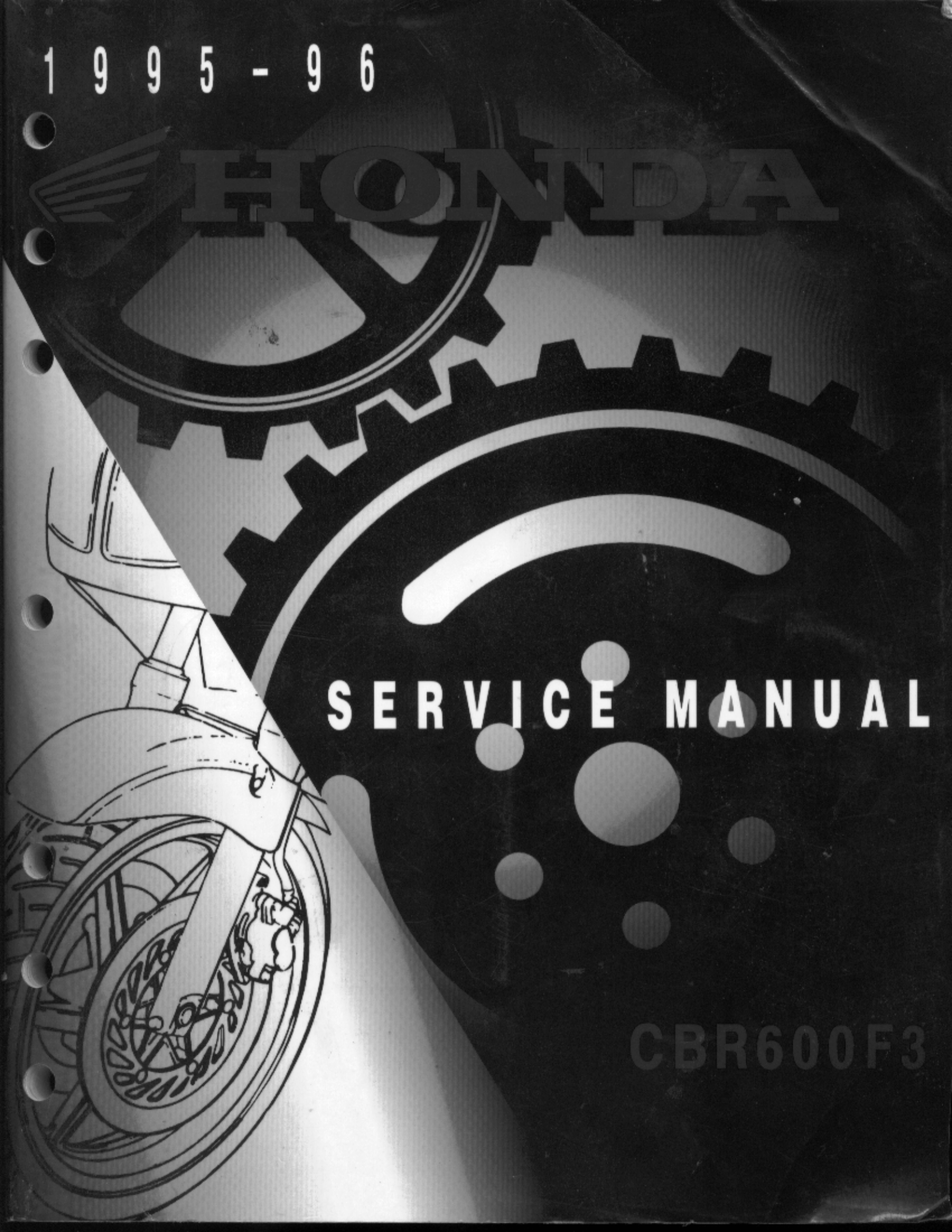


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**HONDA**

**SERVICE MANUAL**

**CBR600F3**



# HOW TO USE THIS MANUAL

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 the 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.

Section 1 and 3 apply to the whole motorcycle. Section 2 illustrates procedures for removal/installation of components that may be required to perform service described in the following sections. Section 4 through 18 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 that section.

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

If you don't know the source of the trouble, go to section 20 Troubleshooting.

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HONDA MOTOR CO., LTD.  
SERVICE PUBLICATION OFFICE

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# 1. GENERAL INFORMATION

1

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## 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 the skin for prolonged periods. Although this is unlikely unless you handle used oil on a daily bases, 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 cause 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.**

If it contacts your skin, wash the affected areas immediately with soap and water. If it contacts your eyes, flush them thoroughly with fresh water and get immediate medical attention. If it is swallowed, the victim must be forced to vomit, then rinse mouth and throat with fresh water before obtaining medical attention. Because of these dangers, always store coolant in a safe place, away from the reach of children.

### Nitrogen Pressure

For shock absorber with a gas-filled reservoir:

#### ▲ WARNING

- **Use only nitrogen to pressurize the shock absorber. The use of an unstable gas can cause a fire or explosion resulting in serious injury.**
- **The shock absorber contains nitrogen under high pressure. Allowing fire or heat near the shock absorber could lead to an explosion that could result in serious injury.**
- **Failure to release the pressure from a shock absorber before disposing of it may lead to a possible explosion and serious injury if it is heated or pierced.**

To prevent the possibility of an explosion, release the nitrogen by pressing the valve core. Then remove the valve stem from the shock absorber reservoir. Dispose of the oil in a manner acceptable to the Environmental Protection Agency (EPA).

Before disposal of the shock absorber, release the nitrogen by pressing the valve core. Then remove the valve stem from the shock absorber.

### Battery Hydrogen Gas & Electrolyte

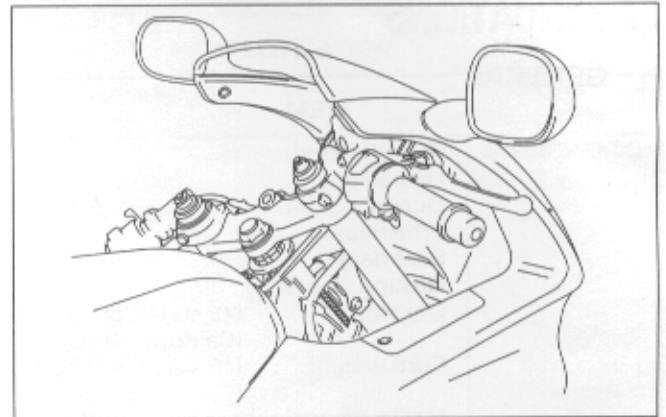
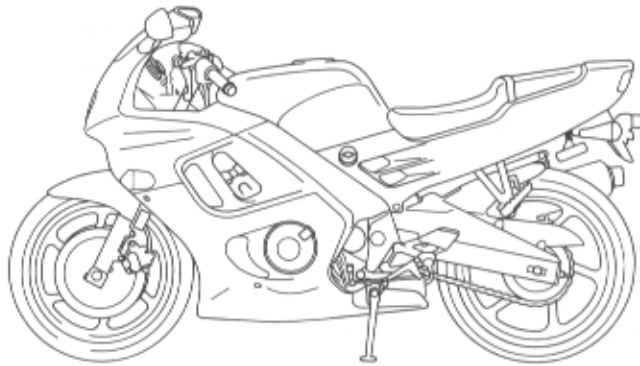
#### ▲ WARNING

- **The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging.**
- **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.

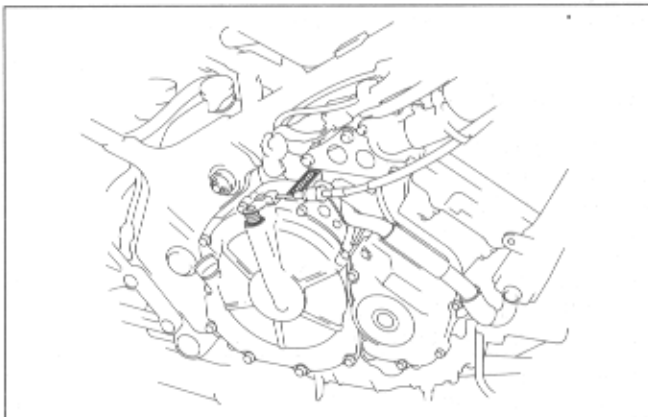
## SERVICE RULES

1. Use genuine HONDA or HONDA-recommended parts and lubrications or their equivalents. Parts that do not meet HONDA's design specifications may damage the motorcycle.
2. Use the special tools designed for this product.
3. Use only metric tools when servicing this motorcycle. Metric bolts, nuts, and screws are not interchangeable with English fasteners. The use of incorrect tools and fasteners may damage the motorcycle.
4. Install new gaskets, O-rings, cotter pins, lock plates, etc. when reassembling.
5. When tightening a series bolts or nuts, begin with the larger-diameter of inner bolts first, and tighten to 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 assembly, check all parts for proper installation and operation.
8. Route all electrical wires as shown on pages 1-20 through 1-27, Cable and Harness Routing.

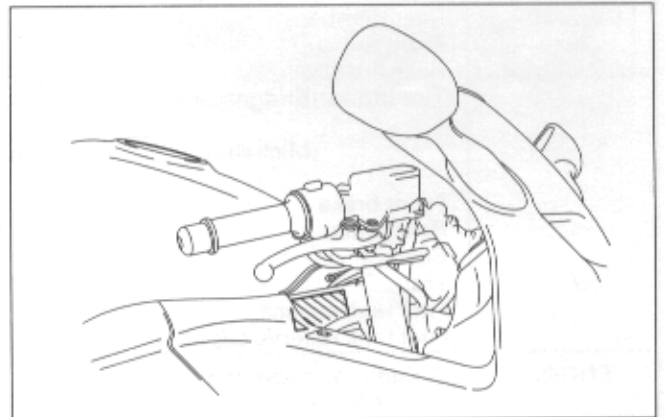
MODEL IDENTIFICATION



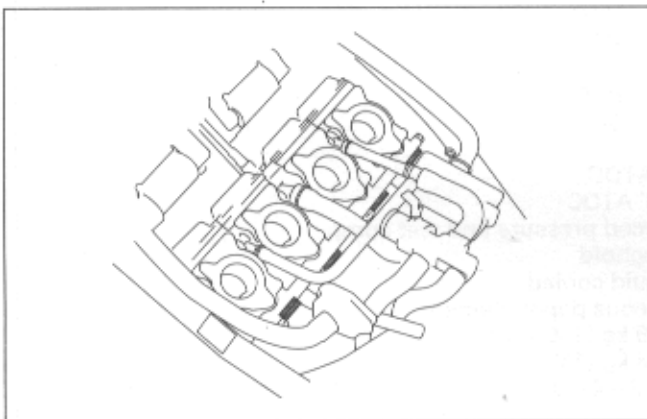
(1) FRAME SERIAL NUMBER  
The frame serial number is stamped on the right side of the steering head.



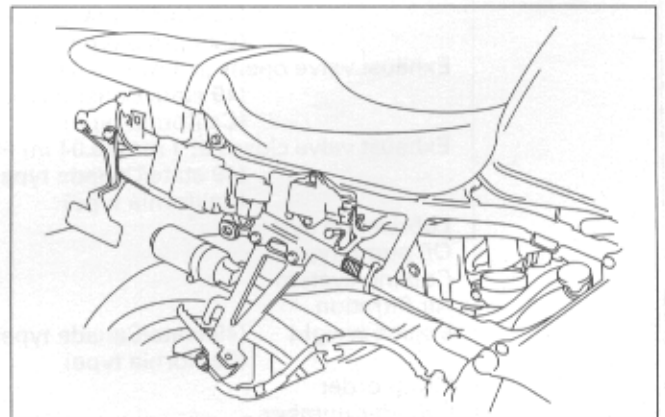
(2) ENGINE SERIAL NUMBER  
The engine serial number is stamped on the right of the upper crankcase.



(3) VEHICLE IDENTIFICATION NUMBER  
The Vehicle Identification Number (VIN) is attached on right side of the frame.



(4) CARBURETOR IDENTIFICATION NUMBERS  
The carburetor identification numbers are on the carburetor body intake side as shown.



(5) COLOR LABEL  
The color label is attached on the frame under the right side cover as shown.

# GENERAL INFORMATION

## SPECIFICATIONS

GENERAL		
	ITEM	SPECIFICATIONS
DIMENSIONS	Overall length	2,055 mm (80.9 in)
	Overall width	685 mm (27.0 in)
	Overall height	1,135 mm (44.7 in)
	Wheelbase	1,405 mm (55.3 in)
	Seat height	810 mm (31.9 in)
	Ground clearance	130 mm (5.1 in)
	Dry weight (49 state/Canada type) (California type)	184 kg (406 lbs) 186 kg (408 lbs)
	Curd weight (49 state/Canada type) (California type)	206 kg (454 lbs) 208 kg (459 lbs)
	Maximum weight capacity (U.S.A. type) (Canada type)	176 kg (388 lbs) 180 kg (397 lbs)
	FRAME	Frame type
Front suspension		Telescopic fork
Front wheel travel		118 mm (4.65 in)
Rear suspension		Swingarm
Rear wheel travel		109 mm (4.29 in)
Rear damper		Nitrogen gas filled damper with reserve tank
Front tire size		120/60 ZR 17
Rear tire size		160/60 ZR 17
Tire brand (Bridgestone)		Front BT50F RADIAL G
		Rear BT50R RADIAL J
(Michelin)		Front MACADAM 90X
		Rear MACADAM 90X
Front brake		Hydraulic dual disc
Rear brake	Hydraulic single disc	
Caster	25° 10'	
Trail	94 mm (3.7 in)	
Fuel tank capacity	17.0 ℓ (4.5 US gal, 3.7 Imp gal)	
Fuel tank reserve capacity	3.0 ℓ (0.8 US gal, 0.7 Imp gal)	
ENGINE	Cylinder arrangement	Vertical 30° inline four
	Bore X Stroke	65.0 X 45.2 mm (2.56 X 1.78 in)
	Displacement	600 cm <sup>3</sup> (36.6 cu-in)
	Compression ratio	12 : 1
	Valve train	Silent multi-link chain driven DOHC
	Intake valve opens at 1 mm (0.04 in) lift (49 state/Canada type) (California type)	15° BTDC -5° BTDC
	Intake valve closes at 1 mm (0.04 in) lift (49 state/Canada type) (California type)	35° ABDC 40° ABDC
	Exhaust valve opens at 1 mm (0.04 in) lift (49 state/Canada type) (California type)	38° BBDC 40° BBDC
	Exhaust valve closes at 1 mm (0.04 in) lift (49 state/Canada type) (California type)	7° ATDC -10° ATDC
	Lubrication system	Forced pressure and wet sump
	Oil pump type	Trochoid
	Cooling system	Liquid cooled
	Air filtration	Viscous paper element
	Engine weight (49 state/Canada type) (California type)	61.9 kg (136.4 lbs) 62.8 kg (138.4 lbs)
	Firing order	1 - 2 - 4 - 3
	Cylinder number	



GENERAL (cont'd)		
	ITEM	SPECIFICATION
CARBURETOR	Carburetor type Throttle bore	Constant velocity 36 mm (1.4 in)
DRIVE TRAIN	Clutch System Clutch operating system Transmission Primary reduction Gear ratio 1st Gear ratio 2nd Gear ratio 3rd Gear ratio 4th Gear ratio 5th Gear ratio 6th Final reduction Gear shift pattern	Multi-plate, wet Cable operating 6-speed 1.863 (82/44) 2.928 (41/14) 2.062 (33/16) 1.647 (28/17) 1.368 (26/19) 1.200 (24/20) 1.086 (25/23) 2.866 (43/15) Left foot operated return system 1 - N - 2 - 3 - 4 - 5 - 6
ELECTRICAL	Ignition system Starting system Charging system Regulator/rectifier type Lighting system	Full transistorized ignition Electric starter motor Triple phase output alternator SCR shorted/triple phase, full-wave rectification Battery

## GENERAL INFORMATION

Unit: mm (in)

LUBRICATION SYSTEM		STANDARD	SERVICE LIMIT
ITEM			
Engine oil capacity	at draining	3.4 ℓ (3.6 US qt, 3.0 Imp qt)	—
	at disassembly	4.2 ℓ (4.4 US qt, 3.7 Imp qt)	—
	at oil filter change	3.7 ℓ (3.9 US qt, 3.3 Imp qt)	—
Recommended engine oil		Use Honda GN4 4-stroke Oil or equivalent API Service Classification: SF or SG Viscosity: SAE 10W-40	—
Oil pressure at oil pressure switch (80°C/176°F)		490.4 kPa (5.0 kg/cm <sup>2</sup> , 71 psi) at 6,000 rpm	—
Oil pump rotor	tip clearance	0.15 (0.006)	0.20 (0.008)
	body clearance	0.15 – 0.22 (0.006 – 0.009)	0.35 (0.014)
	end clearance	0.02 – 0.07 (0.001 – 0.003)	0.10 (0.004)
Oil pump drive sprocket collar O.D.		34.050 – 34.075 (1.3405 – 1.3415)	34.03 (1.35)
Oil pump drive sprocket I.D.		35.025 – 35.075 (1.3789 – 1.3809)	35.10 (1.38)

FUEL SYSTEM		SPECIFICATIONS
ITEM		
Carburetor identification number	49 state type	VP61A
	California type	VP62A
	Canada type	VP60A
Main jet	49 state, Canada type	No. 1/4 carburetor: #135, No. 2/3 carburetor: #138
	California type	#135
Slow jet		#40
Pilot screw	initial/final opening	See page 5-22
	high altitude adjustment	See page 5-23
Float level		13.7 mm (0.54 in)
Idle speed	49 state, Canada type	1,200 ± 100 rpm
	California type	1,400 ± 100 rpm
Carburetor vacuum difference		Within 30 mmHg (1.2 inHg) Base carburetor: No. 3
Throttle grip free play		2 – 6 mm (1/12 – 1/4 in)



**GENERAL INFORMATION**

COOLING SYSTEM		SPECIFICATIONS
ITEM		
Coolant capacity	radiator and engine	2.4 ℓ (0.63 US gal, 0.53 Imp gal)
	reserve tank	0.35 ℓ (0.09 US gal, 0.08 Imp gal)
Radiator cap relief pressure		108 – 137 kPa (1.1 – 1.4 kg/cm <sup>2</sup> , 15.6 – 19.9 psi)
Thermostat	begins to open	80 – 84°C (176 – 183°F)
	fully open	95°C (203°F)
	valve lift	8.0 mm (0.31 in) minimum
Thermo valve starts to close		73 – 77°C (163 – 171°F)

Unit: mm (in)

CYLINDER HEAD/VALVES				STANDARD	SERVICE LIMIT
ITEM					
Cylinder compression				1,275 – 1,314 kPa (13.0 – 13.4 kg/cm <sup>2</sup> , 185 – 191 psi)	—
Valve clearance			IN	0.16 ± 0.03 (0.006 ± 0.001)	—
			EX	0.22 ± 0.03 (0.009 ± 0.001)	—
Cylinder head warpage				—	0.10 (0.004)
Camshaft	Cam lobe height	IN	49 state, Canada type	36.140 – 36.380 (1.4228 – 1.4323)	36.11 (1.422)
			California type	34.540 – 34.780 (1.3598 – 1.3698)	34.51 (1.359)
		EX	49 state, Canada type	35.300 – 35.540 (1.3898 – 1.3992)	35.27 (1.389)
			California type	33.580 – 33.820 (1.3220 – 1.3315)	33.55 (1.321)
	Runout			—	0.05 (0.002)
	Oil clearance			0.02 – 0.062 (0.0008 – 0.0024)	0.1 (0.004)
Journal O.D.				23.959 – 23.980 (0.9433 – 0.9441)	24.955 (0.9825)
Camshaft holder I.D.				24.000 – 24.021 (0.9449 – 0.9457)	—
Valve and valve guide	Valve stem O.D.		IN	3.975 – 3.990 (0.1565 – 0.1571)	3.965 (0.1561)
			EX	3.965 – 3.980 (0.1561 – 0.1567)	3.955 (0.1557)
	Valve guide I.D.		IN	4.000 – 4.012 (0.1575 – 0.1580)	4.04 (0.159)
			EX	4.000 – 4.012 (0.1575 – 0.1580)	4.04 (0.159)
	Stem-to-guide clearance		IN	0.010 – 0.037 (0.0004 – 0.0015)	0.075 (0.0029)
			EX	0.020 – 0.047 (0.0008 – 0.0019)	0.085 (0.0033)
	Valve guide projection above cylinder head		IN	13.1 – 13.3 (0.516 – 0.524)	—
			EX	11.3 – 11.5 (0.445 – 0.453)	—
Seat width			IN/EX	0.9 – 1.1 (0.035 – 0.043)	1.5 (0.06)
Valve spring	Free length		Inner	31.92 (1.257)	30.62 (1.206)
			Outer	35.36 (1.392)	33.86 (1.333)
Valve lifter	O.D.			25.978 – 25.993 (1.0228 – 1.0233)	25.97 (1.022)
	Bore I.D.			26.010 – 26.026 (1.0240 – 1.0246)	26.04 (1.025)

## GENERAL INFORMATION

CLUTCH/GEARSHIFT LINKAGE		Unit: mm (in)	
ITEM		STANDARD	SERVICE LIMIT
Clutch lever free play		10-20 (3/8 - 3/4)	—
Clutch spring free length		49.7 (1.96)	48.3 (1.90)
Clutch disc thickness		2.92 - 3.08 (0.115 - 0.121)	2.60 (0.102)
Clutch plate warpage		—	0.30 (0.012)
Clutch outer guide	O.D.	34.975 - 34.991 (1.3770 - 1.3776)	34.965 (1.3766)
	I.D.	21.994 - 22.007 (0.8659 - 0.8664)	22.017 (0.8668)
Mainshaft O.D. at clutch outer guide		21.980 - 21.993 (0.8654 - 0.8659)	21.95 (0.864)

TRANSMISSION			Unit: mm (in)	
ITEM			STANDARD	SERVICE LIMIT
Trans- mission	Gear I.D.	M5, M6	28.000 - 28.021 (1.1024 - 1.1032)	28.04 (1.104)
		C2, C3, C4	31.000 - 31.025 (1.2205 - 1.2215)	31.04 (1.222)
	Gear bushing O.D.	M5, M6	27.959 - 27.980 (1.1007 - 1.1016)	27.94 (1.100)
		C2	30.959 - 30.980 (1.2189 - 1.2197)	30.94 (1.218)
		C3, C4	30.950 - 30.975 (1.2185 - 1.2195)	30.93 (1.218)
	Gear bushing I.D.	M5	24.985 - 25.006 (0.9837 - 0.9845)	25.016 (0.9849)
		C2	27.985 - 28.006 (1.1018 - 1.1026)	28.021 (1.1032)
	Gear-to-bushing clearance	at M5, M6 gear	0.020 - 0.062 (0.0008 - 0.0024)	—
		at C2, C3, C4 gear	0.020 - 0.070 (0.0008 - 0.0028)	—
	Mainshaft O.D.	at M5 gear bushing	24.967 - 24.980 (0.9830 - 0.9835)	24.960 (0.9827)
		at clutch outer guide	21.980 - 21.993 (0.8654 - 0.8659)	21.95 (0.8694)
	Countershaft O.D.	at C2 gear bushing	27.967 - 27.980 (1.1011 - 1.1016)	27.96 (1.101)
	Gear bushing-to-shaft clearance	at M5 gear	0.005 - 0.039 (0.0002 - 0.0015)	—
		at C2 gear	0.005 - 0.039 (0.0002 - 0.0015)	—
Shift fork/ shaft	Fork claw thickness		5.93 - 6.00 (0.233 - 0.236)	5.90 (0.232)
	Fork I.D.		12.000 - 12.021 (0.4724 - 0.4733)	12.030 (0.4736)
	Shaft O.D.		11.957 - 11.968 (0.4707 - 0.4712)	11.95 (0.470)

**GENERAL INFORMATION**

Unit: mm (in)

CYLINDER/PISTON/CRANKSHAFT ITEM		STANDARD	SERVICE LIMIT	
Cylinder	I.D.	65.000 – 65.015 (2.5591 – 2.5596)	65.10 (2.563)	
	Taper	—	0.10 (0.004)	
	Out of round	—	0.10 (0.004)	
	Warpage	—	0.10 (0.004)	
Piston, piston ring and piston pin	Piston mark direction	"IN" mark facing to the intake side	—	
	Piston O.D.	64.970 – 64.990 (2.5579 – 2.5587) at 11 (0.4) from bottom of skirt	64.90 (2.555)	
	Piston pin hole I.D.	17.002 – 17.008 (0.6694 – 0.6696)	17.02 (0.670)	
	Cylinder-to-piston clearance	0.010 – 0.045 (0.0004 – 0.0018)	0.10 (0.004)	
	Piston pin O.D.	16.994 – 17.000 (0.6690 – 0.6693)	16.98 (0.669)	
	Piston-to-piston pin clearance	0.002 – 0.014 (0.0001 – 0.0006)	0.04 (0.0016)	
	Connecting rod-to-piston pin clearance	0.016 – 0.040 (0.0006 – 0.0016)	0.06 (0.0024)	
	Piston ring-to-ring groove clearane	Top	0.025 – 0.060 (0.0010 – 0.0024)	0.08 (0.003)
		Second	0.015 – 0.050 (0.0006 – 0.0020)	0.08 (0.003)
	Piston ring end gap	Top	0.20 – 0.35 (0.008 – 0.014)	0.5 (0.02)
		Second	0.35 – 0.50 (0.014 – 0.020)	0.7 (0.03)
		Oil (side rail)	0.2 – 0.7 (0.01 – 0.03 )	1.0 (0.04)
	Piston ring mark	Top	"T" or "R" mark facing up	—
Second		"T" or "RN" mark facing up	—	
Crankshaft, connecting rod	Connecting rod small end I.D.	17.016 – 17.034 (0.6699 – 0.6706)	17.04 (0.671)	
	Connecting rod big end side clearane	0.10 – 0.25 (0.004 – 0.01)	0.30 (0.012)	
	Crankshaft runout	—	0.05 (0.002)	
	Crankpin oil clearance	0.028 – 0.052 (0.0011 – 0.0020)	0.06 (0.002)	
	Main journal oil clearance	0.020 – 0.045 (0.0008 – 0.0018)	0.05 (0.002)	

## GENERAL INFORMATION

Unit: mm (in)

FRONT WHEEL/SUSPENSION/STEERING			
ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		—	1.5 (0.06)
Cold tire pressure	UP to 90 kg (200 lb) load	36 psi (2.50 kg/cm <sup>2</sup> , 250 kPa)	—
	Up to maximum weight capacity	36 psi (2.50 kg/cm <sup>2</sup> , 250 kPa)	—
Axle runout		—	0.2 (0.01)
Wheel rim runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Wheel balance weight		—	60g (2.1 oz) max.
Fork spring free length		317.9 (12.6)	311.5 (12.3)
Fork spring direction		With tightly wound coil facing down	—
Fork tube runout		—	2.0 (0.08)
Recommended fork fluid		Pro Honda Suspension fluid SS-8	—
Fork fluid level		117 (4.61)	—
Fork fluid capacity		463 cc (15.7 US oz, 16.3 Imp oz)	—
Spring pre-load adjuster standard position		3rd groove	—
Rebound adjuster standard position		7 clicks out from full in	—
Steering stem bearing pre-load		0.15 – 0.20 kg-m (1.1 – 1.4 lb-ft)	—

Unit: mm (in)

REAR WHEEL/SUSPENSION			
ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		—	2.0 (0.08)
Cold tire pressure	Up to 90 kg (200 lb) load	42 psi (2.90 kg/cm <sup>2</sup> , 290 kPa)	—
	Up to maximum weight capacity	42 psi (2.90 kg/cm <sup>2</sup> , 290 kPa)	—
Axle runout		—	0.2 (0.01)
Wheel rim runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Wheel balance weight		—	60g (2.1 oz) max.
Drive chain slack		15 – 25 (5/8 – 1)	—
Drive chain size/link	RK	RK50MFO/108	—
	DID	DID50V4/108	—
Drive chain slider thickness		—	To the indicator
Damper gas pressure/compressed gas		10 kg/cm <sup>2</sup> (980 kPa)/Nitrogen	—
Spring pre-load adjuster standard position		2nd	—
Rebound adjuster standard position		1 turn out from full in	—
Compression adjuster standard position		1 turn out from full in	—

## GENERAL INFORMATION

Unit: mm (in)

HYDRAULIC DISC BRAKE ITEM		STANDARD	SERVICE LIMIT
Specified brake fluid		DOT 4 brake fluid	—
Brake pad wear		—	To the groove
Brake disc thickness	FR	3.8 – 4.2 (0.15 – 0.17)	3.5 (0.14)
	RR	4.8 – 5.2 (0.19 – 0.20)	4.0 (0.16)
Brake disc runout		—	0.3 (0.012)
Master cylinder I.D.	FR	12.700 – 12.743 (0.5000 – 0.5017)	12.76 (0.502)
	RR	14.000 – 14.043 (0.5512 – 0.5529)	14.055 (0.5533)
Master piston O.D.	FR	12.675 – 12.684 (0.4983 – 0.4994)	12.65 (0.498)
	RR	13.957 – 13.984 (0.5495 – 0.5506)	13.945 (0.5490)
Caliper cylinder I.D.	FR	25.400 – 25.450 (1.0000 – 1.0020)	25.46 (1.002)
	RR	38.180 – 38.230 (1.5031 – 1.5051)	38.24 (1.506)
Caliper piston O.D.	FR	25.335 – 25.368 (0.9974 – 0.9987)	25.33 (0.997)
	RR	38.098 – 38.148 (1.4999 – 1.5019)	38.09 (1.500)

CHARGING SYSTEM/ALTERNATOR ITEM			SPECIFICATIONS
Current leakage			1.2 mA maximum
Alternator charging coil resistance (At 68°F/20°C)			0.1 – 1.0 Ω
Regulator/rectifier regulated voltage			13.0 – 15.5 V at 5,000 rpm
Battery	Capacity		12V-8Ah
	Charging rate	Normal	0.9 A/5 – 10 hr
		Quick	4.0 A/1.0 hr
	Voltage	Fully charged	Over 13.0 V
Needs charging		Below 12.3 V	

IGNITION SYSTEM ITEM		SPECIFICATIONS	
Spark plug	Standard	NGK	NIPPONDENSO
		CR9EH9	U27FER9
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 coil resistance (At 20°C/68°F)	Primary	2.5 – 3.1 Ω	
	Secondary: with plug cap	21 – 25 kΩ	
	Secondary: without plug wire	11 – 15 kΩ	
Ignition pulse generator resistance (At 20°C/68°F)		460 – 580 Ω	
Ignition timing "F" mark	49 state, Canada type	10° BTDC at 1,200 ± 100 rpm	
	California type	5° BTDC at 1,400 ± 100 rpm	

## GENERAL INFORMATION

Unit: mm (in)

### ELECTRIC STARTER/STARTER CLUTCH

ITEM	STANDARD	SERVICE LIMIT
Starter driven gear O.D.	51.699 – 51.718 (2.0354 – 2.0361)	51.684 (2.0348)
Starter motor brush length	12.0 – 13.0 (0.47 – 0.51)	4.5 (0.18)

### LIGHTS/METERS/SWITCHES

ITEM		SPECIFICATIONS
Fuse	Main	30 A
	Sub	15 A X 1, 10 A X 3
Bulb	Headlight (high/low beam)	12 V – 60/55W
	Brake/tail light	12 V – 32/3 cp
	License light	12 V – 4 cp
	Front turn signal/running light	12 V – 32/3 cp X 2
	Rear turn signal light	12 V – 32 cp X 2
	Instrument light	12 V – 1.7 W X 4
	High beam indicator	12 V – 1.7 W
	Turn signal indicator	12 V – 3 W X 2
	Neutral indicator	12 V – 1.7 W
	Side stand indicator	12 V – 1.7 W
	Oil pressure warning indicator	12 V – 1.7 W
Fuel pump flow capacity (min./minute)		700 cc (23.7 US oz, 24.6 Imp oz)
Coolant temperature sensor resistance	80°C/176°F	45 – 60 Ω
	120°C/ 248°F	10 – 20 Ω
Fan motor switch	Start to close (ON)	98 – 102°C (208 – 216°F)
	Stops to open (OFF)	93 – 97°C (199 – 207°F)

## TORQUE VALUES

STANDARD FASTENER TYPE	TORQUE	FASTENER TYPE	TORQUE
	N·m (kg-m, lb-ft)		N·m (kg-m, lb-ft)
5mm hex bolt and nut	5 (0.5, 3.5)	5 mm screw	4 (0.4, 3)
6mm bolt and nut	10 (1.0, 7)	6 mm screw	9 (0.9, 7)
8mm bolt and nut	22 (2.2, 16)	6 mm flange bolt (8 mm head)	9 (0.9, 7)
10mm hex bolt and nut	35 (3.5, 25)	6 mm flange bolt (10 mm head)	12 (1.2, 9)
12mm hex bolt and nut	55 (5.5, 40)	and nut	
		8 mm flange bolt and nut	27 (2.7, 20)
		10 mm flange bolt and nut	40 (4.0, 29)

- Torque specifications listed below and on pages 1-14 and 1-15 are for important fasteners.
- All others should be tightened to the standard torque values listed above.

- NOTES :
1. Apply sealant to the threads.
  2. Apply a locking agent to the threads.
  3. Apply molybdenum disulfide oil (a 50/50 mixture of engine oil and molybdenum disulfide grease) to the threads and seating surface.
  4. Left hand threads.
  5. Stake.
  6. Apply oil to the threads and seating surface.
  7. Apply clean engine oil to the O-ring.
  8. Torque wrench scale reading using a special tool.
  9. Apply grease to the threads and seating surface.
  10. UBS bolt.
  11. Do not apply molybdenum disulfide oil to the threads and seating surface.

## ENGINE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE	REMARKS
			N·m (kg-m, lb-ft)	
<b>Lubrication System :</b>				
Oil drain bolt	1	12	30 (3.0, 22)	
Oil filter cartridge	1	20	10 (1.0, 7)	NOTE 7
Oil filter boss	1	20	18 (1.8, 13)	NOTE 2
Oil pump driven sprocket bolt	1	6	15 (1.5, 11)	NOTE 2
Oil cooler sealing bolt	1	18	50 (5.0, 36)	NOTE 2
Oil pump cover bolt	1	6	8 (0.8, 5.8)	CT Bolt
<b>Cooling System :</b>				
Thermosensor	1	PT 1/8	10 (1.0, 7)	NOTE 1
Fan motor switch	1	—	10 (1.0, 7)	NOTE 1
Water pump bolt	3	6	13 (1.3, 9)	CT Bolt
<b>Fuel System :</b>				
Fuel valve nut	1	22	35 (3.5, 25)	
<b>Cylinder Head :</b>				
Cylinder head bolt	10	9	48 (4.8, 35)	NOTE 3
Spark plug	4	10	12 (1.2, 9)	
Cylinder head cover bolt	6	6	10 (1.0, 7)	
Camshaft holder bolt	20	6	12 (1.2, 9)	NOTE 6
Cylinder head cover breather plate bolt	2	6	12 (1.2, 9)	NOTE 2
Cylinder head stud bolt	8	8	26 (2.6, 19)	
Cam sprocket bolt	4	7	20 (2.0, 14)	NOTE 2
Cylinder head sealing bolt	2	18	33 (3.3, 24)	NOTE 1
Water hose joint	2	10	25 (2.5, 18)	
Vacuum joint	3	5	2.5 (0.25, 1.8)	
Cam chain tensioner slidercap nut	1	6	12 (1.2, 9)	
<b>Clutch/Gearshift Linkage :</b>				
Clutch center lock nut	1	20	110 (11.0, 80)	NOTE 5, 6
Gearshift spindle return spring pin	1	8	23 (2.3, 17)	
Shift drum center bolt	1	8	23 (2.3, 17)	NOTE 2
Clutch spring bolt	4	6	12 (1.2, 9)	
Drum stopper arm bolt	1	6	12 (1.2, 9)	
Right crankcase cover bolt	10	6	12 (1.2, 9)	

## GENERAL INFORMATION

ENGINE (cont'd)				
ITEM	Q'TY	THREAD DIA.(mm)	TORQUE	REMARKS
			N·m (kg·m, lb·ft)	
<b>Crankcase/Cylinder/Piston :</b>				
Crankcase 6 mm bolt	20	6	12 (1.2, 9)	
Crankcase 8 mm bolt	1	8	24 (2.4, 17)	
Main journal bolt	10	8	26 (2.6, 19)	NOTE 6, 11
Crankcase 10 mm bolt	1	10	40 (4.0, 29)	
Connecting rod bearing cap nut	8	7	26 (2.6, 19)	NOTE 6, 11
Neutral switch	1	10	12 (1.2, 9)	NOTE 1
Oil pressure switch	1	PT 1/8	12 (1.2, 9)	NOTE 1
Sealing bolt	2	20	30 (3.0, 22)	NOTE 1
	1	14	25 (2.5, 18)	NOTE 1
<b>Charging System/Alternator :</b>				
Flywheel bolt	1	10	105 (10.5, 76)	NOTE 6
Starter clutch bolt	6	6	16 (1.6, 12)	NOTE 2
Stator bolt	4	6	12 (1.2, 9)	
Stator wire clamp bolt	1	6	10 (1.0, 7)	
<b>Ignition System :</b>				
Ignition pulse generator rotor cover cap	1	45	18 (1.8, 13)	NOTE 9
Ignition pulse generator rotor cover bolt	8	6	12 (1.2, 9)	NOTE 1
Ignition pulse generator rotor bolt	1	10	60 (6.0, 43)	

FRAME				
ITEM	Q'TY	THREAD DIA.(mm)	TORQUE	REMARKS
			N·m (kg·m, lb·ft)	
<b>Frame/Body Panels/Exhaust System :</b>				
Exhaust pipe joint nut	6	7	20 (2.0, 14)	
Exhaust pipe band bolt	2	8	21 (2.1, 15)	
Muffler mounting bolt	1	8	27 (2.7, 20)	
Side stand pivot bolt	1	10	10 (1.0, 7)	
Side stand pivot lock nut	1	10	30 (3.0, 22)	
Side stand bracket bolt	2	10	55 (5.5, 40)	
Side stand switch bolt	1	6	10 (1.0, 7)	
Upper fairing stay bolt	2	8	27 (2.7, 20)	
Footpeg holder bolt	8	8	27 (2.7, 20)	
<b>Engine Mount :</b>				
Engine hanger plate bolt	2	10	45 (4.5, 33)	
Front engine mounting bolt/nut	2	10	65 (6.5, 47)	
Rear engine mounting nut	1	10	45 (4.5, 33)	
Rear lower engine mounting bolt	1	10	45 (4.5, 33)	
Engine mounting adjust bolt	1	20	15 (1.5, 11)	
Engine mounting lock nut	1	20	65 (6.5, 47)	
Drive sprocket bolt	1	10	55 (5.5, 40)	
Gearshift pedal pinch bolt (pedal side)	1	8	27 (2.7, 20)	
(arm side)	1	6	20 (2.0, 14)	
<b>Front Wheel/Suspension/Steering :</b>				
Ignition switch bolt	2	8	25 (2.5, 18)	
Handlebar pinch bolt	2	8	27 (2.7, 20)	
Fork cap bolt	2	37	23 (2.3, 17)	
Fork socket bolt	2	8	20 (2.0, 14)	NOTE 2
Steering stem nut	1	24	105 (10.5, 76)	



## FRAME (cont'd)

ITEM	Q'TY	THREAD DIA.(mm)	TORQUE	REMARKS
			N·m (kg-m, lb-ft)	
Steering adjustment nut	1	26	25 (2.5, 18)	NOTE 6 See page 12-25.
Fork pinch bolt (upper)	2	8	23 (2.3, 17)	
(lower)	2	10	40 (4.0, 29)	
Front axle bolt	1	14	60 (6.0, 43)	
Front axle pinch bolt	4	8	22 (2.2, 16)	
Front brake disc bolt	12	6	20 (2.0, 14)	NOTE 2
<b>Rear Wheel/Rear Suspension :</b>				
Drive chain adjuster lock nut	2	8	22 (2.2, 16)	
Rear axle nut	1	18	95 (9.5, 69)	
Shock absorber mounting nut	2	10	45 (4.5, 33)	
Shock link nut (frame side)	1	10	45 (4.5, 33)	
Shock link nut (shock arm side)	1	10	45 (4.5, 33)	
Shock arm bolt	1	10	45 (4.5, 33)	
Swingarm pivot nut	1	14	110 (11.0, 80)	
Drive chain slider screw	2	6	5.3 (0.53, 3.8)	
Rear brake disc bolt	4	8	43 (4.3, 31)	
Driven sprocket nut	4	12	90 (9.0, 65)	
<b>Brake System :</b>				
Rear master cylinder push rod lock nut	1	8	18 (1.8, 13)	
Rear master cylinder mounting bolt	2	6	9 (0.9, 7)	
Rear brake master cylinder reservoir bolt	1	6	12 (1.2, 9)	
Front brake caliper bracket bolt	4	8	31 (3.1, 22)	NOTE 2
Brake hose bolt	5	10	35 (3.5, 25)	
Front master cylinder holder bolt	2	6	12 (1.2, 9)	
Front brake light switch screw	1	4	1.2 (0.12, 0.9)	
Front reservoir cover 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)	
Breed valve	3	8	6 (0.6, 4.3)	
Brake pipe three way joint bolt	1	6	12 (1.2, 9)	
Front brake hose clamper bolt	1	6	12 (1.2, 9)	
Front brake pipe stay bolt	2	6	12 (1.2, 9)	
Brake pad pin	3	8	18 (1.8, 13)	
Brake pad pin plug	3	8	2.5 (0.25, 1.8)	
Brake pipe flare nut	2	10	17 (1.7, 12)	
Front caliper bracket pin bolt	2	5	13 (1.3, 9)	NOTE 2
Front brake caliper pin bolt	2	8	23 (2.3, 17)	NOTE 2
Rear brake caliper bracket bolt	1	8	23 (2.3, 17)	
Rear brake caliper pin bolt	1	10	28 (2.8, 20)	

