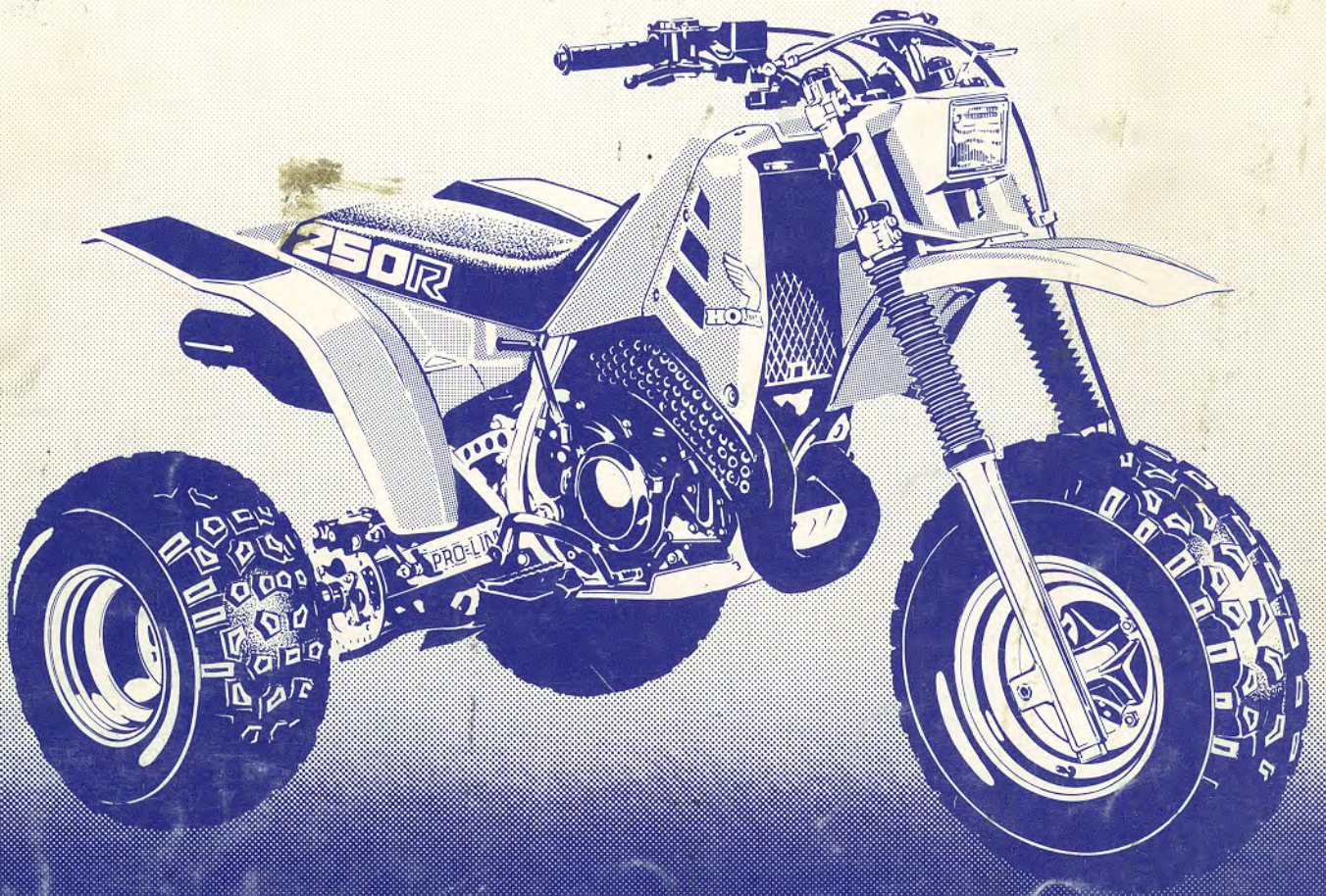


Official

HONDA

SHOP MANUAL

ATC250R



'85~'86

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IMPORTANT SAFETY NOTICE



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 all conceivable ways in which service, whether or not recommended by Honda might be done or of the possibly 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

Sections 1 and 2 apply to the whole ATC while sections 3 through 15 describe parts of the ATC, 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, general instructions, specifications, torque values, tools and troubleshooting for the section. The subsequent pages give detailed procedures.

If you don't know the source of a problem, see section 16, TROUBLESHOOTING.

All information, illustrations, directions and specifications included in this publication are based on the latest product information available at the time of approval for printing.

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HONDA MOTOR CO., LTD.
Service Publications Office

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1. GENERAL INFORMATION

1

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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.

SERVICE RULES

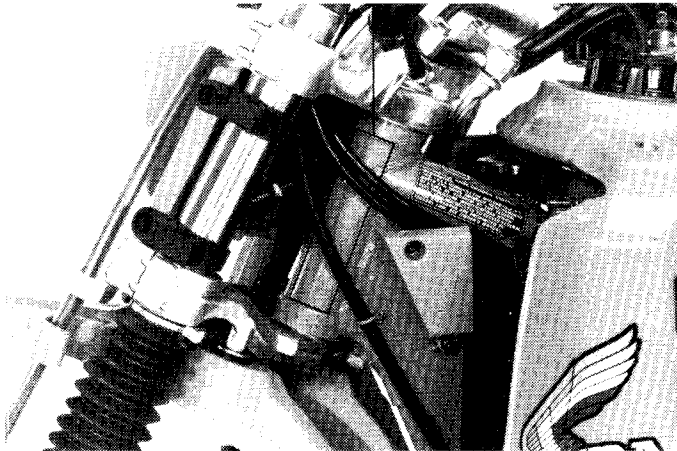
1. Use genuine HONDA or HONDA-recommended parts and lubricants or their equivalent. Parts that do not meet HONDA's design specifications may damage the ATC.
2. Use the special tools designed for this product.
3. Install new gaskets, O-rings, cotter pins, lock plates, etc. when reassembling.
4. When torquing bolts or nuts, begin with larger-diameter or inner bolts first, and tighten to the specified torque diagonally, in incremental steps, unless a particular sequence is specified.
5. Clean parts in non-flammable or high flash point solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
6. When installing a new oil seal, make sure that the sealing lip is lubricated with grease. If an oil seal and related parts have been washed, apply proper grease to the lip of the oil seal.
7. After reassembly, check all parts for proper installation and operation.
8. Use only metric tools when servicing this motorcycle. Metric bolts, nuts, and screws are not interchangeable with English fasteners. The use of incorrect tools and fasteners may damage the ATC.

GENERAL INFORMATION

MODEL IDENTIFICATION

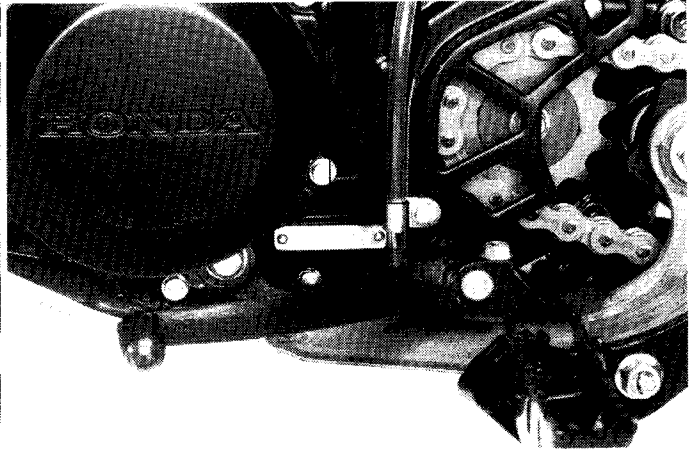


FRAME SERIAL NUMBER



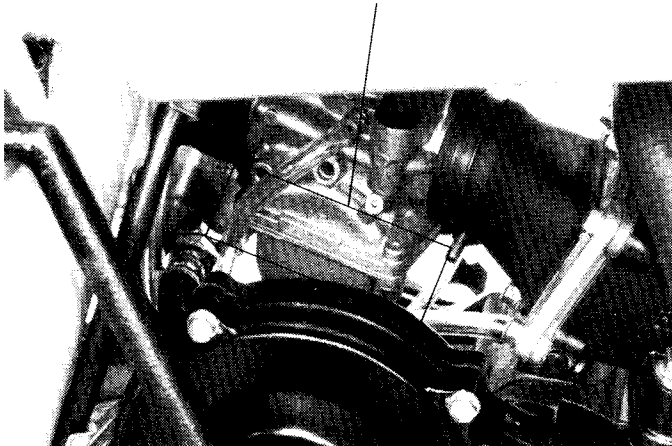
The frame serial number is stamped on the steering head left side.

ENGINE SERIAL NUMBER



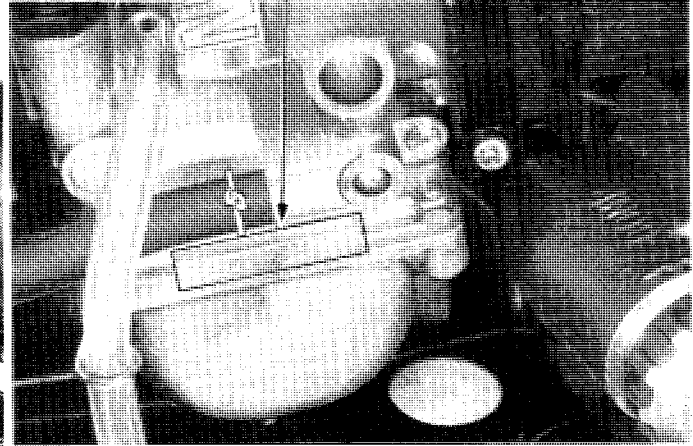
The engine serial number is stamped on the crankcase lower left side.

CARBURETOR IDENTIFICATION NUMBER



'85: The carburetor identification number is stamped on the carburetor body right side.

CARBURETOR IDENTIFICATION NUMBER



AFTER '85: The carburetor identification number is stamped on the carburetor body left side.

SPECIFICATIONS

		'85:	AFTER '85:
DIMENSIONS	Overall length	1,895 mm (74.6 in)	1,905 mm (75.0 in)
	Overall width	1,120 mm (44.1 in)	1,130 mm (44.5 in)
	Overall height	1,090 mm (42.9 in)	1,085 mm (42.7 in)
	Wheelbase	1,295 mm (51.0 in)	1,305 mm (51.4 in)
	Seat height	760 mm (29.9 in)	780 mm (30.7 in)
	Foot peg height	360 mm (14.2 in)	340 mm (13.4 in)
	Ground clearance	120 mm (4.7 in)	110 mm (4.3 in)
	Dry weight	132 kg (291 lb)	131 kg (289 lb)
	Weight distribution	Front Rear	53.0 kg (117 lb) 79.0 kg (174 lb)
FRAME	Type	Semi double cradle	
	Front suspension and travel	Telescopic fork, 250 mm (9.84 in)	
	Rear suspension and travel	Swingarm, Pro-link, 250 mm (9.84 in)	
	Front tire size type	23X8-11	
	Front tire pressure	30 kPa (0.3 kg/cm ² , 4.3 psi)	
	Rear tire size type	20X10-9	
	Rear tire pressure	20 kPa (0.25 kg/cm ² , 3.6 psi)	
	Front brake	Single disc (2 pot)	
	Rear brake	Single disc (2 pot)	
	Fuel capacity	9.8 lit. (2.6 U.S. gal., 2.16 Imp. gal.)	
	Fuel reserve capacity	2.0 lit. (0.53 U.S. gal., 0.44 Imp. gal.)	
	Caster angle	21°	21°30'
	Trail length	37 mm (1.5 in)	38 mm (1.5 in)
Front fork oil	400 cc (13.5 U.S. oz, 0.35 Imp. qt)	464 cc (15.7 U.S. oz, 0.41 Imp. qt)	
ENGINE	Type	Water cooled, 2-stroke	
	Engine dry weight	26.0 kg (57.3 lb)	
	Cylinder arrangement	7° inclined from vertical, single	
	Bore x stroke	66 x 72 mm (2.60 x 2.83 in)	
	Displacement	246 cm ³ (15.01 cu.in)	
	Compression ratio	8.0	
	Transmission oil capacity	700 cc (24 U.S. oz, 0.62 Imp. qt.)	
	Lubrication system	Gasoline/oil mixture	
	Fuel required	Gasoline-oil ratio 20:1 (pre-mixed) (R O.N 92-100)	
Air filtration	Oiled polyurethane form		

GENERAL INFORMATION

		'85:	AFTER '85:						
CARBURETOR	Type	Piston valve							
	Venturi dia.	34 mm (1.3 in)							
	Throttle lever free play	3–8 mm (1/8–5/16 in)							
	Float level	16 mm (0.63 in)							
	Setting mark	PE37A	PJ03A						
	Air screw opening	2 turns out	2-1/4 turns out						
	Idle speed	1,400±150 rpm	1,500±150 rpm						
	Jet needle	2nd groove	3rd groove						
DRIVE TRAIN	Clutch	Wet multi-plate type							
	Transmission	6-speed, constant mesh							
	Primary reduction ratio	2.652							
	Gear ratio	I	2.570						
		II	2.062						
		III	1.667						
		IV	1.333						
		V	1.083						
VI		0.884							
Final reduction ratio	3.000 (39T/13T)								
Gearshift pattern	Left foot operated return system 1-N 2-3-4-5-6								
ELECTRICAL	Ignition system	CDI							
	Ignition timing "F" mark	19° BTDC/1,500 rpm							
	Starting system	Primary kickstarter							
	Alternator	14.5V 159W/5,000 rpm							
	Spark plug	<table border="1"> <thead> <tr> <th>NORMAL</th> <th>COLD WEATHER</th> </tr> </thead> <tbody> <tr> <td>BR9ES (NGK)</td> <td>BR8ES (NGK)</td> </tr> <tr> <td>RN2C (CHAMPION)</td> <td>RN3C (CHAMPION)</td> </tr> </tbody> </table>		NORMAL	COLD WEATHER	BR9ES (NGK)	BR8ES (NGK)	RN2C (CHAMPION)	RN3C (CHAMPION)
		NORMAL	COLD WEATHER						
		BR9ES (NGK)	BR8ES (NGK)						
	RN2C (CHAMPION)	RN3C (CHAMPION)							
Spark plug gap	0.7–0.8 mm (0.028–0.031 in)								
Taillight	12V 5W	12V 5W							
Headlight	12V 45/45W	12V 60/55W							

TORQUE VALUES

ENGINE

Item	Q'ty	Thread Dia. (mm)	Torque N·m (kg·m, ft·lb)	Remarks
Cylinder head nut	6	8	24–29 (2.4–2.9, 17–21)	
Cylinder base nut	4	10	38–48 (3.8–4.8, 27–35)	
Clutch center lock nut	1	18	55–65 (5.5–6.5, 40–47)	
Primary drive gear bolt	1	10	40–50 (4.0–5.0, 29–36)	
Shift drum center pin	1	8	20–40 (2.0–4.0, 14–29)	
Transmission oil drain bolt	1	12	25–35 (2.5–3.5, 18–25)	
Countershaft bearing holder screw	2	6	8–12 (0.8–1.2, 6–9)	
Shift drum stopper arm bolt	1	6	10–14 (1.0–1.4, 7–10)	
Alternator rotor bolt	1	12	65–75 (6.5–7.5, 47–54)	
Drive sprocket bolt	1	8	30–34 (3.0–3.4, 22–24)	
Water pump impeller nut	1	6	8–12 (0.8–1.2, 6–9)	
Spark plug	1	14	15–20 (1.5–2.0, 11–14)	
Transmission oil check bolt	1	6	8–12 (0.8–1.2, 6–9)	
Cylinder coolant drain bolt	1	6	8–12 (0.8–1.2, 6–9)	
Water pump cover coolant drain bolt	1	6	8–12 (0.8–1.2, 6–9)	
Cylinder stud bolt	6	8	10–14 (1.0–1.4, 7–10)	
Gearshift pedal bolt	1	6	10–14 (1.0–1.4, 7–10)	

CHASSIS

Item	Q'ty	Thread Dia. (mm)	Torque N·m (kg·m, ft·lb)	Remarks
Steering stem nut	1	24	80–120 (8.0–12.0, 58–87)	
Steering bearing adjustment nut	1	26	35–45 (3.5–4.5, 25–33)	first
Steering bearing adjustment nut	1	26	36–38 (3.6–3.8, 26–28)	final
Front fork top pinch bolt	4	8	18–25 (1.8–2.5, 13–18)	
Front fork bottom pinch bolt	4	8	18–25 (1.8–2.5, 13–18)	
Front axle	1	14	70–110 (7.0–11.0, 51–80)	
Front axle holder nut	4	6	10–14 (1.0–1.4, 7–10)	
Rear axle nut (outer)	1	48	80–100 (8.0–10.0, 58–72)	left hand
(inner)	1	48	120–140 (12.0–14.0, 87–101)	thread
Rear wheel hub nut (with washer) '85:	2	20	100–120 (10.0–12.0, 72–86)	
Rear wheel hub nut (flange nut type) AFTER MID '85:	2	20	120–170 (12.0–17.0, 87–123)	
Wheel nut (wheel-to-hub)	12	10	60–70 (6.0–7.0, 43–51)	taper nut
Front disc nut	3	8	25–30 (2.5–3.0, 18–22)	
Front brake caliper mounting bolt	2	8	24–30 (2.4–3.0, 17–22)	
Brake hose bolt	4	10	25–35 (2.5–3.5, 18–25)	
Bleed valve	2	7	4–7 (0.4–0.7, 3–5)	
Front master cylinder holder screw	2	6	10–14 (1.0–1.4, 7–10)	
Rear disc bolt	4	8	35–40 (3.5–4.0, 25–29)	
Rear master cylinder mounting bolt	2	8	24–30 (2.4–3.0, 17–22)	
Pad pin bolt	4	8	15–20 (1.5–2.0, 10–14)	
Rear caliper bracket bolt	2	8	28–34 (2.8–3.4, 20–25)	
Rear brake caliper mounting bolt	1	8	20–25 (2.0–2.5, 14–18)	
Parking brake attaching bolt	2	8	20–25 (2.0–2.5, 14–18)	

GENERAL INFORMATION

Item	Q'ty	Thread Dia. (mm)	Torque N·m (kg·m, ft·lb)	Remarks
Shock absorber upper mounting bolt	1	10	45–55 (4.5–5.5, 33–40)	
Shock link-to-frame bolt	1	12	70–80 (7.0–8.0, 51–58)	
Shock link-to-shock arm bolt	1	12	70–80 (7.0–8.0, 51–58)	
Shock arm-to-swingarm bolt	1	12	70–80 (7.0–8.0, 51–58)	
Swing arm pivot nut	1	14	70–110 (7.0–11.0, 51–80)	
Swing arm bearing holder bolt	2	8	18–25 (1.8–2.5, 13–18)	
Skid plate	4	8	28–34 (2.8–3.4, 20–25)	
Driven sprocket bolt	'85: 4	10	32–37 (3.2–3.7, 23–27)	
	AFTER '85: 4	10	47–55 (4.7–5.5, 34–40)	
Driven sprocket bolt	4	8	32–37 (3.2–3.7, 23–27)	
Kick starter pedal bolt	1	8	20–35 (2.0–3.5, 14–25)	
Engine hanger plate bolt (8 mm)	6	8	25–35 (2.5–3.5, 18–25)	
Engine mounting bolt (10 mm)	5	10	50–60 (5.0–6.0, 36–43)	
Footpeg mounting bolt	4	10	50–60 (5.0–6.0, 36–43)	
Front fork cap bolt	2	–	15–30 (1.5–3.0, 11–22)	
Shock absorber spring lock nut	1	–	80–100 (8.0–10.0, 58–72)	
Sub muffler mounting bolt	3	8	28–32 (2.8–3.2, 20–23)	
Gear change pedal bolt	1	6	10–14 (1.0–1.4, 7–10)	

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

STANDARD TORQUE VALUES

Item	Torque Values N·m (kg·m, ft·lb)	Item	Torque Values N·m (kg·m, ft·lb)
5 mm bolt and nut	4.5–6 (0.45–0.6, 3–4)	5 mm screw	3.5–5 (0.35–0.5, 2–4)
6 mm bolt and nut	8–12 (0.8–1.2, 6–9)	6 mm screw and 6 mm bolt with 8 mm head	7–11 (0.7–1.1, 5–8)
8 mm bolt and nut	18–25 (1.8–2.5, 13–18)	6 mm flange bolt and nut	10–14 (1.0–1.4, 7–10)
10 mm bolt and nut	30–40 (3.0–4.0, 22–29)	8 mm flange bolt and nut	24–30 (2.4–3.0, 17–22)
12 mm bolt and nut	50–60 (5.0–6.0, 36–43)	10 mm flange bolt and nut	35–45 (3.5–4.5, 25–33)

TOOLS

SPECIAL

DESCRIPTION	TOOL NUMBER	ALTERNATE TOOL	TOOL NUMBER	REF TO PAGE
Lock nut wrench, 56 mm	07916-HA20100 (07916-9580500)	Lock nut wrench, 56 mm	07916-HA2010A	11-4, 8
Lock nut wrench, 45 mm	07916-1870101	Adjustable opened wrench	Commercially available in U.S.A.	11-4, 5
Steering stem socket	07916-3710100			10-23, 26
Bearing remover set, 12 mm (Bearing remover, 12 mm) (Remover weight)	07936-1660001 (07936-1660100) (07741-0010201)	Remover weight	07936-3710200	9-6
Bearing remover, 17 mm	07936-3710300			8-13, 14
Remover handle	07936-3710100			8-13, 14
Remover weight	07741-0010201	Remover weight	07936-3710200	8-13, 14
Crankcase puller	07937-4300000			8-6
Mechanical seal driver attachment	07945-4150400	Mechanical seal installer	GN-AH-065-415	9-6
Attachment, 28 x 30 mm	07946-1870100			9-6
Needle bearing remover	07946-KA50000			12-6, 8
Snapling pliers	07914-3230001	Equivalent available in U.S.A.		10-6, 20 13-20, 22 10-19
Fork seal driver	07947-4630100			10-25
Steering stem driver	07946-MB00000	Steering stem driver and Attachment	07946-4300100 GN-HT-54 (U.S.A. only)	
Ball race remover	07953-KA50000	Race remover attachment	07953-MJ1000A	10-24
Assembly bolt	07965-1660200			8-13, 15
Thread adaptor	07965-KA30000			8-15
Drive shaft dis/assembly tool	07964-MB00200			8-13, 15
Assembly collar	07931-KF00100	Driver	07945-3710101	8-16
Hex wrench, 6 mm	07917-3230000	Equivalent commercially available in U.S.A.		10-15, 19
Valve wrench	07920-KA30001			12-6, 8
Universal bead breaker driver	07949-3710001	U.S.A. only	6N-AH-958-BB1	

COMMON

DESCRIPTION	TOOL NUMBER	ALTERNATE TOOL	TOOL NUMBER	REF TO PAGE
Float level gauge	07401-0010000			3-12, 3-21
Lock nut wrench, 17 x 27 mm	07716-0020300	Equivalent available in U.S.A.		7-4, 8
Lock nut wrench, 30 x 32 mm	07716-0020400			10-22, 26
Extension bar	07716-0020500			7-4, 8
Universal holder	07725-0030000			10-22, 26
Clutch center holder	07724-0050000	Equivalent available in U.S.A.		6-2, 4
Rotor puller	07733-0010000	Rotor puller	07933-0010000	8-3, 6
Pilot, 12 mm	07746-0040200			7-4, 8
Attachment, 37 x 40 mm	07746-0010200			6-2
Pilot, 17 mm	07746-0040400			9-6
Attachment, 42 x 47 mm	07746-0010300			8-4, 14, 15
Pilot, 15 mm	07746-0040300			8-4
Pilot, 22 mm	07746-0041000			10-8, 25
Attachment, 52 x 55 mm	07746-0010400			10-8
Pilot, 25 mm	07746-0040600			8-14, 15
Pilot, 28 mm	07746-0041100			8-14, 15
Attachment, 62 x 68 mm	07746-0010500			8-14, 15, 11-10
Pilot, 40 mm	07746-0040900			11-10
Attachment, 32 x 35 mm	07746-0010100			10-24
Driver	07749-0010000			
Bearing remover shaft	07746-0050100	Equivalent available in U.S.A.		10-8
Bearing remover head, 15 mm	07746-0050400			10-8

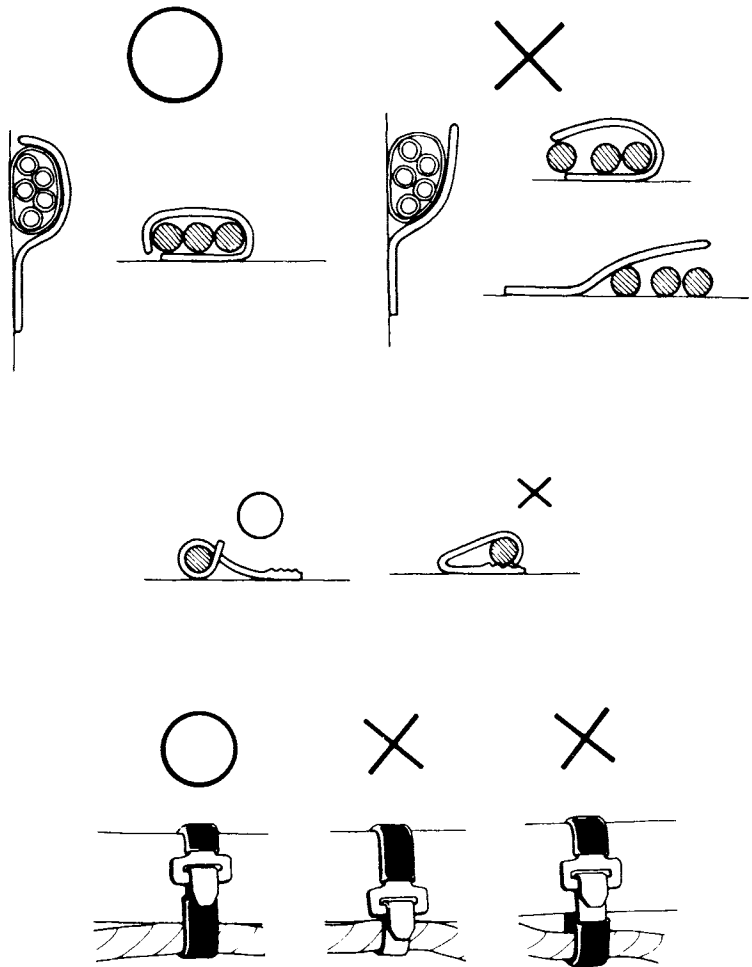
OPTIONAL TOOLS

Pin spanner	89201-KA4-820
Pin spanner	89202-KA4-820

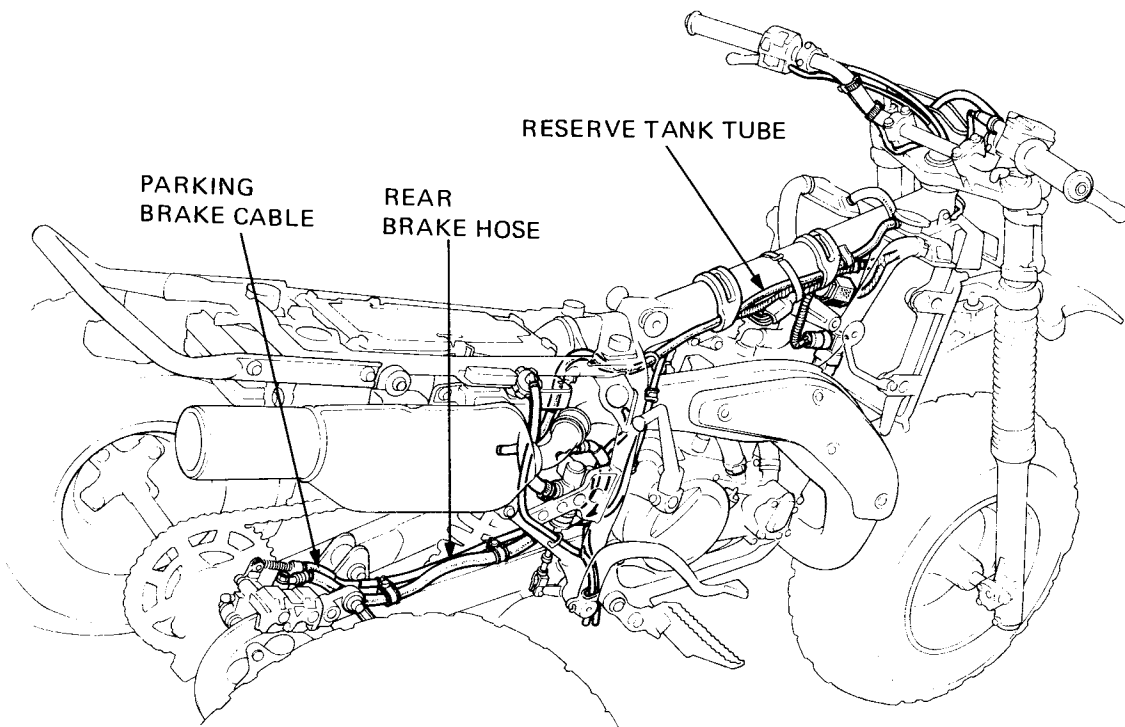
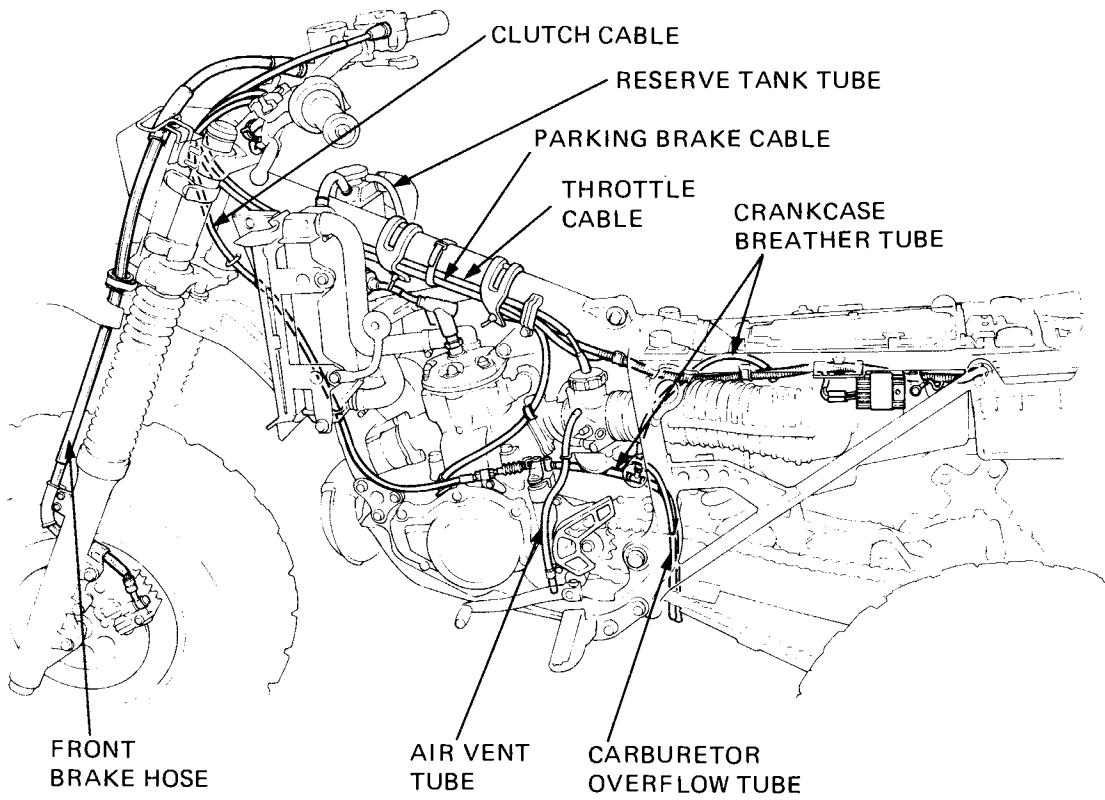
CABLE & HARNES ROUTING

Note the following when routing cables and wire harnesses.

- A loose wire harness or cable can be a safety hazard. After clamping, check each wire to be sure it is secure.
- Do not squeeze wires against a weld or end of its clamp.
- Secure wires and wire harnesses to the frame with their respective wire bands at the designated locations. Tighten the bands so that only the insulated surfaces contact the wires or wire harnesses.
- Route harnesses so they are not pulled tight or have excessive slack.
- Protect wires and harnesses with electrical tape or tubes 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 them with a protective tape or replace them.
- Route wire harnesses to avoid sharp edges or corners.
- Also avoid the projected ends or 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.

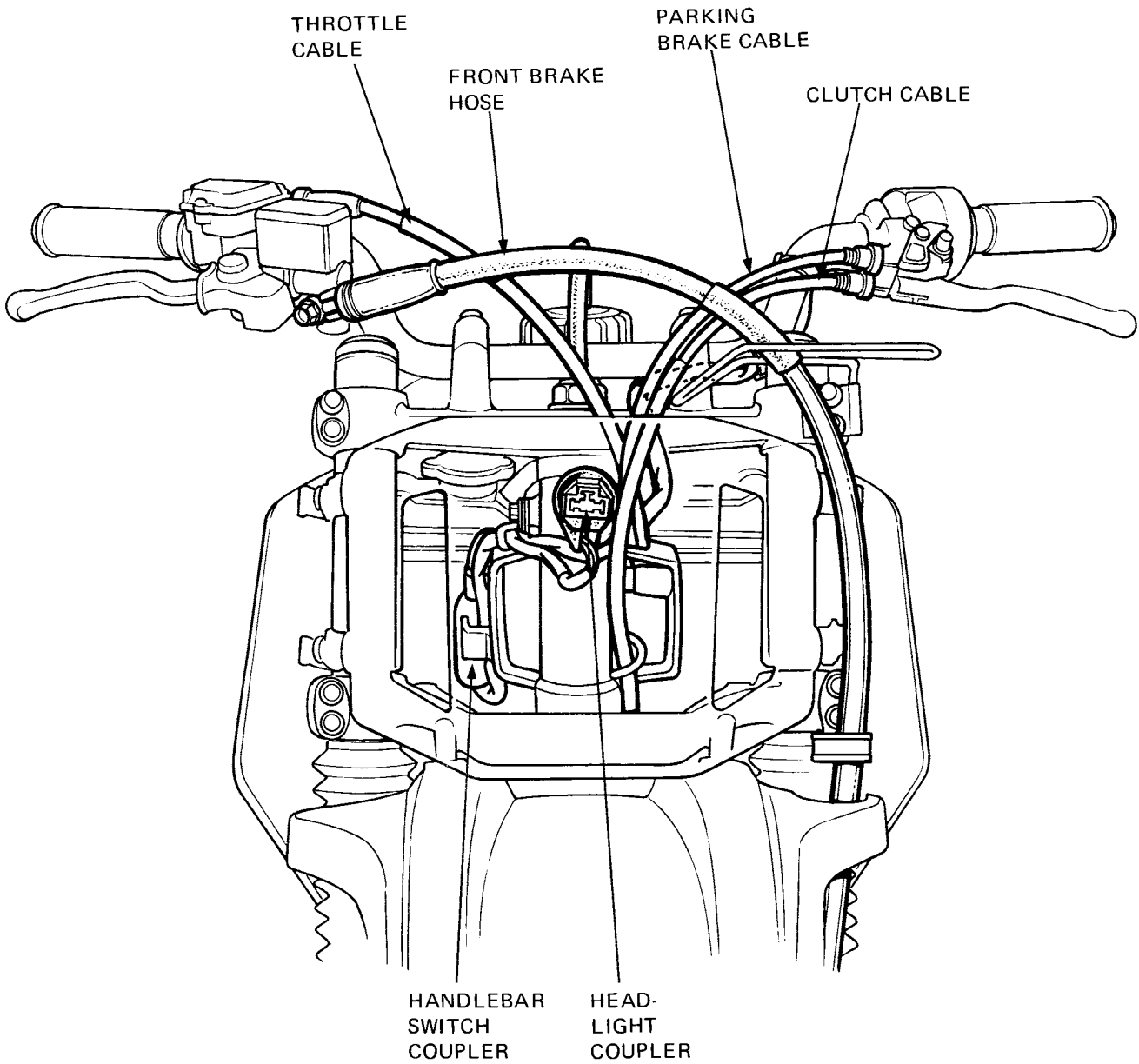


'85:

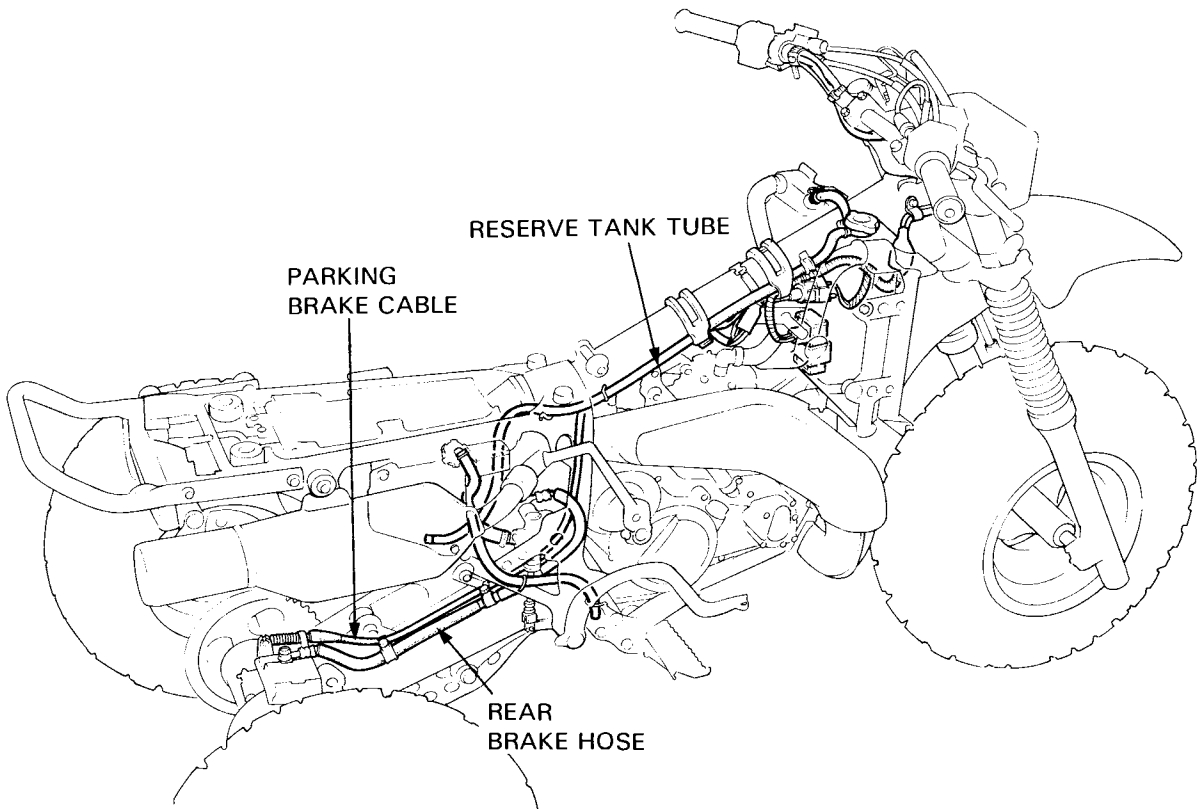
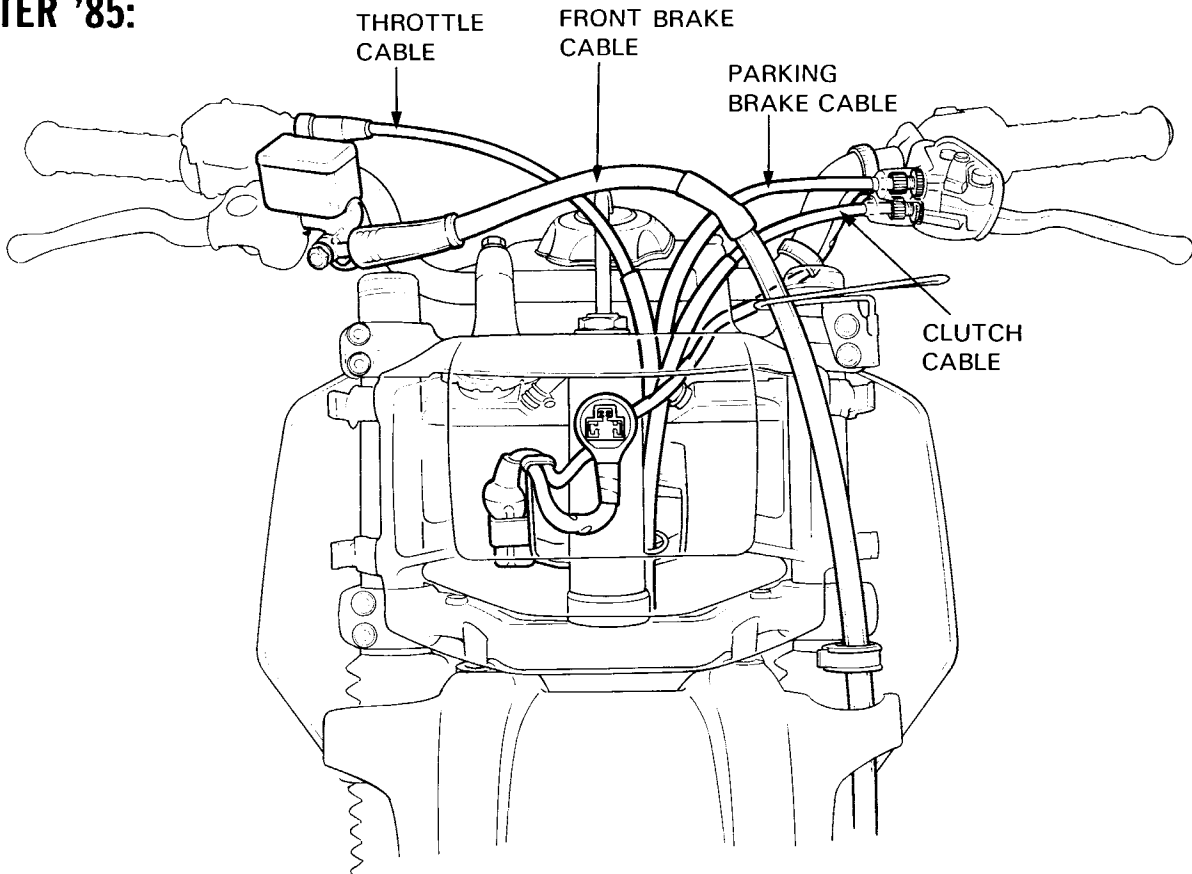


GENERAL INFORMATION

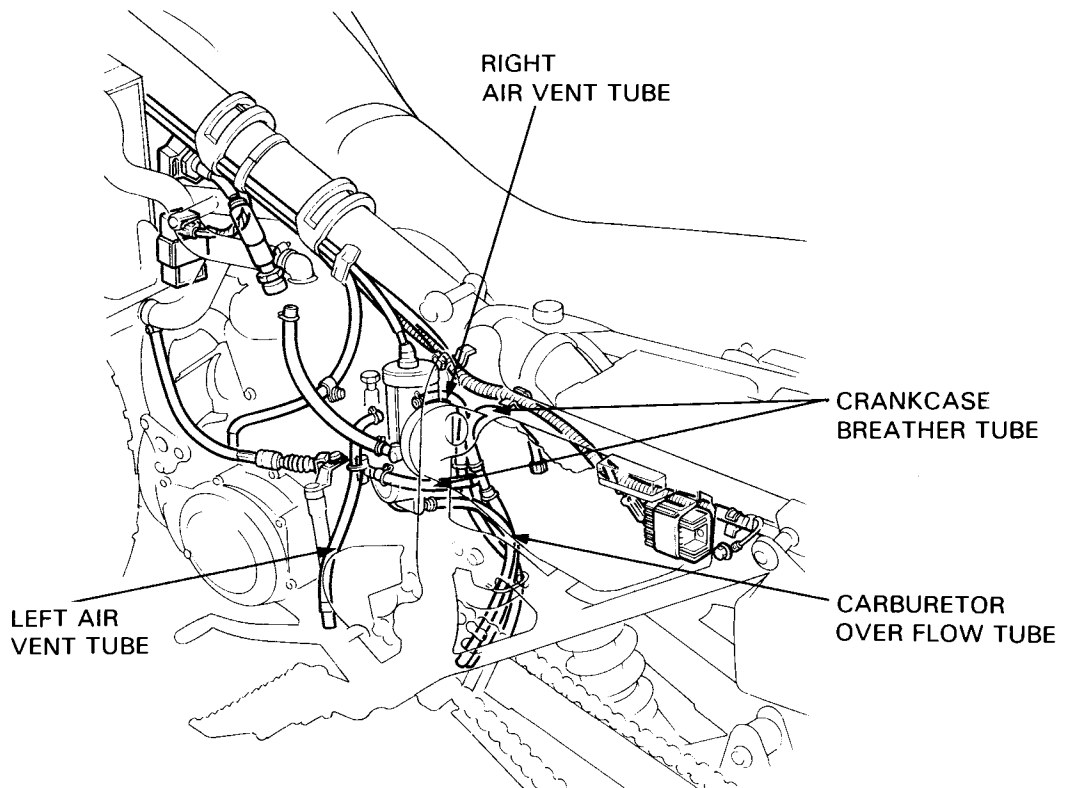
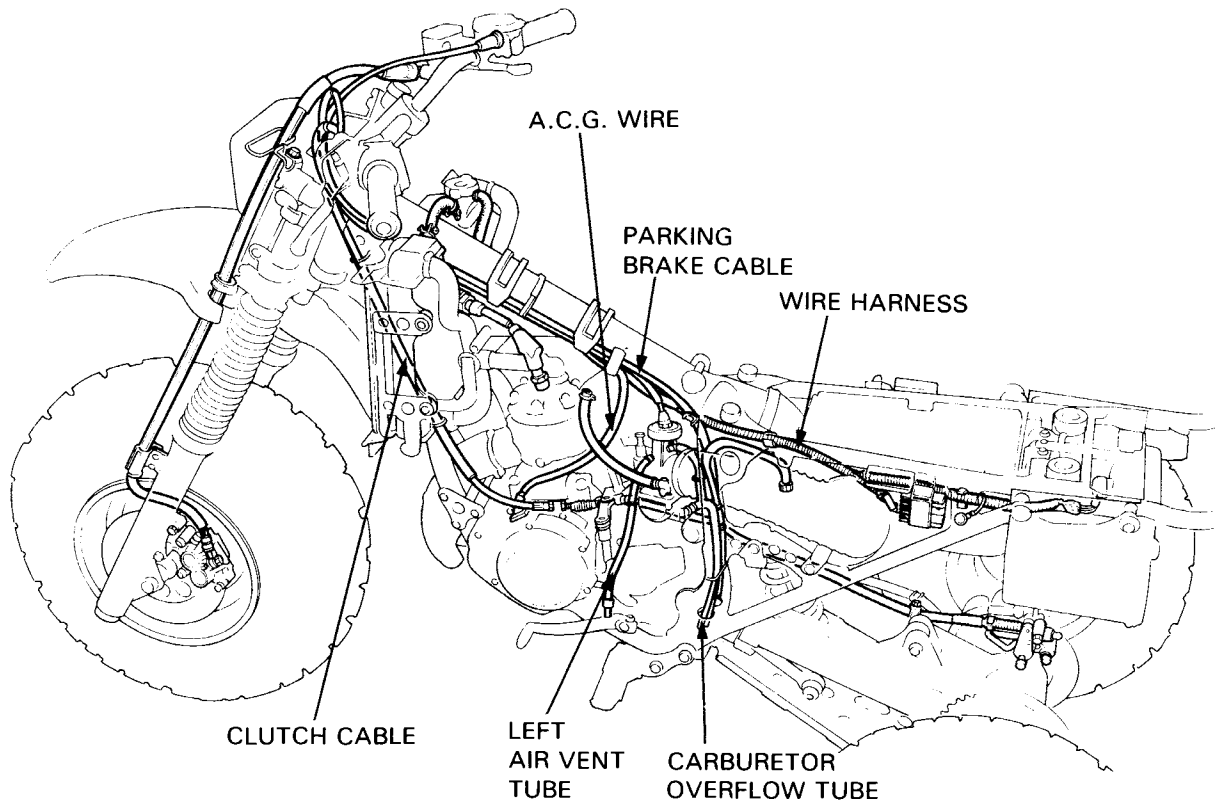
'85:



AFTER '85:



AFTER '85:



OPTIONAL PARTS LIST

ITEM	REMARKS												
<p>ENGINE</p> <ul style="list-style-type: none"> • Oversize pistons <table border="1"> <thead> <tr> <th>Piston oversize</th> <th>Cylinder I.D. mm (in)</th> </tr> </thead> <tbody> <tr> <td>0.25 mm (0.01 in)</td> <td>66.270–66.285 (2.6090–2.6096)</td> </tr> <tr> <td>0.50 mm (0.02 in)</td> <td>66.520–66.535 (2.6189–2.6195)</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Piston oversize</th> <th>Cylinder I.D. Service limit mm (in)</th> </tr> </thead> <tbody> <tr> <td>0.25 mm (0.01 in)</td> <td>66.320 (2.6110)</td> </tr> <tr> <td>0.50 mm (0.02 in)</td> <td>66.570 (2.6209)</td> </tr> </tbody> </table>	Piston oversize	Cylinder I.D. mm (in)	0.25 mm (0.01 in)	66.270–66.285 (2.6090–2.6096)	0.50 mm (0.02 in)	66.520–66.535 (2.6189–2.6195)	Piston oversize	Cylinder I.D. Service limit mm (in)	0.25 mm (0.01 in)	66.320 (2.6110)	0.50 mm (0.02 in)	66.570 (2.6209)	<p>0.25 mm, 0.50 mm (2 sizes) The cylinder must be rebored, and an oversize piston and piston rings fitted if worn or seized. Use the correct oversize piston rings with an oversize piston.</p> <p>0.25 mm, 0.50 mm (2 sizes)</p> <p>NOTE:</p> <ul style="list-style-type: none"> • After reboring, remove all burrs from each port edge and chamfer as indicated below.
Piston oversize	Cylinder I.D. mm (in)												
0.25 mm (0.01 in)	66.270–66.285 (2.6090–2.6096)												
0.50 mm (0.02 in)	66.520–66.535 (2.6189–2.6195)												
Piston oversize	Cylinder I.D. Service limit mm (in)												
0.25 mm (0.01 in)	66.320 (2.6110)												
0.50 mm (0.02 in)	66.570 (2.6209)												
<p>CARBURETOR</p> <ul style="list-style-type: none"> • Main jet 	<p>'85: #138, #140, #145, #148 (See page 3-15 for altitude and temperature adjustment.) AFTER '85: #140, #142, #148, #150 (See page 3-29 for altitude and temperature adjustment.)</p>												

NOISE EMISSION CONTROL SYSTEM (U.S.A. only)

The U.S. Environmental Protection Agency requires manufacturers to certify that vehicles 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 Vehicle Noise Emission Control System is necessary in order to keep the noise emission control system in effect.

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

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

1. Removal of, or puncturing the muffler, bafflers, 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.

MEMO

2. MAINTENANCE

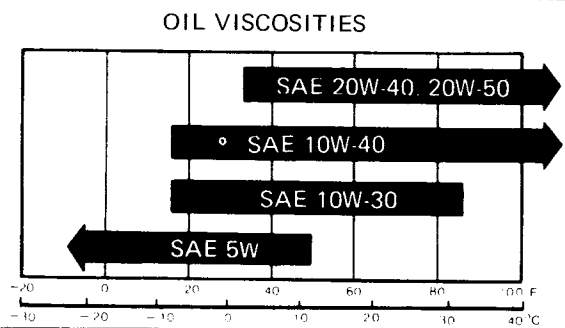
SERVICE INFORMATION	2-1	DRIVE CHAIN	2-10
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SERVICE INFORMATION

SPECIFICATIONS

Transmission oil

Capacity	0.61 ℓ (0.65 U.S. qt.) at oil change 0.7 ℓ (0.74 U.S. qt.) after disassembly
Recommendation	Use HONDA 4-STROKE OIL or equivalent. API SERVICE CLASSIFICATION: SE or SF VISCOSITY: SAE 10W-40 Other oil viscosities may be used when the average temperature in your riding area is within the indicated range on the chart.



Spark plug gap: 0.7–0.8 mm (0.028–0.031 in)

Spark plug type:

NORMAL	COLD WEATHER
BR9ES (NGK)	BR8ES (NGK)
RN2C (CHAMPION)	RN3C (CHAMPION)

Throttle lever free play: 3–8 mm (1/8–5/16 in)

Parking brake lever free play: 31–39 mm (1-1/4–1-1/2 in)

Cylinder compression: 1200–1400 kPa (12.0–14.0 kg/cm², 170.7–199.1 psi)

Carburetor idle speed: '85: 1,400±150 rpm

AFTER '85: 1,500±150 rpm

Air screw opening

'85: 2 turns out

AFTER '85: 2-1/4 turns out

TORQUE:

Transmission oil drain bolt: 25–35 N·m (2.5–3.5 kg·m, 18–25 ft·lb)

Drive chain slack: 30–40 mm (1-1/4–1-1/2 in)

Tire size: Front 23x8–11

Rear 20x10–9

Recommended tire pressure:

Front 4.3 psi (30 kPa, 0.30 kg/cm²)

Rear 3.6 psi (25 kPa, 0.25 kg/cm²)

Standard tire circumference: Front 1,845.0 mm (72.6 in)

Rear 1,560.8 mm (61.4 in)

Clutch lever free play: 10–20 mm (3/8–3/4 in)

MAINTENANCE

MAINTENANCE SCHEDULE

The maintenance intervals shown in the following schedule are based upon average riding conditions. ATC's subjected to severe use, or ridden in unusually wet or dusty areas, require more frequent servicing. Items marked * should be serviced by an authorized Honda dealer, unless the owner has the proper tools and is mechanically proficient. Other maintenance items are simple to perform and may be serviced by the owner.

Perform the Pre-ride Inspection at each scheduled maintenance period.

I: Inspect and Clean, Adjust, Lubricate or Replace, if necessary C: Clean R: Replace A: Adjust L: Lubricate			INITIAL SERVICE PERIOD (First week of operation)	REGULAR SERVICE PERIOD (Every 30 operating days)	Refer to page
		EVERY			
	TRANSMISSION OIL	2 YEARS: R		I	2-4
	AIR CLEANER	NOTE 2		C	2-5
	SPARK PLUG			I	2-6
*	CARBURETOR IDLE SPEED		I	I	2-6
	RADIATOR COOLANT	2 YEARS: R*		I	2-7
*	RADIATOR CORE	NOTE 3		I	2-8
*	COOLING SYSTEM			I	2-8
*	FUEL LINE	YEAR: I			2-8
*	FUEL STRAINER SCREEN	YEAR: C			2-9
*	THROTTLE OPERATION		I	I	2-10
	DRIVE CHAIN	NOTES 2, 3	I, L	i, L	2-10
	DRIVE CHAIN SLIDER			I	2-12
*	SUSPENSION			I	2-13
	SWING ARM BEARINGS		I, L	I, L	2-14
	BRAKE FLUID	2 YEARS: R	I	I	2-17
*	BRAKE PAD WEAR	YEAR: I			2-16
	BRAKE SYSTEM		I	I	2-14
*	CLUTCH SYSTEM		I	I	2-17
*	SPARK ARRESTER (U.S.A. ONLY)	NOTE 1		C	2-18
	NUTS, BOLTS, FASTENERS		I	I	2-20
	LIGHTING EQUIPMENT		I	I	2-19
	TIRES		I	I	2-19
*	STEERING HEAD BEARINGS	YEAR: I			2-19

NOTES: (1) U.S.A. only.

(2) Service more frequently when riding in dusty areas, sand or snow.

(3) Service more frequently after riding in very wet or muddy conditions.

PERIODIC REPLACEMENT PARTS

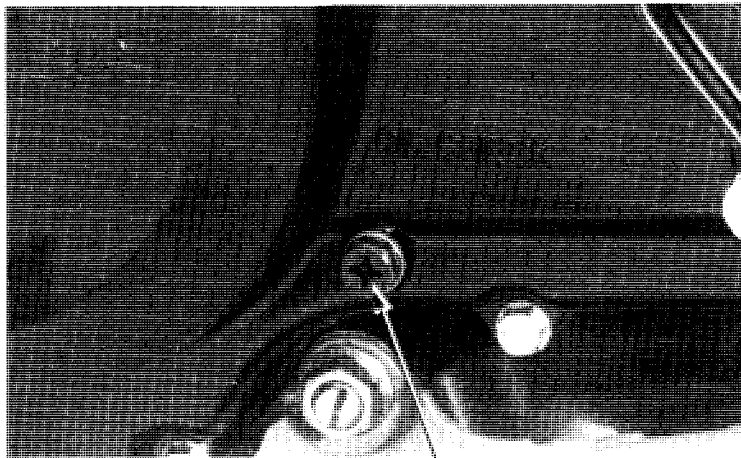
Machines subject to severe use, or ridden in unusually dusty, or muddy areas, require more frequent servicing. The following table serves as a guide in replacing parts when machines are used for competition.

Part Name	Interval	Items to be checked
Piston	Every 30 hours	Seizure, damage, wear
Piston pin	Every 30 hours	Seizure, damage, wear
Piston rings	Every 30 hours	Seizure, chipped end, wear
Connecting rod big end bearing	Every 30 hours	Seizure, wear, damage
Spark plug	Every 20 hours	Worn electrode, improper gap, cracked insulator, fouling
Transmission oil	30 hours	Emulsion
Drive sprocket	Every 20 hours	Wear, damage
Chain slider and roller	Every 30 hours	Amount of recess: 2.0 mm max.
Drive chain	—	Wear
Chain master link	Every 30 hours	Wear
Front brake pads	—	Wear indicator
Rear brake pads	—	Wear indicator
Front brake fluid	Every year	Emulsion
Rear brake fluid	Every year	Emulsion
Master cylinder oil cap	Every 2 years	Damage
Front brake hose	Every 4 years	Cracks, damage
Rear brake hose	Every 4 years	Cracks, damage
Fuel hose	Every 4 years	Cracks, leaks, damage
Cylinder head gasket	30 hours	Leak
Clutch disc	—	Discoloration, wear
Exhaust chamber spring	—	Weak connecting hook

TRANSMISSION OIL

OIL LEVEL CHECK

Place the ATC on level ground.
Stop the engine and remove the oil level check bolt from the right crankcase cover.
A small amount of oil should flow out of the oil level check bolt hole.



OIL CHECK BOLT

OIL CHANGE

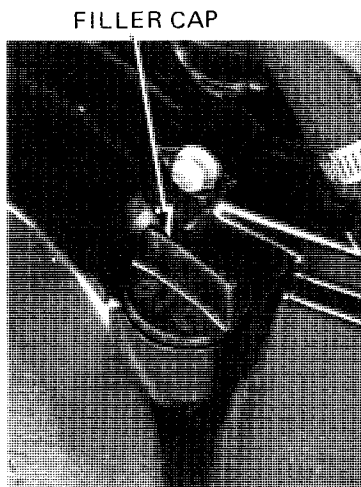
Remove the oil filler cap.
Remove the oil drain bolt and drain the oil.

Reinstall the drain bolt.

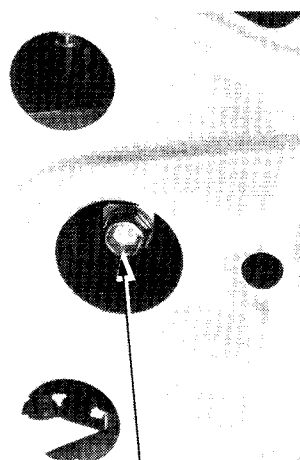
TORQUE: 25–35 N·m
(2.5–3.5 kg·m, 18–25 ft·lb)

CAUTION

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



FILLER CAP



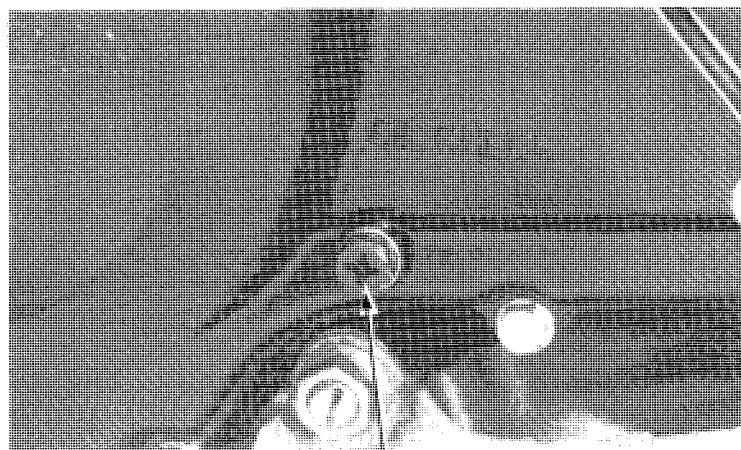
DRAIN BOLT

Refill the transmission gradually up to the proper level.

OIL CAPACITY:

0.61 ℓ (21 U.S. oz.) at oil change
0.7 ℓ (24 U.S. oz.) after disassembly

Reinstall the oil level check bolt and sealing washer.
Start the engine and check for leaks. Stop the engine, wait a few minutes, and recheck the oil level.



OIL CHECK BOLT

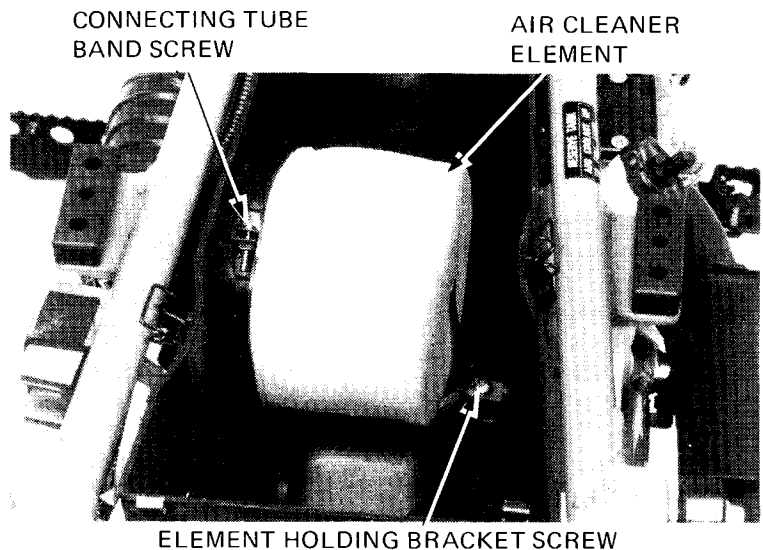
AIR CLEANER

Remove the seat.
Remove the clips attaching the air cleaner cover and remove the cover.



Loosen the connecting tube band screw.
Remove the element holding bracket screw and element.

Remove the element from the holder.



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

CAUTION

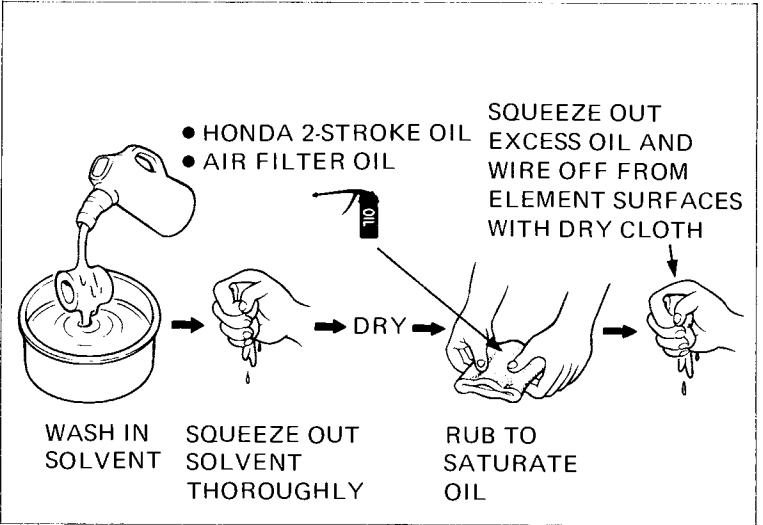
The element is made of several different materials bonded together; to prevent damaging the element, handle it gently.

Soak the element in Honda 2-stroke oil or equivalent and gently squeeze out the excess.

NOTES

- Use commercially available air filter oil when riding dusty track.
- Apply air filter oil to whole surfaces of the element and rub it with both hands to saturate the oil in the element. Squeeze out excess oil and wipe oil off from the element surfaces with a dry cloth.

Apply a thin coat of grease to the sealing surface of the element and install the element holder into the air cleaner case.
Install the air cleaner cover.



MAINTENANCE

SPARK PLUG

Disconnect the spark plug cap and remove the spark plug using the wrench provided in the tool kit.

Visually inspect the spark plug electrodes for wear. The center electrode should have square edges and the side electrode should have a constant thickness. Discard the spark plug if there is apparent wear or if the insulator is cracked or chipped. Measure the gap with a wire-type feeler gauge and adjust by carefully bending the side electrode.

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

NORMAL	COLD WEATHER
BP9ES (NGK)	BR8ES (NGK)
RN2C (CHAMPION)	RN3C (CHAMPION)

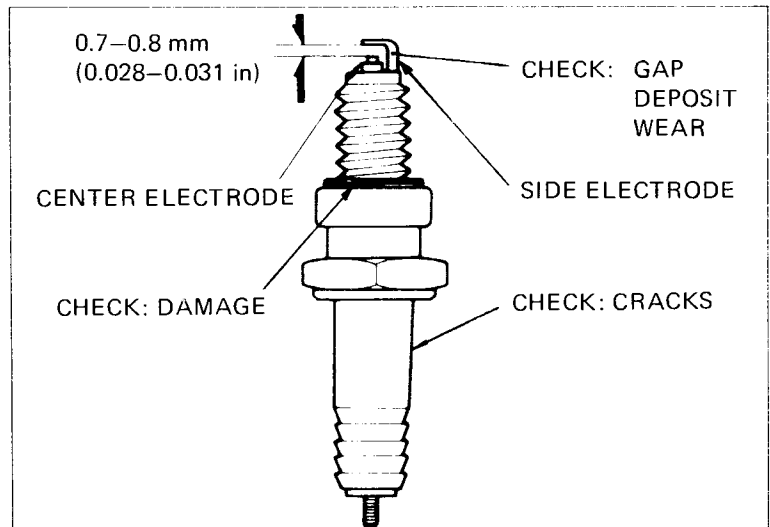
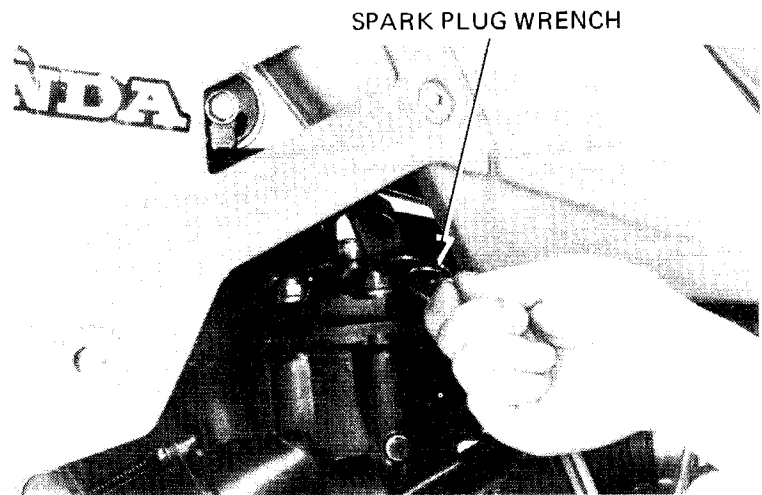
Check the sealing washer and replace the spark plug if the washer is damaged.

With the sealing washer attached, thread the spark plug in by hand to prevent cross-threading.

Tighten the spark plug to the specified torque.

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

Connect the spark plug cap.



CARBURETOR IDLE SPEED

Place the ATC on level ground and shift it into neutral warm up the engine.

Attach an engine tachometer.

'85:

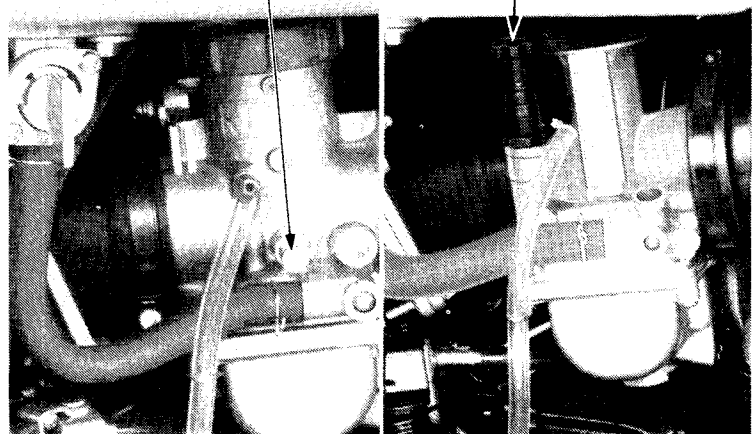
Adjust the idle speed with the throttle stop screw.

AFTER '85:

Adjust the idle speed with the choke/idle speed knob.

IDLE SPEED: '85: 1,400 ± 150 rpm
AFTER '85: 1,500 ± 150 rpm

'85: THROTTLE STOP SCREW **AFTER '85: CHOKE/IDLE SPEED KNOB**



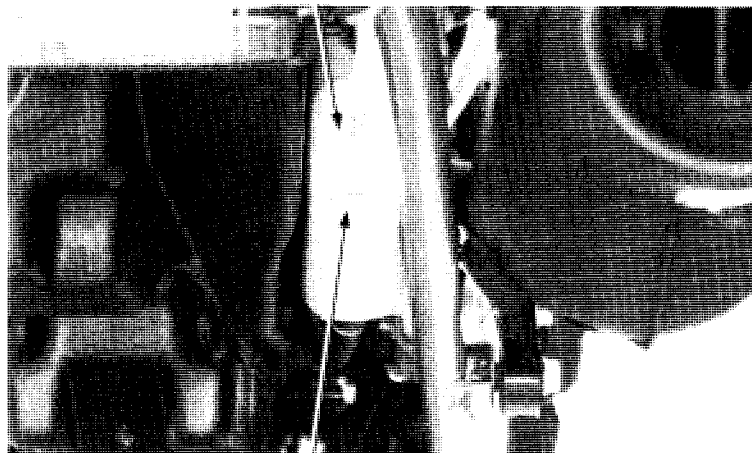
RADIATOR COOLANT

Place the ATC on level ground.

Check the coolant level of the reserve tank with the engine running at normal operating temperature. The level should be between the "F" and "L" level lines.

If necessary, fill the tank to the "F" level line with a 50/50 mixture of distilled water and anti-freeze.

"F" LEVEL LINE



"L" LEVEL LINE

WARNING

Avoid scalding; never remove the radiator cap when the engine is hot. The coolant is under pressure.

If the reserve tank is empty, remove the radiator cap and fill the radiator with recommended coolant up to the filler neck.

Run the engine for 2–3 minutes to allow air to escape.

RADIATOR CAP



"F" LEVEL LINE

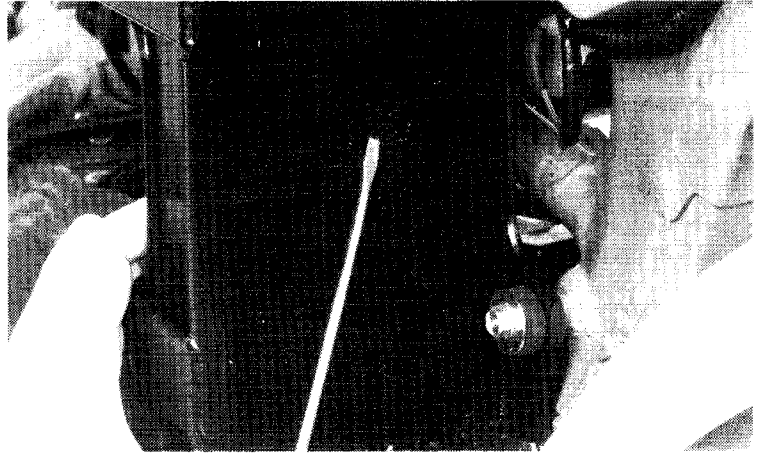
Fill the radiator with coolant and install the cap. Fill the reserve tank to the "F" level line and install the cap.



MAINTENANCE

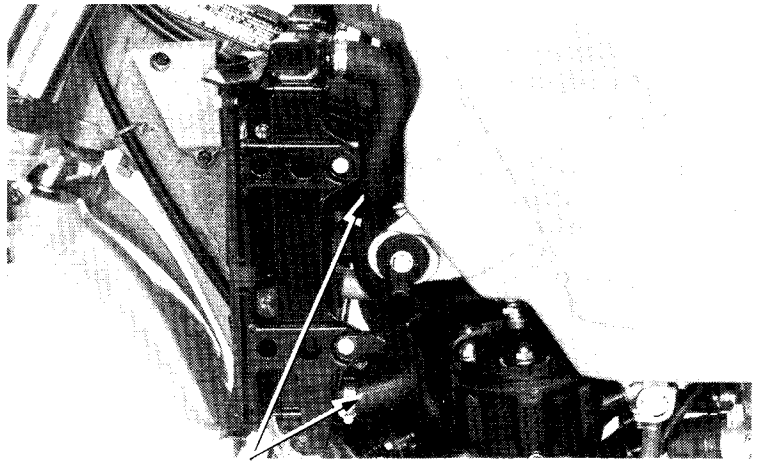
RADIATOR CORE

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



COOLING SYSTEM

Remove the radiator shrouds.
Inspect the hoses for cracks and deterioration.
Replace, if necessary. Check the tightness of the hose clamps and radiator mounting bolts.



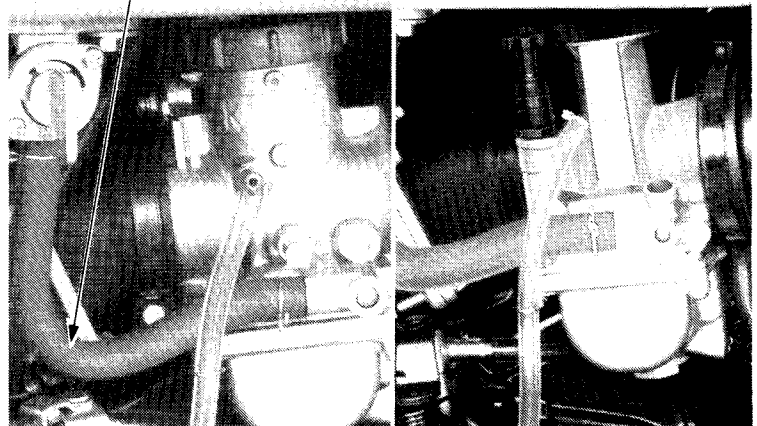
RADIATOR HOSES

FUEL LINE

Inspect the fuel line for damage or deterioration.
Check that the fuel line is intact and has clamps at each connection.
Replace any parts that are damaged, leaking or show signs of deterioration.

'85: FUEL LINE

AFTER '85:

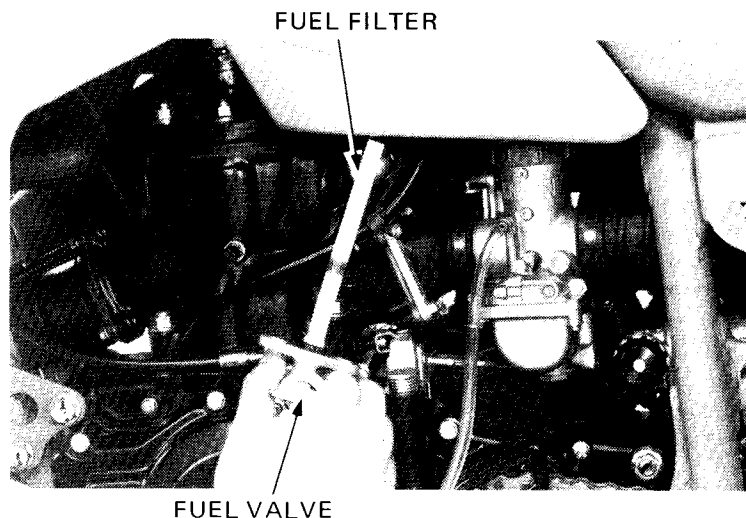


FUEL STRAINER SCREEN

WARNING

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

Drain the fuel from the fuel tank.
Remove the fuel valve by removing the fuel valve mounting bolts.
Remove and clean the fuel filter.
Install the fuel filter and valve.
Attach the fuel line.
Fill the fuel tank and turn the fuel valve to "ON" and check for leaks.



CYLINDER COMPRESSION

Warm up the engine.
Stop the engine and remove the spark plug.
Remove the fuel tank (Page 3-3).
Install a compression gauge.
Pull the starter valve all the way up.
Fully open the throttle.
Operate the starter pedal several times.

NOTE

Watch for compression leaking at the gauge connection. A soap solution is useful for this.

COMPRESSION:

1200–1400 kPa (12.0–14.0 kg/cm²,
170.7–199.1 psi)

Low compression can be caused by:

- Blown cylinder head gasket
- Worn piston rings
- Worn cylinder

High compression can be caused by:

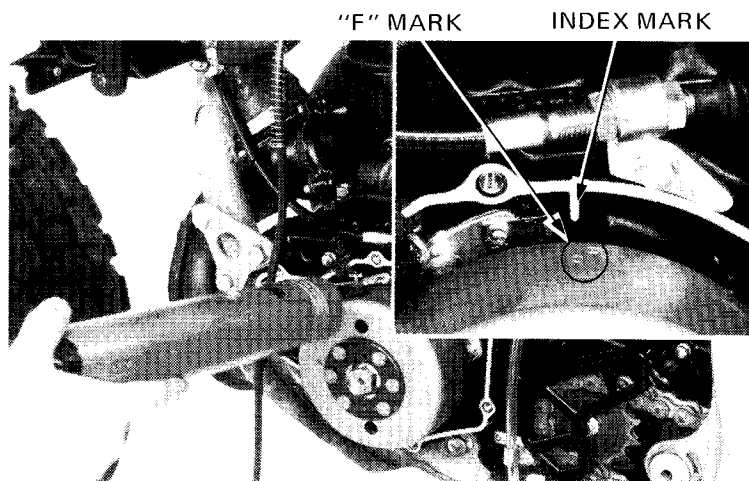
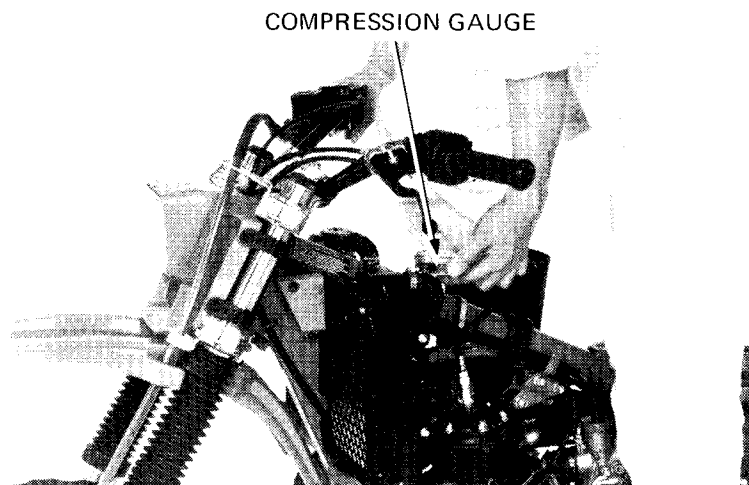
- Carbon deposits in combustion chamber or on piston head.

IGNITION TIMING

NOTE

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

Remove the alternator cover.
Timing is correct if the index mark aligns with the "F" mark at 1,500 rpm.



MAINTENANCE

THROTTLE OPERATION

Check for smooth throttle lever operation at full opening and automatic full closing in all steering positions. Make sure there is no deterioration, damage or kinking in the throttle cable.

Replace any damaged parts.

Remove the throttle housing cover.

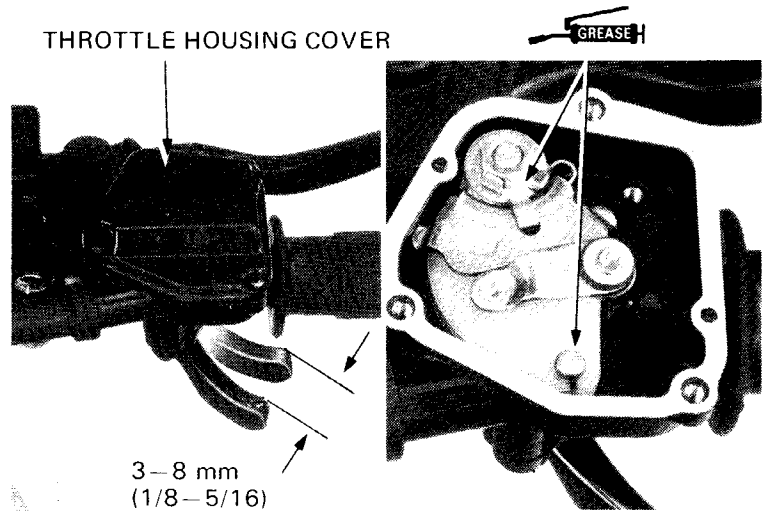
Disconnect the throttle cable at the upper end.

Thoroughly lubricate the cable and pivot point with a commercially available cable lubricant or grease. Install the throttle cable in the reverse order of removal.

Make sure the throttle lever free play is 3–8 mm (1/8–5/16 in) at the tip of the throttle lever.

THROTTLE LEVER FREE PLAY:

3–8 mm (1/8–5/16 in)



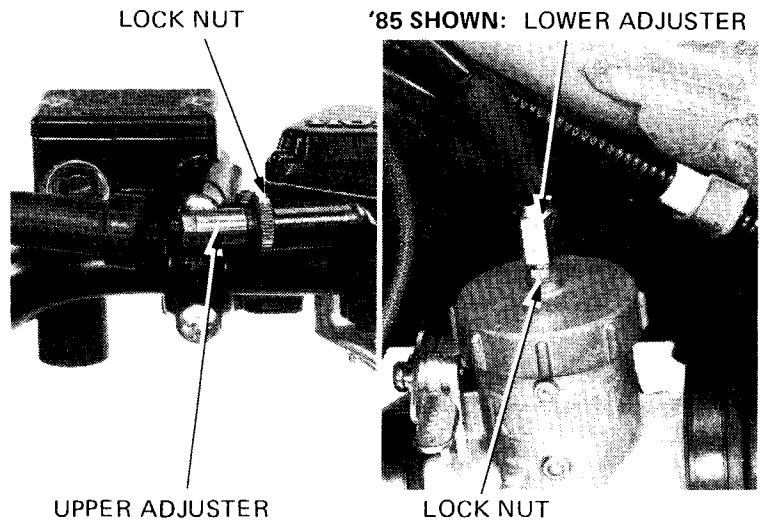
'85:

Pull the rubber cap free, loosen the lock nut, and turn the lower adjuster.

AFTER MID '85:

Adjustments can be made by loosening the lock nut, then turning the upper adjuster. Tighten the lock nut.

Tighten the lock nut and reinstall the rubber cap. Check that the throttle lever moves smoothly and returns completely.



DRIVE CHAIN

INSPECTION

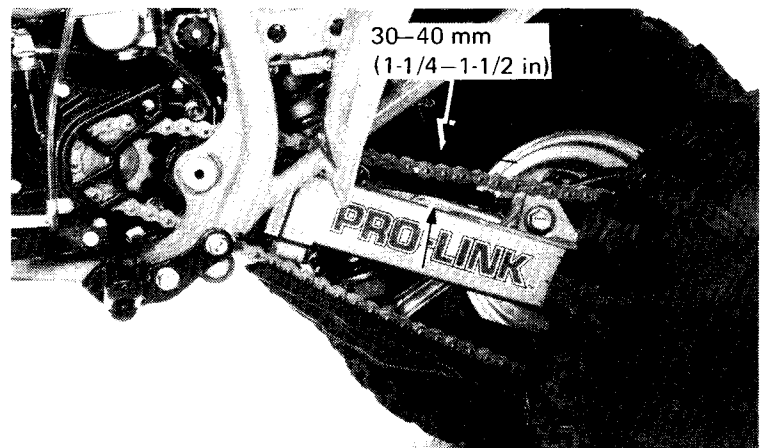
WARNING

Never inspect or lubricate the drive chain while the engine is running.

Stop the engine and shift the transmission into neutral.

Measure the drive chain slack midway between the sprockets.

CHAIN SLACK: 30–40 mm (1-1/4–1-1/2 in)



ADJUSTMENT

Loosen the two lock bolts using the tool provided in the tool kit.

Turn the adjuster to decrease or increase chain slack using the adjusting tool commercially available.

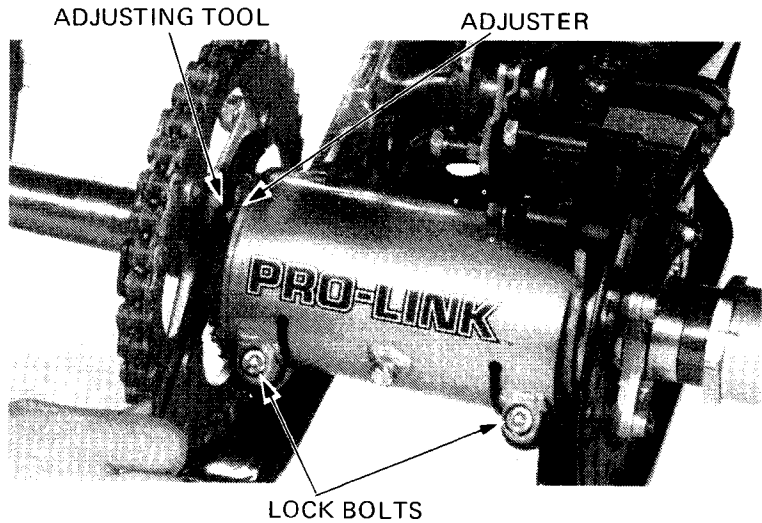
INCREASE: Turn the adjuster clockwise

DECREASE: Turn the adjuster counterclockwise

Then tighten the lock bolts.

NOTE

If drive chain slack is excessive when the adjuster is moved to the limit of adjustment, the drive chain is worn and must be replaced.



Clean the drive chain with a non-flammable or high flash point solvent that will not damage the O-rings, and wipe dry.

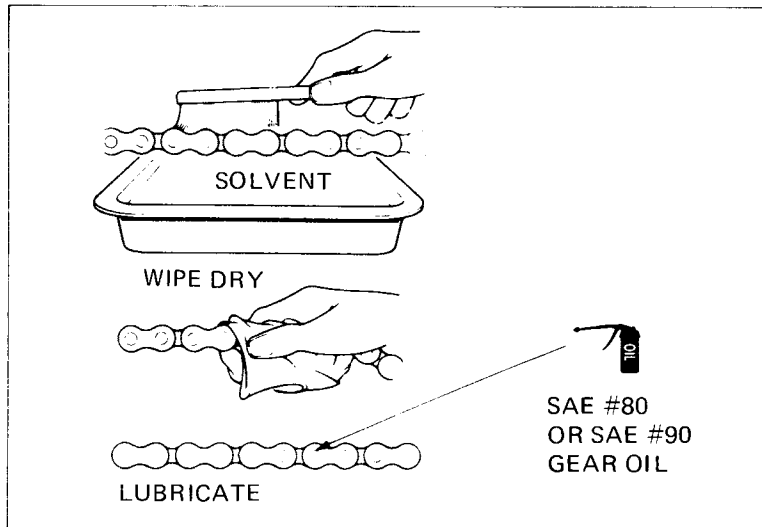
CAUTION

Do not use a steam cleaner, high pressure washers or solvents as these will damage the O-rings.

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

CAUTION

Do not use commercial aerosol chain lubricants. They contain solvents which could damage the O-rings.



Inspect the drive chain and O-rings for possible wear or damage. Replace the chain, if it is worn excessively or damaged.

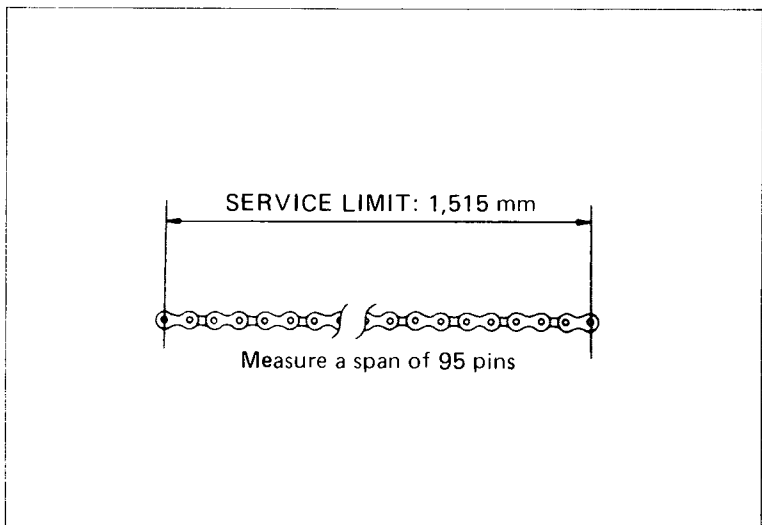
Measure the drive chain length with the chain held so that all links are straight.

95 PINS LENGTH:

STANDARD: 1,508 mm (59.4 in)

SERVICE LIMIT: 1,515 mm (59.6 in)

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

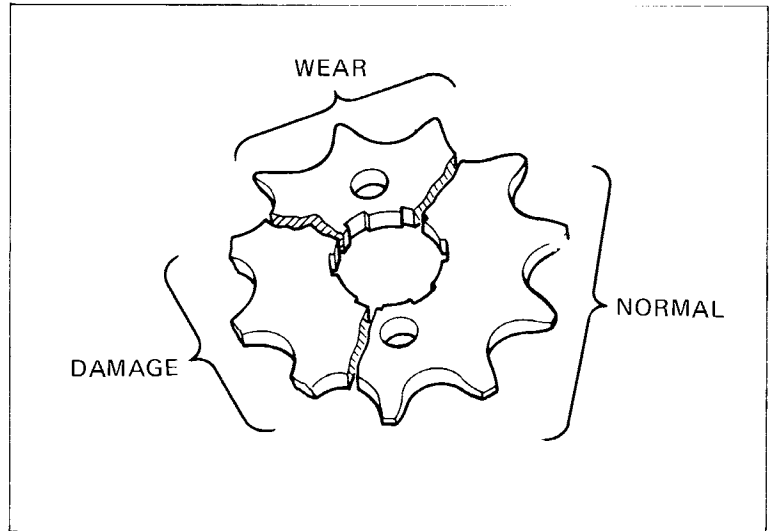


MAINTENANCE

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

NOTE

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



Install the drive chain.
Install the master link with O-rings and chain retaining clip.

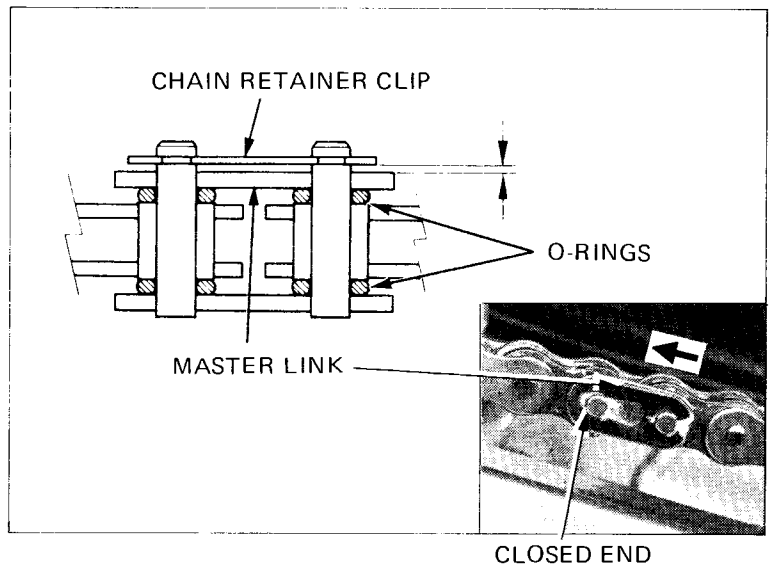
NOTE

The closed end of the clip should face the direction of drive chain travel.

Install the drive sprocket cover.
Adjust the drive chain.

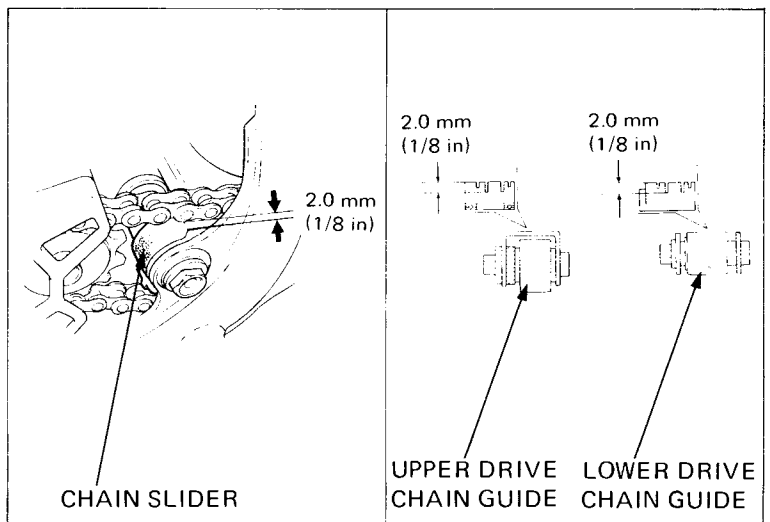
CAUTION

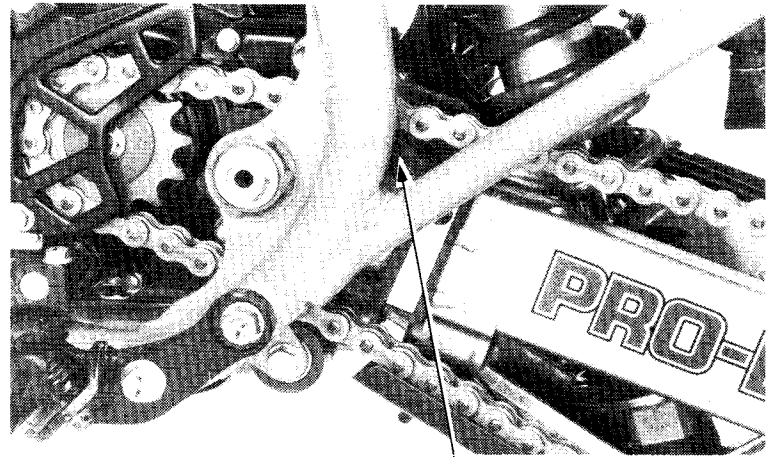
*Do not assemble the drive chain master link without the four O-rings.
Be sure that there is no space between the master link and retaining clip.*



DRIVE CHAIN SLIDER

Check the drive chain slider for wear or damage.
Replace the slider and roller when the depth of the grooves reaches 2.0 mm (1/8 in) or more.





CHAIN SLIDER

SUSPENSION

FRONT

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

Check the entire fork assembly for signs of leaks or damage.

Replace damaged components which cannot be repaired.

NOTE

Do not repair bent fork tubes. They must be replaced.

Tighten all nuts and bolts to the specified torque values.

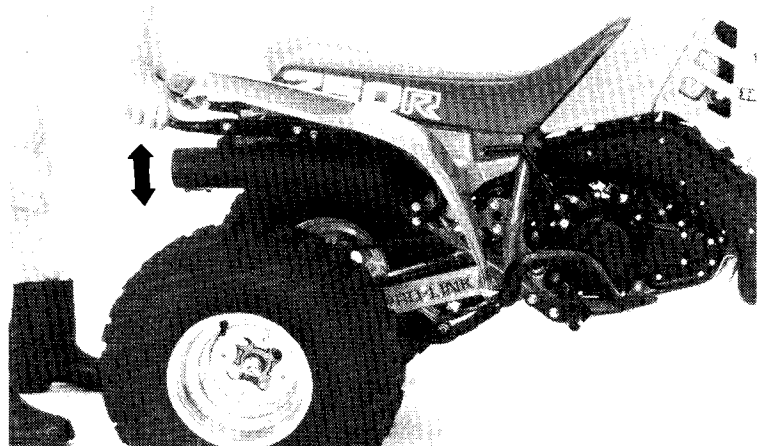


REAR

Check the shock absorber for leak or damage.

Check the suspension operation.

Adjust the spring preload if necessary (Page 12-10).



MAINTENANCE

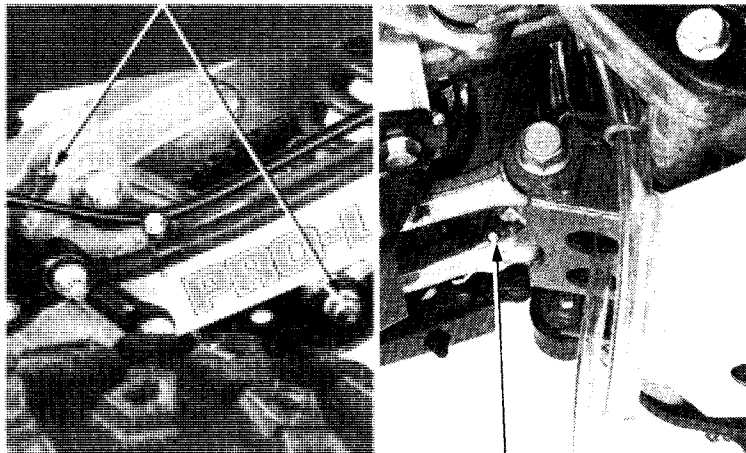
Apply MoS₂ paste to the linkage bushings through the grease fittings on the linkage pivots.

NOTE

Use MoS₂ paste (containing more than 40% of molybdenum) as follows:

- Molykote® G-n Paste manufactured by Dow Corning U.S.A.
- HONDA Moly 45 (U.S.A.)
- Rocol paste manufactured by Sumico Lubricant Co., Ltd., Japan.
- Bel-Ray Moly-Lube MC-8, U.S.A.
- Other lubricants of equivalent quality.

GREASE FITTINGS



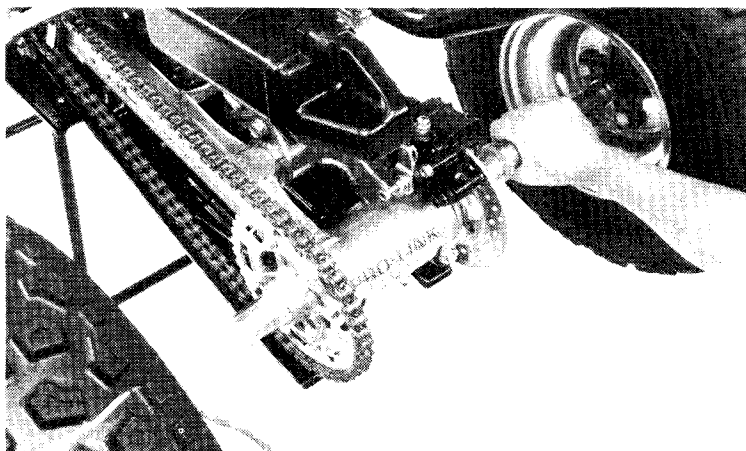
GREASE FITTING

SWING ARM BEARINGS

Raise the rear wheels off the ground with a jack or block under the engine.

Move the rear axle side ways with force to see if the wheel and swing arm bearing are worn.

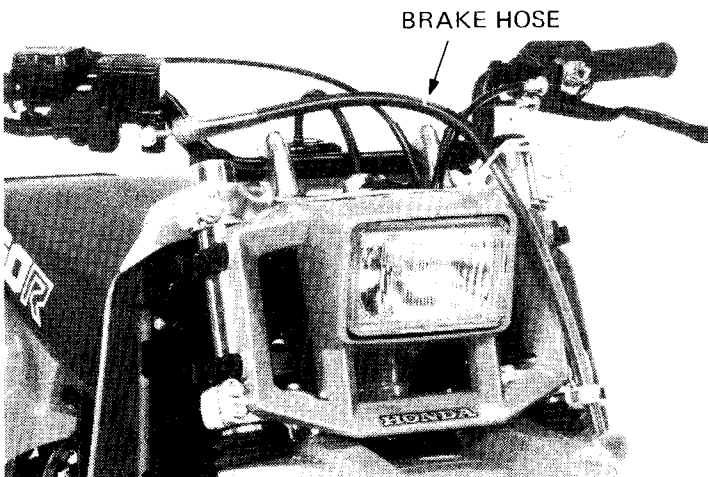
Replace the bearings if there is any play.



BRAKE SYSTEM

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

Replace hoses and fittings as required.



REAR BRAKE PEDAL HEIGHT

Check that the distance between the pedal and upper face of the footpeg is:

'85: 20 mm (3/4 in)

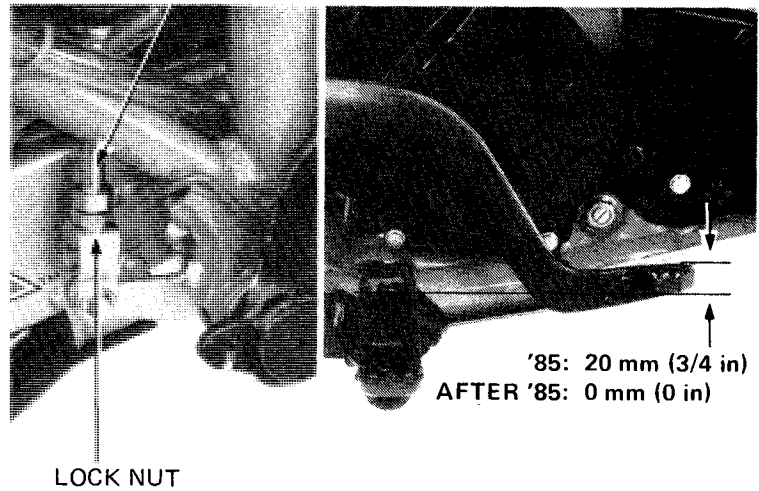
AFTER '85: 0 mm (0 in)

CAUTION

Incorrect brake pedal height can cause brake drag.

To adjust height, loosen the lock nut and turn the master cylinder push rod. Tighten the lock nut.

MASTER CYLINDER PUSH ROD



PARKING BRAKE

Disconnect the clutch cable at lower end.

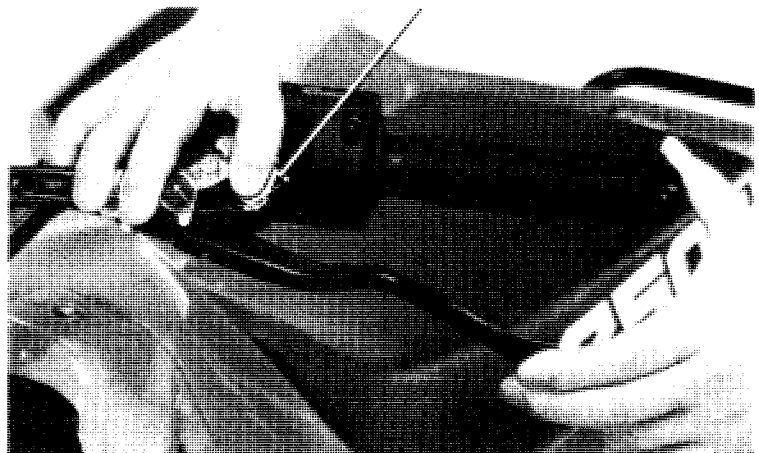
Parking brake adjustment may be required if the parking brake does not hold the rear wheels properly.

Press the parking brake button and pull in the clutch/parking brake lever.

Measure the distance the clutch/parking brake lever is moved.

The distance should be 31–39 mm (1-1/4–1-1/2 in) at the tip of the clutch/parking brake lever.

PARKING BRAKE BUTTON

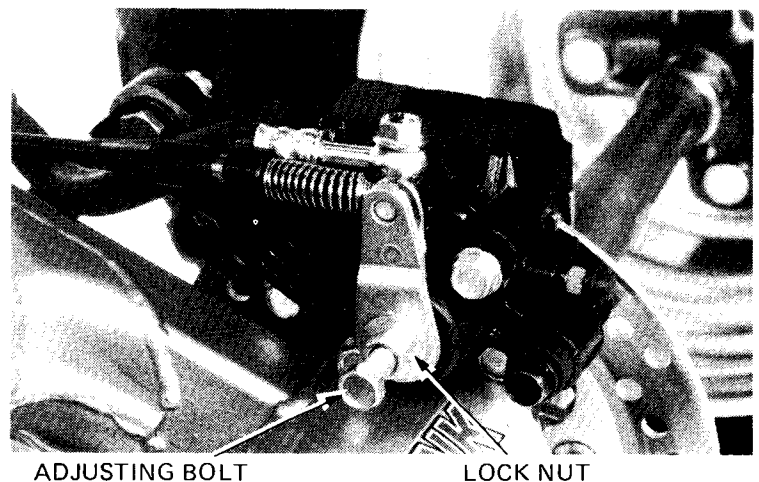


Adjust as follows:

Loosen the lock nut on the rear caliper.

Screw in the adjusting bolt until you feel resistance without applying the clutch/parking brake lever, and tighten the lock nut.

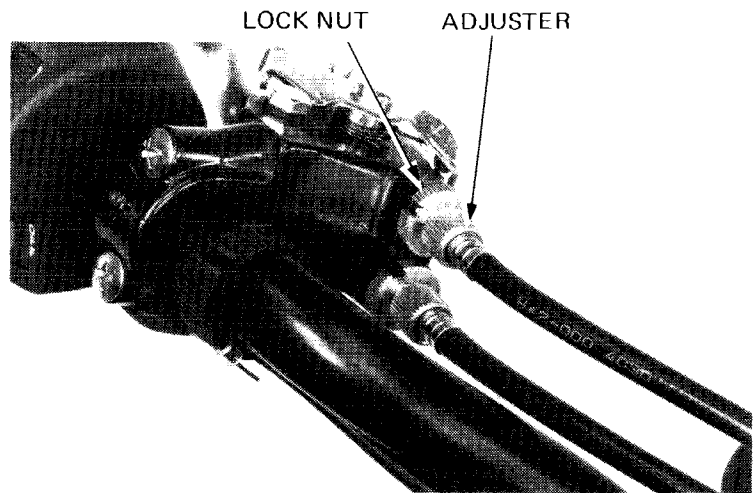
TORQUE: 15–20 N·m (1.5–2.0 kg·m, 11–14 ft·lb)



MAINTENANCE

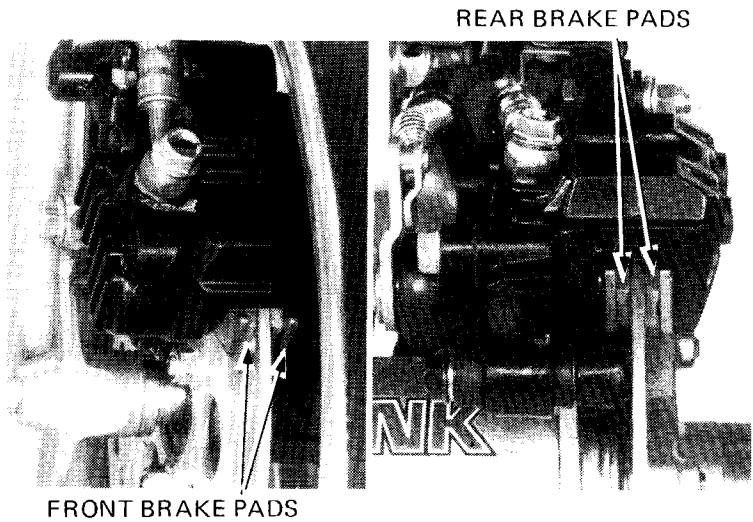
To adjust the distance, loosen the lock nut and turn the adjuster.

