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 **HONDA**

SERVICE MANUAL

**GL1500C/CT/CF
VALKYRIE/
VALKYRIE TOURER™/
VALKYRIE INTERSTATE™**

HOW TO USE THIS MANUAL

This service manual describes the service procedures for the GL1500C, GL1500CT and GL1500CF.

Follow the Maintenance Schedule (Section 3) recommendations to ensure that the Vehicle is in peak operating condition and the emission levels are within the standards set by the U.S. Environmental Protection Agency and California Air Resources Board.

Performing the first scheduled maintenance is very important. It compensates for the initial wear that occurs during the break-in period.

Sections 1 and 3 apply to the whole motorcycle. Section 2 describes procedures for removal/installation of components that may be required to perform service described in the following sections.

Sections 4 through 19 describe parts of the motorcycle, grouped according to location.

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

Most sections start with an assembly or system illustration, service information and troubleshooting for the section. The subsequent pages give detailed procedures.












If you don't know the source of the trouble, go to section 21, Troubleshooting.

CONTENTS

	GENERAL INFORMATION	1
	FRAME/BODY PANELS/EXHAUST SYSTEM	2
	MAINTENANCE	3
ENGINE AND DRIVE TRAIN	LUBRICATION SYSTEM	4
	FUEL SYSTEM	5
	COOLING SYSTEM	6
	ENGINE REMOVAL/INSTALLATION	7
	CYLINDER HEAD/VALVE	8
	CLUTCH	9
	GEARSHIFT LINKAGE/TRANSMISSION	10
	PISTON/CRANKSHAFT	11
	FINAL DRIVE	12
CHASSIS	FRONT WHEEL/SUSPENSION/STEERING	13
	REAR WHEEL/SUSPENSION	14
	HYDRAULIC BRAKE	15
ELECTRICAL	CHARGING SYSTEM/ALTERNATOR	16
	IGNITION SYSTEM	17
	ELECTRIC STARTER/STARTER CLUTCH	18
	LIGHTS/METERS/SWITCHES	19
	AUDIO SYSTEM	20
	WIRING DIAGRAM	21
	TROUBLESHOOTING	22
	INDEX	23

SYMBOLS

The symbols used throughout this manual show specific service procedures. If supplementary information is required pertaining to these symbols, it would be explained specifically in the text without the use of the symbols.

	Replace the part(s) with new one(s) before assembly.
	Use recommended engine oil, unless otherwise specified.
	Use molybdenum oil solution (mixture of the engine oil and molybdenum grease in a ratio of 1:1).
	Use multi-purpose grease (Lithium based multi-purpose grease NLGI #2 or equivalent).
	Use molybdenum disulfide grease (containing more than 3% molybdenum disulfide, NLGI #2 or equivalent). Example: Molykote® BR-2 plus manufactured by Dow Corning, U.S.A. Multi-purpose M-2 manufactured by Mitsubishi Oil, Japan
	Use molybdenum disulfide paste (containing more than 40% molybdenum disulfide, NLGI #2 or equivalent). Example: Molykote® G-n Paste manufactured by Dow Corning, U.S.A. Honda Moly 60 (U.S.A. only) Rocol ASP manufactured by Rocol Limited, U.K. Rocol Paste manufactured by Sumico Lubricant, Japan
	Use silicone grease.
	Apply a locking agent. Use a middle strength locking agent unless otherwise specified.
	Apply sealant.
	Use DOT 4 brake fluid. Use the recommended brake fluid unless otherwise specified.
	Use Fork or Suspension Fluid.

1. GENERAL INFORMATION

GENERAL SAFETY	1-1	LUBRICATION & SEAL POINTS	1-19
SERVICE RULES	1-2	CABLE & HARNESS ROUTING	1-21
MODEL IDENTIFICATION	1-3	EMISSION CONTROL SYSTEMS	1-35
SPECIFICATIONS	1-4	EMISSION CONTROL INFORMATION LABELS	1-38
TORQUE VALUES	1-13		
TOOLS	1-17		

1

GENERAL SAFETY

CARBON MONOXIDE

If the engine must be running to do some work, make sure the area is well ventilated. Never run the engine in an enclosed area.

▲WARNING

- *The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and may lead to death.*

Run the engine in an open area or with an exhaust evacuation system in an enclosed area.

GASOLINE

Work in a well ventilated area. Keep cigarettes, flames or sparks away from the work area or where gasoline is stored.

▲WARNING

- *Gasoline is extremely flammable and is explosive under certain conditions. KEEP OUT OF REACH OF CHILDREN.*

HOT COMPONENTS

▲WARNING

- *Engine and exhaust system parts become very hot and remain hot for some time after the engine is run. Wear insulated gloves or wait until the engine and exhaust system have cooled before handling these parts.*

USED ENGINE/TRANSMISSION OIL

▲WARNING

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

BRAKE DUST

Never use an air hose or dry brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner or alternate method approved by OSHA, designed to minimize the hazard caused by airborne asbestos fibers.

▲WARNING

- *Inhaled asbestos fibers have been found to cause respiratory disease and cancer.*

BRAKE FLUID

CAUTION

- *Spilling fluid on painted, plastic or rubber parts will damage them. Place a clean shop towel over these parts whenever the system is serviced. KEEP OUT OF REACH OF CHILDREN.*

GENERAL INFORMATION

COOLANT

Under some conditions, the ethylene glycol in engine coolant is combustible and its flame is not visible. If the ethylene glycol does ignite, you will not see any flame, but you can be burned.

▲ WARNING

- *Avoid spilling engine coolant on the exhaust system or engine parts. They may be hot enough to cause the coolant to ignite and burn without a visible flame.*
- *Coolant (ethylene glycol) can cause some skin irritation and is poisonous if swallowed. KEEP OUT OF REACH OF CHILDREN.*
- *Do not remove the radiator cap when the engine is hot. The coolant is under pressure and could scald you.*
- *Keep hands and clothing away from the cooling fan, as it starts automatically.*

CAUTION

- *Using coolant with silicate inhibitors may cause premature wear of water pump seals or blockage of radiator passages. Using tap water may cause engine damage.*

SERVICE RULES

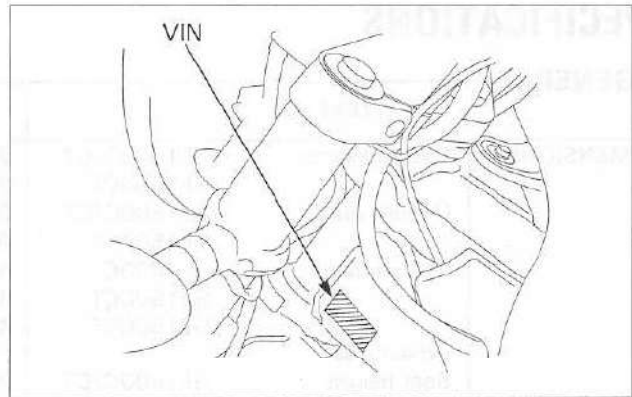
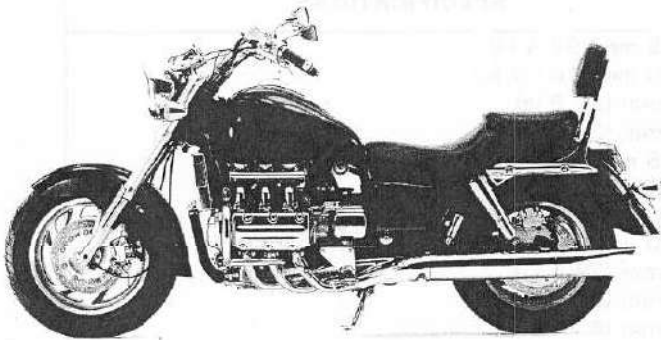
1. Use genuine HONDA or HONDA-recommended parts and lubricants or their equivalents. Parts that don't meet HONDA's design specifications may cause damage to the motorcycle.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing the motorcycle. Metric bolts, nuts and screws are not interchangeable with English fasteners.
4. Install new gaskets, O-rings, cotter pins, and lock plates when reassembling.
5. When tightening bolts or nuts, begin with the larger diameter or inner bolt first. Tighten to the specified torque diagonally in incremental steps unless a particular sequence is specified.
6. Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
7. After reassembly, check all parts for proper installation and operation.
8. Route all electrical wires as shown on pages 1-21 through 1-34, Cable & Harness routing.

BATTERY HYDROGEN GAS & ELECTROLYTE

▲ WARNING

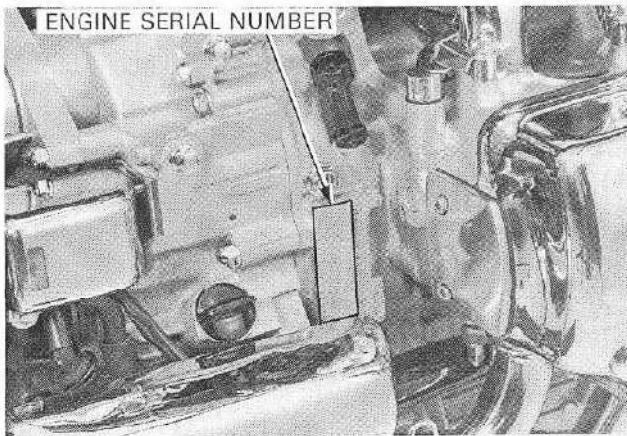
- *The battery gives off explosive gases; keep sparks, flames, and cigarettes away. Provide adequate ventilation when charging or using the battery in an enclosed space.*
- *The battery contains sulfuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and a face shield.*
 - If electrolyte gets on your skin, flush with water.*
 - If electrolyte gets in your eyes, flush with water for at least 15 minutes and call a physician immediately.*
- *Electrolyte is poisonous.*
 - If swallowed, drink large quantities of water or milk and follow with milk of magnesia or vegetable oil and call a physician. KEEP OUT OF REACH OF CHILDREN.*

MODEL IDENTIFICATION



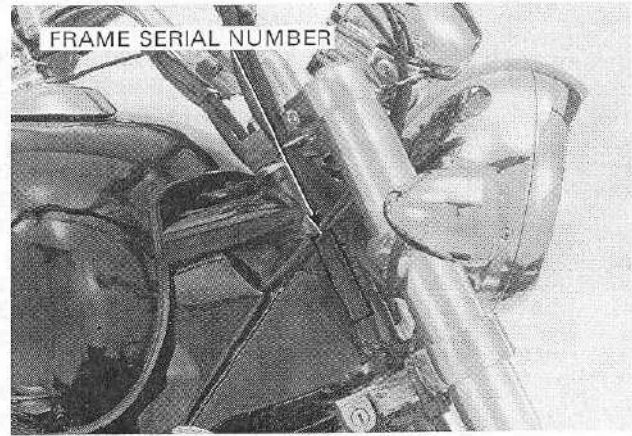
VEHICLE IDENTIFICATION NUMBER

The Vehicle Identification Number (VIN) is attached on the left side of the frame near the steering head.



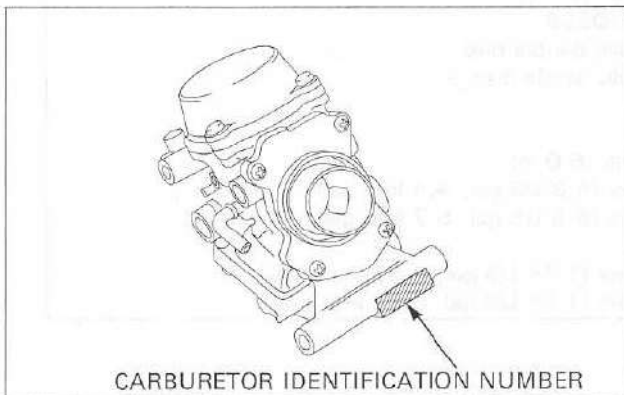
ENGINE SERIAL NUMBER

The engine serial number is stamped on the rear side of the right crankcase.



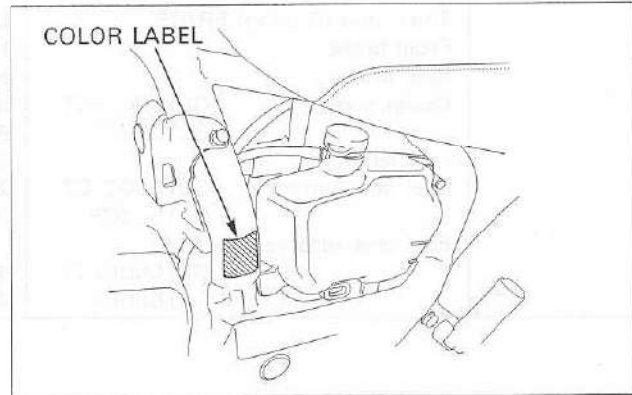
FRAME SERIAL NUMBER

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



CARBURETOR IDENTIFICATION NUMBER

The carburetor identification number is stamped on the intake side of the carburetor body.



COLOR LABEL

The color label is attached to the frame down tube under the left side cover.

GENERAL INFORMATION

SPECIFICATIONS

GENERAL			SPECIFICATIONS	
	ITEM			
DIMENSIONS	Overall length	GL1500C/CT	2,525 mm (99.4 in)	
		GL1500CF	2,660 mm (104.7 in)	
	Overall width	GL1500C/CT	980 mm (38.6 in)	
		GL1500CF	970 mm (38.2 in)	
	Overall height	GL1500C	1,185 mm (46.7 in)	
		GL1500CT	1,485 mm (58.5 in)	
		GL1500CF	1,490 mm (58.7 in)	
	Wheelbase		1,690 mm (66.5 in)	
	Seat height	GL1500C/CT	740 mm (29.1 in)	
		GL1500CF	730 mm (28.7 in)	
	Ground clearance	GL1500C/CT	155 mm (6.1 in)	
		GL1500CF	150 mm (5.9 in)	
	Dry weight (49 state/Canada type)	GL1500C	309 kg (681 lbs)	
			GL1500CT	324 kg (714 lbs)
			GL1500CF	351 kg (774 lbs)
		(California type)	GL1500C	310 kg (683 lbs)
			GL1500CT	325 kg (716 lbs)
			GL1500CF	352 kg (776 lbs)
		Curb weight (49 state/Canada type)	GL1500C	334 kg (736 lbs)
			GL1500CT	349 kg (769 lbs)
GL1500CF			380 kg (838 lbs)	
(California type)			GL1500C	335 kg (739 lbs)
			GL1500CT	350 kg (772 lbs)
			GL1500CF	381 kg (840 lbs)
Maximum weight capacity	GL1500C/CT	180 kg (397 lbs)		
	GL1500CF	188 kg (414 lbs)		
FRAME	Frame type		Diamond	
	Front suspension		Telescopic fork (inverted)	
	Front wheel travel		110 mm (4.3 in)	
	Rear suspension		Swingarm	
	Rear wheel travel		120 mm (4.7 in)	
	Rear damper		Nitrogen gas filled damper	
	Front tire size		150/80R17 72H	
	Rear tire size		180/70R16 77H	
	Tire brand (Dunlop) FR/RR		D206F/D206	
	Front brake		Hydraulic double disc	
	Rear brake		Hydraulic single disc	
	Caster angle	GL1500C/CT	32°12'	
		GL1500CF	32°20'	
	Trail length		152 mm (6.0 in)	
	Fuel tank capacity	GL1500C/CT	20 liters (5.3 US gal, 4.4 Imp gal)	
		GL1500CF	26 liters (6.9 US gal, 5.7 Imp gal)	
	Fuel tank reserve capacity	GL1500C/CT	4.3 liters (1.14 US gal, 0.95 Imp gal)	
		GL1500CF	4.0 liters (1.06 US gal, 0.88 Imp gal)	

GENERAL INFORMATION

GENERAL (Cont'd)								
	ITEM	SPECIFICATIONS						
ENGINE	Cylinder arrangement Bore and stroke Displacement Compression ratio Valve train Intake valve opens at 1mm lift closes at 1mm lift Exhaust valve opens at 1mm lift closes at 1mm lift Lubrication system Oil pump type Cooling system Air filtration Engine dry weight (49 state/Canada type) (California type) Firing order Cylinder number	Flat six 71×64 mm (2.8×2.5 in) 1,520 cm ³ (92.7 cu-in) 9.8 : 1 Belt-driven OHC 5° BTDC (California type: 5° ATDC) 45° ABDC (California type: 40° ABDC) 35° BBDC (California type: 40° BBDC) 5° ATDC (California type: 5° BTDC) Forced pressure and wet sump Trochoid Liquid cooled Viscous paper element 118.7 kg (262 lbs) 119.0 kg (262 lbs) 1-4-5-2-3-6 <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>1</td> <td>3</td> <td>5</td> </tr> <tr> <td>2</td> <td>4</td> <td>6</td> </tr> </table> ←Front	1	3	5	2	4	6
1	3	5						
2	4	6						
CARBURETOR	Carburetor type Throttle bore	CV semi-down-draft 28 mm (1.1 in)						
DRIVE TRAIN	Clutch system Clutch operation system Transmission Primary reduction Secondary reduction (Output drive) Final reduction Gear ratio 1st 2nd 3rd 4th 5th Gearshift pattern	Multi-plate, wet Hydraulic operating Constant mesh, 5-speed 1.591 (78/49) 0.971 (34/35) 2.833 (34/12) 2.666 (40/15) 1.722 (31/18) 1.291 (31/24) 1.000 (30/30) 0.805 (29/36) Left foot operated return system, 1-N-2-3-4-5						
ELECTRICAL	Ignition system Starting system Charging system Regulator/rectifier Lighting system	Full transistorized ignition Electric starter motor Triple phase output alternator Triple phase full-wave rectification with field coil Battery						

GENERAL INFORMATION

Unit: mm (in)

LUBRICATION SYSTEM		ITEM		STANDARD	SERVICE LIMIT
Oil pressure (at oil pressure switch)	Cold (at 35°C, 95°F)	Idle		127 kPa (1.3 kgf/cm ² , 18 psi)	—
		5,000 rpm		490 kPa (5.0 kgf/cm ² , 71 psi)	—
	Hot (at 80°C, 176°F)	Idle		78 kPa (0.8 kgf/cm ² , 11 psi)	—
		5,000 rpm		490 kPa (5.0 kgf/cm ² , 71 psi)	—
Scavenge oil pump	Tip clearance			0.15 (0.006) max.	0.35 (0.014)
	Body clearance			0.15—0.22 (0.006—0.009)	0.42 (0.017)
	Side clearance			0.02—0.07 (0.001—0.003)	0.12 (0.005)
Main oil pump	Tip clearance			0.15 (0.006) max.	0.35 (0.014)
	Body clearance			0.15—0.23 (0.006—0.009)	0.43 (0.017)
	Side clearance			0.02—0.07 (0.001—0.003)	0.12 (0.005)
Relief valve spring free length				90.8 (3.57)	84.0 (3.31)

FUEL SYSTEM		ITEM		SPECIFICATIONS	
Carburetor type		CV semi-down-draft			
Carburetor throttle bore		28 mm (1.1 in)			
Carburetor identification number	Except California type	GL1500C/ GL1500CT	'97:	VPK0A	
			After '97:	VPK0J	
		GL1500CF	VPK1B		
	California type	GL1500C/ GL1500CT	'97:	BPK0B	
			After '97:	VPK0K	
		GL1500CF	VPK1C		
Main jet		#100			
Slow jet		#35			
Jet needle number		'97:	J6KG		
		After '97:	J6KJ		
Pilot screw	Initial/final opening		See page 5-22		
	High altitude adjustment		See page 5-23		
Float level		13.7 ± 0.5 mm (0.54 ± 0.02 in)			
Idle speed		900 ± 100 rpm			

COOLING SYSTEM		ITEM		SPECIFICATIONS	
Coolant capacity	Radiator and engine		3.75 liters (3.9 US qt, 3.3 Imp qt)		
	Reserve tank		1.0 liter (1.1 US qt, 0.9 Imp qt)		
Radiator cap relief pressure		108—137 kPa (1.1—1.4 kgf/cm ² , 16—20 psi)			
Thermostat	Begins to open		80—84°C (176—183°F)		
	Fully open/valve lift		95°C (203°F)/8 (0.31)		
Recommended antifreeze		Pro Honda HP coolant or an equivalent high quality ethylene glycol antifreeze containing corrosion protection inhibitors			

GENERAL INFORMATION

Unit: mm (in)

CYLINDER HEAD/VALVE			STANDARD	SERVICE LIMIT
ITEM				
Cylinder compression			1,177 kPa (12.0 kgf/cm ² , 171 psi) at 400 rpm	—
Cylinder head	Warpage		—	0.10 (0.004)
Camshaft	Cam lobe height	IN	35.1350—35.2950 (1.3833—1.3896)	35.00 (1.378)
		EX	35.1787—35.3387 (1.3850—1.3913)	35.03 (1.379)
	Runout		—	0.10 (0.004)
	Journal O.D.	Both inner	26.944—26.965 (1.0608—1.0616)	26.91 (1.059)
		Both ends	26.959—26.980 (1.0614—1.0622)	26.91 (1.059)
	Journal I.D.		27.000—27.021 (1.0630—1.0638)	27.05 (1.065)
	Oil clearance	Both inner	0.035—0.077 (0.0012—0.0030)	0.14 (0.006)
Both ends		0.020—0.062 (0.0008—0.0024)	0.14 (0.006)	
Rocker arm	Rocker arm I.D.	IN/EX	12.000—12.018 (0.4724—0.4731)	12.03 (0.474)
	Rocker arm shaft O.D.	IN/EX	11.966—11.984 (0.4711—0.4718)	11.95 (0.470)
	Rocker arm-to-shaft clearance	IN/EX	0.016—0.052 (0.0006—0.0020)	0.08 (0.003)
Valve, valve guide	Valve clearance	IN	0.15 (0.006)	—
		EX	0.22 (0.009)	—
	Valve stem O.D.	IN	5.475—5.490 (0.2156—0.2161)	5.45 (0.215)
		EX	5.455—5.470 (0.2148—0.2154)	5.44 (0.214)
	Valve guide I.D.	IN/EX	5.500—5.512 (0.2165—0.2170)	5.55 (0.219)
	Stem-to-guide clearance	IN	0.010—0.037 (0.0004—0.0015)	0.08 (0.003)
		EX	0.030—0.057 (0.0012—0.0022)	0.10 (0.004)
	Valve guide projection above cylinder head	IN/EX	18.5 (0.73)	—
Valve seat width	IN/EX	1.2 (0.05)	—	
Valve spring	Free length	IN/EX	47.8 (1.88)	46.5 (1.83)

CLUTCH			STANDARD	SERVICE LIMIT
ITEM				
Clutch master cylinder	Cylinder I.D.		15.870—15.913 (0.6248—0.6265)	15.93 (0.627)
	Piston O.D.		15.827—15.854 (0.6231—0.6242)	15.82 (0.623)
Clutch	Spring free height		5.38 (0.212)	5.1 (0.20)
	Disc thickness		3.72—3.88 (0.146—0.153)	3.5 (0.14)
	Plate warpage		—	0.30 (0.012)
Clutch fluid			DOT 4 brake fluid	—

GENERAL INFORMATION

Unit: mm (in)

GEARSHIFT LINKAGE/TRANSMISSION ITEM		STANDARD	SERVICE LIMIT
Shift fork	I.D.	14.000—14.021 (0.5512—0.5520)	14.04 (0.553)
	Claw thickness	5.93—6.00 (0.233—0.236)	5.6 (0.22)
Shift fork shaft	O.D.	13.966—13.984 (0.5498—0.5506)	13.90 (0.547)
Output shaft	Damper spring free length		60.82 (2.394)
	Shaft O.D.		22.008—22.021 (0.8665—0.8670)
	Collar	I.D.	22.026—22.041 (0.8672—0.8678)
		O.D.	25.959—25.980 (1.0220—1.0228)
Driven gear I.D.		26.000—26.016 (1.0236—1.0242)	
Transmission	Gear I.D.	M4	31.000—31.025 (1.2205—1.2215)
		M5	30.000—30.021 (1.1811—1.1819)
		C2, C3	34.000—34.016 (1.3386—1.3392)
	Gear bushing O.D.	M4	30.950—30.975 (1.2185—1.2195)
		M5	29.955—29.980 (1.1793—1.1803)
		C2, C3	33.940—33.965 (1.3362—1.3372)
	Gear bushing I.D.	M4	28.000—28.021 (1.1024—1.1032)
		M5	23.000—23.021 (0.9055—0.9063)
		Mainshaft O.D.	M4
	M5		22.974—22.987 (0.9045—0.9050)
	Gear-to-bushing clearance	M4	0.025—0.075 (0.0010—0.0030)
		M5	0.020—0.066 (0.0008—0.0026)
		C2, C3	0.035—0.076 (0.0014—0.0030)
	Bushing-to-shaft clearance	M4	0.013—0.047 (0.0005—0.0019)
		M5	0.013—0.047 (0.0005—0.0019)

GENERAL INFORMATION

Unit: mm (in)

PISTON/CRANKSHAFT		STANDARD	SERVICE LIMIT	
ITEM				
Cylinder	I.D.	71.010—71.025 (2.7957—2.7963)	71.1 (2.80)	
	Out-of-round	—	0.15 (0.006)	
	Taper	—	0.05 (0.002)	
	Top warpage	—	0.05 (0.002)	
Piston, piston pin, piston ring	Piston O.D. at 10(0.4) from the bottom	70.970—70.990 (2.7941—2.7949)	70.85 (2.789)	
	Piston pin bore I.D.	18.010—18.016 (0.7091—0.7093)	18.03 (0.710)	
	Piston-to-cylinder clearance	0.020—0.055 (0.0008—0.0022)	0.10 (0.004)	
	Piston pin O.D. (at sliding surface)	17.994—18.000 (0.7084—0.7087)	17.99 (0.708)	
	Piston-to-piston pin clearance	0.010—0.022 (0.0004—0.0009)	0.05 (0.002)	
	Connecting rod-to-piston pin interference	0.015—0.039 (0.0006—0.0015)	—	
	Piston ring end gap	Top/second	0.15—0.30 (0.006—0.012)	0.5 (0.02)
		Oil (side rail)	0.20—0.70 (0.008—0.028)	0.9 (0.04)
	Piston ring-to-ring groove clearance	Top	0.025—0.055 (0.0010—0.0022)	0.10 (0.004)
Second		0.015—0.045 (0.0006—0.0018)	0.10 (0.004)	
Crankshaft	Connecting rod side clearance	0.15—0.30 (0.006—0.012)	0.40 (0.016)	
	Crankpin bearing oil clearance	0.027—0.045 (0.0011—0.0018)	0.06 (0.002)	
	Main journal bearing oil clearance	0.020—0.038 (0.0008—0.0015)	0.06 (0.002)	
	Runout	—	0.03 (0.001)	
	Crankpin and main journal	Taper	—	0.003 (0.0001)
		Out-of-round	—	0.005 (0.0002)

FINAL DRIVE		STANDARD	SERVICE LIMIT
ITEM			
Recommended final drive oil		Hypoid gear oil, SAE #80	—
Final drive oil capacity	After draining	150 cm ³ (5.1 US oz, 5.3 Imp oz)	—
	After disassembly	170 cm ³ (5.7 US oz, 6.0 Imp oz)	—
Final drive gear backlash		0.05—0.15 (0.002—0.006)	0.30(0.012)
Backlash difference between measurements		—	0.10(0.004)
Ring gear-to-stop pin clearance		0.30—0.60 (0.012—0.024)	—
Final drive gear assembly pre-load		0.2—0.4 N·m (2—4 kgf·cm, 1.7—3.5 lbf·in)	—

GENERAL INFORMATION

Unit: mm (in)

FRONT WHEEL/SUSPENSION/STEERING			STANDARD	SERVICE LIMIT	
ITEM					
Minimum tire tread depth			—	1.5 (0.06)	
Cold tire pressure	Up to 90 kg (200 lb) load		225 kPa (2.25 kgf/cm ² , 33 psi)	—	
	Up to maximum weight capacity		225 kPa (2.25 kgf/cm ² , 33 psi)	—	
Axle runout			—	0.20 (0.008)	
Wheel rim runout	Radial		—	2.0 (0.08)	
	Axial		—	2.0 (0.08)	
Fork	Spring free length		344.2 (13.55)	337 (13.3)	
	Spring installation direction		With the tapered end facing up		
	Tube runout		—	0.20 (0.008)	
	Recommended fork fluid		Pro-Honda Suspension Fluid SS-8		
	Fluid level	GL1500C/ GL1500CT	Right	135 (5.3)	—
			Left	142 (5.6)	—
		GL1500CF	Right	136 (5.4)	—
			Left	148 (5.8)	—
	Fluid capacity	GL1500C/ GL1500CT	Right	670±2.5 cm ³ (22.7±0.08 US oz, 23.6±0.09 Imp oz)	—
			Left	744±2.5 cm ³ (25.2±0.08 US oz, 26.2±0.09 Imp oz)	—
GL1500CF		Right	669±2.5 cm ³ (22.6±0.08 US oz, 23.5±0.09 Imp oz)	—	
		Left	734±2.5 cm ³ (24.8±0.08 US oz, 25.8±0.09 Imp oz)	—	
Steering head bearing pre-load	GL1500C/GL1500CT		0.8—1.2 kgf (1.8—2.6 lbf)	—	
	GL1500CF		0.5—1.0 kgf (1.1—2.2 lbf)	—	

REAR WHEEL/SUSPENSION			STANDARD	SERVICE LIMIT
ITEM				
Minimum tire tread depth			—	2.0 (0.08)
Cold tire pressure	Up to 90 kg (200 lb) load		225 kPa (2.25 kgf/cm ² , 33 psi)	—
	Up to maximum weight capacity		250 kPa (2.50 kgf/cm ² , 36 psi)	—
Axle runout			—	0.20 (0.008)
Wheel rim runout	Radial		—	2.0 (0.08)
	Axial		—	2.0 (0.08)
Shock absorber per-load adjuster setting			2nd position	—

GENERAL INFORMATION

Unit: mm (in)

HYDRAULIC BRAKE		STANDARD	SERVICE LIMIT
ITEM			
Front	Specified brake fluid	DOT 4	—
	Brake disc thickness	5.0 (0.20)	4.0 (0.16)
	Brake disc runout	—	0.30 (0.012)
	Master cylinder I.D.	14.000—14.043 (0.5512—0.5529)	14.055 (0.5533)
	Master piston O.D.	13.957—13.984 (0.5495—0.5506)	13.945 (0.5490)
	Caliper cylinder I.D.	27.000—27.050 (1.0630—1.0650)	27.06 (1.065)
	Caliper piston O.D.	26.935—26.968 (1.0604—1.0617)	26.927 (1.0610)
Rear	Specified brake fluid	DOT 4	—
	Brake disc thickness	7.5 (0.30)	6.0 (0.24)
	Brake disc runout	—	0.30 (0.012)
	Master cylinder I.D.	14.000—14.043 (0.5512—0.5529)	14.055 (0.5533)
	Master piston O.D.	13.957—13.984 (0.5495—0.5506)	13.945 (0.5490)
	Caliper cylinder I.D.	27.000—27.050 (1.0630—1.0650)	27.06 (1.065)
	Caliper piston O.D.	26.935—26.968 (1.0604—1.0617)	26.927 (1.0610)

CHARGING SYSTEM/ALTERNATOR		STANDARD	SERVICE LIMIT	
ITEM				
Alternator	Stator coil resistance	0.1—0.3 Ω (at 20°C/68°F)	—	
	Rotor coil resistance	2.9—4.0 Ω (at 20°C/68°F)	—	
	Rotor coil slip ring O.D.	27.0 (1.06)	26.0 (1.02)	
Battery (Maintenance free: YTX14-BS)	Capacity	12 V—12 Ah	—	
	Current leakage	0.1 mA max.	—	
	Charging rate	Normal	1.4 A X 5—10 h	—
		Quick	6.0 A X 1.0 h	—
	Voltage (at 20°C/68°F)	Fully charged	13.1 V	—
Needs charging		Below 12.3 V	—	

IGNITION SYSTEM		SPECIFICATIONS	
ITEM			
Spark plug		NGK	DENSO
	Standard	DPR7EA-9	X22EPR-U9
	For cold climate (below 5°C/41°F)	DPR6EA-9	X20EPR-U9
	For extended high speed riding	DPR8EA-9	X24EPR-U9
Spark plug gap	0.8—0.9 (0.031—0.035)		
Ignition coil primary peak voltage	100 V minimum		
Ignition pulse generator peak voltage	0.7 V minimum		
Ignition timing "F" mark	3.5° BTDC at idle		
Engine coolant temperature (ECT) sensor resistance	at 20°C (68°F)	2.0—3.0 k Ω	
	at 80°C (176°F)	200—400 Ω	

GENERAL INFORMATION

Unit: mm (in)

ELECTRIC STARTER/STARTER CLUTCH		
ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	12.5 (0.51)	6.0 (0.24)

LIGHTS/METERS/SWITCHES (GL1500C/GL1500CT)		
ITEM		SPECIFICATIONS
Fuse	Main fuse A	30 A
	Main fuse B	55 A
	Sub-fuse	10 A × 5, 5 A × 1
Bulb	Headlight (High/low beam)	12 V – 60/55 W
	Brake/taillight	12 V – 32/3 cp
	License light	12 V – 4 cp
	Front turn signal/running light	12 V – 32/3 cp × 2
	Rear turn signal light	12 V – 32 cp × 2
	Meter light	12 V – 1.7 W (Tachometer), 12 V – 1.7 W (Speedometer)
	High beam indicator	12 V – 3 W
	Turn signal indicator	12 V – 3 W
	Neutral indicator	12 V – 3 W
Thermosensor resistance ('97 – '99)	80 °C (176 °F)	47 – 57 Ω
	120 °C (248 °F)	14 – 18 Ω
Thermostatic switch (After '99)	Start to close (ON)	112 – 118 °C (234 – 244 °F)
	Stop opening (OFF)	108 °C (226 °F) min.
Fan motor switch	Start to close (ON)	98 – 102 °C (208 – 216 °F)
	Stop opening (OFF)	93 – 97 °C (199 – 207 °F)

LIGHTS/METERS/SWITCHES (GL1500CF)		
ITEM		SPECIFICATIONS
Fuse	Main fuse A	30 A
	Main fuse B	55 A
	Sub-fuse	15 A × 3, 10 A × 2, 5 A × 3
Bulb	Headlight (High/low beam)	12 V – 45/45 W × 2
	Brake/taillight	12 V – 21/5 W × 2
	License light	12 V – 4 cp
	Front turn signal/running light	12 V – 35/2.8 cp × 2
	Rear turn signal light	12 V – 36.6 cp × 2
	Trunk accessory light	12 V – 3 W × 2
	Meter light	12 V – 1.7 W × 4
Thermostatic switch	Starts to close (ON)	112 – 118 °C (234 – 244 °F)
	Stop opening (OFF)	108 °C (226 °F) min.
Fan motor switch	Starts to close (ON)	98 – 102 °C (208 – 216 °F)
	Stop opening (OFF)	93 – 97 °C (199 – 207 °F)

TORQUE VALUES

STANDARD FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)	FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)
5 mm bolt and nut	5 (0.5, 3.6)	5 mm screw	4 (0.4, 2.9)
6 mm bolt and nut	10 (1.0, 7)	6 mm screw	9 (0.9, 6.5)
8 mm bolt and nut	22 (2.2, 16)	6 mm flange bolt (8 mm head, small flange)	10 (1.0, 7)
10 mm bolt and nut	34 (3.5, 25)	(8 mm head, large flange)	12 (1.2, 9)
12 mm bolt and nut	54 (5.5, 40)	6 mm flange bolt (10 mm head) and nut	12 (1.2, 9)
		8 mm flange bolt and nut	26 (2.7, 20)
		10 mm flange bolt and nut	39 (4.0, 29)

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

- NOTES:
1. Apply sealant to the threads.
 2. Apply locking agent to the threads.
 3. Apply molybdenum disulfide oil to the threads and seating surface.
 4. Stake.
 5. Apply oil to the threads and seating surface.
 6. Apply engine oil to the O-ring.
 7. U-nut.
 8. ALOC bolt: replace with a new one.
 9. Left-hand threads.

ENGINE ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
MAINTENANCE :				
Spark plug	6	12	16 (1.6, 12)	
Valve adjusting screw lock nut	12	7	23 (2.3, 17)	
Engine oil drain bolt	1	14	34 (3.5, 25)	
Engine oil filter cartridge	1	20	10 (1.0, 7)	NOTE 5, 6
LUBRICATION SYSTEM:				
Oil pressure switch	1	PT 1/8	12 (1.2, 9)	NOTE 1
Oil filter boss	1	20	18 (1.8, 13)	NOTE 2
FUEL SYSTEM:				
Carburetor joint bolt nut	8	6	10 (1.0, 7)	
Intake manifold mounting bolt	12	6	9 (0.9, 6.5)	
Intake manifold vacuum joint	6	5	2.7 (0.28, 2.0)	
COOLING SYSTEM:				
Coolant drain bolt	1	6	13 (1.3, 9)	
Water pump assembly bolt	2	6	13 (1.3, 9)	
Water hose band screw	2	4	2 (0.2, 1.4)	
CYLINDER HEAD/VALVE:				
Timing belt tensioner bolt	2	8	25 (2.6, 19)	NOTE 2
Timing belt driven pulley bolt	2	8	26 (2.7, 20)	
Cylinder head cover bolt	12	6	12 (1.2, 9)	
Cylinder head bolt	16	9	44 (4.5, 33)	NOTE 3
Camshaft holder bolt	16	8	20 (2.0, 14)	
Intake manifold mounting bolt	12	6	9 (0.9, 6.5)	
CLUTCH:				
Clutch slave cylinder bleed valve	1	8	9 (0.9, 6.5)	
Bleeder pipe oil bolt	1	10	34 (3.5, 25)	
Bleeder pipe mounting bolt	1	6	12 (1.2, 9)	NOTE 2
Clutch outer lock nut	1	40	186 (19.0, 137)	NOTE 2, 4
Clutch center lock nut	1	22	127 (13.0, 94)	NOTE 4

GENERAL INFORMATION

ENGINE (Cont'd)				
ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
GEARSHIFT LINKAGE/TRANSMISSION :				
Gearshift arm B bolt	1	8	25 (2.5, 18)	
Shift drum joint bolt	1	8	27 (2.8, 20)	NOTE 2
Oil pump driven sprocket bolt	1	6	18 (1.8, 13)	NOTE 2
Alternator drive gear bolt	6	8	26 (2.7, 20)	NOTE 5
Starter clutch bolt	1	12	74 (7.5, 54)	
Output shaft lock nut	1	30	186 (19.0, 137)	NOTE 4
Mainshaft lock nut	1	22	186 (19.0, 137)	NOTE 4, 9
Countershaft lock nut	1	22	186 (19.0, 137)	NOTE 2, 4, 9
Output shaft bearing holder bolt	3	8	29 (3.0, 22)	
Rear case bolt	16	8	29 (3.0, 22)	
PISTON/CRANKSHAFT :				
Connecting rod bearing cap nut	12	8	31 (3.2, 23)	NOTE 5
Main journal bearing cap bolt	8	10	59 (6.0, 43)	NOTE 5
Crankcase bolt	8	10	34 (3.5, 25)	NOTE 5
Crankcase bolt	4	8	26 (2.7, 20)	
CHARGING SYSTEM/ALTERNATOR :				
Alternator mounting bolt	3	8	29 (3.0, 22)	
Coupler A mounting nut	1	14	57 (5.8, 42)	NOTE 2
Coupler B mounting nut	1	14	57 (5.8, 42)	
IGNITION SYSTEM :				
Engine coolant temperature (ECT) sensor	1	12	27 (2.8, 20)	
Timing belt drive pulley bolt	1	12	74 (7.5, 54)	
ELECTRIC STARTER/STARTER CLUTCH :				
Starter motor mounting bolt	3	8	29 (3.0, 22)	
Starter motor assembly bolt	3	5	5 (0.5, 3.6)	
LIGHTS/METERS/SWITCHES :				
Thermosensor/Thermostatic switch	1	PT 1/8	12 (1.2, 9)	NOTE 1
Neutral switch mounting bolt	2	6	12 (1.2, 9)	

GENERAL INFORMATION

FRAME	ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
FRAME/BODY PANELS/EXHAUST SYSTEM:					
	Grab rail bolt (rear)	2	8	26 (2.7, 20)	NOTE 5
	Grab rail bolt (front)	2	10	39 (4.0, 29)	NOTE 5
	Rear seat bolt	1	6	12 (1.2, 9)	GL1500C/CT
	Fuel tank mounting bolt	1	6	12 (1.2, 9)	
	Fuel valve nut	1	8	26 (2.7, 20)	
	Radiator cover mounting bolt (front lower)	1	22	34 (3.5, 25)	
	Driver footpeg bolt	1	6	10 (1.0, 7)	GL1500CF
	Gearshift pedal pinch bolt	4	8	26 (2.7, 20)	
	Gearshift pedal pinch bolt	1	6	12 (1.2, 9)	
	Exhaust pipe joint nut	12	6	10 (1.0, 7)	
	Muffler mounting nut	4	8	34 (3.5, 25)	
MAINTENANCE:					
	Final drive oil filler cap	1	30	12 (1.2, 9)	
	Final drive oil drain bolt	1	14	20 (2.0, 14)	
ENGINE MOUNTING:					
	Engine mounting bolt	8	10	44 (4.5, 33)	
	Engine mounting bracket bolt	4	8	26 (2.7, 20)	
	Front cross pipe bolt	1	10	44 (4.5, 33)	
	Sub-frame bolt	4	10	44 (4.5, 33)	
	Engine guard bolt	6	8	26 (2.7, 20)	
CLUTCH:					
	Clutch lever pivot bolt	1	6	1 (0.1, 0.7)	
	Clutch lever pivot nut	1	6	6 (0.6, 4.3)	
	Clutch master cylinder holder bolt	2	6	12 (1.2, 9)	
	Clutch hose oil bolt	2	10	34 (3.5, 25)	
	Side stand bracket bolt	2	12	64 (6.5, 47)	NOTE 5, 7
FINAL DRIVE:					
	Final gear case mounting nut	4	10	64 (6.5, 47)	
	Final gear case cover bolt	2	10	62 (6.3, 46)	NOTE 2
		6	8	25 (2.6, 19)	
	Pinion bearing retainer	1	70	147 (15.0, 112)	
	Pinion joint nut	1	16	108 (11.0, 80)	NOTE 2
	Pinion retainer lock plate bolt	1	6	10 (1.0, 7)	
	Dust guard mounting bolt	1	6	10 (1.0, 7)	
FRONT WHEEL/SUSPENSION/STEERING:					
	Handlebar upper holder bolt	4	8	29 (3.0, 22)	
	Handlebar lower holder nut	2	12	64 (6.5, 47)	NOTE 7
	Front axle bolt	1	14	90 (9.2, 67)	
	Front axle holder pinch bolt	2	8	22 (2.2, 16)	
	Front brake disc mounting bolt	6	6	20 (2.0, 14)	NOTE 8
	Steering stem nut	1	24	103 (10.5, 76)	GL1500C/CT
		1	24	100 (10.2, 74)	GL1500CF
	Steering stem bearing adjustment nut	1	26	17 (1.7, 12)	GL1500C/CT
		1	26	13 (1.3, 9)	GL1500CF
	Steering stem bearing adjustment nut lock nut	1	26	—	page 13-39
	Front brake hose clamp bolt	2	6	12 (1.2, 9)	
	Fork top bridge pinch bolt	2	10	55 (5.6, 41)	
	Fork bottom bridge pinch bolt	4	8	25 (2.5, 18)	
	Fork cap	2	50	34 (3.5, 25)	
	Fork cap lock nut	2	8	20 (2.0, 14)	
	Left fork inner bolt	1	—	98 (10.0, 72)	
	Fork socket bolt	2	8	20 (2.0, 14)	NOTE 2

GENERAL INFORMATION

FRAME (Cont'd)				
ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
REAR WHEEL/SUSPENSION:				
Rear axle nut	1	18	110 (11.2, 81)	NOTE 7
Rear brake disc bolt	6	8	42 (4.3, 31)	NOTE 8
Damper holder plate bolt	5	6	20 (2.0, 14)	NOTE 8
Right swingarm pivot bolt	1	30	103 (10.5, 76)	GL1500C/CT
	1	30	98 (10.0, 72)	GL1500CF
Left swingarm pivot bolt	1	30	19 (1.9, 14)	GL1500C/CT
	1	30	22 (2.2, 16)	GL1500CF
Left swingarm pivot lock nut	1	30	113 (11.5, 83)	GL1500C/CT
	1	30	98 (10.0, 72)	GL1500CF
Shock absorber upper mounting bolt	2	8	26 (2.7, 20)	
Left shock absorber lower mounting bolt	1	10	34 (3.5, 25)	
Right shock absorber lower mounting bolt	1	8	23 (2.3, 17)	
Rear brake hose clamp bolt	2	6	12 (1.2, 9)	
HYDRAULIC BRAKE:				
Front brake caliper mounting bolt	4	8	30 (3.1, 27)	NOTE 8
Front brake caliper pin bolt	2	8	23 (2.3, 17)	NOTE 2
Front brake caliper bracket pin bolt	2	8	13 (1.3, 9)	NOTE 2
Front brake master cylinder holder bolt	2	6	12 (1.2, 9)	
Front brake master cylinder reservoir cap screw	2	4	1.5 (0.15, 1.1)	
Brake lever pivot bolt	1	6	1 (0.1, 0.7)	
Brake lever pivot nut	1	6	6 (0.6, 4.3)	
Front brake light switch screw	1	4	1.2 (0.12, 0.9)	
Brake pipe joint	4	10	17 (1.7, 12)	
Rear brake caliper stopper pin bolt	1	18	69 (7.0, 51)	NOTE 8
Rear caliper pin bolt	1	12	27 (2.8, 20)	NOTE 2
Rear caliper bracket pin bolt	1	8	13 (1.3, 9)	NOTE 2
Rear brake master cylinder mounting bolt	2	6	12 (1.2, 9)	
Rear brake reservoir mounting bolt	1	6	12 (1.2, 9)	
Rear brake reservoir cover mounting bolt	1	6	10 (1.0, 7)	
Rear master cylinder adjuster lock nut	1	8	18 (1.8, 13)	
Pad pin	3	10	18 (1.8, 13)	
Pad pin plug	3	10	2.5 (0.25, 1.8)	
Caliper bleed valve	3	8	6 (0.6, 4.3)	
Brake hose oil bolt	5	10	34 (3.5, 25)	
Brake pedal pivot bolt	1	8	21 (2.1, 15)	
LIGHTS/METERS/SWITCHES:				
Fan motor switch	1	16	18 (1.8, 13)	
Side stand switch bolt	1	6	10 (1.0, 7)	NOTE 8
OTHERS:				
Shock absorber mount	2	14	108 (11.0, 80)	NOTE 5
Side stand pivot bolt	1	10	10 (1.0, 7)	
Side stand lock nut	1	10	29 (3.0, 22)	NOTE 7
Ignition switch mounting bolt	2	6	10 (1.0, 7)	
Ignition switch cover screw	1	4	2.1 (0.21, 0.15)	
Horn mounting bolt	1	8	21 (2.1, 15)	
Passenger footpeg bracket bolt	4	10	39 (4.0, 29)	
Passenger footpeg mounting bolt	2	10	39 (4.0, 29)	

TOOLS

DESCRIPTION	TOOL NUMBER	ALTERNATIVE TOOL	TOOL NUMBER
Carburetor float level gauge	07401-0010000		
Oil pressure gauge	07506-3000000	Equivalent commercially available in U.S.A.	
Oil pressure gauge attachment	07510-4220100		
Universal holder	07725-0030000		
Remover weight	07741-0010201	Remover weight	07936-371020A or 07936-3710200
Valve guide driver	07742-0010100		
Valve guide driver	07743-0020000	Valve guide driver	07742-0010100
Attachment, 32×35 mm	07746-0010100		
Attachment, 37×40 mm	07746-0010200		
Attachment, 42×47 mm	07746-0010300		
Attachment, 52×55 mm	07746-0010400		
Attachment, 62×68 mm	07746-0010500		
Attachment, 72×78 mm	07746-0010600		
Attachment, 20 mm I.D.	07746-0020400		
Driver, 40 mm I.D.	07746-0030100		
Attachment, 25 mm I.D.	07746-0030200		
Attachment, 30 mm I.D.	07746-0030300		
Pilot, 17 mm	07746-0040400		
Pilot, 20 mm	07746-0040500		
Pilot, 30 mm	07746-0040700		
Pilot, 22 mm	07746-0041000		
Pilot, 28 mm	07746-0041100		
Bearing remover shaft	07746-0050100	Equivalent commercially available in U.S.A.	
Bearing remover head, 20 mm	07746-0050600		
Driver	07749-0010000		
Driver	07749-3710001		
Valve spring compressor	07757-0010000		
Valve seat cutter, 35 mm (45° IN)	07780-0010400	Equivalent commercially available in U.S.A.	
Valve seat cutter, 33 mm (45° EX)	07780-0010800		
Valve seat cutter, 35 mm (32° IN)	07780-0012300		
Valve seat cutter, 33 mm (32° EX)	07780-0012900		
Valve seat cutter, 37.5 mm (60° IN/EX)	07780-0014100		
Valve seat cutter holder, 5.5 mm	07781-0010101		
Swingarm lock nut wrench	07908-4690003		
Pinion retainer wrench	07910-MA10100		
Snap ring pliers	07914-3230001		
Steering stem socket	07916-3710101	Steering stem socket	07916-3710100
Lock nut wrench, 30×64 mm	07916-MB00002		07916-MB00001
Pinion joint holder	07924-ME40002		
Ball race remover set	07935-MJ10000	Ball race remover set	07935-MJ1000B or 07935-MJ1000A (U.S.A. only)
Remover handle	07936-3710100		
Bearing remover, 17 mm	07936-3710300		
Attachment, 28×30 mm	07946-1870100		
Ball race remover set	07946-3710500	Ball race remover set	M9360-227-91774 (U.S.A. only)
Steering stem driver	07946-MB00000		
Bearing remover	07948-4630100	Not available in U.S.A. Adjustable bearing remover set	07JAC-PH80000 or 07736-A1000B or 07736-A1000A
Seal driver attachment	07984-SB00101		
Driver	07948-SC20200		
Driver	07949-3710001		

GENERAL INFORMATION

DESCRIPTION	TOOL NUMBER	ALTERNATIVE TOOL	TOOL NUMBER
Piston ring compressor	07955-3710000		07JMG-MN5000A (U.S.A. only)
Oil seal driver	07965-MA10200		
Oil seal driver	07965-MB00100		07965-MB0010A (U.S.A. only)
Assembly collar	07965-VM00100		
Adjustable piston pin driver head	07973-6570210		
Adjustable piston pin driver shaft	07973-6570300		
Piston base	07973-6570500		
Piston base spring	07973-6570600		
Valve guide reamer, 5.5 mm	07984-2000001		07984-200000C
Bearing driver attachment	07GAD-SD40101		
Inspection adaptor	07GMJ-ML80100		
Oil filter wrench	07HAA-PJ70100		
Holder plate	07HGB-001010B (U.S.A. only)		07HGB-001010A (U.S.A. only)
Peak voltage adaptor	07HGJ-0020100	Peak voltage tester	
Pinion puller set — shaft puller	07HMC-MM80101	Not available in U.S.A	
— pinion puller base	07931-ME40000		07931-ME4010B and 07931-HB3020A (U.S.A. only)
	07HMC-MM80110		07HMC-MM8011A (U.S.A. only)
Look nut wrench, 46 mm	07JMA-MN50100		
Clutch outer holder	07JMB-MN50100		
Mainshaft holder	07JMB-MN50200		
Piston base set — piston base A	07JMG-MN50100	Not available in U.S.A	
— piston base B	07JMG-MN50111		07JMG-MN5012A (U.S.A. only)
Piston ring compressor	07JMG-MN50300		07JMG-MN5000A (U.S.A. only)
Pilot screw wrench	07KMA-MN90101		07KMA-MN9A100 (U.S.A. only)
Fork seal driver, 45 mm	07KMD-KZ30100	Oil seal driver	07KMD-KZ3010A (U.S.A. only)
Pilot collar	07KMF-MT20200		
Vacuum gauge set	07LMJ-001000A	Vacuum gauge set	M937B-021-XXXXX (U.S.A. only)
Pilot pin	07PAF-0010300	Piston pin driver insert	07973-6570400 (U.S.A. only)
Piston base head	07PAF-0010400	Piston base head	07JGF-001010A (U.S.A. only)
Piston base head insert	07PAF-0010500		
Lock nut wrench, 44 mm	07VMA-MZ0010A (U.S.A. only)		
Clutch center holder pin	07VMB-MZ00100		07VMB-MZ0010A (U.S.A. only)

LUBRICATION & SEAL POINTS

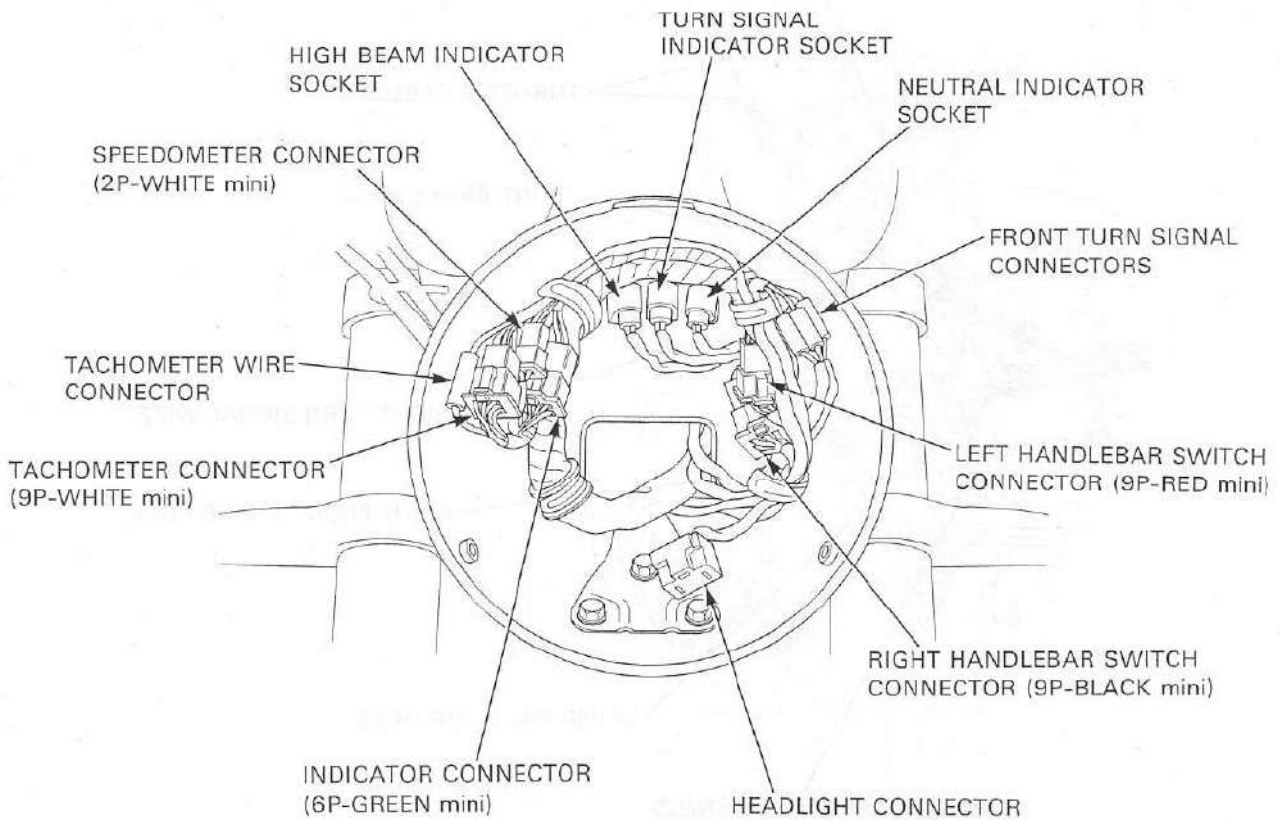
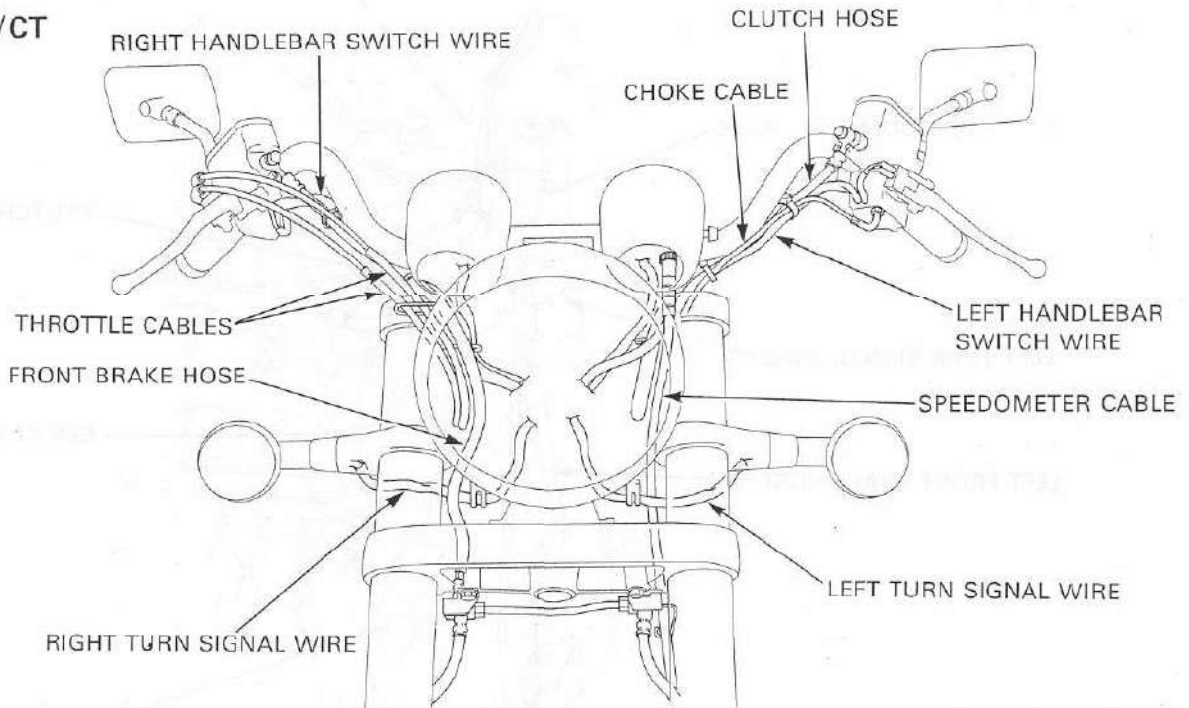
ENGINE	LOCATION	MATERIAL	REMARKS
	Cylinder head-to-camshaft holder mating surfaces Cylinder head-to-cover mating surfaces Camshaft plug/oil seal seating surfaces Timing belt cover socket bolt threads Crankcase-to-transmission cover mating surfaces Crankcase-to-rear case mating surfaces Crankcase mating surface Oil pressure switch threads Thermosensor threads Timing belt tensioner bolt threads Ignition pulse generator mounting bolt threads Thermostat housing left mounting bolt threads Transmission cover 20 mm sealing bolt threads Cylinder head 18 mm sealing bolt threads Left crankcase 18 mm sealing bolt threads Crankcase 20 mm sealing bolt threads	Liquid sealant	See page 8-25 See page 8-25 See page 8-24 See page 8-29 See page 10-9 See page 10-21 See page 11-19 See page 4-3 Do not apply the sensor head. Coating width 7.0 ± 1 mm (0.28 \pm 0.04 in) Coating width 6.5 ± 1 mm (0.26 \pm 0.04 in)
	Crankshaft main journal bearing surfaces Crankpin bearing surfaces Camshaft journal and cam lobe surface IN/EX valve stem sliding surfaces Rocker arm bearing and slipper surfaces Shift fork grooves in the gear shifters Cylinder head bolt threads	Molybdenum disulfide oil (a mixture of 1/2 engine oil and 1/2 molybdenum disulfide grease)	
	Piston ring outer surfaces Piston outer surfaces Each gear dogs and rotating surfaces Each bearing rolling areas Each gear bushing rotating surfaces Oil filter cartridge threads and O-ring Alternator drive gear bolt threads and seating surface Connecting rod bearing cap nut threads and seating surface Main journal bearing cap bolt threads and seating surface 10mm crankcase bolt threads and seating surface Each O-ring Other rotating and sliding surfaces	Engine oil	
	Each oil seal lips	Multi-purpose grease	
	Oil filter boss threads Timing belt shield cover bolt threads Cylinder head rear cover bolt threads Bleed pipe mounting bolt threads Shift drum joint bolt threads Oil pump driven sprocket bolt threads Shift drum bearing set plate bolt threads Countershaft bearing set plate bolt threads Mainshaft bearing set plate bolt threads Clutch outer lock nut threads Countershaft lock nut threads Coupler A mounting nut threads	Locking agent	Coating width 6.5 ± 1 mm (0.26 \pm 0.04 in)

GENERAL INFORMATION

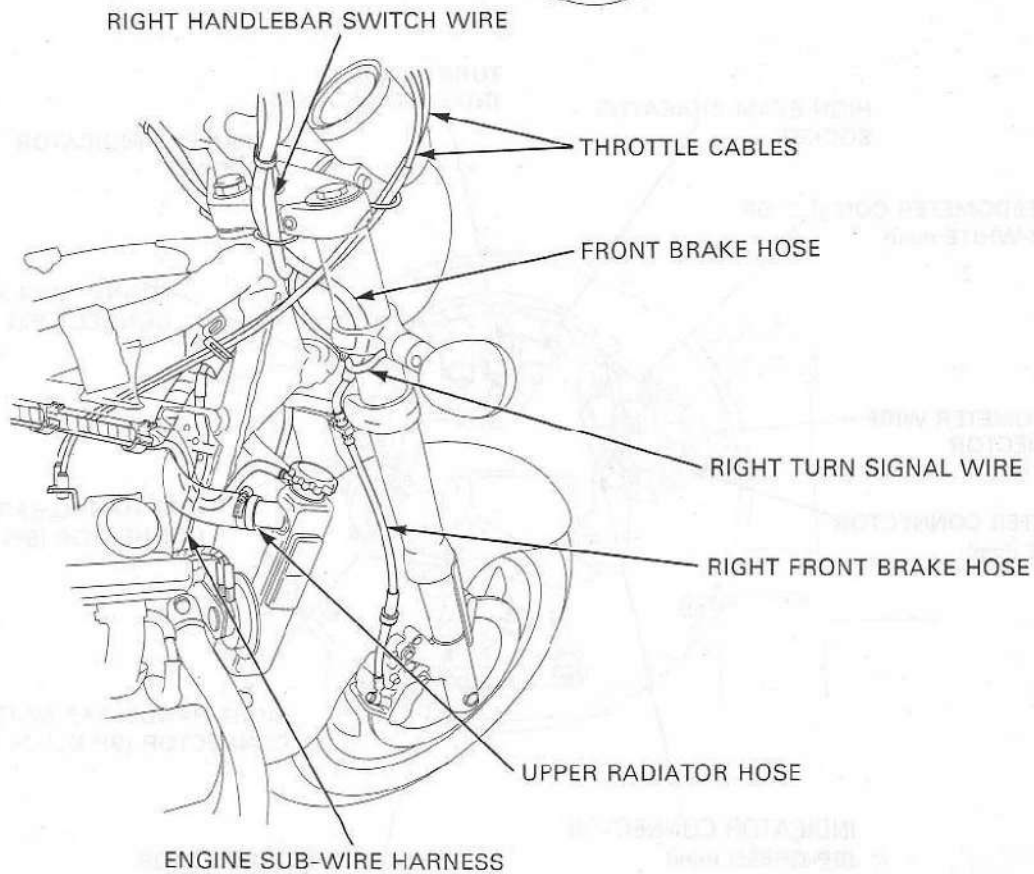
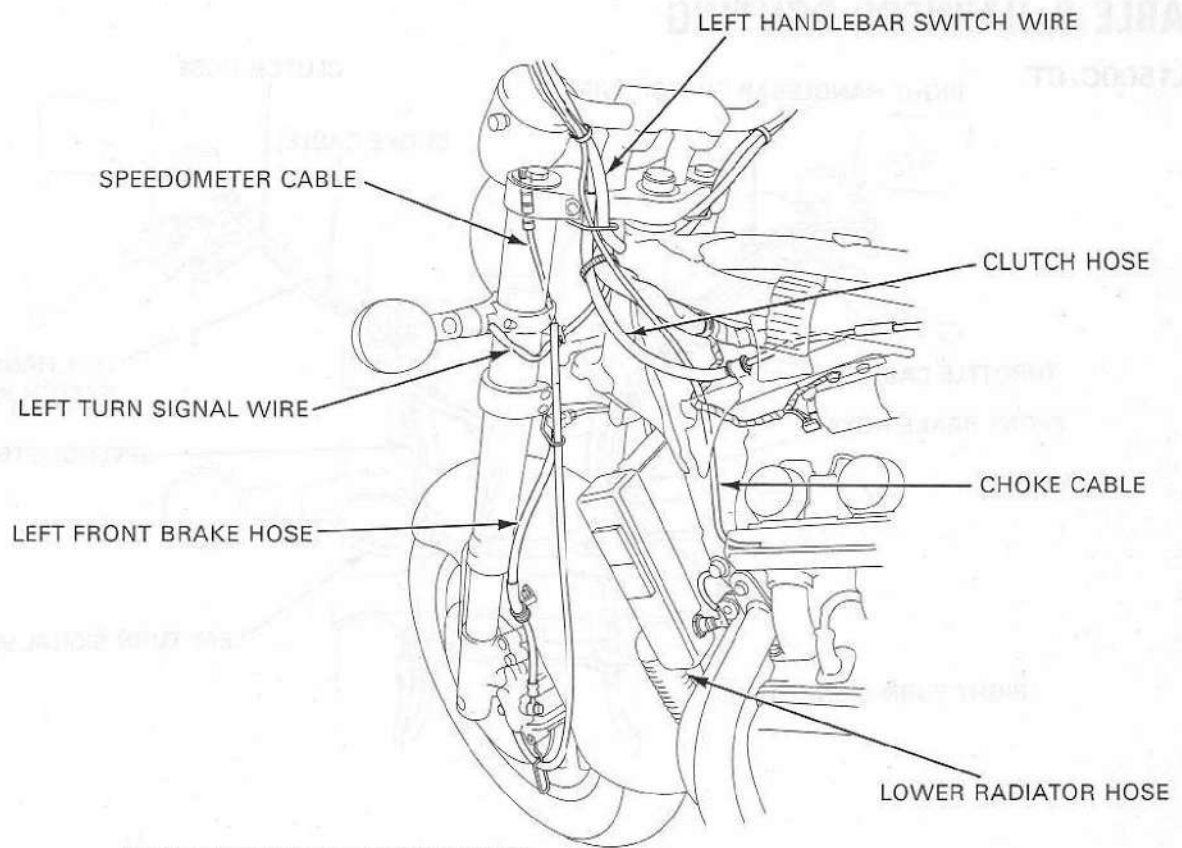
FRAME	LOCATION	MATERIAL	REMARKS
	Side stand pivot sliding surface Driver footpeg sliding surfaces Passenger footpeg sliding surfaces Throttle grip flange sliding surface Brake pedal pivot shaft sliding surface Steering head bearings Steering head bearing dust seal lips Swingarm pivot bearings Swingarm pivot bearing dust seal lips Speedometer gear box inside Final gear case O-rings (3 places) Final gear case oil seal lips (3 places) Front wheel dust seal lips Rear wheel dust seal lips	Multi-purpose grease	
	Final drive pinion joint splines Final drive shaft splines (at universal joint) Output shaft splines (at universal joint) Universal joint bearings and seals Final drive shaft oil seal lips	Molybdenum disulfide grease	Apply 2 g Apply 1 g Apply 1 g Apply 0.5 g
	Rear wheel hub (final driven flange mating surface) Rear wheel hub (final driven flange O-ring groove) Final driven flange splines and O-ring groove Final driven flange (rear wheel hub mating surface) Final driven flange (final gear case O-ring guide joint area)	Molybdenum disulfide paste	Apply 3 g Apply 5 g Apply 3 g Apply 1—2 g
	Throttle cable outer inside Choke cable outer inside Speedometer cable outer inside	Cable lubricant	
	Handlebar grip rubber inside Air cleaner housing-to-connecting tube contacting surfaces	Honda bond A, Honda Hand Grip Cement (U.S.A. only) or equivalent	
	Steering head bearing adjusting nut threads Grab rail bolt threads Side stand bracket bolt threads	Engine oil	
	Front and rear brake master pistons and cups Front and rear caliper pistons	DOT 4 brake fluid	
	Front brake master piston-to-lever contacting area Front brake lever pivot sliding surface Rear master piston-to-push rod contacting area Front and rear caliper piston seals Front and rear caliper pin bolt sliding surfaces Front and rear caliper bracket pin bolt sliding surfaces Clutch master piston-to-push rod contacting area Clutch lever pivot sliding surface	Silicone grease	
	Fork dust seal lips Fork oil seal lips	Pro-Honda Suspension Fluid SS-8	
	Final gear case-to-cover mating surfaces	Liquid sealant	
	Final gear case cover bolt threads Pinion joint nut threads Fork socket bolt threads Front and rear caliper pin bolt threads Front and rear caliper bracket pin bolt threads	Locking agent	

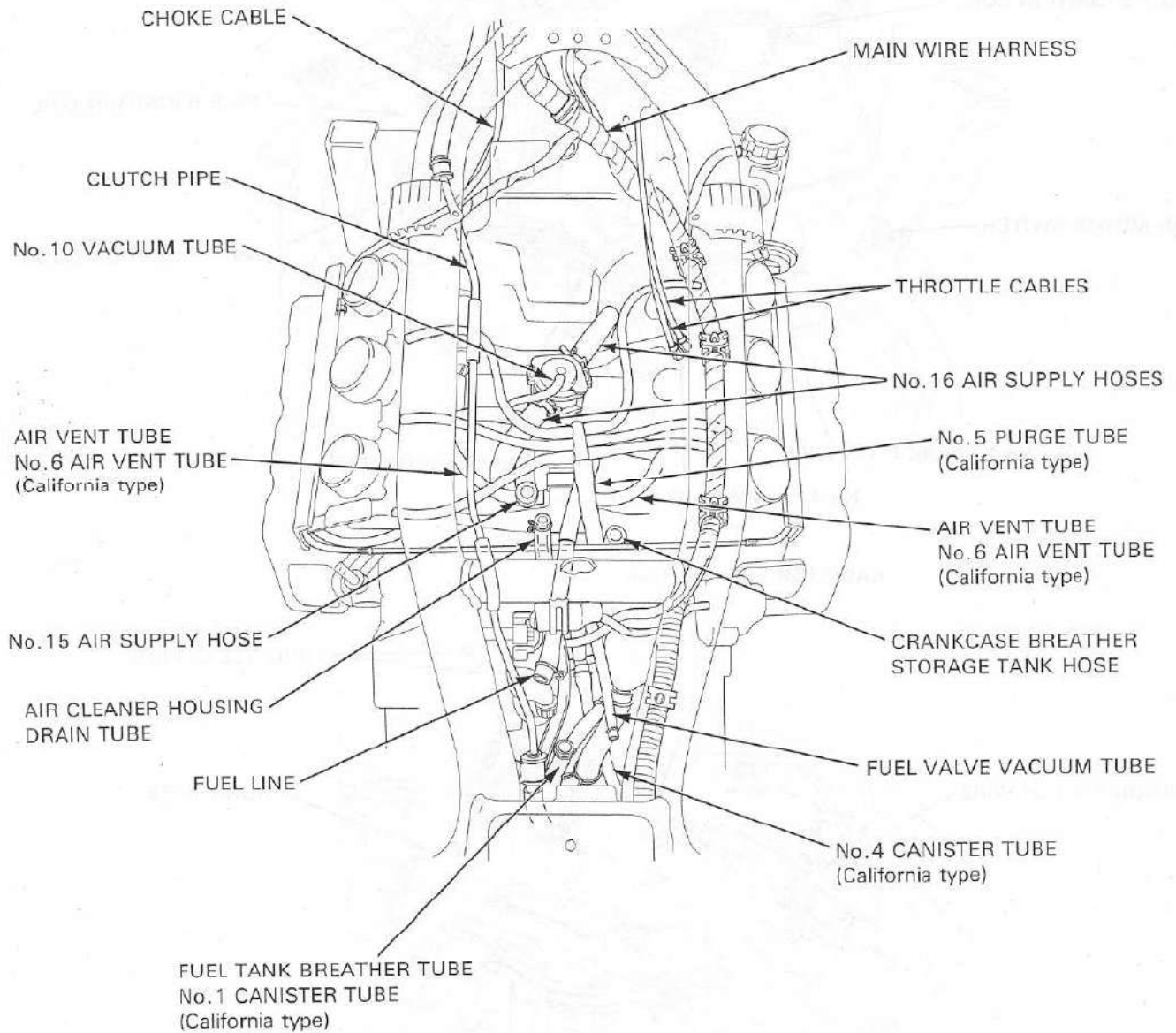
CABLE & HARNESS ROUTING

GL1500C/CT

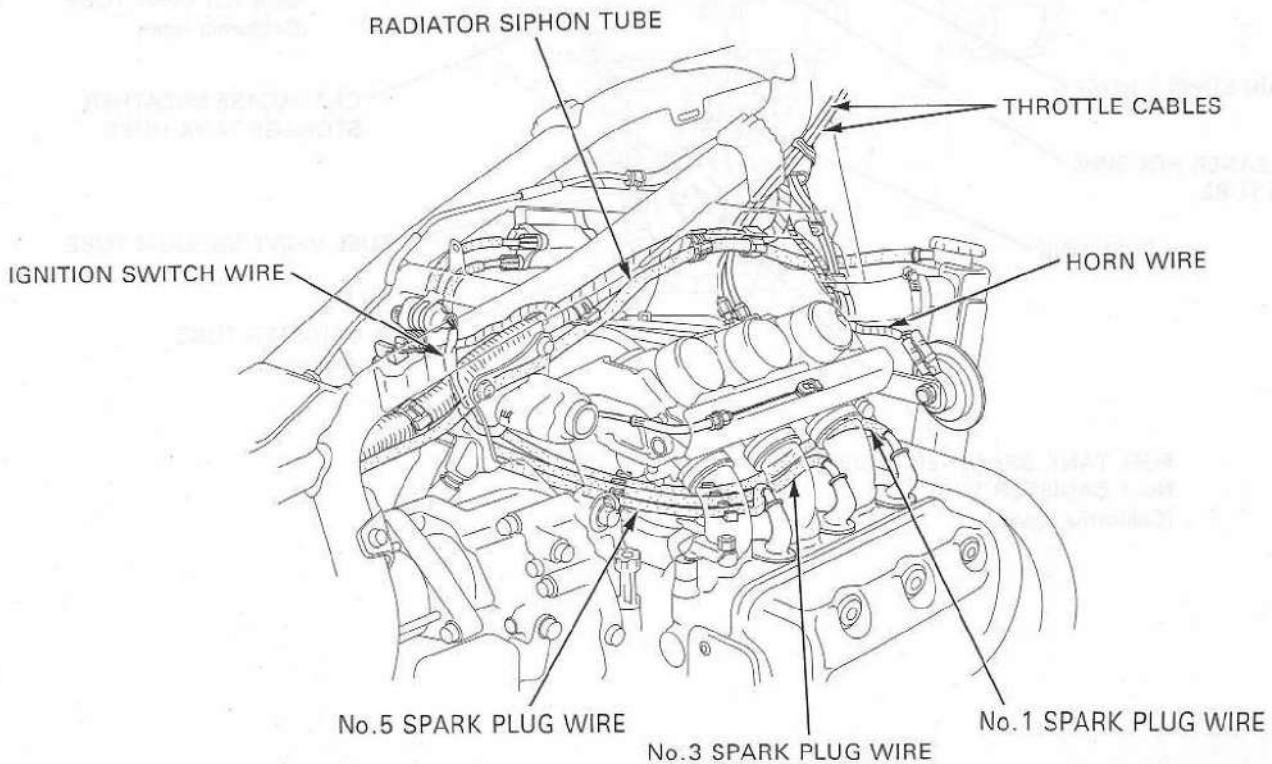
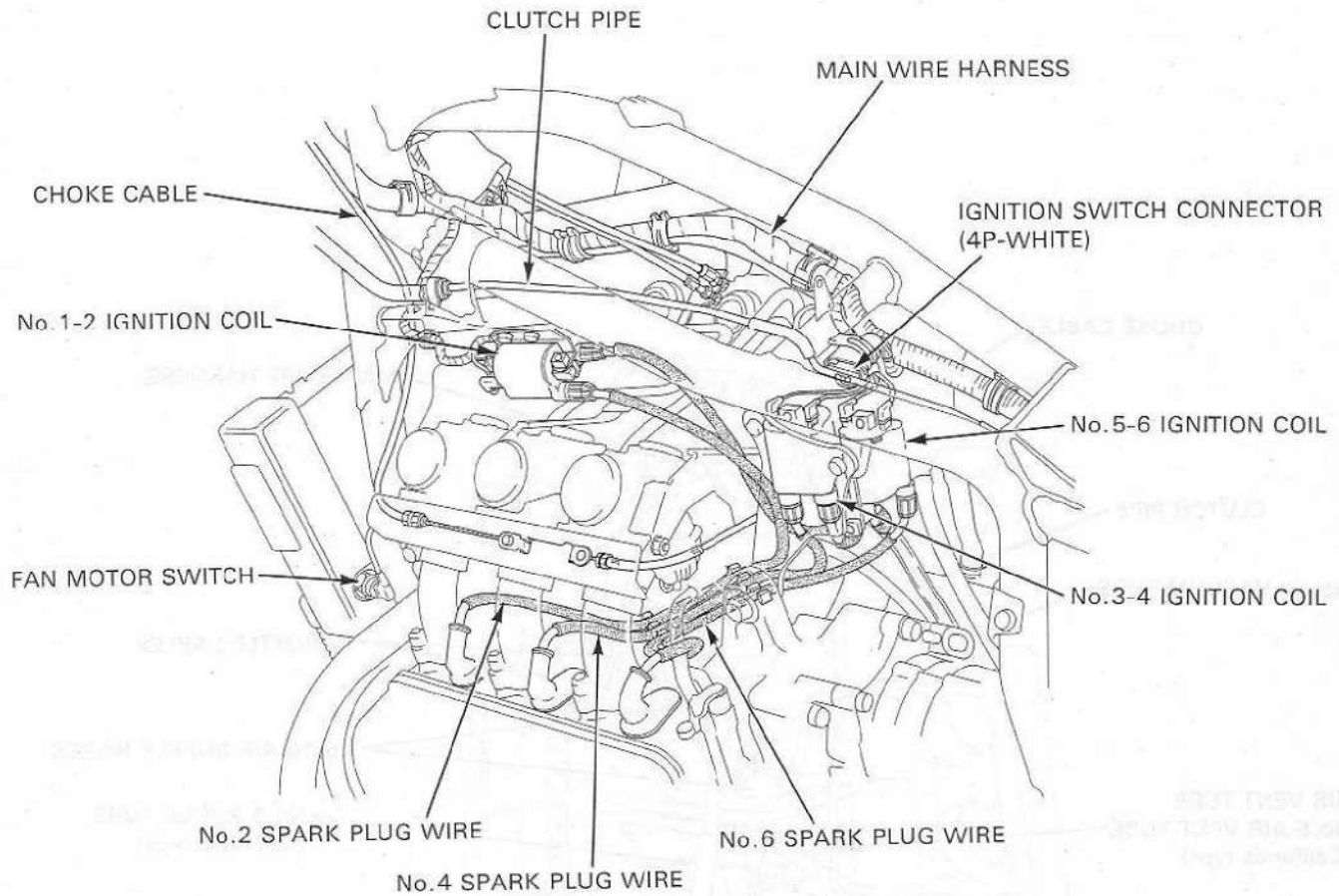


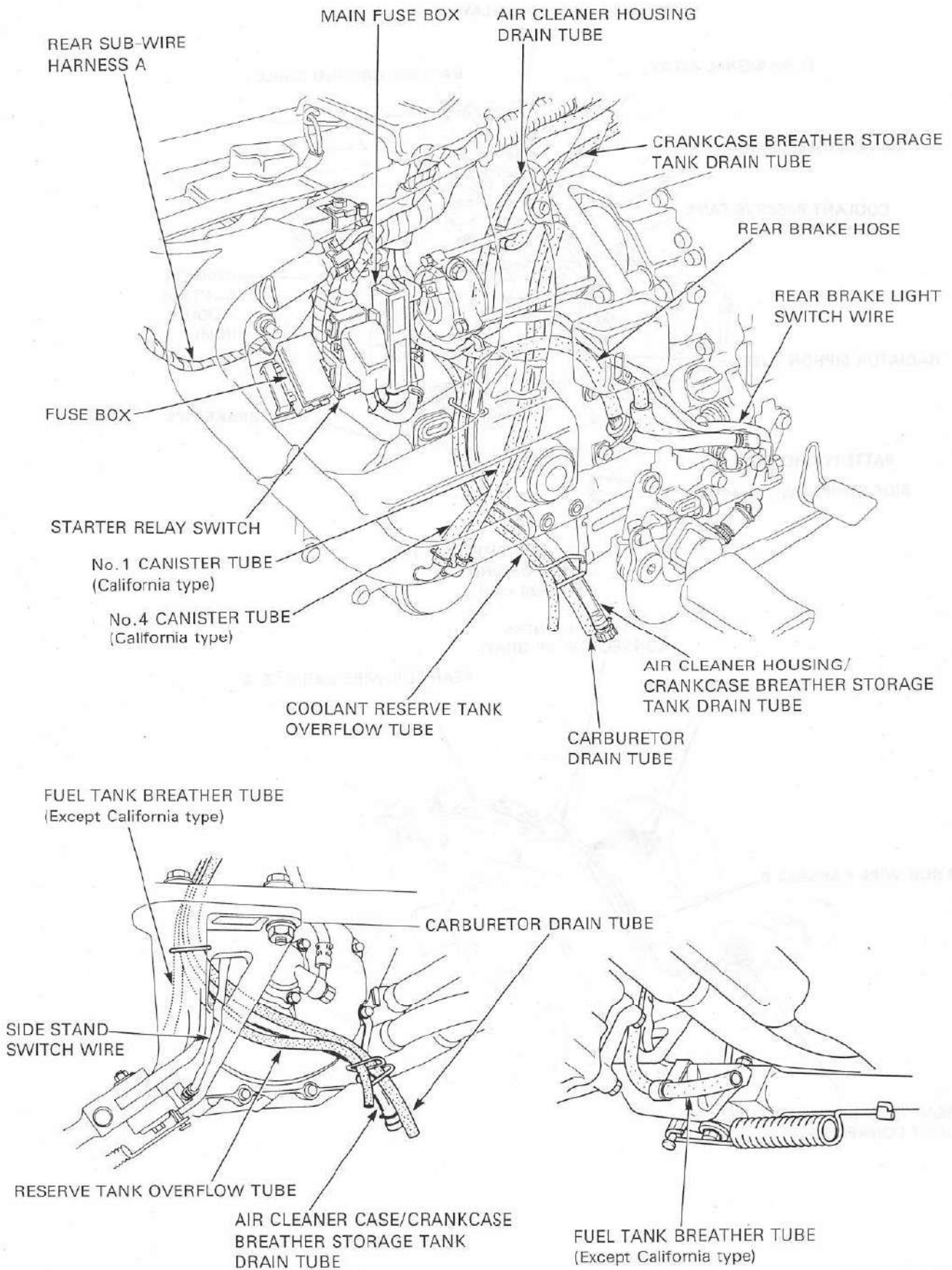
GENERAL INFORMATION



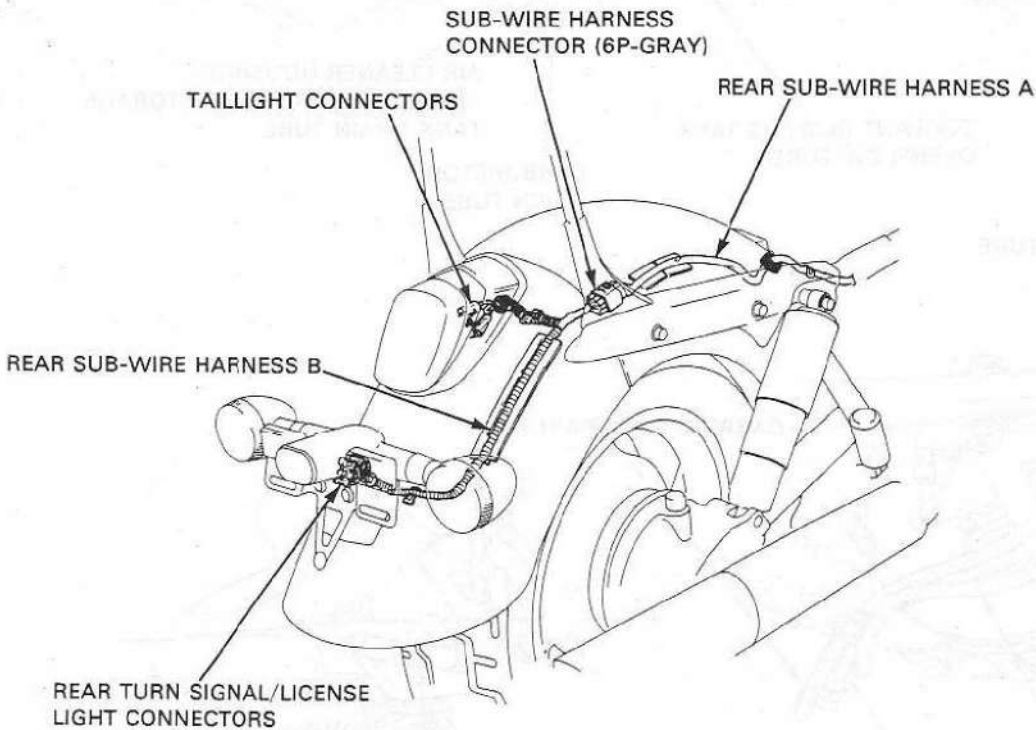
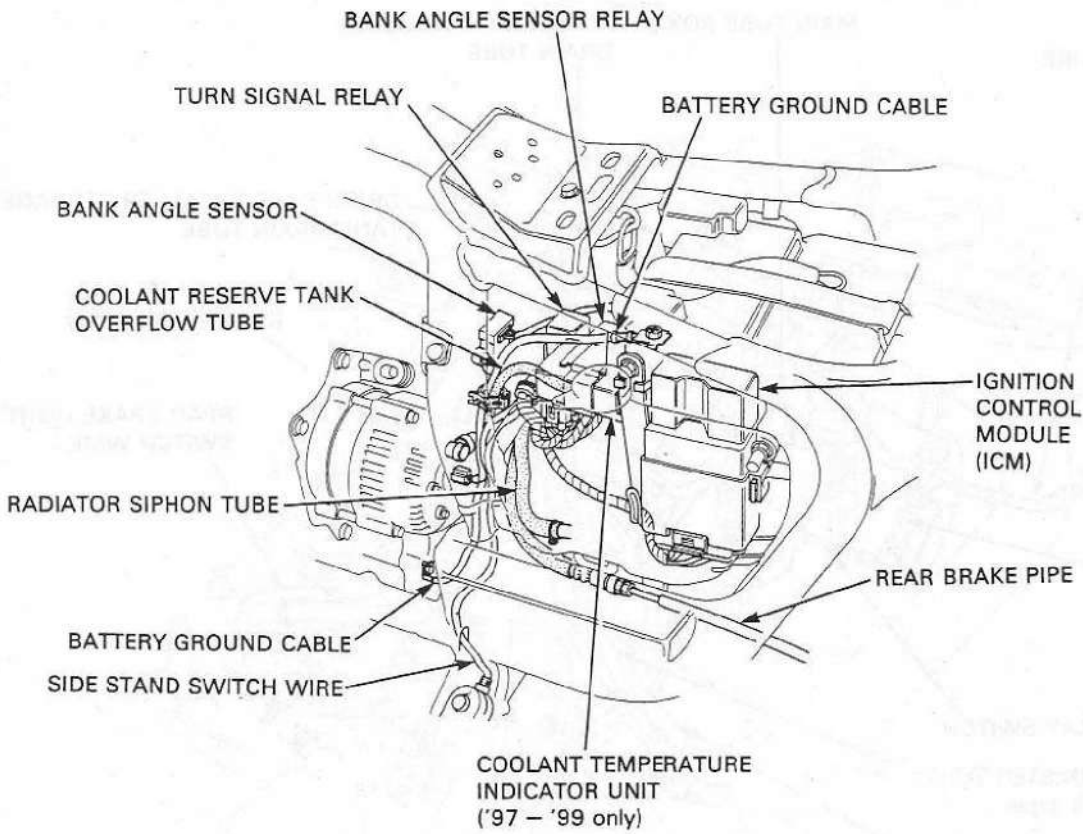


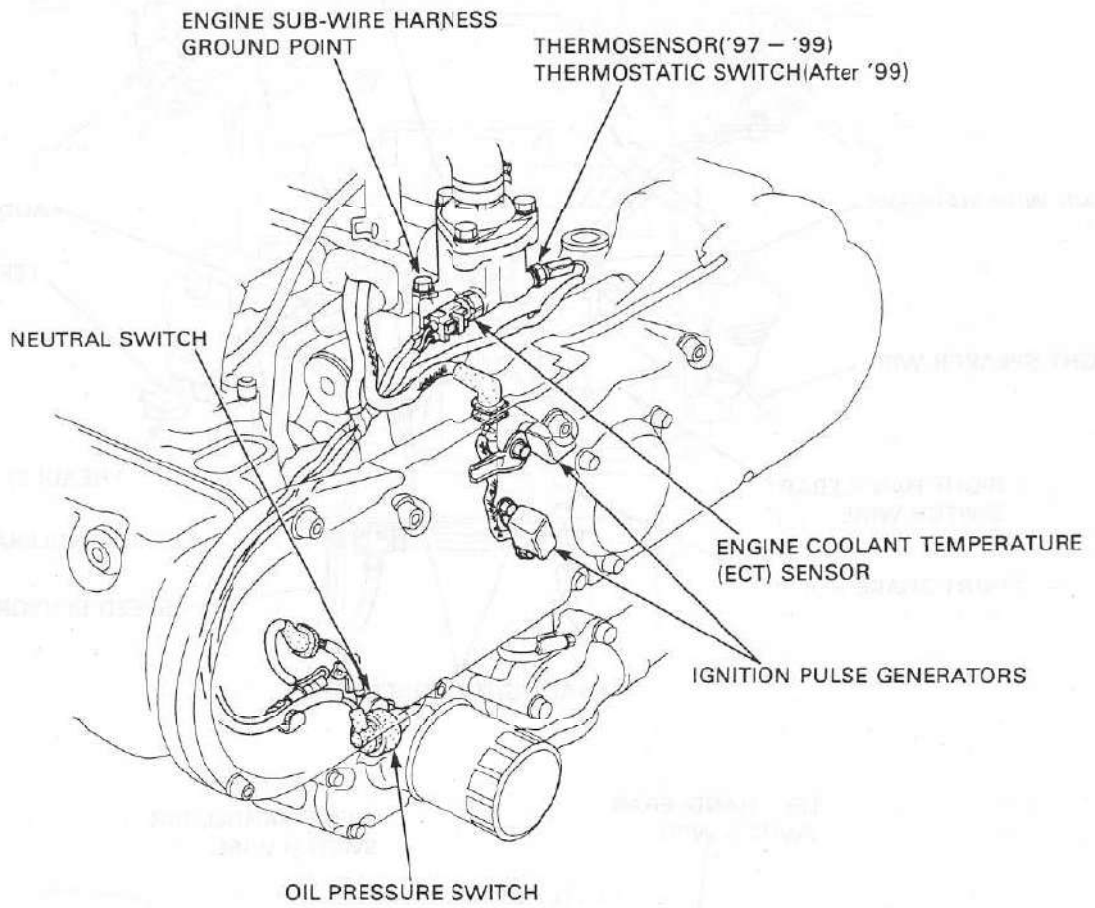
GENERAL INFORMATION





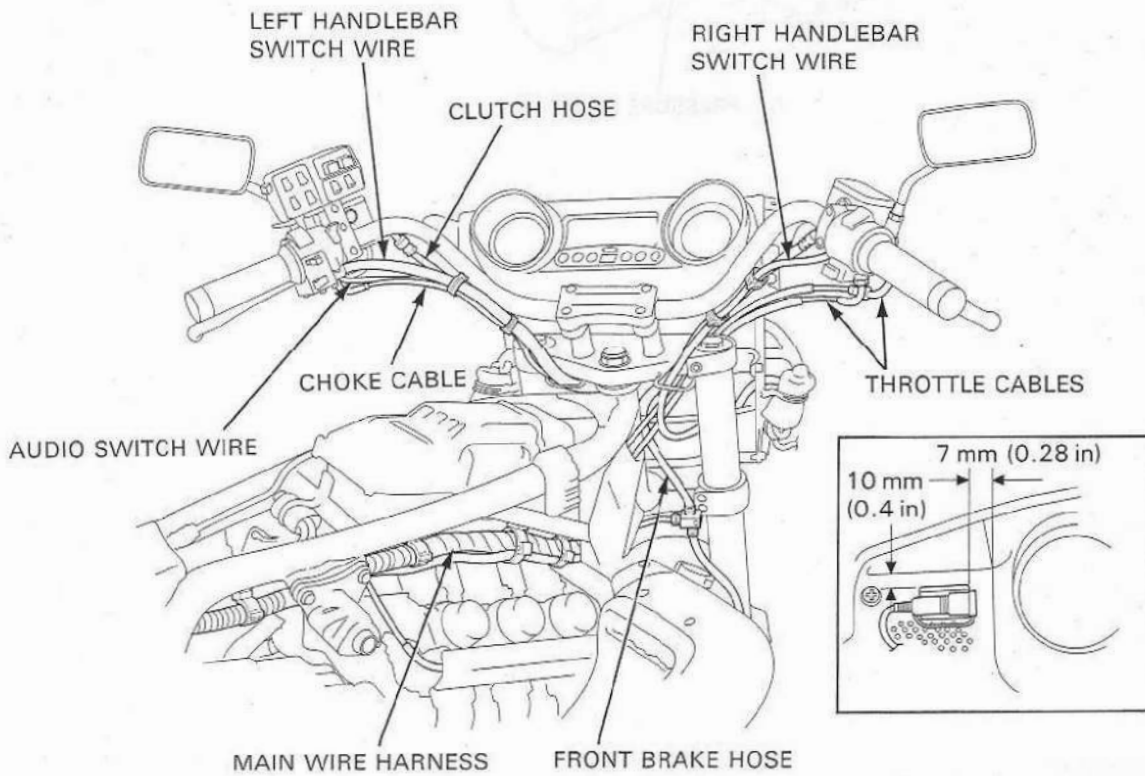
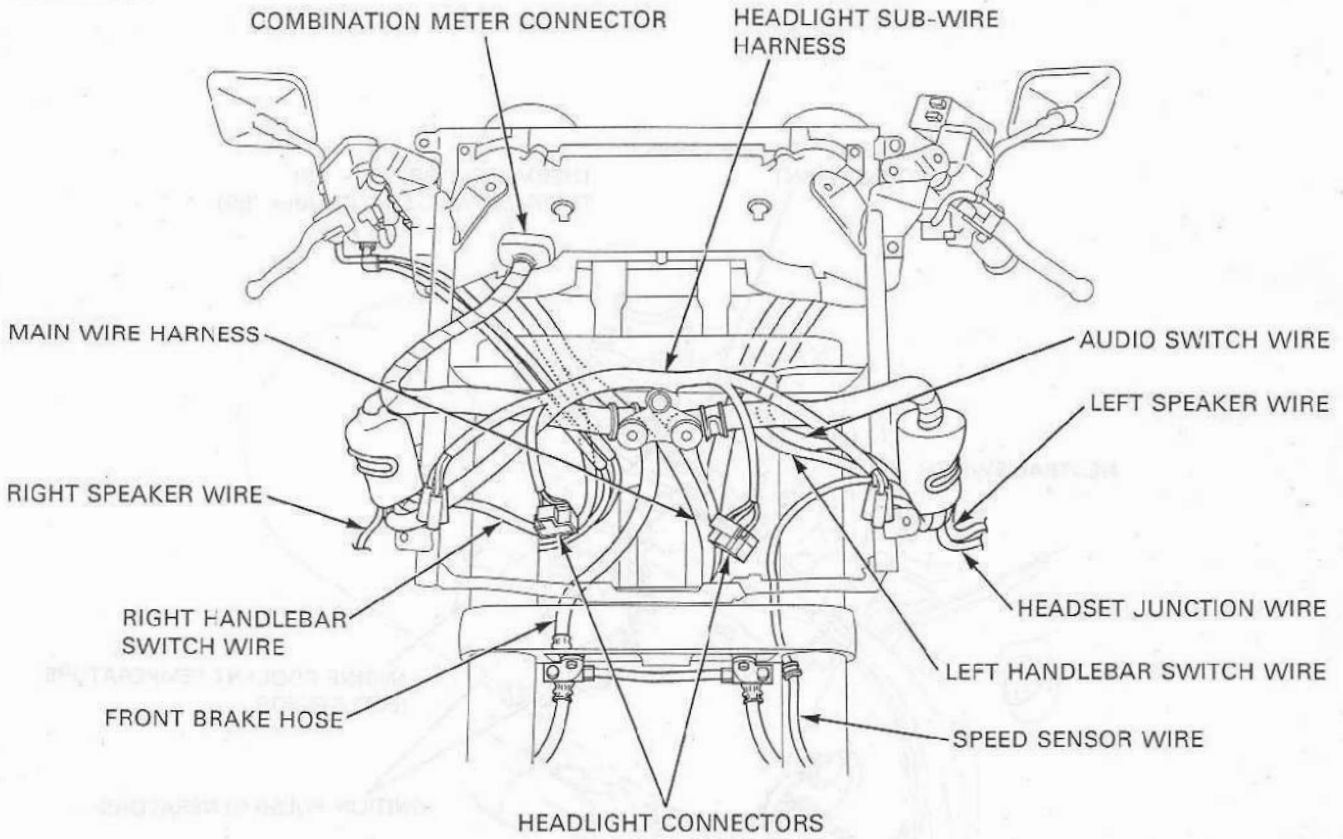
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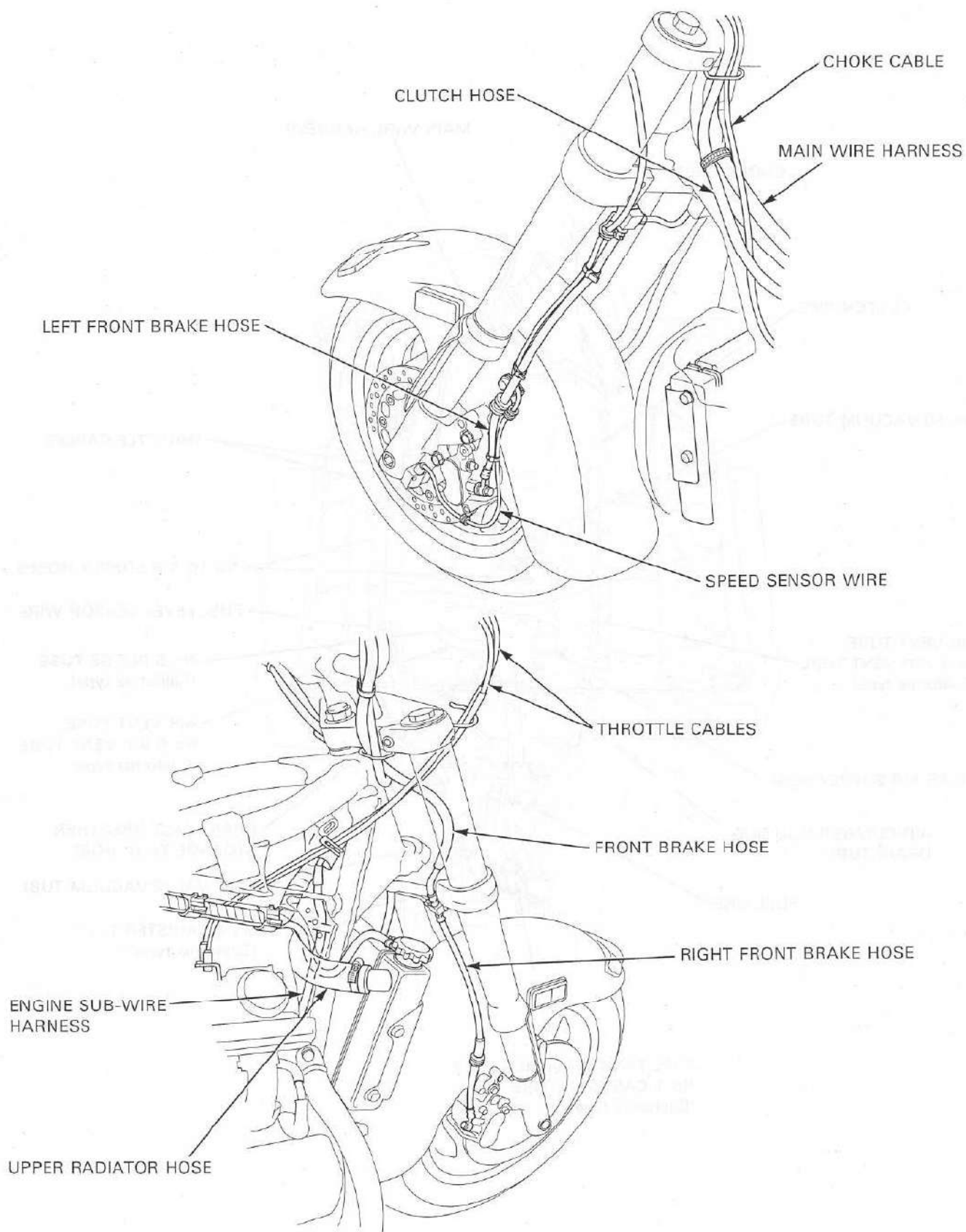




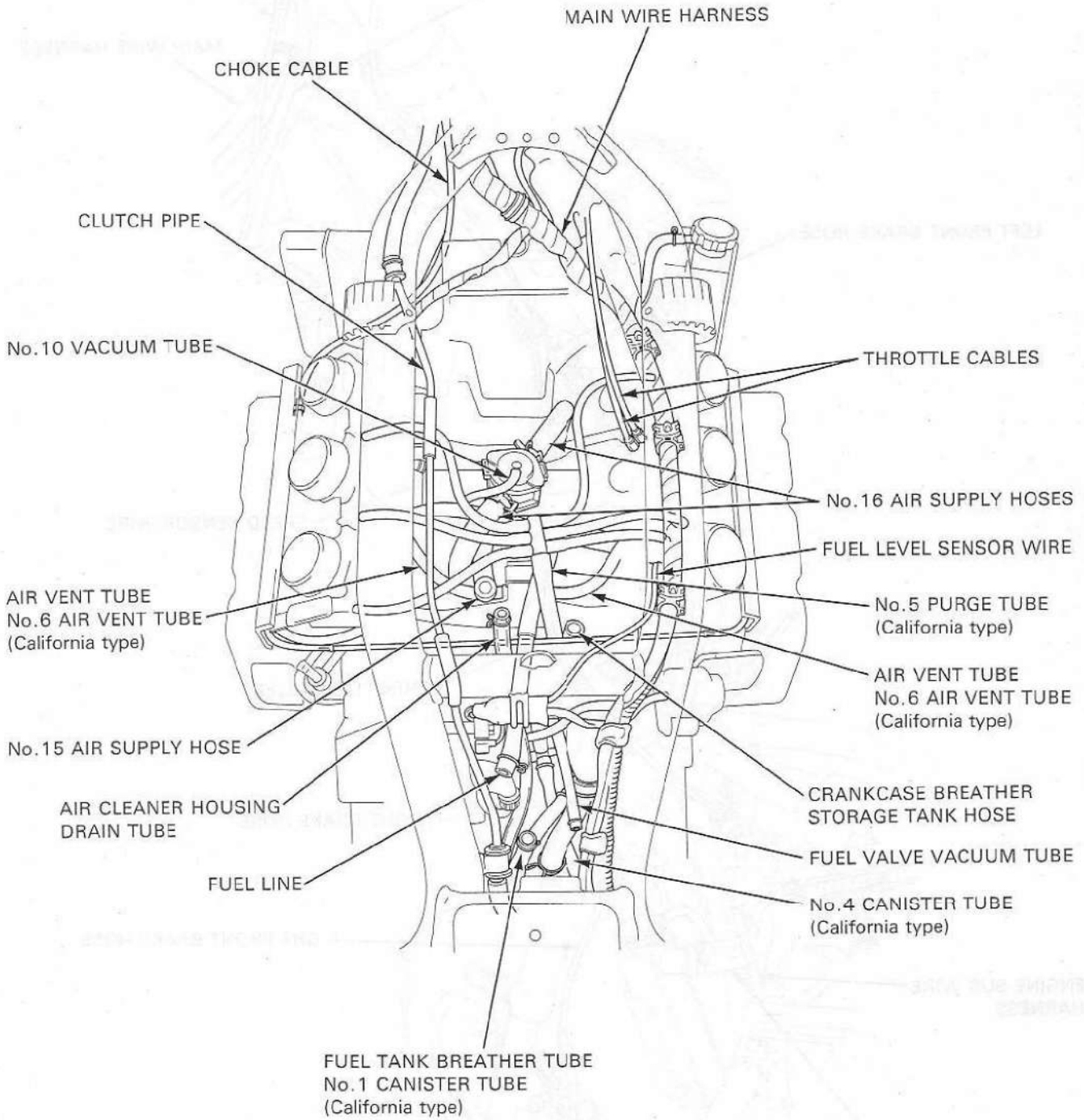
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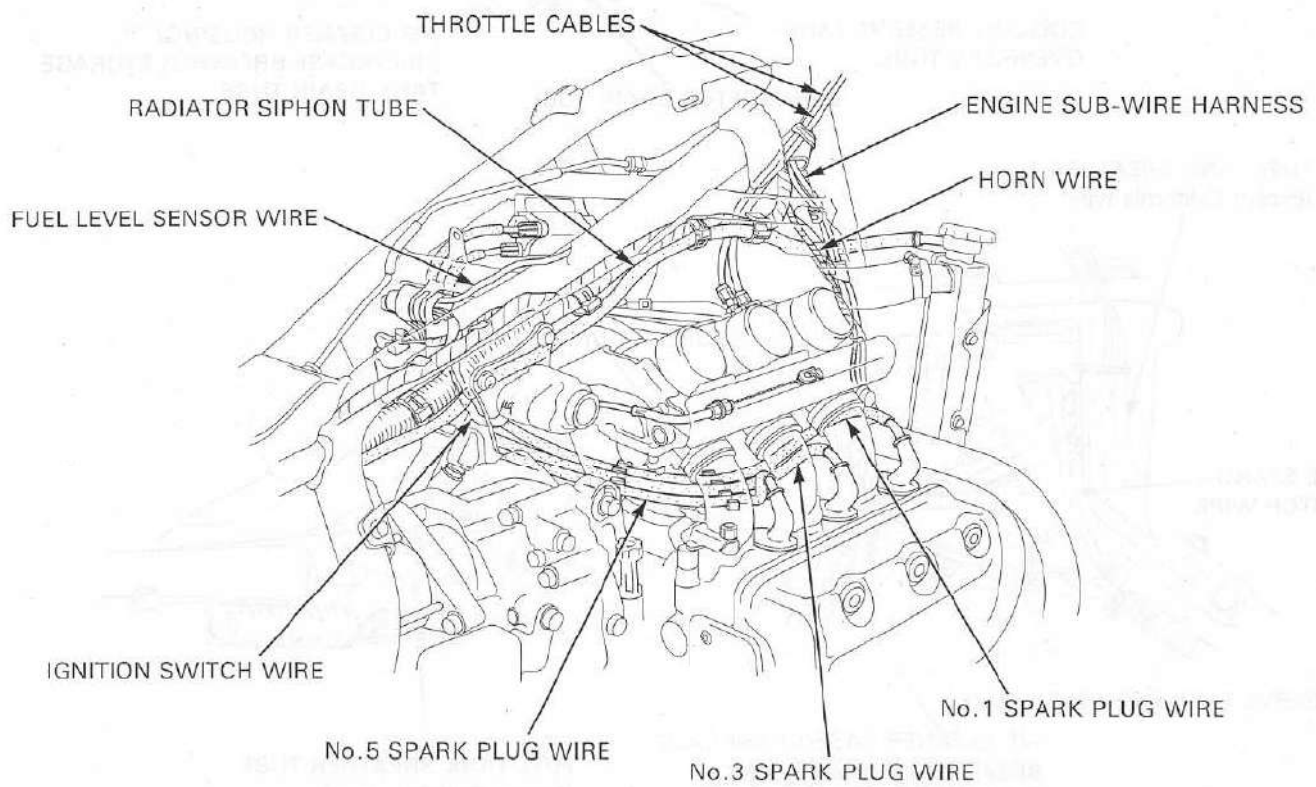
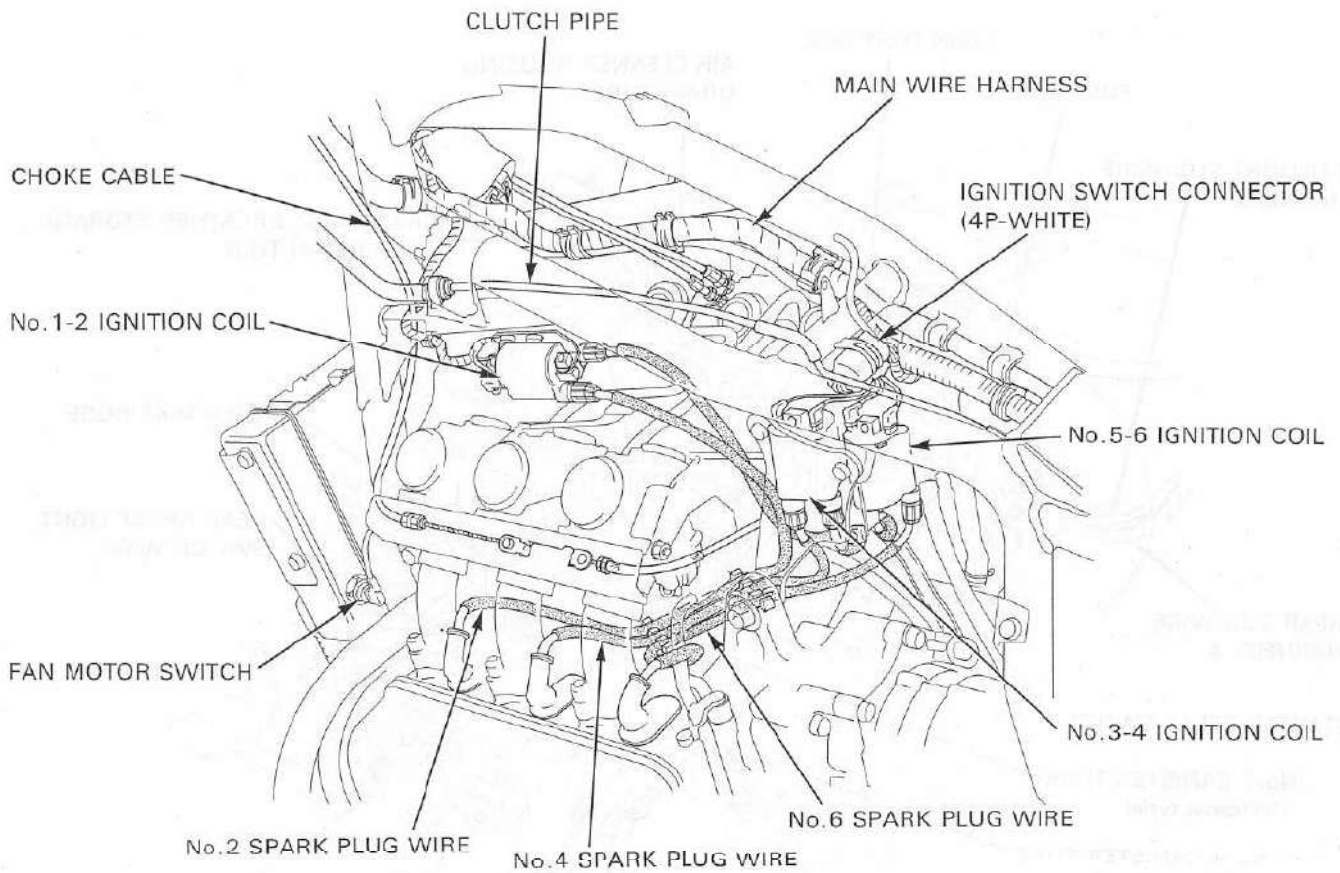
GL1500CF



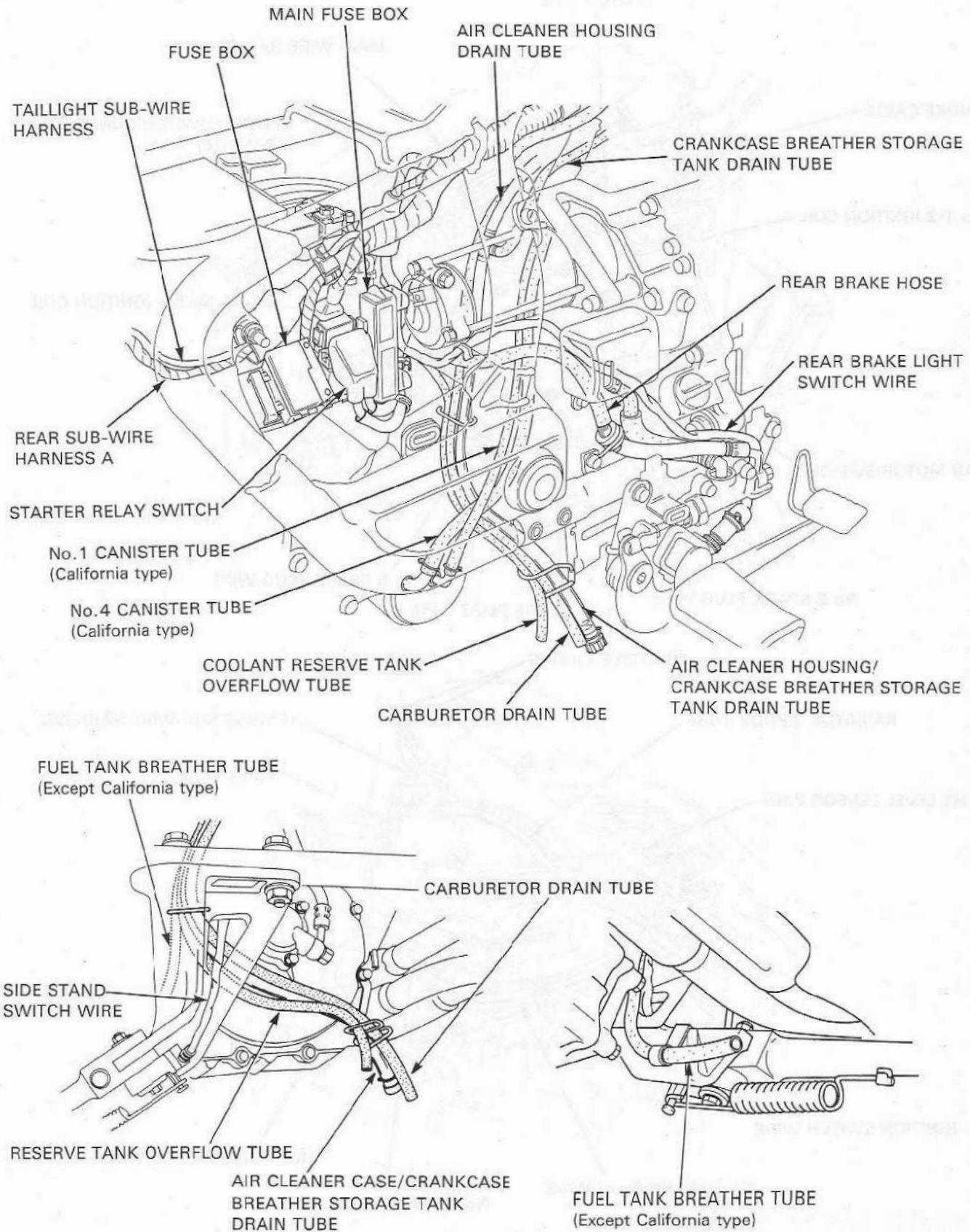


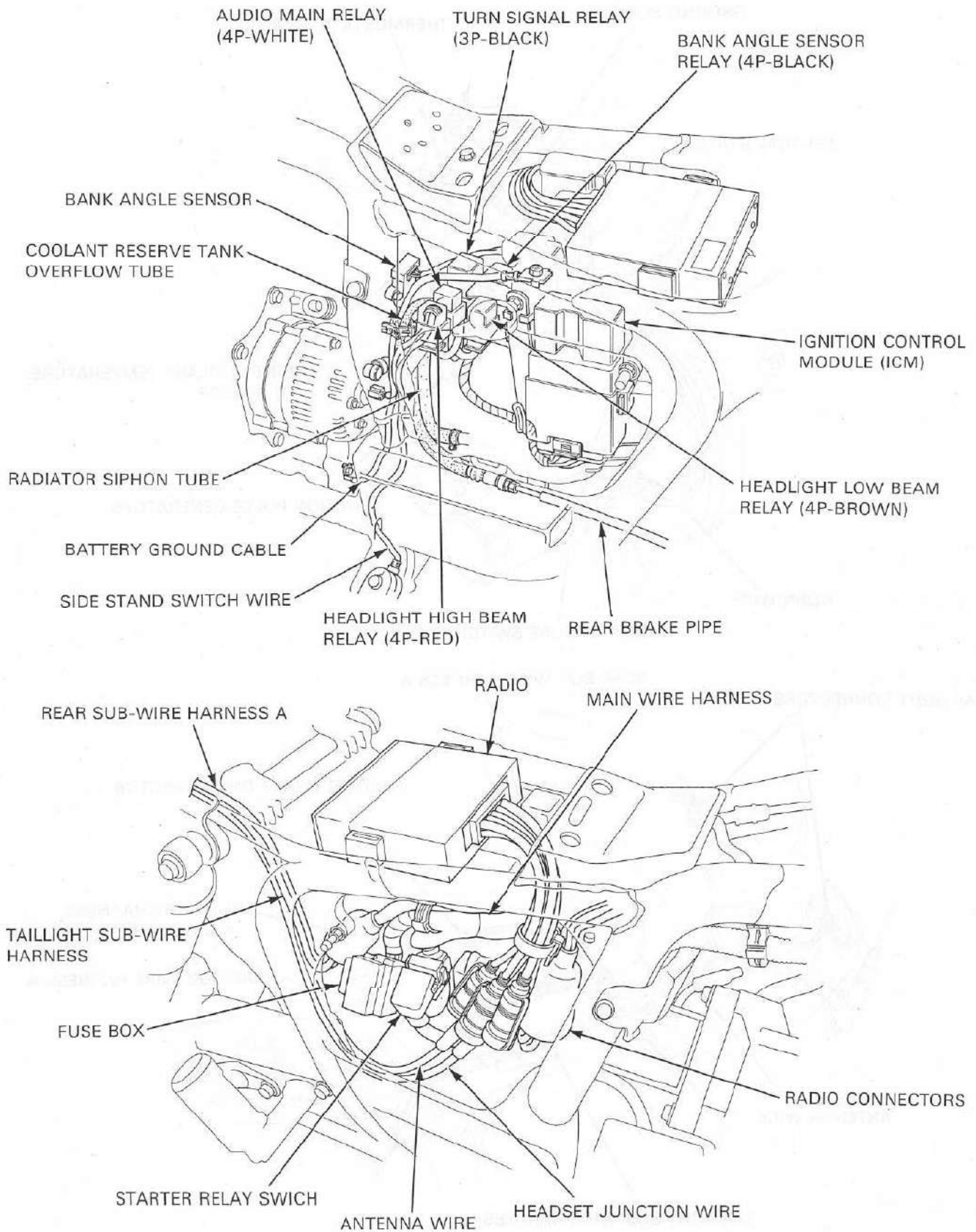
GENERAL INFORMATION



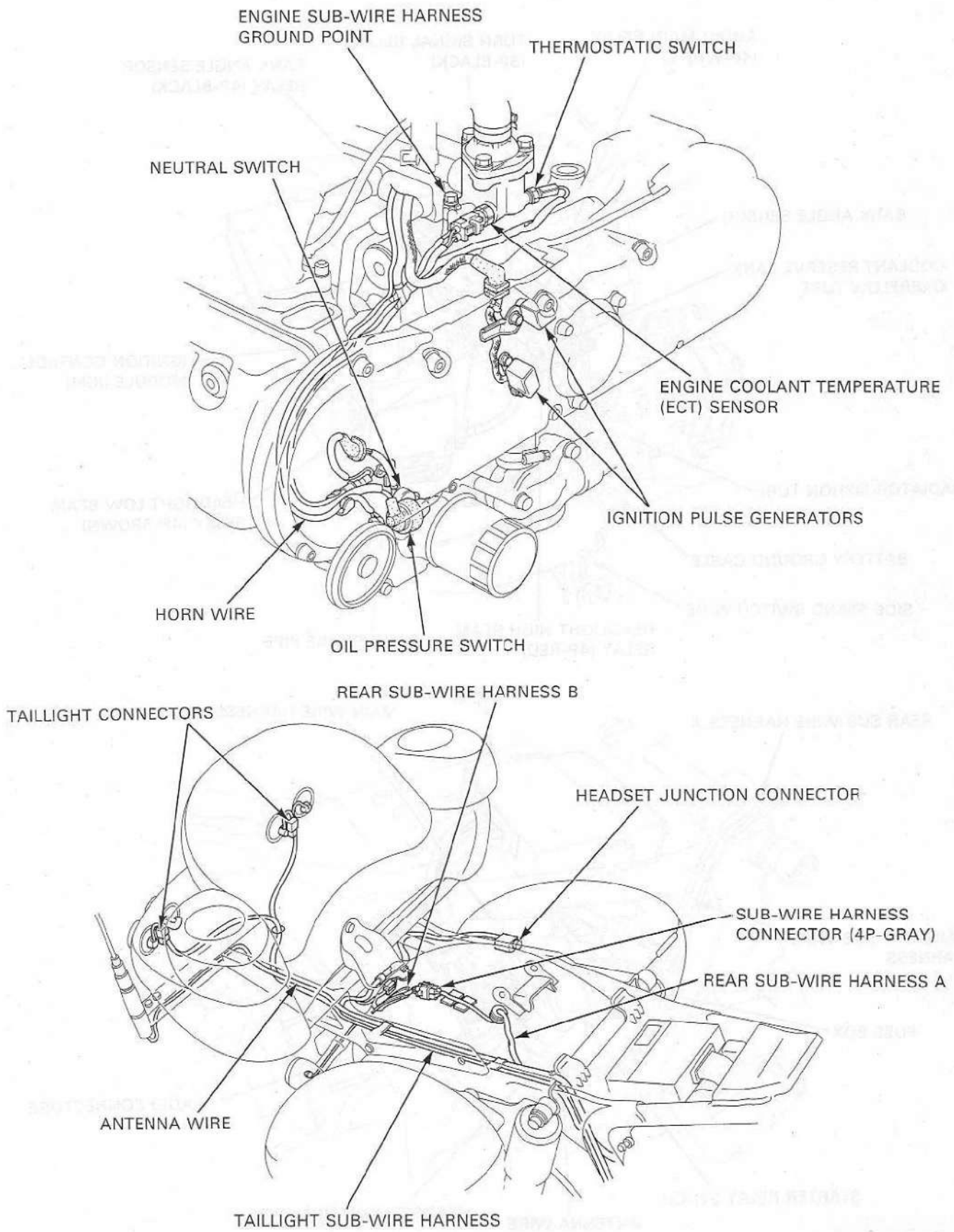


GENERAL INFORMATION





GENERAL INFORMATION



EMISSION CONTROL SYSTEMS

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

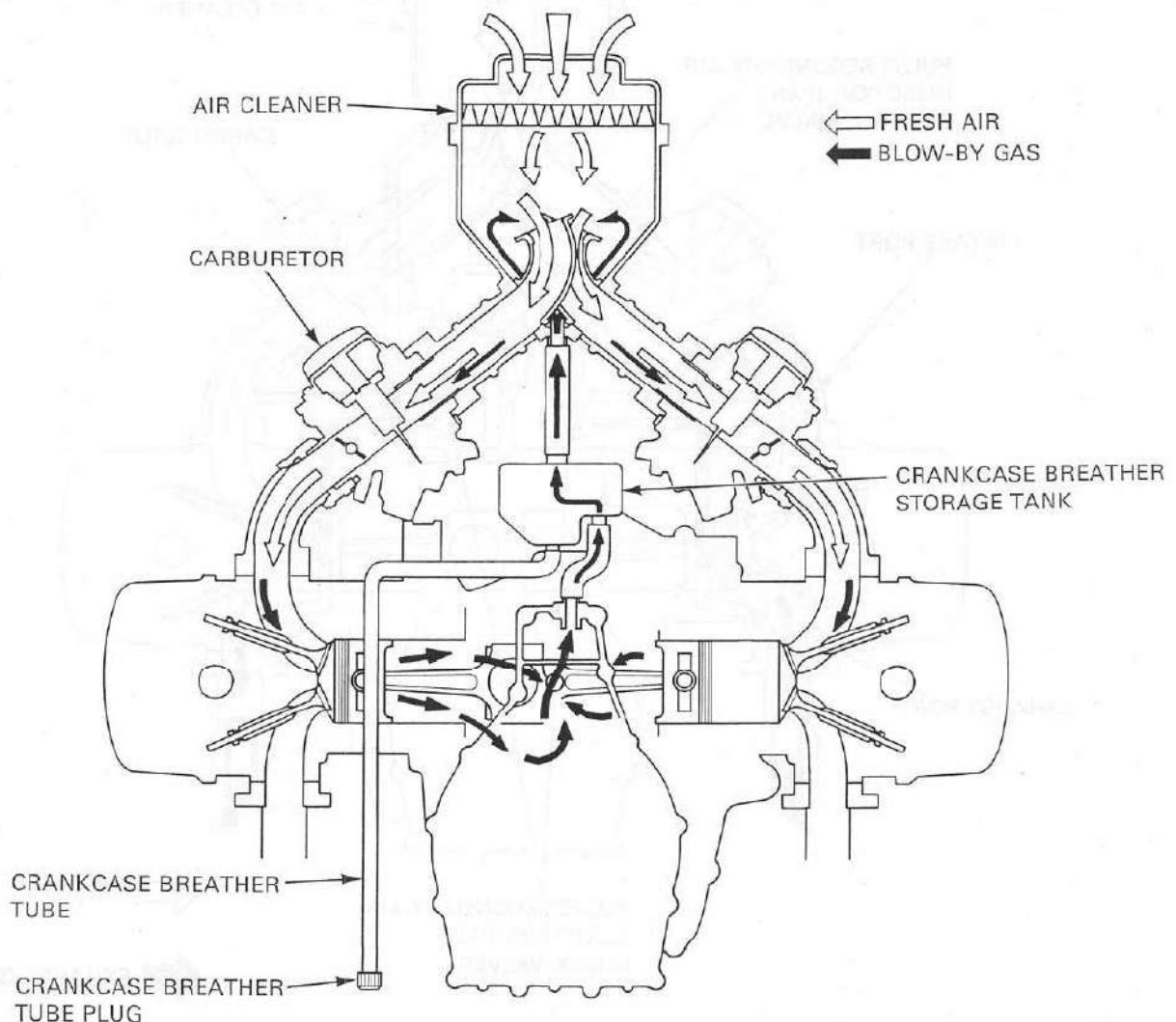
SOURCE OF EMISSIONS

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

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

CRANKCASE EMISSION CONTROL SYSTEM

The engine is equipped with a closed crankcase system to prevent discharging crankcase emissions into the atmosphere. Blow-by gas is returned to the combustion chamber through the air cleaner and carburetor.



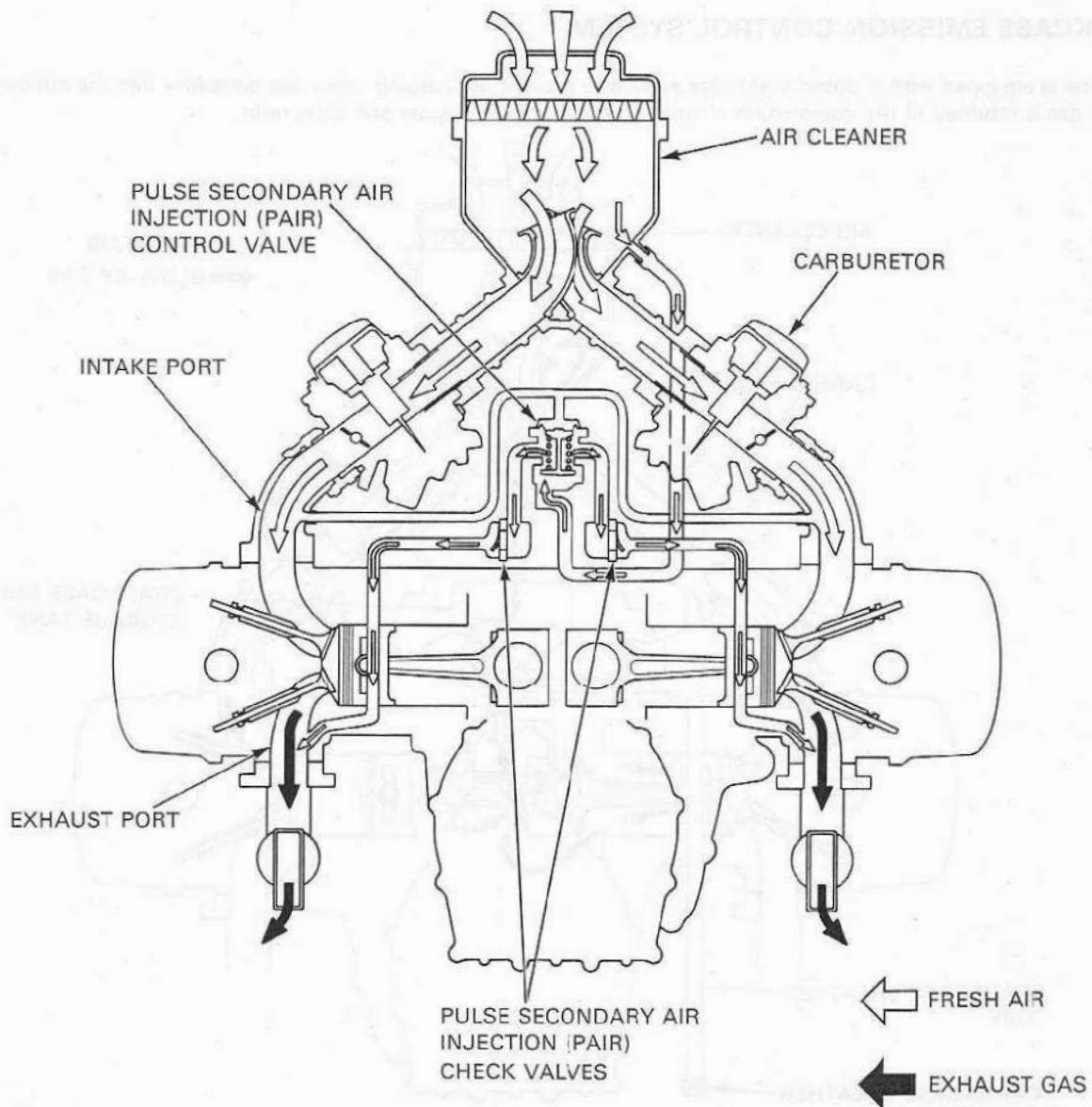
GENERAL INFORMATION

EXHAUST EMISSION CONTROL SYSTEM (PULSE SECONDARY AIR INJECTION SYSTEM)

The exhaust emission control system consists of a secondary air supply system which introduces filtered air into the exhaust gases in the exhaust port. Fresh air is drawn into the exhaust port whenever there is a negative pressure pulse in the exhaust system. This charge of fresh air promotes burning of the unburned exhaust gases and changes a considerable amount of hydrocarbons and carbon monoxide into relatively harmless carbon dioxide and water vapor.

This model has the pulse secondary air injection (PAIR) control valve and PAIR check valves. PAIR check valve prevents reverse air flow through the system. The PAIR control valve reacts to high intake manifold vacuum and will cut off the supply of fresh air during engine deceleration, thereby preventing afterburn in the exhaust system.

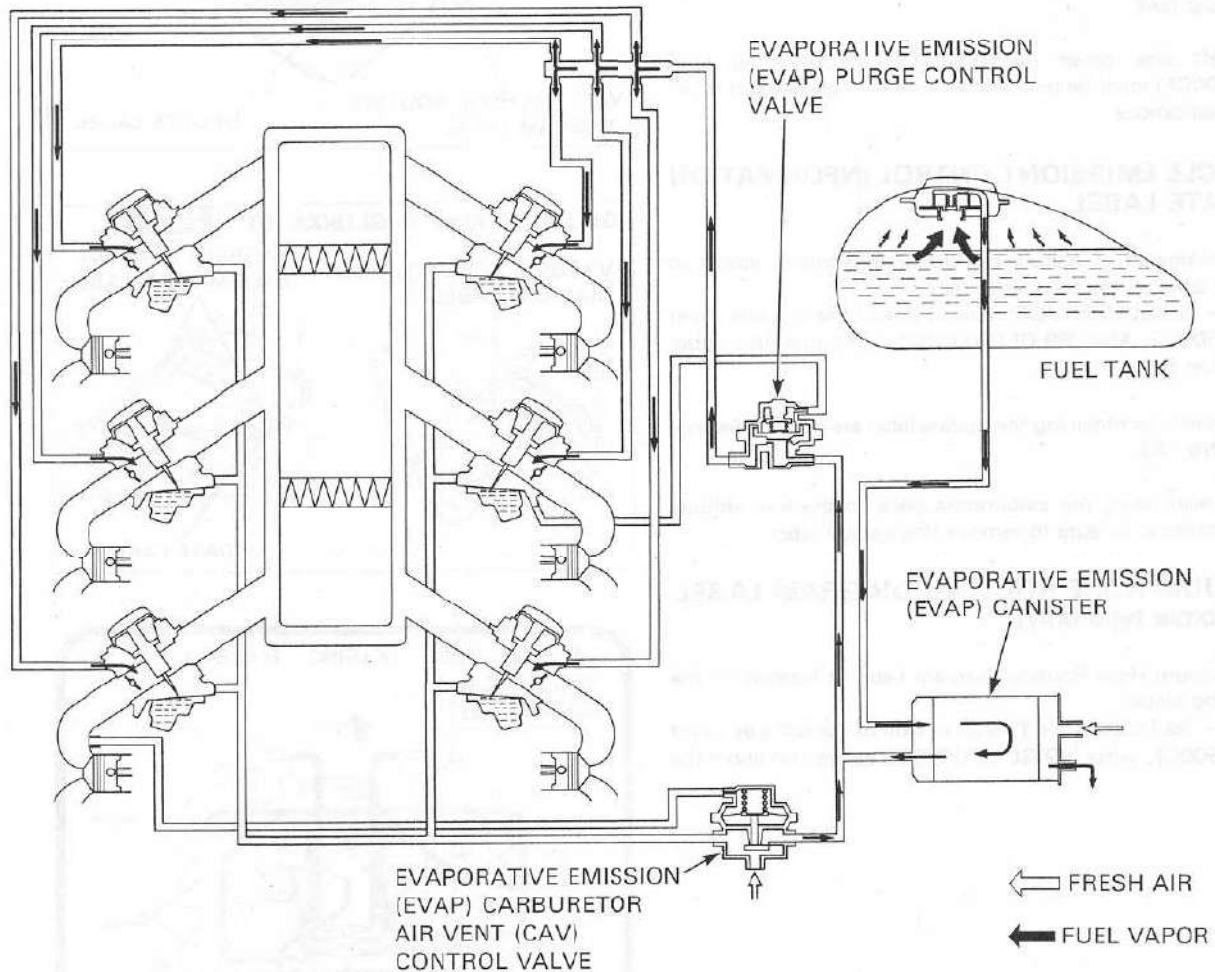
No adjustment to the pulse secondary air injection system should be made, although periodic inspection of the components is recommended.



EVAPORATIVE EMISSION CONTROL SYSTEM (California type only)

This model complies with California Air Resources Board evaporative emission requirements.

Fuel vapor from the fuel tank and carburetors is routed into the evaporative emission (EVAP) canister where it is absorbed and stored while the engine stopped. When the engine is running and the EVAP purge control valve is open, fuel vapor in the EVAP canister is drawn into the engine through the carburetor. At the same time, the EVAP carburetor air vent (CAV) control valve is open and air is drawn into the carburetor through the valve.

**NOISE EMISSION CONTROL SYSTEM**

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

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

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

EMISSION CONTROL INFORMATION LABELS (U.S.A. only)

An Emission Control Information Label is located on the following place:

- '97 - '99 GL1500C/CT: reverse side of the left side cover
- GL1500CF, After '99 GL1500C/CT: left frame tube under the fuel tank

The left side cover (GL1500C/CT) or the fuel tank (GL1500CF) must be removed to read it. It gives basic tune-up specifications.

VEHICLE EMISSION CONTROL INFORMATION UPDATE LABEL

After making a high altitude carburetor adjustment, attach an update label on the following place:

- '97 - '99 GL1500C/CT: reverse side of the left side cover
- GL1500CF, After '99 GL1500C/CT: left frame tube under the fuel tank

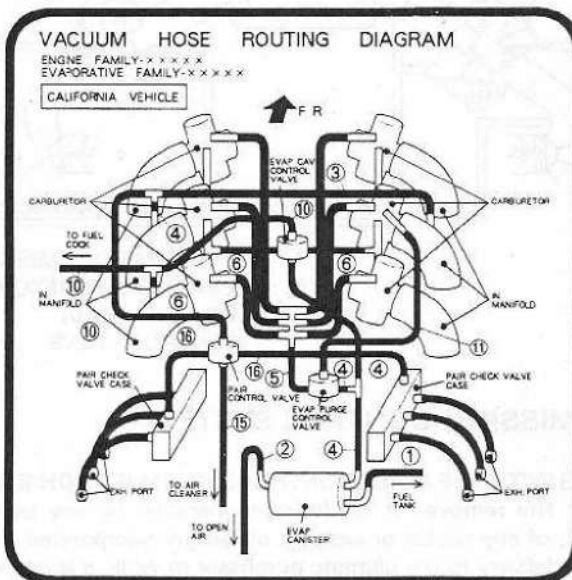
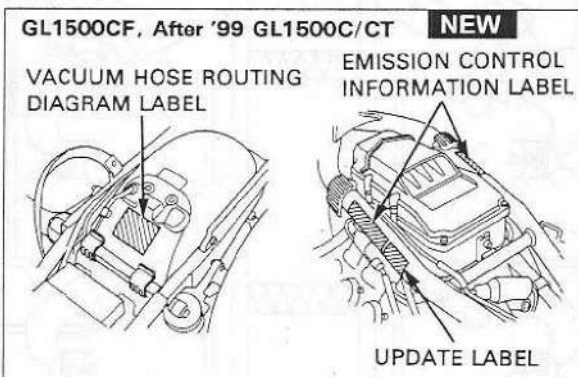
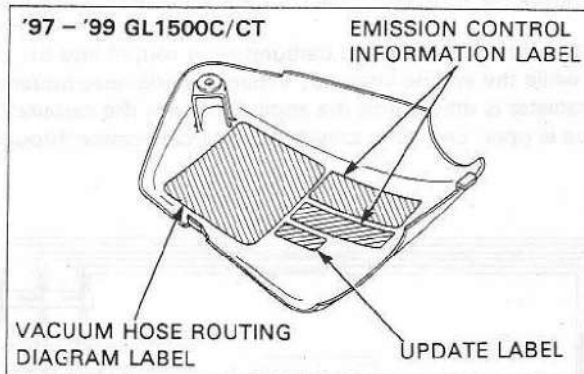
Instructions for obtaining the update label are given in Service Letter No. 132.

When readjusting the carburetors back to the low altitude specifications, be sure to remove this update label.

VACUUM HOSE ROUTING DIAGRAM LABEL (California type only)

The Vacuum Hose Routing Diagram Label is located on the following place:

- '97 - '99 GL1500C/CT: reverse side of the left side cover
- GL1500CF, After '99 GL1500C/CT: rear fender under the seat



2. FRAME/BODY PANELS/EXHAUST SYSTEM

SERVICE INFORMATION	2-1	FRONT INNER FAIRING (GL1500CF only)	2-5
TROUBLESHOOTING	2-1	WINDSHIELD (GL1500CT/CF only)	2-6
SEAT	2-2	FRONT FAIRING (GL1500CF only)	2-7
SIDE COVER	2-3	RADIATOR COVER (GL1500CF only)	2-8
CENTER COVER	2-3	SADDLEBAG (GL1500CT/CF only)	2-9
REAR FENDER	2-4	TRUNK (GL1500CF only)	2-9
FUEL TANK	2-4	EXHAUST SYSTEM	2-12

SERVICE INFORMATION

GENERAL

▲WARNING

- Gasoline is extremely flammable and is explosive under certain conditions. KEEP OUT OF REACH OF CHILDREN.
- Serious burns may result if the exhaust system is not allowed to cool before components are removed or serviced.

- Work in a well ventilated area. Smoking or allowing flames or sparks in the working area or where gasoline is stored can cause a fire or explosion.
- This section covers removal and installation of the frame body panels, fuel tank and exhaust system.
- Always replace the exhaust pipe gasket when removing the exhaust pipe from the engine.
- Always inspect the exhaust system for leaks after installation.

TORQUE VALUES

Grab rail (8 mm)	26 N·m (2.7 kgf·m, 20 lbf·ft)	Apply oil to the threads and seating surface.
(10 mm)	39 N·m (4.0 kgf·m, 29 lbf·ft)	Apply oil to the threads and seating surface.
Rear seat bolt (6 mm)	12 N·m (1.2 kgf·m, 9 lbf·ft)	GL1500C/CT only
Fuel tank mounting bolt (6 mm)	12 N·m (1.2 kgf·m, 9 lbf·ft)	
(8 mm)	26 N·m (2.7 kgf·m, 20 lbf·ft)	
Fuel valve	34 N·m (3.5 kgf·m, 25 lbf·ft)	
Driver footpeg bolt	26 N·m (2.7 kgf·m, 20 lbf·ft)	
Front footpeg bolt	26 N·m (2.7 kgf·m, 20 lbf·ft)	
Gearshift pedal pinch bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Exhaust pipe joint nut	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Muffler mounting nut	34 N·m (3.5 kgf·m, 25 lbf·ft)	

TROUBLESHOOTING

Excessive exhaust noise

- Broken exhaust system
- Exhaust gas leaks

Poor performance

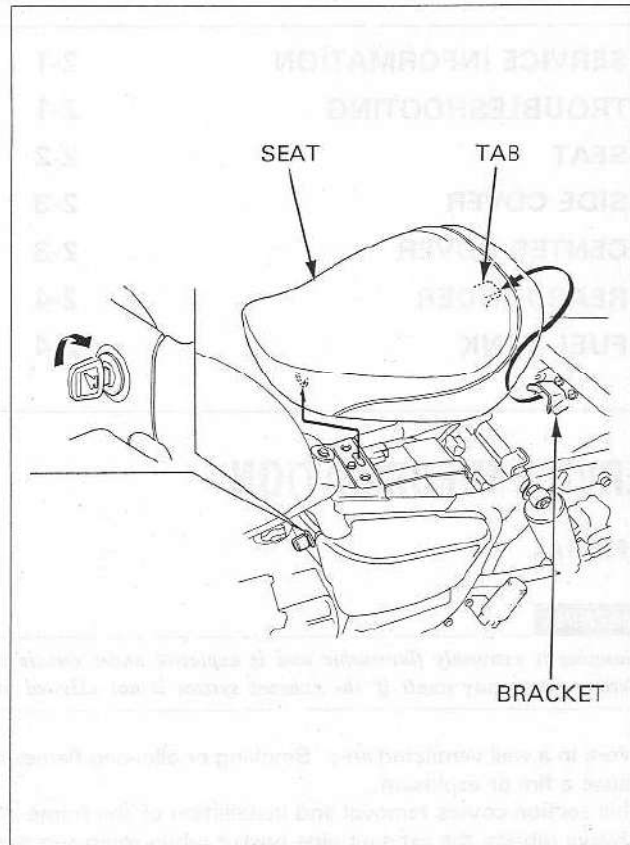
- Deformed exhaust system
- Exhaust gas leaks
- Clogged muffler

SEAT

GL1500C/CT:

Unlock the seat with the ignition key.
Raise the front of the seat and remove it.

Install the seat by aligning the tab with the bracket on the rear fender as shown, and lock it by pushing its front portion down securely.

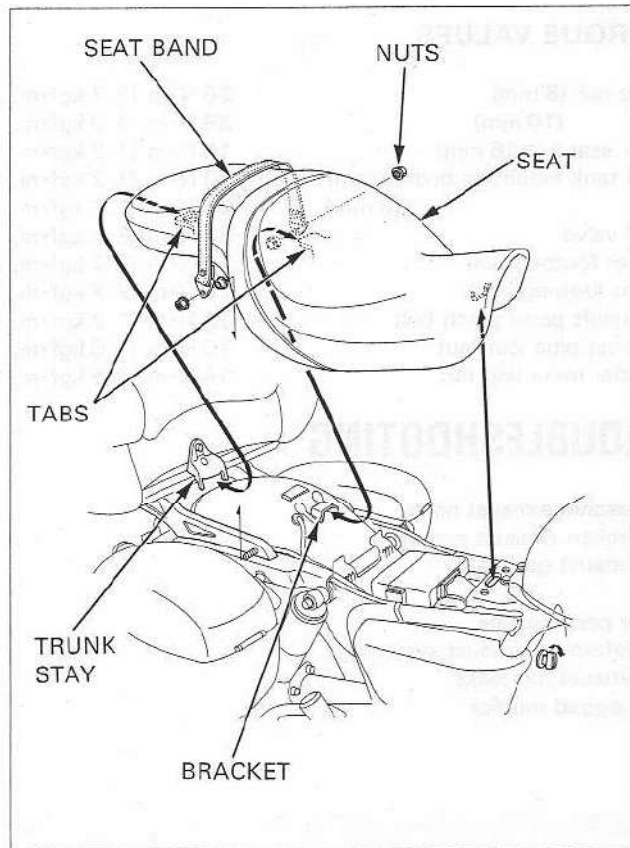


GL1500CF:

Remove the cap nuts, seat band and collars.
Unlock the seat with the ignition key.
Raise the front of the seat and slide the seat forward to remove it.

Insert the rear tab into the trunk stay, then insert the center tab into the bracket on the rear fender.

Lock the seat by pushing its front portion down securely.
Make sure that the rear and center tabs are inserted into the trunk stay and bracket properly.
Install the collars, seat band and cap nuts and tighten the nuts securely.



SIDE COVERS

CAUTION

- *Be careful not to break the cover tabs.*

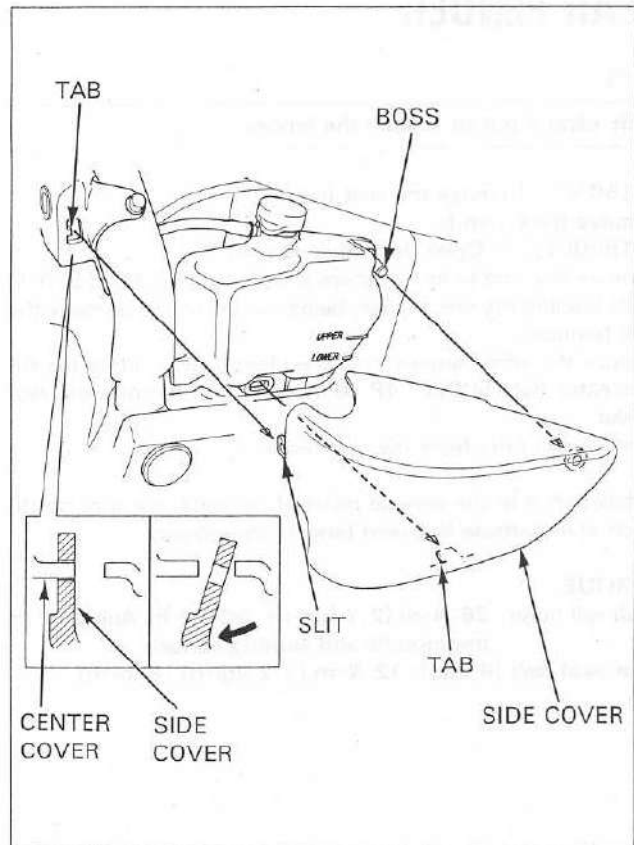
NOTE

- *Be careful not to dislodge the grommets of the frame.*

Carefully release the rear portion of the side cover from the frame boss.

Release the lower side tab from the grommet, then gently pulling out on the rear of the cover end and remove the side cover by releasing the front side slit from the center cover tab, being careful not to damage the cover tab.

Installation is in the reverse order of removal.



CENTER COVER

CAUTION

- *Be careful not to break the cover tab and not scratch the center cover.*

NOTE

- *Be careful not to dislodge the grommets of the frame.*

Remove the seat (page 2-2).

Remove the side covers (see above).

Disconnect the bank angle sensor 3P (White) connector located under the frame cross member.

Remove the two bolts and collars.

Carefully release the cover tab from the grommet.

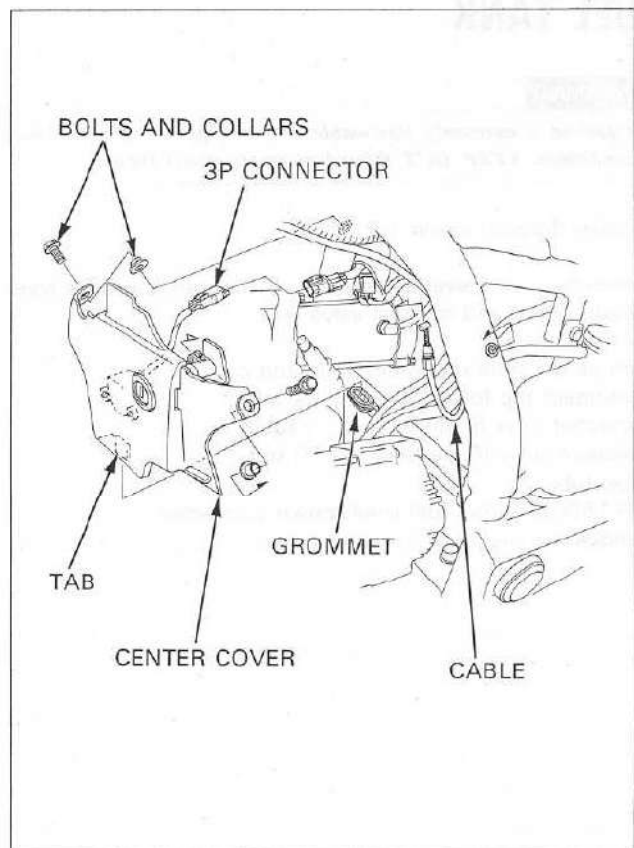
Remove the latch assembly bolt and assembly.

Remove the seat lock cable from the latch assembly and remove the center cover.

Installation is in the reverse order of removal.

CAUTION

- *Do not overtighten center cover bolts. Threads can be stripped inside frame.*



REAR FENDER

NOTE

- Be careful not to scratch the fender.

GL1500CF: Remove the seat (page 2-2).

Remove the 6 mm bolt.

GL1500CT/CF: Open the saddlebag lids.

Remove the two bolts, washers and collars (GL1500CT/CF) while holding the rear fender, being careful not to damage the wire harness.

Release the wire harness from the clamp, disconnect the 6P connector (GL1500CF: 4P connector) and remove the rear fender.

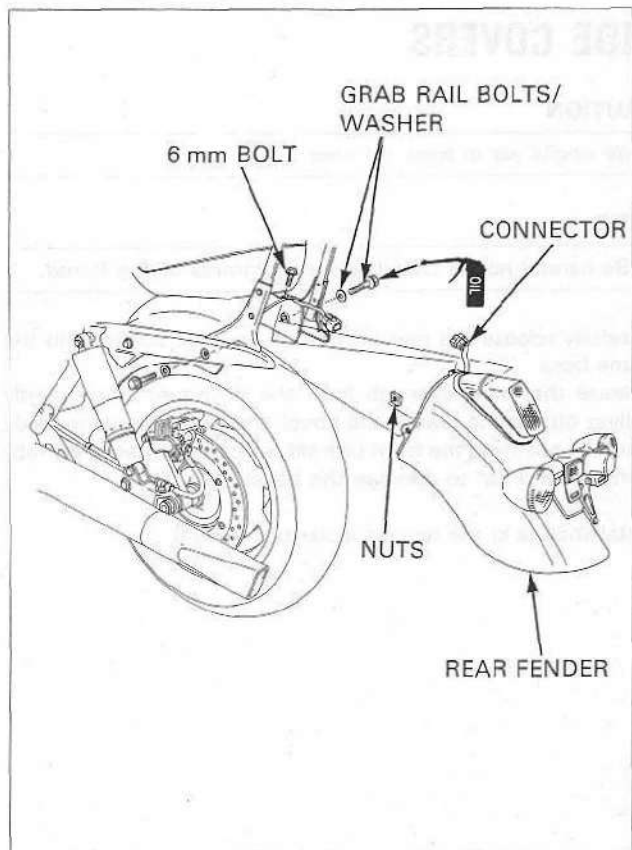
Remove the nuts from the rear fender.

Installation is in the reverse order of removal. Be sure not to pinch wire harness between fender assemblies.

TORQUE:

Grab rail bolts: 26 N·m (2.7 kgf·m, 20 lbf·ft) Apply oil to the threads and seating surface

Rear seat bolt (6 mm): 12 N·m (1.2 kgf·m, 9 lbf·ft)



FUEL TANK

WARNING

- Gasoline is extremely flammable and is explosive under certain conditions. KEEP OUT OF REACH OF CHILDREN.

Remove the seat (page 2-2).

Loosen the valve lever setting screw. Remove the valve lever mounting bolt and the fuel valve lever.

Remove the tank mounting bolts and collars.

Disconnect the following from the tank:

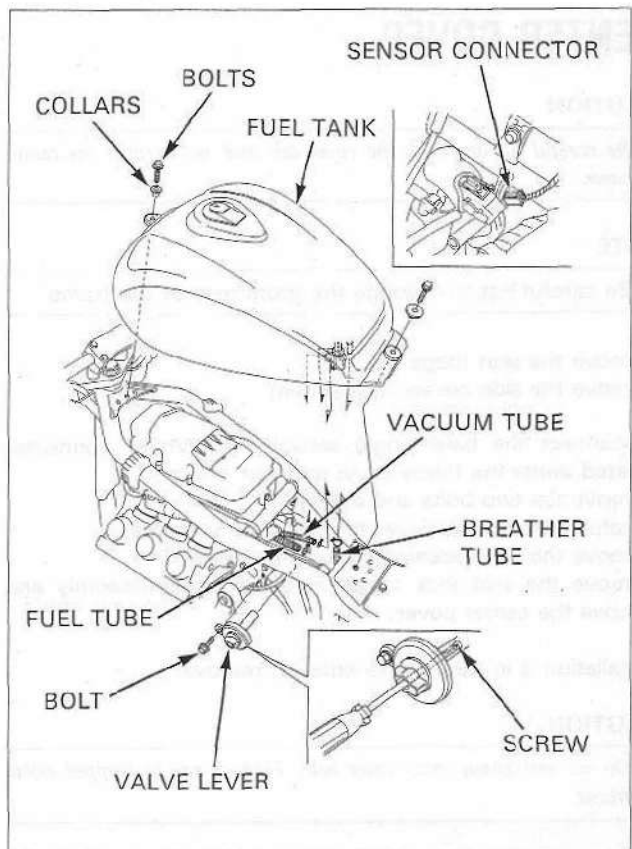
—breather tube (California: No.1 tube)

—vacuum tube (California: No.10 tube)

—fuel tube.

—GL1500CF only: fuel level sensor connector

Remove the fuel tank from the frame.



STEERING SIDE COVER

Remove the trim clip.
Release the cover boss from the grommet and remove the steering side cover.

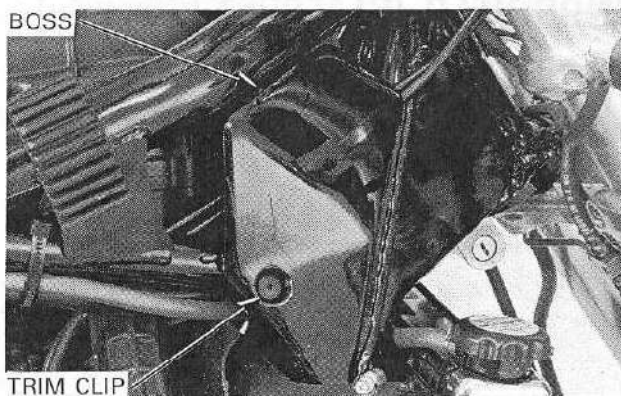
NOTE

- When installing the trim clip, carefully align the clip holes in the frame and cover to avoid damaging the clips.

Installation is in the reverse order of removal.

CAUTION

- Make sure that the breather tube, vacuum tube, and fuel tube are not kinked or bent during fuel tank reattachment. Refer to page 1-23 or 30 for proper routing.



TORQUE:

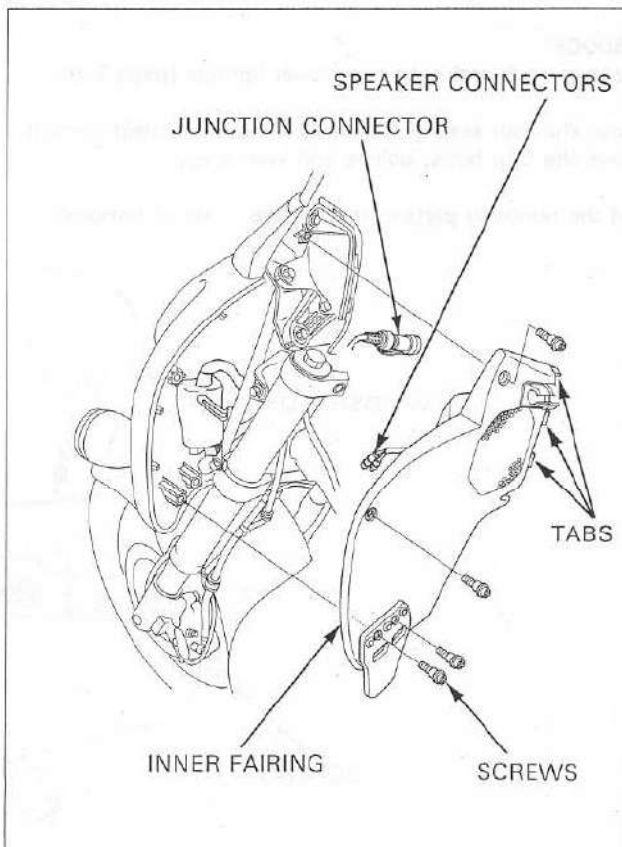
6 mm bolt: 12 N·m (1.2 kgf·m, 9 lbf·ft)
8 mm bolt: 26 N·m (2.7 kgf·m, 20 lbf·ft)

After installation, start the engine and check the fuel line for leakage.

**FRONT INNER FAIRING
(GL1500CF only)**

Left side only: Remove the headset junction connector from the holder.
Remove the four setting screws.
Remove the front inner fairing from the front fairing by releasing the three tabs.
Disconnect the speaker connectors.

Install the inner fairing in the reverse order of removal.



WINDSHIELD (GL1500CT/CF only)

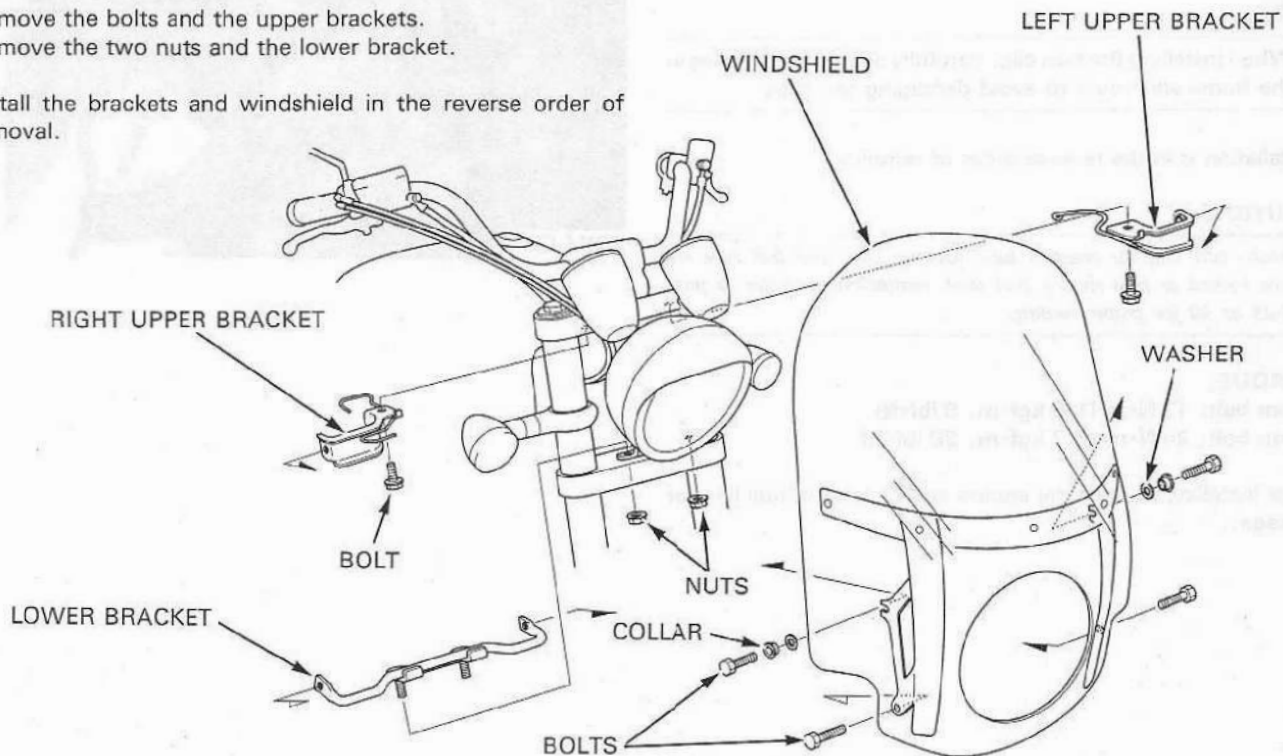
GL1500CT:

Remove the four bolts, two collars, washers and the windshield.

Remove the bolts and the upper brackets.

Remove the two nuts and the lower bracket.

Install the brackets and windshield in the reverse order of removal.



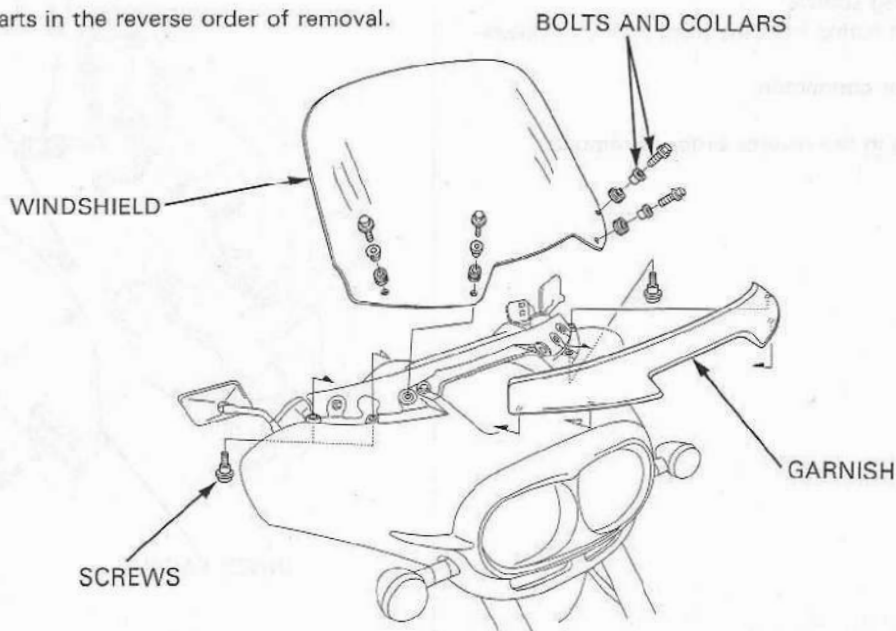
GL1500CF:

Remove the left and right front inner fairings (page 2-5).

Remove the four setting screws and the windshield garnish.

Remove the four bolts, collars and windshield.

Install the removed parts in the reverse order of removal.



FRONT FAIRING (GL1500CF only)

REMOVAL/INSTALLATION

Remove the windshield (page 2-6).

Disconnect the headlight connectors and turn signal light connectors.

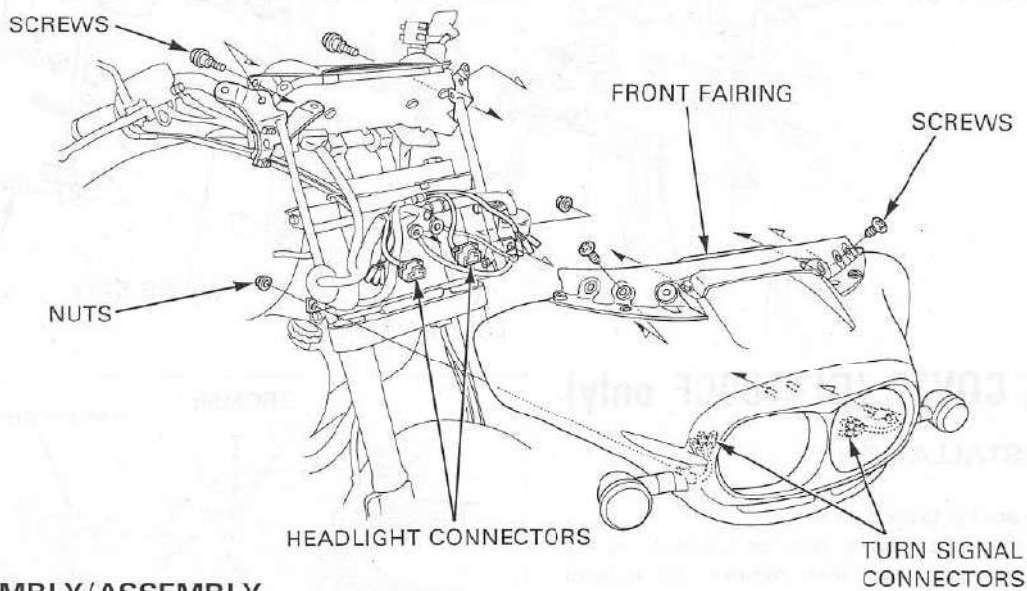
Remove the four screws and two nuts.

Remove the front fairing from the stay.

Installation is in the reverse order of removal.

NOTE

- Align the front fairing bosses with the grommets on the stay.



DISASSEMBLY/ASSEMBLY

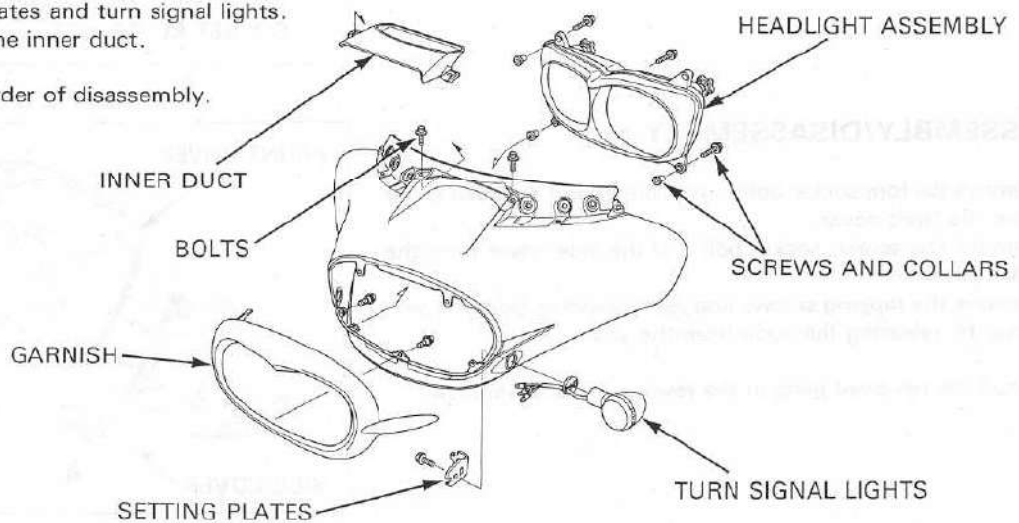
Remove the four screws, collars and the headlight assembly.

Remove the five screws and the headlight garnish.

Remove the bolts, setting plates and turn signal lights.

Remove the two bolts and the inner duct.

Assembly is in the reverse order of disassembly.



FRAME/BODY PANELS/EXHAUST SYSTEM

FAIRING STAY REMOVAL/INSTALLATION

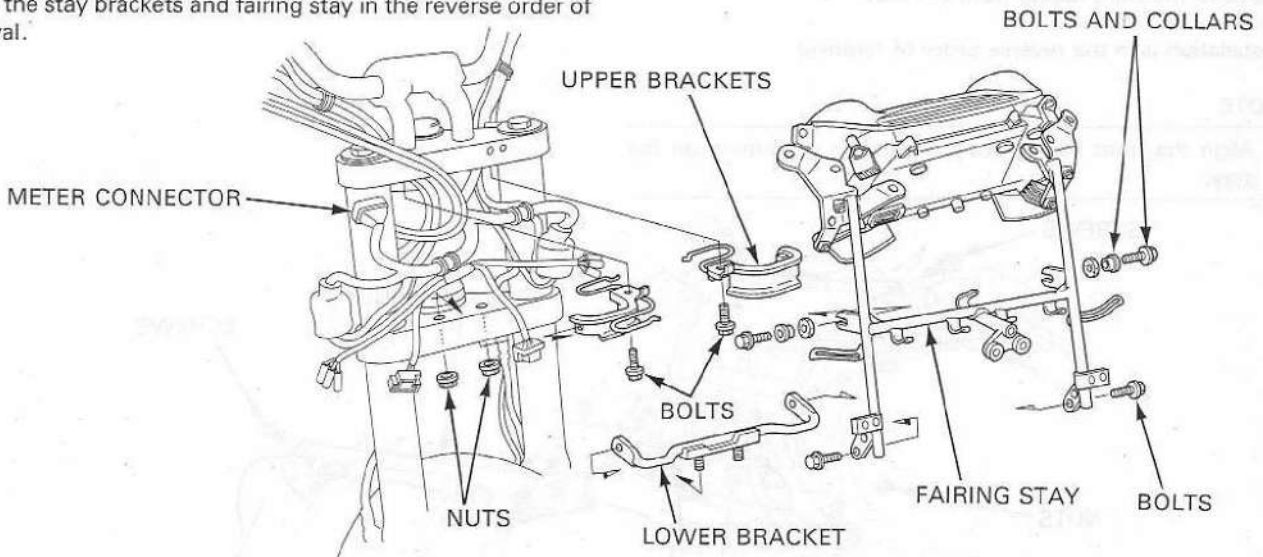
Remove the front fairing (page 2-7).

Disconnect the meter connector.

Loosen the upper mounting bolts, and remove the lower mounting bolts and the stay from the brackets.

Remove the bolts and upper brackets from the top bridge. Remove the nuts and lower bracket from the steering stem.

Install the stay brackets and fairing stay in the reverse order of removal.

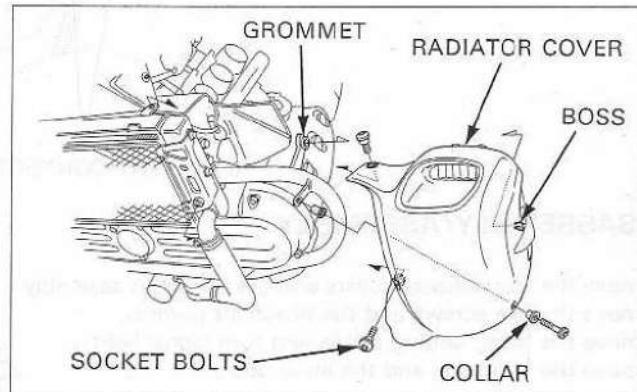


RADIATOR COVER (GL1500CF only)

REMOVAL/INSTALLATION

Remove the three socket bolts and collar. Carefully release the boss of the radiator cover from the grommet on the engine guard, then remove the radiator cover.

Install the radiator cover in the reverse order of removal.



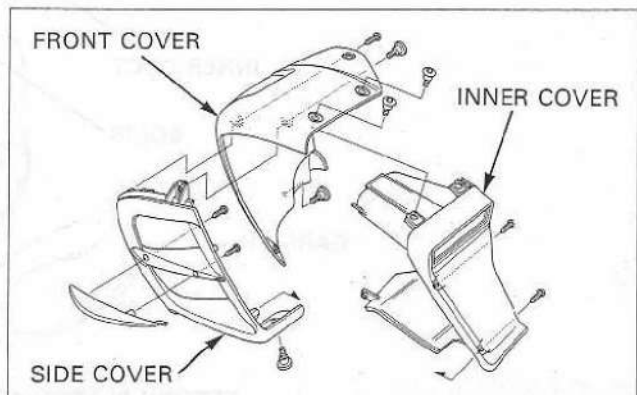
ASSEMBLY/DISASSEMBLY

Remove the four socket bolts, two screws and the inner cover from the front cover.

Remove the screw, socket bolt and the side cover from the front cover.

Remove the tapping screws and side moulding from the side cover by releasing the hook from the slot.

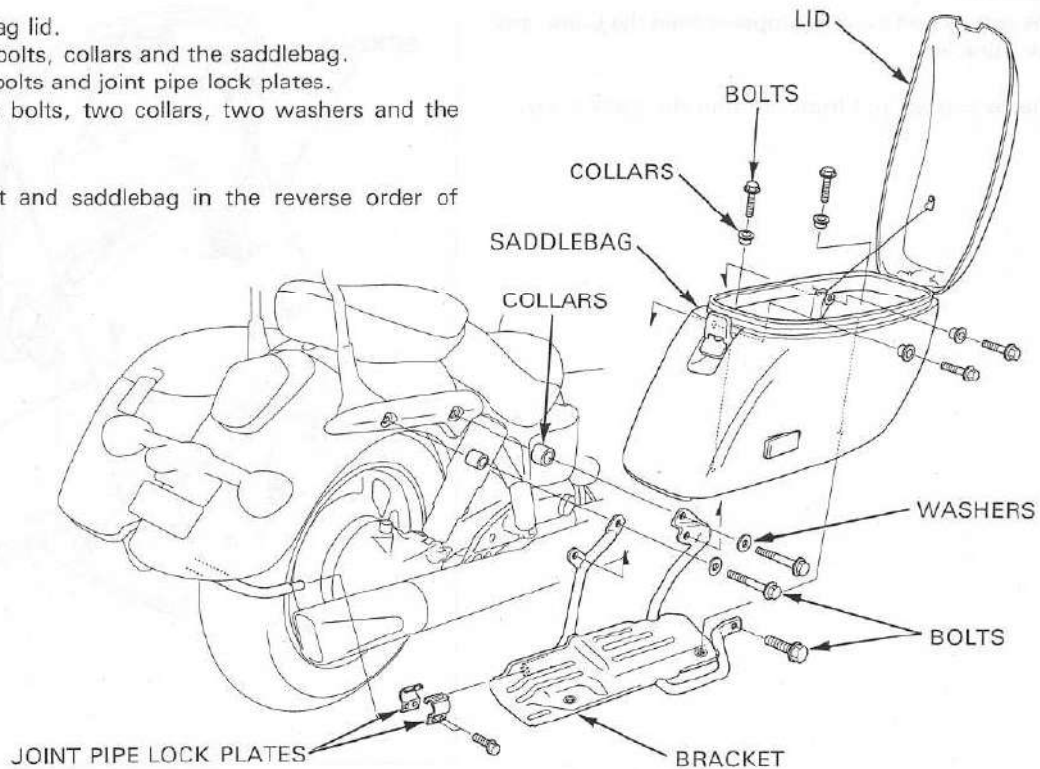
Install the removed parts in the reverse order of removal.



SADDLEBAG (GL1500CT/CF only)

Open the saddlebag lid.
 Remove the four bolts, collars and the saddlebag.
 Remove the two bolts and joint pipe lock plates.
 Remove the three bolts, two collars, two washers and the bracket.

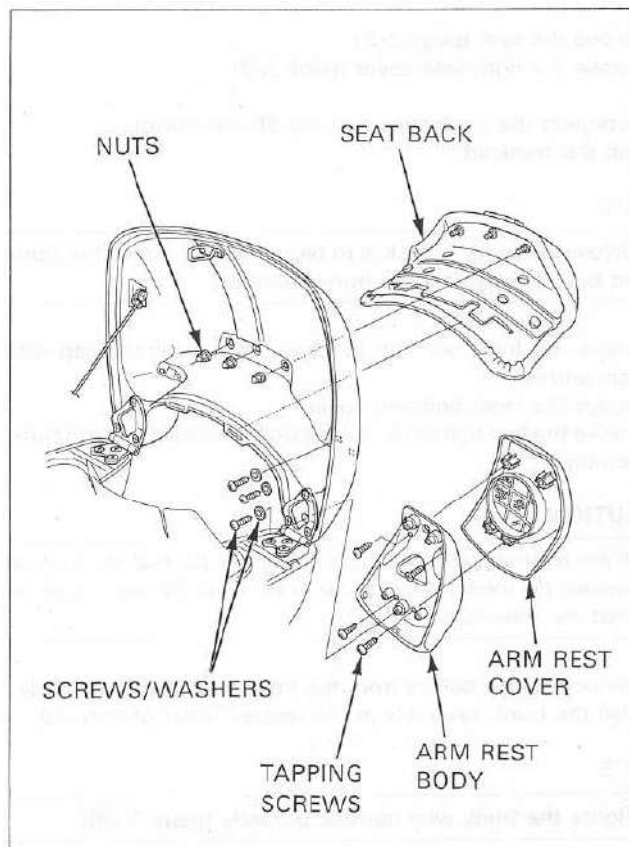
Install the bracket and saddlebag in the reverse order of removal.



TRUNK (GL1500CF only)

SEAT BACK AND ARM REST REMOVAL/INSTALLATION

Open the trunk lid.
 Remove the three nuts and the seat back from the trunk lid.
 Remove the three screws, washers and the arm rest from the trunk lid.
 Remove the four tapping screws and arm rest cover from the arm rest body.
 Install the seat back and arm rest in the reverse order of removal.

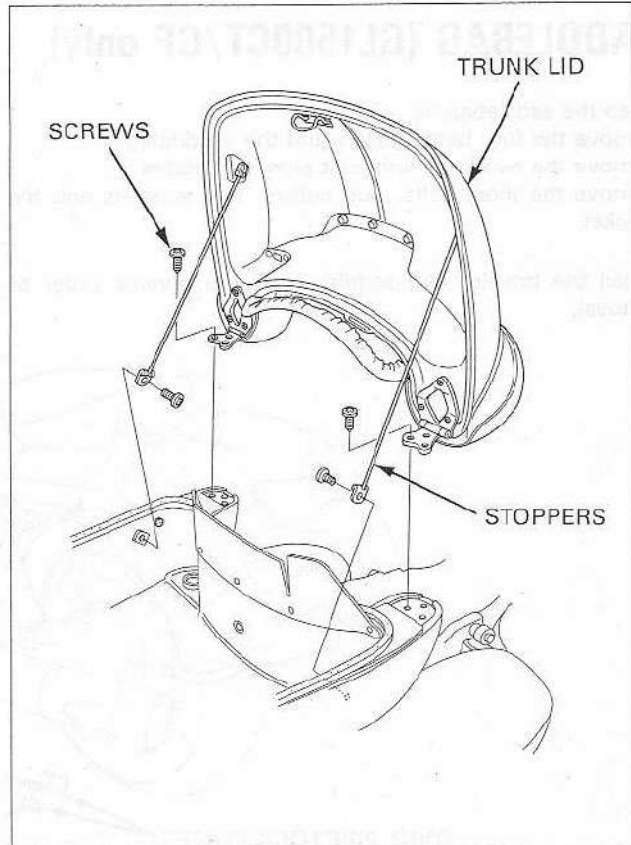


FRAME/BODY PANELS/EXHAUST SYSTEM

TRUNK LID REMOVAL/INSTALLATION

Open the trunk lid.
Remove the screws and trunk lid stoppers from the trunk, and support the trunk lid.

Remove the six screws and trunk lid from the trunk body.



TRUNK ASSEMBLY REMOVAL/INSTALLATION

Remove the seat (page 2-2).
Remove the right side cover (page 2-3).

Disconnect the trunk wire harness 3P connector.
Open the trunk lid.

NOTE

- When the trunk lid lock is to be serviced, remove the trunk lid before removing the trunk assembly.

Remove the front bolt cap by prying the slot in the cap with a screwdriver.

Remove the front bolt and collar.

Remove the five bolt caps, socket bolt, washers and the trunk assembly.

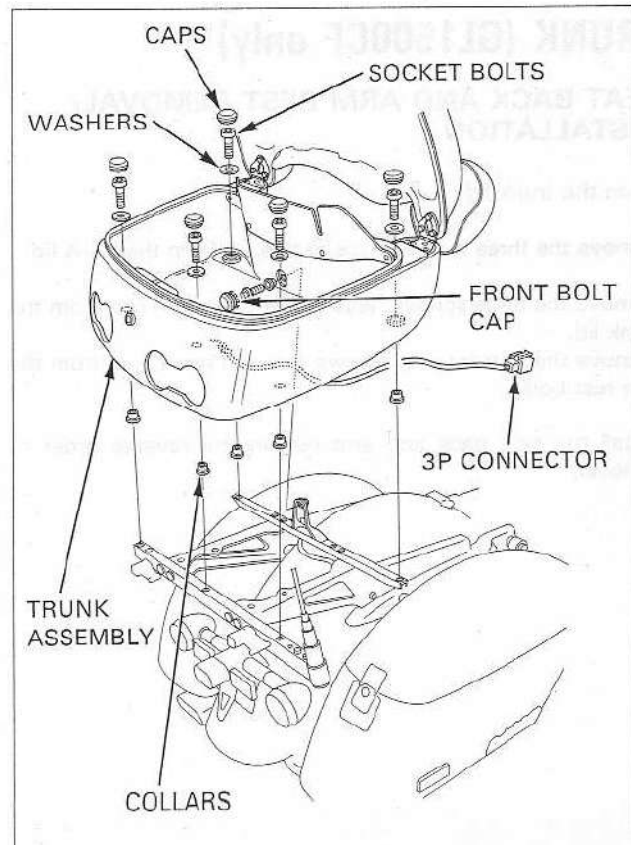
CAUTION

- When removing the trunk assembly with the lid, hold the trunk lid because the trunk turns over due to the trunk lid weight after the bolts are removed.

Remove the five collars from the bottom of the trunk body.
Install the trunk assembly in the reverse order of removal.

NOTE

- Route the trunk wire harness properly (page 1-28).



TRUNK LID LOCK REMOVAL/INSTALLATION

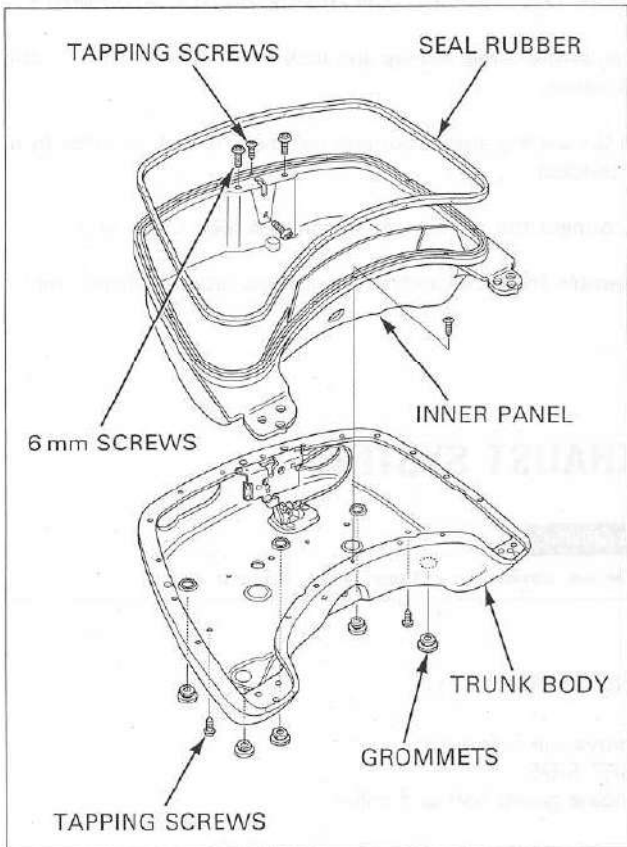
Remove the trunk lid (page 2-10).
 Remove the trunk assembly (page 2-10).
 Remove the taillight assemblies (page 19-5).

Remove the six grommets from the trunk body and inner panel.
 Remove the six tapping screws that attach the bottom of the trunk body to the inner panel.

Remove the seal rubber from the trunk inner panel flange.
 Remove the seventeen tapping screws that attach the inner panel flange to the trunk body.

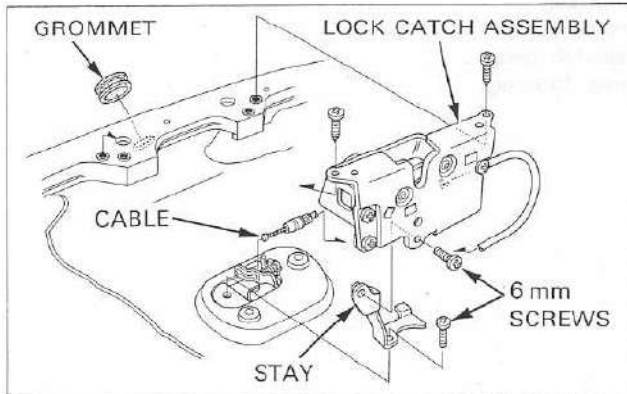
Remove the three 6 mm screws that attach the inner panel to the lock base.

Remove the trunk inner panel from the trunk body.



Remove the two 6 mm screws and lock catch stay.
 Remove the two tapping screws and trunk lid lock catch assembly.
 Disconnect the opener cable from the opener lever arm.

Remove the lock cylinder grommet from the trunk body.

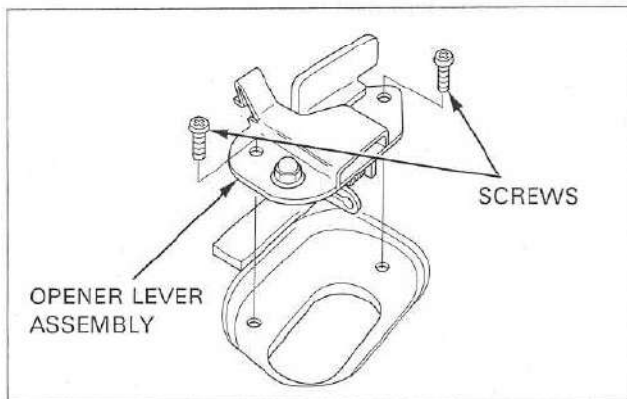


Remove the two screws and trunk lid opener lever assembly from the bottom of the trunk body.

Install the trunk lid lock assembly, opener lever assembly and removed parts in the reverse order of removal.

NOTE

- Replace the trunk lid seal rubber with a new one.



FRAME/BODY PANELS/EXHAUST SYSTEM

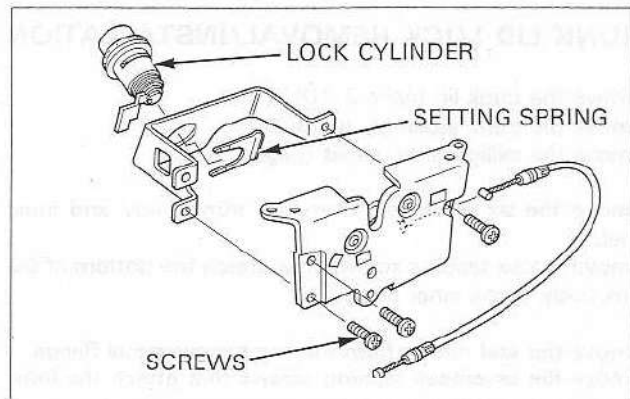
TRUNK LID LOCK CATCH DISASSEMBLY/ASSEMBLY

Remove the three screws and lock cylinder bracket from the lock catch.

Pull the setting spring out and remove the lock cylinder from the bracket.

Disconnect the opener cable from the lock catch arm.

Assemble the lock catch in the reverse order of disassembly.



EXHAUST SYSTEM

▲WARNING

- Do not service the exhaust system while it is hot.

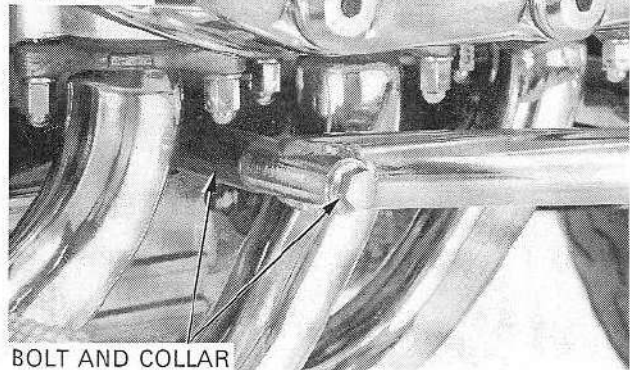
REMOVAL

Remove the following:

RIGHT SIDE:

- engine guard bolt and collar.

RIGHT SIDE:

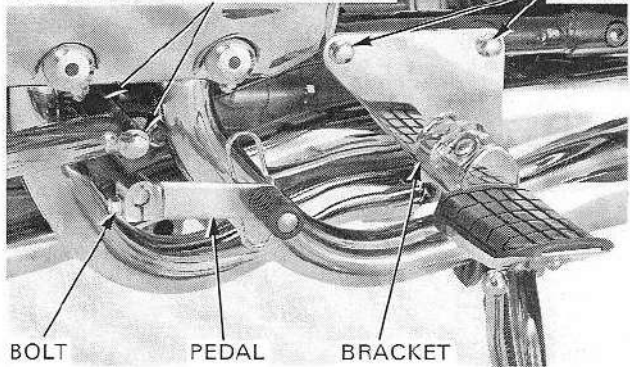


BOLT AND COLLAR

LEFT SIDE:

- engine guard bolt and collar
- gearshift pedal
- driver footpeg.

LEFT SIDE: BOLT AND COLLAR BOLTS

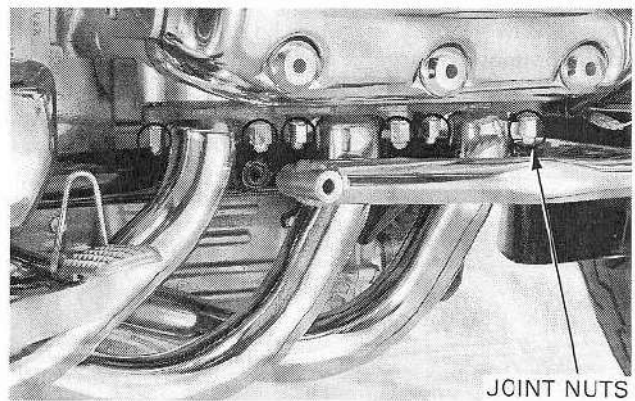


BOLT

PEDAL

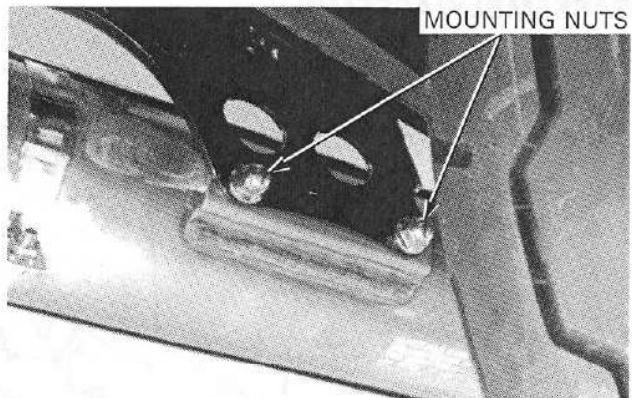
BRACKET

Remove the exhaust pipe joint nuts.



JOINT NUTS

Remove the muffler mounting nuts and the exhaust pipe/muffler assembly.
Remove the exhaust pipe gaskets.



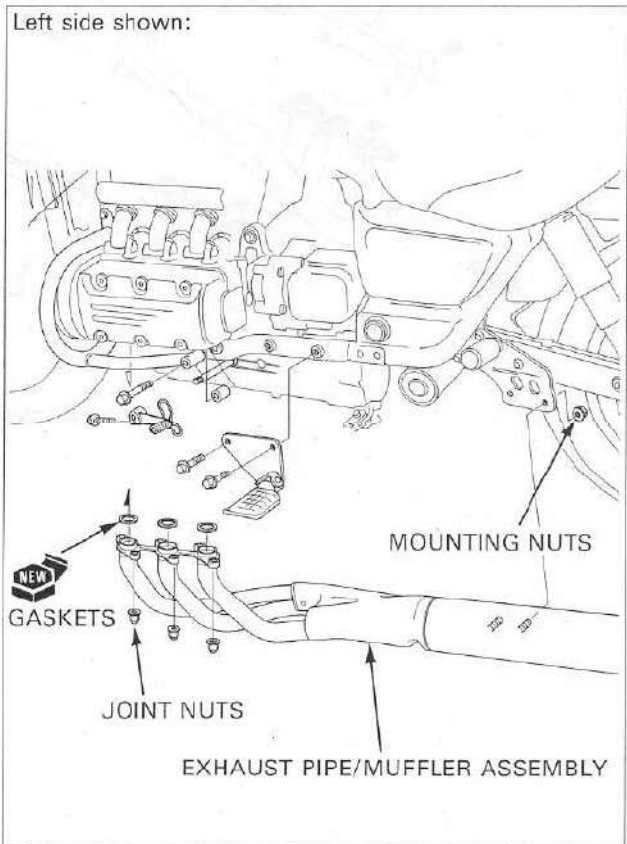
INSTALLATION

Install new gaskets into the exhaust ports in the cylinder head.
Set the exhaust pipe/muffler assembly onto the engine and frame.
Loosely install the muffler mounting nuts and exhaust pipe joint nuts.
Tighten the exhaust pipe joint nuts first, then tighten the muffler mounting nuts.

TORQUE:

Exhaust pipe joint nut: 10 N·m (1.0 kgf·m, 7 lbf·ft)
Muffler mounting nut: 34 N·m (3.5 kgf·m, 25 lbf·ft)

If you tighten the mounting bolt first, the exhaust pipe may not seat properly.

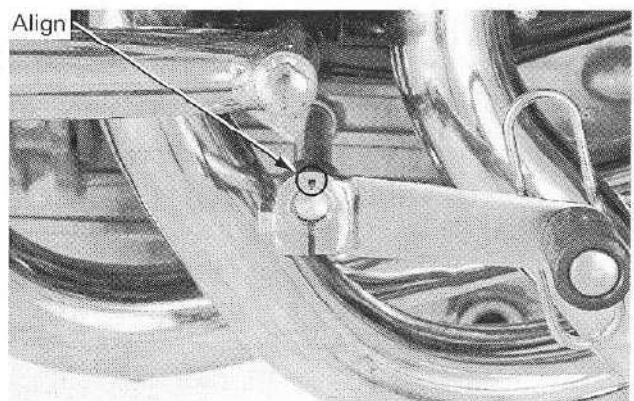


Install the removed parts in the reverse order of removal.

When installing the gearshift pedal, align the groove in the pedal with the punch mark on the shaft.

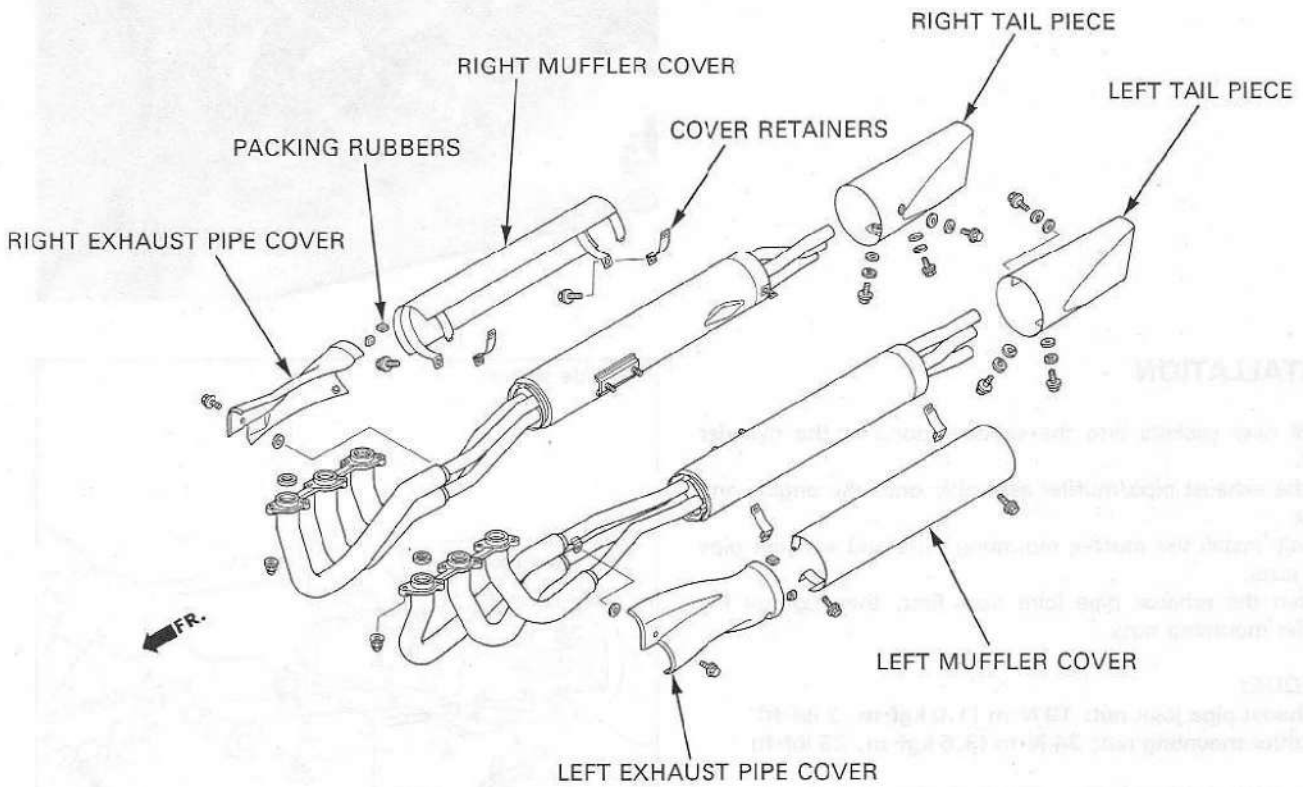
TORQUE:

Driver footpeg bolt: 26 N·m (2.7 kgf·m, 20 lbf·ft)
Gearshift pedal bolt: 12 N·m (1.2 kgf·m, 9 lbf·ft)



FRAME/BODY PANELS/EXHAUST SYSTEM

DISASSEMBLY/ASSEMBLY



3. MAINTENANCE

SERVICE INFORMATION	3-1	SECONDARY AIR SUPPLY SYSTEM	3-13
MAINTENANCE SCHEDULE	3-3	EVAPORATIVE EMISSION CONTROL SYSTEM (California type only)	3-13
FUEL LINE	3-4	FINAL DRIVE OIL	3-14
THROTTLE OPERATION	3-4	BRAKE FLUID	3-15
CARBURETOR CHOKE	3-5	BRAKE PAD WEAR	3-16
AIR CLEANER	3-6	BRAKE SYSTEM	3-16
CRANKCASE BREATHER	3-6	BRAKE LIGHT SWITCH	3-16
SPARK PLUG	3-7	HEADLIGHT AIM	3-17
VALVE CLEARANCE	3-7	CLUTCH SYSTEM	3-17
ENGINE OIL	3-8	CLUTCH FLUID	3-18
ENGINE OIL FILTER	3-9	SIDE STAND	3-18
TIMING BELT	3-10	SUSPENSION	3-19
CARBURETOR SYNCHRONIZATION	3-10	NUTS, BOLTS, FASTENERS	3-19
ENGINE IDLE SPEED	3-12	WHEELS/TIRES	3-20
RADIATOR COOLANT	3-12	STEERING HEAD BEARINGS	3-20
COOLING SYSTEM	3-12		

SERVICE INFORMATION

GENERAL

⚠WARNING

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

SPECIFICATIONS

ITEM		SPECIFICATIONS	
Throttle grip free play		2—6mm (1/12—1/4)	
Spark plug		NGK	DENSO
	Standard	DPR7EA-9	X22EPR-U9
	Cold climate (below 5°C, 41°F)	DPR6EA-9	X20EPR-U9
	Extended high speed riding	DPR8EA-9	X24EPR-U9
Spark plug gap		0.8—0.9 mm (0.031—0.035 in)	
Valve clearance	IN	0.15 mm (0.006 in)	
	EX	0.22 mm (0.009 in)	
Recommended engine oil		Honda GN4 or HP4 4-stroke oil or equivalent motor oil API service classification SF or SG Viscosity: SAE 10W-40	
Engine oil capacity	After draining/filter change	3.7 liters (3.9 US qt, 3.3 Imp qt)	
	At disassembly	4.3 liters (4.5 US qt, 3.8 Imp qt)	
Carburetor vacuum difference		40 mm Hg (1.6 in Hg)	
Engine idle speed		900 ± 100 rpm	

MAINTENANCE

ITEM		SPECIFICATIONS	
Recommended final drive oil		Hypoid gear oil, SEA #80	
Final drive oil capacity after draining		150 cm ³ (5.1 US oz, 5.3 Imp oz)	
Recommended brake fluid		DOT 4 brake fluid	
Recommended clutch fluid		DOT 4 brake fluid	
Cold tire pressure	Up to 90 kg (200 lb) load	Front	225 kPa (2.25 kgf/cm ² , 33 psi)
		Rear	225 kPa (2.25 kgf/cm ² , 33 psi)
	Up to maximum weight	Front	225 kPa (2.25 kgf/cm ² , 33 psi)
		Rear	250 kPa (2.50 kgf/cm ² , 36 psi)
Tire size	Front	160/80R17 72H	
	Rear	180/70R16 77H	
Tire brand (Dunlop)	Front	D206F	
	Rear	D206	
Minimum tread depth	Front	1.5 mm (0.06 in)	
	Rear	2.0 mm (0.08 in)	

TORQUE VALUES

Spark plug	16 N•m (1.6 kgf•m, 12 lbf•ft)
Valve adjusting screw lock nut	23 N•m (2.3 kgf•m, 17 lbf•ft)
Engine oil drain bolt	34 N•m (3.4 kgf•m, 25 lbf•ft)
Oil filter cartridge	10 N•m (1.0 kgf•m, 7 lbf•ft) Apply oil to the threads, seating surface and O-ring.
Final drive oil filler cap	12 N•m (1.2 kgf•m, 9 lbf•ft)
Final drive oil drain bolt	20 N•m (2.0 kgf•m, 14 lbf•ft)

TOOLS

Oil filter wrench	07HAA-PJ70100
Vacuum gauge set	07LMJ-001000A (U.S.A. only) or M937B-021-XXXXX (U.S.A. only)

MAINTENANCE SCHEDULE

Perform the PRE-RIDE INSPECTION in the Owner's Manual at each scheduled maintenance period.

I: Inspect and clean, adjust lubricate or replace if necessary.

C: Clean R: Replace A: Adjust L: Lubricate

The following items require some mechanical knowledge. Certain items (particularly those marked * and **) may require more technical information and tools. Consult your authorized Honda dealer.

ITEM	FREQUENCY	WHICHEVER COMES FIRST → ↓ NOTE	ODOMETER READING (NOTE 1)								Refer to page
			× 1,000 mi	0.6	4	8	12	16	20	24	
			× 100 km	10	64	128	192	256	320	384	
EMISSION RELATED ITEMS	* FUEL LINE				I		I		I	3-4	
	* THROTTLE OPERATION				I		I		I	3-4	
	* CARBURETOR CHOKE				I		I		I	3-5	
	* AIR CLEANER	NOTE 2				R			R	3-6	
	CRANKCASE BREATHER	NOTE 3		C	C	C	C	C	C	3-6	
	SPARK PLUG				R		R		R	3-7	
	* VALVE CLEARANCE					I			I	3-7	
	ENGINE OIL			R		R		R	R	3-8	
	ENGINE OIL FILTER			R		R		R	R	3-9	
	** TIMING BELT			I EVERY 100,000 mi (160,000 km)						3-10	
	* CARBURETOR SYNCHRONIZATION				I		I		I	3-10	
	* ENGINE IDLE SPEED			I	I	I	I	I	I	3-12	
	RADIATOR COOLANT	NOTE 4				I		I	R	3-12	
	* COOLING SYSTEM					I		I	I	3-12	
	* SECONDARY AIR SUPPLY SYSTEM					I		I	I	3-13	
* EVAPORATIVE EMISSION CONTROL SYSTEM	NOTE 5					I		I	3-13		
NON-EMISSION RELATED ITEMS	FINAL DRIVE OIL				I		I		R	3-14	
	BRAKE FLUID	NOTE 4			I	I	R	I	I	3-15	
	BRAKE PAD WEAR				I	I	I	I	I	3-16	
	BRAKE SYSTEM			I		I		I	I	3-16	
	* BRAKE LIGHT SWITCH				I		I		I	3-16	
	* HEADLIGHT AIM				I		I		I	3-17	
	CLUTCH SYSTEM				I		I		I	3-17	
	CLUTCH FLUID	NOTE 4			I	I	R	I	I	3-18	
	SIDE STAND				I		I		I	3-18	
	* SUSPENSION				I		I		I	3-19	
	* NUTS, BOLTS, FASTENERS			I		I		I	I	3-19	
** WHEELS/TIRES				I		I		I	3-20		
** STEERING HEAD BEARINGS			I		I		I	I	3-20		

* Should be serviced by your 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 your authorized Honda dealer.

NOTES: 1. At higher odometer readings, repeat at the frequency interval established here.

2. Service more frequently when riding in unusually wet or dusty areas.

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

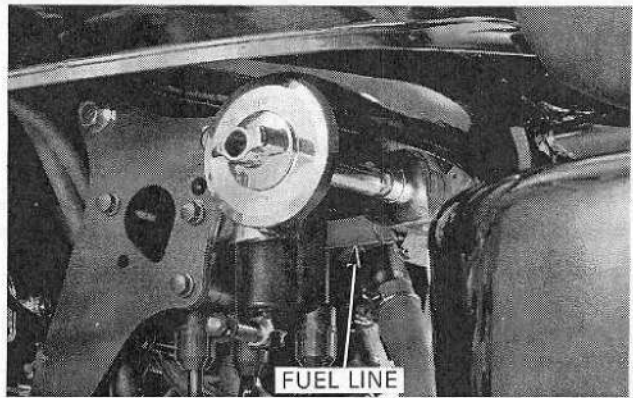
4. Replace every 2 years, or at indicated odometer interval, whichever comes first. Replacement requires mechanical skill.

5. California type only.

MAINTENANCE

FUEL LINE

Check the fuel lines for deterioration, damage or leakage. Replace fuel lines if necessary.



THROTTLE OPERATION

Check for any deterioration or damage to the throttle cables. Check that the throttle grip for smooth operation. Check that the throttle opens and automatically closes in all steering positions.

If the throttle grip does not return properly, lubricate the throttle cables and overhaul and lubricate the throttle grip housing.

For cable lubrication: Disconnect the throttle cables at their upper ends. Thoroughly lubricate the cables and their pivot points with a commercially available cable lubricant or a light weight oil.

If the throttle grip still does not return properly, replace the throttle cables.

▲WARNING

- Reusing a damaged or abnormally bent or kinked throttle cable can prevent proper throttle slide operation and may lead to a loss of throttle control while riding.

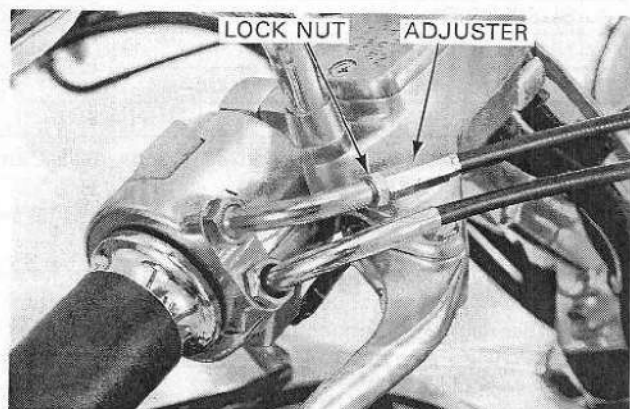
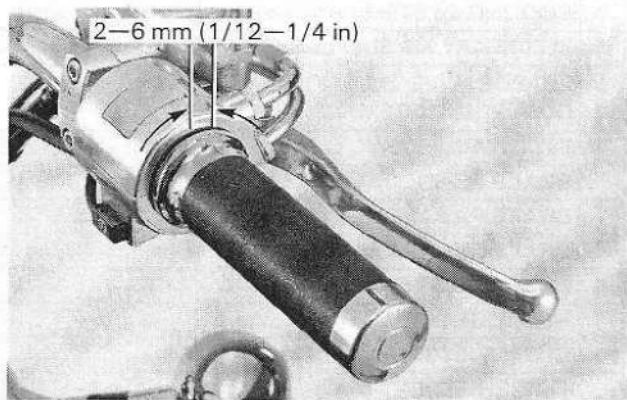
With the engine idling, turn the handlebar all the way to the right and left to ensure that the idle speed does not change. If idle speed increases, check the throttle grip free play and the throttle cable connection.

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

THROTTLE GRIP FREE PLAY: 2–6 mm (1/12–1/4 in)

Throttle grip free play can be adjusted at either end of the throttle cable. Minor adjustments are made with the upper adjuster.