**GENERAL INFORMATION**

**TOOLS**

DESCRIPTION	TOOL NUMBER	APPLICABILITY	REFER TO SECTION(S)
Drive chain cutter	07HMH-MR10102	or 07HMH-MR1010B	3
Link plate holder	07NMH-MW00110	or 07NMH-MW0011A	3
Oil filter wrench	07HAA-PJ70100		3
Oil pressure gauge	07506-3000000	or equivalent com-	4
Oil pressure gauge attachment	07510-4220100	mercially available in U.S.A.	4
Float level gauge	07401-0010000		5
Pilot screw wrench	07KMA-MS60101	or 07MMA-MT3010A	5
Pilot elbow wrench	07PMA-MZ20110	with 07PMA-MZ2011A	5
Pilot screw wrench	07908-4220201		5
Valve spring compressor	07757-0010000		8
Valve compressor attachment	07959-KM30101		8
Tappet hole protector	07HMG-MR70002	or equivalent (see page 8-11)	8
Valve guide driver, 4 mm	07GMD-KT70100		8
Valve guide reamer, 4.008 mm	07MMH-MV90100	or 07MMH-MV9010A	8
Valve seat cutter 24.5 mm (EX 45°)	07780-0010100	or equivalent com-	8
Valve seat cutter 27.5 mm (IN 45°)	07780-0010200	mercially available in U.S.A.	8
Valve seat cutter 24 mm (EX 32°)	07780-0012500		8
Valve seat cutter 27 mm (IN 32°)	07780-0013300		8
Valve seat cutter 22 mm (EX 60°)	07780-0014202		8
Valve seat cutter 26 mm (IN 60°)	07780-0014500		8
Cutter holder, 4.0 mm	07781-0010500		8
Valve guide driver	07743-0020000		8
Compression gauge attachment	07RMJ-MY50100	or equivalent commercial-ly available in U.S.A.	8
Driver	07749-0010000		9, 12, 13
Clutch center holder	07JMB-MN50300	or 07HGB-001000A	9
Pilot, 12mm	07746-0040200		9
Pilot, 35mm	07746-0040800		9
Attachment, 37 x 40 mm	07746-0010200		9
Attachment, 42 x 47 mm	07746-0010300		9
Attachment, 28 x 30 mm	07946-1870100		9, 13
Inner driver	07746-0030100		10, 11
Attachment, 25 mm I.D.	07746-0030200		10
Attachment, 30 mm I.D.	07746-0030300		11
Bearing remover shaft	07746-0050100	or equivalent com-	12, 13
Bearing remover head, 20 mm	07746-0050600	mercially available in U.S.A.	12, 13
Attachment, 42 x 47 mm	07746-0010300		12, 13
Attachment 52 x 55 mm	07746-0010400		12
Pilot, 20 mm	07746-0040500		12, 13
Fork seal driver	07947-KA50100		12
Fork seal driver attachment	07947-KF00100		12
Steering stem socket	07916-3710101	or 07916-3710100	12
Ball race remover	07953-MJ10000	Attachment (07953-MJ1000A	12
-driver attachment	07953-MJ10100	or 07935-MJ1000B), Driver	12
-driver handle	07953-MJ10200	(07949-3710001) and Attachment, 37 x 40 mm (07746-010200)	12
Ball race remover	07946-3710500		12
Steering stem driver	07946-MB00000		12
Pilot, 22 mm	07746-0041000		13
Attachment, 24 x 26 mm	07746-0010700		13
Attachment, 32 x 35 mm	07746-0040400		13
Pilot, 17 mm	07746-0040600		13
Pilot, 25 mm	07746-0010100		13
Driver shaft	07946-MJ00100		13
Bearing remover attachment	07LMC-KV30200		13
Pin driver	07GMD-KT80100	Not available in U.S.A. Driver (07949-3710001) and Pilot, 22 mm (07746-0041000)	13

**GENERAL INFORMATION**

(cont'd)	DESCRIPTION	TOOL NUMBER	APPLICABILITY	REFER TO SECTION(S)
	Remover handle	07936-3710100		13
	Bearing remover	07936-3710300		13
	Remover weight	07741-0010201	or 07936-3710200	13
	Snap ring pliers (IN)	07914-3230001		14
	Digital multimeter (KOWA)	07411-0020000	KS-AHM-32-003 (U.S.A. only)	15, 16, 17, 18
	Analog multimeter (SANWA)	07308-0020001		15, 16, 17, 18
	Analog multimeter (KOWA)	TH-5H		15, 16, 17, 18
	Peak voltage adaptor	07HGJ-0020100	or Imrie diagnostic tester (model 625)	16
	Inspection adaptor	07GMJ-ML80100		16
	Flywheel holder	07925-ME90000	or equivalent commer- cially available in U.S.A.	17
	Rotor puller	07733-0020001	07933-2160000 (U.S.A. only)	17
	Flywheel holder	07725-0040000	or equivalent commer- cially available in U.S.A.	17
	Torx bit (T 30)	07703-0010200		17
	Torx bit (T 40)	07703-0010100		18

**GENERAL INFORMATION**

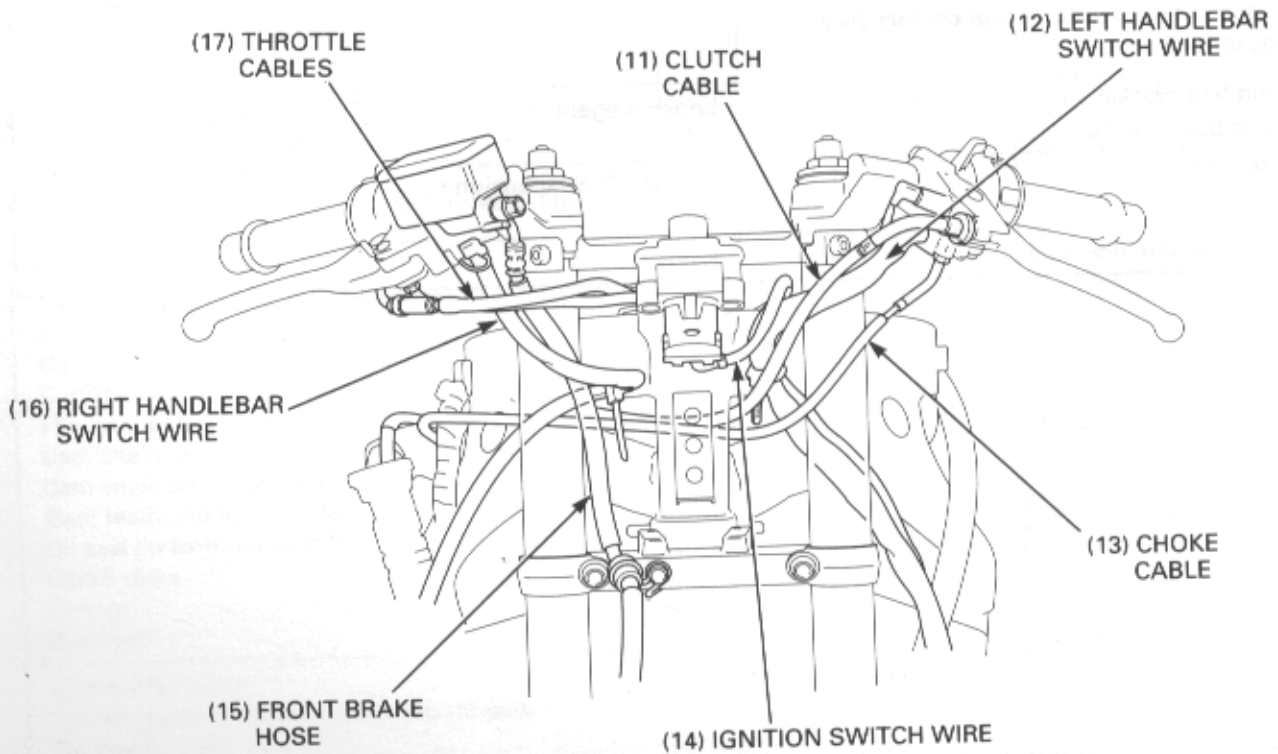
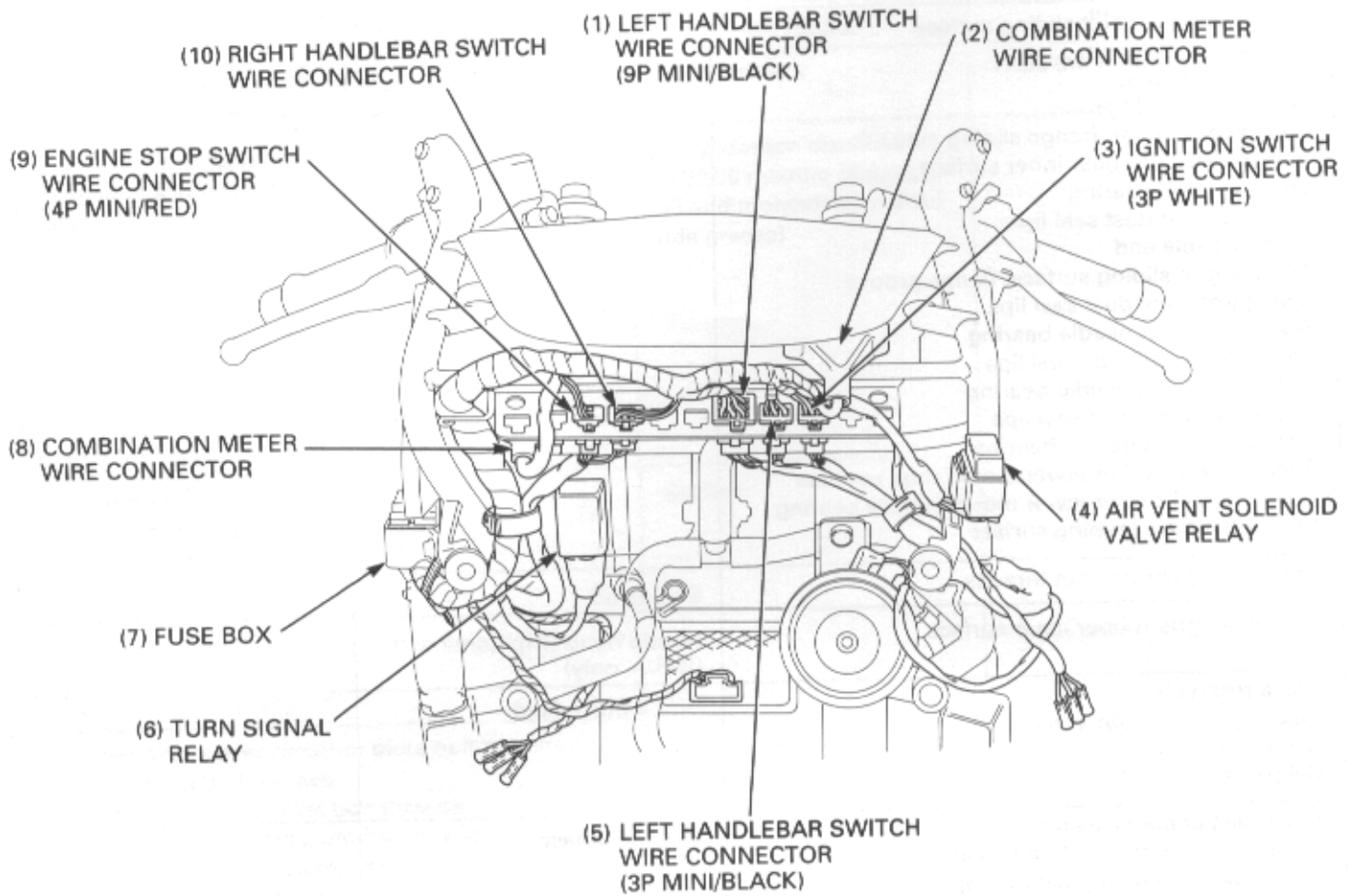
**LUBRICATION & SEAL POINTS**

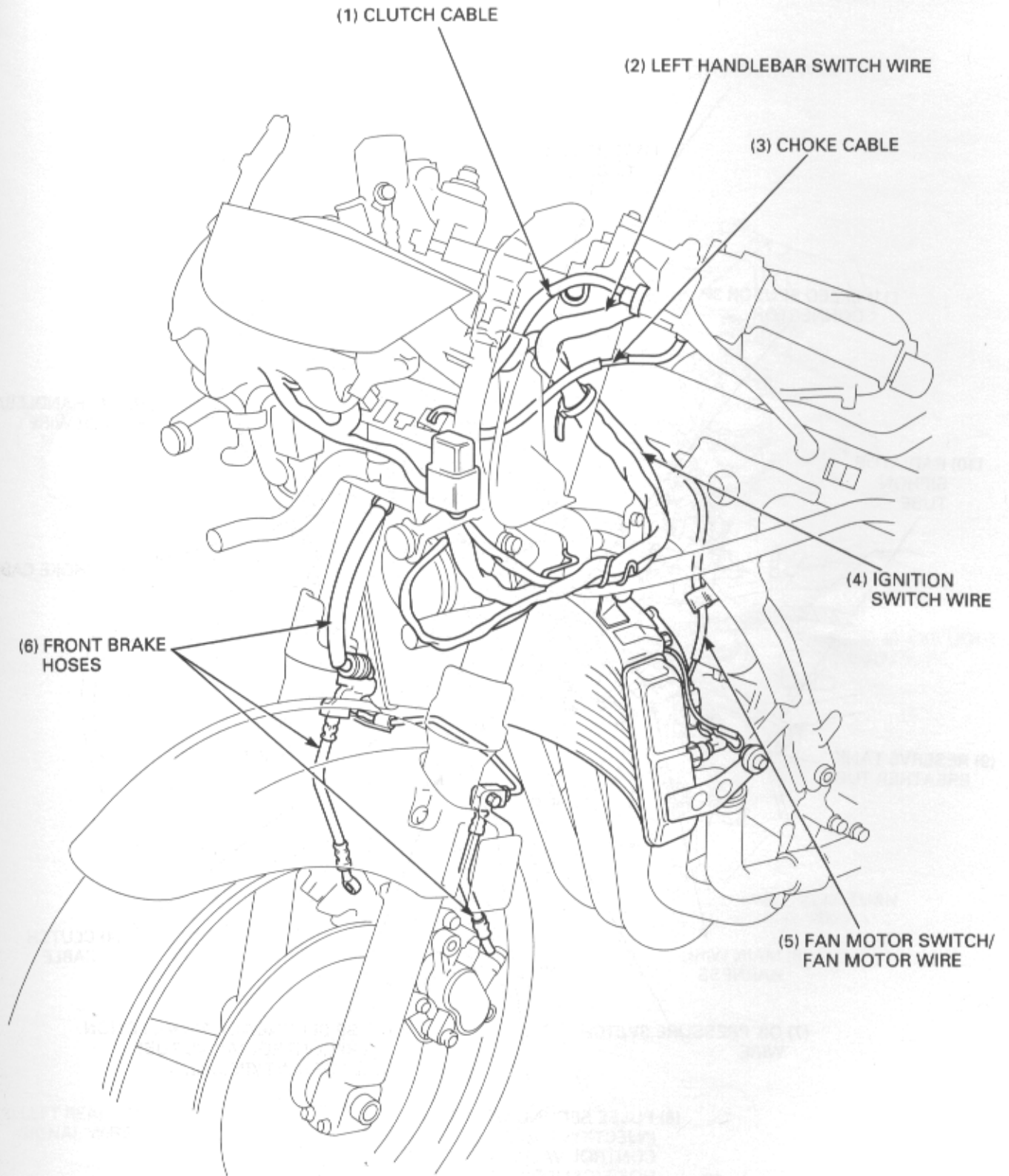
ENGINE	LOCATION	MATERIAL	REMARKS
	Cylinder head semicircular cut-out Crankcase mating surface	Liquid sealant	Wipe the excess of sealant
	Camshaft lobes/journals Valve lifter sliding surfaces Valve stem (valve guide sliding surface) Connecting rod small end inner surface Main journal bearings Connecting rod bearings M3/4. C5. C6 gear shift fork grooves Cylinder head bolt threads and seating surface Crankshaft thrust surfaces Clutch outer sliding surfaces Starter idle gear shaft sliding surfaces	Molybdenum disulfide oil (a 50/50 mixture of engine oil and molybdenum disulfide grease)	
	Oil pressure switch threads Lower crankcase sealing bolt threads Cylinder head sealing bolt threads Alternator grommet Ignition pulse generator grommet Ignition pulse generator rotor cover bolt threads (Marked by "△" mark) Thermosensor threads	Sealant	
	Cylinder head cover breather plate bolt threads Cam sprocket bolt threads Oil pump driven sprocket bolt threads Shift drum bearing set plate bolt threads Starter clutch outer bolt threads Oil cooler sealing bolt threads Shift drum center bolt threads Gearshift spindle oil seal set plate bolt threads Mainshaft bearing set plate bolt threads Oil filter boss threads	Locking agent	Clean and apply to the threads
	Clutch center lock nut threads Starter clutch sliding surface Piston sliding surface. piston ring grooves, pin bore Piston pin surface Piston rings Lower crankcase bolt threads and seating surface (main journal tightening) Connecting rod cap nut threads and seating surface Camshaft holder bolt threads and seating surface Flywheel bolt threads Cam chain tensioner collar sliding surface Cam chain tensioner and slipper surface Gear teeth and rotating surface Oil seal lip (without dust lip) Clutch disks O-rings Bearings	Engine oil	
	Clutch lifter piece Ignition pulse generator cover cap threads Oil seal lip (with dust lip)	Multipurpose grease	

FRAME	LOCATION	MATERIAL	REMARKS
	Side stand pivot bolt sliding surface Gearshift pedal pivot Brake pedal pivot Wheel dust seal lips Rear wheel; driven frange sliding area Rear wheel side collar inner surface Steering stem bearing Steering stem dust seal lip Throttle cable end Throttle grip sliding surface, flange groove Swingarm pivot dust seal lips Swingarm pivot needle bearing Shock arm pivot dust seal lips Shock arm pivot needle bearing Shock link pivot dust seal lips Shock link pivot needle bearing Rear shock absorber lower mount dust seal lips Rear shock absorber lower mount needle bearing Main stand pivot sliding surface	Multipurpose grease	
	Steering adjustment nut threads	Engine oil	
	Handlebar grip rubber inner surface	Honda Hand Grip Cement (U.S.A. only)	
	Brake reservoir Master piston/piston seals Caliper piston Caliper piston seals	DOT 4 brake fluid	
	Brake caliper boots inside Master cylinder rubber boots inside Rear master cylinder push rod top Rear brake caliper pin bolt sliding surface Front master cylinder piston; lever contact area Caliper dust seals	Silicone grease	
	Caliper pin bolt/bracket pin bolt threads Fork socket bolt threads	Locking agent	Clean and apply to the threads
	Fork oil seal lips	Pro Honda Suspension fluid SS-8	
	Air cleaner housing inlet tube joint	Sealant	

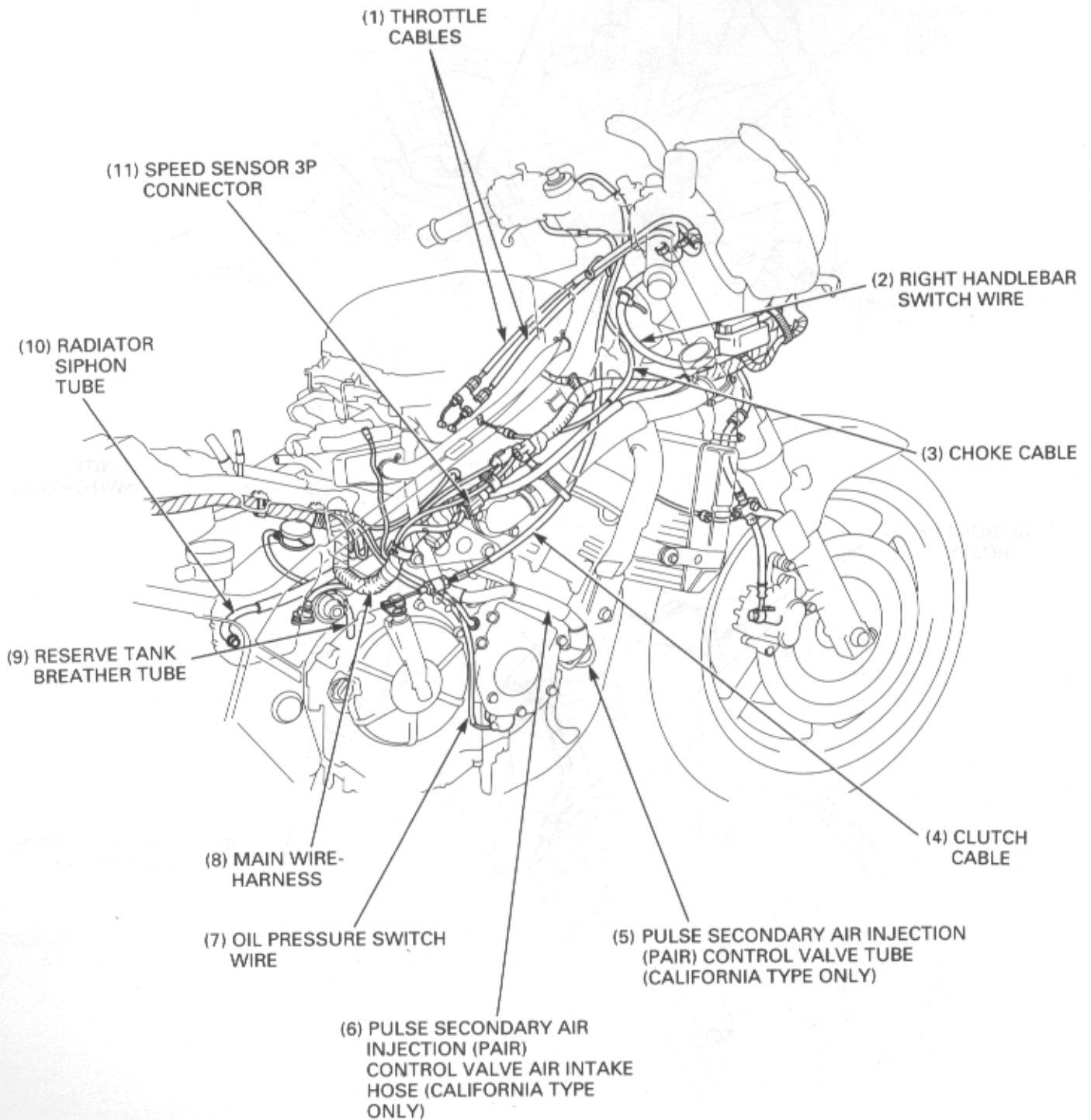
**GENERAL INFORMATION**

**CABLE & HARNESS ROUTING**

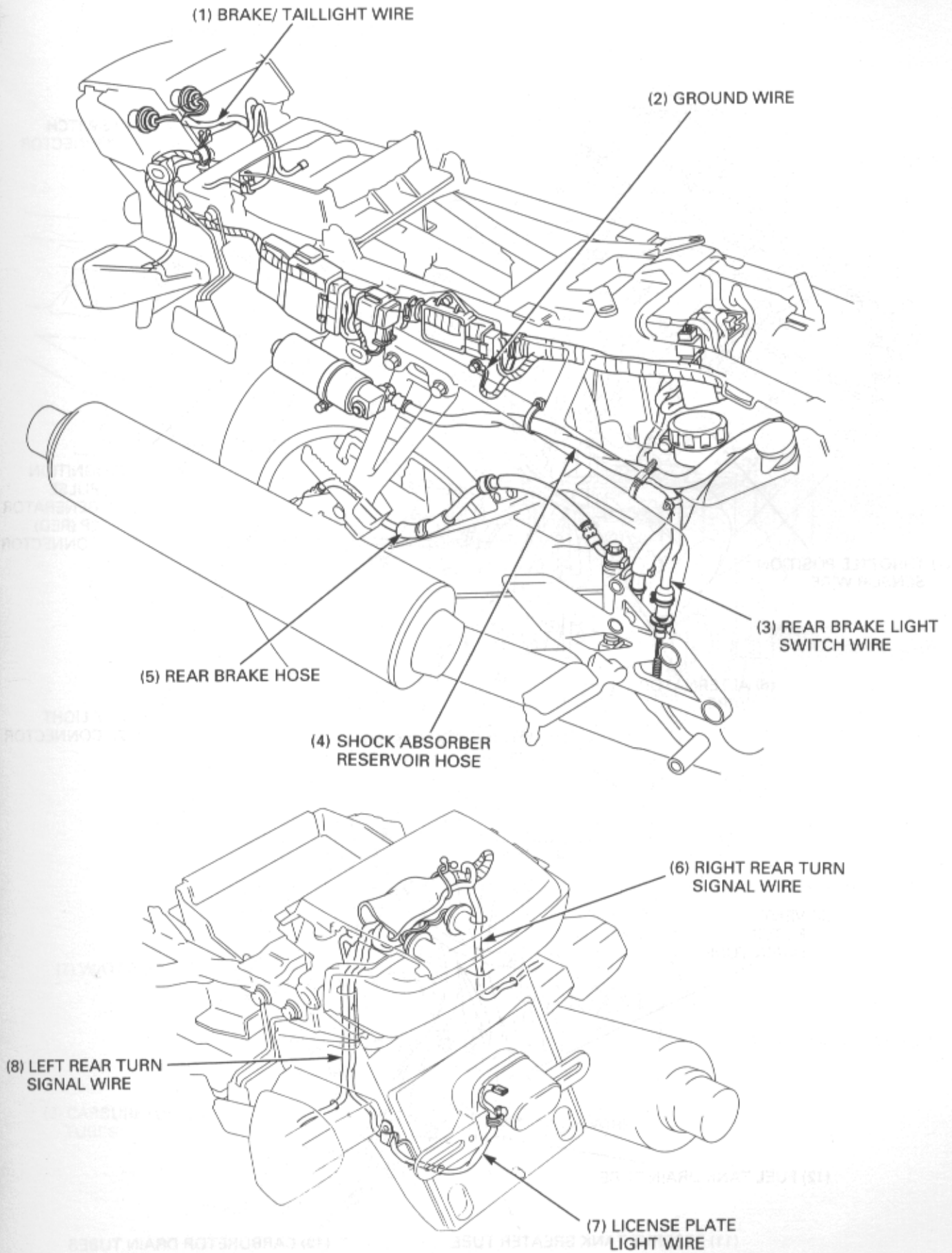




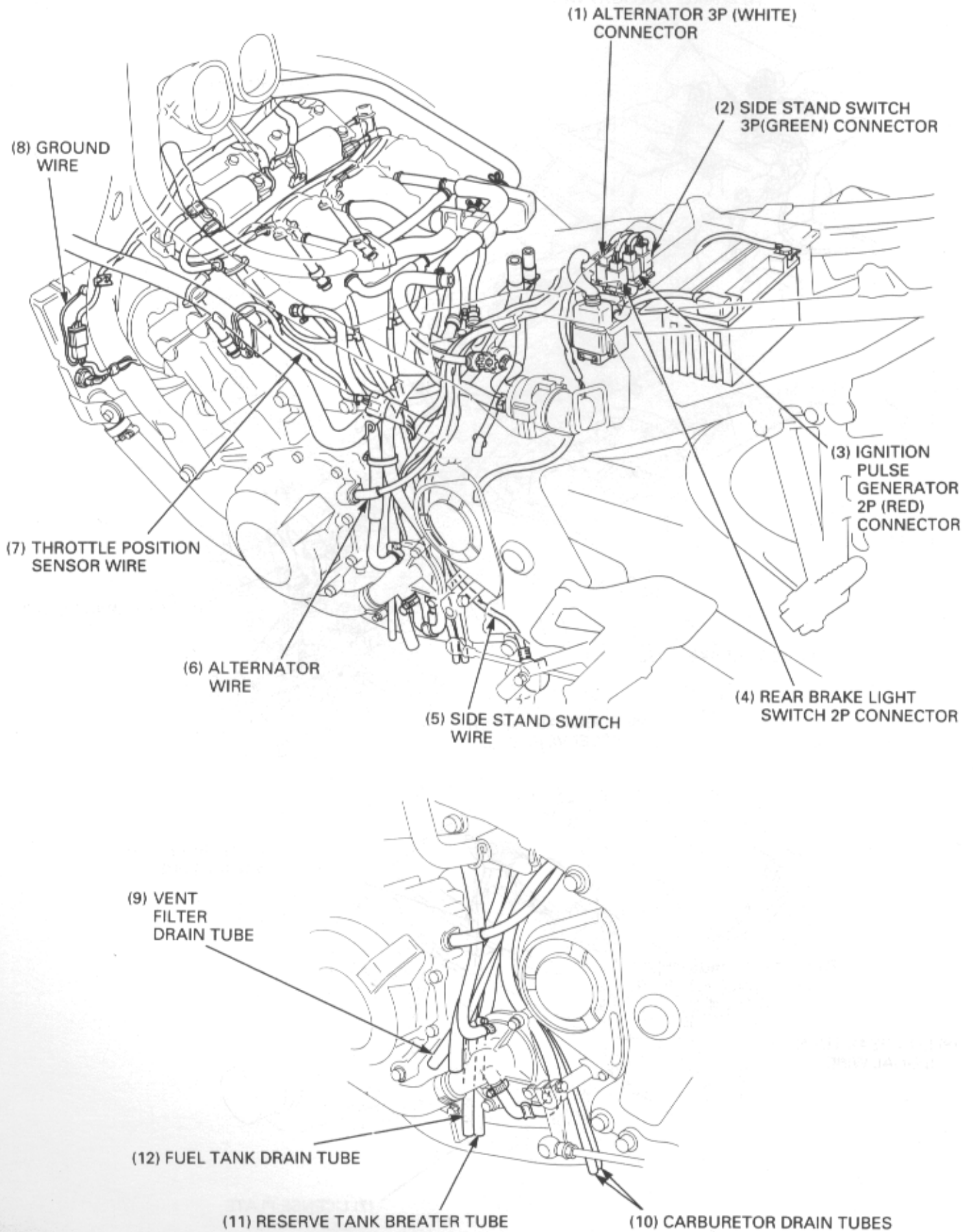
# GENERAL INFORMATION

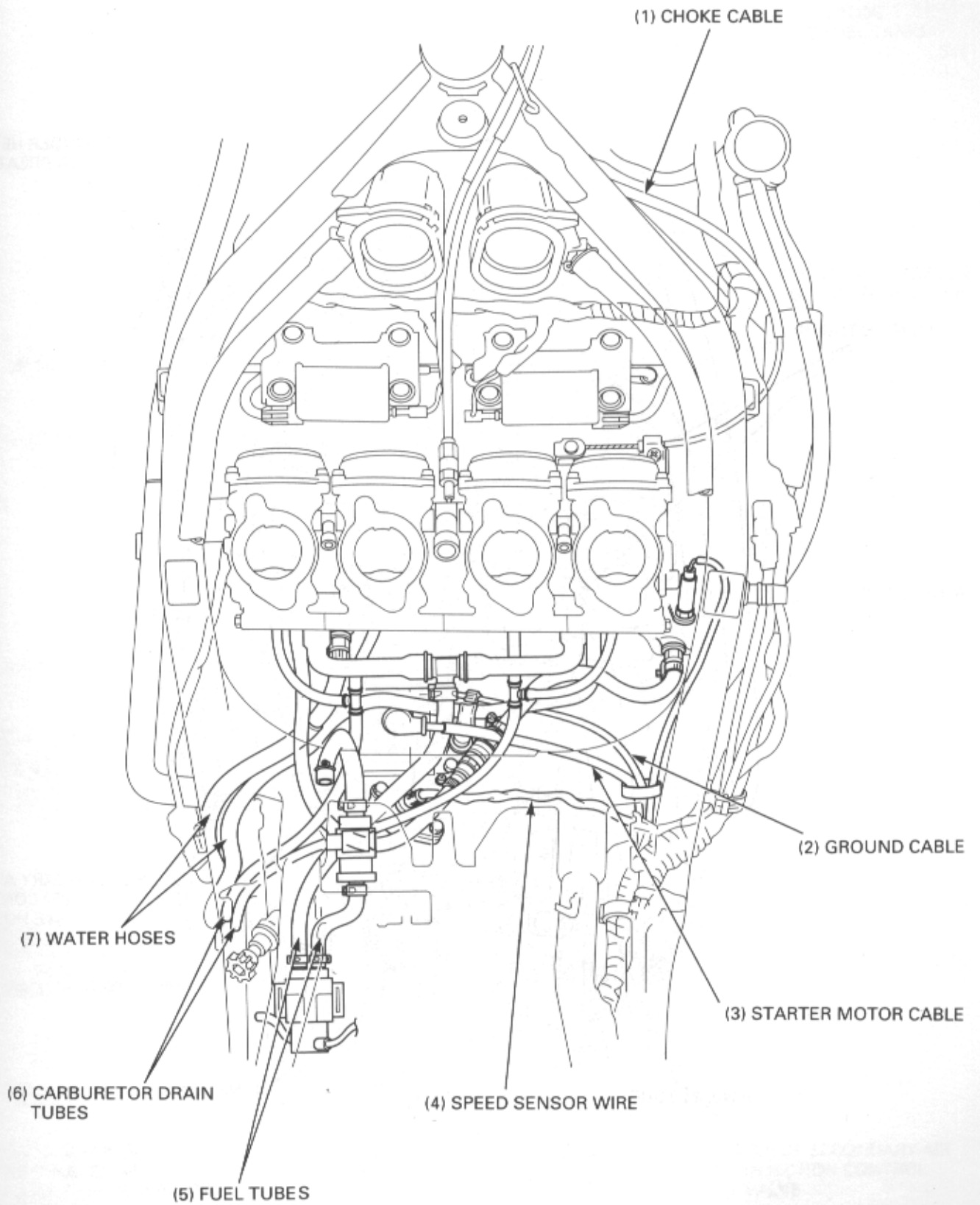






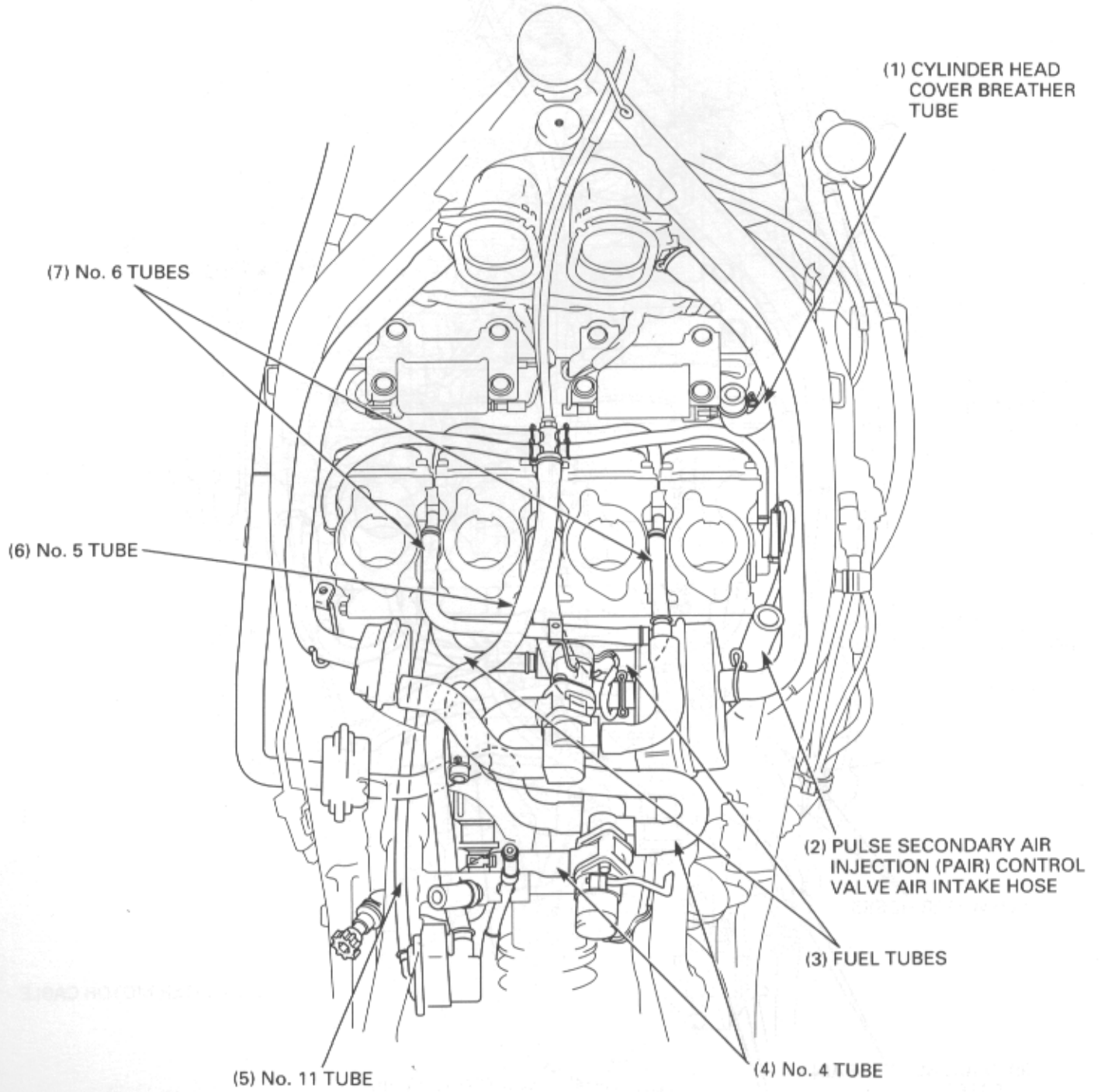
**GENERAL INFORMATION**

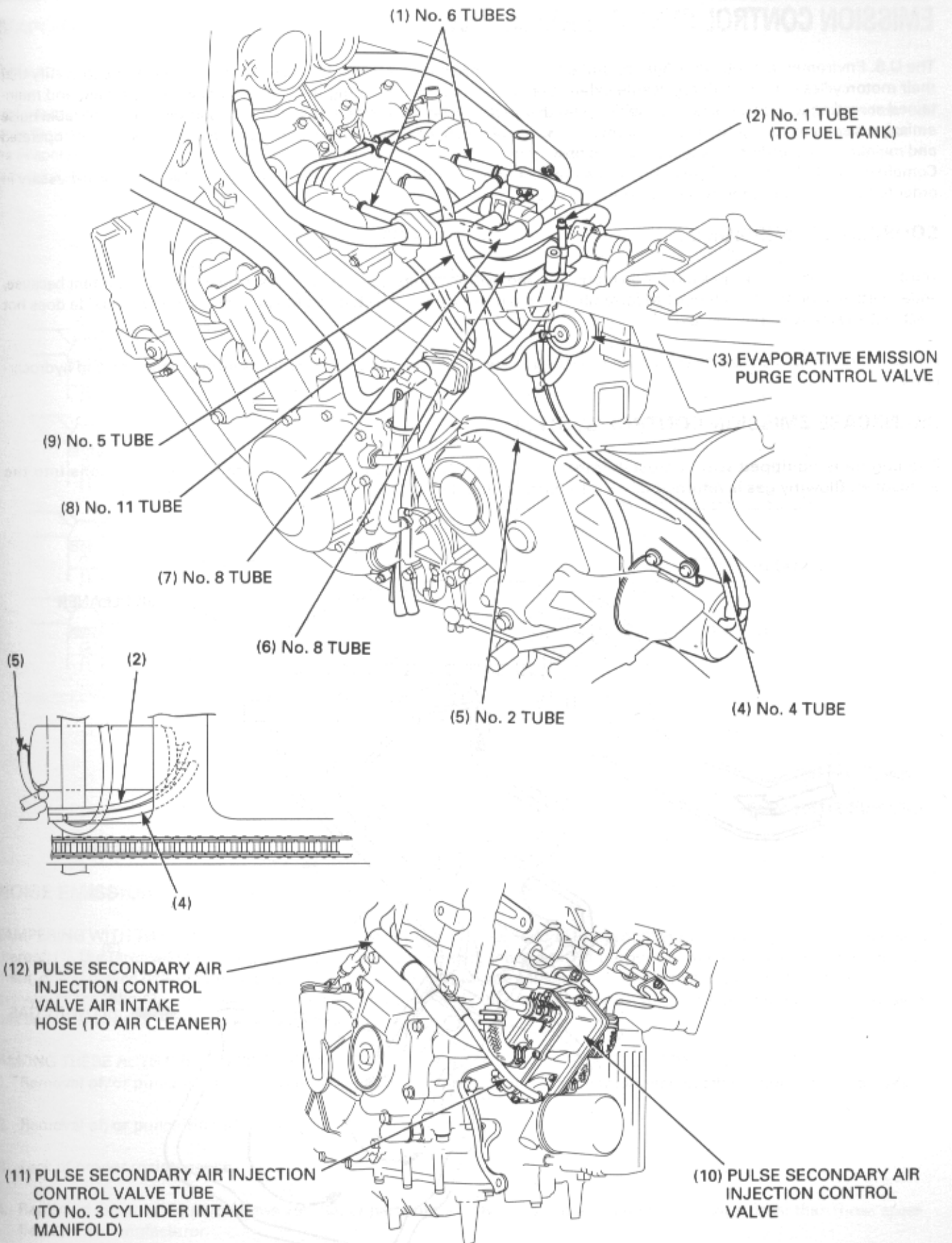




# GENERAL INFORMATION

CALIFORNIA TYPE ONLY:





## GENERAL INFORMATION

### EMISSION CONTROL SYSTEMS (U.S.A. only)

The U.S. Environmental Protection Agency and California Air Resources Board (CARB) require manufactures 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 1 year or 6,000 kilometers ( 3,730 miles) after the time of sale to the ultimate purchaser, when operated and maintained according to the illustrations provided.

