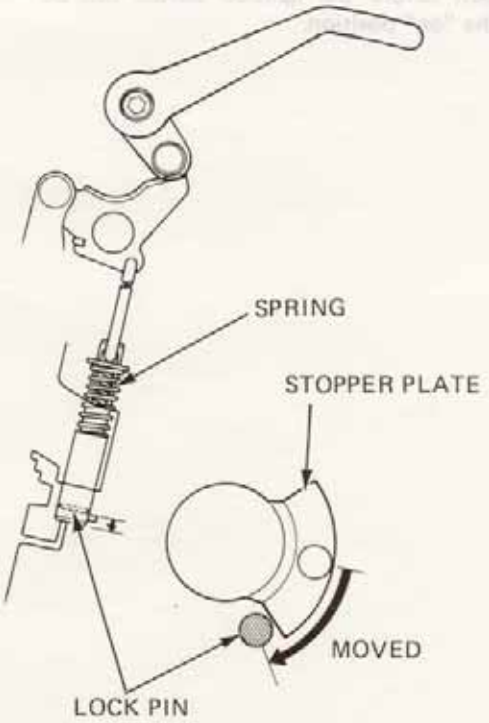
HANDLEBAR LOCK

Pulling up the swing joint/parking lock lever locks the handlebar.

As the lock lever is raised, the link arm rotates, pressing down on the handlebar lock rod until it rests against the stopper, slightly compressing the spring.



When the handlebar is turned right or left completely the lock pin is moved free of the stopper and pressed down by spring tension to lock the handlebar.



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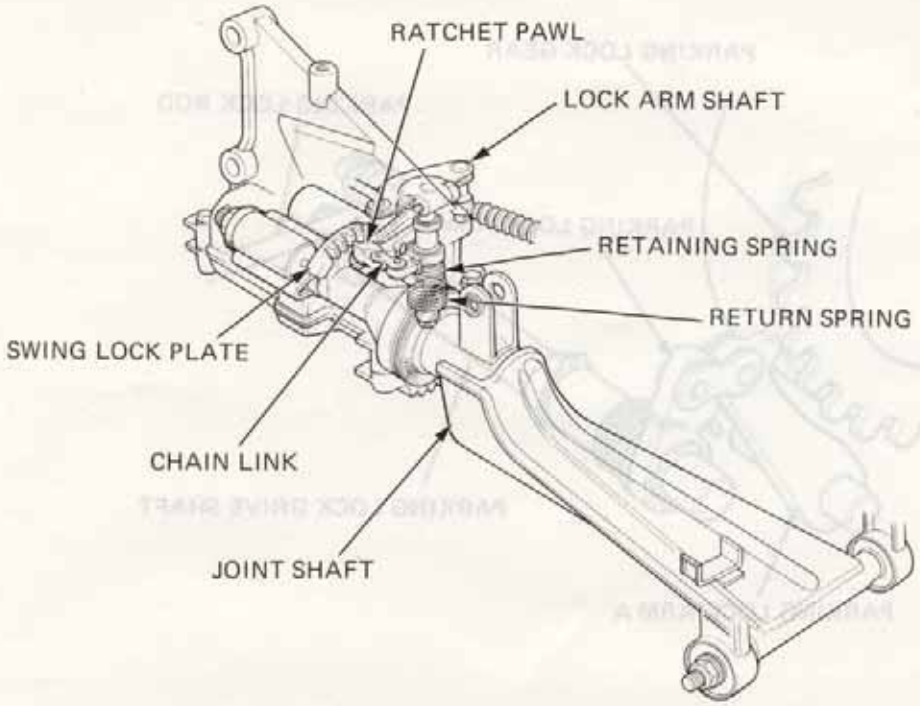
SWING JOINT LOCK

