HONDA

SERVICE MANUAL

86-89

TRX 250R

FOURTRAX® 250R

IMPORTANT SAFETY NOTICE

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

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

NOTE: Gives helpful information.

Detailed descriptions of standard workshop procedures, safety principles and service operations are not included. It is important to note that this manual contains *some* warnings and cautions against some specific service methods which could cause **PERSONAL INJURY** to service personnel or could damage a vehicle or render it unsafe. Please understand that those warnings could not cover 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 FOURTRAX, while sections 3 through 15 describe parts of the FOURTRAX, 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.

HONDA MOTOR CO., LTD.
Service Publications Office

CONTENTS

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1. GENERAL INFORMATION

GENERAL SAFETY

WARNING

If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in a closed area. The exhaust contains poisonous carbon monoxide gas that can cause loss of consciousness and may lead to death.

CAUTION

Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this is unlikely unless you handle used oil on a daily basis, it is still adviseable to thoroughly wash your hands with soap and water as soon as possible after handling used oil.

WARNING

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

WARNING

Inhaled ashbestos fibers have been found to cause respiratory disease and cancer. Never use an air hose or dry brush to clean brake or clutch assemblies. In the united states, Use an OSHA-approved vacuum cleaner or alternate method approved by OSHA designed to minimize the hazard caused by airborne asbestos fibers.

SERVICE RULES

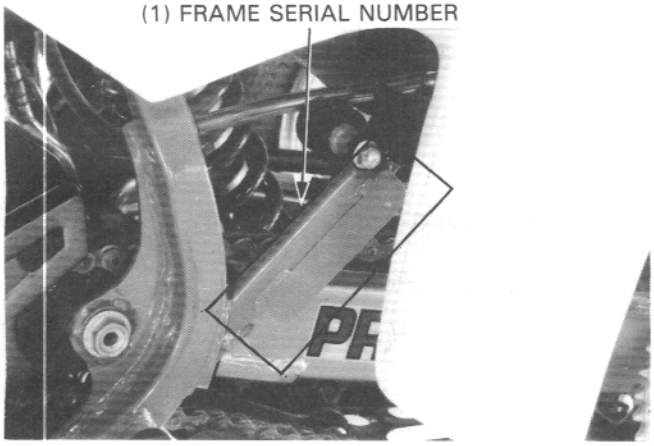
1. Use genuine HONDA or HONDA-recommended parts and lubricants or their equivalent. Parts that do not meet HONDA's design specifications may damage the Fourtrax.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Install new gaskets, O-rings, cotter pins, lock plates, etc. when reassembling.
4. When torquing a series of 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 Fourtrax. Metric bolts, nuts, and screws are not interchangeable with English fasteners. The use of incorrect tools and fasteners may damage the Fourtrax.
9. Route all electrical wires and control cables as shown on page 1-9 through 1-14 Cable and Harness Routing.

MODEL IDENTIFICATION

'86 shown: '87 similar

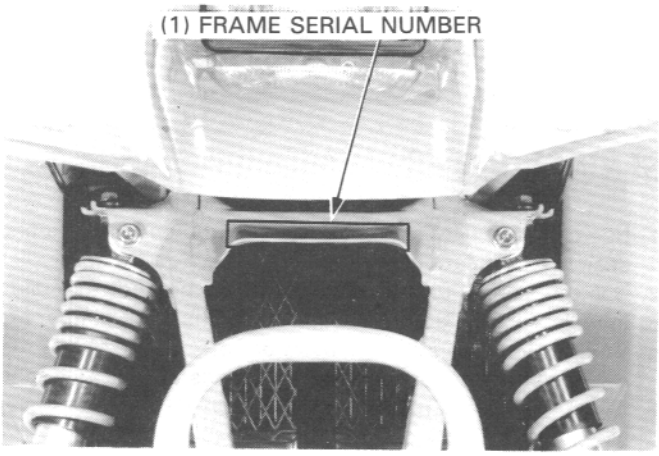
After '87:

'86, '87:

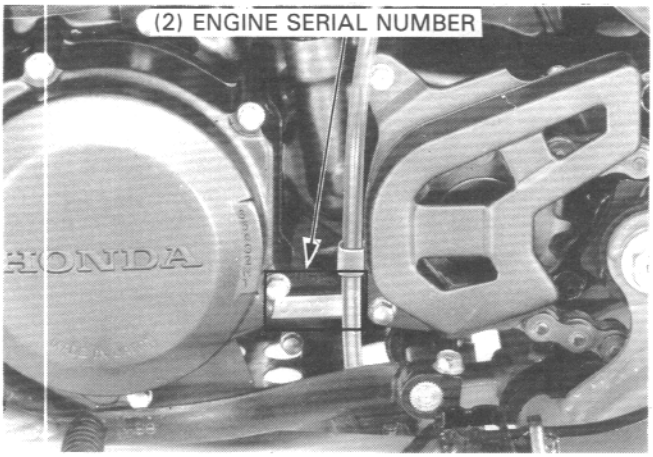


The frame serial number is stamped on the frame left side.

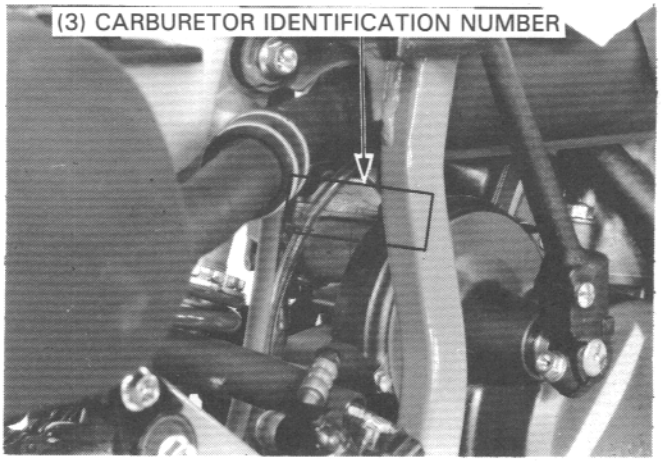
After '87:



The frame serial number is stamped on the frame front side.



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



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

SPECIFICATIONS

DIMENSIONS	Overall length		'86, '87:	1,825 mm (71.9 in)
			After '87:	1,840 mm (72.4 in)
	Overall width		'86, '87:	1,130 mm (44.5 in)
			After '87:	1,160 mm (45.7 in)
	Overall height		'86, '87:	1,070 mm (42.1 in)
			After '87:	1,080 mm (42.5 in)
	Wheelbase		'86, '87:	1,295 mm (51.0 in)
			After '87:	1,265 mm (49.8 in)
	Seat height		'86, '87:	775 mm (30.5 in)
			After '87:	790 mm (31.1 in)
	Foot peg height		'86, '87:	330 mm (13.0 in)
			After '87:	340 mm (13.4 in)
	Ground clearance			110 mm (4.3 in)
	Dry weight	Front	'86, '87:	75 kg (165.3 lb)
			After '87:	73 kg (160.9 lb)
		Rear		74 kg (163.1 lb)
	Weight distribution	Front	'86, '87:	106 kg (233.7 lb)
			After '87:	101 kg (222.7 lb)
		Rear	'86, '87:	131 kg (288.8 lb)
			After '87:	133 kg (293.2 lb)
FRAME	Type			Cradle
	Front suspension, travel			Double wish-bone, 200 mm (7.9 in)
	Rear suspension, travel			Swingarm, Pro-link, 230 mm (9.1 in)
	Rim size	Front		10 x 5.5
		Rear		9 x 8.0 AT
	Tire size	Front	'86, '87:	21 x 7.00-10
			After '87:	AT22 x 7.00-10☆☆
		Rear	'86, '87:	20 x 10.00-9
			After '87:	AT20 X 10.00-9☆
	Tire pressure	Front		4.0 psi (0.275 kg/cm², 27.5 kPa)
		Rear	'86, '87:	2.9 psi (0.2 kg/cm², 20 kPa)
			After '87:	3.3 psi (0.225 kg/cm², 22.5 kPa)
	Front brake, lining swept area			Single disc (twin piston), 392.9 cm² (60.9 sq-in) x 2
	Rear brake, lining swept area			Single disc (twin piston), 259.8 cm² (40.3 sq-in)
	Fuel capacity			10.0 ℓ (2.64 U.S. gal., 2.20 Imp. gal.)
	Fuel reserve capacity			2.0 ℓ (0.53 U.S. gal., 0.44 Imp. gal.)
	Toe-in			10 mm (0.4 in)
	Caster angle		'86, '87:	6°
			After '87:	4°40'
	Camber			0°
	Trail length		'86, '87:	27 mm (1.06 in)
			After '87:	21 mm (0.83 in)
	Tread	Front		910 mm (35.8 in)
		Rear	'86, '87:	870 mm (34.3 in)
			After '87:	900 mm (35.4 in)
ENGINE	Type			Liquid cooled 2-stroke
	Cylinder arrangement			7° inclined from vertical, single
	Engine dry weight			26.0 kg (57.3 lb)
	Bore x stroke			66.0 x 72.0 mm (2.60 x 2.83 in)
	Displacement			246 cm³ (15.01 cu-in)
	Compression ratio		'86:	7.5 : 1
			After '86:	7.7 : 1
	Transmission oil capacity			0.7 ℓ (0.74 U.S. qt., 0.62 Imp. qt.) at disassembly
				0.6 ℓ (0.63 U.S. qt., 0.53 Imp. qt.) after draining
	Lubrication system			Gasoline/oil mixture
	Fuel required			Gasoline-oil ratio 20 : 1 (pre-mixed) (RON, 92-100)
	Air filtration			Oiled polyurethane foam
	Idle speed			1,500 ± 150 rpm

CARBURETOR	Type		Piston valve
	Identification number	'86:	PJ 05A
		'87:	PJ 07A
		'88:	PJ07B
		After '88:	PJ07C
	Main Jet	'86:	#150
		'87:	#152
		'88:	#158
		After '88:	#155
	Venturi diameter		34 mm (1.3 in)
	Slow jet	'86, '87:	#48
		'88:	#45
		After '88:	#42
	Float level		16 mm (0.63 in)
	Air screw initial opening	'86, 87:	1-7/8 turns out
		'88:	1-3/4 turns out
		After '88:	1-1/2 turns out
	Jet needle	'86, After 88:	4th groove
		'87, '88:	3rd groove
DRIVE TRAIN	Clutch		Wet multi-plate type
	Transmission		6-speed, constant mesh
	Primary reduction ratio		2.652 (61/23)
	Gear ratios I		2.570 (36/14)
	II		2.062 (33/16)
	III		1.667 (30/18)
	IV		1.333 (28/21)
	V	'86:	1.083 (26/24)
		After '86:	1.087 (25/23)
	VI	'86:	0.884 (23/26)
		After '86:	0.920 (23/25)
	Final reduction ratio	'86, '87:	3.000 (39/13)
		After '87:	2.923 (38/13)
	Gearshift pattern		Left foot operated return system, 1-N-2-3-4-5-6
ELECTRICAL	Ignition system		CDI
	Ignition timing "F" mark	'86, '87:	19° BTDC/1,500±150 rpm
		After '87:	21° BTDC/1,500±150 rpm
	Starting system		Primary kick starter
	Alternator	'86-'88:	0.159 kW/5,000 rpm
		After '88:	0.154 kW/5,000 rpm
	Spark plug	'86, After '88: (STD)	BR8ES (NGK) RN3C (CHAMPION)
		'87, '88: (STD)	BR9ES (NGK) RN2C (CHAMPION)
	Spark plug		0.7—0.8 mm (0.028—0.031 in)
	Tailight	'86:	12 V—8 W
		After '86:	12 V—5 W
		Headlight	12 V—55/60 W

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	20–24 (2.0–2.4, 14–17)	
Transmission 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 nut	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 '86–'88:	1	6	8–12 (0.8–1.2, 6–9)	
Water pump impeller After '88:	1	6	10–14 (1.0–1.4, 7–10)	
Spark plug	1	14	15–20 (1.5–2.0, 11–14)	
Coolant drain bolt	2	6	8–12 (0.8–1.2, 6–9)	

CHASSIS

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kg-m, ft-lb)	REMARKS
Gearshift pedal bolt	1	6	10–14 (1.0–1.4, 7–10)	
Kick starter pedal pinch bolt	1	8	20–35 (2.0–3.5, 14–25)	
Parking brake adjust bolt lock nut	1	8	15–20 (1.5–2.0, 11–14)	
Front wheel hub nut '86, '87:	2	18	80–120 (8.0–12.0, 58–72)	
After '87:	2	14	60–80 (6.0–8.0, 43–58)	
Tie-rod ball joint nut	4	10	40–50 (4.0–5.0, 29–36)	
Tie-rod lock nut	4	12	50–60 (5.0–6.0, 36–43)	
Front arm ball joint nut ('86, '87 only:)	2	14	60–80 (6.0–8.0, 43–58)	
Knuckle arm nut ('86, '87 only:)	4	10	60–70 (6.0–7.0, 43–51)	
Front arm nut	4	12	50–60 (5.0–6.0, 36–43)	
Front arm mounting bolt '86, After '87:	8	10	35–45 (3.5–4.5, 25–33)	
'87:	8	10	50–60 (5.0–6.0, 36–43)	
Front shock absorber mounting bolt	4	10	40–50 (4.0–5.0, 29–36)	
Steering shaft nut	1	14	60–80 (6.0–8.0, 43–58)	
Handlebar lower holder mounting nut	2	10	40–50 (4.0–5.0, 29–36)	
Steering shaft holder bolt	4	8	25–30 (2.5–3.0, 18–22)	
Rear axle outer lock nut	1	48	80–100 (8.0–10.0, 58–72)	left hand threads
Rear axle inner lock nut	1	48	120–140 (12.0–14.0, 87–101)	left hand threads
Rear wheel hub nut	2	20	120–170 (12.0–17.0, 87–123)	apply oil or grease to threads
Front, rear wheel nut	16	10	60–70 (6.0–7.0, 43–51)	tapered nut
Handlebar upper holder bolt	4	8	24–30 (2.4–3.0, 17–22)	

ITEM	Q'TY (After '87)	THREAD DIA. (mm)	TORQUE N·m (kg-m, ft-lb)	REMARKS
Front disc socket bolt	8(6)	6	14–16 (1.4–1.6, 10–12)	
Front brake caliper mounting bolt	4	8	20–30 (2.0–3.0, 14–22)	
Brake hose oil bolt	5	10	25–35 (2.5–3.5, 18–25)	
Bleed valve	3	7	4–7 (0.4–0.7, 3–5)	
Rear disc socket bolt	4	8	35–40 (3.5–4.0, 25–29)	
Pad pin bolt	4	8	15–20 (1.5–2.0, 10–14)	
Pad pin bolt plug	4	8	10–20 (1.0–2.0, 7–14)	
Rear caliper bracket mounting bolt	2	8	28–34 (2.8–3.4, 20–25)	
Rear caliper mounting bolt	1	8	20–25 (2.0–2.5, 14–18)	
Front brake pipe nut	2	10	15–20 (1.5–2.0, 11–14)	
Brake hose joint				
(hose side) ('86, '87 only:)	2	10	12–15 (1.2–1.5, 9–11)	
(joint side) ('86, '87 only:)	2	10	30–40 (3.0–4.0, 22–29)	
Three-way joint mounting bolt	2 (1)	6	10–14 (1.0–1.4, 7–10 ft-lb)	
Front master cylinder holder	2	6	10–14 (1.0–1.4, 7–10 ft-lb)	
Master cylinder cover screw	4	4	1–2 (0.1–0.2, 0.7–1.4)	
Parking brake attaching bolt	2	8	20–25 (2.0–2.5, 14–18)	
Shock absorber hose oil bolt	2	10	28–32 (2.8–3.2, 20–23)	
Compression damping valve	1	——	15–20 (1.5–2.0, 11–14)	
Rear shock absorber mounting bolt				
(upper)	1	10	45–55 (4.5–5.5, 33–40)	
(lower)	1	12	70–80 (7.0–8.0, 51–58)	
Shock arm pivot bolt	1	12	70–80 (7.0–8.0, 51–58)	
Shock link pivot bolt	1	12	70–80 (7.0–8.0, 51–58)	
Swingarm pivot nut	1	14	70–110 (7.0–11.0, 51–80)	
Swingarm bearing holder socket bolt	2 (4)	8	19–23 (1.9–2.3, 14–17)	Apply oil or grease to threads
Driven sprocket bolt	4	10	47–55 (4.7–5.5, 34–40)	Apply locking agent to threads
Engine hanger plate and pipe bolt	8	8	25–35 (2.5–3.5, 18–25)	
Engine mounting bolt	5 (4)	10	50–60 (5.0–6.0, 36–43)	
Foot peg mounting bolt				
('86, '87 only:)	4	10	50–60 (5.0–6.0, 36–43)	
Shock absorber spring lock nut	1	——	80–100 (8.0–10.0, 58–72)	
Skid plate	4	8	28–34 (2.8–3.4, 20–25)	
Radiator hose band	6	——	0.7–1.0 (0.07–0.1, 0.5–0.7)	
Rear brake torque bolt (After '87:)	1	12	50–60 (5.0–6.0, 36–43)	Apply locking agent

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

STANDARD TORQUE VALUES

ITEM	TORQUE N·m (kg-m, ft-lb)	ITEM	TORQUE N·m (kg-m, ft-lb)
5 mm bolt and nut	4.5–6 (0.45–0.6, 3–4)	5 mm screw	3.5–5 (0.35–0.5, 2–4)
6 mm bolt and nut	8–12 (0.8–1.2, 6–9)	6 mm screw and 6mm 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. SECT.
Camber/caster gauge attachment	07910—MJ30100	Not available in U.S.A.		3
Crankcase puller	07973—4300000			8
Bearing remover, 17mm	07936—3710300			6, 8
Remover handle	07936—3710100			6, 8
Remover weight	07741—0010201	Remover weight	07936—3710200	6, 8
Assembly bolt	07965—1660200			8
Thread adapter	07965—KA30000			8
Driveshaft dis/assembly tool (B)	07964—MB00200			8
Mechanical seal driver attachment	07945—4150400	Mechanical seal installer	GH—AH—065—415 (U.S.A. only)	9
Attachment, 28 x 30 mm	07946—1870100			9 12 (After '87:)
Bearing remover set, 12 mm	07936—1660001	Not available in U.S.A.		9
—Remover weight	07741—0010201	Remover weight	07936—3710200	9
—Bearing spindle assy, 12 mm	07936—1660100			9
Universal bead breaker	GN—AH—958—BB1	(U.S.A only)		10
Ball joint remover	07941—6920003			10
Shock absorber compressor attachment	07959—MB10000			10
Shock absorber compressor attachment	07967—KC10100	Not available in U.S.A.		10
Lock nut wrench, 56mm	07916—HA20000	Lock nut wrench, 56 mm	07916—HA2010A (U.S.A. only)	11
Lock nut wrench, 45 mm	07916—1870101	Equivalent commercially available in U.S.A.		11
Valve wrench	07920—KA30001	Not available in U.S.A.		12
Needle bearing remover	07946—KA50000			12
Snap ring pliers	07914—3230001			13
Circuit tester (SANWA)	07308—0020000	Circuit tester (KOWA)	TH—5H	15
Digital multimeter	07411—0020000	Digital multimeter	KS—AHM—32—002 (U.S.A. only)	15
Spherical bearing driver	07HMF—HC00100			10
Bearing remover (After '87:)	07931—MA70000			12

COMMON

DESCRIPTION	TOOL NUMBER	ALTERNATE TOOL	TOOL NUMBER	REF. SECT.
Float level gauge	07401—0010000			3
Rotor puller	07733—0010000	Rotor puller	07933—0010000	6
Universal holder	07725—0030000			6
Clutch center holder	07724—0050001	Equivalent commercially available in U.S.A.		7
Gear holder	07724—0010100	Not available in U.S.A.		7
Driver	07749—0010000			6,8,9,10,11,12
Attachment, 37 x 40 mm	07746—0010200			6,8,10
Pilot, 17 mm	07746—0040400			6,10
Attachment, 62 x 68 mm	07746—0010500			8,11
Pilot, 28 mm	07746—0041100			8
Attachment, 52 x 55 mm	07746—0010400			8
Pilot, 25 mm	07746—0040600			8
Pilot, 22 mm	07746—0041000			8
Pilot, 12 mm	07746—0040200			9
Bearing remover shaft	07746—0050100	Equivalent commercially		10
Bearing remover head, 20 mm	07746—0050600	available in U.S.A.		10
				12 (After '87)
Attachment, 42 x 47 mm	07746—0010300			10
Pilot, 20 mm	07746—0040500			10
				12 (After '87)
Bearing remover shaft (After '87:)	07GGD—0010100			12
Tire bead breaker set	07772—0050001	Not available in U.S.A.		10
—Breaker arm	07772—0050200			
—Breaker arm compressor	07772—0050101			
Shock absorber compressor	07959—3290001	Shock absorber compressor	07GME—0010000	10
		-Compressor screw assebly	07GME—0010100	10
Pilot, 40 mm	07746—0040900			11
Attachment, 32 x 35 mm (After '87:)	07746—0010100			10
Pilot, 15 mm (After '87:)	07746—0040300			10

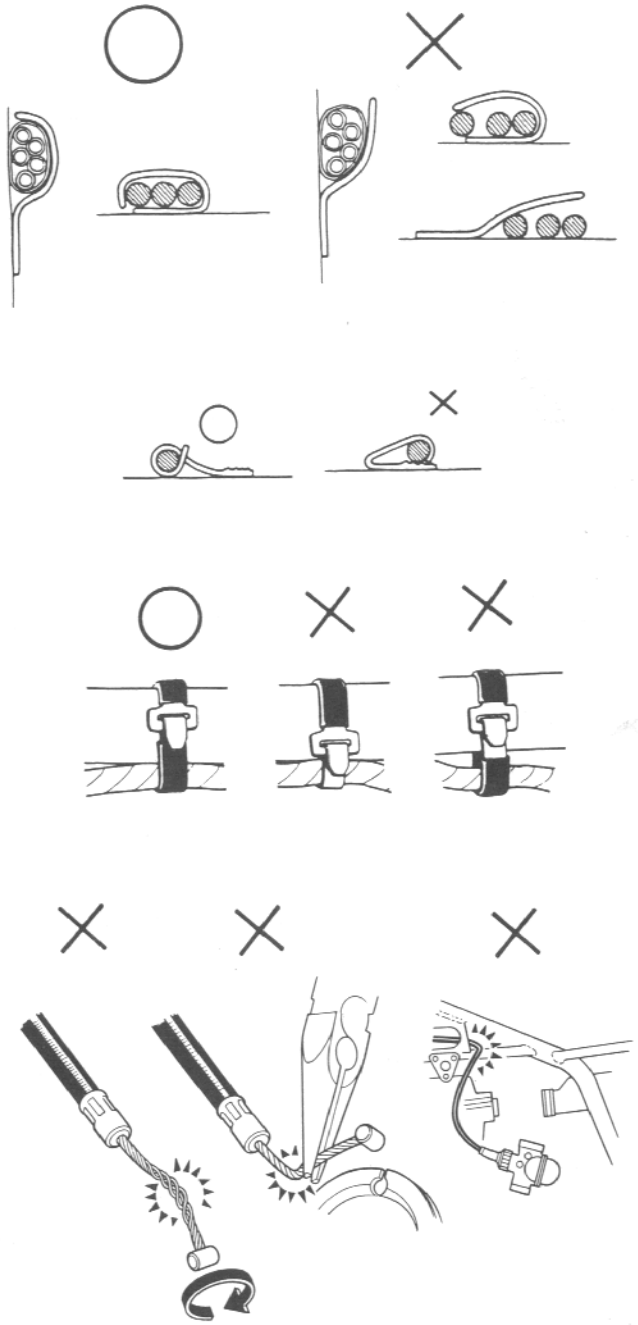
OPTIONAL TOOLS

DESCRIPTION	TOOL NUMBER	ALTERNATE TOOL	TOOL NUMBER	REF. SECT.
Pin spanner	89201—KA4—810			12
Pin spanner	89202—KA4—810			12

CABLE & HARNESS ROUTING

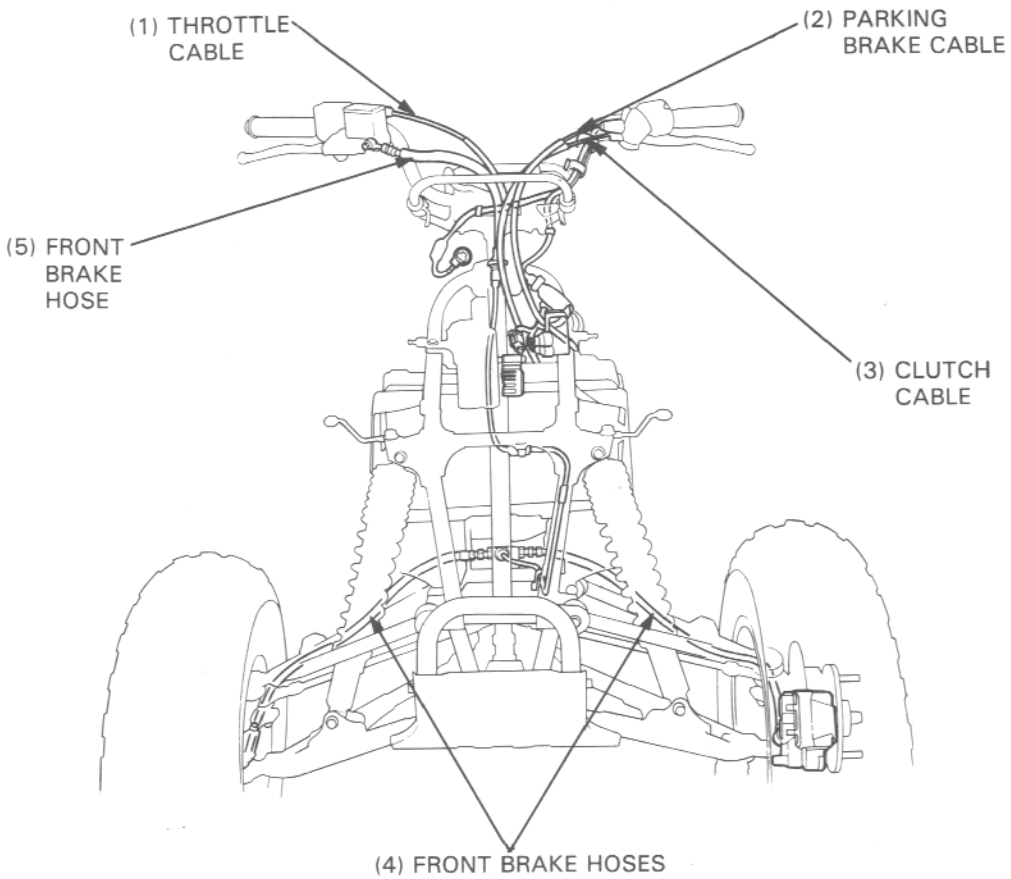
Note the following when routing cable and wire harness.

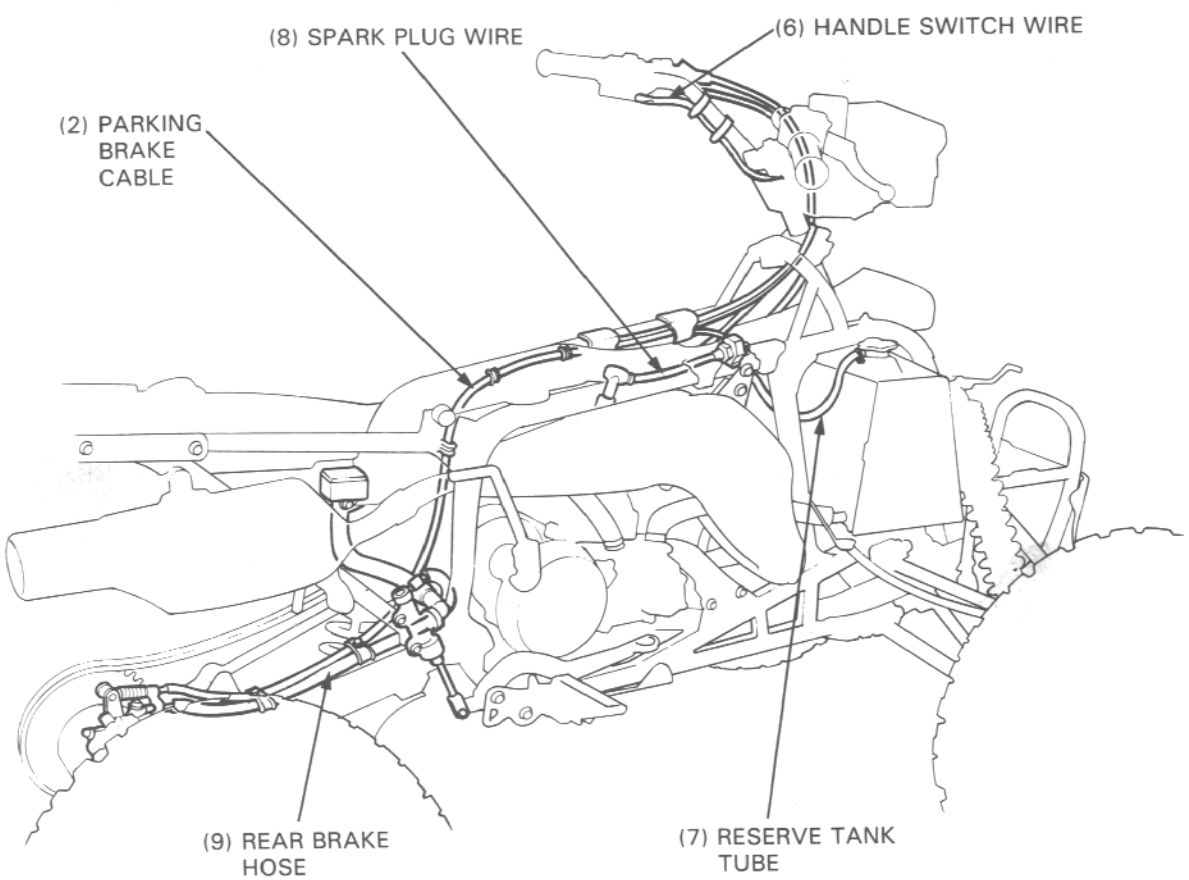
- A loose wire, harness or cable can be a safety hazard. After clamping, check each wire to be sure it is secure.
- Do not squeeze wires against the weld or end of its clamp.
- Secure wires and wire harness to the frame with their respective wire bands at the designated locations. Tighten the bands so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



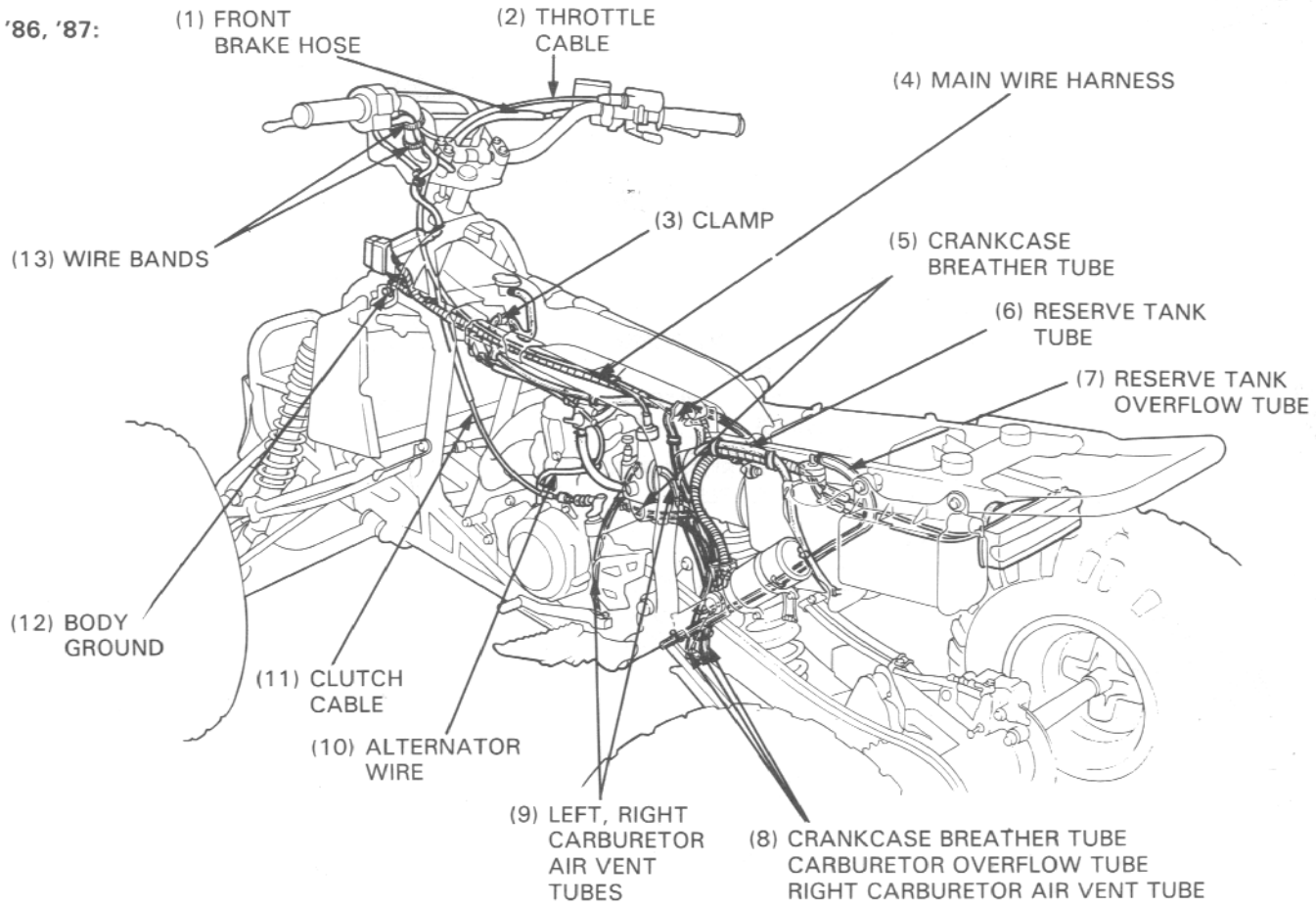
○: CORRECT
×: INCORRECT

'86, '87

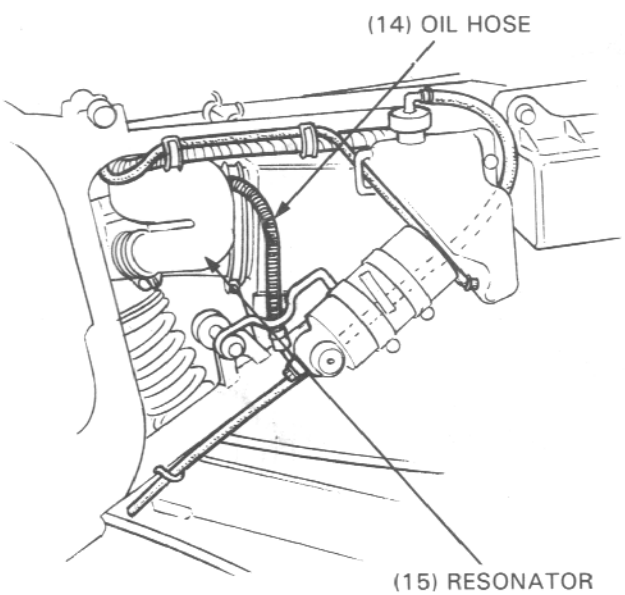

(1) THROTTLE CABLE
(2) PARKING BRAKE CABLE
(5) FRONT BRAKE HOSE
(3) CLUTCH CABLE
(4) FRONT BRAKE HOSES


(8) SPARK PLUG WIRE
(6) HANDLE SWITCH WIRE
(2) PARKING BRAKE CABLE
(9) REAR BRAKE HOSE
(7) RESERVE TANK TUBE

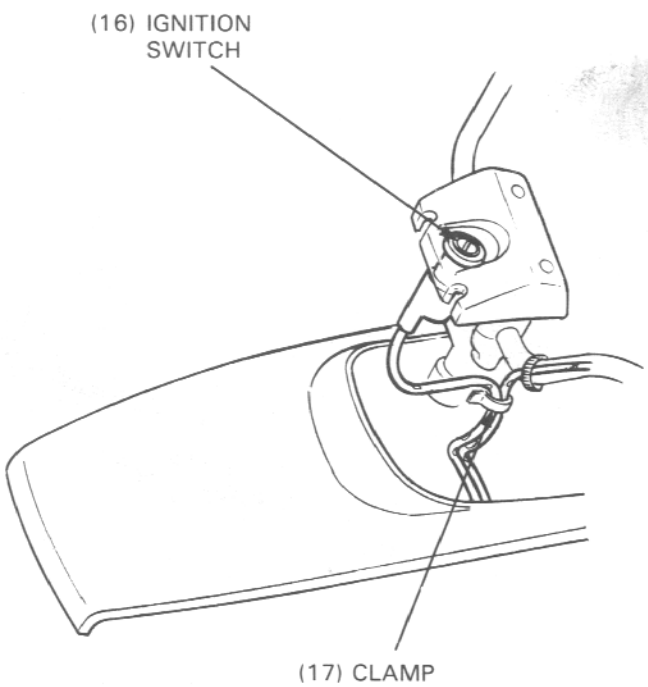
'86, '87:



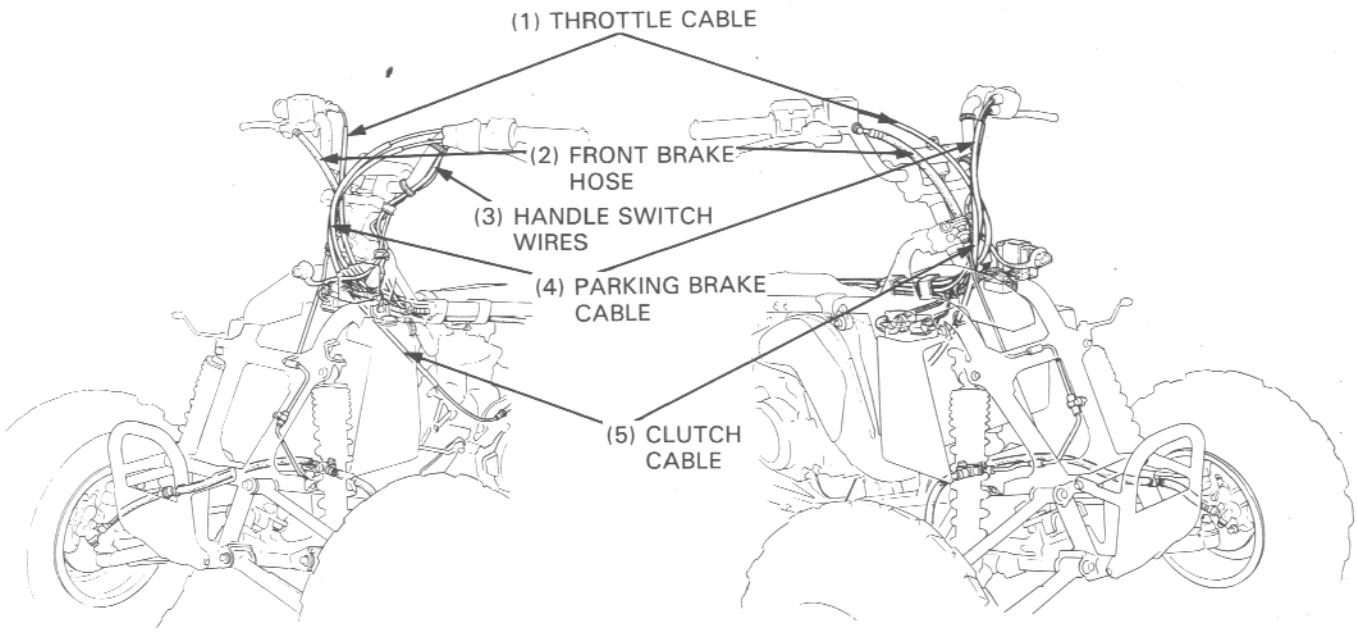
After '86:

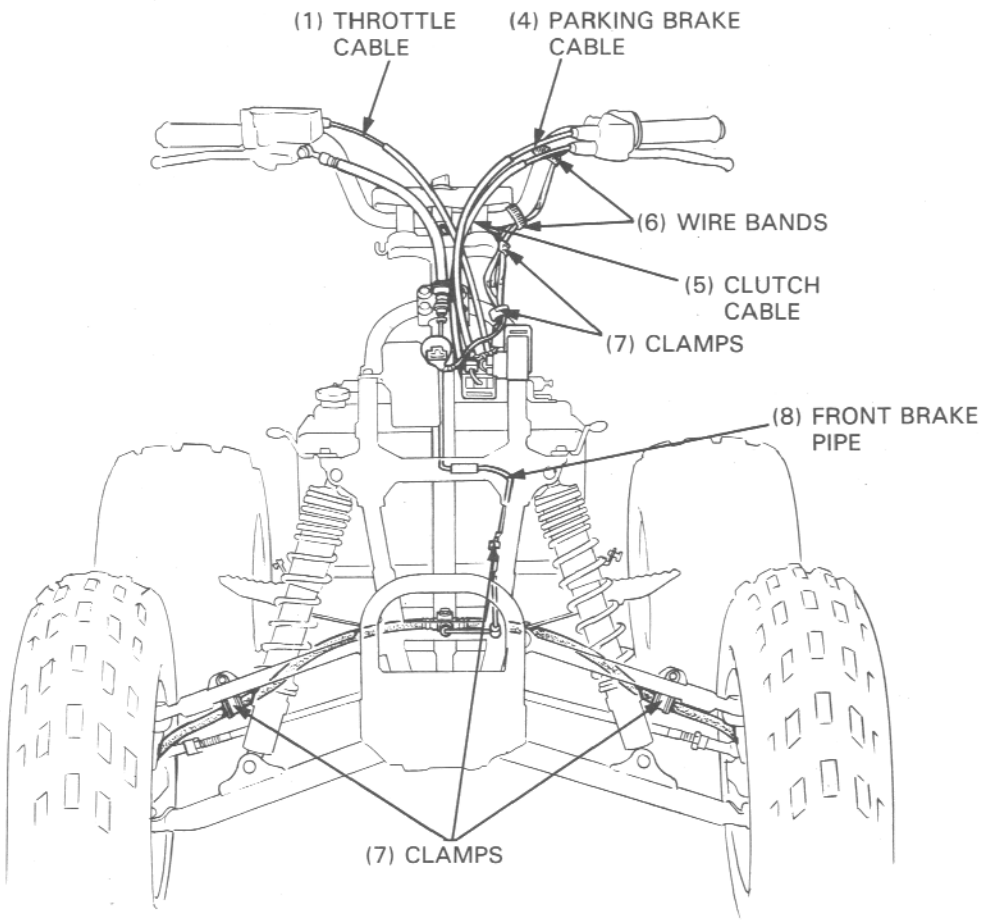


'87:

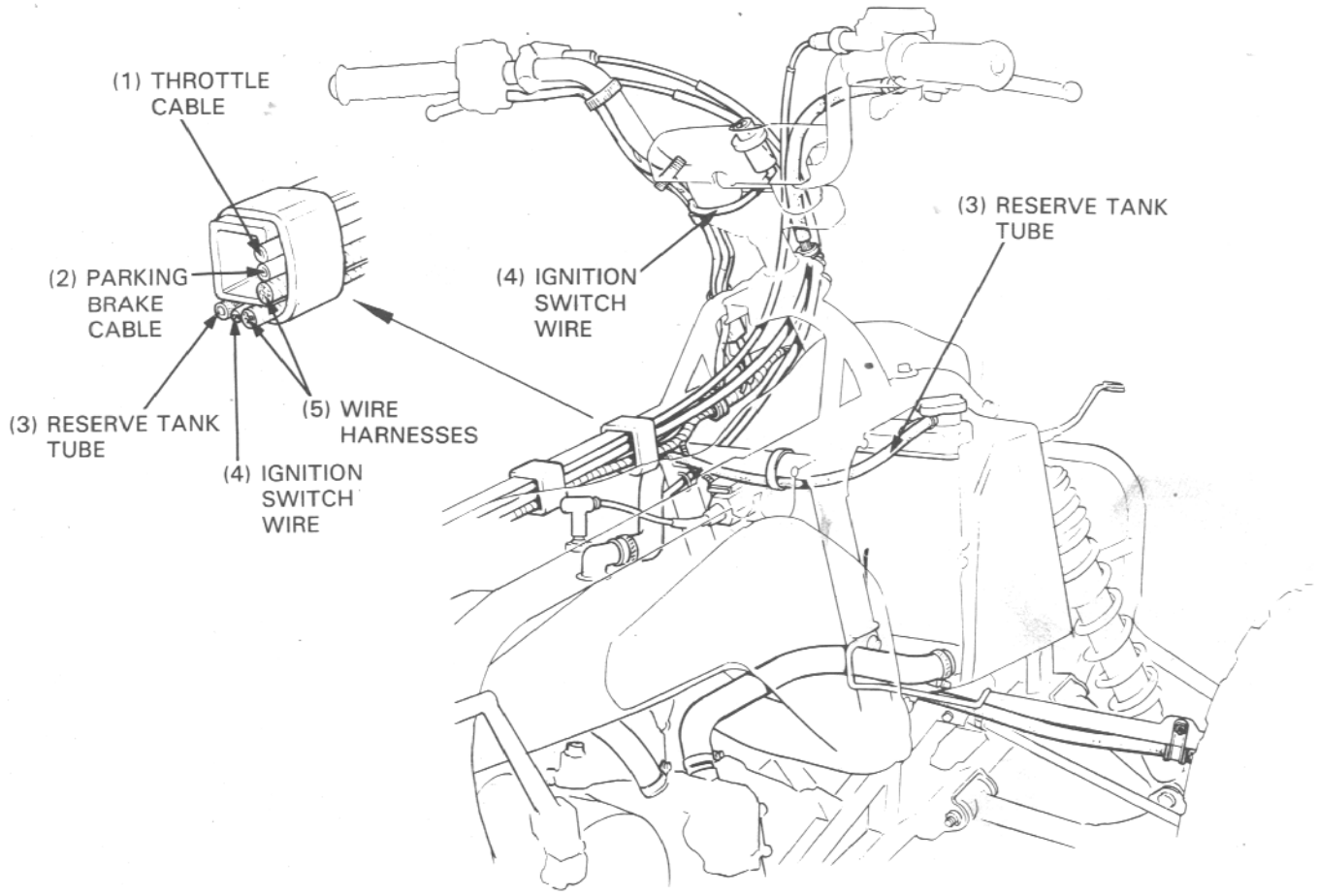


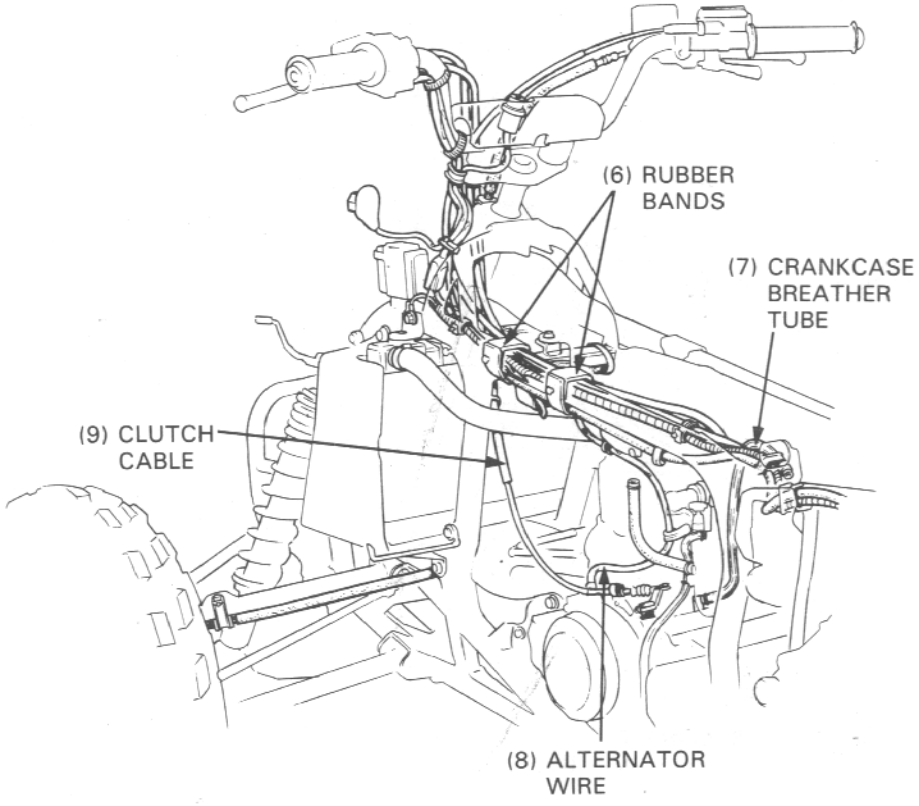
After '87:


(1) THROTTLE CABLE
(2) FRONT BRAKE HOSE
(3) HANDLE SWITCH WIRES
(4) PARKING BRAKE CABLE
(5) CLUTCH CABLE

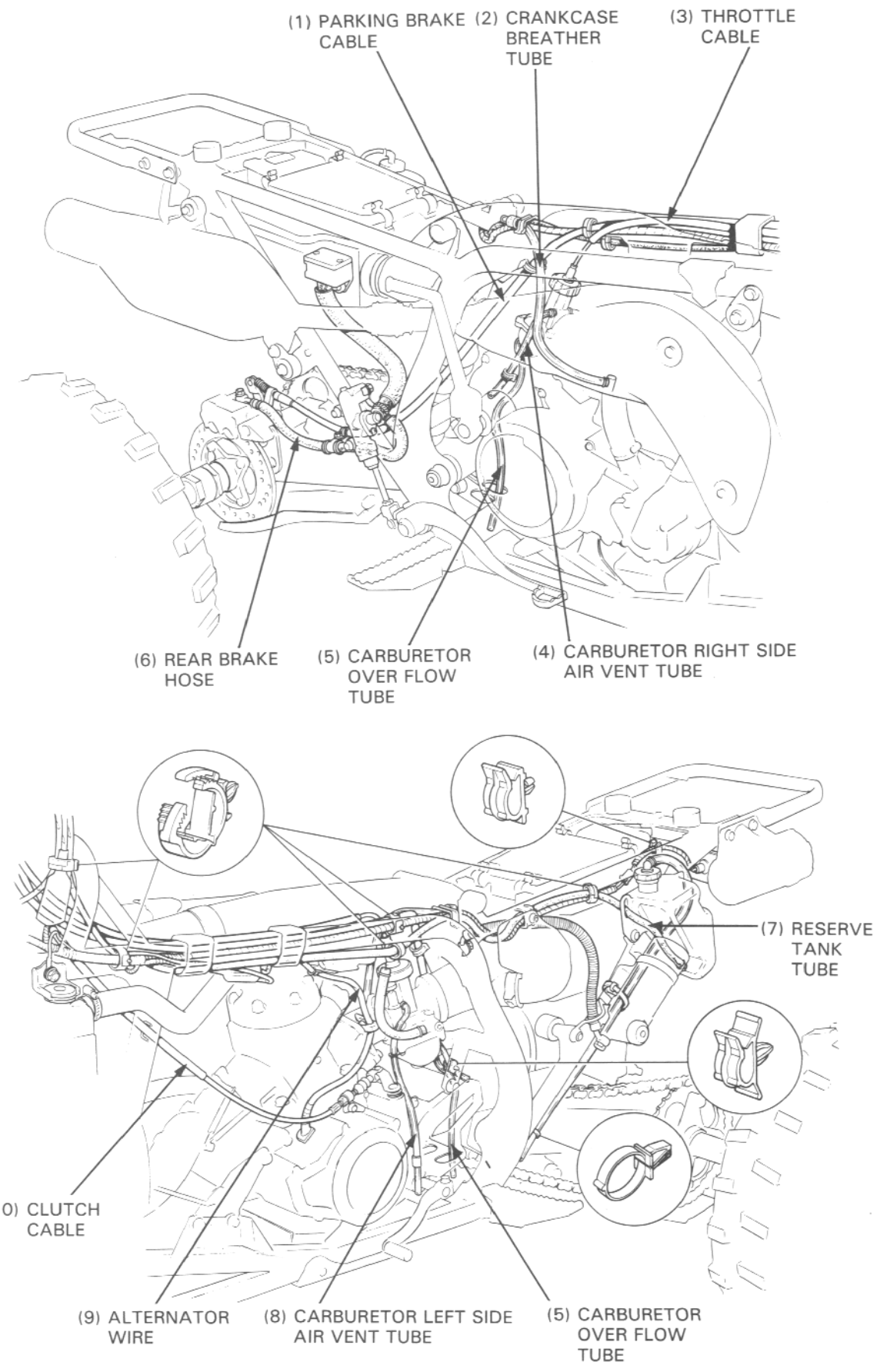

(1) THROTTLE CABLE
(4) PARKING BRAKE CABLE
(6) WIRE BANDS
(5) CLUTCH CABLE
(7) CLAMPS
(8) FRONT BRAKE PIPE
(7) CLAMPS

After '87:


(1) THROTTLE CABLE
(2) PARKING BRAKE CABLE
(3) RESERVE TANK TUBE
(4) IGNITION SWITCH WIRE
(5) WIRE HARNESSES
(3) RESERVE TANK TUBE
(4) IGNITION SWITCH WIRE


(6) RUBBER BANDS
(7) CRANKCASE BREATHER TUBE
(9) CLUTCH CABLE
(8) ALTERNATOR WIRE

After '87:


(1) PARKING BRAKE CABLE
(2) CRANKCASE BREATHER TUBE
(3) THROTTLE CABLE
(6) REAR BRAKE HOSE
(5) CARBURETOR OVER FLOW TUBE
(4) CARBURETOR RIGHT SIDE AIR VENT TUBE
(7) RESERVE TANK TUBE
(10) CLUTCH CABLE
(9) ALTERNATOR WIRE
(8) CARBURETOR LEFT SIDE AIR VENT TUBE
(5) CARBURETOR OVER FLOW TUBE

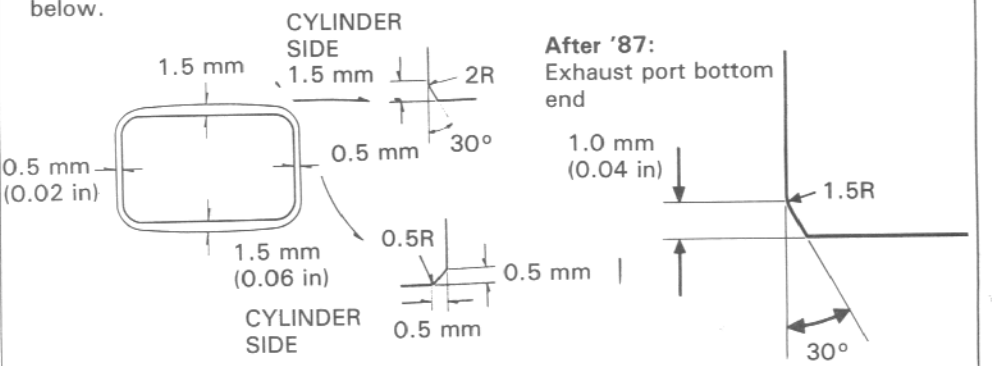
OPTIONAL PARTS LIST

ITEM	REMARKS
ENGINE ● Oversize pistons	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. Oversize rings 0.25 mm, 0.50 mm (2 sizes)

Oversize	Piston manufacturing tolerance mm (in)
0.25 mm (0.01 in)	66.20—66.22 (2.606—2.607)
0.50 mm (0.02 in)	66.45—66.47 (2.616—2.617)

Piston oversize	Cylinder I.D. Service limit mm (in)
0.25 mm (0.01 in)	66.32 (2.611)
0.50 mm (0.02 in)	66.57 (2.621)

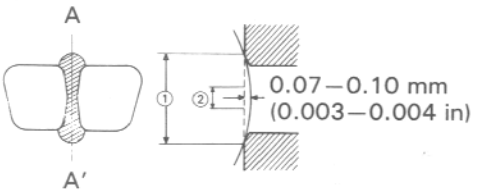
NOTE:
After reboring, remove all burrs from each port edge and chamber as indicated below.



Before reboring the cylinder, follow the contour of the exhaust port bridge with your fingers so that the original radius can be restored after boring. Radius the bridge with a stone or file.

CAUTION

- *Frailure to radius this bridge could cause a seized piston.*
- *Be careful not to damage the cylinder wall.*



'86, '87:
① 32.0—34.0 mm (1.26—1.34 in)
② Bridge width:
a straight 5.0 mm (0.20 in)

After '87:
① 38.0—44.0 mm (1.50—1.73 in)
② Bridge width:
a straight 5.0 mm (0.20 in)

CARBURETOR		
● Main jet	'86:	#145, #148, #152, #155
	'87:	#148, #150, #155, #158
	'88:	#152, #155, #160
	After '88:	#150, #152, #158
		(See page 3-12 for altitude and temperature adjustment)

MEMO

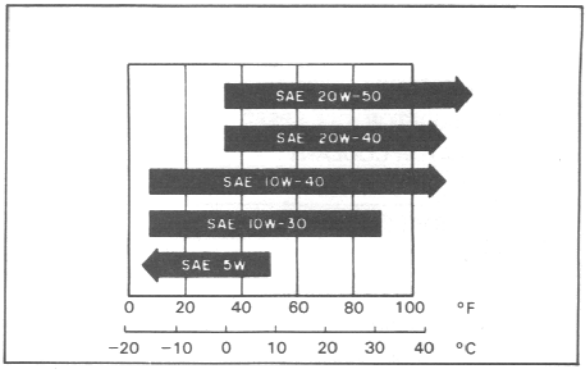
SERVICE INFORMATION

SPECIFICATIONS

Throttle lever free play:		3—8 mm (1/8—5/16 in)
Spark plug gap:		0.7—0.8 mm (0.028—0.031 in)
Recommended spark plug:	'86,After'88:	BR8ES (NGK) RN3C (CHAMPION)
	'87, '88:	BR9ES (NGK) RN2C (CHAMPION)
Carburetor idle speed:		1,500 ± 150 rpm
Recommended transmission oil:		Honda 4-stroke oil or equivalent
API Service Classification:		SE or SF
Viscosity:		10 W—40

NOTE

- Viscosity selection should be based on the average atmospheric temperature in your riding area. Change to the proper viscosity oil whenever the average atmospheric temperature changes substantially.



Oil capacity:		0.6 lit (0.63 U.S. qt., 0.53 Imp qt.) after draining 0.7 lit (0.74 U.S. qt., 0.62 Imp qt.) at disassembly
Drive chain slack:		30—40 mm (1-1/4—1-1/2 in)
Drive chain length ('86, '87: 95 pins, After '87: 91 pins)		Standard: '86, '87: 1,508 mm (59.4 in) After '87: 1,445 mm (56.9 in) Service limit: '86, '87: 1,515 mm (59.6 in) After '87: 1,452 mm (57.2 in)
Parking brake lever free play:	'86:	31—39 mm (1-1/4—1-1/2 in)
	After '86:	25—30 mm (1—1-1/4 in)
Clutch lever free play:		10—20 mm (3/8—3/4 in)
Tire size:	Front '86, '87:	21 x 7.00—10
	After '87:	AT 22 x 7.00—10 ☆☆
	Rear '86, '87:	20 x 10.00—9
	After '87:	AT 20 x 10.00—9 ☆
Recommended tire pressure:	Front	4.0 psi (0.275 kg/cm², 27.5 kPa)
	Rear: '86, '87:	2.9 psi (0.2 kg/cm², 20 kPa)
	After'87:	3.3 psi (0.225 kg/cm², 22.5 kPa)

Toe-in:		10 ± 10 mm (0.4 ± 0.4 in)
Camber:		0°
Caster:	'86, '87:	6°
	After '87:	4°40'
Cylinder compression:		1,177 ± 98 kPa (12.0 ± 1.0 kg/cm², 170 ± 15 psi)

TORQUE VALUES

Tie-rod lock nut	50—60 N·m (5.0—6.0 kg-m, 36—43 ft-lb)
Spark plug	15—20 N·m (1.5—2.0 kg-m, 11—14 ft-lb)
Transmission oil drain bolt	25—35 N·m (2.5—3.5 kg-m, 18—25 ft-lb)
Bearing holder socket bolt	19—23 N·m (1.9—2.3 kg-m, 14—17 ft-lb)
Parking brake adjust bolt lock nut	15—20 N·m (1.5—2.0 kg-m, 11—14 ft-lb)
Radiator hose band	0.7—1.0 N·m (0.07—0.1 kg-m, 0.5—0.7 ft-lb)

TOOL

Special

Camber/caster gauge attachment	07910—MJ30100 Not available in U.S.A.

MAINTENANCE SCHEDULE

The maintenance intervals shown in the following schedule are based on average riding conditions. FOURTRAX's subjected to severe use, or ridden in unusually wet or dusty areas, require more frequent servicing. Perform the Pre-ride Inspection at each scheduled maintenance period.

'86-'88:

I: Inspect and Clean, Adjust, Lubricate or Replace, if necessary
C: Clean R: Replace
A: Adjust L: Lubricate

			EVERY	INITIAL SERVICE PERIOD (First week of operation)	REGULAR SERVICE PERIOD (Every 30 operating days)	Refer to page
*	FUEL LINE		YEAR: I			2-4
*	THROTTLE OPERATION			I	I	2-4
	AIR CLEANER	'86, '87:	NOTE (1)		C	2-4
		After '87:	MONTH: C, NOTE (1)			
	AIR CLEANER CASE DRAIN TUBE		NOTE (2)		I	2-5
	SPARK PLUG				I	2-6
*	CARBURETOR IDLE SPEED			I	I	2-6
	RADIATOR COOLANT		2 YEARS: *R		I	2-6
*	COOLING SYSTEM				I	2-7
	TRANSMISSION OIL		2 YEARS: R		I	2-8
	DRIVE CHAIN		NOTE (1, 2)	I, L	I, L	2-9
	DRIVE CHAIN SLIDER				I	2-11
	BRAKE FLUID		2 YEARS: R		I	2-11
*	BRAKE PAD WEAR		YEAR: I, NOTE (1, 2)			2-12
	BRAKE SYSTEM			I	I	2-12
	SKID PLATE, GUARD PLATE (After '86)				I	2-13
*	CLUTCH SYSTEM			I	I	2-14
*	SUSPENSION				I	2-14
*	SPARK ARRESTER		NOTE (3)		C	2-15
*	NUTS, BOLTS, FASTENERS			I	I	2-16
**	WHEELS/TIRES			I	I	2-16
**	STEERING SHAFT HOLDER BEARINGS		YEAR: I			2-16
**	STEERING SYSTEM		YEAR: I			2-16

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

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

NOTES: (1) Service more frequently when riding in dusty areas, sand or snow.
(2) Service more frequently after riding in very wet or muddy conditions.
(3) U.S.A. only.

After '88:

	I: Inspect and Clean, Adjust, Lubricate or Replace, if necessary C: Clean R: Replace A: Adjust L: Lubricate	EVERY	INITIAL SERVICE PERIOD (First week of operation)	REGULAR SERVICE PERIOD (Every 30 operating days)	Refer to page
*	FUEL LINE	YEAR: I			2-4
*	THROTTLE OPERATION		I	I	2-4
	AIR CLEANER	NOTE (1)		C	2-4
	AIR CLEANER CASE DRAIN TUBE	NOTE (2)		I	2-5
	SPARK PLUG			I	2-6
*	CARBURETOR IDLE SPEED		I	I	2-6
	RADIATOR COOLANT	NOTE (3)		I	2-6
*	COOLING SYSTEM			I	2-7
	TRANSMISSION OIL	2 YEARS: R		I	2-8
	DRIVE CHAIN	NOTE (1, 2)	I, L	I, L	2-9
	DRIVE CHAIN SLIDER			I	2-11
	BRAKE FLUID	NOTE (3)		I	2-11
*	BRAKE PAD WEAR	YEAR: I NOTE (1, 2)			2-12
	BRAKE SYSTEM		I	I	2-12
	SKID PLATE, GUARD PLATE			I	2-13
*	CLUTCH SYSTEM		I	I	2-14
*	SUSPENSION			I	2-14
*	SPARK ARRESTER	NOTE (4)		C	2-15
*	NUTS, BOLTS, FASTENERS		I	I	2-16
**	WHEELS/TIRES		I	I	2-16
**	STEERING SHAFT HOLDER BEARINGS	YEAR: I			2-16
**	STEERING SYSTEM	YEAR: I			2-16

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

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

NOTES: (1) Service more frequently when riding in dusty areas, sand or snow.
(2) Service more frequently after riding in very wet or muddy conditions.
(3) Replace every 2 years. Replacement requires mechanical skill.
(4) U.S.A. only.

PERIODIC REPLACEMENT PARTS

The following table serves as a guide in replacing parts when machines are used for competition.

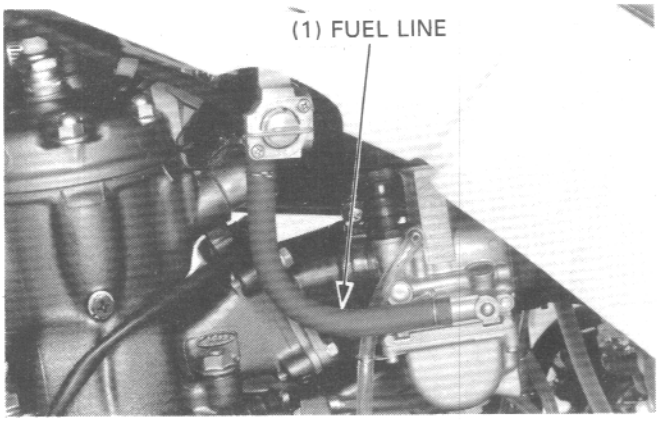
Part Name	Replace	Items to be checked
Piston	Every 30 Hours	Damage at skirt, wear
Piston pin	Every 30 Hours	Seizure, damage, wear
Piston rings	Every 30 Hours	Chipped end, wear
Connecting rod small end bearing	Every 30 Hours	Wear, damage
Spark plug	Every 20 Hours	Worn electrode, improper gap, cracked insulator
Transmission oil	Every 30 Hours	Contamination
* Sprockets	Every 20 Hours	Wear, damage
Chain slider	Every 30 Hours	Amount of recess: 2.0 mm max
* Drive chain	——	
* Chain master link	Every 30 Hours	Wear
Front brake pads	——	Wear indicator
Rear brake pads	——	Wear indicator
Front and rear brake fluid	Every year	Contamination
Master cylinder oil cap diagram	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	Every 30 Hours	Leakage
Clutch disc	——	Discoloration, wear
Exhaust chamber spring	——	Wear on hook
Skid plate	——	Damage
Guard plate	——	Damage

Machines subject to severe use, or ridden in unusually dusty or muddy areas, require more frequent servicing.

* If you are riding under extreme circumstances (sand, water, mud), the chain and sprockets will require more frequent replacement.

FUEL LINE

Inspect the fuel lines (fuel tank-to-fuel valve, fuel valve-to-carburetor) for damage or deterioration.
Check that the fuel lines are intact and have clamps at each connection.
Replace any parts that are damaged, leaking or show signs of deterioration.

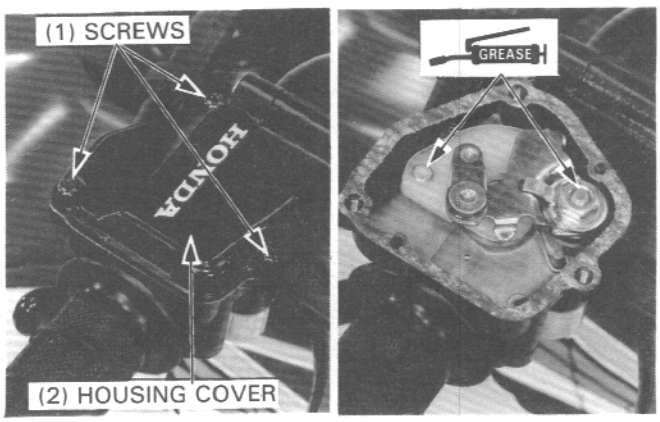


THROTTLE OPERATION

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.

LUBRICATION

Disassemble the throttle housing (page 10-6).
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 cable end and assemble the throttle housing (page 10-6).



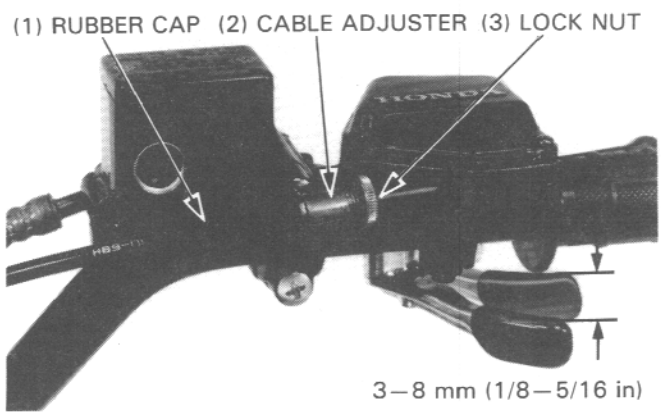
ADJUSTMENT

Measure the throttle lever free play at the tip of the throttle lever.

THROTTLE LEVER FREE PLAY: 3—8 mm (1/8—5/16 in)

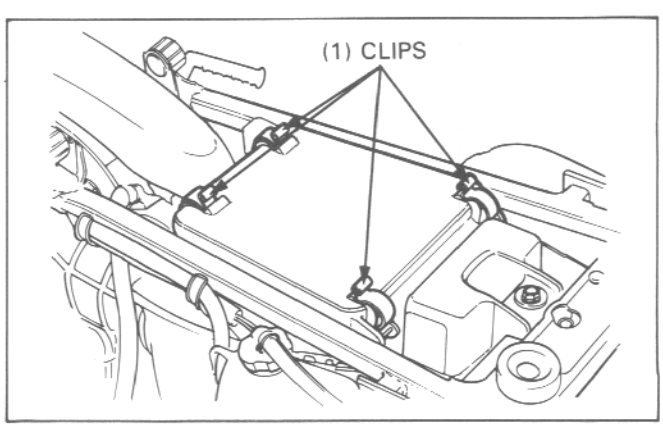
Pull the rubber cap off.
Adjustments can be made by loosening the lock nut, then turning the cable adjuster. Tighten the lock nut.

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

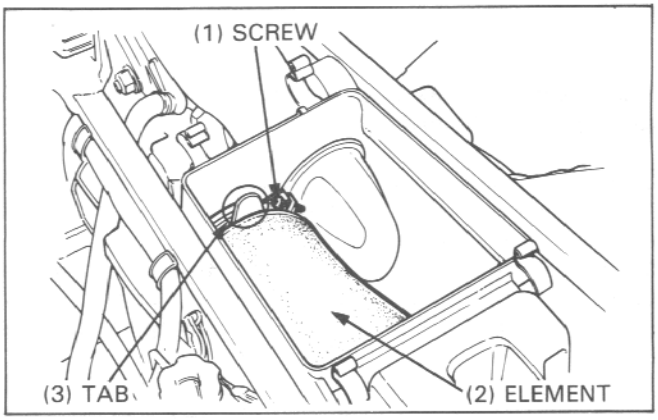


AIR CLEANER

Remove the seat/rear fender.
Remove the clips attaching the air cleaner cover and remove the cover.



Loosen the air cleaner element connecting band and remove the element.
Remove the element from the base.



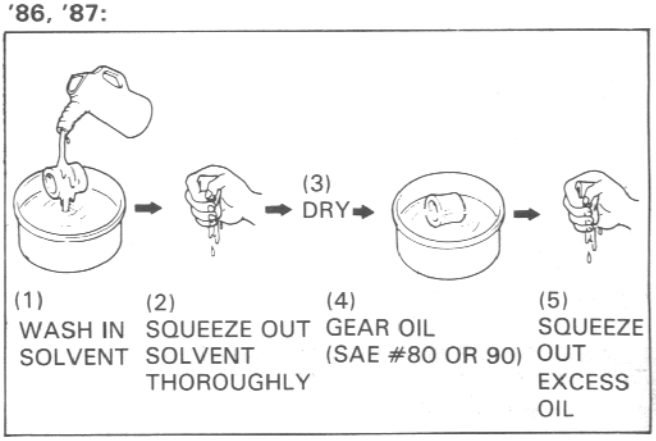
Wash the element in non-flammable or high flash point solvent, squeeze out the solvent thoroughly, and allow to dry.

CAUTION

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

'86, '87:
Soak the element in gear oil (SAE #80 or 90) and squeeze out excess.

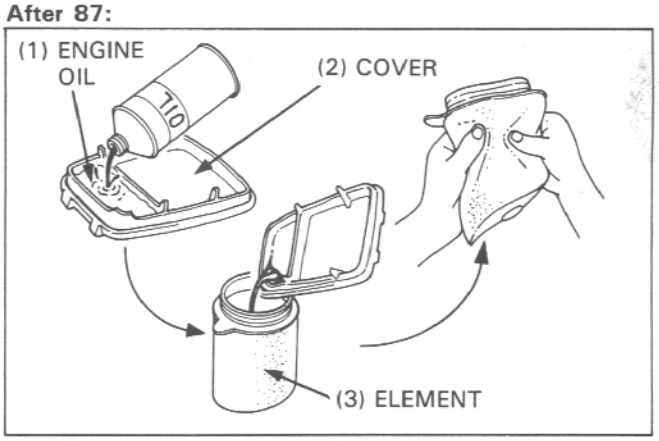
'86, '87:



After '87:
Fill the measuring cap provided in the back of the air cleaner cover with Honda 4-Stroke oil or equivalent.
Pour the measured oil on the air cleaner element. Then rub the air cleaner element until it is saturated with the oil.

Install the element on the base and apply a light coat of grease to the sealing edge of the element.
Install the element into the case with the tab facing up.
Install the air cleaner case cover.
Install the seat/rear fender.

After '87:

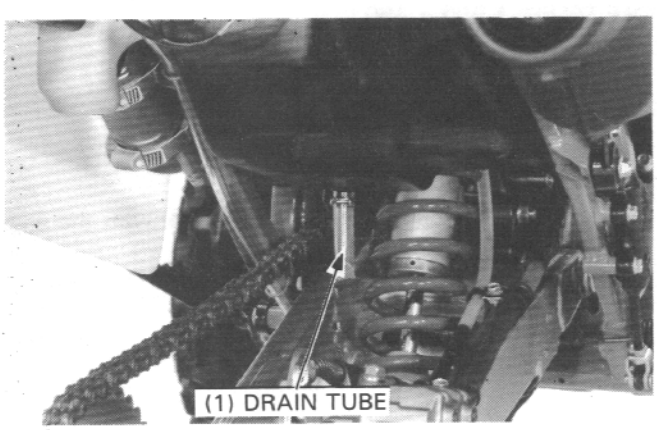


AIR CLEANER CASE DRAIN TUBE

Remove the drain tube and drain the deposits.
Reinstall the drain tube.

NOTE

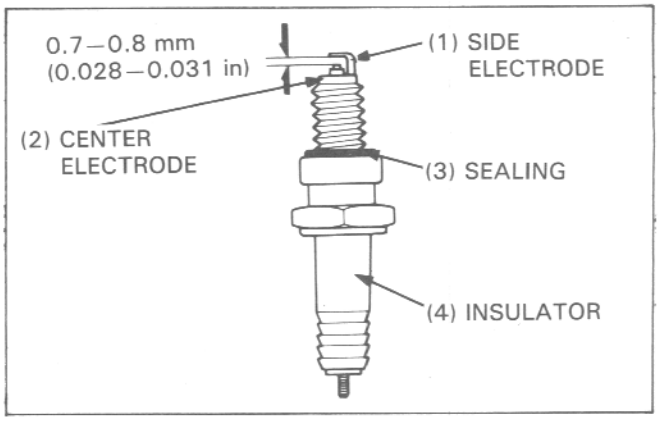
- Service more frequently when riding in very wet, muddy condition or deposits are seen in the drain tube.



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:

	NGK	CHAMPION
'86, After '88: (STD)	BR8ES	RN3C
'87, '88: (STD)	BR9ES	RN2C

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.

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

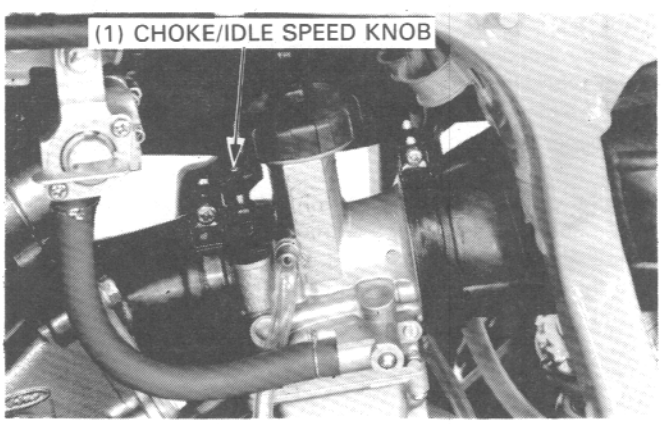
Connect the spark plug cap.

CARBURETOR IDLE SPEED

NOTE

- Inspect and adjust the idle speed after all other engine maintenance items have been performed and are within specifications.
- The engine must be warm for accurate idle speed inspection and adjustment.

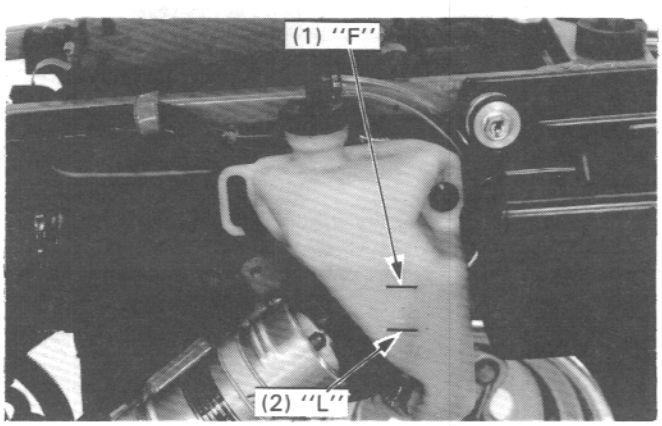
Warm up the engine.
Place the FOURTRAX on level ground and shift it into neutral.
Attach an engine tachometer.
Adjust the idle speed with the choke/idle speed knob.



IDLE SPEED: 1,500 ± 150 rpm

RADIATOR COOLANT

Place the FOURTRAX on level ground.
Remove seat/rear fender.
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.

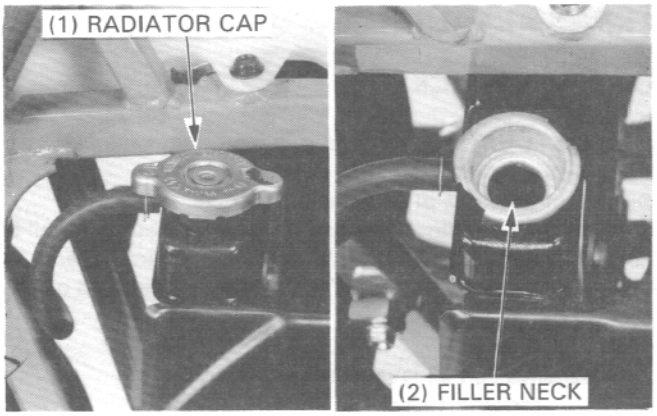


If necessary, fill the tank to the "F" level line with a 50/50 mixture of distilled water and anti-freeze.

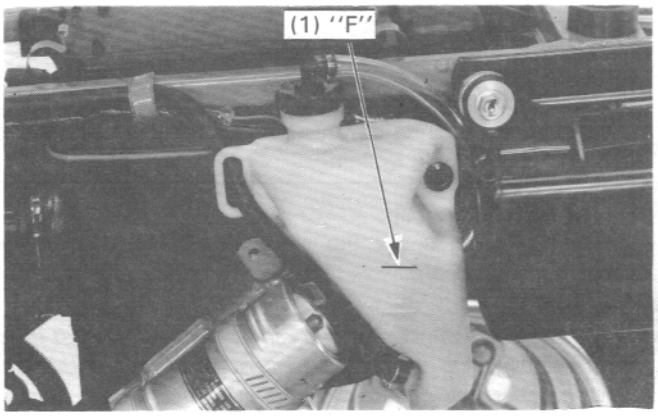
WARNING

- ***To 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 front fender (page 14-2).
Remove the radiator cap and fill the radiator with recommended coolant (page 9-1) up to the filler neck.
Run the engine 2 or 3 minutes to allow air to escape.



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

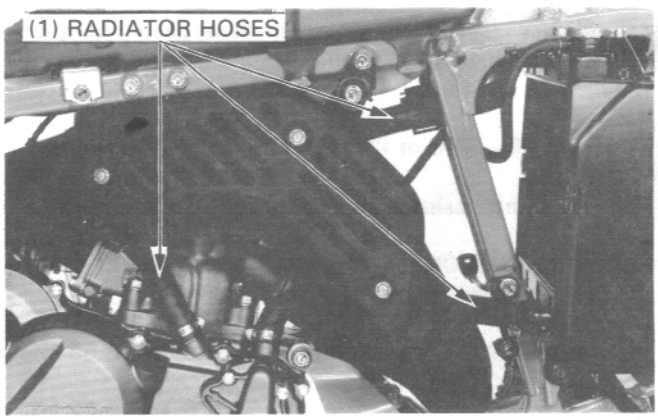


COOLING SYSTEM

RADIATOR HOSE

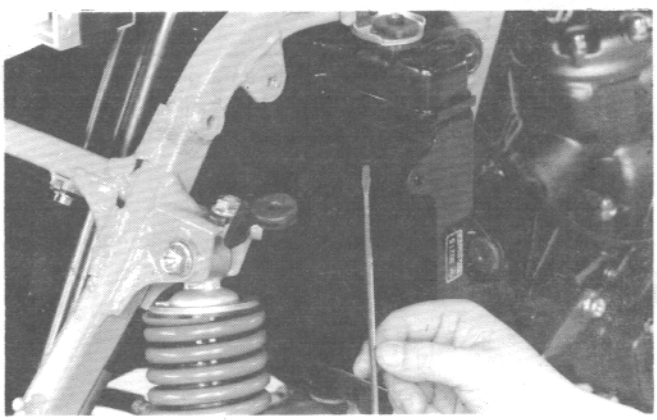
Remove the seat/rear fender and front fender (section 14).
Inspect the radiator hoses for cracks and deterioration. Replace if necessary.
Check the tightness of the hose bands and radiator mounting bolts.

TORQUE:
Radiator hose band: 0.7—1.0 N·m (0.07—0.1 kg-m, 0.5—0.7 ft-lb)



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.

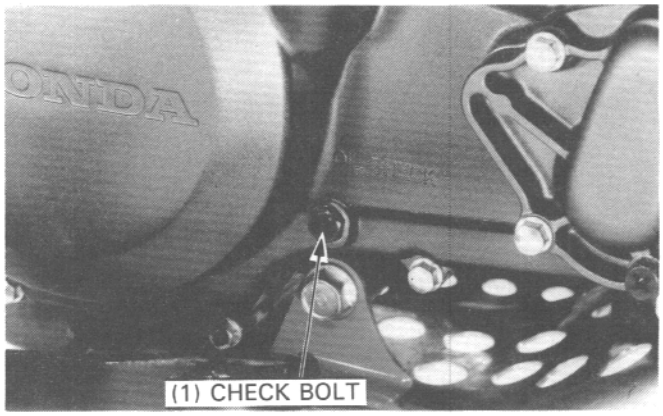


TRANSMISSION OIL

OIL LEVEL CHECK

Place the FOURTRAX on level ground.
Remove the oil filler cap and check bolt.
Oil should flow out of the check bolt hole.
If the oil does not flow out; add oil slowly through the oil filler hole untill the oil starts to flow out of the check hole.
Stop adding the oil and install the sealing washer and oil check bolt.

Low transmission oil level can be caused by:
- Worn crankshaft oil seals
- External oil leaks



OIL CHANGE

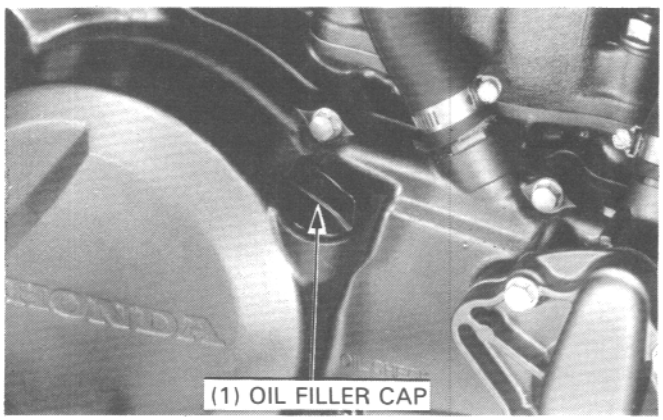
NOTE

- Warm-up the engine before draining the oil. This ensures complete and rapid draining.

Remove the oil filler cap.
Place a drain pan under the engine to catch the oil, then remove the drain bolt.

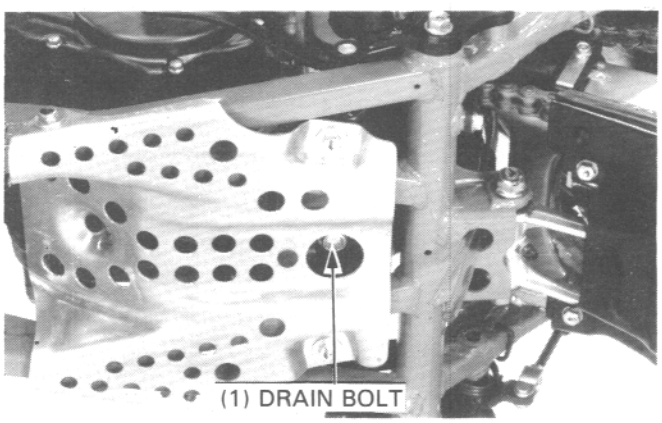
CAUTION:

- *Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this is unlikely unless you handle used oil on a daily basis, it is still adviseable to throughly wash your hands with soap and water as soon as possible after handling used oil.*



After the oil has been completely drained, check that the drain bolt sealing washer is in good condition and install the sealing washer and drain bolt.

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

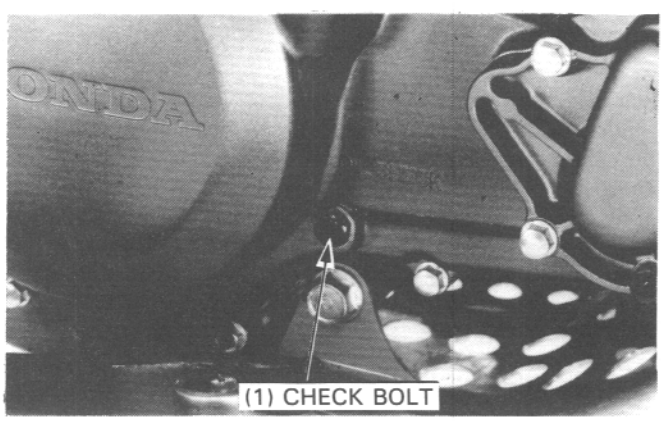


Refill the transmission gradually up to the proper level.

RECOMMENDED OIL:	**Honda 4-Stroke oil or equivalent**
API Service Clasification:	**SE or SF**
Viscosity:	**10 W—40**
OIL CAPACITY:	**0.6 lit (0.63 U.S. qt., 0.53 Imp qt.) after draining**
	0.7 lit (0.74 U.S. qt., 0.62 Imp qt.) at disassembly

NOTE

- Use this specified capacity only as a guide: add oil until it flows out of the oil check bolt hole, allow it stop flowing out, then reinstall and tighten the oil check bolt.



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

DRIVE CHAIN

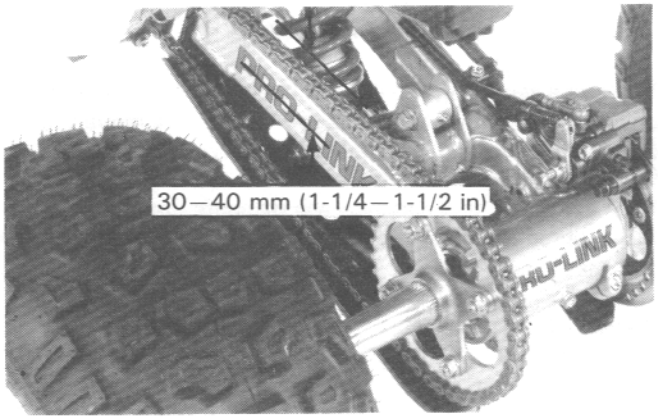
CHAIN SLACK INSPECTION

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)

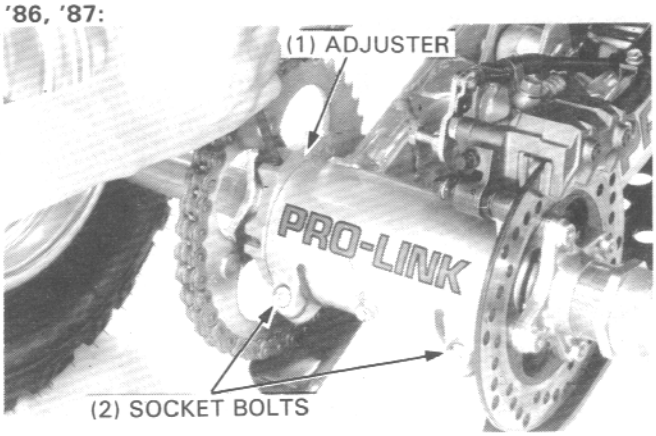


CHAIN SLACK ADJUSTMENT

Loosen the socket bolts: ('86, '87: 2 pieces, After '87: 4 pieces).
Turn the adjuster to decrease or increase.
Adjust the chain slack.

INCREASE: Turn the adjuster clockwise
DECREASE: Turn the adjuster counterclockwise

'86, '87:



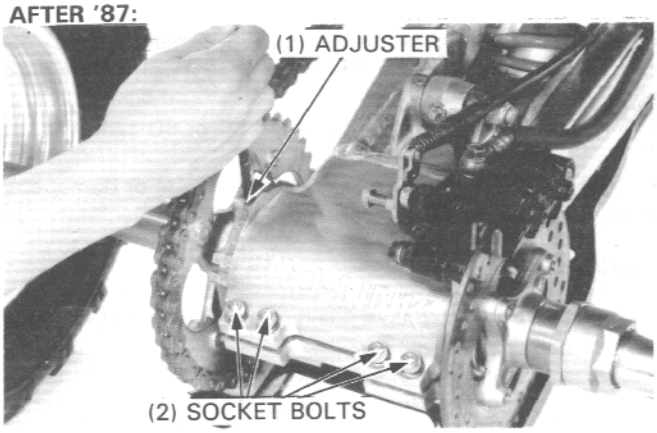
NOTE

- Viewed from left side of sprocket.

Tighten the socket bolts to the specified torque in 2-3 progressive steps.

TORQUE: 19—23 N·m (1.9—2.3 kg-m, 14—17 ft-lb)

AFTER '87:



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.

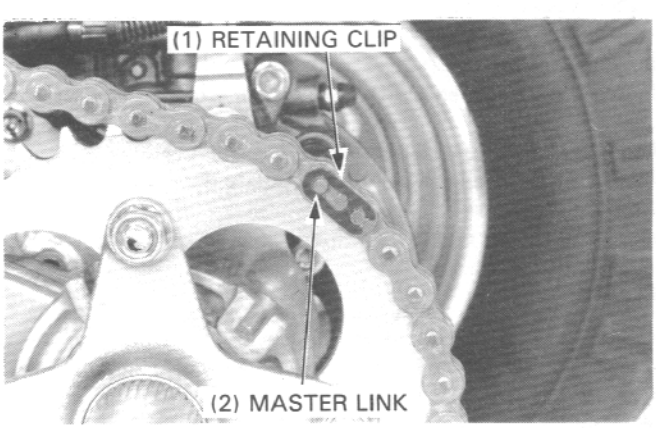
Recheck the drive chain slack.

REMOVAL AND INSPECTION

When the drive chain becomes extremely dirty, it should be removed and cleaned with soapy water prior to lubrication.
Remove the drive sprocket cover.
Remove the chain retaining clip carefully.
Remove the master link, O-rings and the drive chain.

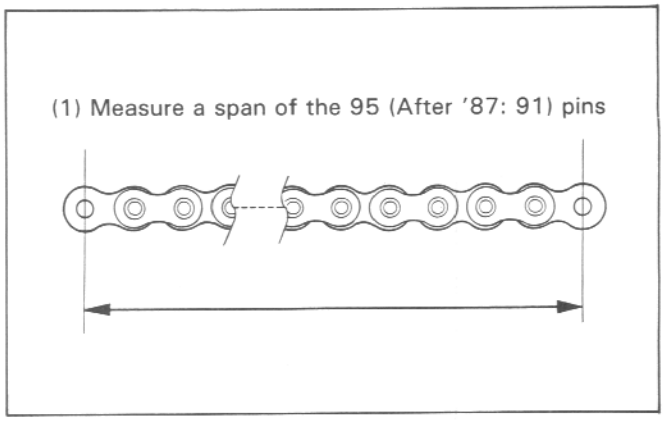
CAUTION

- *Be careful not to lose the O-rings when the clip and master link are removed.*



Visually inspect the drive chain for kinks or damage.

Measure a section of the drive chain to determine whether the drive chain is worn beyond its service limit. Remove the drive chain and measure the distance between a span of 95 (After '87: 91) pins from pin center to pin center.
In a new chain, this distance will measure standard length. If the distance exceeds service limit, the drive chain is worn out and should be replaced.



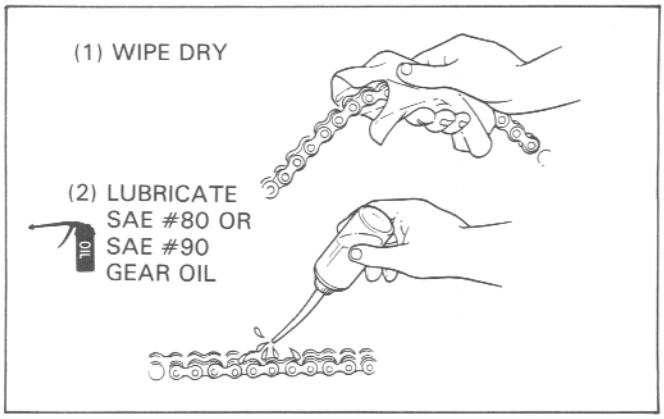
DRIVE CHAIN LENGTH:

Standard:	**'86, '87:**	**1,508 mm (59.4 in)**
	After '87:	**1,429 mm (56.3 in)**
Service limit:	**'86, '87:**	**1,515 mm (59.6 in)**
	After '87:	**1,436 mm (56.5 in)**

REPLACEMENT DRIVE CHAIN:

D.I.D.:	**'86, '87:**	**D.I.D.520V4**
	After '87:	**D.I.D.520V6**
RK:	**RK520HMO**	

Clean the drive chain with a small amount of kerosene or soapy water and wipe dry.



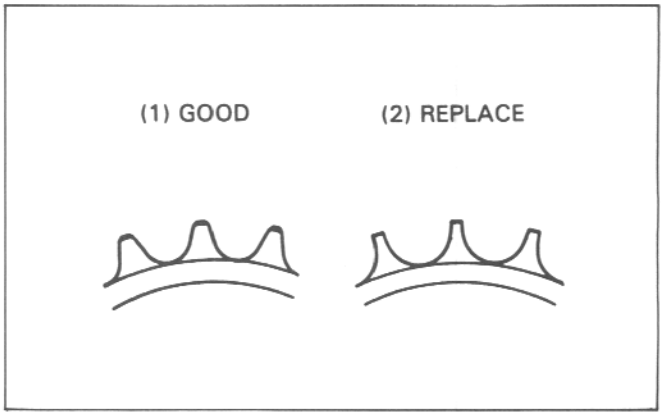
CAUTION

- *Do not use a steam cleaner, high pressure washers or aerosol chain lubricants as these will 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.

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

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

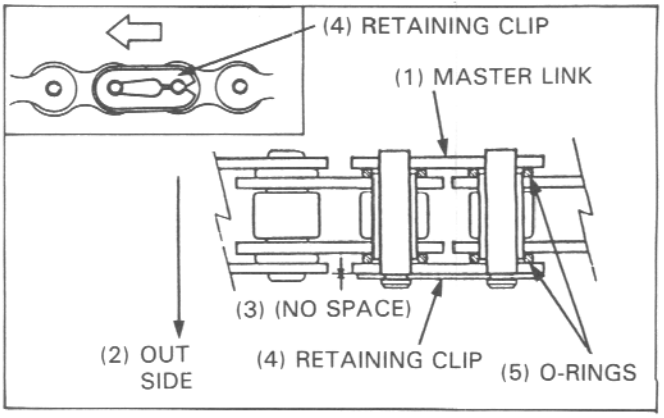


NOTE

- 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.

INSTALLATION

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



Note the installation direction of the chain retaining clip.
Its open end should face in the opposite direction of the wheel rotation as shown.
Adjust the drive chain slack (page 2-9).

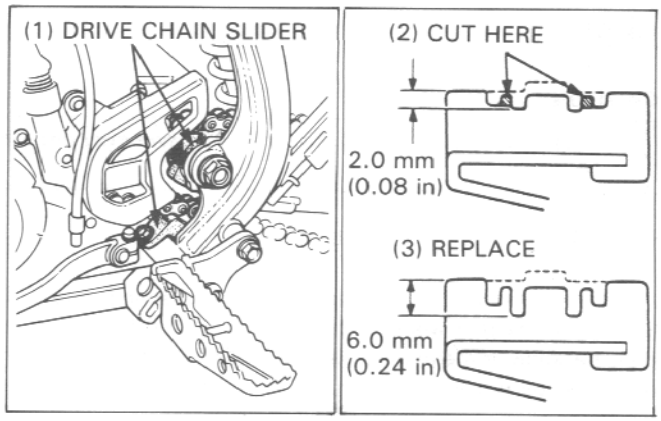
CAUTION

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

DRIVE CHAIN SLIDER

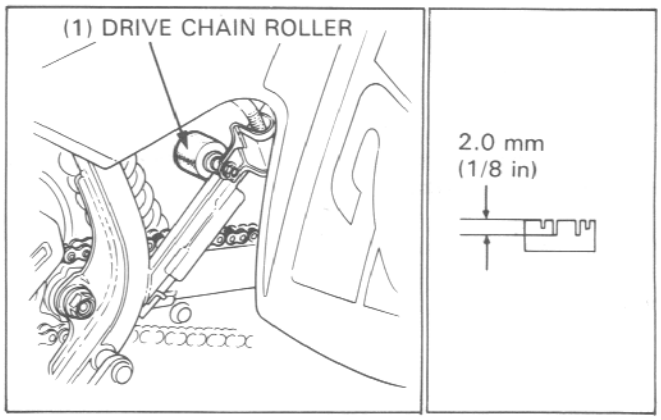
DRIVE CHAIN SLIDERS

Check the upper and lower drive chain sliders for wear or damage.
When the depth of the grooves in the slider reaches 2.0 mm (0.08 in), remove material to lower the height of the center ridge between the grooves to less than 2.0 mm (0.08 in).
Replace the sliders when the depth of the grooves reaches 6.0 mm (1/8 in) or more.