Compliance with the terms of the Distributer's Warranties for Honda Motorcycle Emission Control Systems is necessary in order to keep the emissions system warranty in effect.

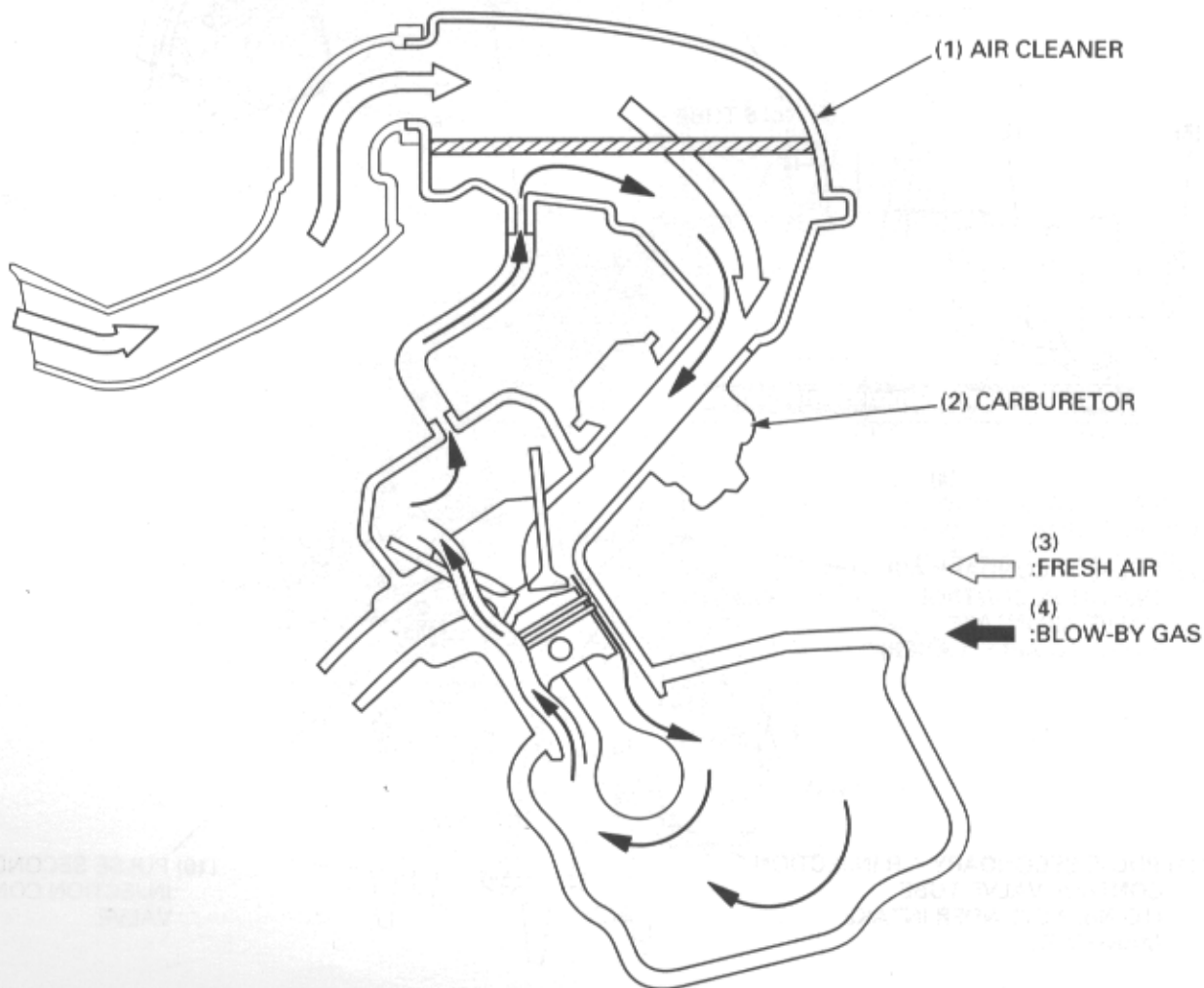
### SOURCES OF EMISSIONS

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

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

### CRANKCASE EMISSION CONTROL SYSTEM

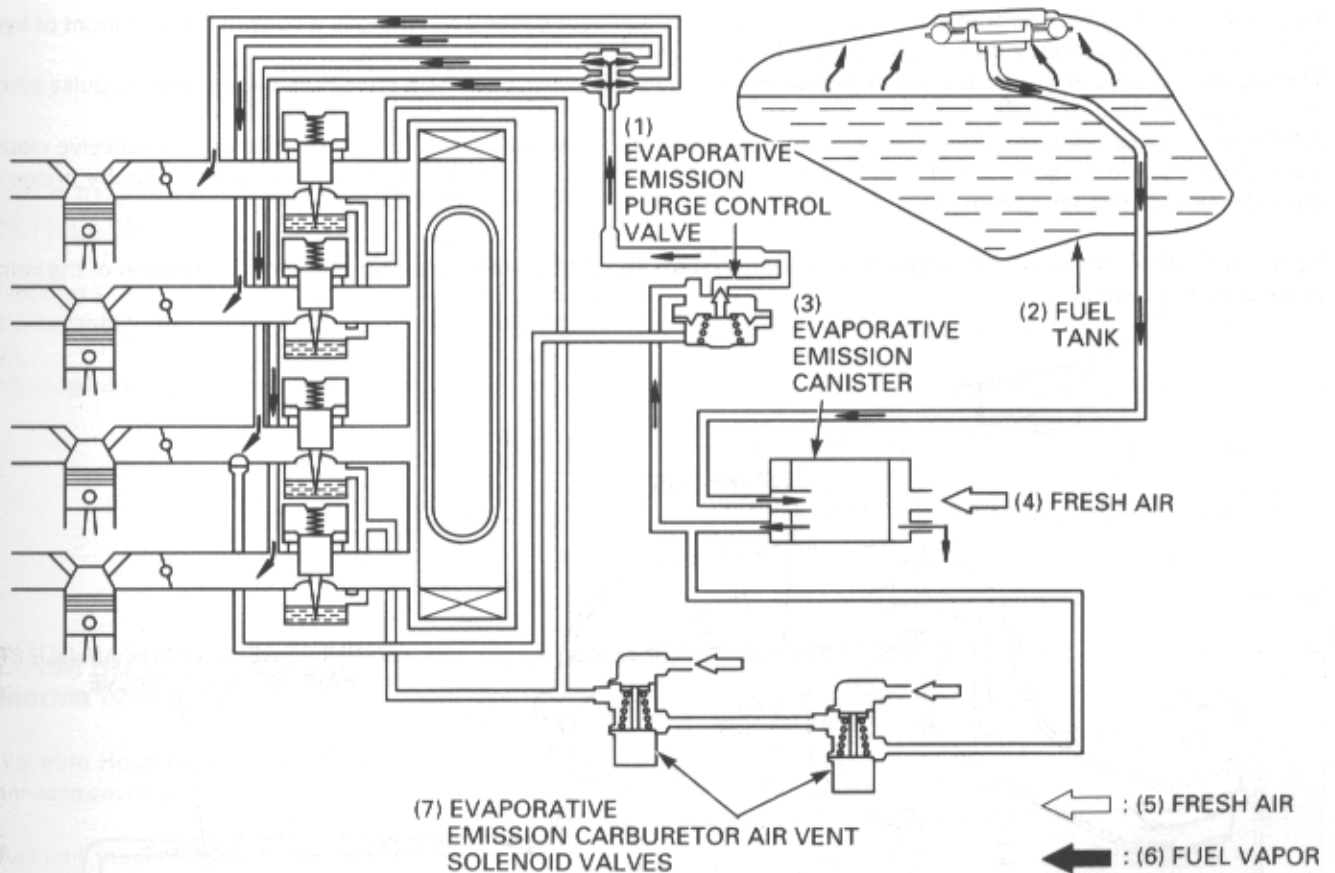
The engine is equipped with a closed crankcase system to prevent discharging crankcase emissions into the atmosphere. Blow-by gas is returned to the combustion chamber through the air cleaner and carburetor.



**EVAPORATIVE EMISSION CONTROL SYSTEM (California type only)**

This vehicle complies with the California Air Resources Board evaporative emission regulations.

Fuel vapor from the fuel tank and carburetors is routed into the evaporative emission canister where it is absorbed and stored while the engine is stopped. When the engine is running and the evaporative emission purge control valve is open fuel vapor in the evaporative emission canister is drawn into the engine through the carburetor. At the same time, the evaporative emission carburetor air vent solenoid 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 purpose of maintenance, repair or replacement, of any device or element of design incorporated into any new vehicle for purpose of noise control prior to its sale or delivery to the ultimate purchaser or while it is in use; or (2) the use of the vehicle after such device or element of design has been removed or rendered inoperative by any person.

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

1. Removal of, or puncturing the muffler baffles, header pipes or any other component which conducts exhaust gases.
2. Removal of, or puncturing of any parts 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.

## GENERAL INFORMATION

### EXHAUST EMISSION CONTROL SYSTEM

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

#### PULSE SECONDARY AIR INJECTION SYSTEM (California type only)

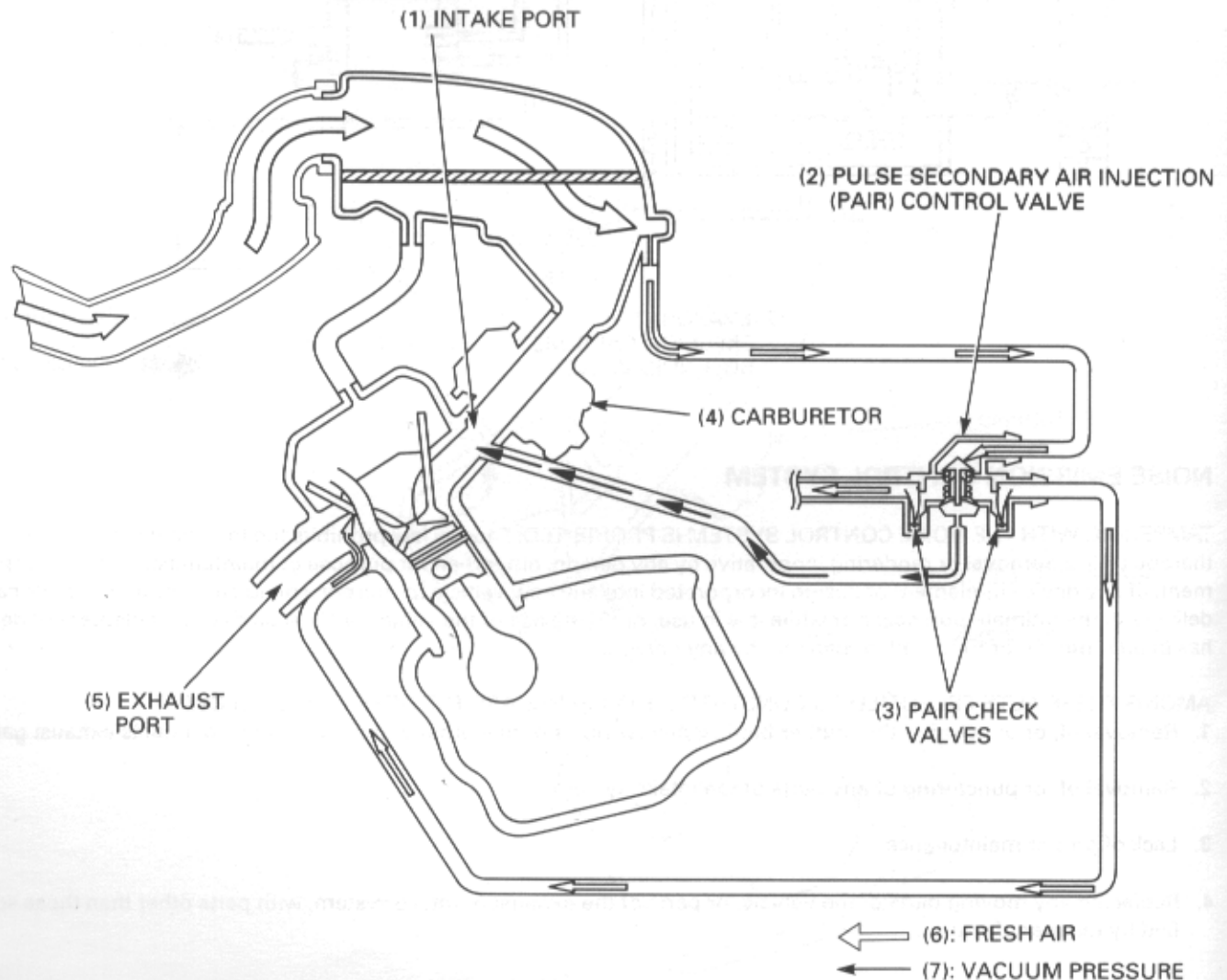
The exhaust emission control system consists of a pulse secondary air injection (PAIR) system which introduces filtered air into the exhaust gases in the exhaust port. Fresh air is drawn into the exhaust port whenever there is a negative pressure pulse in the exhaust system.

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 control valve; it consists of PAIR check valve built into the pulse secondary air injection control valve.

A PAIR check valve prevents reverse air flow through the system. The pulse secondary air injection 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.

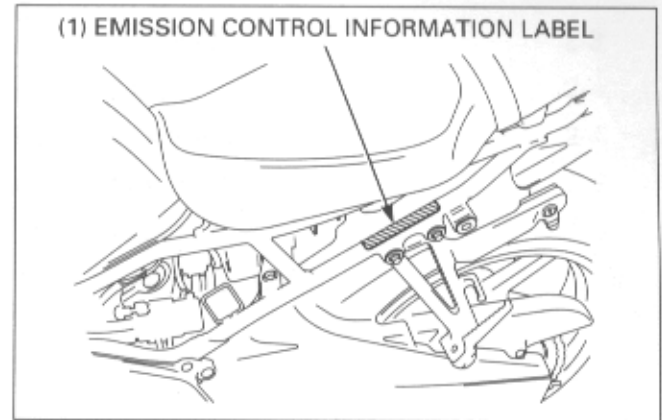




## EMISSION CONTROL INFORMATION LABELS (U.S.A. only)

An Emission Control Information Label is located on the frame under the left side cover as shown. It gives basic tune-up specifications. The left side cover must be removed to read it.

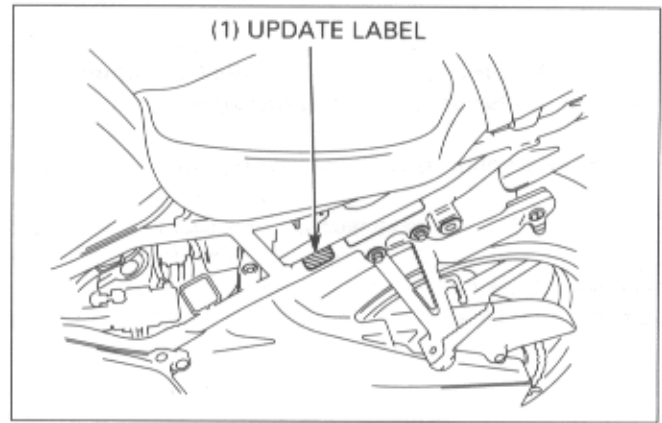
Refer to page 2-2 for left side cover removal.



## VEHICLE EMISSION CONTROL INFORMATION UPDATE LABEL

After making a high altitude carburetor adjustment, attach an update label to the frame under the left side cover as shown.

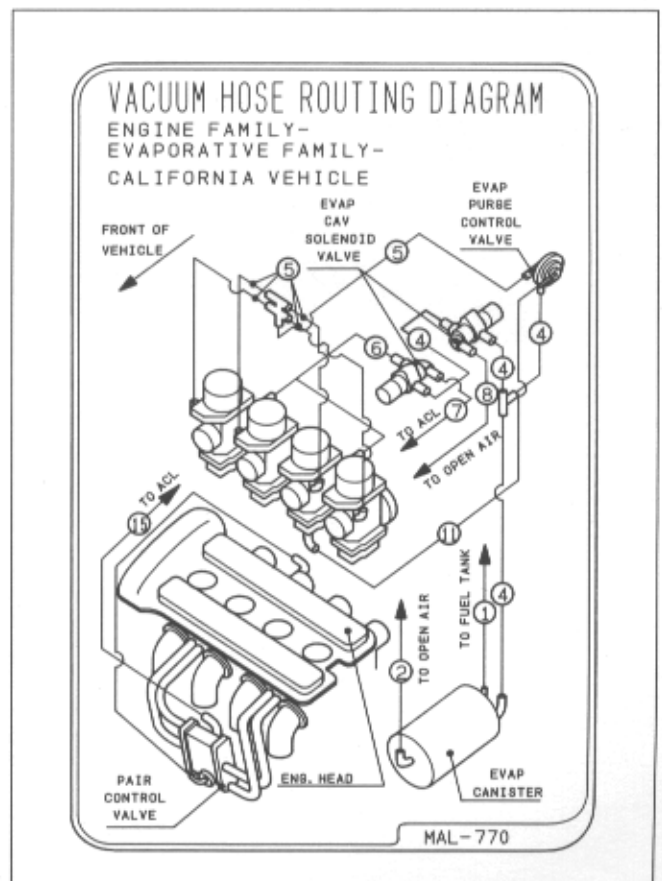
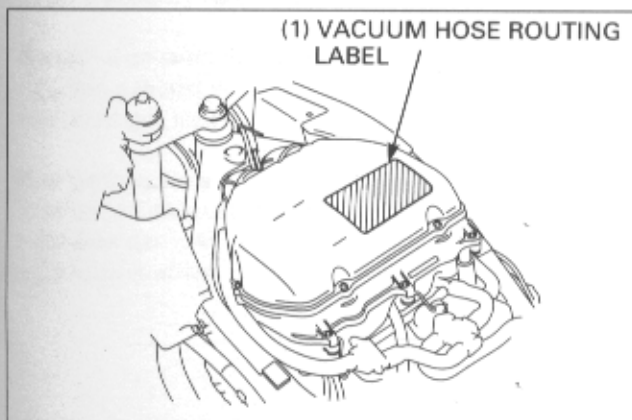
Refer to page 2-2 for left side cover removal.



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

The Vacuum Hose Routing Diagram Label is on the air cleaner case cover as shown.

The fuel tank must be removed to read it.  
Refer to page 2-4 for fuel tank removal.



# 2. FRAME/BODY PANELS/EXHAUST SYSTEM

SERVICE INFORMATION	2-1	SIDE FAIRING	2-3
TROUBLESHOOTING	2-1	FUEL TANK	2-4
SIDE COVER	2-2	UPPER FAIRING	2-4
SEAT	2-2	REAR FENDER A	2-9
TAIL COWL	2-3	REAR FENDER B	2-9
MAINTENANCE COVER	2-3	EXHAUST SYSTEM	2-10

## SERVICE INFORMATION

### GENERAL

**▲ WARNING**

- Gasoline is extremely flammable and is explosive under certain conditions. KEEP OUT OF REACH 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 gaskets when removing the exhaust pipe from the engine.
- When installing the exhaust pipe, install the exhaust system and all fasteners loosely. Always tighten the exhaust clamps first, then tighten the mounting fasteners. If you tighten the mounting fasteners first, the exhaust pipe may not seat properly.
- Always inspect the exhaust system for leaks after installation.

### TORQUE VALUES

Exhaust pipe joint nut	20 N•m (2.0 kg-m, 14 lb-ft)
Exhaust pipe band bolt	21 N•m (2.1 kg-m, 15 lb-ft)
Muffler mounting bolt	27 N•m (2.7 kg-m, 20 lb-ft)
Footpeg holder bolt	27 N•m (2.7 kg-m, 20 lb-ft)
Upper fairing stay bolt	27 N•m (2.7 kg-m, 20 lb-ft)

## TROUBLESHOOTING

### Excessive exhaust noise

- Broken exhaust system
- Exhaust gas leak

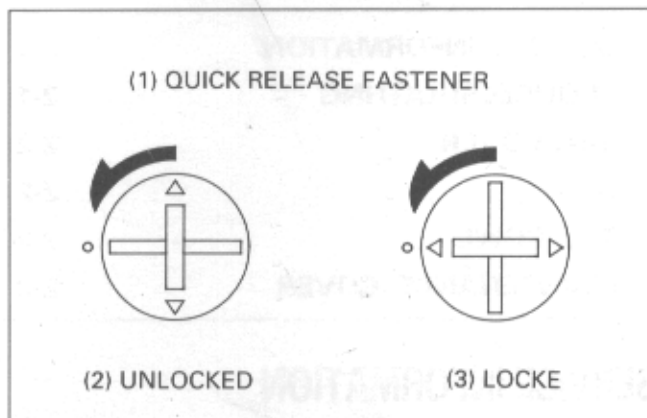
### Poor performance

- Deformed exhaust system
- Exhaust gas leak
- Clogged muffler

## SIDE COVER

### REMOVAL

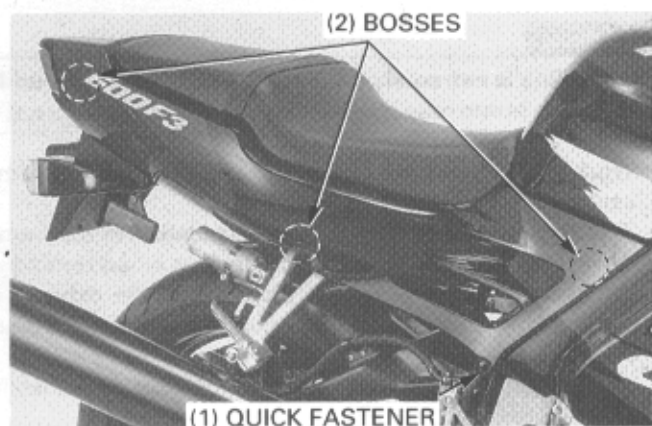
Unlock the quick release fasteners by aligning the long slot with the punch mark.



### CAUTION

- Be careful not to break the pins, tabs and slots in the side cover and tail cowl when removing the side cover.

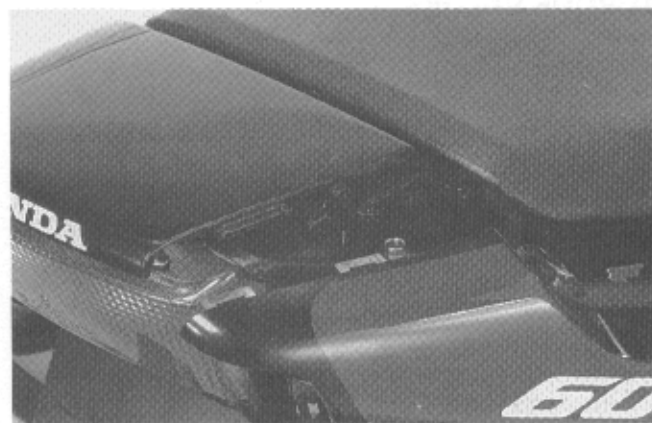
Remove the side cover by releasing the 3 bosses on the cover from the grommets and carefully pulling the cover free from the tabs and pin in the back.



### INSTALLATION

Install the side cover aligning its bosses with the grommets and engage the tabs with the slots, and pins with the hole securely as shown.

Lock the clip by aligning the "△" mark with the punch mark. Do the same on the other side.



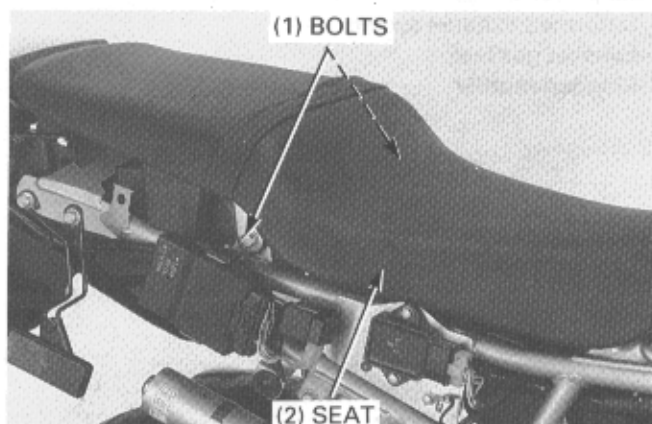
## SEAT

### REMOVAL/INSTALLATION

Remove the side covers.

Remove the seat by removing the 2 bolts and sliding the seat back.

Install the seat in the reverse order of removal, the install the side covers.



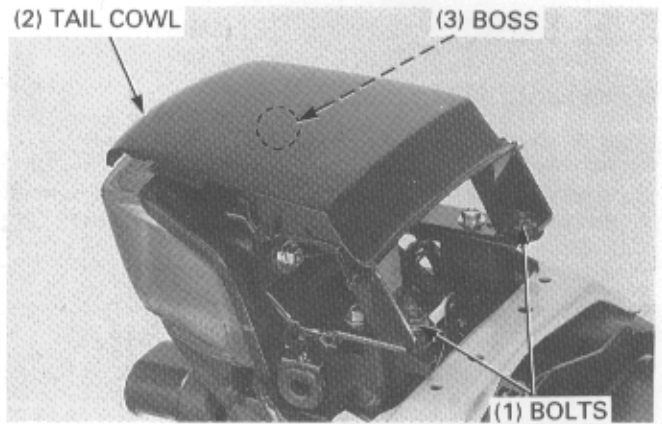
## TAIL COWL

### REMOVAL/INSTALLATION

Remove the seat (page 2-2).

Remove the 2 bolts and the tail cowl (one boss).

Install the tail cowl in the reverse order of removal.



## MAINTENANCE COVER

### REMOVAL/INSTALLATION

Remove the two screws and remove the maintenance cover backward.

Install the maintenance cover in the reverse order of removal.

#### NOTE

- Align the tabs of the maintenance cover with the grooves of the upper and side fairing securely.



## SIDE FAIRING

### REMOVAL/INSTALLATION

Remove the maintenance cover (page 2-3) and side cover (page 2-2).

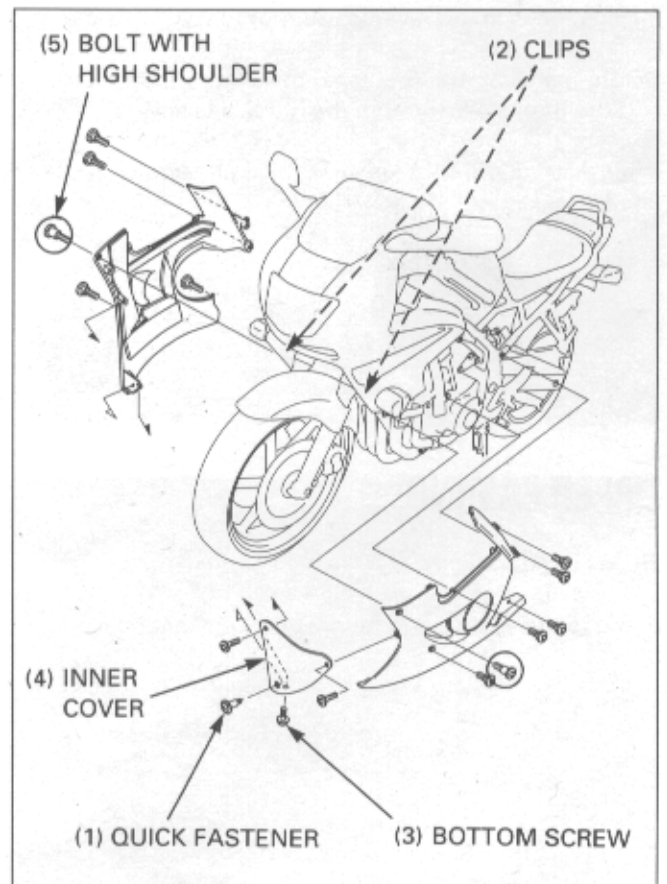
Turn the quick fastener counter-clockwise and loosen it. Remove the bottom screw from the inner cover.

Release the trim clips by pulling the center pin.

Remove the seven bolts.

Release the tabs from upper fairing and remove the side fairing.

Installation is in the reverse order of removal. Install the bolt with the high shoulder as shown.



## FUEL TANK

### REMOVAL/INSTALLATION

**WARNING**

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

Remove the seat (page 2-2).

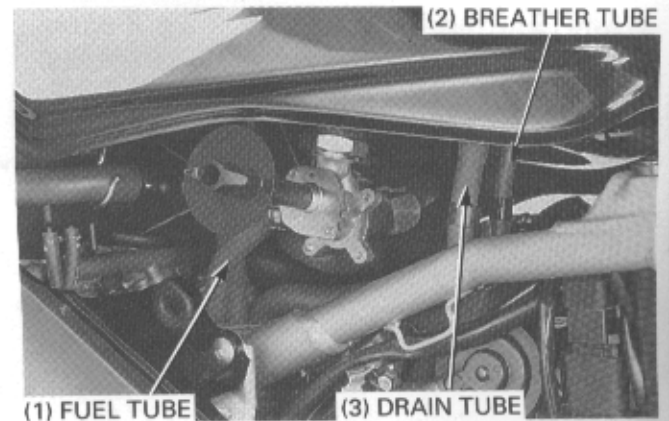
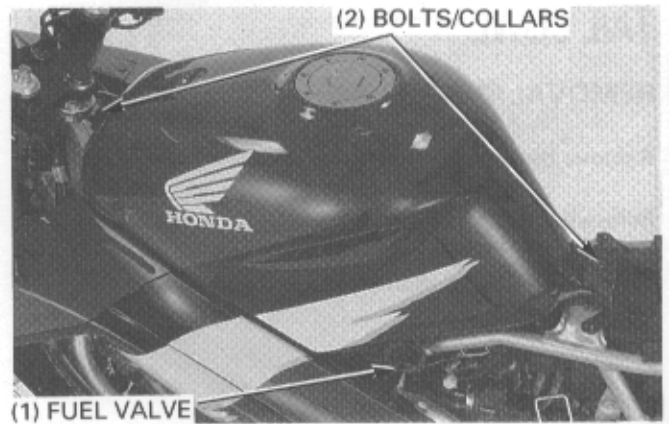
Turn the fuel valve OFF.

Remove the 6 mm bolt and collar.

Remove the 8 mm bolt and collar.

Lift the fuel tank up.

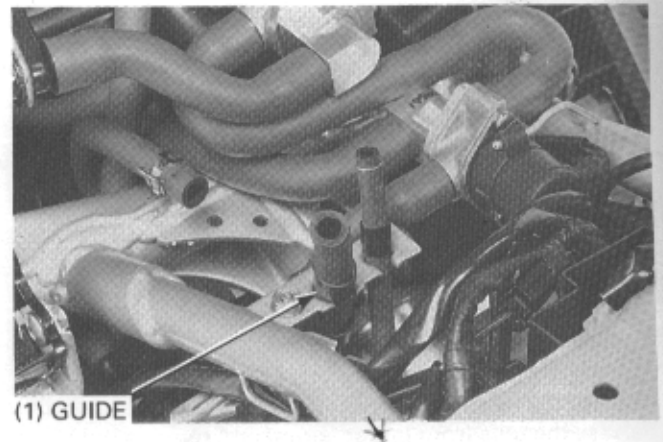
Disconnect the fuel tube, breather tube and drain tube from the fuel tank, then remove the fuel tank.



Installation is in the reverse order of removal.

Before installing the fuel tank, make sure the breather tube and drain tube are through the guide as shown.

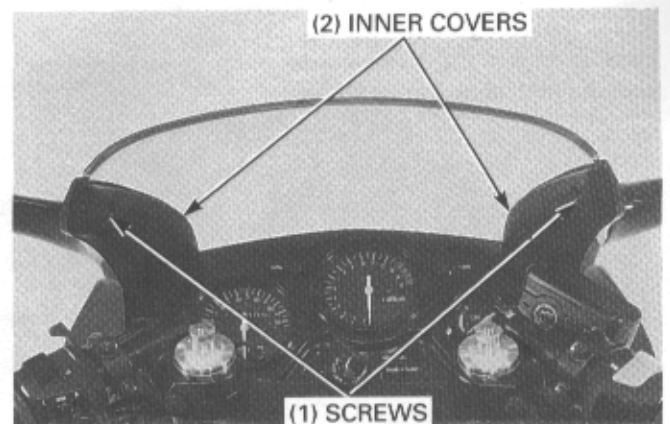
After installation, turn the fuel valve ON and check the fuel line for leakage.



## UPPER FAIRING

### REMOVAL

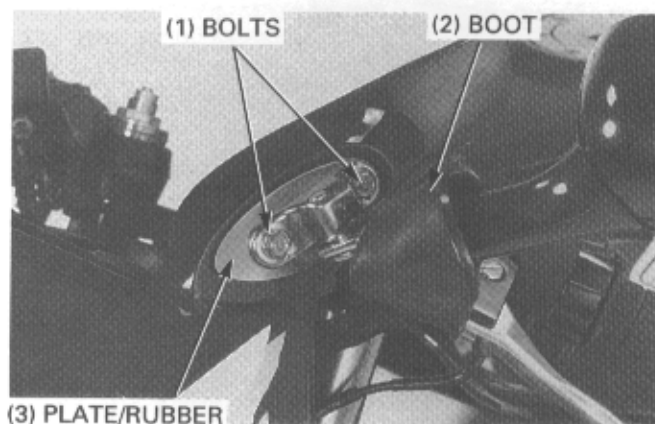
Remove the screws and rearview mirror inner covers.



Remove the rearview mirror pivot boot.

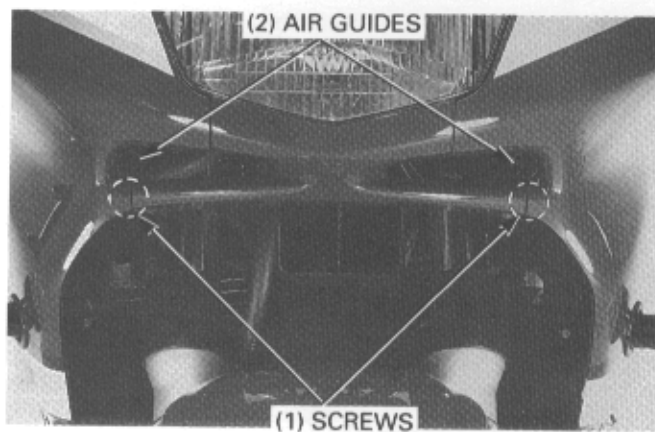
Remove the following:

- Bolts
- Rearview mirror
- Seat rubber plate
- Seat rubber



Remove the upper fairing lower cover (page 18-5).

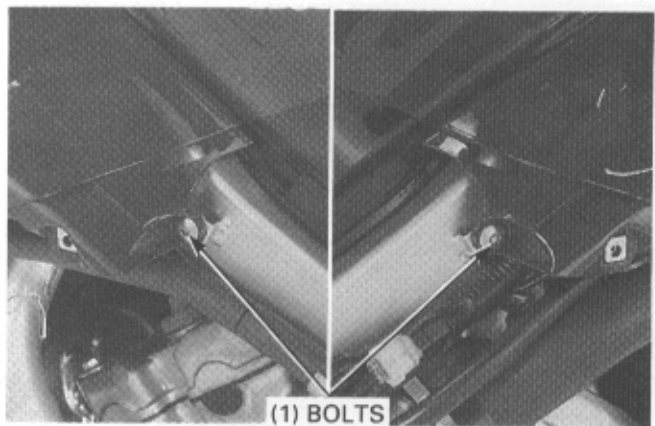
Remove the screws and air guides.



Remove the upper fairing mounting bolts.

Remove the screw and fuse box cover (page 18-18).

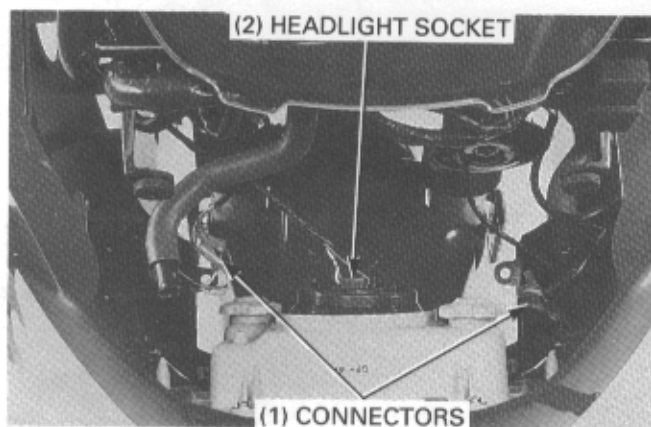
Slightly open both sides of the upper fairing rear ends, then pull the fairing forward.



Disconnect the turn signal connectors.

Release the retaining tabs and remove the headlight socket.

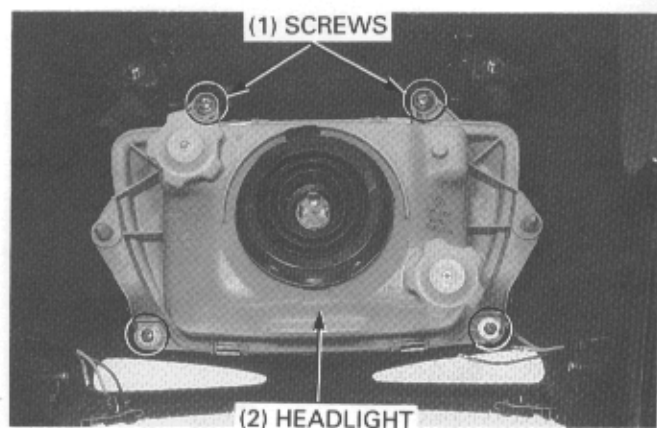
Remove the upper fairing assembly and windscreen.