CONSTRUCTION

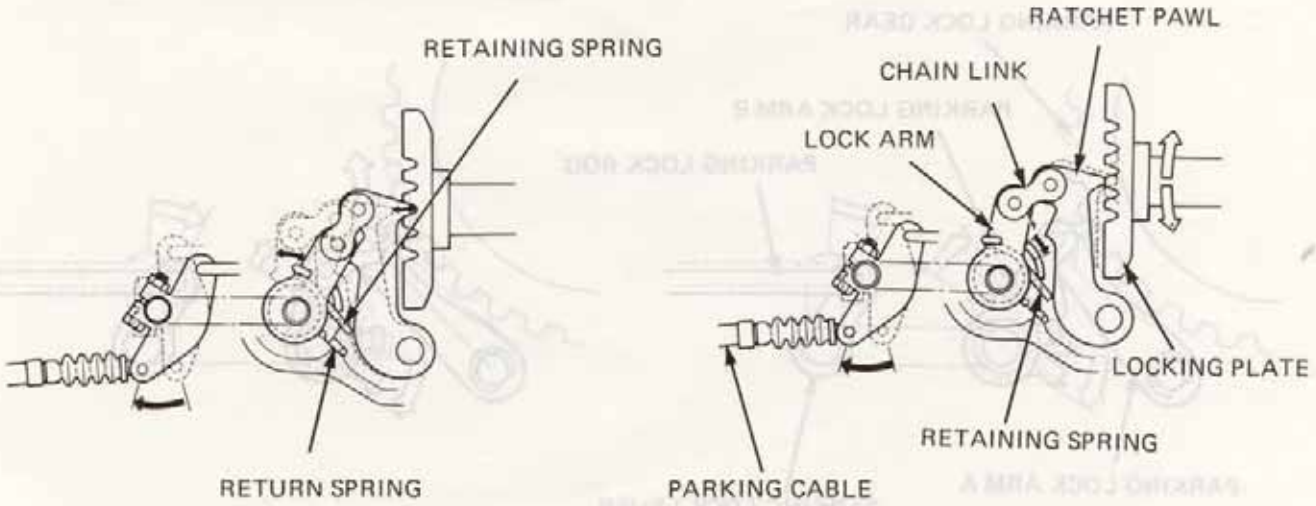
The swing lock system has a ratchet pawl, a chain link and a lock arm. The swing lock plate has six teeth and is located at the front of the swing shaft. The ratchet pawl, chain link and lock arm shaft are assembled in the swing joint case.



OPERATION

When the joint/parking lock lever is raised, the lock arm movement (arrow) is transmitted through a chain link to the ratchet pawl, causing it to engage one of the six teeth on the sector. The swing shaft is then securely locked.

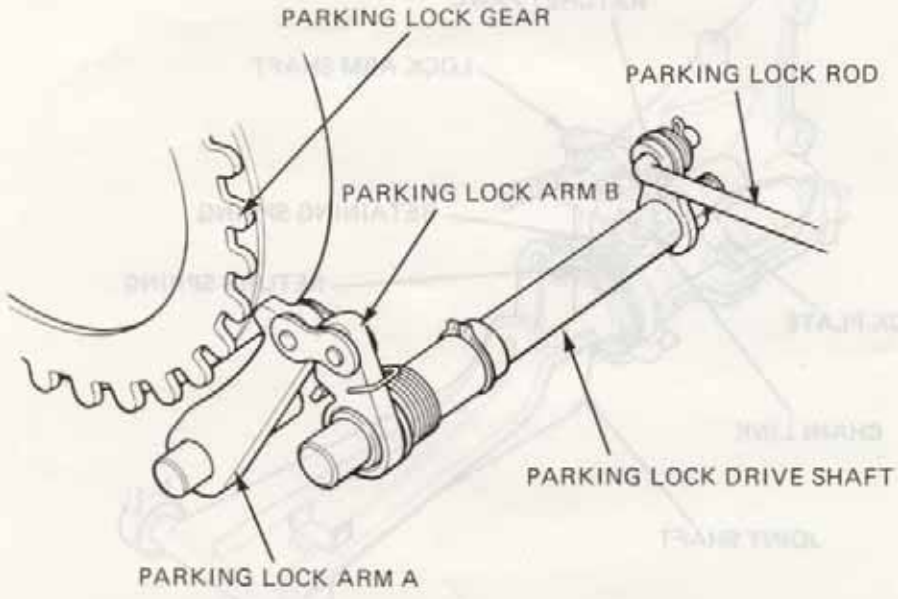
The retaining spring forces the ratchet pawl into engagement with the sector when the frame moves side to side, if the movement of the swing/parking lock lever fails to lock the shaft.