Tighten the lock nut.



BRAKE PADS

Inspect the front and rear brake pads for wear.

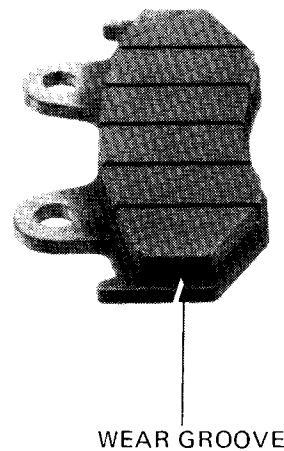


Replace the brake pads if wear groove on the pads reaches the edge of the brake disc.

CAUTION

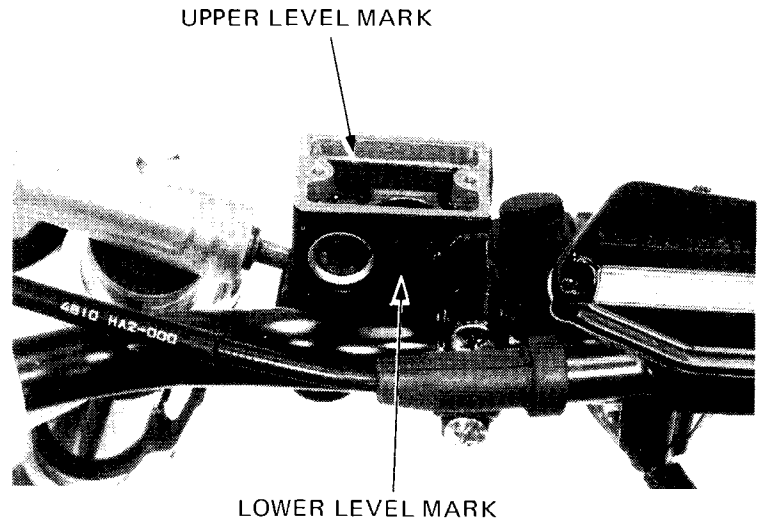
Always replace the brake pads as a set to assure even disc pressure.

Refer to page 13-6 for brake pad replacement.



BRAKE FLUID

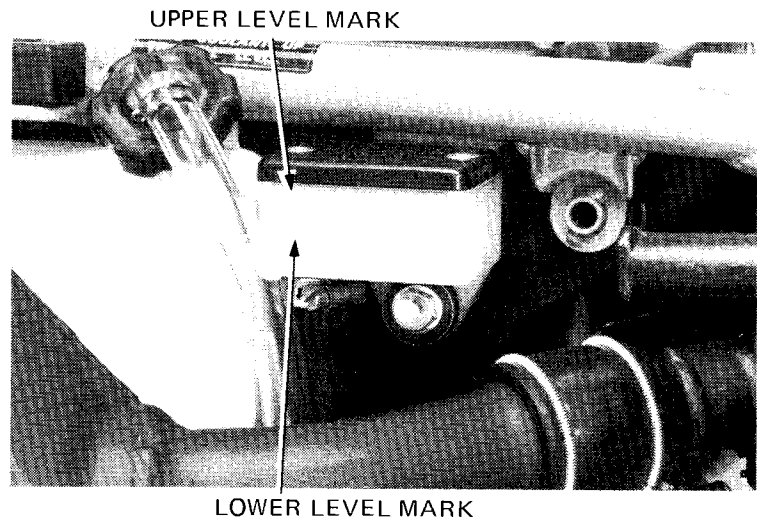
Check the front and rear brake fluid reservoir level. If the level nears the lower level mark, remove the cap and fill the reservoir with DOT-3 or 4 brake fluid to the upper level mark.



Check the entire system for leaks, if the level is low.

CAUTION

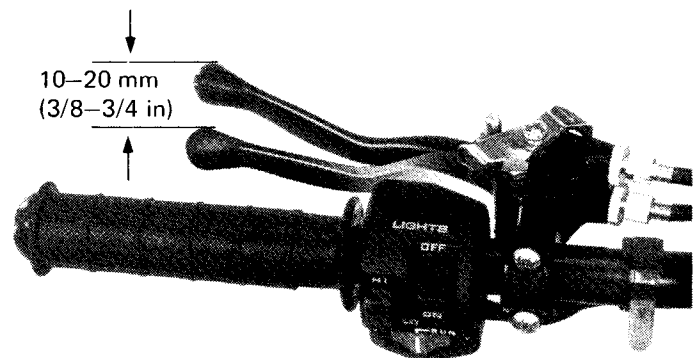
- Do not remove the cover until the handlebar has been turned so that the reservoir is level.
- Do not mix different types of fluid, as they are not compatible with each other.
- Avoid spilling fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.



CLUTCH SYSTEM

Measure the clutch lever free play:

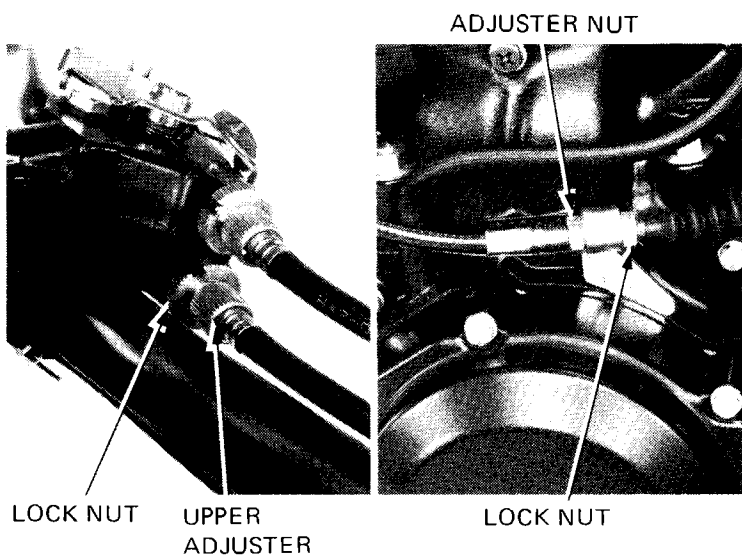
FREE PLAY: 10–20 mm (3/8–3/4 in)



MAINTENANCE

Perform minor adjustments with the upper adjuster. Loosen the lock nut and turn the adjuster. Tighten the lock nut.

Perform major adjustments with the lower adjuster. Loosen the lock nut and turn the adjuster nut. Tighten the lock nut. Check the clutch operation.



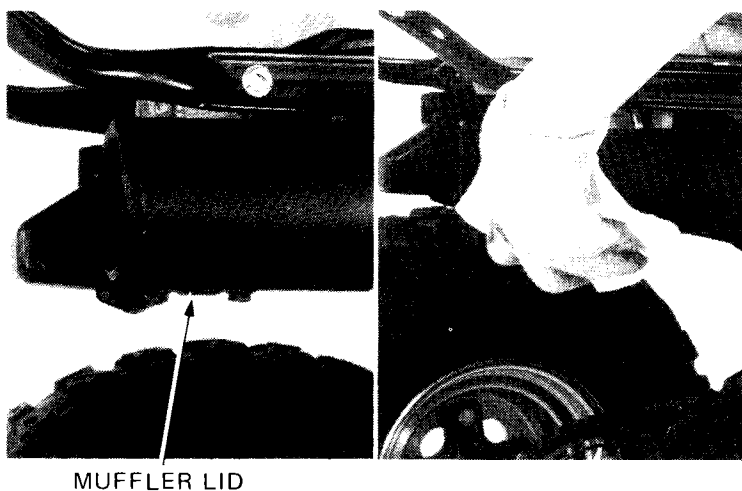
SPARK ARRESTER (U.S.A. only)

WARNING

- Do not remove or install the muffler lid while the exhaust pipe is hot.
- Perform this operation in a well-ventilated area, free from fire hazard.
- Use adequate eye protection.

Remove the muffler lid. Block the end of the muffler with a shop towel.

Start the engine and rev it up about 20 times to blow accumulated carbon deposits out the muffler.

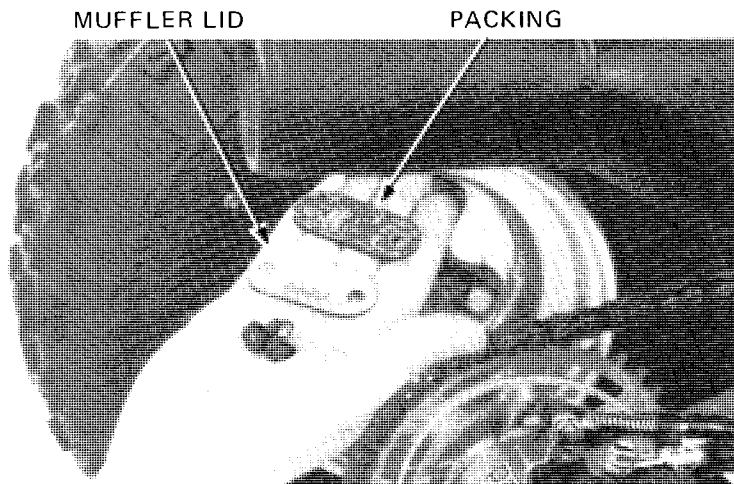


Be sure that the muffler lid screws and packing are in good condition. Replace the screws and packing if necessary.

Install the muffler lid and packing and tighten the screws securely.

CAUTION

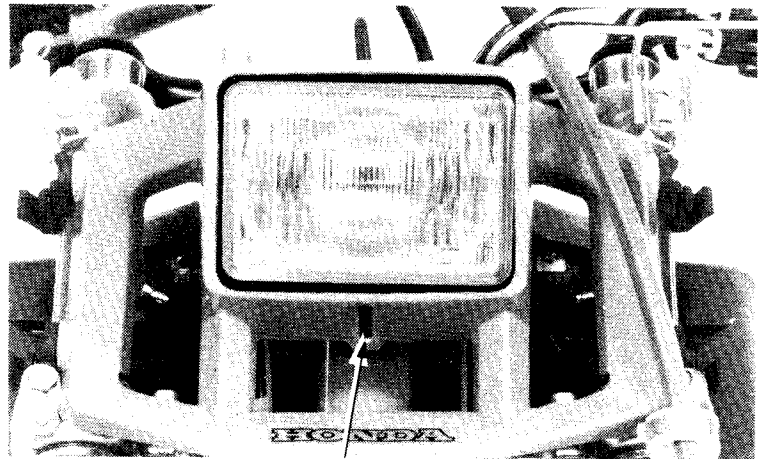
- Do not remove the two screws from the end of the spark arrester.
- The two mounting screws must be installed in the spark arrester body at all times for the spark arrester to be effective.



LIGHTING EQUIPMENT

Apply the parking brake.
Start the engine.

Check the headlight and taillight by operating the headlight ON-OFF switch and dimmer switch:
Adjust the vertical beam by turning the adjusting screw.



VERTICAL BEAM ADJUSTING SCREW

TIRES

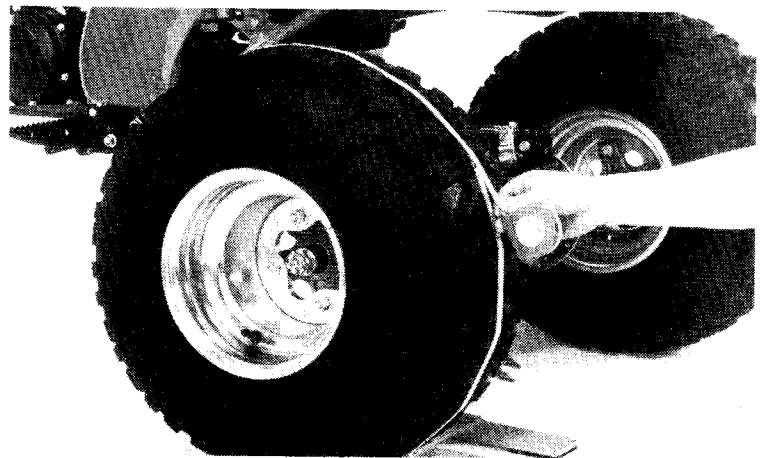
Check the tire for cuts, imbedded nails, or other damage.

NOTES

- Tire pressure should be checked when the tires are COLD.
- Raise the wheels off the ground when measuring tire circumferences.

Check the tire pressure and measure the tire circumference. Adjust accordingly.

	Recom- mended pressure	Min. pressure	Max. pressure	Standard tire circum- ference
Front:	4.3 psi (30 kPa, 0.3 kg/cm ²)	3.9 psi (27 kPa, 0.27 kg/cm ²)	4.7 psi (33 kPa, 0.33 kg/cm ²)	1,844.0 mm (72.6 in)
Rear:	3.6 psi (25 kPa, 0.25 kg/cm ²)	3.2 psi (22 kPa, 0.22 kg/cm ²)	4.0 psi (28 kPa, 0.28 kg/cm ²)	1,565.0 mm (61.6 in)



STEERING HEAD BEARINGS

NOTE

Make sure the cables do not interfere with the rotation of the handlebar.

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

If the handlebar moves unevenly, binds or has vertical play adjust the steering head bearing (Page 10-22).

If after adjustment the handlebar still move unevenly binds or has vertical play, inspect the steering head bearings and replace if necessary (Page 10-22).



NUTS, BOLTS, FASTENERS

Tighten bolts, nuts and fasteners at regular intervals shown in the Maintenance Schedule.

Check that all chassis nuts and bolts are tightened to their correct torque values (Page 1-6). Check that all cotter pins and safety clips are in place.

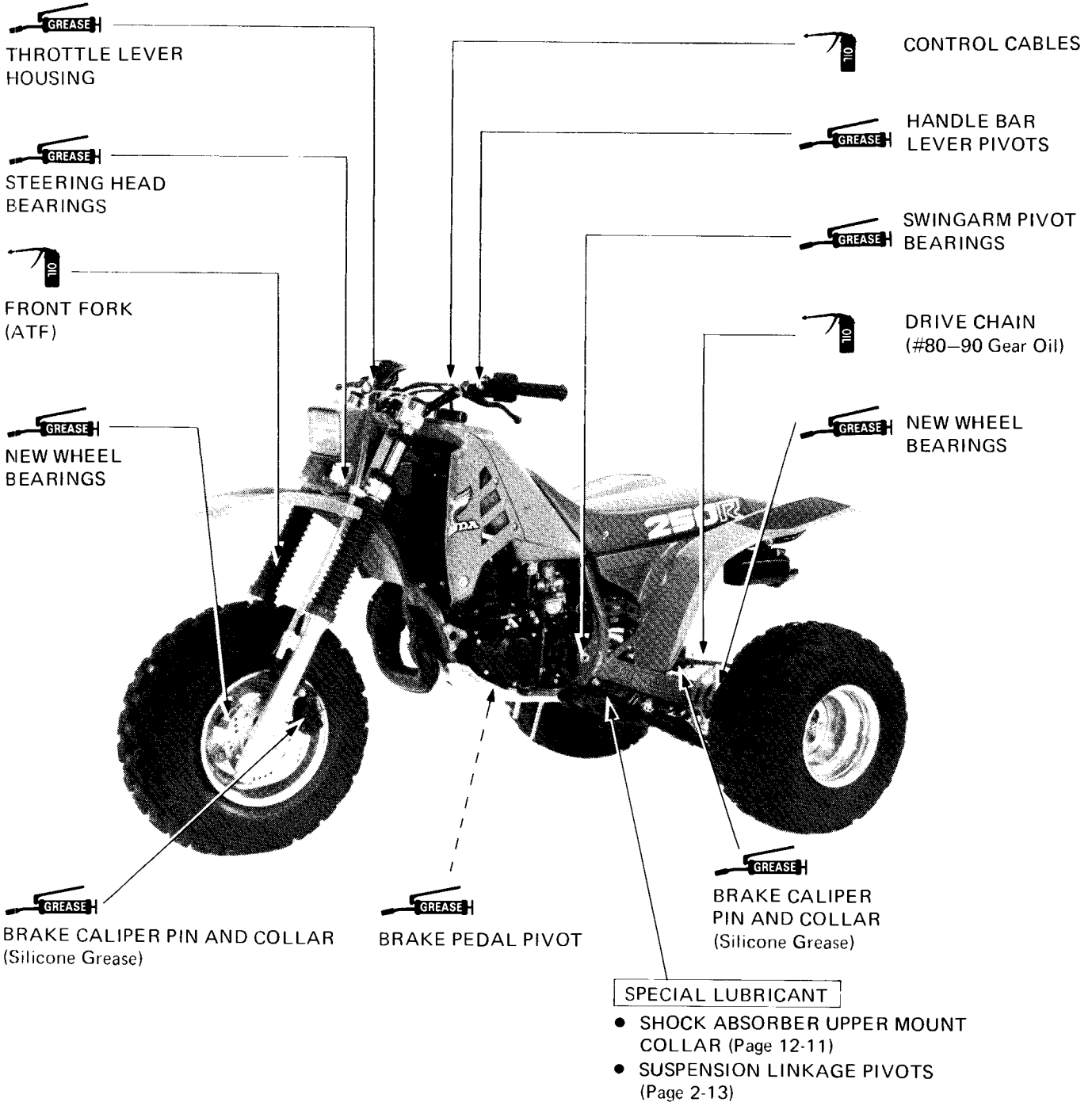
CONTROL CABLE LUBRICATION

Periodically, disconnect the throttle, choke and clutch cables at their upper ends.

Thoroughly lubricate the cables and their pivot points with a commercially available cable lubricant.

LUBRICATION POINTS

Use general purpose grease when no other specification is given. Apply oil or grease to any 2 sliding surfaces.

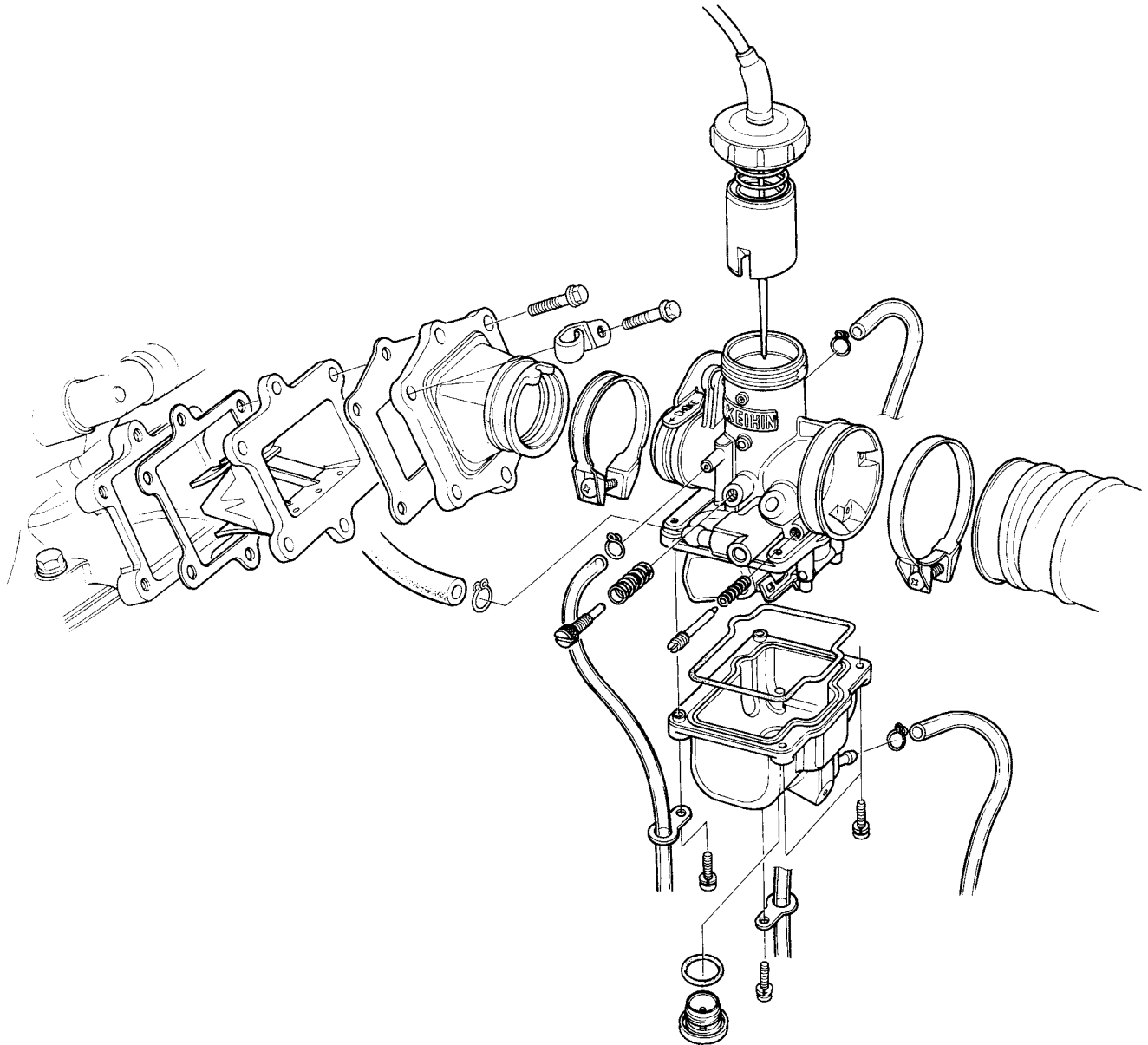


FUEL SYSTEM

'85:

NOTE

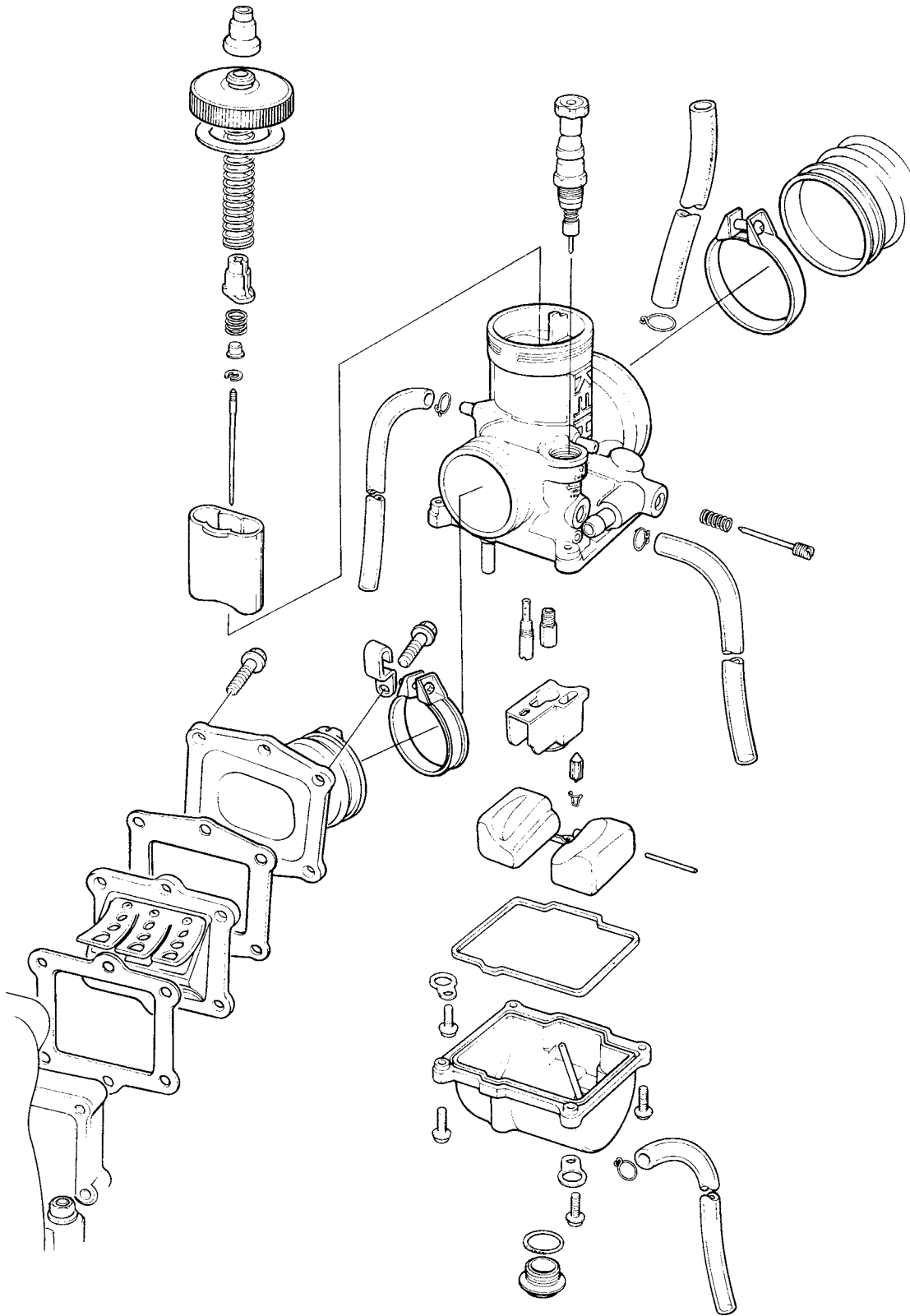
Refer to pages 3-8 through 3-15.



AFTER '85:

NOTE

Refer to pages 3-16 through 3-23.



3. FUEL SYSTEM

SERVICE INFORMATION	3-2	CRANKCASE BREATHER	3-7
TROUBLESHOOTING	3-2	CARBURETOR	'85: 3-8
FUEL TANK	3-3		AFTER '85: 3-16
AIR CLEANER CASE	3-5	REED VALVE	3-24
		CARBURETOR THEORY	3-25

SERVICE INFORMATION

GENERAL

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

SPECIFICATIONS

Fuel tank capacity
 Fuel
 Oil
 Fuel: Oil pre-mix ratio
 Carburetor:

9.8 lit. (2.6 U.S. gal., 2.2 Imp. gal.)
 Premium or leaded gasoline (Octane rating 92-100, RON)
 Honda 2-STROKE OIL or equivalent
 20 : 1

Model	'85	AFTER '85
Identification mark	PE37A	PJ03A
Type	Piston valve	Piston valve
Venturi diameter	34 mm (1.3 in)	34 mm (1.3 in)
Float level	16 mm (0.63 in)	16 mm (0.63 in)
Air screw opening	2 turns out	2-1/4 turns out
Jet needle	2nd groove	3rd groove
Main jet	#142	#145
Slow jet	#52	#42

Optional main jets:

'85: #138, #140, #145, #148 (in increments of 2 or 3).
 AFTER '85: #140, #142, #148, #150 (in increments of 2 or 3).

TOOL

Common

Float level gauge 07401-0010000

TROUBLESHOOTING

Engine cranks but won't start

- No fuel in tank
- No fuel to carburetor
- Too much fuel getting into cylinder
- No spark at plug (ignition malfunction)
- Air cleaner clogged
- Deteriorated premix

Engine idles roughly, stalls, or runs poorly

- Idle speed incorrect
- Ignition malfunction
- Low compression
- Rich mixture
- Lean mixture
- Air cleaner clogged
- Air leaking into inlet pipe
- Fuel contaminated

Lean mixture

- Carburetor fuel jets clogged
- Fuel cap vent clogged or blocked
- Fuel filter clogged
- Fuel line kinked or restricted
- Float valve faulty
- Float level too low
- Air vent tube clogged

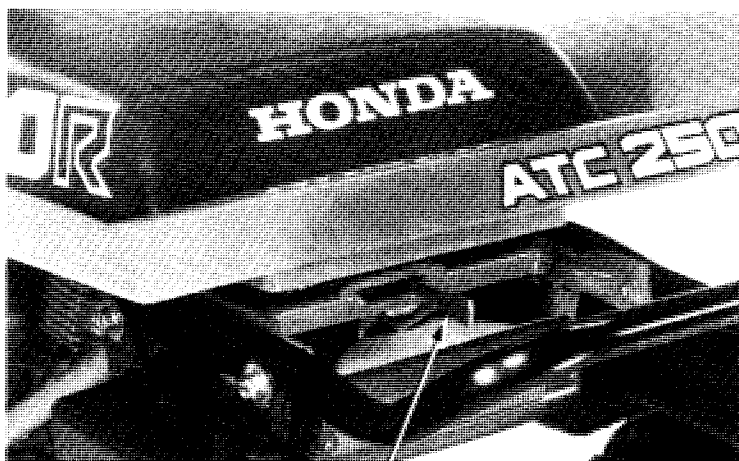
Rich mixture

- Starter valve stuck open
- Worn or damaged starter valve seat
- Faulty float valve
- Float level too high
- Carburetor air jets clogged
- Air cleaner dirty

FUEL TANK

REMOVAL

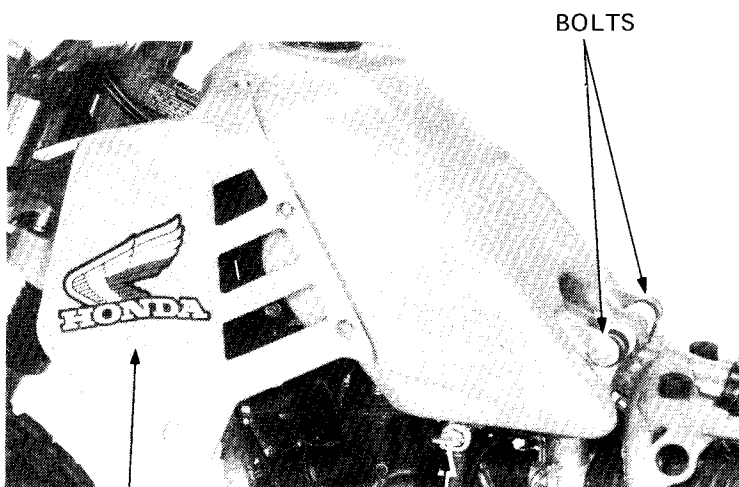
Remove the seat/rear fender by releasing the seat latch lever.



LATCH LEVER

Turn the fuel valve OFF and disconnect the fuel line.

Remove the fuel tank rear mounting bolts.
Remove the radiator shroud.



BOLTS

RADIATOR SHROUD

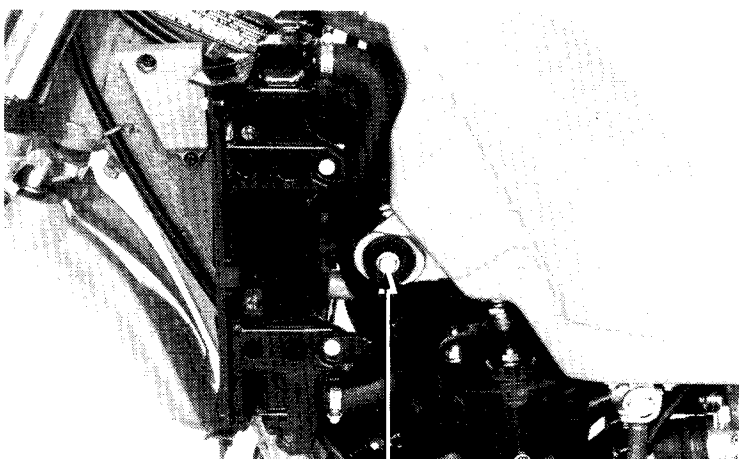
FUEL VALVE

Remove the fuel tank front mounting bolts, then remove the fuel tank.

WARNING

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

Check that fuel flows freely from the fuel valve. Remove the fuel valve and clean the filter if fuel flow is restricted.



BOLT

FUEL SYSTEM

INSTALLATION

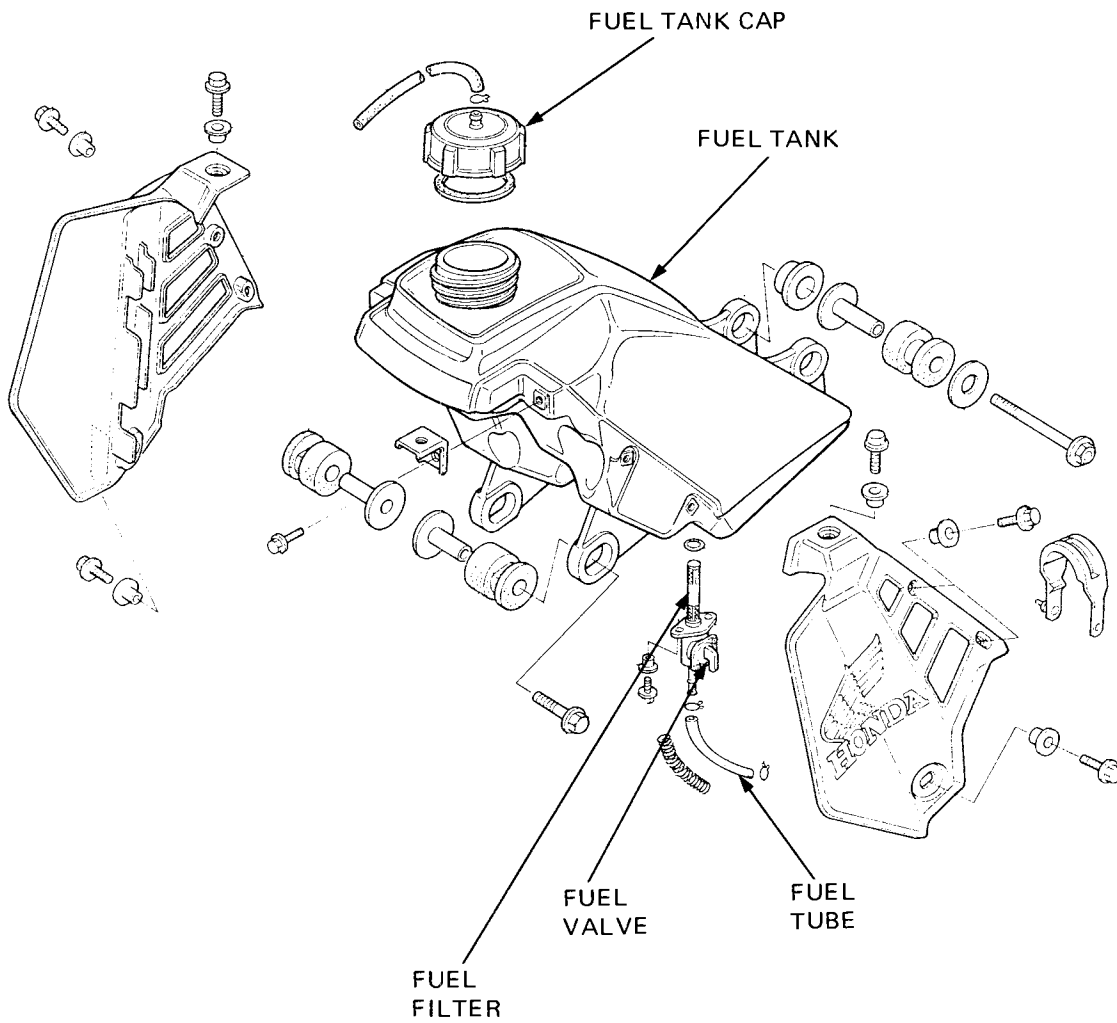
Install the fuel tank and radiator shroud.
Connect the fuel line.
Install the seat/rear fender.

NOTE

After assembly, make sure there are no fuel leaks.

CAUTION

Do not over-tighten the fuel valve.

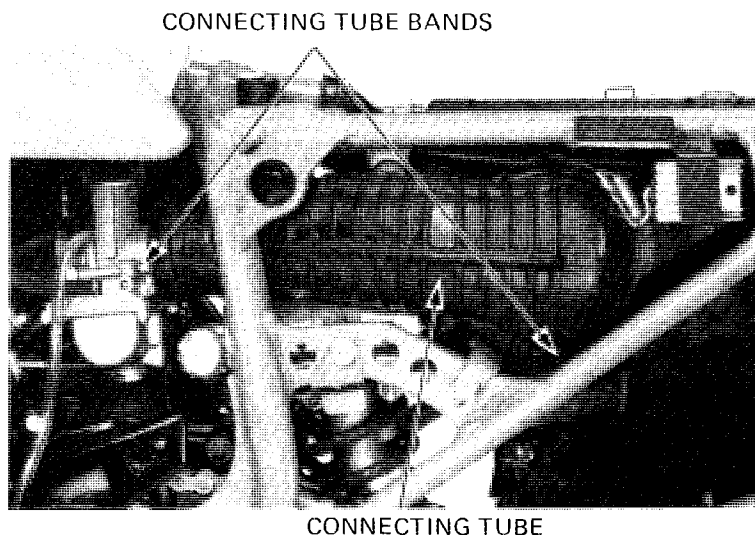


AIR CLEANER CASE

REMOVAL

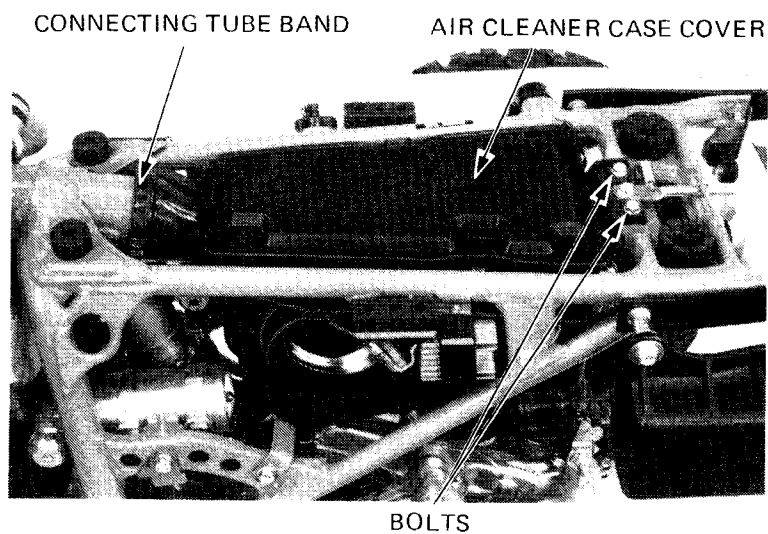
Remove the seat/rear fender.

Remove the connecting tube bands, then remove the connecting tube.



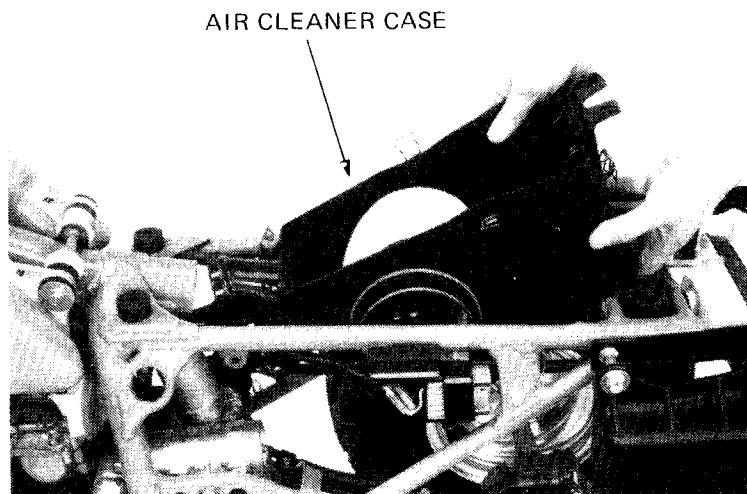
Remove the air cleaner case cover.

Remove the air cleaner case attaching bolts and loosen the connecting tube band.



Remove the air cleaner case.

For air cleaner element service, see page 2-5.



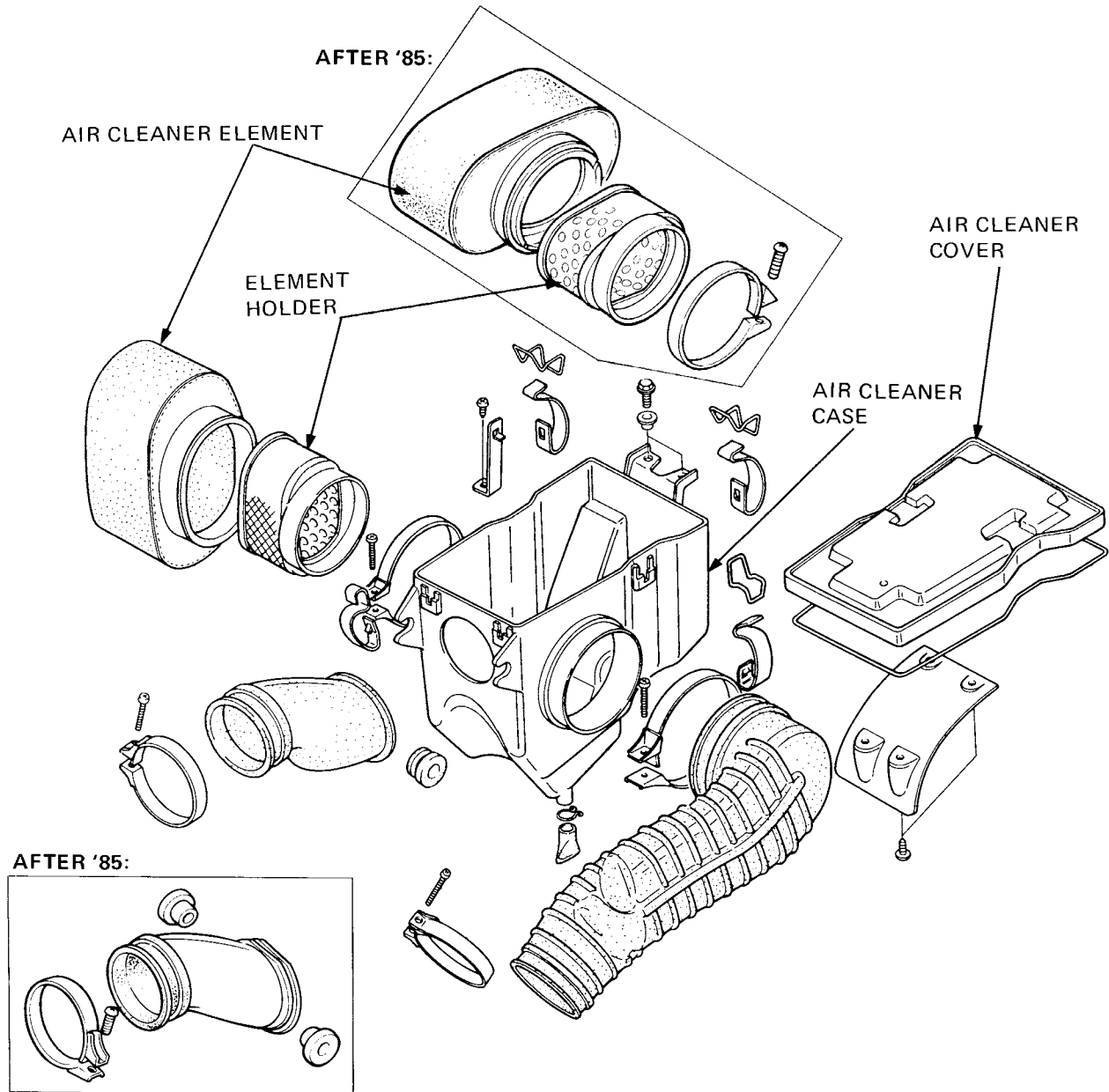
FUEL SYSTEM

INSTALLATION

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

NOTE

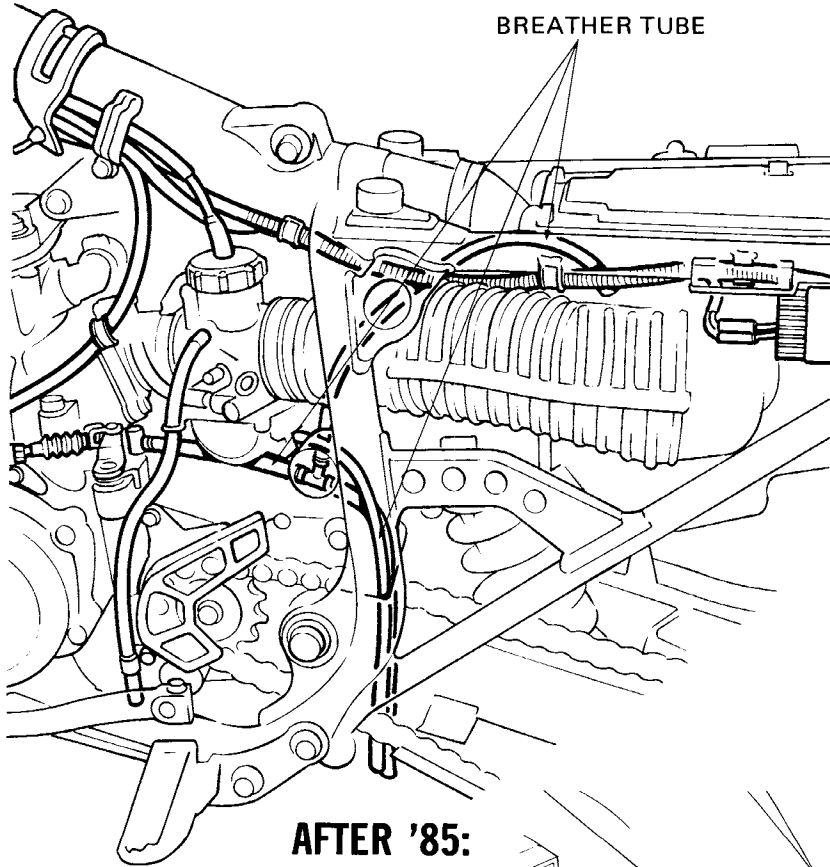
Be sure that the carburetor tube bands are tightened securely.



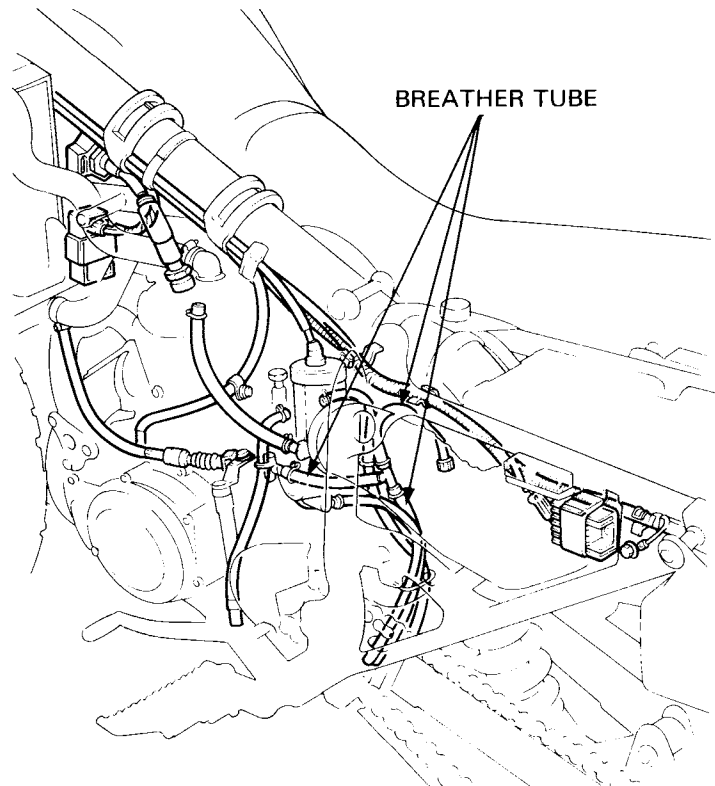
CRANKCASE BREATHER

Route the crankcase breather tube as shown.

'85:



AFTER '85:

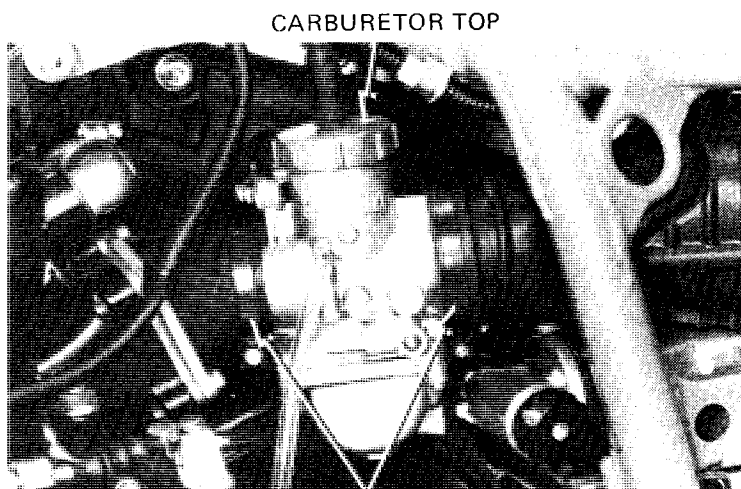


**'85:
CARBURETOR**

REMOVAL/DISASSEMBLY

Turn the fuel valve OFF and disconnect the fuel line and remove the seat and fuel tank (page 3-3). Loosen the drain screw and drain the float chamber. Remove the carburetor connecting tube bands and remove the carburetor top. Pull the throttle valve out.

Remove the carburetor.

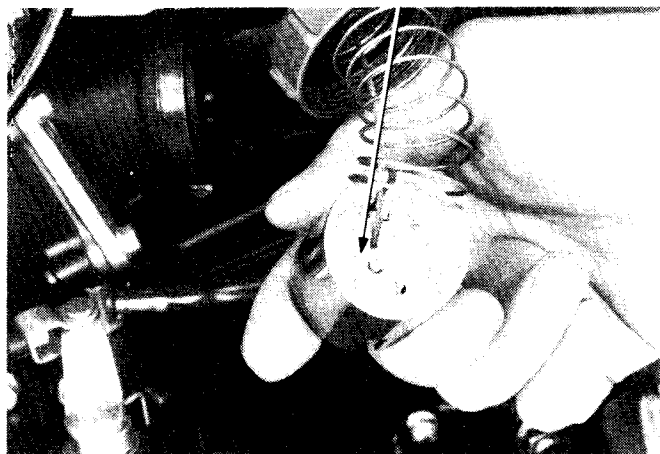


CARBURETOR TOP

CONNECTING TUBE BANDS

Throttle Valve

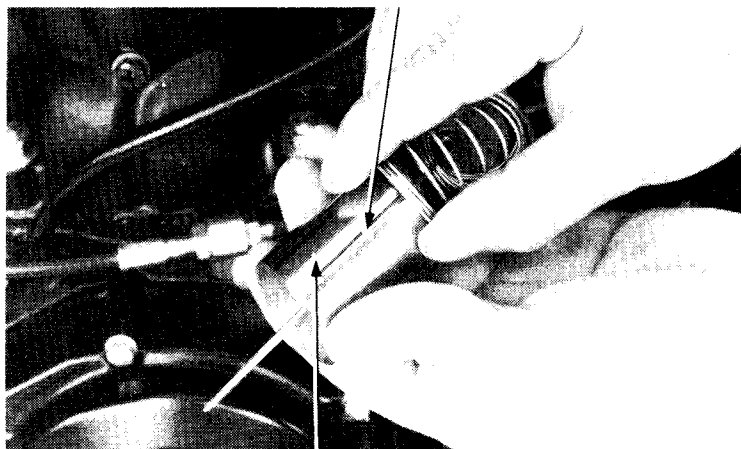
Compress the throttle valve spring and remove the retaining plate clip.



RETAINING PLATE CLIP

Slide the retaining plate up the cable and out of the throttle valve.

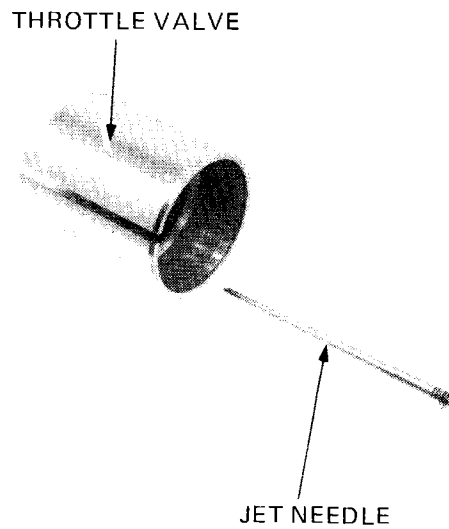
Remove the throttle cable.



THROTTLE CABLE

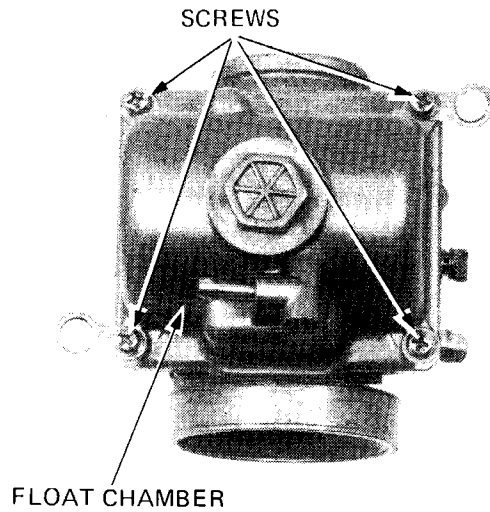
THROTTLE VALVE

Remove the jet needle.
Check the jet needle and throttle valve for wear or damage.



Carburetor Body

Remove the float chamber attaching screws and re-
move the float chamber.

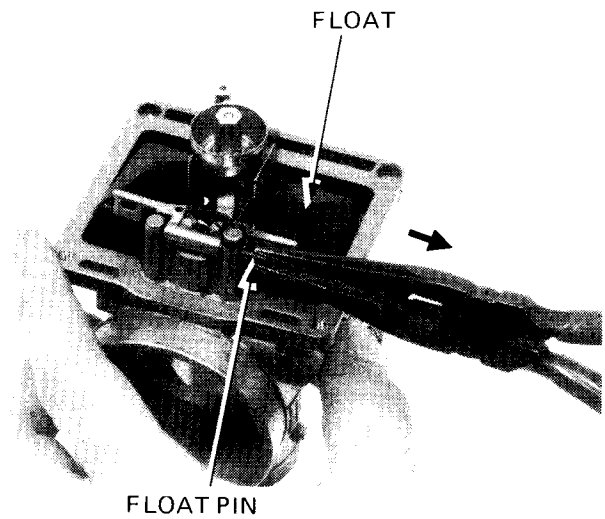


Remove the float pin.

CAUTION

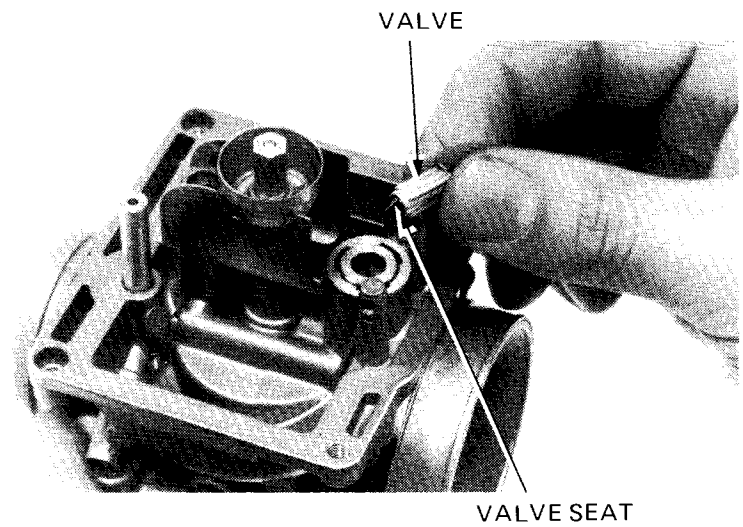
Remove the float pin in the direction of the arrow.

Remove the carburetor float and float valve.

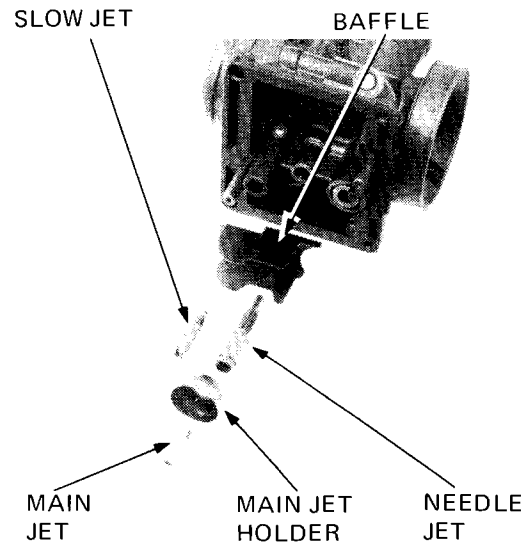


FUEL SYSTEM

Check the valve and seat for wear or damage.
Replace the valve and seat as a set if either part is worn or damaged.



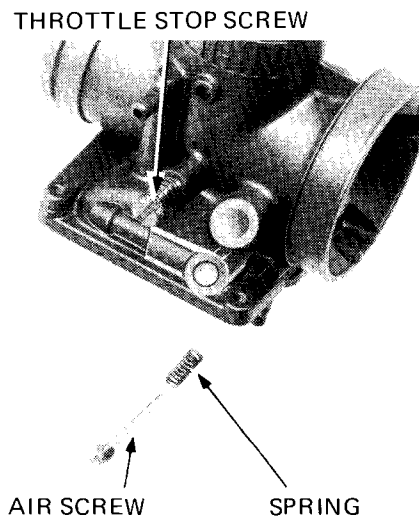
Remove the main jet, main jet holder, needle jet, baffle and slow jet.
Check the each parts for wear or damage.



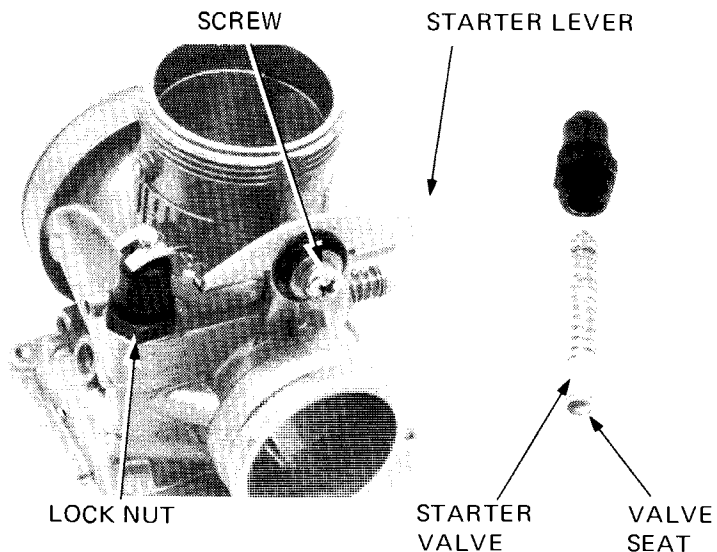
Remove the throttle stop screw and air screw.

NOTE

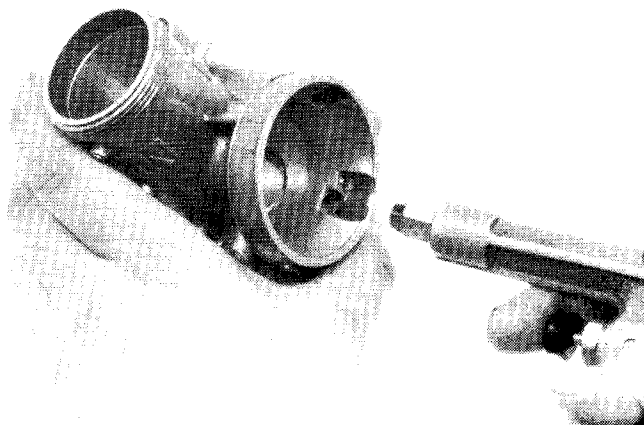
Before removing the throttle stop screw and air screw, record the number of rotations until they seat lightly, so they can be returned to their original positions.



Remove the starter lever.
 Unscrew the lock nut and remove the starter valve.
 Check the starter valve and valve seat for wear or damage.



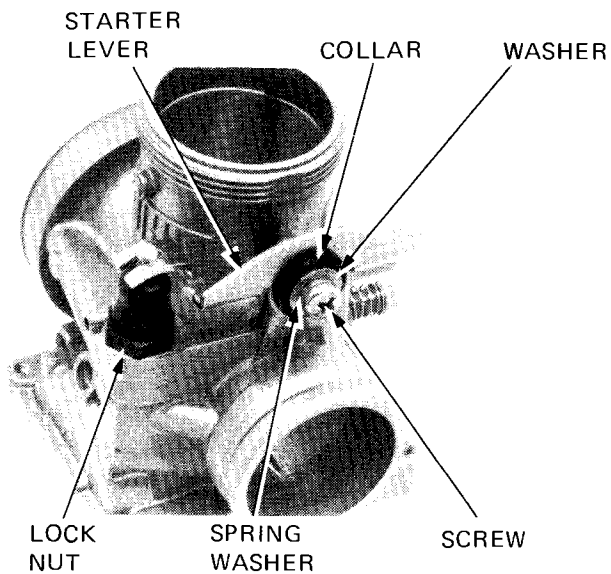
Blow open all jets and body openings with compressed air.



**CARBURETOR ASSEMBLY/
 INSTALLATION**

Carburetor Body

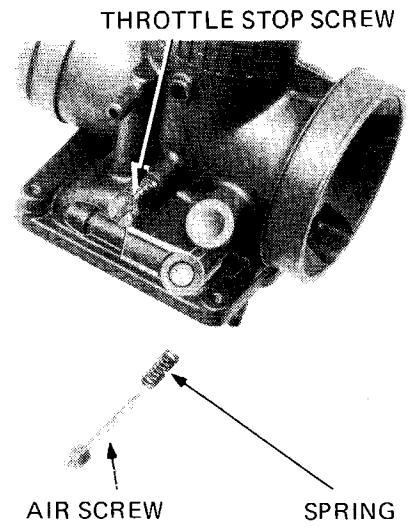
Install the starter valve and tighten the lock nut.
 Install the starter lever and collar, washer, spring washer, and screw.



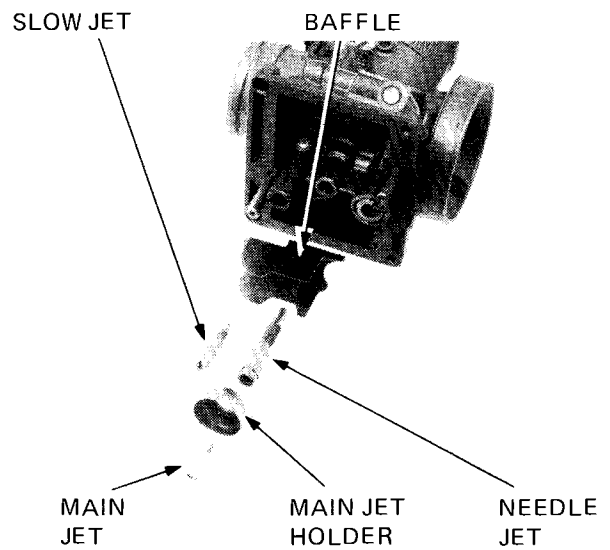
FUEL SYSTEM

Install the air and throttle stop screws and return them to their original position as noted during removal.

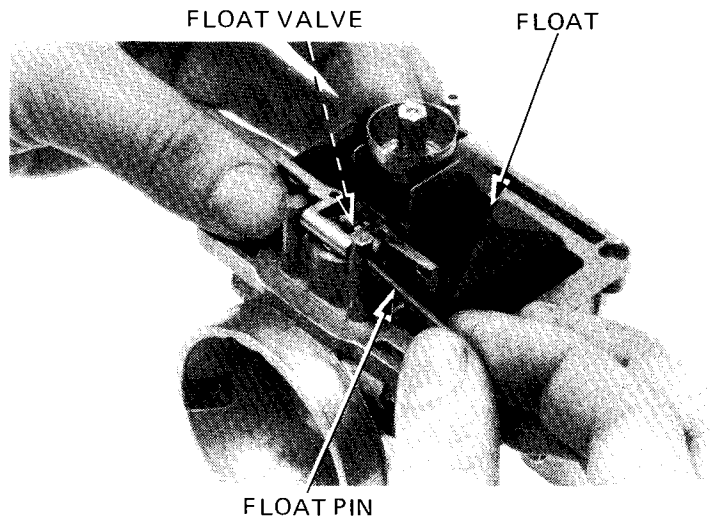
AIR SCREW OPENING: 2 turns out



Install the baffle, slow jet, needle jet, main jet holder and main jet.



Install the float valve, float and float pin.
Check that the float is operating smoothly.



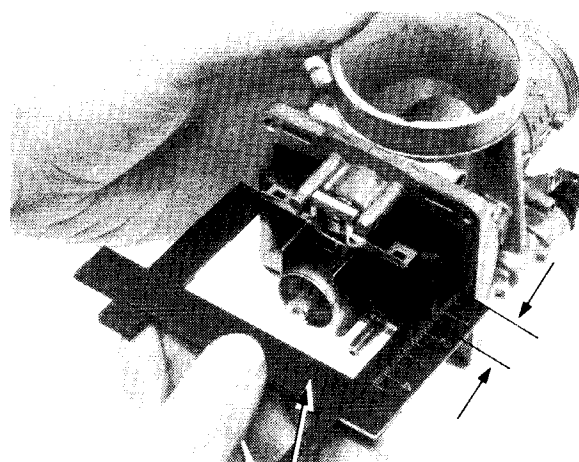
Float Level Inspection

Measure the float level.

FLOAT LEVEL: 16 mm (0.63 in)

To adjust the float level, bend the float arm carefully until the float tip just contacts the float valve.

Install the chamber.



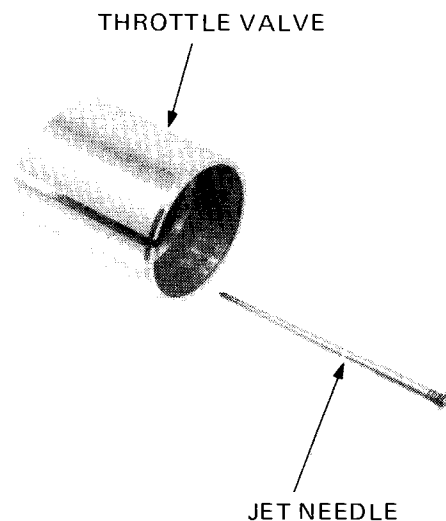
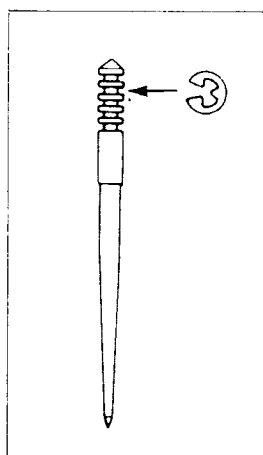
FLOAT LEVEL GAUGE
07401-0010000

Throttle Valve

Install the needle clip on the jet needle.

STANDARD SETTING POSITION: 2nd groove

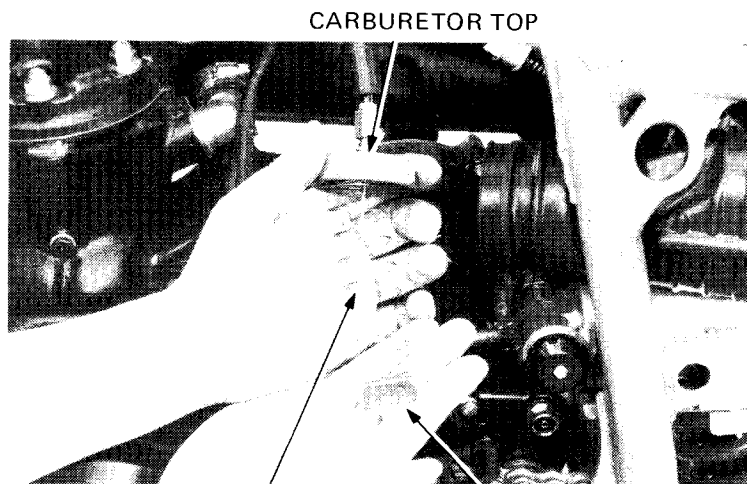
Install the jet needle into the throttle valve.



THROTTLE VALVE

JET NEEDLE

Install the valve spring and retaining plate.



CARBURETOR TOP

SPRING

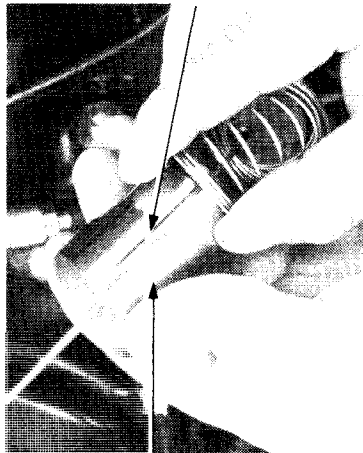
RETAINING
PLATE

FUEL SYSTEM

Compress the spring and insert the throttle cable into the throttle valve.

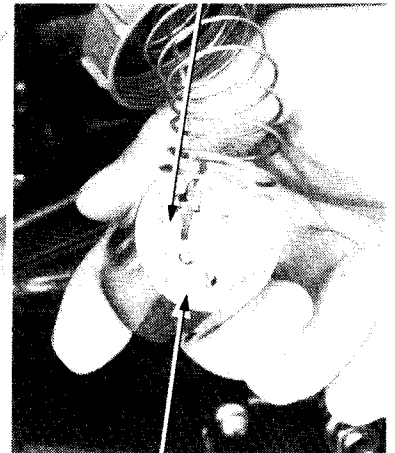
Insert the retaining plate into the recess of the throttle valve fully and secure with the retaining plate clip.

THROTTLE CABLE



THROTTLE VALVE

RETAINING PLATE CLIP



RETAINING PLATE

Align the lug on the carburetor with the groove in the connecting tube.

Install the carburetor connecting tube bands.

Align the groove in the throttle valve with the throttle stop screw.

Install the carburetor top.

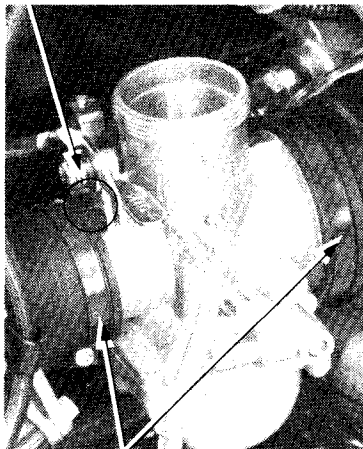
After installing the carburetor, make the following adjustments.

Throttle lever free play (Page 2-10)

Air screw adjustment (Page 3-14).

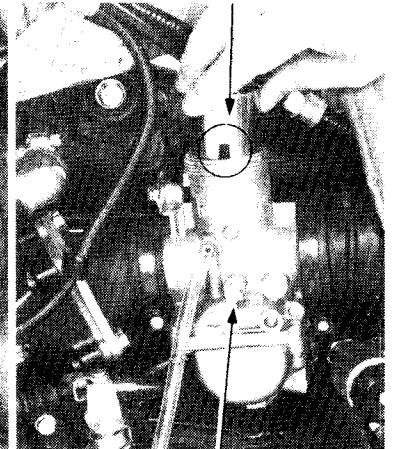
Idle speed adjustment (Page 2-6).

LUG, GROOVE



CONNECTING TUBE BANDS

GROOVE



THROTTLE STOP SCREW

AIR SCREW ADJUSTMENT

NOTE

The engine must be warm for accurate air screw adjustment.

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

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

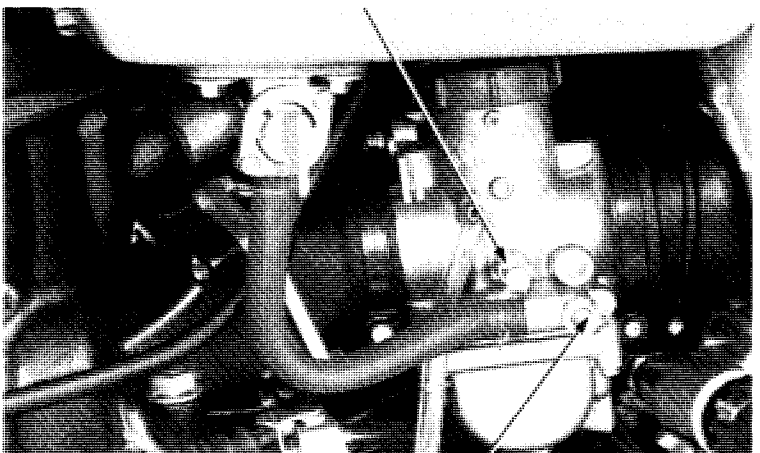
AIR SCREW OPENING: 2 turns out

CAUTION

Damage to the air screw seat will occur if the air screw is tightened against the seat.

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

THROTTLE STOP SCREW



AIR SCREW

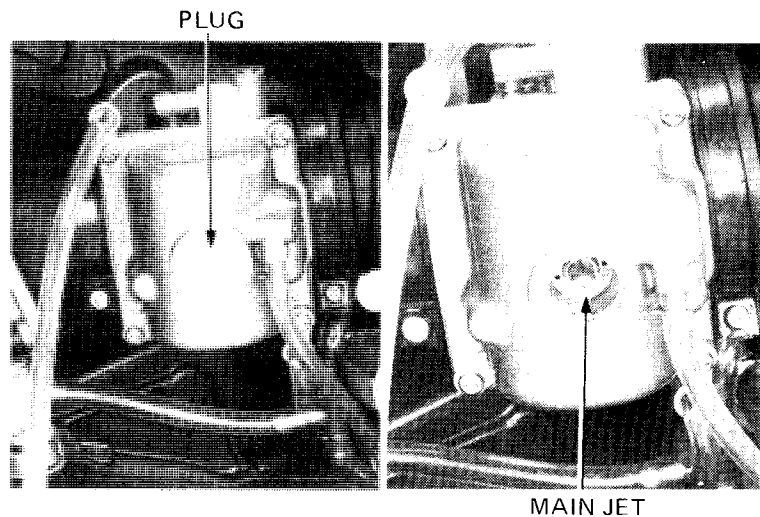
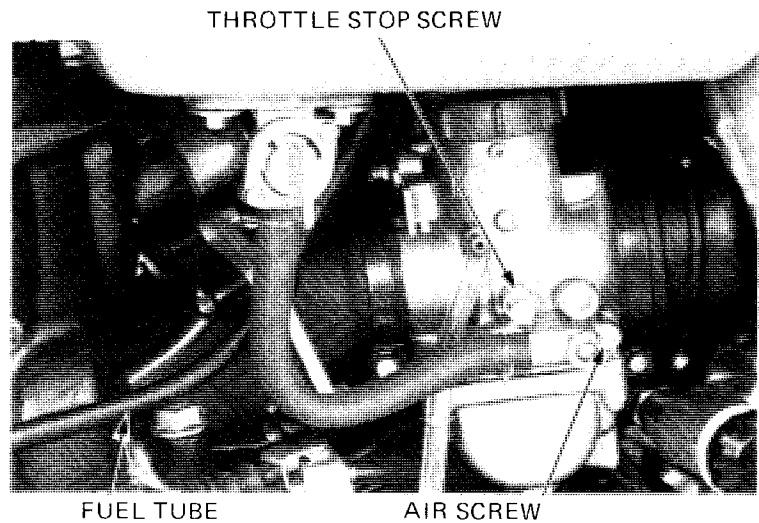
ALTITUDE AND TEMPERATURE ADJUSTMENT

The carburetor must be adjusted for altitude and temperature according to the chart.

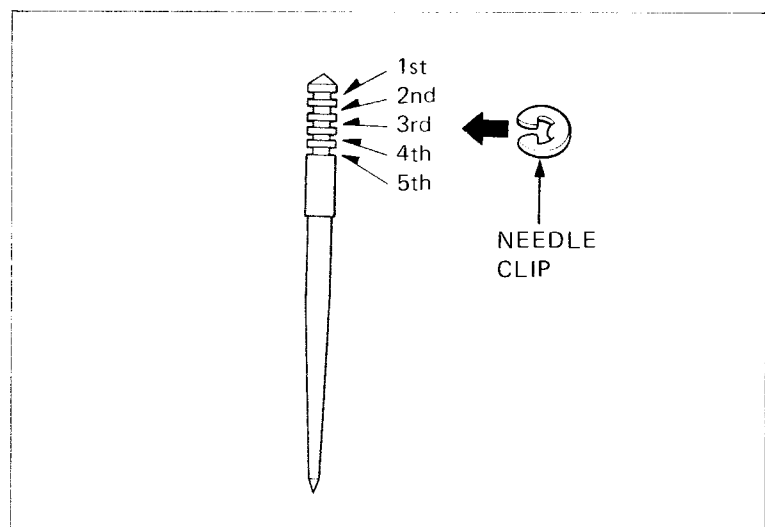
STANDARD SETTING:

Main jet	Jet needle setting	Air screw opening
No. 142	2ND groove	2 turns out

Altitude		Temperature		
		-25°C -17.5°C (13°F 0°F)	-17.5°C -5°C (0°F 22°F)	-5°C 40°C (22°F 104°F)
5,000 ft (1,500 m)	Main jet	≠142	≠140	≠138
	Jet needle setting	3RD	2ND	1ST
	Air screw opening	2 turns out	2-1/2 turns out	2-1/2 turns out
3,300-6,600 ft (1,000-2,000 m)	Main jet	≠145	≠142	≠140
	Jet needle setting	4TH	3RD	2ND
	Air screw opening	1-1/2 turns out	2 turns out	2 turns out
0-5,000 ft (0-1,500 m)	Main jet	≠148	≠145	≠142
	Jet needle setting	4TH	3RD	2ND
	Air screw opening	1-1/2 turns out	2 turns out	2 turns out



Turn the fuel valve "OFF".
 Loosen the drain screw and drain the float chamber.
 Disconnect the fuel tube.
 Remove the carburetor top.
 Remove the throttle valve from the throttle cable.
 Remove the jet needle from the throttle valve.
 Loosen the carburetor connecting tube band and turn the carburetor as shown.
 Remove the float chamber plug.
 Remove the standard main jet and install the applicable main jet.
 Remove the needle clip from the standard groove in the jet needle and install it in the applicable groove.
 Install the removed parts in the reverse order of removal.
 Turn the fuel valve "ON" and start the engine.
 Adjust the idle speed (Page 2-6).
 Also adjust the air screw, according to the chart (Page 3-15).
 Then readjust the idle speed with the throttle stop screw.

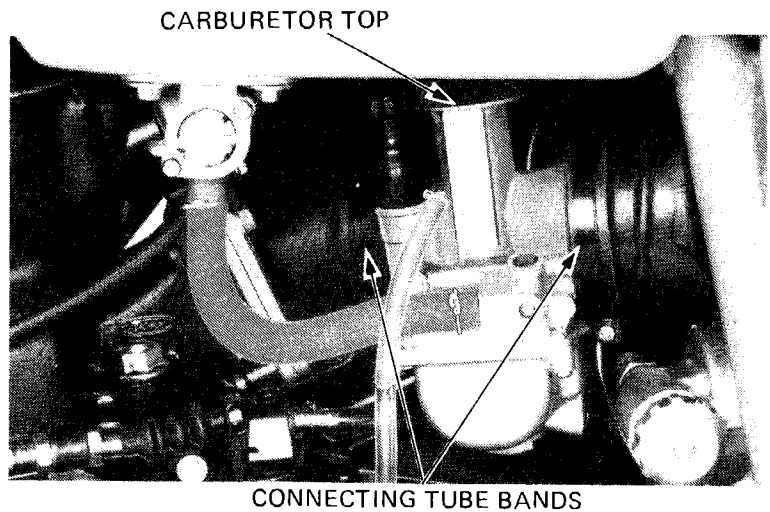


FUEL SYSTEM

AFTER '85: CARBURETOR

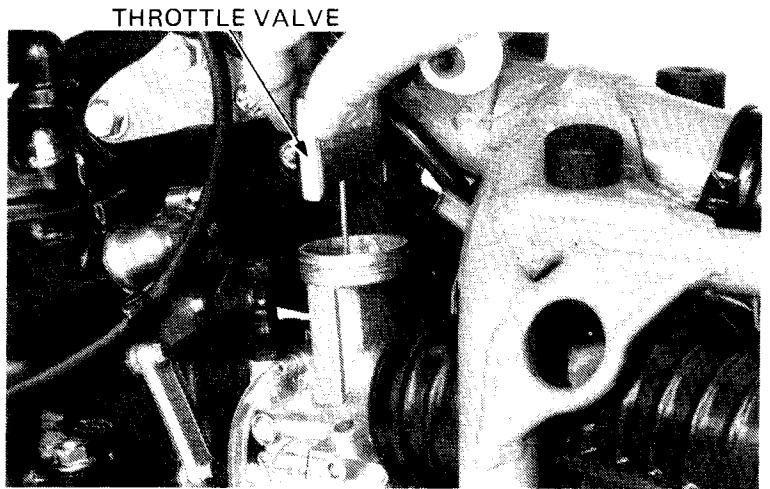
REMOVAL

Turn the fuel valve OFF and disconnect the fuel line and remove the seat and fuel tank (page 3-3). Loosen the drain screw and drain the float chamber. Loosen the carburetor connecting tube bands and remove the carburetor top.



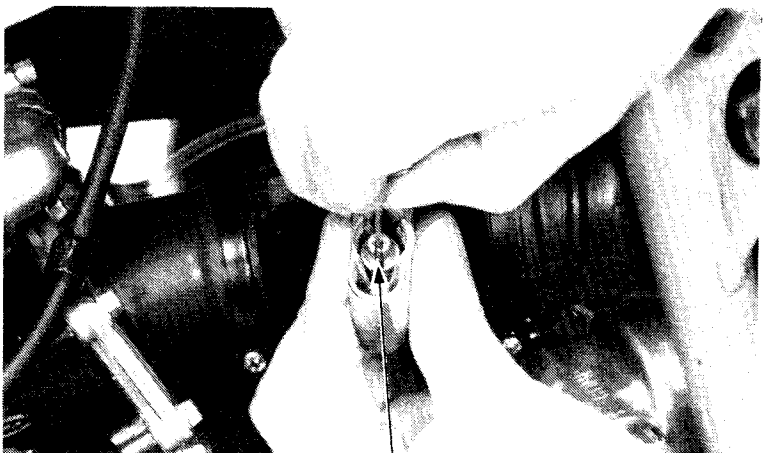
CARBURETOR DISASSEMBLY

Remove the carburetor top and pull out the throttle valve.



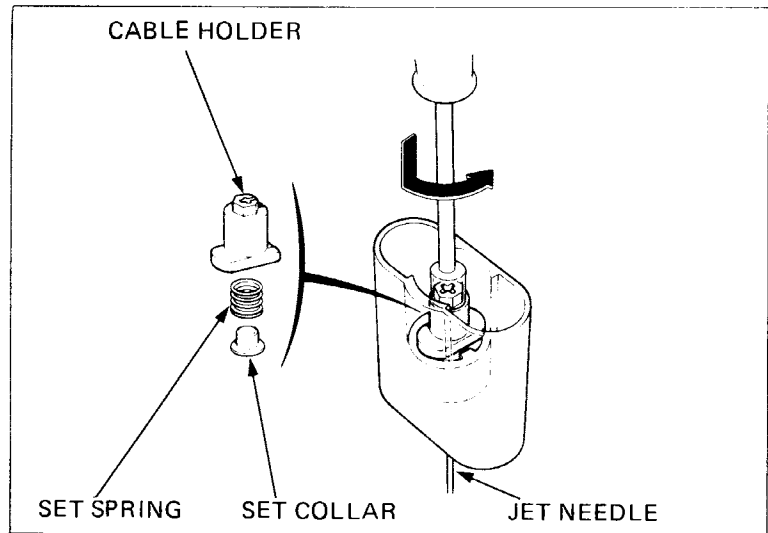
Remove the throttle cable from the cable holder.

Remove the throttle valve spring from the carburetor top.



Push the cable holder in and turn it 90 degrees.

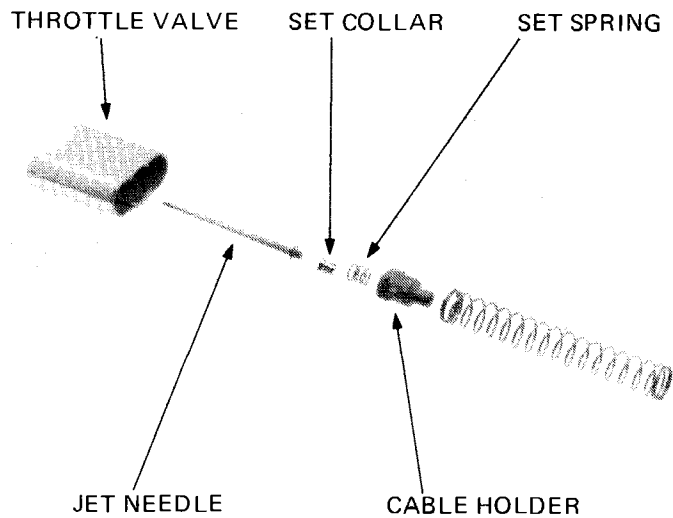
Then remove the cable holder and jet needle, set collar and set spring.



Remove the jet needle from the throttle valve.

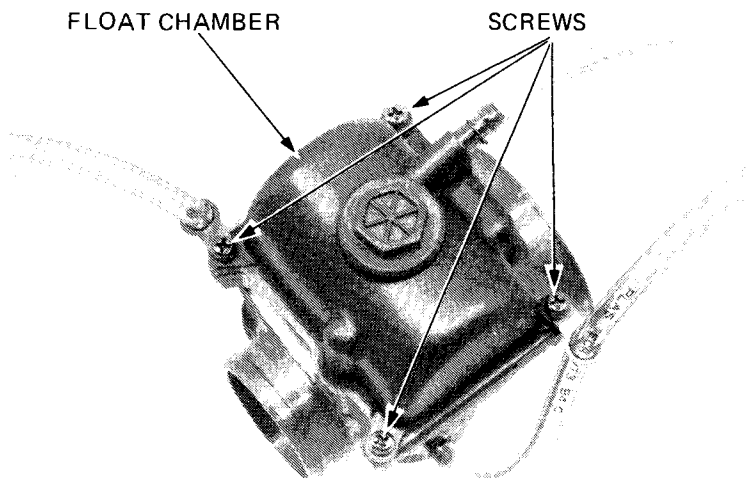
Inspect the throttle valve and jet needle for dirt, scratches or wear.

Install the reverse order of removal.



Carburetor Body

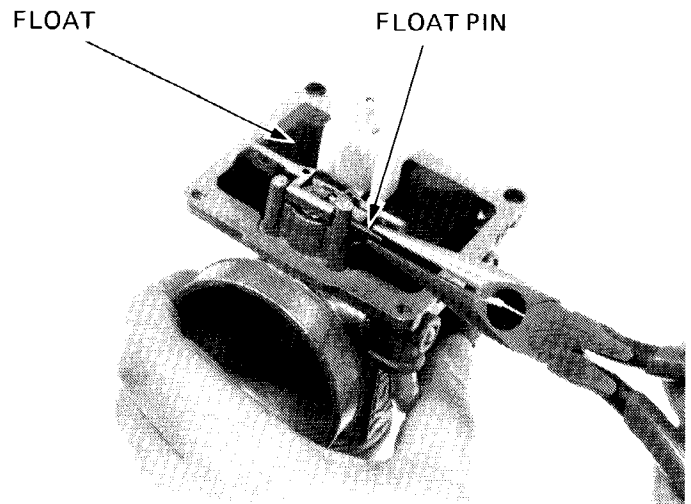
Remove the float chamber attaching screws and remove the float chamber.



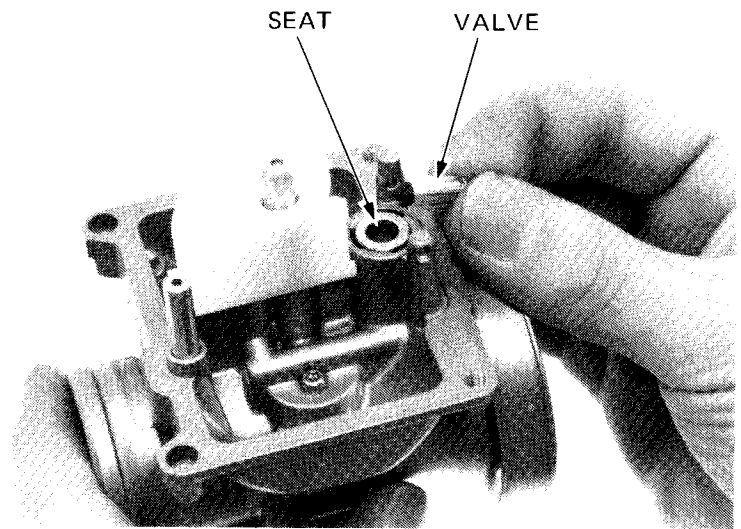
FUEL SYSTEM

Remove the float pin.

Remove the float and float valve.



Check the valve and seat for wear or damage.
Replace the valve if it is worn or damaged.



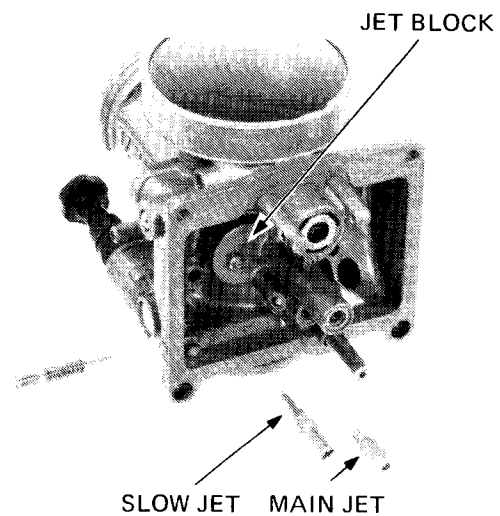
Remove the main jet, baffle plate, slow jet.
Check each part for wear or damage.
Remove the air screw.

NOTE

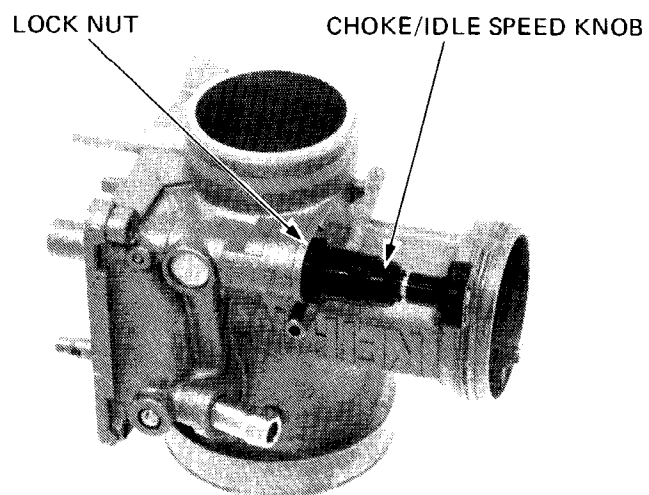
Before removing the air screw, record the number of rotations until it rests lightly, so it can be returned to its original positions.

CAUTION

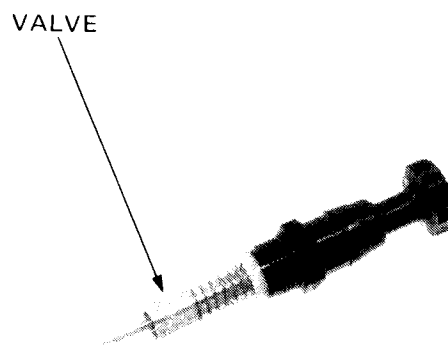
Do not try to remove the jet block from the carburetor body.



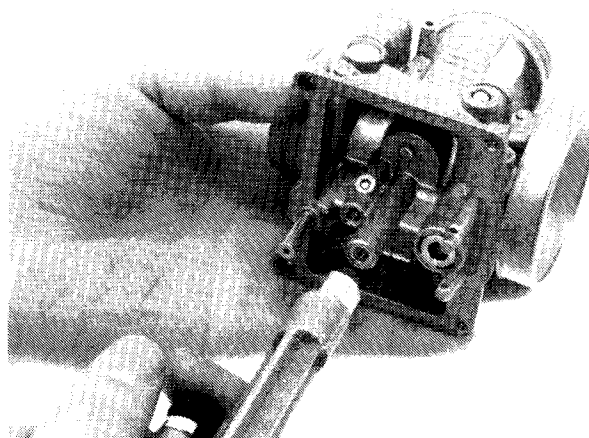
Unscrew the lock nut and remove the choke/idle speed knob.



Check the valve and for wear or damage.



Blow open all jets and body openings with compressed air.



FUEL SYSTEM

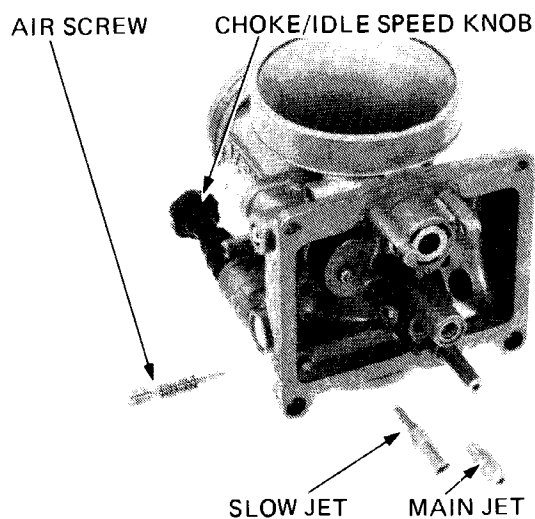
CARBURETOR ASSEMBLY

Install the choke/idle speed knob and tighten the lock nut.

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

AIR SCREW OPENING: 2-1/4 turns out

Install the baffle plate, slow jet, and main jet.



Float Level Inspection

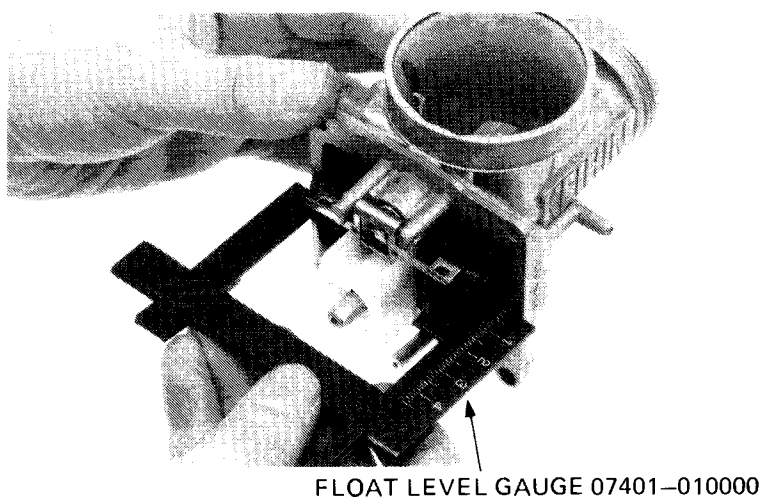
Measure the float level.

To adjust the float level, bend the float arm carefully until the float tip just contacts the float valve.

FLOAT LEVEL: 16 mm (0.63 in)

Install the float chamber.

Reinstall the carburetor onto the engine.

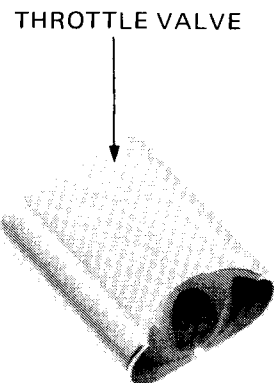
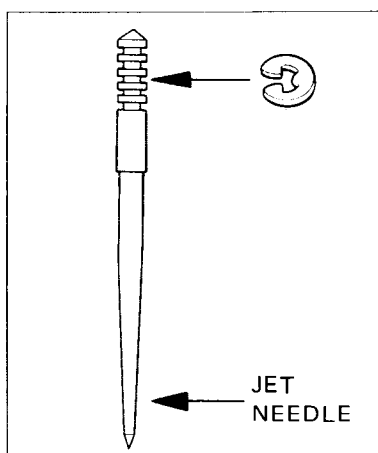


Throttle Valve

Install the needle clip on the jet needle.

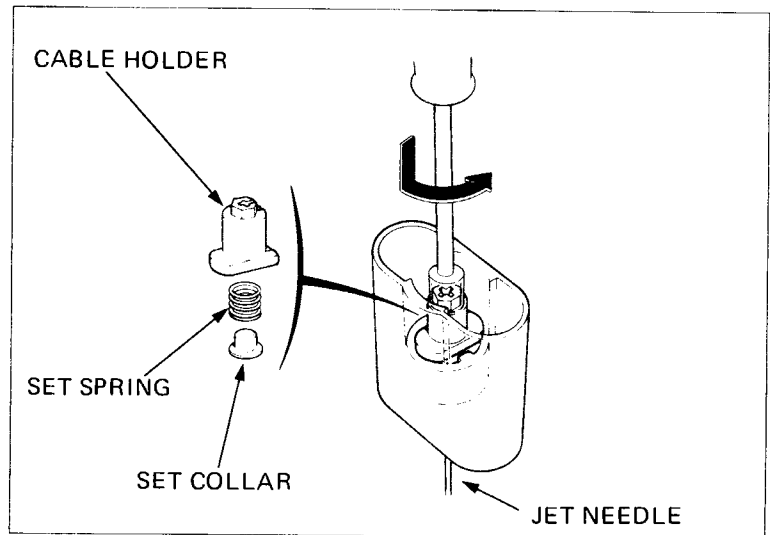
STANDARD SETTING POSITION: 3rd groove

Install the jet needle into throttle valve.

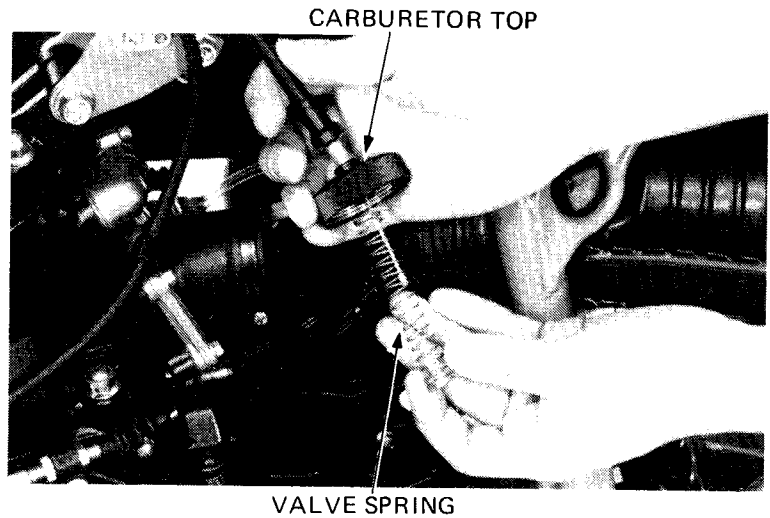


Install the set collar over the jet needle and clip, then install the set spring and cable holder.

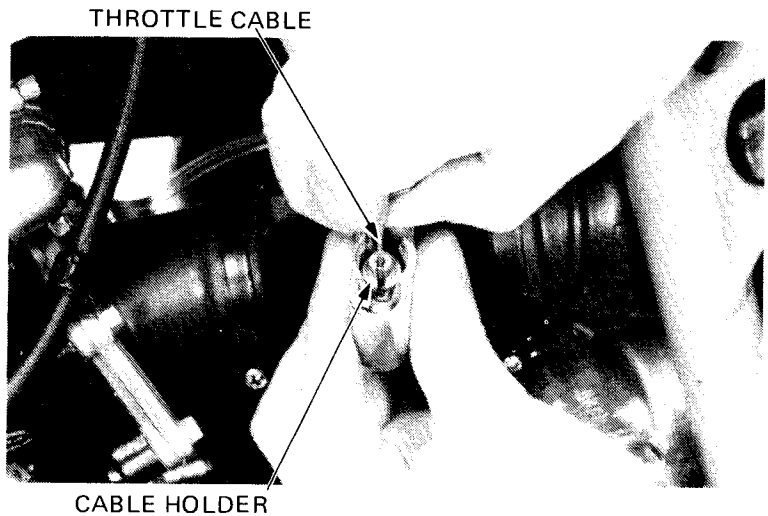
Push the cable holder in and turn it 90 degrees.



Install the valve spring as shown.



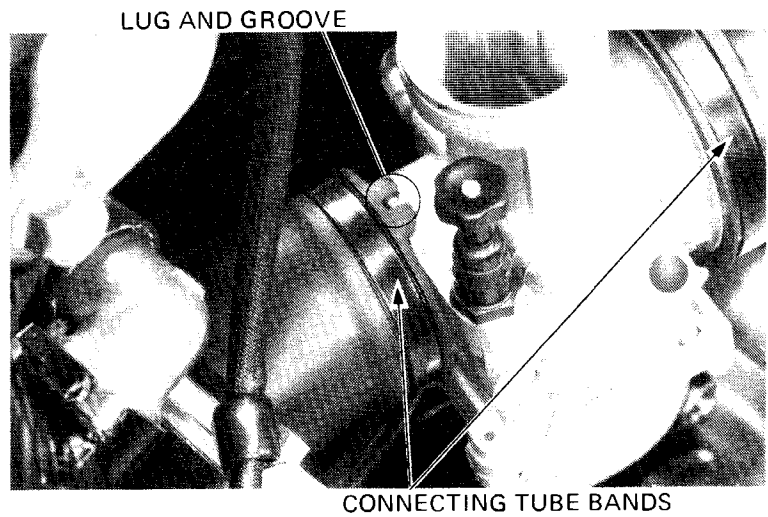
Compress the throttle valve spring and insert the throttle cable into the cable holder.



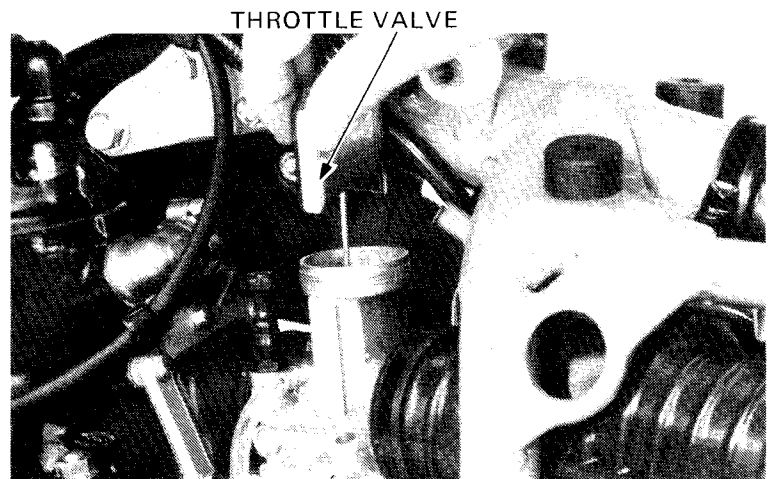
FUEL SYSTEM

CARBURETOR INSTALLATION

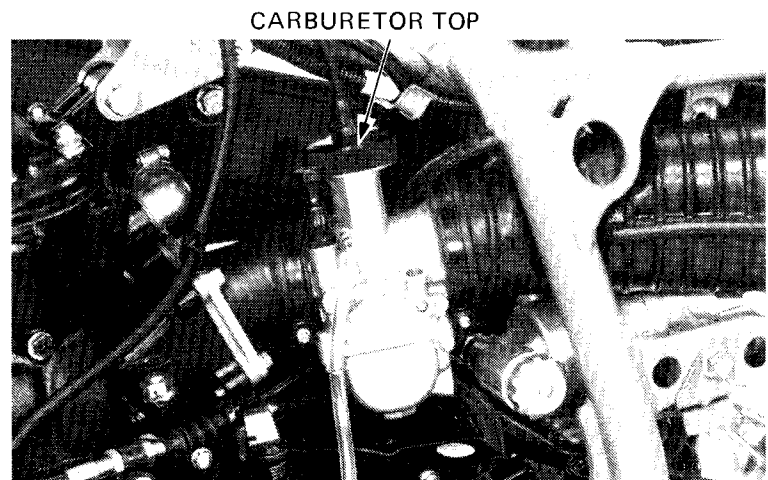
Align the lug on the carburetor with the groove in the connecting tube.
Install the carburetor connecting tube bands.



Install the throttle valve assembly into the carburetor.



Install the carburetor top.
After installing the carburetor, make the following adjustments.
Throttle lever free play (Page 2-10).
Air screw adjustment (Page 3-23).
Idle speed adjustment (Page 2-6).



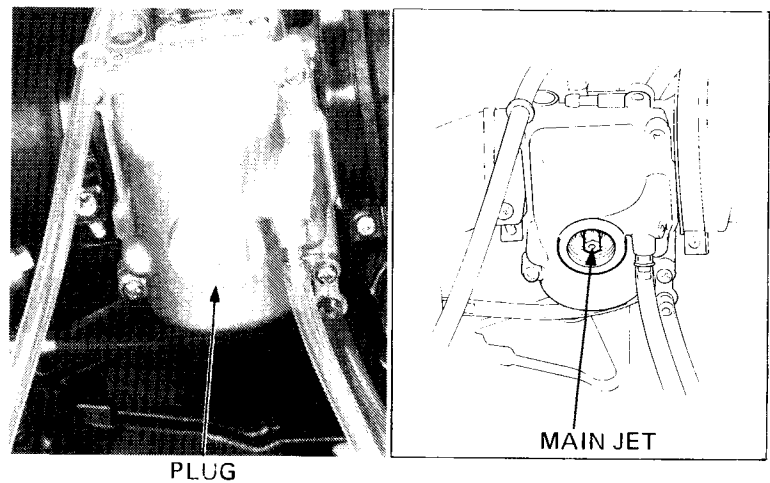
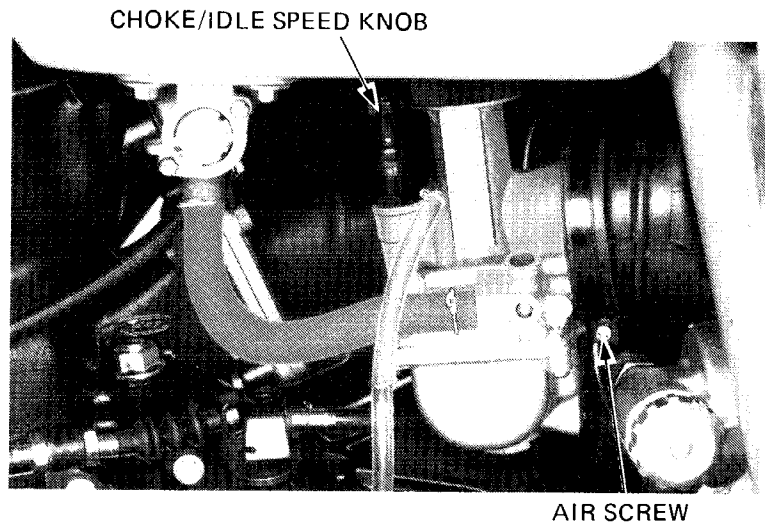
ALTITUDE AND TEMPERATURE ADJUSTMENT

The carburetor must be adjusted for altitude and temperature according to the chart.