## FRAME/BODY PANELS/EXHAUST SYSTEM

### DISASSEMBLY/ASSEMBLY

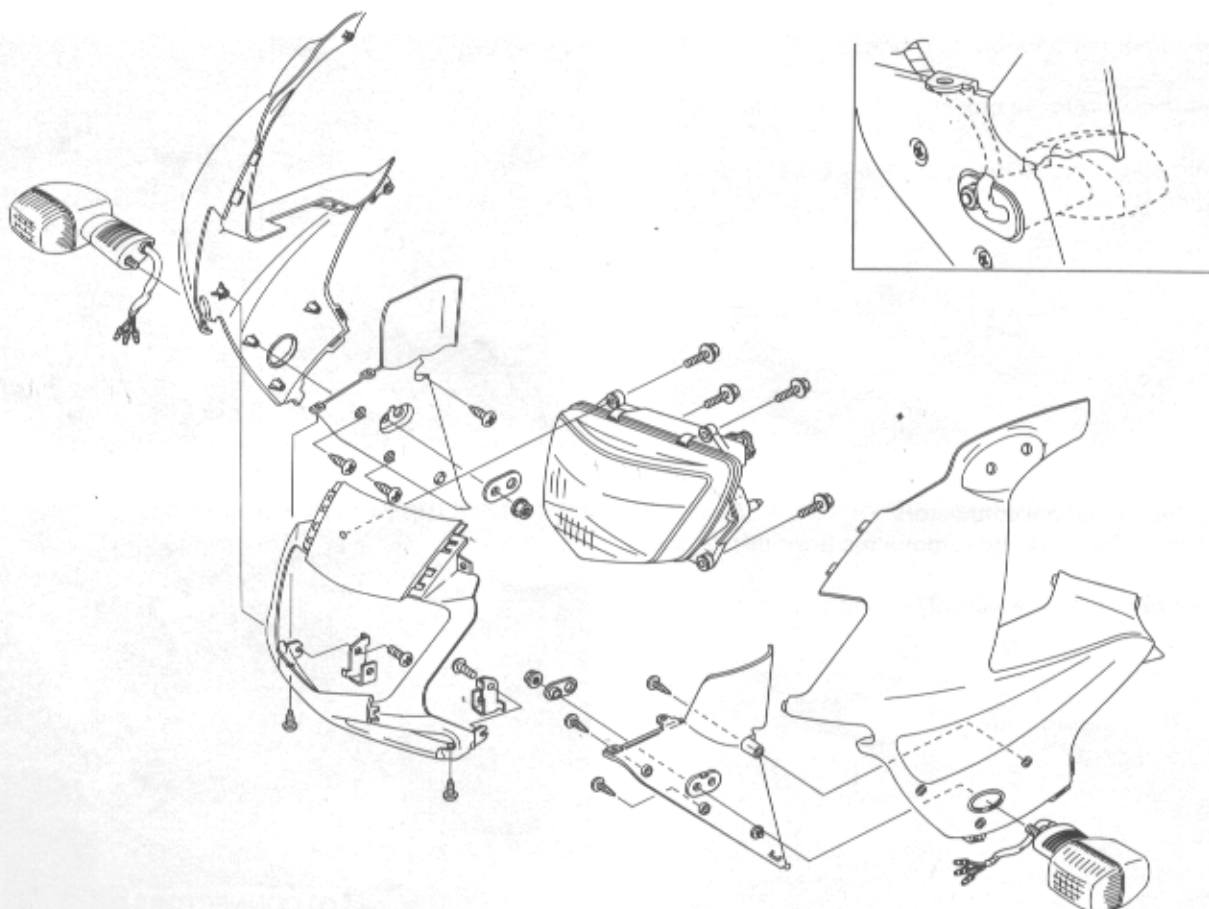
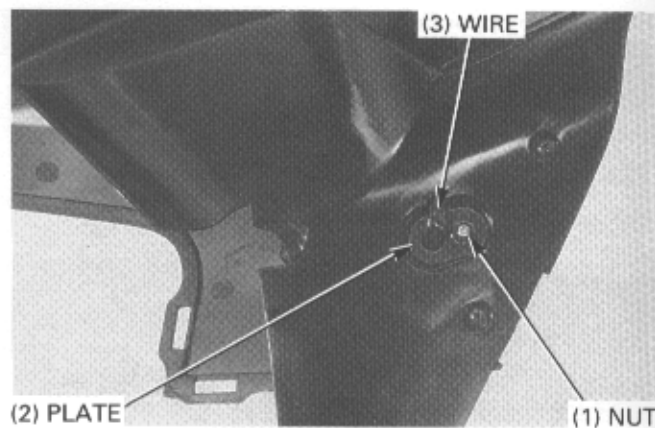
Remove the screws and headlight.



Remove the screws and disassemble the upper fairing.

Pull out the turn signal wire from the wire guide groove.  
Remove the turn signal unit mounting nut and setting plate.  
Remove the screws and inner cowl.

Assembly is in the reverse order of disassembly.



**INSTALLATION**

Install the windscreen.

Connect the turn signal connectors and headlight socket.

Install the upper fairing, aligning its bosses with the grommets.

Engage the windscreen tabs with the upper fairing slots securely as shown.  
Install the upper fairing assembly and windscreen.

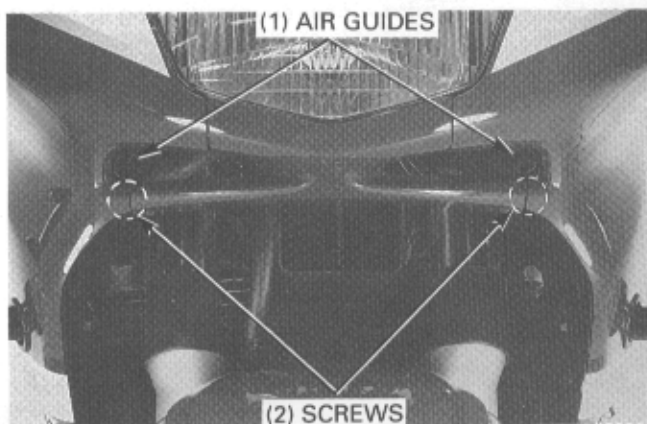
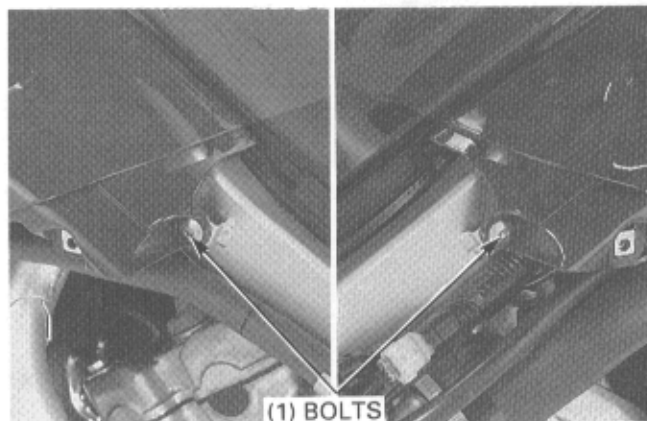
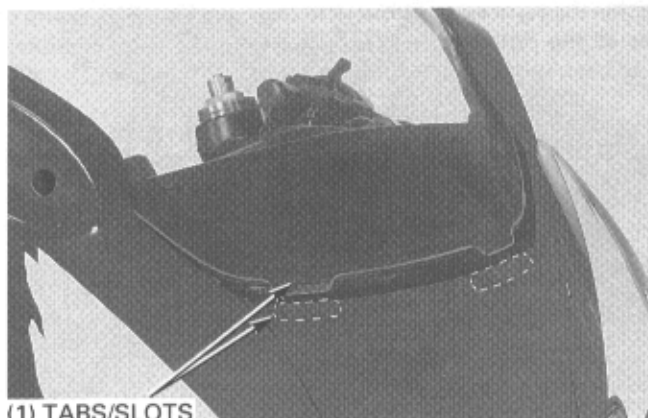
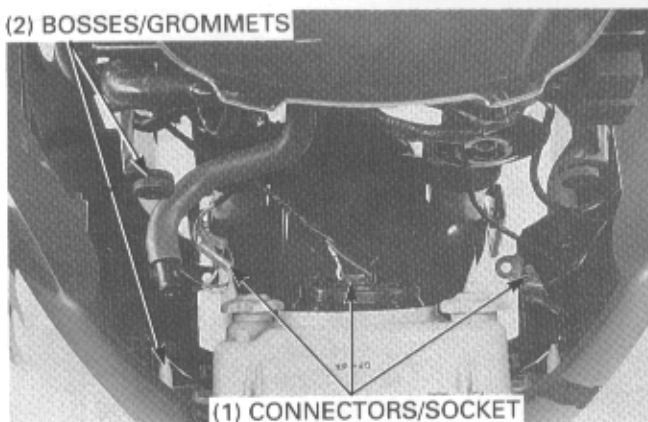
Install the upper fairing mounting bolts.

Install the screw and fuse box cover (page 18-18).

Install the air guides and screws.

Install the upper fairing lower cover (page 18-5).

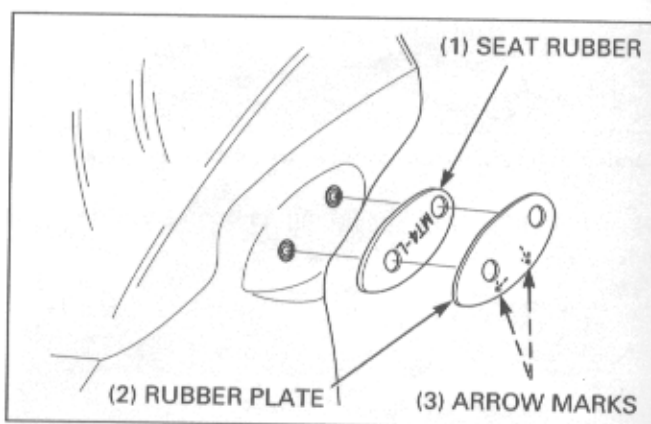
(2) BOSSES/GROMMETS



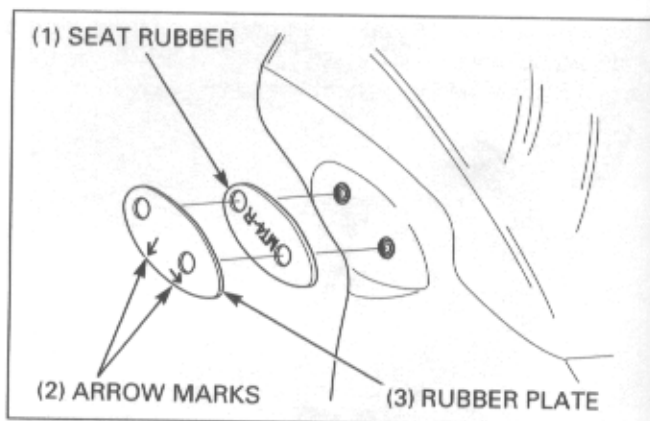


## FRAME/BODY PANELS/EXHAUST SYSTEM

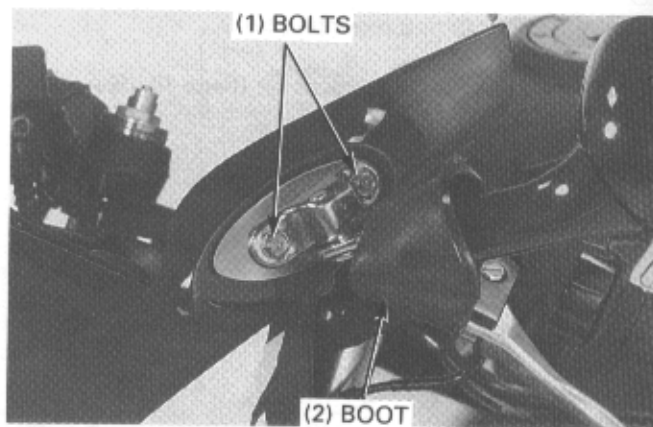
Install the left seat rubber with the mark "MT4-L" facing out. Install the left seat rubber plate with the marked side in and each arrow mark pointing forward and down.



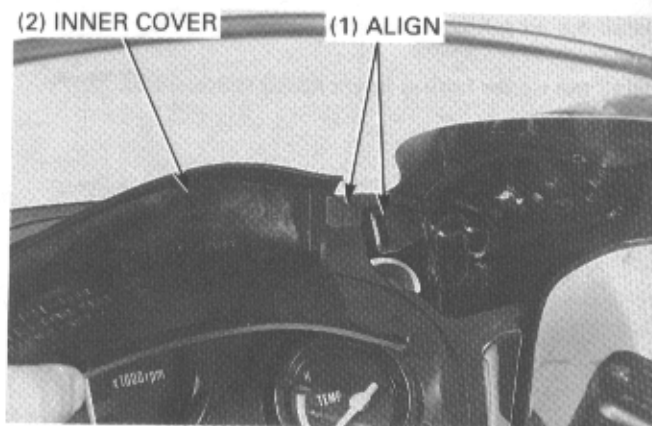
Install the right seat rubber with the mark "MT4-R" facing out. Install the right seat rubber plate with the marked side out and each arrow mark pointing forward and down.



Install the rearview mirror and tighten the bolts.  
Install the rearview mirror pivot boot.



Install the rearview mirror inner covers aligning its tabs with the slots.  
Install and tighten the screws.



## REAR FENDER A

### REMOVAL/INSTALLATION

Remove the tail cowl (page 2-3).

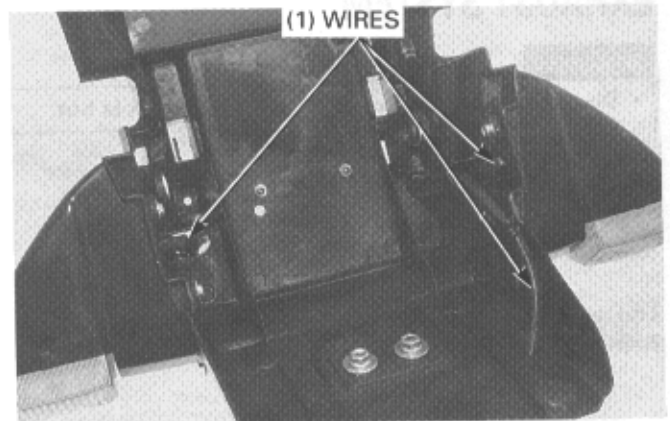
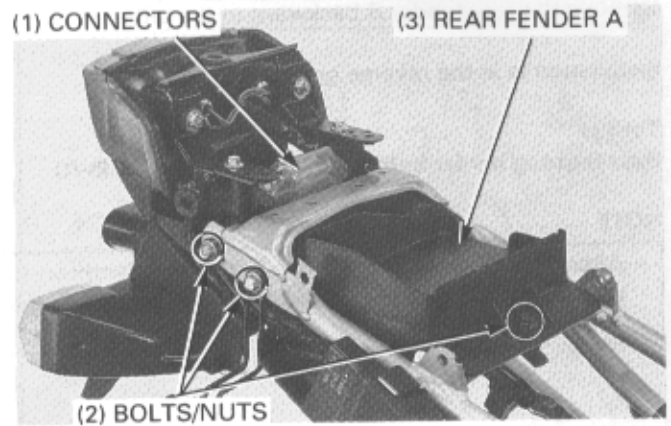
Disconnect the turn signal, brake/tail light and license light connectors.

Remove the bolts, nuts and rear fender A.

Installation is in the reverse order of removal.

#### NOTE

- At turn signal unit and licence light unit installation, route the wires as shown.

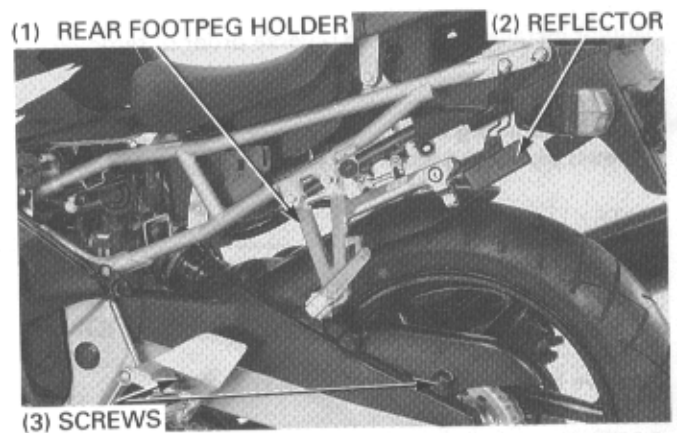


## REAR FENDER B

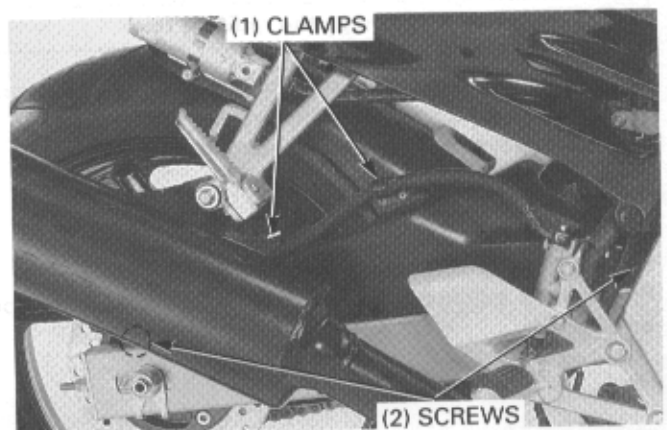
### REMOVAL/INSTALLATION

Remove the side cover (page 2-2).

Remove the bolts and left rear footpeg holder.  
Remove the bolts, nut and left reflector.  
Remove the screws.



Release the rear brake hose from clamps on rear fender B.  
Remove the screws.



## FRAME/BODY PANELS/EXHAUST SYSTEM

Remove the rear fender B backward to the left.

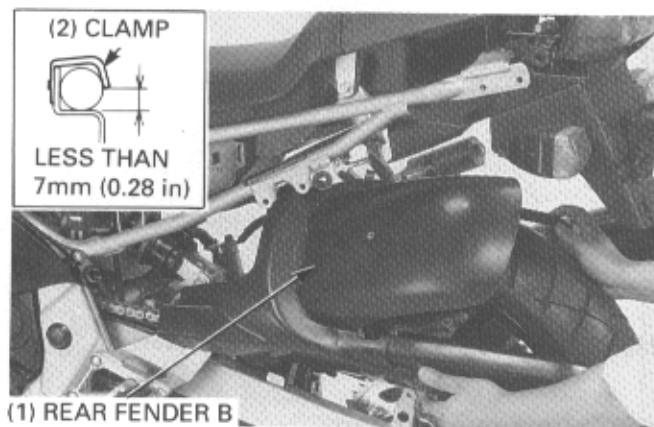
Installation is in the reverse order of removal.

### Torque:

Rear footpeg holder bolt: 27 N·m (2.7 kg-m, 20 lb-ft)

### NOTE

- After clamping the brake hose with rear clamp on the rear fender B, make sure the clamp opening is less than 7 mm (0.28 in).



## EXHAUST SYSTEM

### ▲ WARNING

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

### MUFFLER REMOVAL/INSTALLATION

Remove the side fairing (page 2-3).

Loosen the two exhaust pipe band bolts.  
Remove the muffler mounting bolt, nut and muffler.

Remove the muffler packing.

Muffler installation is in the reverse order of removal.

### Torque:

Muffler mounting bolt: 27 N·m (2.7 kg-m, 20 lb-ft)

Exhaust pipe band bolt: 21 N·m (2.1 kg-m, 15 lb-ft)

### NOTE

- Always replace the muffler packing with a new one.

### EXHAUST PIPE REMOVAL/INSTALLATION

Remove the upper fairing (page 2-4).

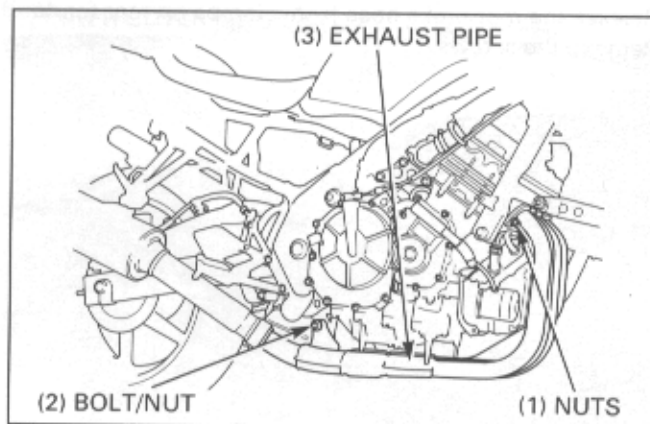
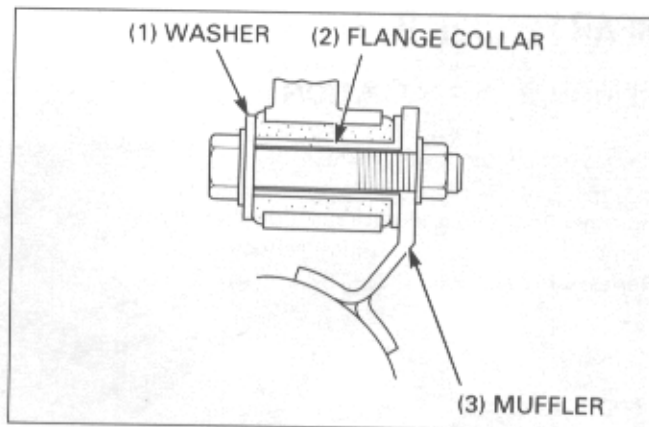
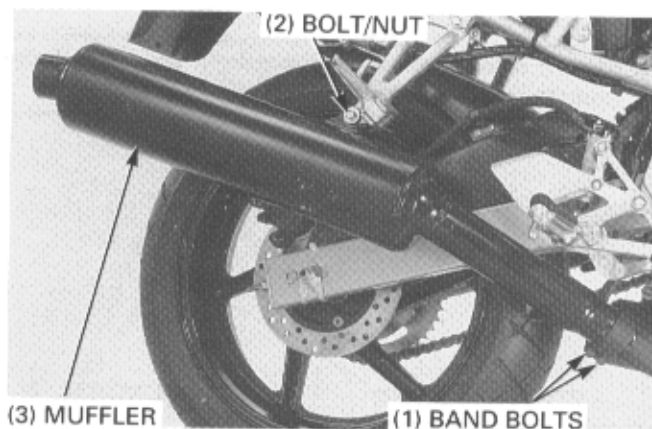
### CAUTION

- Be careful not to damage the radiator fins.

Remove the radiator mounting bolts and release the grommet on the radiator top from the bracket boss.  
Move the radiator forward and secure it (page 8-5).

Remove the muffler.

Remove the exhaust pipe joint nuts.  
Remove the exhaust pipe mounting bolt, nut, exhaust pipe and gaskets.



Exhaust pipe installation is in the reverse order of removal.

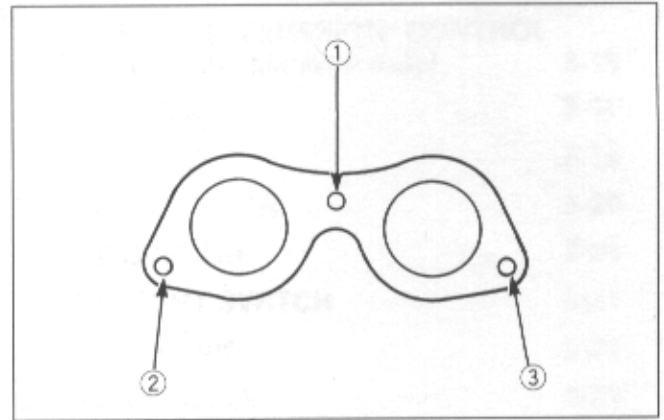
**NOTE**

- Tighten all exhaust pipe joint nuts and clamp bolts loosely. Always tighten the exhaust pipe joint nuts first, then the clamp bolt.
- Tighten the joint nuts in order as shown.

**Torque:**

**Exhaust pipe joint nut:** 20 N·m (2.0 kg-m, 14 lb-ft)

**Exhaust pipe band bolt:** 21 N·m (2.1 kg-m, 15 lb-ft)



SERVICE INFORMATION	3-1	EVAPORATIVE EMISSION CONTROL SYSTEM (California type only)	3-15
MAINTENANCE SCHEDULE	3-3	DRIVE CHAIN	3-16
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SPARK PLUG	3-6	HEADLIGHT AIM	3-21
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COOLING SYSTEM	3-15	STEERING HEAD BEARINGS	3-24
SECONDARY AIR SUPPLY SYSTEM (California type only)	3-15		

## SERVICE INFORMATION

### SPECIFICATION

ITEM		SPECIFICATIONS
Throttle grip free play		2 - 6 mm (1/12 - 1/4 in)
Spark plug	Standard	NGK
		NIPPONDENSO
		CR9EH9
		U27FER9
Spark plug gap		0.8 - 0.9 mm (0.031 - 0.035 in)
Valve clearance	IN	0.16 ± 0.03 mm (0.006 ± 0.001 in)
	EX	0.22 ± 0.03 mm (0.009 ± 0.001 in)
Engine oil capacity	at draining	3.4 ℓ (3.6 US qt, 3.0 Imp qt)
	at disassembly	4.2 ℓ (4.4 US qt, 3.7 Imp qt)
	at oil filter change	3.7 ℓ (3.9 US qt, 3.3 Imp qt)
Carburetor vacuum difference		Within 30 mmHg (1.2 inHg) Base carburetor:No3
Carburetor idle speed	49 state, Canada type	1,200 ± 100 rpm
	California type	1,400 ± 100 rpm
Drive chain slack		15 - 25 mm (5/8 - 1 in)
Drive chain size/link	RK	RK50MFO/108
	DID	DID50V4/108

## MAINTENANCE

ITEM			SPECIFICATIONS
Clutch lever free play			10 – 20 mm (3/8 – 3/4 in)
Cold tire pressure	Up to 90 kg (200 lb) load	Front	36 psi (2.50 kg/cm <sup>2</sup> , 250 kPa)
		Rear	42 psi (2.90 kg/cm <sup>2</sup> , 290 kPa)
	Up to maximum weight capacity	Front	36 psi (2.50 kg/cm <sup>2</sup> , 250 kPa)
		Rear	42 psi (2.90 kg/cm <sup>2</sup> , 290 kPa)
Minimum tire tread depth		Front	1.5 mm (0.06 in)
		Rear	2.0 mm (0.08 in)
Tire size		Front	120/60 ZR 17
		Rear	160/60 ZR 17
Tire brand	Bridgestone	Front	BT50F RADIAL G
		Rear	BT50R RADIAL J
	Michelin	Front	MACADAM 90X
		Rear	MACADAM 90X

## TORQUE VALUES

Spark plug	12 N•m (1.2 kg-m, 9 lb-ft)	
Cylinder head cover bolt	10 N•m (1.0 kg-m, 7 lb-ft)	
Camshaft holder bolt	12 N•m (1.2 kg-m, 9 lb-ft)	Apply oil to the threads.
Ignition pulse generator cover cap	18 N•m (1.8 kg-m, 13 lb-ft)	Apply grease to the threads.
Oil drain bolt	30 N•m (3.0 kg-m, 22 lb-ft)	
Oil filter cartridge	10 N•m (1.0 kg-m, 7 lb-ft)	
Drive chain adjuster lock nut	22 N•m (2.2 kg-m, 16 lb-ft)	
Rear axle nut	95 N•m (9.5 kg-m, 69 lb-ft)	
Side stand pivot bolt	10 N•m (1.0 kg-m, 7 lb-ft)	
Side stand pivot lock nut	30 N•m (3.0 kg-m, 22 lb-ft)	
Side stand bracket bolt	55 N•m (5.5 kg-m, 40 lb-ft)	

## TOOLS

Oil filter wrench	07HAA – PJ70100	
Drive chain cutter	07HMH – MR10102	or 07HMH – MR1010B (U.S.A. only)
Link plate holder	07NMH – MW00110	or 07NMH – MW0011A (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.

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

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

ITEM	FREQUENCY	NOTE ↓	ODOMETER READING (NOTE 1)								Refer to page	
			X1,000mi	0.6	4	8	12	16	20	24		
			X1,000km	1	6	12	18	24	30	36		
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	3-5	
	SPARK PLUG				I	R	I	R	I	R	3-6	
	VALVE CLEARANCE							I			3-7	
	ENGINE OIL					R		R		R	3-11	
	ENGINE OIL FILTER					R		R		R	3-11	
	* CARBURETOR SYNCHRONIZATION					I		I		I	3-12	
	* ENGINE IDLE SPEED				I	I	I	I	I	I	3-14	
	RADIATOR COOLANT	NOTE 3					I		I		R	3-14
	* COOLING SYSTEM						I		I		I	3-15
	* SECONDARY AIR SUPPLY SYSTEM	NOTE 4					I		I		I	3-15
	* EVAPORATIVE EMISSION CONTROL SYSTEM	NOTE 4						I			I	3-15
NON-EMISSION RELATED ITEMS	* DRIVE CHAIN		Every 500mi (800 km) I, L								3-16	
	BRAKE FLUID	NOTE 3			I	I	R	I	I	R	3-19	
	BRAKE PAD WEAR				I	I	I	I	I	I	3-20	
	BRAKE SYSTEM				I		I		I	I	3-21	
	* BRAKE LIGHT SWITCH					I		I		I	3-21	
	* HEADLIGHT AIM					I		I		I	3-21	
	CLUTCH SYSTEM				I	I	I	I	I	I	3-21	
	SIDE STAND					I		I		I	3-22	
	* SUSPENSION					I		I		I	3-23	
	* NUTS, BOLTS, FASTENERS				I		I		I	I	3-23	
** WHEELS/TIRES					I		I		I	3-24		
** STEERING HEAD BEARINGS				I		I		I	I	3-24		

\* Should be serviced by an authorized Honda dealer, unless the owner has the proper tools and service data and is mechanically qualified.

\*\* In the interest of safety, we recommended these items be serviced only by an 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 area.

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

4. California type only.

## MAINTENANCE

### FUEL LINE

#### INSPECTION

Remove the side cover (page 2-2).

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

For the tube routing, see page 1-20.

### THROTTLE OPERATION

Check for any deterioration or damage to the throttle cables. Check the throttle grip for smooth operation. Check that the throttle grip returns from the full open to the full closed position smoothly and automatically in all steering positions.

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

For cable lubrication: Disconnect the throttle cables at their upper ends (page 12-3). 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 side 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 idle speed does not change. If idle speed increases, check the throttle grip free play and the throttle cable connection.

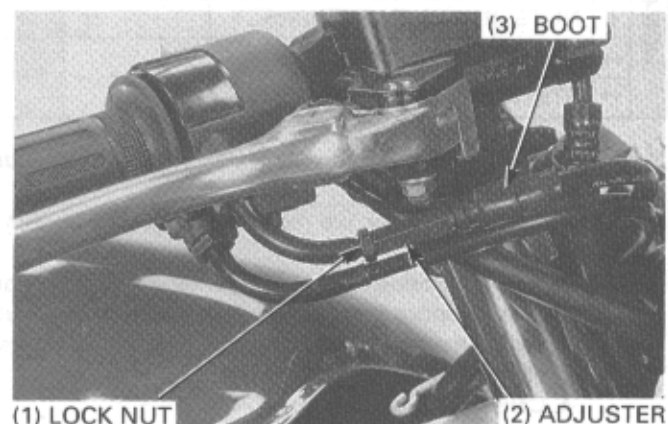
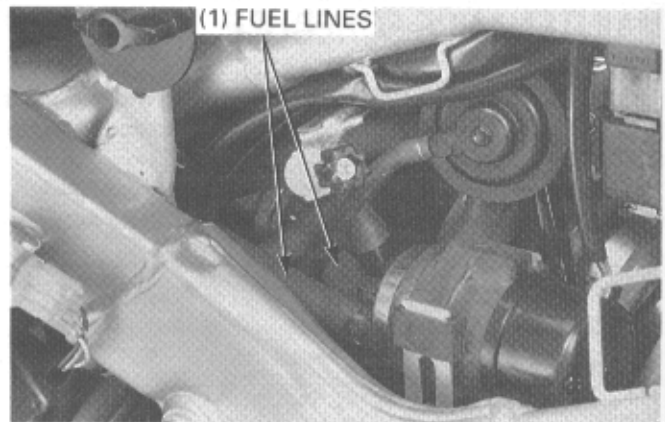
Measure the throttle grip free play at the throttle grip flange.

**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 and turn the adjuster to obtain the free play.

Tighten the lock nut and reposition the adjuster boot properly after the adjustment has been made.

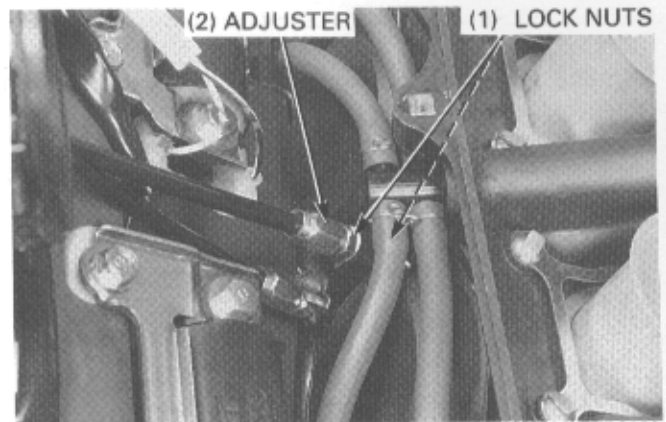




Major adjustments are made with the lower adjuster.

Remove the air cleaner base (page 5-4).  
Loosen the lock nuts and turn the adjuster to obtain the free play.  
Tighten the lock nuts after the adjustment has been made.

Recheck the throttle grip free play.

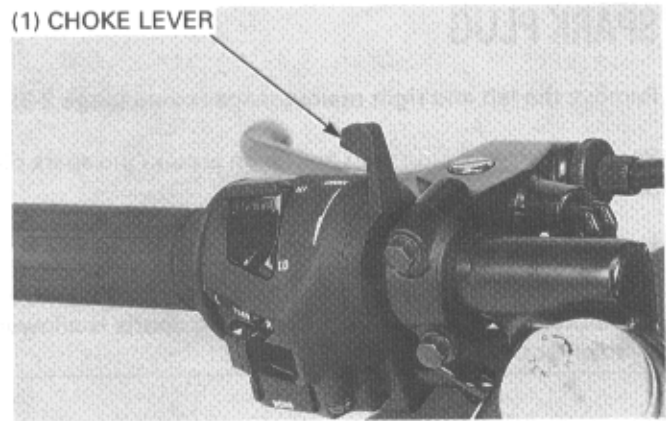


## CARBURETOR CHOKE

### STARTING ENRICHMENT (SE) VALVE

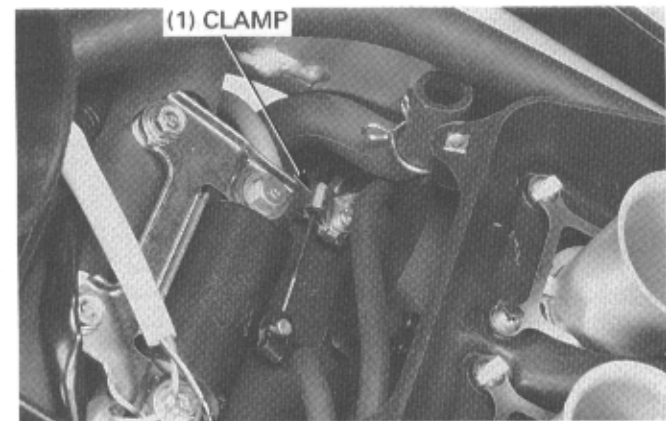
The choke system uses a fuel enrichening circuit controlled by an SE valve. The SE valve opens the enrichening circuit via a cable when the choke lever on the handlebar is moved back.

Check for smooth operation of the choke lever.  
If the operation is not smooth, lubricate the choke cable, overhaul and lubricate the choke lever.  
For cable lubrication: Disconnect the choke cable at the upper end (page 12-6). Thoroughly lubricate the cable and its pivot point with a commercially available cable lubricant or a light weight oil.



Remove the air cleaner base (page 5-4).  
Move the choke lever all the way back to the fully open position. Make sure the SE valve is open by trying to move the choke lever on the carburetor, there should be no free play.

Adjust the free play by loosening the choke cable clamp on the carburetor and moving the choke cable casing so the choke lever is fully open. Tighten the clamp.



Push the choke lever fully closed. Make sure the SE valve is fully closed by checking for free play in the cable between the lever on the carburetor and cable casing.

Install the removed parts in the reverse order of removal.

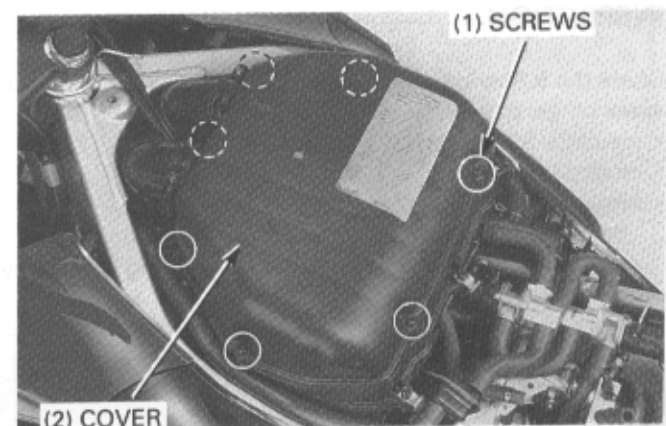
## AIR CLEANER

### 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.
- Replace the air cleaner and sub air cleaner as a set.

Remove the fuel tank (page 2-4).

Remove and loosen the air cleaner housing cover screws.  
Remove the air cleaner housing cover.



## MAINTENANCE

Remove the air cleaner and sub air cleaner.

Replace the air cleaner according to the maintenance schedule (see page 3-3).

Install the removed parts in the reverse order of removal.

(2) SUB AIR CLEANER



(1) AIR CLEANER

## SPARK PLUG

Remove the left and right maintenance covers (page 2-3).

Remove the spark plug caps and clean around the spark plug bases.

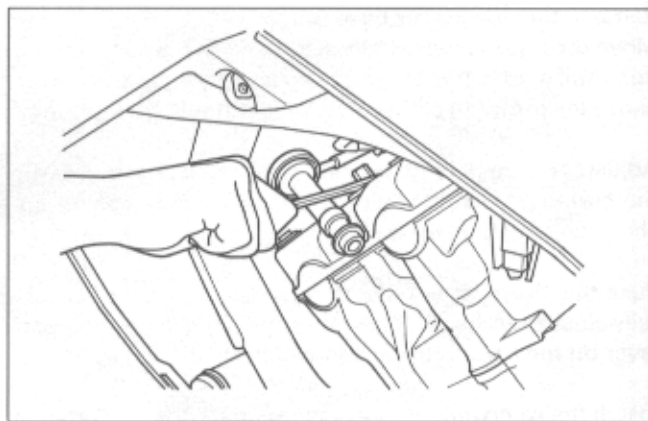
### NOTE

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



(1) PLUG CAPS

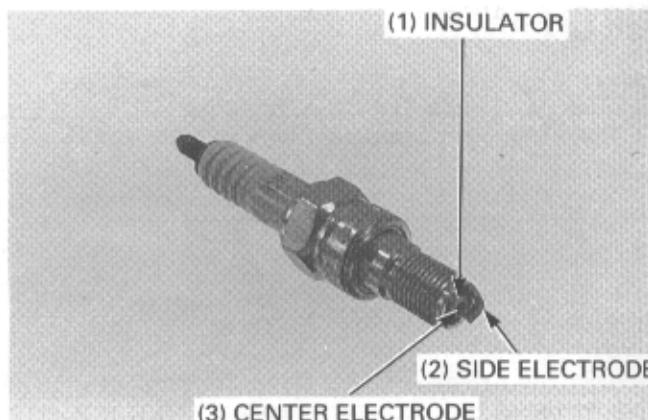
Remove the spark plugs using the spark plug wrench. Inspect or replace as described in the maintenance schedule (page 3-3).



## INSPECTION

Check the following and replace if necessary (recommended spark plugs: page 3-1).

- insulator for damage
- electrodes for wear
- burning condition, coloration
  - dark to light brown indicates good condition.
  - excessive lightness indicates malfunctioning ignition system or lean mixture.
  - wet or black sooty deposit indicates over-rich mixture.



(1) INSULATOR

(2) SIDE ELECTRODE

(3) CENTER ELECTRODE

### REUSING A SPARK PLUG

Clean the spark plug electrodes with a wire brush or spark plug cleaner.

Check the gap between the center and side electrodes with a wire-type feeler gauge. If necessary, adjust the gap by bending the side electrode carefully.

**Spark plug gap: 0.8 – 0.9 mm (0.031 – 0.035 in)**

#### CAUTION

- To prevent damaging the cylinder head, hand-tighten the spark plug before using a wrench to tighten to the specified torque.

Reinstall the spark plug in the cylinder head and hand-tighten, then torque to specification.

**Torque: 12 N·m (1.2 kg-m, 9 lb-ft)**

### REPLACING A SPARK PLUG

Set the plug gap to specification with a wire-type feeler gauge (see above).

#### CAUTION

- Do not overtighten the spark plug.

Install and tighten the new spark plug, then tighten it about 1/4 of turn after sealing washer contacts the seat of the plug hole.