DRIVE CHAIN ROLLER

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



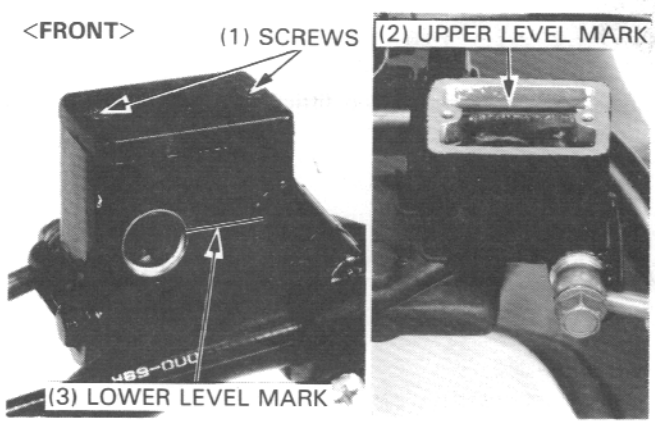
BRAKE FLUID

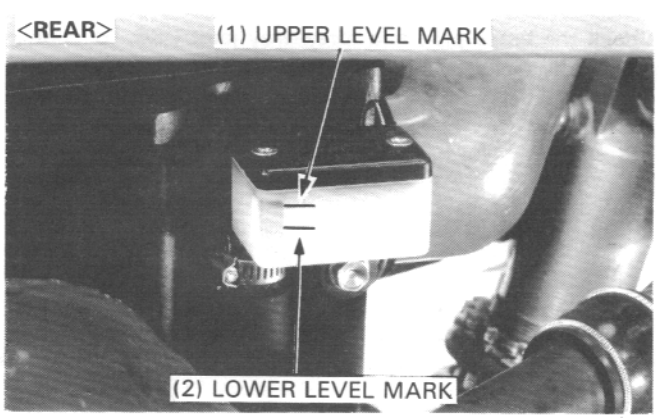
Check the front and rear brake fluid reservoir level.
If the level nears the lower level mark, remove the cover and fill the reservoir with DOT 4 brake fluid to the upper level mark.

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 or fluid may spill out.*
- *Use only DOT 4 brake fluid from a sealed container.*
- *Avoid spilling fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.*





BRAKE PAD WEAR

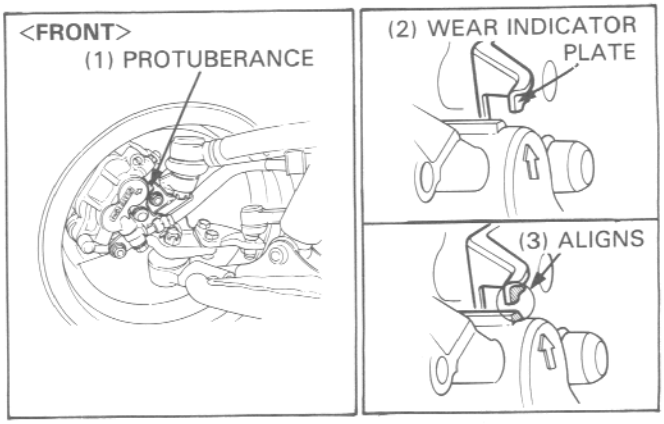
CAUTION

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

FRONT

Inspect the pads visually during all regular service intervals to determine the pad wear. If the wear indicator aligns with the protuberance, it means the pads have been worn to their limit and must be replaced.

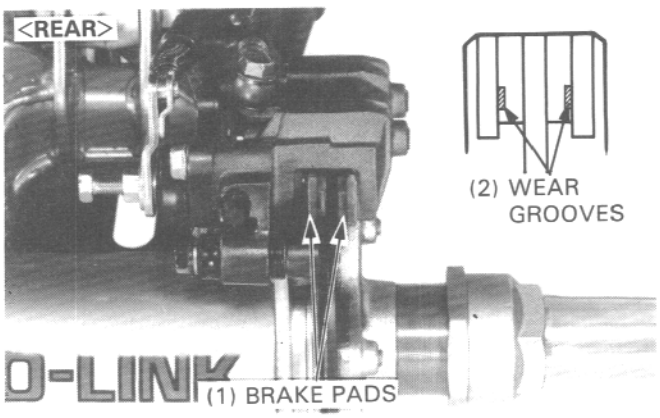
Refer to page 13-5 for front brake pad replacement.



REAR

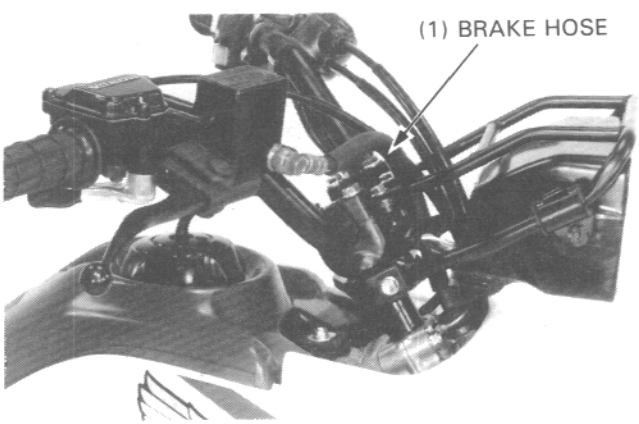
Check the rear brake pads for wear.
If the wear grooves on the pads reach the edges of the brake disc, replace the pads.

Refer to page 13-6 for rear brake pad replacement.

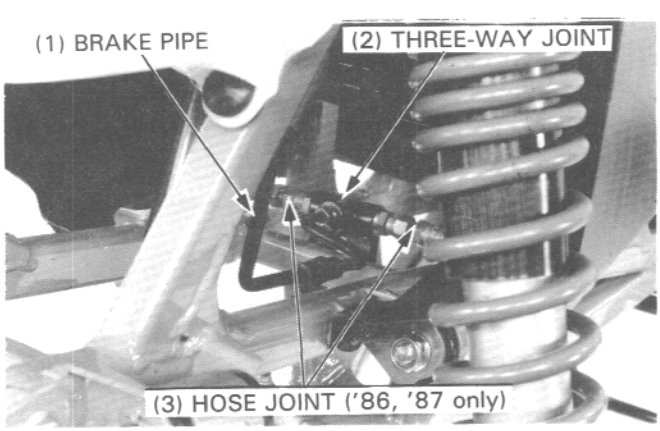


BRAKE SYSTEM

Check the brake hoses and fittings for deterioration, cracks and signs of leakage.



Check the brake pipe and three-way joint ('86, '87 only) for damage or leaks.

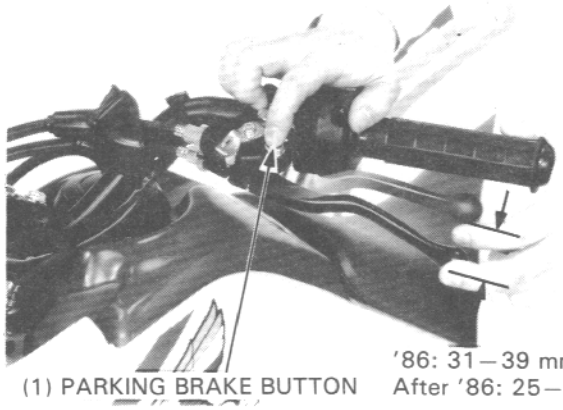


PARKING BRAKE

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 at the tip of the clutch/parking brake lever.

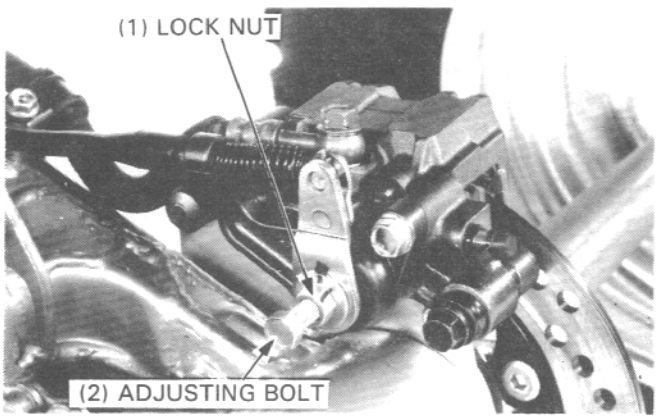
DISTANCE
'86: 31—39 mm (1-1/4—1-1/2 in)
After '86: 25—30 mm (1—1-1/4 in)



Adjust as follows:
Loosen the lock nut on the rear caliper.

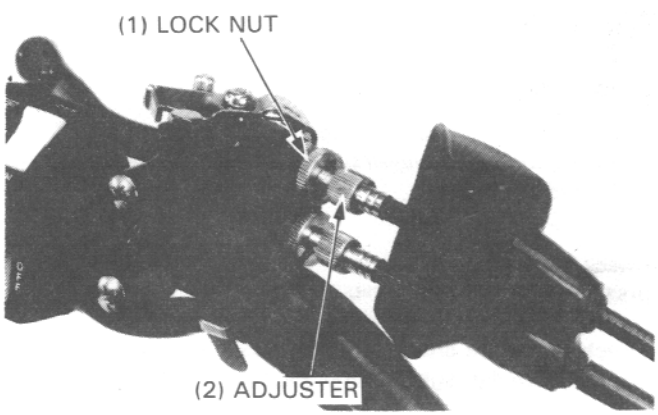
Screw in the adjusting bolt until you feel resistance without applying the clutch/parking brake lever, and then turn the adjusting bolt 1/8 counterclockwise.
Tighten the lock nut.

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



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

Tighten the lock nut.
Connect the clutch cable and check the clutch lever free play (page 2-14).



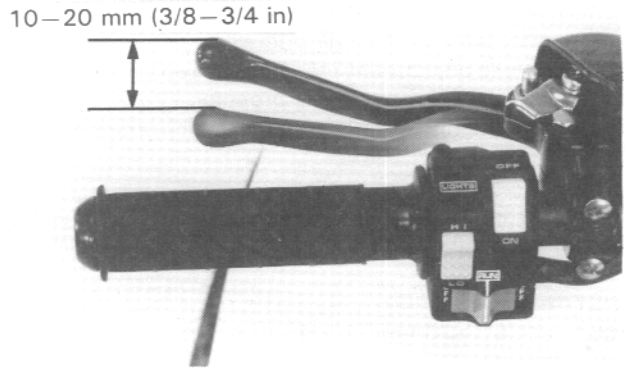
SKID PLATE, GUARD PLATE (AFTER '86:)

The engine guard and skid plates protect the engine, drive chain and driven sprocket from rocks.
Check the guard and plates for cracks, damage or looseness at intervals shown in the Maintenance Schedule (page 2-2).
Replace the guard and plates if they are cracked or damaged.
If the guard and plate bolts are loose, tighten them.

CLUTCH SYSTEM

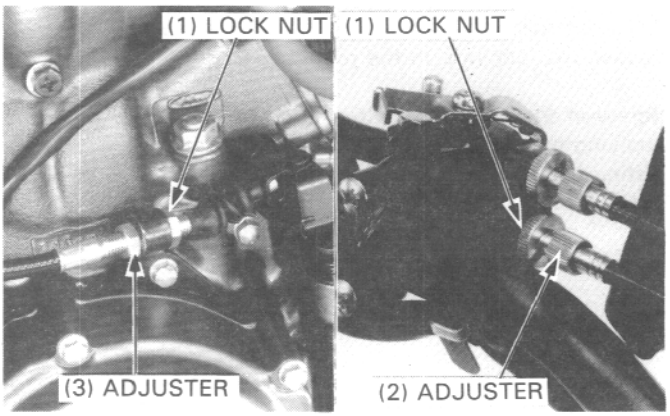
Measure the clutch lever free play at the tip of the lever:

FREE PLAY: 10—20 mm (3/8—3/4 in)



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.



SUSPENSION

WARNING

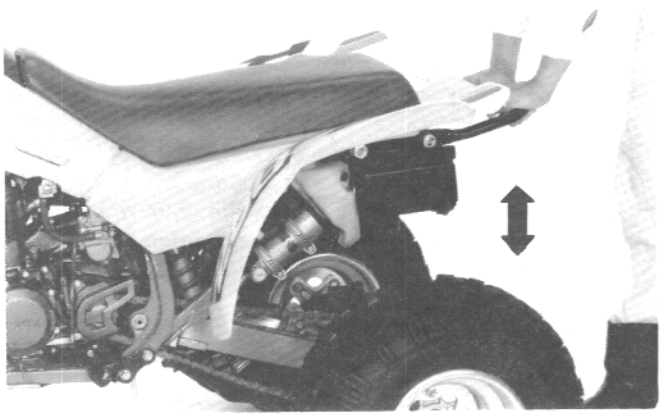
- *Do not ride a vehicle with faulty suspension. Loose, worn or damaged suspension parts impair vehicle stability and control.*

Check the action of the front and rear shock absorbers by compressing them several times.

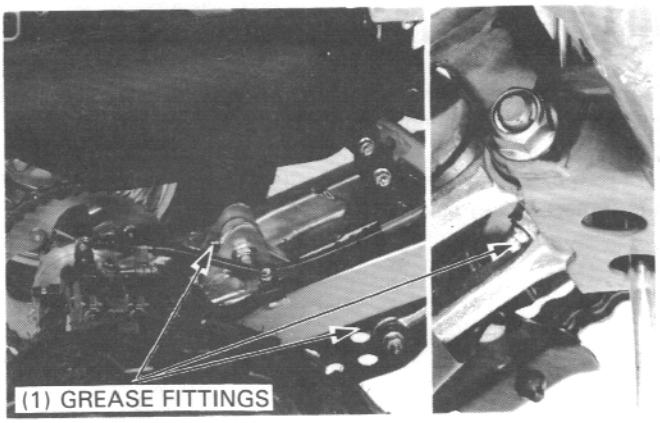
Check the entire shock absorber assembly for leaks or damage. Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

Adjust the rear shock absorber spring preload if necessary (page 12-9).
Adjust the front shock absorbers to the same desired position.



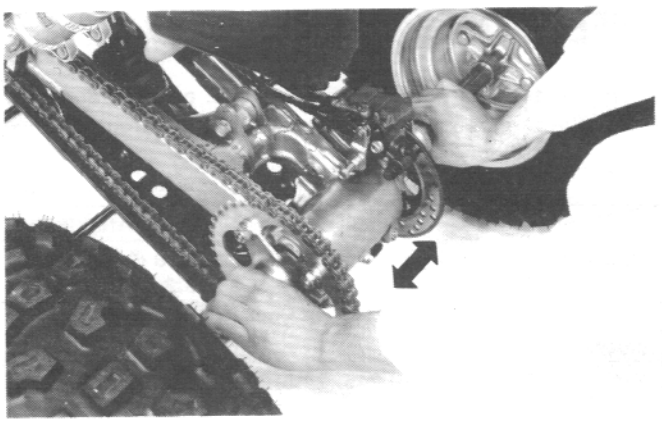
Apply a paste grease with 40% or more molybdenum disulfide to the shock linkage through the grease fittings (page 2-19).



SWINGARM BEARINGS

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

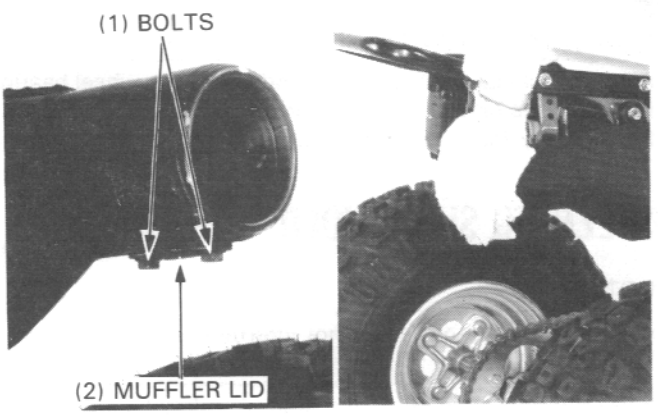
Move the rear axle sideways with force to see if the wheel and swingarm bearing are worn.
Replace the bearings if there is any play (Section 11 and 12).



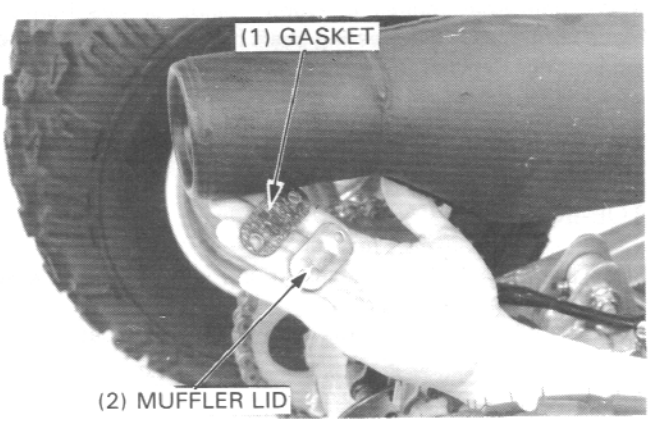
SPARK ARRESTER

WARNING

- ***Do not touch exhaust components while the exhaust system 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 with the transmission in neutral, and purge accumulated carbon from the muffler by momentarily revving up the engine several times.
Stop the engine and allow the exhaust system to cool.
Make sure that the muffler lid bolts and gasket are in good condition. Replace the bolts and gasket if necessary.
Install the gasket and muffler lid, and tighten the bolts 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.

NUTS, BOLTS, FASTENERS

Tighten bolts, nuts and fasteners at regular intervals shown in the Maintenance Schedule (page 2-2).
Check that all chassis nuts and bolts are tightened to their correct torque values (page 1-5, 6). Check that all cotter pins and safety clips are in place.

WHEELS/TIRES

Check the tires for cuts, embedded nails, or other damage.
Check the tire pressure and measure the tire circumference.
Adjust accordingly.

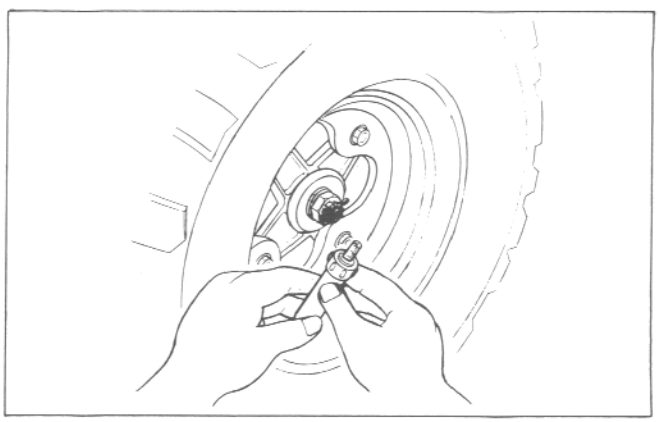
unit: psi (kg/cm², kPa)

	Front	Rear <After '87>:
Recommended pressure	4.0 (0.275, 27.5)	2.9 (0.200, 20) <3.3 (0.225, 22.5)>
Maximum pressure	4.4 (0.305, 30.5)	3.3 (0.230, 23) <3.7 (0.255, 25.5)>
Minimum pressure	3.6 (0.245, 24.5)	2.5 (0.170, 17) <2.9 (0.195, 19.5)>

NOTE

- Tire pressure should be checked when the tires are COLD.

Raise the wheels off the ground and check the wheel bearings for excessive play or abnormal noise.
Replace any faulty parts as necessary (sections 10 and 12)

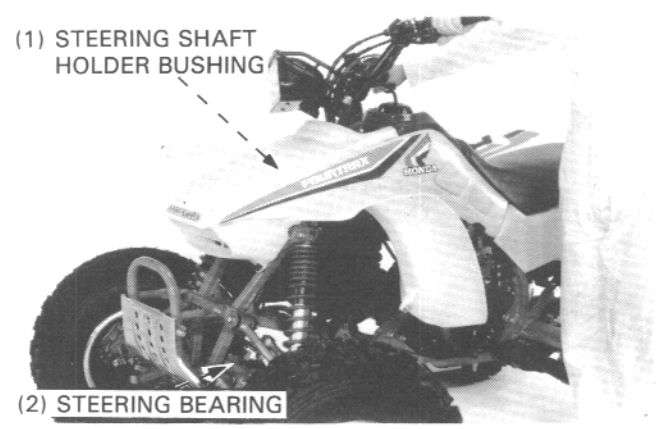


STEERING SHAFT HOLDER BEARINGS

NOTE

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

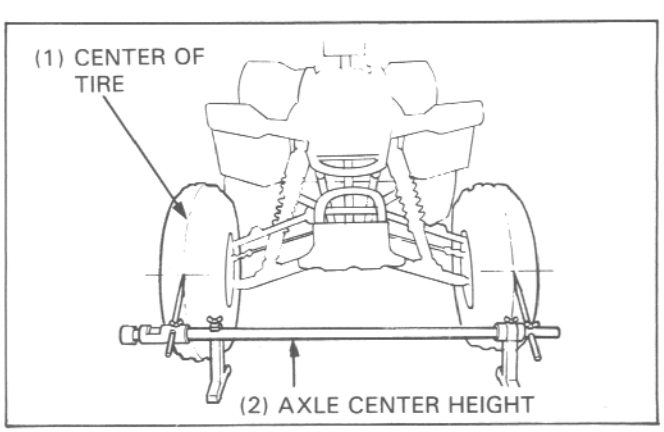
Raise the front wheels off the ground and make sure that the handlebar rotates freely.
If the handlebar moves unevenly, binds or has horizontal movement, check the steering shaft holder bushing and steering bearing. Replace them if necessary (section 10).



STEERING SYSTEM

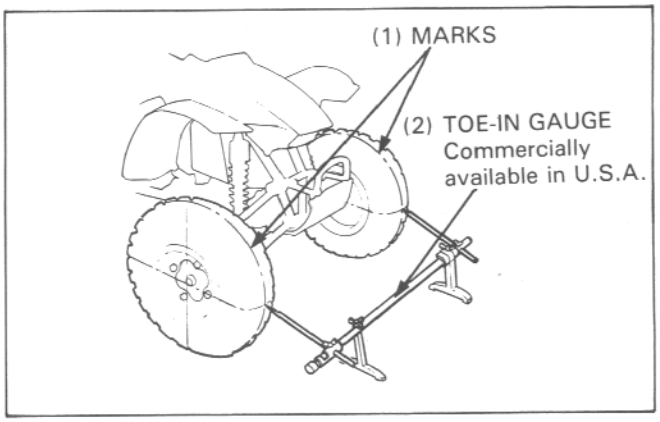
TOE-IN

Place the FOURTRAX on level ground with the front wheels facing straight ahead.
Mark the centers of the tires with chalk to indicate the axle center height.



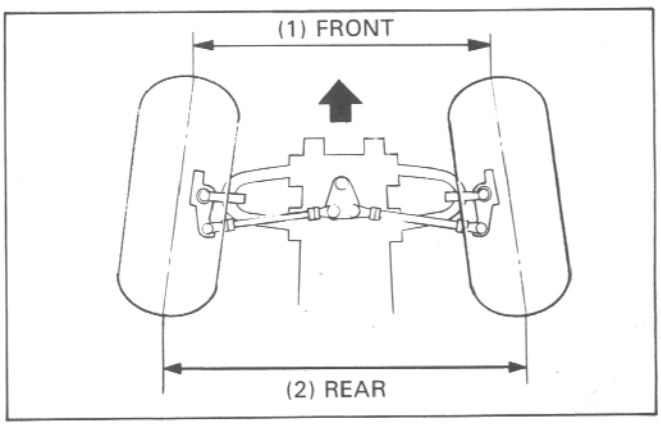
Align the toe-in gauge with the marks on the tires as shown. Check the readings on the gauge's scales.

Slowly move the vehicle back until the wheels have turned 180° so the marks on the tires are aligned with the gauge height on the rear side.



Measure the toe-in on the rear part of the tires at the same points.

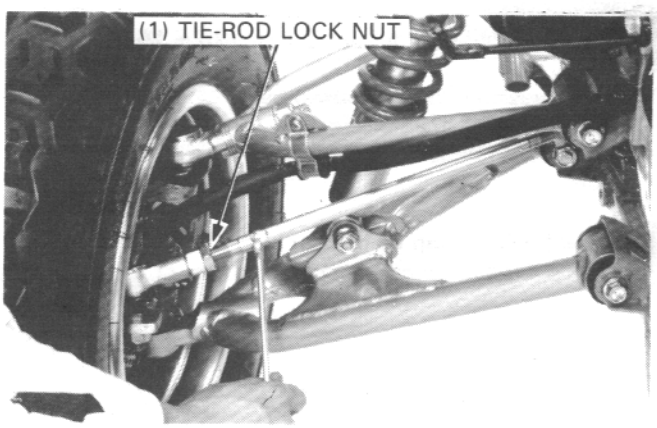
TOE-IN: 10 ± 10 mm (0.4 ± 0.4 in)



When the toe-in is out of specification, adjust it by loosening the tie-rod lock nuts and turning the tie-rod equally while measuring the toe-in.

Tighten the lock nut to the specified torque.

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

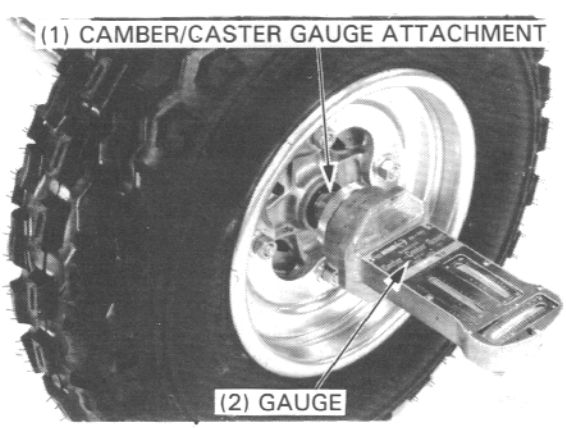


CAMBER/CASTER

Remove the cotter pin and front wheel hub nut (page 10-8).
Install an attachment onto the front wheel hub.
Set the camber and caster gauge to the attachment.
Measure the camber.

CAMBER: 0°

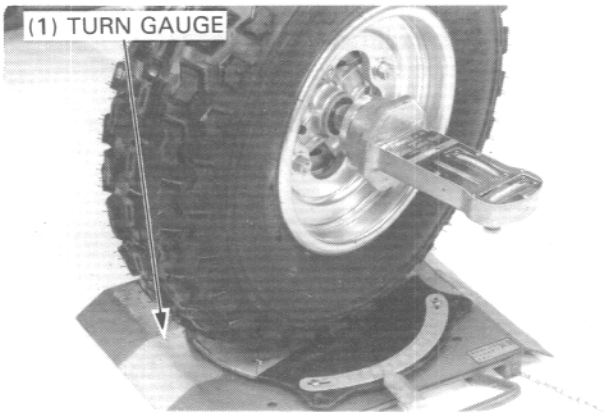
TOOL:
Camber/caster gauge attachment 07910—MJ30100
Not available in U.S.A.



Set the turn gauge under the front wheels.
Measure the caster.

CASTER: '86, '87: 6°
After '87: 4°40'

Camber and caster are not adjustable. If they are out of specification, check the suspension and frame for damage and replace any parts necessary, then recheck alignment.

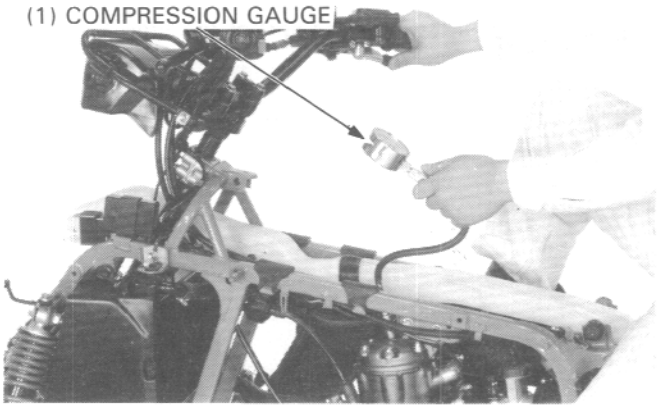


CYLINDER COMPRESSION

Warm up the engine.
Stop the engine and remove the spark plug.
Remove the fuel tank (page 3-3).
Install a compression gauge.
Push the choke/idle speed knob down to the closed position.
Fully open the throttle.
Operate the kick starter pedal several times.

NOTE

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



COMPRESSION:
1,177 ± 98 kPa (12.0 ± 1.0 kg/cm², 170 ± 15 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.

LUBRICATION POINTS

Use general purpose grease when no other specification is given. Apply oil or grease to any sliding surfaces and cables not shown here.

CONTROL CABLES

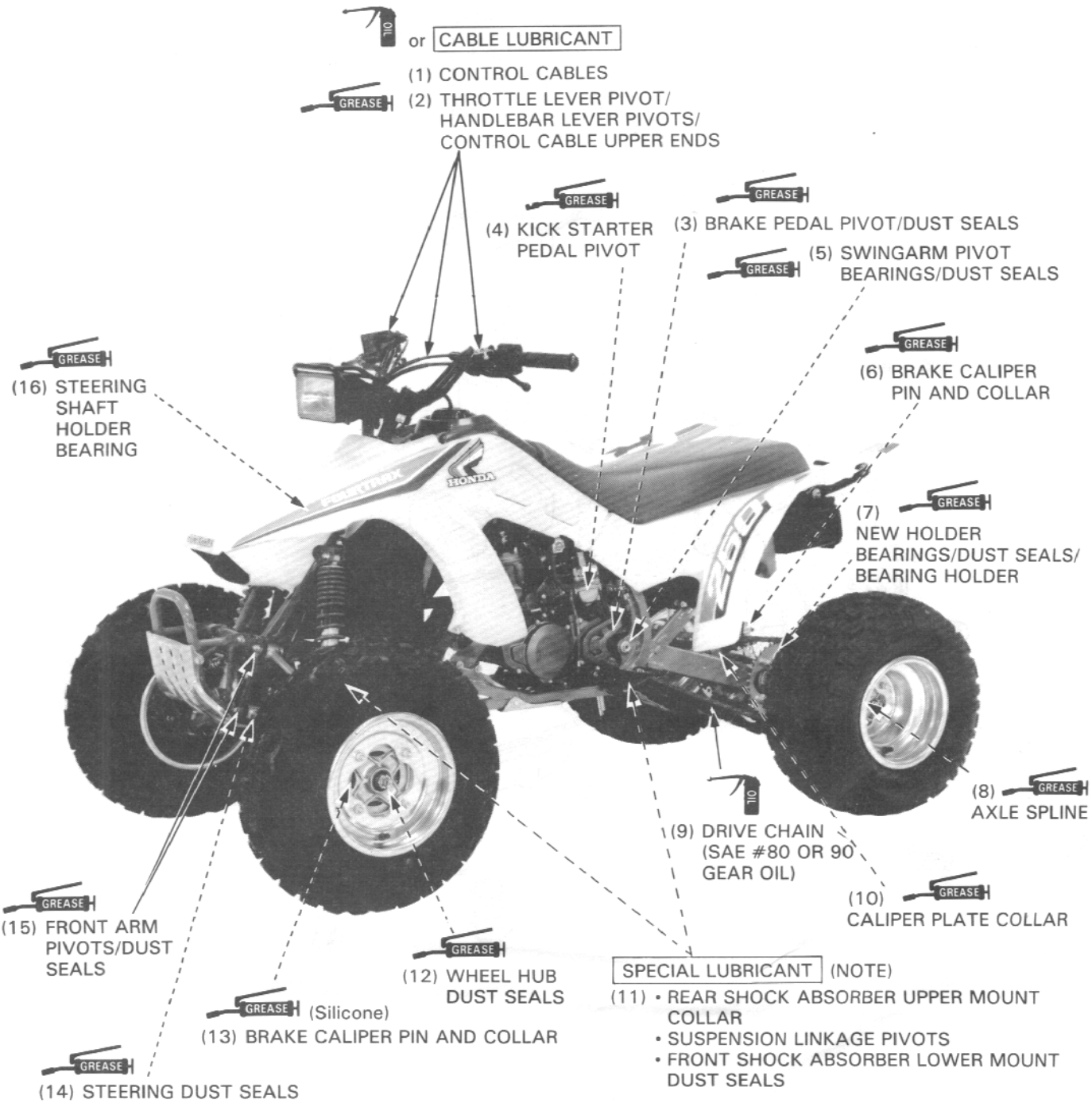
Periodically, disconnect the throttle, parking and brake cables at their upper ends. Thoroughly lubricate the cables and their pivot points with a commercially available cable lubricant or light weight oil.

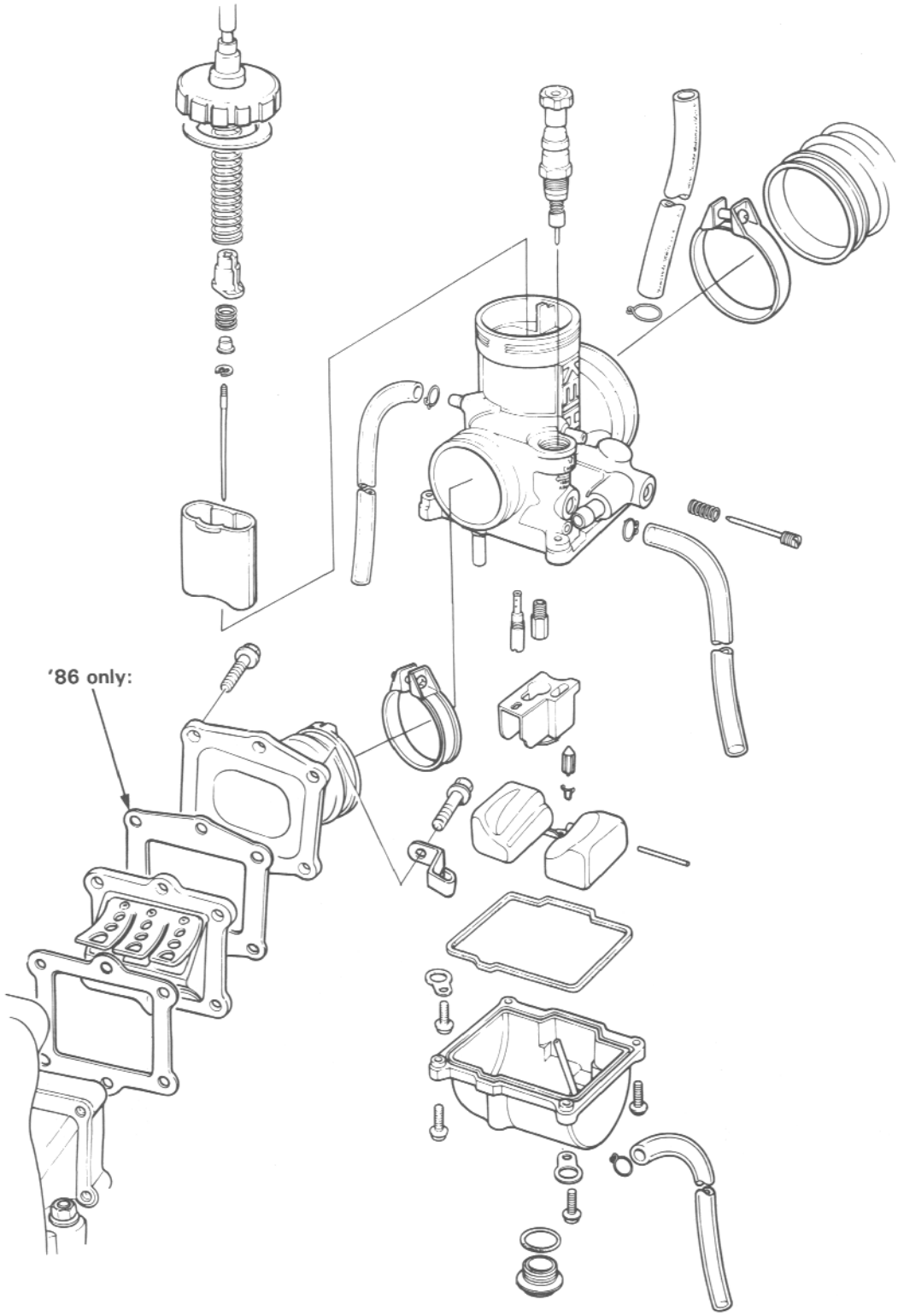
NOTE

Some sources of MoS_2 paste grease with 40% or more molybdenum are:

- Bel-Ray Moly Lube 126 EP#0
- Molykote® G-n Paste manufactured by Dow Corning, U.S.A.
- Honda Moly (U.S.A. only).
- Rocol ASP manufactured by Rocol Limited, U.K.
- Rocol Paste maufactured by Sumico Lubricant, Japan.
- Sta-Lube MP Grease #3141

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




'86 only:

SERVICE INFORMATION

GENERAL

- Use caution when working with gasoline. Always work in a well-ventilated area and away from sparks or flames.
- The float chamber has a 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.

WARNING

- ***Keep gasoline away from flames or sparks. Wipe up spilled gasoline at once. Work in a well ventirated area. Do not smoke or allow flames or sparks in the work area or where gasoline is stored.***

CAUTION

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

NOTE

- If vehicle is to be stored for more than one month, drain the float chamber. Fuel left in the float chamber may cause clogged jets resulting in hard starting or poor driveability.

SPECIFICATIONS

Fuel tank capacity: 10.0 lit. (22.64 U.S. gal., 2.20 Imp. gal.)
Fuel: '86–'88: Premium or leaded gasoline (Octane rating 92–100, RON)
After '88: Unleaded gasoline (Octane rating 92–100, RON)
Oil: Honda 2-Stroke oil or equivalent
Fuel: Oil pre-mix ratio: 20:1

Carburetor:

	'86:	'87:	'88:	After '88:
Identification number	PJ05A	PJ07A	PJ07B	PJ07C
Type	Piston valve			
Venturi diameter	34 mm (1.3 in)			
Float level	16 mm (0.63 in)			
Air screw opening	1-7/8 turns out		1-3/4 turns out	1-1/2 turns out
Jet needle	4th groove	3rd groove		4th groove
Main jet	#150	#152	#158	#155
Slow jet	#48		#45	#42

Optional main jets:
'86: #145, #148, #152, #155
'87: #148, #150, #155, #158
'88: #152, #155, #160
After '88: #150, #152, #158

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 (page 15-2)
- 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
- Worn crankshaft seal (alternator side)

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
- Worn crankshaft seal (clutch side)

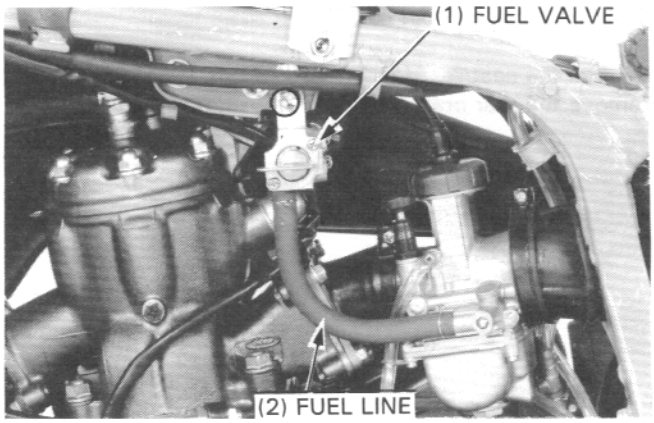
FUEL TANK

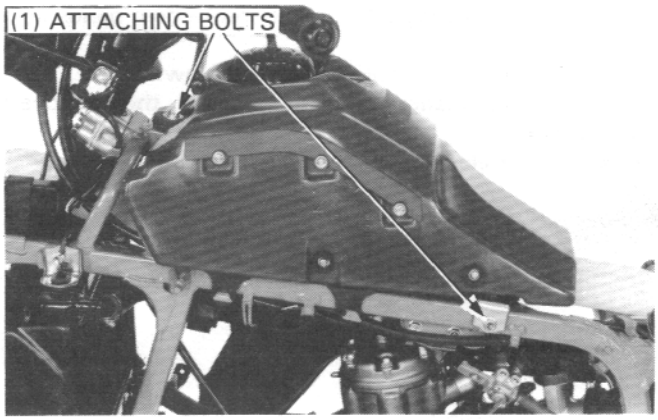
Remove the seat/rear fender and front fender (section 14).
Turn the fuel valve "OFF" and disconnect the fuel line at the carburetor.
Remove the fuel valve mounting bolt, then remove the fuel valve from the frame.

Remove the fuel tank attaching bolts, then remove the fuel tank.

WARNING

- ***Keep gasoline away from flames or sparks. Wipe up spilled gasoline at once. Work in a well ventirated area. Do not smoke or allow flames or sparks in the work area.***





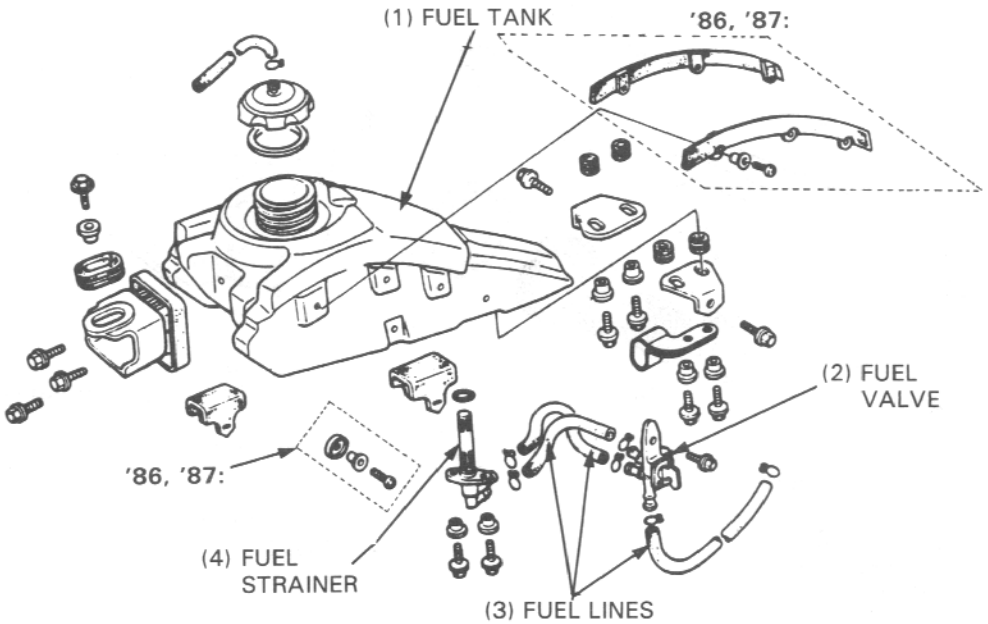
Use a drain pan and check that fuel flows freely out of the fuel line by turning the fuel valve "ON."
If flow is restricted, check and clean the following:

Remove the fuel strainer mounting bolts, then remove the fuel strainer from the fuel tank.
Clean the fuel strainer.
Install the fuel strainer in the reverse order of removal.

CAUTION

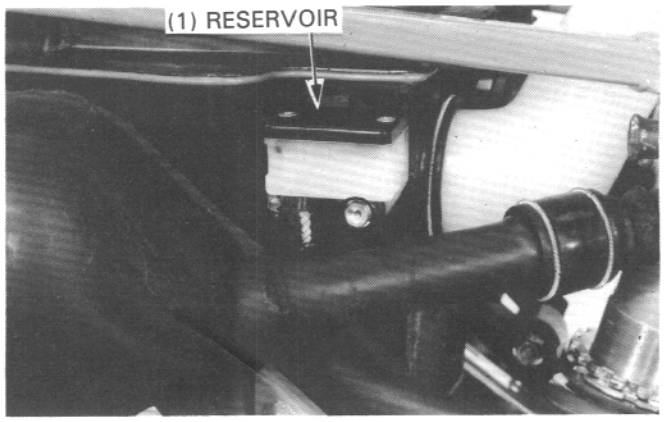
- *Do not over-tighten the fuel strainer mounting bolts.*

Install the fuel tank in the reverse order of removal.
Turn the fuel valve "ON" and make sure that the there are no fuel leaks.
Install the front fender and seat/rear fender (section 14).



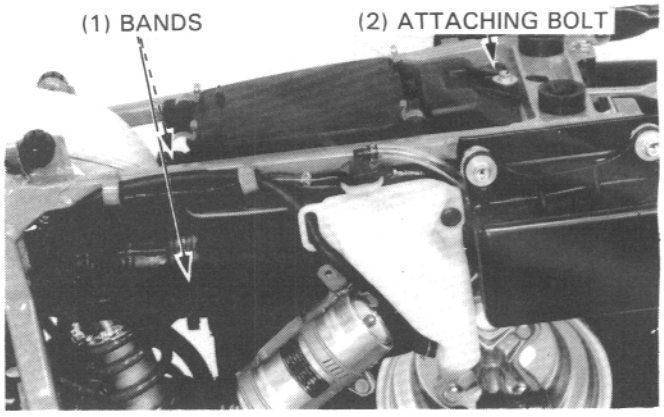
AIR CLEANER CASE

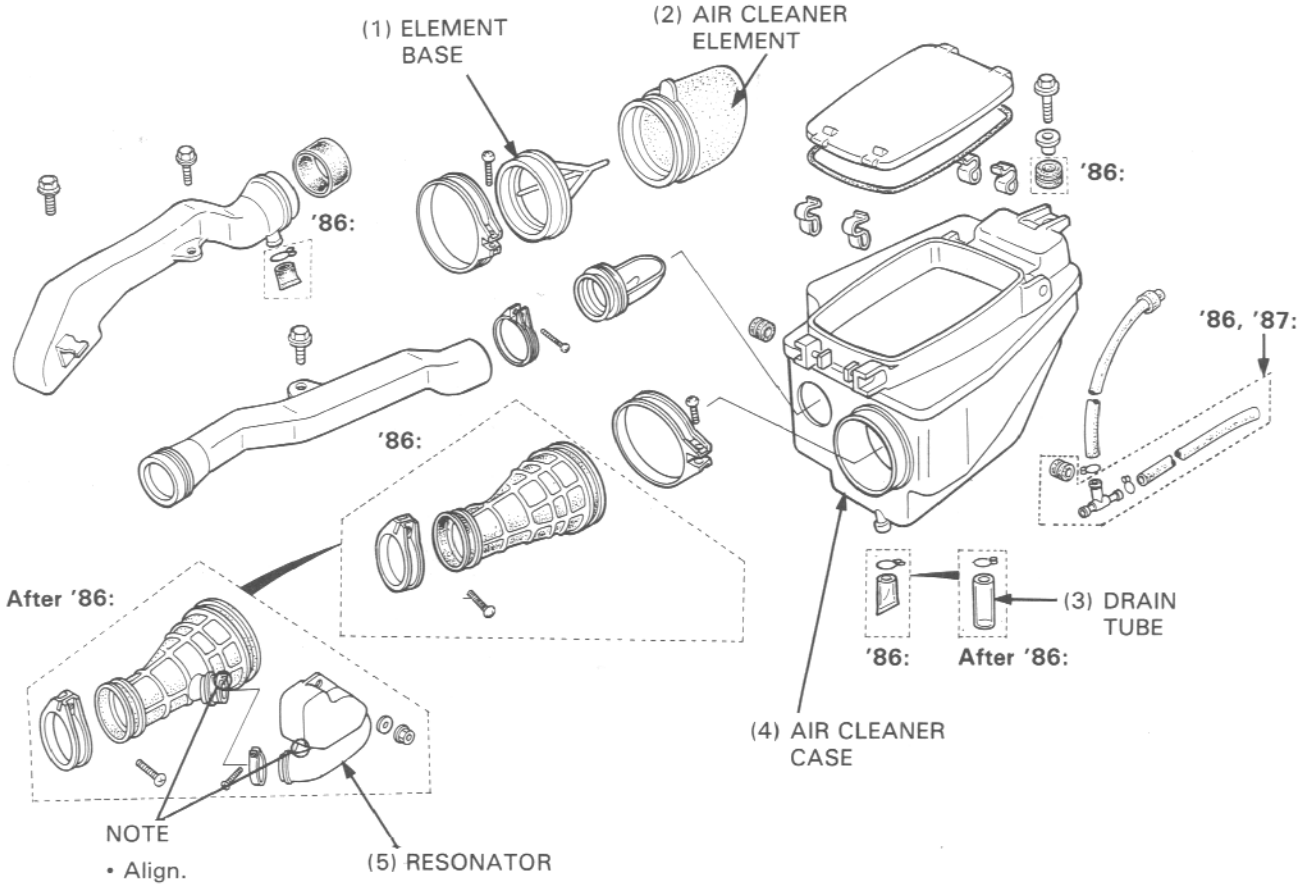
Remove the seat/rear fender.
Remove the rear brake reservoir from the air cleaner case.



Loosen the connecting tube and air intake duct bands at the case side.
After '86: Remove the resonator (see below).
Remove the air cleaner case attaching bolt, then remove the air cleaner case.
For air cleaner element service, see page 2-4.

'86 Shown:

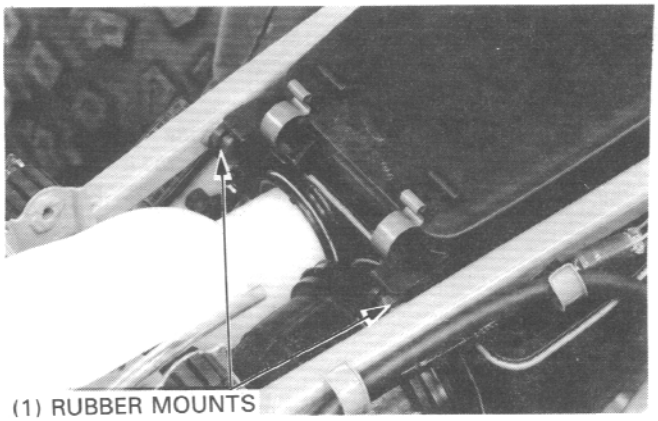




Install the air cleaner case in the reverse order of removal.

NOTE

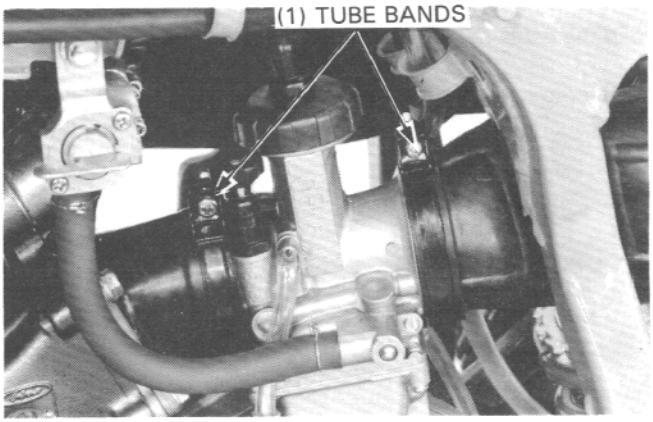
- Be sure to install the air cleaner case onto the rubber mounts correctly.
- Make sure that the connecting tube and air intake duct bands are tightened securely.
- After '86: Make sure that the resonator connecting tube band is tightened securely, aligning the boss of the resonator with the groove of the connecting tube.



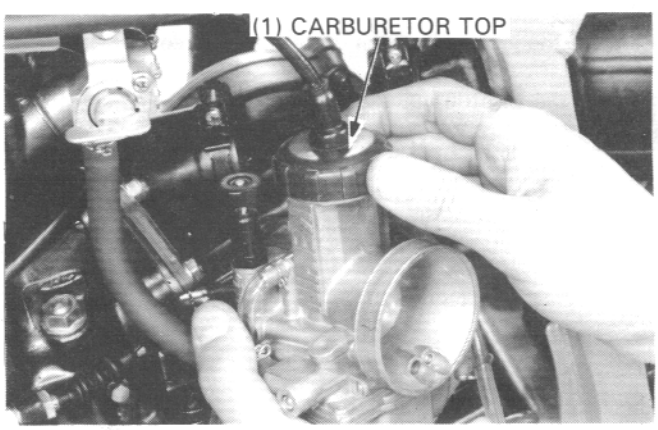
CARBURETOR

REMOVAL

Remove the seat/rear fender.
Turn the fuel valve "OFF."
Loosen the float chamber plug and drain the float chamber.
Disconnect the fuel line from the carburetor.
Loosen the connecting tube bands and remove the carburetor.

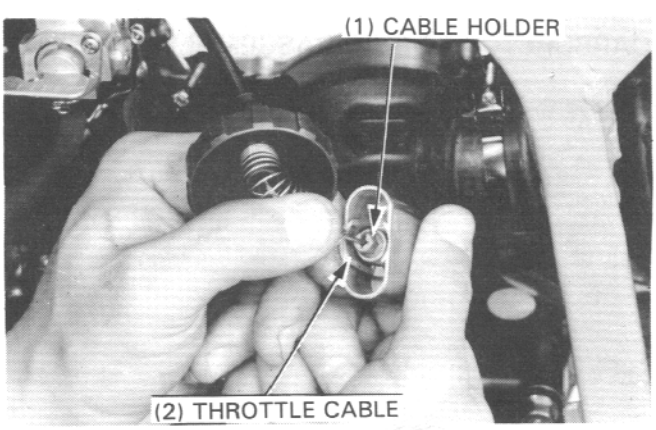


Remove the carburetor top and pull out the throttle valve.



THROTTLE VALVE DISASSEMBLY

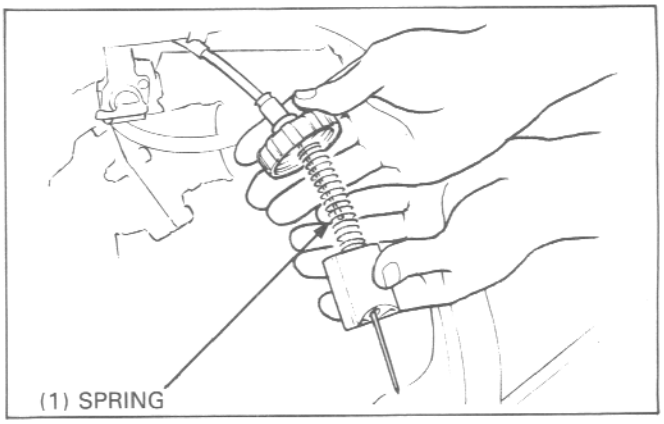
Remove the throttle cable from the cable holder.



Remove the throttle valve spring from the carburetor top.

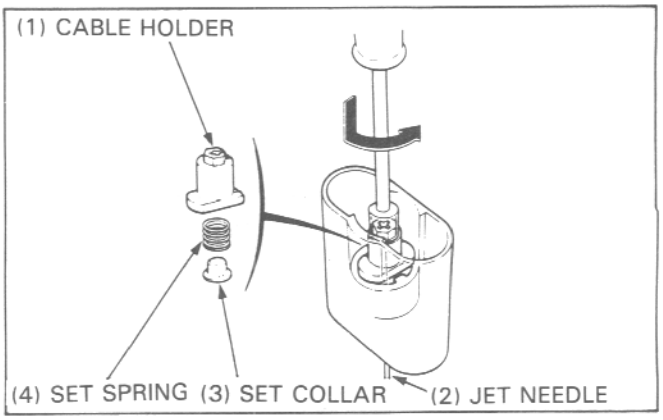
CAUTION

- *The carburetor top is an integral part of the throttle cable assembly. The top cannot be separated from the assembly without causing damage to the cable.*



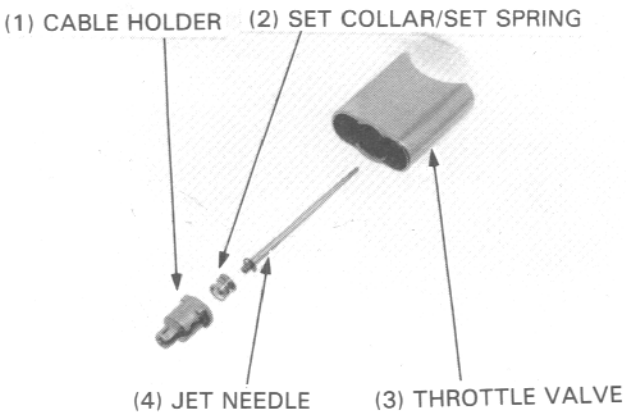
Push the cable holder in and turn it 90 degrees.

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



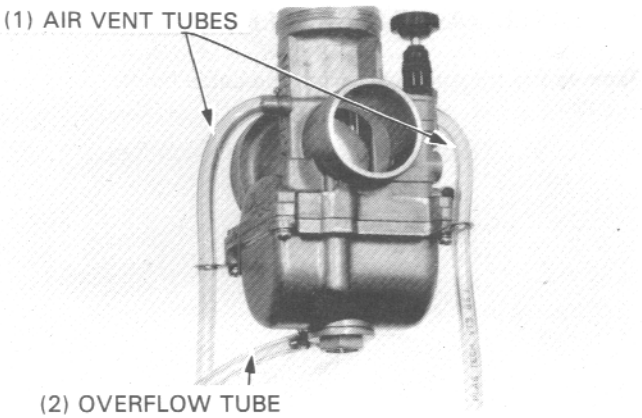
Remove the jet needle from the throttle valve.

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

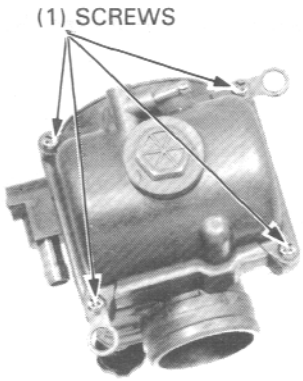


CARBURETOR BODY DISASSEMBLY

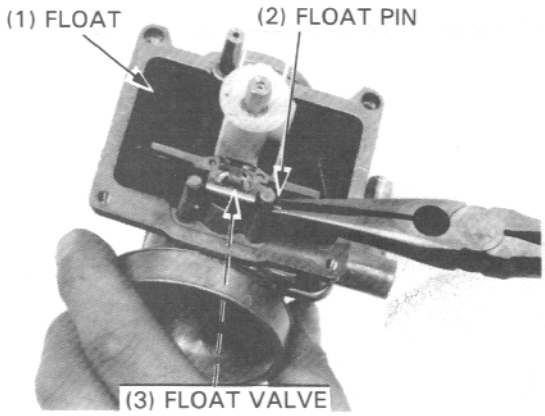
Remove the air vent and overflow tubes.



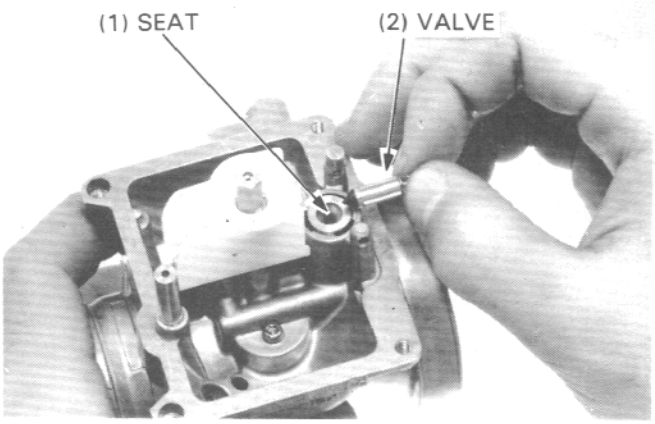
Remove the float chamber attaching screws and remove the float chamber.



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 baffle plate, main jet and slow jet.
Check each part for wear or damage.

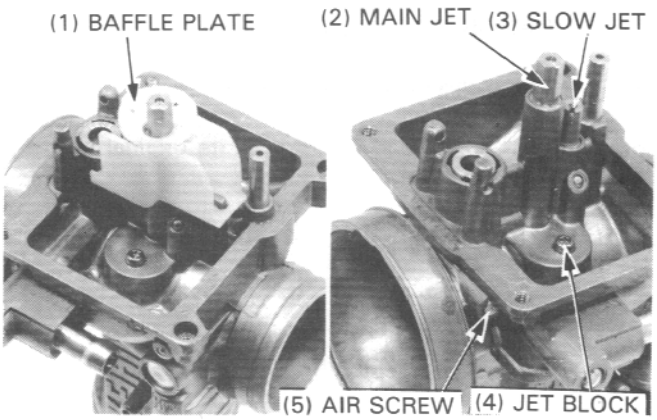
NOTE

- Before removing the air screw, turn it in and carefully count the number of turns before it seats lightly, so it can be returned to its original position.

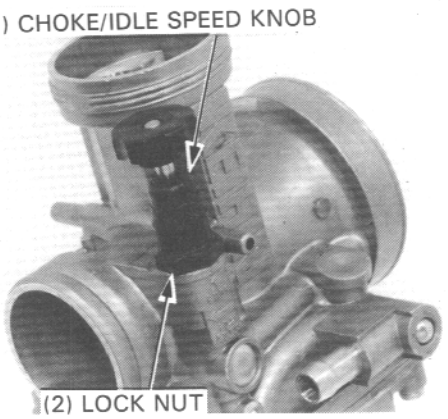
Remove the air screw.

CAUTION

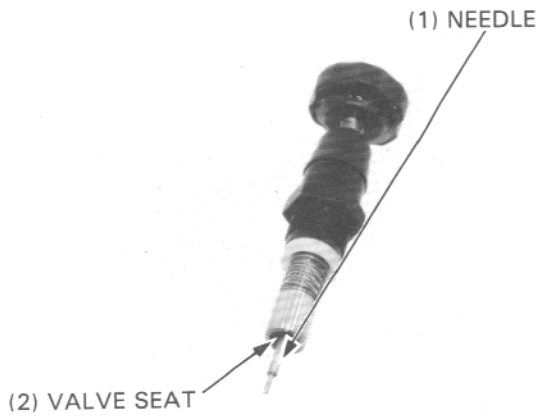
- *Do not try to remove the jet block from the carburetor body.*



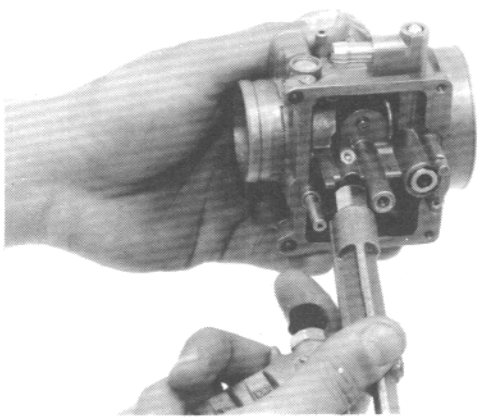
Unscrew the lock nut and remove the choke/idle speed knob.



Check the valve seat and needle for damage or deterioration.



Blow open all jets and body openings with compressed air.



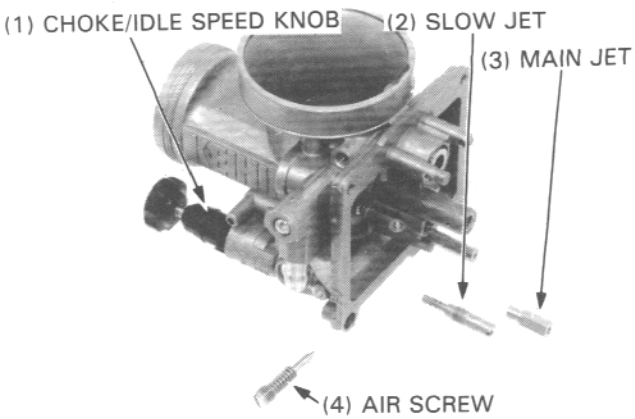
CARBURETOR BODY ASSEMBLY

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.

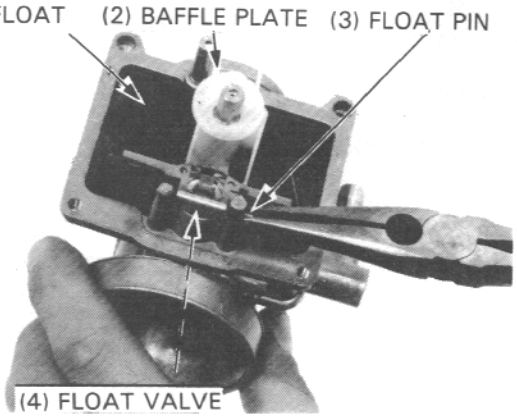
STANDARD:
'86, '87: 1-7/8 turns out
'88: 1-3/4 turns out
After '88: 1-1/2 turns out

Install the slow jet and main jet.



Install the baffle plate.

Install the float valve and float.
Install the float pin.



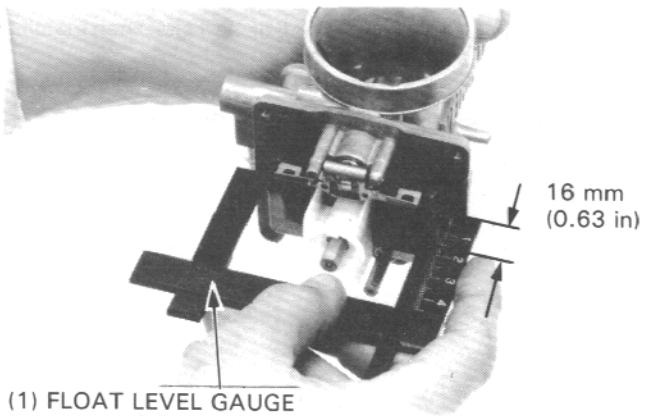
FLOAT LEVEL INSPECTION

Measure the float level.

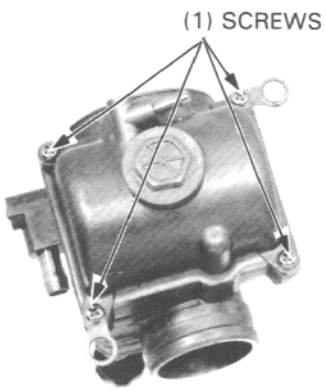
To adjust the float level, bend the float arm carefully until the float tip just contacts the float valve.

FLOAT LEVEL: 16 mm (0.63 in)

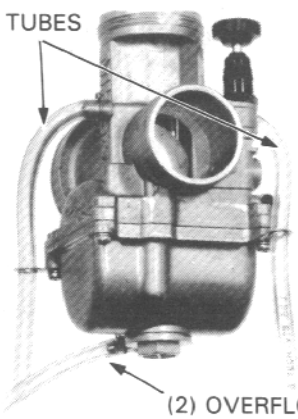
TOOL:
Float level gauge **07401—0010000**



Install the float chamber and attaching screws securely.



Install the air vent and overflow tubes as shown.

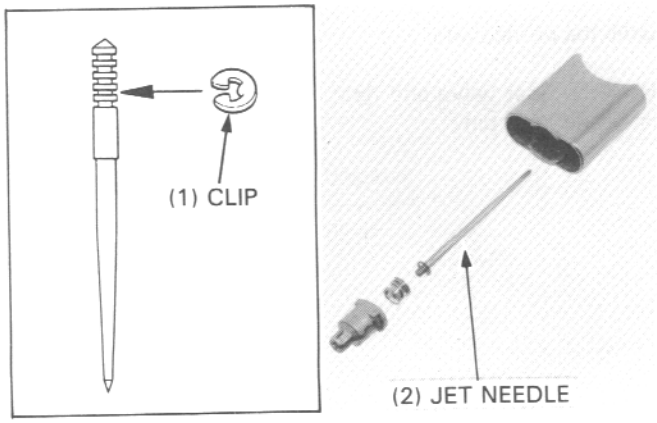


THROTTLE VALVE ASSEMBLY

Install the needle clip on the jet needle.

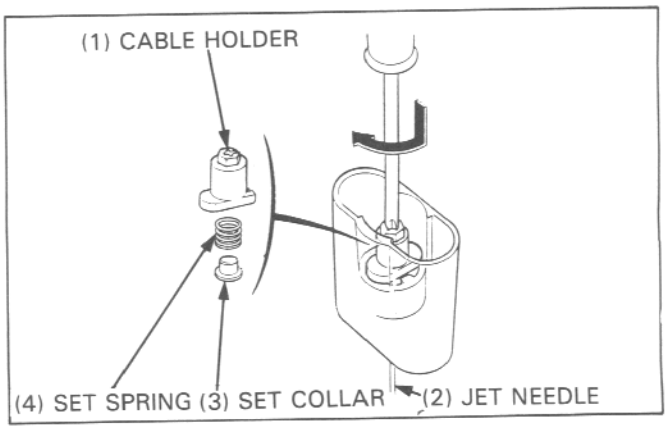
STANDARD POSITION (from the top):
'86, After '88: 4th groove
'87, '88: 3rd groove

Install the jet needle into the throttle valve.

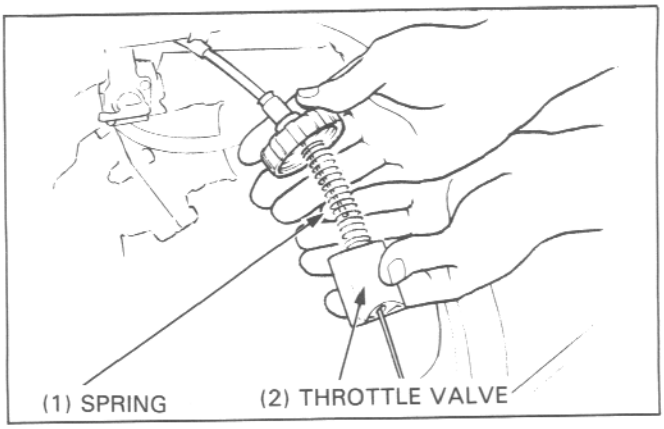


Install the set collar over the jet needle and clip, then install the set spring and cable holder.

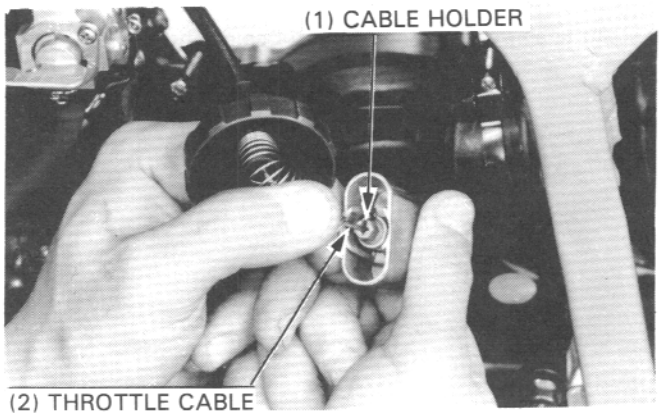
Push the cable holder in and turn it 90 degrees.



Install the throttle valve spring and throttle valve.

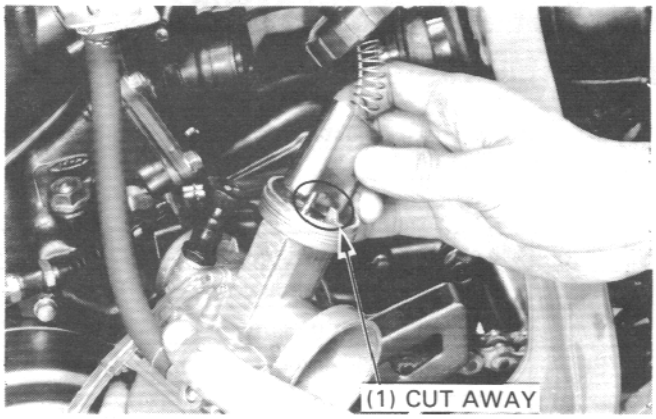


Compress the throttle valve spring and insert the throttle cable into the holder.

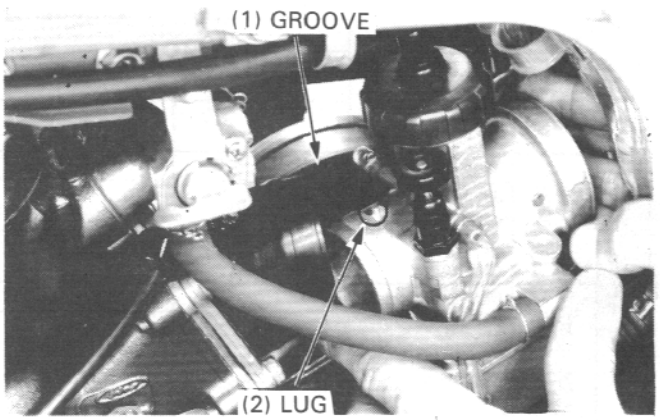


INSTALLATION

Connect the fuel line.
Install the throttle valve assembly into the carburetor body with throttle valve cut away facing to air cleaner.
Tighten the carburetor top securely.



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



Tighten the connecting tube band screws securely.
Turn the fuel valve "ON" and make sure that the there are no fuel leaks.
After installing the carburetor, make the following adjustments.
— throttle lever free play (page 2-4).
— air screw adjustment.
— idle speed adjustment (page 2-6).

Install the seat/rear fender.

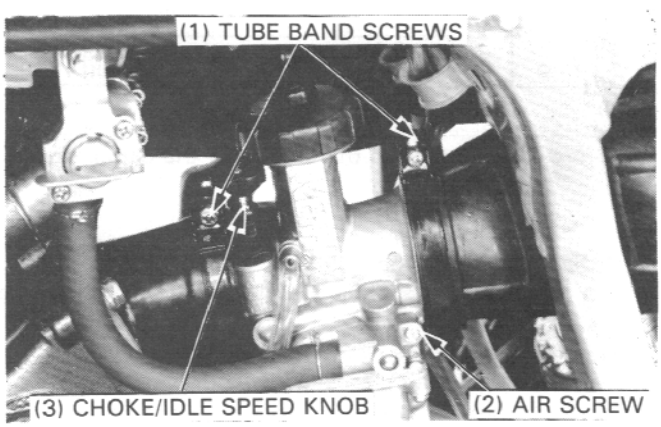
AIR SCREW ADJUSTMENT

NOTE

- Warm the engine up to operating temperature.

CAUTION

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



Turn the air screw clockwise until it seats lightly and back it out to the standard setting.

STANDARD:
'86, '87: 1-7/8 turns out
'88: 1-3/4 turns out
After '88: 1-1/2 turns out

Connect a tachometer. Start the engine and adjust the idle speed with the choke/idle speed knob.

IDLE SPEED: 1,500 ± 150 rpm

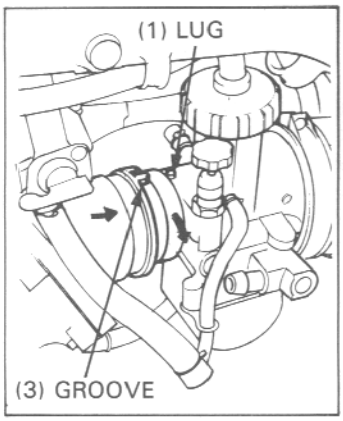
Turn the air screw to find the highest idle speed.
Make sure that the engine does not miss or run erratically.
Adjust the idle speed.
If necessary, repeat the above steps.

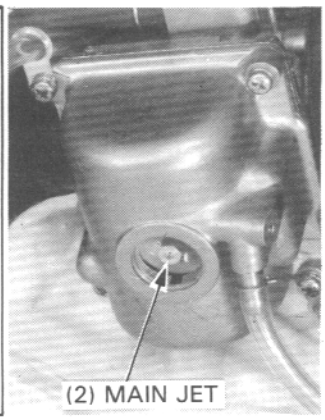
ALTITUDE AND TEMPERATURE ADJUSTMENT

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

STANDARD SETTING:

	Main jet	Jet needle setting	Air screw opening
'86:	#150	4th groove	1-7/8 turns out
'87:	#152	4th groove	1-7/8 turns out
'88:	#158	3rd groove	1-3/4 turns out
After '88:	#155	4th groove	1-1/2 turns out





			Temperature °C (°F)											
			−30 − −17.5 (−22 − 0)				−17.5 − −5 (0 − 22)				−5 − 40 (22 − 104)			
			'86:	'87:	'88:	After '88:	'86:	'87:	'88:	After '88:	'86:	'87:	'88:	After '88:
Altitude	5,000 ft (1,500 m)	Main jet (#)	150	152	158	155	148	150	155	152	145	148	152	150
		Jet needle setting	4th				3rd				2nd			
		Air screw opening	2 turns out		1-3/4 turns out	1-1/2 turns out	2-1/2 turns out		2 turns out	1-3/4 turns out	2-1/2 turns out		2-1/4 turns out	2 turns out
	3,300–6,600 ft (1,000–2,000 m)	Main jet (#)	152	155	160	158	150	152	158	155	148	150	155	152
		Jet needle setting	5th				4th				3rd			
		Air screw opening	1-1/2 turns out:			1-1/4 turns out	2 turns out		1-3/4 turns out	1-1/2 turns out	2 turns out			1-3/4 turns out
	0–5,000 ft (0–1,500 m)	Main jet (#)	155		160	158	152	155	160	158	150	152	158	155
		Jet needle setting	5th				4th				4th	3rd		4th
		Air screw opening	1-1/2 turns out		1-1/4 turns out	1 turn out	2 turns out		1-1/2 turns out	1-1/4 turns out	1-7/8 turns out		1-3/4 turns out	1-1/2 turns out

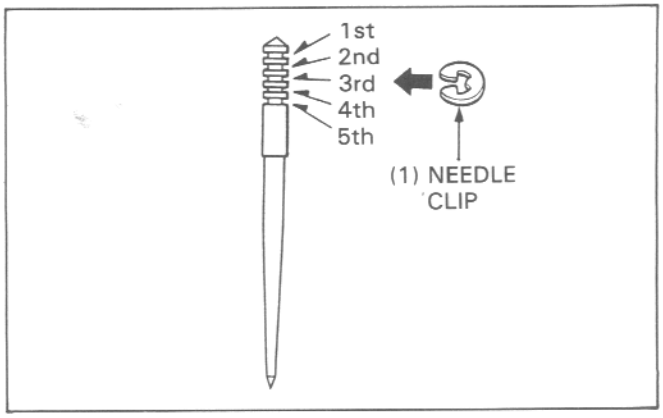
NOTE

- Before adjusting, clean the outside of the carburetor.

Turn the fuel valve to the "OFF" position.
Loosen the float chamber plug and drain the fuel in the float chamber.
Disconnect the fuel line from the carbureor.
Loosen the connecting tube and insulator bands.
Slide the carburetor rearward to release the lug on the carburetor from the groove in the insulator, turn the carburetor and remove the carburetor top.
Remove the jet needle from the throttle valve (page 3-6).
Turn the carburetor and remove the float chamber plug.

CAUTION

- *Be careful not to damage the carburetor insulator and connecting tube.*

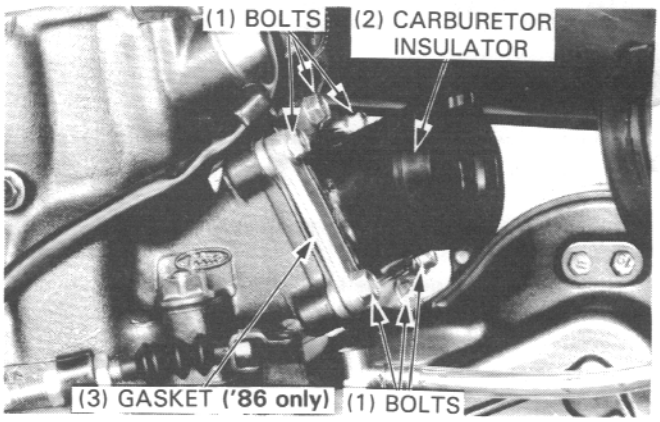


Replace the main jet and adjust the jet needle clip position.
Reinstall the float chamber plug and carburetor top.
Tighten the connecting tube bands.
Adjust the air screw.

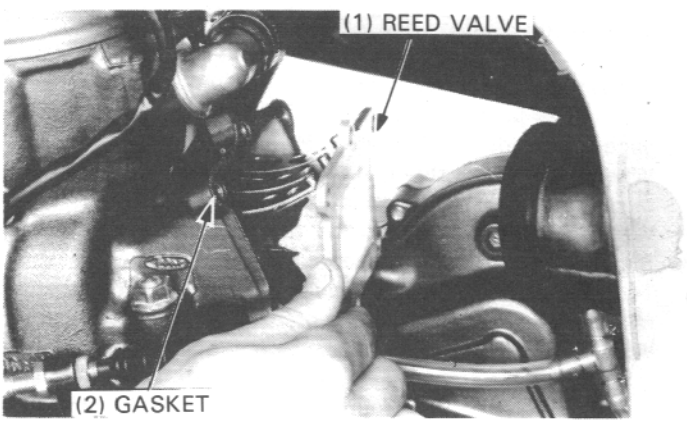
REED VALVE

REMOVAL

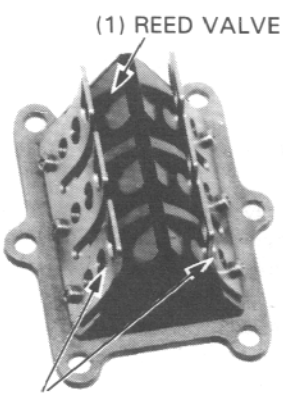
Remove the carburetor (page 3-5).
Remove the six carburetor insulator mounting bolts.
Remove the carburetor insulator and gasket ('86 only).



Remove the reed valve and gasket from the cylinder.



'86, '87 Shown:



'86–'88 SHOW

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 disassemble 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.*

INSTALLATION

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

NOTE

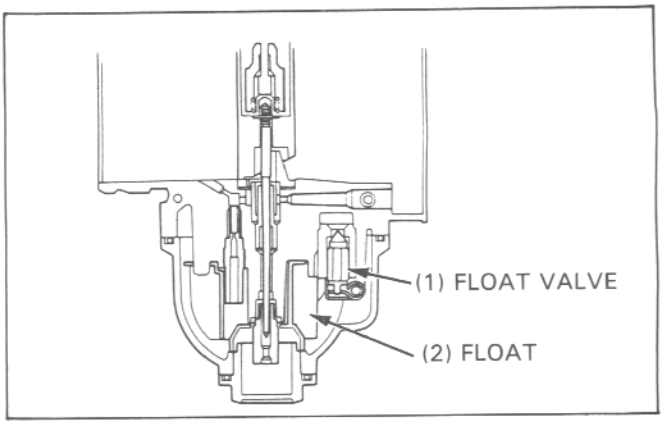
- After installation, check for secondary air leaks around the reed cage and insulator.

CARBURETOR THEORY

FLOAT CHAMBER

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

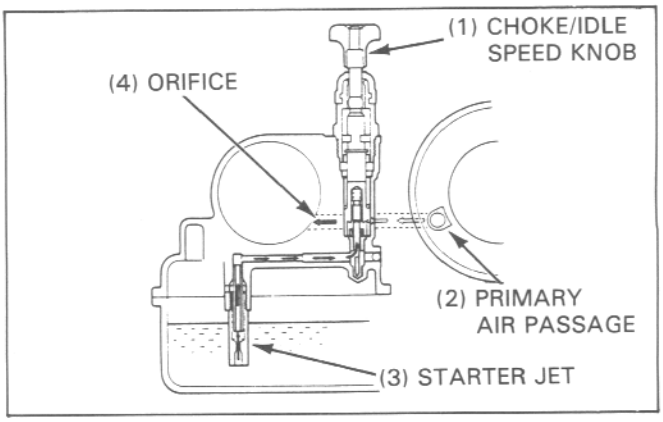
- The float level affects the mixture throughout the entire range.
  - Although it is possible to alter the fuel mixture by changing the float level, it is not recommended.



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).

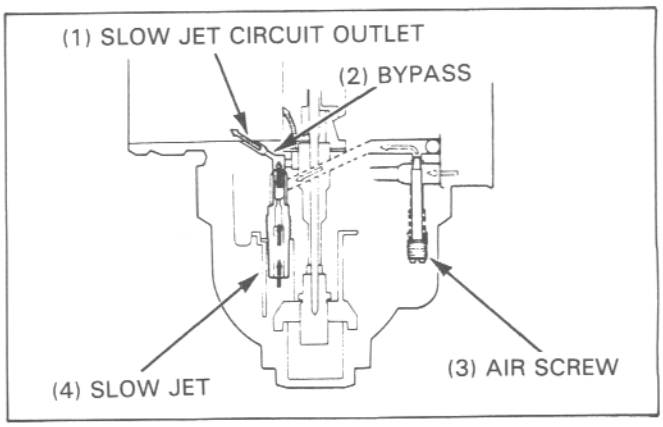
- This circuit has two main functions; to start a cold engine (knob up) or to supply enough fuel/air to allow the engine to idle (knob down and adjusted properly).



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.

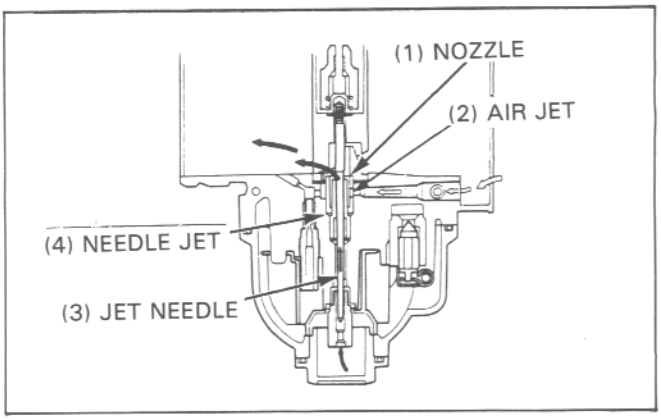
- This circuit affects idle-to-1/4 throttle.
  - The mixture can be altered by changing the slow jet or the air screw adjustment.



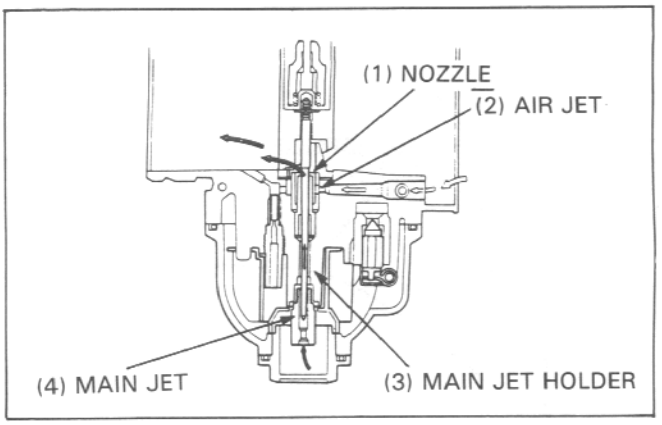
MAIN CIRCUIT

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.

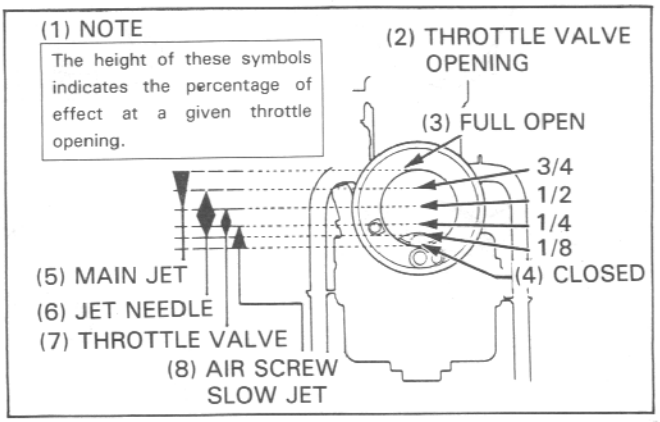


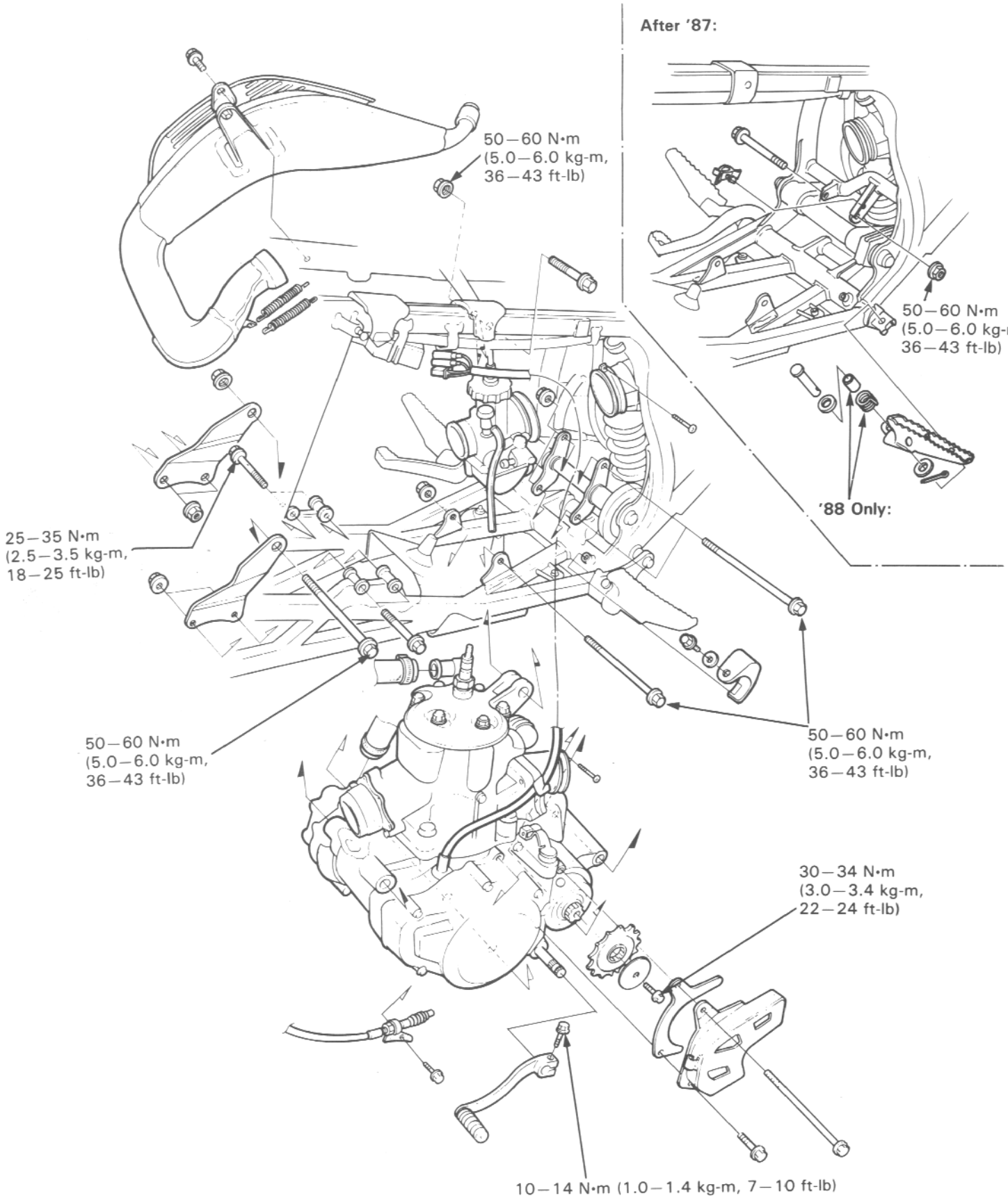
- This final portion of the main circuit affects 1/2-to-full throttle.
  — The mixture can be altered by changing the main jet.



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 3-12.




After '87:
50–60 N·m
(5.0–6.0 kg-m,
36–43 ft-lb)
50–60 N·m
(5.0–6.0 kg-m,
36–43 ft-lb)
'88 Only:
25–35 N·m
(2.5–3.5 kg-m,
18–25 ft-lb)
50–60 N·m
(5.0–6.0 kg-m,
36–43 ft-lb)
50–60 N·m
(5.0–6.0 kg-m,
36–43 ft-lb)
30–34 N·m
(3.0–3.4 kg-m,
22–24 ft-lb)
10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)

4. ENGINE REMOVAL/INSTALLATION

SERVICE INFORMATION

GENERAL

- The engine must be removed from the frame to service the following parts:
  Transmission (section 8)
  Crankshaft (section 8)

SPECIFICATIONS

Engine dry weight:	26.0 kg (57.3 lb)
Transmission oil capacity:	0.7 lit (0.74 U.S. qt., 0.62 Imp. qt.) at disassembly
	0.6 lit (0.63 U.S. qt., 0.53 Imp. qt.) after draining

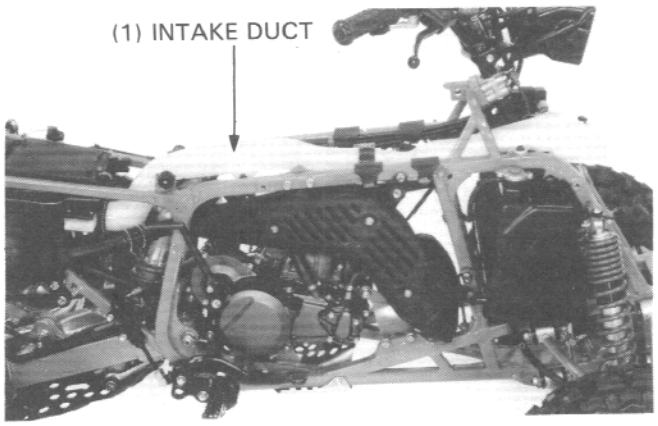
TORQUE VALUES

Engine mounting bolt (10 mm bolt)	50—60 N·m (5.0—6.0 kg-m, 36—43 ft-lb)
Engine hanger plate and pipe 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—24 ft-lb)
Gearshift pedal bolt	10—14 N·m (1.0—1.4 kg-m, 7—10 ft-lb)
Kick starter pedal pinch bolt	20—35 N·m (2.0—3.5 kg-m, 14—25 ft-lb)

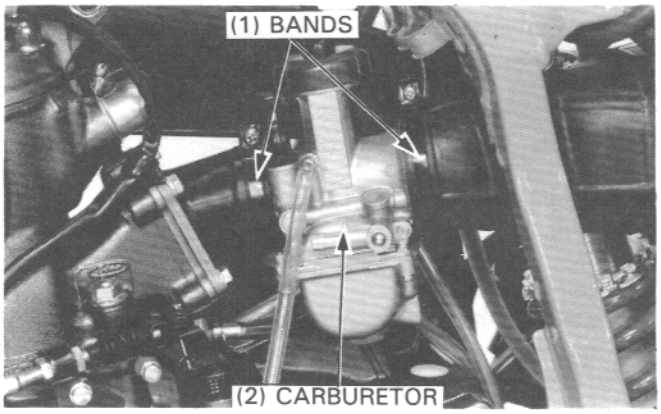
ENGINE REMOVAL

Remove the seat/rear fender and front fender (section 14).
Remove the fuel tank (page 3-3).

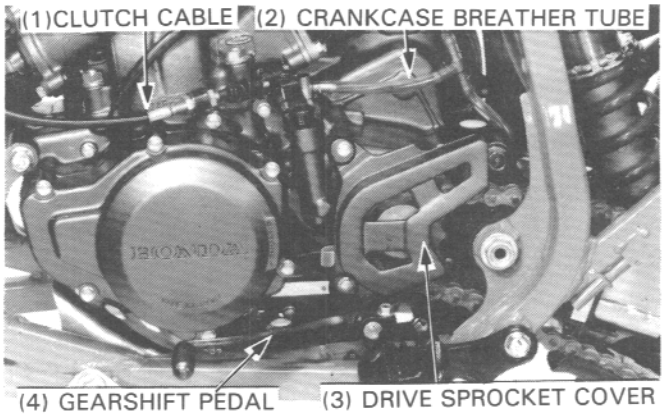
Drain the radiator coolant (page 9-2).
'86, '87: Remove the air intake duct.



Loosen the connecting tube and insulator bands and remove the carburetor.

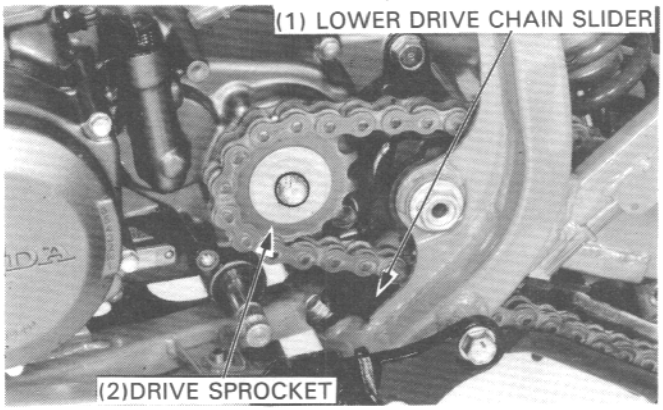


Disconnect the clutch cable at its lower end.
Remove the crankcase breather tube.
Remove the gearshift pedal.
Remove the drive sprocket cover.

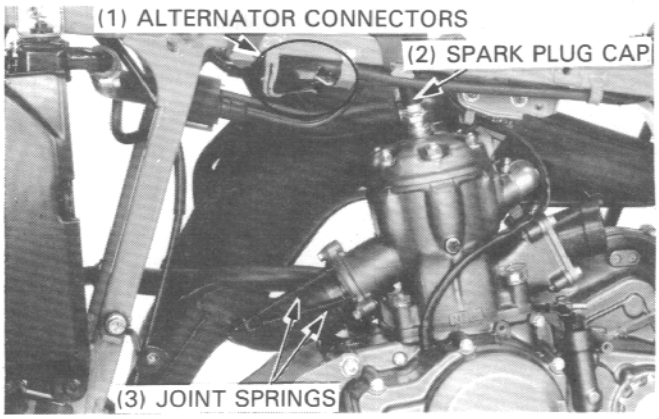


Loosen the drive chain (page 2-9).