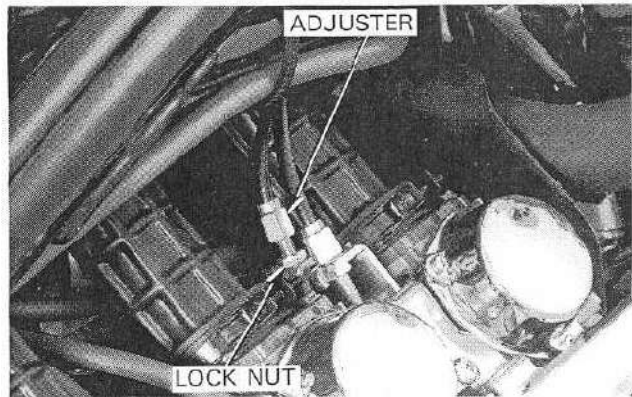
Loosen the lock nut, turn the adjuster as required and tighten the lock nut.



Major adjustments are made with the lower adjuster.

Remove the fuel tank (page 2-4).
Loosen the lock nut, turn the adjuster as required and tighten the lock nut.

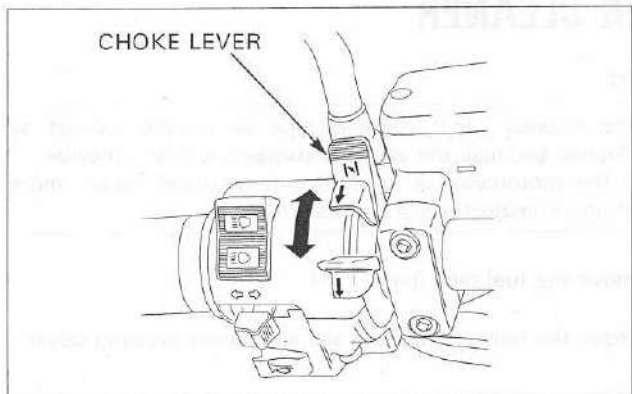
Recheck the throttle operation and install the fuel tank.



CARBURETOR CHOKE

This model's choke system uses a fuel enriching circuit controlled by a starting enrichment (SE) valve. The SE valve opens the enriching circuit via a cable when the choke lever on the handlebar is pulled down.

Check for smooth choke lever operation. If operation is not smooth, lubricate the cable and check the cable condition. Replace the cable if it is frayed or kinked.

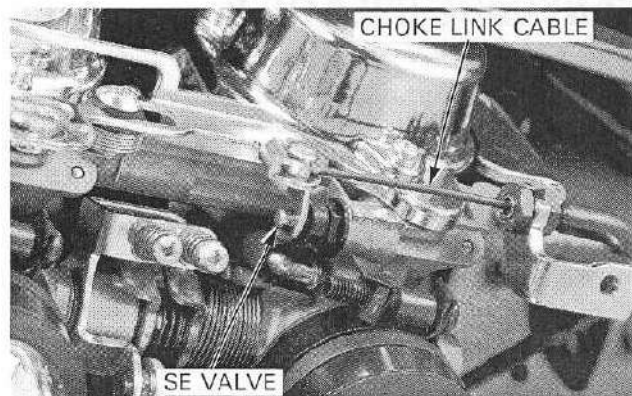


Remove the three screws for each side and the carburetor link covers.



With the choke lever fully closed (OFF) position, check that the SF valves are fully closed as shown, on the left side and right side carburetors. Also check that the choke link cable has no free play.

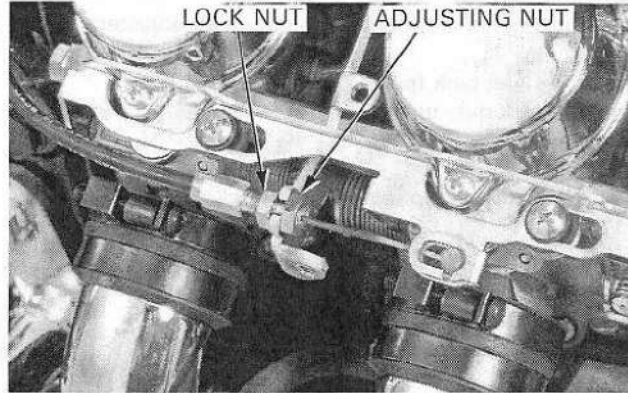
Pull the choke lever down and check that the SE valves are fully open.



MAINTENANCE

To adjust, loosen the lock nut and turn the adjusting nut as required. Tighten the lock nut.

Reinstall the carburetor link covers.



AIR CLEANER

NOTE

- The viscous paper element type air cleaner cannot be cleaned because the element contains a dust adhesive.
- If the motorcycle is used in wet or dusty areas, more frequent inspections are required.

Remove the fuel tank (page 2-4).

Remove the nine screws and the air cleaner housing cover.

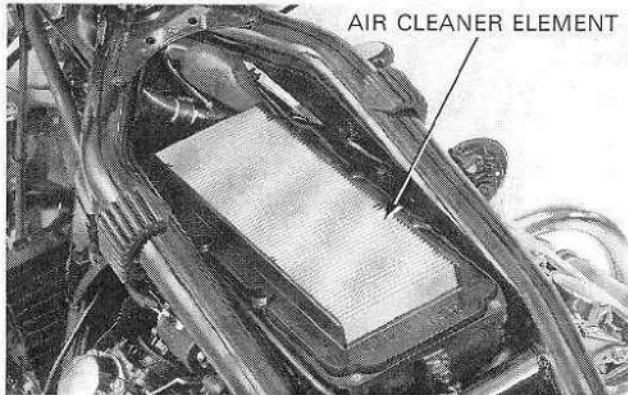


Remove the air cleaner element.

Replace the element in accordance with the maintenance schedule or any time it is excessively dirty or damaged.

Install the air cleaner housing cover and tighten the screws.

Install the fuel tank (page 2-4).

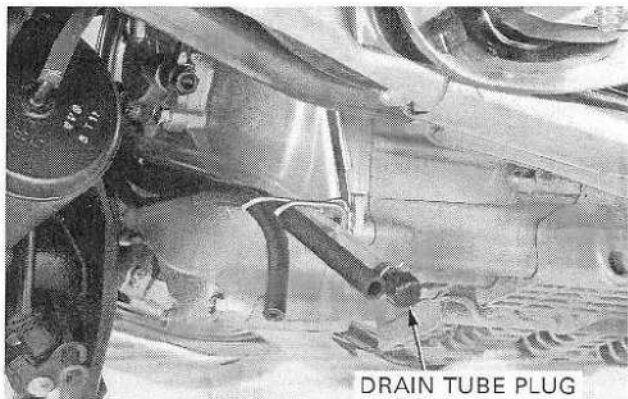


CRANKCASE BREATHER

NOTE

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

Remove the plug from the air cleaner housing/crankcase breather storage tank drain tube and drain deposits into a suitable container, then reinstall the plug securely.



SPARK PLUG

Remove the radiator cover (GL1500CF only: page 2-8). Disconnect the spark plug caps and clean around the spark plug bases.

NOTE

- Clean around the spark plug bases with compressed air before removing the plugs, and be sure that no debris is allowed to enter the combustion chamber.

Remove and discard the spark plugs.

RECOMMENDED SPARK PLUGS:

	NGK	DENSO
Standard	DPR7EA-9	X22EPR-U9
Cold climate (below 5°C, 41°F)	DPR6EA-9	X20EPR-U9
Extended high speed riding	DPR8EA-9	X24EPR-U9

Measure the new spark plug gap with a wire-type feeler gauge.

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

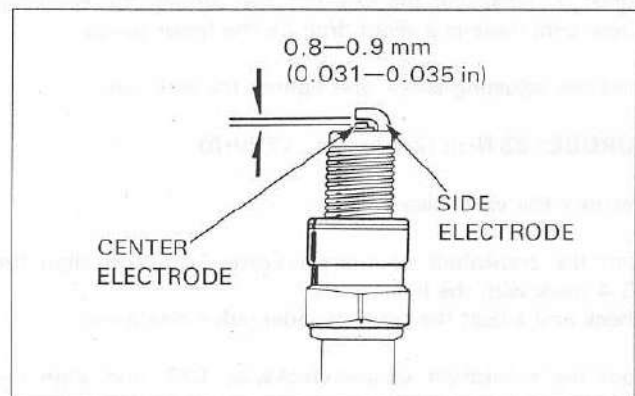
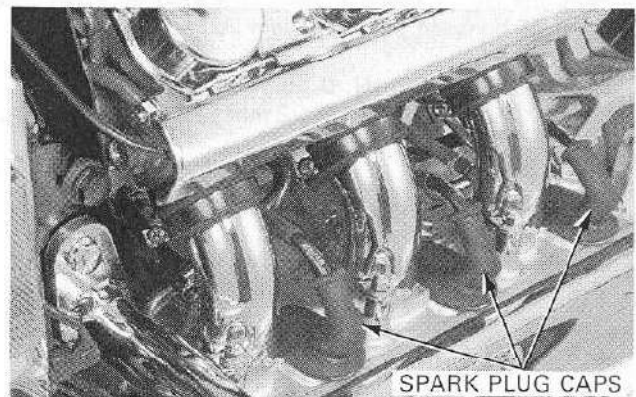
If necessary, adjust the gap by carefully bending the side electrode.

Threads each spark plug in by hand to prevent cross-threading and tighten it.

TORQUE: 16 N·m (1.6 kgf·m, 12 lbf·ft)

Connect the spark plug caps.

Install the radiator cover (GL1500CF only: page 2-8).



VALVE CLEARANCE

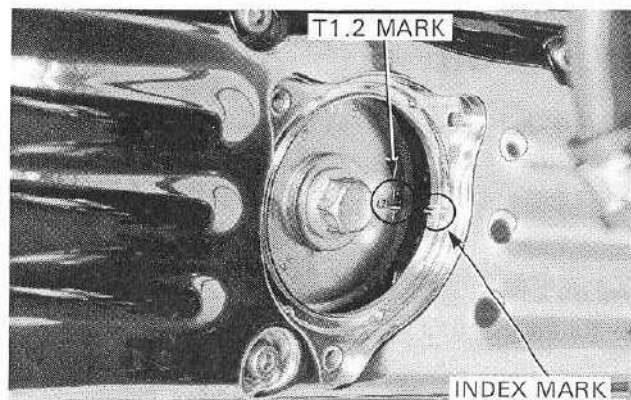
NOTE

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

Remove the left and right cylinder head covers (page 8-7). Remove the timing cover (page 17-8).

Rotate the crankshaft counterclockwise and align the T1.2 mark on the drive pulley guide plate with the index mark on the timing belt cover.

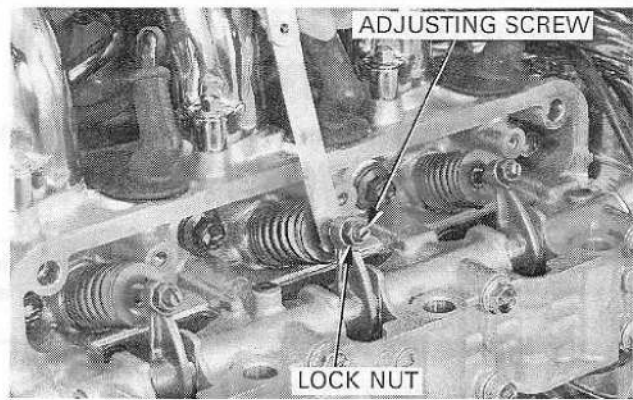
Make sure the No. 1 piston is at TDC (Top Dead Center) on the compression stroke. If not compression stroke, rotate the crankshaft counterclockwise 360° (1 full turn) and align the T1.2 mark with the index mark.



MAINTENANCE

Measure the No. 1 cylinder valve clearance by inserting a feeler gauge between the valve stem and adjusting screw.

VALVE CLEARANCES: IN: 0.15 mm (0.006 in)
EX: 0.22 mm (0.009 in)



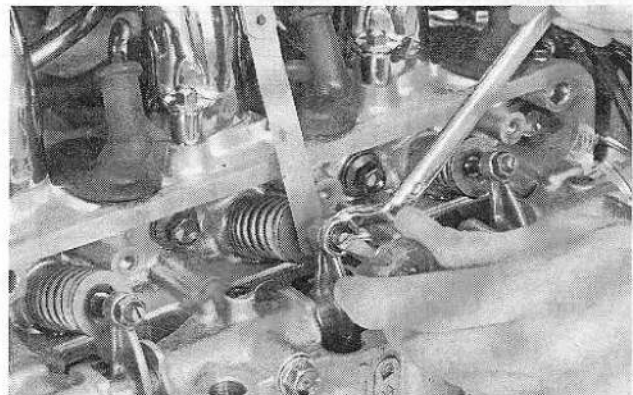
Adjust by loosening the lock nut and turning the adjusting screw until there is a slight drag on the feeler gauge.

Hold the adjusting screw and tighten the lock nut.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)

Recheck the valve clearance.

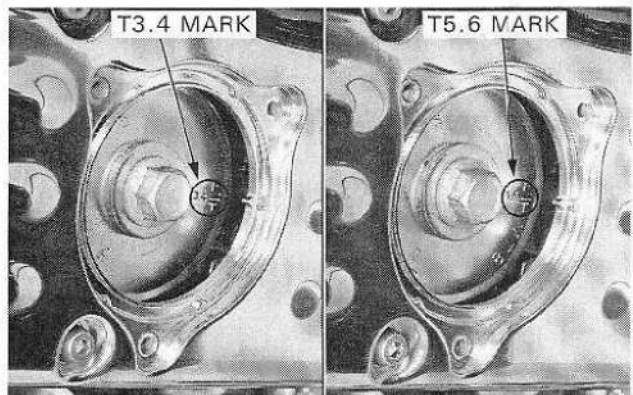
Turn the crankshaft counterclockwise 120° and align the T3.4 mark with the index mark.
Check and adjust the No.4 cylinder valve clearance.



Turn the crankshaft counterclockwise 120° and align the T5.6 mark with the index mark.
Check and adjust the No.5 cylinder valve clearance.

Turn the crankshaft counterclockwise 120° and align the T1.2 mark with the index mark.
Check and adjust the No.2 cylinder valve clearance.

Turn the crankshaft counterclockwise 120° and align the T3.4 mark with the index mark.
Check and adjust the No.3 cylinder valve clearance.



Turn the crankshaft counterclockwise 120° and align the T5.6 mark with the index mark.
Check and adjust the No.6 cylinder valve clearance.

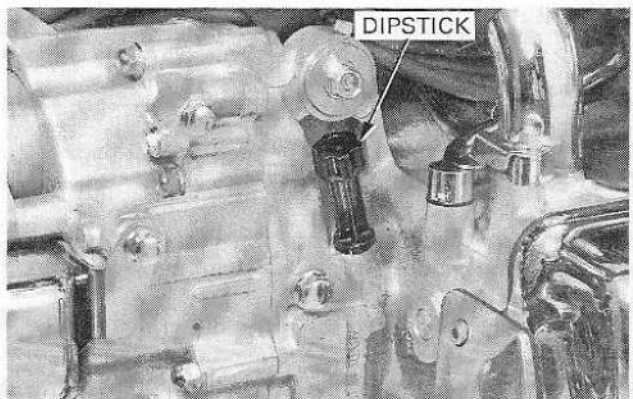
Install the timing cover (page 17-9).
Install the cylinder head covers (page 8-25).

ENGINE OIL

Start the engine and let it idle for a few minutes.

Stop the engine, remove the dipstick and wipe the oil from the dipstick with a clean cloth.

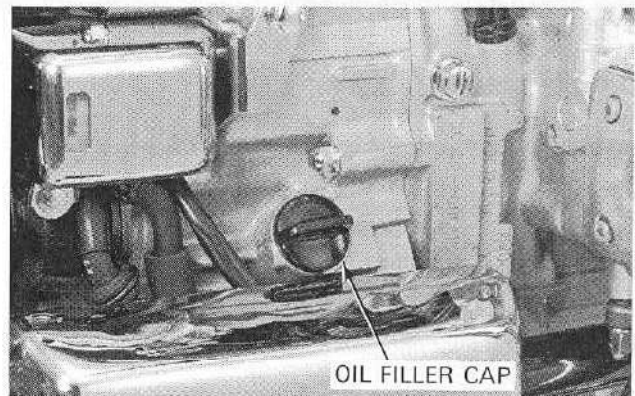
Wait for two or three minutes after stopping the engine.
With the motorcycle in an upright position, insert the dipstick into the dipstick hole without screwing it in.



If the oil level is below or near the lower level mark on the dipstick, remove the oil filler cap and add the recommended engine oil up to the upper level mark.

RECOMMENDED ENGINE OIL:

Honda GN4 or HP4 4-stroke oil or equivalent motor oil certified to meet API service classification: SF or SG
Viscosity: SAE 10W-40



NOTE

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

Reinstall the dipstick and filler cap.

For engine oil change, see below.

ENGINE OIL FILTER

NOTE

- Change the oil with engine warm and the motorcycle upright on a level surface to assure complete and rapid draining.

▲WARNING

- *Engine and exhaust system parts become very hot and remain hot for some time after the engine is run. Wear insulated gloves.*

Stop the engine.

Remove the oil filler cap and drain bolt, and drain the oil with the motorcycle upright.

Remove the oil filter cartridge and let the remaining oil drain out. Discard the filter cartridge.

TOOL:

Oil filter wrench **07HAA-PJ70100**

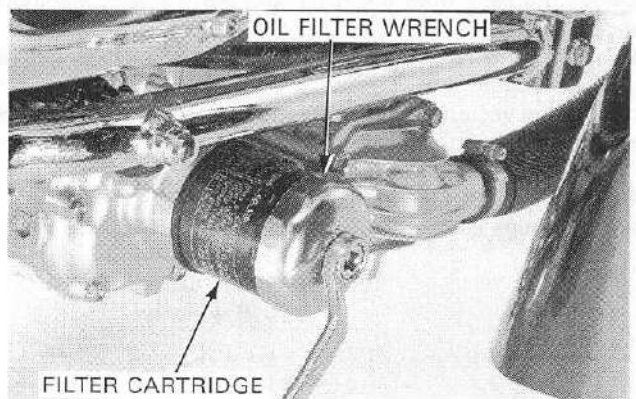
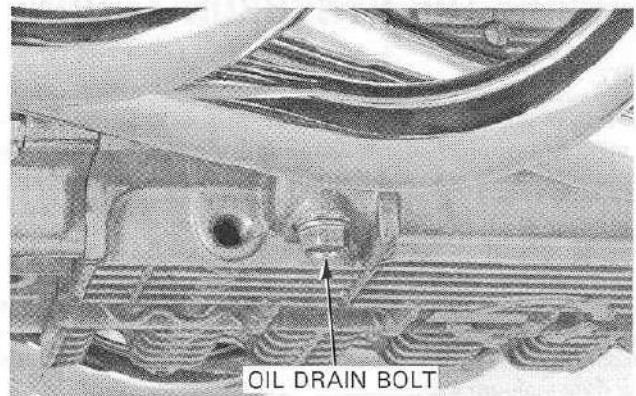
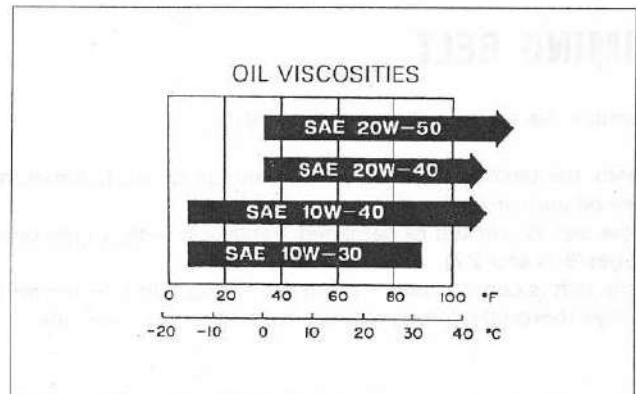
CAUTION

- *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 advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil.*

After draining the oil completely check that the sealing washer on the drain bolt is in good condition and replace it if necessary.

Install and tighten the drain bolt.

TORQUE: 34 N•m (3.5 kgf•m, 25 lbf•ft)



MAINTENANCE

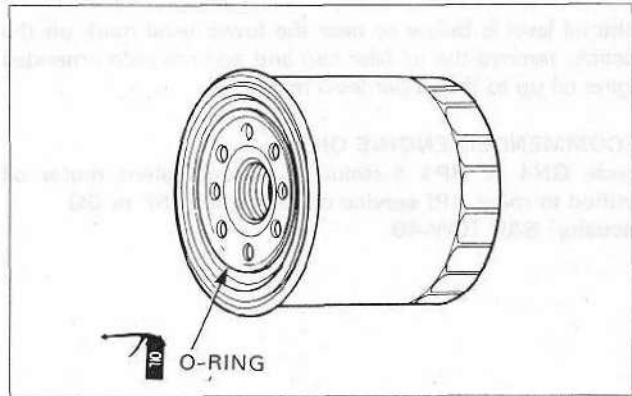
Apply oil to the O-ring and threads of a new oil filter cartridge and install the filter cartridge.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Fill the crankcase with the recommended oil (page 3-9).

OIL CAPACITY: 3.7 liters (3.9 US qt, 3.3 Imp qt)
after draining/filter change
4.3 liters (4.5 US qt, 3.8 Imp qt)
at disassembly

Reinstall the oil filler cap and dipstick.
Check the engine oil level (page 3-9).
Make sure there are no oil leaks.



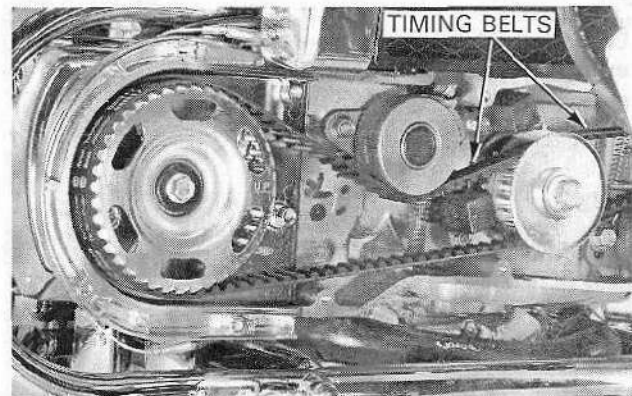
TIMING BELT

Remove the timing belt cover (page 8-5).

Check the timing belts for cracks, damage or contamination with oil and/or coolant.

If the belt is cracked or damaged, replace it with a new one (pages 8-5 and 27).

If the belt is contaminated, clean the timing belt housing and pulleys thoroughly, then replace the belt with a new one.



CARBURETOR SYNCHRONIZATION

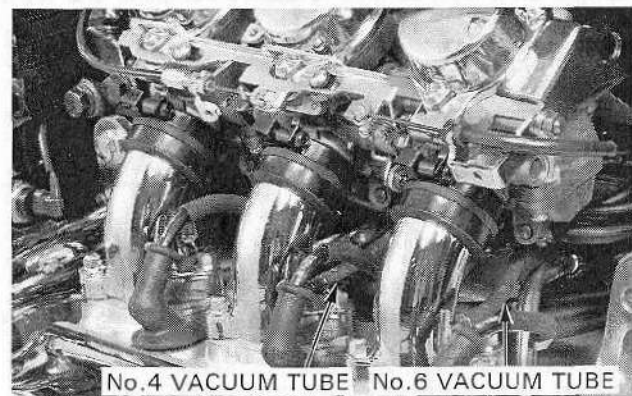
NOTE

- Perform this maintenance with the engine at normal operating temperature and transmission in neutral. Place the motorcycle on a level surface.

Remove the carburetor link covers (page 3-5).

Start the engine, pinch the No.6 vacuum tube using a tube clamp, and stop the engine.

Disconnect the No.4 vacuum tube from the No.4 intake manifold vacuum joint.



Remove the caps from the No.1 and No.5 intake manifold vacuum joints.

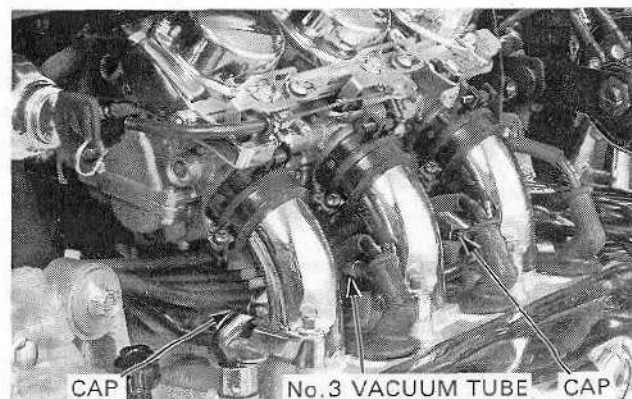
Disconnect the No.3 vacuum tube from the No.3 intake manifold vacuum joint.

Connect the vacuum gauge tubes to the No.1, No.3, No.5 and No.4 intake manifold vacuum joints.

TOOL:

Vacuum gauge set

07LMJ-001000A
(U.S.A. only) or
M937B-021-XXXXX
(U.S.A. only)



Start the engine and adjust the idle speed by turning the throttle stop screw.

IDLE SPEED: 900±100 rpm

Check that the difference in vacuum between each carburetor and No.3 (base) carburetor is within 40 mm Hg (1.6 in Hg).

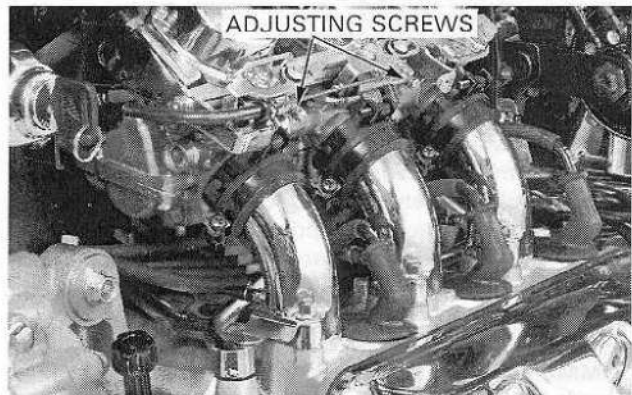
NOTE

- The No.3 carburetor cannot be adjusted; it is base carburetor.

Synchronize to specification by turning each adjusting screw.

Rev the engine up several times.
Recheck the idle speed and synchronization.

Remove the vacuum gauge and install the caps onto the No. 1 and No.5 intake manifold vacuum joints.



Disconnect the No.6 vacuum tube from the No.6 intake manifold vacuum joints.
Remove the cap from the No.2 intake manifold vacuum joint.

Connect the vacuum gauge tubes to the No.2, No.4, No.6 and No.3 intake manifold vacuum joints.

Start the engine and adjust the idle speed by turning the throttle stop screw.

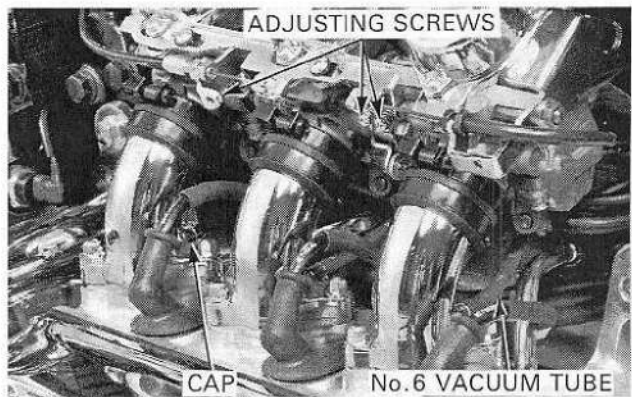
IDLE SPEED: 900±100 rpm

Check that the difference in vacuum between each carburetor and No.3 (base) carburetor is within 40 mm Hg (1.6 in Hg).

Synchronize to specification by turning each adjusting screw.

Rev the engine up several times.
Recheck the idle speed and synchronization.

Remove the vacuum gauge.
Install the cap onto the No.2 intake manifold vacuum joint, and connect the No.3, No.4 and No.6 vacuum tubes to the No.3, No.4 and No.6 intake manifold joints.
Install the carburetor link covers.
Remove the tube clamp from the No.6 vacuum tube.



MAINTENANCE

ENGINE IDLE SPEED

NOTE

- Inspect and adjust the idle speed after 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, shift the transmission into neutral and place the motorcycle on its side stand on a level surface. Check the idle speed and adjust by turning the throttle stop screw as required.

IDLE SPEED: 900±100 rpm

RADIATOR COOLANT

Remove the left side cover (page 2-3). Check the coolant level of the reserve tank with the engine running at normal operating temperature. The level should be between the "UPPER" and "LOWER" level lines with the motorcycle upright on a level surface. If the level is low, remove the reserve tank cap and fill the tank to the "UPPER" level line with a 50/50 solution of distilled water and recommended antifreeze.

RECOMMENDED ANTIFREEZE:

Pro Honda HP coolant or an equivalent high quality ethylene glycol antifreeze containing corrosion protection inhibitors

CAUTION

- *Using coolant with silicate inhibitors may cause premature wear of water pump seals or blockage of radiator passages. Using tap water may cause engine damage.*

Check to see if there are any coolant leaks when the coolant level decreases very rapidly.

If reserve tank becomes completely empty, there is a possibility of air getting into the cooling system.

Be sure to remove all air from the cooling system (page 6-5).

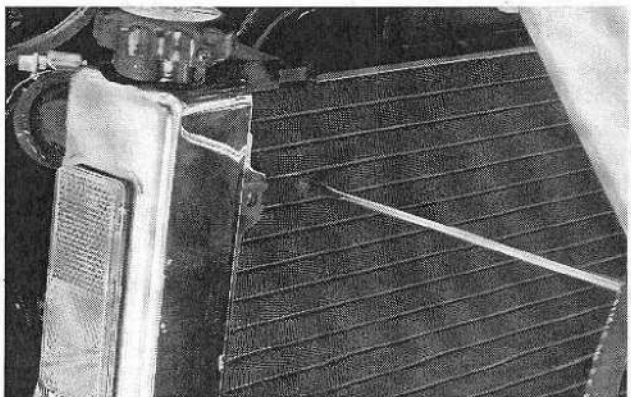
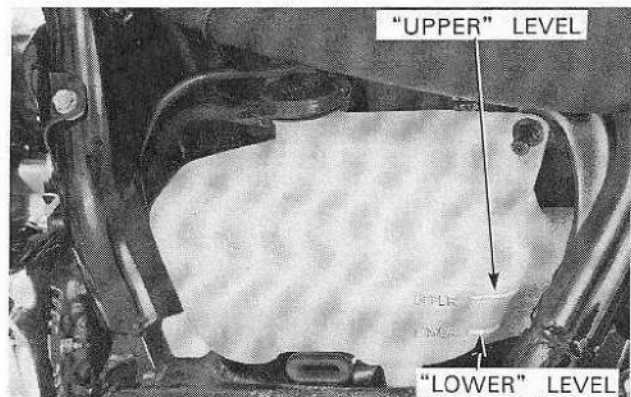
COOLING SYSTEM

Remove the radiator grille (page 6-8). Check the radiator air passage for clogging or damage. Straighten bent fins with a small, flat blade screwdriver and remove insects, mud or other obstructions with compressed air or low pressure water. Replace the radiator if the air flow is restricted over more than 20% of the radiating surface.

Check for any coolant leakage from the water pump, radiator hoses and hose joints.

Check the radiator hoses for cracks or deterioration and replace if necessary.

Check that all hose clamps are tight.



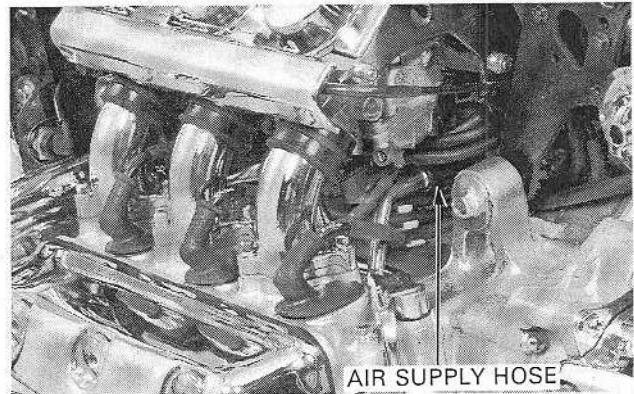
SECONDARY AIR SUPPLY SYSTEM

Remove the air cleaner housing (page 5-4).

Check the air supply hoses and pipes between the pulse secondary air injection (PAIR) check valve cases and exhaust ports for damage or loose connections.
Check the air supply hoses for cracks or deterioration.

NOTE

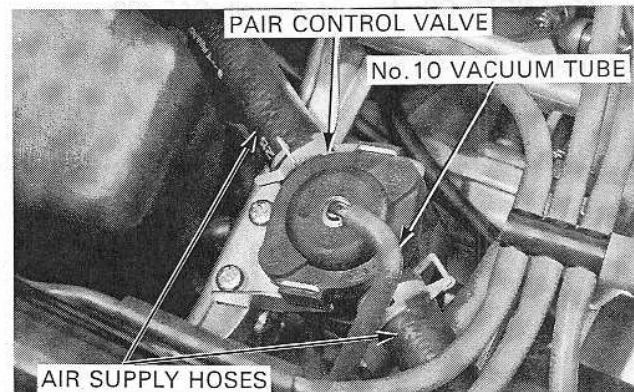
- If the hoses show any signs of heat damage, inspect the PAIR check valves in the case (page 5-25).



Check the air supply hoses between the PAIR check valve cases and PAIR control valve for cracks, deterioration, loose connection or damage.

Check the No. 3, No. 4 and No. 10 vacuum tubes between the intake manifolds and PAIR control valve for deterioration, damage or loose connections. Also check that the tubes are not kinked or pinched.

For PAIR control valve inspection, see page 5-24.



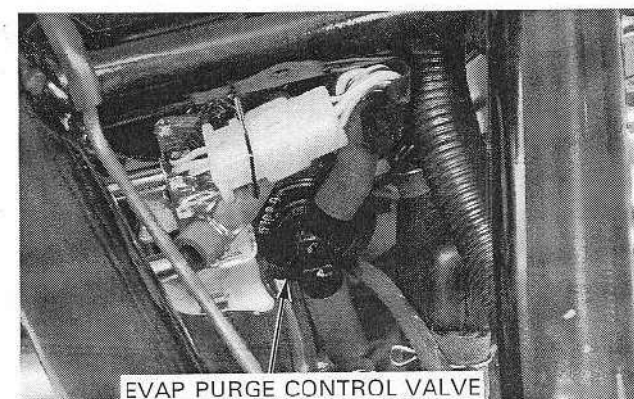
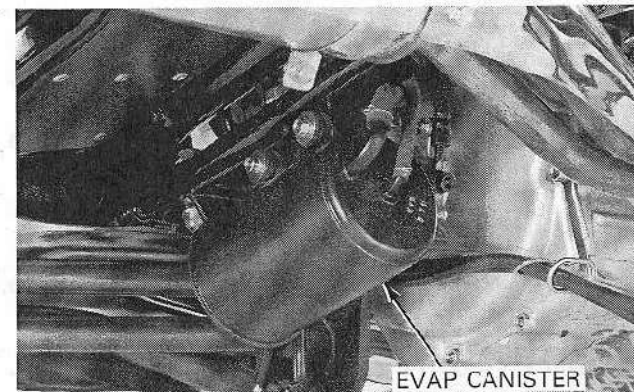
EVAPORATIVE EMISSION CONTROL SYSTEM (California type only)

Remove the air cleaner housing (page 5-4).

Check the tubes between the fuel tank, evaporative emission (EVAP) canister, EVAP purge control valve, EVAP carburetor air vent (CAV) control valve and carburetors for deterioration, damage or loose connections. Also check that the tubes are not kinked or pinched.

Check the EVAP canister for cracks or damage.

Refer to the Vacuum Hose Routing Diagram Label and Cable & Harness Routing (page 1-21) for tube connections.



MAINTENANCE

FINAL DRIVE OIL

LEVEL CHECK

Place the motorcycle on a level surface, and support it upright.

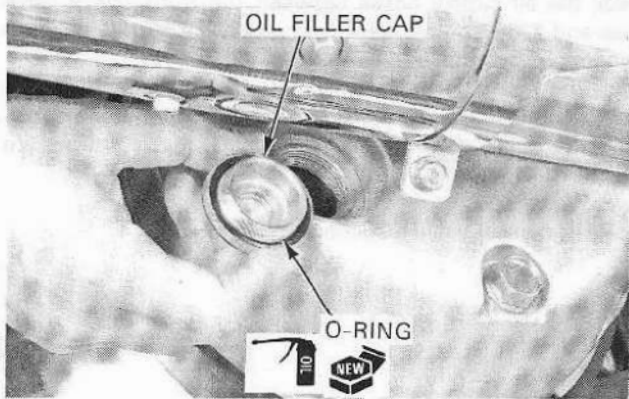
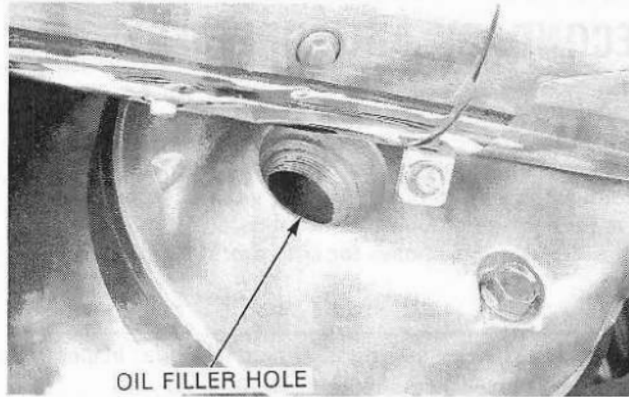
Remove the oil filler cap from the final gear case. Check that the oil level is up to the lower edge of the oil filler hole.

Check for leaks if the oil level is low. Pour the recommended oil through the oil filler hole until it reaches the lower edge of the hole.

RECOMMENDED OIL: Hypoid gear oil, SAE #80

Coat a new O-ring with oil and install it onto the oil filler cap. Install and tighten the oil filler cap.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



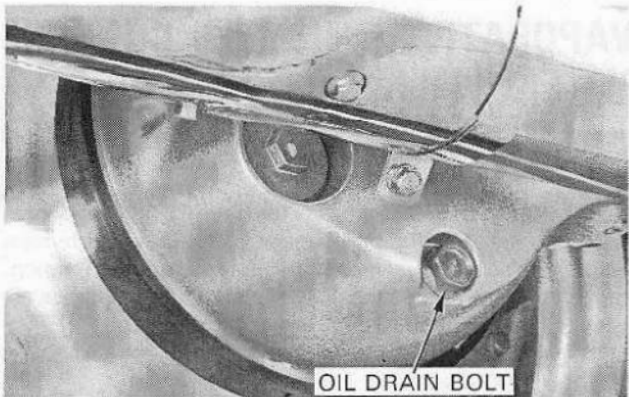
OIL CHANGE

Remove the oil filler cap and drain bolt from the final gear case, slowly turn the rear wheel and drain the oil. After the oil is completely drained, install the drain bolt with a new sealing washer and tighten it.

TORQUE: 20 N·m (2.0 kgf·m, 14 lbf·ft)

Fill the final gear case with the recommended oil up to the correct level (see above).

OIL CAPACITY: 150 cm³ (5.1 US oz, 5.3 Imp oz) after draining



BRAKE FLUID

CAUTION

- Do not mix different types of fluid, as they are not compatible with each other.
- 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 the fluid level is low, check the brake pads for wear (page 3-16). A low fluid level may be due to wear of the brake pads. If the brake pads are worn, the caliper pistons are pushed out, and this accounts for a low reservoir level. If the brake pads are not worn and the fluid level is low, check entire system for leaks (page 3-16).
- Do not remove the level float from the reservoir when filling the brake fluid.

FRONT BRAKE

Turn the handlebar to the left side so that the reservoir is level and check the front brake fluid reservoir level through the sight glass.

If the level is near the "LOWER" level mark, remove the reservoir cap, set plate and diaphragm, and fill the reservoir with DOT 4 brake fluid from a sealed container to the casting ledge.

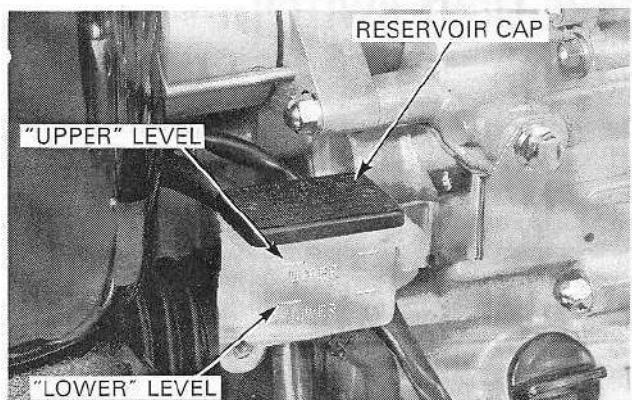
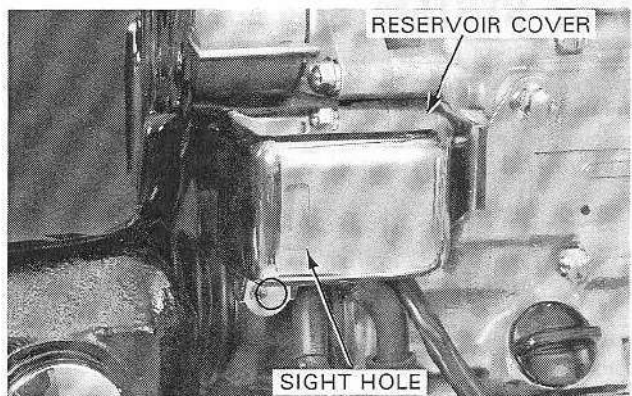
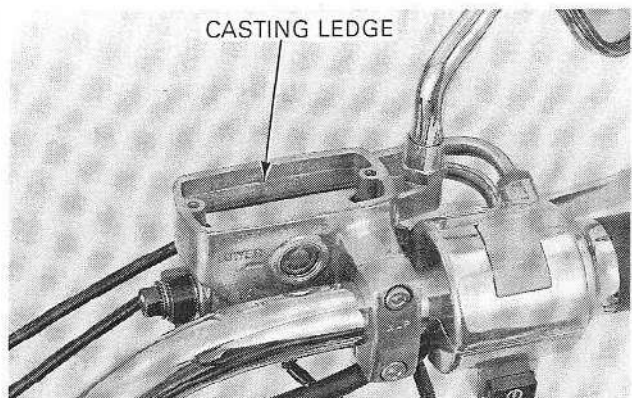
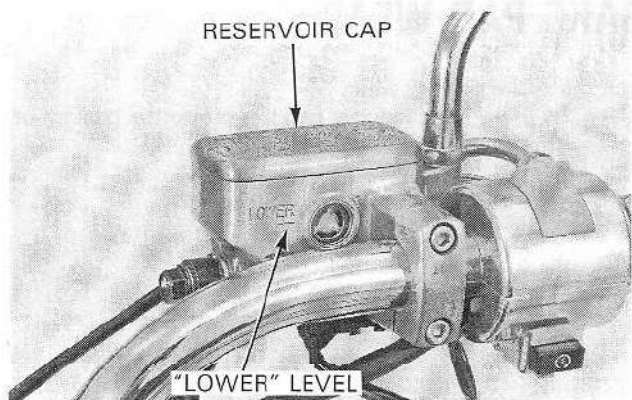
REAR BRAKE

Place the motorcycle on a level surface, and support it upright.

Check the rear brake fluid reservoir level through the sight hole.

If the level is near the "LOWER" level line, remove the bolt and rear brake fluid reservoir cover.

Remove the reservoir cap, set plate and diaphragm, and fill the reservoir with DOT 4 brake fluid from a sealed container to the "UPPER" level line.

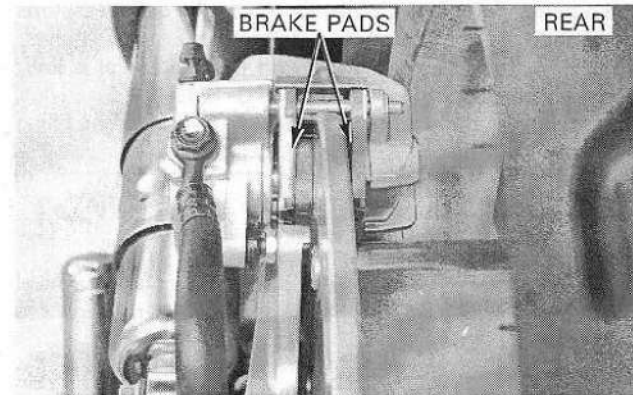
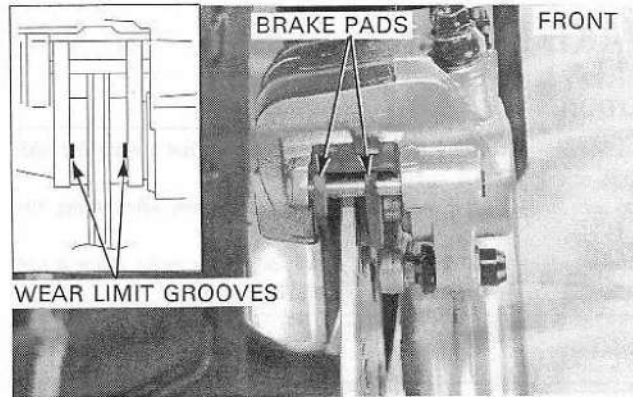


MAINTENANCE

BRAKE PAD WEAR

Check the brake pad for wear.
Replace the brake pads if either pad is worn to the bottom of the wear limit groove.

Refer to page 15-4 for brake pad replacement.

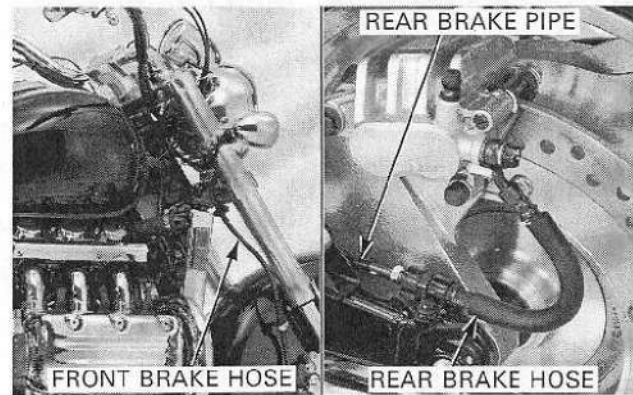


BRAKE SYSTEM

Firmly apply the brake lever or pedal, and check that no air has entered the system.
If the lever or pedal feels soft or spongy when operated, bleed the air from the system.

Refer to page 15-6 for air bleeding procedures.

Inspect the brake hoses, pipes and fittings for deterioration, cracks, damage or signs of leakage.
Tighten any loose fittings.
Replace hoses, pipes and fittings as required.

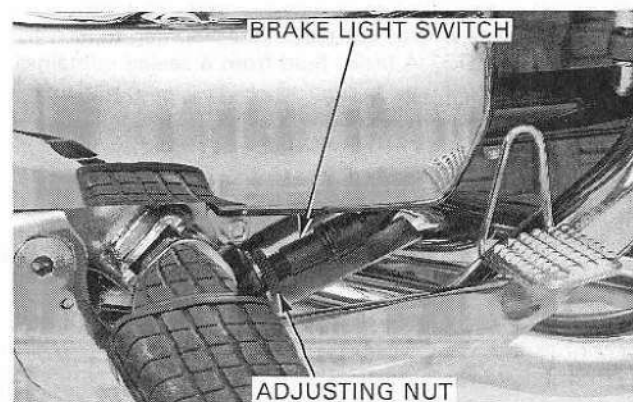


BRAKE LIGHT SWITCH

NOTE

- The front brake light switch does not require adjustment.

Check that the brake light comes on just prior to the brake actually being engaged.
If the light fails to come on, adjust the switch so that the light comes on at proper time.
Hold the switch body and turn the adjusting nut. Do not turn the switch body.



HEADLIGHT AIM

▲WARNING

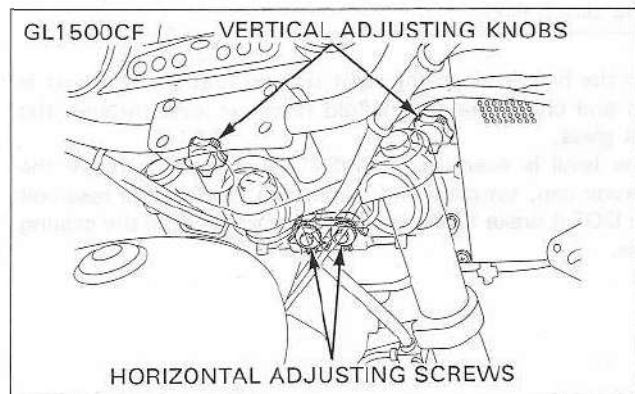
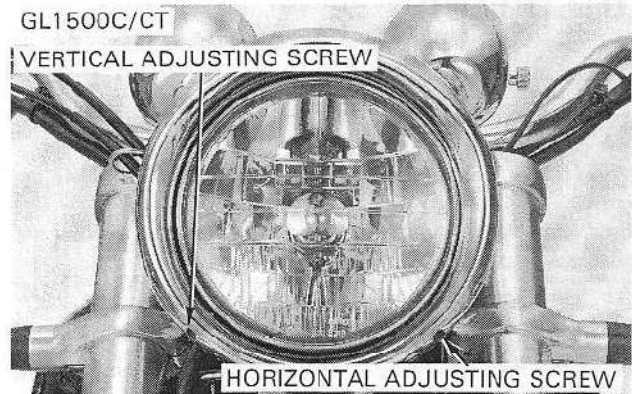
- *An improperly adjusted headlight may blind oncoming drivers, or it may fail to light the road for a safe distance.*

NOTE

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

Adjust vertically by turning the vertical adjusting screw (GL1500CF: knob).

Adjust horizontally by turning the horizontal adjusting screw.



CLUTCH SYSTEM

Operate the clutch lever and check that no air has entered the system.

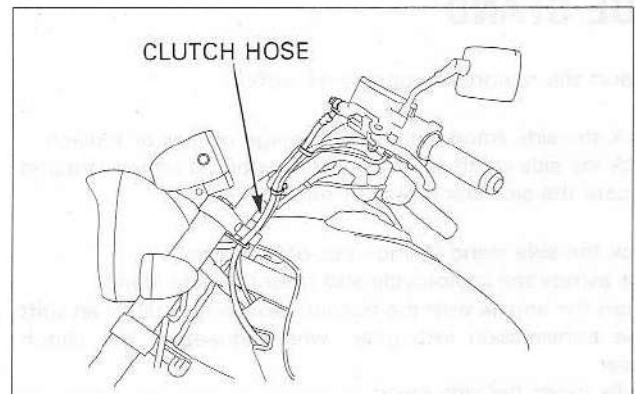
If the clutch is not disengaged properly, or the lever feels soft or spongy, bleed the air from the system.

Refer to page 9-4 for air bleeding procedures.

Inspect the clutch hoses, pipe and fittings for damage, deterioration, cracks or signs of leakage.

Tighten any loose fittings.

Replace hoses, pipe and fittings as required.



MAINTENANCE

CLUTCH FLUID

CAUTION

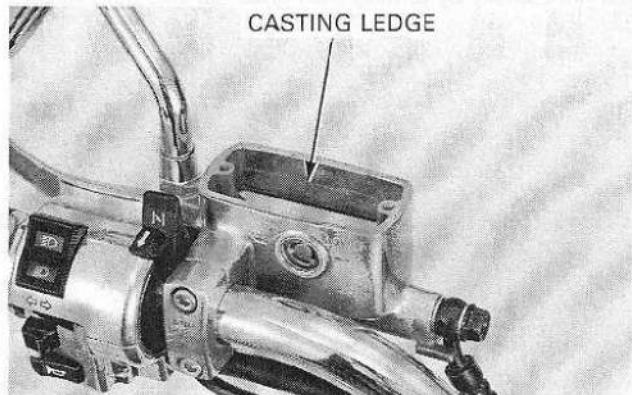
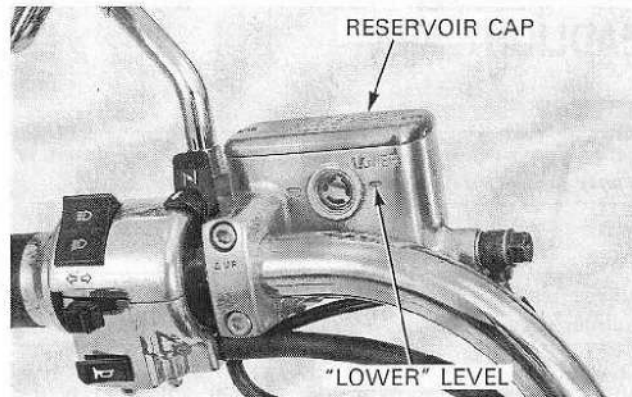
- Do not mix different types of fluid, as they are not compatible with each other.
- Do not allow foreign material to enter the system when filling the reservoir.
- Avoid spilling fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.

NOTE

- When the fluid level is low, check entire system for leaks (see above).
- Do not remove the level float from the reservoir when filling the clutch fluid.

Turn the handlebar to the right side so that the reservoir is level and check the clutch fluid reservoir level through the sight glass.

If the level is near the "LOWER" level mark, remove the reservoir cap, set plate and diaphragm, and fill the reservoir with DOT 4 brake fluid from a sealed container to the casting ledge.



SIDE STAND

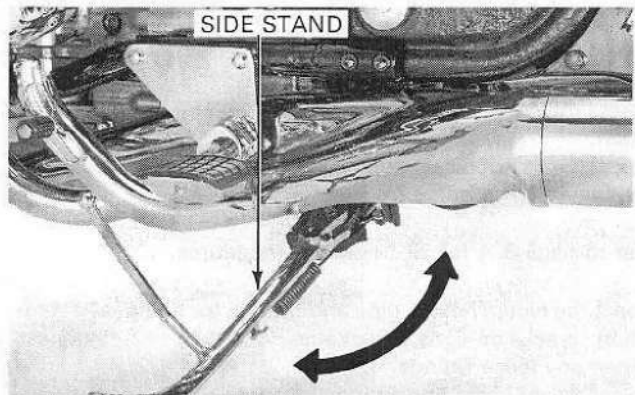
Support the motorcycle on a level surface.

Check the side stand spring for damage or loss of tension. Check the side stand assembly for freedom of movement and lubricate the side stand pivot if necessary.

Check the side stand ignition cut-off system:

- Sit astride the motorcycle and raise the side stand.
- Start the engine with the transmission in neutral, then shift the transmission into gear, while squeezing the clutch lever.
- Fully lower the side stand.
- The engine should stop as the side stand is lowered.

If there is a problem with the system, check the side stand switch (page 19-16).



SUSPENSION

▲WARNING

- *Loose, worn or damaged suspension parts impair motorcycle stability and control. Repair or replace any damaged components before riding. Riding a motorcycle with faulty suspension increases your risk of an accident and possible injury.*

FRONT

Check the action of the forks by operating the front brakes and compressing the front suspension several times. Check the entire assembly for signs of leaks, damage or loose fasteners.

Replace damaged components which cannot be repaired. Tighten all nuts and bolts.

Refer to section 13 for fork service.

REAR

Support the motorcycle securely and raise the rear wheel off the ground.

Check for worn swingarm bearings by grabbing the rear wheel and attempting to move the wheel side to side.

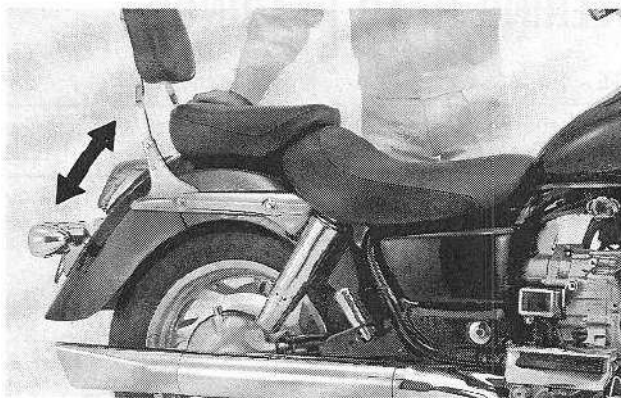
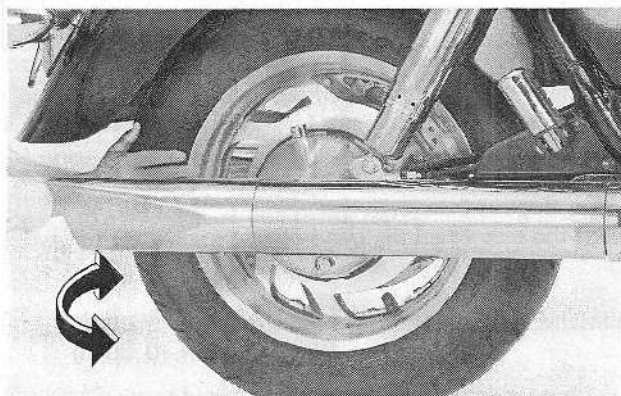
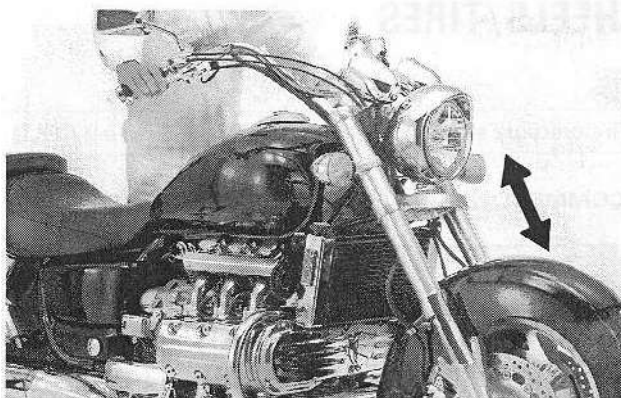
Replace the bearings if any looseness is noted (section 14).

Check the action of the shock absorber by compressing it several times.

Check the entire shock absorber assembly for signs of leaks, damage or loose fasteners.

Replace damaged components which cannot be repaired. Tighten all nuts and bolts.

Refer to section 14 for shock absorber service.



NUTS, BOLTS, FASTENERS

Check that all chassis nuts and bolts are tightened to their correct torque values (page 1-15).

Check that all cotter pins, safety clips, hose clamps and cable stays are in place and properly secured.

MAINTENANCE

WHEELS/TIRES

NOTE

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

RECOMMENDED TIRE PRESSURE AND TIRE SIZE

Unit: kPa (kgf/cm², psi)

		FRONT	REAR
Cold tire pressure	Up to 90 kg (200 lb) load	225 (2.25, 33)	225 (2.25, 33)
	Up to maximum weight capacity	225 (2.25, 33)	250 (2.50, 36)
Tire size		150/80R17 72H	180/70R16 77H
Tire brand (Dunlop)		D206F	D206

Check the tires for cuts, embedded nails, or other damage. Check the front and rear wheels for trueness (refer to sections 13 and 14).

Measure the tread depth at the center of the tires. Replace the tires when the tread depth reaches the following limits.

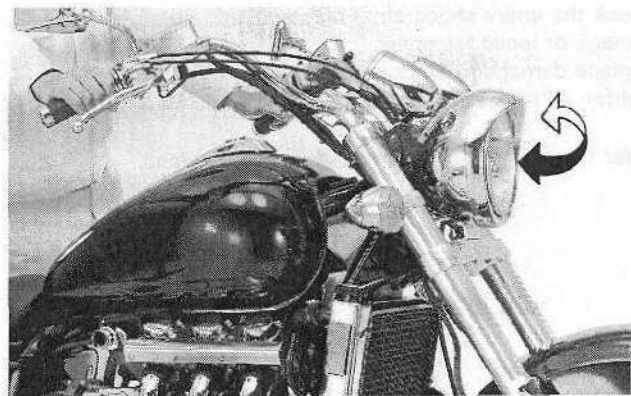
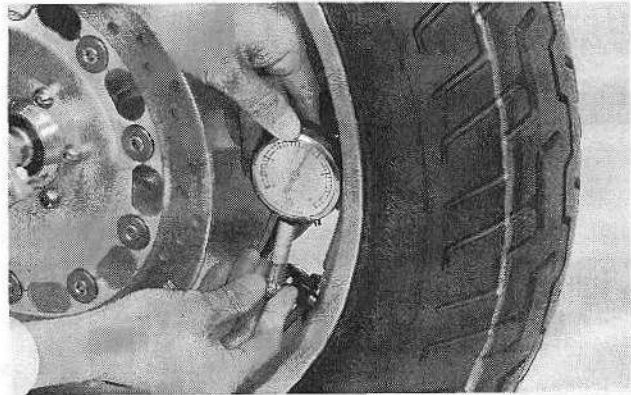
MINIMUM TREAD DEPTH: Front: 1.5 mm (0.06 in)
Rear: 2.0 mm (0.08 in)

STEERING HEAD BEARINGS

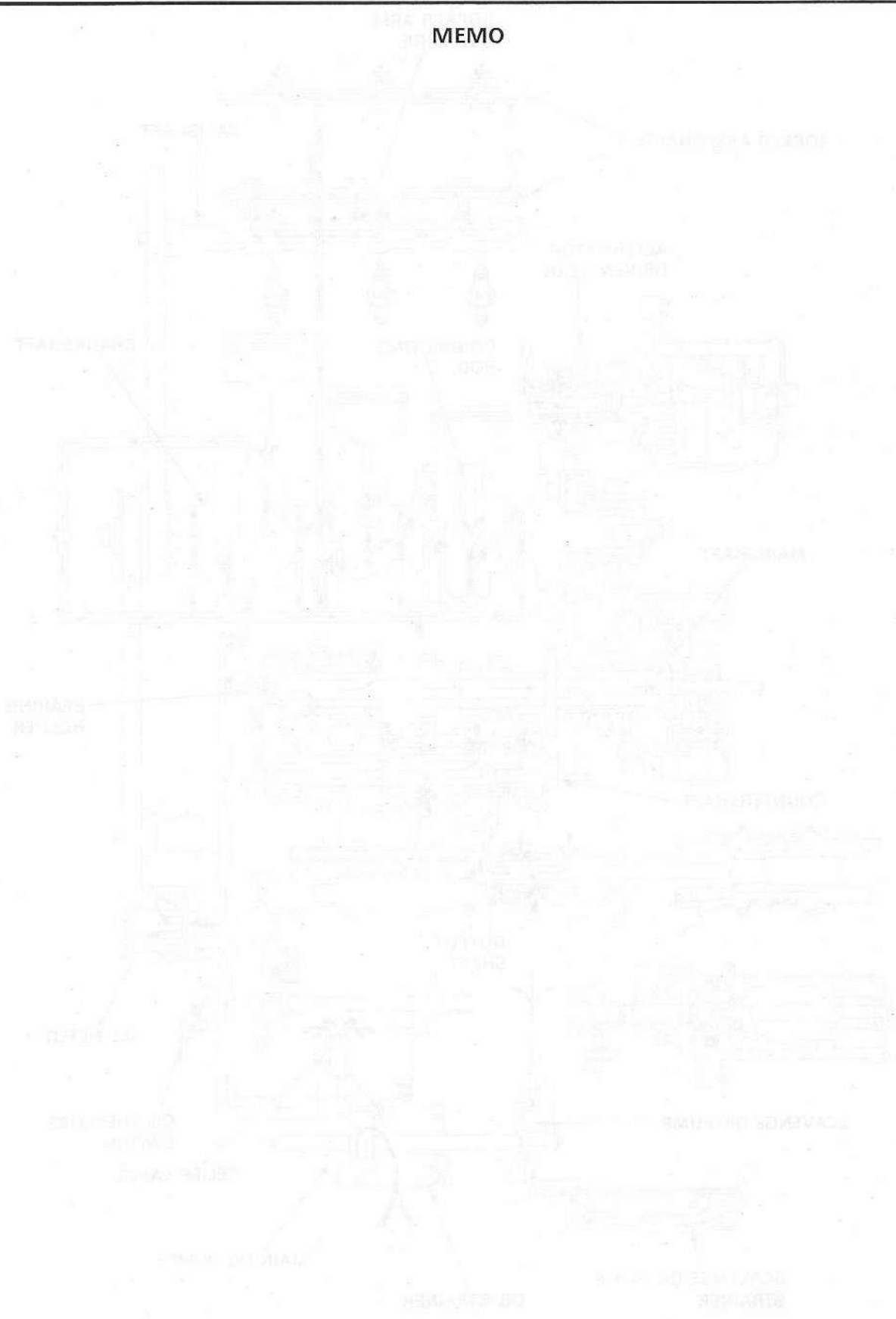
NOTE

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

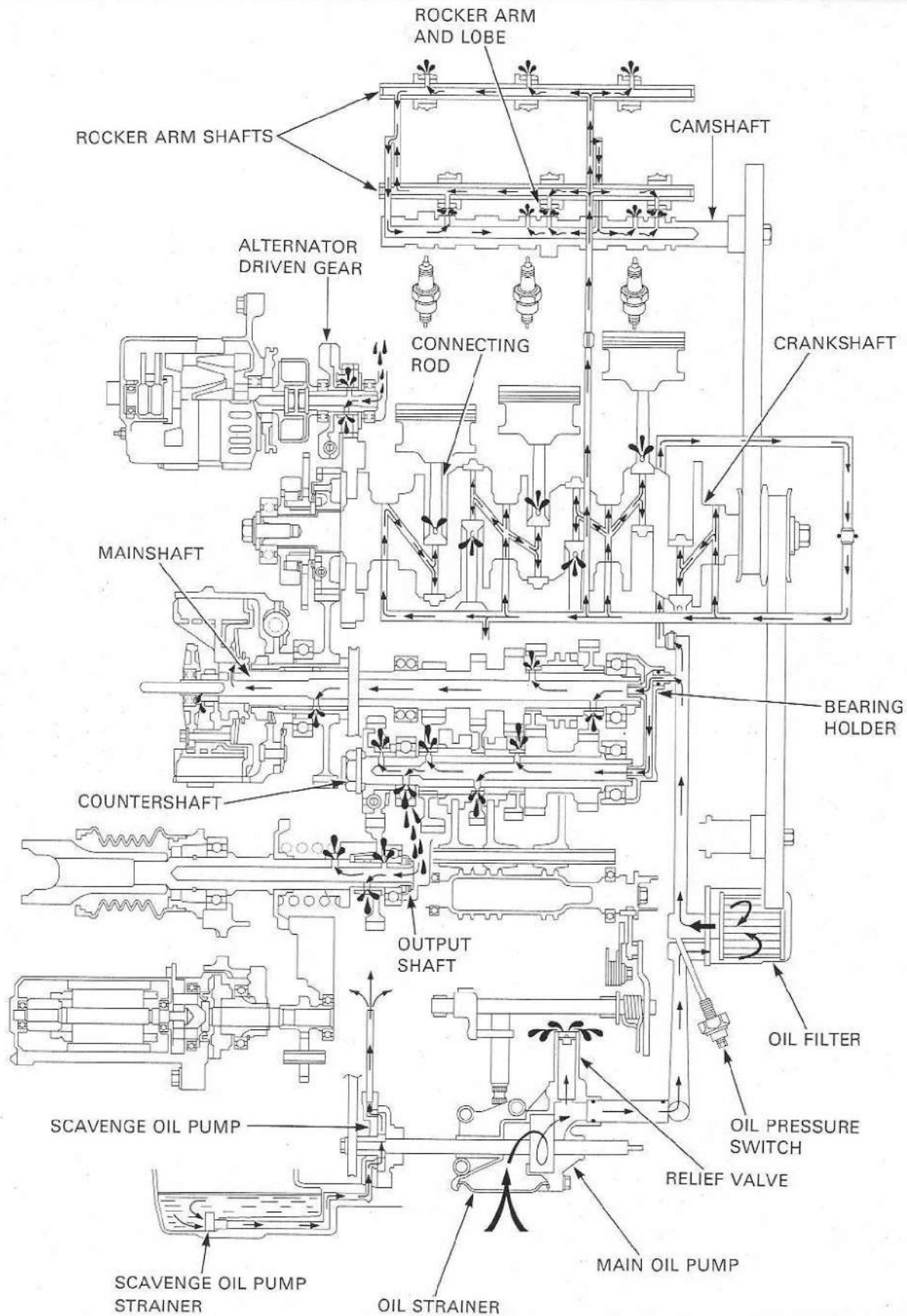
Support the motorcycle securely and raise the front wheel off the ground. Check that the handlebar moves freely from side to side. If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering head bearings (section 13).



MEMO



LUBRICATION SYSTEM



4. LUBRICATION SYSTEM

SERVICE INFORMATION	4-1	SCAVENGE OIL PUMP	4-4
TROUBLESHOOTING	4-2	MAIN OIL PUMP	4-7
OIL PRESSURE CHECK	4-3		

SERVICE INFORMATION

GENERAL

4

▲WARNING

- If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and may lead to death. Run the engine in an open area or with an exhaust evacuation system in an enclosed area.
- 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 advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil.

- The lubrication system uses two oil pumps; main and scavenging. The main oil pump picks up oil from the crankcase and delivers it under pressure to the bearings and other important parts of the engine. It is equipped with a pressure relief valve. The scavenge oil pump draws oil from the clutch housing in the rear case and sends it to the primary drive and driven gears to lubricate and cool them.
- The engine must be removed from the frame to service the oil pumps.
- For engine oil level check, see page 3-8.
- For engine oil and filter change, see page 3-9.
- For final drive oil check and change, see page 3-14.
- For oil pressure switch inspection, see page 19-14.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Oil pressure (at oil pressure switch)	Cold (at 35°C, 95°F)	Idle	127 kPa (1.3 kgf/cm ² , 18 psi)
		5,000 rpm	490 kPa (5.0 kgf/cm ² , 71 psi)
	Hot (at 80°C, 176°F)	Idle	78 kPa (0.8 kgf/cm ² , 11 psi)
		5,000 rpm	490 kPa (5.0 kgf/cm ² , 71 psi)
Scavenge oil pump	Tip clearance	0.15 (0.006) max.	0.35 (0.014)
	Body clearance	0.15—0.22 (0.006—0.009)	0.42 (0.017)
	Side clearance	0.02—0.07 (0.001—0.003)	0.12 (0.005)
Main oil pump	Tip clearance	0.15 (0.006) max.	0.35 (0.014)
	Body clearance	0.15—0.23 (0.006—0.009)	0.43 (0.017)
	Side clearance	0.02—0.07 (0.001—0.003)	0.12 (0.005)
Relief valve spring free length		90.8 (3.37)	84.0 (3.31)

TORQUE VALUES

Oil pressure switch 12 N·m (1.2 kgf·m, 9 lbf·ft) Apply sealant to the threads.

TOOLS

Oil pressure gauge attachment 07510-4220100 or equivalent commercially available in U.S.A.
Oil pressure gauge 07506-3000000

TROUBLESHOOTING

Oil level too low

- Oil consumption
- External oil leak
- Worn piston rings
- Improperly installed piston rings
- Worn cylinders
- Worn stem seals
- Worn valve guide

Low oil pressure

- Oil level low
- Clogged strainer
- Faulty oil pump
- Internal oil leak
- Incorrect oil being used

No oil pressure

- Oil level too low
- Oil pressure relief valve stuck open
- Broken oil pump drive chain
- Broken oil pump drive or driven sprocket
- Damaged oil pump
- Internal oil leak

High oil pressure

- Oil pressure relief valve stuck closed
- Clogged oil gallery or metering orifice
- Incorrect oil being used

Oil contamination

- Oil or filter not changed often enough
- Worn piston rings

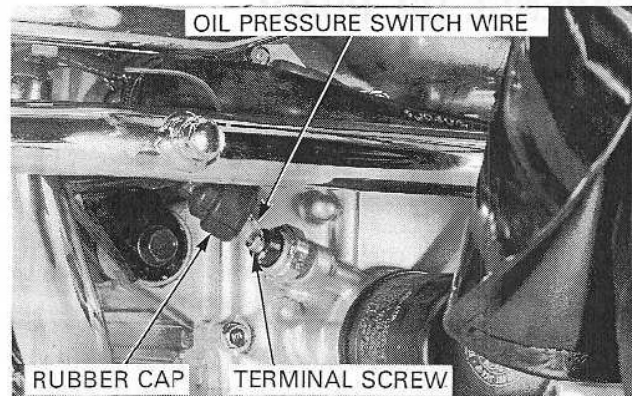
Oil emulsification

- Blown cylinder head gasket
- Leaky coolant passage
- Entry of water

Item	Standard	Unit
Oil pressure	0.15-0.25 MPa (2.2-3.6 psi)	MPa (psi)
Oil level	0.15-0.25 MPa (2.2-3.6 psi)	MPa (psi)
Oil temperature	0.15-0.25 MPa (2.2-3.6 psi)	MPa (psi)
Oil viscosity	0.15-0.25 MPa (2.2-3.6 psi)	MPa (psi)
Oil cleanliness	0.15-0.25 MPa (2.2-3.6 psi)	MPa (psi)
Oil oxidation	0.15-0.25 MPa (2.2-3.6 psi)	MPa (psi)
Oil emulsification	0.15-0.25 MPa (2.2-3.6 psi)	MPa (psi)
Oil contamination	0.15-0.25 MPa (2.2-3.6 psi)	MPa (psi)

OIL PRESSURE CHECK

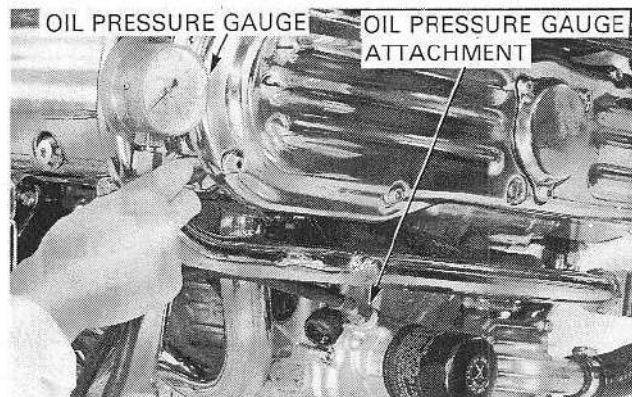
Remove the rubber cap and disconnect the oil pressure switch wire by removing the terminal screw.



Remove the oil pressure switch and connect an oil pressure gauge attachment and gauge to the pressure switch hole.

TOOLS:

Oil pressure gauge attachment 07510-4220100 or equivalent commercially available in U.S.A.
 Oil pressure gauge 07506-3000000 or equivalent commercially available in U.S.A.



Check the oil level and add the recommended oil if necessary (page 3-8).

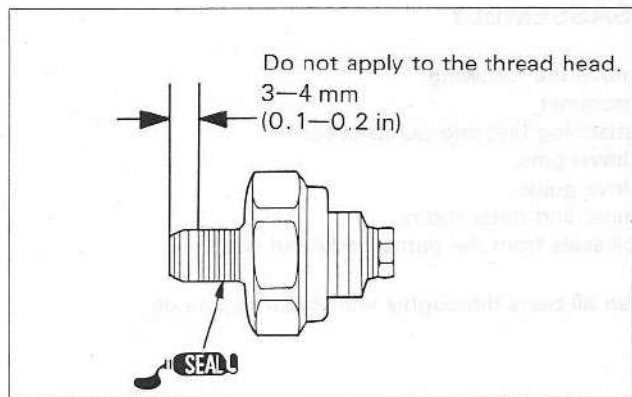
Start the engine and check the oil pressure.

OIL PRESSURE:

Cold (at 35°C, 95°F)	Idle	127 kPa (1.3 kgf/cm ² , 18 psi)
	5,000 rpm	490 kPa (5.0 kgf/cm ² , 71 psi)
Hot (at 80°C, 176°F)	Idle	78 kPa (0.8 kgf/cm ² , 11 psi)
	5,000 rpm	490 kPa (5.0 kgf/cm ² , 71 psi)

Stop the engine.

Apply sealant to the oil pressure switch threads as shown. Remove the oil pressure gauge and attachment and install the oil pressure switch.



TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

CAUTION

- To prevent crankcase damage, do not overtighten the switch.

Connect the oil pressure switch wire and install the rubber cap.

Start the engine.

Check that the oil pressure indicator goes out after one or two seconds.

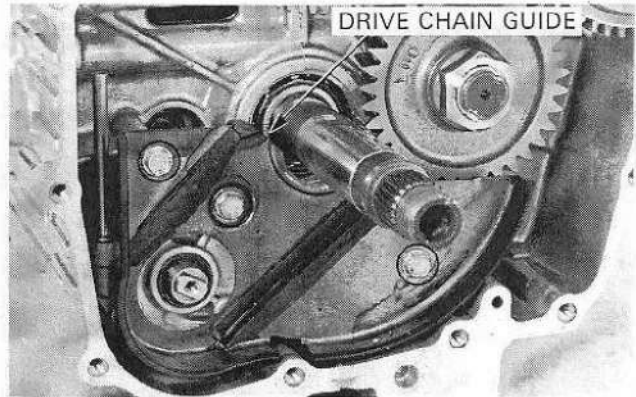
If the oil pressure indicator stays on, stop the engine and check the indicator system (page 19-14).

SCAVENGE OIL PUMP

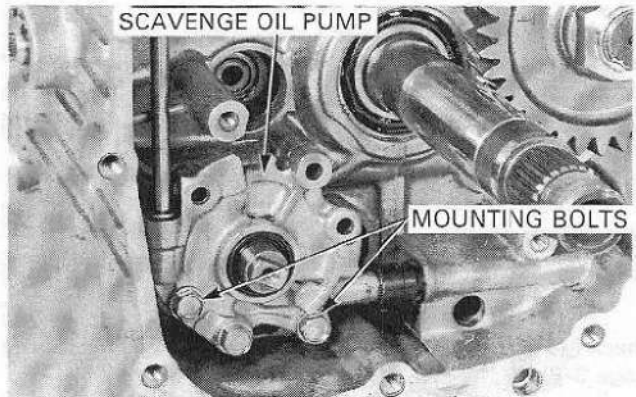
REMOVAL

Remove the following:

- rear case (page 10-10).
- primary driven gear (page 10-12).
- primary driven gear boss (page 10-17).
- three bolts and drive chain guide.



Remove the two mounting bolts and the scavenge oil pump.

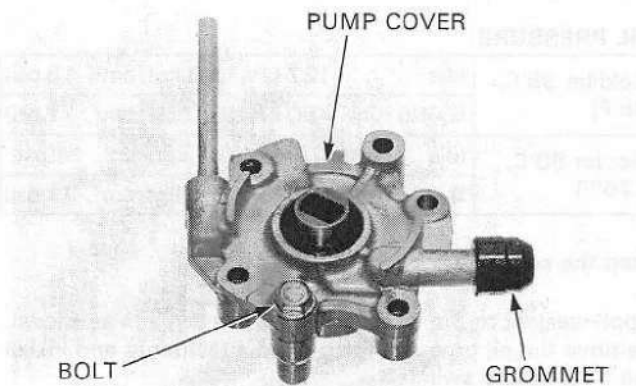


DISASSEMBLY

Remove the following:

- grommet.
- attaching bolt and pump cover.
- dowel pins.
- drive guide.
- inner and outer rotors.
- oil seals from the pump body and cover.

Clean all parts thoroughly with clean engine oil.

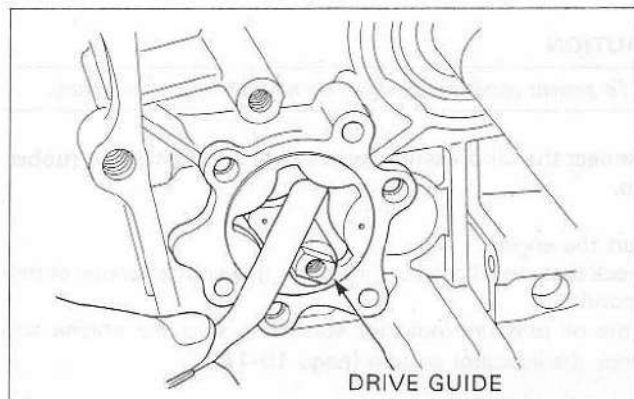


INSPECTION

Temporarily install the drive guide, inner and outer rotors in the scavenge oil pump body, and install them onto the oil pump shaft.

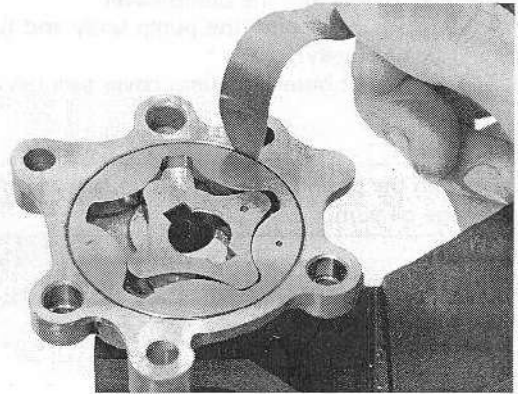
Measure the rotor tip clearance.

SERVICE LIMIT: 0.35 mm (0.014 in)



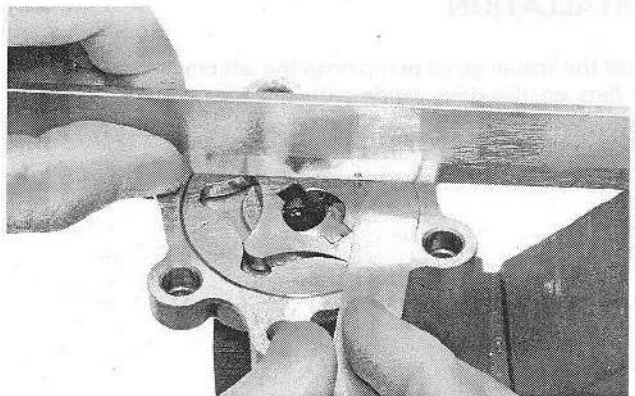
Measure the oil pump body clearance.

SERVICE LIMIT: 0.42 mm (0.017 in)

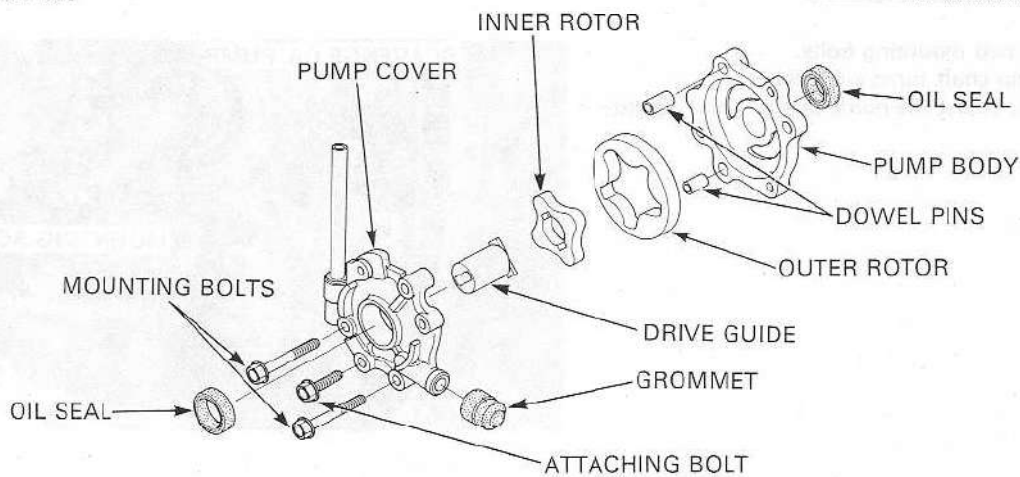


Measure the oil pump side clearance.

SERVICE LIMIT: 0.12 mm (0.005 in)

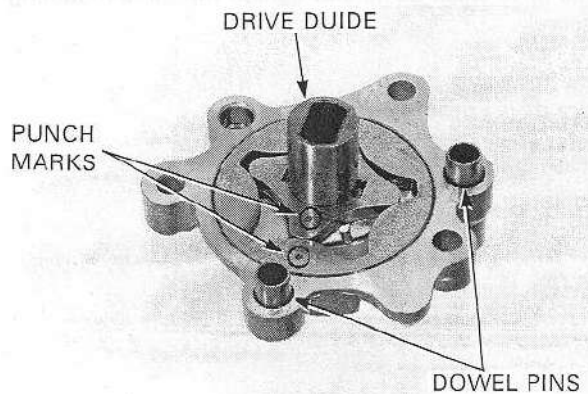


ASSEMBLY



Dip all parts in clean engine oil before reassembly.

- Install a new oil seal into the pump body.
- Install the inner and outer rotors into the pump body with the punch marks facing toward the cover.
- Install the drive guide onto the inner rotor.
- Install the dowel pins into the pump body.



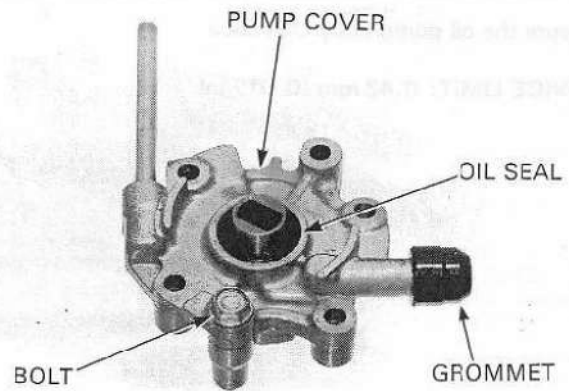
LUBRICATION SYSTEM

Install a new oil seal into the pump cover.
Install the pump cover onto the pump body and tighten the attaching bolt securely.
Install the grommet onto the pump cover securely.

NOTE

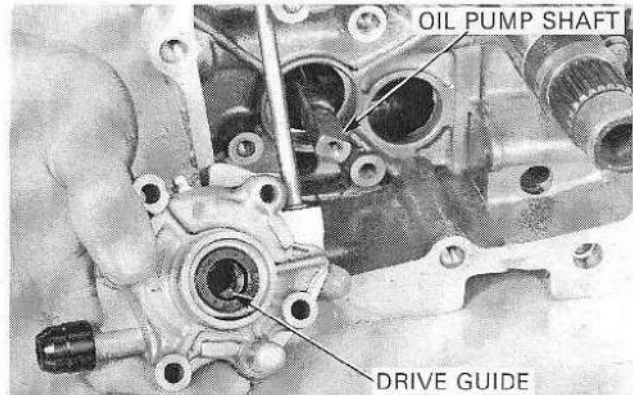
- Be certain the grommet is in position before installing the scavenge oil pump.

Make sure that the drive guide rotates smoothly.

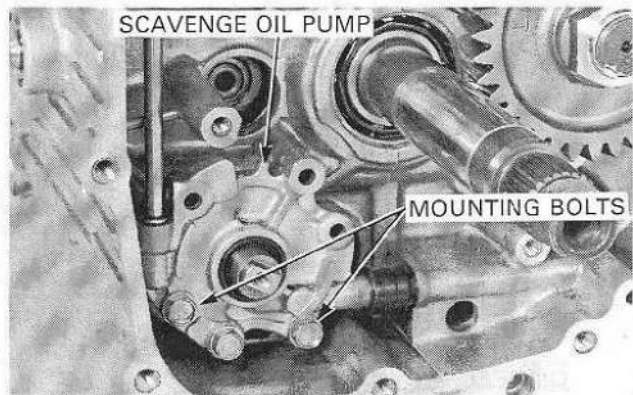


INSTALLATION

Install the scavenge oil pump onto the left crankcase, aligning the flats on the drive guide with the flats on the oil pump shaft.



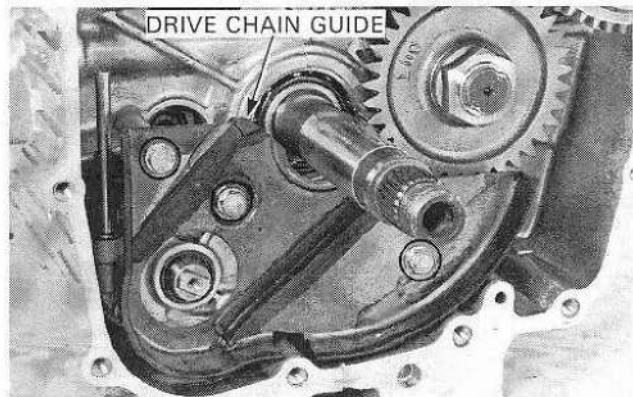
Install and tighten the two mounting bolts.
Check that the oil pump shaft turns smoothly.
If not, loosen the bolts, adjust the pump position and retighten the bolts.



Install the drive chain guide and tighten the three mounting bolts securely.

Install the following:

- primary driven gear boss (page 10-18).
- primary driven gear (page 10-20).
- rear case (page 10-21).

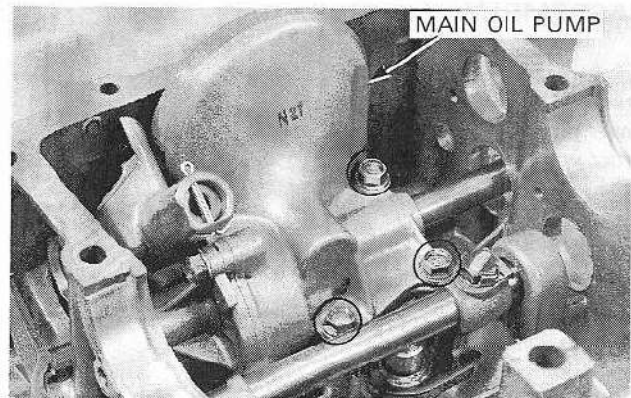


MAIN OIL PUMP

REMOVAL

Separate the crankcase (page 11-3).

Remove the three mounting bolts and the main pump.

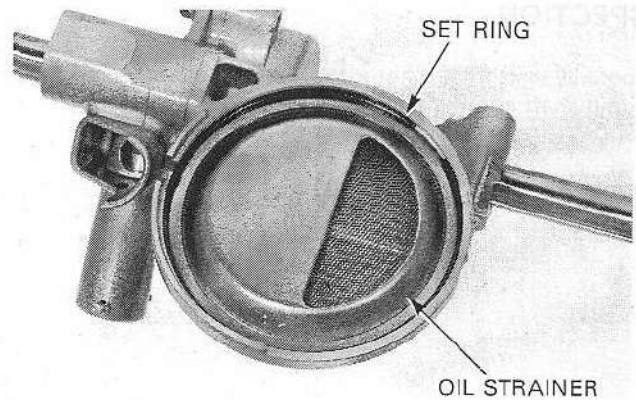


OIL STRAINER CLEANING

Remove the set ring and oil strainer from the main oil pump.

Clean the oil strainer thoroughly with non-flammable solvent.

Install the oil strainer and secure it with the set ring.



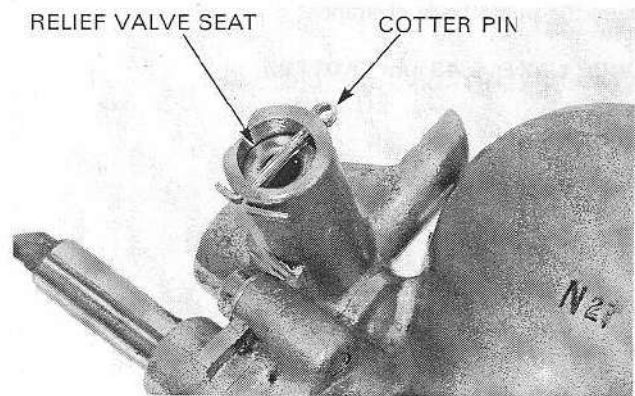
RELIEF VALVE CHECK

Remove the cotter pin while holding the relief valve seat.

NOTE

- The relief valve seat is under spring pressure.

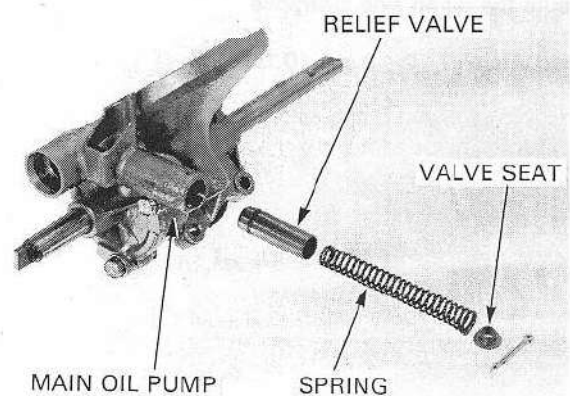
Remove the relief valve seat, spring and relief valve from the main oil pump.



Check the relief valve for wear or damage.
Check the valve body of the main oil pump for clogging.
Measure the relief valve spring free length.

SERVICE LIMIT: 84.0 mm (3.31 in)

Install the relief valve with the open side facing out.
Install the relief valve spring and seat, compress the spring and install a new cotter pin.



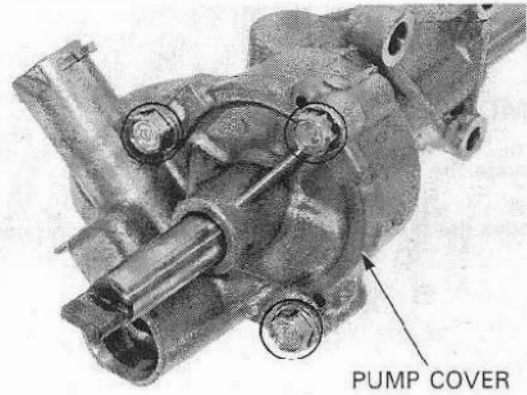
LUBRICATION SYSTEM

DISASSEMBLY

Remove the following:

- attaching bolts and pump cover.
- dowel pins.
- thrust washer.
- drive pin.
- oil pump shaft.
- inner and outer rotors.

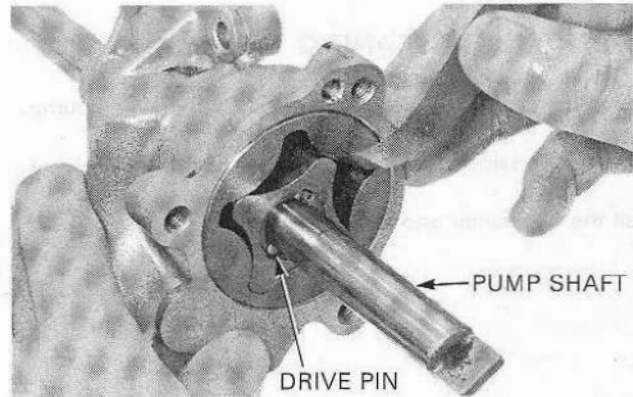
Clean all parts thoroughly in clean engine oil.



INSPECTION

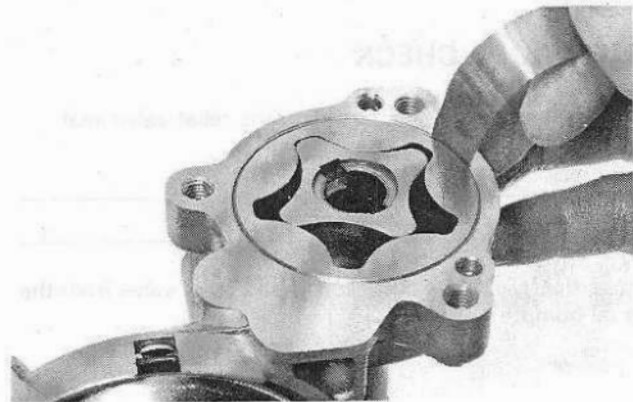
Temporarily install the outer rotor, inner rotor, drive pin and oil pump shaft into the pump body. Measure the rotor tip clearance.

SERVICE LIMIT: 0.35 mm (0.014 in)



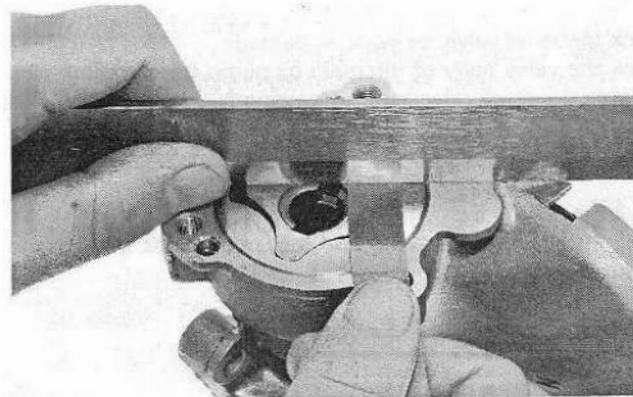
Measure the pump body clearance.

SERVICE LIMIT: 0.43 mm (0.017 in)

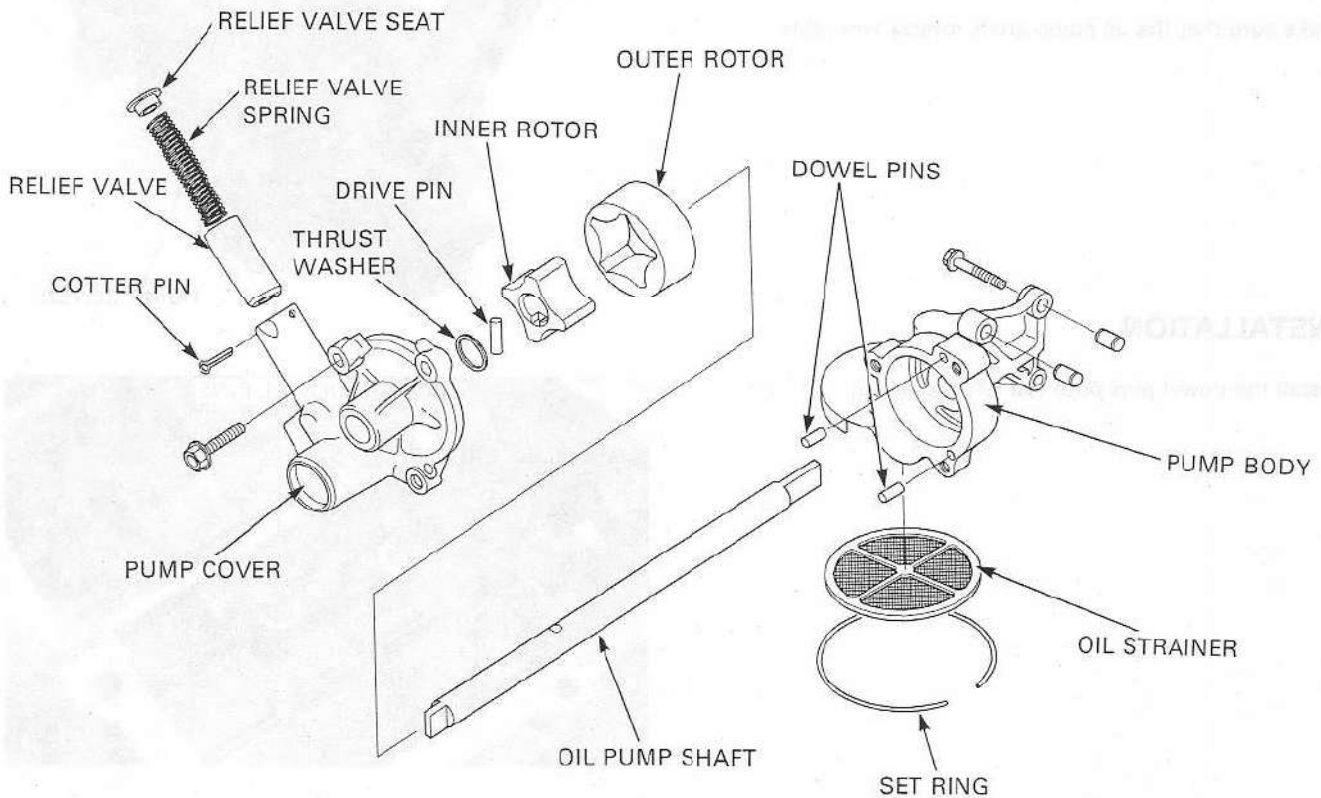


Measure the pump side clearance.

SERVICE LIMIT: 0.12 mm (0.005 in)

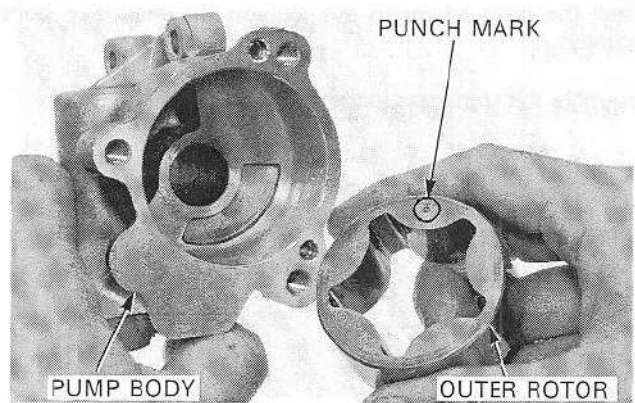


ASSEMBLY

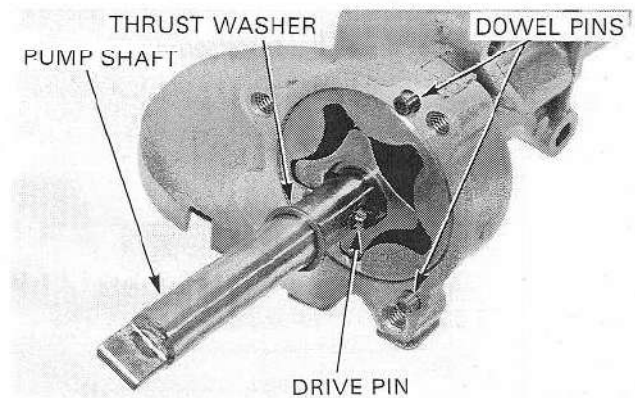


Dip all parts in clean engine oil before reassembly.

Install the outer rotor into the pump body with the punch mark toward the body.



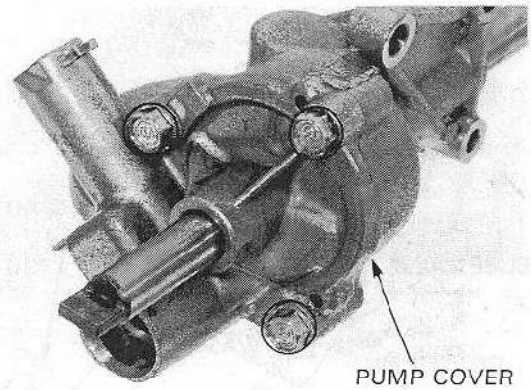
Install the inner rotor with the drive pin slots facing toward the cover.
Install the oil pump shaft.
Insert the drive pin into the oil pump shaft and set it into the slots in the inner rotor.
Install the thrust washer onto the oil pump shaft and inner rotor.
Install the dowel pins.



LUBRICATION SYSTEM

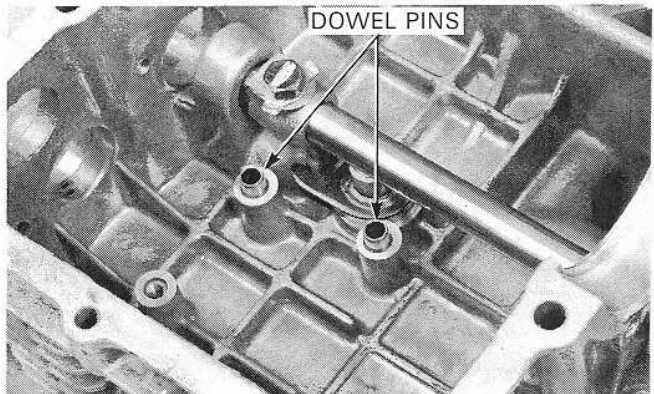
Install the pump cover and tighten the attaching bolts securely.

Make sure that the oil pump shaft rotates smoothly.



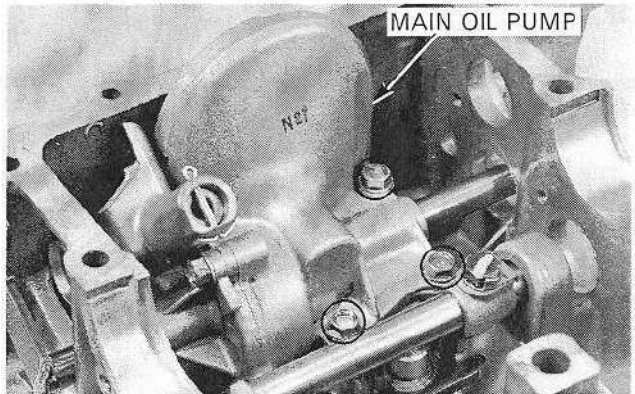
INSTALLATION

Install the dowel pins onto the left crankcase.



Install the main oil pump and tighten the mounting bolts securely.

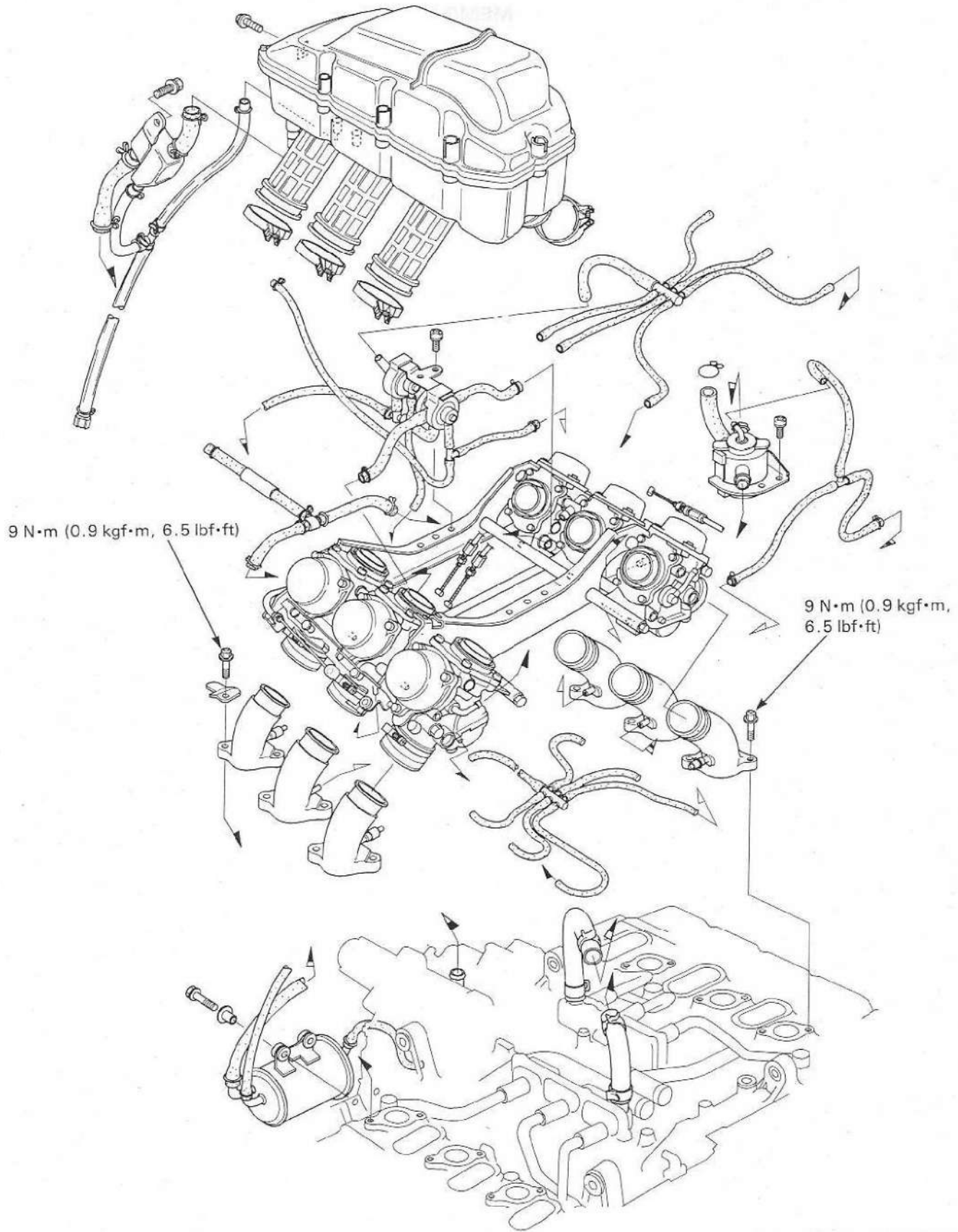
Assemble the crankcase (page 11-17).



MEMO



FUEL SYSTEM



5. FUEL SYSTEM

SERVICE INFORMATION	5-1	CARBURETOR COMBINATION	5-16
TROUBLESHOOTING	5-3	CARBURETOR INSTALLATION	5-19
AIR CLEANER HOUSING	5-4	PILOT SCREW ADJUSTMENT	5-22
CARBURETOR REMOVAL	5-5	HIGH ALTITUDE ADJUSTMENT	5-23
CARBURETOR SEPARATION	5-7	SECONDARY AIR SUPPLY SYSTEM	5-24
CARBURETOR DISASSEMBLY/ INSPECTION	5-9	EVAPORATIVE EMISSION CONTROL SYSEM (California type only)	5-26
CARBURETOR ASSEMBLY	5-13		

5

SERVICE INFORMATION

GENERAL

▲WARNING

- Gasoline is extremely flammable and is explosive under certain conditions. **KEEP OUT OF REACH OF CHILDREN.**
- If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and lead to death. Run the engine in an open area or with an exhaust evacuation system in an enclosed area.
- Bending or twisting the control cables will impair smooth operation and could cause the cables to stick or bind, resulting in loss of vehicle control.

- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.

CAUTION

- Be sure to remove the diaphragms before cleaning air and fuel passages with compressed air. The diaphragms might be damaged.
- For fuel tank removal and installation, see page 2-4.
- Before removing the carburetors, place an approved fuel container under the carburetor drain tube, loosen the drain screws and drain the carburetors.
- When draining the carburetors, support the motorcycle upright on level ground to assure complete draining for the left side (No. 2, 4 and 6) carburetors.
- After removing the carburetors, cover the intake ports of the cylinder heads with shop towels to prevent any foreign material from cropping into the engine.
- When disassembling the fuel system parts, note the locations of the O-rings. Replace them with new ones on reassembly.
- All hoses used in the evaporative emission control system (California type only) and secondary air supply system are numbered for identification. When connecting any of these hoses, compare the hose number with the Vacuum Hose Routing Diagram Label for its proper routing.
- The air funnel, vacuum chamber and float chamber can be serviced with the carburetors combined.
- For carburetor synchronization, see page 3-10.

NOTE

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

FUEL SYSTEM

SPECIFICATIONS

ITEM		SPECIFICATIONS	
Carburetor type		Constant venturi	
Carburetor throttle bore		28 mm (1.1 in)	
Carburetor identification number	Except California type	GL1500C/ GL1500CT	'97: VPK0A After '97: VPK0J
		GL1500CF	VPK1B
	California type	GL1500C/ GL1500CT	'97: BPK0B After '97: VPK0K
		GL1500CF	VPK1C
Main jet		#100	
Slow jet		#35	
Jet needle number		'97:	J6KG
		After '97:	J6KJ
Pilot screw	Initial/final opening		See page 5-22
	High altitude adjustment		See page 5-23
Float level		13.7 ± 0.5 mm (0.54 ± 0.02 in)	
Idle speed		900 ± 100 rpm	

TORQUE VALUES

Carburetor joint bolt nut	10 N•m (1.0 kgf•m, 7 lbf•ft)
Intake manifold bolt	9 N•m (0.9 kgf•m, 5.5 lbf•ft)
Engine mounting bracket bolt	26 N•m (2.7 kgf•m, 20 lbf•ft)
Rear upper engine mounting bolt	44 N•m (4.5 kgf•m, 33 lbf•ft)

TOOLS

Carburetor float level gauge	07401-0010000
Pilot screw wrench, D	07KMA-MN90101 or 07KMA-MN9A100 (U.S.A. only)

TROUBLESHOOTING

Engine cranks but won't start

- No fuel in tank
- No fuel to carburetor
 - Clogged fuel strainer
 - Clogged fuel line
 - Clogged fuel valve vacuum tube
 - Disconnected fuel valve vacuum tube
 - Clogged fuel tank breather tube (except California type)
 - Clogged evaporative emission (EVAP) tube No.1 (California type)
- Too much fuel getting to the engine
 - Clogged air cleaner
 - Flooded carburetor
- Intake air leak
- Contaminated/deteriorated fuel
- Improper starting enrichment valve operation
- Improper throttle operation
- No spark at plug (faulty ignition system-section 17)

Lean mixture

- Clogged fuel jets
- Faulty float valve
- Float level too low
- Restricted fuel line
- Clogged carburetor air vent tube
- Restricted fuel tank breather tube (except California type)
- Restricted EVAP tube No.1 (California type)
- Intake air leak
- Faulty vacuum piston
- Faulty EVAP control system (California type only)
 - Faulty EVAP carburetor air vent (CAV) control valve
 - Clogged hose of the EVAP CAV system

Rich mixture

- Starting enrichment valve open
- Clogged air jets
- Faulty float valve
- Float level too high
- Dirty air cleaner
- Faulty vacuum piston
- Faulty EVAP control system (California type only)
 - Faulty EVAP purge control valve
 - Clogged hose of EVAP purge system

Engine stalls, hard to start, rough idling

- Restricted fuel line
- Fuel mixture too lean/rich
- Contaminated/deteriorated fuel
- Intake air leak
- Misadjusted idle speed
- Misadjusted pilot screw
- Restricted fuel tank breather tube (except California type)
- Restricted EVAP tube No.1 (California type)
- Clogged air cleaner
- Clogged slow circuit
- Starting enrichment valve open
- Faulty EVAP control system (California type only)
 - Faulty EVAP CAV control valve
 - Faulty EVAP purge control valve
 - Clogged hose of the EVAP control system
- Faulty ignition system (section 17)

Afterburn when engine braking is used

- Lean mixture in slow circuit
- Faulty air cut-off valve
- Faulty pulse secondary air injection (PAIR) system
 - Faulty PAIR control valve
 - Faulty PAIR check valve
 - Clogged hose of the PAIR system
- Faulty ignition system (section 17)

Backfiring or misfiring during acceleration

- Lean mixture
- Faulty ignition system (section 17)

Poor performance (driveability) and poor fuel economy

- Clogged fuel system
- Faulty EVAP control system (California type only)
 - Faulty EVAP CAV control valve
 - Clogged hose of the EVAP CAV system
- Faulty ignition system (section 17)

FUEL SYSTEM

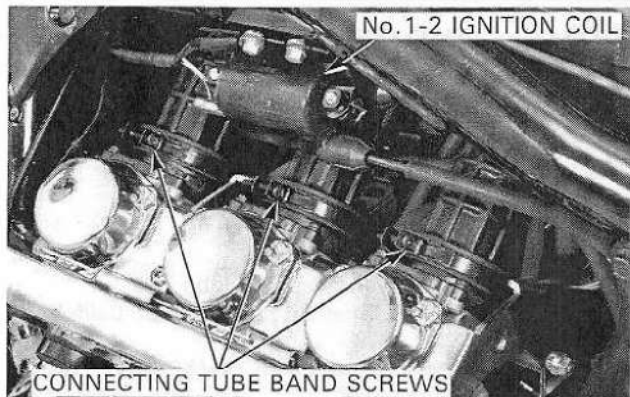
AIR CLEANER HOUSING

REMOVAL/INSTALLATION

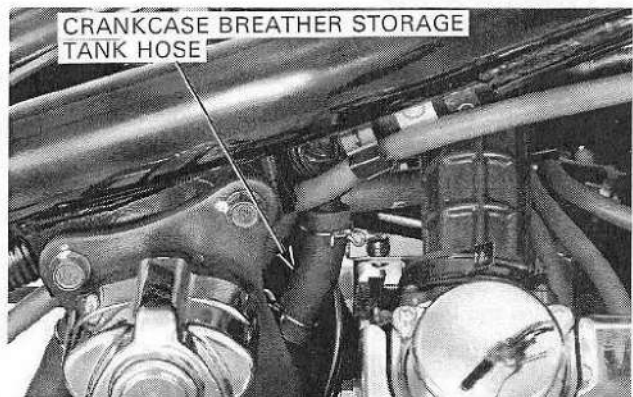
Remove the following:

- fuel tank (page 2-4).
- air cleaner element (page 3-6).
- two bolts and No. 1-2 ignition coil.

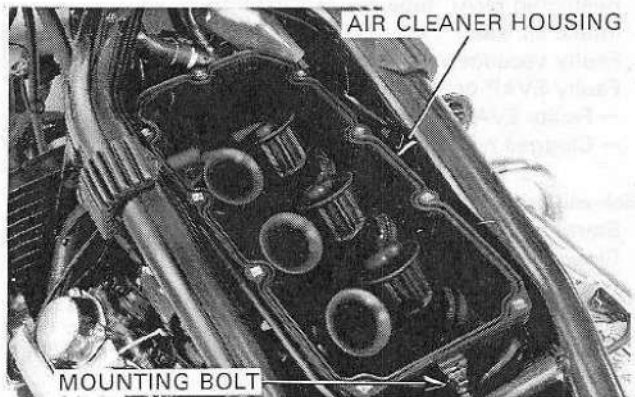
Loosen the connecting tube band screws at both left and right side carburetors.



Disconnect the crankcase breather storage tank hose from the air cleaner housing.

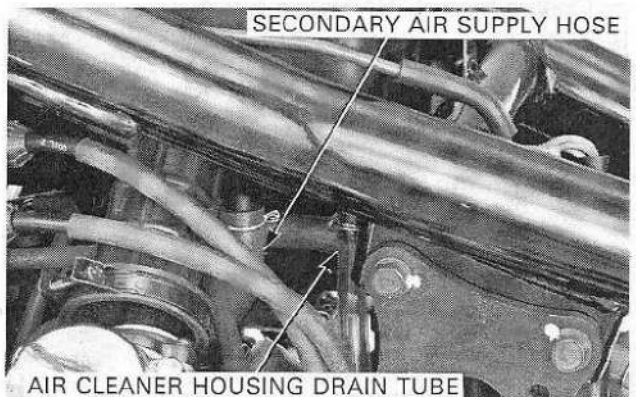


Remove the air cleaner housing mounting bolt and release the connecting tubes from the carburetors.



Disconnect the secondary air supply hose and air cleaner housing drain tube from the air cleaner housing. Remove the air cleaner housing from the frame, being careful not to damage the connecting tubes.

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

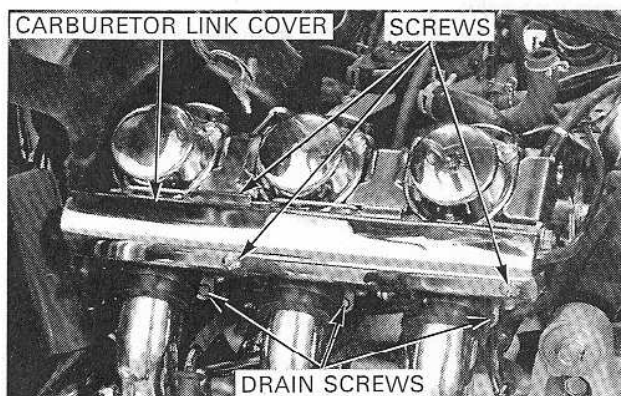


CARBURETOR REMOVAL

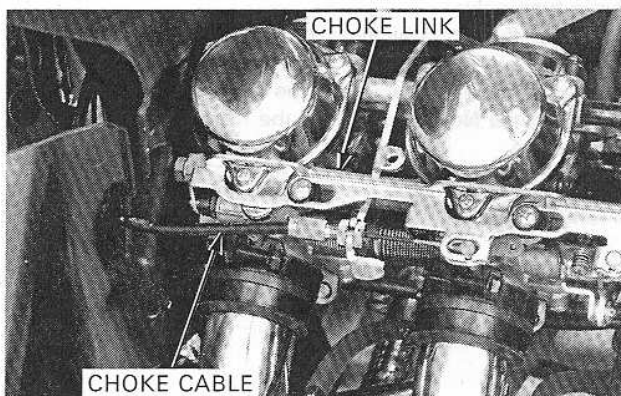
Remove the air cleaner housing (page 5-4).
 GL1500CF only: Remove the right and left radiator covers (page 2-8).

Place an approved fuel container under the carburetor drain tube, loosen the drain screws and drain the carburetors by supporting the motorcycle upright.

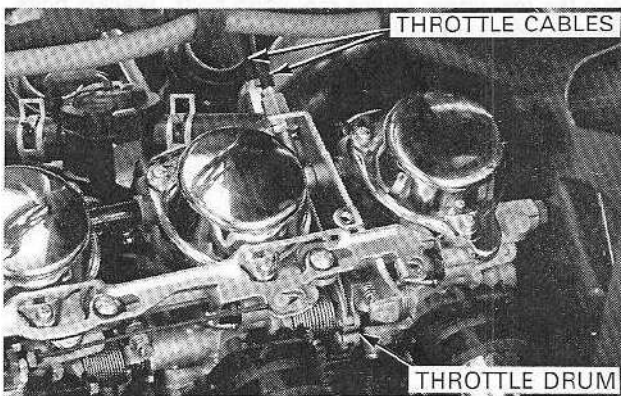
Remove the three screws for each side and both carburetor link covers.



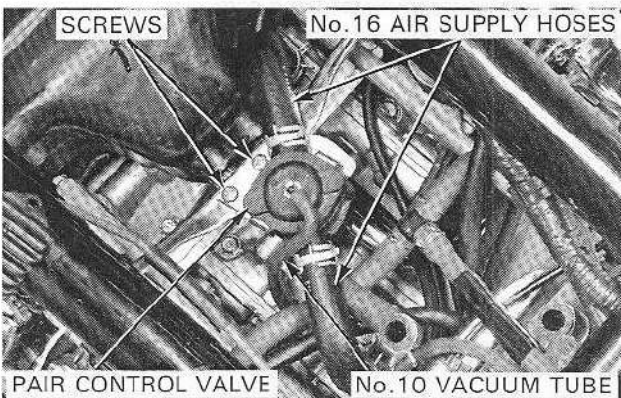
Remove the choke cable from the cable stay and disconnect it from the choke link.



Remove the throttle cables from the cable stay and disconnect them from the throttle drum.



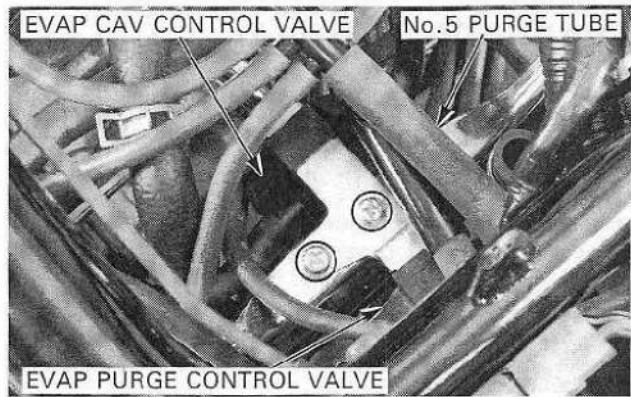
Disconnect the No. 10 vacuum tube from the pulse secondary air injection (PAIR) control valve.
 Remove the two screws attaching the PAIR control valve stay to the carburetor stay plate.
 Disconnect the No. 16 air supply hoses from the PAIR check valve cases and remove the PAIR control valve with its stay and the No. 16 air supply hoses.



FUEL SYSTEM

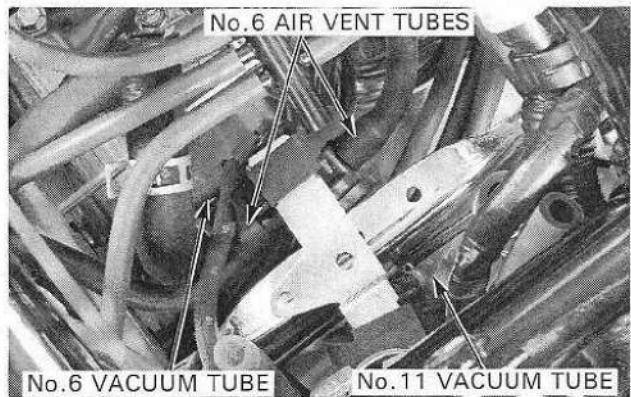
California type only:

Disconnect the No.5 purge tube from the purge joint.
Remove the two screws, and the evaporative emission (EVAP) purge control valve and EVAP carburetor air vent (CAV) control valve with their stay.

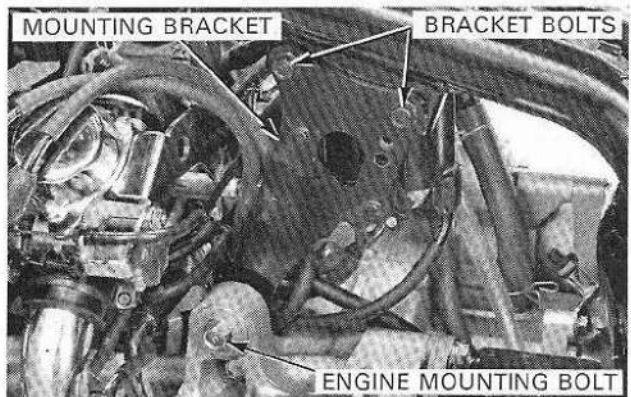


California type only:

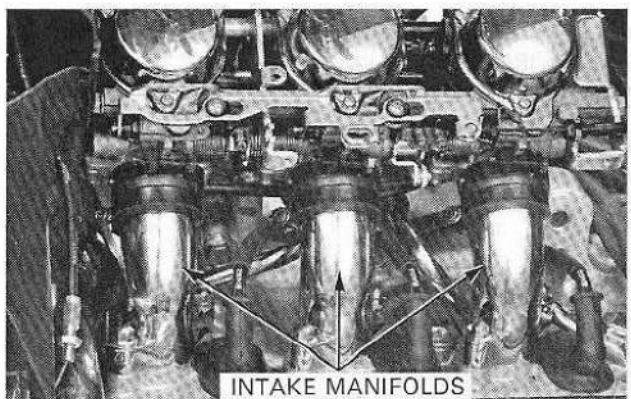
Disconnect the No.6 air vent tubes from the EVAP CAV control valve.
Disconnect the No.6 vacuum tube from the 3-way joint.
Disconnect the No.11 vacuum tube from the EVAP purge control valve.
Disconnect the No.4 purge tube from the 3-way joint.



Remove the rear upper engine mounting bolts, bracket bolts and engine mounting brackets.



Loosen the carburetor insulator band screws.
Remove the intake manifolds from the cylinder heads.
Remove the intake manifolds from the carburetor insulators.

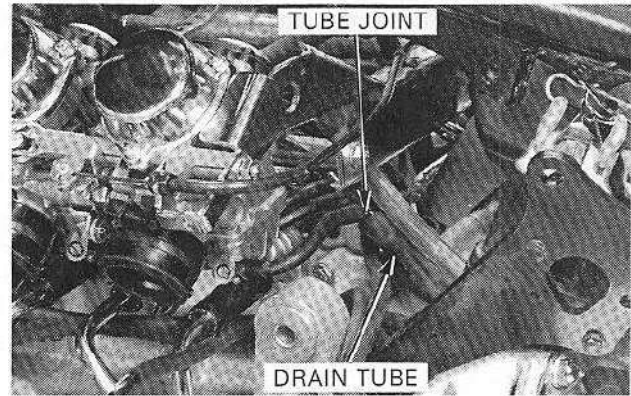


Disconnect the carburetor drain tube from the tube joint.

Remove the carburetor assembly.

CAUTION

- Do not handle the carburetor assembly by holding the throttle link. To do so will cause the improper throttle operation.

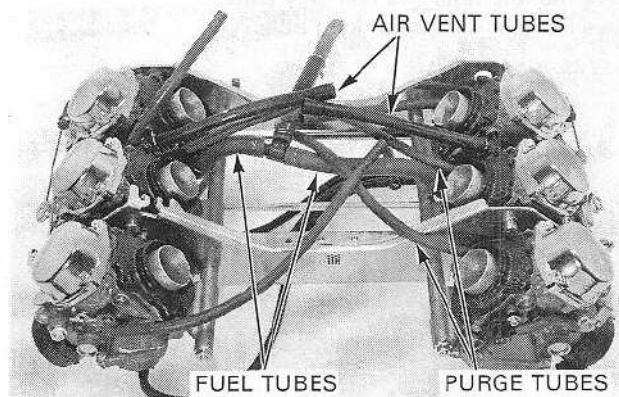


CARBURETOR SEPARATION

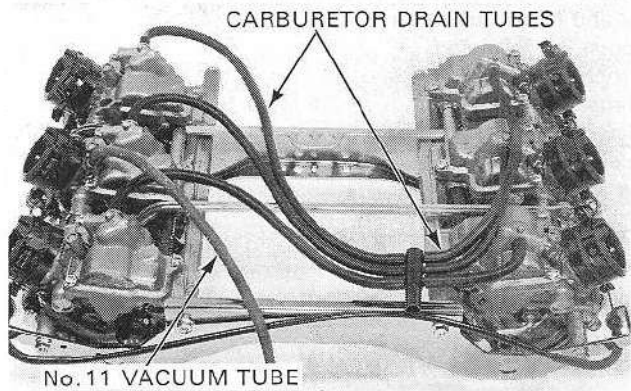
NOTE

- The air funnel, vacuum chamber and float chamber can be serviced without separating the carburetors.

Remove the fuel tubes from the 3-way fuel joints.
 Remove the air vent tubes from the 3-way air joints.
 California type only: Remove the purge tubes from all carburetors.

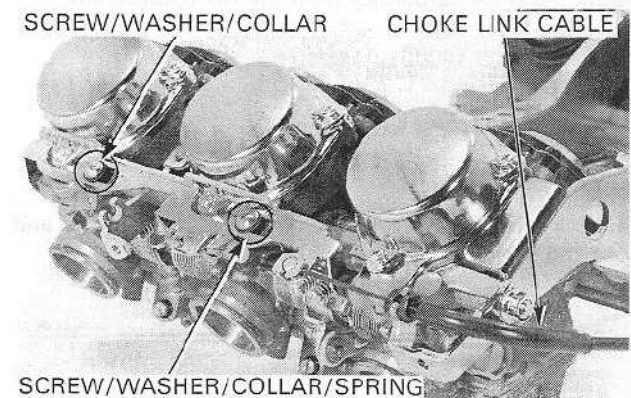


Remove the carburetor drain tubes and carburetor insulators from all carburetors.
 California type only: Disconnect the No.11 vacuum tube from the No.3 carburetor.



Remove the choke link cable from the cable stay and choke links.

Remove the screws, washers, choke link, set collars and choke link spring from each side assembly.

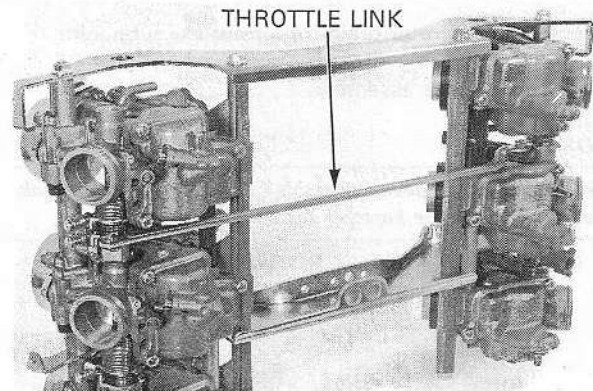


FUEL SYSTEM

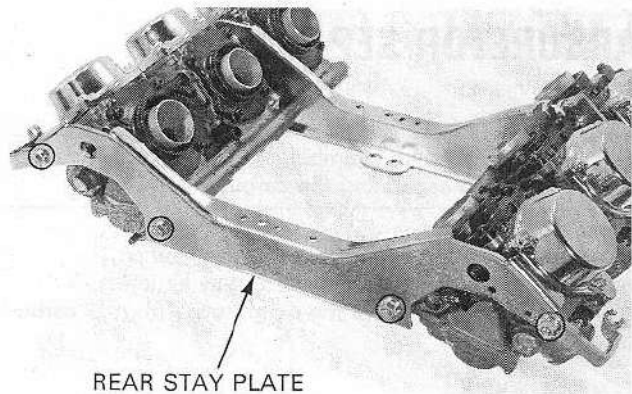
Remove the cotter pins, metallic washers (small), plastic washers, metallic washers (large) and throttle link.
Remove the metallic washers (large) and plastic cone washers.

CAUTION

- *Be careful not to damage or deform the throttle link as the throttle operation will be impaired.*



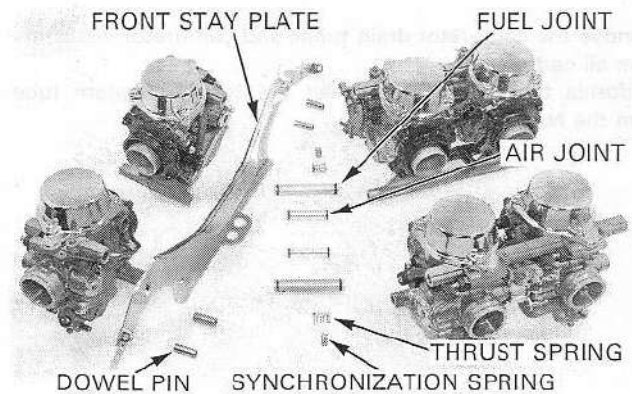
Remove the four nuts and rear stay plate.
Remove the four carburetor joint bolts.



Separate the No. 1 and 2 carburetors from the No. 3 carburetor and No. 4 carburetor.

Remove the following:

- synchronization springs.
- thrust springs.
- dowel pins.
- fuel joints.
- air joints.
- front stay plate.

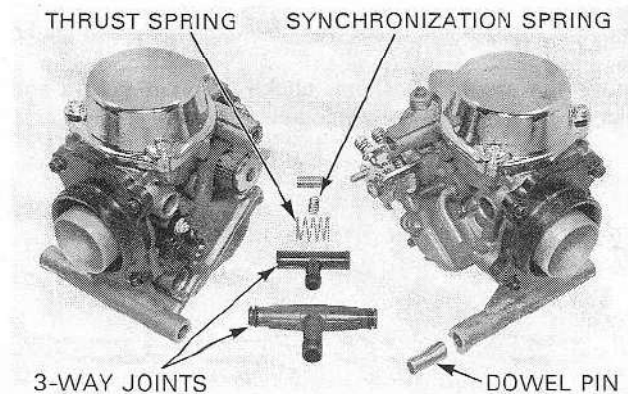


Separate the No. 4 carburetor from the No. 6 carburetor.

Remove the following:

- synchronization spring.
- thrust spring.
- dowel pins.
- 3-way fuel joint.
- 3-way air joint.

Separate the No. 3 carburetor from the No. 5 carburetor and remove the same parts mentioned above.



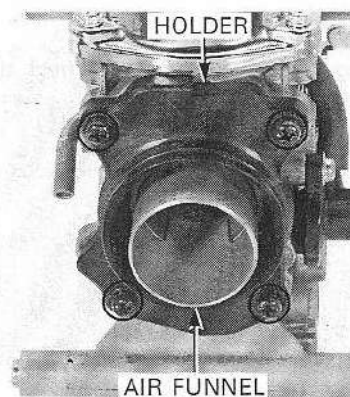
CARBURETOR DISASSEMBLY/ INSPECTION

NOTE

- Note the locations of the carburetor parts so they can be reinstalled in their original locations.
- Each carburetor can be disassembled individually and should be disassembled one-at-a-time so that each carburetor's parts are kept with the original carburetor.

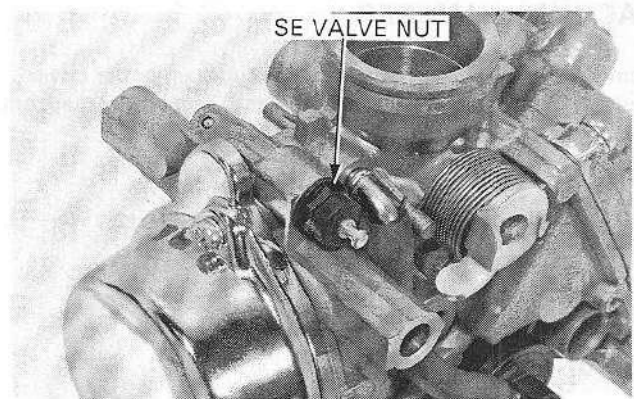
AIR FUNNEL

Remove the four screws and the air funnel holder.
Remove the air funnel and O-ring from the carburetor.



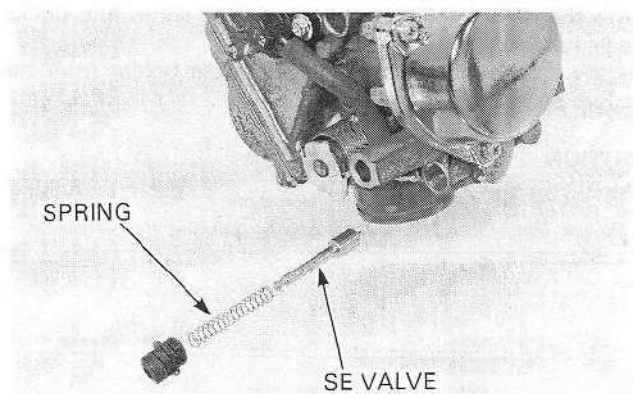
STARTING ENRICHMENT (SE) VALVE

Remove the SE valve nut.



Remove the SE valve spring and SE valve.

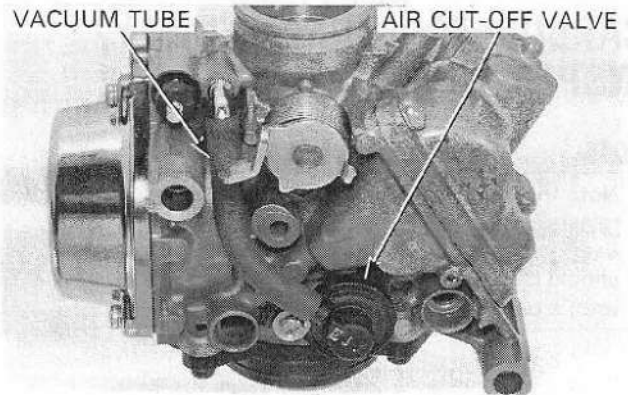
Check the valve face for scoring, scratches or wear.
Check the seat at the tip of the valve for stepped wear.
Check the valve spring for weakness or damage.



FUEL SYSTEM

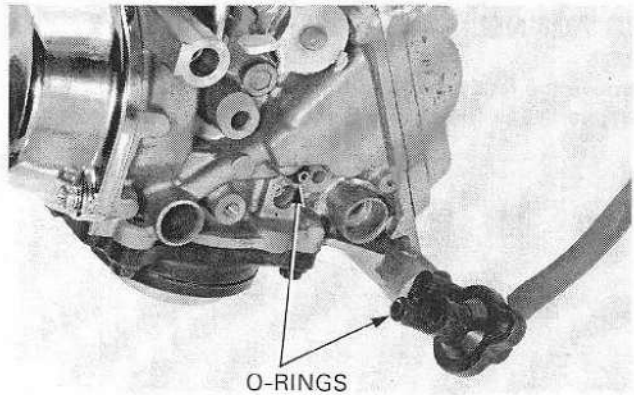
AIR CUT-OFF VALVE

Disconnect the vacuum tube from the carburetor.
Remove the attaching screw, washer and the air cut-off valve.



Remove the O-rings.

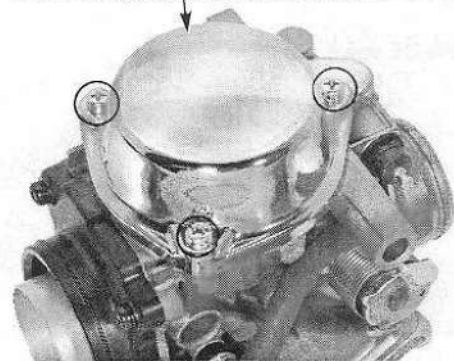
Apply vacuum to the vacuum tube and check the air cut-off valve operation.



VACUUM CHAMBER

Remove the three screws and the vacuum chamber cover.
Remove the compression spring and diaphragm/vacuum piston from the carburetor body.

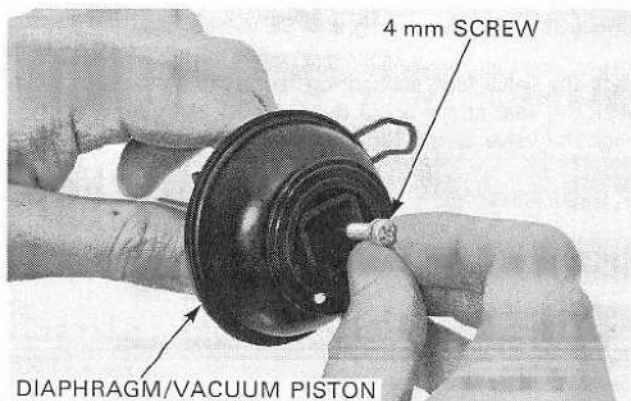
VACUUM CHAMBER COVER



Screw the vacuum chamber cover (4 mm) screw into the jet needle holder.
Pull the screw and remove the jet needle holder from the vacuum piston.

CAUTION

- *Be careful not to damage the diaphragm.*
- *Do not remove the jet needle holder by pushing the jet needle.*

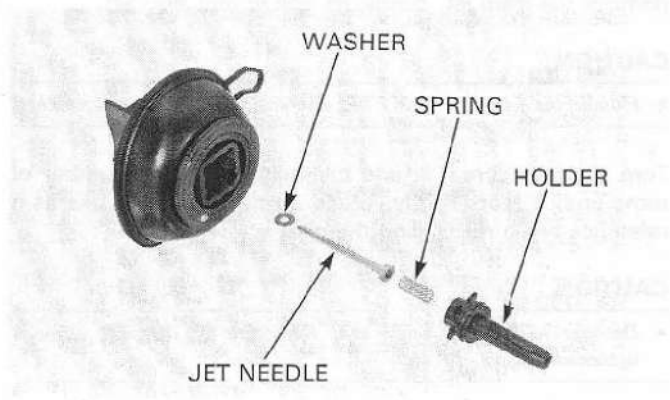


Remove the spring, jet needle and washer from the vacuum piston.

- Check the jet needle for stepped wear.
- Check the vacuum piston for wear or damage.
- Check the diaphragm for pin hole, deterioration or damage.

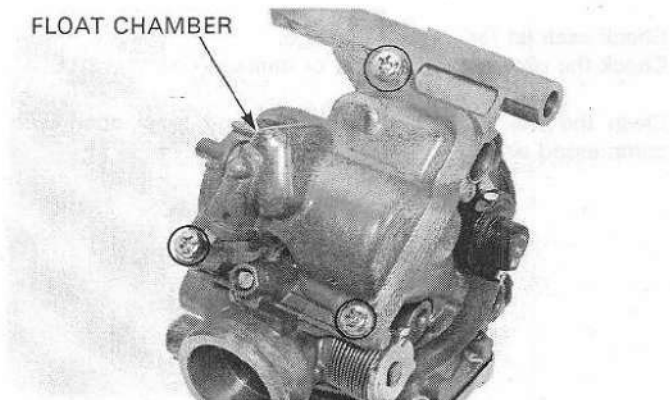
NOTE

- Air leaks out of the vacuum chamber if the diaphragm is damaged in any way, even a pin hole.



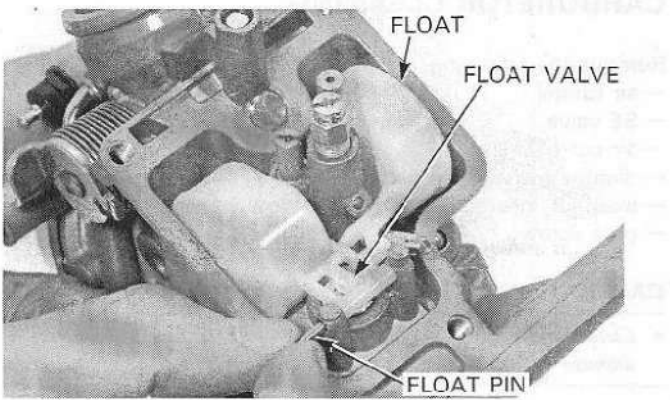
FLOAT CHAMBER

Remove the three screws and the float chamber.

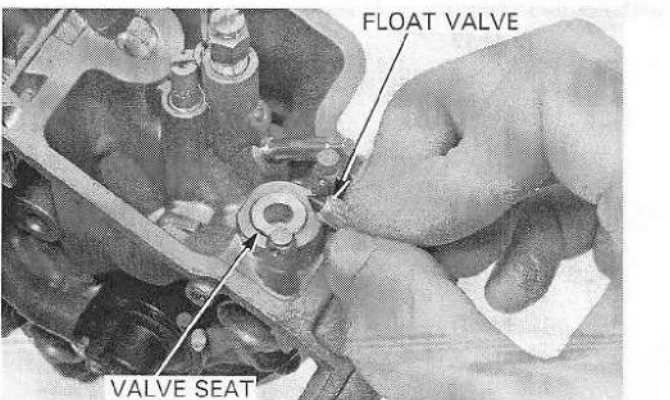


Remove the float pin, float and float valve.

Check the float for damage or fuel in the float.



- Check the float valve and valve seat for scoring, scratches, clogging or damage.
- Check the tip of the float valve, where it contacts the valve seat, for stepped wear or contamination.
- Check the operation of the float valve.



FUEL SYSTEM

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

CAUTION

- *Handle the jets with care. They can easily be scored or scratched.*

Turn the pilot screw in and carefully count the number of turns until it seats lightly. Make a note of this to use as a reference when reinstalling the pilot screw.

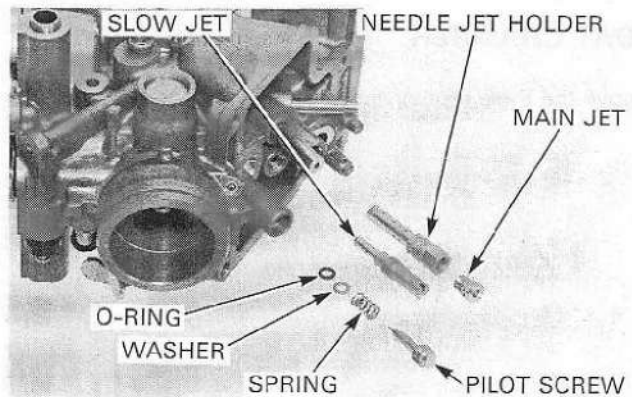
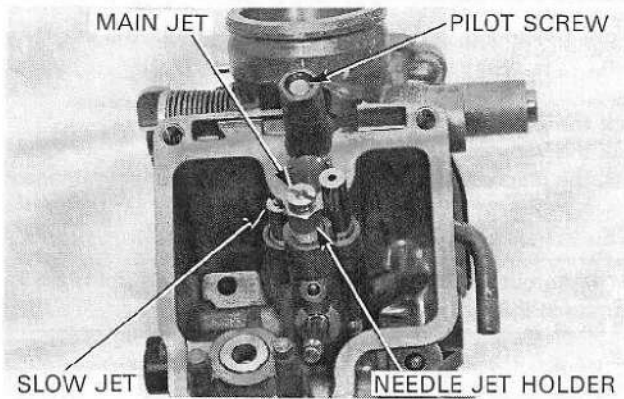
CAUTION

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

Remove the pilot screw, spring, washer and O-ring.

Check each jet for wear or damage.
Check the pilot screw for wear or damage.

Clean the jets with cleaning solvent and blow open with compressed air.



CARBURETOR CLEANING

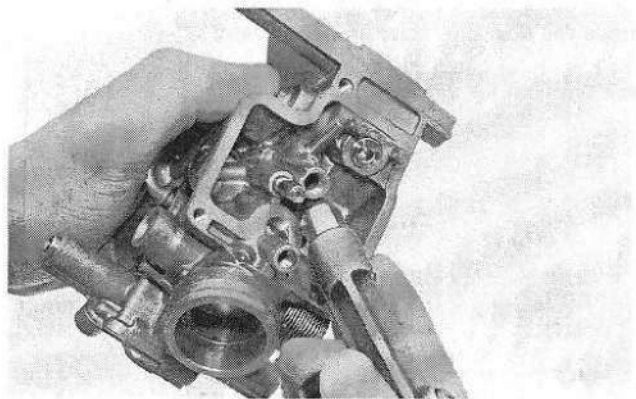
Remove the following:

- air funnel.
- SE valve.
- air cut-off valve.
- diaphragm/vacuum piston.
- main jet, needle jet holder and slow jet.
- pilot screw.

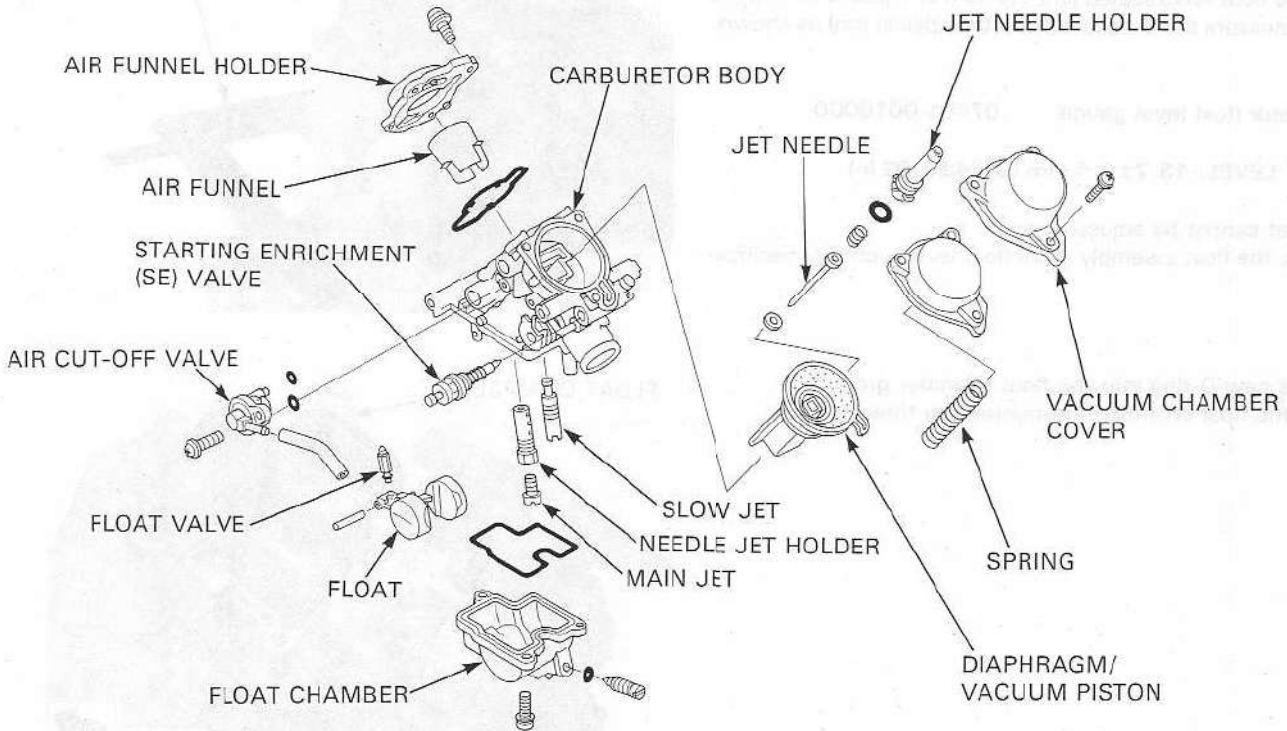
CAUTION

- *Cleaning the air and fuel passages with a piece of wire will damage the carburetor body.*

Blow open all air and fuel passages in the carburetor body with compressed air.



CARBURETOR ASSEMBLY



FLOAT CHAMBER

Install the pilot screw and return them to their original position as noted during removal. Perform the pilot screw adjustment if new pilot screw is installed.

CAUTION

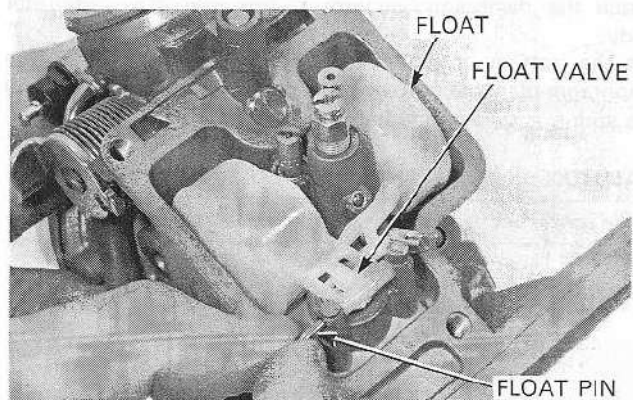
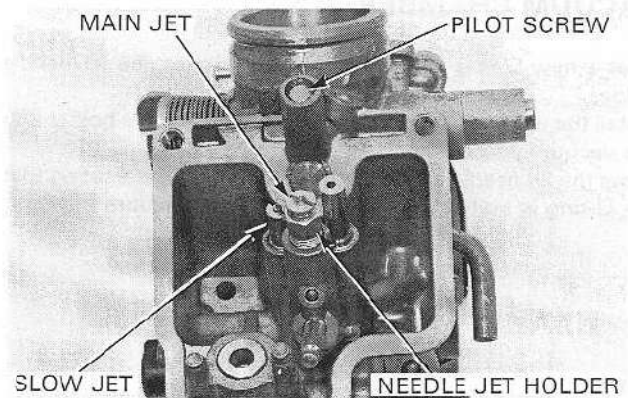
- *Damage to the pilot screw seat will occur if the pilot screw is tightened against the seat.*

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

CAUTION

- *Handle the jets with care. They can easily be scored or scratched.*

Hang the float valve onto the float arm lip. Install the float valve, float and float pin.



FUEL SYSTEM

FLOAT LEVEL INSPECTION

With the float valve seated and the float arm just touching the valve, measure the float level with the special tool as shown.

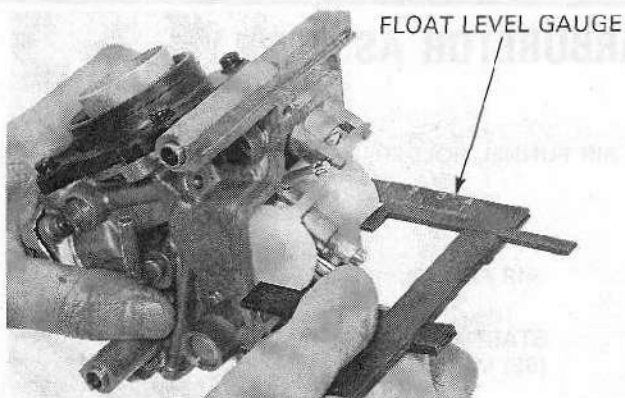
TOOL:

Carburetor float level gauge 07401-0010000

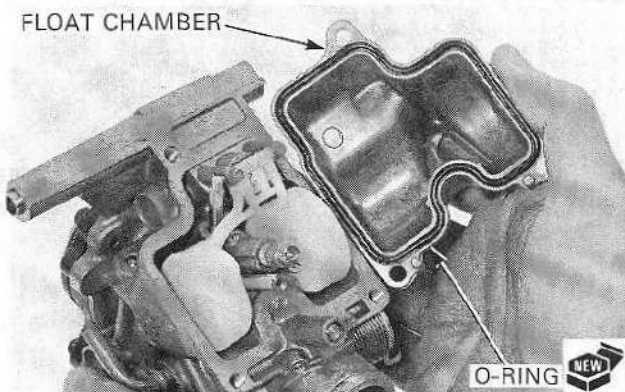
FLOAT LEVEL: 13.7 ± 0.5 mm (0.54 ± 0.02 in)

The float cannot be adjusted.

Replace the float assembly if the float level is out of specification.



Install a new O-ring into the float chamber groove. Install the float chamber and tighten the three screws.

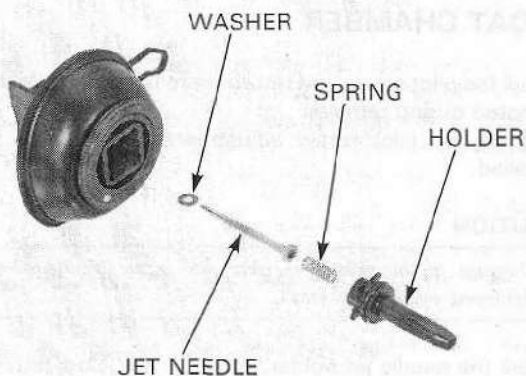


VACUUM CHAMBER

Coat a new O-ring with oil and install it onto the jet needle holder.

Install the washer, jet needle, spring and jet needle holder into the vacuum piston.

Press the jet needle holder until you feel a click indicating that the O-ring is seated into the groove in the vacuum piston.



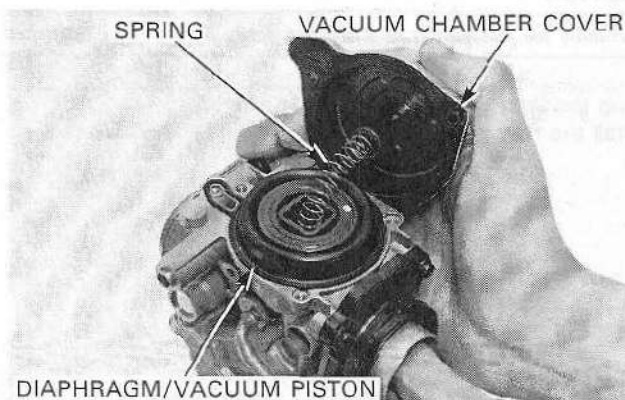
Install the diaphragm/vacuum piston into the carburetor body.

Lift the bottom of the piston with your finger to set the diaphragm rib in the groove in the carburetor body, and install the spring and vacuum chamber cover.

CAUTION

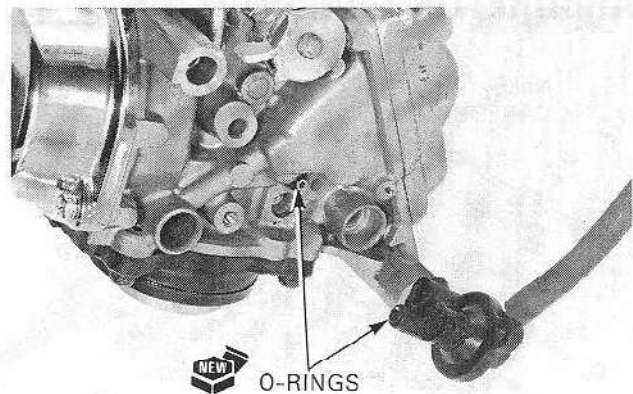
- Be careful not to pinch the diaphragm under the chamber cover.

Install and tighten the three screws.

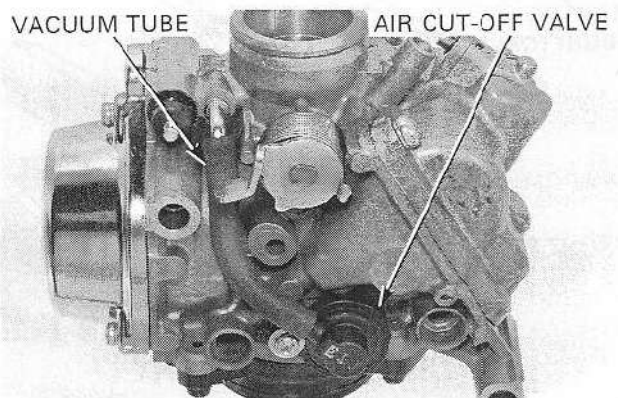


AIR CUT-OFF VALVE

Install new O-rings onto the carburetor body and air cut-off valve.

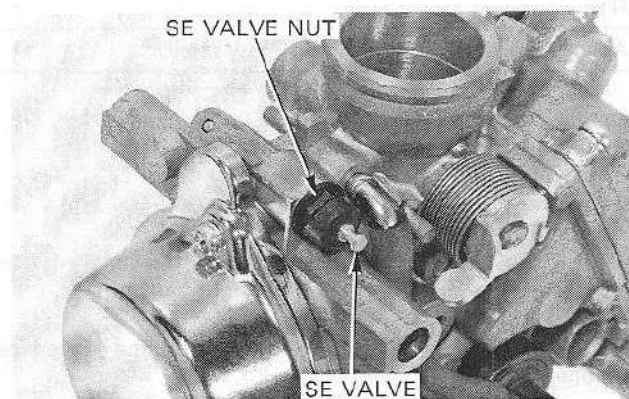


Install the air cut-off valve and secure it with the washer and screw. Connect the vacuum tube to the vacuum pipe of the carburetor body.



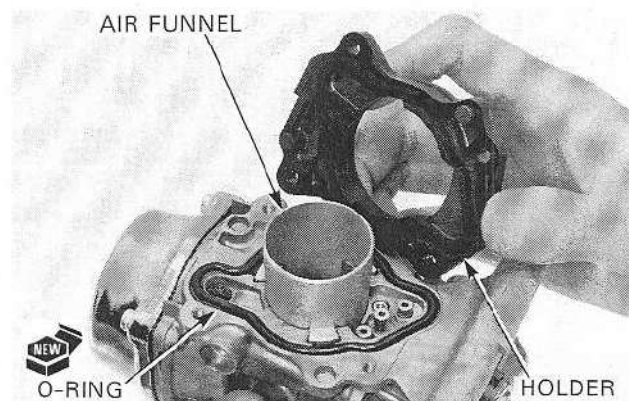
STARTING ENRICHMENT (SE) VALVE

Install the SE valve, spring and SE valve nut, and tighten the nut.

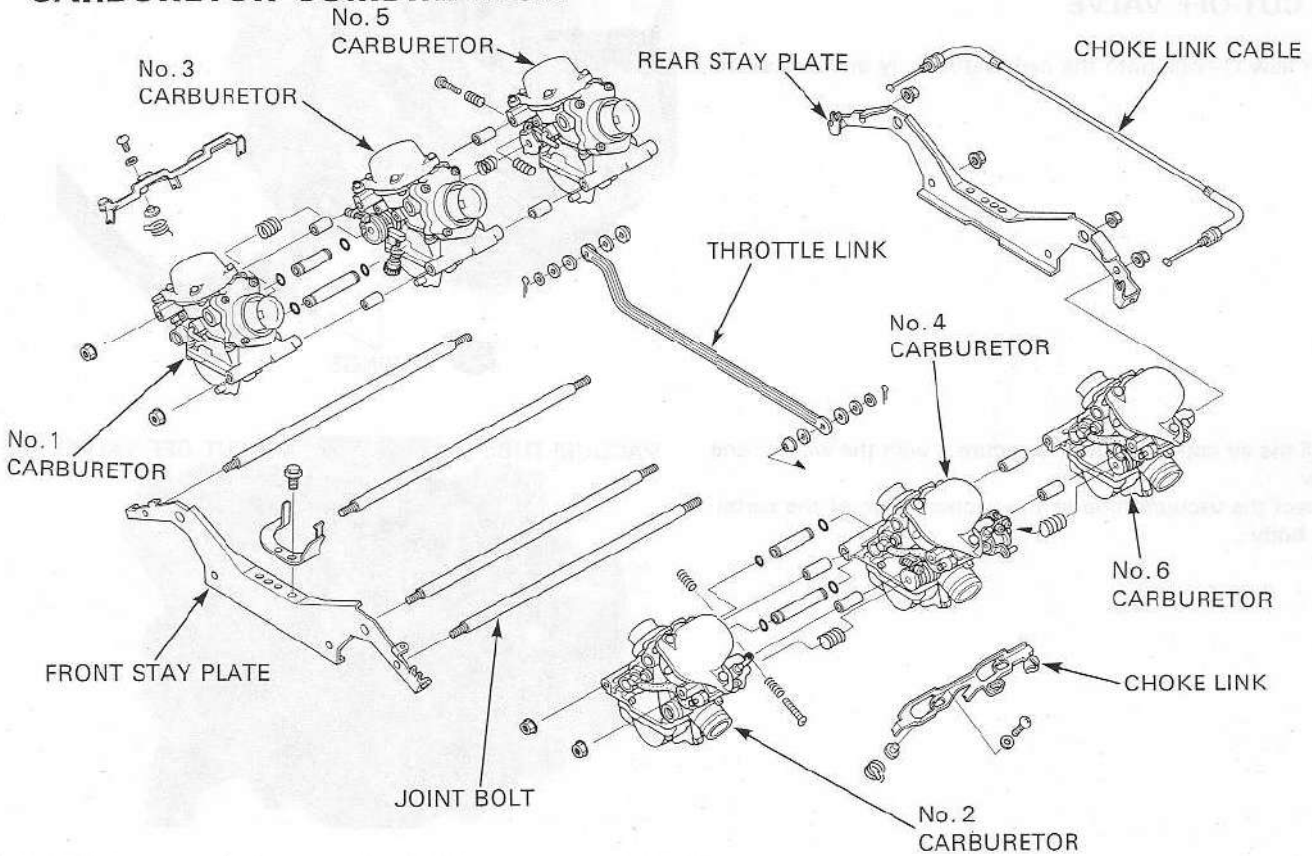


AIR FUNNEL

Install a new O-ring into the groove in the carburetor body. Install the air funnel, aligning the tabs with the grooves in the carburetor body. Install the air funnel holder, aligning the dowel pins with the dowel pin holes in the carburetor body and tighten the four screws.



CARBURETOR COMBINATION



NOTE

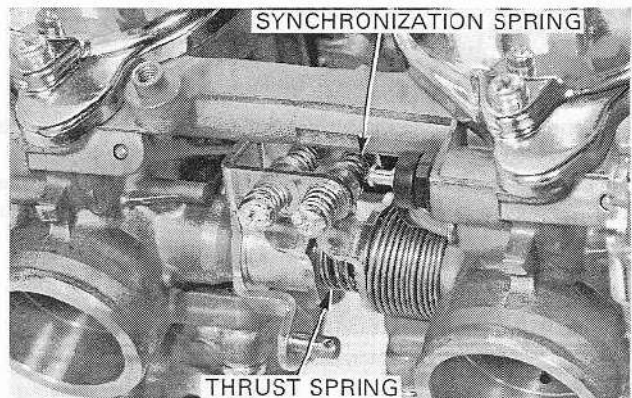
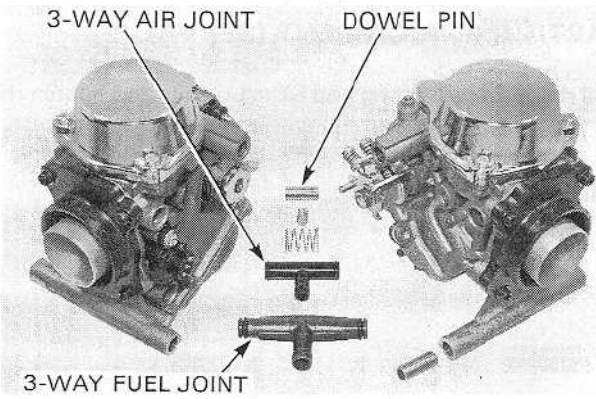
- Always replace the O-rings with new ones.

Install the following:

- 3-way fuel joint with new O-rings.
- 3-way air joint with new O-rings.
- dowel pins.

Assemble the No. 4 and 6 carburetors while installing the thrust spring and synchronization spring in position.

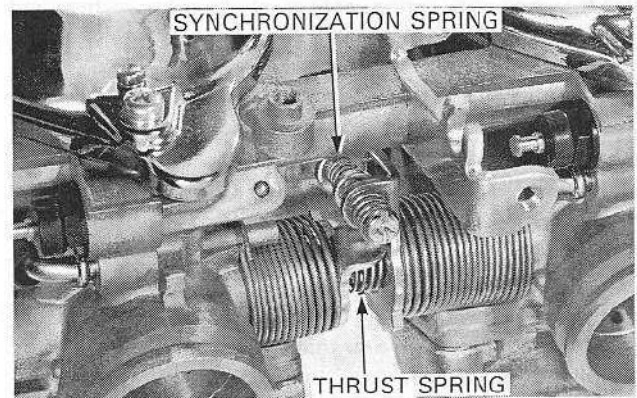
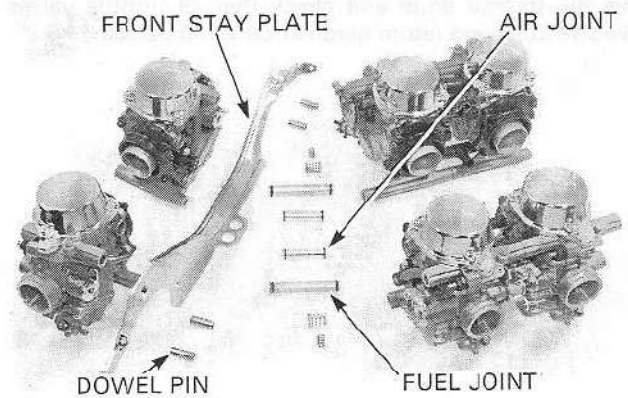
Assemble the No. 3 and 5 carburetors in the same procedure mentioned above.



Install the following:

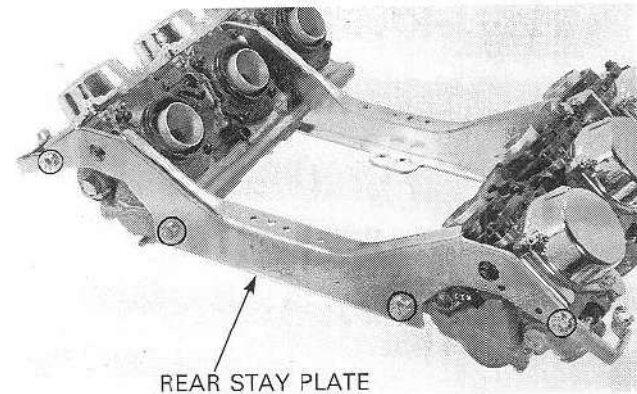
- fuel joints with new O-rings.
- air joints with new O-rings.
- dowel pins.
- front stay plate.

Assemble the No. 1 and 2 carburetors onto the No. 3 and 4 carburetors while installing the thrust springs and synchronization springs in position.



Install the four carburetor joint bolts.
Install the rear stay plate and four nuts, and tighten the nuts.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



Install the plastic cone washer and metallic washer (large) onto each throttle arm pin.

NOTE

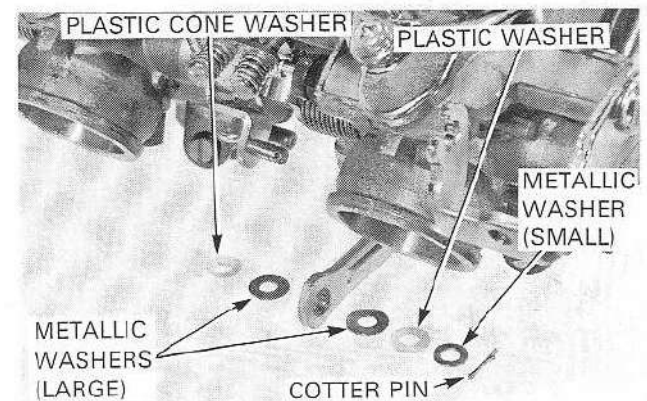
- Install the cone washer with the concaved side facing toward the throttle link.

Install the throttle link onto the throttle arm pins.

CAUTION

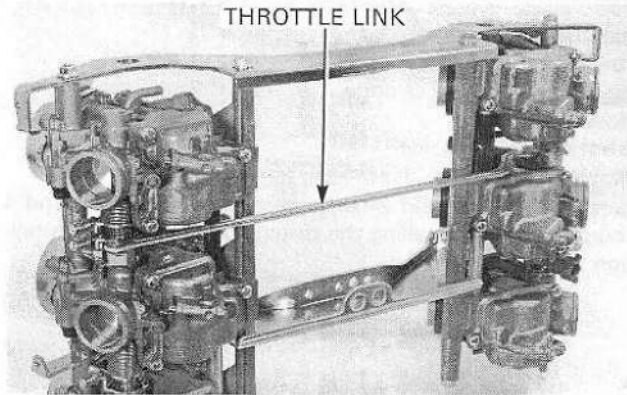
- *Be careful not to damage or deform the throttle link as the throttle operation will be impaired.*

Install the metallic washer (large), plastic washer, metallic washer (small) and a new cotter pin onto each throttle arm pin.



FUEL SYSTEM

Move the throttle drum and check that all throttle valves move smoothly and return automatically without binding.



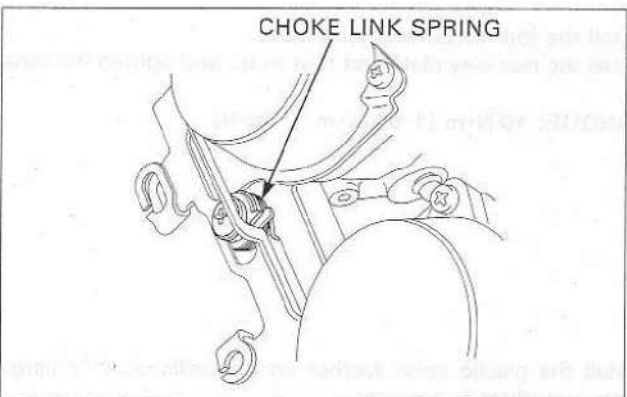
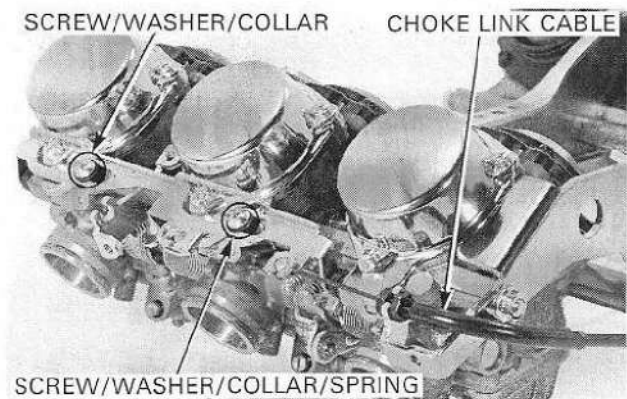
Install the choke link spring, collars, choke link, washers and screws onto each side assembly.

NOTE

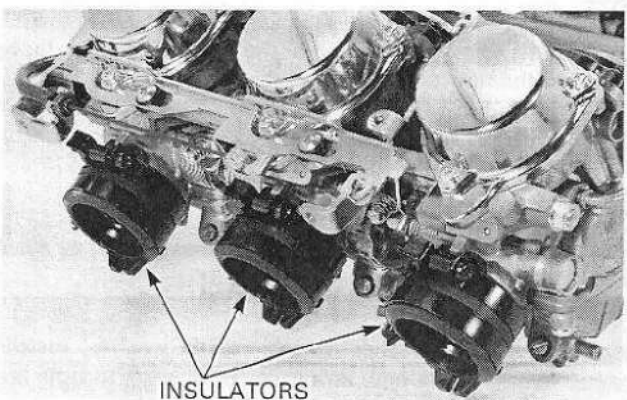
- Set the choke link arms onto the starting enrichment (SE) valves properly.
- Hook the choke link spring ends to the carburetor body and choke link properly.

Connect the choke link cable to the choke links and install it onto the cable stay.

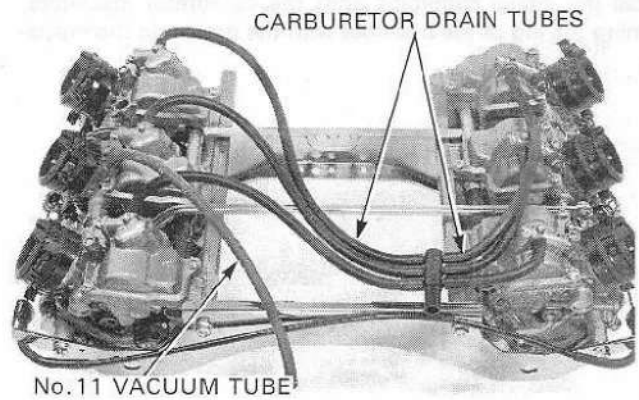
Adjust the choke link cable so that the cable has no free play by turning both adjusting nuts, and tighten both lock nuts. Move the left side choke link and check that all SE valves are fully open and closed completely.



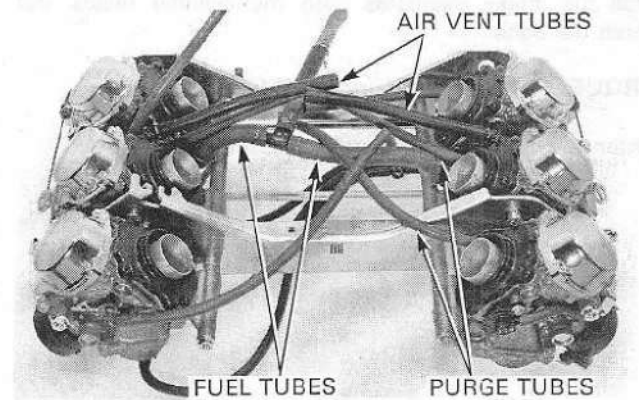
Install the carburetor insulators as shown.



Connect the carburetor drain tubes to all carburetors as shown.
 California type only: Connect the No. 11 vacuum tube to the No. 3 carburetor.



Connect the fuel tubes to the 3-way fuel joints.
 Connect the air vent tubes to the 3-way air joints.
 California type only: Connect the purge tubes to all carburetors.



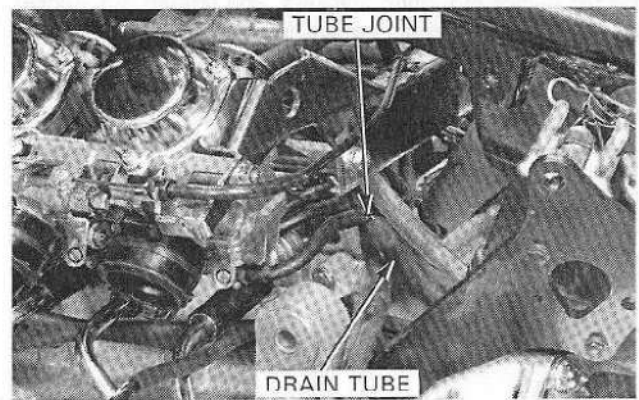
CARBURETOR INSTALLATION

Install the carburetor assembly in the frame.

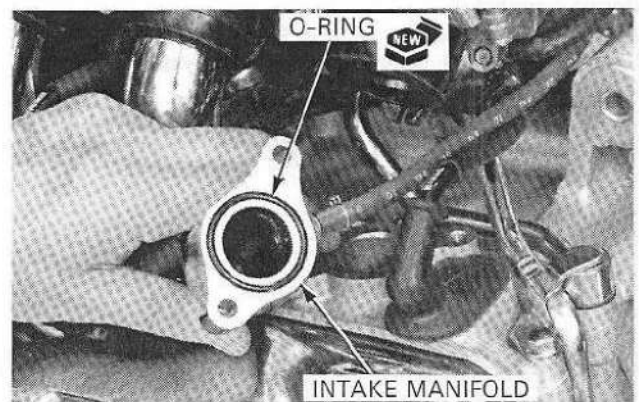
CAUTION

- Do not handle the carburetor assembly by holding the throttle link. To do so will cause improper throttle operation.

Connect the carburetor drain tube to the tube joint.

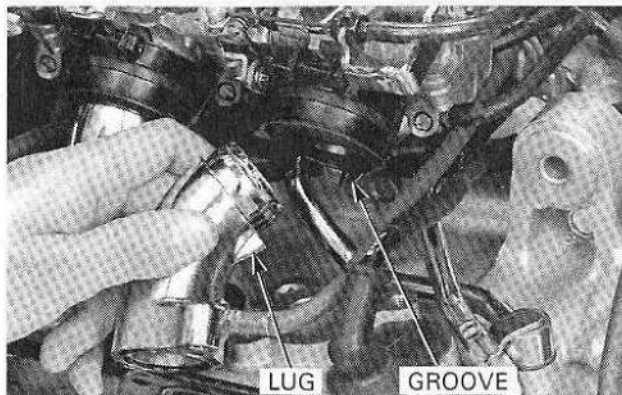


Install new O-rings into the intake manifold grooves.



FUEL SYSTEM

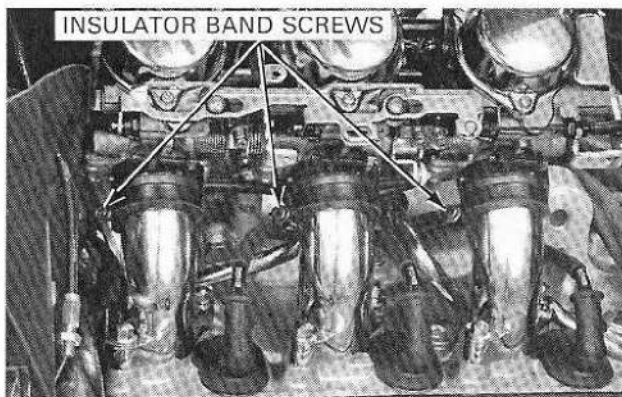
Install the intake manifolds onto the carburetor insulators, aligning the lug of the manifold with the groove in the insulator.



Install the intake manifolds onto the cylinder heads and tighten the bolts.

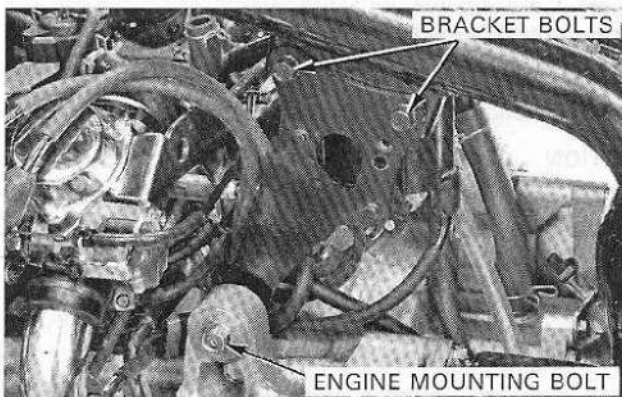
TORQUE: 9 N·m (0.9 kgf·m, 6.5 lbf·ft)

Tighten the carburetor insulator band screws.



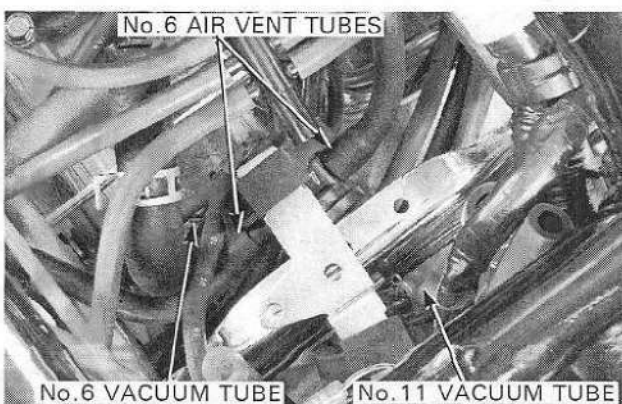
Install the engine mounting brackets, and tighten the bracket bolts and rear upper engine mounting bolts.

TORQUE: Bracket bolt: 26 N·m (2.7 kgf·m, 20 lbf·ft)
Mounting bolt: 44 N·m (4.5 kgf·m, 33 lbf·ft)



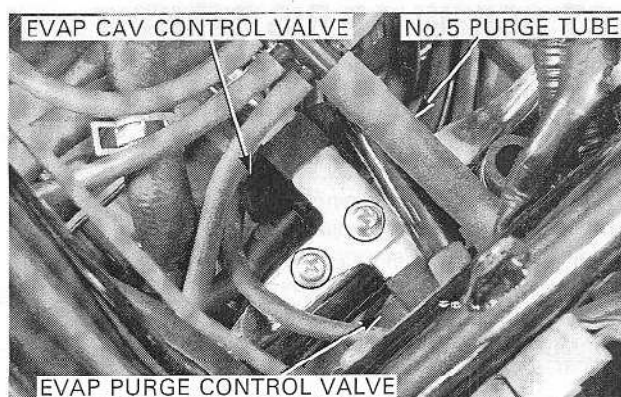
California type only:

- Connect the No.4 purge tube to the 3-way joint.
- Connect the No.11 vacuum tube to the evaporative emission (EVAP) purge control valve.
- Connect the No.6 vacuum tube to the 3-way joint.
- Connect the No.6 air vent tubes to the EVAP carburetor air vent (CAV) control valve.



California type only:

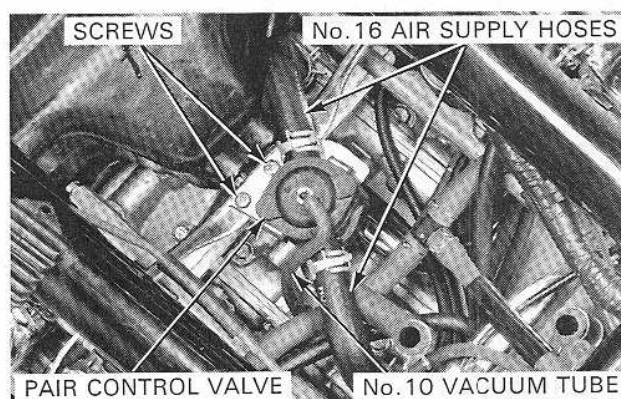
Install the EVAP purge control valve and EVAP CAV control valve with their stay, and tighten the two screws.
Connect the No.5 purge tube to the purge joint.



Install the pulse secondary air injection (PAIR) control valve with its stay and tighten the two screws.

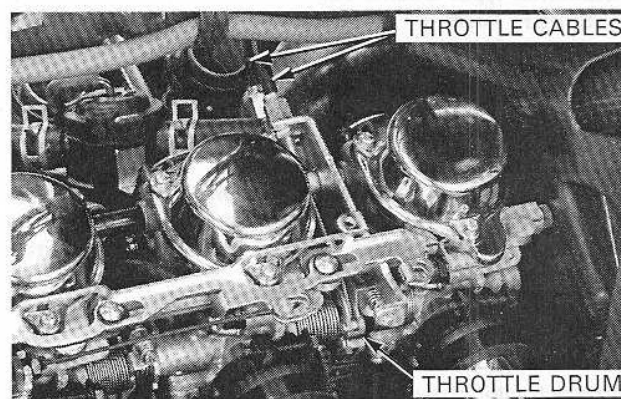
Connect the No.16 air supply hoses to the PAIR check valve cases.

Connect the No.10 vacuum tube to the PAIR control valve.



Connect the throttle cables to the throttle drum and install them onto the cable stay.

Adjust the throttle cable (page 3-4).

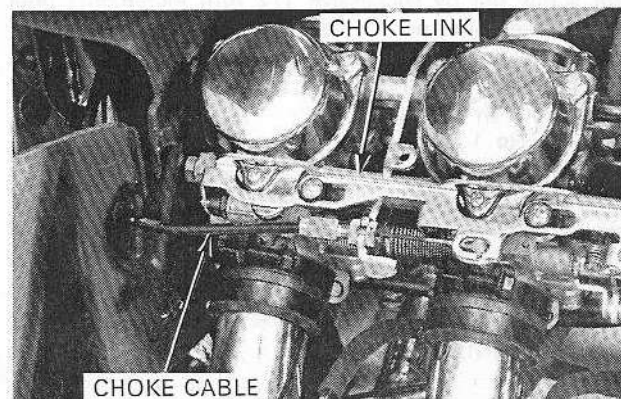


Connect the choke cable to the choke link and install it onto the cable stay.

Adjust the choke cable and install the carburetor link covers (page 3-5).

Install the air cleaner housing (page 5-4).

GL1500CF only: Install the right and left radiator covers (page 2-8).



FUEL SYSTEM

PILOT SCREW ADJUSTMENT

IDLE DROP PROCEDURE

NOTE

- Make sure the carburetor synchronization is within specification before pilot screw adjustment.
- The pilot screws are factory pre-set and no adjustment is necessary unless the pilot screws are replaced.
- Use a tachometer with graduations of 50 rpm or smaller that will accurately indicate a 50 rpm change.

1. Turn the pilot screw clockwise until it seats lightly, then back it out to the specification given. This is an initial setting prior to the final pilot screw adjustment.

CAUTION

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

TOOL:

Pilot screw wrench, D

07KMA-MN90101 or
07MMA-MV9010A
(U.S.A. only)

INITIAL OPENING:

'97 GL1500C/CT:

Except California type: 1-3/4 turns out

California type: 2 turns out

GL1500CF, After '97 GL1500C/CT:

Except California type: 2-1/4 turns out

California type: 2-3/8 turns out

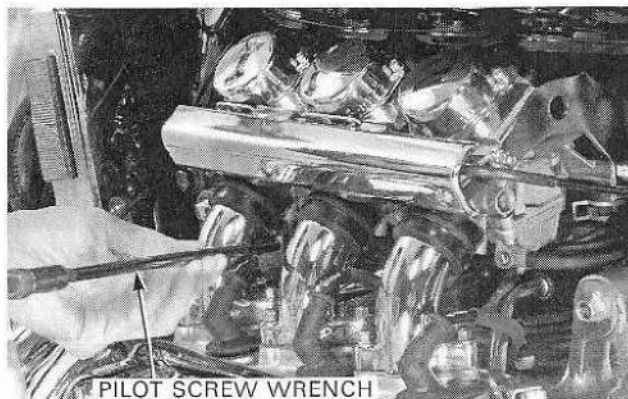
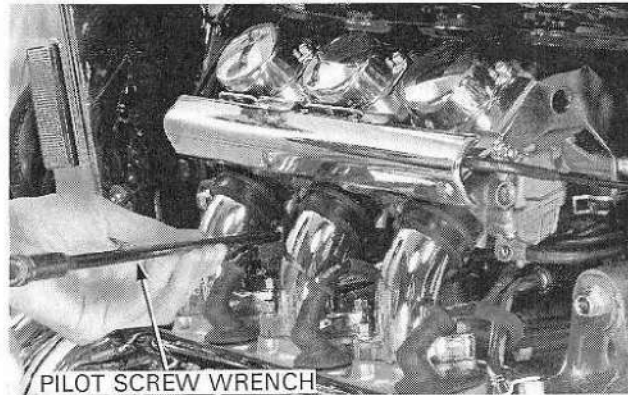
2. Warm up the engine to operating temperature. Stop and go driving for 10 minutes is sufficient.
3. Stop the engine and connect a tachometer according to the tachometer manufacturer's instructions.
4. Start the engine and adjust the idle speed with the throttle stop screw.

IDLE SPEED: 900±100 rpm

5. Turn each pilot screw 1/2 turn out from the initial setting.
6. If the engine speed increases by 50 rpm or more, turn each pilot screw out by successive 1/2 turn increments until engine speed does not increase.
7. Adjust the idle speed with the throttle stop screw.
8. Turn the No. 1 carburetor pilot screw in until the engine speed drops by 50 rpm.
9. Turn the No. 1 carburetor pilot screw out to the final opening from the position obtained in step 8.

FINAL OPENING: 1 turn out

10. Adjust the idle speed with the throttle stop screw.
11. Perform steps 8, 9 and 10 for the No. 2, 3, 4, 5 and 6 carburetor pilot screws.



HIGH ALTITUDE ADJUSTMENT

When the vehicle is to be operated continuously above 2,000 m (6,500 feet), the carburetors must be readjusted as described below to improve driveability and decrease exhaust emissions.

Warm up the engine to operating temperature. Stop and go driving for 10 minutes is sufficient.
Turn each pilot screw in to the specification given.

TOOL:

Pilot screw wrench, D

07KMA-MN90101 or
07MMA-MV9010A
(U.S.A. only)

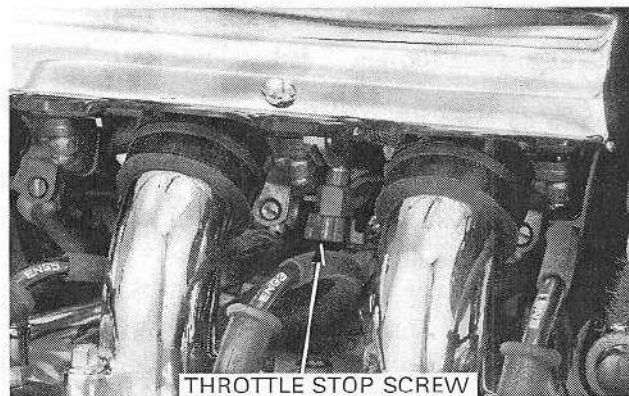
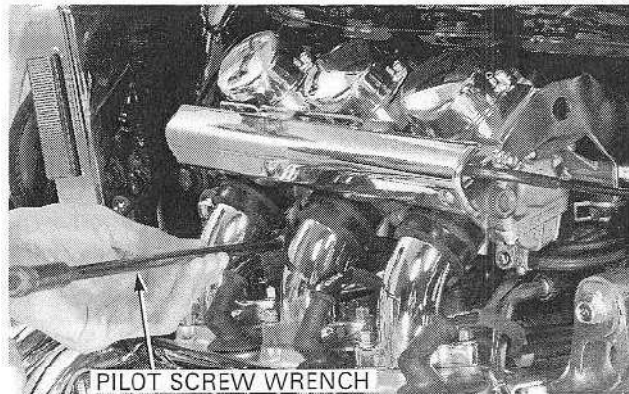
HIGH ALTITUDE SETTING: 1/2 turn in

Adjust the idle speed with the throttle stop screw.

IDLE SPEED: 900±100 rpm

NOTE

- This adjustment must be made at high altitude to ensure proper high altitude operation.



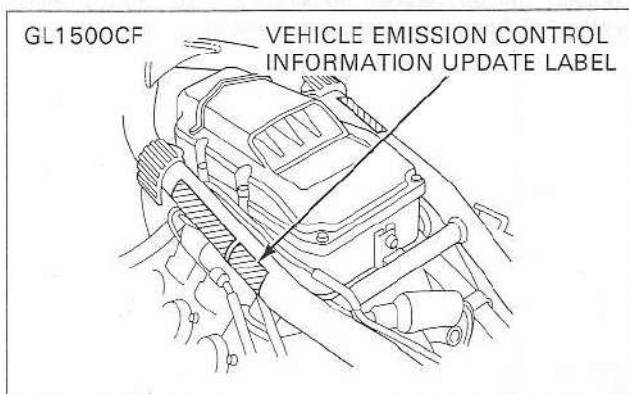
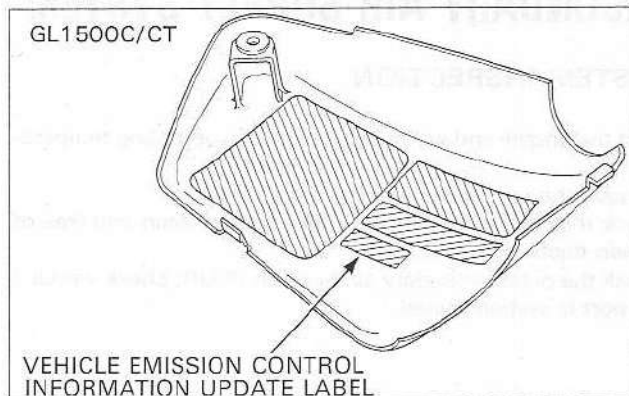
Attach the Vehicle Emission Control Information Update label on the following place:

- GL1500C/CT: reverse side of the left side cover
- GL1500CF: left frame tube under the fuel tank

See Service Letter No.132 for information on obtaining the label.

NOTE

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



FUEL SYSTEM

CAUTION

- Sustained operation at an altitude lower than 1,500 m (5,000 feet) with the carburetors adjusted for high altitude may cause the engine to idle roughly and the engine stall in traffic. It may also cause engine damage due to overheating.

When the vehicle is to be operated continuously below 1,500 m (5,000 feet), turn the pilot screw out 1/2 turn to its original position.

TOOL:

Pilot screw wrench, D

07KMA-MN90101 or
07KMA-MN9A100
(U.S.A. only)

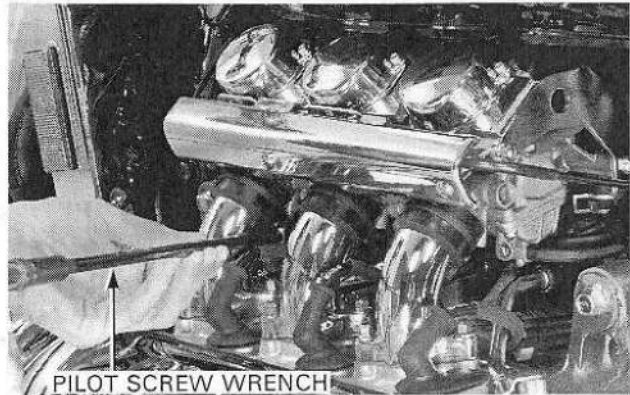
Adjust the idle speed with the throttle stop screw.

IDLE SPEED: 900±100 rpm

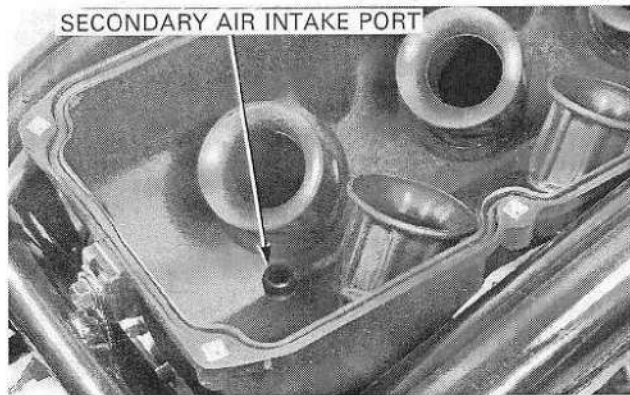
Be sure to do these adjustments at low altitude with the engine at operating temperature.

Remove the Vehicle Emission Control Information Update label that is attached on the following place after adjusting for low altitude:

- GL1500C/CT: reverse of the left side cover
- GL1500CF: left frame tube under the fuel tank



SECONDARY AIR INTAKE PORT



SECONDARY AIR SUPPLY SYSTEM

SYSTEM INSPECTION

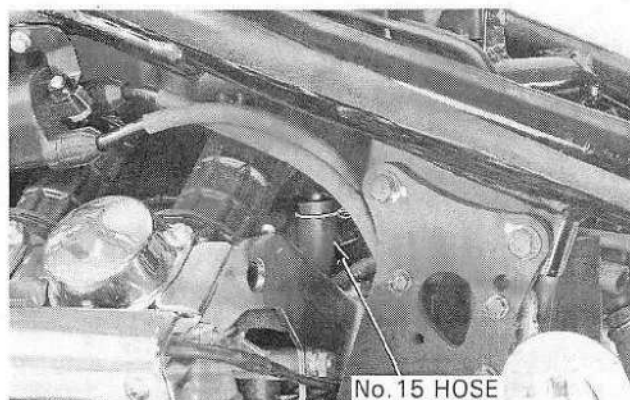
Start the engine and warm it up to normal operating temperature.

Remove the air cleaner element (page 3-6).

Check that the secondary air intake port is clean and free of carbon deposits.

Check the pulse secondary air injection (PAIR) check valves if the port is carbon fouled.

Disconnect the air cleaner housing-to-PAIR control valve hose (No. 15) from the air cleaner housing.



Disconnect the No. 3 vacuum tube from the No. 3 intake manifold and plug the vacuum joint to prevent air from entering the intake manifold.

Connect a vacuum pump to the No. 3 vacuum tube.

Clamp the No. 4 vacuum tube at the No. 4 intake manifold.

Start the engine and open the throttle slightly to be certain that air is sucked in through the No. 15 hose.

If the air is not drawn in, check the No. 15 hose for clogging.

With the engine running, gradually apply vacuum to the No. 3 vacuum tube.

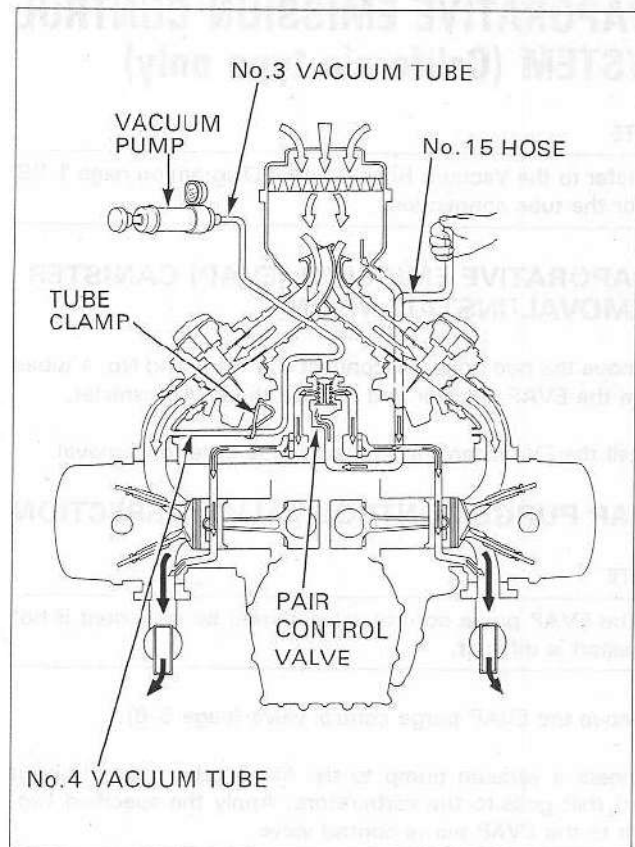
Check that the No. 15 hose stops drawing air, and that the vacuum does not bleed.

SPECIFIED VACUUM: 400 mm Hg (15.7 in Hg)

If the air is drawn in, or if the specified vacuum is not maintained, install a new PAIR control valve.

See page 5-5 for PAIR control valve removal.

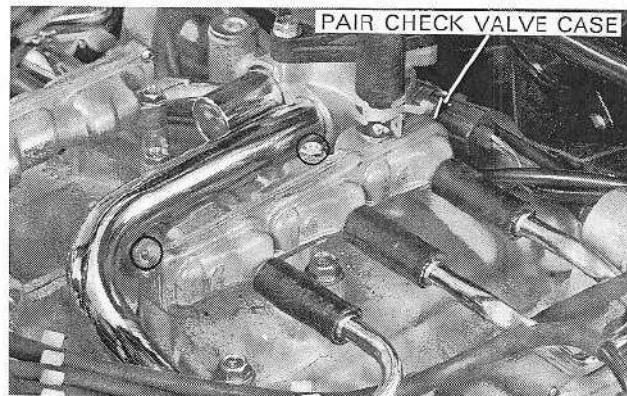
If afterburn occurs on deceleration, even when the secondary air supply system is normal, check the air cut-off valve.



PAIR CHECK VALVE INSPECTION

Remove the carburetor assembly (page 5-5).

Remove the two bolts and the PAIR check valve case.

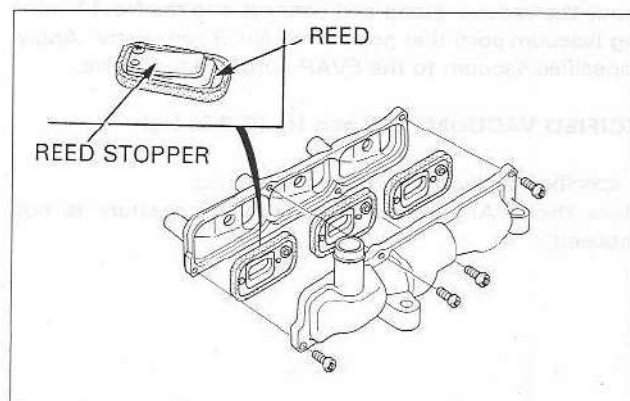


Remove the screws, PAIR check valve cover and PAIR check valves.

Check the reeds for damage or fatigue.

Replace the PAIR check valve case assembly if the seat rubber is cracked, deteriorated or damaged, or if there is clearance between the reed and seat.

Assemble and install the PAIR check valve case in the reverse order of disassembly and removal.



FUEL SYSTEM

EVAPORATIVE EMISSION CONTROL SYSTEM (California type only)

NOTE

- Refer to the Vacuum Hose Routing Diagram on page 1-38 for the tube connections.

EVAPORATIVE EMISSION (EVAP) CANISTER REMOVAL/INSTALLATION

Remove the two bolts, disconnect the No. 1 and No. 4 tubes from the EVAP canister and remove the EVAP canister.

Install the EVAP canister in the reverse order of removal.

EVAP PURGE CONTROL VALVE INSPECTION

NOTE

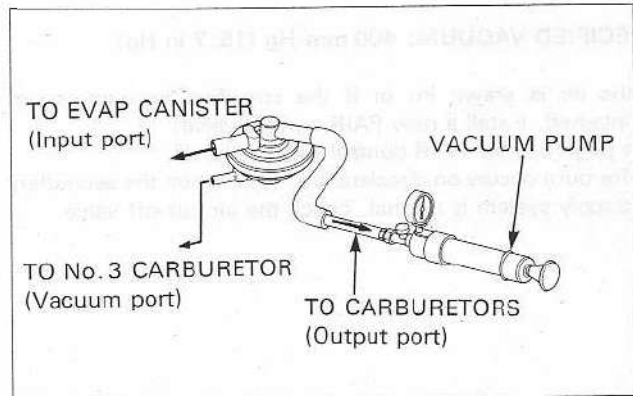
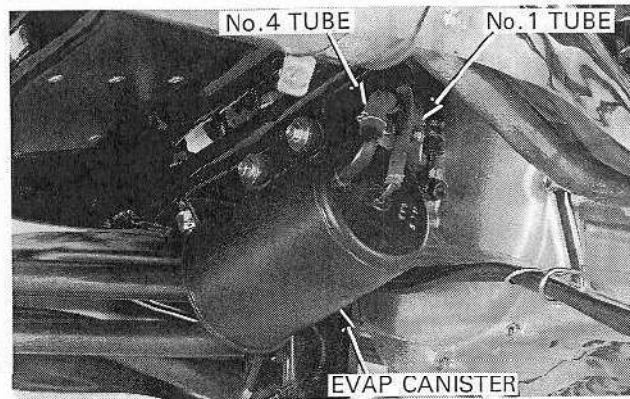
- The EVAP purge control valve should be inspected if hot restart is difficult.

Remove the EVAP purge control valve (page 5-6).

Connect a vacuum pump to the No. 5 tube fitting (output port) that goes to the carburetors. Apply the specified vacuum to the EVAP purge control valve.

SPECIFIED VACUUM: 250 mm Hg (9.8 in Hg)

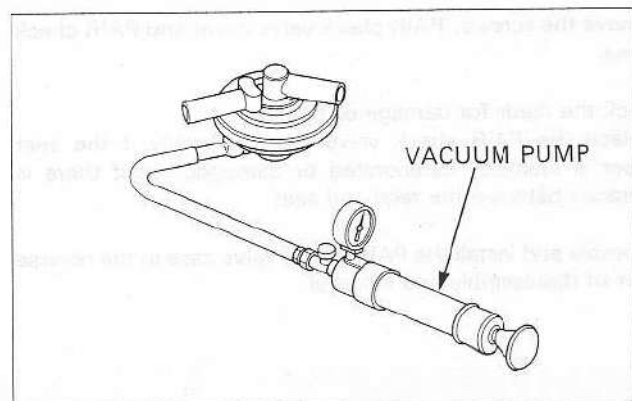
The specified vacuum should be maintained. Replace the EVAP purge control valve if vacuum is not maintained.



Remove the vacuum pump and connect it to the No. 11 tube fitting (vacuum port) that goes to the No. 3 carburetor. Apply the specified vacuum to the EVAP purge control valve.

SPECIFIED VACUUM: 250 mm Hg (9.8 in Hg)

The specified vacuum should be maintained. Replace the EVAP purge control valve if vacuum is not maintained.



Connect a pressure pump to the No. 4 tube fitting (input port) that goes to EVAP canister.

CAUTION

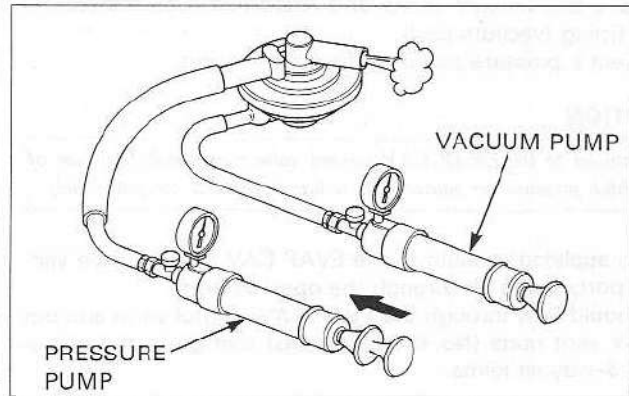
- *Damage to the EVAP purge control valve may result from use of a high pressure air source. Use a hand-operated air pump only.*

While applying the specified vacuum to the EVAP purge control valve vacuum port, pump air through the input port.

SPECIFIED VACUUM: 250 mm Hg (9.8 in Hg)

Air should flow through the EVAP purge control valve and out the output port that goes to the carburetors. Replace the EVAP purge control valve if air does not flow out.

Remove the pumps and install the EVAP purge control valve in the reverse order of removal.



EVAP CARBURETOR AIR VENT (CAV) CONTROL VALVE INSPECTION

NOTE

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

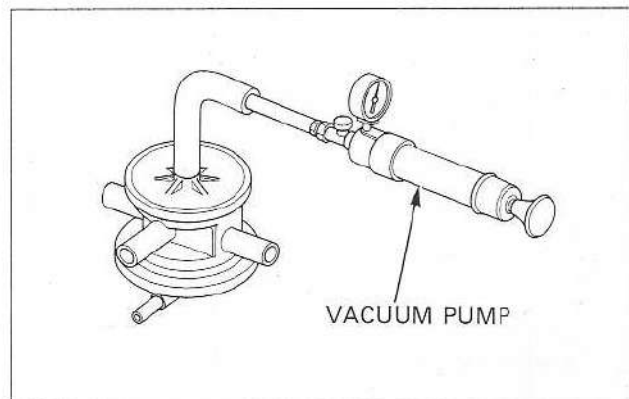
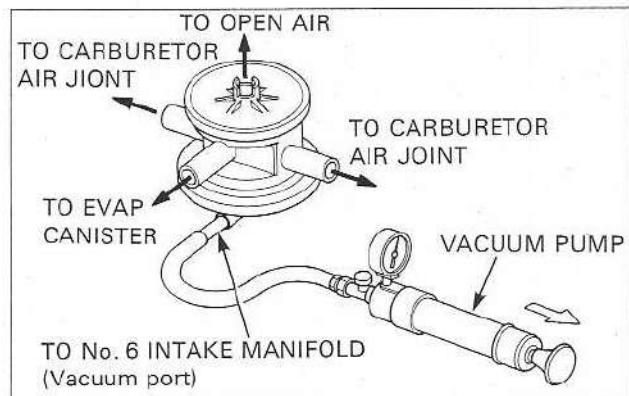
Remove the EVAP CAV control valve (page 5-6).

Connect a vacuum pump to the No. 10 tube fitting (vacuum port) that goes to the No. 6 intake manifold. Apply the specified vacuum to the EVAP CAV control valve.