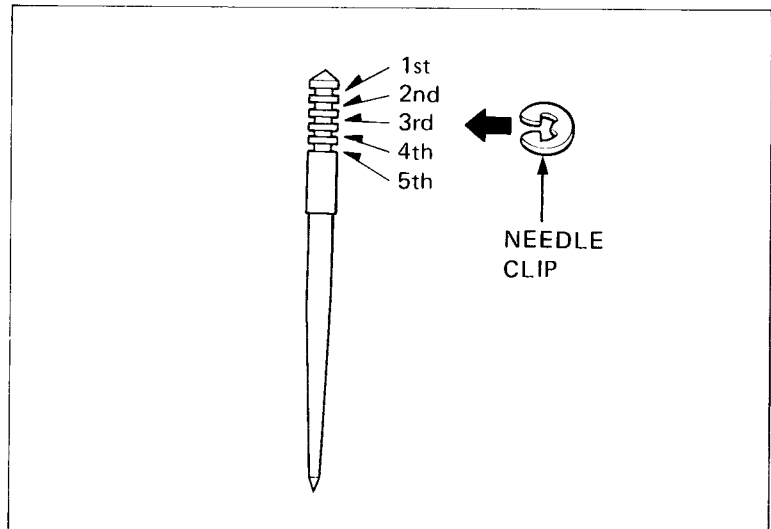
STANDARD SETTING:

Main jet	Jet needle setting	Air screw opening
No. 145	3rd groove	2-1/4 turns out

		Temperature			
		-25°C -17.5°C -13°F 0°F	-17.5°C -5°C 0°F 22°F	-5°C 40°C 22°F 104°F	
Altitude	5,000 ft (1,500 m)	Main jet	#145	#142	#140
		Jet needle setting	3RD	2ND	1ST
		Air screw opening	2-1/4 turns out	2-3/4 turns out	2-3/4 turns out
	3,300-6,600 ft (1,000-2,000 m)	Main jet	#148	#145	#142
		Jet needle setting	4TH	3RD	2ND
		Air screw opening	1-3/4 turns out	2-1/4 turns out	2-1/4 turns out
	0-5,000 ft (0-1,500 m)	Main jet	#150	#148	#145
		Jet needle setting	5TH	4TH	3RD
		Air screw opening	1-3/4 turns out	2-1/4 turns out	2-1/4 turns out



- Turn the fuel valve "OFF".
- Loosen the drain screw and drain the float chamber.
- Disconnect the fuel tube.
- Remove the carburetor top.
- Remove the throttle valve from the throttle cable.
- Remove the jet needle from the throttle valve.
- Loosen the carburetor connecting tube band and turn the carburetor as shown.
- Remove the float chamber plug.
- Remove the standard main jet and install the applicable main jet.
- Remove the needle clip from the standard groove in the jet needle and install it in the applicable groove.
- Install the removed parts in the reverse order of removal.
- Turn the fuel valve "ON" and start the engine.
- Adjust the idle speed (Page 2-6).
- Also adjust the air screw, according to the chart (Page 3-15).
- Then readjust the idle speed with the throttle stop screw.

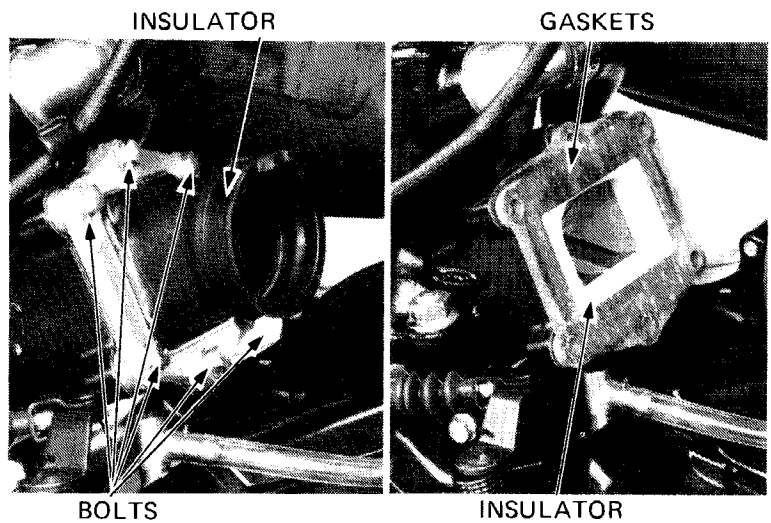


FUEL SYSTEM

REED VALVE

REMOVAL

Remove the carburetor (Page 3-16).
Remove the six carburetor insulator mounting bolts.
Remove the insulator, gasket and reed valve from the cylinder.



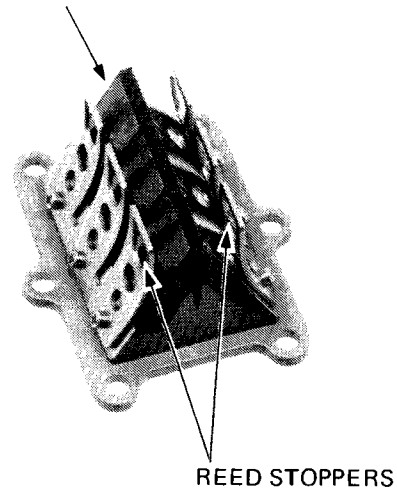
INSPECTION

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

CAUTION:

Do not disassembly or bend the reed stoppers as this may cause improper engine performance. Individual parts are not available for the reed valve; if the stoppers, reed, or seat is faulty, replace the assembly.

REED VALVE



INSTALLATION

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

NOTE

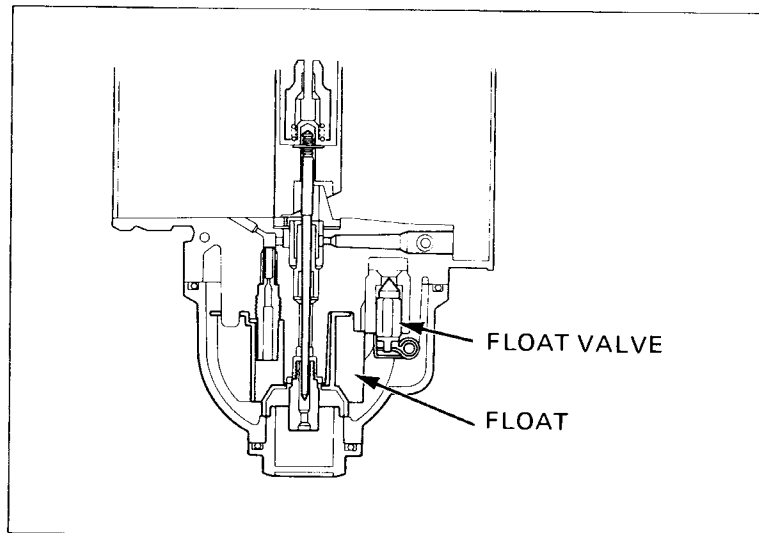
After installation, check for secondary air leaks around the reed cage and insulator.

CARBURETOR THEORY

FLOAT CHAMBER

The float valve and float maintain a constant fuel level in the float chamber.

- The float level affects the mixture throughout the entire range.
 - Although it is possible to alter the fuel mixture by changing the float level, it is not recommended.



STARTING/IDLE CIRCUIT

When the choke valve is opened (knob up), fuel is metered by the starter jet and is mixed with air from the primary air passage to provide a rich mixture to ease starting.

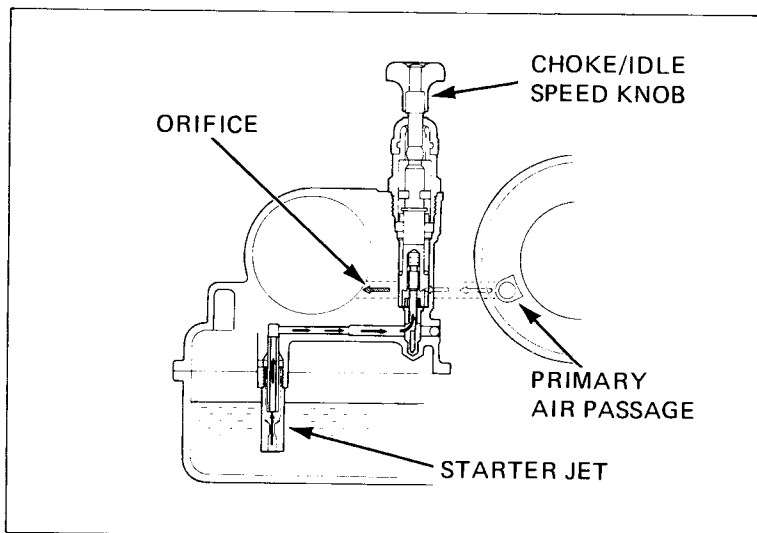
When the choke valve is closed (knob down), it reduces the mixture to a more normal level for idling.

With the knob down, the actual flow of fuel/air is regulated by the adjustment of the choke/idle speed knob.

The end of the threaded choke/idle speed knob acts as a miniature throttle valve in the primary air jet passage.

With the knob threaded all the way down, it cuts off all fuel/air from this passage (no idle speed) and with it threaded all the way up, it allows maximum amount of fuel/air through this passage (high idle speed).

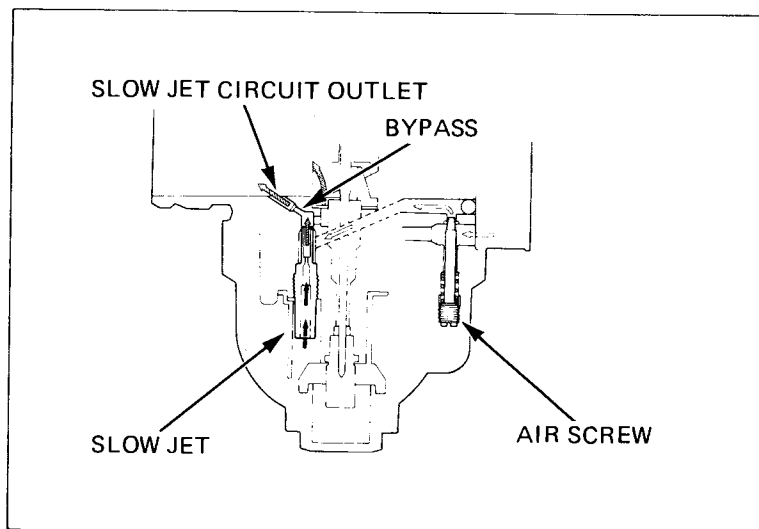
- This circuit has two main functions; to start a cold engine (knob up) or to supply enough fuel/air to allow the engine to idle (knob down and adjustment properly).



SLOW CIRCUIT

Fuel is metered by the slow jet and is mixed with air that has been metered by the air screw. The mixture enters the venturi through the bypass and slow jet circuits.

- This circuit affects idle-to-1/4 throttle.
 - The mixture can be altered by changing the slow jet or the air screw adjustment.

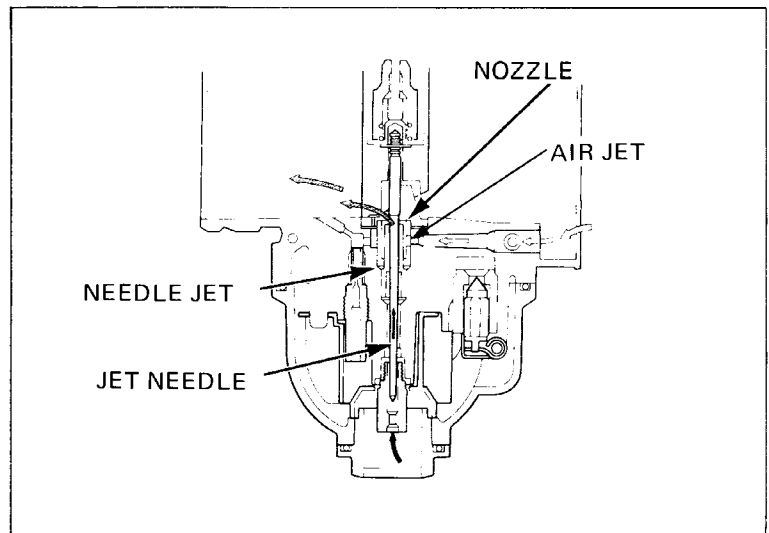


FUEL SYSTEM

MAIN CIRCUIT

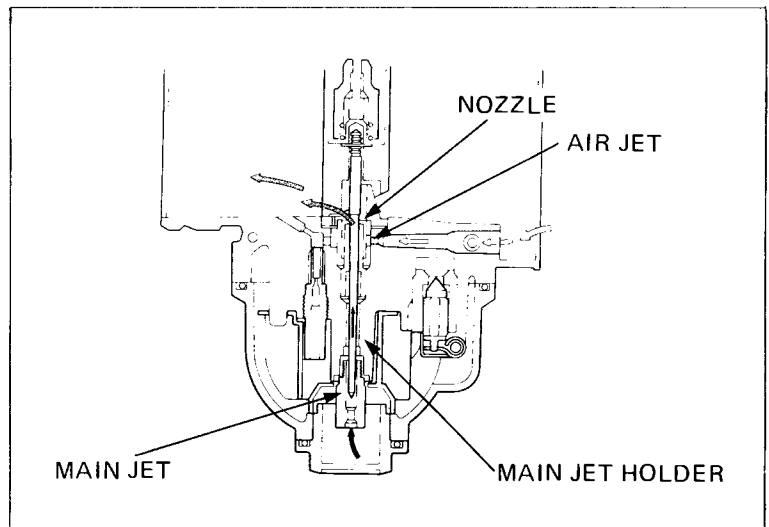
As the throttle valve is raised, fuel is metered by the needle jet, jet needle, and the throttle valve cutway. The fuel is mixed with air from the air jet and enters the venturi at the nozzle.

- This beginning portion of the main circuit affects 1/8-to-3/4 throttle.
 - In the 1/8-to-1/4 throttle range, the mixture can be altered by changing the jet needle O.D.
 - In the 1/4-to-3/4 throttle range, the mixture can be altered by adjusting the jet needle clip position.
- This final portion of the main circuit affects 1/2-to-full throttle.
 - The mixture can be altered by changing the main jet.



CARBURETOR OPERATION

The operation of the carburetor is broken into throttle opening segments; each of the metering units is responsible for one segment. There is always overlap from one segment to the next, so any change will always affect the next segment up or down. Because of this, making carburetor adjustments for altitude or temperature should be done in a methodical manner. See page 3-29.



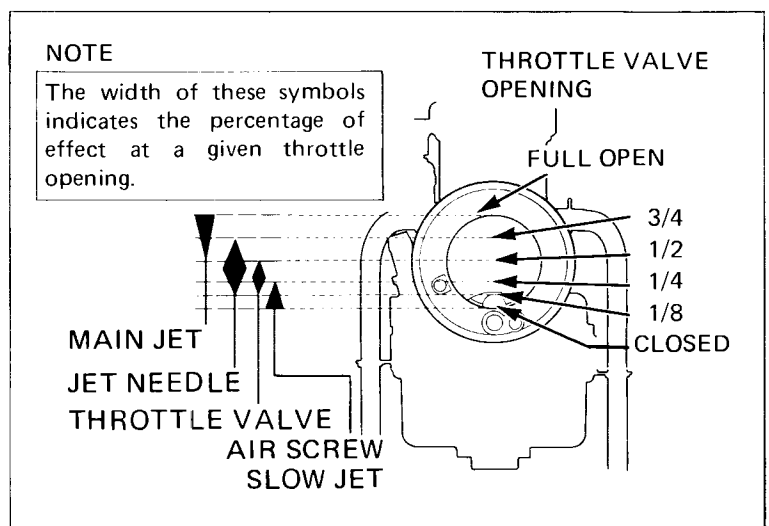
IDLE MIXTURE AND IDLE SPEED

Idle mixture can be adjusted by turning the air screw: turning it in richens the mixture, while turning it out leans the mixture.

To adjust: turn the air screw in until it seats lightly, then back it out to the standard setting.

STANDARD: 2-1/4 turns out

Start the engine. When the engine is warm enough to run without the choke, make fine adjustments in the air screw setting until the engine revs up smoothly.



To adjust the idle speed, if desired, warm up the engine and push the choke/idle speed knob down to the close position.

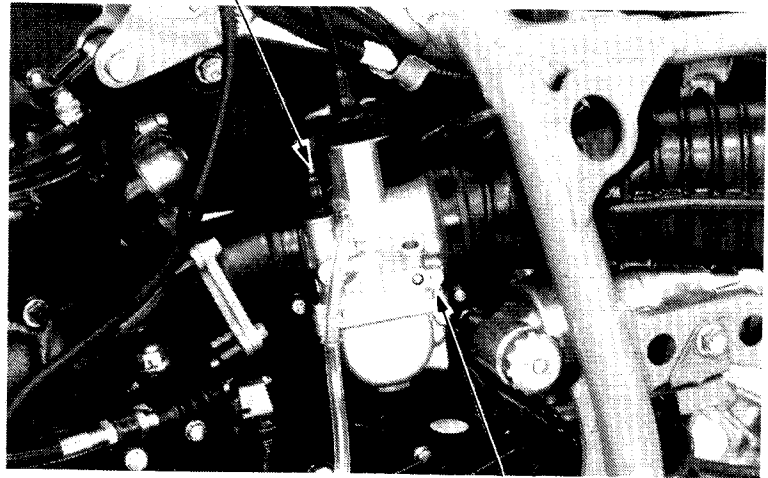
Turn the choke/idle speed knob clockwise to decrease engine speed, or counterclockwise to increase engine speed.

NOTE

For a stable idle speed, turn the choke/idle speed knob at least 4 turns (24 clicks) counterclockwise from the fully seated position.

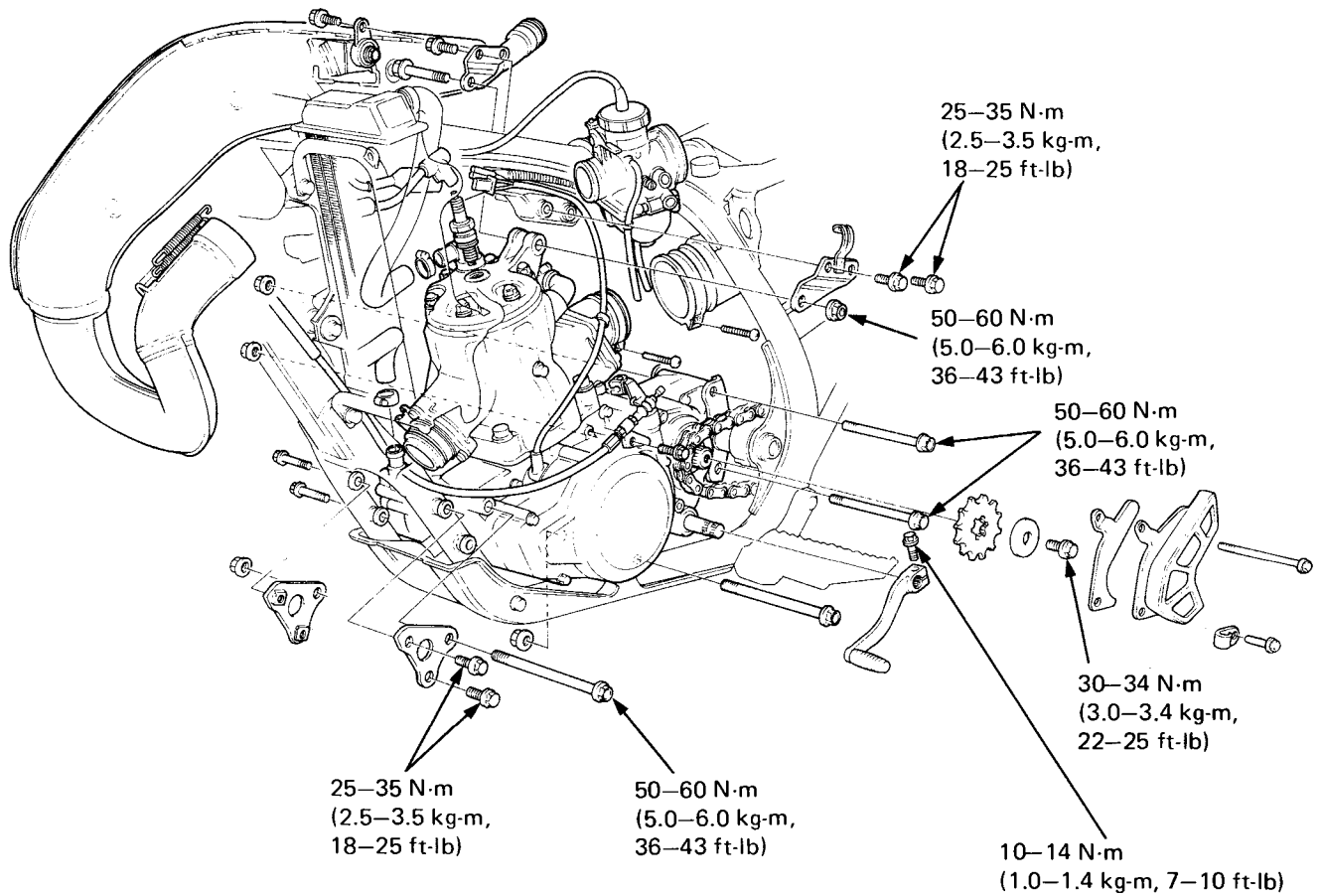
Test the adjustment by accelerating away from a slow corner. Readjust as necessary.

CHOKE/IDLE SPEED KNOB



AIR SCREW

ENGINE REMOVAL/INSTALLATION



4. ENGINE REMOVAL/ INSTALLATION

SERVICE INFORMATION	4-1
ENGINE REMOVAL	4-2
ENGINE INSTALLATION	4-3

GENERAL

The engine must be removed from the frame to service the following parts:

Transmission (Section 8)
Crankshaft (Section 8)

4

SPECIFICATIONS

Engine dry weight '85: 25.3 kg (55.7 lb)
Transmission oil capacity AFTER '85: 26.0 kg (57.3 lb)
0.7 ℓ (0.74 U.S. qt., 0.62 Imp. qt.) after disassembly
0.61 ℓ (0.65 U.S. qt., 0.54 Imp. qt.) after draining

TORQUE VALUES

Engine mount bolt (10 mm bolt) 50-60 N·m (5.0-6.0 kg-m, 36-43 ft-lb)
Engine hanger plate bolt (8 mm bolt) 25-35 N·m (2.5-3.5 kg-m, 18-25 ft-lb)
Drive sprocket bolt 30-34 N·m (3.0-3.4 kg-m, 22-25 ft-lb)
Gearshift pedal bolt 10-14 N·m (1.0-1.4 kg-m, 7-10 ft-lb)

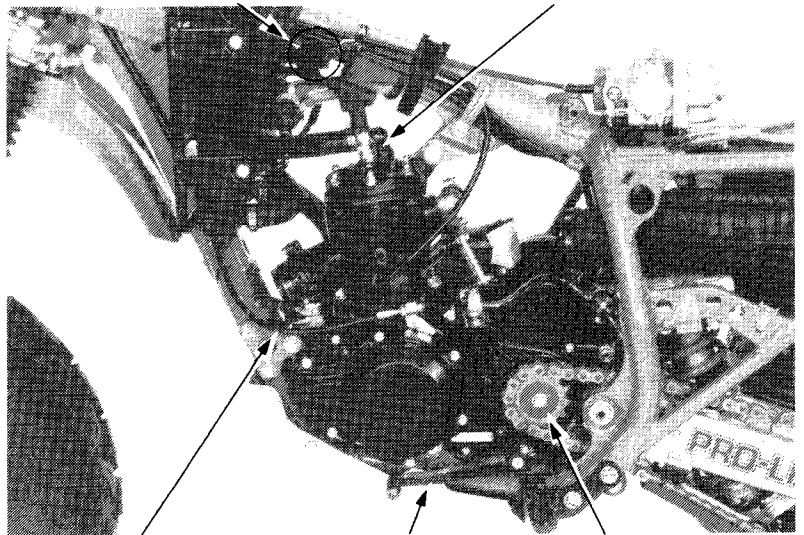
ENGINE REMOVAL/INSTALLATION

ENGINE REMOVAL

Remove the fuel tank and seat (Page 3-3).
Remove the carburetor ('85: Page 3-8, AFTER '85: 3-16).
Drain the radiator coolant (Page 9-3).
Loosen the drive chain (Page 2-10).
Remove the drive sprocket cover and remove the drive sprocket.

Disconnect the alternator coupler, and connectors. Disconnect the spark plug cap. Remove the gear shift pedal. Disconnect the clutch cable at its lower end.

ALTERNATOR COUPLER, CONNECTOR SPARK PLUG CAP



CLUTCH CABLE

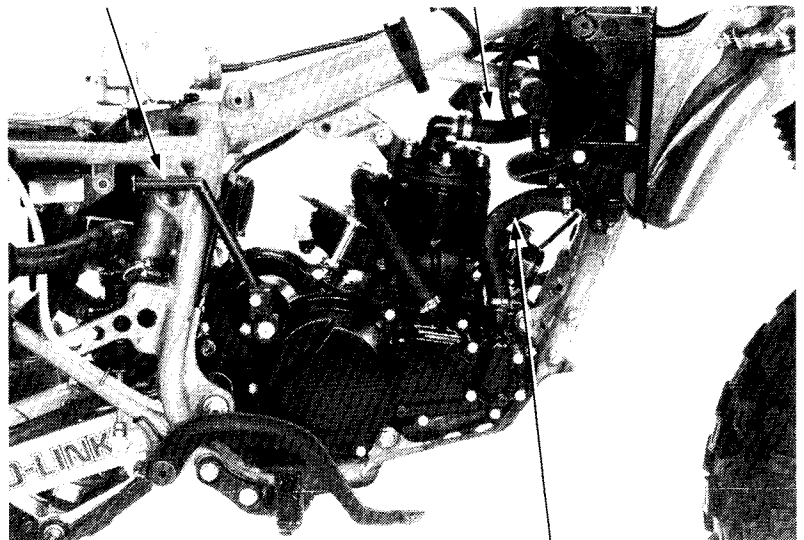
GEARSHIFT
PEDAL

DRIVE SPROCKET

Remove the kick starter pedal. Loosen the radiator hose bands and remove the hoses.

KICK STARTER
PEDAL

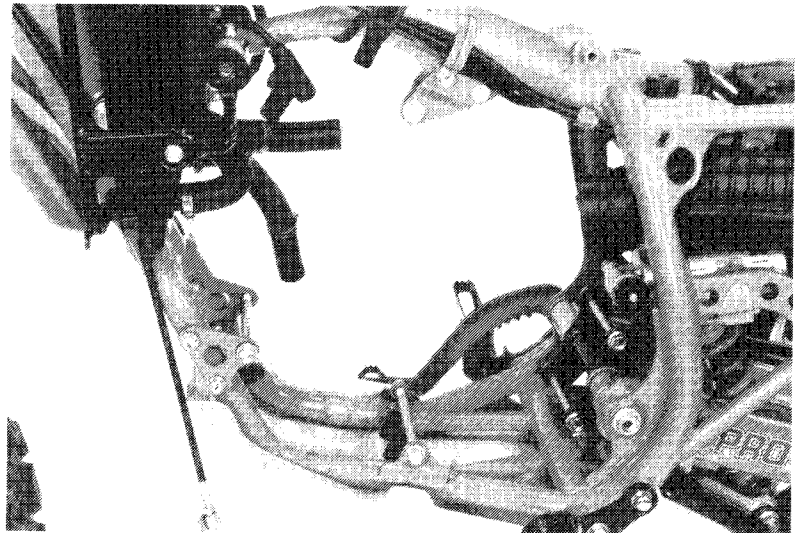
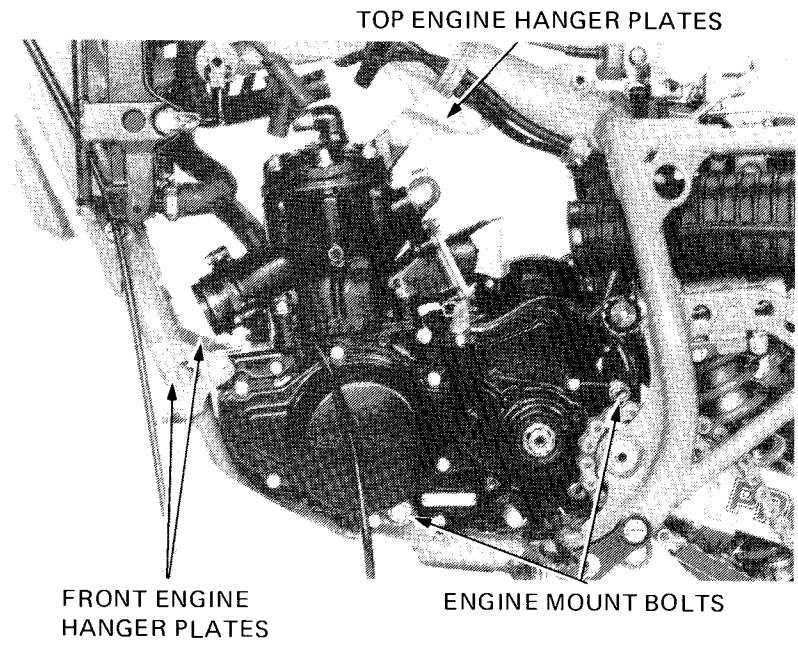
RADIATOR HOSE
(CYLINDER HEAD-TO-RADIATOR)



RADIATOR HOSE
(RADIATOR-TO-WATER PUMP)

ENGINE REMOVAL/INSTALLATION

Remove the engine hanger bolts and hangers.
Remove the engine mounting bolts.
Note the direction of the mounting bolts.
Remove the engine from the frame.



ENGINE REMOVAL/INSTALLATION

ENGINE INSTALLATION

Install the engine in the frame and tighten the engine mounting bolts and hanger plate bolts.

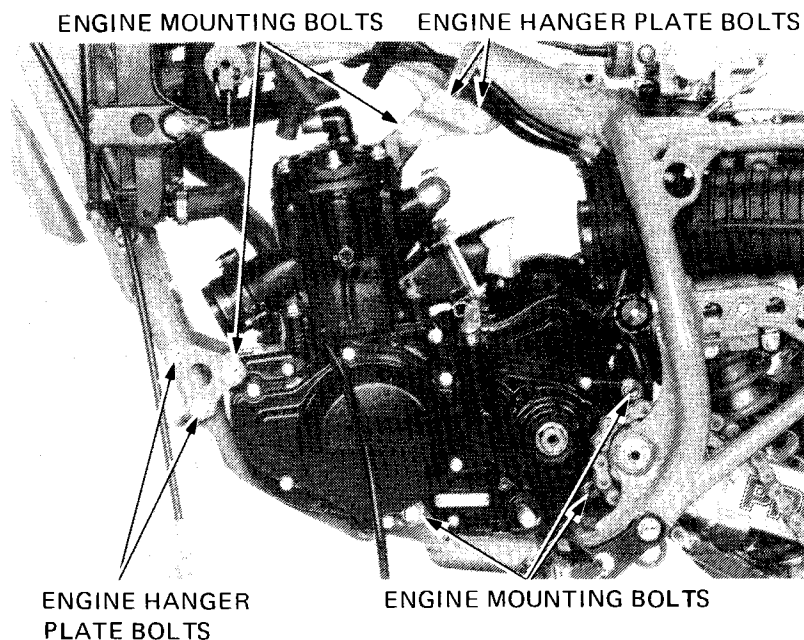
TORQUE:

ENGINE MOUNTING BOLT (10 mm):

50–60 N·m (5.0–6.0 kg·m, 36–43 ft·lb)

ENGINE HANGER PLATE BOLT (8 mm):

25–35 N·m (2.5–3.5 kg·m, 18–25 ft·lb)



Install the drive sprocket with the mark facing out.
Install the sprocket bolt and tighten it.

TORQUE: 30–34 N·m

(3.0–3.4 kg·m, 22–25 ft·lb)

Install the drive sprocket cover.

Install the gear shift pedal.

TORQUE: 10–14 N·m

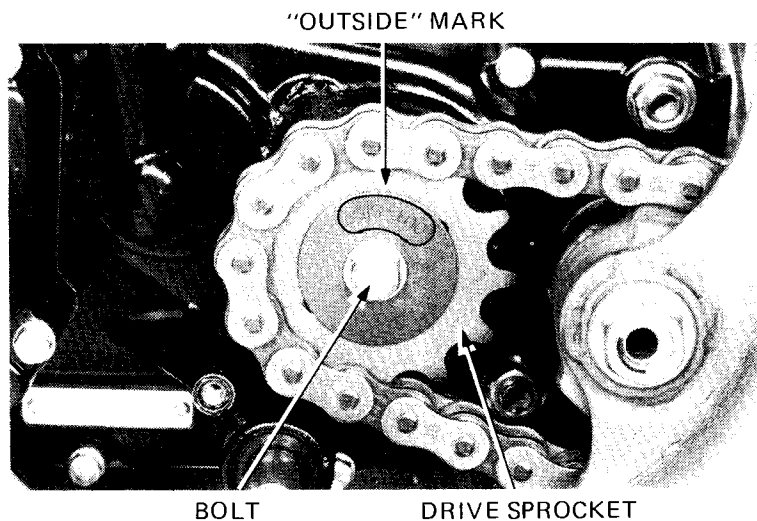
(1.0–1.4 kg·m, 7–10 ft·lb)

Install the removed parts in the reverse order of removal.

Route the cables and wires properly ('85: Page 1-9, AFTER '85: Page 1-12).

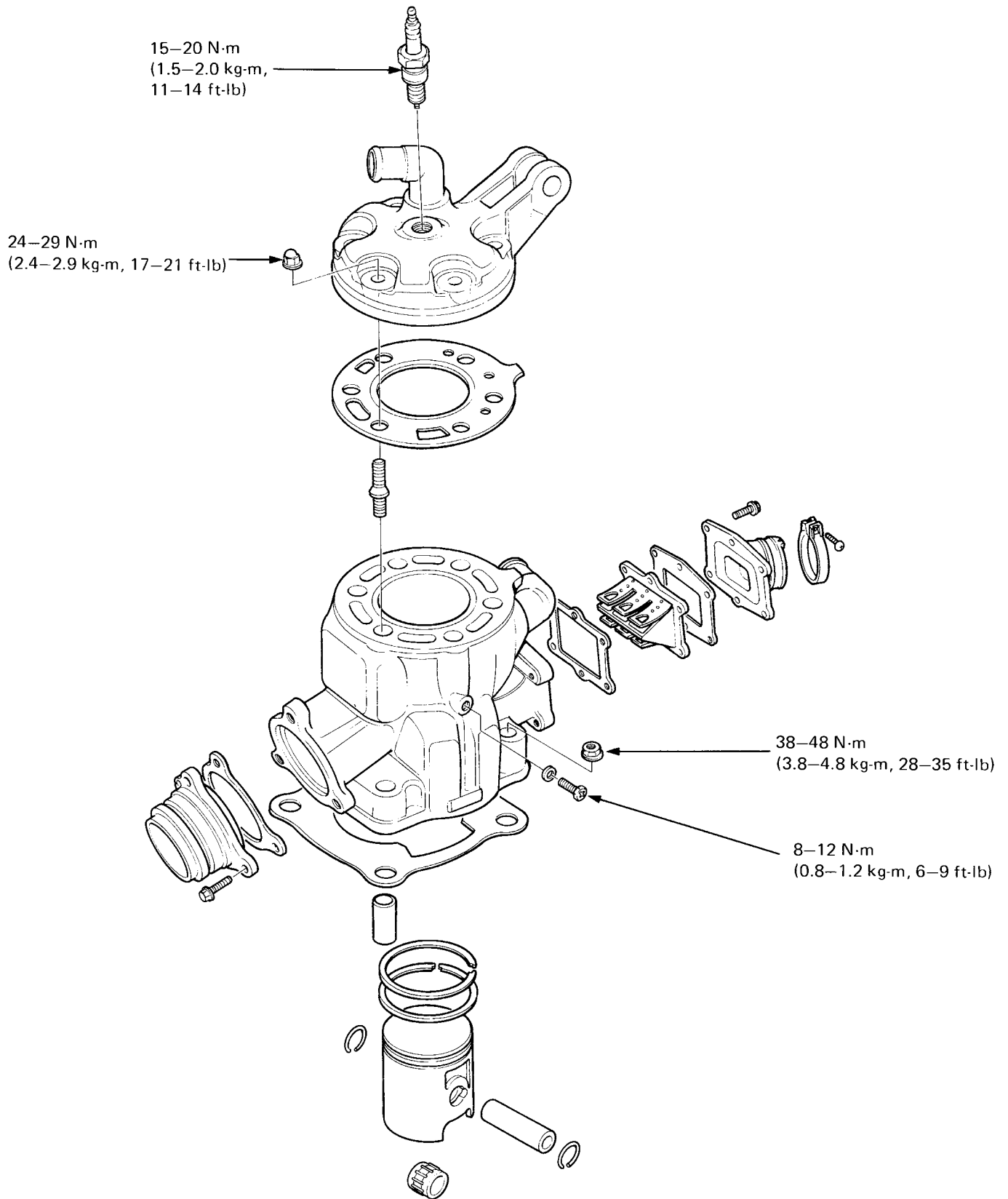
Adjust the clutch lever free play (Page 2-17) and drive chain slack (Page 2-10).

Fill the cooling system with recommended coolant mixture (Page 9-3).



MEMO

CYLINDER HEAD/CYLINDER/PISTON



5. CYLINDER HEAD/ CYLINDER/PISTON

SERVICE INFORMATION	5-1
TROUBLESHOOTING	5-2
CYLINDER HEAD	5-3
CYLINDER/PISTON	5-5

SERVICE INFORMATION

GENERAL

- All cylinder head, cylinder and piston maintenance and inspection can be done with the engine installed.
- Before disassembling the engine, clean the outside of the frame and engine thoroughly so to keep dirt and dust out of the cylinder and crankcase.
- Remove all traces of gasket material from the mating surfaces of the cylinder head, cylinder and crankcase.
- Clean all parts before inspecting.
- Before assembling, apply clean 2-stroke engine oil to all sliding surfaces.
- Under racing conditions, the piston and rings should be replaced after 30 hours of running. The piston pin and small end connecting rod bearing should be replaced after 30 hours of running.
- Optional oversize piston and piston rings are available. Refer to Page 1-14.

5

SPECIFICATIONS

ITEM		STANDARD mm (in)	SERVICE LIMIT mm (in)
Cylinder head warpage		0.05 (0.002)	0.07 (0.003)
Cylinder	I.D.	66.02–66.04 (2.5992–2.5998)	66.07 (2.601)
	Taper	—	0.03 (0.001)
	Out of round	—	0.03 (0.001)
Piston, piston pin, piston ring	Piston O.D. 30 mm (1.18 in) from piston skirt bottom	65.94–65.96 (2.596–2.597)	65.88 (2.594)
	Piston pin bore	18.007–18.013 (0.7089–0.7091)	18.03 (0.710)
	Piston pin O.D.	17.994–18.000 (0.7084–0.7087)	17.98 (0.708)
	Piston pin-to-pin bore	0.007–0.019 (0.0003–0.0007)	0.03 (0.001)
	Piston ring-to-ring groove clearance	0.045–0.075 (0.0018–0.003)	0.095 (0.0037)
	Piston ring end gap	0.2–0.4 (0.01–0.02)	0.5 (0.02)
Cylinder-to-piston clearance		0.060–0.095 (0.0024–0.0037)	0.14 (0.006)
Connecting rod small end I.D.		21.997–22.009 (0.8860–0.8665)	22.022 (0.8670)

TORQUE VALUES

Cylinder head nut	24–29 N·m (2.4–2.9 kg-m, 17–21 ft-lb)
Cylinder base nut	38–48 N·m (3.8–4.8 kg-m, 27–35 ft-lb)
Engine mounting bolt (10 mm)	50–60 N·m (5.0–6.0 kg-m, 36–43 ft-lb)
Engine hanger bolt (8 mm)	25–35 N·m (2.5–3.5 kg-m, 18–25 ft-lb)
Spark plug	15–20 N·m (1.5–2.0 kg-m, 11–14 ft-lb)
Cylinder coolant drain 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

- Blow cylinder head gasket
- Loose spark plug
- Worn, stuck or broken piston rings
- Worn or damaged cylinder and piston
- Faulty reed valve
- Worn crankshaft seals

Compression too high, overheating or knocking

- Excessive carbon buildup in combustion chamber or on piston top

Abnormal noise – piston

- Worn or cracked piston
- Worn cylinder and piston
- Worn piston pin or piston pin hole
- Worn connecting rod small end bearing

Abnormal noise – piston rings

- Worn, stuck or broken piston rings
- Worn or damaged cylinder

Contaminated coolant

- Leaking head gasket

CYLINDER HEAD

REMOVAL

Remove the seat/rear fender (Page 14-1).
 Remove the fuel tank (Page 3-3).
 Drain the coolant (Page 9-3).
 Disconnect the radiator hose from the cylinder head.
 Disconnect the spark plug cap, then remove the spark plug.
 Remove the top engine hanger plates.
 Remove the cylinder head nuts then remove the cylinder head.

NOTE

To avoid warping the cylinder head, use a crisscross pattern to loosen each nut about 1/4 turn, then remove the nuts.

Remove the cylinder head gasket.

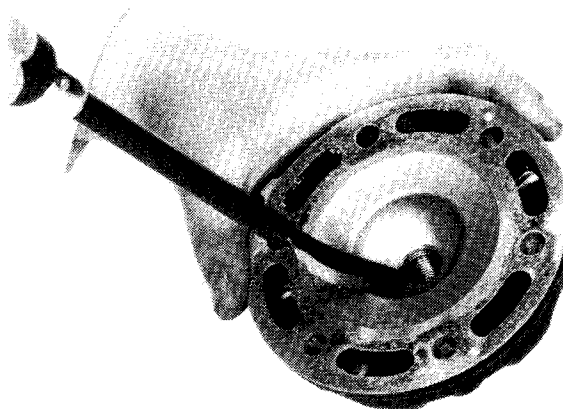
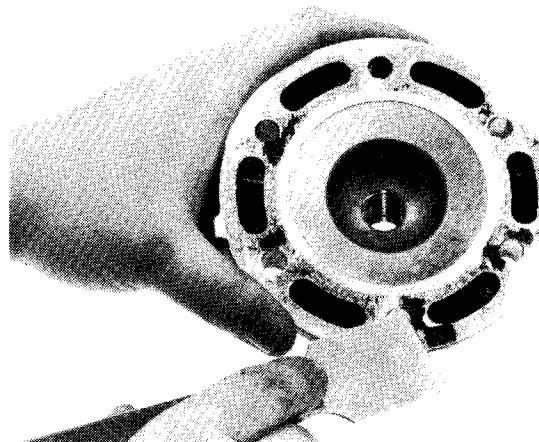
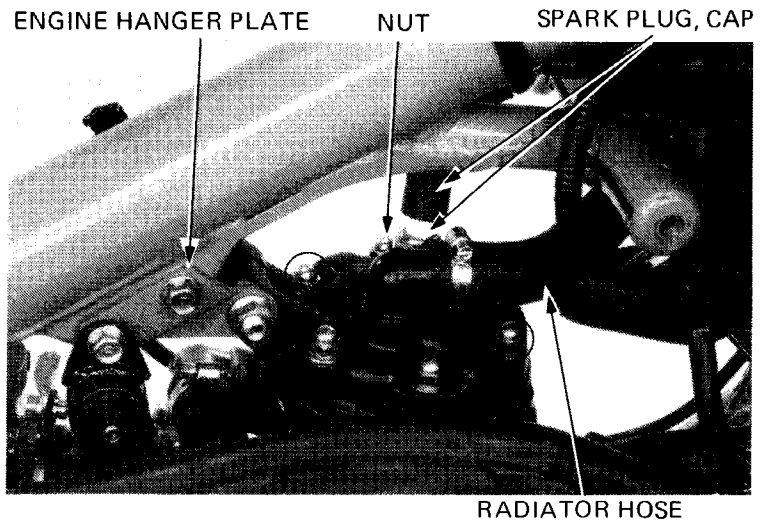
INSPECTION

Clean the head gasket surface of any gasket material.

Remove the carbon deposits from the combustion chamber.

CAUTION

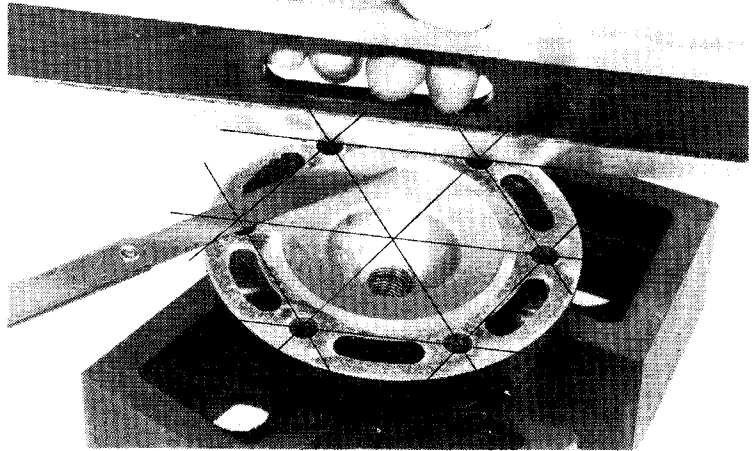
Use care not to scratch the combustion chamber or the head gasket surface.



CYLINDER HEAD/CYLINDER/PISTON

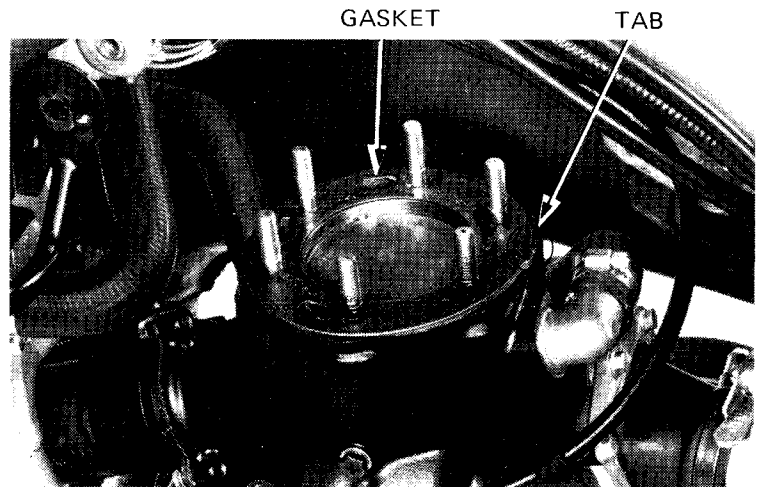
Check the cylinder head for warpage in diagonal directions with a straight edge and a feeler gauge.

SERVICE LIMIT: 0.05 mm (0.002 in)



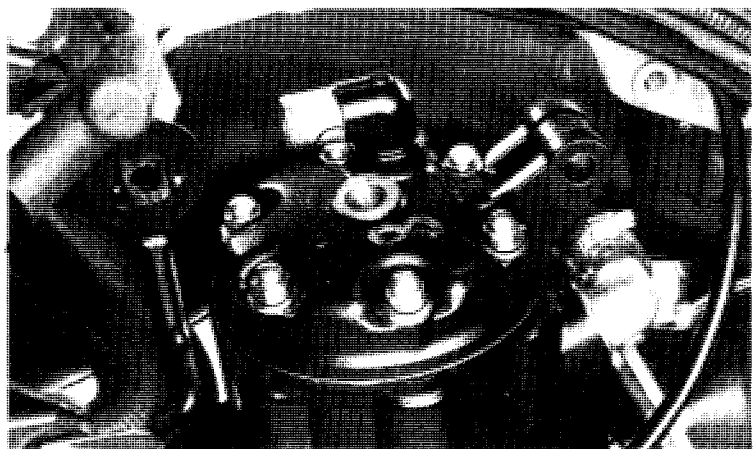
INSTALLATION

Install a new cylinder head gasket with its tab facing the rear.



Place the cylinder head on the cylinder.
Install the seven cylinder head nuts and tighten to the specified torque in a criss-cross pattern in 2 to 3 steps.

TORQUE: 24–29 N·m
(2.4–2.9 kg·m, 17–21 ft·lb)



Install the top engine hanger plates.
Tighten the engine mounting bolt and hanger plate bolts.

TORQUE:

ENGINE MOUNTING BOLT (10 mm bolt):

50–60 N·m (5.0–6.0 kg·m, 36–43 ft·lb)

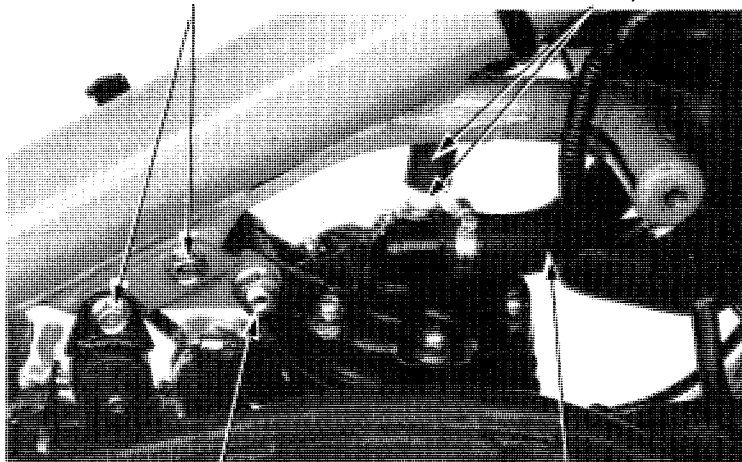
ENGINE HANGER PLATE BOLT (8 mm bolt):

25–35 N·m (2.5–3.5 kg·m, 18–25 ft·lb)

Connect the radiator hose to the cylinder head.
Pour the recommended coolant mixture up to the correct level (Page 9-3).

ENGINE HANGER PLATE BOLTS

SPARK PLUG, CAP



ENGINE MOUNT BOLT

RADIATOR HOSE

CYLINDER/PISTON

REMOVAL

Remove the cylinder head (Page 5-3).
Remove the alternator wire from the clamp.
Remove the exhaust chamber (Page 14-2).
Remove the carburetor (Page 3-7).
Remove the carburetor ('85: Page 3-8, AFTER '85: Page 3-16).
Disconnect the radiator hose (cylinder-to-water pump).
Remove the cylinder base nuts.

CAUTION

Do not pry or strike on the cylinder.

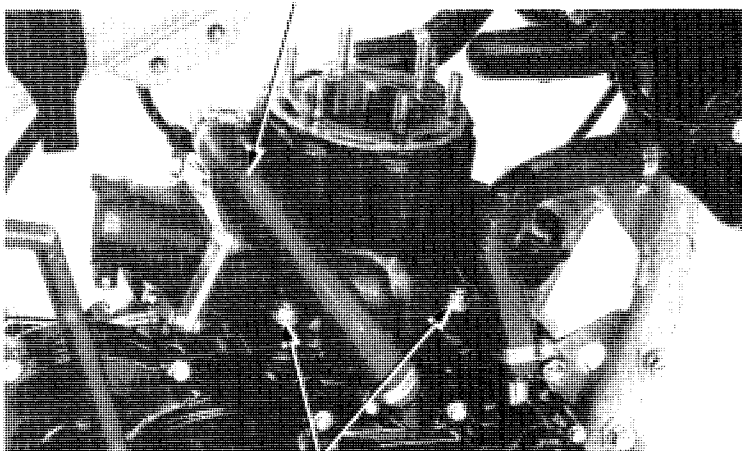
Place a clean shop towel into the crankcase to keep debris out.

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

CAUTION

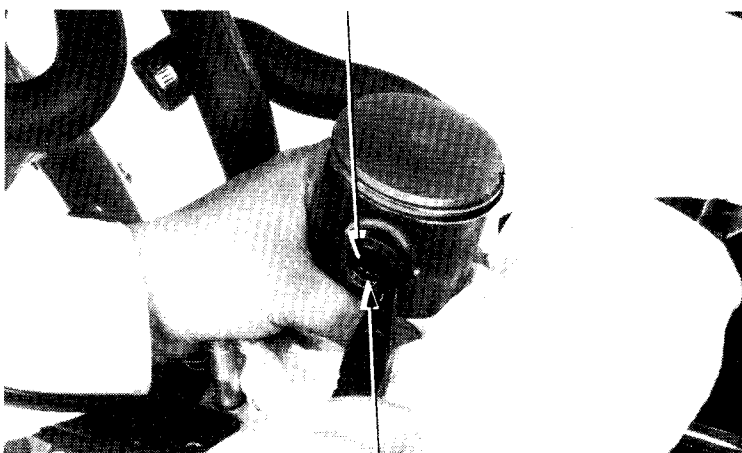
- Do not damage the piston.
- Always support the piston when pressing out the pin.
- Do not let the clips fall into the crankcase.

RADIATOR HOSE



CYLINDER BASE NUTS

PISTON PIN



PISTON PIN CLIP

CYLINDER HEAD/CYLINDER/PISTON

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

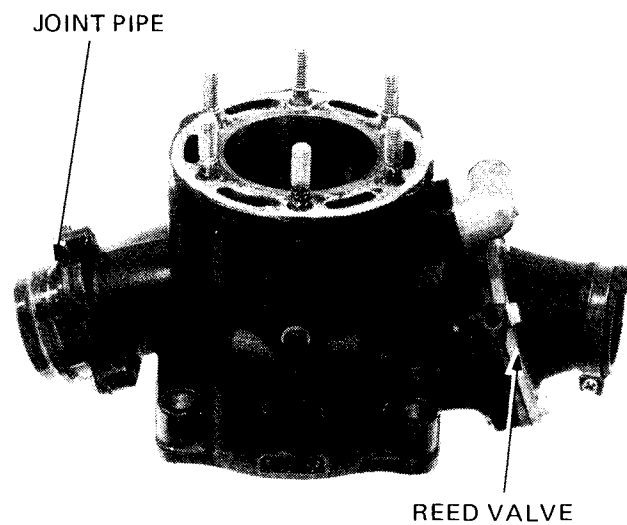
CAUTION

Do not damage the piston rings by spreading the ends too far.

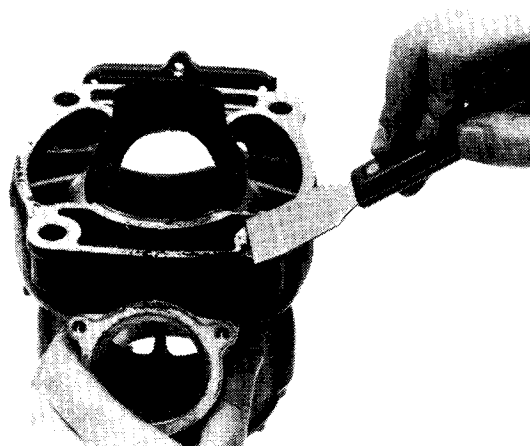


INSPECTION

Remove the exhaust chamber joint pipe and reed valve.



Remove the gasket material from the mating surface of the cylinder.



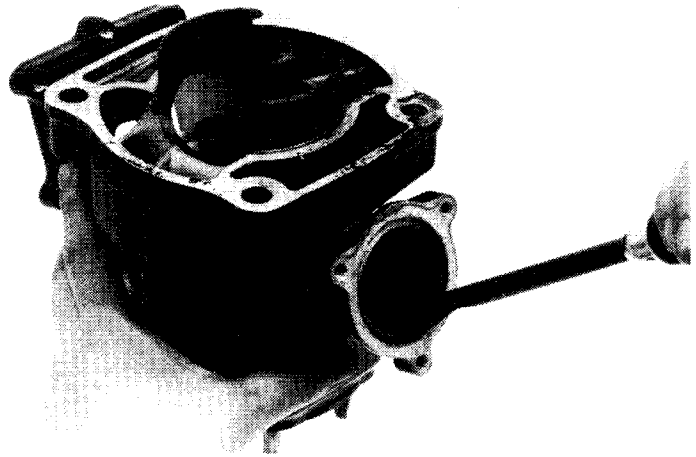
Check the cylinder and piston for wear or damage.
Clean carbon deposits from the exhaust port area.

CAUTION

Do not damage the cylinder bore.

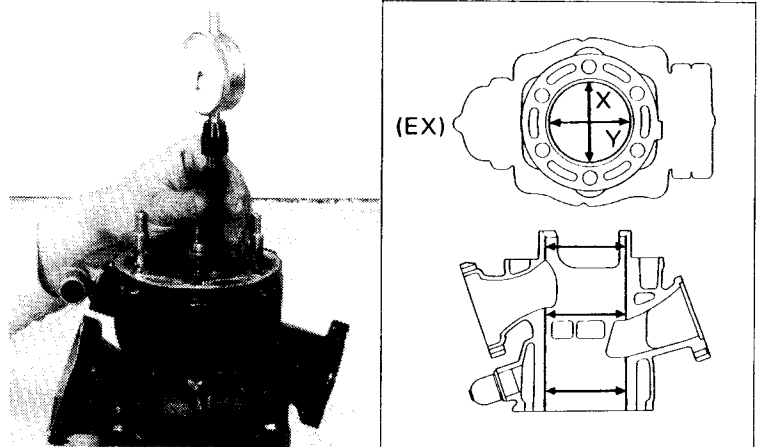
NOTE

Under racing conditions, the piston and rings should be replaced after 30 hours of running. And the piston pin and connecting rod small end bearing replaced after 30 hours of running.



Inspect the cylinder bore for wear at three levels in X and Y directions. Take the maximum figure measured to determine the cylinder wear.

SERVICE LIMIT: 66.07 mm (2.601 in)



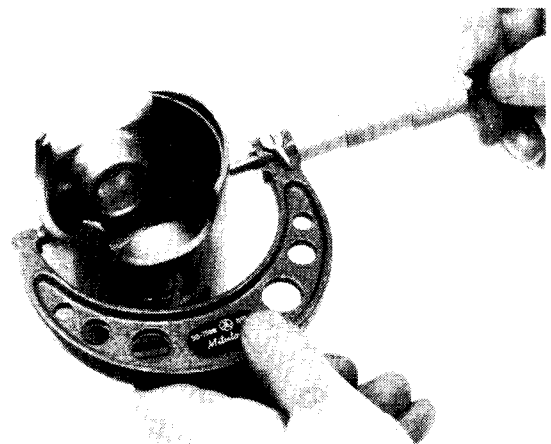
Measure the piston O.D. 30 mm (1.18 in) from the bottom of the skirt and at a right angle to the piston pin hole.

SERVICE LIMIT: 65.88 mm (2.594 in)

If the O.D. is under the service limit, replace the piston with a new one.

Calculate the piston-to-cylinder clearance.

SERVICE LIMIT: 0.14 mm (0.006 in)



CYLINDER HEAD/CYLINDER/PISTON

Measure the piston pin bore I.D.

SERVICE LIMIT: 18.03 mm (0.710 in)

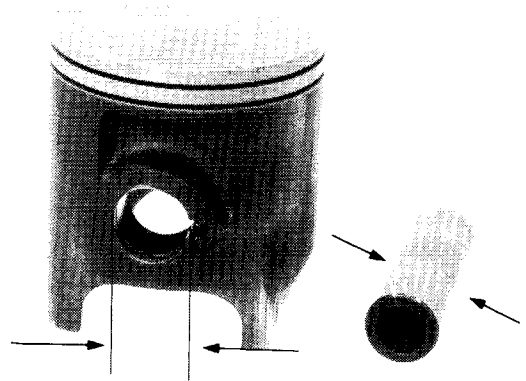
Check the piston pin for wear and excessive discoloration.

Measure the piston pin O.D.

SERVICE LIMIT: 17.98 mm (0.708 in)

Calculate the piston pin-to-piston clearance.

SERVICE LIMIT: 0.03 mm (0.001 in)

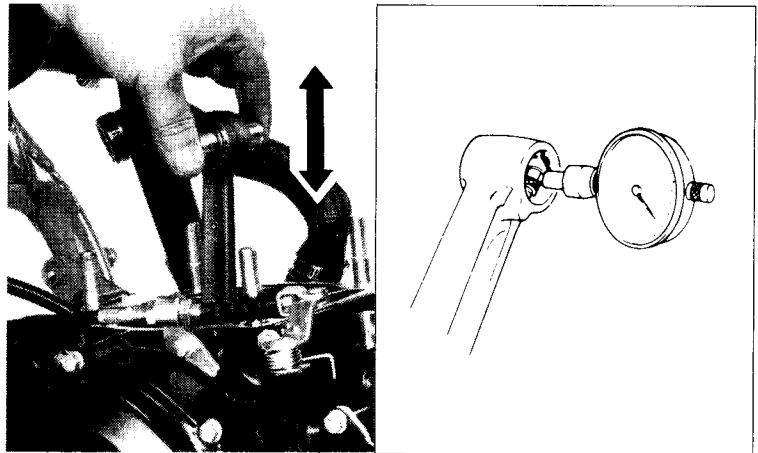


Install the bearing and piston pin in the connecting rod small end and check for excessive play. If it feels loose, measure the small end I.D.

SERVICE LIMIT: 22.022 mm (0.8670 in)

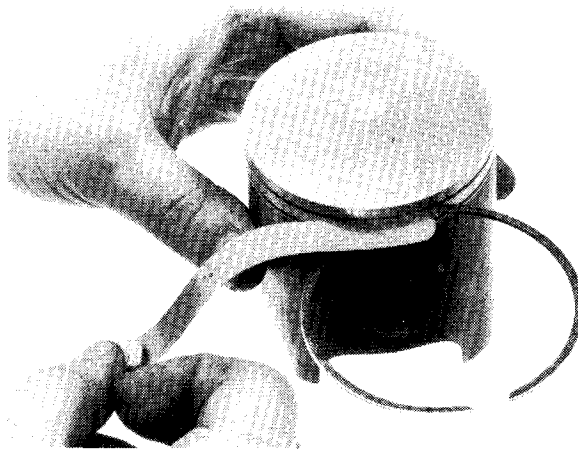
If not over the service limit, replace the piston pin and small end bearing.

If over the service limit, replace the crankshaft assembly.



Inspect the piston ring-to-groove clearance.

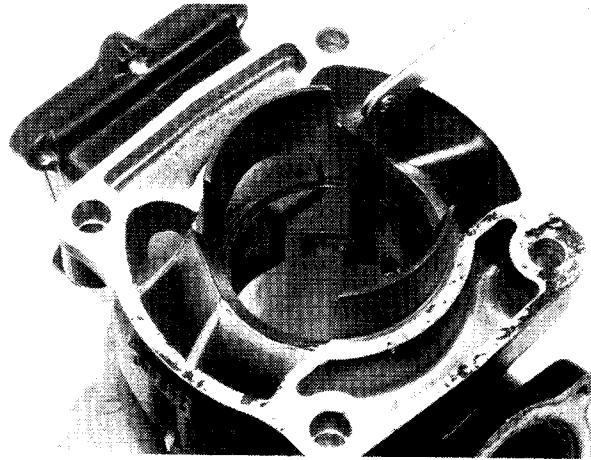
SERVICE LIMIT: 0.095 mm (0.0037 in)



Insert the piston rings into the cylinder. Use the piston to place the ring squarely in the cylinder.

Measure each piston ring's end gap with a feeler gauge.

SERVICE LIMIT: 0.5 mm (0.02 in)

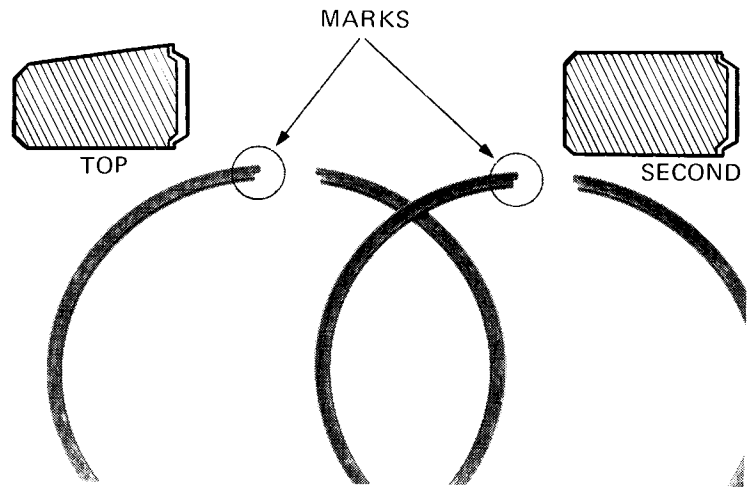


INSTALLATION

Clean the piston ring grooves.
Lubricate the piston rings and piston ring grooves with clean 2-stroke oil.
Install the piston rings on the piston.

NOTE

- Install the piston rings with the marks facing up.
- After installation, check that the rings rotate freely in the ring grooves.



Lubricate the small end bearing and piston pin with clean 2-stroke oil.
Install the connecting rod small end bearing, piston and piston pin.

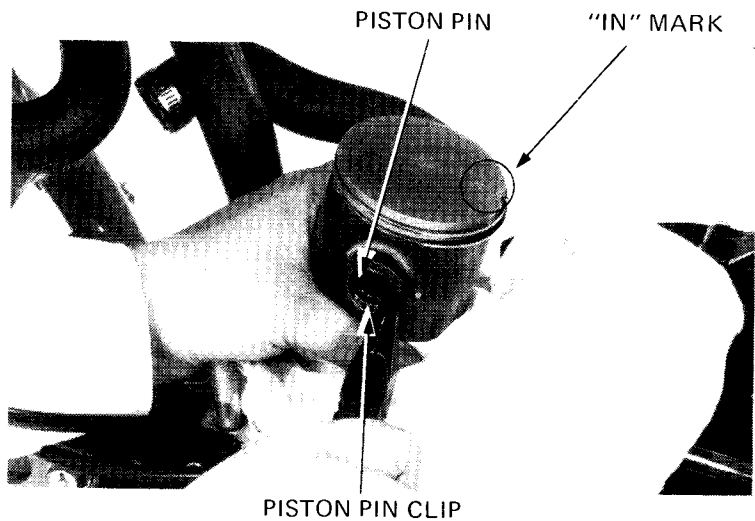
NOTE

- Install the piston with the "IN" mark facing the intake side.

Install the piston pin clips.

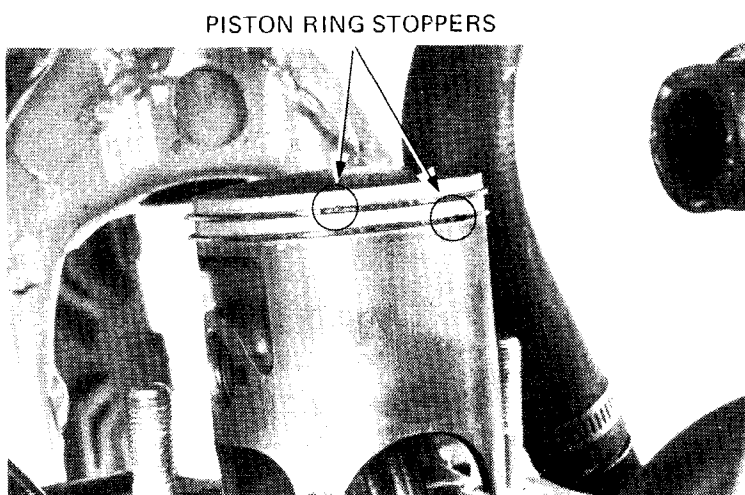
CAUTION

- Use new pin clips. Never reuse old clips.
- Do not let the clips fall into the crankcase.

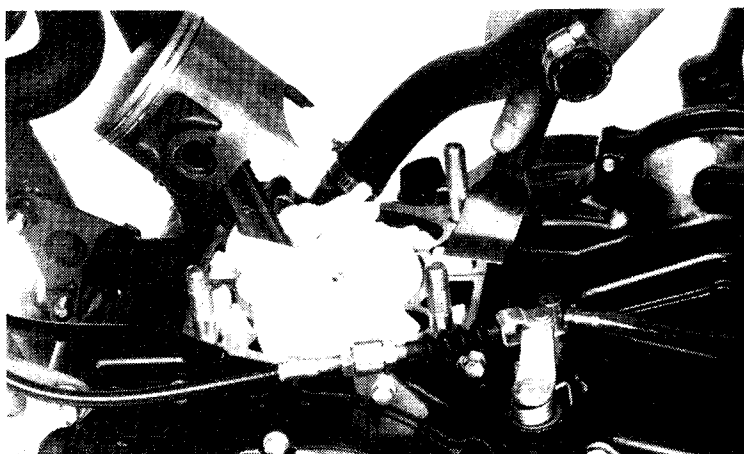


CYLINDER HEAD/CYLINDER/PISTON

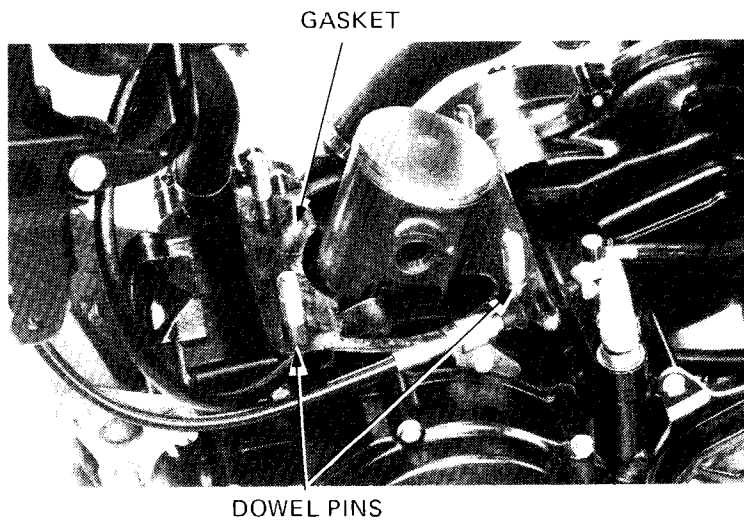
Align each ring end gap with the piston ring stoppers in the ring land.



Clean the cylinder base gasket surfaces.



Place the cylinder base gasket and dowel pins on the crankcase.

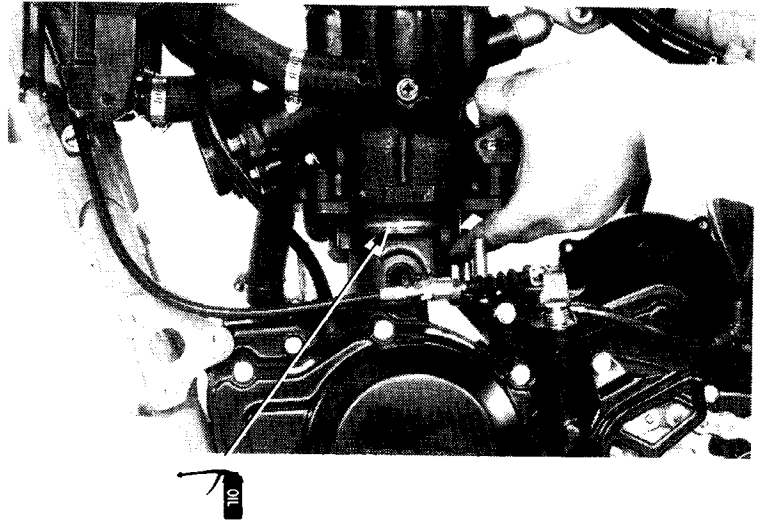


Install the exhaust chamber joint pipe and reed valve.

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

CAUTION

Do not rotate the cylinder, since this may cause the piston rings to snag a cylinder port and break.

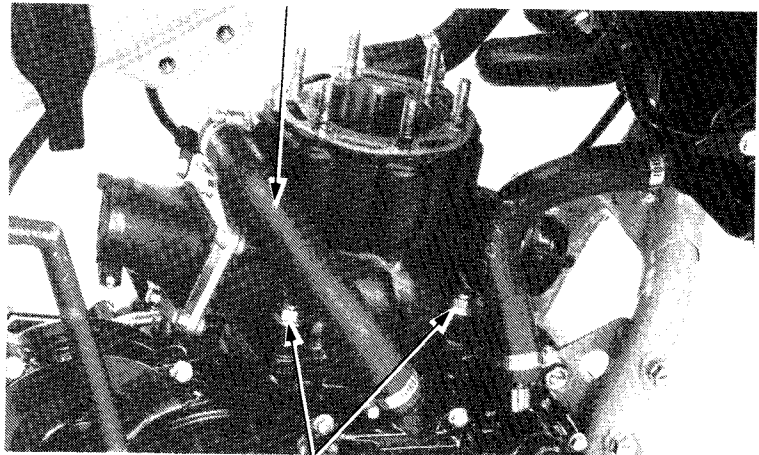


Install the cylinder base nuts.

TORQUE: 38–48 N·m
(3.8–4.8 kg·m, 27–35 ft·lb)

Connect the radiator hose (cylinder-to-water pump).
Install the exhaust chamber (Page 14-3).
Install the carburetor ('85: Page 3-11, AFTER '85: Page 3-22).

RADIATOR HOSE



CYLINDER BASE NUTS

Install a new gasket onto the cylinder with its tab facing the rear.

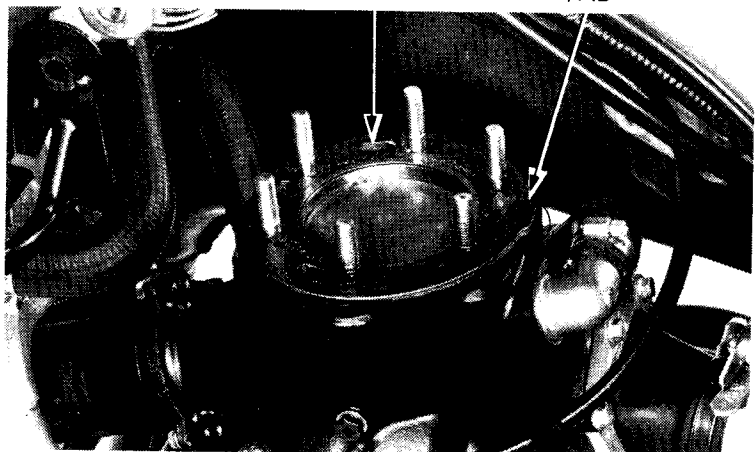
Install the cylinder head (Page 5-4).

Perform the following inspections:

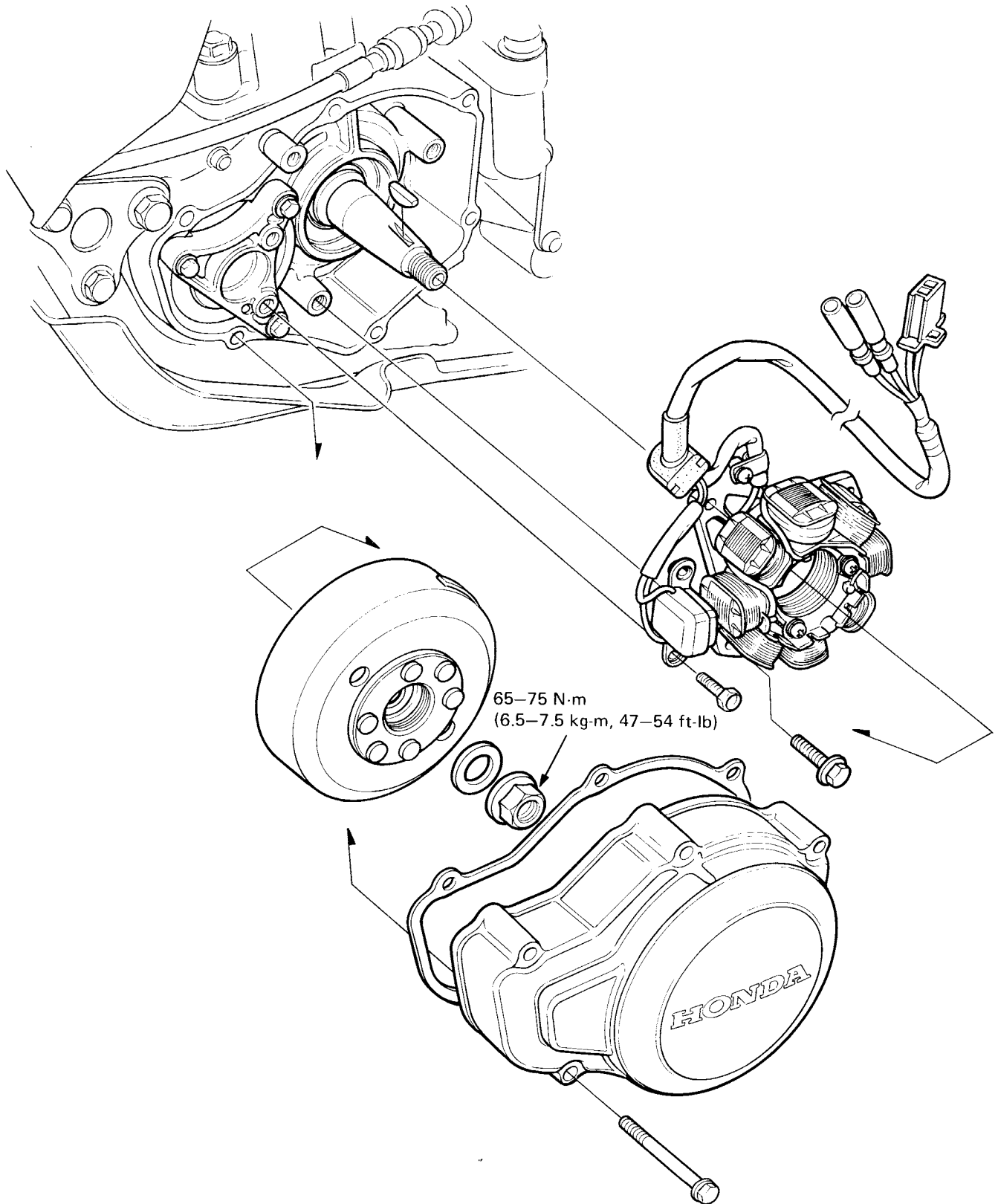
- Check for compression leaks.
- Listen for abnormal engine noises.
- Check for secondary air leaks.

GASKET

TAB



ALTERNATOR



6. ALTERNATOR

SERVICE INFORMATION	6-1
ALTERNATOR REMOVAL	6-2
ALTERNATOR INSTALLATION	6-3

SERVICE INFORMATION

GENERAL

- This section covers removal and installation of the alternator. These operations can be done with the engine installed after removing the left crankcase cover.
- For alternator inspection and troubleshooting, refer to section 15.

TORQUE VALUE

Rotor nut 65–75 N·m (6.5–7.5 kg·m, 47–54 ft·lb)

TOOLS

Common

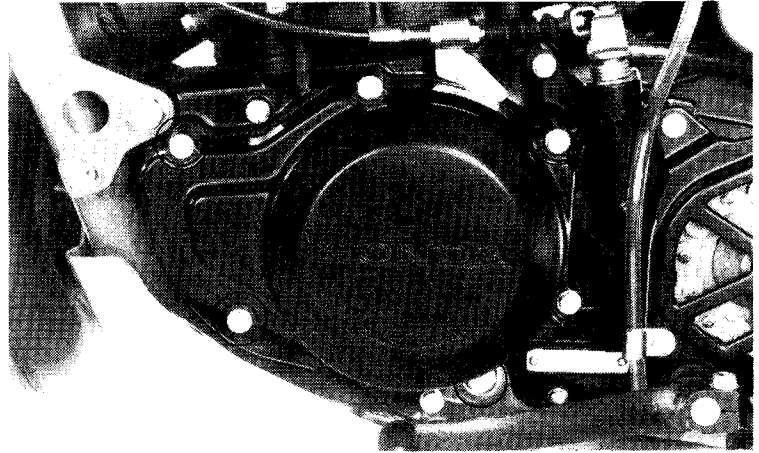
Rotor puller 07733–0010000 or 07933–0010000
Universal holder 07725–0030000

ALTERNATOR

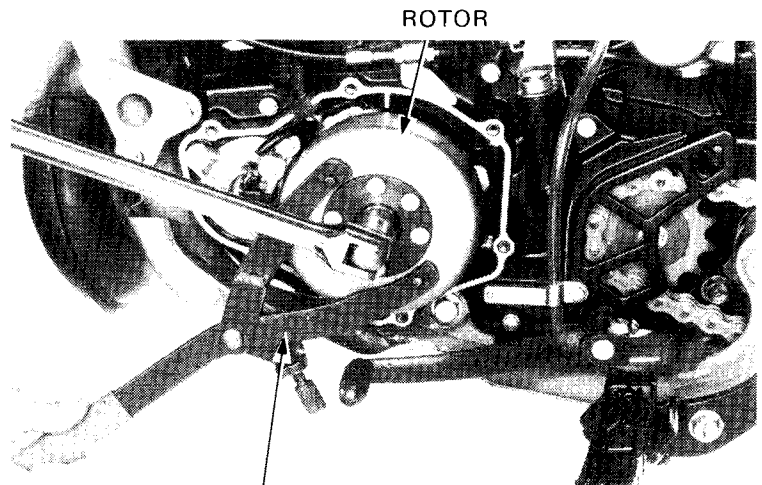
ALTERNATOR REMOVAL

ROTOR REMOVAL

Remove the left crankcase cover attaching bolts and remove the left crankcase cover.
Remove the gasket.

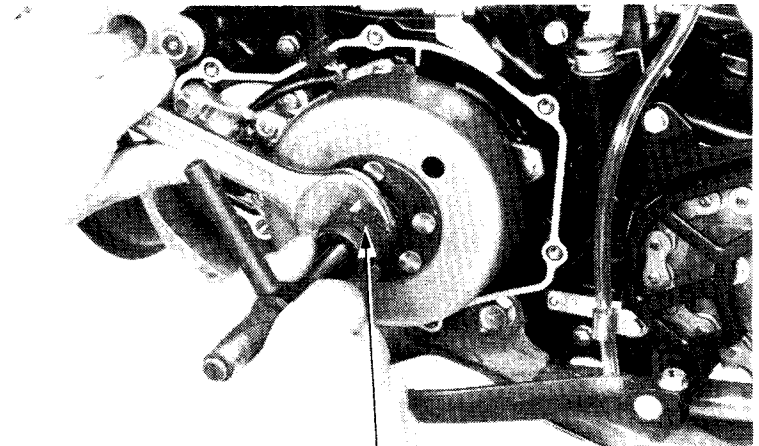


Hold the rotor with a universal holder and remove the rotor nut.



UNIVERSAL HOLDER
07725-0030000

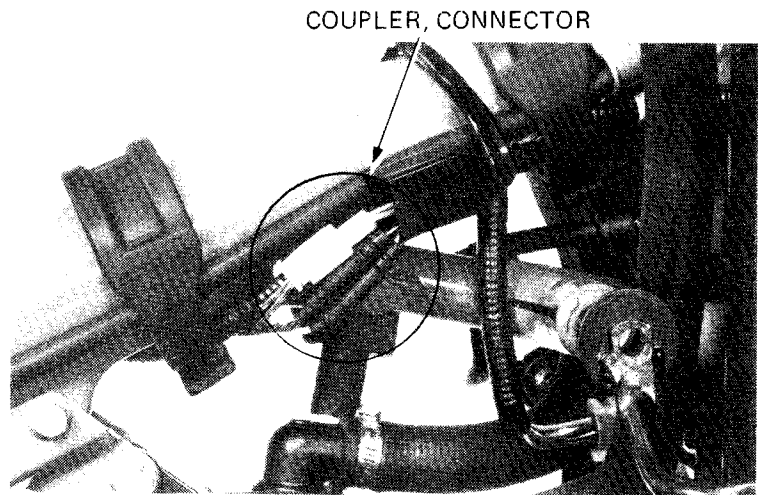
Remove the rotor with a rotor puller.
Remove the woodruff key from the crankshaft.



ROTOR PULLER 07733-0010000 OR
07933-0010000

STATOR REMOVAL

Remove the fuel tank (Page 3-3).
Disconnect the alternator coupler and connector.



Remove the stator attaching bolts and remove the stator.
Remove the pulse generator attaching bolts and remove the pulse generator.

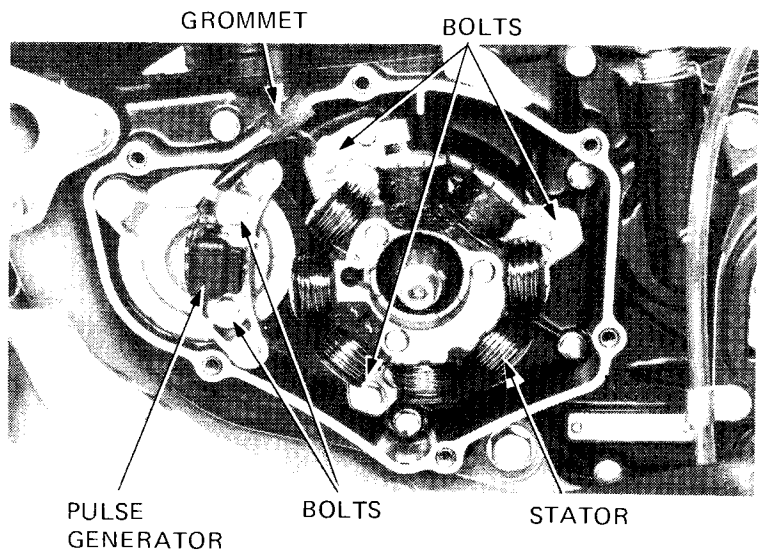
ALTERNATOR INSTALLATION

STATOR INSTALLATION

Install the stator in the reverse order of removal.

NOTE

Install the grommet securely into the left crankcase groove.

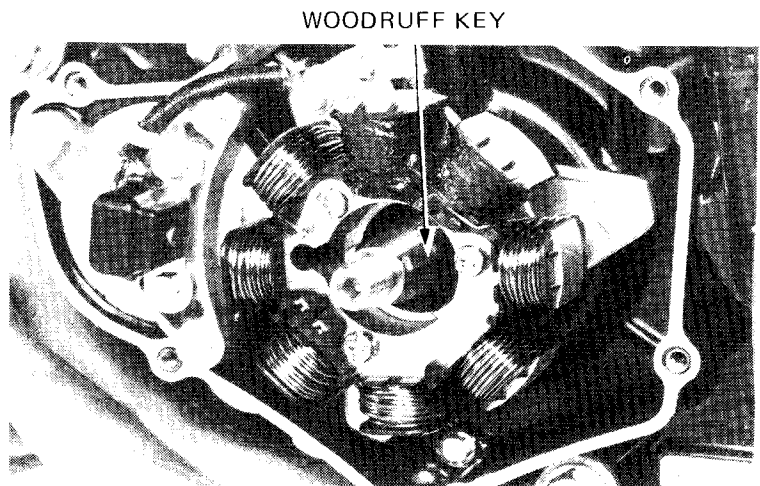


ROTOR INSTALLATION

Install the woodruff key aligning it with the keyway in the crankshaft.

NOTES

- Check that there is no debris inside the rotor before installation. The magnets tend to attract steel filings and other ferrous debris.
- Clean the tapered hole in the rotor of any burrs and other faults; repair if necessary.

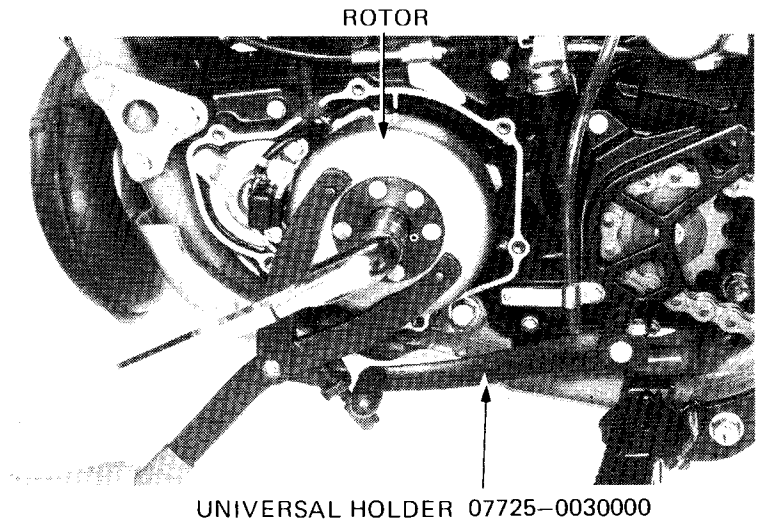


ALTERNATOR

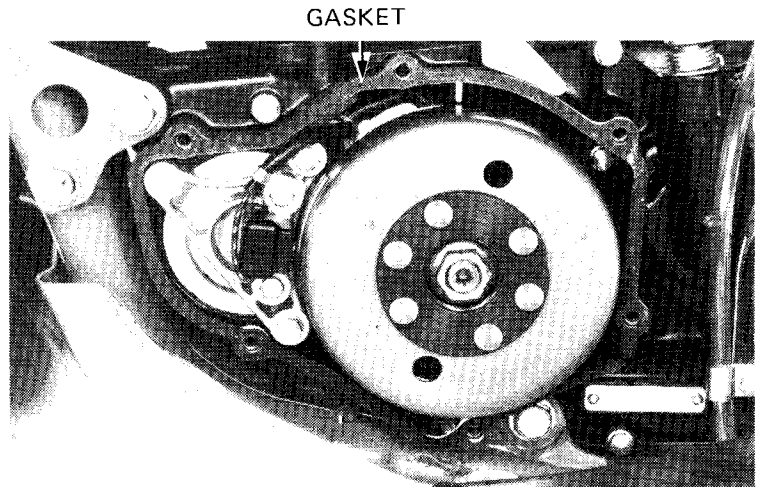
Install the rotor.
Install the washer and nut.
Hold the rotor with a universal holder.
Tighten the nut.

TORQUE: 65–75 N·m
(6.5–7.5 kg·m, 47–54 ft·lb)

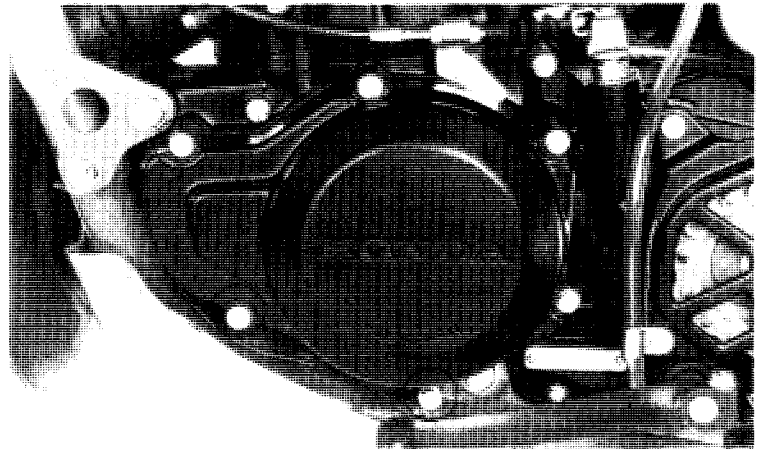
After installing the rotor, inspect the ignition timing
(Page 2-9).



Install the gasket.



Install the left crankcase cover.



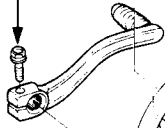
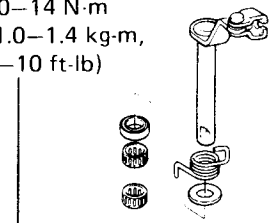
MEMO

CLUTCH/GEARSHIFT LINKAGE/KICK STARTER

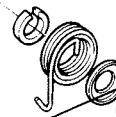
F.W.D.



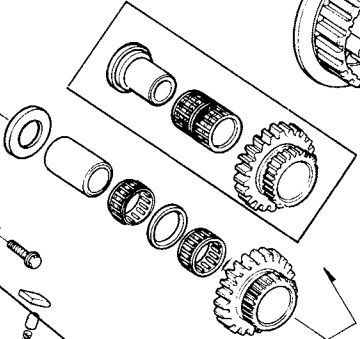
10–14 N·m
(1.0–1.4 kg·m,
7–10 ft·lb)



20–24 N·m
(2.0–2.4 kg·m,
14–17 ft·lb)



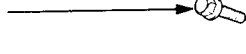
AFTER MID '85:



55–65 N·m
(5.5–6.5 kg·m,
40–47 ft·lb)

10–14 N·m
(1.0–1.4 kg·m,
7–10 ft·lb)

20–35 N·m
(2.0–3.5 kg·m,
14–25 ft·lb)



7. CLUTCH/GEARSHIFT LINKAGE/KICK STARTER

SERVICE INFORMATION	7-1
TROUBLESHOOTING	7-2
CLUTCH	7-3
CLUTCH LIFTER	7-10
SHIFT LINKAGE	7-12
KICK STARTER	7-16

SERVICE INFORMATION

GENERAL

- The clutch, kick starter and shift linkage can be serviced with the engine installed.
- Remove any gasket material from the crankcase mating surfaces.
- Do not allow dirt in the engine.
- Be careful not to damage the case mating surfaces during disassembly.
- Clean all parts before inspecting. Coat all contact surfaces with clean transmission oil before assembly.
- It is not necessary to disconnect the water hoses to remove the right crankcase cover from the crankcase when servicing the clutch, kick starter and gearshift linkage.

7

SPECIFICATIONS

ITEM		STANDARD mm (in)	SERVICE LIMIT mm (in)
Clutch lever free play		10-20 (3/8-3/4)	—
Clutch	Clutch spring free length	47 (1.85)	45 (1.8)
	Clutch disc thickness	2.92-3.08 (0.117-0.121)	2.85 (0.112)
	Clutch plate warpage	—	0.15 (0.006)
	Clutch outer guide O.D.	27.987-28.000 (1.1018-1.1024)	27.97 (1.101)
Kick starter	Kick starter spindle O.D.	21.959-21.980 (0.8645-0.8654)	21.94 (0.864)
	Kick starter pinion gear I.D.	22.020-22.041 (0.8669-0.8677)	22.06 (0.869)

TORQUE VALUES

Clutch center lock nut	55-65 N·m (5.5-6.5 kg-m, 40-47 ft-lb)
Kick starter pedal bolt	20-35 N·m (2.0-3.5 kg-m, 14-25 ft-lb)
Footpeg mounting bolt	50-60 N·m (5.0-6.0 kg-m, 36-43 ft-lb)
Gearshift pedal bolt	10-14 N·m (1.0-1.4 kg-m, 7-10 ft-lb)

TOOLS

Common

Lock nut wrench, 17 x 27 mm	07716-0020300 or equivalent in U.S.A.
Extension bar	07716-0020500 or equivalent in U.S.A.
Clutch center holder	07724-0050000 or equivalent available in U.S.A.

TROUBLESHOOTING

Clutch slips when accelerating

- No free play
- Discs worn
- Springs weak

Clutch operation feels rough

- Outer drum slots rough

Jumps out of gear

- Shift drum stopper arm damaged and/or return spring broken

Hard shifting

- Shift spindle pawl bent or damaged
- Shift spindle bent
- Faulty stopper arm

Kick starter slips

- Worn or damaged starter ratchet and/or pinion gear
- Kick starter ratchet out of ratchet guide

Kick starter pedal does not return

- Weak or damaged kick return spring
- Return spring hook out of place

Gearshift pedal does not return

- Bent gearshift spindle
- Broken shift spindle return spring

Vehicle creeps with clutch disengaged

- Too much free play
- Plates warped

Excessive lever pressure

- Clutch cable kinked, damaged or dirty
- Lifter mechanism damaged
- Clutch cable not routed properly

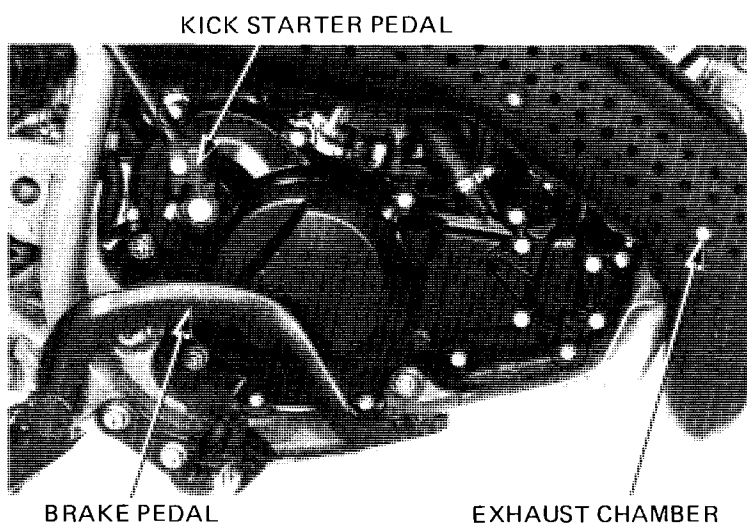
CLUTCH

RIGHT CRANKCASE COVER REMOVAL

Drain the transmission oil (Page 2-4).
 Remove the rear master cylinder mount bolts and brake pedal (Page 13-23).
 Remove the exhaust chamber (Page 14-3).
 Remove the kick starter pedal.

NOTE

It is not necessary to drain radiator coolant when the water hose is not disconnected.



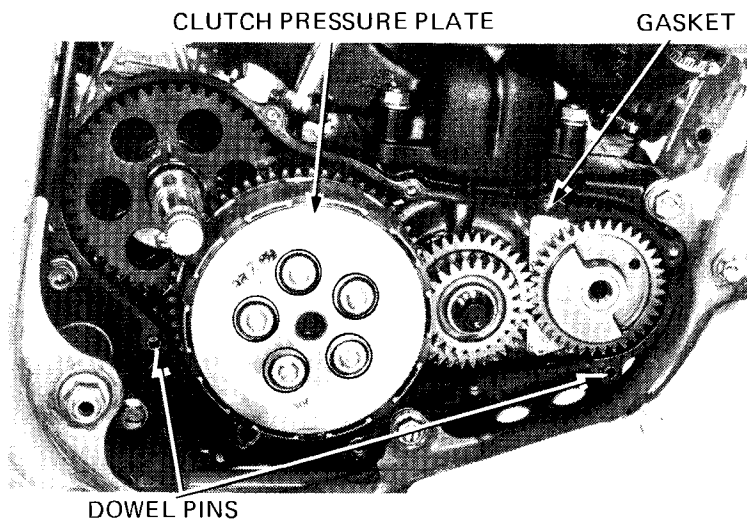
CLUTCH DISASSEMBLY

Remove the gasket and two dowel pins.
 Remove the clutch spring bolts and clutch spring.

NOTE

Loosen the bolts in a criss-cross pattern in 2 or 3 progressive steps.

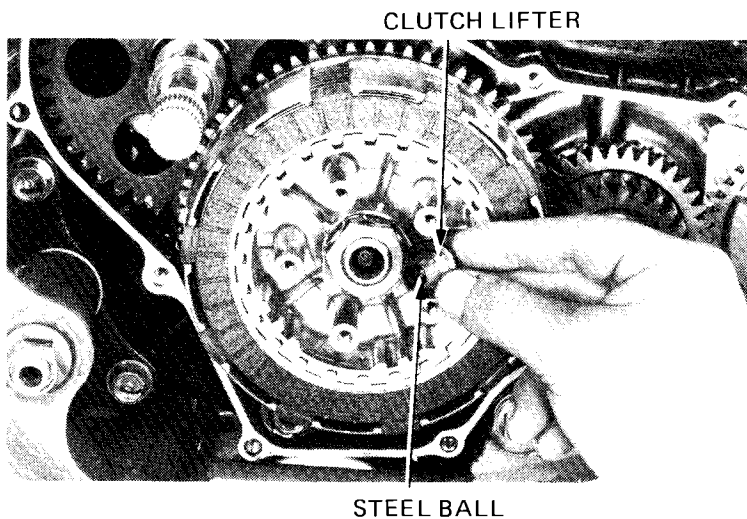
Remove the clutch pressure plate.



Remove the clutch lifter, steel ball.

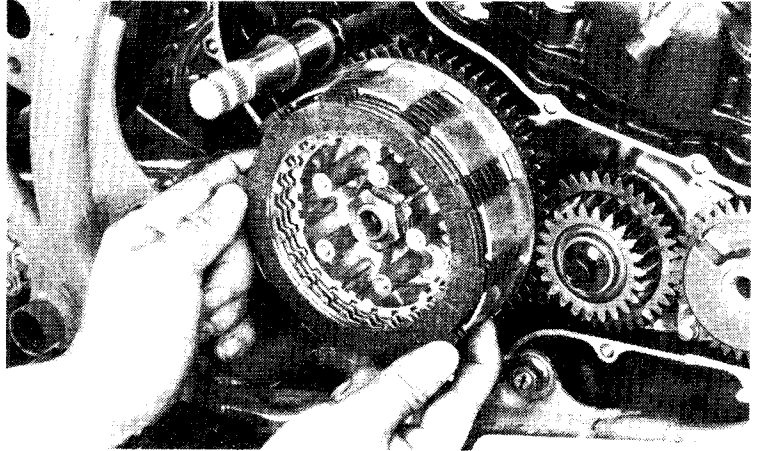
NOTE

To avoid losing the steel ball, be careful when you remove the clutch lifter.



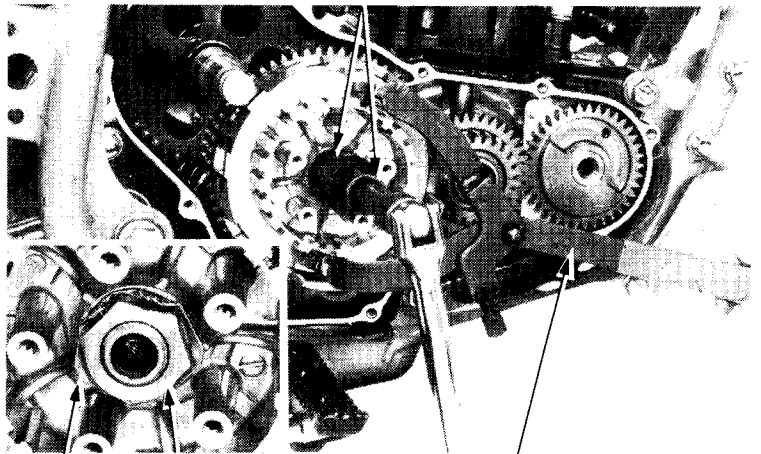
CLUTCH/GEARSHIFT LINKAGE/KICK STARTER

Remove the clutch discs and clutch plates.



LOCK NUT WRENCH, 17 x 27 mm 07716-0020300 OR
EQUIVALENT COMMERCIALY AVAILABLE IN U.S.A.
EXTENSION BAR 00716-0020500

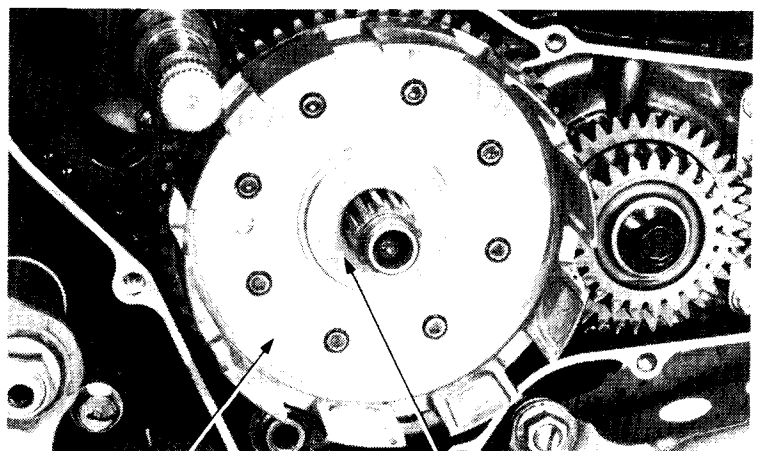
Straighten the tabs of the lock washer.
Hold the clutch center with the clutch center holder.
Remove the clutch center nut, lock washer and
plain washer.
Remove the clutch center.



LOCK WASHER LOCK NUT

CLUTCH CENTER HOLDER
07724-0050000 OR
EQUIVALENT COMMERCIALY
AVAILABLE IN U.S.A.

Remove the washer and clutch outer.



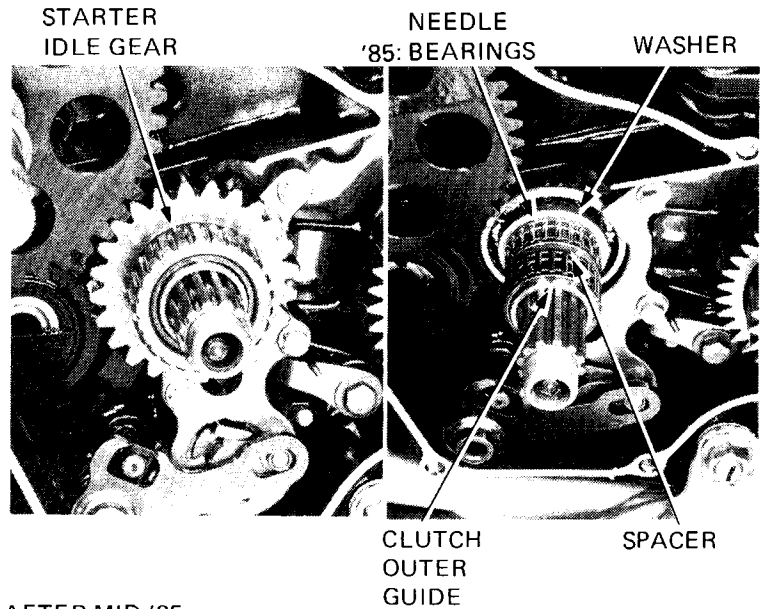
CLUTCH OUTER

WASHER

CLUTCH/GEARSHIFT LINKAGE/KICK STARTER

'85:

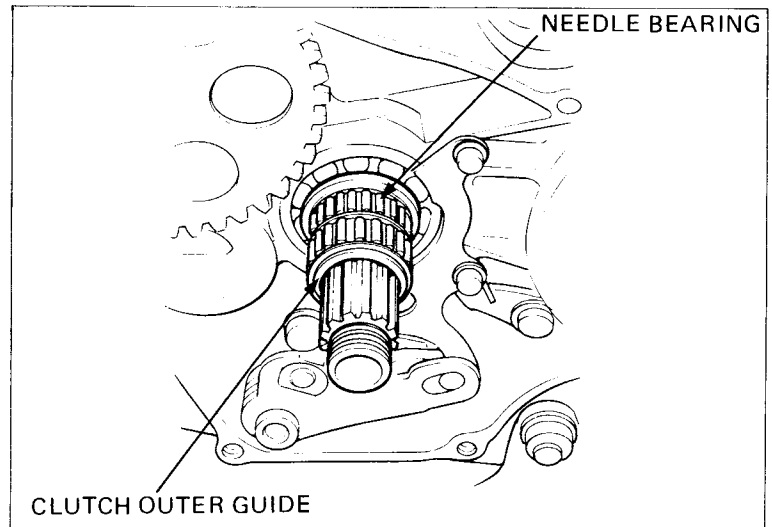
Remove the starter idle gear, needle bearings and spacer.
Check the needle bearings for wear or damage.
Remove the clutch outer guide and thrust washer.



AFTER MID '85:

Remove the starter idle gear and needle bearing.
Check the needle bearing for wear or damage.
Remove the clutch outer guide.

AFTER MID '85:



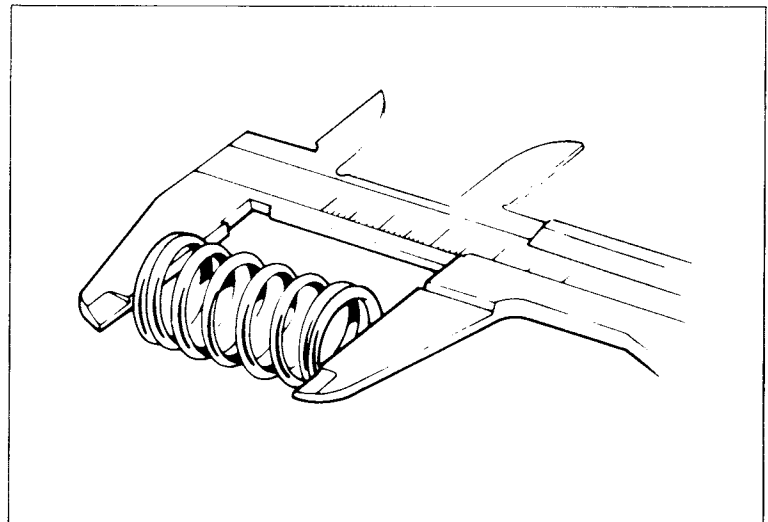
INSPECTION

Measure the spring free length.