PARKING LOCK MECHANISM

CONSTRUCTION

This consists of the parking lock gear, parking lock arms A and B, parking lock drive shaft, and parking lock rod as shown. The parking lock gear is integrated with the drive shaft parking lock arms A and B are installed on the right case cover.

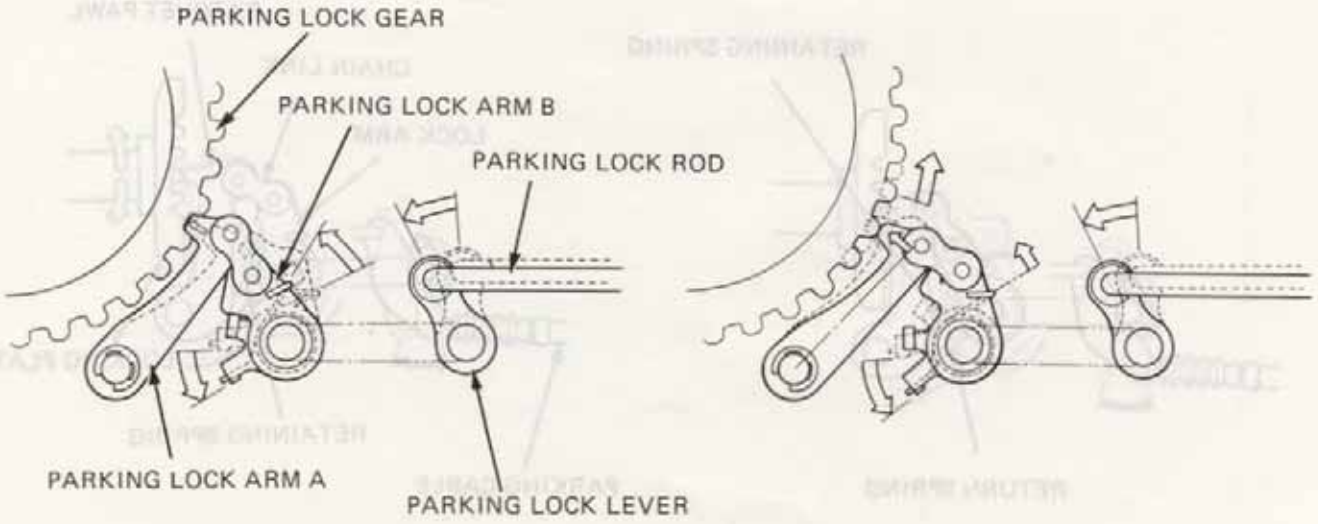


OPERATION

As the swing joint/parking lock lever is raised, a force from the lock rod, through the shaft and spring moves parking lock arm B counterclockwise.

Parking lock arm A then moves into engagement with one of the teeth on the parking lock gear.

As a back up feature, the spring will cause proper engagement of the arm when the rear wheels are rotates about 10 mm (overstroke cancelling) in case the arm is resting on top of any gear tooth.



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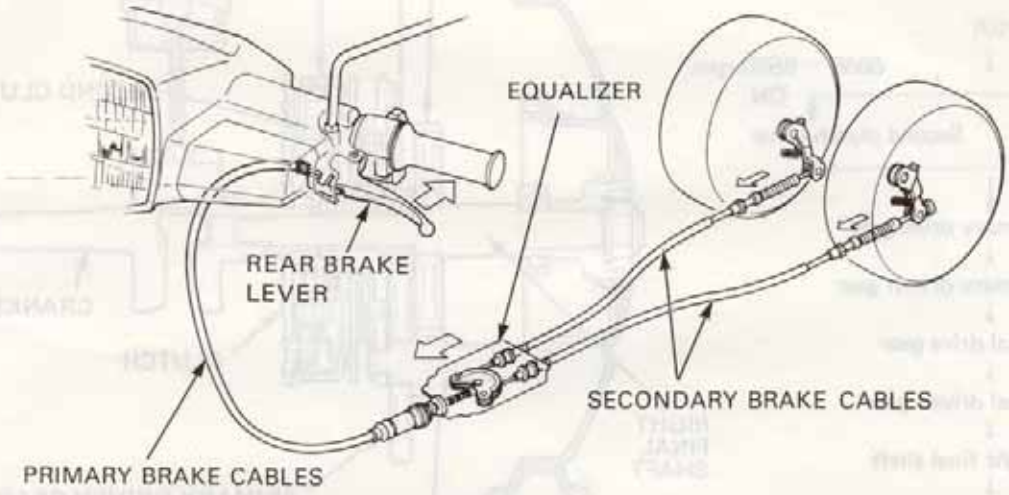
REAR BRAKE EQUALIZER