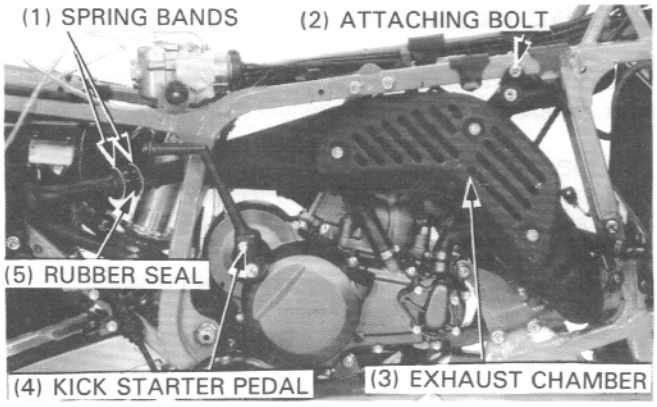
'86, '87: Remove the lower drive chain slider.
Remove the drive sprocket.



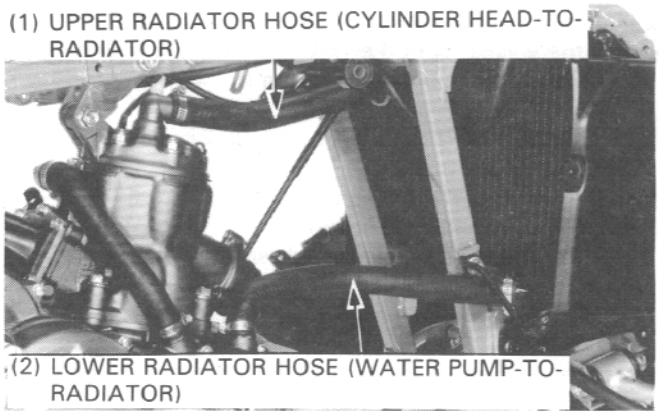
Disconnect the alternator connectors.
Free the alternator wire from the frame clamps.
Remove the spark plug cap.
Remove the exhaust chamber joint springs.



Remove the two spring bands from the rubber seal.
Slide the rubber seal back.
Remove the exhaust chamber attaching bolt and the exhaust chamber.
Remove the kick starter pedal.

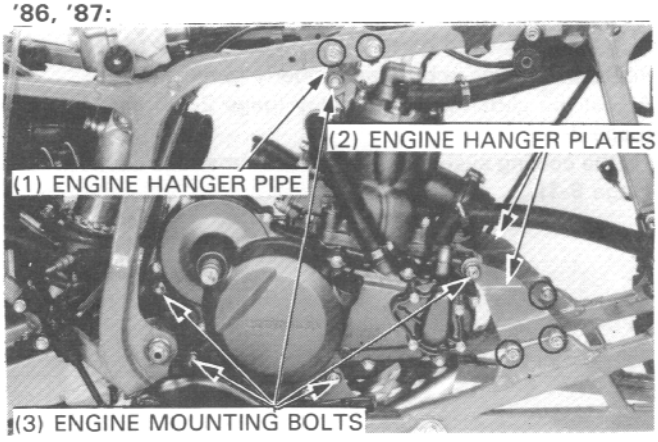


Loosen the radiator hose bands and remove the radiator hoses.



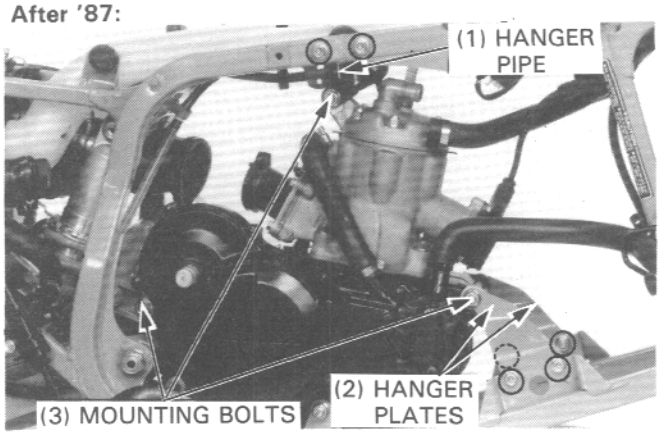
Remove the front engine hanger plates, engine mounting bolts and top engine hanger pipe.
Remove the engine from the frame.

'86, '87:



Note the direction of the mounting bolts.

After '87:

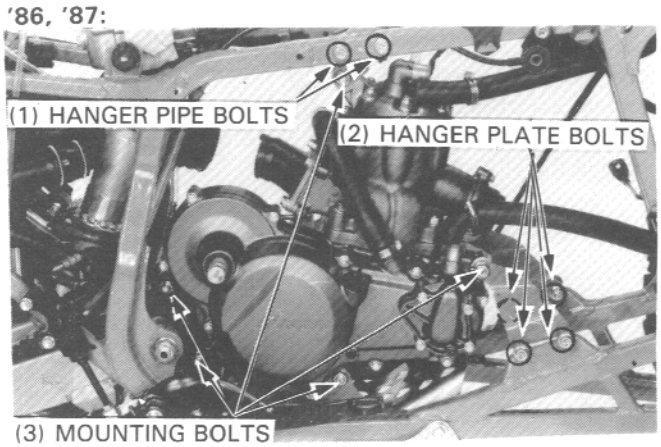


ENGINE INSTALLATION

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

TORQUE:
ENGINE HANGER PLATE AND PIPE BOLT (8 mm bolt):
25—35 N·m (2.5—3.5 kg-m, 18—25 ft-lb)
ENGINE MOUNTING BOLT (10 mm bolt):
50—60 N·m (5.0—6.0 kg-m, 36—43 ft-lb)

'86, '87:



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

TORQUE: 30—34 N·m (3.0—3.4 kg-m, 22—24 ft-lb)

Install the lower drive chain slider.
Install the drive sprocket cover.
Install the gearshift pedal and tighten the bolt.

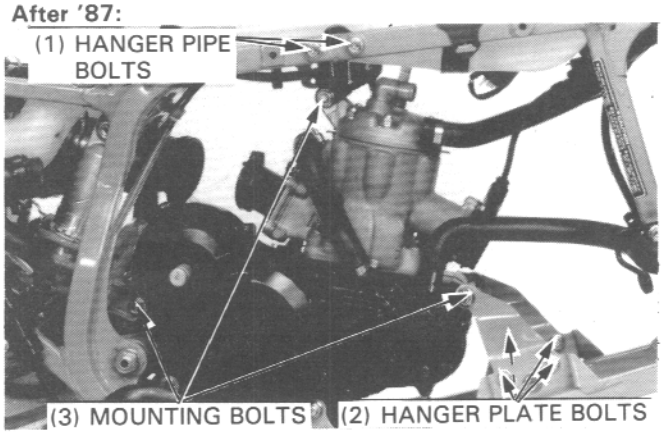
TORQUE: 10—14 N·m (1.0—1.4 kg-m, 7—10 ft-lb)

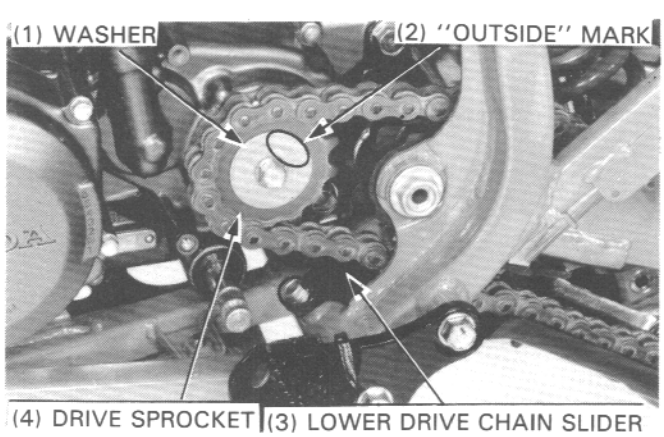
Install the kick starter pedal and tighten the pinch bolt.

TORQUE: 20—35 N·m (2.0—3.5 kg-m, 14—25 ft-lb)

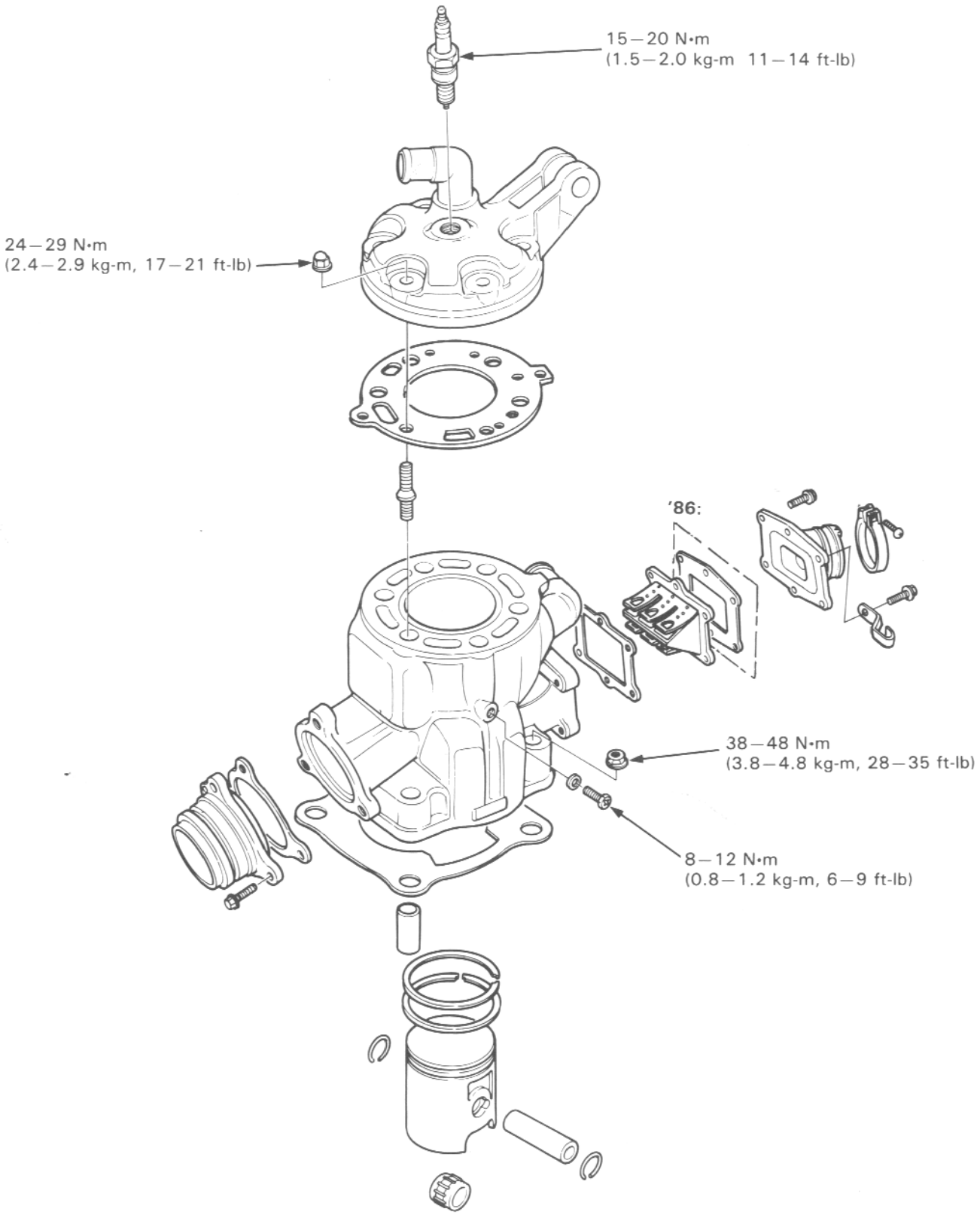
Install the removed parts in the reverse order of removal.
Route the cables and wired properly (page 1-9).
Adjust the clutch lever free play (page 2-14) and drive chain (page 2-9.)
Fill the cooling system with the recommended coolant mixture (page 9-1).

After '87:





MEMO


15—20 N•m
(1.5—2.0 kg-m 11—14 ft-lb)
24—29 N•m
(2.4—2.9 kg-m, 17—21 ft-lb)
'86:
38—48 N•m
(3.8—4.8 kg-m, 28—35 ft-lb)
8—12 N•m
(0.8—1.2 kg-m, 6—9 ft-lb)

5. CYLINDER HEAD/CYLINDER/PISTON

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 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 pistons and piston rings are available. Refer to page 1-15.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder head warpage			0.05 (0.002)	0.07 (0.003)
Cylinder	I.D.	A	66.030–66.040 (2.59961–2.60000)	66.07 (2.6012)
		B	66.020–66.029 (2.59921–2.59957)	66.06 (2.6008)
	Taper		—	0.03 (0.001)
	Out of round		—	0.03 (0.001)
	Warpage		—	0.05 (0.002)
Piston, piston pin, piston ring	Piston O.D. (page 5-6)	A	65.960–65.970 (2.59685–2.59724)	65.90 (2.5945)
		B	65.950–65.959 (2.59646–2.59681)	65.89 (2.5941)
	Piston pin bore		18.007–18.013 (0.7089–0.7092)	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 clearance		0.007–0.019 (0.0003–0.0007)	0.03 (0.001)
	Piston ring end gap		0.2–0.4 (0.01–0.02)	0.5 (0.02)
Cylinder-to-piston clearance			0.060–0.080 (0.0024–0.0031)	0.14 (0.006)
Connecting rod small end I.D.			21.997–22.009 (0.8660–0.8665)	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 pipe bolt (8 mm)	25–35 N·m (2.5–3.5 kg-m, 18–25 ft-lb)
Coolant drain bolt	8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)
Spark plug	15–20 N·m (1.5–2.0 kg-m, 11–14 ft-lb)

TROUBLESHOOTING

Compression too low, hard starting or poor performance at low speed
- Blown 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 head

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

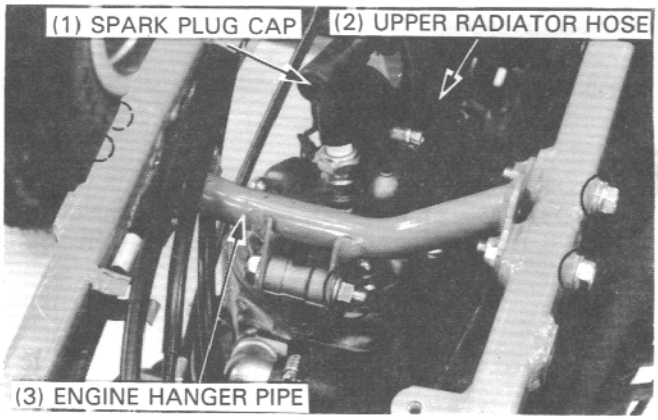
Abnormal noise — piston rings
- Worn, stuck or broken piston rings
- Worn or damaged cylinder

Contaminated coolant
- Leaking head gasket

CYLINDER HEAD

REMOVAL

Remove the seat/rear fender.
Remove the fuel tank (page 3-3).
Drain the coolant (page 9-2).
Disconnect the upper radiator hose from the cylinder head.
Remove the spark plug cap.
Remove the engine hanger pipe.

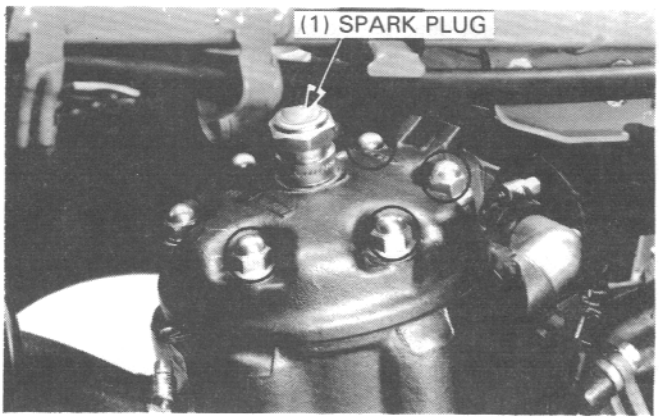


Remove the spark plug.
Remove the cylinder head nuts then remove the cylinder head.

NOTE

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

Remove the cylinder head gasket.



INSPECTION

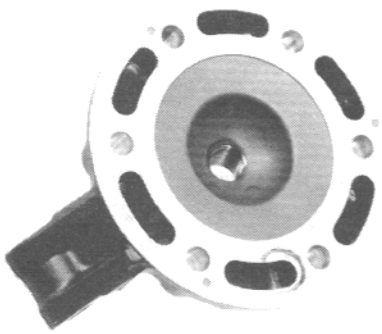
Clean the head gasket surface of any gasket material.
Clean carbon deposits from the combustion chamber.

CAUTION

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

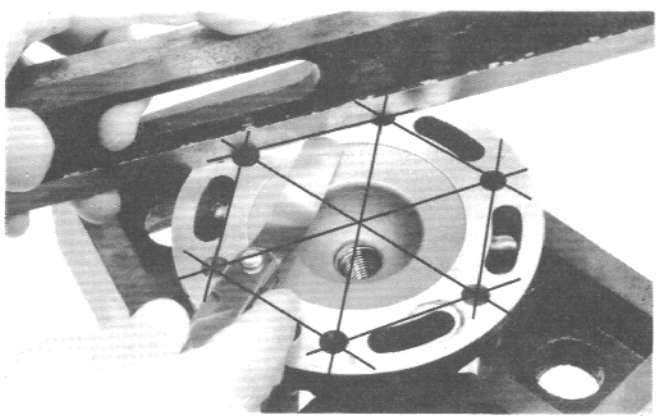
NOTE

- Gasket will come off easier if soaked in solvent.



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

SERVICE LIMIT: 0.07 mm (0.003 in)

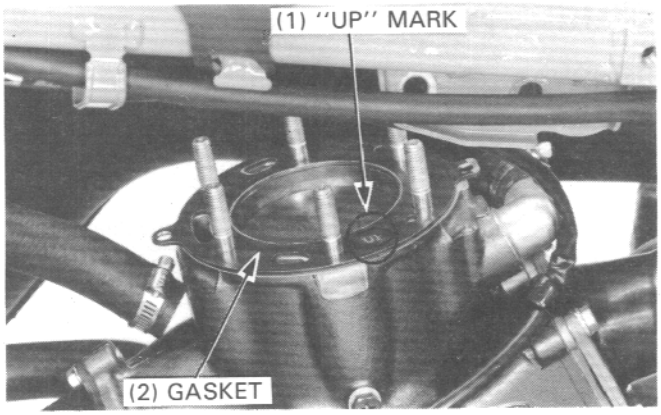


INSTALLATION

Install new cylinder head gasket with the "UP" mark facing up.

NOTE

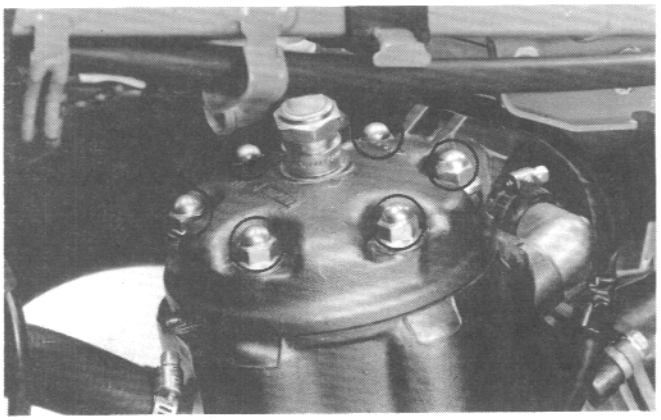
- Be sure to install the cylinder head gasket in the correct direction. If it is reversed, coolant flow will be affected.



Place the cylinder head on the cylinder.
Install the six 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)

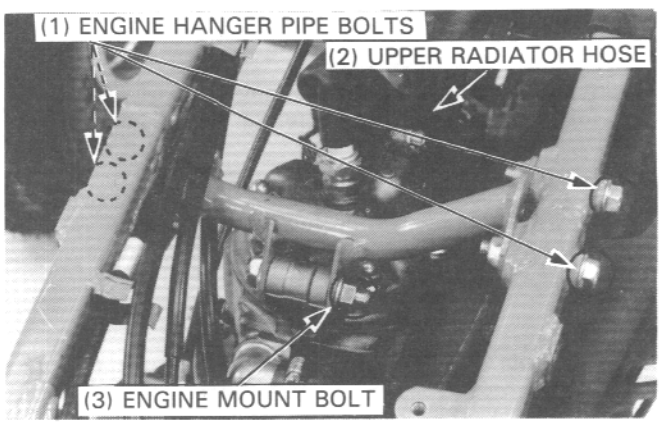
Install the spark plug and spark plug cap.



Install the engine hanger pipe.
Tighten the engine mounting bolt and hanger pipe bolts.

TORQUE:
ENGINE MOUNTING BOLT (10 mm bolt):
50—60 N·m (5.0—6.0 kg-m, 36—43 ft-lb)
ENGINE HANGER PIPE BOLT (8 mm bolt):
25—35 N·m (2.5—3.5 kg-m, 18—25 ft-lb)

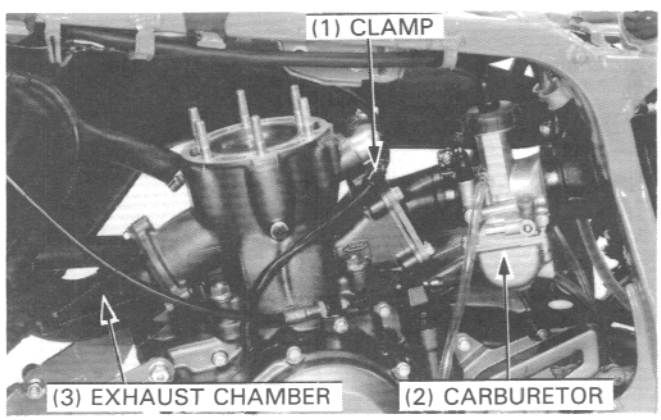
Connect the upper radiator hose to the cylinder head.
Pour the recommended coolant mixture up to the correct level (page 9-3).



CYLINDER/PISTON

REMOVAL

Remove the following:
- cylinder head (page 5-3)
- alternator wire from the clamp
- exhaust chamber (page 14-4)
- carburetor (page 3-5)



Disconnect the radiator hose (cylinder-to-water pump) at the cylinder.
Remove the cylinder base nuts.

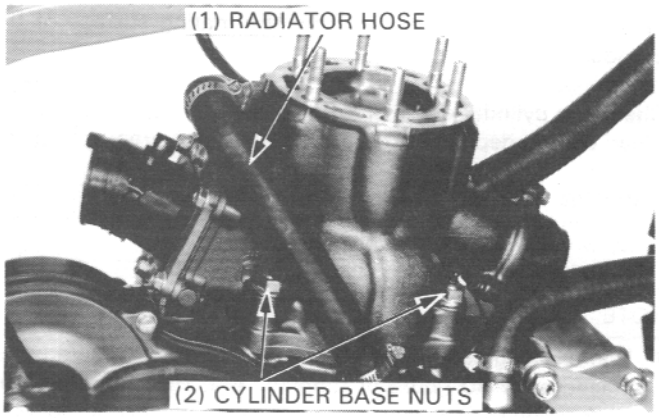
NOTE

- Loosen the nuts in a crisscross pattern in 2 or 3 progressive steps.

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

CAUTION

- *Do not pry or strike on the cylinder.*

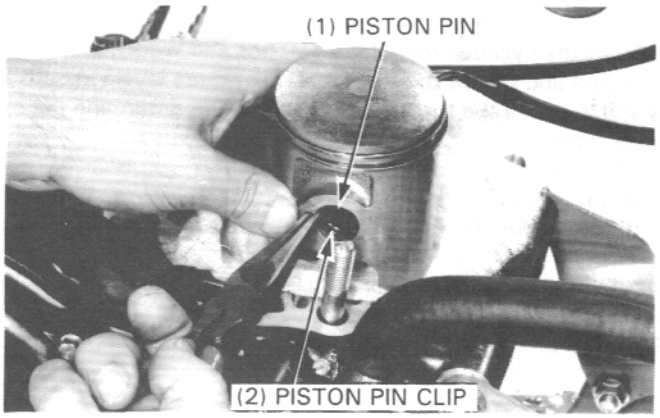


Place a clean shop towel into the crankcase to keep debris out.

Remove the piston pin clip using a pair of needlenose 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.*

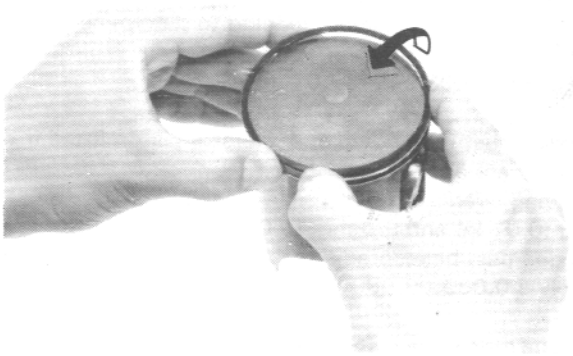


Spread each piston ring and remove by lifting it up at a point just opposite the gap.

Clean carbon deposits from the piston head and piston ring grooves.

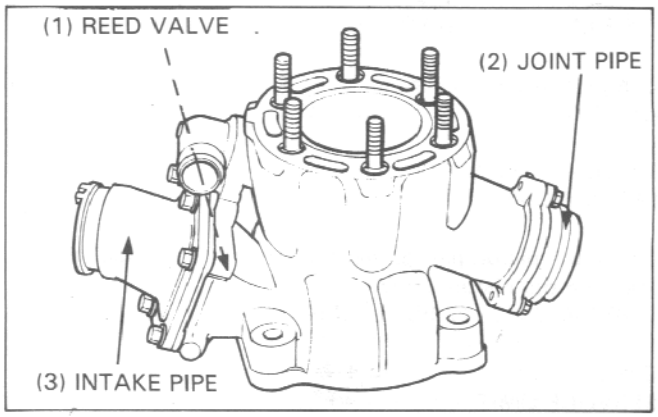
CAUTION

- *Do not damage the piston rings by spreading the ends too far.*
- *Use care not to scratch the piston head or piston ring grooves.*

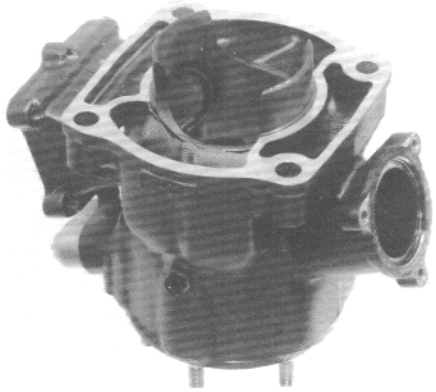


INSPECTION

Remove the exhaust chamber joint pipe, intake pipe and reed valve.



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



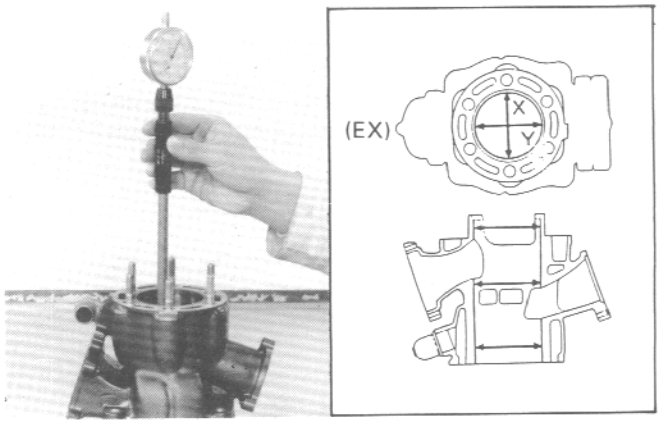
Check the cylinder and piston for wear or damage.
Clean carbon deposits from the exhaust port area.

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.

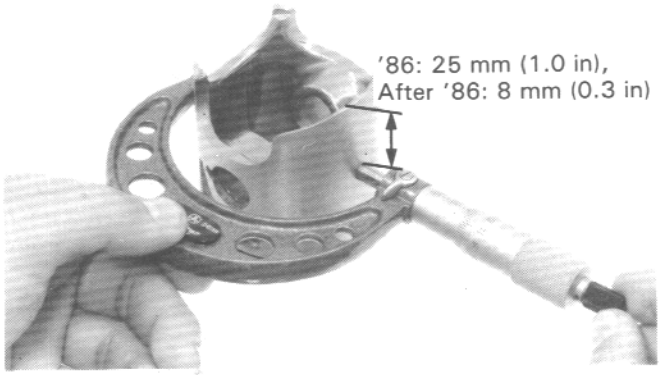


Inspect the cylinder walls for scratches and wear.
Measure and record the cylinder I.D. at three levels in both an X and Y axis. Take the maximum reading to determine the cylinder wear.
SERVICE LIMIT:
A (I.D. code): 66.07 mm (2.6012 in)
B (I.D. code): 66.06 mm (2.6008 in)

Calculate the piston-to-cylinder clearance. Take the maximum reading to determine the clearance.
SERVICE LIMIT: 0.14 mm (0.006 in)

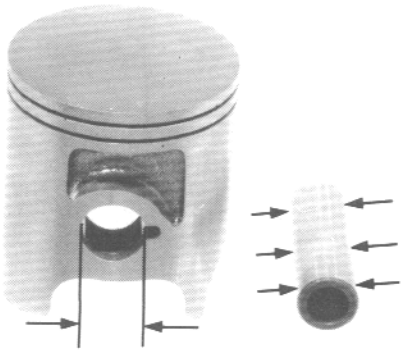
Calculate the cylinder for taper at three levels in a X and Y axis. Take the maximum reading to determine the taper.
SERVICE LIMIT: 0.03 mm (0.001 in)

Calculate the cylinder for out-of-round at three levels in a X and Y axis. Take the maximum reading to determine the out-of-round.
SERVICE LIMIT: 0.03 mm (0.001 in)



The cylinder must be rebored and oversize piston fitted if the service limits are exceeded.
The following oversize pistons are available:
0.25 mm (0.01 in) and 0.5 mm (0.02 in)
The cylinder must be rebored so that the clearance to an oversize piston is 0.060—0.080 mm (0.0024—0.0031 in).

Measure and record the piston O.D. 90° to the piston pin bore.
SERVICE LIMIT:
A (O.D. code): 65.90 mm (2.5945 in)
B (O.D. code): 65.89 mm (2.5941 in)



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

Measure the piston pin bore I.D.
SERVICE LIMIT: 18.03 mm (0.710 in)

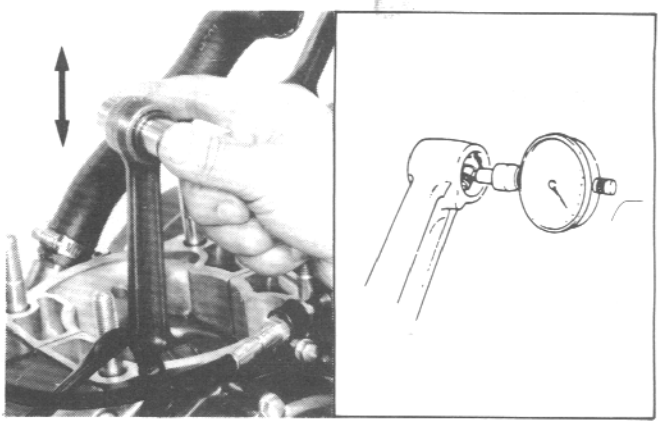
Check the piston pin for wear and excessive discoloration.
Measure the piston pin O.D.
SERVICE LIMIT: 17.98 mm (0.708 in)

Calculate the piston pin-to-piston clearance.
SERVLICE 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)

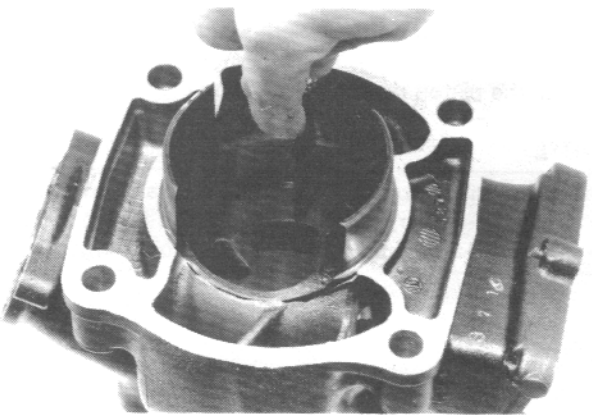
If not over the service limit, replace the piston pin and small end bearing.
If over the service limit, replace the crankshaft assembly.



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)



CYLINDER AND PISTON SELECTION

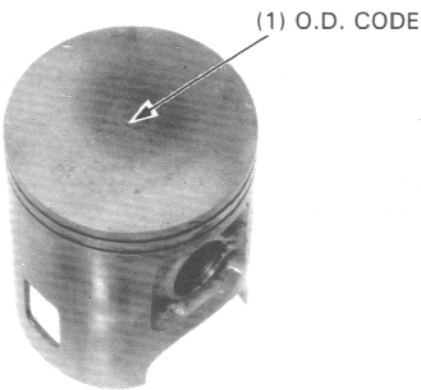
The cylinder and piston are select fitted. Select new proper piston and/or cylinder as follows:

•Piston selection
Record the O.D. code on the piston head.

NOTE

- A cylinder and piston with the same code are used. Refer to the code on the cylinder if you cannot identify the code on the piston head.

Use a new piston with the same O.D. code as the old one.



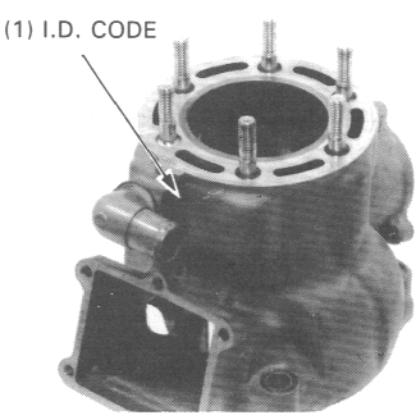
•Cylinder selection
Record the cylinder I.D. code located on the cylinder base rear the radiator hose connection.

Use a new cylinder with the same I.D. code as the old one.

•Cylinder and piston selection
Use new cylinder and piston with the same I.D. and O.D. codes when replacing cylinders and pistons together.

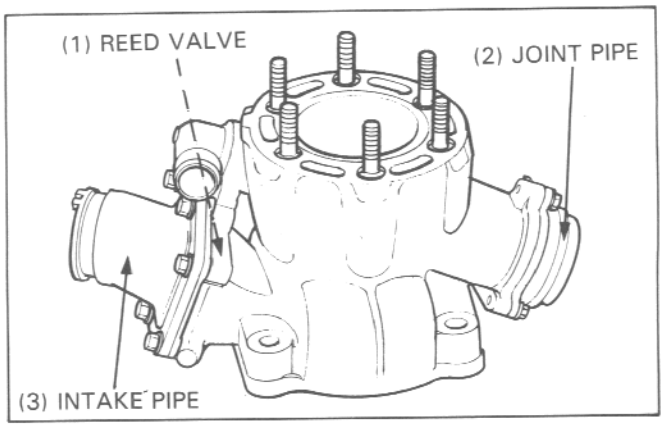
		CYLINDER I.D. CODE	
		A	B
PISTON O.D. CODE	A	O	×
	B	×	O

O: can be used
×: cannot be used



INSTALLATION

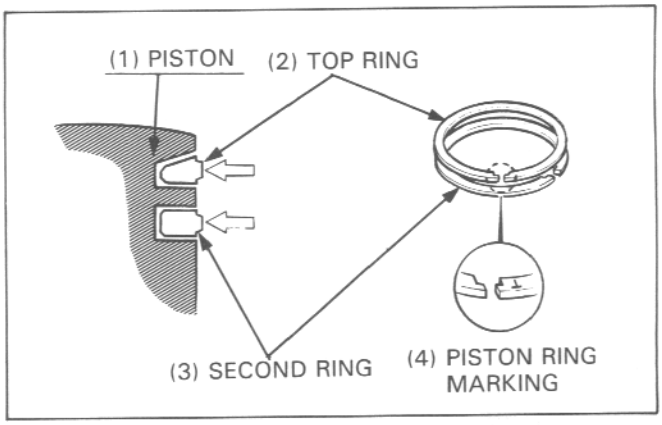
Install the exhaust chamber joint pipe, reed valve and intake pipe.



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.
- Avoid piston and piston ring damage during installation.
- Do not interchange the top and second rings.



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

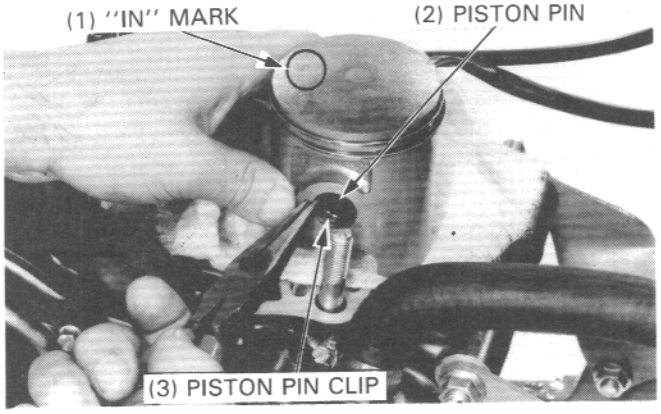
NOTE

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

Install the piston pin clips.

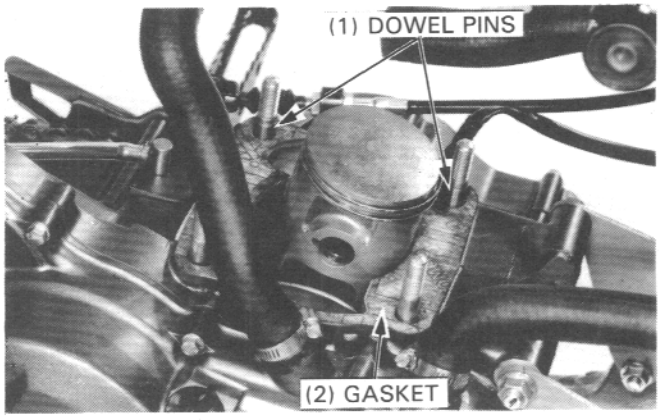
CAUTION

- *Use new pin clips. Never reuse old clips.*
- *Do not let the clips fall into the crankcase.*
- *Do not align the clip end gap with the piston cut-out.*

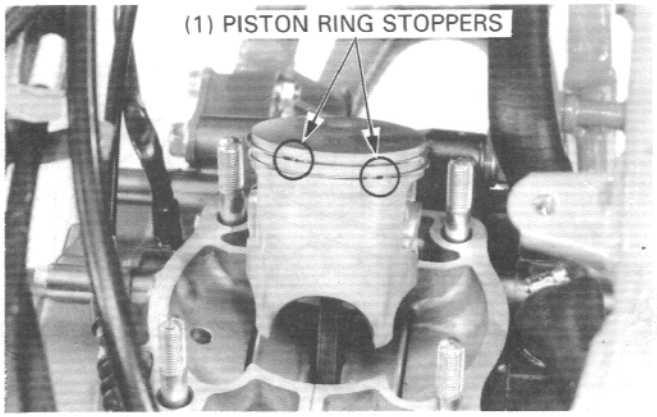


Clean the cylinder base gasket surfaces.

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



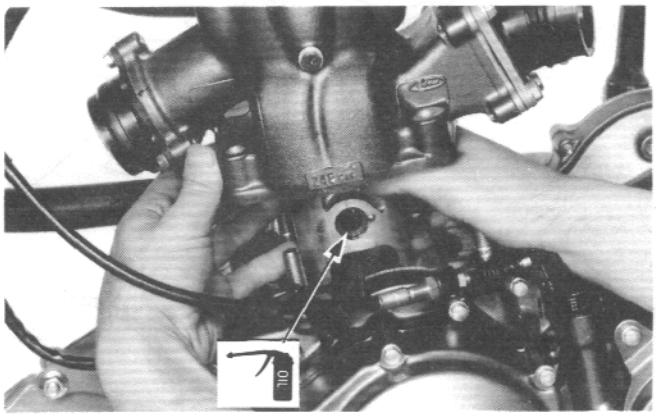
Align each ring end gap with the piston ring stoppers in the ring grooves.



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.*



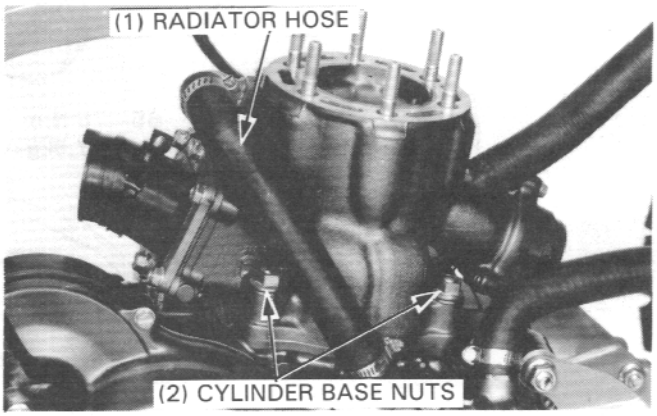
Install the cylinder base nuts.

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

NOTE

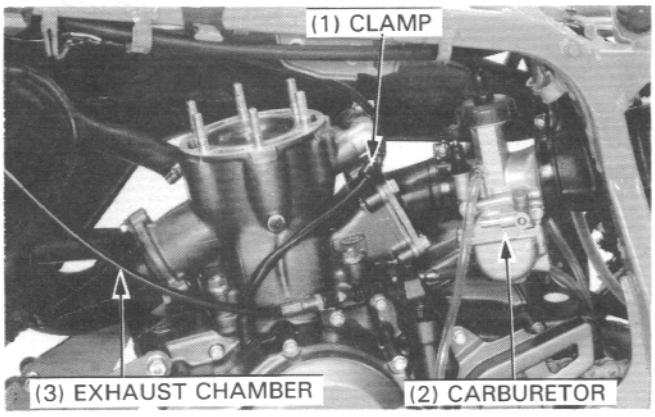
- Tighten the nuts in a crisscross pattern in 2 or 3 progressive steps.

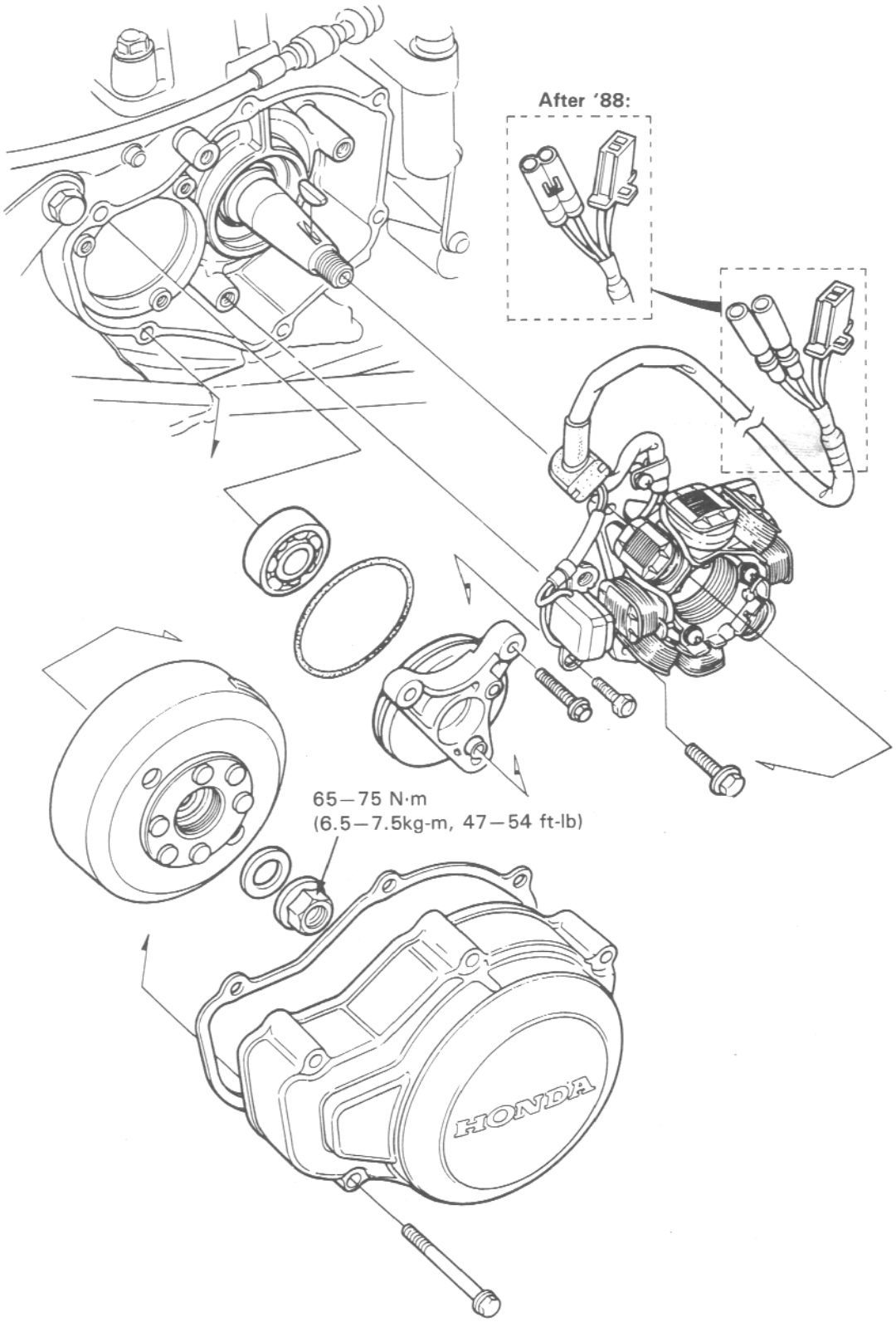
Connect the radiator hose (cylinder-to-water pump).



Install the following parts:
- exhaust chamber (page 14-4)
- carburetor (page 3-11)
- alternator wire onto the clamp
- cylinder head (page 5-4)

Perform the following inspections:
- Check for compression leaks.
- Listen for abnormal engine noises.
- Check for air leaks.




After '88:
65—75 N·m
(6.5—7.5kg-m, 47—54 ft-lb)
HONDA

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.
- The balancer bearing holder can be serviced with the engine in the frame, after removing the balancer (section 7).

TORQUE VALUE

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

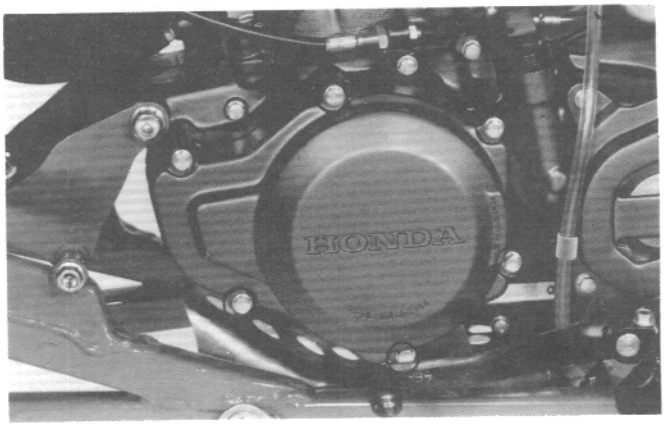
TOOLS

Special	
Bearing remover, 17 mm	07936—3710300
Remover handle	07936—3710100
Remover weight	07741—0010201 or 07936—3710200
Common	
Rotor puller	07733—0010000 or 07933—0010000
Universal holder	07725—0030000
Driver	07749—0010000
Attachment, 37 x 40 mm	07746—0010200
Pilot, 17 mm	07746—0040400

ALTERNATOR REMOVAL

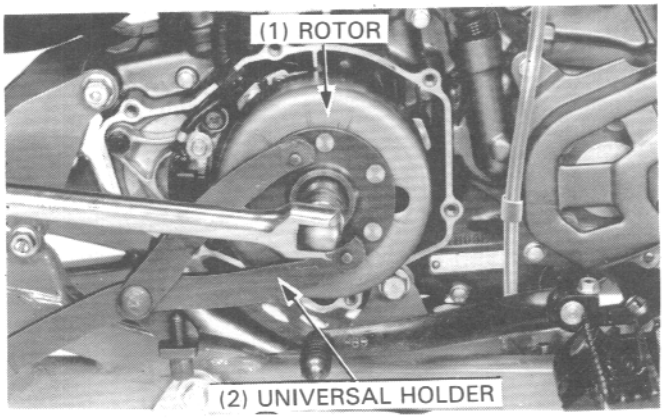
ROTOR REMOVAL

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



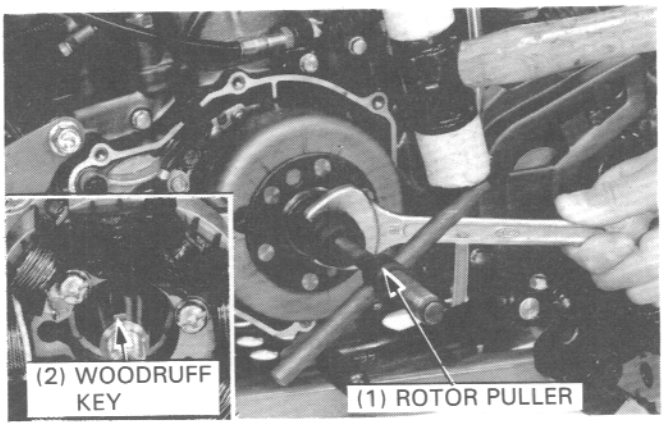
Hold the rotor with a universal holder and remove the rotor nut.

TOOL:
Universal holder **07725—0030000**



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

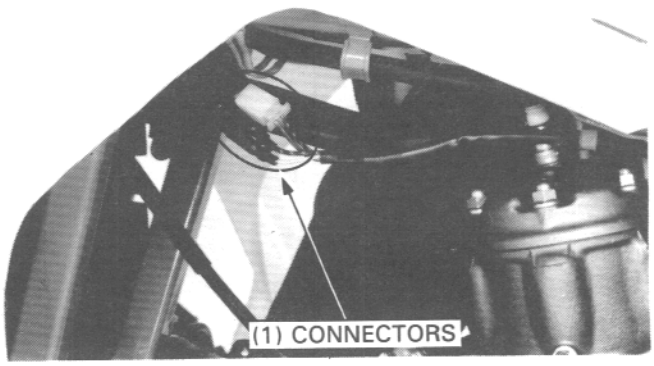
TOOL:
Rotor puller **07733—0010000 or 07933—0010000**



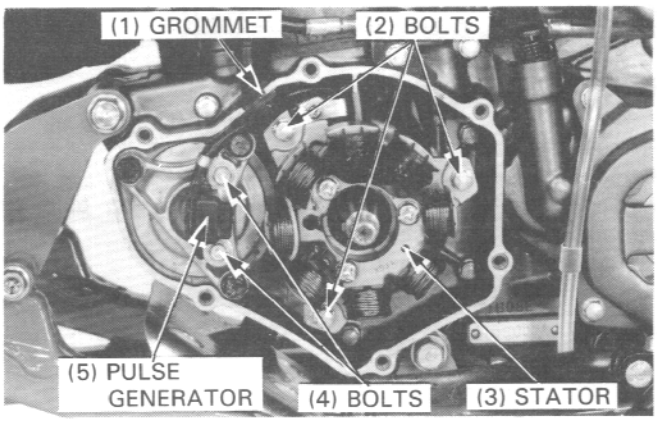
'86—'88 Shown:

STATOR REMOVAL

Disconnect the alternator connectors.



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 and pulse generator in the reverse order of removal.

NOTE

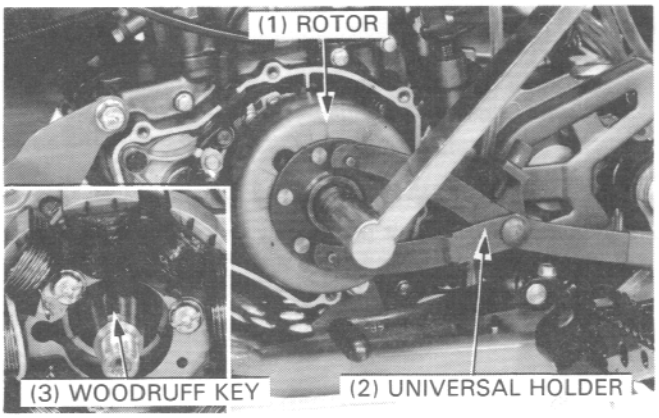
- Install the grommet securely into the left crankcase groove.

ROTOR INSTALLATION

Install the woodruff key in the keyway on the crankshaft.

NOTE

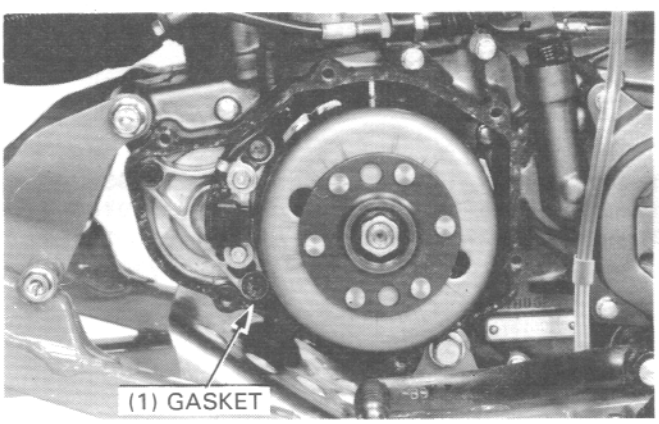
- Check that there is no debris inside the rotor before installation. The magnets tend to attract steel filings and other ferrous debris.
- Clean the tapered hole in the rotor of any burrs and other faults; repair if necessary.



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

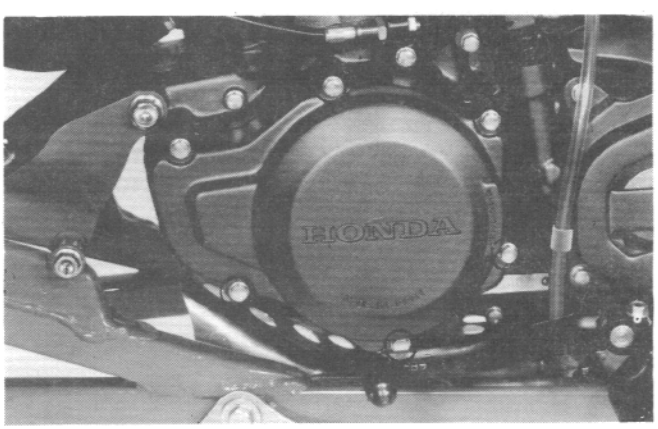
TORQUE: 65—75 N·m (6.5—7.5 kg-m, 47—54 ft-lb)

TOOL:
Universal holder **07725—0030000**



After installing the rotor, inspect the ignition timing (page 15-5).
Install a new gasket.

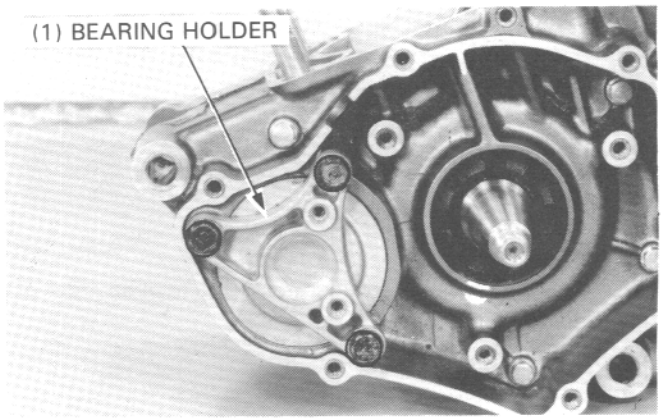
Install the left crankcase cover.



BALANCER BEARING HOLDER

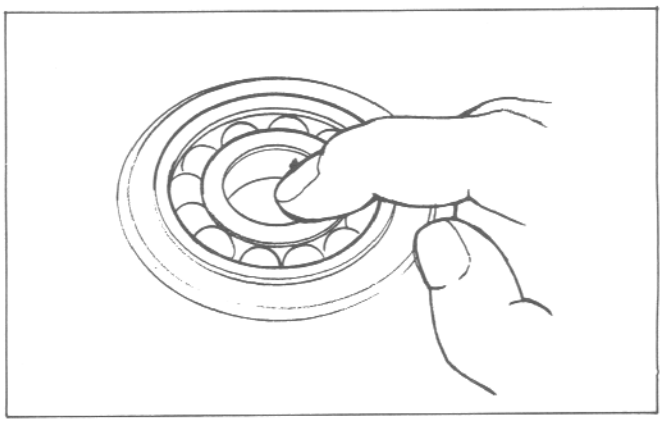
REMOVAL

Remove the balancer (page 7-10).
Remove the alternator (page 6-2).
Remove the balancer bearing holder attaching bolts and remove the balancer bearing holder.
Remove the O ring from the bearing holder.



INSPECTION

Turn the inner race of the bearing with your finger. The bearing should turn smoothly and quietly.
Also check that the bearing outer race fits tightly in the bearing holder.
Remove and discard the bearing if the race does not turn smoothly, quietly, or if it fits loosely in the bearing holder.

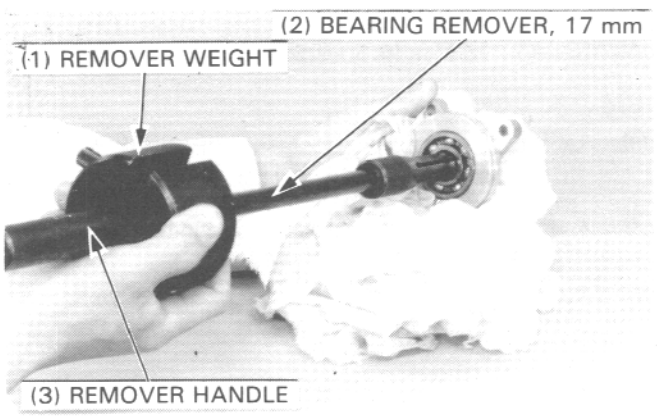


BEARING REPLACEMENT

Remove the bearing from the holder.

TOOLS:

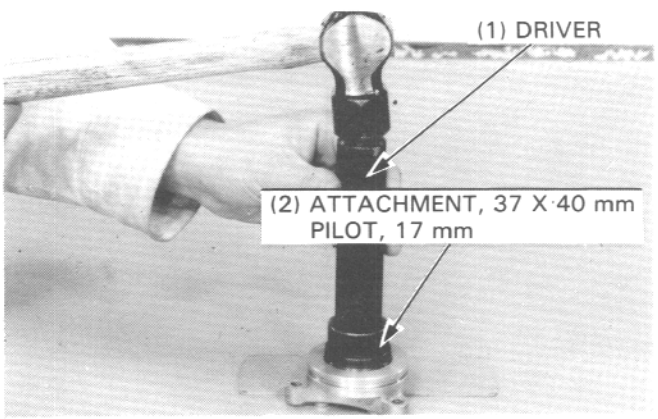
Bearing remover, 17 mm	**07936—3710300**
Remover handle	**07936—3710100**
Remover weight	**07741—0010201 or 07936—3710200**



Drive a new bearing into the bearing holder.

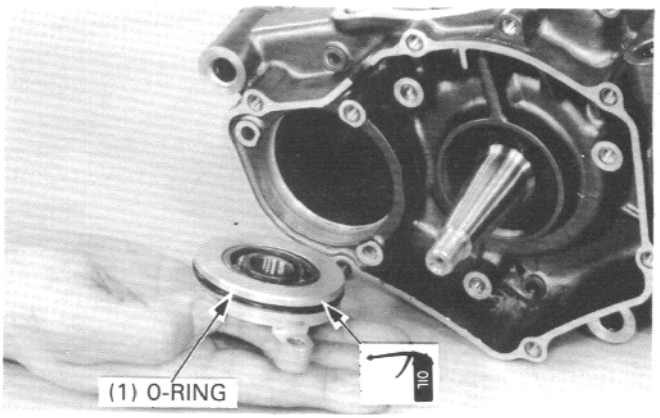
TOOLS:

Driver	**07749—0010000**
Attachment, 37 x 40 mm	**07746—0010200**
Pilot, 17 mm	**07746—0040400**

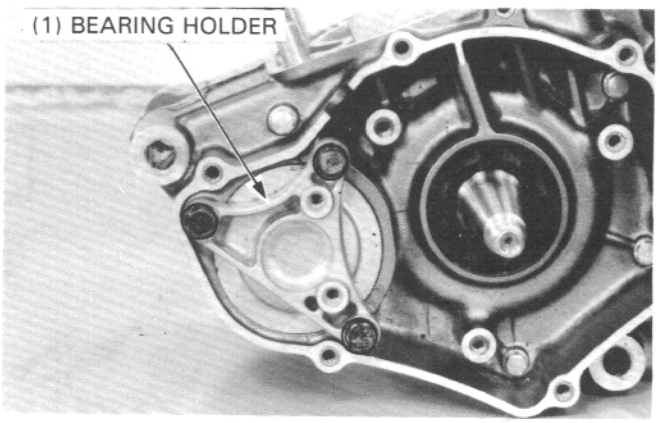


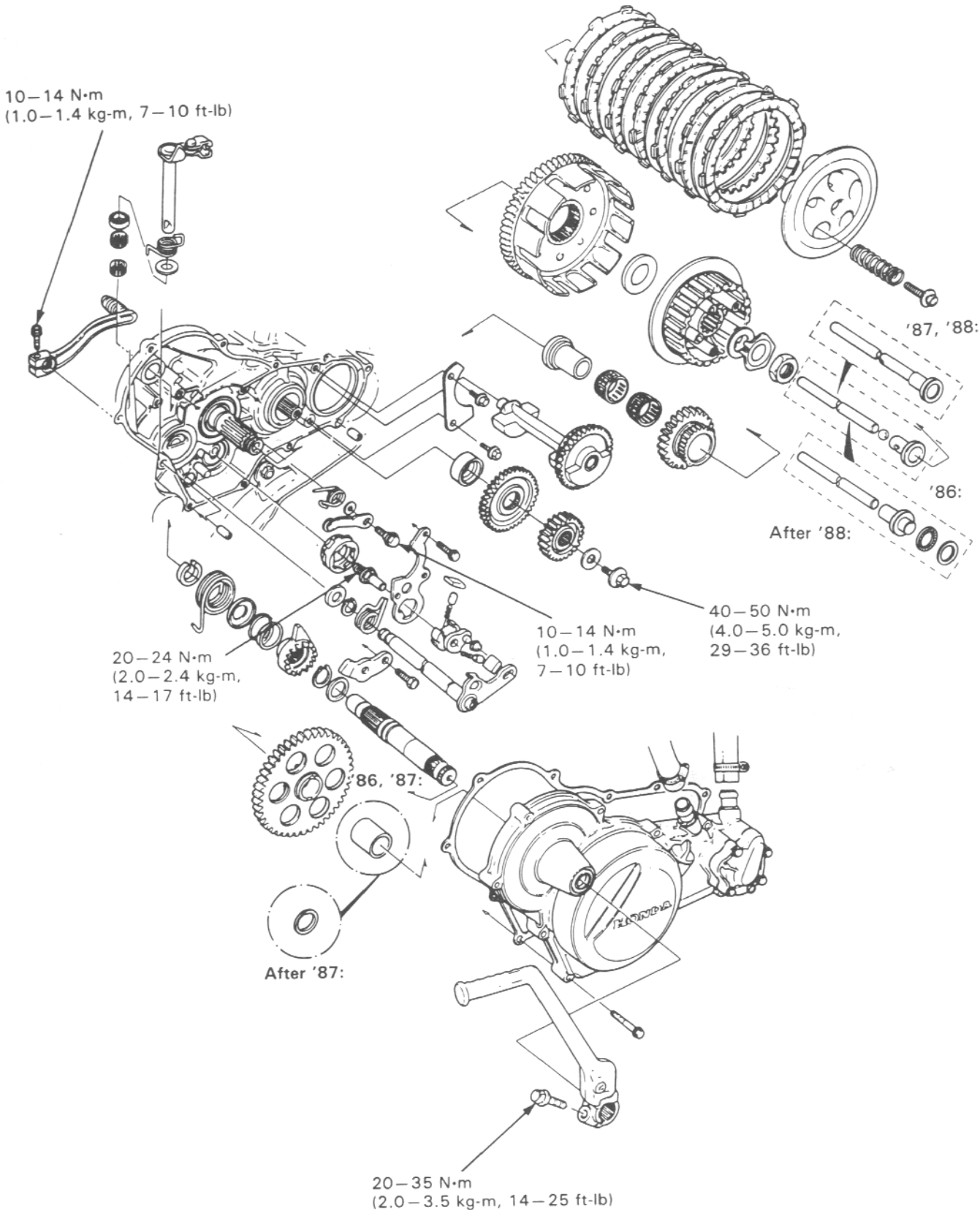
INSTALLATION

Install a new O-ring in the groove in the bearing holder.
Apply transmission oil to the O-ring.



Install the bearing holder onto the left crankcase and tighten the attaching bolts securely.
Install the alternator (page 6-3).
Install the balancer (page 7-11).




10–14 N·m
(1.0–1.4 kg-m, 7–10 ft-lb)
'87, '88:
'86:
After '88:
40–50 N·m
(4.0–5.0 kg-m,
29–36 ft-lb)
10–14 N·m
(1.0–1.4 kg-m,
7–10 ft-lb)
20–24 N·m
(2.0–2.4 kg-m,
14–17 ft-lb)
'86, '87:
After '87:
20–35 N·m
(2.0–3.5 kg-m, 14–25 ft-lb)

7. CLUTCH/BALANCER/GEARSHIFT LINKAGE/KICK STARTER

SERVICE INFORMATION

GENERAL

- The clutch, balancer, kick starter and gearshift 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, balancer, kick starter and gearshift linkage.
- Removing the balancer for improved performance will only create excessive vibration with any increase in performance. Such a modification will only result in accelerated wear and breakage of the engine mounting bolts and frame.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Clutch lever free play			10—20 (3/8—3/4)	—
Clutch	Clutch spring free length	'86, '87:	47.0 (1.85)	45.0 (1.77)
		After '87:	48.0 (1.90)	46.0 (1.81)
	Clutch disc thickness		2.92—3.08 (0.115—0.121)	2.85 (0.112)
	Clutch plate warpage		—	0.15 (0.006)
	Clutch outer guide I.D.		23.000—23.021 (0.9055—0.9063)	23.04 (0.907)
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—0.8678)	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 pinch bolt	20—35 N·m (2.0—3.5 kg-m, 14—25 ft-lb)
Gearshift pedal bolt	10—14 N·m (1.0—1.4 kg-m, 7—10 ft-lb)
Primary drive gear bolt	40—50 N·m (4.0—5.0 kg-m, 29—36 ft-lb)
Shift drum center pin	20—24 N·m (2.0—2.4 kg-m, 14—17 ft-lb)
Stopper arm bolt	10—14 N·m (1.0—1.4 kg-m, 7—10 ft-lb)

TOOLS

Common

Clutch center holder	07724—0050001 or equivalent commercially available in U. S. A.
Gear holder	07724—0010100 Not 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

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

Excessive vibration
- Balancer installed incorrectly

Vehicle creeps with clutch disengaged
- Too much free play
- Plates warped

Excessive clutch lever pressure
- Clutch cable kinked, damaged or dirty
- Lifter mechanism damaged
- Clutch cable not routed properly

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

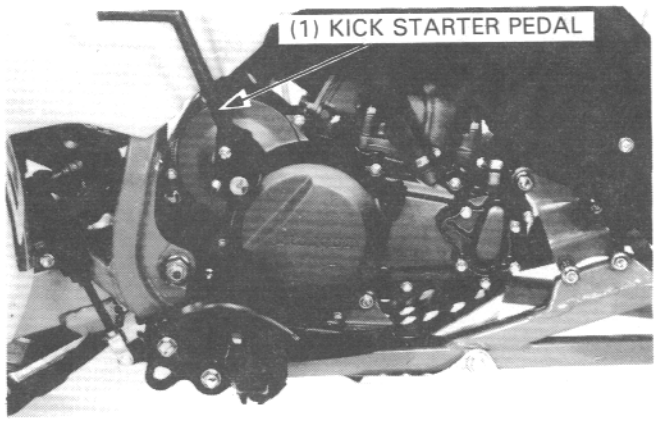
Gearshift pedal does not return
- Bent gearshift spindle
- Broken shift spindle return spring

CLUTCH

RIGHT CRANKCASE COVER REMOVAL

Drain the transmission oil (page 2-8).

Remove the kick starter pedal.

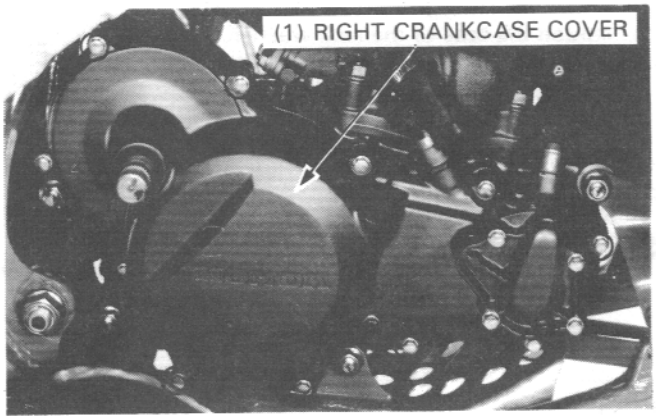


Remove the right crankcase cover attaching bolts and remove the right crankcase cover.

NOTE

- It is not necessary to drain radiator coolant when the radiator hoses are not disconnected.

Remove the gasket and two dowel pins.



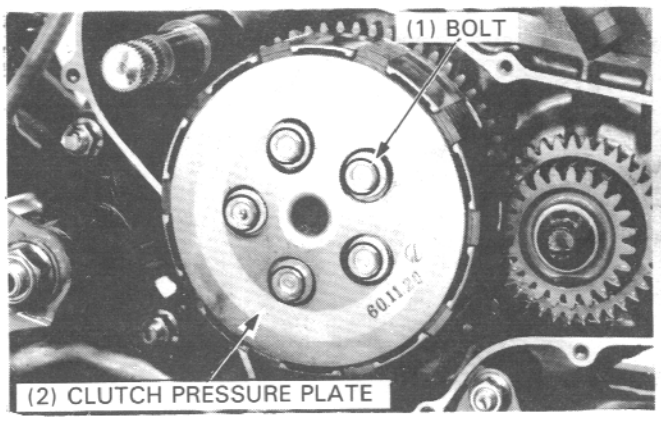
CLUTCH REMOVAL

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 discs and clutch plates.

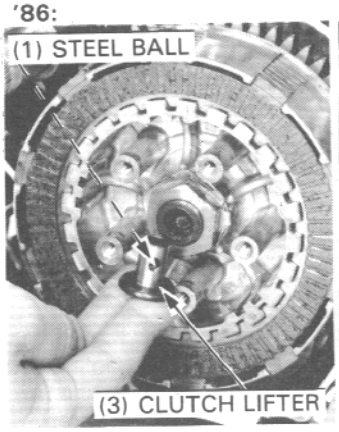
'86:
Remove the clutch lifter and steel ball.

NOTE

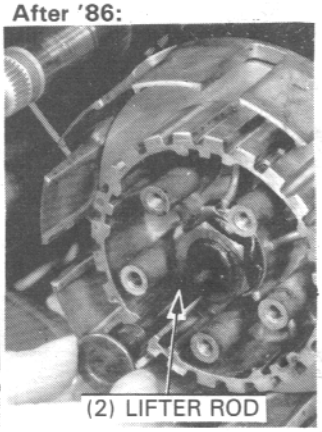
- To avoid losing the steel ball, be careful when you remove the clutch lifter.

After '86:
Remove the clutch lifter rod.

'86:

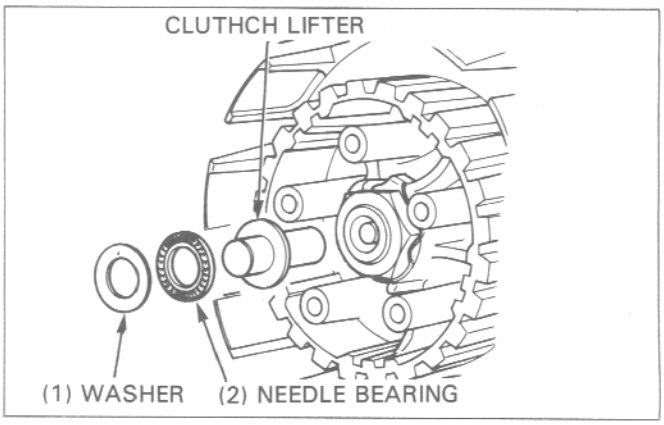


After '86:



After '88:
Remove the washer, needle bearing and clutch lifter.
Remove the lifter rod.

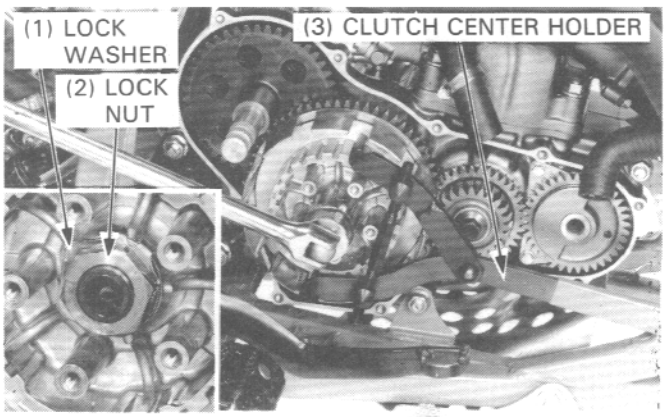
After '88:



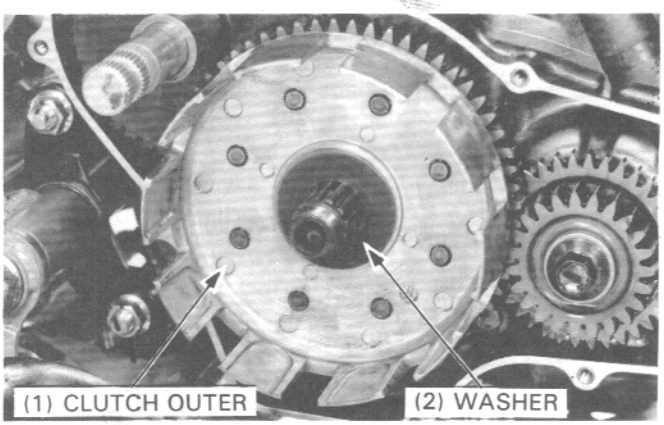
Straighten the tabs of the lock washer.
Hold the clutch center with the clutch center holder.
Remove the clutch center lock nut, lock washer and plain washer.
Remove the clutch center.

TOOL:

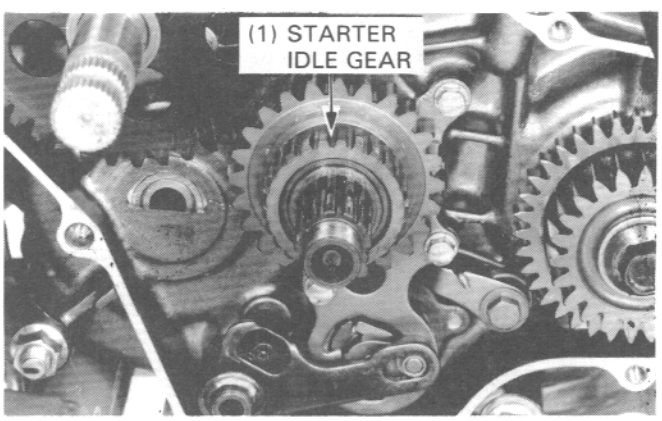
Clutch center holder	**07724—0050001 or equivalent commercially available in U.S.A.**



Remove the washer and clutch outer.

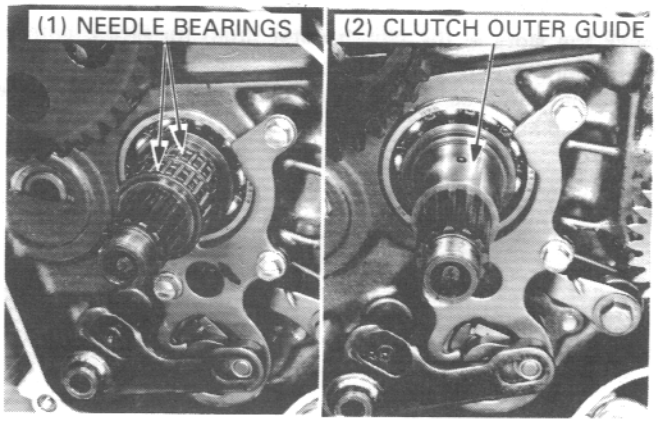


Remove the starter idle gear.



Remove the needle bearings and the clutch outer guide.

Check the needle bearings for wear or damage.



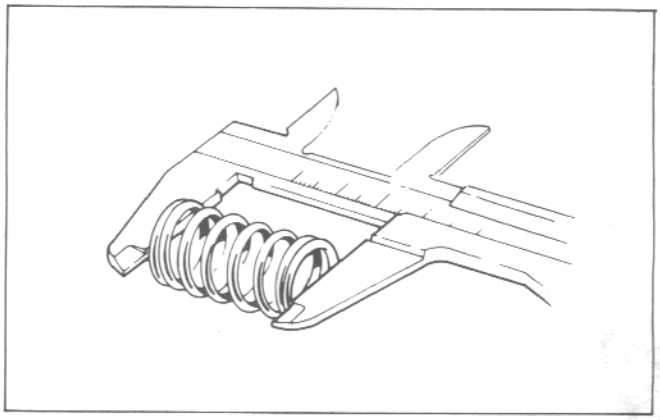
CLUTCH INSPECTION

Measure the spring free length.

SERVICE LIMITS:
'86, '87: 45.0 mm (1.77 in)
After '87: 46.0 mm (1.81 in)

NOTE

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

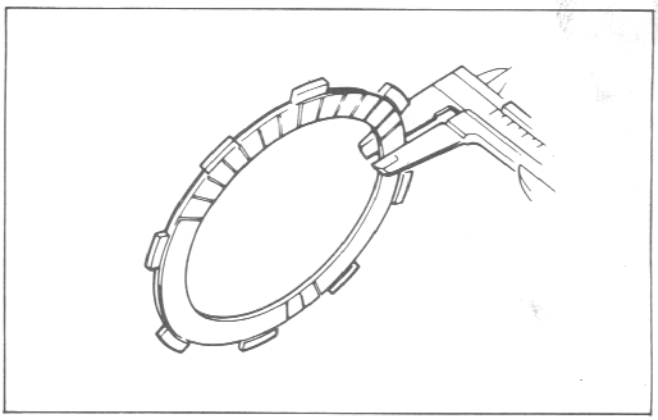


Replace the clutch discs if they show signs of scoring or discoloration.
Measure the disc thickness.

SERVICE LIMIT: 2.85 mm (0.112 in)

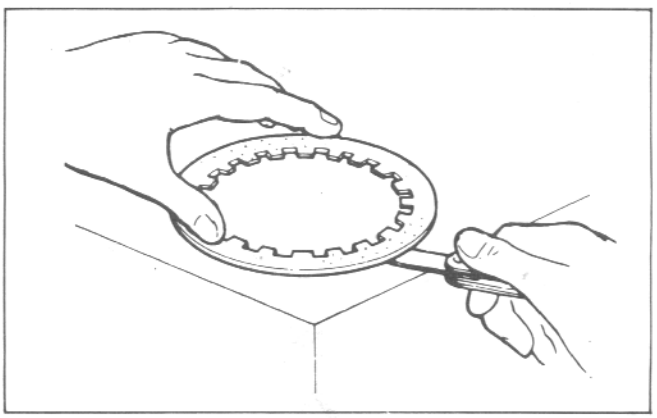
NOTE

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

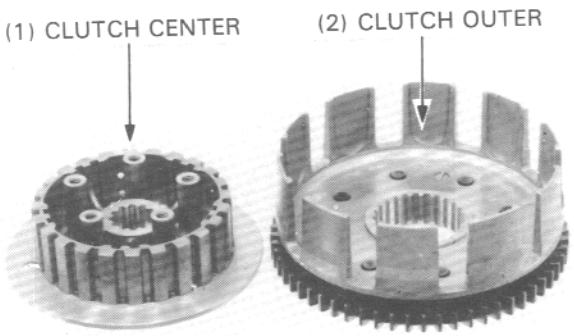


Check for plate warpage on a surface plate, using a feeler gauge.

SERVICE LIMIT: 0.15 mm (0.006 in)



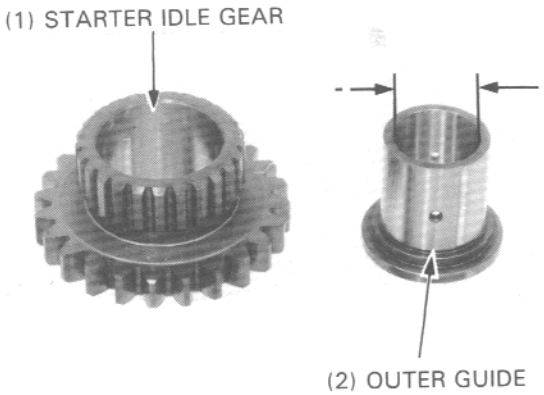
Check the slots in the clutch outer drum for nicks, cuts or indentations made by clutch discs.
Check the clutch center for nicks, cuts or indentations made by clutch plates.



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

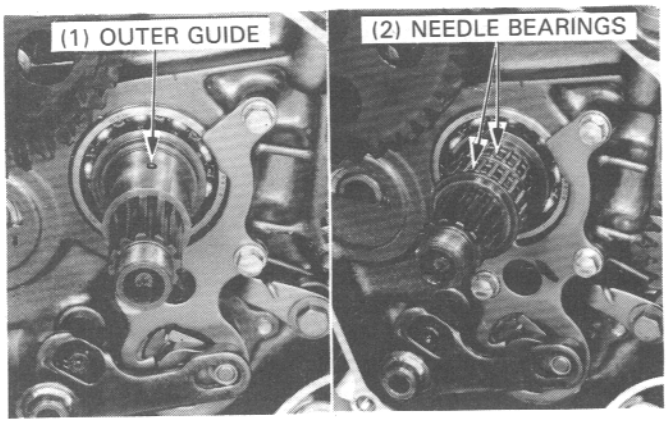
Measure the clutch outer guide I.D.

SERVICE LIMIT: 23.04 mm (0.907 in)

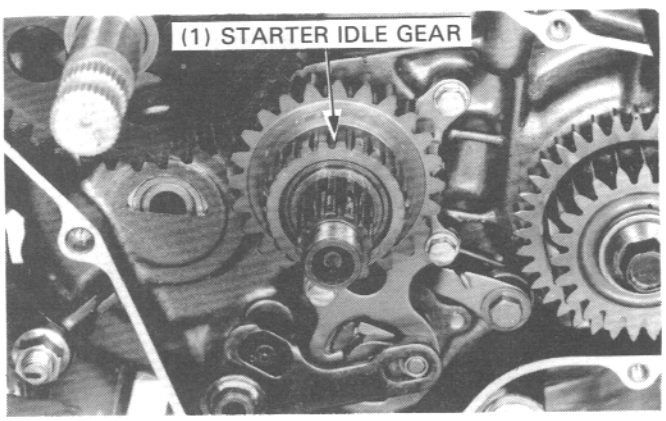


CLUTCH INSTALLATION

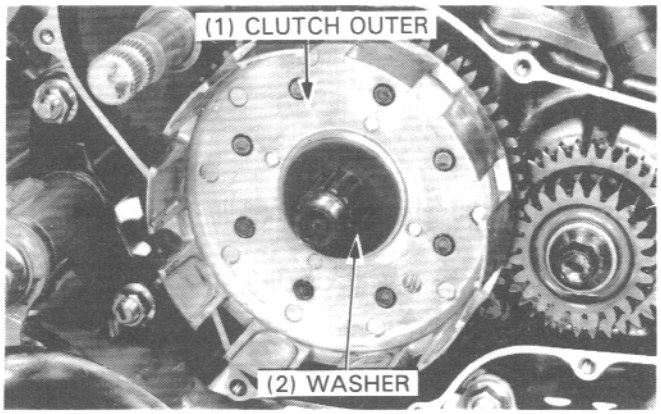
Install the clutch outer guide.
Install the needle bearings.



Install the starter idle gear.



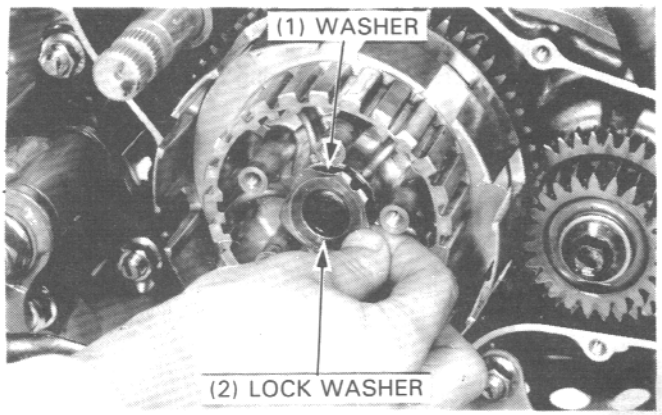
Install the clutch outer and washer.



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.



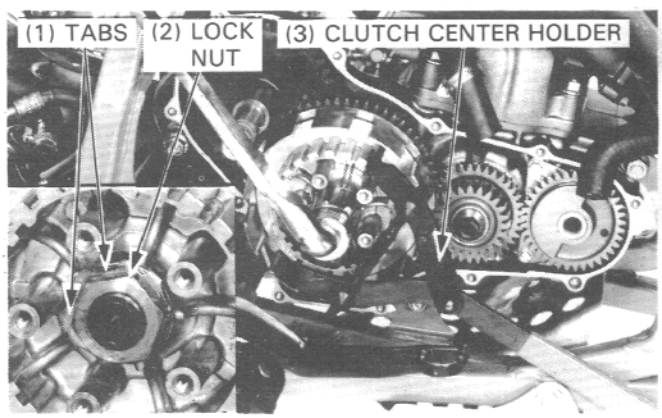
Install the clutch center lock nut and tighten it.

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 lock nut.

TOOL:

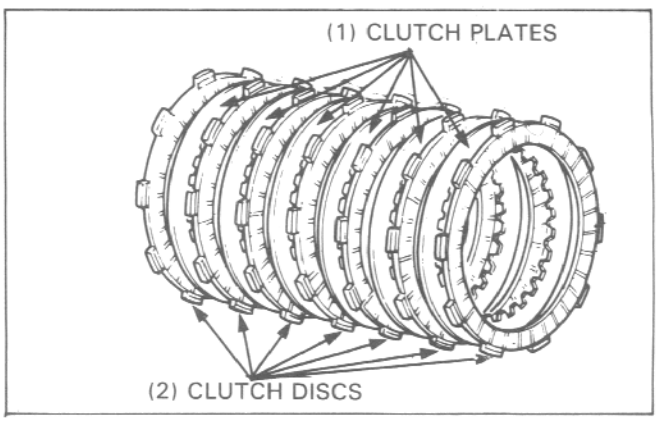
Clutch center holder	**07724—0050001 or equivalent commercially available in U.S.A.**



Install the seven discs and six clutch plates.

NOTE

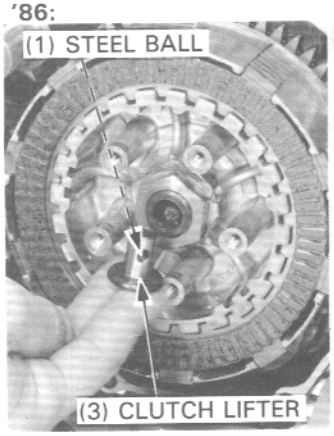
- Stack the discs and plates alternately as shown.
- Before assembly, coat the clutch plates with transmission oil.



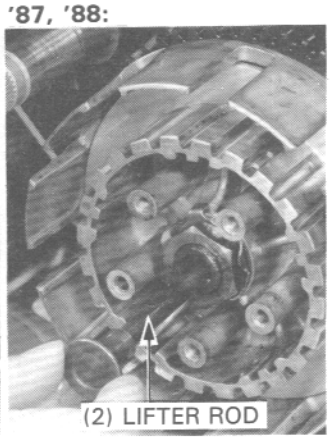
'86:
Apply molybdenum disulfide grease to the steel ball.
Insert the steel ball into the clutch lifter and insert the lifter into the clutch center.

'87, '88:
Insert the clutch lifter rod into the clutch center.

'86:

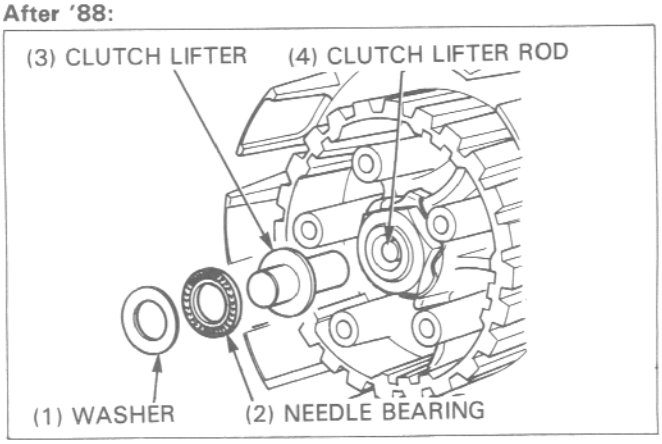


'87, '88:



After '88:
Insert the clutch lifter rod into the clutch center.
Install the clutch lifter, needle bearing and washer.

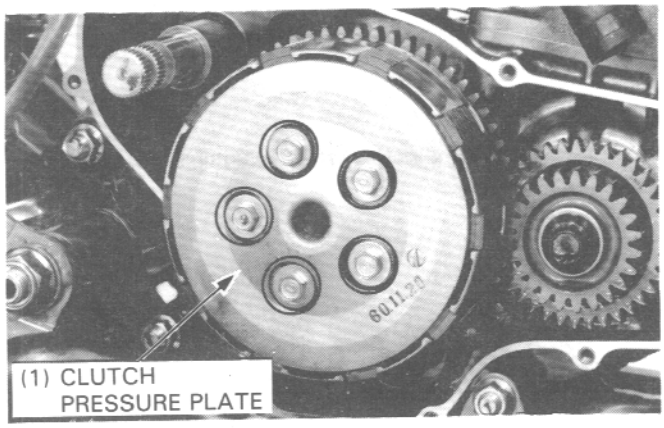
After '88:



Install the clutch springs and bolts, and tighten the bolts.

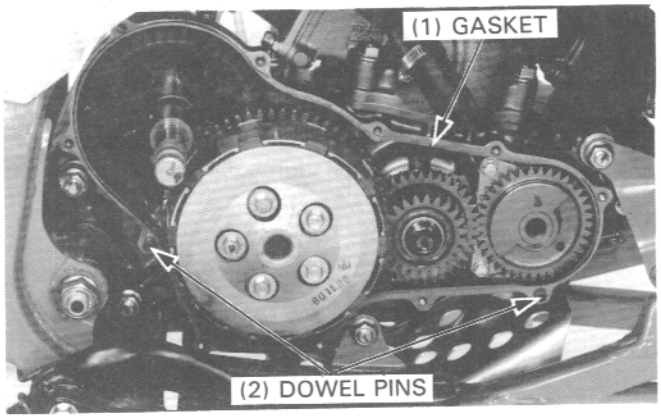
NOTE

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

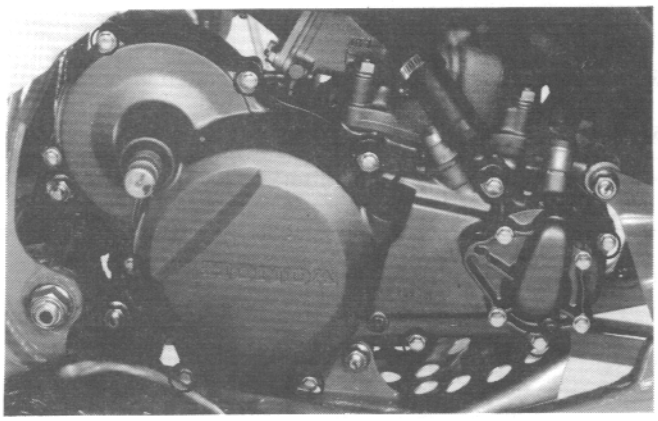


RIGHT CRANKCASE COVER INSTALLATION

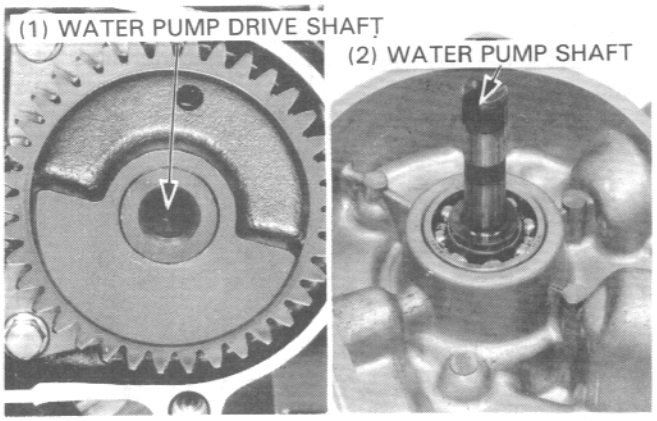
Install a new gasket and two dowel pins.



Install the right crankcase cover and attaching bolts.
Tighten the attaching bolts securely.



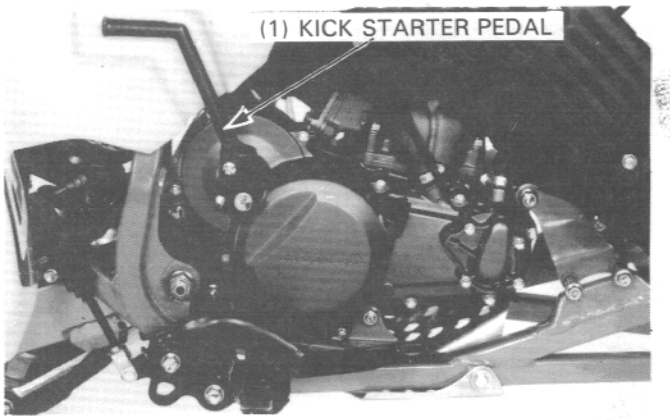
Align the water pump drive shaft and groove on the water pump shaft.



Install the kick starter pedal and tighten the pinch bolt.

TORQUE: 20—35 N·m (2.0—3.5 kg-m, 14—25 ft-lb)

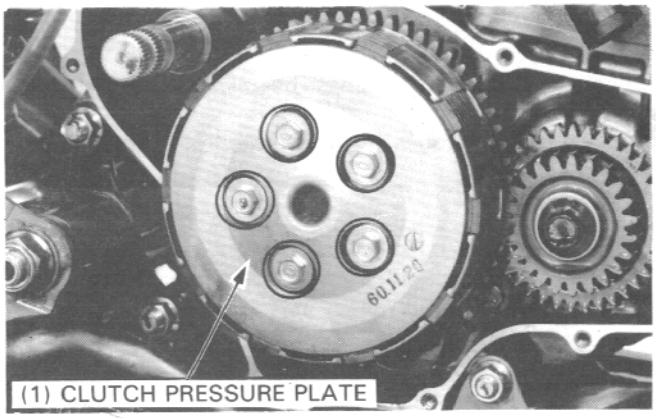
Fill the transmission with the correct type oil and to the level recommended on page 2-8.



CLUTCH LIFTER

REMOVAL

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



'86:
Remove the clutch lifter, steel ball and clutch lifter rod.

NOTE

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

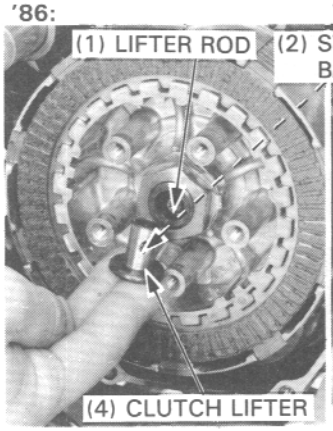
After '86:
Remove the clutch lifter rod.

NOTE

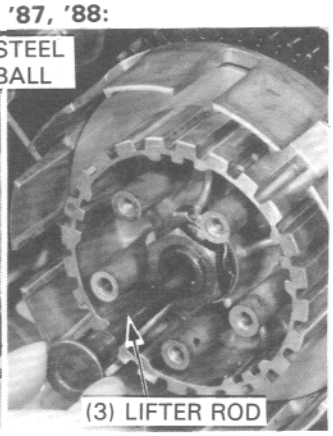
- Do not disassemble the rod.

After 88:
Remove the washer, needle bearing and clutch lifter.
Remove the lifter rod.

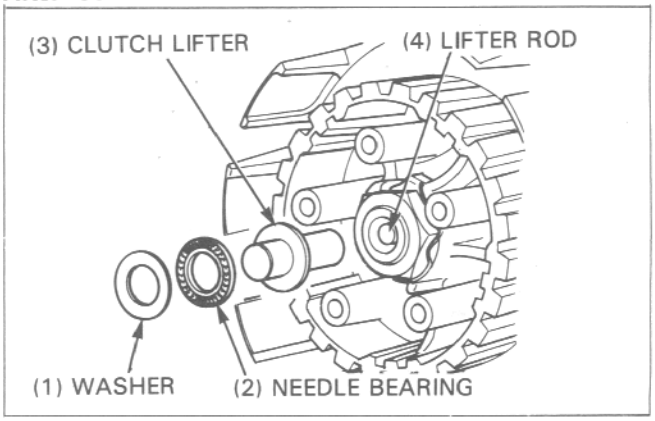
'86:



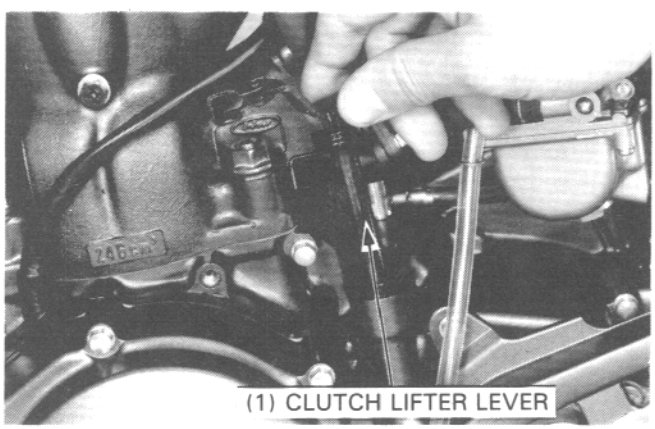
'87, '88:



After '88:



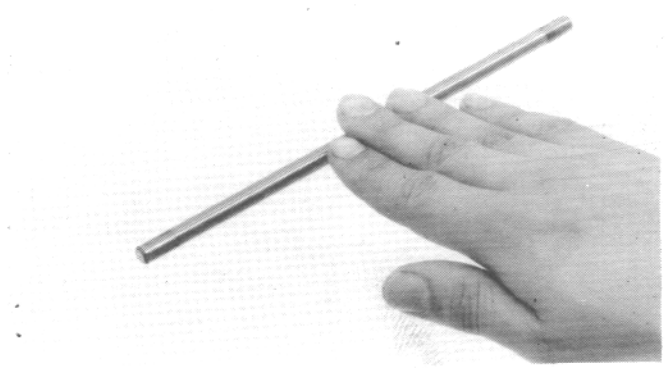
Disconnect the clutch cable.
Remove the clutch lifter lever.