SERVICE LIMIT: 45 mm (1.8 in)

NOTE

Clutch springs should be replaced as a set even if only one is shorter than the service limit.



CLUTCH/GEARSHIFT LINKAGE/KICK STARTER

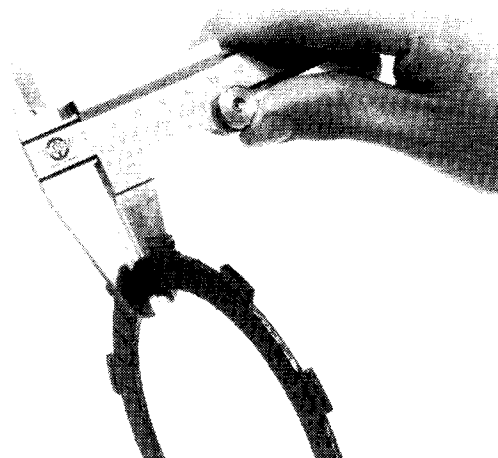
Replace the clutch discs if they show signs of scoring or discoloration.

Measure the disc thickness.

SERVICE LIMIT: 2.85 mm (0.112 in)

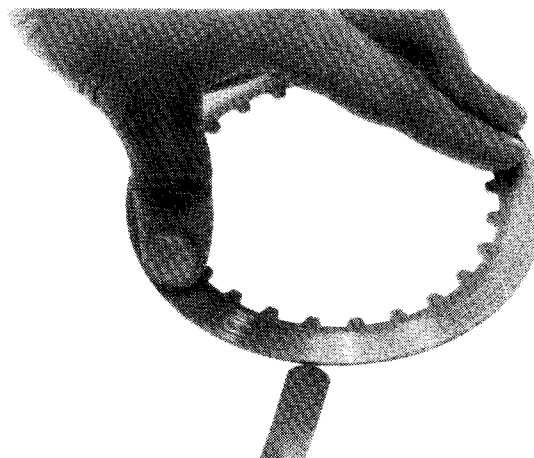
NOTE

Clutch discs and plates should be replaced as a set if any one is beyond the service limit.



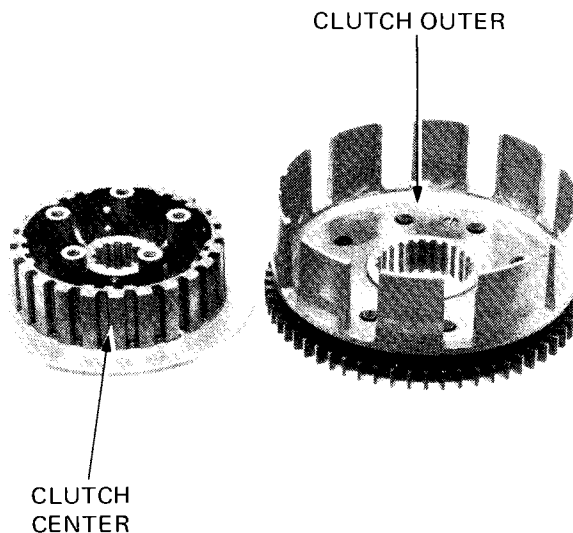
Check for plate warpage on a surface plate, using a feeler gauge.

SERVICE LIMIT: 0.15 mm (0.006 in)



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

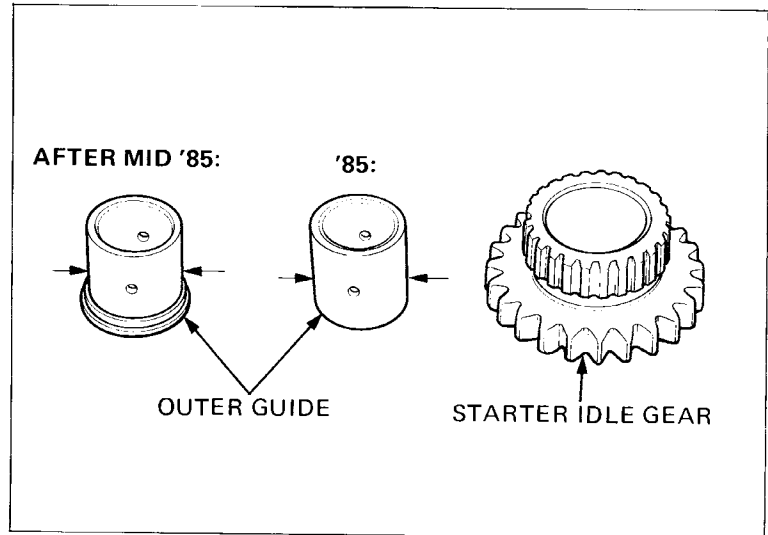
Check the clutch center for nicks, cuts or indentations made by clutch plates.



CLUTCH/GEARSHIFT LINKAGE/KICK STARTER

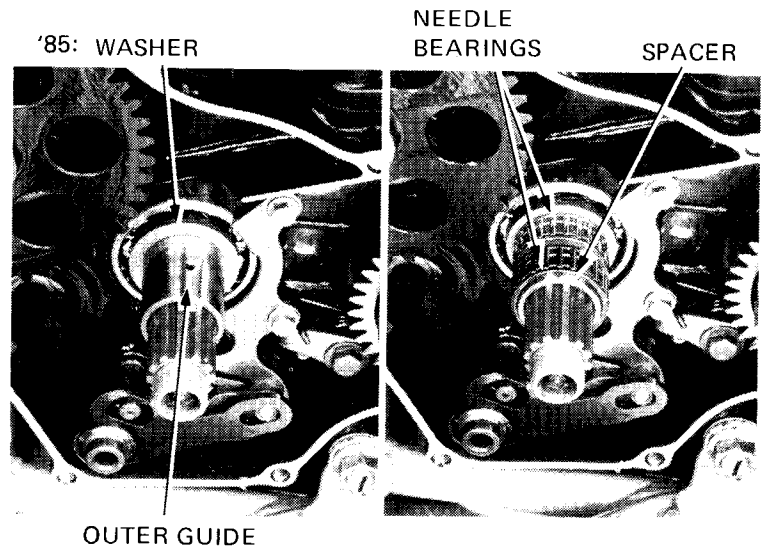
Check the starter idle gear and clutch outer guide for wear or damage.
Measure the clutch outer guide O.D.

SERVICE LIMIT: 27.97 mm (1.101 in)

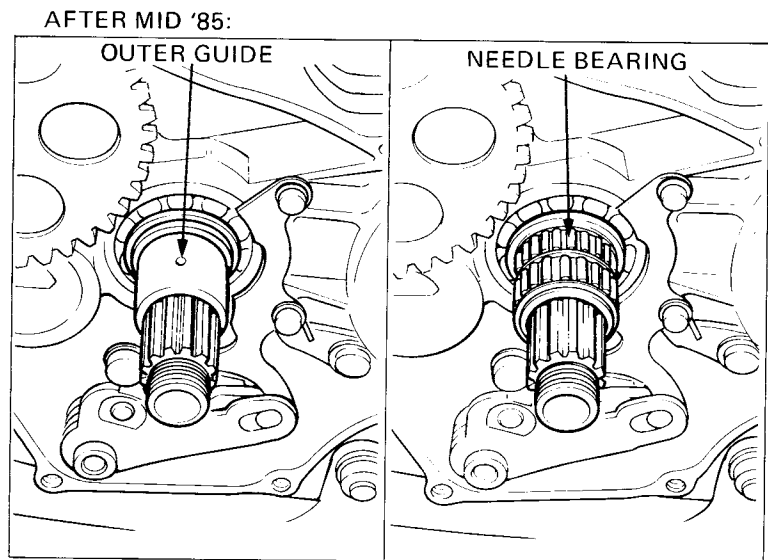


CLUTCH INSTALLATION

'85:
Install the thrust washer and clutch outer guide.
Install the needle bearings and spacer.

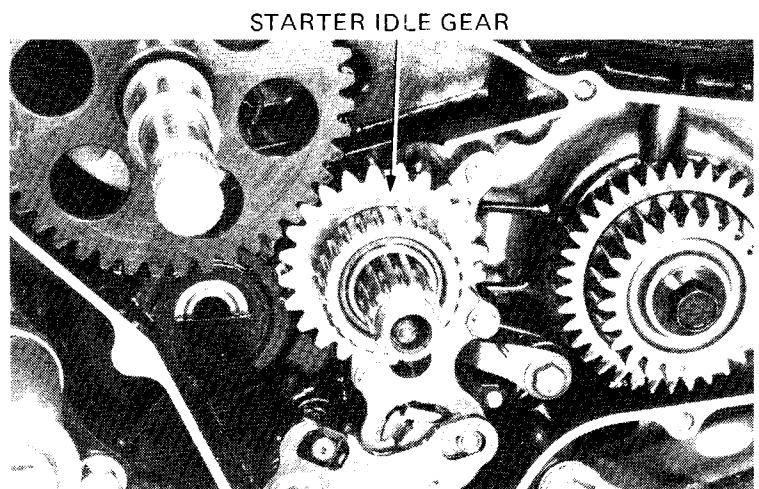


AFTER MID '85:
Install the clutch outer guide.
Install the needle bearing.

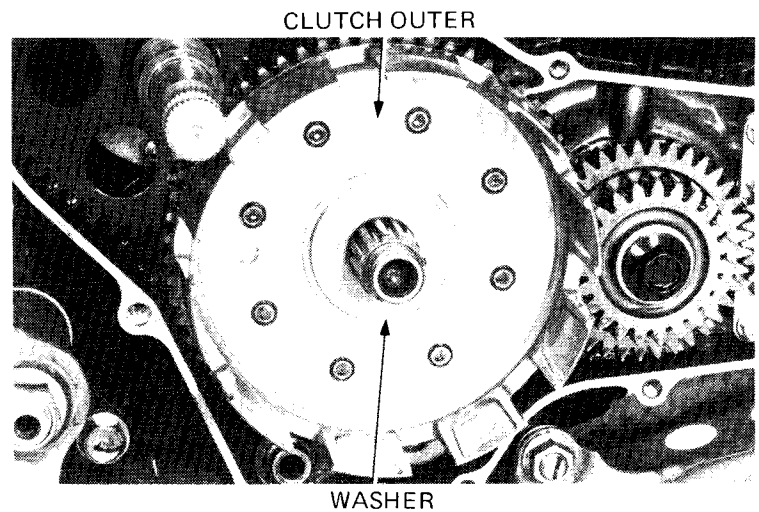


CLUTCH/GEARSHIFT LINKAGE/KICK STARTER

Install the starter idle gear.



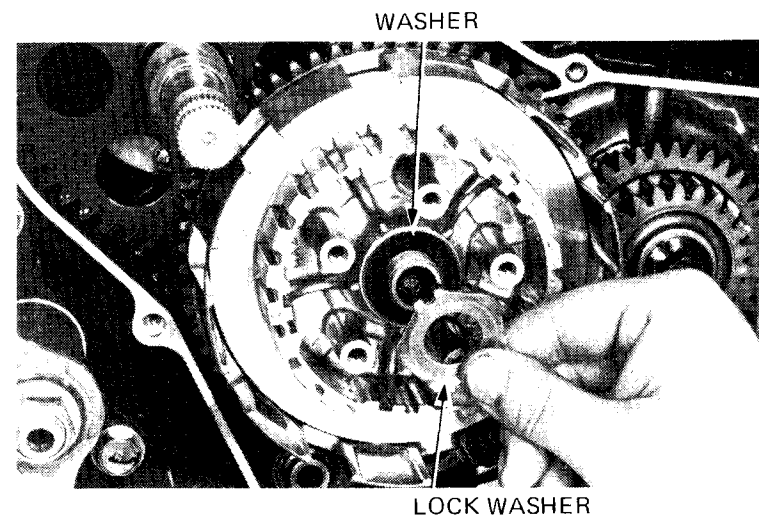
Install the clutch outer and washer.



Install the clutch center.
Install the plain washer and a new lock washer.

NOTE

Align the tab of the lock washer with the groove of the clutch center.

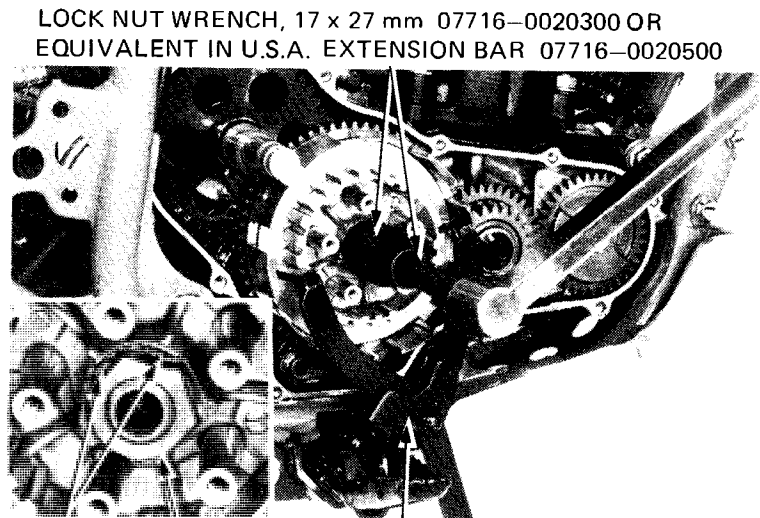


CLUTCH/GEARSHIFT LINKAGE/KICK STARTER

Install the clutch center nut and tighten to the specified torque.

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

Bend the tabs of the lock washer up against the clutch center nut.



TABS

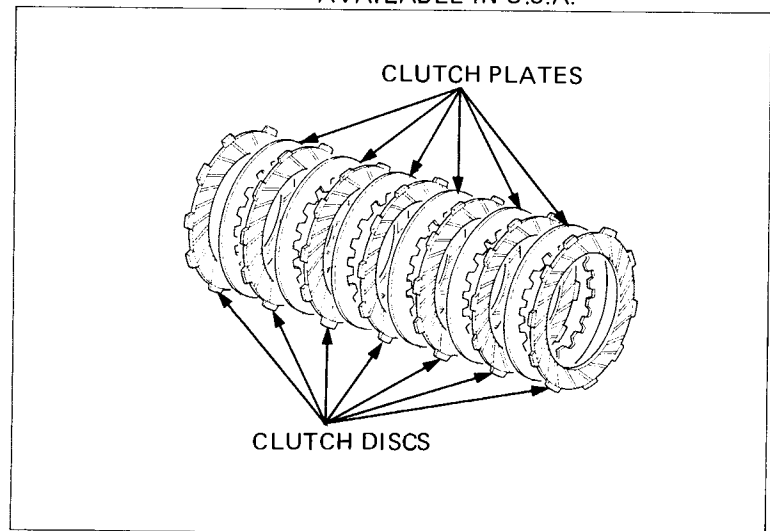
LOCK
NUT

CLUTCH CENTER HOLDER
07724-0050000 OR
EQUIVALENT,
AVAILABLE IN U.S.A.

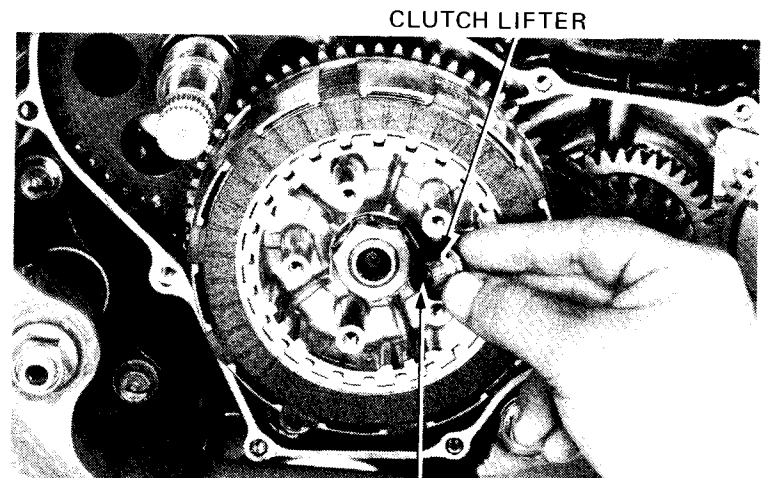
Install the seven discs and six clutch plates.

NOTES

- Stack the discs and plates alternately as shown.
- Before assembly, coat the clutch plates with transmission oil.



Insert the steel ball into the clutch lifter and place the lifter into the clutch center.



STEEL BALL

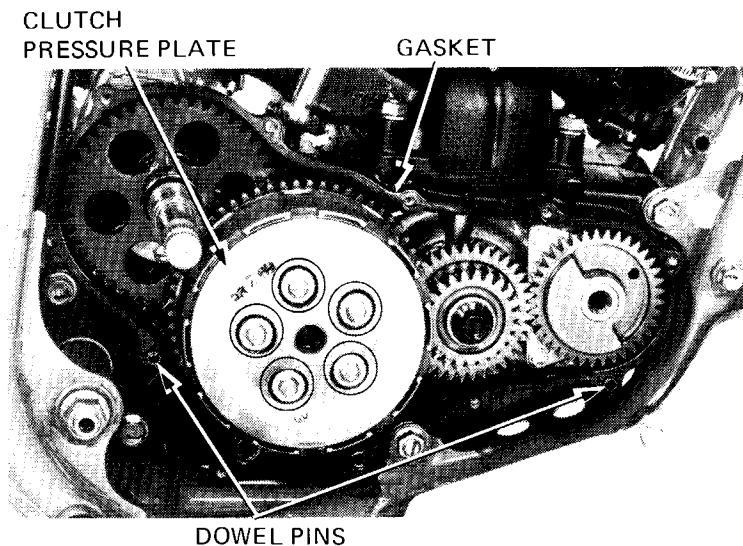
CLUTCH/GEARSHIFT LINKAGE/KICK STARTER

Install the clutch springs and bolts, and tighten to the specified torque.

NOTE

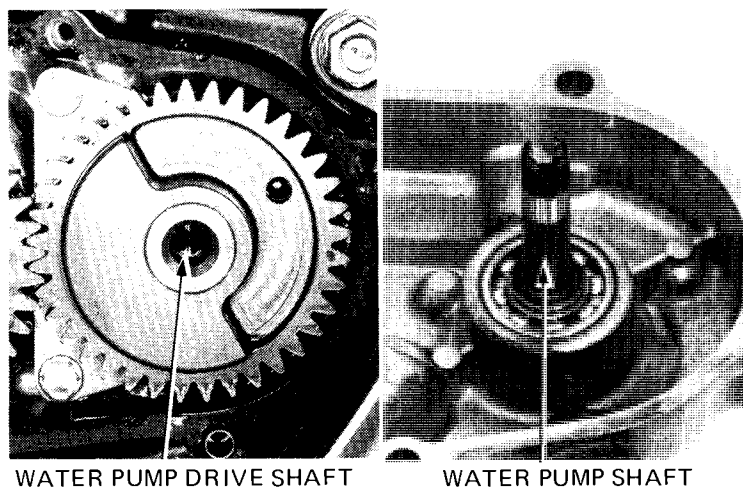
Tighten the clutch bolts in a criss-cross pattern in 2 or 3 progressive steps.

Install the new gasket and two dowel pins.



RIGHT CRANKCASE COVER INSTALLATION

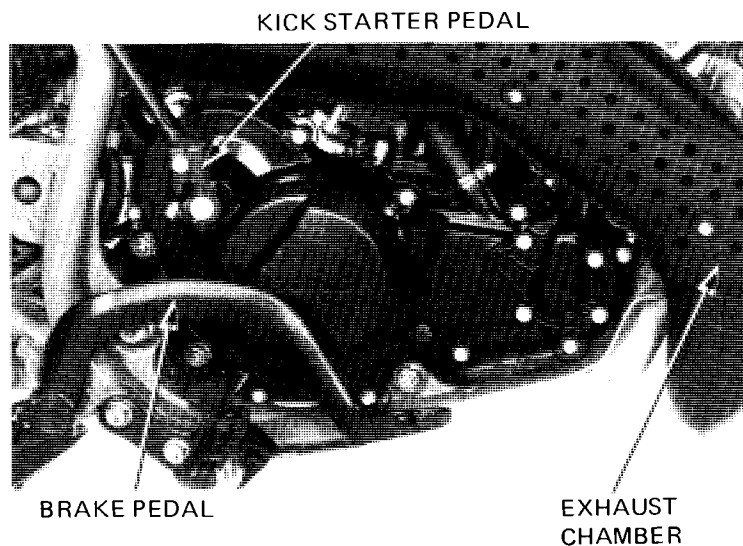
Align the water pump drive shaft and groove on the water pump shaft.



Install the followings:

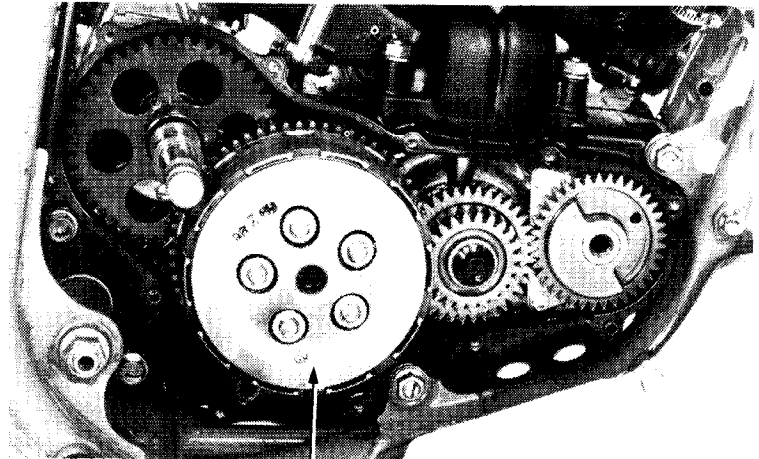
- right crankcase cover.
- kick starter pedal.
- exhaust chamber (Page 14-3).
- rear master cylinder, and rear brake pedal (Page 13-23).

Fill the transmission oil (page 2-4).



CLUTCH LIFTER

Remove the right crankcase cover (Page 7-3).
Remove the clutch pressure plate (Page 7-3).



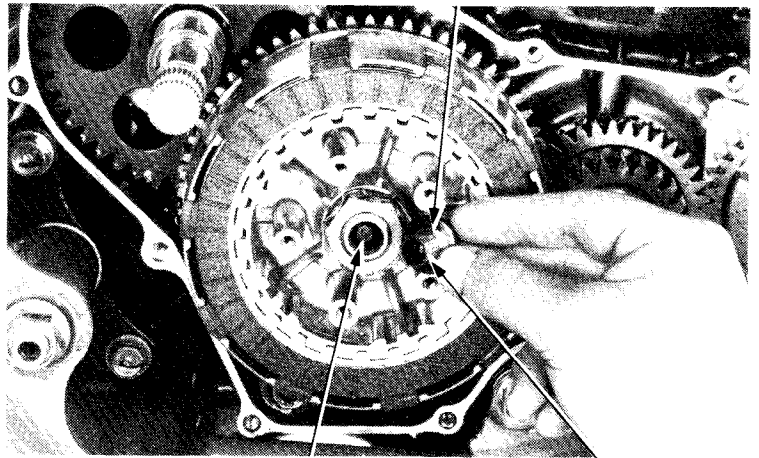
CLUTCH PRESSURE PLATE

Remove the clutch lifter, steel ball and clutch lifter rod.

NOTE

When removing the clutch lifter, be careful not to lose the steel ball.

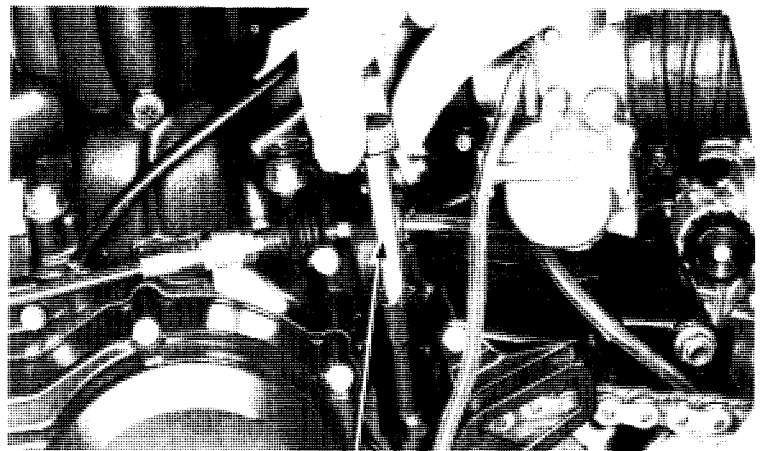
CLUTCH LIFTER



LIFTER ROD

STEEL BALL

Disconnect the clutch cable.
Remove the clutch lifter lever.



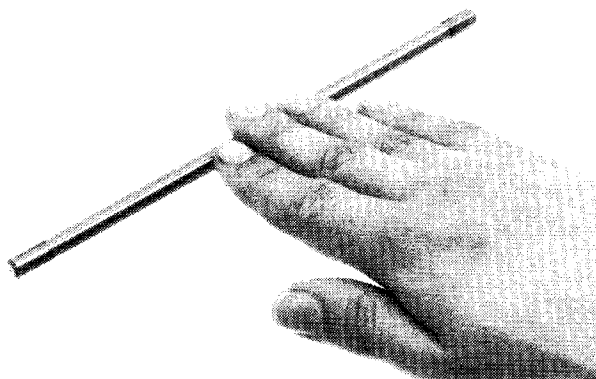
CLUTCH LIFTER LEVER

CLUTCH/GEARSHIFT LINKAGE/KICK STARTER

INSPECTION

Check the lifter rod for trueness by rolling it on a surface plate.

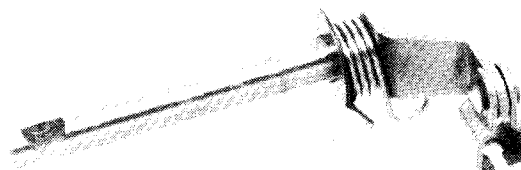
Replace the lifter rod with a new one, if it is bent.



Check the lifter rod, lifter lever and lifter piece for wear or damage.

Repair or replace parts as necessary.

Install in the reverse order of removal.

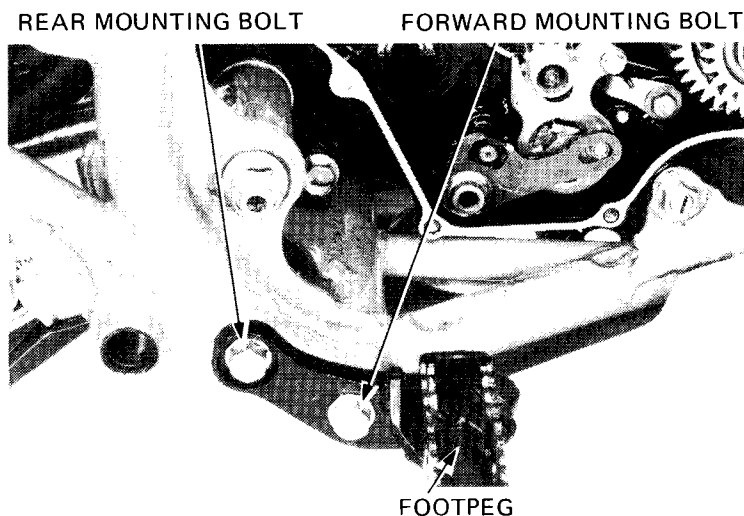


SHIFT LINKAGE

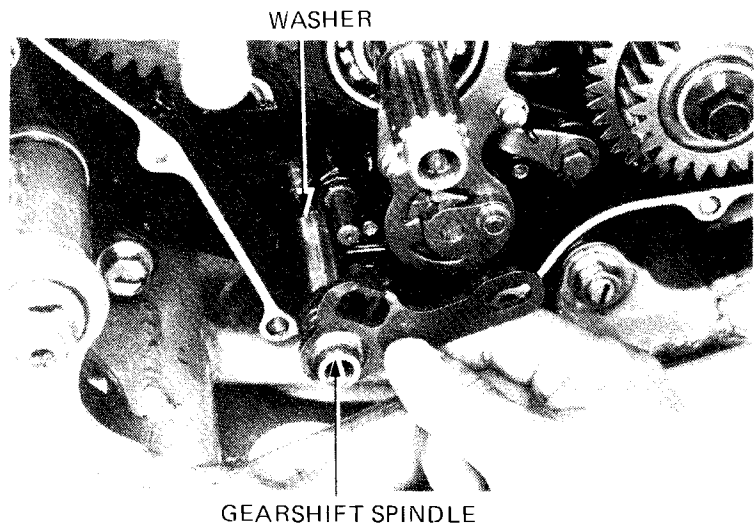
REMOVAL

Remove the followings:

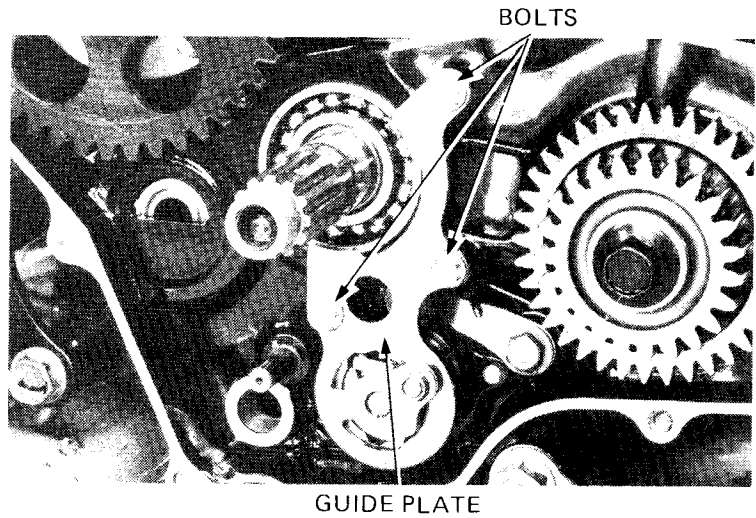
- right crankcase cover (Page 7-3).
- clutch (Page 7-3).
- gearshift pedal.
- forward footpeg mounting bolt and loosen the rear mounting bolt.



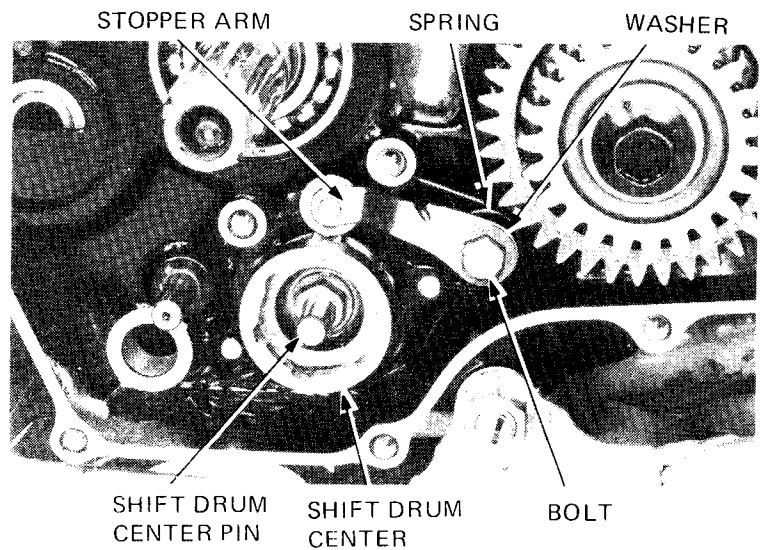
Remove the gearshift spindle.



Remove the guide plate and drum shifter by removing the three mounting bolts.



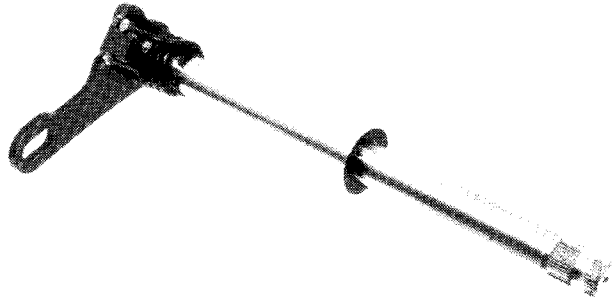
Remove the stopper arm bolt, stopper arm, stopper arm spring and thrust washer.
Remove the shift drum center pin, shift drum center and dowel pin.



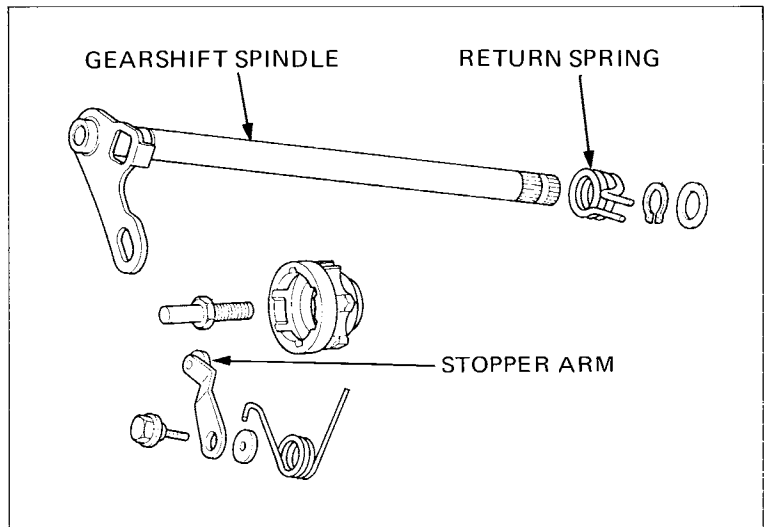
CLUTCH/GEARSHIFT LINKAGE/KICK STARTER

INSPECTION

Inspect the gearshift spindle for damage or wear.

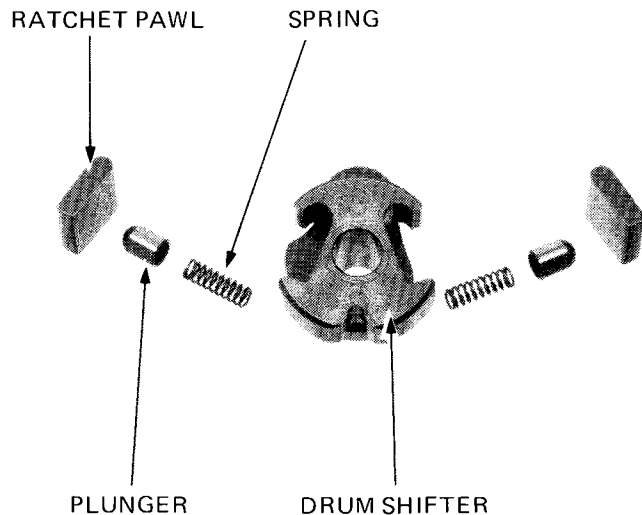


Inspect the stopper arm and spring for damage.
Inspect the gearshift spindle and return springs for damage.



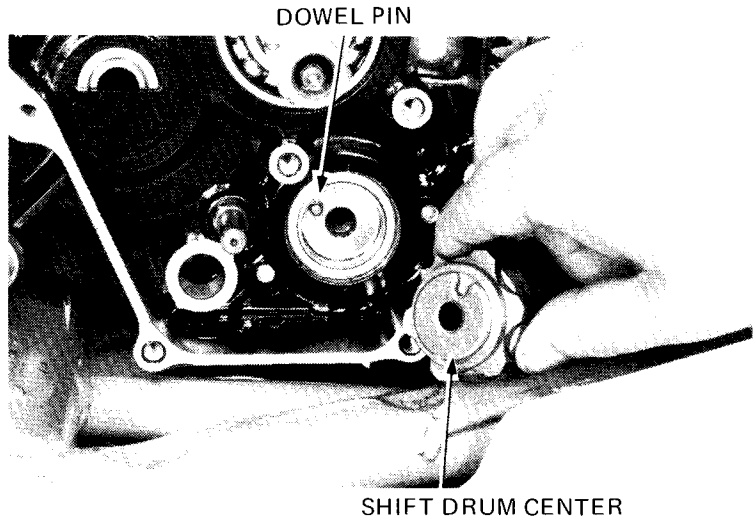
Check the ratchet pawls, springs, drum shifter and plungers for wear or damage.

Apply clean engine oil to the ratchet pawls, springs and drum shifter.



INSTALLATION

Install the dowel pin into the shift drum.
Install the shift drum center aligning the groove in the drum center with the dowel pin on the drum.



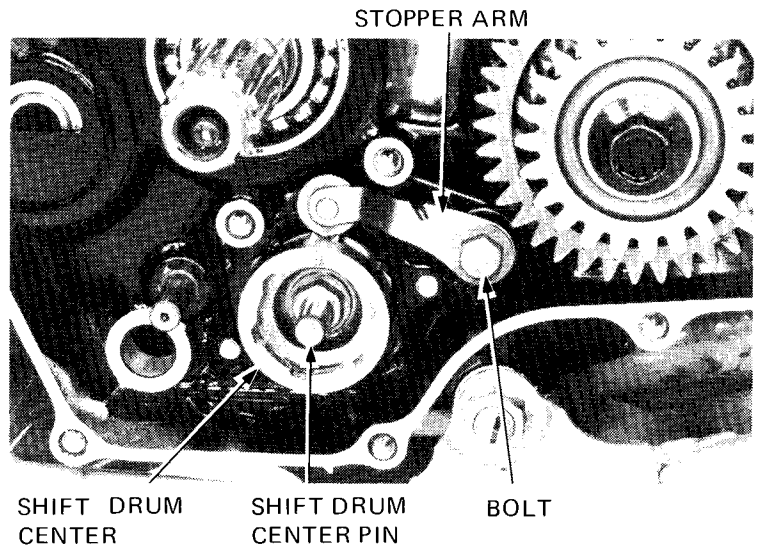
Tighten the shift drum center pin.

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

Install the stopper arm, stopper arm spring and thrust washer.

Tighten the stopper arm bolt.

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



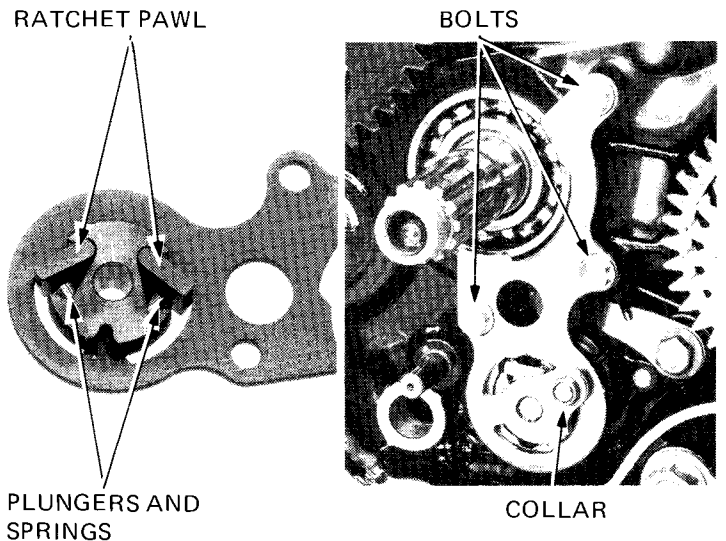
Assemble the ratchet pawls, springs and plungers onto the drum shifter, then install them in the guide plate.

Hold the drum shifter, together and install it onto the shift drum center.

NOTE

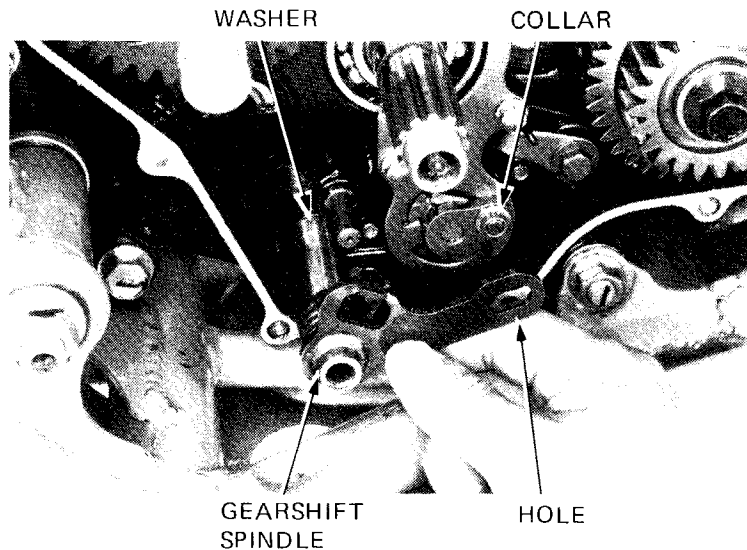
Do not forget to install the shifter collar onto the drum shifter.

Install the three mounting bolts.



CLUTCH/GEARSHIFT LINKAGE/KICK STARTER

Install the washer and gearshift spindle, align the collar on the drum shifter with the hole on the gearshift spindle.



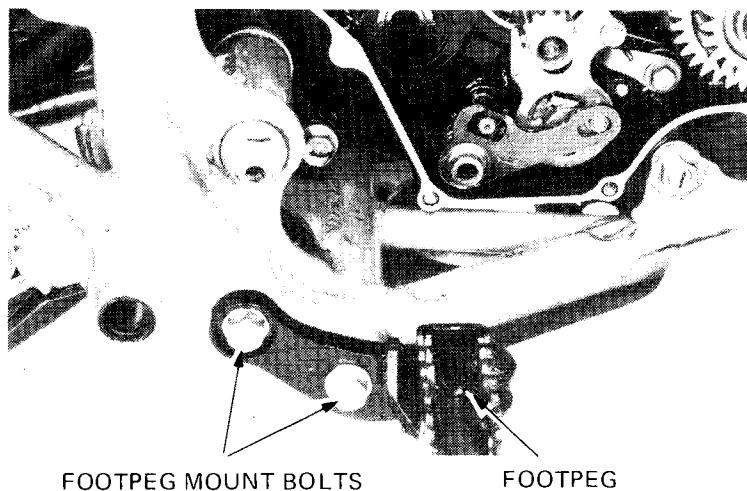
Install the forward footpeg mount bolt and tighten the mount bolts.

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

Install the gearshift pedal.

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

Install the clutch (Page 7-7).
Install the right crankcase cover (Page 7-10).

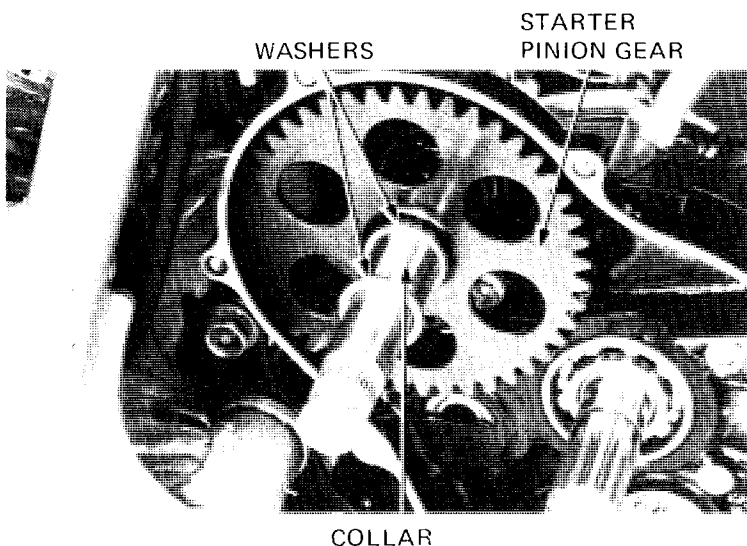


KICK STARTER

REMOVAL

Remove the followings:

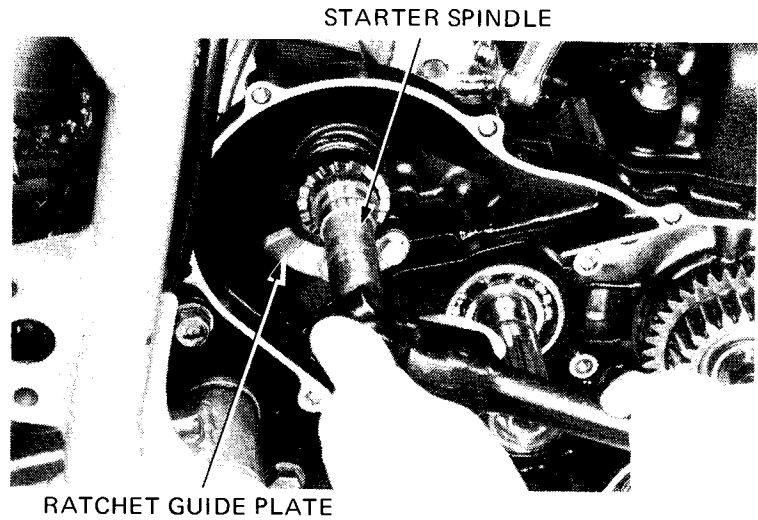
- right crankcase cover (Page 7-3).
- clutch (Page 7-3).
- two washers and collar.
- kick starter pinion gear.



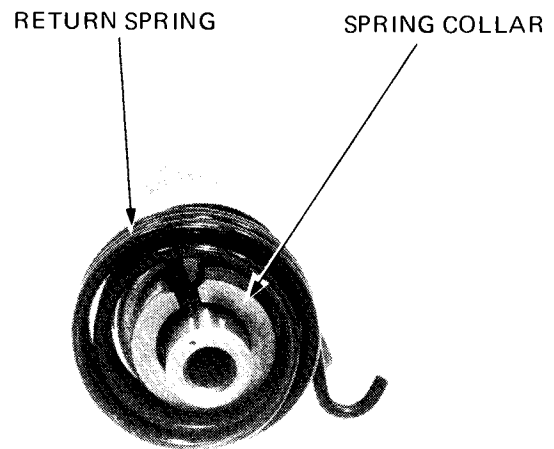
CLUTCH/GEARSHIFT LINKAGE/KICK STARTER

Remove the ratchet guide plate.

Install the kick starter pedal onto the kick starter spindle and remove the spindle by turning it clockwise with the pedal.



Remove the spring collar and return spring.

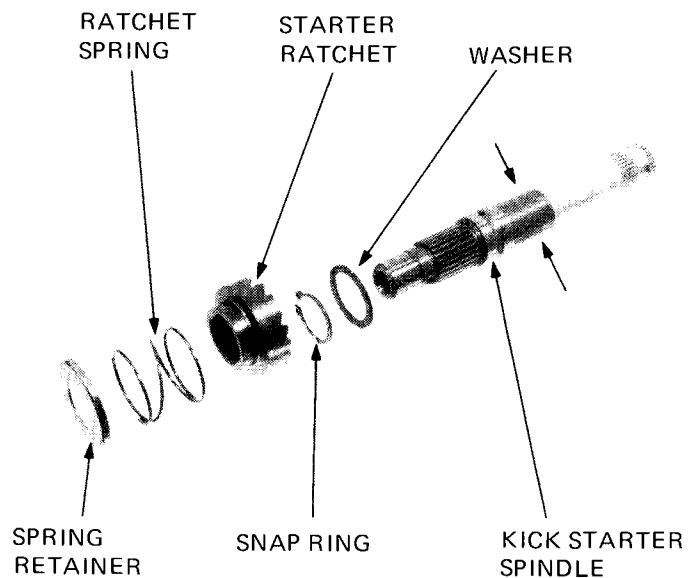


Remove the spring retainer, ratchet spring and starter ratchet.
Remove the snap ring and thrust washer.

INSPECTION

Measure the kick starter spindle O.D.

SERVICE LIMIT: 21.94 mm (0.864 in)

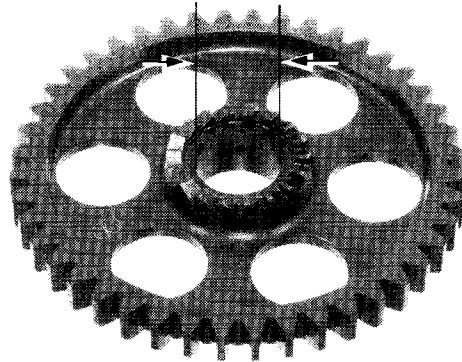


CLUTCH/GEARSHIFT LINKAGE/KICK STARTER

Measure the kick starter pinion gear I.D.

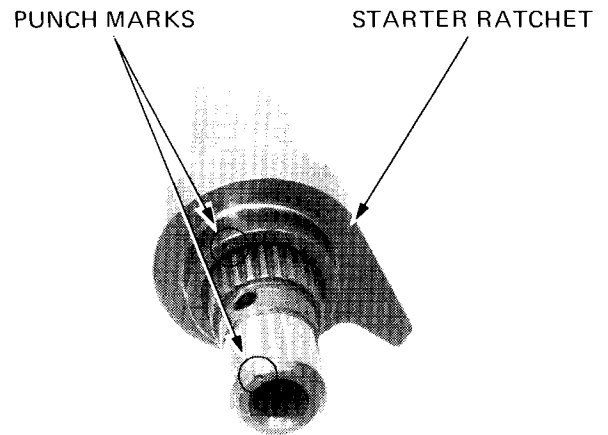
SERVICE LIMIT: 22.06 mm (0.869 in)

Check the ratchet teeth on the pinion for wear or damage.

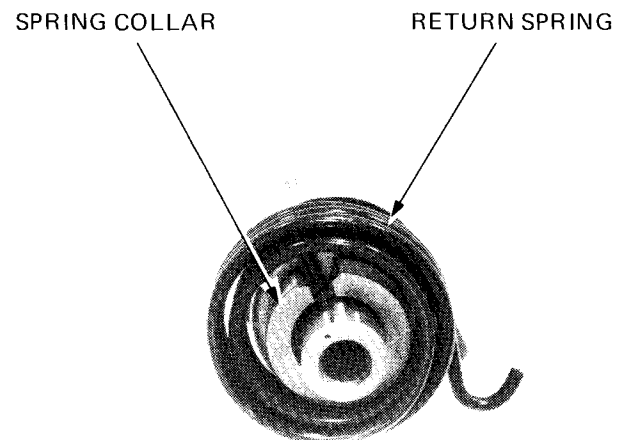


INSTALLATION

Install the thrust washer and snap ring.
Install the starter ratchet on the spindle aligning the punch marks on the spindle and ratchet.

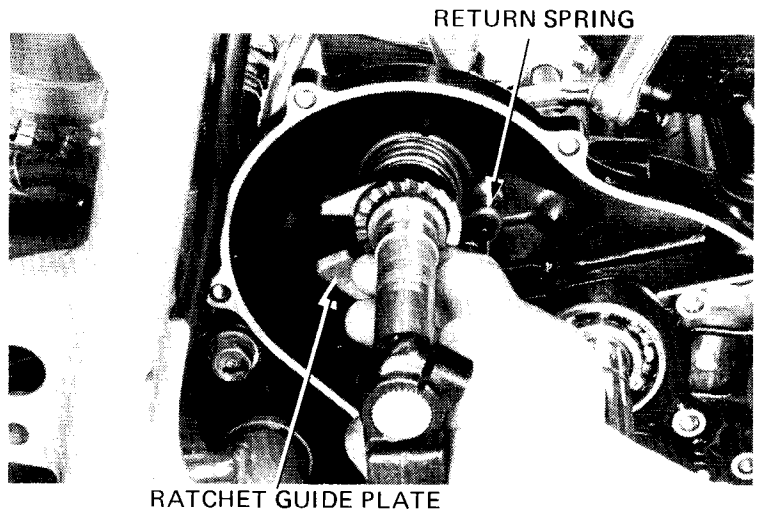


Install the return spring onto the starter spindle and insert the spring end into the hole in the spindle. Install the spring collar aligning the slit with the spring end.

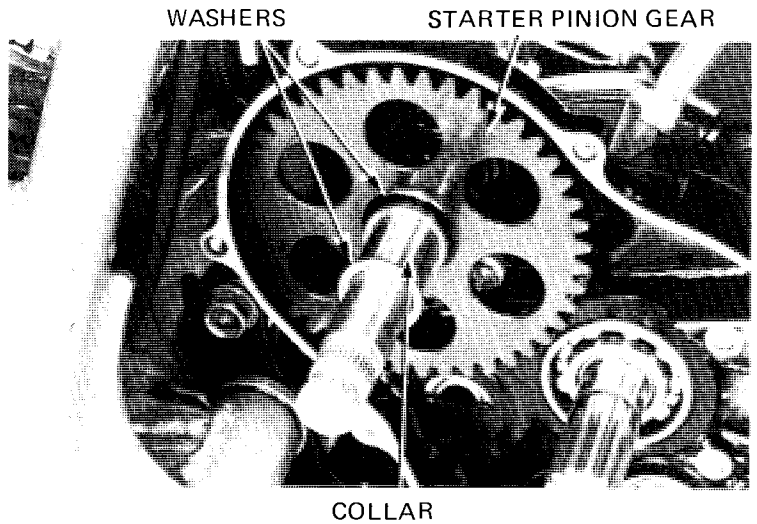


CLUTCH/GEARSHIFT LINKAGE/KICK STARTER

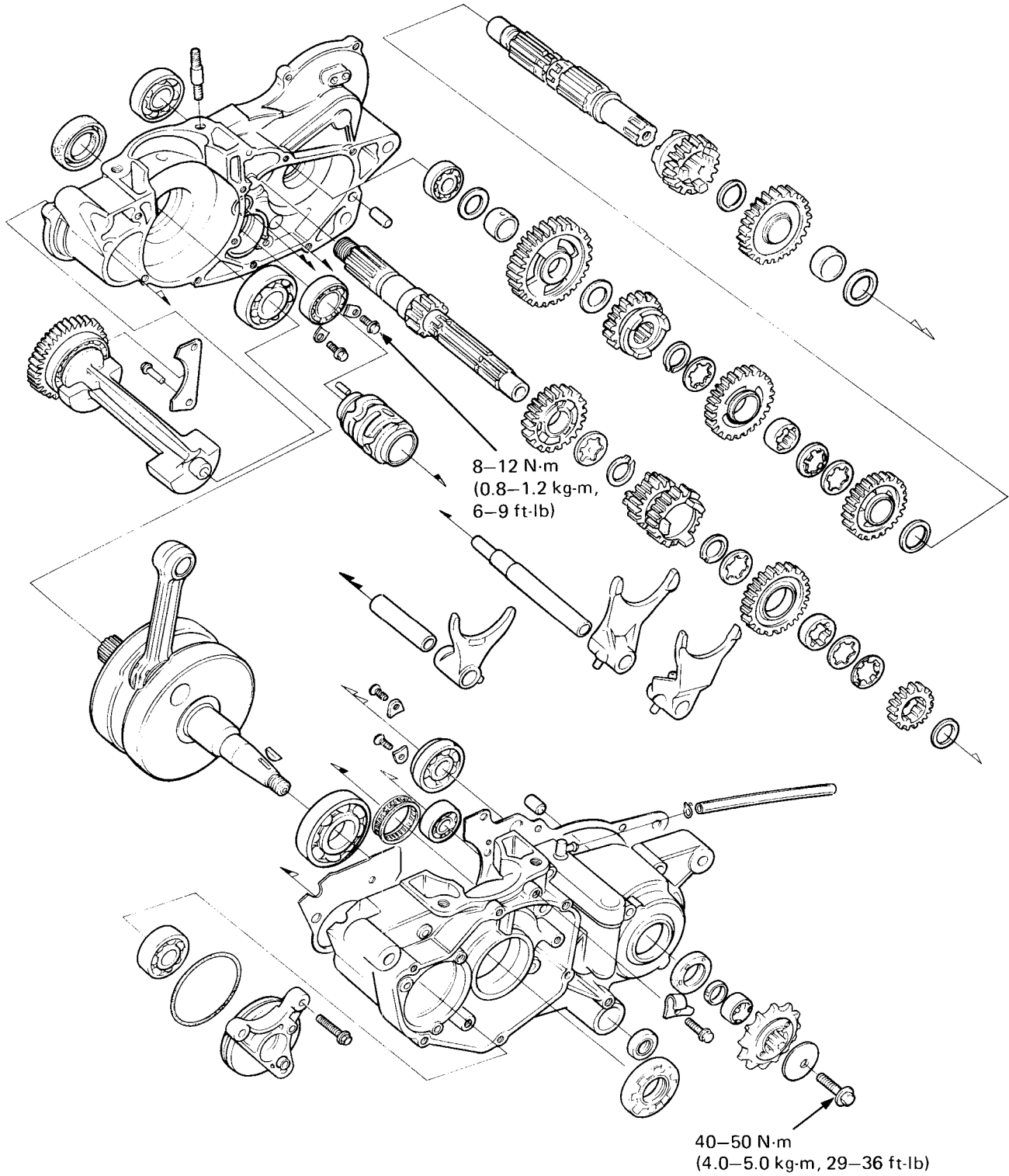
Hook the return spring onto the crankcase.
Install the kick starter pedal by turning the clock-wise.
Push the starter ratchet and fit the starter ratchet to the ratchet guide.
Install the ratchet guide plate.



Install the starter pinion gear.
Install the two washer and collar.
Make sure the kick starter operates correctly.
Install the clutch (Page 7-7).
Install the right crankcase cover (Page 7-10).



TRANSMISSION/CRANKSHAFT/BALANCER



8. TRANSMISSION/ CRANKSHAFT/BALANCER

SERVICE INFORMATION	8-1
TROUBLESHOOTING	8-2
BALANCER	8-3
CRANKCASE SEPARATION	8-6
TRANSMISSION	8-7
CRANKSHAFT	8-11
BEARING REPLACEMENT	8-13
CRANKCASE ASSEMBLY	8-15

SERVICE INFORMATION

GENERAL

- The crankcase halves must be separated to repair the transmission or crankshaft. Remove the following parts before separating the crankcase.

• Engine removal	Section 4	• Gearshift linkage	Section 7
• Cylinder head	Section 5	• Alternator	Section 6
• Cylinder and piston	Section 5	• Kick starter	Section 7
• Clutch	Section 7	• Balancer	Section 8
- The balancer can be serviced with the engine in the frame, after removing the clutch (Section 8).
- The crankshaft ball bearings are an interference fit on the journals.
Use the special tools to remove them from the crankshaft (page 8-6, 13 and 8-15).

SPECIFICATIONS

ITEM		STANDARD mm (in)	SERVICE LIMIT mm (in)	
Shift fork, Shift fork shaft	Shift fork I.D. (R.L.)	12.041–12.056 (0.4741–0.4746)	12.090 (0.4760)	
	Shift fork I.D. (C)	11.041–11.056 (0.4347–0.4353)	11.090 (0.4366)	
	Mainshaft shift fork shaft O.D.	10.983–10.994 (0.4324–0.4328)	10.97 (0.432)	
	Countershaft shift fork shaft O.D.	11.983–11.994 (0.4718–0.4722)	11.97 (0.471)	
	Shift fork shaft pawl thickness	4.93–5.00 (0.194–0.197)	4.8 (0.19)	
Transmission	Gear I.D.	M6, C4	25.020–25.041 (0.9850–0.9859)	25.06 (0.987)
		M5	28.007–28.028 (1.1026–1.1035)	28.05 (1.104)
		C1	22.020–22.041 (0.8669–0.8678)	22.06 (0.869)
		C2	27.020–27.041 (1.0638–1.0646)	27.06 (1.065)
		C3	28.020–28.041 (1.1032–1.1040)	28.06 (1.105)
	Bushing O.D.	C1	21.979–21.000 (0.8653–0.8268)	21.96 (0.865)
		C2	26.979–27.000 (1.0622–1.0630)	27.96 (1.101)
		C3, M5	27.959–27.979 (1.1007–1.1015)	27.94 (1.100)
	Bushing I.D.	C1	19.000–19.021 (0.748–0.7489)	19.04 (0.750)
		C2	24.000–24.021 (0.9449–0.9457)	24.04 (0.947)
	Mainshaft O.D.	M6	24.959–24.980 (0.9826–0.9835)	24.94 (0.982)
	Countershaft O.D.	C1	18.959–18.980 (0.7464–0.7472)	18.94 (0.746)
		C2	23.959–23.980 (0.9433–0.9441)	23.94 (0.943)
		C4	24.959–24.980 (0.9826–0.9835)	24.94 (0.982)

TRANSMISSION/CRANKSHAFT/BALANCER

ITEM	STANDARD mm (in)	SERVICE LIMIT mm (in)
Connecting rod big end side clearance	0.2–0.6 (0.01–0.02)	1.0 (0.04)
Connecting rod big end axial/radial clearance	0.010–0.022 (0.0004–0.0009)	0.04 (0.002)
Crankshaft journal runout	—	0.05 (0.002)

TORQUE VALUES

Primary drive gear bolt	40–50 N·m (4.0–5.0 kg·m, 29–36 ft·lb)
Countershaft bearing holder screw	8–12 N·m (0.8–1.2 kg·m, 6–9 ft·lb)

TOOLS

Special

Crankcase puller	07937–4300000
Bearing remover, 17 mm	07936–3710300
Remover handle	07936–3710100
Remover weight	07741–0010201 or 07736–3710200
Assembly bolt	07965–1660200
Thread adapter	07965–KA30000
Driveshaft dis/assembly tool (B)	07964–MB00200
Assembly collar	07931–KF00100 or 07945–3710101

Common

Driver	07749–0010000
Attachment, 37 x 40 mm	07746–0010200
Pilot, 17 mm	07746–0040400
Attachment, 62 x 68 mm	07746–0010500
Pilot, 28 mm	07746–0041100
Attachment, 52 x 55 mm	07746–0010400
Pilot, 25 mm	07746–0040600
Universal holder	07725–0030000

TROUBLESHOOTING

Engine noise

- Worn crankshaft bearing
- Worn connecting rod big end bearing
- Worn transmission bearing

Transmission jumps out of gear

- Gear dogs and slots worn
- Shift fork bent or damaged
- Shift fork shaft bent
- Shift drum stopper damaged

Hard to shift

- Clutch not adjusted properly
- Shift fork bent
- Shift fork shaft bent
- Worn or damaged shift drum cam grooves

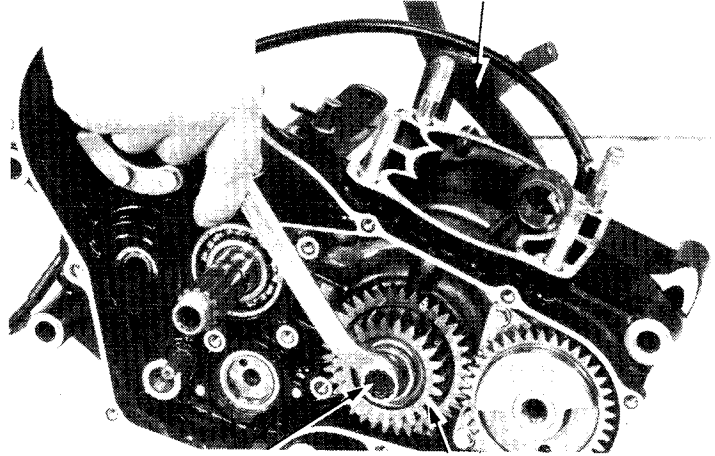
BALANCER

REMOVAL

Hold the rotor with an universal holder and remove the bolt.

Remove the primary drive gear.

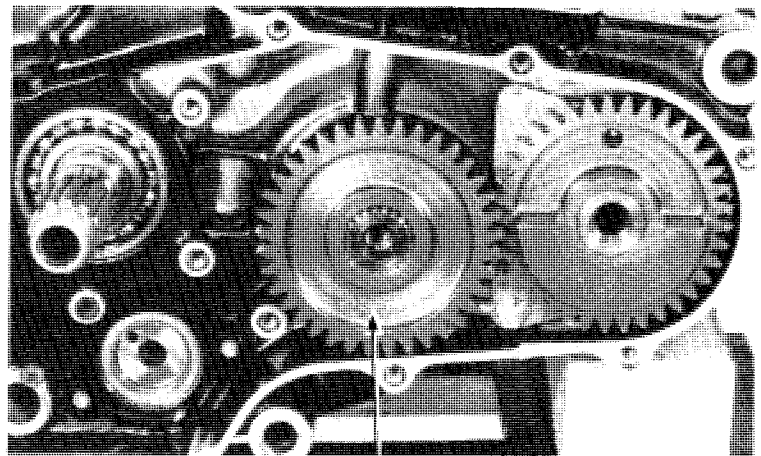
UNIVERSAL HOLDER 07725-0030000



BOLT

PRIMARY DRIVE GEAR

Remove the balancer drive gear.



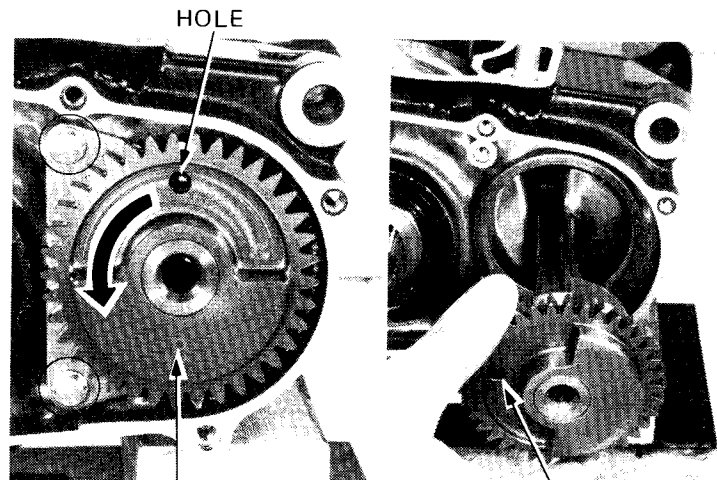
BALANCER DRIVE GEAR

Remove the balancer bearing holder plate attaching bolts and holder plate.

Remove the balancer driven gear.

NOTE

Turn the balancer driven gear counterclockwise 90° to align its hole with the crankshaft center and remove it.

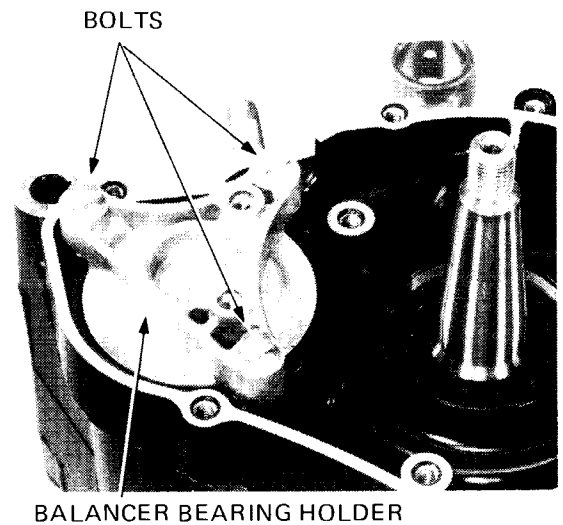


BALANCER DRIVEN GEAR

HOLE

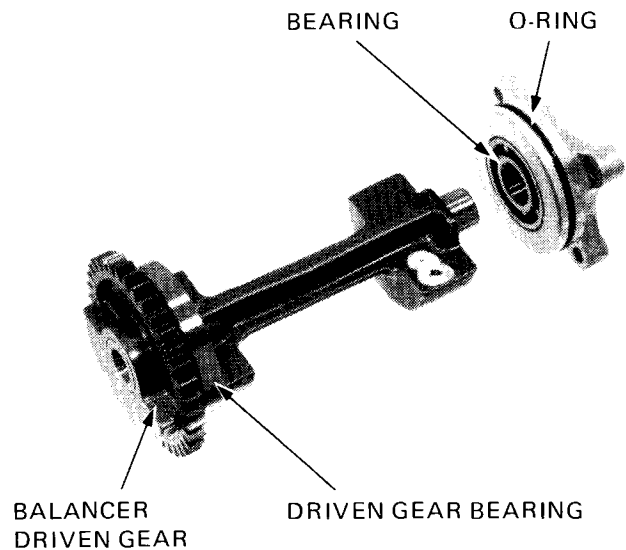
TRANSMISSION/CRANKSHAFT/BALANCER

Remove the alternator (Page 6-2).
Remove the balancer bearing holder attaching bolts and remove the balancer bearing holder.



INSPECTION

Check the bearing and O-ring in the holder.
Replace any part which is worn, damaged or has excessive play.
Check the balancer driven gear and bearing for wear, damage or excessive play.
If the balancer shaft bearing is damaged or has excessive play, the balancer shaft assembly must be replaced.



BEARING REPLACEMENT

NOTE

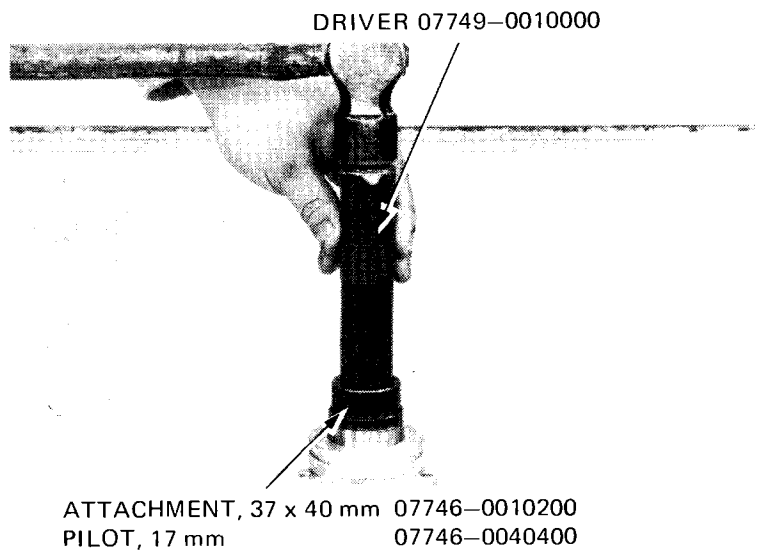
Be sure to remove the O-ring before heating.

Heat the bearing holder around the bearing to around 80°C (176°F).

CAUTION

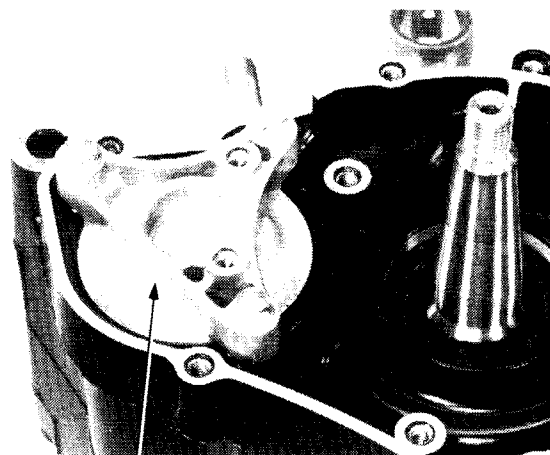
Always wear gloves when handling a heated bearing holder.

Remove the bearing.
Drive a new bearing into the bearing holder.



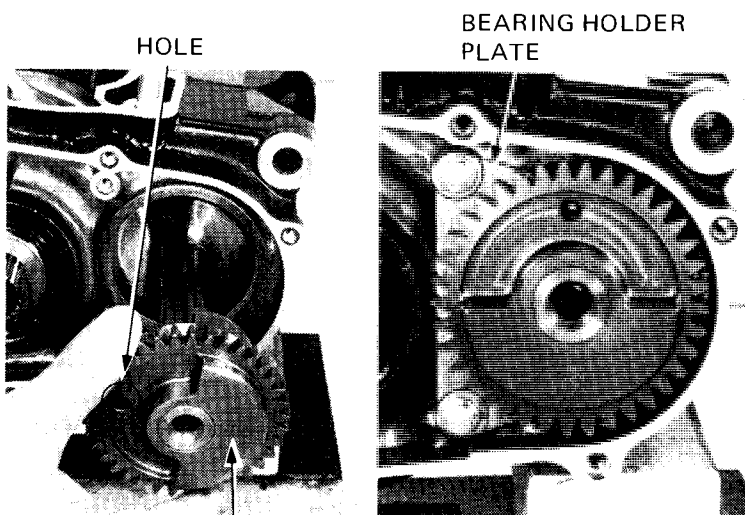
INSTALLATION

Install the bearing holder.
Install the alternator (Page 6-3).



BEARING HOLDER

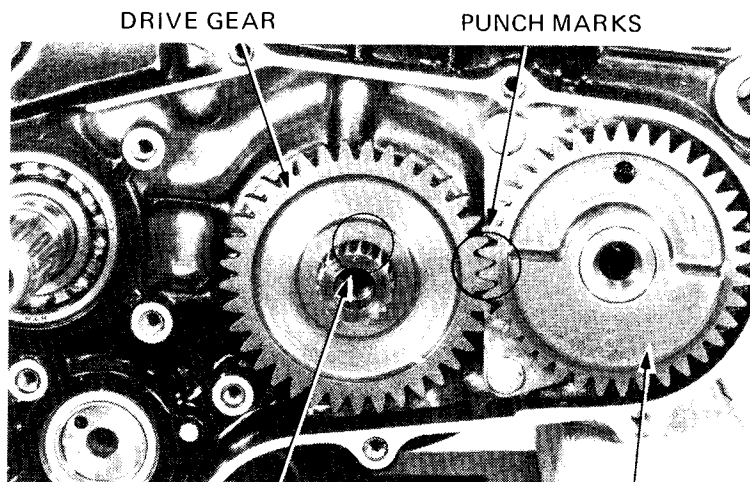
Install the balancer driven gear and balancer driven gear bearing holder plate.



BALANCER DRIVEN GEAR

Align the punch marks on the crankshaft and balancer drive gear and install the drive gear onto the crankshaft.

Install the balancer driven gear aligning the punch mark on the balancer driven gear with the punch mark on the drive gear.



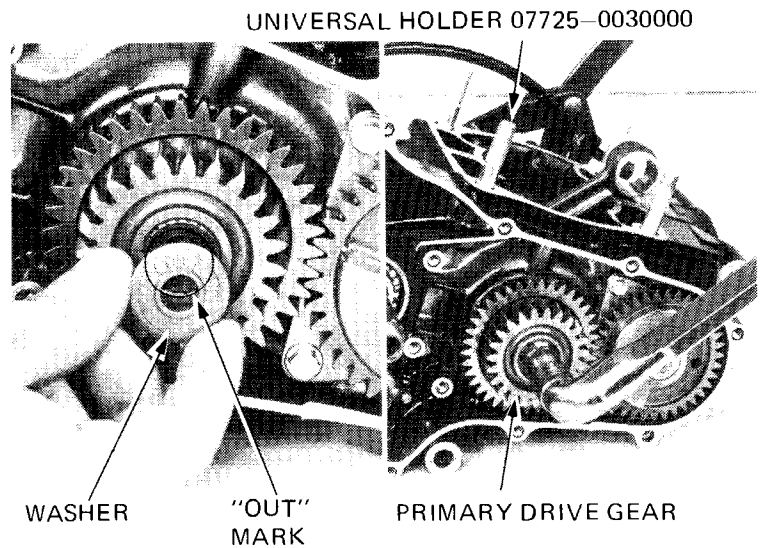
PUNCH MARKS

DRIVEN GEAR

TRANSMISSION/CRANKSHAFT/BALANCER

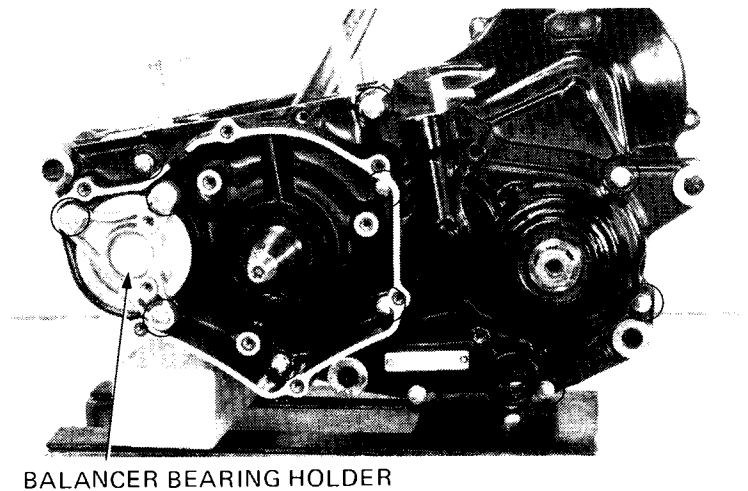
Install the primary drive gear.
Install the washer with its "OUT" mark out.
Hold the rotor with a universal holder and tighten the bolt.

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



CRANKCASE SEPARATION

Remove the balancer (Page 8-3).
Remove the crankcase attaching bolts and balancer bearing holder.

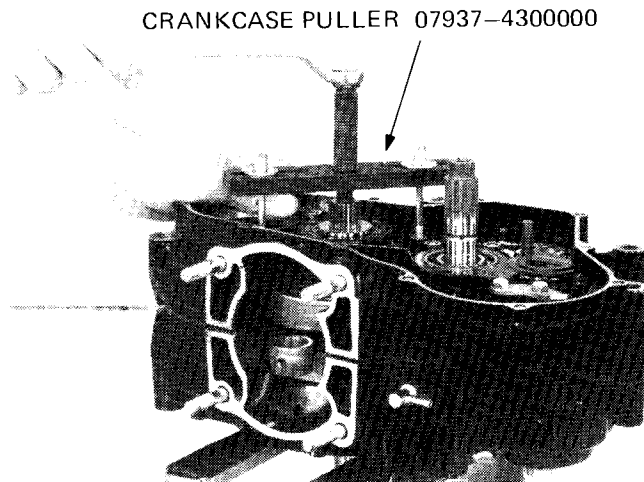


Remove the right crankcase from the left crankcase while tapping them at several locations with a soft hammer.
Attach the crankcase puller to the right crankcase and separate the crankcase halves.

CAUTION

Do not pry the crankcase halves apart with the end of a screwdriver.

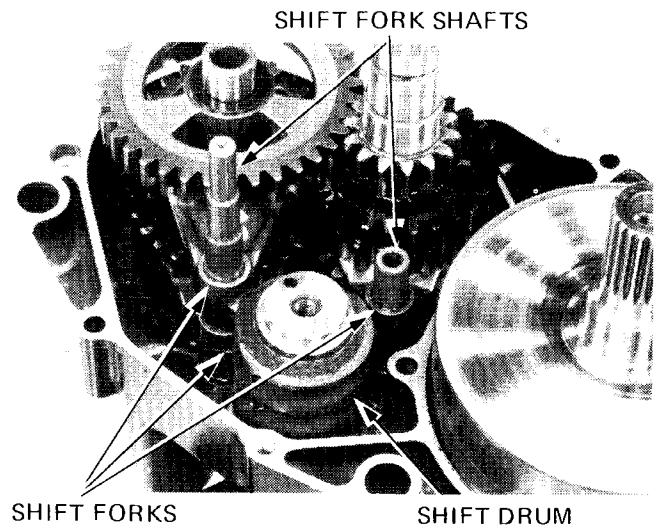
Remove the gasket and dowel pins.



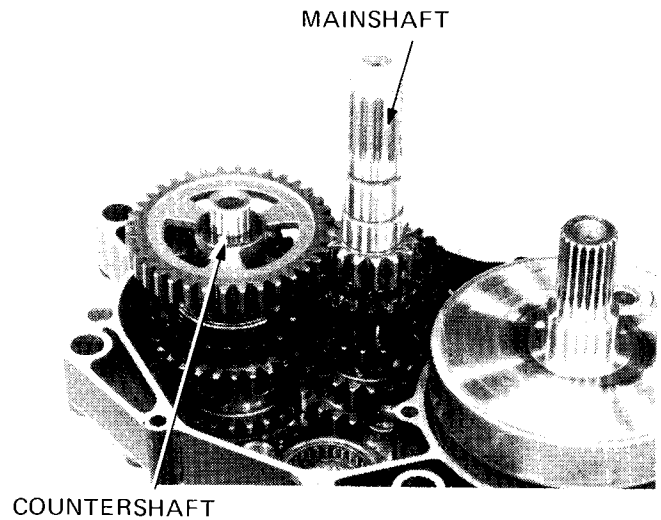
TRANSMISSION

REMOVAL

Remove the shift fork shafts.
Remove the shift forks and shift drum.



Remove the mainshaft and countershaft assemblies as a set from the left crankcase.



INSPECTION

Check that the shift forks are not bent, worn or damaged. Measure the I.D. and shift pawl thickness.

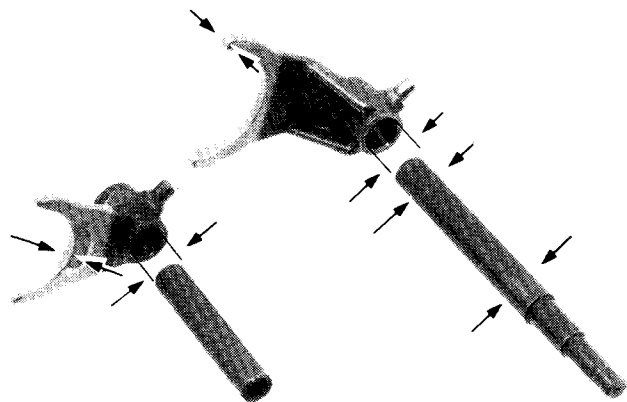
SERVICE LIMITS:

Pawl thickness: 4.8 mm (0.19 in)
I.D.: 12.090 mm (0.4760 in) – R.L.
11.090 mm (0.4366 in) – C.

Check that the shift fork shafts are not bent, worn, or damaged.

Measure the O.D. of the shafts.

SERVICE LIMIT: 10.97 mm (0.432 in)
Mainshaft
11.97 mm (0.471 in)
Countershaft



TRANSMISSION/CRANKSHAFT/BALANCER

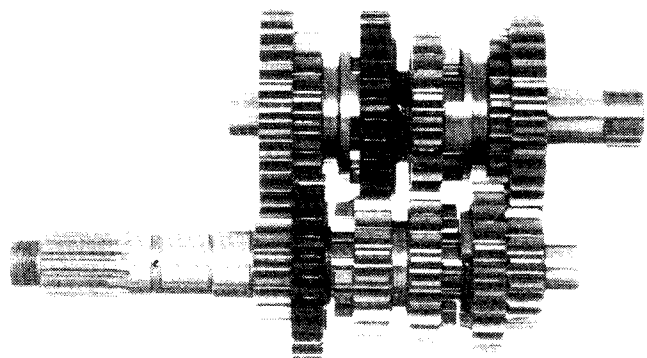
Inspect the shift drum grooves and replace the drum if they are damaged or show excessive wear.



Inspect each gear for wear or damage and replace if necessary.

Check the gear teeth for wear or damage.

Check the engagement dogs of gears for wear or damage.



Measure the I.D. of each gear.

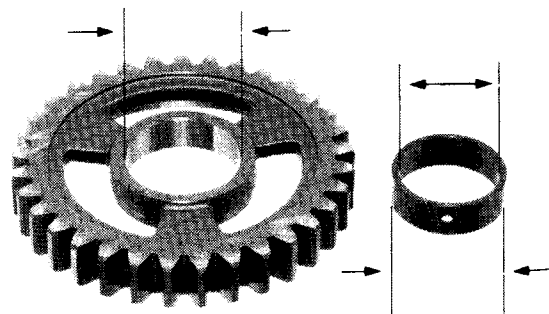
SERVICE LIMIT:	M6	25.06 mm (0.987 in)
	M5	28.05 mm (1.104 in)
	C1	22.06 mm (0.869 in)
	C2	27.06 mm (1.065 in)
	C3	28.06 mm (1.105 in)
	C4	25.06 mm (0.987 in)

Measure the I.D. of each bushing.

SERVICE LIMIT:	C1	19.04 mm (0.750 in)
	C2	24.04 mm (0.947 in)

Measure the O.D. of each bushing.

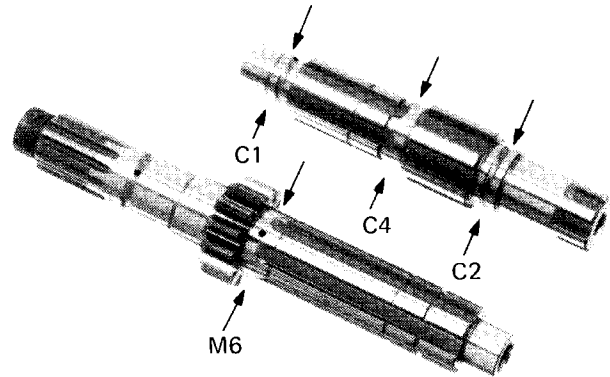
SERVICE LIMIT:	M5	27.94 mm (1.100 in)
	C1	21.96 mm (0.865 in)
	C2	27.96 mm (1.101 in)
	C3	27.94 mm (1.100 in)



Measure the O.D. of the mainshaft and counter-
shaft.

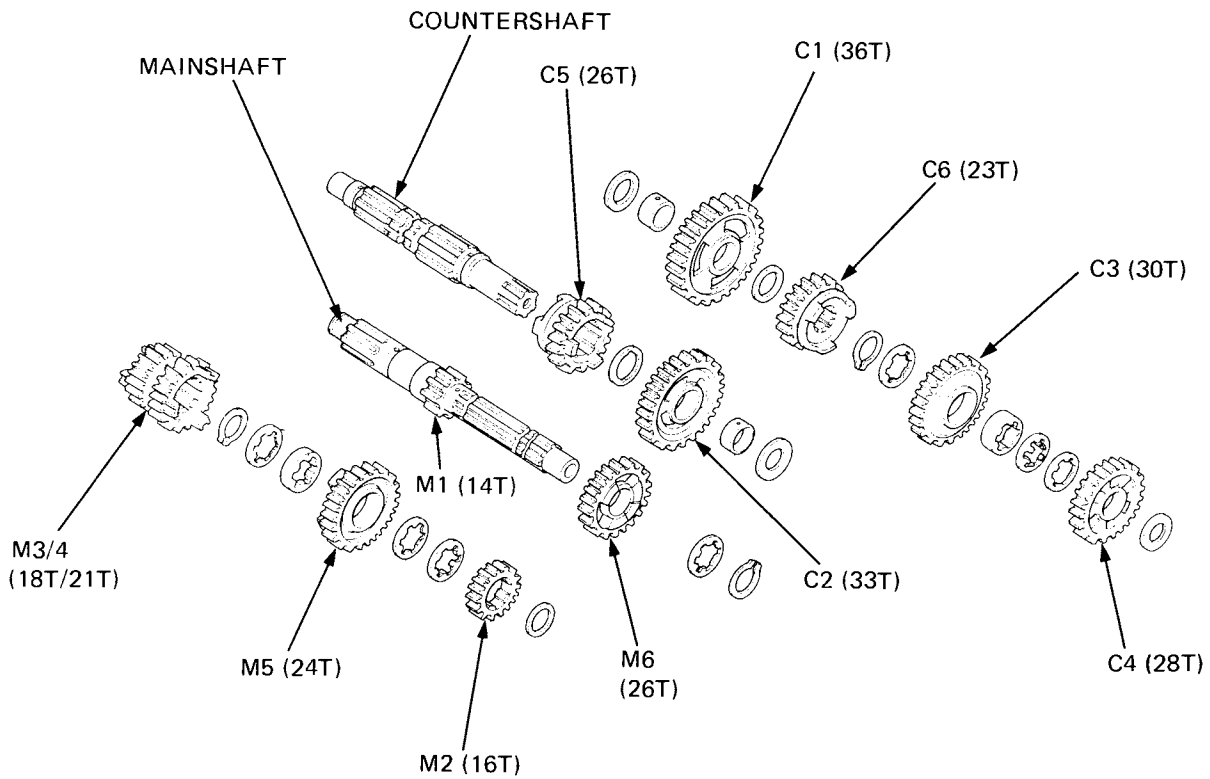
SERVICE LIMIT:

M6	24.94 mm (0.982 in)
C1	18.94 mm (0.746 in)
C2	23.94 mm (0.943 in)
C4	24.94 mm (0.982 in)



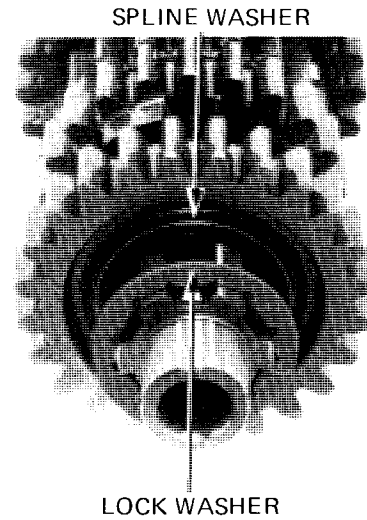
INSTALLATION

Assemble the transmission gears and shafts.

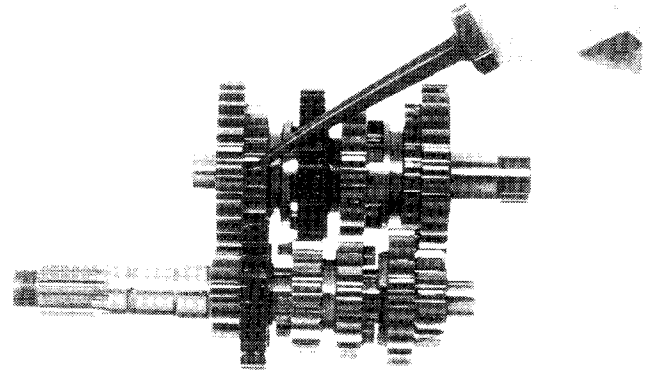


TRANSMISSION/CRANKSHAFT/BALANCER

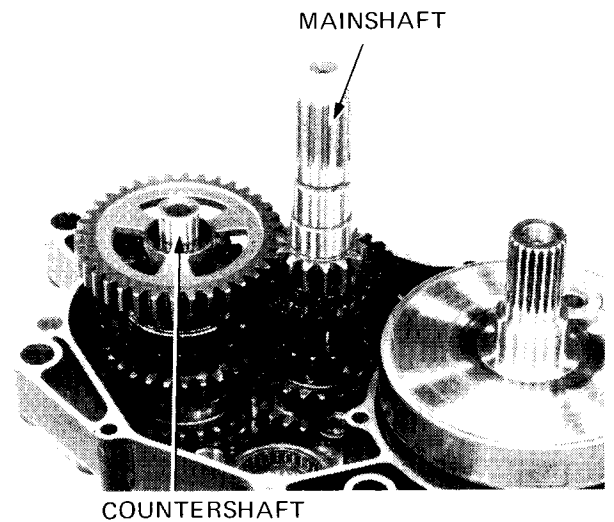
Install the lock washer while aligning the tabs of the lock washer with the grooves in the spline washer.



Coat each gear with transmission oil before assembling. After installing, check for smooth movement.



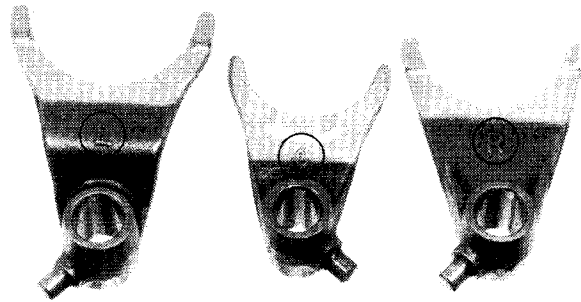
Install the mainshaft and countershaft into the left crankcase.



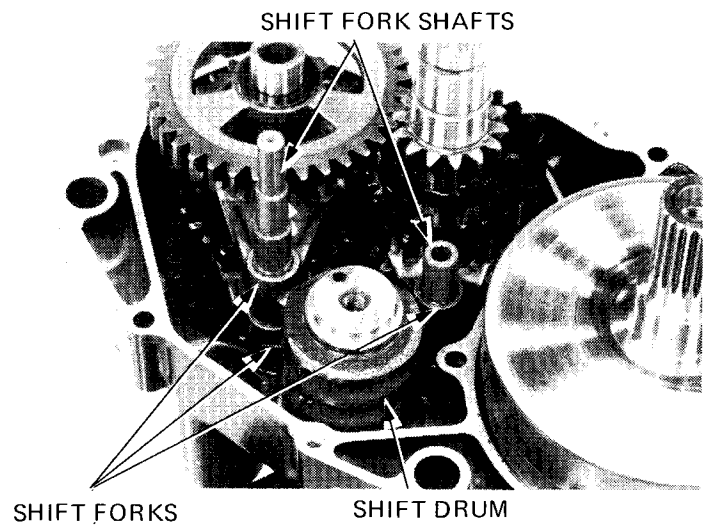
Install the shift drum and shift forks.

CAUTION

Install the shift forks with their marks facing toward the left crankcase.



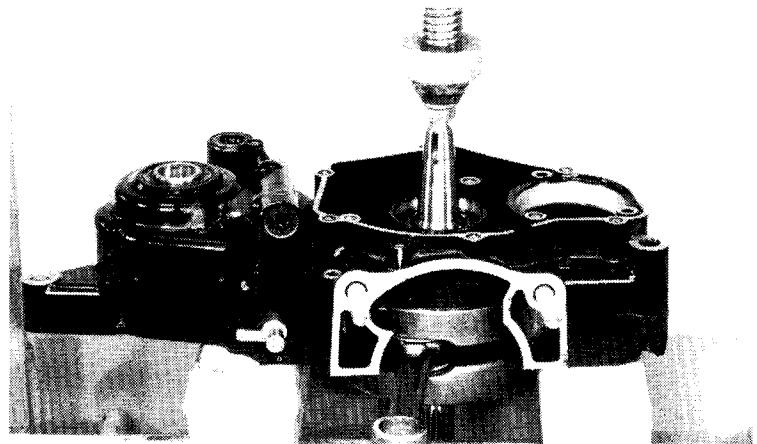
Slide the shift fork shafts through the shift forks, and into the crankcase. After installing, check for smooth operation.



CRANKSHAFT

Separate the crankcase (Page 8-6).
Remove the transmission (Page 8-7).
Remove the oil seal.

Remove the crankshaft from the left crankcase using a hydraulic press.



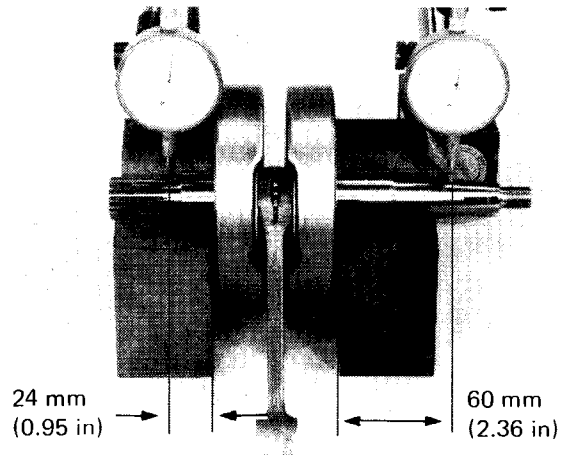
TRANSMISSION/CRANKSHAFT/BALANCER

INSPECTION

Measure the crankshaft runout at the points indicated in the photograph.

SERVICE LIMIT: 0.05 mm (0.002 in)

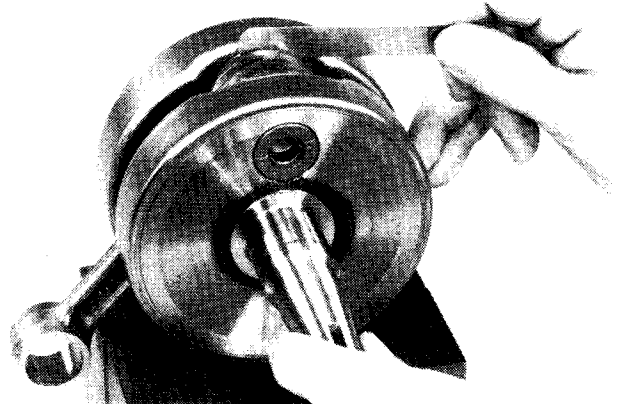
Replace the crankshaft if the runout is larger than the service limit.



Measure the connecting rod big end side clearance.

SERVICE LIMIT: 1.0 mm (0.04 in)

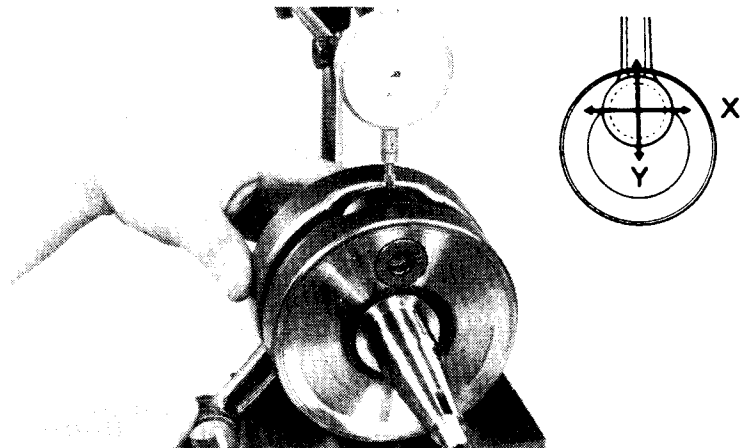
Replace the crankshaft if the clearance is larger than the service limit.



Measure the connecting rod big end radial clearance.

SERVICE LIMIT: 0.04 mm (0.002 in)

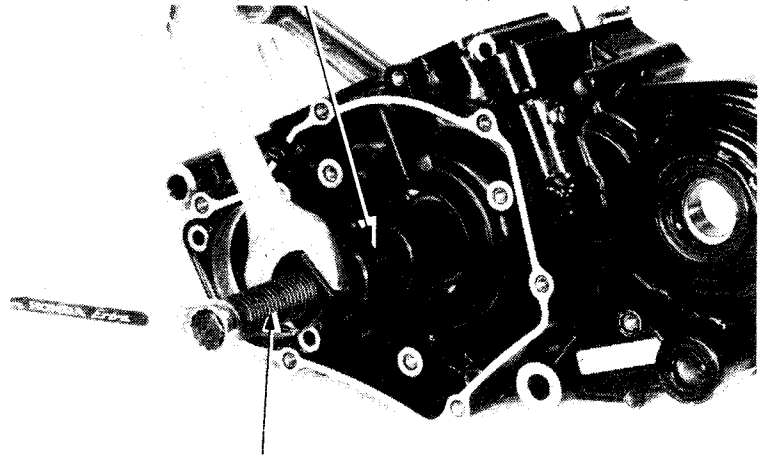
Replace the crankshaft if the clearance is larger than the service limit.



INSTALLATION

Install the crankshaft into the left crankcase.
 Use the special tools to install the crankshaft into the left crankcase.
 Install the transmission (Page 8-9).
 Assemble the crankcase (Page 8-15).

DRIVESHAFT DIS/ASSEMBLY TOOL (B) 07964-MB00200



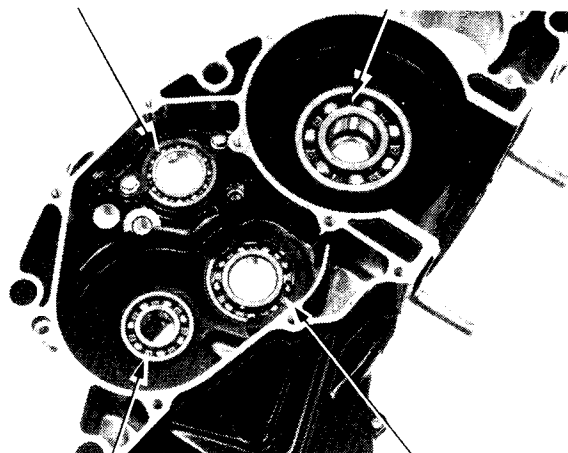
ASSEMBLY BOLT 07965-1660200

BEARING REPLACEMENT

RIGHT CRANKCASE

The bearings must be replaced if they are noisy or have excessive play.

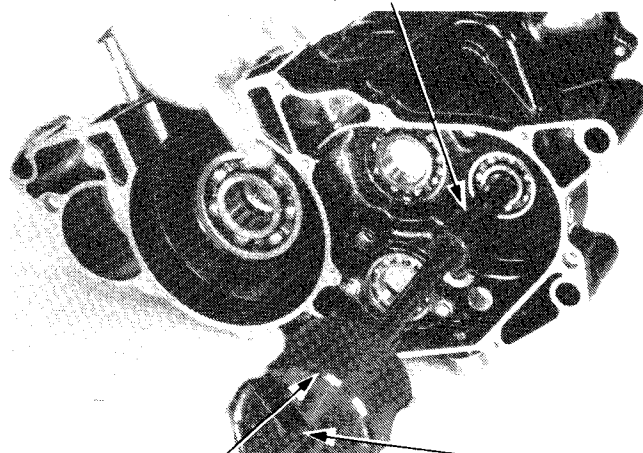
SHIFT DRUM BEARING CRANKSHAFT BEARING



COUNTERSHAFT BEARING MAINSHAFT BEARING

Remove the crankshaft collar, oil seal and bearing.
 Drive out the mainshaft bearing.
 Remove the countershaft bearing with the bearing remover.
 Remove the bearing holders and shift drum bearing.

BEARING REMOVER, 17 mm 07936-3710300



REMOVER WEIGHT
 07741-0010201 or 07736-3710200

REMOVER HANDLE
 07936-3710100

TRANSMISSION/CRANKSHAFT/BALANCER

Install the bearings into the right crankcase using the following tools:

Crankshaft bearing:

Driver	07749-0010000
Attachment, 62 x 68 mm	07746-0010500
Pilot, 28 mm	07746-0041100

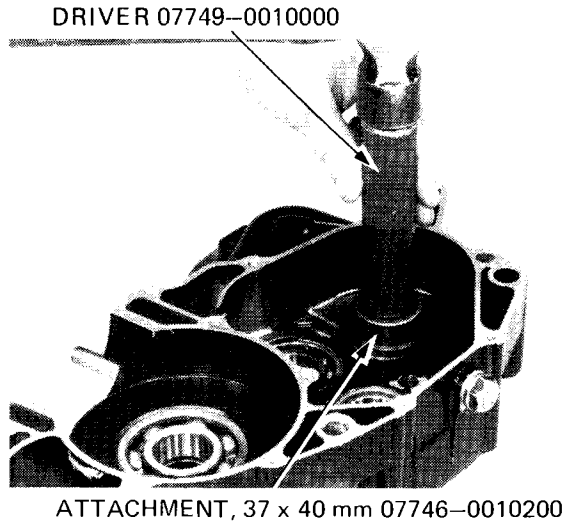
Mainshaft bearing:

Driver	07749-0010000
Attachment, 52 x 55 mm	07746-0010400
Pilot, 25 mm	07746-0040600

Countershaft bearing:

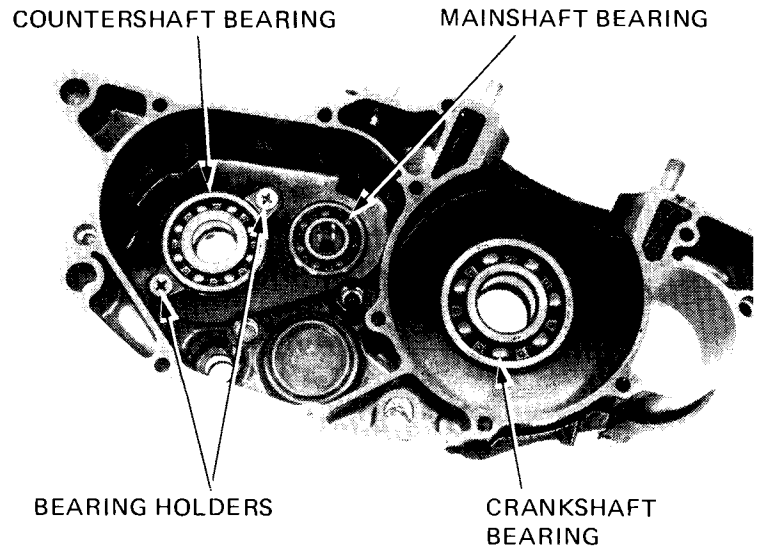
Driver	07749-0010000
Attachment, 37 x 40 mm	07746-0010200

Install the shift drum bearing into the right crankcase and secure it with the bearing holder plates and bolts.



LEFT CRANKCASE

The bearings must be replaced if they are noisy or have excessive play.

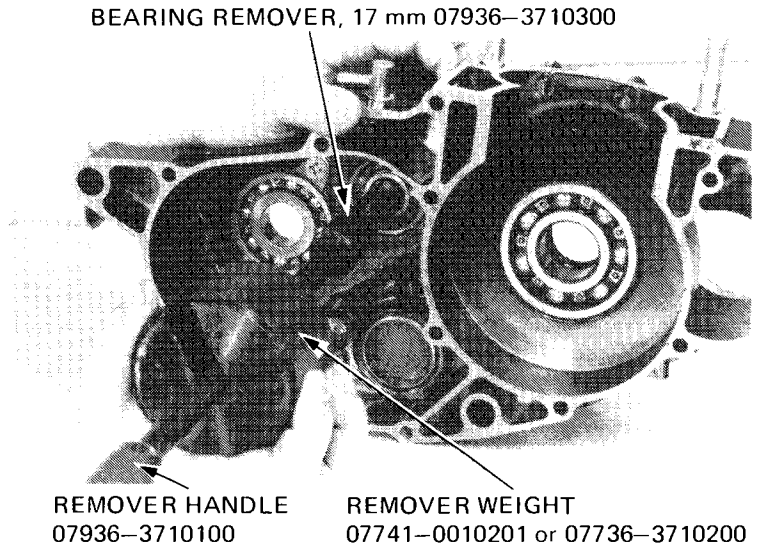


Remove the crankshaft oil seal and drive out the bearing.

Remove the mainshaft bearing with the bearing remover.

Remove the countershaft collar and oil seal.

Remove the countershaft bearing holder plates by removing the screws and drive out the bearing.



Install the bearings into the left crankcase using the following tools:

Crankshaft bearing:

Driver 07749-0010000
Attachment, 62 x 68 mm 07746-0010500
Pilot, 28 mm 07746-0041100

Mainshaft bearing:

Driver 07749-0010000
Attachment, 37 x 40 mm 07746-0010200

Countershaft bearing:

Driver 07749-0010000
Attachment, 52 x 55 mm 07746-0010400
Pilot, 22 mm 07746-0041000

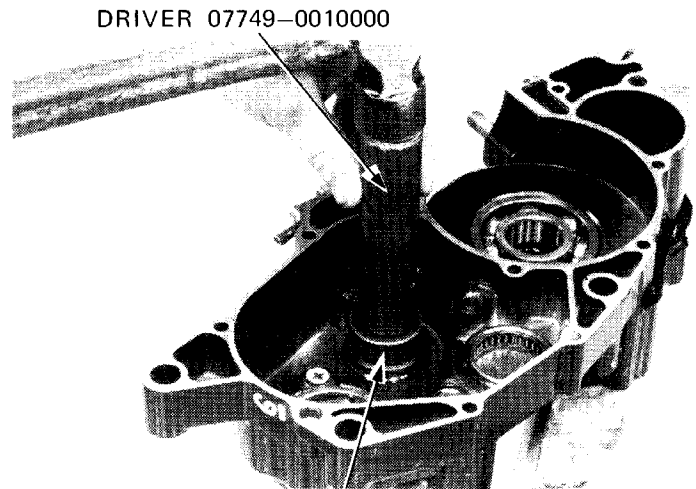
Install a new countershaft oil seal and the collar.