SPECIFIED VACUUM: 250 mm Hg (9.8 in Hg)

The specified vacuum should be maintained. Replace the EVAP CAV control valve if vacuum is not maintained.

Remove the vacuum pump and connect it to the air vent fitting (open air port). Apply vacuum to the EVAP CAV control valve. The vacuum should hold steady. Replace the EVAP CAV control valve if vacuum leaks.



FUEL SYSTEM

Remove the vacuum pump and reconnect it to the No.10 tube fitting (vacuum port).
Connect a pressure pump to the open air port.

CAUTION

- *Damage to the EVAP CAV control valve may result from use of a high pressure air source. Use a hand-operated air pump only.*

While applying vacuum to the EVAP CAV control valve vacuum port, pump air through the open air port.
Air should flow through the EVAP CAV control valve and out the air vent ports (No. 6 tube fittings) that go to the carburetor 3-way air joints.

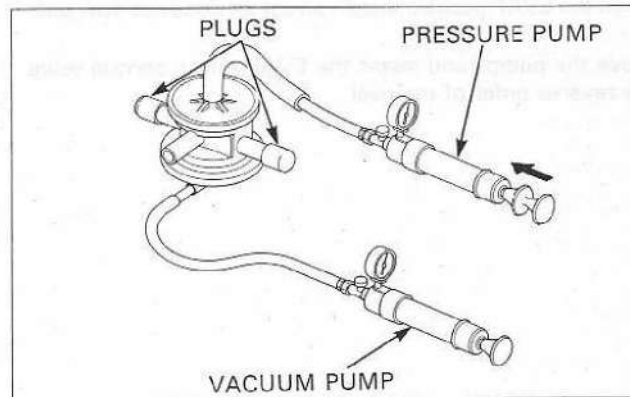
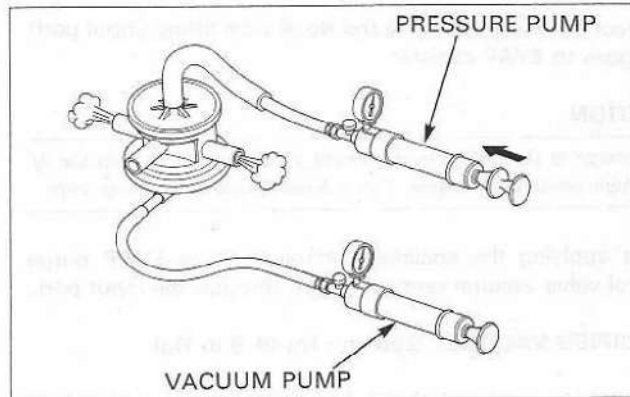
Plug the air vent ports (No. 6 tube fittings) that go to the carburetor 3-way air joints.

While applying vacuum to the vacuum port, apply air pressure to the open air port.

While applying vacuum to the EVAP CAV control valve vacuum port, pump air through the open air port.
It should hold steady.

Replace the EVAP CAV control valve if pressure is not retained.

Remove the pumps and install the EVAP CAV control valve in the reverse order of removal.

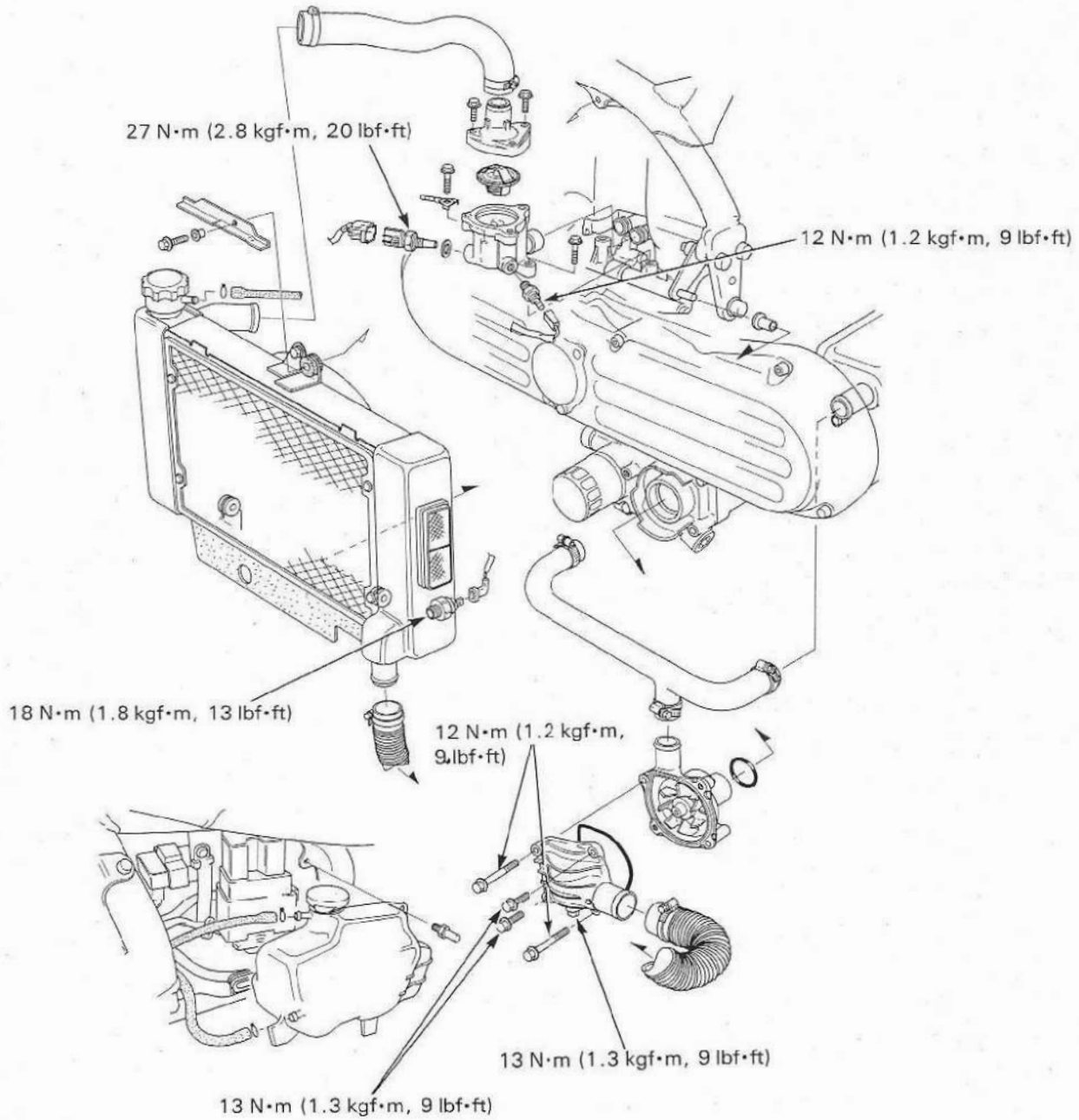


MEMO



2号冷却水タンク
1号冷却水タンク

COOLING SYSTEM



Water hose band screw:
2 N·m (0.2 kgf·m, 1.4 lbf·ft)

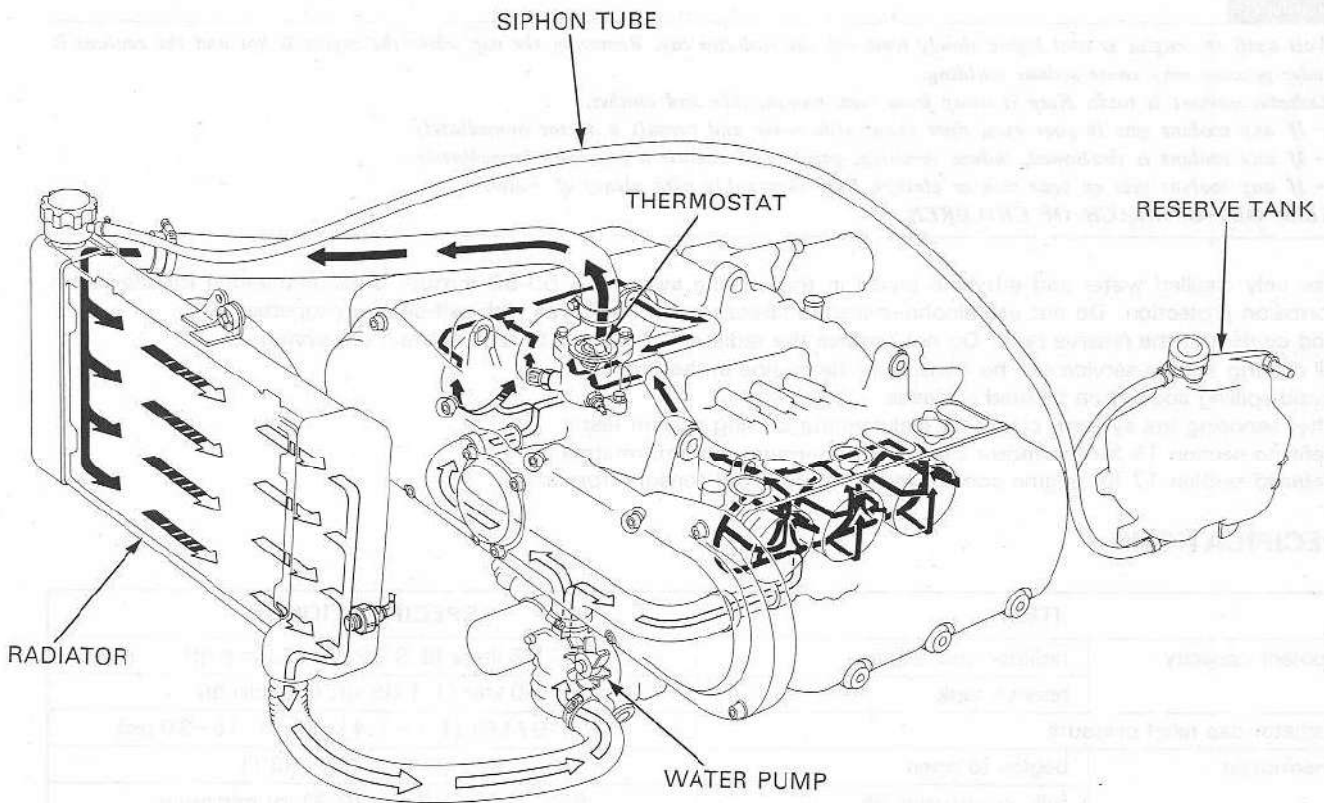
6. COOLING SYSTEM

8-1	COOLANT REPLACEMENT
8-2	SYSTEM TESTING
8-3	TROUBLESHOOTING
8-4	SERVICE INFORMATION
8-5	WATER PUMP
8-6	THERMOSTAT
8-7	RADIATOR/COOLING FAN

SERVICE INFORMATION

GENERAL

6



COOLING SYSTEM

SERVICE INFORMATION	6-2	RADIATOR/COOLING FAN	6-7
TROUBLESHOOTING	6-3	THERMOSTAT	6-10
SYSTEM TESTING	6-4	WATER PUMP	6-12
COOLANT REPLACEMENT	6-5		

SERVICE INFORMATION

GENERAL

▲WARNING

- Wait until the engine is cool before slowly removing the radiator cap. Removing the cap while the engine is hot and the coolant is under pressure may cause serious scalding.
- Radiator coolant is toxic. Keep it away from eyes, mouth, skin and clothes.
 - If any coolant gets in your eyes, rinse them with water and consult a doctor immediately.
 - If any coolant is swallowed, induce vomiting, gargle and consult a physician immediately.
 - If any coolant gets on your skin or clothes, rinse thoroughly with plenty of water.
- KEEP OUT OF REACH OF CHILDREN.

- Use only distilled water and ethylene glycol in the cooling system. A 50-50 mixture is recommended for maximum corrosion protection. Do not use alcohol-based antifreeze or an antifreeze with self-sealing properties.
- Add coolant at the reserve tank. Do not remove the radiator cap except to refill or drain the system.
- All cooling system service can be done with the engine in the frame.
- Avoid spilling coolant on painted surfaces.
- After servicing the system, check for leaks with a cooling system tester.
- Refer to section 19 for fan motor switch and thermosensor information.
- Refer to section 17 for engine coolant temperature (ECT) sensor information.

SPECIFICATIONS

ITEM		SPECIFICATIONS
Coolant capacity	radiator and engine	3.75 liters (3.9 US qt, 3.3 Imp qt)
	reserve tank	1.0 liter (1.1 US qt, 0.9 Imp qt)
Radiator cap relief pressure		108–137 kPa (1.1–1.4 kgf/cm ² , 16–20 psi)
Thermostat	begins to open	80–84°C (176–183°F)
	fully open/valve lift	95°C (203°F)/8 mm (0.31 in) minimum

TORQUE VALUES

Coolant drain bolt	13 N·m (1.3 kgf·m, 9 lbf·ft)
Water pump assembly bolt	13 N·m (1.3 kgf·m, 9 lbf·ft)
Water pump mounting bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Water hose band screw	2 N·m (0.2 kgf·m, 1.4 lbf·ft)

TROUBLESHOOTING

Engine temperature too high

- Faulty temperature unit (indicator) or thermosensor
- Thermostat stuck closed
- Faulty radiator cap
- Insufficient coolant
- Passages blocked in radiator, hoses or water jacket
- Air in system
- Faulty cooling fan motor
- Faulty fan motor switch
- Faulty water pump

Coolant leaks

- Faulty pump mechanical seal
- Deteriorated O-rings
- Faulty radiator cap
- Damaged or deteriorated cylinder gasket
- Loose hose connection or clamp
- Damaged or deteriorated hoses

COOLING SYSTEM

SYSTEM TESTING

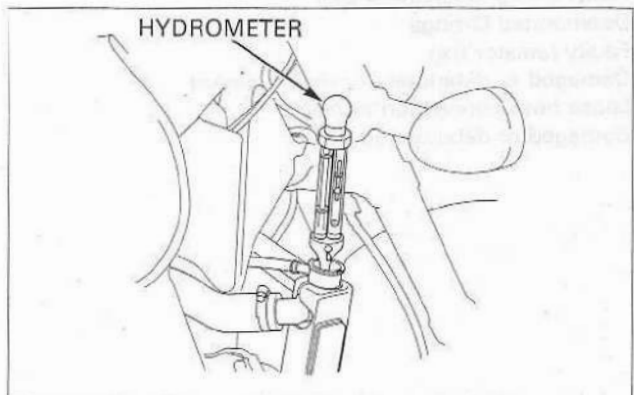
▲WARNING

- *The engine must be cool before removing the radiator cap, or severe scalding may result.*

COOLANT (HYDROMETER TEST)

Remove the radiator cap.

Test the coolant mixture with a hydrometer. (Refer to the Cooling System section of the Common Service Manual for coolant gravity specifications.) For maximum corrosion protection, a 50-50% solution of ethylene glycol and distilled water is recommended (page 6-5). Look for contamination and replace the coolant if necessary.



RADIATOR CAP/SYSTEM PRESSURE INSPECTION

Remove the radiator cap.

NOTE

- Before installing the cap in the tester, wet the sealing surfaces.

Pressure test the radiator cap using the tool. 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 6 seconds.

RADIATOR CAP RELIEF PRESSURE:

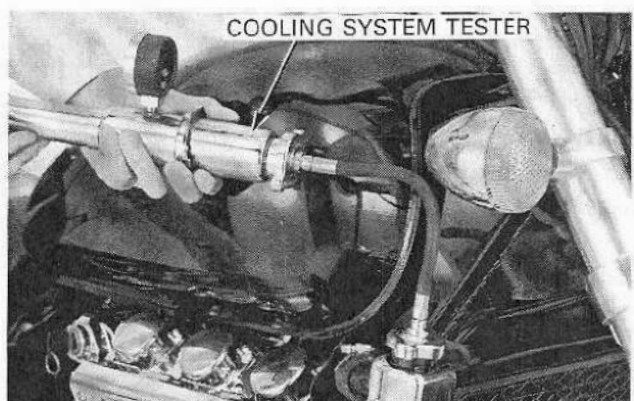
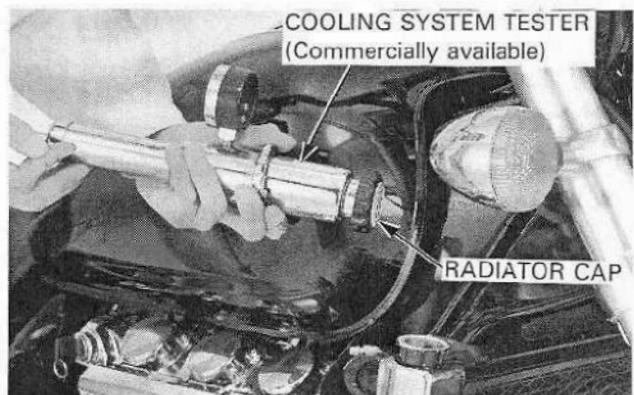
108–137 kPa (1.1–1.4 kgf/cm², 16–20 psi)

Pressure the radiator, engine and hoses using the tool, and check for leaks.

CAUTION

- *Excessive pressure can damage the cooling system components. Do not exceed 137 kPa (1.4 kgf/cm², 20 psi).*

Repair or replace components if the system will not hold specified pressure for at least 6 seconds.



COOLANT REPLACEMENT

PREPARATION

▲WARNING

- Radiator coolant is toxic. Keep it away from eyes, mouth, skin and clothes.
 - If any coolant gets in your eyes, rinse them with water and consult a doctor immediately.
 - If any coolant is swallowed, induce vomiting, gargle with water and consult a physician immediately.
 - If any coolant gets on your skin or clothes, rinse thoroughly with plenty of water.
- KEEP OUT OF REACH OF CHILDREN.

CAUTION

- Using coolant with silicate inhibitors may cause premature wear of water pump seals or blockage of radiator passages. Using tap water may cause engine damage.

NOTE

- The effectiveness of coolant decreases with the accumulation of rust or if there is a change in the mixing proportion during usage. Therefore, for best performance change the coolant regularly as specified in the maintenance schedule.
- Mix only distilled, low mineral water with the antifreeze.

RECOMMENDED ANTIFREEZE:

Pro Honda HP coolant or an equivalent high quality ethylene glycol antifreeze containing corrosion protection inhibitors

RECOMMENDED MIXTURE:

50-50 (Distilled water and recommended antifreeze)

REPLACEMENT/AIR BLEEDING

▲WARNING

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

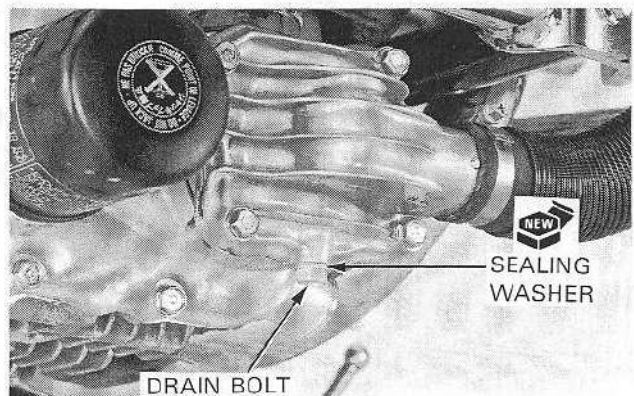
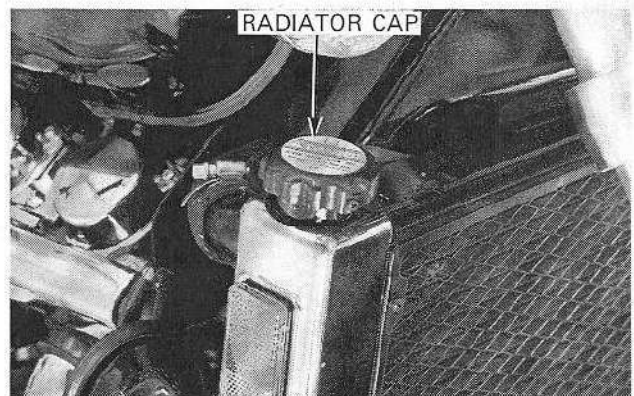
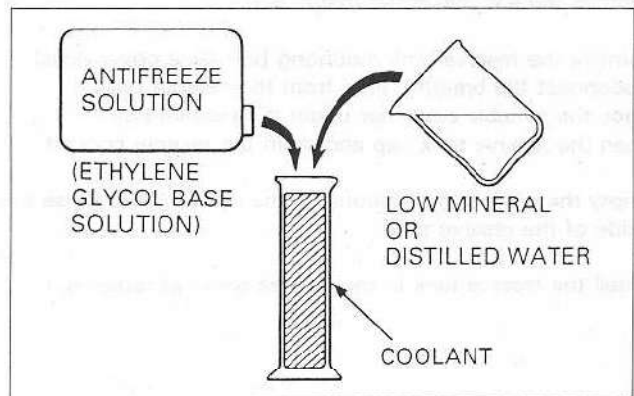
NOTE

- When filling the system or reserve tank with a coolant (checking the coolant level), place the motorcycle in a vertical position on a flat, level surface.

Remove the radiator cap.

Remove the drain bolt on the water pump and drain the system coolant.

Reinstall the drain bolt with a new sealing washer.



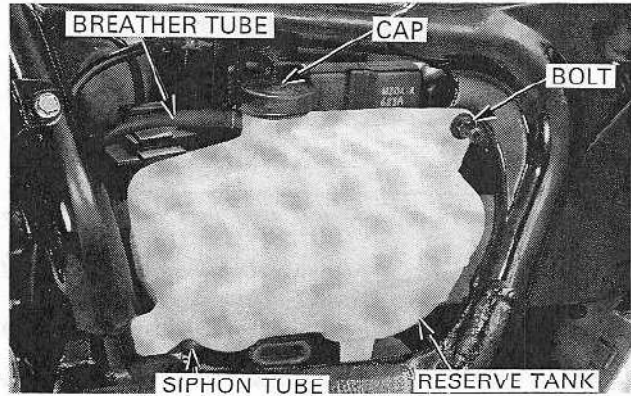
COOLING SYSTEM

Remove the left side cover (page 2-3).

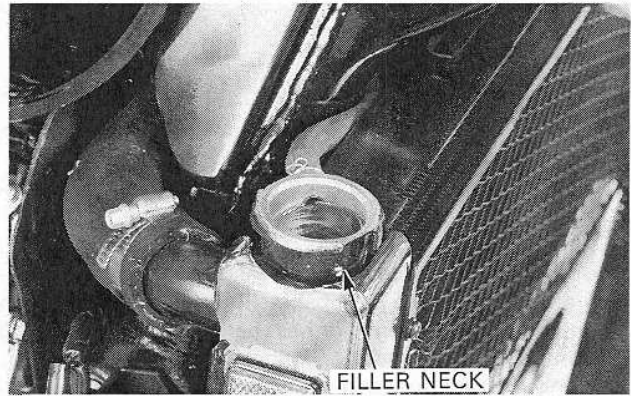
Remove the reserve tank mounting bolt (side cover boss).
Disconnect the breather tube from the reserve tank.
Place the suitable container under the reserve tank.
Open the reserve tank cap and drain the reserve coolant.

Empty the coolant and disconnect the siphon tube. Rinse the inside of the reserve tank.

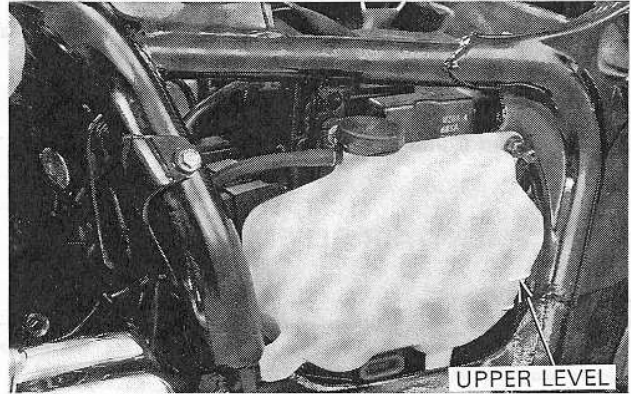
Install the reserve tank in the reverse order of removal.



Fill the system with the recommended coolant through the filler opening up to filler neck.



Fill the reserve tank to the upper level line.



Bleed air from the system as follows:

1. Shift the transmission into neutral.
Start the engine and run it at idle for 2—3 minutes.
2. Snap the throttle 3—4 times to bleed air from the system.
3. Stop the engine and add coolant up to the proper level if necessary. Install the radiator cap.
4. Check the level of coolant in the reserve tank and fill to the upper level if it is low.

RADIATOR/COOLING FAN

CAUTION

- Be careful not to damage the radiator fins while servicing the radiator and fan.

REMOVAL

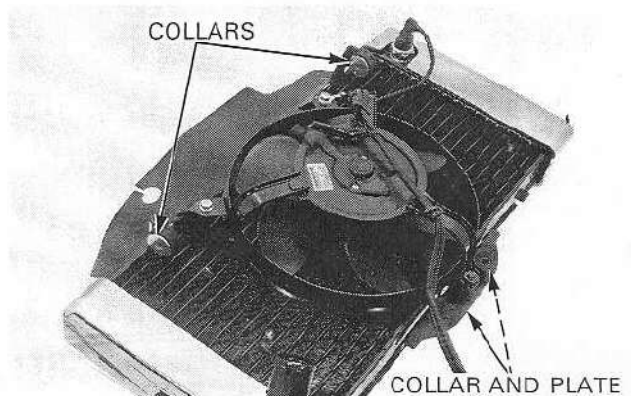
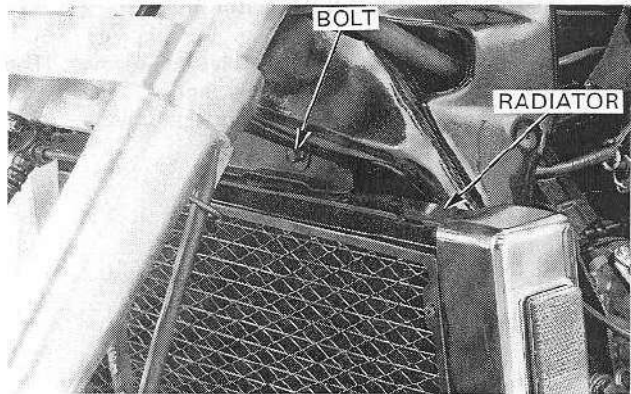
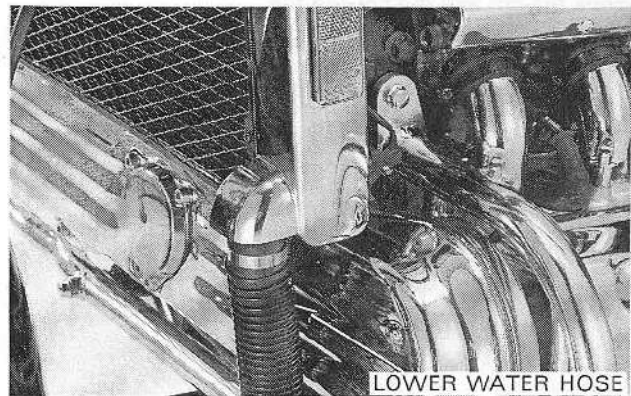
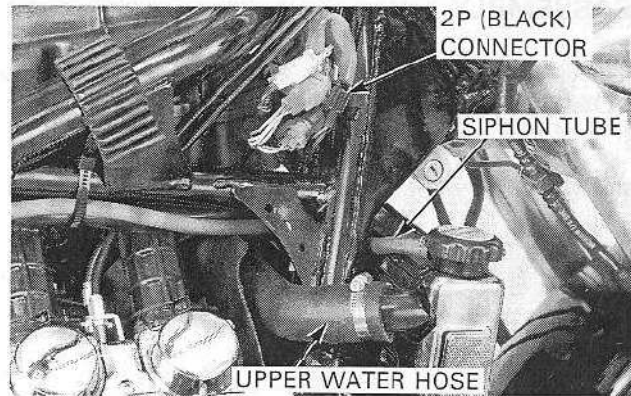
Drain the coolant (page 6-5).
 Remove the right steering side cover (page 2-5).
 Remove the radiator cover (GI 1500CF only: page 2-8).

Disconnect the cooling fan 2P (Black) connector.
 Disconnect the siphon tube and the upper water hose.

Disconnect the lower water hose.

Remove the radiator mounting bolt. Slide the radiator to the left and remove the radiator from the frame stays.

Remove the lower mounting collars.
 Remove the upper mounting collar and cover plate.

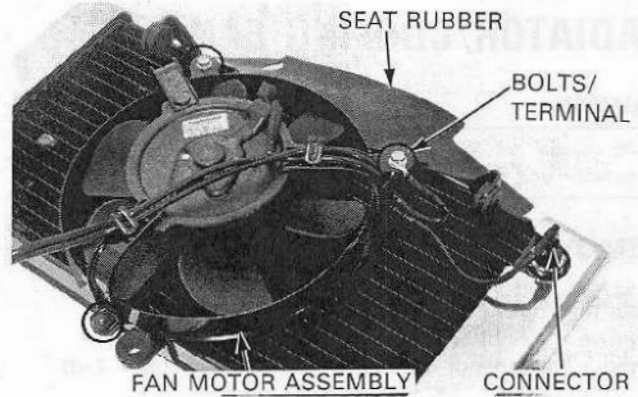


COOLING SYSTEM

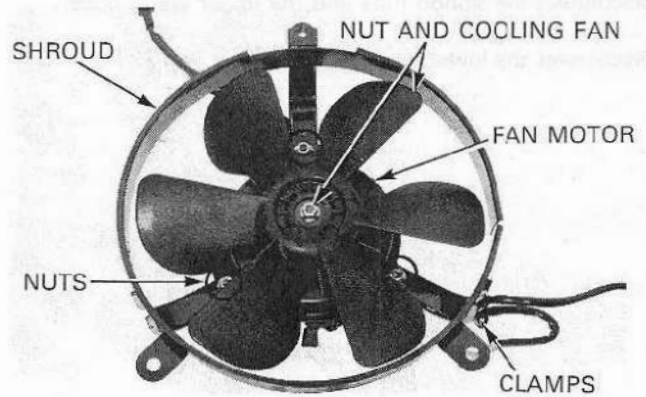
DISASSEMBLY

Disconnect the fan motor switch connector.
Remove the motor assembly by removing the three bolts and ground terminal.

Remove the seat rubber from the motor stays.

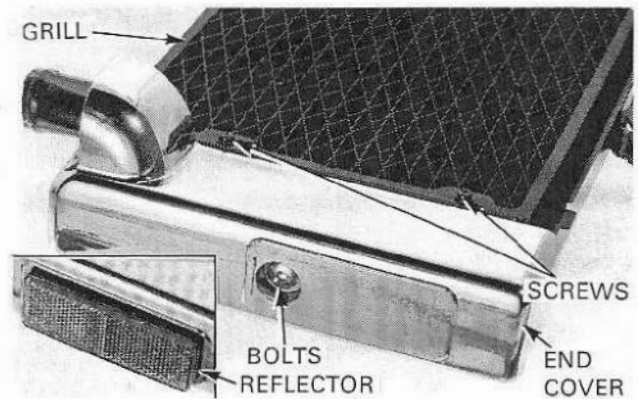


Remove the nut and the cooling fan.
Release the wire harness from the three clamps on the shroud.
Remove the nuts and fan motor.

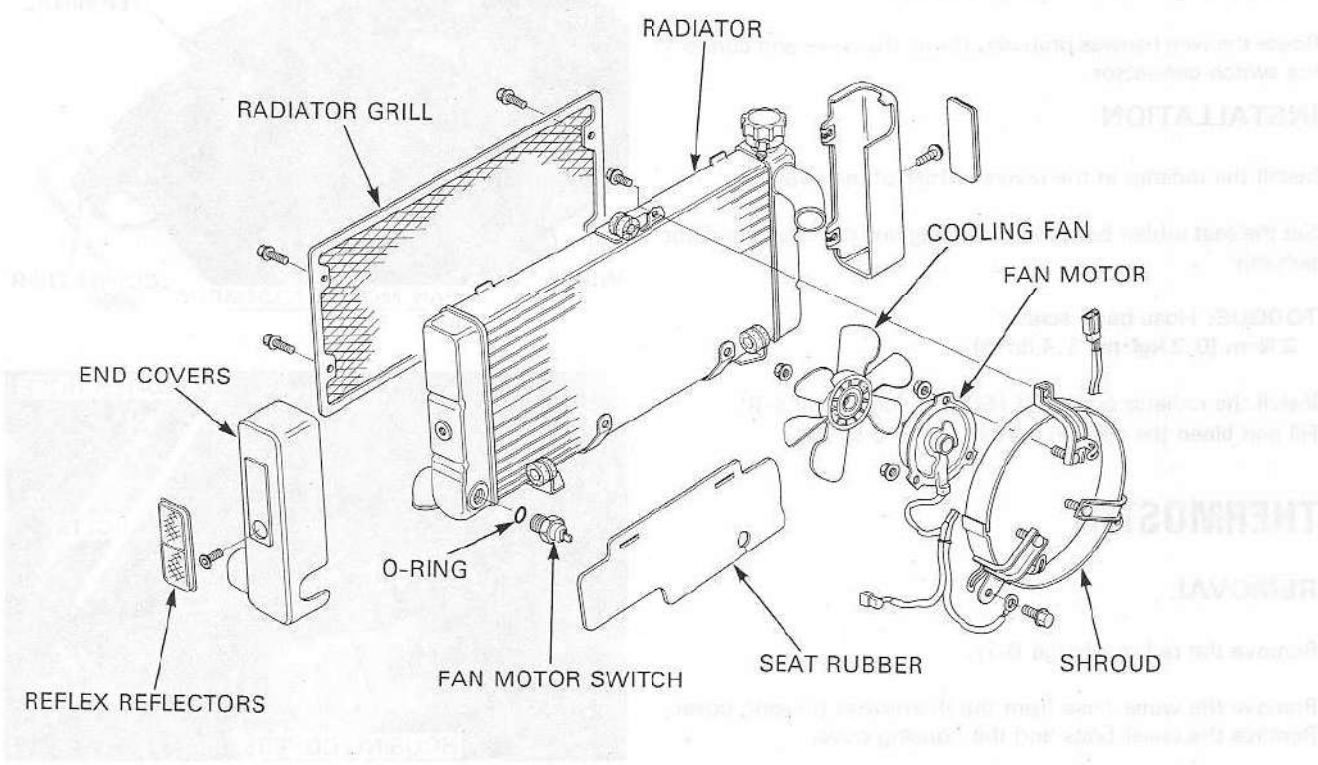


Remove the four screws and the radiator grill.

Remove the reflex reflectors from the radiator end cover. (The reflectors are attached with an adhesive tape.)
Remove the socket bolts and the radiator end covers.

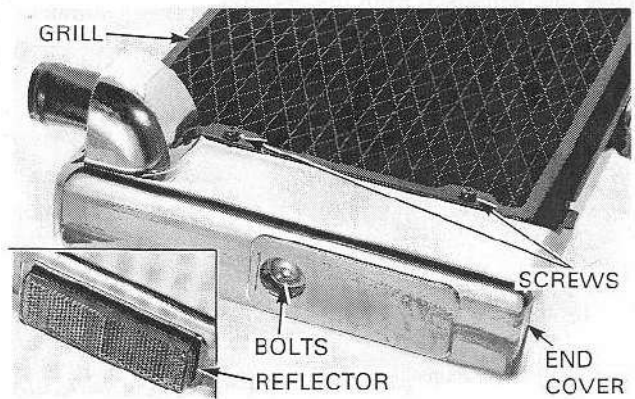


ASSEMBLY

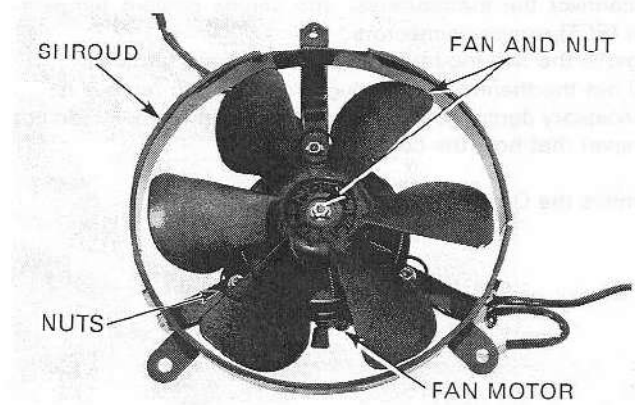


Install the radiator end covers and grill by tightening the two socket bolts and four screws.

Install the reflector onto the end covers.



Install the fan motor onto the shroud and tighten the nuts. Install the cooling fan onto the motor shaft by aligning the flat surfaces. Tighten the fan nut.



COOLING SYSTEM

Install the seat rubber to the fan motor stays as shown. Install the fan motor assembly onto the radiator and tighten the mounting bolts with the ground terminal.

Route the wire harness properly, clamp the wires and connect the switch connector.

INSTALLATION

Install the radiator in the reverse order of removal.

Set the seat rubber between the timing belt cover and radiator properly.

TORQUE: Hose band screw:
2 N·m (0.2 kgf·m, 1.4 lbf·ft)

Install the radiator cover (GL1500CF only: page 2-8).
Fill and bleed the cooling system (page 6-6).

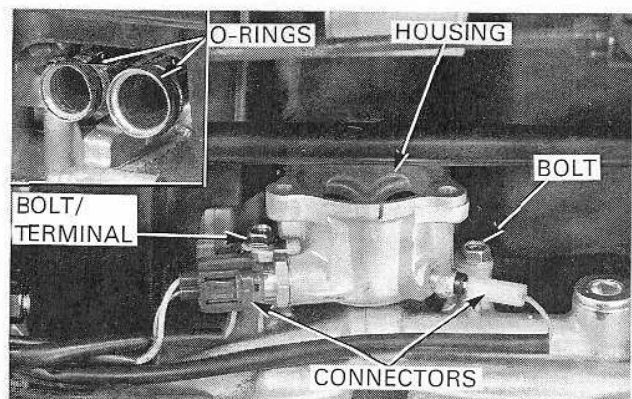
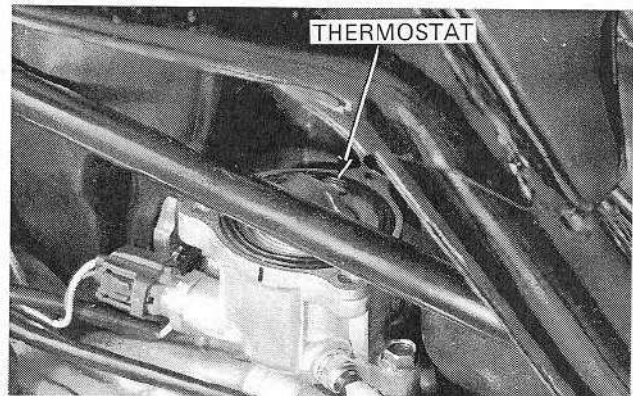
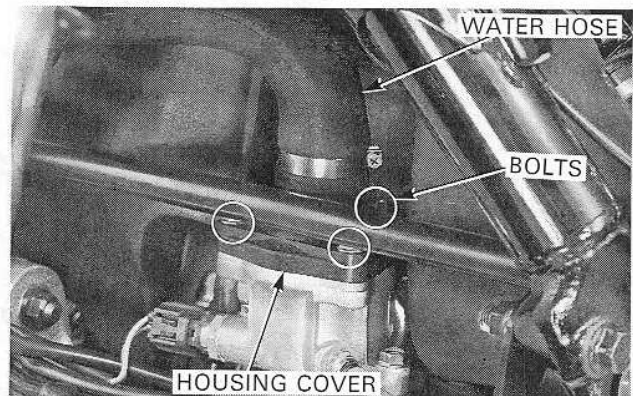
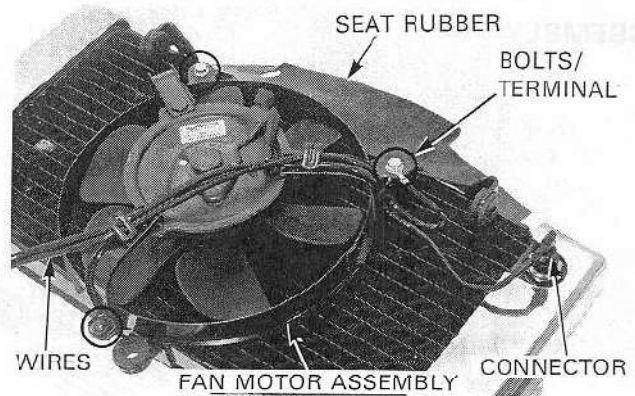
THERMOSTAT

REMOVAL

Remove the radiator (page 6-7).

Remove the water hose from the thermostat housing cover.
Remove the cover bolts and the housing cover.

Remove the thermostat from the housing.



Disconnect the thermosensor and engine coolant temperature (ECT) sensor connectors.
Remove the two mounting bolts and ground terminal.
Pull out the thermostat housing gradually and remove it.
If necessary during housing removal, loosen the bolts (do not remove) that hold the coolant tubes.

Remove the O-rings.

INSPECTION

▲WARNING

- *Wear insulated gloves and adequate eye protection.*
- *Keep flammable materials away from the electric heating element.*

Visually inspect the thermostat for damage.

Heat the water with an electric heating element to operating temperature for 5 minutes.

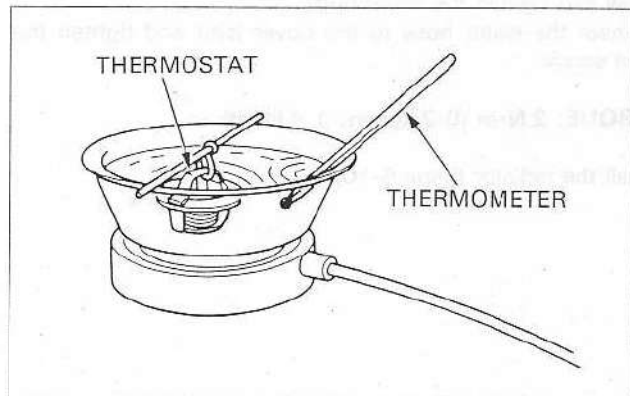
Suspend the thermostat in heated water to check its operation.

NOTE

- Do not let the thermostat or thermometer touch the pan, or you will get false readings.

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

THERMOSTAT BEGINS TO OPEN: 80–84°C (176–183°F)
VALVE LIFT: 8 mm (0.31 in) minimum
at 95°C (203°F)



INSTALLATION

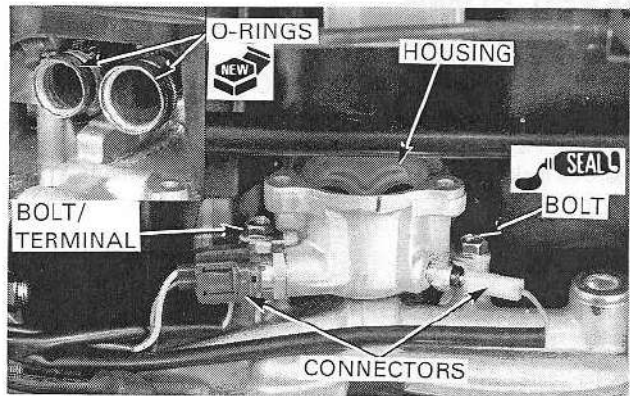
Coat new O-ring with coolant and install them onto the water pipes.

Carefully install the thermostat housing to the water pipes until the bolt holes in the housing and crankcase are aligned.

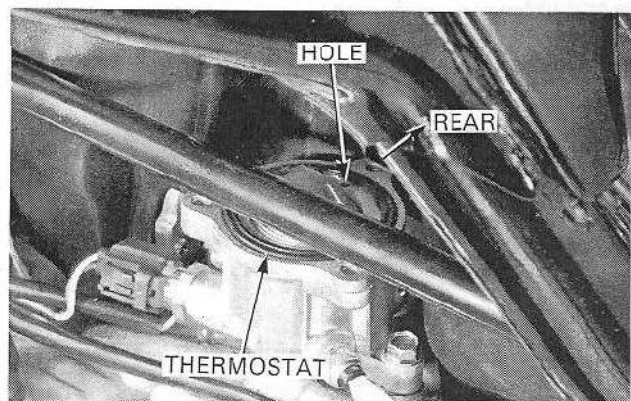
Apply sealant to the housing mounting bolt (left side only) threads.

Install the mounting bolts with the ground terminal and tighten them.

Connect the thermosensor and ECT sensor connectors.

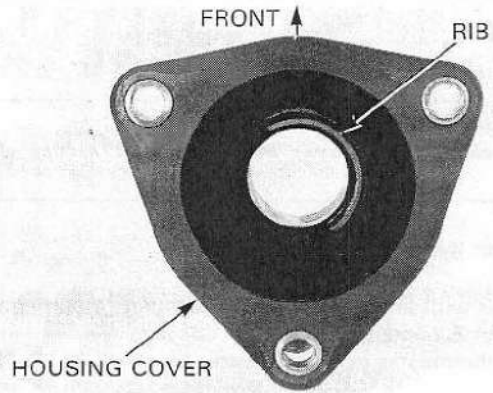


Install the thermostat into the housing with its hole facing the rear side properly.



COOLING SYSTEM

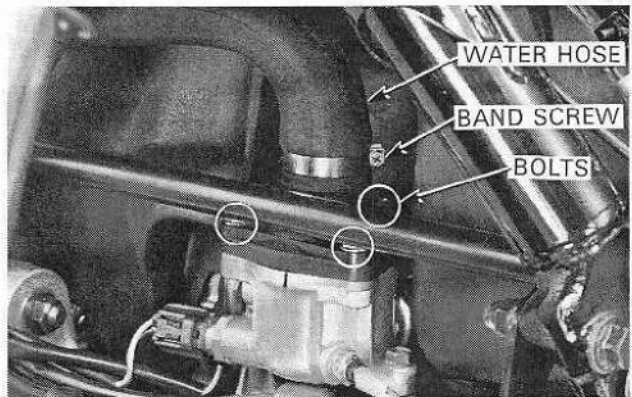
Install the housing cover with its rib side facing the front left side.



Install and tighten the cover bolts.
Connect the water hose to the cover joint and tighten the band screw.

TORQUE: 2 N·m (0.2 kgf·m, 1.4 lbf·ft)

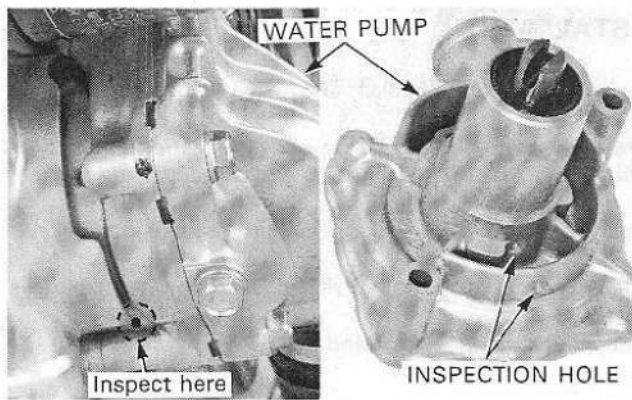
Install the radiator (page 6-10).



WATER PUMP

MECHANICAL SEAL INSPECTION

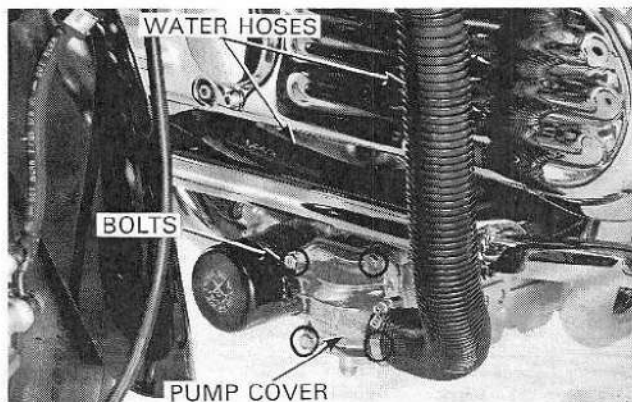
Check the inspection hole for signs of coolant leakage.
If there is leakage, the mechanical seal is defective, and the water pump should be replaced as an assembly.



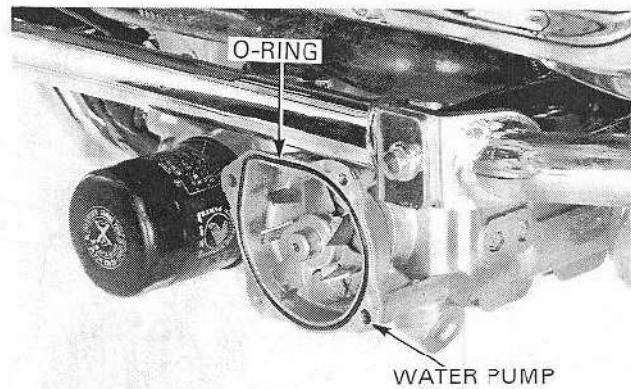
REMOVAL

Drain the coolant (page 6-5).

Disconnect the water hoses from the pump.
Remove the four bolts and the water pump cover.



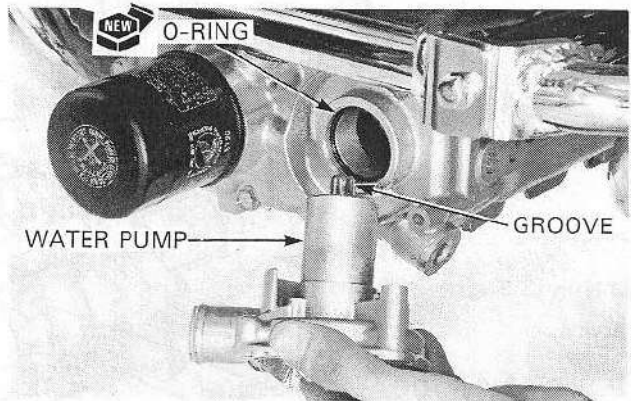
Remove the O-ring and water pump from the engine.



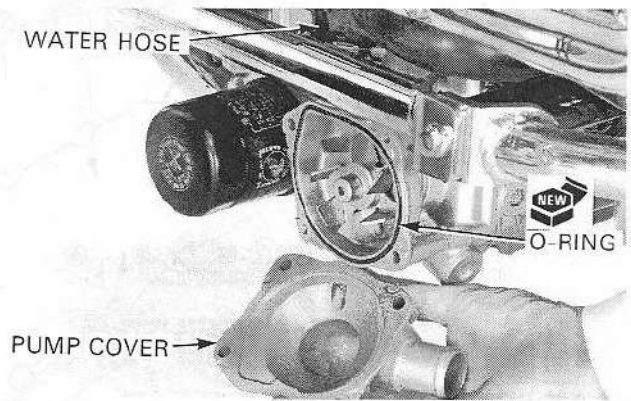
INSTALLATION

Coat a new O-ring with oil and install it onto the stepped portion of the engine.

Install the water pump into the engine while aligning the water pump shaft groove with the oil pump shaft end.



Connect the water hose.
Install a new O-ring into the groove in the water pump.



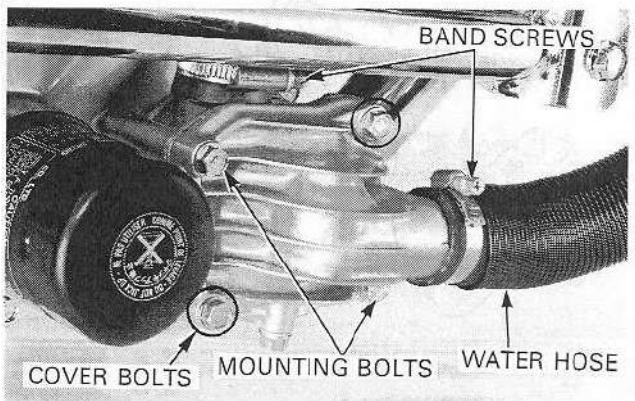
Install the pump cover and tighten the four bolts.

TORQUE: Mounting bolts: 12 N·m (1.2 kgf·m, 9 lbf·ft)
Cover bolts: 13 N·m (1.3 kgf·m, 9 lbf·ft)

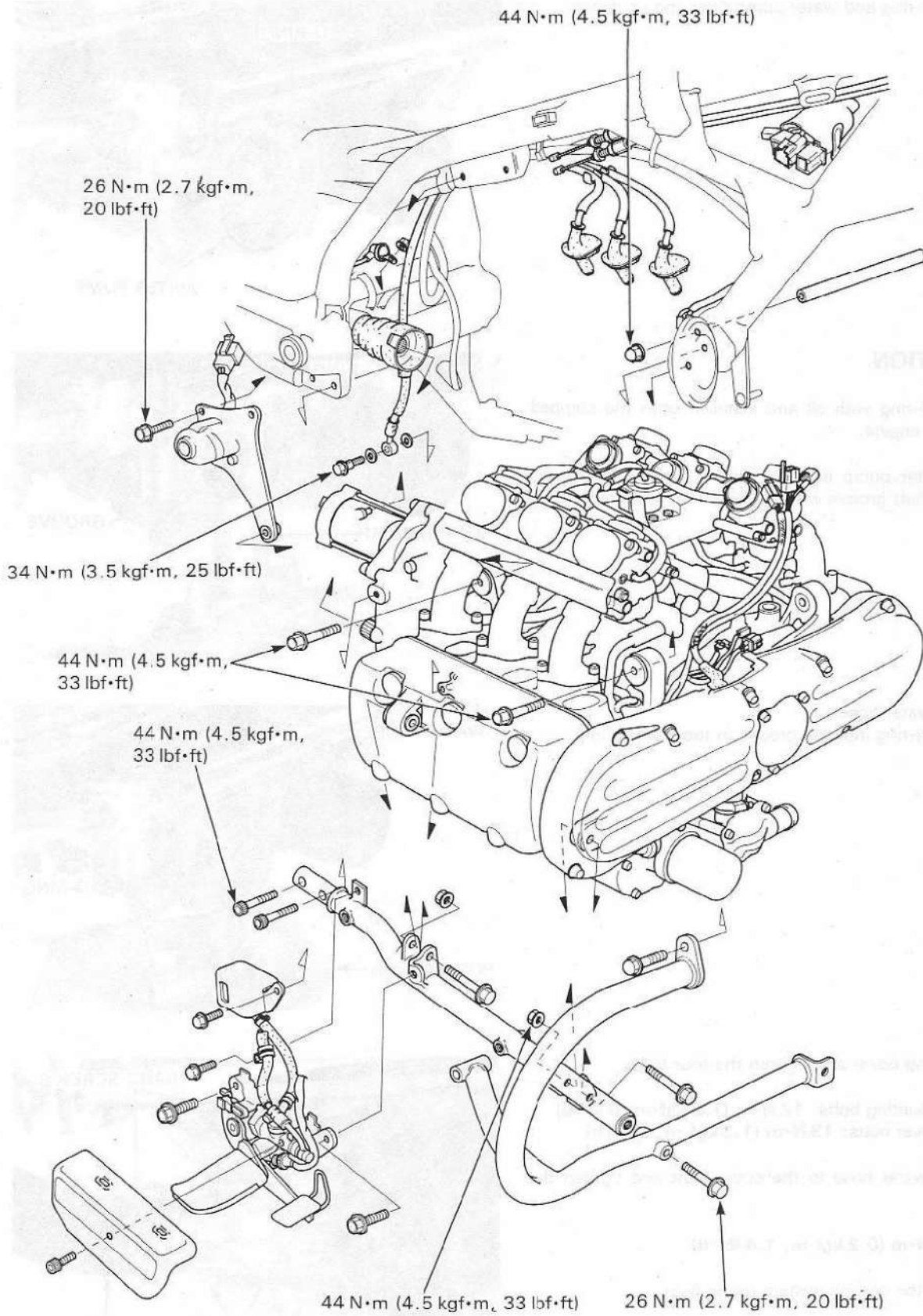
Connect the water hose to the cover joint and tighten the band screws.

TORQUE: 2 N·m (0.2 kgf·m, 1.4 lbf·ft)

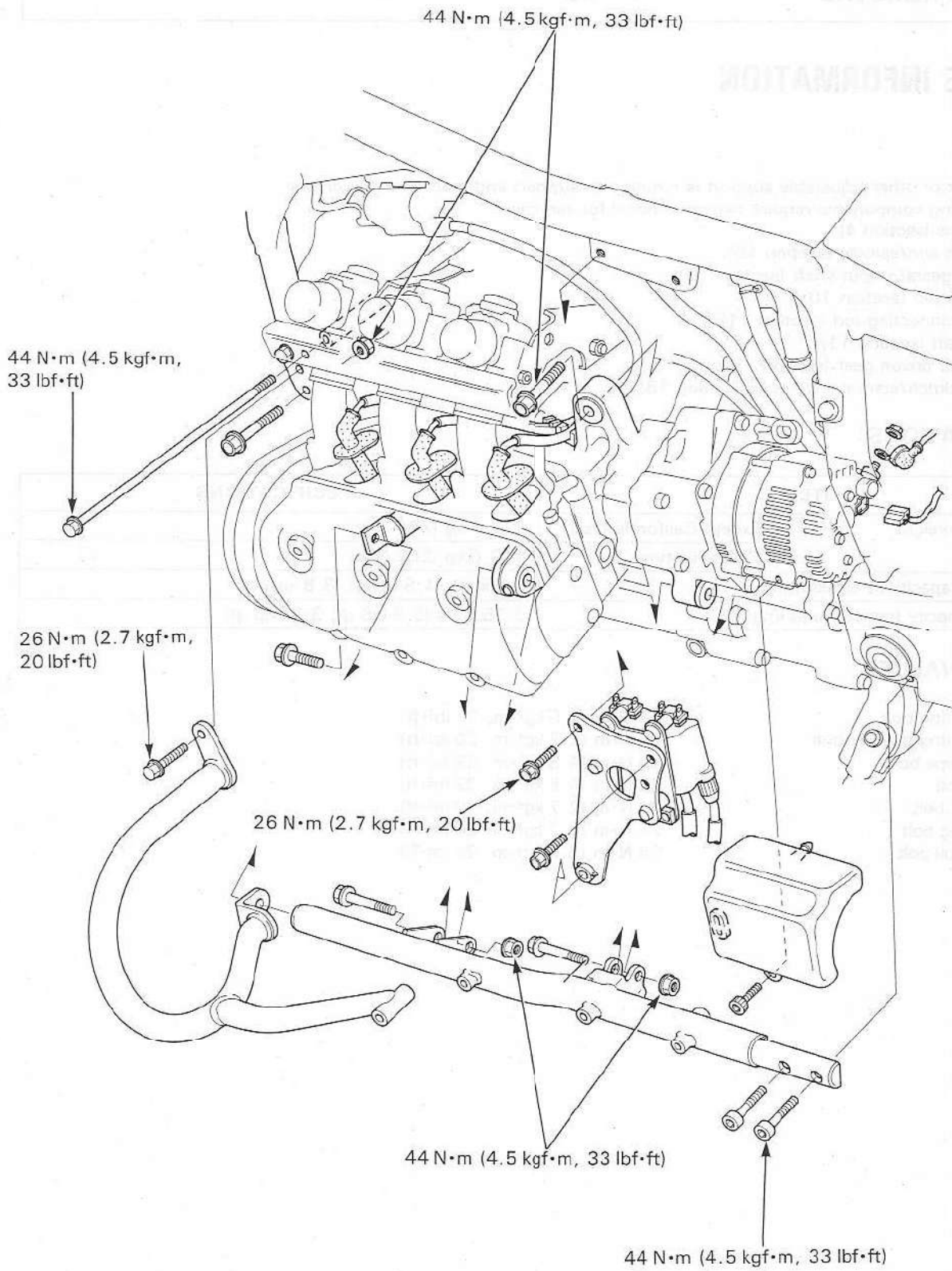
Fill and bleed the cooling system (page 6-5).



ENGINE REMOVAL/INSTALLATION



7. ENGINE REMOVAL/INSTALLATION



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

SERVICE INFORMATION

GENERAL

- A floor jack or other adjustable support is required to support and maneuver the engine.
- The following components require engine removal for service.
 - Oil pumps (section 4)
 - Gearshift arm/spindle (section 10)
 - Primary gears/output shaft (section 10)
 - Transmission (section 10)
 - Piston/connecting rod (section 11)
 - Crankshaft (section 11)
 - Alternator driven gear (section 16)
 - Starter clutch/starter drive gear (section 18)

SPECIFICATIONS

ITEM		SPECIFICATIONS
Engine dry weight	Except California type	118.7 kg (261.7 lb)
	California type	119.0 kg (262.3 lb)
Engine oil capacity at disassembly		4.3 liters (4.5 US qt, 3.8 Imp qt)
Coolant capacity (radiator and engine)		3.75 liters (3.9 US qt, 3.3 Imp qt)

TORQUE VALUES

Engine mounting bolt	44 N·m (4.5 kgf·m, 33 lbf·ft)
Engine mounting bracket bolt	26 N·m (2.7 kgf·m, 20 lbf·ft)
Front cross pipe bolt	44 N·m (4.5 kgf·m, 33 lbf·ft)
Sub-frame bolt	44 N·m (4.5 kgf·m, 33 lbf·ft)
Engine guard bolt	26 N·m (2.7 kgf·m, 20 lbf·ft)
Driver footpeg bolt	26 N·m (2.7 kgf·m, 20 lbf·ft)
Clutch hose oil bolt	34 N·m (3.5 kgf·m, 25 lbf·ft)

ENGINE REMOVAL

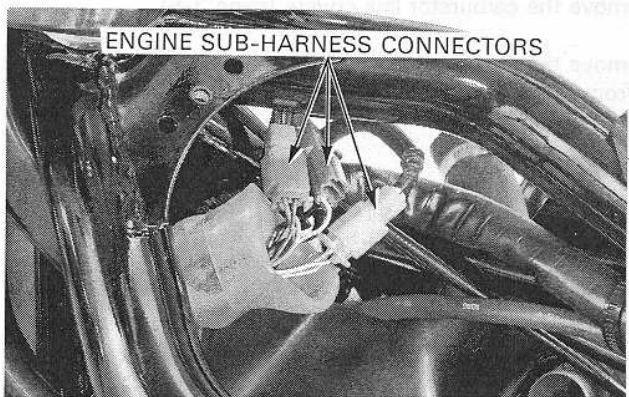
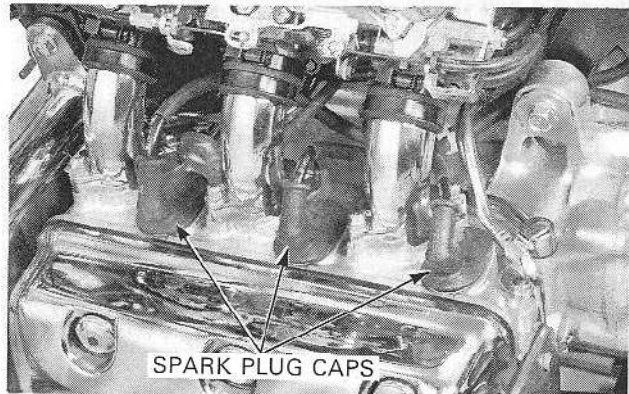
Disconnect the battery negative (-) cable from the battery (page 16-5).
Drain the engine oil (page 3-9).

Remove the following:

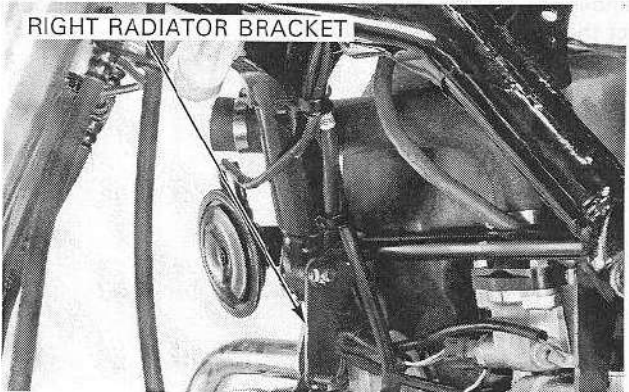
- fuel tank (page 2-4).
- exhaust system (page 2-12).
- air cleaner housing (page 5-4).
- radiator (page 6-7).
- starter motor (page 18-4)

Disconnect the spark plug caps.

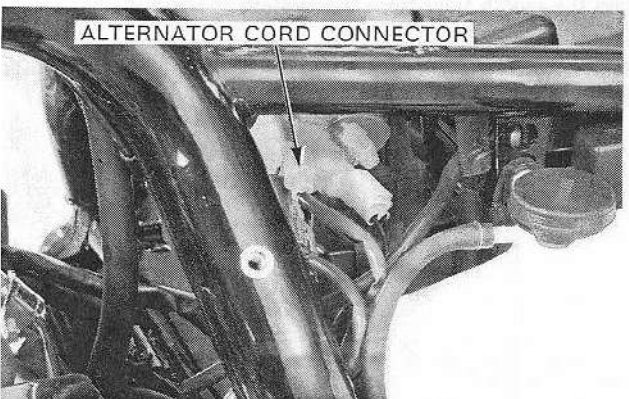
Disconnect the engine sub-harness (4P-White, 2P-Blue, 4P-Red) connectors.



Remove the right radiator bracket and free the engine sub-harness from the frame.

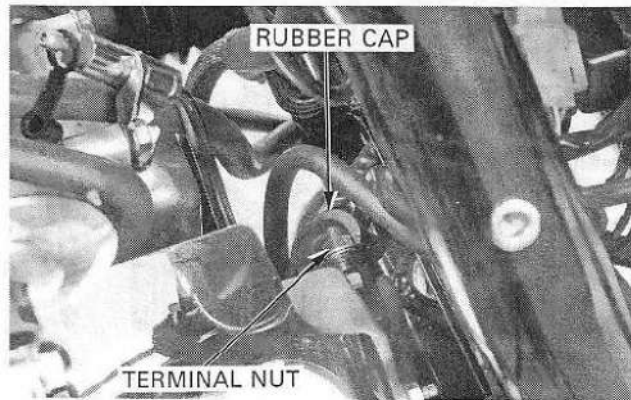


Disconnect the alternator wire (2P-White) connector.



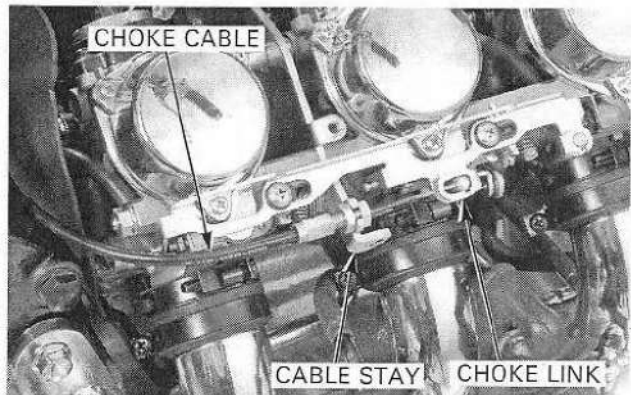
ENGINE REMOVAL/INSTALLATION

Remove the rubber cap and disconnect the alternator cable by removing the terminal nut.

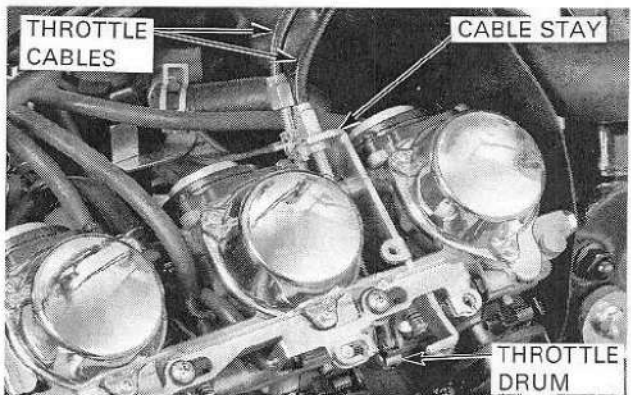


Remove the carburetor link covers (page 3-5).

Remove the choke cable from the cable stay and disconnect it from the choke link.

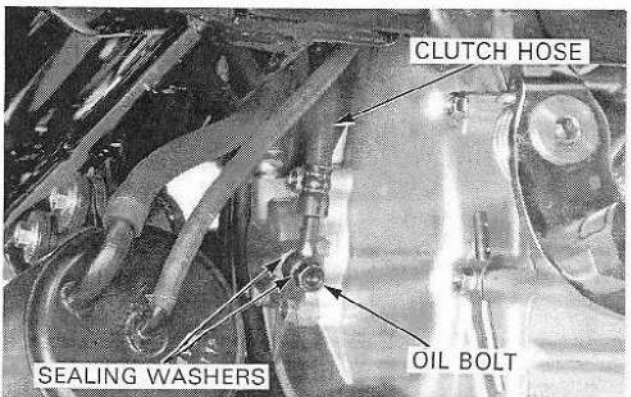


Remove the throttle cables from the cable stay and disconnect them from the throttle drum.



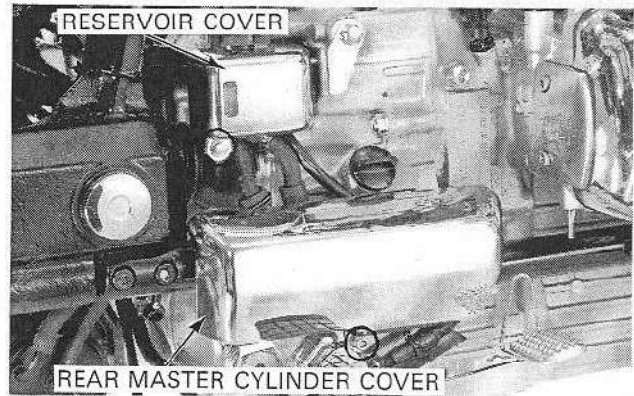
Drain the clutch fluid from the system (page 9-4).

Disconnect the clutch hose from the slave cylinder by removing the oil bolt and sealing washers.



ENGINE REMOVAL/INSTALLATION

Remove the rear master cylinder cover and reservoir cover.



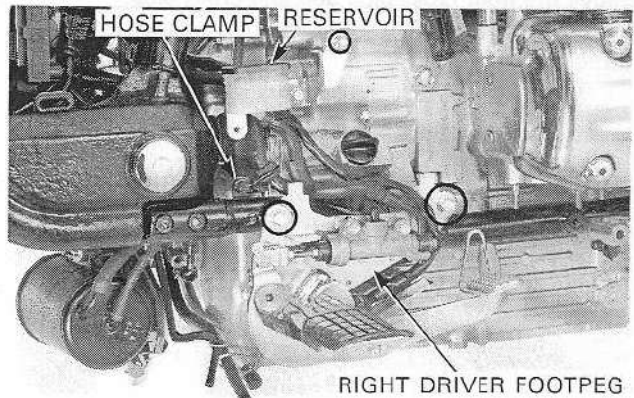
Remove the following as an assembly:

- rear brake fluid reservoir.
- rear brake hose clamp.
- right driver footpeg.

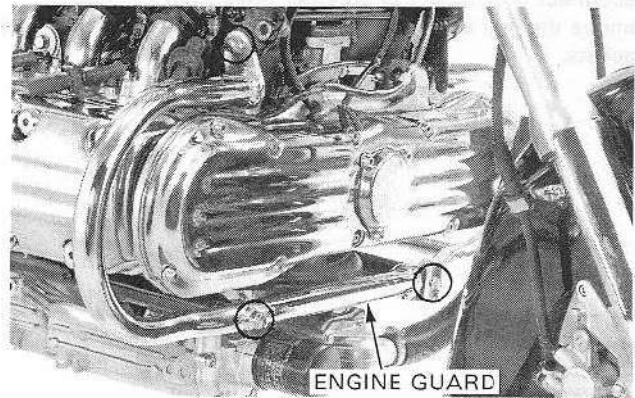
Hang the assembly out of the way using a wire or piece of string.

CAUTION

- *Keep the reservoir upright to prevent air from entering the hydraulic system.*
- *Do not hang the right foot peg from the rear brake hose.*



Remove the engine guards from the frame and sub-frame.

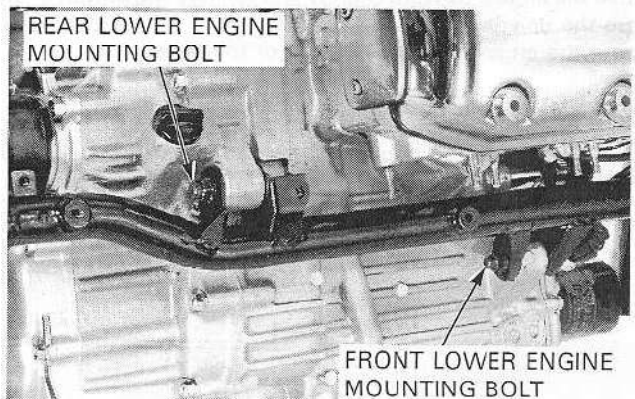


Place a floor jack or other adjustable support under the engine.

NOTE

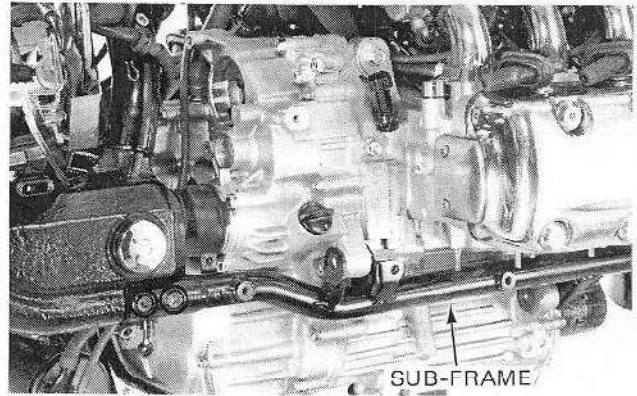
- The jack height must be continually adjusted to relieve stress for ease of bolt removal.

Remove the front and rear lower engine mounting bolts.

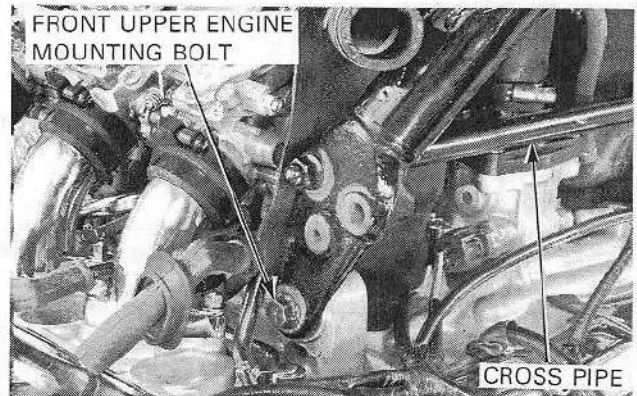


ENGINE REMOVAL/INSTALLATION

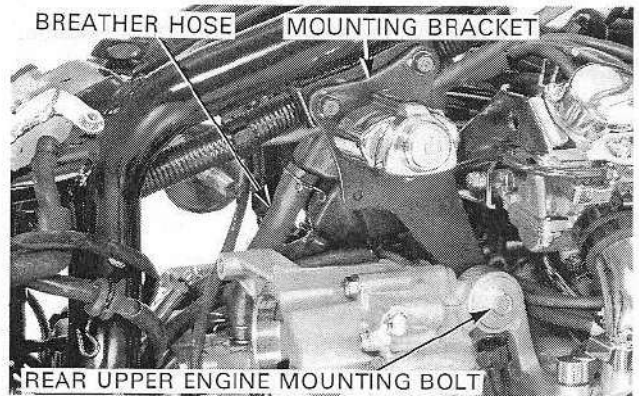
Remove the sub-frame bolts and the sub-frames.



Remove the front cross pipe bolt and cross pipe.
Remove the front upper engine mounting bolts.



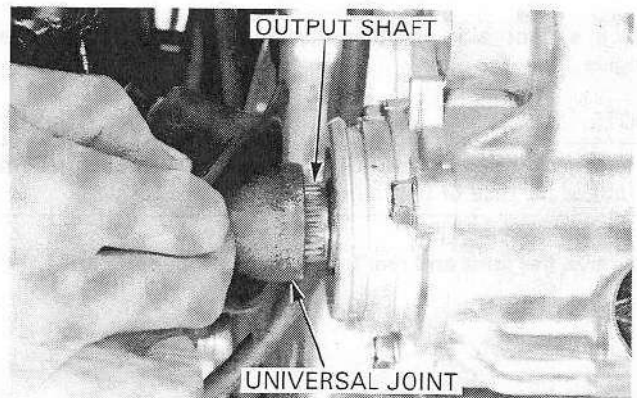
Disconnect the crankcase breather hose from the engine.
Remove the rear upper engine mounting bolts and mounting brackets.



Move the engine forward slightly and remove the output shaft from the universal joint.
Lower the engine and move it out of the frame.

CAUTION

- *Be careful not to damage the wire harnesses, hoses, tubes and cables during engine removal.*



ENGINE INSTALLATION

Apply molybdenum disulfide grease to the output shaft splines.

Carefully maneuver the engine into the frame while aligning the output shaft with the universal joint. Slide the output shaft into the universal joint and install the boot onto the engine.

CAUTION

- *Be careful not to damage the wire harness, hoses, tubes and cables during engine installation.*

Carefully align the mounting points with the jack and install the upper engine mounting bolts and mounting brackets. Install the sub-frames, lower engine mounting bolts and front cross pipe. Hand-tighten all bolts and nuts.

Tighten the mounting bracket bolts and sub-frame bolts.

TORQUE: Bracket bolt: 26 N·m (2.7 kgf·m, 20 lbf·ft)
Sub-frame bolt: 44 N·m (4.5 kgf·m, 33 lbf·ft)

Tighten the front cross pipe bolt.

TORQUE: 44 N·m (4.5 kgf·m, 33 lbf·ft)

Tighten the upper and lower engine mounting bolts.

TORQUE: 44 N·m (4.5 kgf·m, 33 lbf·ft)

Install the removed parts in the reverse order of removal.

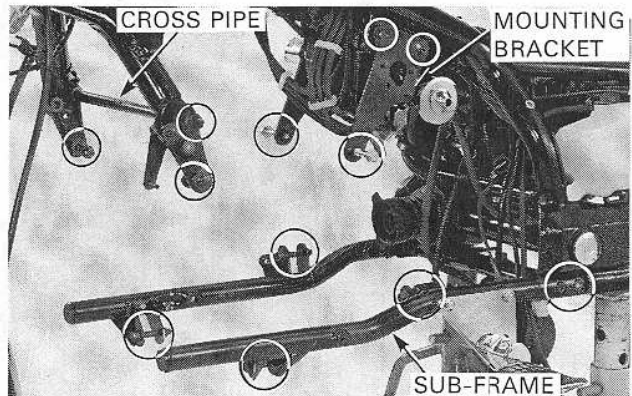
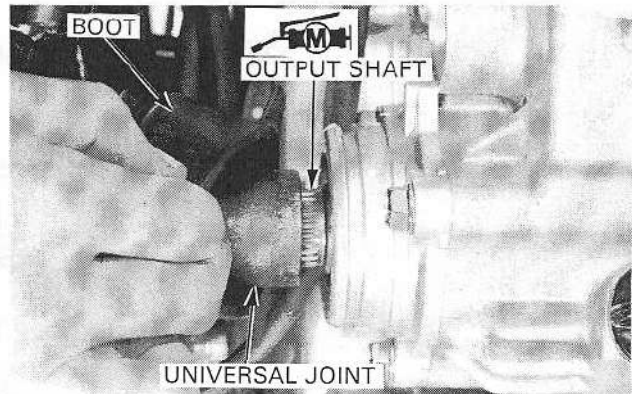
NOTE

- Route the wire harnesses, hoses, tubes and cables properly (page 1-21).
- Use new sealing washers when connecting the clutch hose.

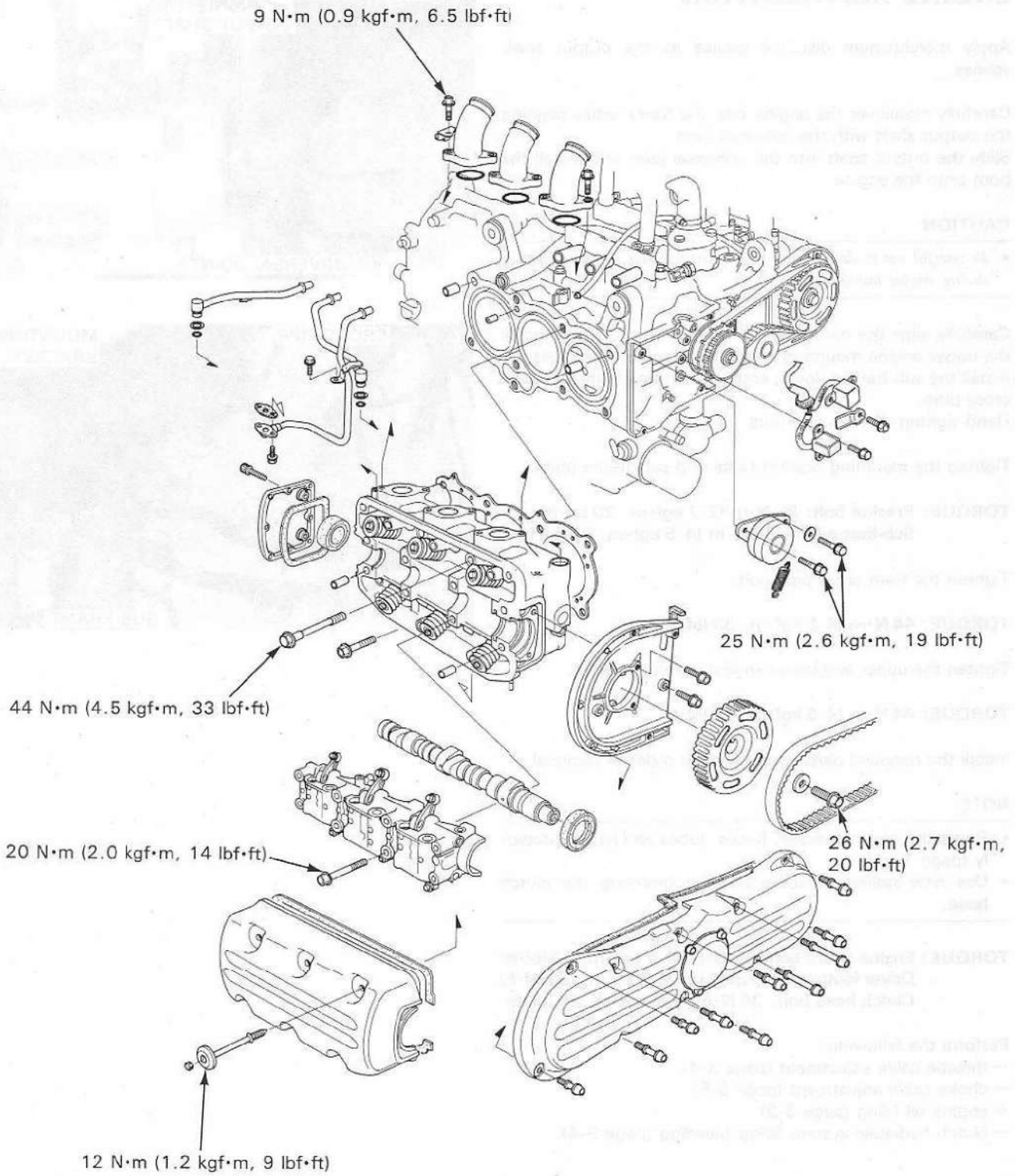
TORQUE: Engine guard bolt: 26 N·m (2.7 kgf·m, 20 lbf·ft)
Driver footpeg bolt: 26 N·m (2.7 kgf·m, 20 lbf·ft)
Clutch hose bolt: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Perform the following:

- throttle cable adjustment (page 3-4).
- choke cable adjustment (page 3-5).
- engine oil filling (page 3-9).
- clutch hydraulic system filling/bleeding (page 9-4).



CYLINDER HEAD/VALVE



8. CYLINDER HEAD/VALVE

SERVICE INFORMATION	8-1	VALVE GUIDE REPLACEMENT	8-15
TROUBLESHOOTING	8-3	VALVE SEAT INSPECTION/ REFACING	8-17
CYLINDER COMPRESSION	8-4	CYLINDER HEAD ASSEMBLY	8-20
TIMING BELT REMOVAL	8-5	CYLINDER HEAD INSTALLATION	8-21
CAMSHAFT REMOVAL	8-7	CAMSHAFT HOLDER ASSEMBLY	8-23
CAMSHAFT HOLDER DISASSEMBLY	8-10	CAMSHAFT INSTALLATION	8-24
CYLINDER HEAD REMOVAL	8-11	TIMING BELT INSTALLATION	8-27
CYLINDER HEAD DISASSEMBLY	8-12		

SERVICE INFORMATION

GENERAL

- This section covers service of the timing belt, cylinder head, valves, camshaft and rocker arms. These parts can be serviced with the engine installed in the frame.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their original locations.
- Clean all disassembled parts with cleaning solvent and dry them by blowing them off with compressed air before inspection.
- Camshaft and rocker arm lubricating oil is fed through oil passages in the cylinder head. Clean the oil passages before assembling cylinder head.
- Be careful not to damage the mating surfaces by using the screw driver when removing the head cover and cylinder head.
- Inspect and adjust the timing belt tension while the engine is cold.
- Do not contaminate the timing belts with oil. Oil will cause the rubber to swell and affect the camshaft timing.
- Do not twist the belts or bend to a radius of less than 25 mm (1 in), to avoid possible fracture of the fiberglass material.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression			1,177 kPa (12.0 kgf/cm ² , 171 psi)/ 400 rpm	—
Cylinder	Warpage		—	0.10 (0.004)
Camshaft	Cam lobe height	IN	35.1350—35.2950 (1.3833—1.3896)	35.00 (1.378)
		EX	35.1787—35.3387 (1.3850—1.3913)	35.03 (1.379)
	Runout		—	0.10 (0.004)
	Journal O.D.	Both inner	26.944—26.965 (1.0608—1.0616)	26.91 (1.059)
		Both ends	26.959—26.980 (1.0614—1.0622)	26.91 (1.059)
	Journal I.D.		27.000—27.021 (1.0630—1.0638)	27.05 (1.065)
	Oil clearance	Both inner	0.035—0.077 (0.0012—0.0030)	0.14 (0.006)
Both ends		0.020—0.062 (0.0008—0.0024)	0.14 (0.006)	
Rocker arm	Rocker arm I.D.	IN/EX	12.000—12.018 (0.4724—0.4731)	12.03 (0.474)
	Rocker arm shaft O.D.	IN/EX	11.966—11.984 (0.4711—0.4718)	11.95 (0.470)
	Rocker arm-to-shaft clearance	IN/EX	0.016—0.052 (0.0006—0.0020)	0.08 (0.003)

CYLINDER HEAD/VALVE

(cont'd)

ITEM			STANDARD	SERVICE LIMIT
Valve and valve guide	Valve clearance	IN	0.15 (0.006)	—
		EX	0.22 (0.009)	—
	Valve stem O.D.	IN	5.475—5.490 (0.2156—0.2161)	5.45 (0.215)
		EX	5.455—5.470 (0.2148—0.2154)	5.44 (0.214)
	Valve guide I.D.	IN/EX	5.500—5.512 (0.2165—0.2170)	5.55 (0.219)
	Stem-to-guide clearance	IN	0.010—0.037 (0.0004—0.0015)	0.08 (0.003)
		EX	0.030—0.057 (0.0012—0.0022)	0.10 (0.004)
	Valve guide projection above cylinder head	IN/EX	18.5 (0.73)	—
Valve seat width	IN/EX	1.2 (0.05)	—	
Valve spring free length	IN/EX	47.8 (1.88)	46.5 (1.83)	

TORQUE VALUES

Timing belt tensioner bolt	25 N•m (2.6 kgf•m, 19 lbf•ft)	Apply locking agent to the threads.
Timing belt driven pulley bolt	26 N•m (2.7 kgf•m, 20 lbf•ft)	
Spark plug	16 N•m (1.6 kgf•m, 12 lbf•ft)	
Cylinder head cover bolt	12 N•m (1.2 kgf•m, 9 lbf•ft)	
Cylinder head bolt (9 mm)	44 N•m (4.5 kgf•m, 33 lbf•ft)	Apply molybdenum oil solution to the threads.
Camshaft holder bolt	20 N•m (2.0 kgf•m, 14 lbf•ft)	
Intake manifold mounting bolt	9 N•m (0.9 kgf•m, 6.5 lbf•ft)	
Engine guard bolt	26 N•m (2.7 kgf•m, 20 lbf•ft)	

TOOLS

Universal holder	07725-0030000	
Valve spring compressor	07757-0010000	
Valve guide driver, 5.5 mm	07742-0010100	
Valve guide driver	07743-0020000	not available in U.S.A. or 07742-0010100
Valve guide reamer, 5.5 mm	07984-2000000	or 07984-200000C
Valve seat cutter holder, 5.5 mm	07781-0010101	or equivalent commercially available in U.S.A.
Valve seat cutter 35 mm (45° IN)	07780-0010400	
33 mm (45° EX)	07780-0010800	
35 mm (32° IN)	07780-0012300	
33 mm (32° EX)	07780-0012900	
37.5 mm (60° IN/EX)	07780-0014100	

TROUBLESHOOTING

Engine top-end problems usually affect engine performances. These can be diagnosed by a compression test, or by tracing top-end noise with a sounding rod or stethoscope. (See page 8-4 for engine compression testing.)

Compression too low, hard starting or poor performance at low speed

- Valves
 - Incorrect valve clearance
 - Burned or bent valves
 - Incorrect valve timing
 - Broken valve spring
 - Uneven valve seating
 - Valve stuck open
- Cylinder head
 - Leaking or damaged cylinder head gasket
 - Warped or cracked cylinder head
 - Loose spark plug

Compression too high

- Excessive carbon build-up on piston or combustion chamber.

Excessive smoke

- Worn valve stem or valve guide
- Damaged stem seal

Excessive noise

- Incorrect valve clearance
- Sticking valve or broken valve spring
- Excessively worn valve seat
- Worn or damaged camshaft
- Worn or damaged rocker arm and/or shaft
- Worn rocker arm follower or valve stem end
- Loose or damaged timing belt
- Weak or damaged belt tensioner
- Damaged timing belt pulleys

Rough idle

- Low cylinder compression

CYLINDER COMPRESSION

Warm up the engine to normal operating temperature.

Stop the engine, disconnect all spark plug caps and remove one spark plug at a time.

NOTE

- To measure the cylinder compression of each cylinder, remove only one plug at a time.

Install the compression gauge into the spark plug hole.

Shift the transmission in neutral.

Open the throttle all the way and crank the engine with the starter motor. Crank the engine until the gauge reading stops rising. The maximum reading is usually reached within 4–7 seconds.

COMPRESSION PRESSURE:

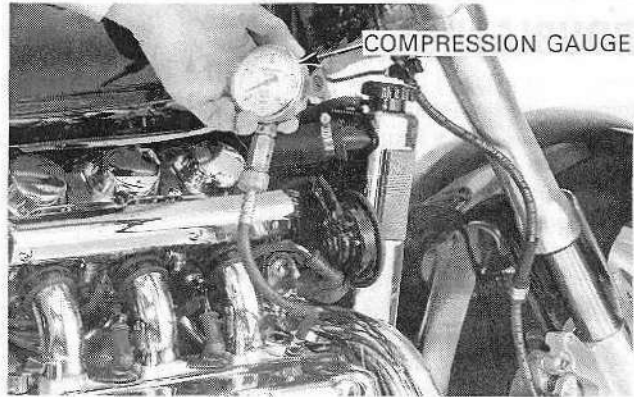
1,177 kPa (12 kgf/cm², 171 psi)/400 rpm

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

If compression is low, pour 3–5 cc (0.1–0.2 oz) of clean engine oil into the cylinder through the spark plug hole and recheck the compression.

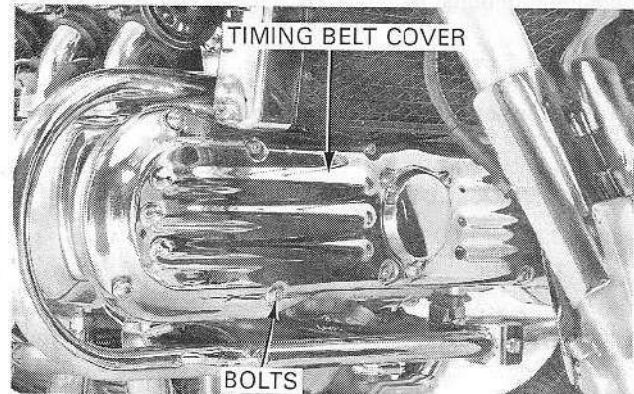
If the compression increases from the previous value, check the cylinder, piston and piston rings.

If compression is the same as the previous value, check the valves for leakage.

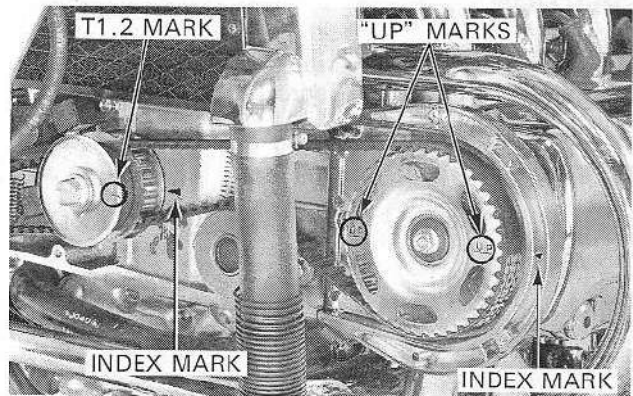


TIMING BELT REMOVAL

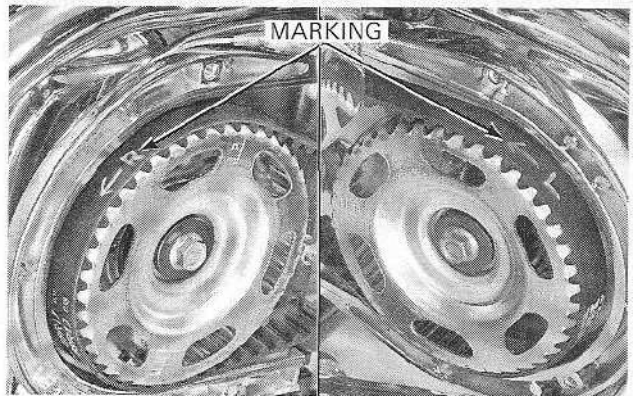
Remove the radiator cover (GL1500CF only: page 2-8).
Remove the cover bolts and the timing belt cover.



Turn the crankshaft counterclockwise until the T1.2 mark on the drive pulley lines up with the index mark on the crankcase. The "UP" marks on the driven pulleys should be facing up.



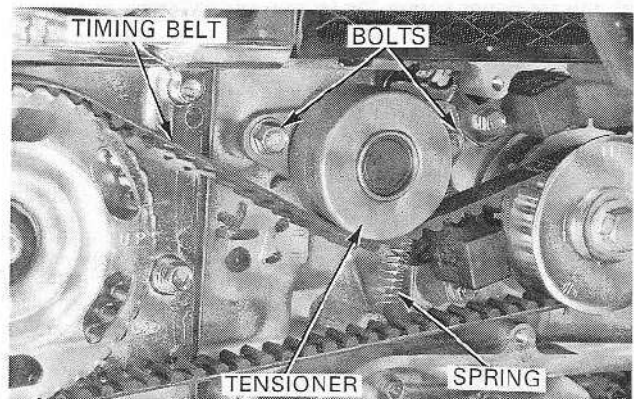
Mark each belt to identify it as "left" or "right" and to show its direction of rotation.



CAUTION

- To prevent belt damage, do not use a screwdriver or other sharp tool to pry off the belts.
- Do not turn the crankshaft or camshafts after removing the timing belt, or you may bend the valves.

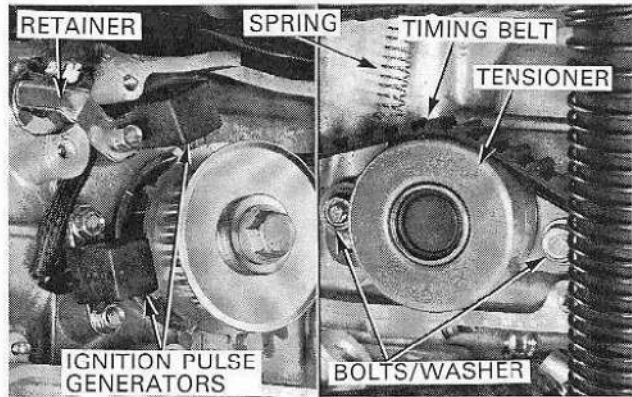
Remove the tensioner spring from the spring holding pin. Loosen the tensioner mounting bolts alternately and gradually, and remove them and the right belt tensioner. Remove the right timing belt.



CYLINDER HEAD/VALVE

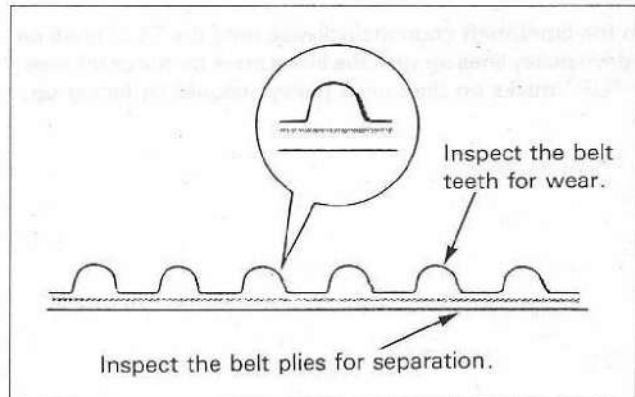
Remove the four bolts, wire retainer and ignition pulse generators.

Remove the tensioner spring from the spring holding pin. Loosen the tensioner mounting bolts alternately and gradually, and remove them and the left belt tensioner. Remove the left timing belt.

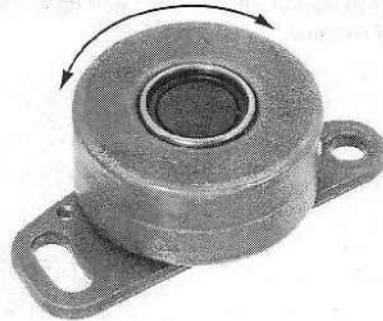


INSPECTION

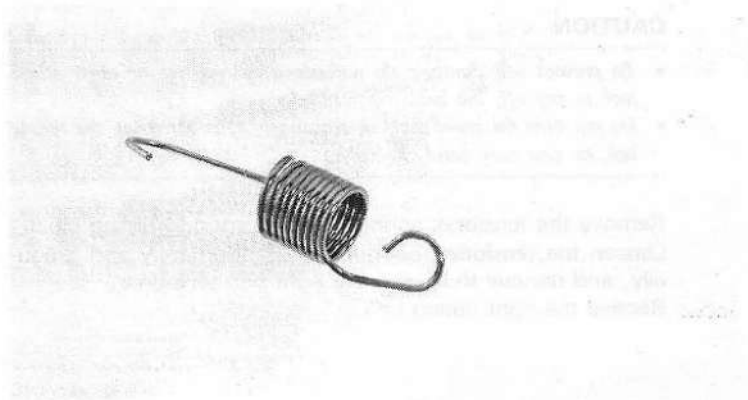
Check the belts for swelling caused by oil contamination. Replace the belts if the material is cracked, teeth are worn, or if swelling is evident.



Inspect the belt tensioner for free movement and smooth rotation.



Check the tensioner spring for fatigue or damage.



CAMSHAFT REMOVAL

Remove the driven pulley bolt, washer and the pulley.

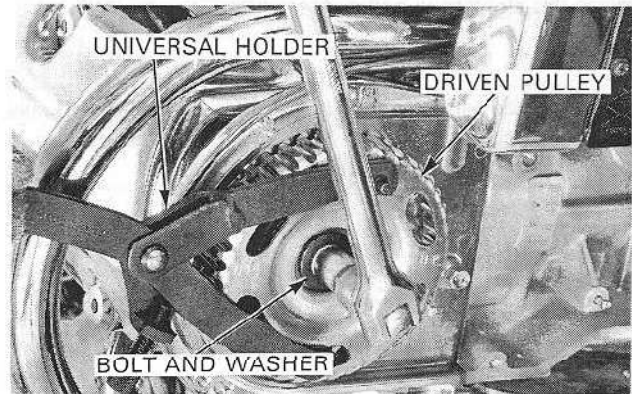
TOOL:

Universal holder

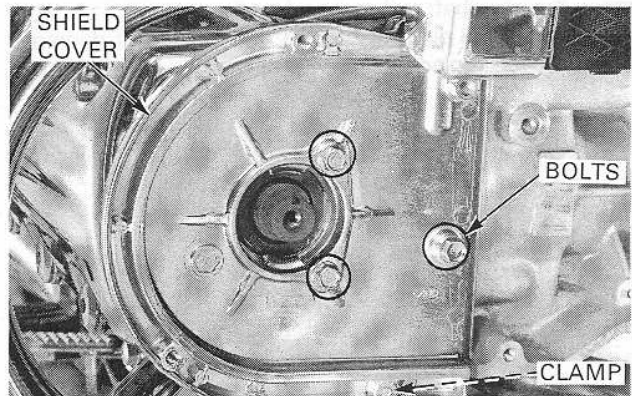
07725-0030000

CAUTION

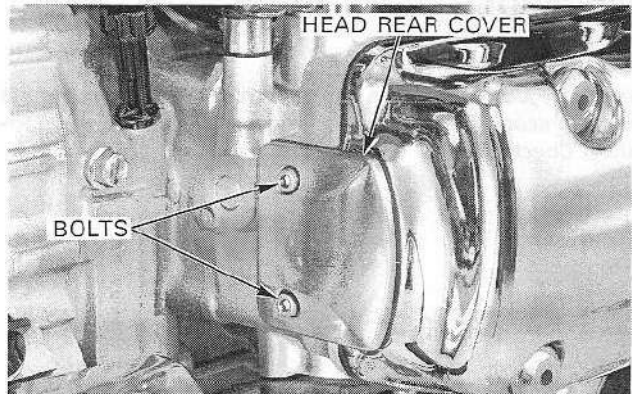
- Do not turn the camshaft (driven pulley) when removing the driven pulley, or you may bend the valves.



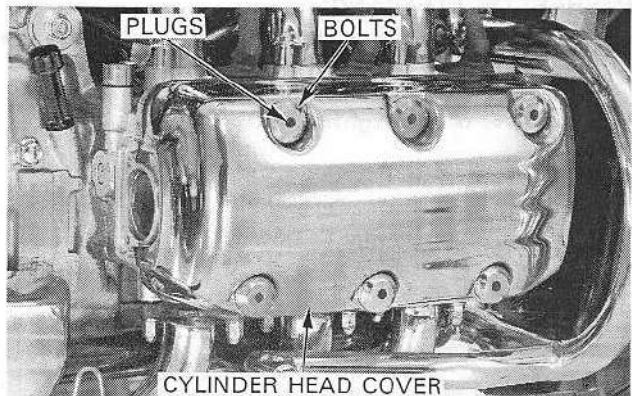
Release the wire harness from the clamp on the right shield cover.
Remove the three bolts and the shield cover.



Remove the two bolts and the cylinder head rear cover.



Remove the rubber plugs from the head cover bolt heads.
Remove the bolts and the cylinder head cover.



CYLINDER HEAD/VALVE

Remove the eight camshaft holder bolts.

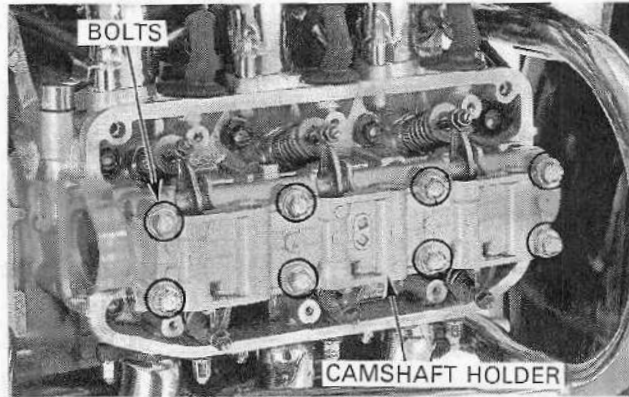
NOTE

- To prevent cocking the camshaft holder assembly gradually loosen the camshaft holder bolts in a crisscross pattern in several steps.

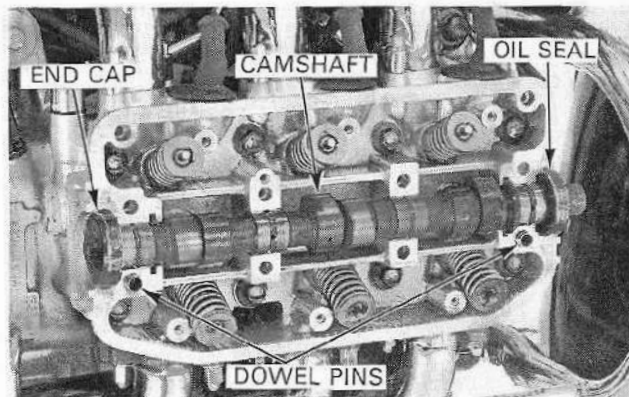
CAUTION

- Do not let the camshaft out of the cylinder head.

Remove the camshaft holder assembly. Mark the camshaft holder as "left" or "right".



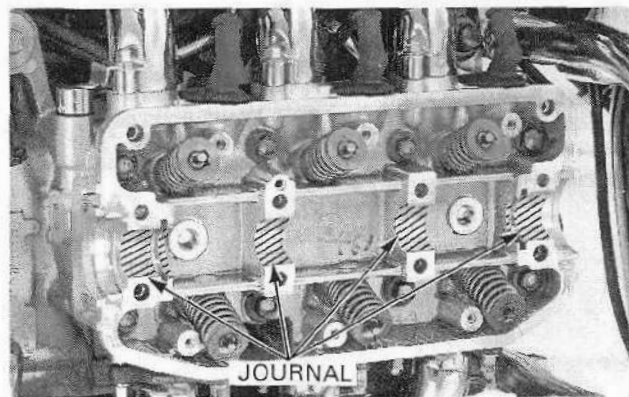
Remove the camshaft, oil seal and end cap. Remove the dowel pins. If the pins are cracked or damaged during removal, replace them with new ones.



INSPECTION

CAMSHAFT JOURNAL

Inspect the journal surfaces of the cylinder head and camshaft holder for scoring, scratching or evidence of insufficient lubrication. Check that the oil passages are clear.



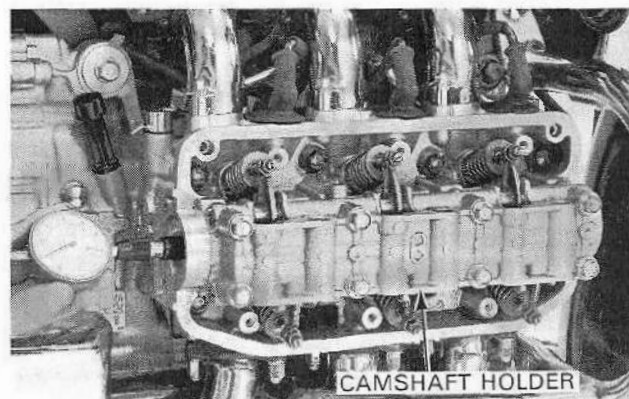
CAMSHAFT OIL CLEARANCE

Install the camshaft holder assembly in place and torque the bolts in a crisscross pattern in 2 or 3 steps.

TORQUE: 20 N·m (2.0 kgf·m, 14 lbf·ft)

Measure and record the I.D. of each bearing.

SERVICE LIMIT: 27.05 mm (1.065 in)



Measure and record the O.D. of each camshaft bearing journal.

SERVICE LIMIT: 26.91 mm (1.059 in)

Subtract each journal O.D. from the corresponding journal I.D. to obtain the oil clearance.

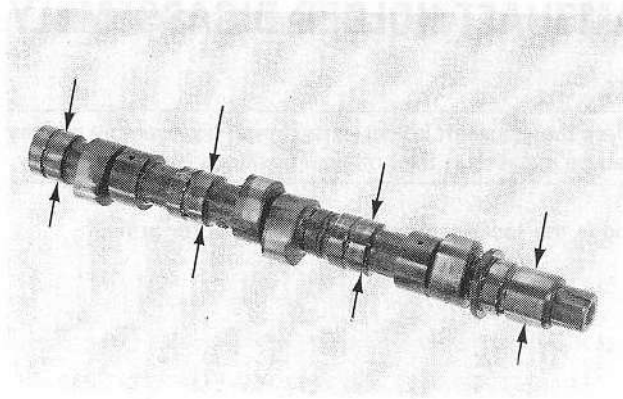
SERVICE LIMIT: 0.14 mm (0.006 in)

NOTE

- Clearance may also be checked by using plastigauge.

When the service limits are exceeded, replace the camshaft and recheck the oil clearance.

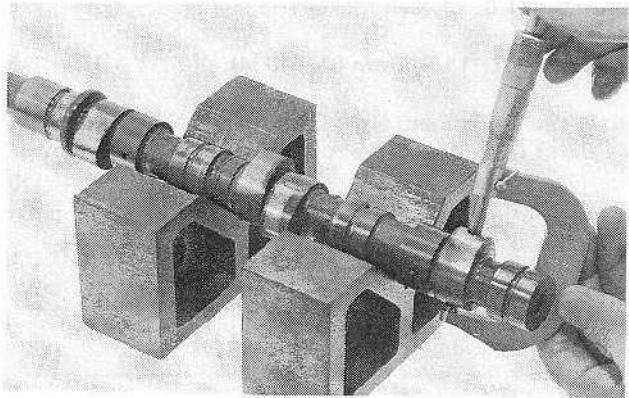
Replace the cylinder head and camshaft holder set if the clearance still exceeds the service limit.



CAM LOBE HEIGHT

Measure the height of each cam lobe using a micrometer.

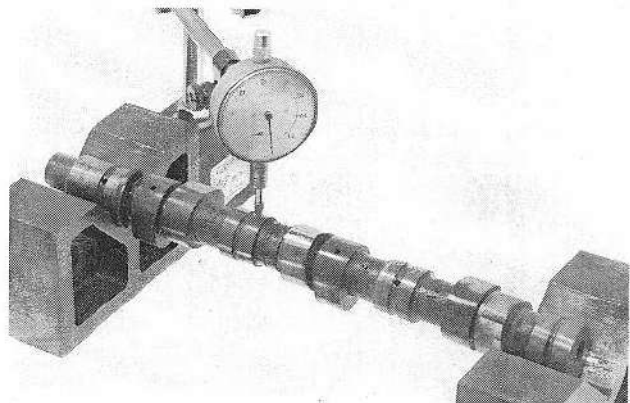
**SERVICE LIMITS: IN: 35.00 mm (1.378 in)
EX: 35.03 mm (1.379 in)**



CAMSHAFT RUNOUT

Support both ends of the camshaft with V-blocks and check the camshaft runout with a dial indicator. Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.10 mm (0.004 in)

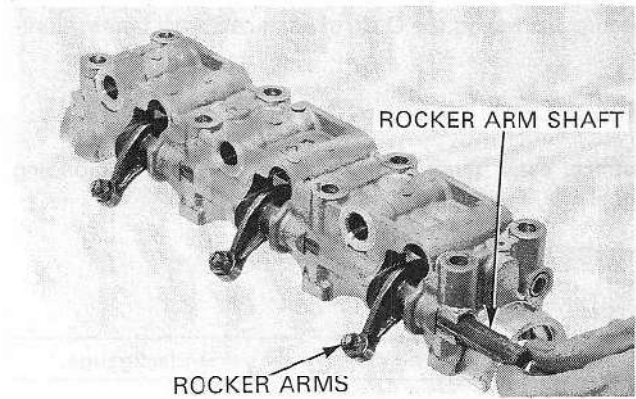


CAMSHAFT HOLDER DISASSEMBLY

NOTE

- Mark the camshaft holder parts during disassembly so they can be installed in their original positions during assembly.

Remove the rocker arm shafts and the rocker arms.



INSPECTION

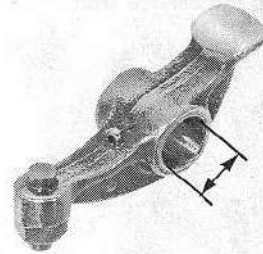
ROCKER ARM/SHAFT

Inspect the rocker arm shafts and rocker arms for wear or damage.

Check that the oil passages are clear.

Measure the I.D. of each rocker arm.

SERVICE LIMIT: 12.03 mm (0.474 in)

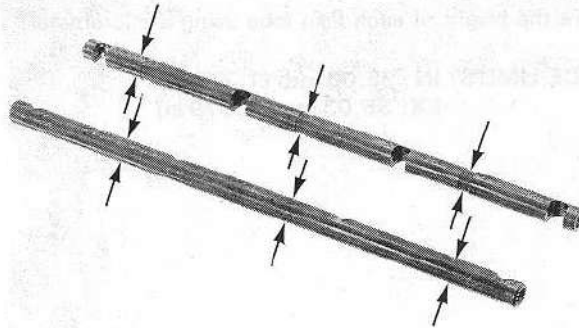


Measure the O.D. of each rocker arm shafts.

SERVICE LIMIT: 11.95 mm (0.470 in)

Subtract each rocker arm shaft O.D. from the corresponding rocker arm I.D. to obtain the rocker arm-to-shaft clearance.

SERVICE LIMIT: 0.08 mm (0.003 in)

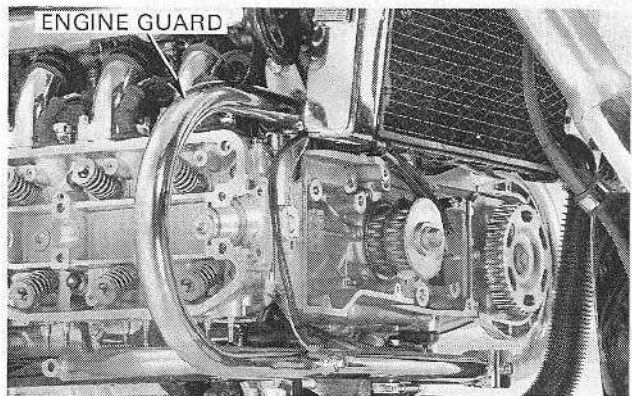


CYLINDER HEAD REMOVAL

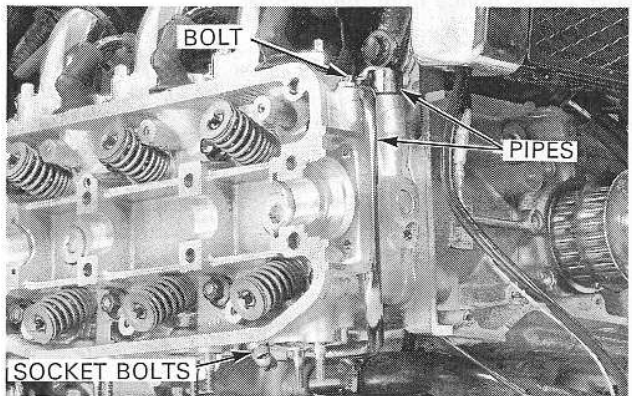
Drain the coolant (page 6-5).

Remove the exhaust pipe/muffler assembly (page 2-12).

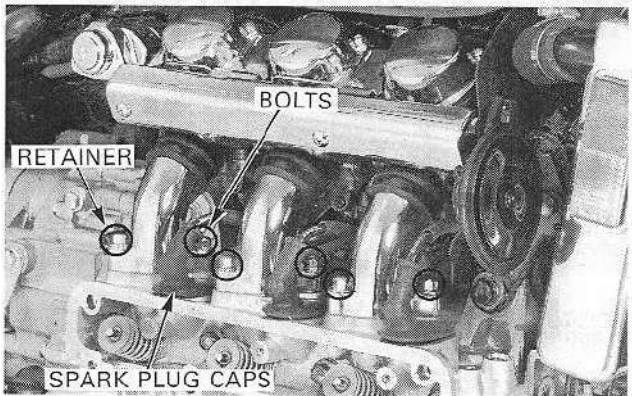
Remove the bolts and the engine guard.



Remove the two socket bolts and pipe retaining bolt.
Remove the air injection pipes from the injection tubes and cylinder head.

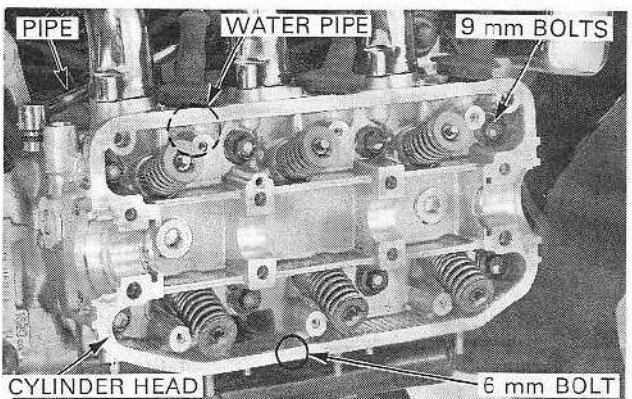


Disconnect the spark plug caps.
Remove the intake manifold bolts and injection pipe retainer.



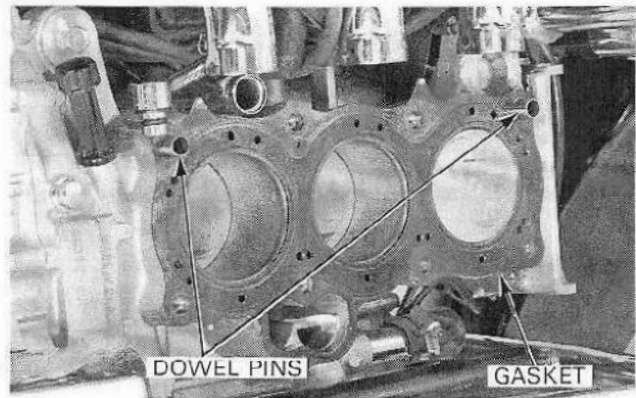
Remove the air injection pipe from the cylinder head.

Remove the eight cylinder head bolts (9 mm) and 6 mm bolt.
Remove the cylinder head from the crankcase and water pipe.



CYLINDER HEAD/VALVE

Remove the cylinder head gasket and dowel pins.
Remove the O-rings from the water pipe, injection pipe and intake manifold.



Remove the oil orifice from the cylinder.



CYLINDER HEAD DISASSEMBLY

NOTE

- Mark all parts during disassembly so they can be placed back in their original locations for installation later.

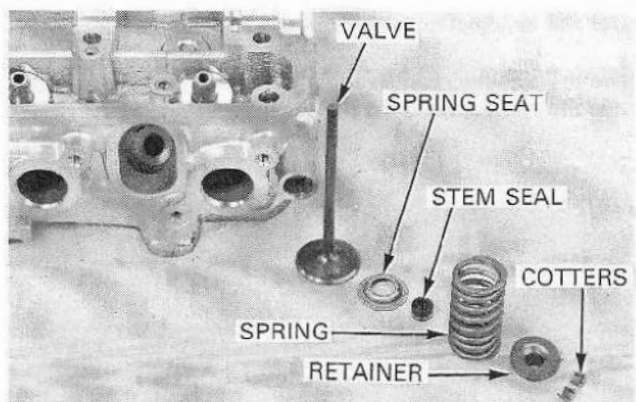
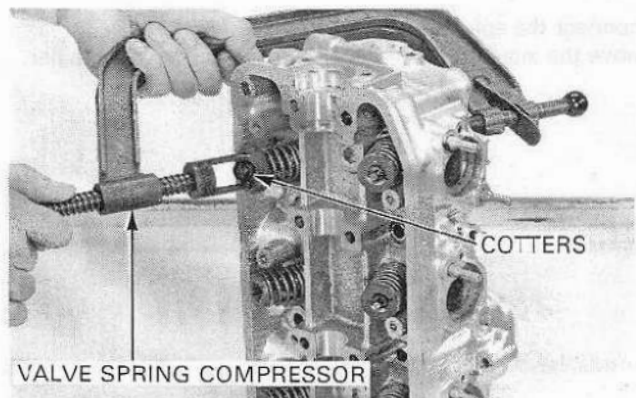
Compress the valve spring using the special tool and remove the valve spring cotters.

TOOL:
Valve spring compressor 07757-0010000

CAUTION

- *Compressing the valve springs more than necessary will cause loss of valve spring tension.*

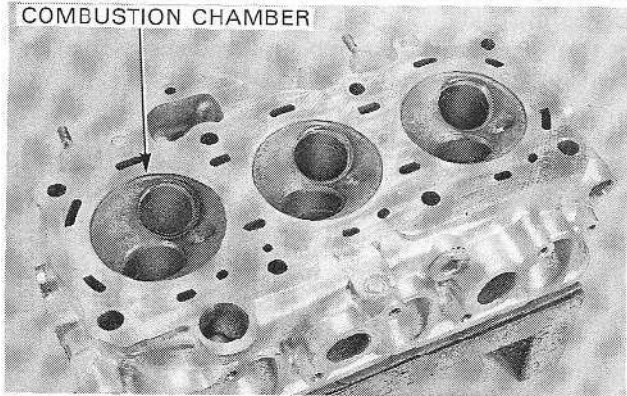
Remove the valve spring compressor, then remove the retainer, spring and valve.
Remove the stem seal and spring seat if necessary.
Do not reuse a removed stem seal.



CAUTION

- *Avoid damaging the gasket and valve seat surfaces.*

Remove the carbon deposits from the combustion chamber and clean off the head gasket surfaces.

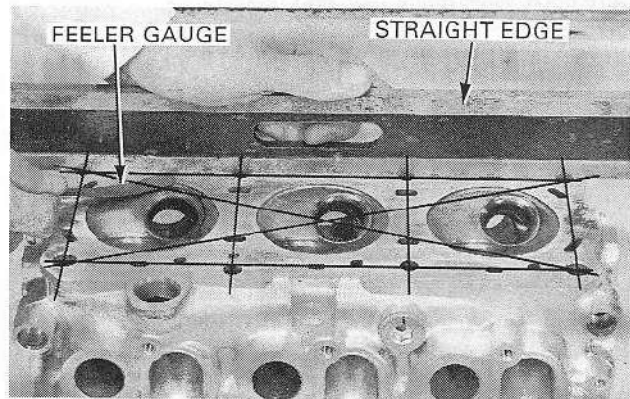


INSPECTION

CYLINDER HEAD

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

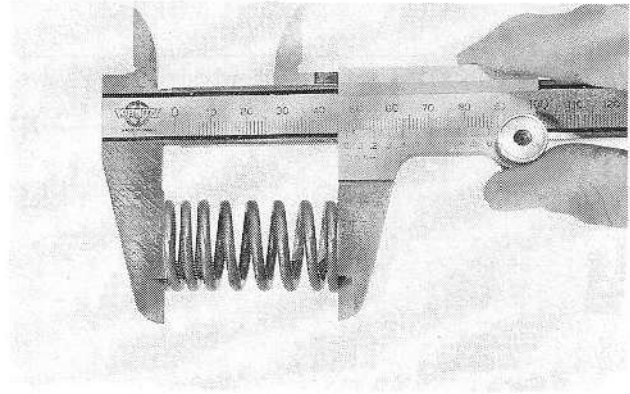
SERVICE LIMIT: 0.10 mm (0.004 in)



VALVE SPRING

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

SERVICE LIMIT: IN/EX: 46.5 mm (1.83 in)



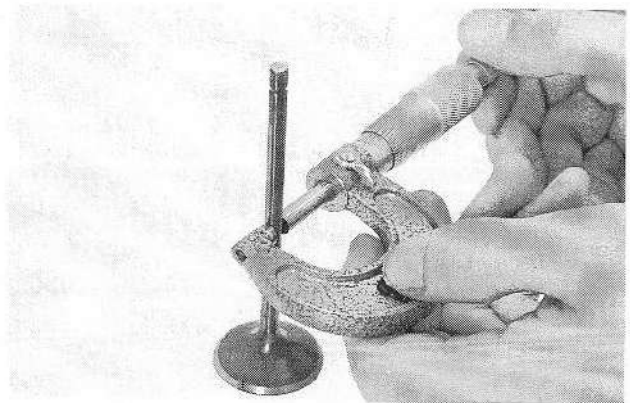
VALVE STEM-TO-GUIDE CLEARANCE

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

Insert the valves in their original positions in the cylinder head. Check that each valve moves up and down smoothly, without binding.

Measure the each valve stem O.D. and record it.

**SERVICE LIMITS: IN: 5.45 mm (0.215 in)
EX: 5.44 mm (0.214 in)**



CYLINDER HEAD/VALVE

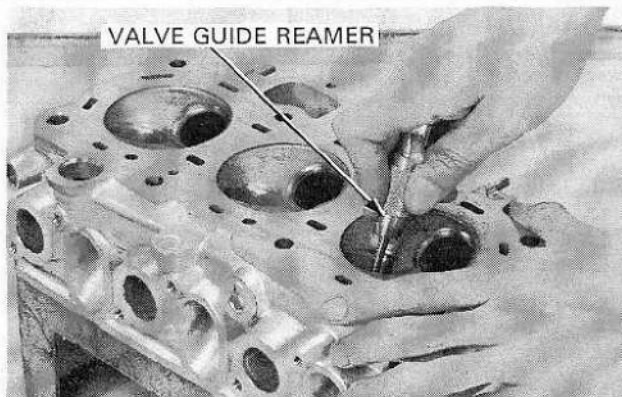
Ream the valve guide to remove any carbon build-up before measuring the guide.

Insert the reamer from the combustion chamber side of the head and always rotate the reamer clockwise.

TOOL:

Valve guide reamer, 5.5 mm

07984-200001 or
07984-20000C



Measure each valve guide I.D. and record it.

SERVICE LIMIT: IN/EX: 5.55 mm (0.219 in)

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

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

If the stem-to-guide clearance exceeds the service limit, determine if a new guide with standard dimensions would bring the clearance within tolerance.

If so, replace any guides as necessary and ream to fit.

If the stem-to-guide clearance exceeds the service limit with new guide, also replace the valve.



NOTE

- Inspect and reface the valve seats whenever the valve guides are replaced (page 8-16).

VALVE GUIDE REPLACEMENT

Chill the valve guides in the freezer section of a refrigerator for about an hour.

▲WARNING

- *Wear insulated gloves to avoid burns when handling the heated cylinder head.*

Heat the cylinder head to 130°C—140°C (275°F—290°F) with a hot plate or oven. Do not heat the cylinder head beyond 150°C (300°F). Use temperature indicator sticks, available from welding supply stores, to be sure the cylinder head is heated to the proper temperature.

CAUTION

- *Using a torch to heat the cylinder head may cause warping.*

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

TOOL:

Valve guide driver 07742-0010100

CAUTION

- *Be careful not to damage the cylinder head.*

Drive the new guides in from the camshaft side of the cylinder head while the cylinder head is still heated using the special tool.

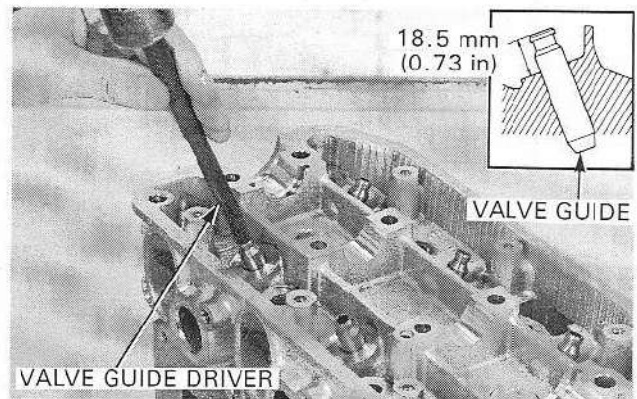
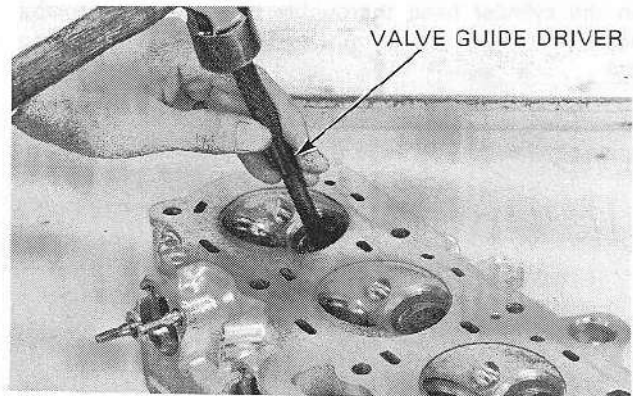
TOOL:

Valve guide driver 07743-0020000
not available in
U.S.A. or
07742-0010100

U.S.A. only procedure:

- using a marker, mark the valve guide with a line at the correct height as specified below.
- chill the guides.
- drive in the valve guide as shown to the line.
- check the projection height with calipers to verify they are within specification.

VALVE GUIDE PROJECTION ABOVE CYLINDER HEAD:
IN/EX: 18.5 mm (0.73 in)



CYLINDER HEAD/VALVE

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

TOOL:

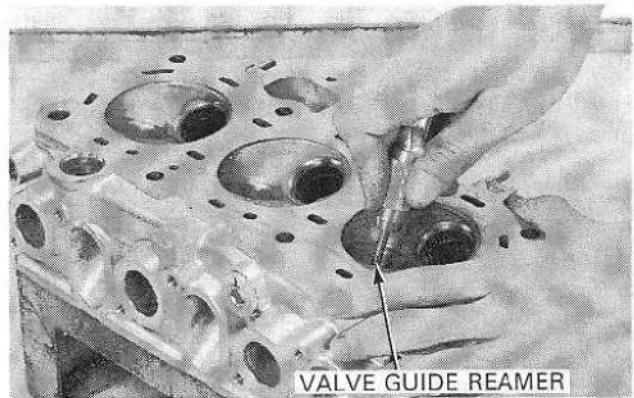
Valve guide reamer, 5.5 mm

07984-200000 or
07984-20000C

NOTE

- Take care not to tilt or lean the reamer in the guide while reaming. Otherwise, the valve will be installed at an angle that causes oil leaks from the stem seal and improper valve seat contact and prevents valve seat refacing.
- Insert the reamer from the combustion chamber side of the head and always rotate the reamer clockwise.

Clean the cylinder head thoroughly to remove any metal particles after reaming and reface the valve seat (following pages).



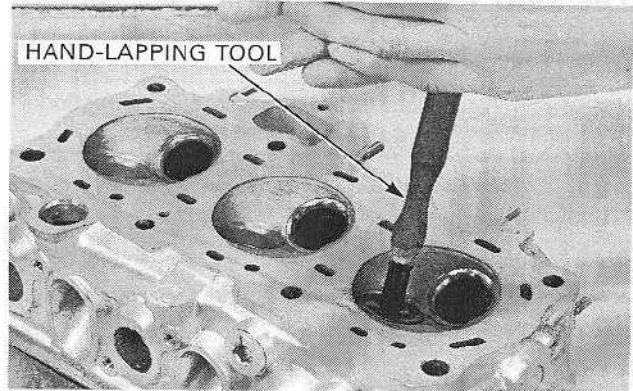
VALVE SEAT INSPECTION/REFACING

INSPECTION

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

Apply a light coating of Prussian Blue to each valve face. Tap the valve against the valve seat several times using a hand-lapping tool, without rotating the valve to make a clear pattern.

Remove the valve and inspect the valve seat face.

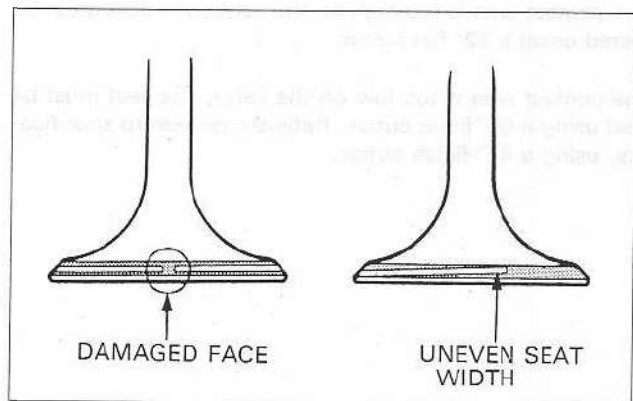


NOTE

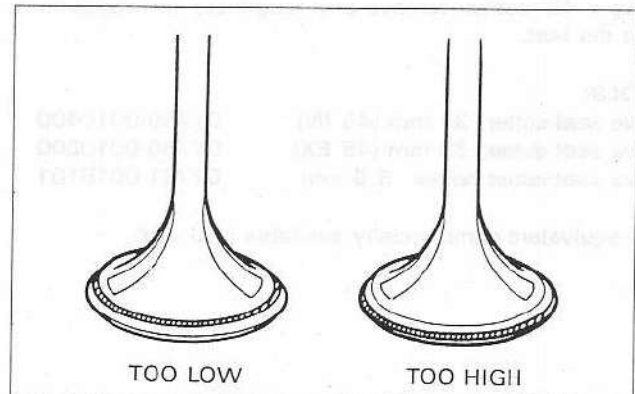
- The valve cannot be ground. If the valve face is burned or badly worn or if it contacts the seat unevenly, replace the valve.

Inspect the valve seat face for:

- Uneven seat width:
 - Bent or collapsed valve stem: Replace the valve and reface the valve seat.
- Damaged face:
 - Replace the valve and reface the valve seat.



- Contact area (too high or too low area):
 - reface the valve seat.

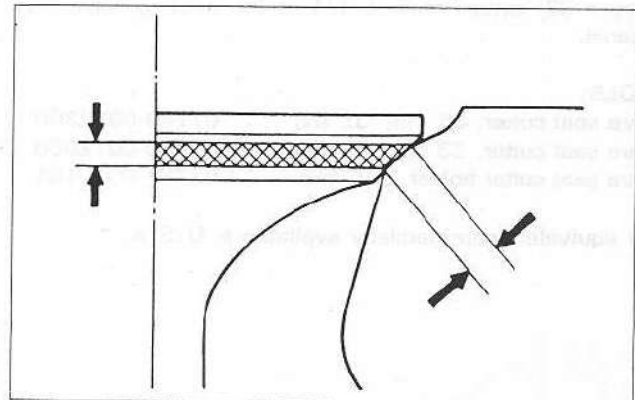


Inspect the width of valve seat.

The valve seat contact should be within the specified width and evenly all around the circumference.

STANDARD: 1.2 mm (0.05 in)

If the valve seat width is not within specification, reface the valve seat.

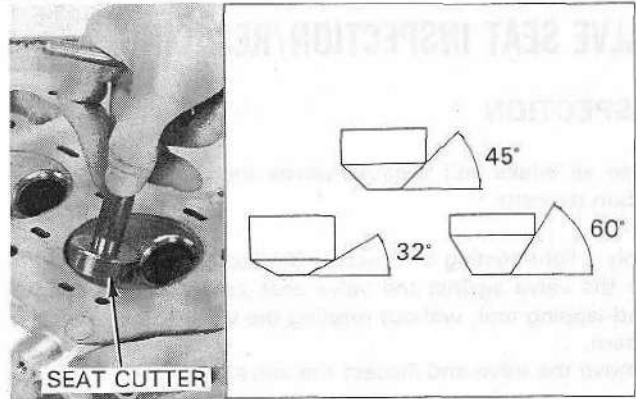


CYLINDER HEAD/VALVE

VALVE SEAT REFACING

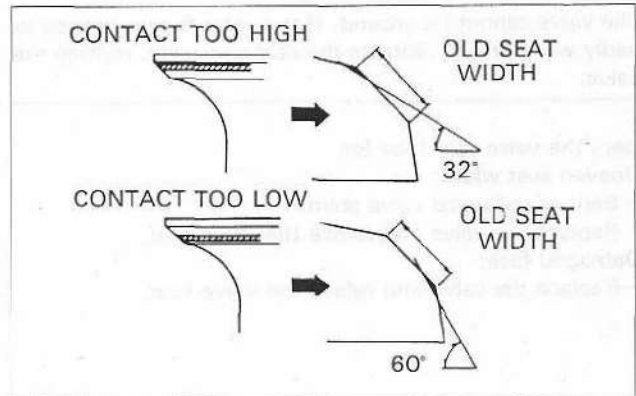
NOTE

- Follow the refacer manufacturer's operating instructions.
- Be careful not to grind the seat more than necessary.



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

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

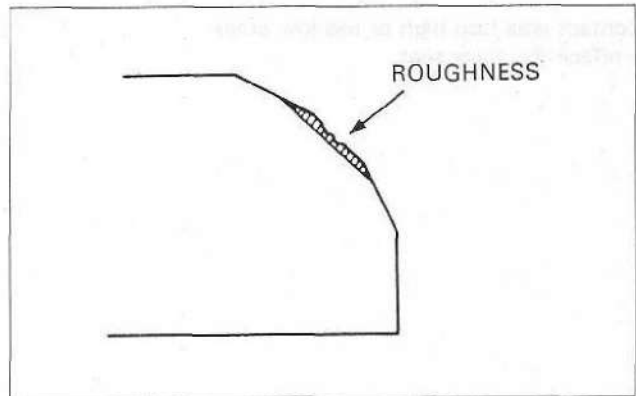


Using a 45° cutter, remove any roughness or irregularities from the seat.

TOOLS:

Valve seat cutter, 35 mm (45° IN)	07780-0010400
Valve seat cutter, 33 mm (45° EX)	07780-0010800
Valve seat cutter holder, 5.5 mm	07781-0010101

or equivalent commercially available in U.S.A.

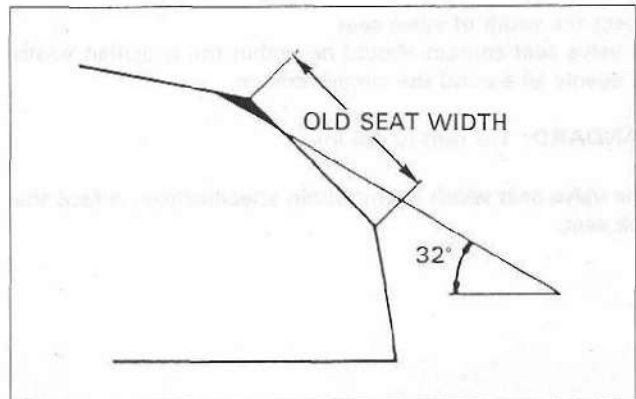


Using a 32° cutter, remove 1/4 of the existing valve seat material.

TOOLS:

Valve seat cutter, 35 mm (32° IN)	07780-0012300
Valve seat cutter, 33 mm (32° EX)	07780-0012900
Valve seat cutter holder, 5.5 mm	07781-0010101

or equivalent commercially available in U.S.A.



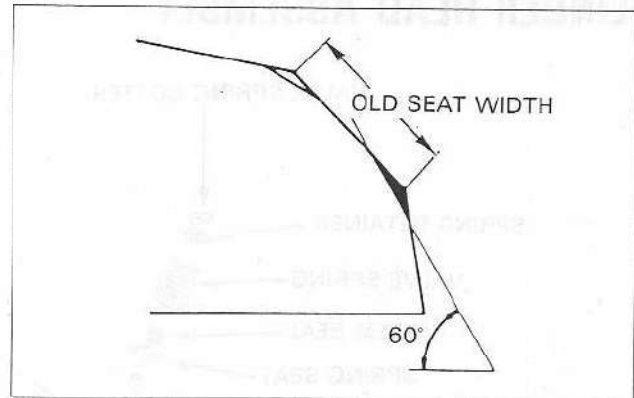
CYLINDER HEAD/VALVE

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

TOOLS:

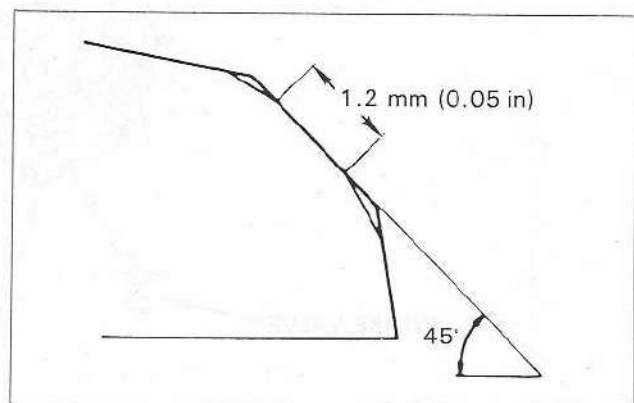
Valve seat cutter, 37.5 mm (60° IN/EX) 07780-0014100
Valve seat cutter holder, 5.5 mm 07781-0010101

or equivalent commercially available in U.S.A.



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

Make sure that all pitting and irregularities are removed.



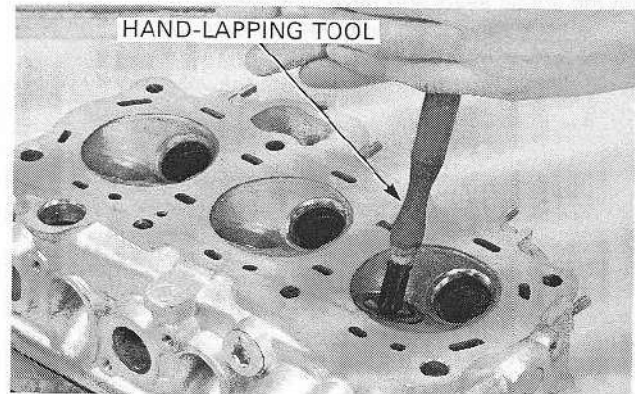
CAUTION

- Excessive lapping pressure may deform or damage the seat.
- Change the angle of lapping tool frequently to prevent uneven seat wear.
- Lapping compound can cause damage if it enters between the valve stem and guide.

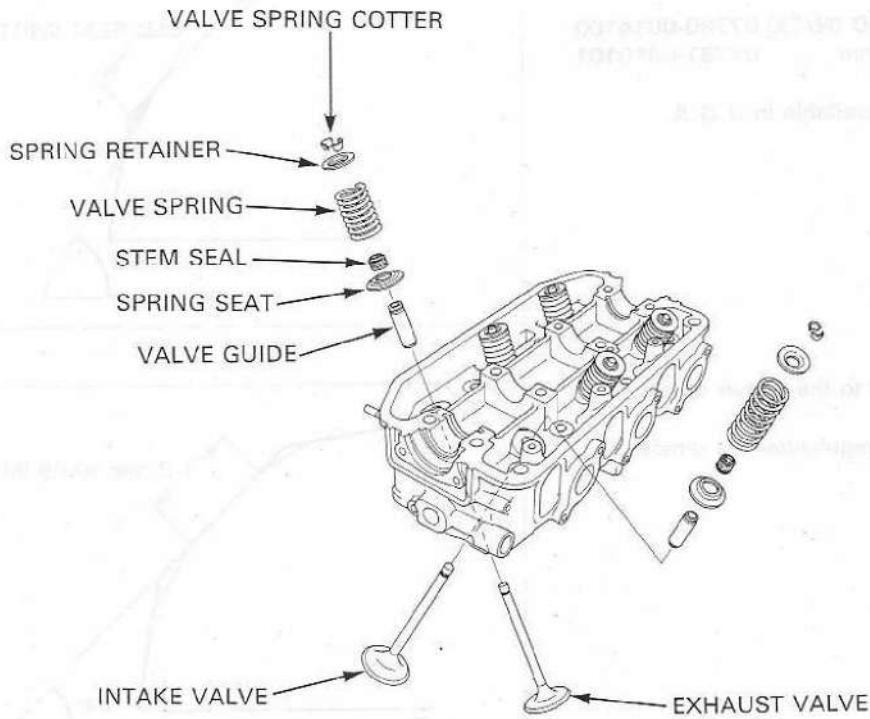
After cutting the seat, apply lapping compound to the valve face, and lap the valve using light pressure.

After lapping, wash any residual compound off the cylinder head and valve.

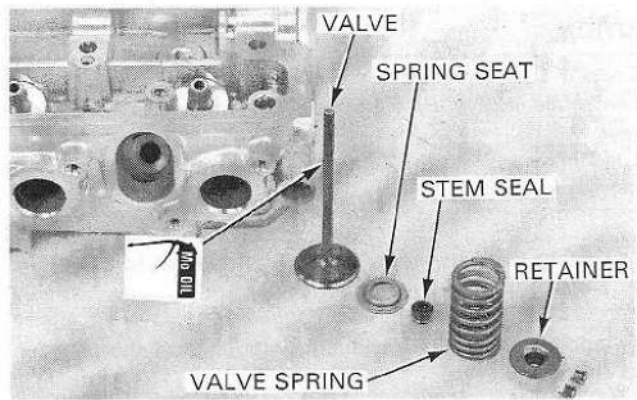
Recheck the seat contact after lapping.



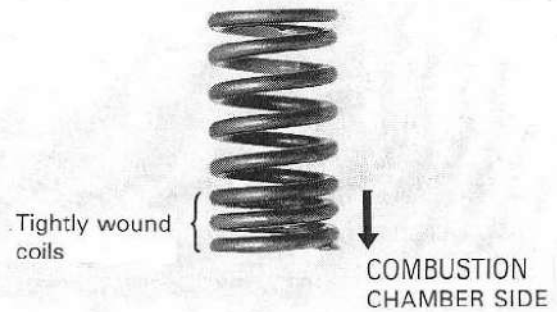
CYLINDER HEAD ASSEMBLY



Install the spring seats and new stem seals. Lubricate each valve stem with molybdenum oil solution and insert the valves into the valve guides. To avoid damage to the stem seal, turn the valve slowly when inserting.



Install the valve springs and retainers. The spring tightly wound coils should face toward the combustion chamber.



CAUTION

- Compressing the valve spring more than necessary when installing the valve cotters may cause loss of valve spring tension.

NOTE

- To ease installation of the cotters, grease them first.

Compress the valve springs with the special tool and install the valve cotters.

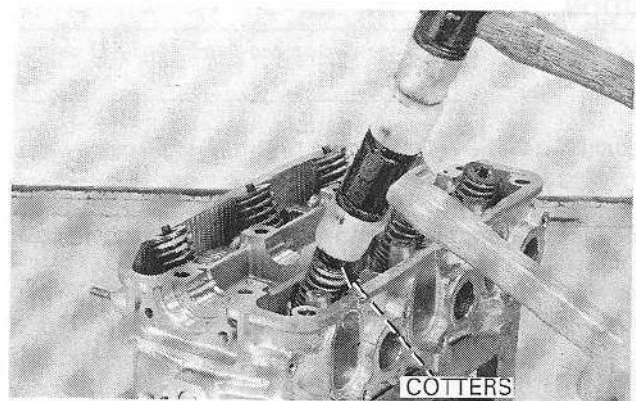
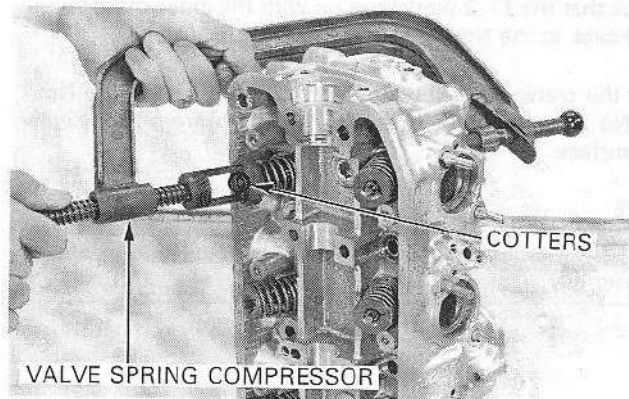
TOOL:

Valve spring compressor **07757-0010000**

NOTE

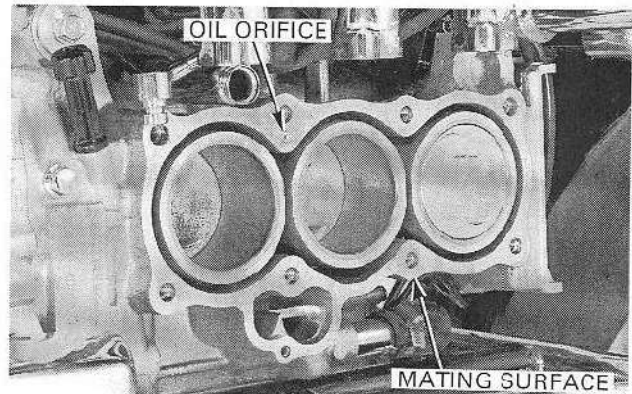
- Support the cylinder head so that the valve heads will not contact anything that causes damage.

Tap the valve stems gently with a soft hammer to firmly seat the cotters.



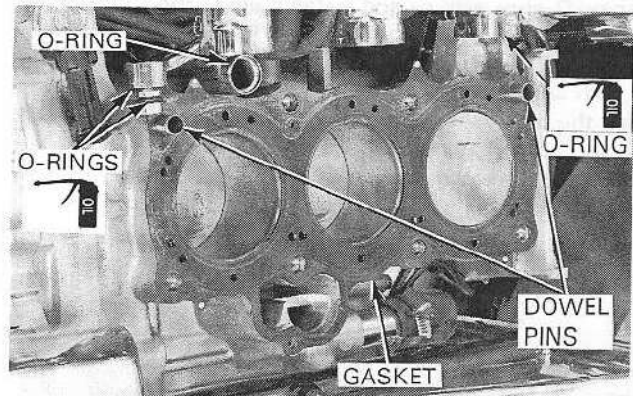
CYLINDER HEAD INSTALLATION

Clean any gasket material from the cylinder mating surfaces, and check that all water and oil passages are clear. Clear the oil passage of the oil orifice and install it in the cylinder.



Coat new O-rings of the intake manifold and air injection pipe with oil, and install them into each groove. Coat a new water pipe O-ring with coolant and install it.

Install the dowel pins and a new gasket.



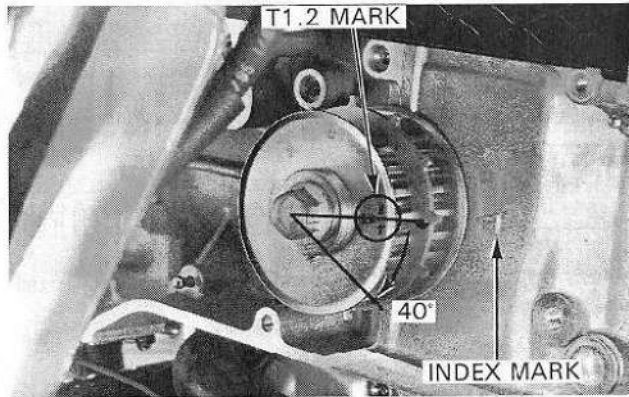
CYLINDER HEAD/VALVE

Check that the T1.2 mark lines up with the index mark on the crankcase at the No.1 and No.2 pistons TDC.

Turn the crankshaft 40 degrees clockwise to lower the No.1 and No.2 pistons 10–15 mm (0.4–0.6 in) from the cylinder top surface.

NOTE

- This will reduce the possibility of bending during engine assembly.



CAUTION

- Be careful not to damage the O-rings and intake manifold during installation.

Carefully install the cylinder head onto the crankcase while connecting the water pipe properly.

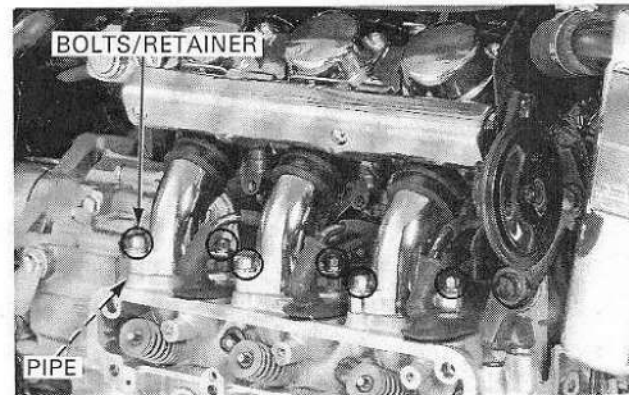
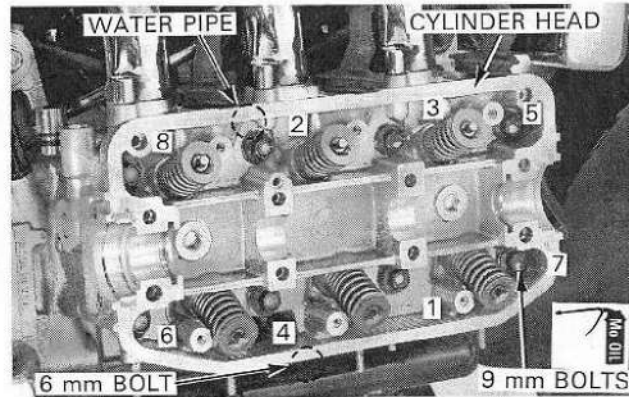
Apply molybdenum oil solution to the 9 mm cylinder head bolt threads and seating surfaces.

Install and tighten the 9 mm bolts in a crisscross pattern in the sequence as shown. Then tighten the 6 mm bolt.

TORQUE: 9 mm: 44 N·m (4.5 kgf·m, 33 lbf·ft)

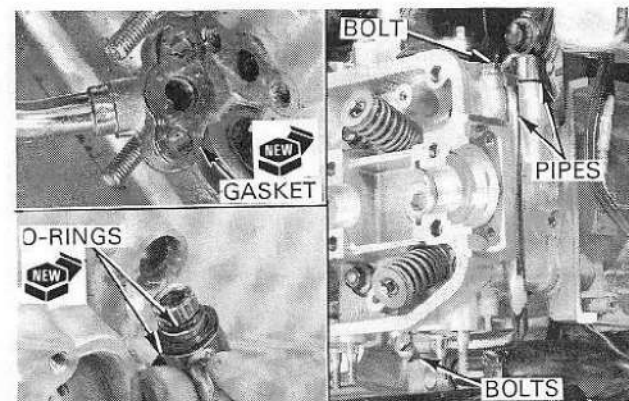
Install the air injection pipe in the cylinder head. Install and tighten the intake manifold bolt with the injection pipe retainer.

TORQUE: 9 N·m (0.9 kgf·m, 6.5 lbf·ft)



Coat new O-rings with oil and install them to the air injection pipe. Install the injection pipes to the injection tubes and cylinder head with a new gasket. Tighten the pipe bolts.

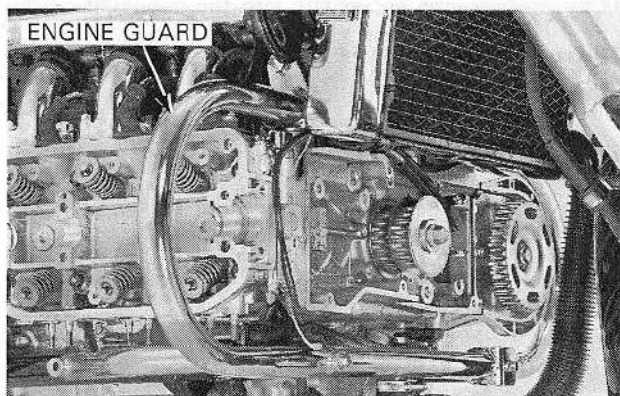
Connect the spark plug caps.



Set the engine guard onto the frame and tighten the bolts.

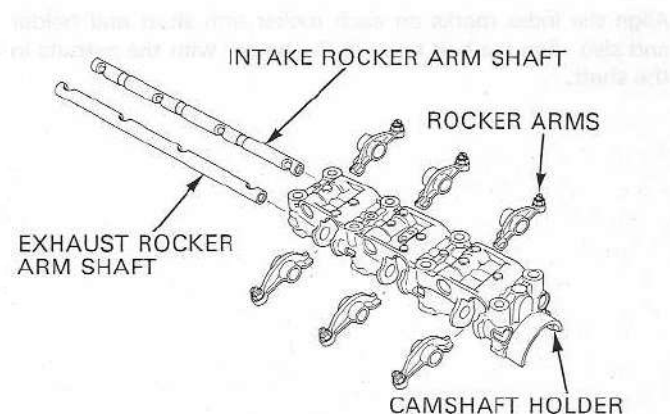
TORQUE: 26 N·m (2.7 kgf·m, 20 lbf·ft)

Install the exhaust system (page 2-12).
Fill and bleed the cooling system (page 6-5).

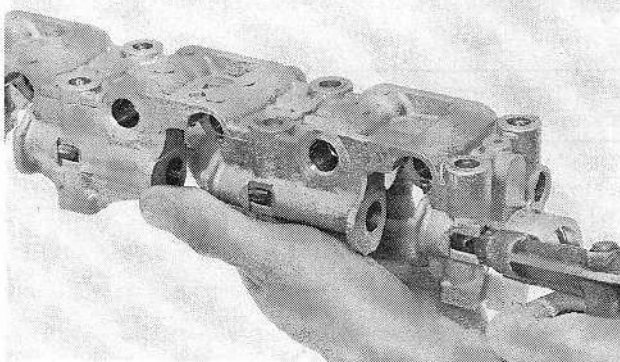


CAMSHAFT HOLDER ASSEMBLY

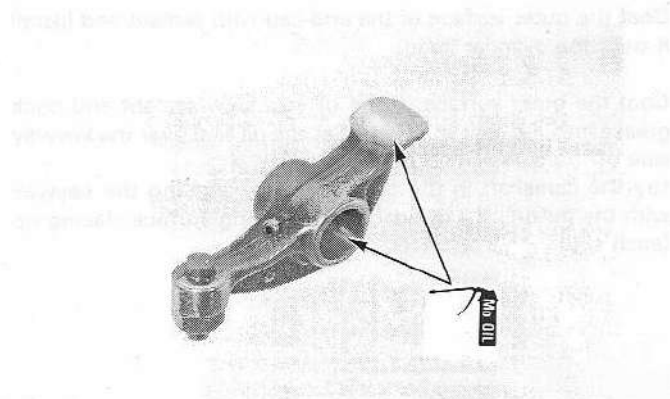
Assemble the rocker arm shafts and rocker arms in their original locations.



Clean the camshaft holder thoroughly. Blow compressed air through all passages.

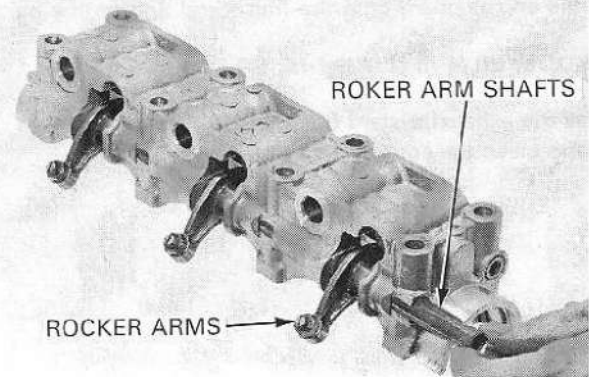


Apply molybdenum oil solution to the rocker arm slipper and sliding surfaces.

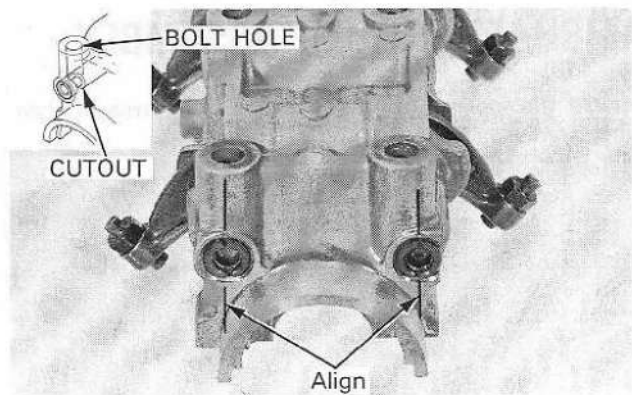


CYLINDER HEAD/VALVE

Install the rocker arms and shafts into the camshaft holder (The grooved shaft is intake side).



Align the index marks on each rocker arm shaft and holder and also align the bolt holes in the holder with the cutouts in the shaft.



CAMSHAFT INSTALLATION

NOTE

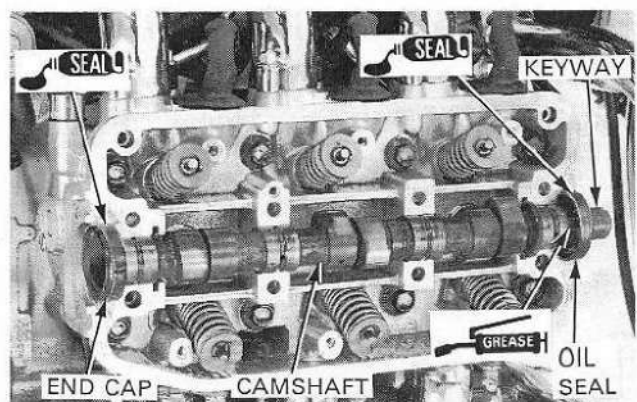
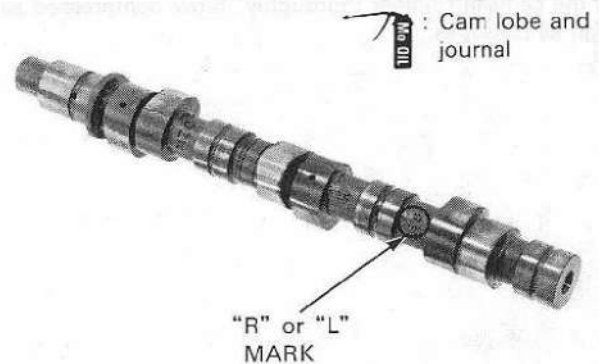
- An "R" mark appears on the right side camshaft; an "L" mark appears on the left side camshaft.

Lubricate the camshaft journals and cam lobes with molybdenum oil solution.

Coat the outer surface of the end cap with sealant and install it onto the cylinder head.

Coat the outer surface of the oil seal with sealant and pack grease into the seal lip cavity. Set the oil seal over the keyway side of the camshaft end.

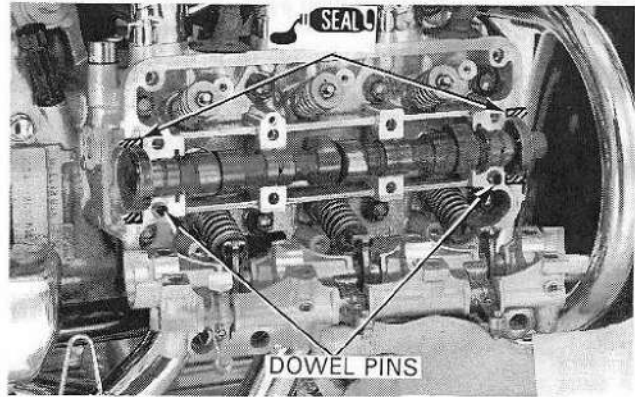
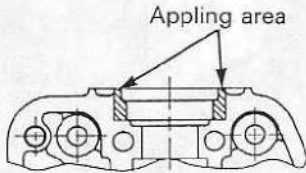
Lay the camshaft in the cylinder head, aligning the keyway with the cylinder head-head cover mating surface, facing up (each side).



CYLINDER HEAD/VALVE

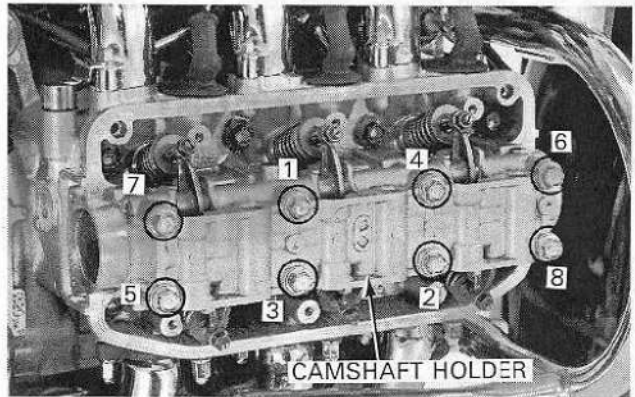
Apply sealant to the oil seal and end cap edges of the head-camshaft holder mating surface as shown.

Install the dowel pins.
Install the camshaft holder onto the cylinder head.



Install and tighten the bolts in the sequence as shown.

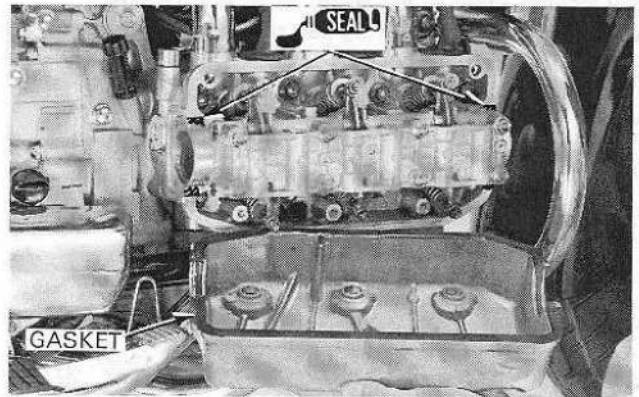
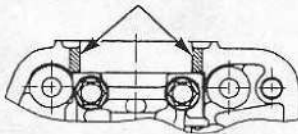
TORQUE: 20 N·m (2.0 kgf·m, 14 lbf·ft)



Replace the head cover gasket with a new one if it is damaged or fatigued.

Clean the gasket groove in the head cover.
Apply Three Bond 1521 or equivalent to the head cover groove evenly. Attach a new gasket into the head cover groove properly.

Apply sealant to the mating surface of the cylinder head-head cover as shown.



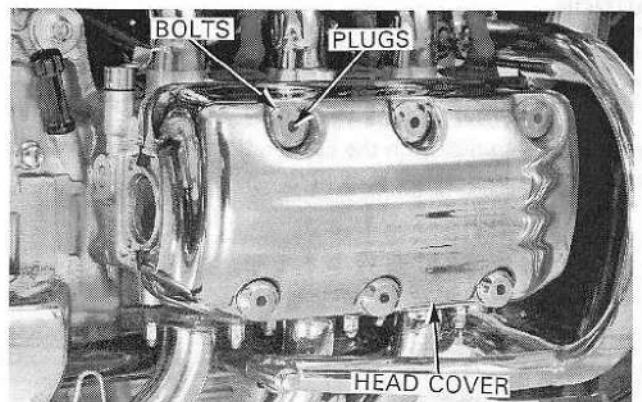
NOTE

- If cam timing procedure is required, cover should not be installed until timing procedure is completed.

Install and tighten the head cover bolt.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

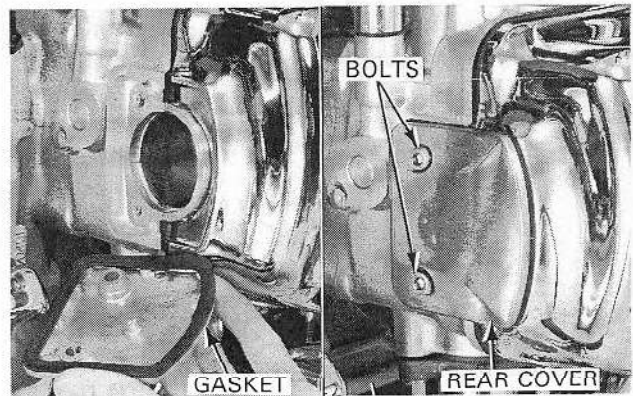
Install the rubber plugs to the bolt heads securely.



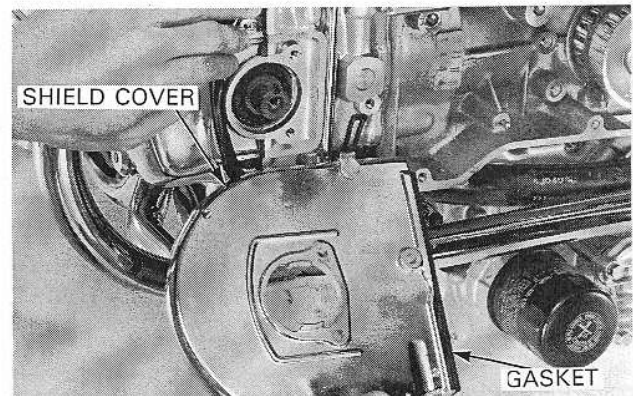
CYLINDER HEAD/VALVE

Replace the rear cover gasket with a new one if it is damaged or fatigued.
Install the gasket onto the cylinder head rear cover aligning its projections with the rear cover holes.

Apply locking agent to the rear over bolt threads.
Install the cylinder head rear cover and tighten the bolts.

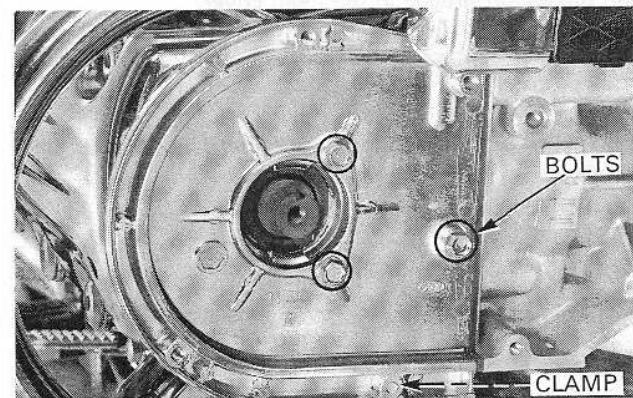


Replace the shield cover gasket with a new one if it is damaged or fatigued.
Clean the gasket surface of the cover. Apply Three Bond 1521 or equivalent and attach a new gasket onto the shield cover.



Apply locking agent to the shield cover bolt threads.
Install the shield cover and tighten the three bolts.

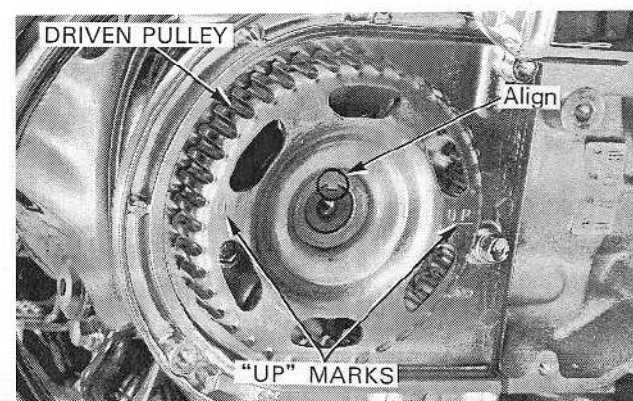
Secure the wire harness with the clamp on the right shield cover.



CAUTION

- Do not turn the camshaft (driven pulley) while timing belts are removed; you may damage the valve and piston.

Install the driven pulley on the camshaft with the "UP" mark facing up and aligning the key with the keyway.



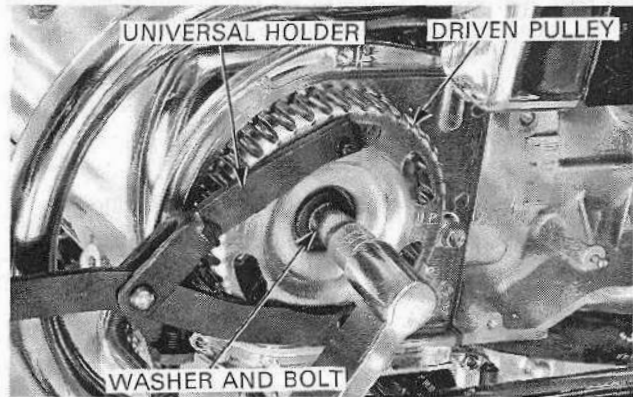
Install the washer and driven pulley bolt with the washer's chamfered side facing out.
Hold the pulley and tighten the bolt using the special tool as shown.

TOOL:

Universal holder

07725-0030000

TORQUE: 26 N·m (2.7 kgf·m, 20 lbf·ft)

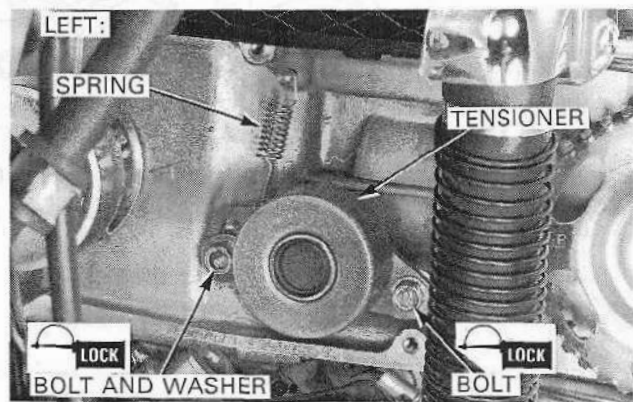


TIMING BELT INSTALLATION

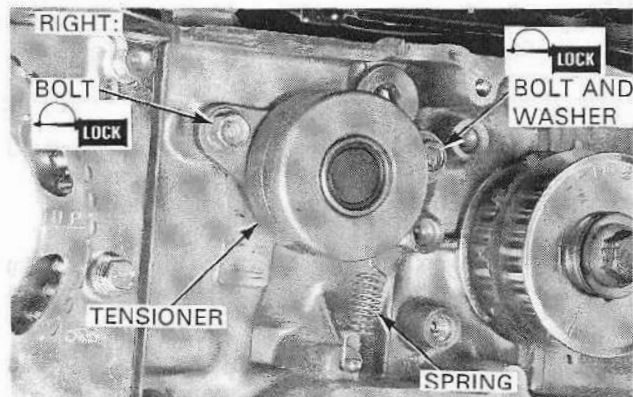
CAUTION

- Do not lubricate the tensioner. Oil will damage the timing belt.

Apply locking agent to the tensioner bolt threads.
Install the timing belt tensioner onto the crankcase with the bolts and washer (drive pulley side only).
Temporarily tighten the bolts just enough to allow smooth movement of the tensioner.



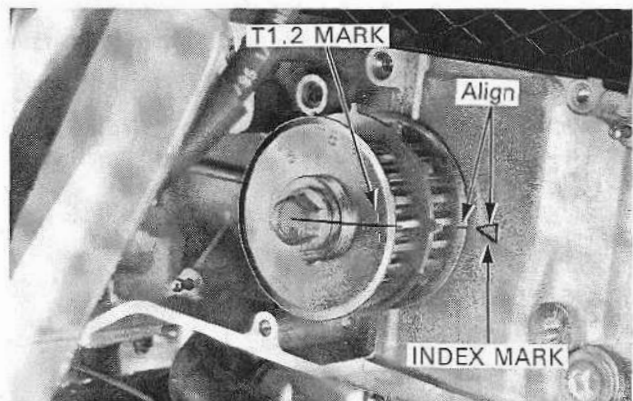
Install the tensioner spring with the open ends at the tensioner facing outward and at the holding pin facing drive pulley side as shown.



CAUTION

- Do not turn the camshaft (driven pulley) while timing belts are removed; you may damage the valve and piston.

Make sure that the T1.2 mark on the drive pulley is aligned with the index mark on the crankcase.

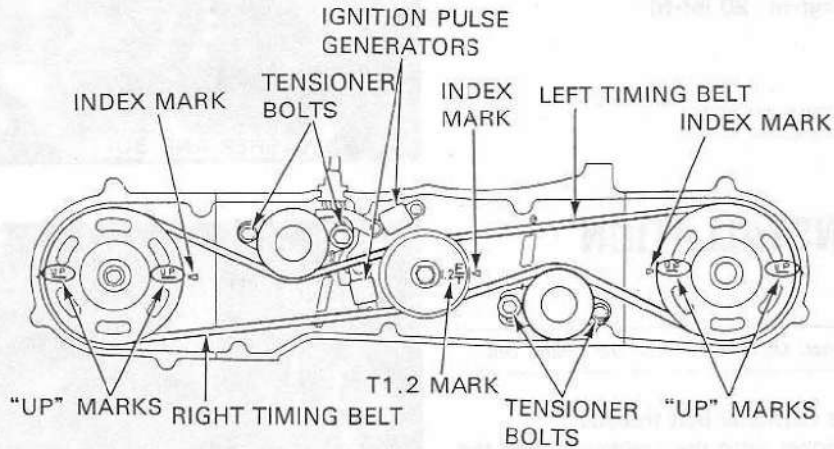


CYLINDER HEAD/VALVE

Make sure that the "UP" marks on the driven pulleys align with the index mark on the shield cover. The pulley "UP" marks should face up.
Install the left timing belt.

Install the ignition pulse generators (page 17-12).

Install the right timing belt using the same procedure.



NOTE

- Inspect and adjust timing belt tension while the engine is cold.

To check the timing mark alignment, turn the crankshaft 90 degrees clockwise and then 90 degrees counterclockwise. Make sure the T1.2 mark is aligned with the index mark.

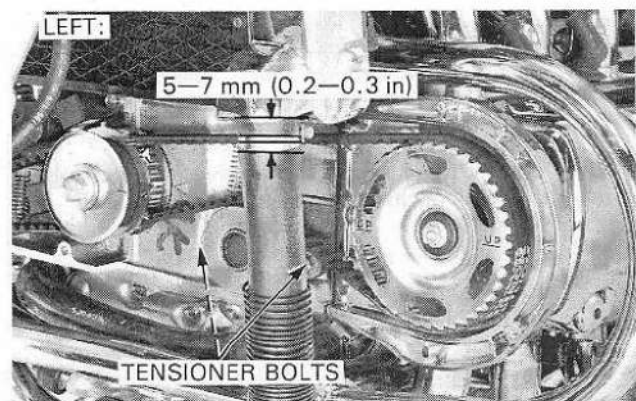
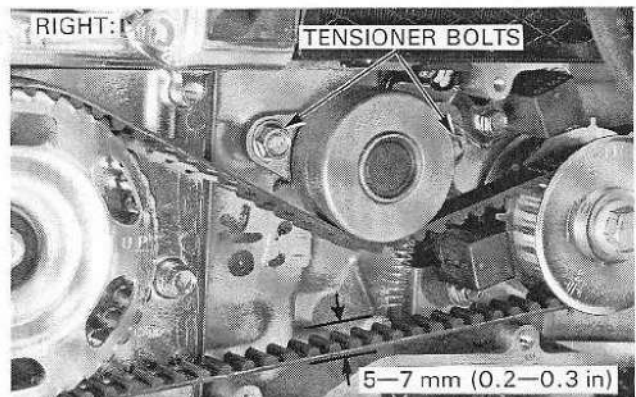
Push the belt lower run midway between the pulleys with 2 kg (4.4 lb) force. Adjust the tensioner position so that the belt slack is 5–7 mm (0.2–0.3 in). Tighten the tensioner bolt of the driven pulley side first, then tighten the drive pulley side bolt.

TORQUE: 25 N·m (2.6 kgf·m, 19 lbf·ft)

Check the timing mark alignment for the left timing belt in the same way.

Push the belt upper run midway between the pulleys with 2 kg (4.4 lb) force. Adjust the tensioner position so that the belt slack is 5–7 mm (0.2–0.3 in). Tighten the tensioner bolt of the driven pulley side first, then tighten the drive pulley side bolt.

TORQUE: 25 N·m (2.6 kgf·m, 19 lbf·ft)



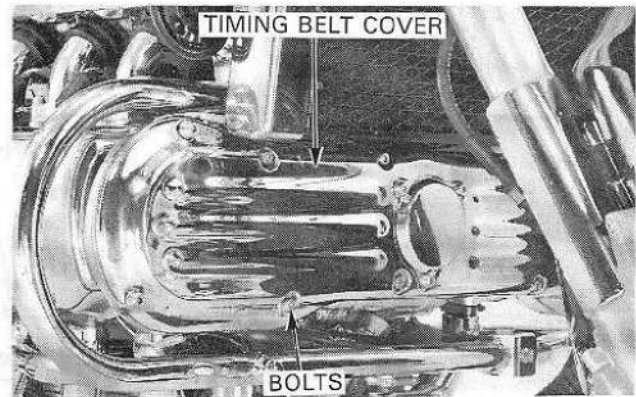
CAUTION

- Do not lubricate the belt tensioners. Oil will damage the timing belts.
- To protect the sealed tensioner bearing, do not use solvents or other cleaning agents inside the front timing cover.

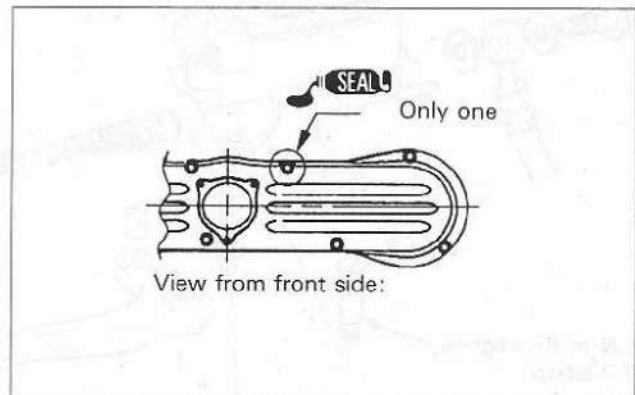
Replace the timing belt cover gasket with a new one if it is damaged or fatigue.

Clean the timing belt cover groove.

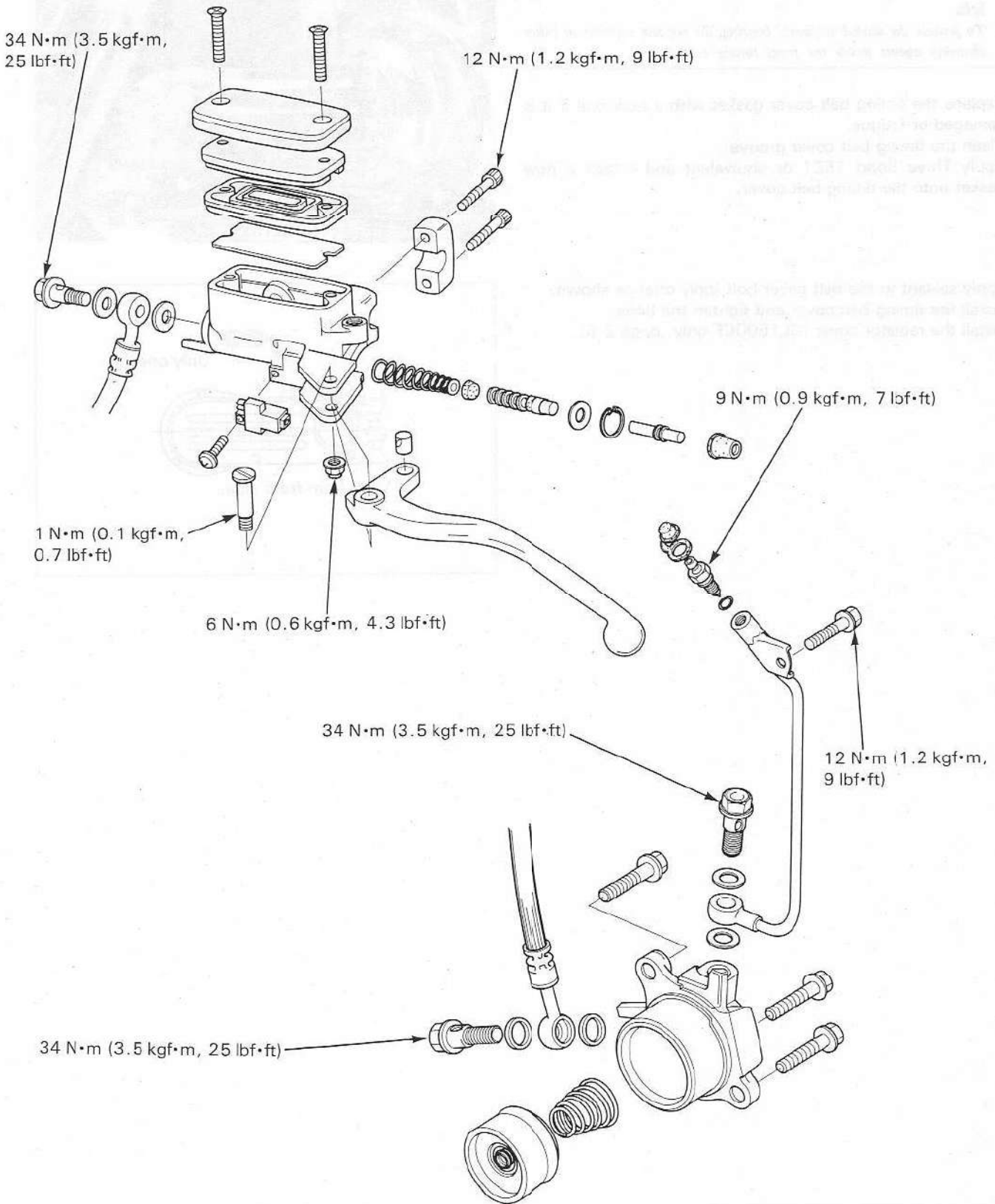
Apply Three Bond 1521 or equivalent and attach a new gasket onto the timing belt cover.



Apply sealant to the belt cover bolt (only one) as shown.
Install the timing belt cover and tighten the bolts.
Install the radiator cover (GL1500CF only: page 2-8).

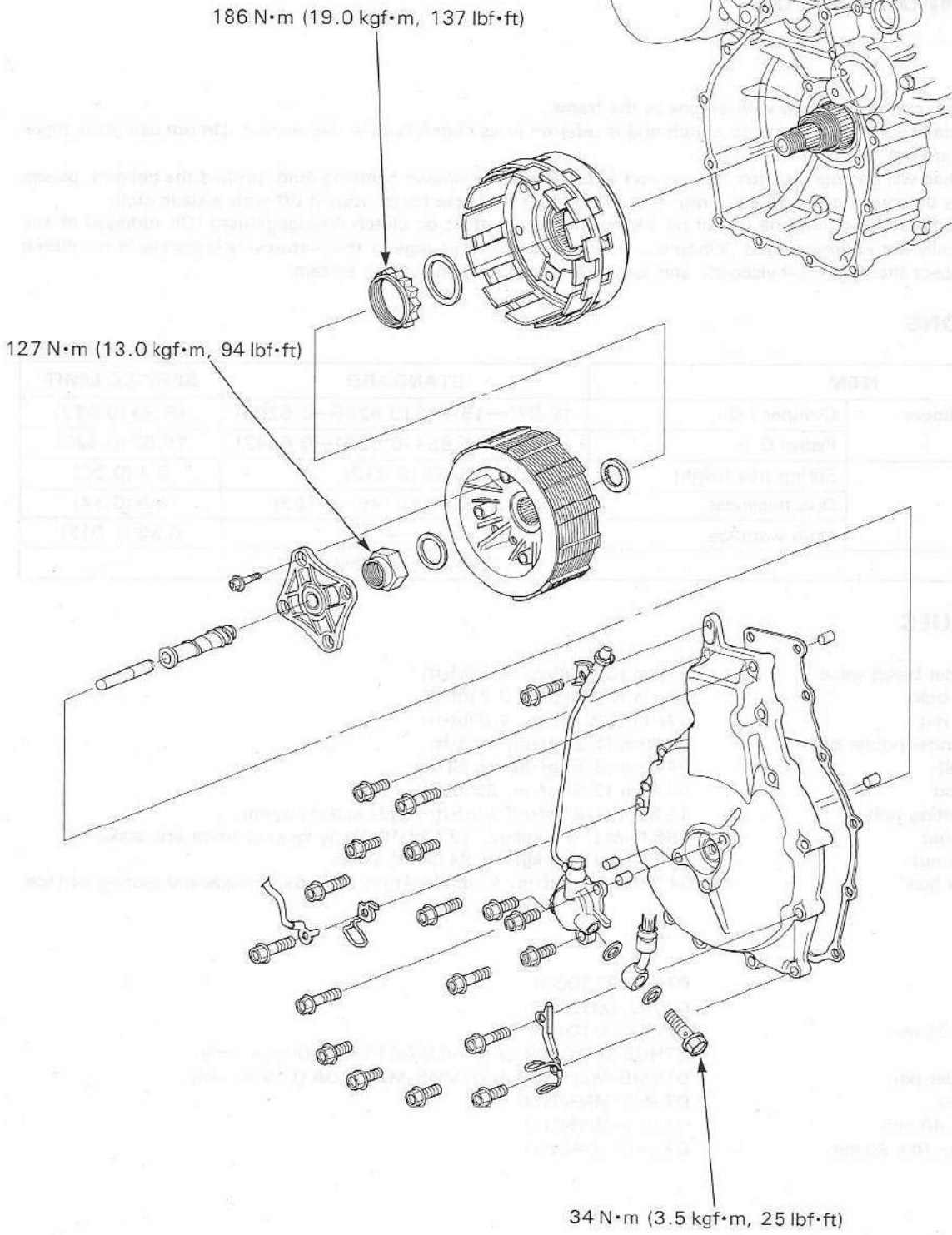


CLUTCH



9. CLUTCH

9-1	CLUTCH	9-2	CLUTCH FLUID REPLACEMENT	SERVICE INFORMATION
9-3	CLUTCH SLAVE CYLINDER	9-3	CLUTCH SLAVE CYLINDER	TROUBLESHOOTING
9-3	CLUTCH MASTER CYLINDER	9-3	CLUTCH MASTER CYLINDER	



CLUTCH

SERVICE INFORMATION	9-2	CLUTCH MASTER CYLINDER	9-5
TROUBLESHOOTING	9-3	CLUTCH SLAVE CYLINDER	9-8
CLUTCH FLUID REPLACEMENT/ AIR BLEEDING	9-4	CLUTCH	9-10

SERVICE INFORMATION

GENERAL

- The clutch system can be serviced with engine in the frame.
- DOT 4 brake fluid used for the hydraulic clutch and is referred to as clutch fluid in this section. Do not use other types of fluid as they are not compatible.
- Brake (clutch) fluid will damage painted, plastic and rubber parts. Whenever handling 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.
- Engine oil viscosity and level and the use of oil additives have an effect on clutch disengagement. Oil additives of any kind are specifically not recommended. When the clutch does not disengage or the motorcycle creeps with the clutch disengaged, inspect the engine oil viscosity and level before servicing the clutch system.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Clutch master cylinder	Cylinder I.D.	15.870—15.913 (0.6248—0.6265)	15.93 (0.627)
	Piston O.D.	15.827—15.854 (0.6231—0.6242)	15.82 (0.623)
Clutch	Spring free height	5.38 (0.212)	5.1 (0.20)
	Disc thickness	3.72—3.88 (0.146—0.153)	3.5 (0.14)
	Plate warpage	—	0.30 (0.012)
Clutch fluid		DOT 4 brake fluid	—

TORQUE VALUES

Clutch slave cylinder bleed valve	9 N·m (0.9 kgf·m, 6.5 lbf·ft)
Clutch lever pivot bolt	1 N·m (0.1 kgf·m, 0.7 lbf·ft)
Clutch lever pivot nut	6 N·m (0.6 kgf·m, 4.3 lbf·ft)
Clutch master cylinder holder bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Clutch hose oil bolt	34 N·m (3.5 kgf·m, 25 lbf·ft)
Bleeder pipe oil bolt	34 N·m (3.5 kgf·m, 25 lbf·ft)
Bleeder pipe mounting bolt	12 N·m (1.2 kgf·m, 9 lbf·ft) Apply locking agent.
Clutch outer lock nut	186 N·m (19.0 kgf·m, 137 lbf·ft) Apply locking agent and stake.
Clutch center lock nut	127 N·m (13.0 kgf·m, 94 lbf·ft) Stake.
Side stand bracket bolt	64 N·m (6.5 kgf·m, 47 lbf·ft) Apply oil to the threads and seating surface.

TOOLS

Snap ring pliers	07914-3230001
Driver	07749-0010000
Attachment, 32×35 mm	07746-0010100
Holder plate	07HGB-001010B or 07HGB-001010A (U.S.A. only)
Clutch center holder pin	07VMB-MZ00100 or 07VMB-MZ0010A (U.S.A. only)
Clutch outer holder	07JMB-MN50100
Lock nut wrench, 46 mm	07JMA-MN50100
Driver attachment, 78×90 mm	07GAD-SD40101

TROUBLESHOOTING

Clutch lever too hard

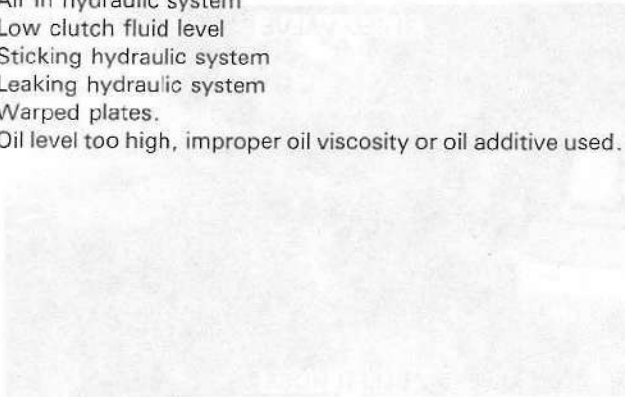
- Sticking hydraulic system
- Clogged hydraulic system

Clutch slips

- Sticking hydraulic system
- Clogged hydraulic system
- Discs worn
- Weak clutch spring

Clutch will not disengage or motorcycle creeps with clutch disengaged

- Air in hydraulic system
- Low clutch fluid level
- Sticking hydraulic system
- Leaking hydraulic system
- Warped plates.
- Oil level too high, improper oil viscosity or oil additive used.



CLUTCH FLUID REPLACEMENT/ BLEEDING

CAUTION

- Do not allow clutch master cylinder to drain or become empty. The clutch will not disengage the lever is raised.
- Do not bleed clutch or change clutch fluid while engine is running.
- Do not bleed clutch or change clutch fluid while motorcycle is on a lift.

CLUTCH FLUID BLEEDING

Turn the front forks to the right and the rearview mirror and front fender to the right and the gear disengagement and front.

Remove a bleed hose to the bleed valve. Turn the bleed valve and pump the clutch lever until there is no more fluid flows out of the bleed valve.

CLUTCH FLUID BLEEDING/ BLEEDING

CAUTION

- Do not allow clutch master cylinder to drain or become empty. The clutch will not disengage the lever is raised.
- Do not bleed clutch or change clutch fluid while engine is running.
- Do not bleed clutch or change clutch fluid while motorcycle is on a lift.

Remove the bleed hose and pump the clutch lever until there is no more fluid flows out of the bleed valve.

NOTE

- Check bleed hose after a few bleedings. The bleed hose may be clogged with dirt or debris.
- When using a clutch master cylinder, pump the clutch lever until there is no more fluid flows out of the bleed valve.

NOTE

- It is important to check the clutch fluid level after every bleed.

CLUTCH

CLUTCH FLUID REPLACEMENT/AIR BLEEDING

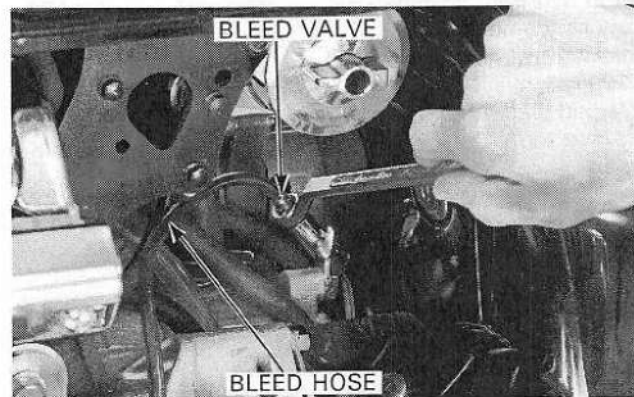
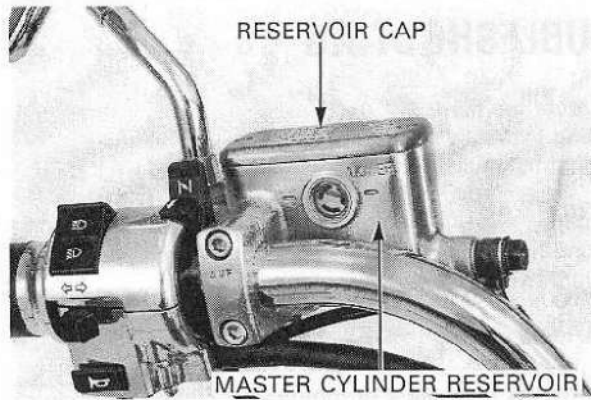
CAUTION

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

CLUTCH FLUID DRAINING

Turn the handlebar to the right until the reservoir is level, and remove the reservoir cap, set plate, diaphragm and float.

Connect a bleed hose to the bleed valve. Loosen the bleed valve and pump the clutch lever until no more fluid flows out of the bleed valve.



CLUTCH FLUID FILLING/BLEEDING

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

CAUTION

- Use only DOT 4 brake fluid from a sealed container.
- Do not mix different types of fluid. They are not compatible.

Connect a commercially available brake bleeder to the bleed valve.

Loosen the bleed valve and pump the brake bleeder. Add brake fluid when the fluid level in the reservoir is low.

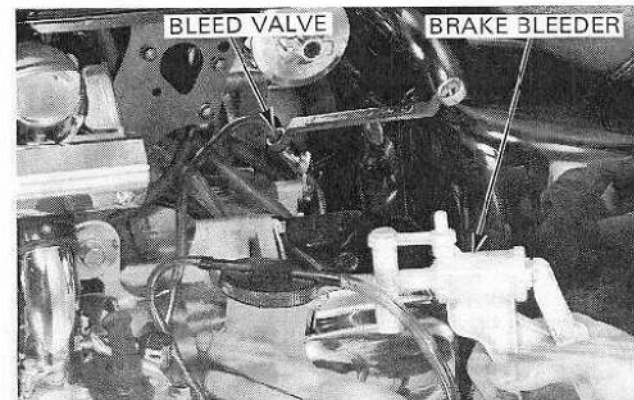
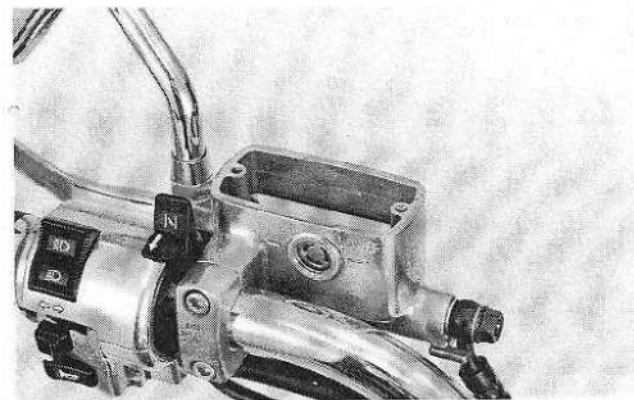
NOTE

- Check the fluid level often while bleeding the clutch 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 new fluid appear coming out of the bleed valve and air bubbles do not appear in the plastic hose.

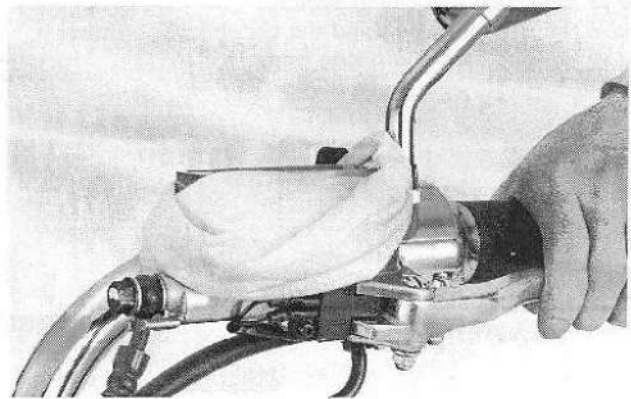
NOTE

- If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.



If a brake bleeder is not available, use the following procedure:

Pump up the system pressure with the clutch lever until the lever resistance is felt.

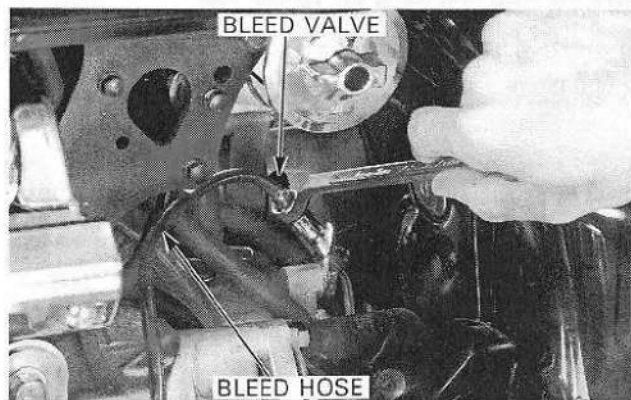


Connect a bleed hose to the bleed valve and bleed the system as follows:

1. Squeeze the clutch lever, open the bleed valve 1/2 turn and then close it.

NOTE

- Do not release the clutch lever until the bleed valve has been closed.



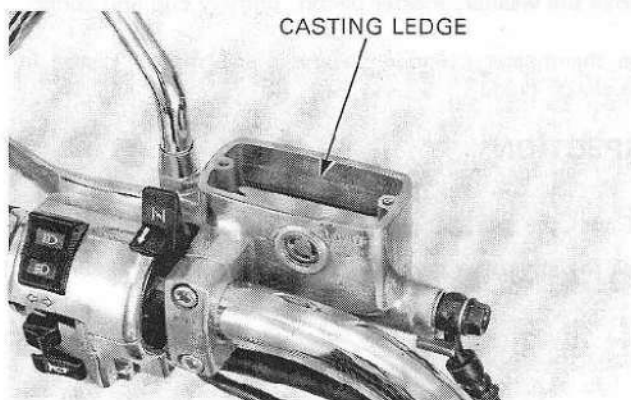
2. Release the clutch lever slowly and wait several seconds after it reaches the end of its travel.

Repeat the steps 1 and 2 until air bubbles do not appear in the bleed hose.

Tighten the bleed valve.

TORQUE: 9 N·m (0.9 kgf·m, 6.5 lbf·ft)

Fill the reservoir to the casting ledge with DOT 4 brake fluid from a sealed container.



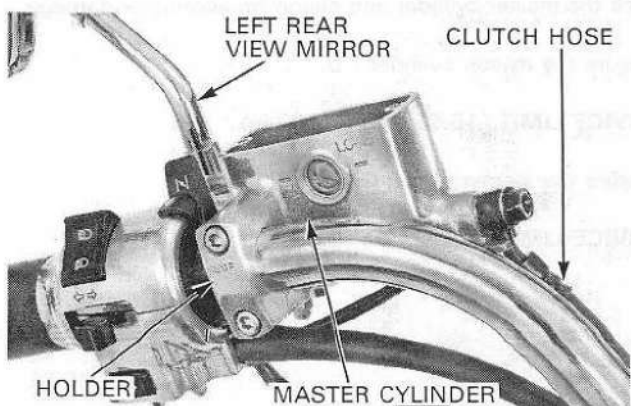
Install the float, diaphragm, set plate and reservoir cap, and tighten the reservoir cap screws.

CLUTCH MASTER CYLINDER

DISASSEMBLY

Drain the clutch fluid from the hydraulic system (page 9-4).

Remove the left rear view mirror. Disconnect the clutch switch connectors. Disconnect the clutch hose from the master cylinder by removing the oil bolt and sealing washers.



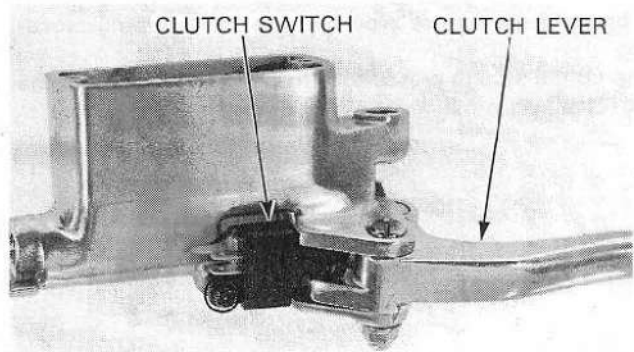
CAUTION

- Avoid spilling clutch 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 master cylinder holder bolts, holder and the master cylinder.

CLUTCH

Remove the screw and clutch switch.
Remove the pivot nut, bolt and the clutch lever.
Remove the push rod and piston boot.

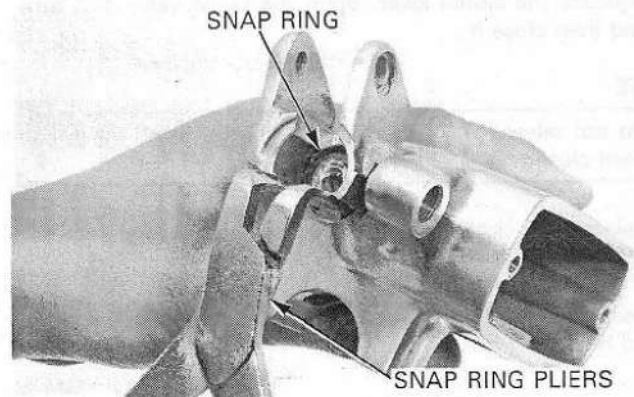


Remove the snap ring using the special tool.

TOOL:

Snap ring pliers

07914-3230001



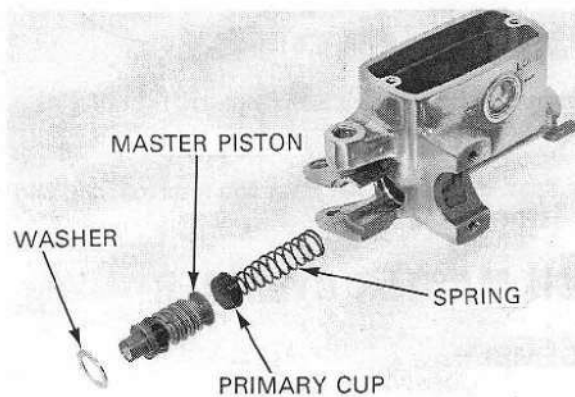
Remove the washer, master piston, primary cup and spring.

Clean the master cylinder, reservoir and master piston in clean clutch fluid.

INSPECTION

Check the piston cups for wear, deterioration or damage.

Check the spring for damage.



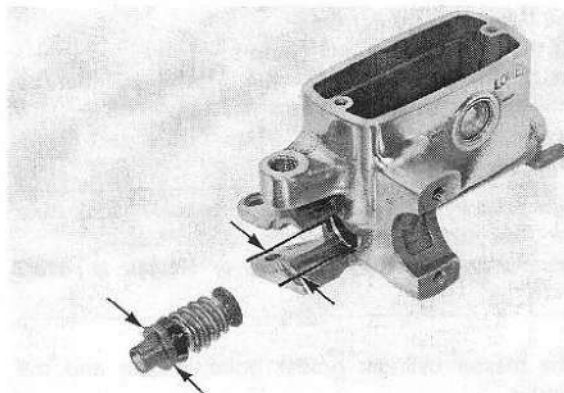
Check the master cylinder and piston for scoring or damage.

Measure the master cylinder I.D.

SERVICE LIMIT: 15.93 mm (0.627 in)

Measure the master piston O.D.

SERVICE LIMIT: 15.82 mm (0.623 in)



ASSEMBLY

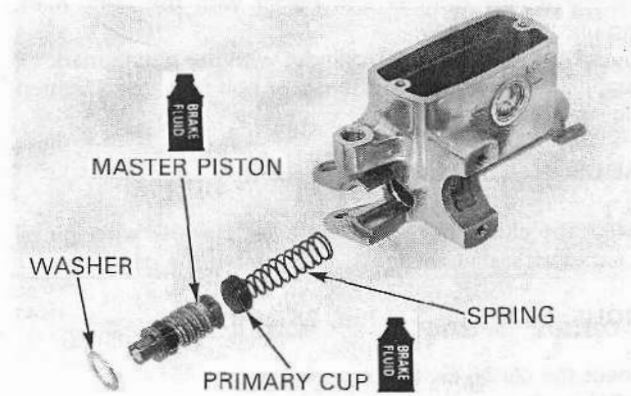
Coat the master piston and piston cups with clean clutch fluid.

Install the spring onto the primary cup.

Install the spring, primary cup, master piston and washer into the master cylinder.

CAUTION

- Do not allow the piston cup lips to turn inside out.



Install the snap ring into the groove in the master cylinder using the special tool.

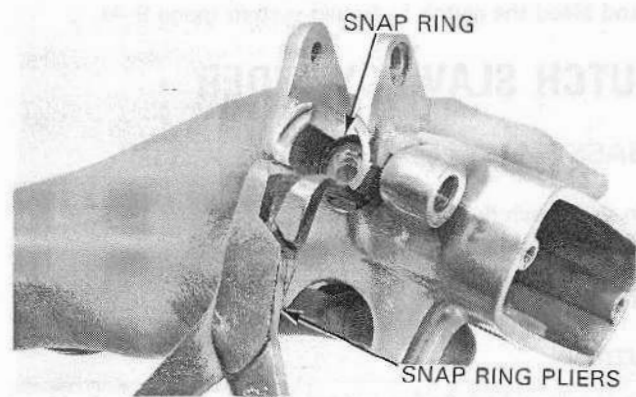
TOOL:

Snap ring pliers

07914-3230001

CAUTION

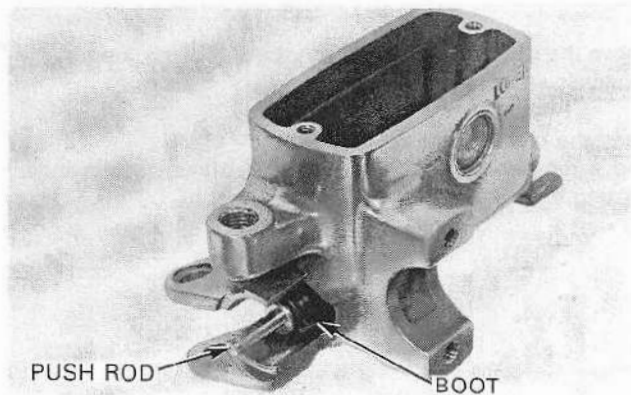
- Be certain the snap ring is firmly seated in the groove.



Apply silicone grease to the push rod contacting surface of the master piston.

Install the boot onto the push rod.

Install the boot and push rod into the master cylinder.



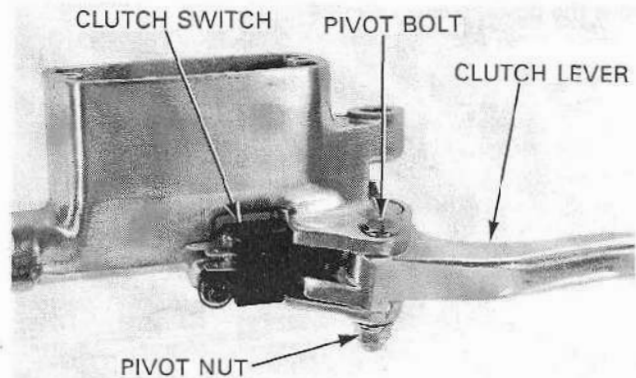
Apply silicone grease to the clutch lever pivot and end piece. Install the clutch lever and pivot bolt, and tighten the bolt.

TORQUE: 1 N·m (0.1 kgf·m, 0.7 lbf·ft)

Install and tighten the clutch lever pivot nut.

TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)

Install the clutch switch and tighten the screw.



CLUTCH

Install the master cylinder and holder with the "UP" mark facing up.

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

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Connect the clutch hose to the master cylinder with the oil bolt and new sealing washers, and tighten the oil bolt.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Connect the clutch switch connectors.
Install the left rear view mirror.