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.

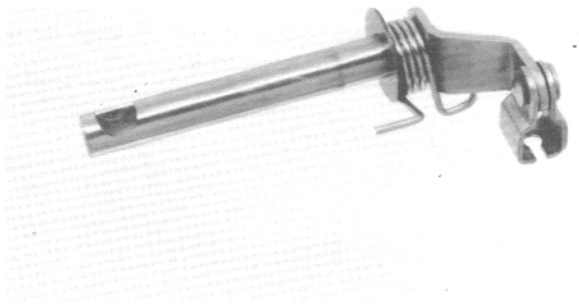


Check the lifter lever and lifter piece for wear or damage.

Repair or replace parts as necessary.

INSTALLATION

Apply molbdenum disulfide grease to the end of the clutch lifter lever shaft.
Install in the reverse order of removal.

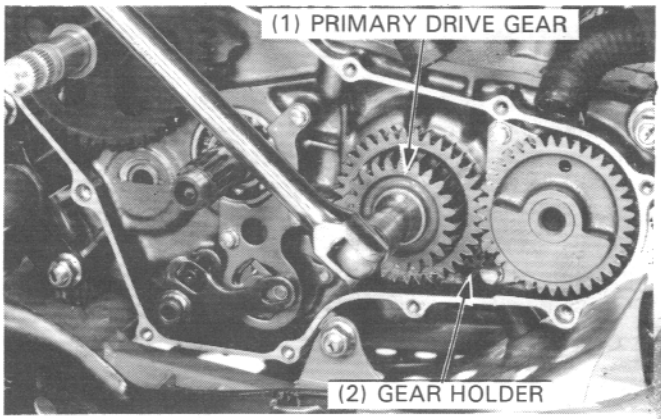


BALANCER

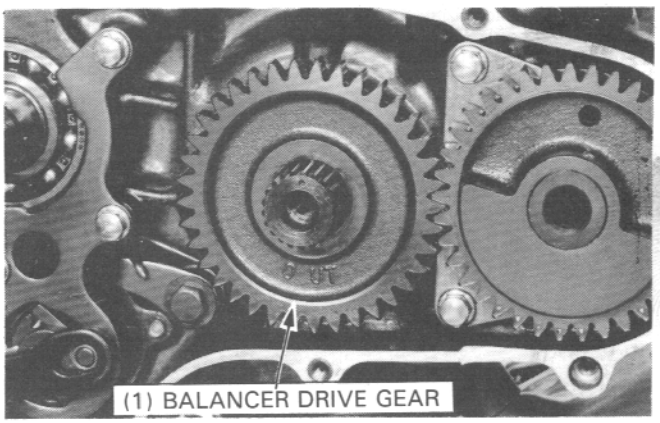
REMOVAL

Remove the right crankcase cover (page 7-3).
Remove the clutch (page 7-3).
Install the gear holder as shown.
Remove the primary drive gear bolt and the primary drive gear.

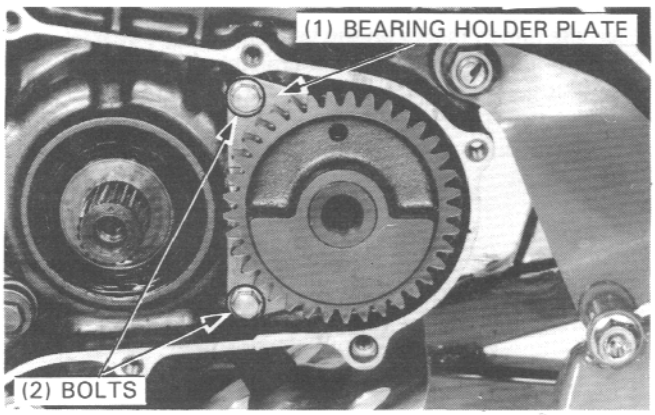
TOOL:
Gear holder **07724—0010100**
Not available in U.S.A.



Remove the balancer drive gear.



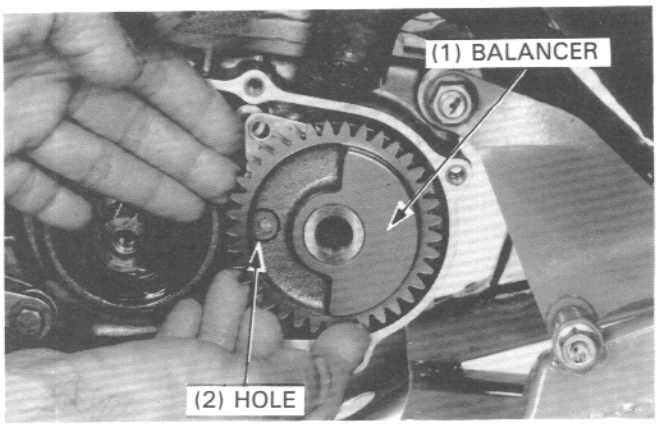
Remove the balancer bearing holder plate attaching bolts.



Remove the balancer and the holder plate.

NOTE

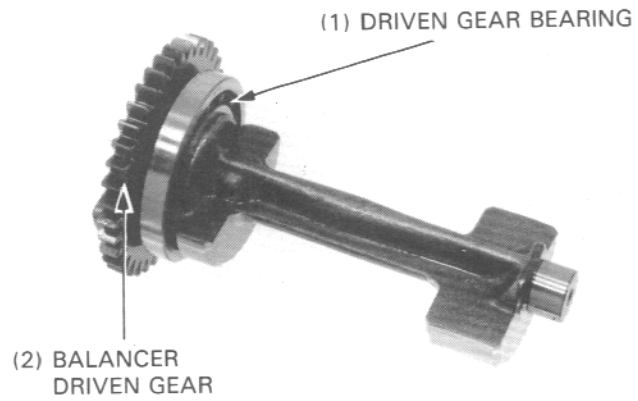
- Turn the balancer counterclockwise 90° to align its hole with the crankshaft center to remove it.



INSPECTION

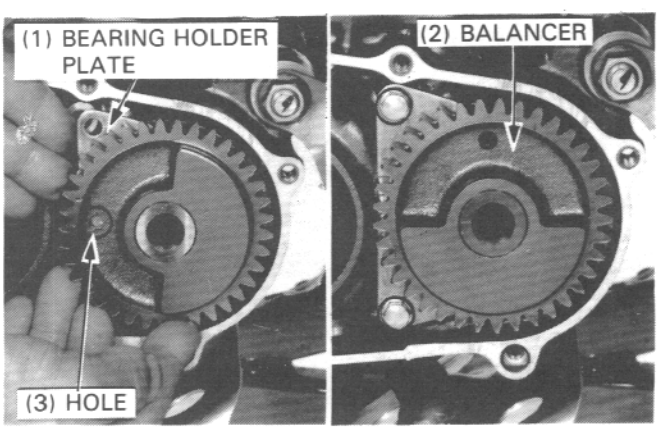
Turn the outer race of the bearing with your finger.
The bearing should turn smoothly and quietly.
If the balancer driven gear bearing does not turn smoothly and quietly, the balancer driven gear shaft assembly must be replaced.

Check the balancer driven gear for wear or damage.
Check the balancer bearing (page 6-4).

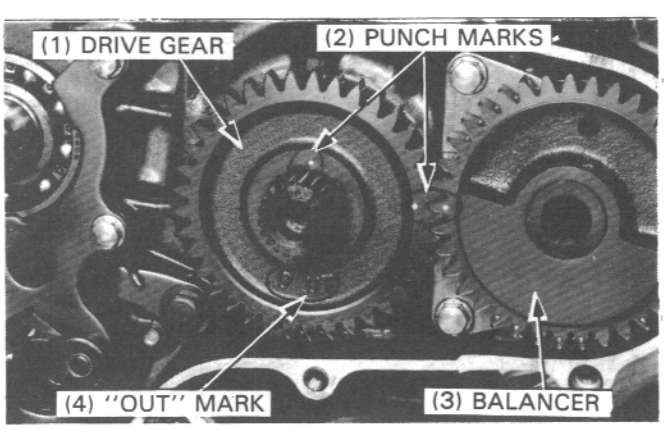


INSTALLATION

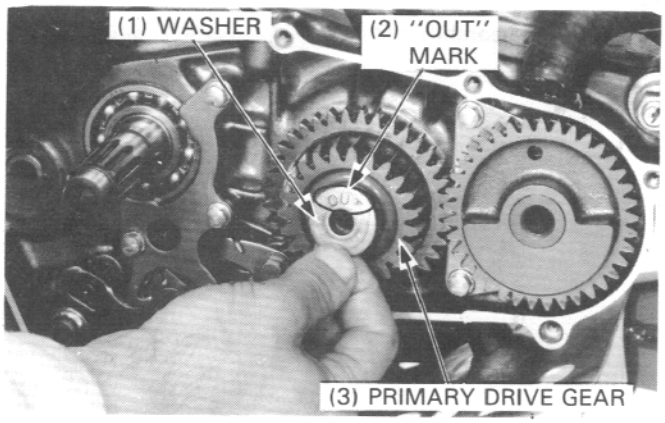
Install the balancer and balancer bearing holder plate.



Align the punch marks on the balancer and drive gear.
Align the punch marks on the crankshaft and balancer drive gear and install the balancer drive gear onto the crankshaft with the "OUT" mark facing out.

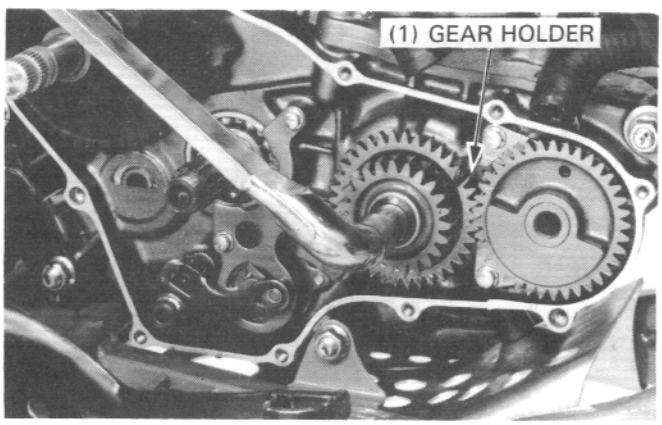


Install the primary drive gear.
Install the washer with the "OUT" mark facing out.



Install the gear holder as shown.

TOOL:
Gear holder **07724—0010100**
Not available in U.S.A.



Install the primary drive gear bolt and tighten it.

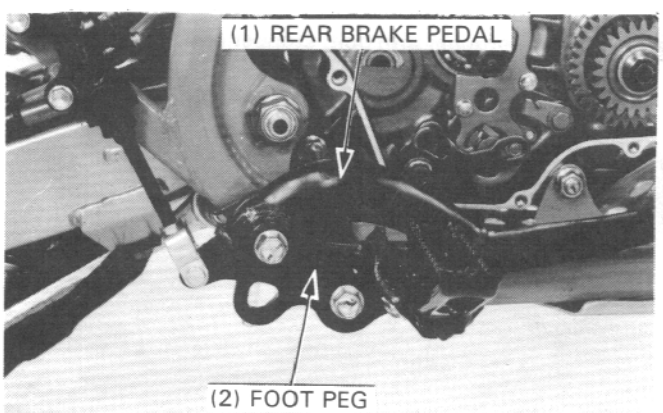
TORQUE: 40—50 N·m (4.0—5.0 kg-m, 29—36 ft-lb)

Install the clutch (page 7-6).
Install the right crankcase cover (page 7-8).

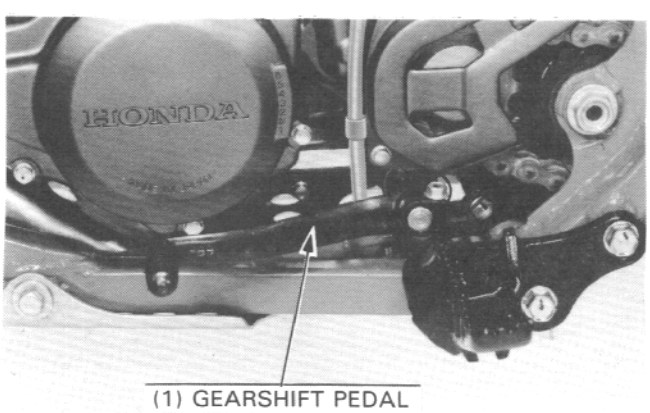
GEARSHIFT LINKAGE

REMOVAL

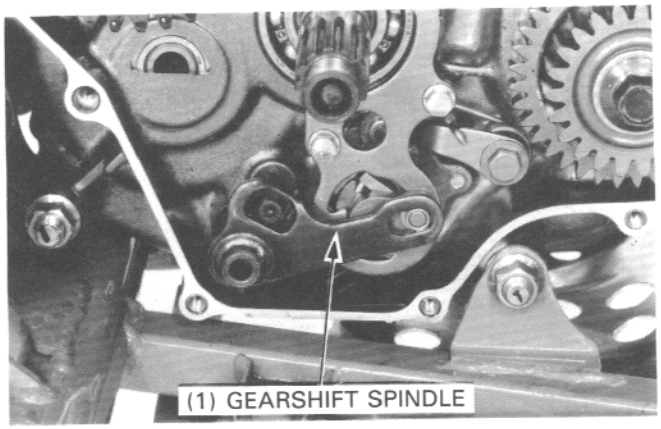
Remove the following:
— right crankcase cover (page 7-3)
— clutch (page 7-3)
— right foot peg ('86, '87:) and rear brake pedal (page 13-18)



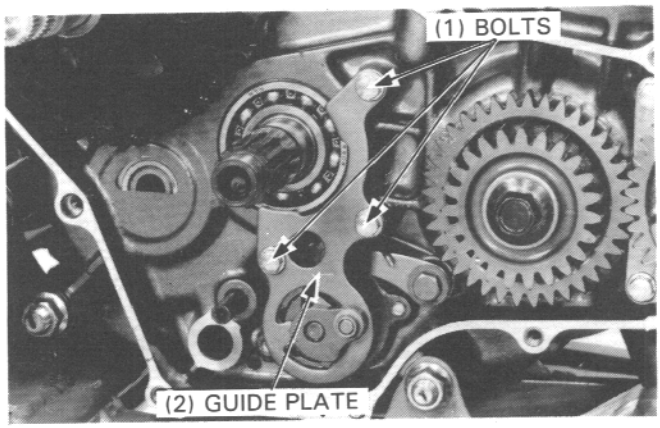
Remove the gearshift pedal.



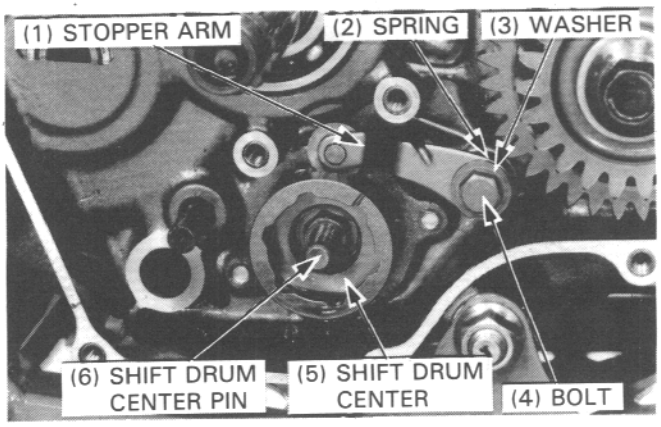
Remove the gearshift spindle.



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

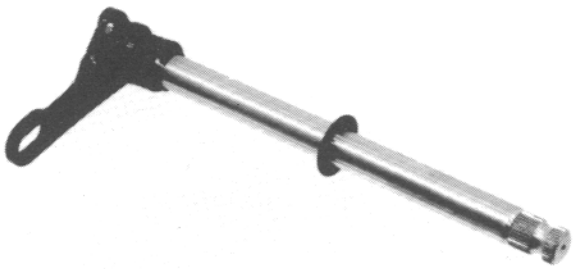


Remove the stopper arm bolt, stopper arm, stopper arm spring and thrust washer.
Remove the shift drum center pin, shift drum center and dowel pin.

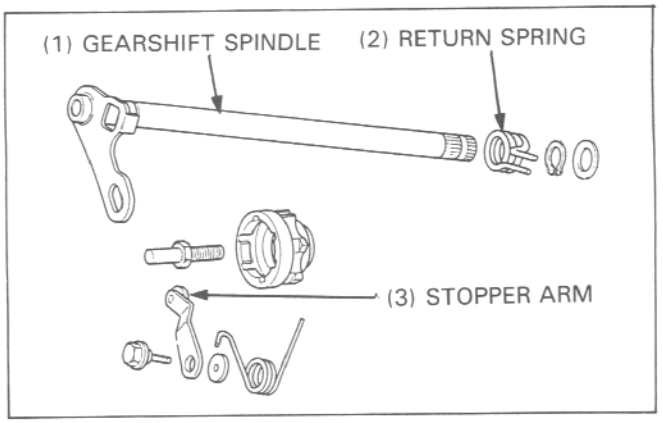


INSPECTION

Inspect the gearshift spindle for damage or wear.

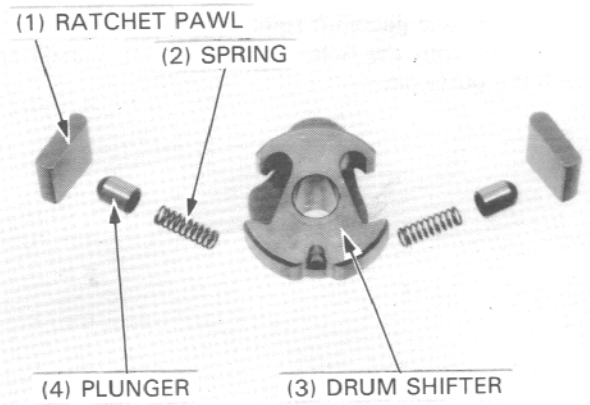


Inspect the stopper arm and spring for damage.
Inspect the gearshift spindle and return springs for damage.



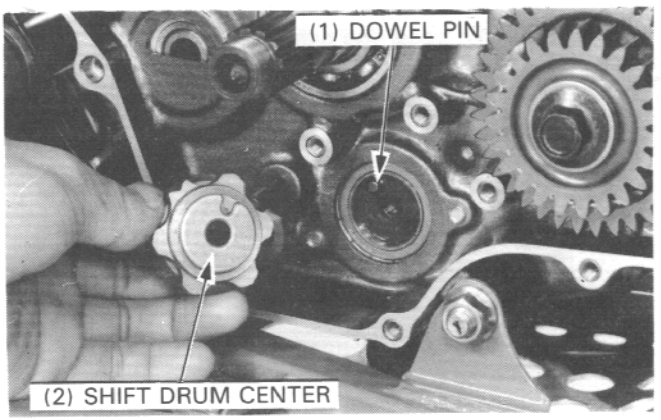
Check the ratchet pawls, springs, drum shifter and plungers for wear or damage.

Apply clean transmission 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.



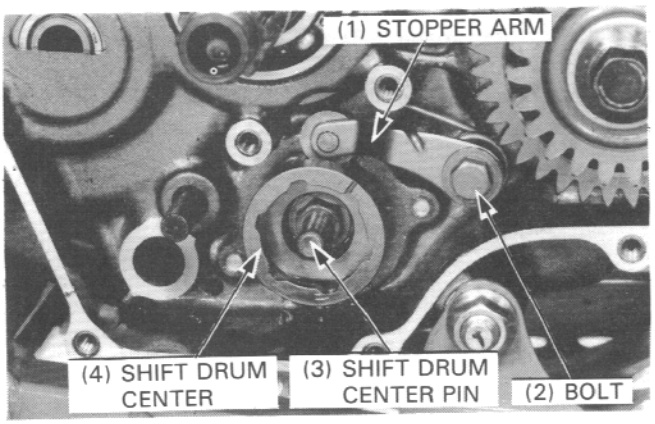
Tighten the shift drum center pin.

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)



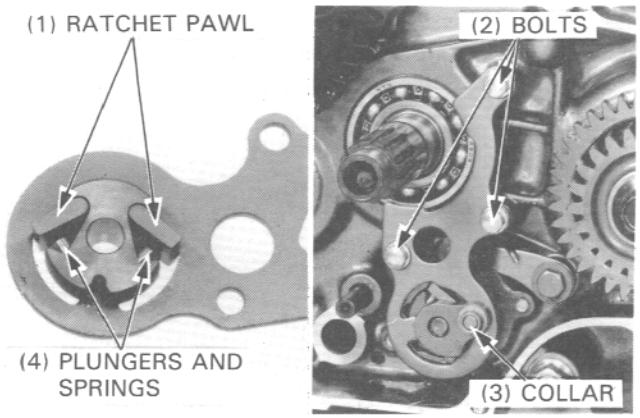
Assemble the ratchet pawls, springs and plungers onto the drum shifter, then install them in the guide plate.

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

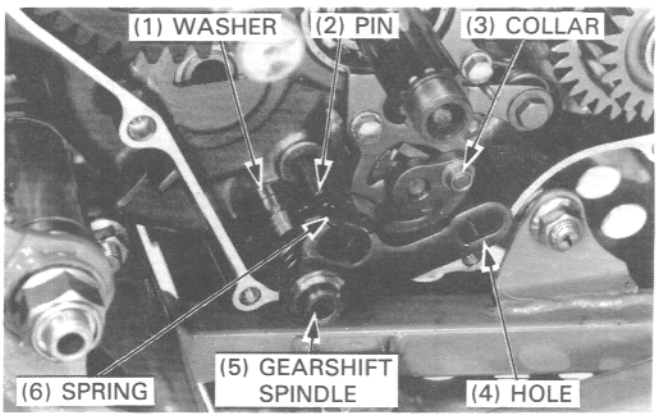
NOTE

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

Install the three mounting bolts.

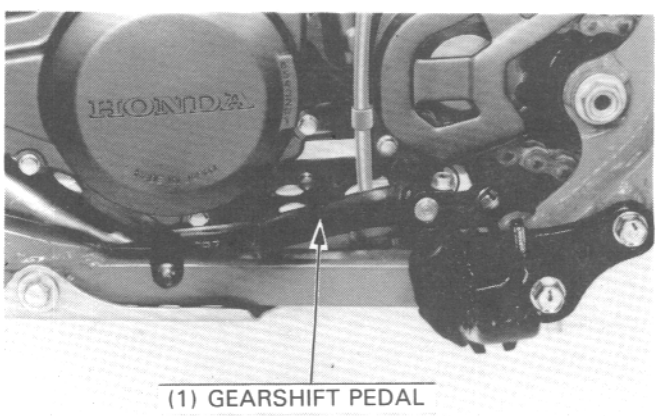


Install the washer and gearshift spindle, aligning the collar on the drum shifter with the hole in the gearshift spindle and spring with the guide pin.

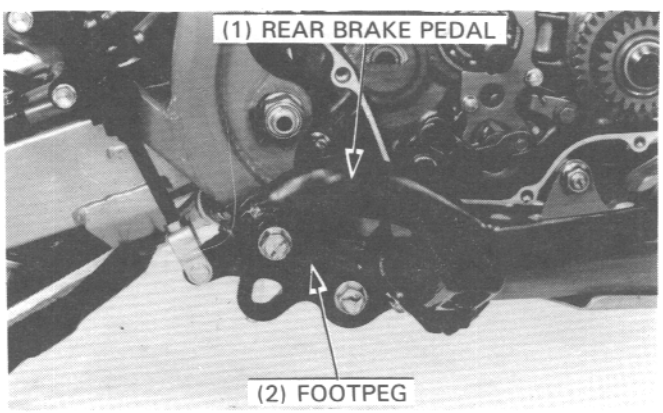


Install the gearshift pedal and tighten the bolt.

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



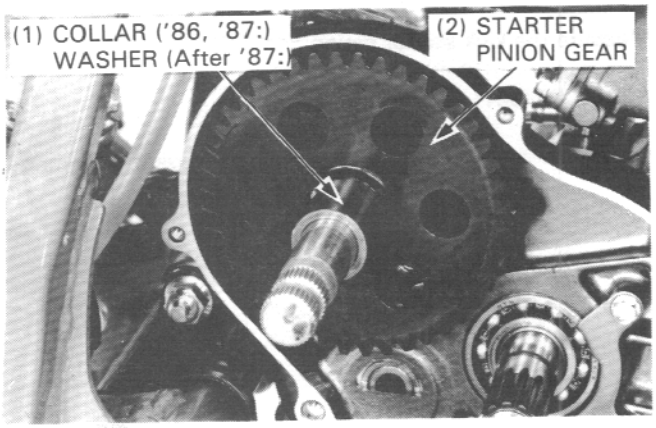
Install the clutch (page 7-6) and right crankcase cover (page 7-8).
Install the rear brake pedal and right footpeg ('86, '87:) (page 13-18).



KICK STARTER

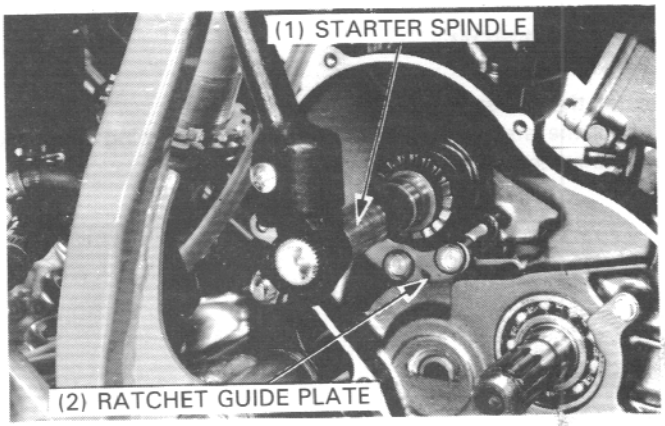
REMOVAL

Remove the following:
- right crankcase cover (page 7-3)
- clutch (page 7-3)
- collar ('86, '87:)
  washer (After '87:)
- kick starter pinion gear

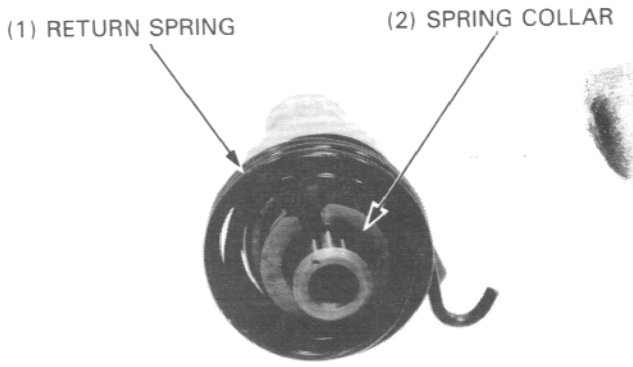


Remove the ratchet guide plate.

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.

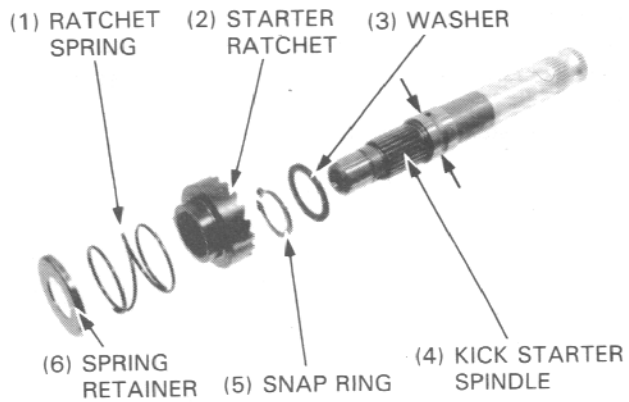


Remove the spring retainer, ratchet spring and starter ratchet.
Remove the snap ring and thrust washer.

INSPECTION

Measure the kick starter spindle O.D.

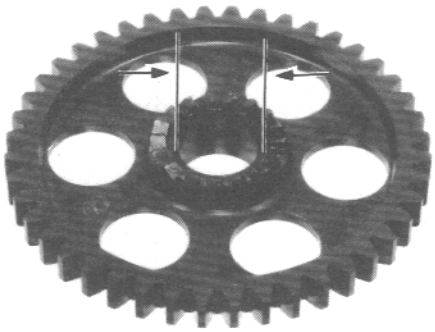
SERVICE LIMIT: 21.94 mm (0.864 in)



Measure the kick starter pinion gear I.D.

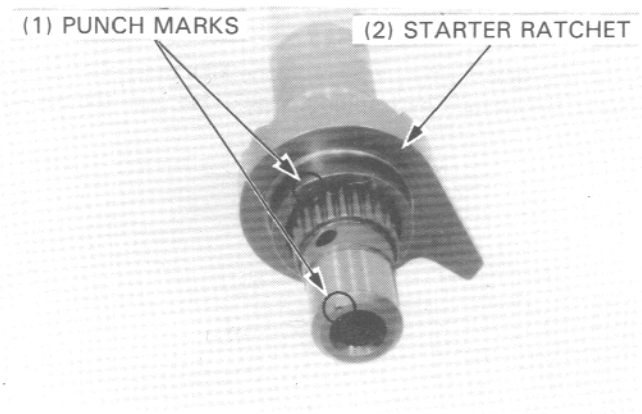
SERVICE LIMIT: 22.06 mm (0.869 in)

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

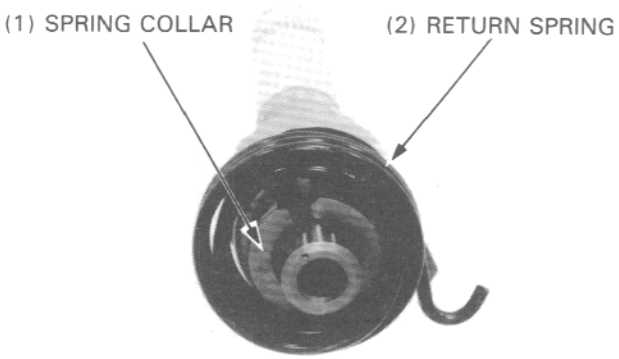


INSTALLATION

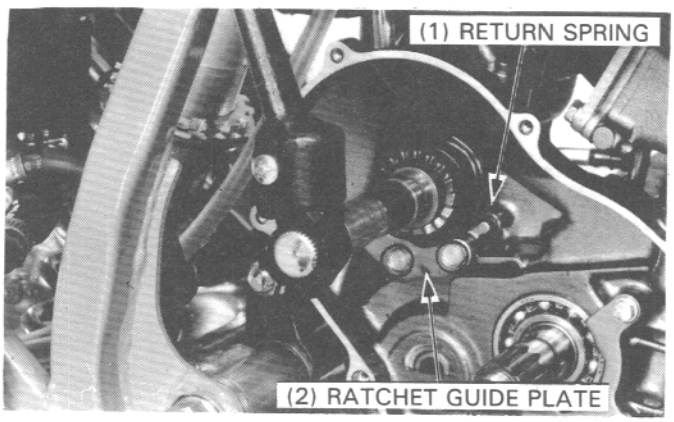
Install the thrust washer and snap ring.
Install the starter ratchet on the spindle aligning the punch marks on the spindle and ratchet.



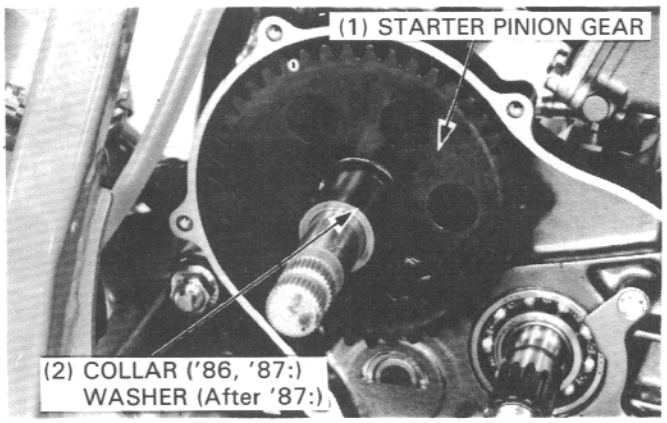
Install the return spring onto the starter spindle and insert the spring end into the hole in the spindle.
Install the spring collar aligning the slit with the spring end.

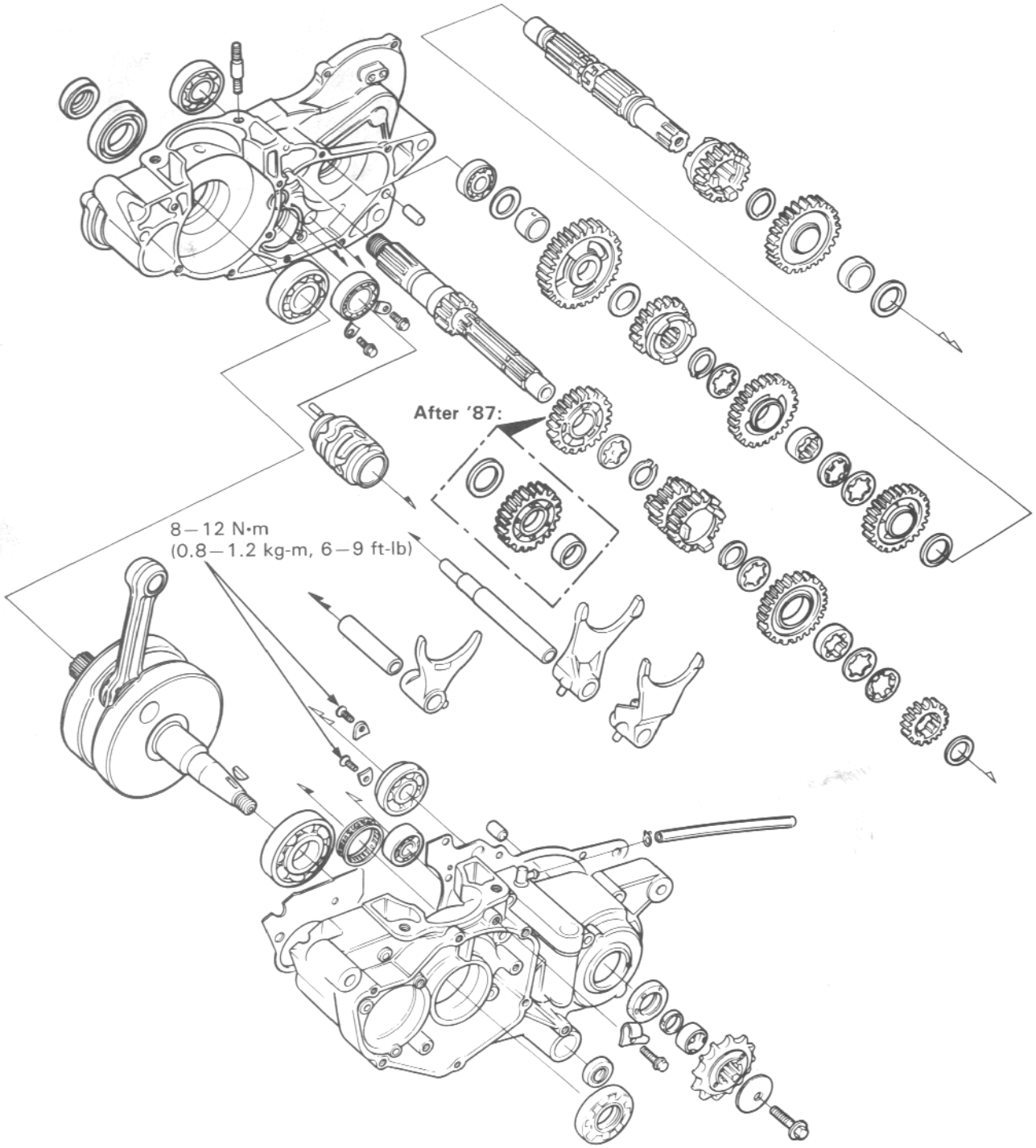


Hook the return spring onto the crankcase.
Install the kick starter pedal by turning clockwise.
Push the starter ratchet and fit the starter ratchet to the ratchet guide.
Install the ratchet guide plate.



Install the starter pinion gear and collar (After '87: washer).
Make sure the kick starter operates correctly.
Install the clutch (page 7-6).
Install the right crankcase cover (page 7-8).




After '87:
8—12 N•m
(0.8—1.2 kg-m, 6—9 ft-lb)

8. TRANSMISSION/CRANKSHAFT

SERVICE INFORMATION

GENERAL

- The crankcase halves must be separated to repair the transmission or replace the crankshaft. Remove the following parts before separating the crankcase.
  - Engine removal — section 4
  - Cylinder head — section 5
  - Cylinder and piston — section 5
  - Clutch — section 7
  - Gearshift linkage — section 7
  - Alternator — section 6
  - Balancer bearing holder — section 6
  - Kick starter — section 7
  - Balancer — section 7
- The crankshaft ball bearings are an interference fit on the journals. Use the special tools to remove them from the crankshaft (page 8-3, 8 and 8-11).

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Shift fork, Shift fork shaft	Shift fork I.D. (R.L.)		12.041–12.056 (0.4741–0.4746)	12.09 (0.476)
	Shift fork I.D. (C)		11.041–11.056 (0.4347–0.4353)	11.09 (0.437)
	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 pawl thickness		4.93–5.00 (0.194–0.197)	4.8 (0.19)
Transmission	Gear I.D.	M6 ('86, '87:), 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 (1.1031–1.1040)	28.06 (1.105)
		M6 (After '87:)	28.020–28.041 (1.1031–1.1040)	28.06 (1.105)
	Bushing O.D.	C1	21.979–22.000 (0.8653–0.8661)	21.96 (0.865)
		C2	26.979–27.000 (1.0622–1.0630)	26.96 (1.061)
		C3, M5	27.959–27.979 (1.1007–1.1015)	27.94 (1.100)
		M6 (After '87:)	27.969–27.990 (1.1011–1.1020)	27.95 (1.100)
	Bushing I.D.	C1	19.000–19.021 (0.7480–0.7489)	19.04 (0.750)
		C2	24.000–24.021 (0.9449–0.9457)	24.04 (0.946)
		M6 (After '87:)	25.010–25.031 (0.9846–0.9855)	25.05 (0.986)
	Mainshaft O.D.	M6	24.959–24.980 (0.9826–0.9835)	24.94 (0.982)
		Clutch outer guide	22.959–22.980 (0.9039–0.9047)	22.94 (0.903)
	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)

Unit: mm (in)

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

TORQUE VALUE

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 07936—3710200
Assembly bolt	07965—1660200
Thread adapter	07965—KA30000
Driveshaft dis/assembly tool (B)	07964—MB00200

Common

Driver	07749—0010000
Attachment, 37 x 40 mm	07746—0010200
Attachment, 62 x 68 mm	07746—0010500
Pilot, 28 mm	07746—0041100
Attachment, 52 x 55 mm	07746—0010400
Pilot, 25 mm	07746—0040600
Pilot, 22 mm	07746—0041000

TROUBLESHOOTING

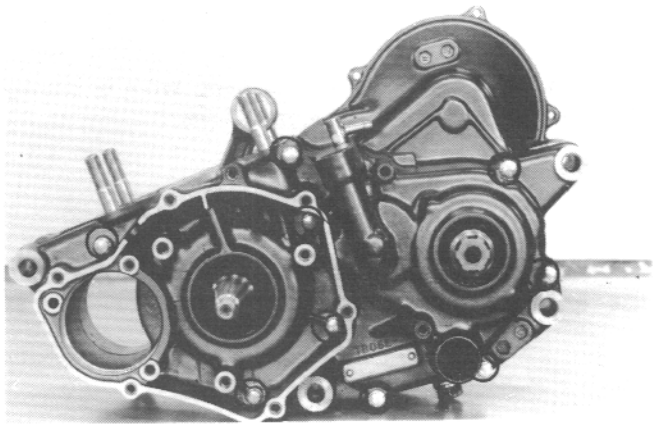
Engine noise
- Worn crankshaft bearing
- Worn connecting rod big end bearing
- Worn transmission bearing

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

CRANKCASE SEPARATION

Remove the crankcase attaching bolts.



Attach the crankcase puller to the right crankcase and separate the crankcase halves.

NOTE

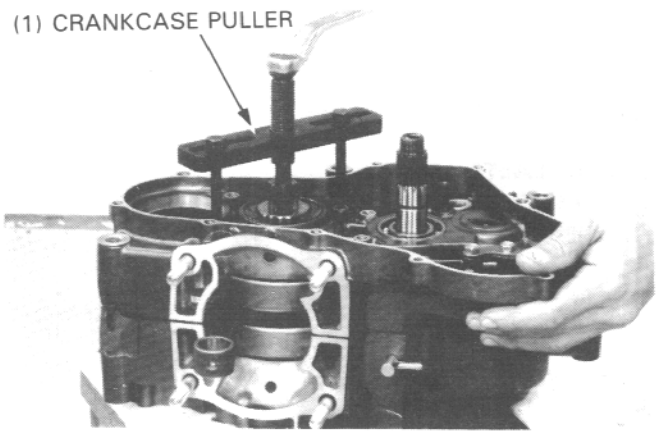
- Separate the right and left crankcases from the each other while tapping them at several locations with a soft hammer.

CAUTION

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

TOOL:

Crankcase puller	**07937–4300000**

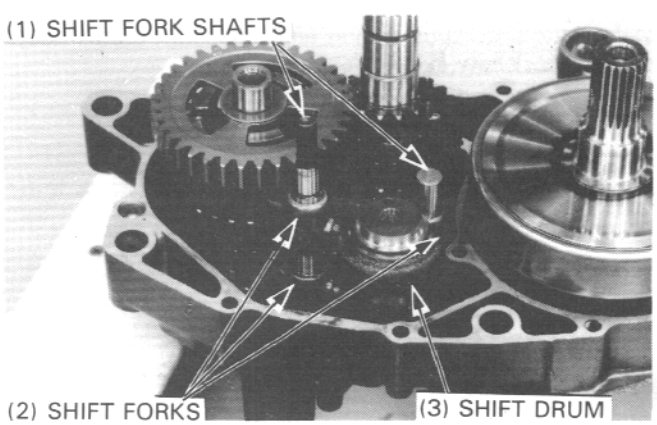


Remove the gasket and dowel pins.

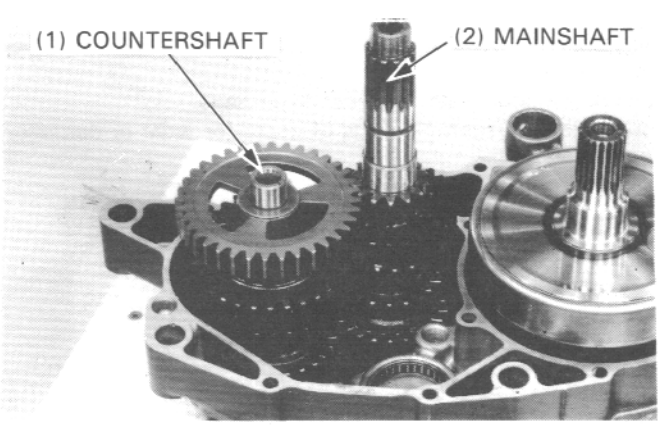
TRANSMISSION

REMOVAL

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

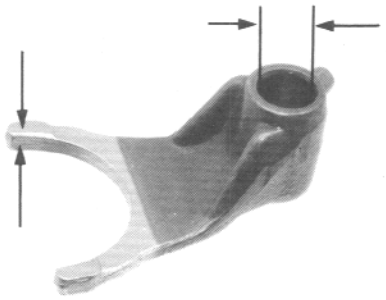


Remove the mainshaft and countershaft assemblies as a set from the left crankcase.



INSPECTION

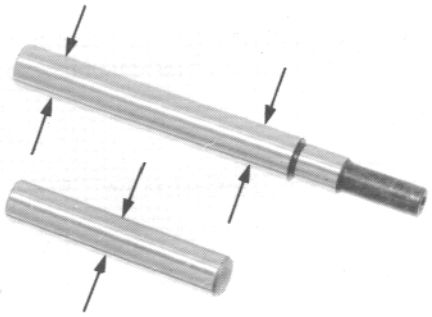
Check that the shift forks are not bent, worn or damaged. Measure the I.D. and shift pawl thickness.



SERVICE LIMITS:
Pawl thickness: 4.8 mm (0.19 in)
I.D.: R., L.: 12.09 mm (0.476 in)
C.: 11.09 mm (0.437 in)

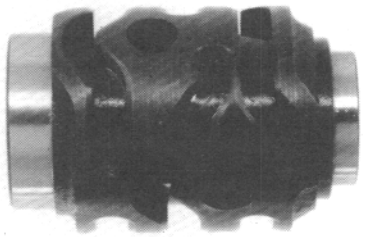
Check that the shift fork shafts are not bent, worn, or damaged.

Measure the O.D. of the shafts.

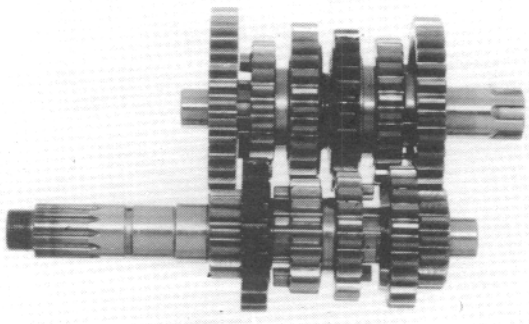


SERVICE LIMITS:
Mainshaft 10.97 mm (0.432 in)
Countershaft 11.97 mm (0.471 in)

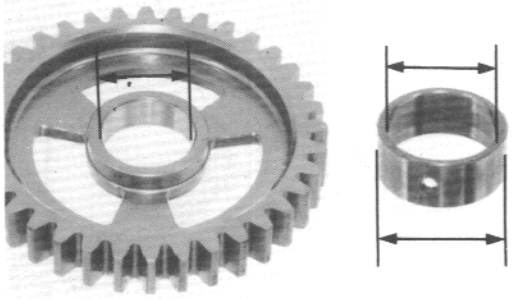
Inspect the shift drum grooves and replace the drum if they are damaged or show excessive wear.



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 LIMITS:

M6 ('86, '87):	25.06 mm (0.987 in)
(After '87):	28.06 mm (1.105 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 LIMITS:

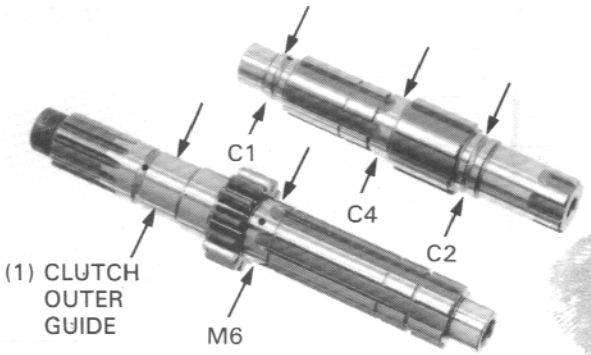
C1:	19.04 mm (0.750 in)
C2:	24.04 mm (0.946 in)
M6 (After '87):	25.05 mm (0.986 in)

Measure the O.D. of each bushing.

SERVICE LIMITS:

M5, C3:	27.94 mm (1.100 in)
C1:	21.96 mm (0.865 in)
C2:	26.96 mm (1.061 in)
M6 (After '87):	27.95 mm (1.100 in)

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



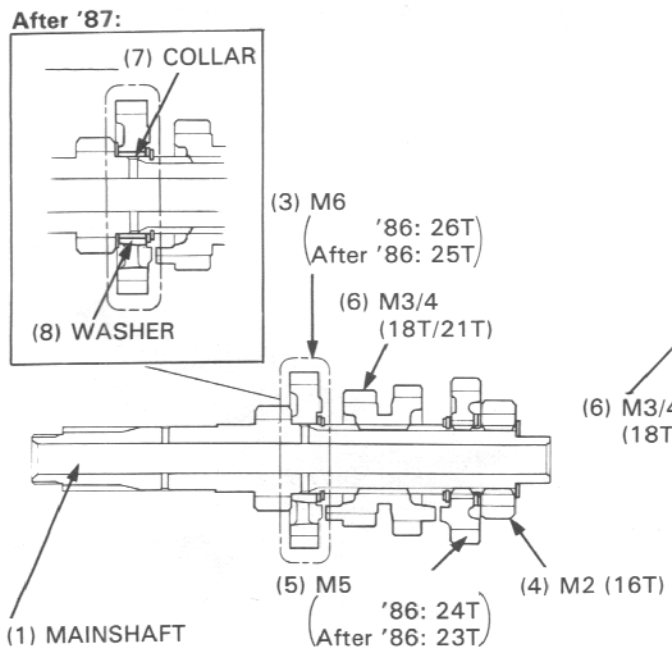
SERVICE LIMITS:

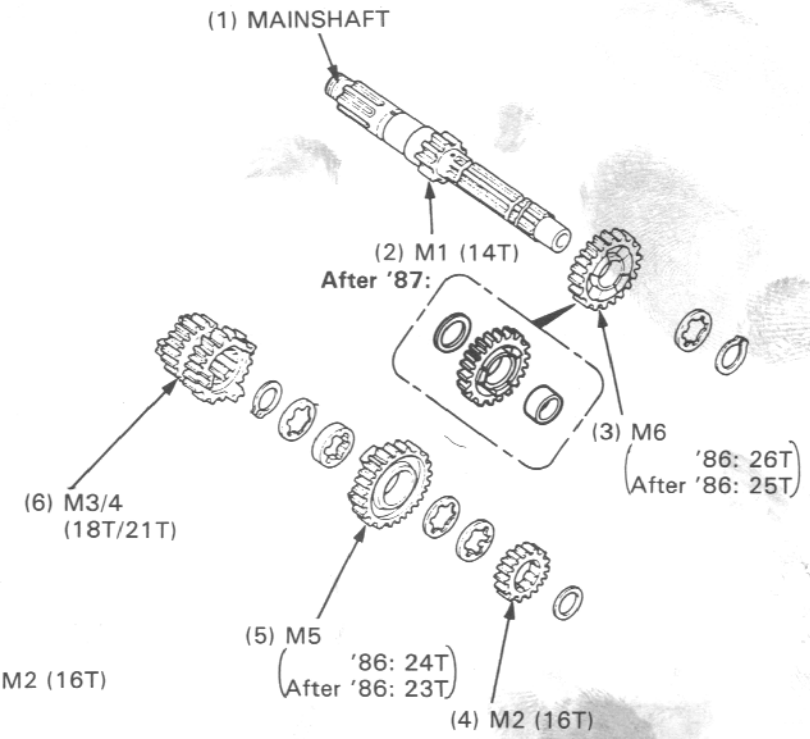
M6, C4:	24.94 mm (0.982 in)
Clutch outer guide:	22.94 mm (0.903 in)
C1:	18.94 mm (0.746 in)
C2:	23.94 mm (0.943 in)

INSTALLATION

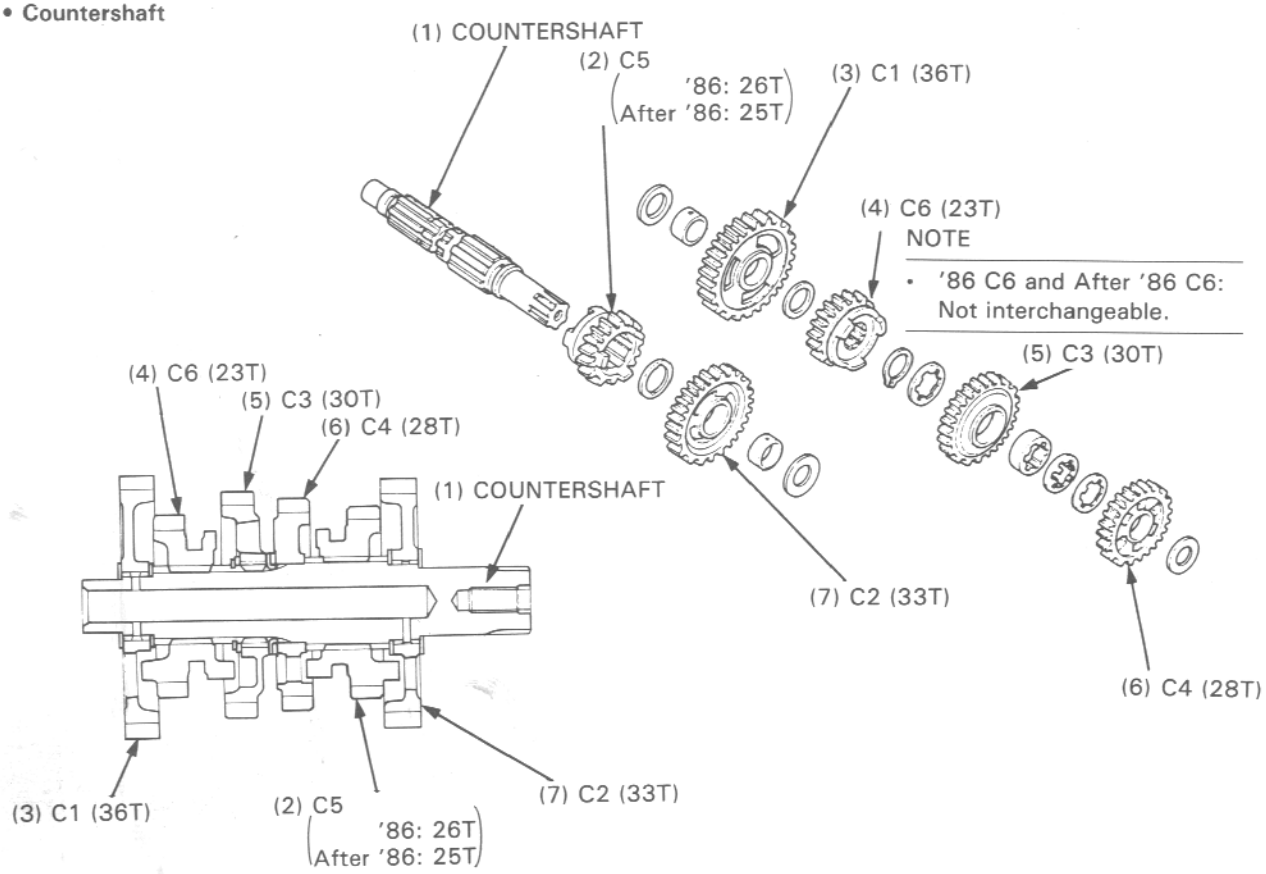
Coat all parts with transmission oil.
Assemble the transmission gears and shafts.

- **Mainshaft**



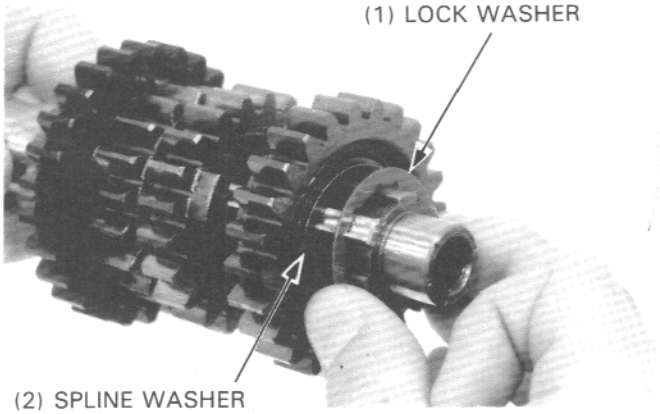


• **Countershaft**

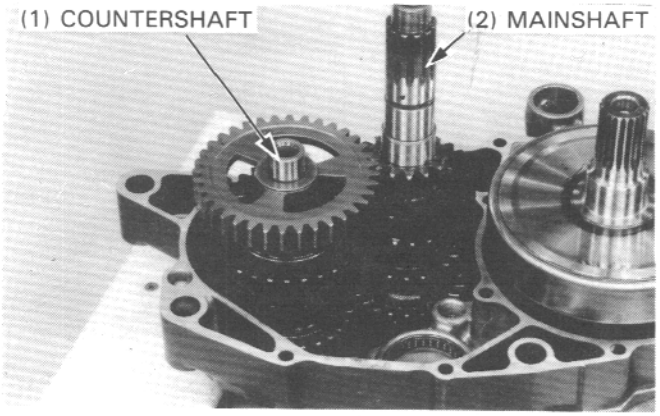


Install the lock washer while aligning the tabs of the lock washer with the grooves in the spline washer.

After assembling, check for smooth movement.



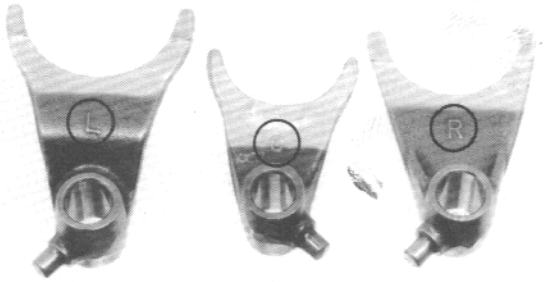
Install the mainshaft and countershaft into the left crankcase.



Install the shift drum and shift forks.

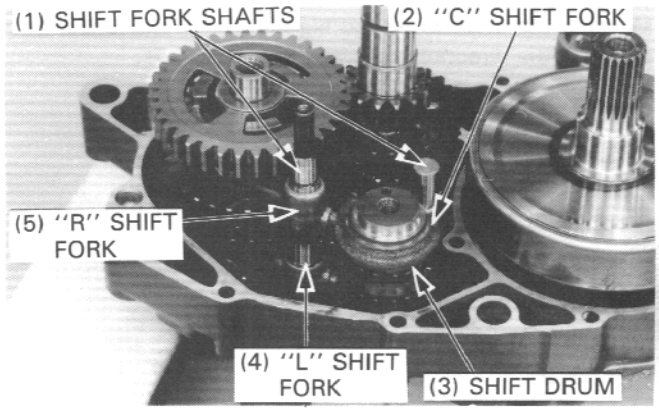
CAUTION

- *Install the shift forks with their marks facing the left crankcase.*



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

Assemble the crankcase (page 8-11).

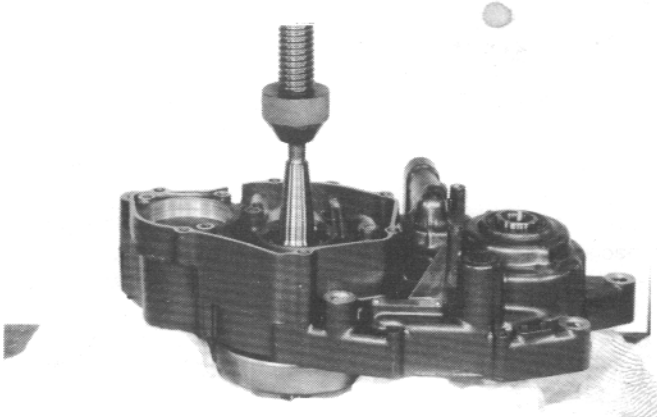


CRANKSHAFT

REMOVAL

Separate the crankcase (page 8-3).
Remove the transmission (page 8-3).

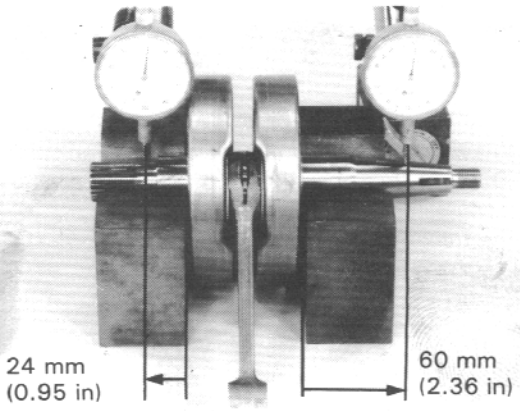
Remove the crankshaft from the left crankcase using a hydraulic press.
Remove the left crankshaft oil seal.



INSPECTION

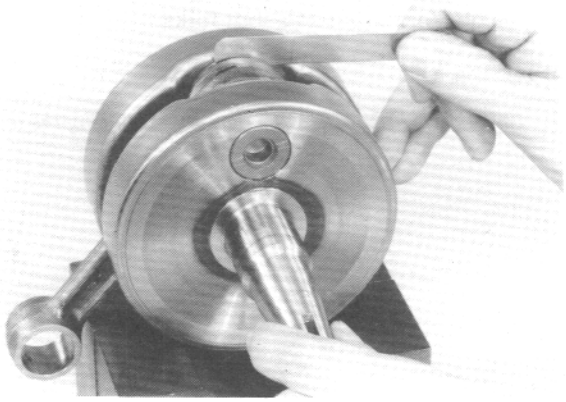
Measure the crankshaft runout at the points indicated in the photograph.

SERVICE LIMIT: 0.05 mm (0.002 in)



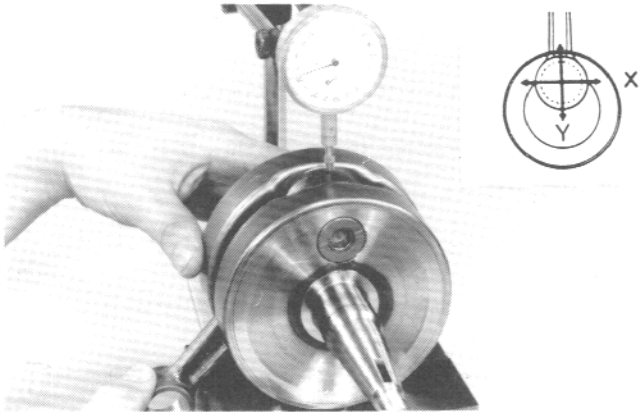
Measure the connecting rod big end side clearance.

SERVICE LIMIT: 1.0 mm (0.04 in)



Measure the connecting rod big end radial clearance, at two points in the direction indicated by the arrows.

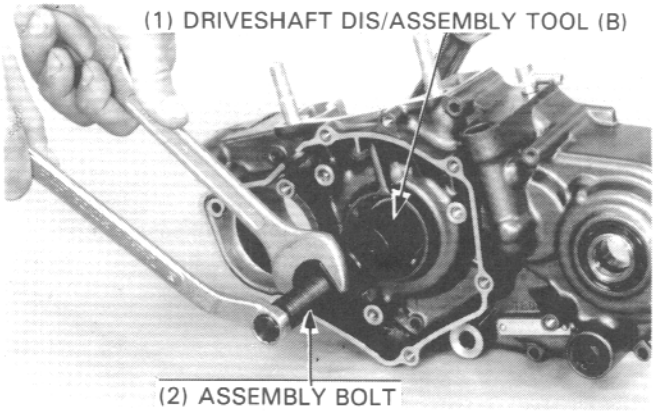
SERVICE LIMIT: 0.04 mm (0.002 in)



INSTALLATION

Place the left crankcase over the crankshaft.

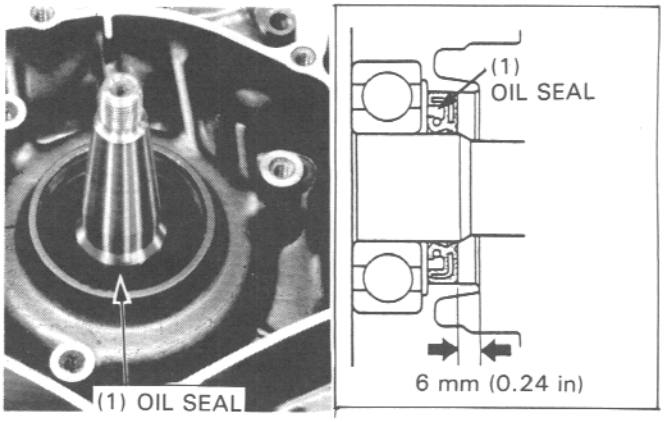
Place the driveshaft dis/assembly tool (B) over the end of the crankshaft.
Thread the assembly bolt onto the crankshaft and tighten the special left-hand thread nut portion of the assembly bolt against the driveshaft dis/assembly tool (B) (counterclockwise).
Hold the center bolt stationary and continue to turn the left-hand nut counterclockwise until the crankcase seats over the crankshaft.
Do not over tighten.



TOOLS:

Driveshaft dis/assembly tool (B)	**07964—MB00200**
Assembly bolt	**07965—1660200**

Install 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.

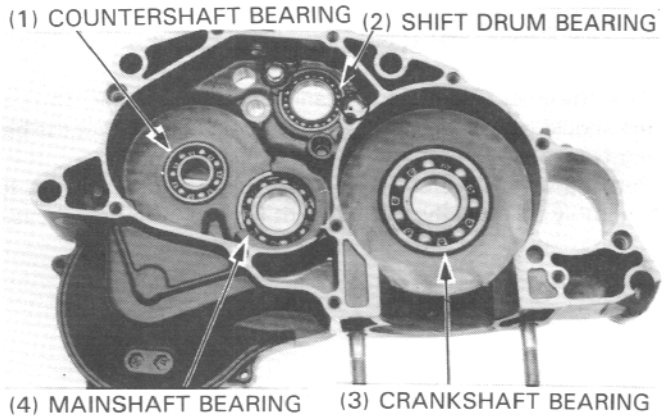


Install the transmission (page 8-5).
Assemble the crankcase (page 8-11).

BEARING REPLACEMENT

RIGHT CRANKCASE

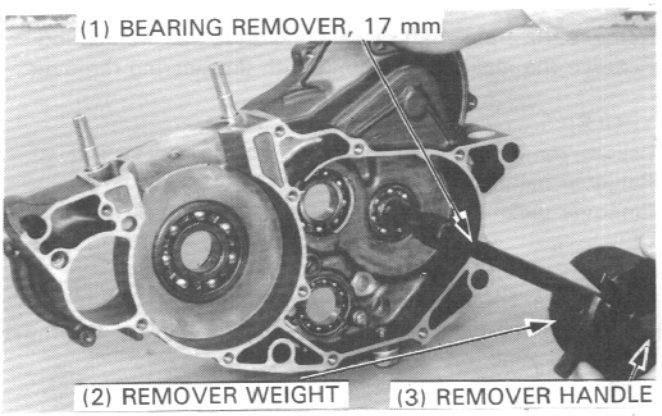
Turn the inner race of each bearing with your finger. The bearing should turn smoothly and quietly.
Also check that the bearing outer race fits tightly in the crankcase.
Remove and discard the bearing if the races do not turn smoothly, quietly, or if they fit loosely in the crankcase.



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

TOOLS:

Bearing remover, 17 mm	**07936—3710300**
Remover handle	**07936—3710100**
Remover weight	**07741—0010201 or 07936—3710200**

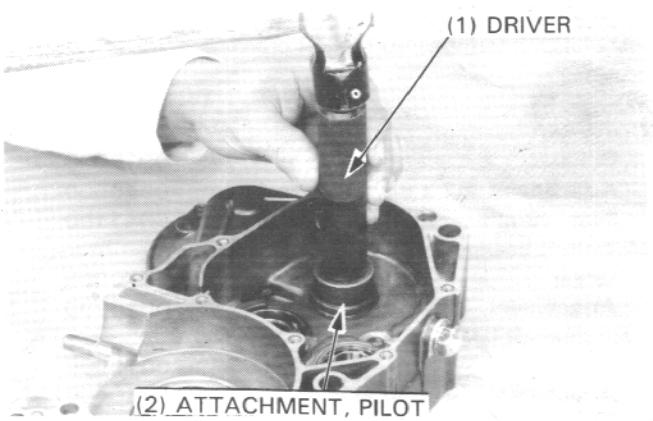


Remove the bearing holders and shift drum bearing.

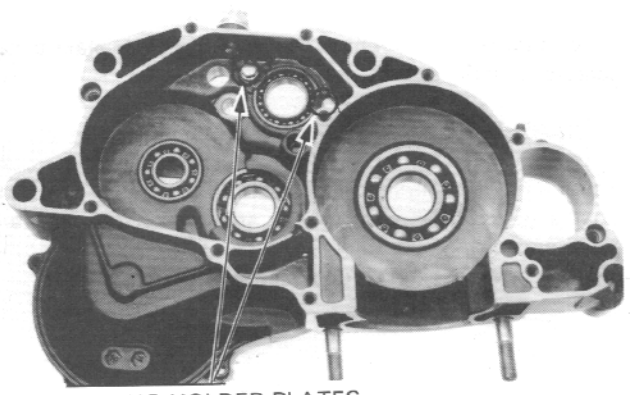
Install new bearings into the right crankcase.

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**

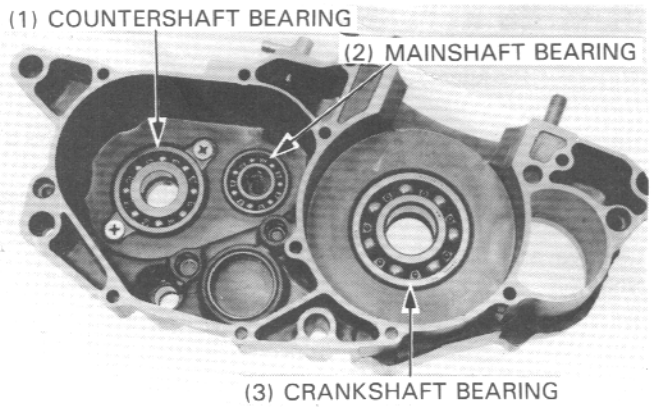


Install the shift drum bearing into the right crankcase and secure it with the bearing holder plates and bolts.



LEFT CRANKCASE

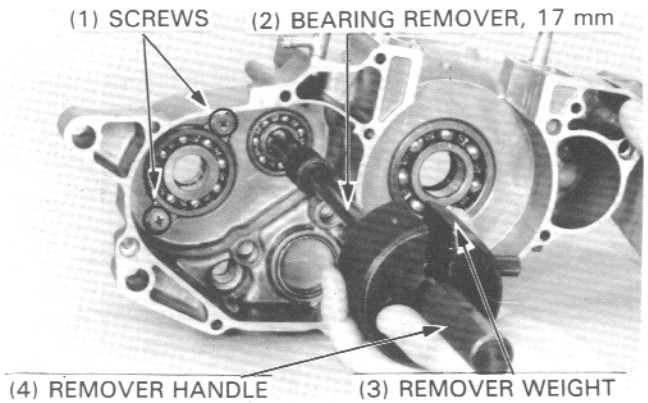
Turn the inner race of each bearing with your finger. The bearing should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the crankcase.
Remove and discard the bearing if the races do not turn smoothly and quietly, or if they fit loosely in the crankcase.



Remove the crankshaft oil seal and drive out the bearing.
Remove the mainshaft bearing with the bearing remover.

TOOLS:

Bearing remover, 17 mm	**07936–3710300**
Remover handle	**07936–3710100**
Remover weight	**07741–0010201 or 07936–3710200**

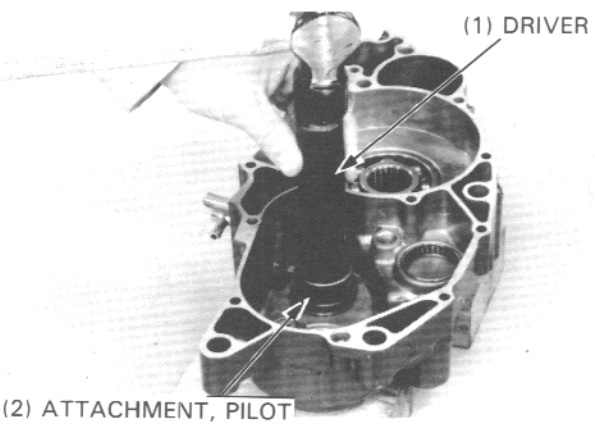


Remove the countershaft collar and oil seal.
Remove the countershaft bearing holder plates by removing the screws and drive out the bearing.

Install new bearings into the left crankcase.

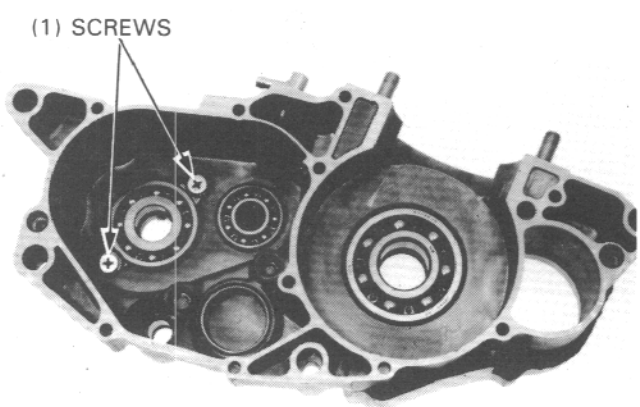
TOOLS:

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**



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

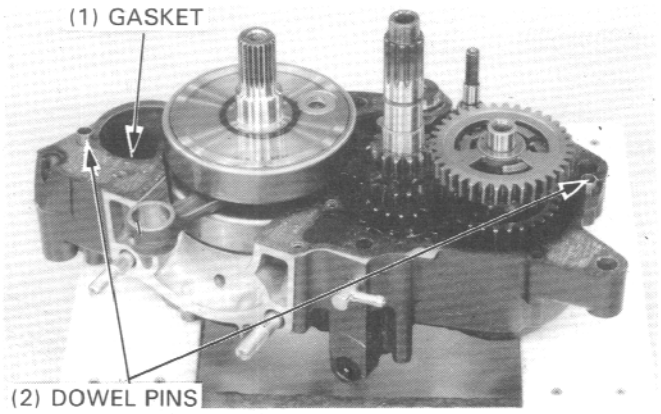
TORQUE: 8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)



Install a new countershaft oil seal.
Coat a new O-ring with grease and install the countershaft collar and O-ring into the crankcase.
Install a new crankshaft oil seal (page 8-11).

CRANKCASE ASSEMBLY

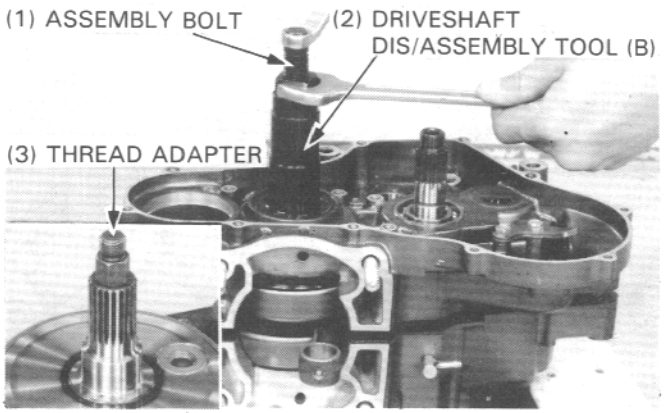
Install a new gasket and the dowel pins.



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.

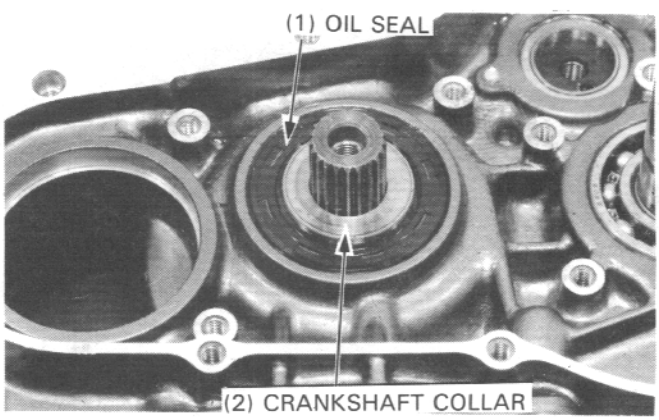
Screw the thread adapter into the crankshaft as shown.
Place the driveshaft dis/assembly tool (B) over the end of the crankshaft.
Thread the assembly bolt onto the thread adapter and tighten the special left-hand thread nut portion of the assembly bolt against the driveshaft dis/assembly tool (B) (counterclockwise).
Hold the center bolt stationary and continue to turn the left-hand nut counterclockwise until the case halves meet.
Do not over tighten.



TOOLS:

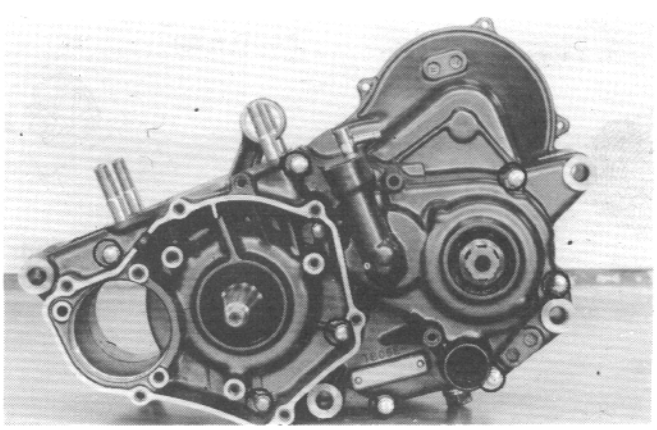
Driveshaft dis/assembly tool (B)	**07964—MB00200**
Assembly bolt	**07965—1660200**
Thread adapter	**07965—KA30000**

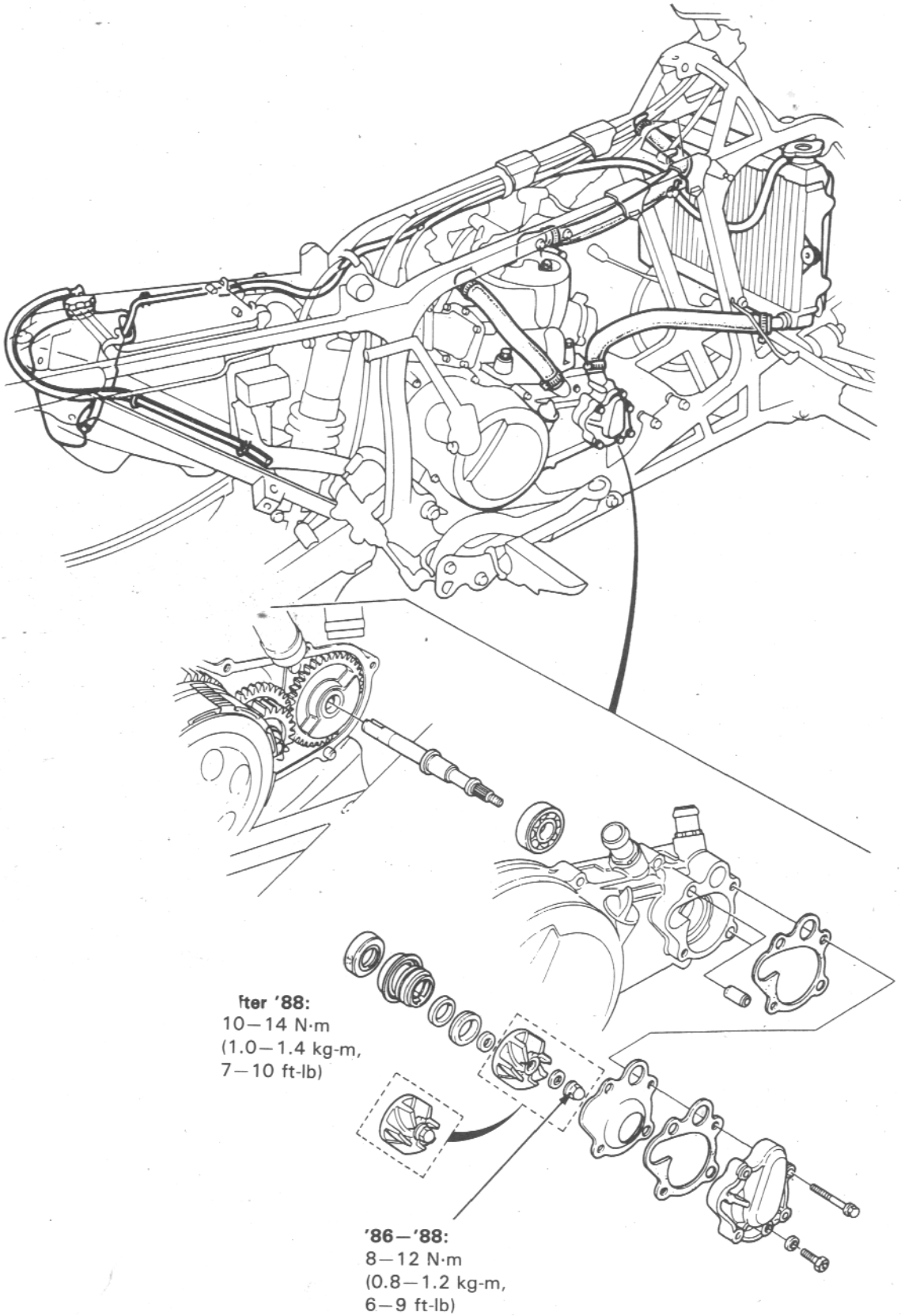
Install a new right crankshaft oil seal into place until it is flush with the crankcase surface.
Install the crankshaft collar.



Install the crankcase attaching bolts and tighten the bolt securely in a crisscross pattern in 2 or 3 progressive steps.

Install the removed parts in the reverse order of removal (page 8-1).




fter '88:
10—14 N·m
(1.0—1.4 kg-m,
7—10 ft-lb)
'86—'88:
8—12 N·m
(0.8—1.2 kg-m,
6—9 ft-lb)

SERVICE INFORMATION

GENERAL

- To enable radiator inspection, coolant replacement and radiator removal, remove the front fender and fuel tank.
- 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		108—137 kPa (1.1—1.4 kg/cm², 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	at replacement	Radiator: 1.16 lit (1.23 U.S. qt., 1.02 Imp. qt.) Reserve tank: 0.22 lit (0.23 U.S. qt., 0.19 Imp. qt.) Total: 1.38 lit (1.46 U.S. qt., 1.21 Imp. qt.)
	at disassembly	Radiator: 1.30 lit (1.37 U.S. qt., 1.14 Imp. qt.) Reserve tank: 0.22 lit (0.23 U.S. qt., 0.19 Imp. qt.) Total: 1.52 lit (1.61 U.S. qt., 1.34 Imp. qt.)

TORQUE VALUES

Water pump impeller nut ('86—'88:)	8—12 N·m (0.8—1.2 kg-m, 6—9 ft-lb)
Water pump impeller (After '88:)	10—14 N·m (1.0—1.4 kg-m, 7—10 ft-lb)
Coolant drain bolt	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-065-415 (U.S.A. only)
Attachment, 28 x 30 mm	07946—1870100
Bearing remover set, 12 mm	07936—1660001 Not available in U.S.A.
— Remover weight	07741—0010201 or 07936—3710200
— Bearing spindle assy, 12 mm	07936—1660100

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 radiator hose connections
- Damaged or deteriorated radiator hoses

COOLING SYSTEM INSPECTION

WARNING

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

Remove the front fender (page 14-2).
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.

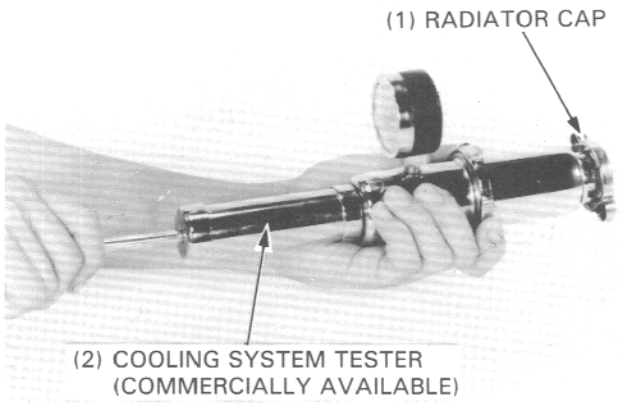
RADIATOR CAP RELIEF PRESSURE:
108—137 kPa (1.1—1.4 kg/cm², 16—20 psi)

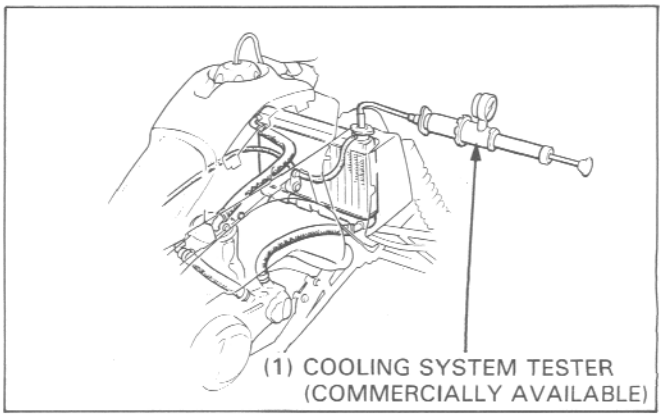
Pressurize the radiator, engine and hoses, and check for leaks.

CAUTION

- *Excessive pressure can damage the radiator. Do not exceed 196 kPa (2.0 kg/cm², 28.4 psi).*

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



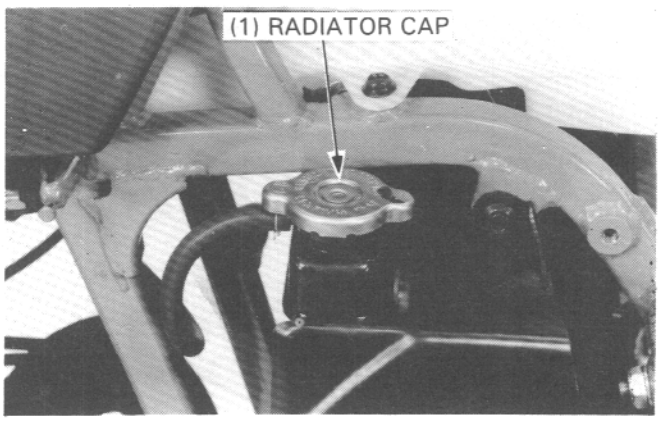


COOLANT REPLACEMENT

WARNING

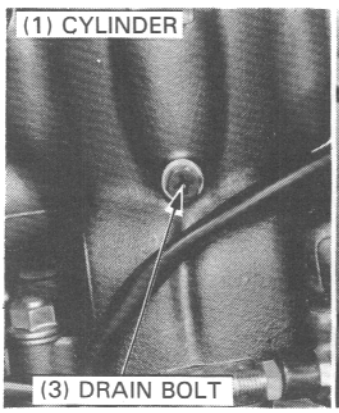
- *The engine must be cool before servicing the cooling system, or severe scalding may result.*

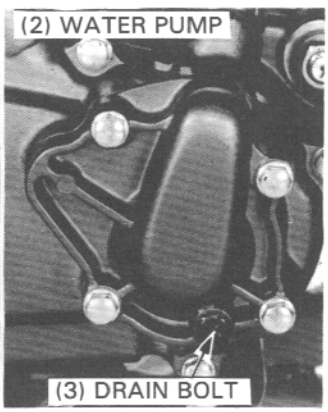
Remove the front fender (page 14-2) and fuel tank (page 3-3).
Remove the radiator cap.



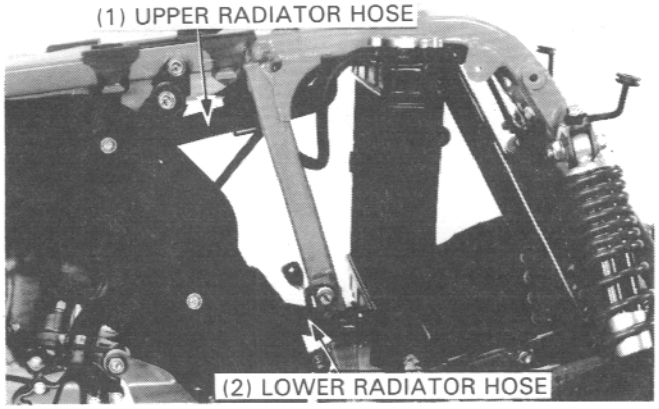
Remove the coolant drain bolt at the cylinder and water pump, and drain the coolant.
Check that the drain bolt sealing washers are in good condition, then install the drain bolts.
Tighten the drain bolts.

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



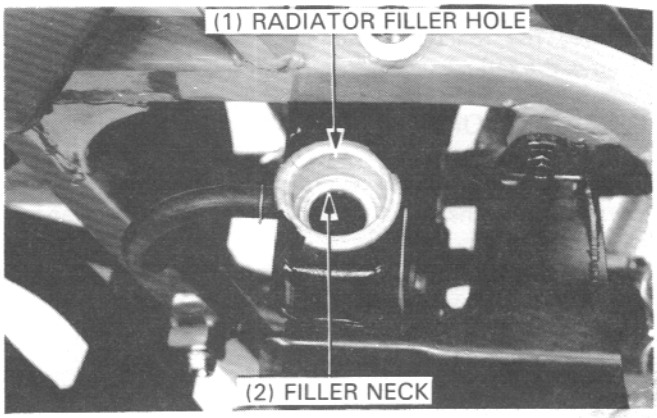


Disconnect the upper and lower radiator hoses from the water pump and cylinder head.
Drain the coolant from the radiator hoses.
Drain the coolant from the radiator reserve tank.



Install the upper and lower radiator hoses and tighten the band screws securely.
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:
Radiator: 1.16 ℓ (1.23 U.S. qt., 1.02 Imp. qt.)
Reserve tank: 0.22 ℓ (0.23 U.S. qt., 0.19 Imp. qt.)
Total: 1.38 ℓ (1.46 U.S. qt., 1.21 Imp. qt.)

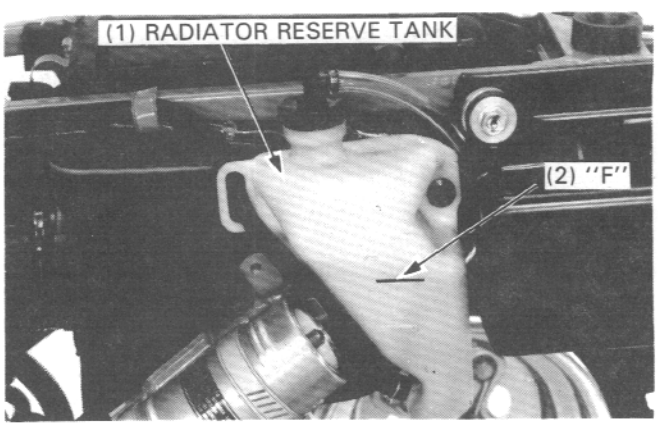


Bleed air from the system as follows:
1. Start the engine and let it idle.
2. Check that there are no air bubbles in the coolant around the filler hole, and the level stabilizes.
3. Stop the engine and replenish coolant up to the filler hole.
4. Check the level of coolant in the reserve tank if necessary,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

Install the radiator cap securely.

NOTE

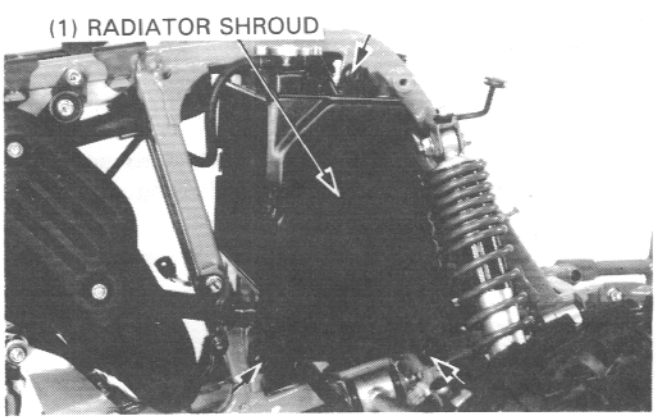
- After the above steps have been completed, check for leaks.



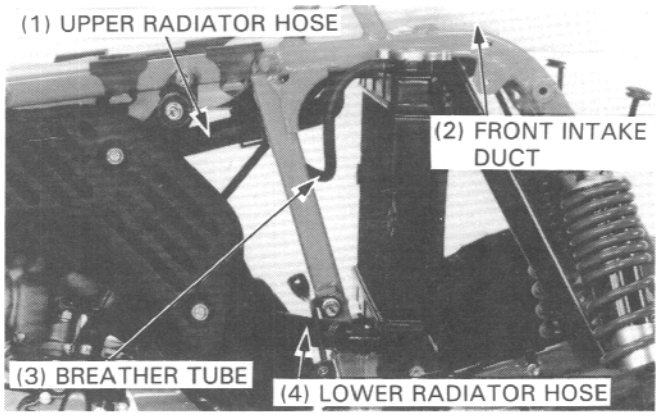
RADIATOR

REMOVAL

Remove the front fender (page 14-2) and fuel tank (page 3-3).
Drain the radiator coolant (page 9-2).
Remove the right and left radiator shroud by removing mounting bolts.



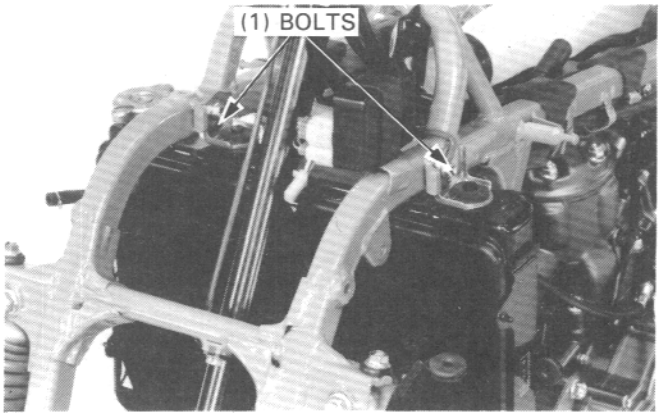
Remove the air cleaner case front air intake duct by removing the bolts.
Disconnect the radiator breather tube, and upper and lower radiator hoses from the radiator.



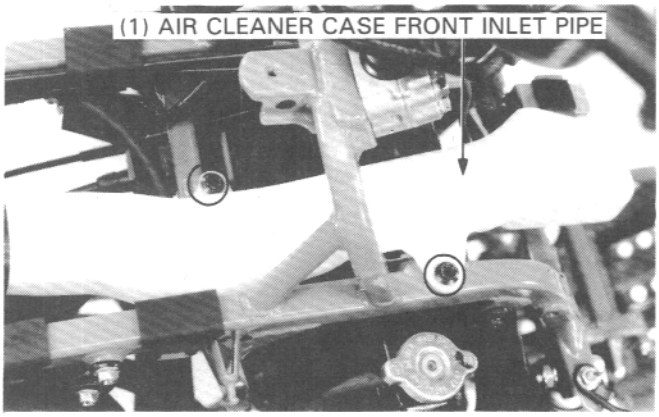
Remove the radiator mount bracket attaching bolts and remove the radiator from the frame.

INSTALLATION

Install the radiator in the reverse order of removal.
Install the breather tube, upper and lower radiator hoses securely.
Fill the cooling system with the recommended coolant (page 9-3).



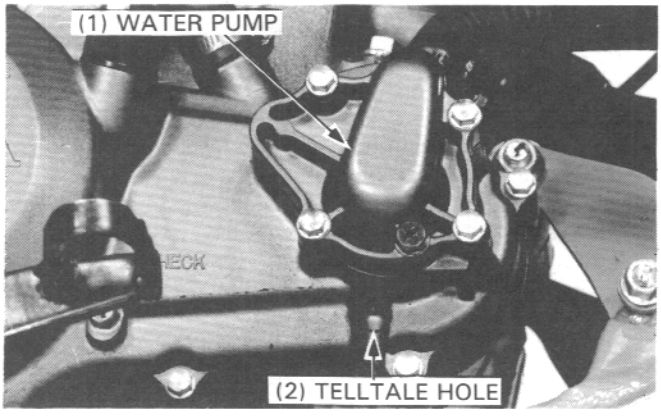
Install the air cleaner case front inlet pipe and tighten the bolts.
Install the front fender (page 14-2) and fuel tank (page 3-3).
After installation, check the radiator and hoses for leaks.



WATER PUMP

MECHANICAL SEAL INSPECTION

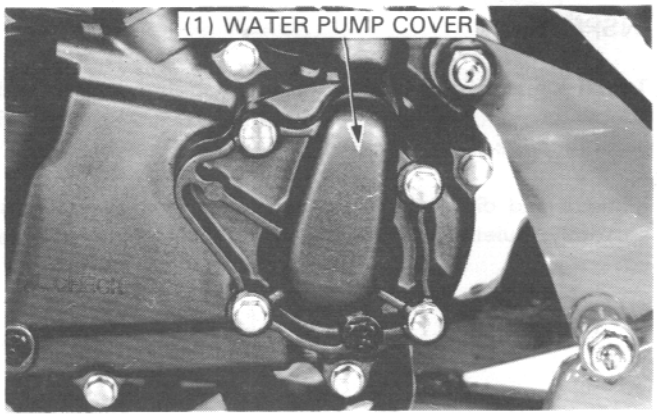
Inspect the telltale hole for signs of coolant leakage.
Replace the mechanical seal if there is leaking.



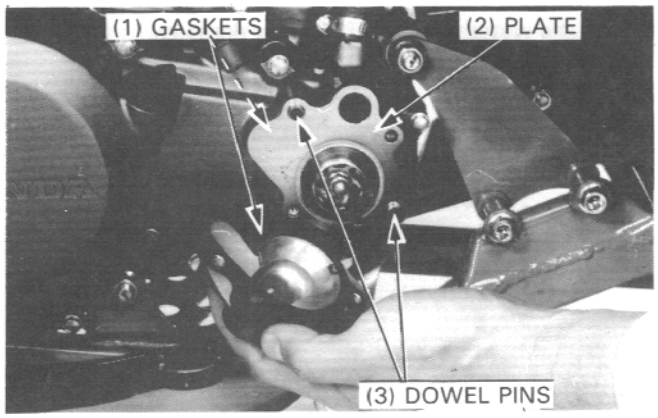
REMOVAL

Drain the radiator coolant (page 9-2).

Remove the water pump cover attaching bolts and remove the water pump cover.



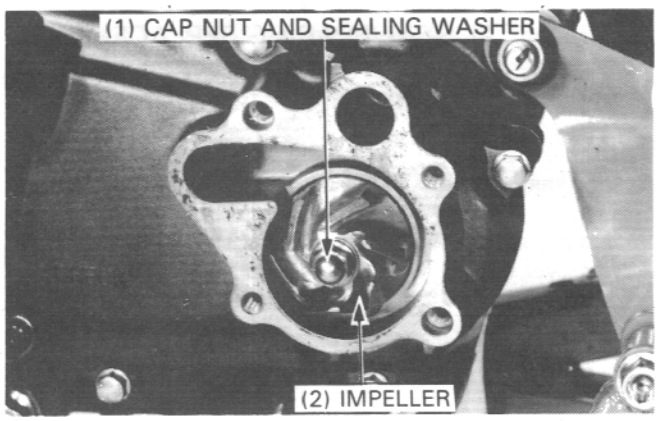
Remove the outer gasket, plate and inner gasket.
Remove the two dowel pins.