Apply a thread lock agent to the bearing holder plate attaching screws, then install the screws.

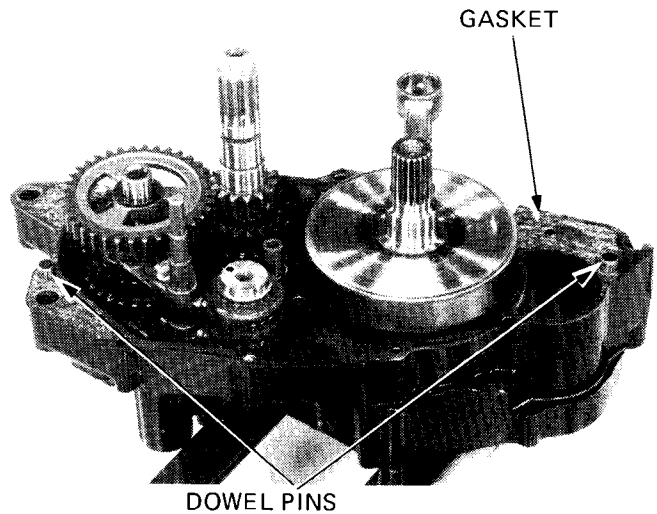
TORQUE: 8–12 N·m (0.8–1.2 kg, 6–9 ft·lb)

CRANKCASE ASSEMBLY

Install a new gasket and the dowel pins.



ATTACHMENT, 37 x 40 mm 07746-0010200



ASSEMBLY BOLT 07965-1660200

Install the right crankcase onto the left crankcase. If the crankshaft-to-right bearing fitting is tight, use the special tools to assemble the cases as described below:

Place the right crankcase over the crankshaft and transmission shafts.

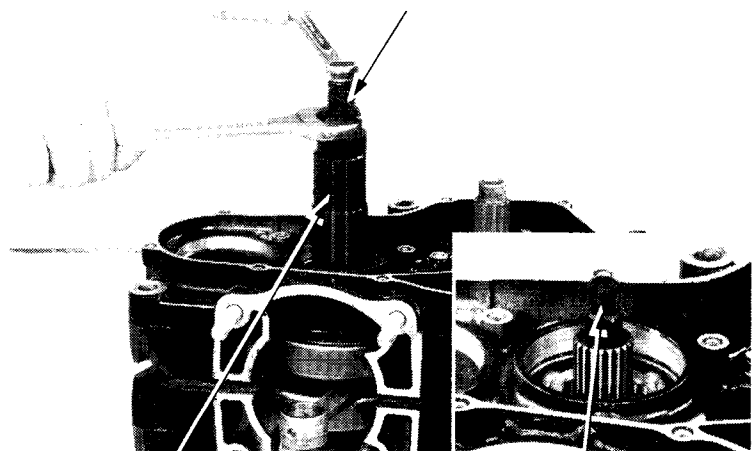
Screw the thread adapter into the crankshaft as shown.

Place the drive shaft dis/assembly tool (B) over the end of the crankshaft.

Thread the assembly bolt onto the thread adapter and tighten the special left-hand thread nut portion of the assembly bolt against the drive shaft dis/assembly tool (B) (counterclockwise).

Hold the center bolt stationary and continue turn the left-hand nut counterclockwise until the case halves meet.

Do not over tighten.



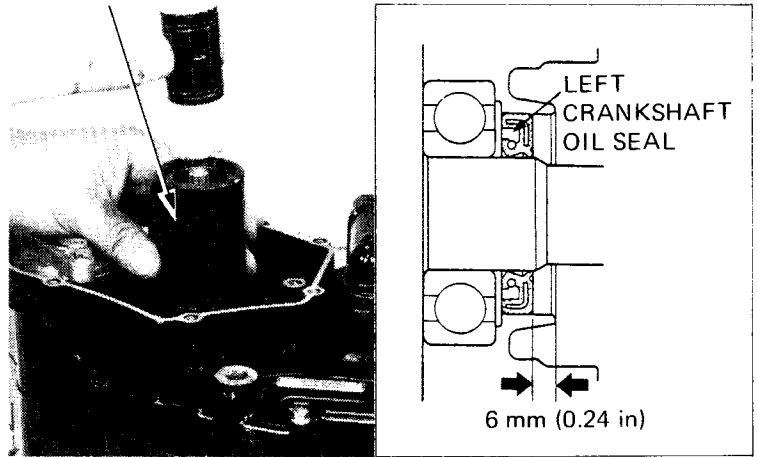
DRIVE SHAFT DIS/ASSEMBLY TOOL (B) 07964-MB00200

THREAD ADAPTER 07965-KA30000

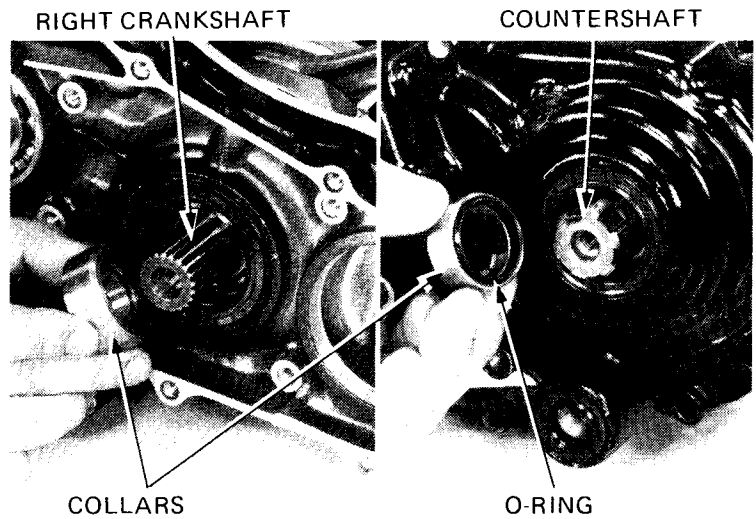
TRANSMISSION/CRANKSHAFT/BALANCER

Drive a new right crankshaft oil seal into place until it is flush with the crankcase surface.
Drive a new left crankshaft oil seal into the crankcase until it is 6 mm (0.24 in) from the left end of the case as shown.

ASSEMBLY COLLAR
07931-KF00100 or 07945-3710101

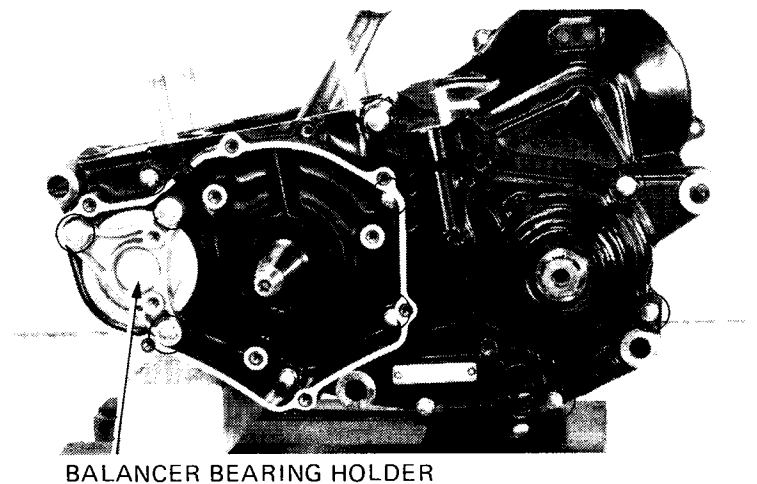


Install the right crankshaft collar.
Coat a new O-ring with grease and install the collar and O-ring onto the countershaft.



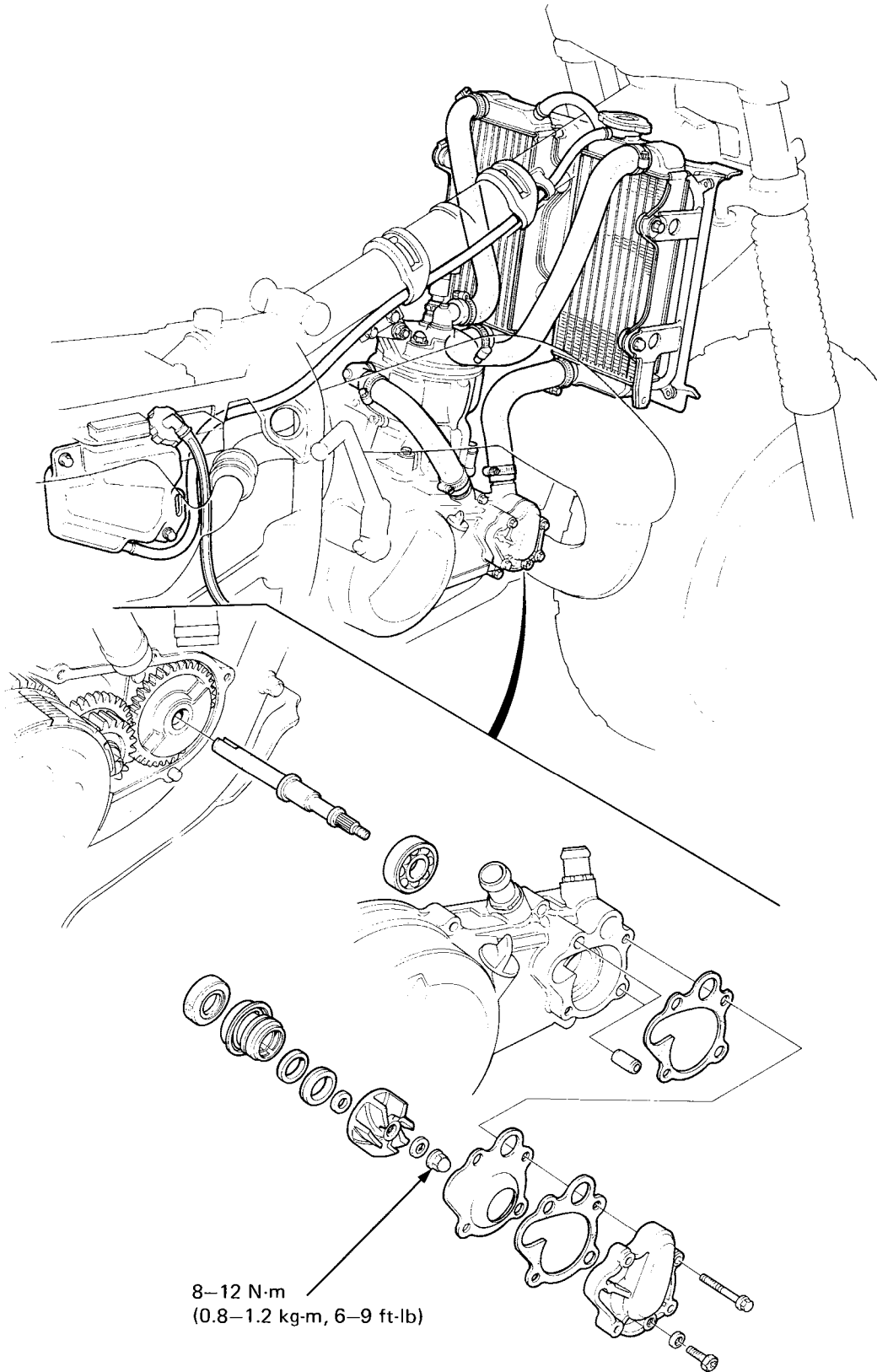
Install the crankcase attaching bolts and balancer bearing holder.

Reinstall the items noted in the information paragraph on page 8-1.



MEMO

COOLING SYSTEM



9. COOLING SYSTEM

SERVICE INFORMATION	9-1
TROUBLESHOOTING	9-1
COOLING SYSTEM INSPECTION	9-2
COOLANT REPLACEMENT	9-2
RADIATOR	9-4
WATER PUMP	9-4

SERVICE INFORMATION

GENERAL

- To service the water pump mechanical seal, remove the right crankcase cover.
- All cooling system service can be done with the engine in the frame.
- Do not remove the radiator cap when the engine is hot. The coolant is under pressure and it could result in scalding. The engine must be cool before servicing the cooling system.
- Avoid spilling coolant on painted surfaces. After servicing the system, check for leaks.
- Use only a high quality ethylene glycol based anti-freeze containing corrosion protection inhibitors specifically recommended for use in aluminum engines.

SPECIFICATIONS

Radiator cap relief pressure	110–140 kPa (1.1–1.4 kg/cm ² , 16–20 psi)
Freezing point	55% Distilled water + 45% ethylene glycol: –32°C (–25°F) 50% Distilled water + 50% ethylene glycol: –37°C (–34°F) 45% Distilled water + 55% ethylene glycol: –44.5°C (–48°F)
Coolant capacity	910 cc (31 US oz, 0.802 Imp qt) at coolant change RADIATOR: 700 cc (23 US oz, 0.617 Imp qt) RESERVE TANK: 210 cc (7 US oz, 0.185 Imp qt) 1,320 cc (45 US oz, 1.623 Imp qt) at disassembly RADIATOR: 1,100 cc (37 US oz, 0.969 Imp qt) RESERVE TANK: 220 cc (7.5 US oz, 0.654 Imp qt)

9

TORQUE VALUES

Water pump impeller 8–12 N·m (0.8–1.2 kg·m, 6–9 ft·lb)

TOOLS

Special

Mechanical seal driver attachment 07945–4150400 or Mechanical installer GH-AH-065415 (U.S.A. only)

Attachment, 28 x 30 mm 07946–1870100

Bearing remover, 12 mm 07936–1660100

Remover weight 07741–0010200 or 07936–3710200

Common

Driver 07749–0010000

Pilot, 12 mm 07746–0040200

TROUBLESHOOTING

Engine temperature too high

- Faulty radiator cap
- Insufficient coolant
- Passages blocked in radiator, hoses or water jacket
- Faulty water pump

Coolant leaks

- Faulty water pump mechanical seal
- Loose water hose connections
- Damaged or deteriorated water hoses

COOLING SYSTEM

COOLING SYSTEM INSPECTION

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

NOTE

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

RADIATOR CAP RELIEF PRESSURE:

110–140 kPa (1.1–1.4 kg/cm², 16–20 psi)

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

CAUTION

*Excessive pressure can damage the radiator.
Do not exceed 2 kg/cm² (28.4 psi).*

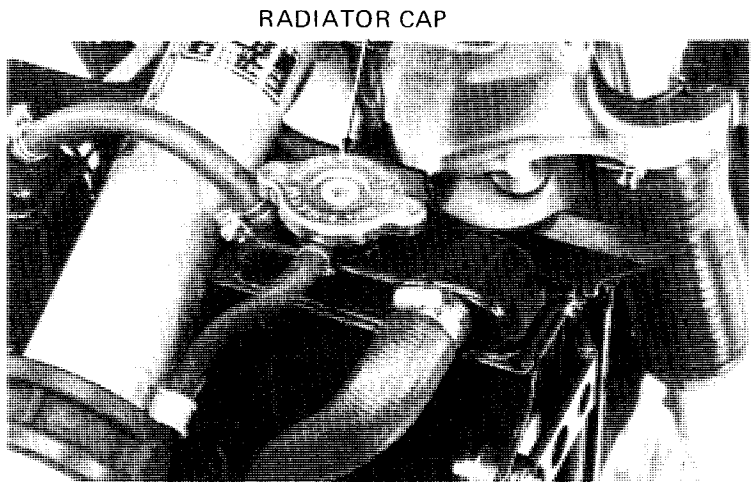
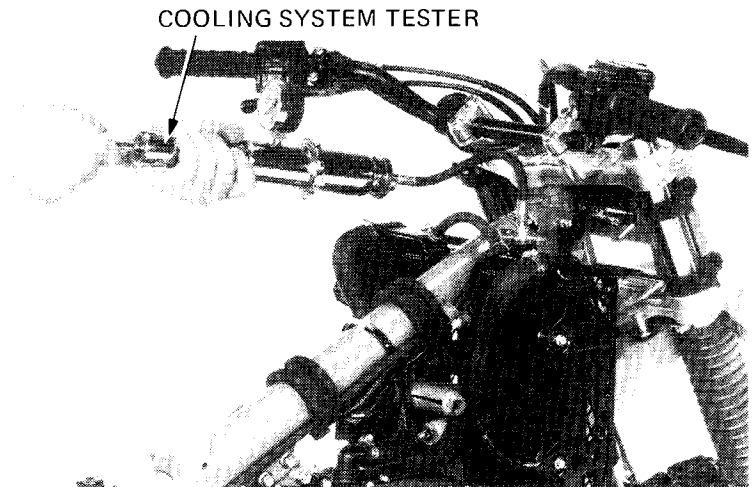
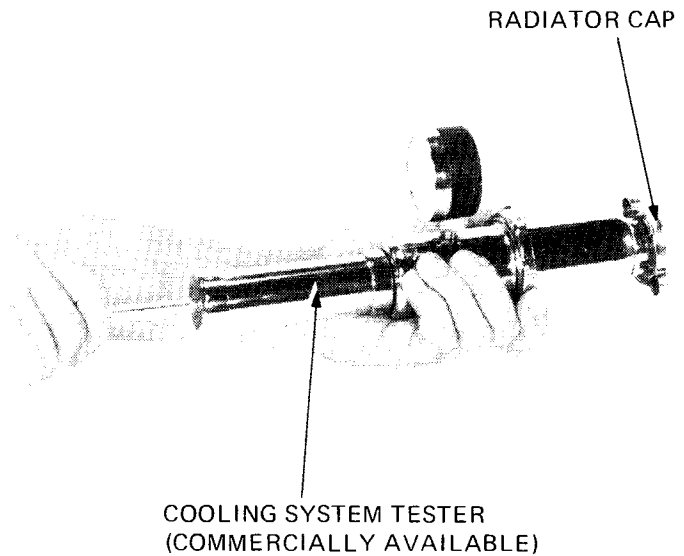
Repair or replace components if the system will
not hold specified pressure for at least six seconds.

COOLANT REPLACEMENT

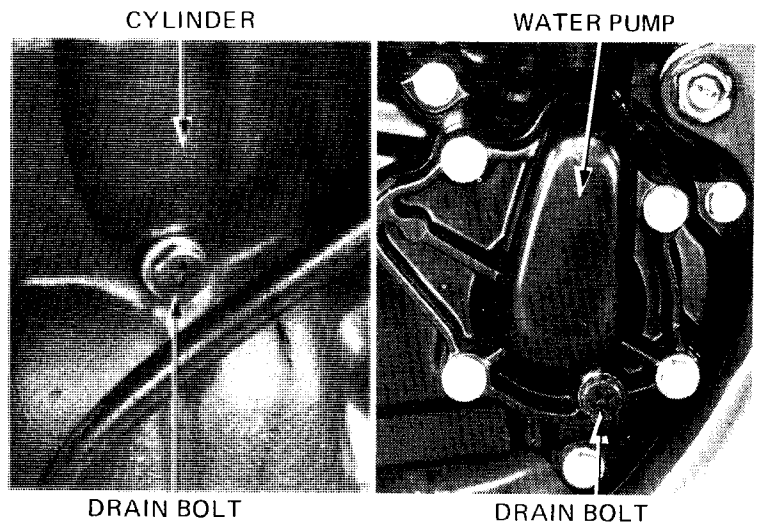
WARNING

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

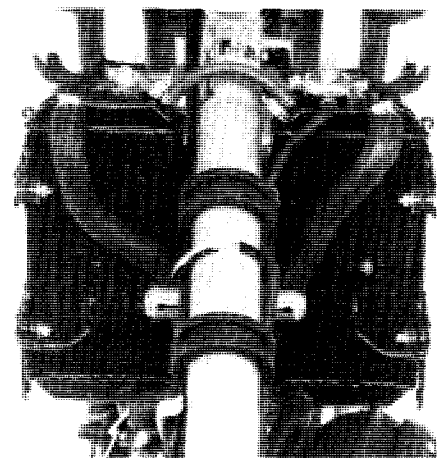
Remove the radiator cap with the machine upright.



Remove the coolant drain bolt at the cylinder and water pump, and drain the coolant.
Check that the drain bolt sealing washers are in good condition, then install the drain bolts.



Remove the left radiator lower hose from the bottom of left radiator.
Drain the coolant from the left radiator and radiator hose.
Drain the coolant from the reserve tank.
Install the radiator hose.



RADIATOR HOSE

Pour recommended coolant mixture (Page 9-1) slowly through the radiator filler hole up to the filler neck.
Pour recommended coolant mixture (Page 9-1) into the reserve tank.

CAPACITY: 910 cc (31 US oz, 0.802 Imp qt)
RADIATOR: 700 cc (23 US oz, 0.617 Imp qt)
RESERVE TANK: 210 cc (7 US oz, 0.185 Imp qt)

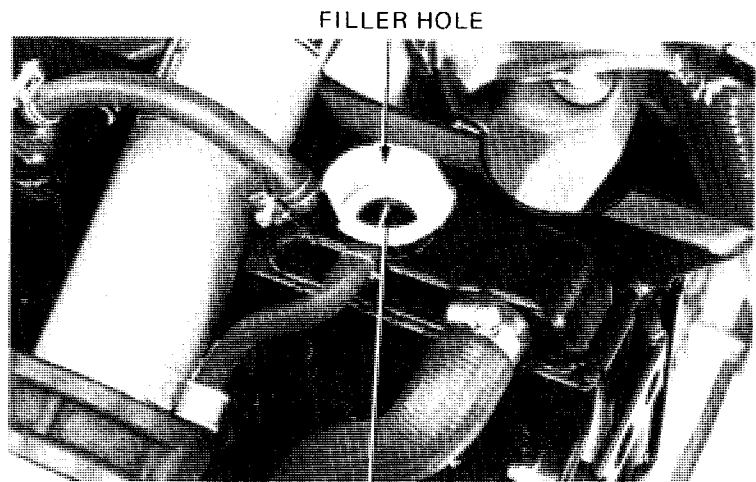
Bleed air from the system as follows:

1. Start the engine and let it idle.
2. Check that there are no air bubbles in the coolant around the filler hole, and the level stabilizes.
3. Stop the engine and replenish coolant up to the filler hole.
4. Check the level of coolant in the reserve tank if necessary, raise the level up to the F mark.

Install the radiator cap securely.

NOTE

After the above steps have been completed, check for leaks.



FILLER NECK

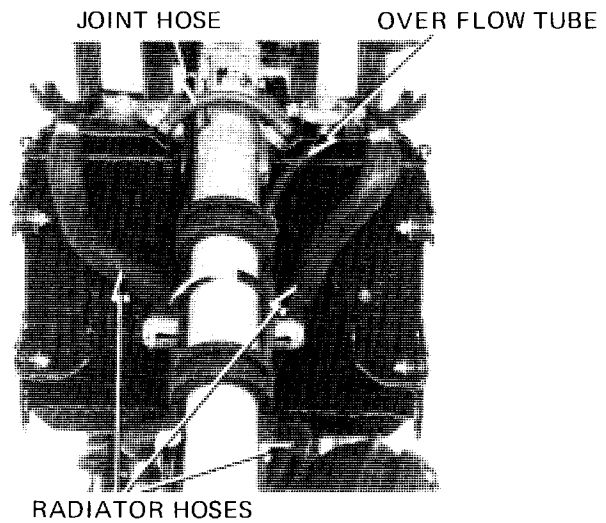
RADIATOR

REMOVAL

Remove the seat and fuel tank (Page 3-3).
Drain the radiator coolant (Page 9-3).
Remove the radiator joint hose and reserve tank tube.

Loosen the radiator hose bands and remove the following hoses:

- radiator-to-cylinder.
- radiator-to-water pump.
- left radiator-to-right radiator.

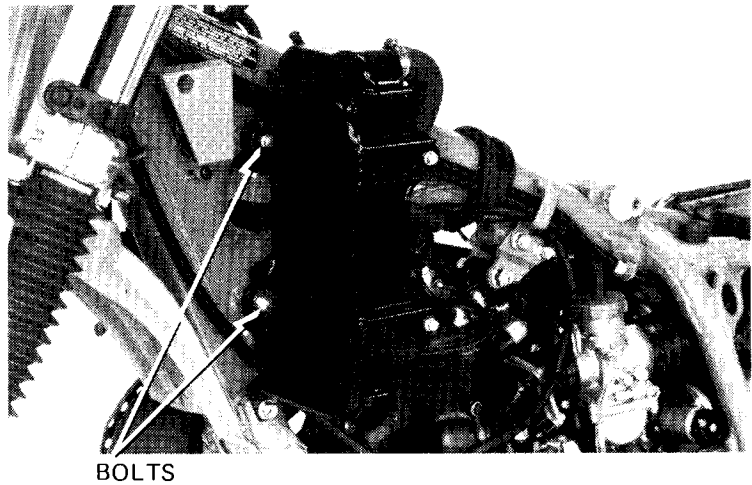


Remove the radiator mount bracket attaching bolts and remove the radiator with the bracket.

INSTALLATION

Installation is essentially the reverse order of removal.
Fill with the recommended coolant (Page 9-3).

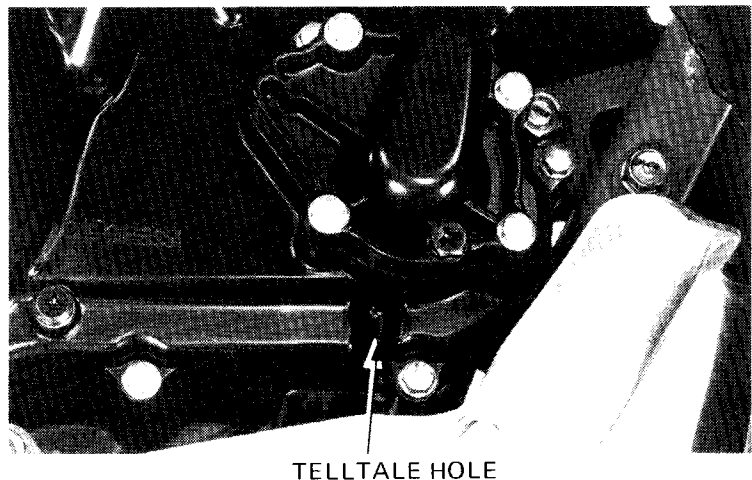
After installation, check the radiator and hoses for leaks.



WATER PUMP

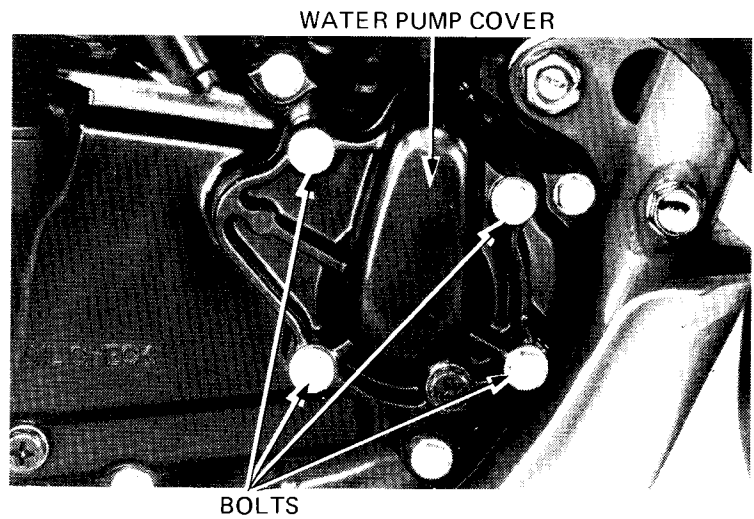
MECHANICAL SEAL INSPECTION

Inspect the telltale hole for signs of coolant leakage.
Replace the mechanical seal if there is leaking.

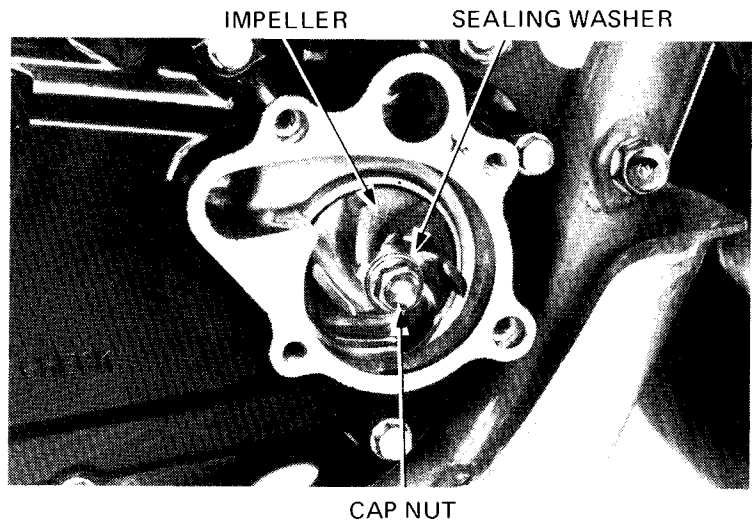


REMOVAL

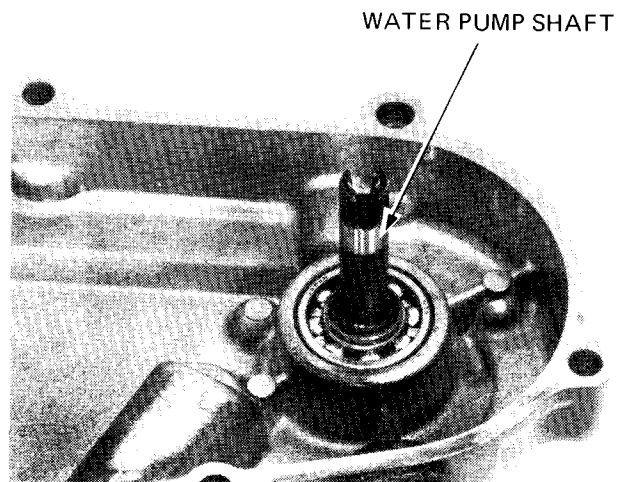
Drain the radiator coolant (Page 9-3).
 Remove the radiator hose.
 Remove the water pump cover attaching bolts and
 remove the water pump cover.
 Remove the gasket and dowel pins.



Hold the rotor with a universal holder.
 Remove the cap nut and sealing washer.
 Remove the impeller and washer.



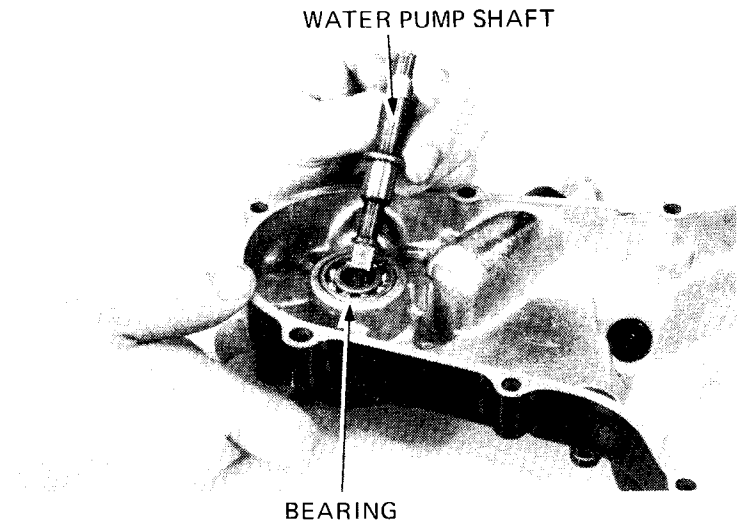
Remove the right crankcase cover (Page 7-3).
 Remove the water pump shaft.



COOLING SYSTEM

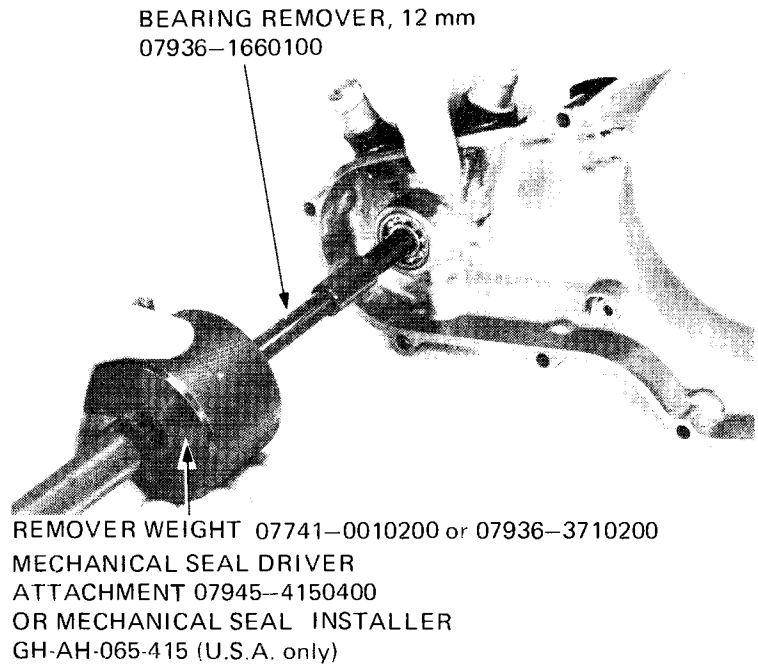
INSPECTION

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



MECHANICAL SEAL/BEARING REPLACEMENT

Remove the bearing with a bearing remover.
Remove the oil seal, then drive out the mechanical seal.



Drive a new mechanical seal carefully into the right crankcase cover.

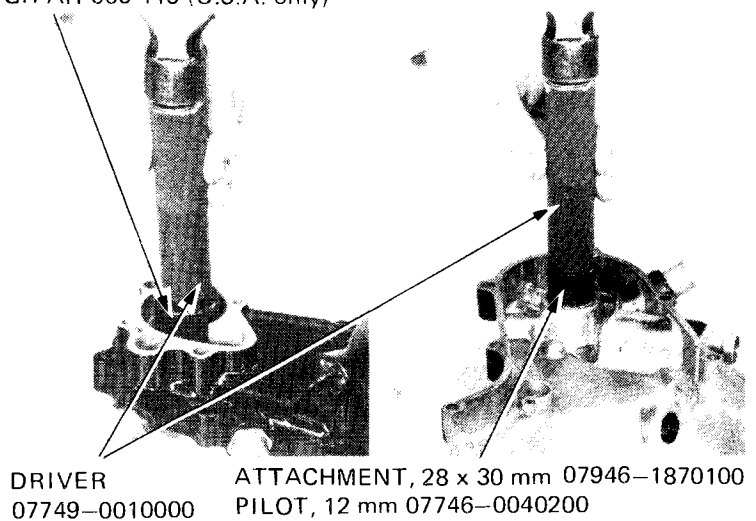
CAUTION

Be careful not to damage the cover when driving the mechanical seal, into the cover.

NOTE

Instructions for usage of the Mechanical Seal Installer are in the Special Tool catalog (U.S.A. only).

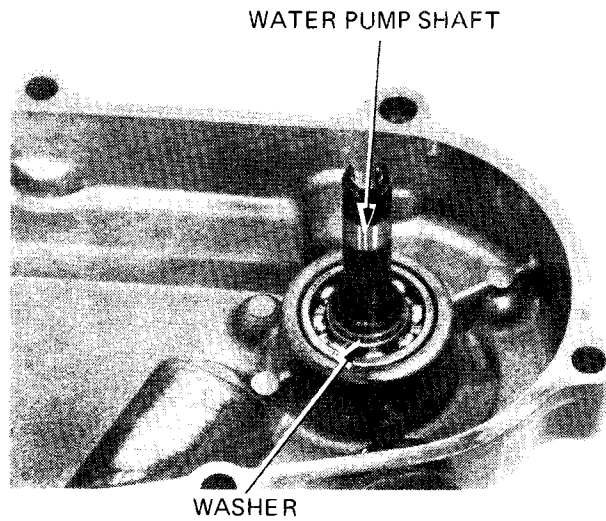
Install a new oil seal and drive a new bearing in the right crankcase cover.



INSTALLATION

Install the water pump shaft.

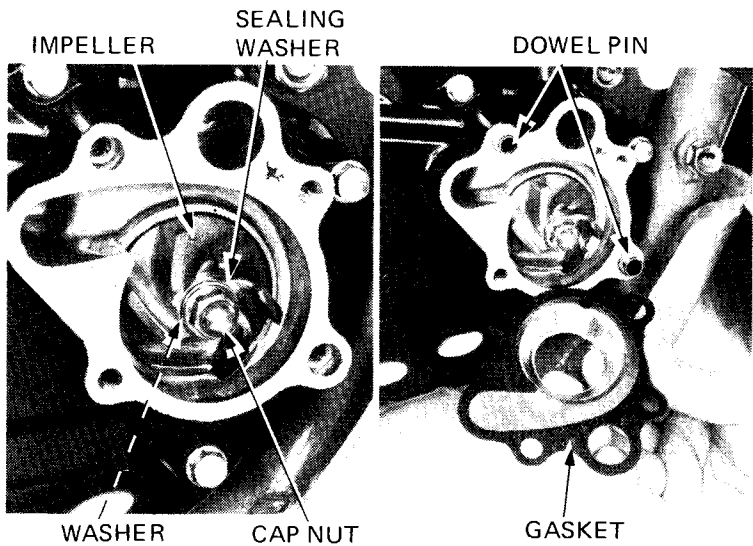
Install the right crankcase cover (Page 7-10).



Install the washer onto the water pump shaft.
 Install the impeller, sealing washer, and cap nut.
 Hold the rotor with a universal holder, then tighten the cap nut.

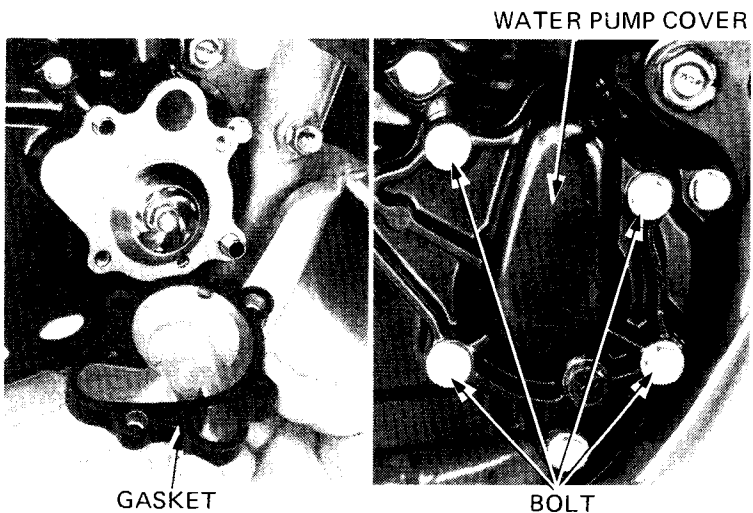
TORQUE: 8–12 N·m
 (0.8–1.2 kg·m, 6–9 ft·lb)

Install a new gasket and the dowel pins.

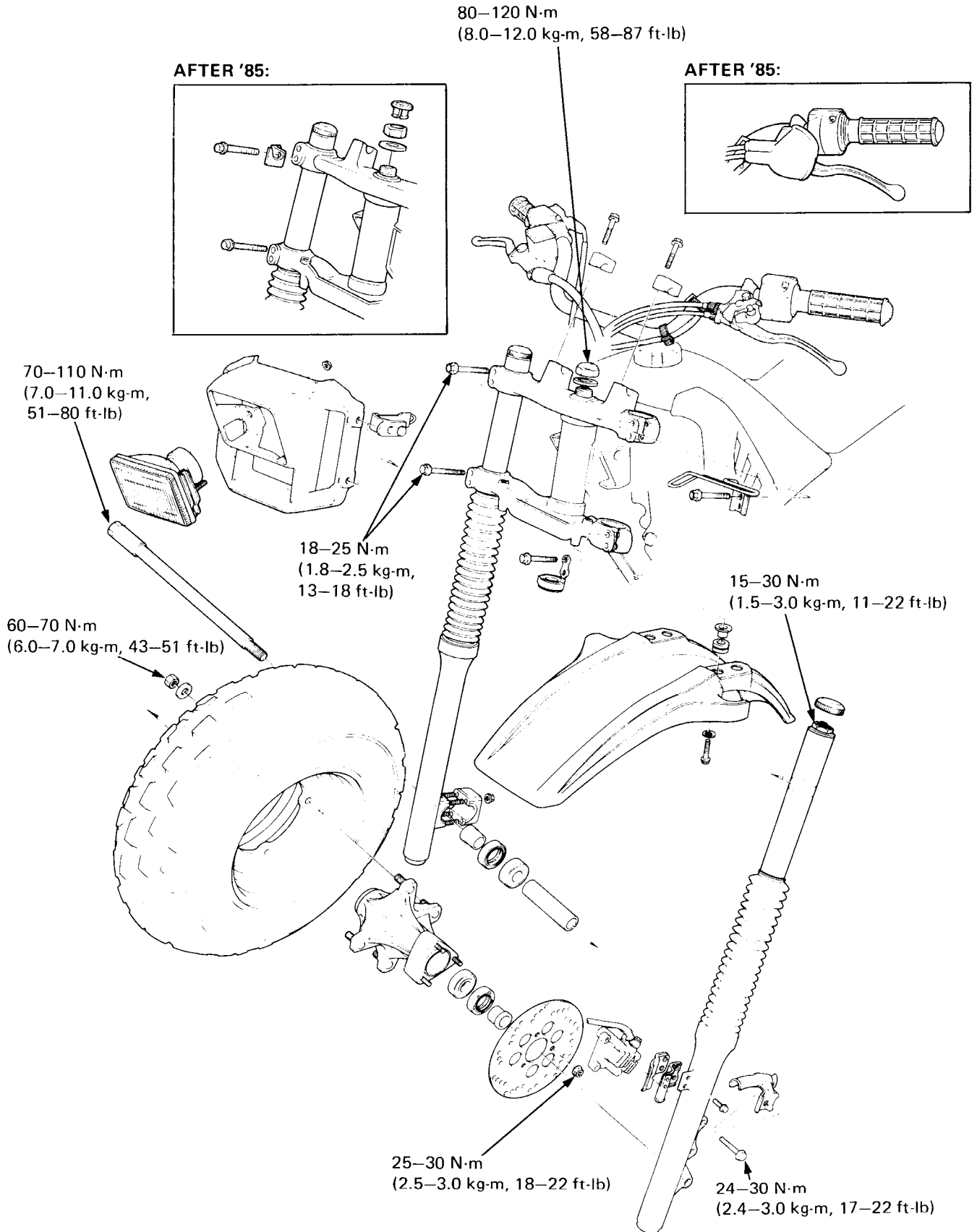


Install the water pump cover with a new gasket.

Install the water pump cover attaching bolts.



FRONT WHEEL/SUSPENSION/STEERING



10. FRONT WHEEL/SUSPENSION/STEERING

SERVICE INFORMATION	10-1
TROUBLESHOOTING	10-2
HANDLEBAR	10-3
FRONT WHEEL	10-6
FRONT FORK	10-14
STEERING STEM	10-22

SERVICE INFORMATION

GENERAL

- This section covers maintenance of the front wheel, front fork and steering system.
- A jack or other support is required to support the ATC.

SPECIFICATIONS

ITEM		STANDARD mm (in)	SERVICE LIMIT mm (in)
Front axle runout		0.3 (0.01)	0.5 (0.02)
Front wheel bearing play	Radial	—	0.05 (0.002)
	Axial	—	0.10 (0.004)
Front fork spring free length	'85:	Upper	76.2–82.2 (3.00–3.24)
		Lower	498.2–508.2 (19.61–20.01)
	AFTER '85:		575.2–586.8 (22.65–23.10)
Front fork tube runout		—	0.2 (0.008)
Front wheel rim runout	Radial	1.0 (0.04)	4.0 (0.16)
	Axial	1.0 (0.04)	4.0 (0.16)
Front fork oil capacity	'85:	400 cc (13.56 oz)	—
	AFTER '85:	465 cc (15.5 oz)	—

10

TORQUE VALUES

Front brake master cylinder		10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)
Front brake disc		25–30 N·m (2.5–3.0 kg-m, 18-22 ft-lb)
Front axle		70–110 N·m (7.0–11.0 kg-m, 51–80 ft-lb)
Axle holder		10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)
Front brake caliper mounting bolt		24–30 N·m (2.4–3.0 kg-m, 17–22 ft-lb)
Front wheel nut		60–70 N·m (6.0–7.0 kg-m, 43–51 ft-lb)
Front fork socket bolt		15–25 N·m (1.5–2.5 kg-m, 11–18 ft-lb)
Fork tube cap		15–30 N·m (1.5–3.0 kg-m, 11–22 ft-lb)
Front fork pinch bolt		18–25 N·m (1.8–2.5 kg-m, 13–18 ft-lb)
Steering bearing adjustment nut	First	35–45 N·m (3.5–4.5 kg-m, 25–33 ft-lb)
	Second	36–38 N·m (3.6–3.8 kg-m, 26–28 ft-lb)
Steering stem nut		80–120 N·m (8.0–12.0 kg-m, 58–87 ft-lb)

FRONT WHEEL/SUSPENSION/STEERING

TOOLS

Special

Universal bead breaker	GN-AH-958-BB1 (U.S.A. only)
Hex. wrench, 6 mm	07917-3230000 or equivalent commercially available in U.S.A.
Snap ring pliers	07914-3230001 or equivalent commercially available in U.S.A.
Fork seal driver	07947-4630100
Steering stem socket	07916-3710100
Ball race remover	07953-KA50000 or 07953-MJ1000A (U.S.A. only)
Steering stem driver	07946-MB00000 or 07946-4300100
Attachment	GN-HT-54 (U.S.A. only)
Driver	07949-3710001 or 07949-3710000

Common

Bearing remover shaft	07746-0050100	} or commercially available in U.S.A.
Bearing remover head, 15 mm	07746-0050400	
Driver	07749-0010000	
Attachment, 42 x 47 mm	07746-0010300	
Extension bar	07716-0020500	or equivalent commercially available in U.S.A.
Lock nut wrench, 30 x 32 mm	07716-0020400	or equivalent commercially available in U.S.A.
Pilot, 15 mm	07746-0040300	
Attachment, 32 x 35 mm	07746-0010100	

TROUBLESHOOTING

Hard steering

- Steering stem nut too tight
- Faulty steering stem bearings
- Damaged steering stem taper roller bearing
- Insufficient tire pressure

Steers to one side or does not track straight

- Bent front forks
- Bent front axle, wheel installed incorrectly
- Unequal rear tire pressure or circumference

Front wheel wobbling

- Bent rim
- Worn front wheel bearing
- Faulty tire
- Axle not tightened properly

Soft suspension

- Weak fork springs
- Insufficient fluid/air in front forks

Hard suspension

- Incorrect fluid/air in front forks
- Fork damaged

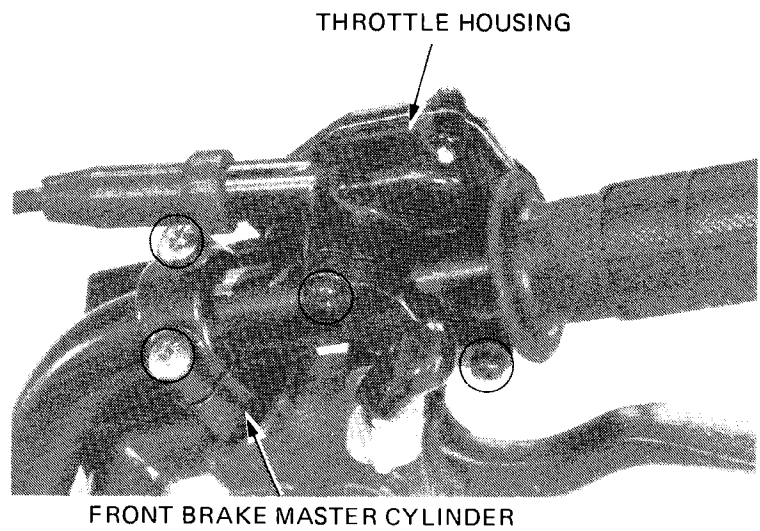
Front suspension noise

- Slider binding
- Loose front fork fasteners
- Insufficient fluid in forks

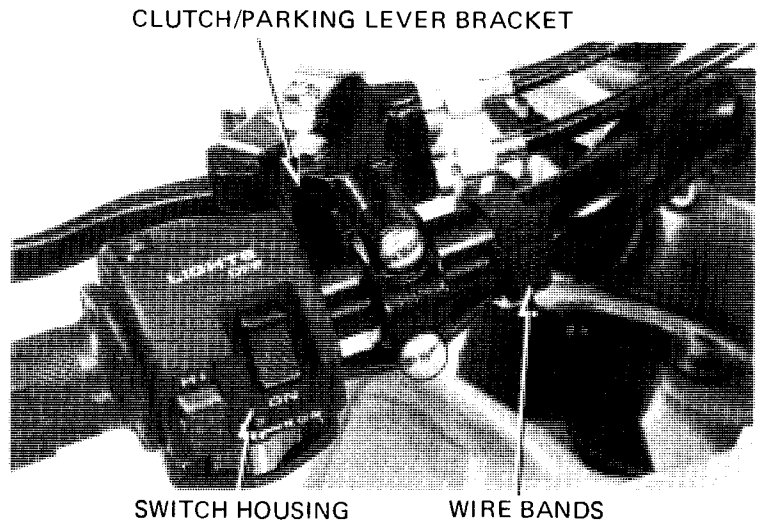
HANDLEBAR

REMOVAL

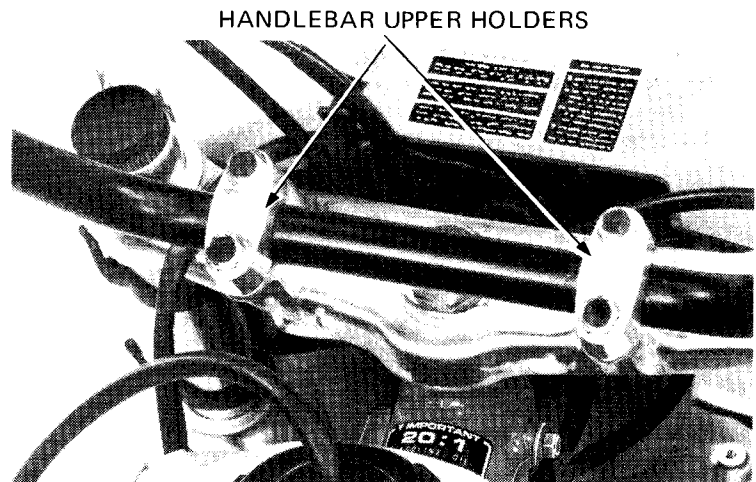
Remove the throttle housing and front brake master cylinder from the handlebar.



Remove the clutch/parking brake lever bracket and switch housing from the handlebar.
Remove the switch wire bands.



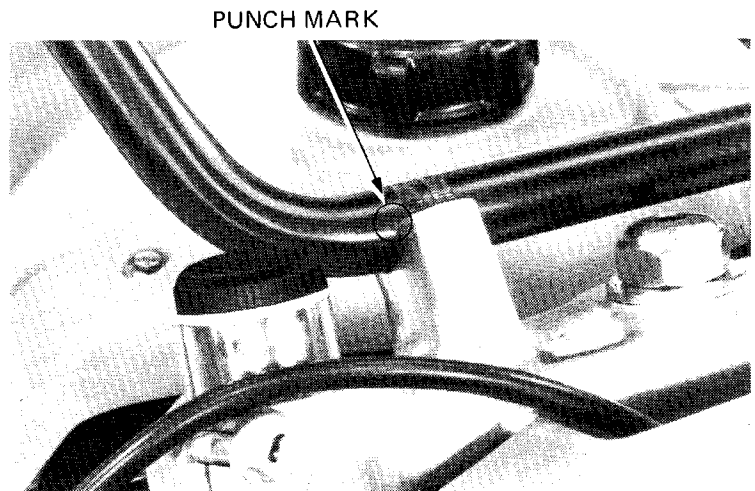
Remove the handlebar upper holders and the handlebar.



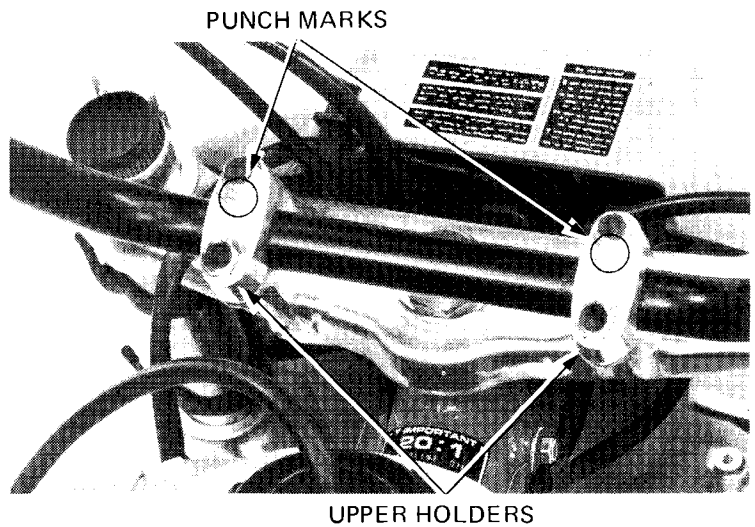
FRONT WHEEL/SUSPENSION/STEERING

INSTALLATION

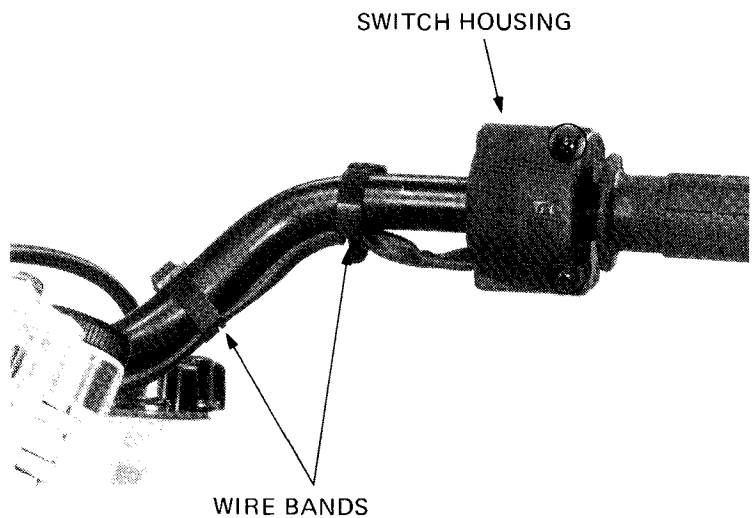
Place the handlebar onto the lower holders, aligning the punch mark on the handlebar with the top of the lower holder.



Install the handlebar upper holders with the punch marks forward. Tighten the front bolts first, then tighten the rear bolts.



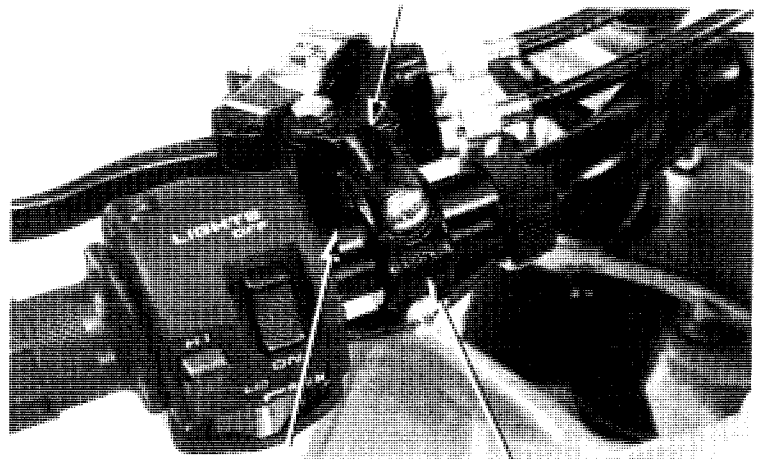
Install the switch housing on the handlebar and tighten the upper screw first, then tighten the lower screw. Install the handlebar switch wire bands.



Place the clutch/parking brake lever bracket on the handlebar and install the holder with the "UP" mark facing up.

Align the bracket holder end with the punch mark on the handlebar and tighten the upper screw first, then tighten the lower screw.

CLUTCH/PARKING BRAKE LEVER BRACKET



PUNCH MARK

"UP" MARK

Place the front brake master cylinder on the handlebar and install the holder with the "UP" mark facing up.

Align the master cylinder holder end with the punch mark on the handlebar and tighten the upper screw first, then tighten the lower screw.

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

FRONT BRAKE MASTER CYLINDER



"UP" MARK

PUNCH MARK

Place the throttle housing on the handlebar and loosely install the holder and screws.

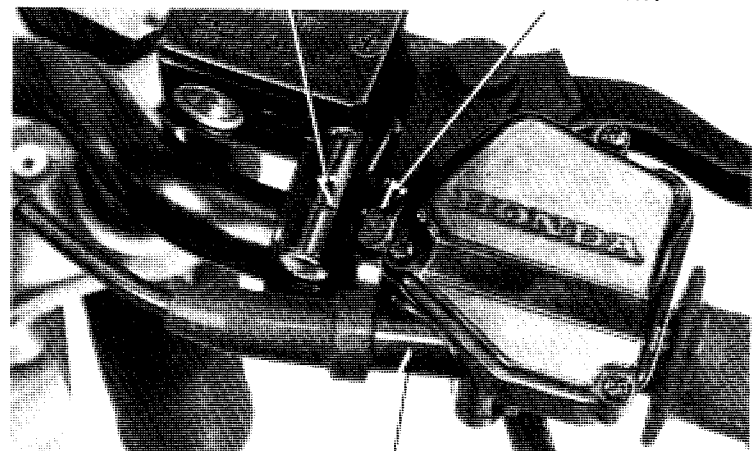
Align the punch mark on the housing with the mating surface of the master cylinder holder, and tighten the forward screw first, then tighten the rear screw.

Perform the following inspections after installing the handlebar.

- Clutch lever free play (Page 2-17)
- Throttle lever free play and return (Page 2-10)
- Operation of parking brake lever (Page 2-15)
- Function of handlebar switch (Page 15-9)
- Operation of front brake lever (Page 2-16)

MATING SURFACE

PUNCH MARK



THROTTLE HOUSING

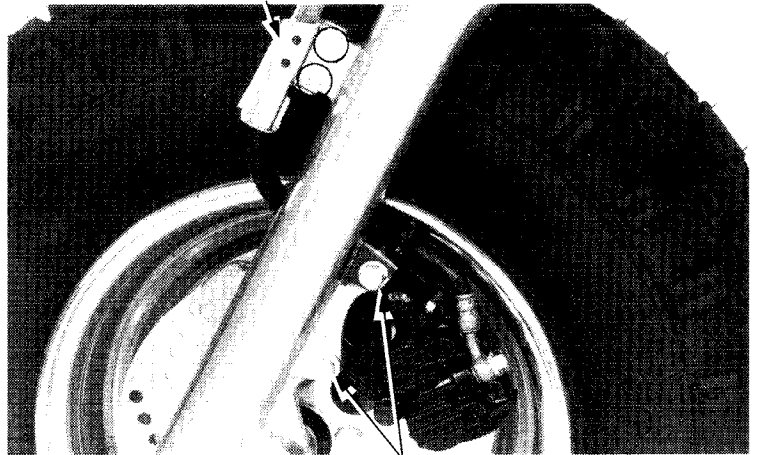
FRONT WHEEL

FRONT WHEEL REMOVAL

Raise the front wheel off the ground by placing a block or safety stand under the skid plate.
Remove the front brake hose clamp from the fork slider.

Remove the front brake caliper mount bolts.

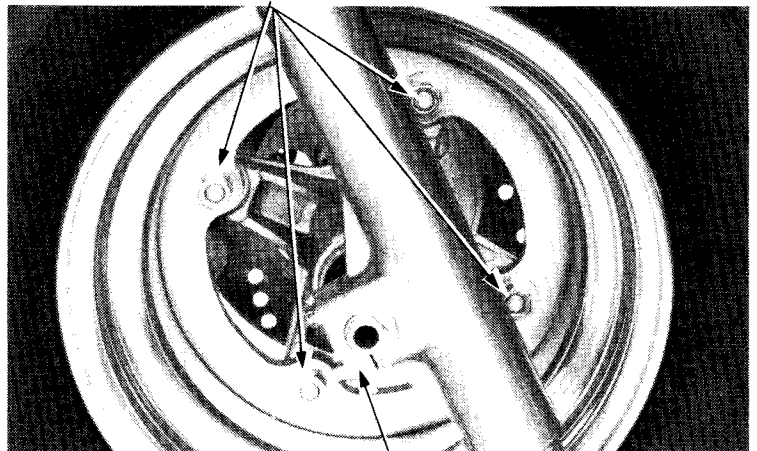
BRAKE HOSE CLAMP



CALIPER MOUNT BOLTS

Remove the front wheel nuts and loosen the axle holder nuts.

WHEEL NUTS



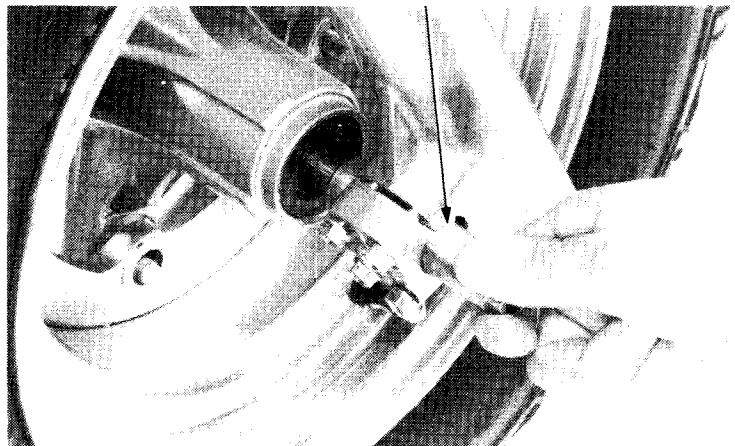
AXLE HOLDER

Loosen the axle and pull it out.
Remove the front wheel being careful not to damage the brake pads.

NOTES

- Place a small wooden wedge between the brake pads to keep them from being forced out at the caliper.
- Do not loosen the brake hose. Whenever the brake hose is loosened, it is necessary to bleed air from the brake. Refer to page 13-4 for bleeding procedures.

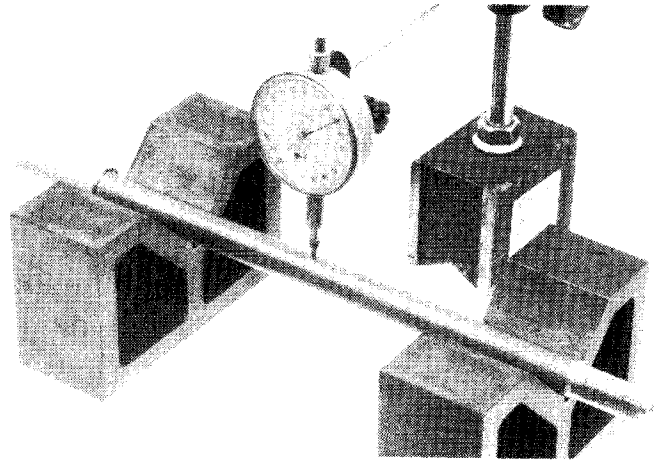
AXLE



FRONT AXLE INSPECTION

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

SERVICE LIMIT: 0.5 mm (0.02 in)



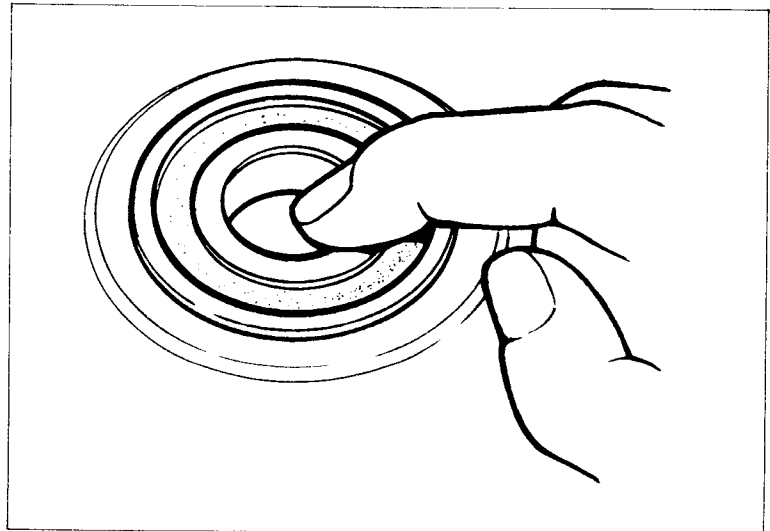
WHEEL BEARING INSPECTION

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

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

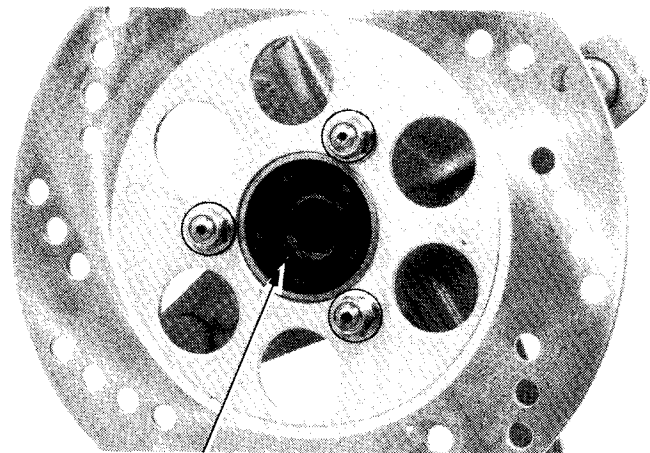
NOTE:

Replace hub bearings in pairs.



WHEEL BEARING REPLACEMENT

Remove the front brake disc from the hub.
Remove the dust seal.



DUST SEAL

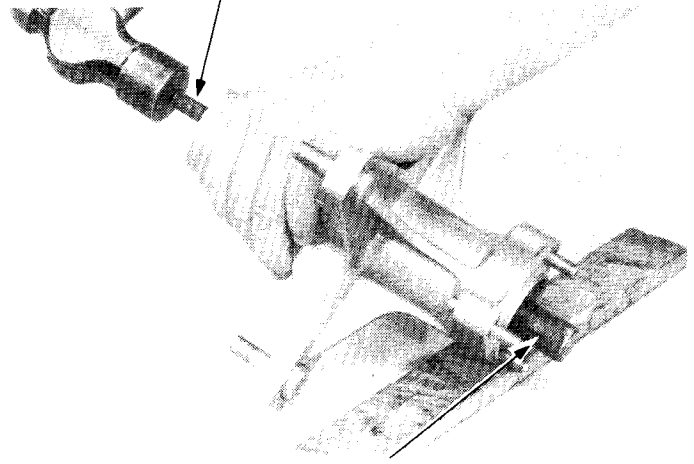
FRONT WHEEL/SUSPENSION/STEERING

Remove the wheel bearings with bearing remover.

NOTE

Never reinstall old bearings; once the bearings have been removed, they must be replaced with new ones.

BEARING REMOVER SHAFT
07746-0050100 OR COMMERCIALY AVAILABLE IN U.S.A.



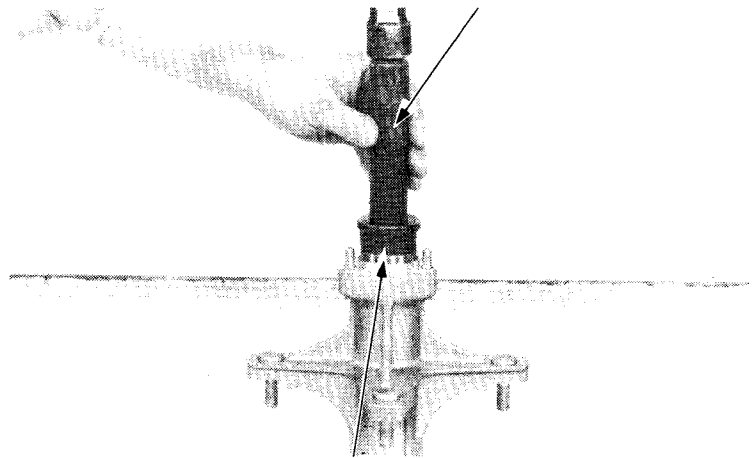
BEARING REMOVER HEAD, 15 mm
07746-0050400 OR COMMERCIALY AVAILABLE IN U.S.A.

NOTE

Replace hub bearings in pairs.

Pack new bearings with grease and install them into the hub with the special tools.

DRIVER 07749-0010000



ATTACHMENT, 42 x 47 mm 07746-0010300
PILOT, 15 mm 07746-0040300

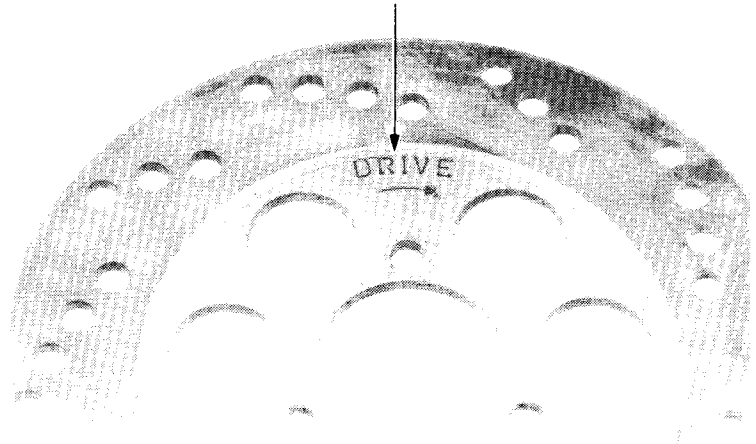
Apply grease to the dust seal lips and install the seals into the hub.

Install the front brake disc with the "DRIVE" mark facing toward the hub (arrow points the normal rotating direction).

Tighten the disc mount nuts.

**TORQUE: 25-30 N·m
(2.5-3.0 kg·m, 18-22 ft·lb)**

"DRIVE" MARK



TIRE REMOVAL

NOTE

This service requires the Universal Bead Breaker (GN-AH-958-BB1) available in U.S.A. only.

Remove the core from the valve stem.

CAUTION

- Use of the Bead Breaker tool is required for tire removal.
- Do not damage the bead seating area of the rim.
- Use a Coats 220 Tire Changer or equivalent to remove the tire from the rim. If a tire changer is not available, rim protectors and tire irons may be used.

Install the proper size blade onto the breaker arm assembly.

- Short blade – 7"/8" rims.
- Long blade – 9"/11" rims.

CAUTION

Use of an improper size blade may result in damage to the rim, tire or blade.

Place the proper size adapter onto the threaded shaft and then put the wheel over the threaded shaft and adapter.

Lube the bead area with water, pressing down on the tire sidewall/bead area in several places, to allow the lubricant to run into and around the bead. Also lube the area where the breaker arm will contact the sidewall of the tire.

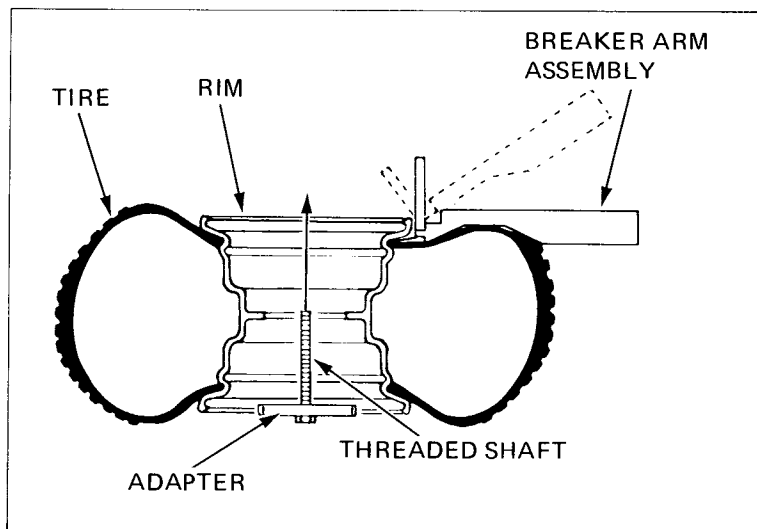
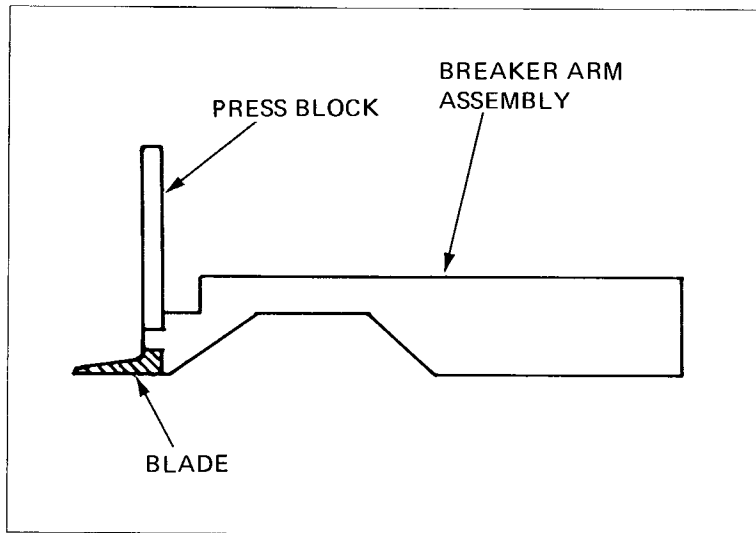
WARNING

Use only water as a lubricant when removing or mounting tires. Soap or some mounting lubricants may leave a slippery residue which can cause the tire to shift on the rim and lose air pressure during riding.

While holding the breaker arm assembly at an approximate 45° position, insert the blade of the breaker arm between the tire and rim. Push the breaker arm inward and downward until it is in the horizontal position with its press block in contact with the rim.

NOTE

It may be necessary to tap the breaker arm with a brass hammer to install it the last 3 mm. While doing so, be sure to hold the arm down in the horizontal position.



FRONT WHEEL/SUSPENSION/STEERING

With the breaker arm in the horizontal position, place the breaker press head assembly over the breaker arm press block. Make sure the press head bolt is backed out all the way and then position the nylon buttons on the press head against the inside edge of the rim.

Insert the threaded shaft through the appropriate hole in the breaker press head assembly and then tighten the lever nut until both ends of the breaker press head assembly are in firm contact with the rim.

NOTE

Insert bolts through the holes in the rim hub mounting tabs and the adapter to position the adapter properly.

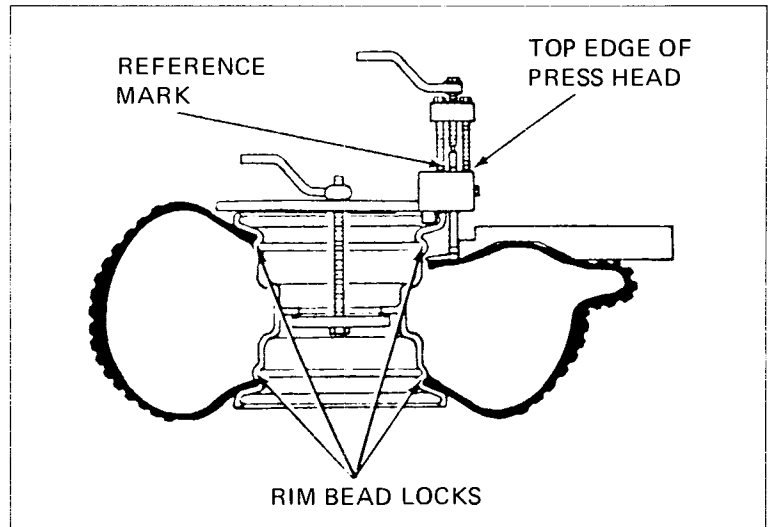
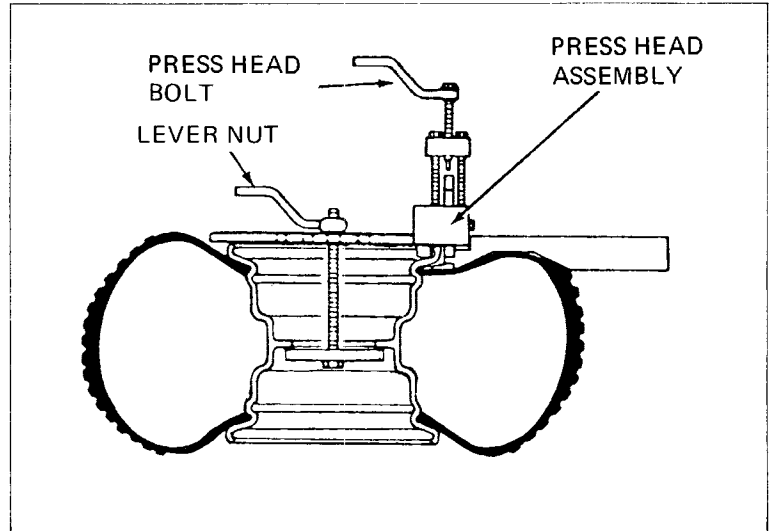
Tighten the press head bolt until the reference mark on the press block is aligned with the top edge of the press head.

If the rest of the bead cannot be pushed down into the center of the rim by hand, loosen the press head bolt and the lever nut. Rotate the breaker arm assembly and breaker press head assembly $1/8$ to $1/4$ the circumference of the rim. Tighten the lever nut and then tighten the press head bolt as described. Repeat this procedure as necessary until the remainder of the bead can be pushed down into the center of the rim.

Assemble the Universal Bead Breaker on the other side of the wheel and break the bead following the same procedures.

Remove the tire from the rim using a tire changer machine or tire irons and rim protectors.

Remove the front tire from the valve stem side and the rear tires from the side opposite the valve stem.



TIRE REPAIR

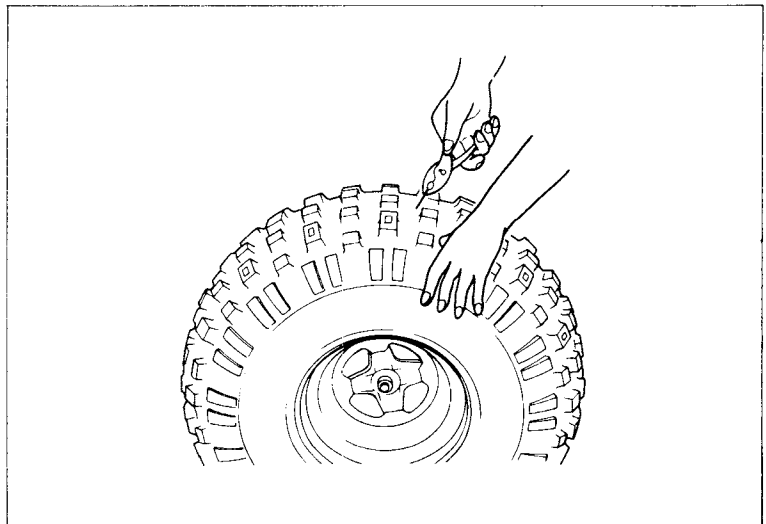
NOTE

Use the manufacturer's instructions for the tire repair kit you are using. If your kit does not have instructions, use the procedures provided here.

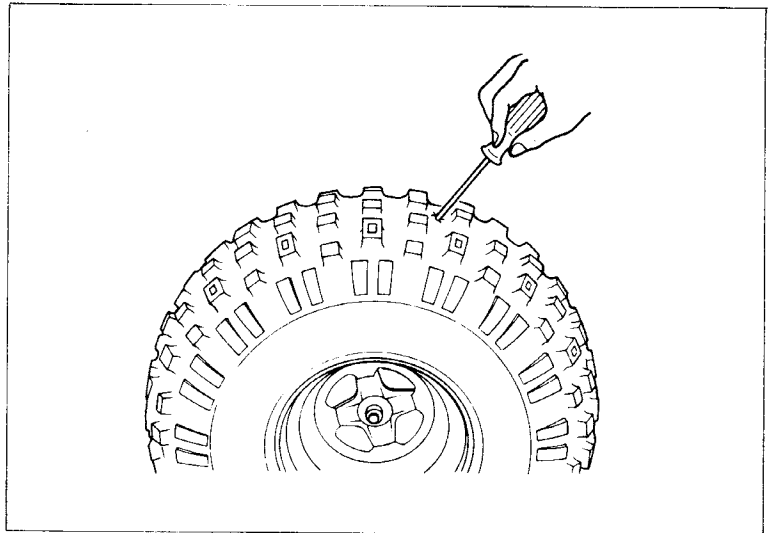
Check the tire for puncturing objects. Chalk mark the punctured area and remove the puncturing object.

Inspect and measure the injury. Tire repairs for injuries larger than 15 mm ($5/8$ in) should be a section repair.

Section repairs should be done by a professional tire repair shop.



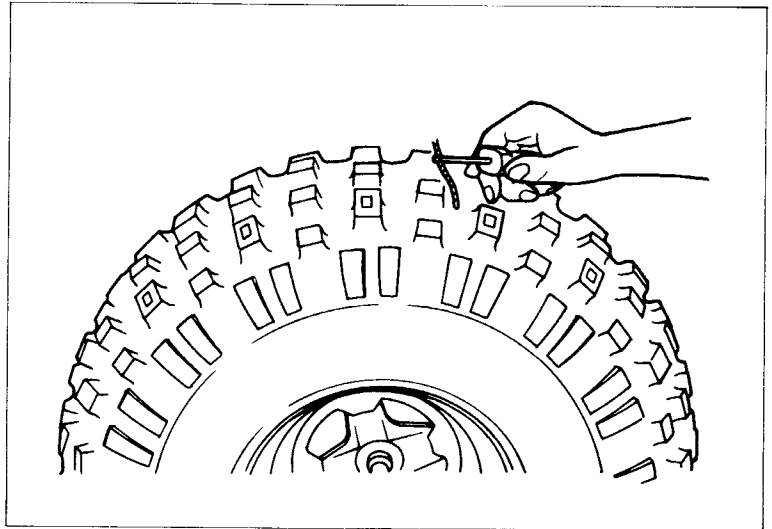
Install a rubber plug into the injury as follow:
 Apply cement to a plug inserting needle and work the needle into the injury to clean and lubricate it. Do this three times. Do not let the cement dry.



Insert and center a rubber plug through the eye of the inserting needle.

Apply cement to the rubber plug.

Push the inserting needle with plug into the injury until the is slightly above the tire. Twist the needle and remove it from the tire, the plug will stay in the tire.



NOTE

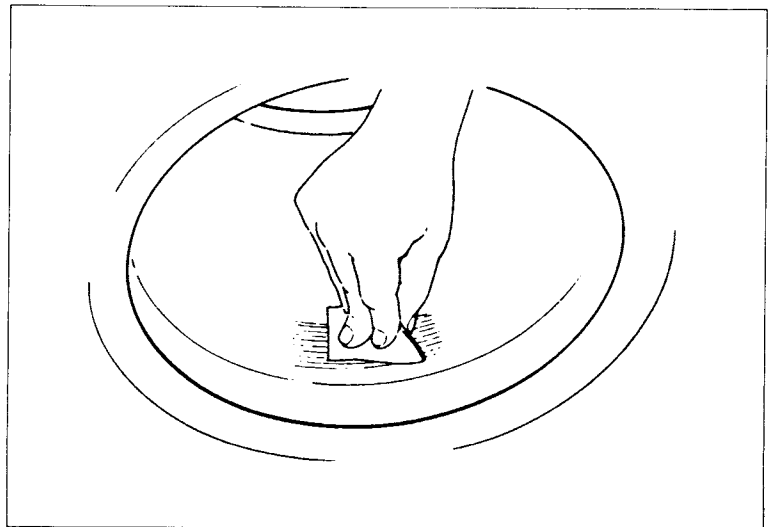
Be careful not to push the plug all the way into the tire to prevent it from falling inside.

Trim the plug to 6 mm (1/4 in) above the tire surface.

Repeat the above procedure if the puncture is large. Do not use more than two plugs per injury.

Allow the repair to dry. Drying time will vary with air temperature. Refer to the tire repair kit manufacturer's recommendations.

Inflate the tire and test the seal by dabbing a small amount of cement around the plug. Escaping air will cause a bubble in the cement. If there is leakage, remove the tire (page 10-9) and apply a patch to the inside of the tire as described.



If a plug has been inserted, trim it even with the inner tire surface.

Temporarily place a rubber patch that is at least twice the size of the puncture over the injury. Make a mark around the patch, slightly larger than the patch itself. Remove the patch.

Roughen the area marked inside the tire with a tire buffer or a wire brush.

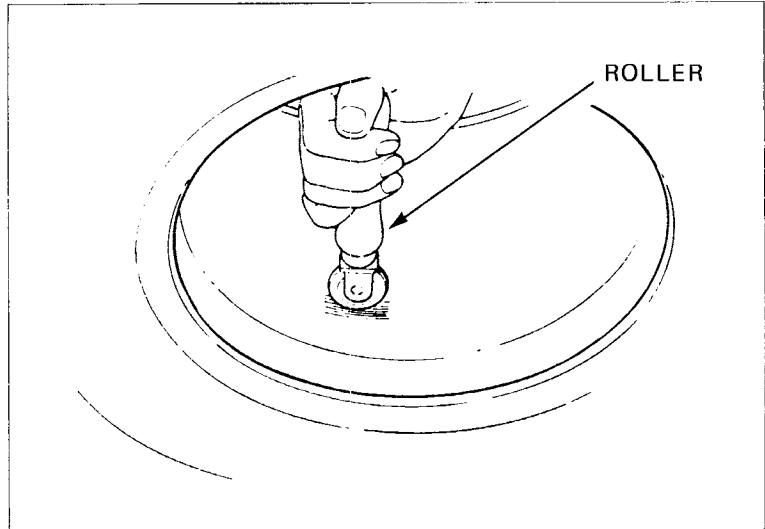
Clean the rubber dust from the buffed area.

FRONT WHEEL/SUSPENSION/STEERING

Apply cement over the area marked and allow it to dry. Remove the lining from patch and center it over the injury. Press the patch against the injury using a special roller.

NOTES

- Allow cement to dry until tacky before applying patch.
- Do not touch the cement with dirty or greasy hands.



TIRE ASSEMBLY

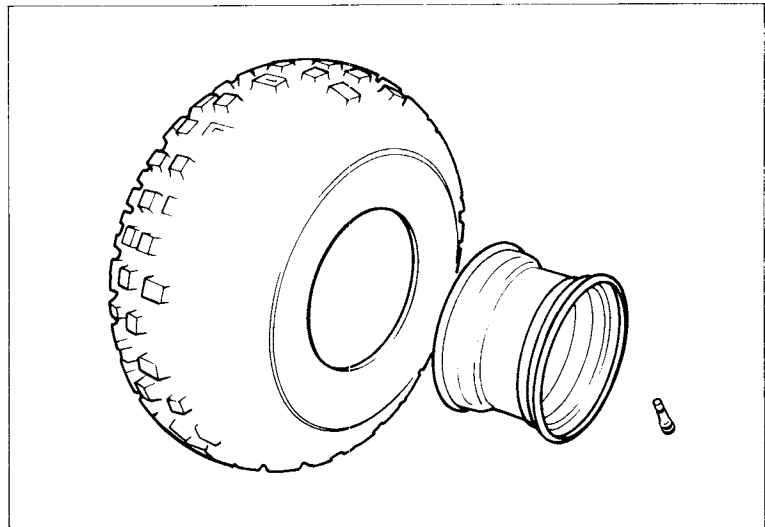
Clean the rim bead seat and flanges.

Install the tire on the rim.
Install the valve stem core.
Flush the rim flanges, bead seat and tire bead with clean water.

Inflate the tire to seat the tire bead.

WARNING

Use only water as a lubricant when removing or mounting tires. Soap or some mounting lubricants may leave a slippery residue which can cause the tire to shift on the rim and lose air pressure during riding.



CAUTION

Do not inflate the tire with more than 1.4 kg/cm² (20 psi) of air.

If the tire does not seat on the rim with 1.4 kg/cm² (20 psi) of air pressure, release the air from the tire and apply tire lubricant to the tire bead and bead seating surface of the rim.

Then, inflate the tire with air again.

Deflate the tire. Wait 1 hour and inflate the tire to the specified pressure.

NOTE

The rear tires must have the same circumference for proper handling.

Check for air leaks and install the valve cap.

	Recommended pressure	Min. pressure	Max. pressure	Standard tire circumference
Front	4.3 psi (30 kPa, 0.3 kg/cm ²)	3.9 psi (27 kPa, 0.27 kg/cm ²)	4.7 psi (33 kPa, 0.33 kg/cm ²)	1844.0 mm (72.6 in)
Rear	3.6 psi (25 kPa, 0.25 kg/cm ²)	3.2 psi (22 kPa, 0.22 kg/cm ²)	4.0 psi (28 kPa, 0.28 kg/cm ²)	1565.0 mm (61.6 in)

FRONT WHEEL INSTALLATION

Install the side spacers onto the hub.

NOTE

The longer spacer is for the right side.

Install the front wheel and hub.
If the axle holder has been removed, loosely install the holder with the "UP" mark facing up.
Insert the axle into the fork slider leg and hub.
Tighten the axle.

TORQUE: 70–110 N·m
(7.0–11.0 kg·m, 51–80 ft·lb)

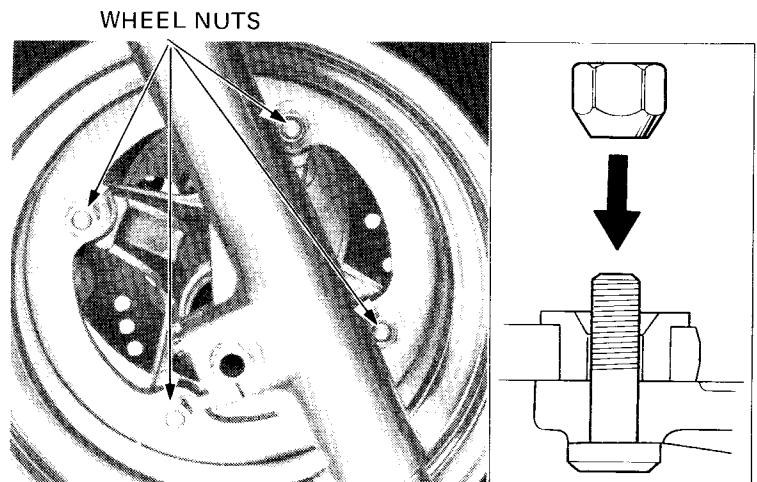
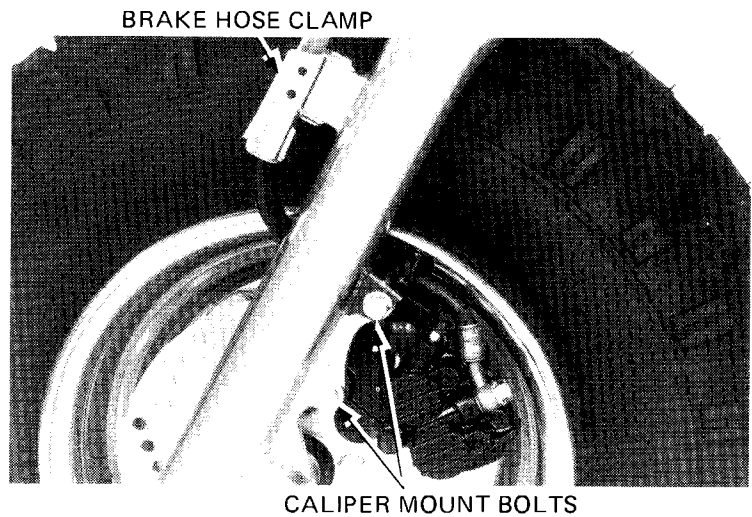
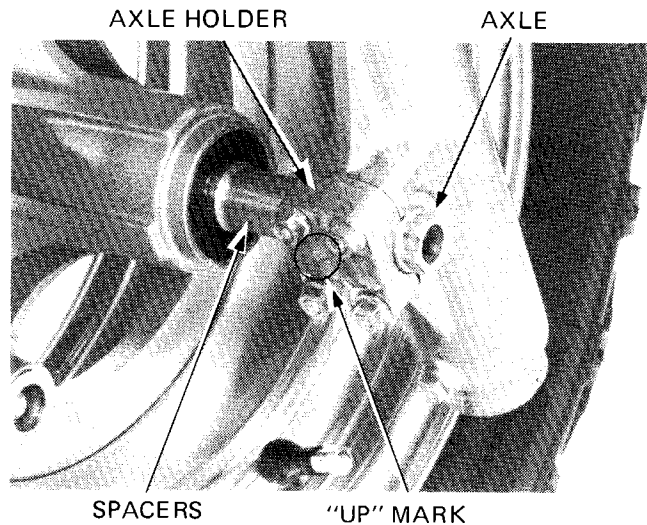
Tighten the upper axle holder nuts first, then tighten the lower nuts.

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

Install the front brake caliper over the disc and on the fork slider being careful not to damage the pads.
Tighten the caliper mount bolts.

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

Install the brake hose clamp onto the fork slider.



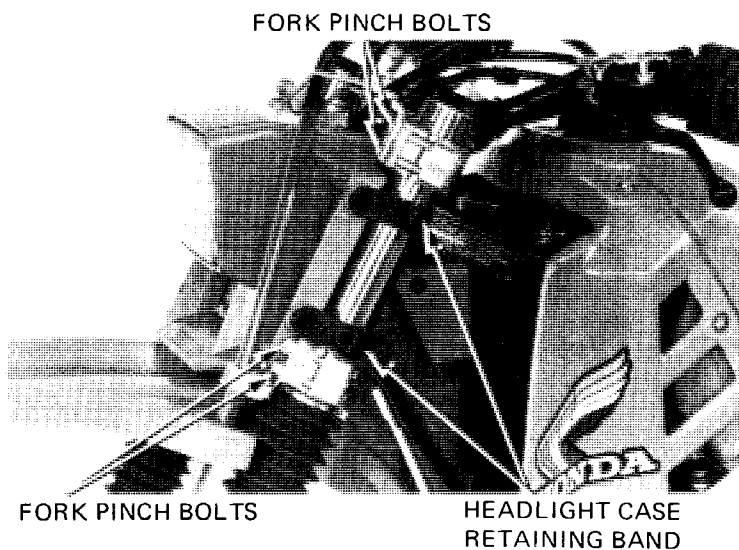
Install the wheel nuts with the tapered side facing in.
Lower the front wheel on the ground and tighten the wheel nuts.

TORQUE: 60–70 N·m
(6.0–7.0 kg·m, 43–51 ft·lb)

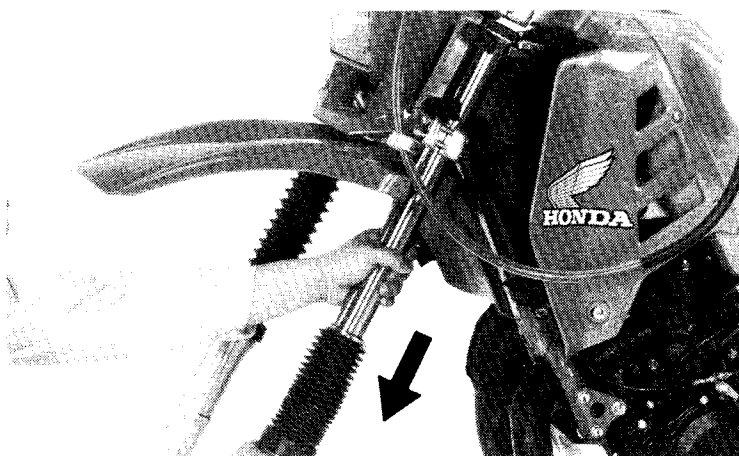
FRONT FORK

REMOVAL

Remove the front wheel (Page 10-6).
Remove the headlight case retaining bands.
Loosen the fork pinch bolts.



Loosen the fork boot band and slide the boot down.
Pull the fork tube out of the bridge and steering stem.



DISASSEMBLY

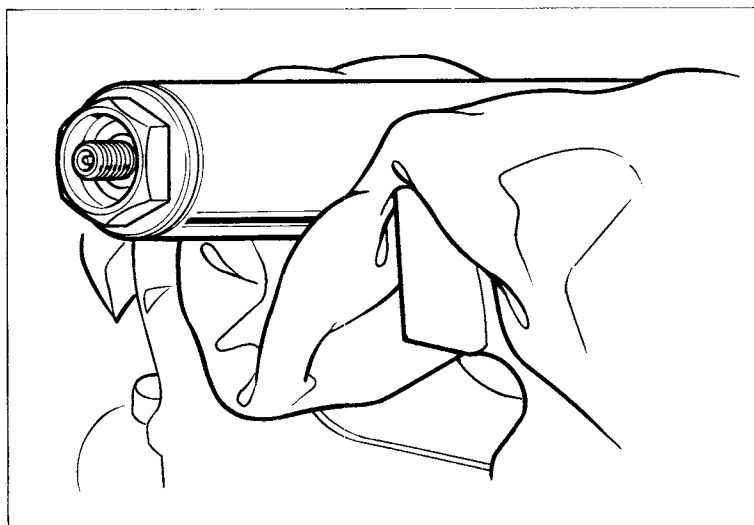
Release air pressure.
Remove the fork boot.
Hold the fork tube in a vise with soft jaws or a shop towel and remove the fork tube cap.

CAUTION

Do not damage the fork tube sliding surface.

WARNING

The fork cap is under spring pressure. Use care when removing the cap to keep it from causing injury.



FRONT WHEEL/SUSPENSION/STEERING

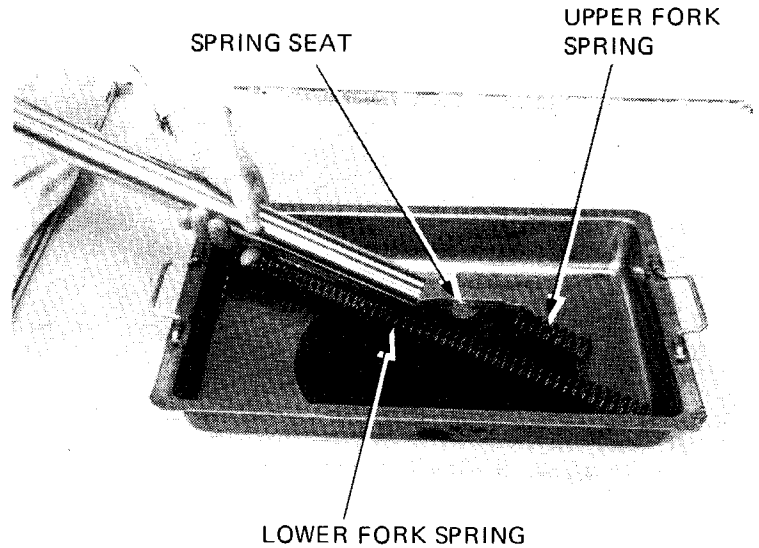
'85:

Remove the spring seat and fork springs.

AFTER '85:

Remove the fork spring.

Drain the fork oil by pumping the fork up and down several times.



Hold the fork slider in a vise with soft jaws or shop towel.

Remove the socket bolt with a hex wrench.

CAUTION

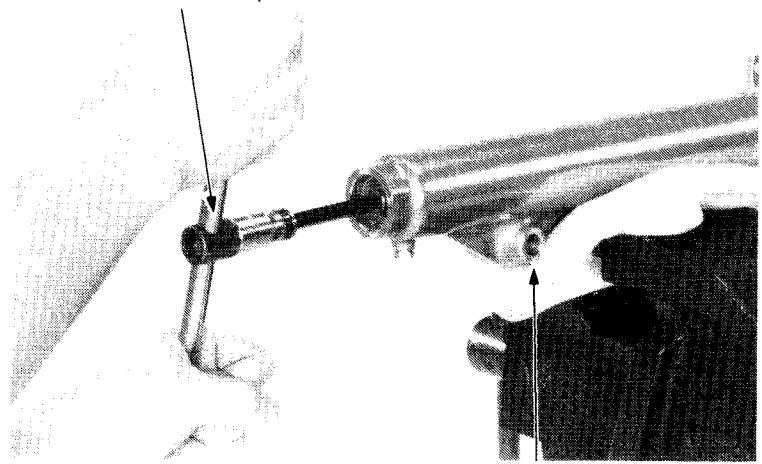
Do not overtighten the slider in the vise. Overtightening will damage the slider.

NOTE

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

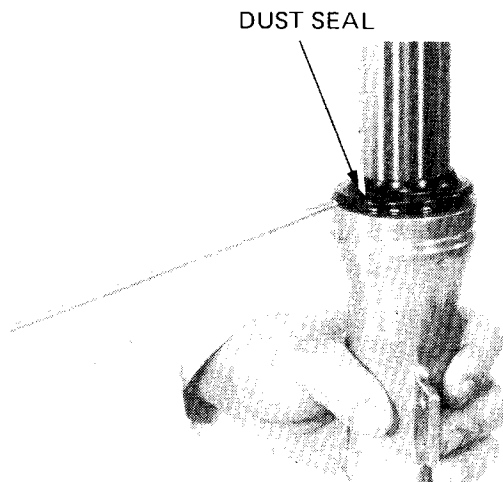
Remove the fork piston and rebound spring.

HEX. WRENCH, 6mm
07917-3230000 or equivalent



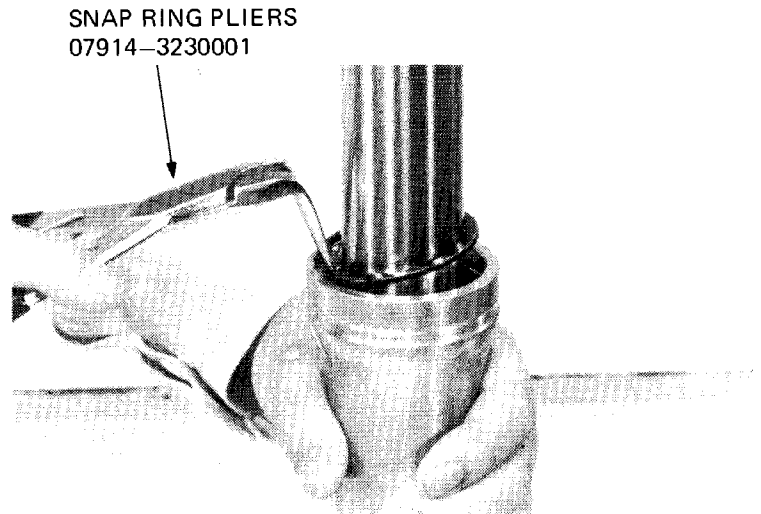
SHOP TOWELS
or SOFT JAWS

Remove the dust seal.

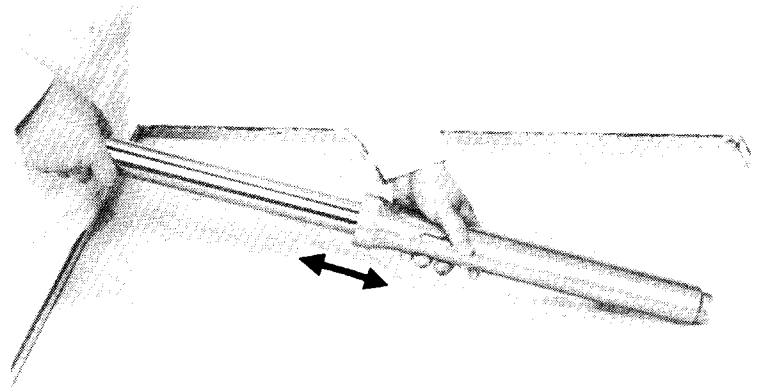


FRONT WHEEL/SUSPENSION/STEERING

Remove the snap ring.



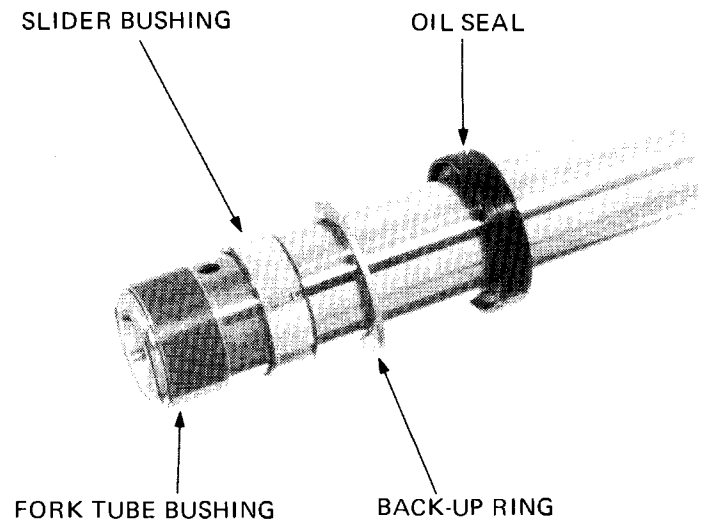
Pull the fork tube out until resistance from the slider bushing is felt. Then move it in and out, tapping the bushing lightly until the fork tube separates from the slider. The slider bushing will be forced out by the fork tube bushing. Remove the oil lock piece.



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

NOTE

Do not remove the fork tube bushings unless it is necessary to replace it with new one.



FORK SPRING

Measure the fork spring free length.

SERVICE LIMITS:

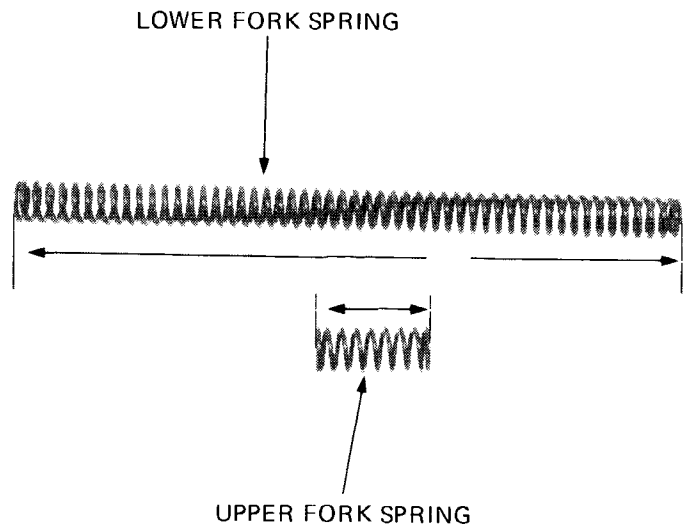
'85:

UPPER FORK SPRING: 75.4 mm (2.97 in)

LOWER FORK SPRING: 493.1 mm (19.41 in)

AFTER '85:

FORK SPRING: 569.4 mm (22.42 in)

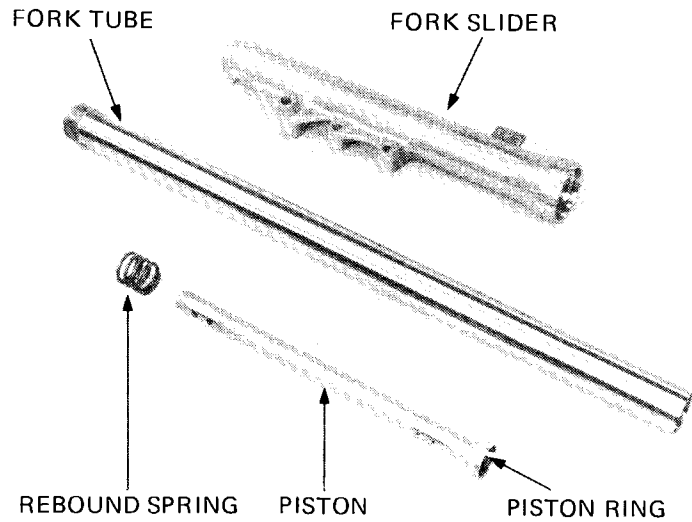


FORK TUBE/SLIDER/PISTON

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

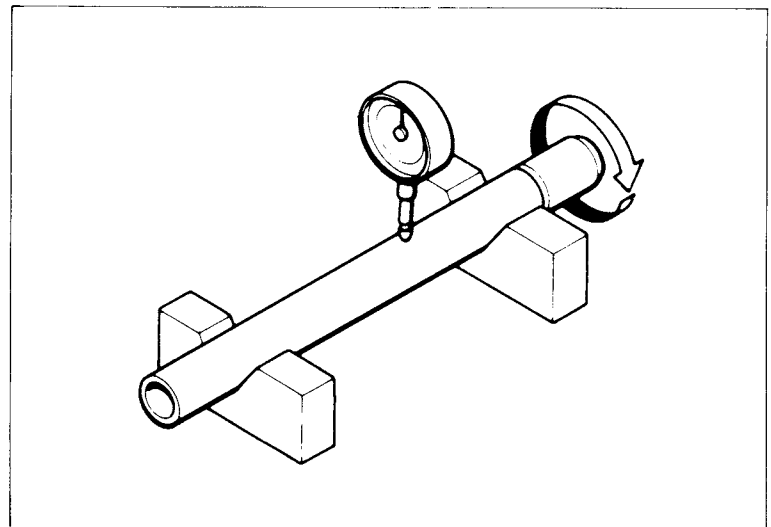
Check the fork piston ring for wear or damage.