Fill and bleed the clutch hydraulic system (page 9-4).

CLUTCH SLAVE CYLINDER

DISASSEMBLY

Drain the clutch fluid from the hydraulic system (page 9-4).

Disconnect the clutch hose from the slave cylinder by removing the oil bolt and sealing washers.

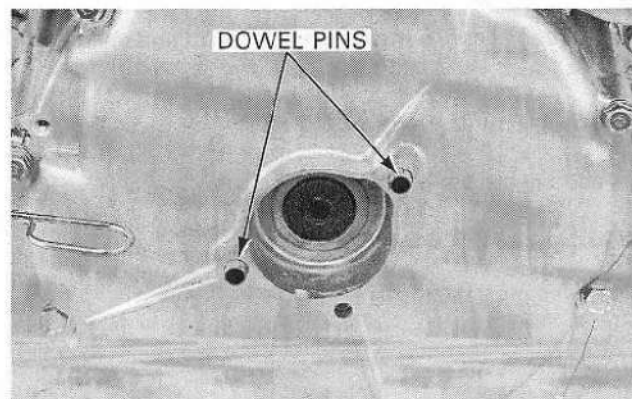
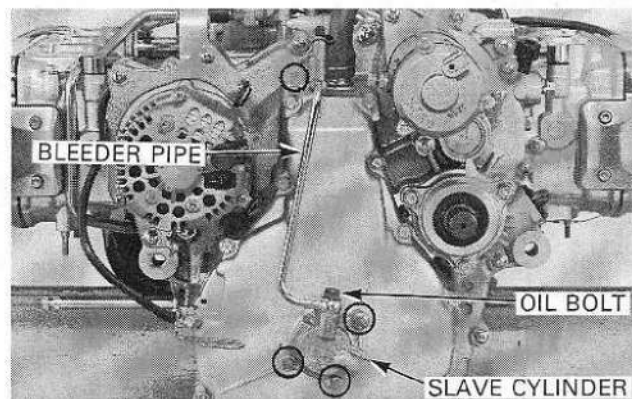
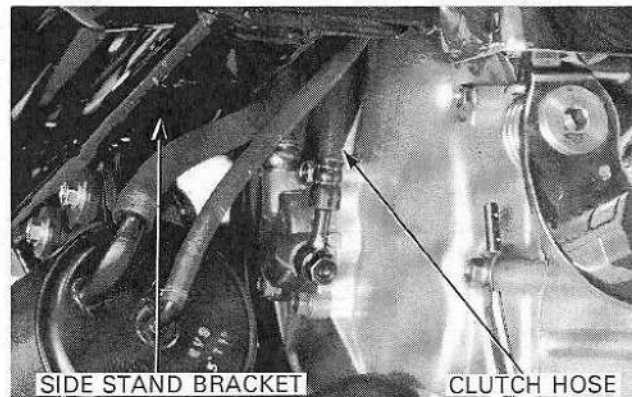
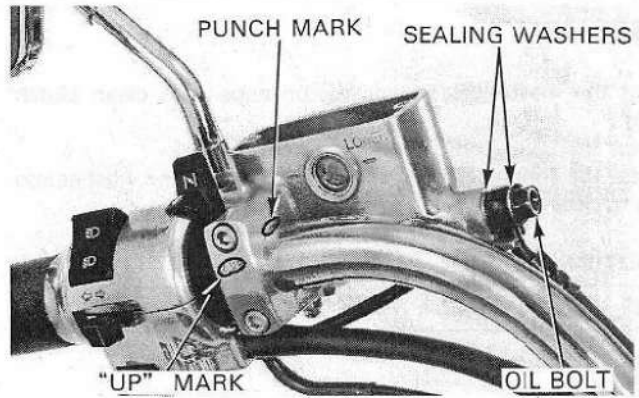
CAUTION

- *Avoid spilling clutch fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.*

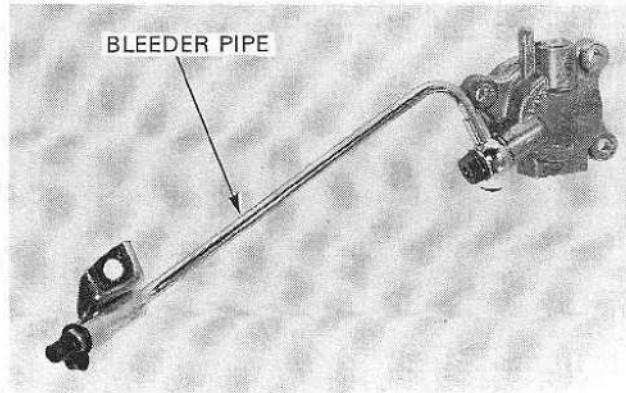
Remove the side stand bracket with the stand and support the motorcycle securely.

Loosen the bleeder pipe oil bolt.
Remove the bleeder pipe mounting bolt, three slave cylinder mounting bolts and the slave cylinder.

Remove the dowel pins.



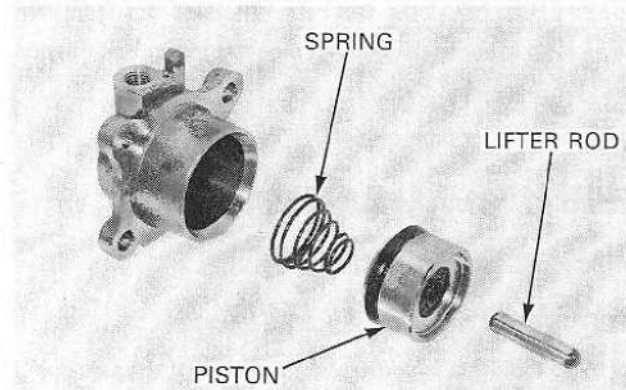
Remove the oil bolt, sealing washers and the bleeder pipe from the slave cylinder.



Remove the lifter rod, piston and spring.
Remove the piston and oil seals from the piston.

INSPECTION

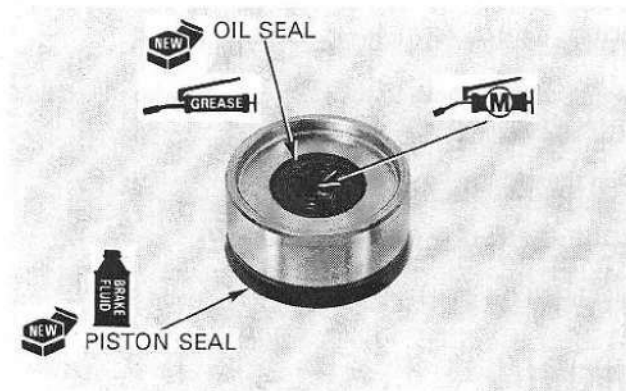
Check the lifter rod for wear or damage.
Check the piston spring for weakness or damage.
Check the slave cylinder and piston for scoring or damage.



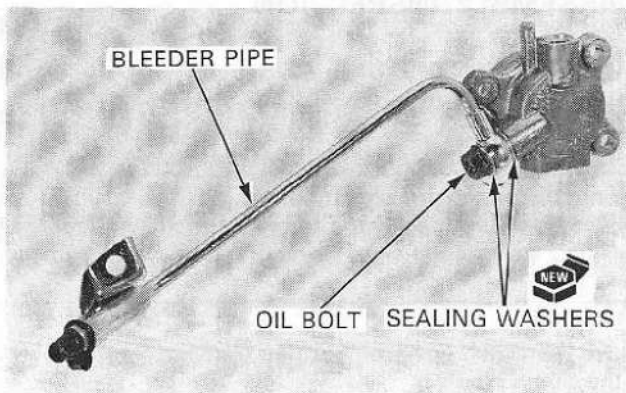
ASSEMBLY

Apply small amount of silicone grease (0.2 grams) to the lifter rod contacting surface of the piston.
Apply grease to new oil seal lips and install the oil seal into the piston.
Install a new piston seal into the piston groove.
Install the piston spring onto the piston.

Coat the piston and piston seal with clutch fluid and install piston and spring into the slave cylinder.

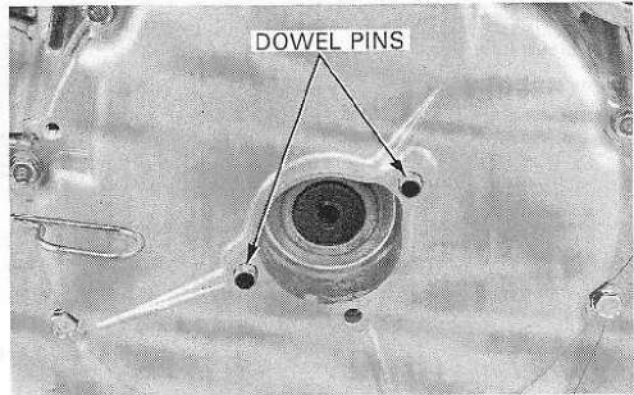


Loosely install the bleeder pipe to the slave cylinder with the oil bolt and new sealing washers.
Install the lifter rod into the slave cylinder oil seal.



CLUTCH

Install the dowel pins into the clutch cover.



Install the slave cylinder onto the clutch cover and tighten the mounting bolts securely.
Apply locking agent to the bleeder pipe mounting bolt threads and loosely install the bolt.

Tighten the bleeder pipe oil bolt.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Tighten the bleeder pipe mounting bolt.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Apply oil to the threads and seating surfaces of the side stand bracket bolts.
Install the side stand bracket and tighten the bolts.

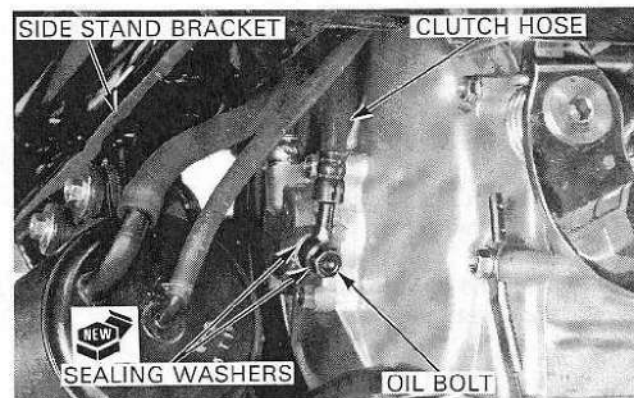
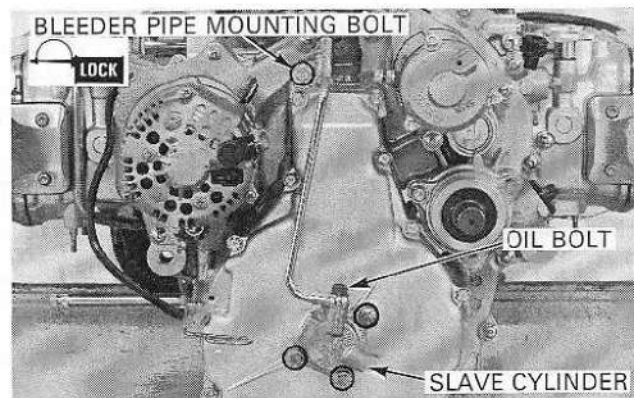
TORQUE: 64 N·m (6.5 kgf·m, 47 lbf·ft)

Connect the clutch hose to the slave cylinder with the oil bolt and new sealing washers.

Tighten the oil bolt.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the clutch hydraulic system (page 9-4).



CLUTCH

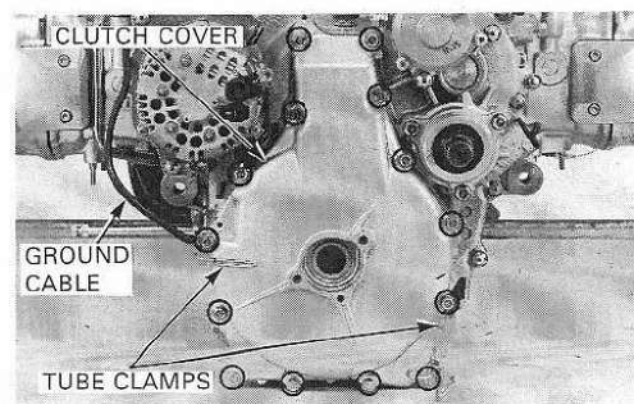
DISASSEMBLY/INSPECTION

Drain the engine oil (page 3-9).
Remove the clutch slave cylinder (page 9-8).

NOTE

- Do not disconnect the clutch hose.
- To keep slave cylinder piston from being forced out of the cylinder, squeeze the clutch lever and tie it to the handlebar.

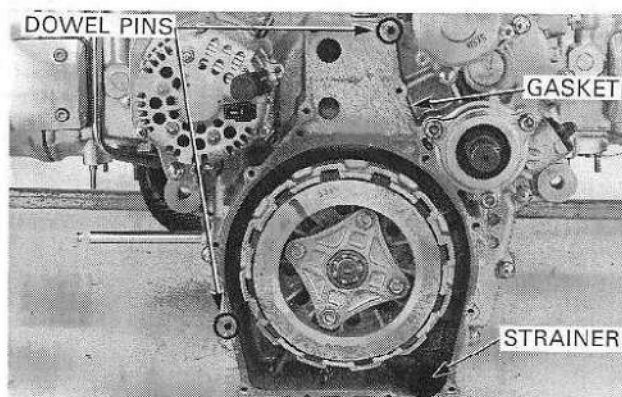
Remove the clutch cover bolts, tube clamps, ground cable and the clutch cover.



Remove the dowel pins and gasket.

Clean the clutch cover gasket surface of the rear case thoroughly, being careful not to damage it.

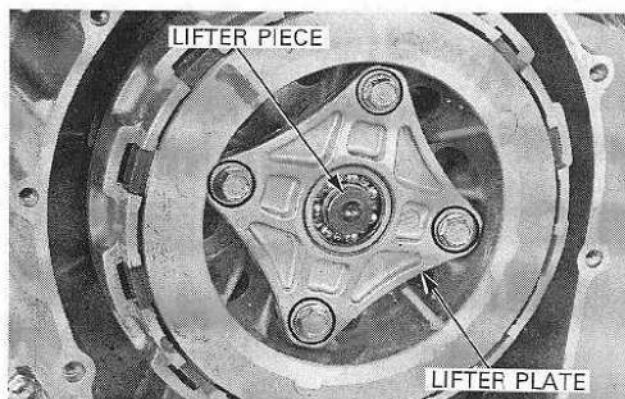
Remove the scavenge oil pump strainer and set aside.



Remove the clutch lifter piece.

Remove the four bolts and the clutch lifter plate.

Check the clutch lifter piece for wear or damage.

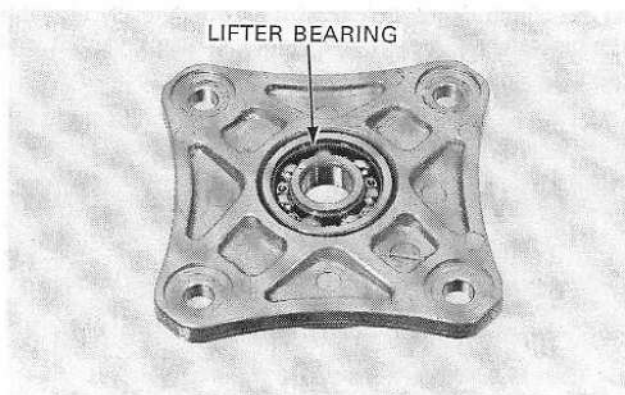


Turn the inner race of the lifter bearing with your finger. The bearing should turn smoothly and quietly.

Also check that the outer race of the bearing fits tightly in the lifter plate.

Remove and discard the bearing if the inner race does not turn smoothly, quietly, or if the outer race fit loosely in the lifter plate.

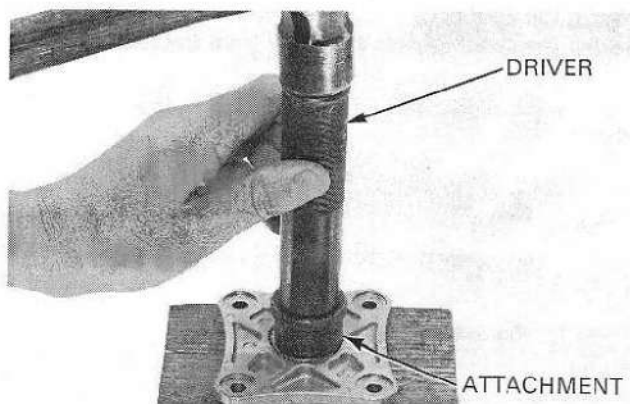
Drive the bearing out of the lifter plate.



Drive a new bearing into the plate with its mark side facing out using the special tools.

TOOLS:

Driver 07749-0010000
Attachment, 32 x 35 mm 07746-0010100

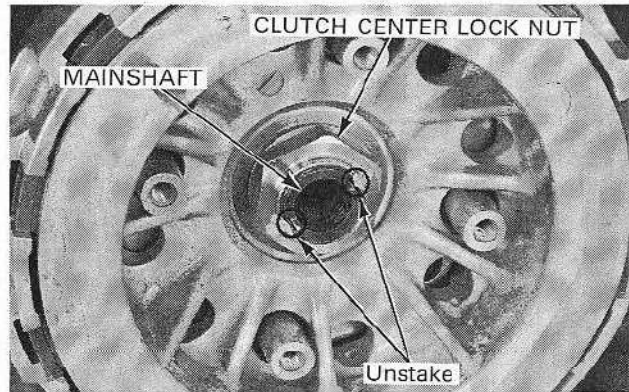


CLUTCH

Unstake the clutch center lock nut with a drill or grinder.

CAUTION

- *Be careful not to damage the mainshaft threads.*



Set the clutch center holder pins in the four holes of the clutch center and pressure plate. Install the holder plate onto the pins, set it with a suitable 6 mm washer and lifter plate (6 mm) bolt, and then tighten the nuts securely.

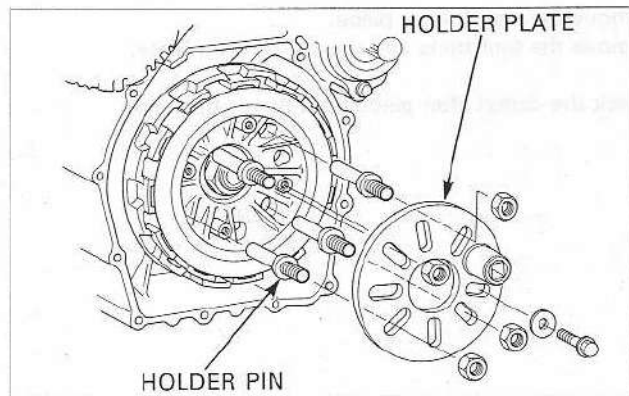
TOOLS:

Clutch center holder pin

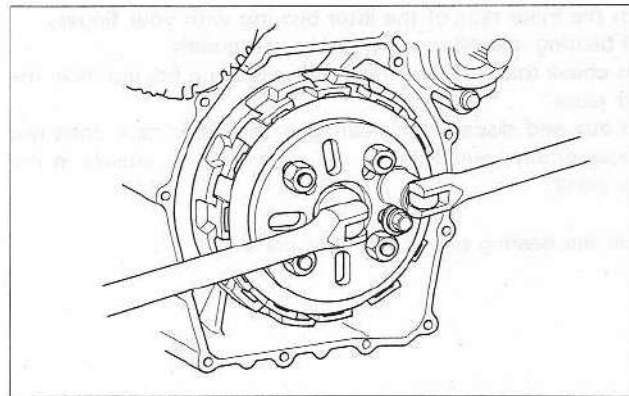
07VMB-MZ00100 or
07VMB-MZ0010A
(U.S.A. only)

Holder plate

07HGB-001010B or
07HGB-001010A
(U.S.A. only)

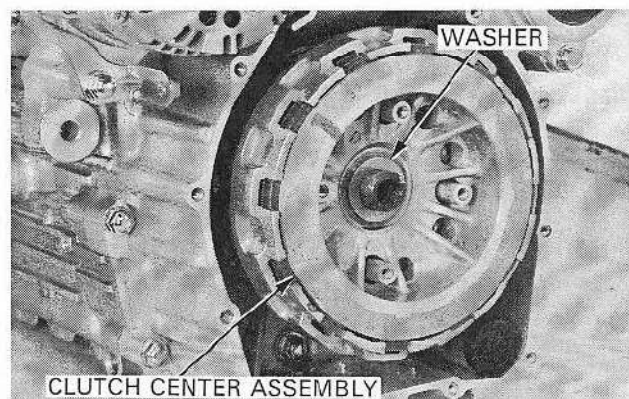


Hold the clutch center holder with a commercially available reversible ratchet, loosen the clutch center lock nut and remove it.



Remove the washer.

Remove the clutch center assembly from the clutch outer.

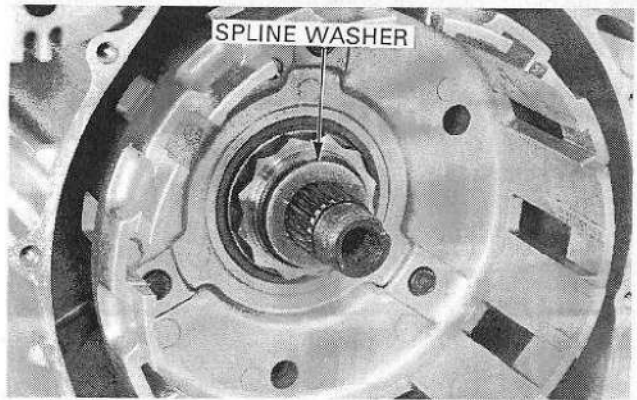


Remove the spline washer.

Install the clutch center holder pins into the holder plate. Place this assembly onto the clutch diaphragm spring and adjust the clutch center holder pins so they are 3—5 mm (0.12—0.20 in) from the snap ring retainer. Place the driver attachment or a flat plate over the holder plate/pins as shown.

TOOLS:

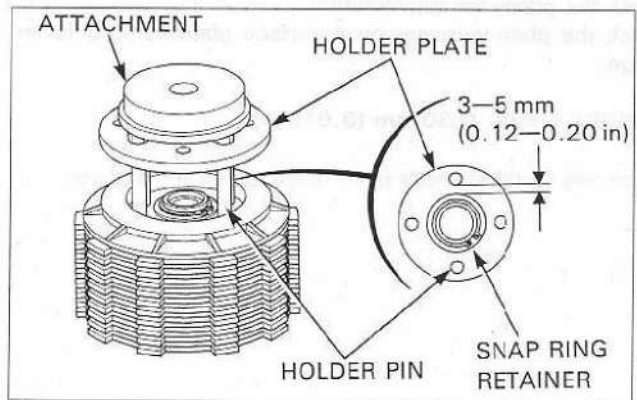
- | | |
|-------------------------------|--|
| Clutch center holder pin | 07VMB-MZ00100 or
07VMB-MZ0010A
(U.S.A. only) |
| Holder plate | 07HGB-001010B or
07HGB-001010A
(U.S.A. only) |
| Driver attachment, 78 × 90 mm | 07GAD-SD40101 |



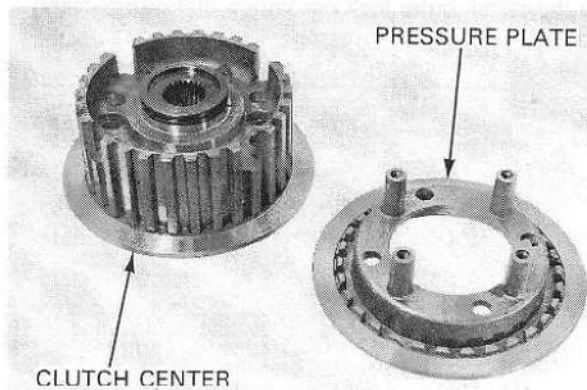
Compress the clutch spring with a hydraulic press just enough to remove the stopper ring; remove the stopper ring and disassemble the clutch center assembly.

CAUTION

- To prevent a loss of tension, do not compress the clutch spring more than necessary to remove the stopper ring.

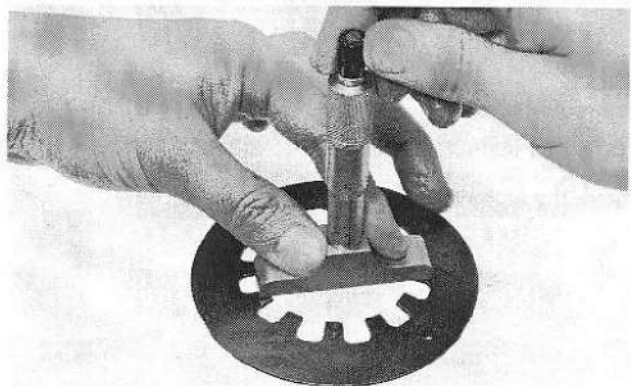


Check the clutch center and pressure plate for nicks, indentation or abnormal wear made by the plates.



Measure the height of the clutch spring.

SERVICE LIMIT: 5.1 mm (0.20 in)



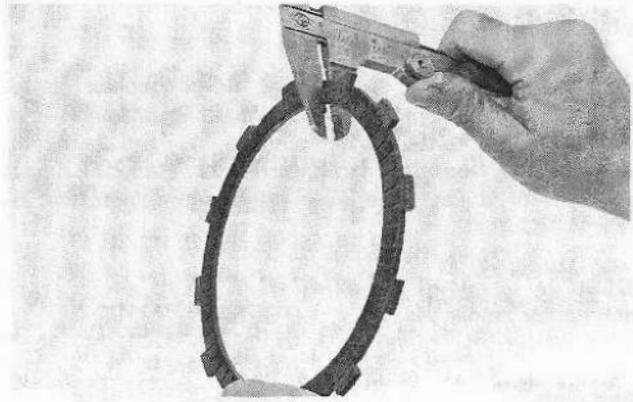
CLUTCH

Check the clutch discs for signs of scoring or discoloration. Measure the clutch disc thickness.

SERVICE LIMIT: 3.5 mm (0.14 in)

NOTE

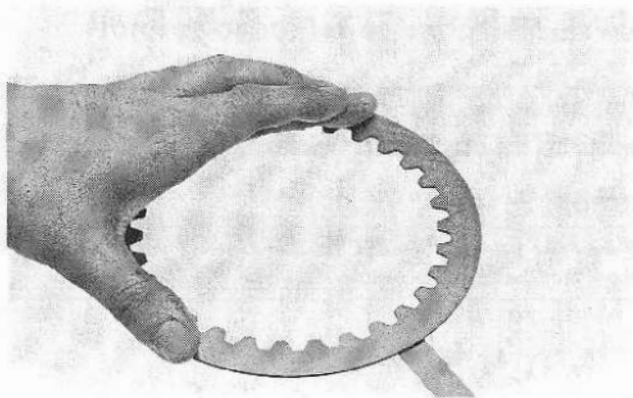
- Replace the clutch discs and plates as a set.



Check the plates for discoloration. Check the plate warpage on a surface plate using a feeler gauge.

SERVICE LIMIT: 0.30 mm (0.012 in)

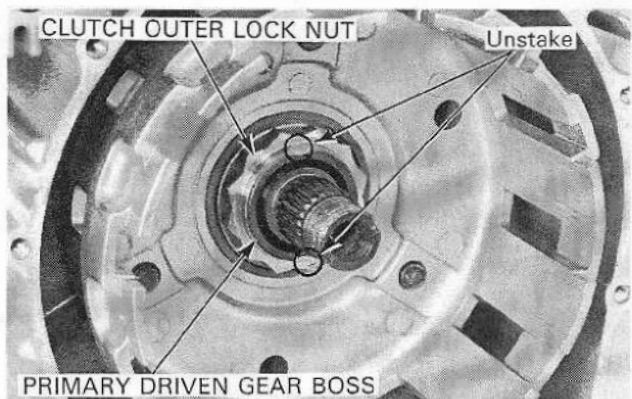
Check the clutch damper plate wave spring for damage.



Unstake the clutch outer lock nut with a drill or grinder.

CAUTION

- *Be careful not to damage the primary driven gear boss threads.*

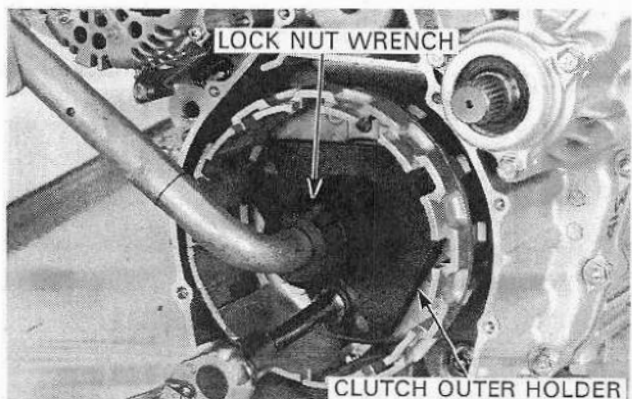


Hold the clutch outer with the clutch outer holder, loosen the clutch outer lock nut and remove it.

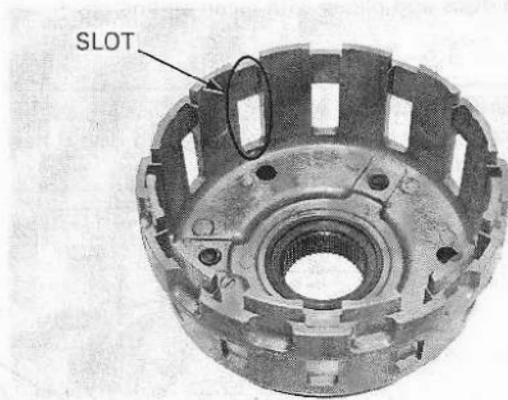
TOOLS:

Clutch outer holder 07JMB-MN50100
Lock nut wrench, 46 mm 07JMA-MN50100

Remove the lock washer and clutch outer.



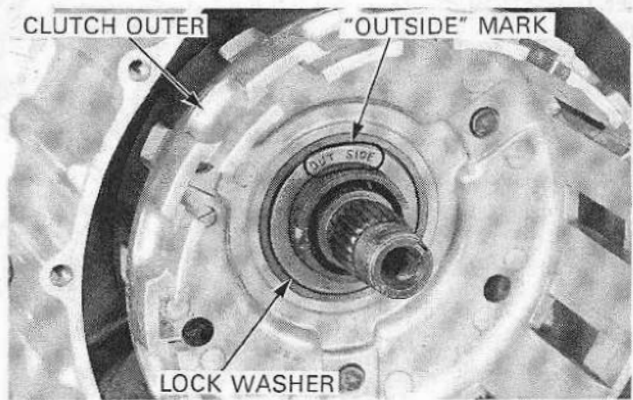
Check the slots in the clutch outer for nicks, indentation or abnormal wear made by the clutch discs.



ASSEMBLY

Clean the primary driven gear boss threads thoroughly.

Install the clutch outer and lock washer with the "OUTSIDE" mark facing out.

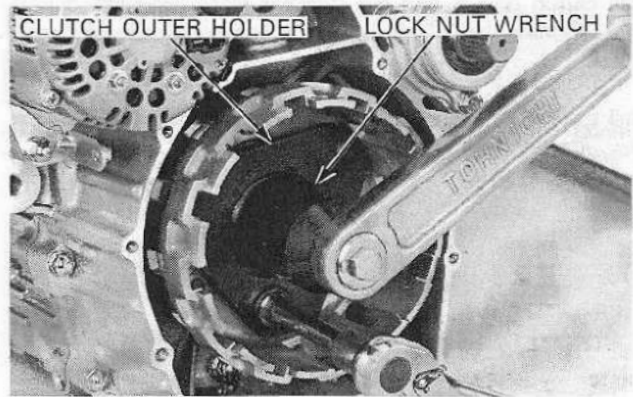


Apply locking agent to the threads of a new clutch outer lock nut and install the nut onto the primary driven gear boss. Hold the clutch outer with the clutch outer holder and torque the lock nut.

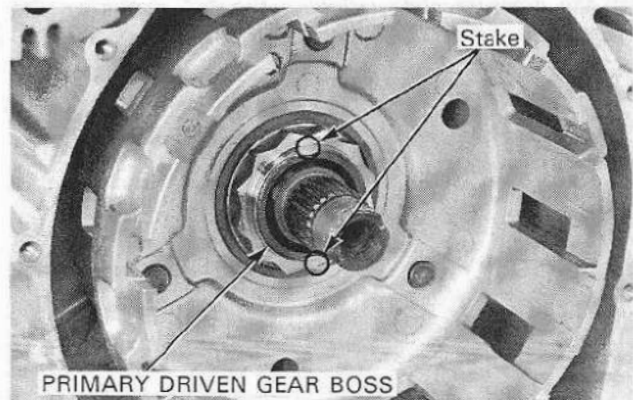
TOOLS:

- Clutch outer holder 07JMB-MN50100
- Lock nut wrench, 46 mm 07JMA-MN50100

TORQUE: 186 N·m (19.0 kgf·m, 137 lbf·ft)



Stake the lock nut into the primary driven gear boss grooves in two places.

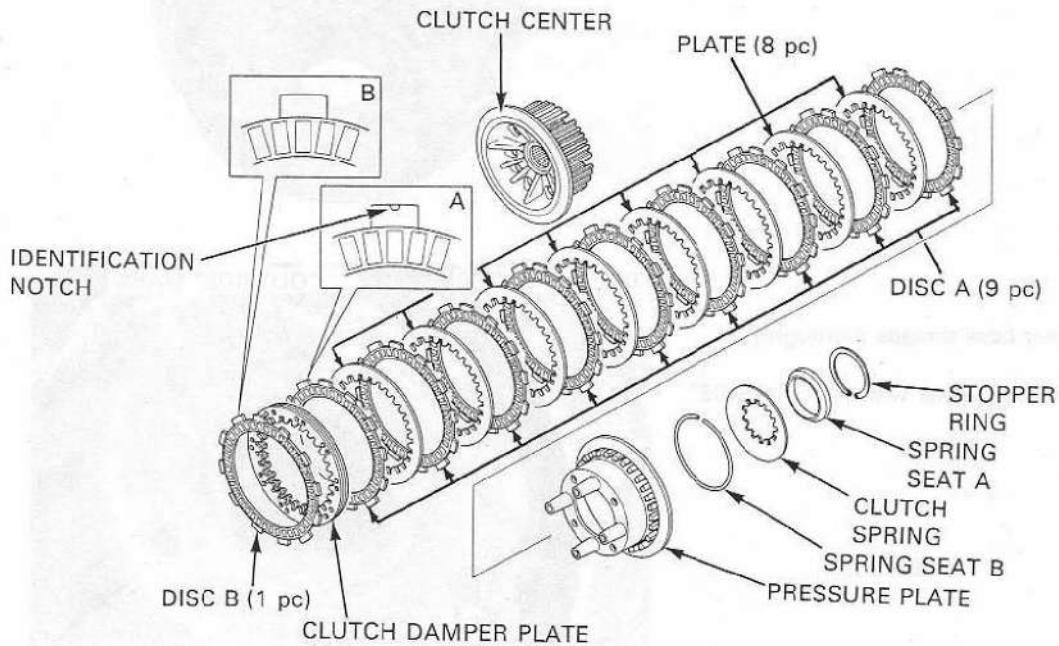


CLUTCH

Coat the clutch discs and plates with clean engine oil.

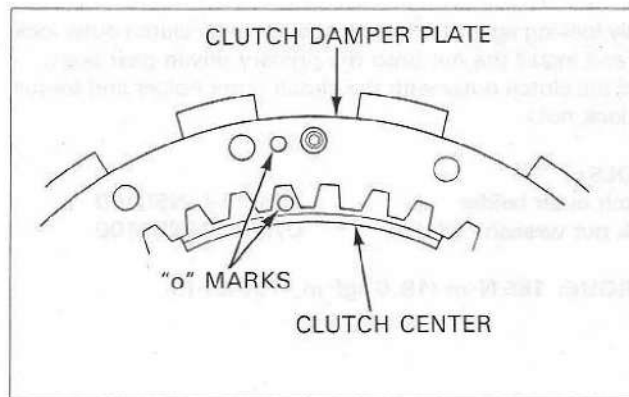
NOTE

Do not interchange clutch disc A and disc B. Disc A has the identification notch in its tab in three places, and disc B has no identification notch.



Install clutch disc B and the damper plate onto the clutch center, aligning the "o" marks on the damper plate and clutch center.

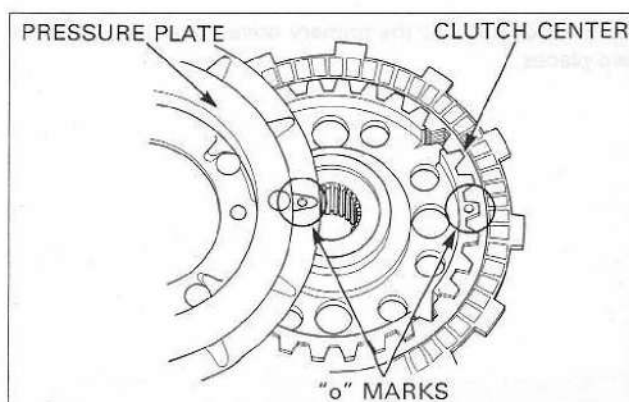
Install the nine clutch discs A and eight clutch plates alternately, starting with a disc.



Install the pressure plate, aligning the "o" marks on the pressure plate and clutch center.

CAUTION

- If the "o" marks are not aligned, the clutch center assembly cannot be assembled properly.



Slide the clutch center assembly into the clutch outer to line up the discs' tabs.
 Remove the clutch center assembly from the clutch outer without disturbing the tabs' alignment.

Install the clutch center holder pins into the holder plate. Place this assembly onto the clutch diaphragm spring and adjust the clutch center holder pins so they are 3–5 mm (0.12–0.20 in) from the snap ring retainer. Place the driver attachment or a flat plate over the holder plate/pins as shown.

TOOLS:

- | | |
|-------------------------------|--|
| Clutch center holder pin | 07VMB-MZ00100 or
07VMB-MZ0010A
(U.S.A. only) |
| Holder plate | 07HGB-001010B or
07HGB-001010A
(U.S.A. only) |
| Driver attachment, 78 × 90 mm | 07GAD-SD40101 |

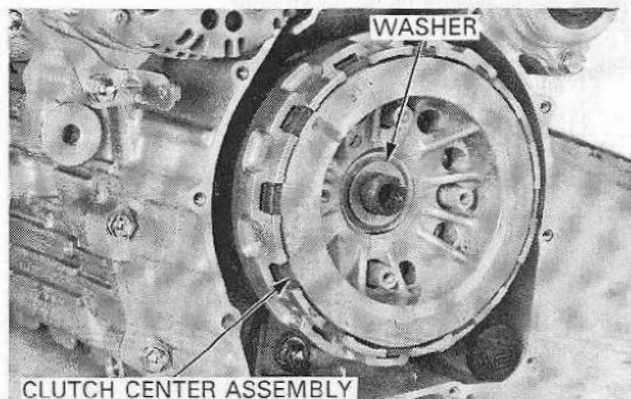
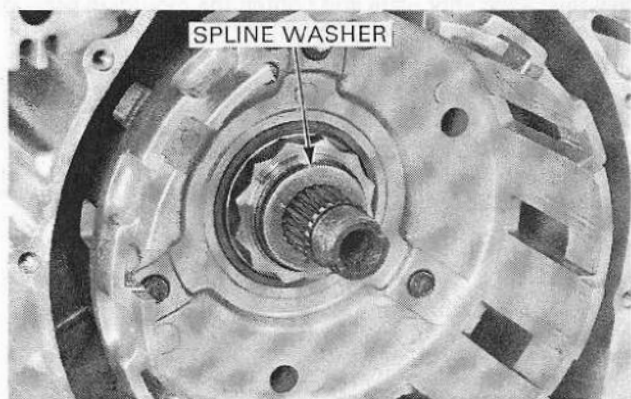
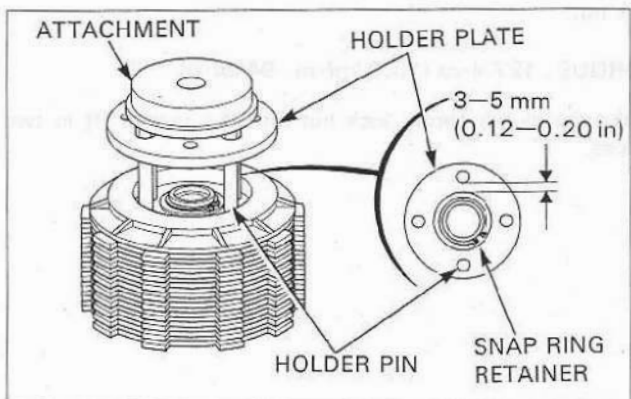
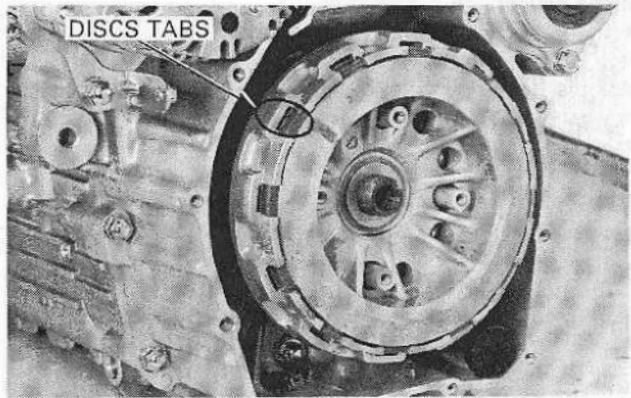
Install spring seat B, the clutch spring and spring seat A on the pressure plate.
 Compress the clutch spring with a hydraulic press just enough to install the stopper ring and install the stopper ring into the groove in the clutch center securely.

CAUTION

- To prevent a loss of tension, do not compress the clutch spring more than necessary to install the stopper ring.

Install the spline washer onto the mainshaft.

Install the clutch center assembly into the clutch outer and onto the mainshaft.
 Install the washer.



CLUTCH

Install a new clutch center lock nut.

Set the clutch center holder pins in the four holes of the clutch center and pressure plate.

Install the holder plate onto the pins, set it with a suitable 6 mm washer and lifter plate (6 mm) bolt, and then tighten the nuts securely.

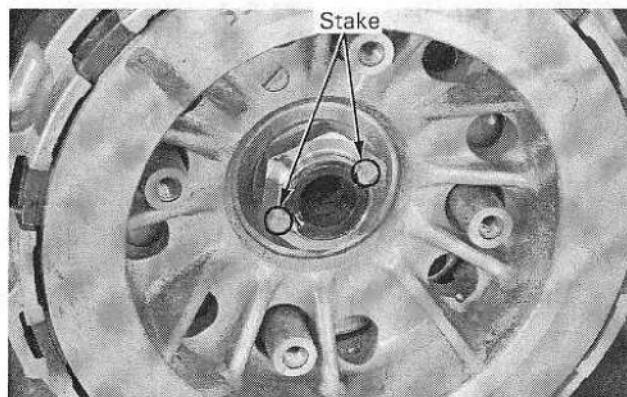
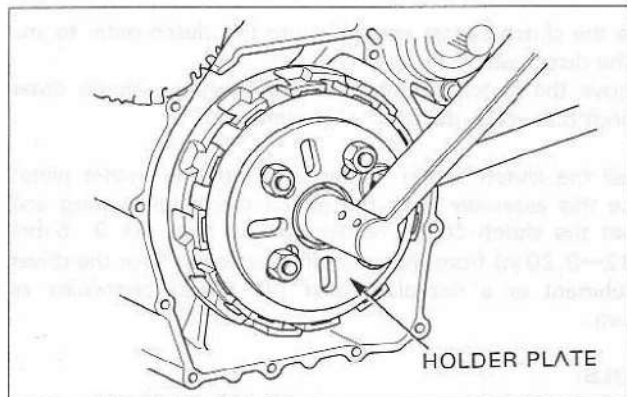
TOOLS:

Clutch center holder pin	07VMB-MZ00100 or 07VMB-MZ0010A (U.S.A. only)
Holder plate	07HGB-001010B or 07HGB-001010A (U.S.A. only)

Hold the clutch center holder and tighten the clutch center lock nut.

TORQUE: 127 N·m (13.0 kgf·m, 94 lbf·ft)

Stake the clutch center lock nut into the mainshaft in two places.

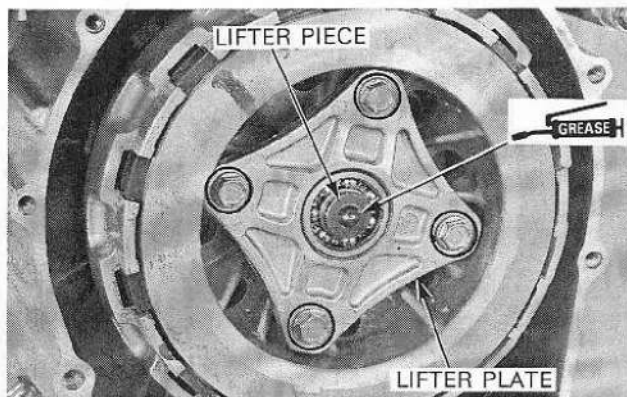


Install the clutch lifter plate and tighten the mounting bolts in a crisscross pattern in 2 or 3 steps.

Coat the clutch lifter piece with grease and install it.

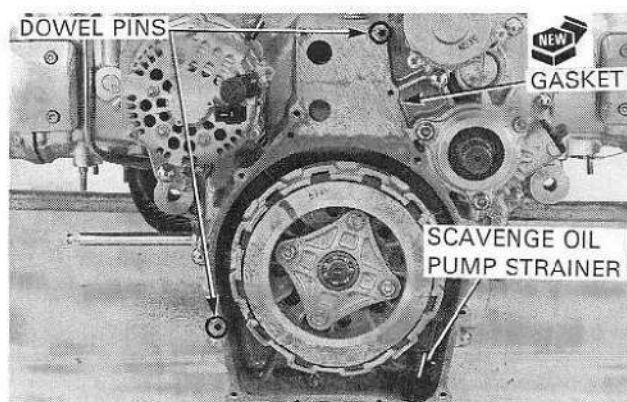
Check that the lifter piece turns smoothly.

If not, loosen the lifter plate bolts, center the lifter plate and retighten the bolts in a crisscross pattern in 2 or 3 steps.



Replace the scavenge oil pump strainer.

Install the dowel pins and a new gasket.



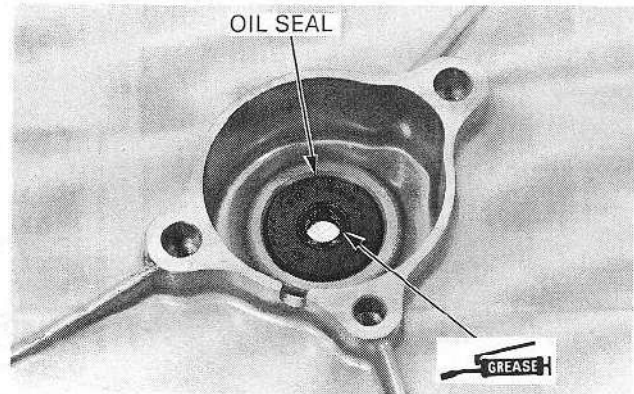
Check the oil seal in the clutch cover for wear, deterioration or damage and replace it with a new one if necessary.

Apply grease to the oil seal lips.

Drive the seal into the cover using the special tools.

TOOLS:

Driver 07749-0010000
Attachment, 32×35 mm 07746-0010100



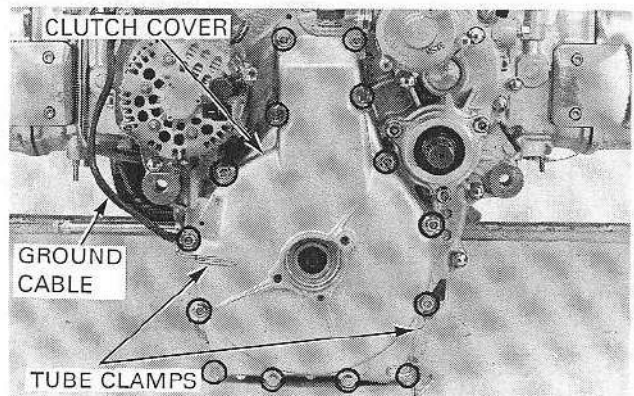
Install the clutch cover, tube clamps, ground cable and cover bolts.

Install the clutch slave cylinder (page 9-10).

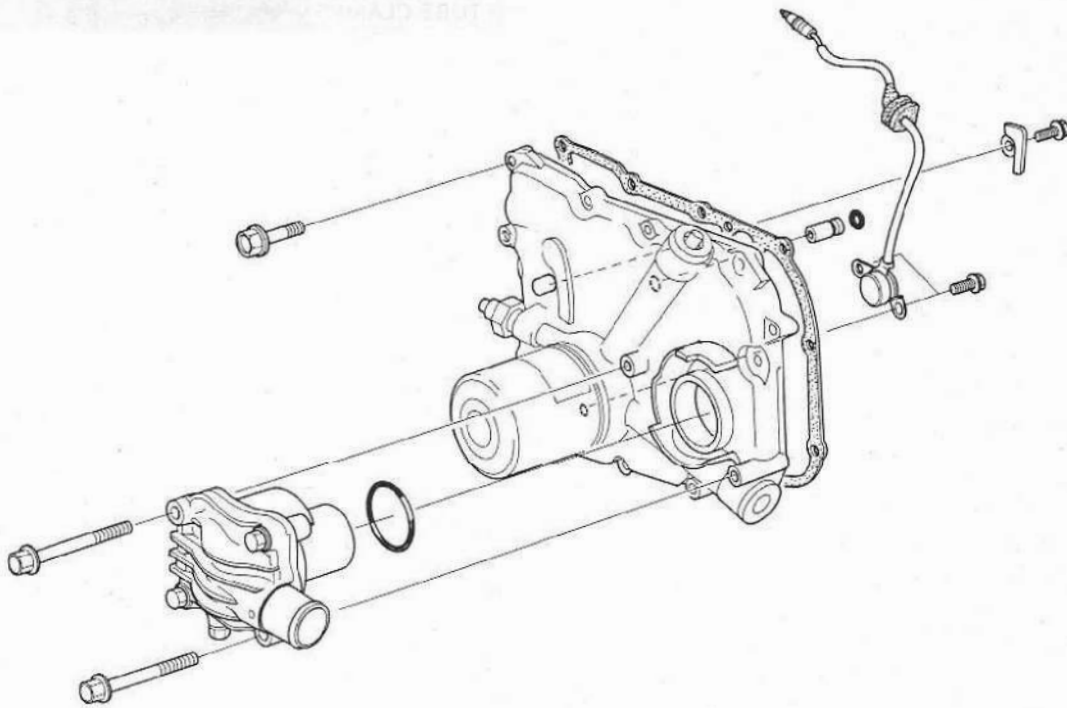
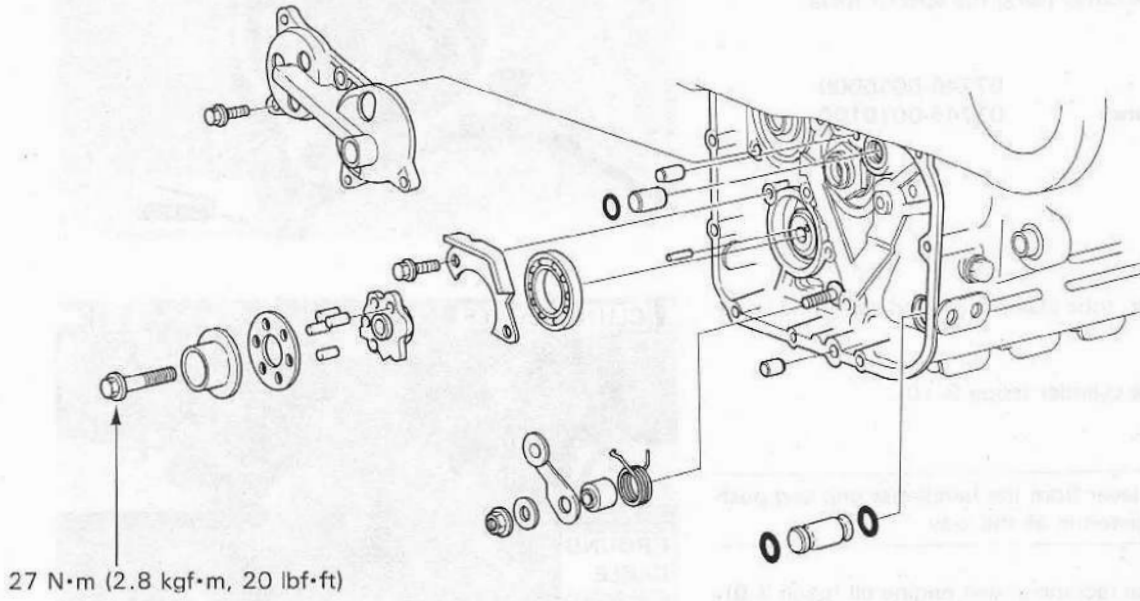
NOTE

- Release the clutch lever from the handlebar grip and push the slave cylinder piston in all the way.

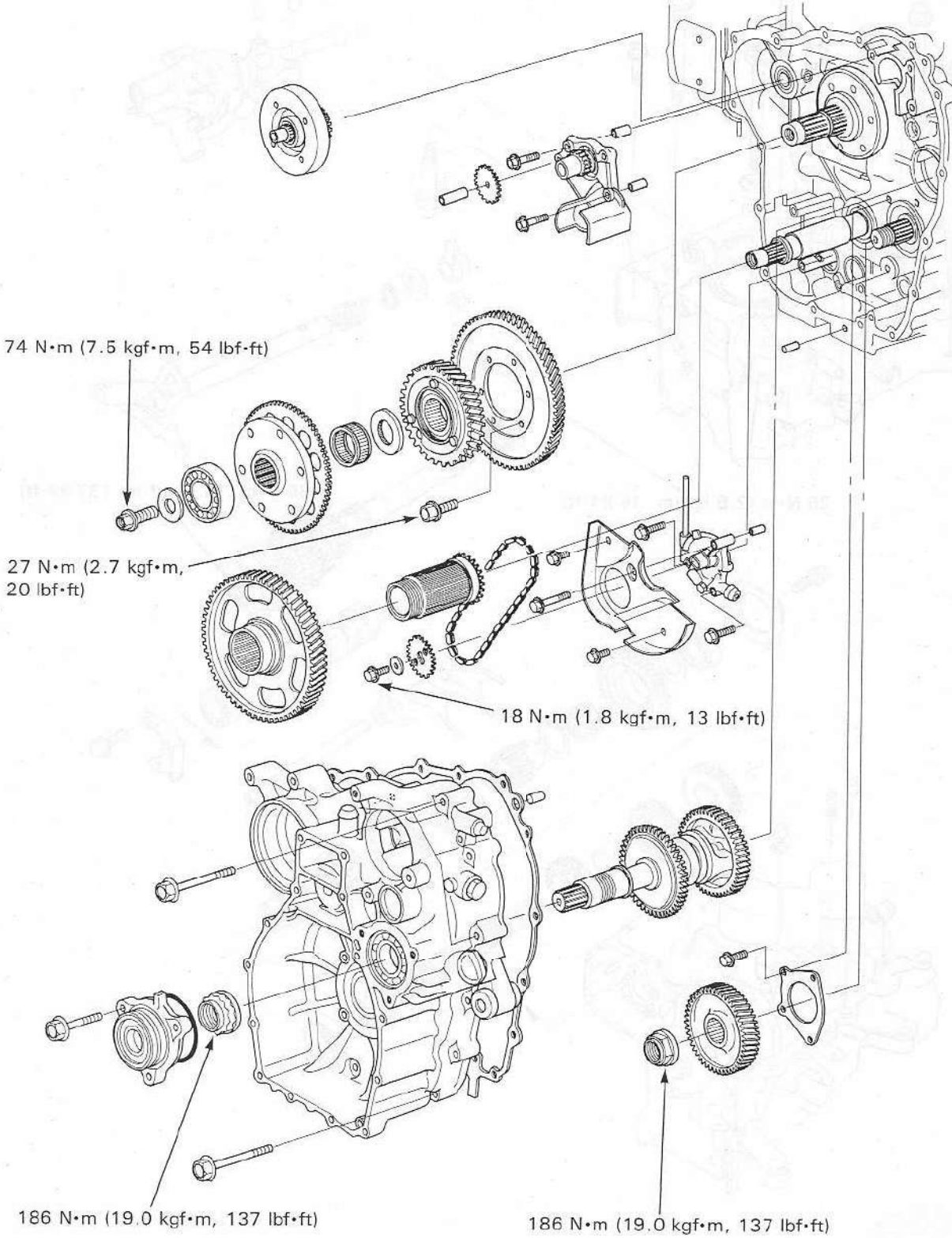
Fill the engine with the recommended engine oil (page 3-9).



GEARSHIFT LINKAGE/TRANSMISSION

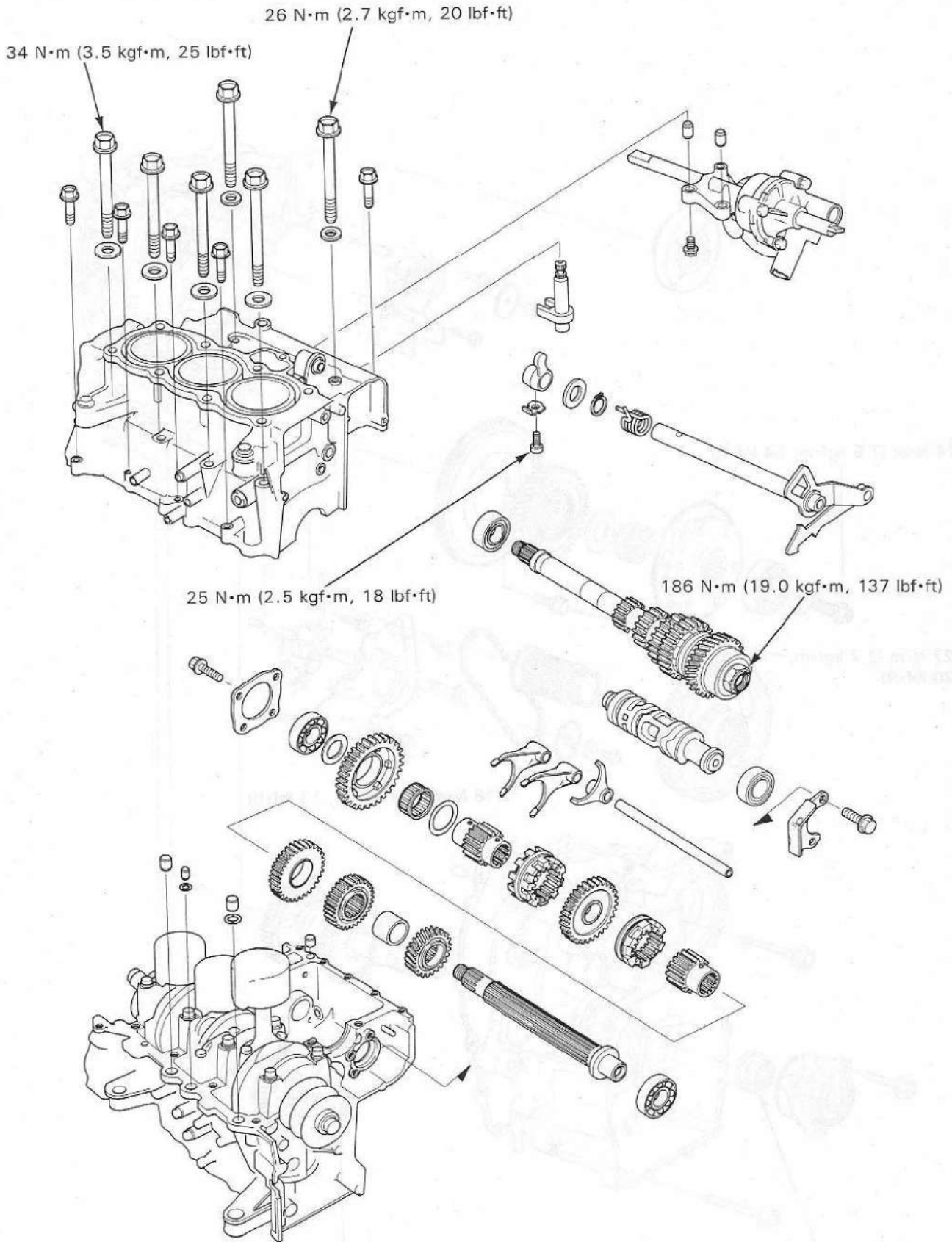


10. GEARSHIFT LINKAGE/TRANSMISSION



10

GEARSHIFT LINKAGE/TRANSMISSION



SERVICE INFORMATION	10-3	PRIMARY GEARS/OUTPUT SHAFT	10-10
TROUBLESHOOTING	10-4	TRANSMISSION	10-22
GEARSHIFT LINKAGE	10-5		

SERVICE INFORMATION

GENERAL

- The gearshift linkage, with the exception of the gearshift spindle and gearshift arm, can be serviced with the engine installed in the frame.
- The engine must be removed from the frame to service the primary gears and output shaft. Refer to section 7 for engine removal and installation.
- The crankcase must be separated to service the transmission. Refer to section 11 for the crankcase separation and assembly.
- When using the lock nut wrench for the output shaft lock nut, use a deflecting beam type torque wrench 20 inches long. The lock nut wrench increases the torque wrench's leverage, so the torque wrench reading will be less than the torque actually applied to the lock nut. The specification given is the actual torque applied to the lock nut, not the reading on the torque wrench. Do not over tighten the lock nut. The specification later in the text gives both actual and indicated.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Shift fork	I.D.	14.000—14.021 (0.5512—0.5520)	14.04 (0.553)	
	Claw thickness	5.93—6.00 (0.233—0.236)	5.6 (0.22)	
Shift fork shaft	O.D.	13.966—13.984 (0.5498—0.5506)	13.90 (0.547)	
Output shaft	Damper spring free length		60.82 (2.394)	
	Shaft O.D.		22.008—22.021 (0.8665—0.8670)	
	Collar	I.D.	22.026—22.041 (0.8672—0.8678)	22.05 (0.868)
		O.D.	25.959—25.980 (1.0220—1.0228)	25.95 (1.022)
	Driven gear I.D.		26.000—26.016 (1.0236—1.0242)	26.03 (1.025)
Transmission	Gear I.D.	M4	31.000—31.025 (1.2205—1.2215)	31.04 (1.222)
		M5	30.000—30.021 (1.1811—1.1819)	30.04 (1.183)
		C2, C3	34.000—34.016 (1.3386—1.3392)	34.04 (1.340)
	Gear bushing O.D.	M4	30.950—30.975 (1.2185—1.2195)	30.93 (1.218)
		M5	29.955—29.980 (1.1793—1.1803)	29.93 (1.178)
		C2, C3	33.940—33.965 (1.3362—1.3372)	33.92 (1.335)
	Gear bushing I.D.	M4	28.000—28.021 (1.1024—1.1032)	28.04 (1.104)
		M5	23.000—23.021 (0.9055—0.9063)	23.03 (0.907)
	Mainshaft O.D.	M4	27.974—27.987 (1.1013—1.1018)	27.95 (1.100)
		M5	22.974—22.987 (0.9045—0.9050)	22.95 (0.904)
	Gear-to-bushing clearance	M4	0.025—0.075 (0.0010—0.0030)	0.10 (0.004)
		M5	0.020—0.066 (0.0008—0.0026)	0.09 (0.004)
		C2, C3	0.035—0.076 (0.0014—0.0030)	0.10 (0.004)
	Bushing-to-shaft clearance	M4	0.013—0.047 (0.0005—0.0019)	0.08 (0.003)
		M5	0.013—0.047 (0.0005—0.0019)	0.08 (0.003)

GEARSHIFT LINKAGE/TRANSMISSION

TORQUE VALUES

Gearshift arm bolt	25 N·m (2.5 kgf·m, 18 lbf·ft)
Shift drum joint bolt	27 N·m (28 kgf·m, 20 lbf·ft) Apply locking agent to the threads.
Oil pump driven sprocket bolt	18 N·m (1.8 kgf·m, 13 lbf·ft) Apply locking agent to the threads.
Alternator drive gear bolt	26 N·m (2.7 kgf·m, 20 lbf·ft) Apply oil to the threads and seating surface.
Starter clutch bolt	74 N·m (7.5 kgf·m, 54 lbf·ft)
Output shaft lock nut	186 N·m (19.0 kgf·m, 137 lbf·ft) Stake.
Mainshaft lock nut	186 N·m (19.0 kgf·m, 137 lbf·ft) Stake.
Countershaft lock nut	186 N·m (19.0 kgf·m, 137 lbf·ft) Apply locking agent to the threads and stake.
Output shaft bearing holder bolt	29 N·m (3.0 kgf·m, 22 lbf·ft)
Rear case bolt	29 N·m (3.0 kgf·m, 22 lbf·ft)

TOOLS

Mainshaft holder	07JMB-MN50200
Lock nut wrench, 30×64 mm	07916-MB00002 or 07916-MB00001
Driver	07749-0010000
Attachment, 42×47 mm	07746-0010300
Bearing driver attachment	07GAD-SD40101
Attachment, 62×68 mm	07746-0010500
Pilot, 30 mm	07746-0040700
Clutch outer holder	07JMB-MN50100
Pilot, 22 mm	07746-0041000
Driver, 22 mm I.D.	07746-0020100
Attachment, 28×30 mm	07946-1870100
Pilot, 28 mm	07746-0041100
Attachment, 32×35 mm	07746-0010100

TROUBLESHOOTING

Hard to shift

- Improper clutch operation (section 9)
- Incorrect engine oil weight
- Bent shift forks
- Bent shift fork shaft
- Bent shift fork claw
- Damaged shift drum cam grooves
- Bent gearshift arm
- Bent gearshift spindle

Transmission jumps out of gear

- Worn gear dogs
- Worn gear shifter
- Bent shift fork shaft
- Broken shift drum stopper
- Worn or bent shift forks
- Broken drum stopper spring
- Broken gearshift arm return spring

Excessive engine noise

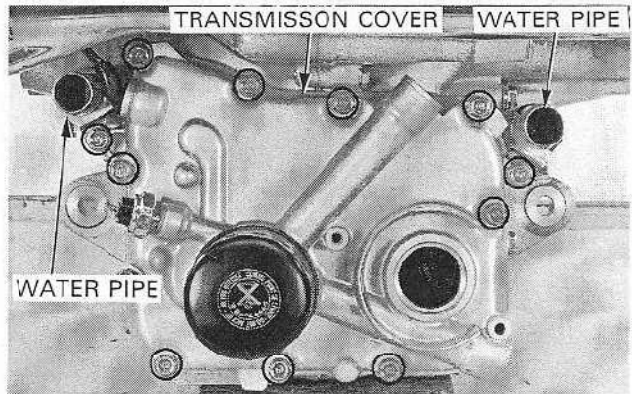
- Worn or damaged transmission gears or bearings
- Worn or damaged primary drive and driven gears or bearings
- Worn or damaged alternator drive and driven gears or bearings
- Worn or damaged final drive and driven gears or bearings

GEARSHIFT LINKAGE

TRANSMISSION COVER REMOVAL

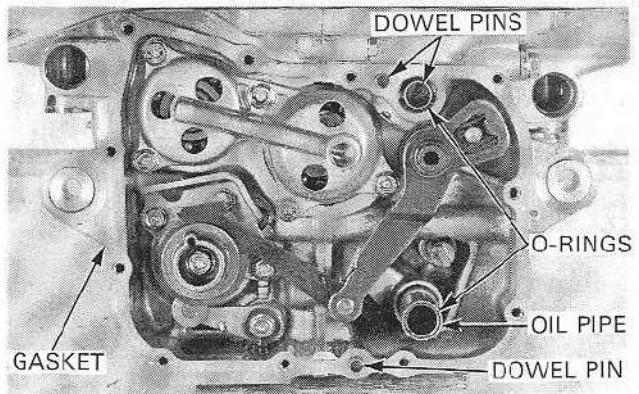
Drain the engine oil (page 3-9).
 Drain the coolant (page 6-5).
 Remove the water pump (page 6-12).
 Disconnect the oil pressure switch connector and neutral switch connector.

Remove the water pipes.
 Remove the transmission cover bolts and the cover.



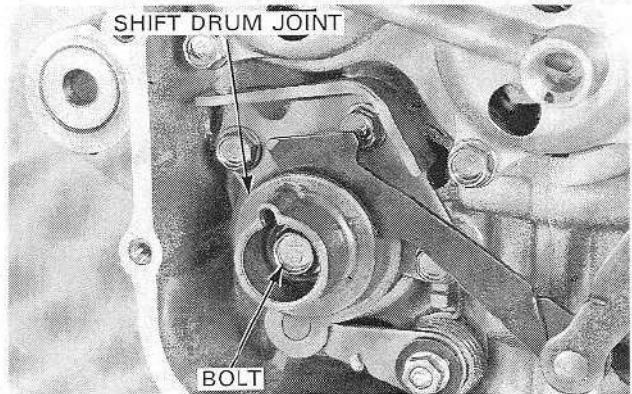
Remove the dowel pins, oil pipe, O-ring and gasket.

Clean the gasket surfaces thoroughly, being careful not to damage them.

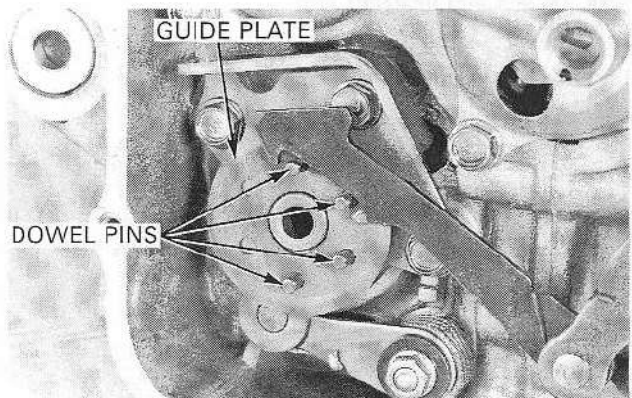


SHIFT DRUM CAM/STOPPER REMOVAL

Remove the bolt and shift drum joint.

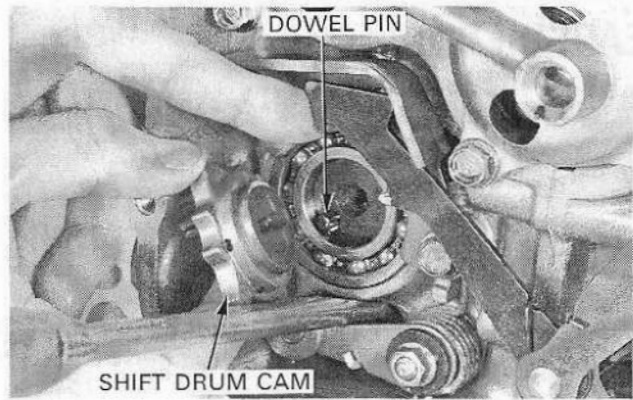


Remove the dowel pins and gearshift arm guide plate.

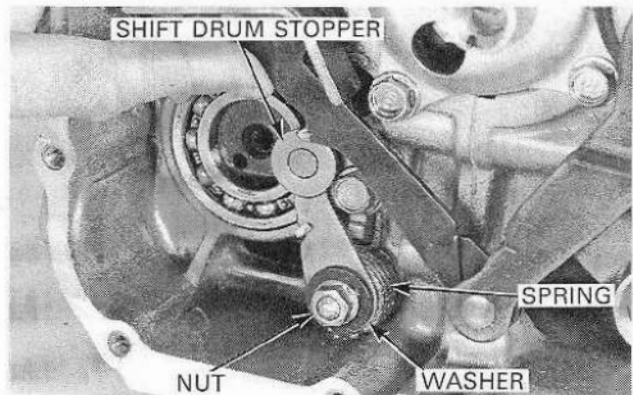


GEARSHIFT LINKAGE/TRANSMISSION

Lower the shift drum stopper and remove the shift drum cam and dowel pin.



Remove the nut, washer, shift drum stopper, collar and spring.



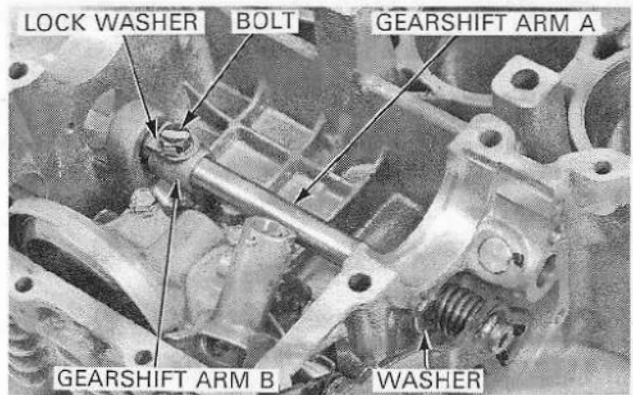
GEARSHIFT ARM/SPINDLE REMOVAL

Separate the crankcase (page 11-3).

Straighten the lock washer tabs.

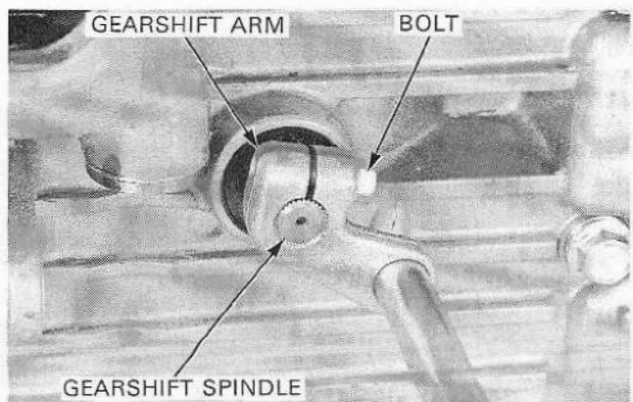
Remove the bolt, lock washer and gearshift arm B.

Remove the gearshift arm A and washer.



Remove the bolt and gearshift arm.

Remove the gearshift spindle.

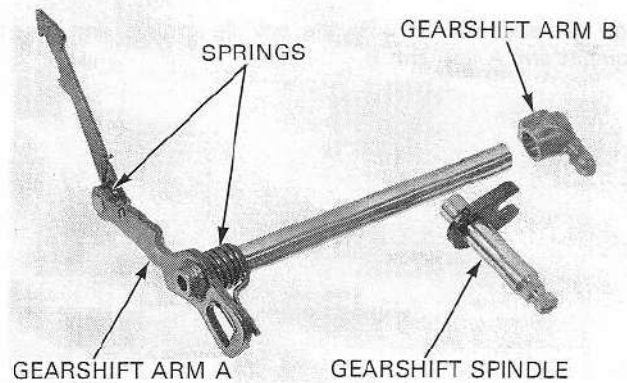


GEARSHIFT LINKAGE/TRANSMISSION

INSPECTION

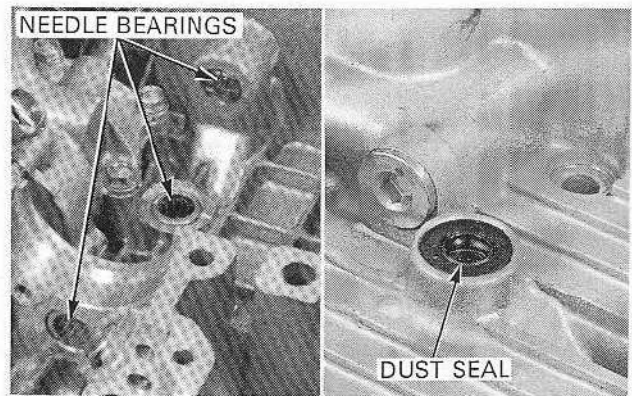
Check the gearshift arms and spindle for wear, damage or bending.

Check the gearshift arm spring and return spring for weakness or damage.



Check the gearshift arm and spindle needle bearings for wear or damage.

Check the gearshift spindle and dust seal for wear, damage or deterioration.

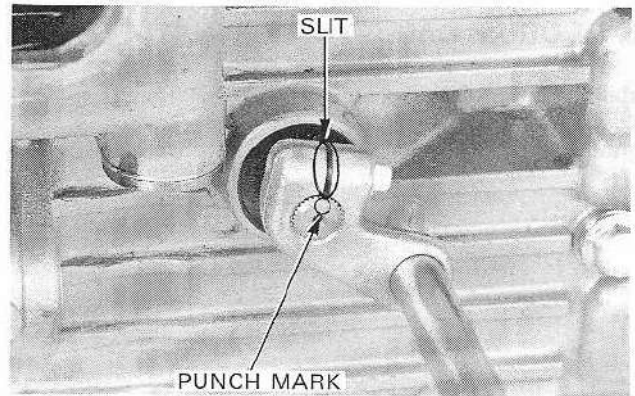


GEARSHIFT ARM/SPINDLE INSTALLATION

Install the gearshift spindle into the left crankcase.

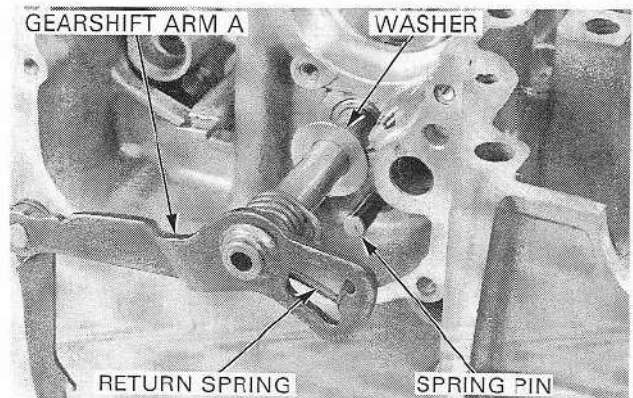
Install the gearshift arm onto the gearshift spindle, aligning the slit of the arm with the punch mark on the spindle.

Tighten the bolt securely.



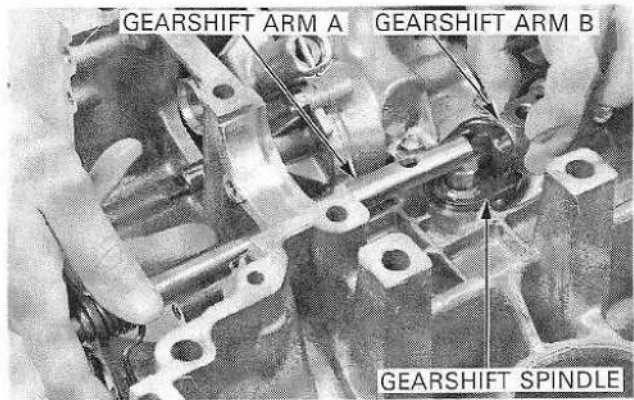
Install the washer onto gearshift arm A.

Install gearshift arm A into the left crankcase, aligning the return spring ends with the spring pin.



GEARSHIFT LINKAGE/TRANSMISSION

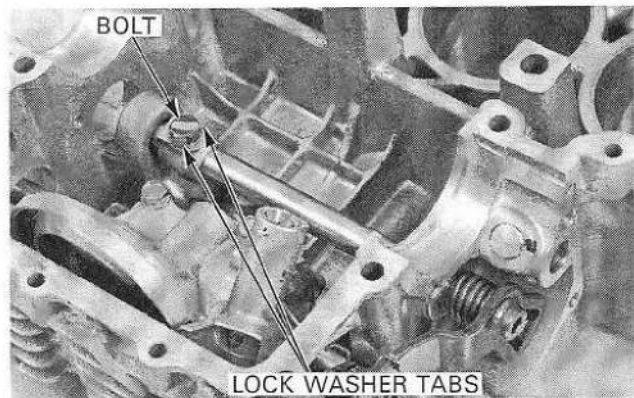
Align gearshift arm B with the spindle groove and insert gearshift arm A into arm B.



Install a new lock washer and the bolt. Tighten the bolt and bend the lock washer tabs against the bolt head.

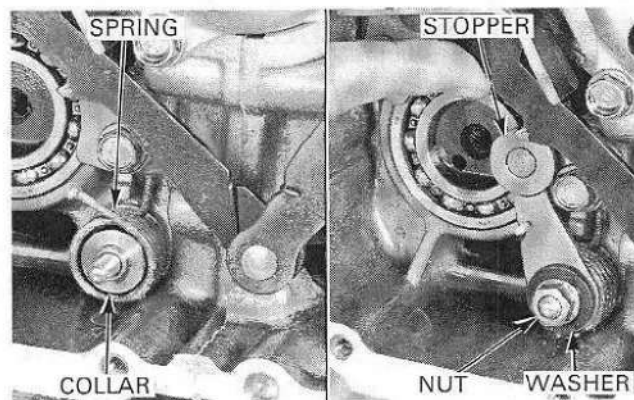
TORQUE: 25 N·m (2.5 kgf·m, 18 lbf·ft)

Assemble the crankcase (page 11-17).

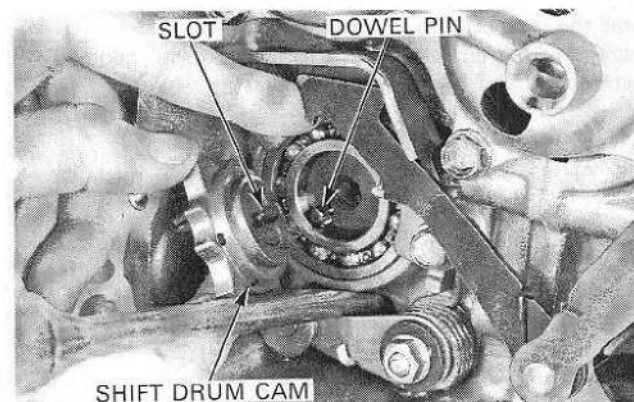


SHIFT DRUM CAM/STOPPER INSTALLATION

Install the collar and stopper spring. Install the stopper, washer and nut. Tighten the nut securely.



Install the dowel pin into the shift drum. Lower the shift drum stopper and install the shift drum cam, aligning the slot in the cam with the dowel pin.

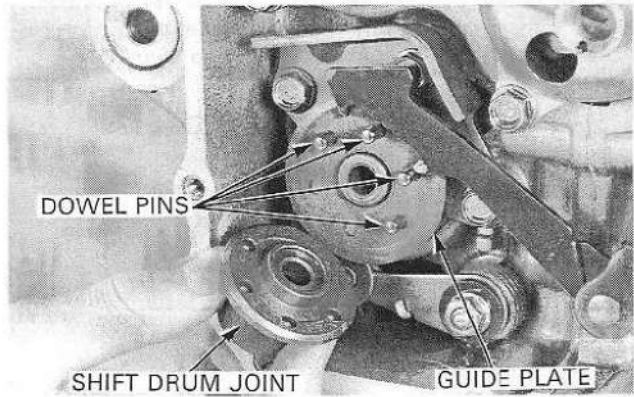


GEARSHIFT LINKAGE/TRANSMISSION

Install the gearshift arm guide plate with the concaved side facing in.

Align the dowel pin holes in the guide plate and drum cam, and install the dowel pins.

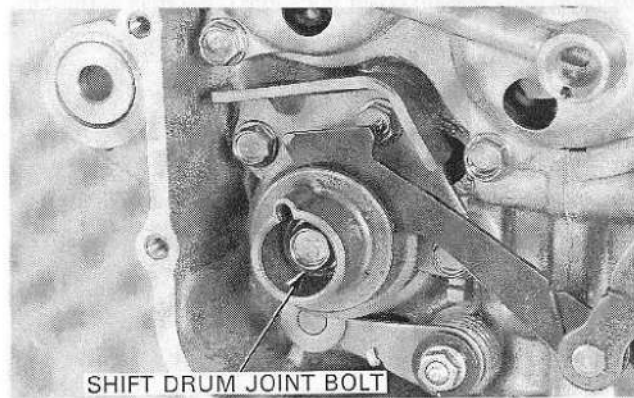
Install the shift drum joint, aligning the holes with the dowel pins.



Apply locking agent to the shift drum joint bolt threads. Install and tighten the bolt.

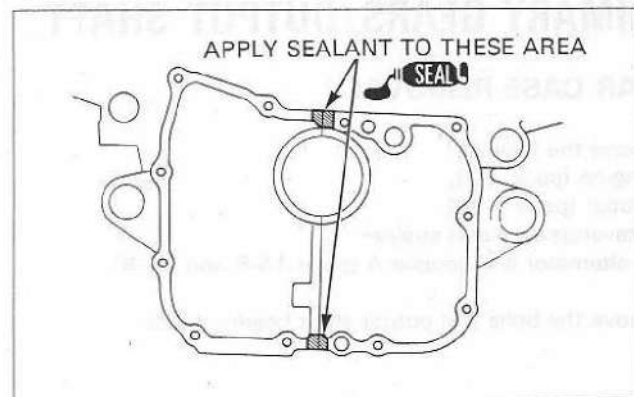
TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)

Check the operation of the gearshift linkage.



TRANSMISSION COVER INSTALLATION

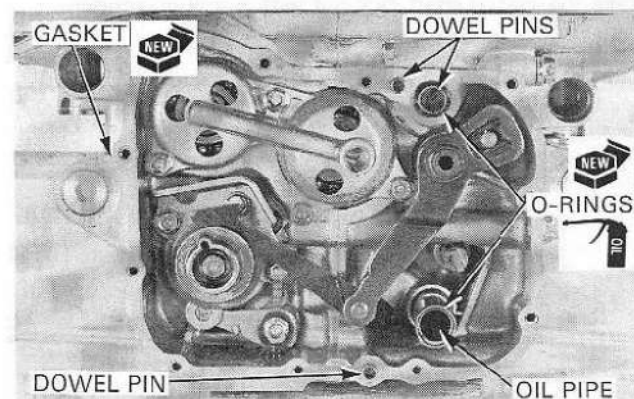
Apply sealant to the crankcase surfaces as shown.



Install the dowel pins and a new gasket.

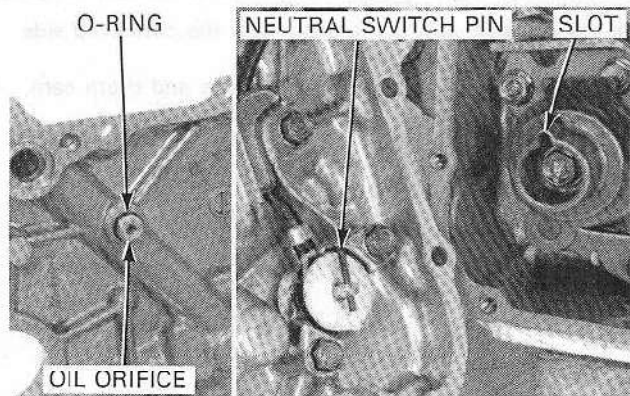
Coat new O-rings with oil and install them onto the oil pipe and dowel pin.

Install the oil pipe.



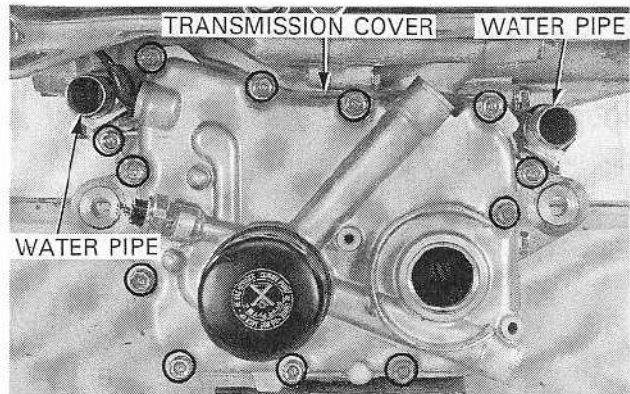
GEARSHIFT LINKAGE/TRANSMISSION

Coat a new O-ring with oil and install it onto the oil orifice. Install the transmission cover, aligning the neutral switch pin with the slot in the shift drum joint and also aligning the oil passages.



Tighten the transmission cover bolts in a crisscross pattern in 2 or 3 steps. Install the water pipes.

Connect the neutral switch connector and oil pressure switch connector. Install the water pump (page 6-13). Fill the engine with recommended engine oil (page 3-9). Fill the engine with recommended coolant (page 6-6).



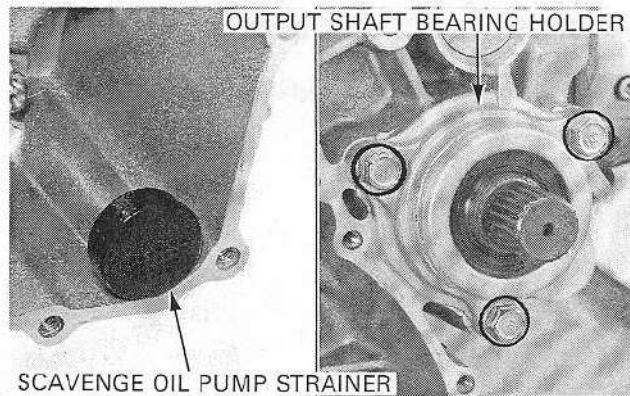
PRIMARY GEARS/OUTPUT SHAFT

REAR CASE REMOVAL

Remove the following:

- engine (page 7-3).
- clutch (page 9-10).
- scavenge oil pump strainer.
- alternator and coupler A (page 16-8 and 16-9).

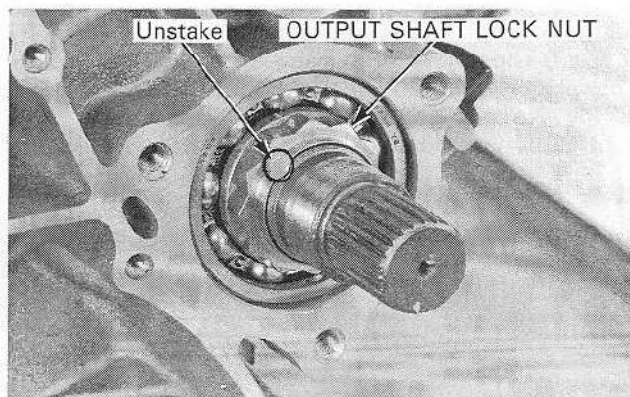
Remove the bolts and output shaft bearing holder.



Unstake the output shaft lock nut with a drill or grinder.

CAUTION

- *Be careful that metal particles do not enter the bearing and that the output shaft threads are not damaged.*

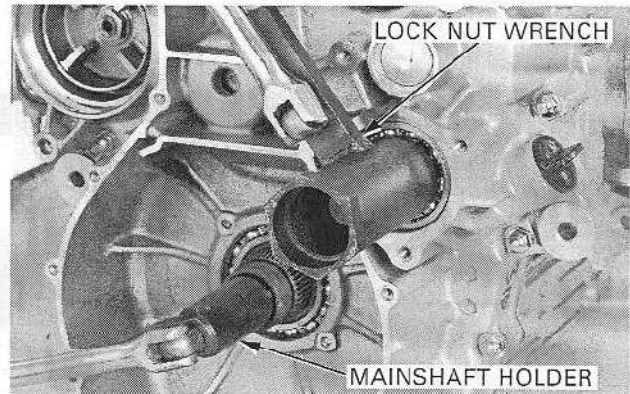


GEARSHIFT LINKAGE/TRANSMISSION

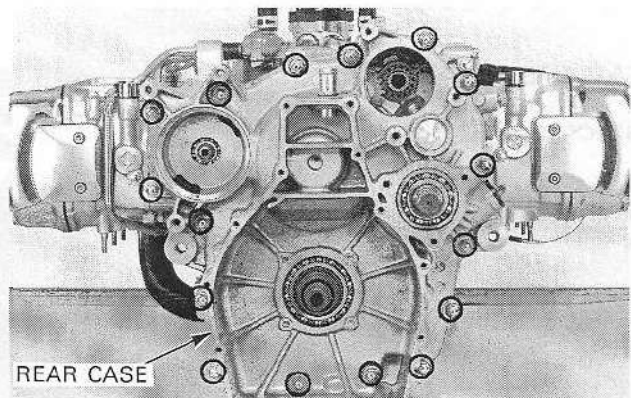
Shift the transmission into any gear.
Hold the mainshaft with the mainshaft holder and loosen the output shaft lock nut using the special tool and a breaker bar.
Remove and discard the lock nut.

TOOLS:

Mainshaft holder 07JMB-MN50200
Lock nut wrench, 30 × 64 mm 07916-MB00002 or 07916-MB00001

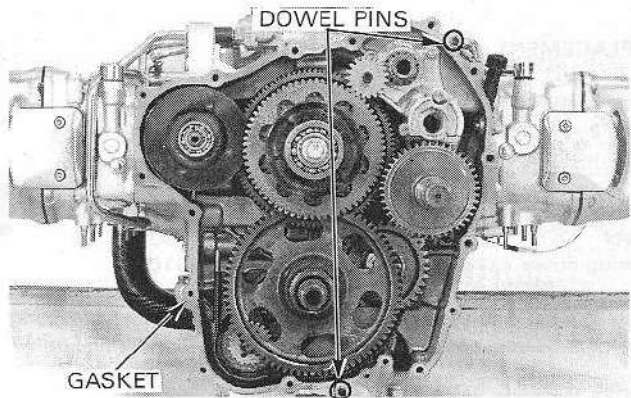


Remove the sixteen rear case bolts and the rear case.



Remove the dowel pins and gasket.

Clean the gasket surfaces thoroughly, being careful not to damage them.



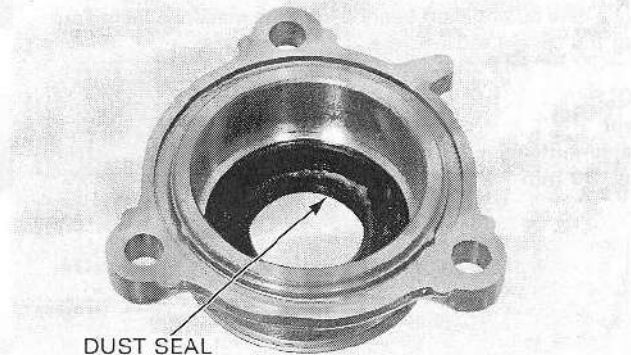
BEARING HOLDER DUST SEAL

INSPECTION

Check the dust seal for wear, damage or deterioration and replace it if necessary.

REPLACEMENT

Remove the dust seal from the bearing holder.

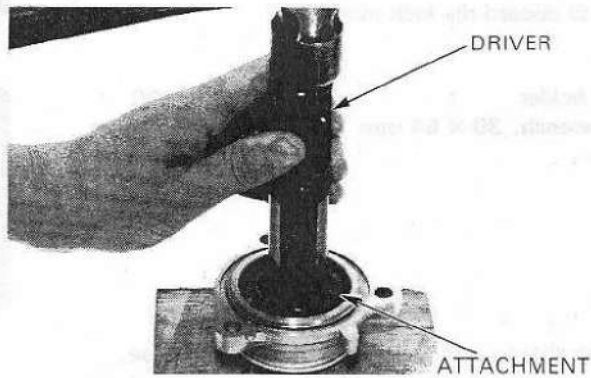


GEARSHIFT LINKAGE/TRANSMISSION

Drive a new dust seal into the bearing holder using the special tools.

TOOLS:

Driver 07749-0010000
Attachment, 42 x 47 mm 07746-0010300

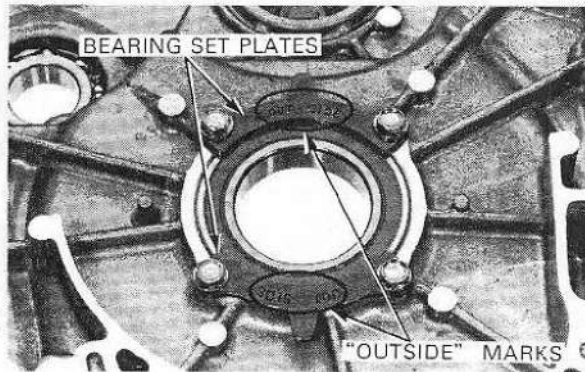


REAR CASE BEARING

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 rear case.

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



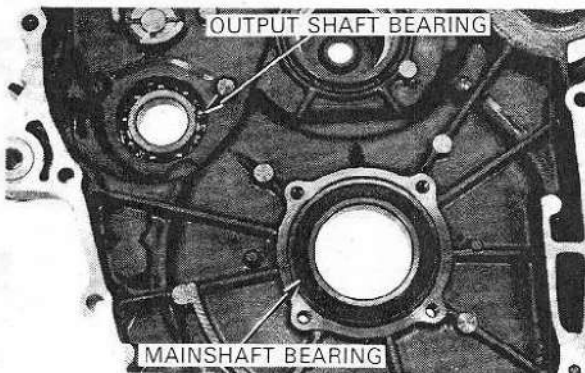
REPLACEMENT

Remove the bearing set plates and mainshaft bearing. Drive a new mainshaft bearing with the sealed side facing inside using the special tools.

TOOLS:

Driver 07749-0010000
Bearing driver attachment 07GAD-SD40101

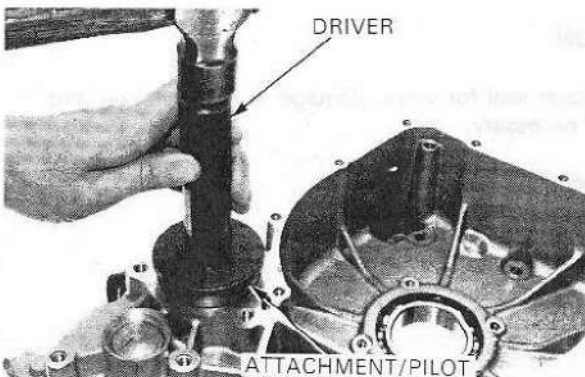
Apply locking agent to the bolt threads.
Install the bearing set plate with the "OUTSIDE" mark facing out.
Tighten the bolts.



Remove the output shaft bearing.
Drive a new output shaft bearing with the markings facing out using the special tools.

TOOLS:

Driver 07749-0010000
Attachment, 62 x 68 mm 07746-0010500
Pilot, 30 mm 07746-0040700



PRIMARY GEAR/OUTPUT SHAFT REMOVAL

Remove the rear case (page 10-10).

Temporarily install the clutch outer onto the primary driven gear boss.

Hold the clutch outer with the special tool and loosen the starter clutch bolt.

TOOL:

Clutch outer holder 07JMB-MN50100

Remove the starter clutch bolt and washer.

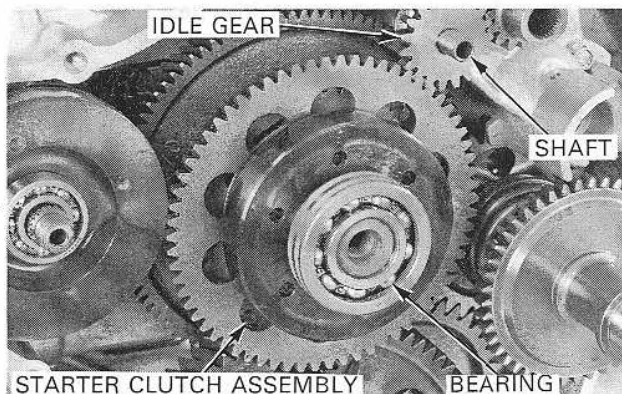
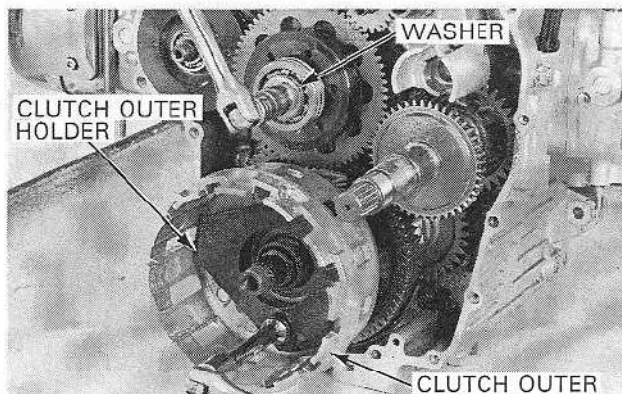
Remove the clutch outer.

Remove the bearing and starter clutch assembly.

NOTE

- For the service procedures of the starter clutch assembly, refer to page 18-13.

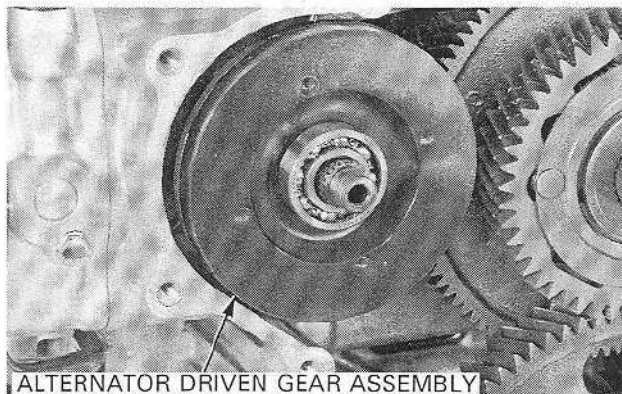
Remove the starter idle gear and shaft.



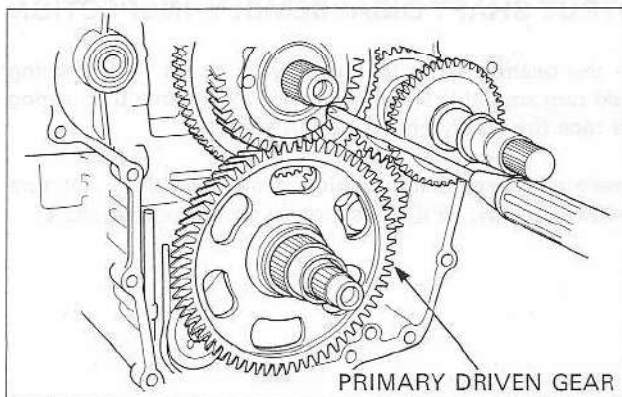
Remove the alternator driven gear assembly.

NOTE

- For the service procedures of the alternator driven gear assembly, refer to page 16-18.

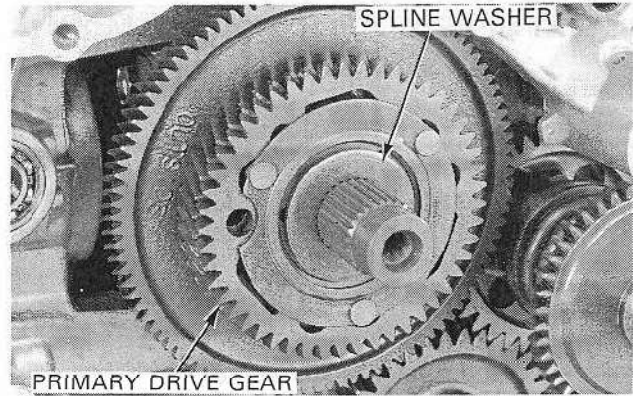


Remove the primary driven gear.

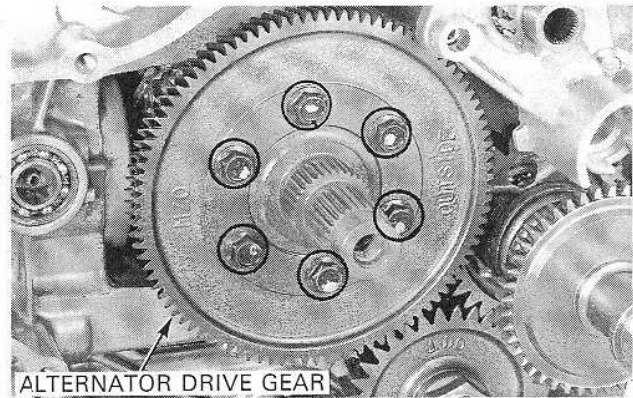


GEARSHIFT LINKAGE/TRANSMISSION

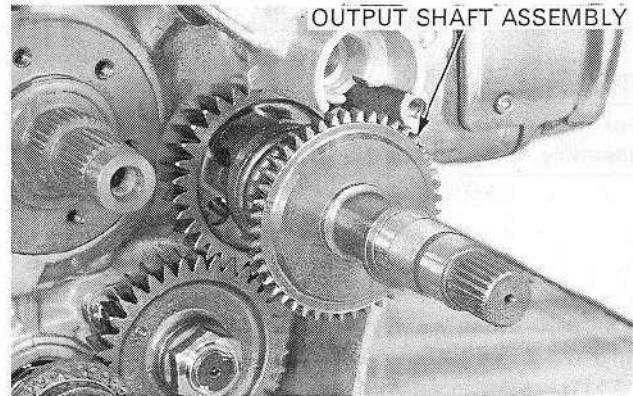
Remove the spline washer and primary drive gear.



Remove the bolts and the alternator drive gear.



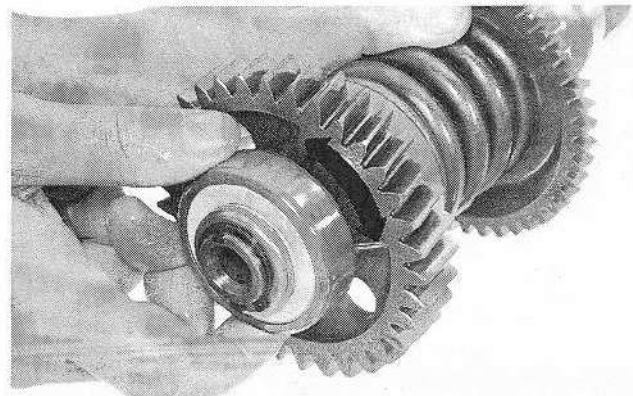
Remove the output shaft assembly.



OUTPUT SHAFT DISASSEMBLY/INSPECTION

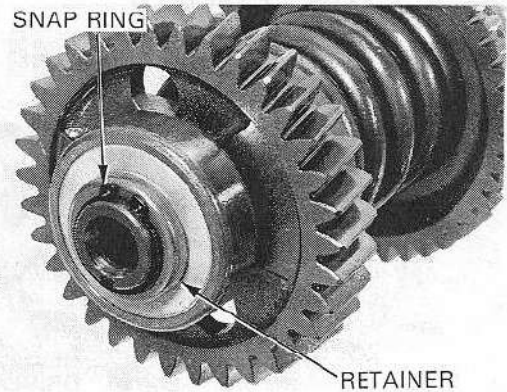
Turn the bearing outer race with your finger. The bearing should turn smoothly and quietly. Also check that the bearing inner race fits tightly on the output shaft.

Remove and discard the bearing if the race does not turn smoothly, quietly, or if it fits loosely on the output shaft.



GEARSHIFT LINKAGE/TRANSMISSION

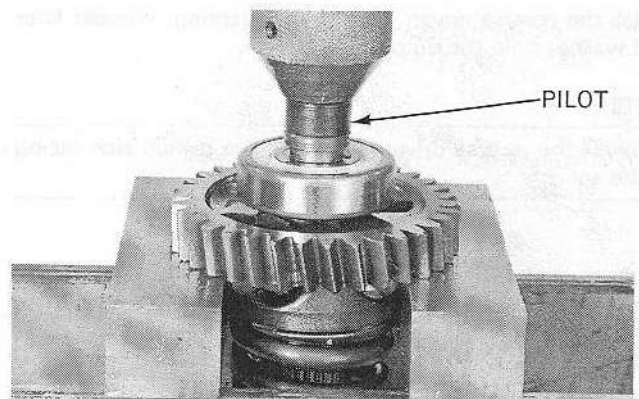
Remove the snap ring and retainer.
Remove the cotters.



Press the output shaft out of the bearing using the special tool.

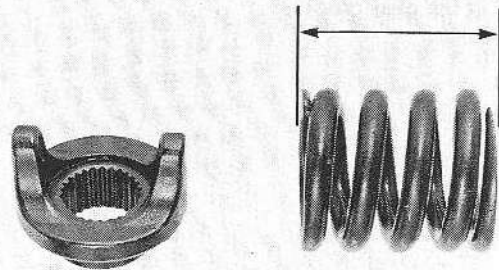
TOOL:
Pilot, 22 mm 07746-0041000

Disassemble the output shaft.



Check the damper lifter for wear or damage.
Measure the damper spring free length.

SERVICE LIMIT: 57.0 mm (2.24 in)



Check the output shaft, collar and final driven gear for wear or damage.

Measure the following:
— driven gear I.D.

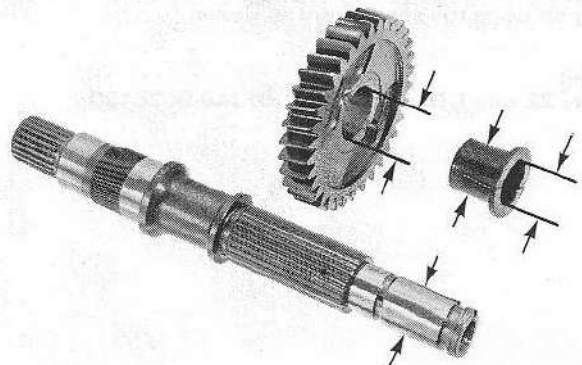
SERVICE LIMIT: 26.03 mm (1.025 in)

— collar O.D. and I.D.

SERVICE LIMITS: O.D. 25.95 mm (1.022 in)
I.D. 22.05 mm (0.868 in)

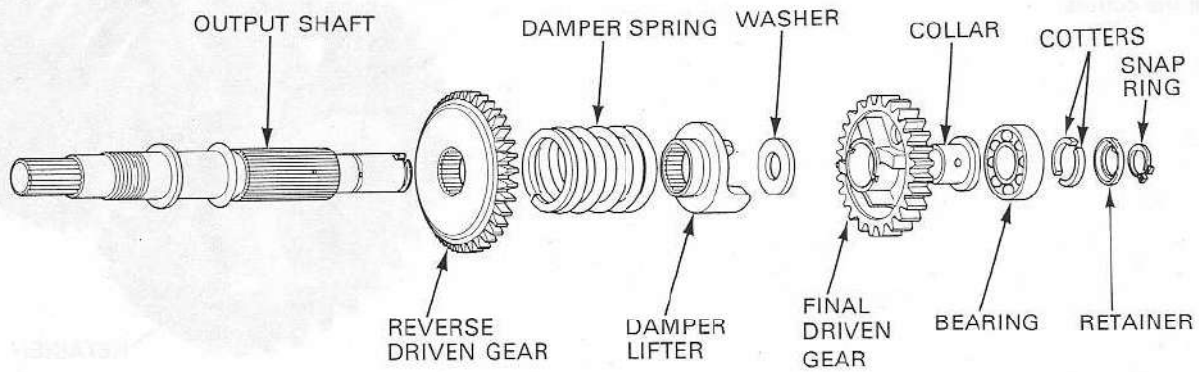
— shaft O.D.

SERVICE LIMIT: 21.99 mm (0.866 in)



GEARSHIFT LINKAGE/TRANSMISSION

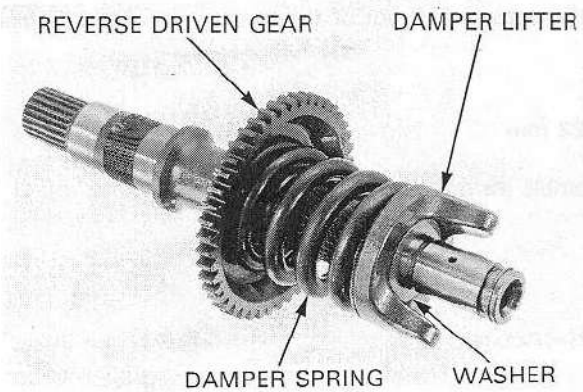
OUTPUT SHAFT ASSEMBLY



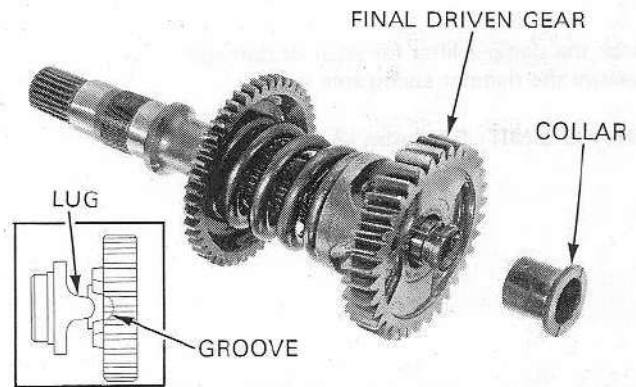
Install the reverse driven gear, damper spring, damper lifter and washer onto the output shaft.

NOTE

- Install the reverse driven gear with the dished side facing the spring.

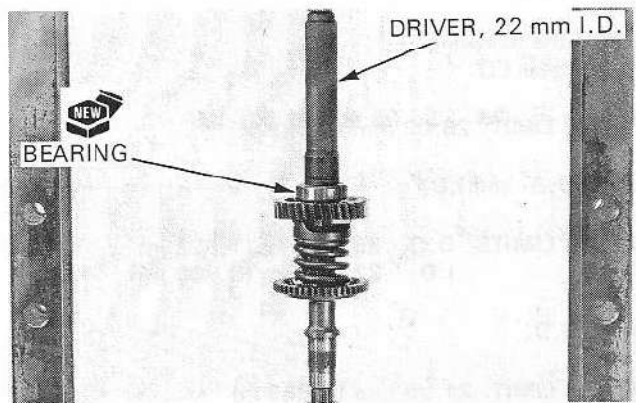


Install the final driven gear so that the damper lifter lugs are positioned in the gear grooves. Install the collar.

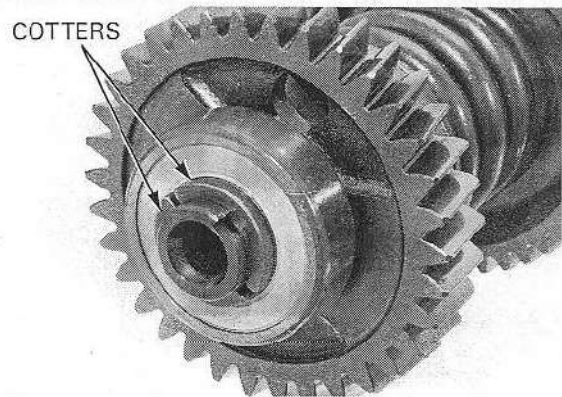


Press a new bearing onto the output shaft with the sealed side facing up using the special tool as shown.

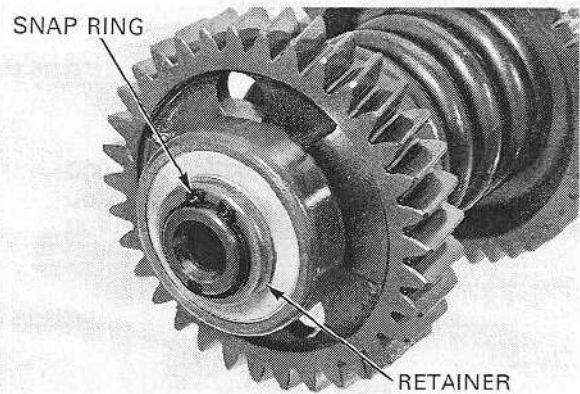
TOOL:
Driver, 22 mm I.D. 07746-0020100



Install the cotters into the shaft groove.



Install the retainer, aligning the tab with the key groove in the shaft.
Install the snap ring with the chamfered surface facing the retainer.



PRIMARY DRIVEN GEAR BOSS

REMOVAL/INSPECTION

Remove the primary driven gear (page 10-13).

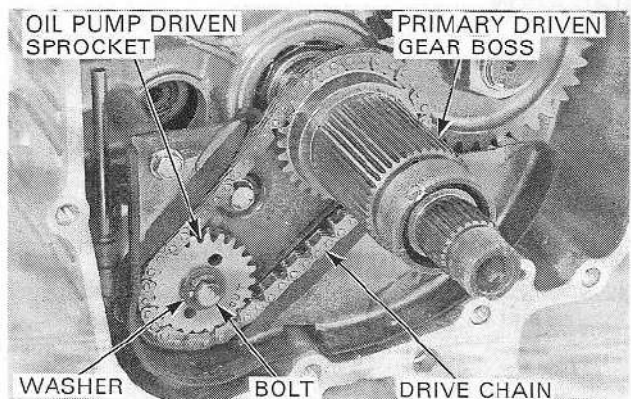
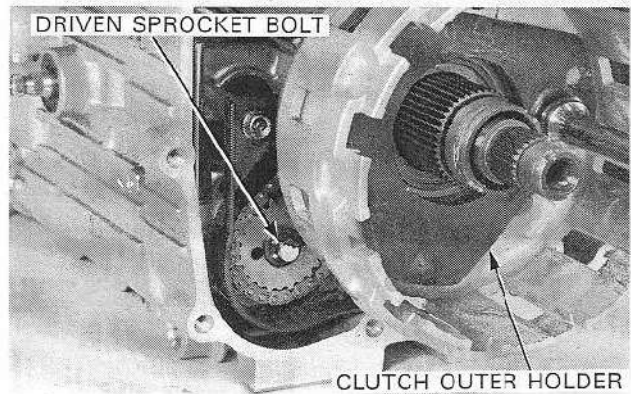
Temporarily install the clutch outer onto the primary driven gear boss.
Hold the clutch outer with the clutch outer holder and loosen the oil pump driven sprocket bolt.

TOOL:

Clutch outer holder 07JMB-MN50100

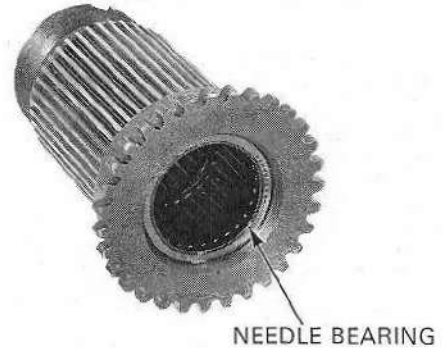
Remove the clutch outer.

Remove the oil pump driven sprocket bolt and washer.
Remove the oil pump driven sprocket, drive chain and primary driven gear boss as a set.



GEARSHIFT LINKAGE/TRANSMISSION

Check the primary driven gear boss and needle bearing for wear or damage.

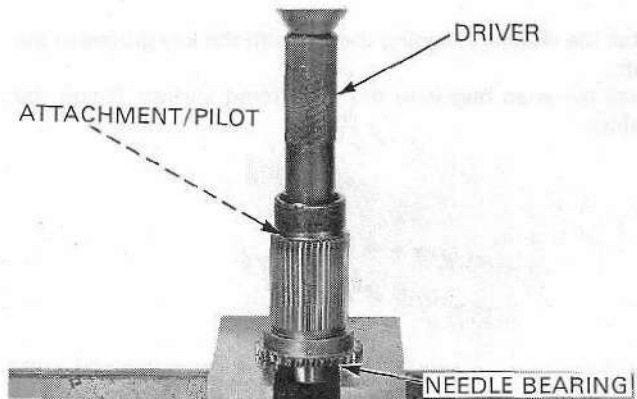


NEEDLE BEARING REPLACEMENT

Press the needle bearing out of the driven gear boss using the special tools.

TOOLS:

Driver	07749-0010000
Attachment, 28 × 30 mm	07946-1870100
Pilot, 28 mm	07746-0041100

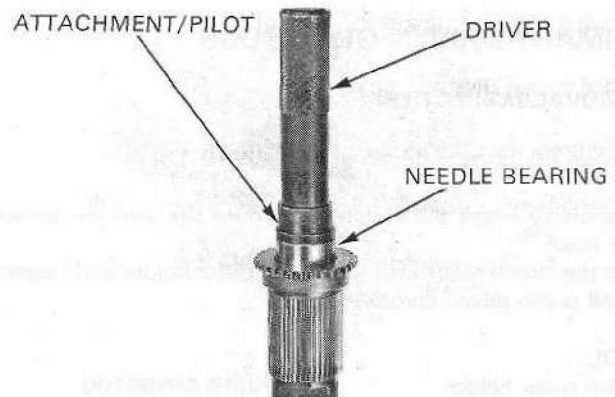


Press a new needle bearing into the driven gear boss to the specified depth from the sprocket side using the special tools.

TOOLS:

Driver	07749-0010000
Attachment, 32 × 35 mm	07746-0010100
Pilot, 28 mm	07746-0041100

SPECIFIED DEPTH: 3.5–4.0 mm (0.14–0.16 in)



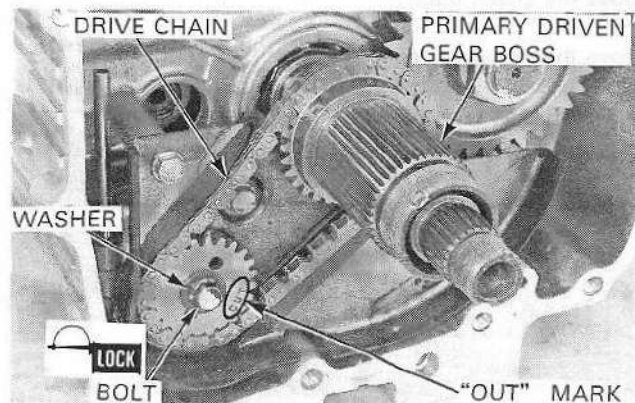
INSTALLATION

Install the oil pump driven sprocket, drive chain and primary driven gear boss as a set.

NOTE

- Install the oil pump driven sprocket with the "OUT" mark facing out.

Apply locking agent to the sprocket bolt threads, and install the washer and bolt.



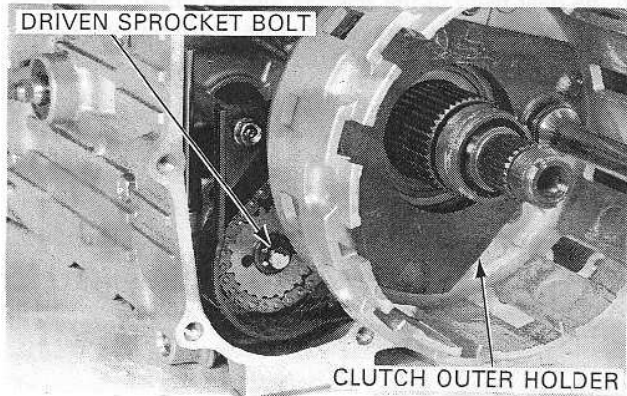
GEARSHIFT LINKAGE/TRANSMISSION

Temporarily install the clutch outer onto the primary driven gear boss.
Hold the clutch outer with the clutch outer holder and tighten the oil pump driven sprocket bolt.

TOOL:

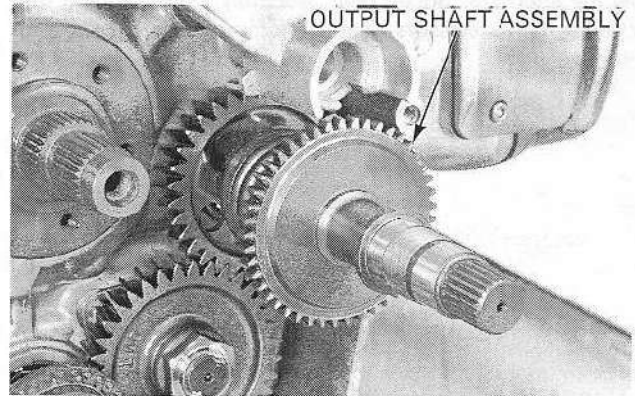
Clutch outer holder 07JMB-MN50100

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)



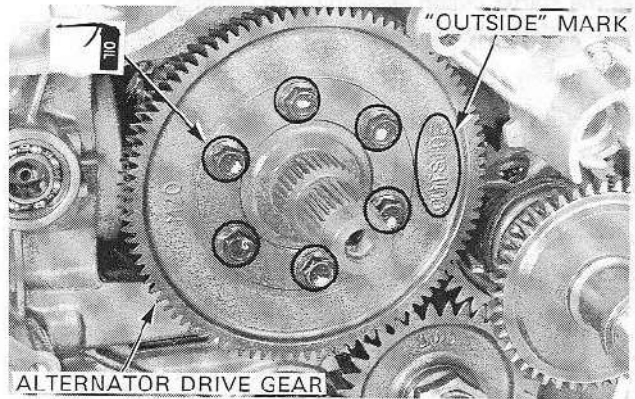
OUTPUT SHAFT/PRIMARY GEAR INSTALLATION

Install the output shaft assembly.

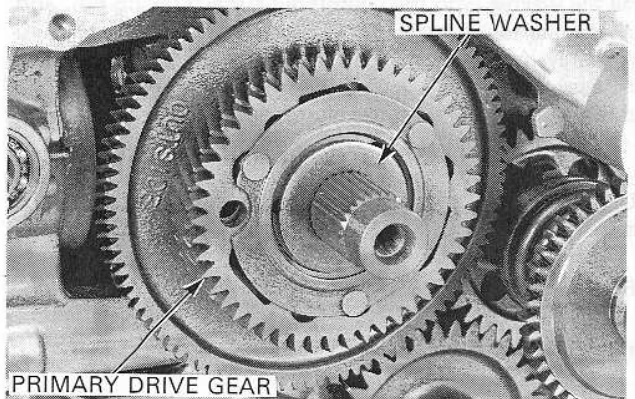


Install the alternator drive gear onto the crankshaft flange with the "OUTSIDE" mark facing out.
Apply oil to the drive gear bolt threads and seating surfaces.
Hold the crankshaft bolt on opposite side while tightening.
Install and tighten the bolts.

TORQUE: 26 N·m (2.7 kgf·m, 20 lbf·ft)

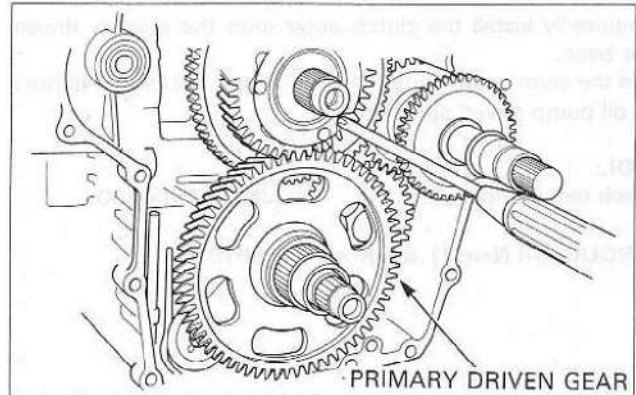


Install the primary drive gear and spline washer.

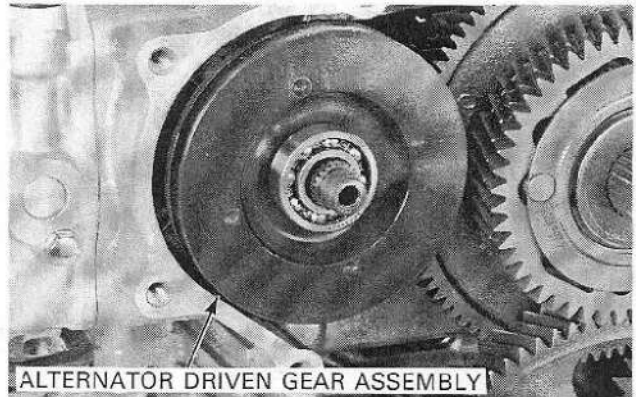


GEARSHIFT LINKAGE/TRANSMISSION

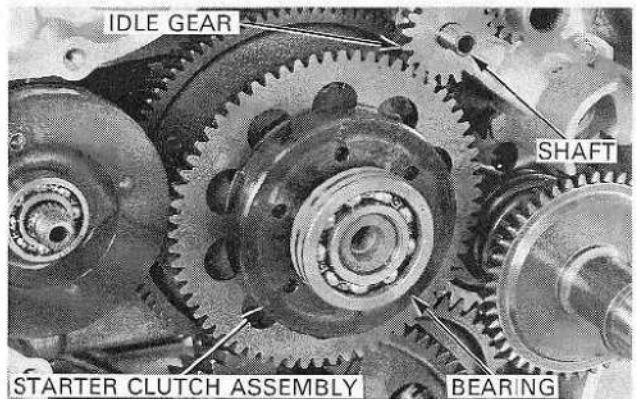
Align the gear teeth of the scissors gears (primary drive gear and sub-gear) by inserting a screwdriver into the gear holes, and install the primary driven gear.



Install the alternator driven gear assembly while aligning the gear teeth of the scissors gears (alternator driven gear and sub-gear).



Install the starter clutch assembly and bearing.
Install the starter idle gear and shaft.



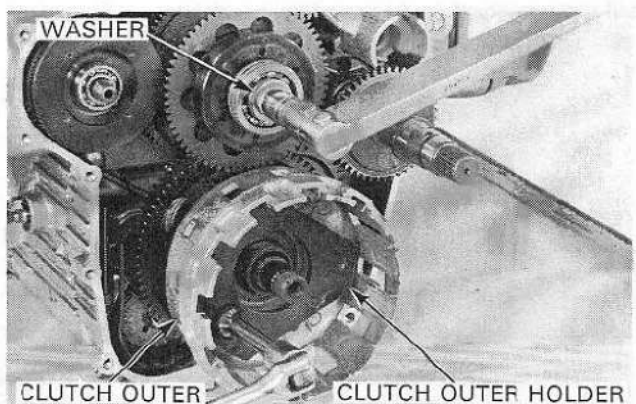
Install the washer with the chamfered surface facing out, and install the starter clutch bolt.
Temporarily install the clutch outer onto the primary driven gear boss.
Hold the clutch outer with the clutch outer holder and tighten the starter clutch bolt.

TOOL:

Clutch outer holder 07JMB-MN50100

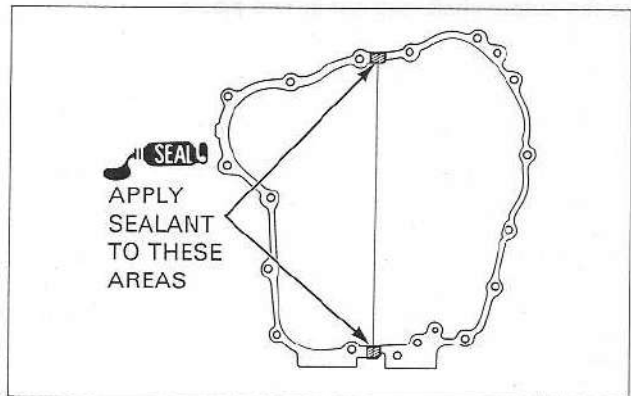
TORQUE: 74 N·m (7.5 kgf·m, 54 lbf·ft)

Remove the clutch outer.

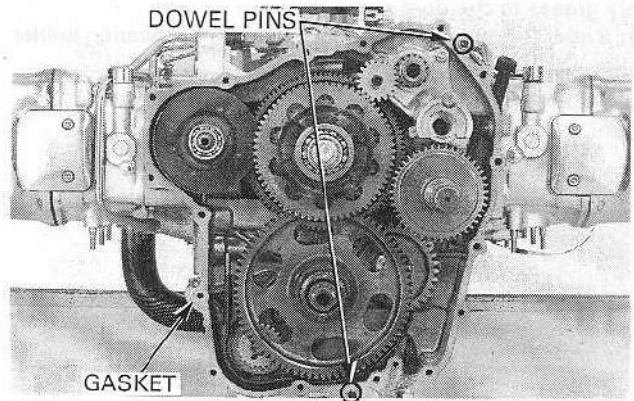


REAR CASE INSTALLATION

Apply sealant to the crankcase surfaces as shown.

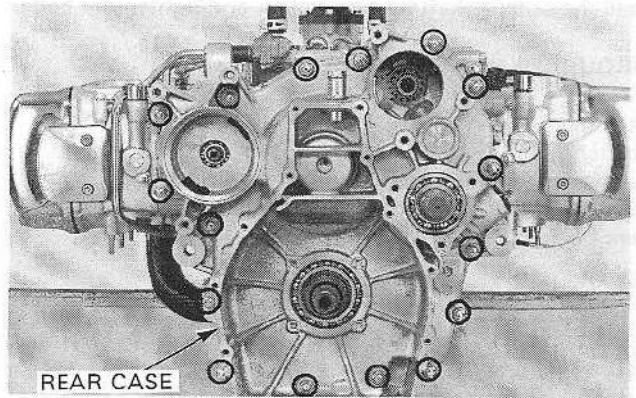


Install the dowel pins and a new gasket.



Install the rear case and tighten the bolts in a crisscross pattern in 2 or 3 steps.

TORQUE: 29 N·m (3.0 kgf·m, 22 lbf·ft)



Shift the transmission into any gear except neutral.
Install a new output shaft lock nut.
Hold the mainshaft with the mainshaft holder and tighten the output shaft lock nut.

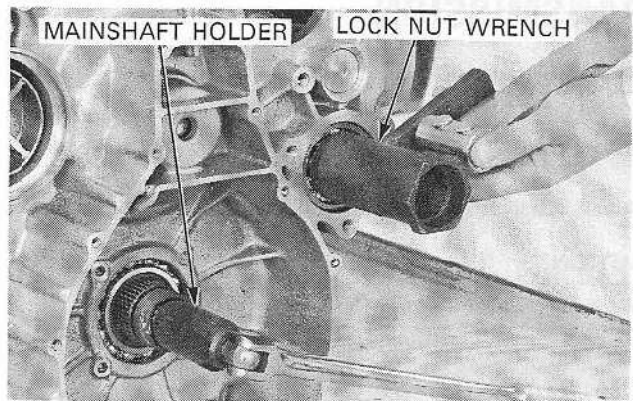
TOOLS:

- Mainshaft holder 07JMB-MN50200
- Lock nut wrench, 30 × 64 mm 07916-MB00002 or 07916-MB00001

TORQUE: Actual: 186 N·m (19.0 kgf·m, 137 lbf·ft)
Indicated: 170 N·m (17.3 kgf·m, 125 lbf·ft)

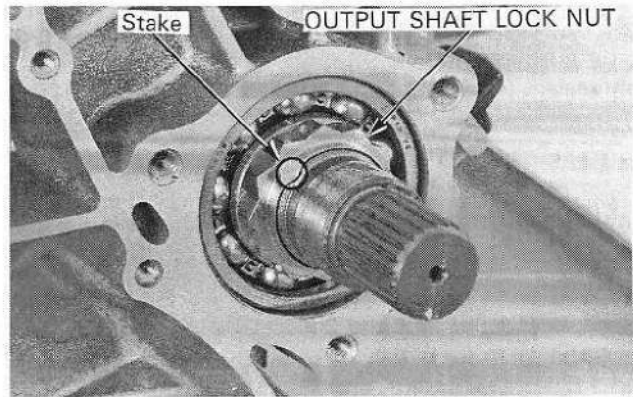
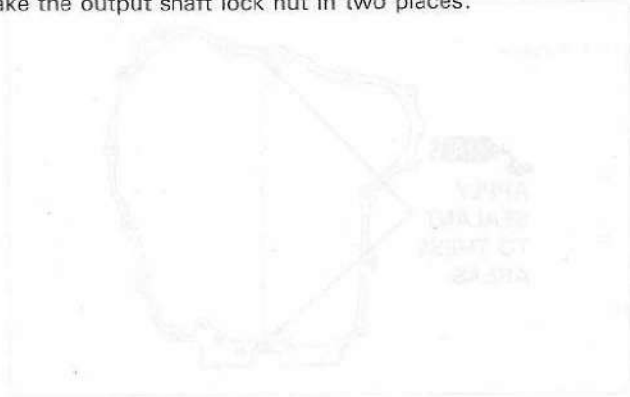
NOTE

- Refer to torque wrench reading information on page 10-3 "SERVICE INFORMATION".

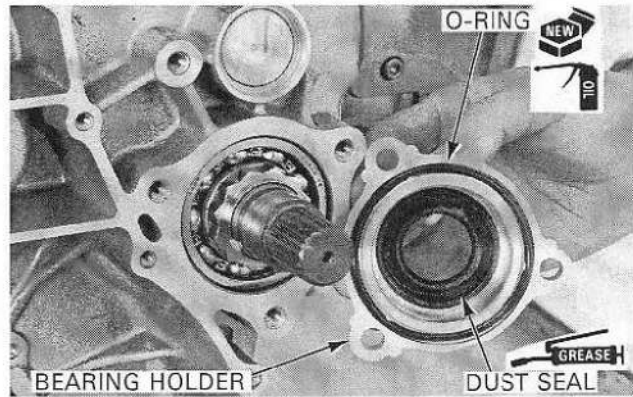


GEARSHIFT LINKAGE/TRANSMISSION

Stake the output shaft lock nut in two places.



Apply grease to the dust seal lips.
Coat a new O-ring with oil and install it into the bearing holder groove.

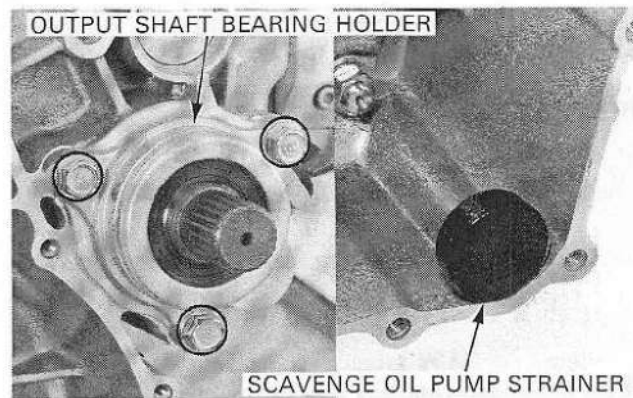


Install the output shaft bearing holder and tighten the bolts.

TORQUE: 29 N·m (3.0 kgf·m, 22 lbf·ft)

Install the following:

- clutch (page 9-15).
- scavenge oil pump strainer.
- coupler A and alternator (pages 16-16 and 16-17).
- engine (page 7-7).



TRANSMISSION

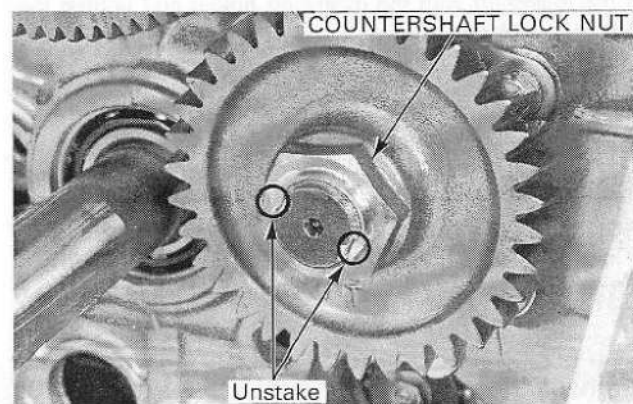
DISASSEMBLY

Remove the output shaft (page 10-13).

Unstake the countershaft lock nut with a drill or grinder.

CAUTION

- *Be careful not to damage the countershaft threads.*



GEARSHIFT LINKAGE/TRANSMISSION

Shift the transmission into any gear except neutral. Hold the mainshaft with the mainshaft holder and remove the countershaft nut.

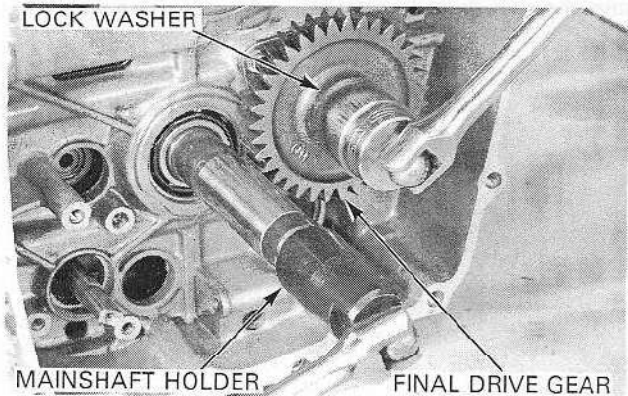
NOTE

- The countershaft lock nut has left-hand threads.

TOOL:

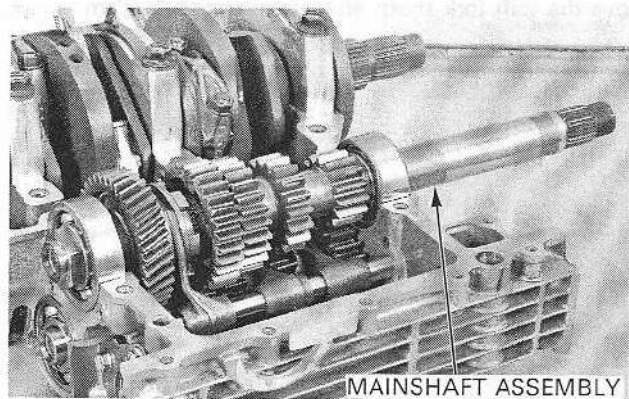
Mainshaft holder 07JMB-MN50200

Remove the lock washer and final drive gear.



Separate the crankcase (page 11-3).

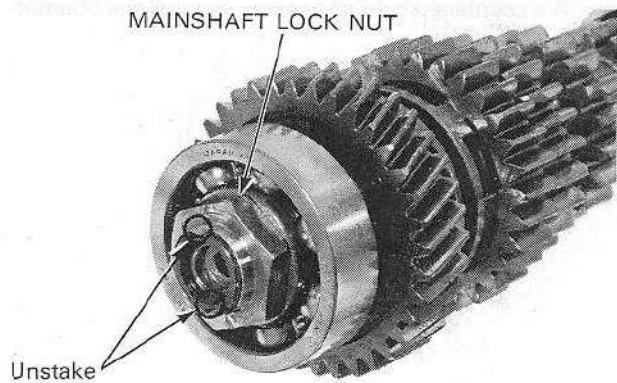
Remove the mainshaft assembly.



Unstake the mainshaft lock nut with a drill or grinder.

CAUTION

- *Be careful not to damage the mainshaft threads.*



Hold the mainshaft with the mainshaft holder in a vise and remove the mainshaft lock nut as shown.

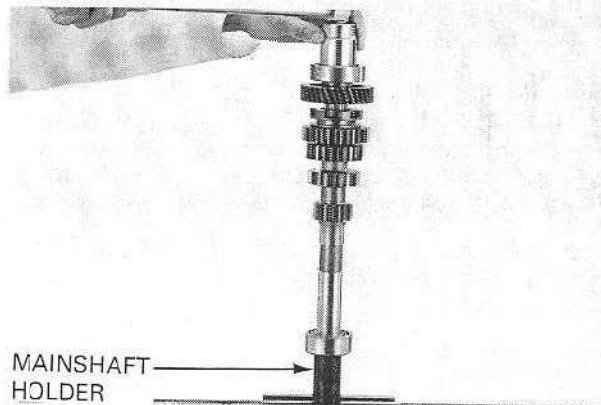
NOTE

- The mainshaft lock nut has left-hand threads.

TOOL:

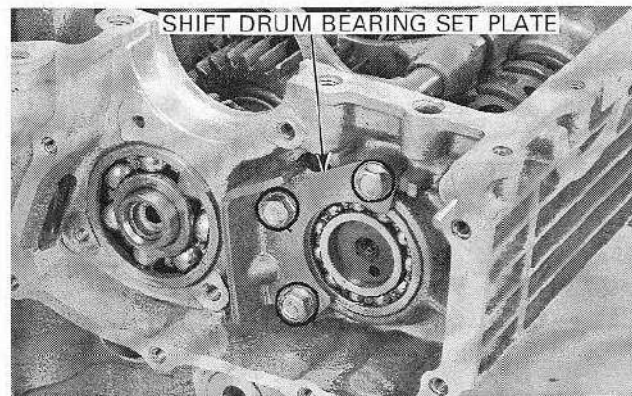
Mainshaft holder 07JMB-MN50200

Disassemble the mainshaft.

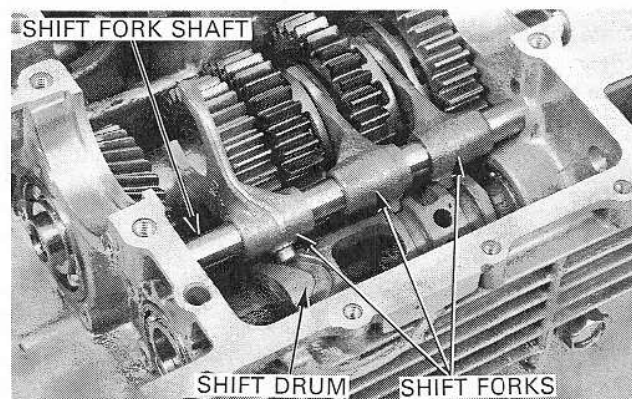


GEARSHIFT LINKAGE/TRANSMISSION

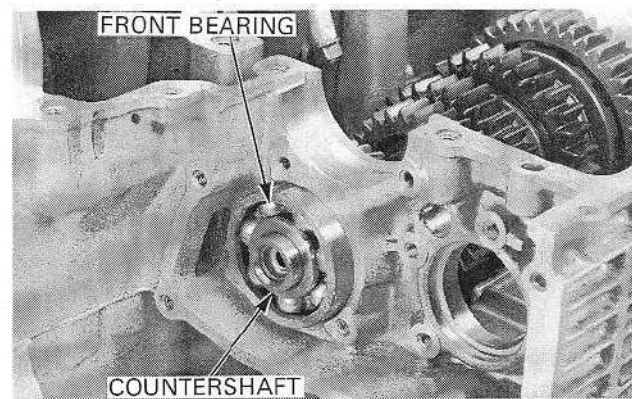
Remove the shift drum bearing set plate.



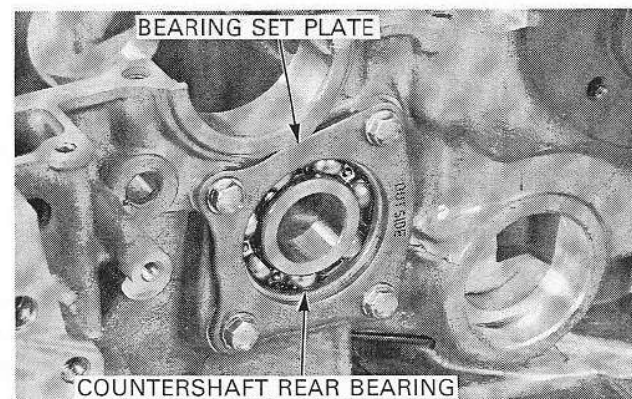
Remove the shift fork shaft, shift forks and shift drum.



Remove the countershaft front bearing and pull the countershaft out of the gears.



Remove the bearing set plate and countershaft rear bearing.



GEARSHIFT LINKAGE/TRANSMISSION

INSPECTION

Check the shift fork guide pins for abnormal wear or damage.
Measure the shift fork claw thickness.

SERVICE LIMIT: 5.6 mm (0.22 in)

Measure the shift fork I.D.

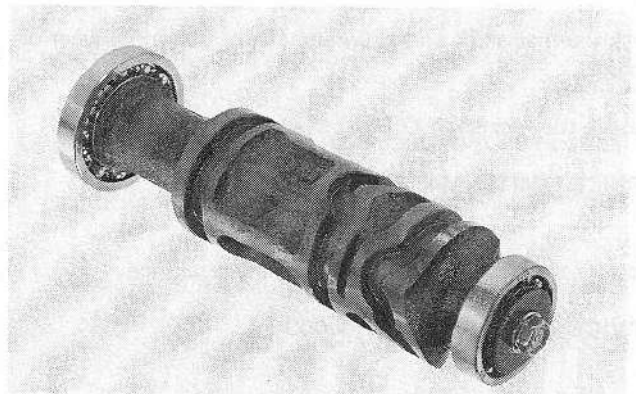
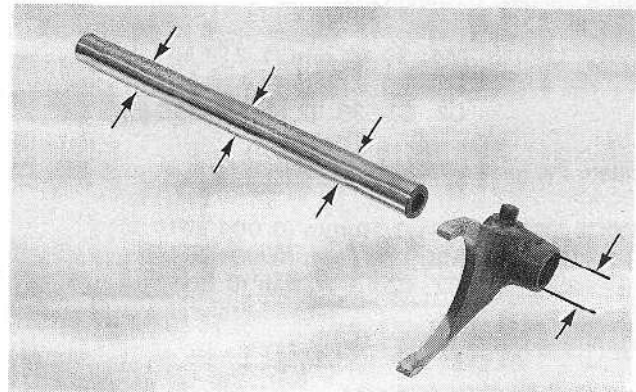
SERVICE LIMIT: 14.04 mm (0.553 in)

Measure the shift fork shaft O.D.

SERVICE LIMIT: 13.90 mm (0.547 in)

Check the shift drum guide groove for abnormal wear or damage.

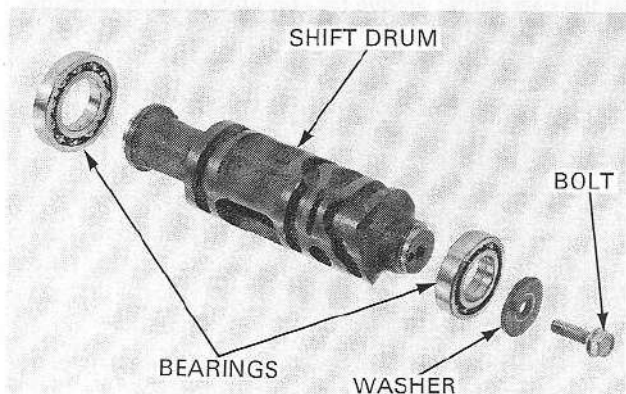
Check the shift drum bearing for smooth rotation.



If necessary, remove the bolt, washer and bearings from the shift drum and replace the bearings with new ones.

NOTE

- Replace the bearings as a set.



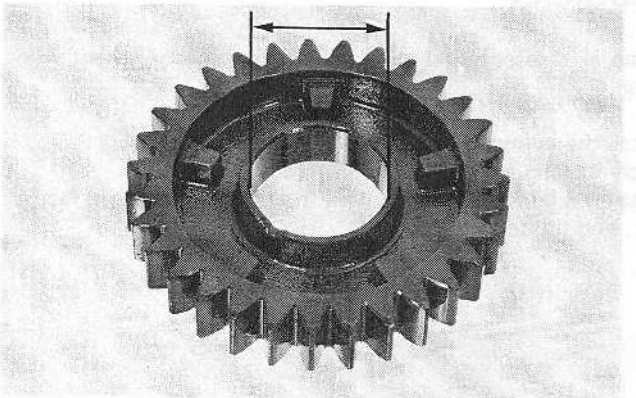
Check the gear dogs and teeth for abnormal wear or damage.

Measure the gear I.D.

SERVICE LIMITS: M4: 31.04 mm (1.222 in)

M5: 30.04 mm (1.183 in)

C2, C3: 34.04 mm (1.340 in)



GEARSHIFT LINKAGE/TRANSMISSION

Measure the gear bushing O.D.

SERVICE LIMITS: M4: 30.93 mm (1.218 in)
M5: 29.93 mm (1.178 in)
C2, C3: 33.92 mm (1.335 in)

Calculate the gear-to-bushing clearance.

SERVICE LIMITS: M4: 0.10 mm (0.004 in)
M5: 0.09 mm (0.004 in)
C2, C3: 0.10 mm (0.004 in)

Measure the gear bushing I.D.

SERVICE LIMITS: M4: 28.04 mm (1.104 in)
M5: 23.03 mm (0.907 in)

Check the mainshaft and countershaft for abnormal wear or damage.

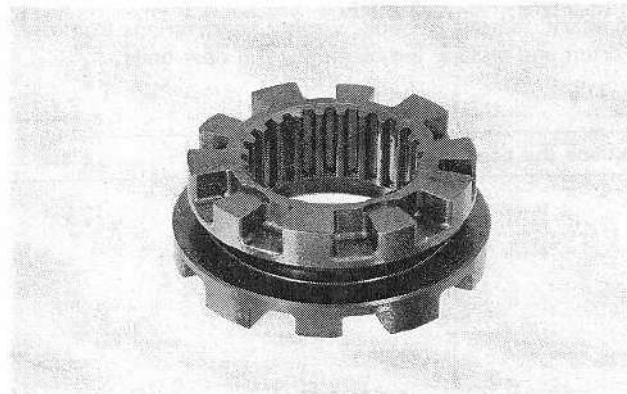
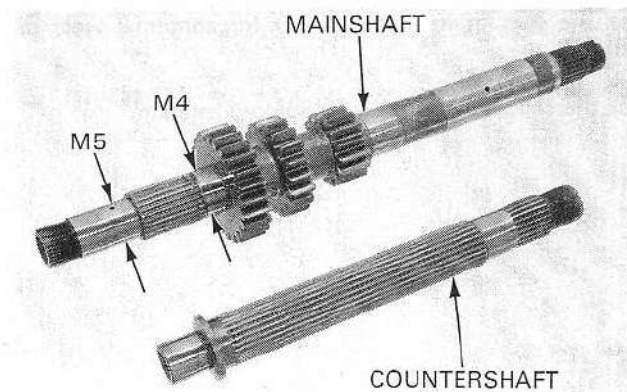
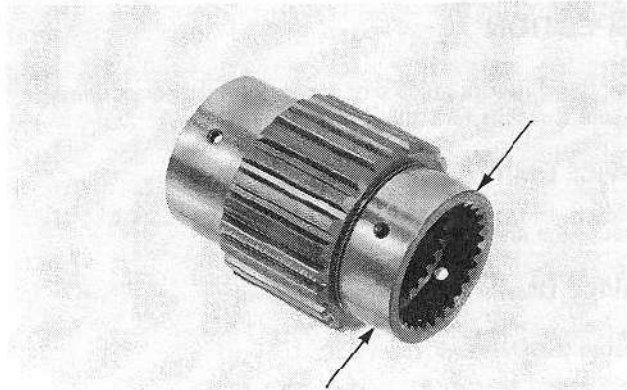
Measure the mainshaft O.D.

SERVICE LIMITS: M4: 27.95 mm (1.100 in)
M5: 22.95 mm (0.904 in)

Calculate the gear bushing-to-mainshaft clearance.

SERVICE LIMIT: 0.08 mm (0.003 in)

Check the gear shifter groove for abnormal wear or damage.



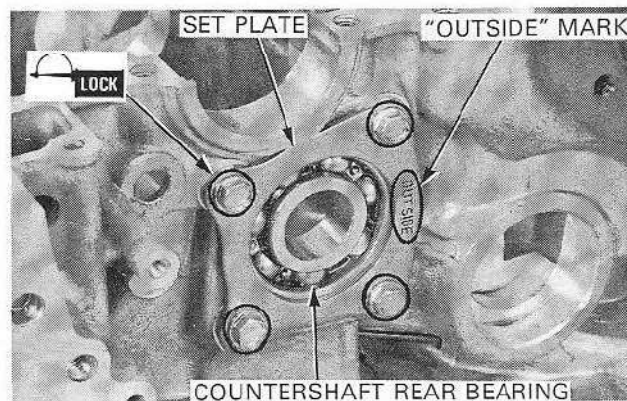
ASSEMBLY

Clean all disassembled parts in solvent and coat them with clean engine oil.

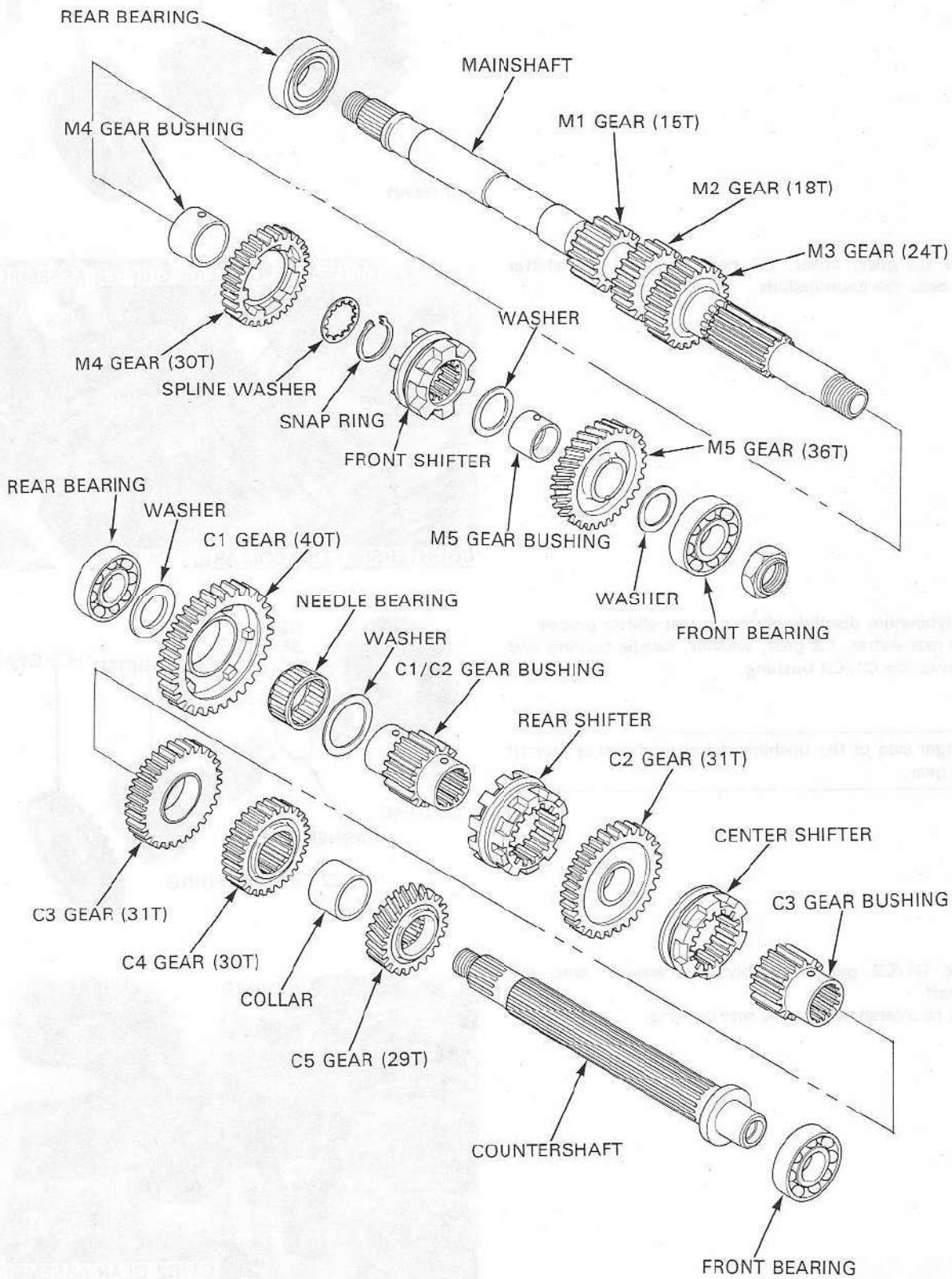
Install the countershaft rear bearing.

Apply locking agent to the bolt threads.

Install the bearing set plate with the "OUTSIDE" mark facing out, and tighten the bolts.

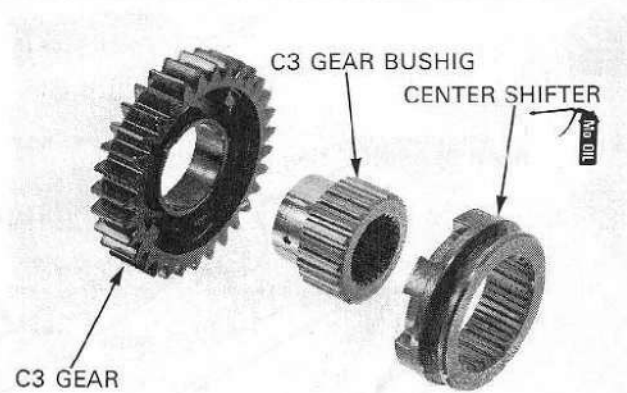


GEARSHIFT LINKAGE/TRANSMISSION

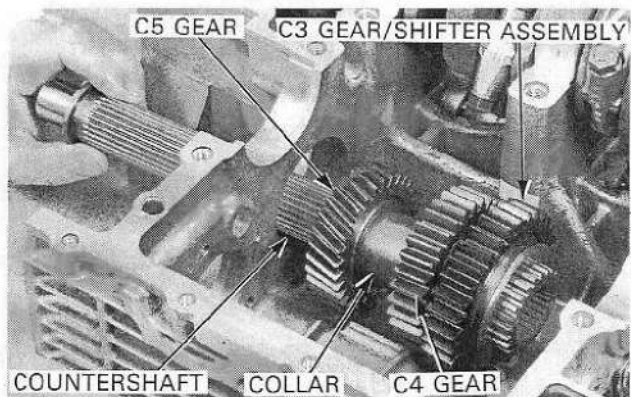


GEARSHIFT LINKAGE/TRANSMISSION

Apply molybdenum disulfide oil to the center shifter groove.
Install the C3 gear and center shifter onto the C3 bushing.



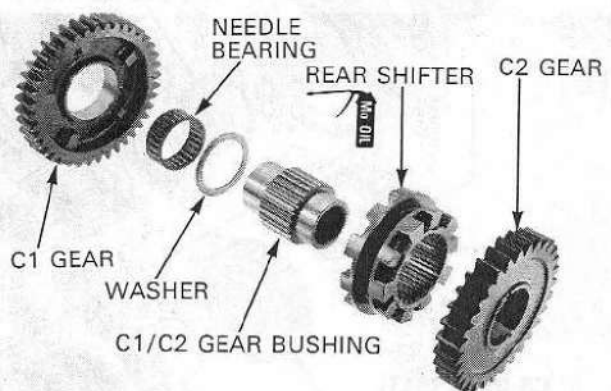
Install the C5 gear, collar, C4 gear and C3 gear/shifter assembly onto the countershaft.



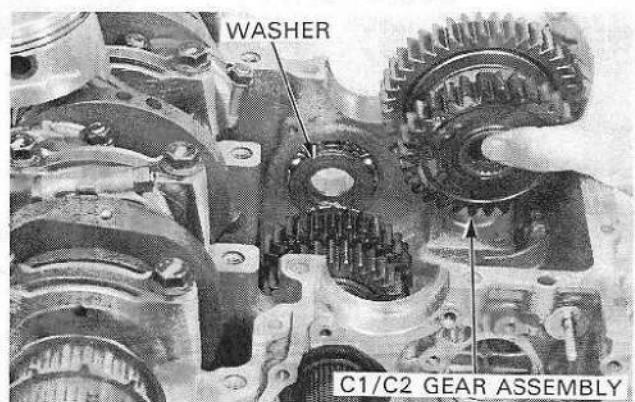
Apply molybdenum disulfide oil to the rear shifter groove.
Install the rear shifter, C2 gear, washer, needle bearing and C1 gear onto the C1/C2 bushing.

NOTE

- The longer side of the bushing sliding surfaces is toward the C1 gear.



Install the C1/C2 gear assembly and washer onto the countershaft.
Install the countershaft into the rear bearing.

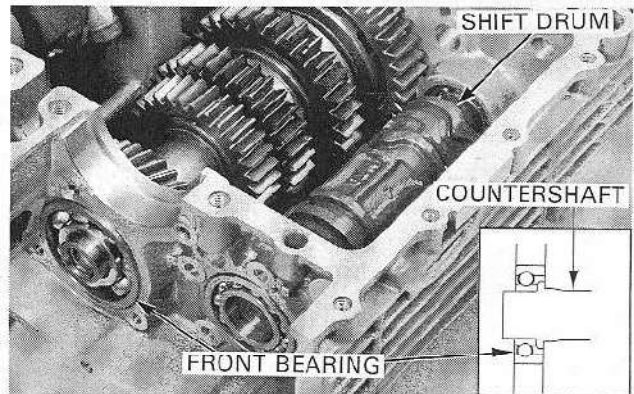


GEARSHIFT LINKAGE/TRANSMISSION

Install the countershaft front bearing with the concaved side facing in.

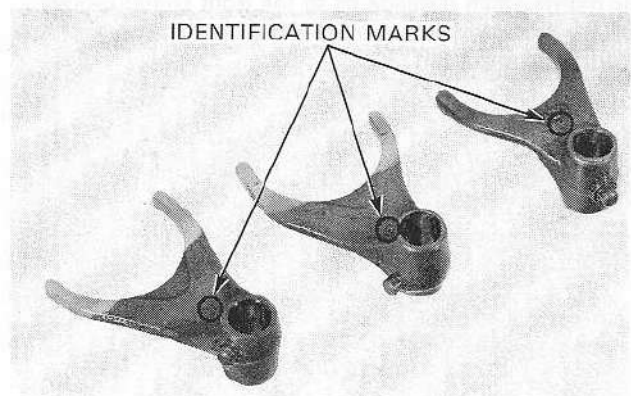
Temporarily install the final drive gear and nut to prevent the countershaft from sliding out of the case.

Install the shift drum.



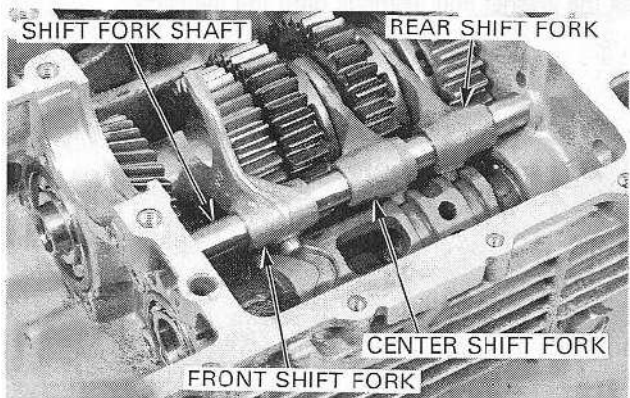
The shift forks have the following identification marks:

- F: front shift fork
- C: center shift fork
- R: rear shift fork

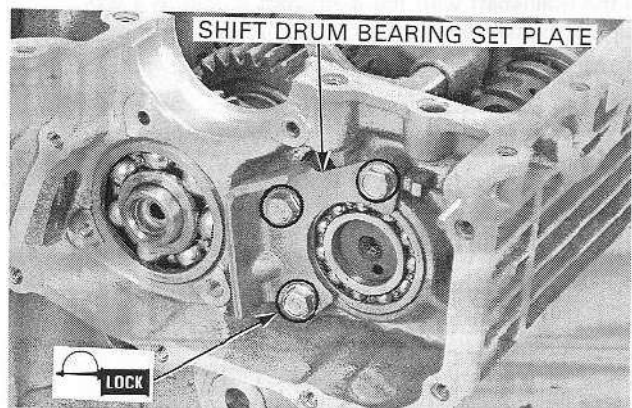


Install the center and rear shift forks into their shifter grooves and shift drum guide grooves with the identification marks facing toward the front.

Install the front shift fork into the shift drum guide groove with the identification mark facing toward the front, and insert the shift fork shaft into the crankcase and shift forks.

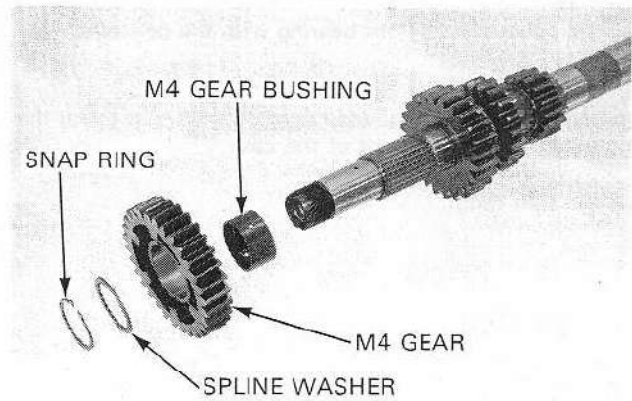


Apply locking agent to the bearing set plate bolt threads. Install the shift drum bearing set plate and tighten the bolts.

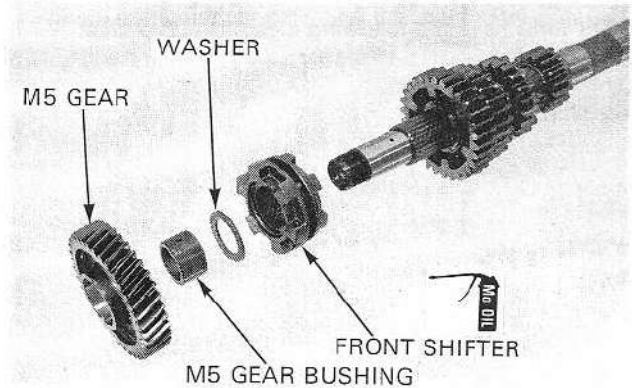


GEARSHIFT LINKAGE/TRANSMISSION

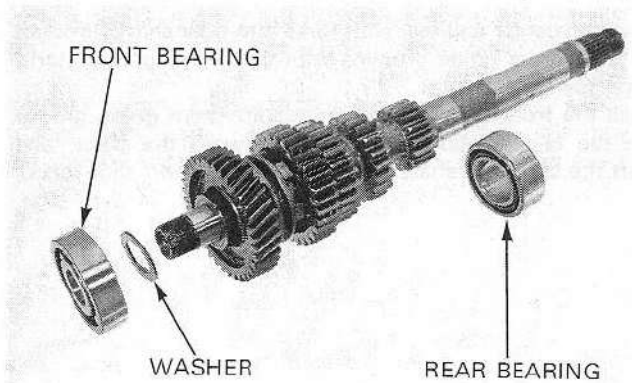
Install the M4 gear bushing and M4 gear onto the mainshaft. Install the spline washer and snap ring with the chamfered side facing the M4 gear.



Apply molybdenum disulfide oil to the front shifter groove. Install the front shifter, washer, M5 gear bushing and M5 gear onto the mainshaft.



Install the washer and bearings onto the mainshaft.



Hold the mainshaft with the mainshaft holder in a vise. Install and tighten a new mainshaft lock nut as shown.

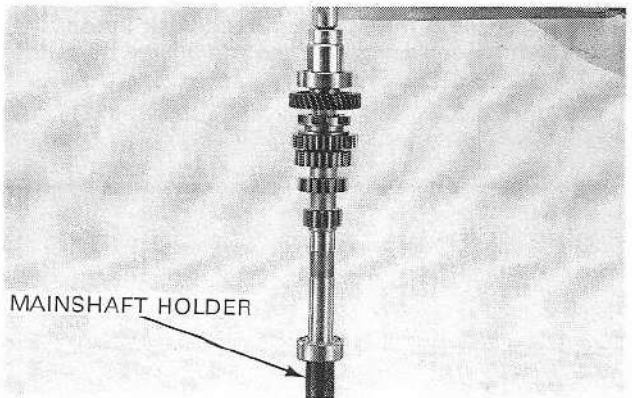
NOTE

- The mainshaft lock nut has left-hand threads.

TOOL:

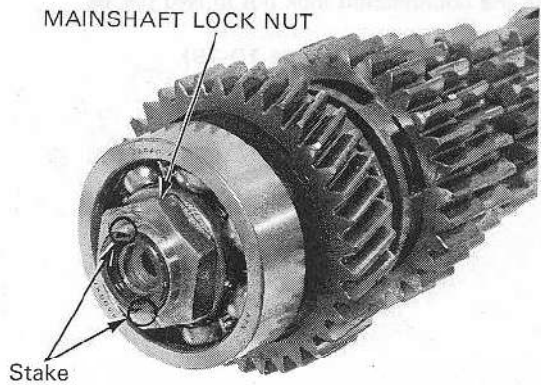
Mainshaft holder 07JMB-MN50200

TORQUE: 186 N·m (19.0 kgf·m, 137 lbf·ft)



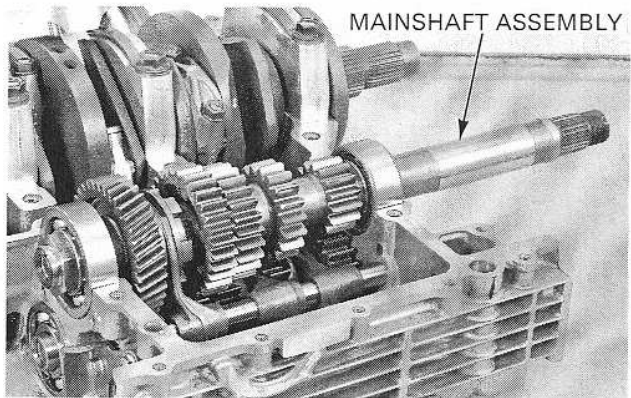
GEARSHIFT LINKAGE/TRANSMISSION

Stake the mainshaft lock nut in two places.



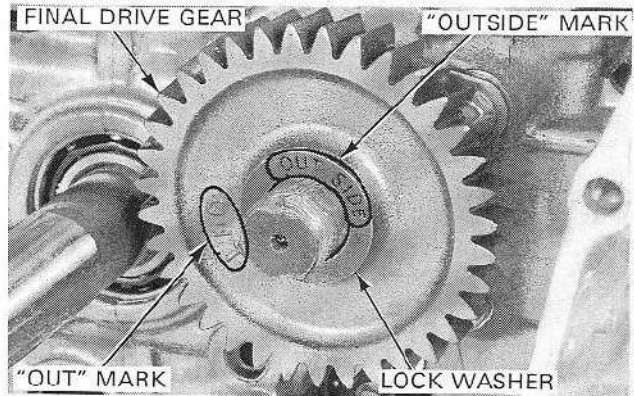
Install the mainshaft assembly, aligning the front shift fork with the front shifter groove and shift drum guide groove.

Assemble the crankcase (page 11-17).



Remove the temporarily installed lock nut and final drive gear.

Install the final drive gear with the "OUT" mark facing out.
Install the lock washer with the "OUTSIDE" mark facing out.



Apply locking agent to the threads of a new countershaft lock nut and install the nut.

Shift the transmission into any gear except neutral.
Hold the mainshaft with the mainshaft holder and tighten the countershaft lock nut as shown.

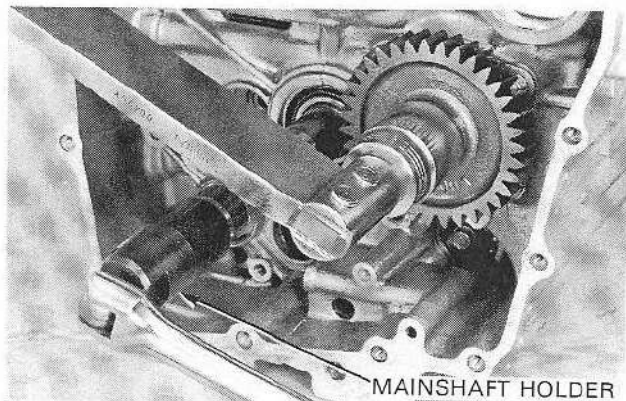
NOTE

- The countershaft lock nut has left-hand threads.

TOOL:

Mainshaft holder 07JMB-MN50200

TORQUE: 186 N·m (19.0 kgf·m, 137 lbf·ft)

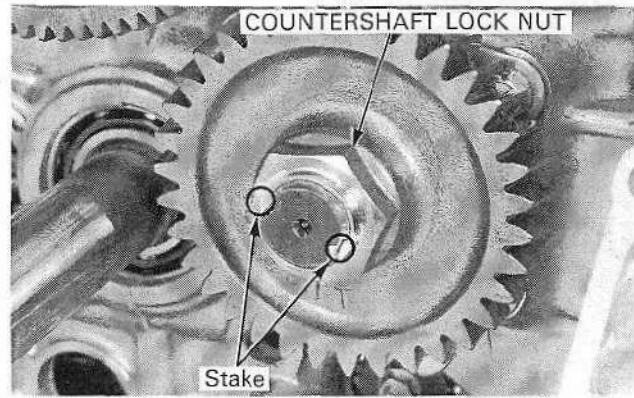


GEARSHIFT LINKAGE/TRANSMISSION

Stake the countershaft lock nut in two places.

Install the output shaft (page 10-19).

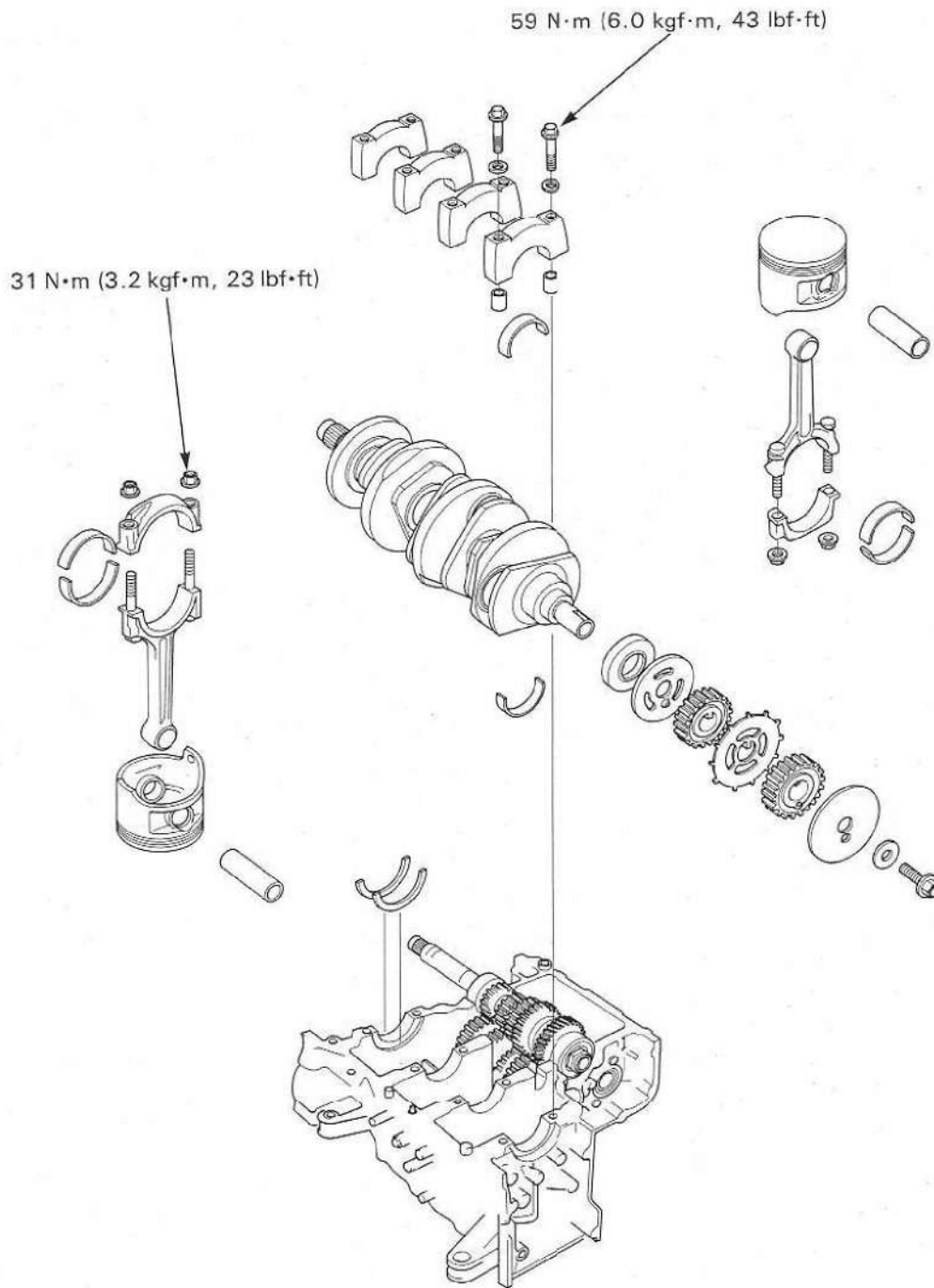
Install the rear case (page 10-21).



MEMO



PISTON/CRANKSHAFT



11. PISTON/CRANKSHAFT

SERVICE INFORMATION	11-1	PISTON/CONNECTING ROD INSTALLATION	11-9
TROUBLESHOOTING	11-2	CRANKSHAFT REMOVAL	11-12
CRANKCASE SEPARATION	11-3	MAIN JOURNAL BEARING	11-13
PISTON/CONNECTING ROD REMOVAL	11-4	CRANKSHAFT INSTALLATION	11-16
CRANKPIN BEARING	11-7	CRANKCASE ASSEMBLY	11-17

SERVICE INFORMATION

GENERAL

- The crankcase must be separated to service the piston/connecting rod and crankshaft.
- Avoid damaging the pistons against the transmission gears or crankcase when separating the crankcase halves because the pistons will fall as the crankcase is pulled off them.
- Prior to assembling the crankcase halves, apply a sealant to their mating surfaces. Wipe off excess sealant thoroughly.
- Mark and store the connecting rods, bearing caps and bearing inserts to be sure of their correct locations for reassembly. If the bearing inserts are improperly installed they will block the oil holes, causing insufficient lubrication and eventual engine seizure.

SPECIFICATIONS

Unit: mm (in)

11

ITEM		STANDARD	SERVICE LIMIT	
Cylinder	I.D.	71.010-71.025 (2.7957-2.7963)	71.1 (2.80)	
	Out-of-round	—	0.15 (0.006)	
	Taper	—	0.05 (0.002)	
	Top warp	—	0.05 (0.002)	
Piston, piston pin, piston ring	Piston O.D. at 10 (0.4) from the bottom	70.970-70.990 (2.7941-2.7949)	70.85 (2.789)	
	Piston pin bore I.D.	18.010-18.016 (0.7091-0.7093)	18.03 (0.710)	
	Piston-to-cylinder clearance	0.020-0.055 (0.0008-0.0022)	0.10 (0.004)	
	Piston pin O.D. (at sliding surface)	17.994-18.000 (0.7084-0.7087)	17.99 (0.708)	
	Piston-to-piston pin clearance	0.010-0.022 (0.0004-0.0009)	0.05 (0.002)	
	Connecting rod-to-piston pin interference	0.015-0.039 (0.0006-0.0015)	—	
	Piston ring end gap	Top/second	0.15-0.30 (0.006-0.012)	0.5 (0.02)
		Oil (side rail)	0.20-0.70 (0.008-0.028)	0.9 (0.04)
Piston ring-to-ring groove clearance	Top	0.025-0.055 (0.0010-0.0022)	0.10 (0.004)	
	Second	0.015-0.045 (0.0006-0.0018)	0.10 (0.004)	
Crankshaft	Connecting rod side clearance	0.15-0.30 (0.006-0.012)	0.40 (0.016)	
	Crankpin bearing oil clearance	0.027-0.045 (0.0011-0.0018)	0.06 (0.002)	
	Main journal bearing oil clearance	0.020-0.038 (0.0008-0.0015)	0.06 (0.002)	
	Runout	—	0.03 (0.001)	
	Crankpin and main journal	Taper	—	0.003 (0.0001)
		Out-of-round	—	0.005 (0.0002)

PISTON/CRANKSHAFT

TORQUE VALUES

Connecting rod bearing cap nut	31 N•m (3.2 kgf•m, 23 lbf•ft)	Apply oil to the threads and seating surface.
Main journal bearing cap bolt	59 N•m (6.0 kgf•m, 43 lbf•ft)	Apply oil to the threads and seating surface.
Crankcase 10 mm bolt	34 N•m (3.5 kgf•m, 25 lbf•ft)	Apply oil to the threads and seating surface.
Crankcase 8 mm bolt	26 N•m (2.7 kgf•m, 20 lbf•ft)	

TOOLS

Piston base	07973-6570500
Piston base spring	07973-6570600
Pilot pin	07PAF-0010300 or 07973-6570400 (U.S.A. only)
Piston base head	07PAF-0010400 or 07JGF-001010A (U.S.A. only)
Piston base head insert (2)	07PAF-0010500
Pilot collar	07KMF-MT20200
Adjustable piston pin driver shaft	07973-6570300
Adjustable piston pin driver head	07973-6570210
Piston ring compressor	07955-3710000 (2 pcs.) not available in U.S.A. 07JMG-MN50300 (1 pc.)
Piston base set	07JMG-MN5000A (3 pcs.) U.S.A. only
— piston base A	07JMG-MN50100 not available in U.S.A.
— piston base B	07JMG-MN50121 (2 pcs.) or 07JMG-MN5012A 07JMG-MN50111 (1 pc.)

TROUBLESHOOTING

Compression too low, hard starting or poor performance at low speed

- Leaking cylinder head gasket
- Worn, stuck or broken piston ring
- Worn or damaged cylinder and piston

Compression too high, overheating or knocking

- Excessive carbon built-up on piston head or combustion chamber

Excessive smoke

- Worn cylinder, piston or piston rings
- Improper installation of piston rings
- Scored or scratched piston or cylinder wall

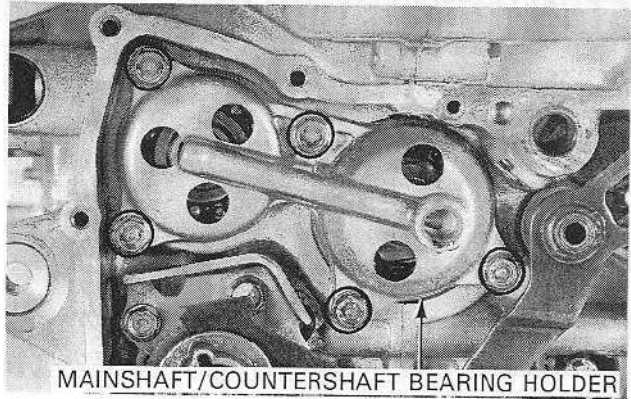
Abnormal noise

- Worn piston pin or piston pin hole
- Worn cylinder, piston or piston rings
- Worn main journal bearings
- Worn crankpin bearings

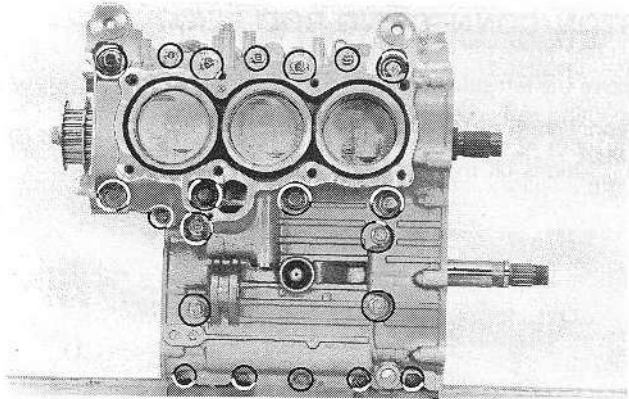
CRANKCASE SEPARATION

Remove the following:

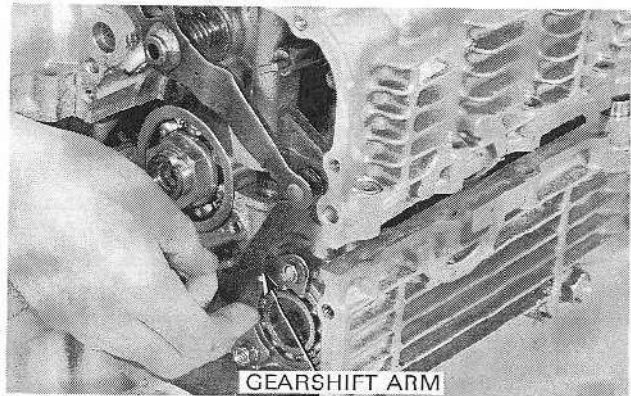
- PAIR check valve cases (page 5-23).
- thermostat (page 6-11).
- cylinder heads (page 8-11).
- transmission cover (page 10-5).
- shift drum cam/stopper (page 10-5).
- rear case (page 10-10).
- primary gears/output shaft (page 10-13).
- primary driven gear boss (page 10-17).
- drive chain guice (page 4-4).
- mainshaft/countershaft bearing holder.



Remove the ten 6 mm bolts, four 8 mm bolts and eight 10 mm bolts.

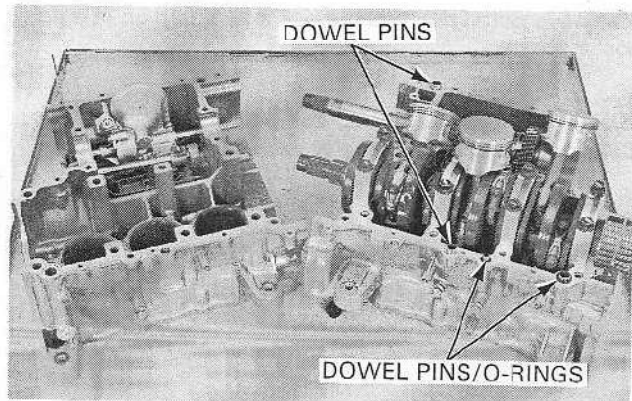


Place the engine with the right crankcase down. Pull the gearshift arm away from the right crankcase, partially separate the crankcase halves and install the case supports. Place shop towels under the pistons to prevent them from falling onto the transmission or right crankcase. Lift off the left crankcase.



Remove the dowel pins and O-rings.

Clean any sealant from the crankcase mating surfaces.



PISTON/CRANKSHAFT

PISTON/CONNECTING ROD REMOVAL

Separate the crankcase (page 11-3).

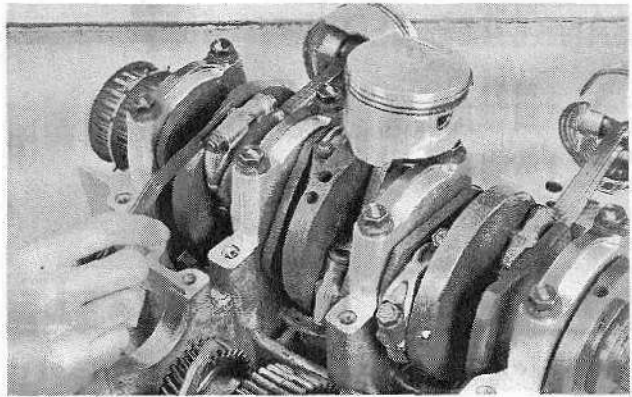
SIDE CLEARANCE INSPECTION

Measure the connecting rod side clearance.

SERVICE LIMIT: 0.40 mm (0.016 in)

If the clearance exceeds the service limit, replace the connecting rod.

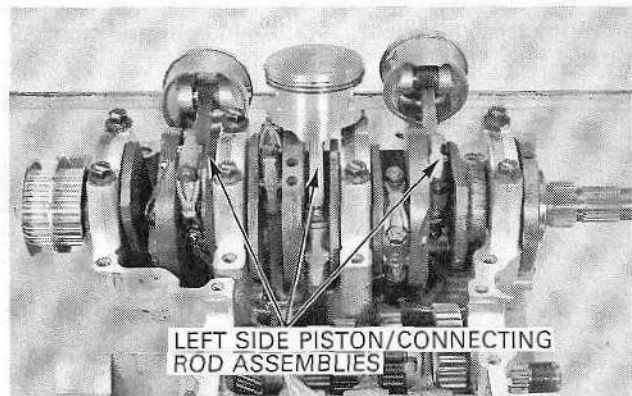
Recheck and if still out of limit, replace the crankshaft.



PISTON/CONNECTING ROD REMOVAL

Remove the left side connecting rod bearing caps and piston/connecting rod assemblies.

Mark them to indicate the correct cylinders (No. 2, 4 and 6) and positions on the crankpins.



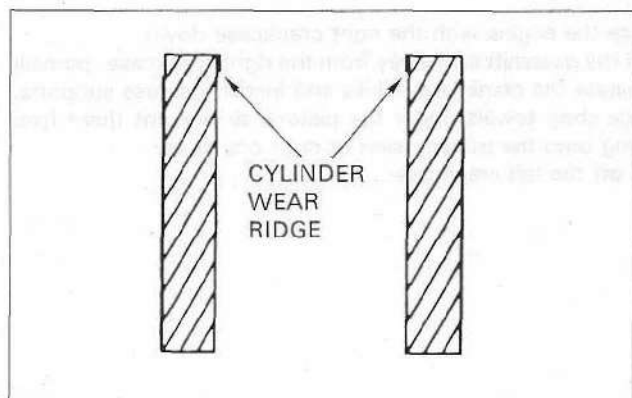
Remove the right side connecting rod bearing caps.

Push the piston/connecting rod assemblies out through the top of the right cylinder bore.

Mark them to indicate the correct cylinders (No. 1, 3 and 5) and positions on the crankpins.

CAUTION

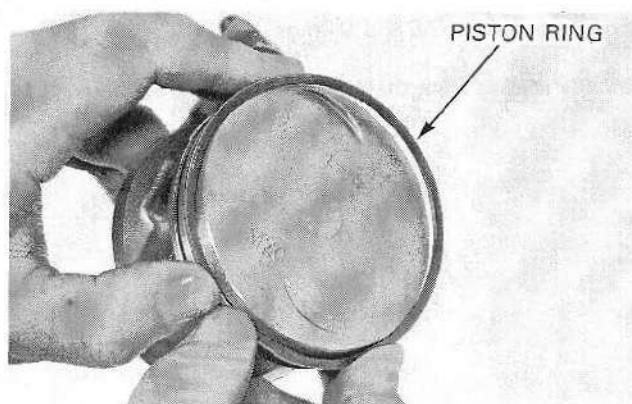
- *On engines with high mileage, inspect the cylinders for a ridge just above the highest point of ring travel. Any ridge must be removed with an automotive type ridge reamer before removing the right side pistons to allow the pistons and rings to pass through the cylinder.*



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

CAUTION

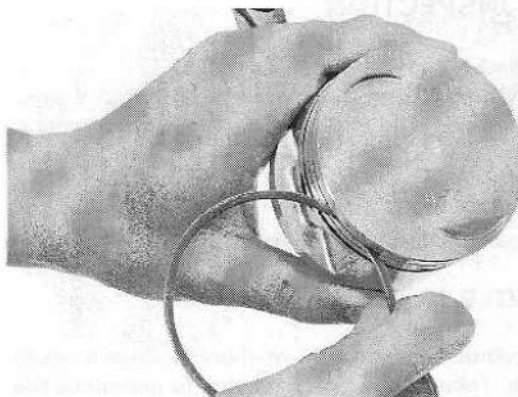
- *Do not damage the piston ring by spreading the ends too far.*



Clean carbon deposits from the piston.

CAUTION

- Clean carbon deposits from the ring grooves with a ring that will be discarded. Never use a wire brush; it will scratch the groove.

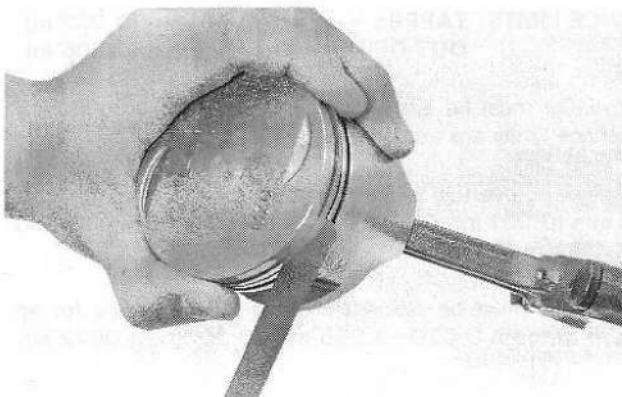


PISTON/PISTON RING INSPECTION

Inspect the piston rings for movement by rotating the rings (except left side bottom rings). The rings should be able to move in their grooves without catching.

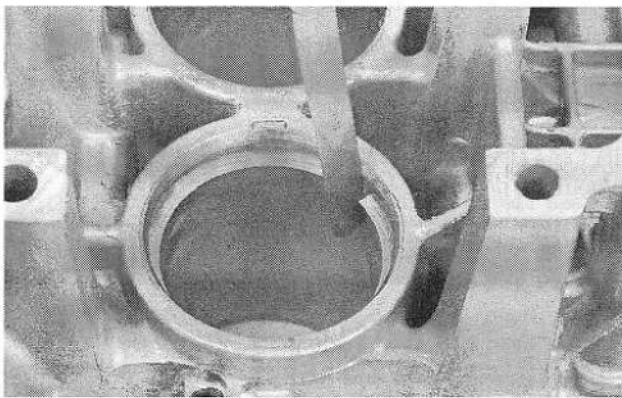
Push the ring until the outer surface of the piston ring is nearly flush with the piston and measure the ring-to-ring groove clearance.

SERVICE LIMIT: 0.10 mm (0.004 in)



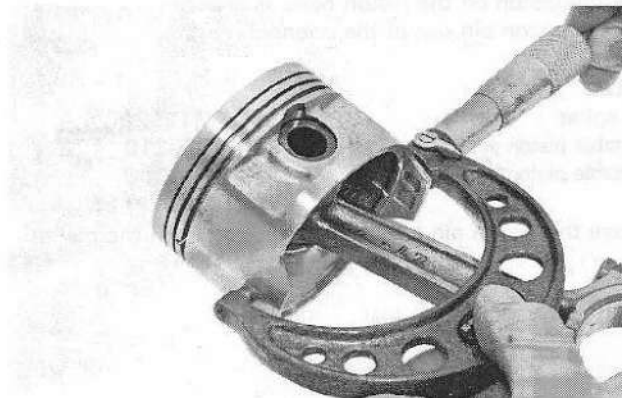
Insert each piston ring into the bottom of the cylinder square-ly using the piston as shown. Measure the ring end gap.

**SERVICE LIMITS: TOP/SECOND: 0.5 mm (0.02 in)
OIL (SIDE RAIL): 0.9 mm (0.04 in)**



Measure the piston O.D. at a point 10 mm (0.4 in) from the bottom and 90° to the piston pin bore.

SERVICE LIMIT: 70.85 mm (2.789 in)



PISTON/CRANKSHAFT

CYLINDER INSPECTION

Inspect the cylinder wall for scratch or wear.
Measure the cylinder I.D. at three levels in an X and Y axis.
Take the maximum reading to determine the cylinder wear.

SERVICE LIMIT: 71.1 mm (2.80 in)

Calculate the cylinder-to-piston clearance.

SERVICE LIMIT: 0.10 mm (0.004 in)

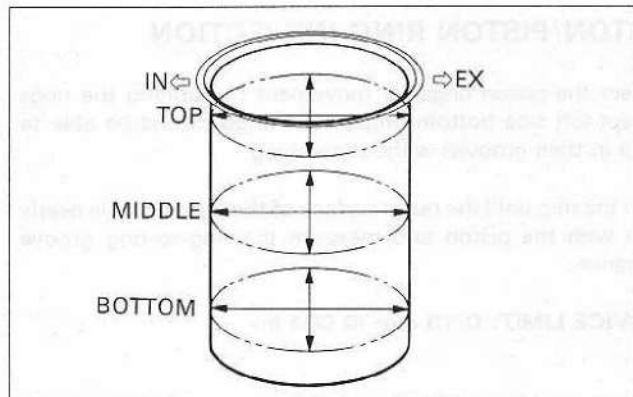
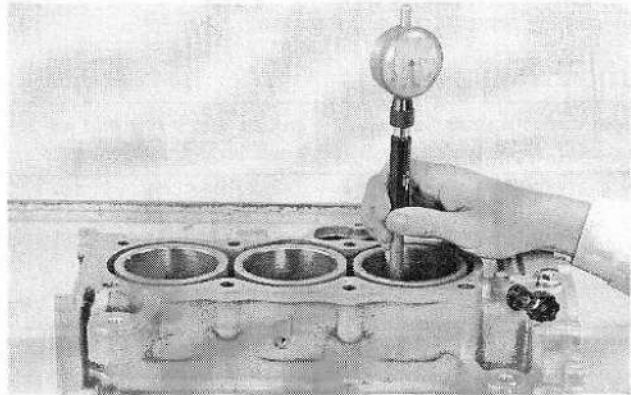
Calculate the cylinder taper and out-of-round at three levels in an X and Y axis. Take the maximum reading to determine the taper and out-of-round.

SERVICE LIMITS: TAPER: 0.05 mm (0.002 in)
OUT-OF-ROUND: 0.15 mm (0.006 in)

The cylinder must be rebored and an oversize piston fitted if the service limits are exceeded.

The following oversize pistons are available:
0.25 mm (0.001 in), 0.50 mm (0.020 in), 0.75 mm (0.030 in), 1.00 mm (0.039 in)

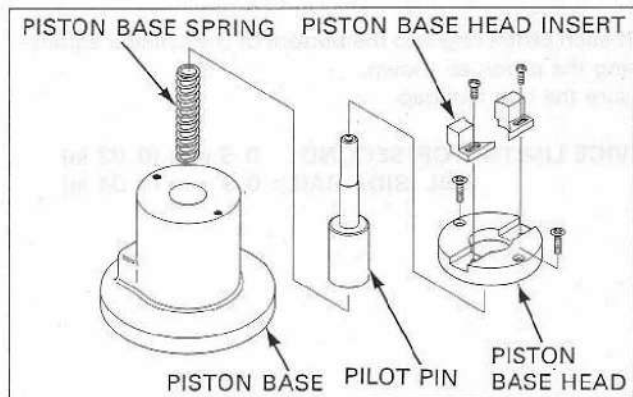
The cylinder must be rebored so that the clearance for an oversize piston is 0.020–0.055 mm (0.0008–0.0022 in).



PISTON REMOVAL

Assemble the piston pin base as shown.

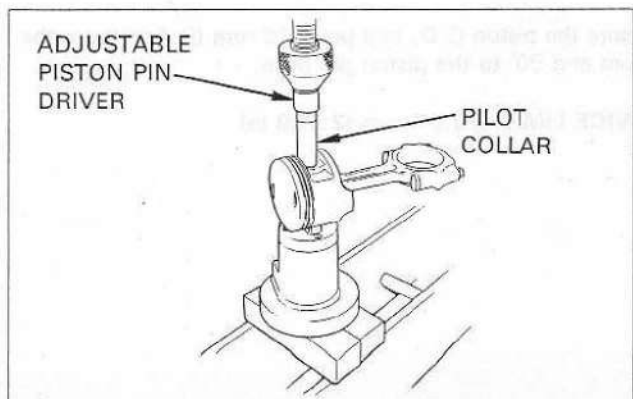
TOOLS:
Piston base 07973-6570500
Piston base spring 07973-6570600
Pilot pin 07PAF-0010300 or 07973-6570400 (U.S.A. only)
Piston base head 07PAF-0010400
Piston base head insert 07PAF-0010500 or 07JGF-001010A (U.S.A. only)



Install the piston on the piston base as shown.
Press the piston pin out of the connecting rod.

TOOLS:
Pilot collar 07KMF-MT20200
Adjustable piston pin driver head 07973-6570210
Adjustable piston pin driver shaft 07973-6570300

Remove the piston pin and connecting rod from the piston.



PISTON/PISTON PIN INSPECTION

Measure the piston pin bore I.D.

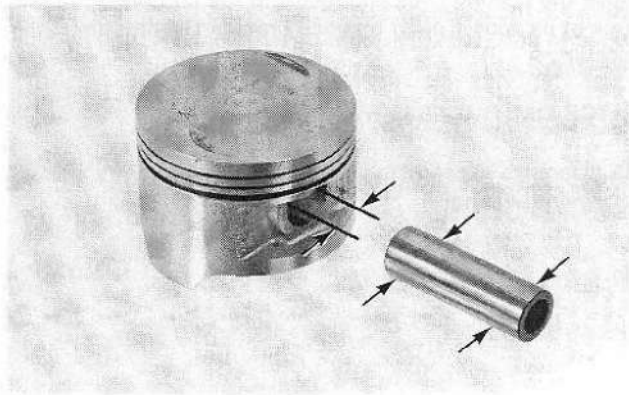
SERVICE LIMIT: 18.03 mm (0.710 in)

Measure the piston pin O.D. at piston sliding surface.

SERVICE LIMIT: 17.99 mm (0.708 in)

Calculate the piston-to-piston pin clearance.

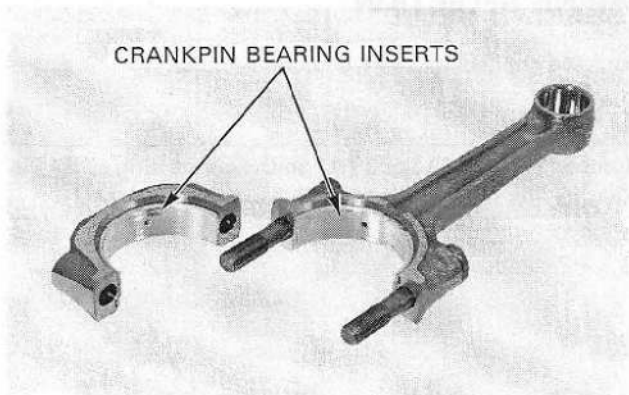
SERVICE LIMIT: 0.05 mm (0.002 in)



CRANKPIN BEARING

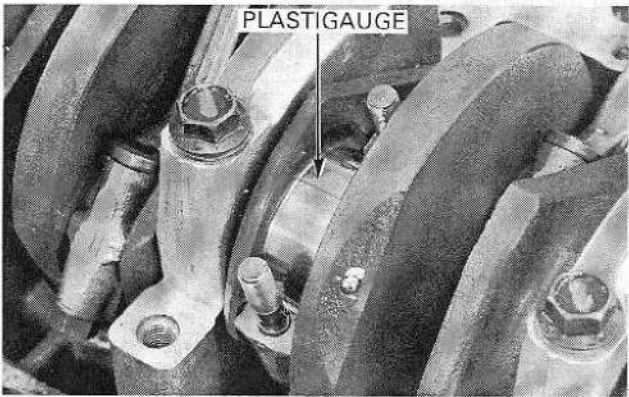
BEARING INSPECTION

Check the bearing inserts for unusual wear or peeling.
Check the bearing tabs for damage.



OIL CLEARANCE INSPECTION

Clean any oil from the bearing inserts and crankpin.
Put a strip of plastigauge lengthwise on each crankpin avoiding the oil hole.



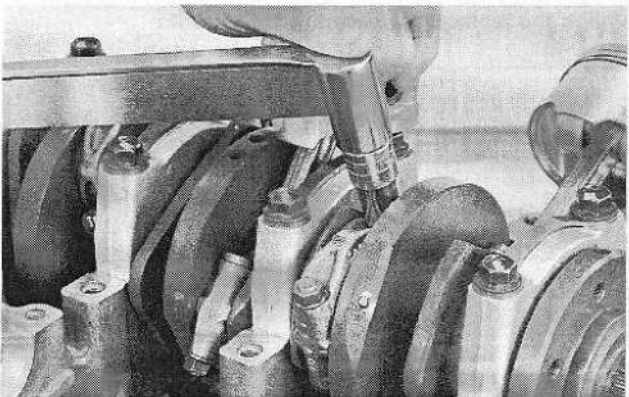
Carefully install the connecting rods and bearing caps on the correct crankpins.

Apply engine oil to the threads and seating surfaces of the bearing cap nuts.
Install the nuts and tighten them in 2 or 3 steps alternately.

TORQUE: 31 N·m (3.2 kgf·m, 23 lbf·ft)

NOTE

- Do not rotate the connecting rod or crankshaft during inspection.

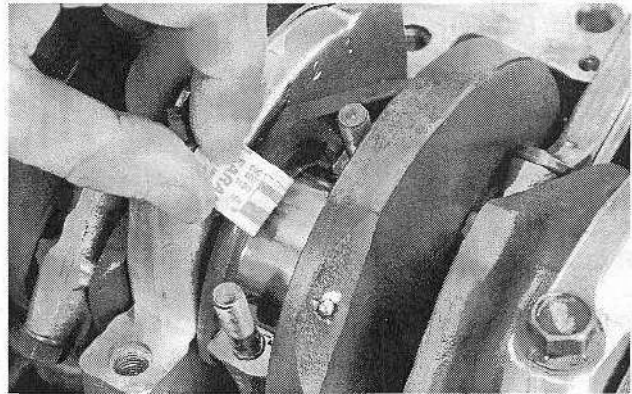


PISTON/CRANKSHAFT

Remove the bearing caps and measure the compressed plastigauge at its widest point on each crankpin to determine the oil clearance.

SERVICE LIMIT: 0.06 mm (0.002 in)

If the clearance exceeds the service limit, select the correct replacement bearings.

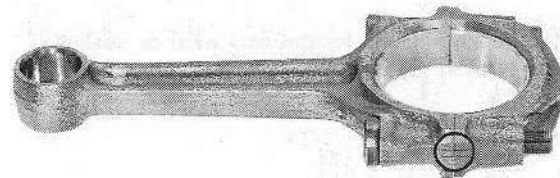


BEARING SELECTION

Record the connecting rod I.D. code number.

NOTE

- Number 1 (I), 2 (II) or 3 (III) on the connecting rod is the code for the connecting rod I.D.

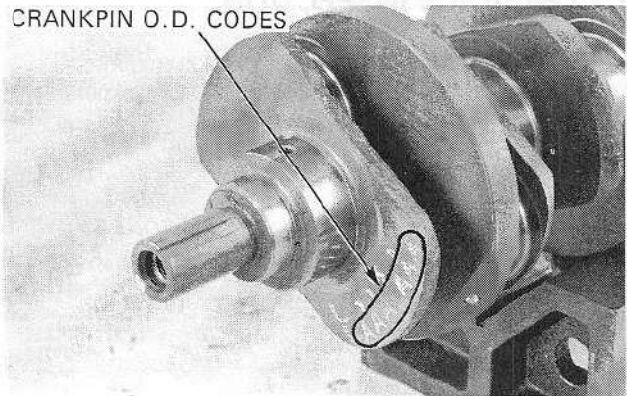


CONNECTING ROD I.D. CODE

Record the crankpin O.D. code letters.

NOTE

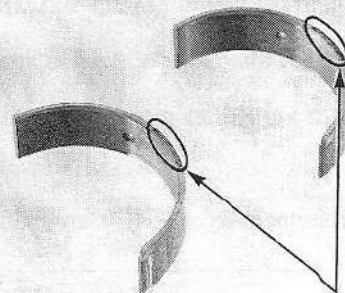
- Letters A, B or C on the front side of the crankshaft are the codes for the crankpin O.D. The codes are stamped in the sequence from the No. 1 crankpin.



CRANKPIN O.D. CODES

Cross reference the connecting rod and crankpin codes to determine the replacement bearing color code.

Connecting rod I.D. code \ Crankpin O.D. code	1 (I)	2 (II)	3 (III)
A	Yellow	Green	Brown
B	Green	Brown	Black
C	Brown	Black	Blue



COLOR CODES

CRANKPIN BEARING INSERT THICKNESS:

- Blue: 1.503—1.506 mm (0.0592—0.0593 in)
- Black: 1.500—1.503 mm (0.0591—0.0592 in)
- Brown: 1.497—1.500 mm (0.0589—0.0591 in)
- Green: 1.494—1.497 mm (0.0588—0.0589 in)
- Yellow: 1.491—1.494 mm (0.0587—0.0588 in)

CAUTION

- After selecting new bearings, recheck the clearance with plastigauge. Incorrect clearance can cause major engine damage.

BEARING INSTALLATION

Clean oil off the bearing outer surfaces, bearing cap and connecting rod.

Install the crankpin bearing inserts onto the bearing cap and connecting rod, aligning each tab with each groove.

PISTON/CONNECTING ROD INSTALLATION

CONNECTING ROD SELECTION

If a connecting rod requires replacement, you should select a rod with the same weight code as the original.

NOTE

- Letter A, B, C, D or E on the connecting rod or bearing cap is the code for the connecting rod weight.

PISTON INSTALLATION

When using the piston base (07JGF-001010A), turn the adjustable piston pin driver shaft on the adjustable piston pin driver head so that dimension A (see drawing) is 51 mm (2.01 in). When using the piston base head (07PAF-0010400) and piston base head insert(s) (07PAF-0010500), turn the adjustable piston pin driver shaft on the piston pin driver head so that dimension A is 55 mm (2.17 in).