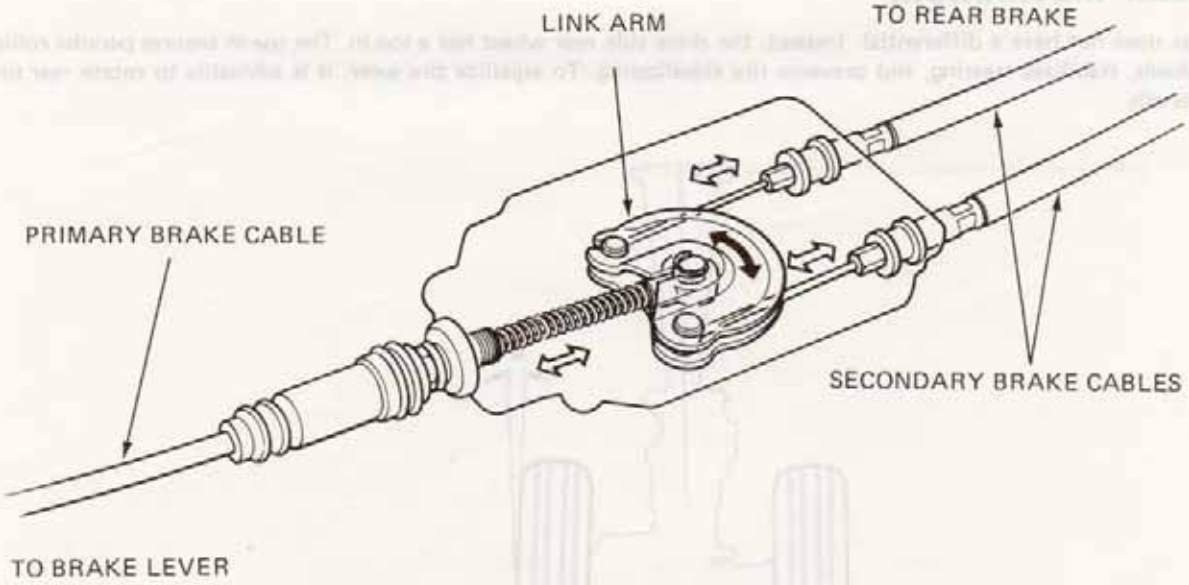
CONSTRUCTION

A rear brake equalizer is between the front brake lever and the rear brakes.