'86–'88 Shown.

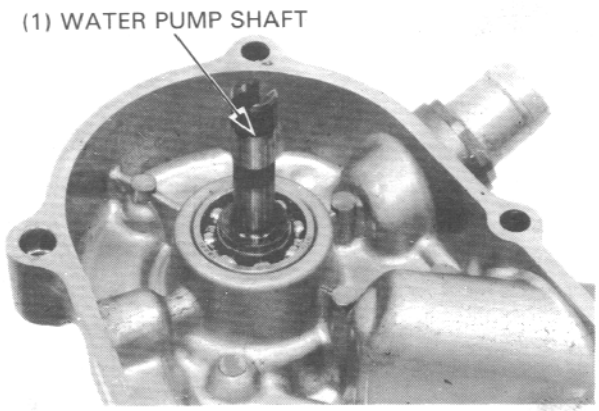
Hold the flywheel with the universal holder (page 6-2).

'86–'88:
Remove the cap nut and sealing washer.
Remove the impeller and washer.



Disconnect the radiator hoses from the right crankcase cover.
Remove the right crankcase cover (page 7-3).

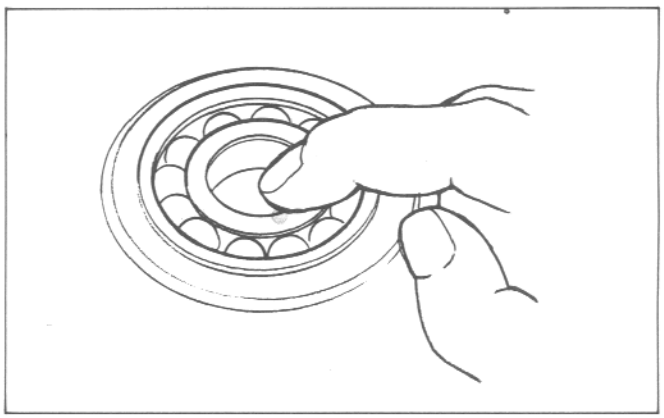
Remove the water pump shaft.



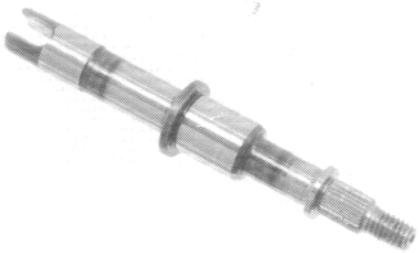
INSPECTION

Turn the inner race of the bearing with your finger. The bearing should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the right crankcase cover.

Remove and discard the bearing if the race does not turn smoothly, quietly, or if it fits loosely in the right crankcase cover.



Check the water pump shaft for any damage.

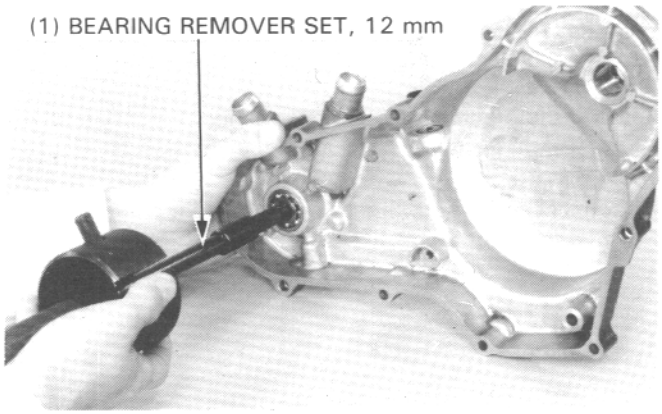


MECHANICAL SEAL/BEARING REPLACEMENT

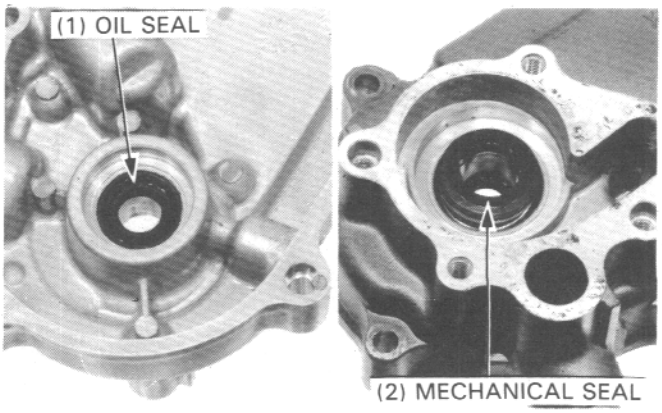
Remove the bearing with a bearing remover.

TOOLS:

Bearing remover set, 12 mm	**07936—1660001 Not available in U.S.A.**
— Bearing spindle assy, 12 mm	**07936—1660100**
— Remover weight	**07741—0010201 or 07936—3710200**



Remove the oil seal, then drive out the mechanical seal.



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

TOOLS:

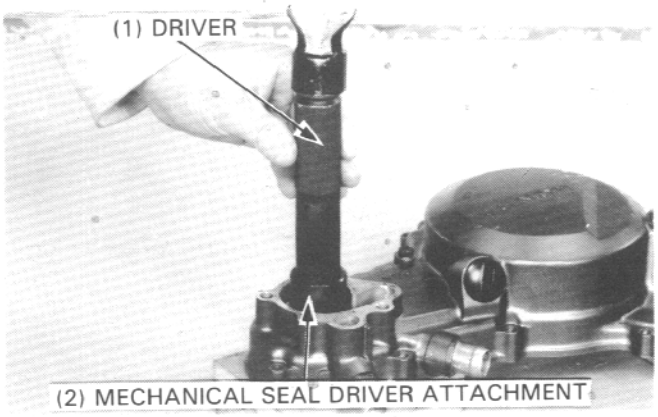
Driver	**07749—0010000**
Mechanical seal driver attachment	**07945—4150400 or Mechanical seal installer GN—AH—065—415 (U.S.A. only)**

CAUTION

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

NOTE

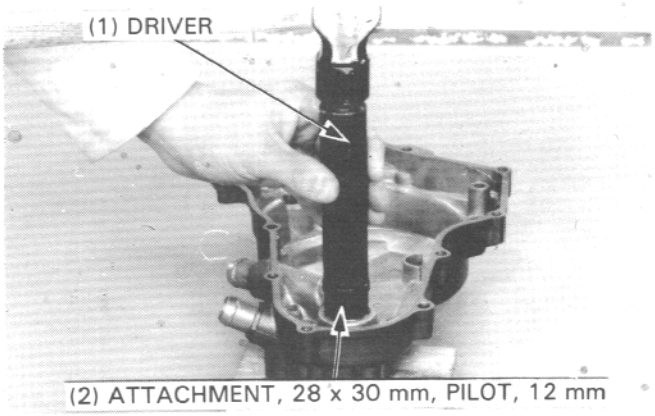
- Instructions for usage of the Mechanical Seal Installer are in the Special Tool catalog (U.S.A. only).



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

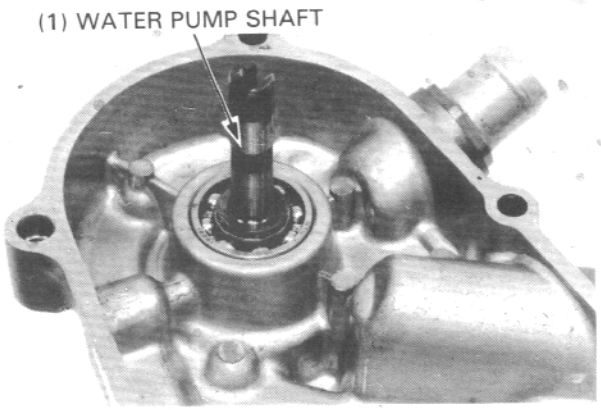
TOOLS:

Driver	**07749—0010000**
Attachment, 28 x 30 mm	**07946—1870100**
Pilot, 12 mm	**07946—0040200**



INSTALLATION

Install the water pump shaft.
Install the right crankcase cover (page 7-8).



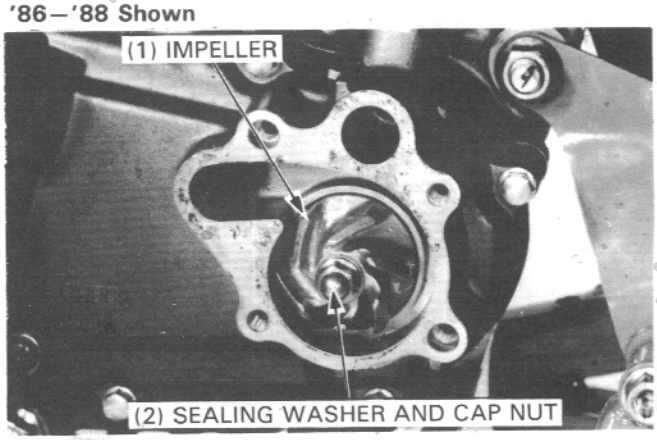
'86—'88:
Install the impeller, sealing washer, and cap nut.

After '88:
Install the impeller.

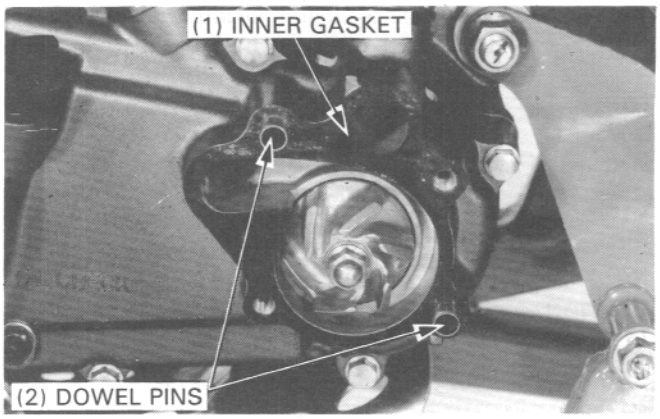
Hold the flywheel with the universal holder (page 6-2), then tighten the cap nut ('86—'88) or impeller (After '88).

TORQUE: '86—'88: 8—12 N·m (0.8—1.2 kg-m, 6—9 ft-lb)
After '88: 10—14 N·m (1.0—1.4 kg-m, 7—10 ft-lb)

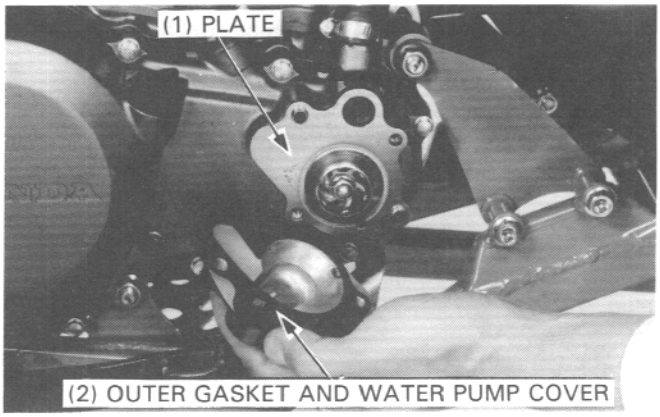
'86—'88 Shown



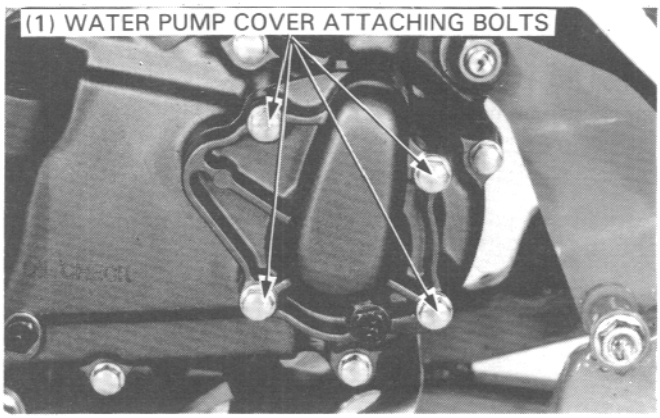
Install the new inner gasket and dowel pins.



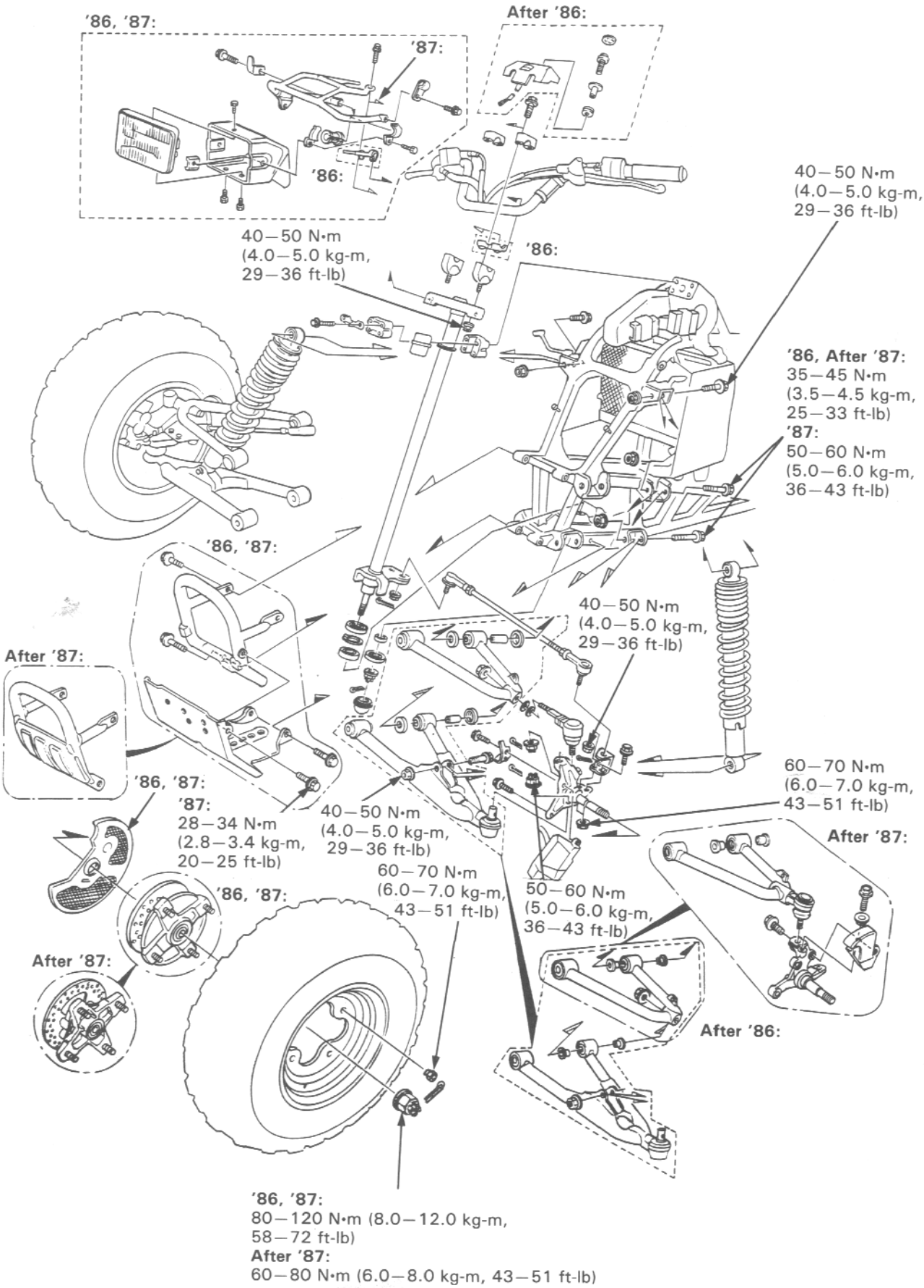
Install the plate, new outer gasket and water pump cover.



Install the water pump cover attaching bolts and tighten them.
Connect the radiator hoses to the right crankcase cover.
Tighten the radiator hose band screws securely.
Fill the cooling system with the recommended coolant (page 9-1 and 3).



MEMO


'86, '87:
'87:
'86:
After '86:
40–50 N·m
(4.0–5.0 kg-m,
29–36 ft-lb)
'86:
40–50 N·m
(4.0–5.0 kg-m,
29–36 ft-lb)
'86, After '87:
35–45 N·m
(3.5–4.5 kg-m,
25–33 ft-lb)
'87:
50–60 N·m
(5.0–6.0 kg-m,
36–43 ft-lb)
'86, '87:
40–50 N·m
(4.0–5.0 kg-m,
29–36 ft-lb)
After '87:
'86, '87:
'87:
28–34 N·m
(2.8–3.4 kg-m,
20–25 ft-lb)
40–50 N·m
(4.0–5.0 kg-m,
29–36 ft-lb)
60–70 N·m
(6.0–7.0 kg-m,
43–51 ft-lb)
60–70 N·m
(6.0–7.0 kg-m,
43–51 ft-lb)
After '87:
'86, '87:
50–60 N·m
(5.0–6.0 kg-m,
36–43 ft-lb)
After '87:
After '86:
'86, '87:
80–120 N·m (8.0–12.0 kg-m,
58–72 ft-lb)
After '87:
60–80 N·m (6.0–8.0 kg-m, 43–51 ft-lb)

10. FRONT WHEEL/SUSPENSION/STEERING

SERVICE INFORMATION

GENERAL

- This section covers maintenance of the front wheel, front shock absorber, steering and suspension.
- A jack or other support is required to support the FOURTRAX.

SPECIFICATION

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Shock absorber spring free length	'86, '87:	271.0–277.0 (10.67–10.91)	268 (10.6)
	After '87:	270.1–276.1 (10.63–10.87)	267 (10.5)

TORQUE VALUES

Front wheel nut	60–70 N·m (6.0–7.0 kg-m, 43–51 ft-lb)
Front brake disc socket bolt	14–16 N·m (1.4–1.6 kg-m, 10–12 ft-lb)
Front wheel hub nut '86, '87:	80–120 N·m (8.0–12.0 kg-m, 58–72 ft-lb)
After '87:	60–80 N·m (6.0–8.0 kg-m, 43–58 ft-lb)
Tie-rod ball joint	40–50 N·m (4.0–5.0 kg-m, 29–36 ft-lb)
Tie-rod lock nut	50–60 N·m (5.0–6.0 kg-m, 36–43 ft-lb)
Front arm ball joint nut ('86, '87:)	60–80 N·m (6.0–8.0 kg-m, 43–58 ft-lb)
Knuckle arm nut ('86, '87:)	60–70 N·m (6.0–7.0 kg-m, 43–51 ft-lb)
Front arm nut	50–60 N·m (5.0–6.0 kg-m, 36–43 ft-lb)
Front arm mounting bolt '86, After '87:	35–45 N·m (3.5–4.5 kg-m, 25–33 ft-lb)
'87:	50–60 N·m (5.0–6.0 kg-m, 36–43 ft-lb)
Front shock absorber mounting bolt	40–50 N·m (4.0–5.0 kg-m, 29–36 ft-lb)
Steering shaft nut	60–80 N·m (6.0–8.0 kg-m, 43–58 ft-lb)
Handlebar lower holder mounting nut	40–50 N·m (4.0–5.0 kg-m, 29–36 ft-lb)
Steering shaft holder bolt	25–30 N·m (2.5–3.0 kg-m, 18–22 ft-lb)
Skid plate ('87 only)	28–34 N·m (2.8–3.4 kg-m, 20–25 ft-lb)
Front master cylinder holder	10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)
Handlebar upper holder bolt	24–30 N·m (2.4–3.0 kg-m, 17–22 ft-lb)

TOOLS

Special

Universal bead breaker	GN—AH—958—BB1 U.S.A. only
Ball joint remover	07941—6920003
Shock absorber attachment	07959—MB10000
Shock absorber attachment	07967—KC10100 Not available in U.S.A
Spherical bearing driver (After '86)	07HMF—HC00100

Common

Bearing remover shaft	07746—0050100 ┐
Bearing remover head, 20 mm	07746—0050600 ┘ or equivalent commercially available in U.S.A.
Driver	07749—0010000
Attachment, 42 x 47 mm	07746—0010300
Pilot, 20 mm	07746—0040500
Tire bead breaker set	07772—0050001 ┐
— Breaker arm	07772—0050200 ├ Not available in U.S.A.
— Breaker arm compressor	07772—0050101 ┘
Shock absorber compressor	07959—3290001 or 07GME—0010000
Attachment, 37 x 40 mm	07746—0010200
Pilot, 17 mm	07746—0040400
Attachment, 32 x 35 mm (After '87:)	07746—0010100
Pilot, 15 mm (After '87:)	07746—0040300

TROUBLESHOOTING

Hard steering
- Steering shaft holder too tight
- Damaged steering bearing and holder bearing
- Insufficient tire pressure
- Unequal rear tire pressure

Steers to one side or does not track straight
- Bent tie-rod
- Bent front frame or wheel installed incorrectly
- Incorrect wheel alignment

Front wheel wobbling
- Bent rim
- Worn wheel hub bearing
- Faulty tire
- Wheel hub nut tightened improperly

Soft suspension
- Weak shock absorber spring
- Loose front suspension fasteners
- Worn or damaged front arm bushings
- Faulty shock absorber damper

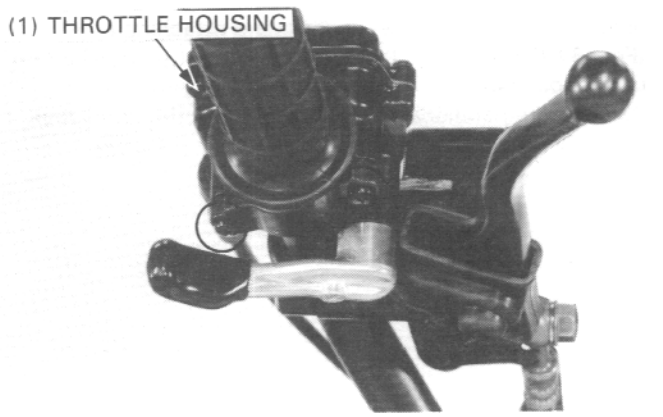
Front suspension noise
- Suspension link binding
- Loose front suspension fasteners
- Damaged front arm pivot spherical bearing (After '86:)

Hard suspension
- Bent shock absorber damper rod
- Improperly installed front arm

HANDLEBAR

REMOVAL

Remove the throttle housing from the handlebar.



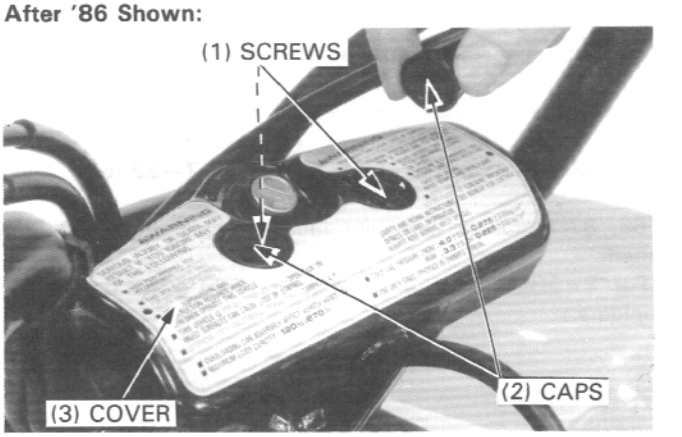
Remove the front brake master cylinder from the handlebar.

CAUTION

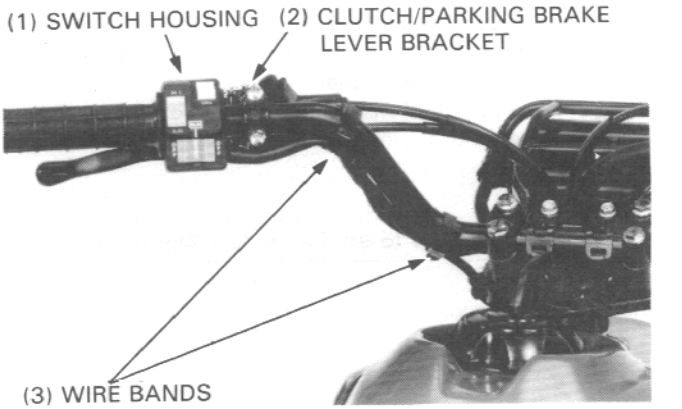
- *Suspend the master cylinder from the upper handle holder so that the air does not get in the brake system.*

Remove the following:
— After '86: handlebar cover

After '86 Shown:

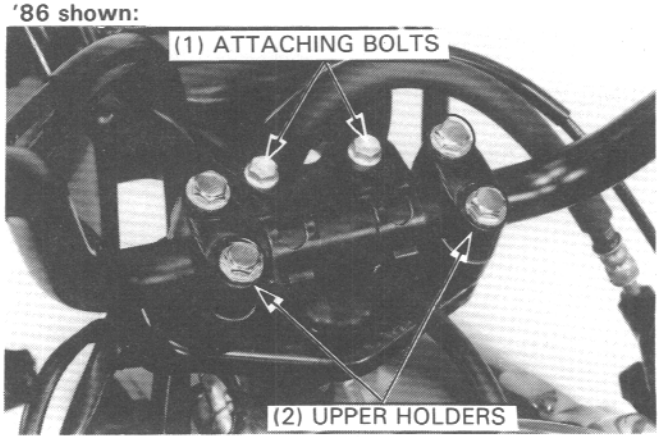


— wire bands
— clutch/parking lever bracket and switch housing from the handlebar
— grip end bolts, then remove the grip ends
— handlebar grips from the handlebar



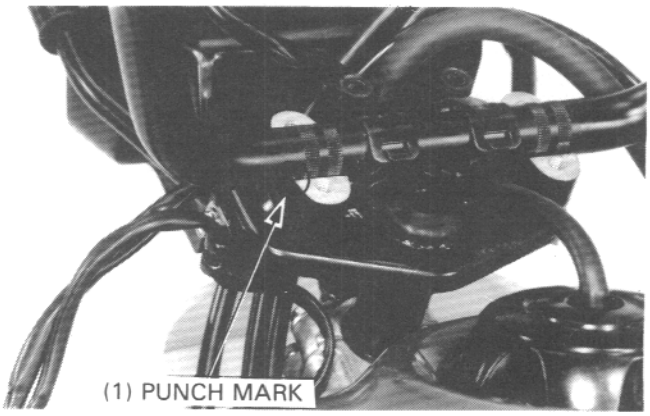
'86, '87: Remove the headlight guard attaching bolts.
(For '87 FOURTRAX, the headlight guard is installed on the upper holders.)
Remove the handlebar upper holders and the handlebar.

'86 shown:



INSTALLATION

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

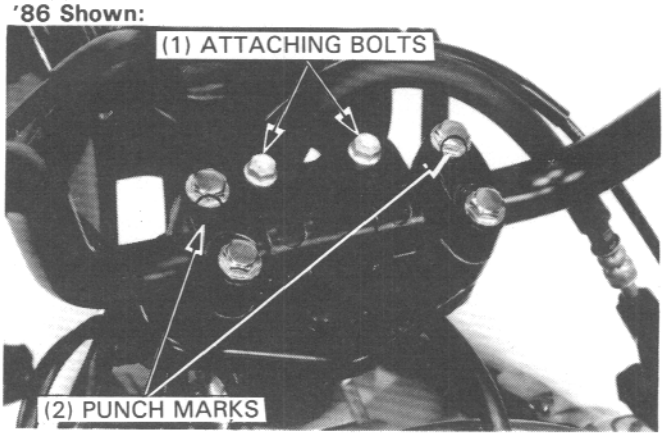


Install the handlebar upper holders with the punch marks forward.
Tighten the front bolts first, then tighten the rear bolts.

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

'86, '87: Install the headlight guard attaching bolts and tighten them.
(For '87 FOURTRAX, install the headlight guard on the upper holders.)

'86 Shown:

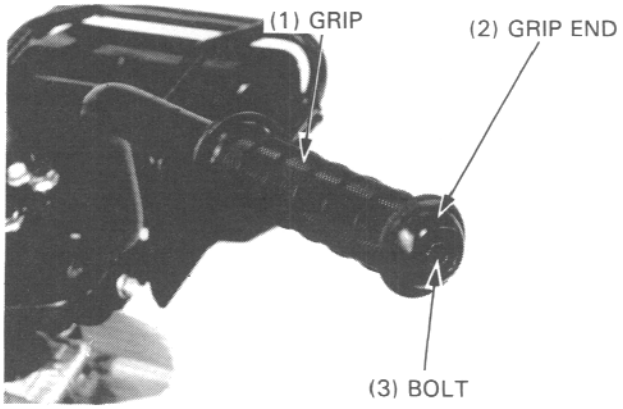


Apply Honda Bond A, Honda Hand Grip Cement (U.S.A. only) or an equivalent to the inside surface of the grips and to the clean surface of the handlebar.
Wait 3-5 minutes and install the grips. Rotate the grips for even application of the adhesive.

NOTE

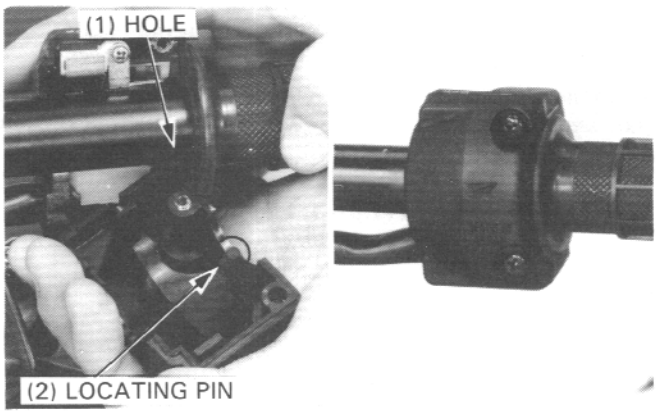
- Allow the adhesive to dry for an hour before using.

Install the grip ends.



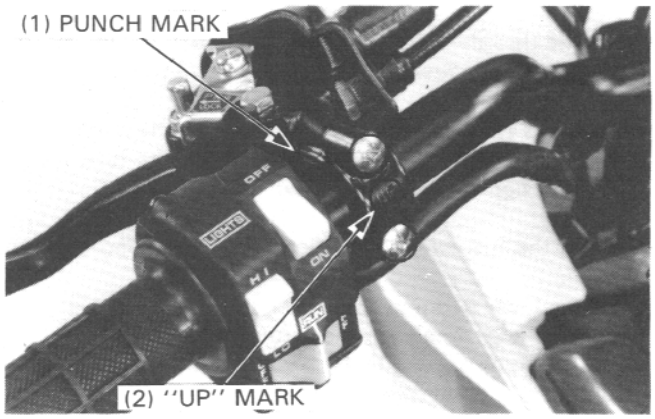
Install the switch housing, aligning the locating pin with the hole in the handlebar.

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

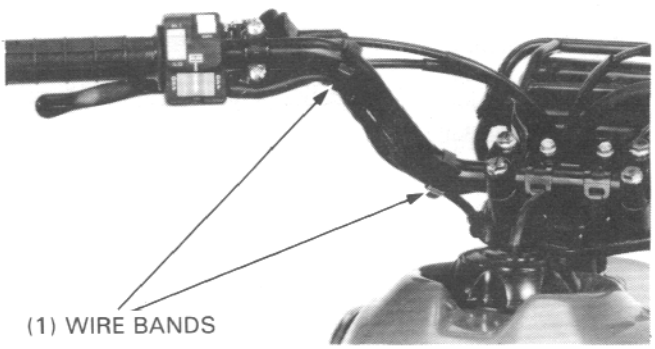


Place the clutch/parking brake lever bracket on the handlebar and install the holder with the ''UP'' mark facing up.

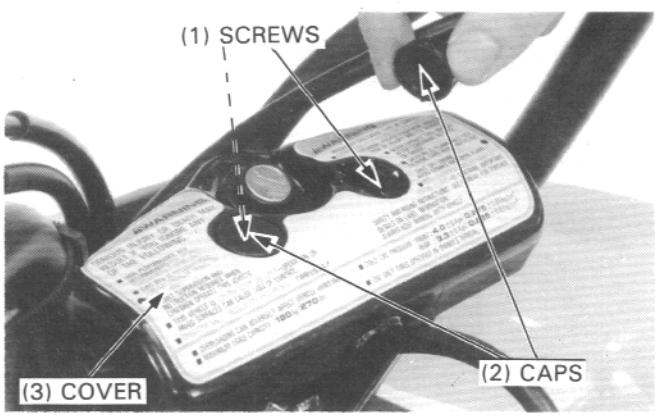
Align the bracket holder end with the punch mark on the handlebar and tighten the upper screw first, then tighten the lower screw.



Install the wire bands.

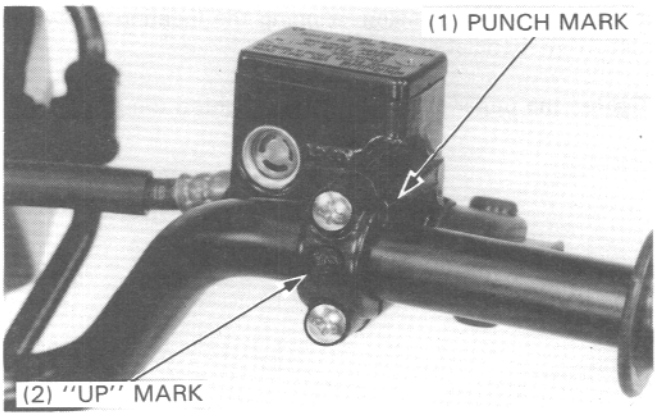


After '86:
Install the handlebar cover.



Install the front brake master cylinder with the "UP" mark on the holder 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.

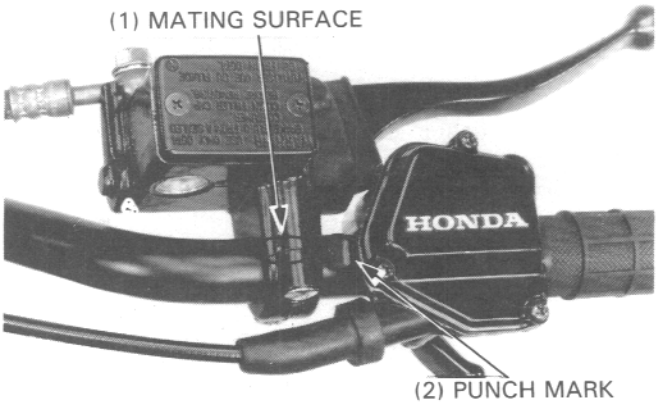
TORQUE: 10—14 N·m (1.0—1.4 kg-m, 7—10 ft-lb)



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 2-14)
— throttle lever free play and return (page 2-4)
— operation of parking brake lever (page 2-13)
— function of handlebar switch (page 15-9)
— operation of front brake lever

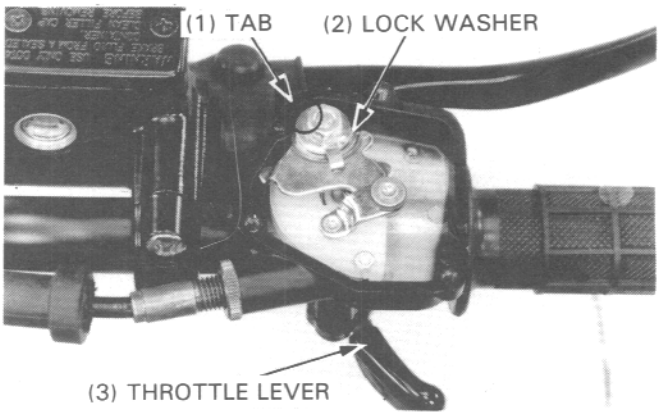


THROTTLE HOUSING

DISASSEMBLY

Remove the three throttle housing cover screws and cover.
Remove the gasket.

Loosen the throttle cable adjuster.
Bend down the lock washer tab and remove the nut and lock washer.
Remove the throttle lever.



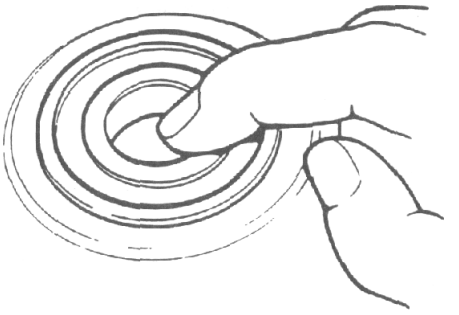
HUB BEARING INSPECTION

Turn the inner race of each bearing with your finger. The bearings should turn smoothly and quietly. Also check that the bearing outer races fit 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.

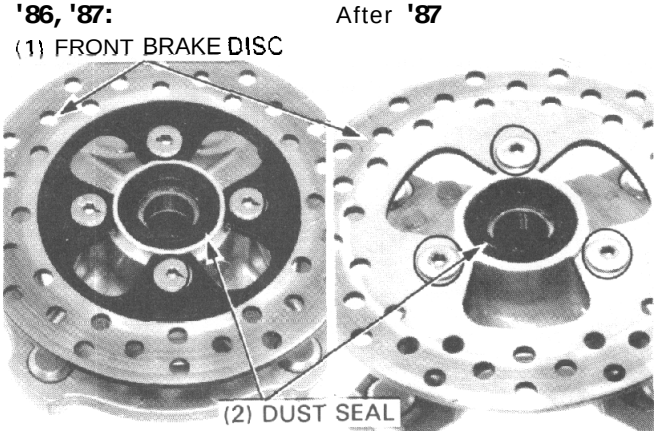
NOTE

- Replace hub bearings in pairs.



HUB BEARING REPLACEMENT

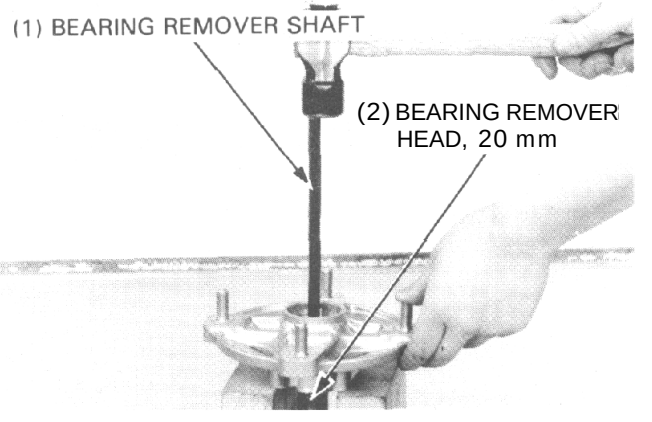
Remove the front brake disc from the hub.
Remove the hub collar and dust seals.



Remove the hub bearings, and distance collar.

TOOLS:

Bearing remover shaft	**07746–0050100** or equivalent commercially available in U.S.A.
Remover head, 20 mm (After **'87:** use inside bearing only)	**07746–0050600** or equivalent commercially available in U.S.A.

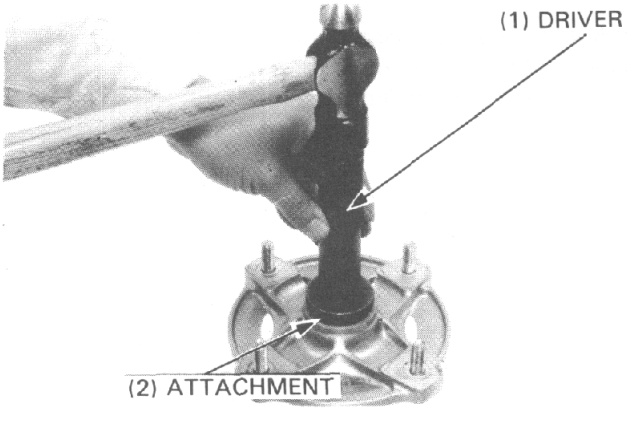


Drive a new outside bearing (After '87: inside bearing) into the wheel hub.
Install the distance collar.
Drive a new inside bearing (After '87: outside bearing) into the wheel hub.

TOOLS:

Driver	**07749–0010000**
Attachment, **42** x **47** mm	**07746–0010300**
Pilot, **20** mm	**07746–0040500**
Attachment, **32** x **35** mm (After '87:)	07746–0010100
Pilot, **15** mm (After **'87:**)	**07746–0040300**

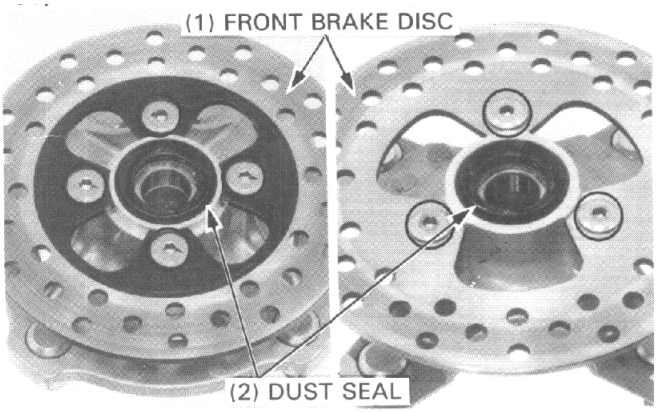
After '87: for inside bearing



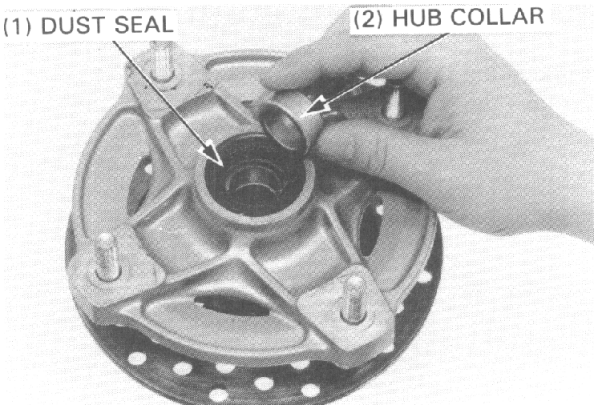
Apply grease to the dust seal lips and install the inside seal. Install the front brake disc onto the hub and tighten the socket bolts.

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

'86, '87: After **'87:**



Apply grease to the dust seal lips and install the outside seal. Install the hub collar onto the hub.

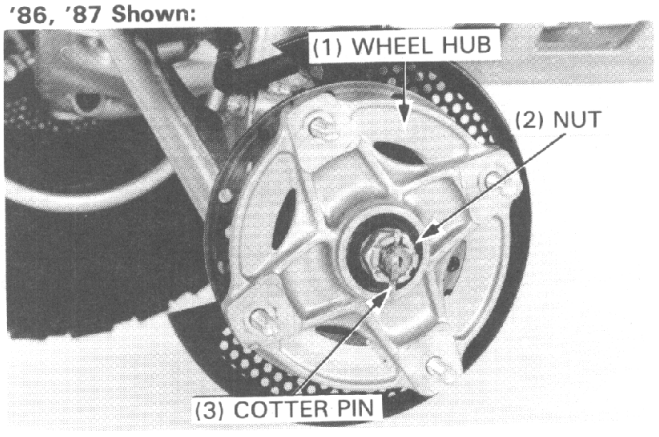


Install the wheel hub, hub nut and tighten the hub nut.

TORQUE:
'86, '87: 80—120 N·m (8.0—12.0kg-m, 58—72 ft-lbl
After **'87: 60—80 N·m (6.0—8.0kg-m, 43—58** ft-lbl

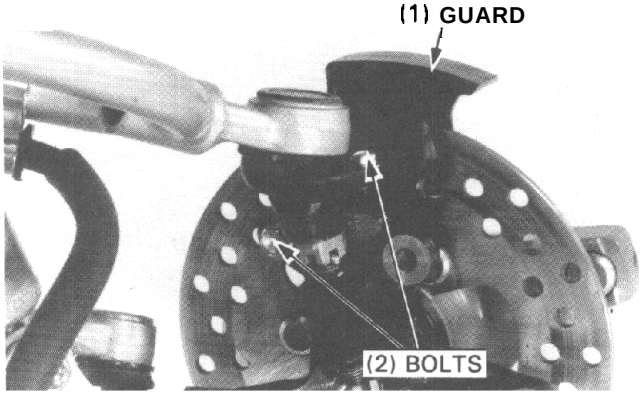
Install a new cotter pin.

'86, '87 Shown:

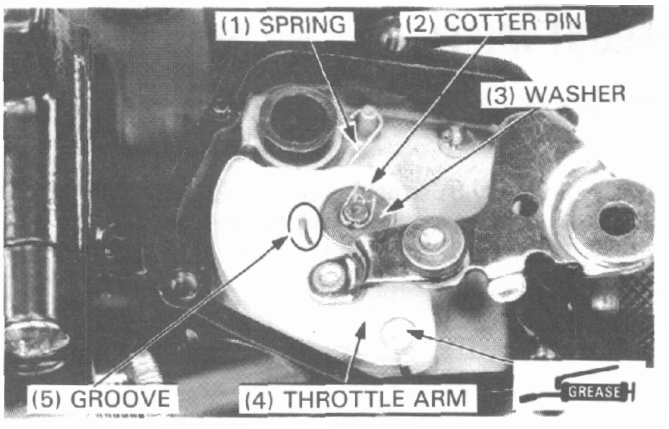


After '87: Install the brake disc guard.
Install the front caliper (page 13-6).
Install the front wheel (page 10-8).

After **'87** shown:



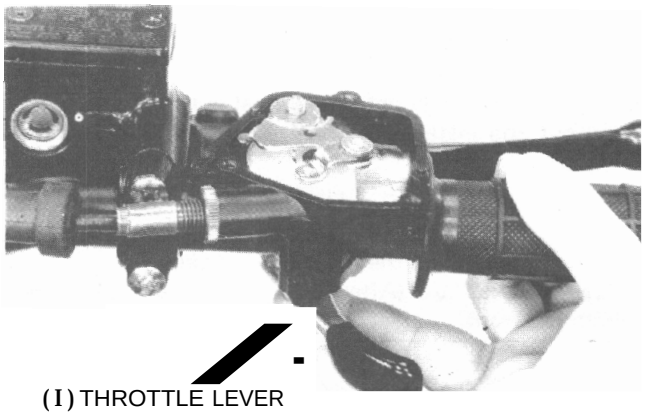
Remove the cotter pin and washer.
Unhook the spring from the throttle housing.
Disconnect the throttle cable from the throttle arm and remove the throttle arm.



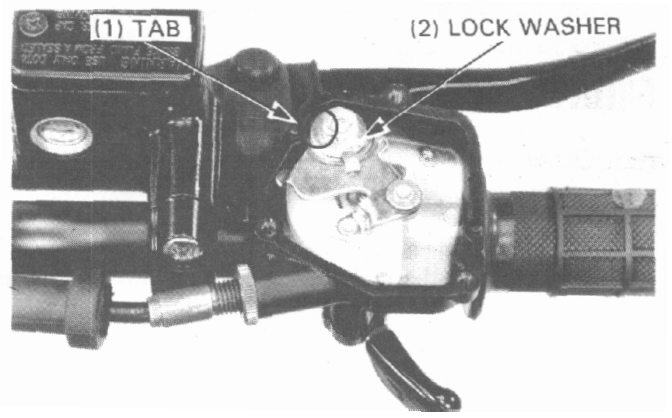
ASSEMBLY

Apply grease to the throttle cable end.
Connect the throttle cable to the throttle arm.
Hook the spring end to the groove in the throttle arm.
Install the throttle arm and hook the spring end as shown.
Install the washer and new cotter pin.

Coat the throttle lever with grease and install the lever into the throttle housing.
Install the throttle lever to the throttle arm by aligning their flats.

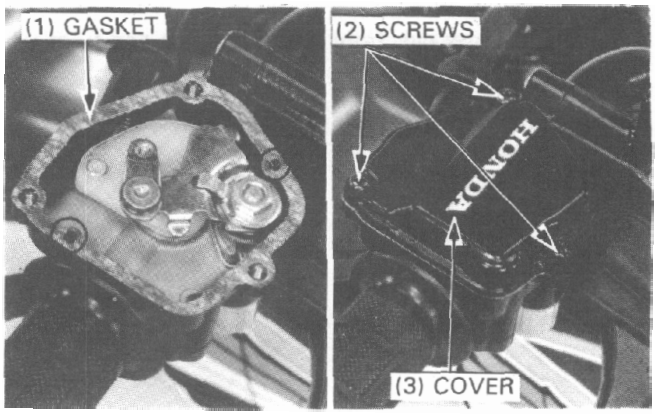


Install a new lock washer and tighten the nut securely.
Bend up the lock washer tab against the nut.



Install a new gasket on the housing, and install the throttle housing cover aligning the holes in the cover with the dowel pins on the housing.

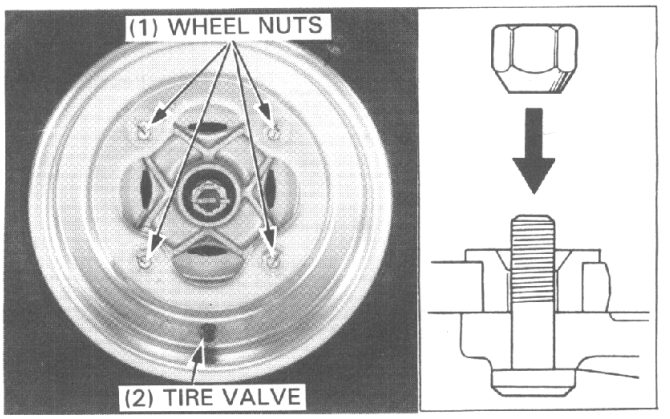
Check the throttle cable free play and adjust if necessary (page 2-4).



FRONT WHEEL

REMOVAL

Loosen the wheel nuts.
Raise the front wheels off the ground by jacking up the frame or placing a support block under the engine.
Remove the wheel nuts and the front wheel from the wheel hub.



INSTALLATION

Install the front wheel onto the wheel hub with the tire valve facing out and install the wheel 'nuts with the tapered side facing in.

NOTE

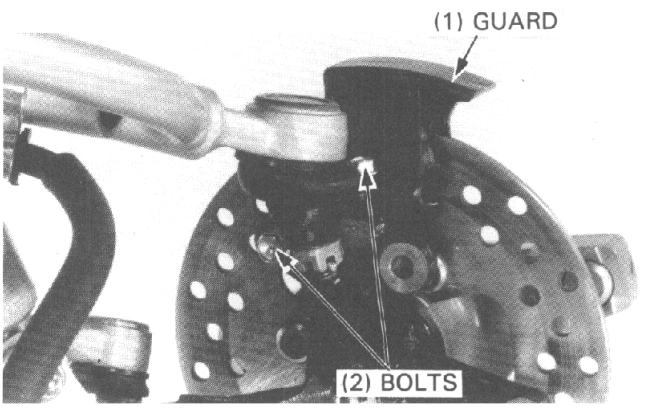
- Do not interchange the right and left tires.
- Tires show a ''V'' (After '87 "A")pattern when viewed from the front.

Lower the front wheels on the ground and tighten the wheel nuts.

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

After '87 Shown:

After *'87* Shown:



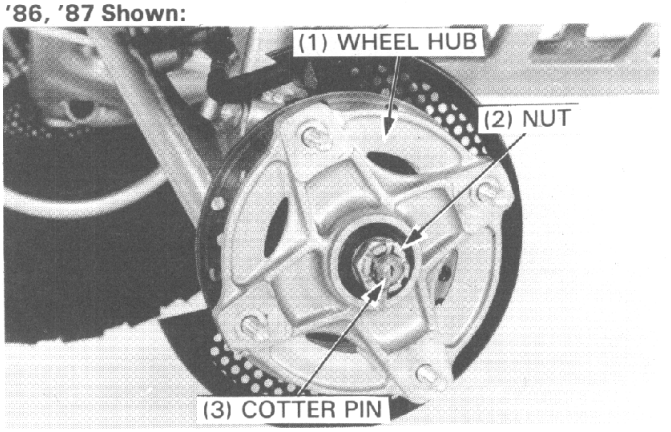
FRONT WHEEL HUB

REMOVAL

Remove the front wheel.
Remove the front caliper (page 13-5).
After '87: Remove the brake disc guard mounting bolts and guard.

Remove the cotter pin, front wheel hub nut and front wheel hub.

'86, '87 Shown:



FRONT TIRE

TIRE REMOVAL (U.S.A. ONLY)

NOTE

- This service requires the Universal Bead Breaker (GN—AH—958—BE1) available in U.S.A. only.

Remove the core from the valve stem.

CAUTION

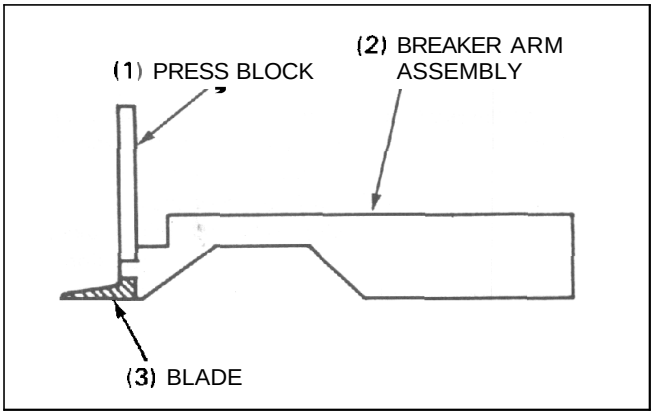
- *Use of the Bead Breaker tool is required for tire removal.*
- *Do not damage the bead seating area of the rim.*
- *Use a Coats 220 Tire Changer or equivalent to remove the tire from the rim. If a tire changer is not available, rim protectors and tire irons may be used.*

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.*

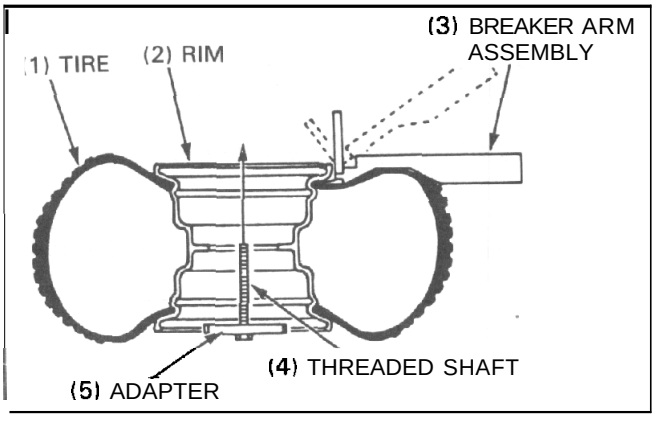


Place the proper size adapter onto the threaded shaft and then put the wheel over the threaded shaft and adapter.

Apply water to the bead area, pressing down on the tire sidewall/bead area in several places, to allow the water to run into and around the bead. Also apply water to 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 positon with its press block in contact with the rim.

NOTE

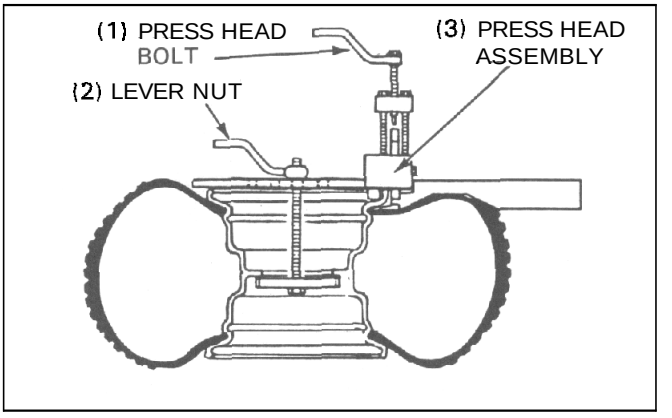
- It may be necessary to tap the breaker arm with a brass hammer to install it the last 3 mm.
  While doing so, be sure to hold the arm down in the horizontal position.

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 it 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.

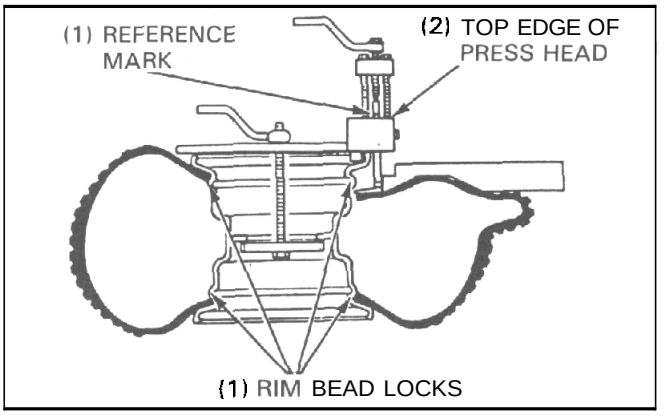
NOTE

- 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.

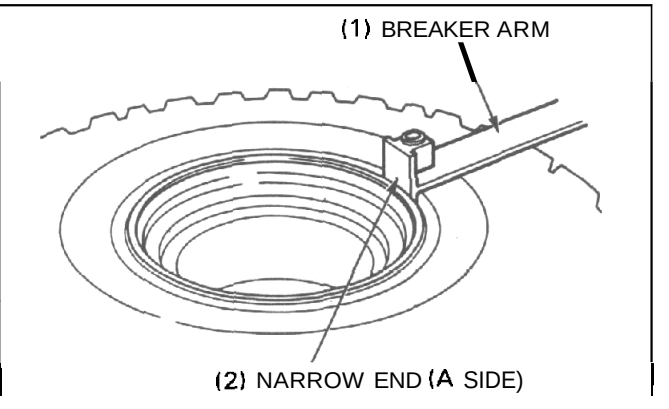
TIRE REMOVAL (EXCEPT U.S.A.)

NOTE

- This service requires the Tire Bead Breaker Set (07772–0050001) not available in U.S.A.

CAUTION

- ***Do not apply water, soapy water, oil etc. to the tire, rim and tool when removing the tire. The tool breaker arm may slip off the tire.***
- ***Do not damage the bead seating area of the rim.***
- ***Follow the bead breaker manufacturer's instructions***

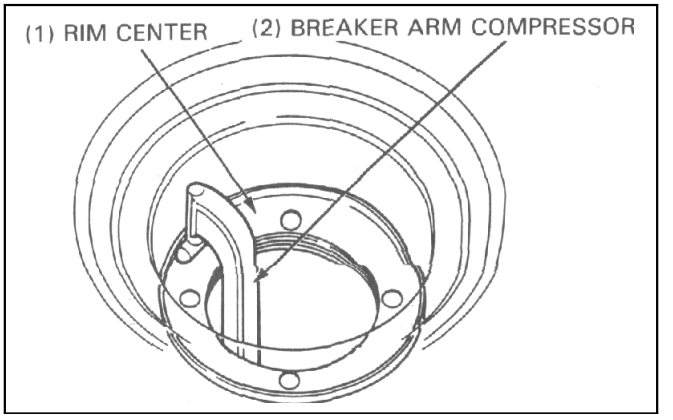


Insert the narrow end (A side) of the breaker arm between the tire and the rim.

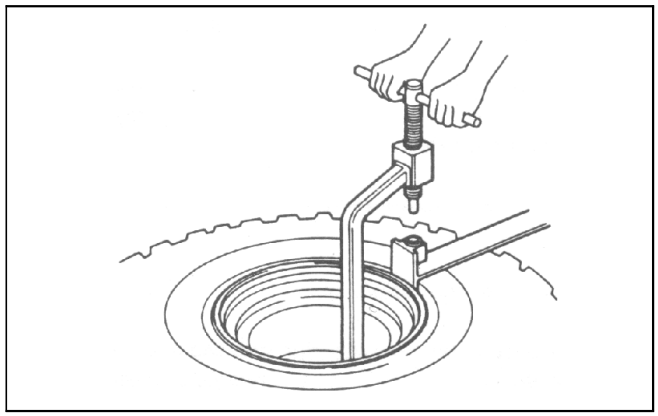
Position the breaker arm compressor onto the rim center as shown.

TOOLS:

Tire bead breaker set	07772–0050001 Not available in U.S.A.
– Breaker arm	07772–0050200
– Breaker arm compressor	07772–0050101

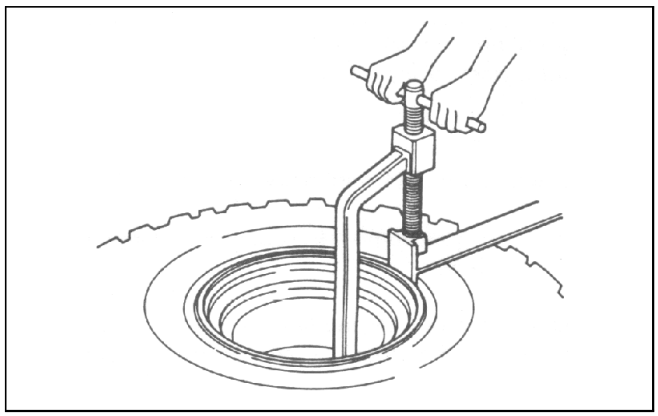


Keep the breaker arm horizontal and align the end of the compressor bolt with the arm hole.

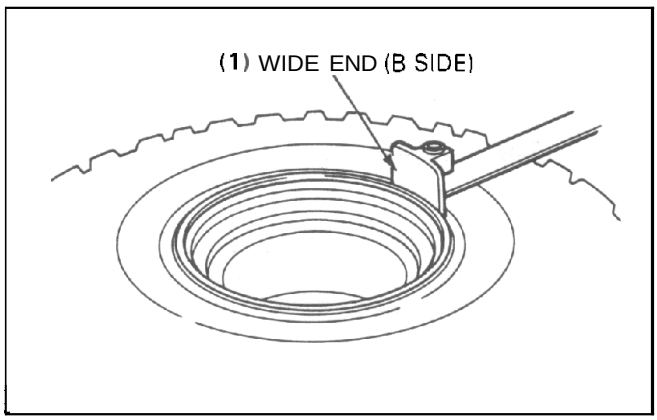


Screw in the breaker arm compressor bolt to break the bead from the tire.

If the rest of the bead cannot be pushed down into the center of the rim, remove and reposition the compressor and arm 1/8 to 1/4 the circumference of the rim. Tighten the compressor bolt to break the bead. Repeat this procedure as necessary until the remainder of the bead can be pushed down into the center of the rim.



If the bead breaking is difficult with the narrow end (A side) of the breaker arm, use the wide end (B side) of the arm and reoeat the orocedure above.



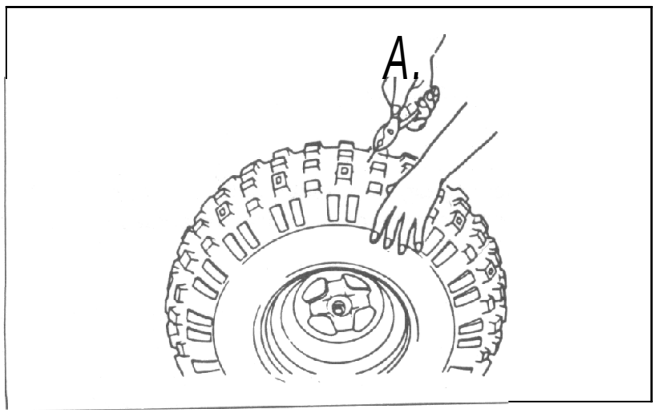
TIRE **REPAIR**

NOTE

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

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

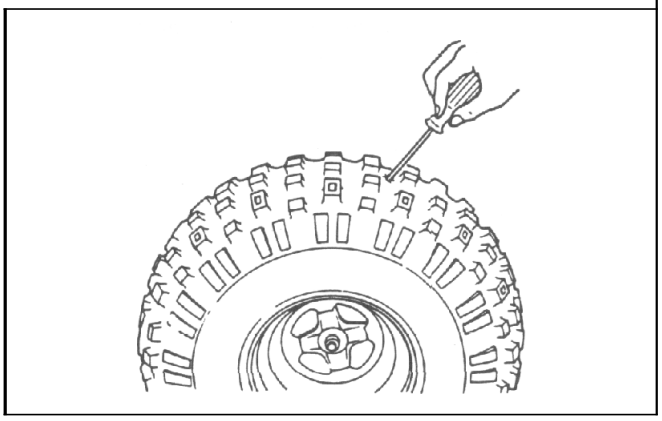
Inspect and measure the injury. Tire repairs for injuries larger than 15 mm (5/8 in) should be a section repair.
Section repairs should be done by a professional tire repair **shop.**



If the injury is smaller than 15 mm (5/8 in), proceed with the repair as described here.

Install a rubber plug into the injury as follows:

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.



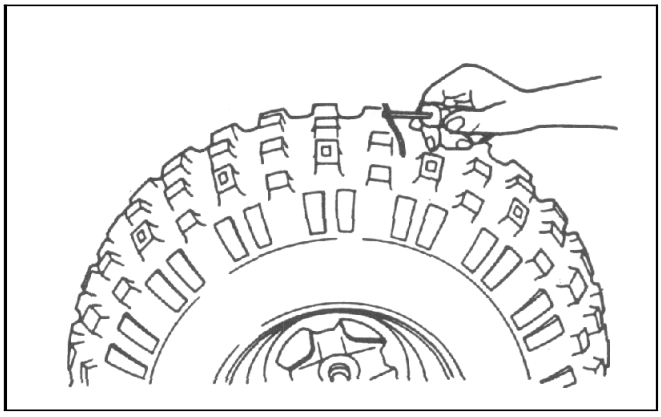
Insert and center a rubber plug through the eye of the inserting needle.

Apply cement to the rubber plug.

Push the inserting needle with plug into the injury until the plug 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.

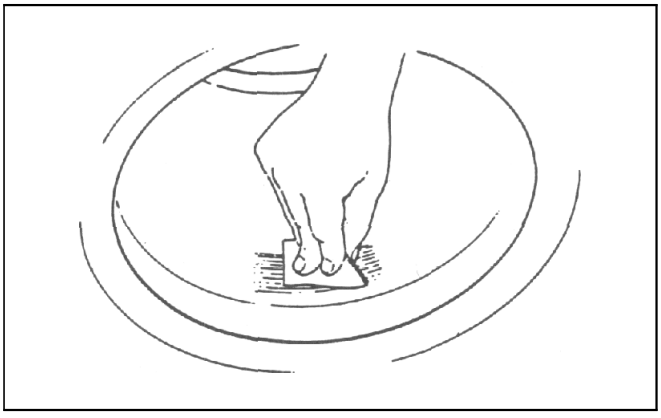


Trim the plug to 6 mm (1/4 in) above the tire surface.

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 10-10) and apply a cold patch to the inside of the tire as described.

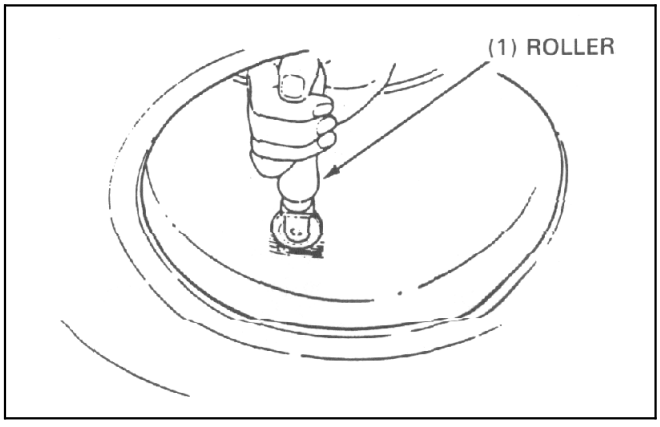


If a plug has been inserted, trim it even with the inner tire surface.

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.

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

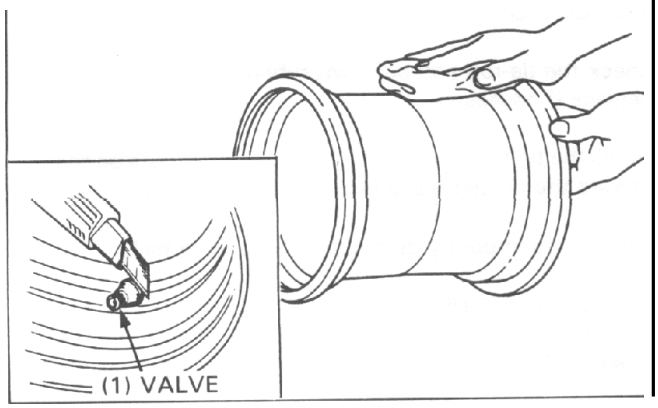


NOTE

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

TIRE ASSEMBLY

After removing the tire from the rim, cut the valve off at the bottom, being careful not to damage the rim.



NOTE

- Be sure to replace the valve with a new one whenever the tire is removed from the rim.

Install a new valve into the valve hole in the rim.
Clean the rim bead seat and flanges.
Apply clean water to the rim flanges, bead seat and base.
Install the tire on the rim.

WARNING

- ***Use only water as a lubricant when 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.***

Install the tire to seat the tire bead.

CAUTION

- ***Do not inflate the tire with mare than 36 psi (2.5 kg/cm², 250 kPa) for the front tire and 35 psi (2.4 kg/cm², 240 kPa) for the rear tire.***

If the tire does not seat on the rim with 36 psi (2.5 kg/cm², 250 kPa) of air prressure for the front tire and 35 psi (2.4 kg/cm², 240 kPa) of air pressure for the rear tire, release the air from the tire and apply water to the tire bead and bead seating surface of the rim.
Inflate the tire with air again, or as is required to properly seat the tire bead.
Deflate the tire. Wait 1 hour, install the valve core in the valve stem and inflate the tire to the specified pressure.

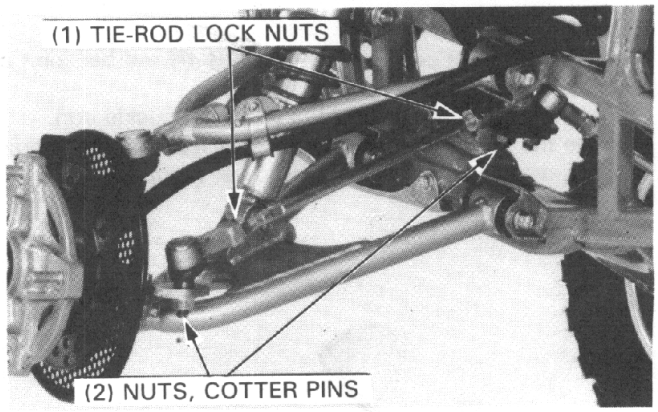
TIRE PRESSURE (STANDARD):
Front: 4.0 psi **(0.275 kg/cm², 27.5 kPa)**
Rear: **'86, '87:** 2.9 **psi (0.2 kg/cm², 20 kPa)**
After **'87: 3.3 psi (0.225 kg/cm², 22.5 kPa)**

Check for air leaks and install the valve cap.

TIE-ROD

REMOVAL

Remove the front wheel (page 10-8).
Loosen the tie-rod lock nuts.
Remove the cotter pins and nuts from both ends of the tie-rod.
Remove the tie-rod from the steering shaft and the knuckle.
Remove the tie-rod ball joints from the tie-rod.



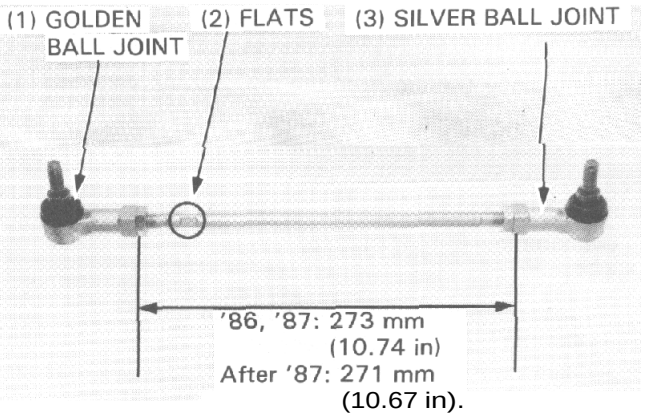
INSPECTION/ASSEMBLY

Check the tie-rod and ball joint rubber for damage.
Replace if necessary.

Install the tie-rod into the ball joints with the flats on the tie-rod toward the golden ball joint.

Set to the temporary distance between the ball joints.

STANDARD SETTINGS:
'86, '87: 273 mm (10.74 in)
After **'87: 271 mm (10.67 in)**



INSTALLATION/ADJUSTMENT

Install the tie-rod with the silver ball joint toward the steering shaft, and the golden ball joint toward the knuckle.
Install and tighten the nuts.

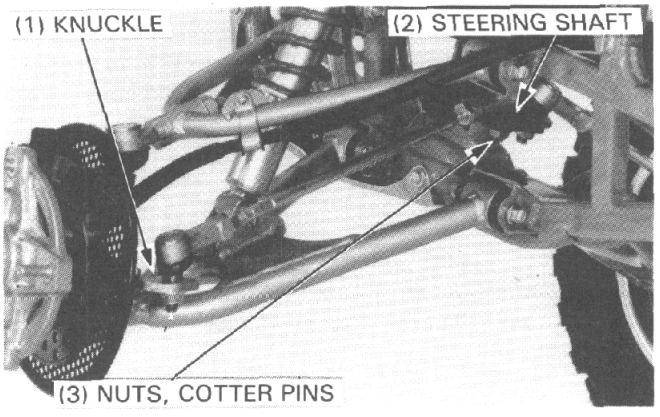
TORQUE: 40—50 N·m (4.0—5.0 kg-m, 29—36 ft-lb)

Secure the nuts with new cotter pins.

Install the front wheel (page 10-8)

Adjust the toe-in (page 2-16).

Make sure the ball joints operate properly by rotating the tie-rods.

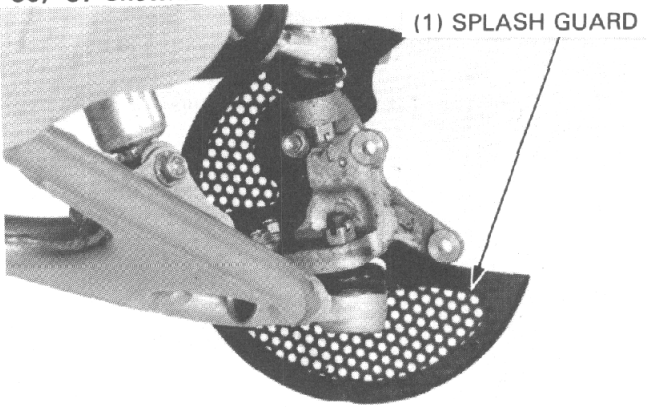


KNUCKLE

REMOVAL

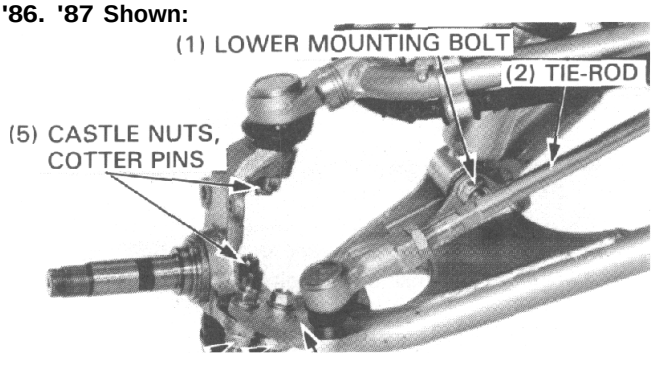
Remove the fornt wheel (page 10-8).
Remove the front wheel hub (page 10-8).
'86, '87: Remove the splash guard.

'86, '87 Shown:



'86. '87:
Remove the cotter pin and nut from the tie-rod ball joint and remove the tie-rod from the knuckle arm.
Remove the cotter pins and nuts and the knuckle arm.
Remove the cotter pins and castle nuts from the front arms.
Remove the front shock absorber lower mounting bolt.

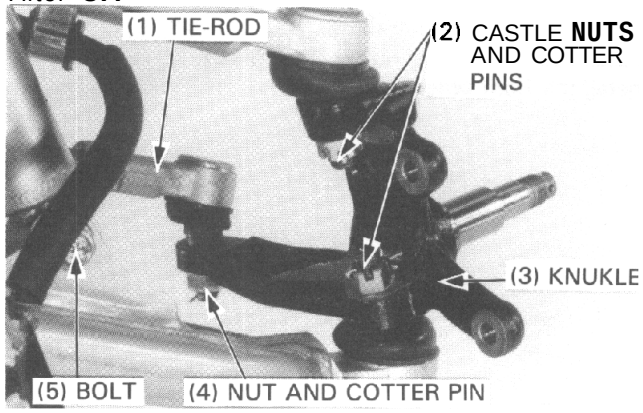
'86. '87 Shown:



141 NUTS, COTTEP **PINS** (3) **KNUCKLE ARM**

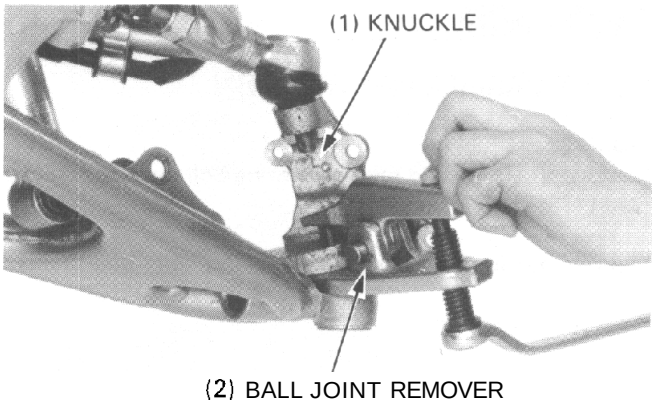
After **'87:**
Remove the cotter pin and nut from the tie-rod ball joint and remove the tie-rod from the knuckle.
Remove the cotter pins and castle nuts from the front arms.
Remove the front shock absorber lower mounting bolt.

After **'87:**



Break loose the upper and lower front arm ball joints using the ball joint remover, then lift upper and lower front arms out of the knuckle.

TOOL:
Ball joint remover **07941—6920003**



Remove the knuckle.

INSPECTION

Inspect the knuckle for damage or cracks.

INSTALLATION

NOTE

- The left knuckle and arm have "L" marks and the right knuckle and arm have "R" marks.
  Install each parts properly.

Install the upper and lower front arms onto the knuckle.
Install the castle nuts and tighten them.

TORQUE: 50—60 N·m (5.0—6.0 kg-m. **36—43** ft-lbl

Install new cotter pins.
Install the front shock absorber lower mounting bolt and tighten it.

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

'86, '87: Install the knuckle arm onto the knuckle.
Install the bolts and nuts and tighten the nuts.

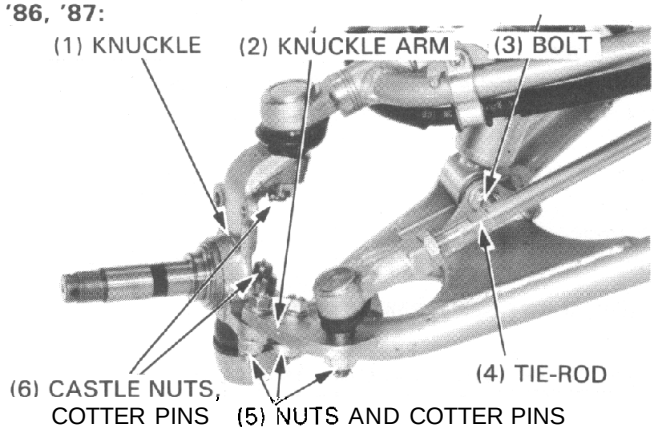
TORQUE: 60—70 N·m (6.0—7.0 kg-rn. **43—51** ft-lb)

install new cotter pins.
Install the tie-rod ball joint onto the knuckle.
Install the nut and tighten it.

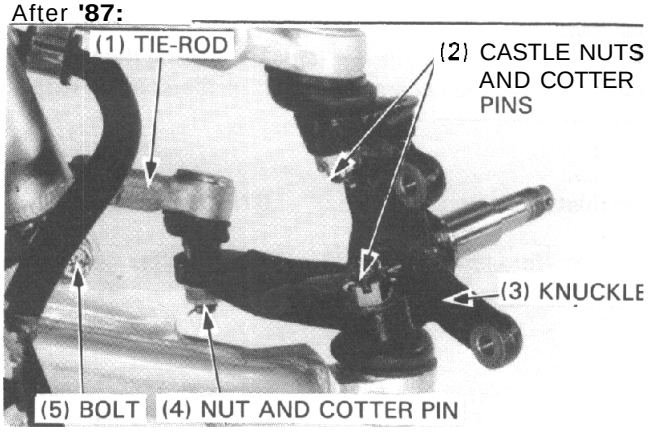
TORQUE: 40—50 N·m (4.0—5.0 kg-m, **29—36** ft-lbl

Install a new cotter pin.

'86, '87:

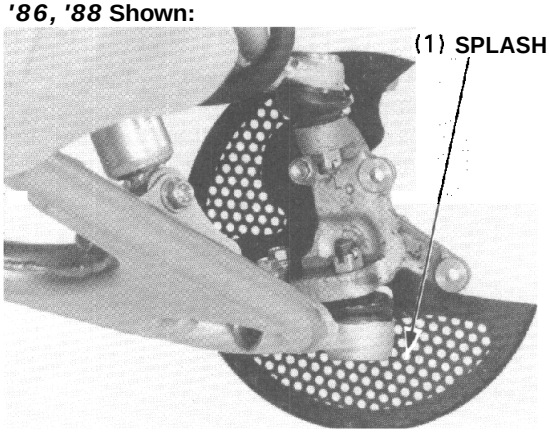


After **'87:**



'86, '87: Install the splash guard.
Install the front wheel hub (page 10-10).
Install the front wheel (page 10-8).

'86, '88 Shown:



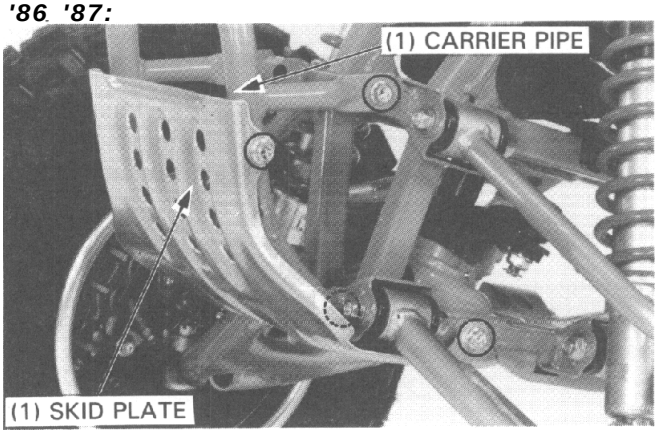
FRONT ARM

FRONT CARRIER PIPE REMOVAL

'86, '87:
Remove the front skid plate mounting bolts and the front skid plate.

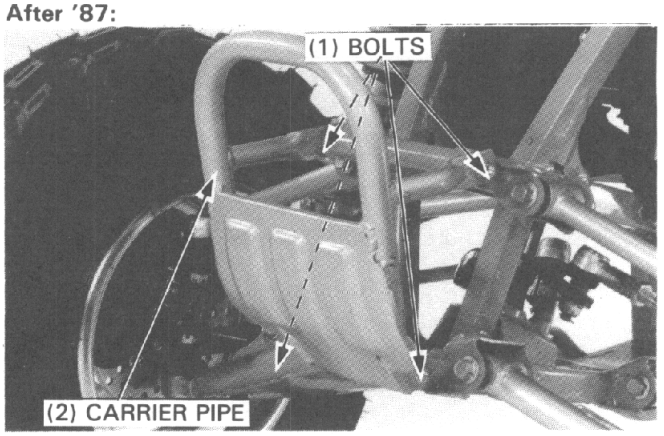
Remove the front carrier pipe mounting bolts and the carrier pipe.

'86, '87:



After *'87:*
Remove the bolts and skid plate/carrier pipe.

After '87:



UPPER FRONT ARM REMOVAL

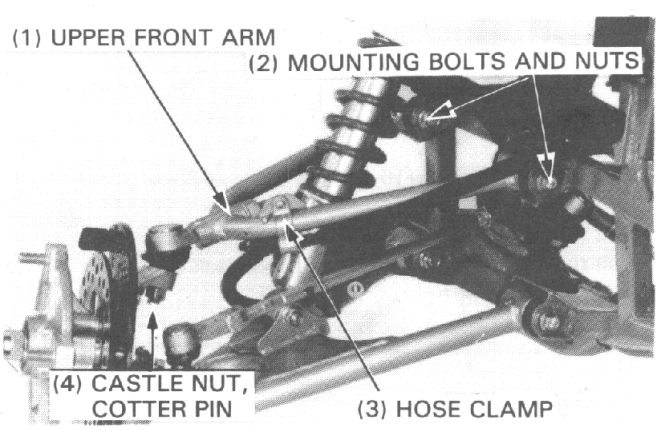
Remove the front wheel (page 10-8).
Remove front caliper (page 13-5).
Remove the hose clamp from the upper front arm.
Remove the cotter pin and castle nut from the upper front arm ball joint.
Break the upper front arm ball joint loose using the ball joint remover, then lift upper front arm out of the knuckle (page 10-171.

TOOL:
Ball joint **remover** 07941—6920003

Remove the upper front arm mounting bolts, nuts and the upper front arm.

CAUTION

- *(After '87 only): Never reinstall old nuts; once the nuts have been removed, ihey must be replaced with new ones.*



LOWER FRONT ARM REMOVAL

Remove the front wheel (page 10-8).
Remove the front caliper (page 13-5).
Remove the cotter pin and castle nut from the lower front arm ball joint.
Remove the front shock absorber lower mounting bolt.
Break the lower front arm ball joint loose using the ball joint remover, then lift lower front arm out of the knuckle (page 10-17).

TOOL:
Ball joint remover **07941—6920003**

Remove the lower front arm mounting bolts, nuts and the lower front arm.

CAUTION

- ***(After '87 only): Never reinstall old nuts; once the nuts have been removed. rhev must be replaced with new ones.***

INSPECTION

Check the upper front arm for damage or cracks.
Check that the upper front arm ball joint operates properly.
After '87: Replace the upper front arm assembly if necessary.

'86, '87:
If the ball joint does not operate properly, it must be replaced.
Remove the ball joint nut, then remove the camber set collars and ball joint from the arm.
Install a new ball joint and the camber set collars.
Install and tighten the ball joint nut.

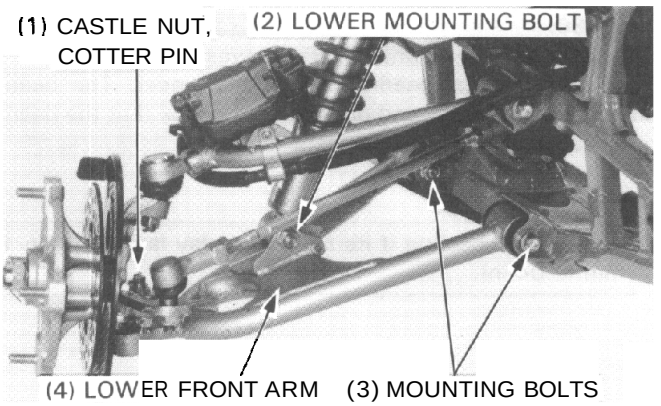
TORQUE: 60—80 N·m (6.0—8.0 kg-m, 43—58 ft-lbl

NOTE

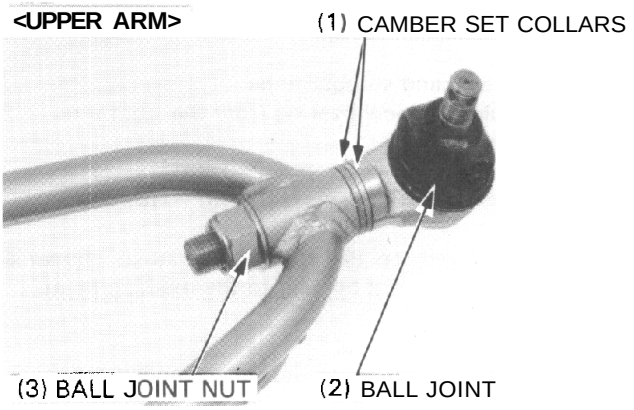
- Be sure to install the two camber set collars in each side.

Check the lower front arm for damage or cracks.
Check that the lower front arm ball joint operates properly.
If the ball joint does not operate properly, the lower front arm assembly must be replaced.

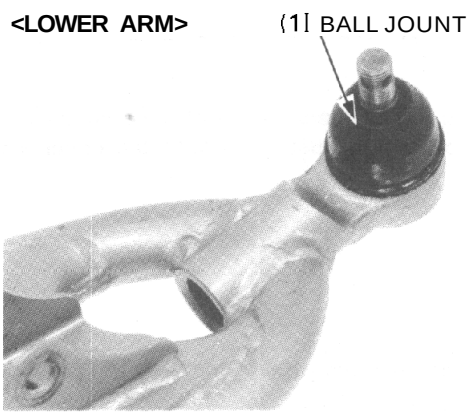
'86:
Check the front arm pivot collars and bushings for wear or damage.
Check the dust seals for wear or damage.



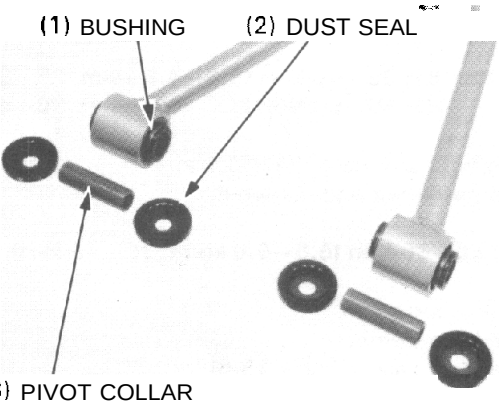
'86, '87 Shown:
<UPPER ARM>



<LOWER ARM>



'86:

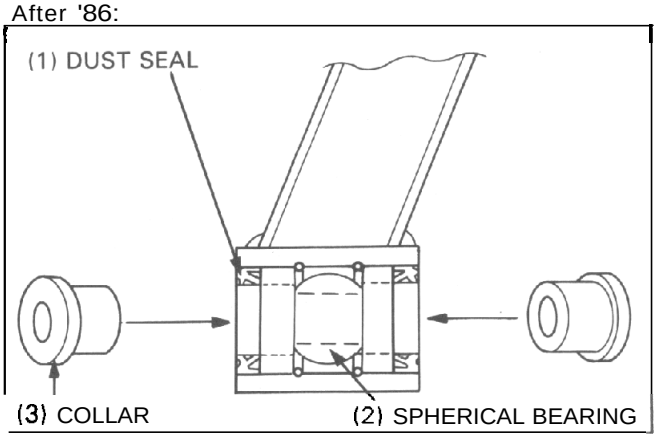


After **'86:**
Check the dust seals and collars for wear or damage.
Turn the spherical bearings with your finger. The bearing should turn smoothly and quietly. Also check that the bearing outer races fit tightly in the front arm.

NOTE

- Replace the bearing if its axial free play is more than 1.0 mm (0.04 in).

After '86:



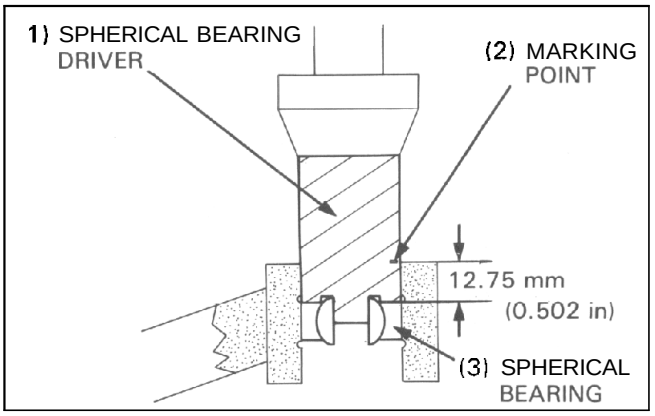
SPHERICAL BEARING REPLACEMENT (After '86:)

Remove dust seals and stopper rings.
Press out the old spherical bearing from the front arm.

TOOL
Spherical bearing driver **07HMF—HC00100**

Mark the special tool on the specified point as shown and press in the new spherical bearing to the marking point.

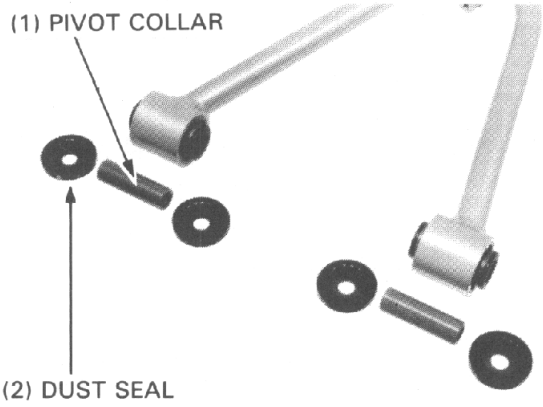
Install the stopper rings.
Apply grease to the bearing and dust seals, and install the dust seals.



UPPER FRONT ARM INSTALLATION

'86:
Apply grease to the pivot collars and lip of the dust seals.
Install the pivot collars and dust seals onto the upper front arm.

'86 Shown:



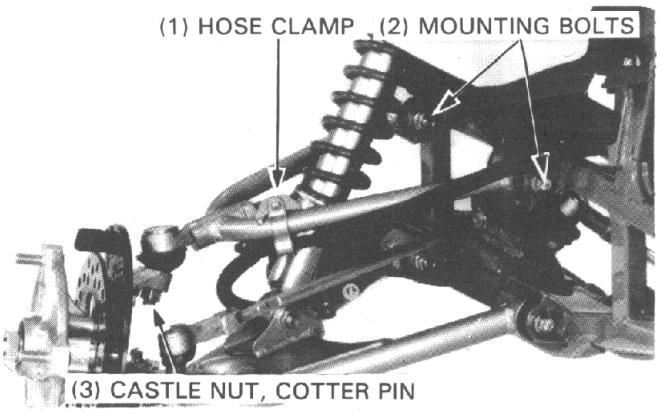
Install the upper front arm onto the frame with the mounting bolts.
Tighten the mounting nuts (After '87: new nuts) to the specified torque.

TORQUE:
'86, After **'87: 35—45 N·m (3.5—4.5** kg-m. **25—33** ft-lb)
'87: **50—60 N·m (5.0—6.0** kg-m. **36—43** ft-lb)

Install the front arm onto the knuckle.
Install the castle nut and tighten it.

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

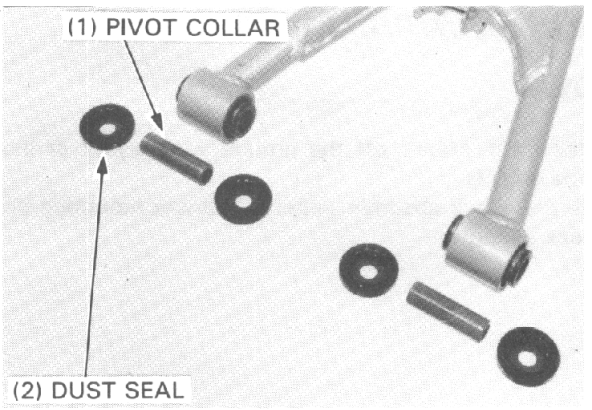
Install a new cotter pin.
Install the hose clamp.
Install the front caliper (page 13-6).
Install the front wheel (page 10-8).



LOWER FRONT ARM INSTALLATION

'86:
Apply grease to the pivot collars and lips of the dust seals.
Install the pivot collars and dust seals onto the lower front arm.

'86 Shown:



Install the lower front arm onto the frame with the mounting bolts.
Tighten the mounting nuts (After '87: new nuts) to the specified torque.

TORQUE:
'86. After '87: 35—45 N·m (3.5—4.5 kg-m. 25—33 ft-lb)
'87: 50—60 N·m (5.0—6.0 kg-m. 36—43 ft-lb)

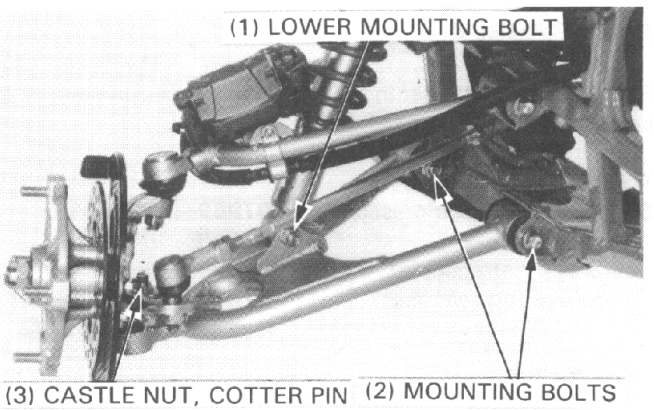
Install the front arm onto the knuckle.
Install the castle nut and tighten it.

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

Install a new cotter pin.
Install the front shock absorber lower mounting bolt and tighten it.

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

Install the front caliper (page 13-6).
Install the front wheel (page 10-8).



FRONT CARRIER INSTALLATION

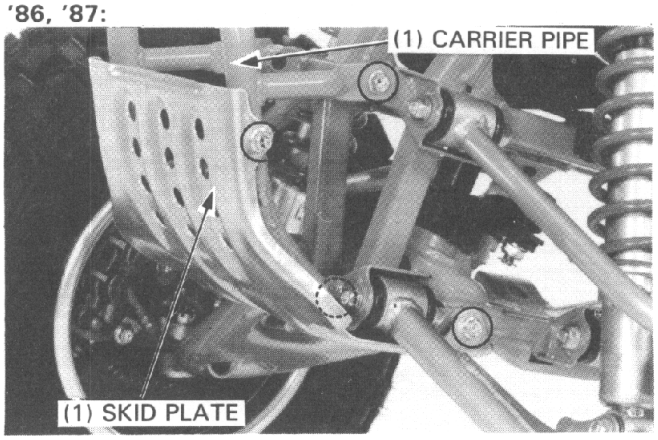
'86, '87:
Install the front carrier pipe onto the frame and the secure it with the mounting bolts.

Install the front skid plate onto the carrier pipe and secure it with the mounting bolts.