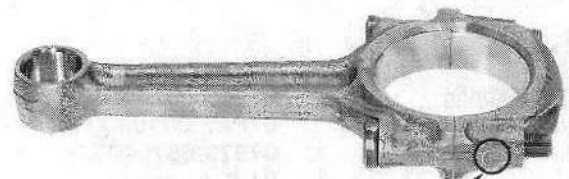
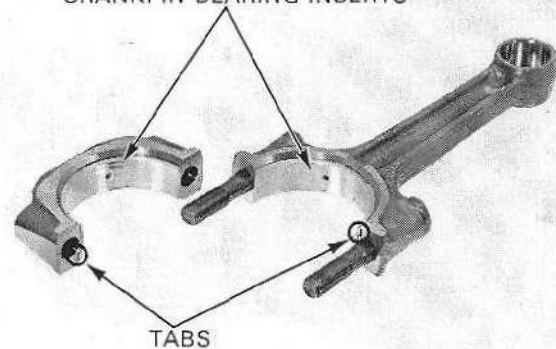
NOTE

- After adjusting the piston pin driver length, the driver shaft will protrude past the adjustable piston pin driver head. Place a suitable 12 mm plain washer over the driver head to prevent direct pressure on the shaft threads when putting the piston pin driver in the hydraulic press.

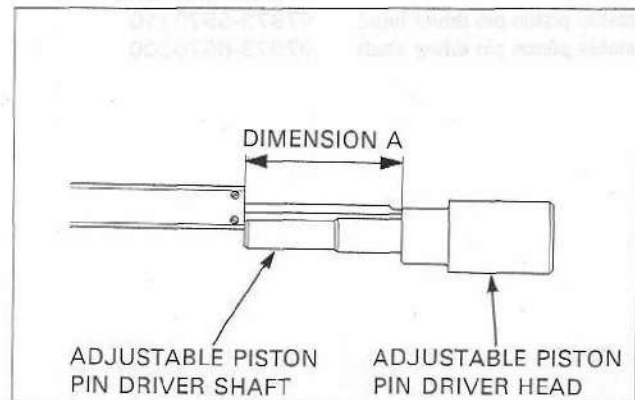
TOOLS:

- Adjustable piston pin driver head 07973-6570210
- Adjustable piston pin driver shaft 07973-6570300

CRANKPIN BEARING INSERTS



CONNECTING ROD WEIGHT CODE

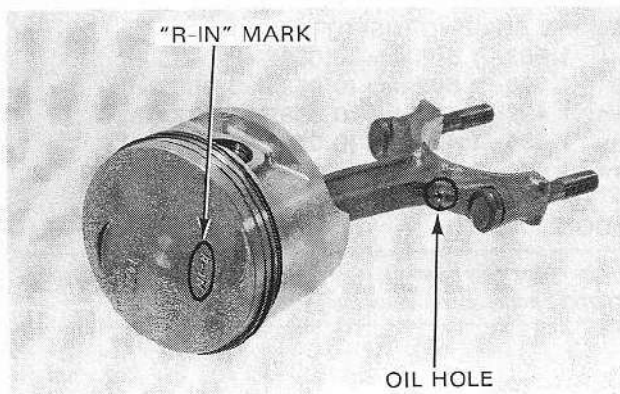


PISTON/CRANKSHAFT

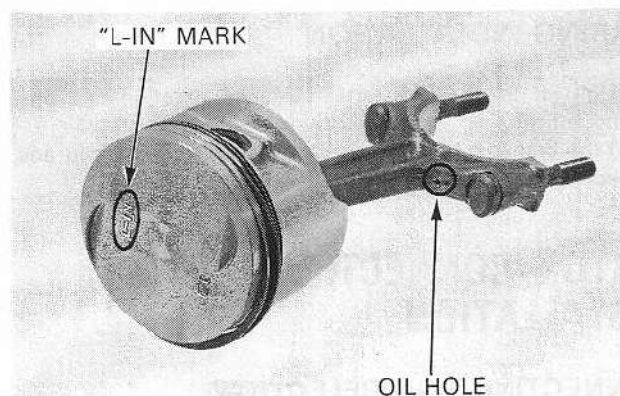
Install the pilot collar on the pilot pin of the piston base assembly.

Install the piston and connecting rod on the piston base as follows:

Right side (No. 1, 3 and 5) pistons: "R-IN" mark on the piston head is facing the same direction as the oil hole in the connecting rod.



Left side (No. 2, 4 and 6) pistons: "L-IN" mark on the piston head is opposite the oil hole in the connecting rod.

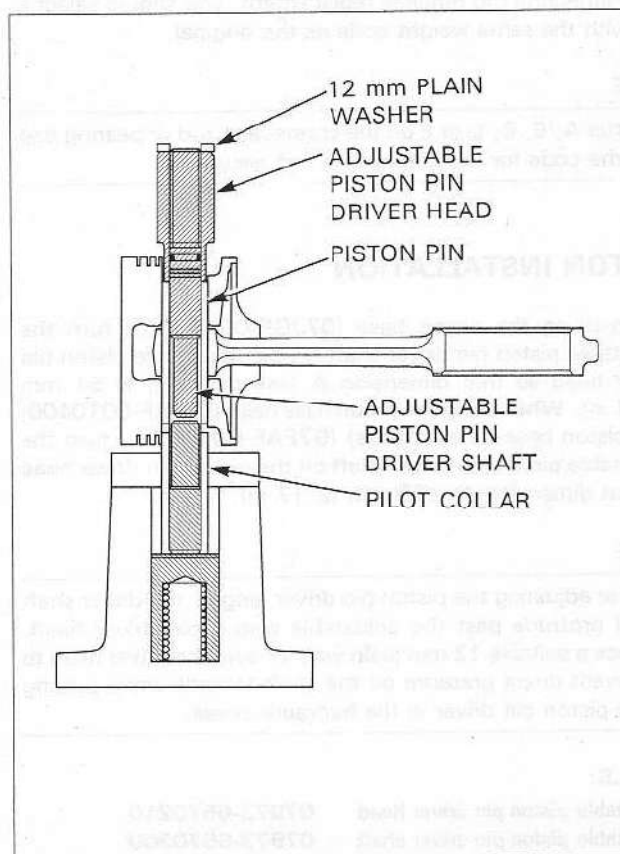


Coat the piston pin with clean engine oil and insert it into the piston.

Press the piston pin into the connecting rod through the piston using the adjustable piston pin driver as described on page 11-9.

TOOLS:

Piston base	07973-6570500
Piston base spring	07973-6570600
Pilot pin	07PAF-0010300 or 07973-6570400 (U.S.A. only)
Piston base head	07PAF-0010400
Piston base head insert	07PAF-0010500 or 07JGF-001010A (U.S.A. only)
Pilot collar	07KMF-MT20200
Adjustable piston pin driver head	07973-6570210
Adjustable piston pin driver shaft	07973-6570300



PISTON RING INSTALLATION

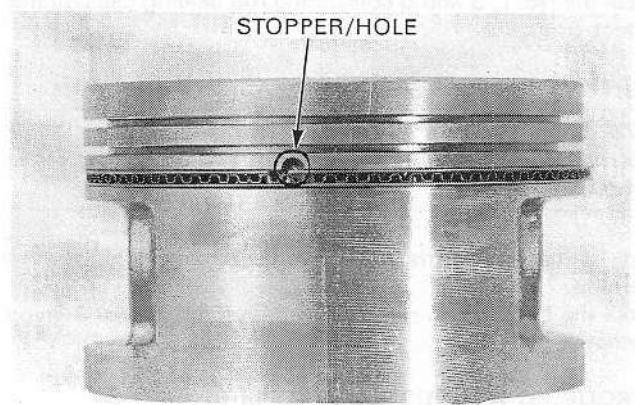
Carefully install the piston rings into the piston grooves with the markings facing up.

CAUTION

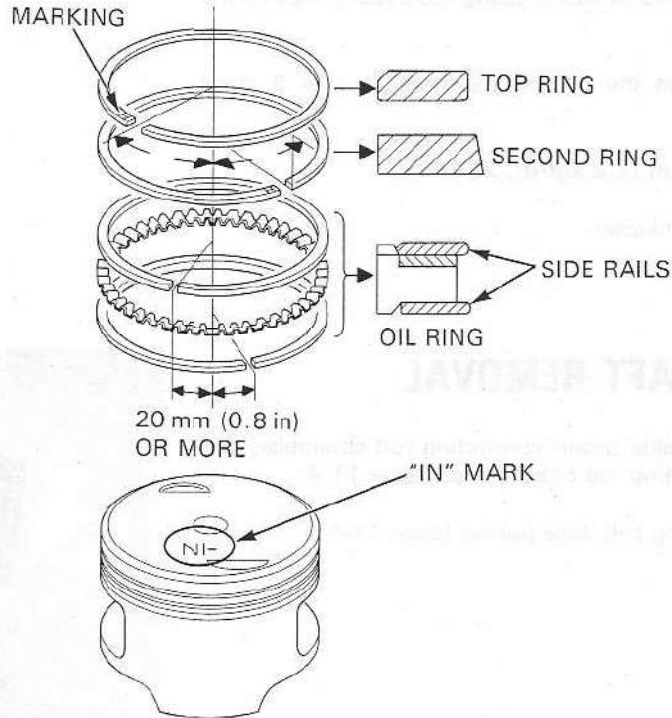
- Be careful not to damage the piston and rings during installation.

NOTE

- Do not interchange the top and second rings.
- To install the oil ring, install the spacer first, then install the side rails.
- On the upper side rail of the left cylinder (No.2, No.4 and No.6) piston, align the end stopper with the stopper hole.

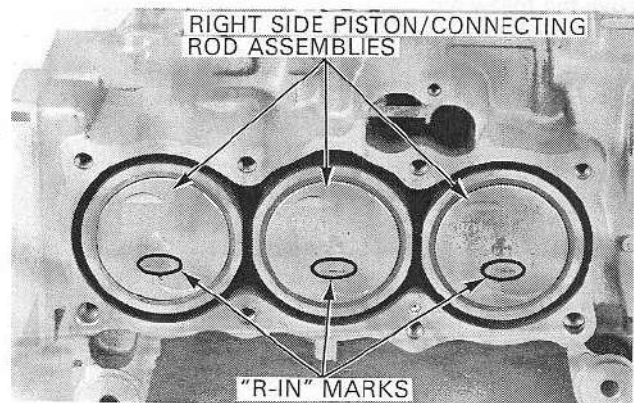


Stagger the top and second piston ring end gaps 60 degrees apart from "IN" mark as shown.
Stagger the side rail end gaps as shown.



PISTON/CONNECTING ROD INSTALLATION

Apply molybdenum disulfide oil to the crankpin bearings. To prevent damaging the crankpin, slip short sections of rubber hose over the rod bolts before installation. Coat the right cylinders, pistons and piston rings with clean engine oil. Install right side piston/connecting rod assembly in No.1, 3 and 5 cylinders in their original positions with the "R-IN" marks toward the top of the engine, using a commercially available piston ring compressor.



PISTON/CRANKSHAFT

Install the No. 1, 3 and 5 connecting rod bearing caps on the correct crankpins.

CAUTION

- *The bearing caps must be installed in their correct locations, or the bearing oil clearance may not be correct. This could cause engine damage.*

Apply oil to the threads and seating surfaces of the bearing cap nuts.
Install the bearing cap nuts and tighten them in 2 or 3 steps alternately.

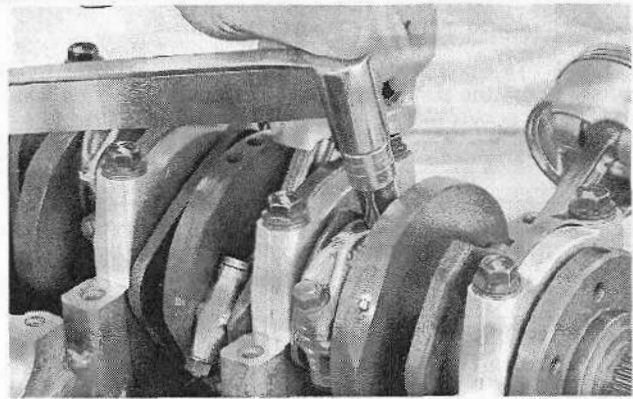
TORQUE: 31 N·m (3.2 kgf·m, 23 lbf·ft)

Install left side piston/connecting rod assembly on the No. 2, 4 and 6 crankpins in their original positions with the "L-IN" marks toward the top of the engine.
Install the No. 2, 4 and 6 connecting rod bearing caps on the correct crankpins.

Install and tighten the bearing cap nuts in 2 or 3 steps alternately.

TORQUE: 31 N·m (3.2 kgf·m, 23 lbf·ft)

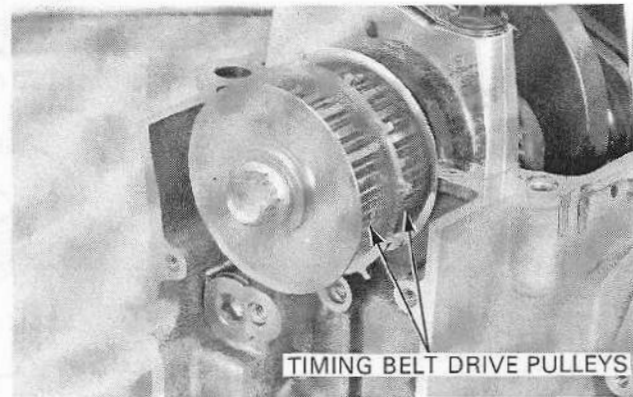
Assemble the crankcase.



CRANKSHAFT REMOVAL

Remove the left side piston/connecting rod assemblies and right side connecting rod bearing caps (page 11-4).

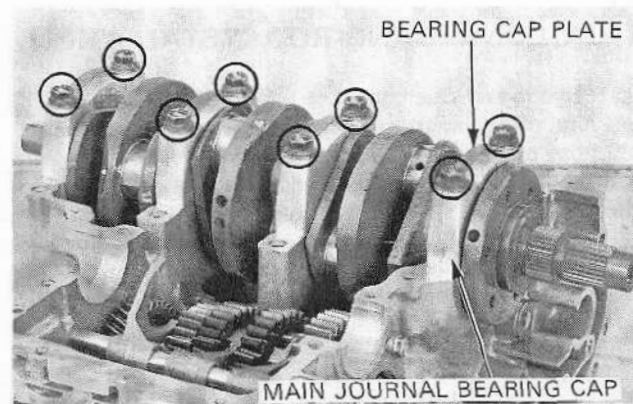
Remove the timing belt drive pulleys (page 17-12).



- Remove the following:
- main journal bearing cap bolts.
 - bearing cap plates.
 - main journal bearing caps.
 - dowel pins.
 - crankshaft.
 - thrust bearings.

NOTE

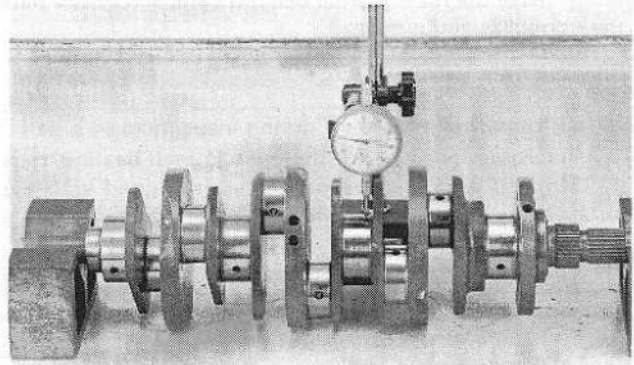
- Do not forcibly remove the dowel pins from the bearing caps.



CRANKSHAFT INSPECTION

Place the crankshaft on a stand or V-blocks.
Set a dial indicator on a center main journal.
Rotate the crankshaft two revolutions and read the runout at two points.
Divide the total indicator reading in half to get the actual runout.

SERVICE LIMIT: 0.03 mm (0.001 in)

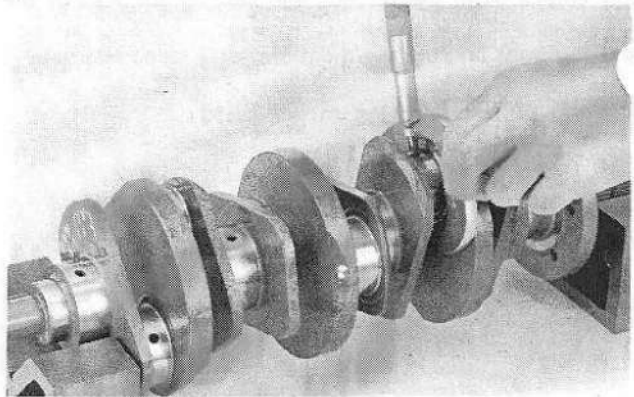


Measure the main journals and crankpins with a micrometer for out-of-round and taper.

SERVICE LIMITS: TAPER: 0.003 mm (0.0001 in)
OUT-OF-ROUND: 0.005 mm (0.0002 in)

NOTE

- The crankshaft cannot be repaired. Replace it if the journals or crankpins are burnt, cracked, or out of tolerance; or if the runout is beyond limits.

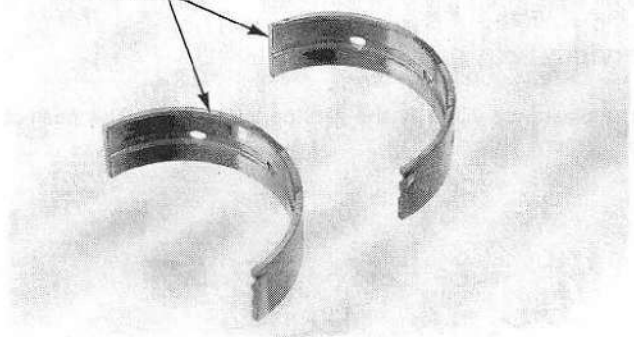


MAIN JOURNAL BEARING

BEARING INSPECTION

Check the bearing inserts of unusual wear or peeling.
Check the bearing tabs for damage.

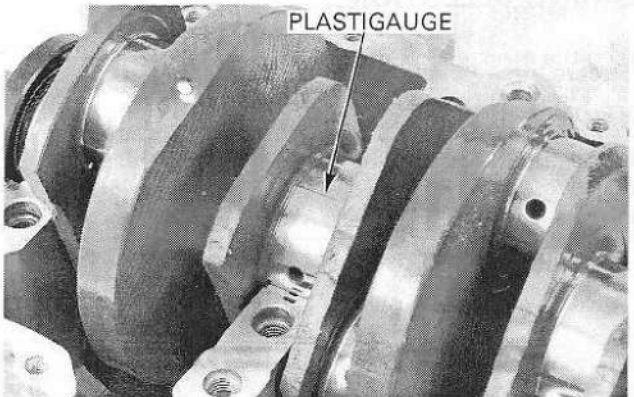
MAIN JOURNAL BEARING
INSERTS



OIL CLEARANCE INSPECTION

Clean any oil from the bearing inserts and main journals.
Put a strip of plastigauge lengthwise on each main journal avoiding the oil hole.

PLASTIGAUGE

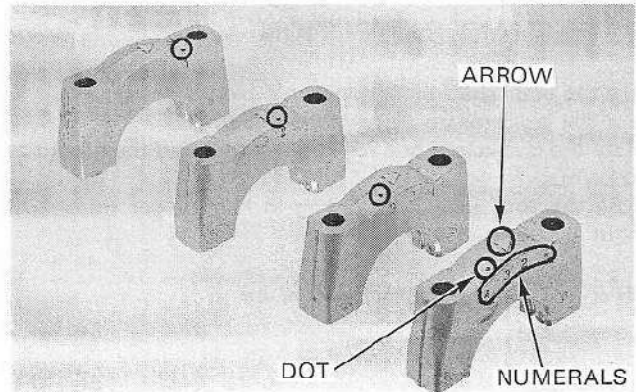


PISTON/CRANKSHAFT

Carefully install the main journal bearing caps and dowel pins on the correct main journals.

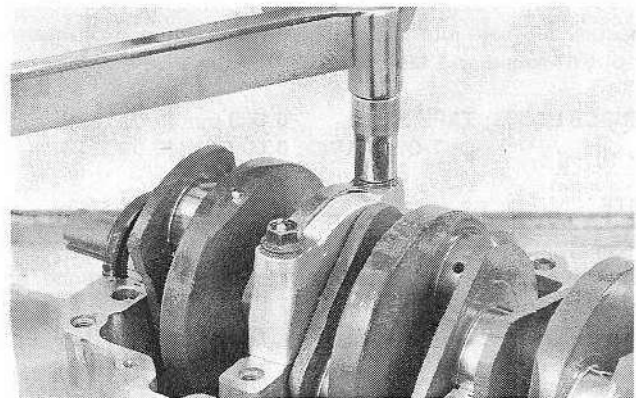
NOTE

- Do not rotate the crankshaft during inspection.
- The installation positions of the main journal bearing caps are identified with the dot marks that is aligned with the numerals 1, 2, 3 and 4, viewed from the front of the engine.
- The arrows on the caps should face toward the engine top.



Apply engine oil to the threads and seating surfaces of the bearing cap bolts. Install the bolts and tighten them in 2 or 3 steps alternately.

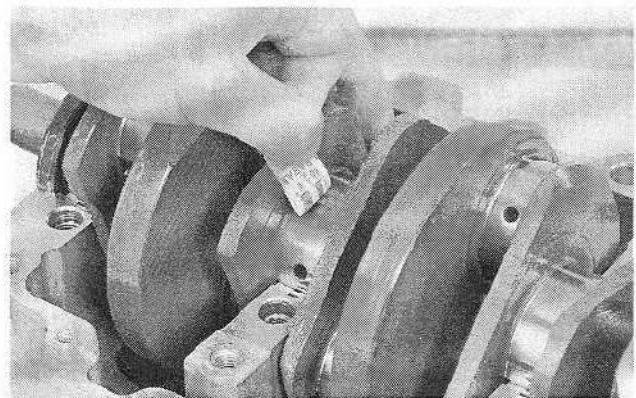
TORQUE: 59 N·m (6.0 kgf·m, 43 lbf·ft)



Remove the bearing caps and measure the compressed plastigauge at its widest point on each main journal to determine the oil clearance.

SERVICE LIMIT: 0.06 mm (0.002 in)

If the clearance exceeds the service limit, select the correct replacement bearings.

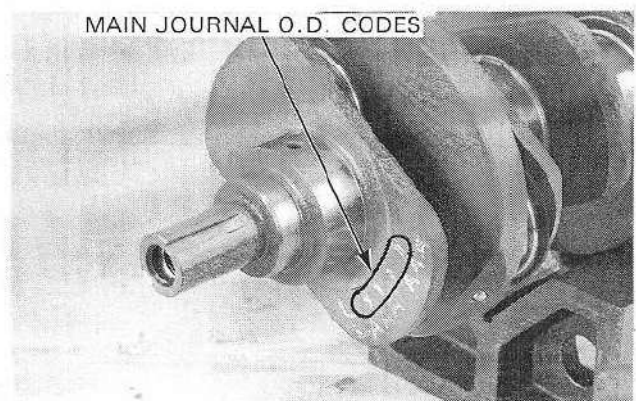


BEARING SELECTION

Record the main journal O.D. code number.

NOTE

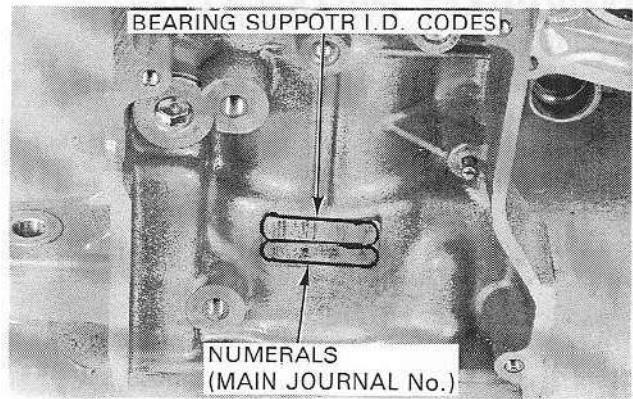
- Numbers 1, 2 or 3 on the front side of the crankshaft are the codes for the main journal O.D. The codes are stamped in the sequence from the No.1 main journal.



Record the crankcase bearing support I.D. codes.

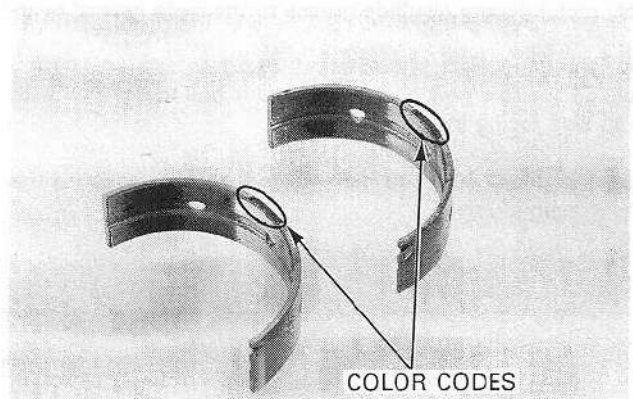
NOTE

- Letters I, II or III on the front side of the right crankcase are the crankcase bearing support I.D. codes. The numerals 1, 2, 3 and 4 stand for the crankshaft main journals, as viewed from the front.



Cross reference the main journal and bearing support codes to determine the replacement bearing color code.

Bearing support I.D. code	I	II	III
Main journal O.D. code			
1	Yellow	Green	Brown
2	Green	Brown	Black
3	Brown	Black	Blue



CRANKPIN BEARING INSERT THICKNESS:

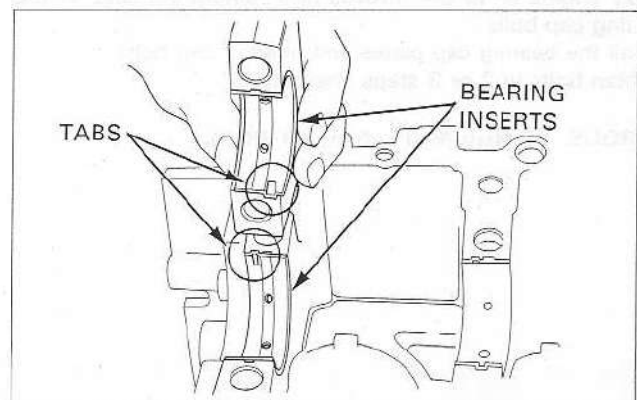
- Blue: 2.012—2.015 mm (0.0792—0.0793 in)
- Black: 2.009—2.012 mm (0.0791—0.0792 in)
- Brown: 2.006—2.009 mm (0.0790—0.0791 in)
- Green: 2.003—2.006 mm (0.0789—0.0790 in)
- Yellow: 2.000—2.003 mm (0.0787—0.0789 in)

CAUTION

- After selecting new bearings, recheck the clearance with plastigauge. Incorrect clearance can cause major engine damage.

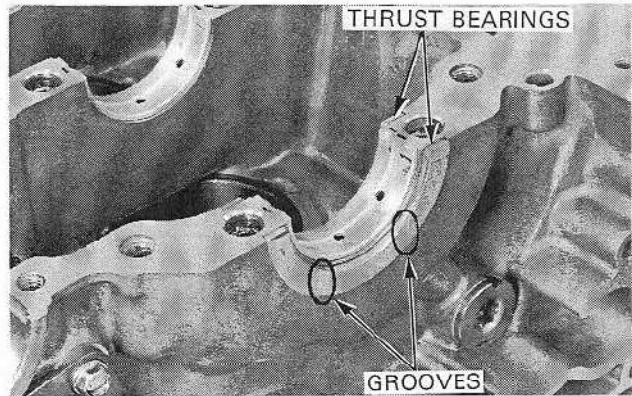
BEARING INSTALLATION

Clean oil off the bearing outer surfaces, bearing caps and crankcase bearing supports. Install the main journal bearing inserts onto the bearing caps and crankcase bearing supports, aligning each tab with each groove.

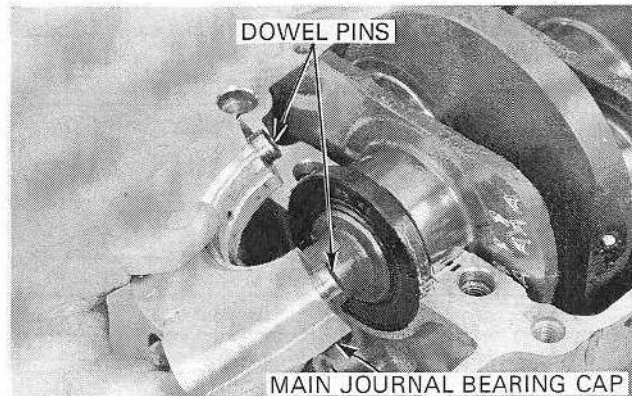


CRANKSHAFT INSTALLATION

Inspect the thrust bearings for wear, scoring or discoloration and replace them if necessary.
Install the thrust bearings with the groove sides facing out.



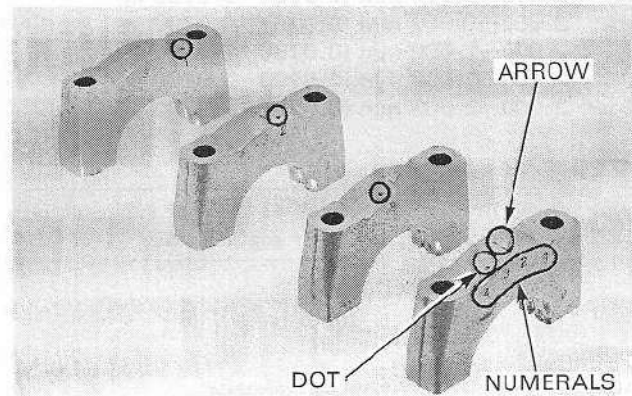
Apply molybdenum disulfide grease to the main journal bearing surfaces.
Install the crankshaft.
Apply grease to a new oil seal lips and install the oil seal with the lip side facing inside.



Install the dowel pins and main journal bearing caps on the correct main journals.

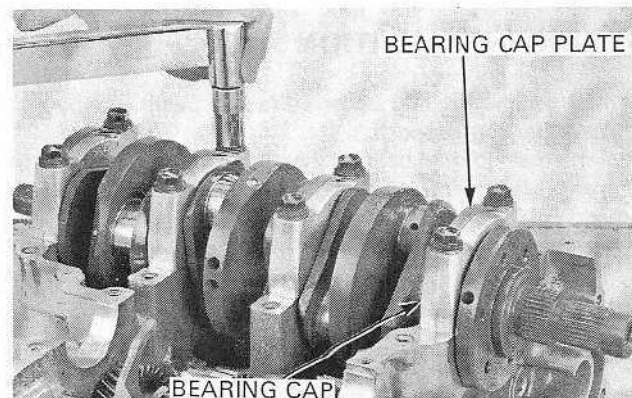
NOTE

- The installation positions of the main journal bearing caps are identified with the dot marks that are aligned with the numerals 1, 2, 3 and 4, starting from the front of the engine.
- The arrows on the caps should face toward the top of the engine.



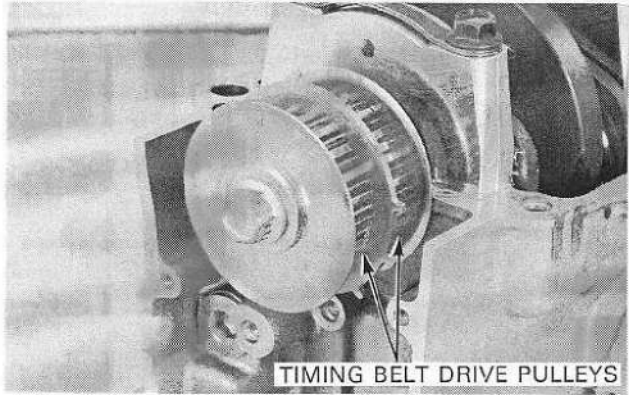
Apply engine oil to the threads and seating surfaces of the bearing cap bolts.
Install the bearing cap plates and bearing cap bolts.
Tighten bolts in 2 or 3 steps alternately.

TORQUE: 59 N·m (6.0 kgf·m, 43 lbf·ft)



Install the timing belt drive pulleys (page 17-12).

Install the right side connecting rod bearing caps and left side piston/connecting rod assemblies (page 11-11).



TIMING BELT DRIVE PULLEYS

CRANKCASE ASSEMBLY

Coat the left cylinders, pistons and piston rings with clean engine oil.

Make sure that the piston rings are properly installed (page 11-11).

Turn the crankshaft counterclockwise until the T1.2 drive pulley mark is facing up.

Set the special tools as shown.

TOOLS:

Except U.S.A.:

- | | |
|------------------------|------------------------|
| Piston ring compressor | 07955-3710000 (2 pcs.) |
| Piston base set | 07JMG-MN50300 (1 pc.) |
| — piston base A | 07JMG-MN50100 |
| — piston base B | 07JMG-MN50121 (2 pcs.) |
| | 07JMG-MN50111 (1 pc.) |

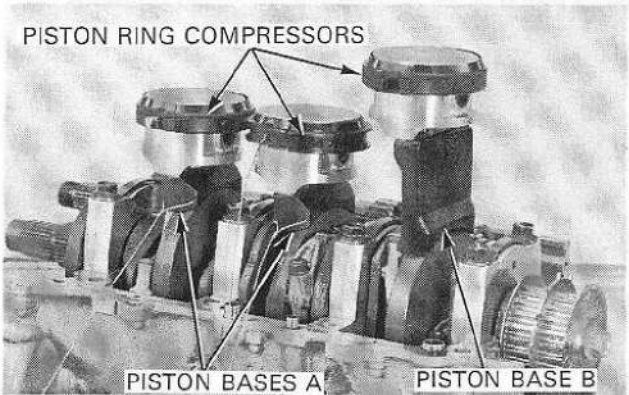
U.S.A. only:

- | | |
|------------------------|------------------------|
| Piston ring compressor | 07JMG-MN5000A (3 pcs.) |
| Piston base A | 07JMG-MN5012A |
| Piston base B | 07JMG-MN50111 |

Position the gearshift arm out of the way using a wire. Use suitable wooden blocks (40×40×86 mm, 1-1/2×1-1/2×3-3/8 in) as crankcase support blocks, place them as shown.

Place shop towels over the transmission and crankcase mating surface.

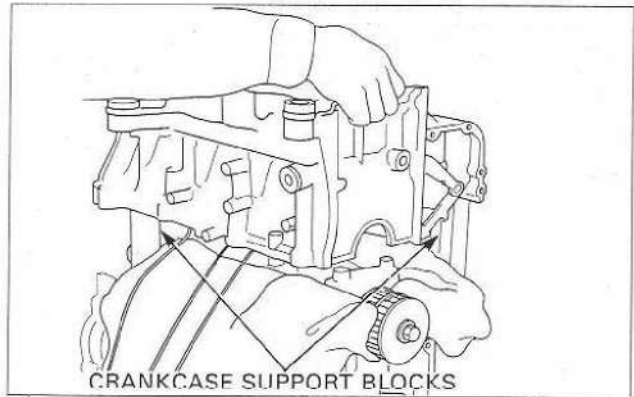
Hold the left crankcase over the No.2 piston, align the cylinder with the piston and set the crankcase straight onto the piston. The crankcase will rest on the crankcase support blocks.



PISTON RING COMPRESSORS

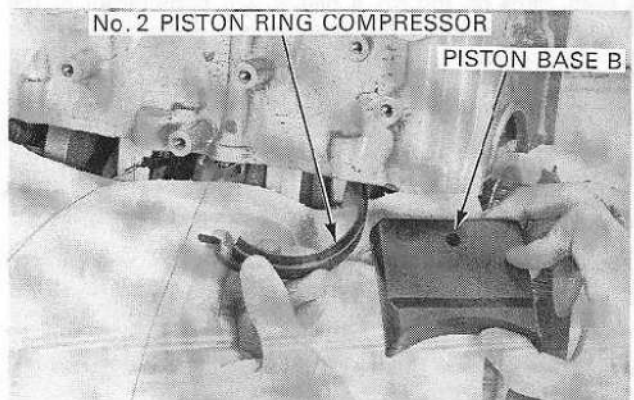
PISTON BASES A

PISTON BASE B



CRANKCASE SUPPORT BLOCKS

Remove the No.2 piston ring compressor and piston base B.

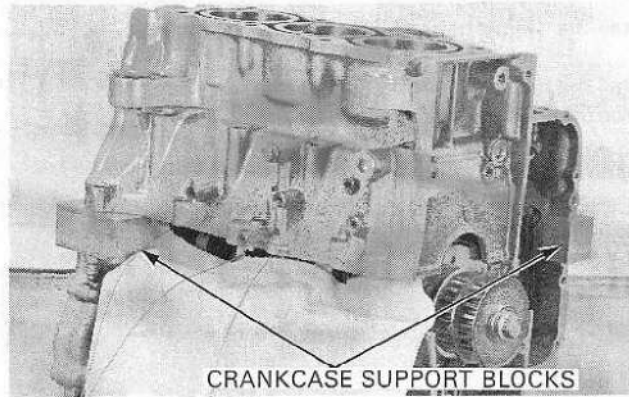


No. 2 PISTON RING COMPRESSOR

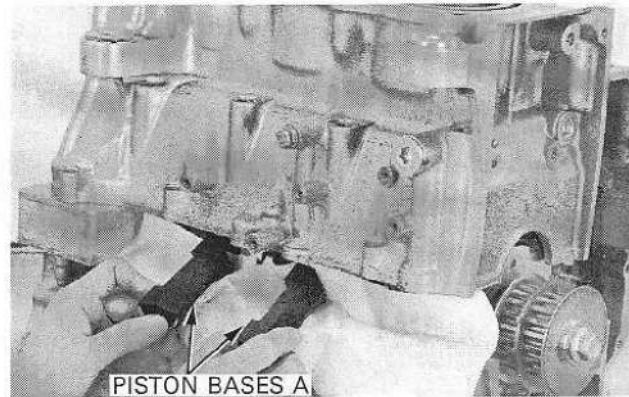
PISTON BASE B

PISTON/CRANKSHAFT

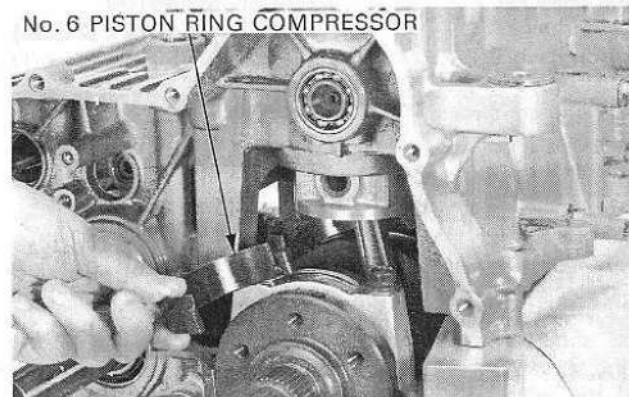
Have an assistant turn the crankcase support blocks on their sides as shown.
Set the left crankcase straight onto the No. 4 and 6 pistons and let it rest on the crankcase support blocks.



Remove piston bases A under the No. 4 and 6 pistons.



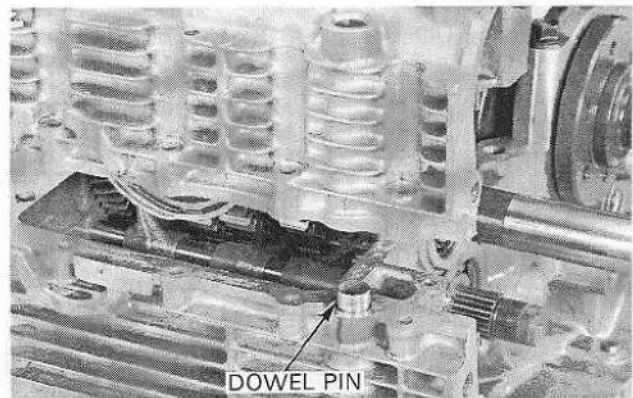
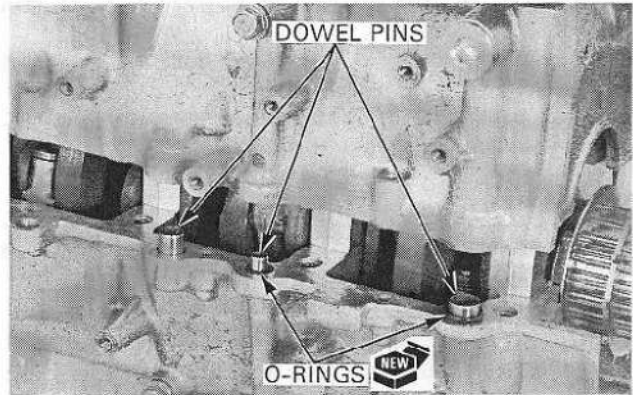
Remove the No. 6 piston ring compressor.



Pull both wires on the No. 4 piston ring compressor at the same time to separate the two halves. Then remove the piston ring compressor.



Remove the shop towels.
Install the dowel pins and new O-rings.



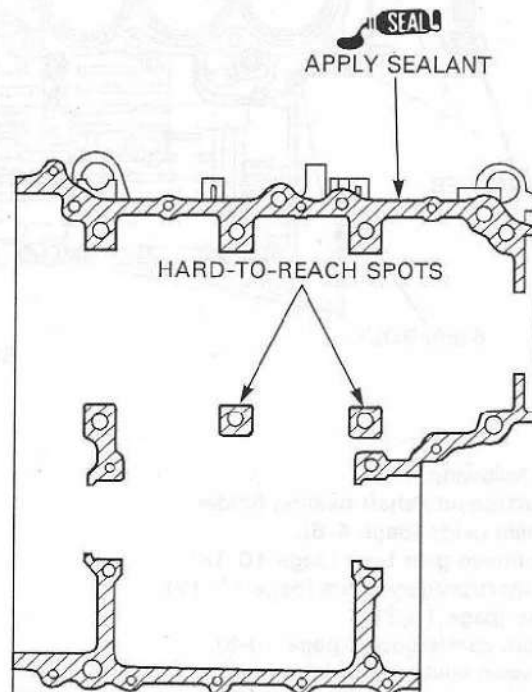
Apply sealant to the crankcase mating surfaces as shown.

NOTE

- Be sure to apply sealant to the hard-to-reach spots as indicated.

Have an assistant hold the left crankcase while you remove the crankcase support blocks and apply sealant to the areas where the support blocks were.

Assemble the crankcase.



PISTON/CRANKSHAFT

Apply oil to the threads and seating surfaces of all 10 mm bolts.

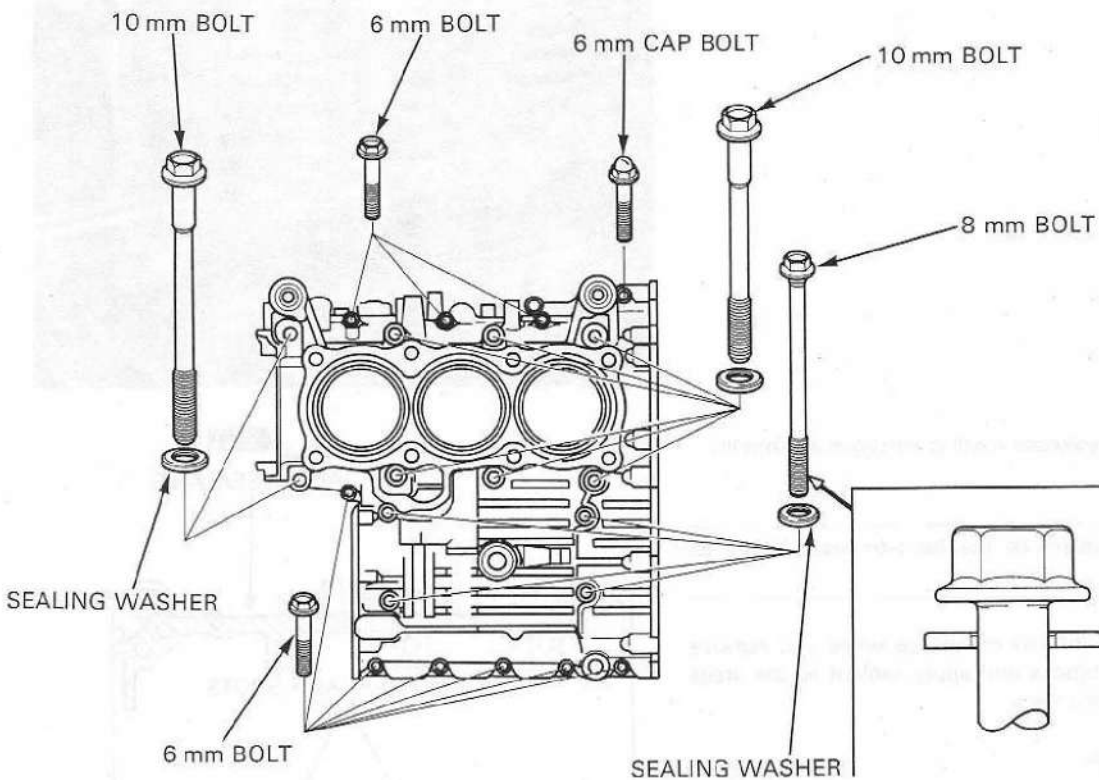
Install the eight 10 mm bolts, four 8 mm bolts and ten 6 mm bolts.

Tighten all bolts in 2 or 3 steps in a crisscross pattern, beginning with larger diameter bolts first.

NOTE

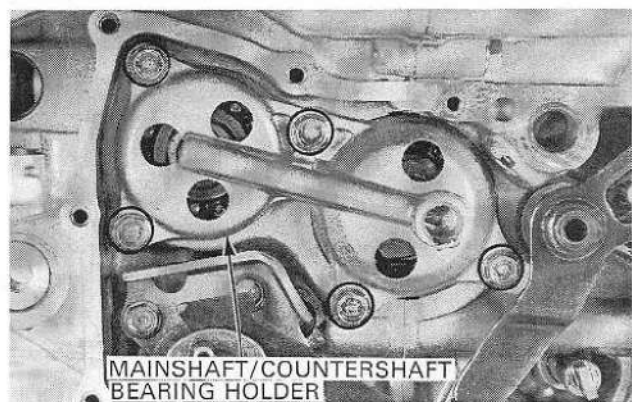
- Two front side 10 mm bolts and four 8 mm bolts have sealing washers.

TORQUE: 10 mm bolts: 34 N·m (3.5 kgf·m, 25 lbf·ft)
8 mm bolts: 25 N·m (2.6 kgf·m, 19 lbf·ft)



Install the following:

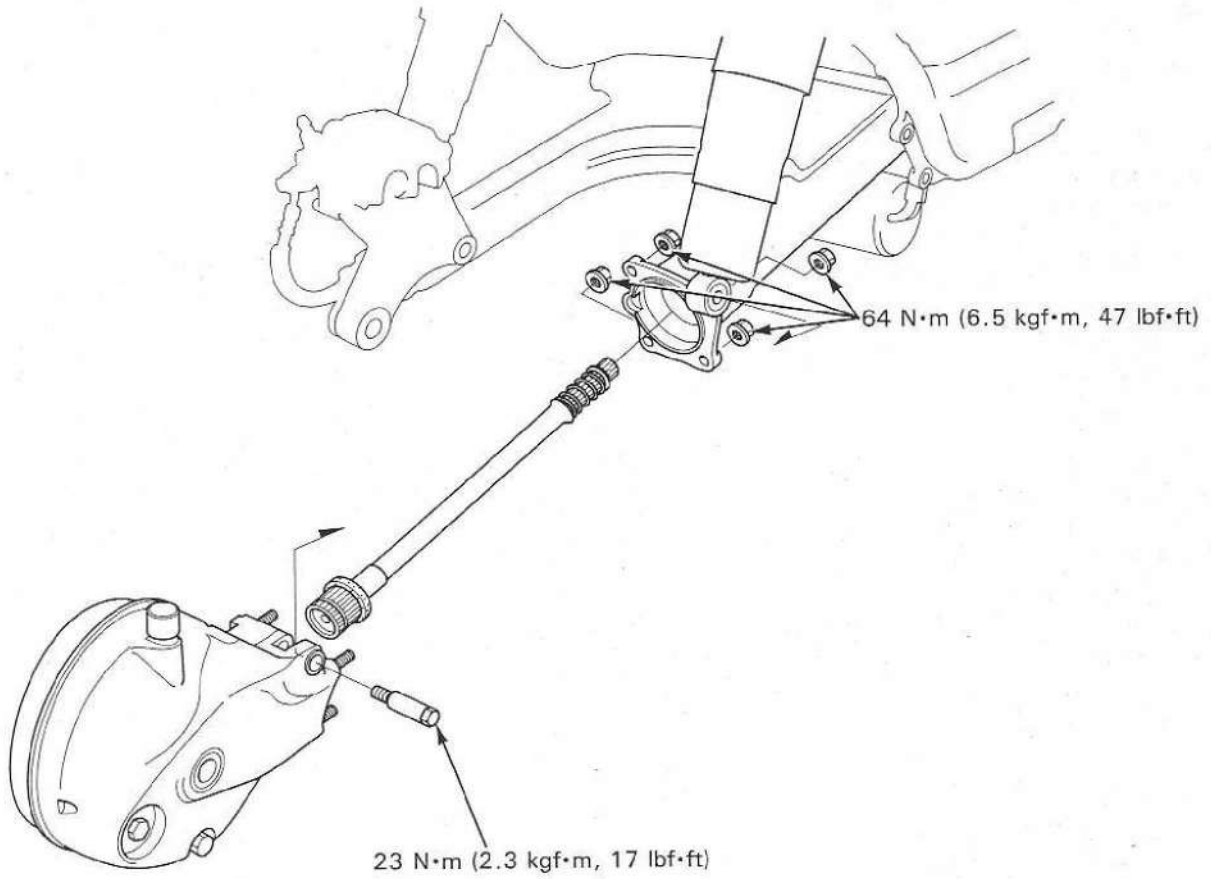
- mainshaft/countershaft bearing holder.
- drive chain guide (page 4-6).
- primary driven gear boss (page 10-18).
- output shaft/primary gears (page 10-19).
- rear case (page 10-21).
- shift drum cam/stopper (page 10-8).
- transmission cover (page 10-9).
- cylinder heads (page 8-21).
- thermostat (page 6-11).
- PAIR check valve cases (page 5-25).



MEMO



DR331



12. FINAL DRIVE

SERVICE INFORMATION	12-1	FINAL DRIVE DISASSEMBLY	12-5
TROUBLESHOOTING	12-2	FINAL DRIVE ASSEMBLY	12-10
FINAL DRIVE REMOVAL	12-3	FINAL DRIVE INSTALLATION	12-18

SERVICE INFORMATION

GENERAL

- The final drive gear assembly and final drive shaft must be removed together.
- Replace the ring and pinion gears as a set.
- Perform the gear contact pattern and backlash inspection whenever you replace the bearings, gear or gear case. The extension lines from the gear engagement surfaces should intersect at one point.
- Protect the gear case with a shop towel or soft jaws while holding it in vise. Do not clamp it too tightly as it could damage the gear case.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Recommended final drive oil		Hypoid gear oil, SAE #80	—
Final drive oil capacity	After draining	150 cm ³ (5.1 US oz, 5.3 Imp oz)	—
	At disassembly	170 cm ³ (5.7 US oz, 6.0 Imp oz)	—
Final drive gear backlash		0.05 - 0.15 (0.002 - 0.006)	0.30 (0.012)
Backlash difference between measurements		—	0.10 (0.004)
Ring gear-to-stop pin clearance		0.30 - 0.60 (0.012 - 0.024)	—
Final drive gear assembly pre-load		0.2 - 0.4 N·m (2 - 4 kgf·cm, 1.7 - 3.5 lbf·in)	—

12

TORQUE VALUES

Final gear case mounting nut	64 N·m (6.5 kgf·m, 47 lbf·ft)	UBS nut
Right shock absorber lower mounting bolt	23 N·m (2.3 kgf·m, 17 lbf·ft)	
Final gear case drain bolt	20 N·m (2.0 kgf·m, 14 lbf·ft)	
Final gear case oil filler cap	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Final gear case cover bolt, 10 mm	62 N·m (6.3 kgf·m, 46 lbf·ft)	Apply a locking agent to the threads.
8 mm	25 N·m (2.6 kgf·m, 19 lbf·ft)	
Pinion bearing retainer	147 N·m (15.0 kgf·m, 112 lbf·ft)	
Pinion joint nut	108 N·m (11.0 kgf·m, 80 lbf·ft)	Apply a locking agent to the threads.
Pinion retainer locking plate bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Dust guard mounting bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	CT bolt

FINAL DRIVE

TOOLS

Attachment, 52×55 mm	07746-0010400	
Attachment, 62×68 mm	07746-0010500	
Attachment, 72×78 mm	07746-0010600	
Driver, 40 mm I.D.	07746-0030100	
Attachment, 25 mm I.D.	07746-0030200	
Pilot, 35 mm	07746-0040800	
Driver	07749-0010000	
Pinion retainer wrench	07910-MA10100	or 07910-4150000
Pinion joint holder	07924-ME40002	or 07924-ME40010 and 07924-ME40020 (U.S.A. only)
Bearing remover	07948-4630100	Not available in U.S.A. or 07JAC-PH80000 Not available in U.S.A. —07JAC-PH80100 —07JAC-PH80200 —07741-0010201 or 07736-A1000B or 07736-A1000A
Seal driver attachment	07948-SB00101	Not available in U.S.A.
Driver	07948-SC20200	or 07JMA-MN50100
Oil seal driver	07965-MB00100	or 07965-MB0010A or 07965-SD90100 and 07746-0010600
Pinion puller set	07HMC-MM80101	
– shaft puller	07931-ME40000	or 07931-ME4010B and 07931-HB3020A (U.S.A. only)
– pinion puller base	07HMC-MM80110	or 07HMC-MM8011A (U.S.A. only)
Slide hammer 3/8×16		Commercially available

TROUBLESHOOTING

Excessive noise

- Worn or scored ring gear shaft and driven flange
- Scored driven flange and wheel hub
- Worn or scored drive pinion and splines
- Worn pinion and ring gears
- Excessive backlash between pinion and ring gear
- Oil level too low

Oil leak

- Clogged breather
- Oil level too high
- Seals damaged

FINAL DRIVE REMOVAL

GEAR CASE REMOVAL

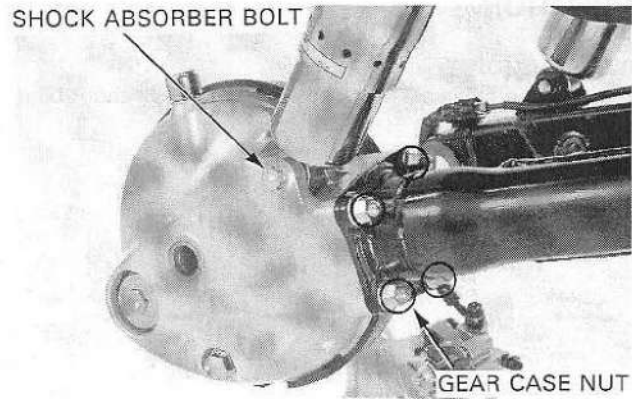
Support the motorcycle securely using a hoist or other support.

Remove the right and left mufflers (page 2-12).

Remove the rear wheel (page 14-3).

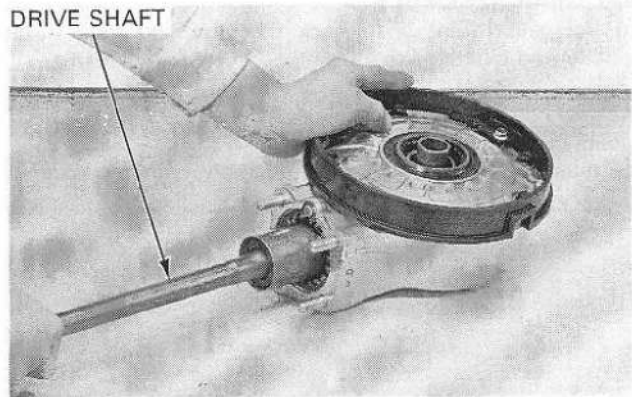
Drain the final drive oil (page 3-14).

Remove the right shock absorber lower mounting bolt.
Remove the gear case mounting nuts, then remove the final gear case from the swingarm.



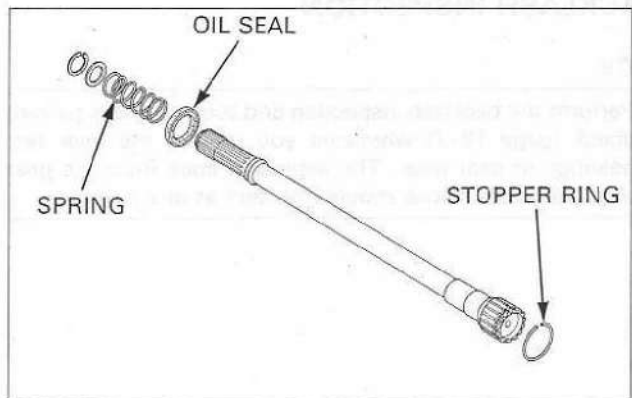
DRIVE SHAFT REMOVAL/DISASSEMBLY

Separate the drive shaft from the gear case by gently turning the drive shaft and pulling.



Remove the spring, oil seal and stopper ring from the drive shaft.

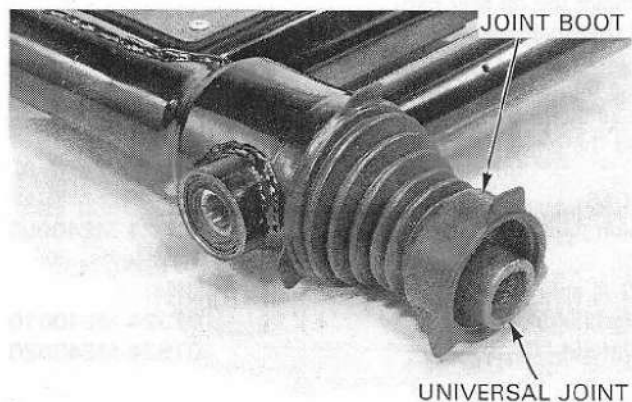
Check the splines of the drive shaft for wear or damage. If the splines are damaged, check the universal joint splines also.



UNIVERSAL JOINT REMOVAL

Remove the swingarm (page 14-10).

Remove the universal joint from the swingarm.

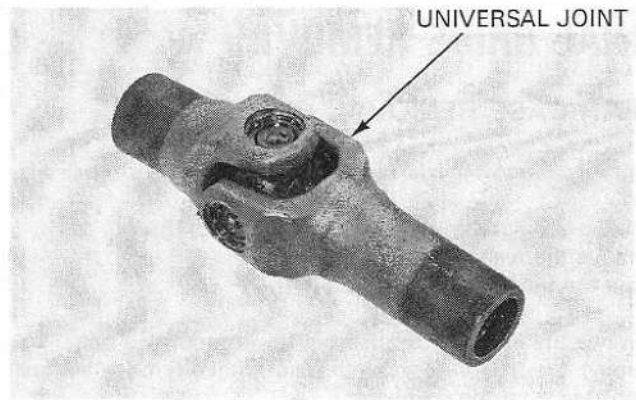


FINAL DRIVE

INSPECTION

UNIVERSAL JOINT

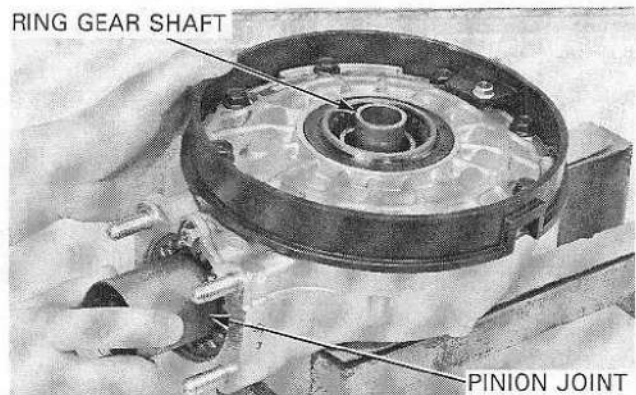
Check that the universal joint moves smoothly without binding or noise.
Check the splines for wear or damage.



FINAL GEAR ASSEMBLY

Turn the pinion joint and check that the ring gear turns smoothly and quietly without binding.

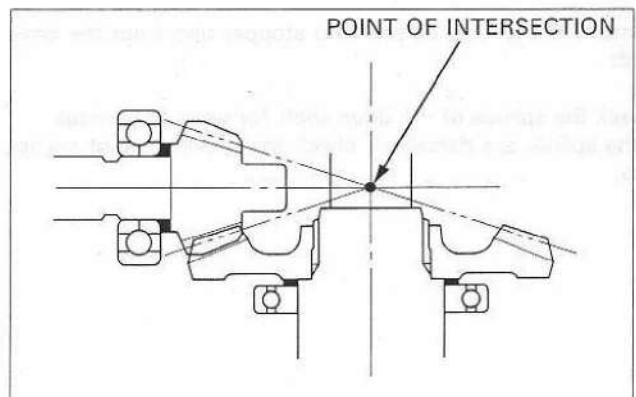
If the gears do not turn smoothly or quietly, the bearings and/or gears may be damaged or faulty.
They must be checked after disassembly; replace them if necessary.



BACKLASH INSPECTION

NOTE

- Perform the backlash inspection and tooth contact pattern check (page 12-7) whenever you replace the gear set, bearings or gear case. The extension lines from the gear engagement surfaces should intersect at one point.



Remove the oil filler cap.
Set the final gear assembly into a jig or vise with soft jaws.

Set a horizontal type dial indicator on the ring gear, through the oil filler hole.
Hold the pinion gear spline with the special tools.

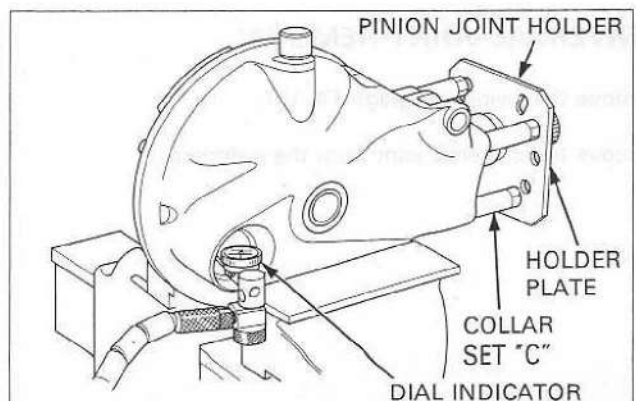
TOOLS:

Pinion joint holder 07924-ME40002

U.S.A only

Pinion holder plate 07924-ME40010

Collar set "C" 07924-ME40020



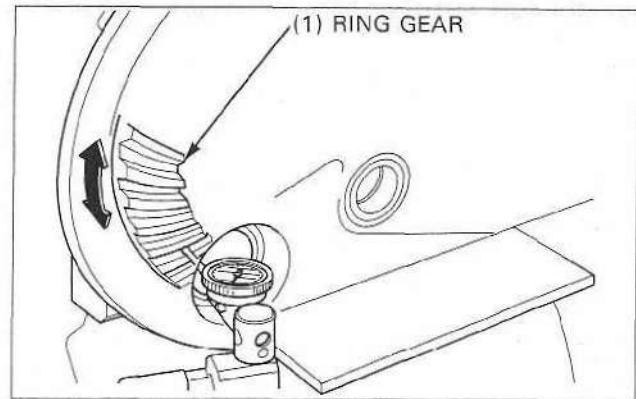
Turn the ring gear back and forth to read backlash.

STANDARD: 0.05 - 0.15 mm (0.002 - 0.006 in)
SERVICE LIMIT: 0.30 mm (0.012 in)

Remove the dial indicator.
 Turn the ring gear 120° and measure backlash.
 Repeat this procedure once more.

Compare the difference between the three measurements.

BACKLASH DIFFERENCE BETWEEN MEASUREMENT:
SERVICE LIMIT: 0.10 mm (0.004 in)

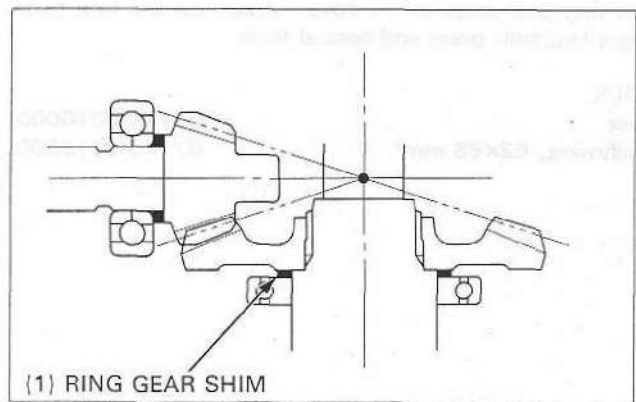


If the difference in measurements exceeds the limit, it indicates that the bearing is not installed squarely. Inspect the bearings and reinstall the bearing if necessary.

If backlash is excessive, replace the ring gear shim with a thicker one.
 If the backlash is too small, replace the ring gear shim with a thinner one.

RING GEAR SHIMS:

- A: 1.82 mm (0.072 in)
- B: 1.88 mm (0.074 in)
- C: 1.94 mm (0.076 in)
- D: 2.00 mm (0.079 in) -Standard
- E: 2.06 mm (0.081 in)
- F: 2.12 mm (0.083 in)
- G: 2.18 mm (0.086 in)
- H: 2.24 mm (0.088 in)
- I: 2.30 mm (0.091 in)

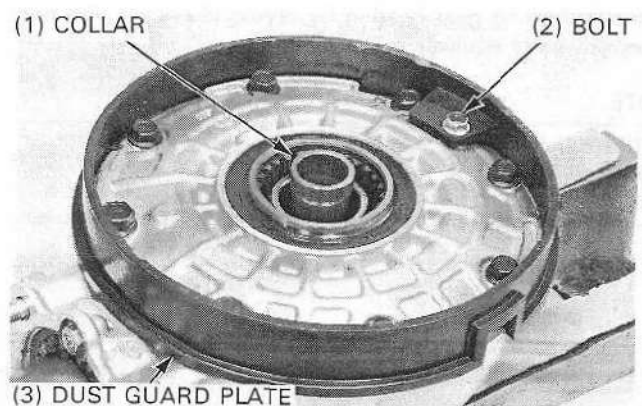


FINAL DRIVE DISASSEMBLY

RING GEAR REMOVAL

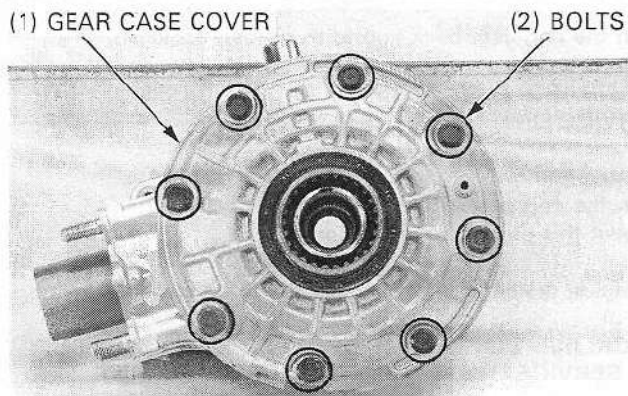
Remove the distance collar.

Remove the dust guard plate bolt and remove the dust guard plate by turning it clockwise.



FINAL DRIVE

Remove the eight case cover bolts and the gear case cover.

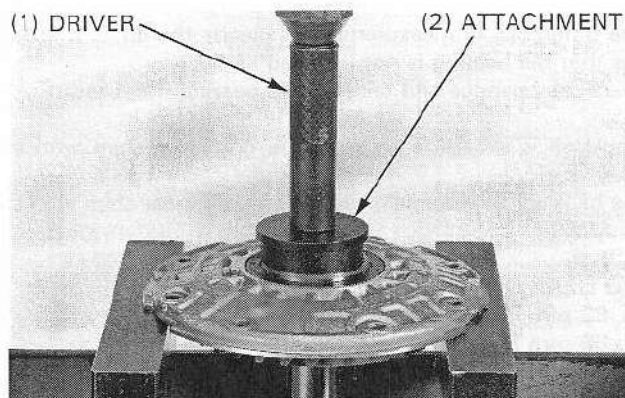
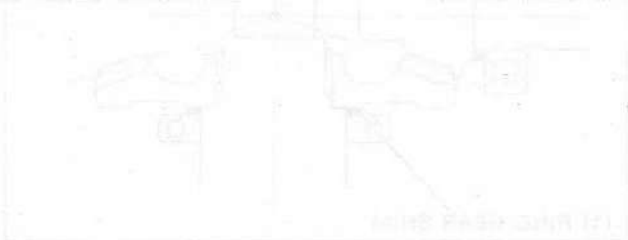


If the ring gear stays in the cover, press out the ring gear using a hydraulic press and special tools.

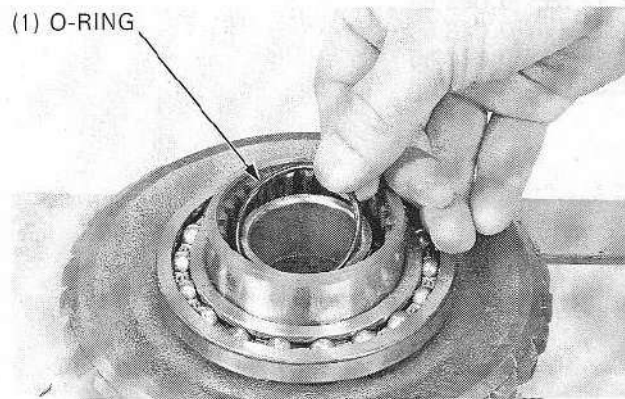
TOOLS:

Driver
Attachment, 62×68 mm

07749-0010000
07746-0010500



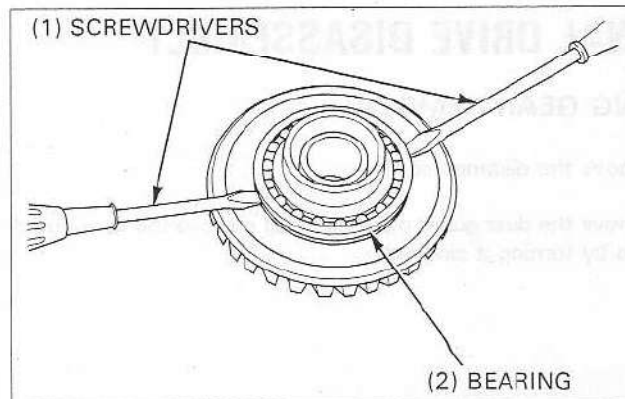
Remove the ring gear from the gear case.
Remove the O-ring.



Remove the ring gear bearing by prying it evenly with two screwdrivers or equivalent as shown.

NOTE

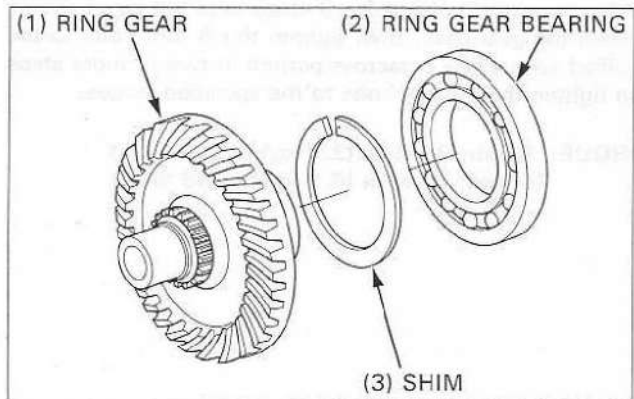
- This bearing may not need to be replaced after removal. However, inspect the bearing for excessive play after removal.



Remove the ring gear and shim.

NOTE

- If the gear set, pinion bearing, ring gear bearing and/or gear case are replaced, install a 2.00 mm (0.079 in) thick shim (standard).

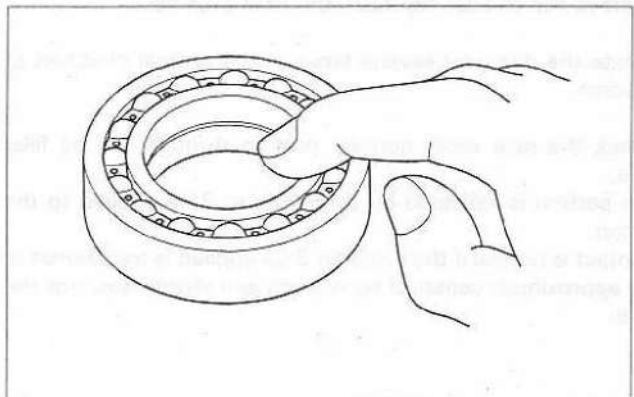


RING GEAR BEARING INSPECTION

Turn the inner race of the ring gear bearings with your finger. The bearings should turn smoothly and quietly. Also check that the outer races fit tightly in the case or cover.

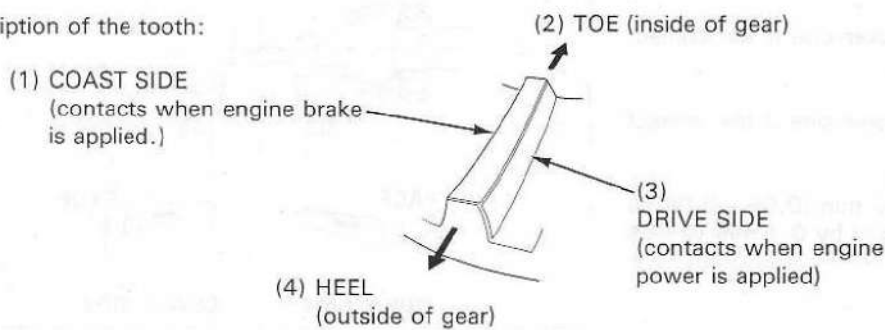
Remove and discard the bearings if the races do not turn smoothly and quietly, or if they loosely fit in the case or cover.

For ring gear bearing replacement, refer to page 12-15.
For drive pinion removal and disassembly, refer to page 12-9.

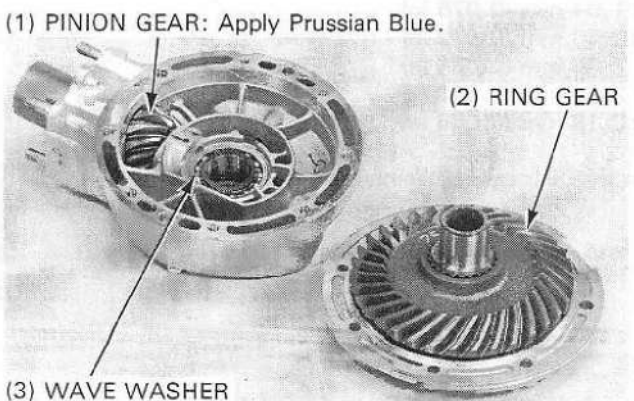


GEAR TOOTH CONTACT PATTERN CHECK

Description of the tooth:



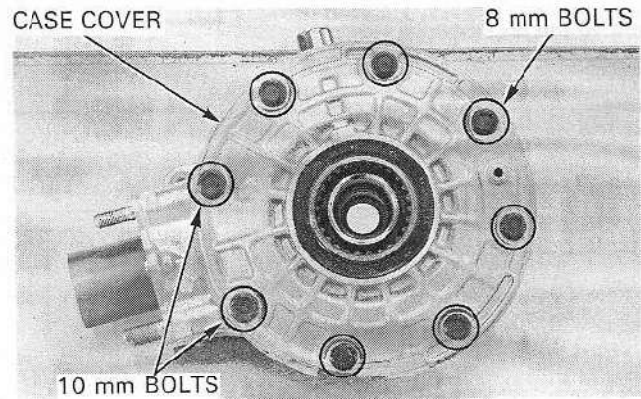
Apply a thin coat of Prussian Blue to the pinion gear teeth for a tooth contact pattern check.
Place the wave washer and ring gear into the gear case.



FINAL DRIVE

Tighten the cover bolts in 2 - 3 steps until the cover evenly touches the gear case, then tighten the 8 mm bolts to the specified torque in a crisscross pattern in two or more steps then tighten the 10 mm bolts to the specified torque.

TORQUE: 8 mm: 25 N·m (2.6 kgf·m, 19 lbf·ft)
10 mm: 62 N·m (6.3 kgf·m, 46 lbf·ft)



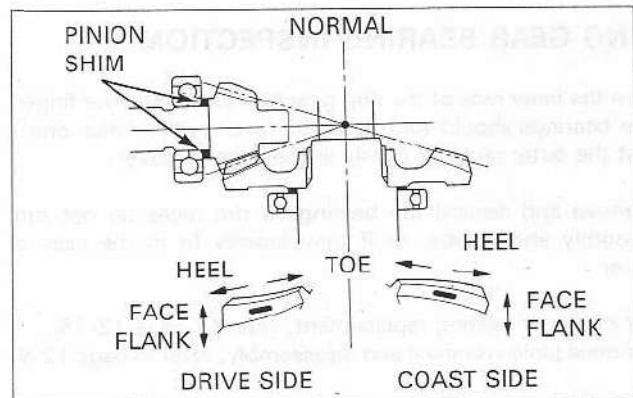
Remove the oil filler cap from the final gear case.

Rotate the ring gear several times in the normal direction of rotation.

Check the gear tooth contact pattern through the oil filler hole.

The pattern is indicated by the Prussian Blue applied to the pinion.

Contact is normal if the Prussian Blue applied is transferred to the approximate center of each tooth and slightly towards the face.



If the pattern is not correct, remove and change the pinion shim.

Replace the pinion shim with a thicker one if the contact pattern is too high.

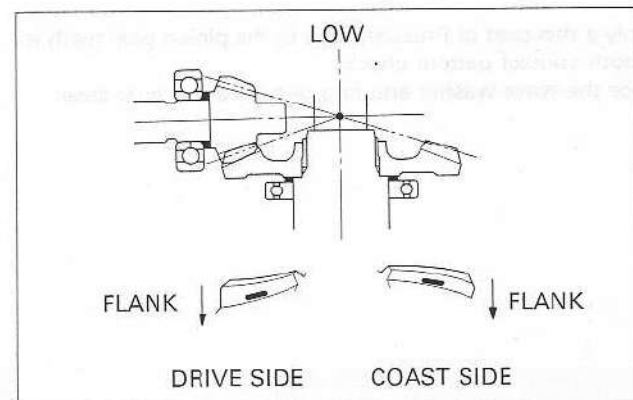
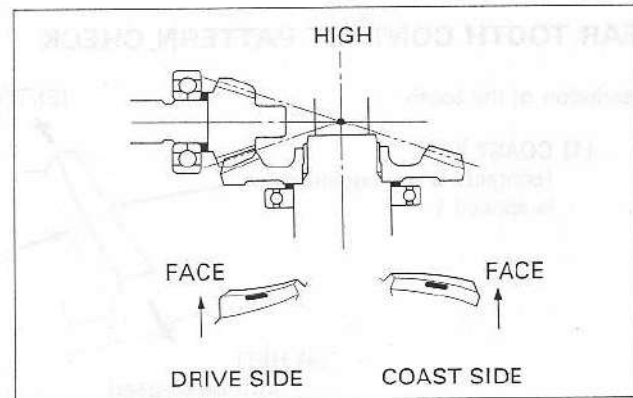
Replace the pinion shim with a thinner one if the contact pattern is too low.

The pattern will shift about 1.5 - 2.0 mm (0.06 - 0.08 in) when the thickness of shim is changed by 0.1 mm (0.004 in).

Pinion spacer:

- A: 1.82 mm (0.072 in)
- B: 1.88 mm (0.074 in)
- C: 1.94 mm (0.076 in)
- D: 2.00 mm (0.079 in) - Standard
- E: 2.06 mm (0.081 in)
- F: 2.12 mm (0.083 in)
- G: 2.18 mm (0.086 in)

For the gear case assembly, see page 12-17.



PINION GEAR REMOVAL/SHIM REPLACEMENT

CAUTION

- Be careful not to damage the gear case.

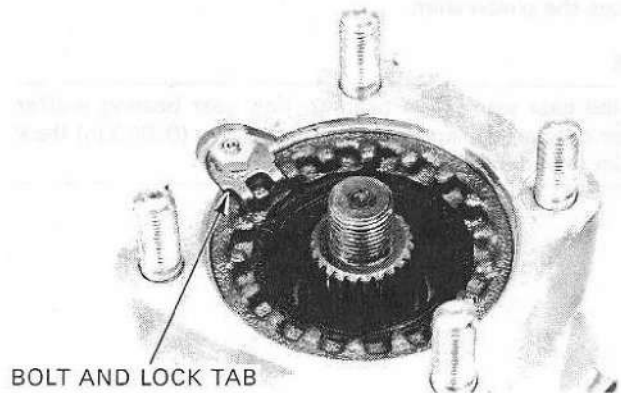
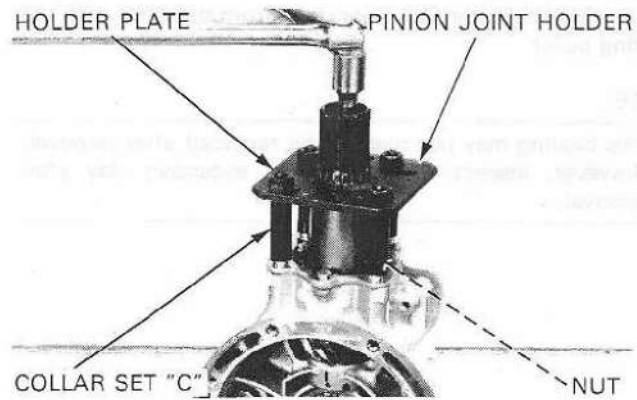
Place the final gear case in a vise with a soft jaws.

Position the special tool onto the gear case as shown. Remove the pinion gear shaft nut and pinion joint.

TOOLS:

- | | |
|---------------------|---------------|
| Pinion joint holder | 07924-ME40002 |
| U.S.A only | |
| Pinion holder plate | 07924-ME40010 |
| Collar set "C" | 07924-ME40020 |

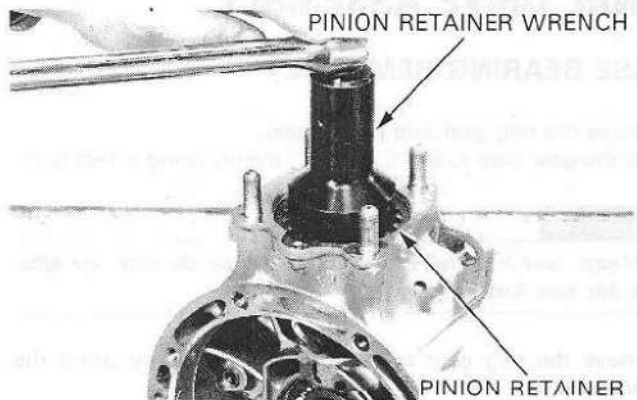
Remove the bolt and retainer lock tab.



Remove the pinion bearing retainer using the special tool.

TOOL:

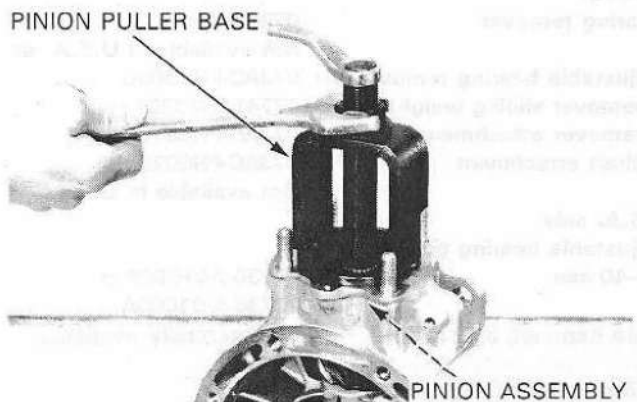
- | | |
|------------------------|--------------------------------|
| Pinion retainer wrench | 07910-MA10100 or 07910-4150000 |
|------------------------|--------------------------------|



Assemble the special tools as shown. Pull the pinion assembly off of the gear case.

TOOLS:

- | | |
|-----------------------------|--|
| Pinion puller set | 07HMC-MM80101 |
| — shaft puller | Not available in U.S.A. |
| — shaft puller, 22x1.45x240 | 07931-ME40000 or 07931-ME4010B and 07931-HB3020A (U.S.A. only) |
| — special nut | |
| — pinion puller base | 07HMC-MM80110 or 07HMC-MN8011A |
| — puller base "A" | |

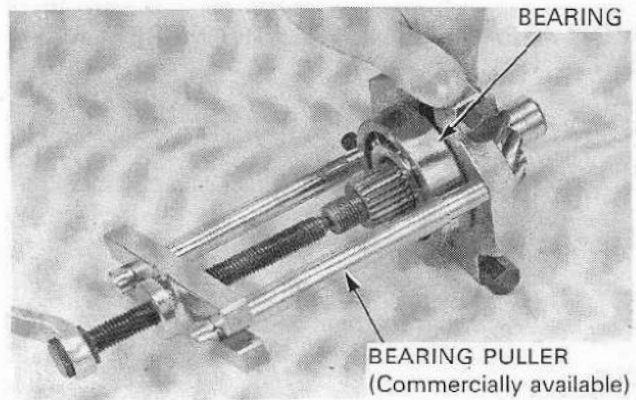


FINAL DRIVE

Pull the bearing outer and inner races from the shaft with the bearing puller.

NOTE

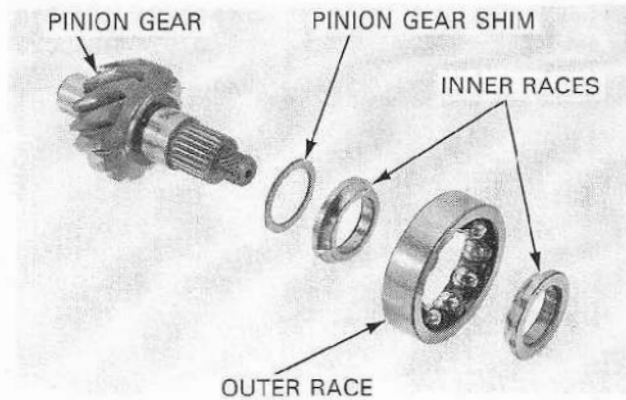
- This bearing may not need to be replaced after removal. However, inspect the bearing for excessive play after removal.



Remove the pinion shim.

NOTE

- If the gear set, pinion bearing, ring gear bearing and/or gear case are replaced, install a 2.00 mm (0.079 in) thick shim (standard) for initial reference.



FINAL DRIVE ASSEMBLY

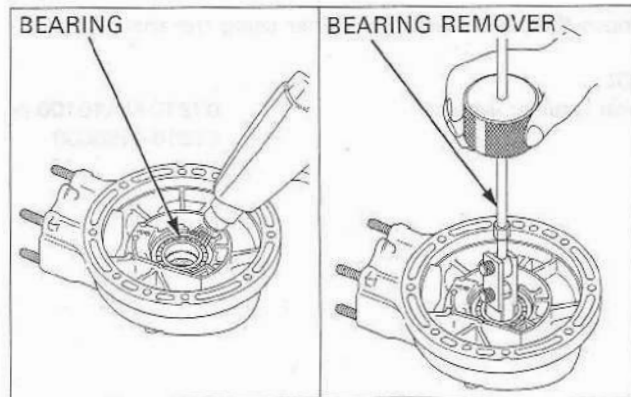
CASE BEARING REMOVAL

Remove the ring gear and pinion gear.
Heat the gear case to 80 °C (176 °F) evenly using a heat gun.

▲WARNING

- Always wear insulated gloves when handling the gear case after it has been heated.

Remove the ring gear case bearing if necessary using the special tools.



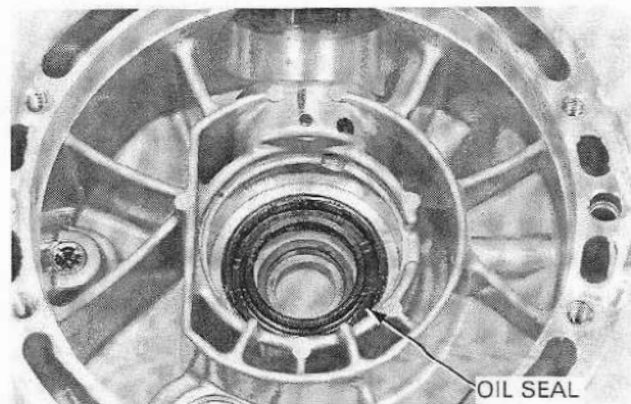
TOOLS:

Bearing remover	07948-4630100 Not available in U.S.A. or
Adjustable bearing remover set	07JAC-PH80000
- remover sliding weight	07741-0010201
- remover attachment	07JAC-PH80100
- shaft attachment	07JAC-PH80200 Not available in U.S.A.

U.S.A. only

Adjustable bearing puller, 25-40 mm	07736-A01000B or 07736-A-01000A Commercially available
Slide hammer, 3/8x16	Commercially available

Remove the oil seal and discard it.

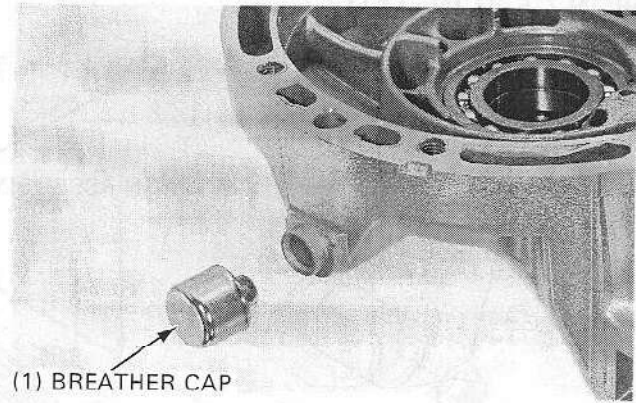


BREATHER HOLE CLEANING

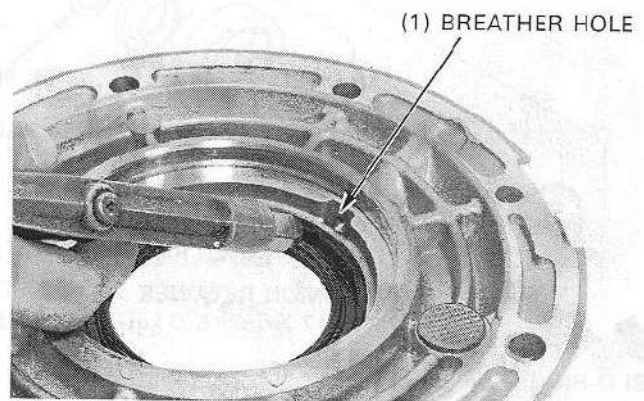
CAUTION

- Be careful not to deform or damage the breather cap.

Remove the breather cap.



Blow compressed air through the breather hole.

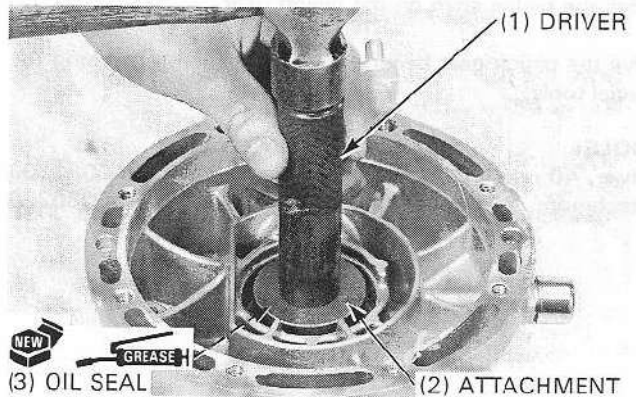


CASE BEARING INSTALLATION

Drive a new oil seal into the gear case.

TOOLS:

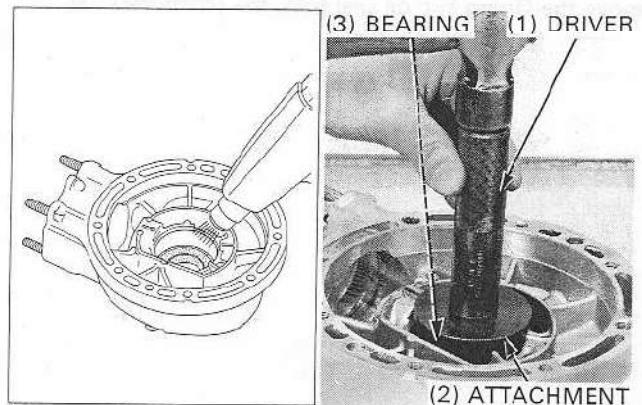
- Driver 07749-0010000
- Attachment, 52X55 mm 07746-0010400



Heat the gear case to 80°C (176°F) evenly using a heat gun. Install a new ring gear case bearing into the gear case if necessary using the special tools as shown.

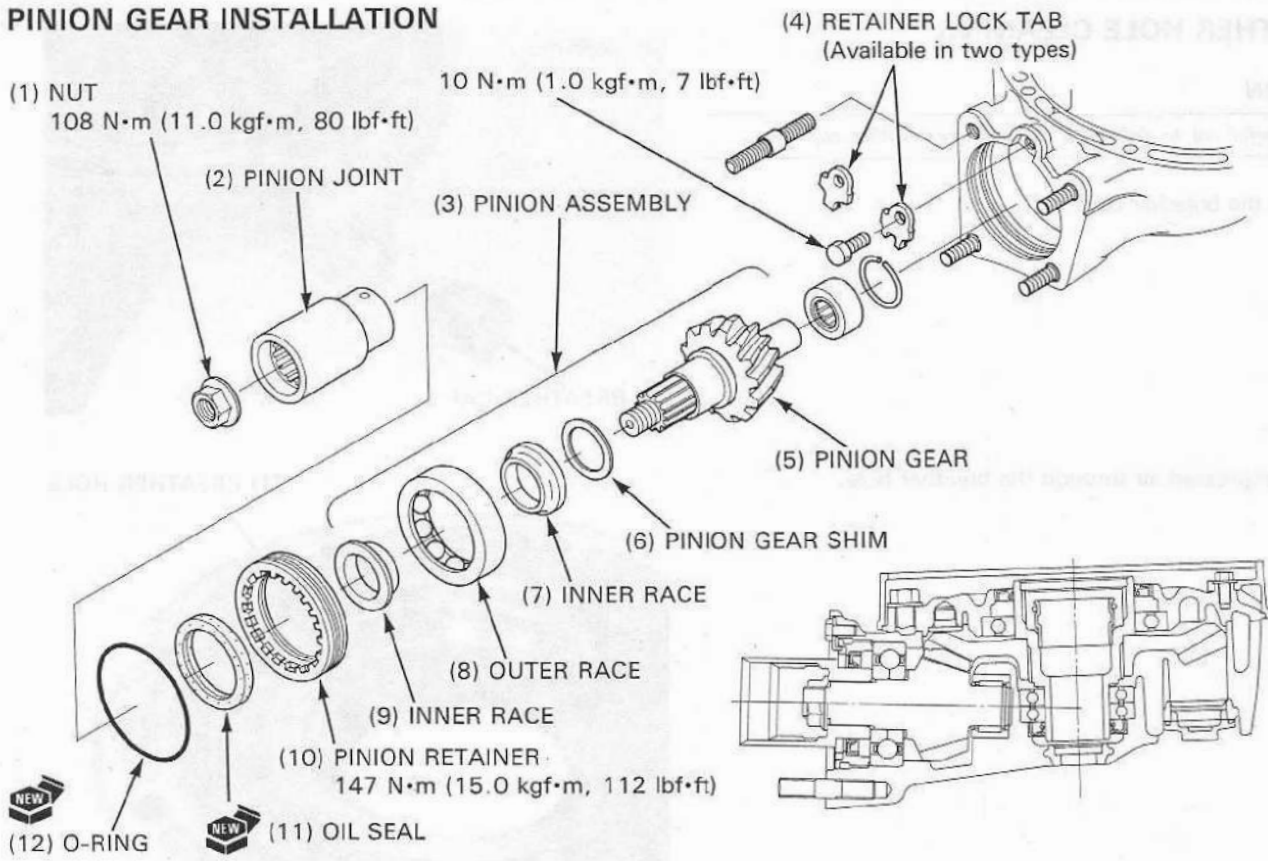
TOOLS:

- Driver 07749-0010000
- Attachment, 62X68 mm 07746-0010500
- Pilot, 35 mm 07746-0040800



FINAL DRIVE

PINION GEAR INSTALLATION



Install the pinion shim on the pinion gear.

Drive the pinion gear bearing onto the pinion gear using the special tools.

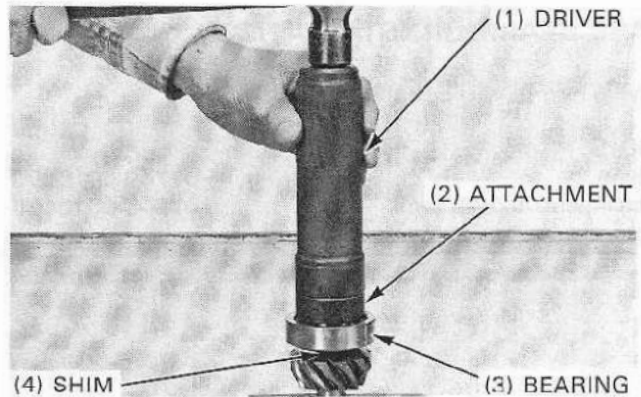
TOOLS:

Driver, 40 mm I.D.

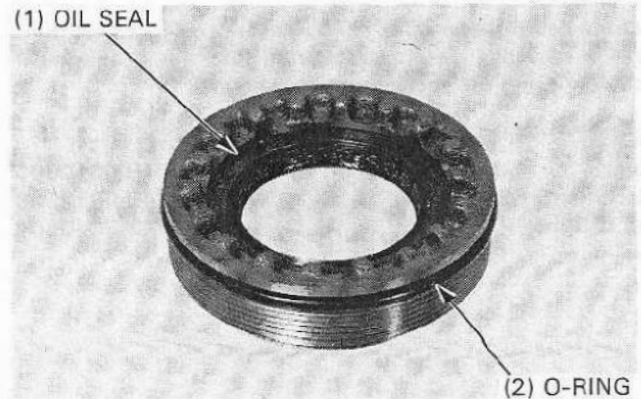
07746-0030100

Attachment, 25 mm I.D.

07746-0030200



Remove the O-ring and oil seal from the pinion retainer.

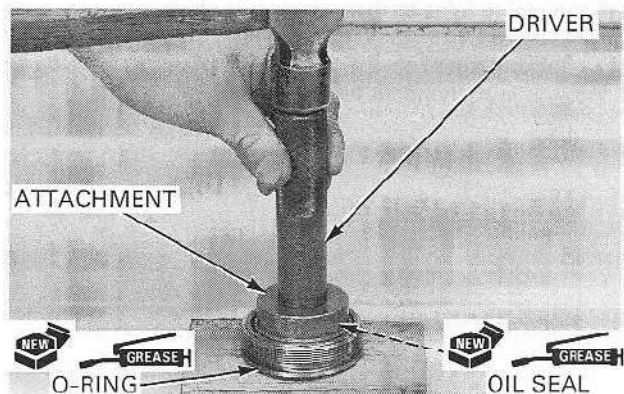


Drive a new oil seal into the retainer using the special tools.

TOOLS:

Driver 07746-0010000
Attachment, 52x55 mm 07746-0010400

Pack grease into the seal lip cavity.
 Coat a new O-ring with grease and install it on the retainer.



Place the gear case in a vise with a soft jaws.

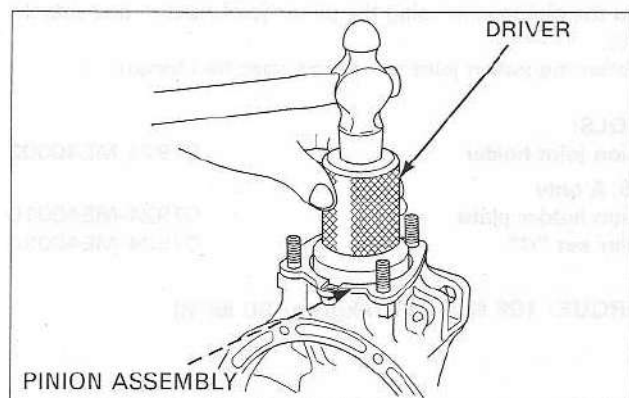
CAUTION

- Be careful not to damage the gear case.

Drive the pinion assembly into the gear case until enough threads are visible to accept the pinion retainer.

TOOLS:

Driver 07948-SC20200 or
Lock nut socket, 46 mm 07JMA-MN50100

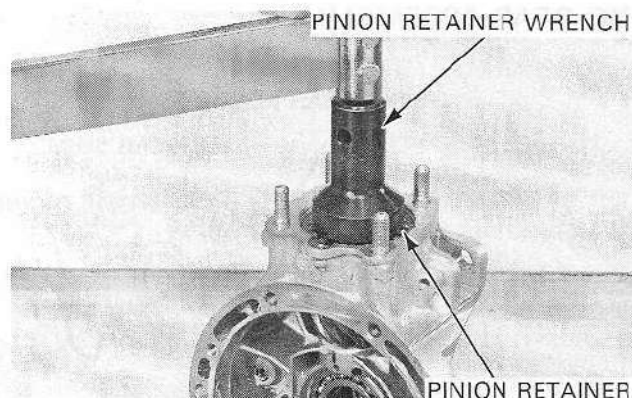


Press the pinion bearing in place, then tighten the retainer to the specified torque.

TOOL:

Pinion retainer wrench 07910-MA10100 or
 07910-4150000

TORQUE: 147 N·m (15.0 kgf·m, 112 lbf·ft)



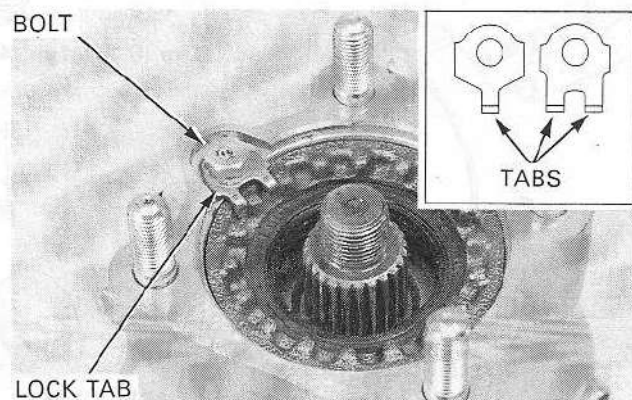
Install the retainer lock tab, depending on the position of the pinion retainer grooves in relation to the lock tabs.

NOTE

- The lock tab plate is available in the two types shown.

Install and tighten the lock tab bolt.

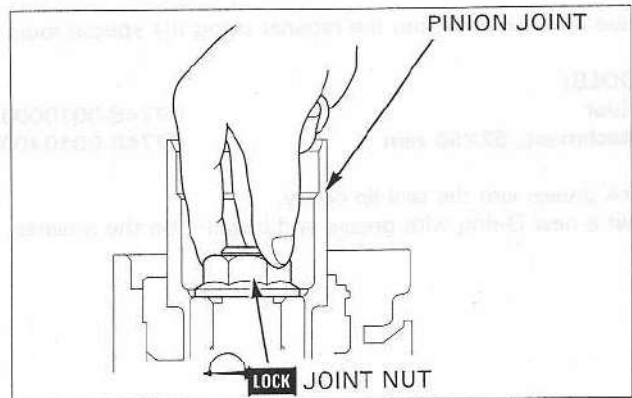
TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



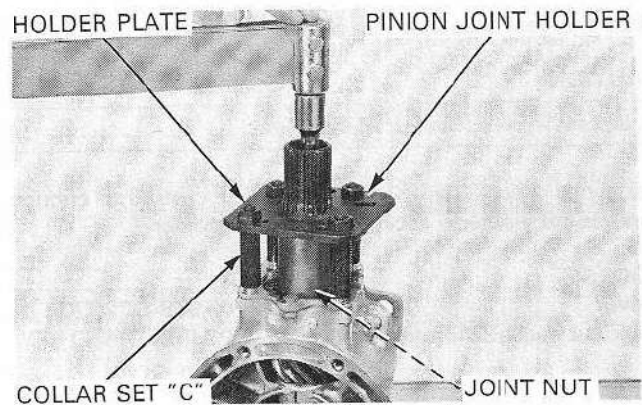
FINAL DRIVE

Install the pinion joint to the pinion gear shaft.

Apply a locking agent to the threads of the pinion joint nut and screw it in by hand as far as it goes.



Hold the pinion joint using the pinion joint holder, and attachment. Tighten the pinion joint nut to the specified torque.

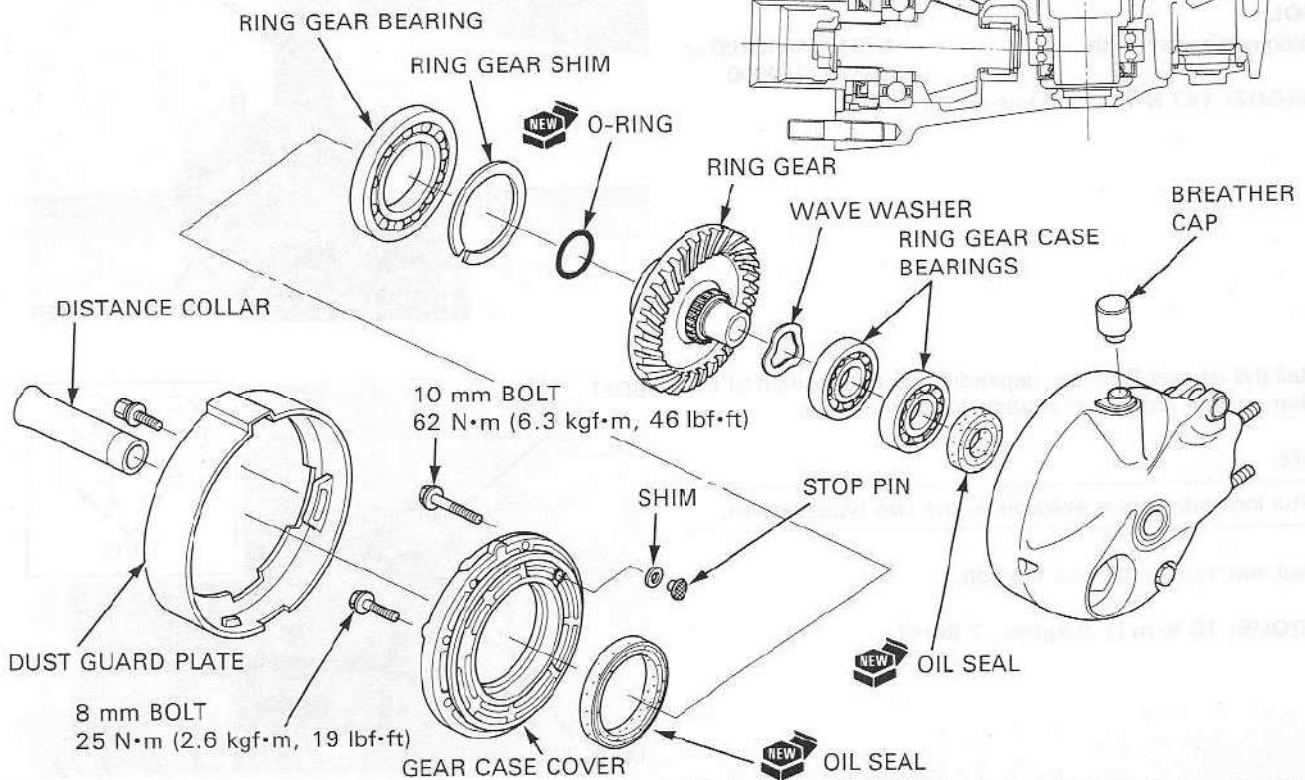
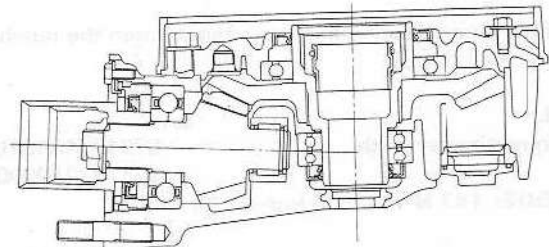


TOOLS:

Pinion joint holder	07924-ME40002
U.S.A only	
Pinion holder plate	07924-ME40010
Collar set "C"	07924-ME40020

TORQUE: 108 N·m (11.0 kgf·m, 80 lbf·ft)

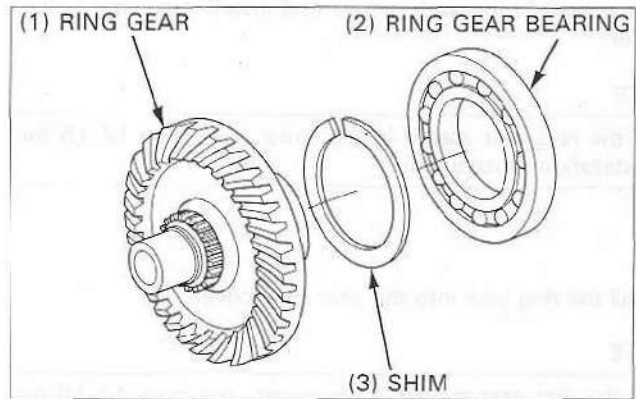
RING GEAR ASSEMBLY



NOTE

- If the ring gear assembly was loose against the cover (if it didn't stay in the cover), do the following:

Place the ring gear shim onto the ring gear.

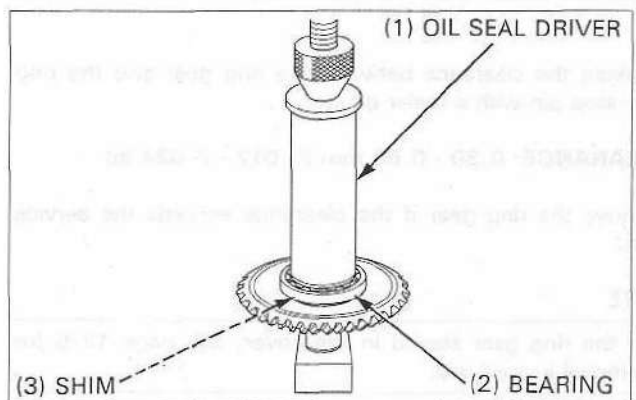


Press the bearing onto the shaft using the special tool and suitable plate as shown.

TOOL:

Oil seal driver

07965-MB00100 or
07965-MB0010A or
07965-SD90100 and
07746-0010600



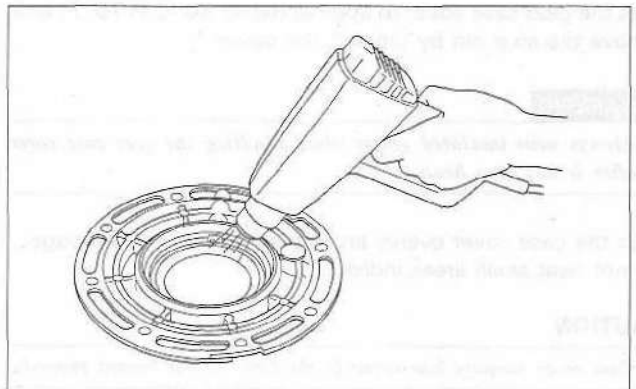
NOTE

- If the ring gear remained in the cover, do the following:

Remove the case cover oil seal.
Heat the case cover to 80 °C (176°F) using a heat gun.

▲ WARNING

- Always wear insulated gloves when handling the gear case after it has been heated.



Install the ring gear bearing into the cover. If necessary, use the special tools as shown.

TOOLS:

Driver
Seal driver attachment

07749-0010000
07948-SB00101

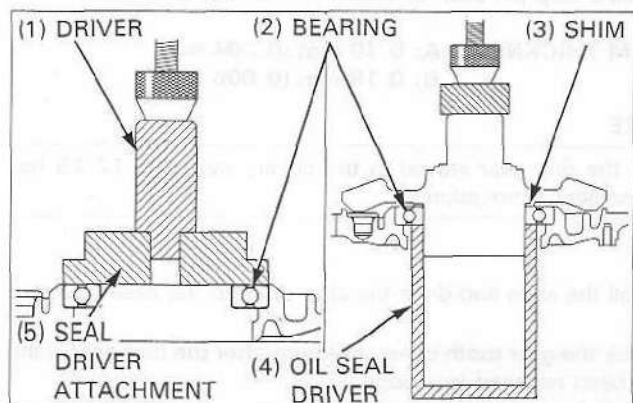
Install the shim onto the ring gear (See above).

Support the bearing inner race with the special tool, and press the ring gear into the bearing.

TOOL:

Oil seal driver

07965-MB00100 or
07965-SD90100 and
07746-0010600



FINAL DRIVE

Coat a new O-ring with grease and install it on the O-ring holder.

NOTE

- If the ring gear stayed in the cover, see page 12-15 for installation procedures.

Install the ring gear into the gear case cover.

NOTE

- If the ring gear stayed in the cover, see page 12-15 for installation procedures.

Measure the clearance between the ring gear and the ring gear stop pin with a feeler gauge.

CLEARANCE: 0.30 - 0.60 mm (0.012 - 0.024 in)

Remove the ring gear if the clearance exceeds the service limit.

NOTE

- If the ring gear stayed in the cover, see page 12-6 for removal procedures.

Heat the gear case cover to approximately 80 °C (176 °F) and remove the stop pin by tapping the cover.

▲WARNING

- *Always wear insulated gloves when handling the gear case cover after it has been heated.*

Heat the case cover evenly and slowly to prevent warpage. Do not heat small areas individually.

CAUTION

- *Case cover warpage can occur if the cover is not heated properly.*

Install a stop pin shim to obtain the correct clearance.

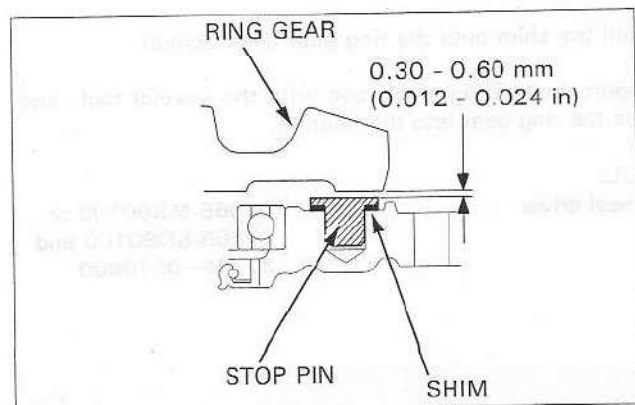
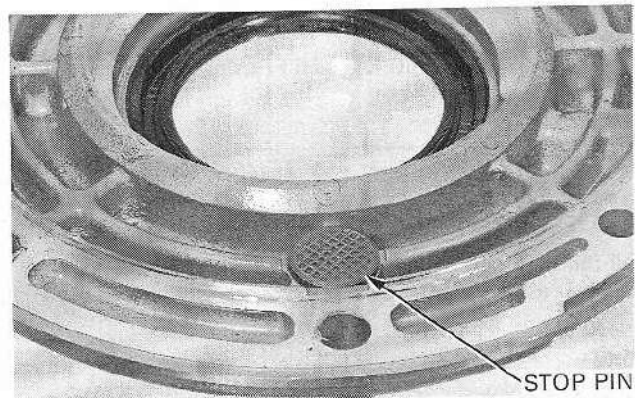
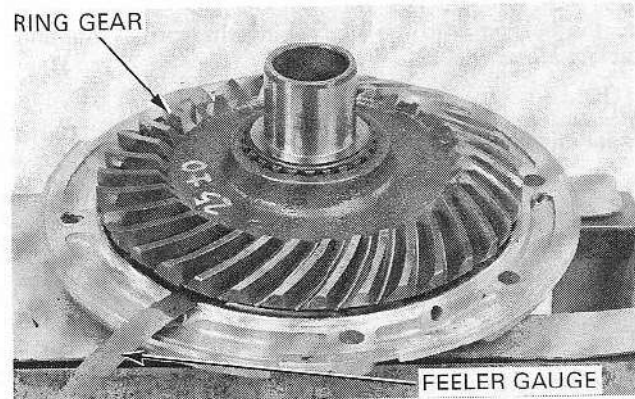
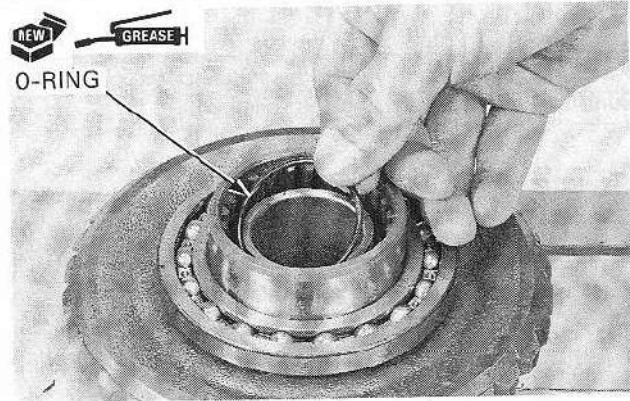
SHIM THICKNESS: A: 0.10 mm (0.004 in)
B: 0.15 mm (0.006 in)

NOTE

- If the ring gear stayed in the cover, see page 12-15 for installation procedures.

Install the shim and drive the stop pin into the case cover.

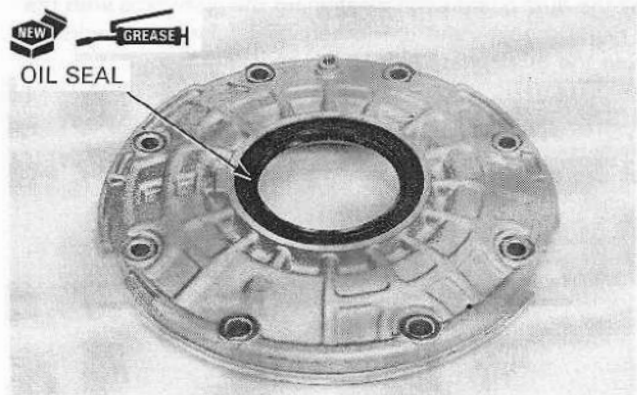
Check the gear tooth contact pattern after the ring gear shim has been replaced (see page 12-7).



Apply grease to the new oil seal lips, then install it into the cover groove.
The seal should align with cover surface.

TOOLS:

- | | |
|---------------------------|------------------|
| Driver | 07749-0010000 |
| Attachment, 72x78 mm | 07746-0010600 or |
| Bearing driver attachment | 07GAD-SD40101 |



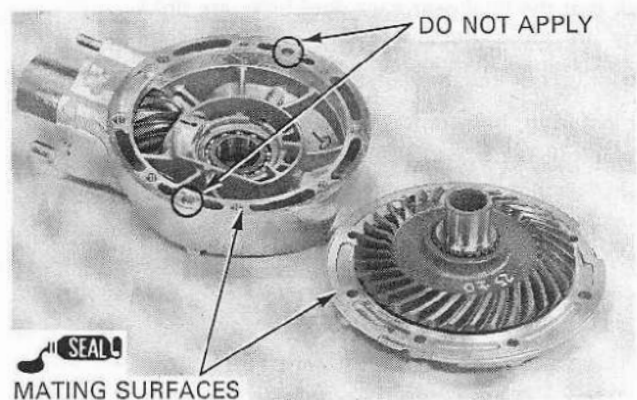
GEAR CASE ASSEMBLY

Clean all sealing material off the mating surfaces of the gear case cover.

NOTE

- Keep dust and dirt out of the gear case.
- Be careful not to damage the mating surfaces.

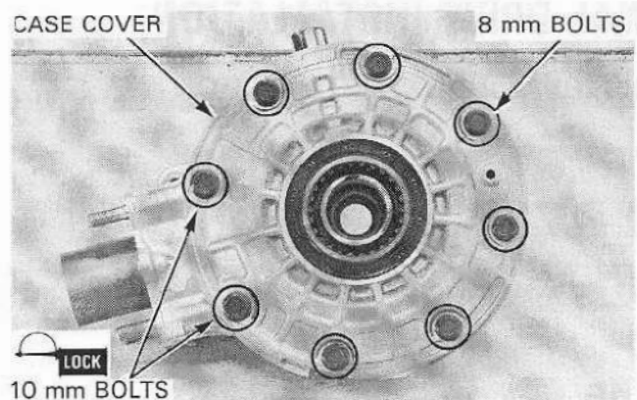
Apply liquid sealant to the mating surface of the gear case and cover. Do not apply sealant around the dowel holes.



Install the gear case cover.

Tighten the cover bolts in 2 - 3 steps until the cover evenly touches the gear case, then tighten the 8 mm bolts to the specified torque in a crisscross pattern in two or more steps. Next, apply a locking agent to the 10 mm bolt threads and tighten them to the specified torque.

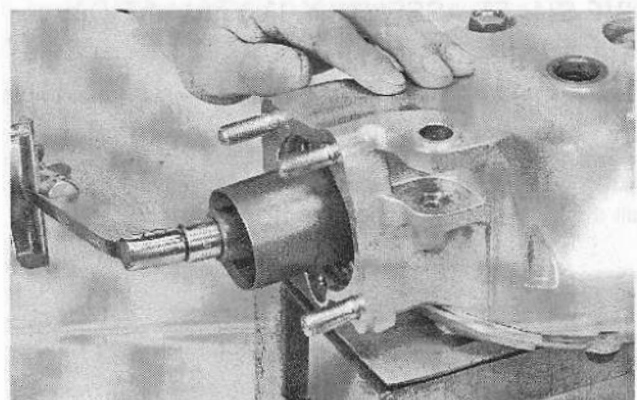
- TORQUE:** 8 mm: 25 N·m (2.6 kgf·m, 19 lbf·ft)
10 mm: 62 N·m (6.3 kgf·m, 46 lbf·ft)



Make sure that the gear assembly rotates smoothly without binding.
Measure the final gear assembly pre-load.

PRE-LOAD: 0.2 - 0.4 N·m (2 - 4 kgf·cm, 1.7 - 3.5 lbf·in)

If the pre-load reading does not fall within the limit, disassemble the final gear and check the bearings for proper installation.



FINAL DRIVE

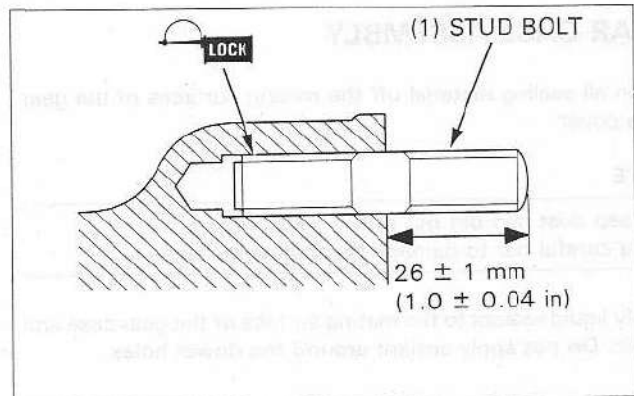
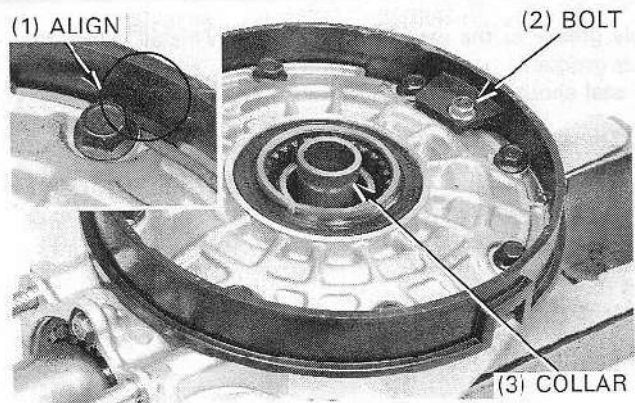
Install the dust guard plate by aligning the plate tabs with the case cover grooves and turn it counterclockwise to lock. Tighten the guard plate bolt to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the distance collar with the polished side facing the gear case.

Check that the final gear case stud bolts are tight. If any are loose, remove them, clean their threads with contact cleaner, then install them using locking agent.

After installing, be sure to measure the distance from top of each stud to the final gear case surface as shown.



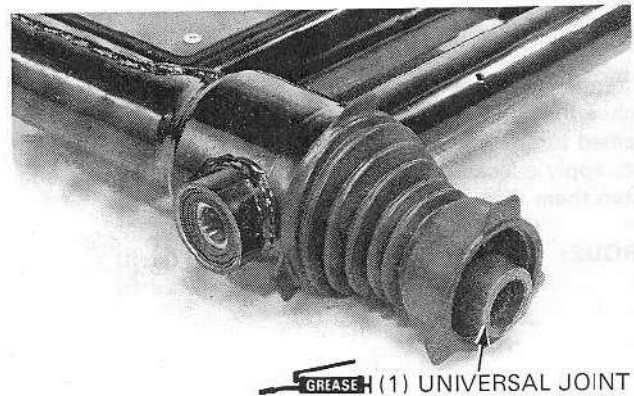
FINAL DRIVE INSTALLATION

UNIVERSAL JOINT INSTALLATION

Apply grease to the universal joint splines.

Install the universal joint into the swingarm with the long spline side forward.

Install the swingarm (page 14-13).

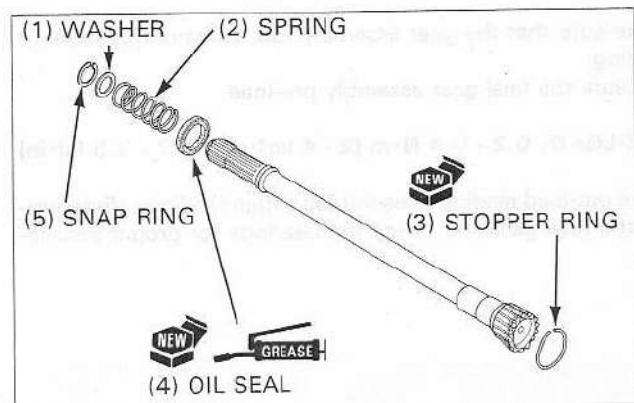


DRIVE SHAFT ASSEMBLY/INSTALLATION

Install the new stopper ring.

Install the new oil seal and pack 0.5 g (0.02 oz) of grease onto the splines.

Install the spring, washer and snap ring.

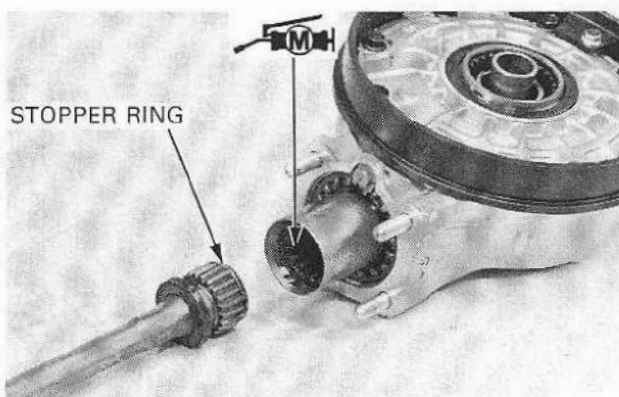


Pack 2 g (0.08 oz) of molybdenum disulfide grease into the pinion joint spline.

Install the drive shaft into the pinion joint until the stopper ring seats in the pinion spline groove.

NOTE

- Make sure that the stopper ring is seated properly by pulling on the drive shaft lightly.
- Be careful not to damage the drive shaft oil seal.



Pack 1 g (0.04 oz) of molybdenum disulfide grease into the drive shaft spline.

Insert the final drive assembly into the swingarm and align the splines with the universal joint by holding the swingarm.

Temporarily install the gear case mounting nuts and shock absorber lower mounting bolt.

Tighten the gear case mounting nut to the specified torque.

TORQUE: 64 N·m (6.5 kgf·m, 47 lbf·ft)

Install the rear wheel (page 14-8).

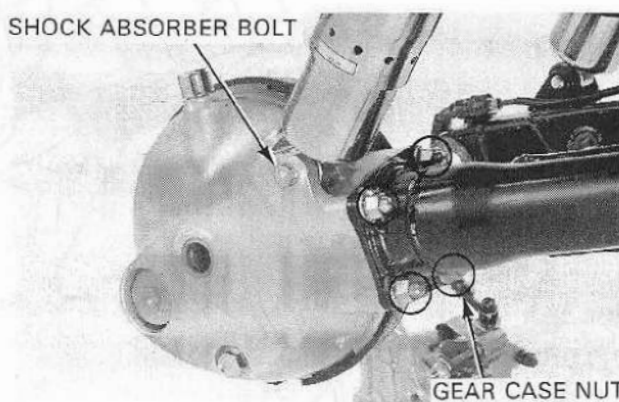
Tighten the right shock absorber lower mounting bolt to the specified torque.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)

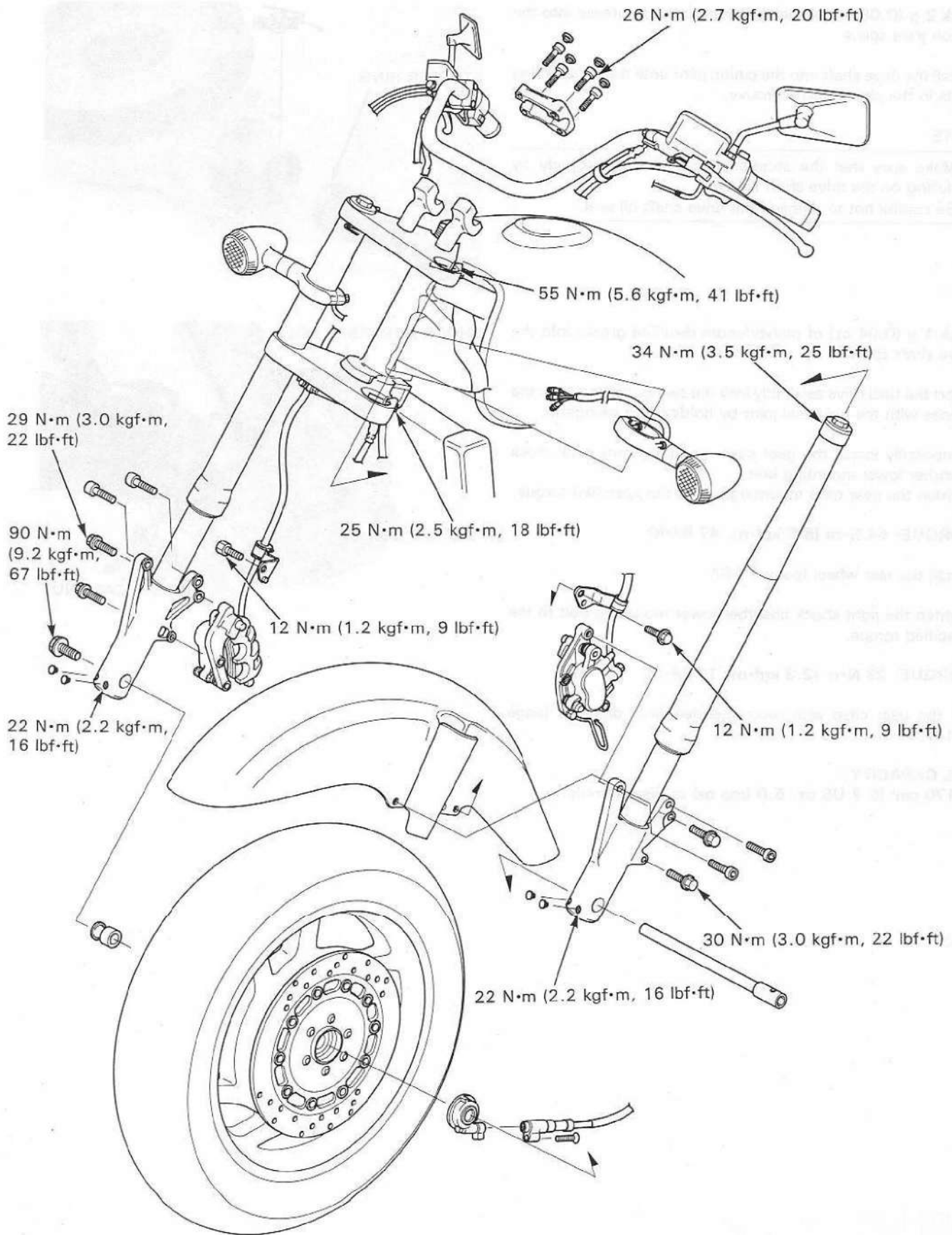
Fill the gear case with recommended final drive oil (page 3-14).

OIL CAPACITY:

170 cm³ (5.7 US oz, 6.0 Imp oz) at disassembly



FRONT WHEEL/SUSPENSION/STEERING



13. FRONT WHEEL/SUSPENSION/STEERING

SERVICE INFORMATION	13-1	FRONT WHEEL	13-8
TROUBLESHOOTING	13-2	FORK	13-16
HANDLEBAR	13-3	STEERING STEM	13-35

SERVICE INFORMATION

GENERAL

▲WARNING

- Riding on damaged rims impairs safe operation of the vehicle.
 - A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
-
- When servicing the front wheel, fork or steering stem, support the vehicle using a safety stand or hoist.
 - Refer to section 15 for brake system information.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Minimum tire tread depth		—	1.5 (0.06)	
Cold tire pressure	Up to 90 kg (200 lb) load	225 kPa (2.25 kgf/cm ² , 33 psi)	—	
	Up to maximum weight capacity	225 kPa (2.25 kgf/cm ² , 33 psi)	—	
Axle runout		—	0.20 (0.008)	
Wheel rim runout	Radial	—	2.0 (0.08)	
	Axial	—	2.0 (0.08)	
Wheel balance weight		—	60 g (2.1 oz)	
Fork	Spring free length		344.2 (13.55)	
	Spring direction		With the tapered end facing up	
	Tube runout		—	
	Recommended fork fluid		Pro-Honda Suspension Fluid SS-8	
	Fluid level	GL1500C/ GL1500CT	Right	135 (5.3)
			Left	142 (5.6)
		GL1500CF	Right	136 (5.4)
			Left	148 (5.8)
	Fluid capacity	GL1500C/ GL1500CT	Right	670 ± 2.5 cm ³ (22.7 ± 0.08 US oz, 23.6 ± 0.09 Imp oz)
			Left	744 ± 2.5 cm ³ (25.2 ± 0.08 US oz, 26.2 ± 0.09 Imp oz)
GL1500CF		Right	669 ± 2.5 cm ³ (22.6 ± 0.08 US oz, 23.5 ± 0.09 Imp oz)	
		Left	734 ± 2.5 cm ³ (24.8 ± 0.08 US oz, 25.8 ± 0.09 Imp oz)	
Steering head bearing pre-load	GL1500C/GL1500CT	0.8—1.2 kgf (1.8—2.6 lbf)	—	
	GL1500CF	0.5—1.0 kgf (1.1—2.2 lbf)	—	

FRONT WHEEL/SUSPENSION/STEERING

TORQUE VALUES

Handlebar upper holder bolt	26 N·m (2.7 kgf·m, 20 lbf·ft)	
Handlebar lower holder nut	64 N·m (6.5 kgf·m, 47 lbf·ft)	U-nut
Front brake master cylinder bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Clutch master cylinder bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Front axle bolt	90 N·m (9.2 kgf·m, 67 lbf·ft)	
Front axle holder pinch bolt	22 N·m (2.2 kgf·m, 16 lbf·ft)	
Front brake disc mounting bolt	20 N·m (2.0 kgf·m, 14 lbf·ft)	ALOC bolt
Front brake caliper mounting bolt	30 N·m (3.1 kgf·m, 22 lbf·ft)	ALOC bolt
Front brake hose joint bolt	17 N·m (1.7 kgf·m, 12 lbf·ft)	
Steering stem nut	GL1500C/CT: 103 N·m (10.5 kgf·m, 76 lbf·ft) GL1500CF: 100 N·m (10.2 kgf·m, 74 lbf·ft)	
Steering stem bearing adjustment nut	GL1500C/CT: 17 N·m (1.7 kgf·m, 12 lbf·ft) GL1500CF: 13 N·m (1.3 kgf·m, 9 lbf·ft)	} See page 13-40
Steering stem bearing adjustment nut lock nut	See page 13-41	
Fork top bridge pinch socket bolt	50 N·m (5.1 kgf·m, 37 lbf·ft)	
Fork bottom bridge pinch socket bolt	25 N·m (2.5 kgf·m, 18 lbf·ft)	
Fork cap	34 N·m (3.5 kgf·m, 25 lbf·ft)	
Fork cap lock nut	20 N·m (2.0 kgf·m, 14 lbf·ft)	
Left fork inner bolt	98 N·m (10.0 kgf·m, 72 lbf·ft)	
Fork socket bolt	20 N·m (2.0 kgf·m, 14 lbf·ft)	Apply a locking agent to the threads.

TOOLS

Attachment, 37×40 mm	07746-0010200	
Attachment, 42×47 mm	07746-0010300	
Attachment, 52×55 mm	07746-0010400	
Pilot, 20 mm	07746-0040500	
Bearing remover shaft	07746-0050100	
Bearing remover head, 20 mm	07746-0050600	
Driver	07749-0010000	
Driver	07749-3710001	
Steering stem socket	07916-3710101	or 07916-3710100
Ball race remover attachment	07935-MJ10000	or 07935-MJ1000B (U.S.A. only) or 07935-MJ1000A (U.S.A. only)
Ball race remover set	07946-3710500	
Steering stem driver	07946-MB00000	
Fork seal driver, 45 mm	07KMD-KZ30100	or 07KMD-KZ3010A (U.S.A. only)
Lock nut wrench, 44 mm	07VMA-MZ00100	

TROUBLESHOOTING

Hard steering

- Steering head bearing adjustment nut too tight
- Worn or damaged steering head bearings
- Worn or damaged steering head bearing races
- Bent steering stem
- Insufficient tire pressure
- Faulty front tire

Steers to one side or does not track straight

- Faulty steering head bearings
- Bent fork
- Bent axle
- Wheel installed incorrectly
- Bent frame
- Faulty front tire
- Worn or damaged wheel bearing
- Worn or damaged swingarm pivot components

Front wheel wobbling

- Bent rim
- Worn or damaged front wheel bearings
- Faulty front tire
- Unbalanced tire and wheel
- Loose front axle fasteners

Wheel turns hard

- Faulty front wheel bearings
- Faulty speedometer gear
- Bent front axle
- Brake drag

Soft suspension

- Insufficient fluid in fork
- Weak fork springs
- Deteriorated fork fluid
- Incorrect fork fluid weight
- Tire pressure too low

Hard suspension

- Incorrect fluid weight
- Too much fluid in fork
- Incorrect fork fluid weight
- Clogged fork fluid passage
- Bent fork tubes
- High tire pressure

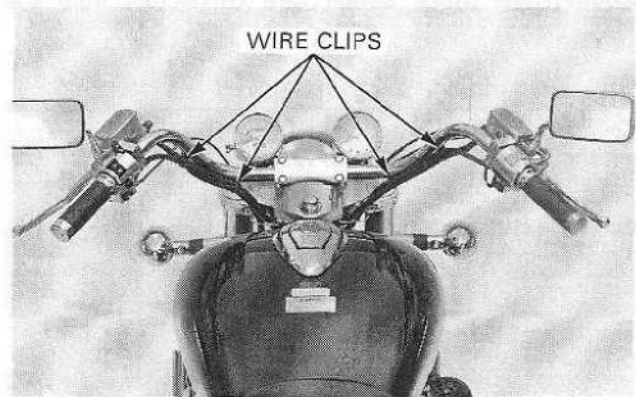
Front suspension noisy

- Incorrect slider or fork tube bushing
- Insufficient fluid in fork
- Loose fork fasteners

HANDLEBAR

REMOVAL

Remove the wire clips.

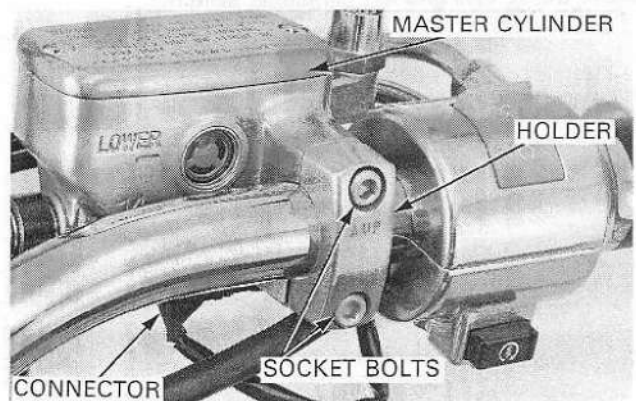


Disconnect the front brake switch wires connectors from the switch.

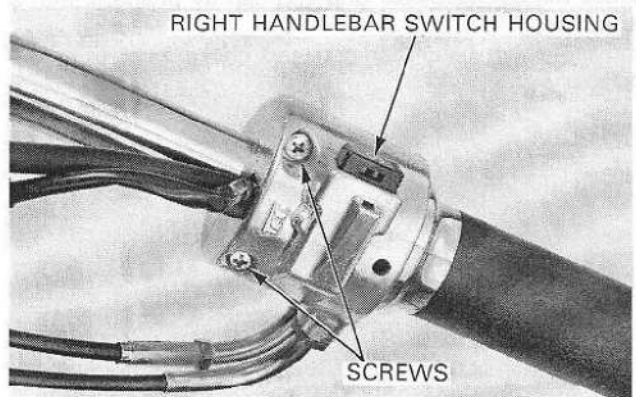
NOTE

- Keep the master cylinder upright to prevent air from entering the hydraulic system.

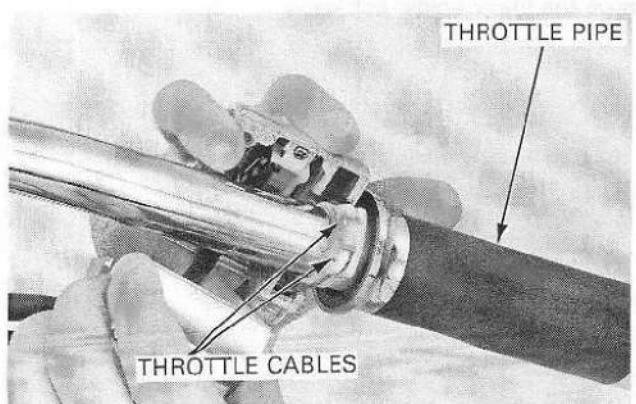
Remove the master cylinder holder socket bolts, holder and master cylinder assembly.



Remove the right handlebar switch/throttle housing screws.



Disconnect the throttle cables from the throttle pipe and remove the housing.
Remove the throttle pipe from the handlebar.



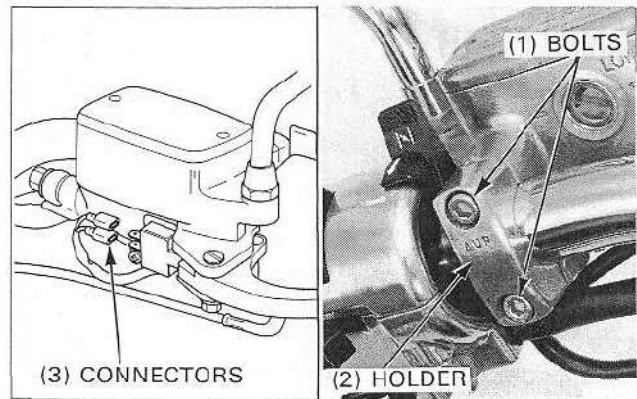
FRONT WHEEL/SUSPENSION/STEERING

Disconnect the clutch switch wire connectors from the switch.

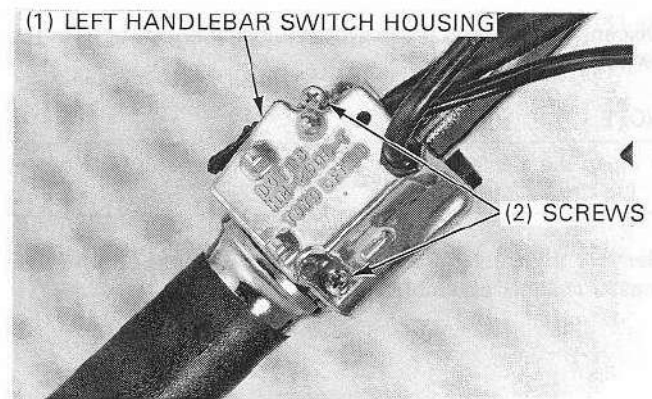
NOTE

- Keep the master cylinder upright to prevent air from entering the hydraulic system.

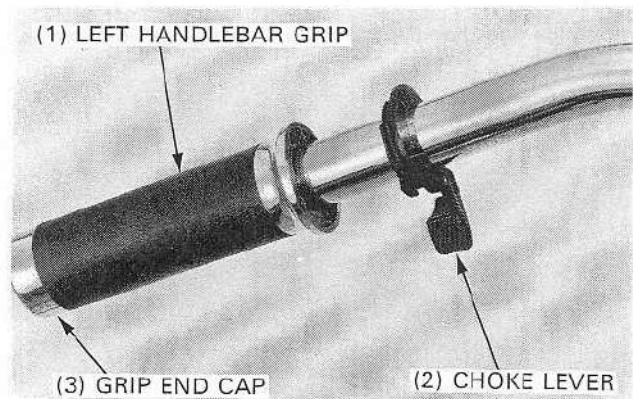
Remove the clutch master cylinder holder socket bolts, holder and master cylinder assembly.



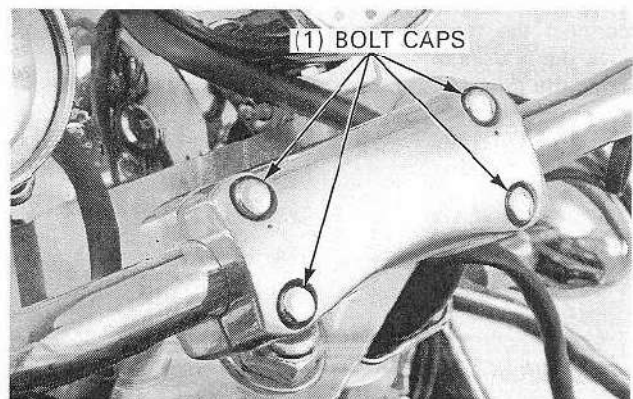
Remove the screws and left handlebar switch.



Remove the left handlebar grip end cap by prying it with a screwdriver.
Remove the left handlebar grip and choke lever from the handlebar.

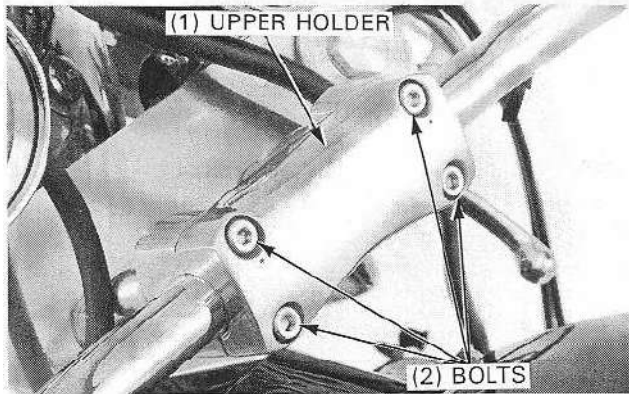


Remove the upper holder bolt caps.



FRONT WHEEL/SUSPENSION/STEERING

Remove the bolts and upper holders.
Remove the handlebar from the lower holders.

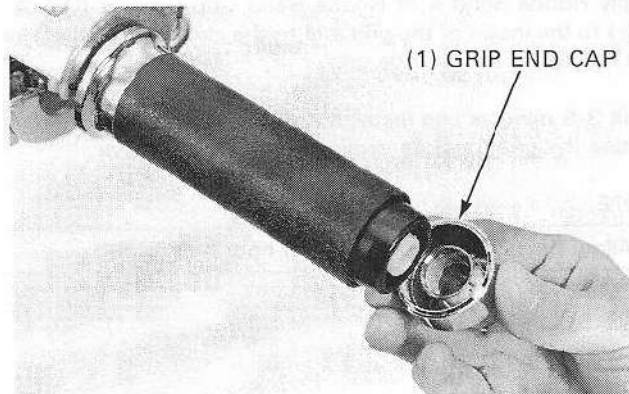


INSTALLATION

RIGHT HANDLEBAR GRIP END CAP REPLACEMENT

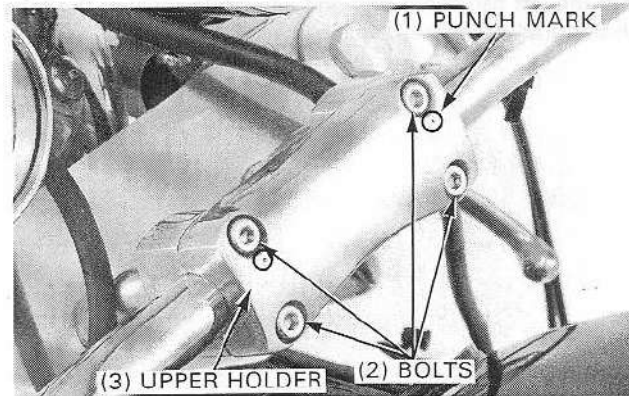
Hold the throttle grip securely and remove the grip end cap by turning it counterclockwise.

Install a new grip end cap.
Hold the throttle grip securely, tighten the cap being careful not to damage it.

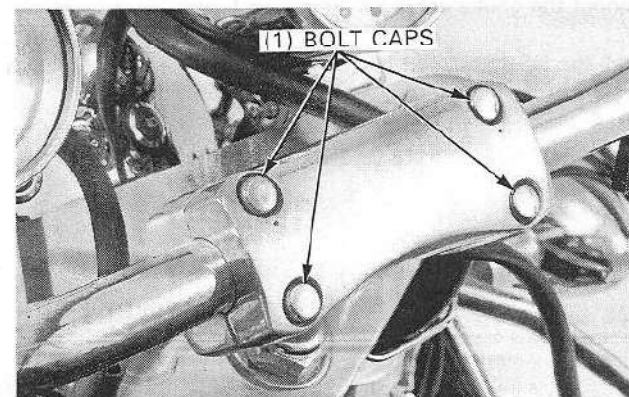


Place the handlebar onto the lower holders and align the punch marks on the handlebar with the top of the lower holder.
Install the upper holders with their punch marks facing forward.
Install the socket bolts and tighten the forward bolts first, then tighten the rear bolts.

TORQUE: 26 N·m (2.7 kgf·m, 20 lbf·ft)

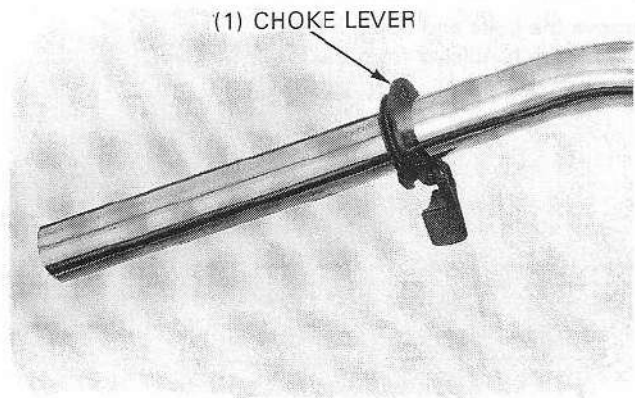


Install the bolt caps.



FRONT WHEEL/SUSPENSION/STEERING

Install the choke lever onto the handlebar.

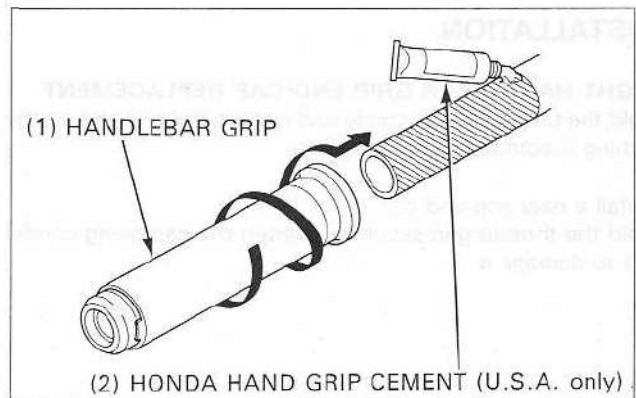


Apply Honda Bond A or Honda Hand Grip Cement (U.S.A. only) to the inside of the grip and to the clean surfaces of the left handlebar and throttle grip.

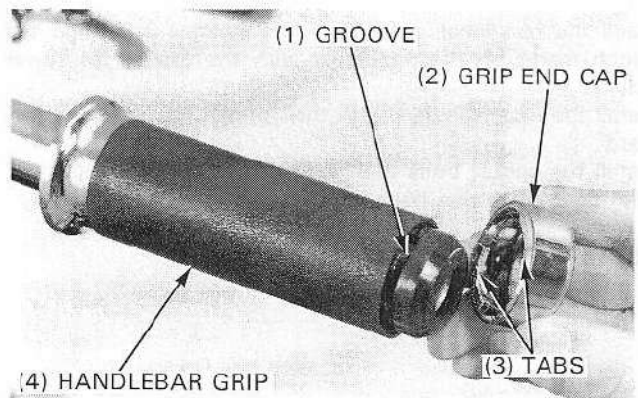
Wait 3-5 minutes and install the grip
Rotate the grip for even application of the adhesive.

NOTE

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

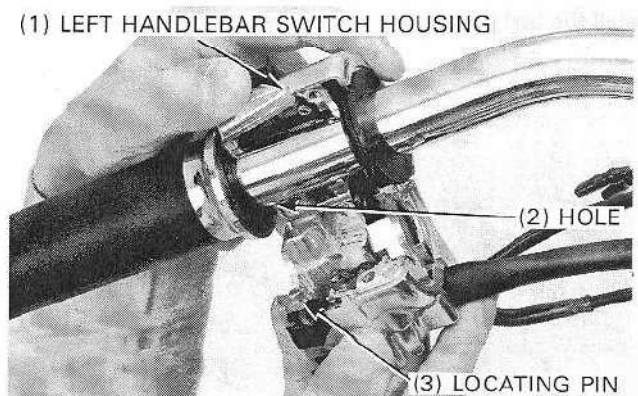


Install the left handlebar grip end cap while aligning the tabs with the grooves in the handlebar grip.



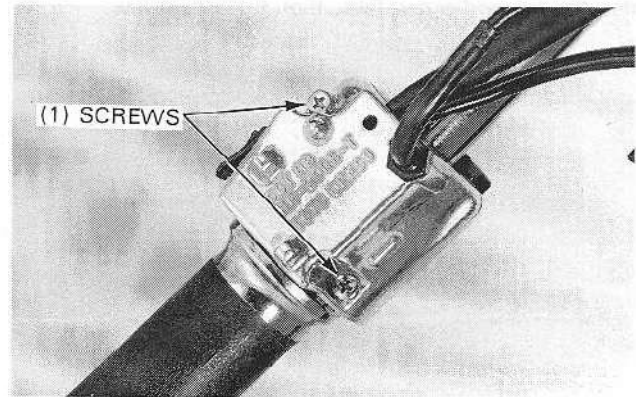
Connect the choke cable to the choke lever.

Install the left handlebar switch aligning its locating pin with the hole in the handlebar.



FRONT WHEEL/SUSPENSION/STEERING

Install and tighten the forward screw first, then the rear screw.

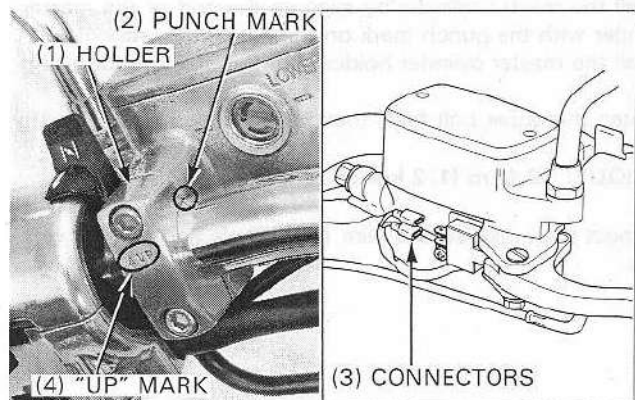


Install the clutch master cylinder by aligning the end of the master cylinder with the punch mark on the handlebar. Install the master cylinder holder with the "UP" mark facing up.

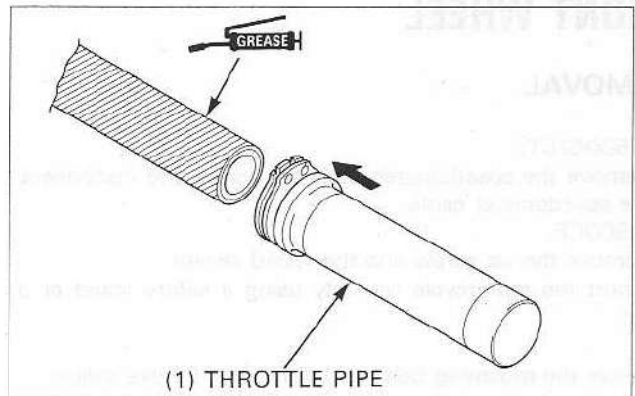
Tighten the upper bolt first, then lower bolt.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Connect the clutch switch wires.

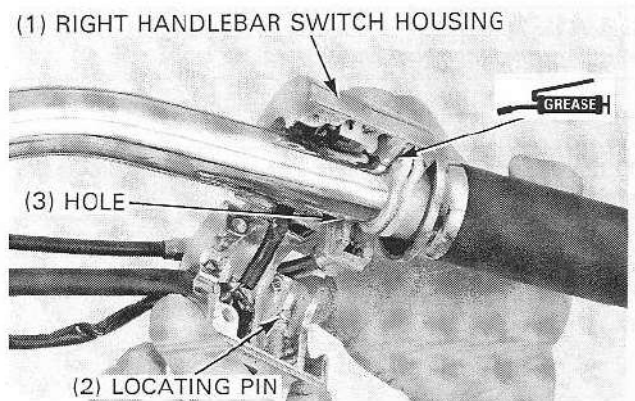


Apply grease to the sliding surface of the throttle pipe. Install the throttle pipe on the right handlebar.



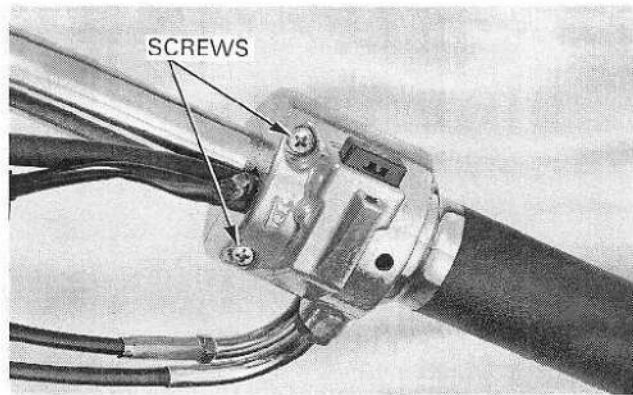
Apply grease to the throttle cable ends. Connect the throttle cables to the throttle pipe.

Install the right handlebar switch/throttle housing by aligning its locating pin with the hole in the handlebar.



FRONT WHEEL/SUSPENSION/STEERING

Tighten the forward screw first, then the rear screw.

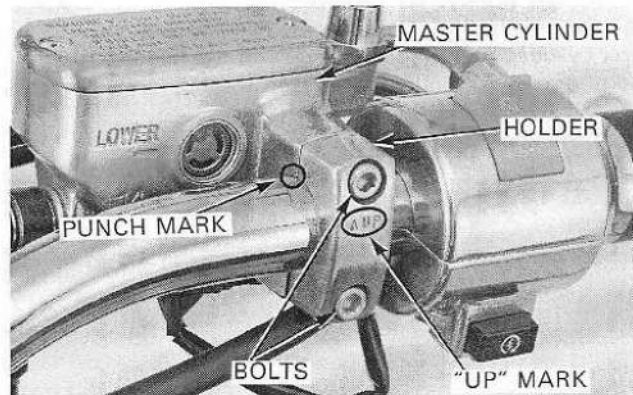


Install the master cylinder by aligning the end of the master cylinder with the punch mark on the handlebar. Install the master cylinder holder with the "UP" mark facing up.

Tighten the upper bolt first, then lower bolt.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Connect the brake switch wire connectors and set the wire clips.



FRONT WHEEL

REMOVAL

GL1500C/CT:

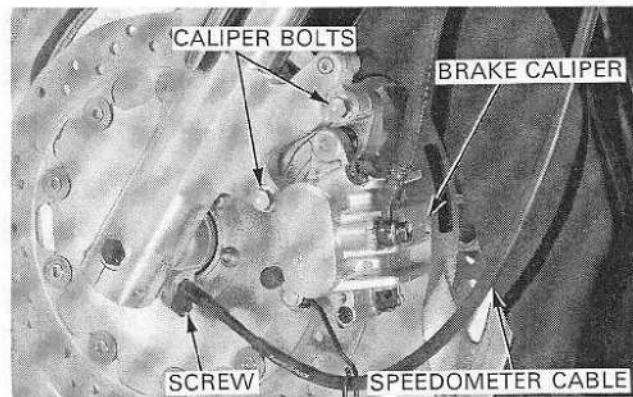
Remove the speedometer cable set screw and disconnect the speedometer cable.

GL1500CF:

Remove the set screw and the speed sensor.

Support the motorcycle securely using a safety stand or a hoist.

Remove the mounting bolts and right or left brake caliper.



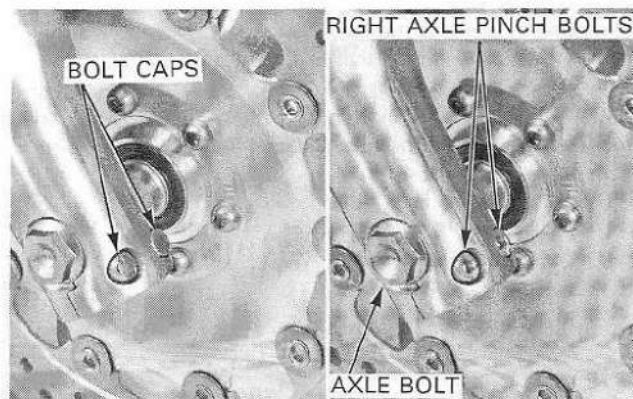
CAUTION

- Support the brake caliper with a piece of wire so that it does not hang from the brake hose. Do not twist the brake hose.

NOTE

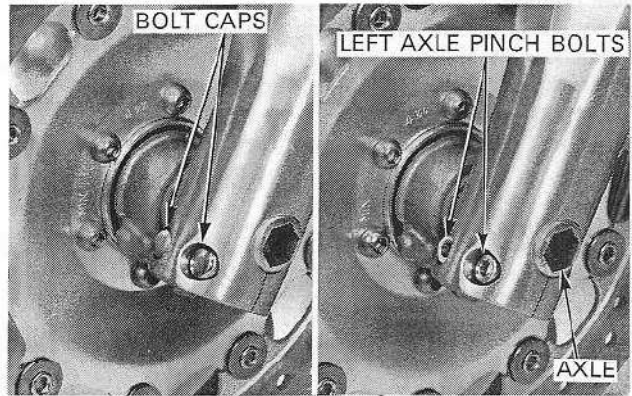
- Do not operate the brake lever after the brake calipers are removed.

Remove the right axle pinch bolt caps.
Loosen the right axle pinch bolts.
Remove the axle bolt.

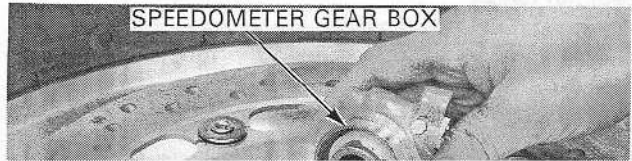


FRONT WHEEL/SUSPENSION/STEERING

Remove the left axle pinch bolt caps.
Loosen the left axle pinch bolts.
Remove the axle by reinstalling axle bolt and gently driving out axle from right side using a soft driver. Remove the front wheel.



Remove the speedometer gearbox from left wheel hub.



FRONT WHEEL/SUSPENSION/STEERING

Wheel bearing

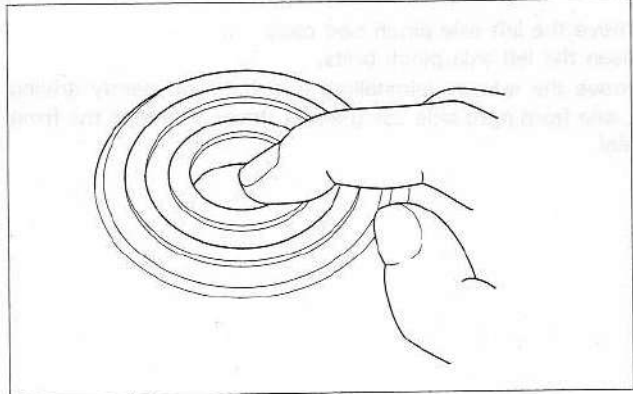
Turn the inner race of each bearing with your finger. The bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the hub.

Remove and discard the bearings if they do not turn smoothly, quietly, or if they fit loosely in the hub (page 13-11).

NOTE

- Replace the bearing in pairs.

Install the new bearings into the hub using the special tools (page 13-12).



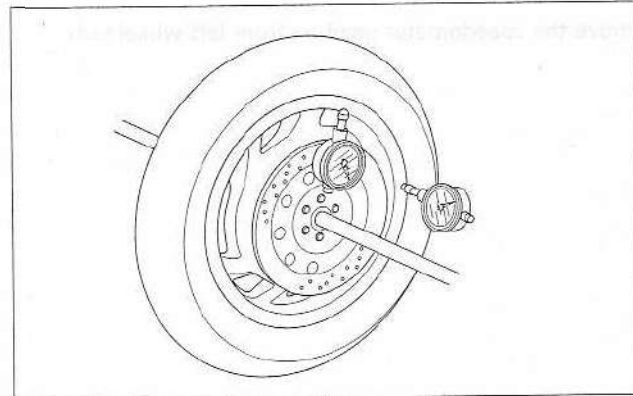
Wheel rim runout

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

Actual runout is 1/2 the total indicator reading.

SERVICE LIMITS:

- Radial: 2.0 mm (0.08 in)
- Axial: 2.0 mm (0.08 in)



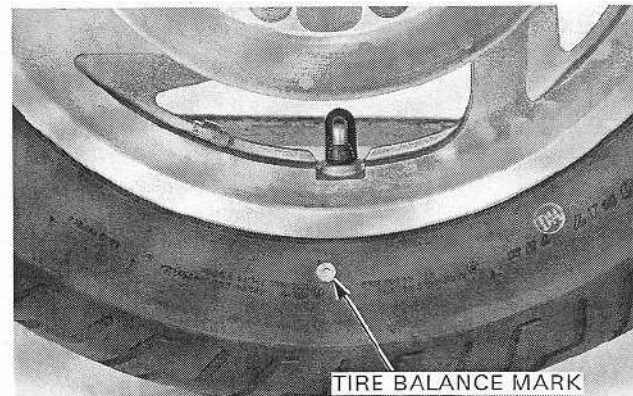
Wheel balance

CAUTION

- *Wheel balance directly affects the stability, handling and overall safety of the motorcycle. Always check balance when the tire has been removed from the rim.*

NOTE

- For optimum balance, the tire balance mark (a paint dot on the side wall) must be located next to the valve stem. Remount the tire if necessary.
- Note the rotating direction marks on the wheel and tire.

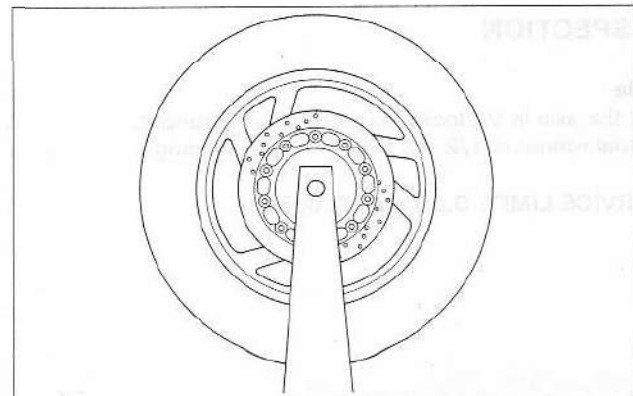


Remove the dust seals from the wheel.

Mount the wheel, tire and brake discs assembly in an inspection stand.

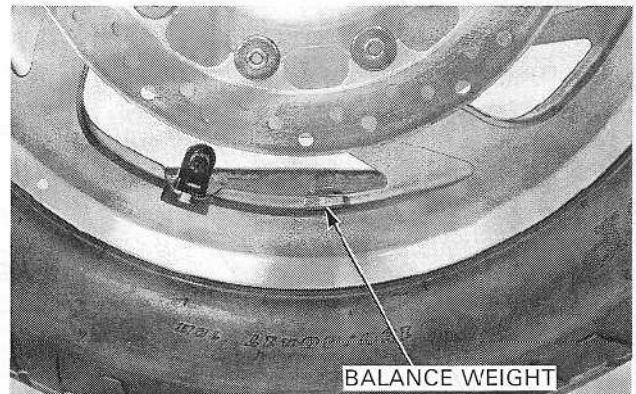
Spin the wheel, allow it to stop, and mark the lowest (heaviest) point of the wheel with a chalk.

Do this two or three times to verify the heaviest area. If the wheel is balanced, it will not stop consistently in the same position.



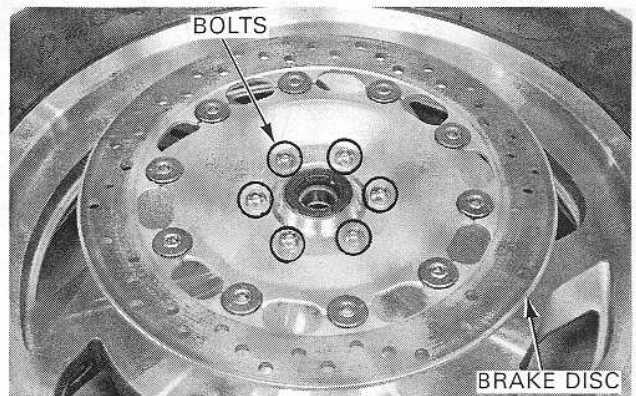
FRONT WHEEL/SUSPENSION/STEERING

To balance the wheel, install wheel weights on the lightest side of the rim, the side opposite the chalk marks. Add just enough weight so the wheel will no longer stop in the same position when it is spun. Do not add more than 60 grams (2.1 oz) to the wheel.



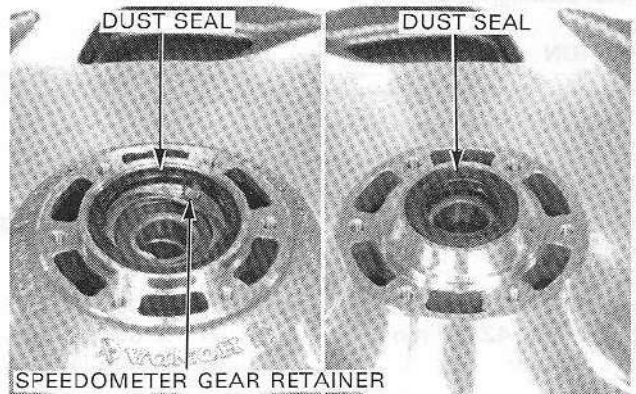
DISASSEMBLY

Remove the bolts and brake discs.



Remove the dust seal from the right wheel hub.

Remove the dust seal from the left wheel hub.
Remove the speedometer gear retainer.



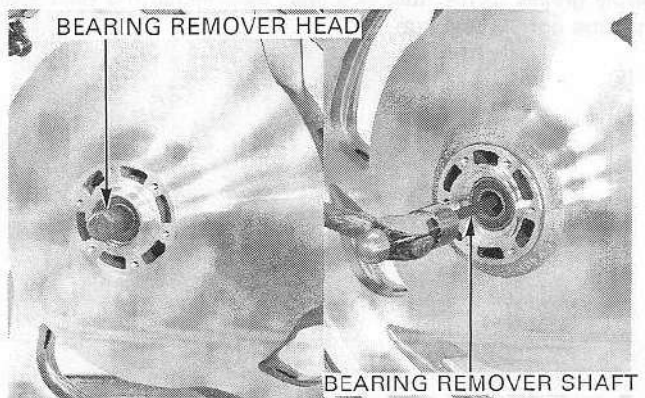
Wheel bearing removal

Install the bearing remover head into the bearing.
From the opposite side, install the bearing remover shaft and drive the bearing out of the wheel hub.
Remove the distance collar and drive out the other bearing.

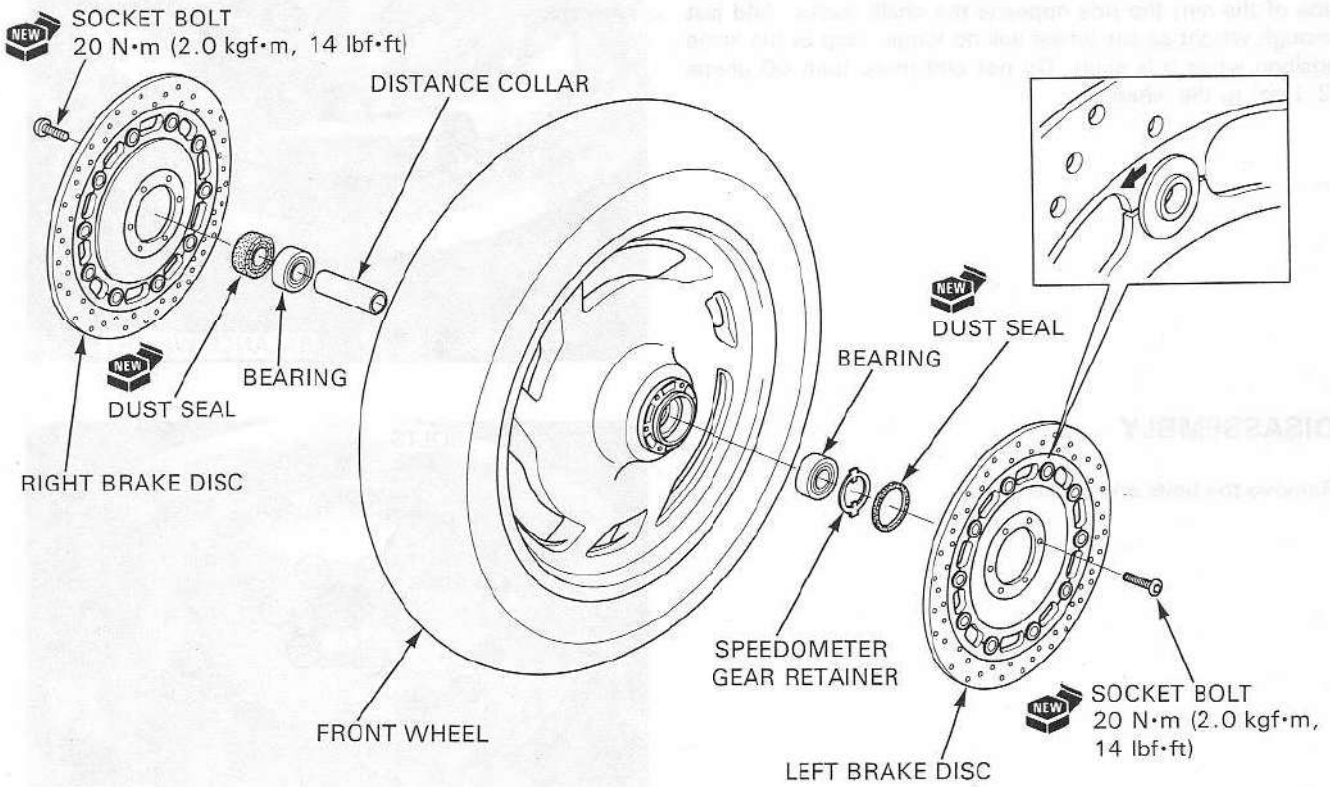
TOOLS:

Bearing remover head, 20 mm
Bearig remover shaft

07746-0050600
07746-0050100



ASSEMBLY



Wheel bearing installation

CAUTION

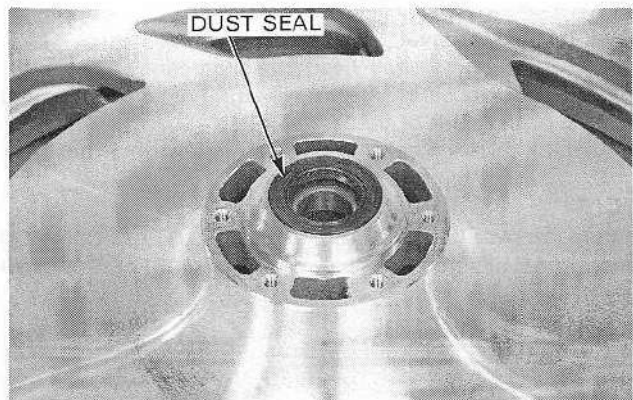
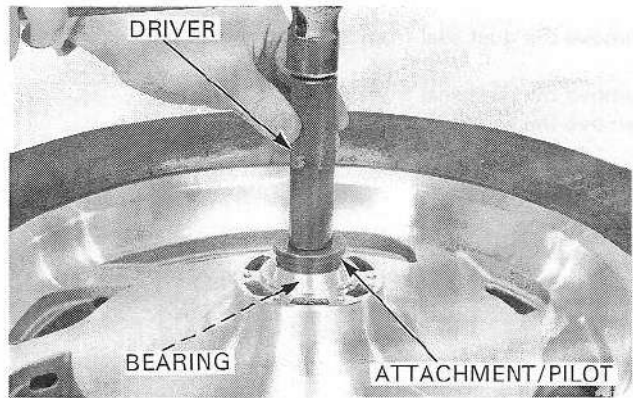
- Never install the old bearings. Once the bearing has been removed, the bearing must be replaced with new ones.

Drive in a new right bearing squarely. Install the distance collar, then drive in the left bearing using the special tools.

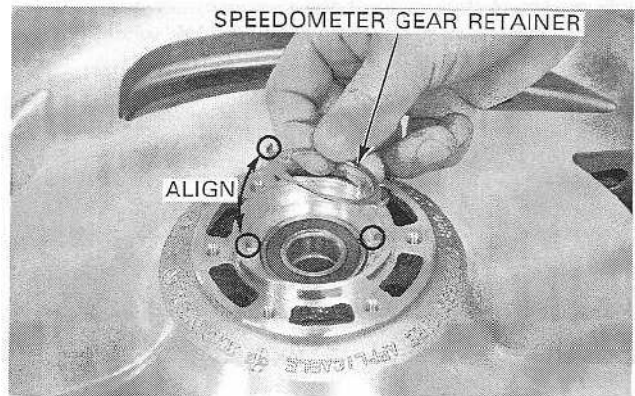
TOOLS:

Driver	07749-001000
Attachment, 42×47 mm	07746-0010300
Pilot, 20 mm	07746-0040500

Apply grease to the dust seal lips, then install the dust seal into the right wheel hub.



Install the speedometer gear retainer into the wheel hub, aligning the tangs with the slots in the hub.



SPEEDOMETER GEAR RETAINER

ALIGN

Apply grease to the dust seal lips, then install the dust seal into the left wheel hub.

▲WARNING

- Do not grease on the brake discs or stopping power will be reduced.



DUST SEAL

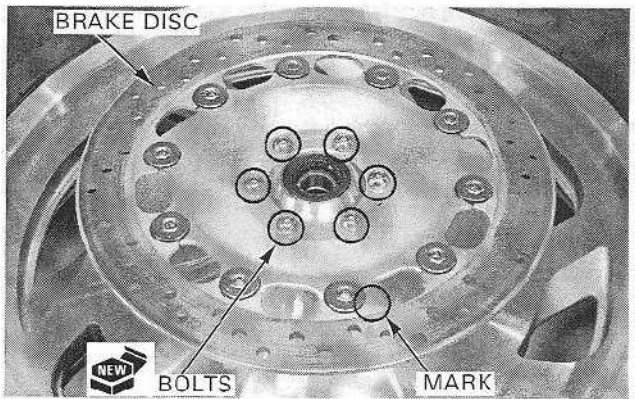
Install the brake discs on the wheel hub.

NOTE

- Install the disc with the "L" mark on the left side, and the disc with the "R" mark on the right side.

Install and tighten the new mounting bolts to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 14 lbf·ft)



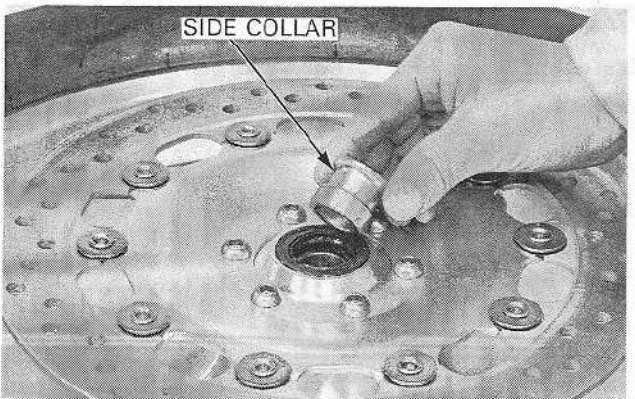
BRAKE DISC

BOLTS

MARK

INSTALLATION

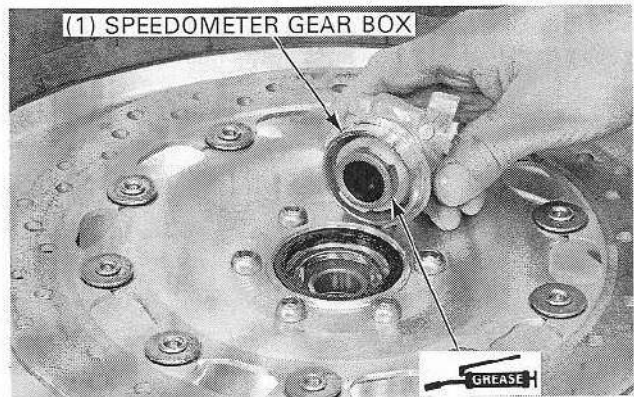
Install the right side collar.



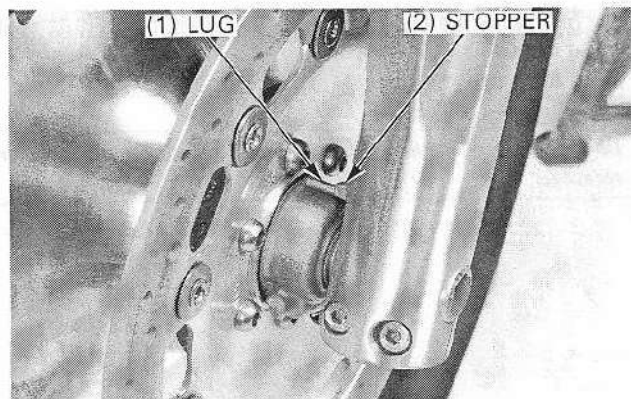
SIDE COLLAR

FRONT WHEEL/SUSPENSION/STEERING

Apply grease to the inside of the speedometer gear box.
Install the speedometer gear box into the left wheel hub.



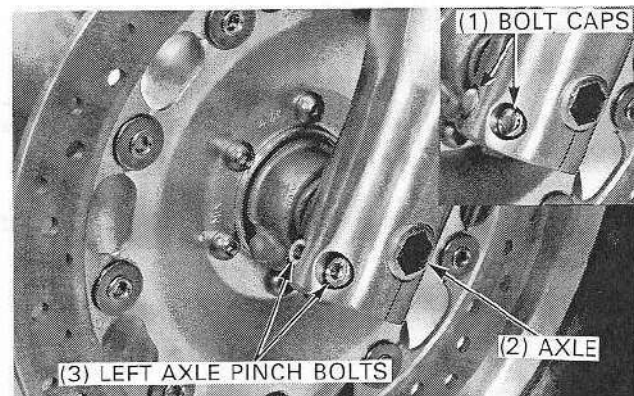
Install the front wheel between the fork legs.
Install the front axle.
Position the lug on the speedometer gear box against the back of stopper on the fork leg.



Tighten the left axle pinch bolts to the specified torque.

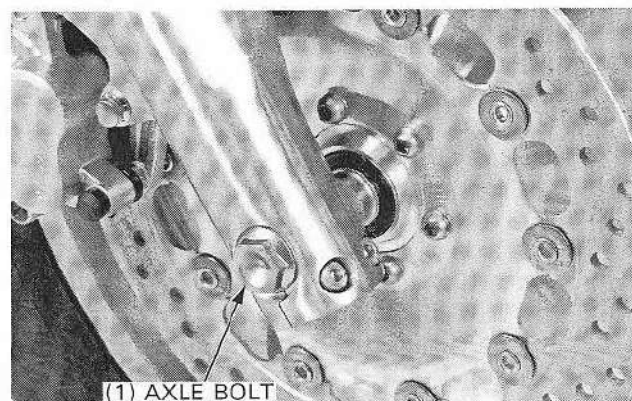
TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

Install the bolt caps onto the left axle pinch bolts.



Install and tighten the axle bolt to the specified torque.

TORQUE: 90 N·m (9.2 kgf·m, 67 lbf·ft)



FRONT WHEEL/SUSPENSION/STEERING

Install the brake caliper onto the fork leg.
Install and tighten the new caliper mounting bolts to the specified torque.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

GL1500C/CT:

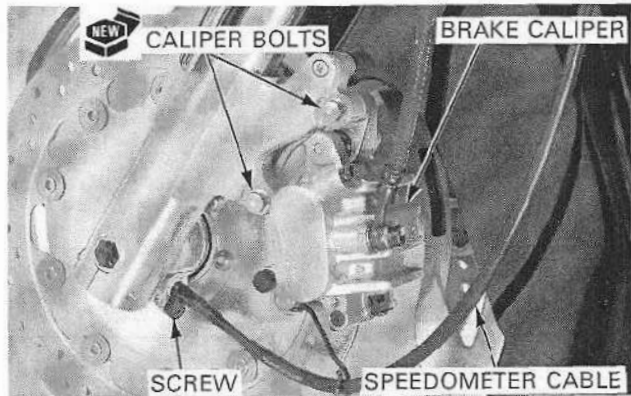
Connect the speedometer cable to the speedometer gear box.

Install and tighten the screw.

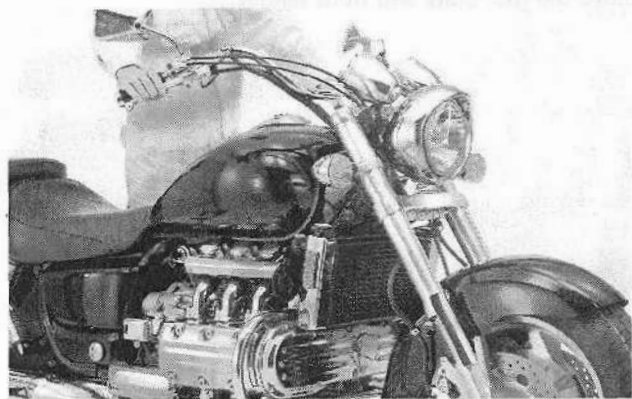
GL1500CF:

Install a new O-ring onto the speed sensor.

Install the speed sensor and tighten the set screw.



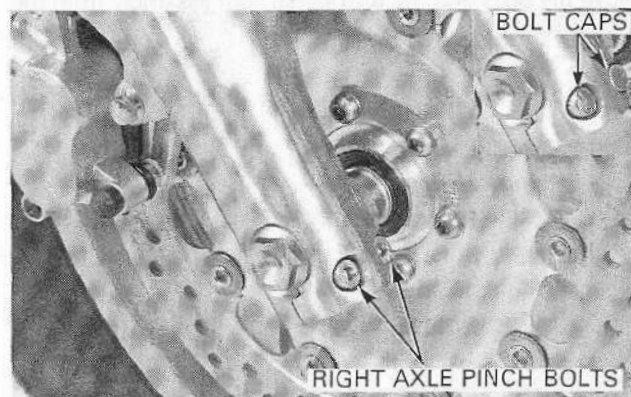
With the front brake applied, pump the fork up and down several times to seat the axle and check brake operation.



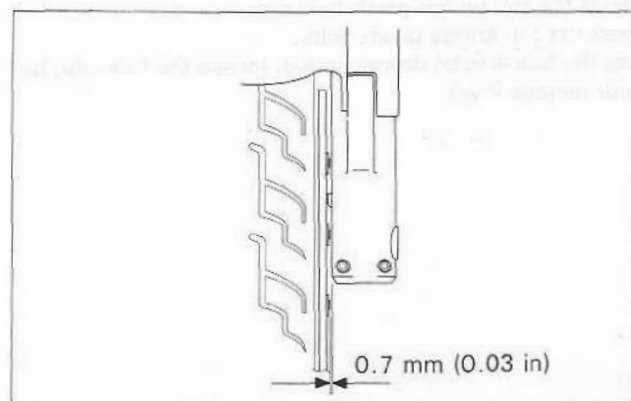
Tighten the right axle pinch bolts to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

Install the bolt caps onto the right axle pinch bolts.



Check the clearance between the brake disc and caliper bracket on each side after installation.
The clearance should be at least 0.7 mm (0.03 in).



FORK

REMOVAL

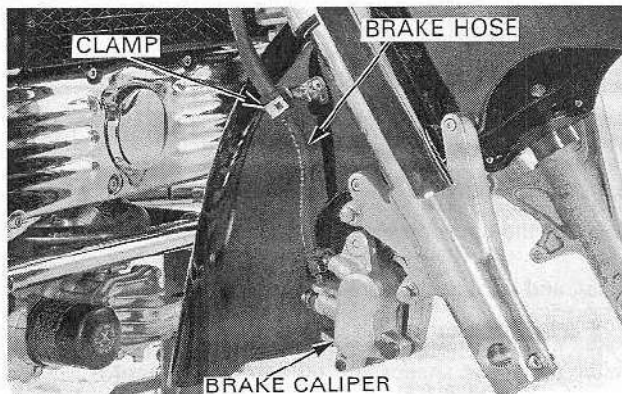
Remove the right and left brake calipers (page 15-16).

Remove the front wheel (page 13-8).

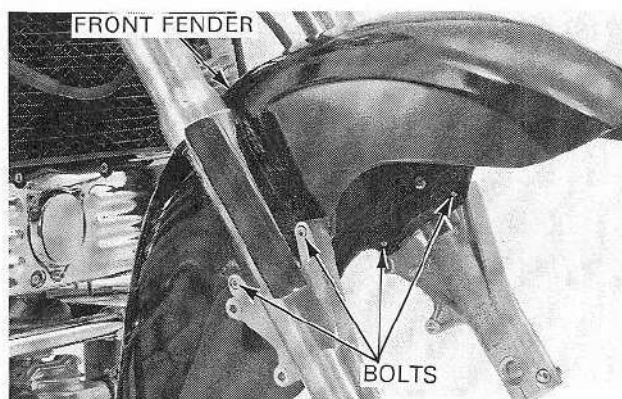
Remove the brake hose clamp from the front fender.

CAUTION

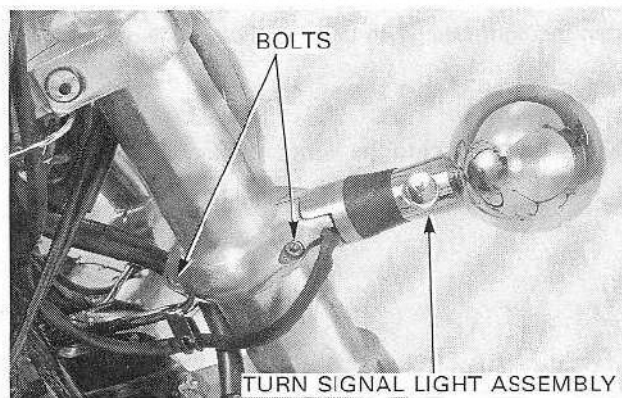
- Do not hang the brake caliper from the brake hose.



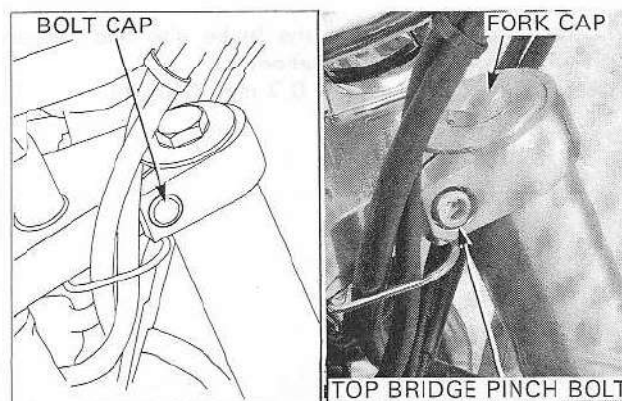
Remove the four bolts and front fender.



Remove the bolts and the turn signal light assembly from the fork tube (GL1500C/CT only).

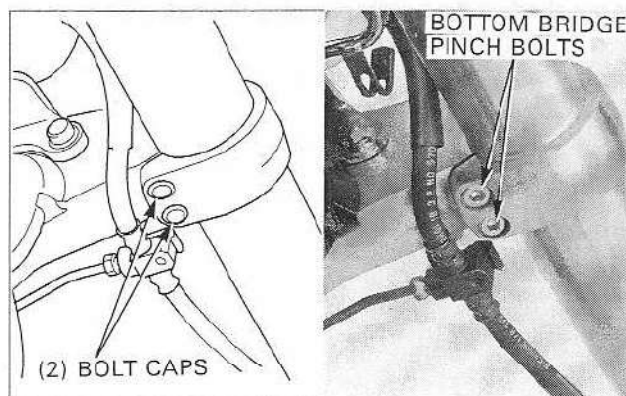


Remove the top bridge pinch bolt caps. Loosen the top bridge pinch bolts. When the fork is to be disassembled, loosen the fork cap, but do not remove it yet.



FRONT WHEEL/SUSPENSION/STEERING

Remove the bottom bridge pinch bolt caps.
Loosen the fork bottom bridge pinch bolts and remove the fork tube from the fork top bridge and steering stem.

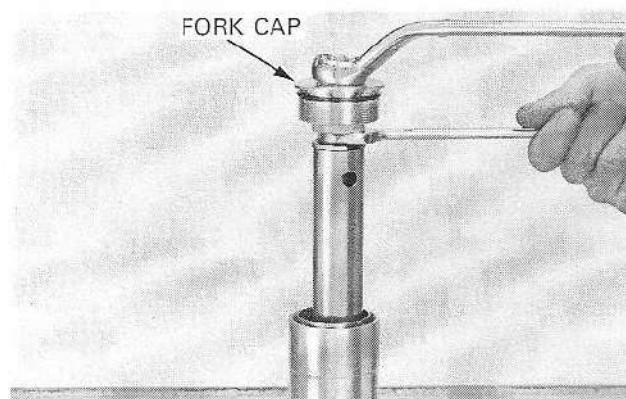


RIGHT FORK DISASSEMBLY

CAUTION

- *Be careful not to scratch the fork tube or damage the dust seal.*

Hold the fork tube, remove the fork cap from the fork tube and slide the fork tube down onto the axle holder.
Remove the fork cap from the damper rod.

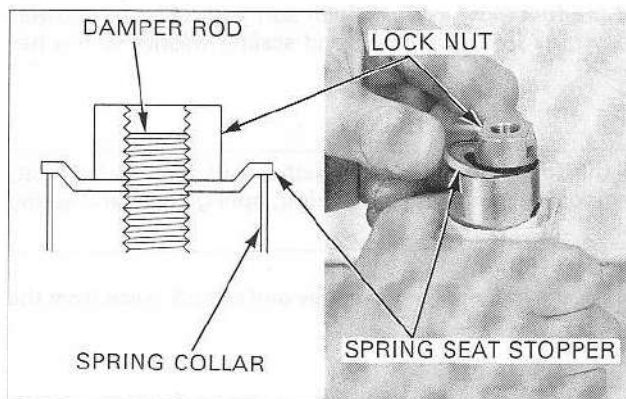


Loosen the lock nut as shown.

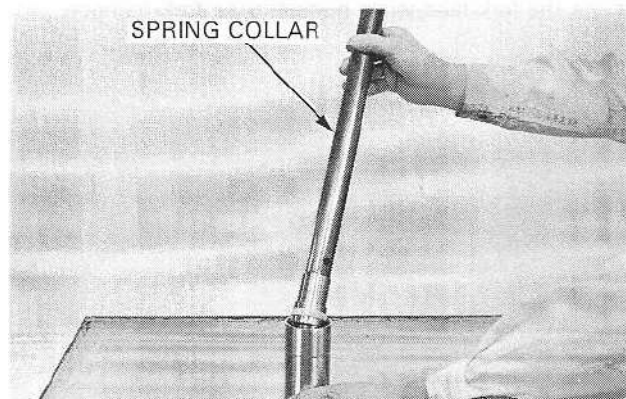
▲WARNING

- *The spring seat stopper and spring collar are under spring pressure. Use care when removing them and wear eye and face protection.*

While pushing down the spring collar, remove the spring seat stopper.

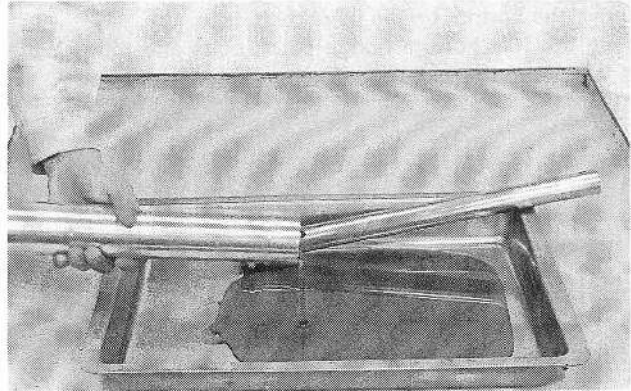
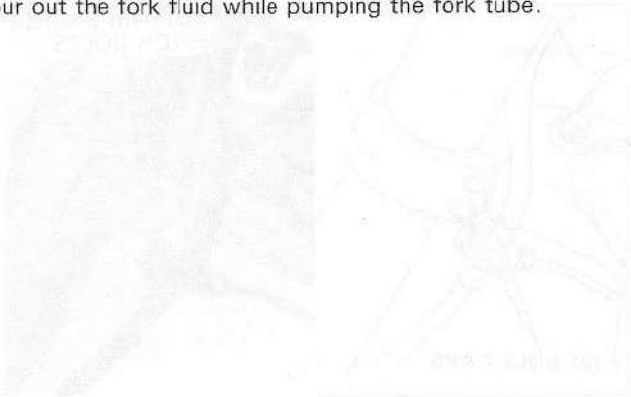


Remove the spring collar.

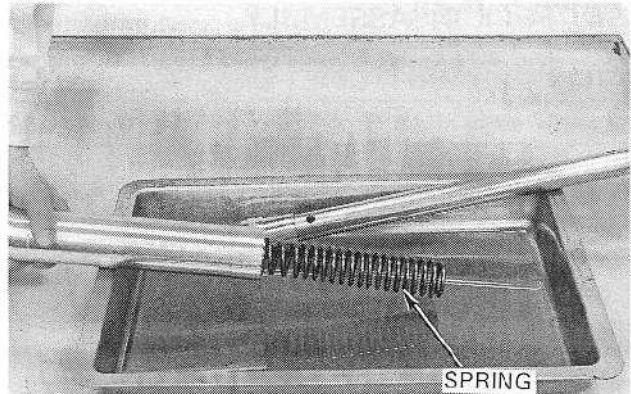
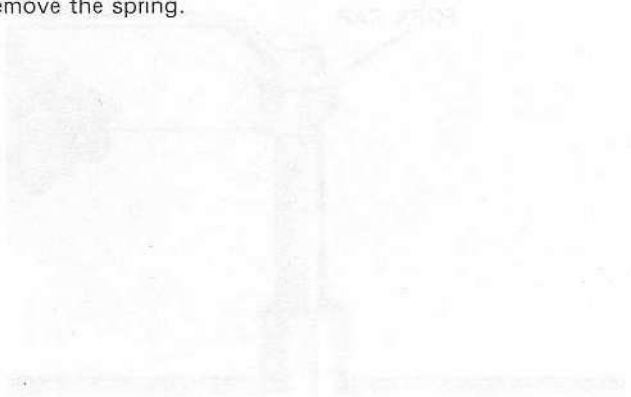


FRONT WHEEL/SUSPENSION/STEERING

Pour out the fork fluid while pumping the fork tube.



Remove the spring.

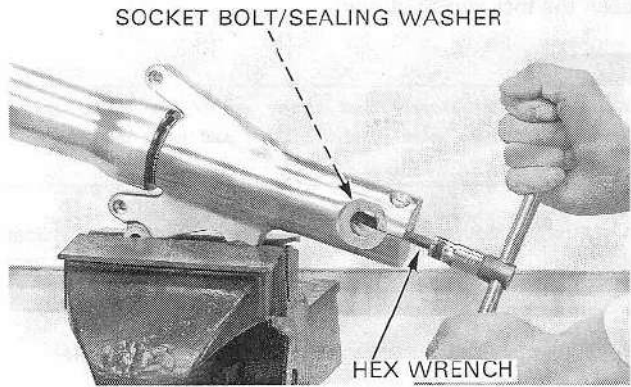


Hold the fork slider in a vise with soft jaws or a shop towel. Remove the fork socket bolt and sealing washer with a hex wrench.

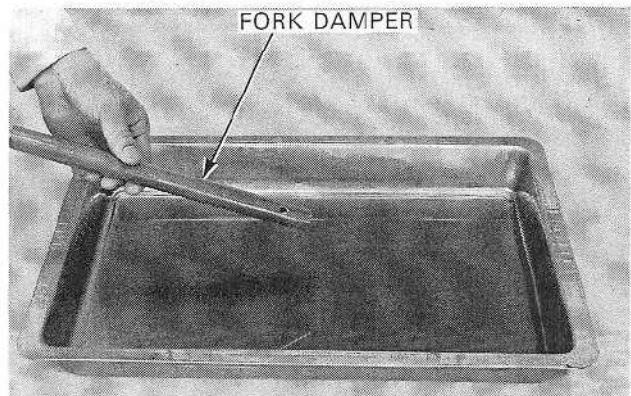
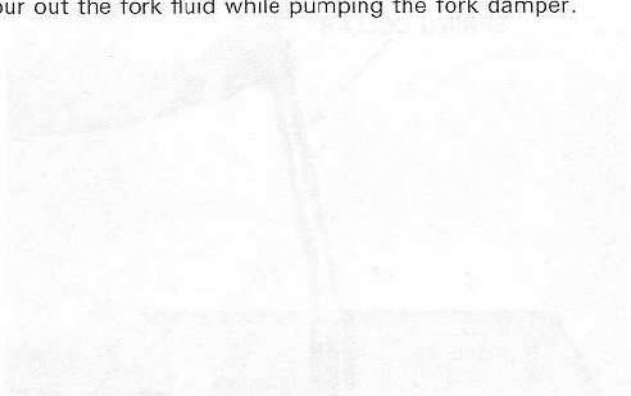
NOTE

- If the fork damper turns together with the socket bolt, temporarily install the fork spring, spring collar and spring seat.

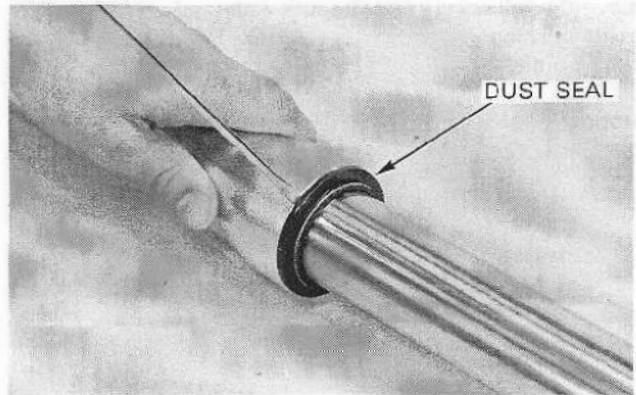
Remove the fork damper assembly and oil lock piece from the fork tube.



Pour out the fork fluid while pumping the fork damper.



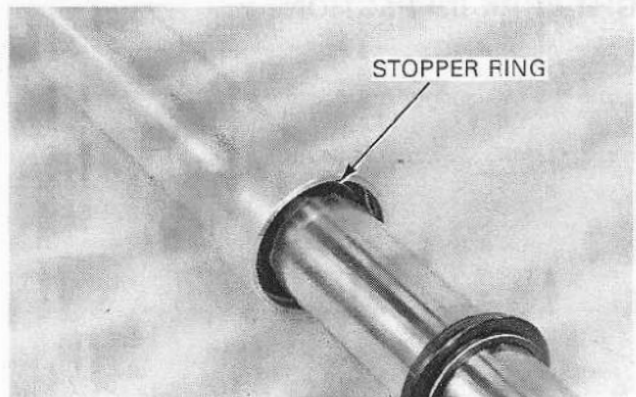
Remove the dust seal from the fork tube.



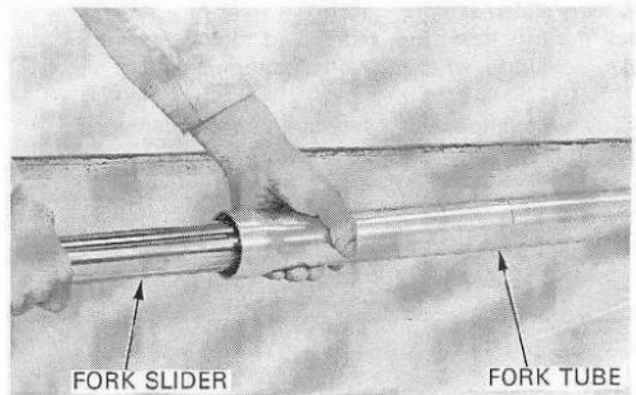
Remove the oil seal stopper ring.

CAUTION

- Do not scratch fork tube sliding surface.



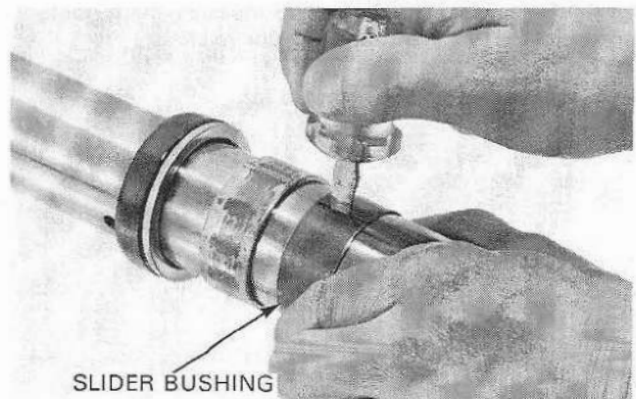
Pull the fork tube out until you feel resistance from the slider bushing. Then move it in and out, tapping the bushing lightly until the fork tube separates from the fork slider. The slider bushing will be forced out by the fork tube bushing.



Carefully remove the slider bushing by prying the slot with a screwdriver until the bushing can be pulled off by hand.

CAUTION

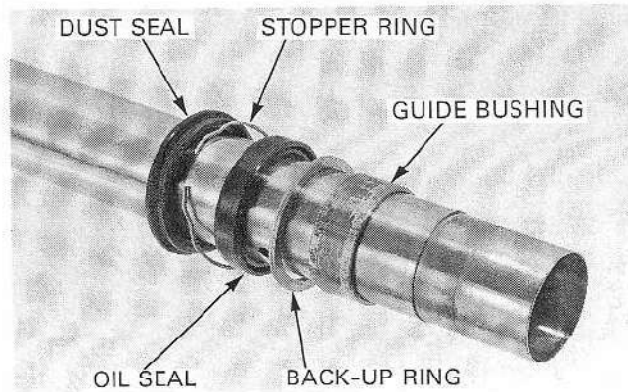
- Do not damage the slider bushing, especially the sliding surface. To maintain rebound damping effectiveness, do not open the bushing more than necessary.



FRONT WHEEL/SUSPENSION/STEERING

Remove the following from the fork slider:

- guide bushing.
- back-up ring.
- oil seal.
- stopper ring.
- dust seal.

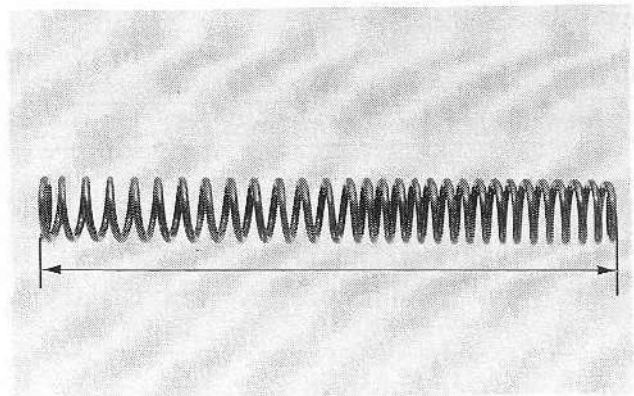


RIGHT FORK INSPECTION

Fork spring

Measure the fork spring free length.

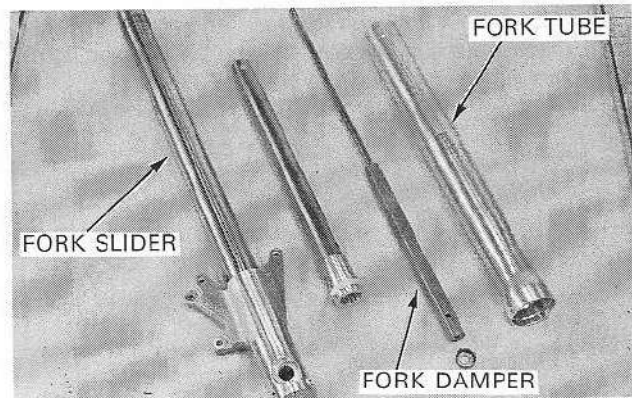
SERVICE LIMIT: 337 mm (13.3 in)



Fork tube/slider/damper

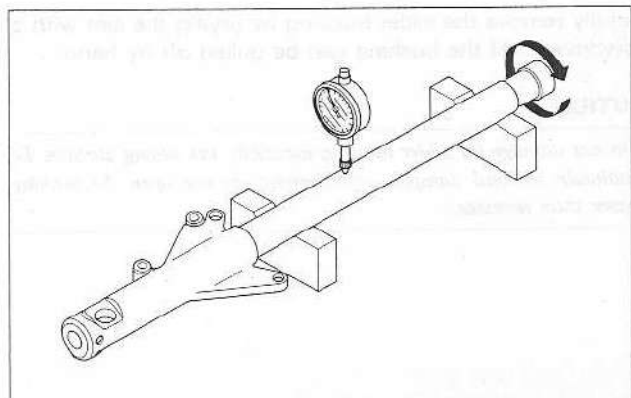
Check the fork tube, fork slider, and fork damper for score marks, scratches, or excessive or abnormal wear.

Replace any components which are worn or damaged.