Check the rebound spring for fatigue or damage.



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

SERVICE LIMIT: 0.2 mm (0.008 in)

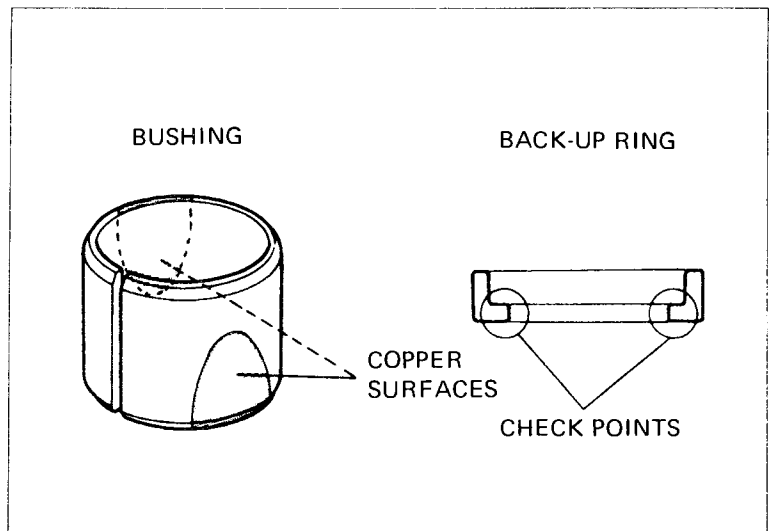


FRONT WHEEL/SUSPENSION/STEERING

BUSHING/BACK-UP RING

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

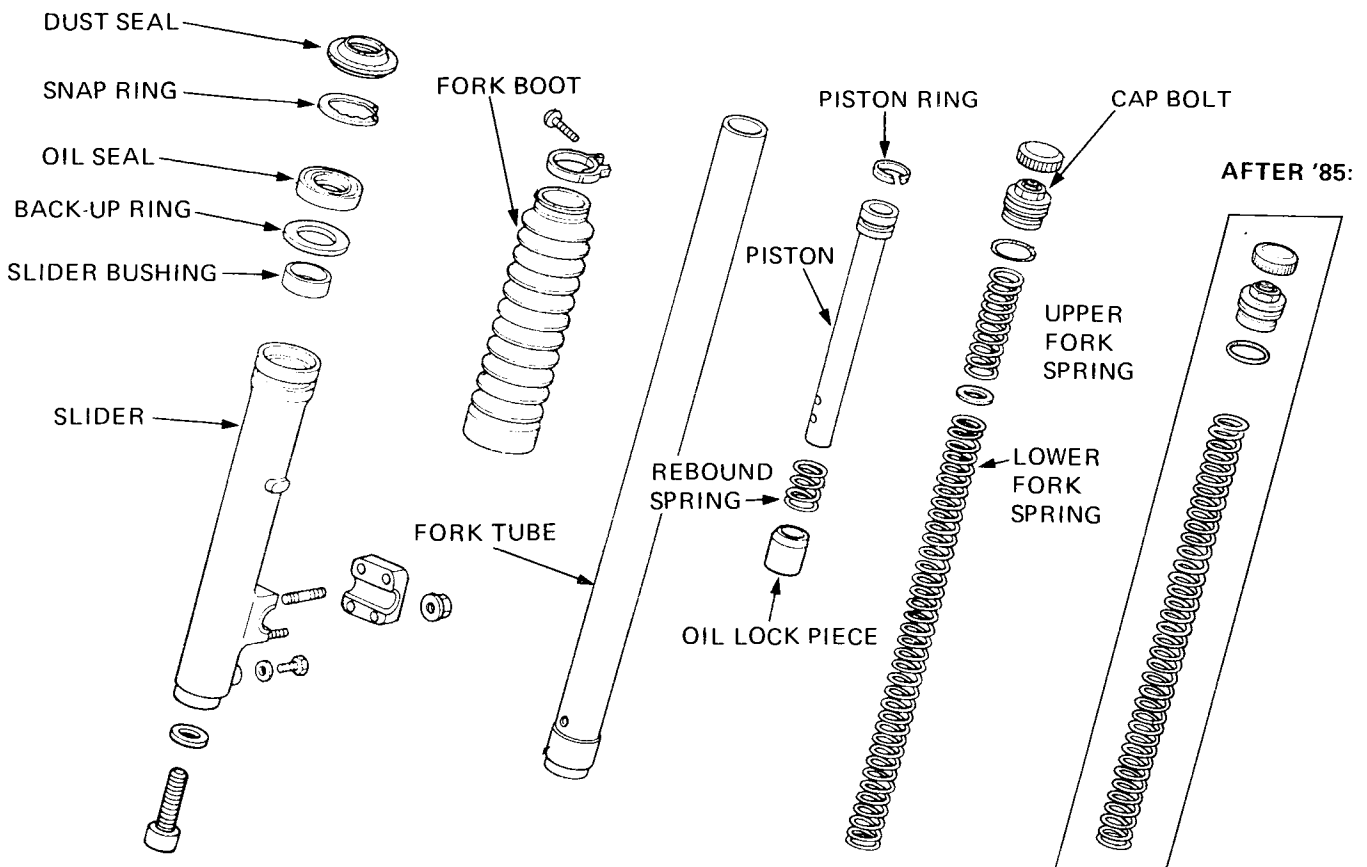
Check the back-up ring at the points shown. Replace if there is any distortion at the points shown.



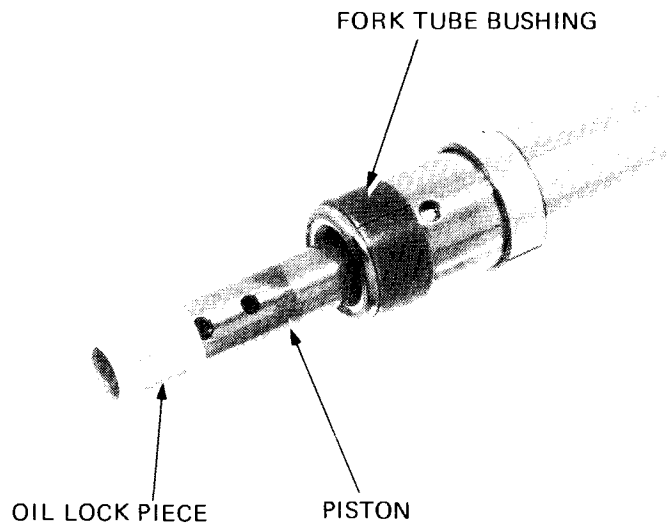
ASSEMBLY

NOTE

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



Install the piston ring on the piston.
 Install the fork tube bushing if a new one is being installed.
 Install the rebound spring and piston into the fork tube.
 Place the oil lock piece on the end of the piston and insert the fork tube into the slider.

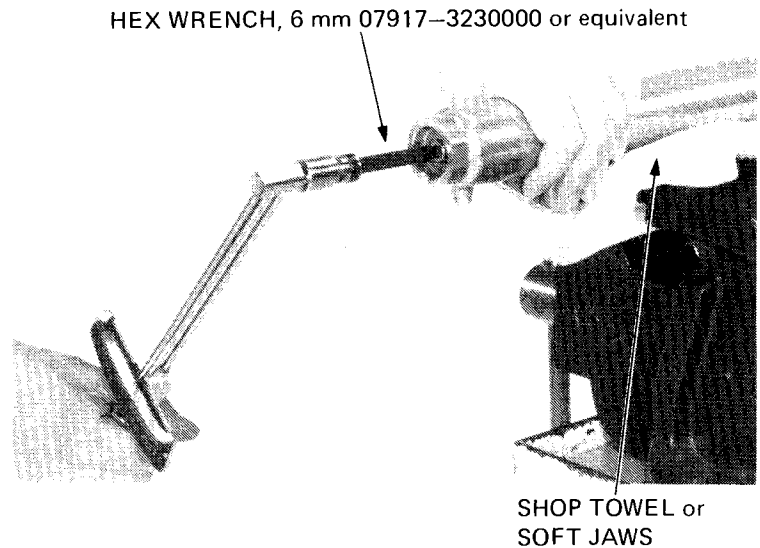


Place the fork slider in a vise with soft jaws or a shop towel.
 Clean the socket bolt threads and apply thread lock agent to the threads.
 Screw the socket bolt into the piston and tighten it with a 6 mm hex wrench.

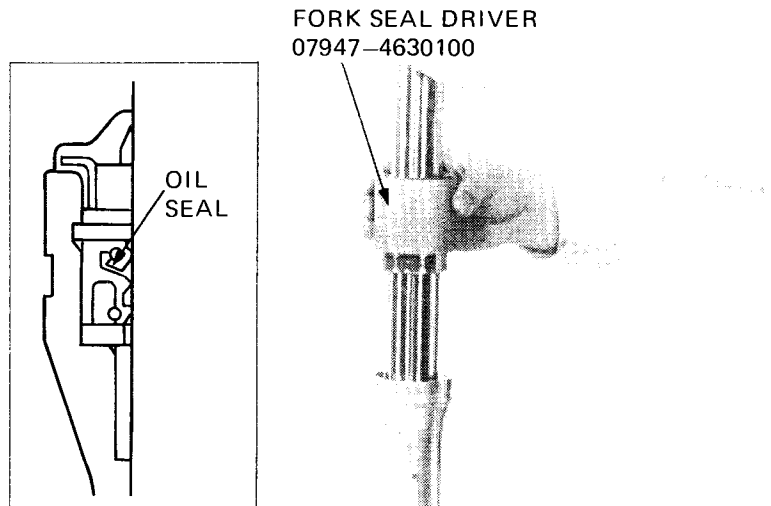
NOTE

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

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

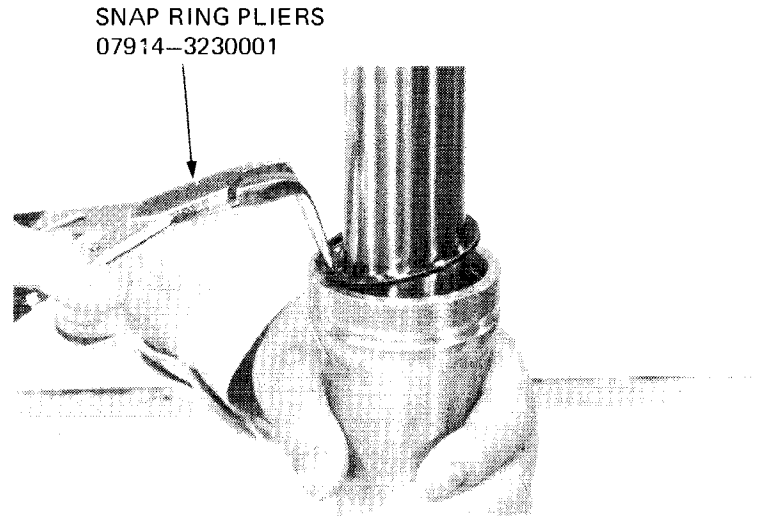


Place the slider bushing over the fork tube and rest it on the slider. Put the back-up ring and an old bushing or equivalent tool on the top.
 Drive the bushing into place with the fork seal driver and remove the old bushing or equivalent tool.
 Wrap tape on the top of the fork tube.
 Coat a new oil seal with ATF and install it with the seal markings facing up. Drive the seal in, until the snap ring groove is visible, with the fork seal driver.



FRONT WHEEL/SUSPENSION/STEERING

Install the snap ring and dust seal.



Fill the fork with ATF.

CAPACITY:

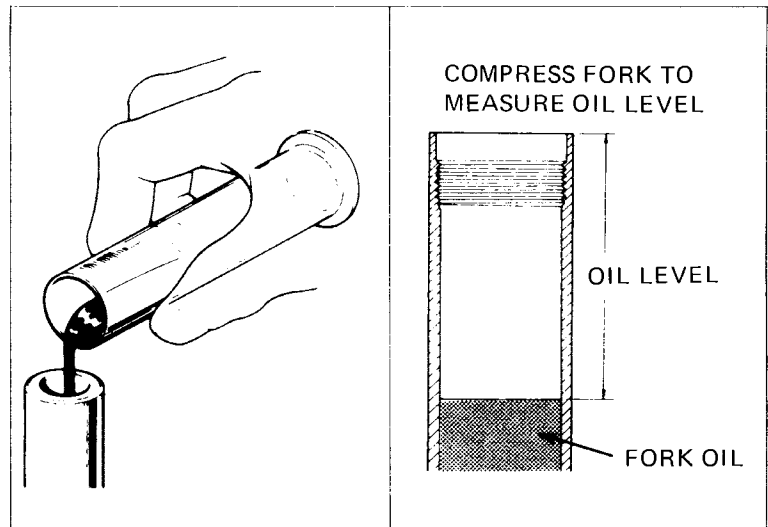
'85: 400 cc (13.56 oz)
AFTER '85: 465 cc (15.5 oz)

Pump the fork several times.

Compress the fork and measure the ATF level from the top of the tube after the level stabilizes.

SPECIFIED LEVEL:

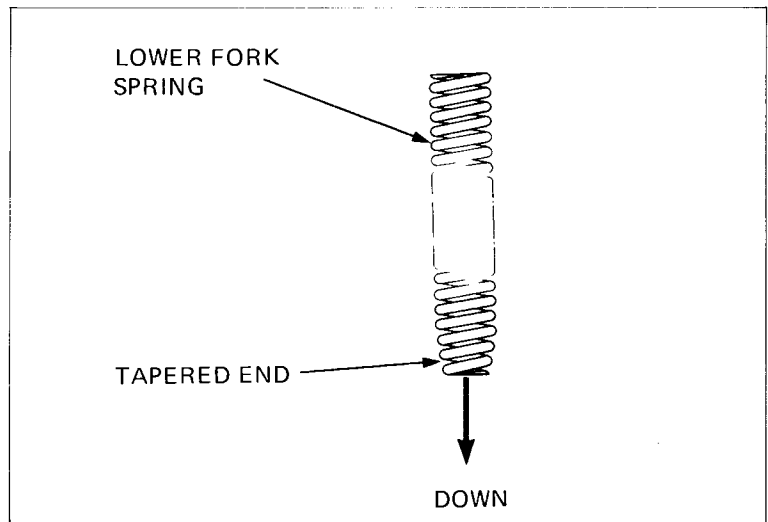
'85: 186 mm (7.3 in)
AFTER '85: 113 mm (4.4 in)



Wipe oil off the spring thoroughly using a clean cloth.

Install the lower fork spring with the taper end facing down.

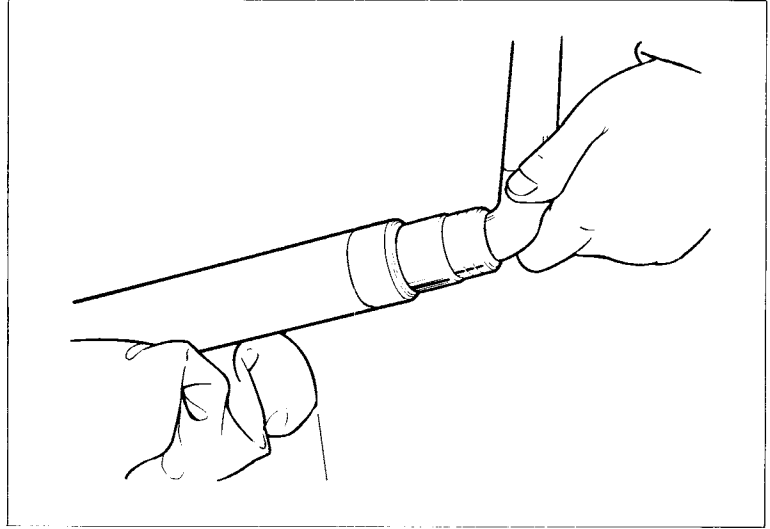
Install the spring seat and upper fork spring on the lower fork spring.



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

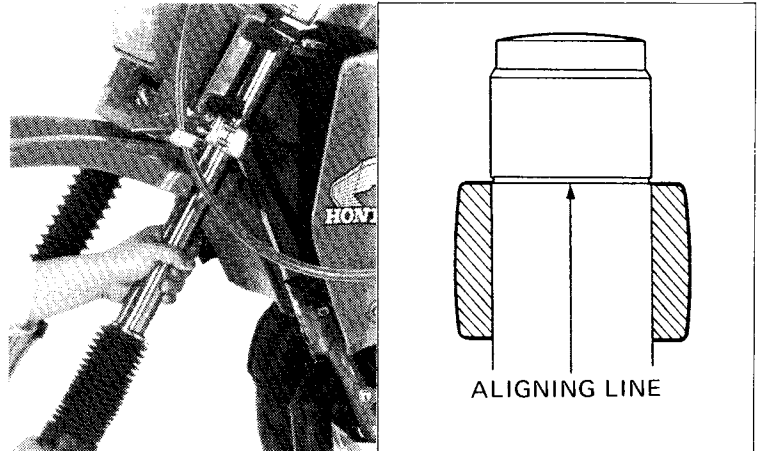
TORQUE: 15–30 N·m
(1.5–3.0 kg·m, 11–22 ft·lb)

Install the fork boot on the fork tube and slider.



INSTALLATION

Install the front fork into the steering stem and fork bridge and bring the aligning line on the fork tube up to the top of the fork bridge.



Tighten the fork top and bottom pinch bolts.

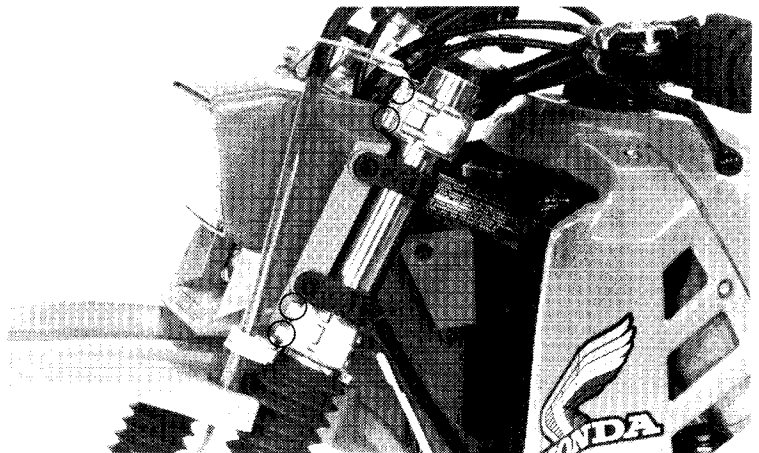
TORQUE: 18–25 N·m
(1.8–2.5 kg·m, 13–18 ft·lb)

Slide the fork boot up to the steering stem and tighten the boot band.

Install the headlight case retaining bands.

FRONT FORK AIR PRESSURE:
0–70 kPa (0–0.7 kg/cm², 0–1.0 psi)

Install the front wheel (Page 10-13).

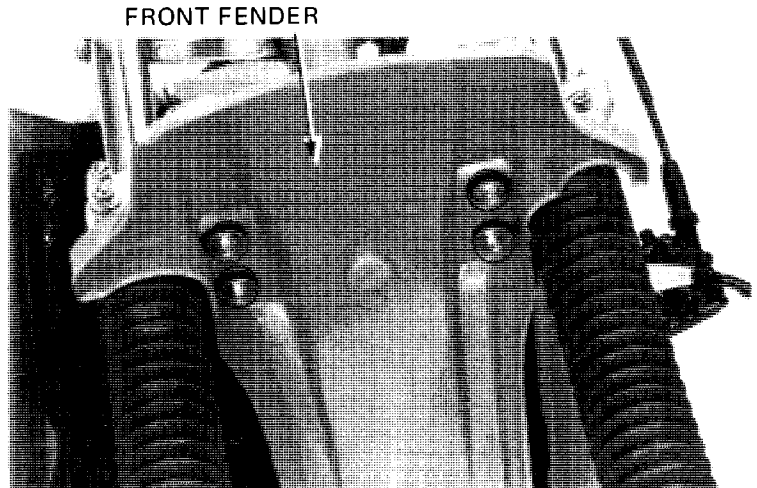


FRONT WHEEL/SUSPENSION/STEERING

STEERING STEM

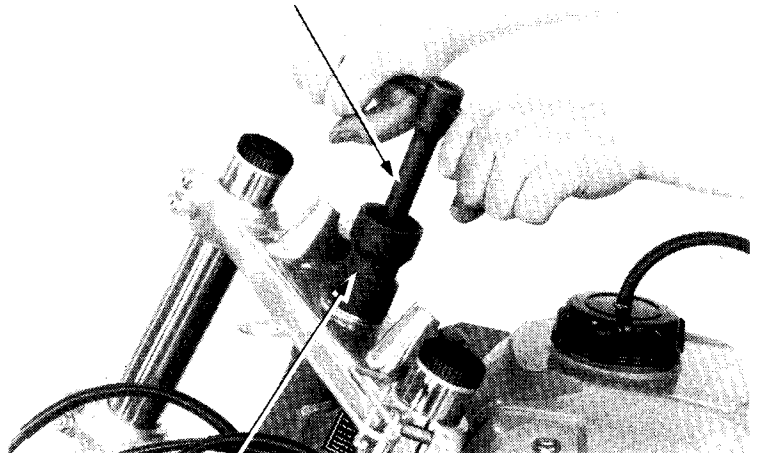
REMOVAL

- Remove the following parts:
- Headlight case (Page 10-14).
 - Handlebar (Page 10-3).
 - Front wheel (Page 10-6).
 - Front fender.



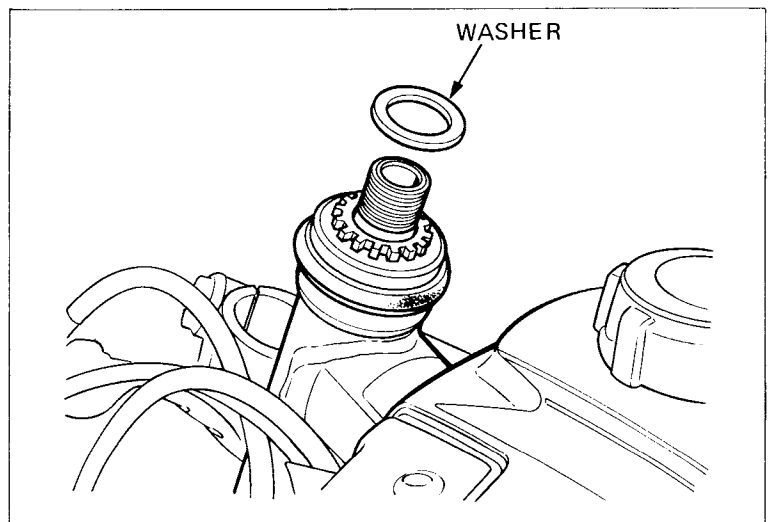
- Remove the steering stem nut and washer.
Loosen the fork pinch bolts, and remove the front forks.
Remove the fork bridge.

EXTENSION BAR 07716-0020500 OR EQUIVALENT
AVAILABLE IN U.S.A.



LOCK NUT WRENCH, 30 x 32 mm 07716-0020400
OR EQUIVALENT AVAILABLE IN U.S.A.

- Remove the washer and dust seal.



FRONT WHEEL/SUSPENSION/STEERING

Loosen the steering bearing adjustment nut, and remove the nut.

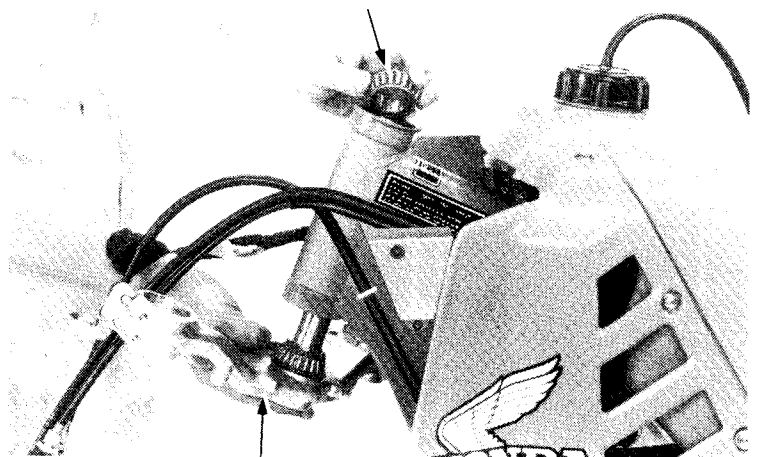
STEERING STEM SOCKET
07916-3710100



ADJUSTMENT NUT

Remove the steering stem and upper bearing from the steering head pipe.

UPPER BEARING

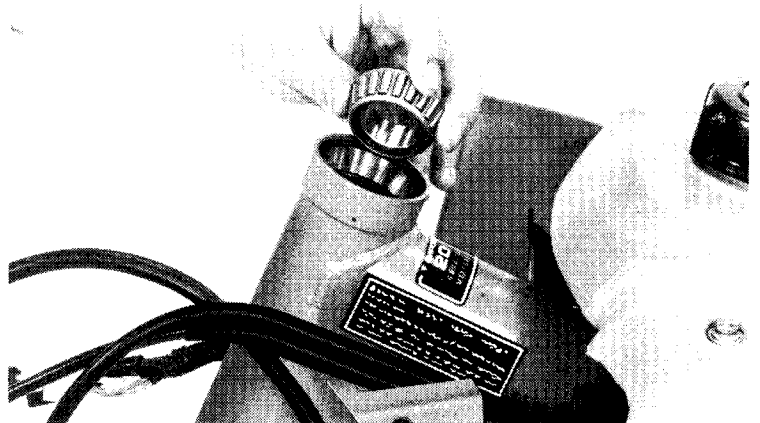


STEERING STEM

Check the steering head bearings and outer races for wear or damage.

NOTE

Replace the taper roller bearing and outer race as a set.

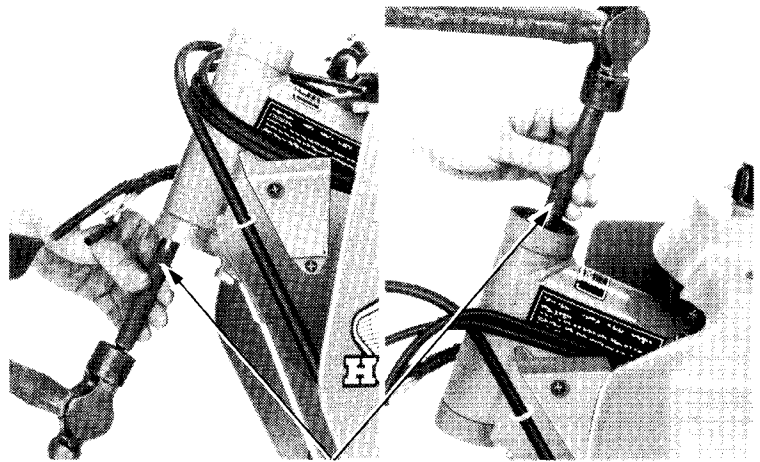


FRONT WHEEL/SUSPENSION/STEERING

Drive out the upper and lower bearing outer races from the steering head pipe.

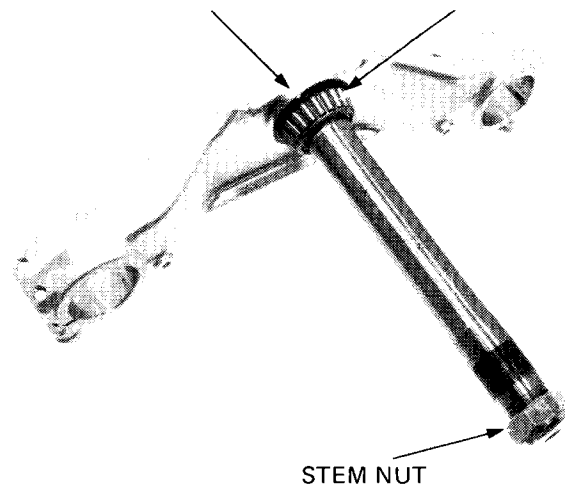
NOTES

- If the motorcycle has been involved in an accident, examine the area around the steering head pipe for cracks.
- When removing the steering head races, use the "B" side of the tool (07953-MJ1000A).

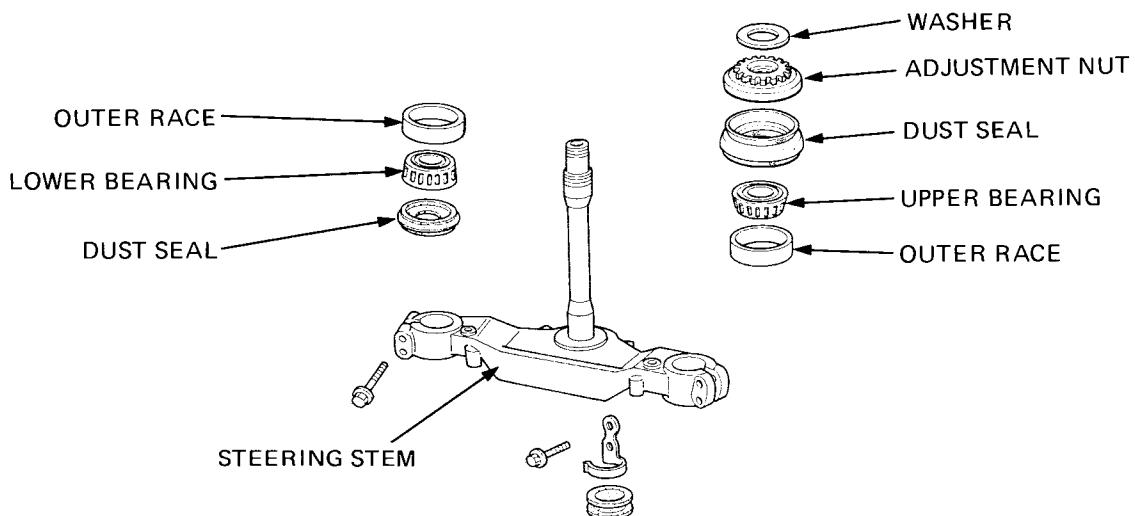


BALL RACE REMOVER 07953-KA50000 OR
RACE REMOVER ATTACHMENT 07935-MJ1000A
ATTACHMENT, 32 x 35 mm 07746-0010100
DRIVER 07949-3710001 OR 07949-3710000
DUST SEAL LOWER BEARING

Install the stem nut onto the stem to prevent the threads from being damaged when removing the lower bearing from the stem.
Remove the lower bearing with a chisel, being careful not to damage the stem.



STEM NUT



Install the dust seal onto the steering stem and press a new lower bearing over the stem with a special tool.

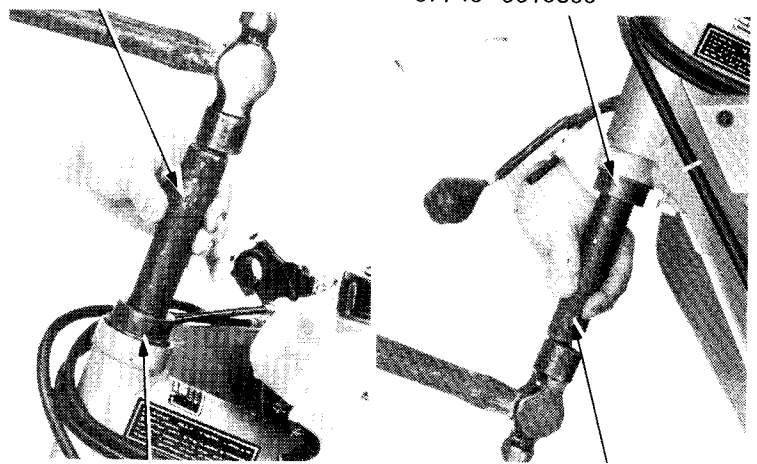


STEERING STEM DRIVER AND ATTACHMENT
07946-MB00000 or 07953-4300100
ATTACHMENT GN-HT-54 (U.S.A. only)

DRIVER
07749-0010000

ATTACHMENT, 42 x 47 mm
07746-0010300

Drive new upper and lower bearing outer races into the steering head pipe.

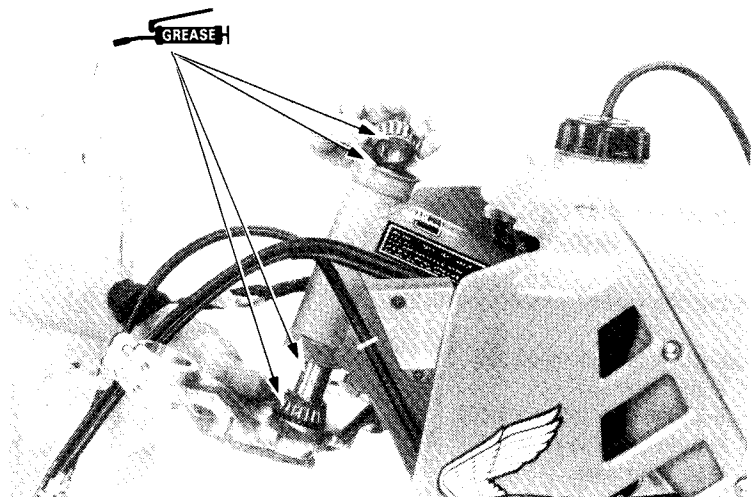


ATTACHMENT, 42 x 47 mm
07746-0010300

DRIVER
07749-0010000

INSTALLATION

Apply grease to the bearings and outer races.
Install the steering stem and upper bearing into the steering head pipe.



FRONT WHEEL/SUSPENSION/STEERING

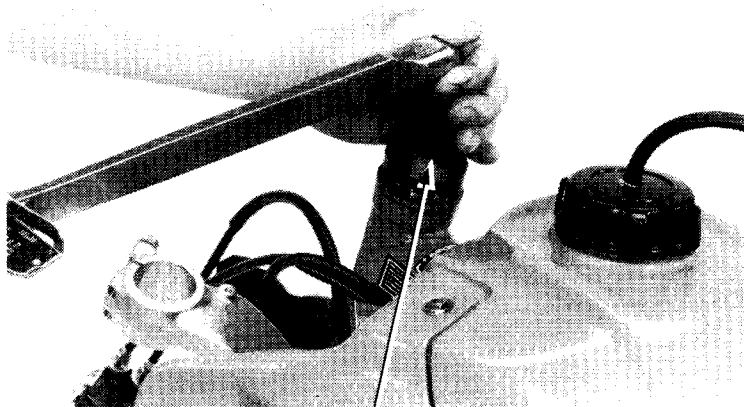
Install the adjustment nut with the stepped side facing down.

Tighten the adjustment nut to the first specified torque.

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

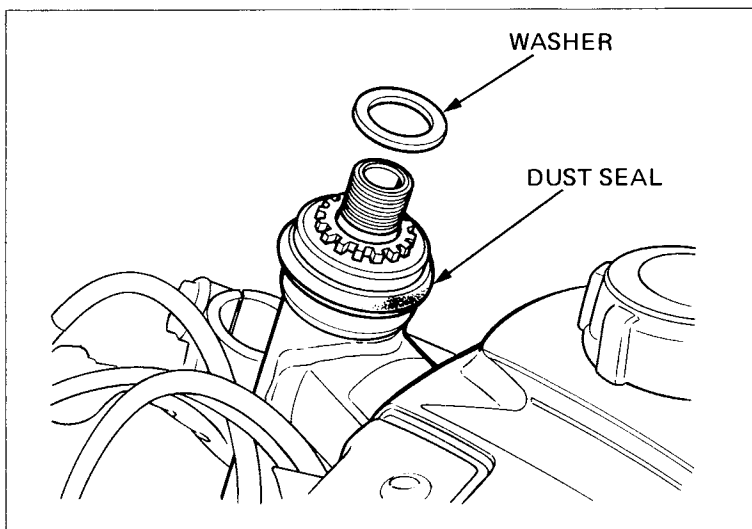
Turn the steering stem all the way to the right and left five times to seat the bearings loosen the adjustment nut and retighten it to the second specified torque.

TORQUE: 36–38 N·m
(3.6–3.8 kg·m, 26–28 ft·lb)



STEERING STEM SOCKET
07916–3710100

Install the washer and dust seal.



EXTENSION BAR OR EQUIVALENT
AVAILABLE IN U.S.A.
07716–0020500

Install the fork bridge, stem nut washer and stem nut.

Temporarily install the front forks.

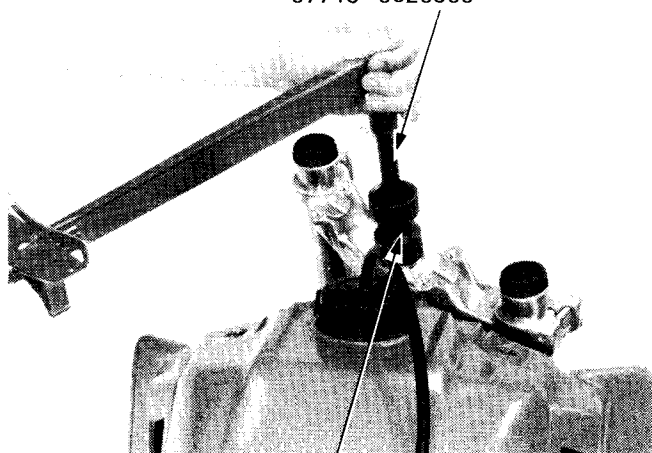
Tighten the steering stem nut.

TORQUE: 80–120 N·m
(8.0–12.0 kg·m, 58–88 ft·lb)

Install the front forks (Page 10-21).

Install the following parts:

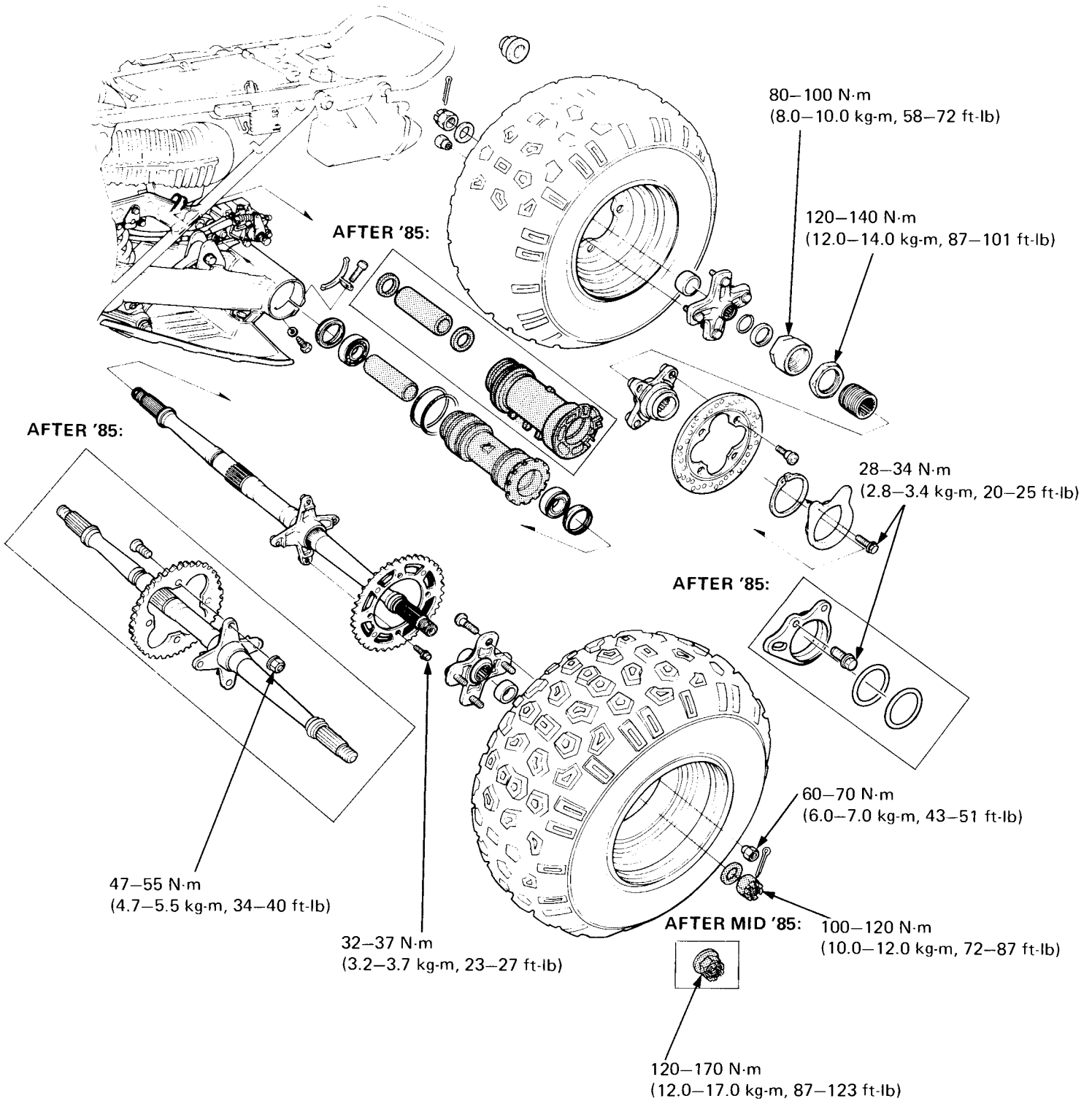
- Front fender.
- Front wheel (Page 10-13).
- Handlebar (Page 10-4).
- Headlight case.



LOCK NUT WRENCH, 30 x 32 mm
OR EQUIVALENT AVAILABLE IN U.S.A. 07716–0020400

MEMO

REAR WHEEL/DRIVE MECHANISM



11. REAR WHEEL/DRIVE MECHANISM

SERVICE INFORMATION	11-1	REAR AXLE	11-3
TROUBLESHOOTING	11-2	REAR WHEEL BEARINGS	11-9
REAR WHEEL	11-3		

SERVICE INFORMATION

GENERAL

- This section covers maintenance of the rear wheel and drive mechanism.
- A jack or block is required to support the ATC.

SPECIFICATIONS

ITEM		STANDARD mm (in)	SERVICE LIMIT mm (in)
Rear axle runout		1.0 (0.04)	3.0 (0.12)
Rear wheel rim runout	Radial	1.0 (0.04)	4.0 (0.16)
	Axial	1.0 (0.04)	4.0 (0.16)

TORQUE VALUES

Wheel nut		60–70 N·m (6.0–7.0 kg-m, 43–51 ft-lb)
Brake disc socket bolt		35–40 N·m (3.5–4.0 kg-m, 25–29 ft-lb)
Rear axle outer lock nut		80–100 N·m (8.0–10.0 kg-m, 58–72 ft-lb) Left-hand threads
Rear axle inner lock nut		120–140 N·m (12.0–14.0 kg-m, 87–101 ft-lb) Left-hand threads
Rear caliper bracket bolt		28–34 N·m (2.8–3.4 kg-m, 20–25 ft-lb)
Driven sprocket bolt	'85:	32–37 N·m (3.2–3.7 kg-m, 23–27 ft-lb)
	AFTER '85:	47–55 N·m (4.7–5.5 kg-m, 34–40 ft-lb)
Rear wheel hub nut (with washer)	'85:	100–122 N·m (10.0–12.2 kg-m, 72–87 ft-lb)
	AFTER MID '85:	120–170 N·m (12.0–17.0 kg-m, 87–123 ft-lb)
Rear wheel hub nut (flange nut type)		
Bearing holder socket bolt		18–25 N·m (1.8–2.5 kg-m, 13–18 ft-lb)

TOOLS

Special

Lock nut wrench, 56 mm	07916–HA20100 or 07916–HA2010A
Lock nut wrench, 45 mm	07916–1870101 or equivalent

Common

Driver	07749–0010000
Attachment, 62 x 68 mm	07746–0010500
Pilot, 40 mm	07746–0040900

TROUBLESHOOTING

Wheel wobble or vibration in vehicle

- Bent rim
- Loose wheel bearings
- Faulty rear axle bearing holder
- Faulty tire
- Loose axle
- Worn or damaged swing arm pivot bearings

REAR WHEEL

REMOVAL

Raise the rear wheels off the ground by placing a jack or block under the engine.
Remove the rear wheel nuts and the wheels.

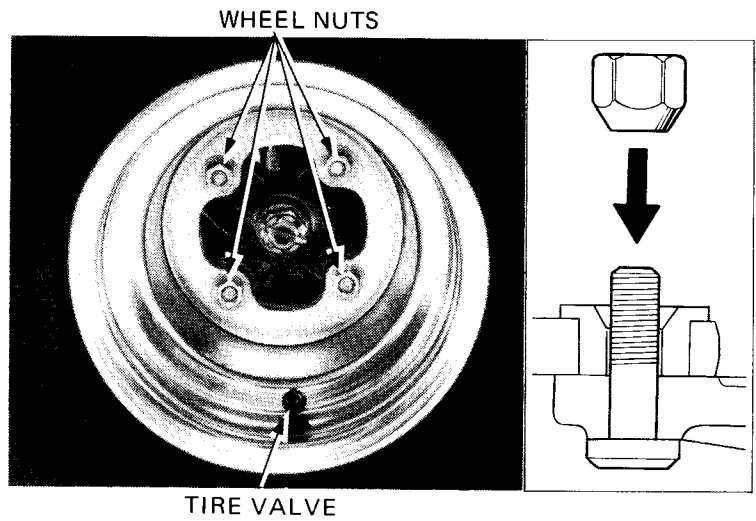
DISASSEMBLY

For tire disassembly, assembly and repair, refer to Pages 10-9 to 10-12.

INSTALLATION

Install each rear wheel with the tire valve facing out.
Tighten the wheel nuts.

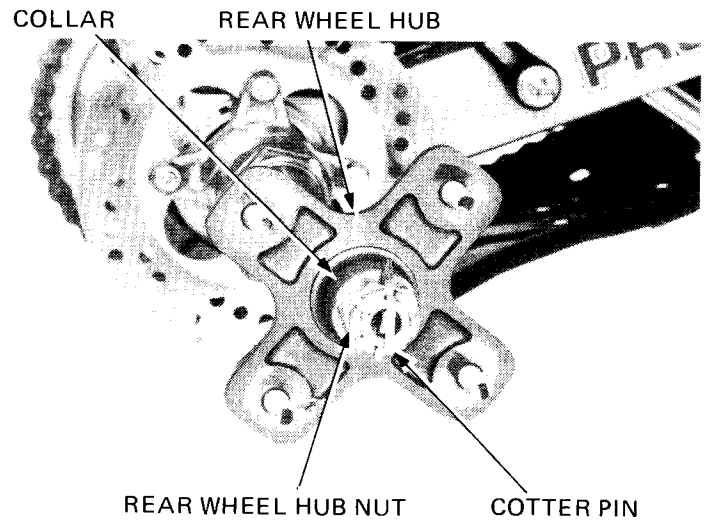
TORQUE: 60–70 N·m
(6.0–7.0 kg·m, 43–51 ft·lb)



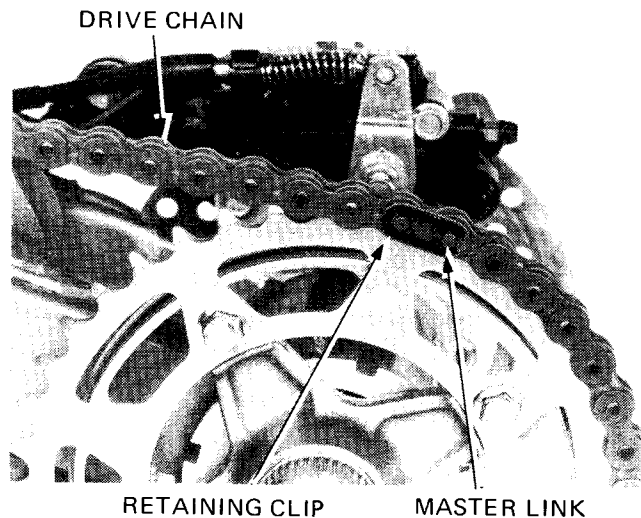
REAR AXLE

REMOVAL

Remove the rear wheels.
Remove the cotter pins, rear wheel hub nuts, collars and rear wheel hubs from the axle.



Loosen the drive chain adjuster (page 2-11).
Remove the drive chain retaining clip, master link and drive chain.

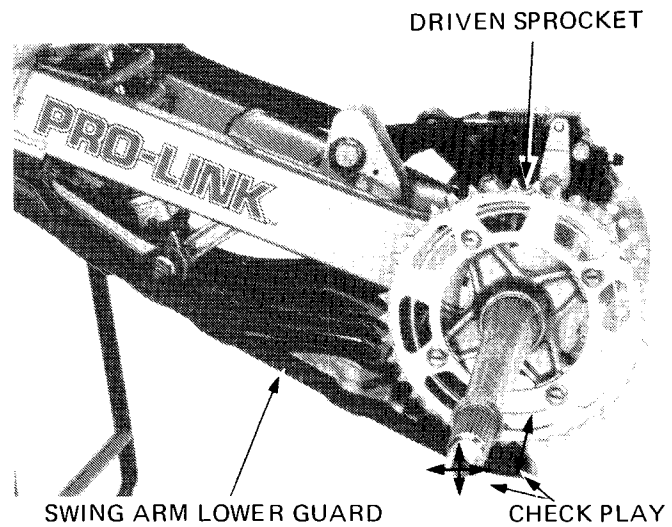


REAR WHEEL/DRIVE MECHANISM

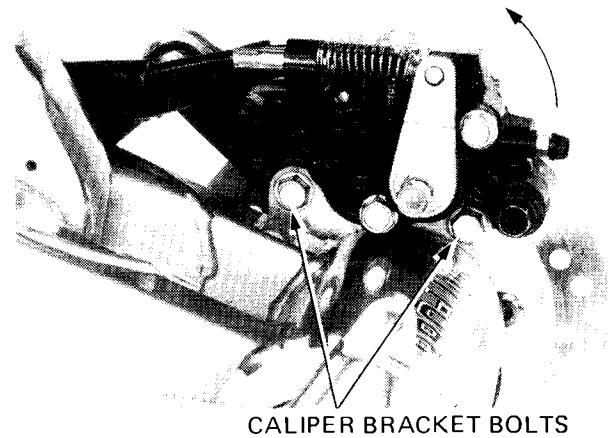
Move the ends of the axle to back and forth, and up and down to check the wheel bearing play. If the play is excessive, replace the wheel bearings (Page 11-9).

Remove the swing arm lower guard by removing the four bolts.

Remove the four sprocket bolts and remove the driven sprocket from the sprocket hub.



Remove the caliper bracket bolts and raise the caliper off the brake disc.

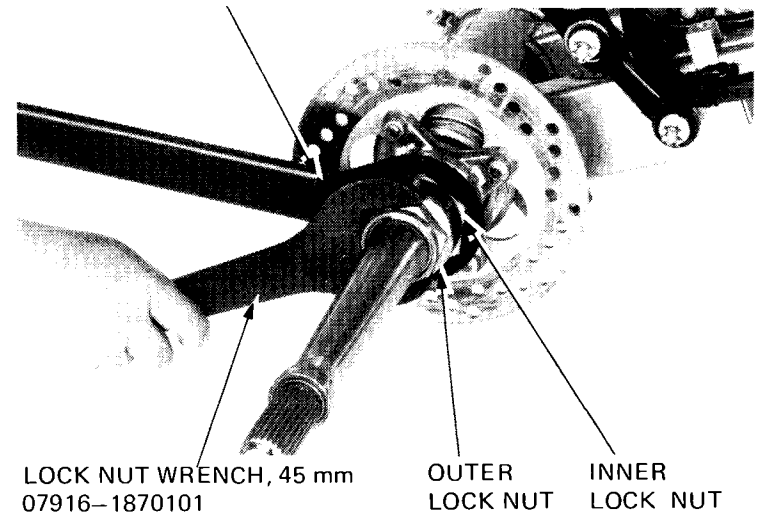


Loosen the rear axle inner lock nut while holding the outer lock nut.

NOTE

The rear axle lock nuts have left-hand threads. 07916-HA20000 consists of 56 mm wrench (07916-HA20100) and handle (07916-9580500). If you have 41 mm wrench set (07916-9580300), the handle (07916-9580500) can be used from the set.

LOCK NUT WRENCH SET, 56 mm
07916-HA20000 or 07916-HA2010A



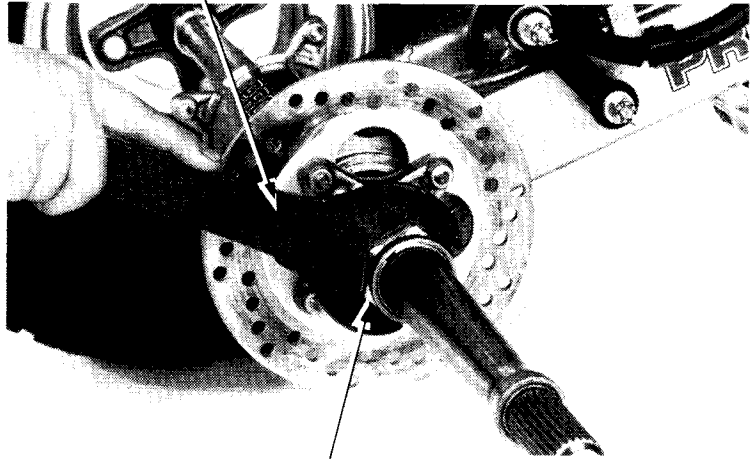
REAR WHEEL/DRIVE MECHANISM

Temporarily install the left wheel hub and wheel. Loosen the outer lock nut until the snap ring can be removed.

NOTE

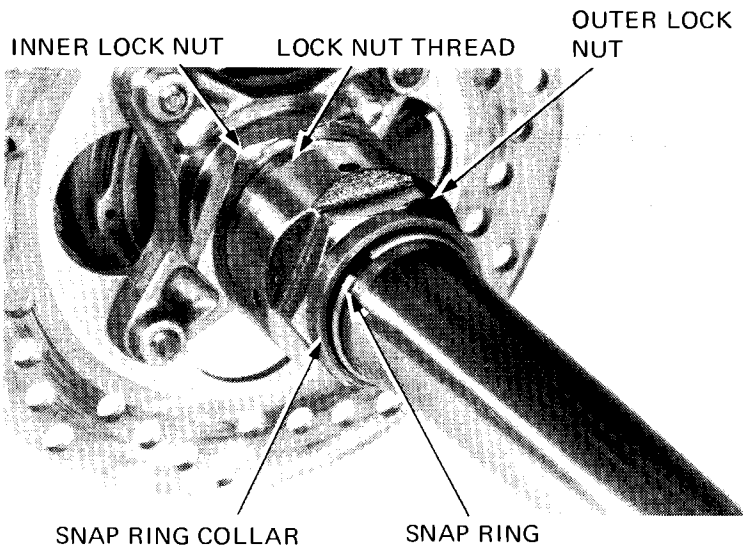
The rear axle lock nuts have left-hand threads.

LOCK NUT WRENCH, 45 mm
07916-1870101



OUTER LOCK NUT

Remove the snap ring, snap ring collar, outer lock nut, lock nut thread, and inner lock nut from the axle.



INNER LOCK NUT

LOCK NUT THREAD

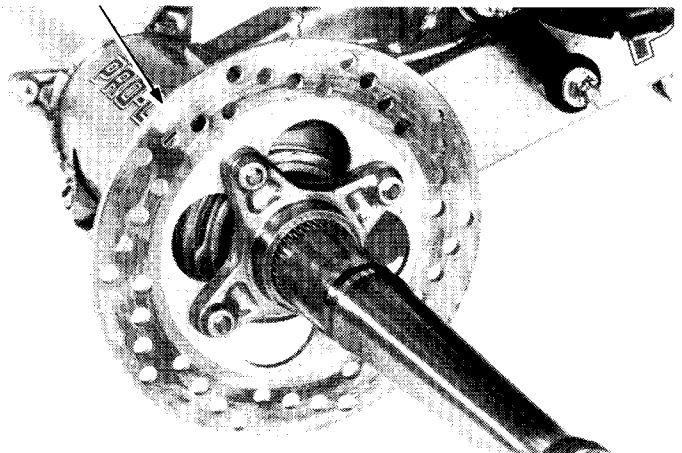
OUTER LOCK NUT

SNAP RING COLLAR

SNAP RING

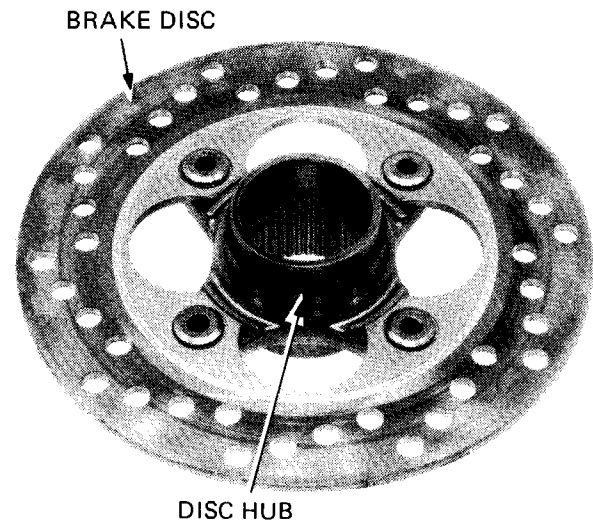
Remove the rear brake disc from the axle.

BRAKE DISC

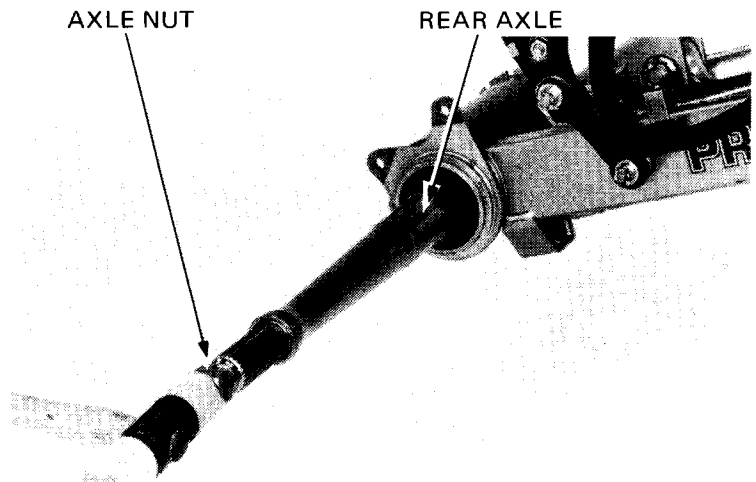


REAR WHEEL/DRIVE MECHANISM

Remove the four socket bolts and the brake disc from the disc hub.



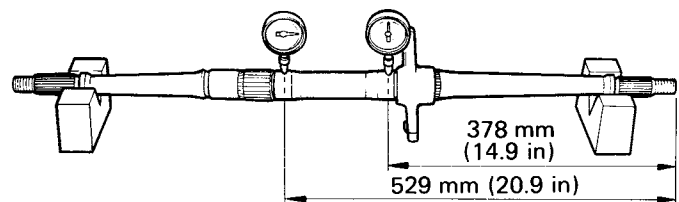
Install the axle nut onto the right axle end. Drive the axle out of the wheel bearings from the right side with a plastic hammer.



INSPECTION

Place the rear axle in V-blocks and measure the runout.

SERVICE LIMIT: 3.0 mm (0.12 in)

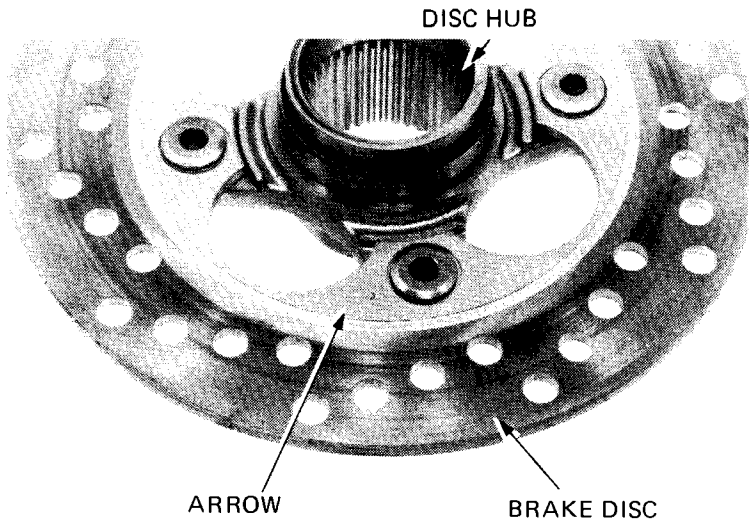


INSTALLATION

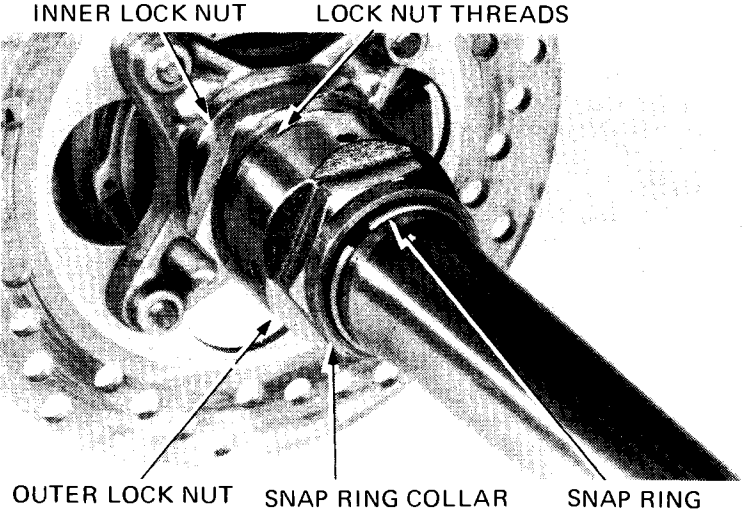
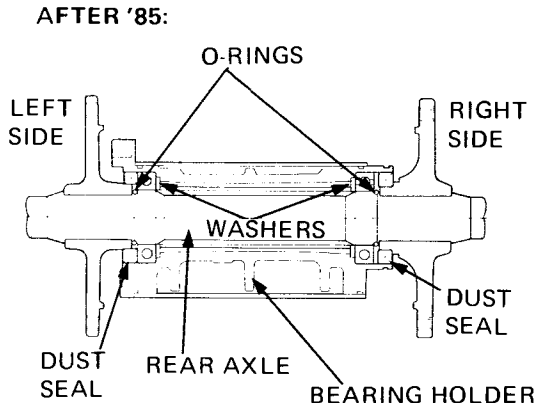
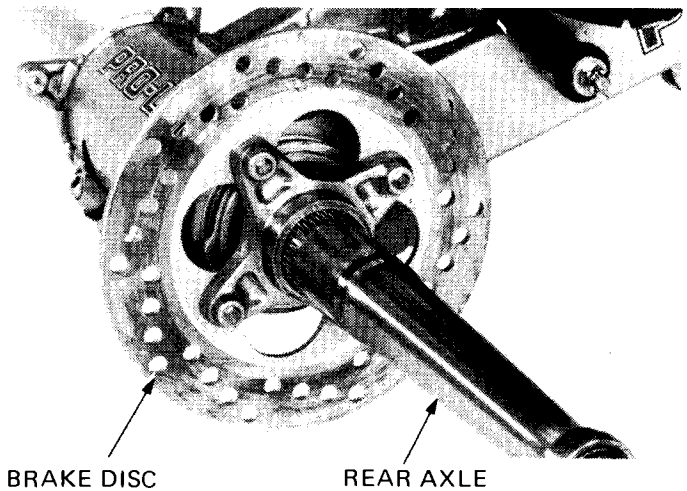
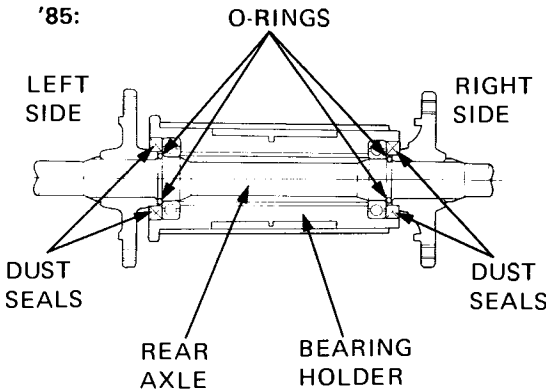
Install the brake disc onto the disc hub with its arrow facing the inside.
 Apply grease or oil to the disc socket bolts and tighten the bolts.

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

WARNING
Grease or oil on the disc will reduce stopping power. Clean the disc with a high quality brake degreaser if oil or grease gets on the disc.



Install a new O-ring over the rear axle and insert the rear axle from the left side.
 Install a new O-ring and brake disc over the axle.



Apply a thread lock agent to the inner lock nut threads.
 Thread the inner and outer lock nuts over the lock nut thread and install them onto the axle.
 Install the snap ring collar and snap ring.

REAR WHEEL/DRIVE MECHANISM

Temporarily install the left rear wheel hub and wheel.

Tighten the outer lock nut to the specified torque against the snap ring collar while holding the left rear wheel.

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

NOTE

The inner and outer lock nuts have left-hand threads.

Remove the left rear wheel and wheel hub.
Tighten the inner lock nut against the outer lock nut.

TORQUE: 120–140 N·m
(12.0–14.0 kg·m, 87–101 ft·lb)

Lower the brake caliper and align the brake disc between the brake pad.
Tighten the brake caliper bracket bolts.

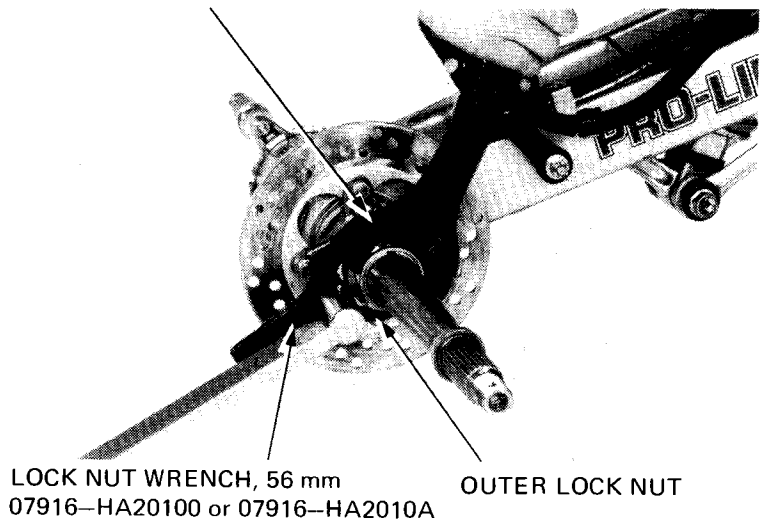
TORQUE: 28–34 N·m
(2.8–3.4 kg·m, 20–25 ft·lb)

Install the driven sprocket onto the hub on the axle with its teeth number mark facing out.
Apply a thread lock agent to the sprocket bolts thread and tighten the bolts.

TORQUE:
'85: 32–37 N·m
(3.2–3.7 kg·m, 23–27 ft·lb)
AFTER '85: 47–55 N·m
(4.7–5.5 kg·m, 34–40 ft·lb)

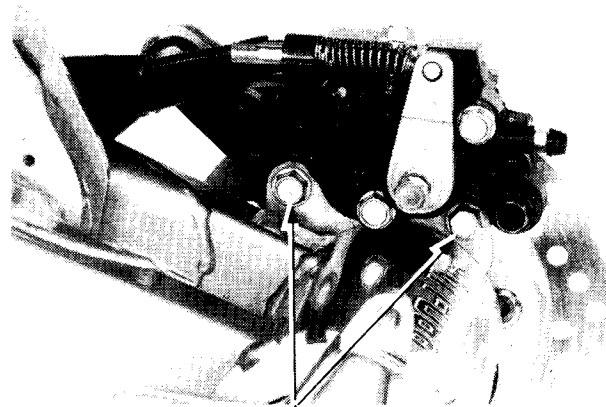
Install the drive chain with the master link and retaining clip. Face the closed end of the retaining clip to the rotating direction of the chain.
Install the swing arm lower guard with its four bolts.

LOCK NUT WRENCH, 45 mm or equivalent
07916–1870101

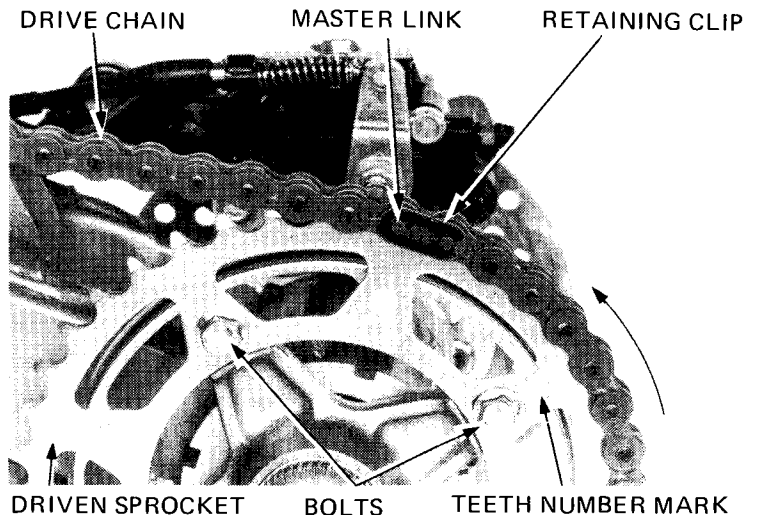


LOCK NUT WRENCH, 56 mm
07916–HA20100 or 07916–HA2010A

OUTER LOCK NUT



CALIPER BRACKET BOLTS



DRIVEN SPROCKET

BOLTS

TEETH NUMBER MARK

Apply grease to the splines on both end of the axle.
 Install the wheel hubs, wheel hub collars, and wheel hub nuts.
 Tighten the axle nuts.

TORQUE:

With washer '85:

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

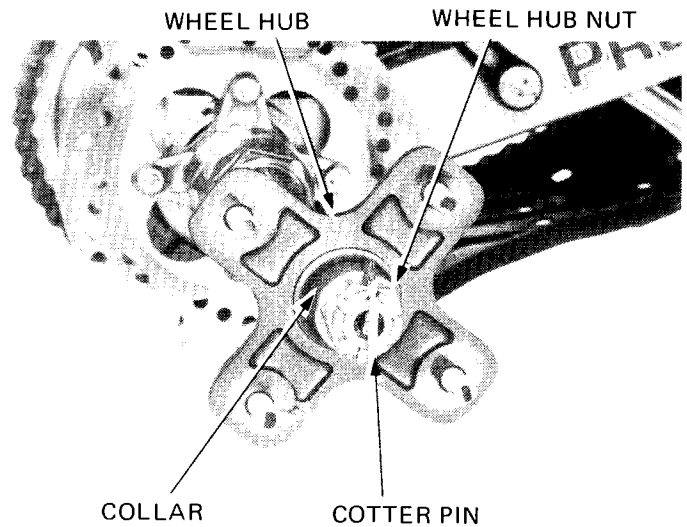
Flange nut type AFTER MID '85:

120–170 N·m
 (12.0–17.0 kg·m, 87–123 ft·lb)

Install new cotter pins and spread the ends as shown.

Install the rear wheels (Page 11-3).

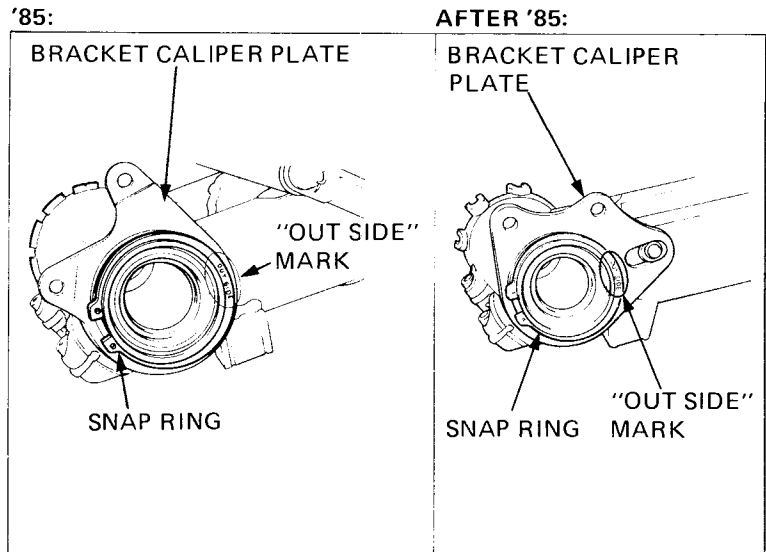
Adjust drive chain slack (Page 2-10).



REAR WHEEL BEARINGS

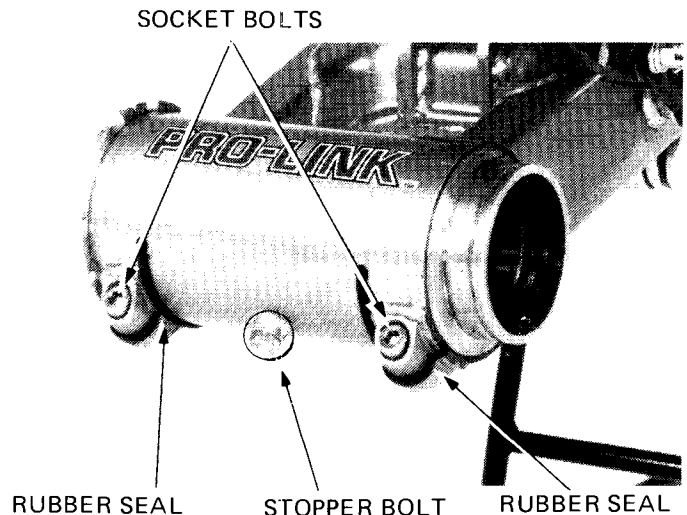
BEARING HOLDER REMOVAL

Remove the rear wheels and axle (Page 11-3).
 Remove the snap ring and brake caliper mounting plate.



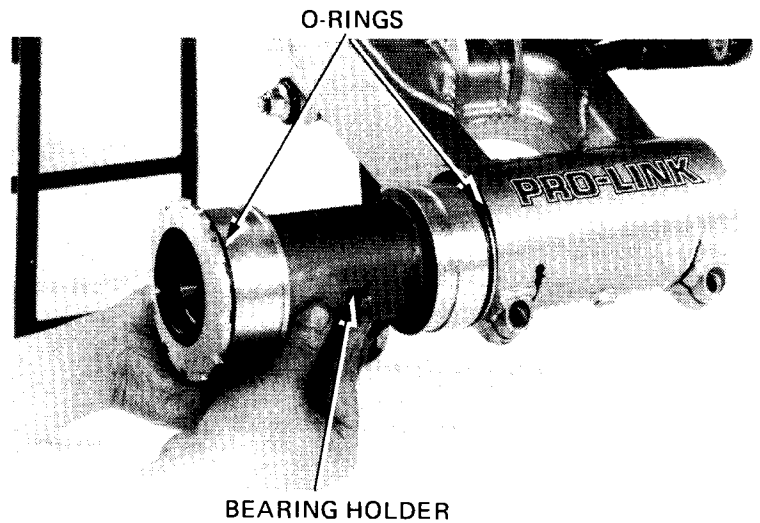
Remove the two socket bolts and rubber seals from the swing arm.

Remove the stopper bolt.



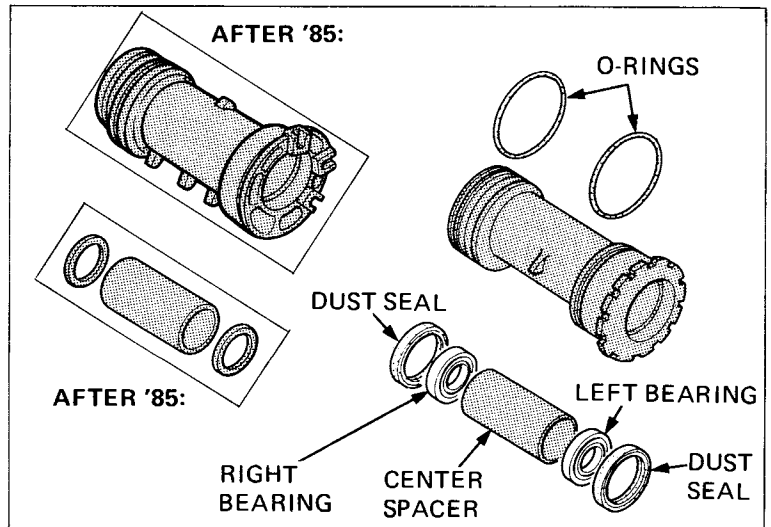
REAR WHEEL/DRIVE MECHANISM

Remove the bearing holder from the swing arm.
Remove the O-rings from the bearing holder.

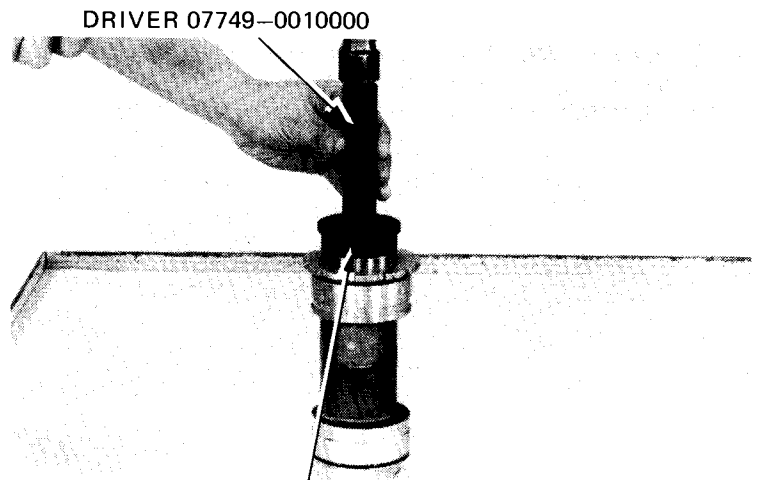


BEARING REPLACEMENT

Remove the dust seals, bearings and center spacer from the bearing holder.



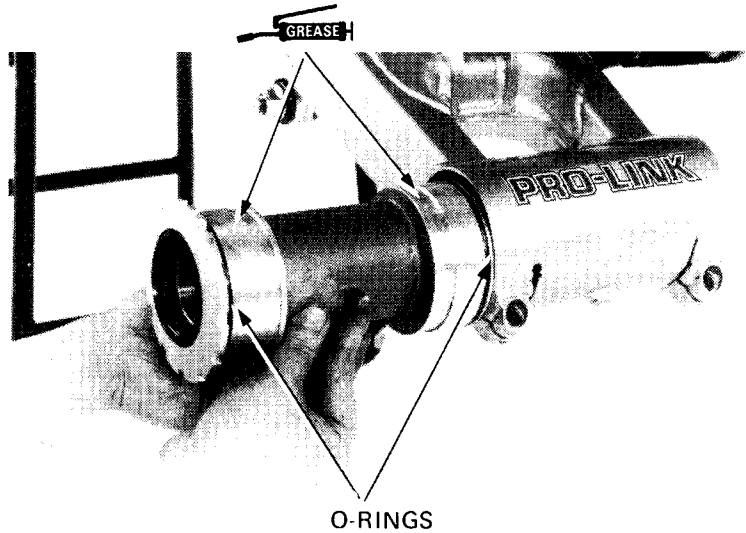
Drive a new right bearing into the bearing holder with the special tools.
Install the center spacer.
Drive a new left bearing into place with the same tools.
Apply grease to the lip of new dust seals and drive the dust seals into the bearing holder until their out side surfaces flush with the end surface of the holder.



ATTACHMENT, 62 x 68 mm 07746-0010500
PILOT, 40 mm 07746-0040900

BEARING HOLDER INSTALLATION

Install new O-rings in the groove of the bearing holder.
Apply grease to the outside surfaces of the bearing holder.



'85:

Install the bearing holder into the swing arm as shown in the figure.

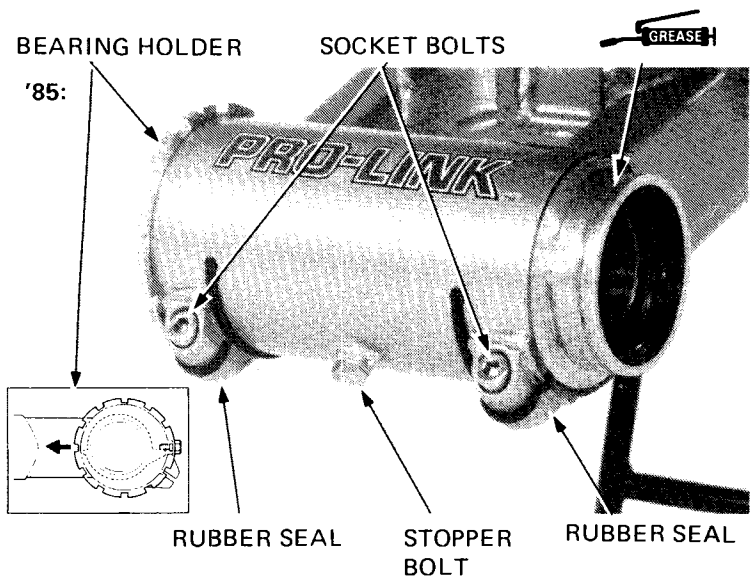
AFTER '85:

Install the bearing holder into the swing arm after aligning the center tang on the bearing holder with the punch mark on the swing arm.

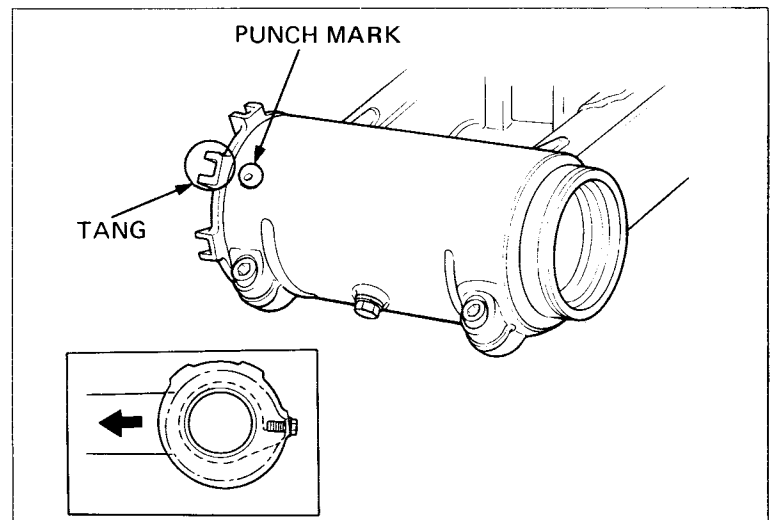
'85 AND AFTER '85:

Install the rubber seals, and stopper bolt.
Apply grease to the caliper mount plate installation surface of the bearing holder.
Tighten the socket bolt to the specified torque.

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



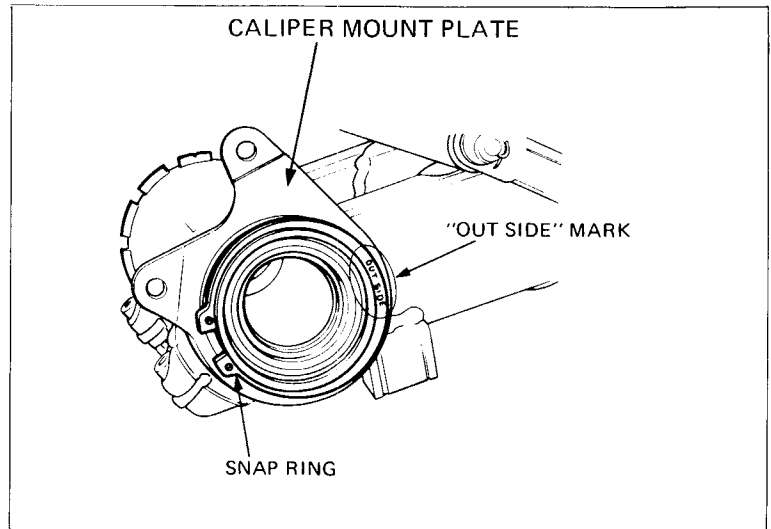
AFTER '85:



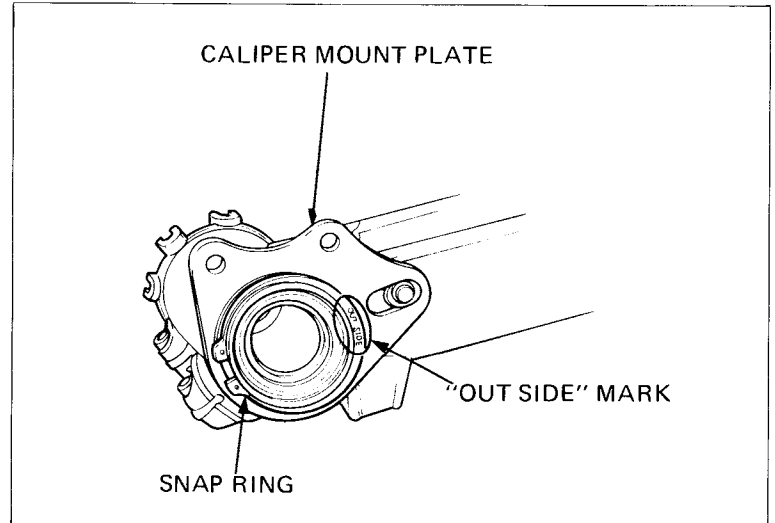
REAR WHEEL/DRIVE MECHANISM

Install the caliper mount plate.
Install the snap ring with its "OUT SIDE" mark facing out and with its ends positioned as shown.
Install the rear axle (Page 11-7).
Install the rear wheels (Page 11-3).
Adjust the drive chain (Page 2-10).

'85:

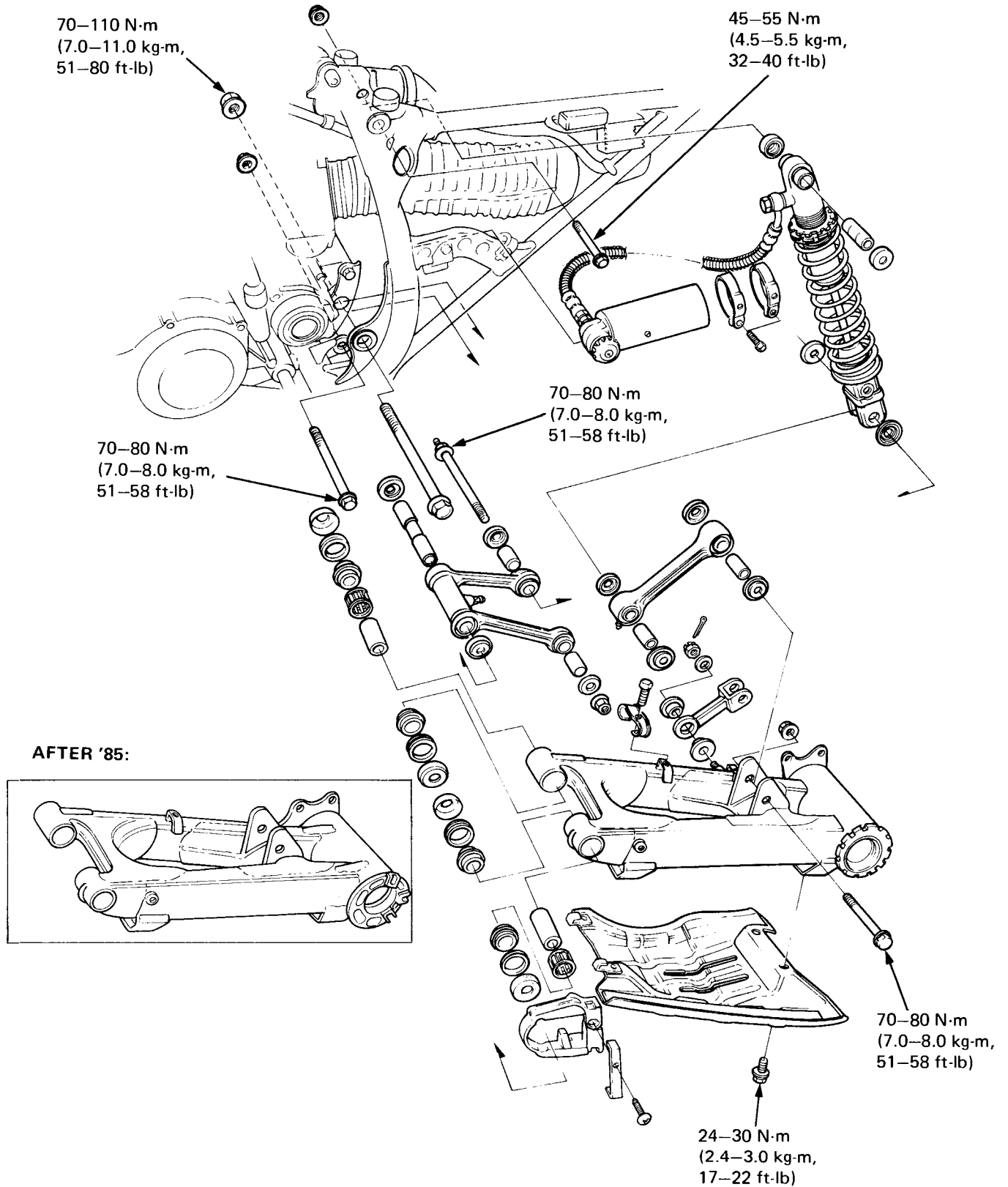


AFTER '85:



MEMO

REAR SUSPENSION



12. REAR SUSPENSION

SERVICE INFORMATION	12-1	SUSPENSION LINKAGE	12-12
TROUBLESHOOTING	12-2	SWING ARM	12-14
SHOCK ABSORBER	12-3		

SERVICE INFORMATION

GENERAL

- This section deals with rear shock absorber and swing arm repairs.
- A jack or block is required to support the ATC.
- Use genuine bolts for the rear suspension linkage and shock absorber pivot and mounting; ordinary bolts lack adequate strength for these applications. Also take note of the installation direction of these bolts since they must be installed correctly.

WARNING

- *The shock absorber is fitted with a gas-filled reservoir. Do not fill the reservoir with air; use only nitrogen and have the shock pressure checked and/or charged by an authorized Honda dealer equipped with a proper nitrogen charging system.*
- *The shock absorber contains nitrogen under high pressure. Do not allow fire or heat near the shock and be sure to release the nitrogen gas pressure before discarding the shock.*

SPECIFICATIONS

ITEM		STANDARD mm (in)	SERVICE LIMIT mm (in)	
Rear suspension	Rear shock absorber spring free length	254.7–260.7 (10.028–10.264)	252.1 (9.93)	
	Spring installation load length	Standard length	241.7 (9.52)	
		Min-max length	236.7–248.7 (9.319–9.791)	
	Damper rod compression force, 10 mm (0.4 in)	'85:	15–25 kg (33–55 lb)	–
		AFTER '85:	23.1–38.5 kg (51–85 lb)	–
	Nitrogen pressure	'85:	13–16 kg/cm ² (185–230 psi)	–
AFTER '85:		20–23 kg/cm ² (284–327 psi)	–	

12

TORQUE VALUES

Shock absorber oil hose bolt	28–32 N·m (2.8–3.2 kg-m, 20–23 ft-lb)
Shock absorber oil hose joint lock nut	28–32 N·m (2.8–3.2 kg-m, 20–23 ft-lb)
Shock absorber spring lock nut	80–100 N·m (8.0–10.0 kg-m, 58–72 ft-lb)
Shock absorber upper mount bolt	45–55 N·m (4.5–5.5 kg-m, 32–40 ft-lb)
Shock absorber lower mount bolt	70–80 N·m (7.0–8.0 kg-m, 51–58 ft-lb)
Shock arm pivot bolt	70–80 N·m (7.0–8.0 kg-m, 51–58 ft-lb)
Shock link pivot bolt	70–80 N·m (7.0–8.0 kg-m, 51–58 ft-lb)
Swing arm pivot nut	70–110 N·m (7.0–11.0 kg-m, 51–80 ft-lb)
Skid plate	24–30 N·m (2.4–3.0 kg-m, 17–22 ft-lb)

REAR SUSPENSION

TOOLS

Special

Valve wrench	07920–KA30001
Needle bearing remover	07946–KA500000

Optional

Pin spanner	89201–KA4–820
Pin spanner	89202–KA4–820

TROUBLESHOOTING

Wobble or vibration in motorcycle

- Bent rim
- Loose wheel bearing(s)
- Damaged tire
- Axle not tightened properly
- Swing arm pivot bearing worn
- Bent frame or swing arm

Soft suspension

- Spring preload adjustment is improper for rider's weight — See Owner's Manual
- Compression damping adjustment improper — See Owner's Manual
- Weak shock spring

Hard suspension

- Spring preload is improper for rider's weight — See the Owner's Manual
- Compression or rebound damping is misadjusted — See Owner's Manual
- Bent shock damper rod
- Swing arm pivot bearings damaged
- Frame or swing arm bent

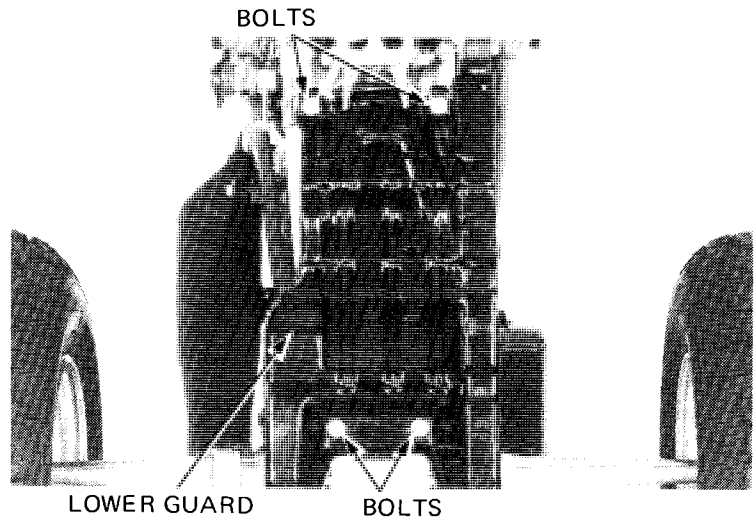
Suspension noise

- Faulty rear damper
- Loose fasteners
- Worn suspension linkage needle bearing

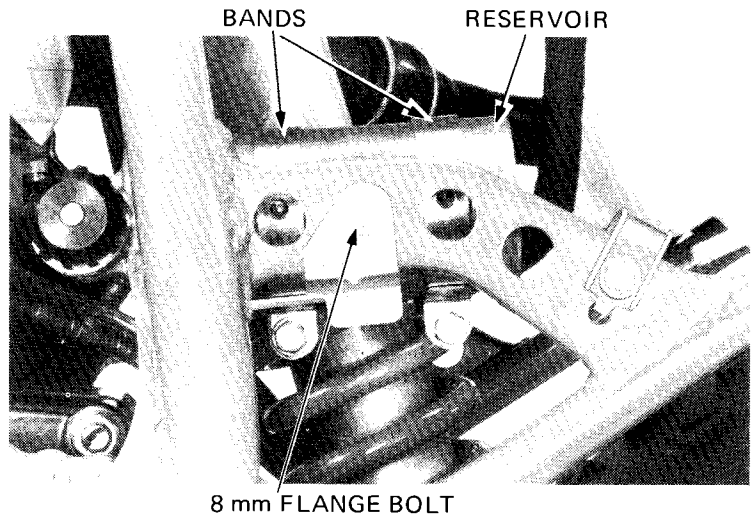
SHOCK ABSORBER

REMOVAL

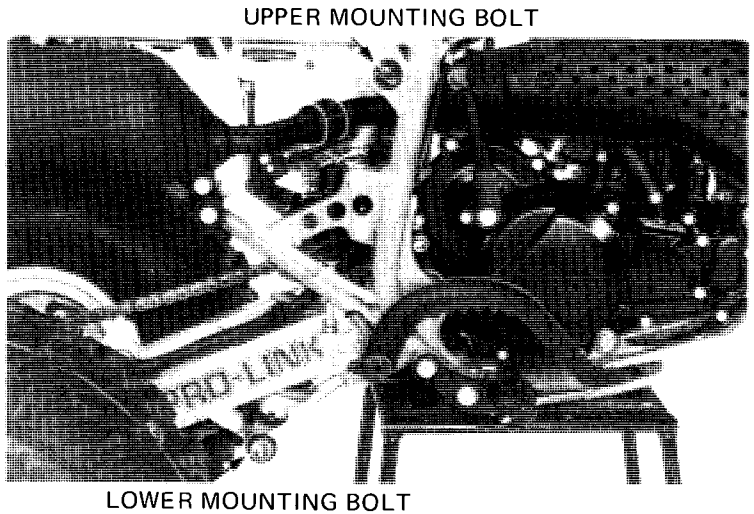
Raise the rear wheels off the ground by placing a jack or block under the engine.
 Remove the air cleaner case (Page 3-5).
 Remove the lower guard by removing the four bolts.



Remove the 8 mm flange bolt and the reservoir from the frame.



Remove the shock upper and lower mounting bolts and the shock absorber.



REAR SUSPENSION

DISASSEMBLY

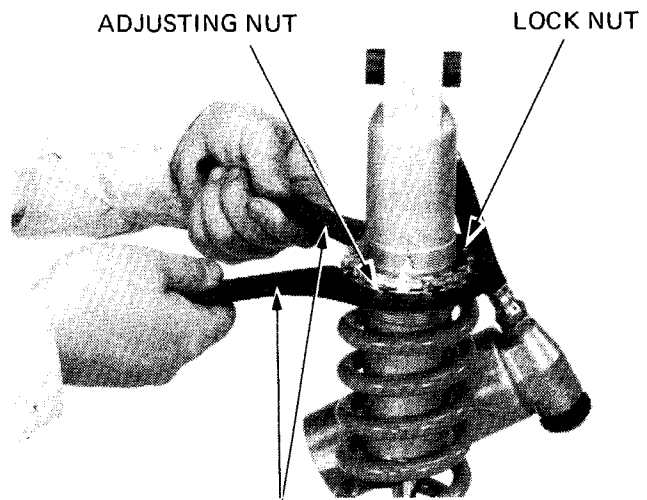
Hold the lower shock mount in a vise with soft jaws or a shop towel.
Loosen the lock and adjusting nuts.

CAUTION

Be careful not to damage the hose connection in a vise.

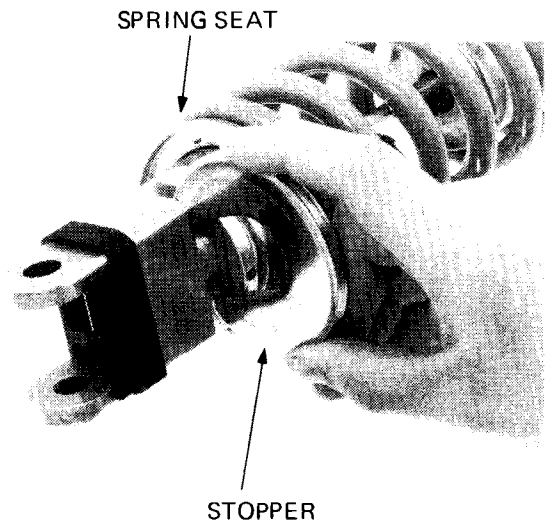
NOTE

The pin spanners are optional tools.



PIN SPANNER 89201-KA4-820, AND 89202-KA4-820

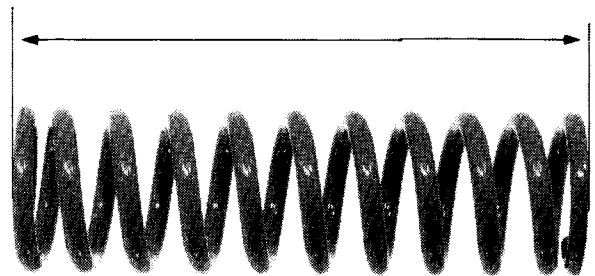
Remove the spring seat, stopper and spring.



INSPECTION

Measure the spring free length.

SERVICE LIMIT: 252.1 mm (9.93 in)



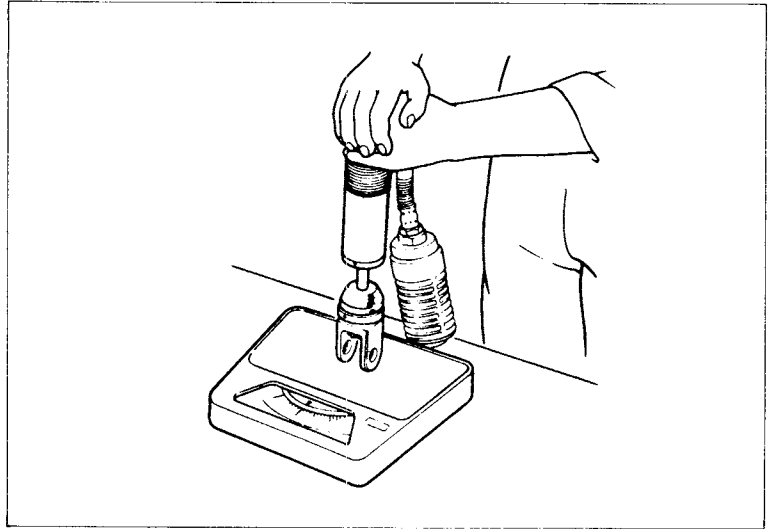
Visually inspect the damper unit for dents, oil leaks or other damage. Replace the damper unit if necessary. Place the damper rod on a scale and measure the force required to compress the damper unit 10 mm (0.14 in).

SPECIFIED FORCE:

'85: 15–25 kg (33–55 lb)

AFTER '85: 23.1–38.5 kg (51–85 lb)

If the force required is less than 15 kg (33 lbs) gas is leaking. Examine the damper rod and replace the damper if the rod is bent or scored.

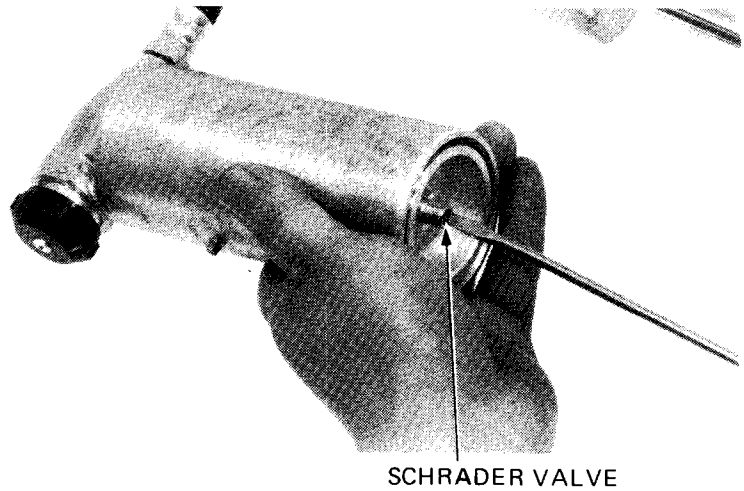


DISASSEMBLY

Depress the Schrader valve to release the nitrogen from the reservoir.

CAUTION

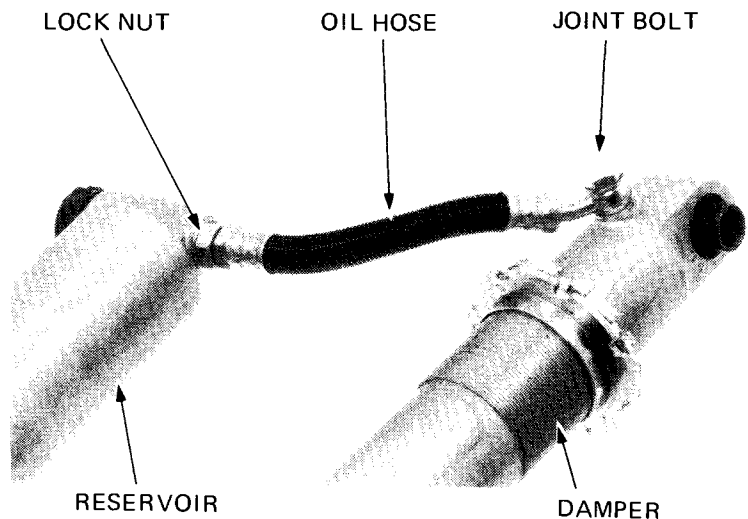
Point the reservoir charging valve away from you when discharging the nitrogen pressure. Do not remove the valve core before discharging the nitrogen pressure.



Remove the oil hose joint bolt and two sealing washers and disconnect the oil hose from the damper.

Loosen the lock nut and oil hose and disconnect the oil hose from the reservoir.

Drain the oil from the reservoir, hose and damper.



REAR SUSPENSION

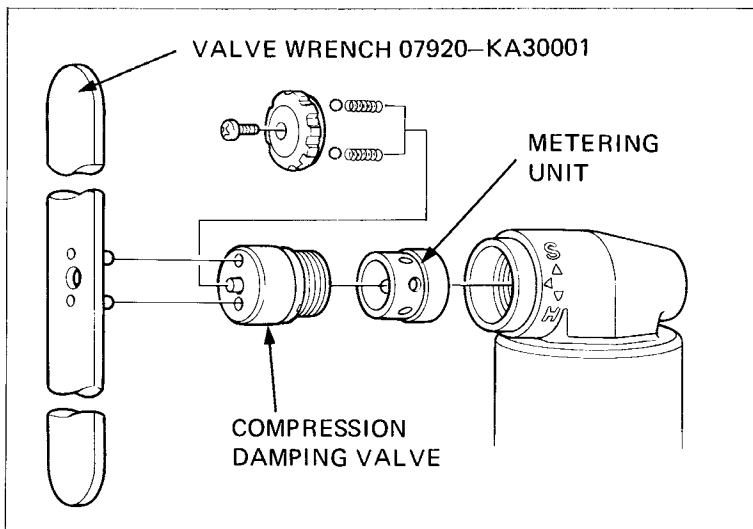
SERVICING THE RESERVOIR

Remove the Philips screw from the center of the compression damping adjustment knob, then remove the knob, its two springs and detent balls.