### VALVE CLEARANCE

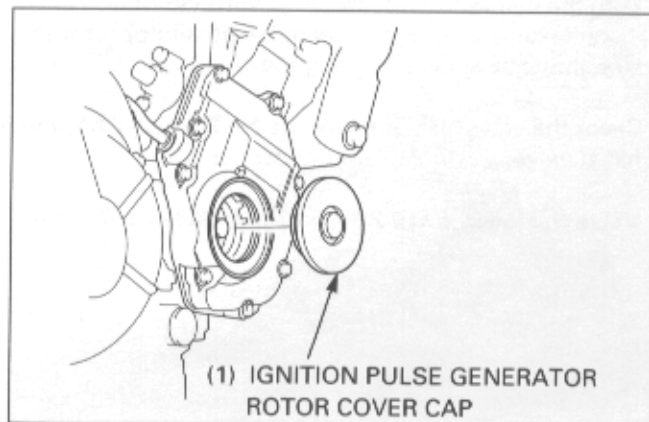
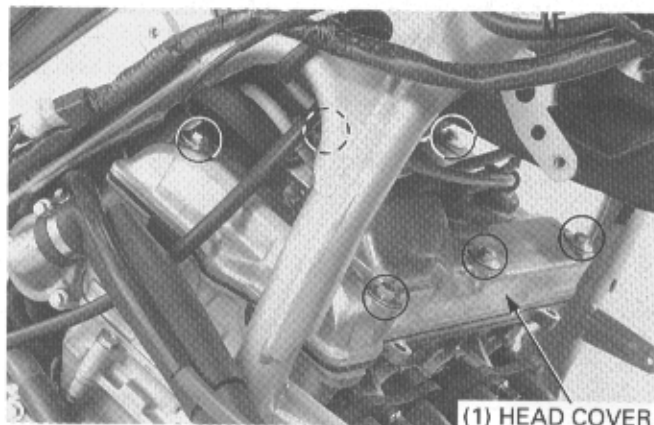
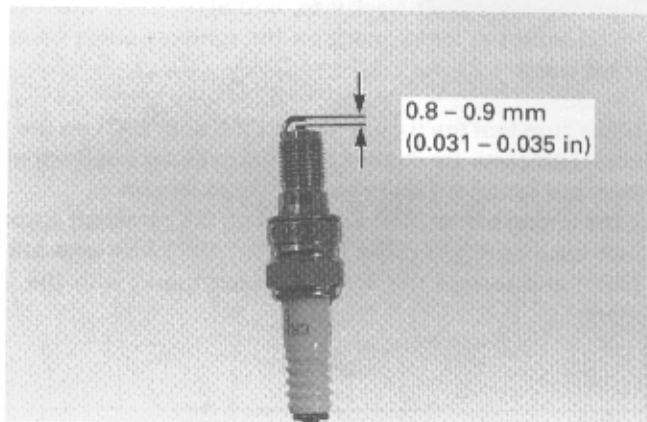
#### NOTE

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

Remove the cylinder head cover (page 8-5).

#### INSPECTION

Remove the ignition pulse generator rotor cover cap.

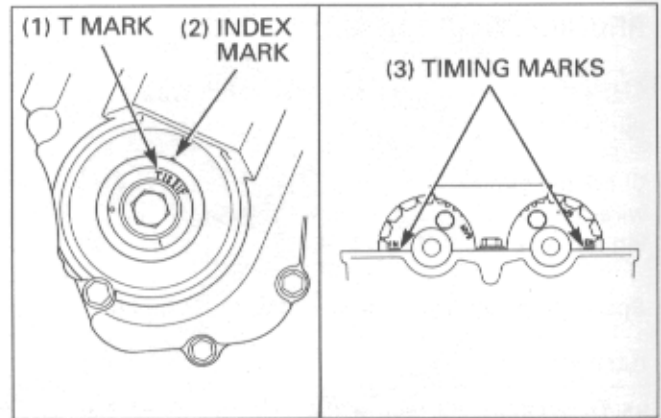


## MAINTENANCE

Turn the crankshaft clockwise, and align the T mark (notch mark) with the index mark on the ignition pulse generator rotor cover.

Make sure that the timing marks ("IN" and "EX") on the camshaft sprockets are aligned with the cylinder head upper surface and facing opposite each other as shown.

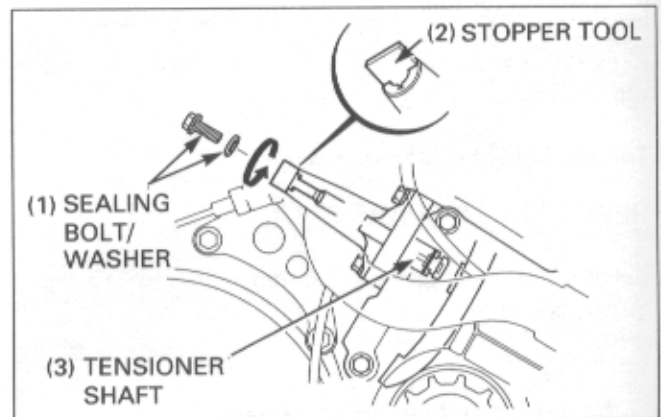
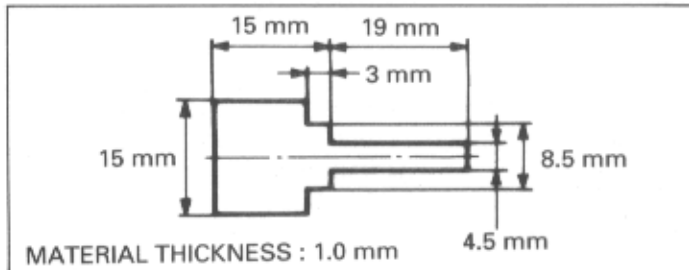
If the timing marks ("IN" and "EX") on the camshaft sprockets face each other, turn the crankshaft clockwise one full turn (360°) and realign the T mark (notch mark) with the index mark.



Remove the cam chain tensioner lifter sealing bolt and sealing washer.

Turn the tensioner shaft fully in (clockwise) and secure it using the stopper tool.

This tool can easily be made from a thin (1 mm thickness) piece of steel using the dimensions shown below.



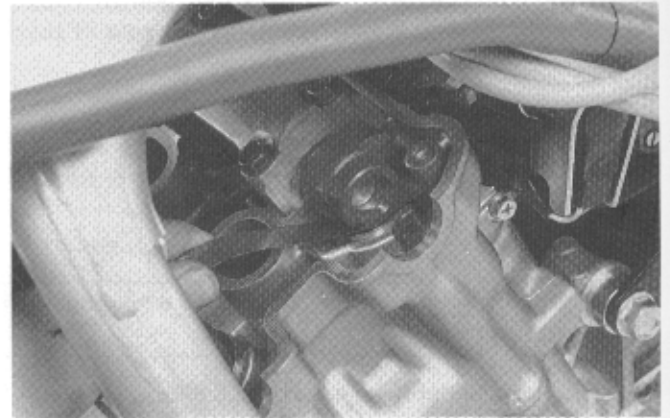
Check the valve clearance for the No.1 and No.3 cylinder intake valves using a feeler gauge.

Insert the feeler gauge between the valve lifter and the cam lobe.

**Valve clearance: IN:  $0.16 \pm 0.03$  mm ( $0.006 \pm 0.001$  in)**

### NOTE

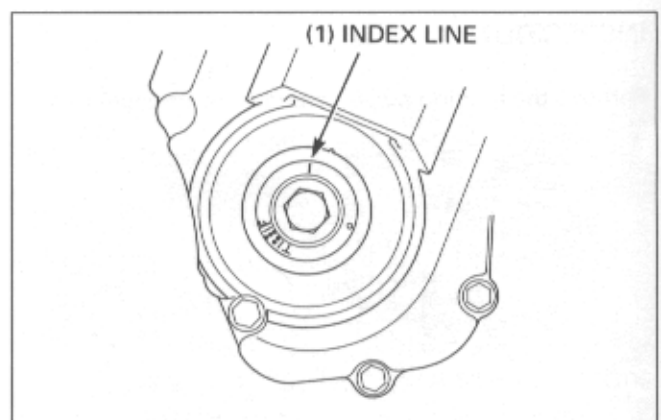
- Record the clearance for each valve in case shim selection is required for adjustment.



Turn the crankshaft clockwise 1/2 turn (180°) and make sure the index line on the ignition pulse generator rotor is facing straight up as shown (not aligned with the index mark).

Check the valve clearance for the No.2 and No.4 cylinder exhaust valves using a feeler gauge.

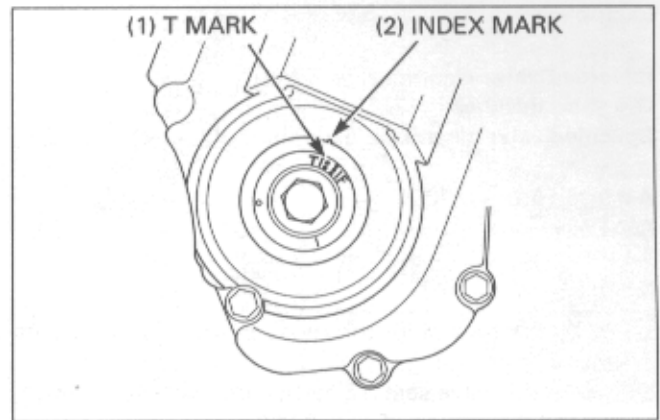
**Valve clearance: EX:  $0.22 \pm 0.03$  mm ( $0.009 \pm 0.001$  in)**



Turn the crankshaft clockwise 1/2 turn (180°) and make sure the T mark (notch mark) on the ignition pulse generator rotor aligns with the index mark.

Check the valve clearance for the No.2 and No.4 cylinder intake valves using a feeler gauge.

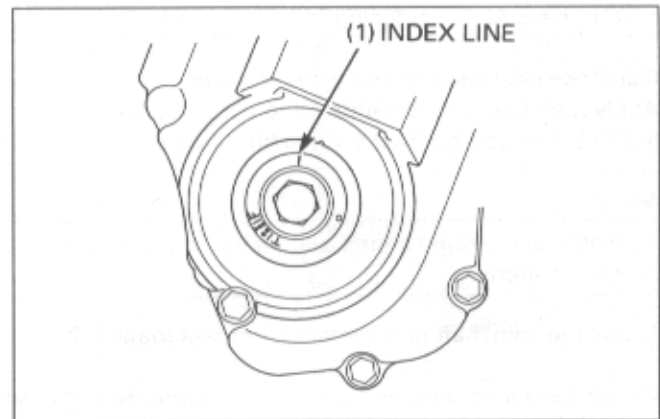
**Valve clearance: IN: 0.16 ± 0.03 mm (0.006 ± 0.001 in)**



Turn the crankshaft clockwise 1/2 turn (180°) and make sure the index line on the ignition pulse generator rotor is facing straight up as shown (not aligned with the index mark).

Check the valve clearance for the No.1 and No.3 cylinder exhaust valves using a feeler gauge.

**Valve clearance: EX: 0.22 ± 0.03 mm (0.009 ± 0.001 in)**



## ADJUSTMENT

Remove the camshafts (page 8-5).  
Remove the valve lifters and shims.

### NOTE

- Shims may stick to the inside of the valve lifter. Do not allow the shims to fall into the crankcase.
- Mark all valve lifters and shims to ensure correct reassembly in their original locations.
- The valve lifter can be easily removed with a valve lapping tool or magnet.
- The shims can be easily removed with tweezers or a magnet.

Clean the valve shim contact area in the valve lifter with compressed air.

Measure the shim thickness and record it.

### NOTE

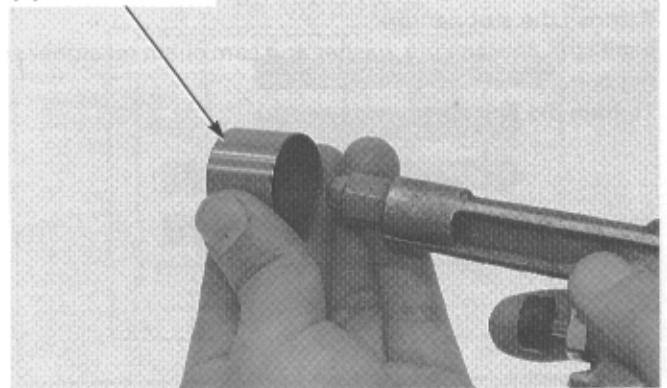
- Sixty-five different shim thicknesses are available: from 1.200 mm to 2.800 mm in intervals of 0.025 mm.

Calculate the new shim thickness using the equation below.

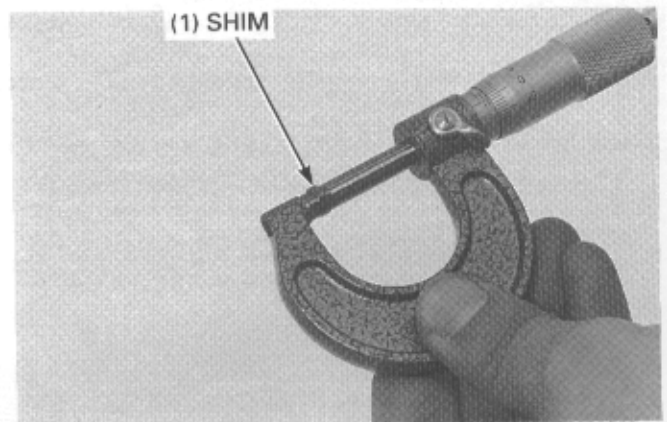
$$A = B - C + D$$

- A: New shim thickness
- B: Recorded valve clearance
- C: Specified valve clearance
- D: Old shim thickness

(1) VALVE LIFTER



(1) SHIM



## MAINTENANCE

### Example:

Recorded valve clearance: 0.16 mm

Old shim thickness: 1.725 mm

Specified valve clearance: 0.20 mm

$$A = 0.16 - 0.20 + 1.725$$

$$A = 1.685$$

### NOTE

- Verify the new shim thickness by measuring it with a micrometer.
- Reface the valve seat if a carbon deposit results in a calculated dimension of over 2.800 mm.
- If the valve seat must be refaced, re-calculate the shim thickness AFTER refacing.

Install the new shim on the valve retainer.  
Apply molybdenum disulfide oil to the valve lifters.  
Install the valve lifter in the valve lifter holes.

### NOTE

- Install unchanged shims and valve lifters in their original locations.

Install the camshaft and camshaft holders (page 8-21).

Rotate the camshafts by rotating the crankshaft clockwise several times.

Recheck the valve clearance.

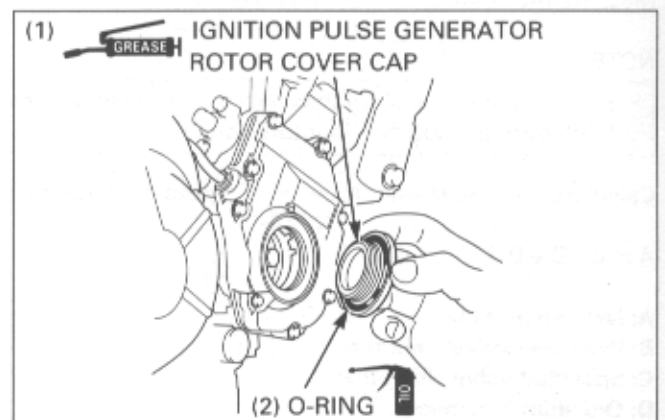
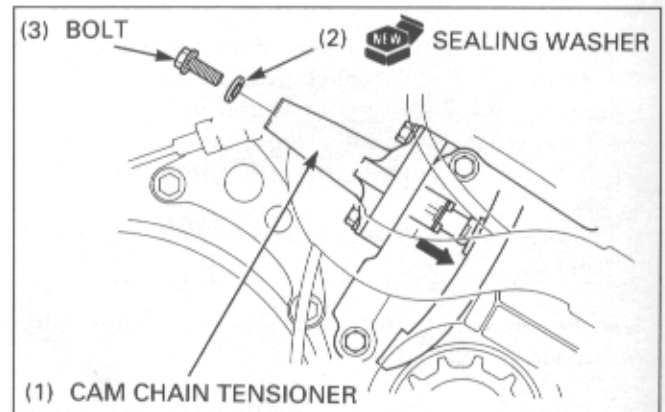
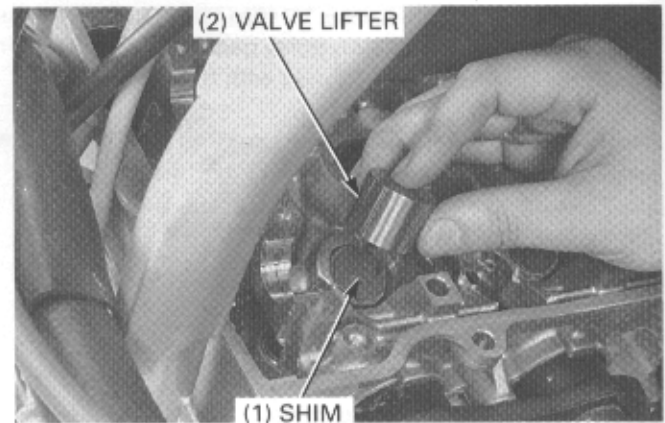
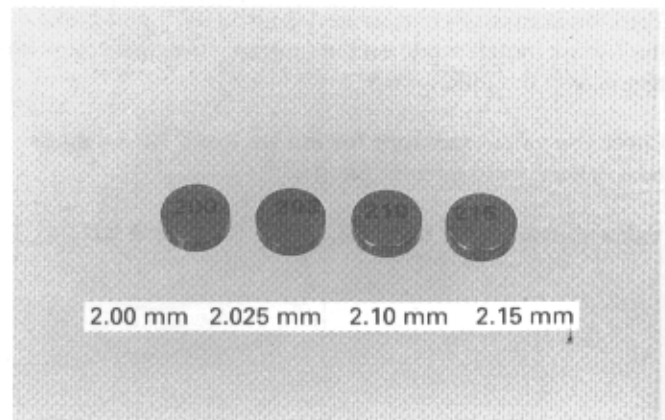
Remove the stopper tool.  
Install the new sealing washer and cam chain tensioner sealing bolt.  
Tighten the bolt securely.

Install the removed parts in the reverse order of removal.

Check that the O-ring is in good condition, replace if necessary.

Apply grease to the ignition pulse generator cover cap threads, install and tighten the cap.

**Torque: 18 N·m (1.8 kg·m, 13 lb·ft)**



## ENGINE OIL/OIL FILTER

### OIL LEVEL 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.

Start the engine and let it idle for 2 - 3 minutes.  
Stop the engine and wait 3 minutes.

Remove the dipstick and wipe the oil from the dipstick with a clean cloth.

With the motorcycle upright on level ground, insert the dipstick into the stick hole without screwing it in.  
Remove the dipstick and check the oil level.

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

**Recommended engine oil:**

**Honda GN4 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.

For engine oil change, see below.

### ENGINE OIL AND FILTER CHANGE

**NOTE**

- Change engine oil with the engine warm and the motorcycle on its side stand to assure complete and rapid draining.

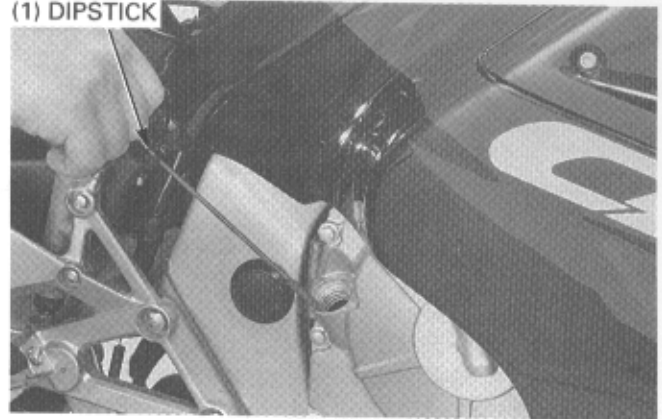
**⚠ WARNING**

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

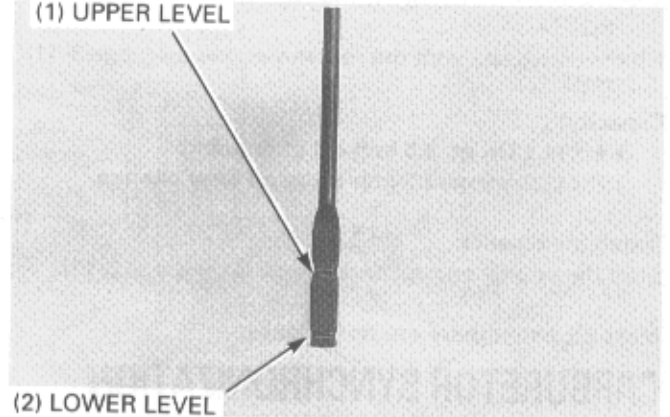
Remove the dipstick.

Place an oil drain pan under the engine to catch the oil, then remove the drain bolt.

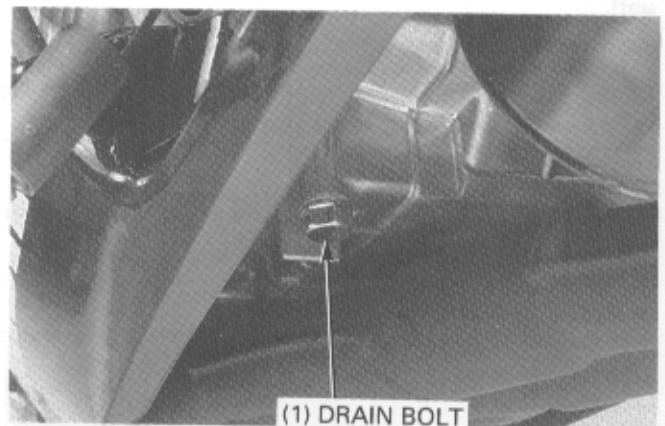
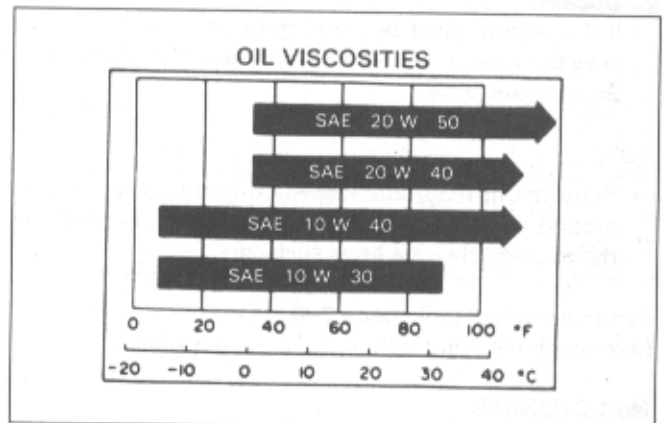
(1) DIPSTICK



(1) UPPER LEVEL



(2) LOWER LEVEL



(1) DRAIN BOLT

## MAINTENANCE

Remove the side fairings (page 2-3).  
Remove the oil filter using the oil filter wrench.

### Tool:

**Oil filter wrench** 07HAA - PJ70100

Check that the sealing washer on the drain bolt is in good condition, replace it if necessary.  
Install and tighten the drain bolt to the specified torque.

**Torque: 30 N·m (3.0 kg·m, 22 lb-ft)**

Apply oil to the new oil filter O-ring.  
Install the new oil filter and tighten to the specified torque.

**Torque: 10 N·m (1.0 kg·m, 7 lb-ft)**

Fill the crankcase with the recommended oil (page 3-11).

### Capacity:

- 3.4 ℓ (3.6 US qt, 3.0 Imp qt) at draining
- 3.7 ℓ (3.9 US qt, 3.3 Imp qt) at oil filter change

Install the dipstick.

Start the engine and recheck the oil level (page 3-11).

Make sure that there are no oil leaks.

## CARBURETOR SYNCHRONIZATION

### ▲ 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.

### NOTE

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

Remove the fuel tank (page 2-4).

Remove the left and right engine hanger plates.

### No.1 CYLINDER:

Remove the plug and washer from the cylinder head intake port.

### ▲ WARNING

- Remove the rubber cap by pinching the end of the cap. Do not pinch the cap body or it will be damaged.

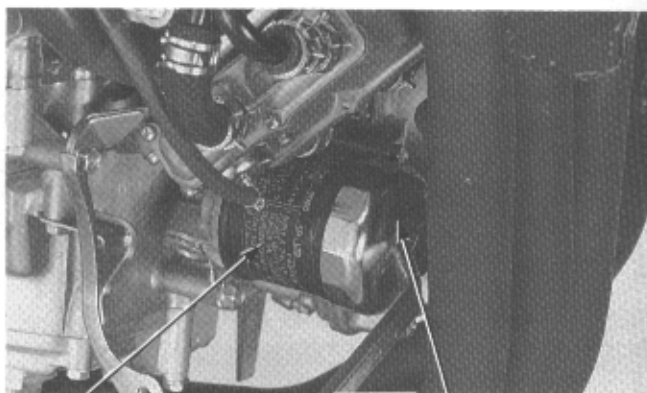
### No.2, 4 CYLINDER:

Remove the rubber caps from the vacuum joint on cylinder head intake port.

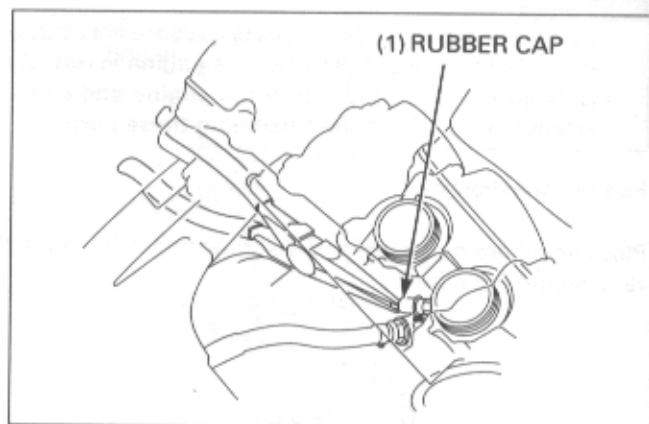
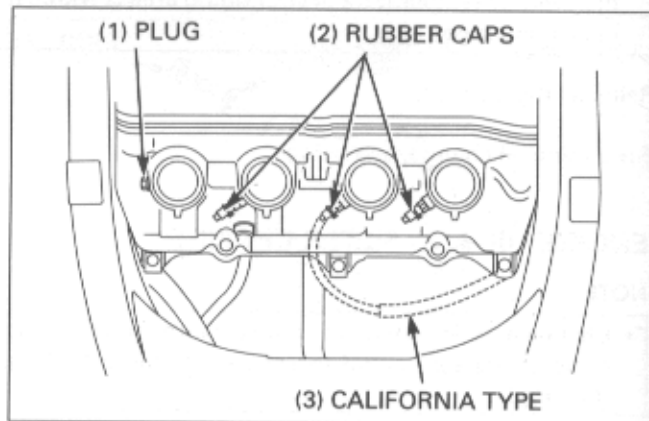
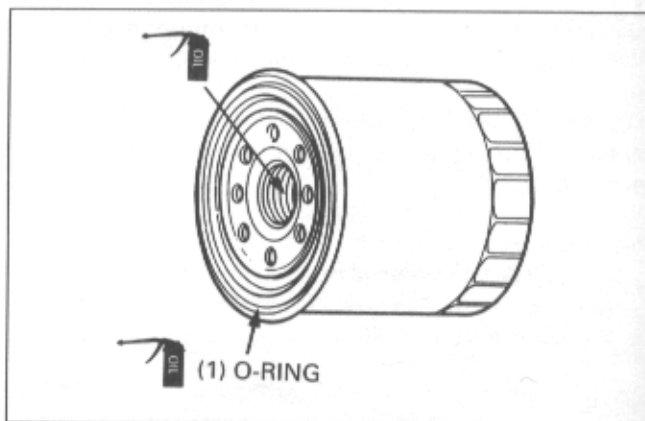
### No.3 CYLINDER:

- 49 STATE, CANADA TYPE:

Remove the rubber cap from the vacuum joint on cylinder head intake port.



(1) OIL FILTER (2) S. TOOL OIL FILTER WRENCH





**- CALIFORNIA TYPE:**

Disconnect the No.3 cylinder vacuum tube from the pulse secondary air injection (PAIR) control valve.



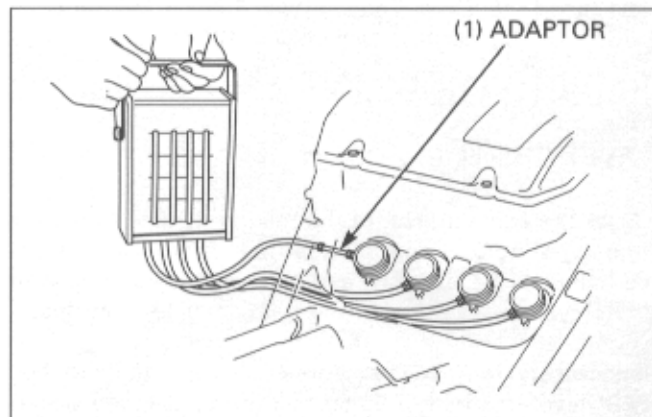
Screw the adaptor in the No.1 intake port vacuum hole and connect the vacuum gauge tube to the adaptor.

Connect the vacuum gauge tubes to the No.2, 3, 4 vacuum joints.

**CALIFORNIA TYPE ONLY:**

Connect the vacuum gauge tube to the No.3 vacuum tube.

Install the fuel tank and connect the fuel tube but do not install the fuel tank mounting bolts.



1. Turn the fuel valve ON. Start the engine and adjust the idle speed to the specification.

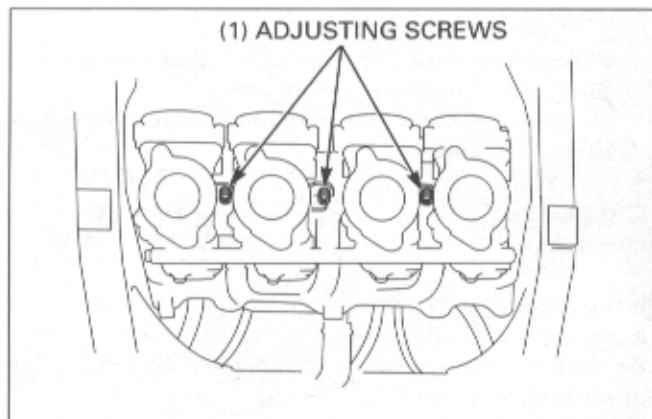
**Idle speed : 49 State, Canada type: 1,200 ± 100 rpm**  
**California type: 1,400 ± 100 rpm**

2. Check the difference in vacuum between each carburetor.

**Carburetor vacuum difference: Within 30 mm Hg (1.2 in Hg)**

**NOTE**

- No.3 carburetor is the base carburetor.



3. Synchronize to specification by turning the adjusting screws with the phillips screwdriver as shown.

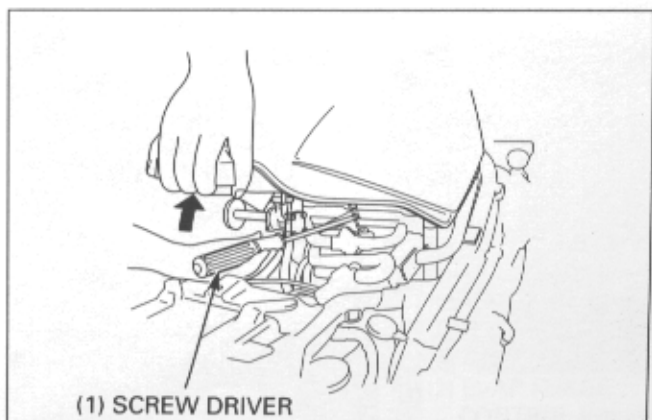
4. Be sure that the synchronization is stable by snapping the throttle grip several times.

5. Snap the throttle grip several times and recheck the idle speed and difference in vacuum between each carburetor.

Disconnect the vacuum gauge and install the removed parts.

**Torque:**

**Engine hanger plate 10 mm bolt : 45 N·m (4.5 kg-m, 33 lb-ft)**



## ENGINE IDLE SPEED

### NOTE

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

Warm up the engine.

Support the motorcycle on a level surface and shift the transmission into neutral.

Check the idle speed and adjust by turning the throttle stop screw if necessary.

**Idle speed : 49 State, Canada type:  $1,200 \pm 100$  rpm**  
**California type:  $1,400 \pm 100$  rpm**

## RADIATOR COOLANT

### LEVEL CHECK

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 in a vertical position on a flat, level surface.

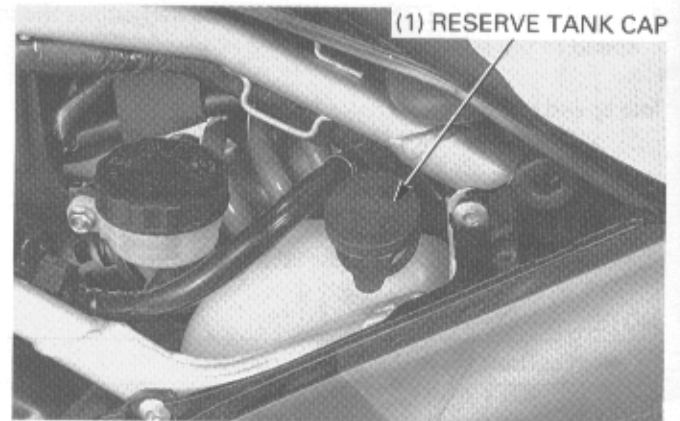
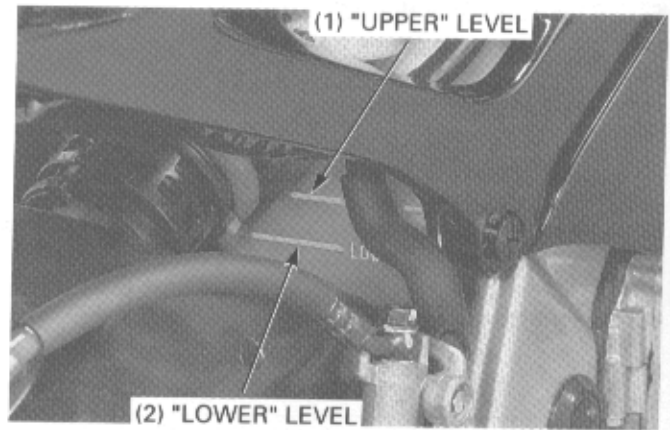
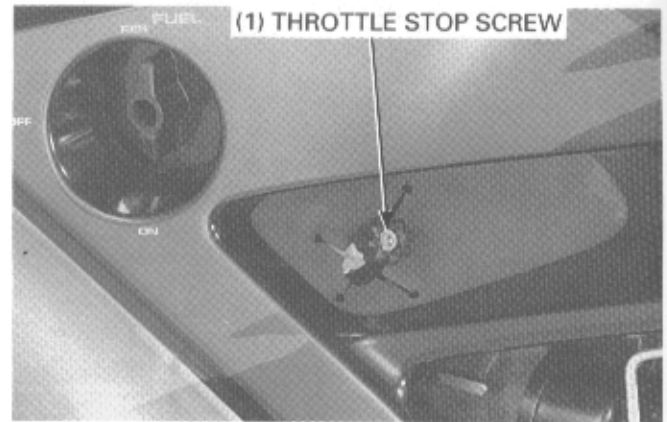
If necessary, remove the reserve tank cap and fill to the "UPPER" level line with a 50-50 mixture of distilled water and antifreeze (coolant mixture preparation: page 6-4).

### CAUTION

- **Be sure to use the proper mixture of antifreeze and distilled water to protect the engine.**
- **Use distilled water. Tap water may cause the engine to rust or corrode.**

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

If the 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 as described on page 6-4.



## COOLING SYSTEM

Check the radiator air passages 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.

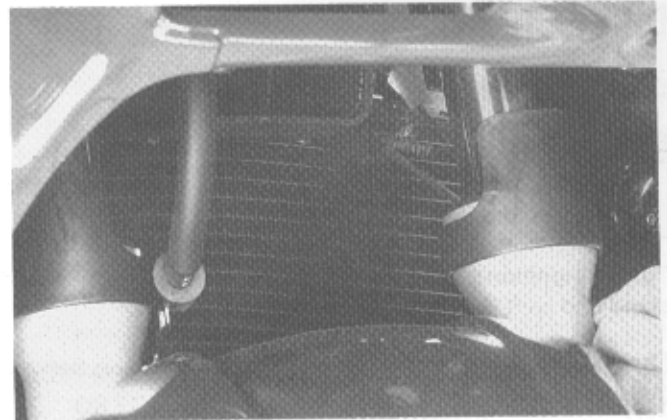
Replace the radiator if the air flow is restricted over more than 20% of the radiating surface.

For radiator replacement, refer to page 6-8.

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

Make sure the hoses are in good condition; they should not show any signs of deterioration.

Replace any hose that shows any sign of deterioration. Check that all hose clamps are tight.



## SECONDARY AIR SUPPLY SYSTEM (California type only)

Check the air supply hoses between the reed valve and intake pipes for deterioration, damage or loose connections. Make sure the hoses are not kinked or pinched.

### NOTE

- If the hoses show any signs of heat damage, remove the reed valves and inspect for damage (page 5-38).

Check the vacuum hose between the intake port and valve for deterioration, damage or loose connections. Make sure the hose is not kinked or pinched.

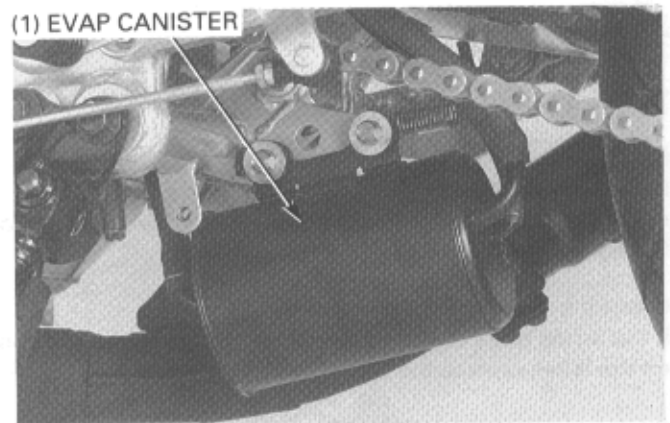


(1) PAIR CONTROL VALVE

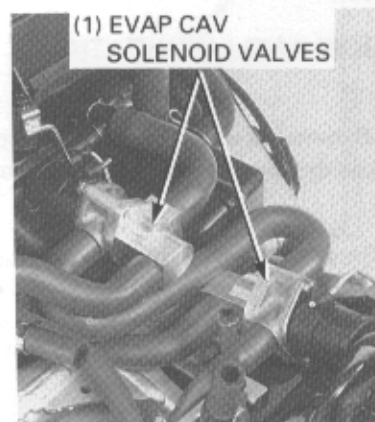
## EVAPORATIVE EMISSION CONTROL SYSTEM (California type only)

Check the tubes between the fuel tank, EVAP canister, EVAP purge control valve, EVAP CAV solenoid valve and carburetors for deterioration, damage or loose connections. Check the EVAP canister for cracks or other damage.

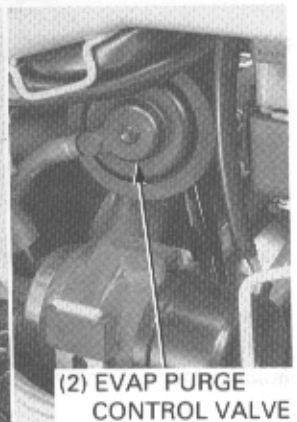
Refer to the Vacuum Hose Routing Diagram label and Cable & Harness Routing (page 1-20) for tube connections.



(1) EVAP CANISTER



(1) EVAP CAV  
SOLENOID VALVES



(2) EVAP PURGE  
CONTROL VALVE

## DRIVE CHAIN

### DRIVE CHAIN SLACK INSPECTION

**▲ WARNING**

- Never inspect and adjust the drive chain while the engine is running.

Turn the ignition switch OFF, place the motorcycle on its side stand and shift the transmission into neutral.

Check the slack in the drive chain lower run midway between the sprockets.

**Drive chain slack: 15 – 25 mm (5/8 – 1 in)**

Lubricate the drive chain with Pro Honda Chain Lube or equivalent chain lubricant designed specifically for use O-ring chains. Wipe off the excess chain lube.

### ADJUSTMENT

Loosen the axle nut.

Loosen both lock nuts and turn both adjusting nuts until the correct drive chain slack is obtained.

Make sure the index marks on the both adjusters are aligned with the rear edges of the axle slots in the swingarm.

Tighten both lock nuts.

**Torque: 22 N·m (2.2 kg·m, 16 lb-ft)**

Tighten the rear axle nut.

**Torque: 95 N·m (9.5 kg·m, 69 lb-ft)**

Recheck chain slack and free wheel rotation.

Lubricate the drive chain with Pro Honda Chain Lube or equivalent chain lubricant designed specifically for use on O-ring chains. Wipe off the excess chain lube.

Check the chain wear label.

If the arrow mark of the chain adjuster reaches the red zone on the label, replace the drive chain with a new one.