Place the fork slider in V-blocks and measure the runout. Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.20 mm (0.008 in)

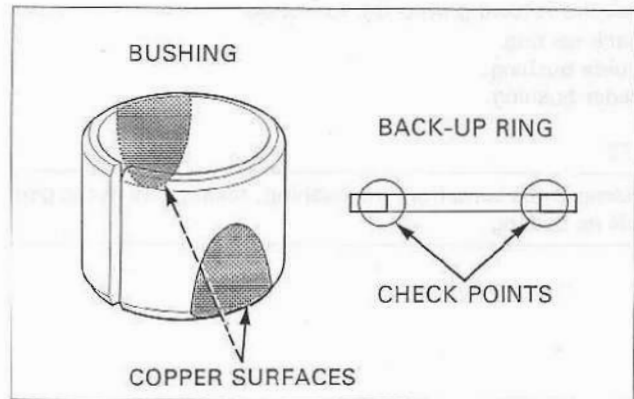


FRONT WHEEL/SUSPENSION/STEERING

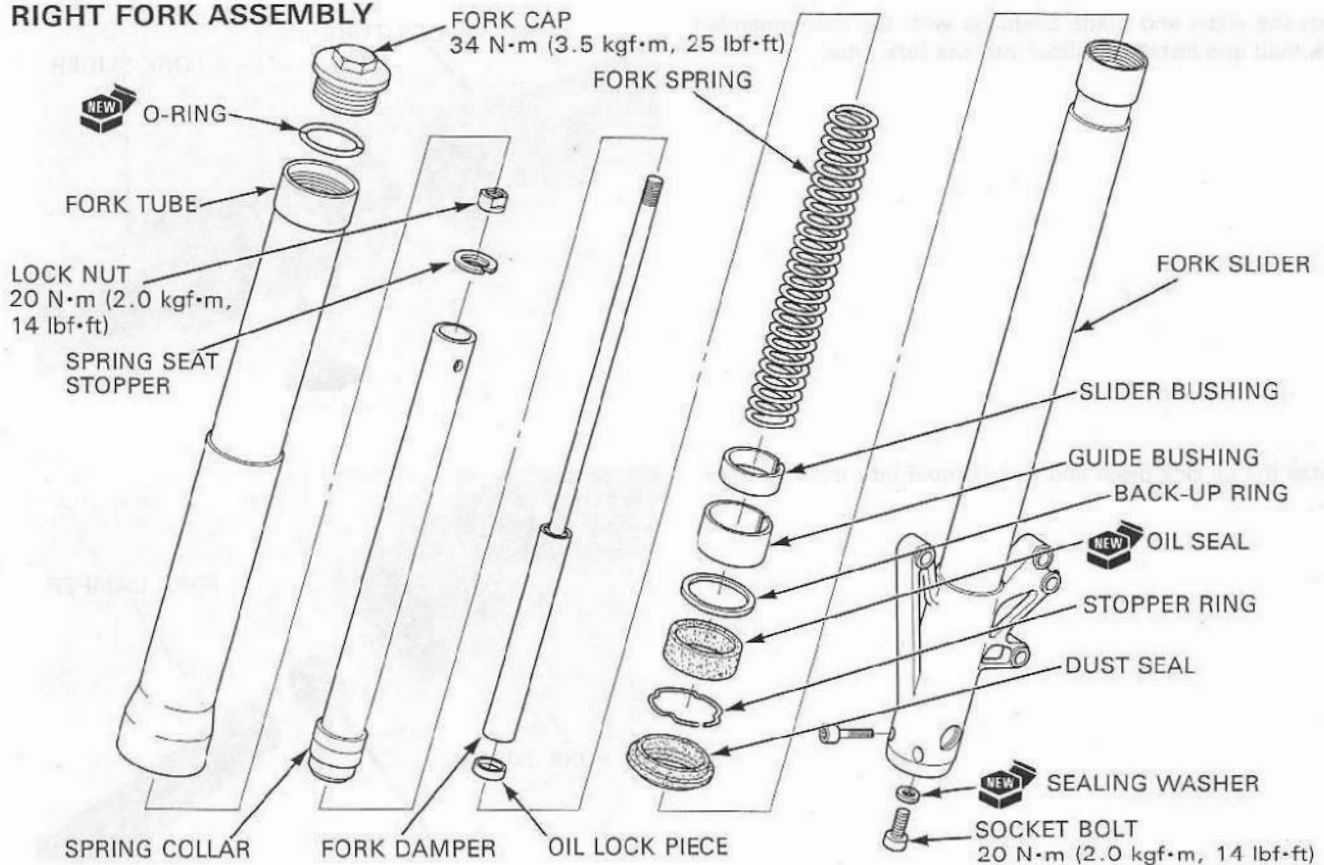
Fork slider bushing

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

Check the back-up ring; replace it if there is any distortion at the points shown.



RIGHT FORK ASSEMBLY



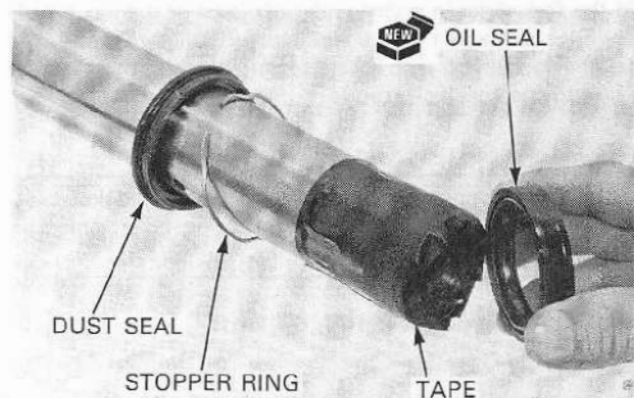
Before assembly, wash all parts with a high flash point or non-flammable solvent and wipe them dry. Wrap the end of the fork slider with tape.

Install the following onto the fork slider:

- dust seal.
- stopper ring.
- oil seal.

NOTE

- Install the oil seal with its marked side facing the axle holder.



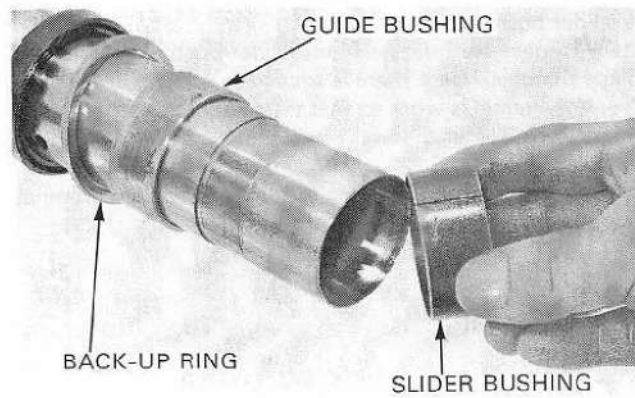
FRONT WHEEL/SUSPENSION/STEERING

Install the following onto the fork slider:

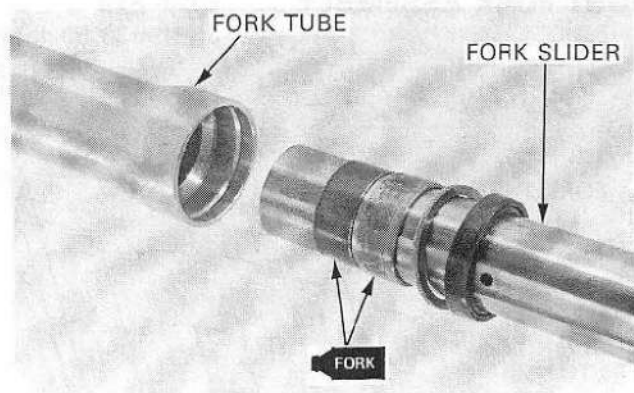
- back-up ring.
- guide bushing.
- slider bushing.

NOTE

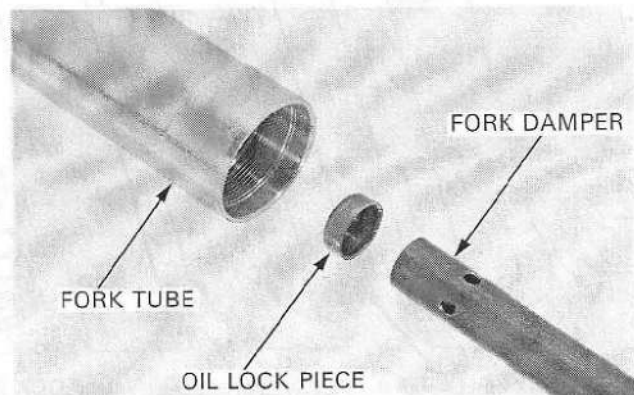
- Remove the burrs from the bushing, taking care not to peel off its coating.



Coat the slider and guide bushings with the recommended fork fluid and install the slider into the fork tube.



Install the oil lock piece and fork damper into the fork tube.

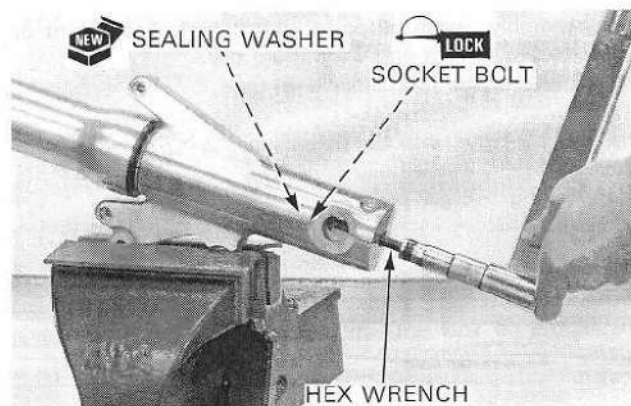


Hold the fork slider in a vise with soft jaws or a shop towel. Apply a locking agent to the fork socket bolt threads. Install the socket bolt with a new sealing washer, then tighten the bolt to the specified torque.

NOTE

- If the fork damper turns together with the socket bolt, temporarily install the fork spring, spring collar and fork cap.

TORQUE: 20 N·m (2.0 kgf·m, 14 lbf·ft)



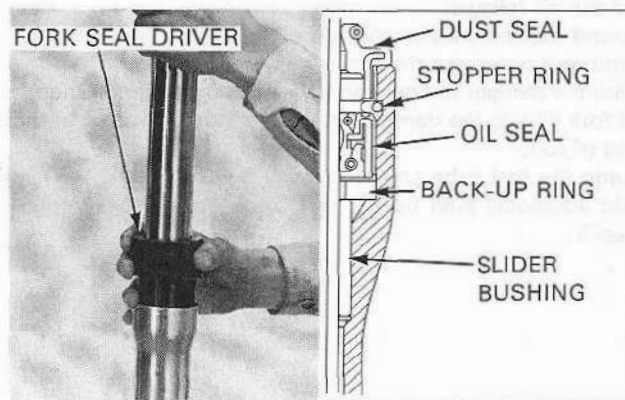
FRONT WHEEL/SUSPENSION/STEERING

Drive the oil seal in using the special tool.

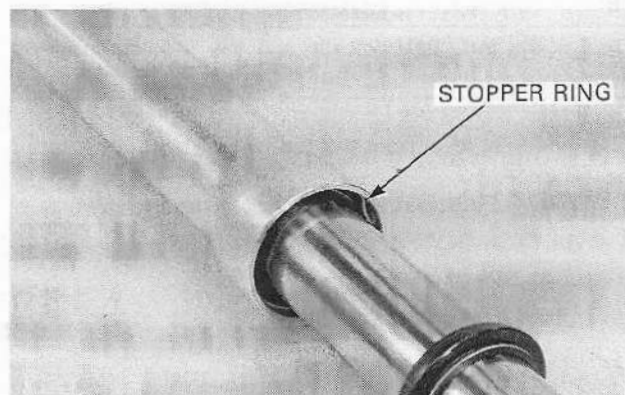
TOOL:

Fork seal driver, 45 mm

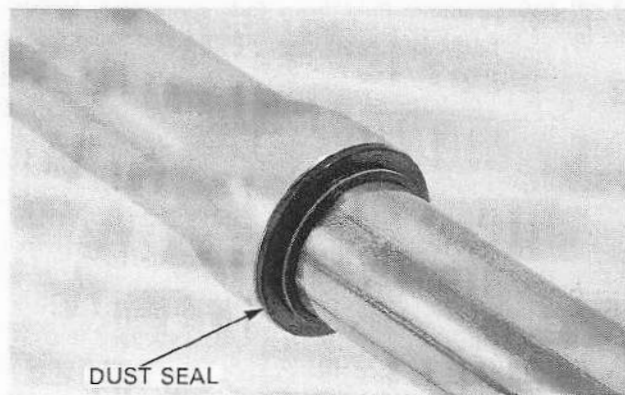
07KMD-KZ30100 or
07KMD-KZ3010A
(U.S.A. only)



Install the stopper ring into the fork tube groove securely.



Install the dust seal.



Add recommended fork fluid into the damper rod until the fluid flows out the damper rod end.

Pour the half amount of the recommended fork fluid into the fork leg.

RECOMMENDED FORK FLUID:

Pro Honda Suspension Fluid SS-8

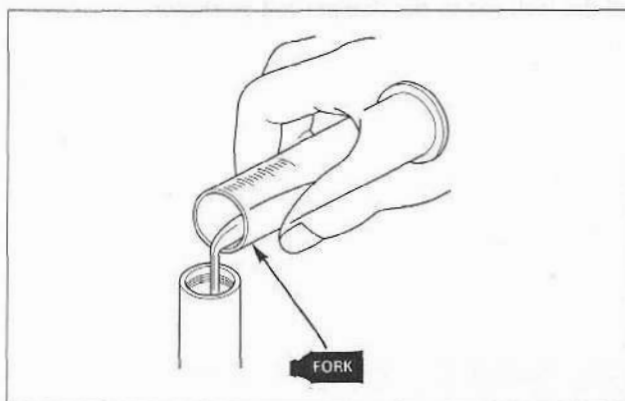
FORK FLUID CAPACITY:

GL1500C/CT:

$670 \pm 2.5 \text{ cm}^3$ (22.7 \pm 0.08 US oz, 23.6 \pm 0.09 Imp oz)

GL1500CF:

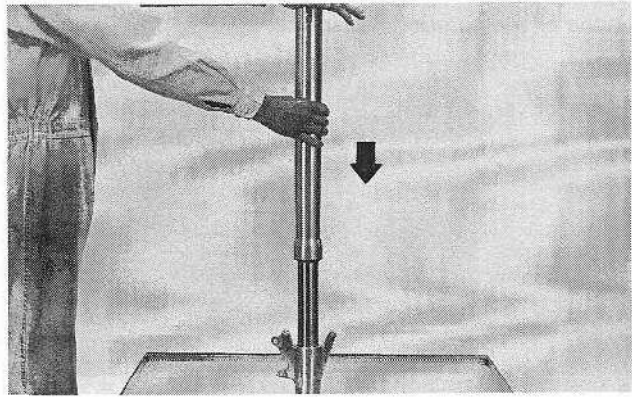
$669 \pm 2.5 \text{ cm}^3$ (22.6 \pm 0.08 US oz, 23.5 \pm 0.09 Imp oz)



FRONT WHEEL/SUSPENSION/STEERING

Bleed the air follows:

1. Extend the fork. Cover the top of the fork tube with your hand and compress the fork slowly.
2. With the damper rod pushed fully in, pour the recommended fork oil into the damper rod until a little flows out of the end of rod.
3. Pump the fork tube and rod slowly 8-10 times.
4. Add additional fluid up the specified capacity and repeat step 3.

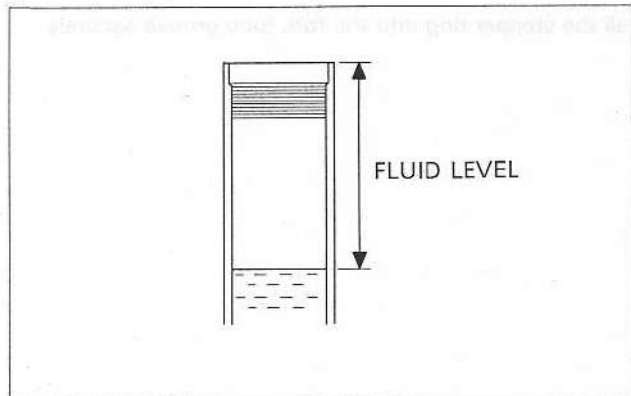


NOTE

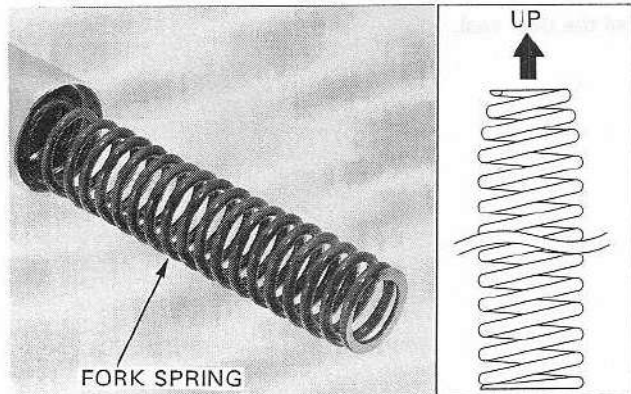
- Support the fork leg vertically and the fork compressed fully whenever measuring the fluid level.

Measure the fluid level from the top of the fork tube.

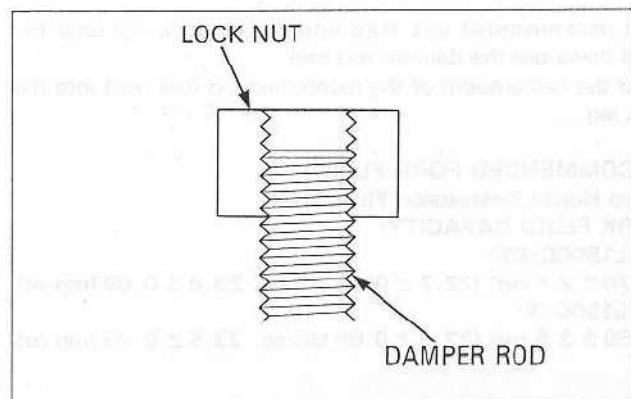
FORK FLUID LEVEL: GL1500C/CT: 135 mm (5.3 in)
GL1500CF: 136 mm (5.4 in)



Wipe off any excessive fluid from fork spring and spring collar. Install the fork spring with its tapered end facing up.



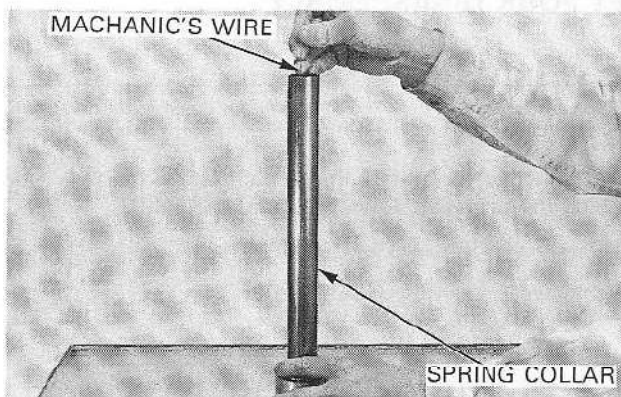
Install the lock nut to the damper rod as shown.



FRONT WHEEL/SUSPENSION/STEERING

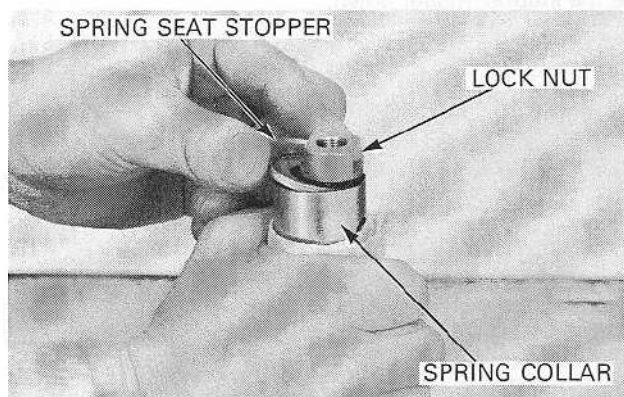
Attach a 600 mm (2 feet) length of mechanic's wire to the lock nut on the damper rod.

Pull the damper rod up and install the spring collar.



While pushing the spring collar down and install the spring seat stopper.

Remove the mechanic's wire from the damper rod. Tighten the lock nut by hand until it bottoms on the damper rod.

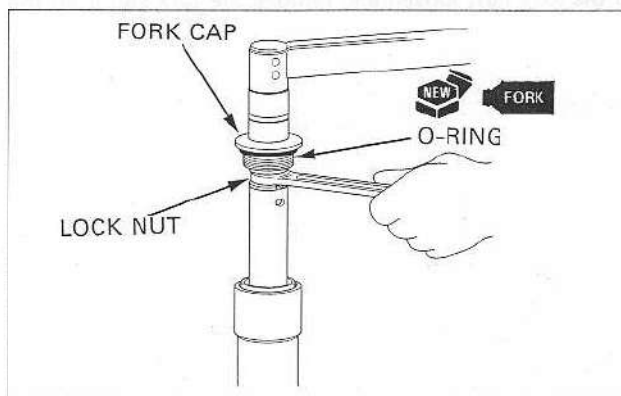


Install the new O-ring onto the fork cap. Apply fork fluid to the new O-ring.

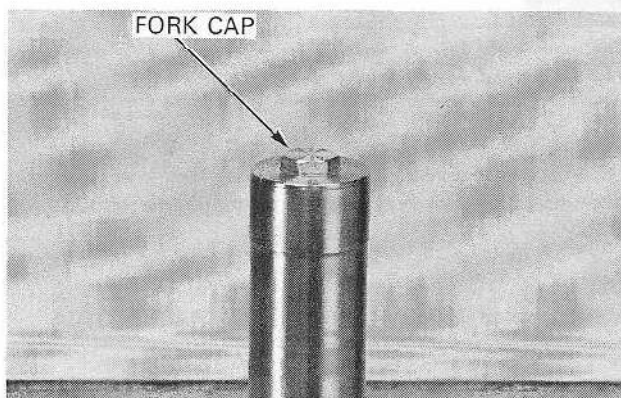
Hold the damper rod and screw the fork cap onto the damper rod.

Hold the lock nut and tighten the fork cap to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 14 lbf·ft)



Screw the fork cap into the fork tube.



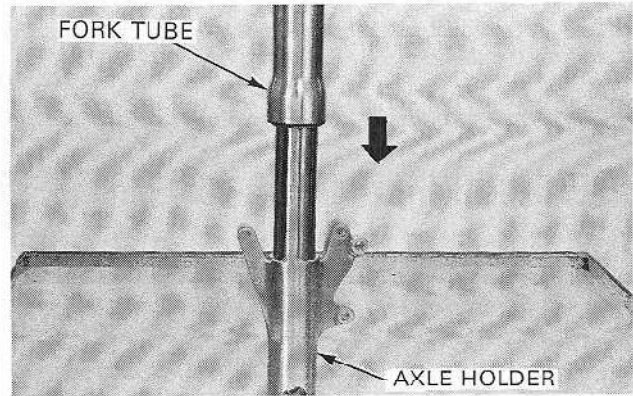
FRONT WHEEL/SUSPENSION/STEERING

LEFT FORK DISASSEMBLY

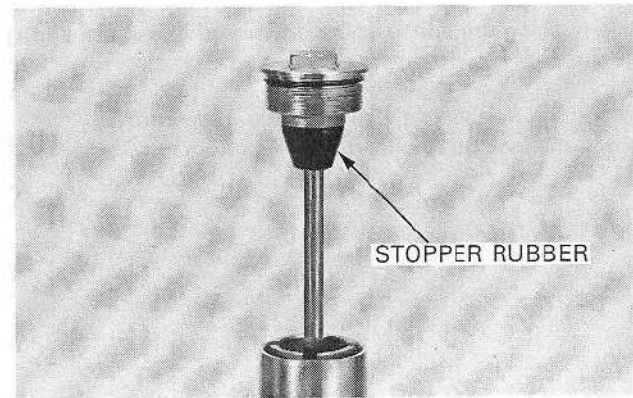
CAUTION

- *Be careful not to scratch the fork tube or damage the dust seal.*

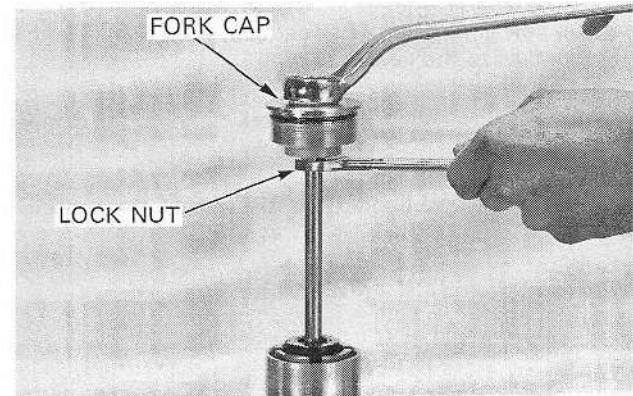
Hold the fork tube, remove the fork cap from the fork tube and slide the fork tube down onto the axle holder.



Slide the stopper rubber down.



Hold the lock nut, loosen and remove the fork cap from the rod.



▲WARNING

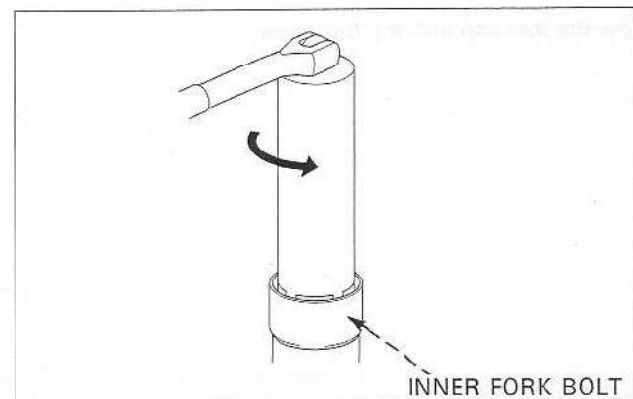
- *The inner fork bolt is under spring pressure. Use care when removing it and wear eye and face protection.*

Clamp the fork slider in a vise using soft jaws. Slip the fork tube down so that the inner fork bolt is visible. Remove the inner fork bolt and then remove the rebound rod assembly.

TOOL:

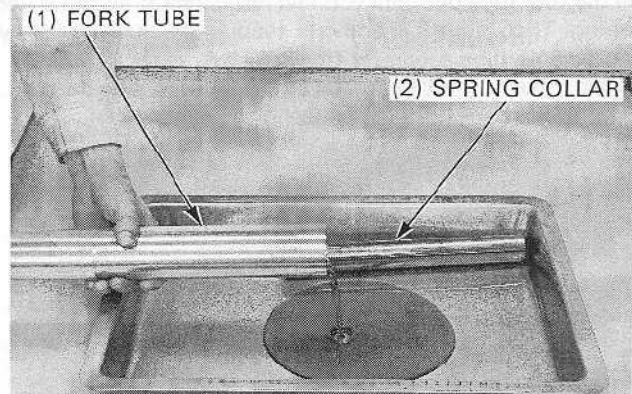
Lock nut wrench, 44 mm

07VMA-MZ0010A

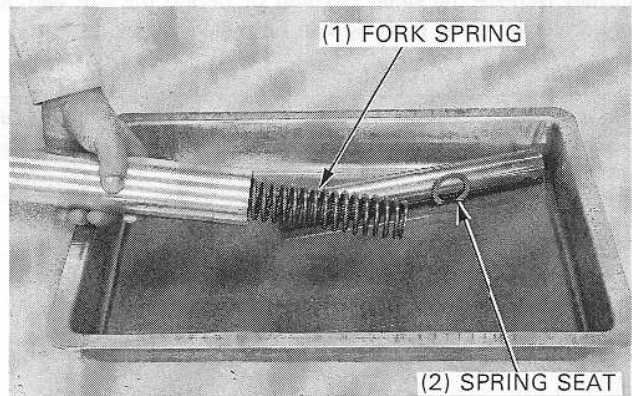


FRONT WHEEL/SUSPENSION/STEERING

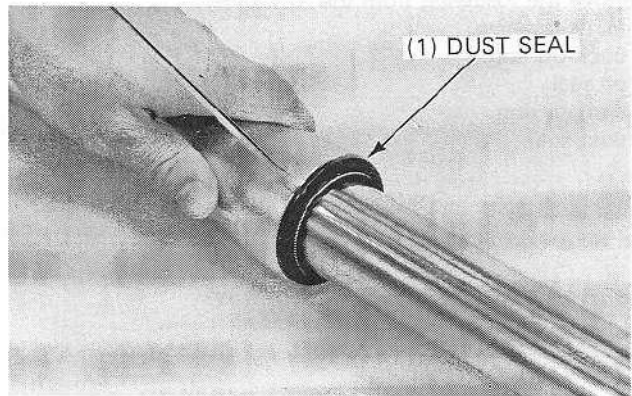
Remove the spring collar.
Pour out the fork fluid while pumping the fork tube.



Remove the spring seat and fork spring.



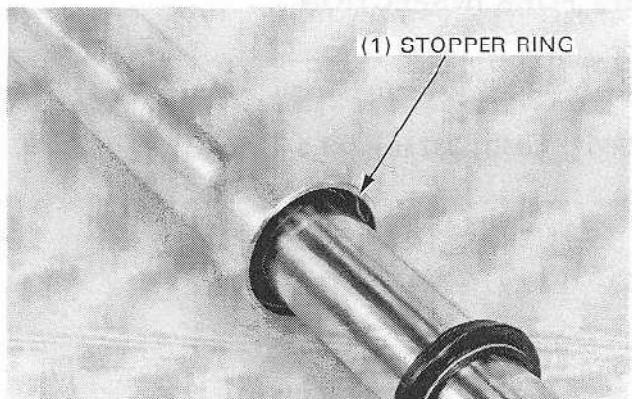
Remove the dust seal from the fork tube.



Remove the oil seal stopper ring.

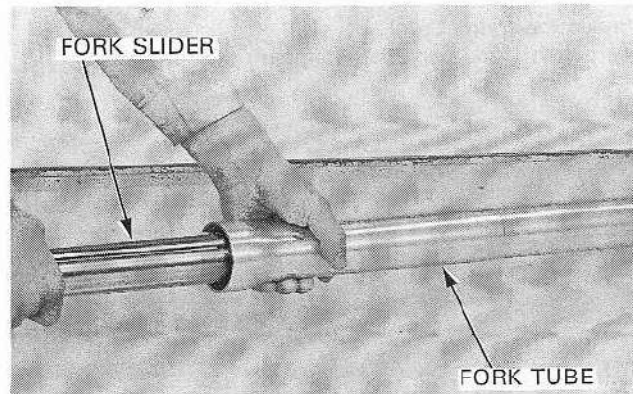
CAUTION

- Do not scratch the fork tube sliding surface.



FRONT WHEEL/SUSPENSION/STEERING

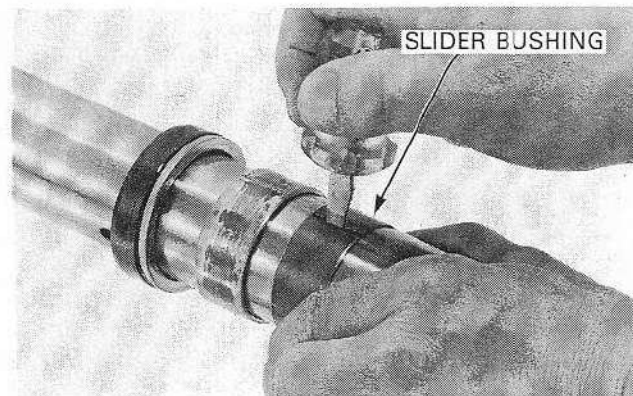
Pull the fork tube out until you feel resistance from the slider bushing. Then move it in and out, tapping the bushing lightly until the fork tube separates from the fork slider. The slider bushing will be forced out by the fork tube bushing.



Carefully remove the slider bushing by prying the slot with a screwdriver until the bushing can be pulled off by hand.

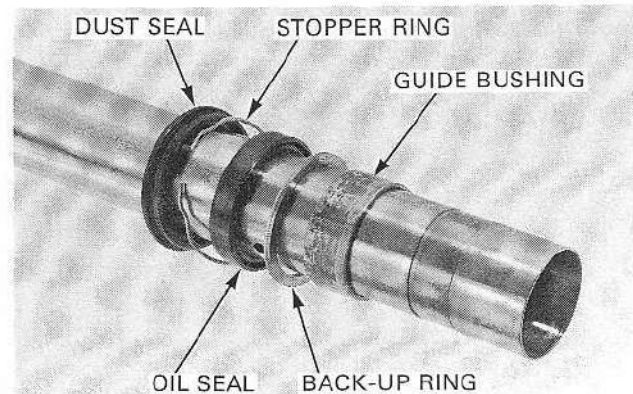
CAUTION

- *Do not damage the slider bushing, especially the sliding surface. To maintain rebound damping effectiveness, do not open the bushing more than necessary.*



Remove the following from the fork slider:

- guide bushing.
- back-up ring.
- oil seal.
- stopper ring.
- dust seal.

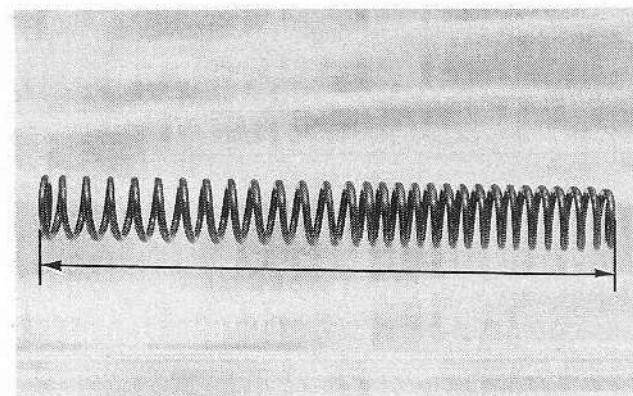


LEFT FORK INSPECTION

Fork spring

Measure the fork spring free length.

SERVICE LIMIT: 337 mm (13.3 in)

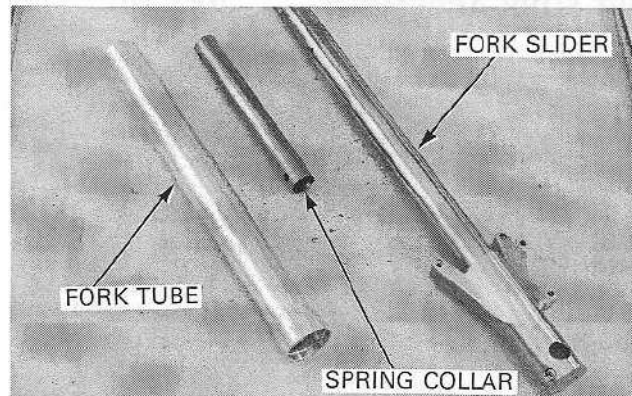


FRONT WHEEL/SUSPENSION/STEERING

Fork tube/slider/spring collar

Check the fork tube, fork slider and spring collar for score marks, scratches, or excessive or abnormal wear.

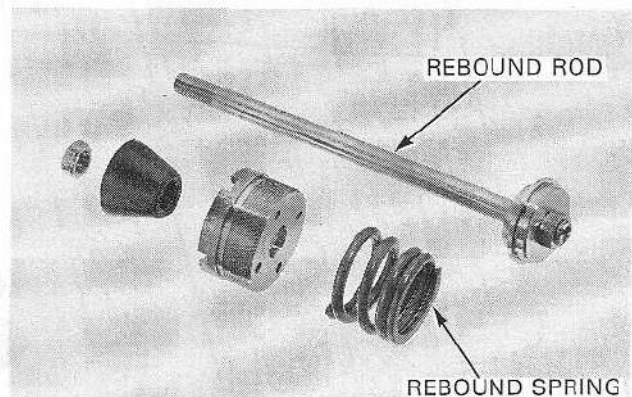
Replace any components which are worn or damaged.



Rebound rod/spring

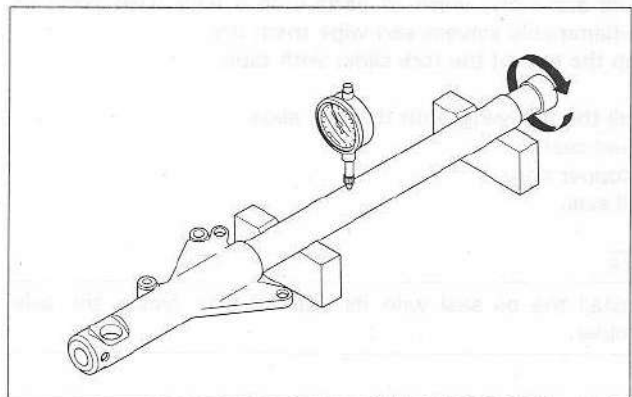
Check the rebound rod for bend or other damage.
Check the rebound spring for fatigue or damage.

Replace the rebound rod assembly if any components are damaged.



Place the fork slider in V-blocks and measure the runout.
Actual runout is 1/2 the total indicator reading.

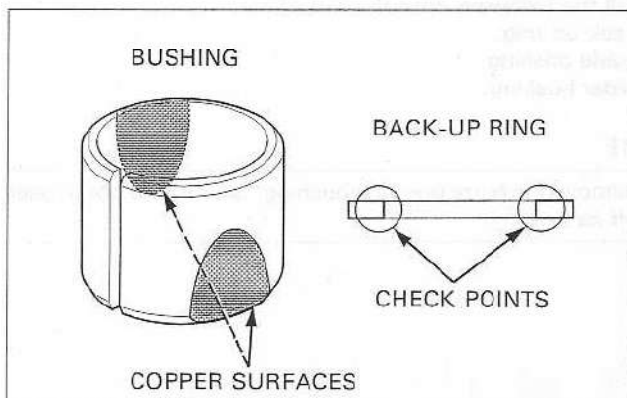
SERVICE LIMIT: 0.20 mm (0.008 in)



Fork tube bushing

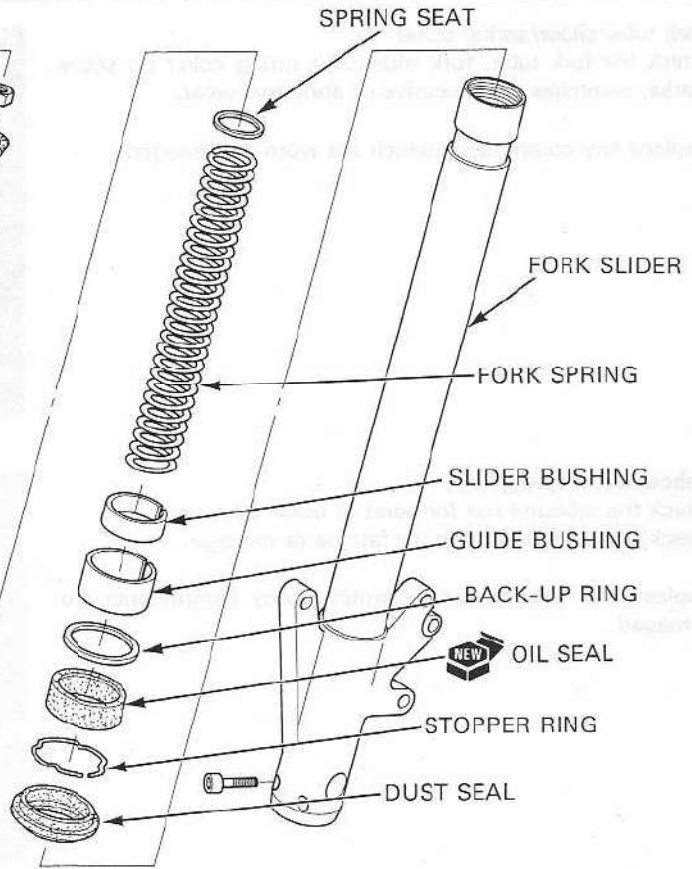
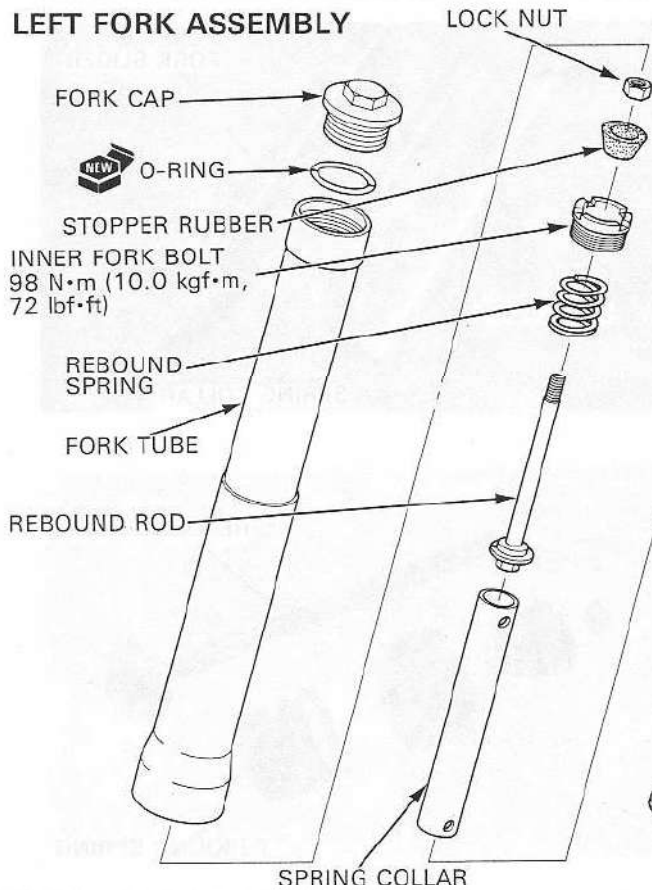
Visually inspect the fork slider and slider bushings.
Replace the bushings if there is excessive scoring or scratching, or if the teflon is worn so that the copper surface appears on more than 3/4 of the entire surface.

Check the back-up ring; replace it if there is any distortion at the points shown.



FRONT WHEEL/SUSPENSION/STEERING

LEFT FORK ASSEMBLY



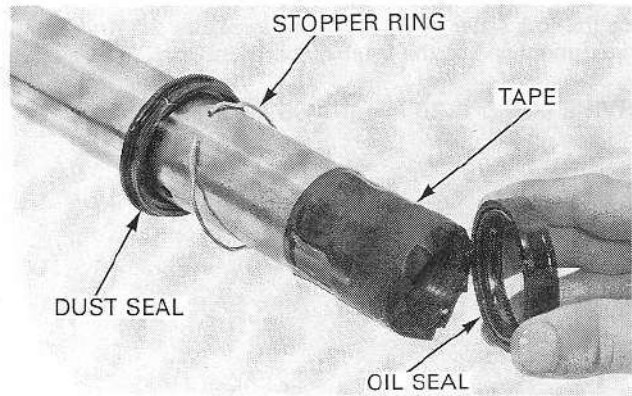
Before assembly, wash all parts with a high flash point or non-flammable solvent and wipe them dry. Wrap the end of the fork slider with tape.

Install the following onto the fork slider.

- dust seal.
- stopper ring.
- oil seal.

NOTE

- Install the oil seal with its marked side facing the axle holder.

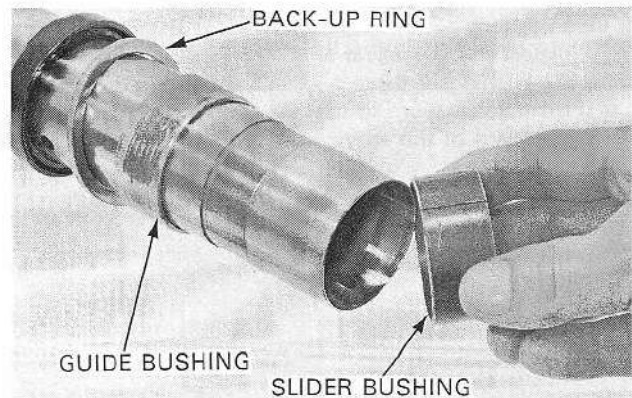


Install the following onto the fork slider.

- back-up ring.
- guide bushing.
- slider bushing.

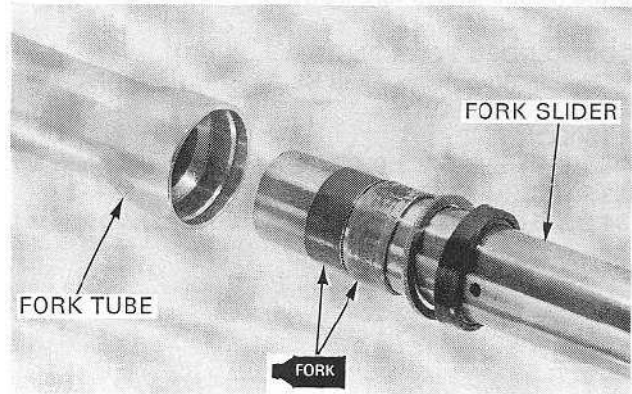
NOTE

- Remove the burrs from the bushing, taking care not to peel off its coating.



FRONT WHEEL/SUSPENSION/STEERING

Coat the slider and guide bushings with the recommended fork fluid and install the slider into the fork tube.

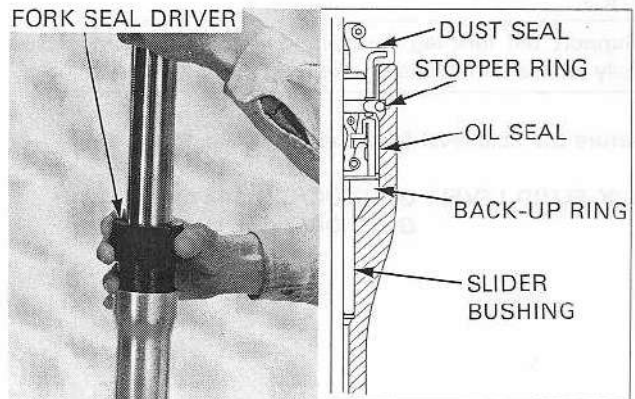


Drive the oil seal in using the special tool.

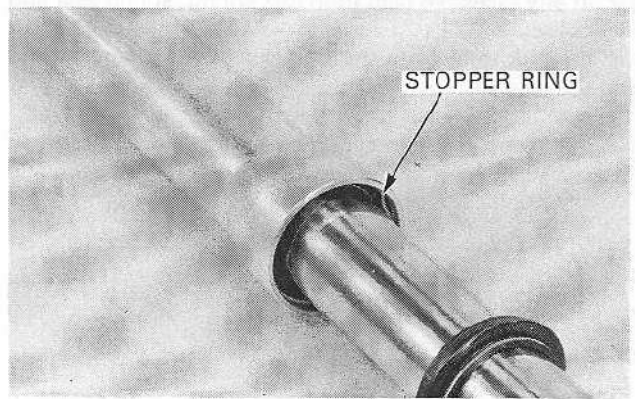
TOOL:

Fork seal driver, 45 mm

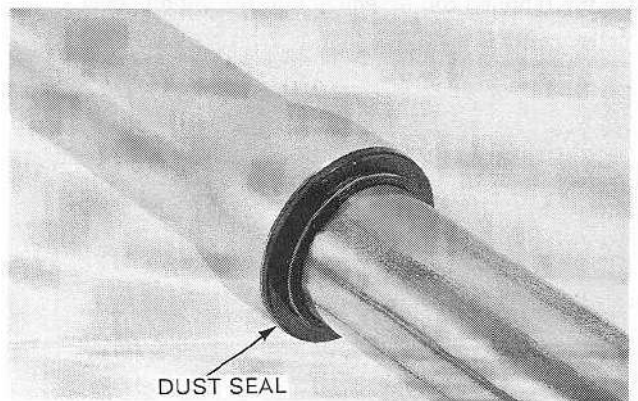
07KMD-KZ30100 or
07KMD-KZ3010A
(U.S.A. only)



Install the stopper ring into the fork slider groove securely.



Install the dust seal.



FRONT WHEEL/SUSPENSION/STEERING

Pour the recommended fork fluid into the fork leg.

RECOMMENDED FORK FLUID:

Pro Honda Suspension Fluid SS-8

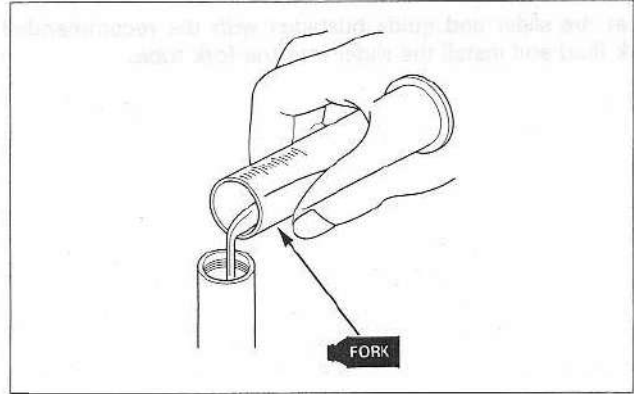
FORK FLUID CAPACITY:

GL1500C/CT:

$744 \pm 2.5 \text{ cm}^3$ (25.2 \pm 0.08 US oz, 26.2 \pm 0.09 Imp oz)

GL1500CF:

$734 \pm 2.5 \text{ cm}^3$ (24.8 \pm 0.08 US oz, 25.8 \pm 0.09 Imp oz)

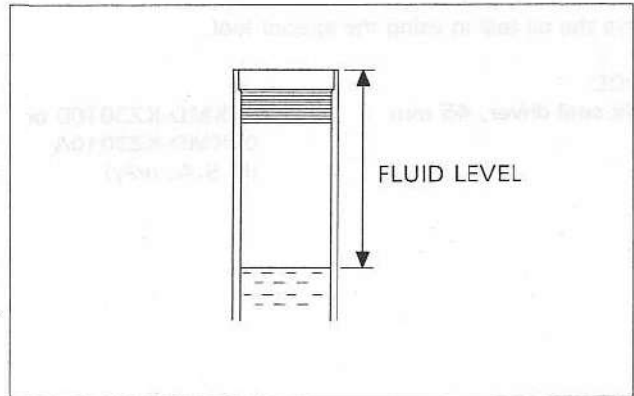


NOTE

- Support the fork leg vertically and the fork compressed fully whenever measuring the fluid level.

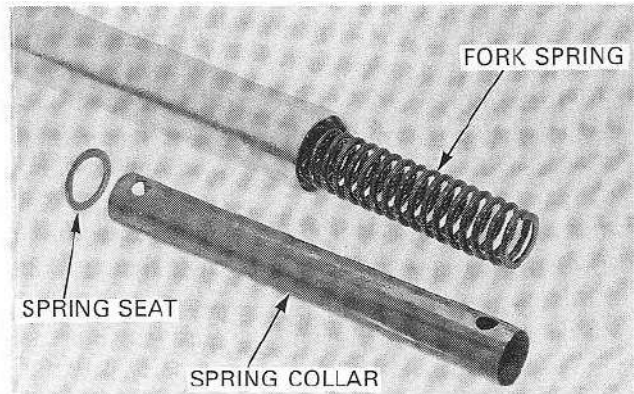
Measure the fluid level from the top of the fork tube.

FORK FLUID LEVEL: GL1500C/CT: 142 mm (5.6 in)
GL1500CF: 148 mm (5.8 in)

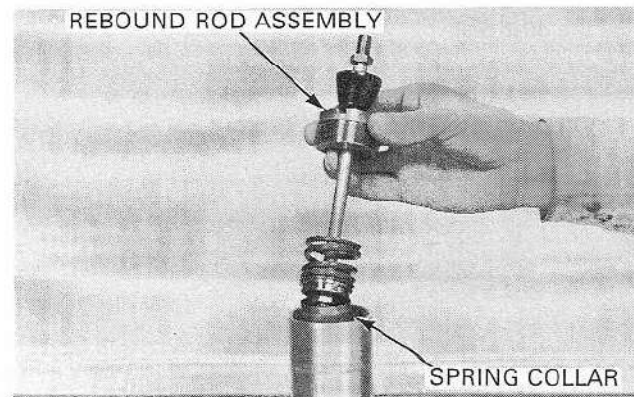


Wipe off any excessive fluid from fork spring, spring seat and spring collar.
Install the fork spring into the fork slider with it tapered end facing up.

Install the spring seat and spring collar into the fork slider.



Install the rebound rod assembly into the spring collar.



FRONT WHEEL/SUSPENSION/STEERING

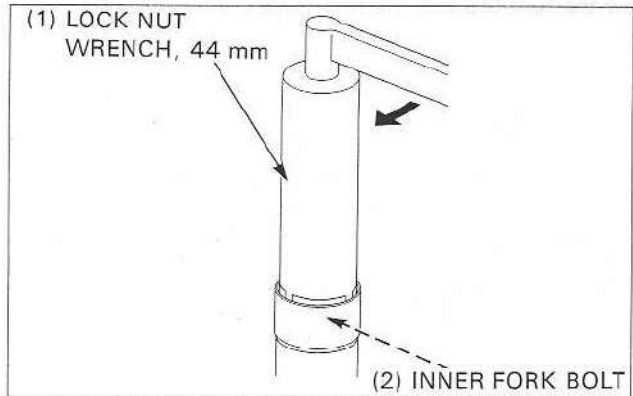
Pushing down and tighten the inner fork bolt to the specified torque.

TOOL:

Lock nut wrench, 44 mm

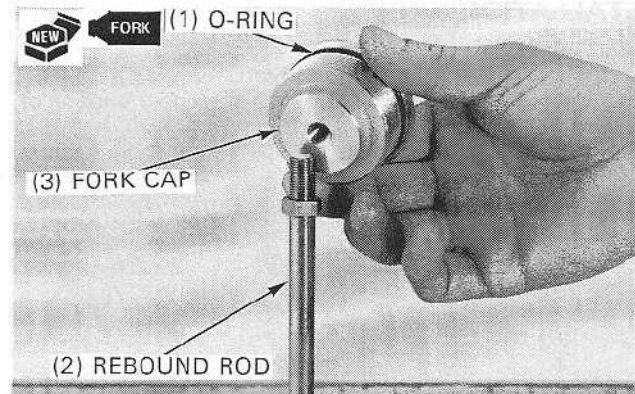
07VMA-MZ0010A

TORQUE: 98 N·m (10.0 kgf·m, 72 lbf·ft)



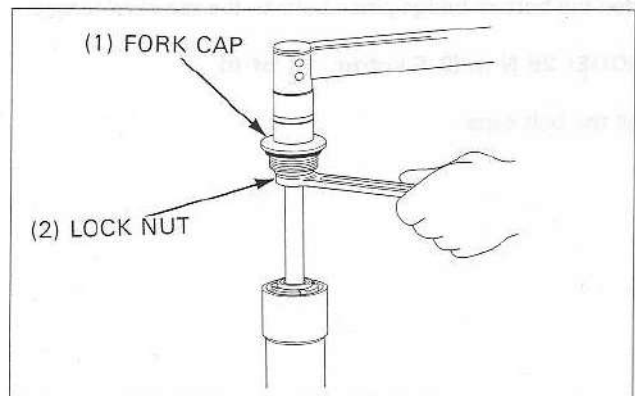
Install the new O-ring onto the fork cap.
Apply fork fluid to the new O-ring.

Install the fork cap onto the rebound rod.

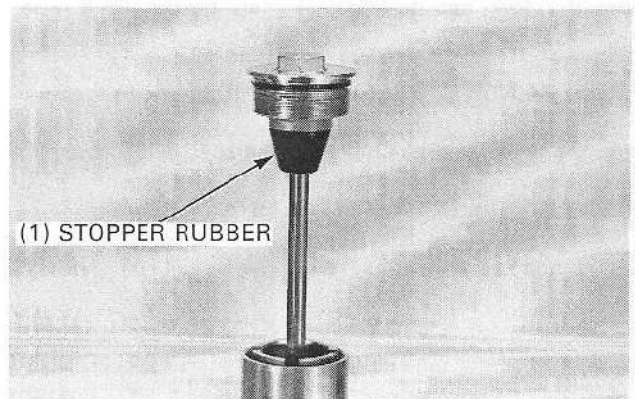


Hold the lock nut and tighten the fork cap to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 14 lbf·ft)

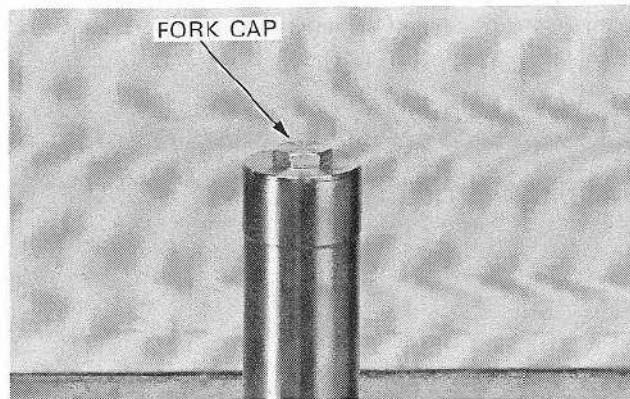


Slide the stopper rubber up.



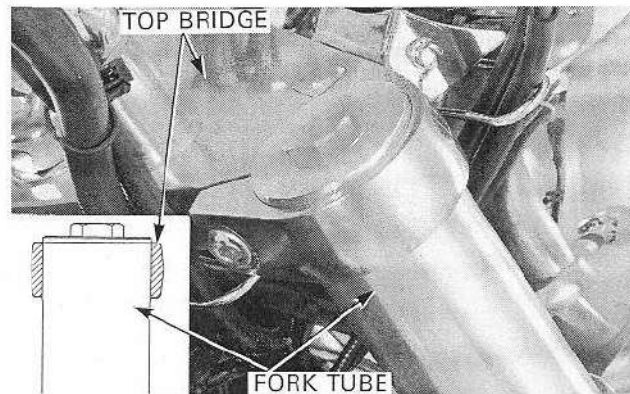
FRONT WHEEL/SUSPENSION/STEERING

Screw the fork cap into the fork tube.



INSTALLATION

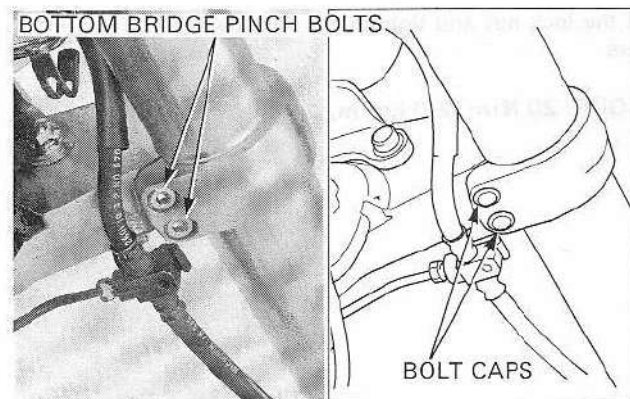
Install the fork legs into the steering stem and fork top bridge. Align the top end of the fork tube with the upper surface of the top bridge as shown.



Tighten the bottom bridge pinch bolts to the specified torque.

TORQUE: 25 N·m (2.5 kgf·m, 18 lbf·ft)

Install the bolt caps.



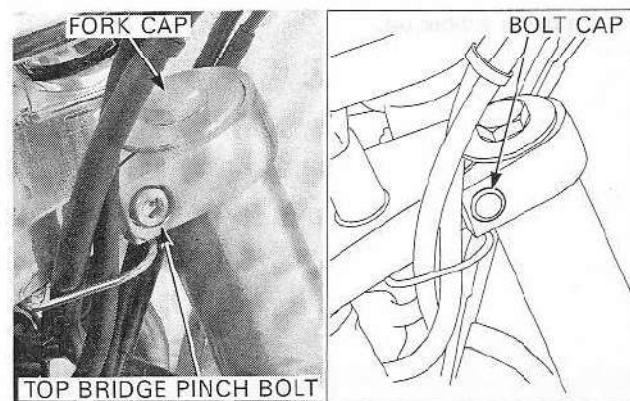
Tighten the fork cap to the specified torque (if it was removed).

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Tighten the top bridge pinch bolt to the specified torque.

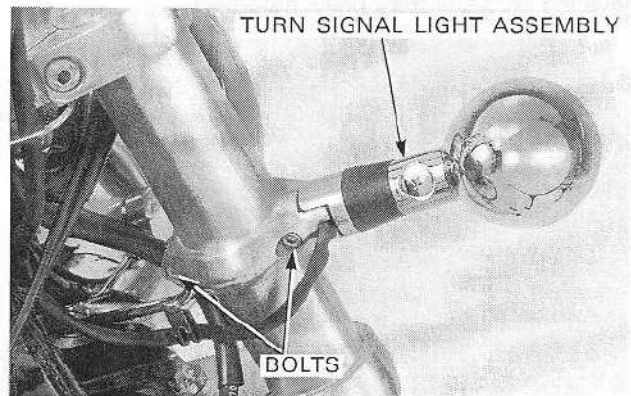
TORQUE: 55 N·m (5.6 kgf·m, 41 lbf·ft)

Install the bolt cap.

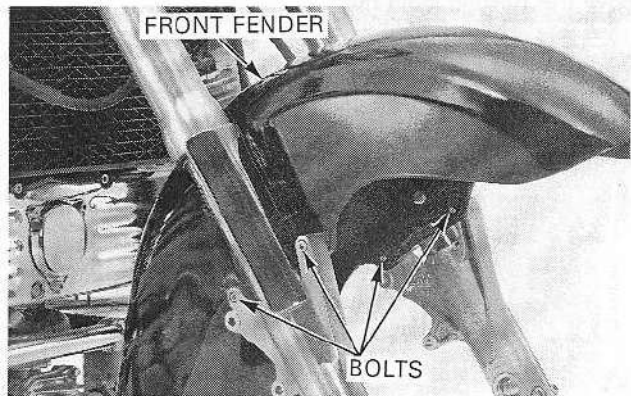


FRONT WHEEL/SUSPENSION/STEERING

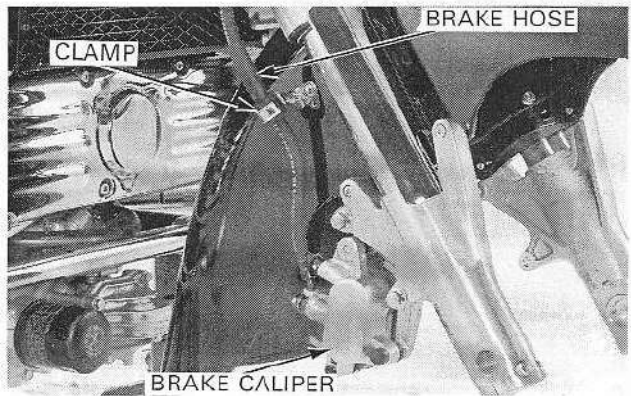
Install the turn signal light assembly and tighten the bolts (GL1500C/CT only).



Install the front fender and tighten the bolts.



Install the brake hose and clamp to the front fender and tighten the bolts.



Install the front wheel (page 13-13).

Install the right and left brake calipers (page 15-19).

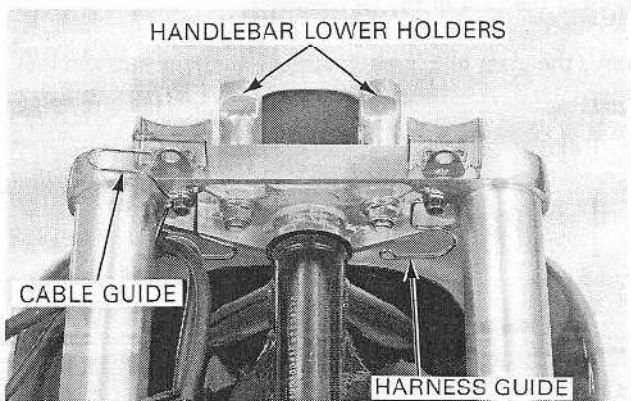
STEERING STEM

REMOVAL

Remove the following:

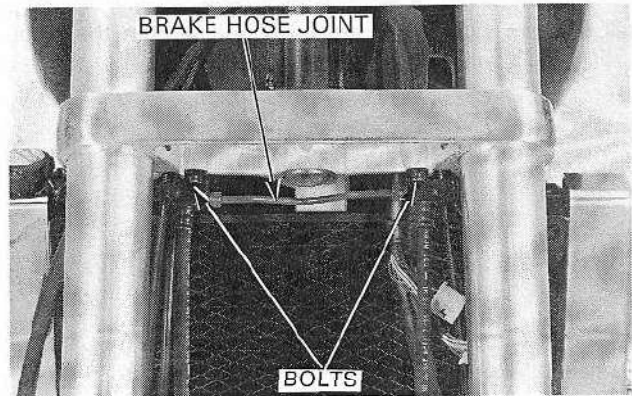
- headlight and headlight case (GL1500C/CT: page 19-4).
- meters (GL1500C/CT: page 19-6).
- handlebar (page 13-3).
- front wheel (page 13-8).
- front fender (page 13-16).
- front fairing, fairing stay, stay brackets (GL1500CF: page 2-7).

Remove the harness guide, cable guide and handlebar lower holders if necessary.



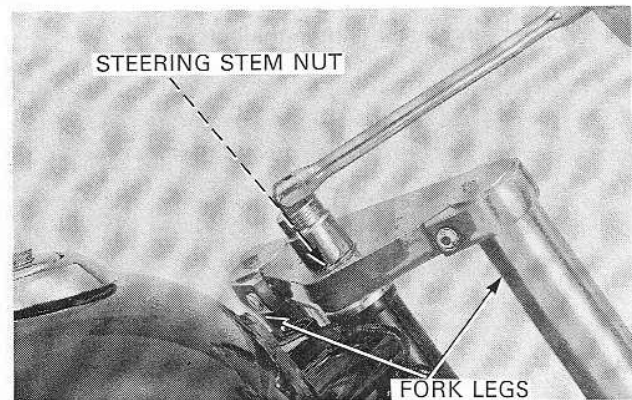
FRONT WHEEL/SUSPENSION/STEERING

Remove the bolts and front brake hose joint.

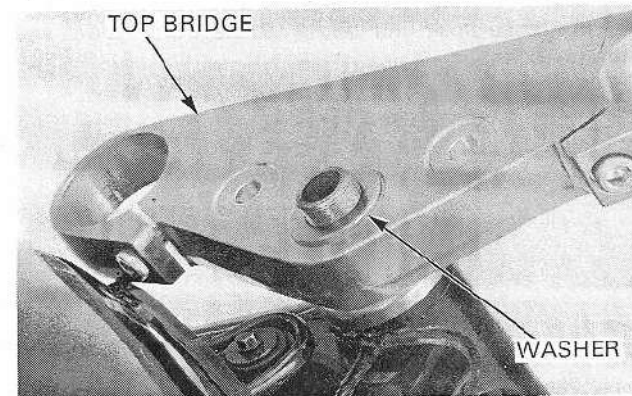


Remove the steering stem nut.

Remove the fork legs (page 13-16).

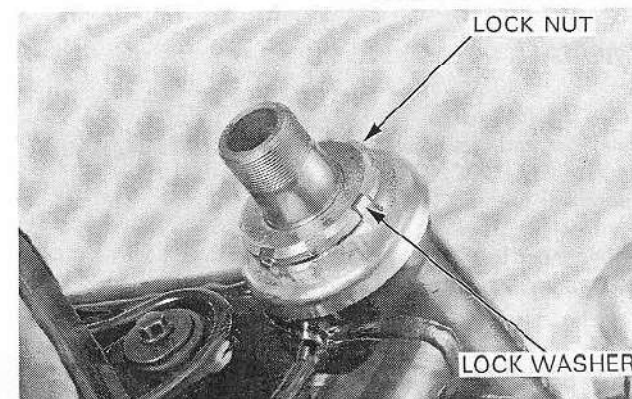


Remove the washer and the top bridge.



Straighten the tabs of the lock washer.

Remove the stem bearing adjustment nut, lock nut, and lock washer.



FRONT WHEEL/SUSPENSION/STEERING

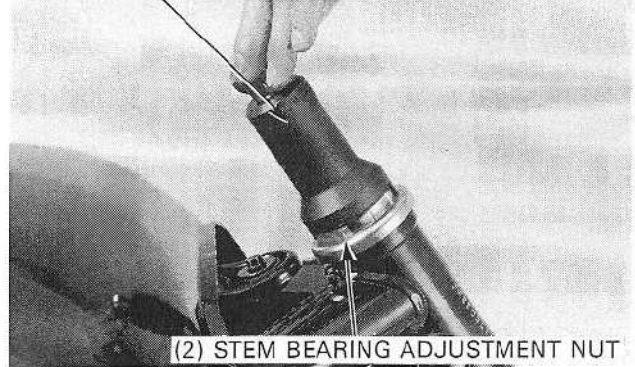
Remove the steering stem bearing adjustment nut using the special tool.

TOOL:

Steering stem socket

07916-3710100

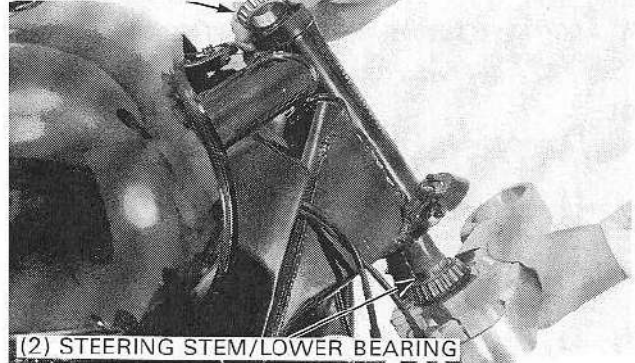
(1) STEERING STEM SOCKET



(2) STEM BEARING ADJUSTMENT NUT

Remove the upper bearing and steering stem/lower bearing.

(1) UPPER BEARING



(2) STEERING STEM/LOWER BEARING

BEARING REPLACEMENT

NOTE

- Always replace the bearings and races as a set.

Drive out the upper bearing outer race using the special tool.

TOOLS:

Bearing race remover attachment 07935-MJ1000B or
07935-MJ1000A
and

Driver 07949-3710001
Attachment, 37×40 mm 07746-0010200

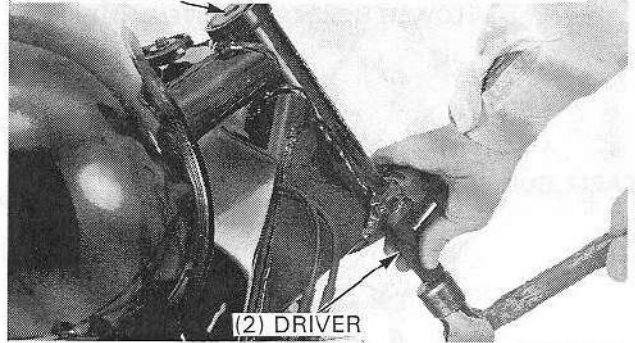
Drive out the lower bearing outer race using the special tool.

TOOLS:

Ball race remover 07946-3710500 or
M9360-277-91774
(U.S.A. only)
and

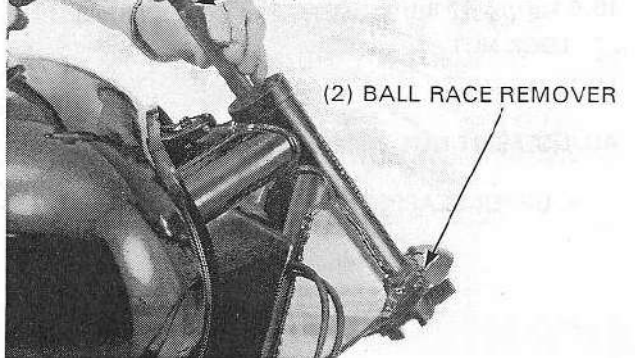
Driver 07949-3710001
Attachment, 37×40 mm 07746-0010200

(1) BALL RACE REMOVER ATTACHMENT (SIDE B)
AND ATTACHMENT



(2) DRIVER

(1) DRIVER

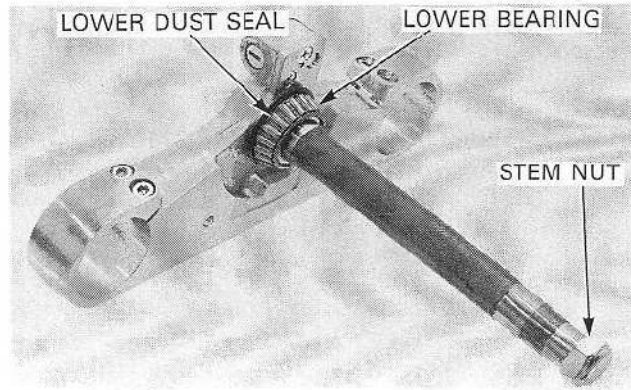


(2) BALL RACE REMOVER

FRONT WHEEL/SUSPENSION/STEERING

Temporarily install the steering stem nut to prevent the threads from being damaged when removing the lower bearing from the stem.

Remove the lower bearing and dust seal from the steering stem.

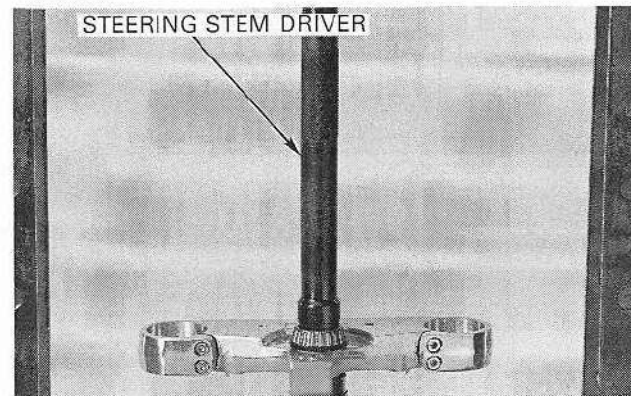


Apply grease to new dust seal lips and install it over the steering stem. Install a new lower bearing inner race using a special tool and a hydraulic press.

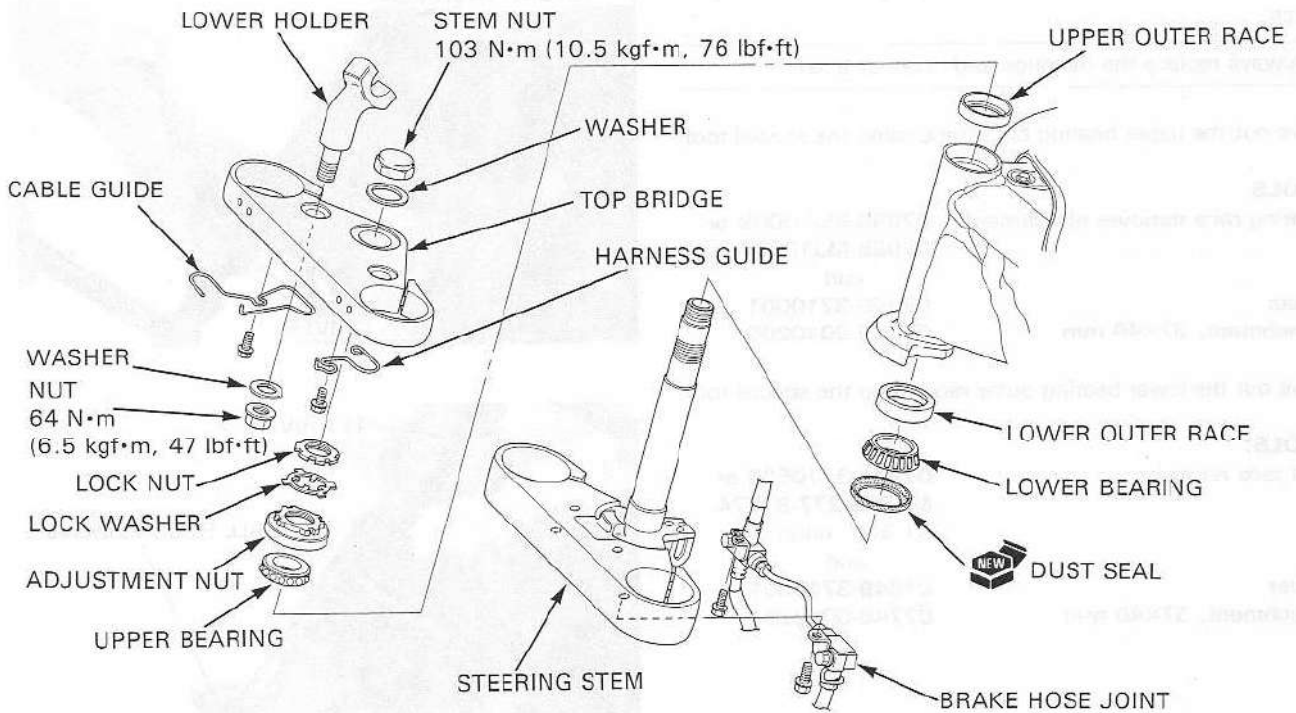
TOOL:

Steering stem driver

07946-MB00000



INSTALLATION

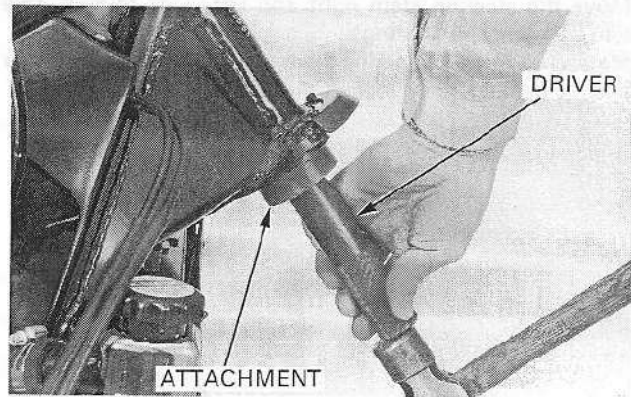


FRONT WHEEL/SUSPENSION/STEERING

Drive a new lower bearing outer race into the steering head pipe using the special tools.

TOOLS:

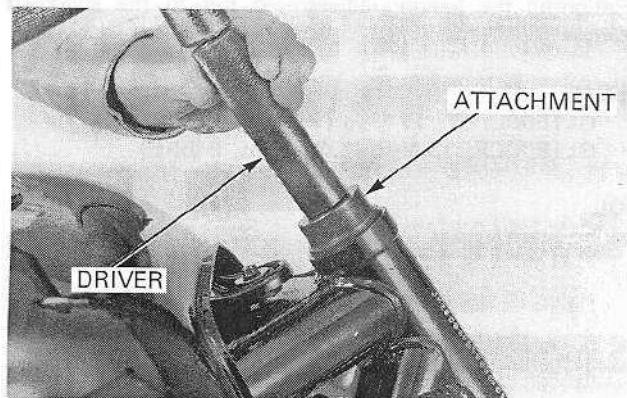
Driver 07749-0010000
Attachment, 52×55 mm 07746-0010400



Drive a new upper bearing outer race into the steering head pipe using the special tools.

TOOLS:

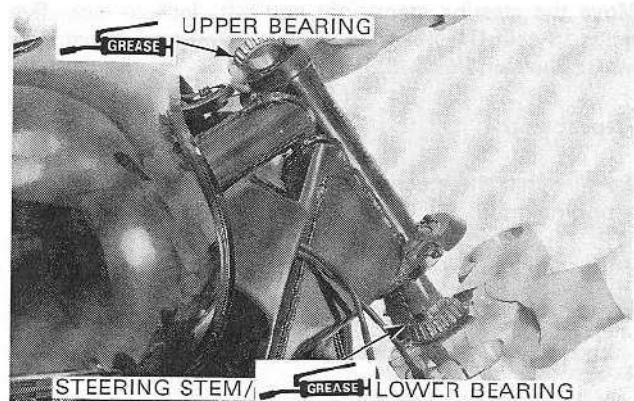
Driver 07749-0010000
Attachment, 42×47 mm 07746-0010300



Apply 3g (0.11 oz) of grease to upper and lower bearings.

Apply oil to the bearing adjustment nut threads.

Install the steering stem into the steering head pipe, and install the upper bearing and stem bearing adjustment nut.



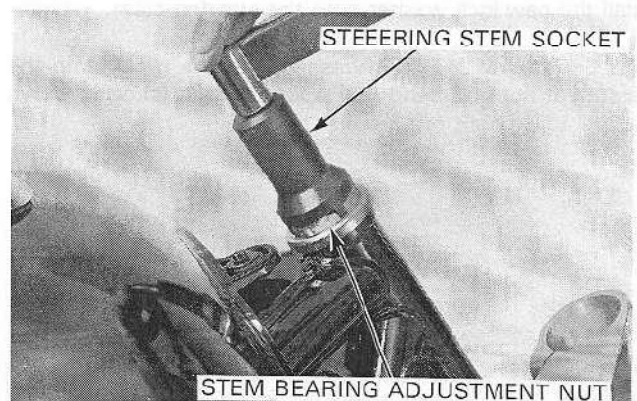
Tighten the stem bearing adjustment nut as follows:

1. Tighten the stem bearing adjustment nut to the initial torque.

TOOL:

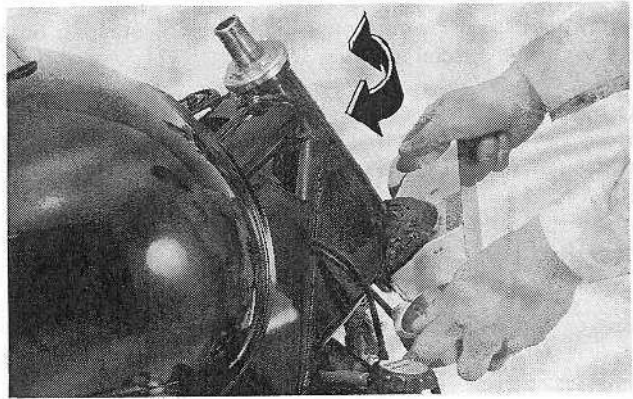
Steering stem socket 07916-3710100

TORQUE: 40 N·m (4.1 kgf·m, 30 lbf·ft)



FRONT WHEEL/SUSPENSION/STEERING

2. Move the steering stem right and left, lock-to-lock, five times to seat the bearings.
Make sure that the steering stem moves smoothly, without play or binding; then loosen the bearing adjustment nut.



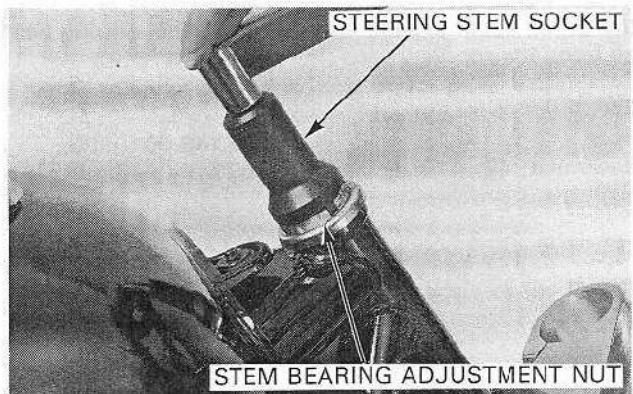
3. Retighten the bearing adjustment nut to the specified torque.

TORQUE:

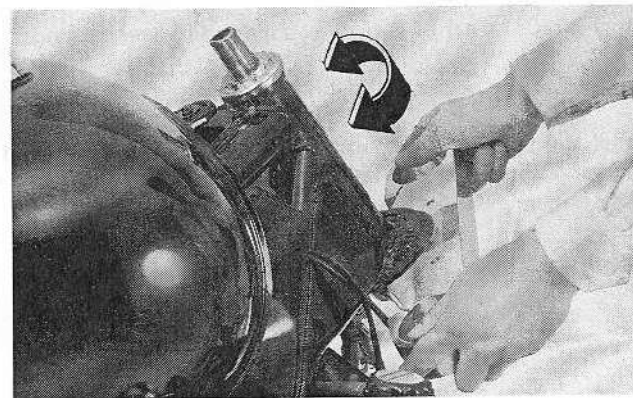
GL1500C/CT: 17 N·m (1.7 kgf·m, 12 lbf·ft)
GL1500CF: 13 N·m (1.3 kgf·m, 9 lbf·ft)

TOOL:

Steering stem socket 07916-3710100



4. Move the steering stem right and left, lock-to-lock, five times to seat the bearings and retighten and adjustment nut to the same torque.

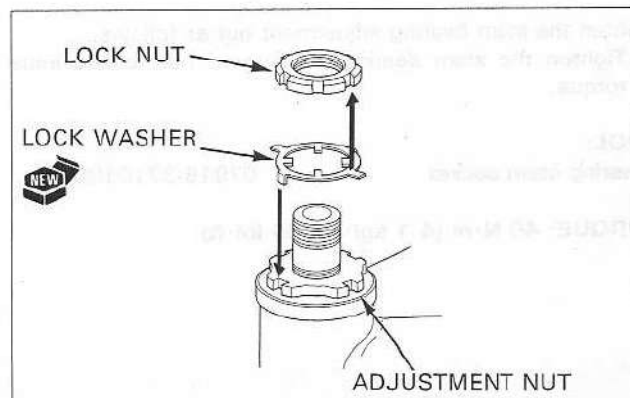


5. Repeat step 4.

Make sure that the steering stem moves smoothly, without play or binding.

Install the new lock washer onto the steering stem.

Align the tabs of the lock washer with the grooves in the adjustment nut and bend two opposite tabs (shorter) down into the adjustment nut groove.

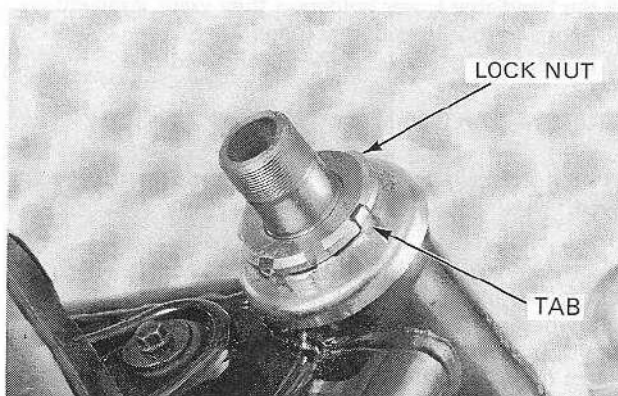


FRONT WHEEL/SUSPENSION/STEERING

Install and finger tighten the stem bearing adjustment lock nut.

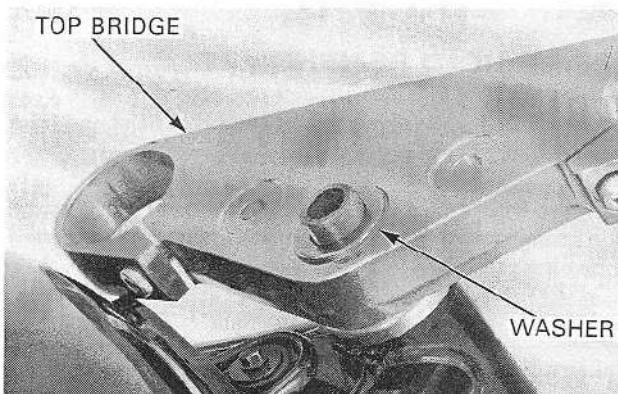
Hold the adjustment nut and further tighten the lock nut within 1/4 turn (90°) enough to align its grooves with the lock washer tabs.

Bend the lock washer tabs up into the lock nut groove.



Install the top bridge and washer.

Install the fork legs (page 13-34).



Install the steering stem nut.

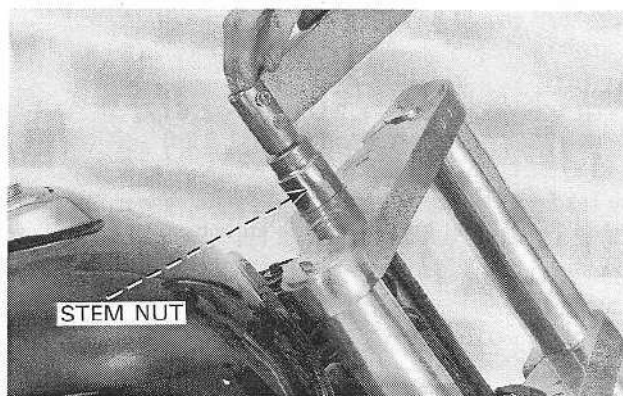
Tighten the steering stem nut to the specified torque.

TORQUE:

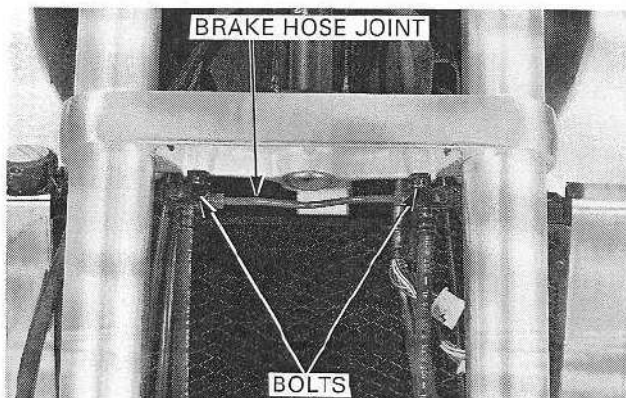
GL1500C/CT: 103 N·m (10.5 kgf·m, 76 lbf·ft)

GL1500CF: 100 N·m (10.2 kgf·m, 74 lbf·ft)

Make sure that the steering stem moves smoothly without play or binding.



Install the brake hose joint and tighten the bolts.



FRONT WHEEL/SUSPENSION/STEERING

Install the handlebar lower holders if they were removed.
Install the handlebar temporarily (page 13-5)
Install and tighten the nuts to the specified torque.

TORQUE: 64 N·m (6.5 kgf·m, 47 lbf·ft)

Install the harness guide and cable guide if they were removed.

Install the following:

- front fender (page 13-35).
- front wheel (page 13-13).
- handlebar (page 13-5).
- meters (GL1500C/CT: page 19-6).
- headlight and headlight case (GL1500C/CT: page 19-4).
- stay brackets, fairing stay, front fairing (GL1500CF: page 2-7).

STEERING HEAD BEARING PRE-LOAD

Support the motorcycle using a safety stand or hoist and raise the front wheel off the ground.

Position the steering stem to the straight ahead position.
Hook a spring scale to the fork tube and measure the steering head bearing pre-load.

NOTE

- Make sure that there is no cable or wire harness interference.

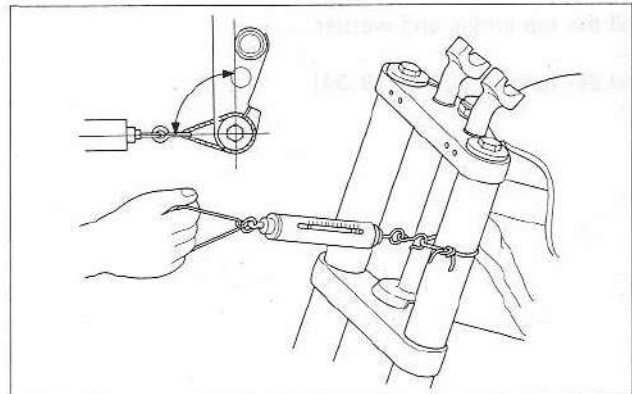
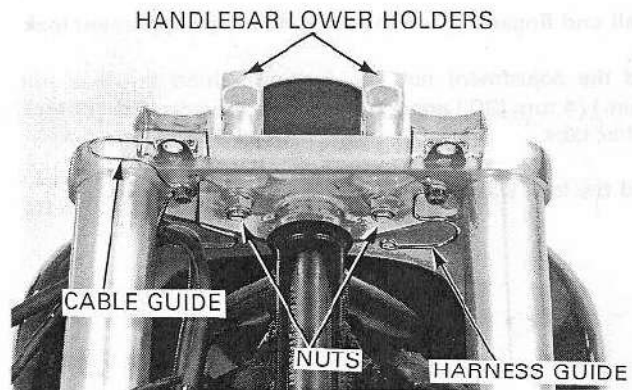
The pre-load should be within the specification.

PRE-LOAD:

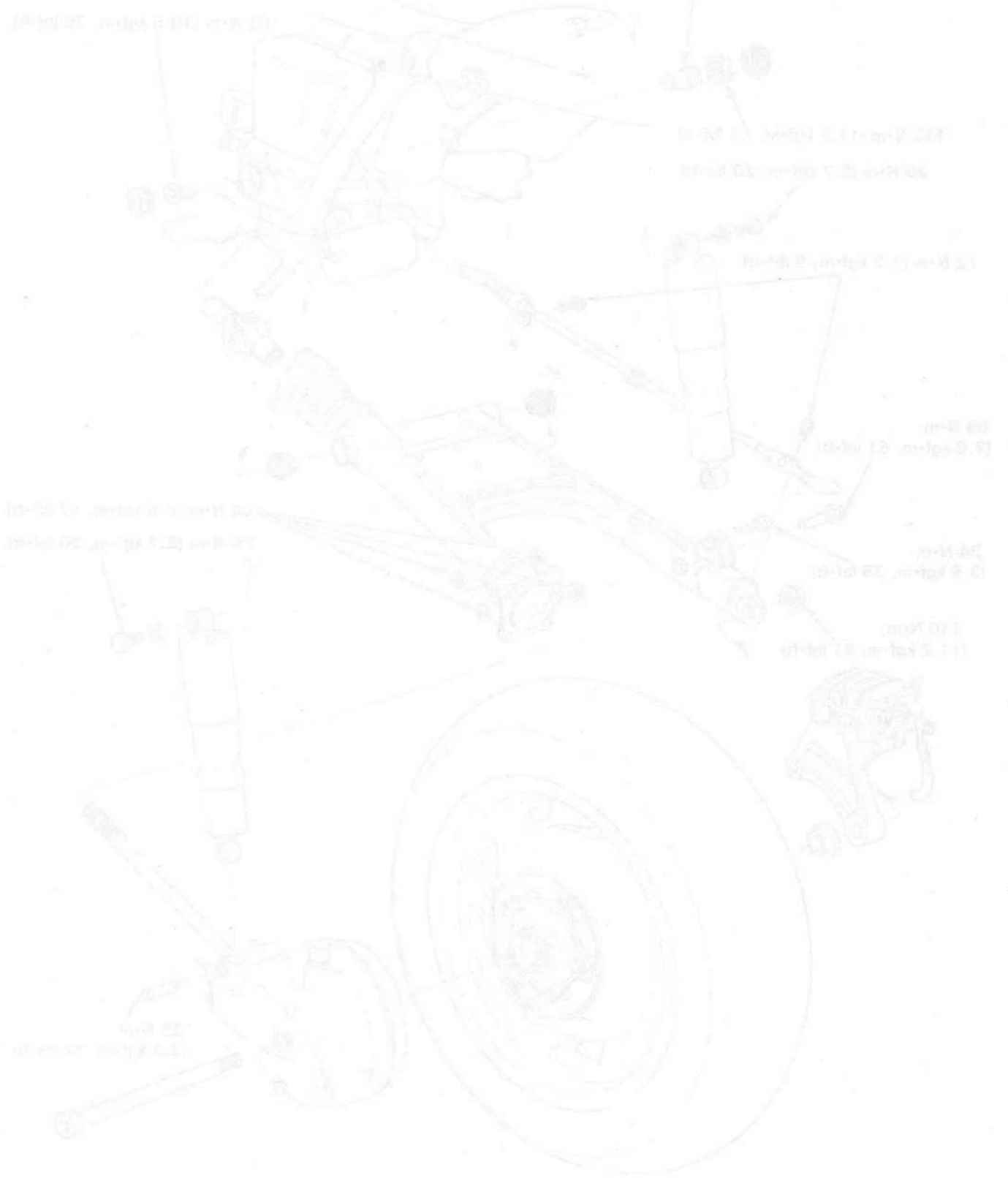
GL1500C/CT: 0.8—1.2 kgf (1.8—2.6 lbf)

GL1500CF: 0.5—1.0 kgf (1.1—2.2 lbf)

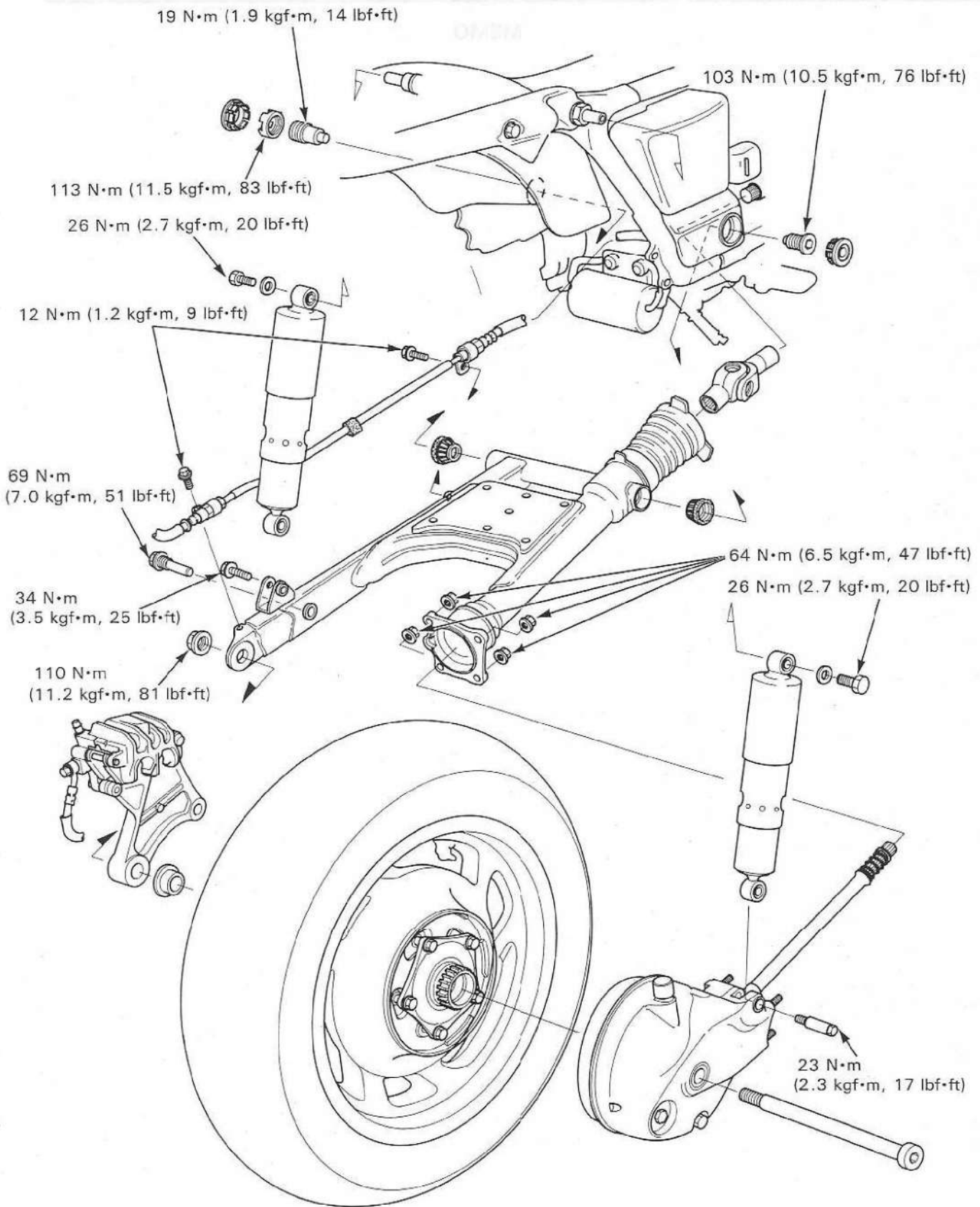
If the readings do not fall within the limits, lower the front wheel to the ground and adjust the steering bearing adjustment nut.



MEMO



REAR WHEEL/SUSPENSION



14. REAR WHEEL/SUSPENSION

SERVICE INFORMATION	14-1	SHOCK ABSORBER	14-9
TROUBLESHOOTING	14-2	SWINGARM	14-10
REAR WHEEL	14-3		

SERVICE INFORMATION

GENERAL

▲ 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.

- When servicing the rear wheel, shock absorber or swingarm, support the motorcycle using a safety stand or hoist.
- Refer to section 15 for brake system information.
- Use only tires marked "TUBELESS" and tubeless valves on rim marked "TUBELESS APPLICABLE".
- Use genuine Honda replacement bolts and nuts for all suspension pivot and mounting points.
- When using the lock nut wrench, use a deflecting beam type torque wrench 20 inches long. The lock nut wrench increases the torque wrench's leverage, so the torque wrench reading will be less than the torque actually applied to the lock nut. The specification given below is the actual torque applied to the lock nut, not the reading on the torque wrench when used with the lock nut wrench. The procedure later in the text gives both actual and indicated.

SPECIFICATIONS

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Minimum tire tread depth	—	2.0 (0.08)
Cold tire pressure	Up to 90 kg (200 lb) load	225 kPa (2.25 kgf/cm ² , 33 psi)
	Up to maximum weight capacity	250 kPa (2.50 kgf/cm ² , 36 psi)
Axle runout	—	0.20 (0.008)
Wheel rim runout	Radial	—
	Axial	—
Shock absorber pre-load adjuster setting	2nd position	—

14

TORQUE VALUES

Rear axle nut	110 N·m (11.2 kgf·m, 81 lbf·ft)	
Rear brake disc bolt	42 N·m (4.3 kgf·m, 31 lbf·ft)	ALOC bolt
Damper holder plate bolt	20 N·m (2.0 kgf·m, 14 lbf·ft)	
Driven flange pin bolt	59 N·m (6.0 kgf·m, 14 lbf·ft)	ALOC bolt
Swingarm pivot (Right)	103 N·m (10.5 kgf·m, 76 lbf·ft)	
Swingarm pivot (Left)	19 N·m (1.9 kgf·m, 14 lbf·ft)	
Swingarm pivot lock nut	113 N·m (11.5 kgf·m, 83 lbf·ft)	
Shock absorber upper mounting bolt	64 N·m (6.5 kgf·m, 47 lbf·ft)	UBS nut
Shock absorber lower mounting bolt	Right: 23 N·m (2.3 kgf·m, 17 lbf·ft)	
	Left: 34 N·m (3.5 kgf·m, 25 lbf·ft)	
Rear brake hose clamp bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Rear brake caliper stopper pin bolt	69 N·m (7.0 kgf·m, 51 lbf·ft)	

REAR WHEEL/SUSPENSION

TOOLS

Attachment, 32×35 mm	07746-0010100
Attachment, 37×40 mm	07746-0010200
Attachment, 42×47 mm	07746-0010300
Pilot, 20 mm	07746-0040500
Bearing remover shaft	07746-0050100
Bearing remover head, 20 mm	07746-0050600
Driver	07749-0010C00
Swingarm lock nut wrench	07908-4690C03
Slide hammer, 3/8×16	

Commercially available

TROUBLESHOOTING

Soft suspension

- Weak shock absorber spring
- Incorrect suspension adjustment
- Oil leakage from damper unit
- Tire pressure too low

Hard suspension

- Damaged shock absorber mount bushing
- Bent damper rod
- Damaged swingarm pivot bearings
- Bent swingarm pivot
- Incorrect suspension adjustment
- Tire pressure too high

Steers to one side or does not track straight

- Bent swingarm

Rear wheel wobbling

- Bent rim
- Worn rear wheel bearings
- Faulty tire
- Unbalanced tire and wheel
- Tire pressure too low
- Faulty swingarm pivot bearings

REAR WHEEL

REMOVAL

Remove the right and left mufflers (page 2-12).

Support the motorcycle securely using a hoist or equivalent.

Remove the rear fender (page 2-4).

Remove the saddlebag bracket joint pipe (GL1500CT/CF: page 2-9).

Remove the axle nut.

Remove the rear brake caliper stopper bolt.

Pull out the rear axle.

Remove the rear brake caliper from the brake disc.

CAUTION

- Do not hang the brake caliper from the brake hose. Do not twist the brake hose. Support caliper from grab rail using a strap or hanger.

NOTE

- Do not depress the brake pedal after removing the caliper.

Move the rear wheel to the left to separate it from the final gear case and remove the rear wheel.

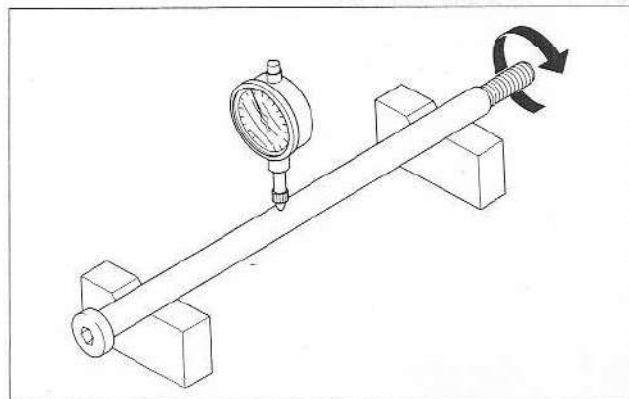
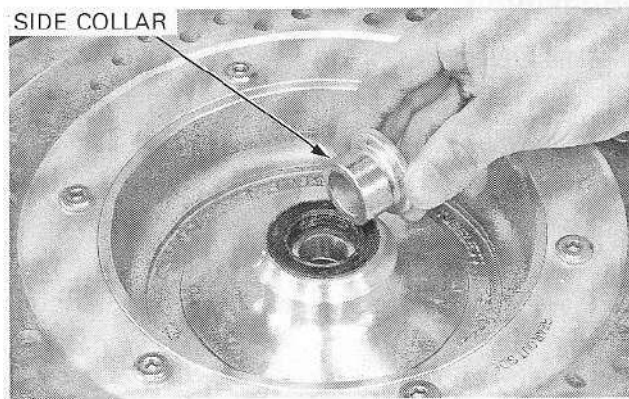
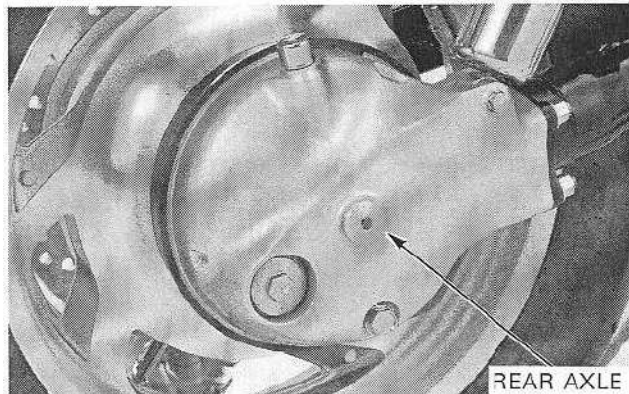
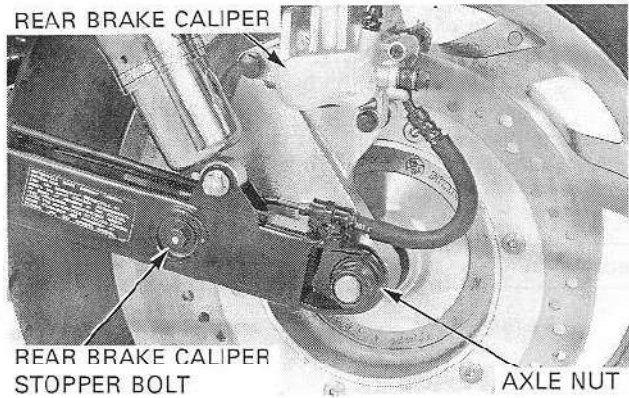
Remove the left side collar.

INSPECTION

Axle

Place the axle in V-blocks and measure the runout. Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.20 mm (0.008 in)



REAR WHEEL/SUSPENSION

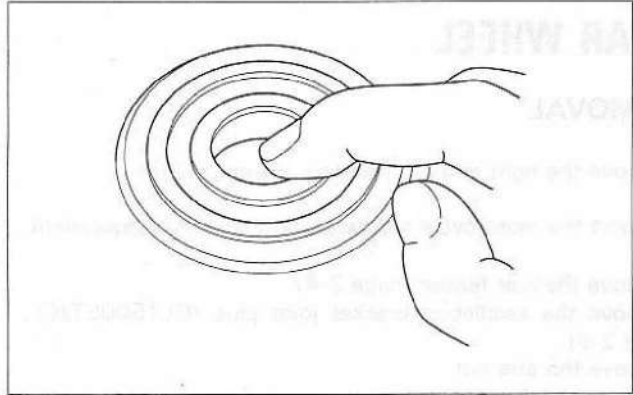
Wheel bearing

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

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

NOTE

- Replace the wheel bearings in pairs.



Wheel rim runout

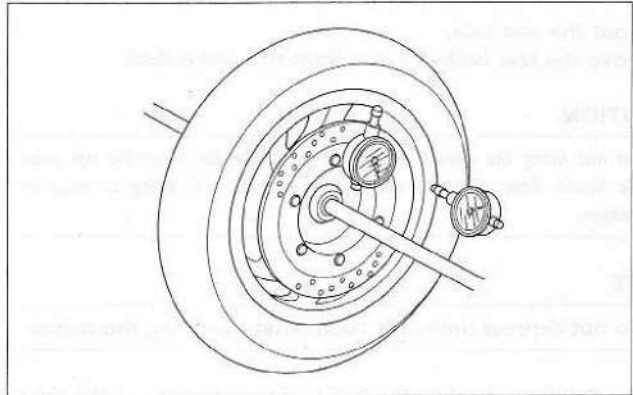
Check the rim runout by placing the wheel in a truing stand. Spin the wheel slowly and read the runout using a dial indicator.

Actual runout is 1/2 the total indicator reading.

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

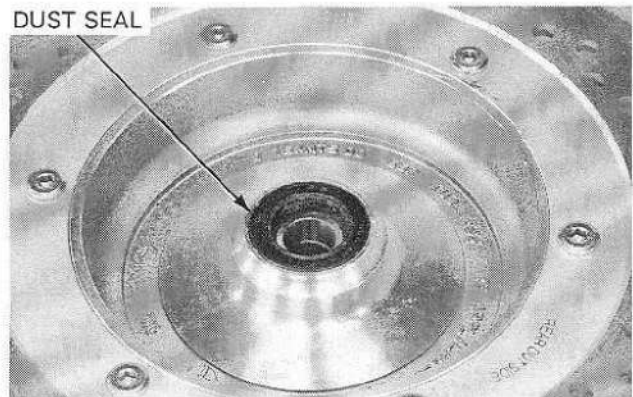
Wheel balance

See page 13-10 for wheel balance.

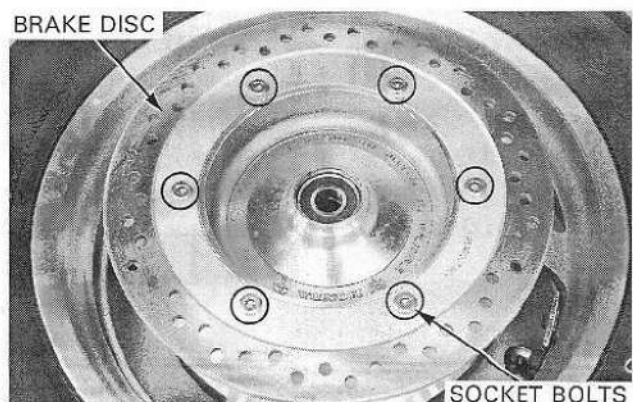


DISASSEMBLY

Remove the left dust seal.



Remove the bolts and brake disc.

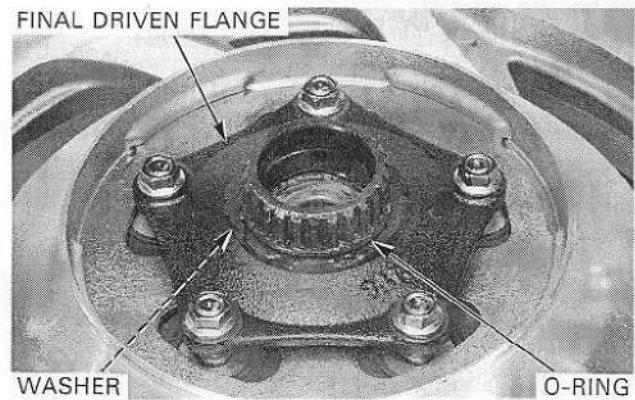


REAR WHEEL/SUSPENSION

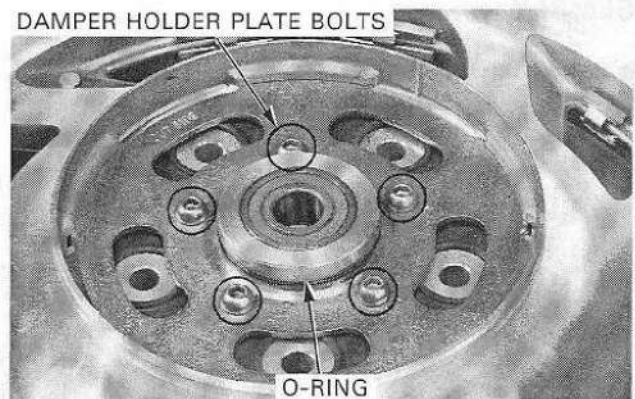
Remove the O-ring from the driven flange.
Remove the driven flange assembly and washer from the left wheel hub.

NOTE

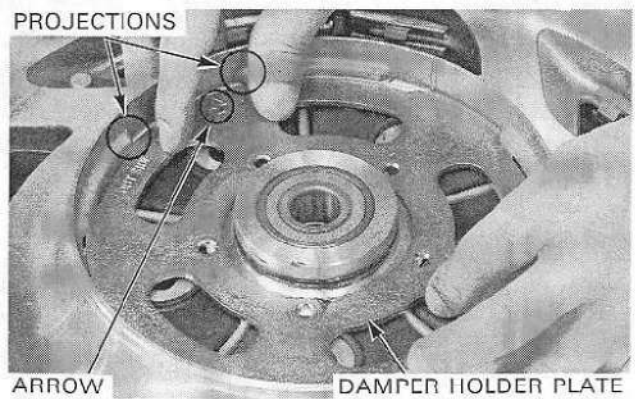
- Do not try to disassemble the final driven flange assembly.



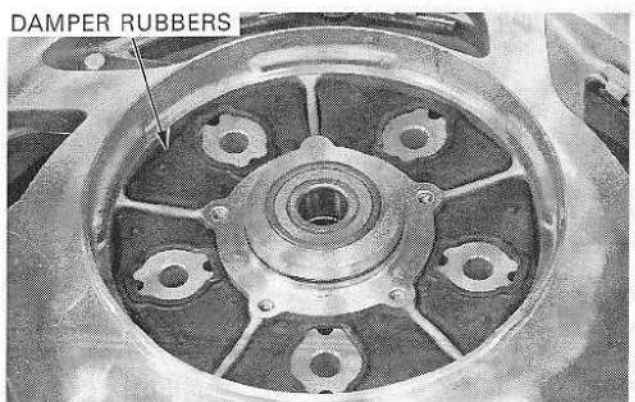
Remove the O-ring.
Remove the damper holder plate bolts.



Align the arrow on the damper holder plate between the projections on the wheel by turning the holder plate and remove the plate.



Remove the damper rubbers.



REAR WHEEL/SUSPENSION

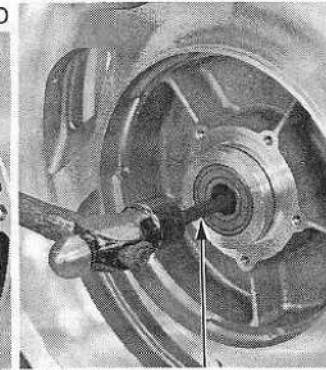
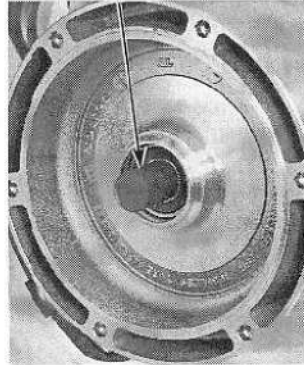
Wheel bearing removal

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

TOOLS:

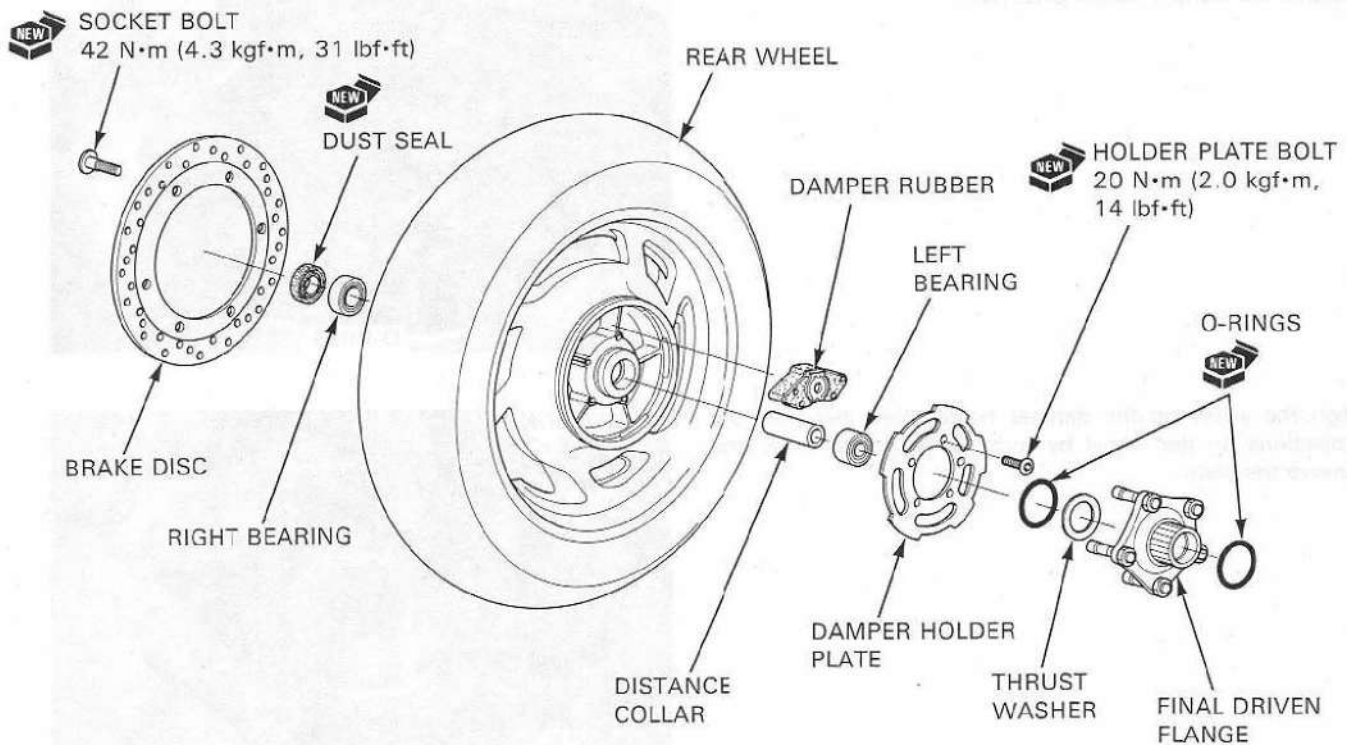
Bearing remover head, 20 mm 07746-0050600
Bearing remover shaft 07746-0050100

BEARING REMOVER HEAD



BEARING REMOVER SHAFT

ASSEMBLY



Wheel bearing installation

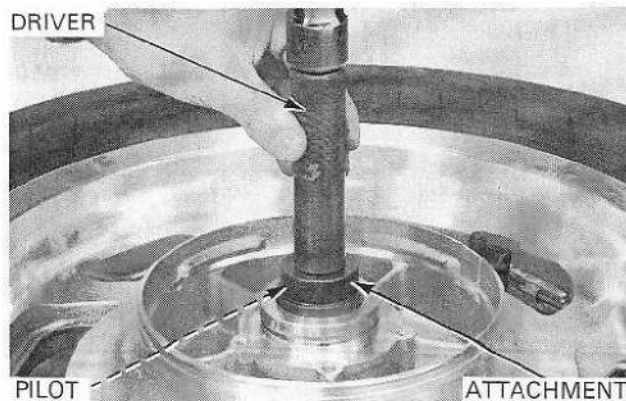
CAUTION

- Never install the old bearings, once the bearings have been removed, the bearings must be replaced with new ones.

Drive in a new right bearing squarely.
Install the distance collar, then drive in the left side bearing.

TOOLS:

Driver 07749-0010000
Attachment, 42×47 mm 07746-0010300
Pilot, 20 mm 07746-0040500



REAR WHEEL/SUSPENSION

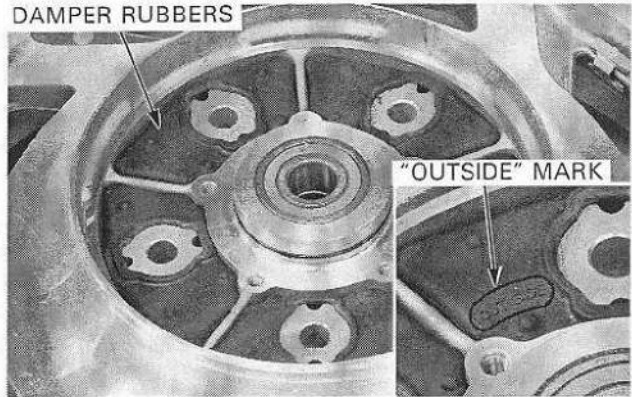
Check the wheel damper rubbers for deterioration or damage and replace them with new ones if necessary.

NOTE

- Replace the wheel damper rubbers as a set.

Install the wheel damper rubbers into the wheel hub with the "OUTSIDE" mark facing out.

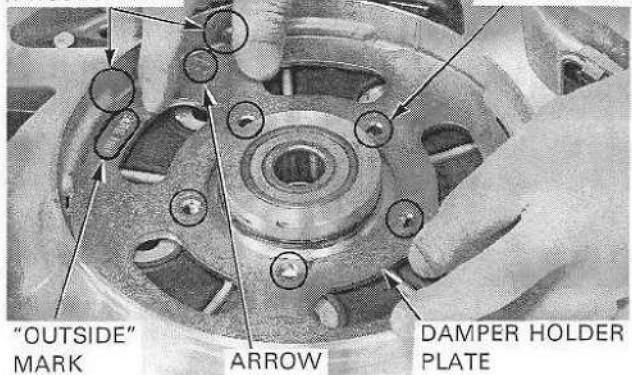
DAMPER RUBBERS



Install the damper holder plate with the "OUTSIDE" mark facing out, aligning the arrow between the projections on the wheel, and turn it clockwise until the bolt holes in the holder plate and wheel align.

PROJECTIONS

BOLT HOLES



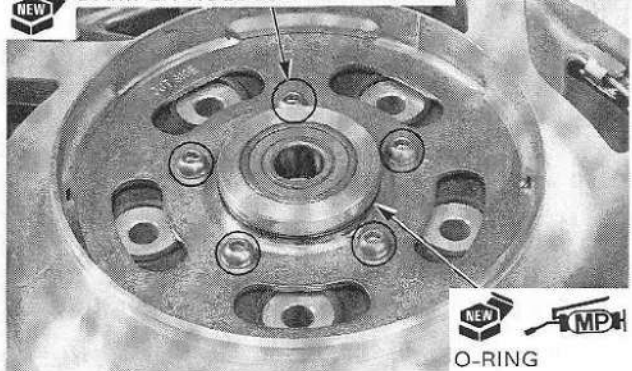
Install and tighten the new damper holder plate bolts to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 14 lbf·ft)

Pack molybdenum disulfide paste into the O-ring groove in the wheel hub.

Coat a new O-ring with molybdenum disulfide paste and install it into the groove.

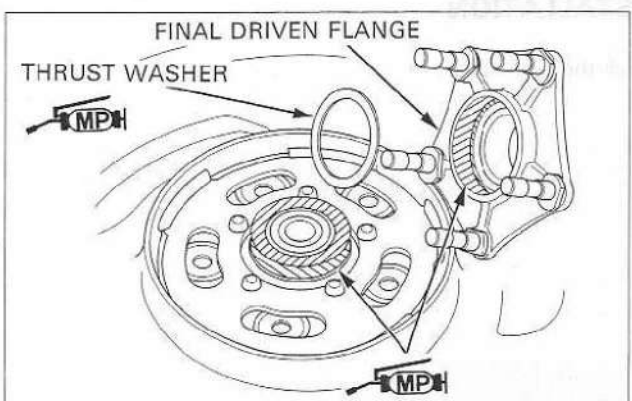
DAMPER HOLDER PLATE BOLTS



Apply 3 g (0.11 oz) of molybdenum disulfide paste to the mating surface of the wheel hub and final driven flange as shown.

Apply molybdenum disulfide paste to the whole surface of the thrust washer.

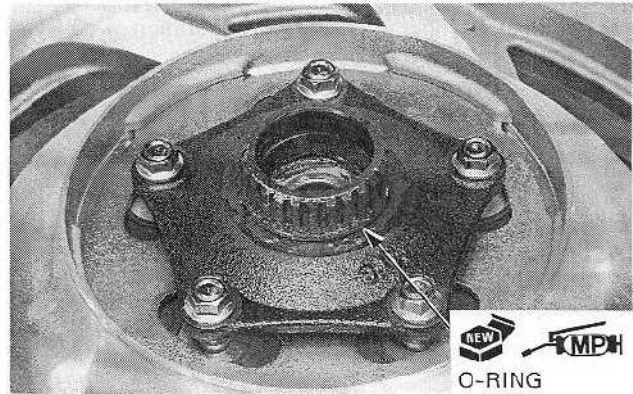
Install the thrust washer and the final driven flange onto the wheel hub.



REAR WHEEL/SUSPENSION

Pack molybdenum disulfide paste into the O-ring groove in the driven flange.

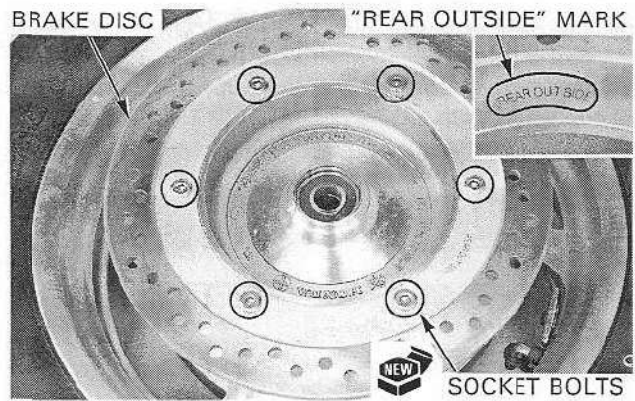
Coat a new O-ring with molybdenum disulfide paste and install it into the groove.



Install the brake disc with its "REAR OUTSIDE" mark facing out.

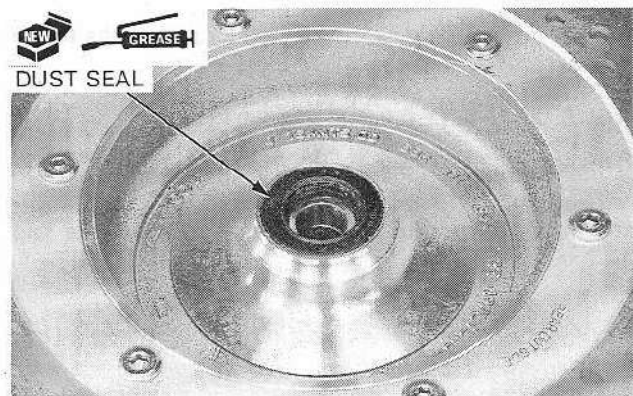
Install and tighten the new bolts to the specified torque.

TORQUE: 42 N·m (4.3 kgf·m, 31 lbf·ft)



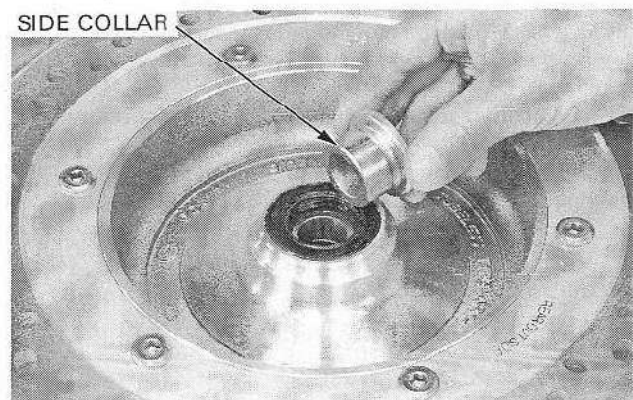
Apply grease to the new dust seal lips.

Install the dust seal into the right wheel hub.



INSTALLATION

Install the side collar.

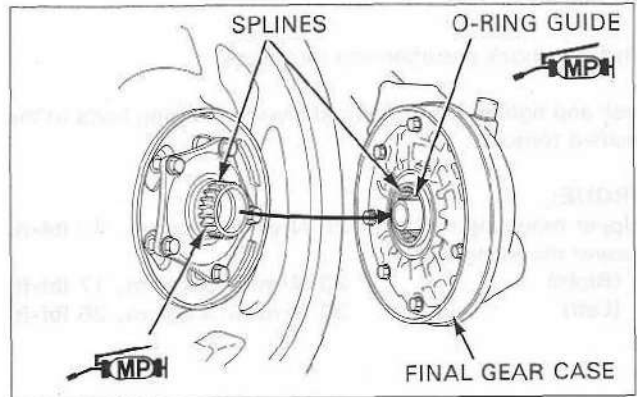


Apply 3 g (0.11 oz) of molybdenum disulfide paste to the final driven flange splines.

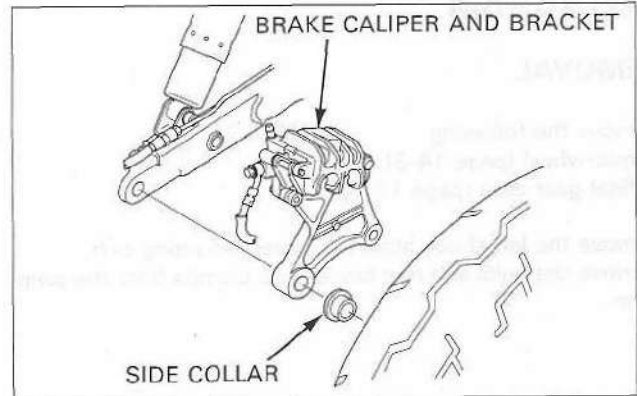
Apply 1 - 2 g (0.04 - 0.07 oz) of molybdenum disulfide paste to the joint surface of the final gear case O-ring guide and driven flange.

Loosen the final gear case mounting nuts to ease axle installation and to assure proper driven flange alignment.

Engage the rear wheel with the final gear case, making sure that the splines are correctly aligned.



Install the rear brake caliper in position, and insert the rear axle through the final gear case, wheel hub, side collar, brake caliper and swingarm.



Install and tighten the rear brake caliper stopper bolt.

TORQUE: 69 N·m (7.0 kgf·m, 51 lbf·ft)

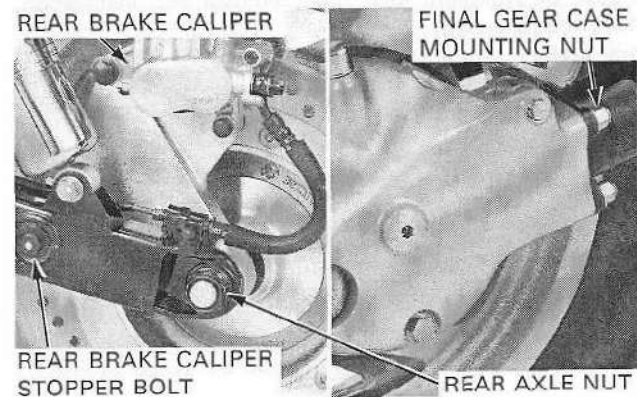
Install and tighten the axle nut to the specified torque.

TORQUE: 110 N·m (11.2 kgf·m, 81 lbf·ft)

Tighten the final gear case mounting nuts to the specified torque.

TORQUE: 64 N·m (6.5 kgf·m, 47 lbf·ft)

Install the saddlebag bracket joint pipe (GI 1500CT/CF: page 2-9).



SHOCK ABSORBER

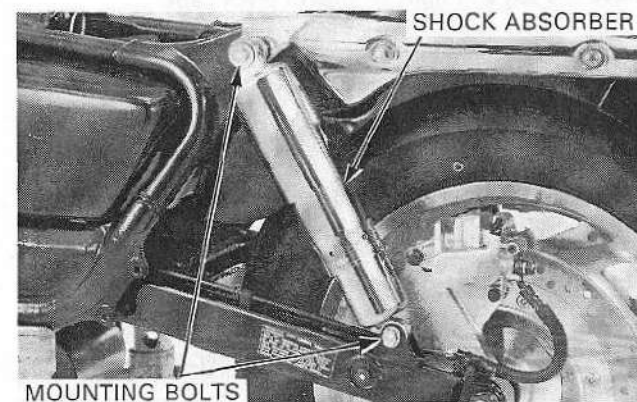
REMOVAL

Remove the seat (page 2-2).

Remove the right and left mufflers (page 2-12).

Support the motorcycle securely using a hoist or equivalent.

Remove the upper and lower mounting bolts and shock absorber.



REAR WHEEL/SUSPENSION

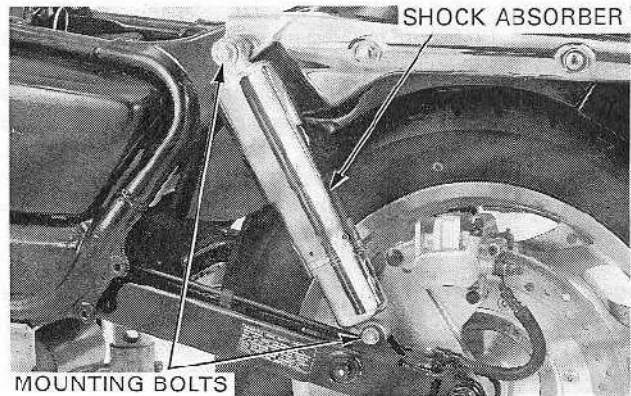
INSTALLATION

Install the shock absorber into the frame.

Install and tighten the upper and lower mounting bolts to the specified torque.

TORQUE:

Upper mounting bolt:	26 N·m (2.7 kgf·m, 20 lbf·ft)
Lower mounting bolt:	
(Right)	23 N·m (2.3 kgf·m, 17 lbf·ft)
(Left)	34 N·m (3.5 kgf·m, 25 lbf·ft)



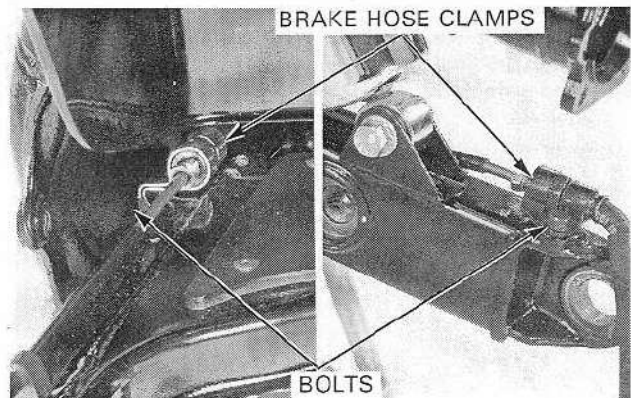
SWINGARM

REMOVAL

Remove the following:

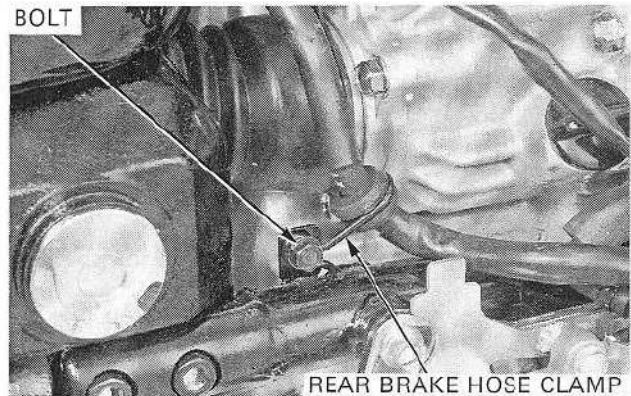
- rear wheel (page 14-3).
- final gear case (page 12-3).

Remove the left shock absorber lower mounting bolt. Remove the bolts and rear brake hose clamps from the swingarm.

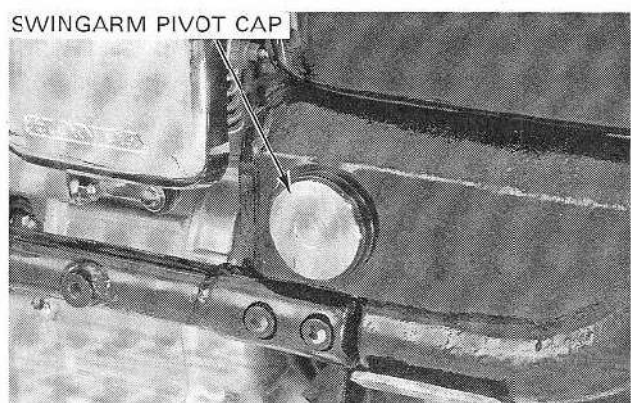


For ease of swingarm joint boot removal and installation, remove the following:

- rear brake reservoir (page 15-16).
- master cylinder cover (page 15-12).
- bolt and rear brake hose clamp.



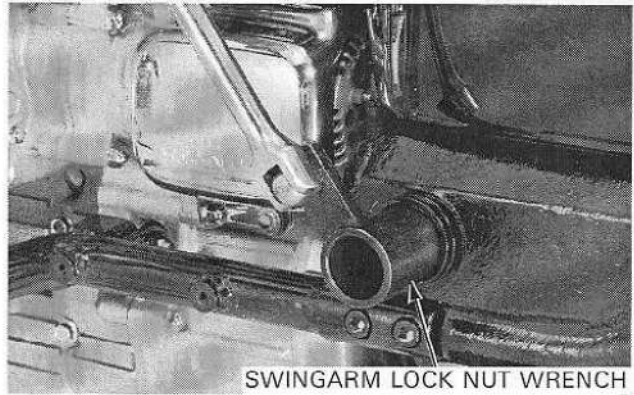
Remove the left and right swingarm pivot caps.



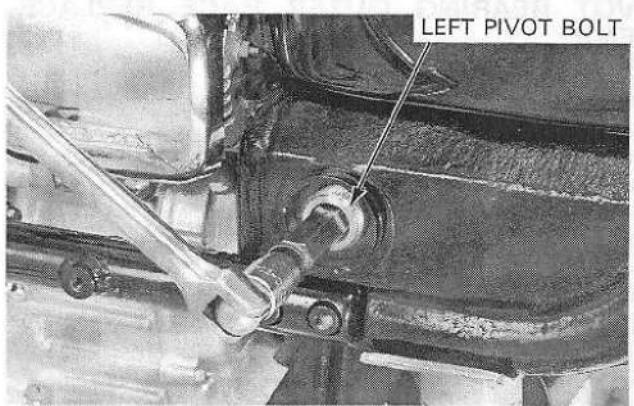
REAR WHEEL/SUSPENSION

Loosen and remove the left pivot lock nut using the special tool.

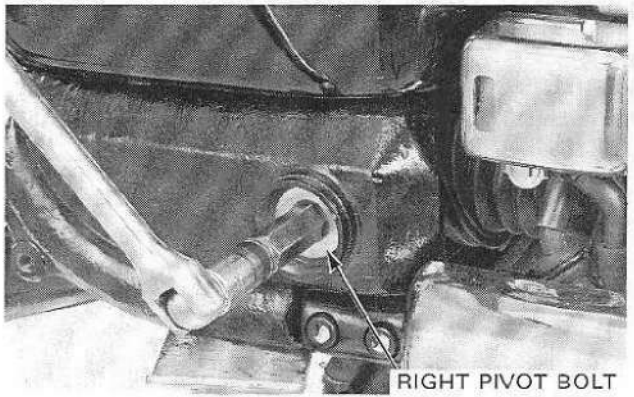
TOOL:
Swingarm lock nut wrench 07908-4690003



Loosen and remove the swingarm left pivot bolt.

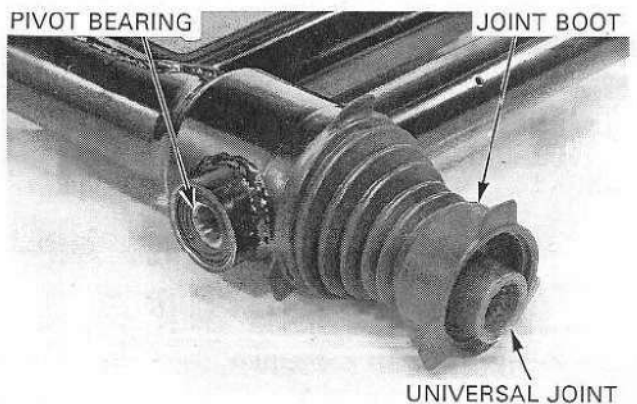


Loosen and remove the swingarm right pivot bolt.
Remove the swingarm and joint boot from the frame.



Remove the joint boot and universal joint.

Remove the pivot bearings from the swingarm.



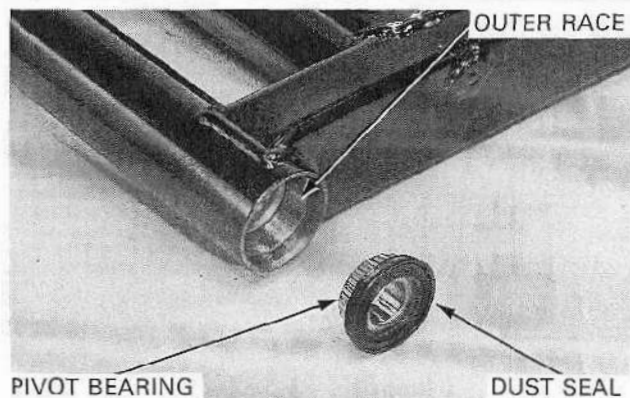
REAR WHEEL/SUSPENSION

INSPECTION

Check the bearing, dust seal and outer race for wear or damage.

NOTE

- Both bearings, outer races and grease retainer plates must be replaced as a set if any part is damaged or worn.



PIVOT BEARING OUTER RACE REPLACEMENT

Punch or drill a 1/2 inch hole into the grease retainer plate of the bearing race.

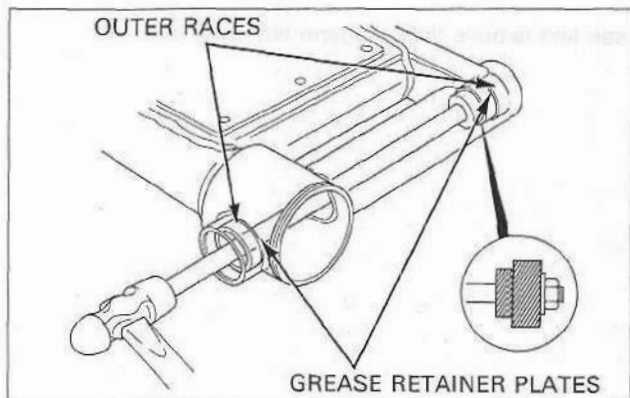
Insert the threaded end of the slide hammer into the hole and attach the special tools as shown.

Remove the outer race and grease retainer with the installed tools.

TOOLS:

Attachment, 32x35 mm
Slide hammer, 3/8x16

07746-0010100
Commercially
available

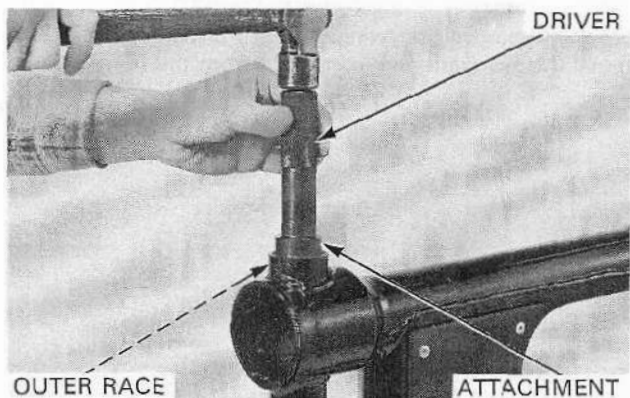


Install the new grease retainer plates and drive new bearing outer races into the swingarm.

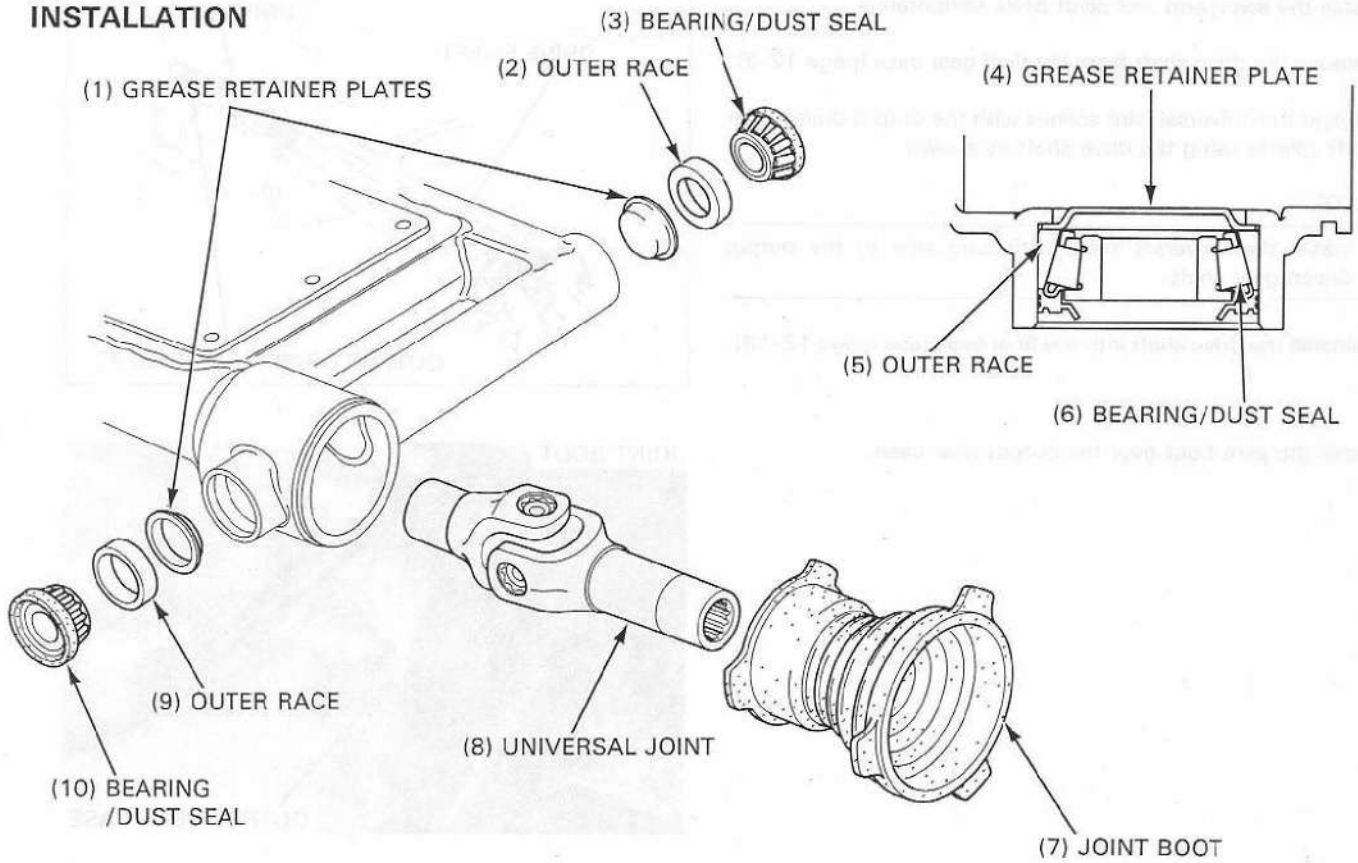
TOOLS:

Driver
Attachment, 37x40 mm

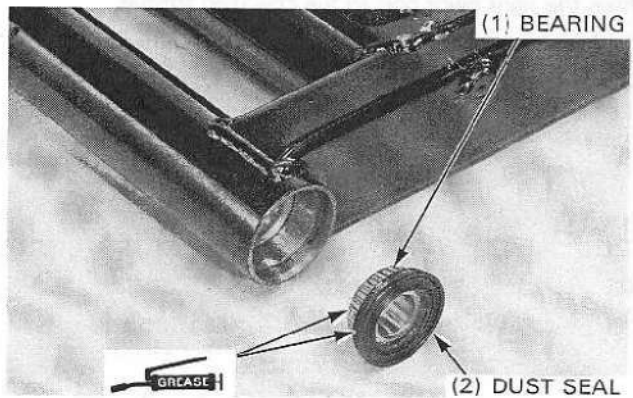
07749-0010000
07746-0010200



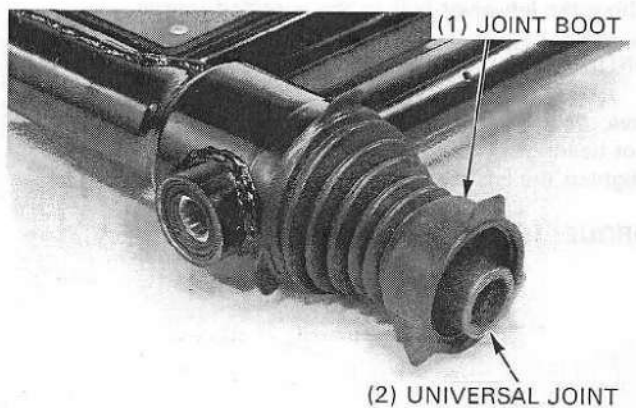
INSTALLATION



Apply grease to the pivot bearings and dust seal lips.
 Install the bearings/dust seals into the swingarm pivot.



Install the universal joint into the swingarm.
 Install the joint boot onto the swingarm.



REAR WHEEL/SUSPENSION

Install the swingarm and pivot bolts temporarily.

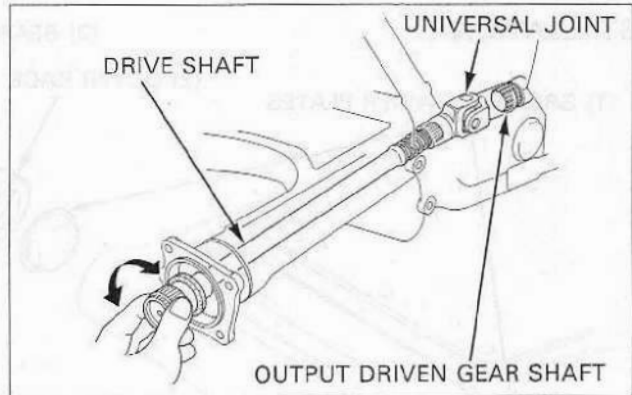
Remove the drive shaft from the final gear case (page 12-3).

Engage the universal joint splines with the output driven gear shaft splines using the drive shaft as shown.

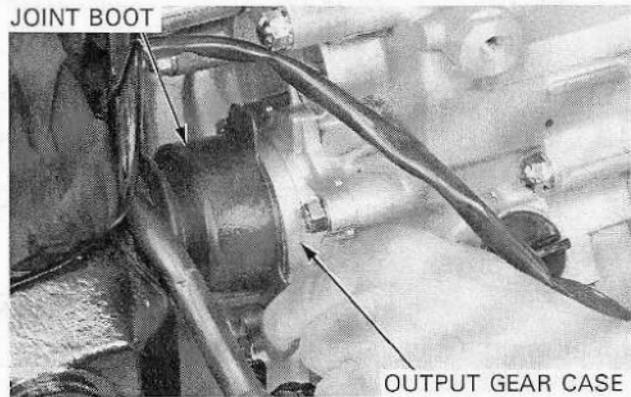
NOTE

- Install the universal joint, with long side to the output driven gear shaft.

Reinstall the drive shaft into the final gear case (page 12-18).

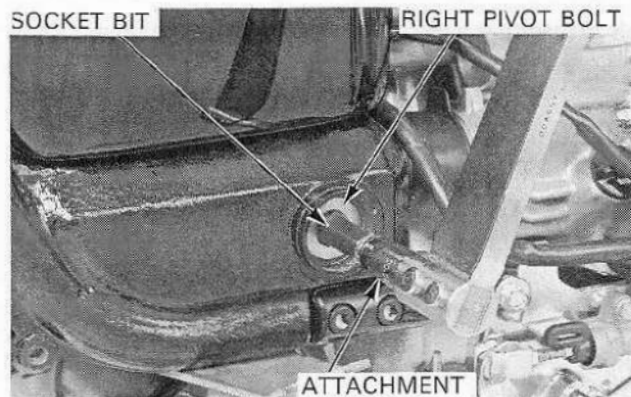


Install the joint boot over the output gear case.



Tighten the right pivot bolt to the specified torque.

TORQUE: 103 N·m (10.5 kgf·m, 76 lbf·ft)



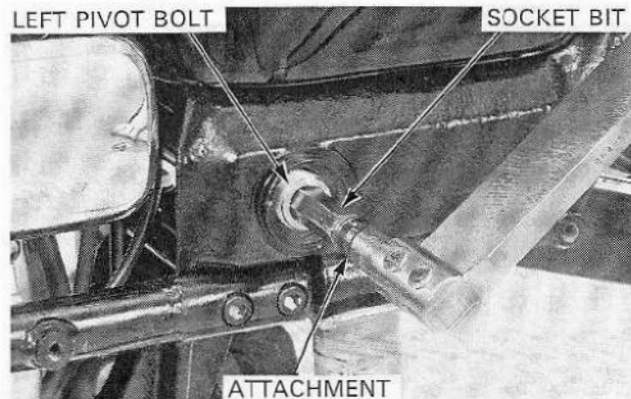
Tighten the left pivot bolt to the specified torque.

TORQUE: 19 N·m (1.9 kgf·m, 14 lbf·ft)

Move the swingarm up and down several times to seat the pivot bearings.

Retighten the left pivot bolt to the specified torque.

TORQUE: 19 N·m (1.9 kgf·m, 14 lbf·ft)



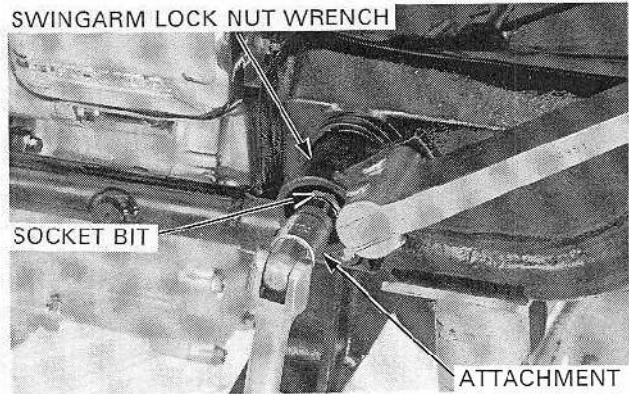
Tighten the left pivot lock nut to the specified torque while holding the pivot bolt.

TOOL:
Swingarm lock nut wrench 07908-4690003

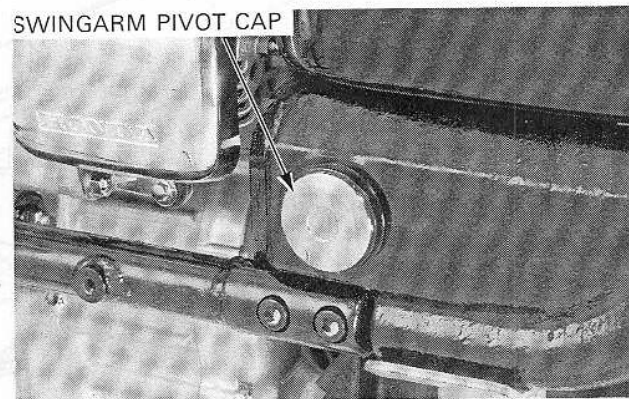
TORQUE:
Actual: 113 N·m (11.5 kgf·m, 83 lbf·ft)
Scale reading: 103 N·m (10.5 kgf·m, 76 lbf·ft)

NOTE

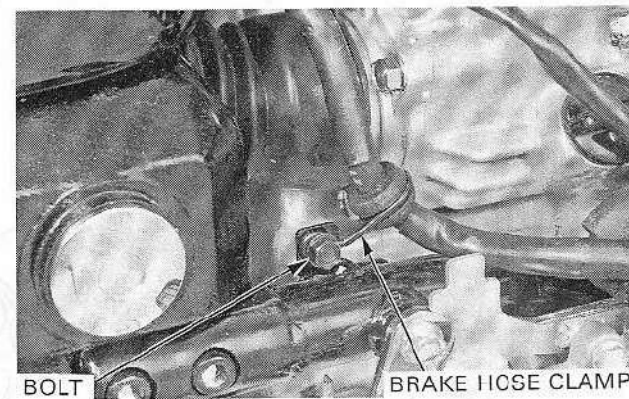
- Refer to torque wrench reading information on page 14-1; Service Information.



Install the left and right swingarm pivot caps.



- Install the following parts if removed:
- brake hose and bolt.
 - rear brake master cylinder cover (page 15-16).
 - rear brake reservoir (page 15-16).



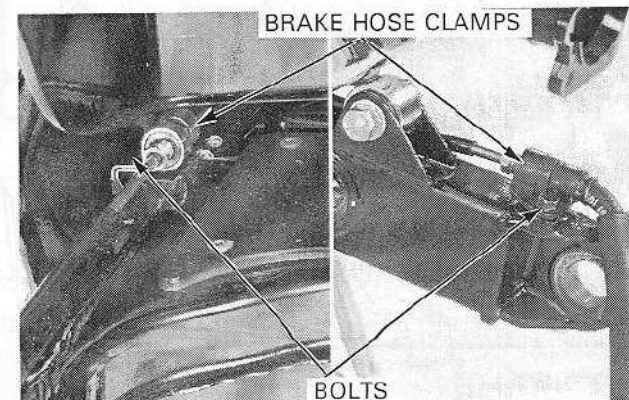
Install the brake hose clamps with new bolts and tighten to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

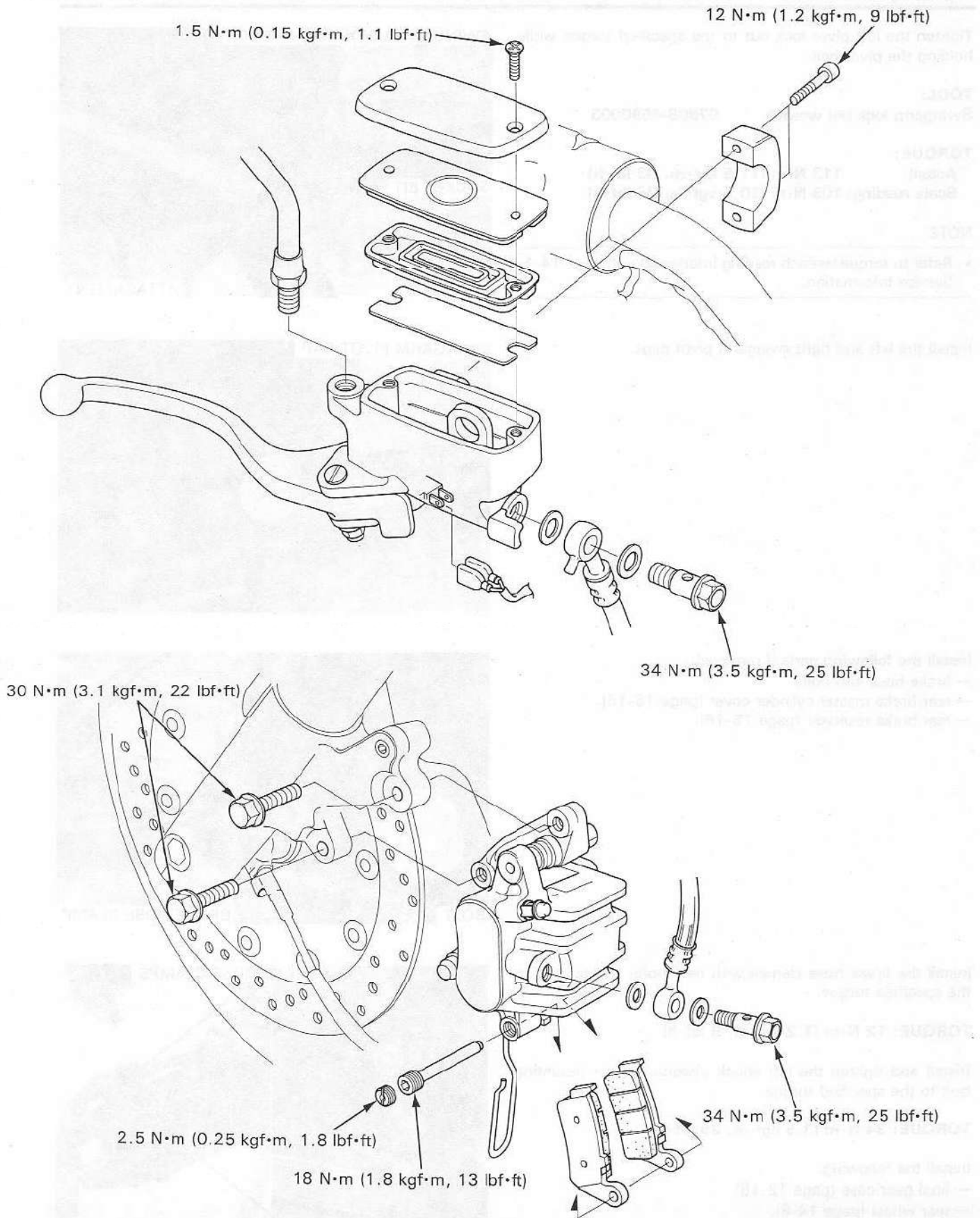
Install and tighten the left shock absorber lower mounting bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

- Install the following:
- final gear case (page 12-18).
 - rear wheel (page 14-8).

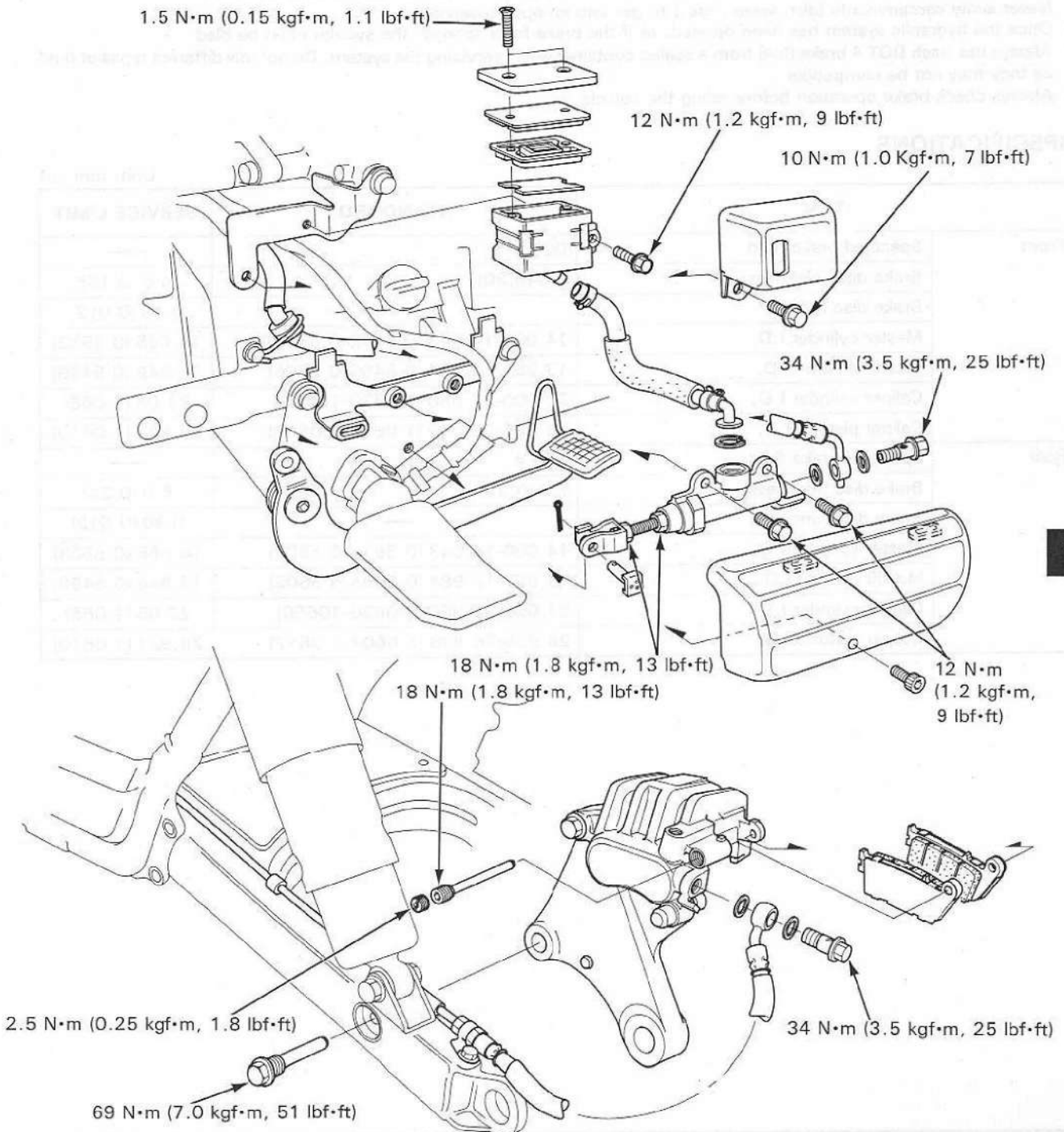


HYDRAULIC BRAKE



15. HYDRAULIC BRAKE

SERVICE INFORMATION	15-2	REAR MASTER CYLINDER	15-12
TROUBLESHOOTING	15-3	FRONT BRAKE CALIPER	15-16
BRAKE FLUID REPLACEMENT/ AIR BLEEDING	15-4	REAR BRAKE CALIPER	15-19
BRAKE PAD/DISC	15-6	BRAKE PEDAL	15-22
FRONT MASTER CYLINDER	15-9		



SERVICE INFORMATION

GENERAL

▲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.
- Spilled brake fluid will severely damage instrument lenses and painted surfaces. It is also harmful to some rubber parts. Be careful whenever you remove the reservoir cap; make sure the front reservoir is horizontal first.
- Never allow contaminants (dirt, water, etc.) to get into an open reservoir.
- Once the hydraulic system has been opened, or if the brake feels spongy, the system must be bled.
- Always use fresh DOT 4 brake fluid from a sealed container when servicing the system. Do not mix different types of fluid as they may not be compatible.
- Always check brake operation before riding the vehicle.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Front	Specified brake fluid	DOT 4	—
	Brake disc thickness	5.0 (0.20)	4.0 (0.16)
	Brake disc runout	—	0.30 (0.012)
	Master cylinder I.D.	14.000-14.043 (0.5512-0.5529)	14.055 (0.5533)
	Master piston O.D.	13.957-13.984 (0.5495-0.5506)	13.945 (0.5490)
	Caliper cylinder I.D.	27.000-27.050 (1.0630-1.0650)	27.06 (1.065)
	Caliper piston O.D.	26.935-26.968 (1.0604-1.0617)	26.927 (1.0610)
Rear	Specified brake fluid	DOT 4	—
	Brake disc thickness	7.5 (0.30)	6.0 (0.24)
	Brake disc runout	—	0.30 (0.012)
	Master cylinder I.D.	14.000-14.043 (0.5512-0.5529)	14.055 (0.5533)
	Master piston O.D.	13.957-13.984 (0.5495-0.5506)	13.945 (0.5490)
	Caliper cylinder I.D.	27.000-27.050 (1.0630-1.0650)	27.06 (1.065)
	Caliper piston O.D.	26.935-26.968 (1.0604-1.0617)	26.927 (1.0610)

TORQUE VALUES

Front brake caliper mounting bolt	30 N•m (3.1 kgf•m, 22 lbf•ft)	ALOC bolt
Front brake caliper pin bolt	23 N•m (2.3 kgf•m, 17 lbf•ft)	Apply a locking agent to the threads.
Front brake caliper bracket pin bolt	13 N•m (1.3 kgf•m, 9 lbf•ft)	Apply a locking agent to the threads.
Front brake master cylinder mounting bolt	12 N•m (1.2 kgf•m, 9 lbf•ft)	
Front brake master cylinder reservoir cap screw	1.5 N•m (0.15 kgf•m, 1.1 lbf•ft)	
Brake lever pivot bolt	1 N•m (0.1 kgf•m, 0.7 lbf•ft)	
Brake lever pivot nut	6 N•m (0.6 kgf•m, 4.3 lbf•ft)	
Front brake light switch mounting screw	1.2 N•m (0.12 kgf•m, 0.9 lbf•ft)	
Front brake pipe mounting bolt	17 N•m (1.7 kgf•m, 12 lbf•ft)	
Front brake hose clamp bolt	12 N•m (1.2 kgf•m, 9 lbf•ft)	
Brake pipe joint	17 N•m (1.7 kgf•m, 12 lbf•ft)	
Rear brake caliper stopper pin bolt	69 N•m (7.0 kgf•m, 51 lbf•ft)	
Rear brake caliper pin bolt	27 N•m (2.8 kgf•m, 20 lbf•ft)	Apply a locking agent to the threads.
Rear brake caliper bracket pin bolt	13 N•m (1.3 kgf•m, 9 lbf•ft)	Apply a locking agent to the threads.
Rear master cylinder mounting bolt	12 N•m (1.2 kgf•m, 9 lbf•ft)	
Rear brake reservoir mounting bolt	12 N•m (1.2 kgf•m, 9 lbf•ft)	
Rear brake reservoir cover mounting bolt	10 N•m (1.0 kgf•m, 7 lbf•ft)	
Rear master cylinder adjuster lock nut	18 N•m (1.8 kgf•m, 13 lbf•ft)	
Rear brake hose guide bolt	12 N•m (1.2 kgf•m, 9 lbf•ft)	
Pad pin	18 N•m (1.8 kgf•m, 13 lbf•ft)	
Pad pin plug	2.5 N•m (0.25 kgf•m, 1.8 lbf•ft)	
Brake caliper bleed valve	6 N•m (0.6 kgf•m, 4.3 lbf•ft)	
Brake hose oil bot	34 N•m (3.5 kgf•m, 25 lbf•ft)	

TOOL

Snap ring pliers 07914-3230001

TROUBLESHOOTING

Brake lever/pedal soft or spongy

- Air in hydraulic system
- Leaking hydraulic system
- Contaminated brake pad/disc
- Worn caliper piston seal
- Worn master cylinder piston cups
- Worn brake pad/disc
- Contaminated caliper
- Caliper not sliding properly
- Low brake fluid level
- Clogged fluid passage
- Warped/deformed brake disc
- Sticking/worn caliper piston
- Sticking/worn master cylinder piston
- Contaminated master cylinder
- Bent brake lever/pedal

Brake lever/pedal hard

- Clogged/restricted brake system
- Sticking/worn caliper piston
- Caliper not sliding properly
- Clogged/restricted fluid passage
- Worn caliper piston seal
- Sticking/worn master cylinder piston
- Bent brake lever/pedal

Brake grab or pull to one side

- Contaminated brake pad/disc
- Misaligned wheel
- Clogged/restricted brake hose joint
- Warped/deformed brake disc
- Caliper not sliding properly

Brake drag

- Contaminated brake pad/disc
- Misaligned wheel
- Worn brake pad/disc
- Warped/deformed brake disc
- Caliper not sliding properly

HYDRAULIC BRAKE

BRAKE FLUID REPLACEMENT/AIR BLEEDING

▲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.

BRAKE FLUID DRAINING

For the front brake, turn the handlebar to the left until the reservoir is parallel to the ground, before removing the reservoir cap.

For the rear brake, remove the reservoir cover.

Remove the reservoir cap, set plate and diaphragm.

Connect a bleed hose to the caliper bleed valve. Loosen the bleed valve and pump the brake lever or pedal. Stop pumping the lever when no more fluid flows out of the bleed valve.

BRAKE FLUID FILLING

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

CAUTION

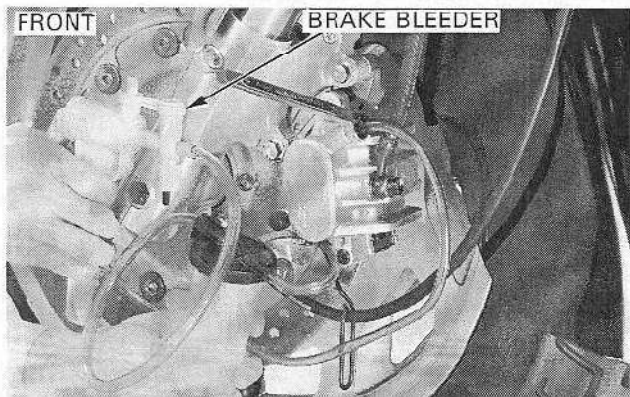
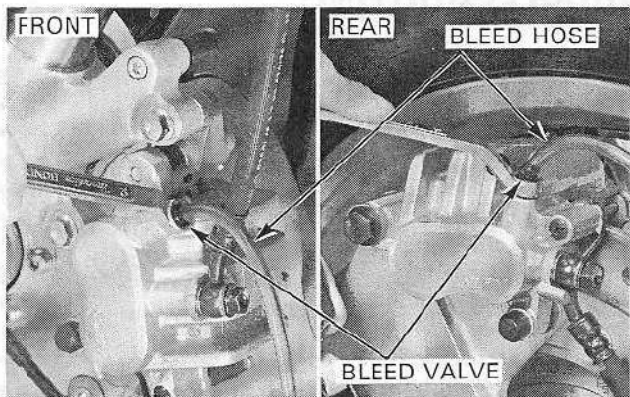
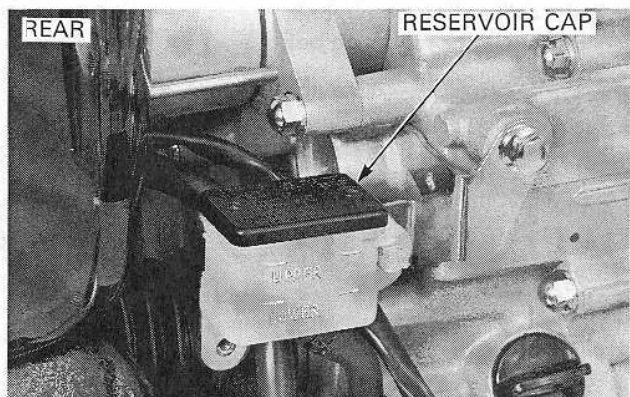
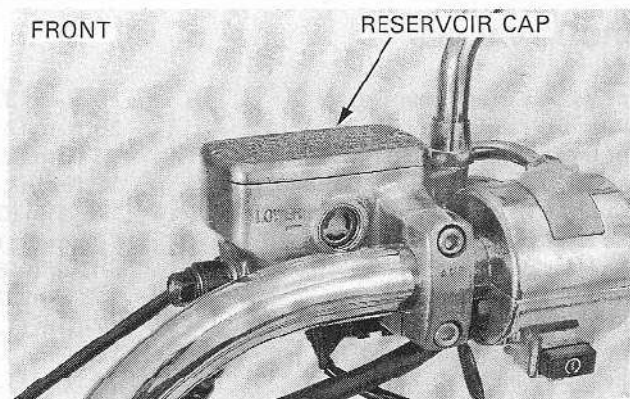
- Use only DOT 4 brake fluid from a sealed container.
- Do not mix different types of fluid. They are not compatible.

Connect a commercially available brake bleeder to the bleed valve.

Pump the brake bleeder and loosen the bleed valve, adding 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.

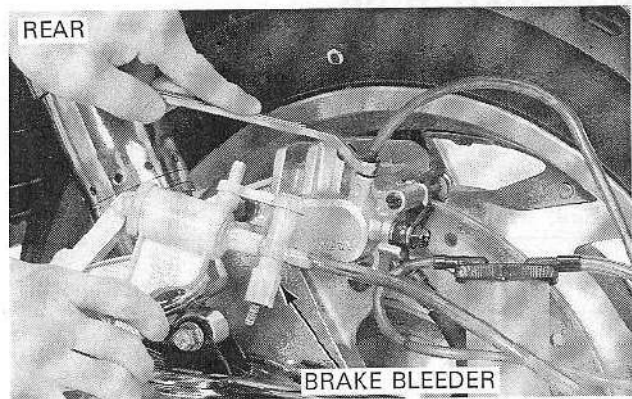


Repeat the previous step procedures until air bubbles do not appear in the plastic hose.

NOTE

- If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.
- If a brake bleeder is not available, fill the master cylinder and operate the brake lever or pedal to fill the system.

Close the bleed valve. Next, perform the bleeding procedure.



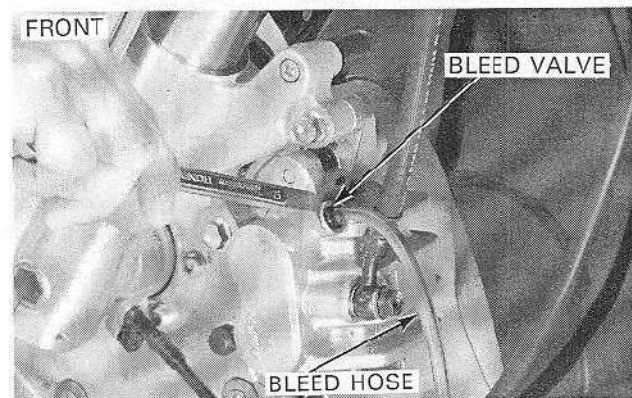
BRAKE BLEEDING

Connect a clear bleed hose to the bleed valve. Pump up the system pressure with the lever or pedal until there are no air bubbles in the fluid flowing out of the master cylinder and lever resistance is felt.

1. Squeeze the brake lever or push the brake pedal, open the bleed valve 1/2 turn and then close the valve.

NOTE

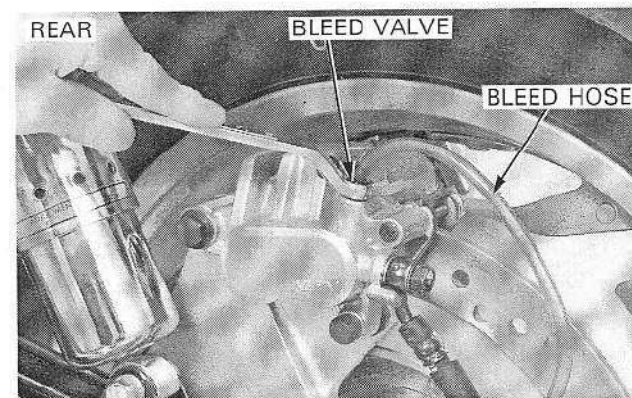
- Do not release the brake lever or pedal until the bleed valve has been closed.



2. Release the brake lever or pedal when the bleed valve has been closed.

Repeat steps 1 and 2 until bubbles cease to appear in the fluid coming out of the bleed valve. Tighten the bleed valve.

TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)



Fill the fluid reservoir to the upper level.

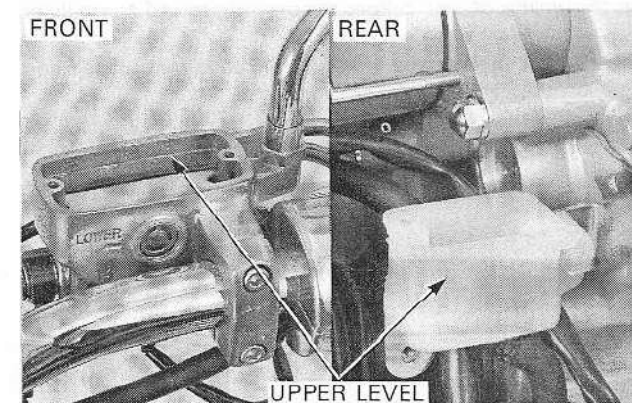
Reinstall the diaphragm and diaphragm plate.

Install the reservoir cap, and tighten the screws to the specified torque.

TORQUE: 1.5 N·m (0.15 kgf·m, 1.1 lbf·ft)

On the rear brake, install the reservoir cover, and tighten the mounting bolt.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



BRAKE PAD/DISC

FRONT BRAKE PAD REPLACEMENT

NOTE

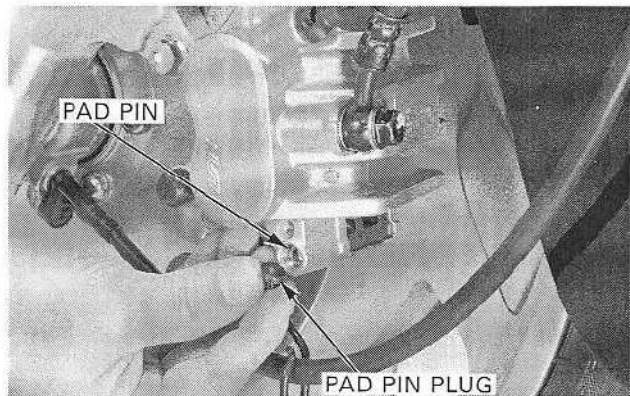
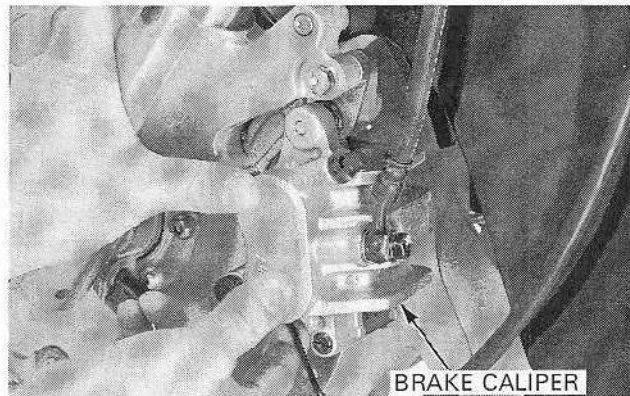
- Always replace the brake pads in pairs to assure even disc pressure.

Push the caliper pistons all the way in to allow installation of new brake pads.

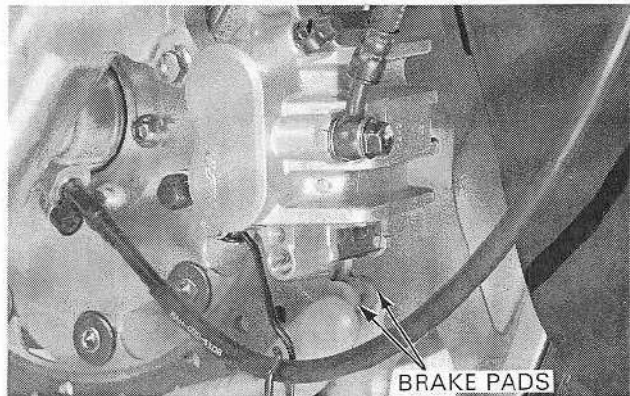
NOTE

- Check the brake fluid level in the brake master cylinder reservoir as this operation causes the level to rise.

Remove the pad pin plug and pad pin.

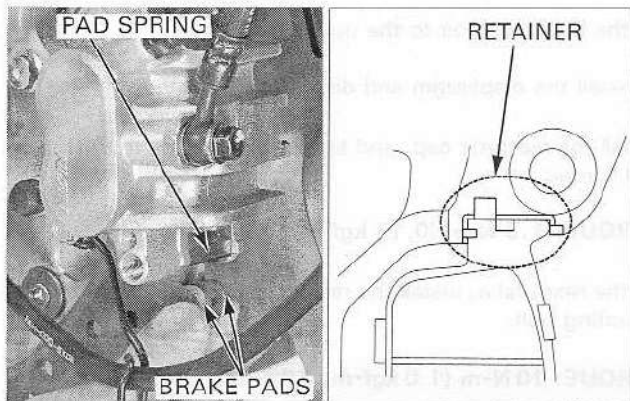


Remove the brake pads.



Clean the inside of the caliper especially around the caliper pistons.

Install the new brake pads so that their ends rest on the pad retainer on the caliper bracket properly.



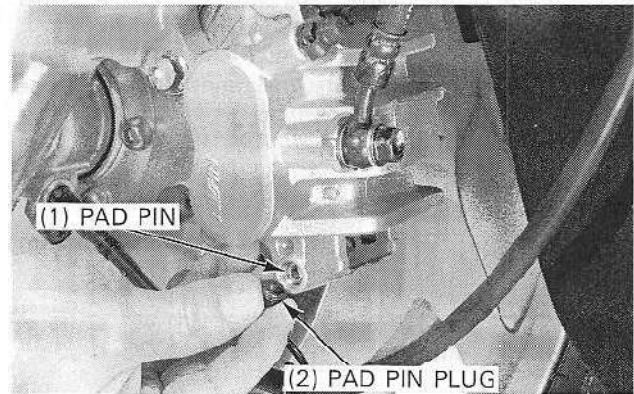
Install the pad pin by pushing the pads against the pad spring to align the pad pin holes in the pads and caliper. Tighten the pad pin to the specified torque.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

Install and tighten the pad pin plug.

TORQUE: 2.5 N·m (0.25 kgf·m, 1.8 lbf·ft)

Operate the brake lever to seat the caliper pistons against the pads.



REAR BRAKE PAD REPLACEMENT

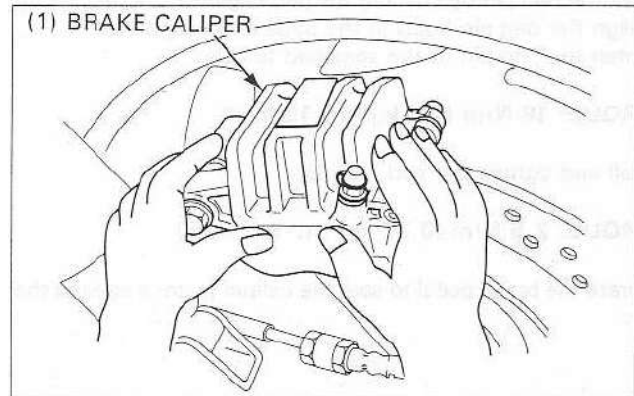
NOTE

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

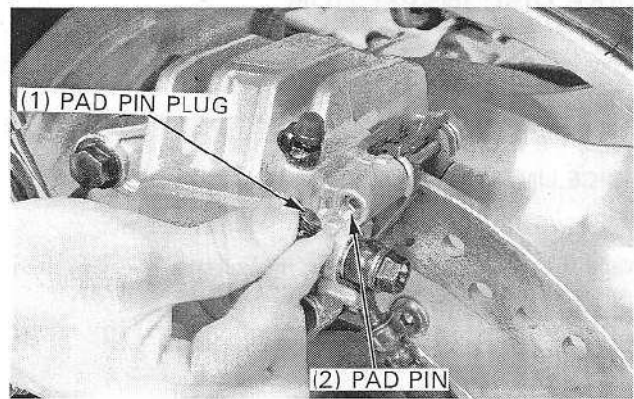
Push the caliper pistons all the way in by pushing the caliper body inward to allow installation of new brake pads.

NOTE

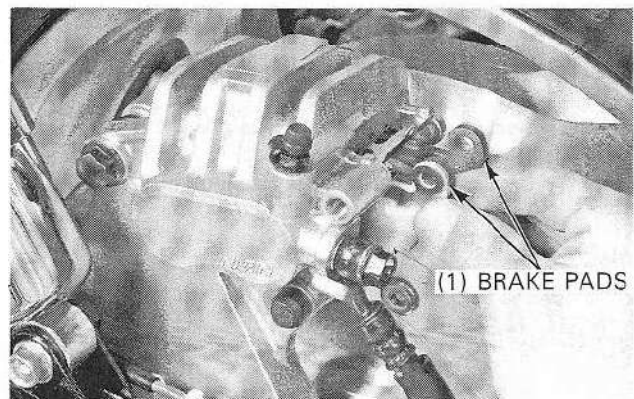
- Check the brake fluid level in the brake master cylinder reservoir as this operation causes the level to rise.



Remove the pad pin plug and pad pin.



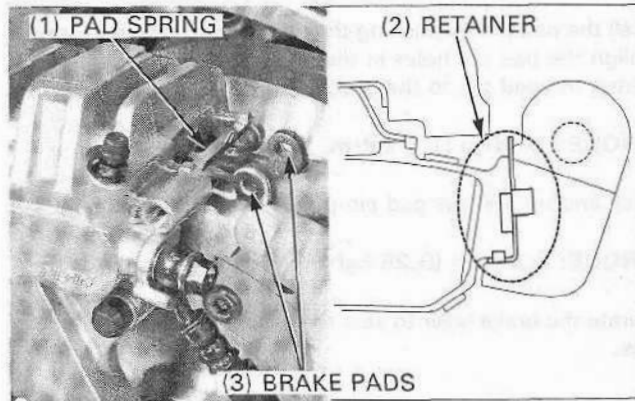
Remove the brake pads.



HYDRAULIC BRAKE

Clean the inside of the caliper especially around the caliper pistons.

Install the new brake pads so that their ends rest on the pad retainer on the caliper bracket properly.



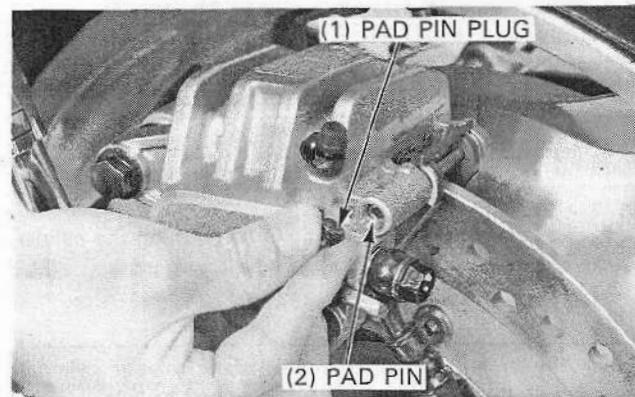
Install the pad pin by pushing the pads against the pad spring to align the pad pin holes in the pads and caliper. Tighten the pad pin to the specified torque.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

Install and tighten the pad pin plug.

TORQUE: 2.5 N·m (0.25 kgf·m, 1.8 lbf·ft)

Operate the brake pedal to seat the caliper pistons against the pads.



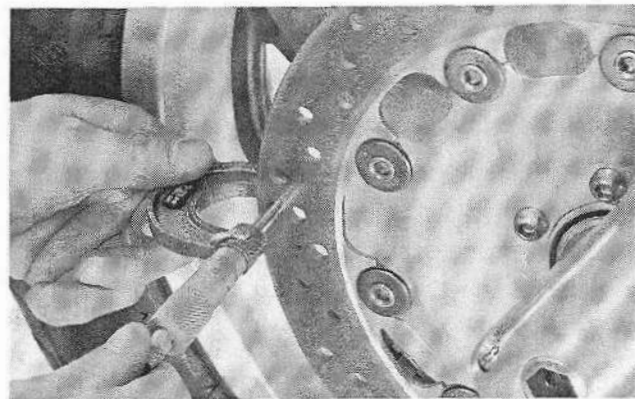
BRAKE DISC INSPECTION

Visually inspect the brake disc for damage or cracks.

Measure the brake disc thickness with a micrometer.

SERVICE LIMITS: FRONT: 4.0 mm (0.16 in)
REAR: 6.0 mm (0.24 in)

Replace the brake disc if smallest measurement is less than the service limit.

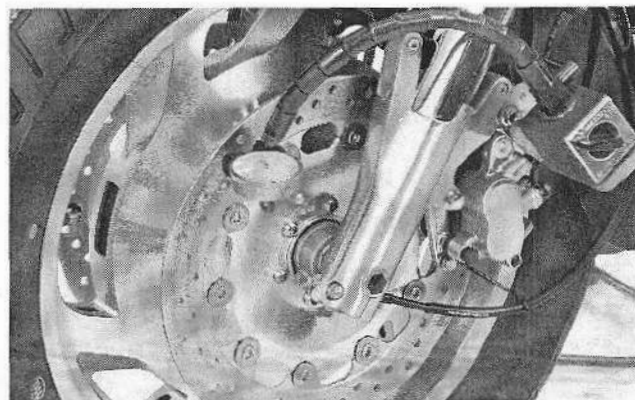


Measure the brake disc warpage with a dial indicator.

SERVICE LIMIT: 0.30 mm (0.012 in)

Check the wheel bearings for excessive play, if the warpage exceeds the service limit.

Replace the brake disc if the wheel bearings are normal.



FRONT MASTER CYLINDER

REMOVAL

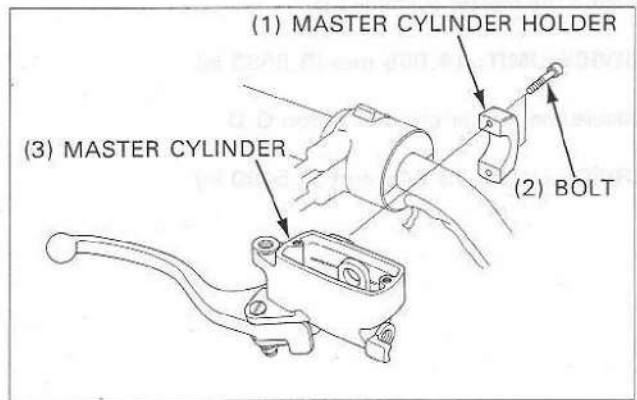
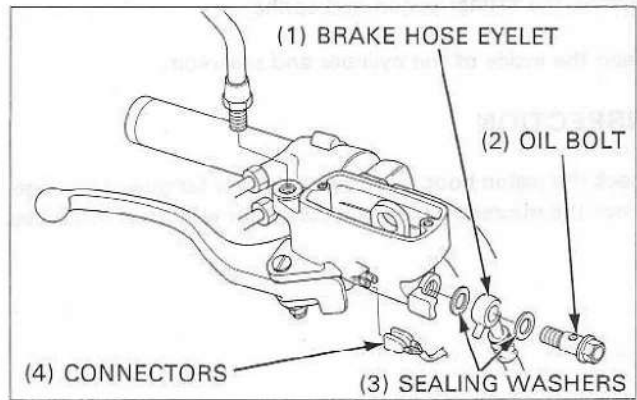
Drain the front hydraulic system (page 15-4).

Disconnect the brake light switch wire connectors. Remove the brake hose oil bolt, sealing washers and brake hose eyelet.

CAUTION

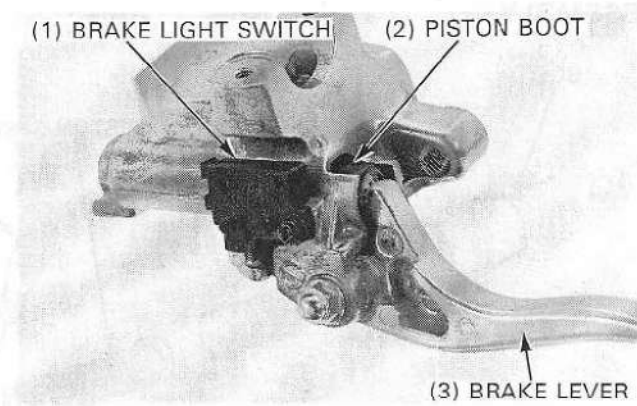
- *Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.*

Remove the bolts from the master cylinder holder and remove the master cylinder assembly.



DISASSEMBLY

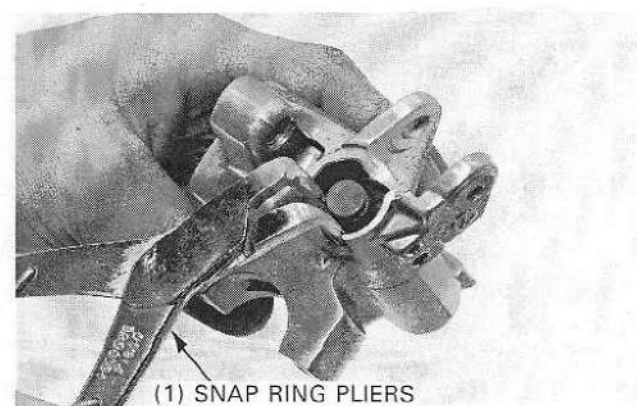
Remove the pivot bolt/nut and brake lever assembly. Remove the screw and brake light switch. Remove the piston boot.



Remove the snap ring from the master cylinder body using the special tool as shown.

TOOL:
Snap ring pliers

07914-3230001



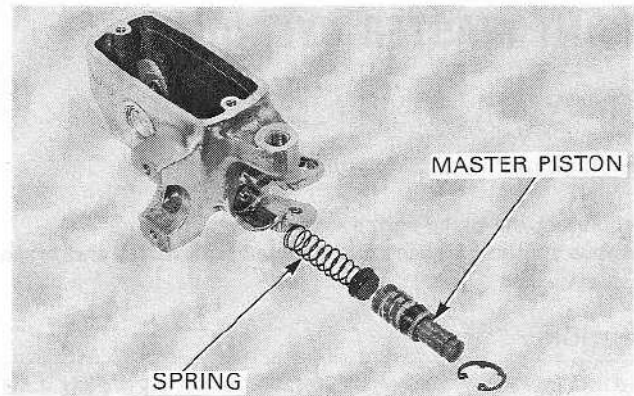
HYDRAULIC BRAKE

Remove the master piston and spring.

Clean the inside of the cylinder and reservoir.

INSPECTION

Check the piston boot and piston cups for fatigue or damage.
Check the master cylinder and piston for abnormal scratches.

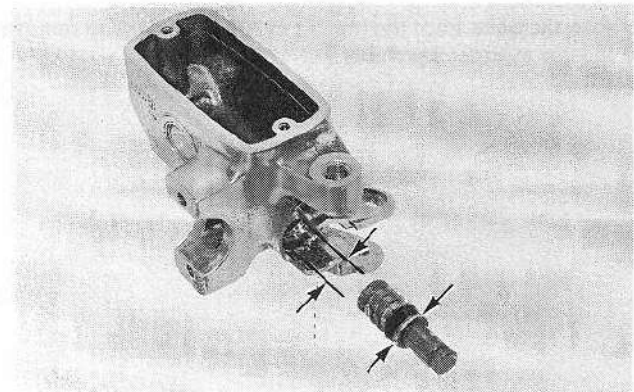


Measure the master cylinder I.D.

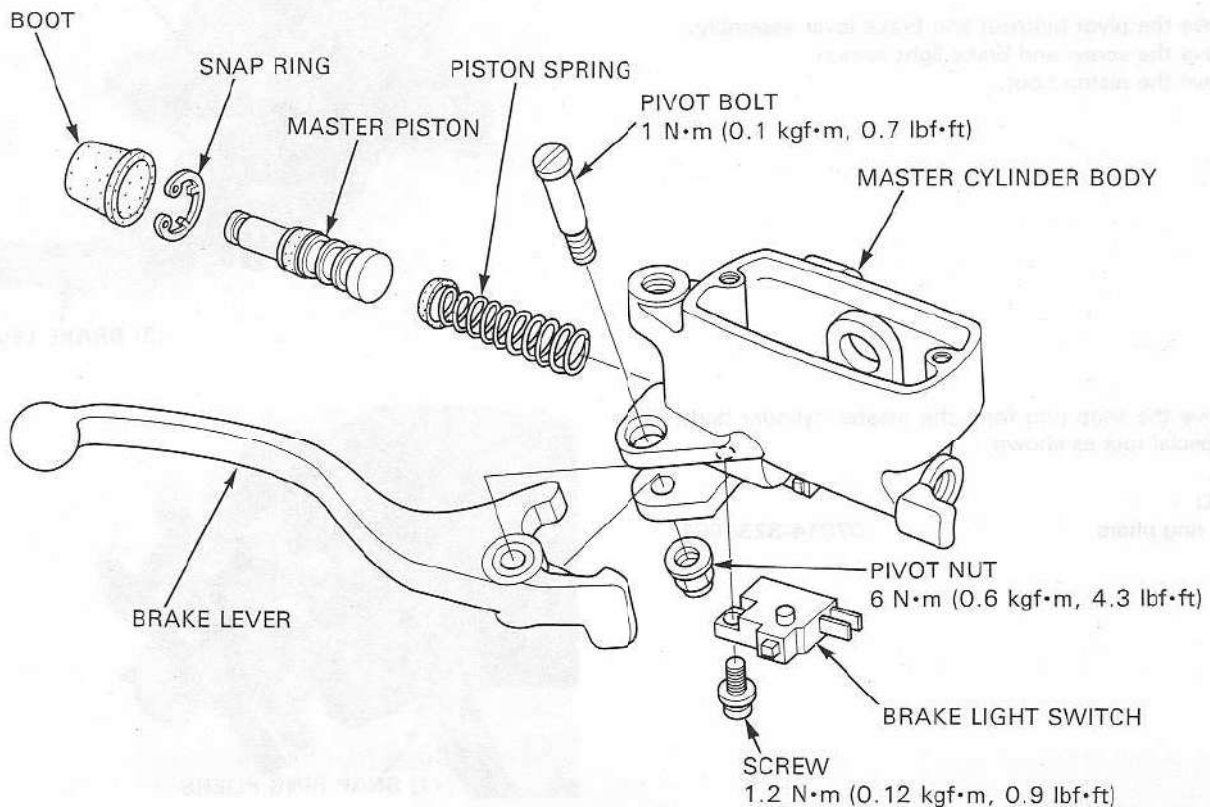
SERVICE LIMIT: 14.055 mm (0.5533 in)

Measure the master cylinder piston O.D.

SERVICE LIMIT: 13.945 mm (0.5490 in)



ASSEMBLY



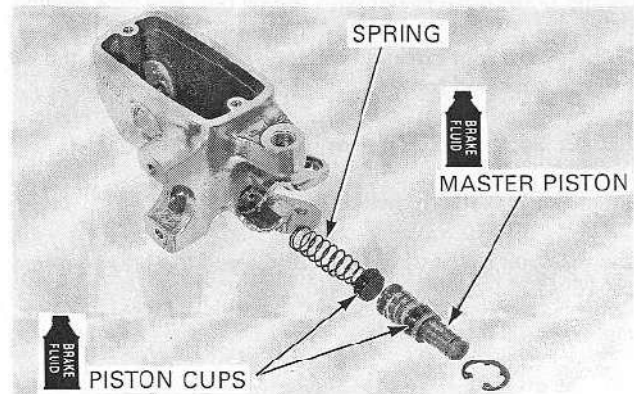
CAUTION

- Keep the piston, cups, spring, snap ring and boot as a set; do not substitute individual parts.

Coat all parts with clean brake fluid before assembly. Dip the piston in brake fluid. Install the spring and piston assembly into the master cylinder.

CAUTION

- When installing the cups, do not allow the lips to turn inside out.



Install the snap ring using the special tool.

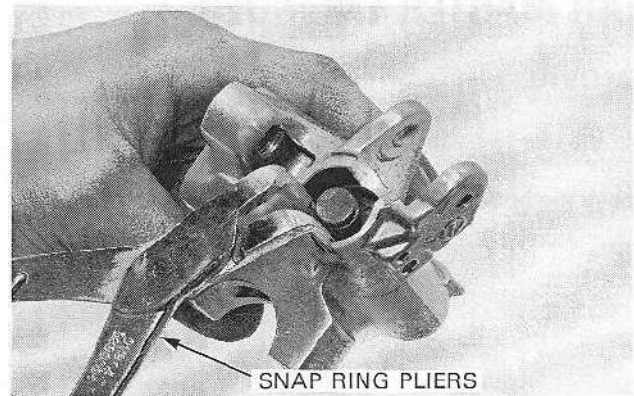
CAUTION

- Be certain the snap ring is firmly seated in the groove.

TOOL:

Snap ring pliers

07914-3230001



Install the boot.

Install the brake light switch and tighten the screw to the specified torque.

TORQUE: 1.2 N·m (0.12 kgf·m, 0.9 lbf·ft)

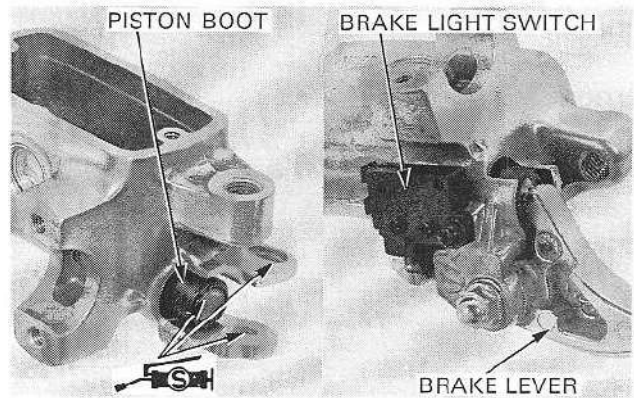
Apply silicone grease to the brake lever contacting surface of the master piston and brake lever pivot bolt sliding surface of the master cylinder.

Install the brake lever assembly and tighten the pivot bolt.

TORQUE: 1 N·m (0.1 kgf·m, 0.7 lbf·ft)

Hold the pivot bolt and tighten the pivot nut.

TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)

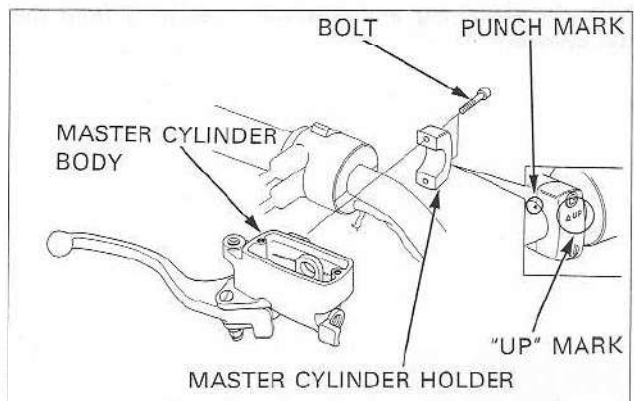


INSTALLATION

Place the master cylinder assembly on the handlebar. Align the end of the master cylinder with the punch mark on the handlebar.

Install the master cylinder holder with "UP" mark facing up. Tighten the upper bolt first, then the lower bolt.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



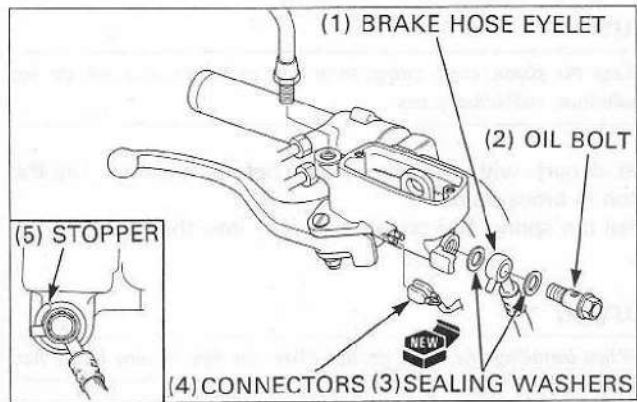
HYDRAULIC BRAKE

Install the brake hose eyelet with the oil bolt and new sealing washers.
Push the eyelet joint against the stopper, then tighten the oil bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Connect the brake light switch wire connectors.

Fill the reservoir to the upper level and bleed the brake system (page 15-4).

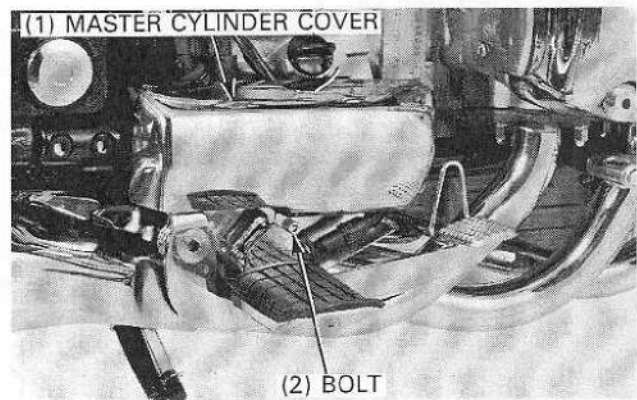


REAR MASTER CYLINDER

REMOVAL

Drain the rear hydraulic system (page 15-4).

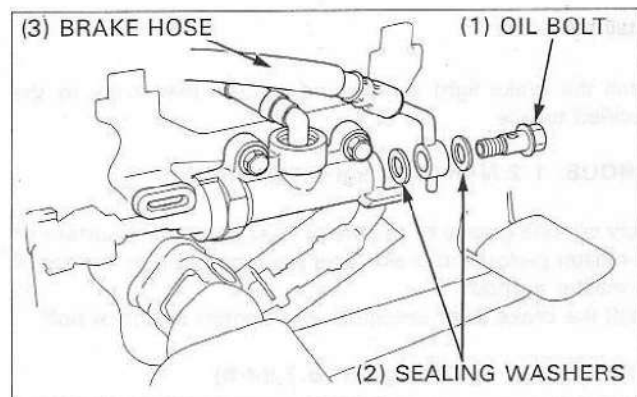
Remove the bolt and rear master cylinder cover.



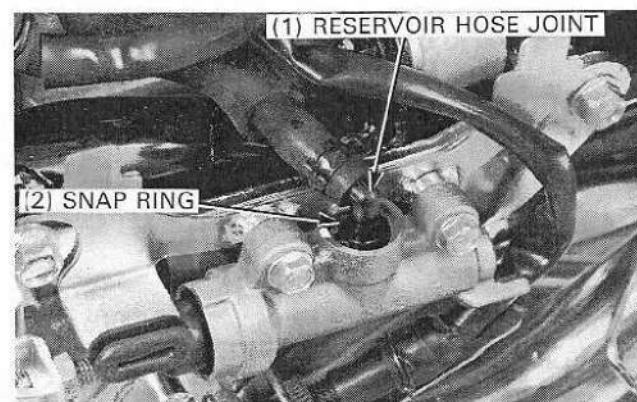
Remove the brake hose oil bolt, sealing washers and brake hose.

CAUTION

- *Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.*

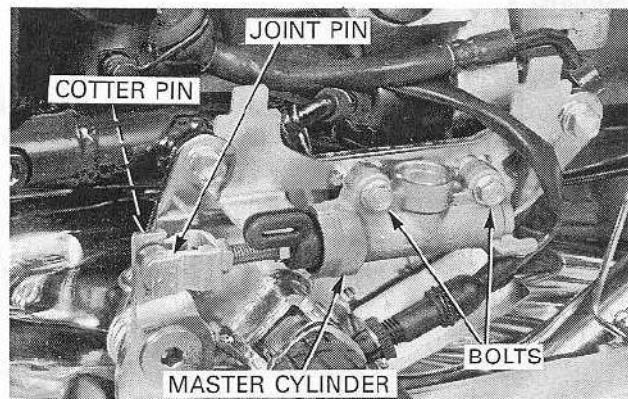


Remove the snap ring and reservoir hose joint from the master cylinder.



Remove and discard the brake pedal joint cotter pin.
Remove the joint pin.

Remove the bolts and master cylinder assembly.