OPERATION

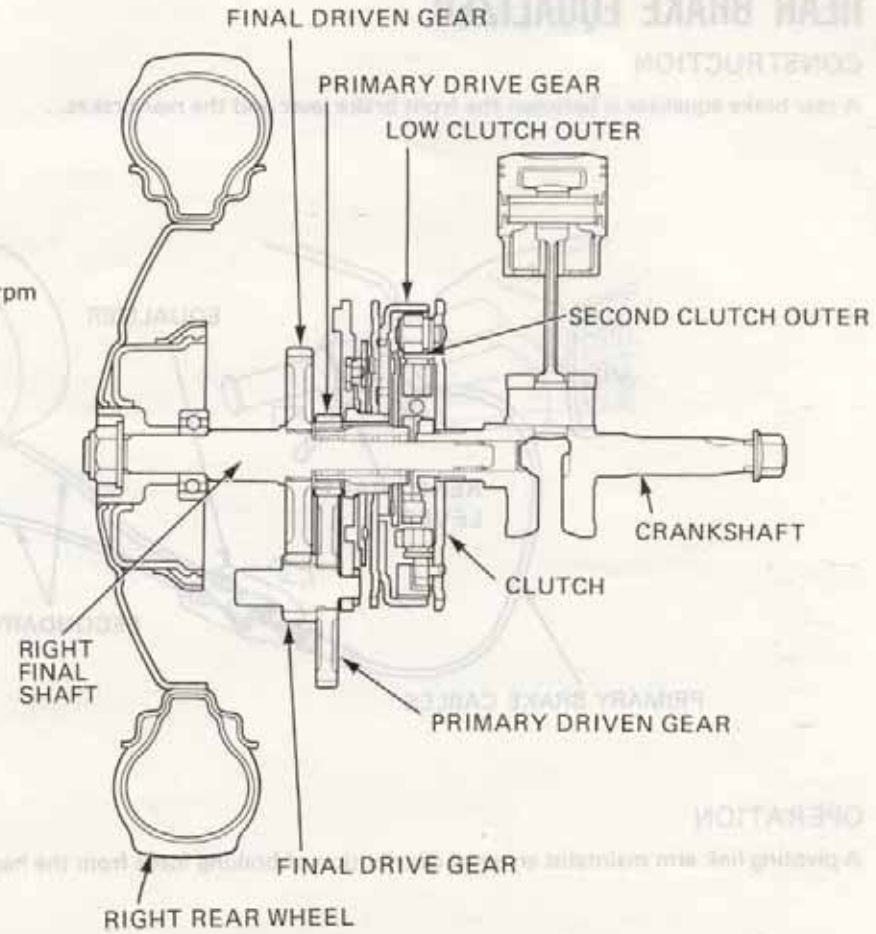
A pivoting link arm maintains an equal distribution of braking force from the handlebar brake lever to the rear wheels.



ENGINE

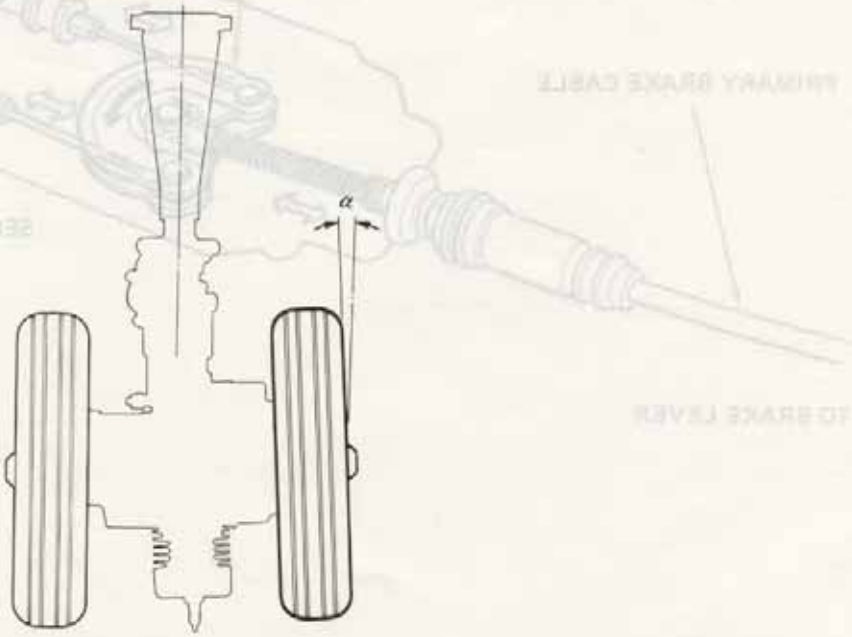
CLUTCH

POWER FLOW:
Crankshaft
↓
Clutch
↓
4150 ~ 4450 rpm ON → Low clutch outer
6050 ~ 6550 rpm ON → Second clutch outer
↓
Primary drive gear
↓
Primary driven gear
↓
Final drive gear
↓
Final driven gear
↓
Right final shaft
↓
Right rear wheel



DIFF-LESS MECHANISM

The scooter does not have a differential. Instead, the drive side rear wheel has a toe-in. The toe-in ensures parallel rolling of the rear wheels, stabilizes steering, and prevents tire sideslipping. To equalize tire wear, it is advisable to rotate rear tires at regular intervals.