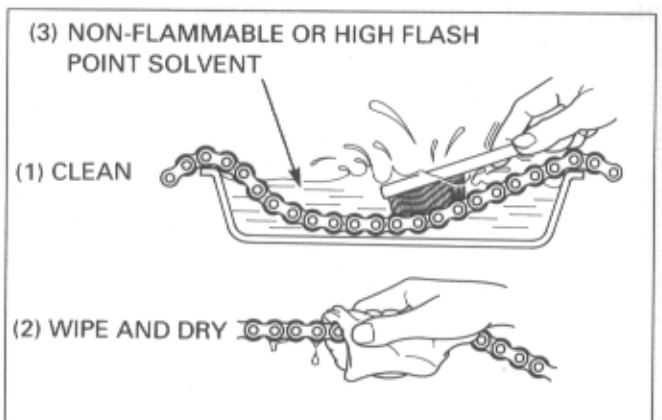
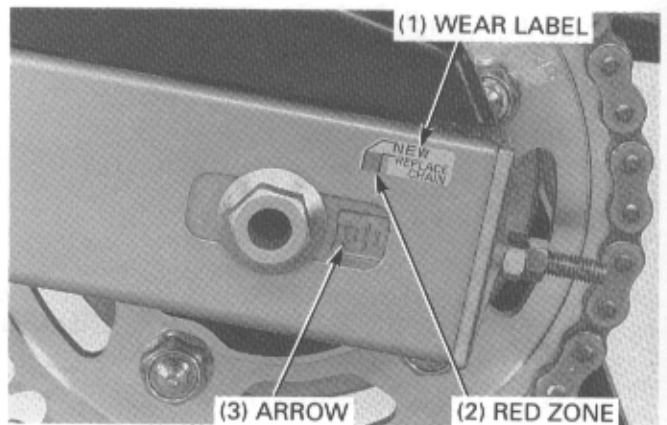
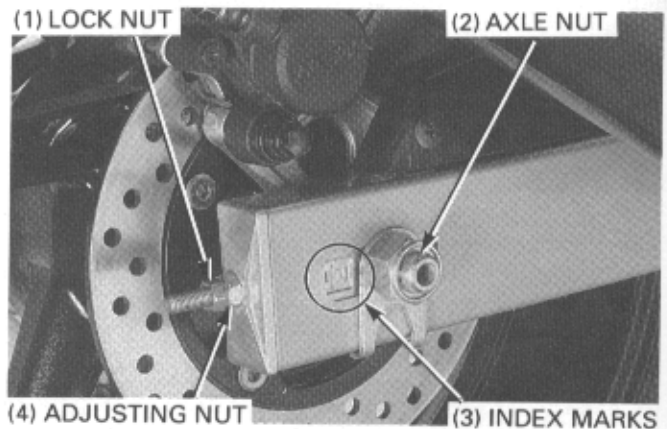
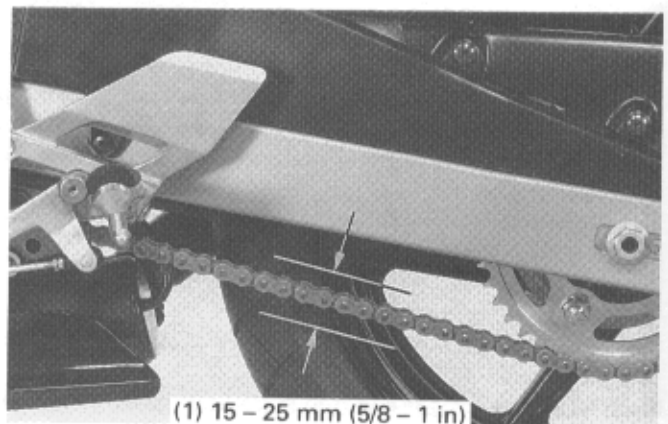
**Replacement chain: RK50MFO  
DID50V4**

### CLEANING, INSPECTION AND LUBRICATION

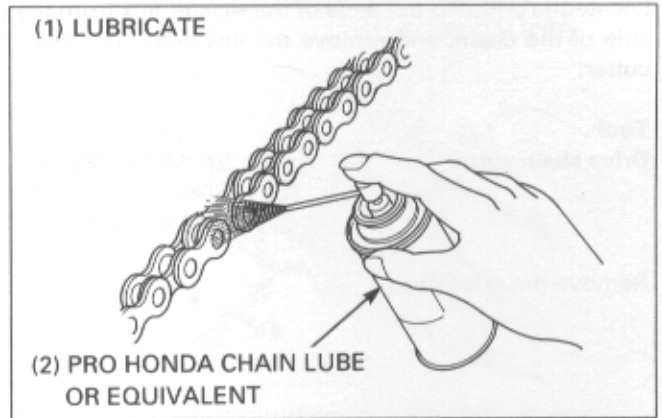
#### CHAIN

Clean the chain with non-flammable or high flash point solvent and wipe it dry. Be sure the chain has dried completely before lubricating.

Inspect the drive chain for possible damage or wear. Replace any chain that has damaged rollers, loose fitting links, or other wise appears unservicable. Installing a new chain on bodily worn sprockets will cause the new chain to wear quickly. Inspect and replace sprockets as necessary.



Lubricate the drive chain with Pro Honda Chain Lube or equivalent chain lubricant designed specifically for use on O-ring chains. Wipe off the excess chain lube.

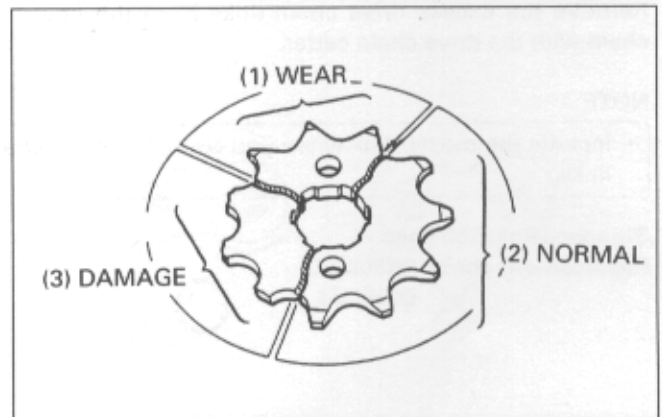


**SPROCKETS**

Inspect the drive and driven sprocket teeth for damage or wear. Replace if necessary.

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

Check the attachment bolt and nuts on the drive and driven sprockets. If any are loose, torque them.



**REPLACEMENT**

This motorcycle uses a drive chain with a staked master link.

Loosen the drive chain (page 3-16).

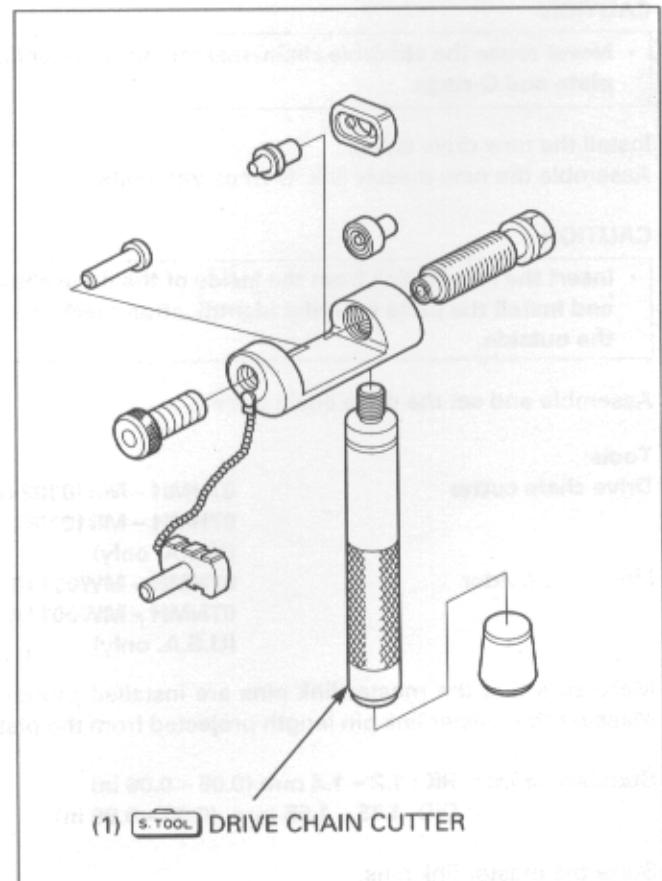
Assemble the special tool as shown.

**Tool:**  
Drive chain cutter

**07HMH - MR10102 or  
07HMH - MR1010B  
(U.S.A. only)**

**NOTE**

- When using the special tool, follow the manufacturer's instructions.



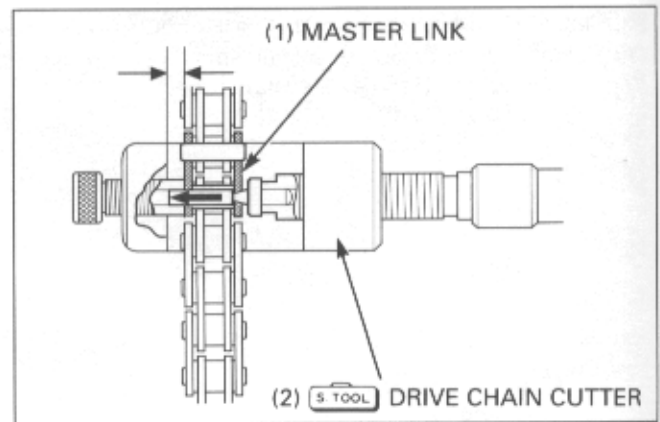
## MAINTENANCE

Locate the crimped pin ends of the master link from the outside of the chain, and remove the link with the drive chain cutter.

**Tool:**  
Drive chain cutter

07HMH - MR10102 or  
07HMH - MR1010B  
(U.S.A. only)

Remove the drive chain.



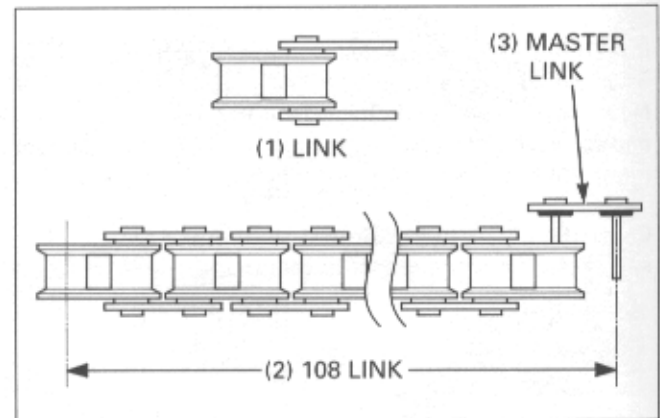
Remove the excess drive chain links from the new drive chain with the drive chain cutter.

### NOTE

- Include the master link when you count the drive chain links.

**Standard link: 108 links**

**Replacement chain: RK50MFO  
DID50V4**



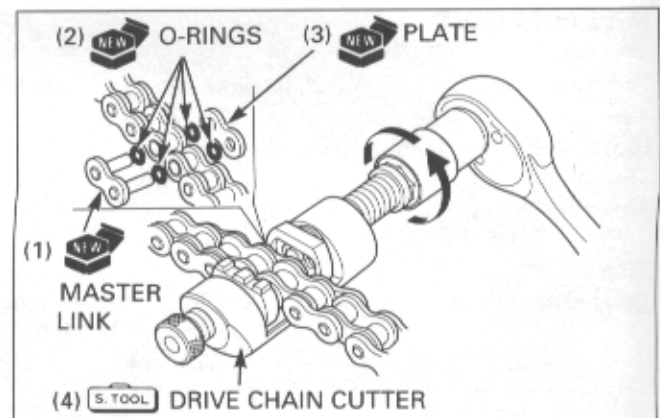
### CAUTION

- Never reuse the old drive chain, master link, master link plate and O-rings.

Install the new drive chain.  
Assemble the new master link, O-rings and plate.

### CAUTION

- Insert the master link from the inside of the drive chain, and install the plate with the identification mark facing the outside.



Assemble and set the drive chain cutter.

**Tools:**  
Drive chain cutter

07HMH - MR10102 or  
07HMH - MR1010B  
(U.S.A. only)

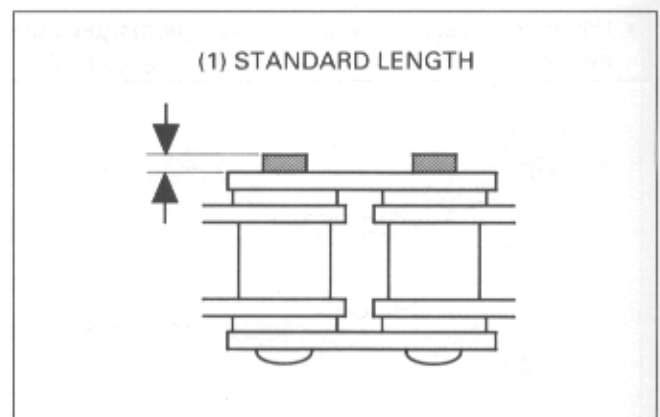
Link plate holder

07NMH - MW00110 or  
07NMH - MW0011A  
(U.S.A. only)

Make sure that the master link pins are installed properly.  
Measure the master link pin length projected from the plate.

**Standard length: RK : 1.2 - 1.4 mm (0.05 - 0.06 in)  
DID: 1.15 - 1.55 mm (0.05 - 0.06 in)**

Stake the master link pins.

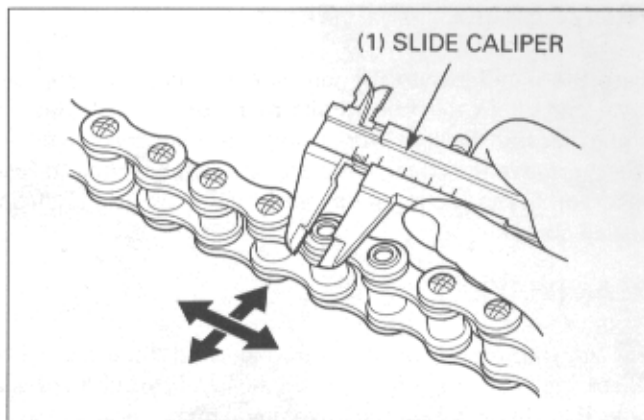


Make sure that the pins are staked properly by measuring the diameter of the staked area using a slide caliper.

**Diameter of the staked area:**

RK: 5.55 – 5.85 mm (0.219 – 0.230 in)

DID: 5.50 – 5.80 mm (0.217 – 0.228 in)

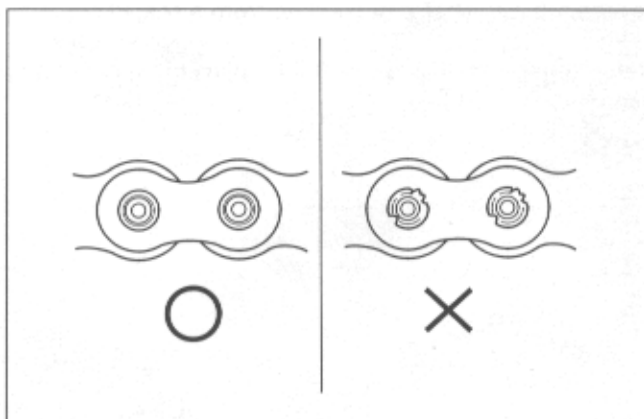


After staking, check the staked area of the master link for cracks.

If there is any cracking, replace the master link, O-rings and plate.

**CAUTION**

- A drive chain with a clip-type master link must not be used.



**BRAKE FLUID**

**CAUTION**

- Do not remove the cover or cap unless the reservoir is level because fluid may spill out.
- 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 (see below). A low fluid level may be due to wear of the brake pads. If the brake pads are worn, the caliper piston is 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 3-21).
- Do not remove the level float from the reservoir when filling with brake fluid.

## MAINTENANCE

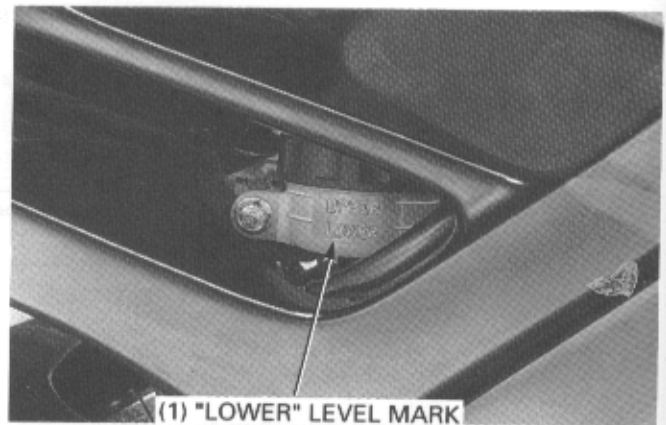
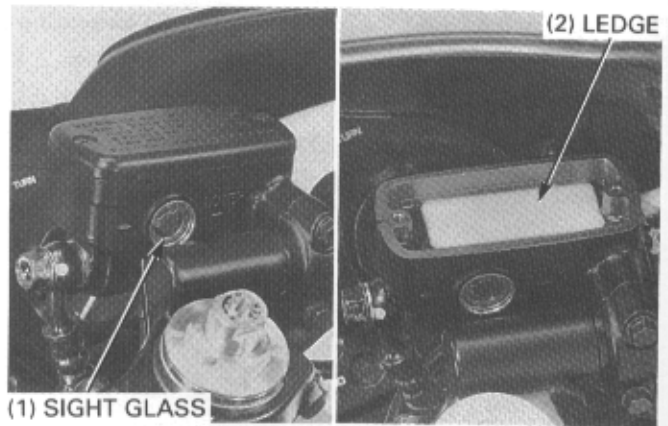
### FRONT BRAKE

Turn the handlebar to the left side so that the reservoir is level and check the front brake reservoir level through the sight glass. If the level (float edge) is near the lower level mark, remove the cover, set plate and diaphragm and fill the reservoir to the casting ledge with DOT 4 brake fluid from a sealed container.

### 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 mark, remove the side cover and cap (page 2-2) and fill the reservoir to the upper level mark with DOT 4 brake fluid from a sealed container.

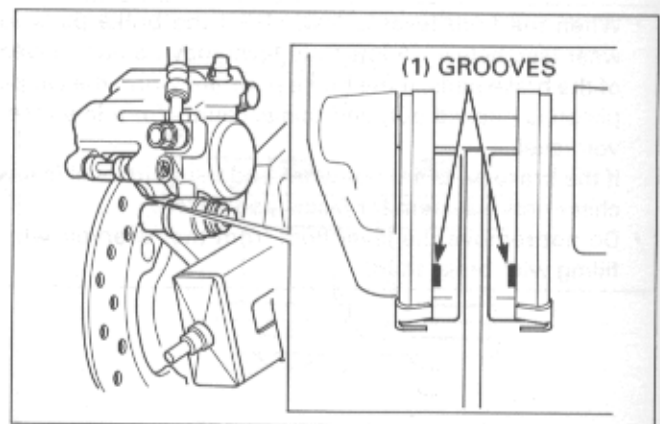
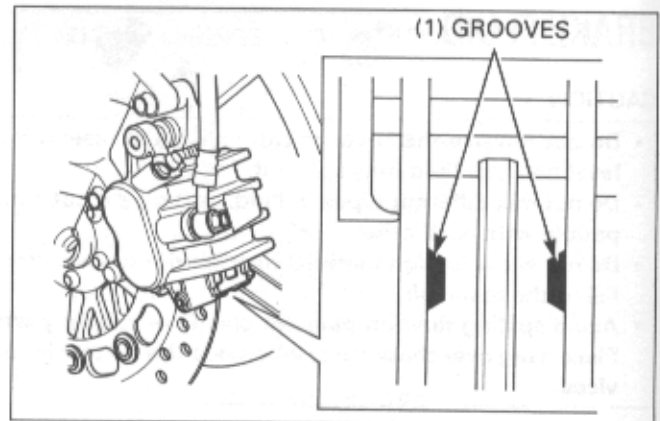
Refer to page 14-4 for brake fluid replacement/bleeding procedures.



### BRAKE PAD WEAR

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

Refer to page 14-6 for brake pad replacement.



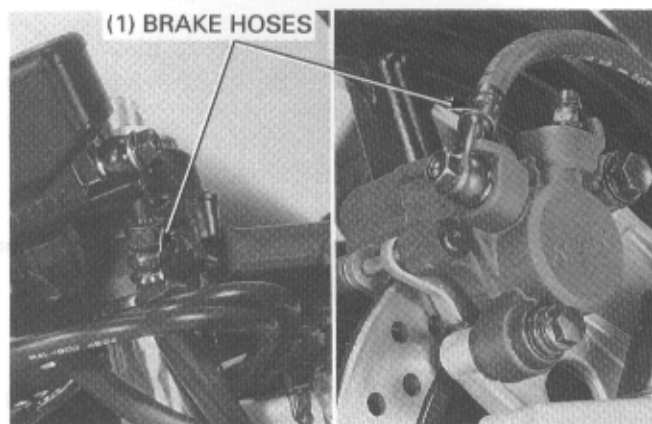


## BRAKE SYSTEM

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 air from the system.

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

Refer to page 14-4 for brake bleeding procedures.

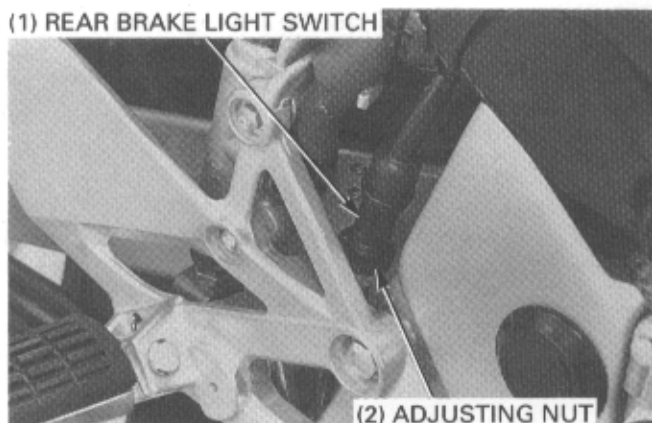


## BRAKE LIGHT SWITCH

### NOTE

- The front brake light switch does not require adjustment.

Adjust the rear brake light switch so 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 the 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 on-coming drivers, or it may fail to light the road for a safe distance.

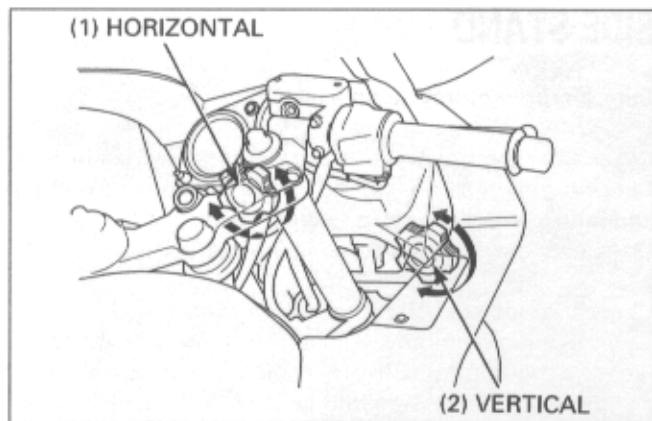
### NOTE

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

Place the motorcycle on a level surface.

Adjust the headlight beam horizontally by turning the horizontal adjusting knob. Turn the adjusting knob clockwise to direct the beam down.

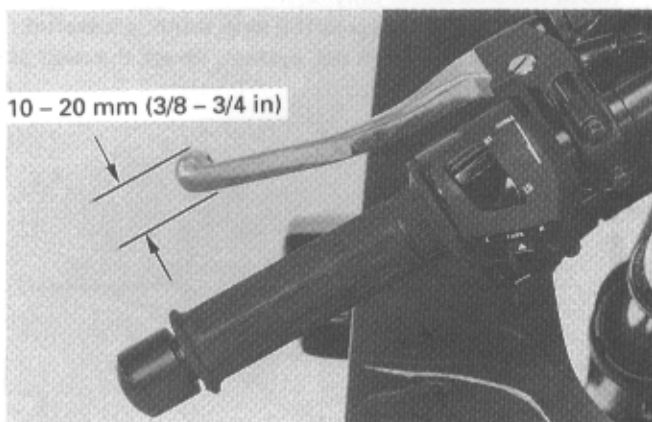
Adjust the headlight beam vertically by turning the vertical adjusting knob. Turn the adjusting knob clockwise to direct the beam toward the right side of the rider.



## CLUTCH SYSTEM

Measure the clutch free play at the end of the clutch lever.

Free play: 10 – 20 mm (3/8 – 3/4 in)



## MAINTENANCE

Adjust as follows:

Minor adjustments are made at the adjuster near the lever. Loosen the lock nut and turn the adjuster. Tighten the lock nut.

### CAUTION

- The adjuster may be damaged if it is positioned too far out, leaving minimal thread engagement.

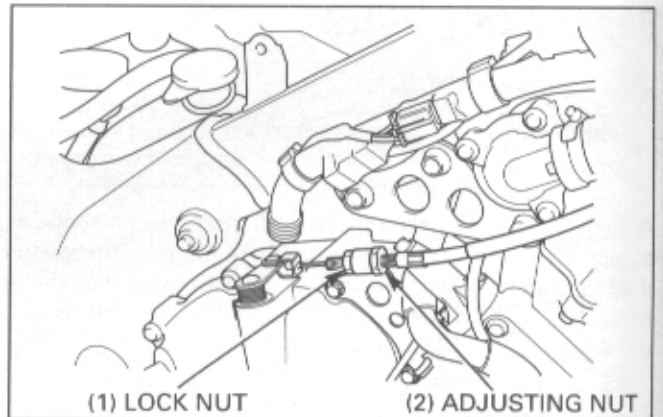
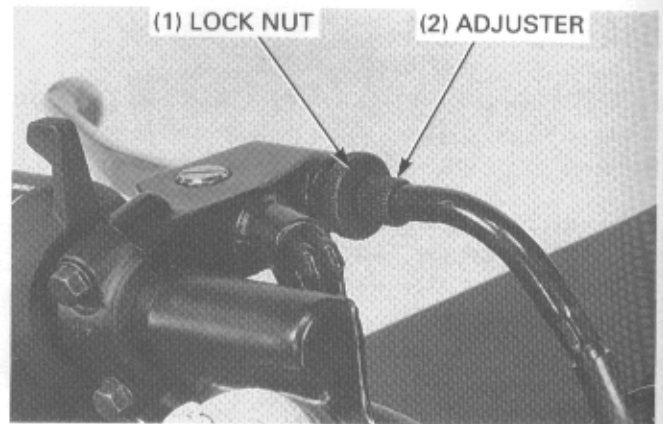
If the adjuster is threaded out near its limit and the correct free play cannot be obtained, turn the adjuster all the way in and back out one turn. Tighten the lock nut and make a major adjustment as described below.

Major adjustment is performed at the clutch arm. Remove the left side fairing (page 2-3).

Loosen the lock nut and turn the adjusting nut to adjust free play. Hold the adjusting nut securely while tightening the lock nut.

If proper free play cannot be obtained, or the clutch slips during the test ride, disassemble and inspect the clutch (see section 9).

Install the left side fairing in the reverse order of removal.



## SIDE STAND

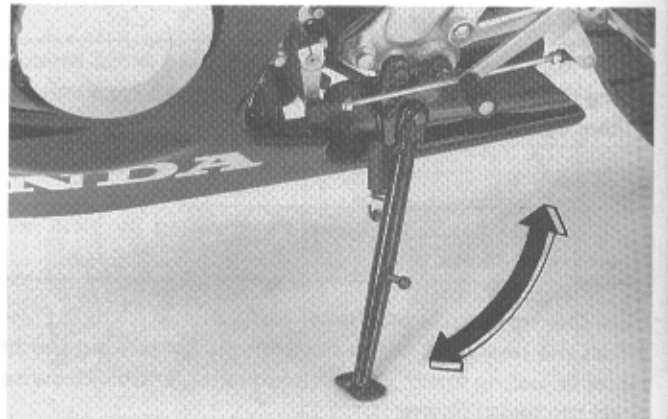
Support the motorcycle on a level surface.

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. Make sure that the side stand is not bent.

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, with the clutch lever squeezed.
- Move the side stand fully down.
- The engine should stop as the side stand is lowered.

If there is a problem with the system, check the side stand switch (section 18).



## 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 fork assembly for signs of leaks, damage or loose fasteners.

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

Refer to section 12 for front 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 13).

Check the action of the shock absorbers by compressing them 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 13 for shock absorber service.



## NUTS, BOLTS, FASTENERS

Check that all chassis nuts and bolts are tightened to their correct torque values (page 1-13).

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

## WHEELS/TIRES

NOTE

- Tire pressure should be checked when tires are COLD.

**Recommended tire pressure and tire sizes:**

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

		Front	Rear
Cold tire pressure	Up to 90 kg (200 lb) load	36 (2.50, 250)	42 (2.90, 290)
	Up to maximum weight capacity	36 (2.50, 250)	42 (2.90, 290)
Tire size		120/60 ZR17	160/60 ZR 17

Check the tires for cuts, embedded nails, or other damage. Check the front and rear wheels for trueness (refer to sections 12 and 13).

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

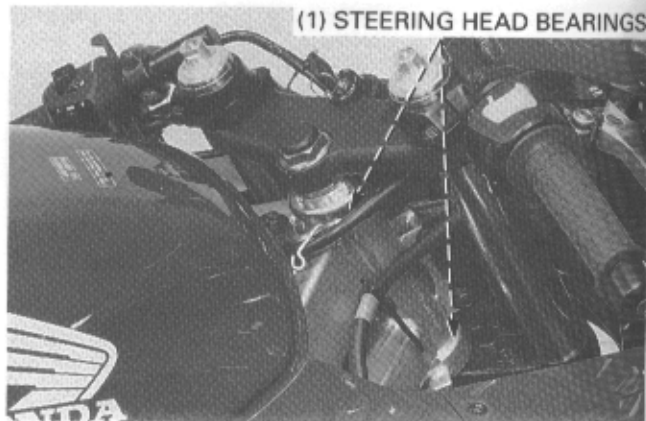
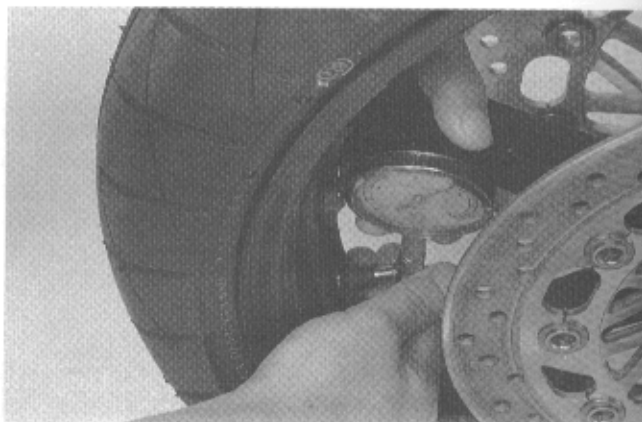
**Minimum tread depth: Front: 1.5 mm (0.06 in)**  
**Rear: 2.0 mm (0.08 in)**

## STEERING HEAD BEARINGS

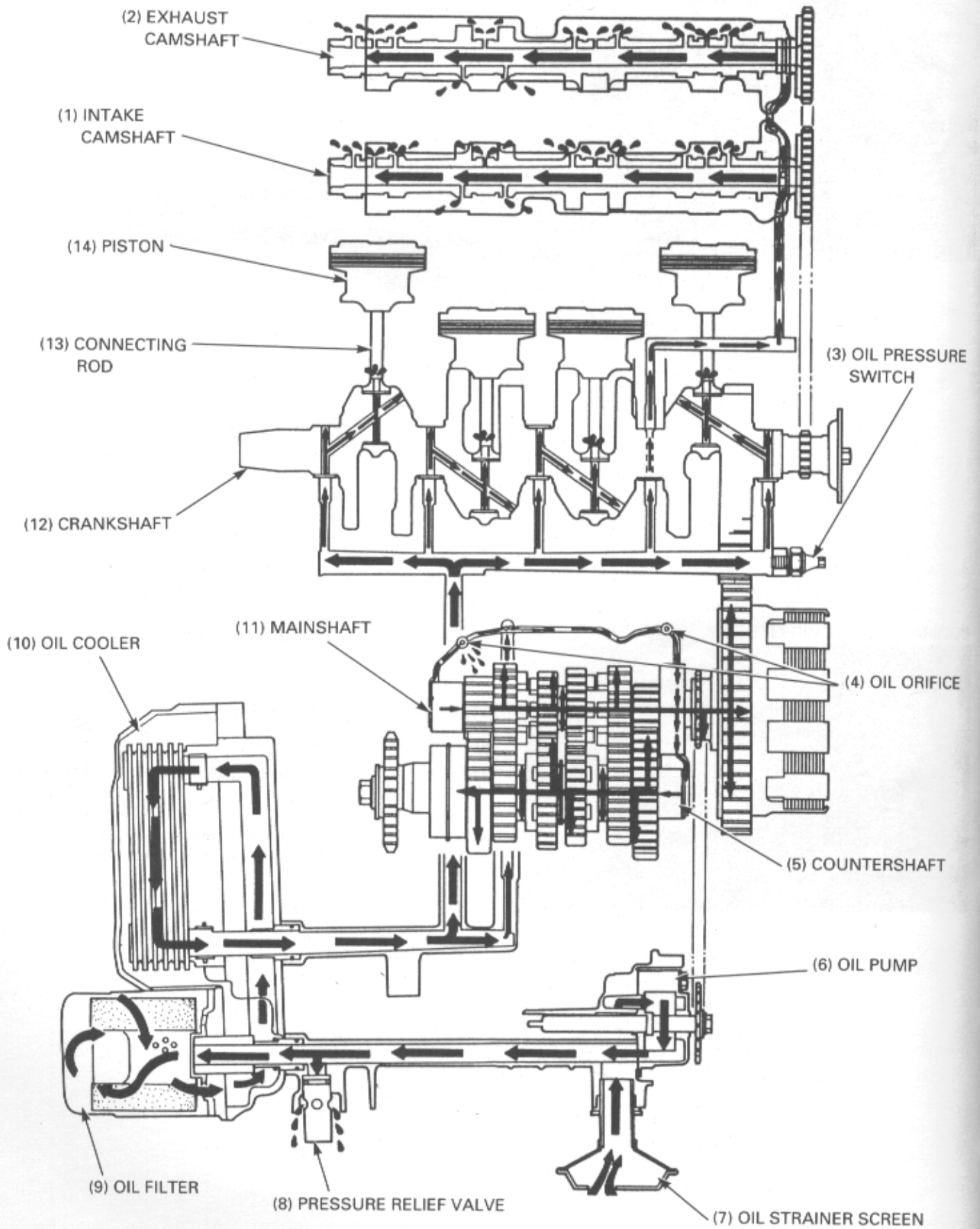
NOTE

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

Support the motorcycle securely and raise the front wheel off 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 12).



# LUBRICATION SYSTEM



# 4. LUBRICATION SYSTEM

SERVICE INFORMATION	4-1	OIL PAN	4-4
TROUBLESHOOTING	4-2	OIL PUMP	4-6
OIL PRESSURE CHECK	4-3	OIL COOLER	4-10

## 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 can 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. **KEEP OUT OF REACH OF CHILDREN.**

- The service procedures in this section can be performed with the engine in the frame.
- When removing and installing the oil cooler and oil pump, use care not to allow dust or dirt to enter the engine.
- If any portion of the oil pump is worn beyond the specified service limits, replace the oil pump as an assembly.
- After the oil pump has been installed, check that there are no oil leaks and that the oil pressure is correct.
- For oil pressure indicator inspection, refer to section 18 of this manual.

### SPECIFICATIONS

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Oil pressure at oil pressure switch (80°C/176°F)	490.4 kPa (5.0 kg/cm <sup>2</sup> , 71 psi) at 6,000 rpm	—
Oil pump rotor	tip clearance	0.15 (0.006)
	body clearance	0.15 – 0.22 (0.006 – 0.009)
	end clearance	0.02 – 0.07 (0.001 – 0.003)
Oil pump drive sprocket collar O.D.	34.050 – 34.075 (1.3405 – 1.3415)	34.03 (1.35)
Oil pump drive sprocket I.D.	35.025 – 35.075 (1.3789 – 1.3809)	35.10 (1.38)

### TORQUE VALUES

Oil filter boss	18 N•m (1.8 kg-m, 13 lb-ft) Apply locking agent to the threads.
Oil pump driven sprocket bolt	15 N•m (1.5 kg-m, 11 lb-ft) Apply locking agent to the threads.
Oil pressure switch	12 N•m (1.2 kg-m, 9 lb-ft) Apply sealant to the threads.
Oil pump cover bolt	8 N•m (0.8 kg-m, 5.8 lb-ft)
Oil cooler sealing bolt	50 N•m (5.0 kg-m, 36 lb-ft) Apply locking agent to the threads.

### TOOLS

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

### TROUBLESHOOTING

#### Oil level low

- Oil consumption
- External oil leaks
- Worn piston ring or incorrect piston ring installation
- Worn valve guide or seal

#### Oil contamination

- From coolant mixing with oil
  - Faulty water pump mechanical seal
  - Faulty cylinder head gasket
  - Water leak in crankcase

#### No oil pressure

- Oil level too low
- Oil pump drive chain or drive sprocket broken
- Oil pump damaged (pump shaft)
- Internal oil leak

#### Low oil pressure

- Pressure relief valve stuck open
- Clogged oil filter and strainer screen
- Oil pump worn or damaged
- Internal oil leak
- Incorrect oil being used
- Oil level too low

#### High oil pressure

- Pressure relief valve stuck closed
- Plugged oil filter, gallery, or metering orifice
- Incorrect oil being used

#### Seized engine

- No or low oil pressure
- Clogged oil orifice/passage
- Internal oil leaks
- Non-recommended oil used

## OIL PRESSURE CHECK

Remove the side fairing (page 2-3).

### NOTE

- If the engine is cold, the pressure reading will be abnormally high. Warm up the engine to normal operating temperature before starting this test.

Stop the engine.

Remove the switch cover and disconnect the oil pressure switch wire by removing the 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  
 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 3-11).

Start the engine and check the oil pressure at 6,000 rpm.

### Oil pressure:

490.4 kPa (5.0 kg/cm<sup>2</sup>, 71 psi) at 6,000 rpm (80°C/176°F)

Stop the engine.

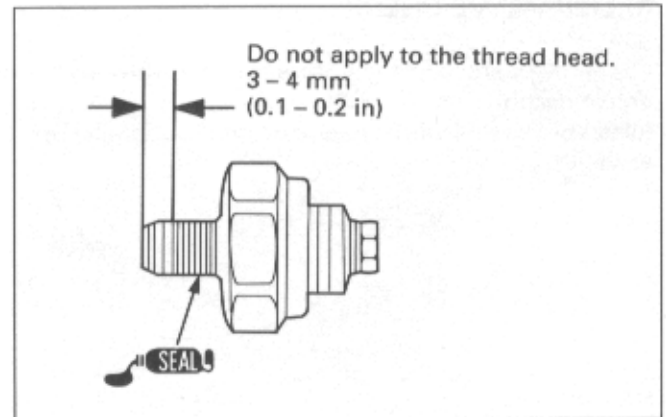
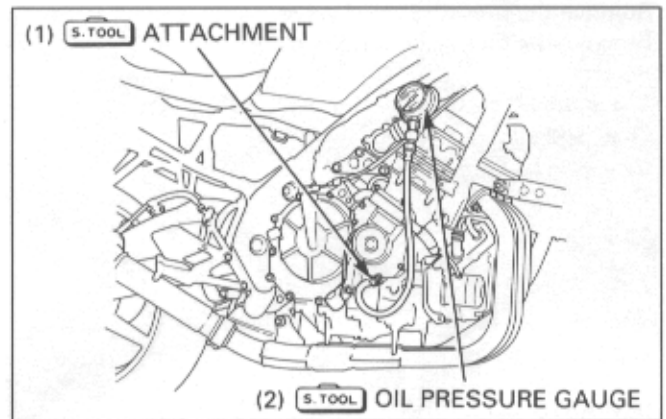
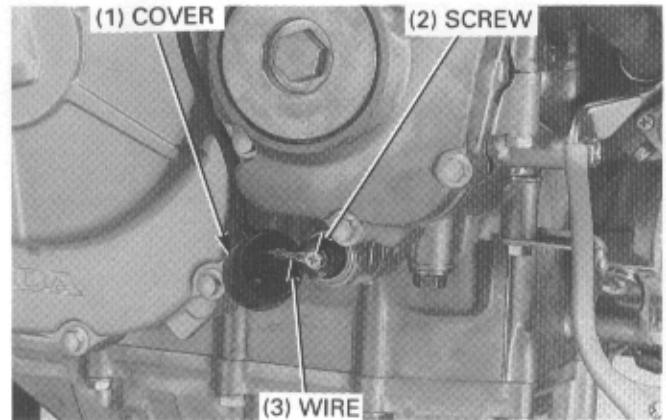
Apply sealant to the pressure switch threads as shown and install it.

**Torque: 12 N·m (1.2 kg-m, 9 lb-ft)**

Connect the oil pressure switch wire and install the switch cover.

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 immediately and determine the cause (page 18-10).