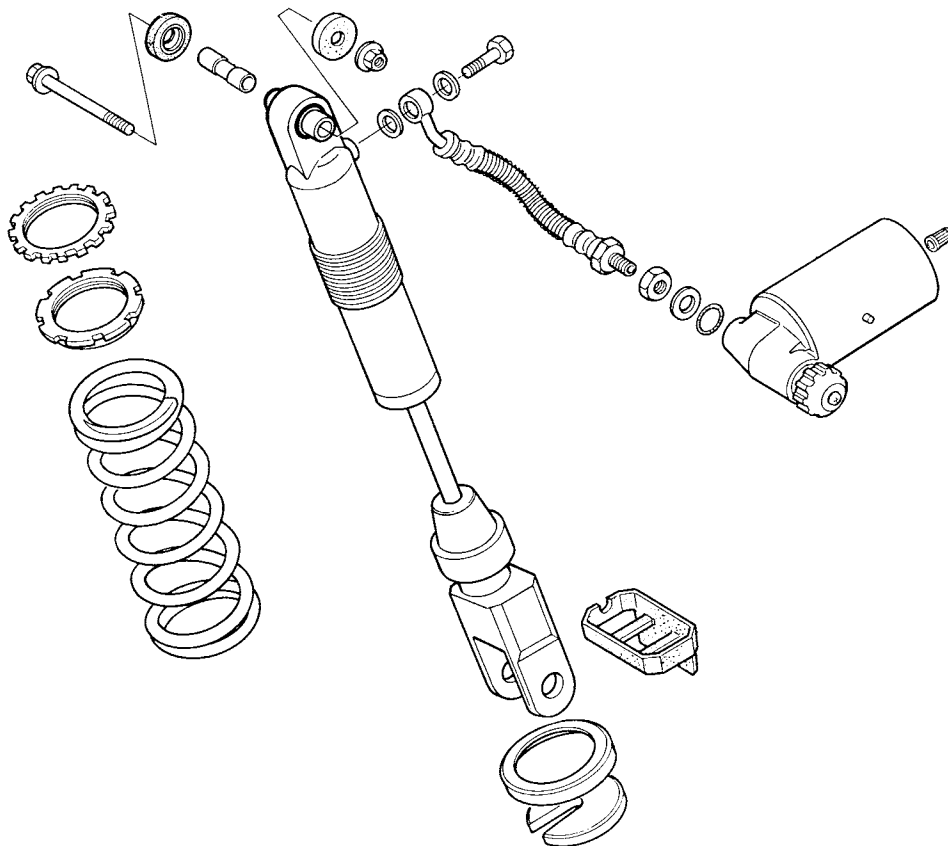
Using the special tool, remove the compression damping valve from the reservoir; turn counter-clockwise to remove.

Remove the spring and metering unit from the reservoir.

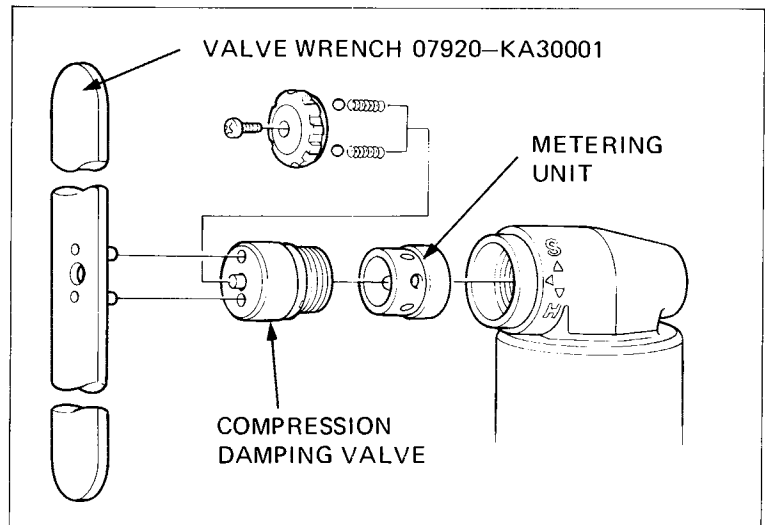
Turn the reservoir upside down to allow the ATF to drain.



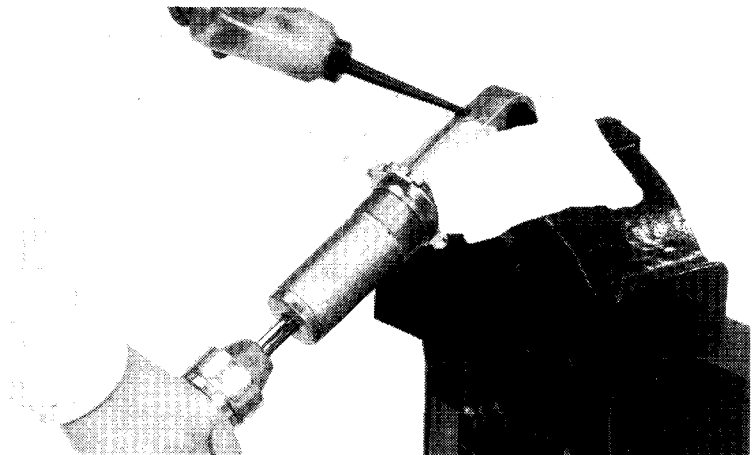
ASSEMBLY



Install the metering unit into the reservoir.
 Install the valve into the reservoir being careful not to damage the O-ring and tighten it with the special tool.
 Install the two springs, detent balls and adjusting knob onto the valve. Align the flats on the adjusting knob and the adjusting screw.
 Tighten the knob screw securely.



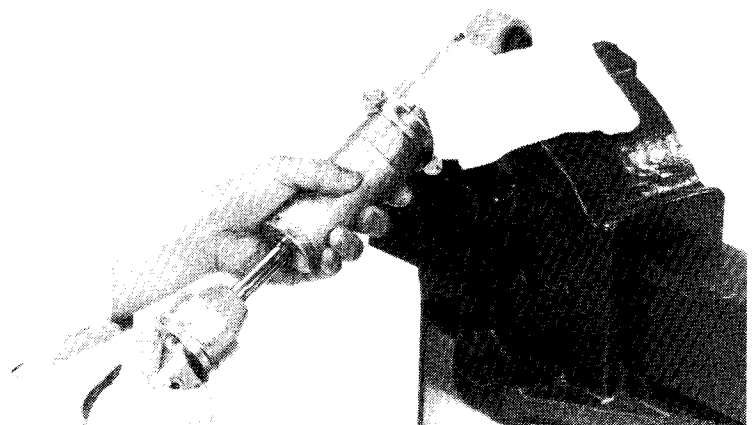
Hold the upper shock mount in a vise with soft jaws or a shop towel. Point the hole straight up.
 Pull out the damper rod all the way.
 Fill the damper with ATF.



Bleed air from the damper by moving the damper rod with short strokes, in and out several times slowly.
 Fill the damper with ATF as required.

NOTE

The damper should be as free of air as possible.

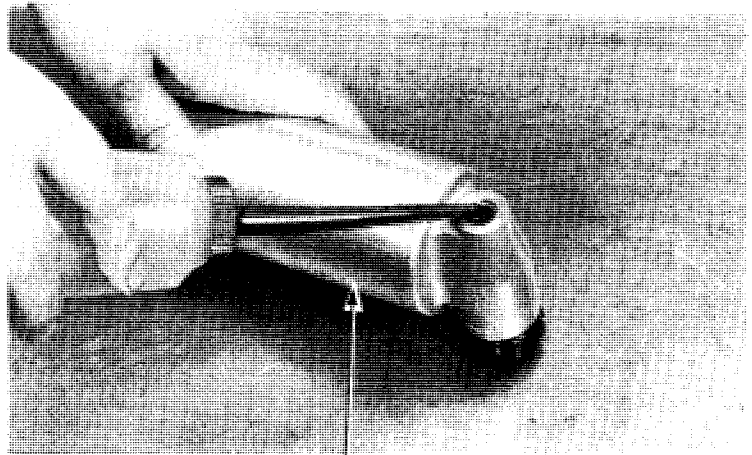


REAR SUSPENSION

Fill the reservoir with ATF.

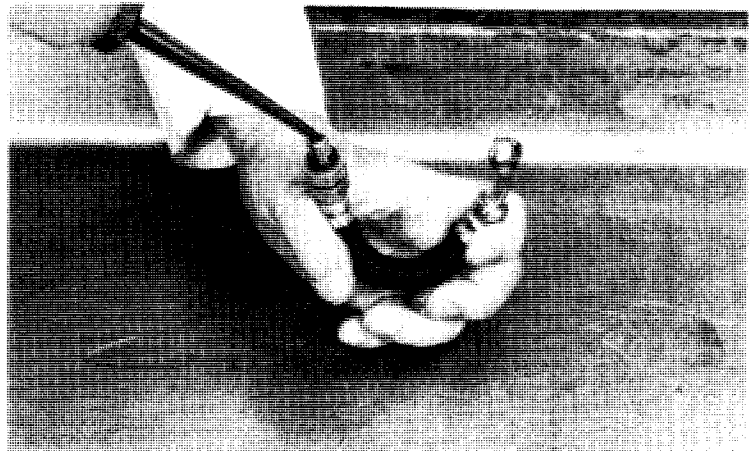
NOTE

Make sure that there is no gas pressure in the reservoir.



RESERVOIR

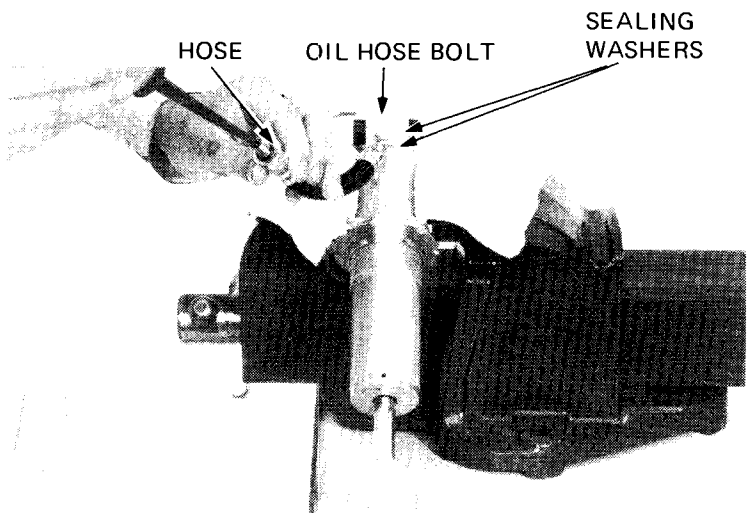
Fill the hose with ATF.



Connect the hose to the damper unit with two sealing washers and the bolt and tighten the oil hose bolt.

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

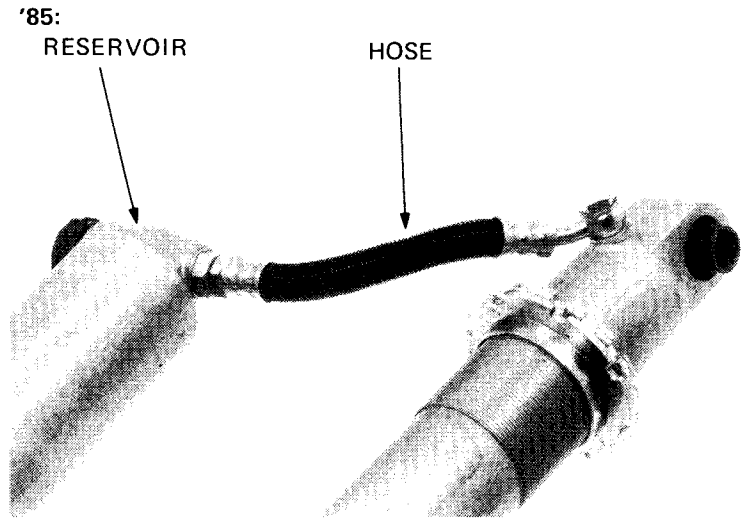
Very slowly push the damper rod in until ATF begins to overflow from the hose.
Pull the damper rod out all the way and fill the hose with ATF.



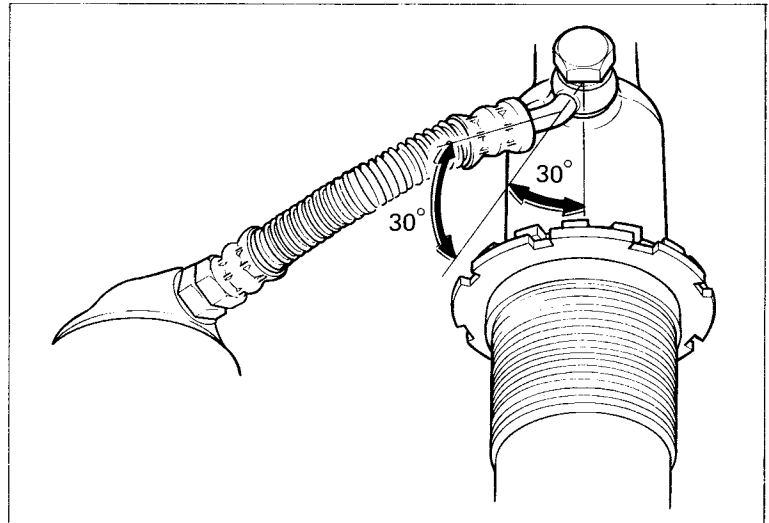
Very carefully connect the reservoir to the shock hose and tighten the hose joint lock nut.

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

Make sure that there is no air in the damper by operating the damper before charging the reservoir with gas.
If damper force is uneven, bleed air from the damper.



AFTER '85:



Fill the reservoir with nitrogen gas to:

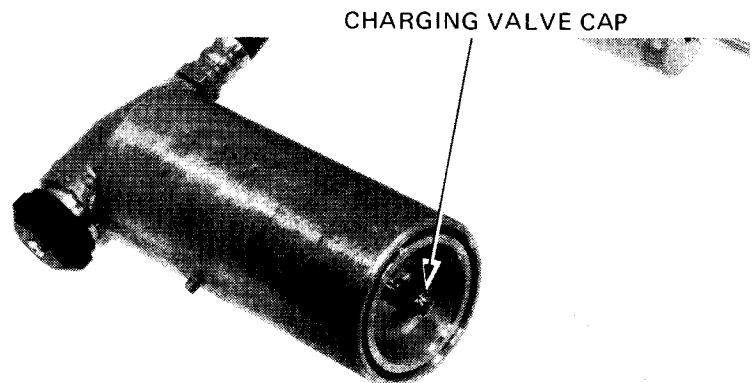
'85: 13–16 kg/cm² (185–230 psi)

AFTER '85: 20–23 kg/cm² (284–327 psi)

WARNING

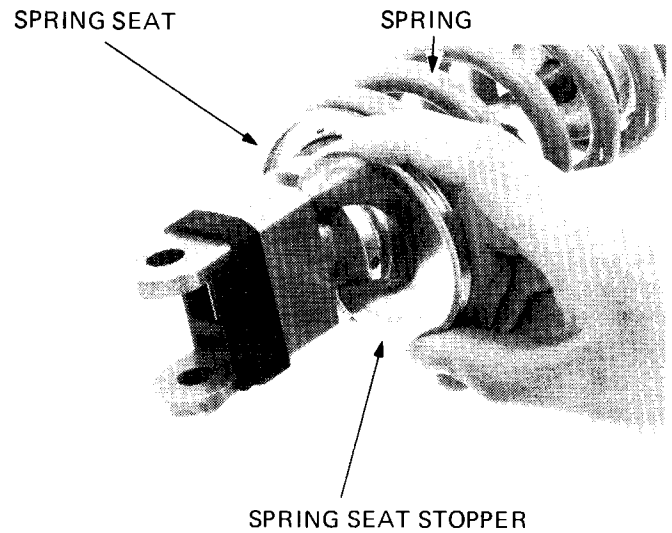
Use only nitrogen to pressurize the shock absorber. The use of an unstable gas can cause a fire or explosion.

Install the charging valve cap.

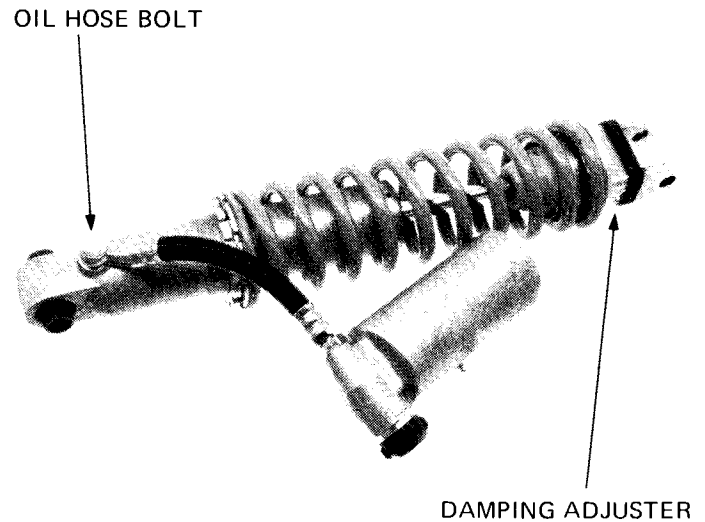


REAR SUSPENSION

Install the spring, spring seat and spring seat stopper.



Align the shock mounts so that the oil hose bolt faces the rear and the damping adjuster on the lower mount faces the left.



Turn the adjusting nut to obtain the correct spring length.

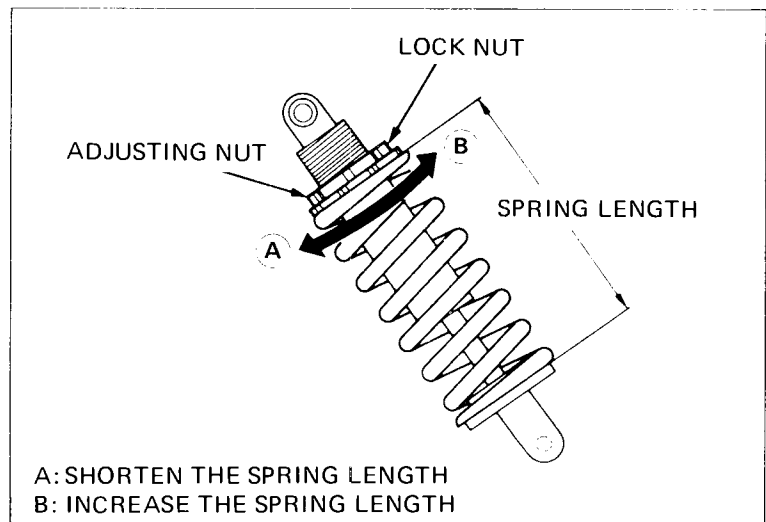
Measure the spring length.

STANDARD SPRING LENGTH: 241.7 mm (9.52 in)

NOTE

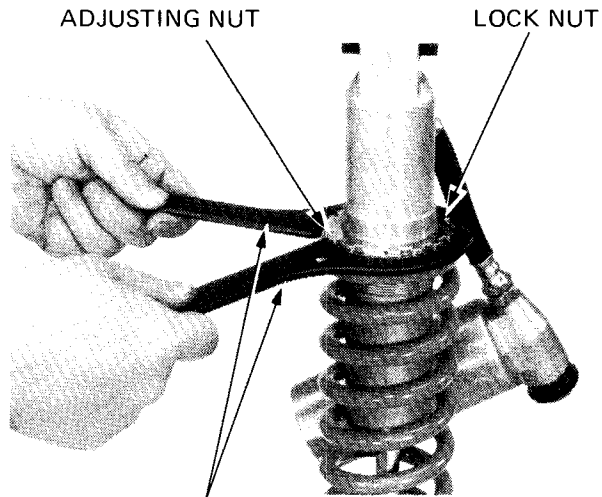
One turn of the adjusting nut changes the spring length by 1.5 mm (0.06 in).

Use this standard spring preload length as a baseline. See the Owner's Manual for detailed instructions on adjusting preload for rider weight and setting damping for riding conditions and rider skill.



Tighten the lock nut while holding the adjusting nut.

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



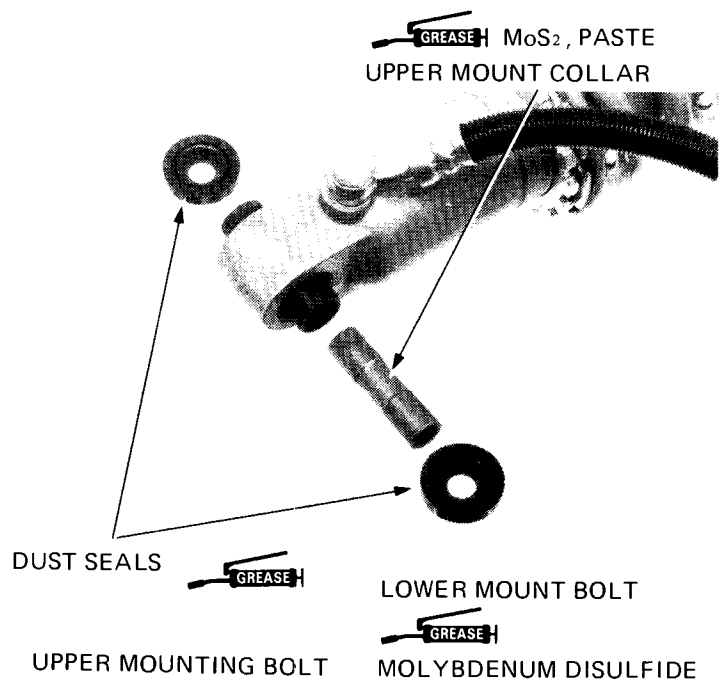
PIN SPANNERS
89201-KA4-810 and 89202-KA4-810

Apply a paste grease with 40% or more molybdenum disulfide to the upper mount collar and install the collar into the upper mount.

NOTES

- Some sources of MoS₂ paste grease with 40% or more molybdenum are:
- Molykote® G-n Paste manufactured by Dow Corning, U.S.A.
 - Moly 45, U.S.A.
 - Local Paste manufactured by Sumico Lubricant, Japan.
 - Bel-Ray Moly-Lube MC 8, U.S.A.
- Any other manufacturer's paste grease equivalent to the above may also be used.

Apply grease to the dust seals and install the dust seals onto the upper mount.



INSTALLATION

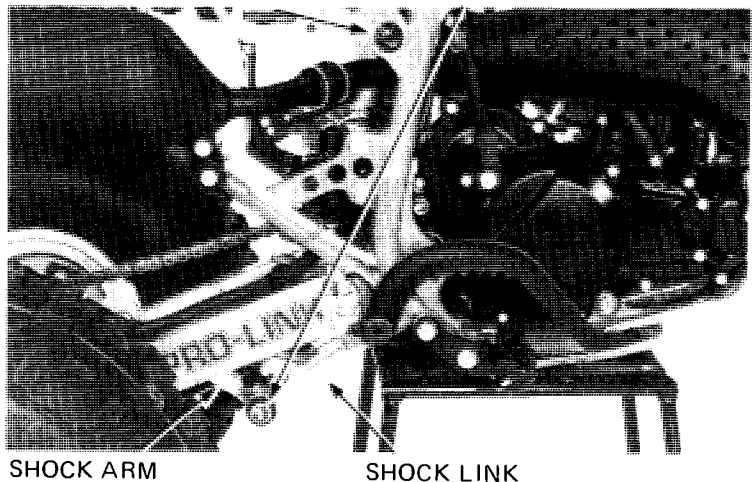
Apply molybdenum disulfide grease to the lower mount bolt.

Align the shock lower mount with the shock arm and shock link holes, install and tighten the lower mounting bolt.

TORQUE: 70–80 N·m
(7.0–8.0 kg·m, 51–58 ft·lb)

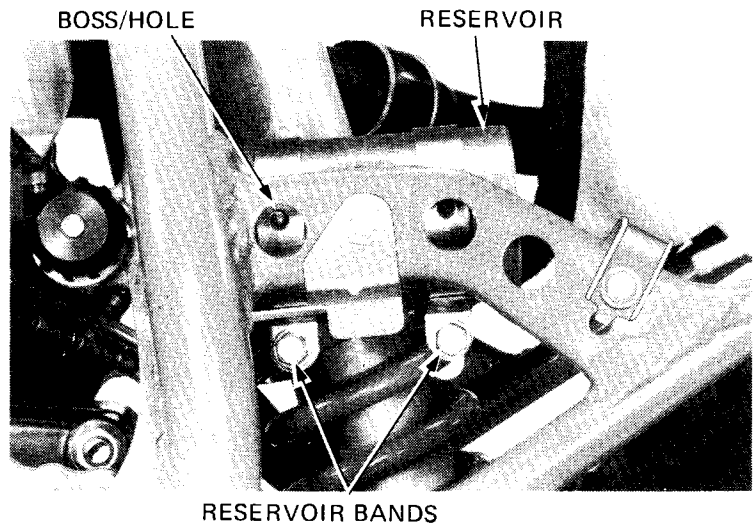
Connect the upper mount to the frame and tighten the upper mounting bolt.

TORQUE: 45–55 N·m
(4.5–5.5 kg·m, 32–40 ft·lb)

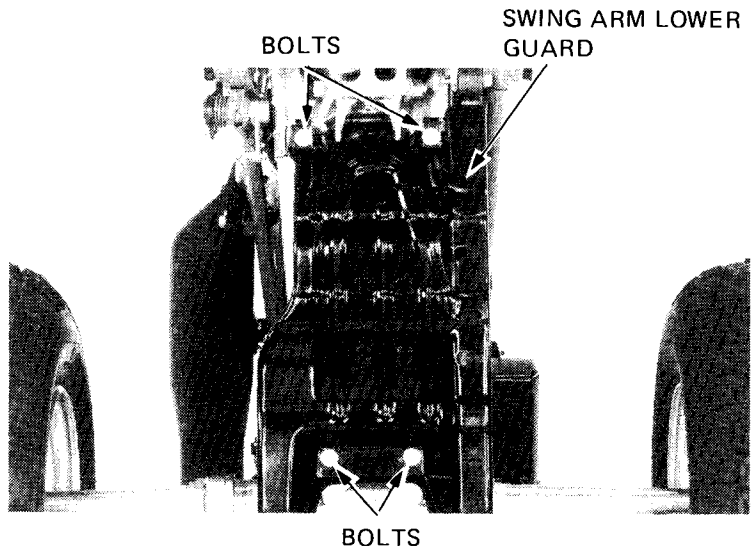


REAR SUSPENSION

Position the reservoir so that its boss aligns with the hole in the bracket on the frame and secure it with the two reservoir bands as shown.



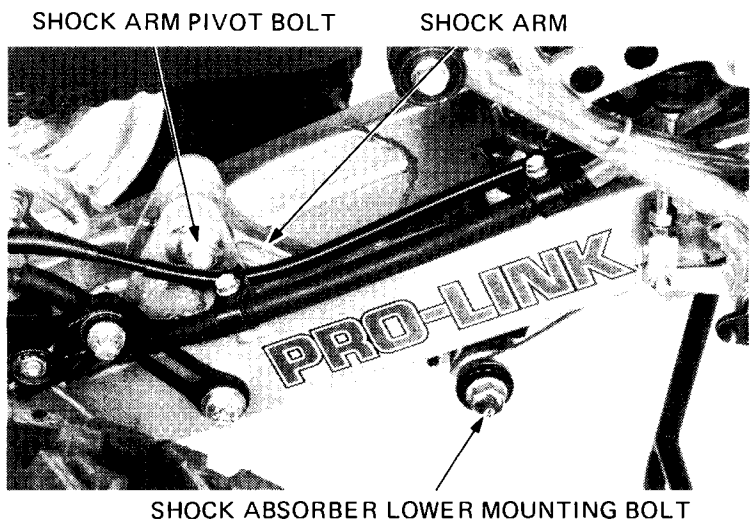
Install the swing arm lower guard with the four bolts.



SUSPENSION LINKAGE

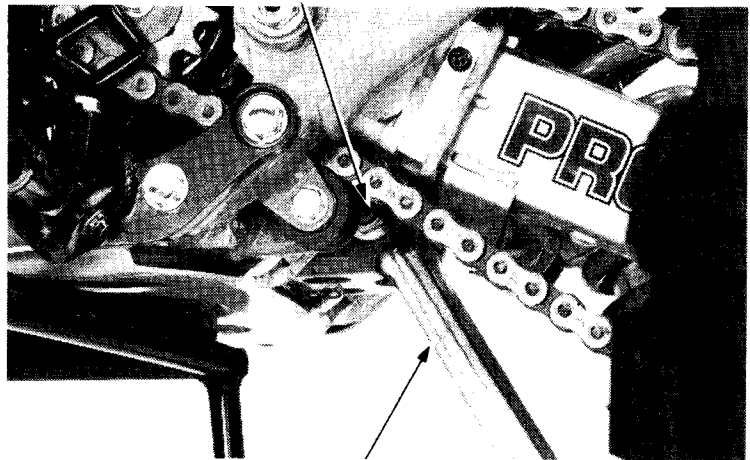
REMOVAL

Remove the swing arm lower guard.
Place a jack or block under the engine.
Remove the shock absorber lower mounting bolt.
Remove the shock arm pivot bolt and shock arm from the swing arm.



Remove the shock link pivot bolt and shock link from the frame.

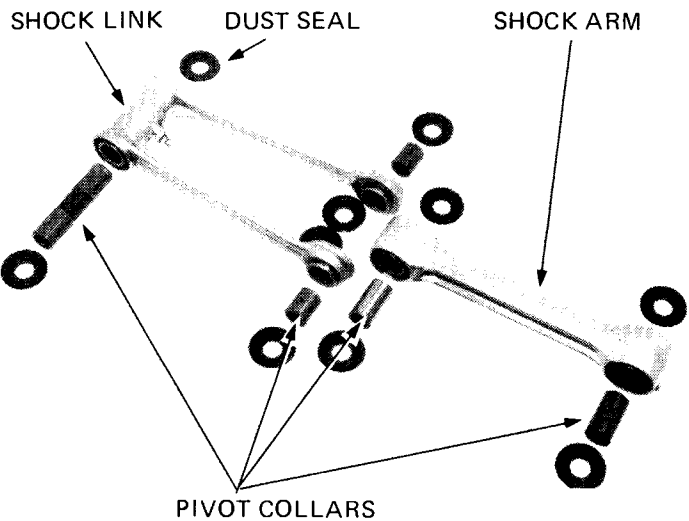
SHOCK LINK PIVOT BOLT



SHOCK LINK

INSPECTION

Inspect the linkage pivot bushings and collars for score marks, scratches, or excessive or abnormal wear.
Check the dust seals for wear or damage.

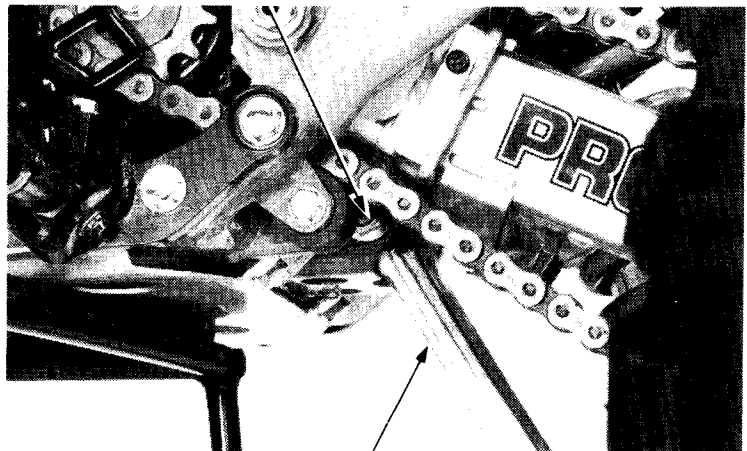


INSTALLATION

Apply molybdenum disulfide grease to the pivot bushings and collars.
Install the shock link to the frame and tighten the pivot bolt.

TORQUE: 70–80 N·m
(7.0–8.0 kg·m, 51–58 ft·lb)

SHOCK LINK PIVOT BOLT



SHOCK LINK

REAR SUSPENSION

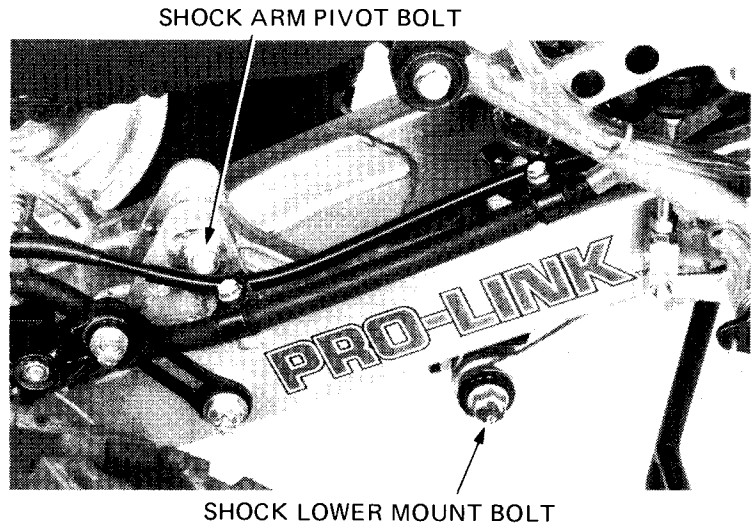
Install the shock arm to the swing arm and tighten the pivot bolt.

TORQUE: 70–80 N·m
(7.0–8.0 kg·m, 51–58 ft·lb)

Connect the shock lower mount to the shock link and arm with the lower mounting bolt and torque the bolt.

TORQUE: 70–80 N·m
(7.0–8.0 kg·m, 51–58 ft·lb)

Install the swing arm lower guard (Page 12-13).



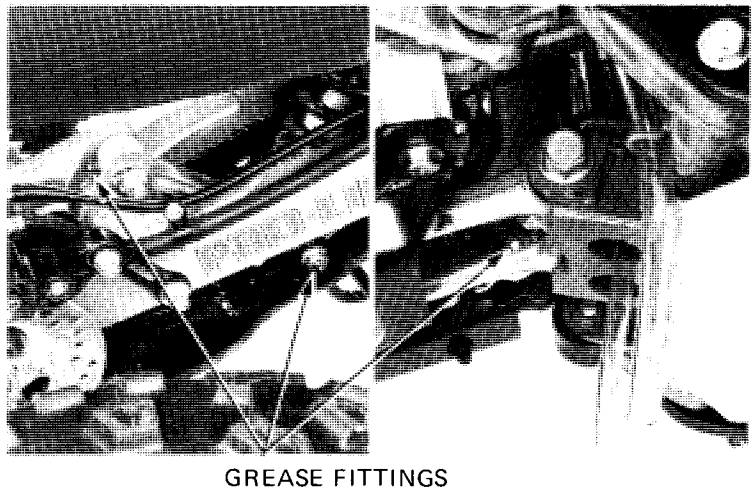
Apply molybdenum disulfide grease to the shock linkage pivots through the grease fittings.

NOTE

Use MoS₂ paste (containing more than 40% of molybdenum) as follows:

- Molykote® G-n Paste manufactured by Dow Corning U.S.A.
- Moly 45, U.S.A.
- Rocol paste manufactured by Sumico Lubricant Co. Ltd., Japan.
- Bel-Ray Moly-Lube MC-8, U.S.A.

Any other manufacturer's paste grease equivalent to the above may also be used.

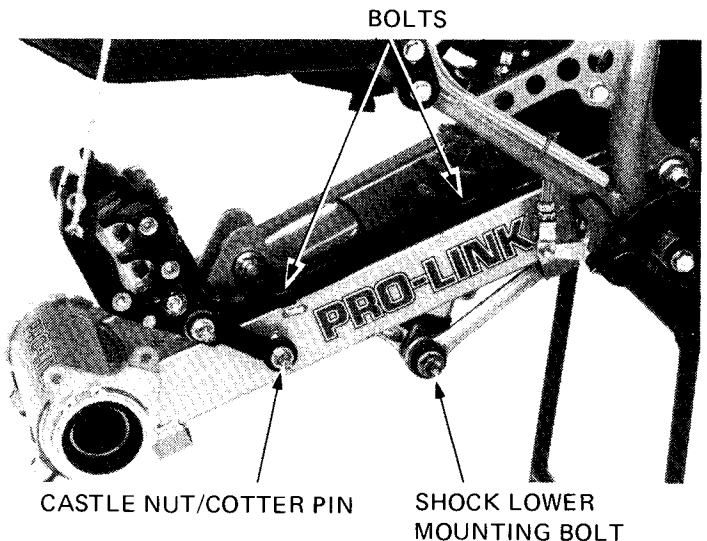


SWING ARM

REMOVAL '85:

Remove the following:

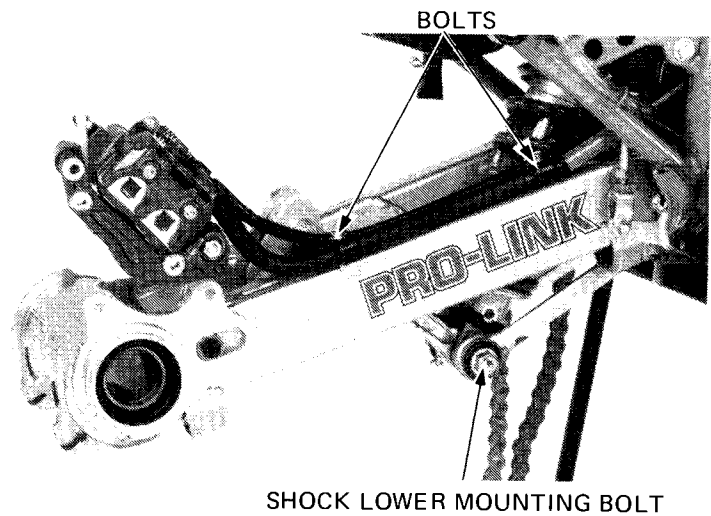
- rear wheels and axle (Page 11-3).
- two bolts attaching the brake hose clamps to the swing arm.
- brake caliper from the swing arm by removing the cotter pin and castle nut.
- shock lower mounting bolt.



AFTER '85:

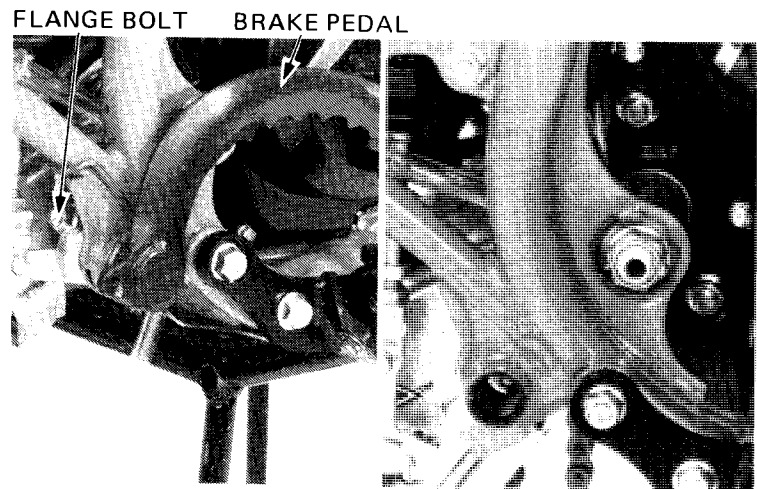
Remove the following:

- rear wheels and axle (Page 11-3).
- two bolts attaching the brake hose clamps to the swing arm.



'85 AND AFTER '85:

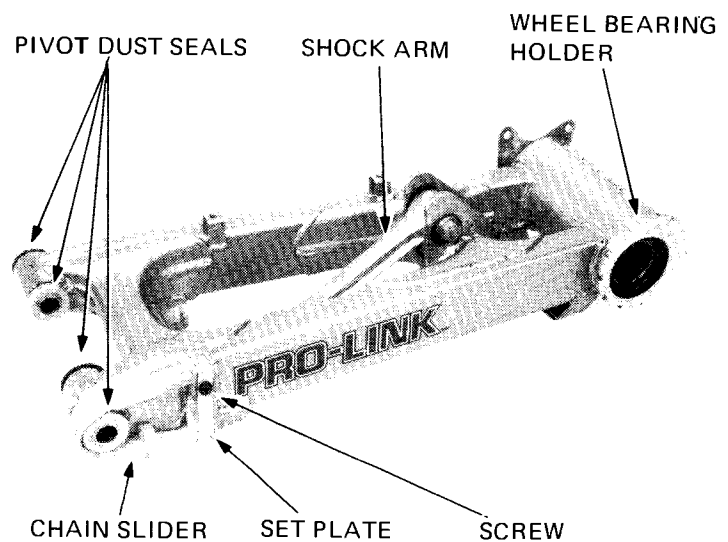
Remove the flange bolt and brake pedal.



Remove the shock arm pivot bolt and shock arm from the swing arm.

Remove the screw attaching the chain slider set plate and remove the set plate and slider.

Remove the wheel bearing holder (Page 11-9), swing arm pivot dust seals, and pivot collars.

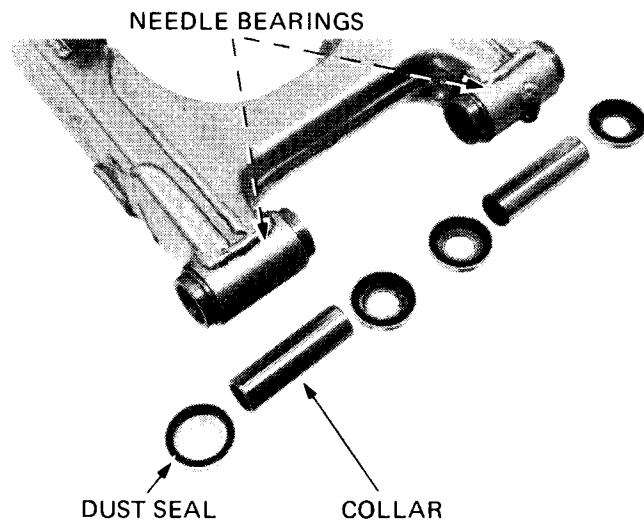


REAR SUSPENSION

INSPECTION

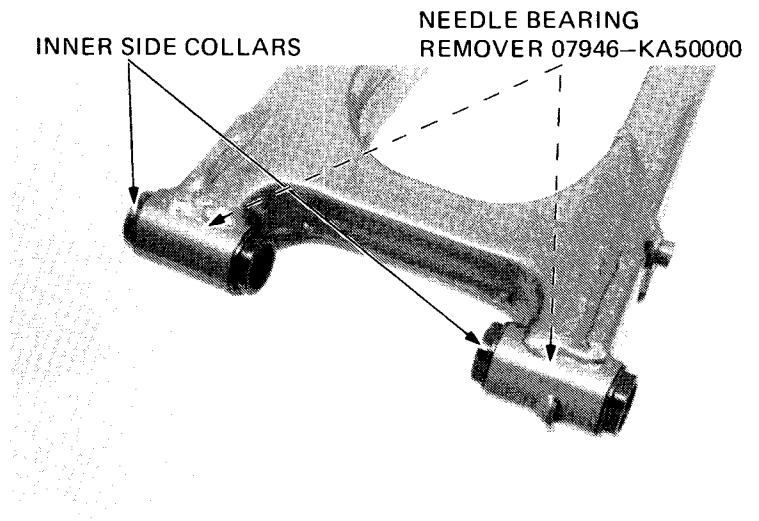
Check the swing arm for damage and replace if necessary.

Check the swing arm pivot needle bearings, collars, and dust seals for wear or damage.

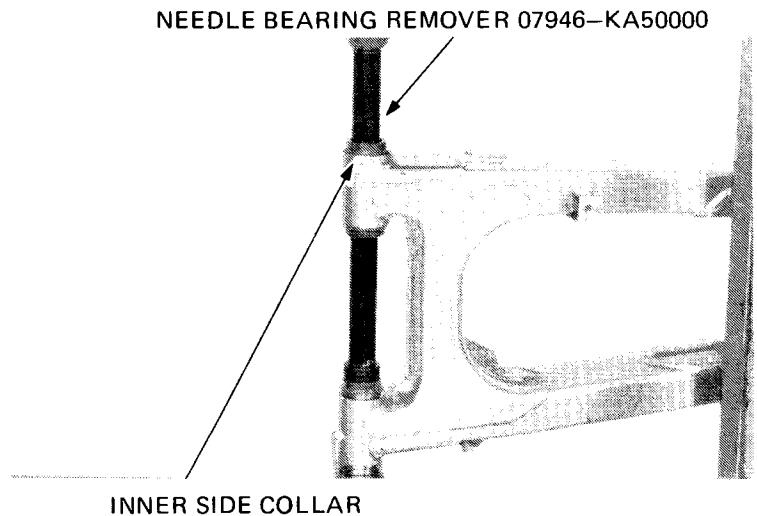


PIVOT BEARING REPLACEMENT

Remove the inner pivot side collars with a drift. Drive out the pivot needle bearings and outer pivot side collars.

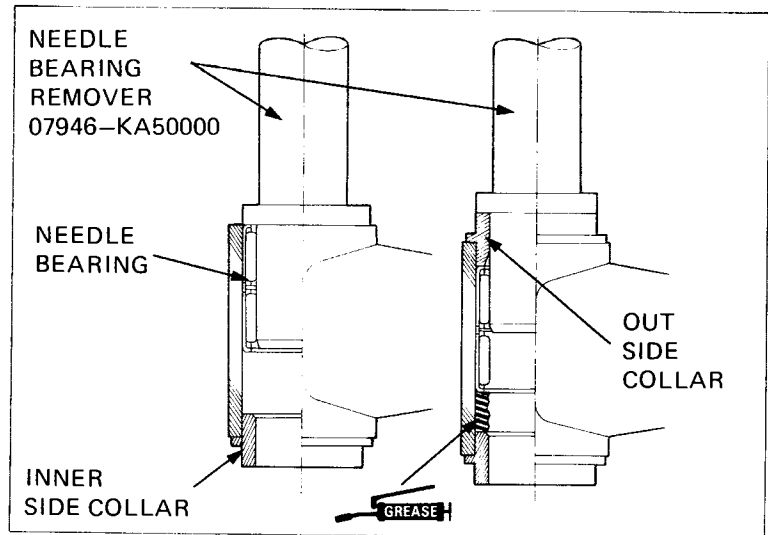


Drive in the inner pivot side collars.



Install a new needle bearing into the swing arm pivot as follows:

- Place the bearing into the pivot with its marking facing to the out side.
- Press the bearing into the pivot using the special tool, just past the edge of pivot.
- Place the out side collar into the swing arm and press the collar and needle bearing into the pivot.
- Pack grease into the cavity of the pivot as shown.

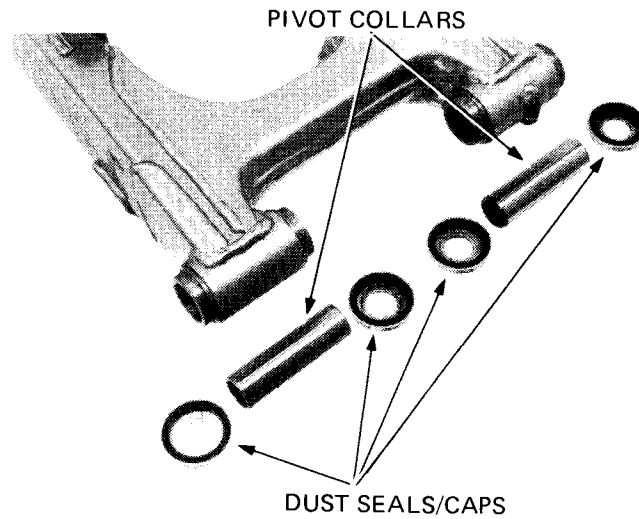
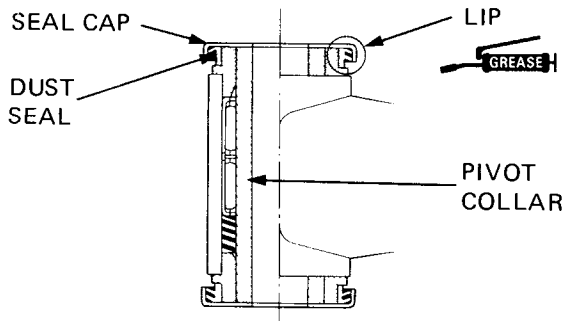


INSTALLATION

Apply grease to the pivot collars and lips of the dust seals.

Install the pivot collars and dust seals onto the swing arm pivot as shown.

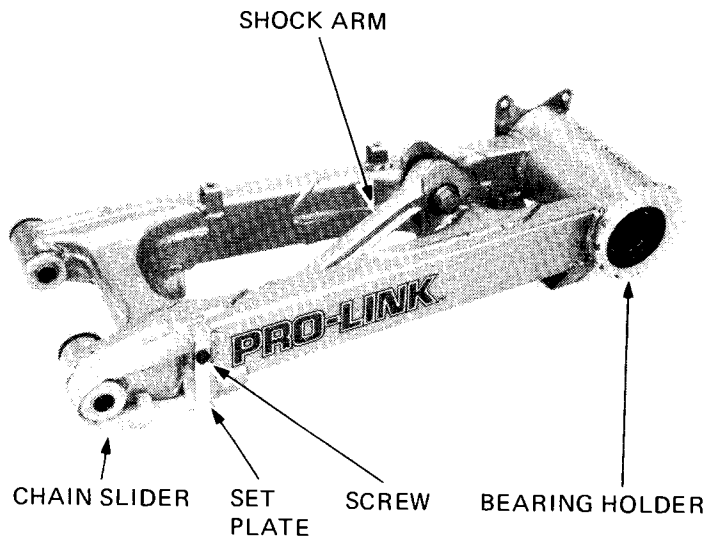
Install the dust seal caps.



Install the wheel bearing holder (Page 11-11).

Install the shock arm to the swing arm.

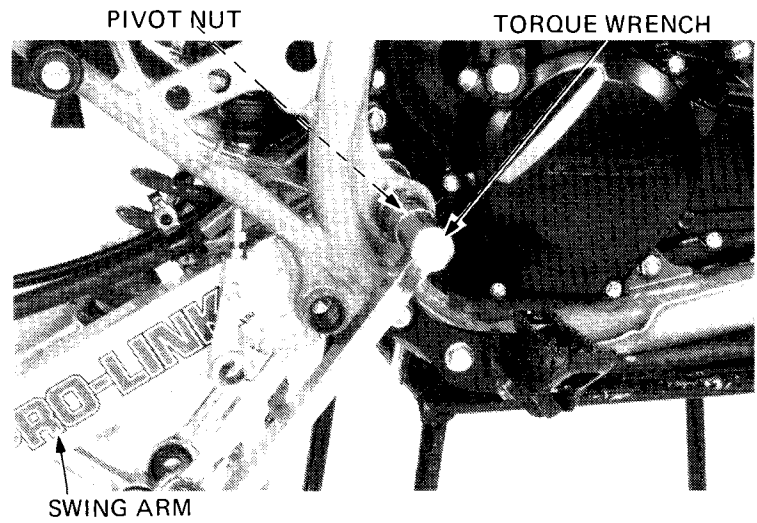
Install the drive chain slider onto the swing arm and secure it with the set plate and screw.



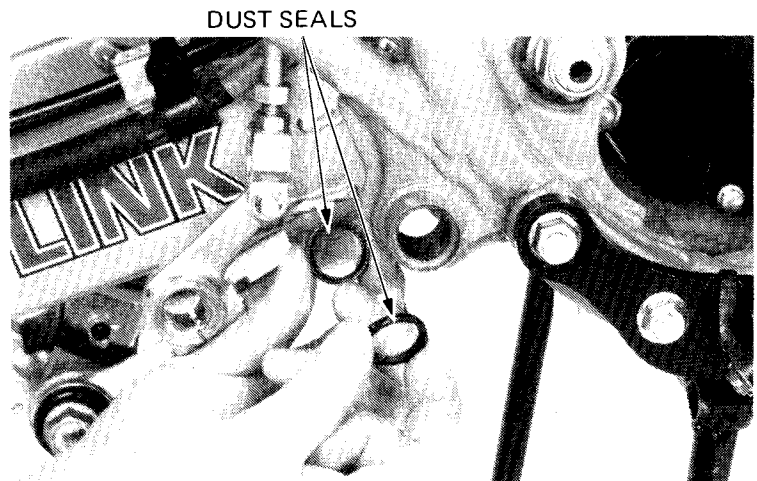
REAR SUSPENSION

Place the swing arm into the frame and install the pivot bolt and nut.
Tighten the pivot nut.

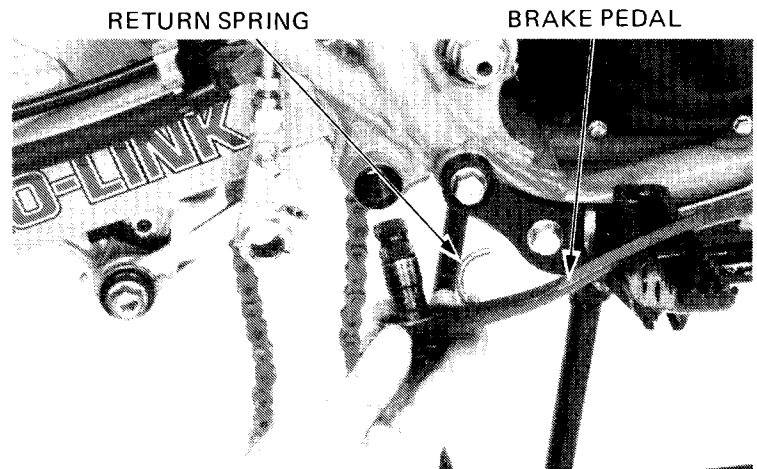
TORQUE: 70–110 N·m
(7.0–11.0 kg·m, 51–80 ft·lb)



Install the dust seals.



Install the return spring onto the brake pedal spindle and install the brake pedal by hooking the return spring on the frame body.
Secure the brake pedal by tightening the flange bolt (Page 12-15).

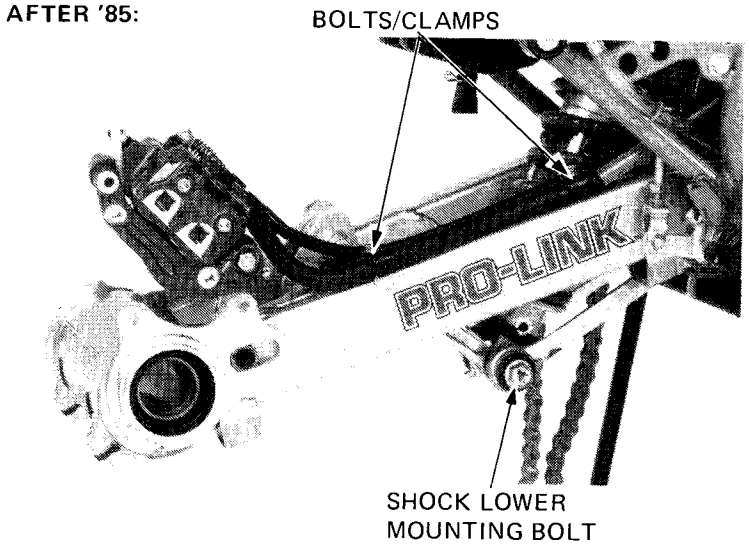
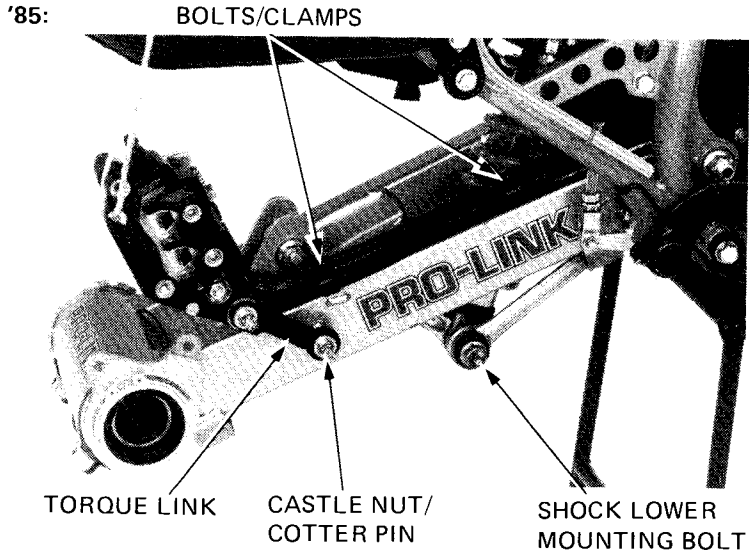


'85:

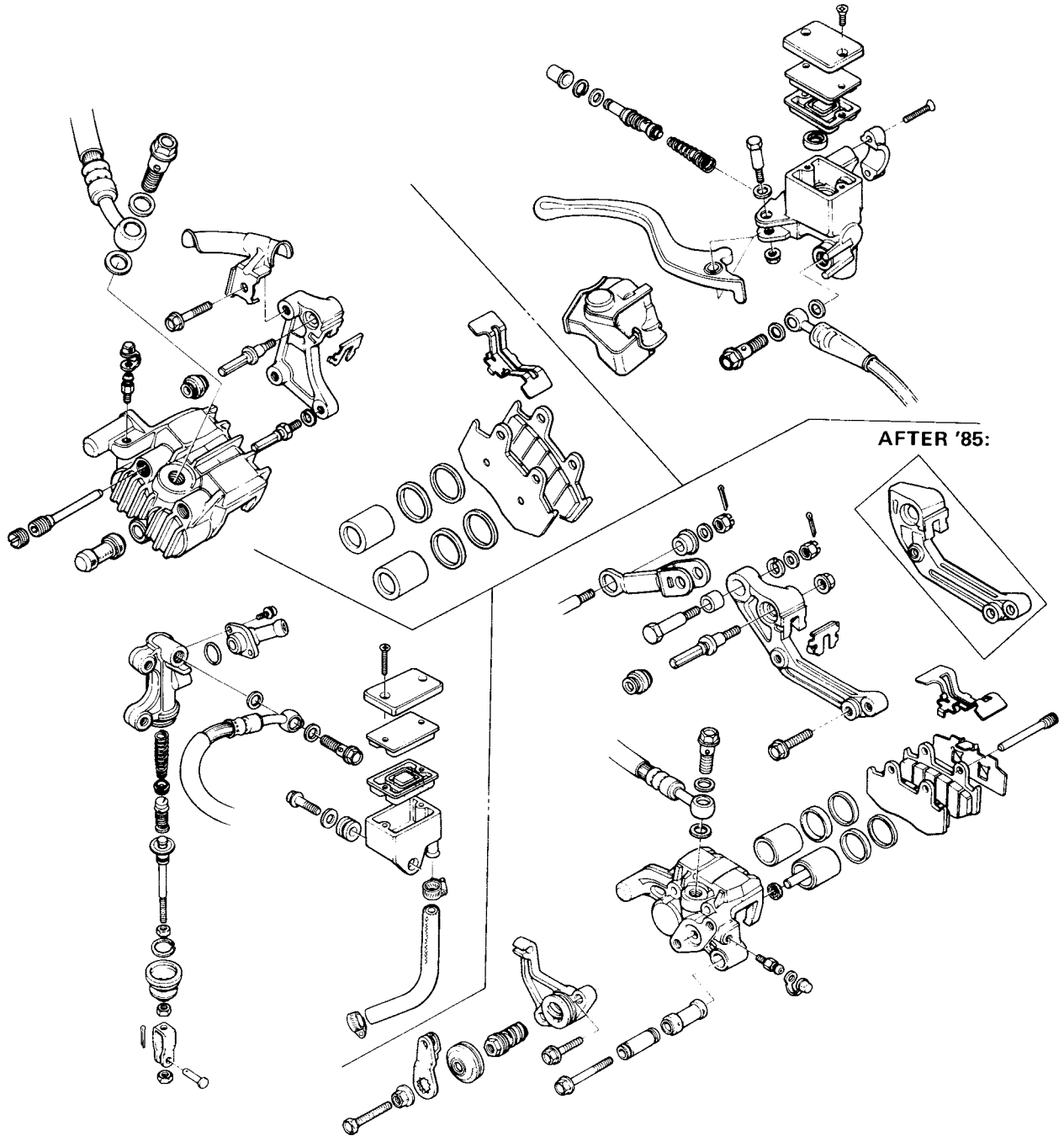
Install the brake caliper torque link onto the swing arm and tighten the castle nut.
Install a new cotter pin.

'85 AND AFTER '85:

Secure the brake hose and cable to the swing arm with the two bolts and clamps.
Connect the shock link and arm to the shock lower mount (Page 12-14).
Install the rear axle (Page 11-7) and wheels (Page 11-3).



HYDRAULIC DISC BRAKES



13. HYDRAULIC DISC BRAKES

SERVICE INFORMATION	13-1
TROUBLESHOOTING	13-2
BRAKE FLUID REPLACEMENT/BLEEDING	13-3
BRAKE PAD REPLACEMENT	13-6
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REAR CALIPER	13-15
FRONT MASTER CYLINDER	13-20
REAR MASTER CYLINDER	13-21
REAR BRAKE PEDAL	13-23

SERVICE INFORMATION

GENERAL

- The front and rear brakes can be removed without disconnecting the hydraulic system.
- Once the hydraulic systems have been opened, or if the brakes feel spongy, the system must be bled.
- Do not allow foreign material to enter the system when filling the reservoir.
- Brake fluid will damage painted, plastic, and rubber parts. Whenever handling brake fluid, protect the painted, plastic, and rubber parts by covering them with a rag. If fluid does get on these parts, wipe it off with a clean cloth.
- Always check brake operation before riding the ATC.

SPECIFICATIONS

ITEM		STANDARD mm (in)	SERVICE LIMIT mm (in)
Front disc	Thickness	3.8–4.2 (0.15–0.17)	3.0 (0.12)
	Runout	0–0.15 (0–0.006)	0.3 (0.012)
Front master cylinder	Cylinder I.D.	12.700–12.743 (0.5000–0.5017)	12.755 (0.5022)
	Piston O.D.	12.657–12.684 (0.4983–0.4994)	12.645 (0.4978)
Front caliper	Cylinder I.D.	25.40–25.45 (1.000–1.002)	25.46 (1.002)
	Piston O.D.	25.30–25.35 (0.996–0.998)	25.30 (0.996)
Rear master cylinder	Cylinder I.D.	14.000–14.043 (0.5512–0.5529)	14.055 (0.5533)
	Piston O.D.	13.957–13.984 (0.5495–0.5506)	13.945 (0.5490)
Rear caliper	Cylinder I.D.	25.40–25.45 (1.000–1.002)	25.46 (1.002)
	Piston O.D.	25.318–25.368 (0.9968–0.9987)	25.30 (0.996)
Rear disc	Thickness	3.8–4.2 (0.15–0.17)	3.0 (0.12)
	Runout	0–1.5 (0–0.006)	0.3 (0.012)

HYDRAULIC DISC BRAKES

TORQUE VALUES

Air bleed valve	4–7 N·m (0.4–0.7 kg-m, 2.9–5.1 ft-lb)
Reservoir cover	1–2 N·m (0.1–0.2 kg-m, 0.7–1.4 ft-lb)
Front brake caliper mounting bolt	24–30 N·m (2.4–3.2 kg-m, 17–22 ft-lb)
Pad pin bolt	15–20 N·m (1.5–2.0 kg-m, 10–15 ft-lb)
Pad pin bolt plugs	10–20 N·m (1.0–2.0 kg-m, 7–14 ft-lb)
Rear caliper bracket bolt	28–34 N·m (2.8–3.4 kg-m, 20–25 ft-lb)
Front brake disc nut	25–30 N·m (2.5–3.0 kg-m, 18–22 ft-lb)
Rear brake disc nut	35–40 N·m (3.5–4.0 kg-m, 25–29 ft-lb)
Brake hose oil bolt	25–35 N·m (2.5–3.5 kg-m, 18–25 ft-lb)
Parking brake attaching bolt	20–25 N·m (2.0–2.5 kg-m, 14–18 ft-lb)
Rear brake caliper mounting bolt	20–25 N·m (2.0–2.5 kg-m, 14–18 ft-lb)
Front master cylinder holder screw	10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)
Rear master cylinder mounting bolt	24–30 N·m (2.4–3.0 kg-m, 17–22 ft-lb)

TOOL

Special

Snap ring pliers 07914–3230001

TROUBLESHOOTING

Brake lever/pedal soft or spongy

- Air bubbles in hydraulic system
- Low fluid level
- Hydraulic system leaking

Brake lever/pedal too hard

- Sticking piston(s)
- Clogged hydraulic system
- Pads glazed or worn excessively

Brake drag

- Hydraulic system sticking
- Sticking piston(s)

Brakes grab

- Pads contaminated
- Disc or wheel misaligned

Brake chatter or squeal

- Pads contaminated
- Excessive disc runout
- Caliper installed incorrectly
- Disc or wheel misaligned

BRAKE FLUID REPLACEMENT/ BLEEDING

BRAKE FLUID DRAINING

WARNING

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

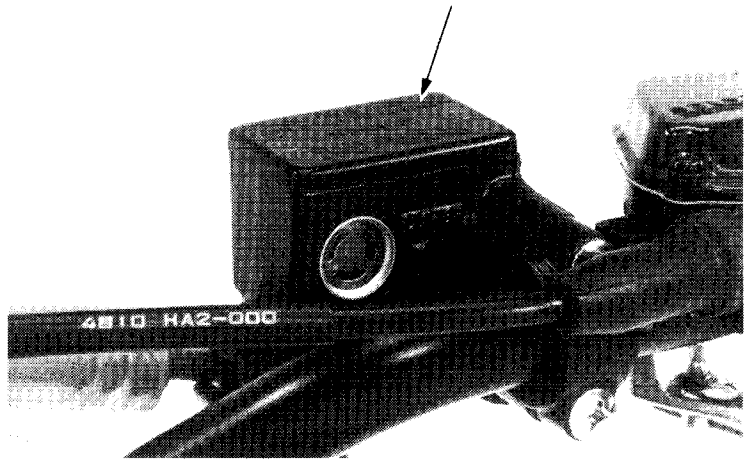
CAUTION

- Do not allow foreign material to enter the system when filling the reservoir.
- Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.

With the fluid reservoir parallel to the ground, remove the reservoir cover and diaphragm.

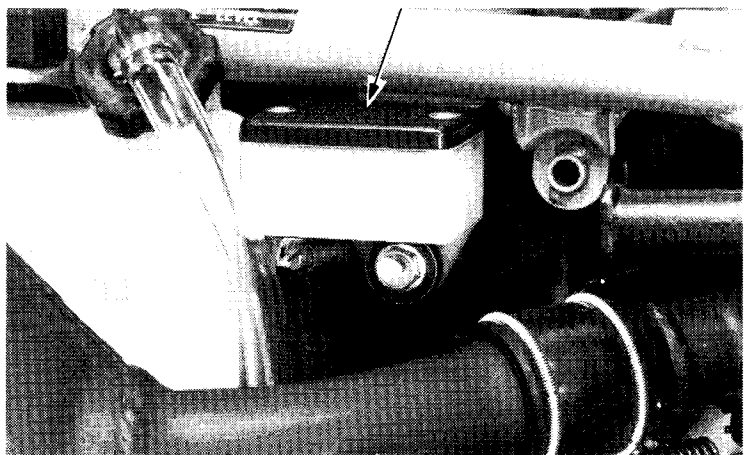
<FRONT>

RESERVOIR COVER



<REAR>

RESERVOIR COVER



Connect a hose to the bleed valve.

Loosen the caliper bleed valve and pump the brake lever (or pedal) until no more fluid flows out of the bleed valve.

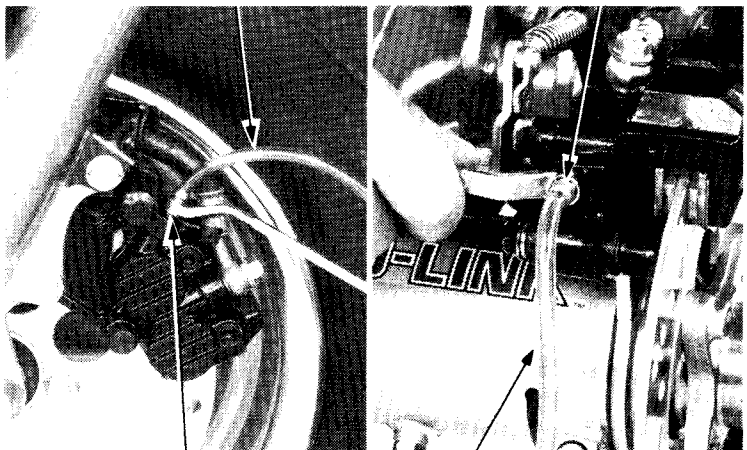
Close the bleed valve.

<FRONT>

BLEED HOSE

<REAR>

BLEED VALVE



BLEED VALVE

BLEED HOSE

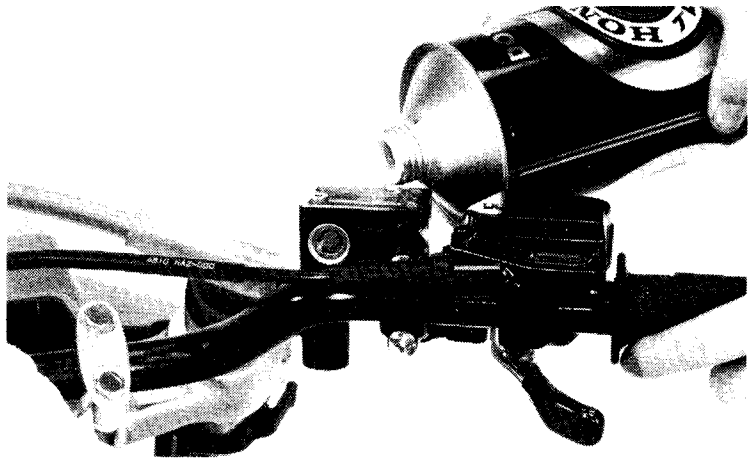
HYDRAULIC DISC BRAKES

BRAKE FLUID FILLING/BLEEDING

Fill the reservoir with DOT-3 or 4 brake fluid from a sealed container.

CAUTION

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

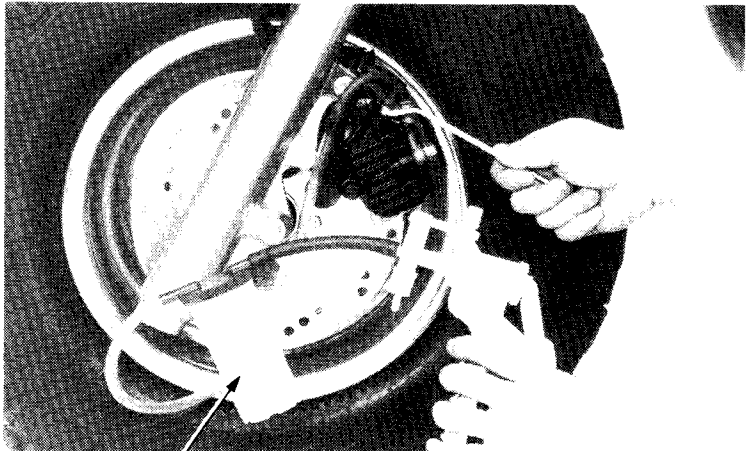


Connect the commercially available brake bleeder to the bleed valve.

Pump the brake bleeder and loosen the bleed valve. Add fluid when the fluid level in the master cylinder reservoir is low.

NOTES

- Check the fluid level often while bleeding the brakes to prevent air from being pumped into the system.
- When using a brake bleeding tool, follow the manufacturer's operating instructions.



MITYVAC BRAKE BLEEDER
OR EQUIVALENT

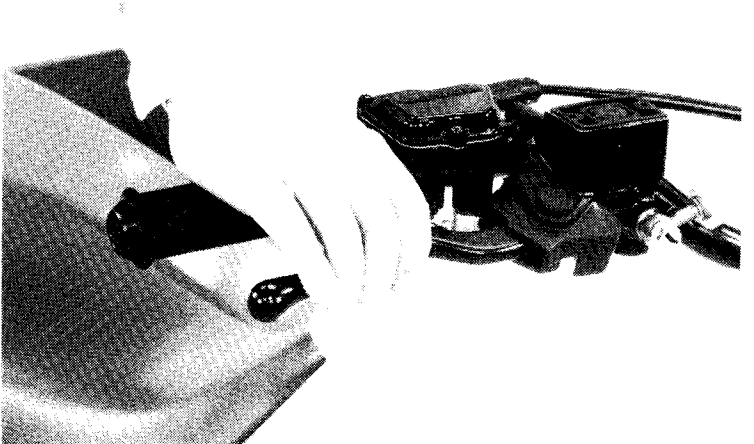
Repeat the above procedures until air bubbles do not appear in the plastic hose.

NOTE

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

Close the bleed valve and operate the brake lever or pedal. If it feels spongy, bleed the system by performing the procedure.

If a brake bleeder is not available use the following procedure:
Pump up the system pressure with the lever (or pedal) until there are no air bubbles in the fluid flowing out of the reservoir small hole and lever resistance is felt.



1. Squeeze the brake lever (or depress the brake pedal), open the bleed valve 1/2 turn and then close the valve.

NOTES

Do not release the brake lever (or pedal) until the bleed valve has been closed.

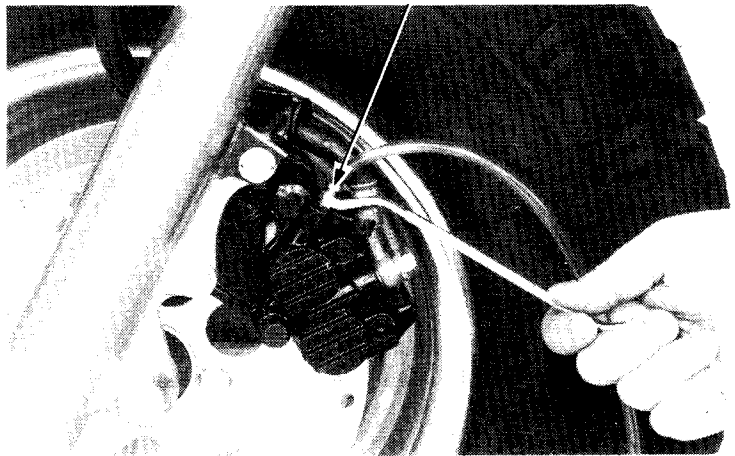
2. Release the brake lever (or pedal) slowly and wait several seconds after it reaches the end of its travel.

Repeat steps 1 and 2 until bubbles cease to appear in the fluid coming out of the bleeder valve. Tighten the bleed valve.

TORQUE: 4–7 N·m
(0.4–0.7 kg·m, 2.9–5.1 ft·lb)

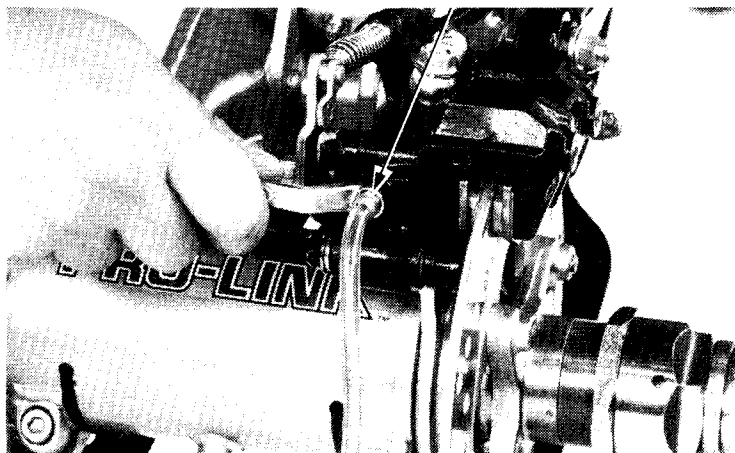
<FRONT>

BLEED VALVE



<REAR>

BLEED VALVE



Fill the fluid reservoir to the upper level mark.

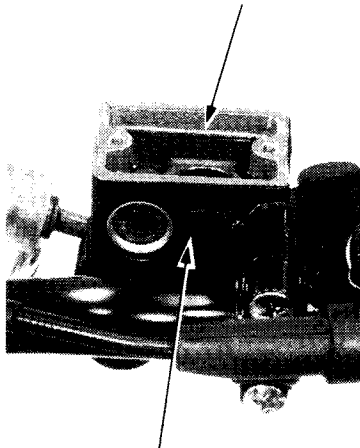
Reinstall the diaphragm and master cylinder cover.

WARNING

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

<FRONT>

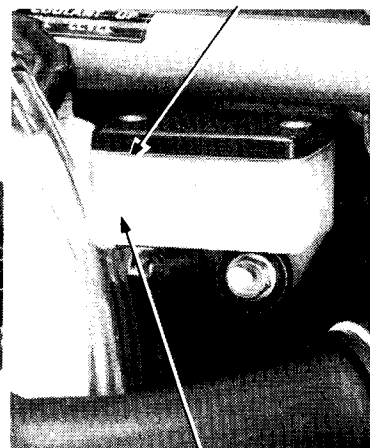
UPPER LEVEL



LOWER LEVEL

<REAR>

UPPER LEVEL



LOWER LEVEL

HYDRAULIC DISC BRAKES

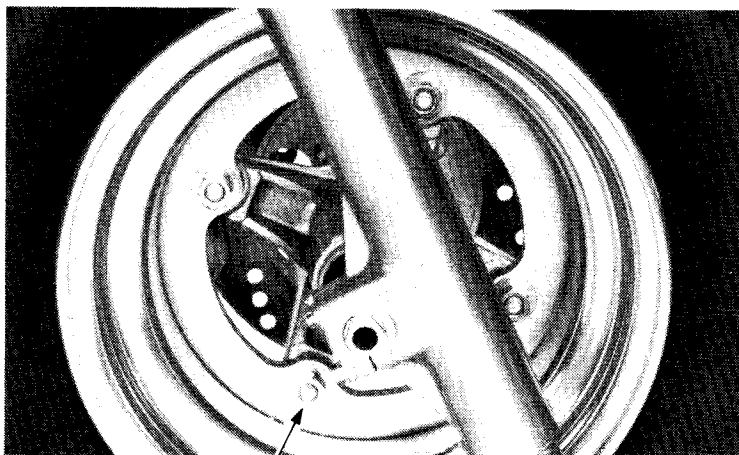
BRAKE PAD REPLACEMENT

NOTES

- Always replace the brake pads in pairs to assure even disc pressure.
- Always use new pads with marks "N18FF" (FRONT) and "TT2202FF" (REAR) on the pads.

FRONT BRAKE

Raise the front wheel off the ground by placing a block or safety stand under the skid plate.
Remove the wheel nuts.

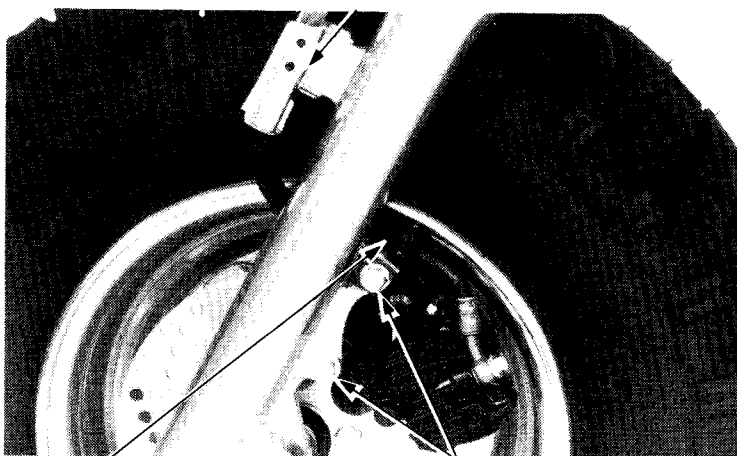


WHEEL NUT

Remove the front brake hose clamp from the front fork.

Remove the pad pin bolt plugs from the caliper.
Loosen the pad pin bolts.
Remove the front caliper mounting bolts and guide plate.

HOSE CLAMP

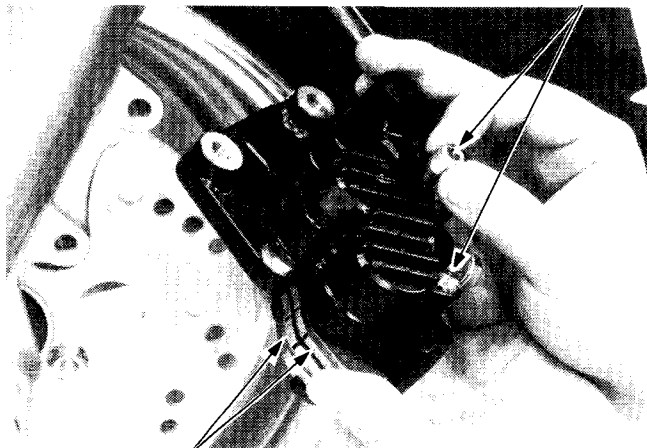


GUIDE PLATE

BOLTS

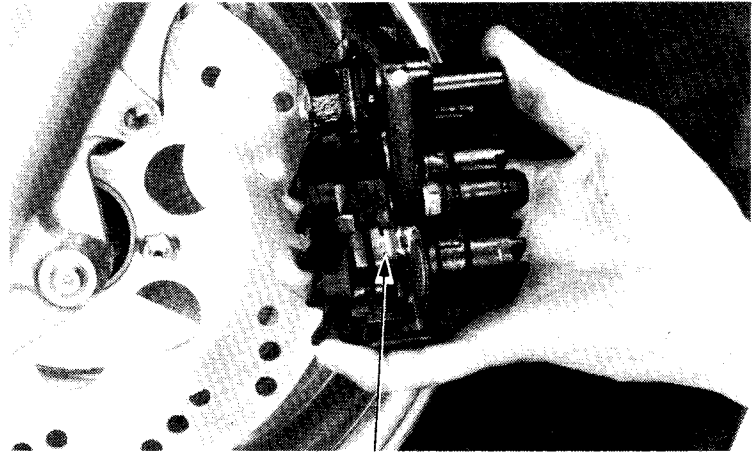
Remove the pad pin bolts and brake pad.

PAD PIN BOLTS



PADS

Make sure that the pad spring and retainer clip are installed in the position shown.

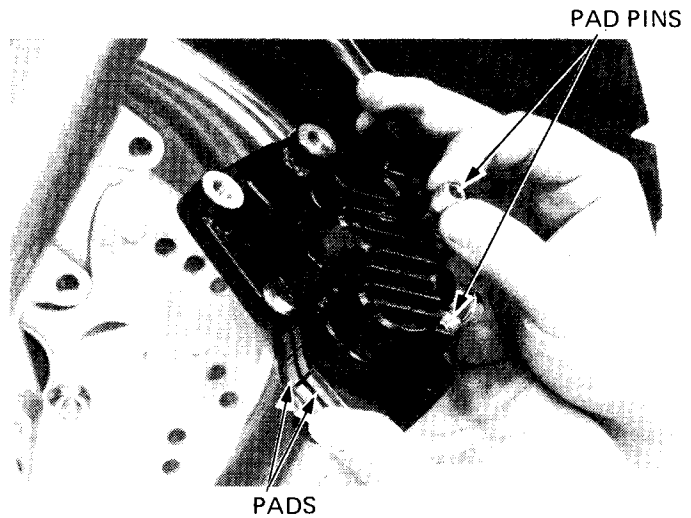


PAD SPRING

Install new brake pads and the pad pins.

NOTE

Always use new pads with mark "N18FF" on the pad.



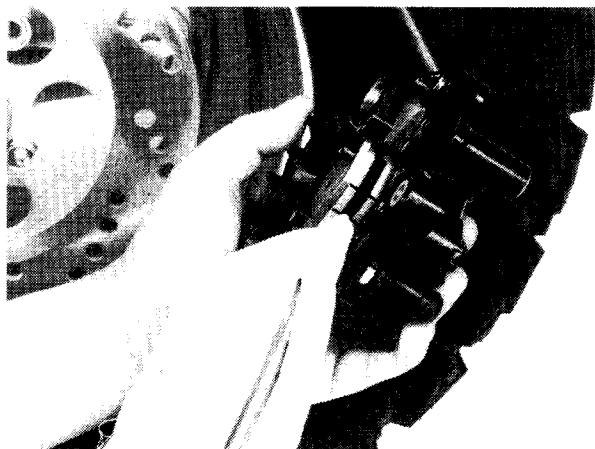
PAD PINS

PADS

Push the caliper pistons in all the way.

CAUTION

- *Be careful that the master cylinder does not overflow when the caliper pistons are compressed.*
- *Brake fluid can cause damage to painted, plastic, or rubber surfaces.*



HYDRAULIC DISC BRAKES

Install the caliper to the front fork so the disc is positioned between the pads, being careful not to damage the pads.

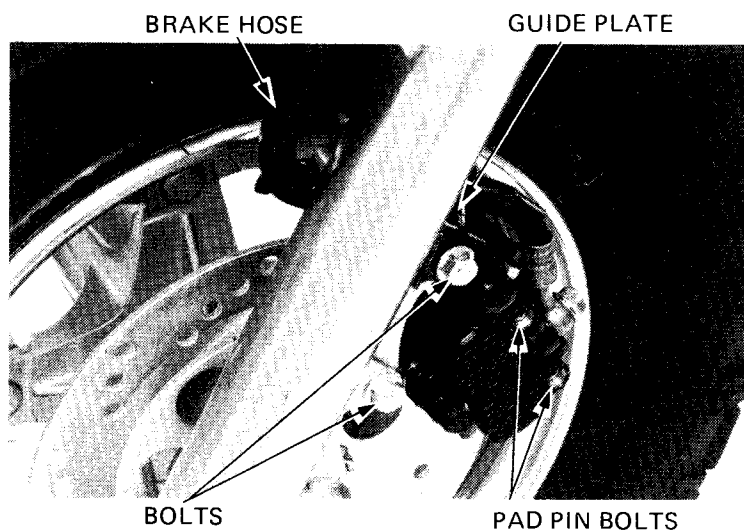
Make sure that the guide plate and brake hose are installed in the position shown.

Tighten the caliper mounting bolts.

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

Tighten the pad pin bolts.

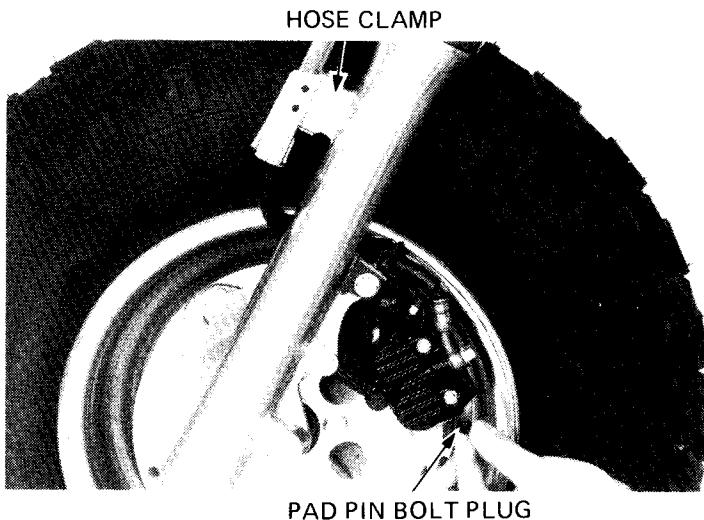
TORQUE: 15–20 N·m
(1.5–2.0 kg·m, 10–14 ft·lb)



Install the pad pin bolt plugs and tighten them.

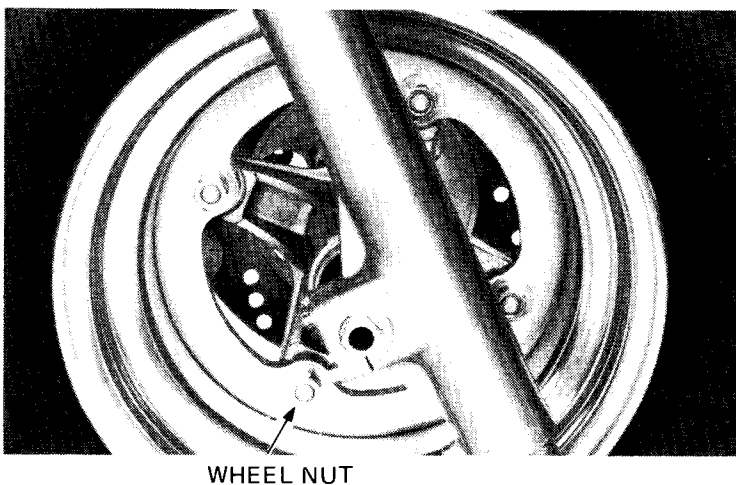
TORQUE: 10–20 N·m
(1.0–2.0 kg·m, 7–14 ft·lb)

Install the front brake hose clamp to the front fork.



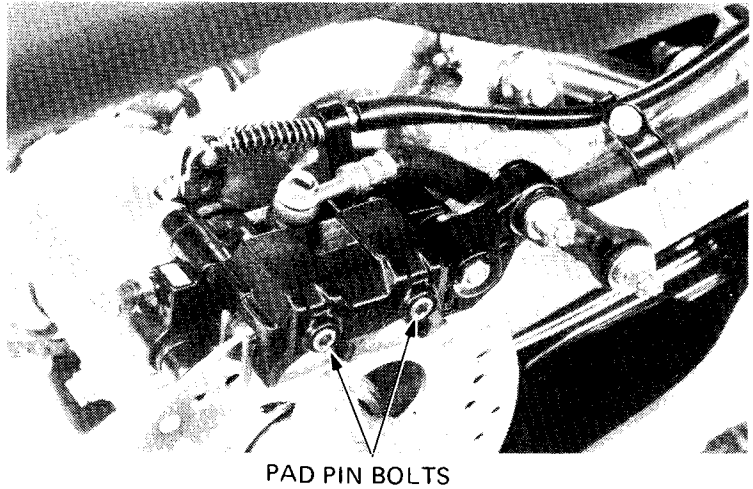
Install the front wheel nuts.

TORQUE: 60–70 N·m
(6.0–7.0 kg·m, 43–51 ft·lb)

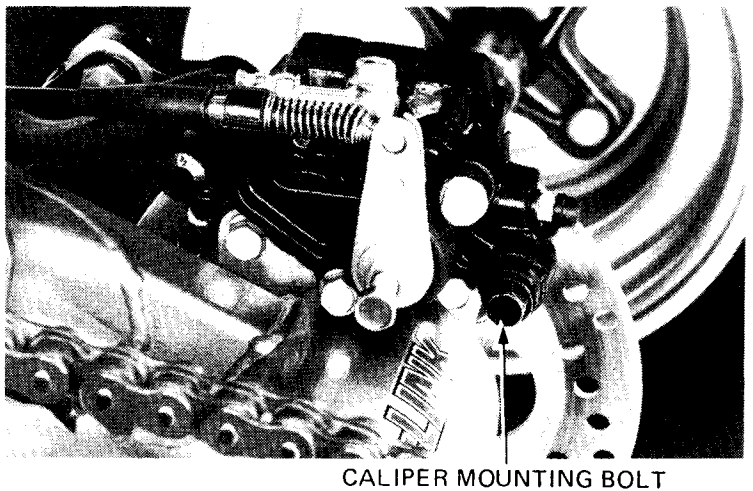


REAR BRAKE

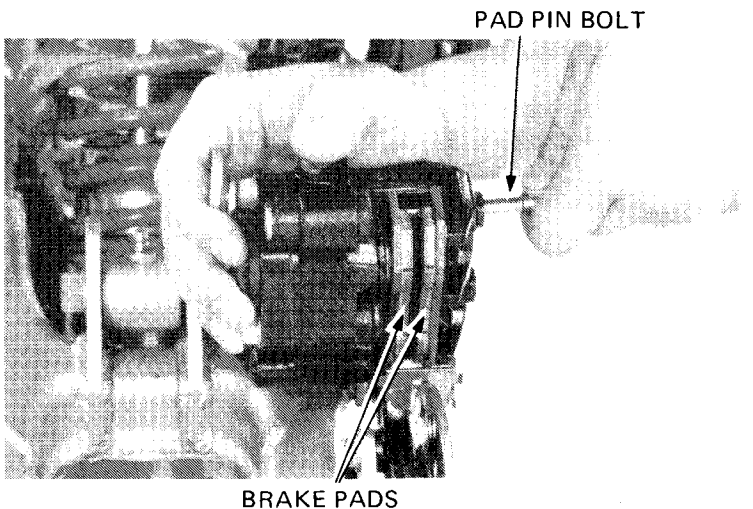
Remove the pad pin bolt plugs, and then loosen the pad pin bolts.



Remove the rear brake caliper mounting bolt.

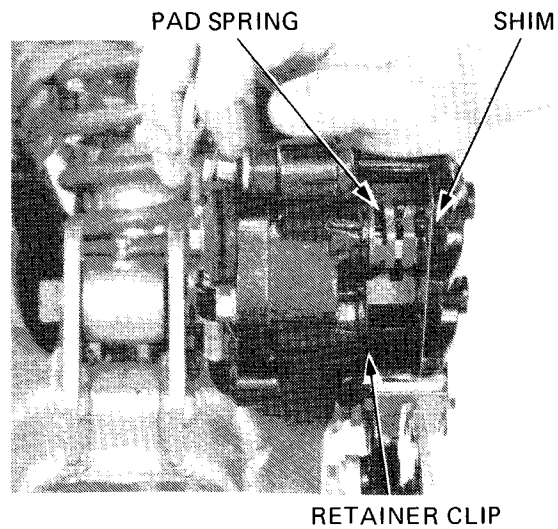


Raise the caliper out of the way.
Remove the pad pin bolts and brake pads.



HYDRAULIC DISC BRAKES

Make sure that the pad spring, retainer clip and shim are installed in position.



Install new pads in the caliper. Align the pad pin bolt holes by depressing the pads against the caliper, and install the pad pin bolts.

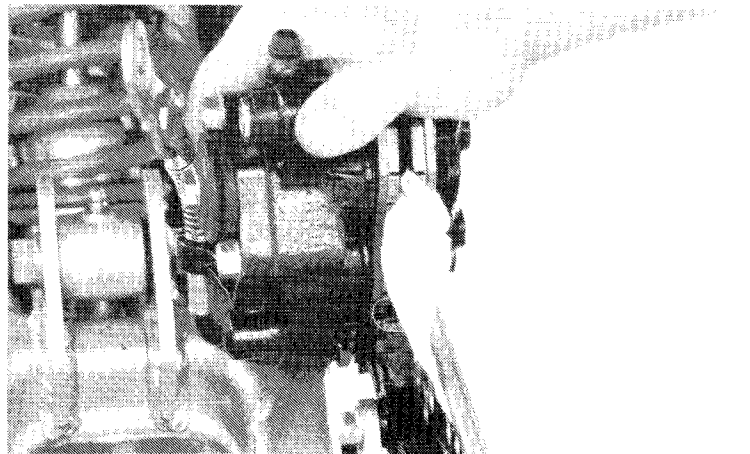
Push the caliper pistons in all the way, being careful not to damage the pads.

NOTE

Always use new pads with mark "TT2202FF" on the pad.

CAUTION

- *Be careful that the master cylinder does not overflow when the caliper pistons are compressed.*
- *Brake fluid can cause damage to painted, plastic, or rubber surfaces.*



Install and tighten the caliper mounting bolt.

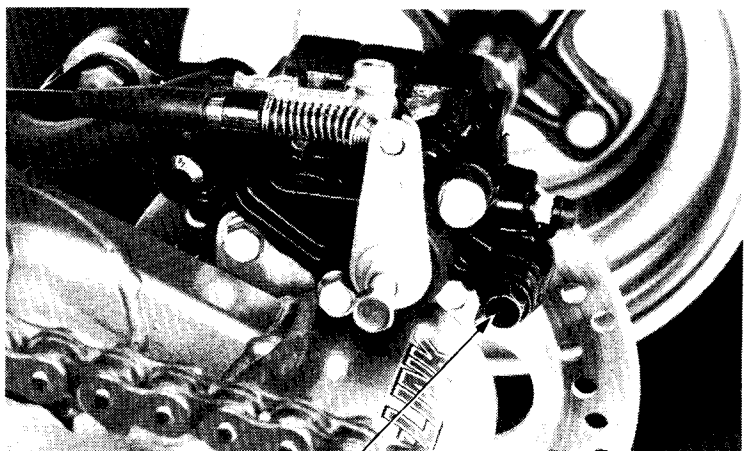
TORQUE: 20–25 N·m
(2.0–2.5 kg·m, 14–18 ft·lb)

Tighten the pad pin bolts.

TORQUE: 15–20 N·m
(1.5–2.0 kg·m, 10–14 ft·lb)

Tighten the pad pin bolt plugs.

TORQUE: 10–20 N·m
(1.0–2.0 kg·m, 7–14 ft·lb)



CALIPER MOUNTING BOLT

BRAKE DISC

INSPECTION

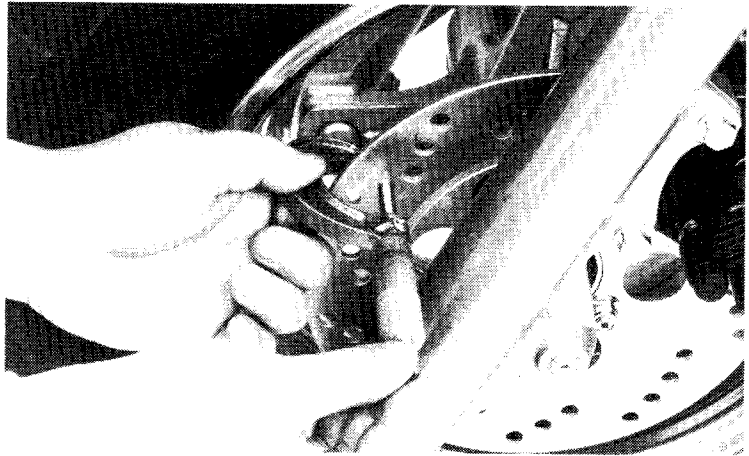
- **THICKNESS**

Measure the brake disc thickness with a micrometer.

SERVICE LIMIT:

FRONT: 3.0 mm (0.12 in)

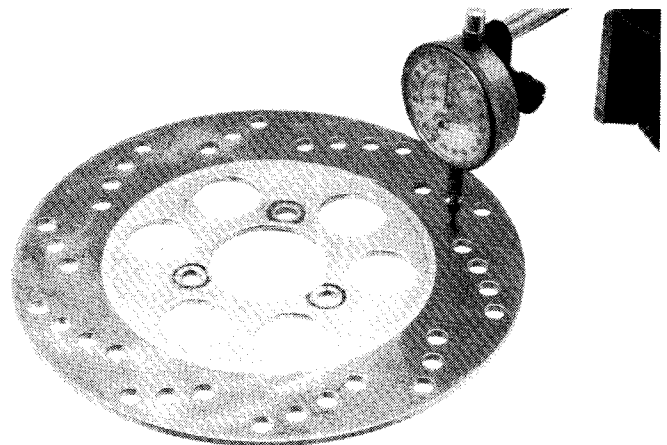
REAR: 3.0 mm (0.12 in)



- **FRONT DISC WARPAGE**

Measure the front brake disc for warpage.

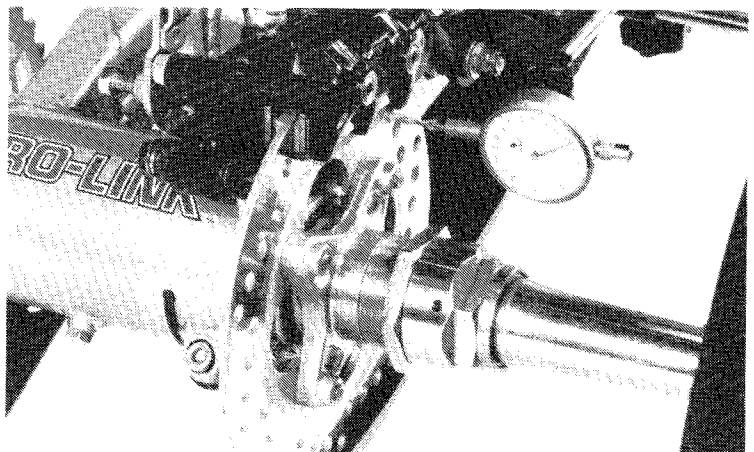
SERVICE LIMIT: 0.3 mm (0.012 in)



- **REAR BRAKE DISC RUNOUT**

Measure the rear brake disc runout with a dial indicator.

SERVICE LIMIT: 0.3 mm (0.012 in)



HYDRAULIC DISC BRAKES

REMOVAL/INSTALLATION

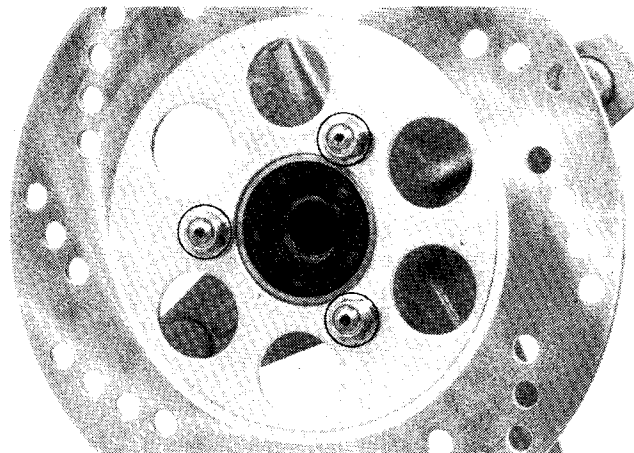
• FRONT BRAKE DISC

Remove the front wheel (Page 10-6).
Remove the front brake disc from the front wheel hub.

Install the front brake disc and tighten the mount nuts.

TORQUE: 25–30 N·m
(2.5–3.0 kg·m, 18–22 ft·lb)

Install the front wheel (Page 10-13).

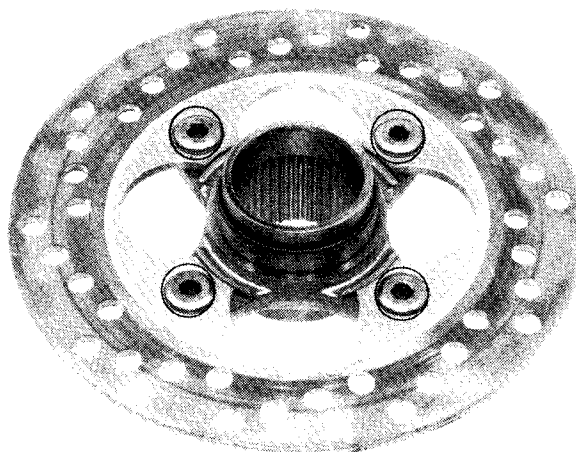


• REAR BRAKE DISC

Remove the rear axle (Page 11-3).
Remove the rear brake disc from the disc hub.
Install the rear brake disc and tighten the mounting bolts.

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

Install the rear axle (Page 11-7).



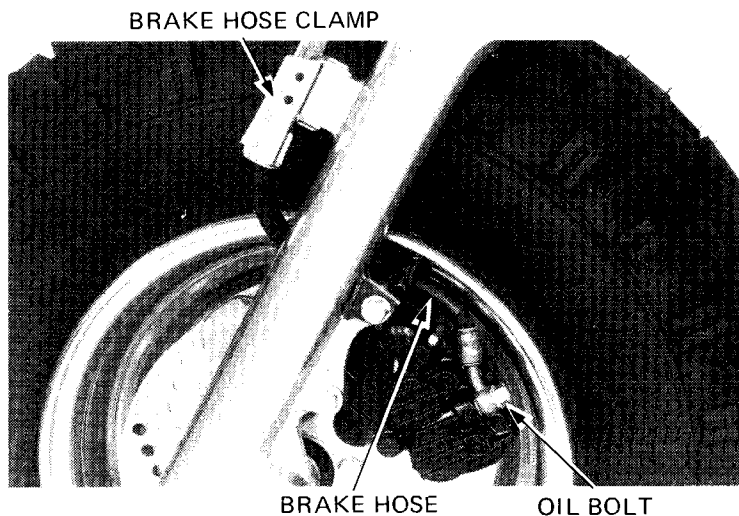
FRONT CALIPER

REMOVAL

Drain the brake fluid from the front hydraulic system.
Remove the front brake hose clamp from the front fork leg.
Remove the oil bolt and front brake hose from the caliper (Page 13-6).

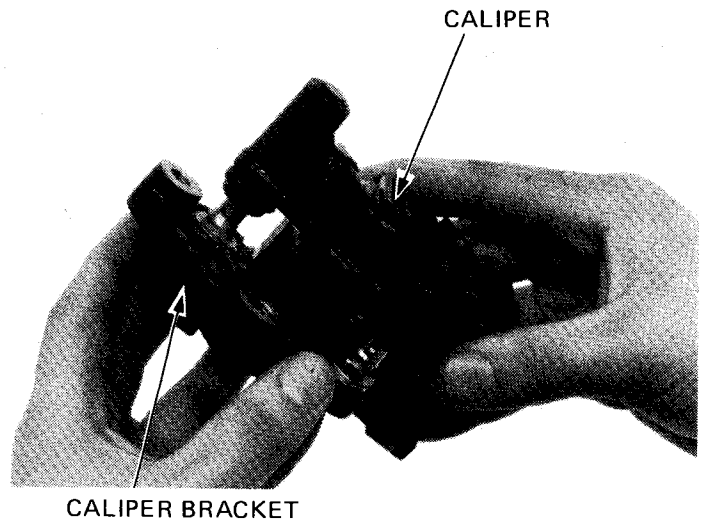
CAUTION

Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.

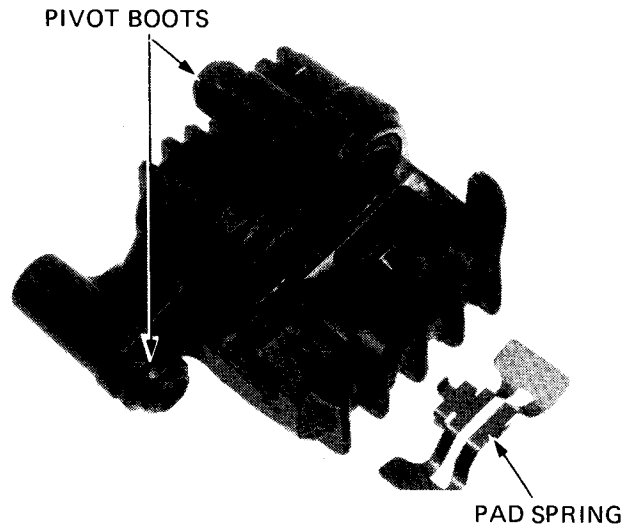


DISASSEMBLY

Remove the caliper bracket from the caliper.



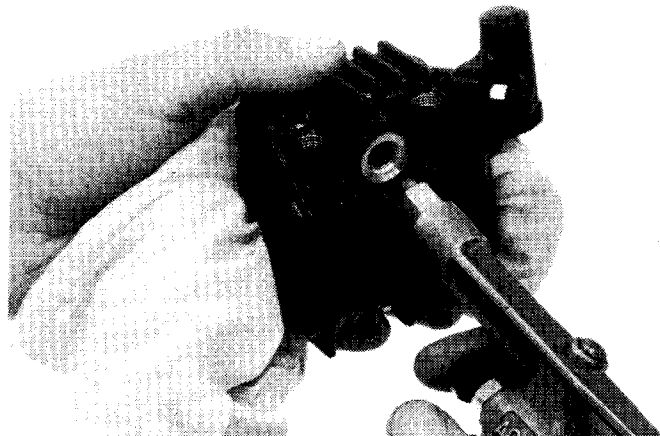
Remove the pad spring.
Remove the caliper pivot boots.