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ENGINE DOES NOT START OR IS HARD TO START

		Probable Cause
1. Check if fuel is getting to carburetor by loosening drain screw	NOT GETTING TO CARBURETOR →	(1) Not fuel in fuel tank (2) Clogged fuel line to carburetor, vacuum tube up to inlet pipe, or fuel pipe (3) Clogged float valve (4) Clogged fuel tank cap breather hole (5) Clogged fuel strainer (6) Clogged fuel filter
GETTING TO CARBURETOR ↓		
2. Try spark test	WEAK OR NO SPARK →	(1) Faulty spark plug (2) Fouled spark plug (3) Faulty CDI unit (4) Faulty alternator (5) Broken or shorted spark plug wire (6) Broken or shorted ignition coil (7) Faulty ignition switch
SPARK JUMPS ↓		
3. Test cylinder compression	LOW COMPRESSION →	(1) Stuck piston rings (2) Faulty or deteriorated reed valve (3) Worn cylinder and piston rings (4) Faulty cylinder or cylinder head casting (5) Compression leak past crankcase (6) Leaking cylinder head gasket
NORMAL COMPRESSION ↓		
4. Start by following normal starting procedure	ENGINE FIRES BUT SOON STOPS →	(1) Faulty auto bystarter (2) Air leaking past intake pipe (3) Improper ignition timing (4) Carburetor air screw out of adjustment
ENGINE DOES NOT FIRE ↓		
5. Remove spark plug	WET PLUG →	(1) Carburetor overflooded (2) Faulty auto bystarter (3) Throttle valve excessively open (4) Water in fuel line (5) Fuel deteriorated in float chamber
DRY		

ENGINE LACKS POWER

		Probable Cause
1. Lightly accelerate engine ENGINE SPEED INCREASES ↓	ENGINE SPEED DOES NOT INCREASE SUFFICIENTLY →	(1) Clogged air cleaner (2) Restricted fuel flow (3) Clogged fuel tank cap breather hole (4) Clogged muffler
2. Check ignition timing CORRECT ↓	INCORRECT →	(1) Faulty CDI unit (2) Faulty alternator
3. Test cylinder compression by operating the starter NORMAL ↓	TOO LOW →	(1) Worn cylinder or piston rings (2) Blown cylinder head gasket (3) Flaws in cylinder or cylinder head (4) Faulty or deteriorated reed valve
4. Check carburetor for clogging NOT CLOGGED ↓	CLOGGED →	Carburetor not serviced frequently enough
5. Remove spark plug NOT FOULED OR DISCOLORED ↓	FOULED OR DISCOLORED →	(1) Plug not service frequently enough (2) Use of plug with improper heat range
6. Check if engine overheats NOT OVERHEATED ↓	OVERHEATED →	(1) Worn cylinder or piston (2) Fuel-air mixture too lean (3) Use of improper grade of fuel (4) Excessive carbon build-up in combustion chamber (5) Ignition timing too advanced
7. Try rapid acceleration or run at high speed ENGINE DOES NOT KNOCK	ENGINE KNOCKS →	(1) Excessive carbon build-up in combustion chamber (2) Use of improper grade of fuel (3) Clutch slipping (4) Fuel-air mixture too lean (5) Ignition timing too early

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POOR PERFORMANCE AT LOW AND IDLE SPEEDS

		Probable Cause
1. Check ignition timing	INCORRECT →	(1) Faulty CDI unit (2) Faulty alternator
CORRECT ↓		
2. Check carburetor air screw for proper adjustment	INCORRECT →	(1) Fuel-air mixture too rich (Screw out to correct) (2) Fuel-air mixture too lean (Screw in to correct)
CORRECT ↓		
3. Check if air is leaking past intake pipe	LEAKING →	(1) Deteriorated insulator gasket (2) Loose carburetor (3) Deteriorated intake pipe gasket (4) Deteriorated insulator O-ring
NOT LEAKING ↓		
4. Try spark test	WEAK OR INTERMITTED SPARK →	(1) Faulty, carbon or wet fouled spark plug (2) Faulty CDI unit (3) Faulty alternator (4) Faulty ignition coil (5) Broken or shorted high tension wire (6) Faulty ignition switch
GOOD SPARK		