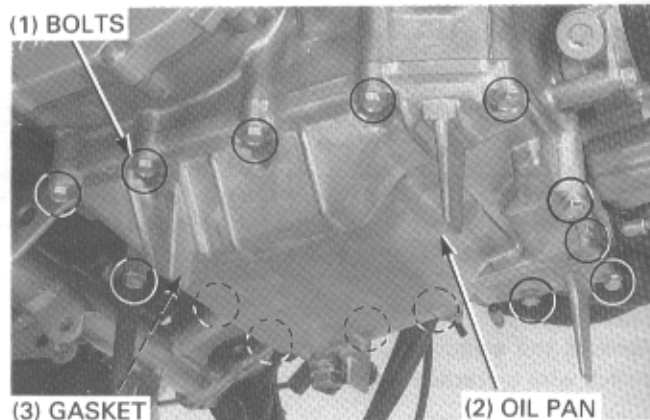
## LUBRICATION SYSTEM

### OIL PAN

#### REMOVAL

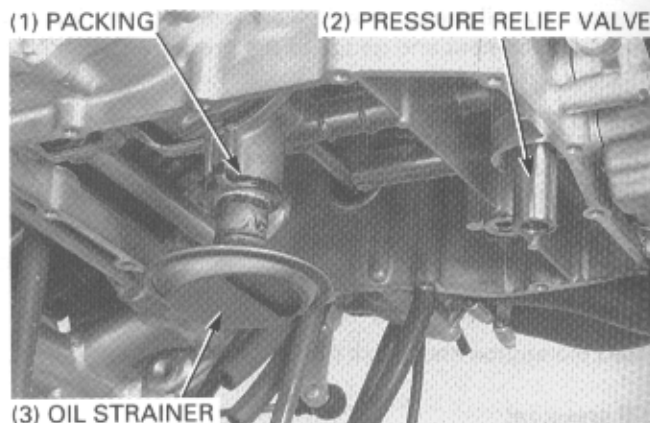
Remove the exhaust pipe (page 2-10).  
Drain the engine oil (page 3-11).

Remove the oil pan bolts.  
Remove the oil pan and gasket.



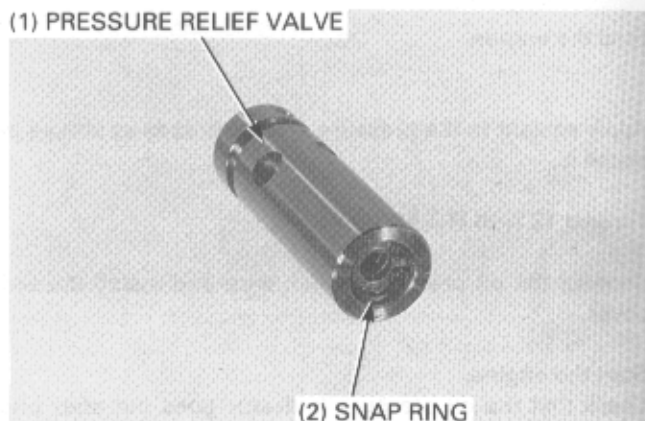
Remove the pressure relief valve.  
Remove the oil strainer and packing.

Check the oil strainer for damage or clogging.  
Clean the oil strainer.



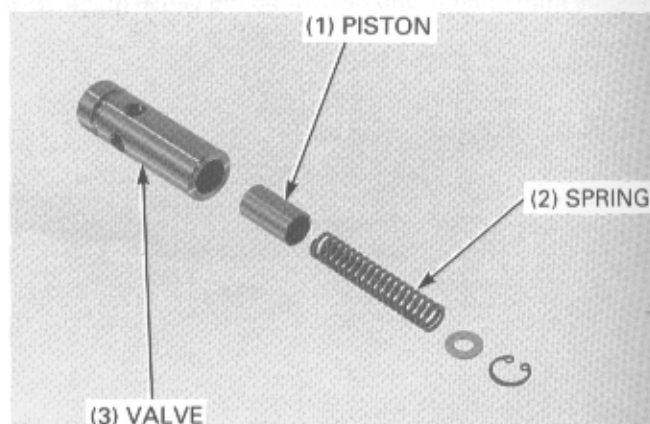
#### RELIEF VALVE CHECK

Check the operation of the pressure relief valve by pushing on the piston.  
Remove the relief valve snap ring and disassemble the relief valve.



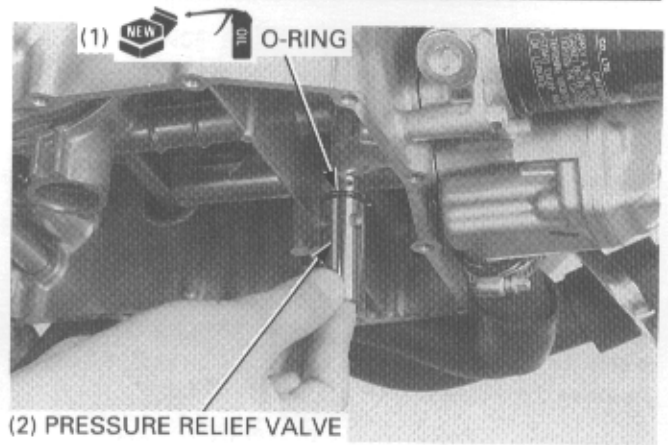
Check the piston for wear, sticking or damage.  
Check the spring and piston for wear or damage.  
Check the valve for clogging or damage.

Clean the remaining parts and assemble the relief valve in the reverse order of disassembly.

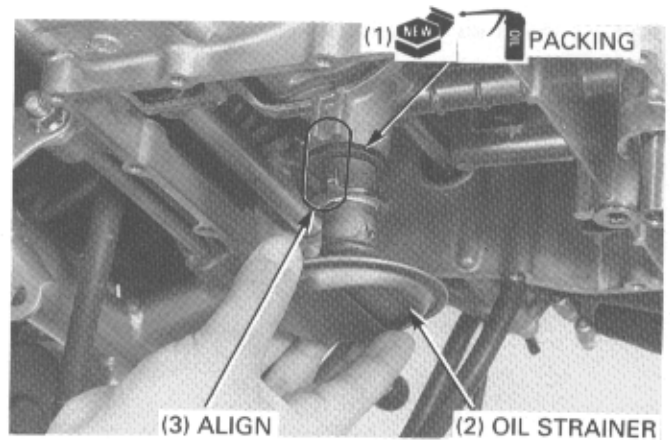


**INSTALLATION**

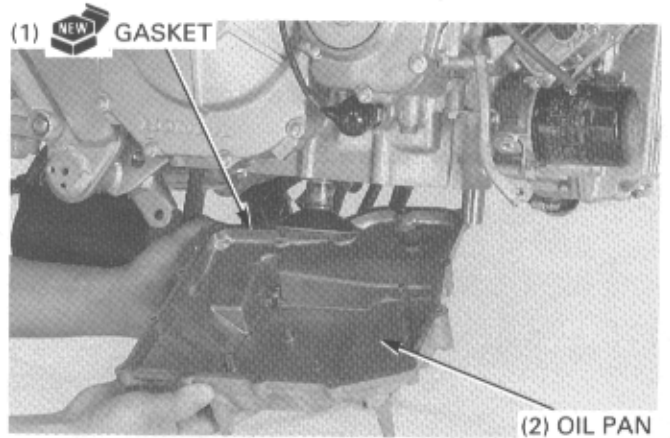
Apply oil to the new O-ring and install the pressure relief valve groove, and install the relief valve to the crankcase.



Coat a new packing with the engine oil and install into the crankcase. Install the oil strainer by aligning the crankcase slot and strainer tab.



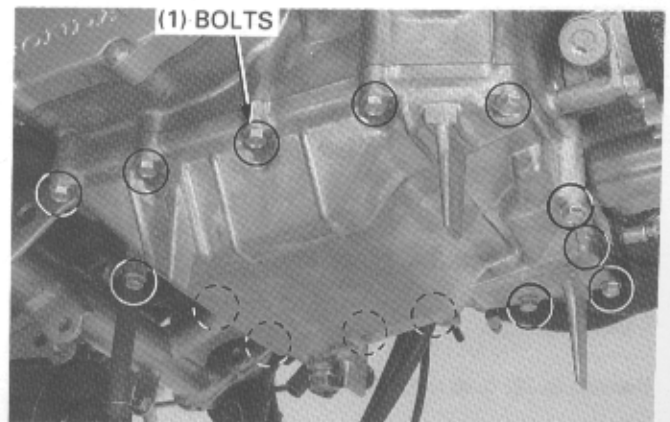
Install the new gasket and oil pan.



Install the bolts. Tighten the bolts in a gradual, crisscross pattern.

Install the exhaust pipe (page 2-10).  
Fill the engine with oil (page 3-12).

Check that there are no oil leaks and that oil pressure is correct.



## LUBRICATION SYSTEM

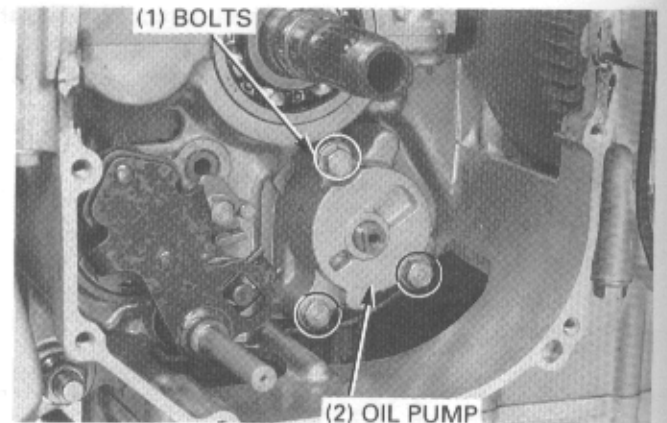
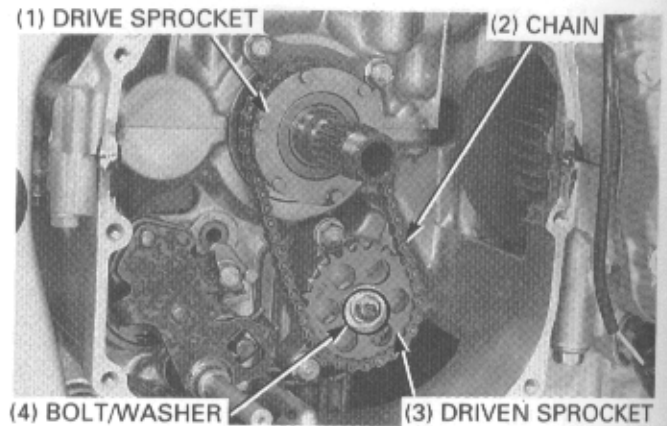
### OIL PUMP

#### REMOVAL

Drain the engine oil (page 3-11).  
Remove the clutch (page 9-3).

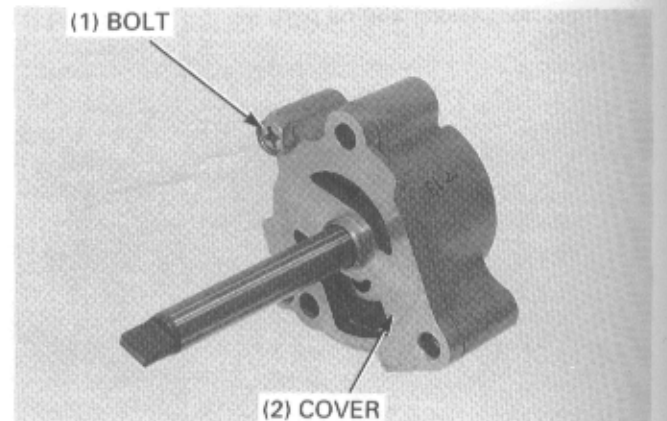
Remove the oil pump driven sprocket bolt/washer.  
Remove the oil pump drive and driven sprocket and chain as a set.  
Remove the oil pump drive sprocket collar.

Remove the three mounting bolts and the oil pump.



#### DISASSEMBLY

Remove the oil pump cover bolt and cover.  
Remove the dowel pin.  
Disassemble the oil pump and clean the removed parts.



#### INSPECTION

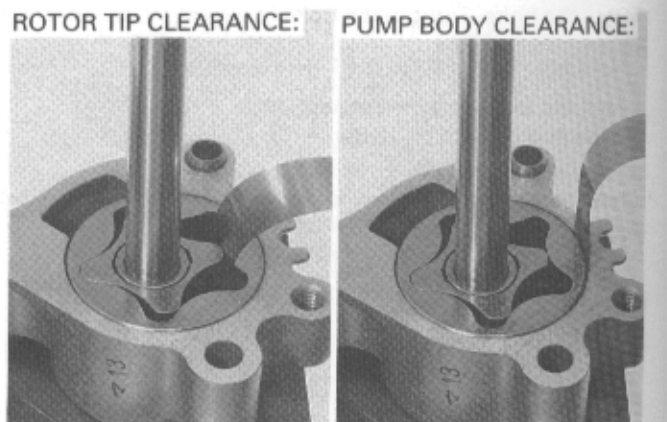
If any portion of the oil pump is worn beyond the service limit, replace the oil pump as an assembly.

Measure the rotor tip clearance.

**Service limit: 0.20 mm (0.008 in)**

Measure the pump body clearance.

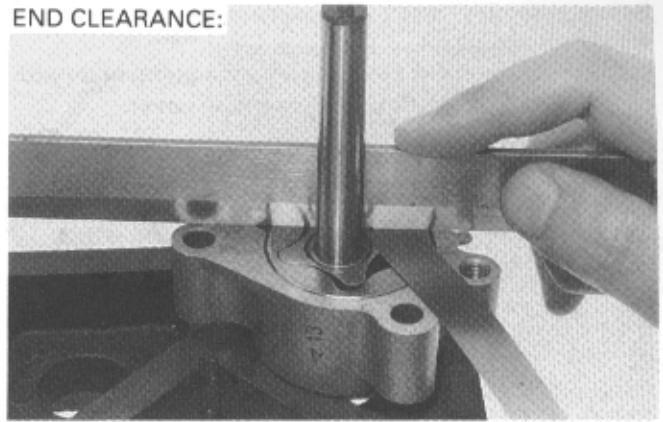
**Service limit: 0.35 mm (0.014 in)**



Measure the oil pump end clearance.

Service limit: 0.10 mm (0.004 in)

END CLEARANCE:

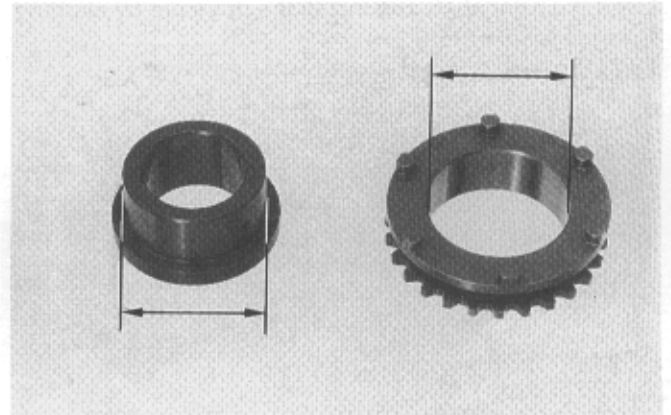


Measure the oil pump drive sprocket collar.

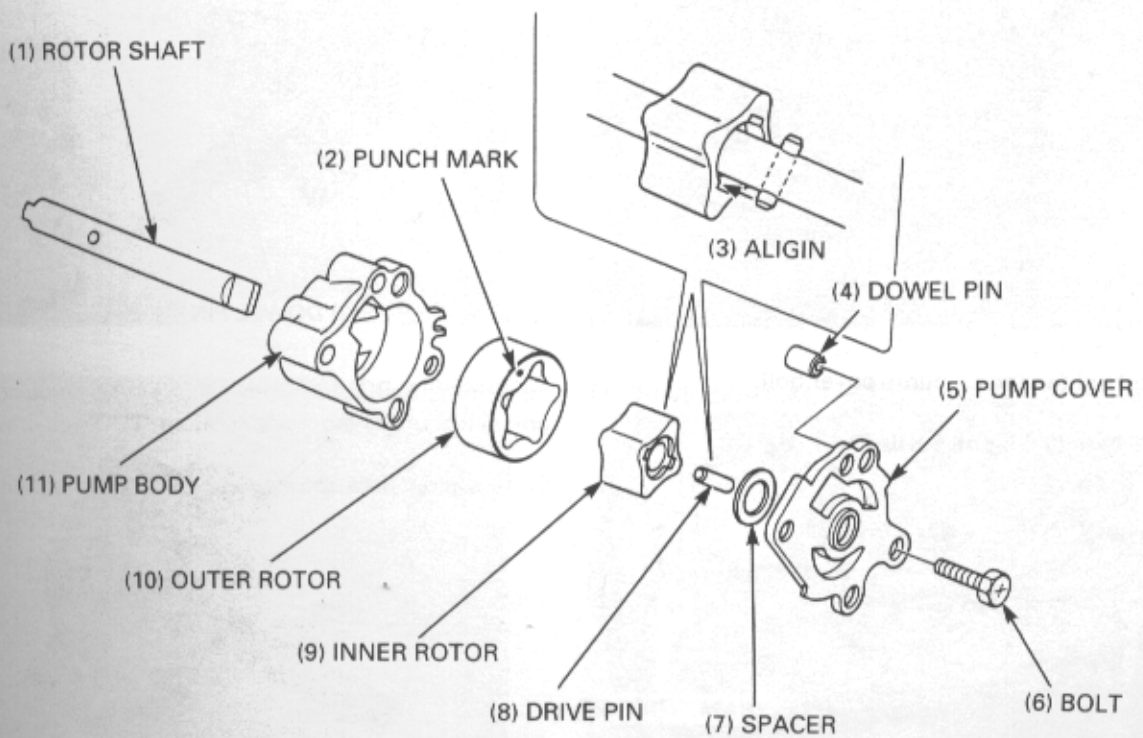
Service limit: O.D.: 34.03 mm (1.35 in)

Measure the oil pump drive sprocket.

Service limit: I.D.: 35.10 mm (1.38 in)



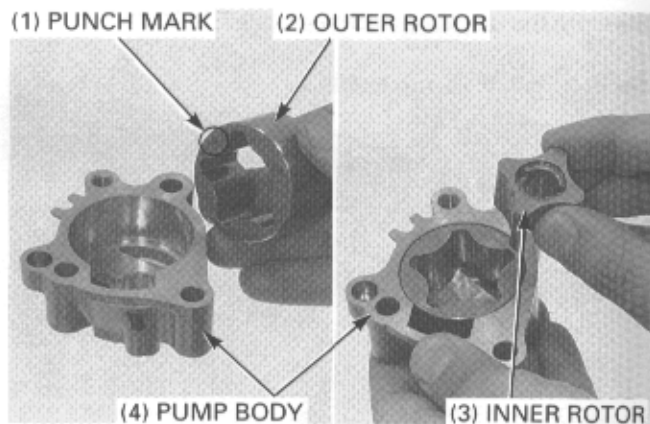
ASSEMBLY



## LUBRICATION SYSTEM

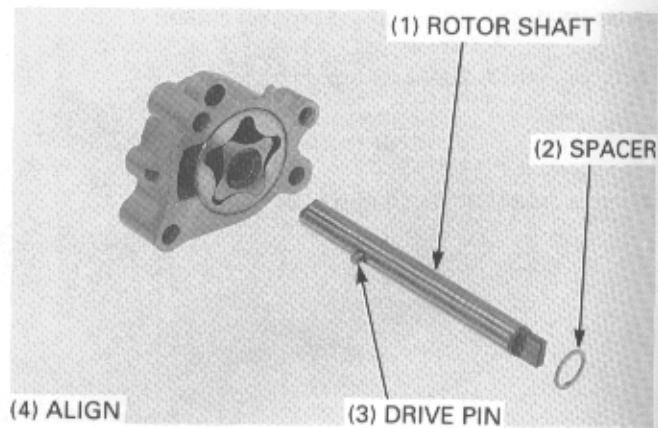
Before assembly, clean all disassembled parts thoroughly with clean engine oil.

Install the outer and inner rotors into the pump body with the outer rotor punch mark facing the pump cover.

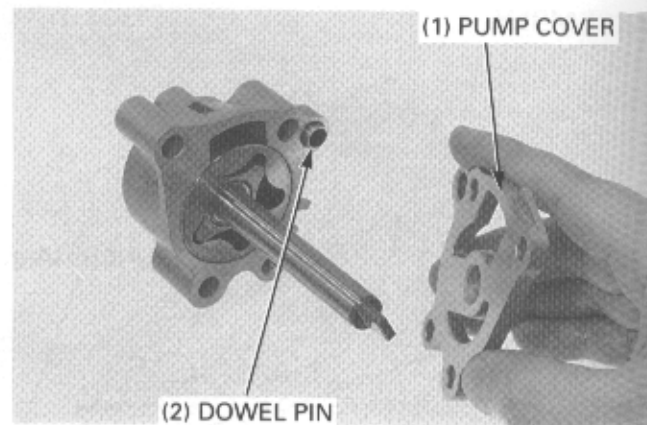


Insert the rotor shaft and install the drive pin by aligning the slots in the inner rotor.

Place the spacer into the inner rotor groove.

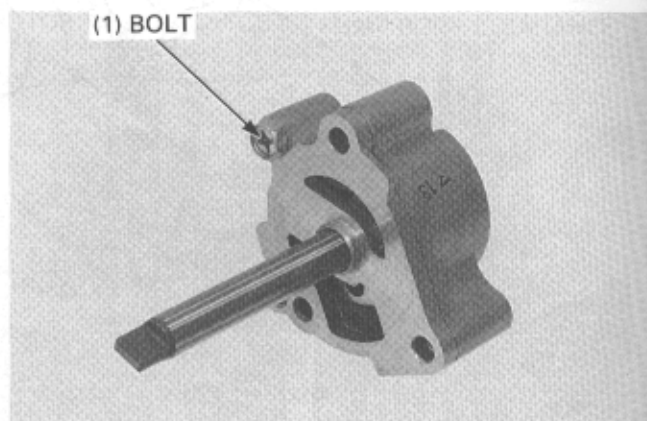


Install the dowel pin in the oil pump body.  
Install the oil pump cover.



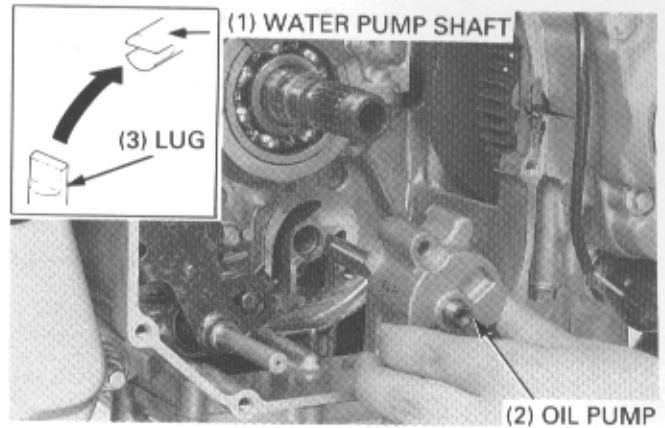
Install and tighten the oil pump cover bolt.

**Torque: 8 N·m (0.8 kg·m, 5.8 lb-ft)**

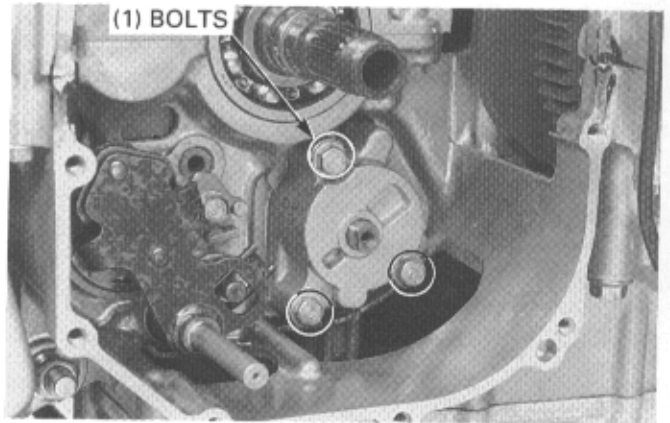


**INSTALLATION**

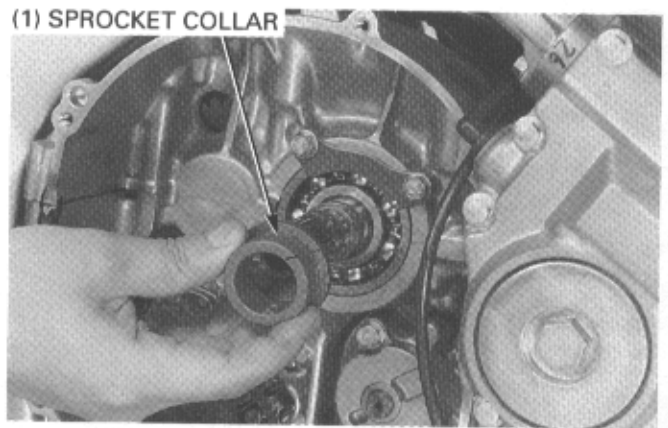
Align the rotor shaft lug with the water pump shaft groove and install the oil pump into the crankcase.



Install and tighten the oil pump mounting bolts.

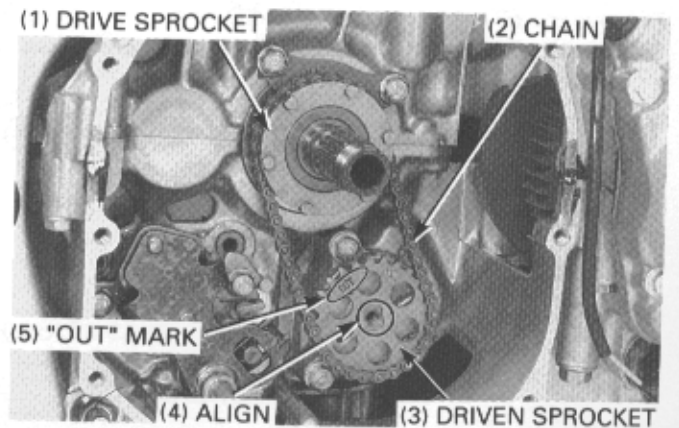


Install the drive sprocket collar over the mainshaft.



Install the oil pump drive and driven sprocket and chain as an assembly with the "OUT" mark on the driven sprocket facing out.

Align the flat surfaces of the driven sprocket hole and oil pump shaft end.



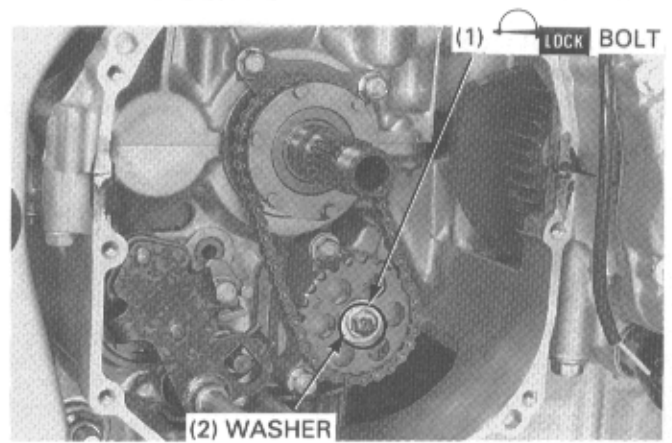
## LUBRICATION SYSTEM

Apply locking agent to the driven sprocket bolt threads, and install the bolt with the washer and tighten it securely.

**Torque: 15 N·m (1.5 kg-m, 11 lb-ft)**

Install the clutch (page 9-11).  
Fill the engine with oil (page 3-12).

Check that there are no oil leaks and that oil pressure is correct.

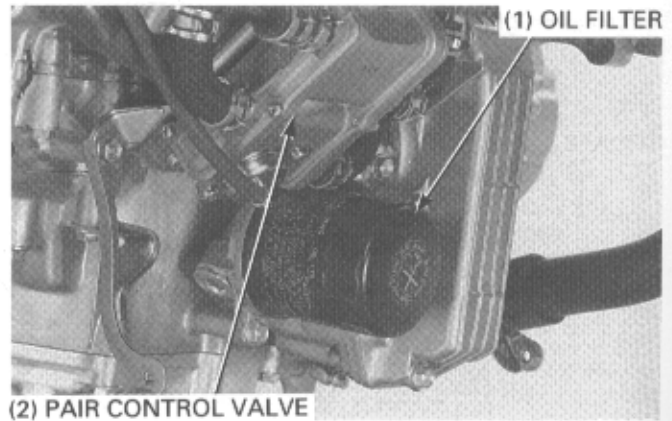


## OIL COOLER

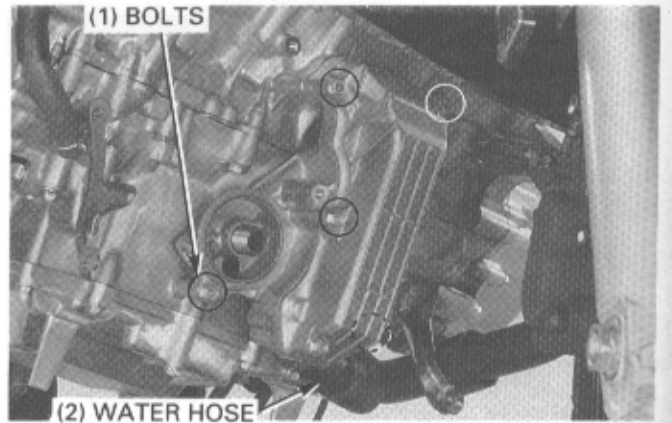
### REMOVAL

Remove the exhaust pipe (page 2-10).  
Drain the engine oil (page 3-11).  
Drain the coolant (page 6-4).

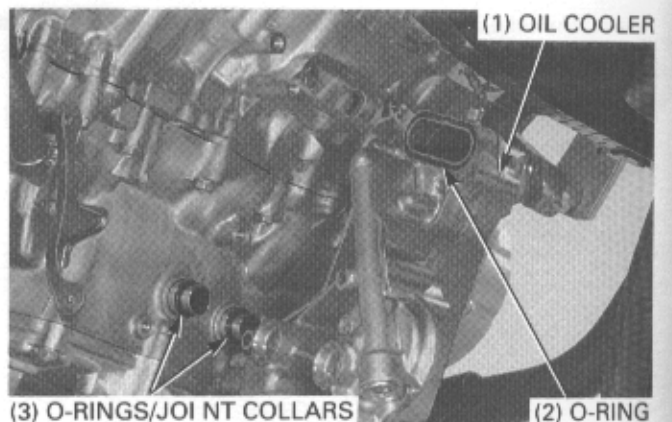
Remove the oil filter (page 3-12).  
Remove the pulse secondary air injection (PAIR) control valve (California type only: page 5-38).



Remove the water hose.  
Remove the oil cooler mounting bolts.

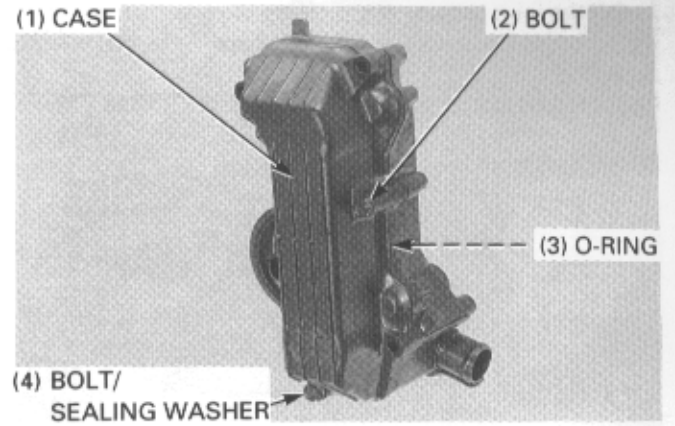


Remove the oil cooler assembly and O-ring.  
Remove the O-rings and joint collars from the crankcase.

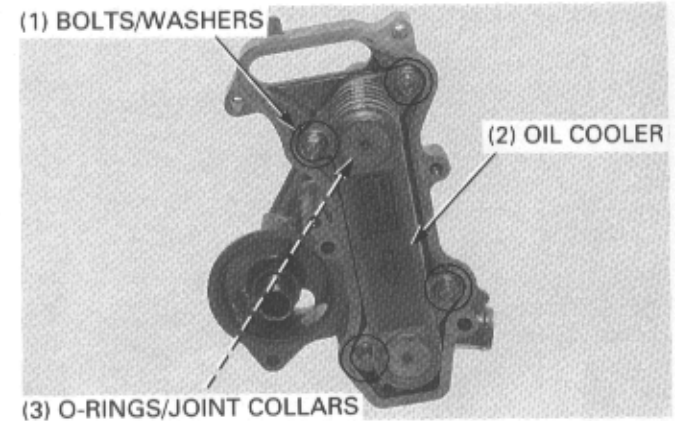


**DISASSEMBLY**

Remove the oil cooler case bolts and sealing washer.  
Remove the oil cooler case and O-ring.

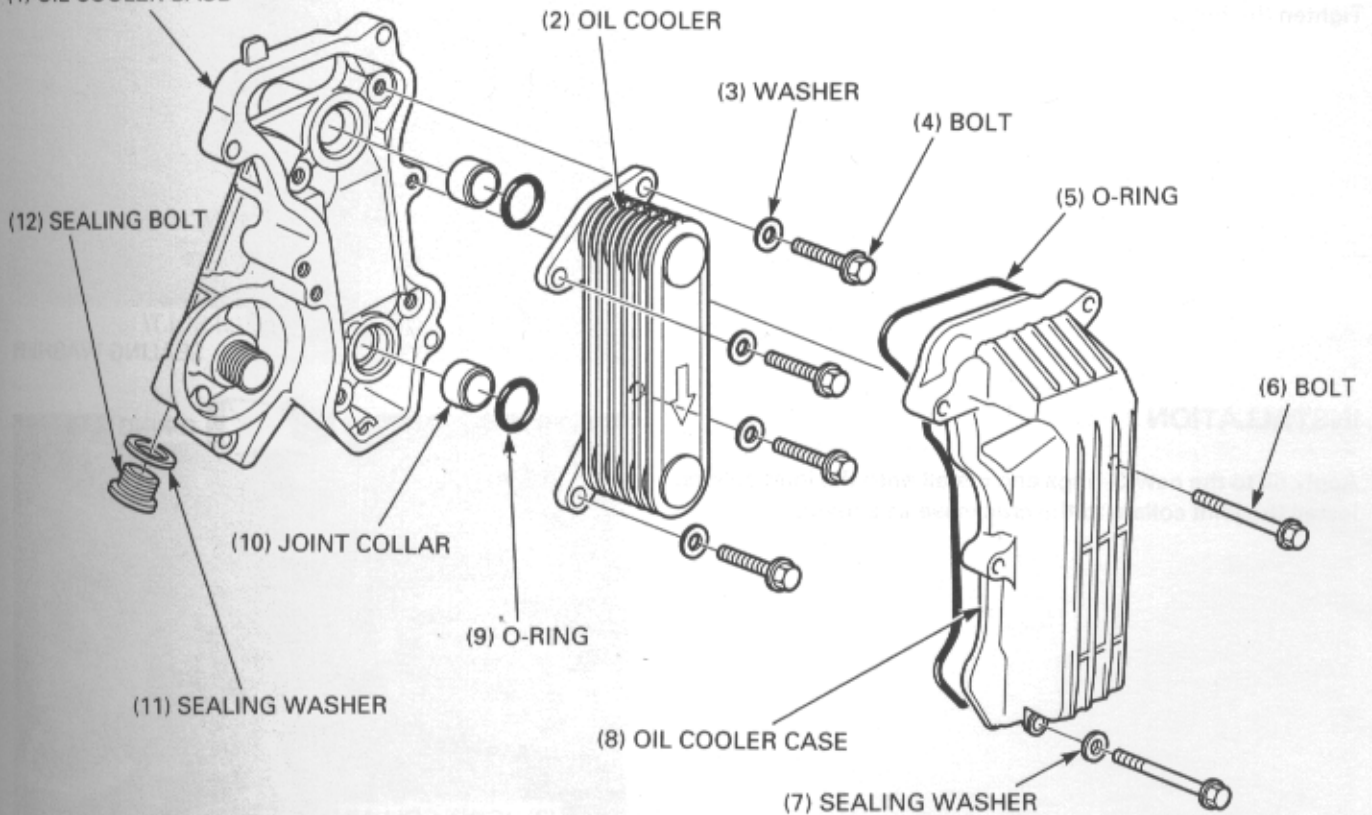


Remove the bolts and washers.  
Remove the oil cooler.  
Remove the O-rings and joint collars from the oil cooler base.



**ASSEMBLY**

(1) OIL COOLER BASE





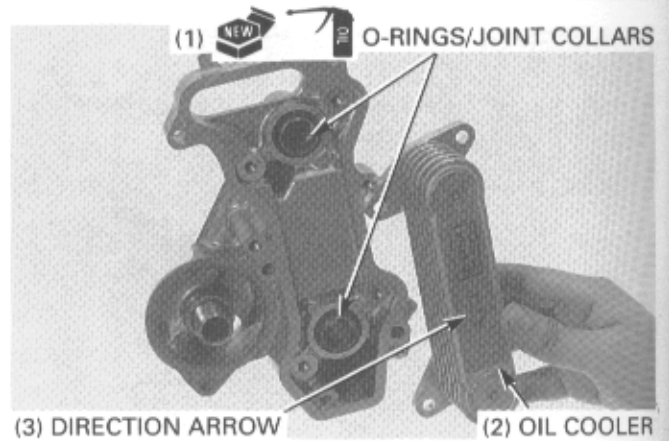
## LUBRICATION SYSTEM

Install the joint collars.

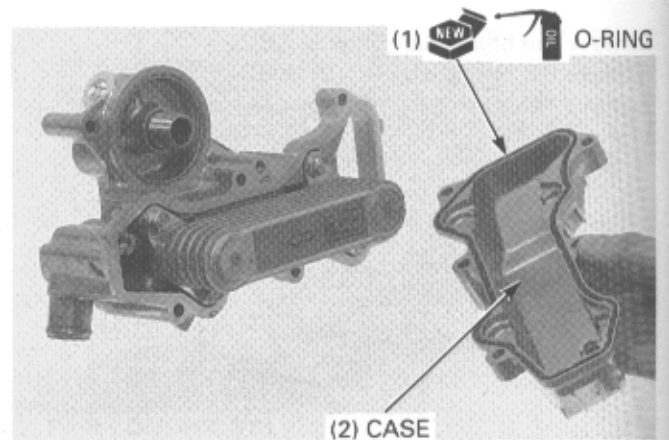
Apply oil to the new O-rings and install into the oil cooler base.

Install the oil cooler with the direction arrow facing down.

Install and tighten the bolts and washers.



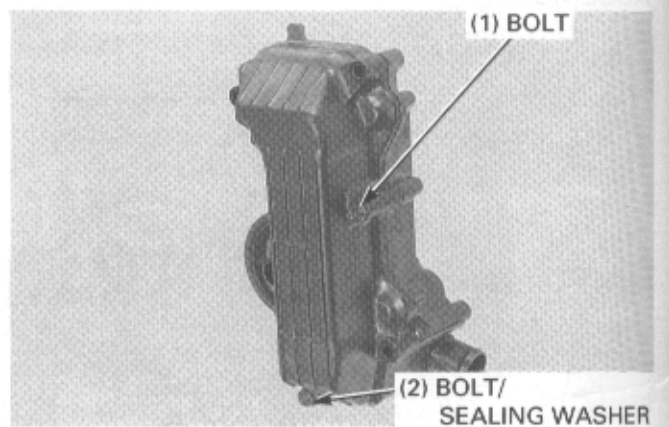
Apply oil to the new O-ring and install into the oil cooler case.



Install the oil cooler case.

Install the oil cooler case bolts and sealing washer.

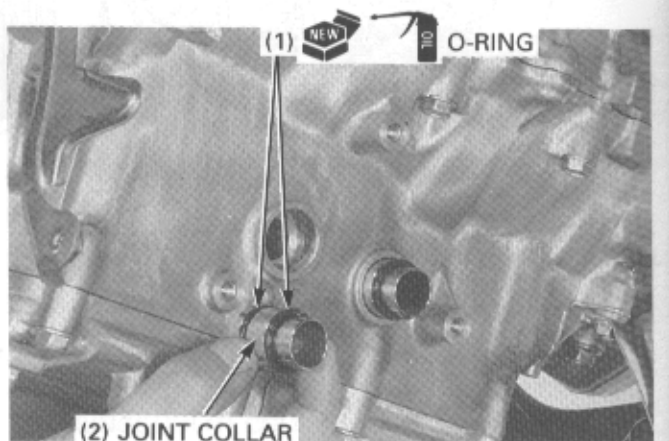
Tighten the bolts.