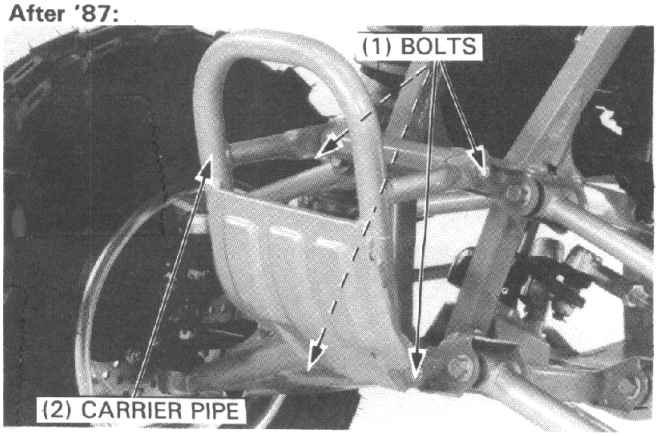
TORQUE ('87 only):
28—34 N·m (2.8—3.4 kg-m, 20—25 ft-lb)

After '87:
Install the carrier pipe.

'86, '87:



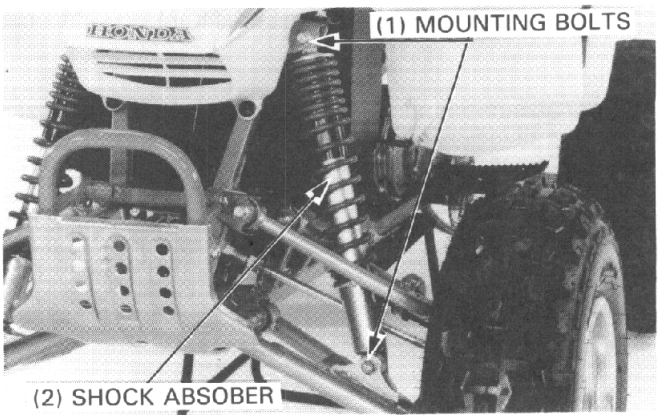
After '87:



FRONT SHOCK ABSORBER

REMOVAL

Raise the front wheels off the ground with a jack or block under the engine.
Remove the shock absorber upper and lower mounting bolts and shock absorber.

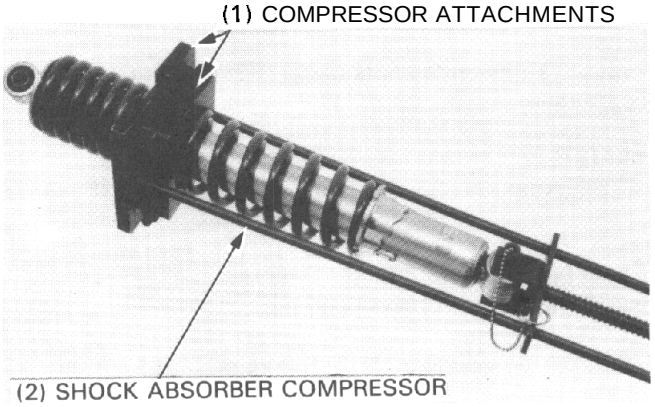


DISASSEMBLY

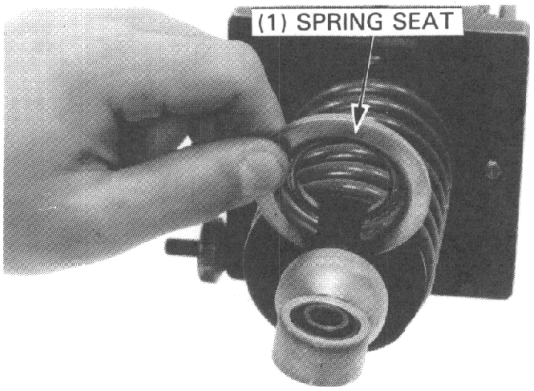
Set the shock absorber in the shock absorber compressor and compress the spring.

TOOLS:

Shock absorber compressor	**07959—3290001** or **07GME—0010000**
Compressor attachment	**07959—MB10000**
Compressor attachment	**07967—KC10100** Not available in U.S.A.

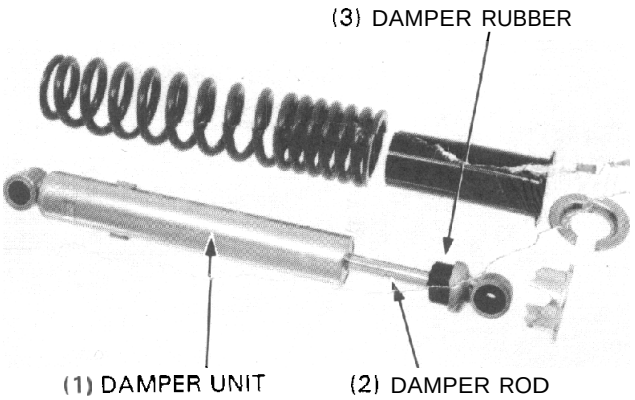


Remove the spring seat.
Disassemble the shock absorber.



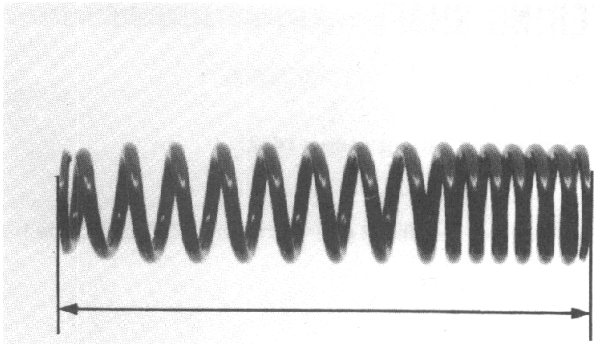
INSPECTION

Check the following:
- damper rod for bends or damage
- damper unit for oil leaks
- damper rubber for damage



Inspect the spring for damage and measure its free length.

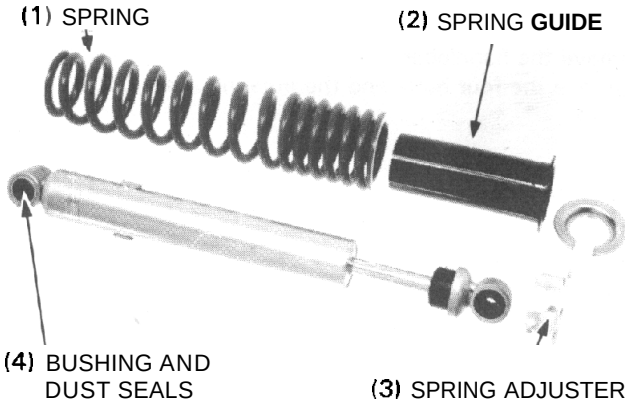
SERVICE LIMIT:
'86, '87: 268 mm (10.6 in).
After **'87: 267** mm **(10.5 in)**



ASSEMBLY

Install the spring adjuster onto the damper.
Install the spring with tightly wound coil facing up.
Install the spring guide.

Apply a paste grease with 40% or more molybdenum disulfide to the lower mount bushing and dust seals (page 2-19).

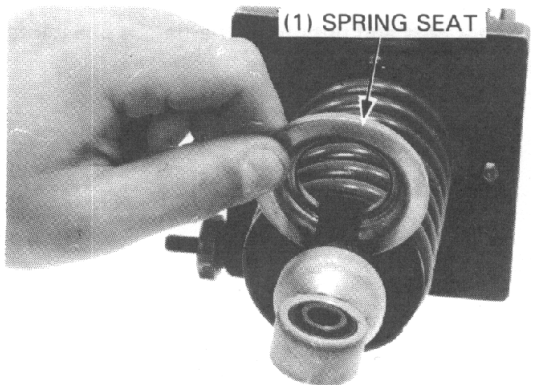


Place the shock absorber into the compressor.

TOOLS:

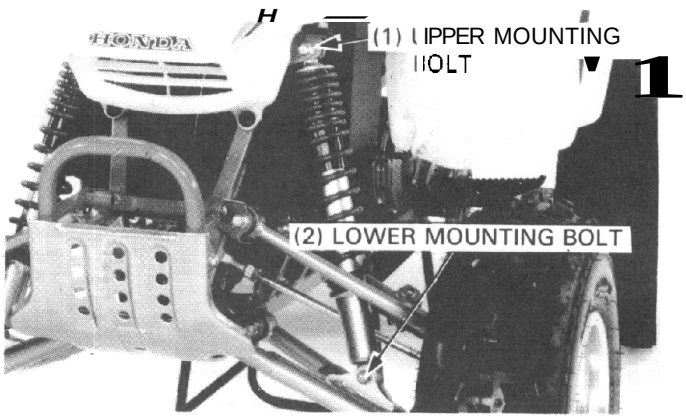
Shock absorber compressor	**07959—3290001** or **07GME—0010000**
Compressor attachment	**07959—MB1**0000
Compressor attachment	**07967—KC10100** Not available in U.S.A.

compress the spring and install the spring seat.



Install the shock absorber and tighten the upper and lower mounting bolts.

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



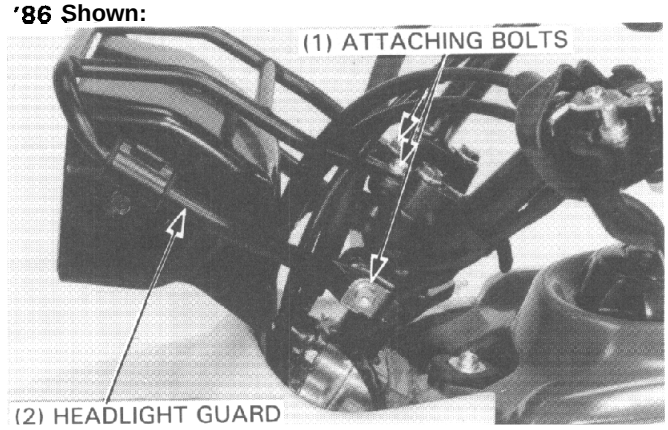
STEERING SHAFT

REMOVAL

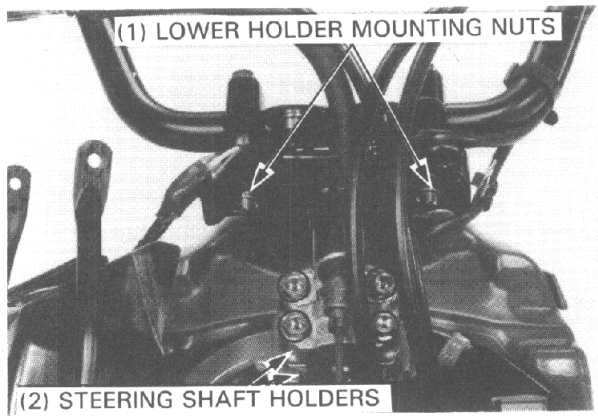
Remove the front fender (page 14-2).

'86, '87:
Remove the four headlight guard attaching bolts and the headlight guard.

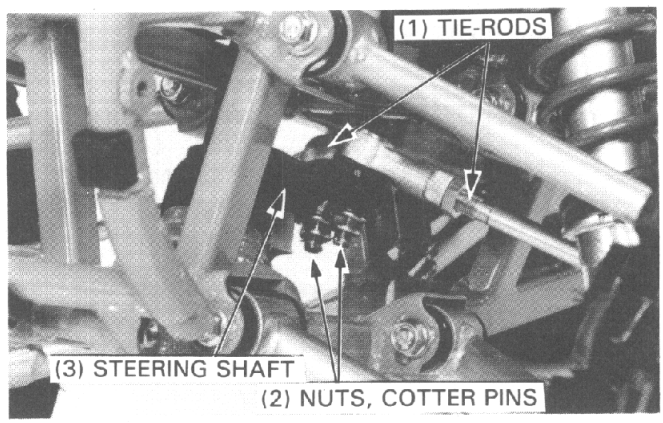
'86 Shown:



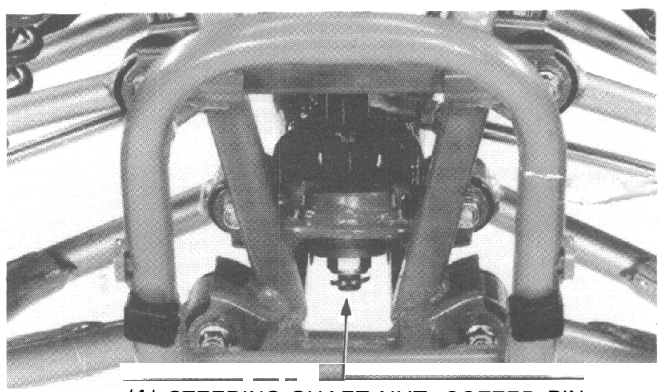
Remove the handlebar lower holder mounting nuts, then remove the handlebar.
Remove the four bolts and the steering shaft holder.



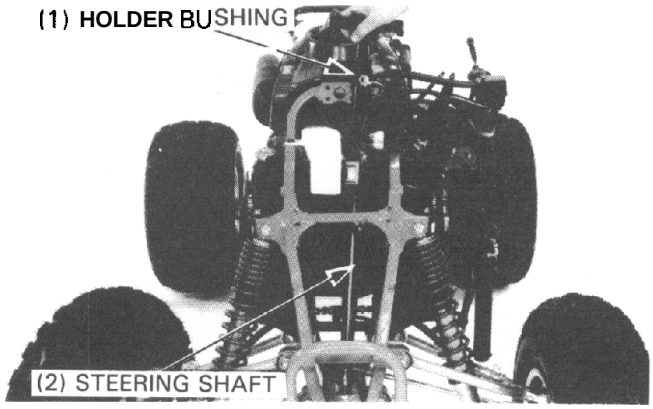
Remove the cotter pins and nuts from the tie-rod ball joints at the steering shaft.
Remove the tie-rods from the steering shaft.



Remove the dust cap from the shaft nut.
Remove the cotter pin and steering shaft nut.

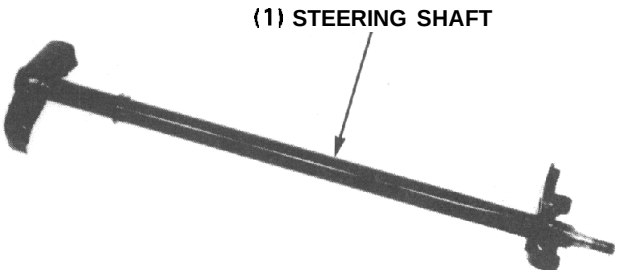


Remove the steering shaft from the frame, then remove the holder bushing from the shaft.

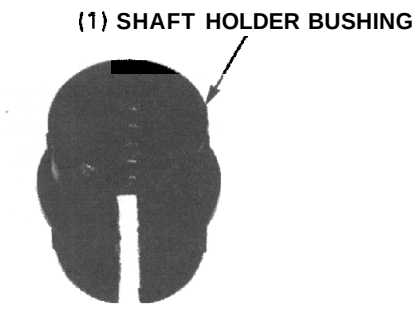


INSPECTION

Check the steering shaft to be sure it is straight. Replace steering shaft if necessary.

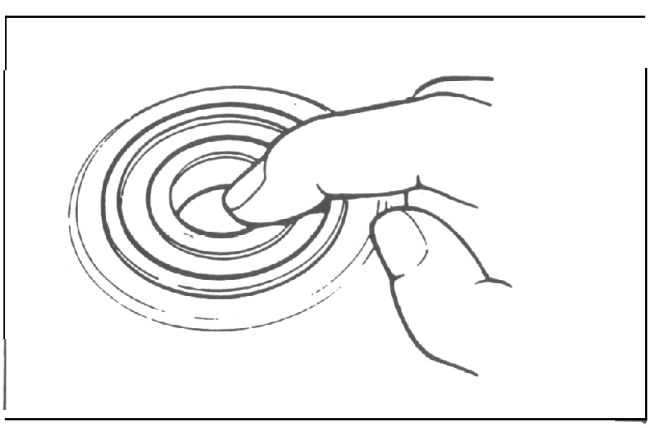


Check the steering shaft holder bushing for deterioration, wear or damage.



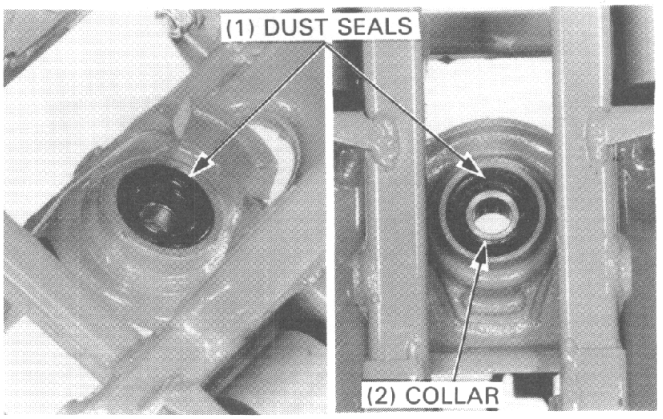
Turn the inner race of the steering shaft bearing with your finger. The bearing should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the frame.

Remove and discard the bearing if the race does not turn smoothly, quietly, or if it fits loosely in the frame.

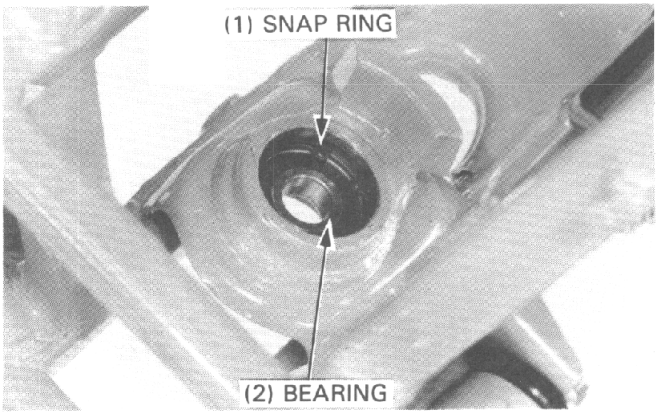


STEERING BEARING REPLACEMENT

Remove the collar from the lower side dust seal and remove the dust seals.



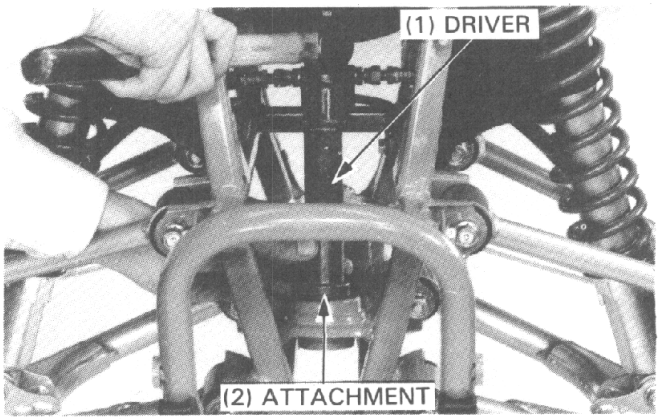
Remove the snap ring and drive the bearing out of the frame.



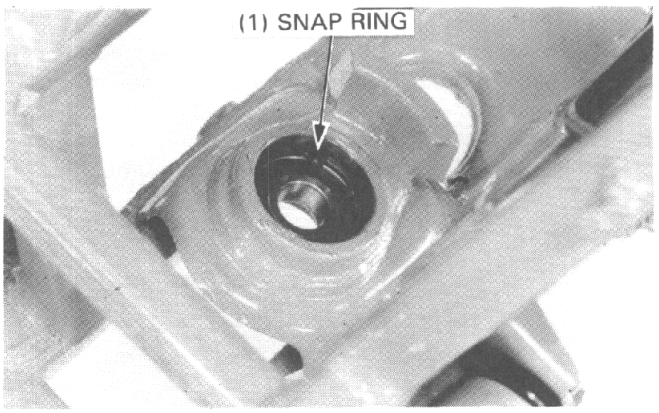
Drive a new bearing into the frame until it is fully seated.

TOOLS:

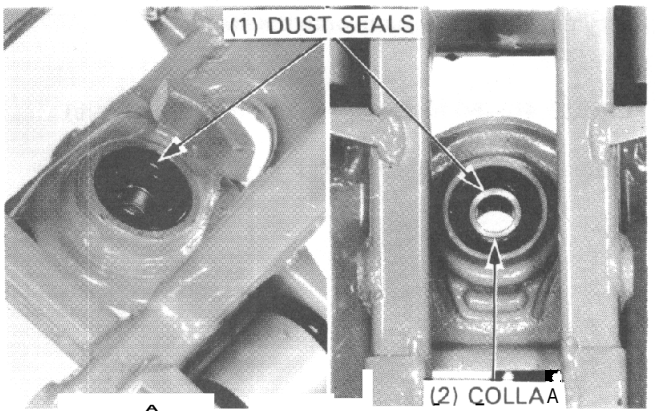
Driver	**07749–0010000**
Anachment, 37 x 40 mm	**07746–0010200**
Pilot, 17 mm	**07746–0040400**



Install the snap ring in the groove of the frame.

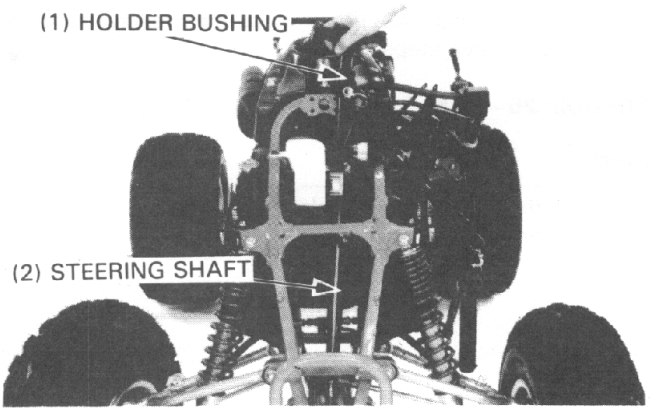


Apply grease to the lips of new dust seals.
Install the dust seals.
Install the collar onto the lower side dust seal.



INSTALLATION

Apply grease to the inside of the steering shaft holder bushing and install the steering shaft holder bushing onto the shaft.
Install the steering shaft into the frame.

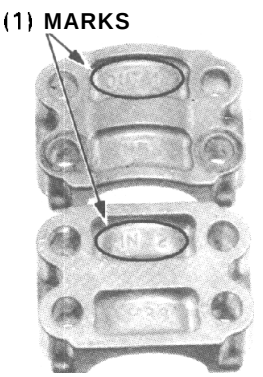


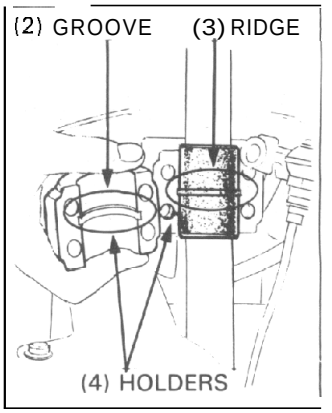
Install the steering shaft holders aligning their grooves with the ridge on the holder bushing.

NOTE

- The inner steering holder has "IN" mark and the outer steering holder has "OUT" mark.

Loosely install the four steering shaft holder bolts.

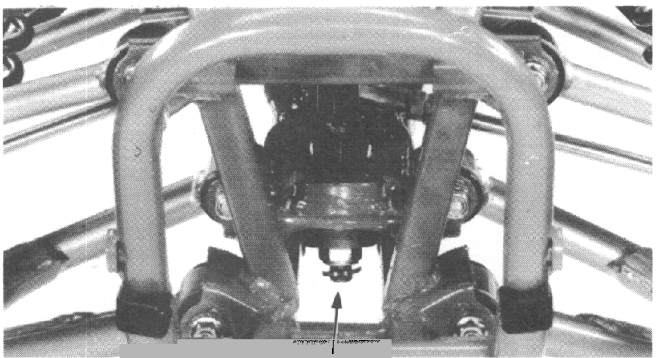




Install the steering shaft nut and tighten it.

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

Install a new cotter pin.
Install the dust cap over the shaft nut.

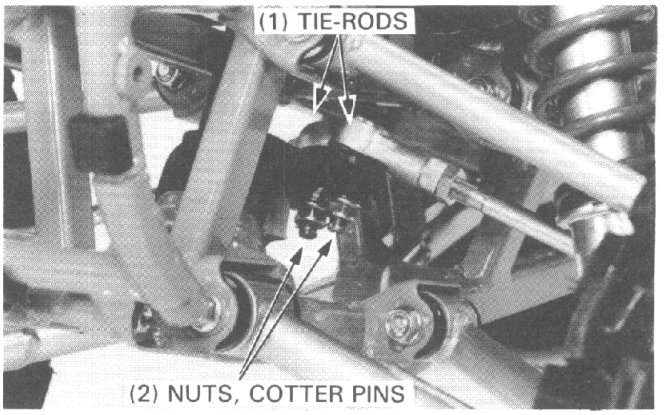


(1) STEERING SHAFT NUT, COTTER PIN

Install the tie-rod ball joints onto the steering shaft and tighten the nuts.

TORQUE: 40—50 N·m 14.0—5.0 kg-m, 29—36 ft-lb)

Secure the **nuts** with new cotter pins.



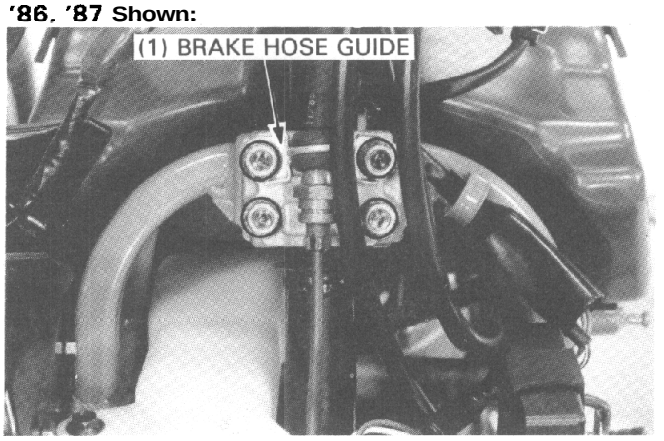
Tighten the steering shaft holder bolts in a crisscross pattern in 2 or 3 progressive steps.

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

NOTE

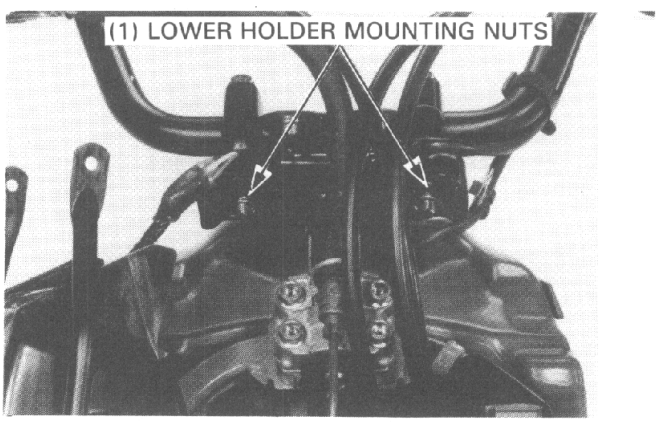
- Install the brake hose guide with two upper (After '87: lower) bolts.

'86, '87 Shown:



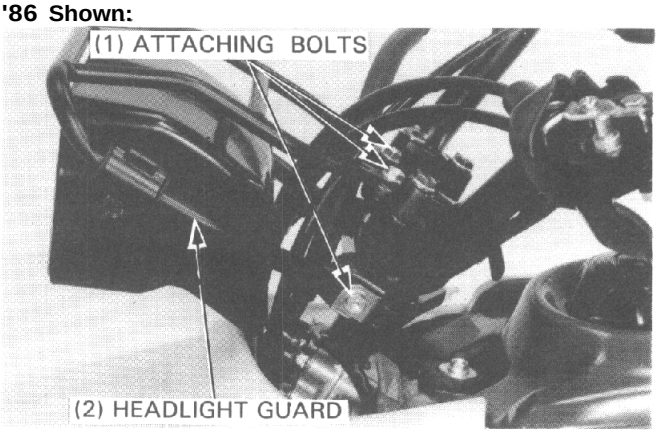
Install the handlebar onto the steering shaft and tighten the mounting nuts.

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

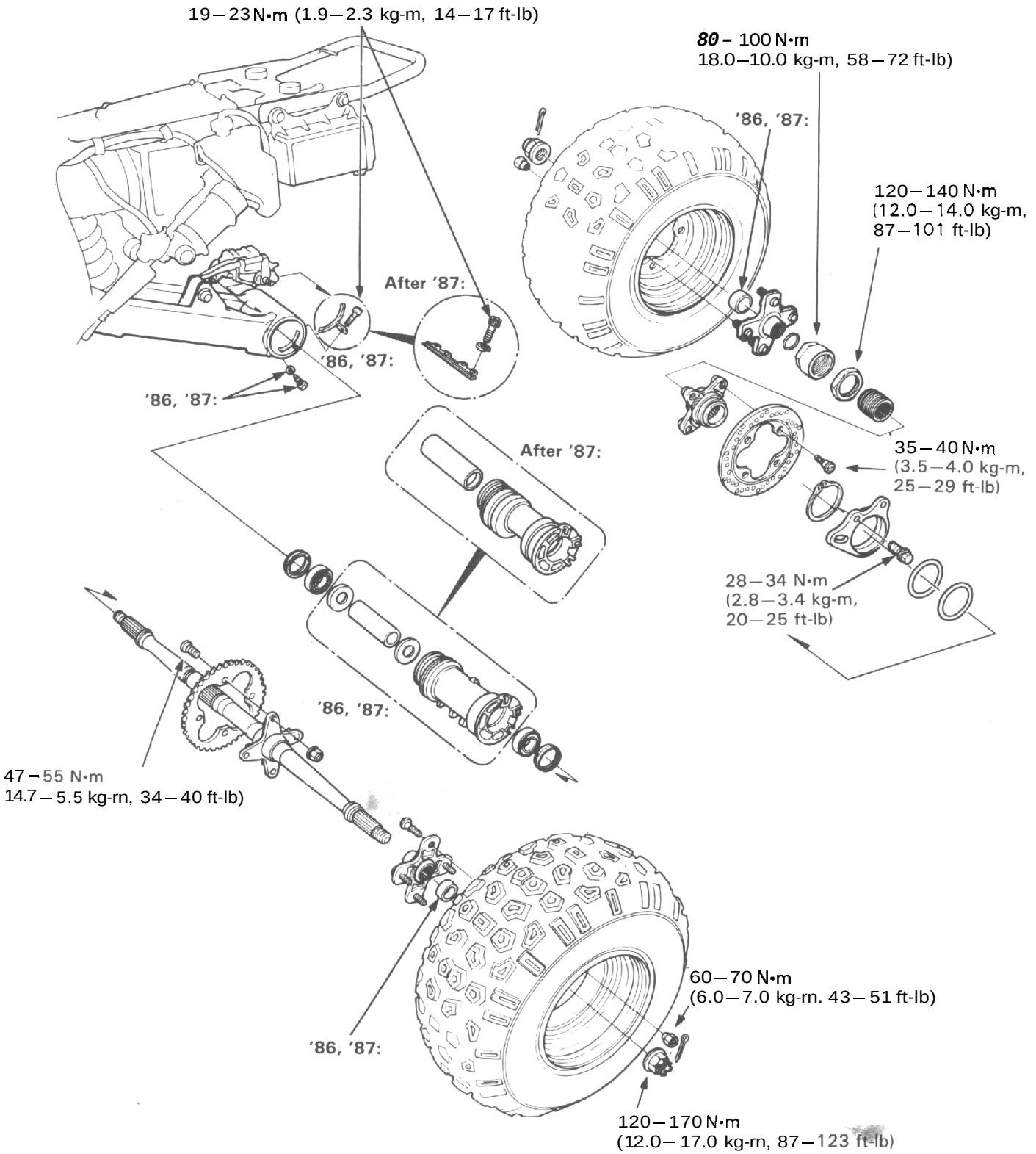


'86, '87: Install the headlight guard and tighten the attaching bolts.
Install the front fender (page 14-2).

'86 Shown:



MEMO


19–23 N•m (1.9–2.3 kg-m, 14–17 ft-lb)
80 – 100 N•m
18.0–10.0 kg-m, 58–72 ft-lb)
'86, '87:
120–140 N•m
(12.0–14.0 kg-m,
87–101 ft-lb)
After '87:
'86, '87:
'86, '87:
After '87:
35–40 N•m
(3.5–4.0 kg-m,
25–29 ft-lb)
28–34 N•m
(2.8–3.4 kg-m,
20–25 ft-lb)
'86, '87:
47 – 55 N•m
14.7 – 5.5 kg-rn, 34–40 ft-lb)
60–70 N•m
(6.0–7.0 kg-rn. 43–51 ft-lb)
'86, '87:
120–170 N•m
(12.0– 17.0 kg-rn, 87–123 ft-lb)

11. REAR WHEEL/DRIVE MECHANISM

SERVICE INFORMATION

GENERAL

- This section covers maintenance of the rear wheel and drive mechanism.
- A jack or block is required to support the FOURTRAX.
- When using the lock nut wrench tool, use a deflecting beam type torque wrench 20 inches long.
  The lock nut wrench increases the torque wrench's leverage, *so* the wrench reading will be less than the torque actually applied.
  The torque scale below gives the actual torque specifications. On the procedural page, both actual and indicated are given.
- For tire removal see page 10-11.
- For tire repair see page 10-13.

SPECIFICATIONS

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Rear axle runout	—	3.0 10.121

Wheel nut	60 – 70N•m (6.0–7.0 kg-m, 43 – 51 ft-lb)
Brake disc socket bolt	35 – 40N•m (3.5–4.0 kg-m, 25 – 29ft-lb)
Rear axle outer lock nut	80 – 100N•m (8.0–10.0 kg-m, 58 – 72ft-lbl Left-hand threads
Rear axle inner lock nut	120 – 140N•m (12.0 – 14.0 kg-m, 87 – 101ft-lb) Left-hand threads
Rear caliper bracket mounting bolt	28 – 34N•m (2.8–3.4 kg-m, 20–25 ft-lb)
Driven sprocket bolt	47 – 55N•m (4.7–5.5 kg-m, 34–40 ft-lb) Apply locking agent to threads
Rear wheel hub nut	120–170N•m (12.0 – 17.0 kg-m, 87 – 123ft-lb) Apply oil or grease to threads
Bearing holder socket bolt	19 – 23N•m (1.9–2.3 kg-m, 14 – 17ft-lb)

TOOLS

Special	
Lock nut wrench, 56 mm	07916 – HA20000 or 07916 – HA2010A (U.S.A. only).
Lock nut wrench, 45 mm	07916 – 1870101 or equivalent commercially available in U.S.A.
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 axle bearings.
- Faulty axle bearing holder.
- Faulty tire.
- Loose axle.
- Worn or damaged swingarm 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.

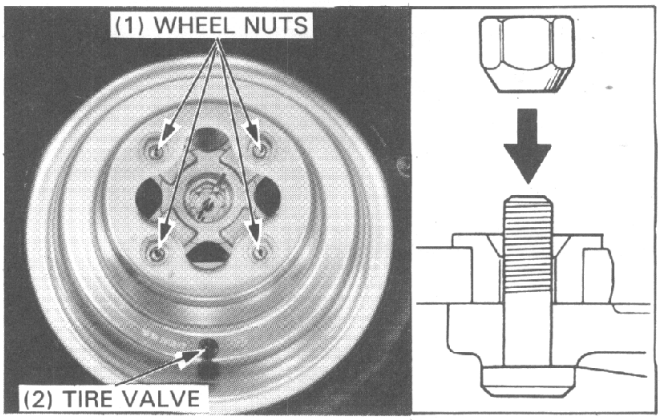
DISASSEMBLY

For tire disassembly, assembly and repair, refer to pages 10-10 to 10-14.

INSTALLATION

Install both rear wheels 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)**

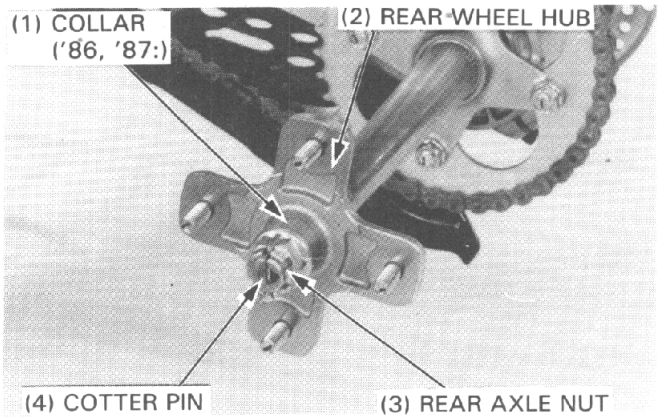


REAR AXLE

REMOVAL

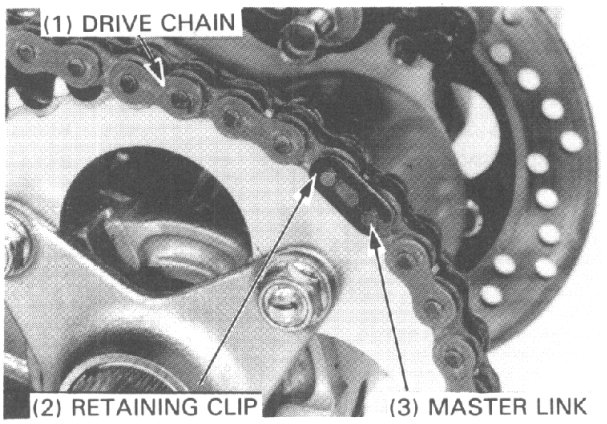
Remove the rear wheels.
After '87: Remove the skid plate.

Remove the cotter pins.
Hold the rear axle by applying the rear brake.
Remove the axle nuts, collars ('86, '87:) and wheel hubs from the axle.

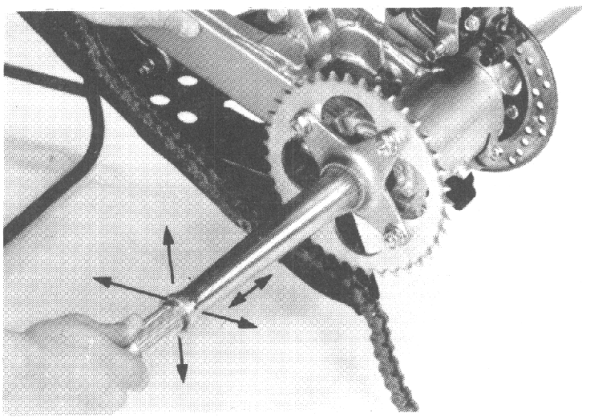


Loosen the drive chain adjuster (page 2-9).

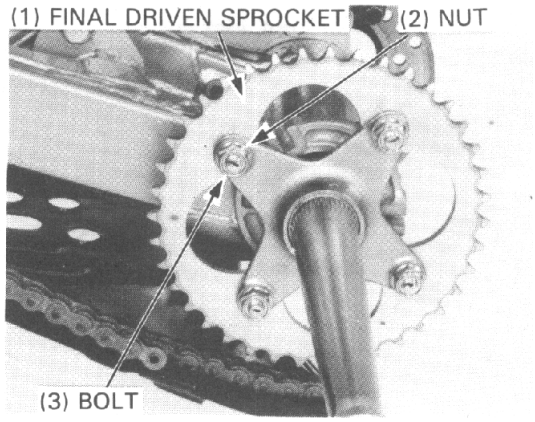
Remove the drive chain retaining clip, master link, O-rings and drive chain.



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



Remove the sprocket nuts, bolts and final driven sprocket from the sprocket hub.



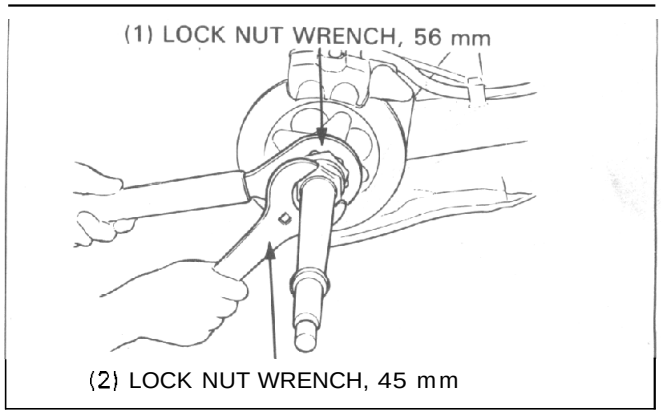
Loosen the axle inner lock nut while holding the outer lock nut.

NOTE

- The lock nuts have left-hand threads.

TOOLS:

Lock nut wrench, **56** mm	**07916—HA20000** or **07916—HA201OA (U.S.A.** only)
Lock nut wrench, **45** mm	**07916—1870101** or equivalent commercially available in **U.S.A.**



Hold the rear axle by applying the rear brake.

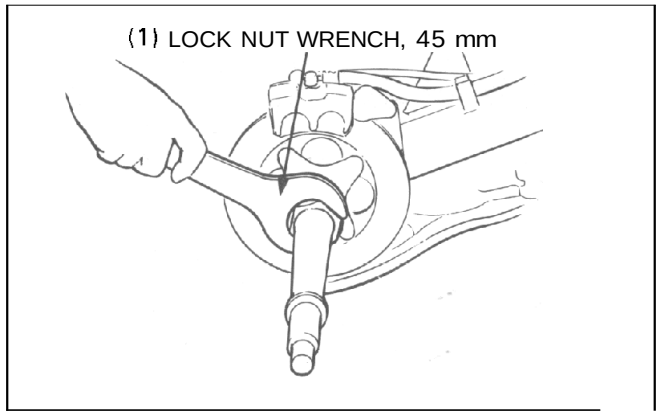
Loosen the outer lock nut until the snap ring can be removed.

NOTE

- The lock nuts have left-hand threads.

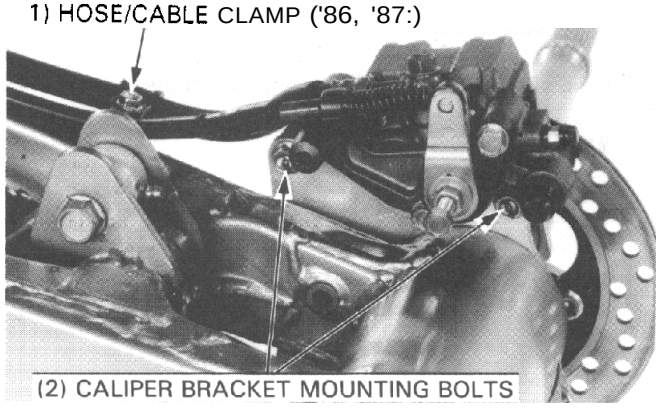
TOOL:

Lock nut wrench, **45** mm	**07916—1870101** or equivalent commercially available in **U.S.A.**

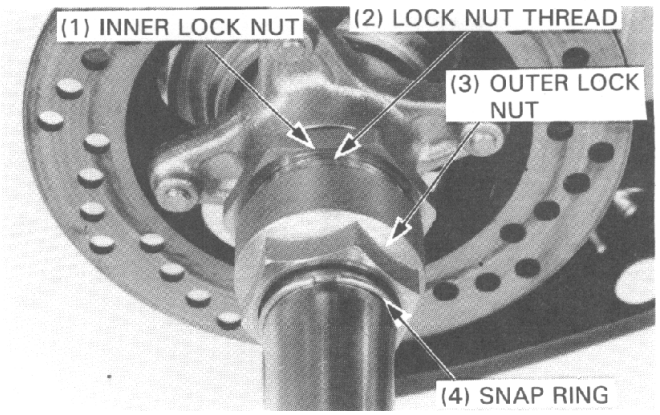


'86, '87: Remove the hoseicable clamp from the swingarm.

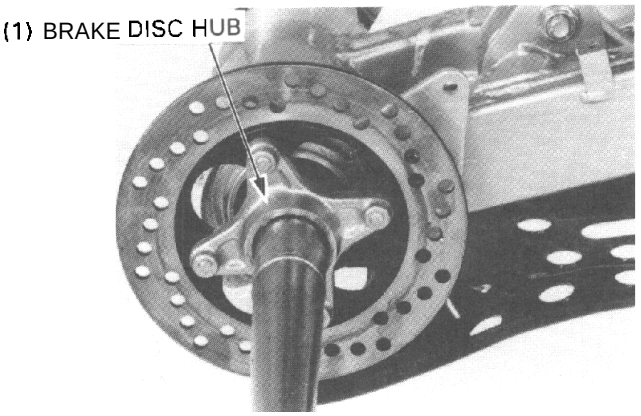
Remove the caliper bracket mounting bolts and raise the caliper off the brake disc.



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

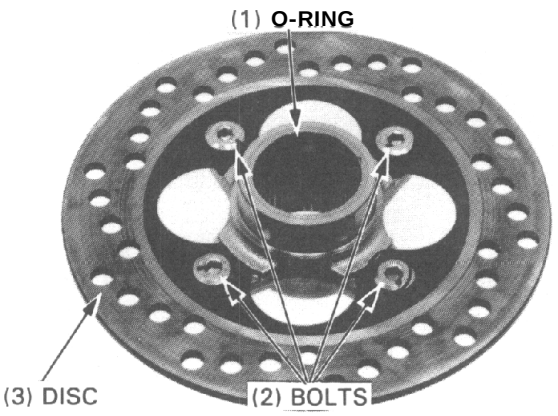


Remove the brake disc with the hub from the axle.



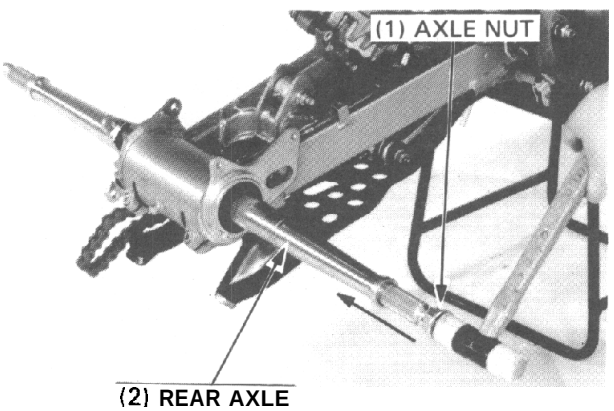
Remove the O-ring from the groove in the disc hub.

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

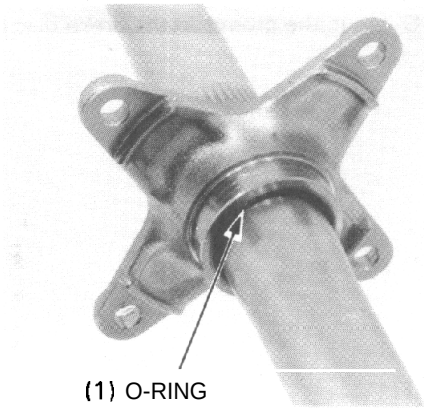


Install the axle nut onto the right axle end.

Drive the axle out of the axle bearings from the right side with a plastic hammer.



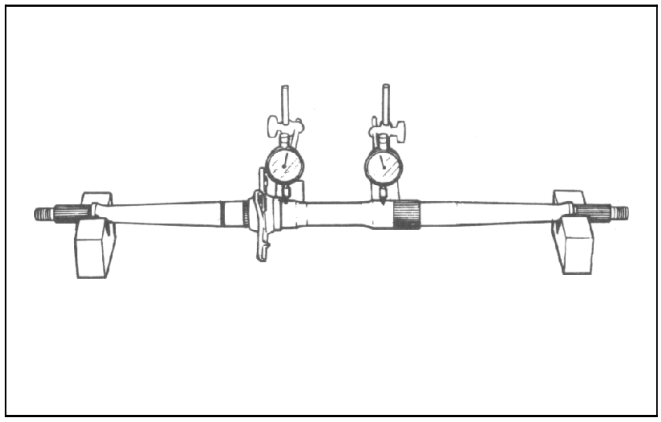
Remove the O-ring from the axle.



INSPECTION

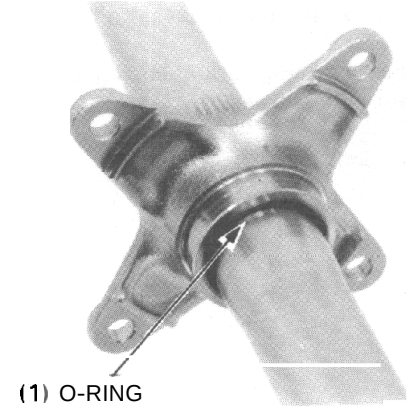
Place the axle in V-blocks and measure the runout.

SERVICE LIMIT: **3.0 mm 10.12 in)**



INSTALLATION

Place a new O-ring on the axle and install the axle from the left side.

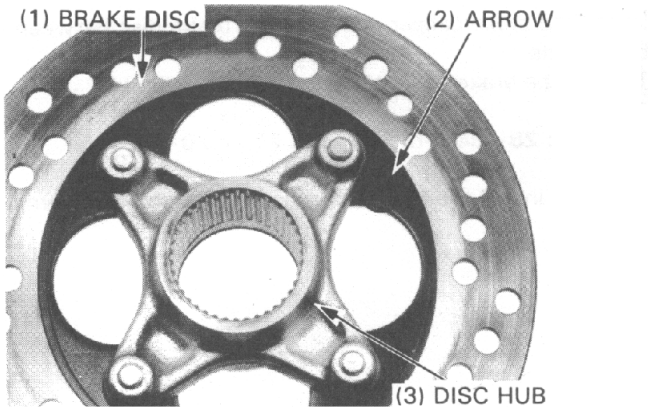


Install the brake disc onto the disc hub with its arrow facing the outside.
Apply a light coating of grease or oil to the disc socket bolt threads and tighten the bolts.

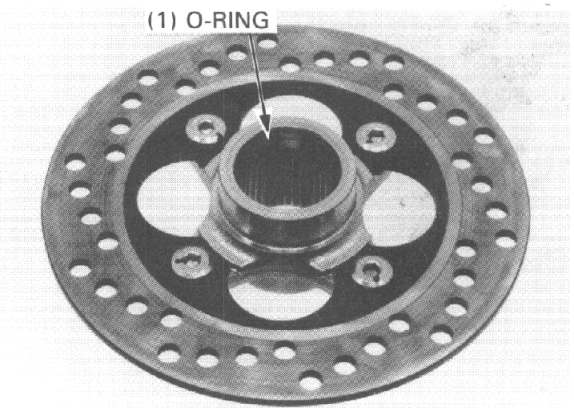
TORQUE: 35—40 N·m (3.5—4.0 kg-m, 25—29 ft-lb)

WARNING

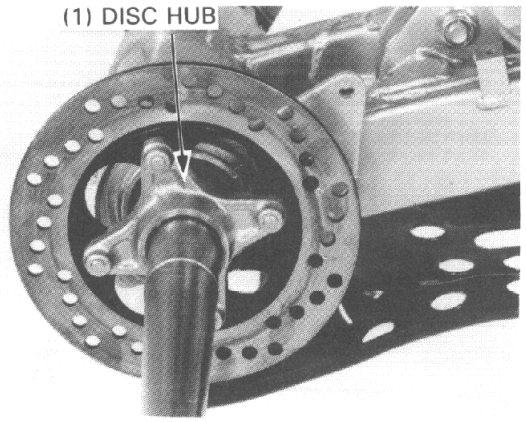
- ***Crease or oil on the disc will reduce stopping power. Clean the disc with a hight quality brake degreaser if oil or grease gets on the disc.***



Install a new O-ring in the groove in the brake disc hub.



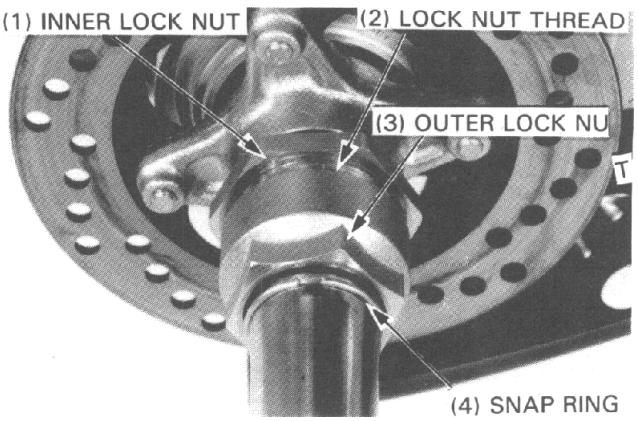
Install the brake disc hub.



Apply locking 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.

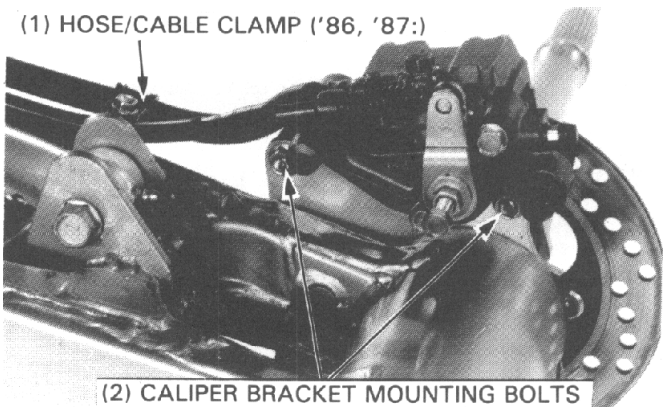
Install the snap ring.



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

TORQUE: 28—34 N·m (2.8—3.4 kg-m. 20—25 ft-lb)

'86, '87: Install the hose/cable clamp onto the swingarm.



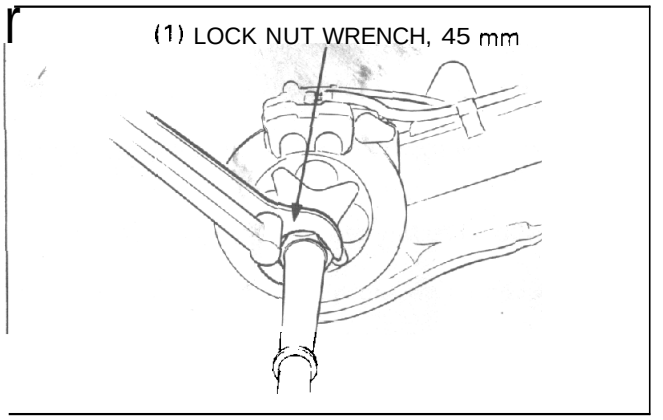
...xle by applying the rear brake.
Tighten the outer lock nut to the specified torque against the snap ring.,

TORQUE:
Actual: **80—100 N·m (8.0—10.0** kgm, **58—72 ft-lbl**
Indicated: **73—91 N·m (7.3—9.1** kg-m. **53—66 ft-lb)**

NOTE

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

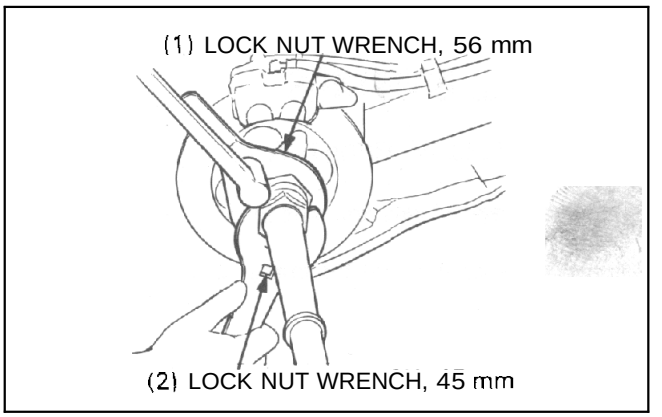
TOOLS:
Lock nut wrench, **45 mm** — **07916—1870101** or equivalent commercially available in U.S.A.



Tighten the inner lock nut against the outer lock nut.

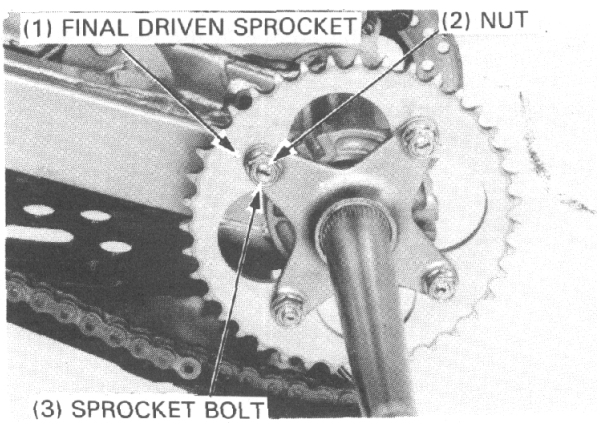
TORQUE
Actual: **120—140 N·m (12.0—14.0** kg-m, **87—101** ft-lb)
Indicated: **109—127 N·m (10.9—12.7** kg-m. **79—92 ft-lb)**

TOOLS:
Lock nut wrench. **56** mm — **07916—HA20000** or **07916—HA201**OA (U.S.A. only)
Lock nut wrench, **45** mm — **07916—1870101** or equivalent commercially available in U.S.A.

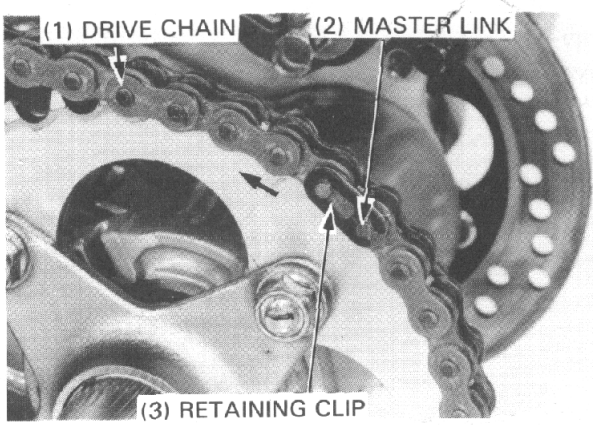


Install the final driven sprocket onto the hub on the axle with its teeth number mark facing out.
Apply a thread lock agent to the sprocket bolt threads and tighten the bolts.

TORQUE: **47—55 N·m (4.7—5.5** kg-m, **34—40 ft-lb)**



Install the drive chain with the master link, O-rings and retaining clip.
Face the closed end of the retaining clip in the rotating direction of the chain.

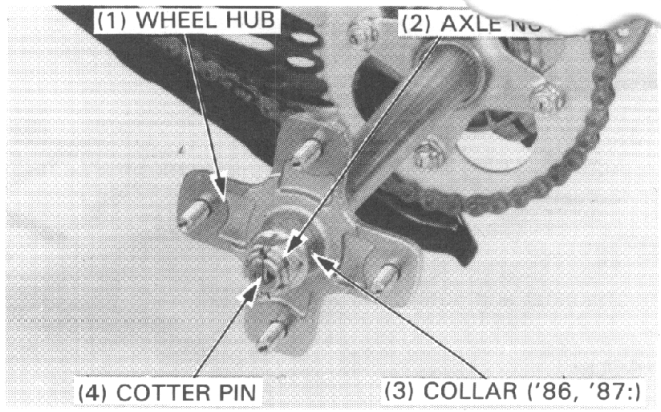


Apply oil or grease to the splines on both ends of the axle.

Install the wheel hub, wheel hub collars ('86, '87:), and axle nuts.
Hold the rear axle by applying the rear brake and tighten the axle nuts.

TORQUE: 120—170 N·m (12.0—17.0 kg-rn, 87—123 ft-lb)

Install new cotter pins and spread the ends as shown.



Install the rear wheels (page 11-21

After '87: Install the skid plate.

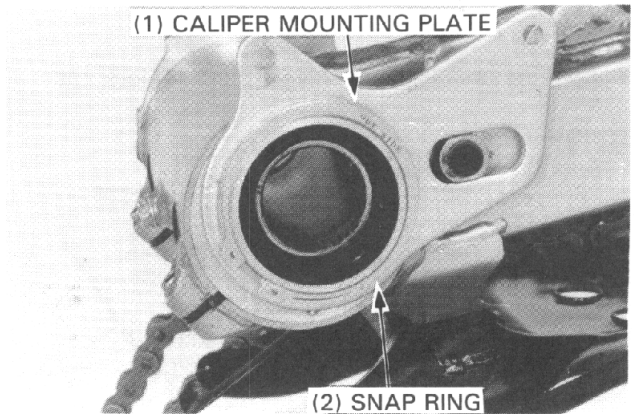
Adjust drive chain slack (page 2-9).

REAR AXLE BEARINGS

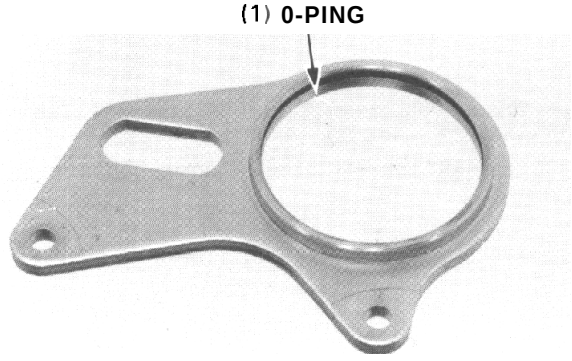
BEARING HOLDER REMOVAL

Remove the rear wheels and axle (page 11-2).

Remove the snap ring and the brake caliper mounting plate.

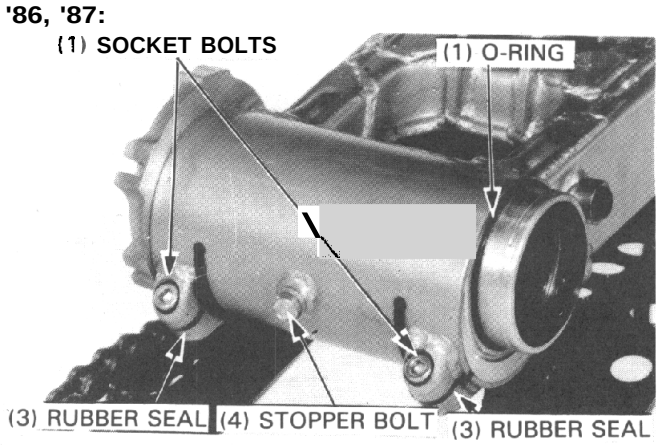


Remove the O-ring from the groove in the caliper mounting plate.



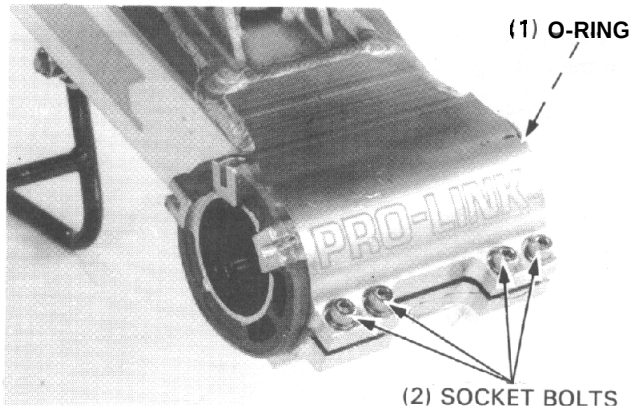
'86. '87:
Remove the O-ring from the bearing holder right side.
Remove the two socket bolts and rubber seals from the swing arm.

Remove the stopper bolt.



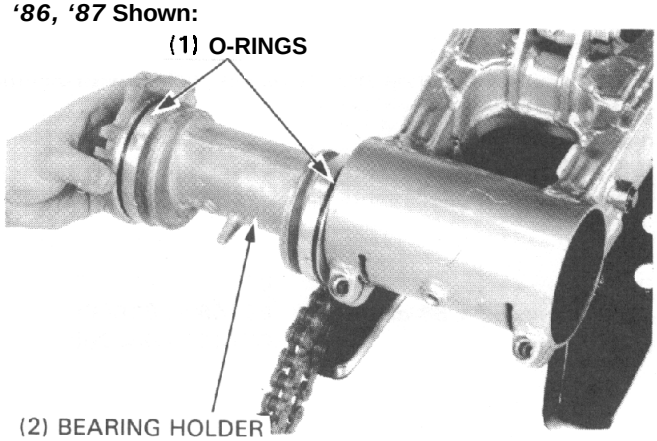
Remove the O-ring from the bearing holder right side.
Loosen the four socket bolts.

After '87:



Remove the bearing holder from the swingarm.
Remove the O-rings from the arooves in the bearing holder.

***'86, '87* Shown:**



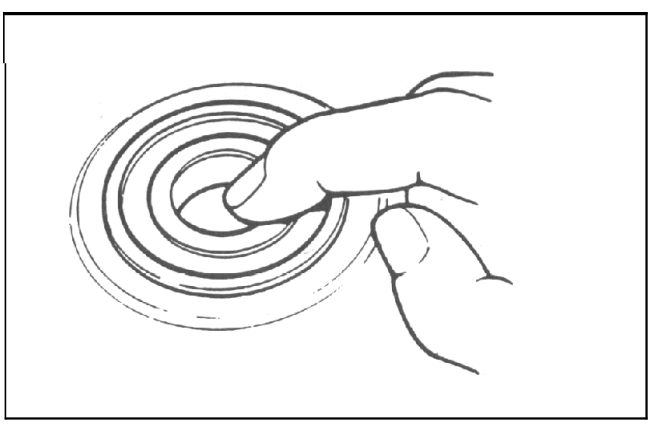
BEARING INSPECTION

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

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

NOTE

- Replace the axle bearings in pairs.

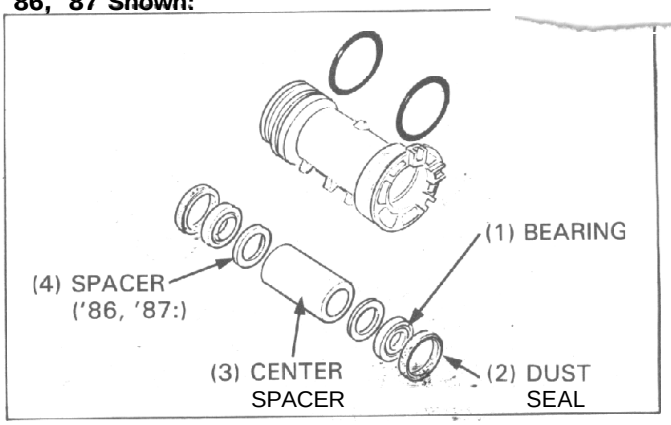


BEARING REPLACEMENT

Remove the dust seals from the bearing holder.

Remove the bearings, spacers ('86, '87:) and center spacer from the bearing holder.

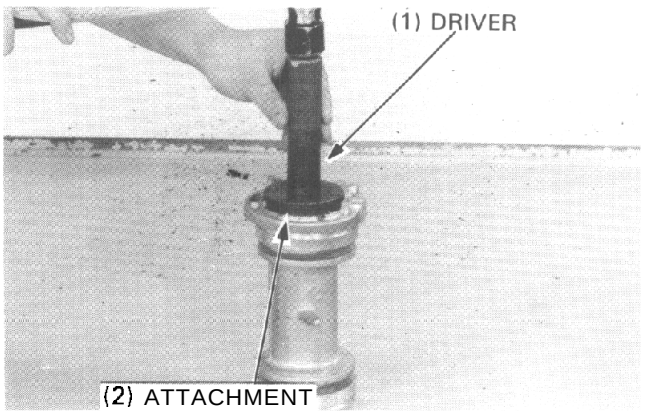
'86, '87 Shown:



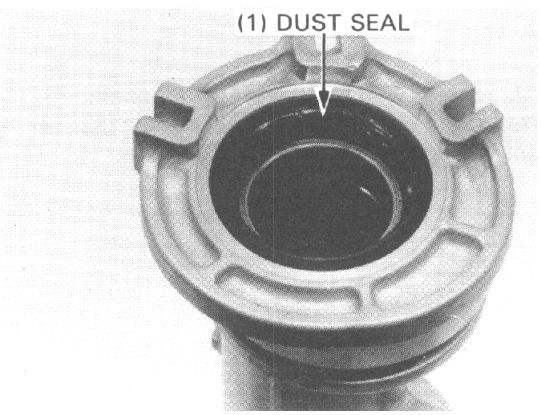
'86, '87: Install the spacer into the bearing holder.
Drive a new right bearing into the bearing holder with common tools.
Install the center spacer.
'86, '87: Install the spacer into the bearing holder.
Drive a new left bearing into place with the same tools.

TOOLS:

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



Apply grease to the lip of new dust seals and drive the dust seals into the bearing holder until their outside surfaces are flush with the end surfaces of the holder.

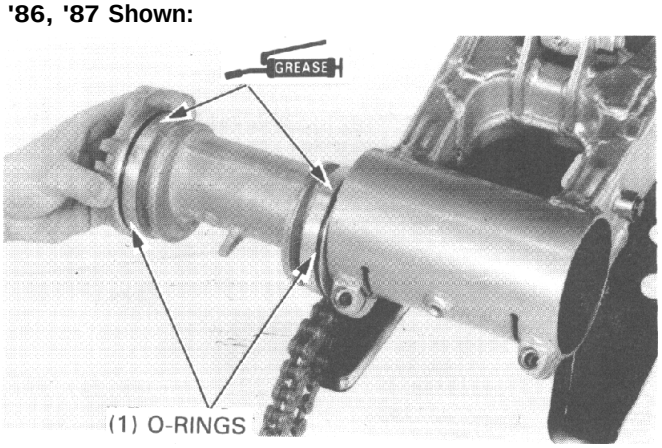


BEARING HOLDER INSTALLATION

Install new O-ring in the grooves of the bearing holder.

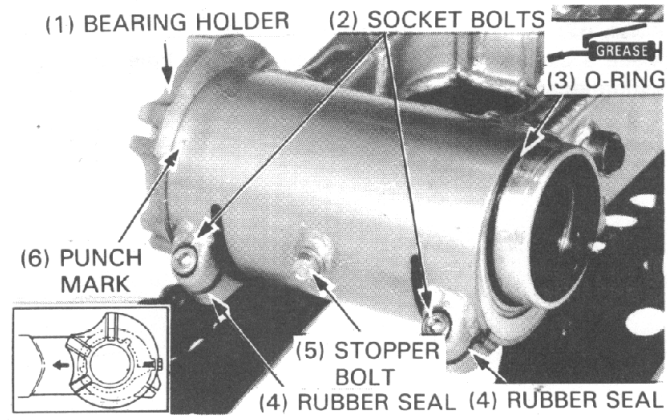
Apply grease to the outside surfaces of the bearing holder and install it in the swingarm.

'86, '87 Shown:



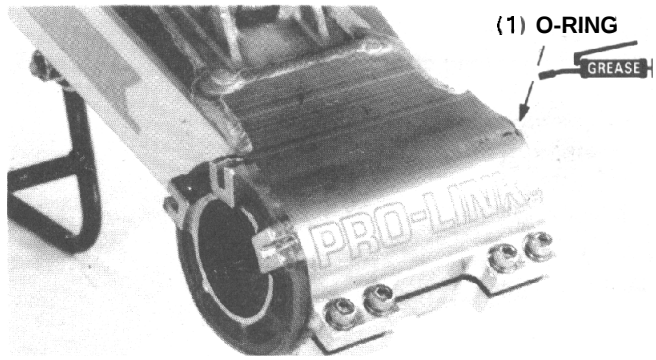
'86, '87:
Align the center tang on the bearing holder with the punch mark on the swingarm.
Install the rubber seals, and stopper bolt.
Install a new O-ring onto the bearing holder right side.
Apply grease to the caliper mounting plate installation surface of the bearing holder.
Tighten the socket bolts.

TORQUE: **19—23 N·m (1.9—2.3 kg-m, 14—17** ft-lb)

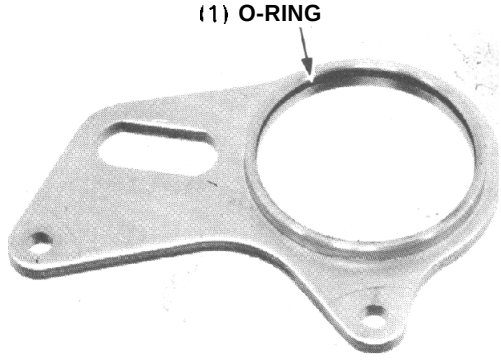


After **'87:**
Install a new O-ring onto the bearing holder right side.
Apply grease to the caliper mounting plate installation surface of the bearing holder.

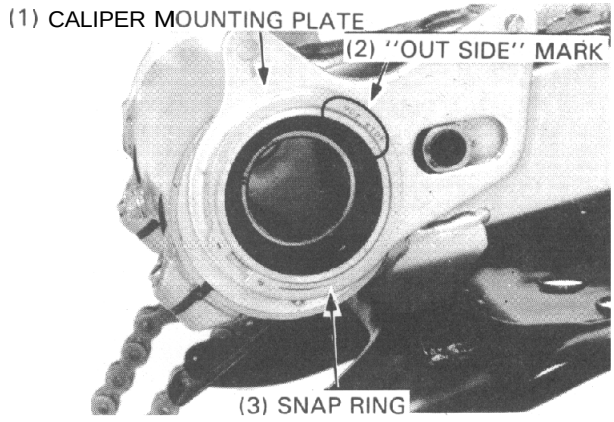
After '87:



Install a new O-ring in the groove of the caliper mounting plate.



Install the caliper mounting plate.
Install the snap ring with its "OUT SIDE" mark facing out and with its ends positioned as shown.

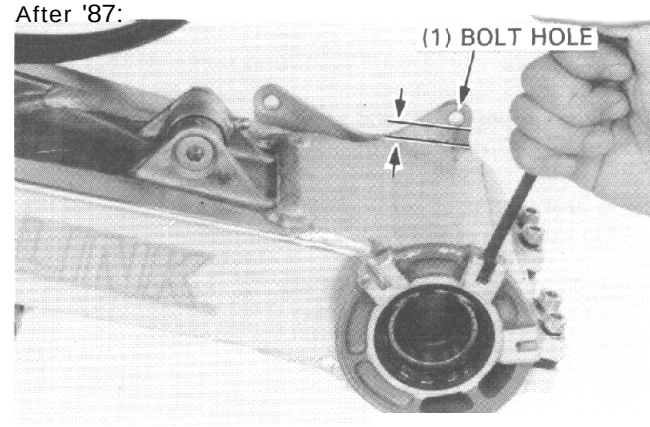


'86. '87:
Install the rear axle (page **11-5).**
Install the rear wheels (page **11-2).**
Adjust the drive chain (page 2-9).

After '87:
Make a clearance between the caliper bolt hole (8 mm) and swing arm while turning the bearing holder.

Install the rear axle and rear brake caliper (page 11-51.

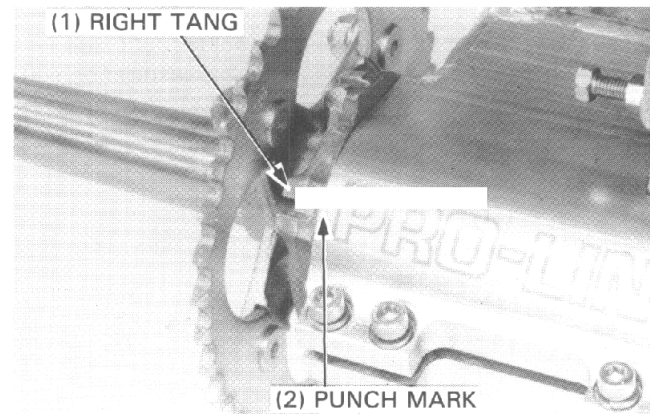
After '87:



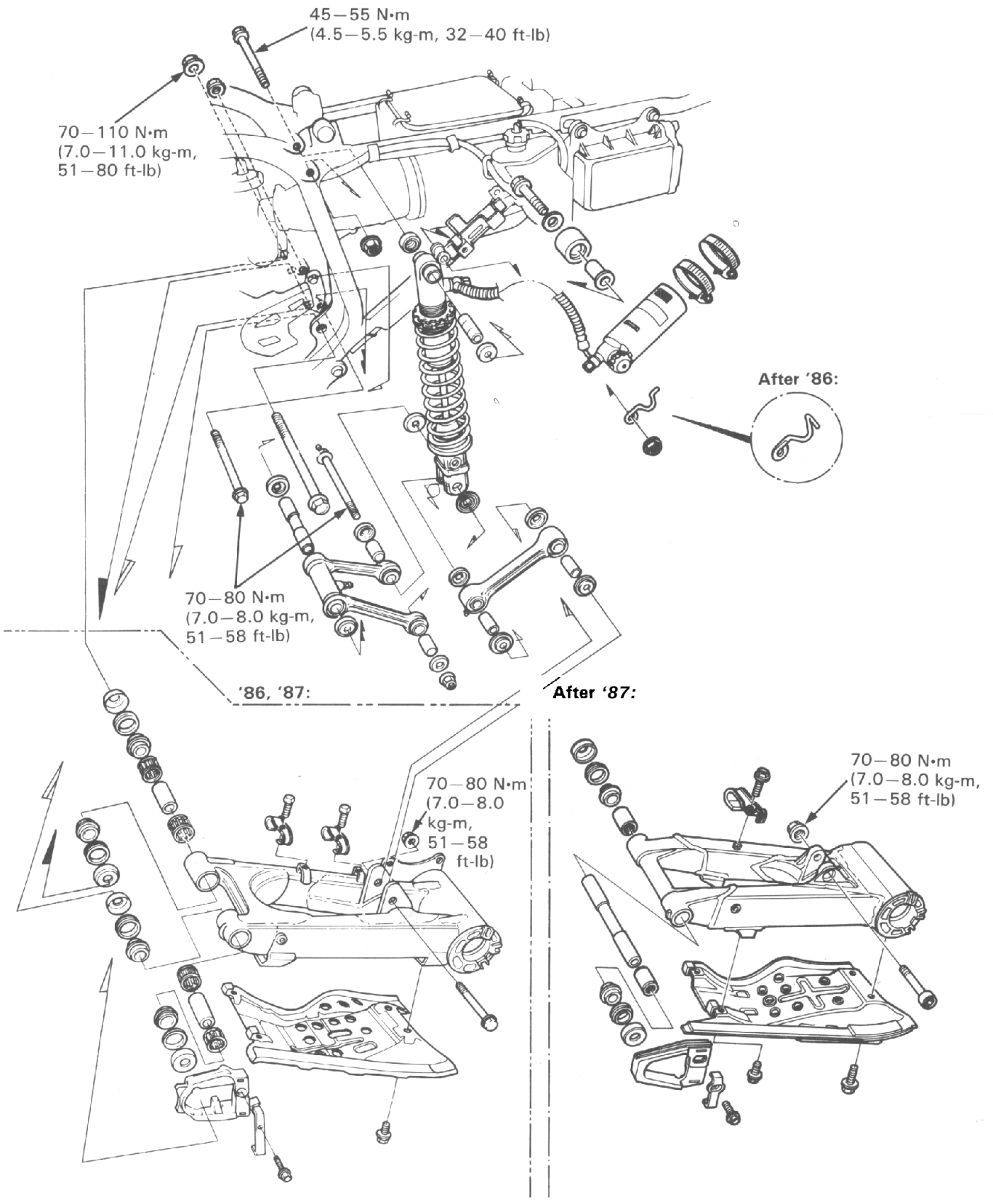
After '87:
Align the right tang of the bearing holder with punch mark on the swing arm.
Install the drive chain (page 11-7).
Install the rear wheels (page 11-2).

Adjust the drive chain (page 2-9).

After '87:



MEMO


45—55 N•m
(4.5—5.5 kg-m, 32—40 ft-lb)
70—110 N•m
(7.0—11.0 kg-m,
51—80 ft-lb)
After '86:
70—80 N•m
(7.0—8.0 kg-m,
51—58 ft-lb)
'86, '87:
After '87:
70—80 N•m
(7.0—8.0
kg-m,
51—58
ft-lb)
70—80 N•m
(7.0—8.0 kg-m,
51—58 ft-lb)

SERVICE INFORMATION

GENERAL

- This section covers servicing of the rear shock absorber and swingarm repairs.
- A jack or block is required to support the FOURTRAX.
- Use genuine Honda 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 shack absorber contains nitrogen gas under high pressure. Do not allow fire or heat near the shock absorber.*
- *Before disposal of the shock absorber, release the nitrogen by pressing the valve core. Then remove the valve from the shock absorber.*
- *The shock absorber has a gas-filled reservoir. Use only nitrogen to pressurize the shock absorber. The use of an unstable gas can cause a fire or explosion resulting in serious injury.*

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Rear shock absorber spring free length		'86:	247.0–253.0 (9.72–9.96)	244 (9.6)
		'87:	225.7–231.7 (8.89–9.12)	224 (8.8)
		After '87:	233.6–239.6 (9.20–9.43)	231 (9.1)
Spring preload length	Standard length	'86:	241.3 (9.50)	—
	Min-max length	'86:	236.3–241.3 (9.30–9.50)	—
		'87:	215.7–220.7 (8.49–8.69)	—
		After '87:	220.0–225.0 (8.66–8.86)	—
Damper rod compression force, 10 mm (0.4 in)		'86:	23.1–38.5 kg (50.93–84.88 lb)	—
		'87:	11.6–19.2 kg (25.57–42.33 lb)	—
		After '87:	10.9–15.6 kg (24.03–34.39 lb)	—
Nitrogen pressure		'86:	1.961–2.256 kPa (20–23 kg/cm², 284–327 psi)	—
		After '86:	981–1.275 kPa (10–13 kg/cm², 142–185 psi)	—

TORQUE VALUES

Compression damping valve	15 – 20N.m (1.5 – 2.0 kg-m, 11 – 14 ft-lb)
Shock absorber hose oil bolt	28 – 32N·m (2.8 – 3.2 kg-m, 20 – 23ft-lb)
Shock absorber spring lock nut	80 – 100N·m 18.0 – 10.0 kg-m, 58 – 72ft-lb)
Shock absorber upper mount bolt	45 – 55N·m (4.5 – 5.5 kg-m, 32 – 40 ft-lb)
Shock absorber lower mount bolt	70 – 80N·m (7.0 – 8.0 kg-m, 51 – 58 ft-lb)
Shock arm pivot bolt	70 – 80N·m (7.0 – 8.0 kg-m, 51 – 58ft-lb)
Shock link pivot bolt	70 – 80N·m (7.0 – 8.0 kg-m, 51 – 58ft-lb)
Swingarm pivot nut	70 – 110 N-m (7.0 – 11.0 kg-m, 51 – 80 ft-lb)

TOOLS

Special	
Valve wrench	07920 – KA30001 Not available in U.S.A.
Needle bearing remover	07946 – KA50000
Attachment, 28 x 30 mm (After '87)	07946 – 1870100
Bearing remover (After '87)	07931 – MA70000
Common (After '87)	
Bearing remover shaft	07GGD – 0010100
Bearing remover head, 20 mm	07746 – 0050600
Driver	07749 – 0010000
Pilot, 20 mm	07746 – 0040500
Optional	
Pin spanner	89201 – KA4 – 810
Pin spanner	89202 – KA4 – 810

TROUBLESHOOTING

Wobble or vibration
- Bent rim
- Loose axle bearing(s)
- Damaged tire
- Axle not tightened properly
- Swingarm pivot bearing worn
- Bent frame or swingarm

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

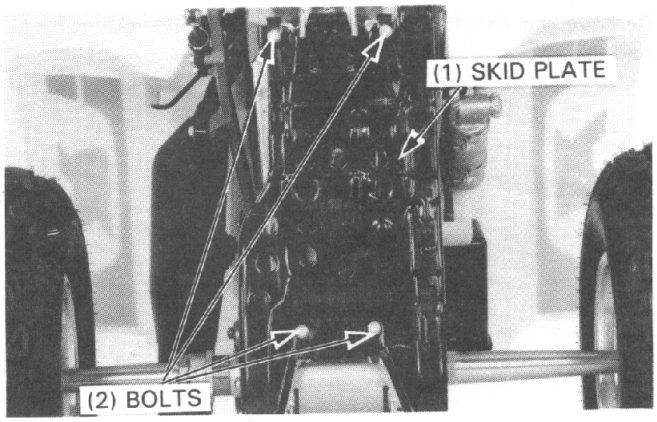
Hard suspension
- Spring preload adjustment is improper for rider's weight – See the Owner's Manual
- Compression or rebound damping is misadjusted – See Owner's Manual
- Bent shock damper rod
- Swingarm pivot bearings damaged
- Frame or swingarm bent

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

SHOCK ABSORBER

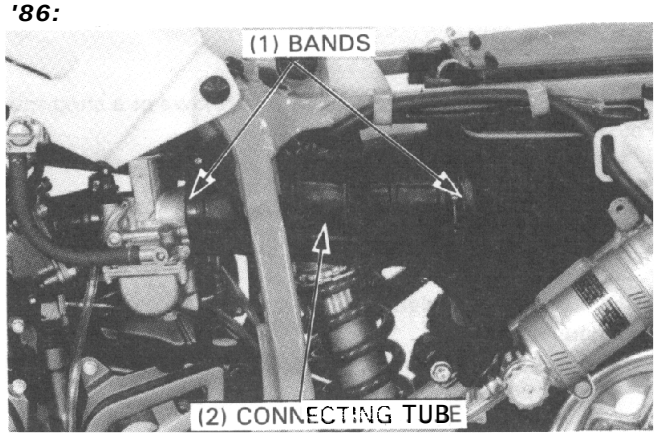
REMOVAL

Raise the rear wheels off the ground by placing a jack or block under the engine.
Remove the rear skid plate by removing the four bolts and washers.

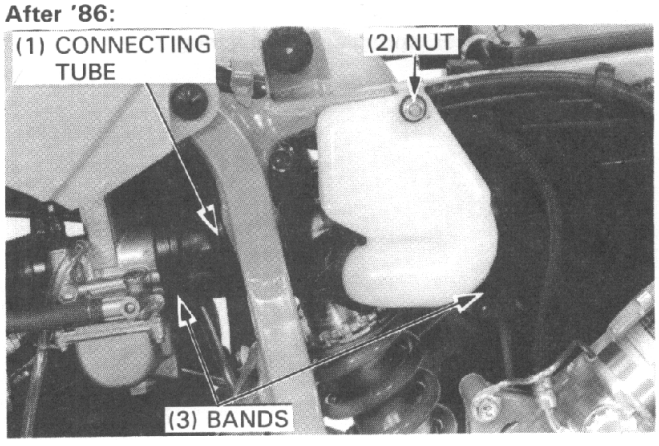


Remove the seat/rear fender.
After '86: Remove the resonator mounting nut.
Loosen the connecting tube bands and remove the connecting tube (air cleaner case-to-carburetor).

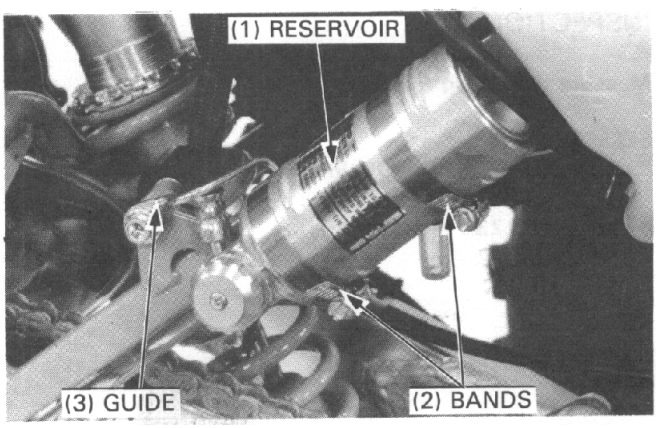
'86:



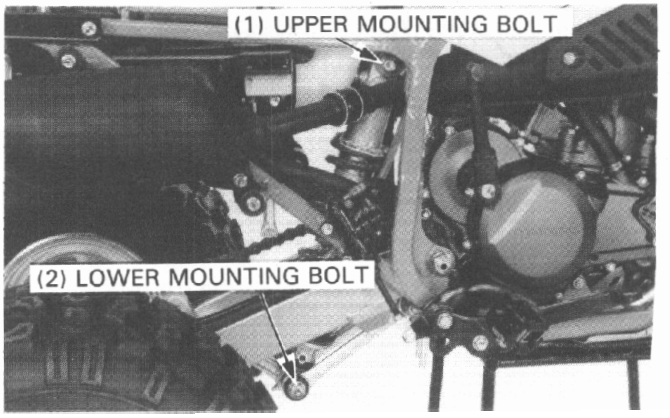
After '86:



Remove the hose guide.
Loosen the bands and remove the reservoir from the frame.



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



DISASSEMBLY

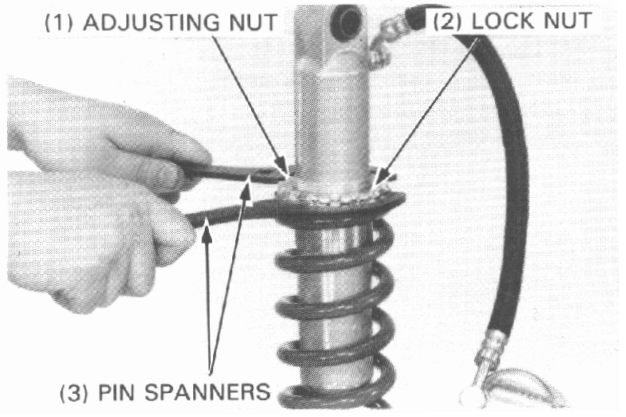
Hold the lower mount in a vise with soft jaws or a shop towel. Loosen the lock and adjusting nuts.

CAUTION

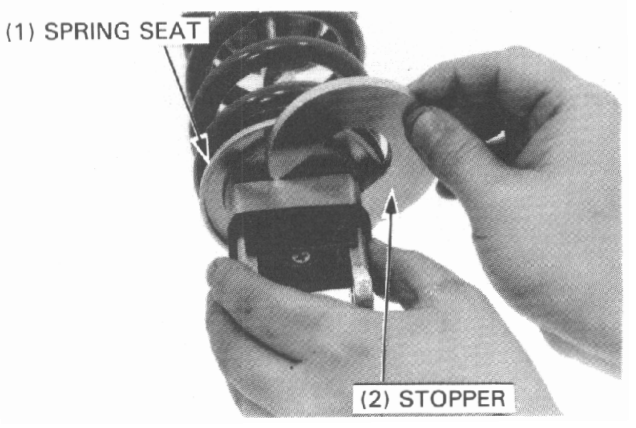
- *Be careful not to damage the hose connection in a vise.*

TOOLS (Optional tools):

Pin spanner	**89201–KA4–810**
Pin spanner	**89202–KA4–810**



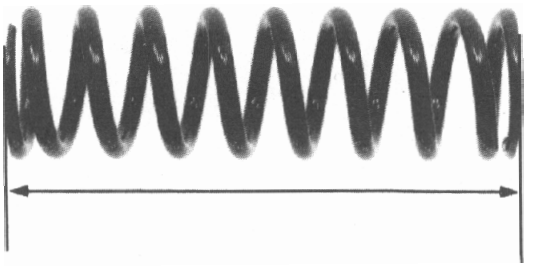
Remove the stopper, spring seat and spring.



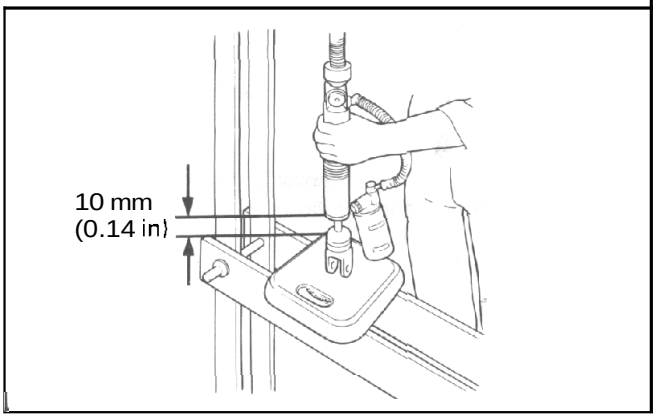
INSPECTION

Measure the spring free length.

SERVICE LIMIT:
'86: 244 mm 19.6 in)
'87: 224 mm 18.8 in)
After **'87: 231** mm **19.1** 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:
'86: 23.1—38.5 kg (50.93—84.88 lb)
'87: 11.6—19.2 kg (25.57—42.33 lb)
After **'87: 10.9—15.6 kg (24.03—34.39 lb)**

If the force required is less than minimum damping force gas is leaking.

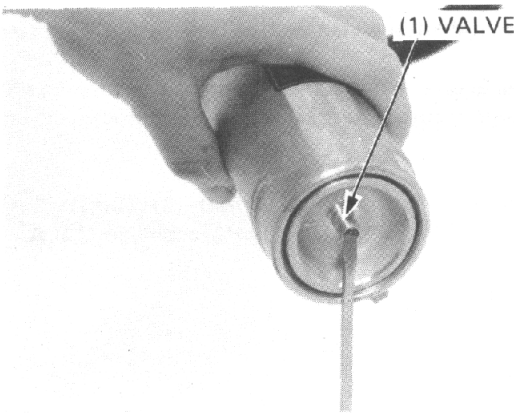
Examine the damper rod and replace the damper if the rod is bent or scored.

DAMPER DISASSEMBLY

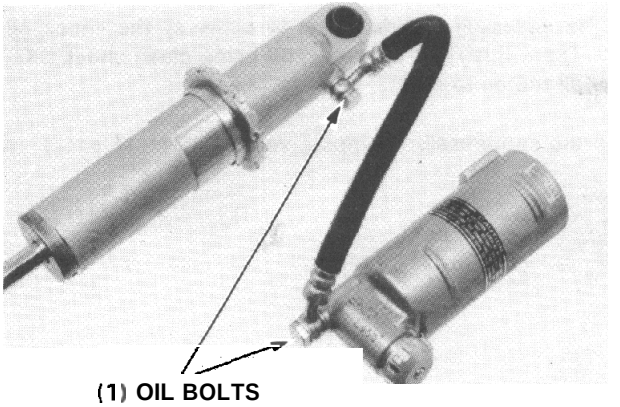
Release the nitrogen from the reservoir by depressing the valve core. Do not remove the valve until pressure is released.

WARNING

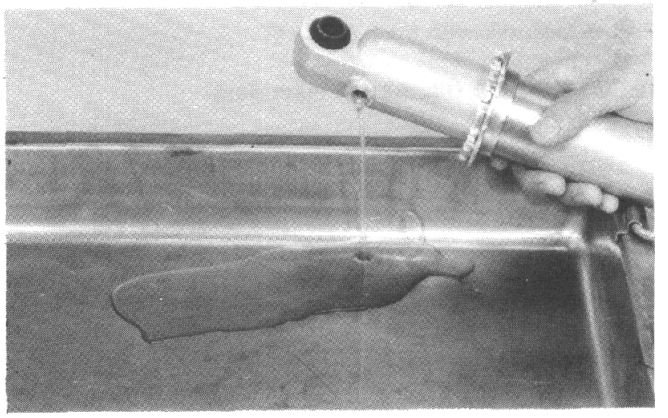
- ***Point the valve away from you to prevent debris from getting in your eyes.***
- ***Before disposal of the shock absorber, release the nitrogen gas from the reservoir and then remove the valve.***



Hold the damper in a vise with soft jaws or a shop towel.
Place a clean container under the oil bolts, then remove the bolts.
Separate the reservoir. hose and damper.



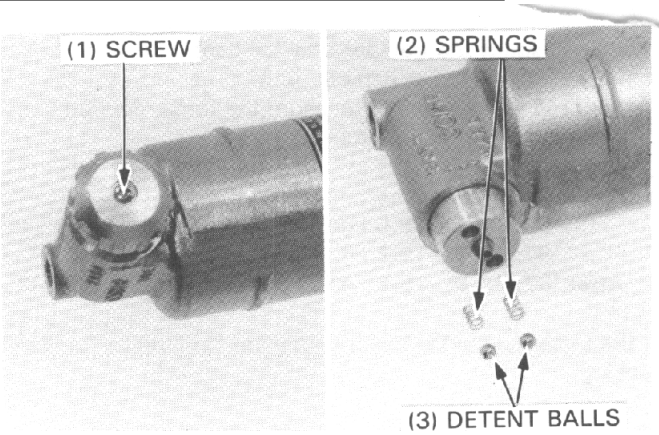
Drain the oil from the hose and damper. Pump the damper back-and-forth, several times to drain most of the oil.



SERVICING THE RESERVOIR

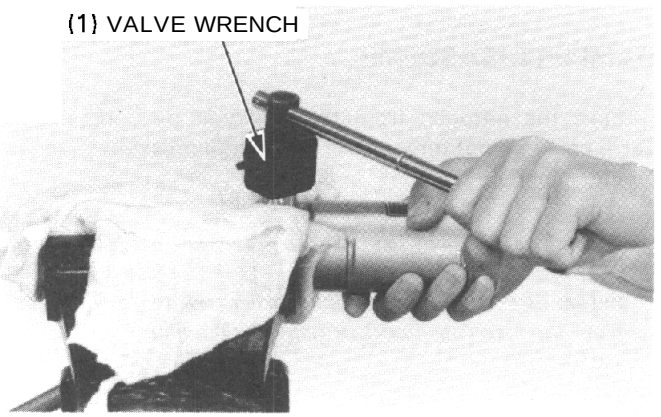
The compression damping valve must be removed from the reservoir to drain the shock oil.

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



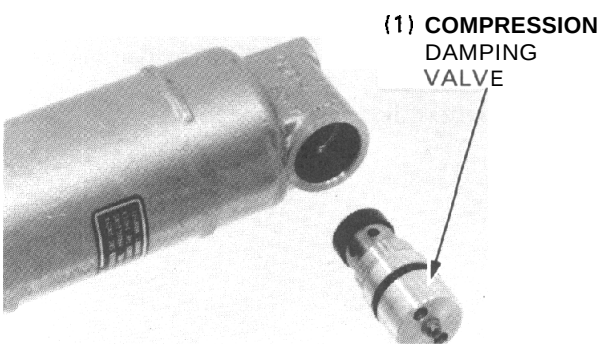
Hold the upper mount in a vise with soft jaws or a shop towel as shown.
Using the special tool, remove the compression damping valve from the reservoir; turn counterclockwise to remove.

TOOL:
Valve wrench — 07920—KA30001
Not available in **U.S.A.**



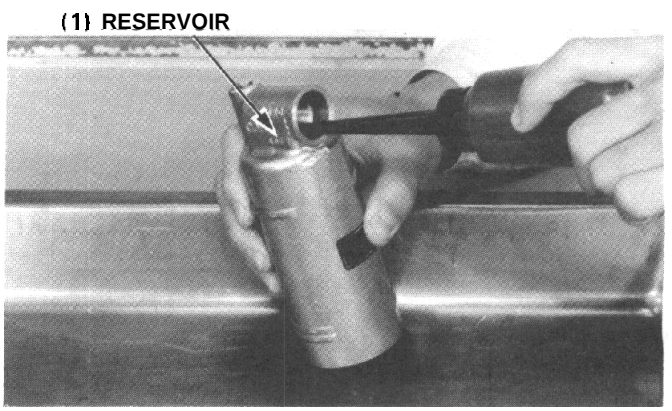
Turn the reservoir upside down to allow all the shock oil to drain. Then, flush out the reservoir using clean shock oil.
Allow all the oil to drain.