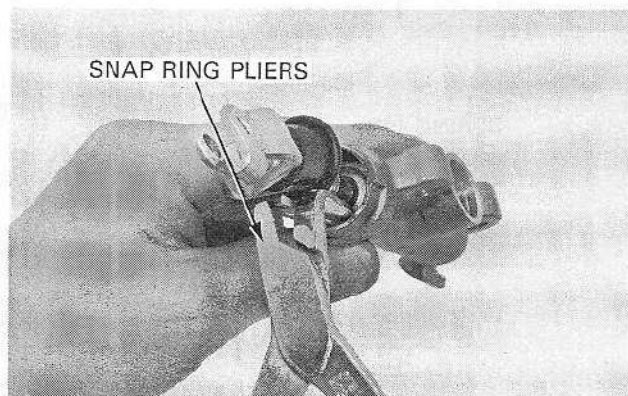
DISASSEMBLY

Remove the snap ring from the master cylinder body using the special tool as shown.

TOOL:
Snap ring pliers **07914-3230001**

Remove the push rod, master piston and spring.

Clean the inside of the cylinder with brake fluid.



INSPECTION

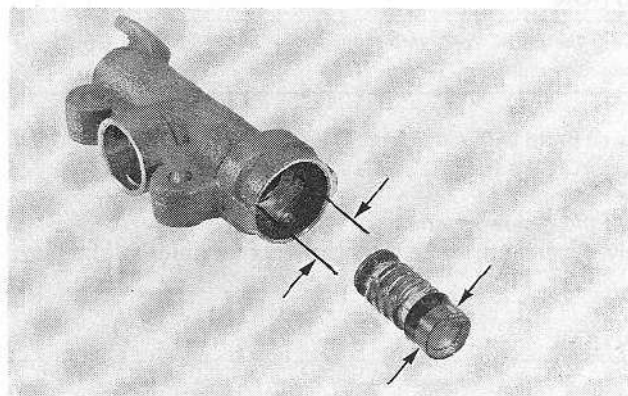
Check the piston boot and piston cups for fatigue or damage.
Check the master cylinder and piston for abnormal scratches.

Measure the master cylinder I.D.

SERVICE LIMIT: 14.055 mm (0.5533 in)

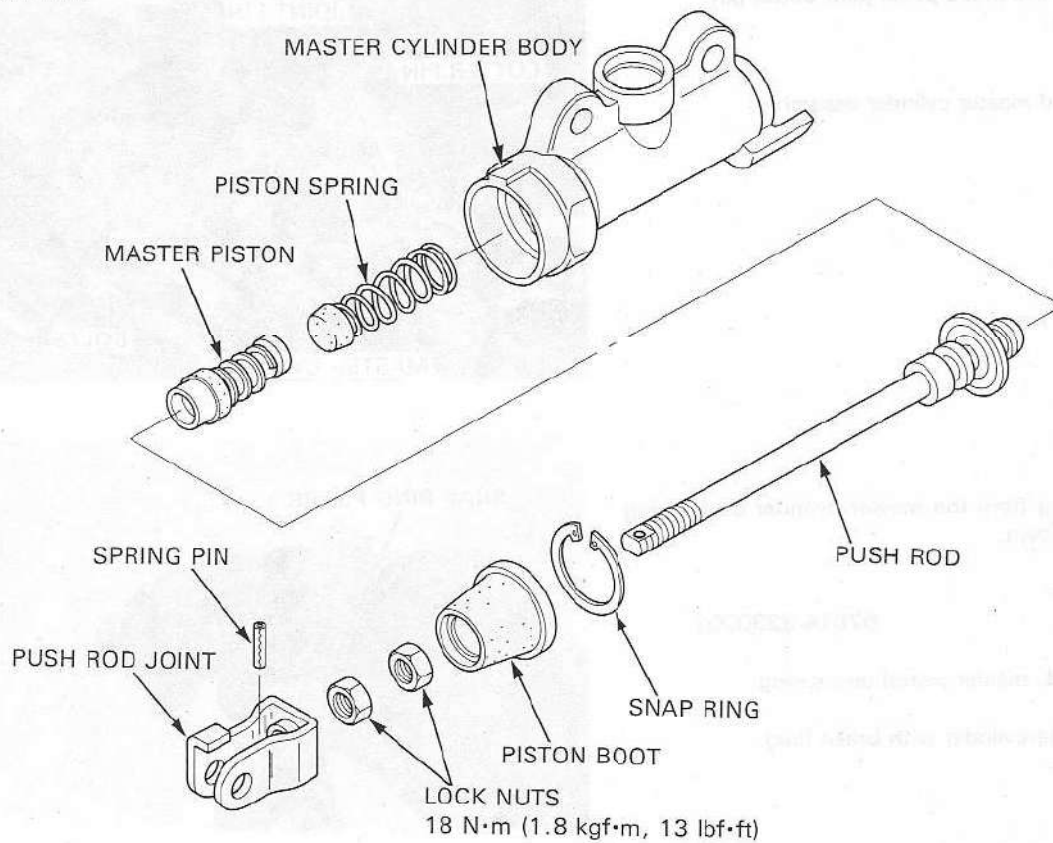
Measure the master cylinder piston O.D.

SERVICE LIMIT: 13.945 mm (0.5490 in)



HYDRAULIC BRAKE

ASSEMBLY



CAUTION

- Keep the piston, cups, spring, snap ring and boot as a set; do not substitute individual parts.

Coat all parts with clean brake fluid before assembly. Dip the piston in brake fluid.
Install the spring.
Install the piston assembly.
Apply silicone grease to the piston contact area of the push rod.

CAUTION

- When installing the cups, do not allow the lips to turn inside out.

Install the push rod into the master cylinder.
Install the snap ring using the special tool.

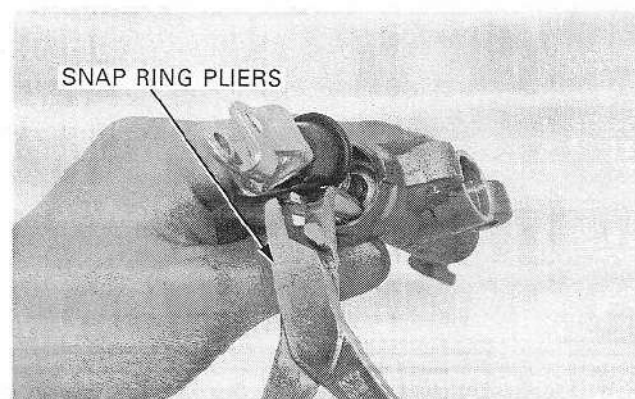
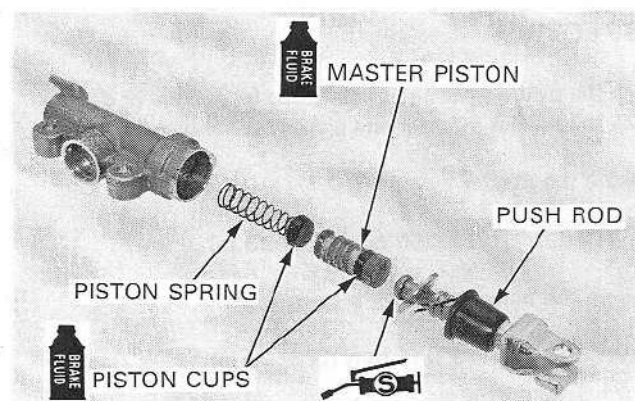
CAUTION

- Be certain the snap ring is firmly seated in the groove.

TOOL:

Snap ring pliers

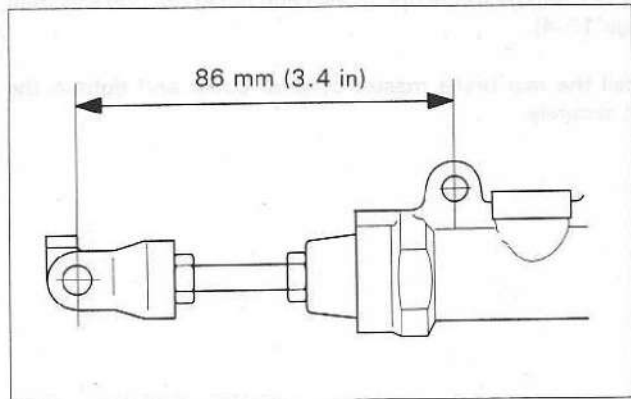
07914-3230001



HYDRAULIC BRAKE

If the push rod joint is reinstalled, adjust the push rod length so that the distance from the center of the master cylinder rear mounting bolt hole to the center of the joint pin hole is 86 mm (3.4 in). After adjustment, tighten the lock nut to the specified torque.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

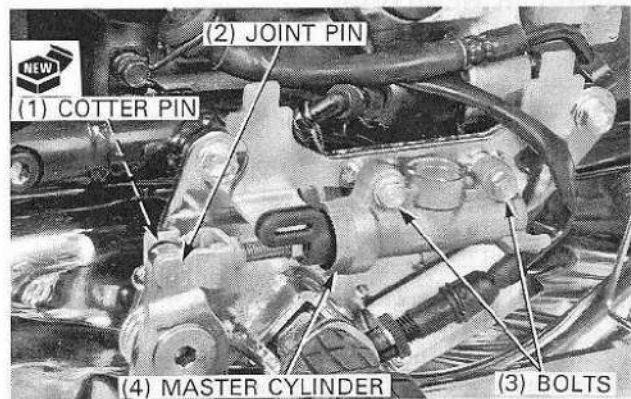


INSTALLATION

Place the master cylinder onto the frame and tighten the bolts to the specified torque.

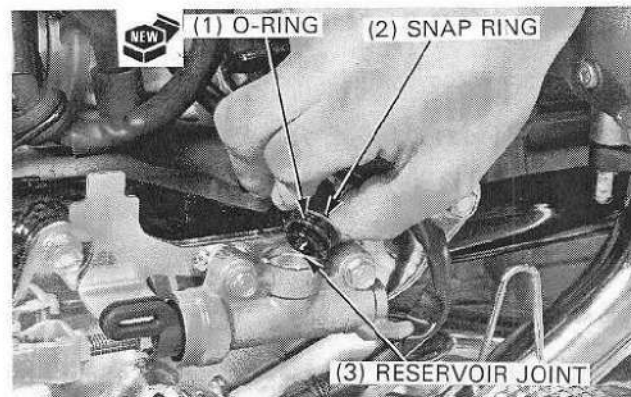
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Connect the brake pedal to the push rod lower joint. Install the joint pin and secure it with a new cotter pin.



Apply brake fluid to a new O-ring and install it onto the reservoir joint.

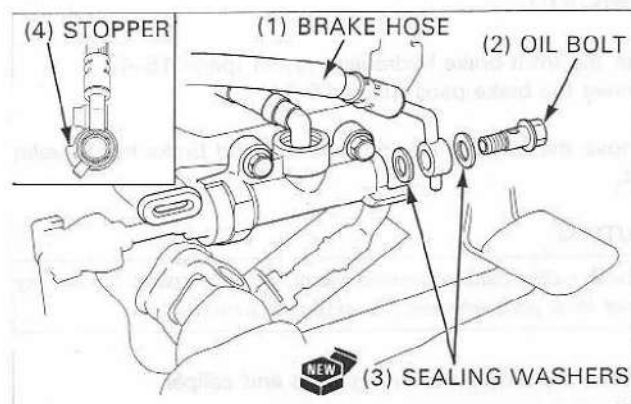
Install the reservoir joint into the master cylinder. Install the snap ring.



Install the brake hose with the oil bolt and new sealing washers.

Push the eyelet joint against the stopper, then tighten the oil bolt to the specified torque.

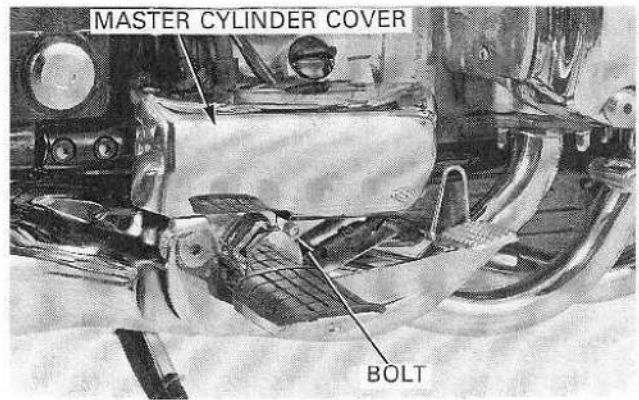
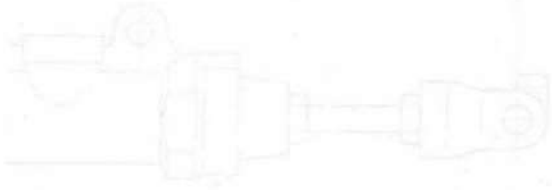
TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)



HYDRAULIC BRAKE

Fill the reservoir to the upper level and bleed the brake system (page 15-4).

Install the rear brake master cylinder cover and tighten the bolt securely.



RESERVOIR REMOVAL

Remove the mounting bolt and the reservoir cover.

Drain the brake fluid from the rear hydraulic system (page 15-4).

Remove the mounting bolt and reservoir.
Disconnect the reservoir hose from the reservoir.

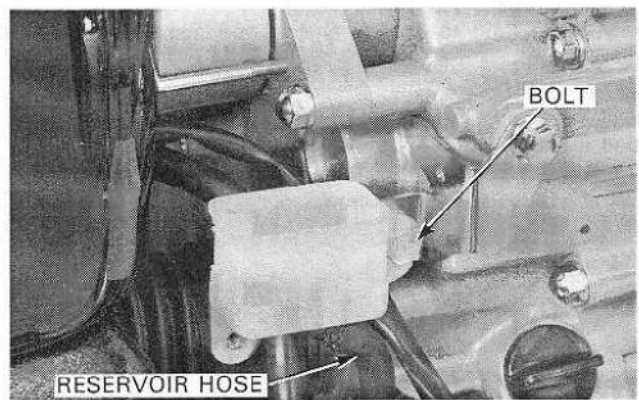
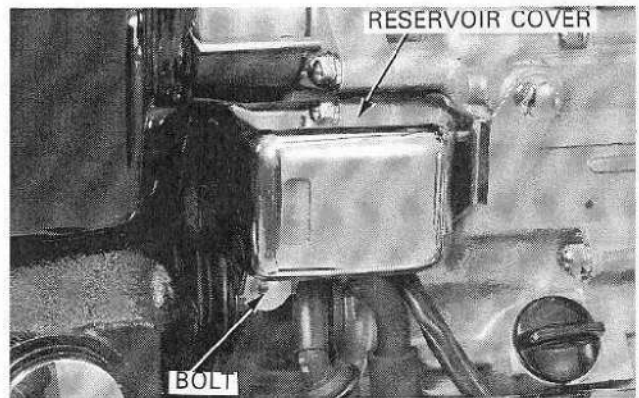
RESERVOIR INSTALLATION

Connect the reservoir hose to the reservoir.
Install the reservoir onto the frame and tighten the mounting bolt.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the reservoir cover and tighten the mounting bolt.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



FRONT BRAKE CALIPER

REMOVAL

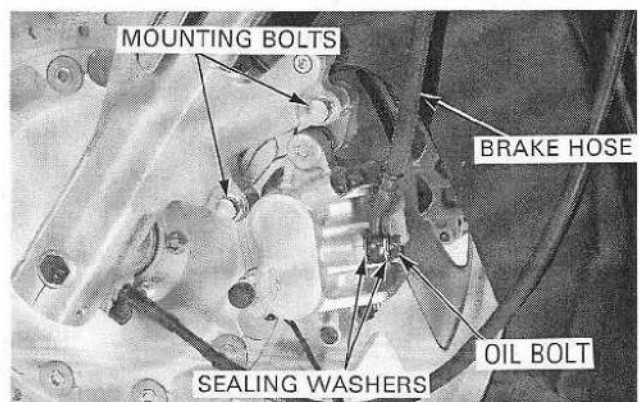
Drain the front brake hydraulic system (page 15-4).
Remove the brake pads (page 15-5).

Remove the oil bolt, sealing washers and brake hose eyelet joint.

CAUTION

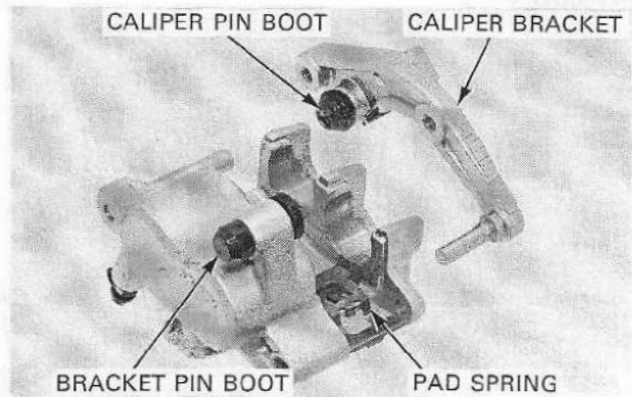
- *Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.*

Remove the caliper mounting bolts and caliper.



DISASSEMBLY

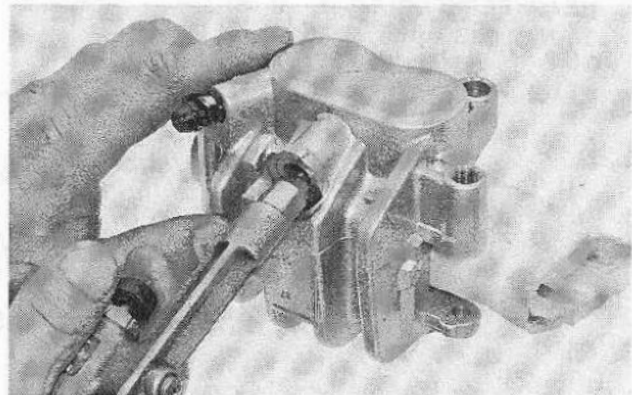
Remove the caliper bracket from the caliper body.
Remove the caliper pin boot from the bracket.
Remove the pad spring and bracket pin boot from the caliper body.



Place a shop towel over the pistons.
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.

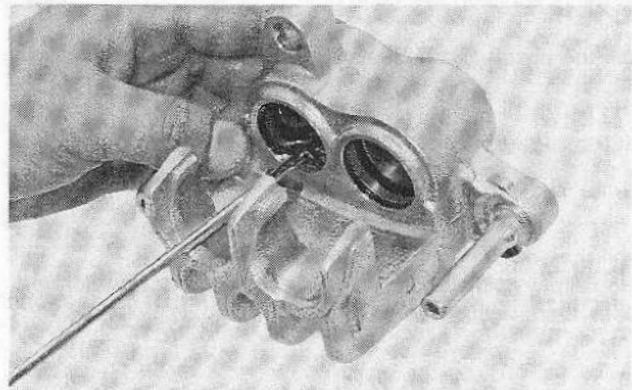


Push the dust seals and piston seals in and lift them out.

CAUTION

- Be careful not to damage the piston sliding surface.

Clean the seal grooves with clean brake fluid.



INSPECTION

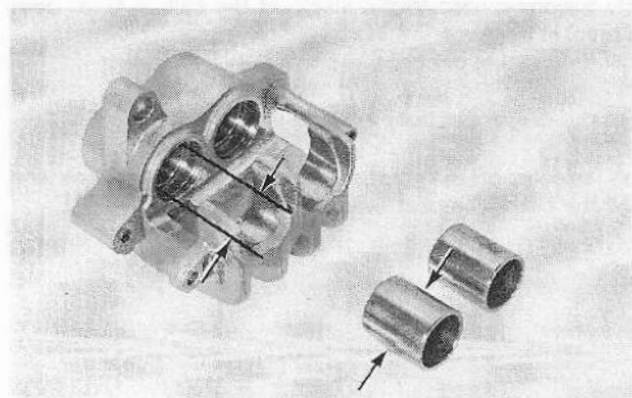
Check the caliper cylinders and pistons for scoring or other damage.

Measure the caliper cylinder I.D.

SERVICE LIMIT: 27.06 mm (1.065 in)

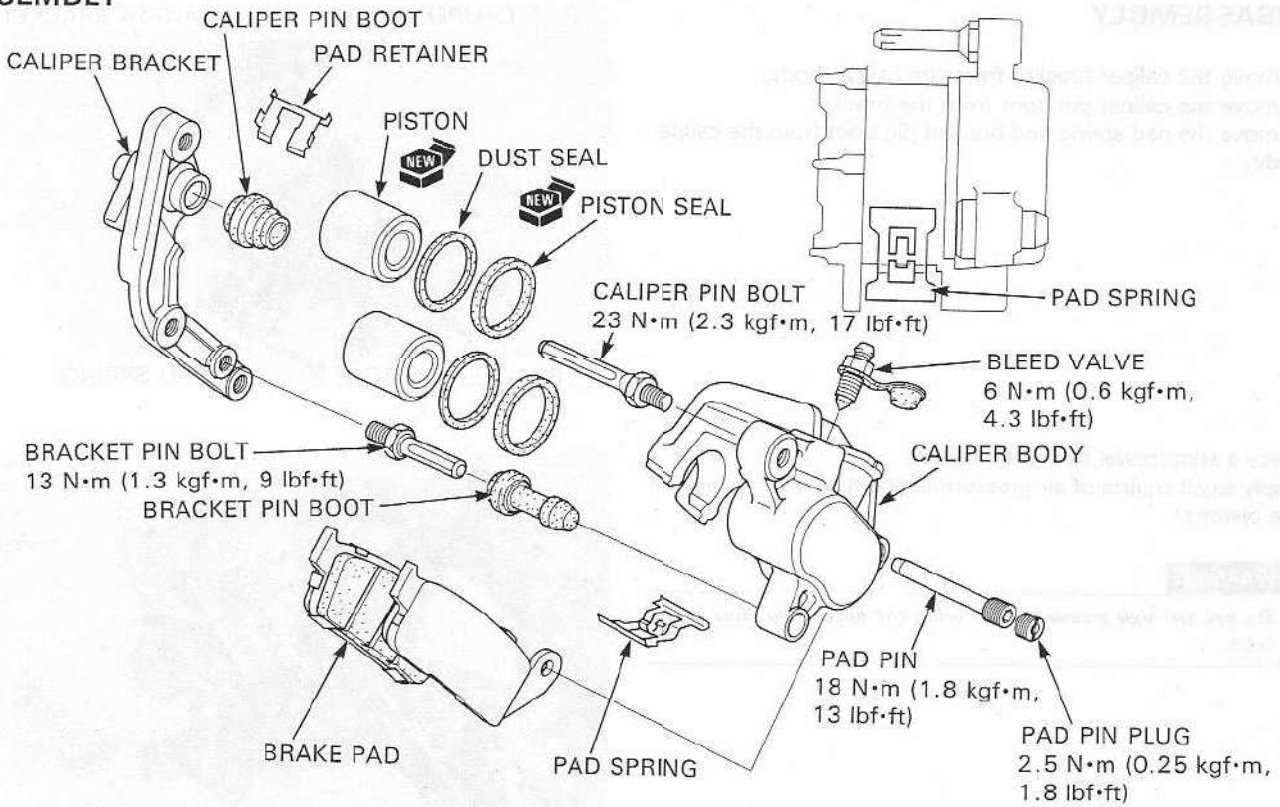
Measure the caliper piston O.D.

SERVICE LIMIT: 26.927 mm (1.0610 in)



HYDRAULIC BRAKE

ASSEMBLY

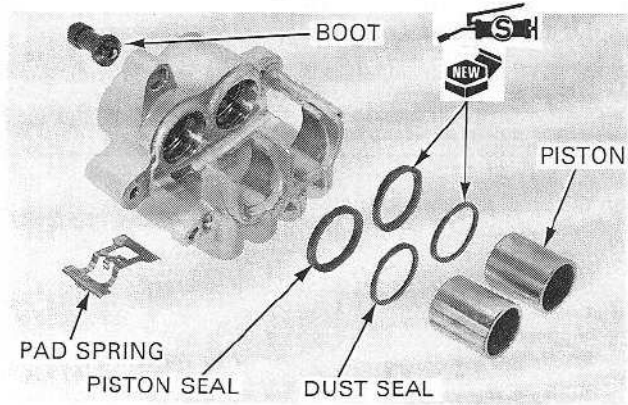


Coat the new piston seals and dust seals with silicone grease.

Install the piston and dust seal into the groove of the caliper body.

Coat the caliper pistons with clean brake fluid and install them into the caliper cylinder with their opening ends toward the pad.

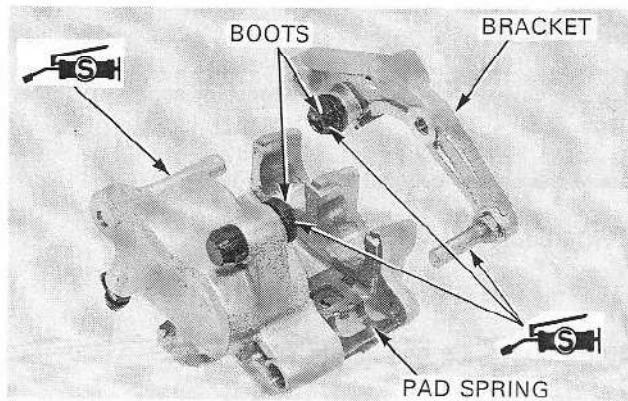
Install the pad spring in the caliper body. If the caliper and bracket pin boots are hard or deteriorated, replace them with new ones.



Apply silicone grease to the inside of the caliper pivot boot and bracket pin boot. Install the bracket pin boot into the caliper body.

Install the caliper pin boot into the bracket.

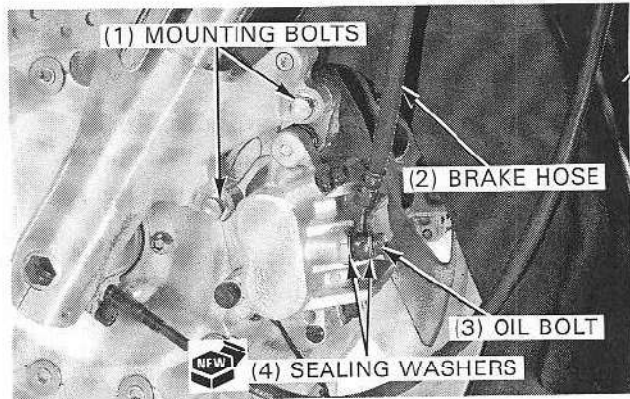
Apply silicone grease to the caliper and bracket pins and install the caliper bracket over the caliper body.



INSTALLATION

Install the caliper onto the fork leg.
Install and tighten the new caliper mounting bolts to the specified torque.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

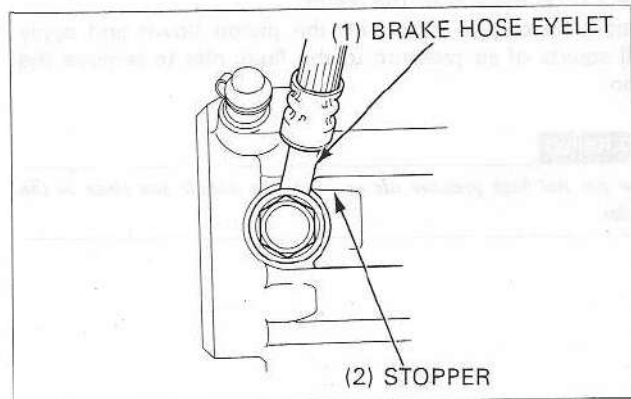


Install the brake hose eyelet to the caliper body with two new sealing washers and oil bolt.
Push the brake hose eyelet to the stopper on the caliper, then tighten the oil bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Install the brake pads (page 15-6).

Fill and bleed the front brake hydraulic system (page 15-4).



REAR BRAKE CALIPER

REMOVAL

NOTE

- Loosen the oil bolt before removing the rear axle.

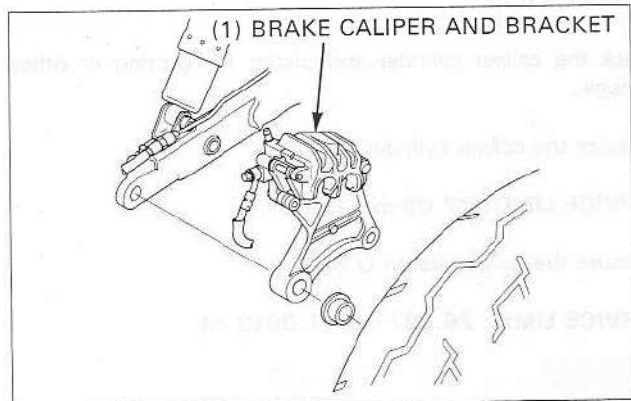
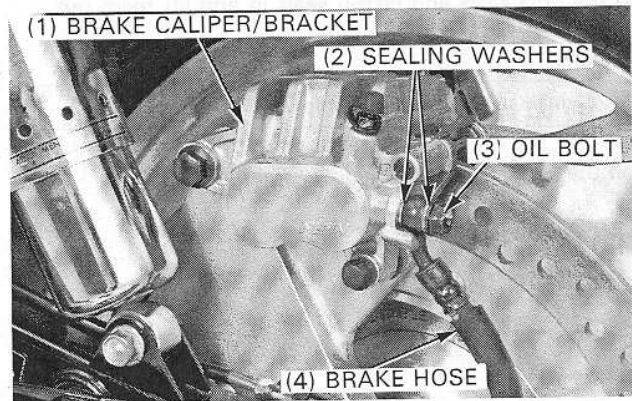
Drain the rear brake hydraulic system (page 15-4).
Remove the brake pads (page 15-6).

Remove the rear wheel (page 14-3).
Remove the brake caliper and bracket.

Remove the oil bolt, sealing washers and brake hose eyelet joint.

CAUTION

- Avoid spilling fluid on painted, plastic, or rubber part. Place a rag over these parts whenever the system is serviced.

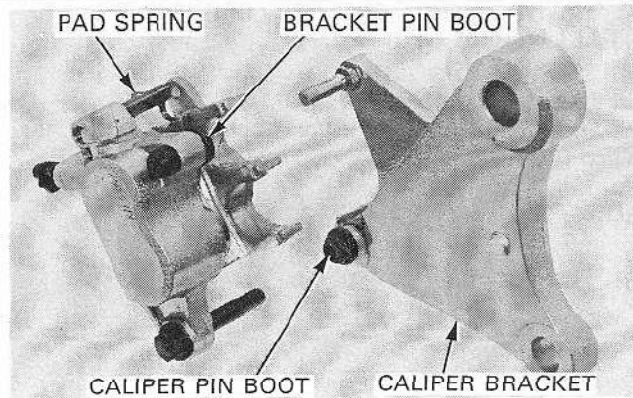


HYDRAULIC BRAKE

DISASSEMBLY

Remove the caliper pin boot from the bracket.

Remove the pad spring and boot from the caliper body.

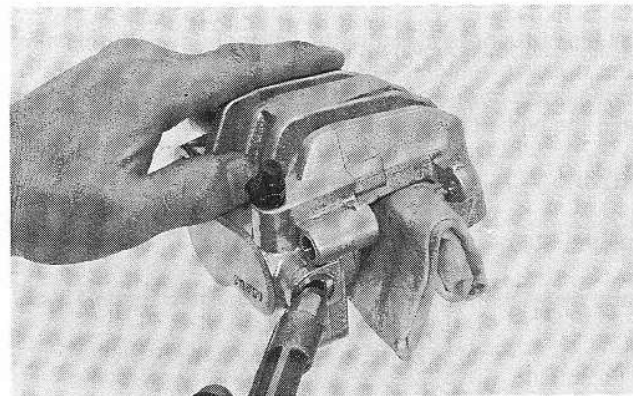


Place a shop towel over the piston.

Position the caliper body with the piston down and apply small squirts of air pressure to the fluid inlet to remove the piston.

▲WARNING

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

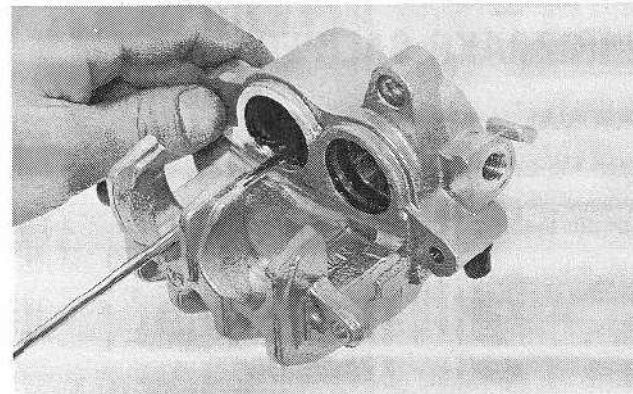


Push the dust seals and piston seals in and lift them out.

CAUTION

- Be careful not to damage the piston sliding surface.

Clean the seal grooves with clean brake fluid.



INSPECTION

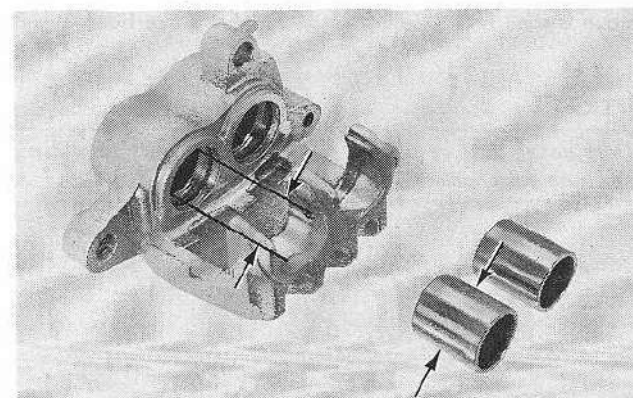
Check the caliper cylinder and piston for scoring or other damage.

Measure the caliper cylinder I.D.

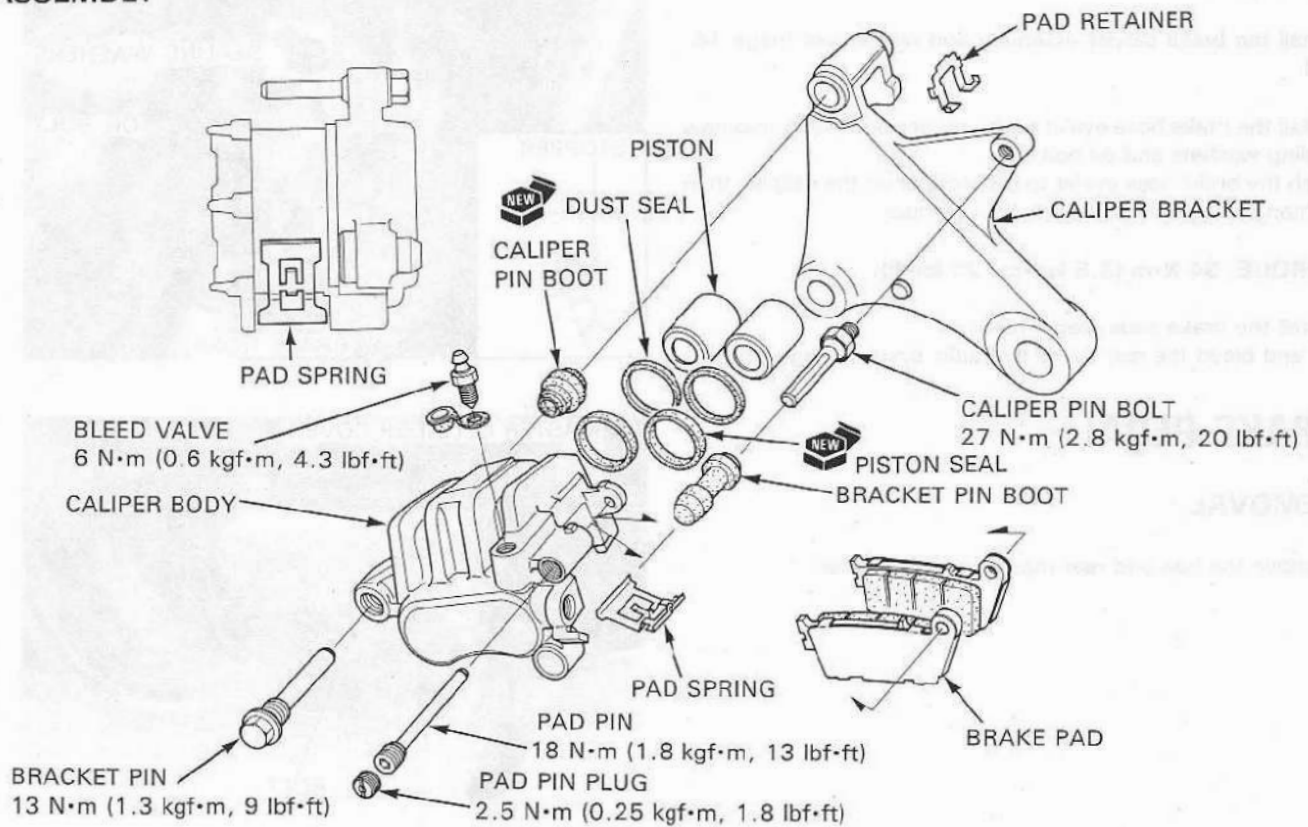
SERVICE LIMIT: 27.06 mm (1.065 in)

Measure the caliper piston O.D.

SERVICE LIMIT: 26.927 mm (1.0610 in)



ASSEMBLY

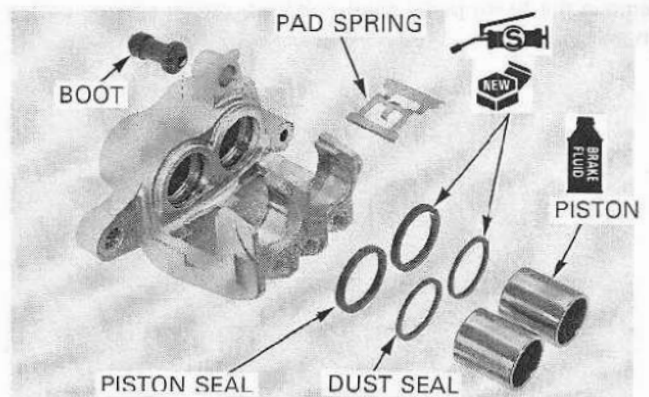


Coat the new piston seals and dust seals with silicone grease.

Install the piston seals and dust seals into the groove of the caliper body.

Coat the caliper piston with clean brake fluid and install it into the caliper cylinder with its opening end toward the pad.

Install the pad spring into the caliper body.
If the caliper and bracket pin boots are hard or deteriorated, replace them with new ones.

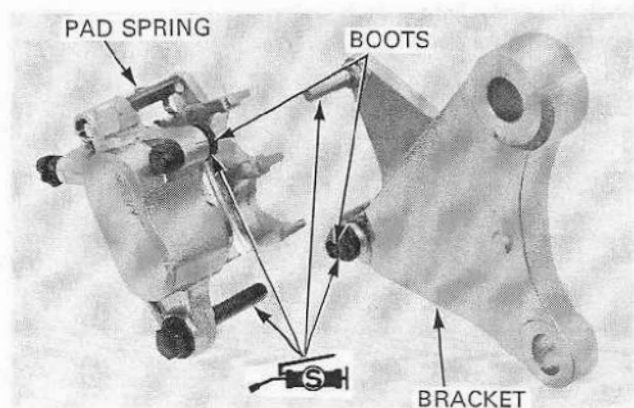


Apply silicone grease to the inside of the caliper pivot boot and bracket pin boot.

Install the bracket pin boot into the caliper body.

Install the caliper pin boot into the bracket.

Apply silicone grease to the caliper and bracket pins and install the caliper bracket over the caliper body.



HYDRAULIC BRAKE

INSTALLATION

Install the brake caliper assembly and rear wheel (page 14-10).

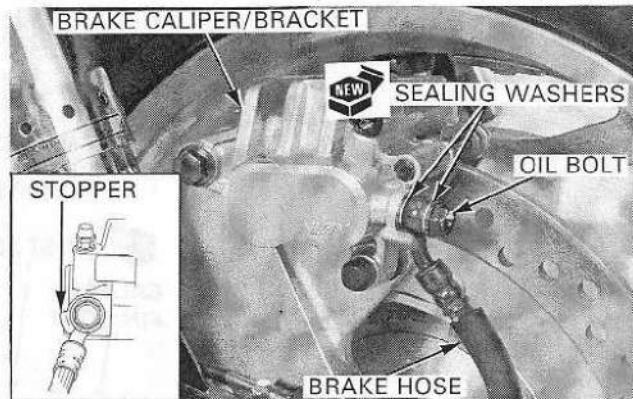
Install the brake hose eyelet to the caliper body with two new sealing washers and oil bolt.

Push the brake hose eyelet to the stopper on the caliper, then tighten the oil bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Install the brake pads (page 15-8).

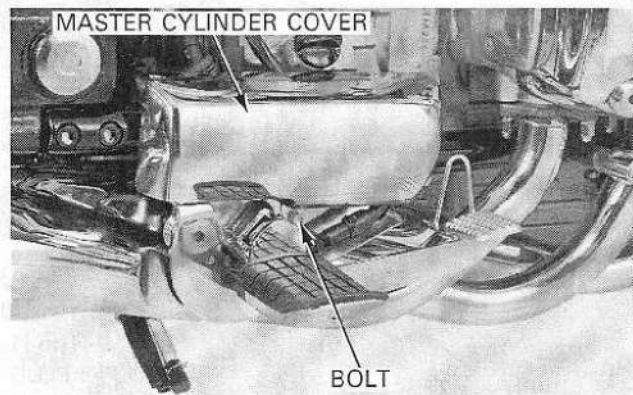
Fill and bleed the rear brake hydraulic system (page 15-4).



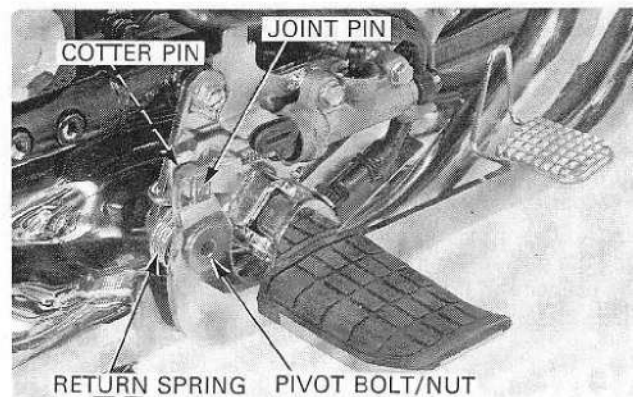
BRAKE PEDAL

REMOVAL

Remove the bolt and rear master cylinder cover.

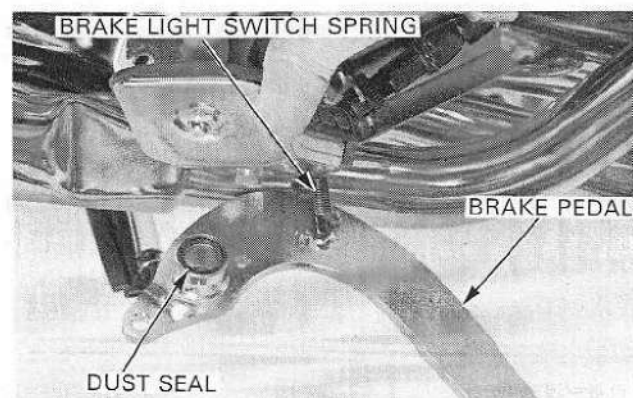


Remove the brake pedal pivot bolt/nut, return spring, cotter pin and joint pin.

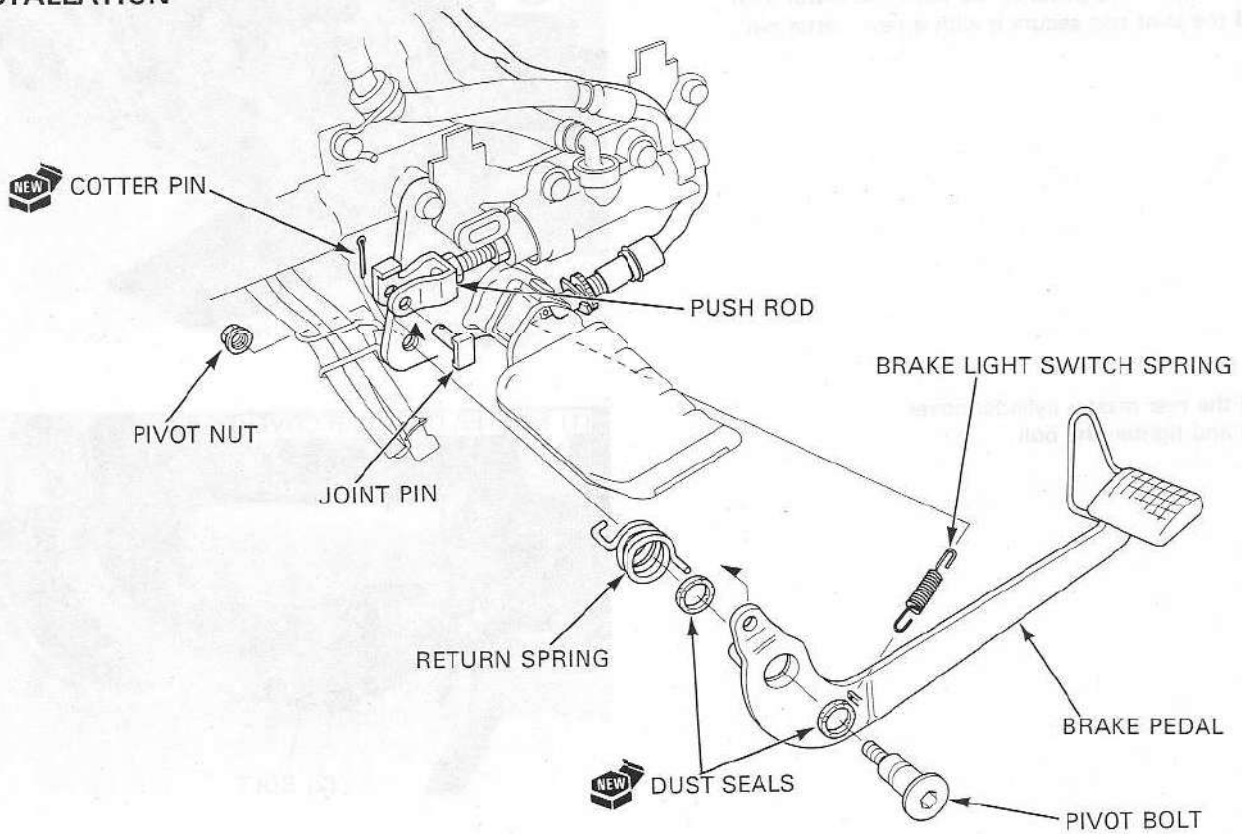


Unhook the brake light switch spring.
Remove the brake pedal.

Remove the dust seals from the pedal pivot.

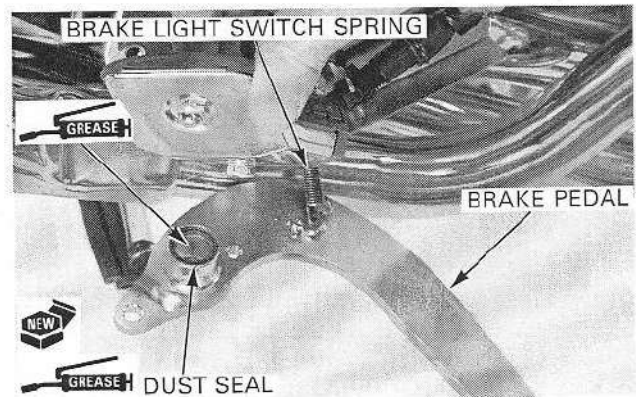


INSTALLATION

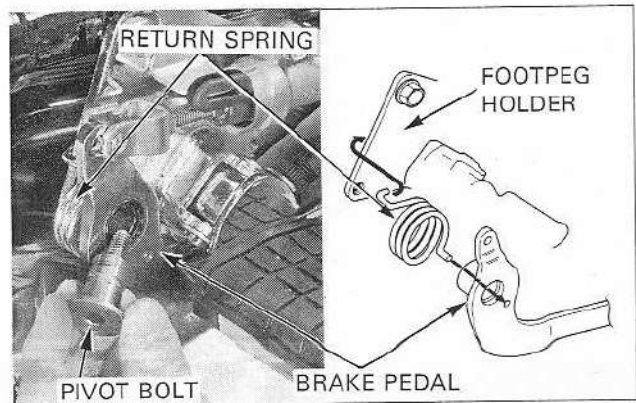


Apply grease to the sliding surface of the brake pedal pivot and dust seal lips.
Install the new dust seals into the brake pedal pivot.

Hook the brake light switch spring.

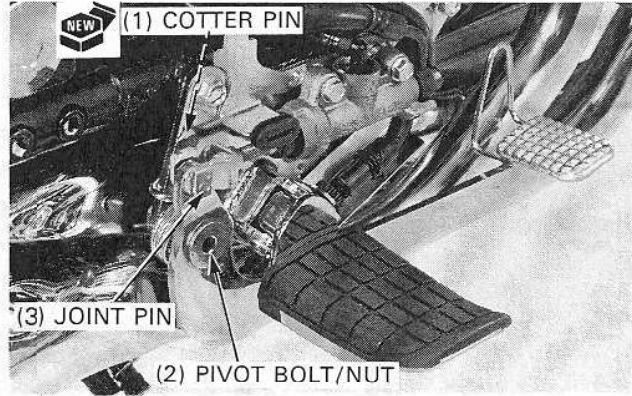


Install the return spring and brake pedal as shown.
Install the pivot bolt.

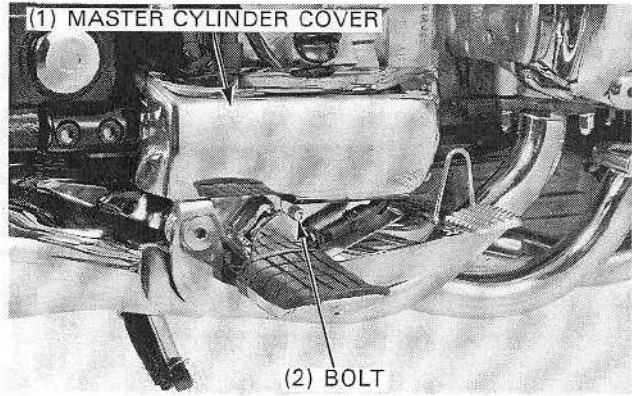


HYDRAULIC BRAKE

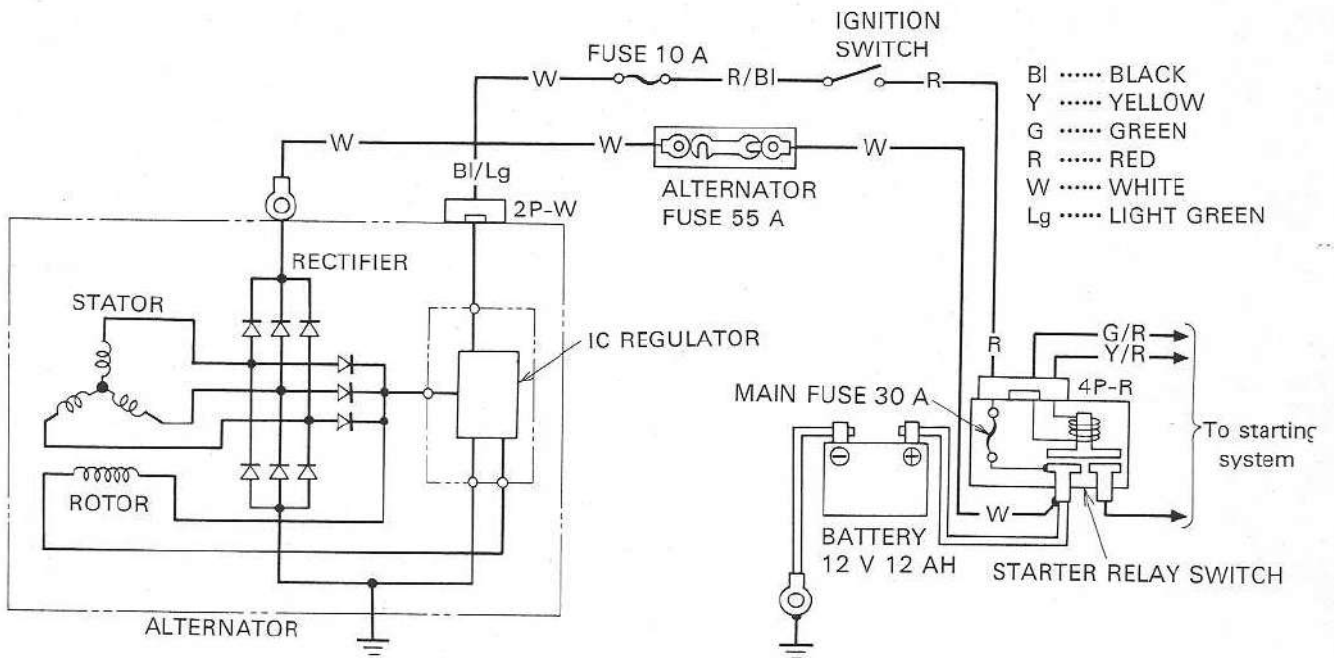
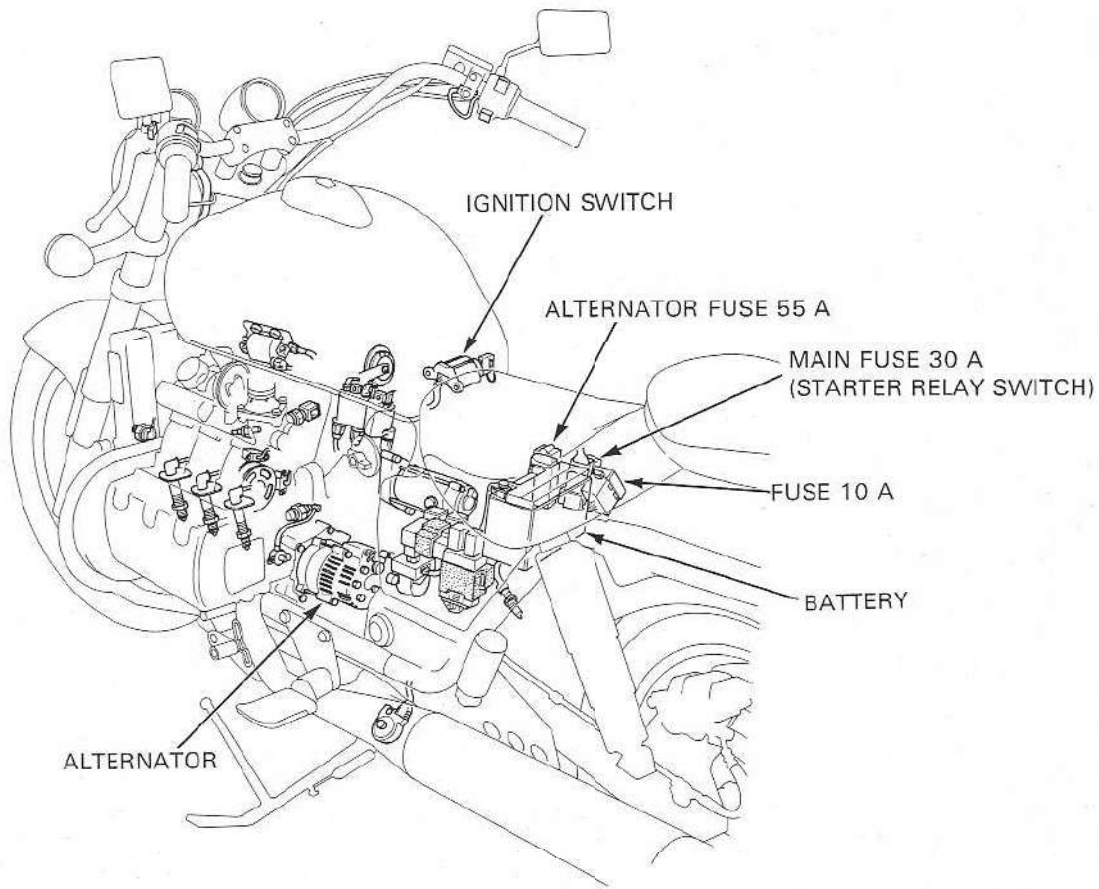
Install and tighten the pivot nut.
Connect the brake pedal to the push rod lower joint.
Install the joint and secure it with a new cotter pin.



Install the rear master cylinder cover.
Install and tighten the bolt.



CHARGING SYSTEM/ALTERNATOR



16. CHARGING SYSTEM/ALTERNATOR

SERVICE INFORMATION	16-1	CHARGING SYSTEM INSPECTION	16-6
TROUBLESHOOTING	16-3	ALTERNATOR	16-8
BATTERY	16-5	ALTERNATOR DRIVEN GEAR	16-16

SERVICE INFORMATION

GENERAL

▲WARNING

- The battery gives off explosive gases; keep sparks, flames, and cigarettes away. Provide adequate ventilation when charging or using the battery in an enclosed space.
 - The battery contains sulfuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and a face shield.
 - If electrolyte gets on your skin, flush with water.
 - If electrolyte gets in your eyes, flush with water for at least 15 minutes and call a physician immediately.
 - Electrolyte is poisonous. If swallowed, drink large quantities of water or milk and follow with milk of magnesia or vegetable oil and call a physician.
 - **KEEP OUT OF REACH OF CHILDREN**
 - When disconnecting the alternator cable terminal from the alternator, first disconnect the battery negative cable from the battery.
- Always turn off the ignition switch before disconnecting any electrical component.

CAUTION

- Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is ON and current is present.
 - For battery charging, do not exceed the charging current and time specified on the battery (and shown below). Use of excessive current or charging time may damage the battery.
- For extended storage, remove the battery, give it a full charge, and store it in a cool, dry place.
- For a battery remaining in a stored motorcycle, disconnect the negative battery cable from the battery terminal.

NOTE

- The maintenance free (MF) battery must be replaced when it reaches the end of its service life.

CAUTION

- The battery caps should not be removed. Attempting to remove the sealing caps from the cells may damage the battery.
- Battery can be damaged if overcharged or undercharged, or if left to discharge for long periods. These same conditions contribute to shortening the "life span" of the battery. Even under normal use, the performance of a battery deteriorates after 2–3 years.
- Battery voltage may recover after battery charging, but under heavy load, battery voltage will drop quickly and eventually die out. For this reason, the charging system is often suspected to be the problem. Battery overcharge often results from problems in the battery itself, which may appear to be an overcharge symptom. If one of the battery cells is shorted and battery voltage does not increase, the regulator/rectifier supplies excess voltage to the battery. Under these conditions, the electrolyte level goes down quickly.
- Before troubleshooting the charging system, check for proper use and maintenance of the battery. Check if the battery is frequently under heavy load, such as having the headlight and taillight ON for long periods of time without riding the motorcycle.
- The battery will self-discharge when the motorcycle is not in use. For this reason, charge the battery every two weeks to prevent sulfation from forming.
- Remove the battery from the vehicle for charging. Slow charge the battery whenever possible. Quick charging should be an emergency procedure only.
- Filling a new battery with electrolyte will produce some voltage, but in order to achieve its maximum performance, always charge the battery. Also, the battery life is lengthened when it is initial-charged.
- When checking the charging system, always follow the steps in the troubleshooting flow chart (page 16-3).

CHARGING SYSTEM/ALTERNATOR

GENERAL (cont'd)

- The regulator/rectifier is located in the alternator.
- The alternator service may be done with the engine in the frame. Maintenance services and repairs of the alternator driven gear described in this section must be performed with the engine removed from the frame. For starter clutch and alternator driven/drive gears removal/installation, see section 10.

BATTERY TESTING

Refer to the instructions in the Operation Manual for the recommended battery tester for details about battery testing. The recommended battery tester puts a "load" on the battery so that the actual battery condition can be measured.

Recommended battery tester

BM-210-AH, BM-210

SPECIFICATIONS

ITEM		STANDARD	SERVICE LIMIT	
Alternator	Stator coil resistance	0.1—0.3 Ω (at 20°C/68°F)	—	
	Rotor coil resistance	2.9—4.0 Ω (at 20°C/68°F)	—	
	Rotor coil slip ring O.D.	27.0 mm (1.06 in)	26.0 mm (1.02 in)	
Battery (Maintenance free: YTX14-BS)	Capacity	12 V—12 Ah	—	
	Current leakage	0.1 mA max.	—	
	Charging rate	Normal	1.4 A \times 5—10 h	—
		Quick	6.0 A \times 1.0 h	—
	Voltage (at 20°C/ 68°F)	Fully charged	13.1 V	—
Needs charging		Below 12.3 V	—	

TORQUE VALUES

Alternator mounting bolt	29 N·m (3.0 kgf·m, 22 lbf·ft)
Coupler A mounting nut	57 N·m (5.8 kgf·m, 42 lbf·ft) Apply locking agent to the threads.
Coupler B mounting nut	57 N·m (5.8 kgf·m, 42 lbf·ft)

TOOLS

Universal holder	07725-0030000
Bearing remover, 17 mm	07936-3710300
Remover handle	07936-3710100
Remover weight	07741-0010201 or 07936-371020A or 07936-3710200
Driver	07749-0010000
Attachment, 32 \times 35 mm	07746-0010100
Pilot, 20 mm	07746-0040500
Driver, 40 mm I.D.	07746-0030100
Attachment, 30 mm I.D.	07746-0030300
Digital multimeter	Commercially available

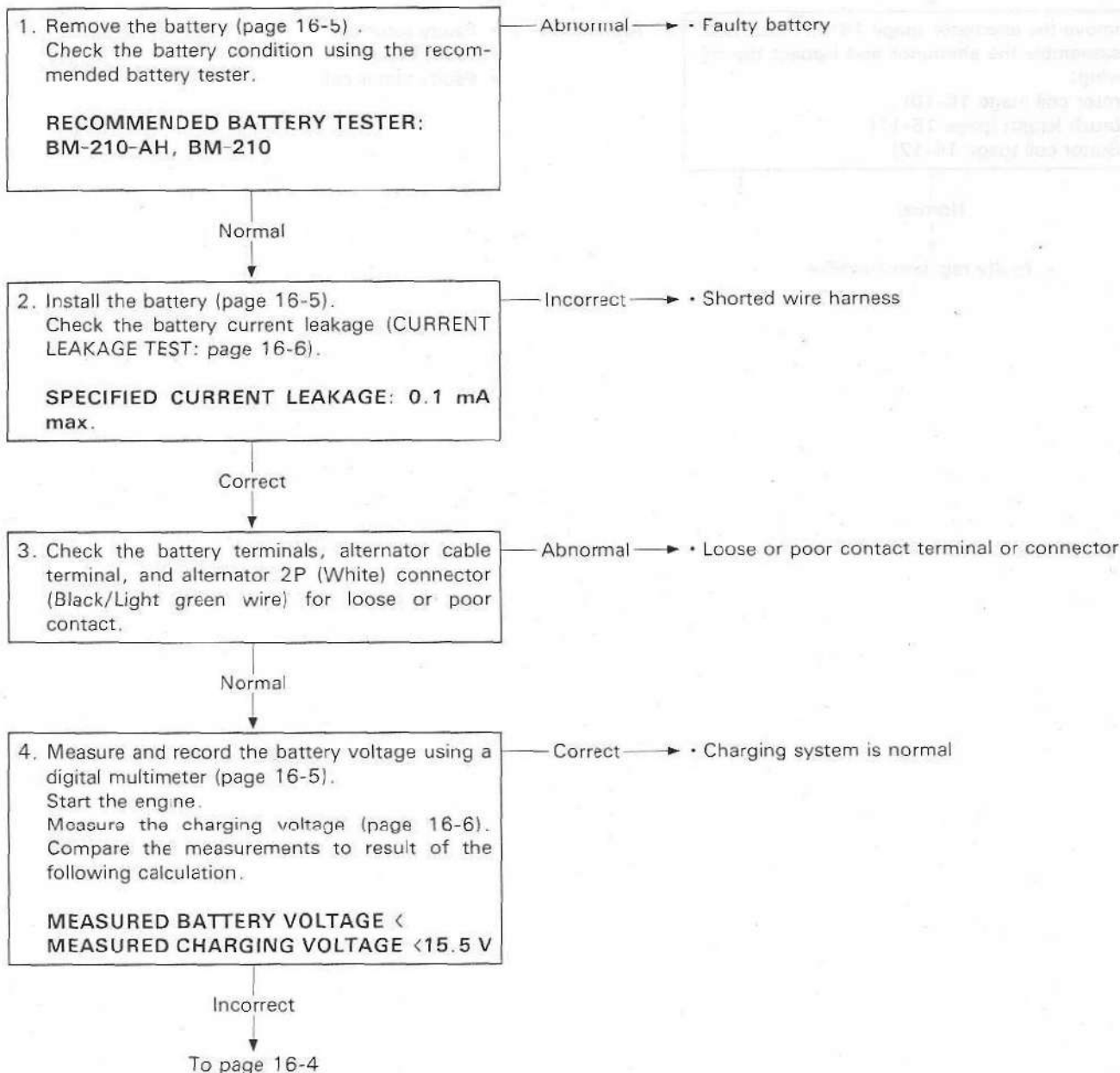
TROUBLESHOOTING

ABNORMAL ENGINE NOISE (Gear noise)

- Worn or damaged alternator drive or driven gear.

BATTERY IS DAMAGED OR WEAK

- Check for blown alternator fuse (55 A) before servicing.



CHARGING SYSTEM/ALTERNATOR

From page 16-3

5. Perform the wire harness inspection (page 16-7).

Abnormal

- Open circuit in wire harness
- Loose or poor contacts in alternator 2P (White) connector (located under the seat)

Normal

6. Remove the alternator (page 16-8).
Disassemble the alternator and inspect the following:
—rotor coil (page 16-10).
—brush length (page 16-11).
—Stator coil (page 16-12).

Abnormal

- Faulty rotor coil
- Worn brush
- Faulty stator coil

Normal

- Faulty regulator/rectifier

BATTERY

REMOVAL/INSTALLATION

Remove the seat (page 2-2).
 Remove the radio (GL1500CF only: page 20-6).
 Release the battery fixing strap and remove the battery cover.
 With the ignition switch OFF, disconnect the negative (-) cable first, then the positive cable (+). Remove the battery.

Installation is in the reverse order of removal.

NOTE

- Connect the positive cable terminal (+) first and then the negative cable (-).

After installing the battery, coat the terminals with grease.

VOLTAGE INSPECTION

Measure the battery voltage using a digital multimeter.

VOLTAGE: Fully charged: 13.0–13.2 V
 Under charged: Below 12.3 V

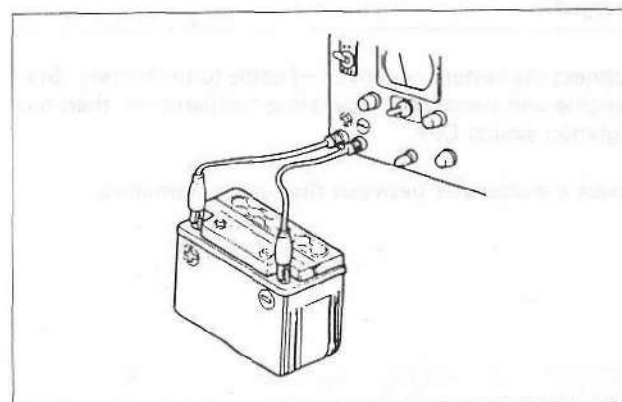
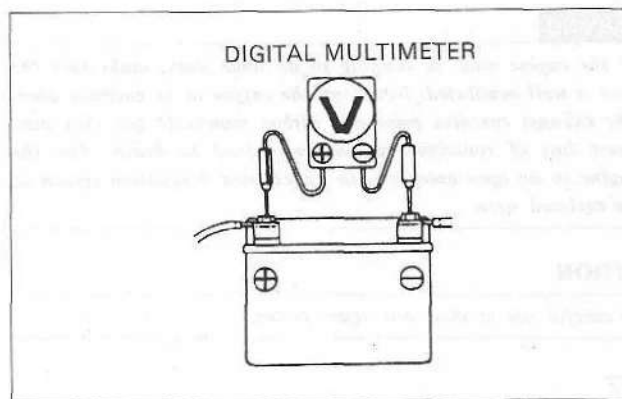
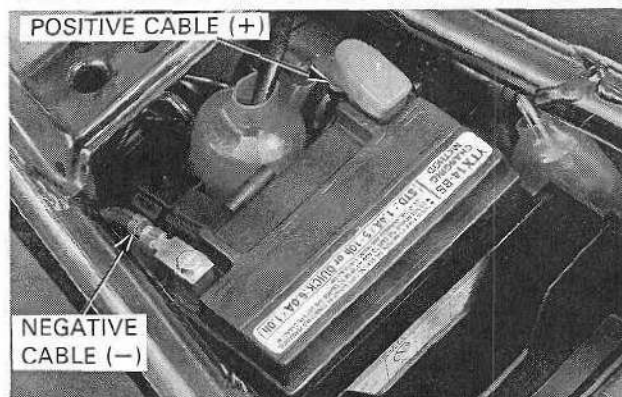
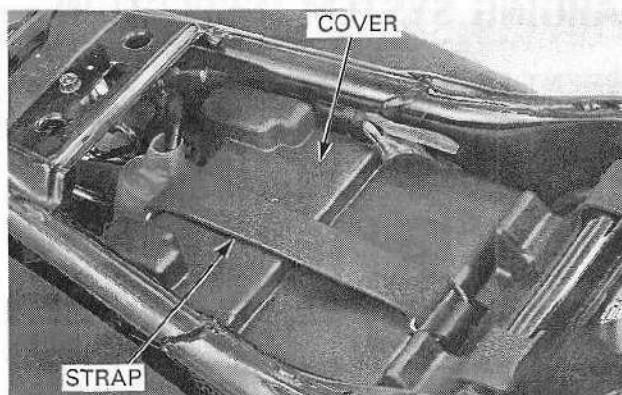
BATTERY CHARGING

CAUTION

- *Quick charging should only be done in an emergency; slow charging is preferred.*
- *For battery charging, go not exceed the charging current and time specified on the battery. Using excessive current or extending the charging time may damage the battery.*

Remove the battery (see above).
 Connect the charger positive (+) cable to the battery positive (+) terminal and the charger negative (-) cable to the battery (-) terminal.

	Standard	Quick
Charging current	1.4 A	6.0 A
Charging time	5–10 hours	1.0 hour



CHARGING SYSTEM INSPECTION

CURRENT LEAKAGE TEST

Remove the seat (page 2-2) and battery cover (page 16-5). Turn off the ignition switch, and disconnect the negative cable (-) from the battery.

Connect the ammeter (+) probe to the negative cable and the ammeter (-) probe to the battery (-) terminal.

With the ignition switch off, check for current leakage.

NOTE

- When measuring current using a tester, set it to a high range, and then bring the range down to an appropriate level. Current flow larger than the range selected may blow out the fuse in the tester.
- While measuring current, do not turn the ignition ON. A sudden surge of current may blow out the fuse in the tester.

SPECIFIED CURRENT LEAKAGE: 0.1 mA max.

If current leakage exceeds the specified value, a shorted circuit is likely.

Locate the short by disconnecting connections one by one and measuring the current.

CHARGING VOLTAGE INSPECTION

⚠ WARNING

- *If the engine must be running to do some work, make sure the area is well ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and may lead to death. Run the engine in an open area or with an exhaust evacuation system in an enclosed area.*

CAUTION

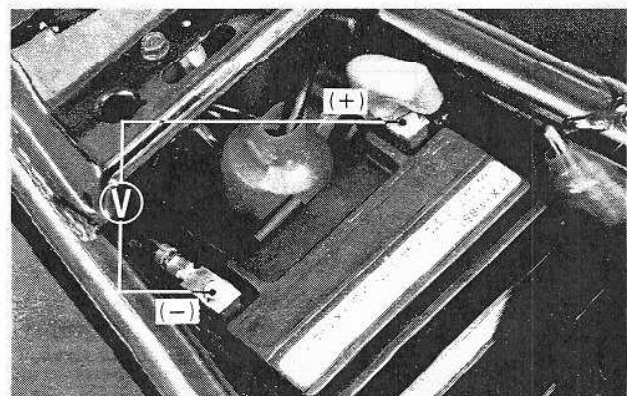
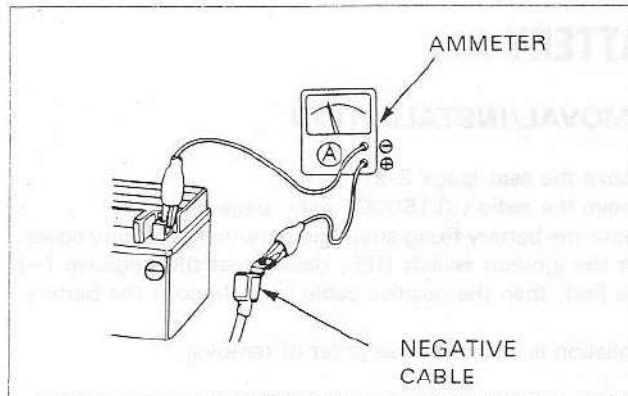
- *Be careful not to short any tester probes.*

NOTE

- Before performing this test, be sure that the battery is fully charged.

Reconnect the battery negative (-) cable to the battery. Start the engine and warm up to operating temperature, then turn the ignition switch OFF.

Connect a multimeter between the battery terminals.



With the headlight Hi beam on, restart the engine. Measure the voltage on the multimeter when the engine runs at 5,000 rpm.

STANDARD:

Measured battery voltage (page 16-5) < Measured charging voltage (see above) < 15.5 V at 5,000 rpm

WIRE HARNESS INSPECTION

▲WARNING

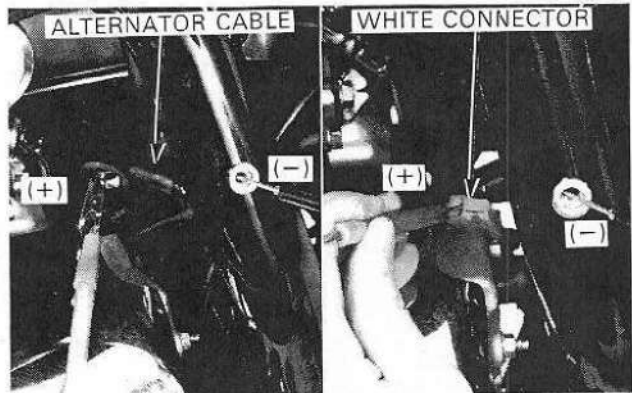
- Disconnect the battery negative cable from the battery to prevent sparking when disconnecting the alternator cable from the alternator.

Disconnect the battery negative cable. Disconnect the alternator cable terminal and Black/Light Green wire connector (white) from the alternator.

Connect the battery negative cable onto the battery. Measure voltage between each wire (wire harness side) and ground as indicated on the chart.

Disconnect the battery negative cable to avoid sparking which would otherwise occur when connecting each wire to the alternator.

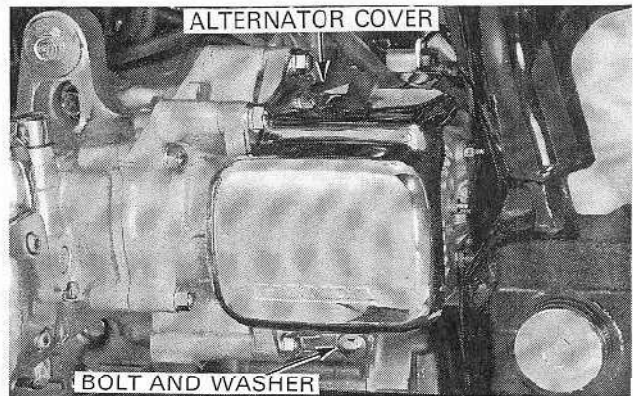
ITEM	TERMINALS	SPECIFICATION
Battery charging line	Alternator cable (+) and ground (-)	Battery voltage should register
Battery voltage input line	Black/Light Green (+) and ground (-)	Battery voltage should register with the ignition switch ON



ALTERNATOR

REMOVAL

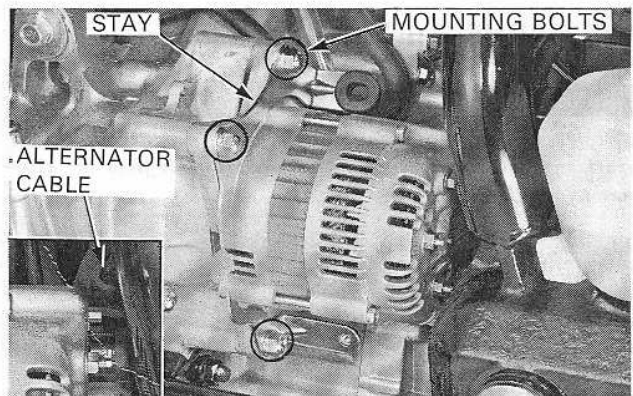
Remove the cover bolt.
Release the cover boss from the grommet and remove the alternator cover, being careful not to scratch or damage the cover.



GL1500C/CT:

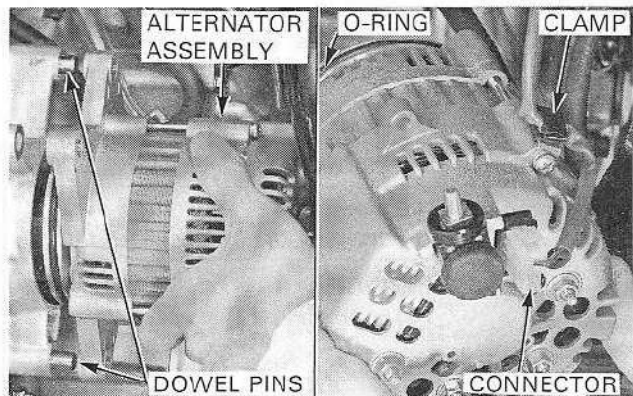
Disconnect the battery negative cable from the battery.
Disconnect the alternator cable terminal from the alternator.

Remove the three alternator mounting bolts and cover stay.



Remove the alternator assembly from the engine.
Disconnect the 2P connector and release wire from the clamp.

Remove the dowel pins.
Remove the O-ring from the alternator.

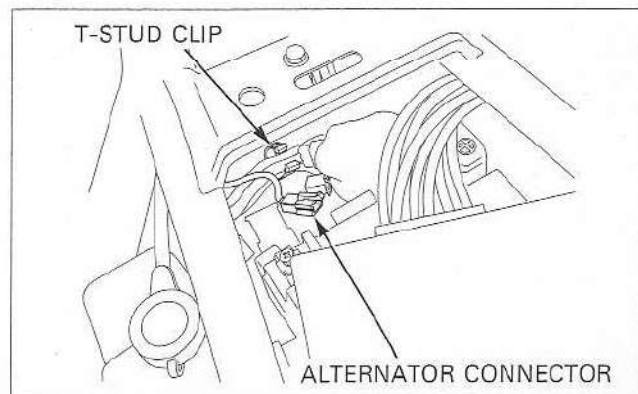


GL1500CF:

Remove the seat and side cover (pages 2-2 and 2-3).
Remove the center cover if necessary (page 2-3).
Disconnect the battery negative cable from the battery.
Unfasten T-stud clip and disconnect the alternator 1P connector.

NOTE

- Do not remove the T-stud clip from the frame. Re-use strictly prohibited.



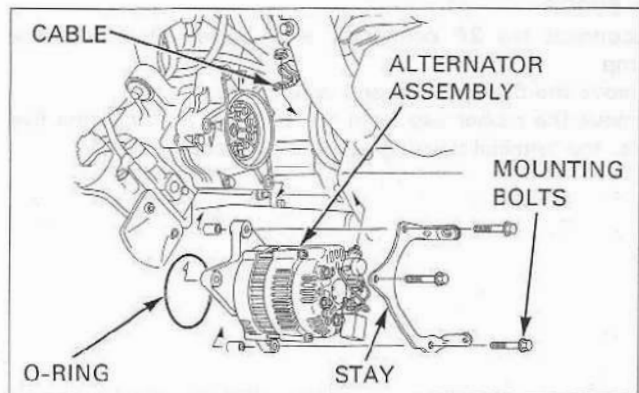
CHARGING SYSTEM/ALTERNATOR

Disconnect the alternator cable terminal from the alternator.

Remove the three alternator mounting bolts and cover stay.
Remove the alternator assembly from the engine.

Remove the dowel pins.

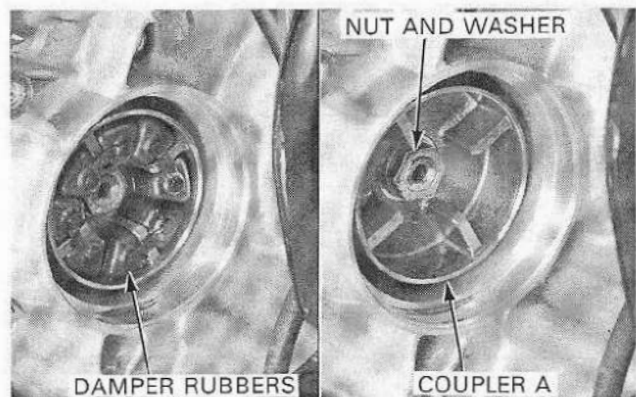
Remove the O-ring from the alternator.



Remove the damper rubbers from the coupler A.

Set the transmission in any gear. Check that the transmission is in gear by trying to move the rear wheel.

Remove the nut, washer and alternator coupler A.



DISASSEMBLY

Check the rotor rotation by rotating the rotor shaft with your finger. The rotor should rotate smoothly.

Hold coupler B with the special tool as shown, and remove the nut, washer, and coupler B.

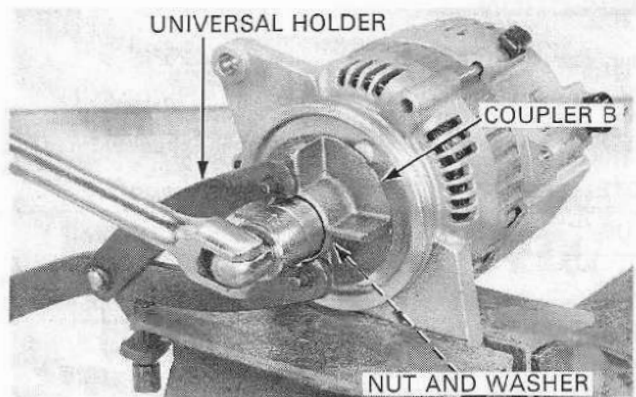
TOOL:

Universal holder

07725-0030000

NOTE

- It is not necessary to remove the coupler unless servicing the rotor front bearing and oil seal is required.

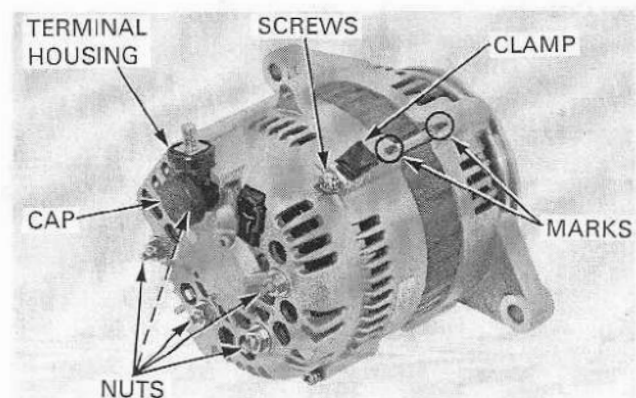


Mark the front and rear cover before removal to identify their original position.

GL1500C/CT:

Remove the three screws and wire clamp.

Remove the rubber cap from the terminal housing, the five nuts and the terminal housing.



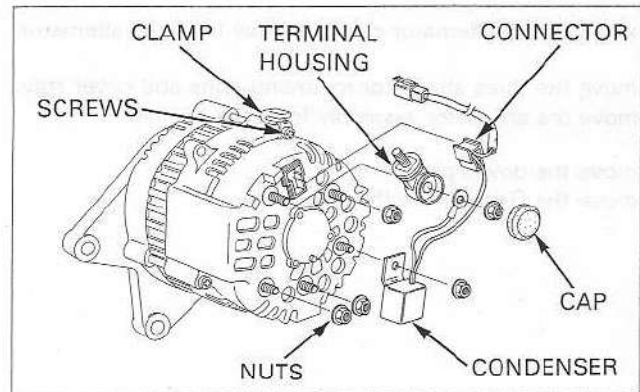
CHARGING SYSTEM/ALTERNATOR

GL1500CF:

Disconnect the 2P connector and release wire from the clamp.

Remove the three screws and wire clamp.

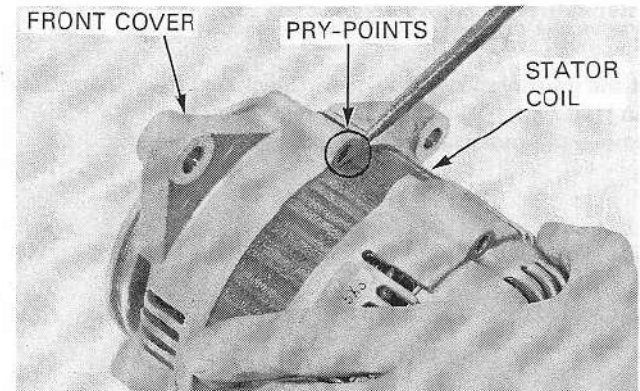
Remove the rubber cap from the terminal housing, the five nuts, the terminal housing and the condenser.



Separate the front cover/rotor from the rear cover/stator by prying them apart with a screwdriver.

CAUTION

- There are three pry-point positions which have screw threads on the front cover. Do not damage the stator coil when prying.



Separate the stator coil from the rear cover.

CAUTION

- Do not damage the stator coil. Protect it with a shop towel.

INSPECTION

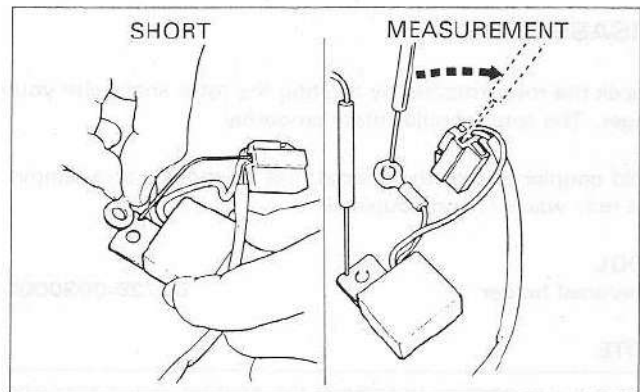
Condenser (GL1500CF only)

Short each terminal of the condenser as shown. Then, check for continuity between each terminal. The tester needle should swing momentarily, then return to ∞ .

NOTE

- Use a analog ohmmeter on this test.

If Continuity does exist or the tester needle will not swing, replace the condenser.

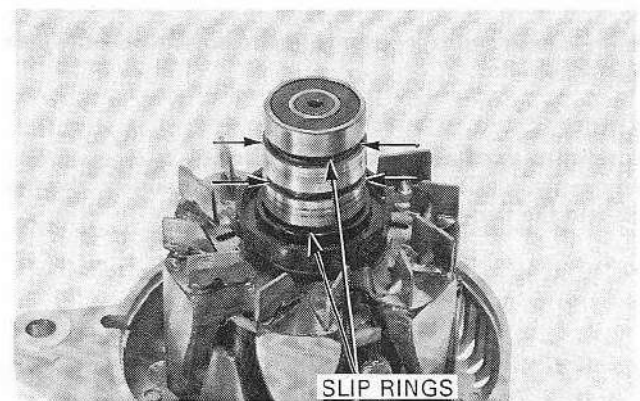


Rotor Coil

Inspect the slip rings for discoloration. Measure the O.D. of the slip rings.

SERVICE LIMIT: 26.0 mm (1.02 in)

For rotor replacement, see page 16-13 (rotor bearing replacement).



CHARGING SYSTEM/ALTERNATOR

Check for resistance between the slip rings. There should be

Normal: Light resistance

Replace the new brush
assembly.

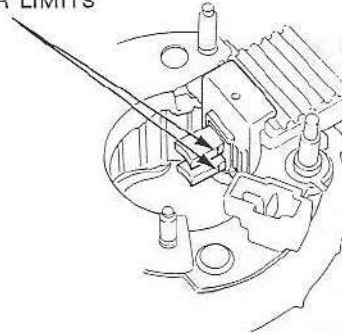
Brush Length

Replace the brushes if they are worn down to or near to their wear lines.

CAUTION

- Always replace the brushes in pairs.

WEAR LIMITS



CHARGING SYSTEM/ALTERNATOR

If replacement is necessary, melt the solder securing the brushes and pull them out of the brush holder.

Install new brushes in the brush holder with their marked side facing to the rear cover.
Set the brushes at the installed length as shown.

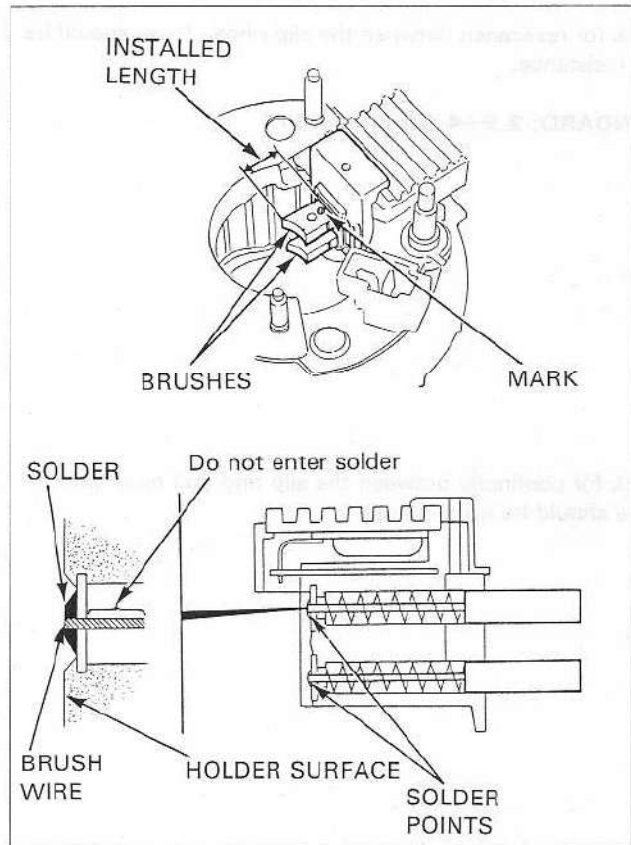
INSTALLED LENGTH: 18.0 mm (0.71 in)

Heat the soldering iron (Capacity: about 32 W). Use low-temperature (180°–200°F) solder to solder the new brushes.

CAUTION

- Take care that solder does not enter the brush holder, or the brush will not operate properly.
- Do not apply excess solder; align the solder end with the brush holder surface as shown.
- Work quickly to avoid heat damage to the regulator/rectifier.

Cut off the surplus brush wires.

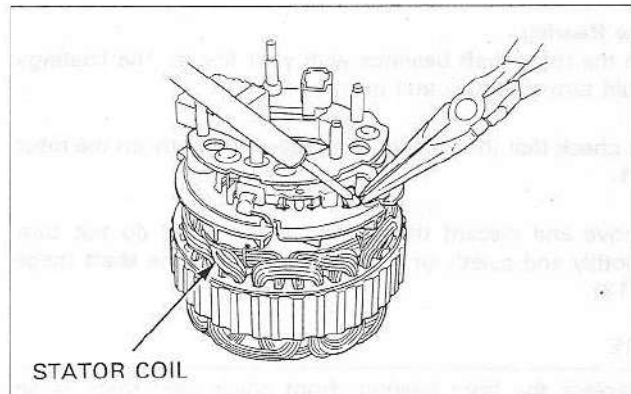


Stator Coil

Melt the solder and separate the stator coil from the regulator/rectifier.

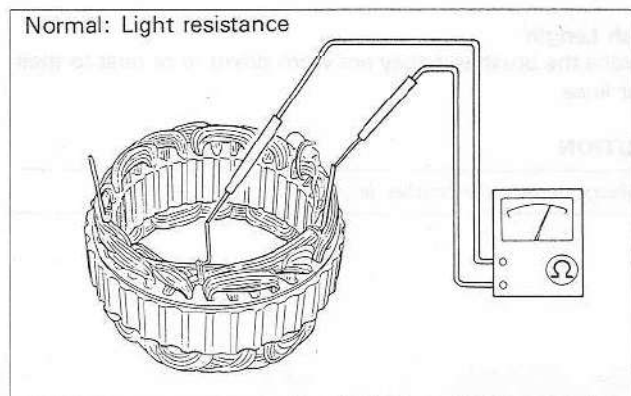
CAUTION

- Work quickly to avoid heat-damage to the regulator/rectifier.
- Hold the stator coil lead wire with pliers to dissipate heat.



Check for resistance between the stator coil wires. There should be light resistance.

STANDARD: 0.1–0.3Ω (20°C/68°F)



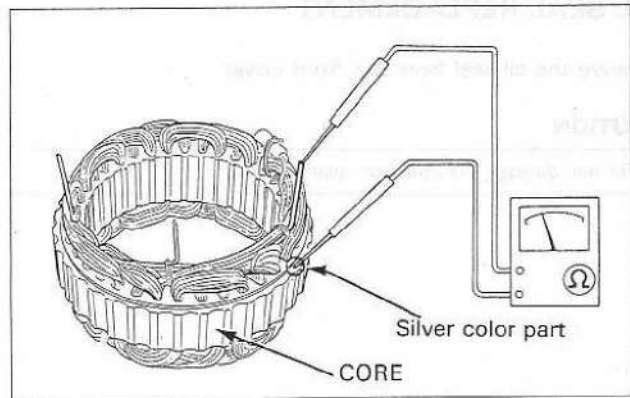
CHARGING SYSTEM/ALTERNATOR

Check for continuity between the wire and stator core.
There should be no continuity.

NOTE

- The green part of the core is insulated. Put the tester probe on the silver color part of the core.

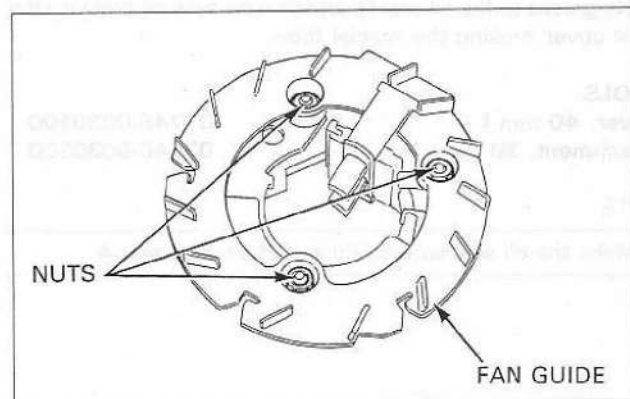
For stator coil assembly, see page 16-14.



Fan Guide

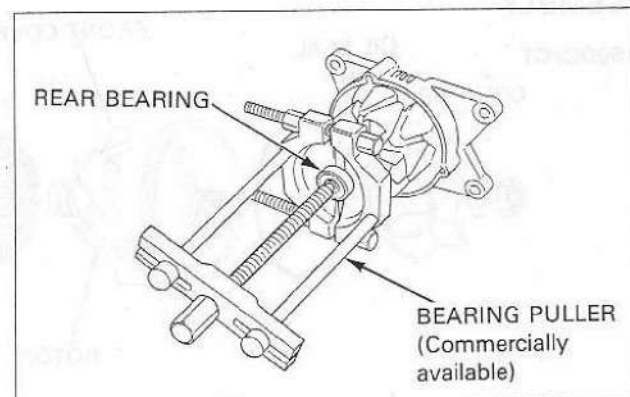
If you need to remove the fan guide, separate it from the regulator/rectifier by removing the three attaching nuts.

Install the fan guide in the reverse order of removal.



ROTOR BEARING REPLACEMENT

Remove the rear rotor bearing using a bearing puller.

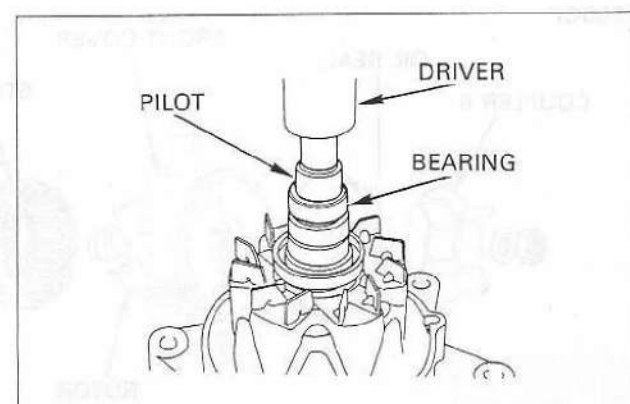


Drive a new bearing onto the rotor shaft using the special tools.

TOOLS:

Driver
Pilot, 20 mm

07749-0010000
07746-0040500



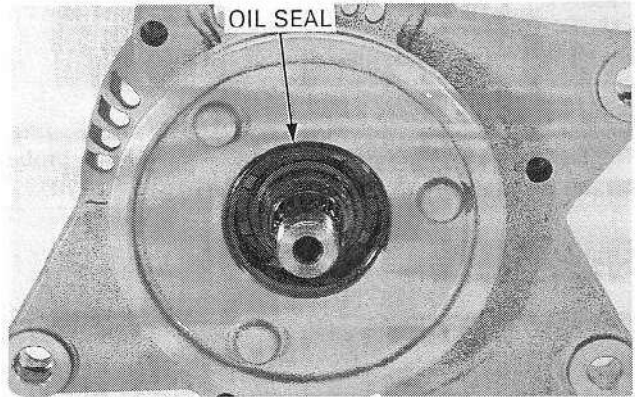
CHARGING SYSTEM/ALTERNATOR

OIL SEAL REPLACEMENT

Remove the oil seal from the front cover.

CAUTION

- Do not damage the cover or rotor shaft.



Apply grease to the oil seal lip and press a new oil seal into the front cover A using the special tools.

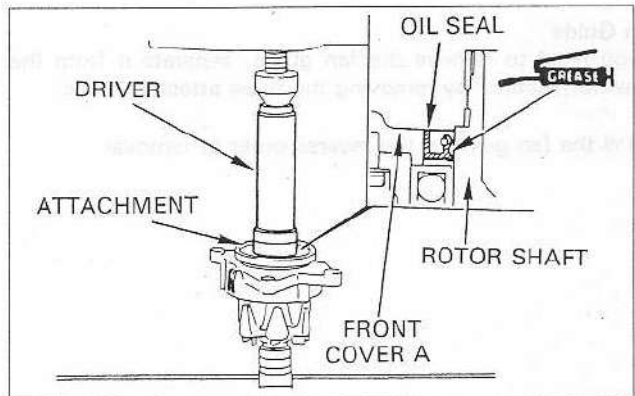
TOOLS:

Driver, 40 mm I.D.
Attachment, 30 mm

07746-0030100
07746-0030300

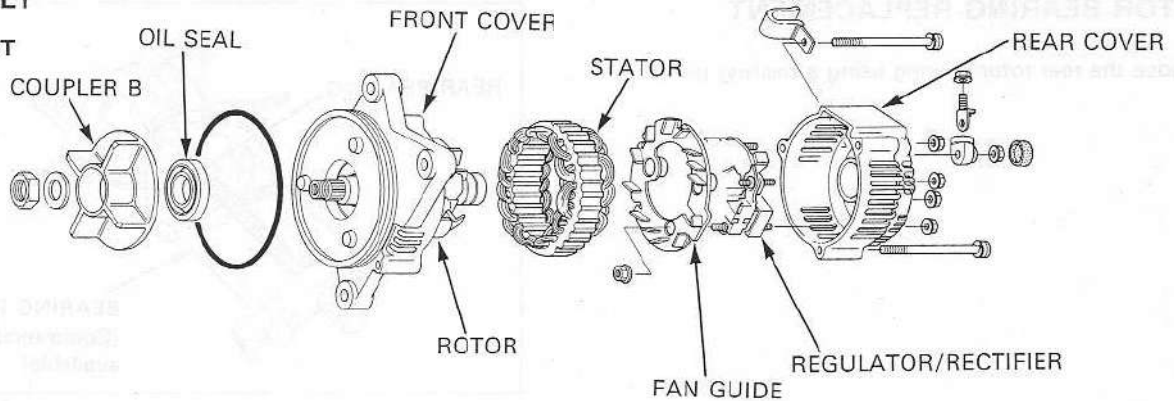
NOTE

- Make the oil seal surface flush with front cover A.

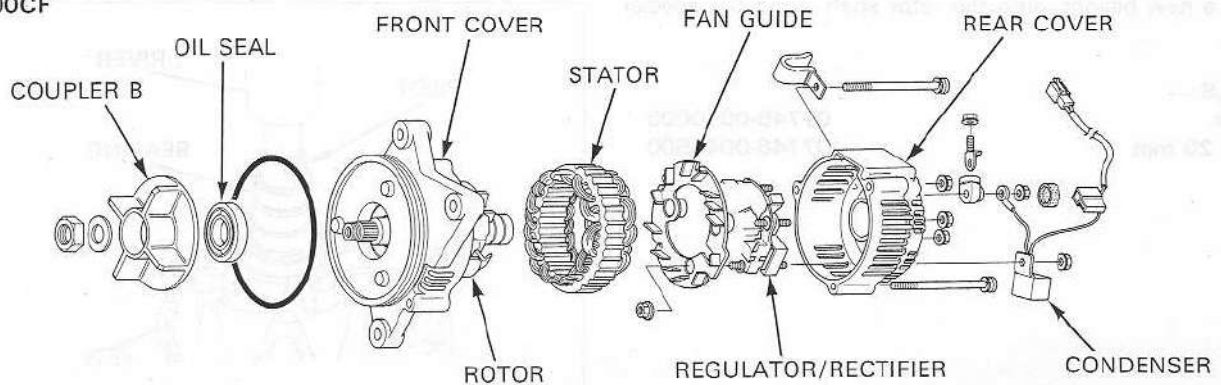


ASSEMBLY

GL1500C/CT



GL1500CF



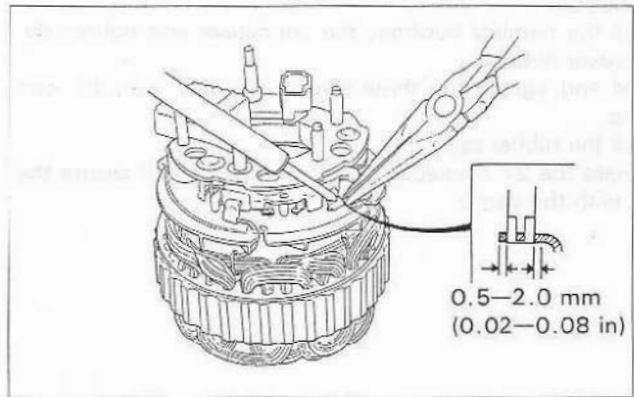
CHARGING SYSTEM/ALTERNATOR

Heat a high-amperage soldering iron (capacity: about 110 W).

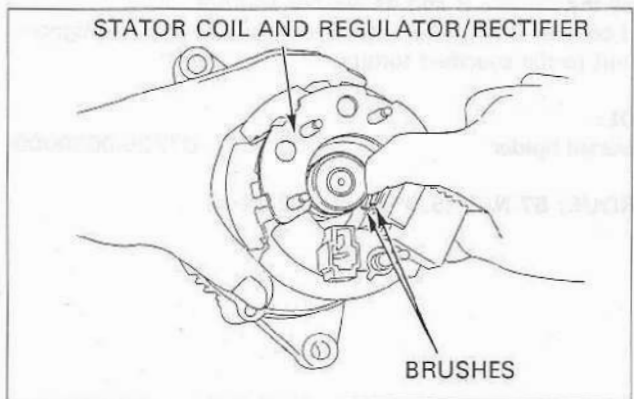
Using a high-temperature (300°C), high-lead content solder, join the stator and regulator/rectifier by soldering the stator coil wires on the diode terminals.

CAUTION

- *Work quickly to avoid heat-damage to the regulator/rectifier.*
- *Position the wires onto the terminals as shown.*



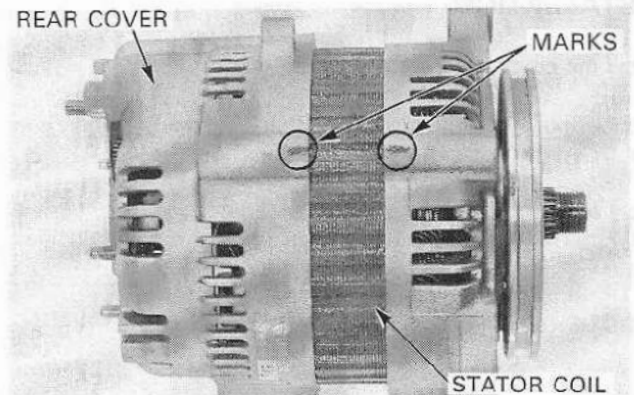
Install the stator coil and regulator/rectifier assembly over the front cover, while pressing the brushes into the holder.



Install the rear cover onto the regulator/rectifier and align the marks on the front and rear covers while moving the stator coil.

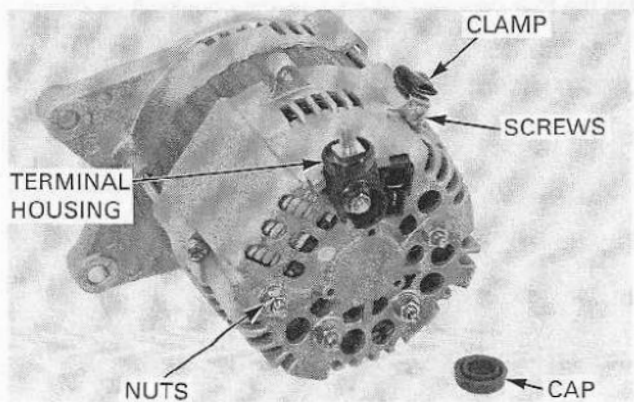
CAUTION

- *Do not move the rear cover when aligning the marks, or damage to the stator coil wire will result.*



GL1500C/CT:

Install the terminal housing and tighten the rear cover nuts. Install and tighten the three screws securely with the wire clamp. Install the rubber cap.



CHARGING SYSTEM/ALTERNATOR

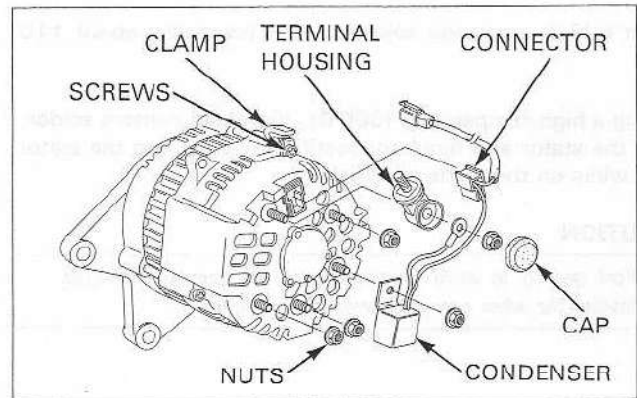
GL1500CF:

Install the terminal housing, the condenser and tighten the rear cover nuts.

Install and tighten the three screws securely with the wire clamp.

Install the rubber cap.

Connect the 2P connector to the alternator and secure the wire with the clamp.



Install the coupler B and its washer and nut.

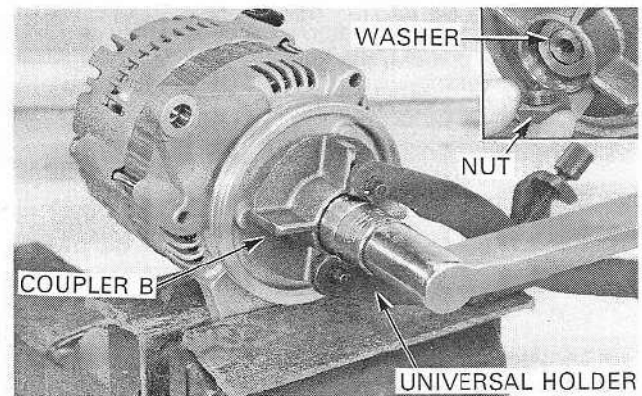
Hold coupler B with the special tool, as shown, and tighten the nut to the specified torque.

TOOL:

Universal holder

07725-0030000

TORQUE: 57 N·m (5.8 kgf·m, 42 lbf·ft)



INSTALLATION

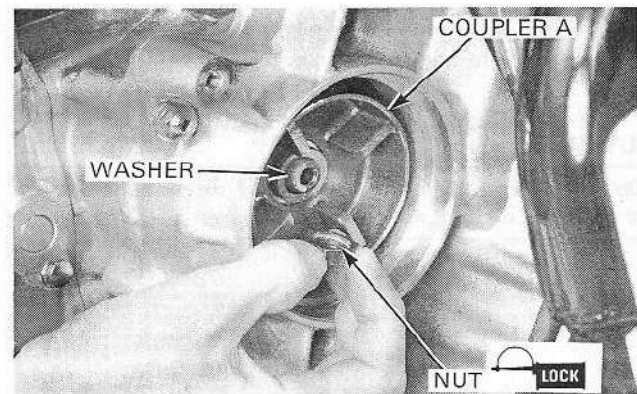
Install the coupler A onto the driven shaft.

Set the transmission in any gear. Check the transmission is in gear by trying to move the rear wheel.

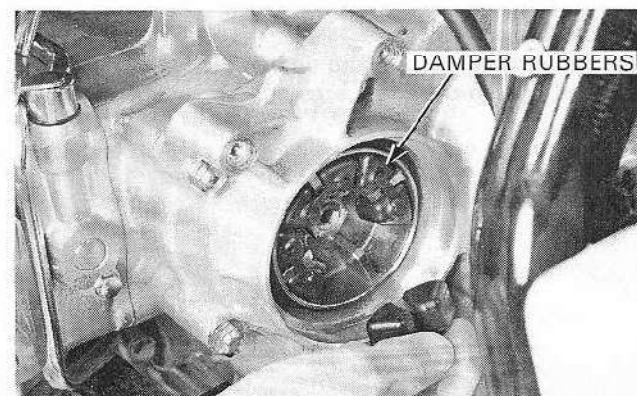
Apply a locking agent to the nut threads.

Install the washer and nut. Tighten the nut to the specified torque.

TORQUE: 57 N·m (5.8 kgf·m, 42 lbf·ft)



Install the four damper rubbers into the coupler A as shown.



CHARGING SYSTEM/ALTERNATOR

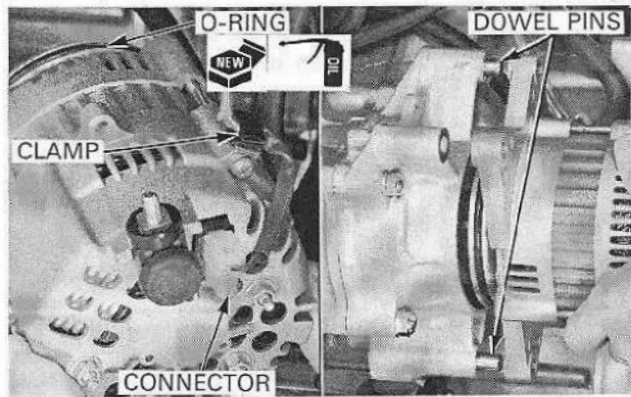
GL1500C/CT:

Apply oil to a new O-ring and install it into the groove in the front cover.

Install the two dowel pins.

Connect the 2P connector to the alternator and secure the wire with the clamp.

Install the alternator onto the engine, aligning the tabs of the coupler B with the damper rubber grooves until the alternator evenly touches the engine.

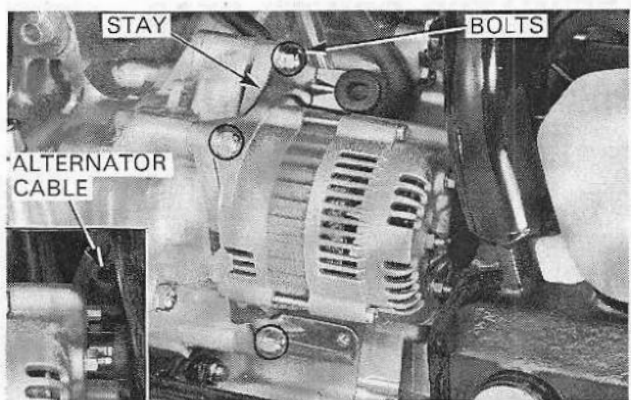


Install the alternator mounting bolts with the alternator cover stay. Tighten the mounting bolts.

TORQUE: 29 N·m (3.0 kgf·m, 22 lbf·ft)

Connect the alternator cable terminal by tightening the terminal nut. Install the rubber cap securely.

Connect the battery negative cable to the battery.



GL1500CF:

Apply oil to a new O-ring and install it into the groove in the front cover.

Install the two dowel pins.

Install the alternator onto the engine, aligning the tabs of the coupler B with the damper rubber grooves until the alternator evenly touches the engine.

Install the alternator mounting bolts with the alternator cover stay. Tighten the mounting bolts.

TORQUE: 29 N·m (3.0 kgf·m, 22 lbf·ft)

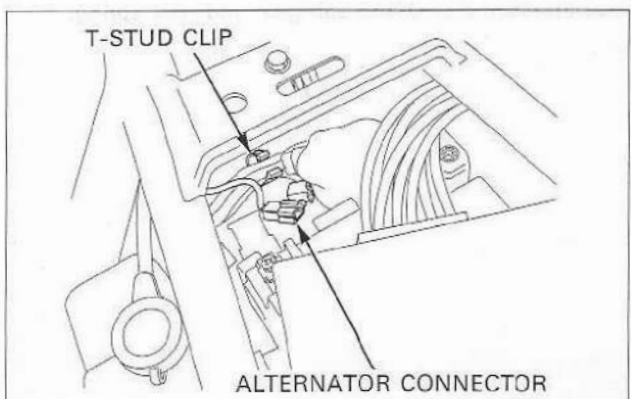
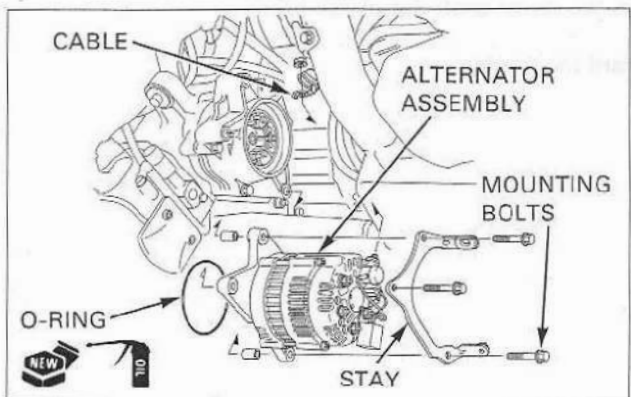
Connect the alternator cable terminal by tightening the terminal nut. Install the rubber cap securely.

Connect the alternator 1P connector and fasten T-stud clip.

NOTE

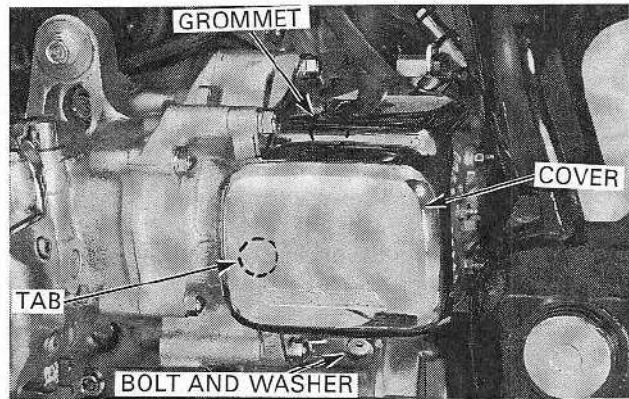
- Do not remove the T-stud clip from the frame. Re-use strictly prohibited.

Connect the battery negative cable to the battery. Install the seat and side cover (pages 2-2 and 2-3). Install the center cover if it has been removed (page 2-3).



CHARGING SYSTEM/ALTERNATOR

Carefully install the alternator cover by inserting the cover boss into the grommet while aligning the tab on the stay with the groove in the cover. Tighten the cover bolts with the washer.



ALTERNATOR DRIVEN GEAR

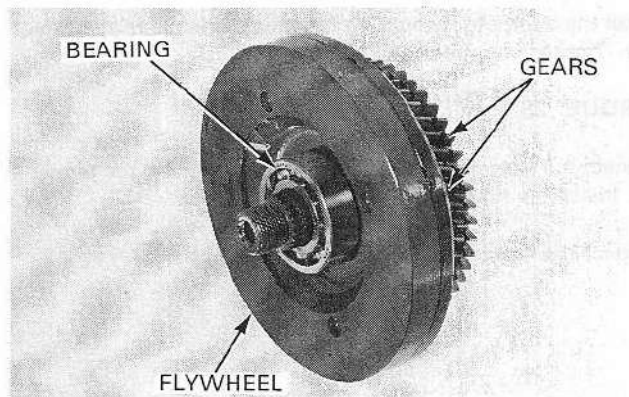
DISASSEMBLY/INSPECTION

Remove the alternator driven gear (page 10-10).

Turn the outer race of the bearing with your finger. The bearing should turn smoothly and quietly.

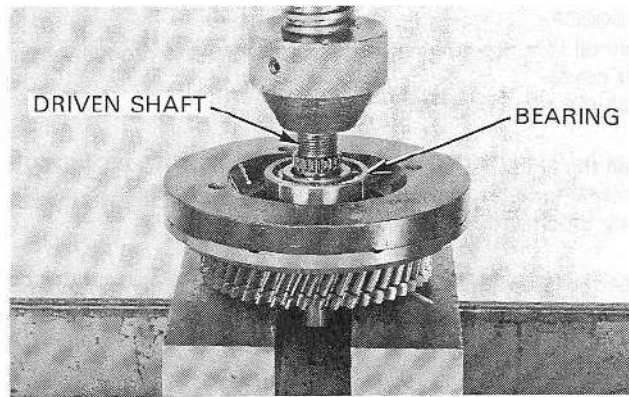
Also check that the inner race of the bearing fits tightly on the shaft.

Inspect the gears or flywheel for damage or wear.

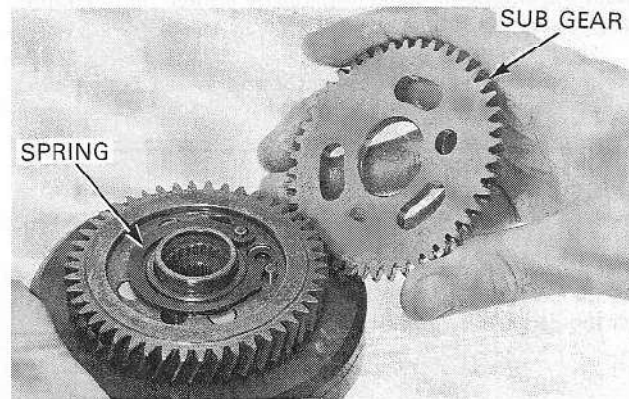


Press the driven shaft out of the bearing.

Discard the bearing.



Remove the alternator driven sub gear and gear spring.

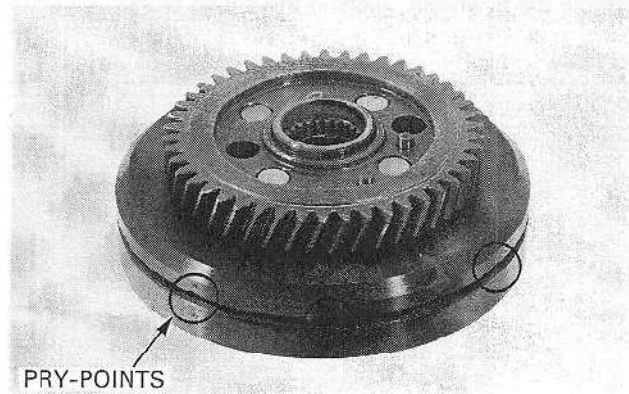


CHARGING SYSTEM/ALTERNATOR

Separate the flywheels while prying open evenly.

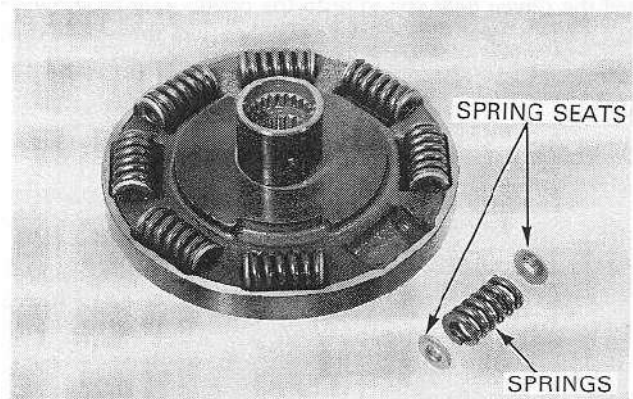
NOTE

- There are eight pry point positions.
- Do not damage the flywheels when prying.

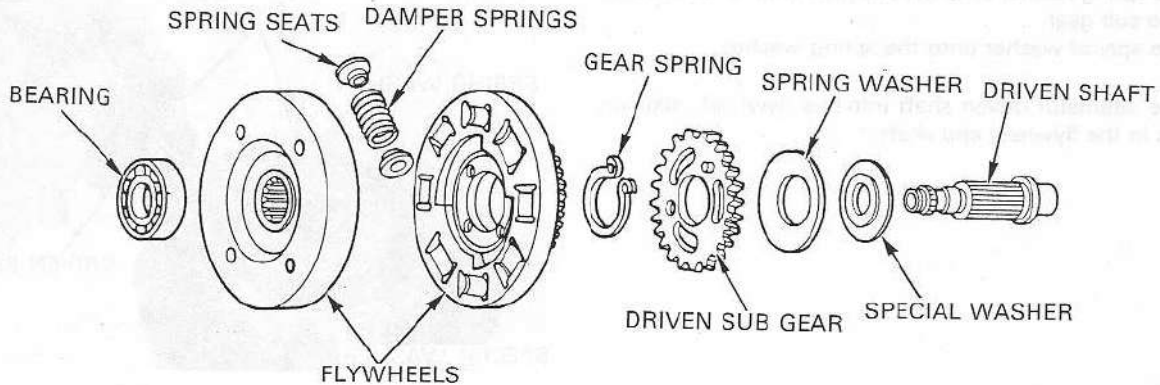


Remove the damper springs and spring seats from the flywheel.

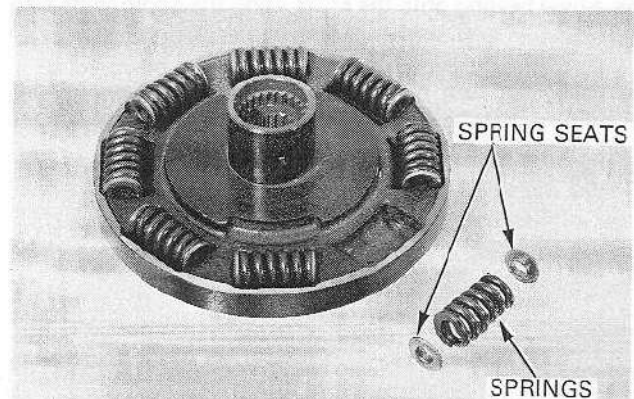
Check the springs and seats for damage or fatigue.



ASSEMBLY



Apply oil to the damper springs.
Install the springs and spring seats into the flywheels as shown.

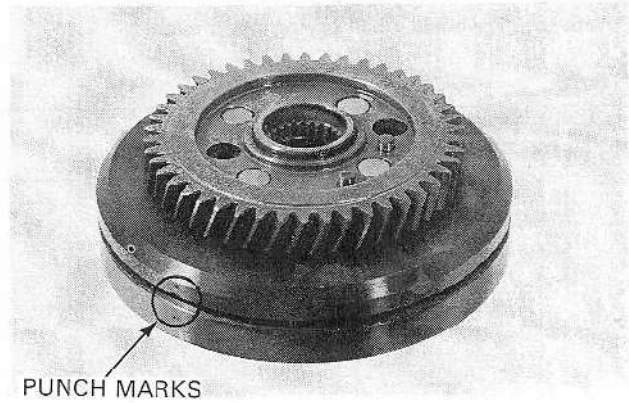


CHARGING SYSTEM/ALTERNATOR

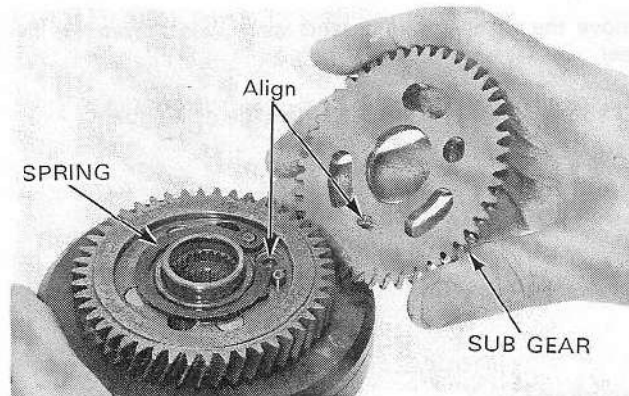
Assemble the flywheels, aligning the punch marks.

CAUTION

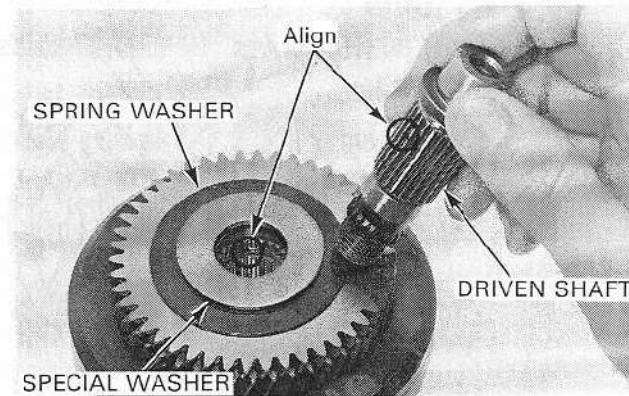
- Do not damage the spring seats.



Install the driven gear spring onto the driven gear as shown. Install the sub gear, aligning the gear boss with the hole in the spring.



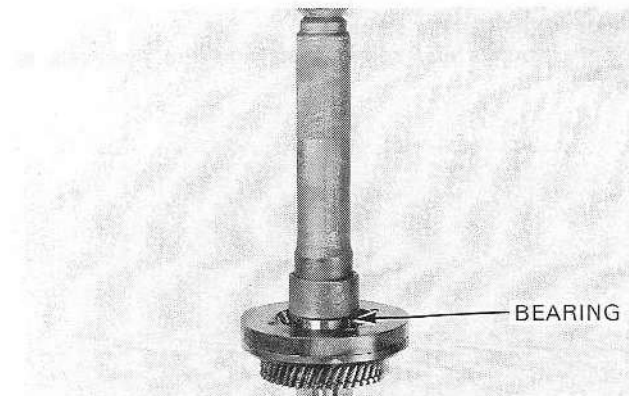
Install the spring washer onto the sub gear with its dished side facing the sub gear. Install the special washer onto the spring washer.



Install the alternator driven shaft into the flywheel, aligning the holes in the flywheel and shaft.

Press a new bearing onto the shaft using the appropriate size socket.

After assembly, turn the sub gear clockwise (viewed from gear side) so that the driven gear spring contacts the stopper pin on the driven gear. Install the alternator driven gear (page 10-20).



CASE BEARING REPLACEMENT

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

Remove the bearing from the case using the special tools.

TOOLS:

- | | |
|------------------------|---|
| Bearing remover, 17 mm | 07936-3710300 |
| Remover handle | 07936-3710100 |
| Remover weight | 07741-0010201 or
07936-371020A or
07936-3710200 |

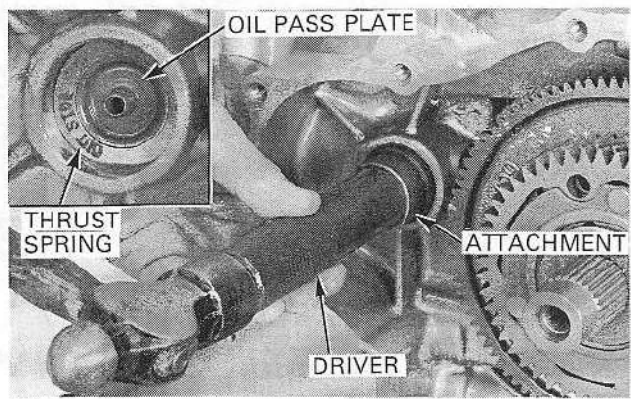
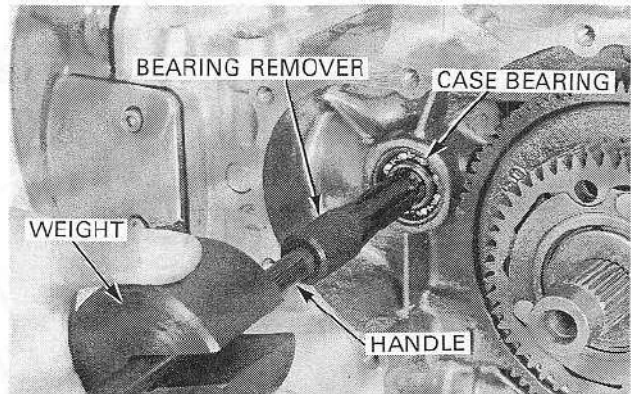
Install a new alternator shaft oil pass plate and a new thrust spring with the "OUTSIDE" mark facing out. Drive a new bearing into the case using the special tools.

NOTE

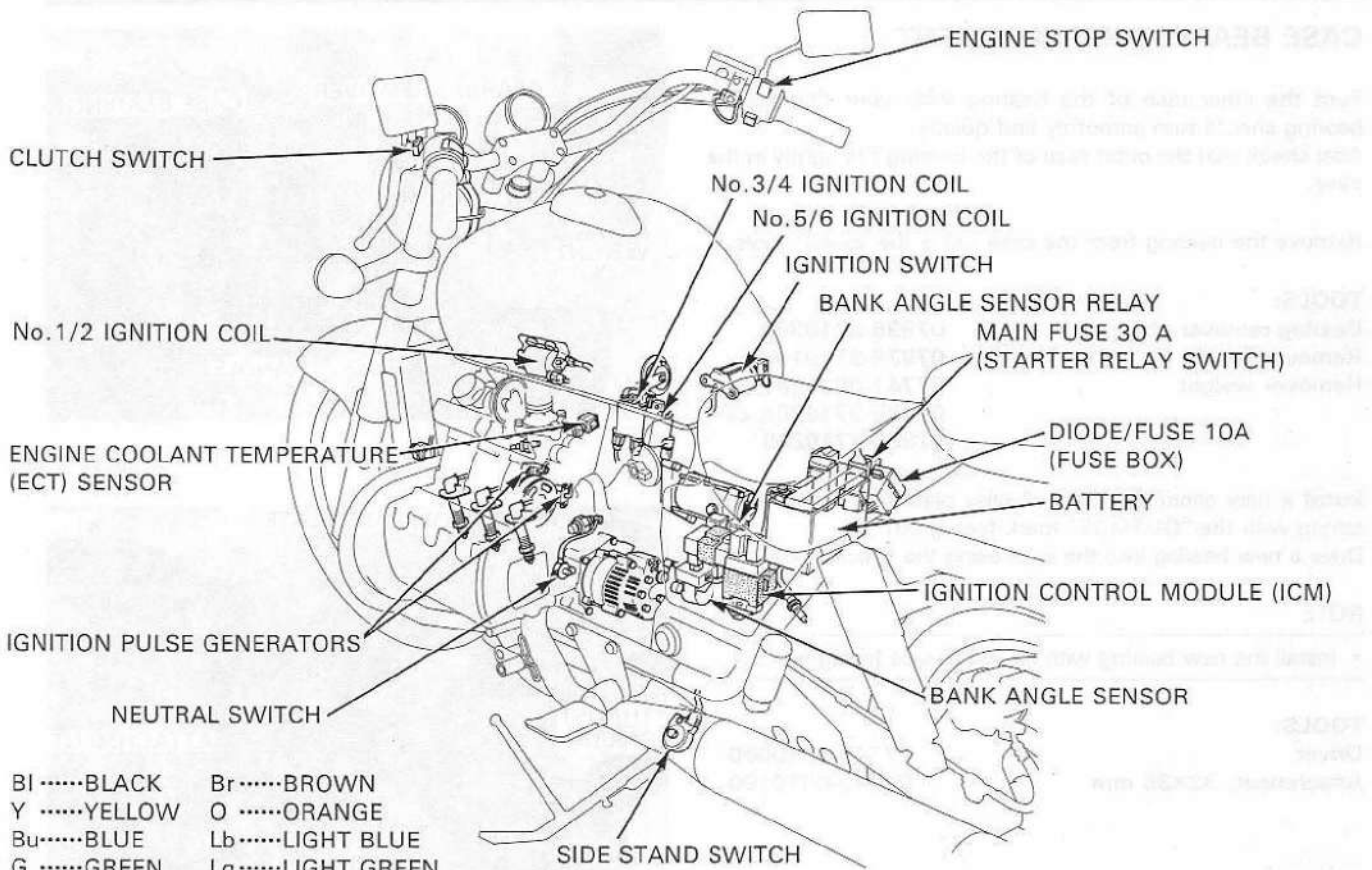
- Install the new bearing with its sealed side facing inside.

TOOLS:

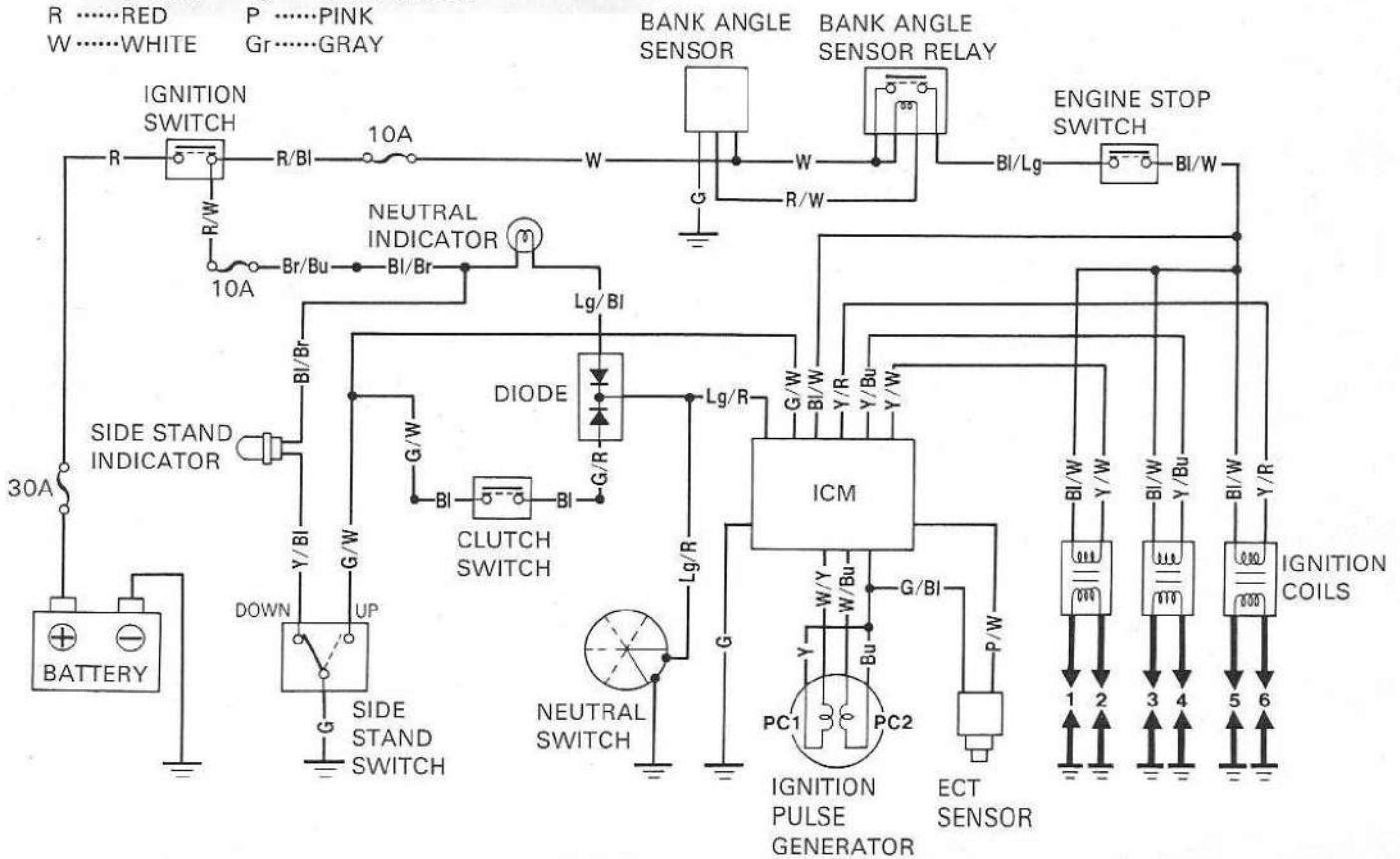
- | | |
|----------------------|---------------|
| Driver | 07749-0010000 |
| Attachment, 32×35 mm | 07746-0010100 |



IGNITION SYSTEM



- | | |
|--------------|--------------------|
| Bl.....BLACK | Br.....BROWN |
| Y.....YELLOW | O.....ORANGE |
| Bu.....BLUE | Lb.....LIGHT BLUE |
| G.....GREEN | Lg.....LIGHT GREEN |
| R.....RED | P.....PINK |
| W.....WHITE | Gr.....GRAY |



17. IGNITION SYSTEM

SERVICE INFORMATION	17-1	ENGINE COOLANT TEMPERATURE (ECT) SENSOR	17-10
TROUBLE SHOOTING	17-3	IGNITION COIL	17-11
IGNITION SYSTEM INSPECTION	17-5	IGNITION PULSE GENERATOR	17-12
IGNITION TIMING	17-8		

SERVICE INFORMATION

GENERAL

▲WARNING

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

CAUTION

- Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is ON and current is present.

- When servicing the ignition system, always follow the steps in the troubleshooting flow chart (page 17-3).
- The transistorized ignition system uses an electrically controlled ignition timing system. No adjustments can be made to the ignition timing.
- The ignition control module (ICM) varies ignition timing according to engine speed. The engine coolant temperature (ETC) sensor signals the ICM to compensate the ignition timing according to the coolant temperature.
- A rough diagnosis can be made by identifying a cylinder where spark timing is incorrect.
- The ignition control module (ICM) may be damaged if dropped. Also, if the connector is disconnected when current is flowing, the excessive voltage may damage the module. Always turn off the ignition switch before servicing.
- A faulty ignition system is often related to poor connections. Check those connections before proceeding.
- Make sure the battery is adequately charged. Using the starter motor with a weak battery results in a slower engine cranking speed as well as no spark at the spark plugs.
- Use spark plugs of the correct heat range. Using spark plugs with an incorrect heat range can damage the engine.
- For spark plug gap inspection and adjustment procedure, see section 3.
- See section 19 for following components:
 - Ignition switch
 - Engine stop switch
 - Neutral switch
 - Side stand switch
 - Clutch switch
 - Bank angle sensor and sensor relay
 - Diode.

IGNITION SYSTEM

SPECIFICATIONS

ITEM		SPECIFICATIONS	
Spark plug		NGK	DENSO
	Standard	DPR7EA-9	X22EPR-U9
	For cold climate/below 5°C/41°F	DPR6EA-9	X20EPR-U9
	For extended high speed riding	DPR8EA-9	X24EPR-U9
Spark plug gap	0.8—0.9 mm (0.031—0.035 in)		
Ignition coil primary peak voltage	100 V minimum		
Ignition pulse generator peak voltage	0.7 V minimum		
Ignition timing "F" mark	3.5° BTDC at idle		
Engine coolant temperature (ECT) sensor resistance	at 20°C (68°F)	2.0—3.0 kΩ	
	at 80°C (176°F)	200—400 Ω	

TORQUE VALUES

Engine coolant temperature (ECT) sensor 27 N·m (2.8 kgf·m, 20 lbf·ft)
Timing belt drive pulley bolt 74 N·m (7.5 kgf·m, 54 lbf·ft)

TOOLS

Peak voltage tester (U.S.A. only) or
Peak voltage adaptor 07HGJ-0020100 (not available in U.S.A.) with commercially available digital multimeter (impedance 10 MΩ/DVC minimum)

TROUBLESHOOTING

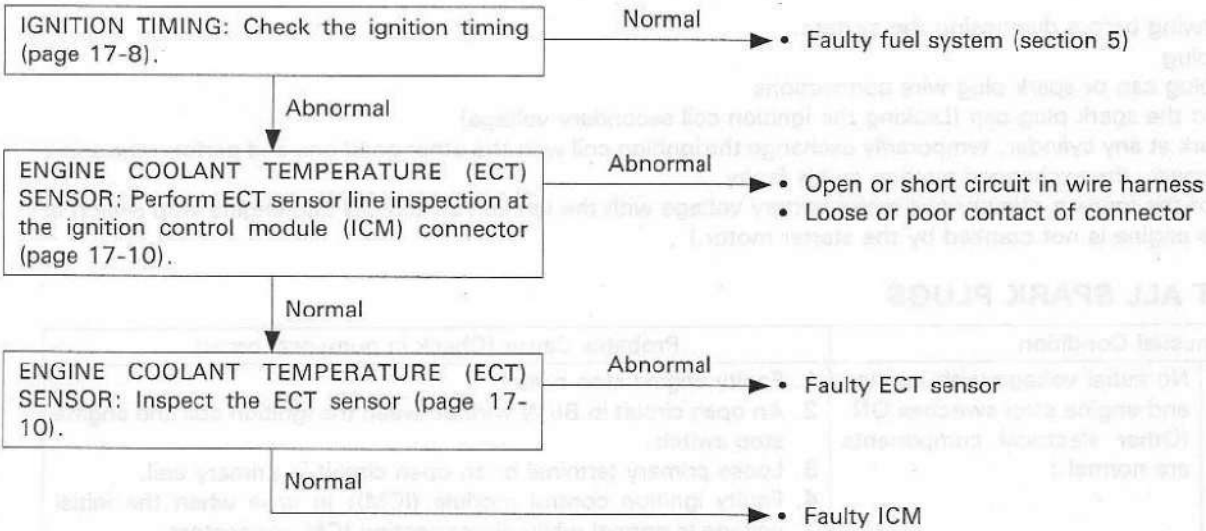
- Inspect the following before diagnosing the system.
 - Faulty spark plug
 - Loose spark plug cap or spark plug wire connections
 - Water got into the spark plug cap (Leaking the ignition coil secondary voltage)
- If there is no spark at any cylinder, temporarily exchange the ignition coil with the other good one and perform the spark test. If there is spark, the exchanged ignition coil is faulty.
- "Initial voltage" of the ignition primary coil is the battery voltage with the ignition switch ON and engine stop switch at RUN. (when the engine is not cranked by the starter motor.)

NO SPARK AT ALL SPARK PLUGS

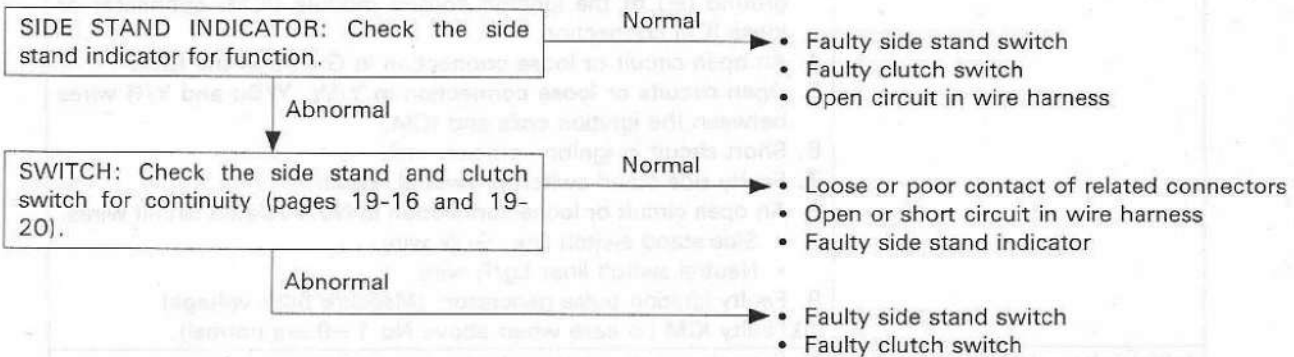
Unusual Condition		Probable Cause (Check in numerical order)
Ignition coil primary voltage	No initial voltage with ignition and engine stop switches ON. (Other electrical components are normal.)	1. Faulty engine stop switch. 2. An open circuit in BI/W wire between the ignition coil and engine stop switch. 3. Loose primary terminal or an open circuit in primary coil. 4. Faulty ignition control module (ICM): in case when the initial voltage is normal while disconnecting ICM connectors.
	Initial voltage is normal, but it drops down to 2—4V while cranking the engine.	1. Incorrect peak voltage adaptor connections. 2. Undercharged battery. 3. No voltage at the power source wire between BI/W (+) and ground (-) of the ignition control module (ICM) connector or loose ICM connection. 4. An open circuit or loose connection in G wire of the ICM. 5. Open circuits or loose connection in Y/W, Y/Bu and Y/R wires between the ignition coils and ICM. 6. Short circuit in ignition primary coil. 7. Faulty side stand switch or neutral switch. 8. An open circuit or loose connection in No. 7 related circuit wires. <ul style="list-style-type: none"> • Side stand switch line: G/W wire • Neutral switch line: Lg/R wire 9. Faulty ignition pulse generator. (Measure peak voltage) 10. Faulty ICM (in case when above No. 1—9 are normal).
	Initial voltage is normal, but no peak voltage while cranking the engine.	1. Incorrect peak voltage adaptor connections. 2. Faulty peak voltage adaptor. 3. Faulty ICM (in case when above No. 1, 2 are normal).
	Initial voltage is normal, but peak voltage is lower than standard value.	1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Cranking speed is too slow (battery is undercharged). 3. The sample timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the standard voltage at least once). 4. Faulty ICM (in case that above No. 1—3 are normal).
	Initial and peak voltage are normal, but does not spark.	1. Faulty spark plug or leaking ignition coil secondary current ampere. 2. Faulty ignition coils.
Ignition pulse generator	Peak voltage is lower than standard value.	1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Cranking speed is too slow (battery is undercharged). 3. The sample timing of the tester and measured ignition pulse were not synchronized (System is normal if measured voltage is over the standard voltage at least once). 4. Faulty ICM (in case when above No. 1—3 are normal).
	No peak voltage.	1. Faulty peak voltage adaptor. 2. Faulty ignition pulse generator.

IGNITION SYSTEM

ENGINE STARTS, BUT RUNS ROUGH AT LOW ENGINE SPEED (below 2,000 rpm)



ENGINE STARTS, BUT SIDE STAND SWITCH DOES NOT FUNCTION



IGNITION SYSTEM INSPECTION

NOTE

- If no spark at all plugs, check that all connections for loose or poor contact before measuring each peak voltage.
- Use recommended digital multimeter or commercially available digital multimeter with an impedance 10 M Ω /DCV minimum.
- The display value differs depending upon the internal impedance of the multimeter.
- If using Imrie diagnostic tester, follow the manufacturer's instructions.

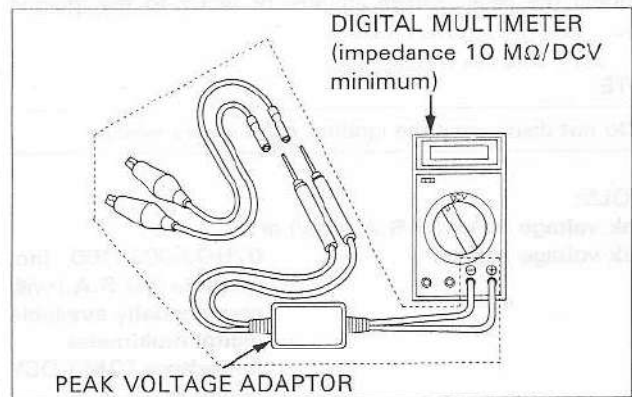
Connect the peak voltage adaptor to the digital multimeter, or use the peak voltage tester.

TOOLS:

Peak voltage tester (U.S.A. only) or

Peak voltage adaptor

07HGJ-0020100 (not available in U.S.A.) with commercially available digital multimeter (impedance 10 M Ω /DCV minimum)



IGNITION PRIMARY VOLTAGE INSPECTION

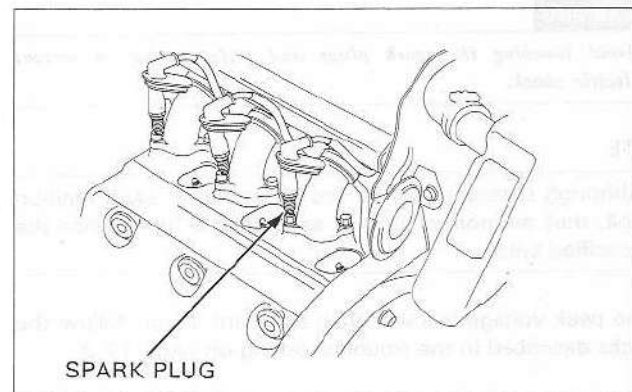
NOTE

- Check all system connections before the inspection. If the system is disconnected, incorrect peak voltage might be measured.
- Check cylinder compression at each cylinder and check that the spark plugs are installed correctly in each cylinder.

Remove the fuel tank (page 2-4)

Disconnect the spark plug caps from the spark plugs on each cylinder head.

Connect good known spark plugs to each spark plug cap and ground the spark plugs to the cylinder head as done in a spark test.



IGNITION SYSTEM

Connect the peak voltage adaptor or tester to the ignition coil.

NOTE

- Do not disconnect the ignition coil primary wires.

TOOLS:

Peak voltage tester (U.S.A. only) or
Peak voltage adaptor

07HGJ-0020100 (not available in U.S.A.) with commercially available digital multimeter (impedance 10 M Ω /DCV minimum)

CONNECTION:

No. 1/2 ignition coil: Yellow/White (+)—Body ground (—)
No. 3/4 ignition coil: Yellow/Blue (+)—Body ground (—)
No. 5/6 ignition coil: Yellow/Red (+)—Body ground (—)

Turn the ignition switch "ON" and engine stop switch to "RUN".

Check for the initial voltage.

If battery voltage is not present, follow the checks described in the troubleshooting on page 17-3.

Shift the transmission into neutral.

Crank the engine with the starter motor and read each ignition coil primary voltage.

PEAK VOLTAGE: 100 V minimum

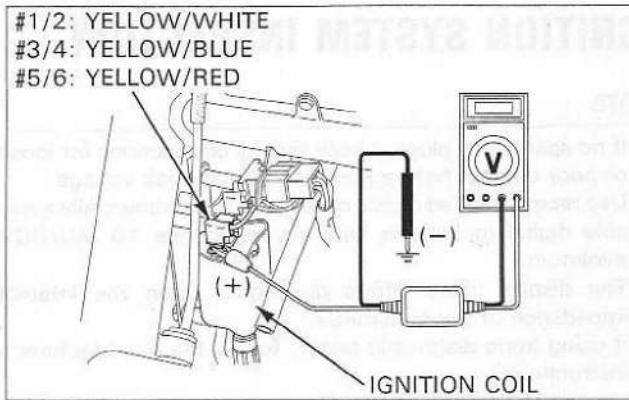
▲WARNING

- Avoid touching the spark plugs and tester probes to prevent electric shock.

NOTE

- Although measured values are different for each ignition coil, they are normal as long as voltage is higher than the specified value.

If the peak voltage is lower than standard value, follow the checks described in the troubleshooting on page 17-3.



IGNITION PULSE GENERATOR PEAK VOLTAGE INSPECTION

Remove the radiator reserve tank without disconnecting the siphon tube (page 6-6).

Disconnect the ignition control module (ICM) connector and connect the peak voltage adaptor or tester probes to the connector terminals of the ignition pulse generator side.

TOOLS:

- Peak voltage tester (U.S.A. only) or Peak voltage adaptor
- 07HGJ-0020100 (not available in U.S.A.) with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)

CONNECTION:

White/Yellow terminal (+)—Green/Black terminal (—)
 White/Blue terminal (+)—Green/Black terminal (—)

Crank the engine with starter motor and read the peak voltage.

PEAK VOLTAGE: 0.7 V minimum

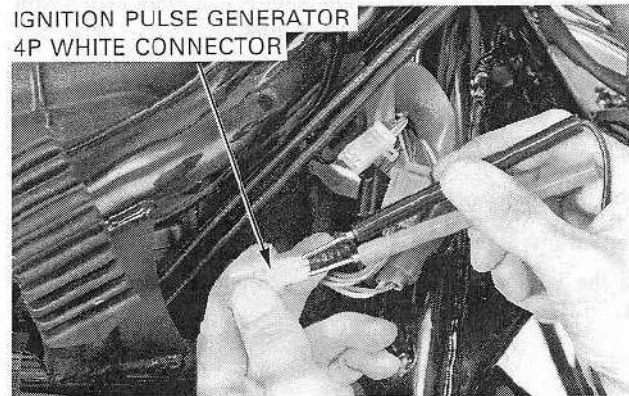
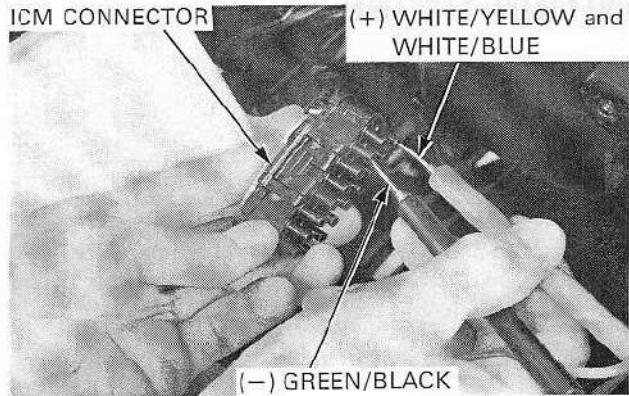
If the peak voltage measured at the ICM connector is abnormal, measure the peak voltage at the ignition pulse generator connector.

Remove the right steering side cover (page 2-5). Disconnect the ignition pulse generator 4P (White) connector and connect the peak voltage or tester probes to the connector terminal of the ignition pulse generator side. In the same manner as at the ICM connector, measure the peak voltage and compare it to the voltage measured at the ICM connector.

CONNECTION:

White/Yellow terminal (+)—Yellow terminal (—)
 White/Blue terminal (+)—Blue terminal (—)

- If the peak voltage measured at the ICM is abnormal and the one measured at the ignition pulse generator is normal, the wire harness has an open circuit or loose connection.
- If the peak voltage is lower than standard value, follow the checks described in the troubleshooting on page 17-3.



IGNITION SYSTEM

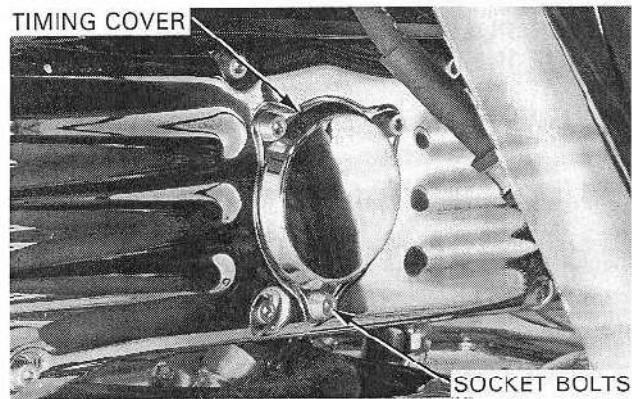
IGNITION TIMING

IDLE TIMING INSPECTION

NOTE

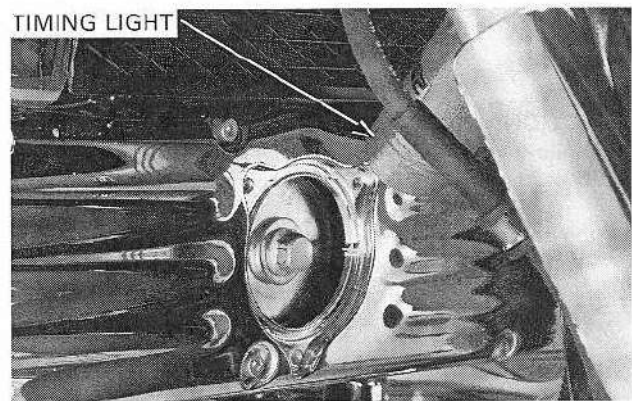
- Read the instructions for timing light operating.

Start the engine and warm it to operating temperature. Stop the engine. Remove the three bolts and the timing cover.



Connect a timing light to the No. 1 or No. 2 cylinder spark plug wire.

Start the engine with the transmission in neutral and let the engine idle.

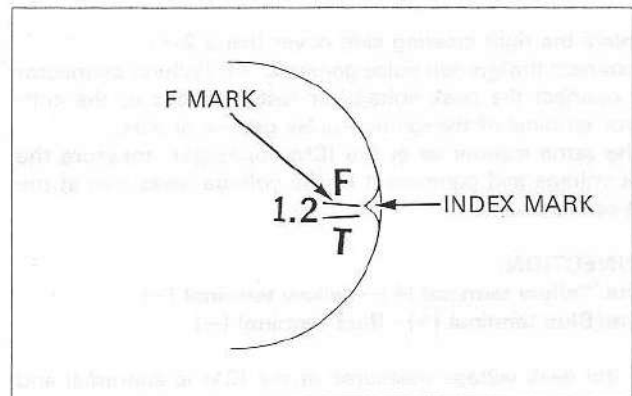


The timing is correct if the guide plate F 1.2 mark aligns with the timing belt cover index mark at idle.

Connect the timing light to the No. 3 or No. 4 cylinder spark plug wire and check the ignition timing as previously described by observing the F 3.4 mark.

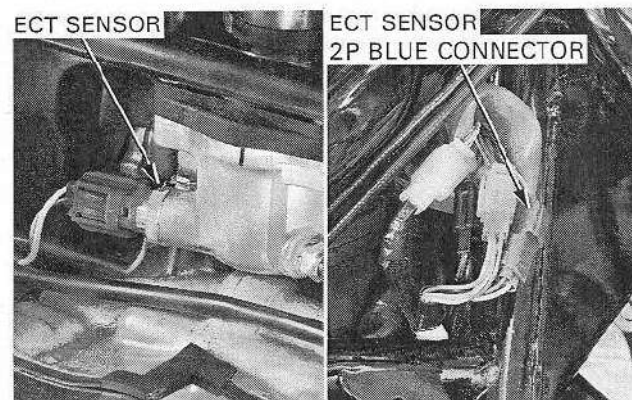
Check the No. 5 or No. 6 cylinder in the same way, using the F 5.6 mark.

Stop the engine and check the coolant temperature timing shift.



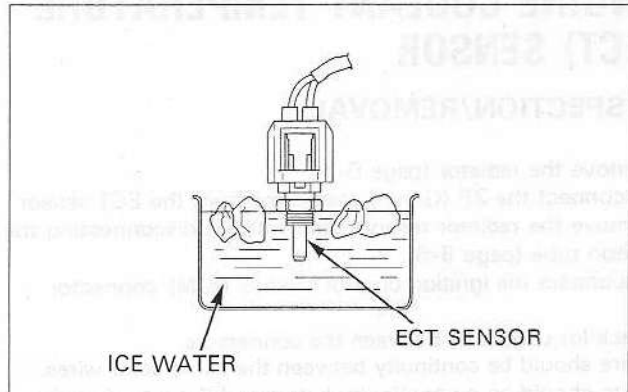
ENGINE COOLANT TEMPERATURE (ECT) SENSOR TIMING SHIFT INSPECTION

Remove the radiator and ECT sensor (page 17-10). Remove the right steering side cover (page 2-5) and disconnect the ECT sensor 2P (Blue) connector.



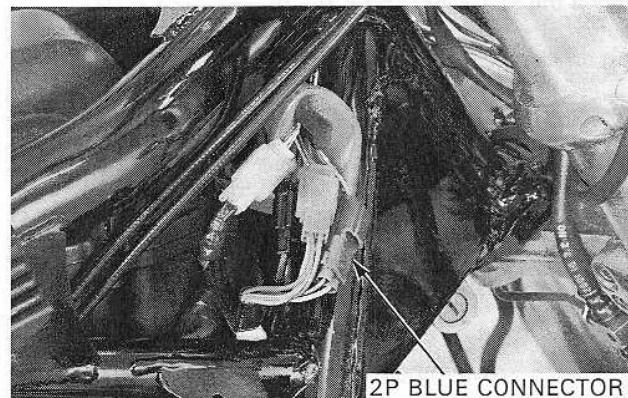
Reconnect the ECT sensor to the 2P (Green) connector.
Cool the ECT sensor in the ice water for approximately 10 minutes.

Plug the ECT sensor hole and install the radiator (page 6-10).
Start the engine and warm it to operating temperature.



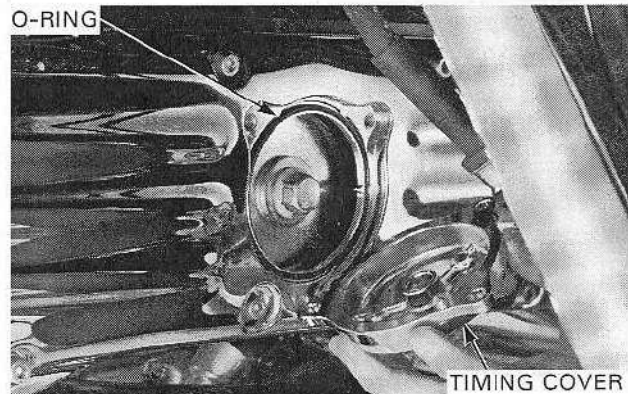
Connect the ECT sensor 2P (Blue) connector.
The engine speed should increase by approximately 200 rpm.

If it is abnormal, inspect the ECT sensor system (page 17-10).



After the inspections have been made, install the following:

- steering side cover (page 2-5).
- fuel tank (page 2-4).
- seat (page 2-2).
- ECT sensor (page 17-10).
- radiator (page 6-10).
- timing cover.



IGNITION SYSTEM

ENGINE COOLANT TEMPERATURE (ECT) SENSOR

INSPECTION/REMOVAL

Remove the radiator (page 6-7).
Disconnect the 2P (Green) connector from the ECT sensor.
Remove the radiator reserve tank without disconnecting the siphon tube (page 6-6).
Disconnect the ignition control module (ICM) connector.

Check for continuity between the connectors.
There should be continuity between the same color wires.
There should be no continuity between different color wires.

Remove the ECT sensor from the thermostat housing.
Suspend the sensor in cold water. Heat the water slowly, using an electric heating element.

▲WARNING

- Keep flammable materials away from the electric heating element.
- Wear insulated gloves and adequate eye protection.

Measure resistance between the terminals.

STANDARD: 2.0–3.0 k Ω at 20°C (68°F)
200–400 Ω at 80°C (176°F)

NOTE

- If the ECT sensor or thermometer touches the pan, false readings will result.
- Stir the water well

If resistance is outside the above ranges, replace the ECT sensor.

INSTALLATION

Install the ECT sensor with a new sealing washer into the thermostat housing.
Tighten the sensor.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)

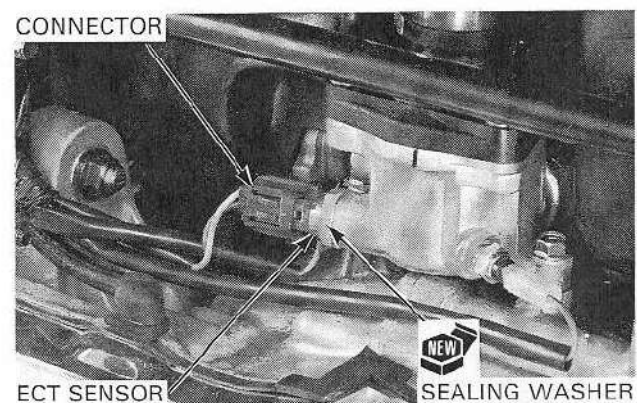
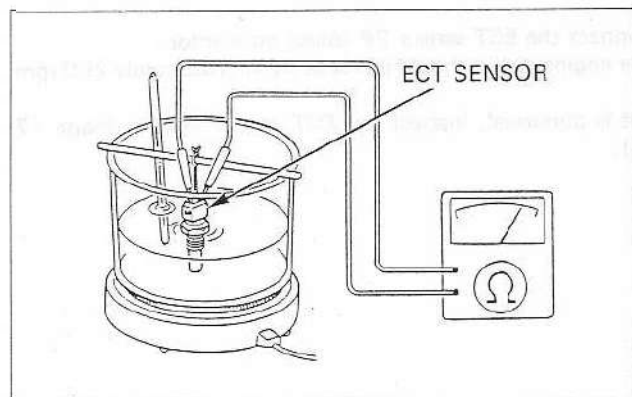
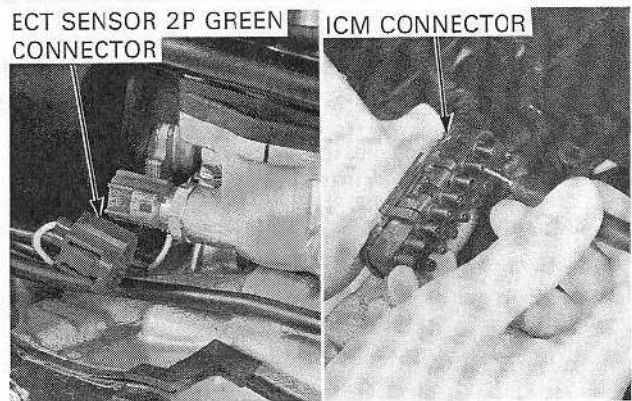
CAUTION

- Keep water off the sensor terminals.

Connect the 2P (Green) connector to the ECT sensor.
Connect the ICM connector to the ICM.

Install the following:

- radiator (page 6-10).
- left side cover (page 2-3).

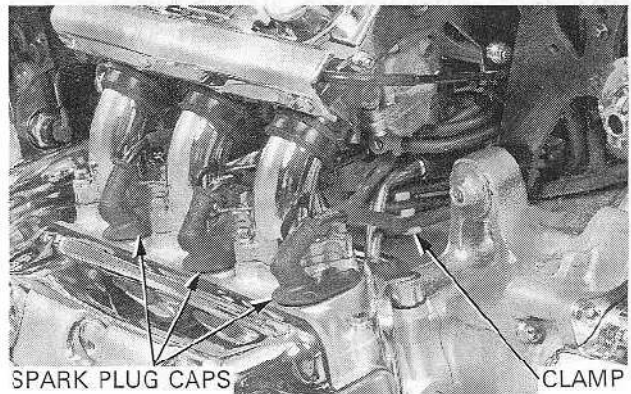


IGNITION COIL

REMOVAL

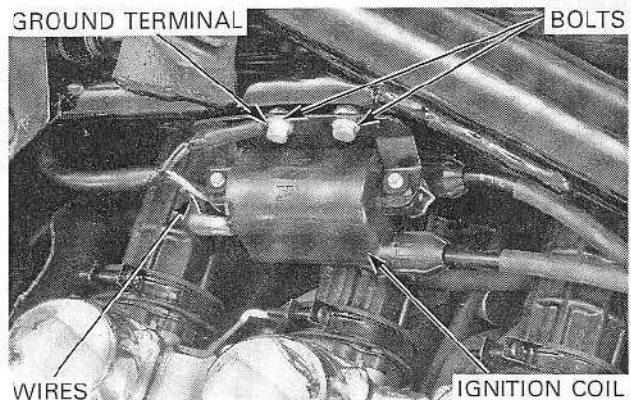
Remove the fuel tank (page 2-4).

Remove the spark plug caps from the spark plugs.
Release the wire clamps from the spark plug wires.



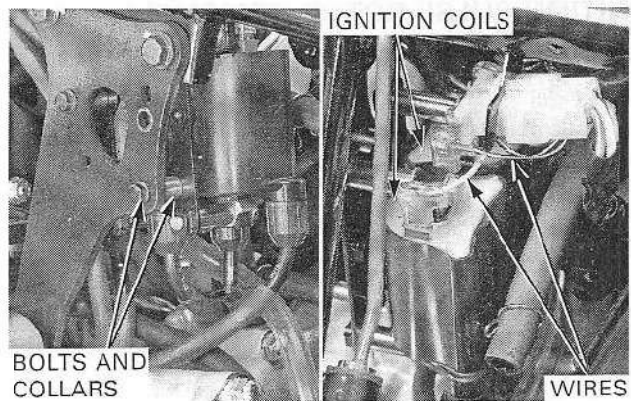
No. 1-2 COIL:

Disconnect the ignition coil wires from the primary terminals.
Remove the two bolts, ground terminal and the ignition coil.



No. 3-4 and 5-6 COILS:

Remove the two bolts, collars.
Disconnect the ignition coil wires from the primary terminals
and remove the ignition coils.



INSTALLATION

Install the ignition coils onto the frame in the reverse order of removal.

TORQUE: 9 N·m (0.9 kgf·m, 6.5 lbf·ft)

NOTE

- Route the spark plug wires properly (page 1-24).
- Connect the ignition coil wires on the primary terminals properly described below.

	BLACK TERMINAL	GREEN TERMINAL
1-2 Coil	Black/White wire	Yellow/White wire
3-4 Coil	Black/White wire	Yellow/Blue wire
5-6 Coil	Black/White wire	Yellow/Red wire

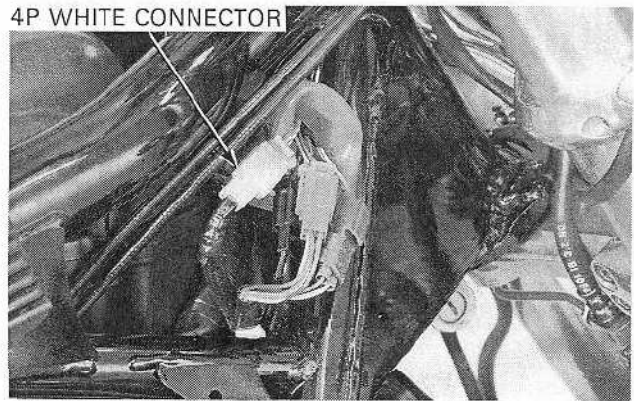
Install the fuel tank and seat (pages 2-4 and 2-2)

IGNITION SYSTEM

IGNITION PULSE GENERATOR

IGNITION PULSE GENERATOR REMOVAL/INSTALLATION

Remove the right steering side cover (page 2-5).
Disconnect the ignition pulse generator 4P (White) connector.



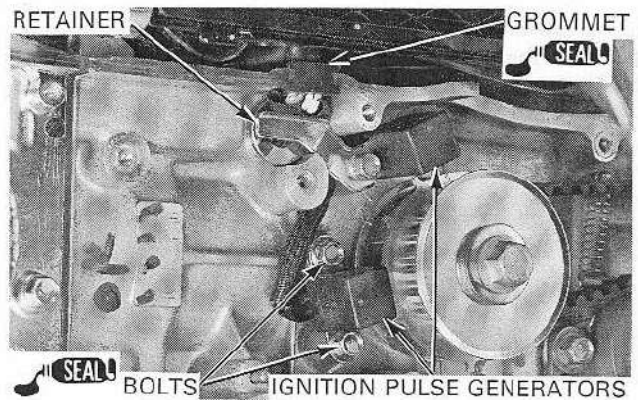
Remove the following:

- right timing belt (page 8-5).
- four mounting bolts and retainer.
- wire grommet from the crankcase.
- ignition pulse generators.

Installation is in the reverse order of removal.

Apply sealant to the ignition pulse generator bolt threads.
Apply sealant to the grommet seating surface.

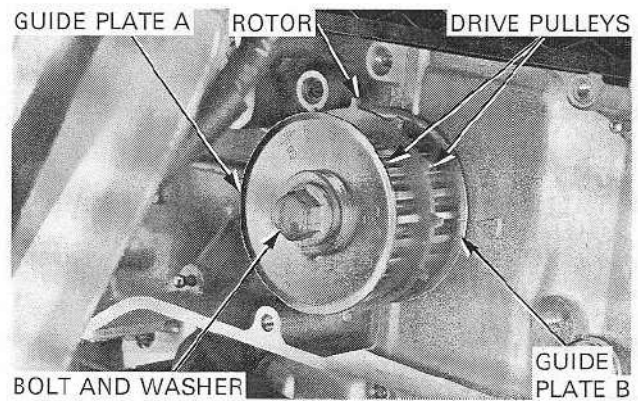
Route the wire harness properly (page 1-21).



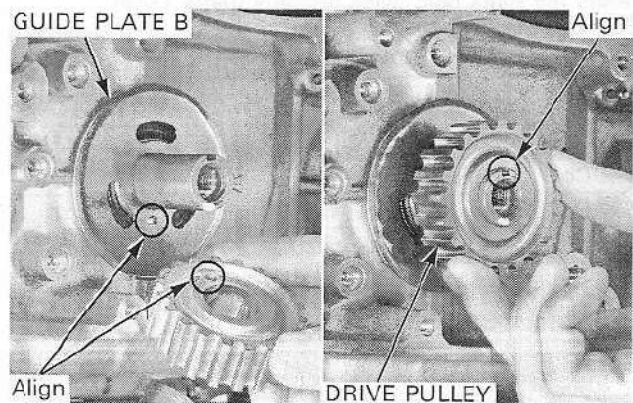
IGNITION PULSE ROTOR REMOVAL/INSTALLATION

Remove the right timing belt and ignition pulse generator from the crankcase (see above).
Remove the left timing belt (page 8-6).

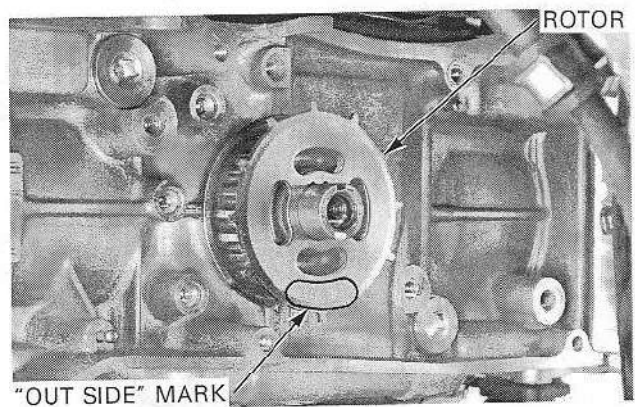
Remove the timing belt drive pulley bolt and disassemble the rotors.



Install the guide plate B with its projection facing out.
Install one timing belt drive pulley by aligning the pulley hole with the guide projection and the pulley key with the crankshaft keyway.

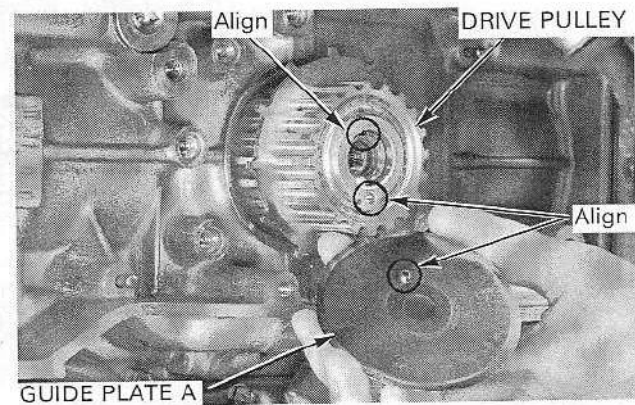


Install the ignition pulse rotor with its "OUT SIDE" mark facing out, aligning the rotor key with the crankshaft keyway.



Install the timing belt drive pulley with its hole facing out, aligning the pulley key with the crankshaft keyway.

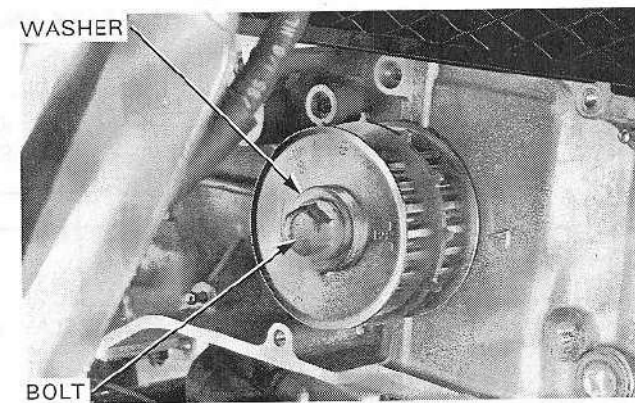
Install the guide plate A, aligning its projection with the pulley hole.



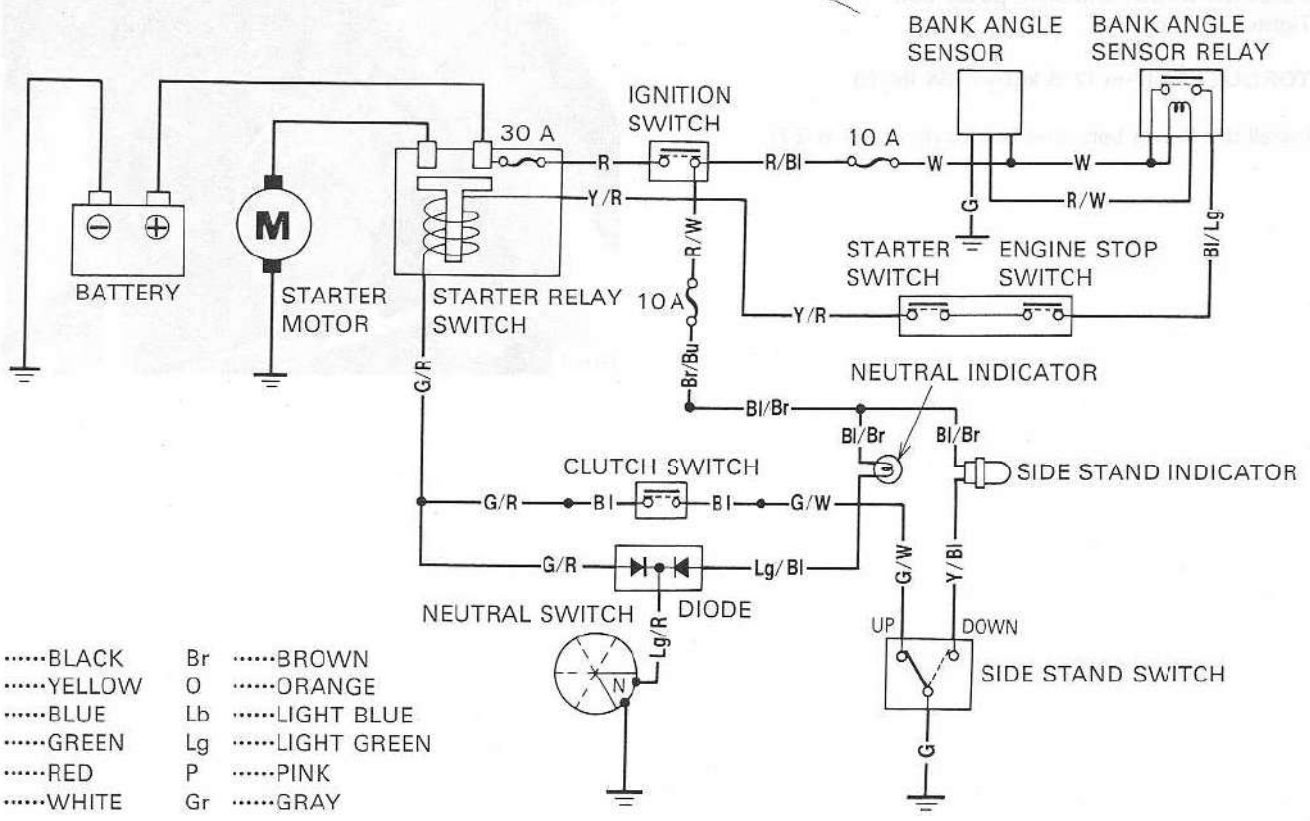
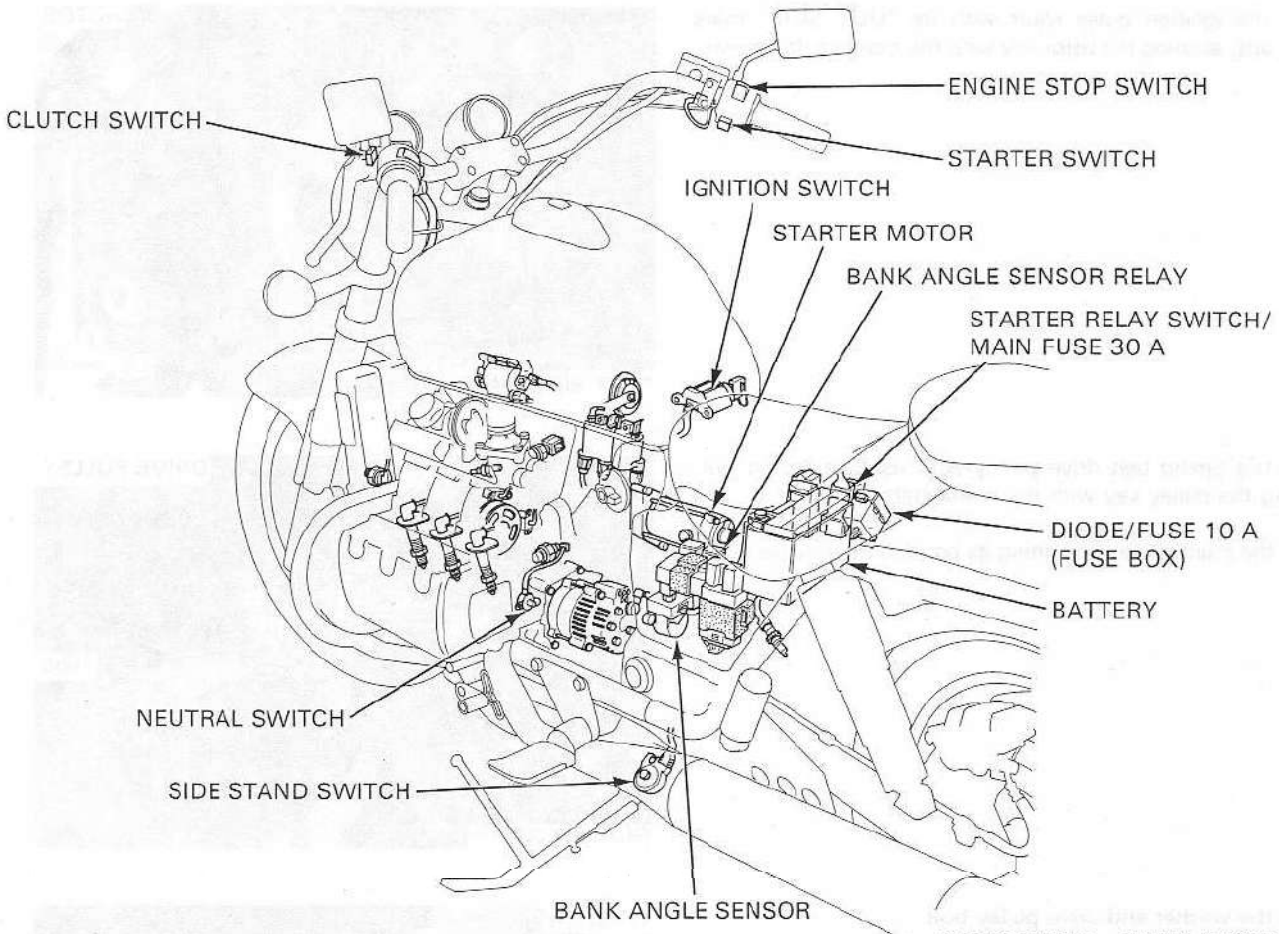
Install the washer and drive pulley bolt.
Tighten the bolt.

TORQUE: 74 N·m (7.5 kgf·m, 54 lbf·ft)

Install the timing belts and belt cover (page 8-27).



ELECTRIC STARTER/STARTER CLUTCH



- | | |
|---------------|---------------------|
| BlBLACK | BrBROWN |
| YYELLOW | OORANGE |
| BuBLUE | LbLIGHT BLUE |
| GGREEN | LgLIGHT GREEN |
| RRED | PPINK |
| WWHITE | GrGRAY |

18. ELECTRIC STARTER/STARTER CLUTCH

SERVICE INFORMATION	18-1	STARTER CLUTCH/STARTER DRIVE GEAR	18-13
TROUBLESHOOTING	18-2	STARTER RELAY SWITCH	18-16
STARTER MOTOR	18-4		

SERVICE INFORMATION

GENERAL

WARNING

• Always turn the ignition switch OFF before servicing the starter motor. The motor could suddenly start, causing serious injury.

- The starter motor can be serviced without removing the engine from the frame. To service the starter clutch, the engine must be removed from the frame, see section 7.
- A weak battery may be unable to turn the starter motor quickly enough, or supply adequate ignition current.
- If the current is kept flowing through the starter motor to turn it while the engine is not cranking over, the starter motor may be damaged.
- See section 19 for following components:
 - Ignition switch
 - Engine stop switch
 - Neutral switch
 - Side stand switch
 - Clutch switch
 - Bank angle sensor and sensor relay
 - Diode.

SPECIFICATIONS

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	12.5 (0.51)	6.0 (0.24)

TORQUE VALUES

Starter motor mounting bolt	29 N·m (3.0 kgf·m, 22 lbf·ft)
Starter motor assembly bolt	5 N·m (0.5 kgf·m, 3.6 lbf·ft)

TOOLS

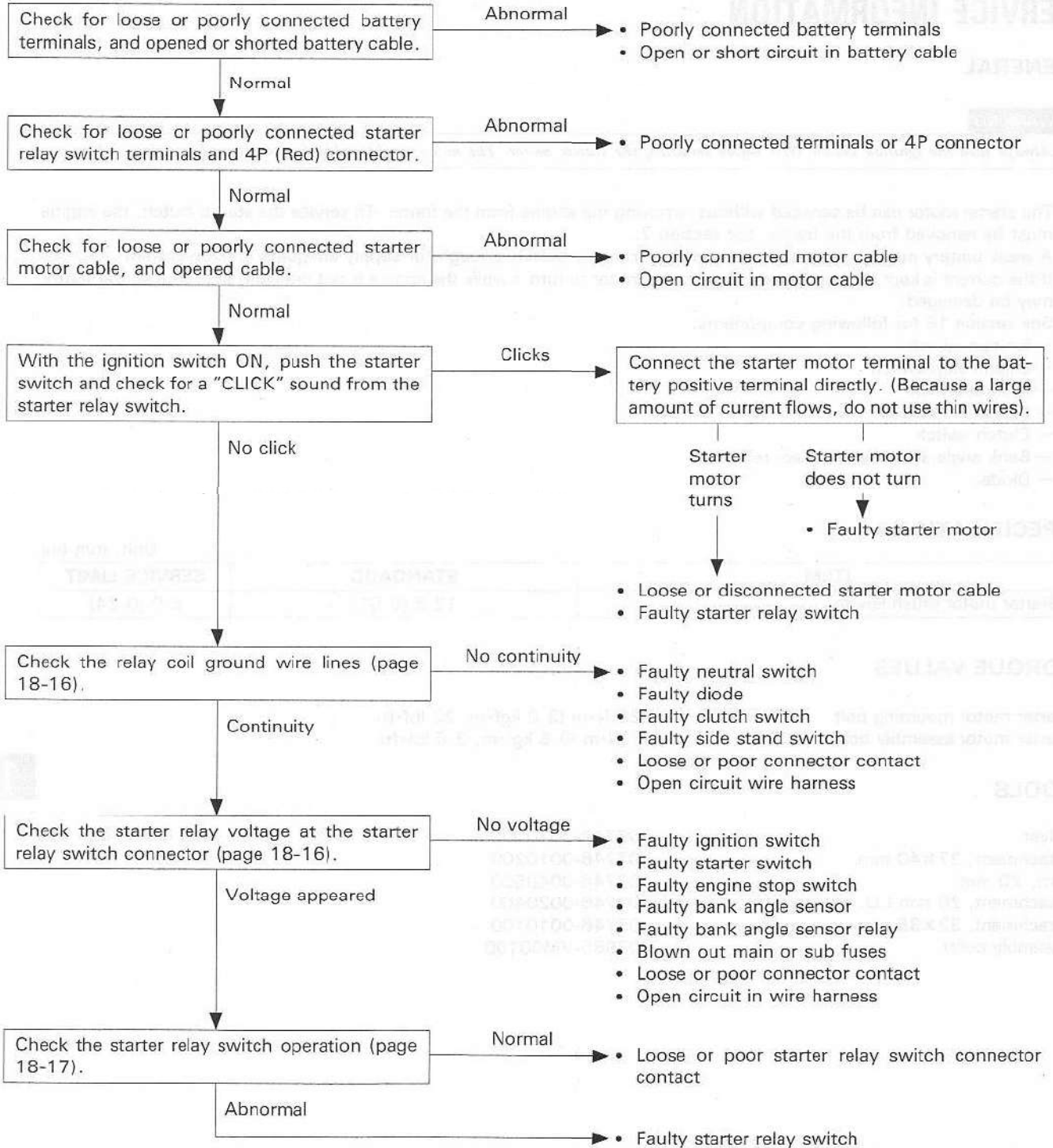
Driver	07749-0010000
Attachment, 37×40 mm	07746-0010200
Pilot, 20 mm	07746-0040500
Attachment, 20 mm I.D.	07746-0020400
Attachment, 32×35 mm	07746-0010100
Assembly collar	07965-VM00100

18

TROUBLESHOOTING

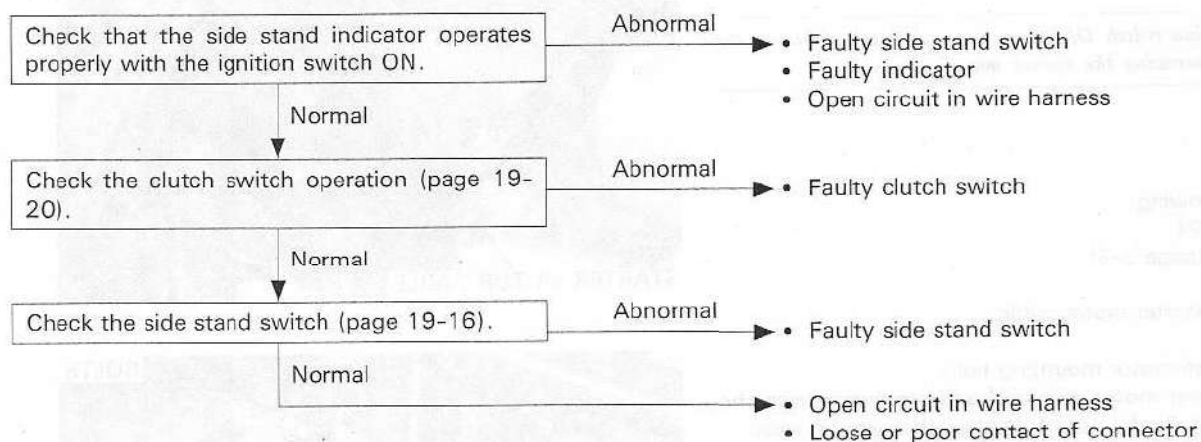
Starter motor will not turn

- Check for a blown main or sub fuse before servicing.
- Make sure the battery is fully charged and in good condition.
- The starter motor can turn when the transmission is in neutral position, or when the side stand up, the clutch lever is pulled in, and the transmission is in gear.



ELECTRIC STARTER/STARTER CLUTCH

The starter motor turns when the transmission is in neutral, but does not turn with the transmission in any position except neutral, with the side stand up and the clutch lever pulled in.



Starter motor turns slowly

- Weak battery (or dead battery)
- Poorly connected battery terminal cable
- Poorly connected starter motor cable
- Faulty starter motor
- Poorly connected battery ground cable

Starter motor turns, but engine does not turn

- Starter motor is running backwards
 - Case assembled improperly
- Faulty starter clutch
- Damaged or faulty starter motor gears.

Starter relay switch "Click", but engine does not turn over

- Crankshaft does not turn due to engine problems
- Excessive starter motor gear friction

STARTER MOTOR

▲WARNING

- With the ignition switch OFF, remove the negative cable at the battery before servicing the starter motor.

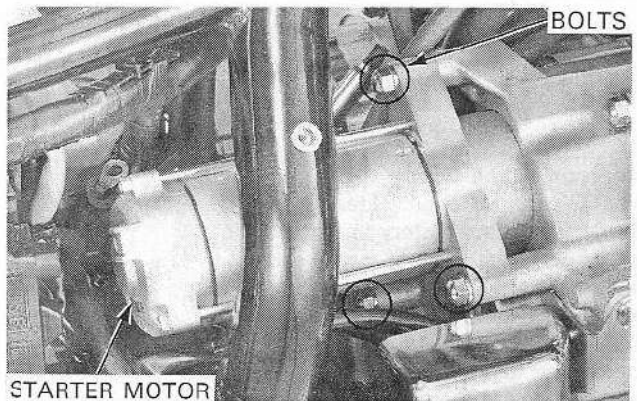
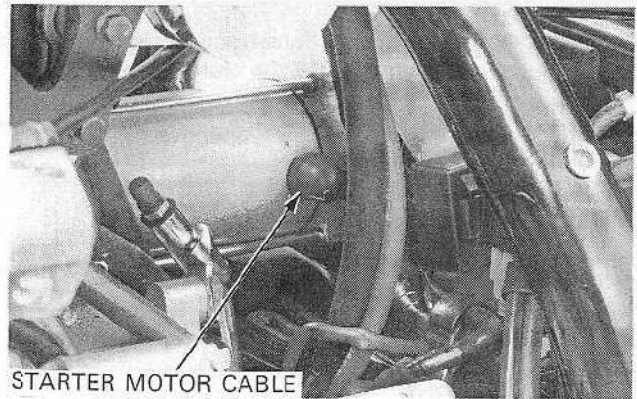
REMOVAL

Remove the following:

- seat (page 2-2).
- center cover (page 2-3).

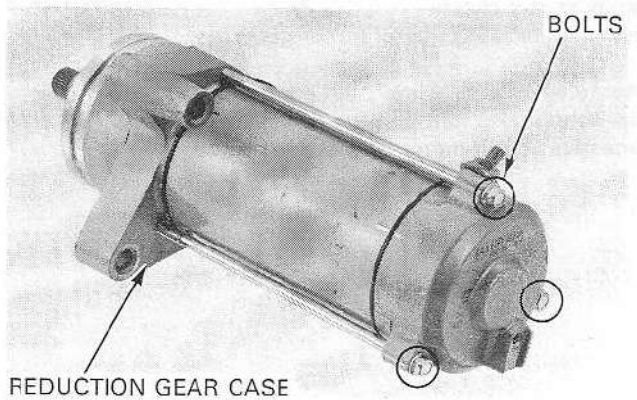
Disconnect the starter motor cable.

Remove the three motor mounting bolts. Pull out the starter motor rearward and remove it from the crankcase, being careful not to damage the wire harness. Remove the O-ring from the starter motor.

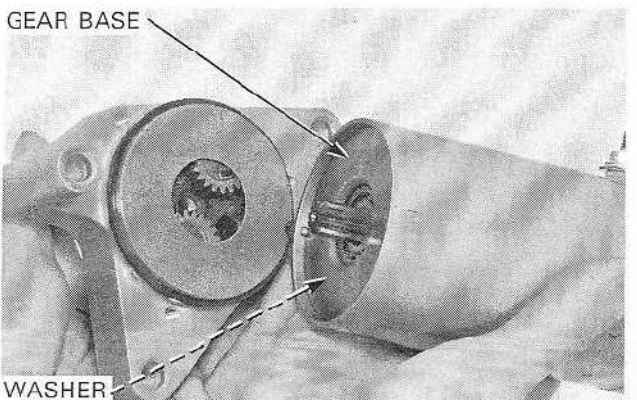


MOTOR DISASSEMBLY

Remove the motor attaching bolts and separate the motor reduction gear case from the starter motor.



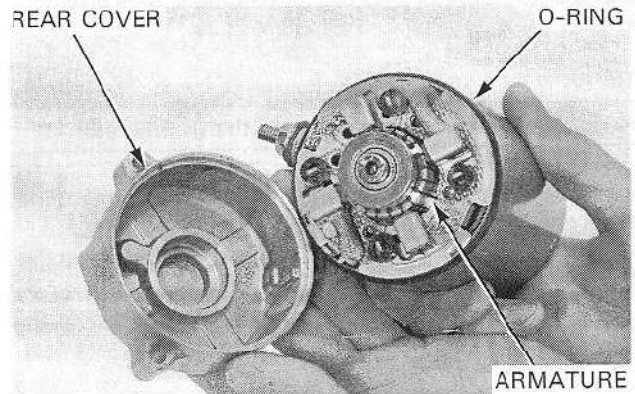
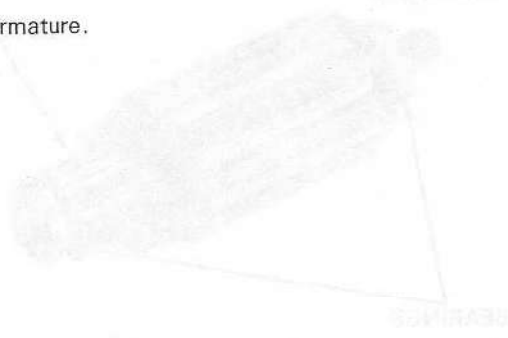
Remove the reduction gear base and washer.



ELECTRIC STARTER/STARTER CLUTCH

Remove the rear cover and O-ring.

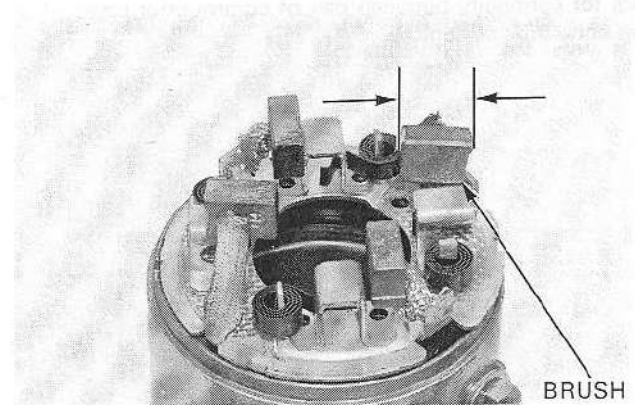
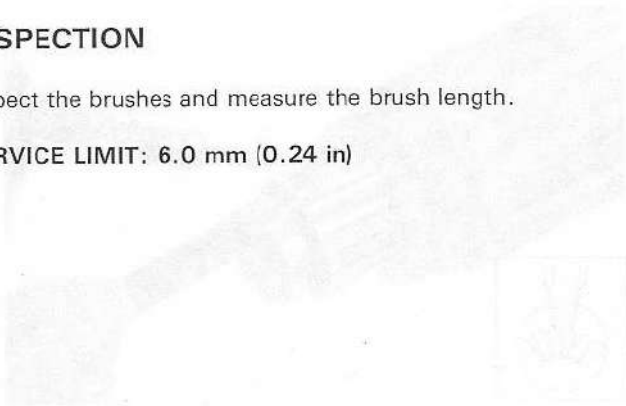
Remove the armature.



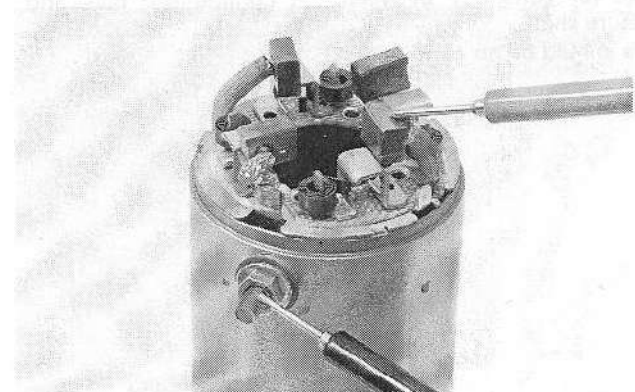
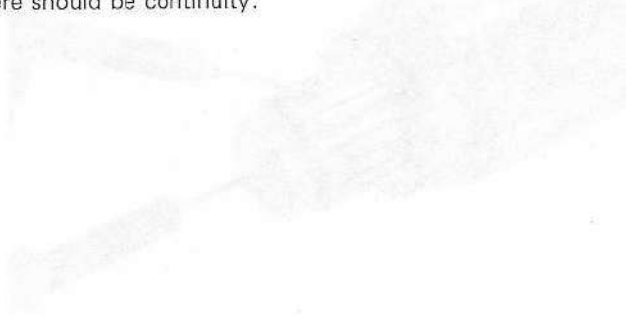
INSPECTION

Inspect the brushes and measure the brush length.

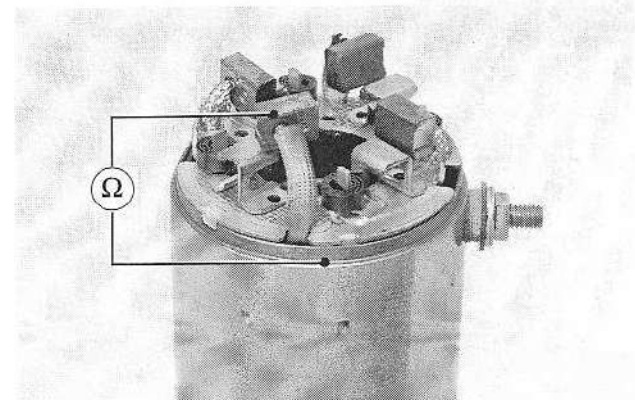
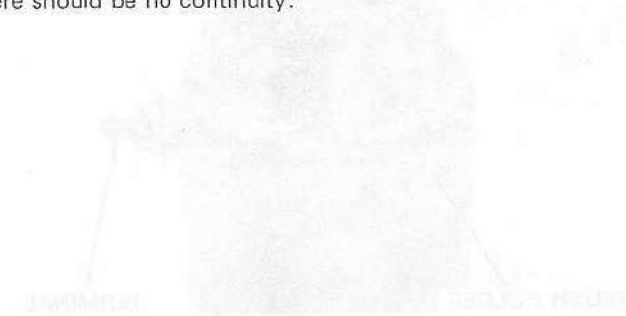
SERVICE LIMIT: 6.0 mm (0.24 in)



Check the continuity between the motor cable terminal and brushes with insulated wire. There should be continuity.



Check for continuity between the motor cable terminal and motor case. There should be no continuity.



ELECTRIC STARTER/STARTER CLUTCH

Inspect the commutator bars for discoloration. Bars discolored in pairs indicate grounded armature coils.

NOTE

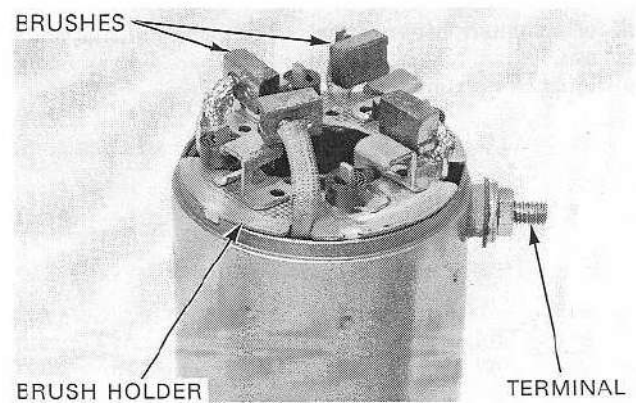
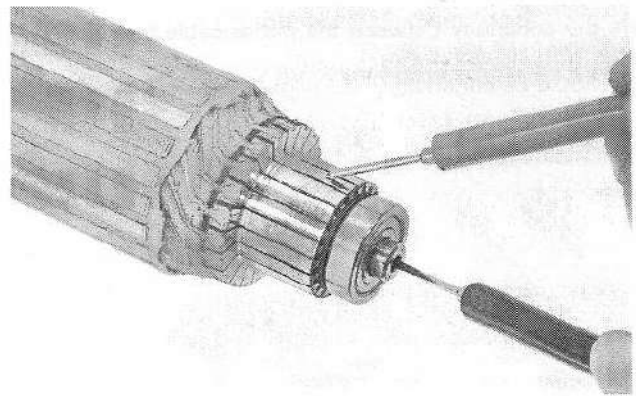
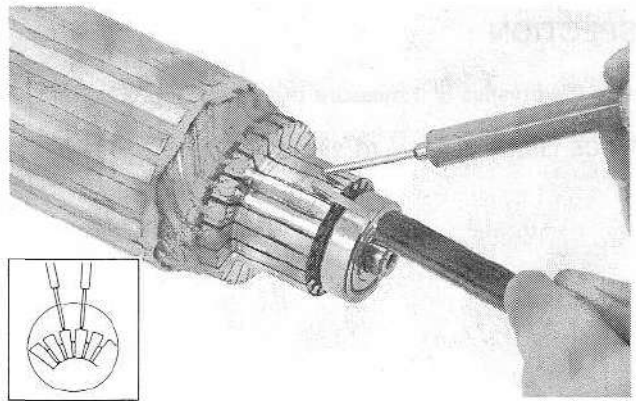
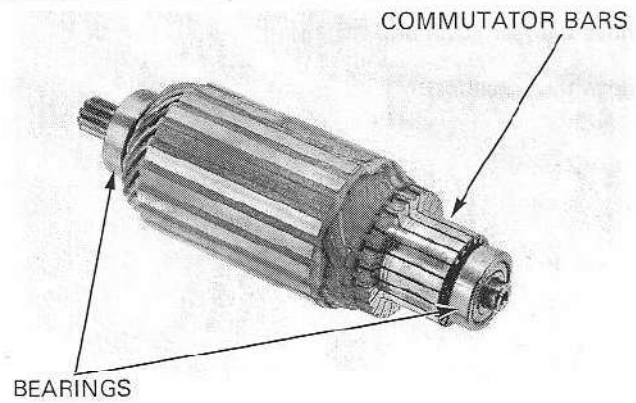
- Do not use emery or sand paper on the commutator.

Turn the outer race of the bearings with your finger. The bearings should turn smoothly and quietly. Also check that the inner race of the bearings fit tightly in the shaft.

Check for continuity between pair of commutator bars. There should be continuity.

Check for continuity between the commutator bars and armature shaft. There should be no continuity.

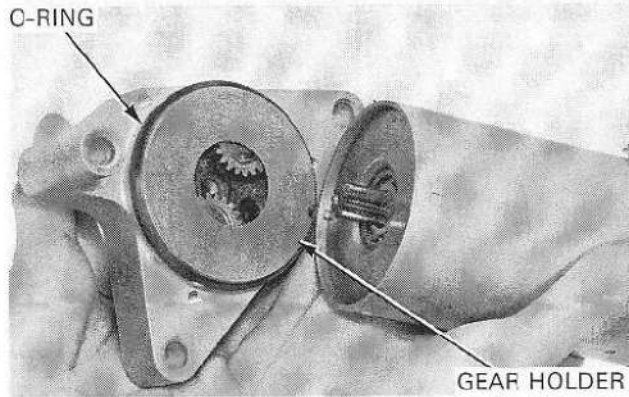
Remove the brush holder.
Remove the terminal and brushes from the motor case.



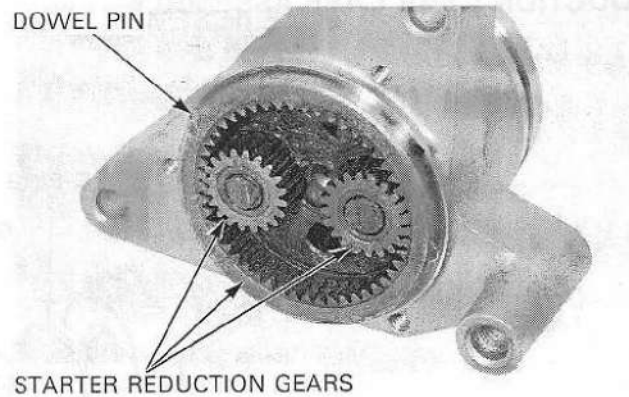
**REDUCTION GEAR CASE DISASSEMBLY/
INSPECTION**

Separate the motor reduction gear case from the motor case (page 18-4).

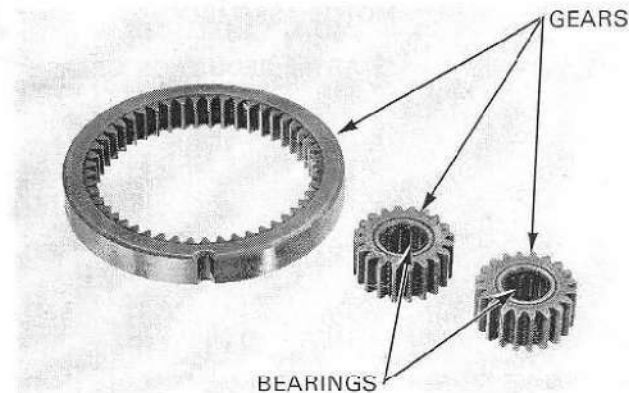
Remove the gear holder and O-ring.



Remove the starter reduction gears and dowel pin.

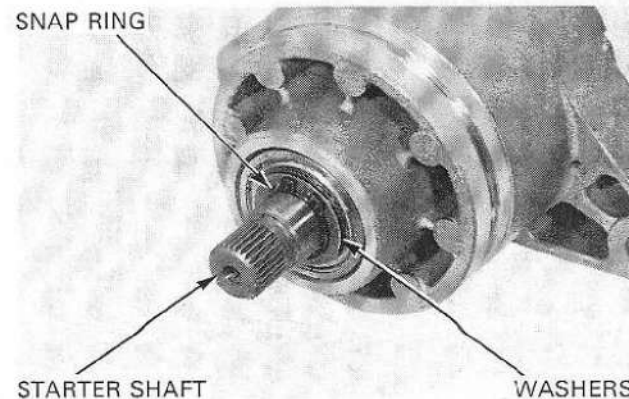


Check the starter reduction gears for excessive or abnormal wear.
Check the gear needle bearings for damage or excessive wear.



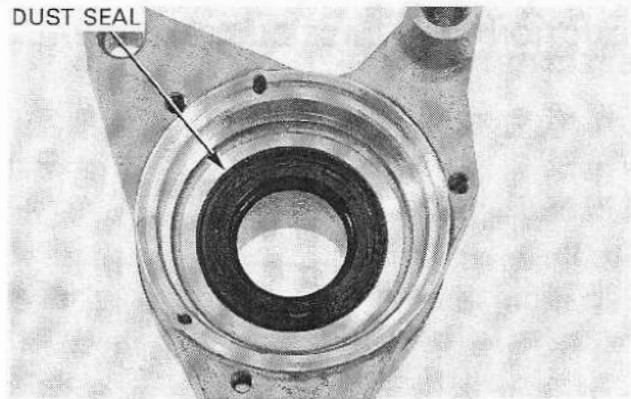
Turn the starter shaft and check the bearing condition.
The bearing should turn smoothly and quietly.