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

WARNING

- *Do not use high pressure air or bring the nozzle too close to the inlet.*
- *Place a shop towel over the piston to prevent the piston from becoming a projectile.*

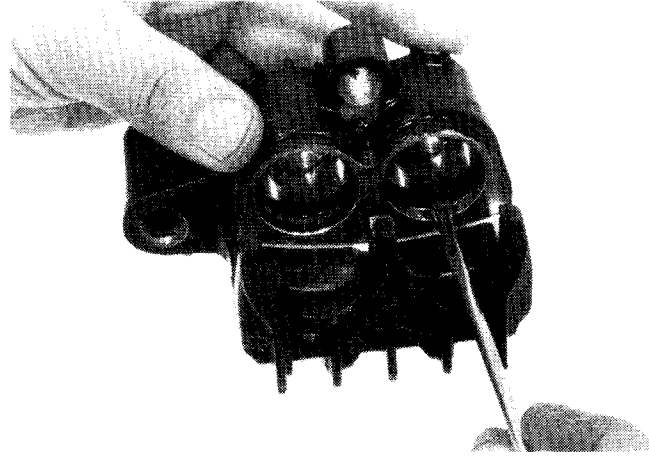


HYDRAULIC DISC BRAKES

Push the dust and piston seals in and lift them out.
Clean the seal grooves with clean brake fluid.

CAUTION

Be careful not to damage the piston sliding surfaces.



INSPECTION

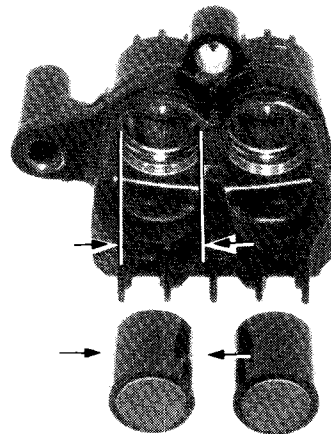
Check the caliper cylinders and pistons for scratches, scoring or other damage.

Measure the cylinder inside diameter and piston outside diameter.

SERVICE LIMITS:

CYLINDER I.D.: 25.46 mm (1.002 in)

PISTON O.D.: 25.30 mm (0.996 in)



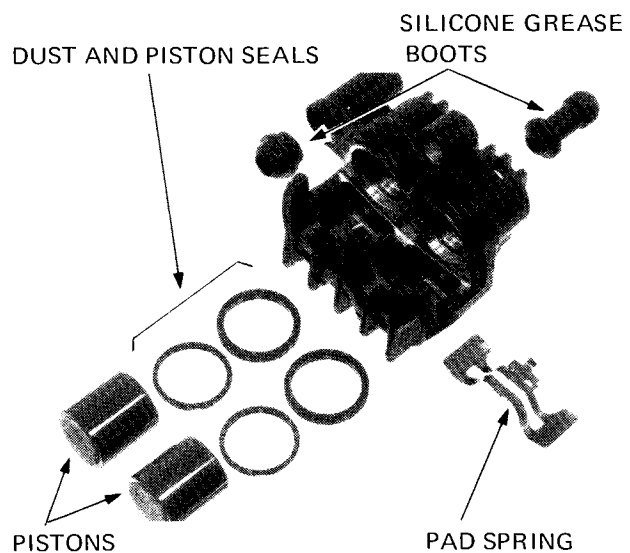
ASSEMBLY

Coat new dust and piston seals with clean brake fluid and install them in the seal grooves in the caliper.

Lubricate the caliper cylinders and pistons with clean brake fluid and install the pistons into the caliper cylinders with the piston pad end facing the pad side.

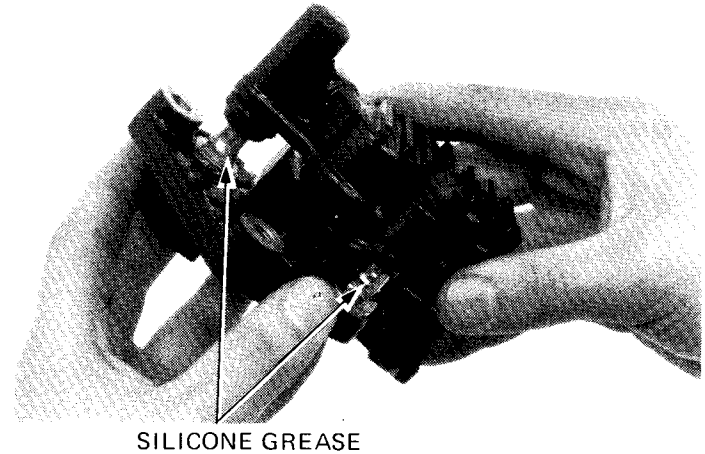
Apply silicone grease to the pivot collar and boots and install the boots making sure that the boots are seated in the caliper grooves properly.

Install the pad spring.



Coat the caliper pins with silicone grease and install the caliper bracket to the caliper.

Install the front brake pads (Page 13-7).

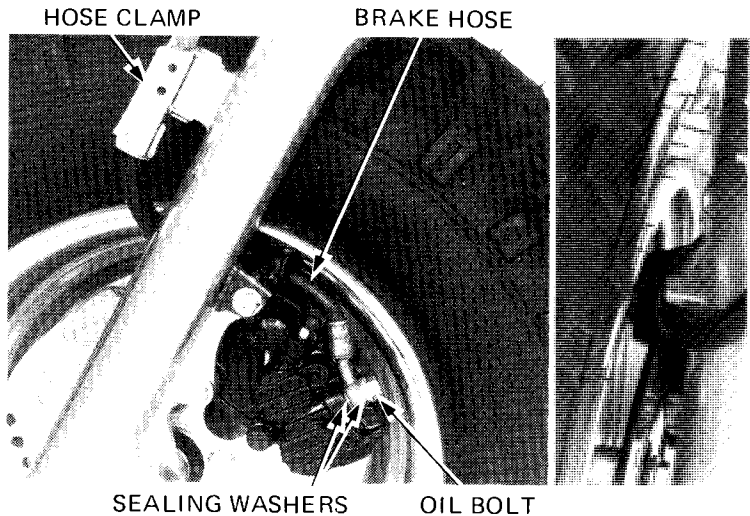


Connect the front brake hose to the caliper with the oil bolt and two new sealing washers, and tighten the oil bolt.

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

Route the front brake hose as shown, and install the front brake hose clamp onto the front fork.

Fill the front brake reservoir and bleed the front brake system (Page 13-4).



REAR CALIPER

REMOVAL

Drain the brake fluid from the rear hydraulic system. Remove the oil bolt and rear brake hose from the rear brake caliper.

CAUTION

Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.

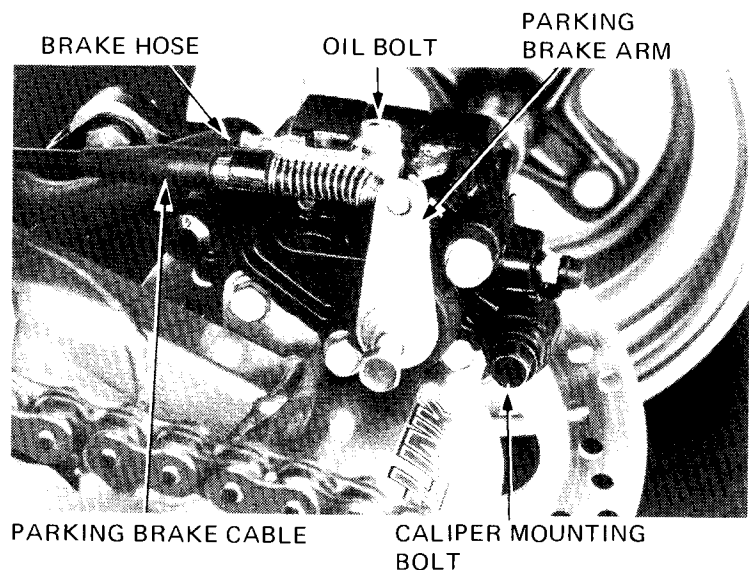
Remove the pad pin bolt plugs, and then loosen the pad pin bolts.

Loosen the parking brake adjusting bolt lock nut, and remove the parking brake adjusting bolt and arm.

Remove the parking brake cable from the parking brake on the caliper.

Remove the rear caliper mount bolt.

Pivot the rear caliper up out of the way and remove the caliper from the caliper pin on the bracket.

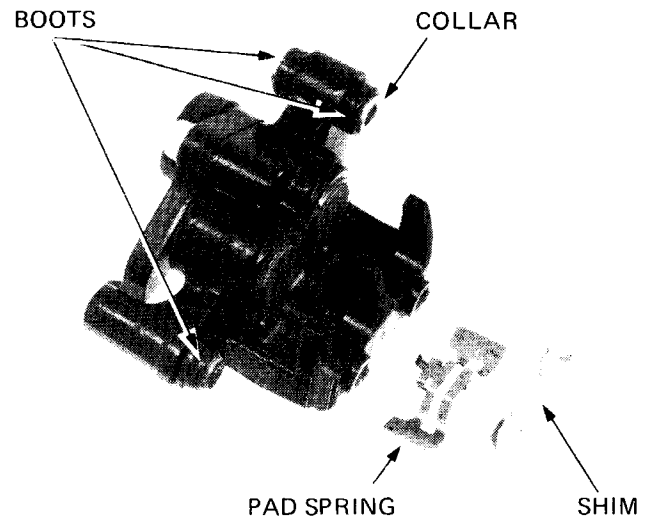


HYDRAULIC DISC BRAKES

DISASSEMBLY

Remove the following:

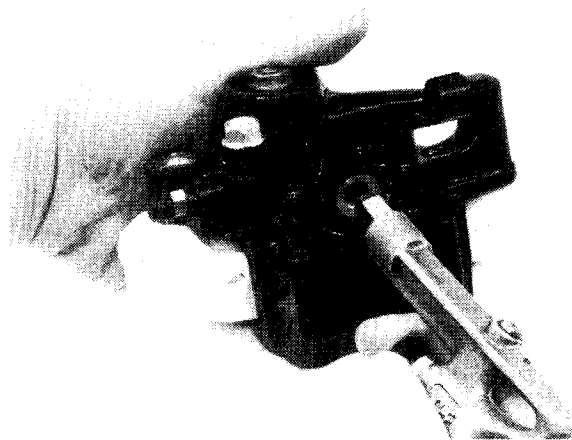
- pad pin bolts and pads from the caliper.
- pad spring and shim.
- caliper pivot collar and boots.



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

WARNING

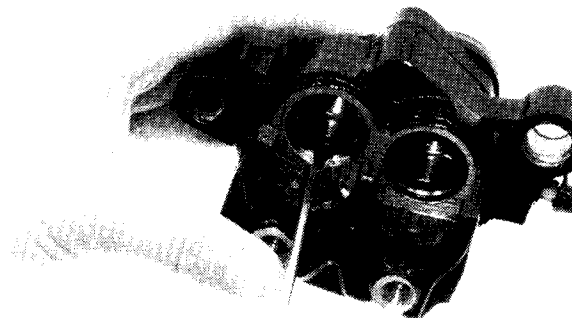
- *Do not use high pressure air or bring the nozzle too close to the inlet.*
- *Place a shop towel over the piston to prevent the pistons from becoming a projectile.*



Push the dust and piston seals in and lift them out. Clean the seal grooves with clean brake fluid.

CAUTION

Be careful not to damage the piston sliding surfaces.



INSPECTION

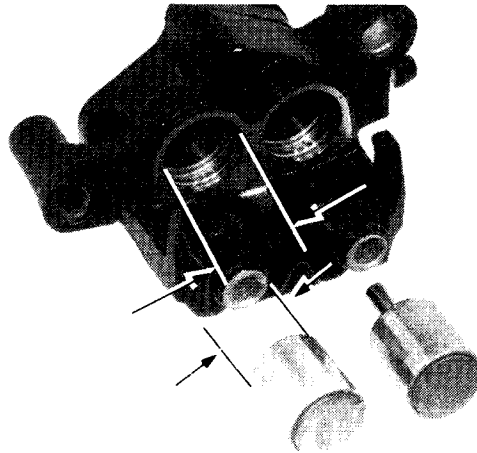
Check the caliper cylinders and pistons for scratches, scoring or other damage.

Measure the cylinder inside diameter and piston outside diameter.

SERVICE LIMITS:

CYLINDER I.D.: 25.46 mm (1.002 in)

PISTON O.D.: 25.30 mm (0.996 in)



ASSEMBLY

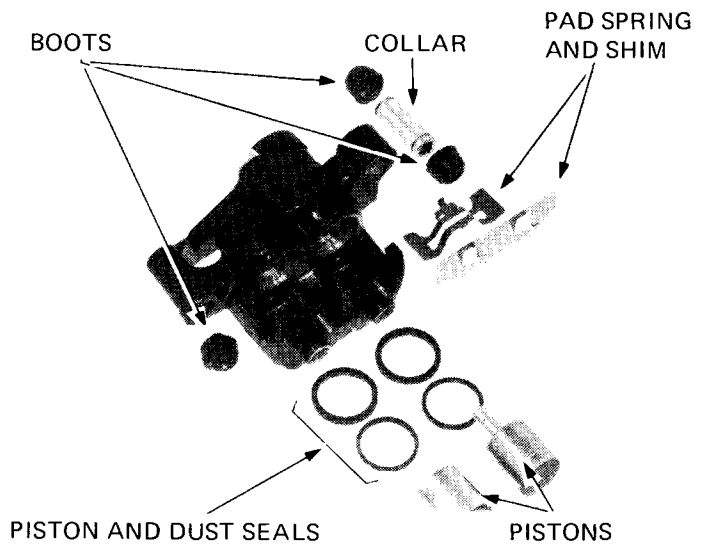
Coat new dust and piston seals with clean brake fluid and install them in the seal groove in the caliper.

Lubricate the caliper cylinders and pistons with brake fluid, and install the pistons with the piston pad end facing the pad.

Apply silicone grease to the pivot collar and boots. Install the collar and boots making sure that the boots are seated in the collar and caliper grooves properly.

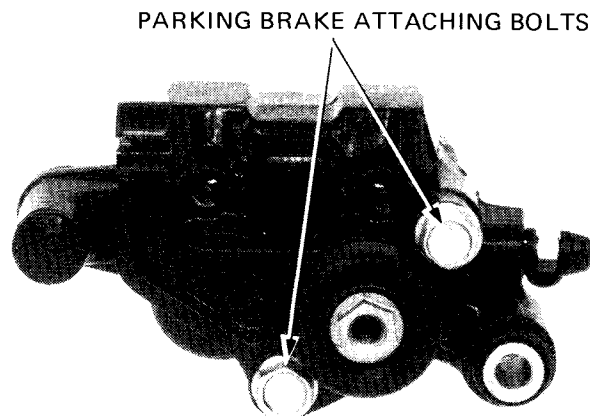
Install the pad spring and shim.

Install the pads and pad pin bolts.



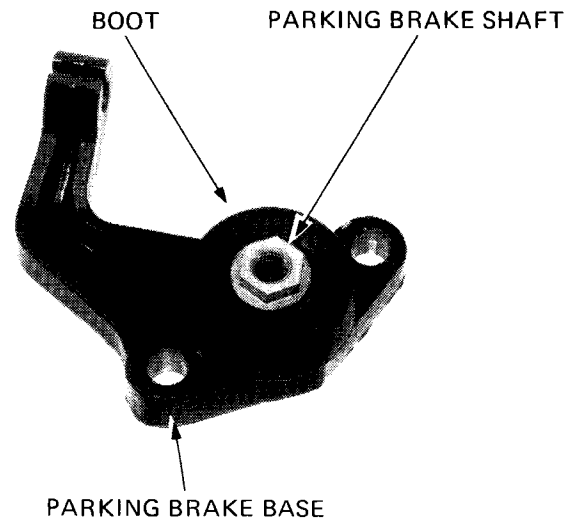
PARKING BRAKE MECHANISM

Remove the parking brake attaching bolts and parking brake from the caliper.

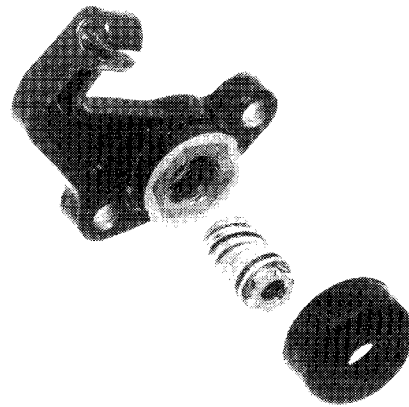


HYDRAULIC DISC BRAKES

Remove the boot and parking brake shaft from the parking brake base.



Check the boot for deterioration or damage.
Check the parking brake shaft and base threads for wear or damage.



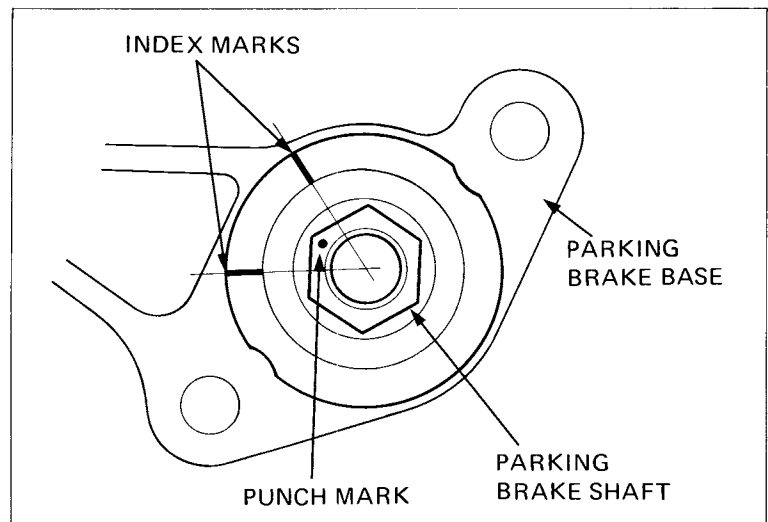
Apply grease to the parking brake shaft, position the shaft so that the punch mark is within the index marks on the parking brake base and thread the shaft into the parking brake base.

NOTE

Parking brake shaft has left hand threads.

Screw the parking brake shaft in fully, back it about 1/8 turn and make sure that the punch mark on the shaft is within the index marks on the base.

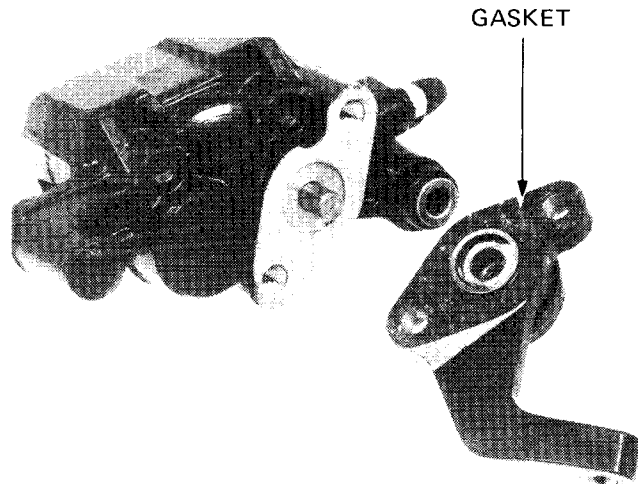
Install the boot over the shaft and base, making sure that the boot is seated in the groove in the shaft and base properly.



Install the parking brake onto the rear brake caliper with a new gasket.

Tighten the parking brake attaching bolts.

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



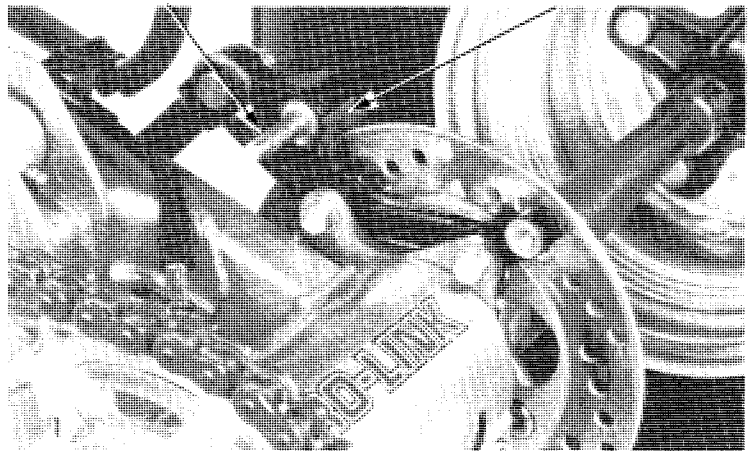
Make sure that the retainer clip is installed properly on the caliper bracket.

Coat the caliper pin with silicone grease.

Install the caliper on the caliper pin and place the caliper over the brake disc being careful not to damage the pads.

CALIPER PIN

RETAINER CLIP



Install the caliper mounting bolt and tighten it.

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

Install the parking brake cable to the parking brake.

Connect the parking brake cable to the parking brake arm and install the arm on the shaft, aligning the punch marks on the shaft and arm.

Install the parking brake adjusting bolt.

Connect the rear brake hose with the oil bolt and two new sealing washers.

Tighten the oil bolt.

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

Tighten the brake pad bolts.

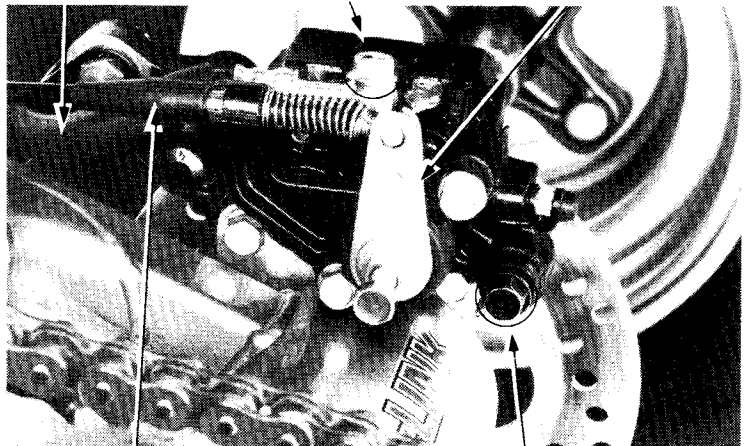
TORQUE: 15–20 N·m
(1.5–2.0 kg·m, 10–14 ft·lb)

Tighten the brake pad pin plugs.

TORQUE: 10–20 N·m
(1.0–2.0 kg·m, 7–14 ft·lb)

Fill and bleed the rear brake system (Page 13-4).
Adjust the parking brake (Page 2-15).

BRAKE HOSE OIL BOLT PARKING BRAKE ARM



PARKING BRAKE
CABLE

CALIPER MOUNTING
BOLT

FRONT MASTER CYLINDER

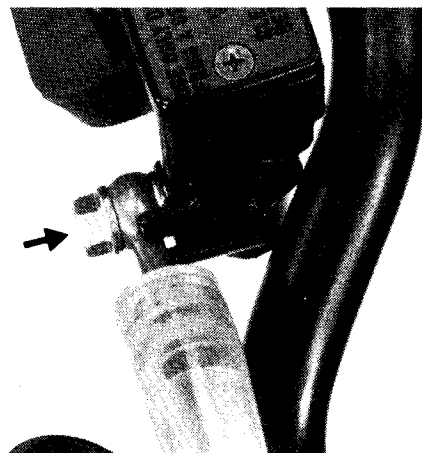
REMOVAL

Drain brake fluid from the front hydraulic system. Remove the front brake lever and disconnect the front brake hose from the master cylinder.

CAUTION

- *Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.*
- *When removing the oil bolt, cover the end of the hose to prevent contamination.*

Remove the throttle housing, then remove the master cylinder from the handlebar.

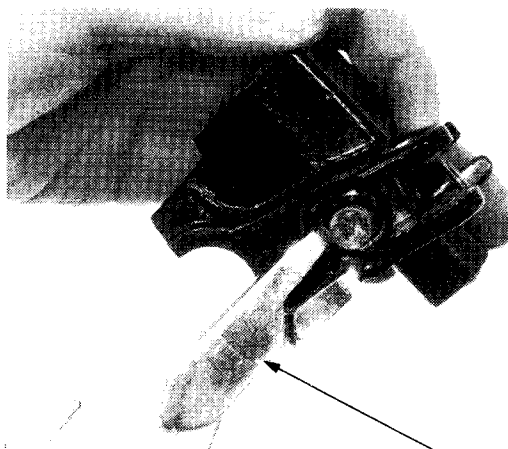


DISASSEMBLY

Remove the piston boot and the snap ring from the master cylinder body.

Remove the master piston and spring from the master cylinder.

Clean the master cylinder, reservoir and master piston in clean brake fluid.



SNAP RING PLIERS
07914-3230001

INSPECTION

Check the primary and secondary cups for wear, deterioration or damage.

Check the master cylinder and master piston for scratches, scoring or other damage.

Measure the master cylinder inside diameter and master piston outside diameter.

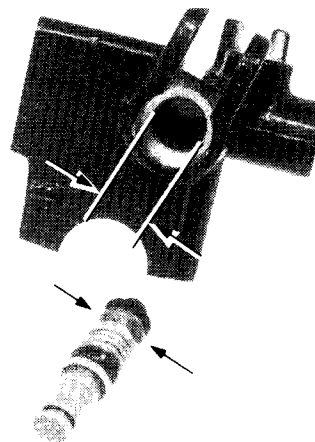
SERVICE LIMITS:

MASTER CYLINDER I.D.:
12.755 mm (0.5022 in)

MASTER PISTON O.D.:
12.645 mm (0.4978 in)

NOTE

The piston, piston cups and spring must be replaced as a set.



ASSEMBLY

Coat the master piston, primary and secondary cups with clean brake fluid, then install the piston spring and piston.

Install the snap ring.

CAUTION

Do not allow the lips of the cups to turn inside out and be certain the snap ring is firmly seated in the groove.

Install the boot.

INSTALLATION

Place the front brake master cylinder on the handlebar and install its holder with the "UP" mark facing up.

Align the end of the holder with the punch mark on the handlebar and tighten the upper screw first, then tighten the lower screw.

TORQUE: 10–14 N·m

(1.0–1.4 kg·m, 7–10 ft·lb)

Install the front brake lever.

Install the throttle housing aligning the punch mark on the housing with the mating surface of the master cylinder and holder.

Connect the front brake hose to the master cylinder with the oil bolt and two new sealing washers so the hose joint neck is positioned in the stopper of the master cylinder body.

Tighten the oil bolt.

TORQUE: 25–35 N·m

(2.5–3.5 kg·m, 18–25 ft·lb)

Fill and bleed the front master cylinder (Page 13-4).

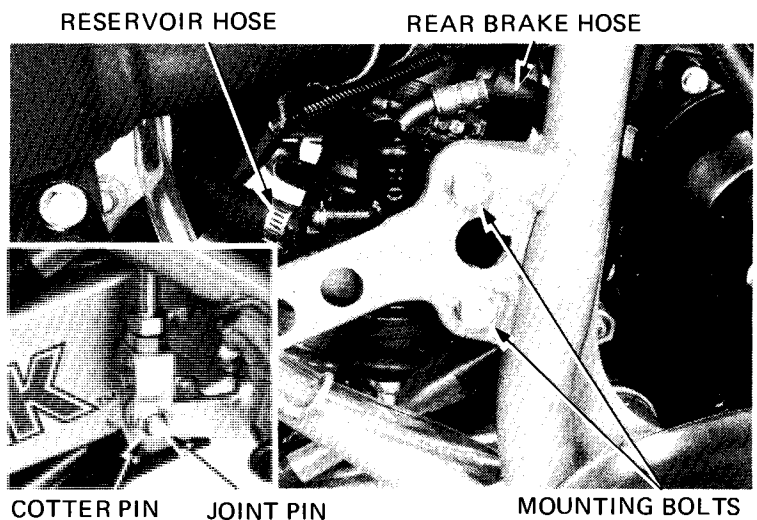
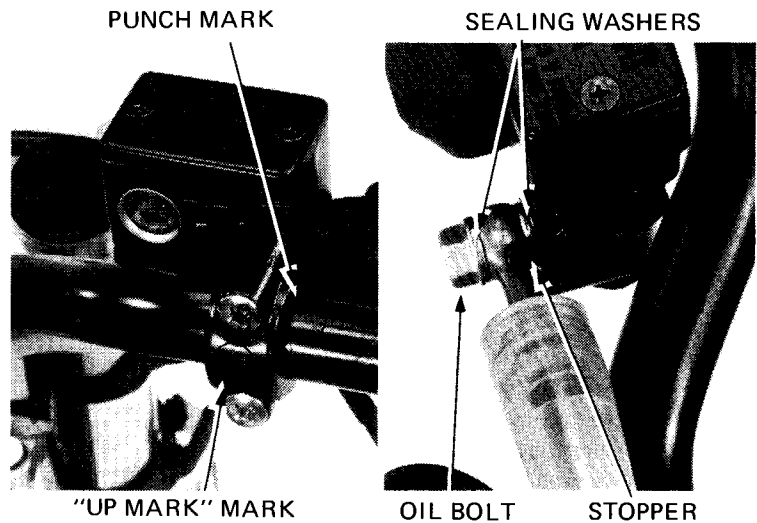
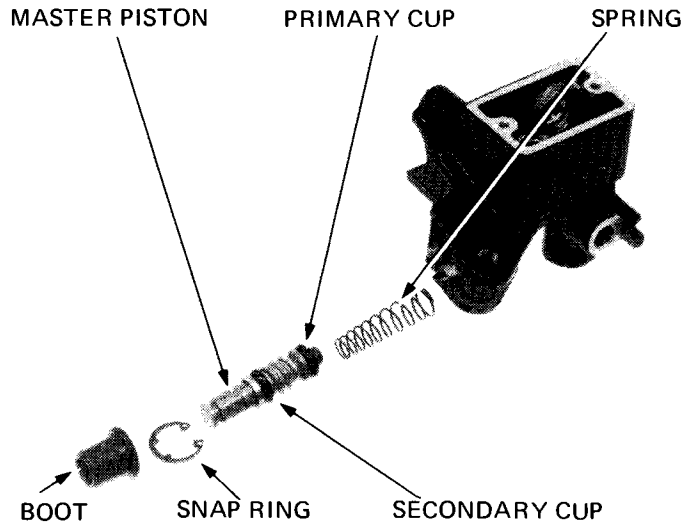
REAR MASTER CYLINDER

REMOVAL

Remove the rear master cylinder mounting bolts. Disconnect the rear master cylinder push rod from the rear brake actuating arm by removing the cotter pin and joint pin.

Disconnect the rear brake hose from the master cylinder.

Remove the hose connector screws and disconnect the reservoir hose.



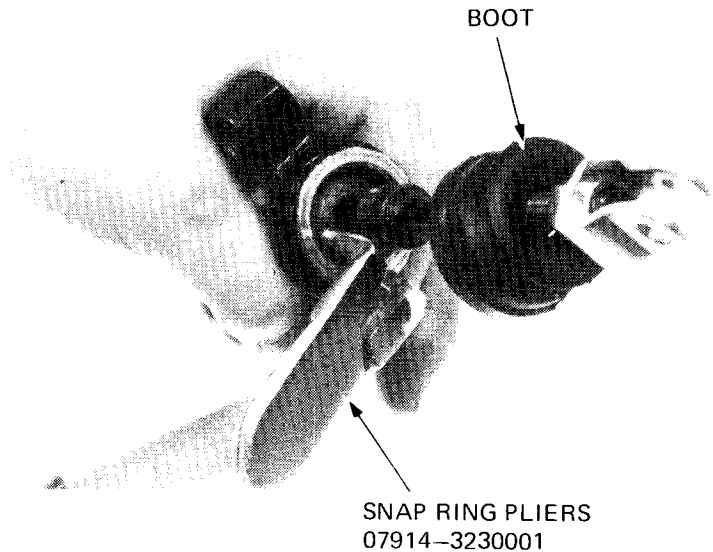
HYDRAULIC DISC BRAKES

DISASSEMBLY

Remove the following:

- rubber boot.
- snap ring and push rod.
- master piston, primary cup and spring.

Clean the master piston and inside of the master cylinder with clean brake fluid.



INSPECTION

Check the primary and secondary cups for wear, deterioration or damage.

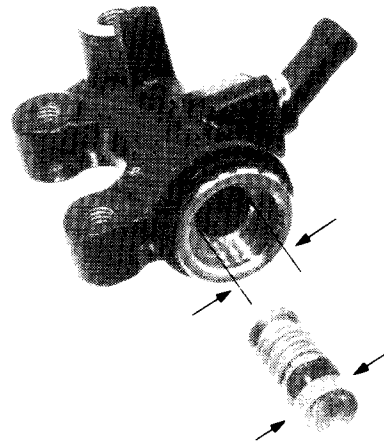
Check the master cylinder and master piston for scratches, scoring or damage.

Measure the master cylinder inside diameter and master piston outside diameter.

SERVICE LIMITS:

MASTER CYLINDER I.D.:
14.055 mm (0.5533 in)

MASTER PISTON O.D.:
13.945 mm (0.5490 in)



NOTE

The piston, piston cup and spring must be replaced as a set.

ASSEMBLY

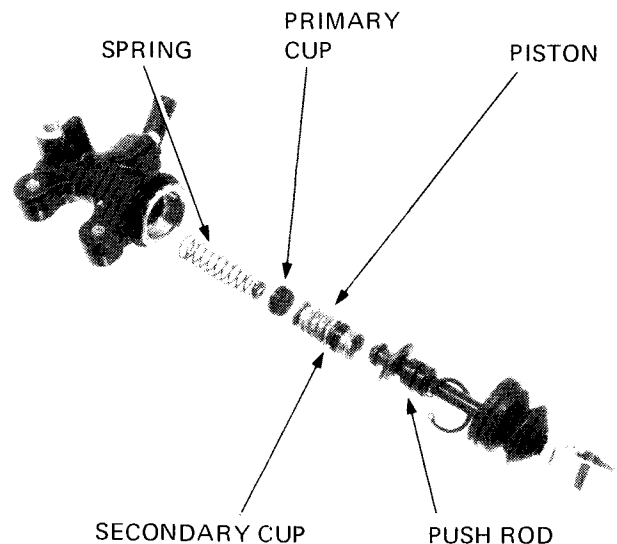
Coat the master piston, primary and secondary cups with clean brake fluid, install the spring and primary cup together, and install the piston with secondary cup.

Install the push rod and snap ring.

CAUTION

Do not allow the lips of the cups to turn inside out and be certain the snap ring is seated in the groove.

Install the rubber boot.



INSTALLATION

Connect the reservoir joint hose to the master cylinder with a new O-ring and the screws.

Connect the rear brake hose with the oil bolt and two new sealing washers, and tighten the oil bolt.

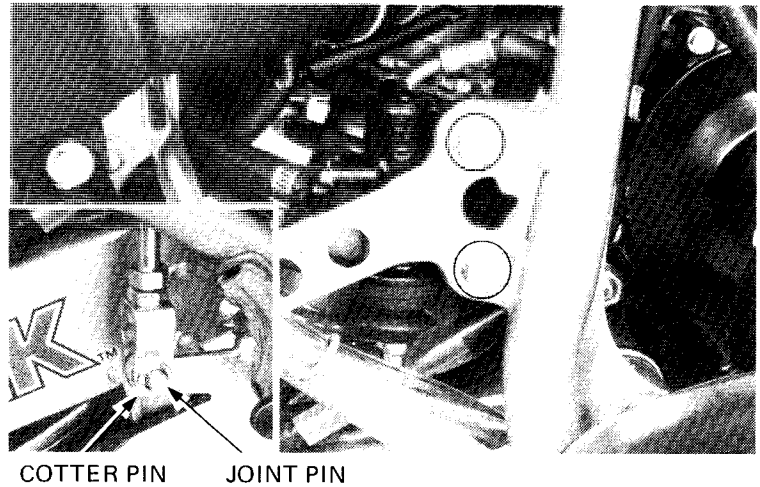
TORQUE: 25–35 N·m
(2.5–3.5 kg·m, 18–25 ft·lb)

Connect the master cylinder push rod and actuating arm with the joint pin and secure it with a new cotter pin.

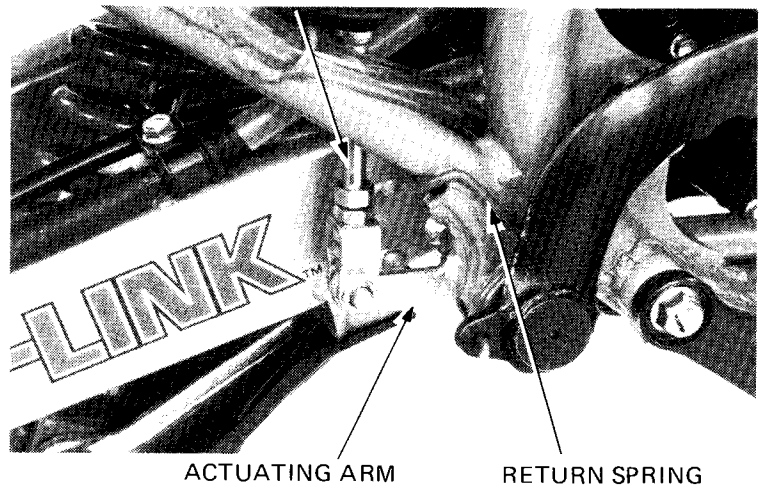
Install the master cylinder to the frame and tighten the mount bolts.

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

Fill and bleed the rear hydraulic system (Page 13-4).



REAR MASTER CYLINDER PUSH ROD



REAR BRAKE PEDAL

REMOVAL

Remove the rear master cylinder mounting bolts and disconnect the actuating arm from the master cylinder push rod by removing the cotter pin and joint pin.

Remove the actuating arm bolt, arm, rear brake pedal and return spring.

INSTALLATION

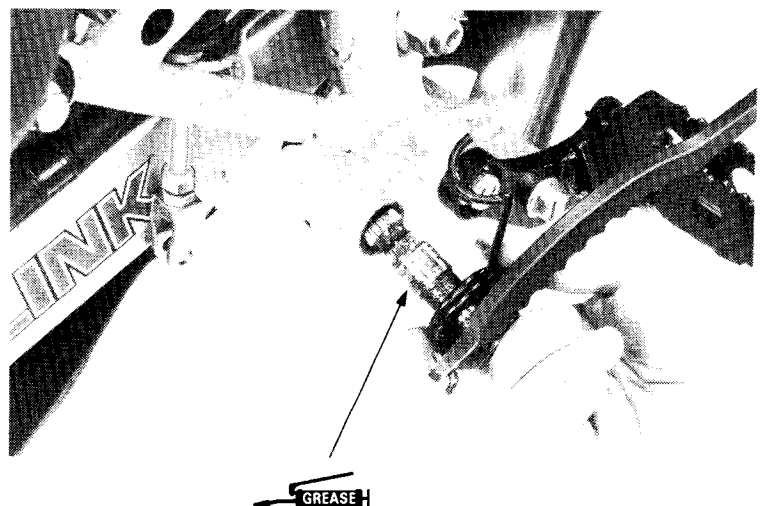
Install the return spring over the rear brake pedal and hook the spring end into the hole in the pedal. Apply grease to the pedal pivot and install the pedal half way into the frame.

Install the actuating arm with pinch bolt facing up onto the pedal pivot, aligning the punch marks on the arm and pedal.

Install and tighten the actuating arm bolt.

Connect the actuating arm to the rear master cylinder push rod with the joint pin and secure the joint pin with a new cotter pin.

Install the rear master cylinder to the frame and tighten the mount bolts.



MEMO

14. REAR FENDER/SEAT/ EXHAUST SYSTEM

SERVICE INFORMATION

14-1

REAR FENDER/SEAT

14-1

EXHAUST SYSTEM

14-2

SERVICE INFORMATION

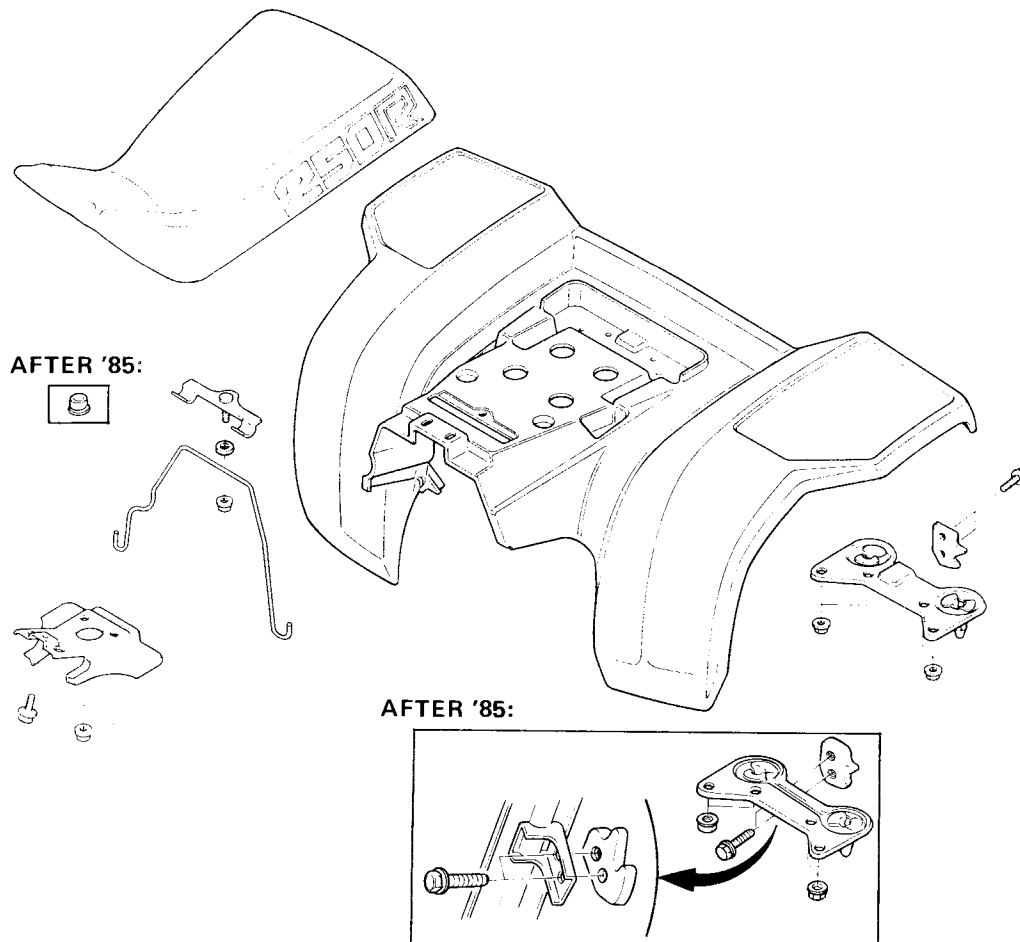
GENERAL

- Refer to section 2 for spark arrester cleaning.
- Replace the exhaust chamber with a new one if it is deformed.

WARNING

Do not service the exhaust system while it is hot.

REAR FENDER/SEAT

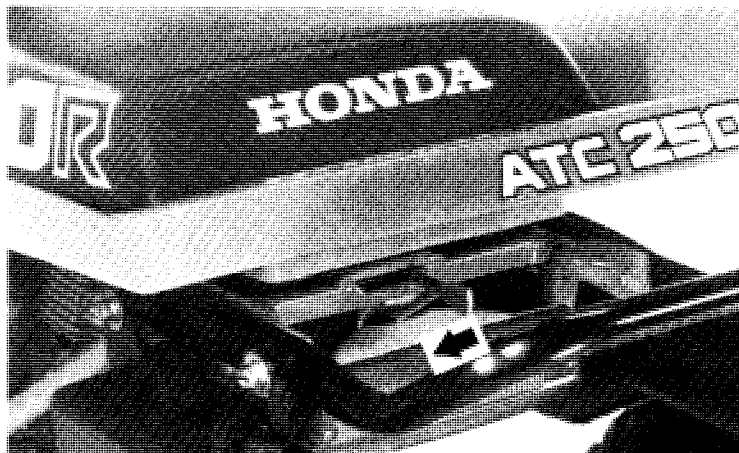


14

REAR FENDER/SEAT/EXHAUST SYSTEM

REMOVAL

Release the seat lock by moving the lever in the direction shown and remove the seat and rear fender.



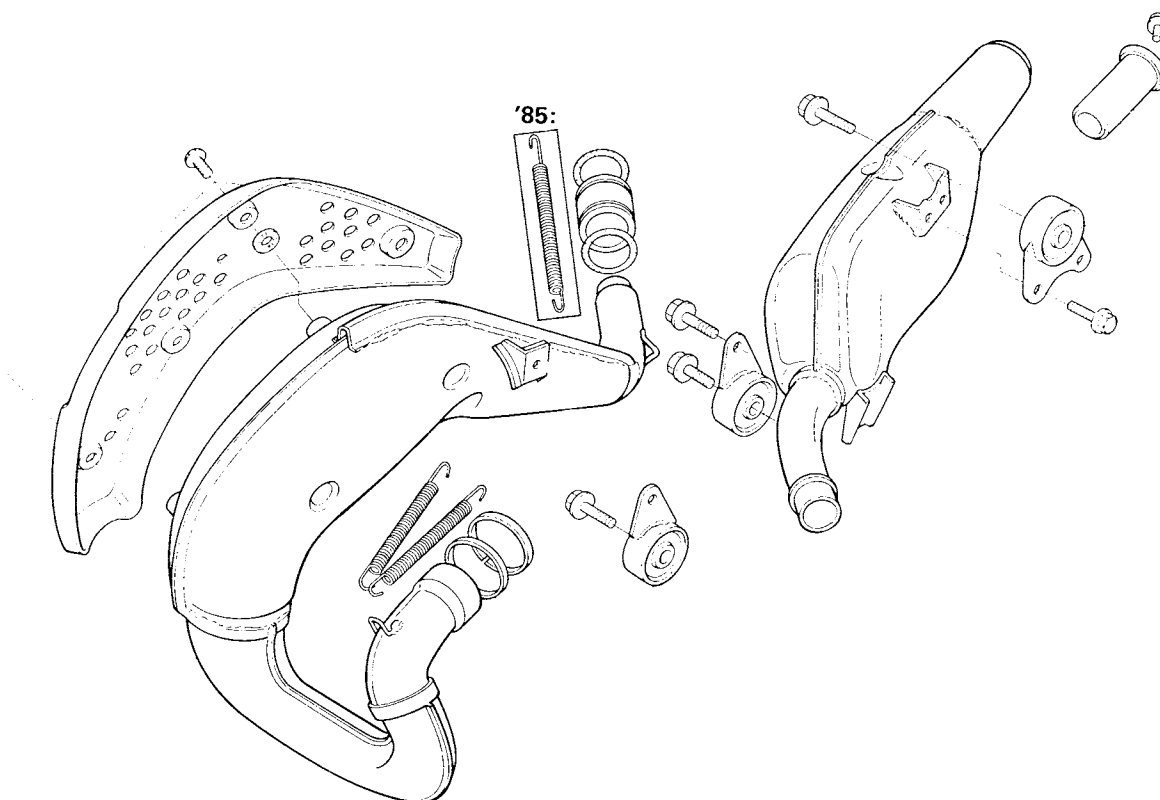
INSTALLATION

Apply grease to the seat catch.
Install the seat and fender in the reverse order of removal.

EXHAUST SYSTEM

WARNING

Do not service the exhaust chamber or muffler while they are hot.



EXHAUST CHAMBER REMOVAL

Remove the following:

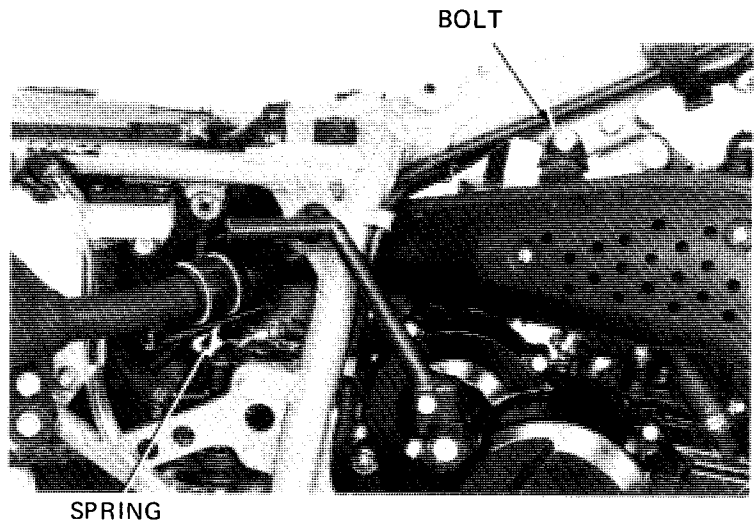
- seat and rear fender (Page 14-1).
- fuel tank (Page 3-3).

'85:

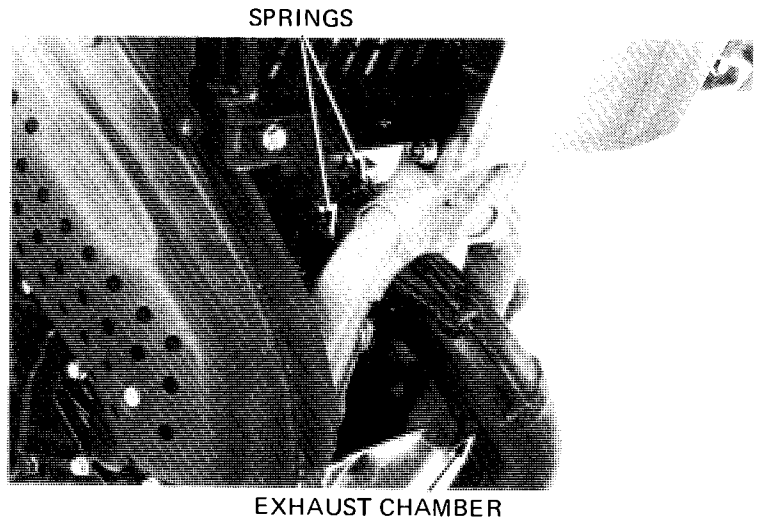
- exhaust chamber mounting bolt and spring.

AFTER '85:

- exhaust chamber mounting bolt.

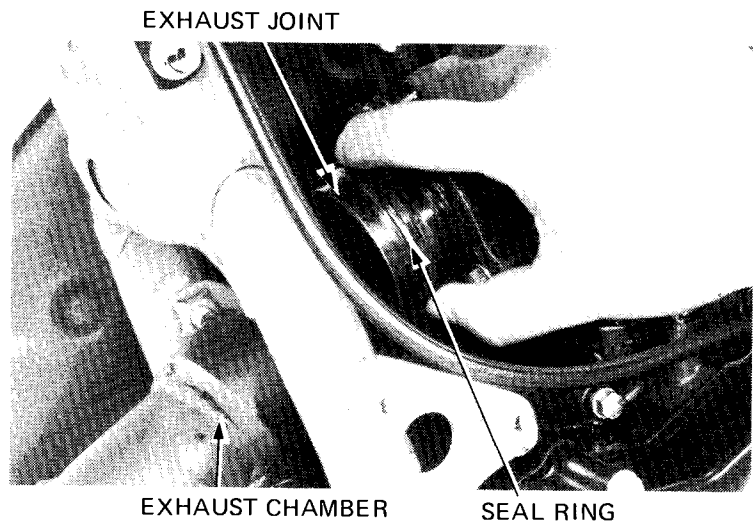


Remove the exhaust chamber joint mounting springs.
Remove the exhaust chamber.



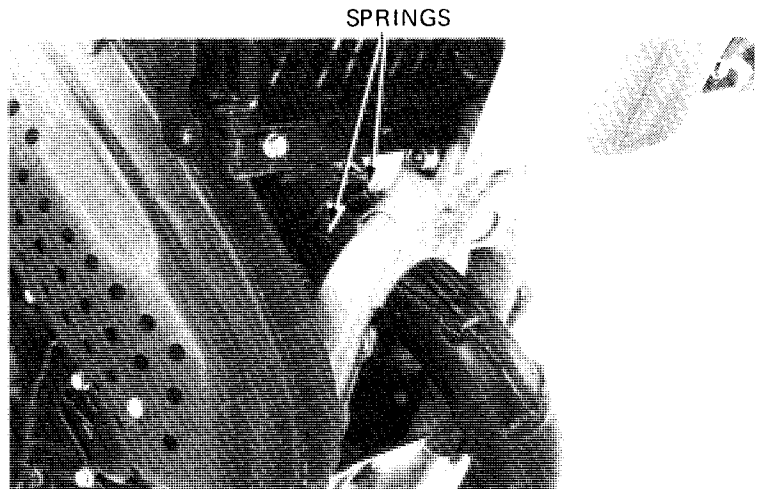
EXHAUST CHAMBER INSTALLATION

Compress the seal ring into the groove of the exhaust joint and connect the exhaust chamber to the joint.



REAR FENDER/SEAT/EXHAUST SYSTEM

Install the exhaust chamber mounting springs.



Slide the rubber seal over the joint and secure it with two spring bands.

'85:

Install the chamber mounting bolt and spring.

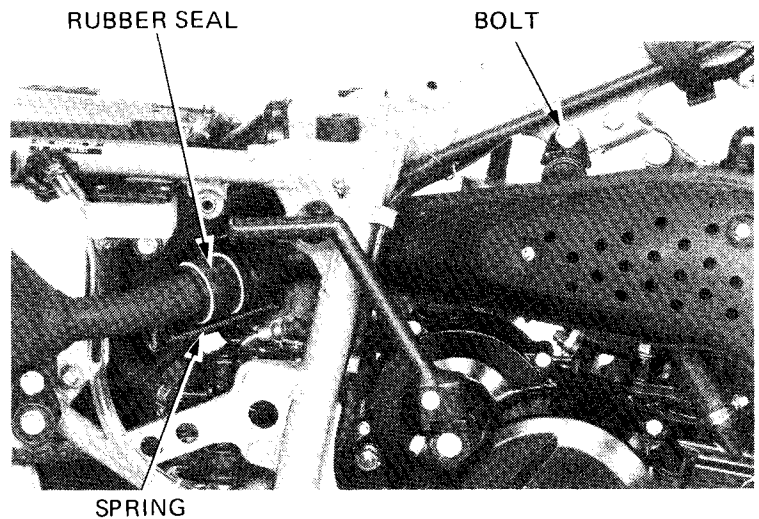
AFTER '85:

Install the chamber mounting bolt.

'85 AND AFTER '85:

Make sure that there are no exhaust leaks after installation.

Install the fuel tank and rear fender/seat.



EXHAUST MUFFLER REMOVAL/ INSTALLATION

Remove the rear fender and seat (Page 14-1).

'85:

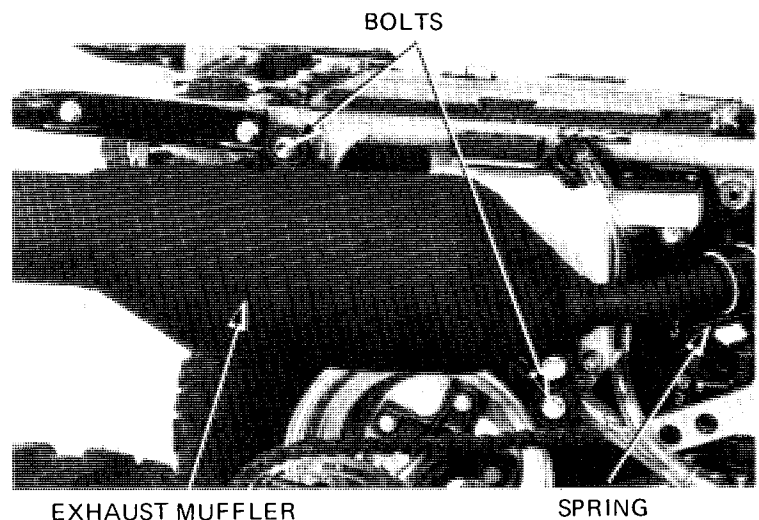
Remove the muffler mounting bolts, spring and the muffler.

AFTER '85:

Remove the muffler mounting bolts and the muffler.

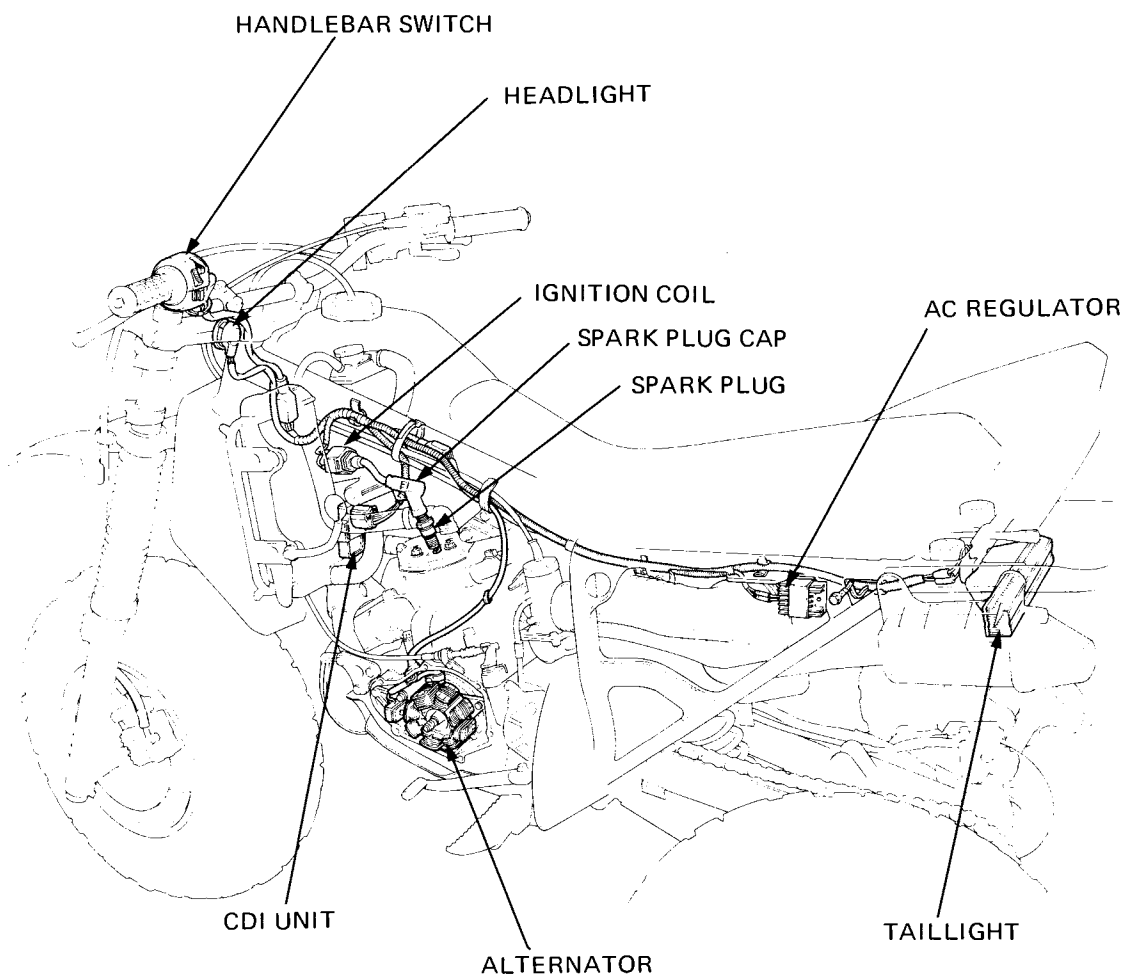
Install the muffler in the reverse order of removal.

Make sure that there are no exhaust leaks after installation.



MEMO

ELECTRICAL SYSTEM



15. ELECTRICAL SYSTEM

SERVICE INFORMATION	15-1
TROUBLESHOOTING	15-1
IGNITION SYSTEM	15-2
HEADLIGHT	15-5
AC REGULATOR	15-6
SWITCHES	15-8
WIRING DIAGRAM	'85: 15-9 AFTER '85: 15-10

SERVICE INFORMATION

GENERAL

- Ignition timing does not need to be adjusted since the CDI (Capacitive Discharge Ignition) unit is factory pre-set.
- For spark plug inspection and ignition timing check, refer to section 2.
- For pulse generator, exciter coil and lighting coil removal, refer to section 6.
- All plastic connectors have locking tabs that must be released before disconnecting, and must be aligned when reconnecting.
- A continuity check can usually be made without removing the part from the ATC by simply disconnecting the wires and connecting a continuity tester or voltmeter to the terminals or connections.

SPECIFICATIONS

ITEM			
Spark plug	Gap	0.7–0.8 mm (0.028–0.031 in)	
	Normal	BR9ES (NGK)	RN2C (CHAMPION)
	Cold weather	BR8ES (NSK)	RN3C (CHAMPION)
Ignition coil	Primary coil resistance	0.16–0.2 Ω	
	Secondary coil resistance (Without spark plug cap)	3.69–4.51 k Ω	
Exciter coil resistance		50–250 Ω	
Pulse generator coil resistance		50–200 Ω	
Lighting coil resistance		0.1–1.0 Ω	
AC regulator	Regulating voltage	13.5–14.5 V	
	Resistance	100 k Ω – ∞	

15

TROUBLESHOOTING

No spark at plug

- Faulty spark plug
- Poorly connected, broken or shorted wires
 - Between alternator and CDI unit
 - Between CDI unit and engine stop switch
 - Between CDI unit and ignition coil
 - Between ignition coil and spark plug
 - Between pulse generator and CDI unit
- Faulty ignition coil
- Faulty CDI unit
- Faulty pulse generator
- Faulty alternator

Engine starts but runs poorly

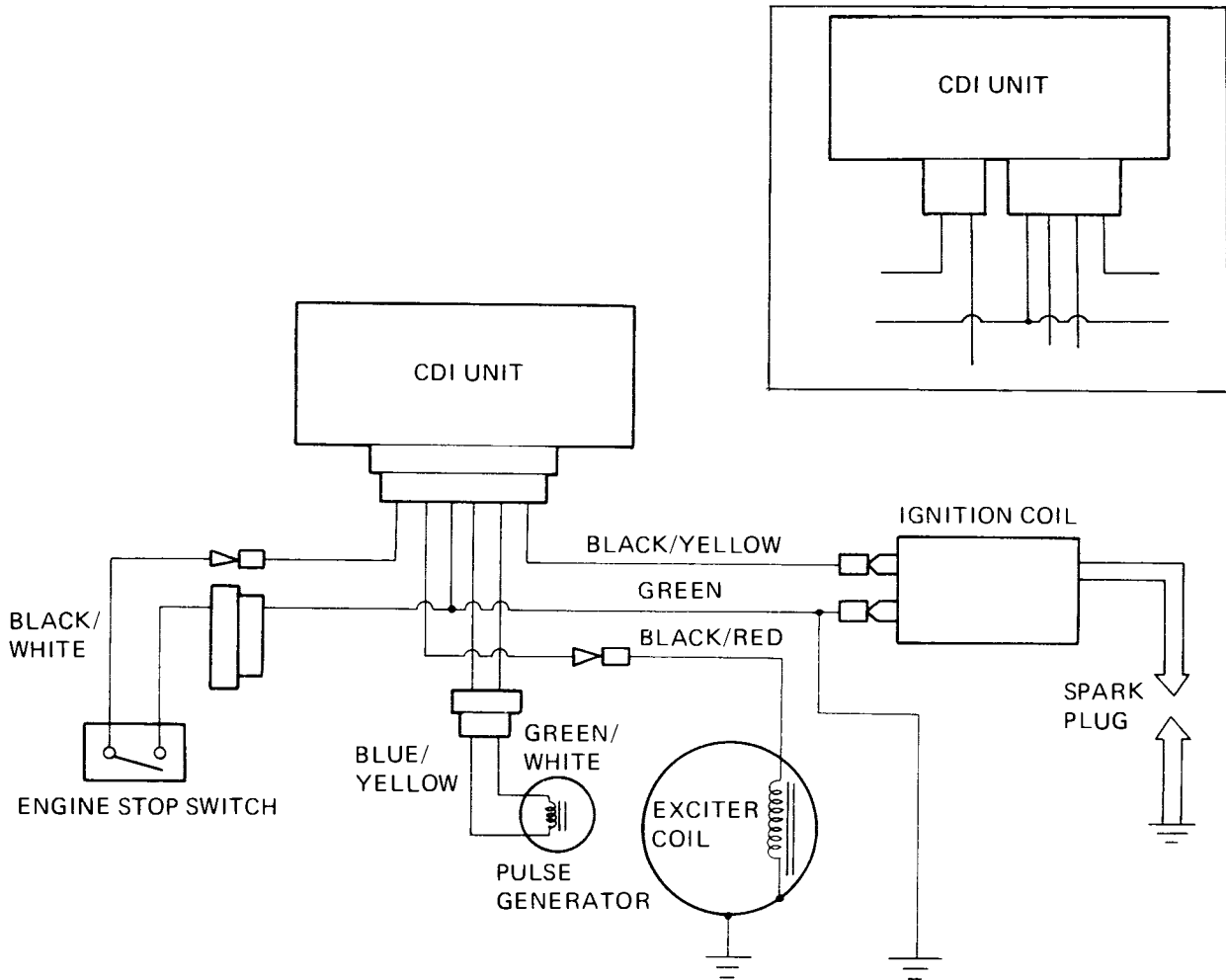
- Ignition primary circuit
 - Faulty ignition coil
 - Loose or bare wire
 - Faulty alternator
 - Faulty CDI unit
 - Faulty pulse generator
- Ignition secondary circuit
 - Faulty plug
 - Faulty spark plug wire
 - Faulty ignition coil
- Improper ignition timing
 - Faulty pulse generator
 - Faulty CDI unit

No lights with engine is running

- Faulty bulb
- Poorly connected or loose connectors
- Faulty alternator

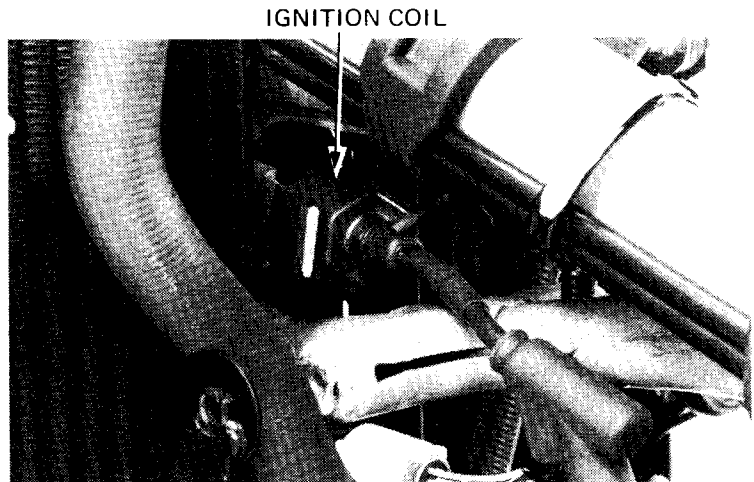
IGNITION SYSTEM

AFTER '85:



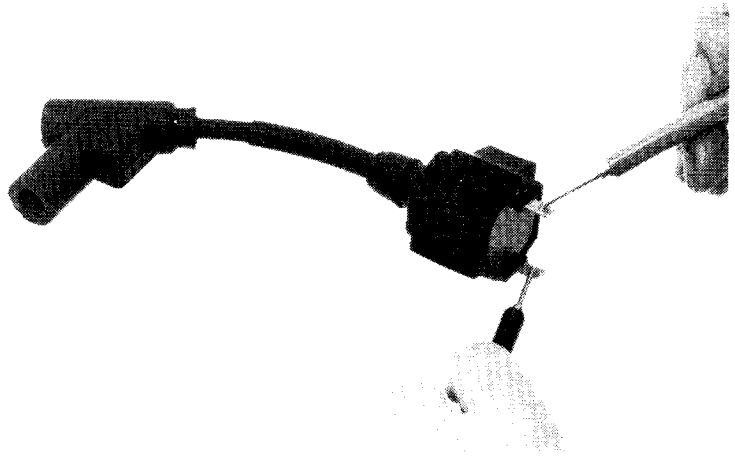
IGNITION COIL

- Remove the fuel tank (Page 3-3).
- Remove the spark plug cap.
- Disconnect the primary and ground wires from the ignition coil.
- Remove the ignition coil.



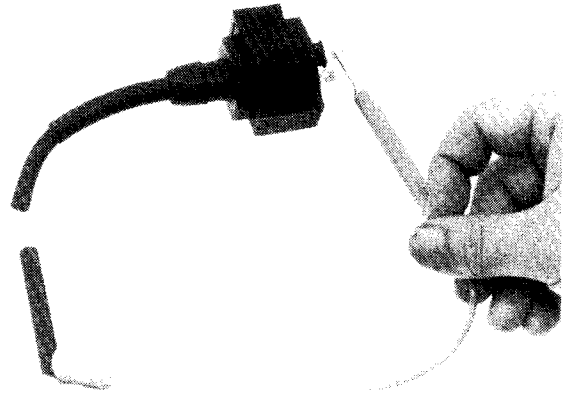
Measure the primary coil resistance between the primary and ground terminals.

PRIMARY COIL RESISTANCE: 0.16–0.2 Ω



Remove the spark plug cap from the spark plug wire.
Measure the secondary coil resistance without the spark plug cap.

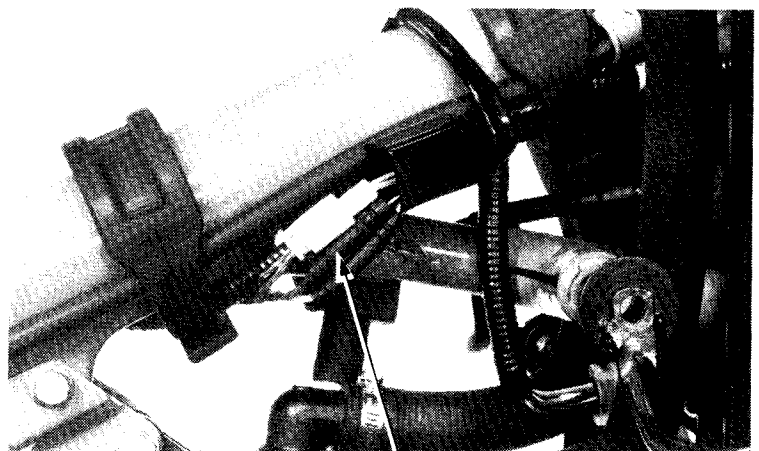
SECONDARY COIL RESISTANCE: 3.69–4.51 k Ω



EXCITER COIL

Remove the fuel tank (Page 3-3).
Disconnect the exciter coil wire connector.
Measure the exciter coil resistance between the wire terminal and ground.

EXCITER COIL RESISTANCE: 50–250 Ω
For exciter coil replacement, refer to section 6.

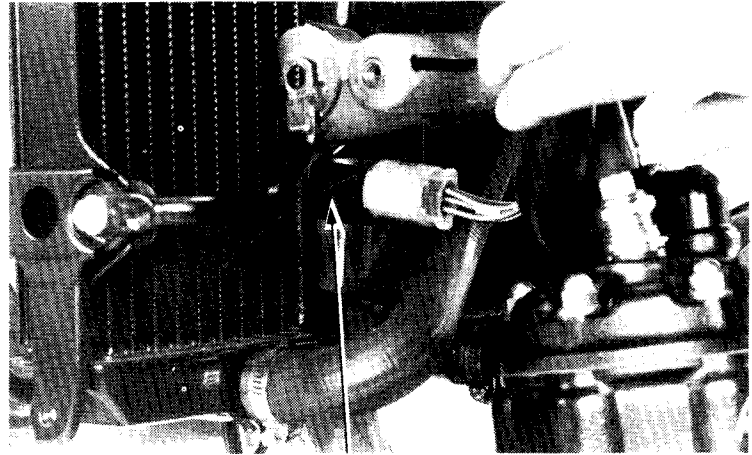


EXCITER COIL WIRE CONNECTOR
(BLACK/RED)

ELECTRICAL SYSTEM

CDI UNIT

Remove the fuel tank (Page 3-3).
 Disconnect the CDI unit wire coupler.
 Remove the CDI unit.

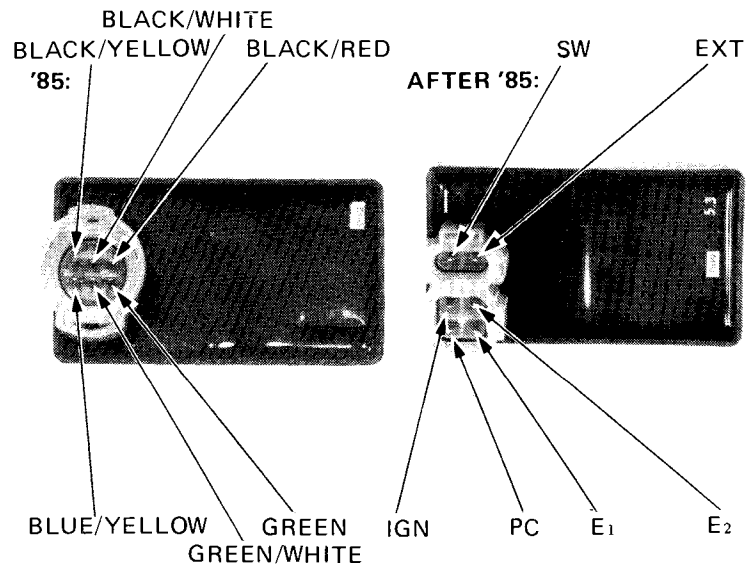


CDI UNIT

Measure the resistance between the terminals.
 Replace the CDI unit if the readings are not within
 the specifications in the table below.

NOTE

- The CDI unit is fully transistorized.
- For accurate testing, it is necessary to use a specified electric tester. Use of an improper tester may give a false reading.
- Use Sanwa Electric Tester (07308-0020000) or Kowa Tester (TH-5H-1) or Kowa Digital Multi-Tester (07411-0020000 or KS-AHM-32-003: U.S.A. only).



'85:

Unit: kΩ

(-) \ (+)	BLACK/WHITE	GREEN	BLACK/RED	GREEN/WHITE	BLUE/YELLOW	BLACK/YELLOW
BLACK/WHITE		∞	∞	∞	∞	∞
GREEN	2-200		0.2-20	0	10-100	∞
BLACK/RED	0.2-20	∞		∞	∞	∞
GREEN/WHITE	2-200	0	0.2-20		10-100	∞
BLUE/YELLOW	50-1000	10-100	20-200	10-100		∞
BLACK/YELLOW	∞	∞	∞	∞	∞	

AFTER '85:

Unit: SANWA $\times k\Omega$
KOWA $\times 100 \Omega$

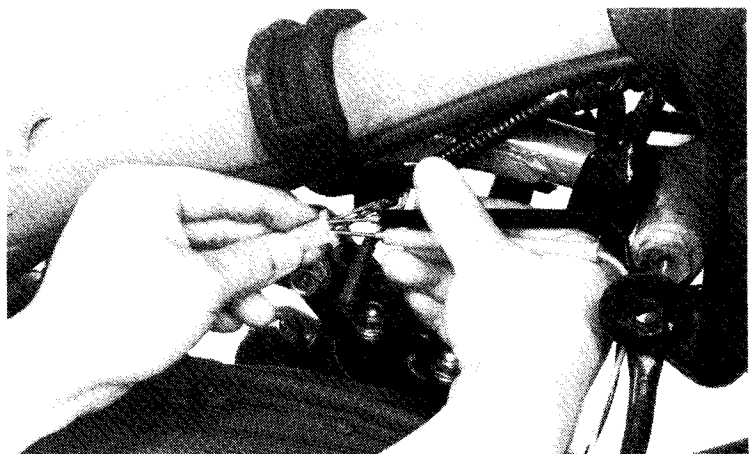
(-)	(+)	SW	EXT	P-C	E1.2	IGN
SW			∞	∞	∞	∞
EXT		0.2-20		∞	∞	∞
P-C		50-1000	20-200		10-100	∞
E1.2		2-200	0.2-20	10-100		∞
IGN		∞	∞	∞	∞	

PULSE GENERATOR

Remove the fuel tank (Page 3-3).
Disconnect the pulse generator wire coupler.
Measure the pulse generator coil resistance between the coupler terminals.

PULSE GENERATOR COIL RESISTANCE:
50-200 Ω

For pulse generator coil replacement, refer to section 6.

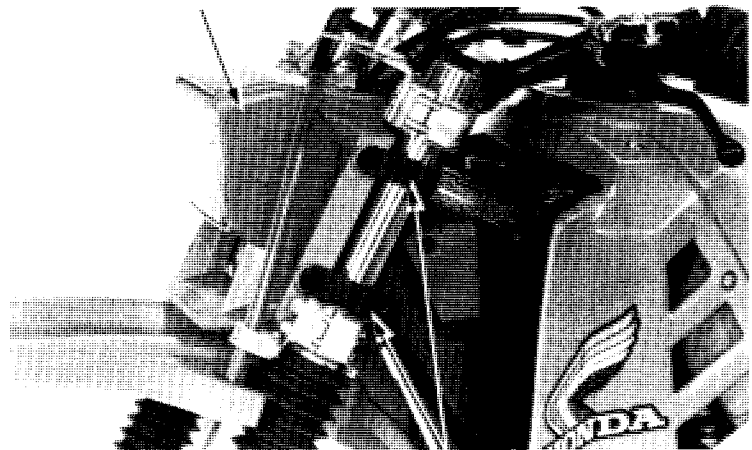


HEADLIGHT

HEADLIGHT BULB REPLACEMENT

Remove the headlight case from the front fork tubes by releasing the four retaining bands.

HEADLIGHT CASE



RETAINING BANDS

ELECTRICAL SYSTEM

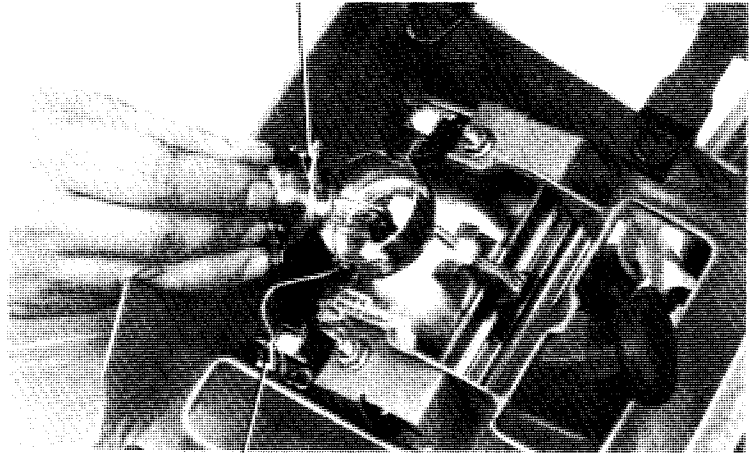
Disconnect the headlight coupler and remove the dust cover from the headlight.

Release the retaining clip and remove the headlight bulb.

Replace the faulty bulb with a new one.

Install the removed parts in the reverse order of removal.

HEADLIGHT BULB



RETAINING CLIP

TAILLIGHT BULB REPLACEMENT

Remove the taillight lens by removing the two screws and nuts.

Remove the taillight bulb by pushing it in and turning it counterclockwise.

Replace the faulty bulb with a new one.

Install the removed parts in the reverse order of removal.

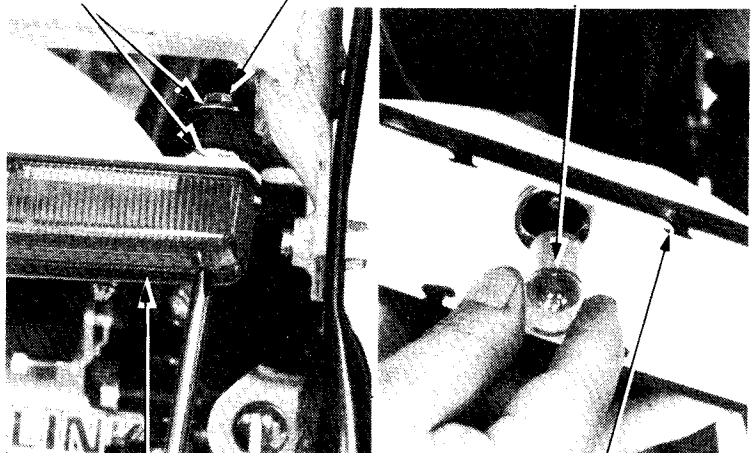
NOTES

- Make sure that the taillight lens rubber seal is in good condition.
- Be sure to install the washers on both side of the rubber mount.

WASHERS

NUT

TAILLIGHT BULB



TAILLIGHT LENS

RUBBER SEAL

LIGHTING COIL INSPECTION

Remove the fuel tank (Page 3-3).

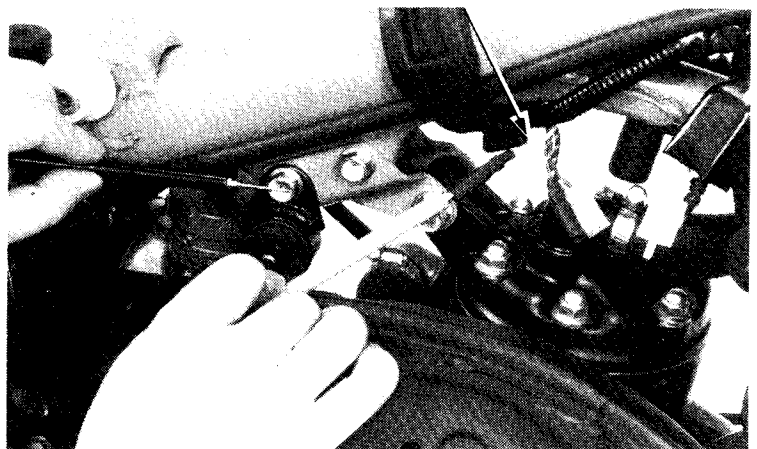
Disconnect the lighting coil wire connector.

Measure the lighting coil resistance between the wire terminal and ground.

LIGHTING COIL RESISTANCE: 0.1–1.0 Ω

For lighting coil replacement, refer to section 6.

LIGHTING COIL WIRE (WHITE/YELLOW)

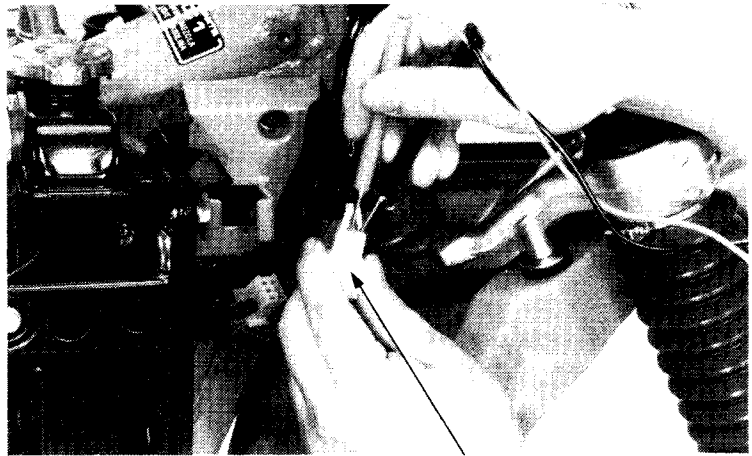


AC REGULATOR

Remove the headlight case (Page 15-6).
 Disconnect the lighting switch coupler.
 Start the engine and measure the voltage between the white/yellow and green wire terminals at the main harness side of the coupler.

VOLTAGE: 13.5–14.5 V

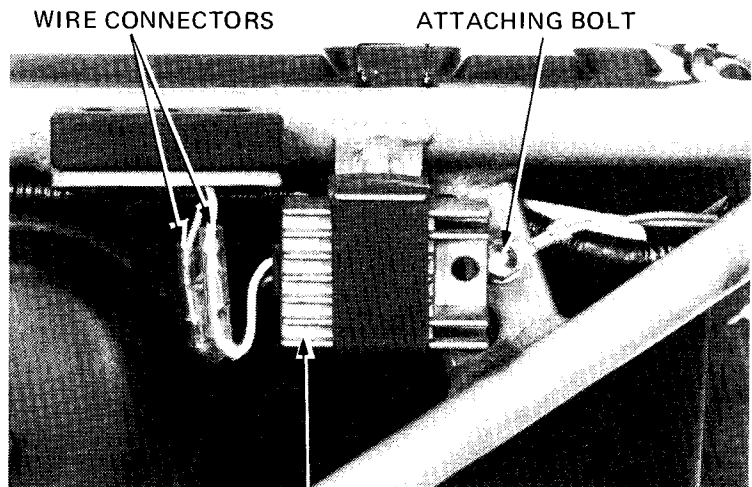
If the voltage is not within specifications, check the AC regulator as described on next page.



LIGHTING SWITCH COUPLER

Remove the seat/rear fender.

Disconnect the AC regulator wire connectors, and remove the regulator attaching bolt and the regulator.



AC REGULATOR

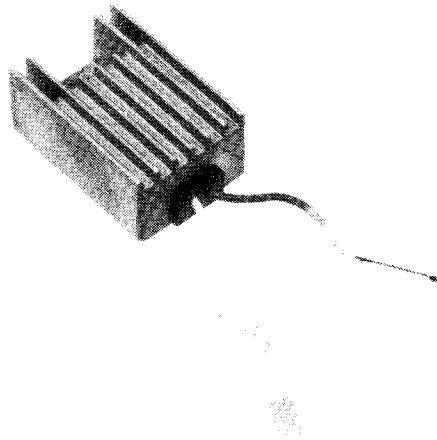
Measure the resistance between the wire terminals.

RESISTANCE: 100 k Ω – ∞

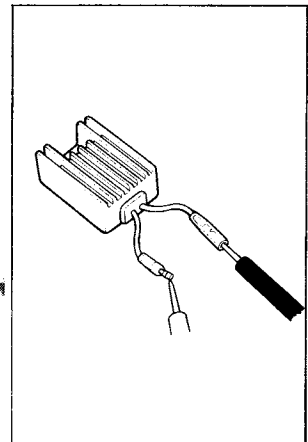
Replace the AC regulator with a new one if the resistance is not within the specifications.

Install the regulator in the reverse order of removal.

'85:



AFTER '85:



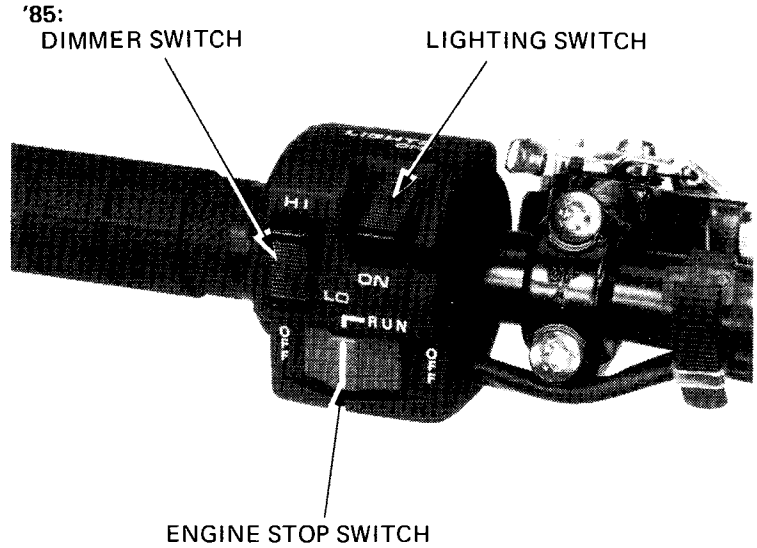
SWITCHES

NOTE:

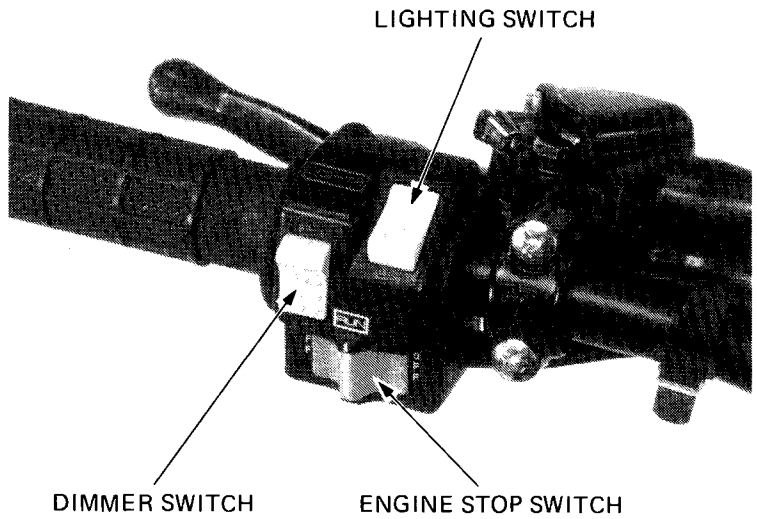
Engine stop switch, lighting switch and dimmer switch must be replaced as an assembly.

Remove the headlight case and disconnect the engine stop switch/lighting switch wire coupler and connector.

Continuity should exist between the color coded wires in each chart.



AFTER '85:



ENGINE STOP SWITCH

COLOR CODE	BLACK/ WHITE	GREEN
SWITCH POSITION		
OFF	○ — ○	
RUN		

LIGHTING SWITCH

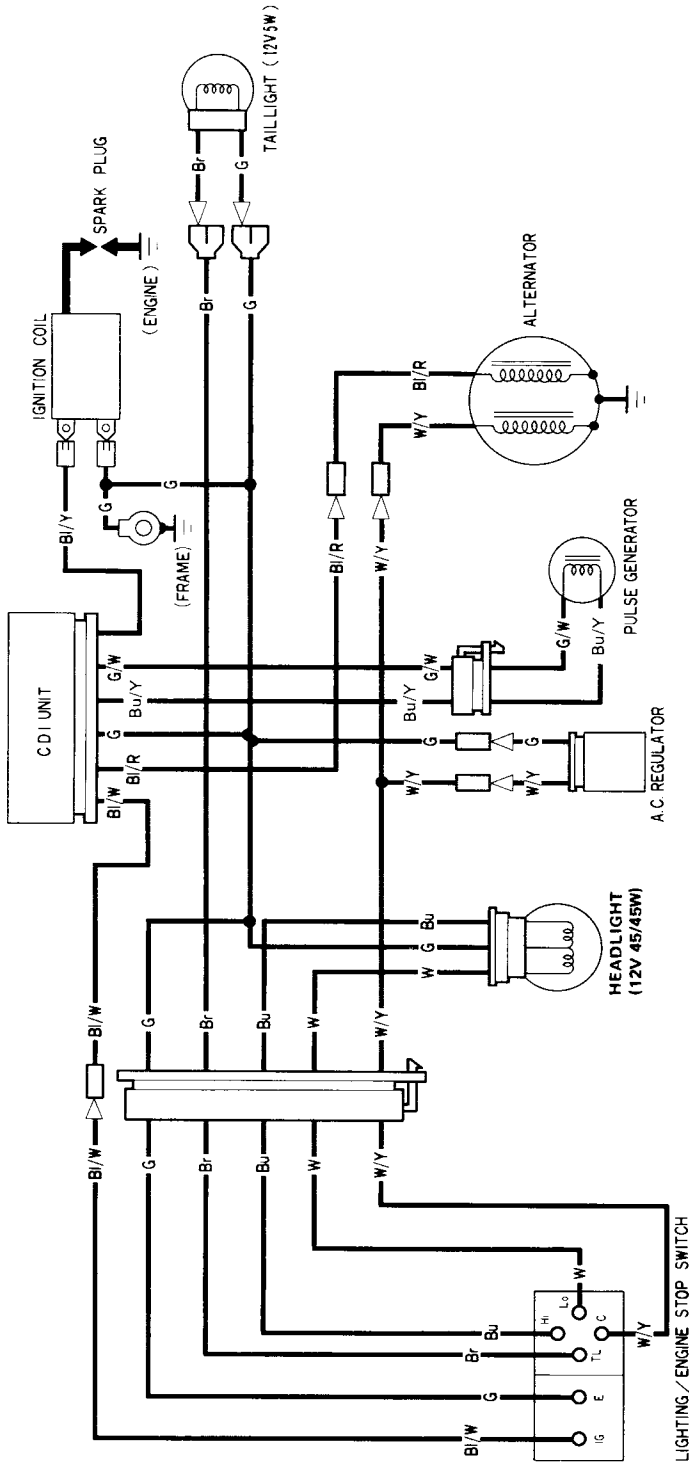
COLOR CODE	WHITE/ YELLOW	BROWN
SWITCH POSITION		
OFF		
ON	○ — ○	

DIMMER SWITCH

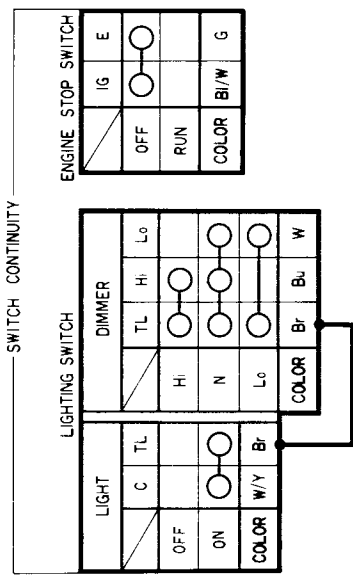
COLOR CODE	BROWN	BLUE	WHITE
SWITCH POSITION			
HI	○ — ○		
(N)	○ — ○	○ — ○	○ — ○
Lo	○ — ○		○ — ○

WIRING DIAGRAM

'85:



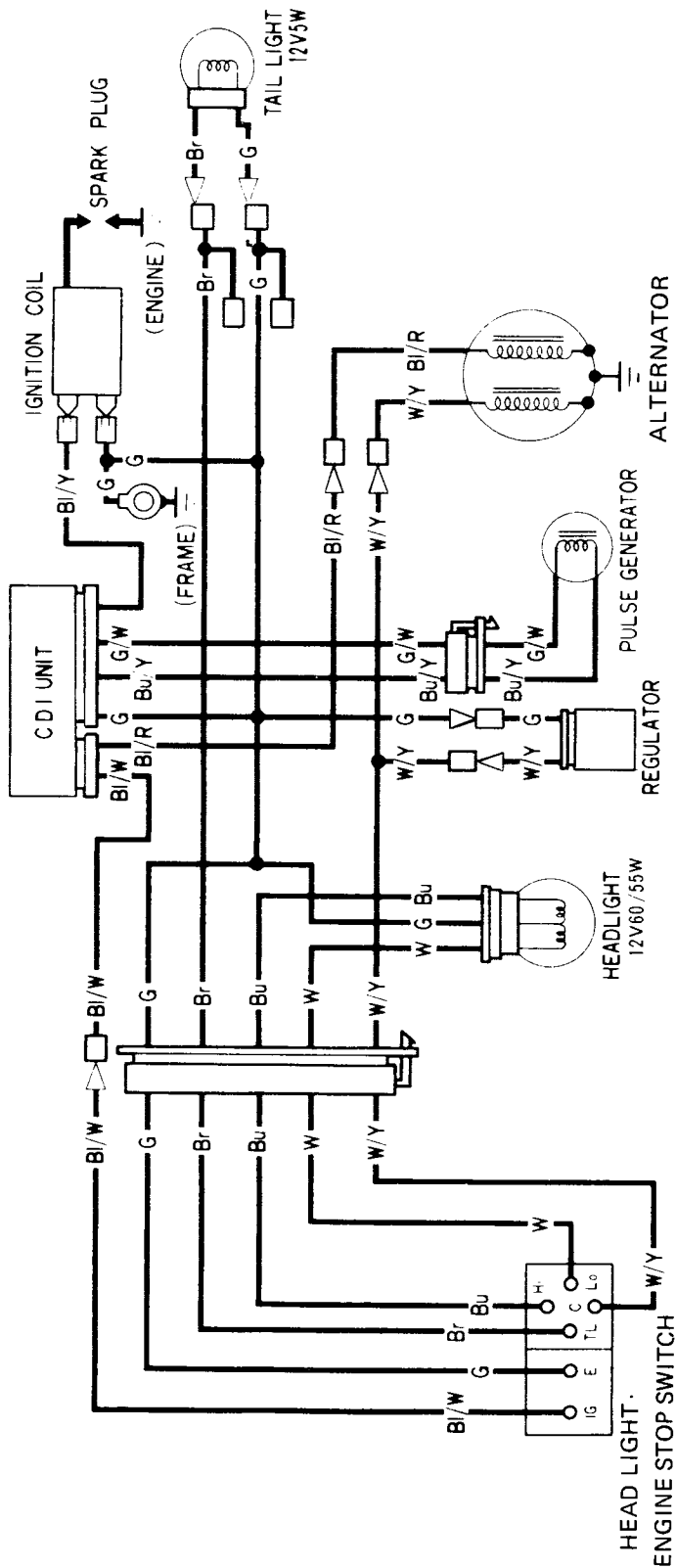
- Bi BLACK
- Y YELLOW
- Bu BLUE
- G GREEN
- R RED
- W WHITE
- Br BROWN
- O ORANGE
- Lb LIGHT BLUE
- Lg LIGHT GREEN
- P PINK
- Gr GRAY



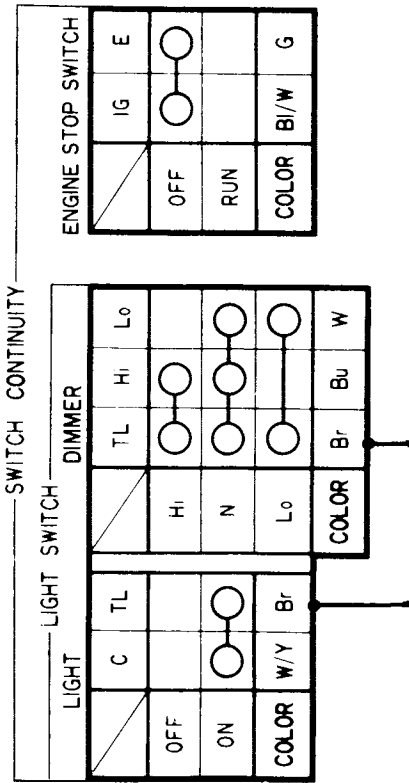
0030Z-HA2-0000

ELECTRICAL SYSTEM

AFTER '85:



- BI BLACK
- Y YELLOW
- Bu BLUE
- G GREEN
- R RED
- W WHITE
- Br BROWN
- O ORANGE
- Lb LIGHT BLUE
- Lg LIGHT GREEN
- P PINK
- Gr GRAY



0030Z-HA2-6700

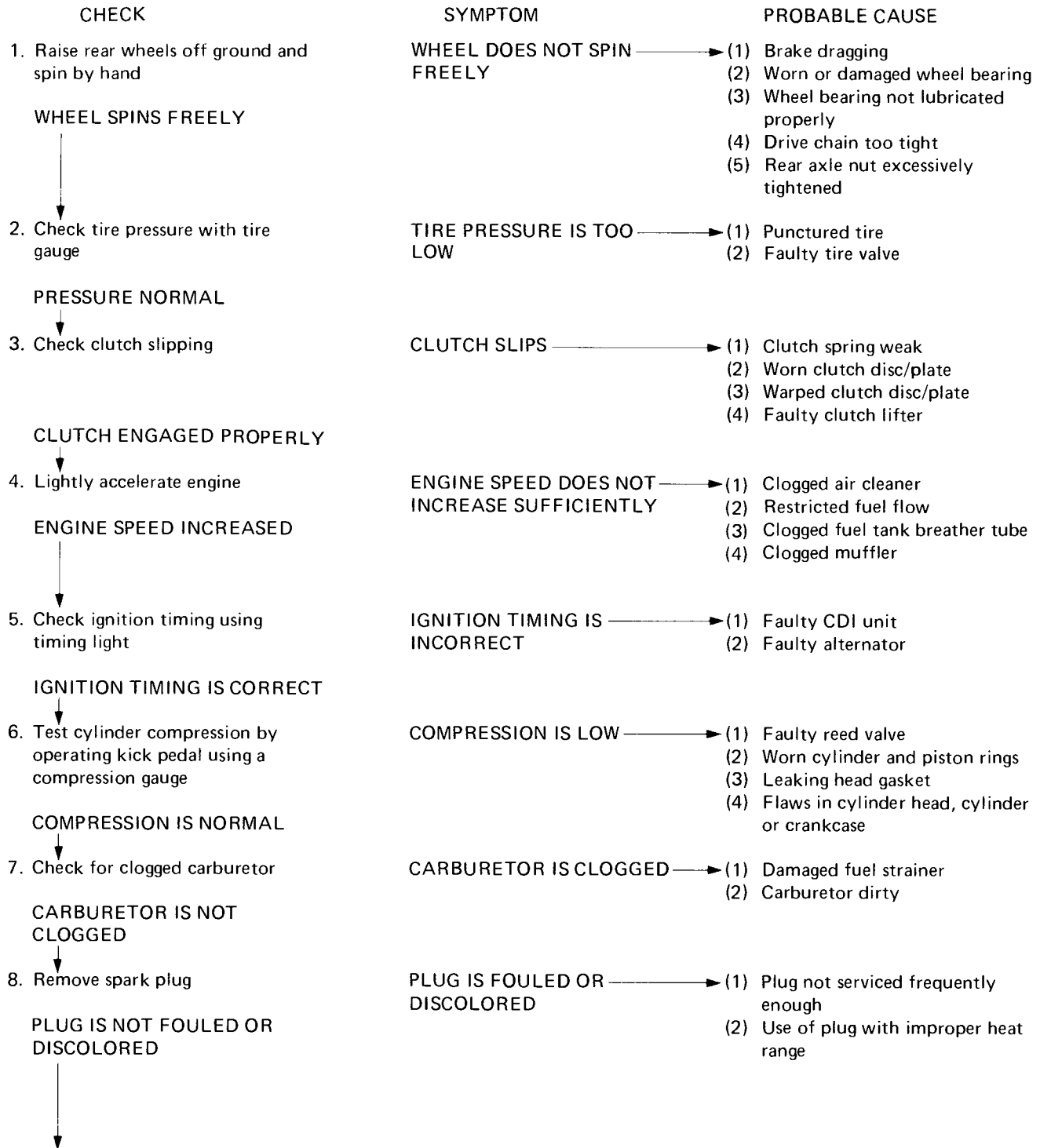
16. TROUBLESHOOTING

ENGINE DOES NOT START OR IS HARD TO START	16-1
ENGINE LACKS POWER	16-2
POOR PERFORMANCE AT LOW AND IDLE SPEEDS	16-3
POOR PERFORMANCE AT HIGH SPEEDS	16-4
POOR HANDLING	16-4

ENGINE DOES NOT START OR IS HARD TO START

CHECK	SYMPTOM	PROBABLE CAUSE
1. Check if fuel is reaching carburetor	NO FUEL TO CARBURETOR	(1) No fuel in fuel tank (2) Clogged fuel line or fuel filler on Carburetor (3) Clogged carburetor float valve (4) Clogged fuel tank cap breather tube
FUEL TO CARBURETOR ↓		
2. Remove spark plug	WET	(1) Carburetor flooded (2) Carburetor starter valve stuck open (3) Damaged starter valve seat (4) Throttle valve adjusted to low
DRY ↓		
3. Test spark	NO SPARK OR SPARK IS WEAK	(1) Faulty spark plug (2) Fouled spark plug (3) Faulty CDI unit (4) Broken or shorted spark plug wire (5) Broken or shorted ignition coil (6) Faulty engine stop switch (7) Faulty Alternator (8) Faulty pulse generator
SPARK JUMPS ↓		
4. Test cylinder compression by operating kick pedal	LOSS OF COMPRESSION	(1) Piston rings stuck (2) Flaw in casting (3) Compression leak (4) Faulty or clogged reed valve (5) Worn cylinder and piston rings (6) Blown cylinder head gasket
COMPRESSION IS NORMAL ↓		
5. Start by following normal starting procedure	ENGINE FIRES BUT STOPS SOON	(1) Excessively open bystarter (choke) (2) Starter valve stuck opened (3) Air leaking past intake pipe (4) Improper Ignition timing (CDI unit or pulse generator faulty)
ENGINE DOES NOT FIRE ↓		
6. Restart with bystarter (choke) applied		

ENGINE LACKS POWER



CHECK	SYMPTOM	PROBABLE CAUSE
<p>9. Check oil level. Also check oil for contamination</p> <p>TRANSMISSION IS FILLED TO PROPER LEVEL</p>	OIL LEVEL INCORRECT	<p>(1) Oil level too high</p> <p>(2) Oil level too low</p> <p>(3) Contaminated oil</p>
<p>10. Check if engine overheats</p> <p>ENGINE IS NOT OVERHEATED</p>	ENGINE OVERHEATS	<p>(1) Excessive carbon build-up in combustion chamber</p> <p>(2) Use of improper quality fuel</p> <p>(3) Mixture too lean</p> <p>(4) Clutch slipping</p>
<p>11. Accelerate or run at high speed</p> <p>ENGINE DOES NOT KNOCK</p>	ENGINE KNOCKS	<p>(1) Worn piston and cylinder</p> <p>(2) Fuel-air mixture too lean</p> <p>(3) Excessive carbon build-up in combustion chamber</p> <p>(4) Ignition timing too advanced (Faulty CDI unit)</p>

POOR PERFORMANCE AT LOW AND IDLE SPEEDS

<p>1. Check ignition timing</p> <p>NORMAL</p>	INCORRECT	<p>(1) Faulty CDI unit</p> <p>(2) Faulty pulse generator</p>
<p>2. Check carburetor air screw adjustment</p> <p>NORMAL</p>	INCORRECT	<p>(1) Fuel-air mixture too lean (To correct, turn screw out)</p> <p>(2) Fuel-air mixture too rich (To correct, turn screw in)</p>
<p>3. Air is leaking past carburetor gasket</p> <p>NOT LEAKING</p>	LEAKING	<p>(1) Deteriorated insulator or reed valve gasket</p> <p>(2) Loose carburetor</p>
<p>4. Remove spark plug and try spark test</p> <p>GOOD SPARK</p>	WEAK OR INTERMITTENT SPARK	<p>(1) Faulty, carbon or wet fouled spark plug</p> <p>(2) Faulty CDI unit</p> <p>(3) Faulty alternator</p> <p>(4) Faulty ignition coil</p> <p>(5) Broken or shorted spark plug wire</p>

TROUBLESHOOTING

POOR PERFORMANCE AT HIGH SPEEDS

CHECK	SYMPTOM	PROBABLE CAUSE
1. Check ignition timing	INCORRECT	(1) Faulty CDI unit (2) Faulty pulse generator
↓ PROPER		
2. Disconnect fuel tube at carburetor	FUEL FLOW RESTRICTED	(1) Lack of fuel in tank (2) Clogged fuel line (3) Clogged fuel tank breather tube (4) Clogged fuel valve
↓ FUEL FLOWS OUT FREELY		
3. Remove air cleaner	FOULED	Not cleaned frequently enough
↓ AIR CLEANER NOT FOULED		
5. Check carburetor jet for clogging	CLOGGED	Contaminants in the fuel
↓ NOT CLOGGED		
6. Replace carburetor main jet	CONDITION WORSE	Jet size wrong, rejet in the opposite direction

POOR HANDLING

CHECK	SYMPTOM	PROBABLE CAUSE
1. If steering is heavy	Check tire pressure	(1) Steering head adjuster too tight (2) Damaged steering stem bearing (3) Bent steering stem
2. If either wheel is wobbling		(1) Excessive wheel bearing play (2) Distorted rim (3) Improperly installed wheel hub (4) Swing arm pivot bearing and bushing excessively worn (5) Distorted frame (6) Improper drive chain adjustment (7) Bent axle
3. If the vehicle pulls to one side		(1) Rear tire pressure not equal (2) Bent front fork (3) Bent swing arm
4. If the front suspension too soft		(1) Weak springs (2) Insufficient front fork oil
5. If the front suspension is hard		(1) Incorrect front fork oil: (viscosity too high) (2) Excessive front fork fluid (3) Excessive fork air pressure
6. If the rear suspension too soft		(1) Weak spring (2) Improper rear suspension adjustment (3) Insufficient nitrogen gas pressure
7. If the rear suspension is hard		(1) Improper rear suspension adjustment (2) Bent shock absorber rod