POOR PERFORMANCE AT HIGH SPEED

1. Check ignition timing	INCORRECT →	(1) Faulty CDI unit (2) Faulty alternator
CORRECT ↓		
2. Disconnect fuel tube at fuel valve	FUEL FLOW RESTRICTED →	(1) No fuel in fuel tank (2) Clogged fuel tube or fuel filter (3) Clogged fuel tank cap breather hole
FUEL FLOWS FREELY ↓		
3. Remove carburetor and check for clogged jets	CLOGGED →	Clean
NOT CLOGGED		

CLUTCH AND TRANSMISSION

	Probable Cause
1. If engine fires but scooter does not start	(1) Separated clutch linings (2) Loose clutch drive plate nut or damaged splines (3) Damaged transmission (4) Seized transmission
2. If scooter creeps or engine starts but stalls (rear wheels rotate at idle)	Broken shoe spring

POOR HANDLING

LOSS OF CONTROL — Check tire pressure

	Probable Cause
1. If steering is heavy	(1) Steering head adjuster too tight (2) Damaged steering cones or steel balls
2. If either wheel is wobbling	(1) Excessive wheel bearing play (2) Bent rim (3) Loose axle nut
3. If the scooter pulls to one side	(1) Bent front fork (2) Twisted joint shaft bracket, cracked or damaged mount rubber

POOR FRONT/REAR SUSPENSION PERFORMANCE

	Probable Cause
1. If suspension is too soft	(1) Weak spring (2) Excessive load (3) Leaky damper seal
2. If suspension is too hard	(1) Bent fork or shock rod
3. If suspension is noisy	(1) Slider binding (2) Damaged shock stopper rubber (3) Loose fasteners

POOR BRAKE PERFORMANCE

	Probable Cause
1. If wear indicator arrow aligns with index mark on brake panel	(1) Worn brake shoes (2) Worn brake cam (3) Worn cam contacting face of shoe (4) Worn brake drum
2. If either brake is squealing	(1) Worn brake shoes (2) Foreign matter on brake lining (3) Rough shoe contact face of brake drum
3. If brake performance is poor	(1) Misadjusted or stretched brake cable (2) Brake shoes partially contacting brake drum (3) Mud or water in brake drum (4) Brake linings fouled with grease or oil

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SWING LOCK

	Probable Cause
1. If parking lever is not locked	(1) Improperly adjusted cable (2) Broken or stretched cable (3) Damaged parking return spring on swing case side
2. If parking lever does not release or is sluggish	(1) Excessive cable play (2) Damaged return spring (3) Cable clip coming off swing lock lever
3. If parking brake is not locked with swing mechanism locked	(1) Cable not adjusted properly (2) Broken or disconnected rod between swing lock and parking lock (3) Damaged parking lock arm pawl (4) Damaged parking gear teeth
4. If parking lever can be returned with ignition switch in LOCK position.	(1) Deformed or damaged stopper plate (2) Twisted or damaged parking lever shaft (3) Worn friction surface between parking lever shaft and stopper plate

OIL INDICATOR

INDICATOR DOES NOT LIGHT WHEN IGNITION SWITCH IS TURNED ON OR NO OIL IN TANK

		Probable Cause
1. Check battery circuit by operating turn signals	SIGNALS DIM, REMAIN ON OR DO NOT OPERATE →	(1) Blown fuse (2) Weak or deal battery (3) Faulty ignition switch (4) Disconnected wire connector (5) Broken wire harness
SIGNALS OPERATING CORRECTLY (60—120 flashes/min) ↓		
2. Remove instruments and connect black wire to battery positive terminal and green wire to negative terminal LED LIT ↓	LED DOES NOT LIGHT →	(1) Loose connection (2) Faulty LED or LED drive circuit
3. Check for loose, disconnect or improperly connected terminal	INCORRECT →	(1) Loose or disconnected terminal (2) Broken wire harness (3) Incorrect connection
CORRECT ↓		
4. Remove oil level sensor and check operation Float up: Indicator off Float down: indicator on	INCORRECT →	(1) Stuck float (2) Internal fault
CORRECT		

INDICATOR LAMP REMAINS ON WITH SUFFICIENT OIL IN OIL TANK (IGNITION SWITCH ON)