Clean the compression damping valve with clean shock oil.

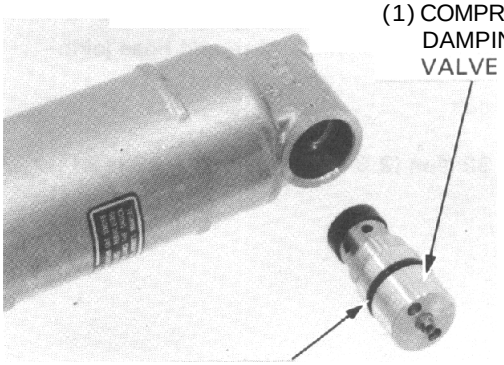


Fill the reservoir with fresh shock oil.

RECOMMENDED OIL: ATF **or** equivalent



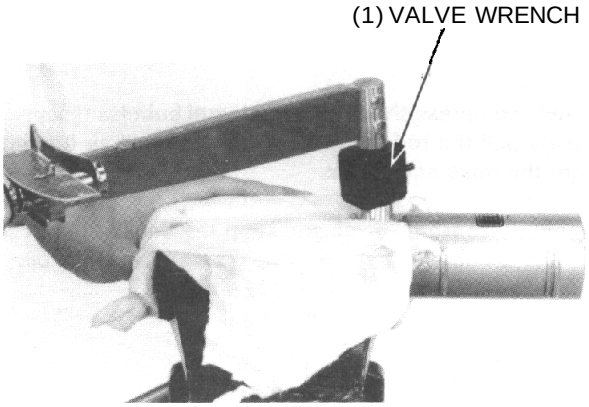
Install the compression damping valve into the reservoir being careful not to damage the O-ring.



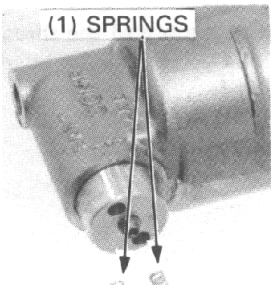
Hold the upper mount in a vise with soft jaws or a shop towel as shown.
Tighten the compression damping valve with the special tool.

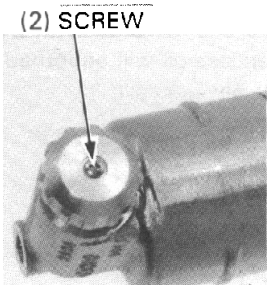
TORQUE: **15—20 N·m (1.5—2.0 kg-m, 11—14 ft-lb)**

TOOL:
Valve wrench **07920—KA30001**
Not available in U.S.A.



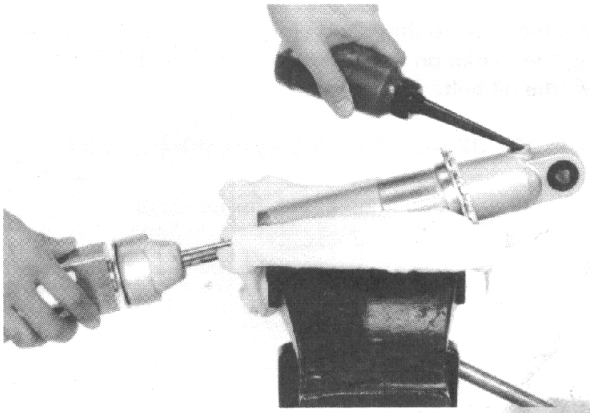
Install the two springs, detent balls and compression damping adjusting knob onto the valve. Align the flats on the adjusting knob and the compression damping valve.
Tighten the knob screw securely.





DAMPER ASSEMBLY

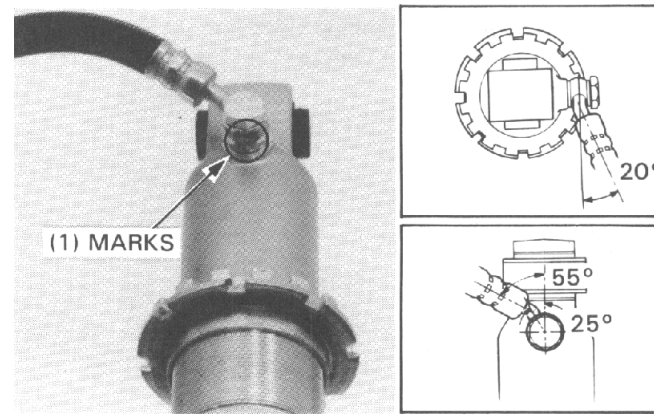
Hold the damper in a vise with soft jaws or a shop towel as shown.
Pull out the damper rod all the way.
Fill the damper with shock oil.



Connect the hose to the shock using new sealing washers, aligning the marks on the damper case and hose joint.

Tighten the oil bolt.

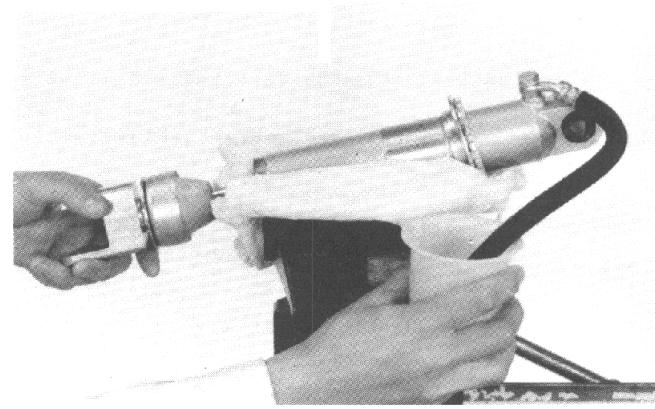
TORQUE: **28 – 32 N·m (2.8 – 3.2 kg-m, 20 – 23 ft-lb)**



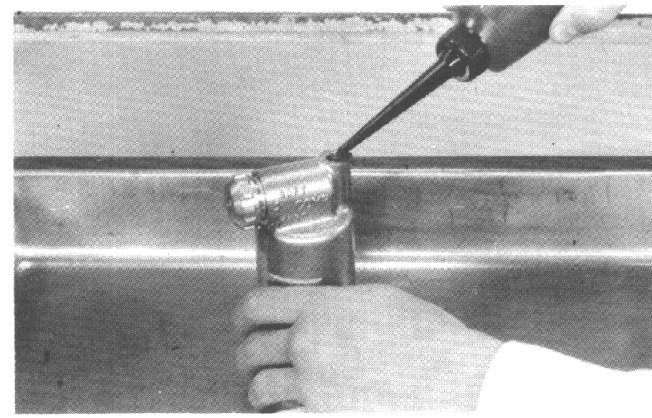
Dip the reservoir-end of the hose into a container filled with shock oil.

Very slowly compress the damper rod until bubbles disappear, then slowly pull the rod out. Repeat this until all air has been bled from the hose and shock.

Remove the hose from the oil and keep the shock upright and the open hose end elevated to avoid losing any shock oil.



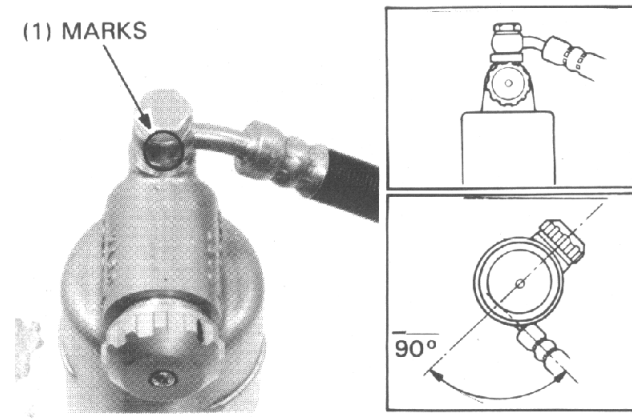
Fill the reservoir with shock oil to the top of the threads; this excess oil will be forced out when you install the hose fitting.



Connect the hose to the reservoir using new sealing washers, aligning the marks on the reservoir and hose joint.
Tighteh the oil bolt.

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

Wipe off any excess oil and check for oil leaks.

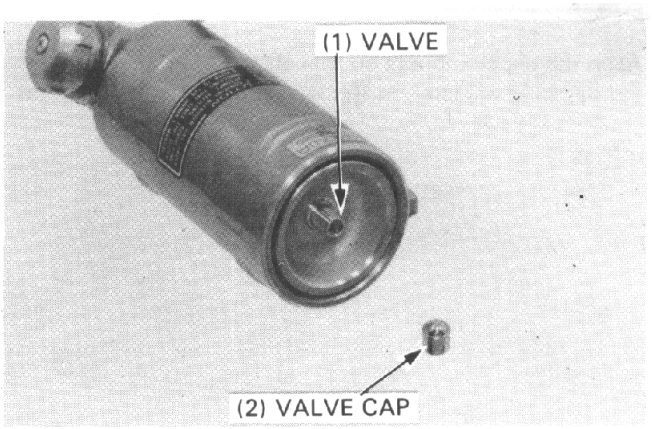


Fill the reservoir with nitrogen.

STANDARD PRESSURE:
'86: 1,961—2,256 kPa
(20—23 kg/cm², 284—327 psi)
After **'86: 981—1,275 kPa**
(10—13 kg/cm², 142—185 psi)

WARNING

- ***The shock absorber is fitted with a gas-filed resewoir. Use only nitrogen gas to pressurize the shock absorber. The use of an unstable gas can cause a fire or explosion resulting in serious injury.***

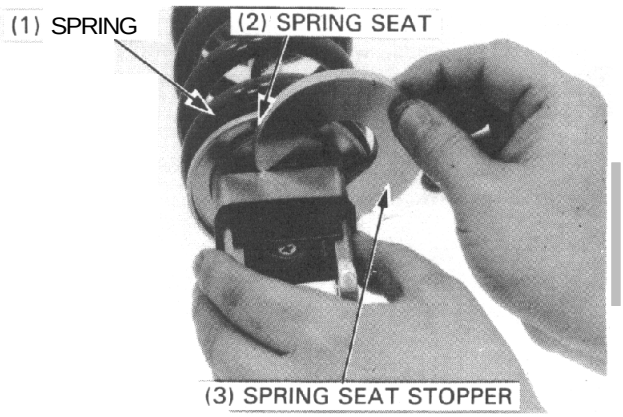


Check the damper compression force is within specification (page 12-4).

SPECIFIED FORCE:
'86: 23.1—38.5kg (50.93—84.88lb)
'87: 11.6—19.2 kg (25.57—42.33lb)
After **'87: 10.9—15.6 kg (24.03—34.39** lb)

Install the valve cap.

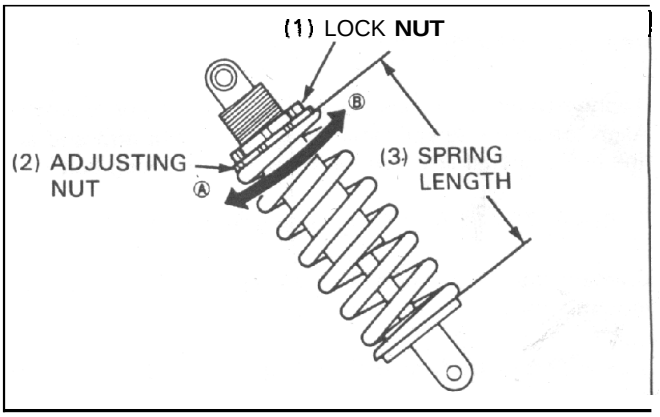
Install the spring, spring seat and spring seat stopper.



Turn the spring adjuster nut until the spring length is as specified.

A: DECREASE THE SPRING LENGTH
B: INCREASE THE SPRING LENGTH

STANDARD SPRING LENGTH:
'86: 241.3 mm (9.50 in)
'87: 220.7 mm (8.69 in)
After **'87: 225.0** mm **(8.86 in)**
MIN—MAX SPRING LENGTH:
'86: 236.3—241.3 mm (9.30—9.50 in)
'87: 215.7—220.7 mm **18.49—8.69** in)
After **'87: 220.0—225.0** mm **(8.66—8.86** in)



Hold the adjuster nut and lock nut but do not tighten at this time.

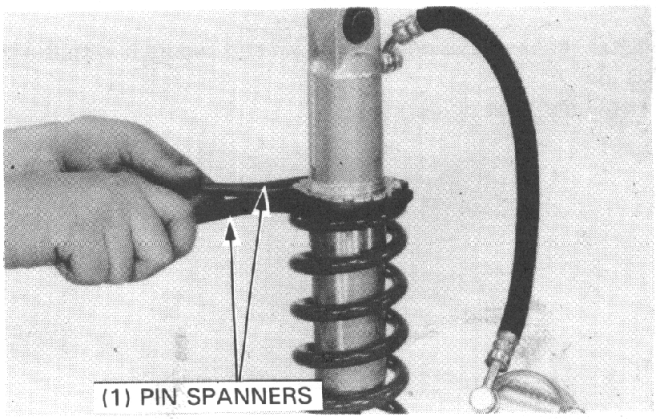
NOTE

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

Use this standard spring preload length just 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.

Hold the lower mount in a vise with soft jaws or a shop towel. Tighten the lock nut while holding the adjusting nut.

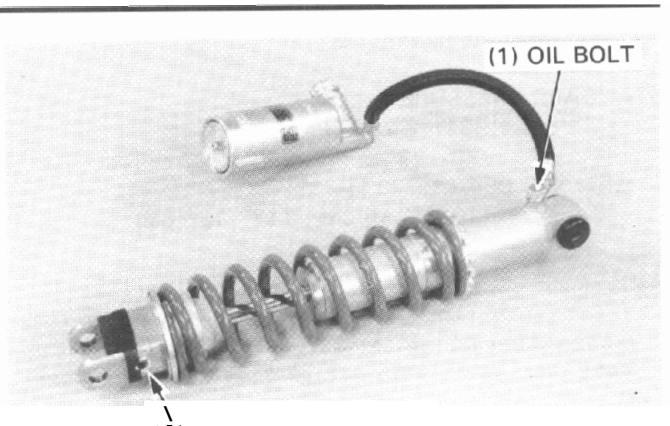
TORQUE: 80—100 N·m (8.0—10.0 kg-m. **58—72 ft-lb)**



TOOLS (Optional tools):

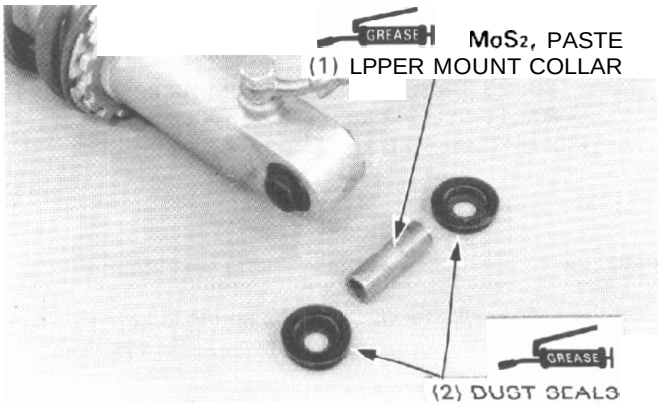
Pin spanner	**89201—KA4—810**
Pin spanner	**89202—KA4—810**

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



Apply a paste grease with 40% or more molybdenum disulfide to the upper mount collar and install the collar into the upper mount (page 2-19).

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



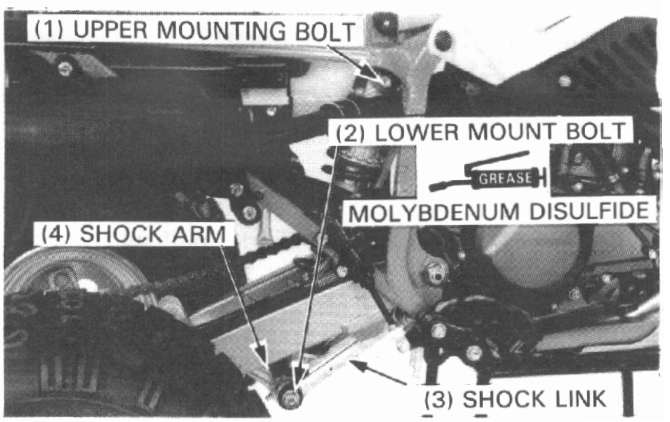
INSTALLATION

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.

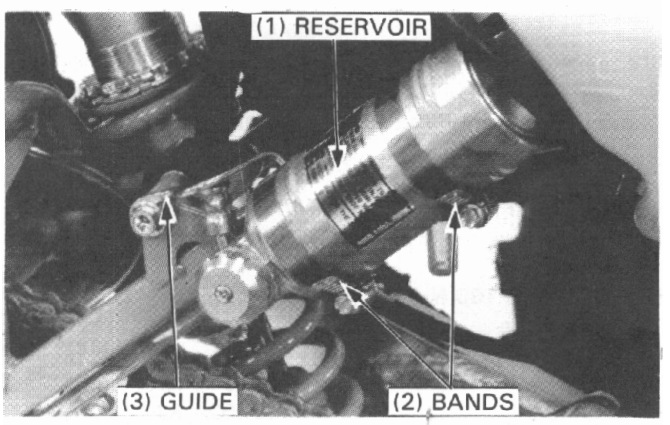
TORQUE: *70—80*N·m (7.0—8.0kg-m, 51—58ft-lb)

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

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



Install the reservoir onto the frame and secure it with the two bands.
Install the hose guide.



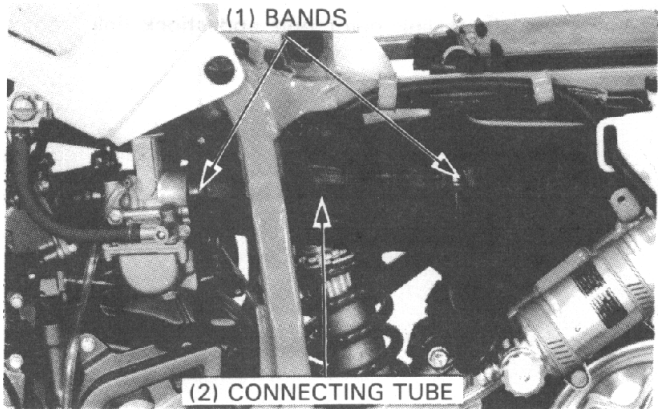
Install the connecting tube lair cleaner case-to-carburetor) and tighten the connecting tube bands.

After '86: Install and tighten the washer and resonator mounting nut securely.

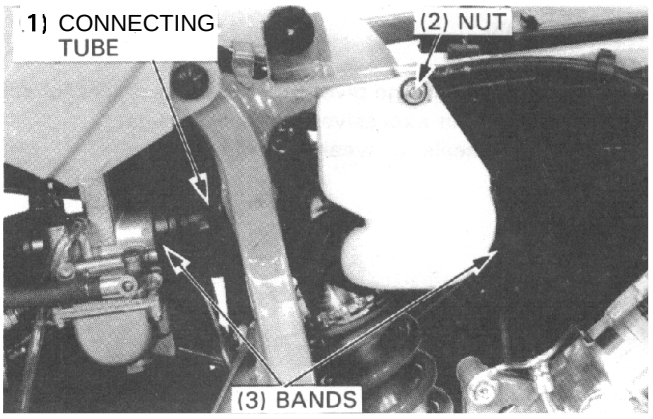
NOTE

- Route the oil hose properly (page **1-11** and **14).**

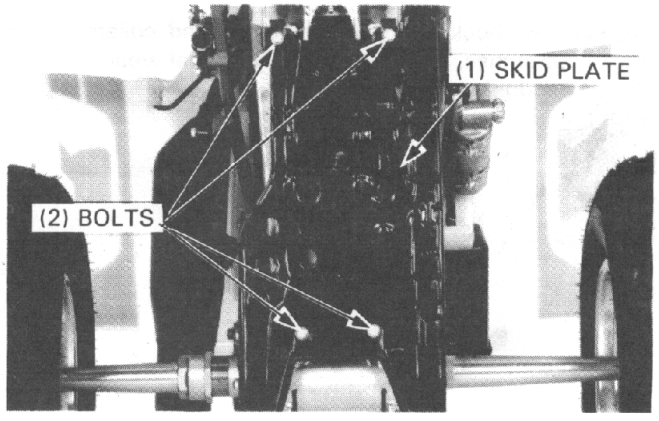
'86:



After *'86:*



Install the rear skid plate with the four bolts and washers.



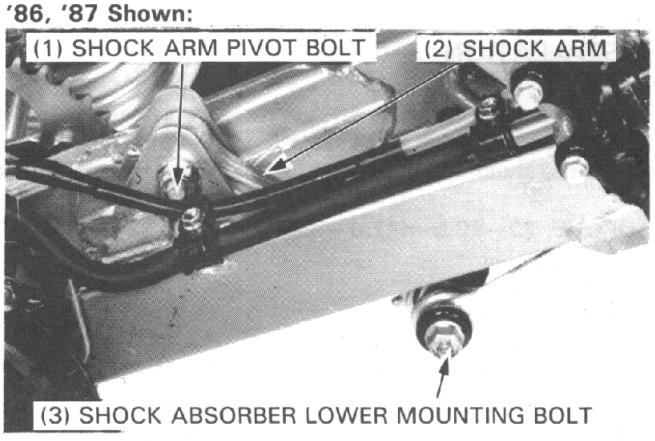
SUSPENSION LINKAGE

AEM OVAL

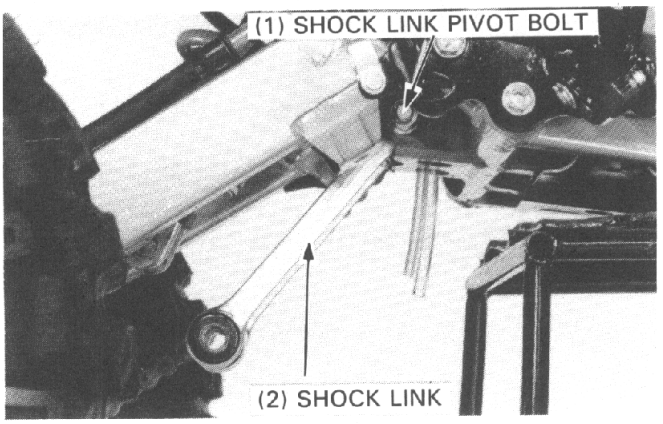
Remove the rear skid plate (page **12-3).**

Remove the shock absorber lower mounting bolt.
Remove the shock arm pivot bolt and shock arm from the swingarm.

'86, '87 Shown:

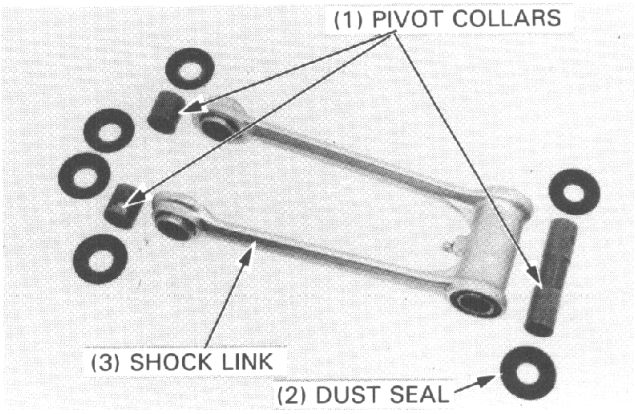


Remove the shock link pivot bolt and shock link from the frame.

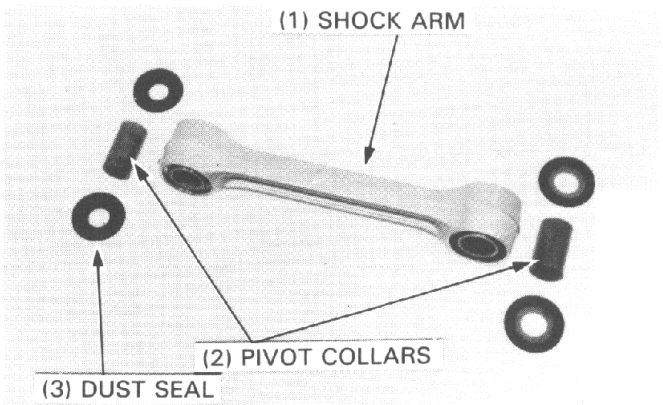


INSPECTION

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



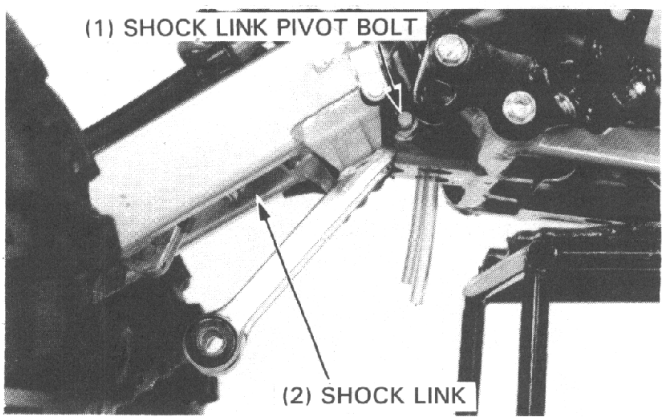
Inspect the shock arm pivot bushings and collars for score marks, scratches, or excessive or abnormal wear.
Check the dust seals for wear or damage.



INSTALLATION

Apply a paste grease with 40% or more molybdenum disulfide to the pivot bushings and collars (page 2-19).
Install the shock link to the frame and tighten the pivot bolt.

TORQUE: **70—80 N·m 17.0—8.0 kg-m. 51—58ft-lb)**



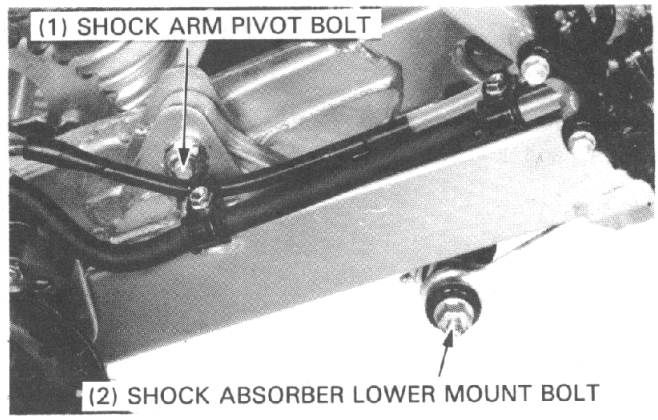
Install the shock arm to the swingarm and tighten the pivot bolt.

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

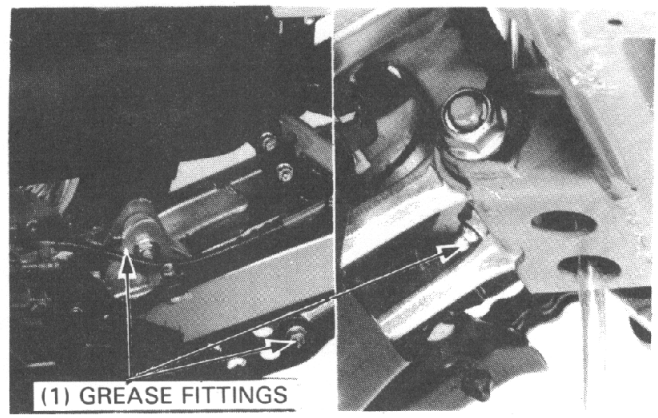
Connect the shock absorber lower mount to the shock link and arm with the lower mounting bolt and torque the bolt.

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

Install the rear skid plate (page 12-11).



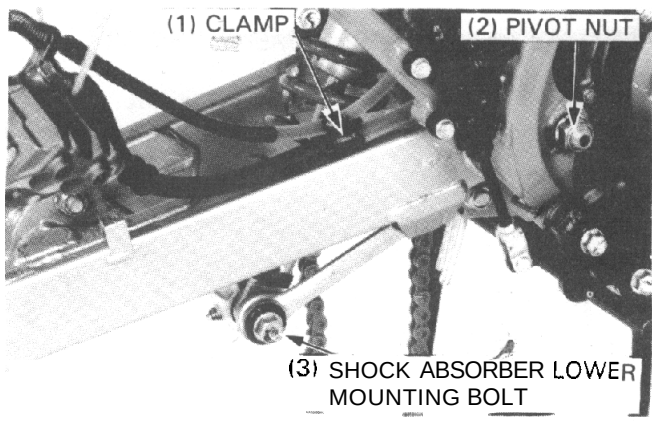
Apply a paste grease with 40% or more molybdenum disulfide to the shock linkage through the grease fittings (page 2-19).



SWINGARM

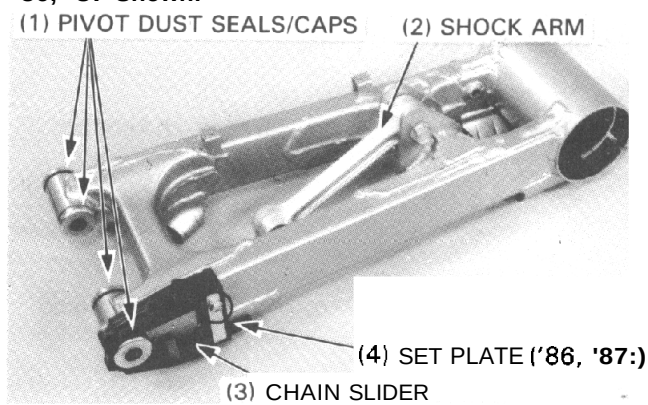
REMOVAL

Remove the following:
- rear wheels and axle (page 11-2)
- rear axle bearing holder (page 11-8)
- hose/cable clamp from the swingarm
- shock absorber lower mounting bolt
- swingarm pivot nut and the swingarm



Remove the shock arm pivot bolt and shock arm from the swingarm.
Remove the bolt attaching the chain slider set plate and remove the set plate **('86, '87)** and slider.
Remove the swingarm pivot dust seals/caps, and pivot collars.

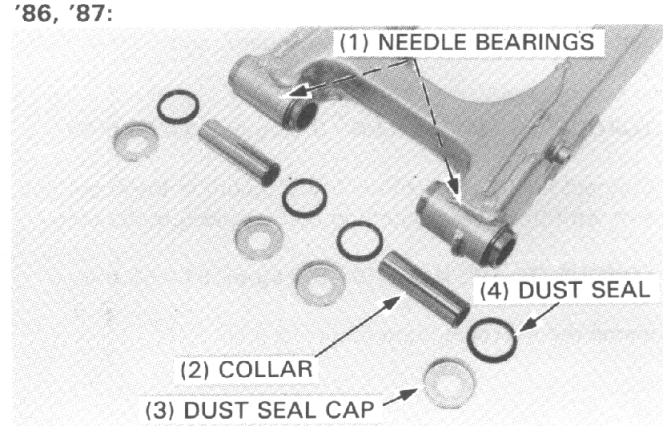
'86, '87 Shown:



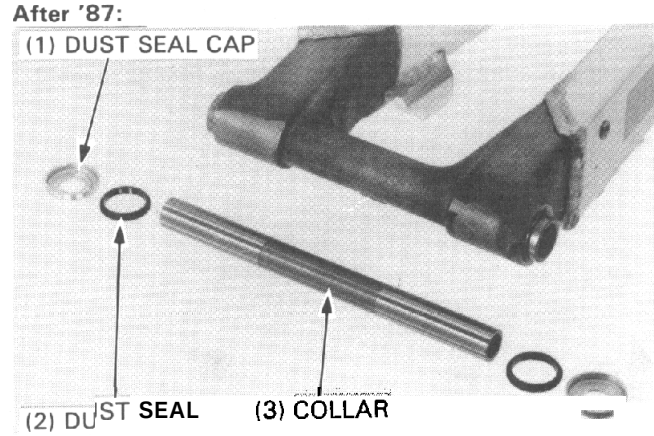
INSPECTION

Check the swingarm for damage and replace if necessary.
Check the swingarm pivot needle bearings, collars (After '87: collar), and dust seals/caps for wear or damage.

'86, '87:

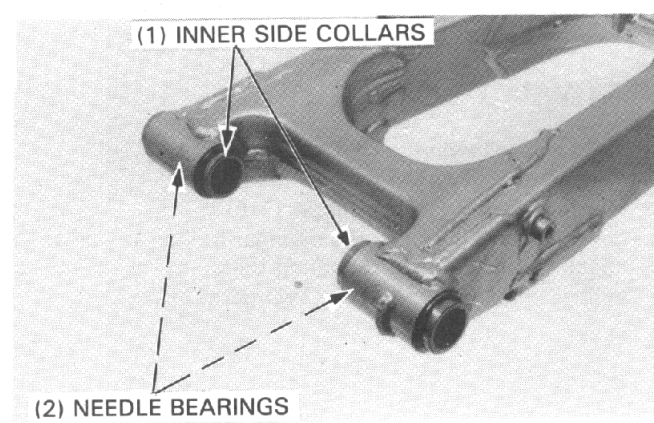


After '87:



PIVOT BEARING REPLACEMENT ('86, '87)

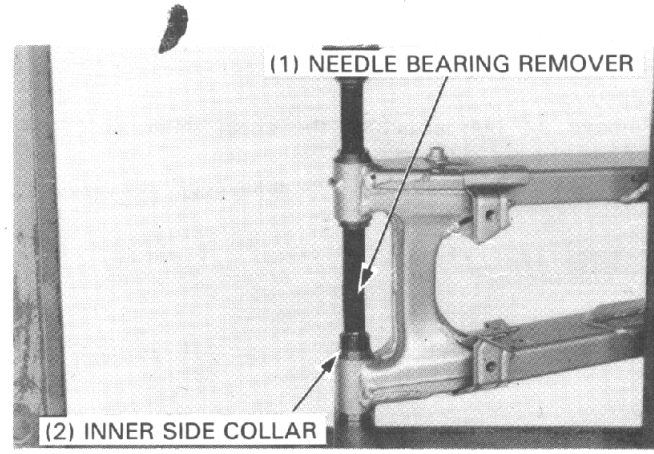
Remove the inner pivot side collars with a drift.
Drive out the pivot needle bearings and outer pivot side collars.



Drive in the inner Divot side collars.

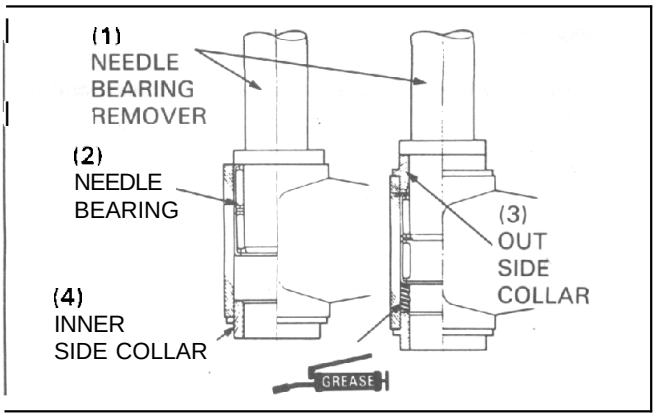
TOOL:

Needle bearing remover	07946—KA50000



Install a new needle bearing into the swingarm pivot as follows:
- Place the bearing into the pivot with its marking facing to the outside.
- Press the bearing into the pivot using the special tool, just past the edge of pivot.
- Place the outside collar into the swingarm and press the collar and needle bearing into the pivot.
- Pack grease into the cavity of the pivot as shown.

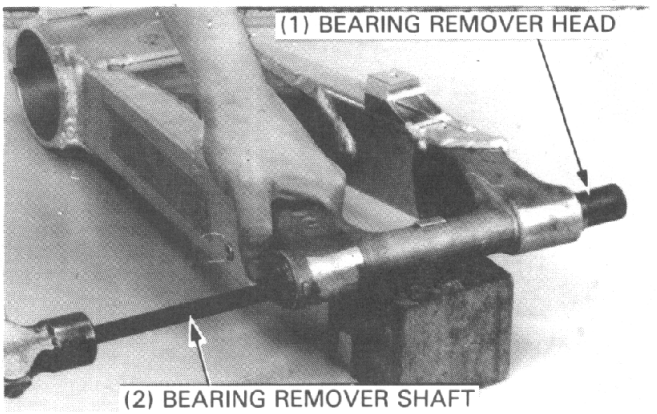
TOOL:
Needle bearing remover **07946—KA50000**



PIVOT BEARING REPLACEMENT (After '87)

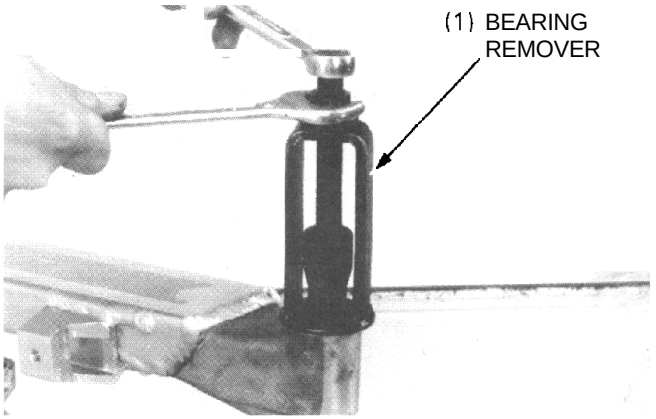
Remove the side collar.

TOOLS:
Bearing remover shaft **07GGD—0010100**
Bearing remover head, 20 mm **07746—0050600**



Remove the needle bearing.

TOOL:
Bearing remover **07931—MA70000**

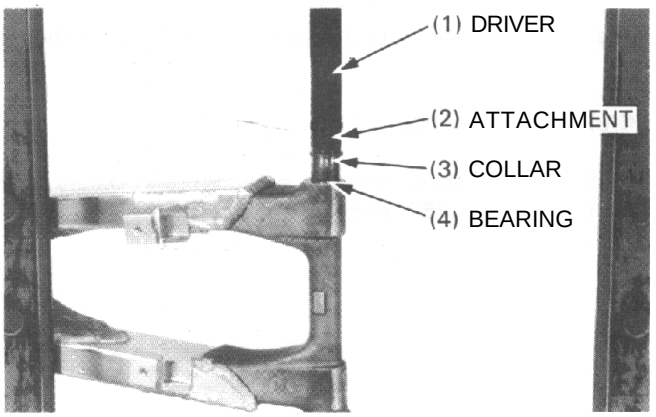


Install a new needle bearing into the swingarm pivot with the side collar.

NOTE
- Install the bearing its marking facing to outside.

TOOLS:
Driver **07749—0010000**
Attachment, **28** x **30 mm** **07946—1870100**
Pilot, 20 mm **07746—0040500**

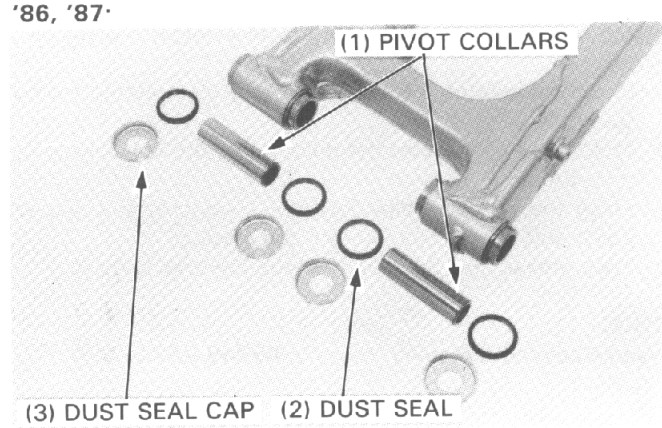
Pack grease into the cavity of the pivot.



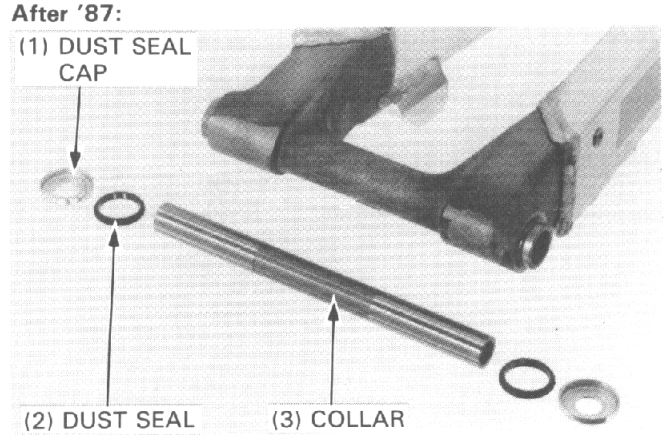
INSTALLATION

Apply grease to the pivot collars (After '87: collar) and lips of the dust seals.

'86, '87:

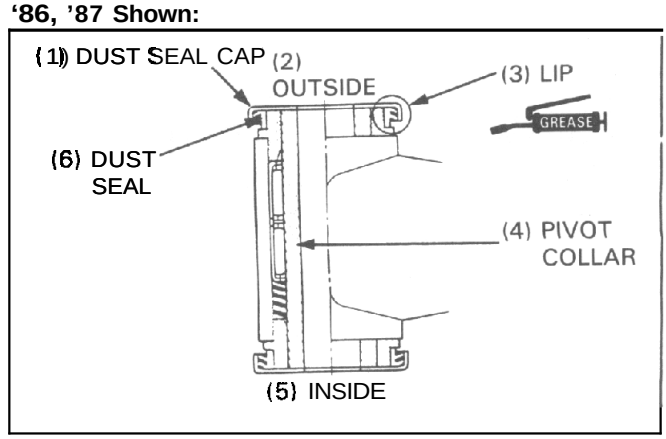


After '87:



Install the pivot collars and dust seals onto the swingarm pivot as shown.
Install the dust seal caps.

'86, '87 Shown:

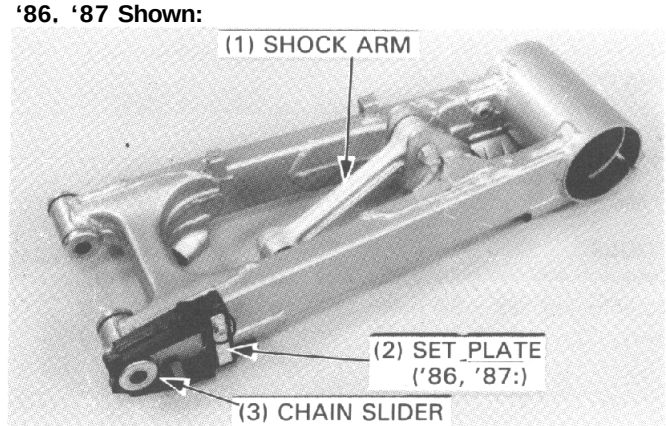


Install the shock arm onto the swingarm and tighten the pivot bolt.

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

Install the chain slider onto the swingarm and secure it with the set plate ('86, '87) and bolt.

'86, '87 Shown:



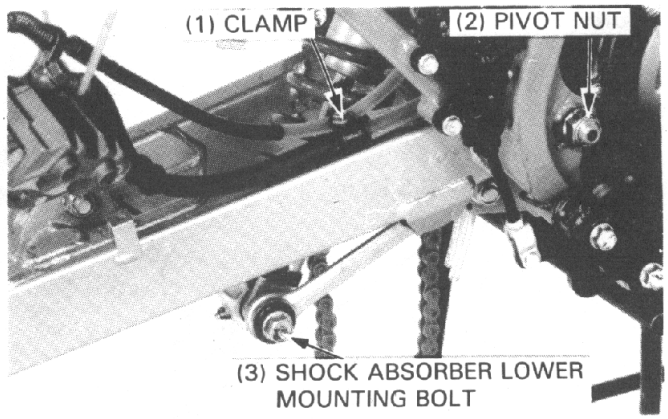
Place the swingarm into the frame and install the pivot bolt and nut.
Tighten the pivot nut.

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

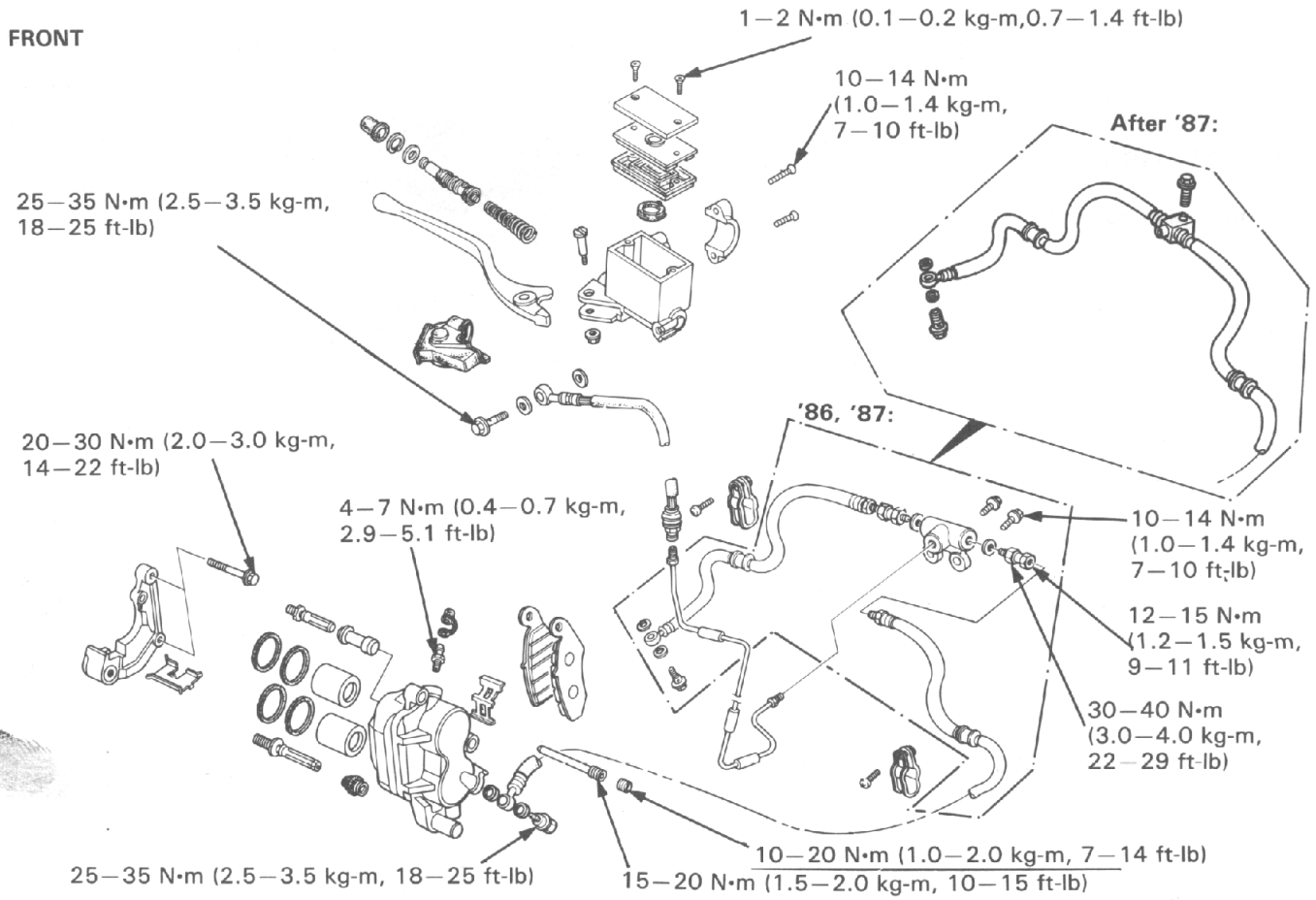
Secure the brake hose and cable to the swingarm with the clamp.
Connect the shock link and arm to the shock absorber lower mount.
Tighten the shock absorber lower mounting bolt.

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

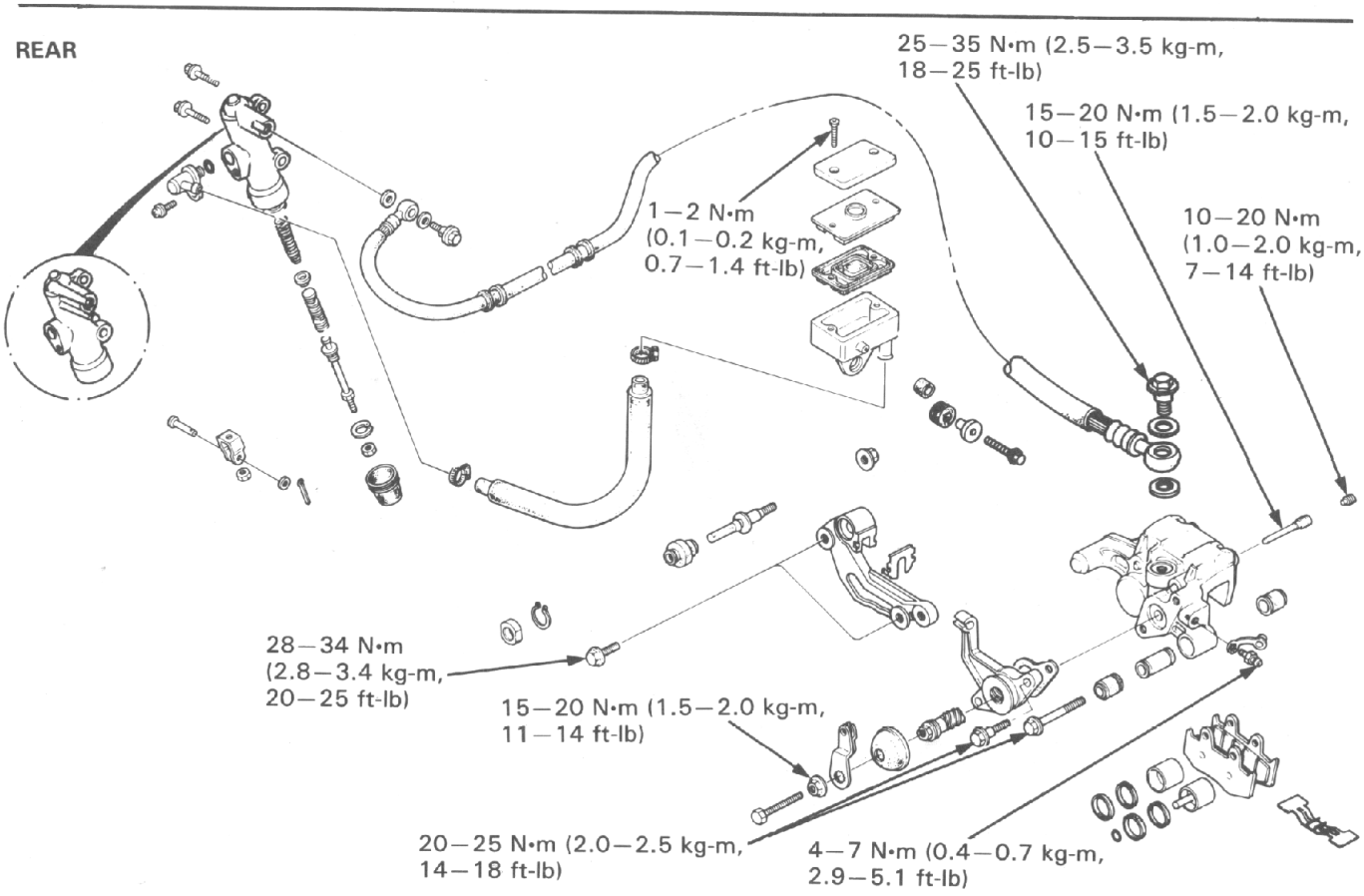
Install the axle bearing holder (page 11-10).
Install the rear axle (page 11-5) and wheels (page 11-2).



FRONT


1—2 N•m (0.1—0.2 kg-m,0.7—1.4 ft-lb)
10—14 N•m (1.0—1.4 kg-m, 7—10 ft-lb)
After '87:
25—35 N•m (2.5—3.5 kg-m, 18—25 ft-lb)
'86, '87:
20—30 N•m (2.0—3.0 kg-m, 14—22 ft-lb)
4—7 N•m (0.4—0.7 kg-m, 2.9—5.1 ft-lb)
10—14 N•m (1.0—1.4 kg-m, 7—10 ft-lb)
12—15 N•m (1.2—1.5 kg-m, 9—11 ft-lb)
30—40 N•m (3.0—4.0 kg-m, 22—29 ft-lb)
25—35 N•m (2.5—3.5 kg-m, 18—25 ft-lb)
10—20 N•m (1.0—2.0 kg-m, 7—14 ft-lb)
15—20 N•m (1.5—2.0 kg-m, 10—15 ft-lb)

REAR


25—35 N•m (2.5—3.5 kg-m, 18—25 ft-lb)
15—20 N•m (1.5—2.0 kg-m, 10—15 ft-lb)
1—2 N•m (0.1—0.2 kg-m, 0.7—1.4 ft-lb)
10—20 N•m (1.0—2.0 kg-m, 7—14 ft-lb)
28—34 N•m (2.8—3.4 kg-m, 20—25 ft-lb)
15—20 N•m (1.5—2.0 kg-m, 11—14 ft-lb)
20—25 N•m (2.0—2.5 kg-m, 14—18 ft-lb)
4—7 N•m (0.4—0.7 kg-m, 2.9—5.1 ft-lb)

13. HYDRAULIC DISC BRAKES

SERVICE INFORMATION

GENERAL

- The front and rear brake pads can be replaced 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 FOURTRAX.
- When servicing the front brake, remove the front wheels (page 10-8).
- Brake dust may contain the asbestos.

WARNING

- ***Inhaled asbestos fibers have been found to cause respiratory disease and cuncer. Never use an air hose or dry brush to clean brake.***
- ***Use OSHA-upproved vacuum cleaner or alternate method approved by OSHA designed to minimize the hazard caused by airborne asbestos fibers.***

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Front disc	Thickness	3.8—4.2 (0.15—0.17)	3.0 (0.12)
	Runout	—	0.30 (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.	25.400—25.450 (1.0000—1.0020)	25.46 (1.002)
	Piston O.D.	25.300-25.350 (0.9961-0.9980)	25.29 (0.996)
Rear master	Cylinder I.D		
	Piston O.D.	13.957-13.984 (0.5495—0.5506)	13.945 (0.5490)
Rear caliper	Cylinder I.D.	25.400—25.450 (1.0000—1.0020)	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		

TORQUE VALUES

Bleed valve	4—7 N·m (0.4—0.7 kg-m. 2.9—5.1 ft-lbl
Front brake caliper mounting bolt	20—30 N·m (2.0—3.0 kg-m, 14—22 ft-lb)
Pad pin bolt	15—20 N·m (1.5—2.0 kg-m, 10—15 ft-lb)
Pad pin bolt plug	10—20 N·m (1.0—2.0 kg-m, 7—14 ft-lb)
Rear caliper bracket mounting bolt	28—34 N·m (2.8—3.4 kg-m, 20—25 ft-lb)
Footpeg mounting bolt ('86, '87:)	50—60 N·m (5.0—6.0 kg-m, 36—43 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-lbl
Rear brake caliper mounting bolt	20—25 N·m (2.0—2.5 kg-m, 14—18 ft-lbl
Front master cylinder holder	10—14 N·m (1.0—1.4 kg-m. 7—10 ft-lb)
Master cylinder cover screw	1—2 N·m (0.1—0.2 kg-m, 0.7—1.4 ft-lb)
Brake hose joint 1'86, '87:)	
hose side:	12—15 N·m (1.2—1.5 kg-m, 9—11 ft-lb)
joint side:	30—40 N·m (3.0—4.0 kg-m, 22—29 ft-lb)

TOOL

Special	
Snap ring pliers	07914—3230001

TROUBLESHOOTING

Brake leverlpedal soft or spongy
- Air bubbles in hydraulic system
- Low fluid level
- Hydraulic system leaking

Brake leverlpedal too hard
- Sticking piston(s)
- Clogged hydraulic system
- Pads glazed or worn excessively

Brake drag
- Hydraulic system sticking
- Sticking piston(s)

Brake 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

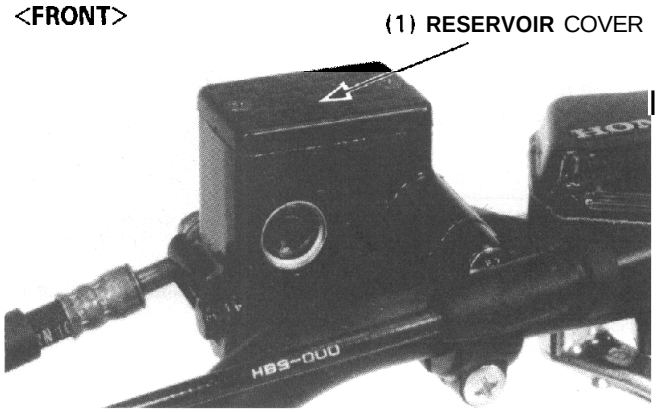
Do not allow foreign material to enter the system when filling the reservoir.

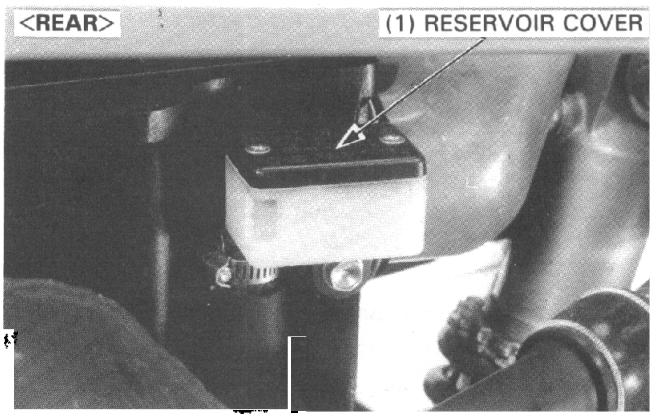
- ***Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.***

NOTE

- When servicing the front brake, remove the front wheels (page 10-8).

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

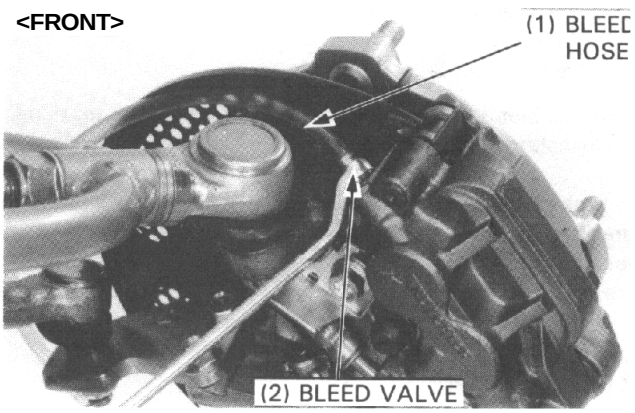


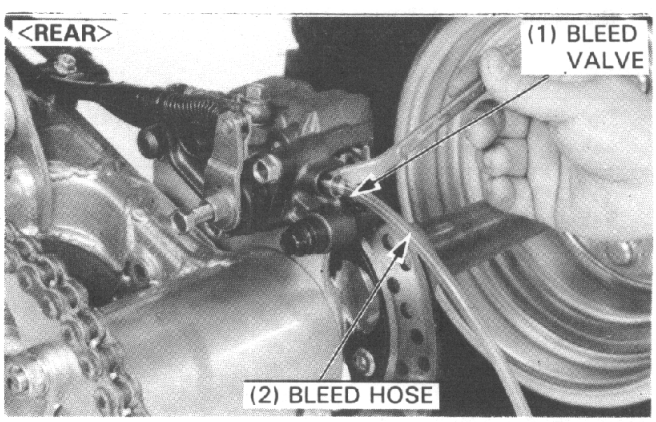


Connect a bleed hose to the bleed valve.

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.





BRAKE FLUID FILLING

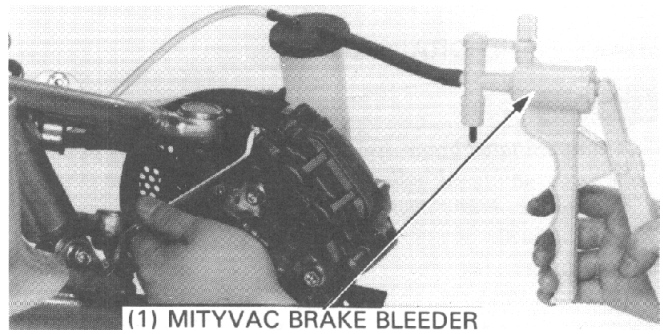
Fill the reservoir with DOT-4 brake fluid from a sealed container.

CAUTION

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

Connect the commercially available brake bleeder to the bleed valve.

<FRONT>



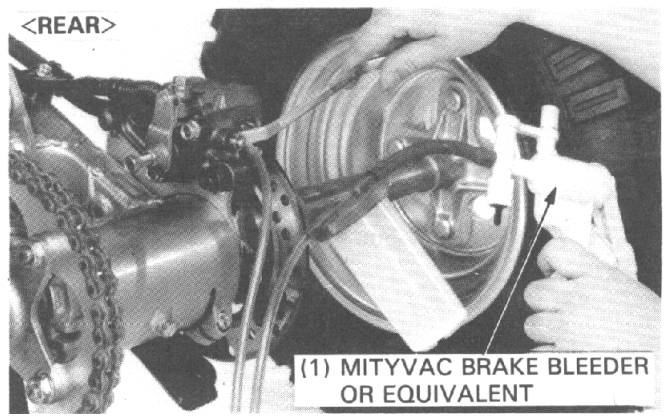
(1) MITYVAC BRAKE BLEEDER OR EQUIVALENT

Pump the brake bleeder and loosen the bleed valve.
Add fluid when the fluid level in the master cylinder reservoir is low.

NOTE

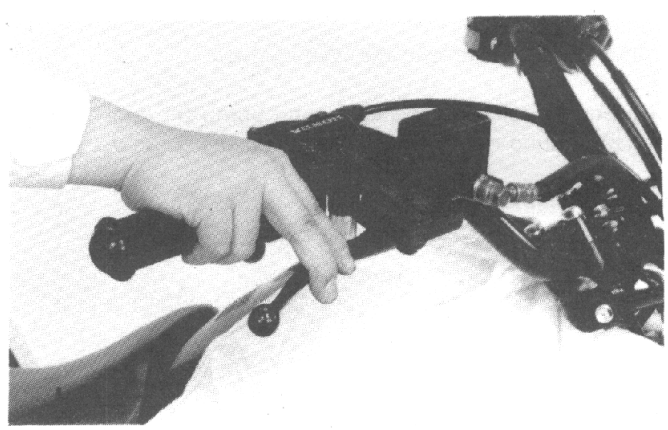
- Check the fluid level often while bleeding the brakes to prevent air from being pumped into the system.
- When using a brake bleeding tool, follow the manufacturer's operating instructions.

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 small hole inside the reservoir, and lever (or pedal) resistance is felt.

BLEEDING

1. Squeeze the brake lever (or depress the brake pedal), open the bleed valve 1/2 turn and then close the valve.

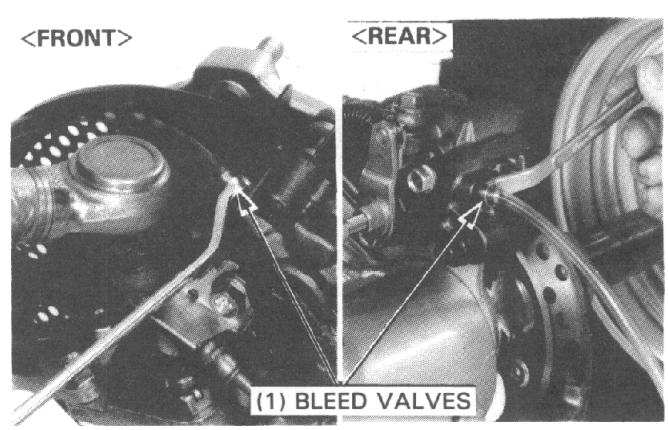
NOTE

- 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.

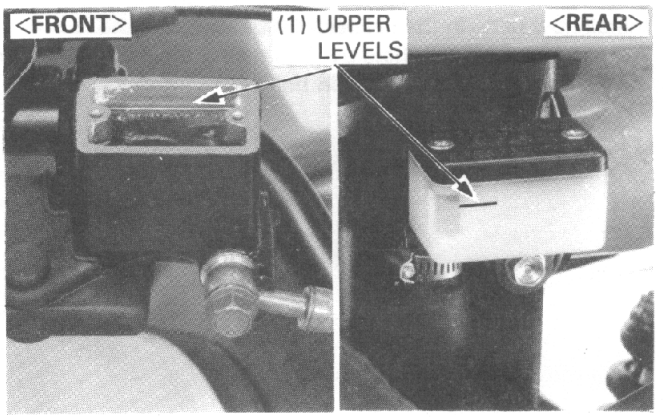
TORQUE: 4 – 7 N·m (0.4 – 0.7 kg-m, 2.9 – 5.1 ft-lb)



Fill the fluid reservoir to the upper level mark.

Reinstall the diaphragm and reservoir cover.

TORQUE: 1 – 2 **N·m (0.1 – 0.2 kg-m, 0.7 – 1.4 ft-lb)**



WARNING

- ***A** contaminated brake disc or pad reducesstoppingpower. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.*

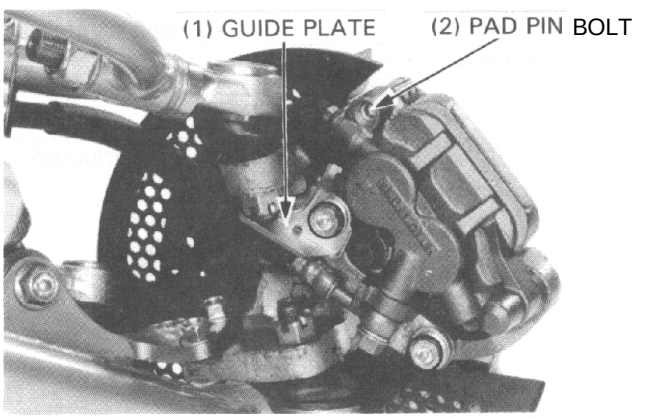
BRAKE PAD REPLACEMENT

NOTE

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

FRONT BRAKE

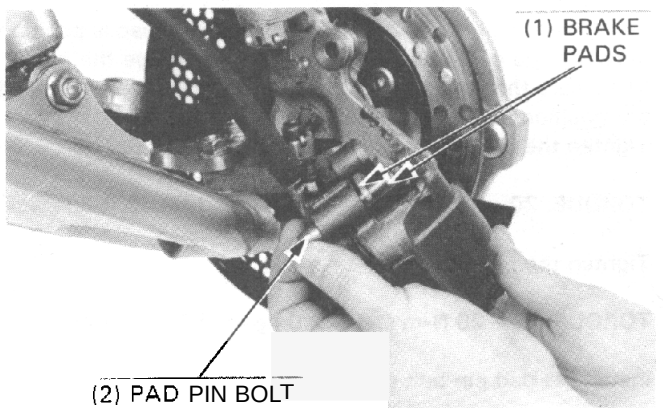
Raise the front wheel off the ground by placing a block or safety stand under the engine.
Remove the front wheel lpage 10-8).
Remove the pad pin bolt plug from the caliper.
Loosen the pad pin bolt.
Remove the front caliper mounting bolts and guide plate.



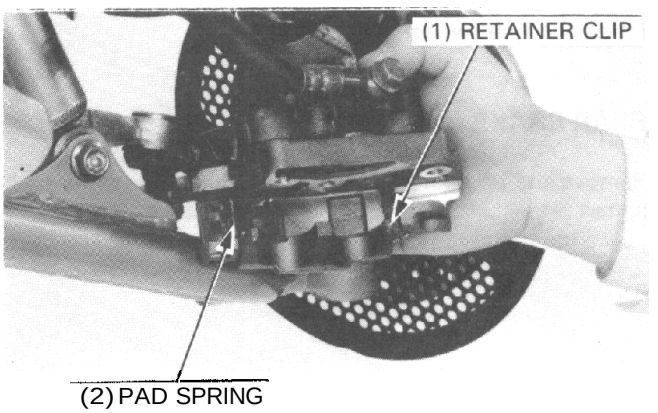
Remove the pad pin bolt and brake pads.

WARNING

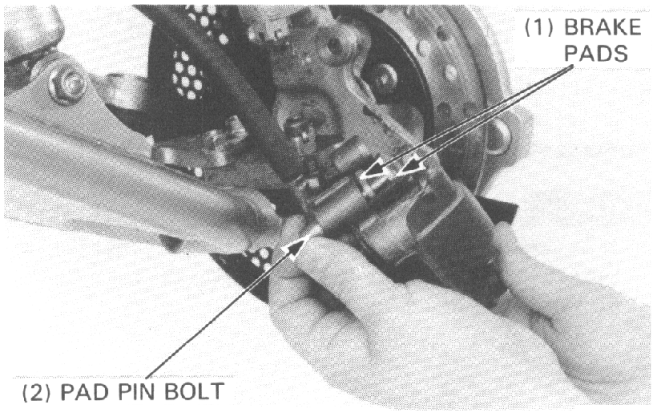
- *Inhaled asbestos fibers have been found to cause respiratory disease and cancer. Never use an air hose or dry brush to clean brake. Use OSHA-approved vacuum cleaner or alternate method approved by **OSHA** designed to minimize the hazard caused by airborne asbestos fibers.*



Make sure that the pad spring and retainer clip are installed in the position shown.



Install new pads in the caliper.
Align the pad pin bolt hole by depressing the pads against the caliper, and install the pad pin bolt.



Push the caliper pistons in all the way, being careful not to damage the pads.

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 the caliper to the knuckle so that 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: 20—30 N·m (2.0—3.0 kg-m. 14— 22 **ft-lb)**

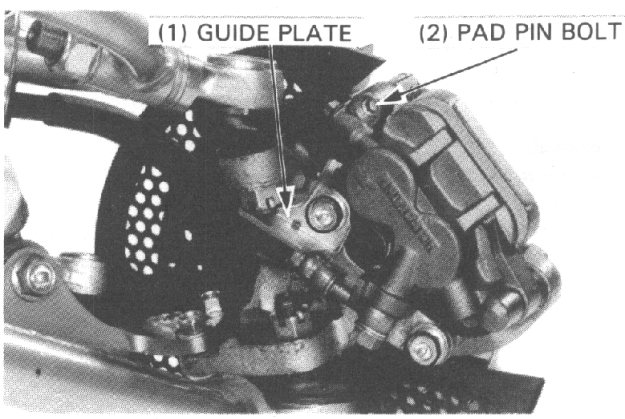
Tighten the pad pin bolt

TORQUE: 15—20 **N·m (1.5—2.0 kg-m. 10—14 ft-lb)**

Install the pad pin bolt plug and tighten it.

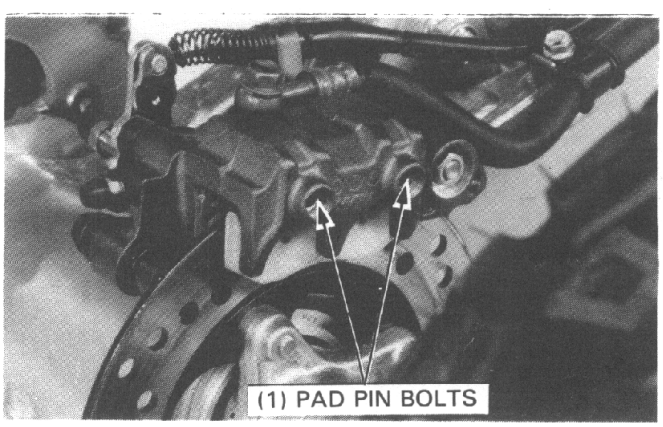
TORQUE: 10—20 **N·m (1.0—2.0 kg-m,** 7— 14 ft-lbl

Install the front wheel (page 10-8).



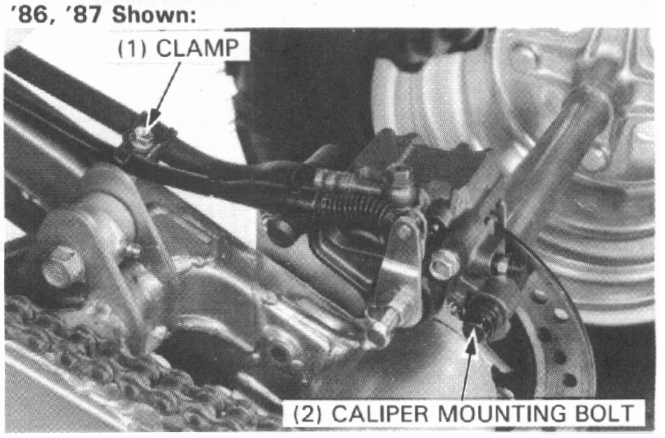
REAR BRAKE

Remove the pad pin bolt plugs, and then loosen the pad pin bolts.



'86, '87: Remove the hose/cable clamp.
Remove the rear brake caliper mounting bolt.

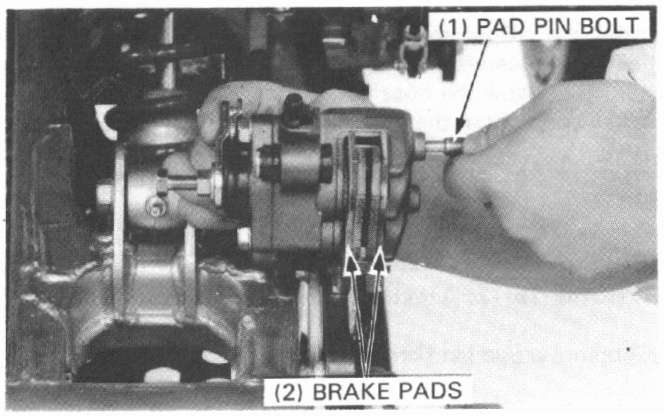
'86, '87 Shown:



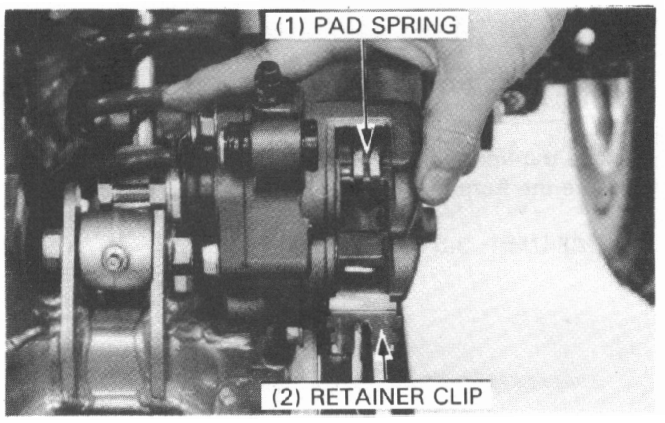
Raise the caliper out of the way.
Remove the pad pin bolts and brake pads.

WARNING

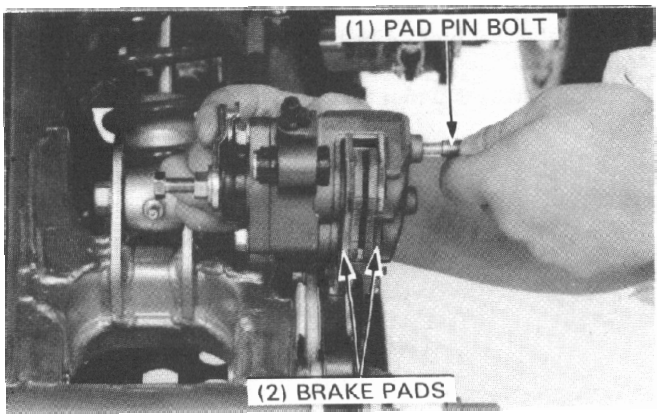
- ***Inhaled asbestos fibers have been found to cause respiratory disease and cancer. Never use an air hose or dry brush to clean brake. Use OSHA-approved vacuum cleaner or alternate method approved by OSHA designed to minimize the hazard caused by airborne asbestos fibers.***



Make sure that the pad spring and retainer clip are installed in the position shown.



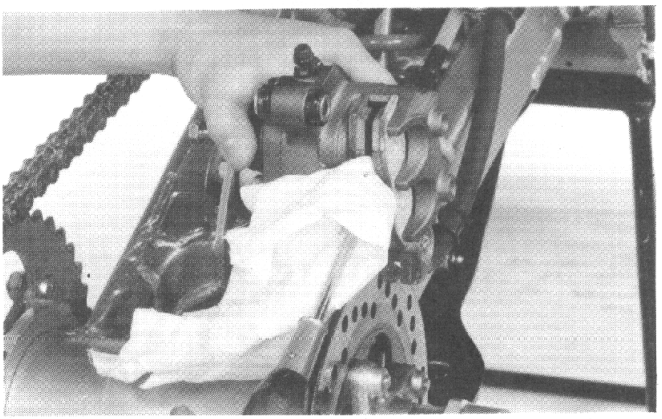
Install new pads in the caliper.
Align the pad pin bolt holes by depressing the pads against the caliper, and install the pad pin bolts.



Push the caliper pistons in all the way, being careful not to damage the pads.

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 the caliper so that the disc is positioned between the pads, being careful not to damage the pads.
'86, '87: Install the hose/cable clamp.
Install and tighten the caliper mounting bolt.

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

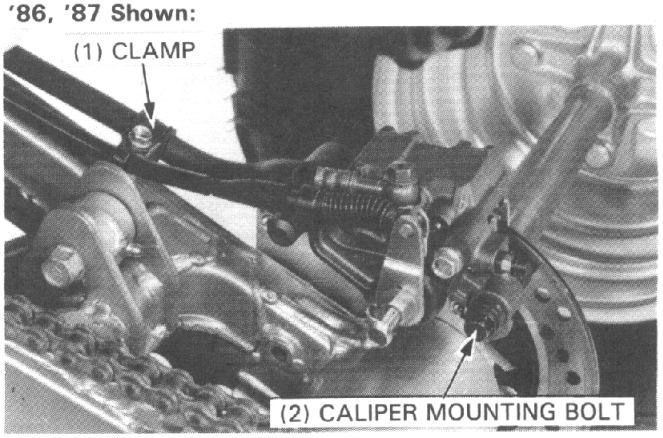
Tighten the pad pin bolts.

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 11.0—2.0 kg-rn, 7—14 ft-lb)

'86, '87 Shown:

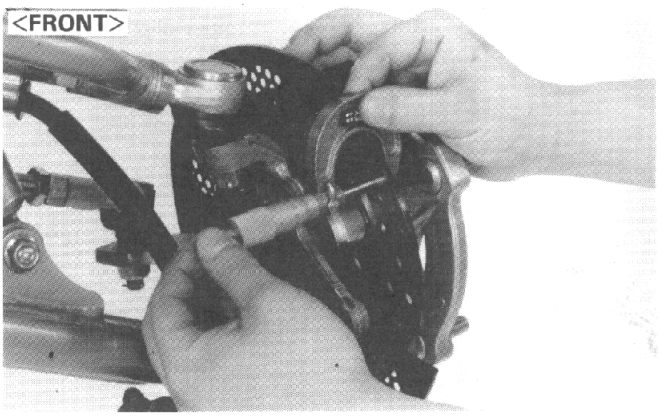


BRAKE DISC

INSPECTION

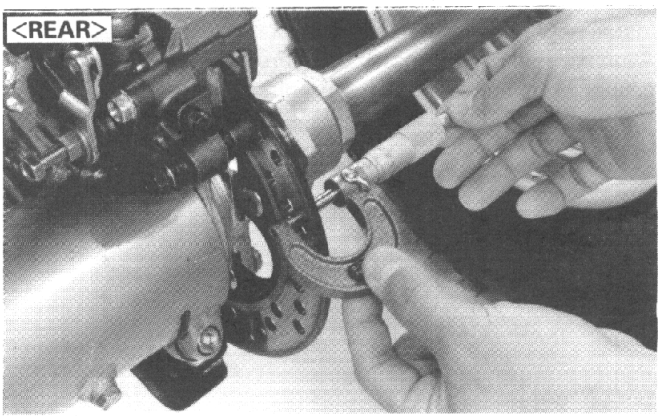
Remove the front wheel (page 10-8).
Measure the front brake disc thickness with a micrometer.

SERVICE LIMIT: 3.0 mm (0.12 in)



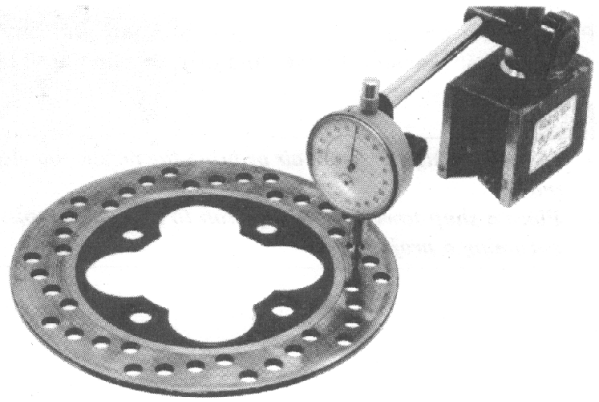
Measure the rear brake disc thickness with a micrometer.

SERVICE LIMIT: **3.0 mm 10.12 in)**



Remove the front and rear brake discs (pages 10-9, 11-4).
Measure each disc for warpage.

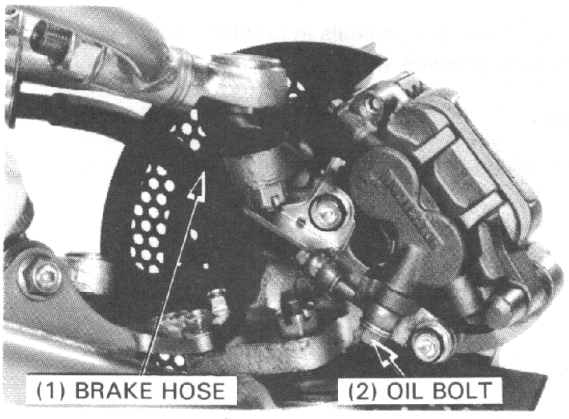
SERVICE LIMIT: 0.30 **mm** (0.012 in)



FRONT CALIPER

REMOVAL

Remove the front wheel (page 10-8).
Drain the brake fluid from the front hydraulic system (page 13-31.
Remove the oil bolt, sealing washers and front brake hose from the caliper.
Remove the caliper and brake pads (page 13-51.



WARNING

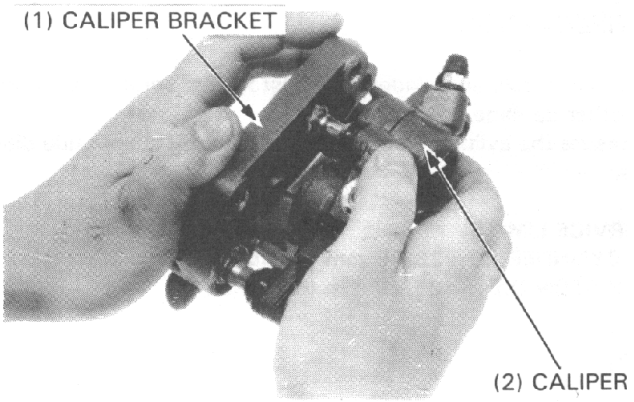
- *Inhaled asbestos fibers have been found* **to** *cause respiratory disease and cancer. Never use an air hose or dry brush to clean brake. Use OSHA-approved vacuum cleaner or alternate method approved by OSHA designed to minimize the hazard caused by airborne asbestos fibers.*

CAUTION

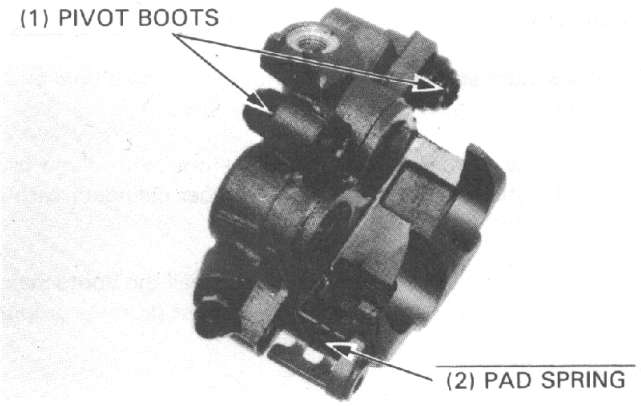
- *Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the sytem is serviced.*

DISASSEMBLY

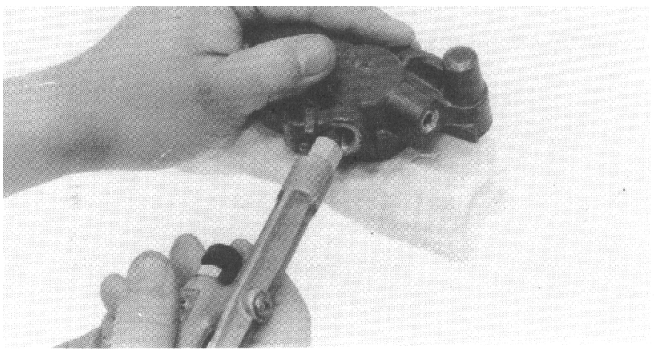
Remove the caliper bracket from the caliper.



Remove the pad spring.
Remove the caliper pivot boots.



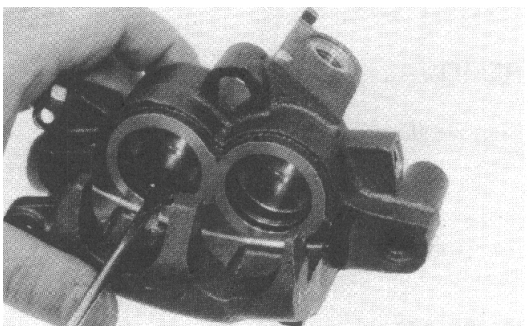
Position the caliper with the pistons down and apply small squirts of air pressure to the fluid inlet to remove the pistons.



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.*

Push the dust and piston seals in and lift them out.
Clean the seal grooves with clean brake fluid.

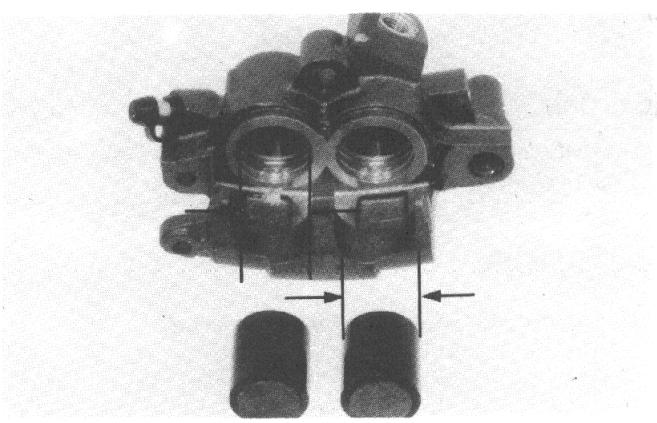


CAUTION

- *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.: 25.29 mm (0.996 in)

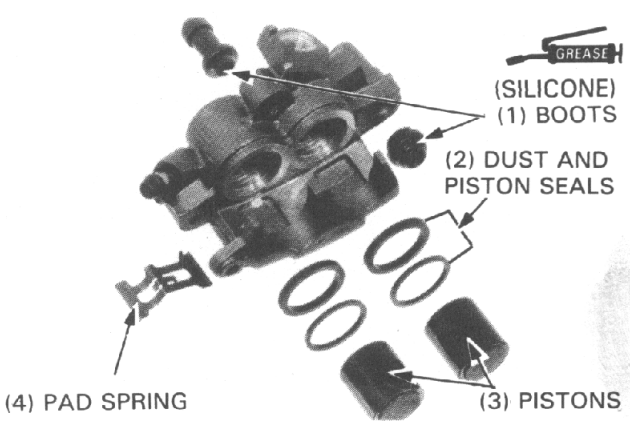
ASSEMBLY

Coat new dust and piston seals with clean brake fluid and install them in the seal grooves in the caliper.

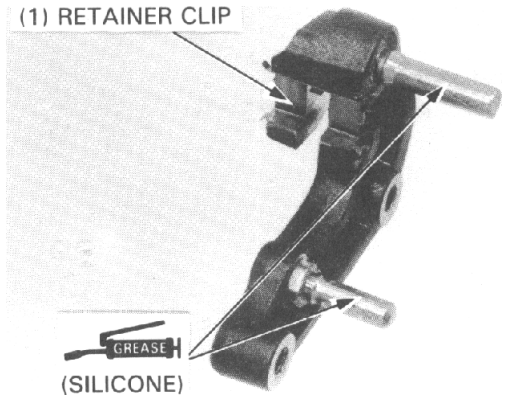
Lubricate the caliper cylinders and pistons with clean brake fluid and install the pistons into the caliper cylinders with the piston pad end facing the pad side.

Apply silicone grease to the boots and install the boots making sure that the boots are seated in the caliper grooves properly.

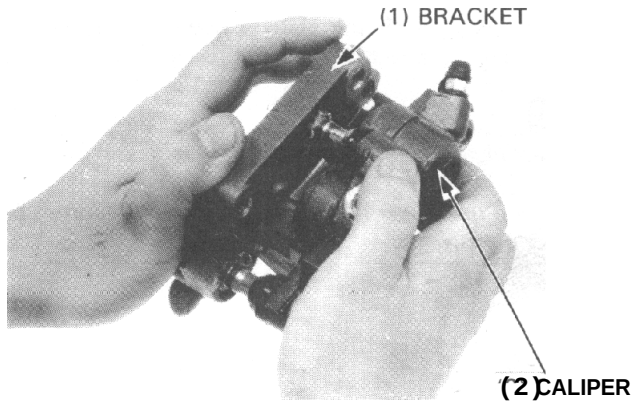
Install the pad spring.



Make sure that the retainer clip is installed properly on the caliper bracket.
Coat the caliper pin with silicone grease.



Install the caliper bracket onto the caliper.



Install the brake pads and caliper (page 13-6).
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)

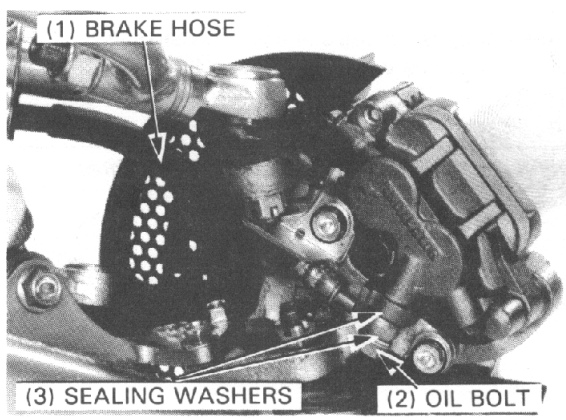
Route the front brake hose as shown.

Fill the front brake reservoir and bleed the front brake system (page 13-41.

REAR CALIPER

REMOVAL

Drain the brake fluid from the rear hydraulic system (page 13-3).
'86, '87: Remove the hose/cable clamp.
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 oil bolt, sealing washers and rear brake hose from the rear brake caliper.



WARNING

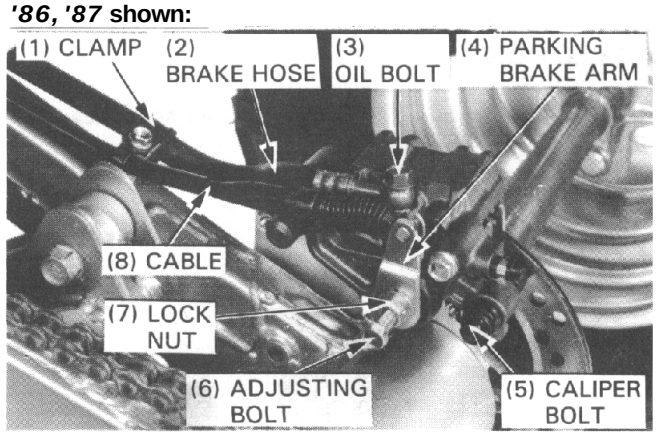
- *Inhaled asbestos fibers have been found to cause respiratory disease and cancer. Never use an air hose or dry brush to clean brake. Use OSHA-approved vacuum cleaner or alternate method approved by OSHA designed to minimize the hazard caused by airborne asbestos fibers.*

CAUTION

- *Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.*

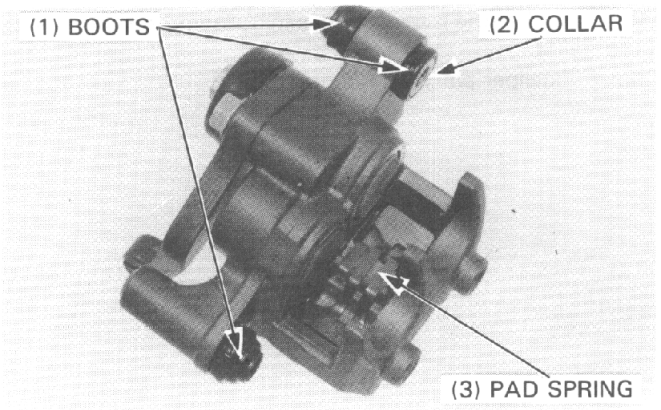
Remove the brake pads (page 13-6).
Pivot the rear caliper up out of the way and remove the caliper from the caliper pin on the bracket.

***'86, '87* shown:**



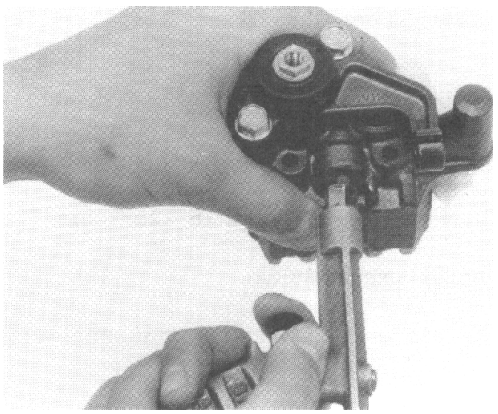
DISASSEMBLY

Remove the pad spring.
Remove the 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.

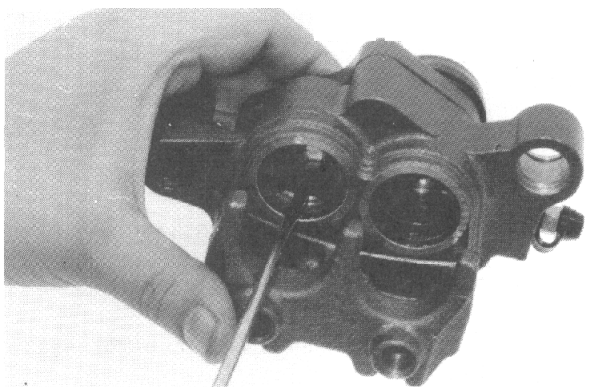
- ***Do not use high pressure air or bring the nozzle too close to the inlet.***
- ***Place a shop towel over the piston to prevent the pistons from becoming a projectile.***



Push the dust and piston seals in and lift them out.
Clean the seal grooves with clean brake fluid.

CAUTION

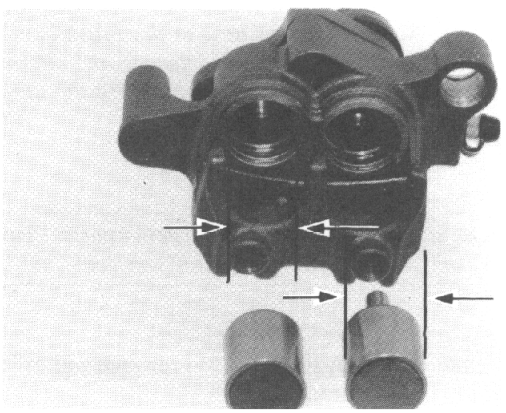
- ***Be careful not to damage the piston sliding surfaces.***



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)

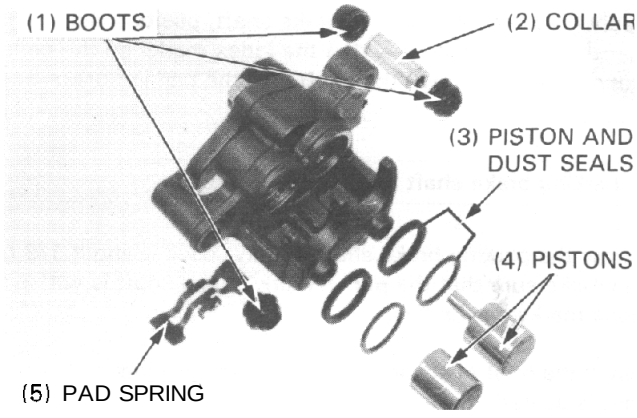


ASSEMBLY

Coat new dust and piston seals with clean brake fluid and install them in the seal groove in the caliper.

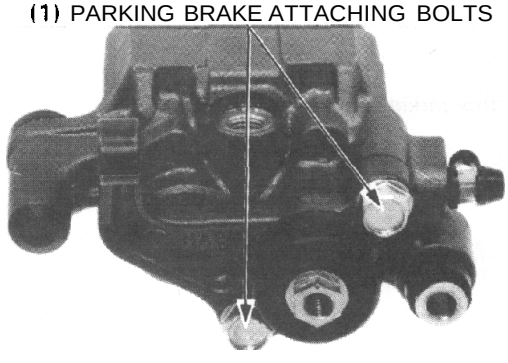
Lubricate the caliper cylinders and pistons with brake fluid, and install the pistons with the piston pad end facing the pad.

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.

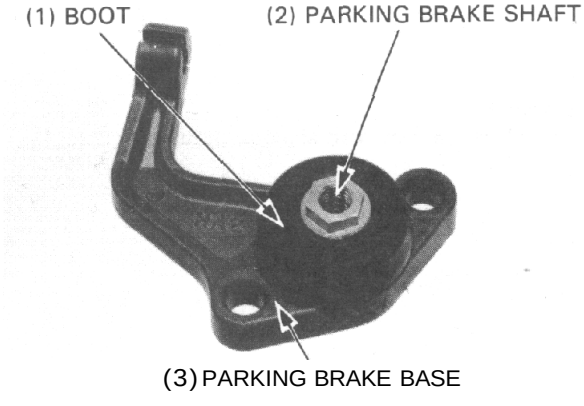


PARKING BRAKE MECHANISM

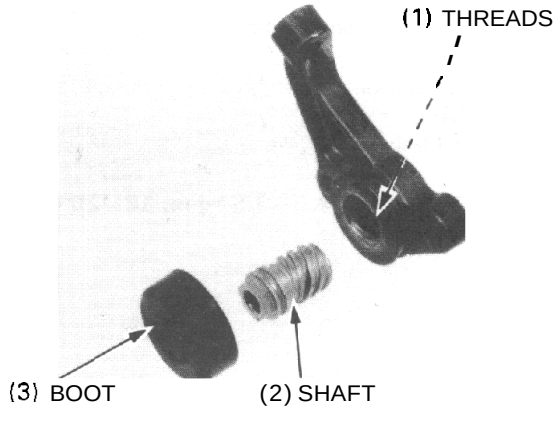
Remove the parking brake attaching bolts and parking brake from the caliper.