Remove the snap ring and washers from the starter shaft.
Separate the starter shaft from the reduction gear case.

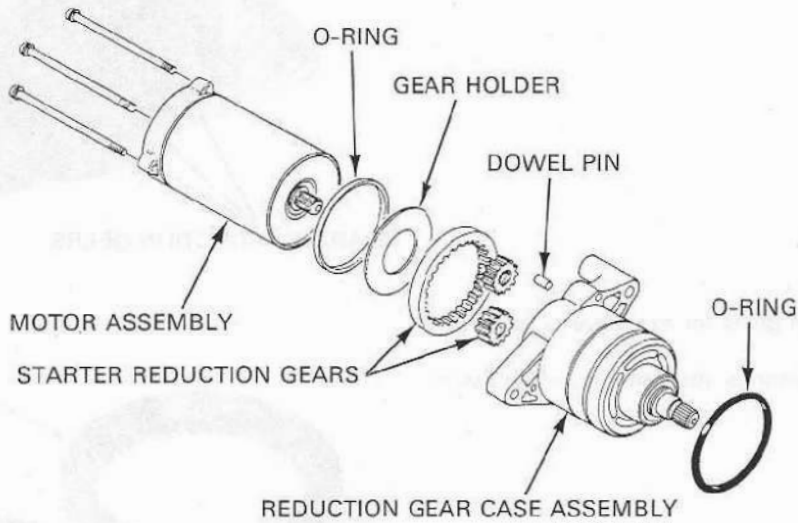


ELECTRIC STARTER/STARTER CLUTCH

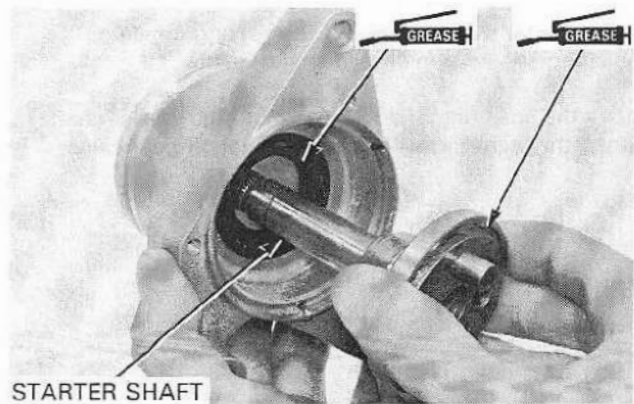
Inspect the dust seal of the gear case for fatigue or damage.



REDUCTION GEAR CASE ASSEMBLY

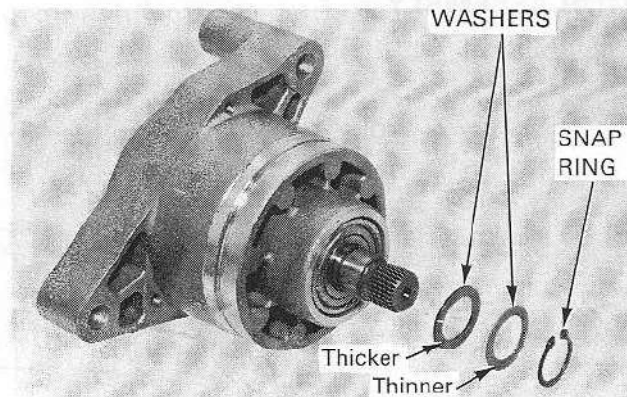


Apply grease to the dust seal lips.
Pack the bearing cavities with grease.
Install the starter shaft into the reduction gear case.

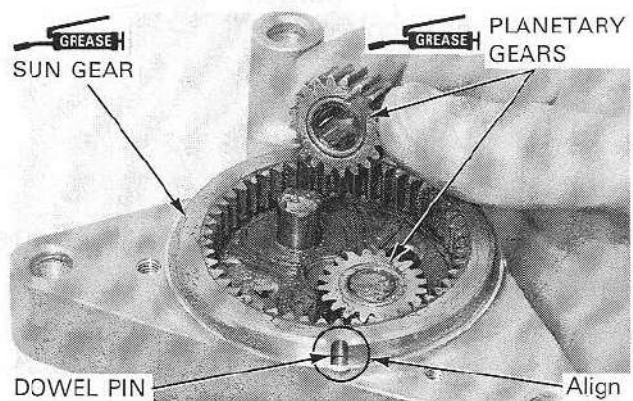


ELECTRIC STARTER/STARTER CLUTCH

Install the washers (thicker washer, inside; thinner one, outside) onto starter shaft.
Install the snap ring into the shaft groove securely.

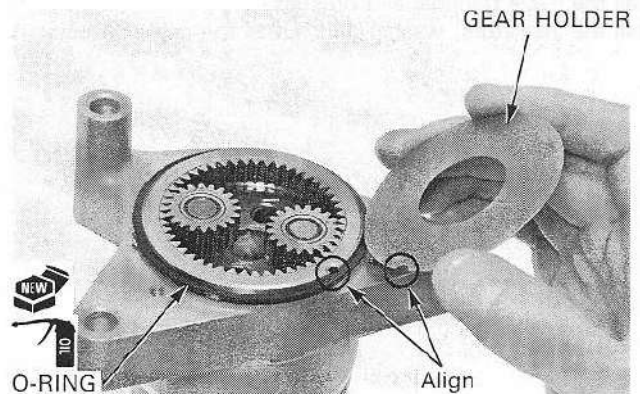


Apply grease to the gear teeth and bearings.
Install the dowel pin into the hole in the reduction gear case.
Install the sun gear, aligning the gear groove with the dowel pin.
Install the planetary gears over the bosses.



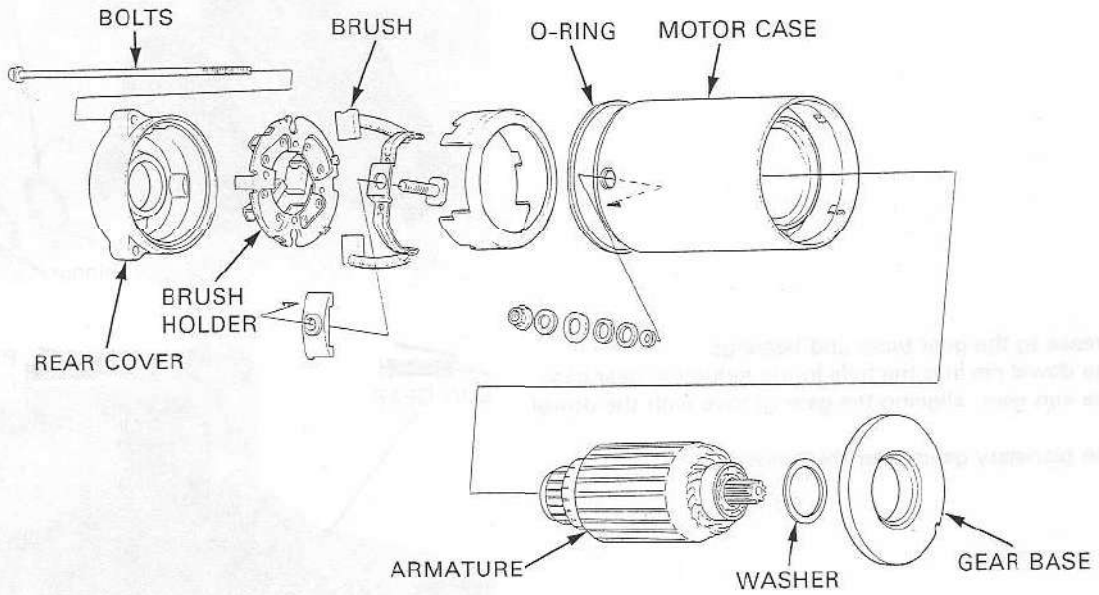
Coat a new O-ring with oil and install it onto the gear case.
Place the gear holder onto the reduction gears, aligning the holder groove with the dowel hole.

Install the reduction gear case onto the motor case (page 18-11).

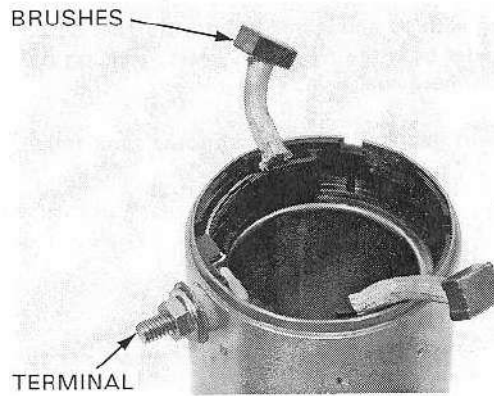


ELECTRIC STARTER/STARTER CLUTCH

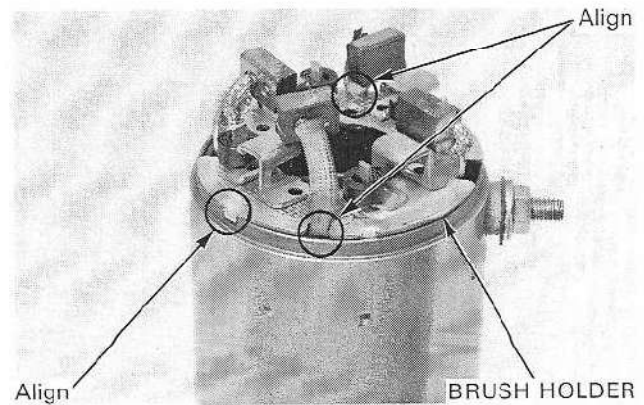
MOTOR ASSEMBLY



Install the cable terminal and brushes.
Install the insulators, washer and nut to the cable terminal.



Install the brush holder, aligning holder tab with the case groove, and the holder grooves with the insulated wires.



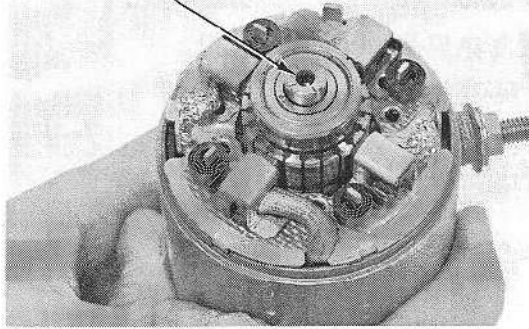
ELECTRIC STARTER/STARTER CLUTCH

Push and hold the brushes inside the brush holder, and insert the armature through the brush holder. When installing the armature into the case, hold the armature tightly to keep the magnet from pulling the armature against the case.

CAUTION

- *The coil may be damaged if the magnet pulls the armature against the case.*

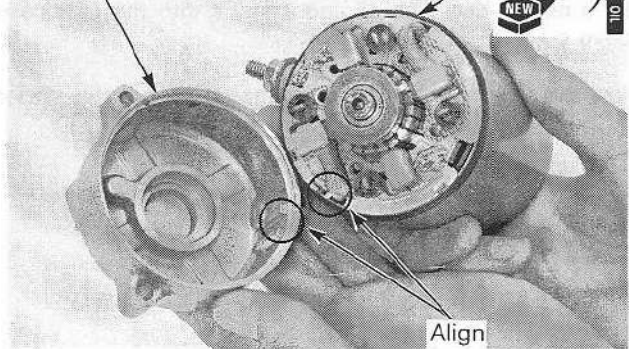
ARMATURE



Coat a new O-ring with oil and install it onto the motor case. Install the rear cover, aligning its groove with the tab of the brush holder.

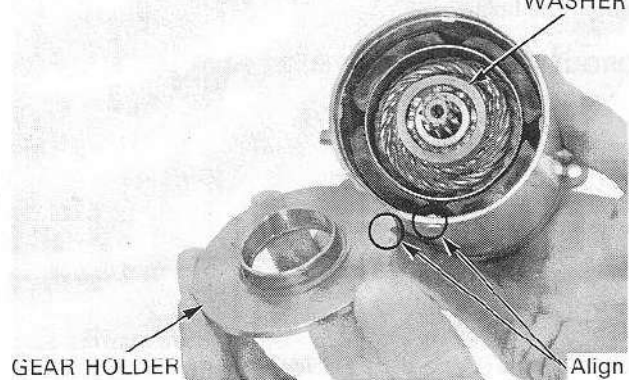
REAR COVER

O-RING



Install the washer onto the armature bearing. Install the reduction gear holder, aligning its groove with the case projection.

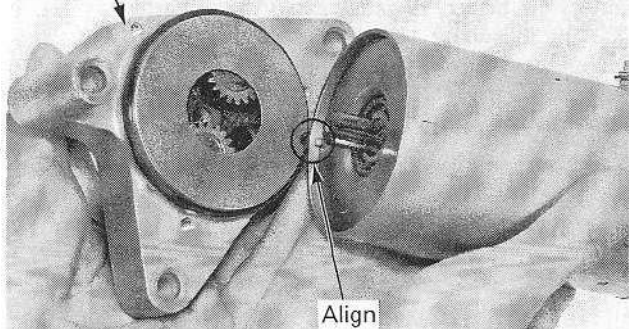
WASHER



GEAR HOLDER

Install the reduction gear case onto the motor case, aligning the groove in the sun gear with the projection of the motor case.

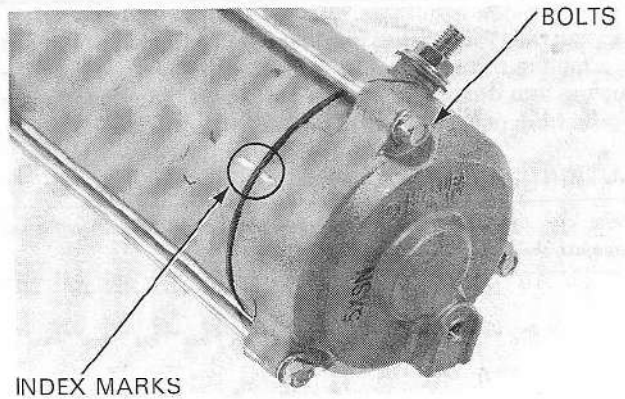
REDUCTION GEAR CASE



ELECTRIC STARTER/STARTER CLUTCH

Make sure the index marks on the rear cover and motor case are aligned.
Install the motor attaching bolts and tighten them.

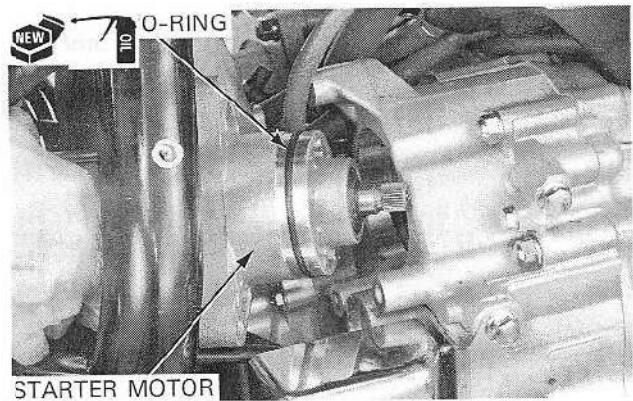
TORQUE: 5 N·m (0.5 kgf·m, 3.6 lbf·ft)



INSTALLATION

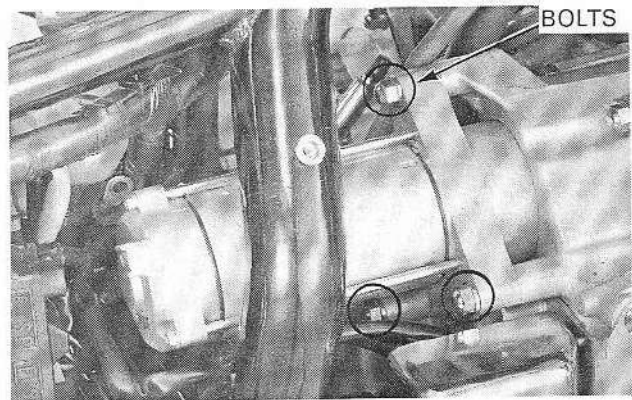
Coat a new O-ring with oil and install it into the gear case groove.

Install the starter motor into the crankcase until the starter motor flange touches the crankcase bosses evenly.
Be careful not to damage the wire harness.



Install the starter motor mounting bolts.
Tighten the bolts.

TORQUE: 29 N·m (3.0 kgf·m, 22 lbf·ft)

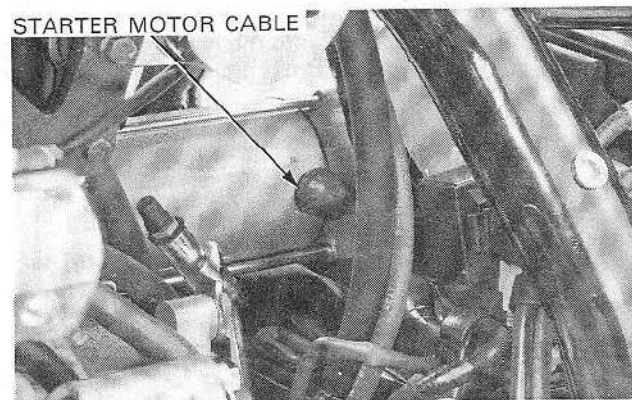


Connect the starter motor cable by tightening the terminal nut and install the rubber cap securely.

Connect the battery negative cable to the battery.

Install the following:

- center cover (page 2-3).
- side cover (page 2-3).
- seat (page 2-2).



STARTER CLUTCH/STARTER DRIVE GEAR

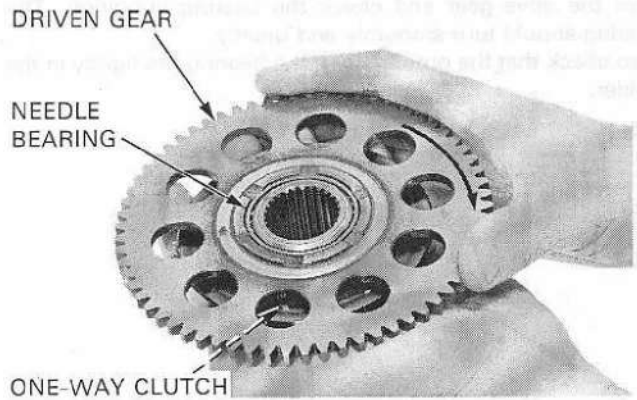
STARTER CLUTCH DISASSEMBLY

Remove the starter clutch assembly (page 10-10).

Make sure that the starter driven gear only rotates clockwise smoothly in one direction and lock up in the other direction.

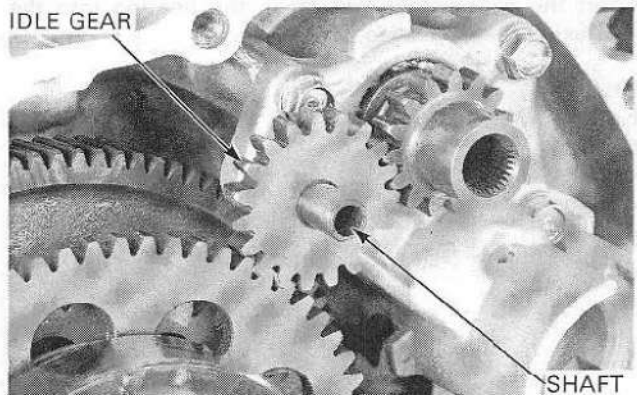
Remove the starter driven gear, needle bearing and one-way clutch from the clutch outer.

Check the starter driven gear boss and teeth for wear or damage.
Check the one-way clutch rollers for wear or damage.

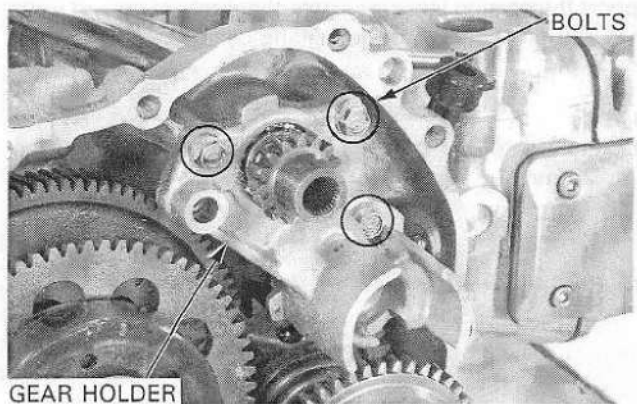


STARTER DRIVE AND IDLE GEAR REMOVAL

Remove the starter idle gear and gear shaft.

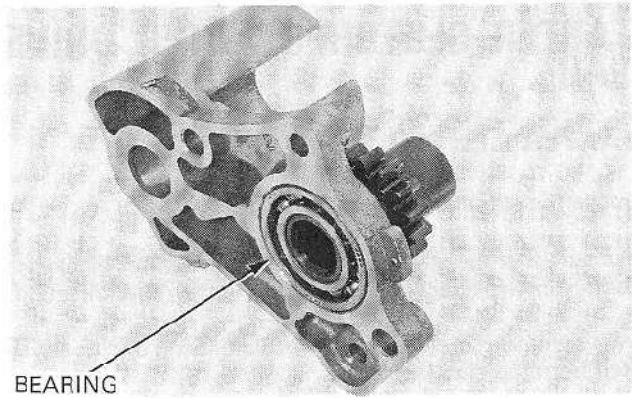


Remove the three bolts and starter drive gear holder.
Remove the two dowel pins.



ELECTRIC STARTER/STARTER CLUTCH

Turn the drive gear and check the bearing condition. The bearing should turn smoothly and quietly. Also check that the outer race of the bearing fits tightly in the holder.



BEARING REPLACEMENT

Support the gear holder and press the starter drive gear out of the bearing using the special tools.

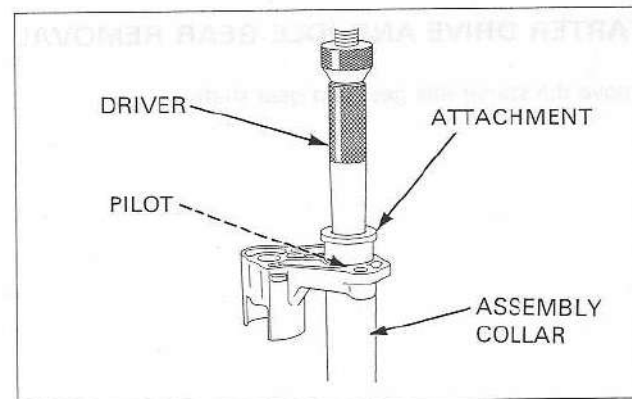
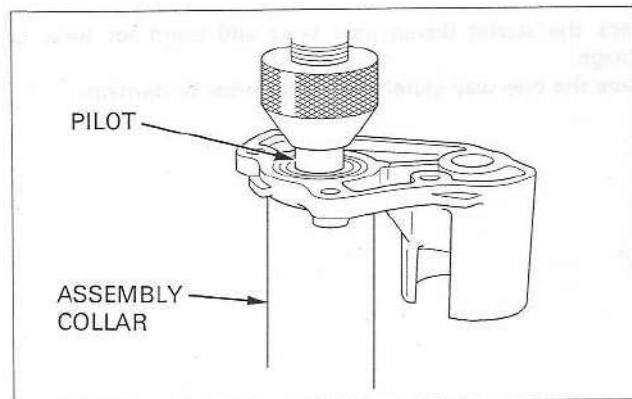
TOOLS:
Pilot, 20 mm **07746-0040500**
Assembly collar **07965-VM00100**

Press the bearing out of the holder using the special tools.

TOOLS:
Driver **07749-0010000**
Attachment, 32×35 mm **07746-0010100**
Assembly collar **07965-VM00100**

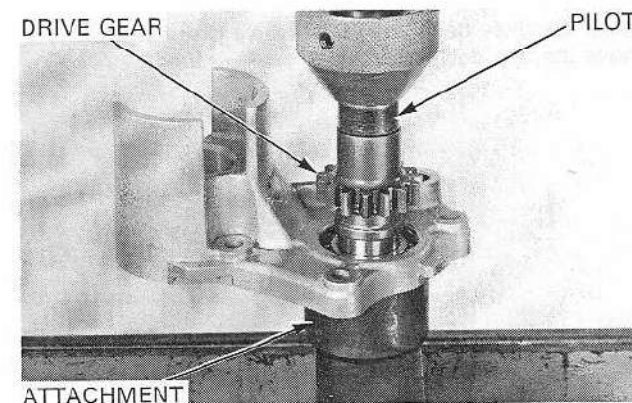
Support the gear holder and press the bearing into the holder using the special tools as shown.

TOOLS:
Driver **07749-0010000**
Attachment, 37×40 mm **07746-0010200**
Pilot, 20 mm **07746-0040500**
Assembly collar **07965-VM00100**



Support the bearing inner race with the attachment and press the starter drive gear into the bearing using the special tools as shown.

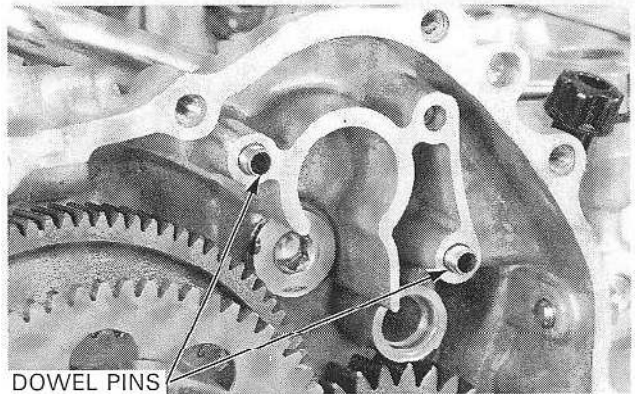
TOOLS:
Attachment, 20 mm I.D. **07746-0020400**
Pilot, 20 mm **07746-0040500**



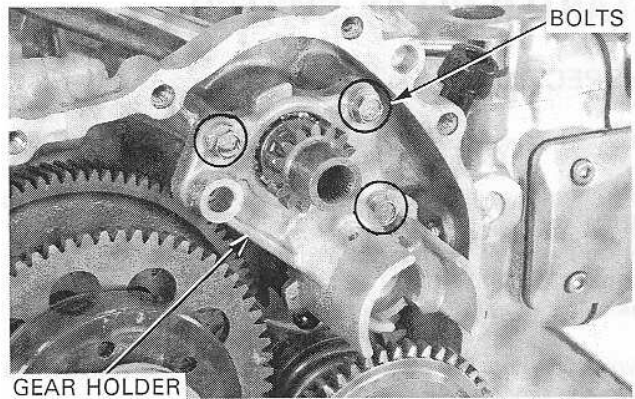
ELECTRIC STARTER/STARTER CLUTCH

STARTER DRIVE AND IDLE GEAR INSTALLATION

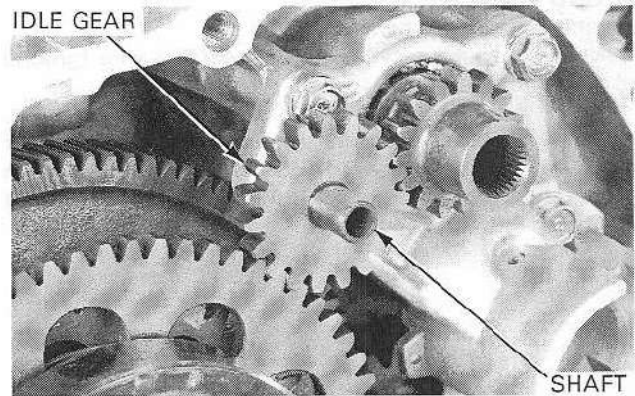
Install the dowel pins to the crankcase.



Install the starter drive gear holder.
Install and tighten the gear holder bolts securely.

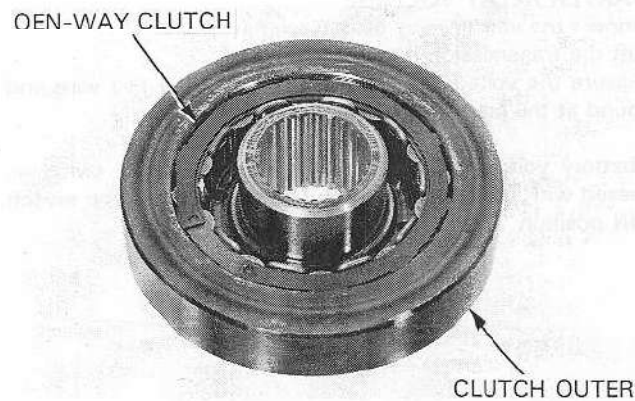


Install the starter idle gear and shaft.



STARTER CLUTCH ASSEMBLY

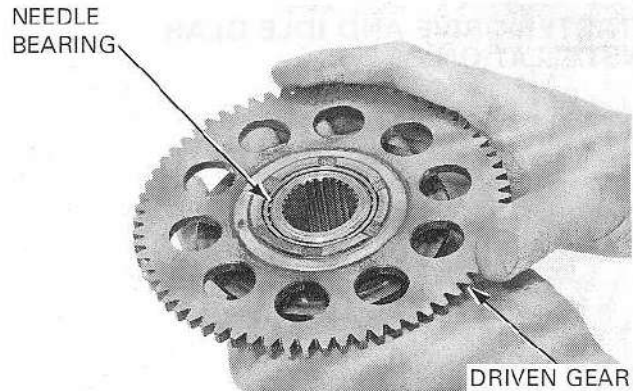
Install the one-way clutch into the clutch outer with its snap ring side facing up.



ELECTRIC STARTER/STARTER CLUTCH

Install the needle bearing and driven gear, rotating it clockwise.

Install the starter clutch assembly (page 10-20).



STARTER RELAY SWITCH

INSPECTION

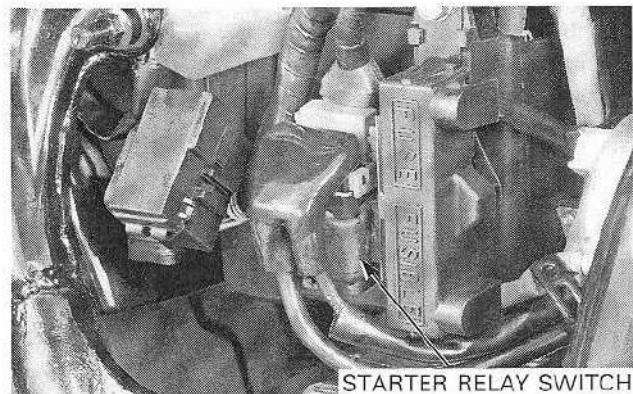
Remove the right side cover (page 2-3).

Shift the transmission into neutral and engine stop switch to "RUN".

Turn the ignition switch ON and depress the starter switch button.

The coil is normal if the starter relay switch clicks.

If you don't hear the switch "CLICK", inspect the relay switch using the procedure below.

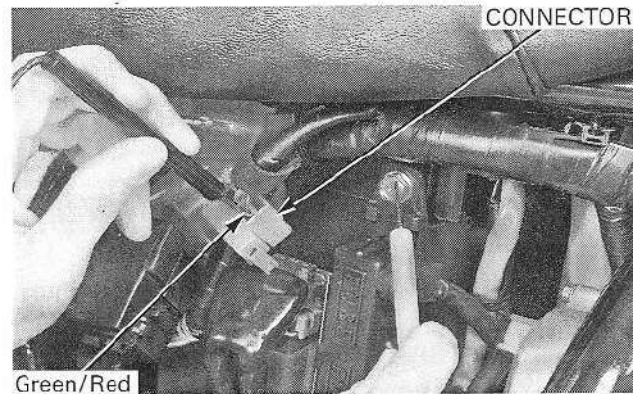


GROUND LINE

Disconnect the switch connector.

Check for continuity between the Green/Red wire (ground line) and ground.

If there is continuity when the transmission is in neutral or when the clutch is disengaged and the side stand switch is up, the ground circuit is normal. (In neutral, there is a slight resistance due to the diode)



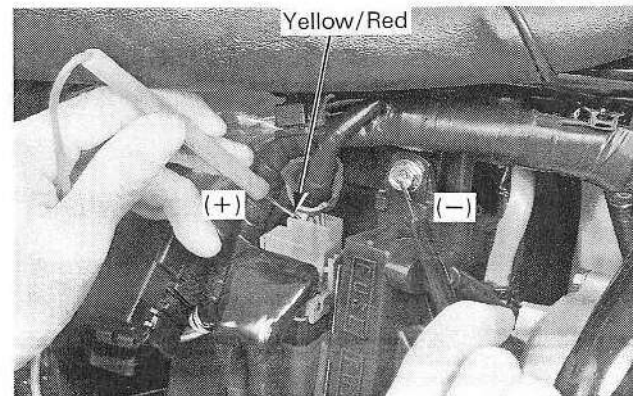
STARTER RELAY VOLTAGE

Connect the starter relay switch connector.

Shift the transmission into neutral.

Measure the voltage between the Yellow/Red (+) wire and ground at the starter relay switch connector.

If battery voltage appears only when the starter switch is pressed with the ignition switch ON and engine stop switch RUN position, it is normal.



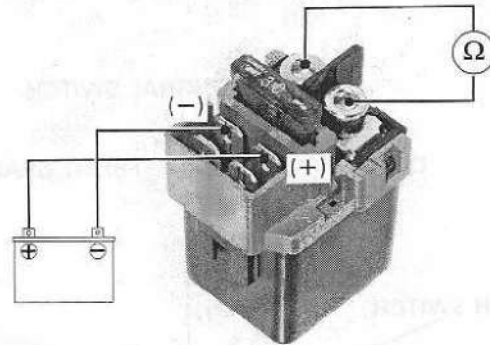
ELECTRIC STARTER/STARTER CLUTCH

OPERATION CHECK

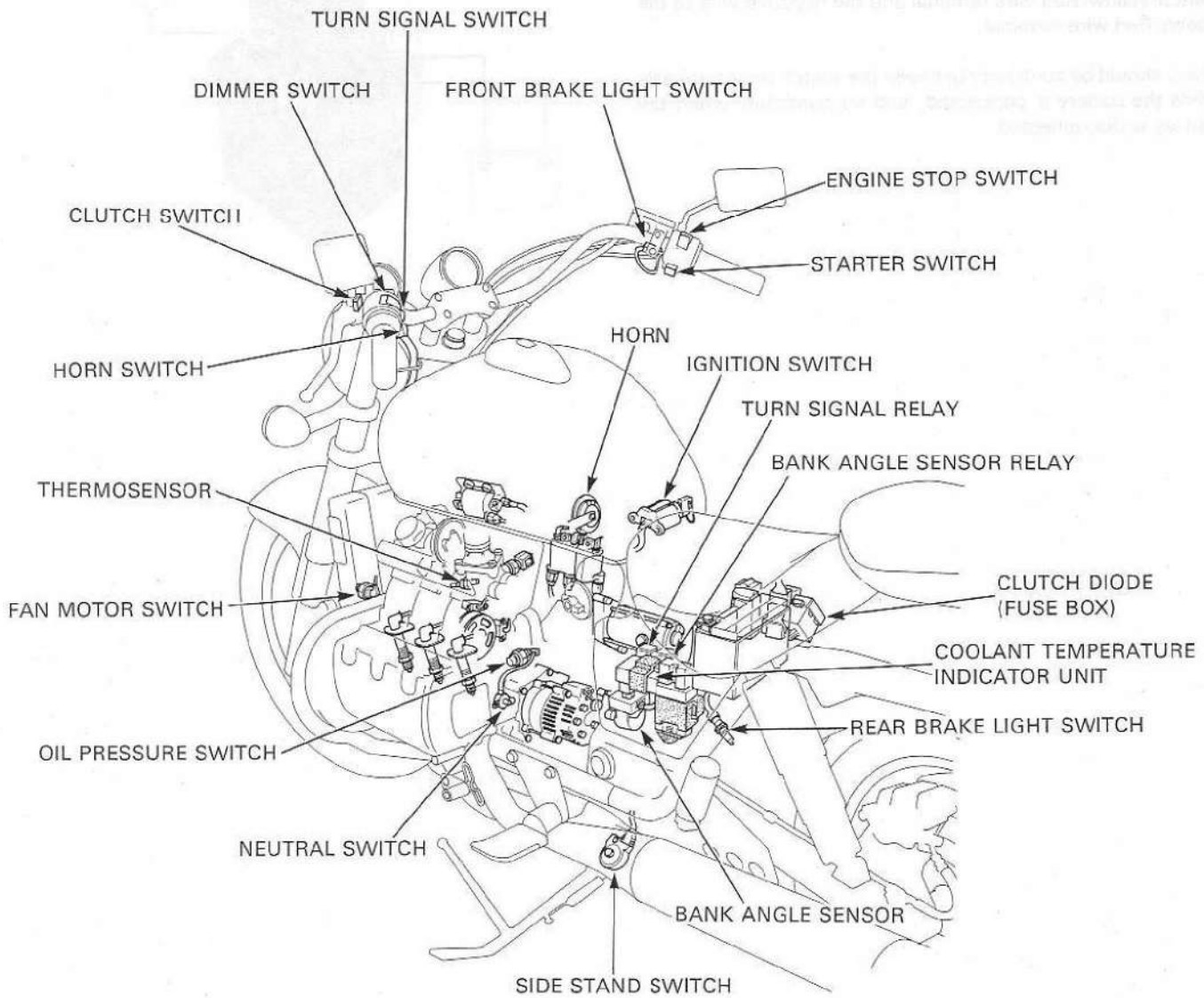
Disconnect the connector and cables.

Connect a fully charged 12 V battery positive wire to the relay switch Yellow/Red wire terminal and the negative wire to the Green/Red wire terminal.

There should be continuity between the switch large terminals while the battery is connected, and no continuity when the battery is disconnected.



LIGHTS/METERS/SWITCHES



GL1500C shown, GL1500CT and GL1500CF similar.

19. LIGHTS/METERS/SWITCHES

SERVICE INFORMATION	19-1	FUEL GAUGE (GL1500CF only)	19-15
HEADLIGHT	19-3	SIDE STAND SWITCH	19-16
TURN SIGNAL LIGHT	19-4	FAN MOTOR SWITCH	19-17
BRAKE/TAILLIGHT	19-5	BANK ANGLE SENSOR	19-18
LICENSE LIGHT	19-5	IGNITION SWITCH	19-19
INDICATOR (GL1500C/CT only)	19-6	FRONT BRAKE LIGHT SWITCH	19-19
METERS (GL1500C/CT)	19-6	REAR BRAKE LIGHT SWITCH	19-19
COMBINATION METER (GL1500CF)	19-8	CLUTCH SWITCH	19-20
SPEEDOMETER/SPEED SENSOR (GL1500CF only)	19-9	HANDLEBAR SWITCH	19-20
TACHOMETER (GL1500CF only)	19-10	HORN	19-21
COOLANT TEMPERATURE INDICATOR	19-11	TURN SIGNAL RELAY	19-21
OIL PRESSURE INDICATOR	19-14	NEUTRAL SWITCH DIODE	19-22
NEUTRAL SWITCH	19-15		

SERVICE INFORMATION

GENERAL

▲WARNING

- A halogen headlight bulb becomes very hot while the headlight is ON, and remains hot for a while after it is turned OFF. Be sure to let it cool down before servicing.
- Use an electric heating element to heat the water/coolant mixture for the thermosensor inspection. Keep all flammable materials away from the electric heating element. Wear protective clothing, insulated gloves and eye protection.

- Note the following when replacing the halogen headlight bulb.
 - Wear clean gloves while replacing the bulb. Do not put finger prints on the headlight bulb, as they may create hot spots on the bulb and cause it to fail.
 - If you touch the bulb with your bare hands, clean it with a cloth moistened with alcohol to prevent its early failure.
 - Be sure to install the dust cover after replacing the bulb.
- Check the battery condition before performing any inspection that requires proper battery voltage.
- A continuity test can be made with the switches installed on the motorcycle.
- The following color codes used are indicated throughout this section.

Bu: Blue	G: Green	Lg: Light Green	R: Red
Bl: Black	Gr: Gray	O: Orange	W: White
Br: Brown	Lb: Light Blue	P: Pink	Y: Yellow

SPECIFICATIONS

GL1500C/CT

ITEM		SPECIFICATIONS
Fuse	Main fuse A	30 A
	Main fuse B	55 A
	Sub-fuse	10 A × 5, 5 A × 1
Bulb	Headlight (High/low beam)	12 V – 60/55 W
	Brake/taillight	12 V – 32/3 cp
	License light	12 V – 4 cp
	Front turn signal/running light	12 V – 32/3 cp × 2
	Rear turn signal light	12 V – 32 cp × 2
	Meter light	12 V – 1.7 W (Tachometer), 12 V – 1.7 W (Speedometer)
	High beam indicator	12 V – 3 W
	Turn signal indicator	12 V – 3 W
	Neutral indicator	12 V – 3 W
Thermosensor resistance ('97 – '99)	80 °C (176 °F)	47 – 57 Ω
	120 °C (248 °F)	14 – 18 Ω
Thermostatic switch (After '99)	Start to close (ON)	112 – 118 °C (234 – 244 °F)
	Stop opening (OFF)	108 °C (226 °F) min.
Fan motor switch	Start to close (ON)	98 – 102 °C (208 – 216 °F)
	Stop opening (OFF)	93 – 97 °C (199 – 207 °F)

GL1500CF

ITEM		SPECIFICATIONS
Fuse	Main fuse A	30 A
	Main fuse B	55 A
	Sub-fuse	15 A × 3, 10 A × 2, 5 A × 3
Bulb	Headlight (High/low beam)	12 V – 45/45 W × 2
	Brake/taillight	12 V – 21/5 W × 2
	License light	12 V – 4 cp
	Front turn signal/running light	12 V – 35/2.8 cp × 2
	Rear turn signal light	12 V – 36.6 cp × 2
	Trunk accessory light	12 V – 3 W × 2
	Meter light	12 V – 1.7 W × 4
Thermostatic switch	Start to close (ON)	112 – 118 °C (234 – 244 °F)
	Stop opening (OFF)	108 °C (226 °F) min.
Fan motor switch	Start to close (ON)	98 – 102 °C (208 – 216 °F)
	Stop opening (OFF)	93 – 97 °C (199 – 207 °F)

TORQUE VALUES

Fan motor switch	18 N·m (1.8 kgf·m, 13 lbf·ft)	
Thermosensor/Thermostatic switch	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply sealant to the threads (Do not apply sealant to the sensor head)
Neutral switch	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Side stand switch bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	Apply locking agent to the threads

HEADLIGHT

BULB REPLACEMENT

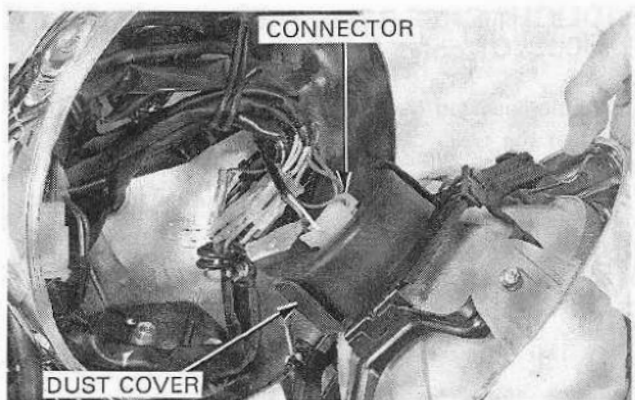
▲WARNING

- *A halogen headlight bulb becomes very hot while the headlight is ON, and will remain hot for a while after it is turned OFF. Be sure to let it cool down before servicing.*

GL1500C/CT only: Remove the two screws and the headlight.



Disconnect the headlight connector and remove the dust cover.



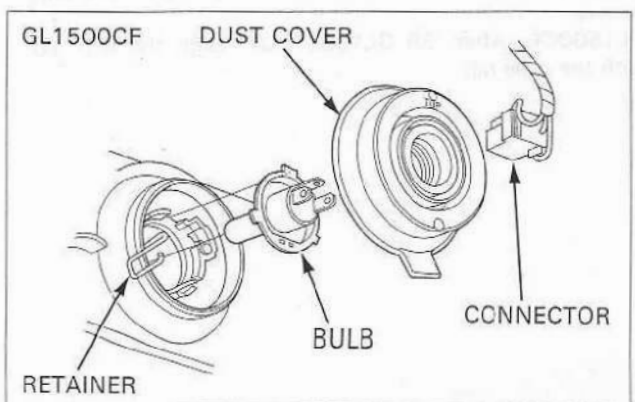
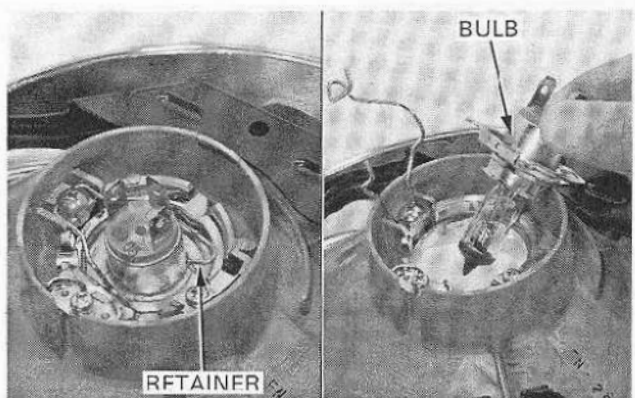
Release the bulb retainer and replace the headlight bulb.

CAUTION

- *Avoid touching halogen headlight bulb. Finger prints can create hot spots that cause a bulb to break.*

If you touch the bulb with your bare hands, clean it with cloth moistened with denatured alcohol to prevent early bulb failure.

Set the bulb with the bulb retainer.



LIGHTS/METERS/SWITCHES

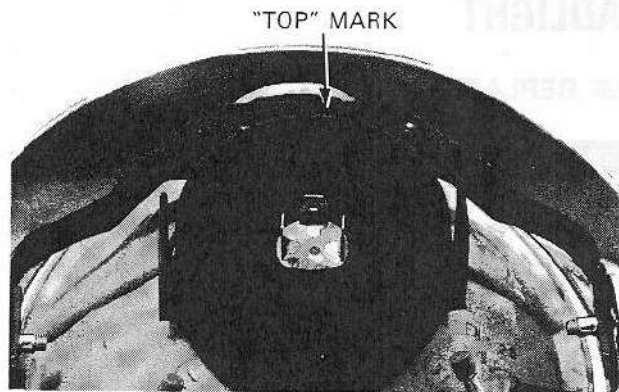
Install the dust cover tightly against the headlight with the "TOP" mark facing up.

Connect the headlight connector.

GL1500C/CT only: Install the headlight in the reverse order of removal.

NOTE

- For headlight removal/installation of the GL1500CF, refer to page 2-7).



HEADLIGHT CASE REMOVAL/INSTALLATION (GL1500C/CT only)

Remove the headlight (see previous page).

Disconnect the connectors and release the wire harnesses from the clamps.

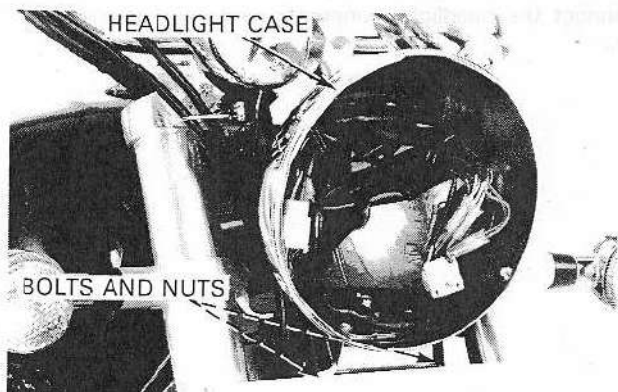
GL1500C: Remove the headlight case mounting nuts, bolts and the headlight case.

GL1500CT: Remove the windshield, lower bracket (page 2-6) and the headlight case.

Installation is in the reverse order of removal.

NOTE

- Route the wire harnesses properly (page 1-21).



TURN SIGNAL LIGHT

BULB REPLACEMENT

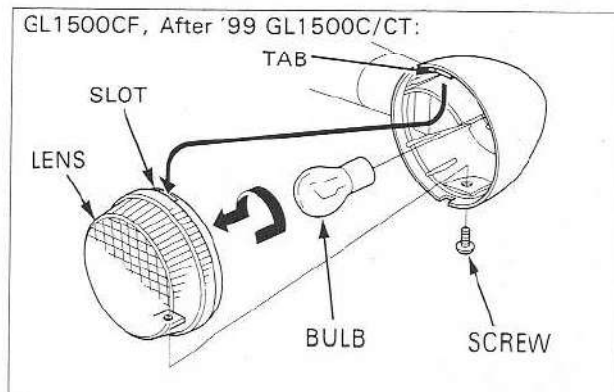
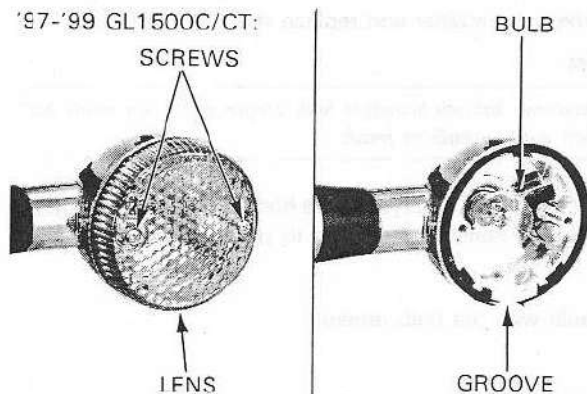
Remove the screw(s) and the turn signal light lens.

While pushing the bulb in, turn it counterclockwise to remove it and replace it with a new one.

Install the removed parts in the reverse order of removal.

When installing the lens:

- '97-'99 GL1500C/CT: align the lens tab with the case groove.
- GL1500CF, After '99 GL1500C/CT: align the lens slot with the case tab.



BRAKE/TAILLIGHT

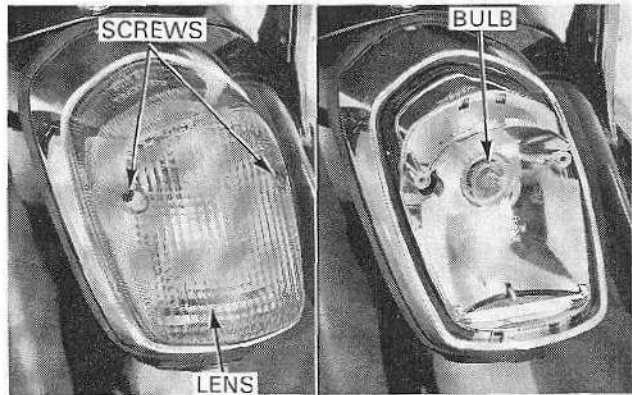
BULB REPLACEMENT

GL1500C/CT:

Remove the two screws and the brake/taillight lens.

While pushing the bulb in, turn it counterclockwise to remove it and replace it with a new one.

Install the removed parts in the reverse order of removal.



GL1500CF:

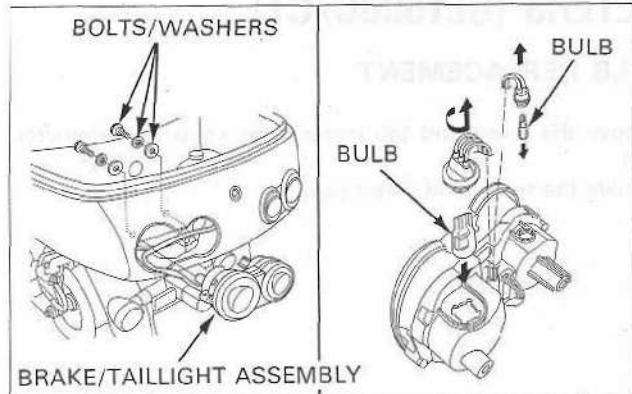
Open the trunk lid.

Remove the two bolts, washers, rubber washers and the brake/taillight assembly from the trunk.

Turn the brake/taillight bulb socket counterclockwise and remove it from the case. Pull the bulb out of the socket and replace it with a new one.

Pull the accessory light bulb socket out of the case. Pull the bulb out of the socket and replace it with a new one.

Install the removed parts in the reverse order of removal.



LICENSE LIGHT

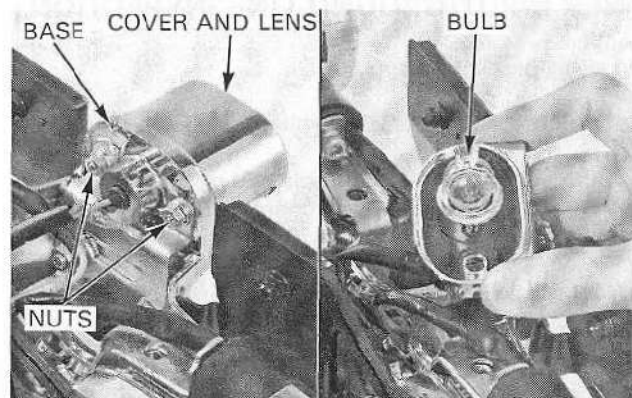
BULB REPLACEMENT

Remove the two screws and the license light stay cover.

Remove the two attaching nuts, license light cover, lens and base from the stay.

While pushing the bulb in, turn it counterclockwise to remove it from the base and replace it with a new one.

Install the removed parts in the reverse order of removal.



LIGHTS/METERS/SWITCHES

INDICATOR (GL1500C/CT only)

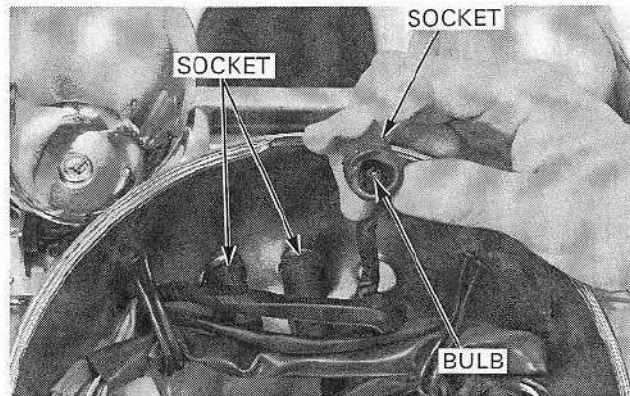
BULB REPLACEMENT

Remove the headlight (page 19-3).

Remove the indicator light lens, then remove the bulb socket from the headlight case.

Pull the bulb out of the socket and replace it with a new one.

Install the removed parts in the reverse order of removal.

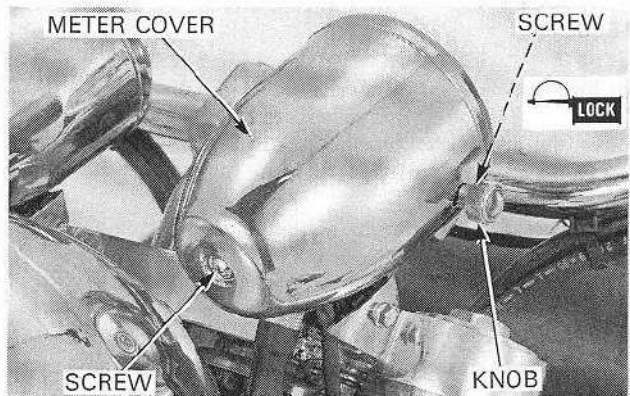


METERS (GL1500C/CT)

BULB REPLACEMENT

Remove the screw and trip meter reset knob (speedometer only).

Remove the screw and meter cover.



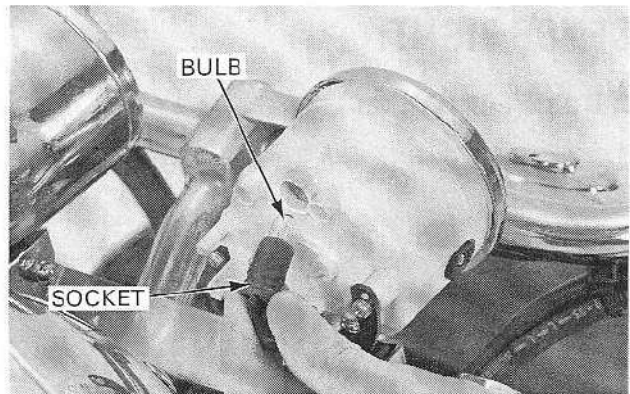
Pull the bulb socket out of the meter case.

Pull the bulb out of the socket and replace it with a new one.

Install the removed parts in the reverse order of removal.

NOTE

- Apply locking agent to the reset knob screw threads when installing it



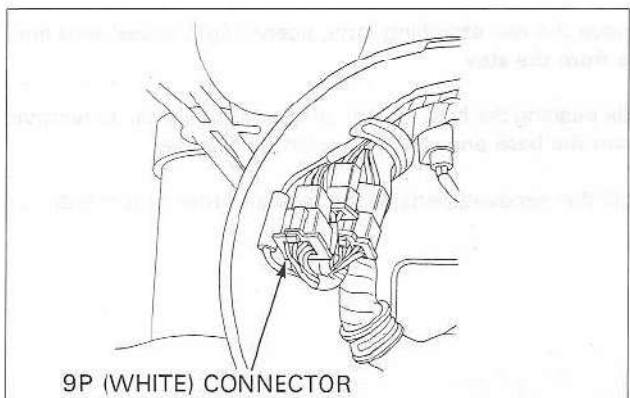
POWER INPUT/GROUND LINE INSPECTION

Remove the headlight (page 19-3).

Disconnect the tachometer 9P (white) connector.

Check the voltage between the black/brown wire terminal (+) of the main wire harness side connector and ground (-). There should be battery voltage with the ignition switch ON.

Check for continuity between the green wire terminal of the main wire harness side connector and body ground. There should be continuity.



TACHOMETER INSPECTION

Turn the ignition switch ON and check that the indicators come on.

- If they do not come on, perform the power input/ground line inspection at the tachometer 9P connector (page 19-6).
- If they come on, check as follows:
Connect the peak voltage adaptor to the yellow/green wire connector terminal (+) and green wire terminal (-) of the 9P connector with the connectors connected.

TOOLS:

Peak voltage tester (U.S.A. only) or
Peak voltage adaptor 07HGJ-0020100
with commercially available digital multimeter
(impedance 10 MΩ/DCV minimum)

Start the engine and measure the tachometer signal peak voltage.

PEAK VOLTAGE: 10.5 V minimum

- If the measured value is more than 10.5 V replace the tachometer assembly.
- If the measured value is less than 10.5 V, replace the ignition control module (ICM).
- If there is no voltage, disconnect the ICM connector (page 17-7) and check as follows:
Check the yellow/green wire for continuity between the tachometer meter and ICM connectors.
There should be continuity.

Check for continuity between the yellow/green wire terminal and ground.
There should be no continuity.

REMOVAL/INSTALLATION

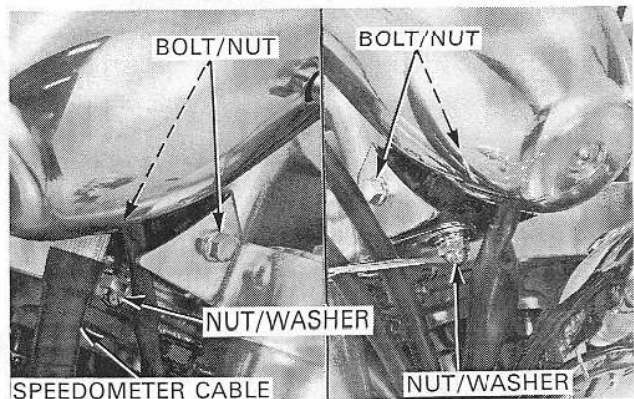
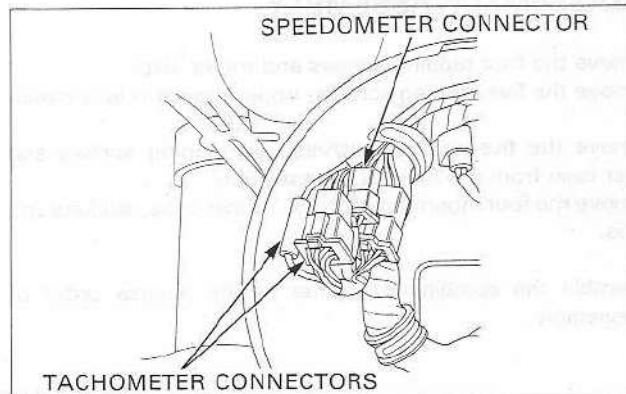
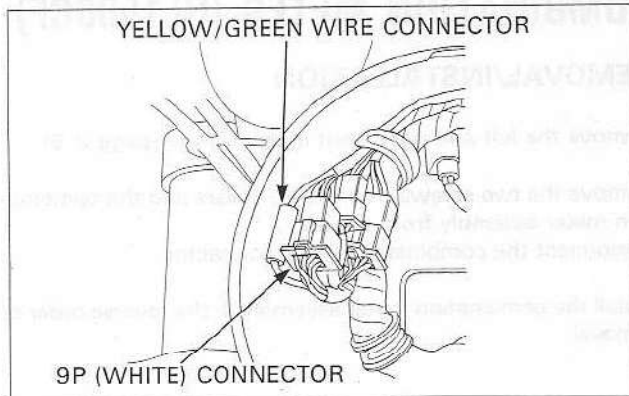
Remove the headlight (page 19-3).

Disconnect the connector(s) in the headlight case.

Disconnect the speedometer cable from the speedometer.

Remove the nuts, washer, bolt and the meter assembly.

Install the meter assembly in the reverse order of removal.



COMBINATION METER (GL1500CF)

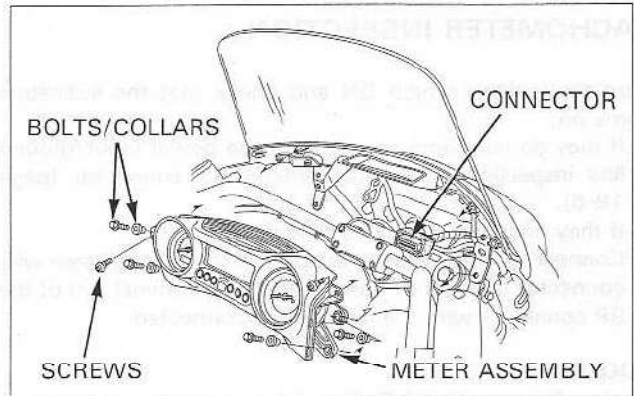
REMOVAL/INSTALLATION

Remove the left and right front inner fairings (page 2-5).

Remove the two screws, four bolts, collars and the combination meter assembly from the stay.

Disconnect the combination meter connector.

Install the combination meter assembly in the reverse order of removal.



BULB REPLACEMENT

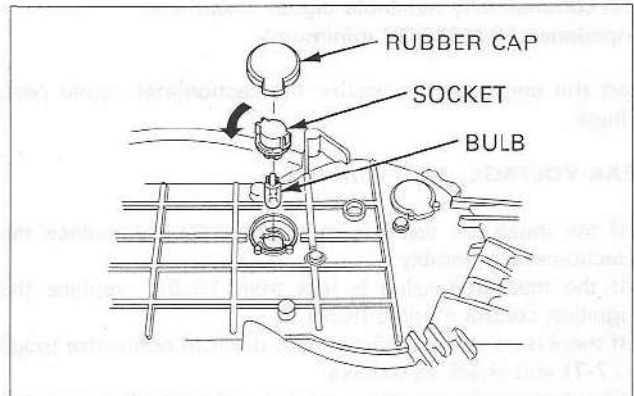
Remove the meter assembly.

Remove the rubber cap from the meter lower case.

Remove the bulb socket from the circuit board by turning it 45° counterclockwise.

Pull the bulb out of the socket and replace it with a new one.

Install the removed parts in the reverse order of removal.



DISASSEMBLY/ASSEMBLY

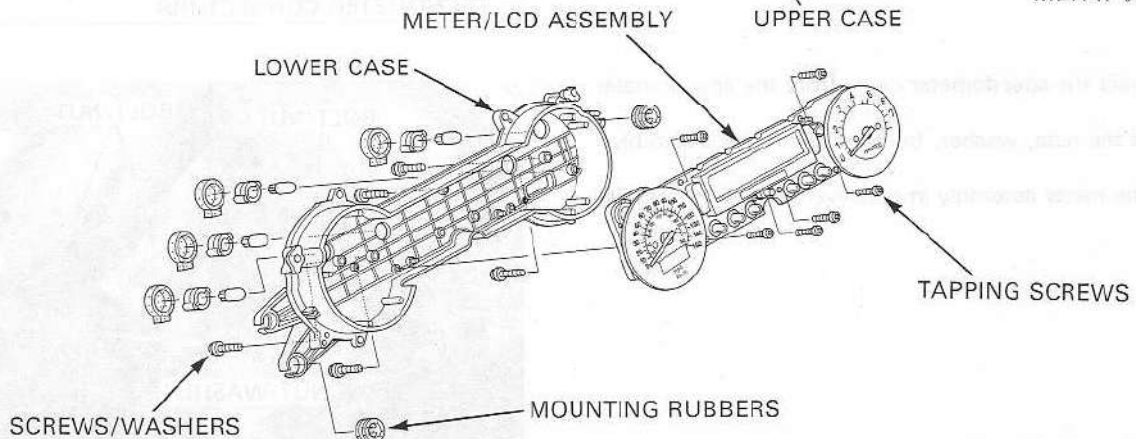
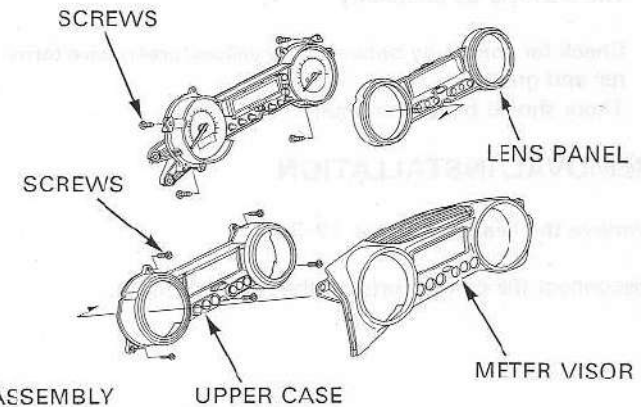
Remove the four tapping screws and meter visor.

Remove the five tapping screws, upper case and lens panel.

Remove the five screws/washers, six tapping screws and lower case from the meter/LCD assembly.

Remove the four mounting rubbers, rubber caps, sockets and bulbs.

Assemble the combination meter in the reverse order of disassembly.



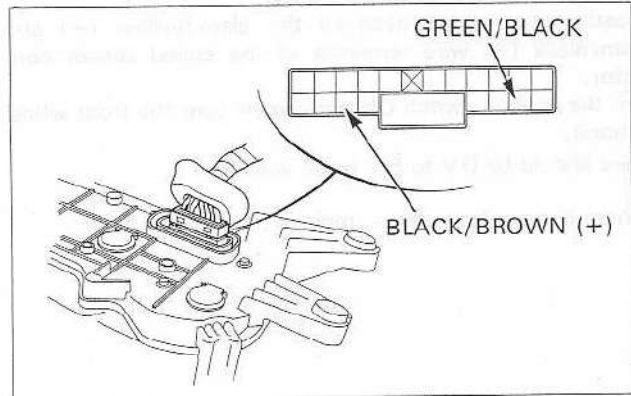
POWER/SENSOR GROUND LINE INSPECTION

Remove the combination meter (page 19-8) and check the following at the wire harness side connector.

Measure the voltage between the black/brown wire terminal (+) and ground (-). There should be battery voltage with the ignition switch ON.

Check for continuity between the green/black wire terminal and ground. There should be continuity.

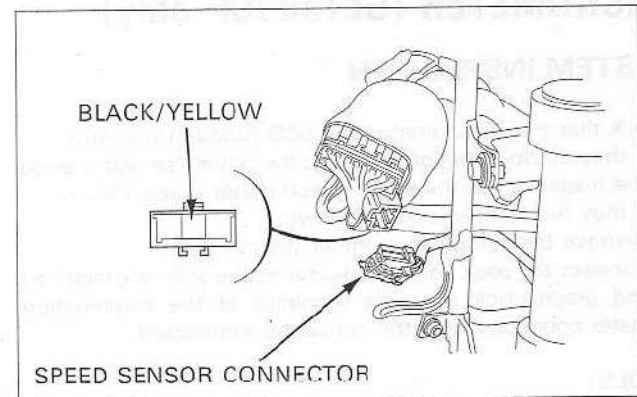
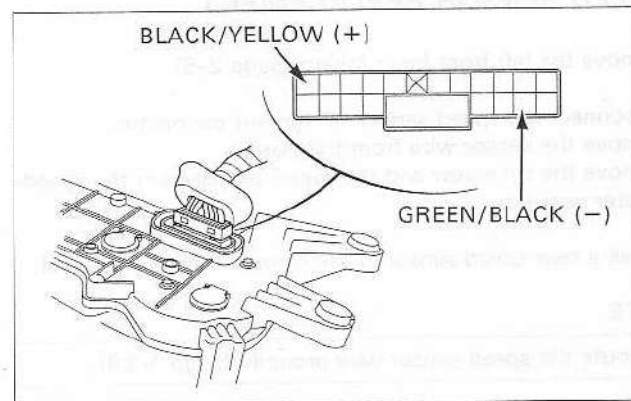
If there is no voltage or no continuity, check for open circuit in the wire harness.



SPEEDOMETER/SPEED SENSOR (GL1500CF only)

SYSTEM INSPECTION

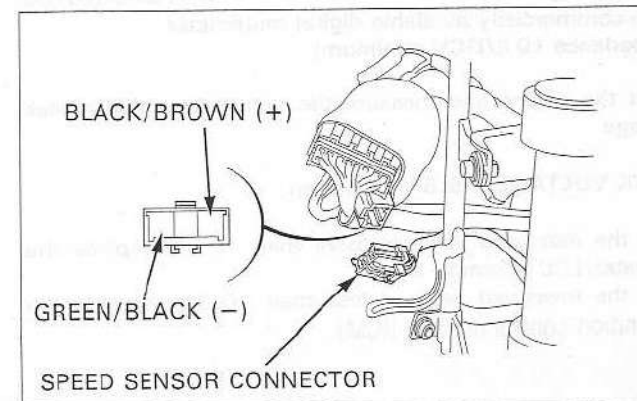
- Check that the tachometer and LCD function properly.
- If they do not function, perform the power/sensor ground line inspection at the combination meter (see above).
- If they function, check as follows:
 - Remove the combination meter (page 19-8).
 - Measure the voltage between the black/yellow (+) and green/black (-) wire terminals of the wire harness side connector.
 - Turn the ignition switch ON and slowly turn the front wheel by hand.
 - There should be 0 V to 5 V pulse voltage.
- If pulse voltage appears, replace the meter/LCD assembly.
- If pulse voltage does not appear, remove the left front inner fairing (page 2-5). Check for open or short circuit in black/yellow wire between the combination meter and speed sensor connectors.
- If the black/yellow wire is OK, check the speed sensor.



SPEED SENSOR INSPECTION

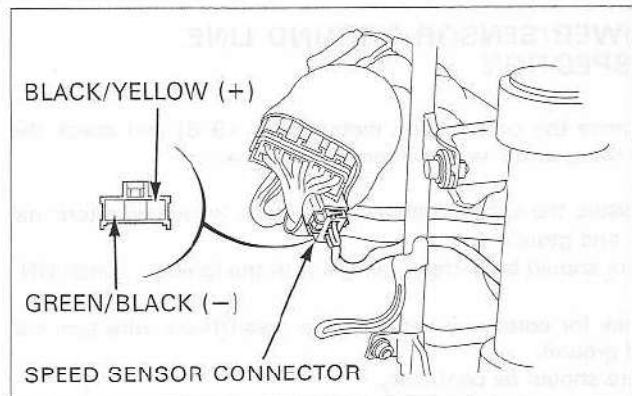
Remove the left front inner fairing (page 2-5). Disconnect the speed sensor 3P (green) connector. Measure the voltage between the black/brown (+) and green/black (-) wire terminals of the wire harness side connector. There should be battery voltage with the ignition switch ON.

If there is no voltage, check for open circuit in the wire harness.



LIGHTS/METERS/SWITCHES

Connect the speed sensor connector.
Measure the voltage between the black/yellow (+) and green/black (-) wire terminals of the speed sensor connector.
Turn the ignition switch ON and slowly turn the front wheel by hand.
There should be 0 V to 5 V pulse voltage.
If there is no pulse voltage, replace the speed sensor.



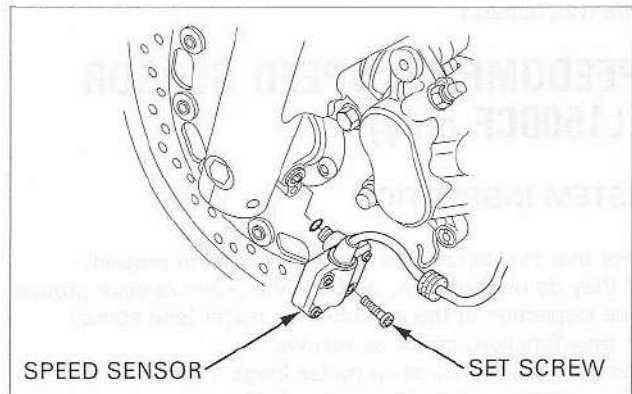
SPEED SENSOR REPLACEMENT

Remove the left front inner fairing (page 2-5).
Disconnect the speed sensor 3P (green) connector.
Remove the sensor wire from the clamps.
Remove the set screw and the speed sensor from the speedometer gear box.

Install a new speed sensor in the reverse order of removal.

NOTE

- Route the speed sensor wire properly (page 1-28).



TACHOMETER (GL1500CF only)

SYSTEM INSPECTION

Check that the speedometer and LCD function properly.

- If they do not function, perform the power/sensor ground line inspection at the combination meter (page 19-9).
- If they function, check as follows:
Remove the combination meter (page 19-8).
Connect the peak voltage adaptor to the yellow/green (+) and green/black (-) wire terminals of the combination meter connector with the connector connected.

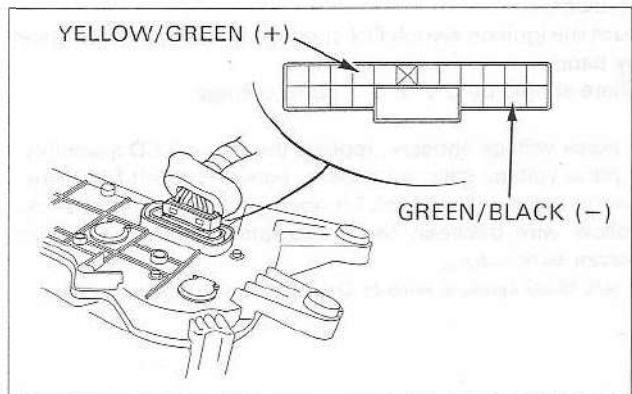
TOOLS:

Peak voltage tester (U.S.A. only) or
Peak voltage adaptor **07HGJ-0020100**
with commercially available digital multimeter
(impedance 10 Ω /DCV minimum)

Start the engine and measure the tachometer signal peak voltage.

PEAK VOLTAGE: 10.5 V minimum

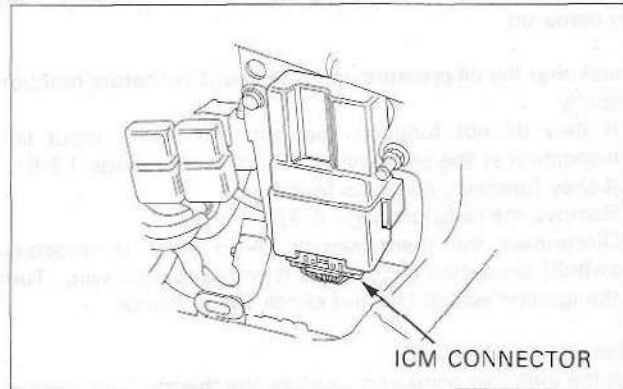
- If the measured value is more than 10.5 V replace the meter/LCD assembly.
- If the measured value is less than 10.5 V, replace the ignition control module (ICM).



- If there is no voltage, disconnect the ICM connector (page 17-7) and check as follows:
Check the yellow/green wire for continuity between the tachometer meter and ICM connectors.
There should be continuity.

Check for continuity between the yellow/green wire terminal and ground.
There should be no continuity.

If the yellow/green wire is OK, replace the ICM.



COOLANT TEMPERATURE INDICATOR

INSPECTION

GL1500C/CT:

The indicator comes on when the ignition switch is turned ON

Remove the radiator (page 6-7).
Disconnect the thermosensor (After '99: thermostatic switch) connector.
Turn the ignition switch ON and check the indicator.

After '99 GL1500C/CT:

- If the indicator does not come on, replace the thermostatic switch.
- If the indicator comes on, check for short circuit in the green/blue or light green/black wire between the thermostatic switch and tachometer 9P connector. If the wire is OK, replace the tachometer assembly (page 19-7).

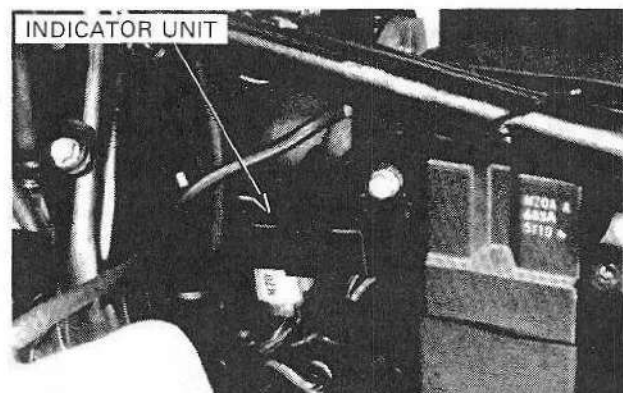
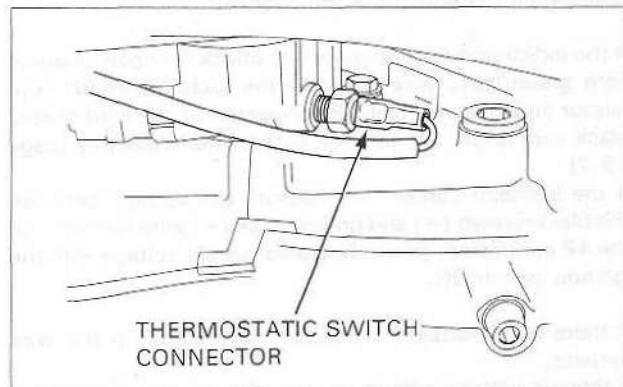
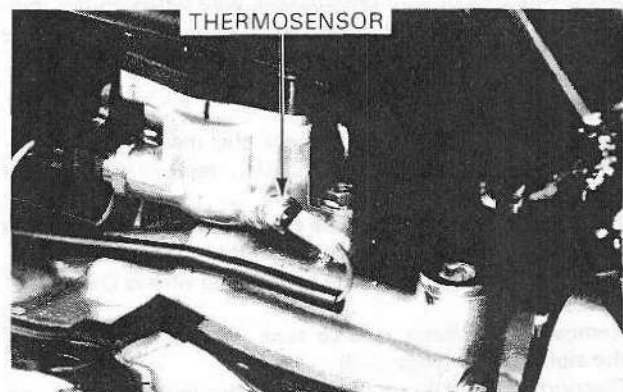
'97-'99 GL1500C/CT:

- If the indicator does not come on, check the thermosensor (page 19-12). If the thermosensor is OK, replace the coolant temperature indicator unit.
- If the indicator comes on, check as follows:
Remove the radiator reserve tank without disconnecting the siphon tube (page 6-6). Disconnect the 2P connector from the coolant temperature indicator unit. Turn the ignition switch ON and check the indicator.

- If the indicator does not come on, repair the short circuit in green/blue wires between the indicator unit 2P connector and thermosensor.

- If the indicator comes on, check as follows:
Disconnect the 4P connector from the indicator unit.
Turn the ignition switch ON and check the indicator.

- If the indicator does not come on, replace the indicator unit.
- If the indicator comes on, check for short circuit in the light green/black wire between the tachometer 9P connector and indicator unit 4P connector. If the light green/black wire is OK, replace the tachometer assembly (page 19-7).



LIGHTS/METERS/SWITCHES

The coolant temperature is too high, but the indicator does not come on

Check that the oil pressure and side stand indicators function properly.

- If they do not function, perform the power input line inspection at the tachometer 9P connector (page 19-6).
- If they function, check as follows:
 - Remove the radiator (page 6-7).
 - Disconnect the thermosensor (After '99: thermostatic switch) connector and ground it with a jumper wire. Turn the ignition switch ON and check the indicator.

After '99 GL1500C/CT:

- If the indicator comes on, replace the thermostatic switch.
- If the indicator does not come on, check for open circuit in the green/blue or light green/black wire between the thermostatic switch and tachometer 9P connector. If the wire is OK, replace the tachometer assembly (page 19-7).

'97-'99 GL1500C/CT:

- If the indicator comes on, check the thermosensor (see below). If the thermosensor is OK, replace the coolant temperature indicator unit.
 - If the indicator does not come on, check for open circuit in the green/blue wire between the thermosensor and indicator unit 2P connector. If the green/blue wire is OK, check as follows:
 - Remove the radiator reserve tank without disconnecting the siphon tube (page 6-6).
 - Disconnect the 4P connector from the indicator unit and ground the light green/black wire terminal. Turn the ignition switch ON and check the indicator.
 - If the indicator does not come on, check for open circuit in light green/black wire between the tachometer 9P connector and indicator unit 4P connector. If the light green/black wire is OK, replace the tachometer assembly (page 19-7).
 - If the indicator comes on, measure the voltage between the black/brown (+) and green/black (-) wire terminals of the 4P connector. There should be battery voltage with the ignition switch ON.
- If there is no voltage, check for open circuit in the wire harness.
 - If there is battery voltage, replace the indicator unit.

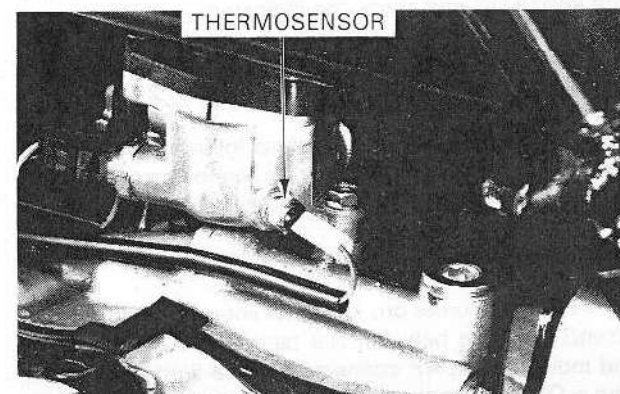
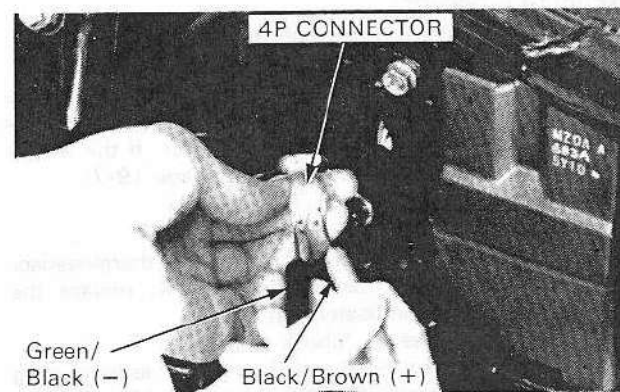
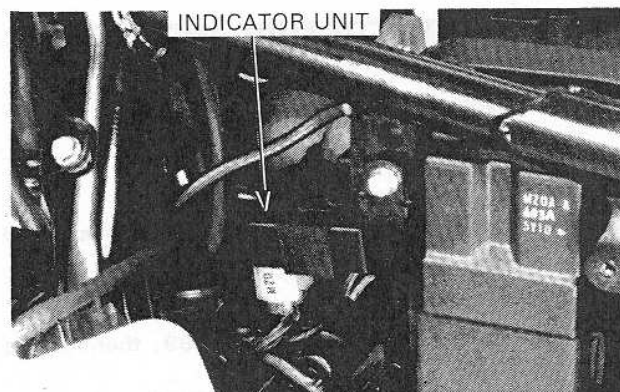
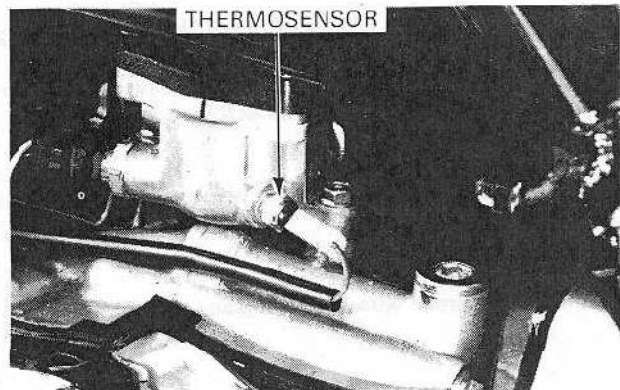
THERMOSENSOR INSPECTION

▲WARNING

- *Keep all flammable materials away from the electric heating element. Wear protective clothing, insulated gloves and eye protection.*

Remove the radiator (page 6-7).

Disconnect the thermosensor connector and remove the thermosensor.



Suspend the thermosensor in a pan of coolant (50-50 mixture) on an electric heating element and measure the resistance through the sensor as the coolant heats up.

NOTE

- Soak the thermosensor in coolant up to its threads with at least 40 mm (1.57 in) from the bottom of the pan to the bottom of the sensor.
- Keep the temperature constant for 3 minutes before testing. A sudden change of temperature will result in incorrect readings. Do not let the thermometer or thermosensor touch the pan.

Temperature	80°C (176°F)	120°C (248°F)
Resistance	47–57 Ω	14–18 Ω

Replace the thermosensor if it is out of specifications by more than 10% at any temperature listed.

Apply sealant to the thermosensor threads. Do not apply sealant to the sensor head.
Install and tighten the thermosensor.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Connect the thermosensor connector.

Install the radiator (page 6-10).
Fill and bleed the cooling system (page 6-5).

GL1500CF:

The indicator does not come on when the ignition switch is turned ON

Check that the speedometer, tachometer and LCD function properly.

- If they do not function, perform the power/sensor ground line inspection at the combination meter (page 19-9).
- If they function, replace the meter/LCD assembly.

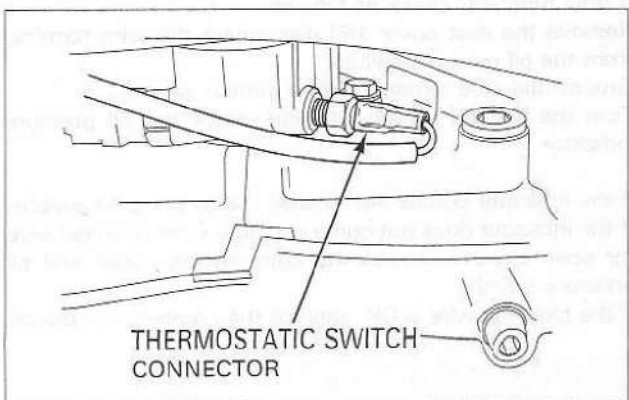
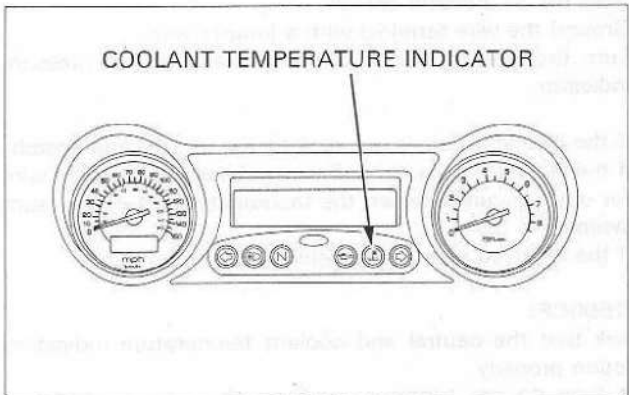
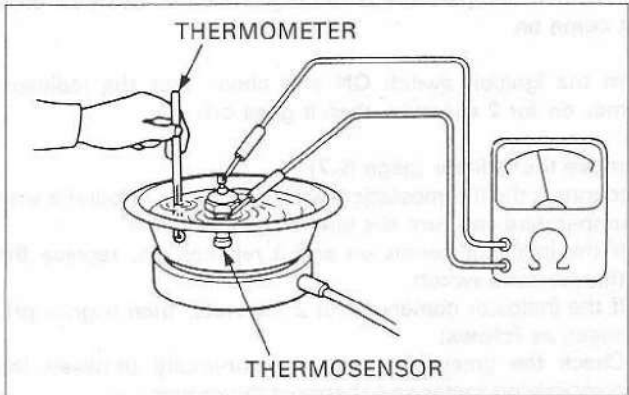
The indicator remains on with the ignition switch ON

Remove the radiator (page 6-7).
Disconnect the thermostatic switch connector.
Turn the ignition switch ON and check the indicator.

- If the indicator comes on for 2 seconds, then it goes off, replace the thermostatic switch.
- If the indicator comes on and it remains on, check for continuity between the green/blue wire terminal and ground.
There should be no continuity.

— If there is continuity, check for short circuit in the green/blue wire between the combination meter and thermostatic switch.

— If there is no continuity, replace the meter/LCD assembly.



LIGHTS/METERS/SWITCHES

The coolant temperature is too high, but the indicator does not come on

Turn the ignition switch ON and check that the indicator comes on for 2 seconds, then it goes off.

Remove the radiator (page 6-7).

Disconnect the thermostatic switch connector, ground it with a jumper wire and turn the ignition switch ON.

- If the indicator comes on and it remains on, replace the thermostatic switch.

- If the indicator comes on for 2 seconds, then it goes off, check as follows:

Check the green/blue wire for continuity between the combination meter and thermostatic switch.

If the green/blue wire is OK, replace the meter/LCD assembly.

OIL PRESSURE INDICATOR

INSPECTION

The indicator does not come on with the ignition switch ON

GL1500C/CT:

Check that the side stand and coolant temperature indicators function properly.

- If they do not function, perform the power input line inspection at the tachometer 9P connector (page 19-6).

- If they function, check as follows:

Remove the dust cover and disconnect the wire terminal from the oil pressure switch.

Ground the wire terminal with a jumper wire.

Turn the ignition switch ON and check the oil pressure indicator.

— If the indicator comes on, replace the oil pressure switch.

— If the indicator does not come on, check the blue/red wire for open circuit between the tachometer and oil pressure switch.

If the blue/red wire is OK, replace the tachometer.

GL1500CF:

Check that the neutral and coolant temperature indicators function properly.

- If they do not function, perform the power input line inspection at the combination meter (page 19-9).

- If they function, check as follows:

Remove the dust cover and disconnect the wire terminal from the oil pressure switch.

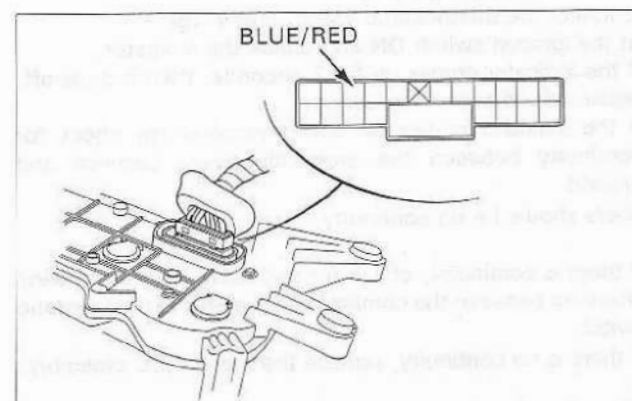
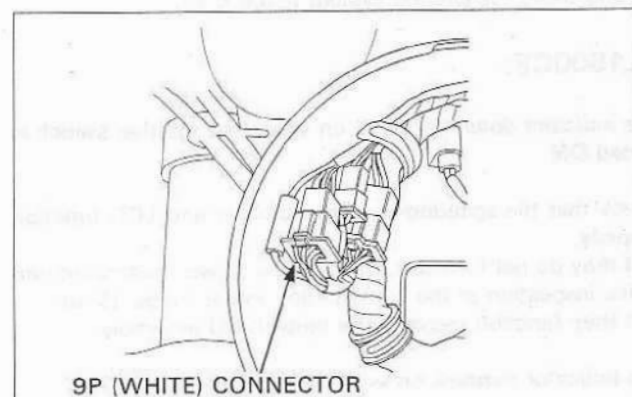
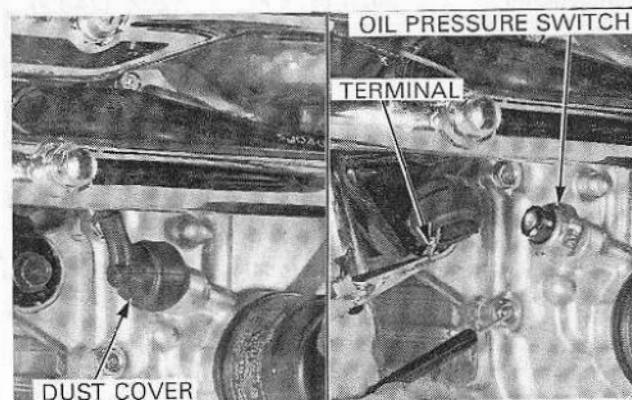
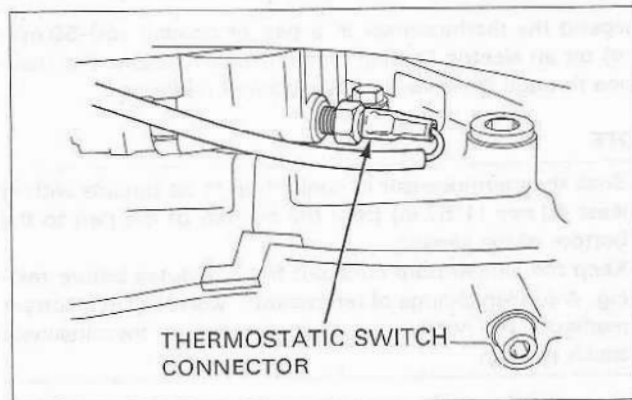
Ground the wire terminal with a jumper wire.

Turn the ignition switch ON and check the oil pressure indicator.

— If the indicator comes on, replace the oil pressure switch.

— If the indicator does not come on, check the blue/red wire for open circuit between the combination meter and oil pressure switch.

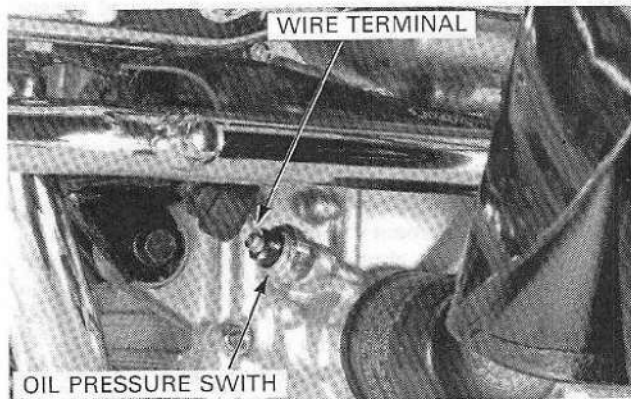
If the blue/red wire is OK, replace the combination meter.



The indicator stays on while the engine is running

Remove the dust cover and disconnect the wire terminal from the oil pressure switch.

- Check for continuity between the wire terminal and ground.
- If there is continuity, check for short circuit in the blue/red wire.
- If there is no continuity, check the oil pressure. If it is normal, replace the oil pressure switch (page 4-3).



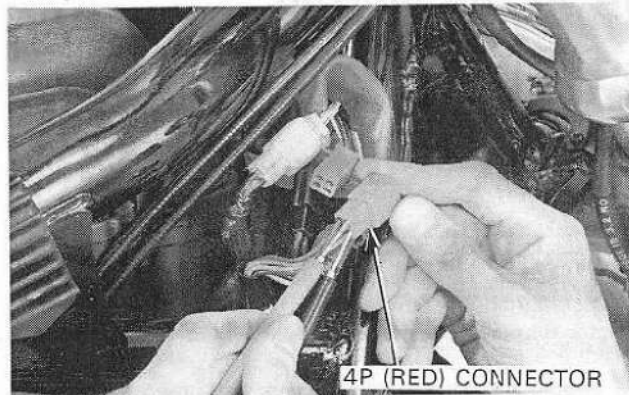
NEUTRAL SWITCH

INSPECTION

Remove the right steering side cover (page 2-5).

Disconnect the 4P (red) connector and check for continuity between the light green/red wire terminal of the engine sub-harness side connector and ground.

There should be continuity when the transmission is in neutral and no continuity when the transmission is in any other gear.



REMOVAL/INSTALLATION

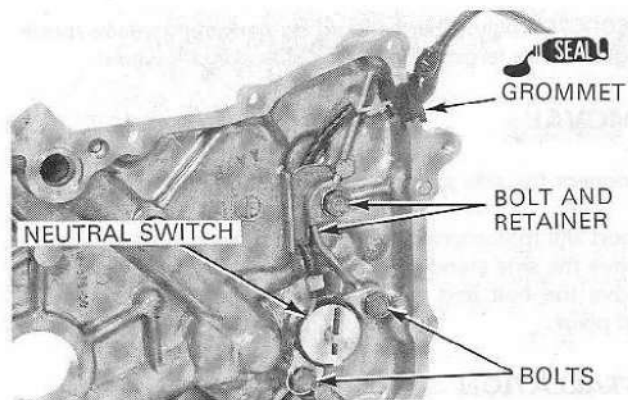
Remove the transmission cover (page 10-5).

Remove the wire grommet from the cover groove.
Remove the bolt and wire retainer.
Remove the two bolts and the neutral switch.

Installation is in the reverse order of removal.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Apply sealant to the seating surface of the grommet.



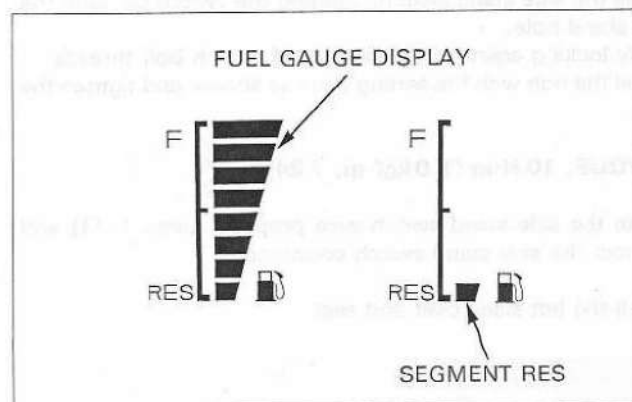
FUEL GAUGE (GL1500CF only)

INSPECTION

Turn the ignition switch on and check that the fuel gauge display appears on the LCD.

If it does not appear, perform the power/sensor ground line inspection at the combination meter (page 19-9).

If the power/sensor ground lines are OK, replace the meter/LCD assembly.



LIGHTS/METERS/SWITCHES

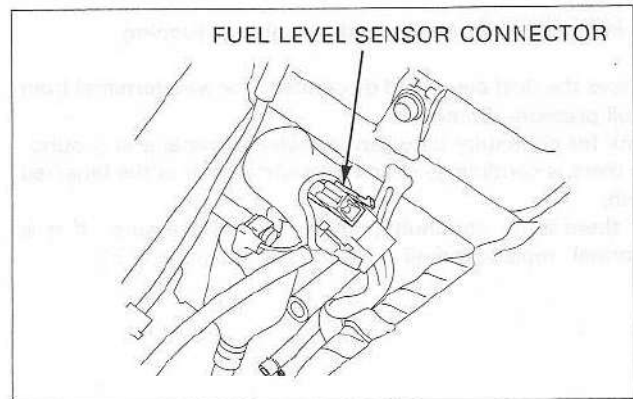
Remove the fuel tank and disconnect the fuel level sensor connector (page 2-4).

Turn the ignition switch ON and check the fuel gauge display. The segment RES should be blinking.

Turn the ignition switch OFF and short the wire harness side sensor connector terminals with a jumper wire.

Turn the ignition switch ON and check the fuel gauge display. All segments up to segment F should appear.

- If the test results are abnormal, check for open or short circuit in gray/black wire and check for open circuit in green/black wire.
If the wires are OK, replace the meter/LCD assembly.
- If the test results are OK but the gauge does not indicate properly, replace the fuel level sensor.



SIDE STAND SWITCH

INSPECTION

Remove the following:

- seat (page 2-2).
- left side cover (page 2-3).

Disconnect the side stand switch 3P-green (GL1500CF: 2P-green) connector under the frame cross member. Check for continuity between the side stand switch side connector terminals.

There should be continuity between the green/white and green wire terminals with the side stand retracted.

GL1500C/CT only: There should be continuity yellow/black and green wire terminals with the side stand lowered.

REMOVAL

Disconnect the side stand switch connector (page 19-16).

Support the motorcycle securely and retract the side stand. Remove the side stand switch wire from the wire clamps. Remove the bolt and the side stand switch from the side stand pivot.

INSTALLATION

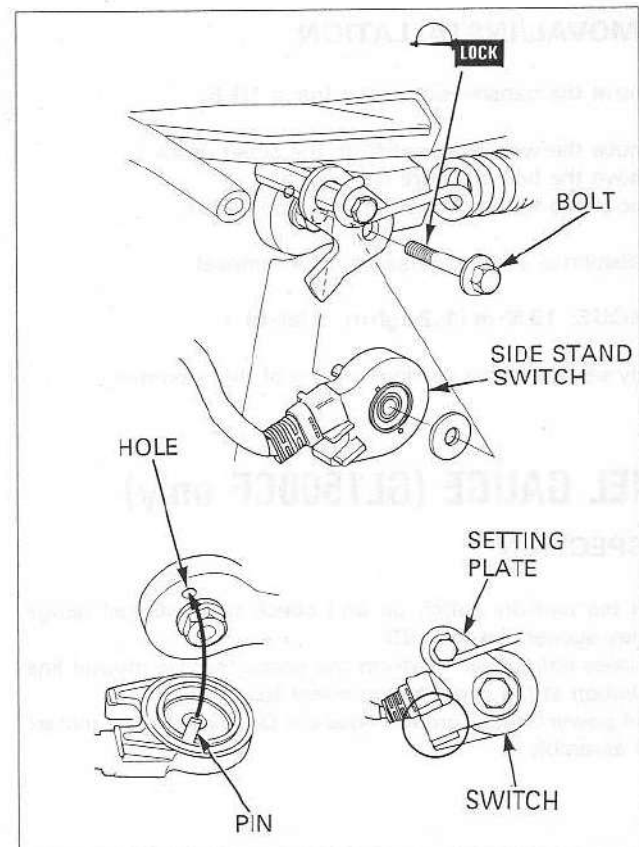
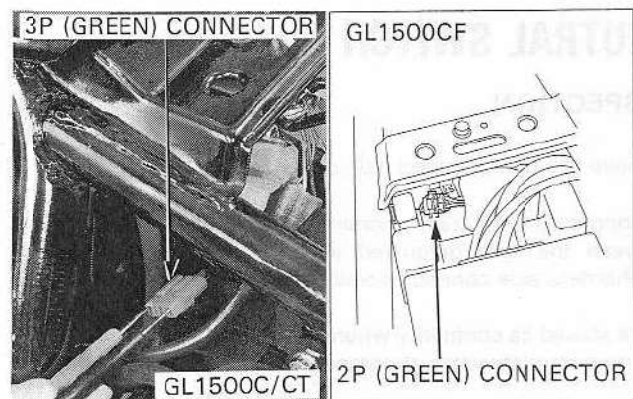
Install the side stand switch, aligning the switch pin with the side stand hole.

Apply locking agent to the side stand switch bolt threads. Install the bolt with the setting plate as shown and tighten the bolt.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Route the side stand switch wire properly (page 1-21) and connect the side stand switch connector.

Install the left side cover and seat.



FAN MOTOR SWITCH

INSPECTION

GL1500CF only: Remove the left radiator cover (page 2-8).

Fan motor does not stop

Turn the ignition switch OFF, disconnect the connector from the fan motor switch and turn the ignition switch ON again.

- If the fan motor does not stop, check for short circuit between the fan motor and switch.
- If the fan motor stops, replace the fan motor switch.

Fan motor does not start

Before testing, check for a blown fan motor fuse. Warm up the engine to operating temperature.

Disconnect the connector from the fan motor switch and ground it with a jumper wire.

Turn the ignition switch ON and check the fan motor.

- If the motor starts, check the connection at the fan motor switch terminal. If it is OK, replace the fan motor switch.
- If the fan motor does not start, measure the voltage between the black/blue (+) and green (-) wire terminals at the fan motor 2P (black) connector. There should be battery voltage.

- If there is battery voltage, replace the fan motor.
- If there is no voltage, check for open circuit in black/blue and green wires.

REMOVAL/INSTALLATION

Drain the coolant (page 6-5).

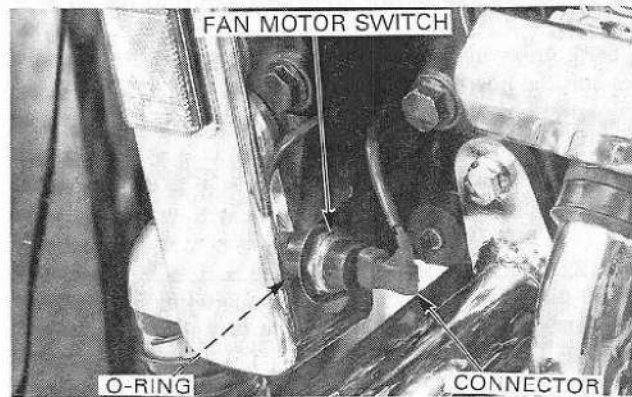
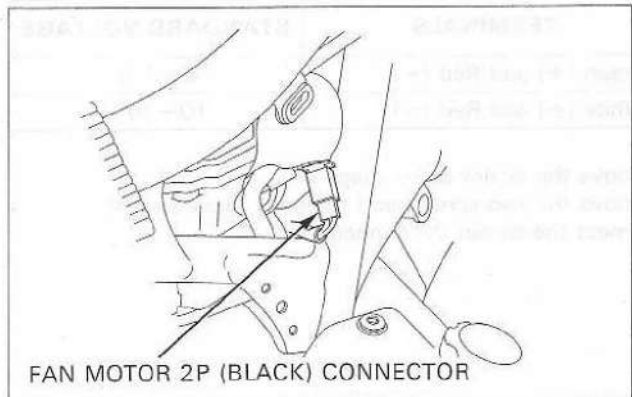
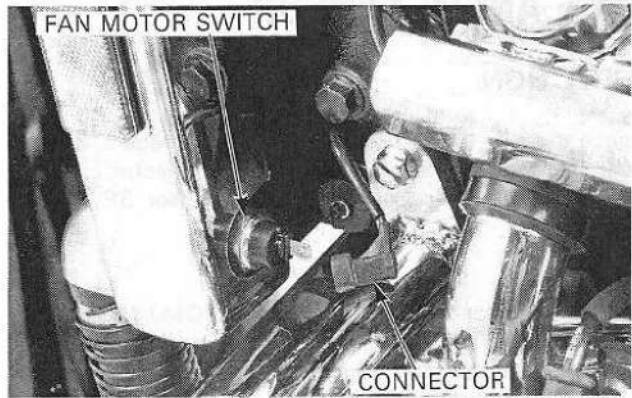
Disconnect the fan motor switch connector and remove the switch.

Install a new O-ring onto the fan motor switch. Install and tighten the fan motor switch.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

Connect the fan motor switch connector.

Fill and bleed the cooling system (page 6-5).



BANK ANGLE SENSOR

INSPECTION

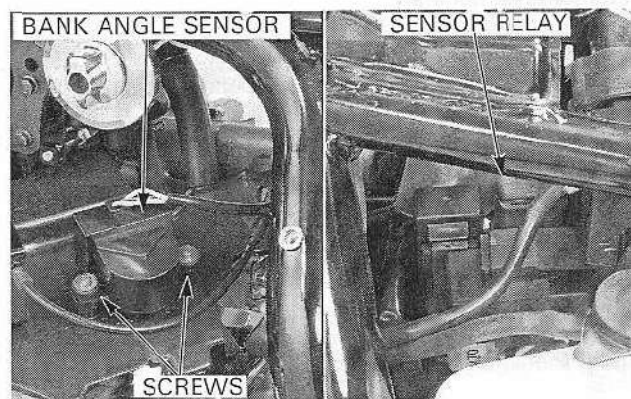
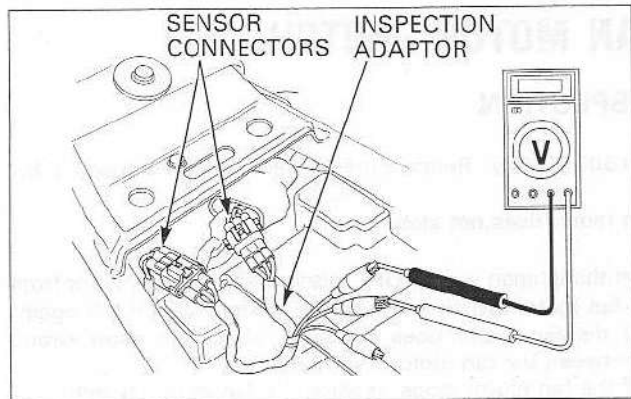
Remove the seat (page 2-2) and side cover (page 2-3). Disconnect the angle sensor 3P (White) connector. Connect the inspection adaptor to the sensor 3P (White) connectors.

TOOL:
Inspection adaptor 07GMJ-ML80100

Turn the ignition switch ON and measure the voltage between the following terminals of the tool.

TERMINALS	STANDARD VOLTAGE
Green (+) and Red (-)	0-1 V
White (+) and Red (-)	10-14 V

Remove the center cover (page 2-3). Remove the two screws and the bank angle sensor. Connect the sensor 3P connector.



Place the bank angle sensor horizontal and turn the ignition switch ON.

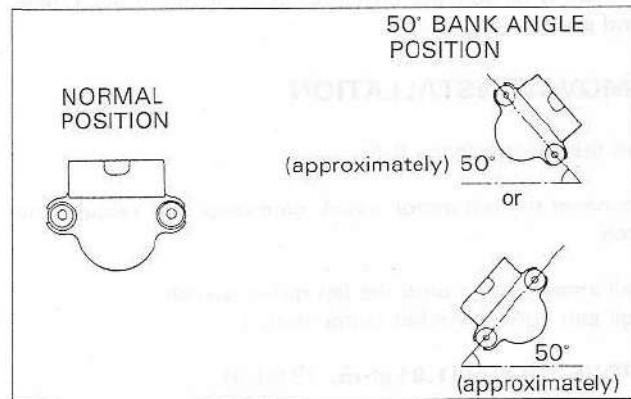
The bank angle sensor is normal if the angle sensor relay clicks and the power supply line is closed.

Position the sensor at approximately 50 degrees to the left or right with the ignition switch ON.

The bank angle sensor is normal if the angle sensor relay clicks and the power supply line is open.

NOTE

- If you repeat this test, first turn the ignition switch OFF, then back to ON before you try the test again.



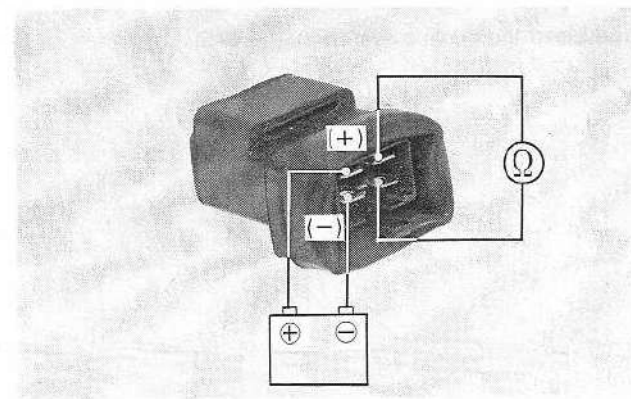
RELAY

Remove the angle sensor relay from the stay of the battery box and disconnect the relay connector.

Connect the 12 V battery to the White and Red/White terminals as shown.

There should be continuity between the White and Black/Light green terminals while the battery is connected, and no continuity when the battery is disconnected.

Installation is in the reverse order of removal.



IGNITION SWITCH

INSPECTION

Remove the fuel tank (page 2-4).

Disconnect the ignition switch 4P (white) connector.
 GL1500CF only: Disconnect the yellow/black wire connector.

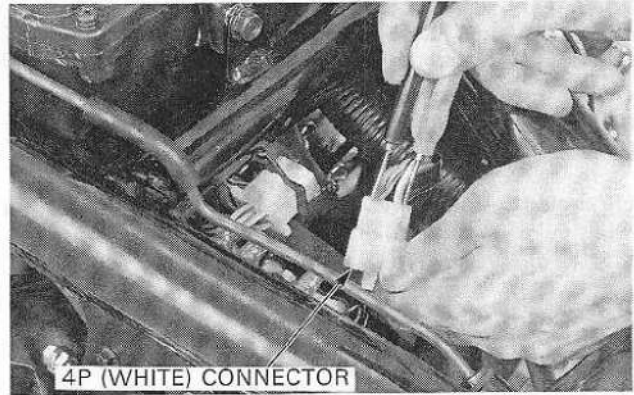
Check for continuity between the terminals.
 Continuity should exist between the color coded wires in the chart below.

GL1500C/CT:

	R	R/BI	Bu/O	R	R/W
ON	○	○	○	○	○
OFF					

GL1500CF:

	Y/BI	R	R/BI	Bu/O	R	R/W
ON		○	○	○	○	○
OFF						
ACC	○	○				



HANDLEBAR SWITCH

INSPECTION

GL1500CF

Remove the fuel tank (page 2-4).
 Disconnect the left handlebar switch 2P (black) connector.
 Disconnect the right handlebar switch 2P (black) connector.
 Check for continuity between the terminals.

GL1500C

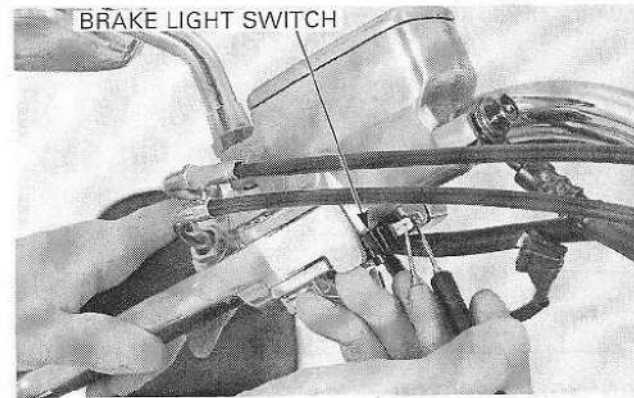
Remove the fuel tank (page 2-4).
 Disconnect the left handlebar switch 2P (black) connector.
 Disconnect the right handlebar switch 2P (black) connector.

FRONT BRAKE LIGHT SWITCH

INSPECTION

Disconnect the front brake light switch wire connectors and check for continuity between the switch terminals.

There should be continuity with the front brake lever squeezed and no continuity with the lever released.



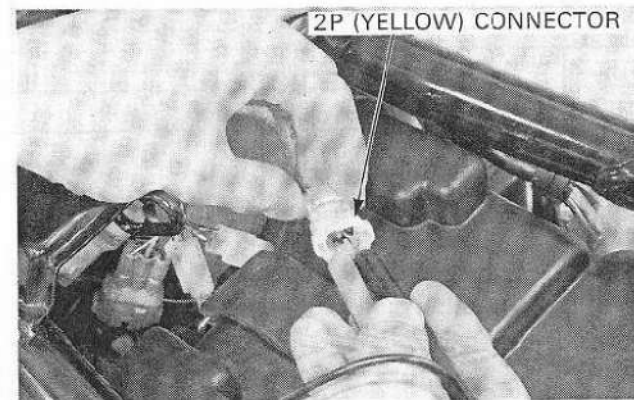
REAR BRAKE LIGHT SWITCH

INSPECTION

Remove the seat (page 2-2).

Disconnect the rear brake light switch 2P (yellow) connector and check for continuity between the switch side connector terminals.

There should be continuity with the rear brake pedal depressed and no continuity with the pedal released.



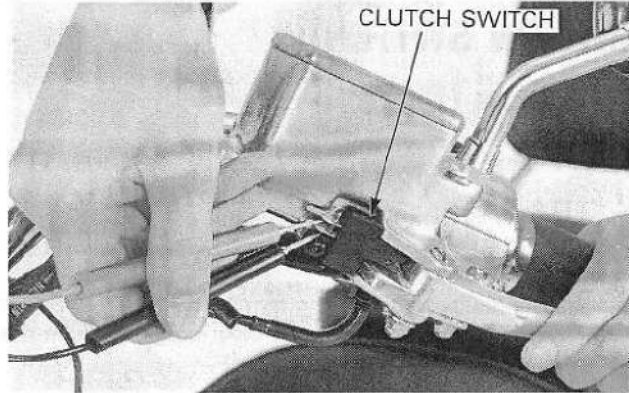
LIGHTS/METERS/SWITCHES

CLUTCH SWITCH

INSPECTION

Disconnect the clutch switch wire connectors and check for continuity between the switch terminals.

There should be continuity with the clutch lever squeezed and no continuity with the lever released.



HANDLEBAR SWITCH

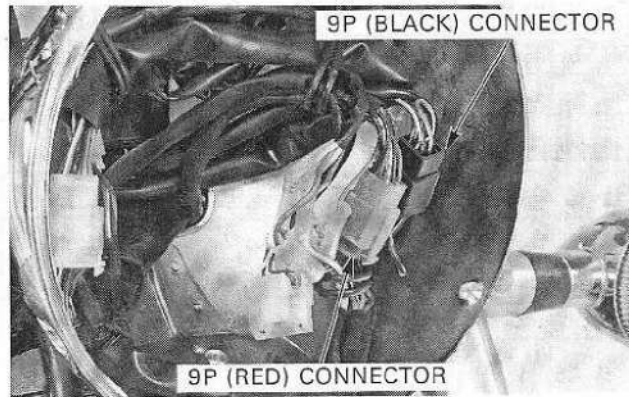
INSPECTION

GL1500C/CT:

Remove the headlight (page 19-3).
 Disconnect the left handlebar switch 9P (red) connector, right handlebar switch 9P (black) connector, blue/white wire connector and brown wire connector.

GL1500CF:

Remove the front inner fairings (page 2-5).
 Disconnect the left handlebar switch 14P (green) connector and right handlebar switch 9P (red) connector.



Check for continuity between the connector terminals. Continuity should exist between the color coded wires in each chart.

LEFT HANDLEBAR SWITCH

DIMMER SWITCH

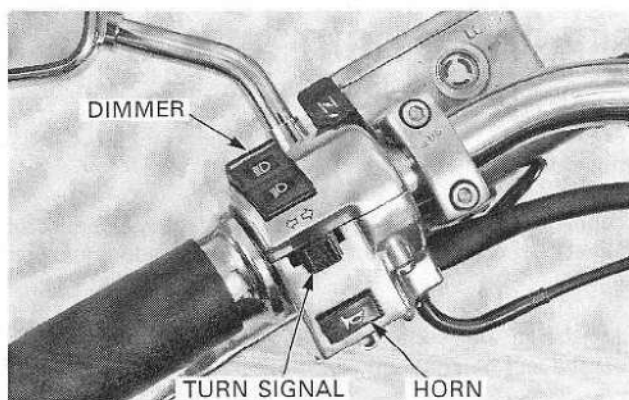
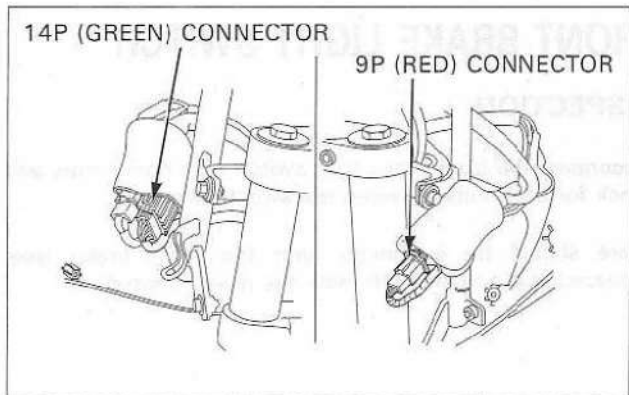
	Bu/W	Bu	W
Lo	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(N)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

TURN SIGNAL SWITCH

	Gr	Lb	O	Br	Lb/W	O/W
R	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
N				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
L	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	

HORN SWITCH

	Bl/Br	Lg
FREE		
PUSH	<input type="checkbox"/>	<input type="checkbox"/>



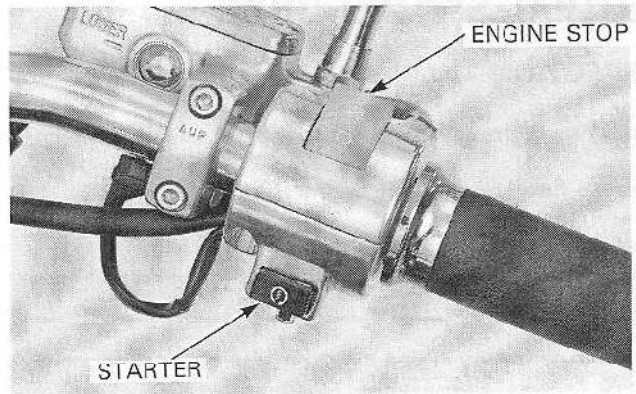
RIGHT HANDLEBAR SWITCH

STARTER SWITCH

	Bl/W	Y/R	Bl/R	Bu/W
FREE			○ — ○	
PUSH	○ — ○			

ENGINE STOP SWITCH

	Bl/Lg	Bl/W
RUN	○ — ○	
OFF		

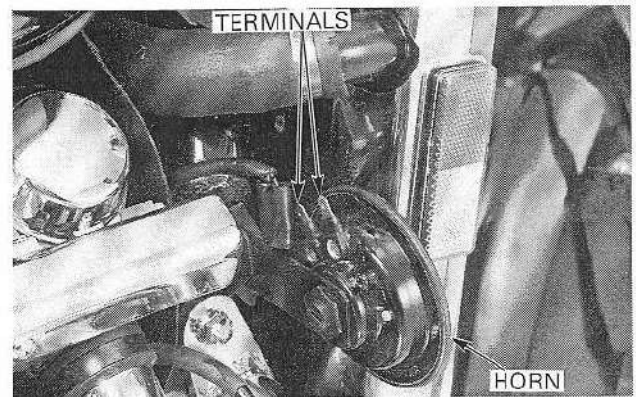


HORN

INSPECTION

Disconnect the wire connectors from the horn. Connect a 12 V battery to the horn terminals.

The horn is normal if it sounds when the 12 V battery is connected across the horn terminals.



TURN SIGNAL RELAY

INSPECTION

Turn signal light does not blink

Remove the following:

- seat (page 2-2)
- left side cover (page 2-3)
- radiator reserve tank without disconnecting the siphon tube (page 6-6)

Remove the turn signal relay from the stay on the battery box and disconnect the relay connector.

Short the black and gray wire terminals of the relay connector with a jumper wire.

Turn the ignition switch ON, operate the turn signal switch and check the turn signal light.

- If the light does not come on, check for open circuit in black and gray wires.
 - If the light comes on, check for continuity between the green wire terminal and body ground.
 - If there is no continuity, check for open circuit in green wire.
 - If there is continuity, check the connector terminals for loose or poor contact.
- If the connector terminals are OK, replace the turn signal relay.



NEUTRAL SWITCH DIODE

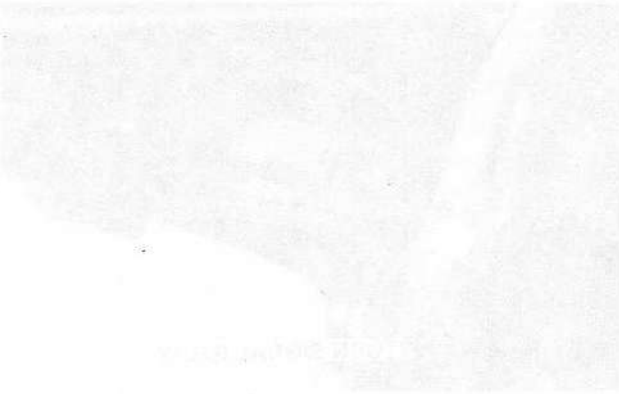
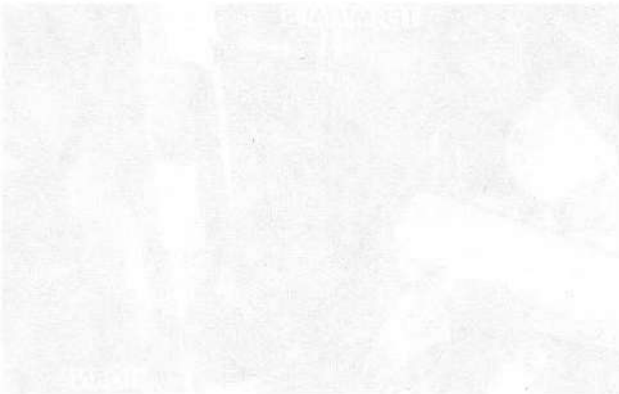
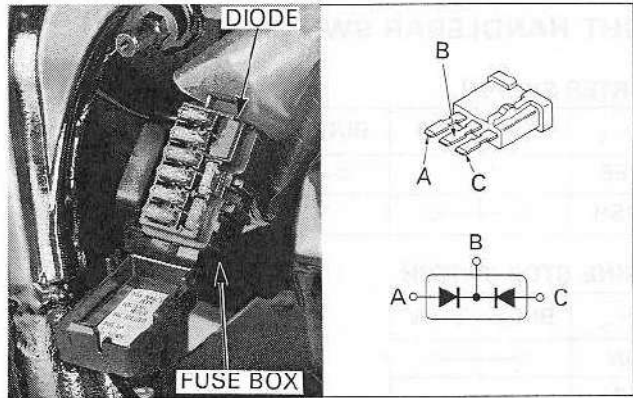
INSPECTION

Remove the right side cover (page 2-3).

Open the fuse box and remove the diode.

Check for continuity between the diode terminals. When there is continuity, a small resistance value will register.

If there is continuity in one direction, the diode is normal.

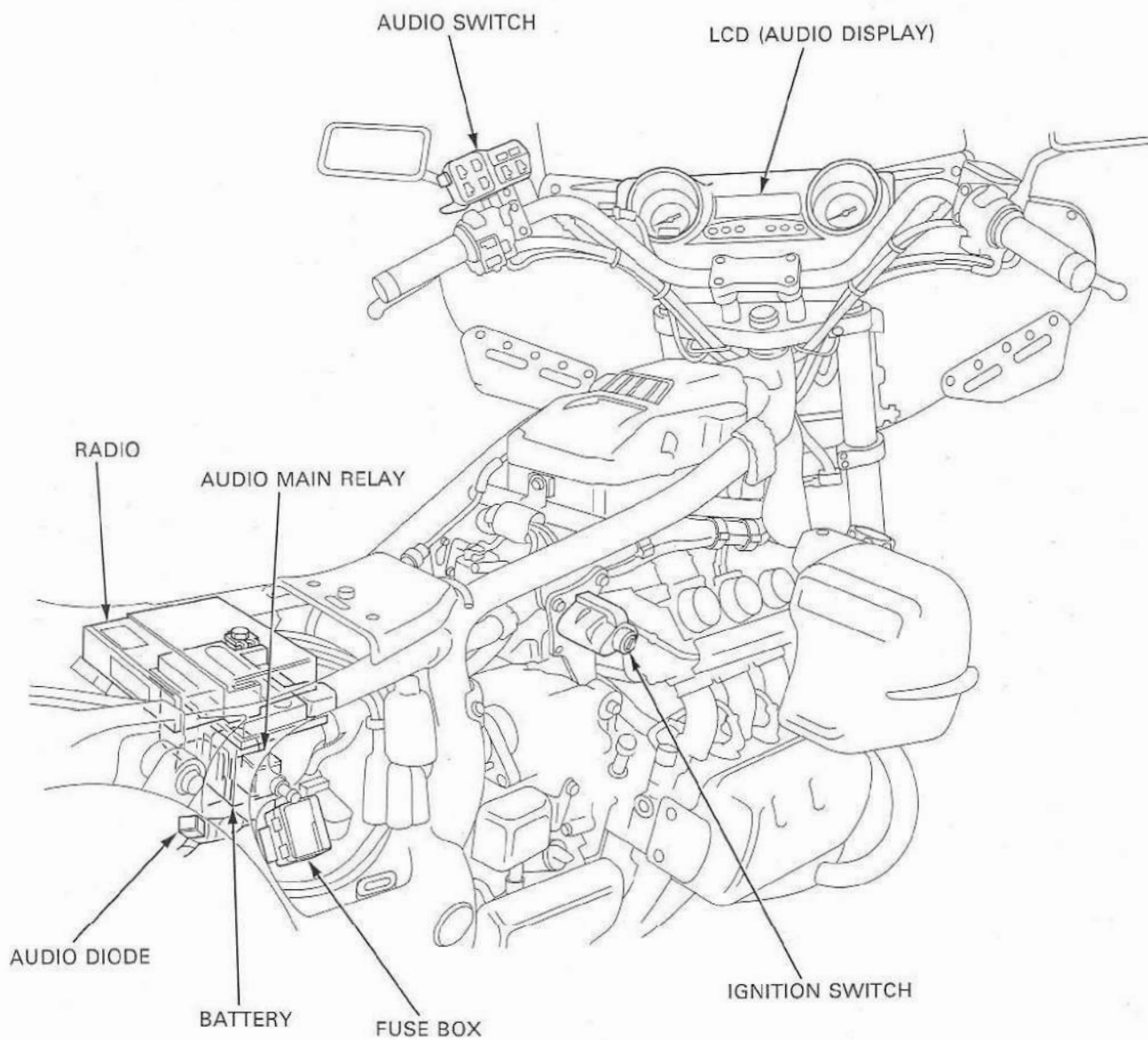


MEMO



AUDIO SYSTEM

MEMO



20. AUDIO SYSTEM

SERVICE INFORMATION	20-1	ANTENNA	20-10
TROUBLESHOOTING	20-2	COMBINATION METER	20-11
RADIO	20-6	SPEAKER	20-11
AUDIO MAIN RELAY	20-8	HEADSET JUNCTION WIRE	20-11
AUDIO SWITCH	20-8	AUDIO DIODE	20-11

SERVICE INFORMATION

GENERAL

- The audio system is only for the GL1500CF.
- When checking the audio system, always follow the steps in the troubleshooting flow chart (page 20-2).
- All memorized radio channels are erased when the battery cable is disconnected. Upon reconnecting the battery cable, the following channels will be set automatically.

Channels	AM (kHz)	FM (MHz)
1	530	87.5
2	600	90.1
3	1000	98.1
4	1400	106.1
5	1620	107.9
6	530	87.5

- The AM frequency moves in sequence in 10 kHz steps. The FM frequency moves in sequence in 0.2 MHz steps.
- The "ambience" (AMB) circuit blends and boosts certain frequencies from both channels for a "live performance" effect. AMB may be used for stereo programs from the FM radio. However, the ambience circuit may make weak FM stereo signals sound worse.

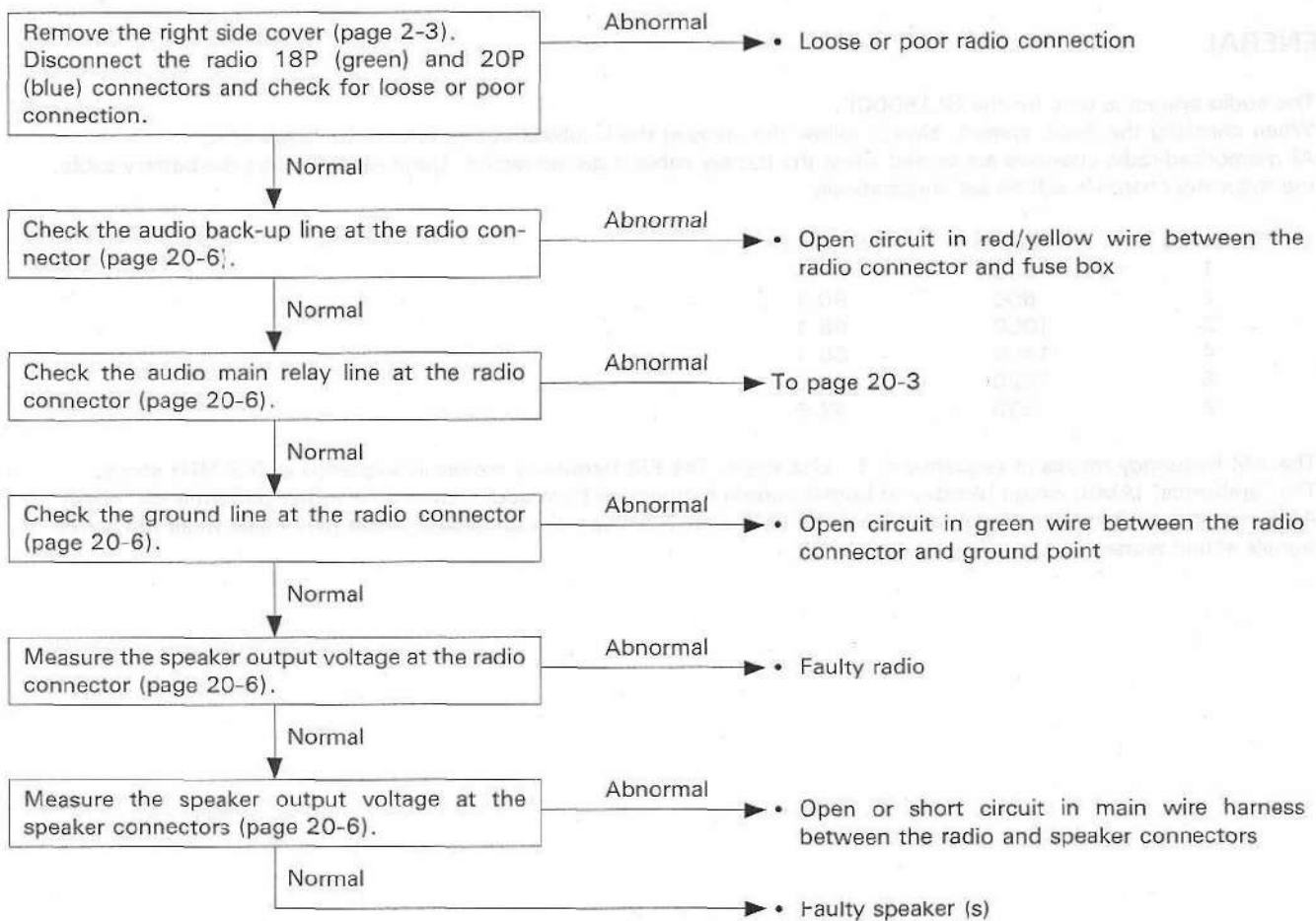
TROUBLESHOOTING

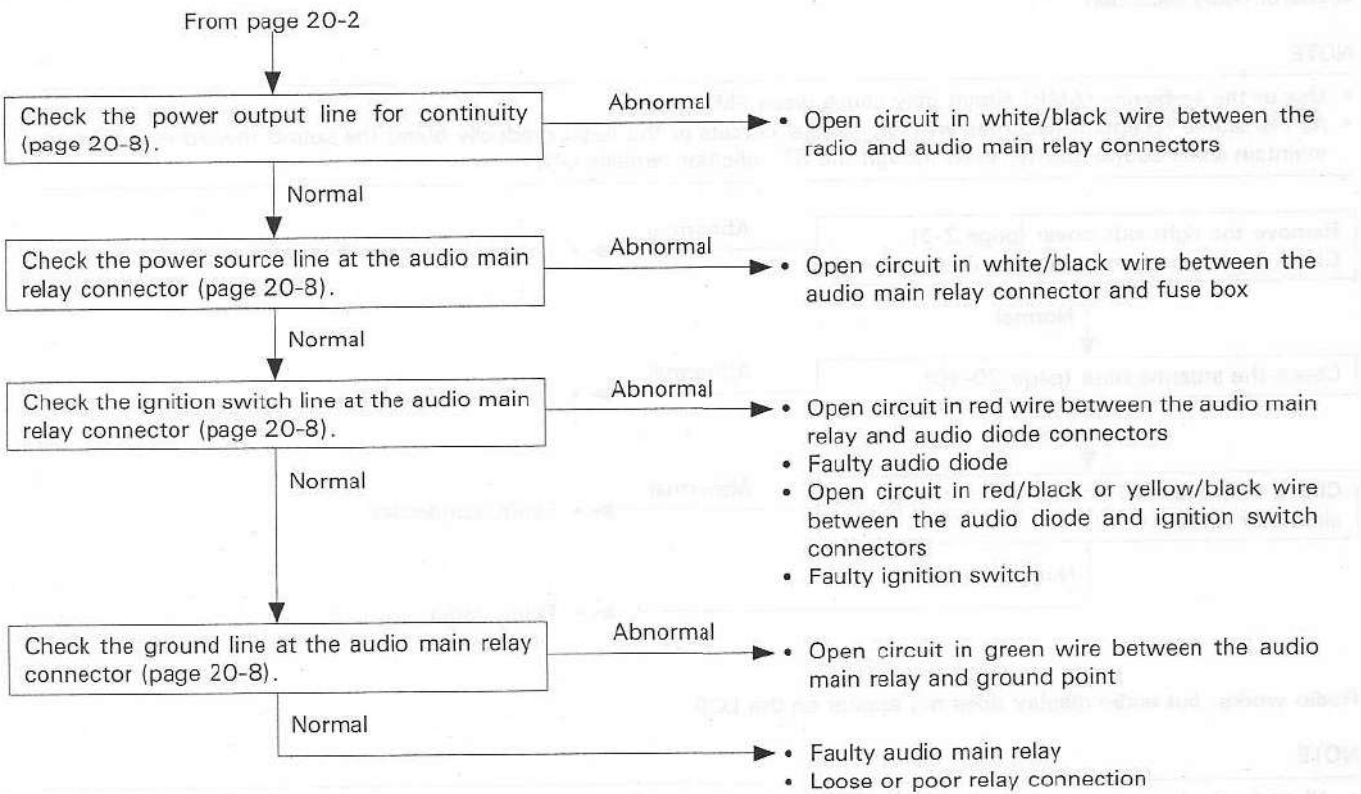
- Check that the radio reception by tuning to a station known to have a strong signal.
- Check that the following fuses are good:
 - AUDIO BACK-UP fuse (15 A)
 - AUDIO, METER fuse (5 A)

No sound from speakers

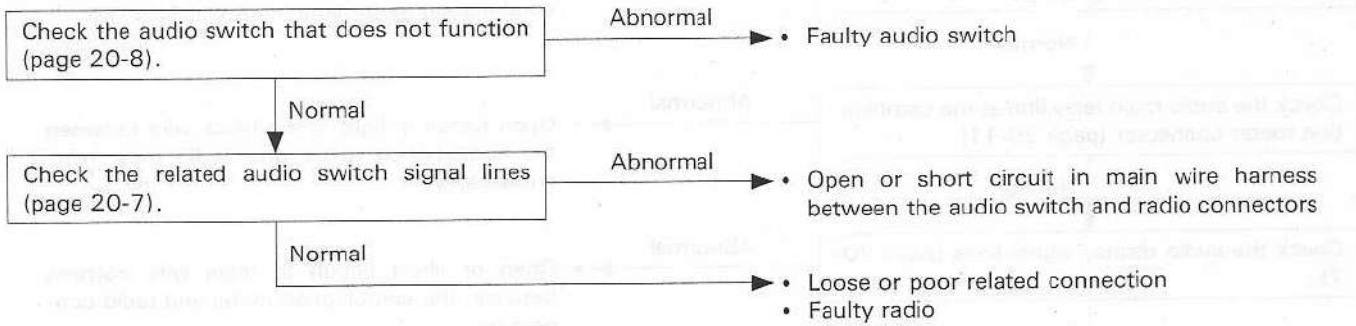
NOTE

- Select the speaker with the SPKR/HS switch. The display will clear the headset indicator.





Radio works, but audio switch does not function

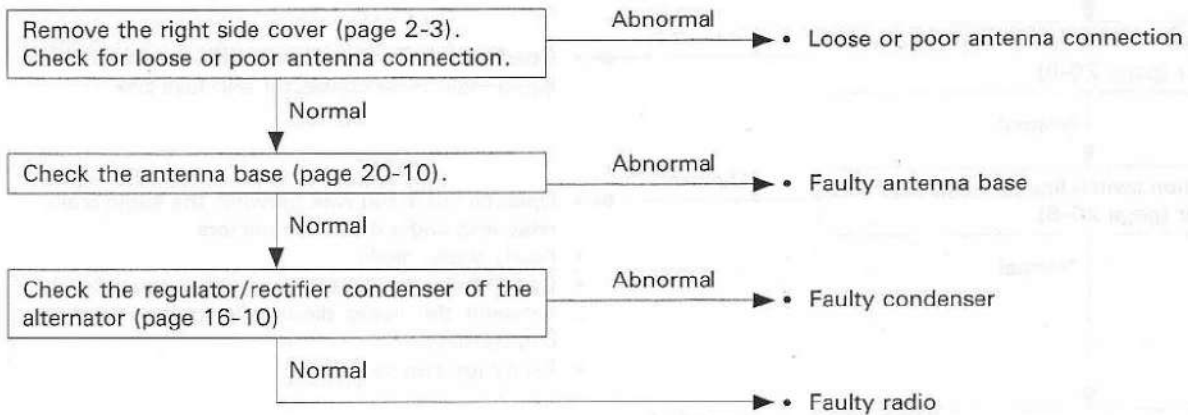


AUDIO SYSTEM

Weak or noisy reception

NOTE

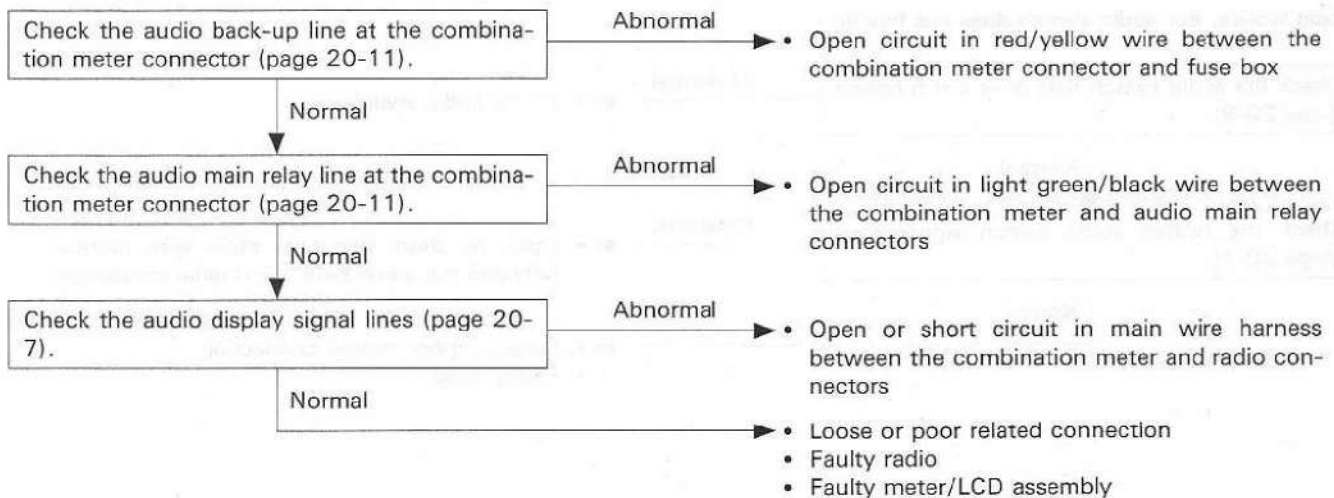
- Use of the ambience (AMB) circuit may cause weak FM signals.
- As FM stereo reception becomes weaker, special circuits in the radio gradually blend the sound toward monaural to maintain some sound quality, even though the ST indicator remains ON.



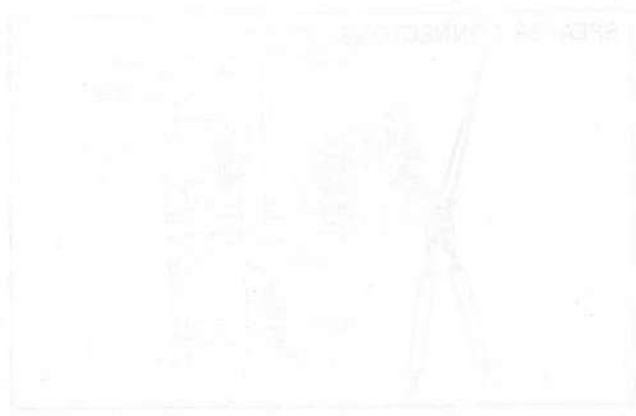
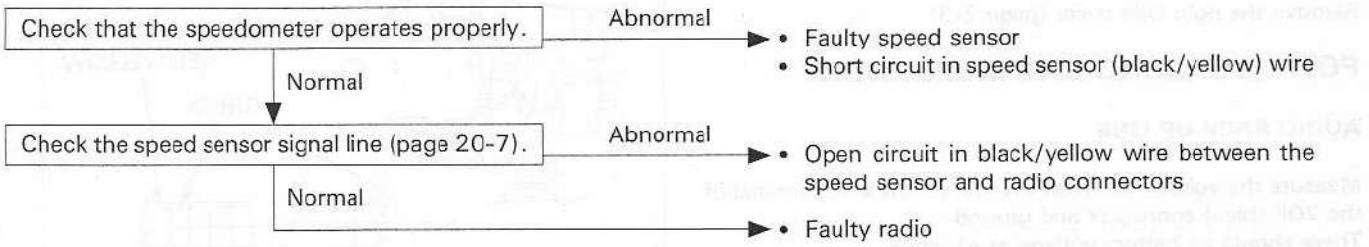
Radio works, but audio display does not appear on the LCD

NOTE

- All audio displays appear when the ignition switch is turned to ON or ACC if the system is normal.



AVC (Auto Volume Control) does not work at all



SPEAKER OUTPUT VOLTAGE INSPECTION

Check for continuity between the ground wire terminal of the radio and the ground line.

Measure the voltage between the (+) and (-) terminals of the speaker. The voltage should be about 12V.

If the voltage is low, check the speaker wire and the ground line.

NOTE:

- The voltage should increase as the volume is turned up as well as the engine.

Measure the speaker output voltage with the engine running. The voltage should be about 12V.

Check the (+) wire terminal for the left front speaker.

Remove the (+) wire from the radio.

Measure the speaker output voltage with the engine running. The voltage should be about 12V.

AUDIO SYSTEM

RADIO

Remove the right side cover (page 2-3).

POWER/GROUND LINE INSPECTION

AUDIO BACK-UP LINE

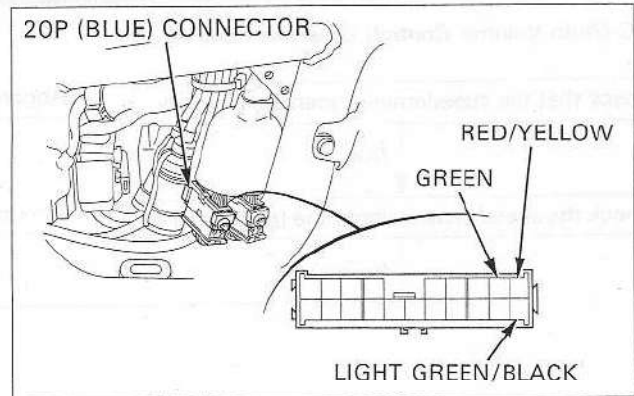
Measure the voltage between the red/yellow wire terminal of the 20P (blue) connector and ground. There should be battery voltage at all times.

AUDIO MAIN RELAY LINE

Measure the voltage between the light green/black wire terminal of the 20P (blue) connector and ground. There should be battery voltage with the ignition switch ON or ACC.

GROUND LINE

Check for continuity between the green wire terminal of the radio 20P (blue) connector and ground. There should be continuity.



SPEAKER OUTPUT VOLTAGE INSPECTION

Select the AC range on the tester. Measure the voltage between the red/green (+) and brown/black (-) wire terminals of the radio 18P (green) connector for the right front speaker. Turn the radio on. There should be voltage.

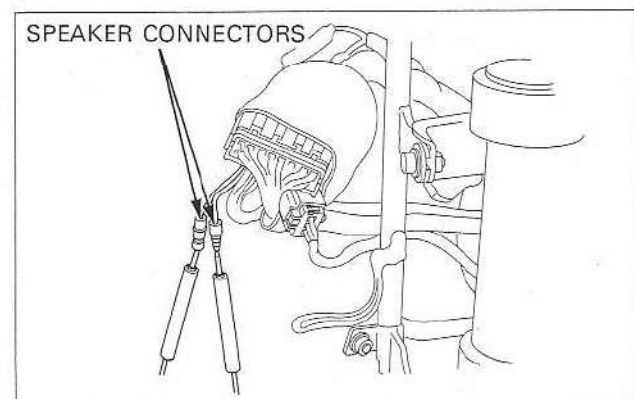
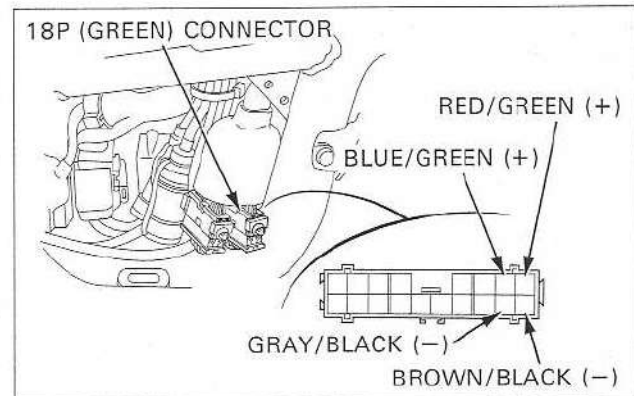
NOTE

- The voltage should increase or decrease in accordance with the volume.

Measure the voltage between the blue/green (+) and gray/black (-) wire terminals for the left front speaker.

Remove the front inner fairings (page 2-5).

Measure the speaker output voltage at the wire harness side speaker connector terminals in the same manner as measured at the radio connector.



MAIN WIRE HARNESS INSPECTION

Disconnect the radio 20P (blue) connector.
 Check the audio signal lines for open circuit between the radio 20P (blue) connector terminals and other audio part connector terminals.
 There should be continuity between the same color wire terminals.
 Also, check for short circuit between each connector terminal and ground.
 There should be no continuity.

AUDIO SWITCH LINES

Remove the left front inner fairing (page 2-5).
 Disconnect the audio switch 9P (black) connector and check the audio switch signal lines for open or short circuit.

- No. 1: White wire
- No. 2: Orange wire
- No. 3: Green wire
- No. 4: Black wire
- No. 10: Yellow wire
- No. 11: Red wire
- No. 12: Blue wire
- No. 13: Brown wire
- No. 15: Light green wire

AUDIO DISPLAY SIGNAL LINES

Remove the combination meter (page 19-8).
 Check the audio display signal lines for open or short circuit.

- No. 5: Yellow wire
- No. 6: Shield wire
- No. 16: Green wire
- No. 17: Blue wire

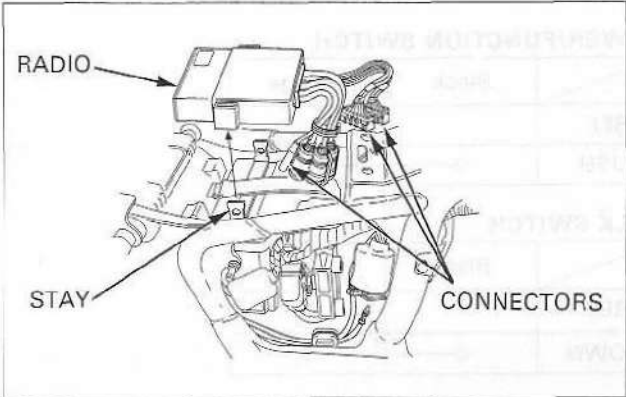
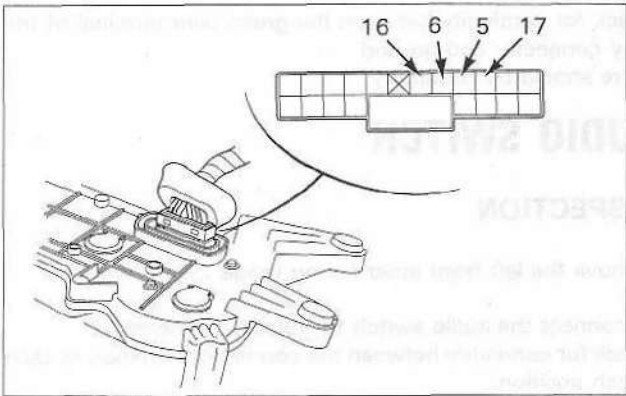
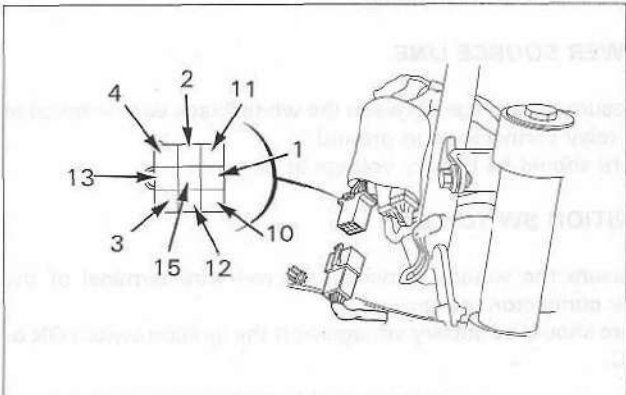
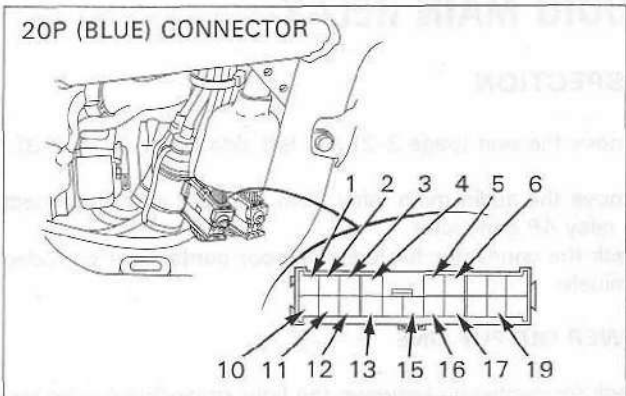
SPEED SENSOR SIGNAL LINE

Remove the left front inner fairing (page 2-5).
 Disconnect the speed sensor 3P (green) connector and check the speed sensor signal line for open or short circuit.

- No. 19: Black/yellow wire

REMOVAL/INSTALLATION

Remove the seat (page 2-2).
 Disconnect the antenna, 18P (green) and 20P (blue) connectors.
 Remove the radio from the stays on the battery cover.
 Install the radio in the reverse order of removal.



AUDIO SYSTEM

AUDIO MAIN RELAY

INSPECTION

Remove the seat (page 2-2) and left side cover (page 2-3).

Remove the audio main relay from the stay and disconnect the relay 4P connector.
Check the connector for loose or poor contact, or corroded terminals.

POWER OUTPUT LINE

Check for continuity between the light green/black wire terminals of the relay 4P and radio 20P (blue) connectors. There should be continuity.

POWER SOURCE LINE

Measure the voltage between the white/black wire terminal of the relay connector and ground. There should be battery voltage at all times.

IGNITION SWITCH LINE

Measure the voltage between the red wire terminal of the relay connector and ground. There should be battery voltage with the ignition switch ON or ACC.

GROUND LINE

Check for continuity between the green wire terminal of the relay connector and ground. There should be continuity.

AUDIO SWITCH

INSPECTION

Remove the left front inner fairing (page 2-5).

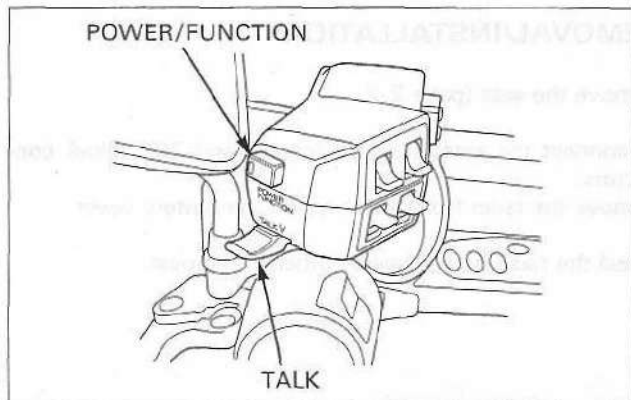
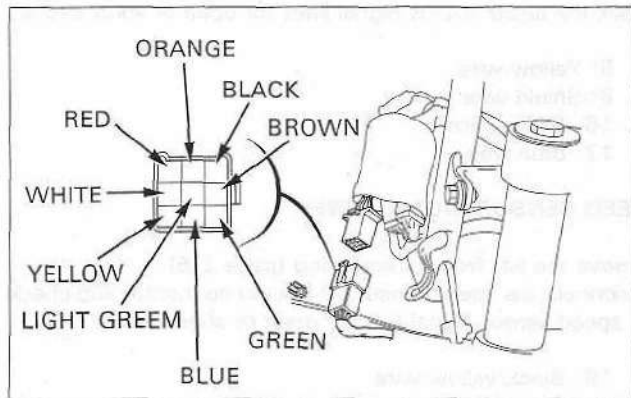
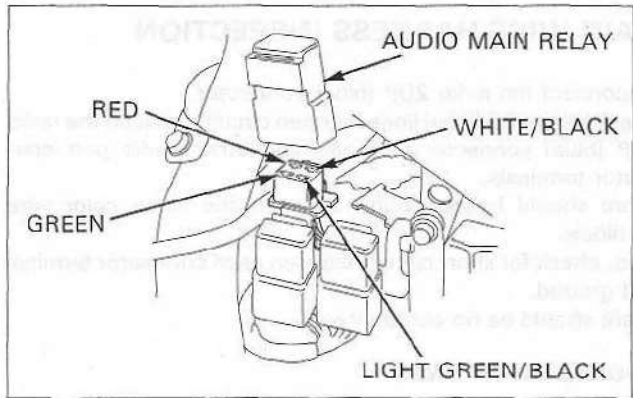
Disconnect the audio switch 9P (black) connector. Check for continuity between the connector terminals in each switch position. Continuity should exist between the color coded wire terminals as follows:

POWER/FUNCTION SWITCH

	Black	Orange
FREE		
PUSH	○	○

TALK SWITCH

	Black	Red
FREE		
DOWN	○	○



CLOCK SWITCH

	Blue	Yellow
FREE		
PUSH	<input type="checkbox"/>	<input type="checkbox"/>

CH. MEMO SWITCH

	Light green	White
FREE		
PUSH	<input type="checkbox"/>	<input type="checkbox"/>

CB-SQL SWITCH

	Light green	Orange	Red
UP	<input type="checkbox"/>	<input type="checkbox"/>	
FREE			
DOWN	<input type="checkbox"/>		<input type="checkbox"/>

CB-CH SWITCH

	Black	White	Yellow
UP	<input type="checkbox"/>	<input type="checkbox"/>	
FREE			
DOWN	<input type="checkbox"/>		<input type="checkbox"/>

VOLUME SWITCH

	Green	Orange	Red
UP	<input type="checkbox"/>	<input type="checkbox"/>	
FREE			
DOWN	<input type="checkbox"/>		<input type="checkbox"/>

TUNE SWITCH

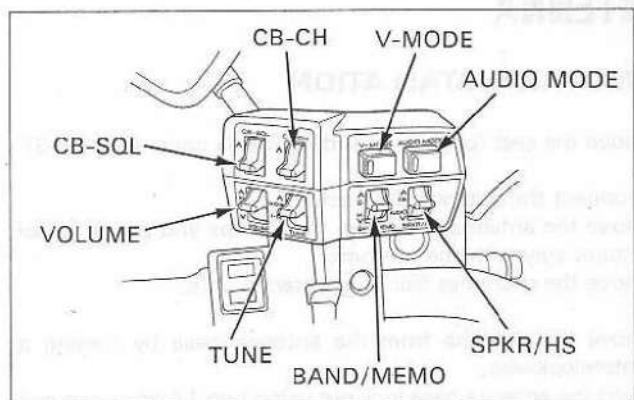
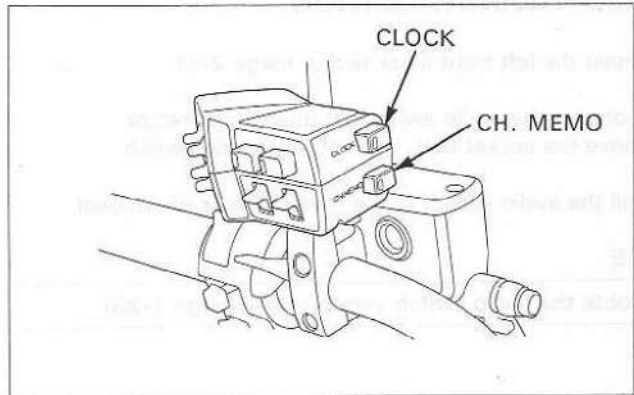
	Brown	Orange	Red
UP	<input type="checkbox"/>	<input type="checkbox"/>	
FREE			
DOWN	<input type="checkbox"/>		<input type="checkbox"/>

BAND/MEMO SWITCH

	Blue	Red	White
UP	<input type="checkbox"/>	<input type="checkbox"/>	
FREE			
DOWN	<input type="checkbox"/>		<input type="checkbox"/>

SPKR/HS SWITCH

	Brown	Yellow	White
UP	<input type="checkbox"/>	<input type="checkbox"/>	
FREE			
DOWN	<input type="checkbox"/>		<input type="checkbox"/>



V-MODE SWITCH

	Green	White
FREE		
PUSH	<input type="checkbox"/>	<input type="checkbox"/>

AUDIO MODE SWITCH

	Blue	Orange
FREE		
PUSH	<input type="checkbox"/>	<input type="checkbox"/>

AUDIO SYSTEM

REMOVAL/INSTALLATION

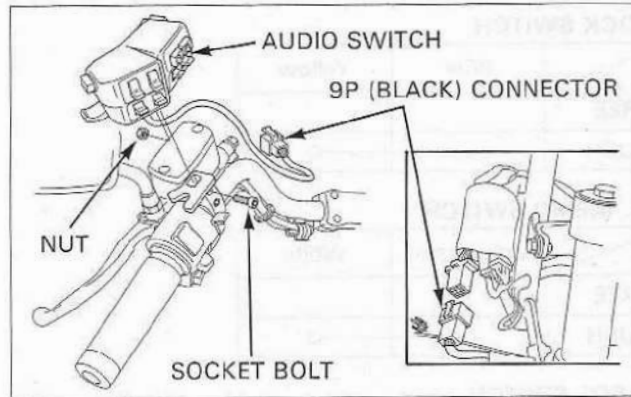
Remove the left front inner fairing (page 2-5).

Disconnect the audio switch 9P (black) connector.
Remove the socket bolt, nut and the audio switch.

Install the audio switch in the reverse order of removal.

NOTE

- Route the audio switch wire properly (page 1-28).



ANTENNA

REMOVAL/INSTALLATION

Remove the seat (page 2-2) and right side cover (page 2-3).

Disconnect the antenna connector.
Remove the antenna wire from the clamps and pull it out of the trunk stay with the grommet.
Remove the grommet from the antenna wire.

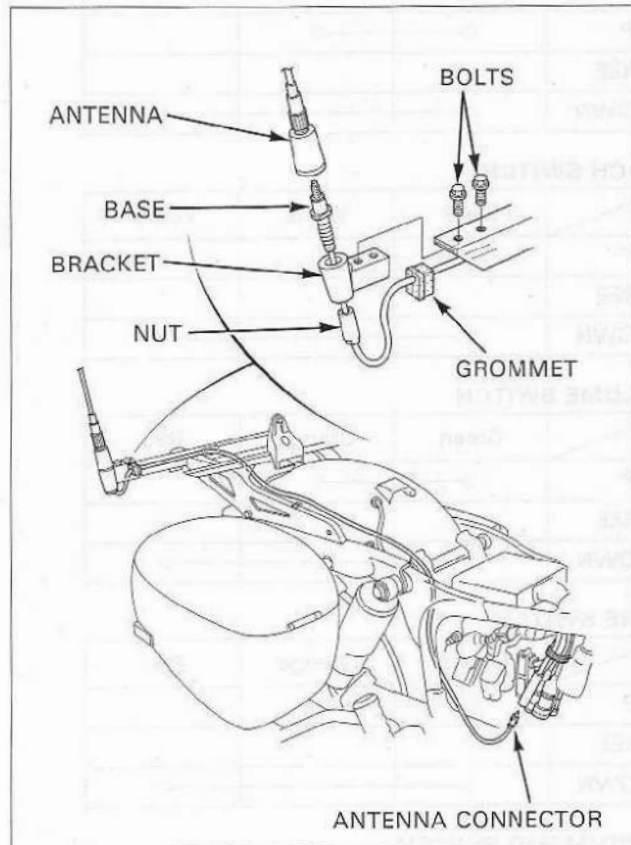
Remove the antenna from the antenna base by turning it counterclockwise.
Loosen the antenna base lock nut using two 14 mm open end wrenches and remove it.
Remove the antenna base from the antenna bracket.

Remove the trunk assembly (page 2-10).
Remove the two bolts and antenna bracket.

Install the removed parts in the reverse order of removal.

NOTE

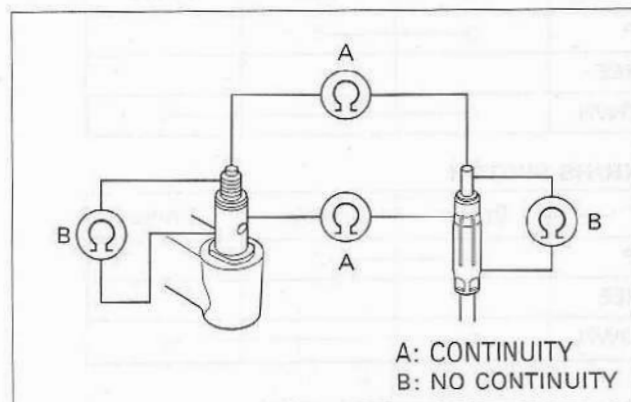
- Route the antenna wire properly (page 1-34).
- Set the wire grommet into the trunk stay properly.



INSPECTION

Remove the right side cover (page 2-3).

Disconnect the antenna connector.
Remove the antenna from the antenna base by turning it counterclockwise.
Check for continuity between the antenna connector and base as shown.



COMBINATION METER

INSPECTION

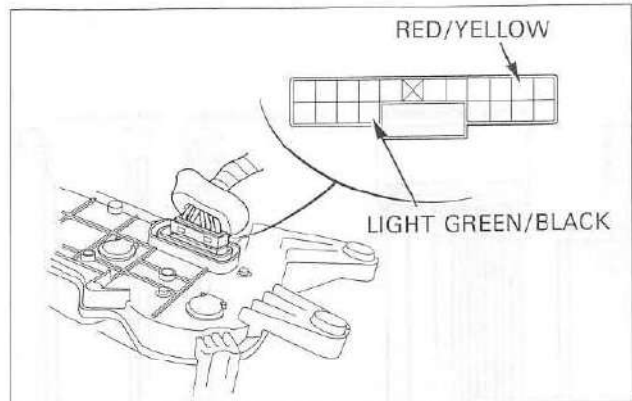
Remove the combination meter (page 19-8).

AUDIO BACK-UP LINE

Measure the voltage between the red/yellow wire terminal of the combination meter connector and ground. There should be battery voltage at all times.

AUDIO MAIN RELAY LINE

Measure the voltage between the light green/black wire terminal of the combination meter connector and ground. There should be battery voltage with the ignition switch ON or ACC.



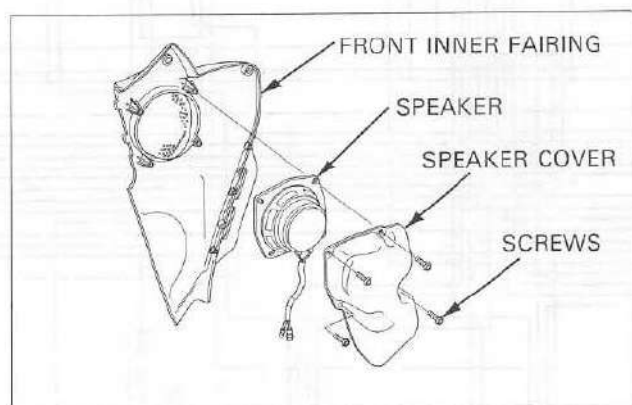
SPEAKER

REMOVAL/INSTALLATION

Remove the front inner fairing (page 2-5).

Remove the four screws, speaker cover and speaker from the front inner fairing.

Install the speaker in the reverse order of removal.

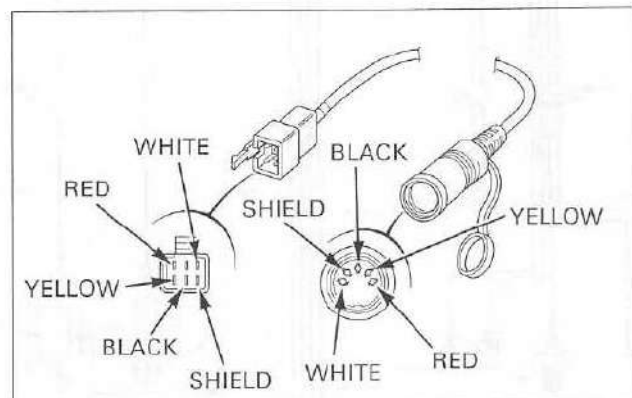


HEADSET JUNCTION WIRE

INSPECTION

Front: Remove the left front inner fairing (page 2-5).
Rear: Remove the seat (page 2-2) and right side cover (page 2-3).

Disconnect the headset junction wire 6P (red) connector and remove the junction wire. Check for continuity between the same color wire terminals of the 6P (red) connector and junction connector. There should be continuity.



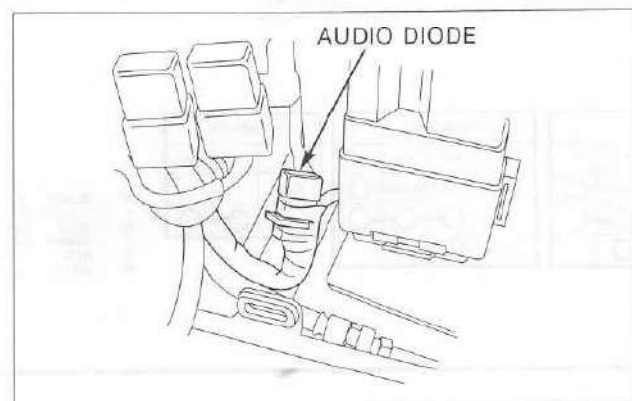
AUDIO DIODE

INSPECTION

Remove the radiator reserve tank without disconnecting the siphon tube (page 6-6).

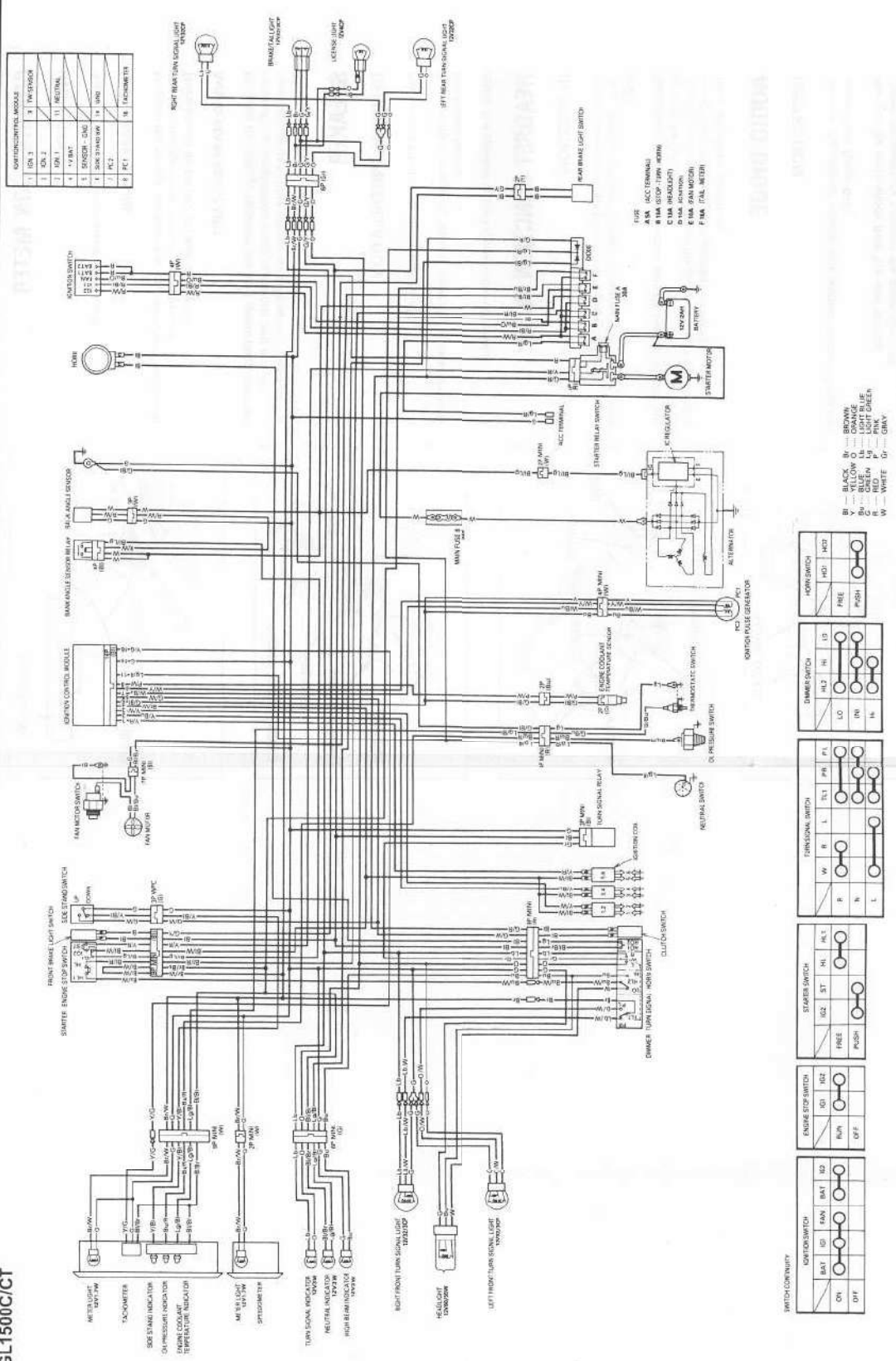
Remove the audio diode from the wire harness. Check for continuity between the diode terminals. When there is continuity, a small resistance value will register.

If there is continuity in one direction, the diode is normal.



WIRING DIAGRAM

After '99 GL1500C/CT

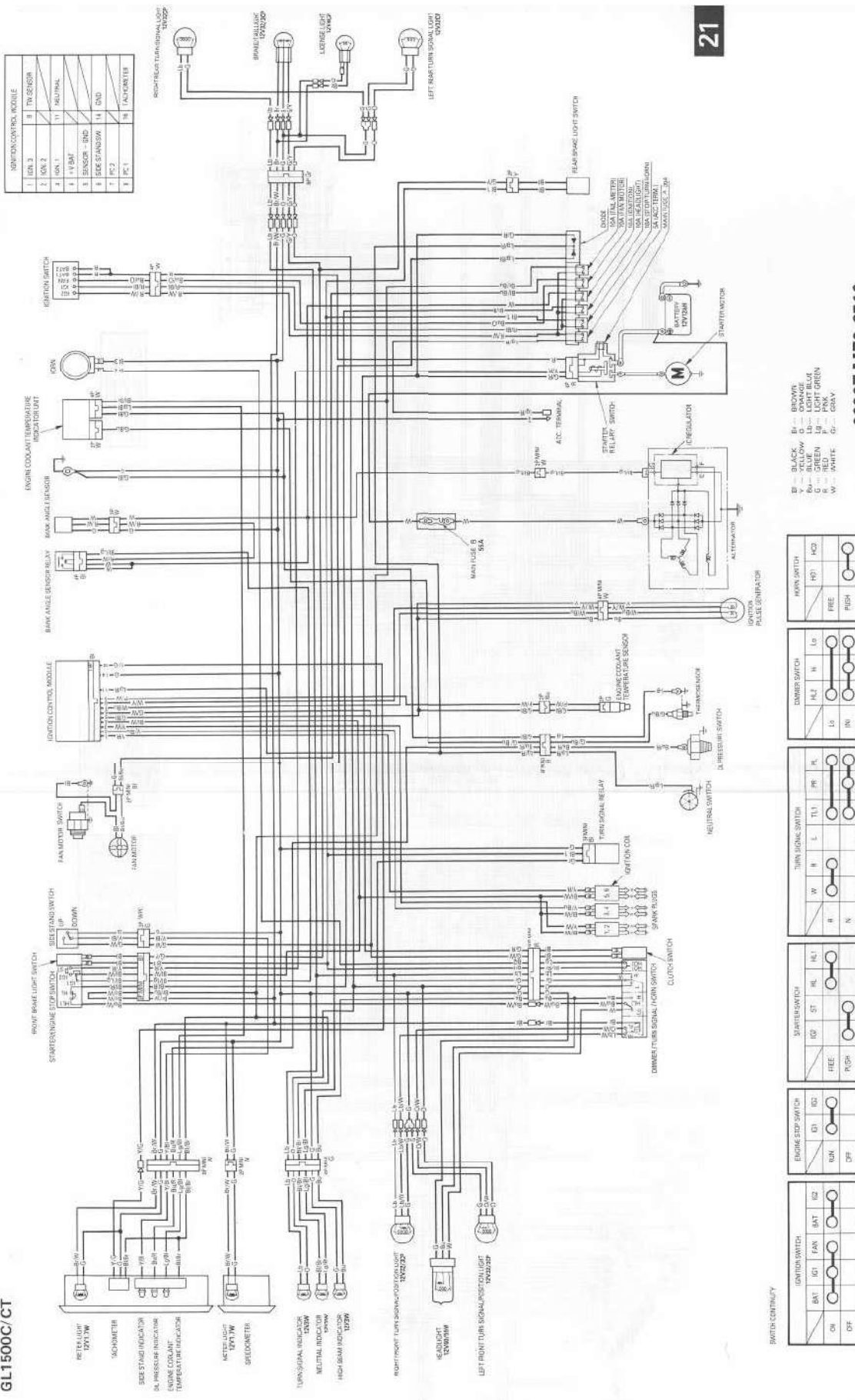


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Revised: September, 1999 '97 - '00 GL1500C/CT/CF
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 MSV B571 (9/99)

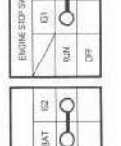
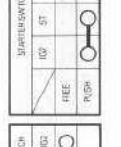
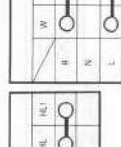
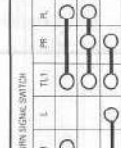
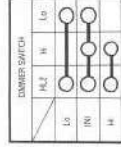
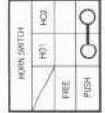
21. WIRING DIAGRAM

GL1500C/CT



IGNITION CONTROL MODULE	
1 IGN. 3	8 TR. STOP SW
2 IGN. 2	11 A/D SIGNAL
3 IGN. 1	14 V. BAT.
4 V. BAT.	15 SENSORS - B/D
5 SENSORS - B/D	16 END
6 SENSORS - B/D	17 END
7 P.C. 1	18 FAN MOTOR

- B - BLACK
- Y - YELLOW
- BL - BLUE
- R - RED
- W - WHITE
- BR - BROWN
- D - DORADO
- LB - LIGHT BLUE
- GN - GREEN
- PK - PINK
- GR - GRAY



SWITCH CONTINUED

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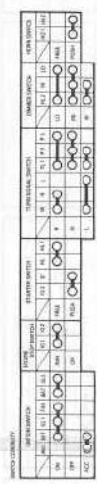
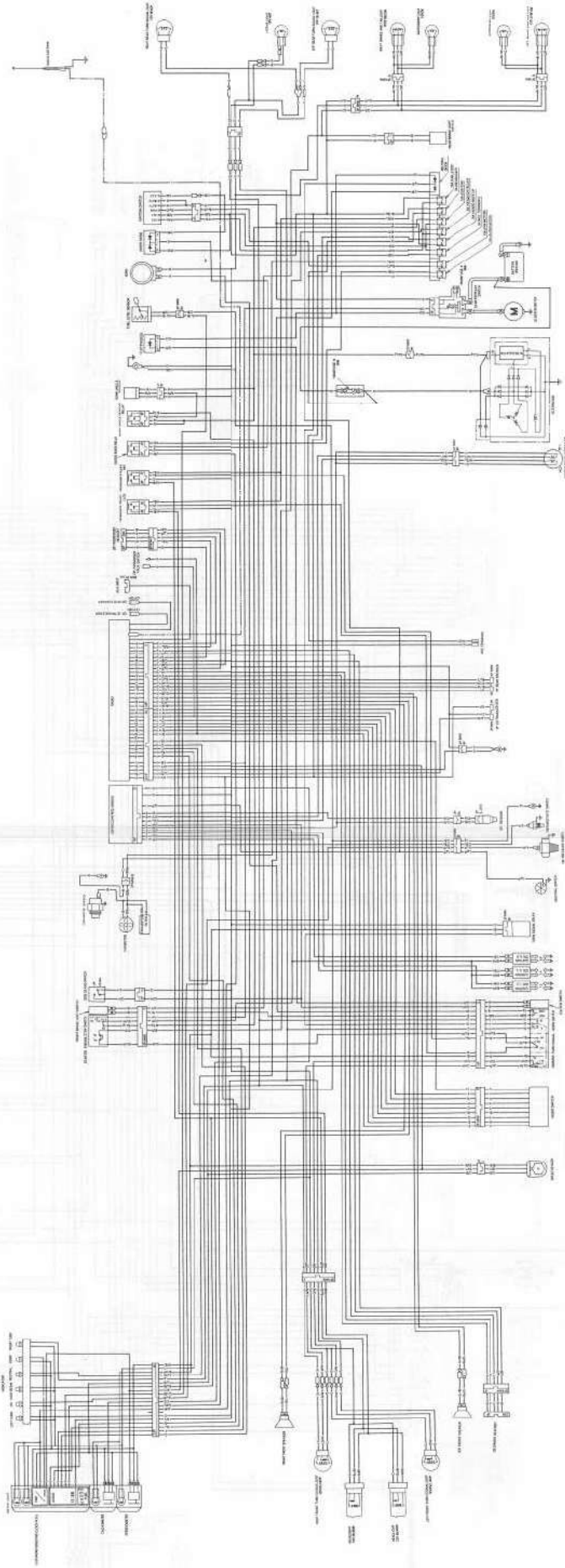
WIRING DIAGRAM

GL1500CF

WIRING DIAGRAM			
1. FUSE	2. FUSE	3. FUSE	4. FUSE
5. FUSE	6. FUSE	7. FUSE	8. FUSE
9. FUSE	10. FUSE	11. FUSE	12. FUSE
13. FUSE	14. FUSE	15. FUSE	16. FUSE
17. FUSE	18. FUSE	19. FUSE	20. FUSE
21. FUSE	22. FUSE	23. FUSE	24. FUSE
25. FUSE	26. FUSE	27. FUSE	28. FUSE
29. FUSE	30. FUSE	31. FUSE	32. FUSE

WIRING DIAGRAM			
1. FUSE	2. FUSE	3. FUSE	4. FUSE
5. FUSE	6. FUSE	7. FUSE	8. FUSE
9. FUSE	10. FUSE	11. FUSE	12. FUSE
13. FUSE	14. FUSE	15. FUSE	16. FUSE
17. FUSE	18. FUSE	19. FUSE	20. FUSE
21. FUSE	22. FUSE	23. FUSE	24. FUSE
25. FUSE	26. FUSE	27. FUSE	28. FUSE
29. FUSE	30. FUSE	31. FUSE	32. FUSE

WIRING DIAGRAM			
1. FUSE	2. FUSE	3. FUSE	4. FUSE
5. FUSE	6. FUSE	7. FUSE	8. FUSE
9. FUSE	10. FUSE	11. FUSE	12. FUSE
13. FUSE	14. FUSE	15. FUSE	16. FUSE
17. FUSE	18. FUSE	19. FUSE	20. FUSE
21. FUSE	22. FUSE	23. FUSE	24. FUSE
25. FUSE	26. FUSE	27. FUSE	28. FUSE
29. FUSE	30. FUSE	31. FUSE	32. FUSE



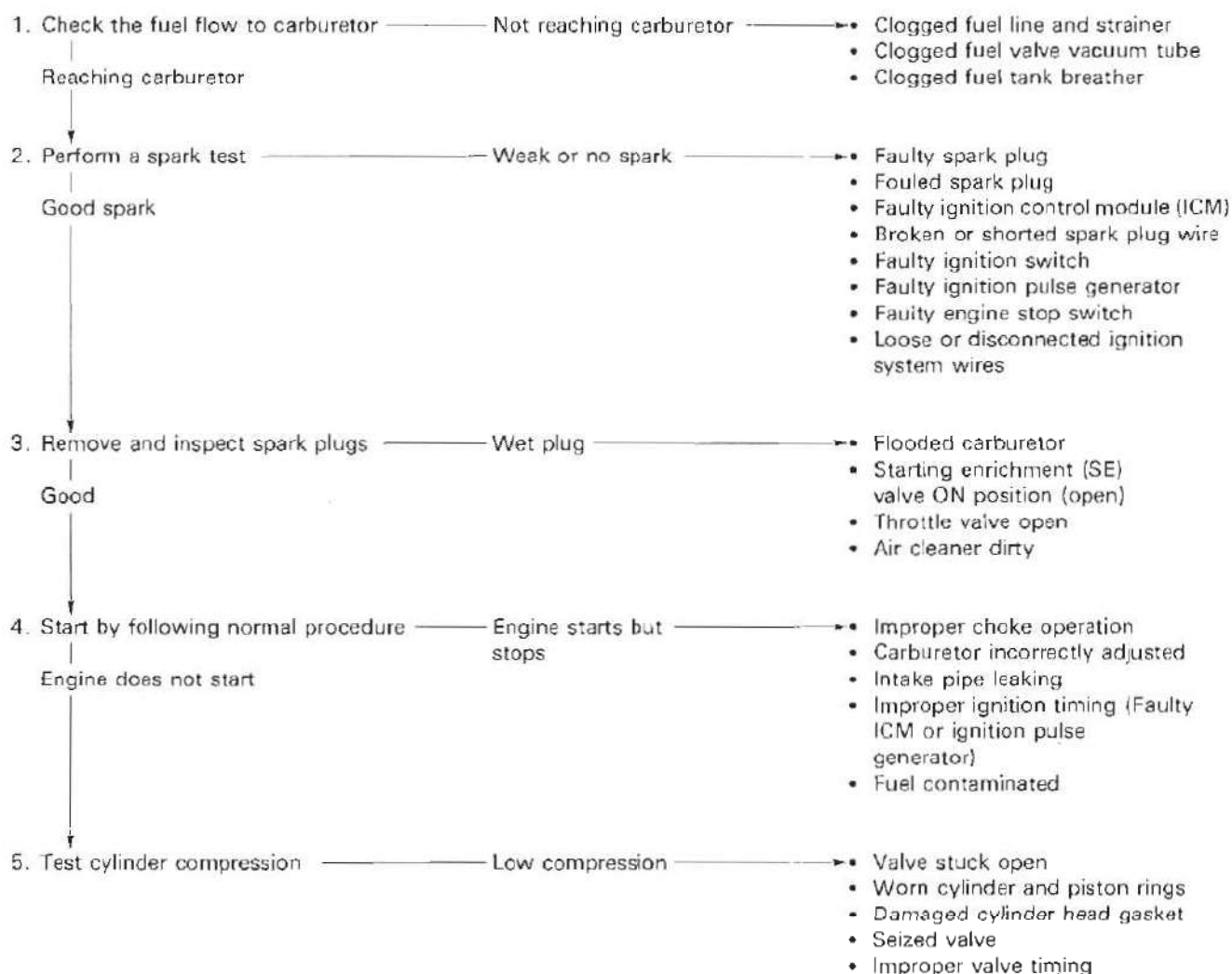
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22. TROUBLESHOOTING

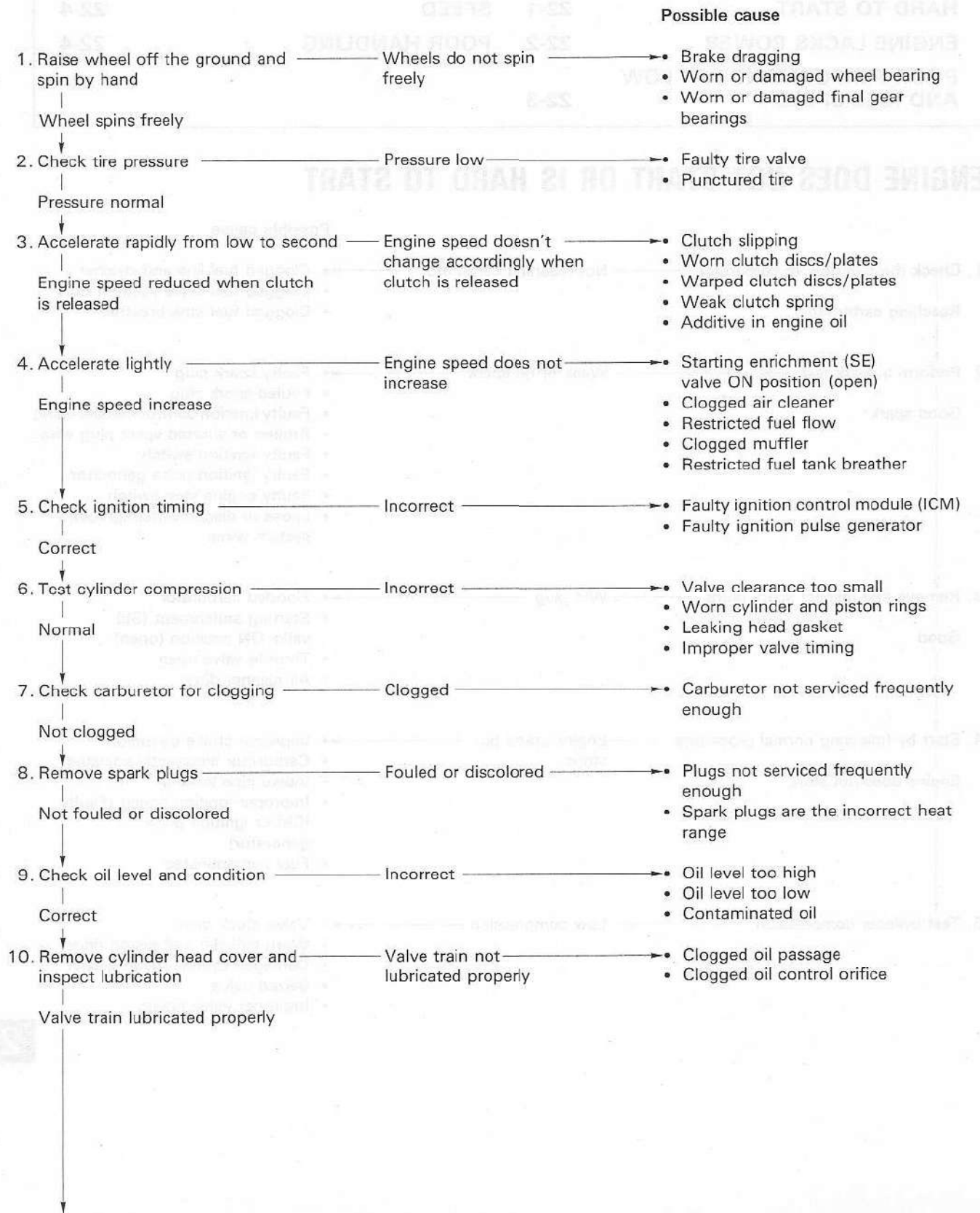
ENGINE DOES NOT START OR IS HARD TO START	22-1	POOR PERFORMANCE AT HIGH SPEED	22-4
ENGINE LACKS POWER	22-2	POOR HANDLING	22-4
POOR PERFORMANCE AT LOW AND IDLE SPEED	22-3		

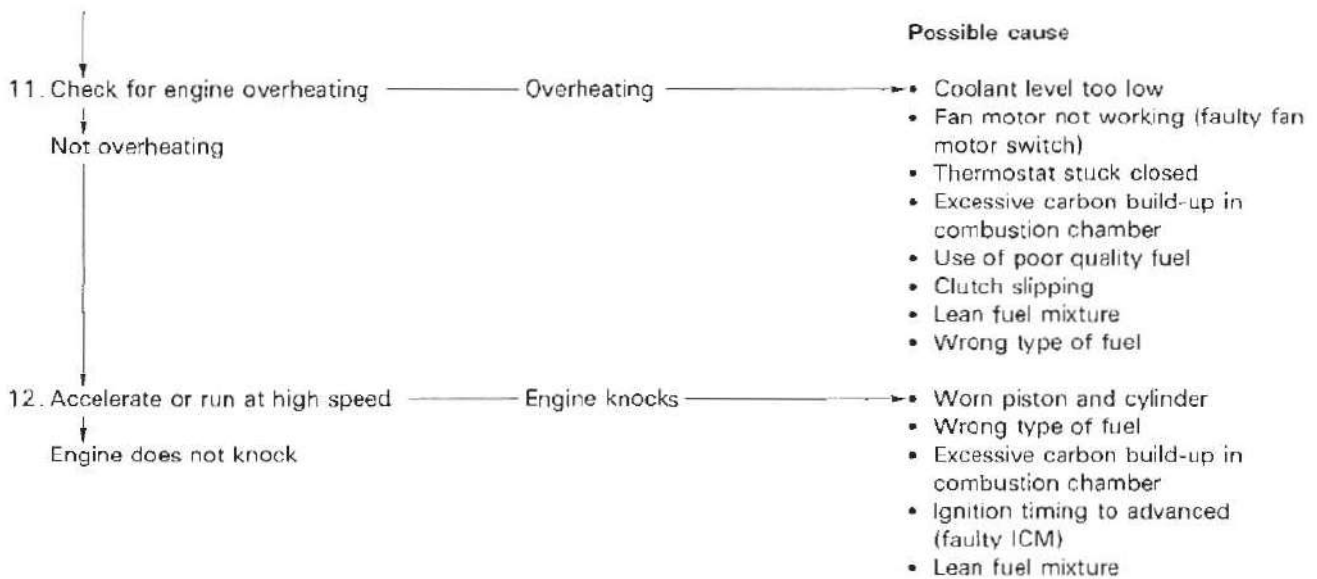
ENGINE DOES NOT START OR IS HARD TO START

Possible cause

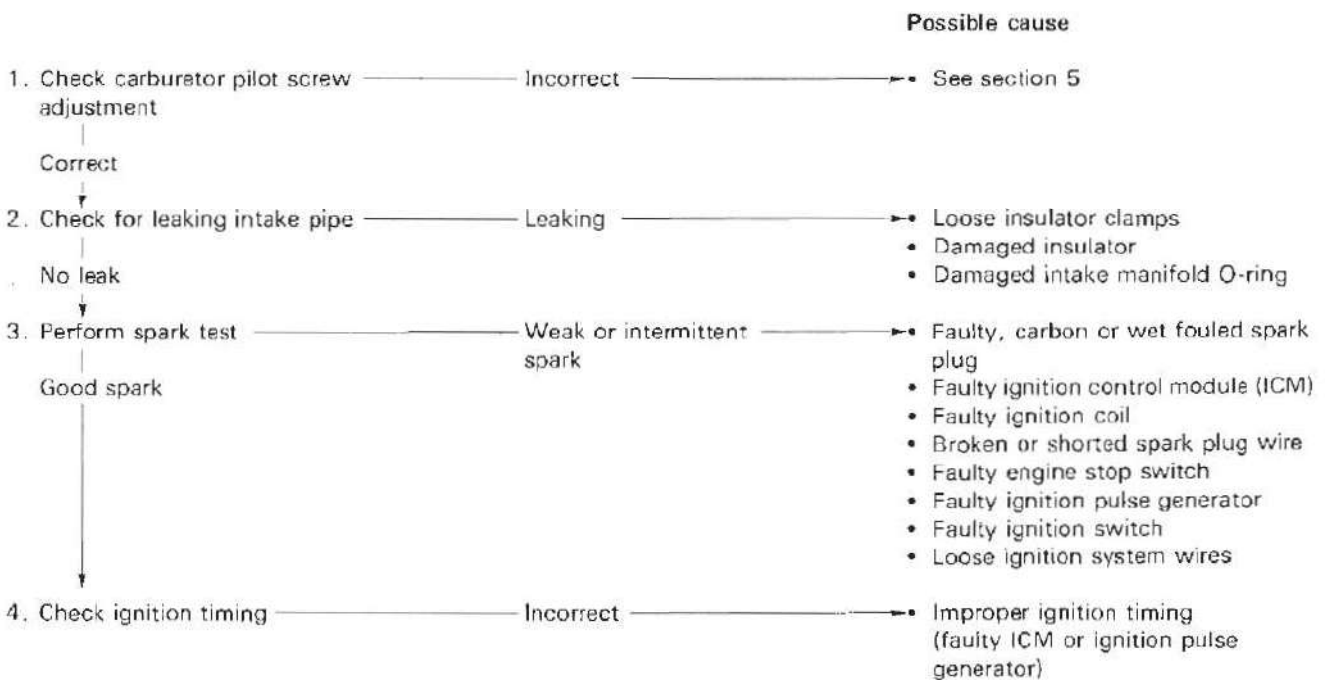


ENGINE LACKS POWER



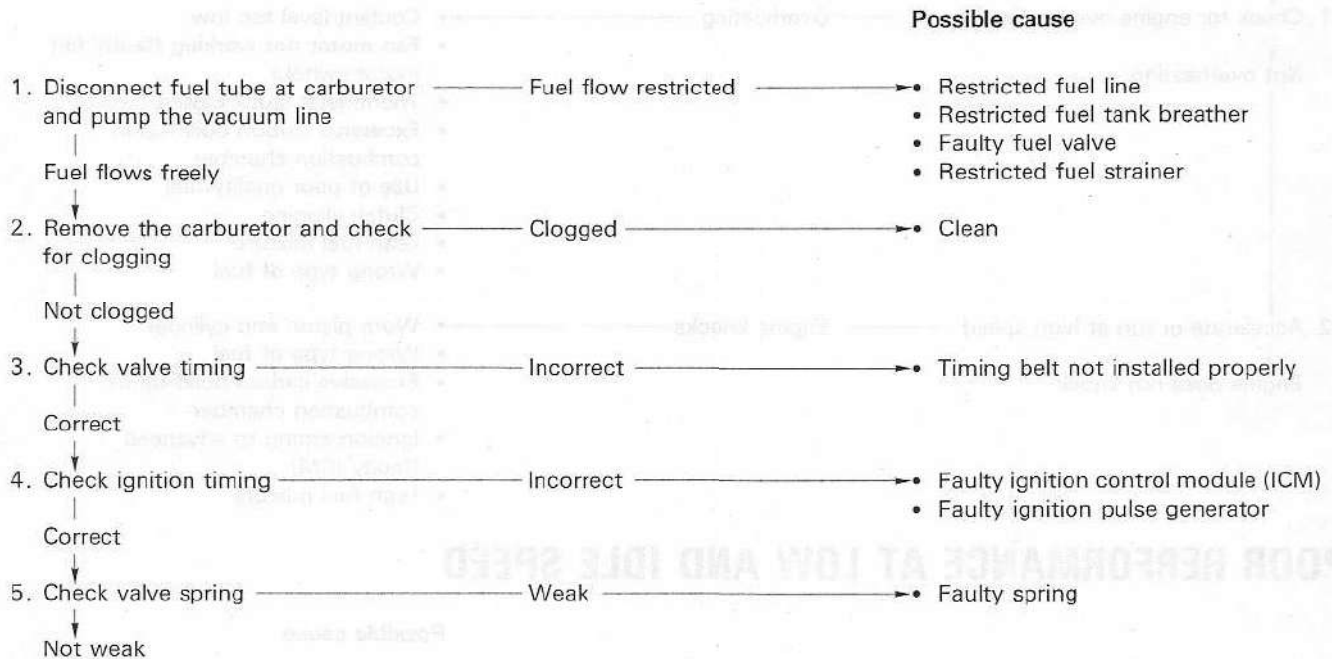


POOR PERFORMANCE AT LOW AND IDLE SPEED



TROUBLESHOOTING

POOR PERFORMANCE AT HIGH SPEED



POOR HANDLING

	Possible cause
1. If steering is heavy	→ <ul style="list-style-type: none">• Steering stem adjusting nut too tight• Damaged steering head bearings
2. If either wheel is wobbling	→ <ul style="list-style-type: none">• Excessive wheel bearing play• Bent rim• Improperly installed wheel hub• Swingarm pivot bearing excessively worn• Bent frame
3. If the motorcycle pulls to one side	→ <ul style="list-style-type: none">• Faulty shock absorber• Front and rear wheel not aligned• Bent fork• Bent swingarm• Bent axle• Bent frame

23. INDEX

AIR CLEANER	3-6	ENGINE DOES NOT START OR IS HARD TO START	22-1
AIR CLEANER HOUSING	5-4	ENGINE IDLE SPEED	3-12
ALTERNATOR	16-8	ENGINE INSTALLATION	7-7
ALTERNATOR DRIVEN GEAR	16-18	ENGINE LACKS POWER	22-2
ANTENNA	20-10	ENGINE OIL	3-8
AUDIO DIODE	20-11	ENGINE OIL FILTER	3-9
AUDIO MAIN RELAY	20-8	ENGINE REMOVAL	7-3
AUDIO SWITCH	20-8	EVAPORATIVE EMISSION CONTROL SYSTEM (California type only)	3-13
BANK ANGLE SENSOR	19-18	EVAPORATIVE EMISSION CONTROL SYSTEM (California type only)	5-26
BATTERY	16-5	EXHAUST SYSTEM	2-12
BRAKE FLUID	3-15	FAN MOTOR SWITCH	19-17
BRAKE FLUID REPLACEMENT/AIR BLEEDING	15-4	FINAL DRIVE ASSEMBLY	12-10
BRAKE LIGHT SWITCH	3-16	FINAL DRIVE DISASSEMBLY	12-5
BRAKE PAD WEAR	3-16	FINAL DRIVE INSTALLATION	12-18
BRAKE PAD/DISC	15-6	FINAL DRIVE OIL	3-14
BRAKE PEDAL	15-22	FINAL DRIVE REMOVAL	12-3
BRAKE SYSTEM	3-16	FORK	13-16
BRAKE/TAILLIGHT	19-5	FRONT BRAKE CALIPER	15-16
CABLE & HARNESS ROUTING	1-21	FRONT BRAKE LIGHT SWITCH	19-19
CAMSHAFT HOLDER ASSEMBLY	8-23	FRONT FAIRING (GL1500CF only)	2-7
CAMSHAFT HOLDER DISASSEMBLY	8-10	FRONT INNER FAIRING (GL1500CF only)	2-5
CAMSHAFT INSTALLATION	8-24	FRONT MASTER CYLINDER	15-9
CAMSHAFT REMOVAL	8-7	FRONT WHEEL	13-8
CARBURETOR ASSEMBLY	5-13	FUEL GAUGE (GL1500CF only)	19-15
CARBURETOR CHOKE	3-5	FUEL LINE	3-4
CARBURETOR COMBINATION	5-16	FUEL TANK	2-4
CARBURETOR DISASSEMBLY/INSPECTION	5-9	GEARSHIFT LINKAGE	10-5
CARBURETOR INSTALLATION	5-19	GENERAL SAFETY	1-1
CARBURETOR REMOVAL	5-5	HANDLEBAR	13-3
CARBURETOR SEPARATION	5-7	HANDLEBAR SWITCH	19-20
CARBURETOR SYNCHRONIZATION	3-10	HEADLIGHT	19-3
CENTER COVER	2-3	HEADLIGHT AIM	3-17
CHARGING SYSTEM INSPECTION	16-6	HEADSET JUNCTION WIRE	20-11
CLUTCH	9-10	HIGH ALTITUDE ADJUSTMENT (U.S.A. only)	5-23
CLUTCH DIODE	19-15	HORN	19-21
CLUTCH FLUID	3-18	IGNITION COIL	17-11
CLUTCH FLUID REPLACEMENT/AIR BLEEDING	9-4	IGNITION PULSE GENERATOR	17-12
CLUTCH MASTER CYLINDER	9-5	IGNITION SWITCH	19-19
CLUTCH SLAVE CYLINDER	9-8	IGNITION SYSTEM INSPECTION	17-5
CLUTCH SWITCH	19-20	IGNITION TIMING	17-8
CLUTCH SYSTEM	3-17	INDICATOR (GL1500C/CT only)	19-6
COMBINATION METER	20-11	LICENSE LIGHT	19-5
COMBINATION METER (GL1500CF)	19-8	LUBRICATION & SEAL POINTS	1-19
COOLANT REPLACEMENT	6-5	MAIN JOURNAL BEARING	11-13
COOLANT TEMPERATURE INDICATOR	19-11	MAIN OIL PUMP	4-7
COOLING SYSTEM	3-12	MAINTENANCE SCHEDULE	3-3
CRANKCASE ASSEMBLY	11-17	METERS (GL1500C/CT)	19-6
CRANKCASE BREATHER	3-6	MODEL IDENTIFICATION	1-3
CRANKCASE SEPARATION	11-3	NEUTRAL SWITCH	19-15
CRANKPIN BEARING	11-7	NEUTRAL SWITCH DIODE	19-22
CRANKSHAFT INSTALLATION	11-16	NUTS, BOLTS, FASTENERS	3-19
CRANKSHAFT REMOVAL	11-12	OIL PRESSURE CHECK	4-3
CYLINDER COMPRESSION	8-4	OIL PRESSURE INDICATOR	19-14
CYLINDER HEAD ASSEMBLY	8-20	PILOT SCREW ADJUSTMENT	5-22
CYLINDER HEAD DISASSEMBLY	8-12	PISTON/CONNECTING ROD INSTALLATION	11-9
CYLINDER HEAD INSTALLATION	8-21	PISTON/CONNECTING ROD REMOVAL	11-4
CYLINDER HEAD REMOVAL	8-11	POOR HANDLING	22-4
EMISSION CONTROL INFORMATION LABELS	1-31	POOR PERFORMANCE AT HIGH SPEED	22-4
EMISSION CONTROL SYSTEMS	1-28		
ENGINE COOLANT TEMPERATURE (ECT) SENSOR	17-10		

INDEX

POOR PERFORMANCE AT LOW AND IDLE		TORQUE VALUES	1-13
SPEED	22-3	TRANSMISSION	10-22
PRIMARY GEARS/OUTPUT SHAFT	10-10	TROUBLESHOOTING	
RADIATOR COOLANT	3-12	(AUDIO SYSTEM)	20-2
RADIATOR/COOLING FAN	6-7	(CHARGING SYSTEM/ALTERNATOR)	16-3
RADIATOR COVER (GL1500CF only)	2-8	(CLUTCH)	9-3
RADIO	20-6	(COOLING SYSTEM)	6-3
REAR BRAKE CALIPER	15-19	(CYLINDER HEAD/VALVE)	8-4
REAR BRAKE LIGHT SWITCH	19-19	(ELECTRIC STARTER/STARTER CLUTCH)	18-2
REAR FENDER	2-4	(FINAL DRIVE)	12-2
REAR MASTER CYLINDER	15-12	(FRAME/BODY PANELS/EXHAUST SYSTEM)	2-1
REAR WHEEL	14-3	(FRONT WHEEL/SUSPENSION/STEERING)	13-2
SADDI FRAG (GI 1500CT/CF only)	2-9	(FUEL SYSTEM)	5-3
SCAVENGE OIL PUMP	4-4	(GEARSHIFT LINKAGE/TRANSMISSION)	10-4
SEAT	2-2	(HYDRAULIC BRAKE)	15-3
SECONDARY AIR SUPPLY SYSTEM	3-13	(IGNITION SYSTEM)	17-3
SECONDARY AIR SUPPLY SYSTEM	5-24	(LUBRICATION SYSTEM)	4-2
SERVICE INFORMATION		(PISTON/CRANKSHAFT)	11-2
(AUDIO SYSTEM)	20-1	(REAR WHEEL/SUSPENSION)	14-2
(CHARGING SYSTEM/ALTERNATOR)	16-1	TRUNK (GL1500CF only)	2-9
(CLUTCH)	9-2	TURN SIGNAL LIGHT	19-4
(COOLING SYSTEM)	6-2	TURN SIGNAL RELAY	19-21
(CYLINDER HEAD/VALVE)	8-1	VALVE CLEARANCE	3-7
(ELECTRIC STARTER/STARTER CLUTCH)	18-1	VALVE GUIDE REPLACEMENT	8-15
(ENGINE REMOVAL/INSTALLATION)	7-2	VALVE SEAT INSPECTION/REPLACEMENT	8-17
(FINAL DRIVE)	12-1	WATER PUMP	6-12
(FRAME/BODY PANELS/EXHAUST SYSTEM)	2-1	WHEELS/TIRES	3-20
(FRONT WHEEL/SUSPENSION/STEERING)	13-1	WINDSHIELD (GL1500CT/CF only)	2-6
(FUEL SYSTEM)	5-1	WIRING DIAGRAM	21-1
(GEARSHIFT LINKAGE/TRANSMISSION)	10-3		
(HYDRAULIC BRAKE)	15-2		
(IGNITION SYSTEM)	17-1		
(LIGHTS/METERS/SWITCHES)	19-1		
(LUBRICATION SYSTEM)	4-1		
(MAINTENANCE)	3-1		
(PISTON/CRANKSHAFT)	11-1		
(REAR WHEEL/SUSPENSION)	14-1		
SERVICE RULES	1-2		
SHOCK ABSORBER	14-9		
SIDE COVER	2-3		
SIDE STAND	3-18		
SIDE STAND SWITCH	19-16		
SPARK PLUG	3-7		
SPEAKER	20-11		
SPECIFICATIONS	1-4		
SPEEDOMETER/SPEED SENSOR			
(GL1500CF only)	19-9		
STARTER CLUTCH/STARTER DRIVE GEAR	18-13		
STARTER MOTOR	18-4		
STARTER RELAY SWITCH	18-16		
STEERING HEAD BEARINGS	3-20		
STEERING STEM	13-36		
SUSPENSION	3-19		
SWINGARM	14-10		
SYSTEM TESTING	6-4		
TACHOMETER (GL1500CF only)	19-10		
THERMOSTAT	6-10		
THROTTLE OPERATION	3-4		
TIMING BELT	3-10		
TIMING BELT INSTALLATION	8-27		
TIMING BELT REMOVAL	8-5		
TOOLS	1-17		