		Probable Cause
1. Check for loose, disconnected or improperly connected terminals	INCORRECT →	(1) Loose or disconnected terminal (2) Broken wire harness (3) Incorrect connection
CORRECT ↓		
2. Disconnect the green/red wire at instruments	LED REMAINS ON →	(1) Faulty LED drive circuit
LED GOES OFF ↓		
3. Remove oil level sensor and check operation: Float up: Indicator off Float down: Indicator on	INCORRECT →	(1) Jammed or stuck float (2) Broken or shorted indicator sensor
CORRECT ↓		
4. Check for deformed tank or foreign matter in tank		

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FUEL GAUGE

POINTER DOES NOT REGISTER CORRECTLY (IGNITION SWITCH ON)

		Probable Cause
1. Check battery circuit by operating turn signals	SIGNALS DIM, REMAINED ON OR DID NOT OPERATE →	(1) Blown fuse (2) Weak or dead battery (3) Faulty ignition switch (4) Disconnected terminal (5) Broken wire harness
SIGNALS OPERATED PROPERLY ↓		
2. Remove fuel level sensor and check for operation by moving float Float up: Pointer at FULL Float down: Pointer at EMPTY	POINTER MOVED →	Faulty float
POINTER DOES NOT MOVE ↓		
3. Short the open tank unit terminals on wire harness side	POINTER MOVED →	Broken or shorted balancing coil coil
POINTER NOT MOVED ↓		
4. Check for loose, disconnected or incorrectly connected terminals	INCORRECT →	(1) Disconnected terminal (2) Incorrectly connected terminals (3) Shorted or broken balancing coil/lead

POINTER FLUCTUATES OR SWINGS VIOLENTLY (IGNITION SWITCH ON)

		Probable Cause
1. Check battery circuit by operating turn signals	SIGNALS DIM, REMAIN ON OR DID NOT OPERATE →	(1) Blown fuse (2) Weak or dead battery (3) Broken or shorted ignition switch (4) Loose or disconnected terminal (5) Broken wire harness
SIGNALS OPERATED PROPERLY ↓		
2. Remove tank unit and check for operation by moving float POINTER MOVED	POINTER DOES NOT MOVE →	Loose or poor connection in fuel level sensor
↓		
3. Move float up and down rapidly (up-and-down stroke/sec)	POINTER DOES NOT MOVE →	Lack of damper oil in meter
POINTER MOVED ↓		
4. Checked each connector	INCORRECT →	(1) Loose or disconnected terminal (2) Shorted or broken balancing coil/lead
CORRECT		

STARTER MOTOR

STARTER MOTOR DOES NOT TURN

		Probable Cause
1. Check operation of brake stop light by operating brakes	DID NOT GO ON →	(1) Blown fuse (2) Weak or dead battery (3) Faulty stop light switch (4) Disconnected terminal (5) Broken or shorted ignition switch
WENT ON ↓		
2. Check battery circuit by operating turn signals	SIGNALS DIM, REMAINED ON OR DID NOT OPERATE →	Dead battery
SIGNALS OPERATE PROPERLY (60—120 flashes/min) ↓		
3. Check starter relay for operation by depressing starter button	ABNORMAL →	(1) Poorly contacted starter switch (2) Broken or shorted starter relay (3) Loose connector or terminal
NORMAL ↓		
4. Test starter by connecting it to battery	DID NOT TURN →	(1) Worn brushes (2) Broken or shorted rotor windings (3) Broken starter motor wire (4) Loose terminal
TURNS		

STARTER MOTOR TURNS SLUGGISHLY OR FAILS TO CRANK ENGINE

		Probable Cause
1. Check battery circuit by operating turn signals	SIGNALS DIM, REMAIN ON OR DID NOT OPERATED AT ALL →	Dead battery
SIGNALS OPERATED PROPERLY ↓		
2. Connect starter motor sub wires across battery terminals	TURNED PROPERLY →	(1) Loose connector/terminal (2) Poorly contacted starter relay
OPERATES NORMALLY →		(1) Broken or shorted starter motor windings (2) Faulty starter pinion

STARTER WONT' STOP

		Probable Cause
1. Turn ignition switch OFF	STOPPED →	Pinion stuck out
DOES NOT STOP →		Starter relay shorted or stuck closed

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