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.



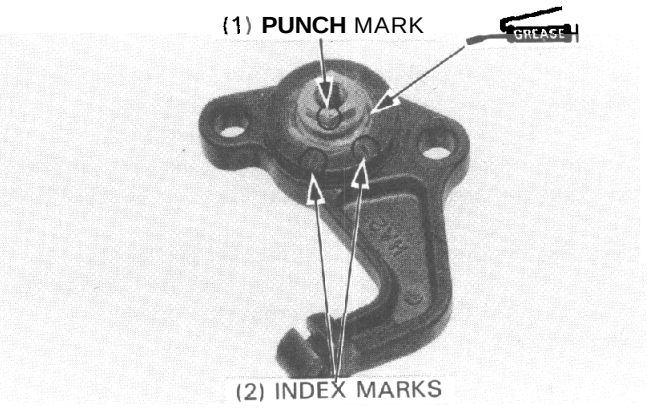
Apply grease to the parking brake shaft, position the shaft so that the punch mark is within the index marks on the parking brake base and thread the shaft into the parking brake base.

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.

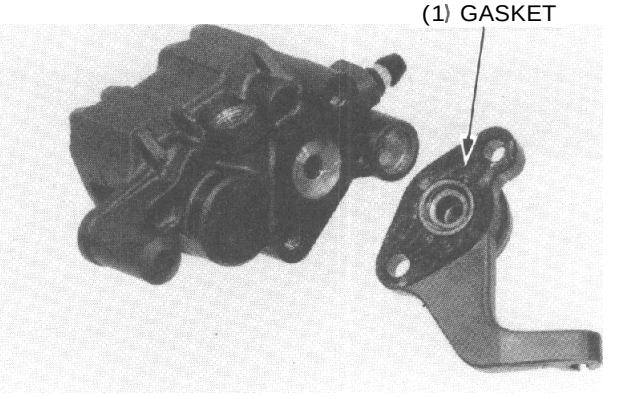
Install the boot over the shaft and base, making sure that the boot is seated in the groove in the shaft and base properly.



Install the parking brake onto the rear brake caliper with a new gasket.

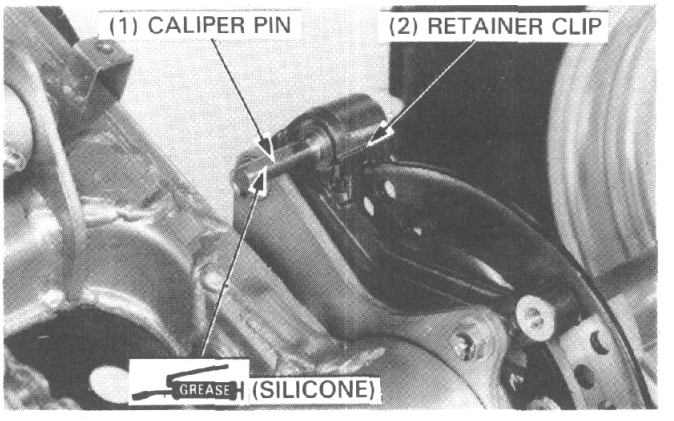
Tighten the parking brake attaching bolts.

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



INSTALLATION

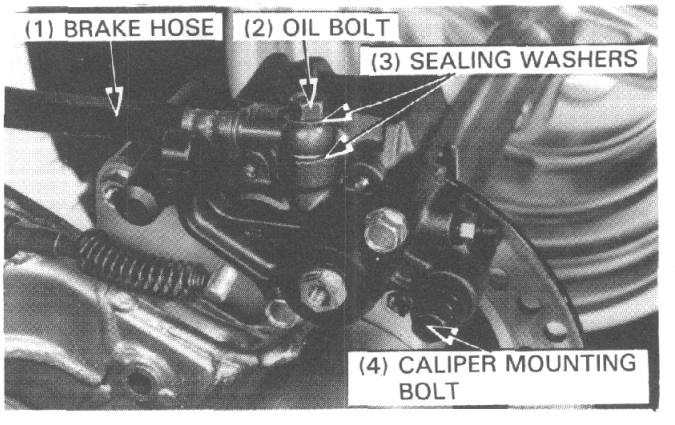
Make sure that the retainer clip is installed properly on the caliper bracket.
Coat the caliper pin with silicone grease.



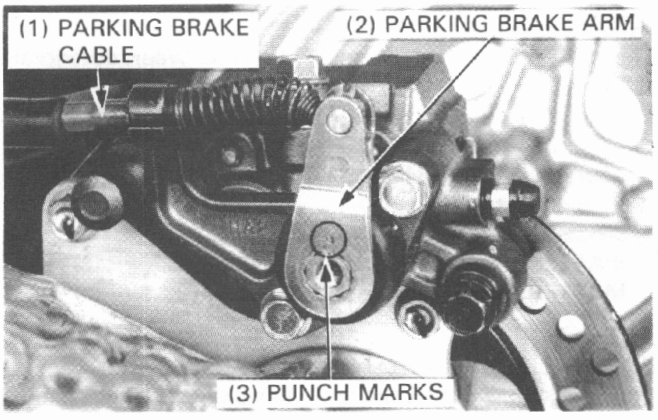
Install the brake pads and caliper (page 13-7)

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-lbl



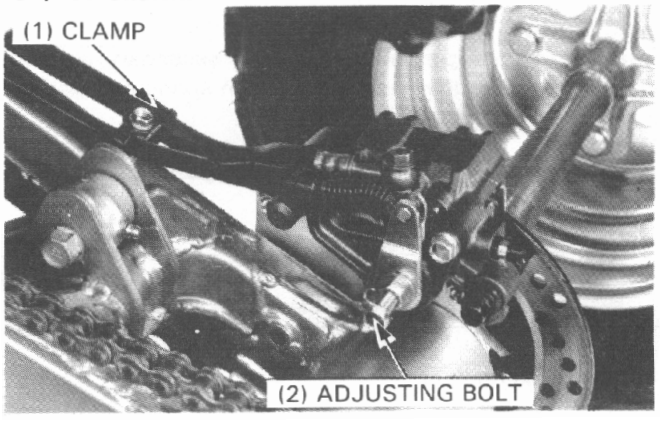
Install the parking brake cable to the parking brake.
Connect the parking brake cable to the parking brake arm and install the arm on the shaft, aligning the punch marks on the shaft and arm.



'86, '87: Install the hose/cable clamp.

Install the parking brake adjusting bolt.
Fill and bleed the rear brake system (page 13-4).
Adjust the parking brake (page 2-13).

'86, '87 Shown:



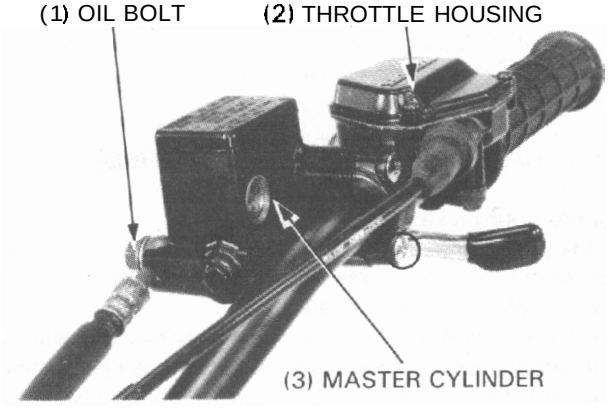
FRONT MASTER CYLINDER

REMOVAL

Drain the brake fluid from the front hydraulic system (page 13-3).
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

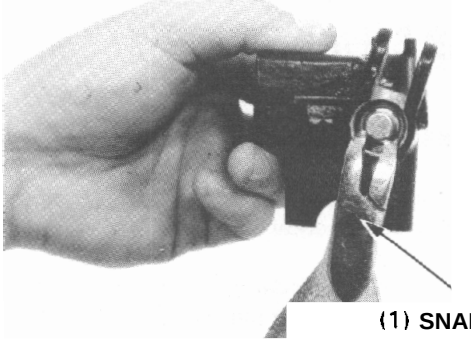
Remove the piston boot and the snap ring from the master cylinder body.

TOOL:

Snap ring pliers	**07914—3230001**

Remove the master piston and spring from the master cylinder.

Clean the master cylinder, reservoir and master piston in clean brake fluid.



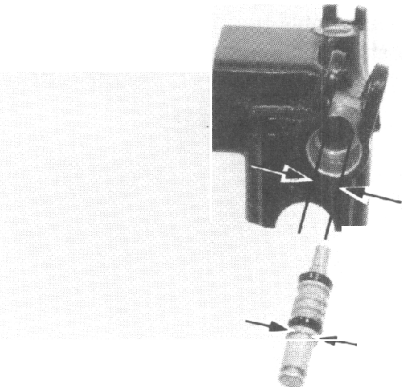
INSPECTION

Check the primary and secondary cups for wear, deterioration or damage.
Check the master cylinder bore 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.



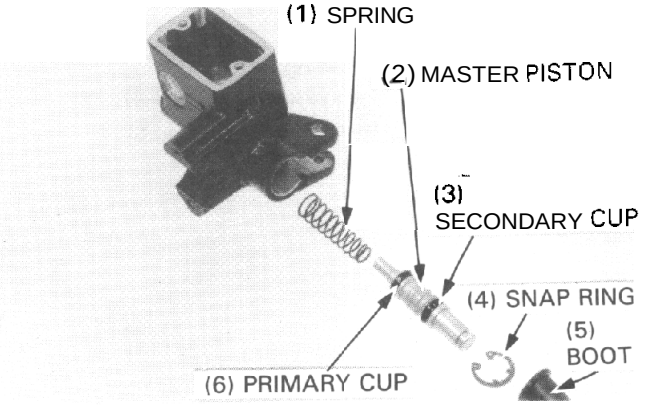
ASSEMBLY

Coat the master piston, primary and secondary cups with clean brake fluid, then install the piston spring and piston.
Install the snap ring.

TOOL:
Snap ring pliers **07914—3230001**

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.***

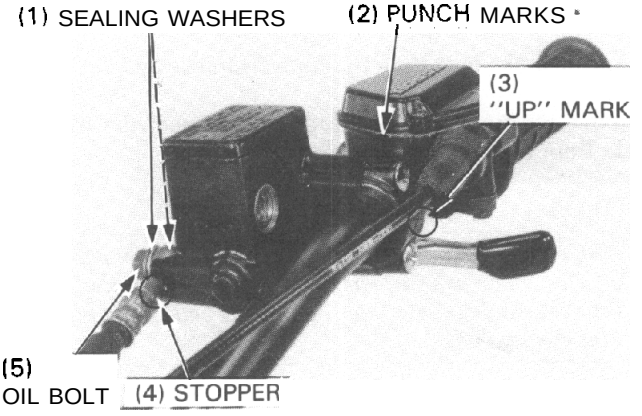


Install the piston boot.

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.
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.
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.

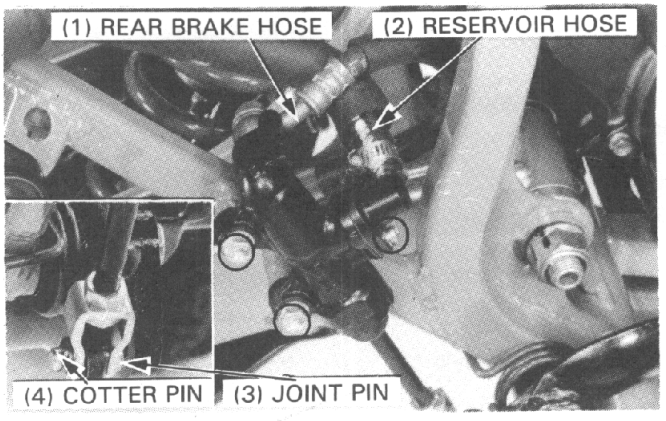
TORQUE: 25—35 N·m (2.5—3.5 kg-m, 18—25 ft-lbl

Fill and bleed the front master cylinder (page **13-4).**

REAR MASTER CYLINDER

REMOVAL

Drain the brake fluid from the rear hydraulic system (page 13-3).
Disconnect the rear brake hose from the master cylinder.
Remove the hose connector screw and disconnect the reservoir hose.
Disconnect the rear master cylinder push rod from the rear brake pedal by removing the cotter pin and joint pin.
Remove the rear master cylinder mounting bolts.

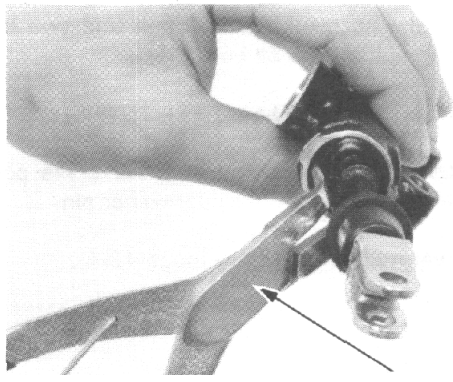


DISASSEMBLY

Remove the piston boot and the snap ring from the master cylinder.

TOOL:
Snap ring pliers **07914—3230001**

Remove the master piston and spring from the master cylinder.
Clean the master cylinder and master piston in clean brake fluid.


(1) SNAP RING PLIERS

INSPECTION

Check the primary and secondary cups for wear, deterioration or damage.

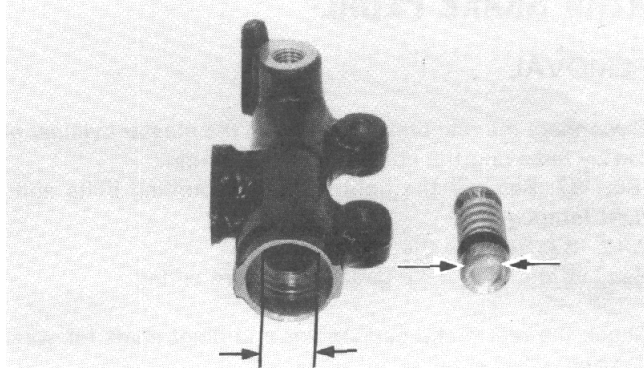
Check the master cylinder and master piston for scratches, scoring or damage.

Measure the master cylinder inside diameter and master piston outside diameter.

SERVICE LIMITS:
MASTER CYLINDER I.D.: 14.055 mm 10.5533 in)
MASTER WSTON O.D.: 13.945 mm 10.5490 in)

NOTE

- The piston, piston cup and spring must be replaced as a set.



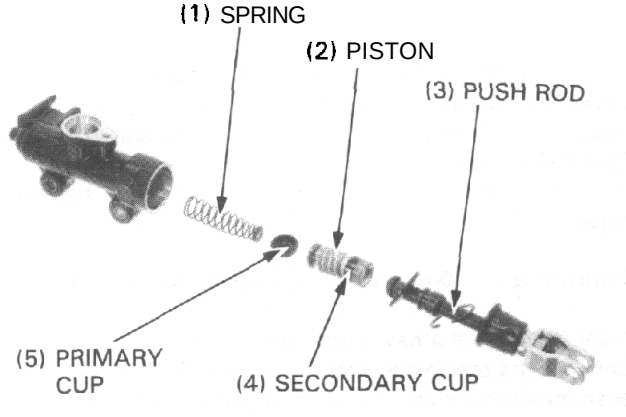
ASSEMBLY

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.

TOOL:
Snap ring pliers **07914—3230001**

CAUTION

- ***Do not allow the lips of the cups to turn inside out and be certain the snap ring is seated in the groove.***

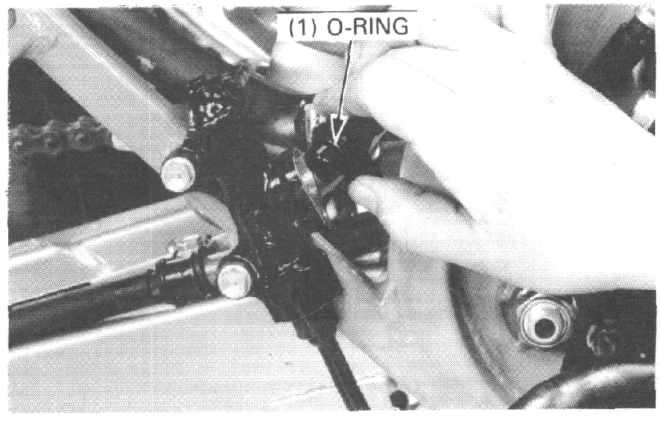


Install the piston boot.

INSTALLATION

Install the master cylinder to the frame and tighten the mounting bolts securely.

Connect the reservoir joint hose to the master cylinder with a new O-ring and the screw.

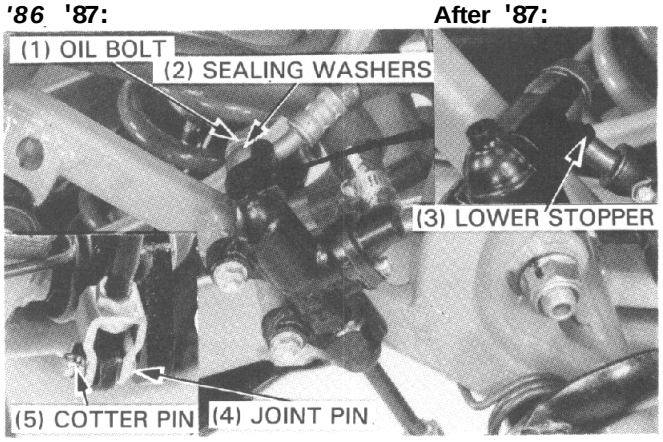


Connect the rear brake hose with the oil bolt and two new sealing washers, and tighten the oil bolt.

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

Connect the master cylinder push rod and rear brake pedal with the joint pin and secure it with a new cotter pin.

Fill and bleed the rear hydraulic system (page 13-4).

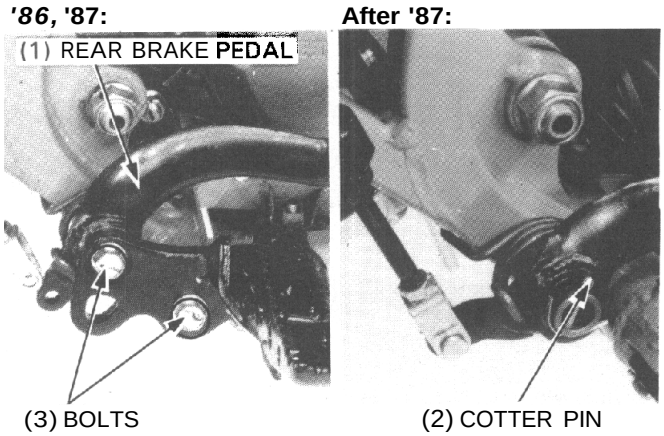


REAR BRAKE PEDAL

REMOVAL

Disconnect the rear brake pedal from the master cylinder push rod by removing the cotter pin and joint pin.
'86, '87: Remove the right footpeg mounting bolts and the right footpeg.
After '87: Remove the cotter pin.
Remove the rear brake pedal and return spring.

Check the rear brake pedal pivot and pivot shaft for wear or damage.

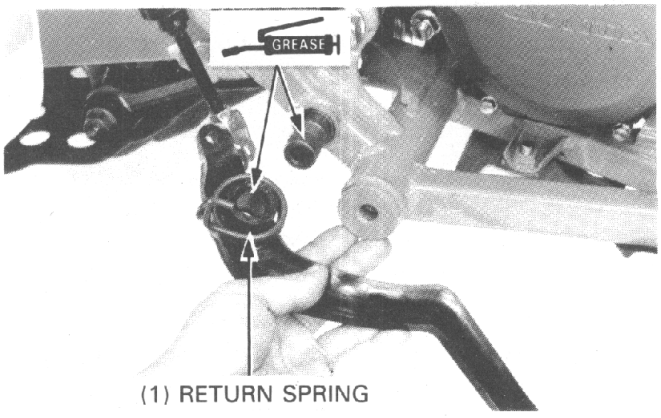


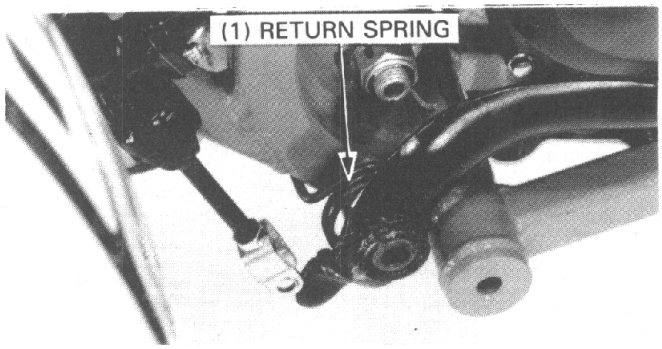
INSTALLATION

Apply grease to the pivot shaft and pedal pivot.
Install the return spring over the rear brake pedal.
Install the rear brake pedal and hook the spring end to the frame as shown.
'86, '87: Install the right footpeg and tighten the monting bolts.

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

After '87: Install a new cotter pin.
Connect the rear brake arm to the rear brake master cylinder push rod with the joint pin and secure it with a new cotter pin.





14. FENDERS/EXHAUST SYSTEM

SERVICE INFORMATION

GENERAL

- Refer to section 2 for spark arrester cleaning.
- Replace the exhaust chamber with a new one if it is deformed.

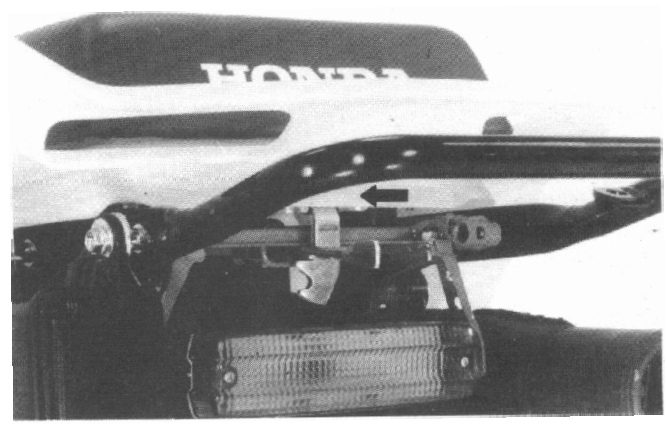
WARNING

- *Do not service the exhaust system while it is hot.*

SEAT/ REAR FENDER

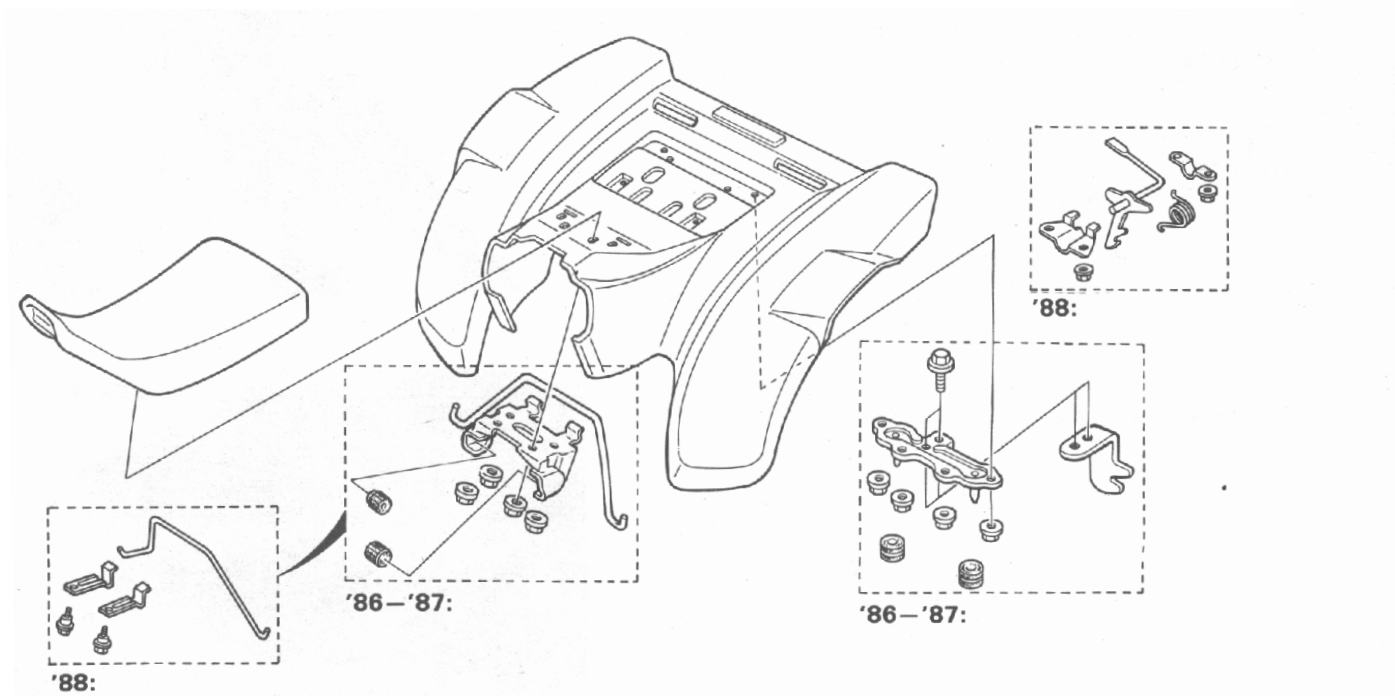
REMOVAL/INSTALLATION

Release the seat lock by moving the lever in the direction shown and remove the seat/rear fender.

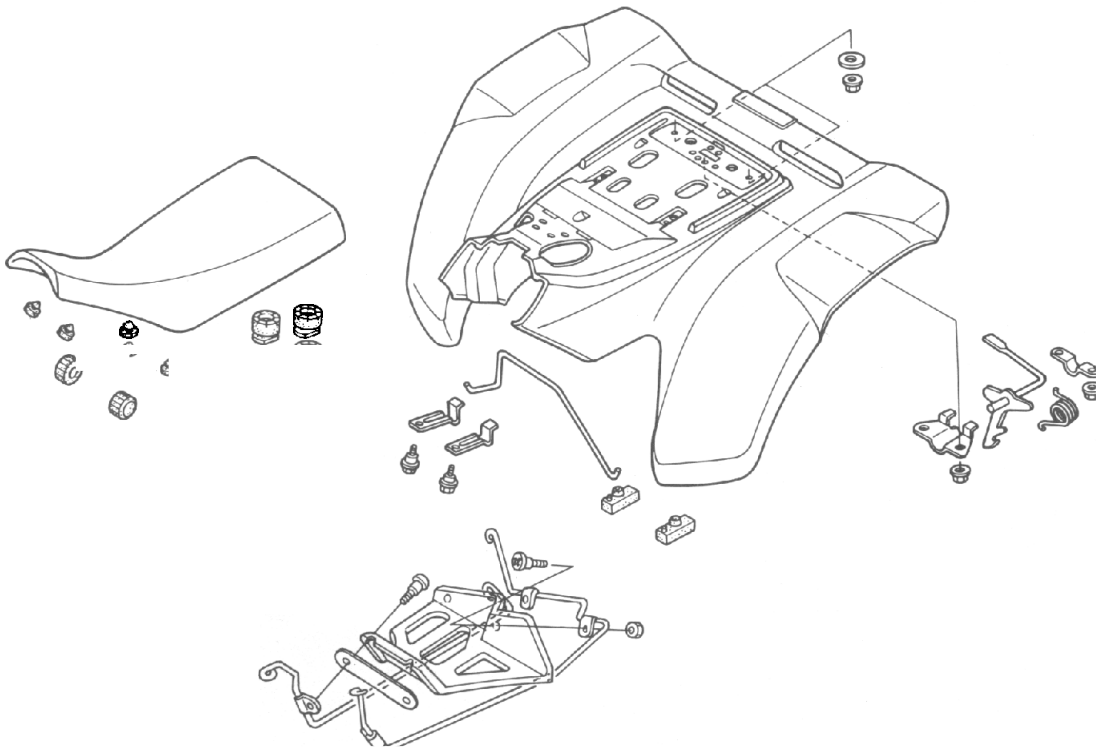


Apply grease to the seat catch.
Install the seat/rear fender in the reverse order of removal.

'86–'88:



After '88:

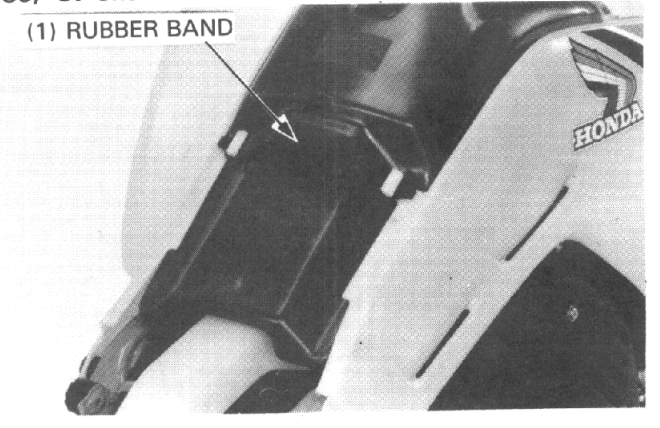


FRONT FENDER

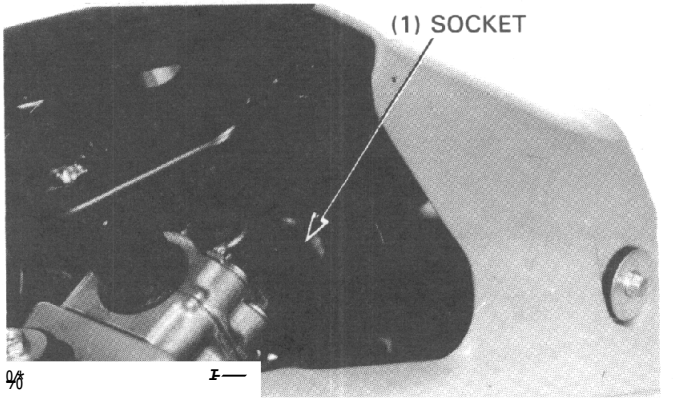
REMOVAL/INSTALLATION

Remove the seat/rear fender (page 14-1).
Unhook the rubber band.

'86, '87 Shown:



After '87:
Disconnect the headlight bulb socket.

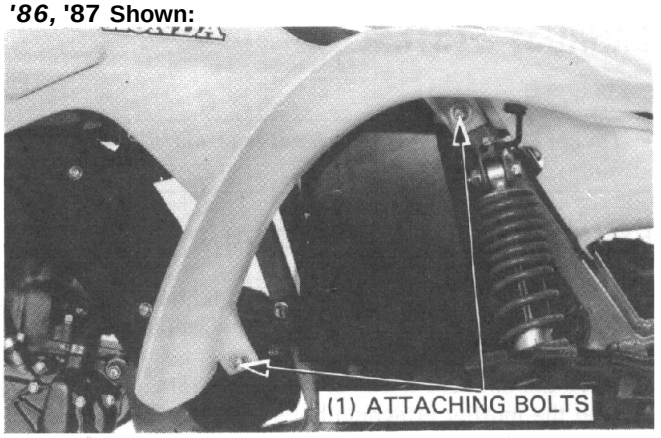


Remove the four front fender attaching bolts.
Remove the four grommets from the locating pins.
Lift the front fender forward and off being careful not to damage it.
Install the front fender in the reverse order of removal.

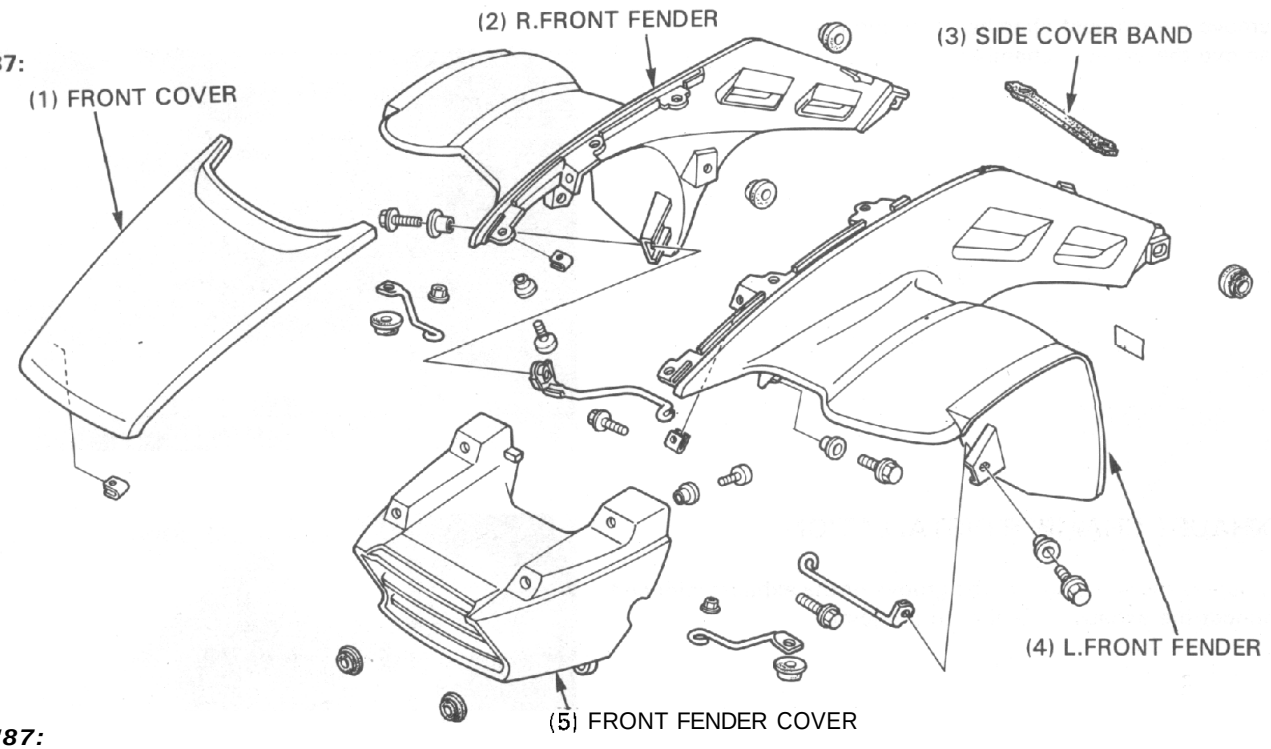
NOTE

- Install the grommets securely into the locating pins.

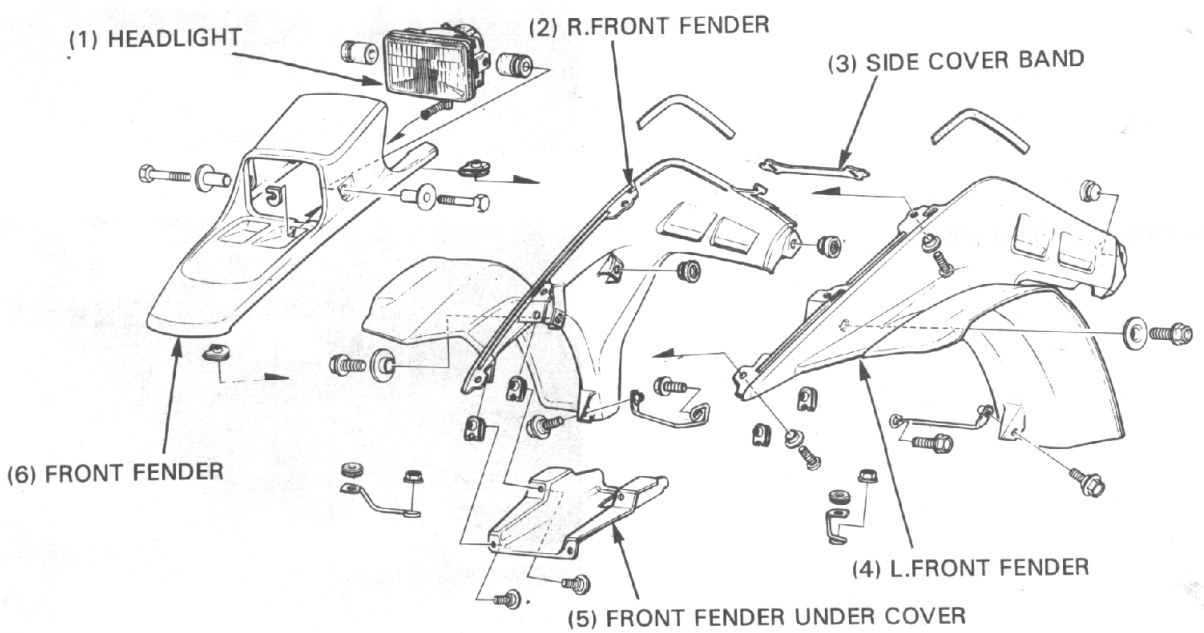
***'86*, '87 Shown:**



'86, '87:



After *'87:*



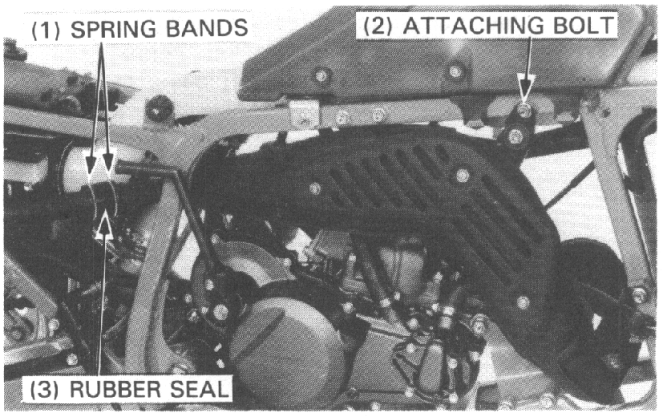
EXHAUST SYSTEM

WARNING

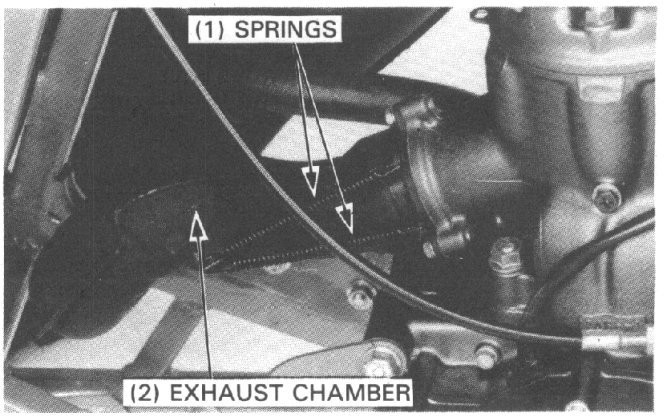
- *Do not* ***service the exhaust chamber or muffler while they are hot.***

EXHAUST CHAMBER REMOVAL

Remove the seat/rear fender and front fender (page 14-1, 2).
Remove the two spring bands from the rubber seal.
Slid the rubber seal back.
Remove the exhaust chamber attaching bolt.
Loosen the muffler attaching bolts (page 14-5).

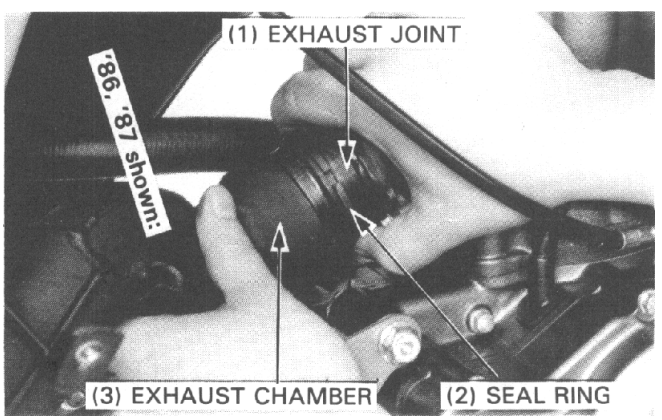


Remove the exhaust chamber joint springs.
Remove the exhaust chamber.

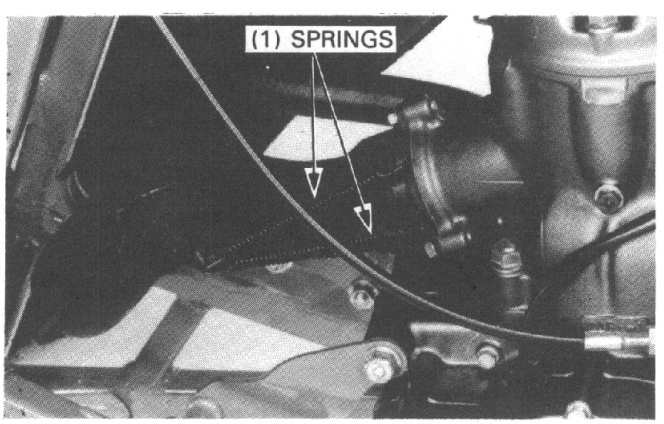


EXHAUST CHAMBER INSTALLATION

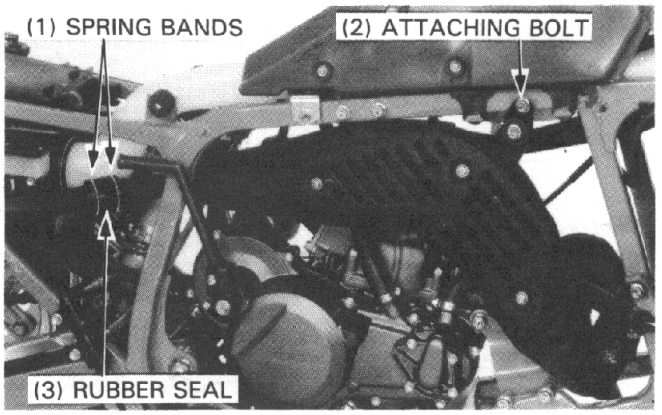
Compress the seal ring into the groove of the exhaust joint and connect the exhaust chamber to the joint.



install the exhaust chamber joint springs.

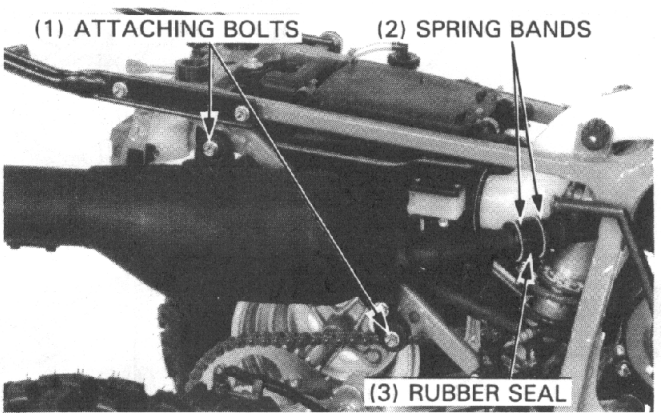


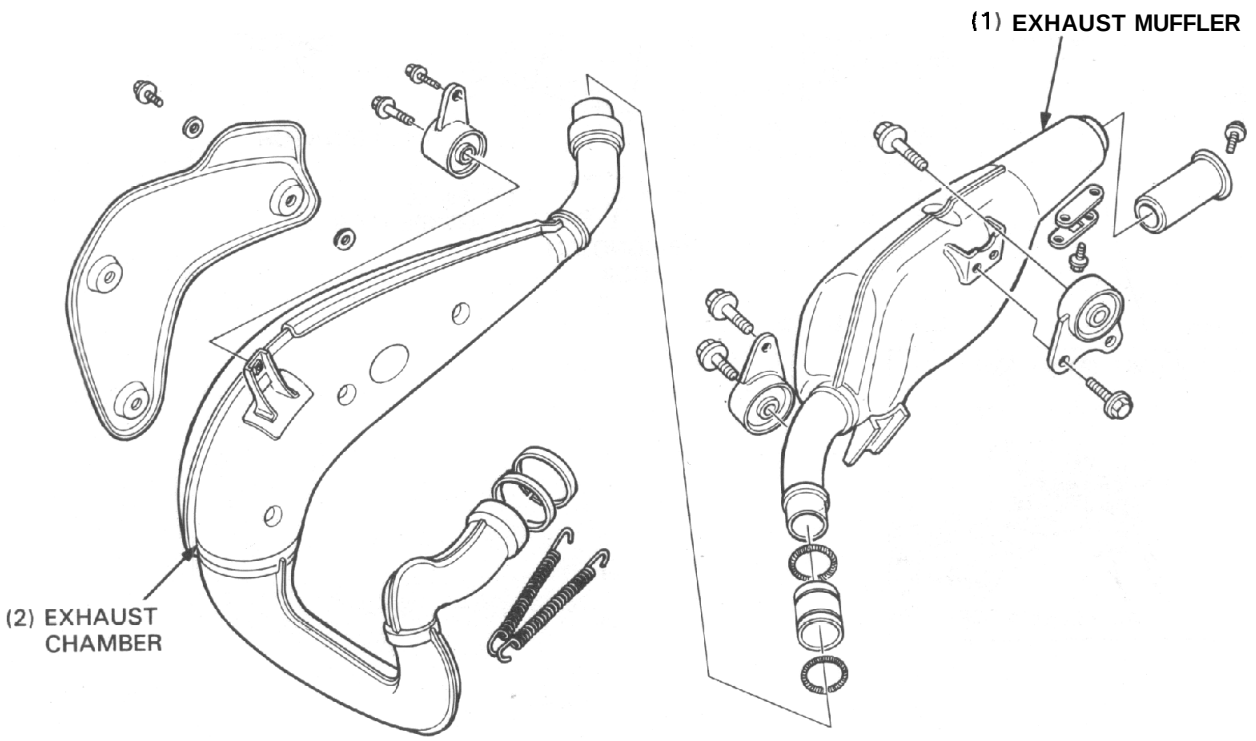
Slide the rubber seal over the joint and secure it with two spring bands.
Install the exhaust chamber attaching bolt.
Tighten the muffler attaching bolts.
Make sure that there are no exhaust leaks after installation.
Install the seat/rear fender, and front fender (page 14-1, 2).

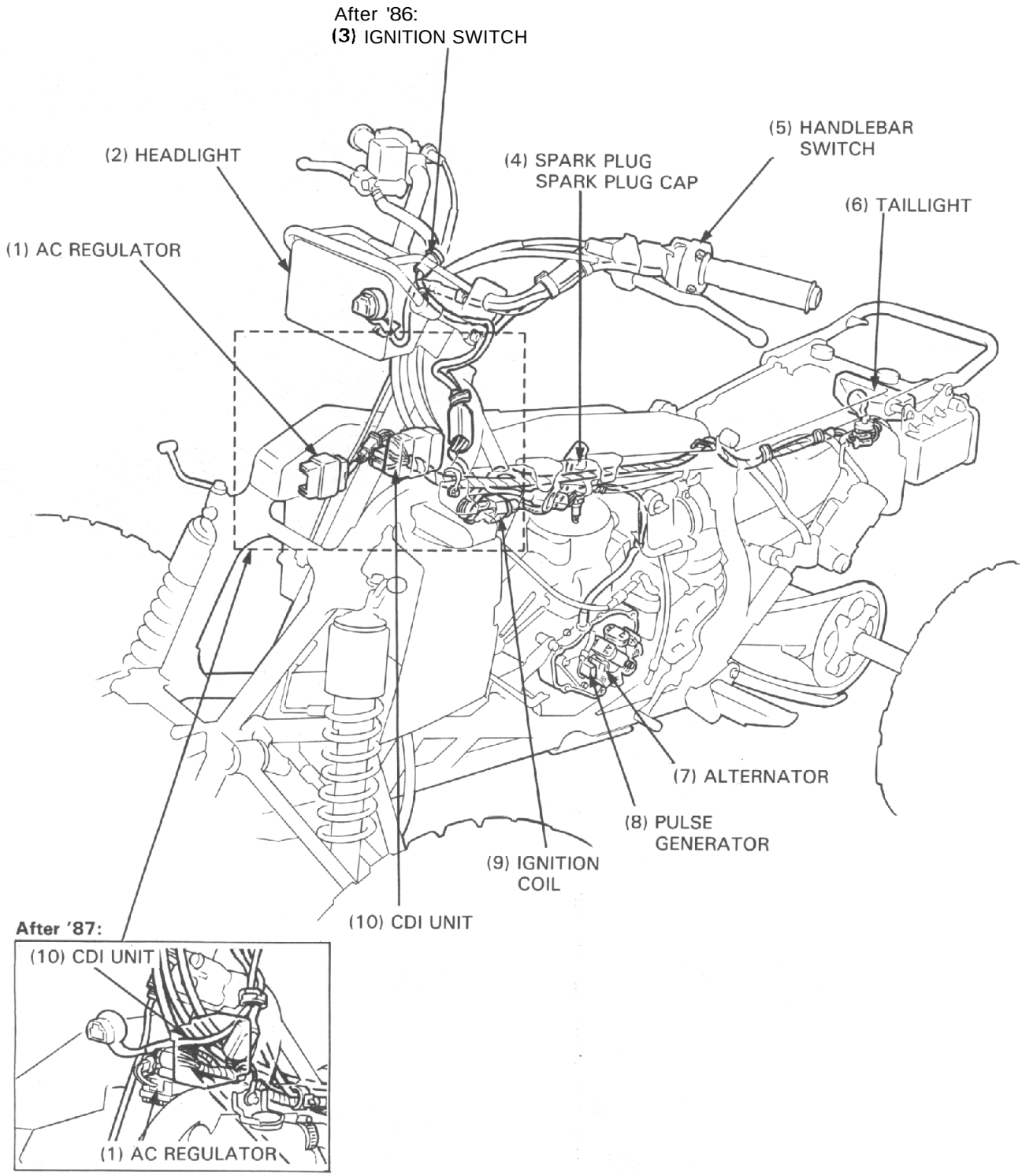


EXHAUST MUFFLER REMOVAL/INSTALLATION

Remove the seat/rear fender (page 14-1).
Remove the two spring bands from the rubber seal.
Slide the rubber seal back.
Remove the exhaust muffler attaching bolts and the exhaust muffler.
Install the exhaust muffler in the reverse order of removal.
Make sure that there are no exhaust leaks after installation.






After '86:
(3) IGNITION SWITCH
(2) HEADLIGHT
(4) SPARK PLUG
SPARK PLUG CAP
(5) HANDLEBAR
SWITCH
(6) TAILLIGHT
(1) AC REGULATOR
(7) ALTERNATOR
(8) PULSE
GENERATOR
(9) IGNITION
COIL
(10) CDI UNIT
After '87:
(10) CDI UNIT
(1) AC REGULATOR

15. ELECTRICAL SYSTEM

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, 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.
- The following color codes used are indicated throughout this section.

Bl: Black	Bu: Blue
W: White	G: Green
Y: Yellow	R: Red

- When inspecting the ignition system, check the system components and lines step-by-step according to the troubleshooting guide on next page.

SPECIFICATIONS

ITEM			STANDARD
Spark plug gap			0.7—0.8 mm (0.028—0.031 in)
Spark plug		'86, After '88:	BR8ES (NGK) RN3C (CHAMPION)
Ignition timing "F" mark		'86, '87:	19° BTDC/1,500 ± 150 rpm
		After '87:	21° BTDC/1,500 ± 150 rpm
Ignition coil	Primary coil resistance		0.1 —0.3 Ω (20°C/68°F)
	Secondary coil resistance	with spark plug cap	7 — 11 kΩ (20°C/68°F)
		without spark plug cap	3 — 5kΩ (20°C/68°F)
Exciter coil resistance			50 — 250Ω (20°C/68°F)
Pulse generator coil resistance			50 — 200Ω (20°C/68°F)
Lighting coil resistance			0.1 —1.0Ω (20°C/68°F)
AC regulator regulated voltage		'86:	13.0—15.0 V at 5,000 rpm
		After '86:	12.0—14.0 V at 3.000 rom
Headlight			12 V— 55/60 W
Tailight		'86:	12 V— 8 W
		After '86:	12 V— 5 W

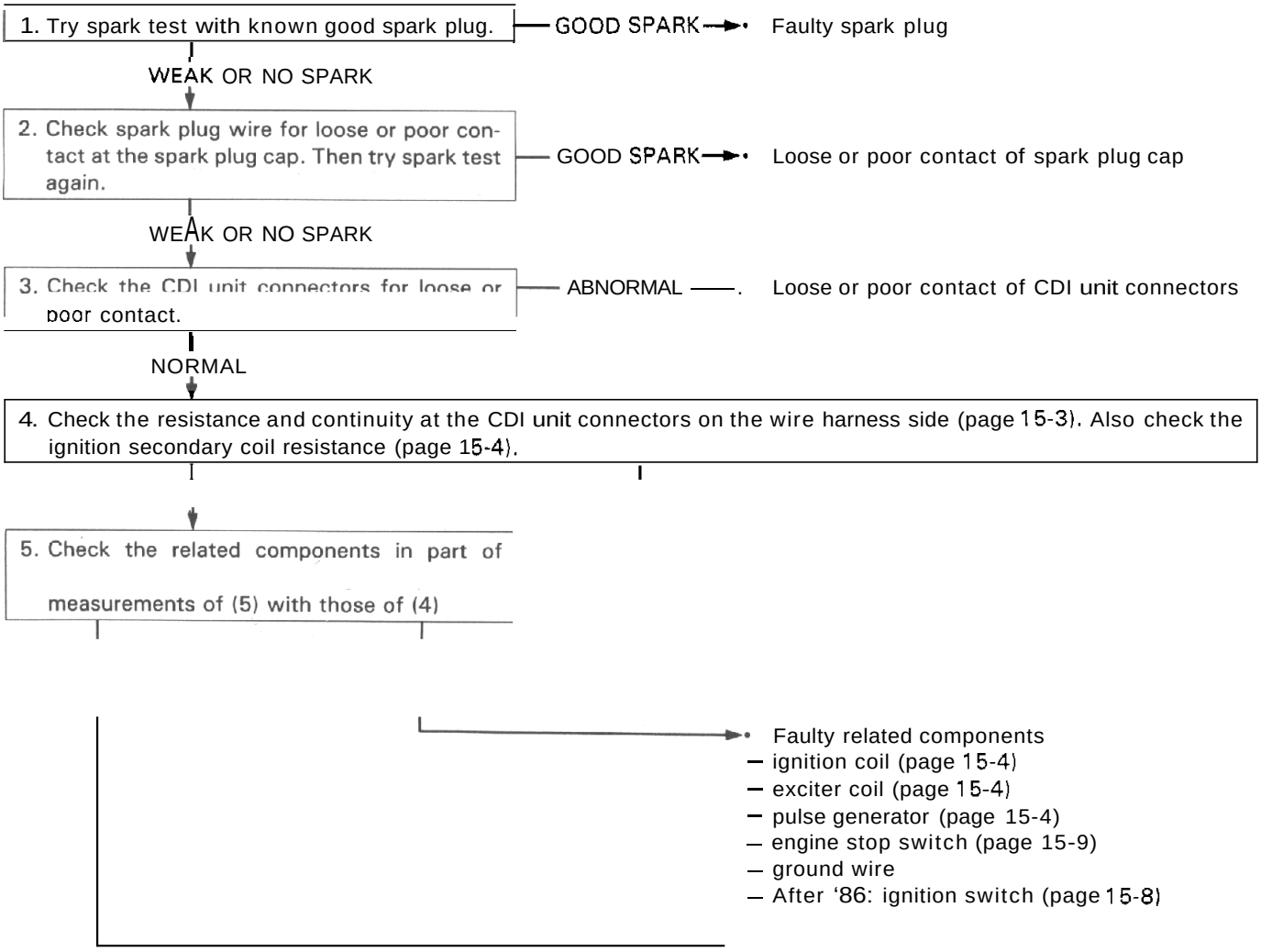
TOOLS

Circuit tester (SANWA)	07308—0020000 or Circuit tester (KOWA) TH-5H
or	
Digital multimeter	07411—0020000 Not available in U.S.A.
or	
Digital multimeter	KS— AHM— 32— 003 (U.S.A. only)

TROUBLESHOOTING

IGNITION SYSTEM

Weak or no spark at plug

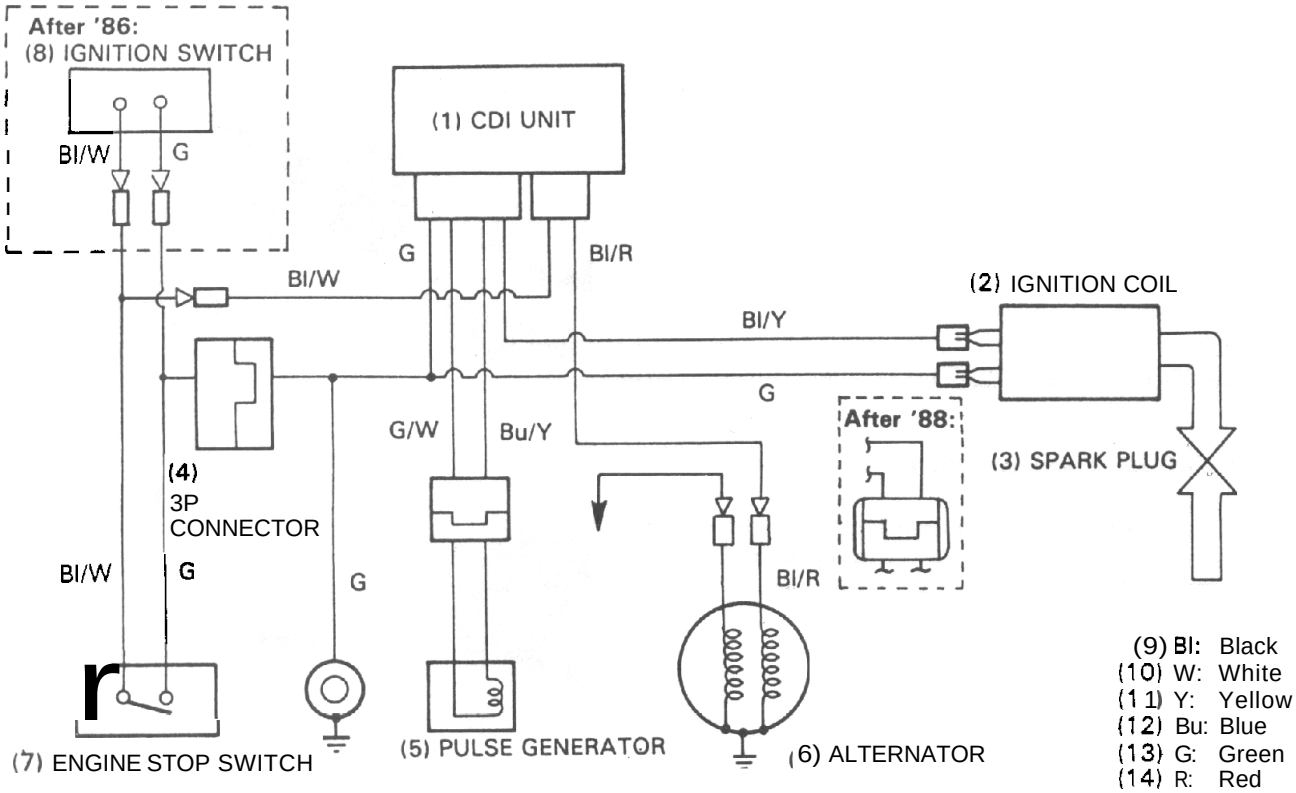


LIGHTING SYSTEM

No lights with engine is running

- Faulty bulb
- Poorly connected or loose connectors
- Faulty alternator
- Faulty AC regulator

IGNITION SYSTEM INSPECTION



NOTE

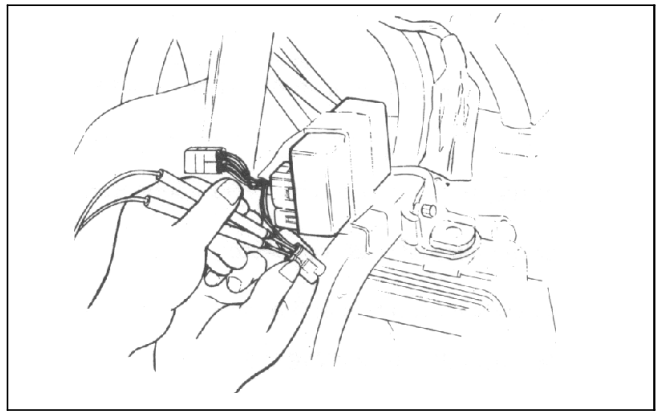
- Check the system components and lines step-by-step according to the troubleshooting guide on page 15-2.
- This method does not include an inspection of the ignition timing advance system at the CDI unit.

Remove the front fender (page 14-2).

Disconnect the 2P and 4P connectors from the CDI unit and check them for loose contact or corroded terminals.

Measure the resistance and continuity between connector terminals on the wire harness side on the following items in the chart below.

***'86,* '87 Shown:**



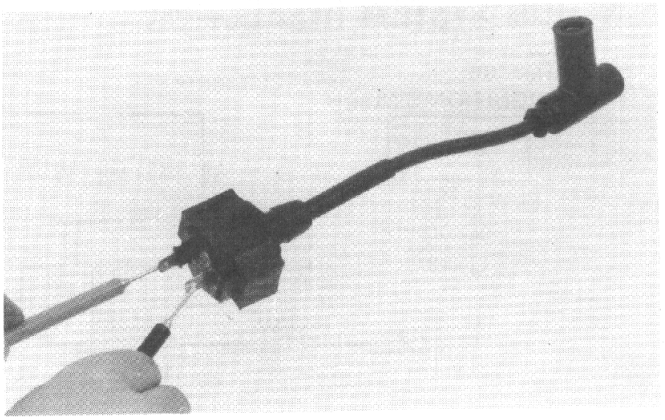
ITEM	TERMINAL	STANDARD
Ignition coil primary circuit	Green and Black/Yellow	0.1 – 0.3 Ω (at 20°C/68°F)
Alternator exciter coil	Black/Red and Green	50 – 250 Ω (at 20°C/68°F)
Pulse generator	Green/White and Blue/Yellow	50 – 200 Ω (at 20°C/68°F)
Engine stop switch (Set the engine stop switch RUN position)	Black/White and Green	No continuity (∞)
After '86: Ignition switch (ON position)	Black/white and Green	No continuity (∞)

IGNITION COIL

INSPECTION

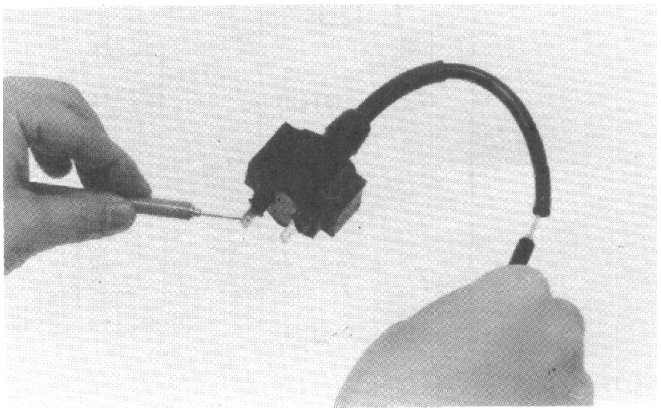
Measure the primary coil resistance between the black and green terminals.

STANDARD: 0.1—0.3Ω (20°C/68°F)



Measure the secondary coil resistance with spark plug cap in place.

STANDARD: 7—11 kΩ **(20°C/68°F)**



If the resistance is out of the specification, remove the spark plug cap from the spark plug wire and measure the secondary coil resistance without the spark plug cap.

STANDARD: 3—5 kΩ (20°C/68°F)

EXCITER COIL

INSPECTION

NOTE

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

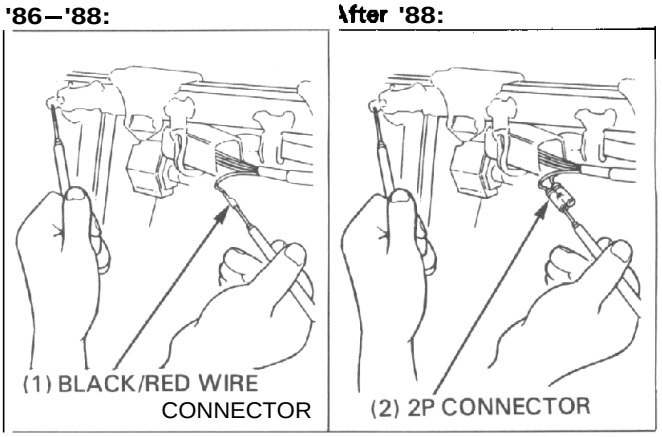
'86—'88:
Disconnect the alternator black/red wire connector.
After '88:
Disconnect the alternator 2P connector.

Check the reisistance between the blacklred and ground.

STANDARD: 50—250 Ω (20°C/68°F)

Replace the alternator stator if the reading is not within the specification.

'86—'88: **After '88:**



PULSE GENERATOR

INSPECTION

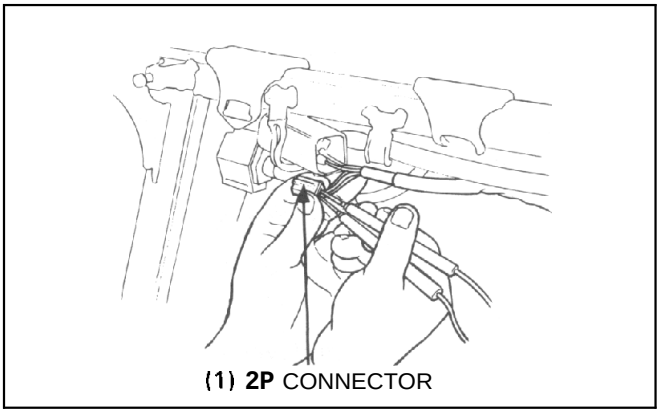
NOTE

- It is not necessary to remove the pulse generator coil to make this test.

Disconnect the pulse generator 2P connector.
Check the resistance between the blue/yellow and green/white.

STANDARD: 50—200 61 (20°C/68°F)

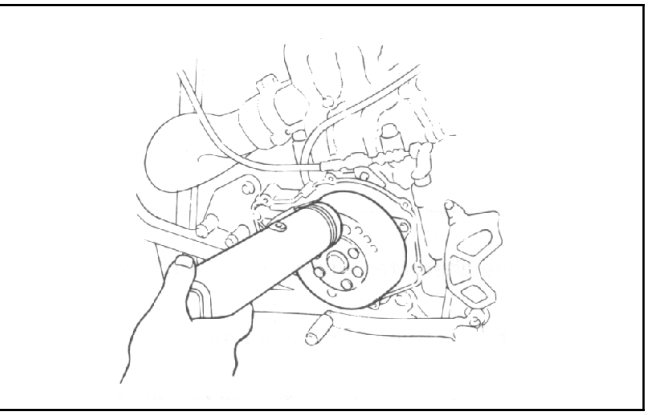
Replace the pulse generator if the reading is not within the specification.



IGNITION TIMING

NOTE

- The CDI unit timing is not adjustable. If the ignition timing is incorrect, check the ignition system (page 15-3) and replace any faulty parts. If all of the other components check out OK, replace the CDI unit.

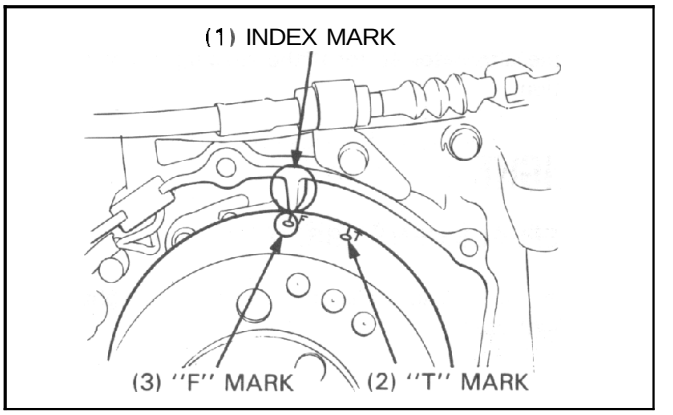


Warm up the engine to operating temperature.
Remove the alternator cover.

Connect a tachometer and timing light.
Start the engine and allow it to idle.

IDLE SPEED: 1,500 ± 150 rpm
Timing is correct if the index mark aligns with the "F" mark at idle.

Gradually increase the engine speed and make sure that the index mark lines up between the "F" mark and "T" mark.

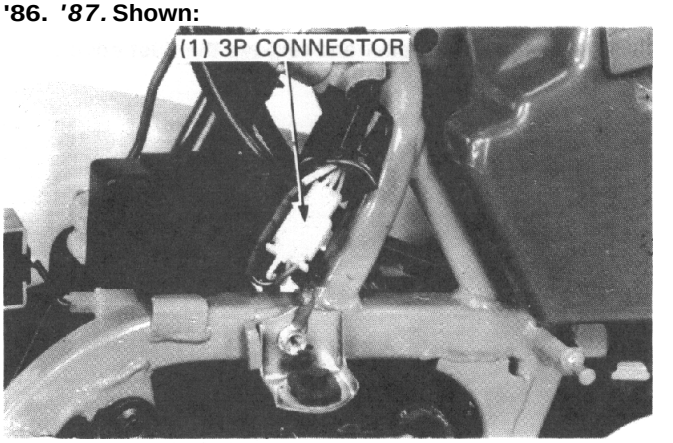


AC REGULATOR

Remove the front fender (page 14-2).
Disconnect the handlebar switch 3P connector.
Connect a tachometer.
Start the engine and measure the voltage between the White/Yellow and Green wire terminals at the wire harness side of the connector.

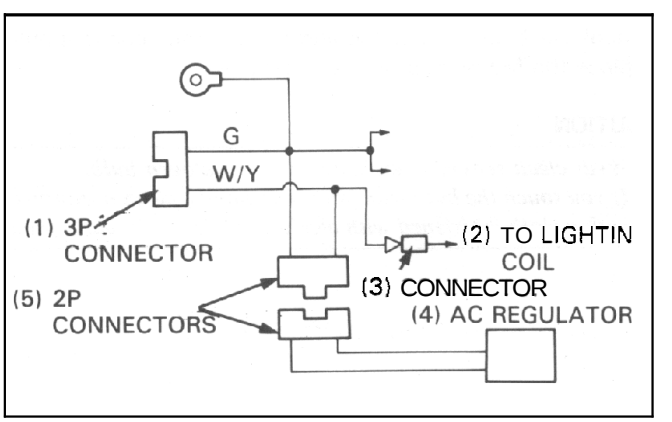
REGULATED VOLTAGE:
'86: 13.0—15.0 at **5,000** rpm
After **'86: 12.0—14.0** at **3.000 rpm**

'86. *'87.* Shown:



If the voltage is not within specification, according to the following:
Stop the engine.

Check the AC regulator 2P connector and alternator lighting coil connector (White/Yellow) for loose contact or corroded terminals.
Check the alternator lighting coil (page 15-6).
Check the wire harness for short or open circuit.
If each of these items checks out OK, replace the AC regulator.



LIGHTING COIL

INSPECTION

NOTE

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

'86–'88:
Disconnect the alternator white/yellow wire connector.

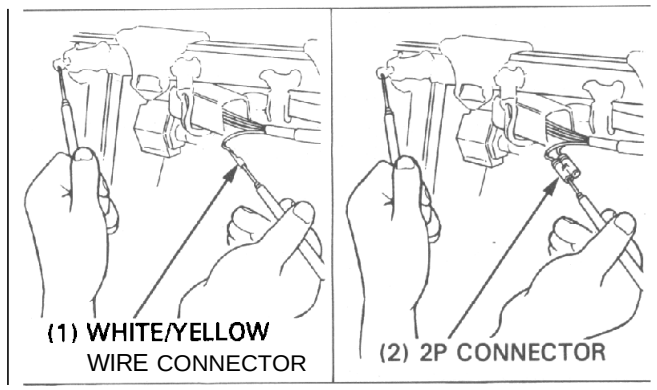
After '88:
Disconnect the alternator 2P connector.

Check the resistance between the white/yellow and ground.

STANDARD: 0.1–1.0Ω (20°C/68°F)

Replace the alternator stator if the reading is not within the specification.

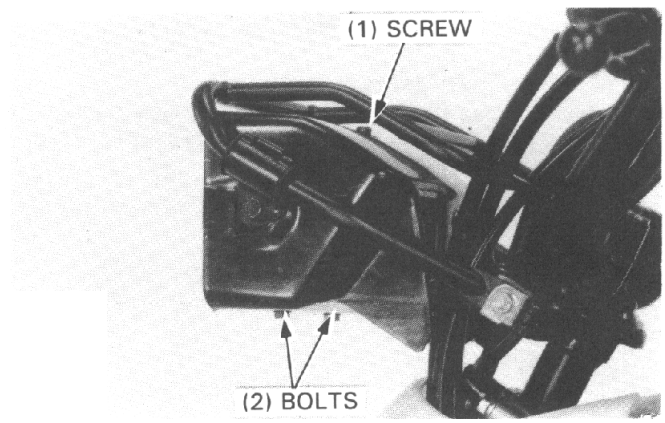
'86–'88: After '88:



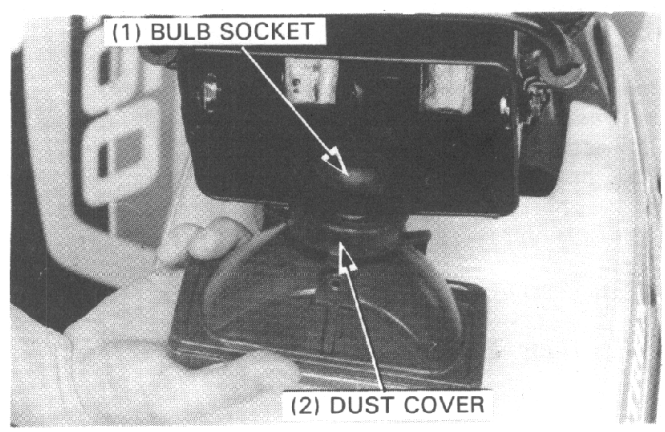
HEADLIGHT

BULB REPLACEMENT ('86, '87:)

Remove the screw and bolts, and slide the headlight out from the headlight case.



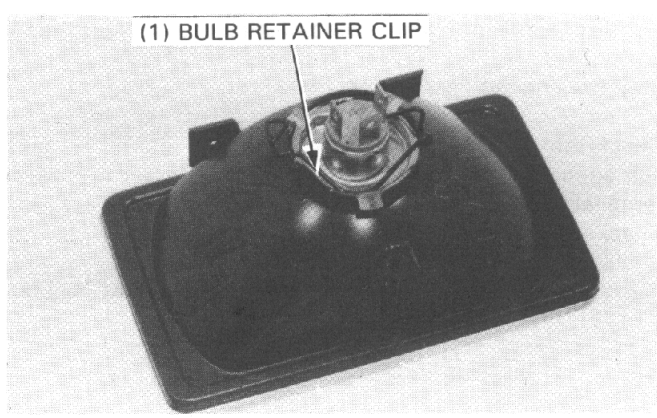
Disconnect the bulb socket and remove the dust cover.



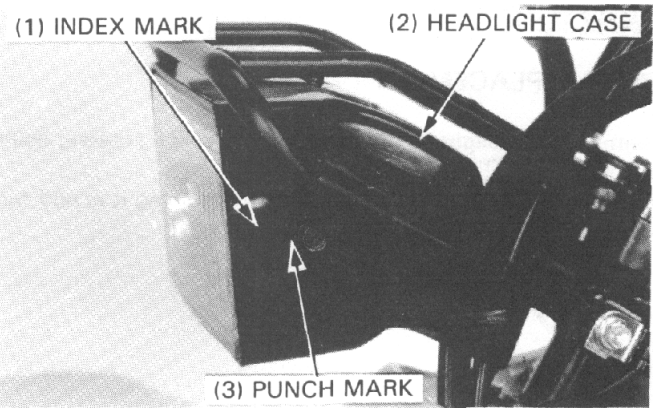
Unhook the bulb retainer clip and remove the headlight bulb. Replace the faulty bulb with a good one.

CAUTION

- ***Wear clean groves when installing the halogen bulb. If you touch the bulb with your bare hands, clean it thoroughly with a cloth moistened with alcohol to prevent its early failure.***



Install the headlight in the reverse order of removal.
Tighten the screw and bolts securely.
Make sure that the headlight case, is aligned with the punch mark on the headlight bracket and index mark on the case.

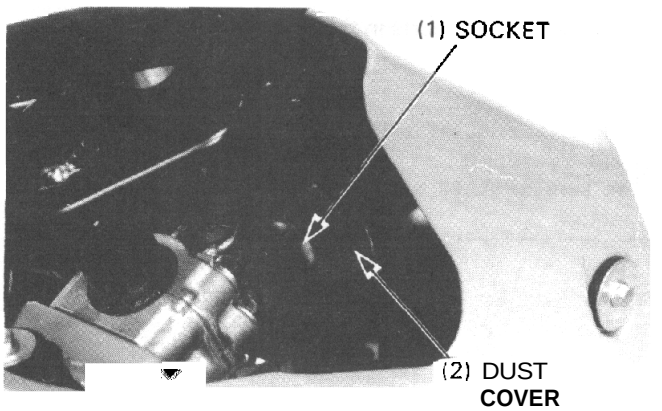


BULB REPLACEMENT (After '87:)

Disconnect the bulb socket and remove the dust cover.

NOTE

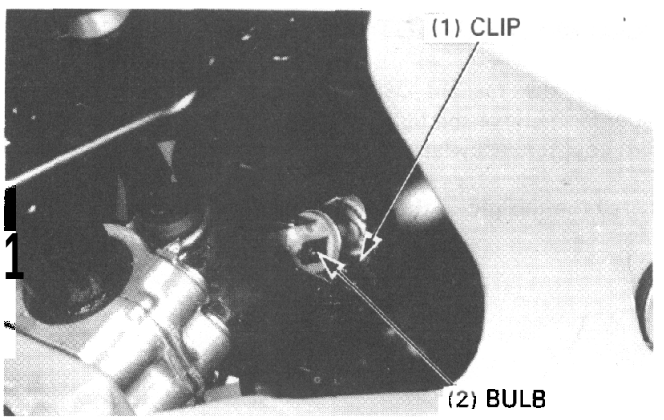
- Remove the front fender if necessary.



Unhook the bulb retainer clip and remove the headlight bulb.
Replace the faulty bulb with a good one.

CAUTION

- ***Wear clean groves when installing the halogen bulb. If you touch the bulb with your bare hands, clean it thoroughly with a cloth moistened with alcohol to prevent its early failure.***



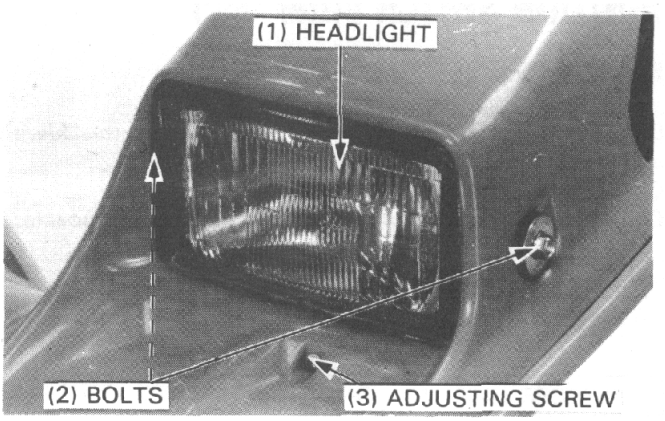
REMOVAL/INSTALLATION (After '87:)

Disconnect the headlight bulb socket.
Remove the mounting bolts and unhook headlight aim adjusting screw.
Remove the headlight.

Install the headlight in the reverse order of removal.

HEADLIGHT AIM

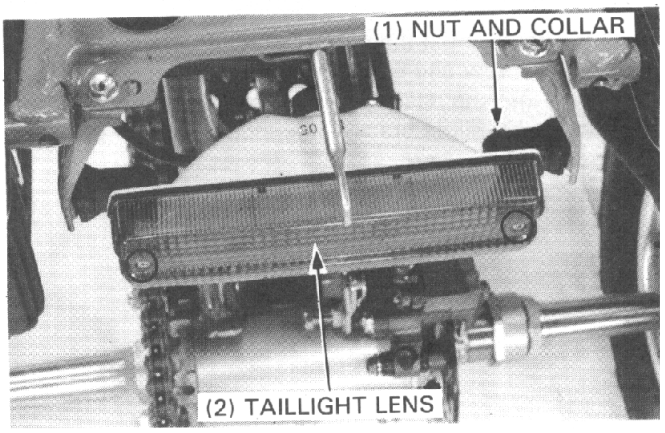
Adjust the vertical beam by turning the adjusting screw.



TAILLIGHT

BULB REPLACEMENT ('86:)

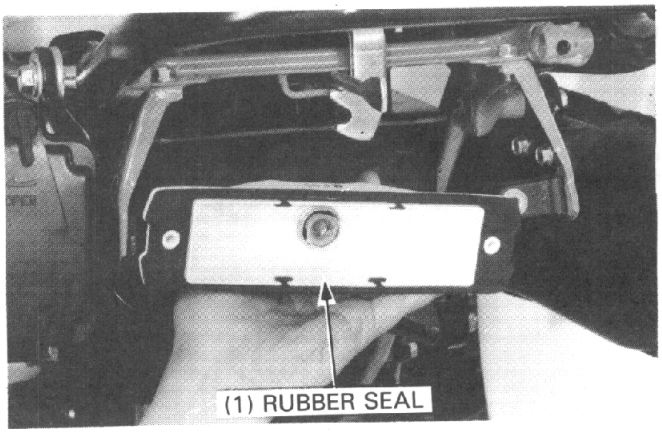
Remove the taillight lens by removing the two screws, collars and nuts.
Remove the tail and brake light bulb by pushing it in and turning it counterclockwise.



Install the removed parts in the reverse order of removal.

NOTE

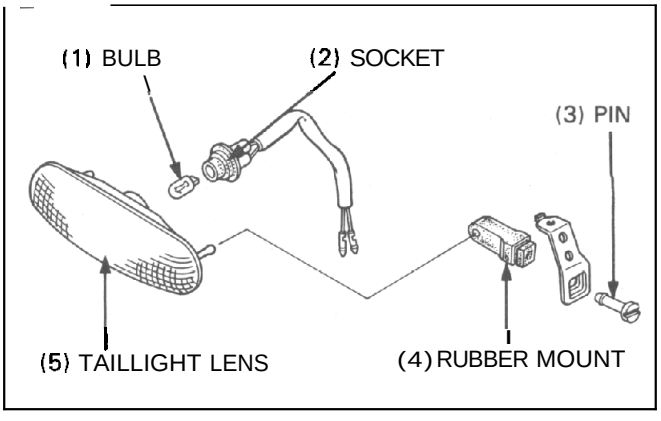
- Make sure that the taillight lens rubber seal is in good condition.
- Be sure to install the collars on both sides of the rubber mount.



BULB REPLACEMENT (After '86:)

Remove the taillight assembly from its two side rubber mounts. Remove the bulb socket by turning it about a quarter turn counterclockwise.

Install the taillight in the reverse order of removal.

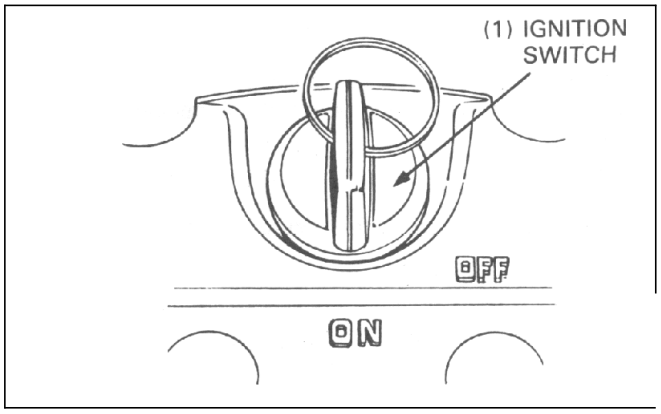


IGNITION SWITCH (After '86:)

INSPECTION

Disconnect the ignition switch wire connectors (black/white and green).
Check for continuity between terminals.
Continuity should exist with the switch in the OFF position.

COLOR CODE / SWITCH POSITION	BLACK/ WHITE	GREEN
•		
OFF	O——O	



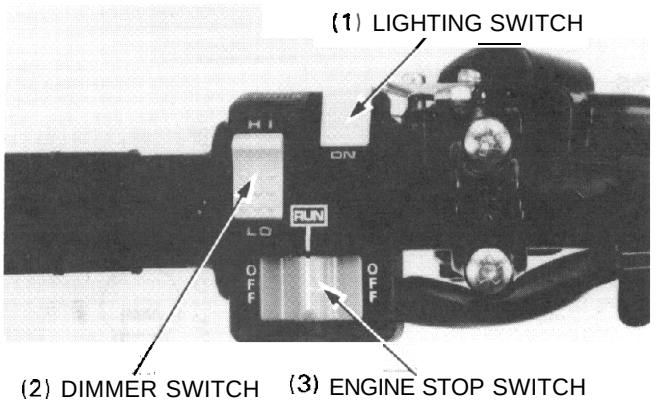
SWITCHES

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 indicated by interconnected circles.



LIGHTING SWITCH

COLOR CODE / SWITCH POSITION	WHITE/ YELLOW	BROWN
OFF		
ON	○	○

COLOR CODE / SWITCH POSITION	BROWN	BLUE	WHITE
HI	○	○	
(N)	○		○
Lo	○		○

INTER-CONNECTIONS

ENGINE STOP SWITCH

COLOR CODE / SWITCH POSITION	BLACK/ WHITE	GREEN
OFF	○	○
RUN		

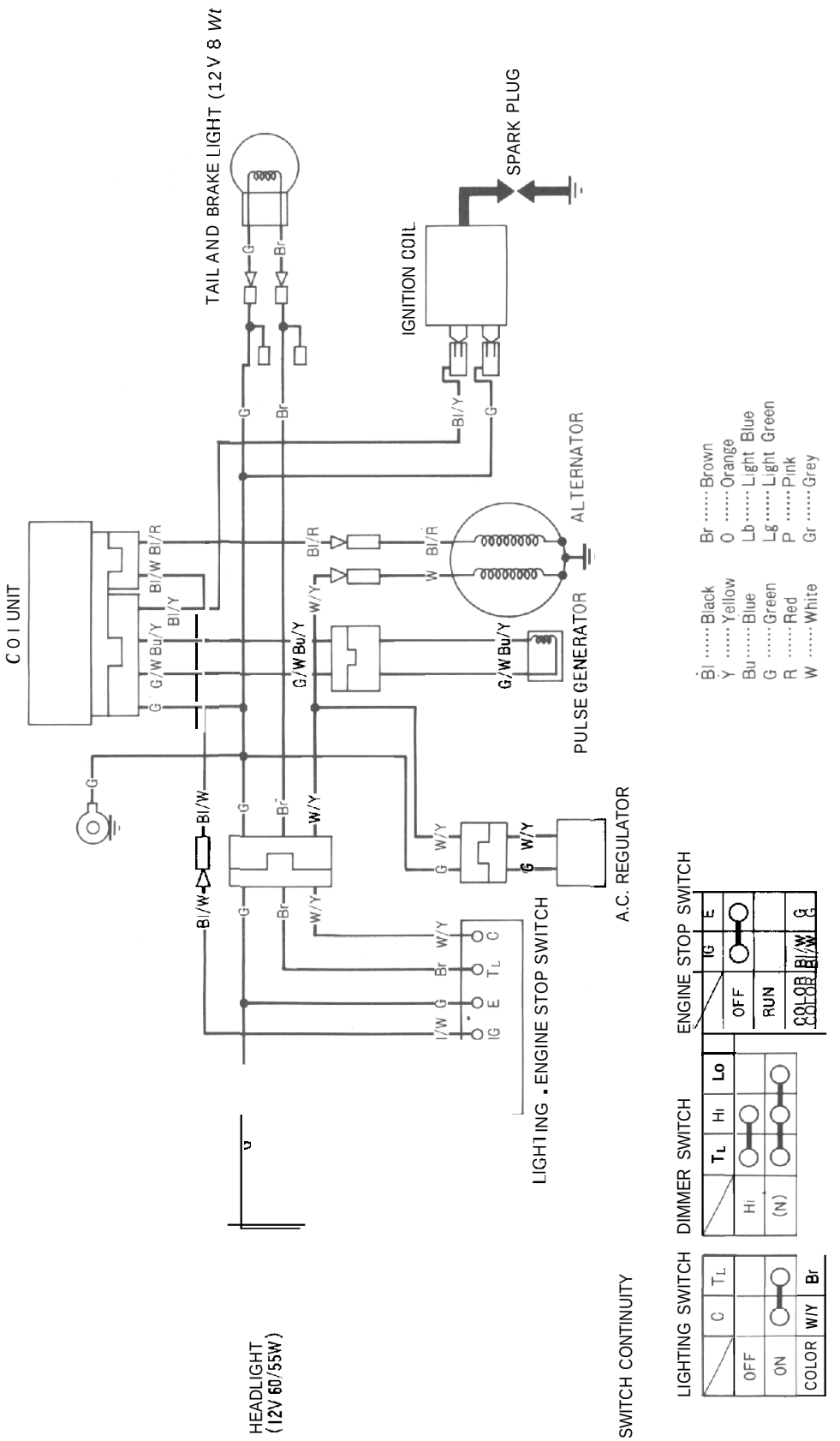
After '86:

IGNITION SWITCH

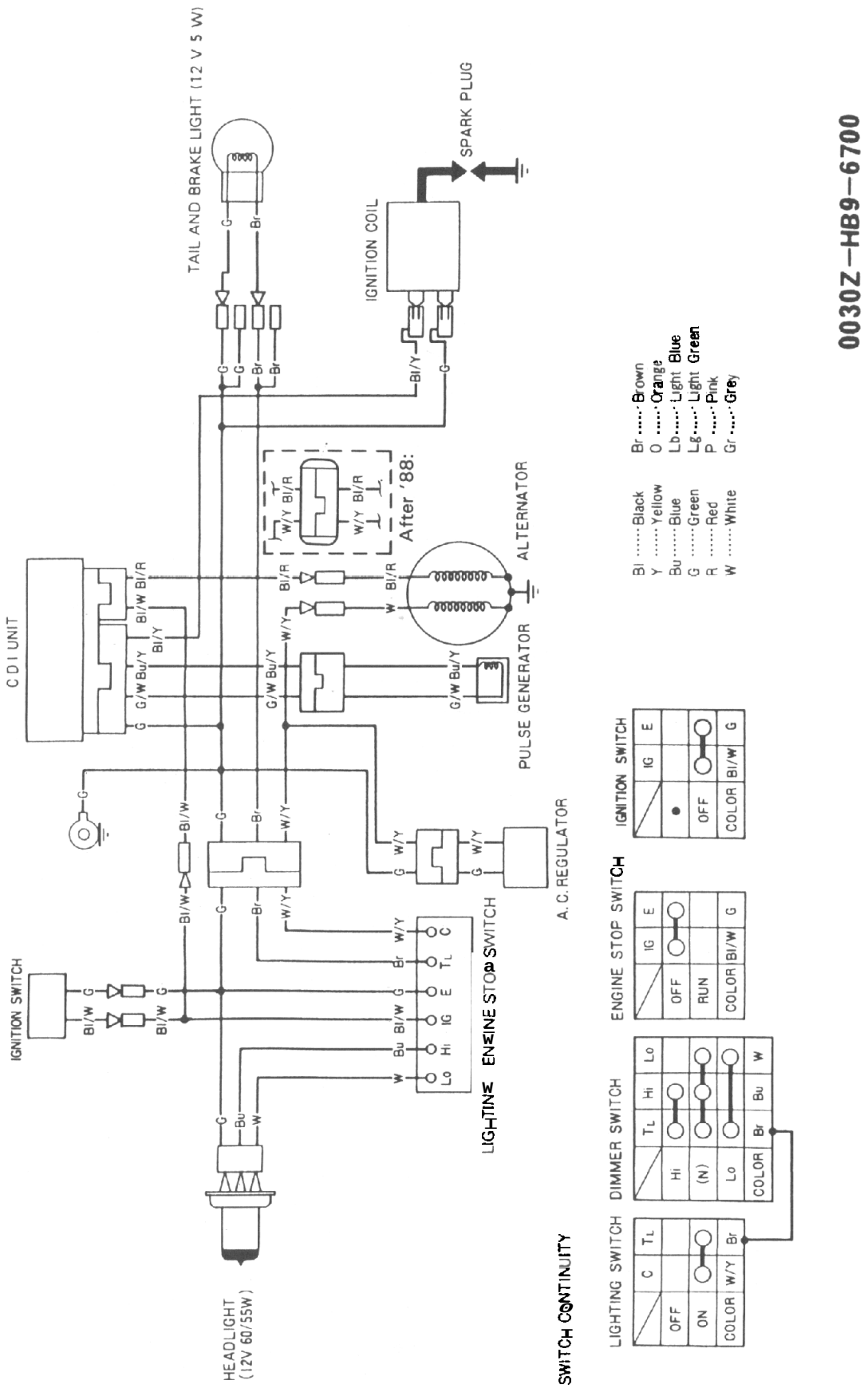
COLOR CODE / SWITCH POSITION	BLACK/ WHITE	GREEN
●		
OFF	○	○

WIRING DIAGRAM

'86:



After *'86:*


0030Z-HB9-6700
TAIL AND BRAKE LIGHT (12 V 5 W)
SPARK PLUG
IGNITION COIL
After '88:
ALTERNATOR
PULSE GENERATOR
C D I UNIT
A. C. REGULATOR
IGNITION SWITCH
LIGHTING SWITCH
ENGINE STOP SWITCH
DIMMER SWITCH
HEADLIGHT (12V 60/55W)
Bl ..... Black
Y ..... Yellow
Bu ..... Blue
G ..... Green
R ..... Red
W ..... White
Br ..... Brown
O ..... Orange
Lb ..... Light Blue
Lg ..... Light Green
P ..... Pink
Gr ..... Grey
SWITCH CONTINUITY

MEMO

ENGINE DOES NOT START OR IS HARD TO START

CHECK	CONDITION	PROBABLE CAUSE
1. Check if fuel is reaching carburetor	NO FUEL TO CARBURETOR →	• No fuel in fuel tank • Clogged fuel line or fuel filter • Clogged carburetor float valve • Clogged fuel tank cap breather tube
FUEL TO CARBURETOR ↓		
2. Remove spark plug	WET →	• Carburetor flooded • Carburetor starter valve stuck open • Damaged starter valve seat • Throttle valve adjusted to low
DRY ↓		
3. Test spark	WEAK OR NO SPARK →	GO TO PAGE 15-2
SPARK ↓		
4. Test cylinder compression by operating kick starter	LOSS OF COMPRESSION →	Piston rings stuck • Flaw in casting • Compression leak • Faulty or clogged reed valve • Worn cylinder and piston rings • Blown cylinder head gasket
COMPRESSION IS NORMAL ↓		
5. Start by following normal starting procedure	ENGINE FIRES BUT STOPS SOON →	• Excessively open choke • Starter valve stuck opened • Air leaking past intake pipe • Improper ignition timing (CDI unit or pulse generator faulty)
ENGINE DOES NOT FIRE ↓		
6. Restart with choke applied		

ENGINE LACKS POWER

CHECK	CONDITION	PROBABLE CAUSE
1. Raise rear wheels off ground and spin by hand	WHEELS DO NOT SPIN FREELY	• Brake dragging • Worn or damaged axle bearing • Axle bearing not lubricated properly • Drive chain too tight
WHEEL SPINS FREELY ↓		
2. Check tire pressure with tire gauge	TIRE PRESSURE IS TOO LOW	• Punctured tire • Faultv tire valve
PRESSURE NORMAL ↓		
3. Check clutch slipping	CLUTCH SLIPS	• Clutch spring weak • Worn clutch disclplate • Warped clutch disclplate • Faulty clutch lifter system
CLUTCH ENGAGED PROPERLY ↓		
4. Llghtly accelerate engine	ENGINE SPEED DOES NOT INCREASE SUFFICIENTLY	Clogged air cleaner • Restricted fuel flow • Clogged fuel tank breather tube • Clogged muffler
ENGINE SPEED INCREASED ↓		
5. Check ignition timing using timing light	IGNITION TIMING IS INCORRECT	• Faulty CDI unit. • Faulty pulse generator
IGNITION TIMING IS CORRECT ↓		
6. Test cylinder compression by operating kick starter using a compression gauge	COMPRESSION IS LOW	• Faulty reed valve • Worn cylinder and piston rings • Leaking head gasket • Flaws in cylinder head, Cylinder or crankcase
COMPRESSION IS NORMAL ↓		
7. Check for clogged carburetor	CARBURETOR IS CLOGGED	• Damaged fuel strainer • Carburetor dirty
CARBURETOR IS NOT CLOGGED ↓		
8. Remove spark plug	PLUG IS FOULED OR DISCOLORED	• Plug not serviced frequently enough • Use of plug with improper heat range
PLUG IS NOT FOULED OR DISCOLORED ↓		

9. Check if engine overheats	ENGINE OVERHEATS →	Excessive carbon build-up in combustion chamber • Use of improper quality fuel • Mixture too lean • Clutch slipping • Clogged radiator
ENGINE IS NOT OVERHEATED ↓		
10. Accelerate or run at high speed	ENGINE KNOCKS →	• Worn piston and cylinder Fuel-air mixture too lean Excessive carbon build-up in combustion chamber • Ignition timing advanced too far (Faulty CDI unit)
ENGINE DOES NOT KNOCK		

POOR PERFORMANCE AT LOW AND IDLE SPEEDS

CHECK	CONDITION	PROBABLE CAUSE
1. Check ignition timing	INCORRECT →	Faulty CDI unit Faulty pulse generator
NORMAL ↓		
2. Check carburetor air screw adjustment	INCORRECT →	Fuel-air mixture too lean (To correct, turn screw out) Fuel-air mixture too rich (To correct, turn screw in)
NORMAL ↓		
3. Air is leaking past carburetor gasket	LEAKING →	Deteriorated insulator or reed valve gasket Loose carburetor
NOT LEAKING ↓		
4. Remove spark plug and try	WEAK OR NO SPARK →	*GO TO PAGE 15-2
GOOD SPARK		

POOR PERFORMANCE AT HIGH SPEEDS

CHECK	CONDITION	PROBABLE CAUSE
1. Check ignition timing	INCORRECT →	• Faulty CDI unit • Faulty pulse generator
CORRECT ↓		
2. Disconnect fuel tube at carburetor	FUEL FLOW RESTRICTED →	• Lack of fuel in tank • Clogged fuel line • Clogged fuel tank breather tube • Clogged fuel valve • Clogged fuel strainer
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 • Damaged fuel strainer
NOT CLOGGED ↓		
6. Replace carburetor main jet	CONDITION WORSE →	• Jet size wrong, turn to page 3-14