## INSTALLATION

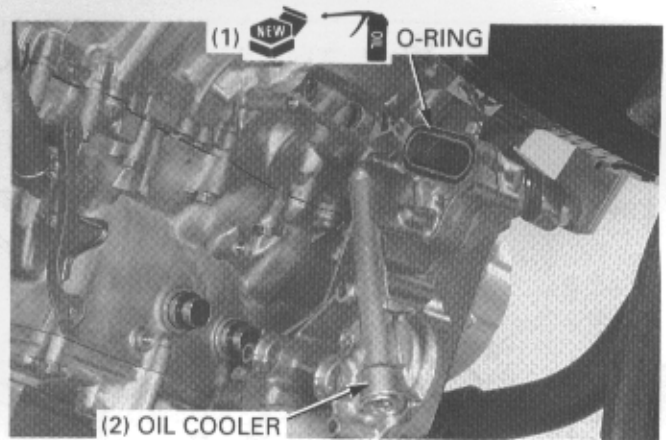
Apply oil to the new O-rings and install onto the joint collars.

Install the joint collars to the crankcase as shown.



Apply oil to the new O-ring and install into the oil cooler base.

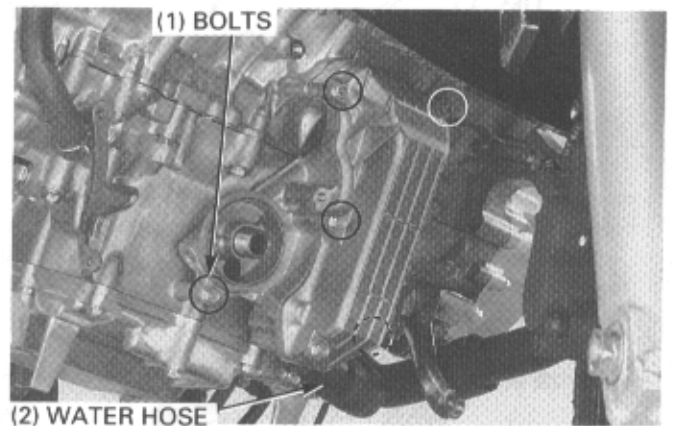
Install the oil cooler assembly.



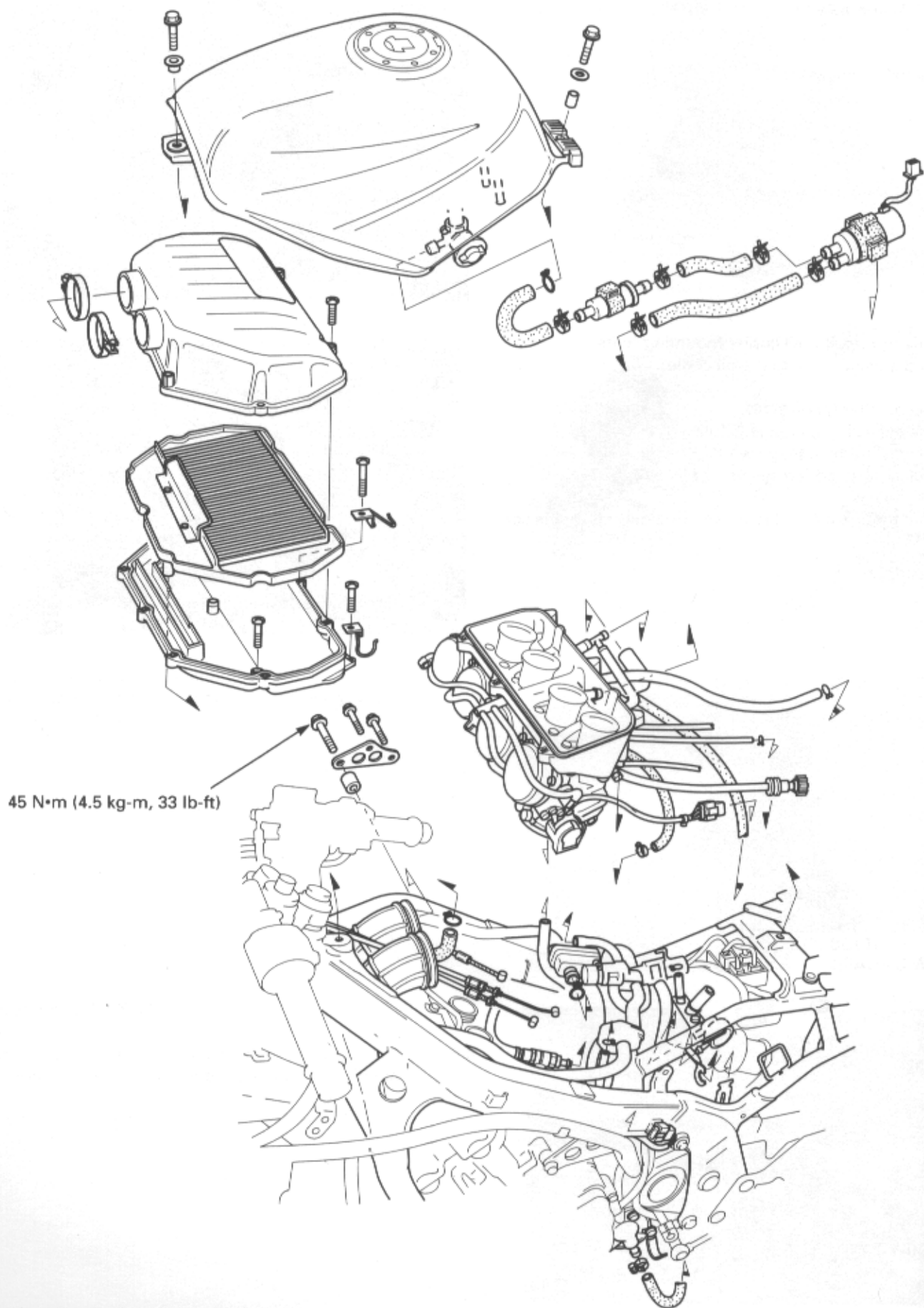
Install and tighten the oil cooler mounting bolts.  
Connect the water hose to the oil cooler.

Install the oil filter (page 3-12).  
Install the exhaust pipe (page 2-10).  
Fill the engine with oil (page 3-12).  
Fill and bleed the cooling system (page 6-5).

Check that there are no oil leaks and that oil pressure is correct.



# FUEL SYSTEM



# 5. FUEL SYSTEM

SERVICE INFORMATION	5-1	PILOT SCREW ADJUSTMENT	5-22
TROUBLESHOOTING	5-3	HIGH ALTITUDE ADJUSTMENT (U.S.A. only)	5-23
AIR CLEANER HOUSING/DIRECT AIR INTAKE (D.A.I.) DUCT	5-4	DIRECT AIR INTAKE (D.A.I.) SYSTEM	5-25
CARBURETOR REMOVAL	5-5	SECONDARY AIR SUPPLY SYSTEM (California type only)	5-38
CARBURETOR DISASSEMBLY	5-8	EVAPORATIVE EMISSION CONTROL SYSTEM (California type only)	5-39
CARBURETOR ASSEMBLY	5-13		
CARBURETOR INSTALLATION	5-19		

## 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 the 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 cable 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.

### 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.
- For fuel tank removal and installation, refer to Section 2.
- For fuel pump inspection, refer to Section 18.
- Before disassembling the carburetor, place an approved fuel container under the carburetor drain tube, loosen the carburetor drain screw and drain the carburetor.
- When disassembling the fuel system parts, note the locations of the O-rings. Replace them with new ones on reassembly.
- After removing the carburetor, wrap the intake ports of an engine with a shop towel or cover them with a piece of tape to prevent any foreign material from dropping into the engine. Be sure to remove the cover when reinstalling the carburetor.
- When checking the direct air intake system, follow the steps in the troubleshooting flow chart (page 5-26).
- All hoses used in the direct air intake system are numbered for identification. When connecting one of these hoses, compare the hose number with the Hose Routing Diagram Label on page 5-33, for its proper routing.
- All hoses used in the secondary air supply and evaporative emission control system (California type only) are numbered for identification. When connecting one of these hoses, compare the hose number with the Vacuum Hose Routing Diagram Label on the air cleaner housing cover or page 1-31, for its proper routing.

## FUEL SYSTEM

### SPECIFICATIONS

ITEM		SPECIFICATIONS
Carburetor type		Constant velocity
Carburetor throttle bore		36 mm (1.4 in)
Carburetor identification number	49 state type	VP61A
	California type	VP62A
	Canada type	VP60A
Main jet	49 state, Canada type	No. 1/4 carburetor: #135, No.2/3 carburetor: #138
	California type	#135
Slow jet		#40
Pilot screw	initial/final opening	See page 5-22
	high altitude adjustment	See page 5-23
Float level		13.7 mm (0.54 in)
Idle speed	49 states, Canada type	1,200 ± 100 rpm
	California type	1,400 ± 100 rpm

### TOOLS

Carburetor float level gauge	07401 - 0010000
Vacuum/Pressure pump	A937X - 041 - XXXXX or
Vacuum pump	ST - AH-260 - MC7 (U.S.A. only)
Pressure pump	ST - AH - 255 - MC7 (U.S.A. only)
Pilot screw wrench	07KMA - MS60101 with
Pilot elbow wrench	07PMA - MZ20110
Pilot screw wrench	07908 - 4220201
or	Canada type
U.S.A. only	
Pilot screw wrench	07MMA - MT3010A with
Adjustable guide	07PMA - MZ2011A

## TROUBLESHOOTING

### NOTE

- When checking the direct air intake system, follow the steps in the procedure on page 5-26.

#### Engine cranks but won't start

- No fuel in tank
- No fuel to carburetor
  - Fuel filter clogged
  - Fuel line clogged
  - Fuel level faulty
  - Fuel tank breather tube restricted, 49 state/Canada type)
  - Evaporative emission tube No.1 restricted (California type)
- Too much fuel getting to the engine
  - Air cleaner clogged
  - Flooded carburetor
- Intake air leak
- Fuel contaminated/deteriorated
  - jets clogged
- Improper starting enrichment valve operation
- Starting enrichment valve circuit clogged
- Improper throttle operation
- No spark at plug (ignition system faulty)

#### Lean mixture

- Fuel jets clogged
- Float valve faulty
- Float level too low
- Fuel line restricted
- Intake air leak
- Vacuum piston faulty
- Throttle valve faulty
- Emission control system faulty (California type only)
  - Hose of the emission control system faulty

#### Rich mixture

- Starting enrichment valve open
- Float valve faulty
- Float level too high
- Air jets clogged
- Air cleaner clogged
- Flooded carburetor
- Vacuum piston faulty
- Emission control system faulty (California type only)
  - Evaporative emission purge control valve faulty
  - Hose of the emission control system faulty

#### Engine stalls, hard to start, rough idling

- Fuel line restricted
- Fuel mixture too lean/rich
- Fuel contaminated/deteriorated
  - jets clogged
- Intake air leak
- Idle speed misadjusted
- Float level misadjusted
- Fuel tank breather tube restricted (49 state/Canada type)
- Evaporative emission tube No.1 restricted (California type)
- Pilot screw misadjusted
- Starting enrichment valve circuit clogged
- Thermo valve stuck open
- Thermo valve stuck closed
- Ignition system malfunction
- Emission control system faulty (California type only)
  - Evaporative emission purge control valve faulty
  - Hose of the emission control system faulty

#### Afterburn when engine braking is used

- Lean mixture in slow circuit
- Air cut-off valve malfunction
- ICM stops ignition intermittently to prevent over revolution (rev limiter functioning)

#### Backfiring or misfiring during acceleration

- Ignition system malfunction
- Fuel mixture too lean
- ICM stops ignition intermittently to prevent over revolution (rev limiter functioning)

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

- Fuel system clogged
- Ignition system malfunction
- Emission control system faulty (California type only)
  - Hose of the emission control system faulty

## FUEL SYSTEM

### AIR CLEANER HOUSING/DIRECT AIR INTAKE (D.A.I.) DUCT

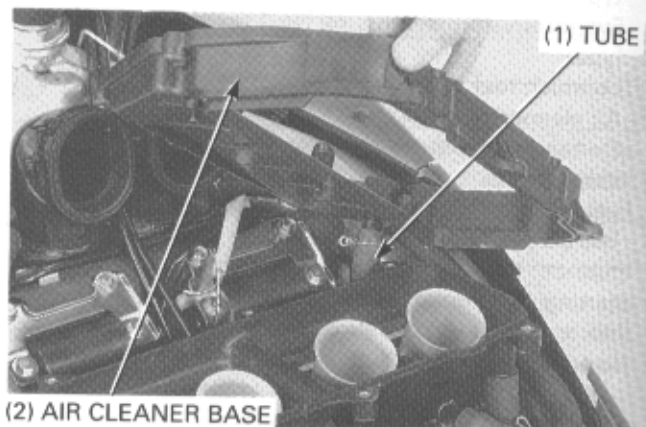
#### REMOVAL/INSTALLATION

Remove the air cleaner housing cover and air cleaner (page 3-5).

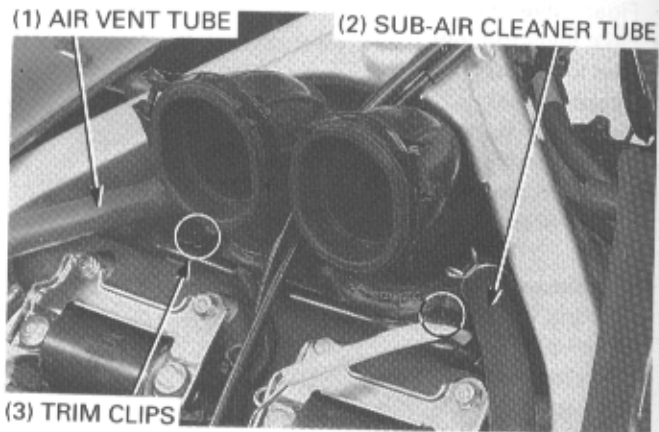
Remove the screws.



Disconnect the cylinder head cover breather tube and remove the air cleaner base.



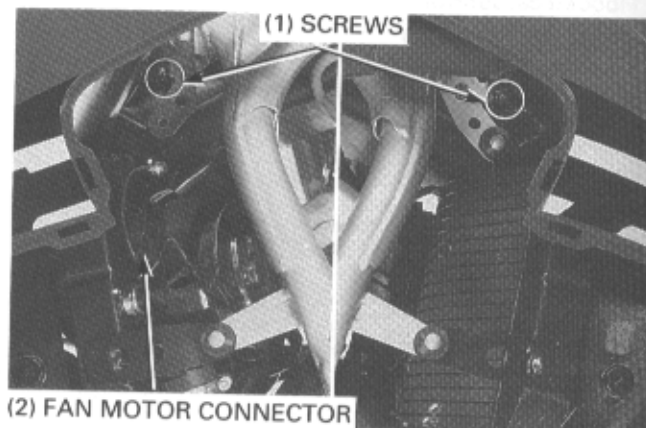
Disconnect the sub-air cleaner tube and air vent tube from the direct air intake (D.A.I.) duct. Remove the trim clips.



Remove the radiator mounting bolts and D.A.I. duct mounting screws.

Disconnect the fan motor connector.

Remove the upper fairing (page 2-4).



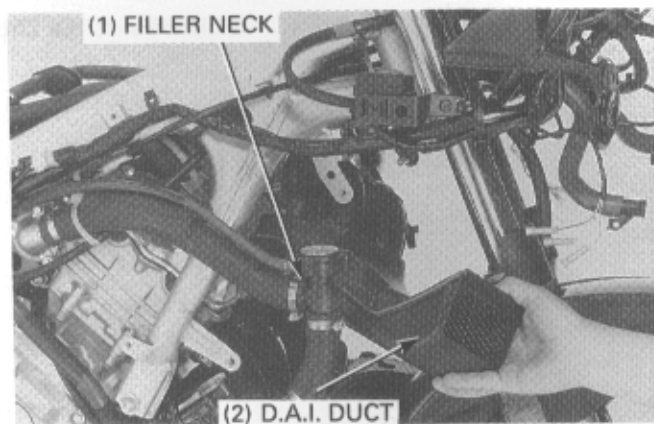
Release the grommet on the left side radiator top from the boss.

Release the hook on the filler neck from the hook.

Move the radiator down and secure it with pieces of strings (page 8-5).

Remove the D.A.I. duct.

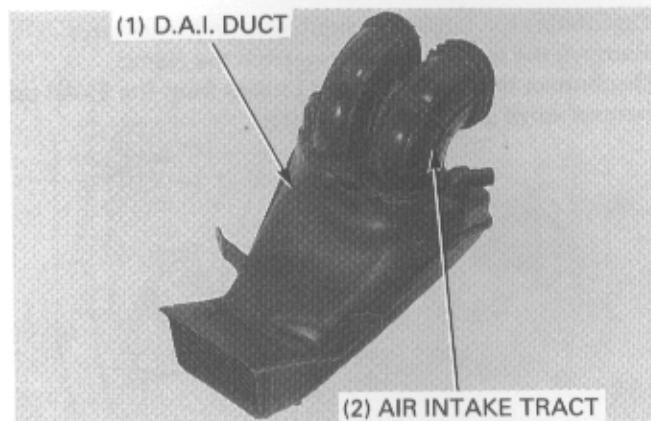
Installation is in the reverse order of removal.



### INSPECTION

Inspect the D.A.I. duct and air intake tract for signs of deterioration or air passage clogging.

Remove insects, mud or other obstructions with compressed air or low pressure water.

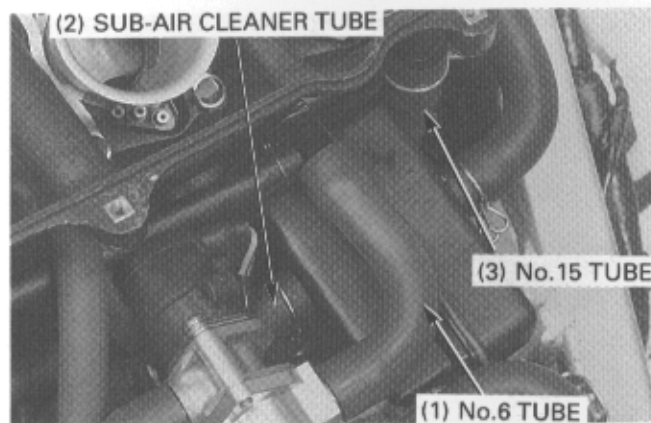


### CARBURETOR REMOVAL

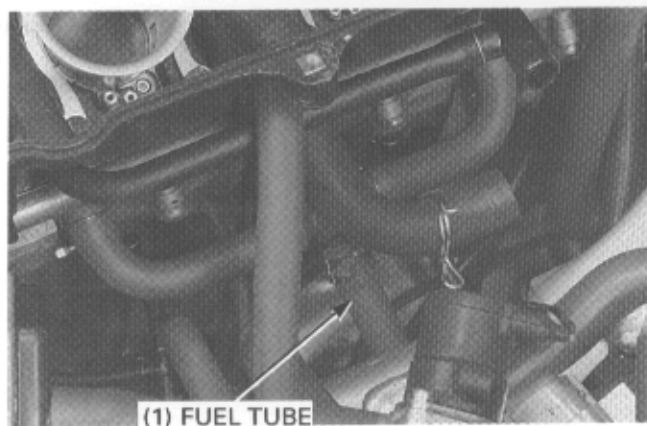
Remove the air cleaner base (page 5-4).

Disconnect the No.15 tube (California type only) from the air chamber.

Disconnect the sub-air cleaner tube from the sub-air cleaner.  
Disconnect the No.6 tube from the tube joint.



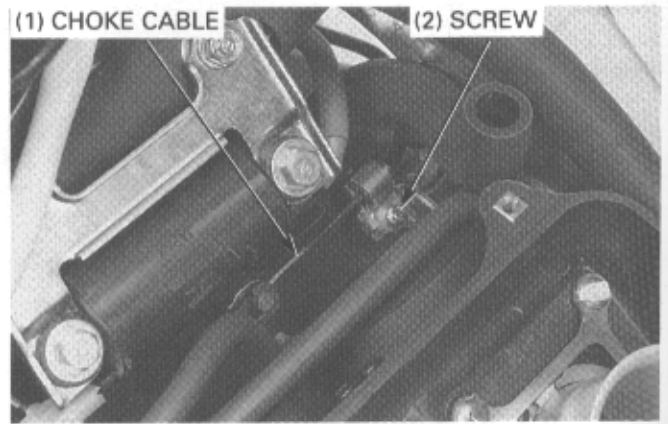
Disconnect the fuel tube from the tube joint.



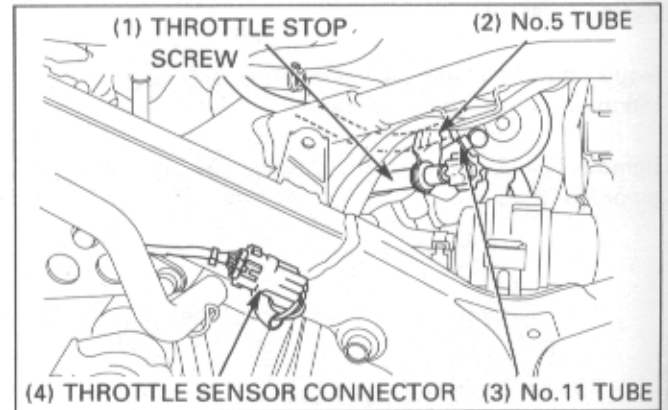


## FUEL SYSTEM

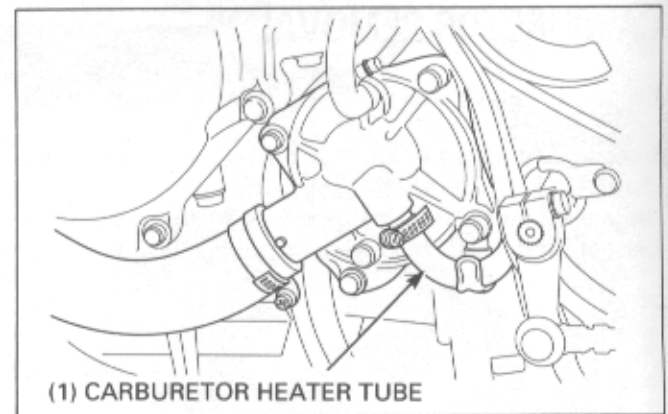
Loosen the cable clamp screw and disconnect the choke cable from the carburetor.



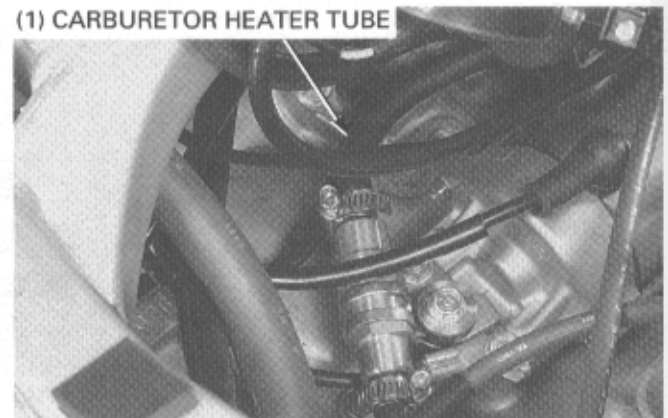
Disconnect the throttle position sensor connector. Remove the throttle stop screw from the clamp. Disconnect the No.5 and No.11 tubes from the EVAP purge control valve (California type only).



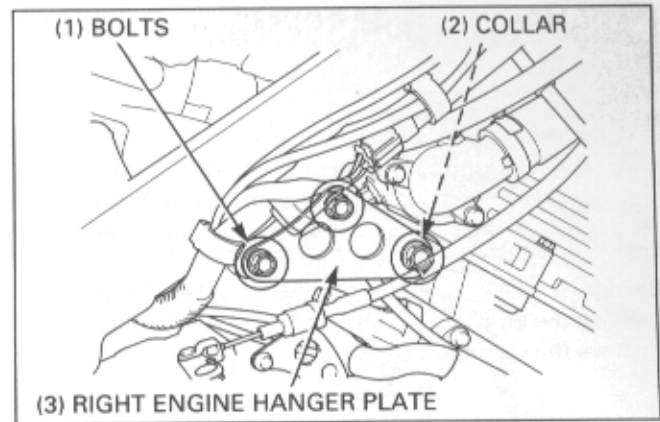
Disconnect the carburetor heater tube from the water pump.



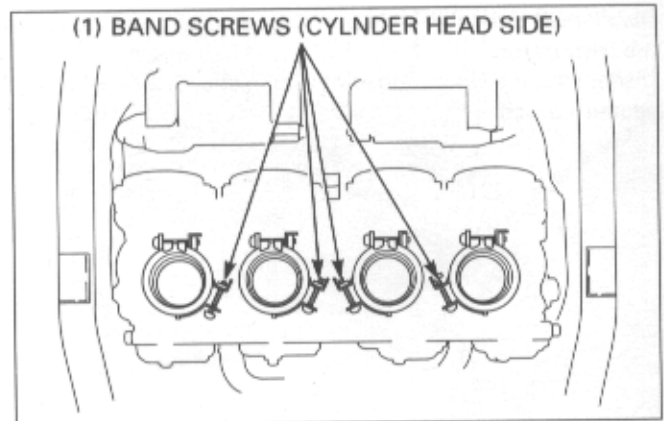
Disconnect the carburetor heater tube from the thermostat valve.



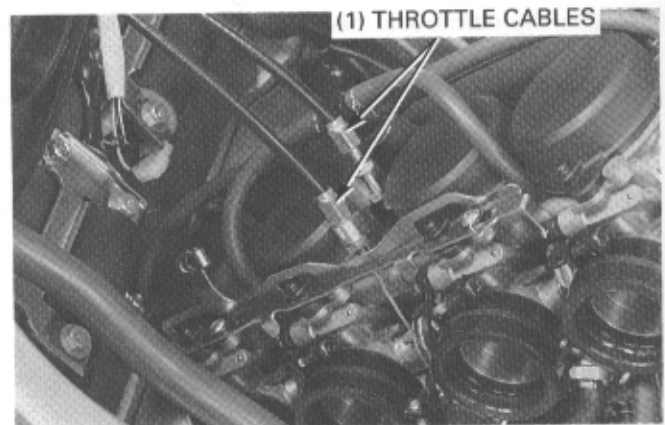
Remove the bolts, right engine hanger plate and collar.



Loosen each insulator band screw at cylinder head side as shown.



Release the insulators from the cylinder head while carefully raising the carburetor assembly. Disconnect the throttle cables from the throttle drum and remove the carburetor assembly.



# CARBURETOR DISASSEMBLY

NOTE

- vacuum chambers, float chambers and pilot screws can be serviced without separating the carburetors.
- Keep each carburetor's parts separate from the other's so you can install the parts in their original positions.

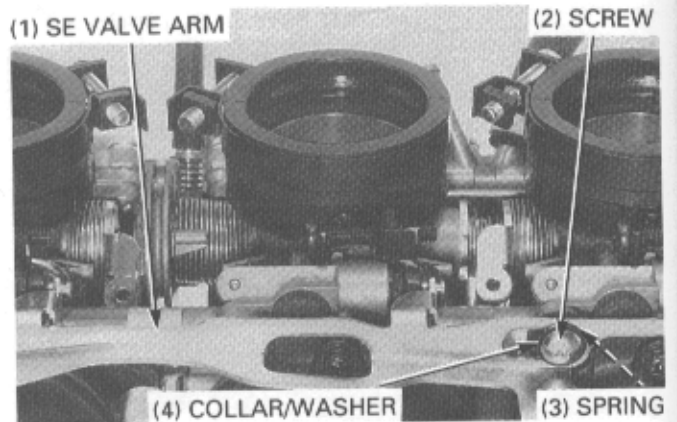
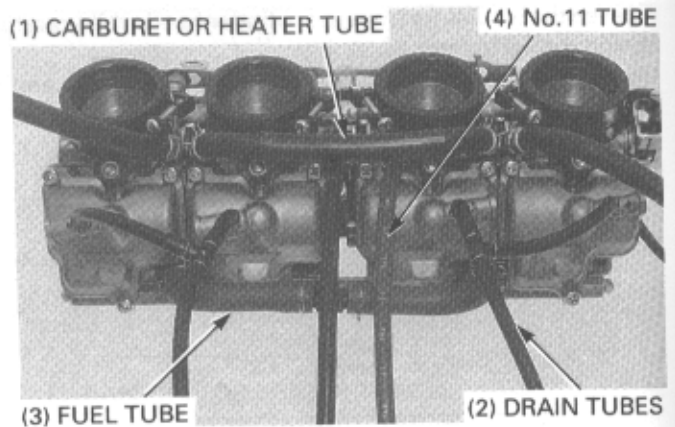
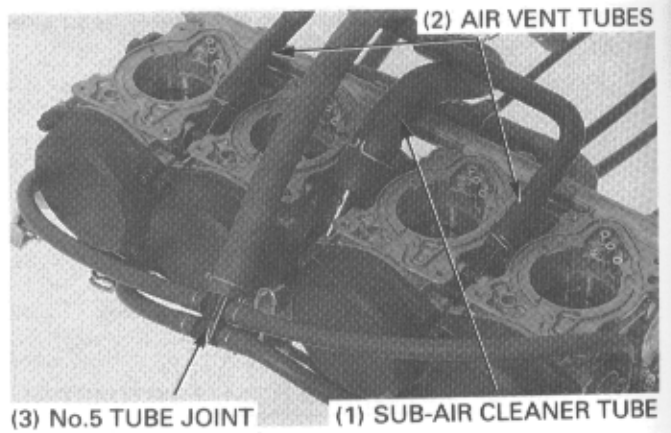
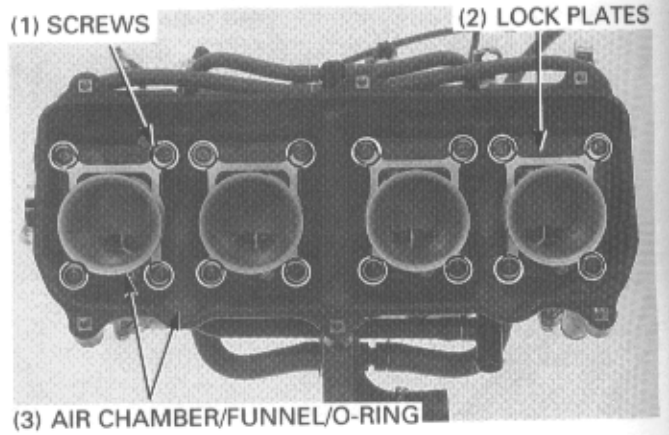
Bend up the lock plate tabs and remove the screws.  
Remove the air chamber and air funnel assembly.  
Remove the O-rings.

Disconnect the sub-air cleaner tube and air vent tubes from the carburetor.  
Disconnect the No.5 tube joint (California type only) from the vacuum tubes.

Remove the carburetor heater tube, fuel tube and drain tubes.  
Remove the No.11 tube (California type only).

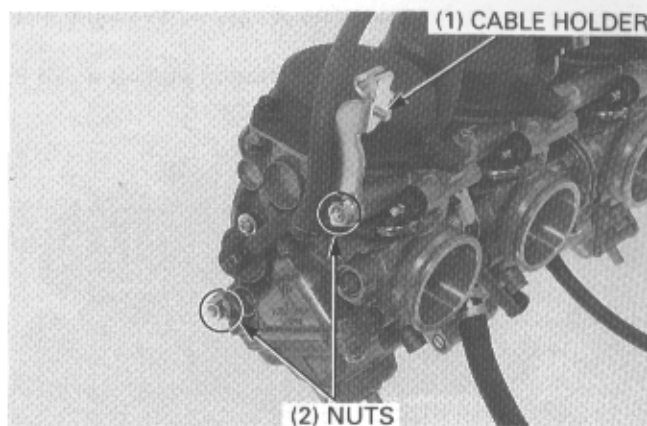
Loosen the insulator band screws and remove the insulators.

- Remove the following:
- SE valve arm screws
  - Plastic washers
  - SE valve arm
  - Plastic collars
  - Spring



Loosen the carburetor connecting nuts gradually and alternately.

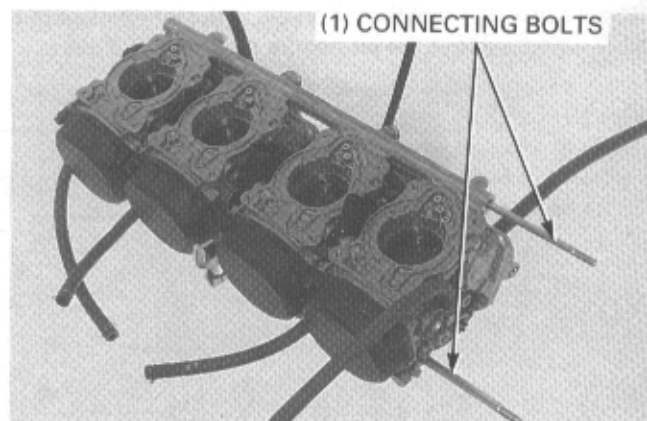
Remove the nuts and choke cable holder.



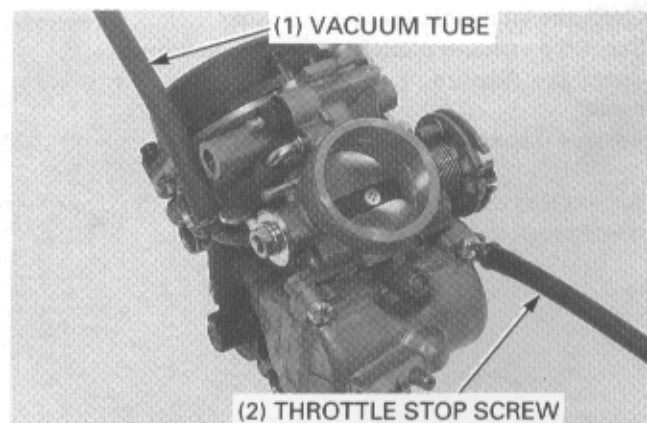
Remove the connecting bolts and separate the carburetors.

NOTE

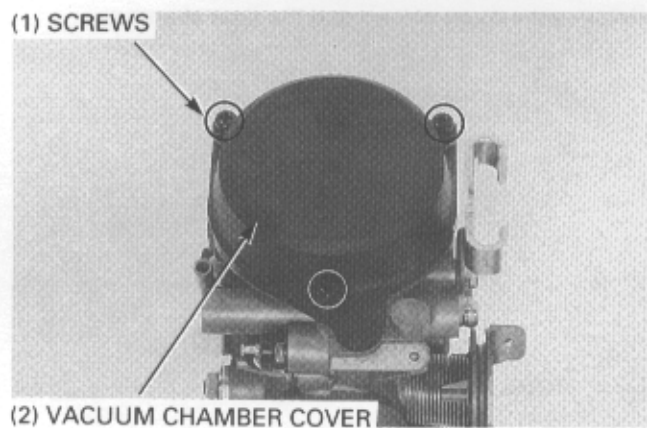
- Do not lose the three synchronization adjusting springs and two thrust springs.
- Do not damage the fuel and air joint pipes.



Remove the vacuum tubes (California type only) and throttle stop screw (No.3 carburetor only).



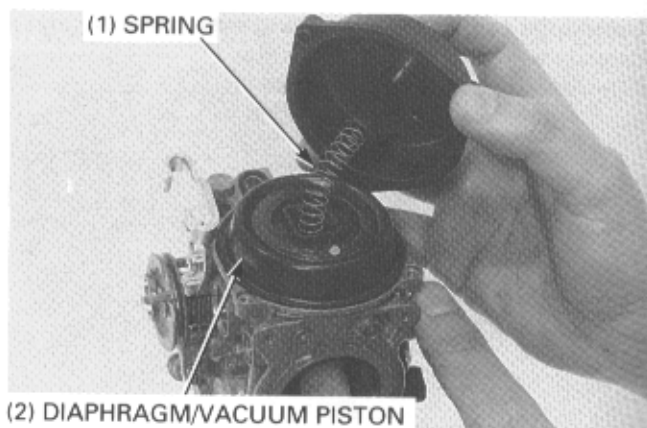
Remove the three screws and vacuum chamber cover.



## FUEL SYSTEM

Remove the diaphragm spring, diaphragm/vacuum piston.

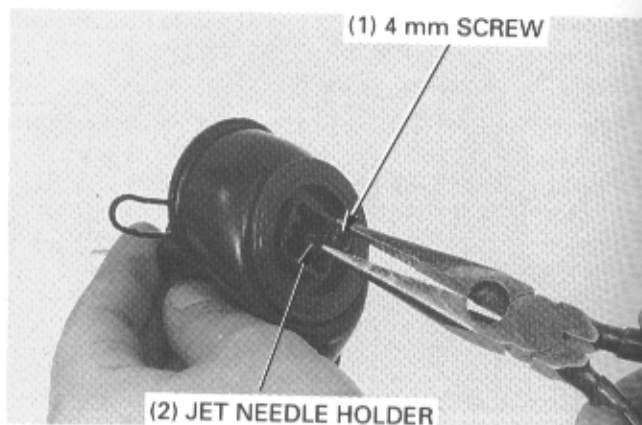
Check the piston for smooth operation up and down in the carburetor body.



Screw a proper 4 mm thread screw in the jet needle holder as shown and pull out the jet needle holder with a pliers.

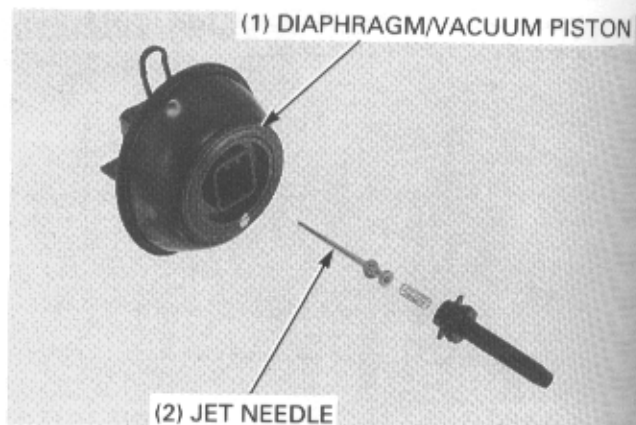
### NOTE

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

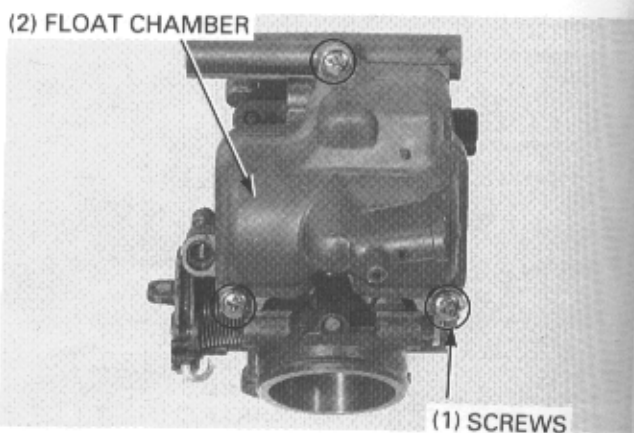


Check the jet needle for stepped wear.  
Check the vacuum piston for wear or damage.  
Check the diaphragm for damage, pin holes, wrinkles or bends.  
Replace these parts if necessary.

Air will leak out of the vacuum chamber if the diaphragm is damaged in any way—even a pin hole.



Remove the three screws and the float chamber.



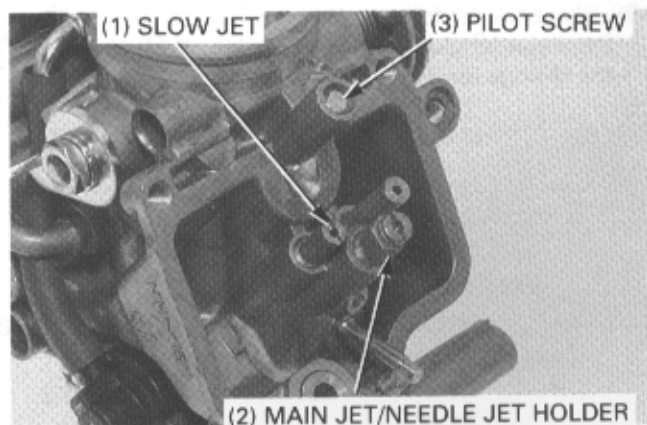
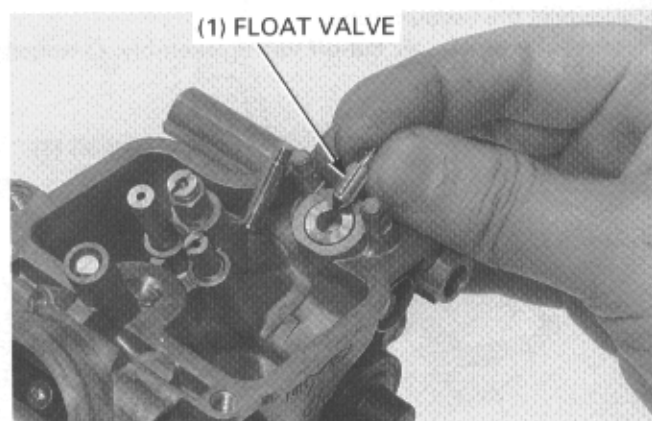
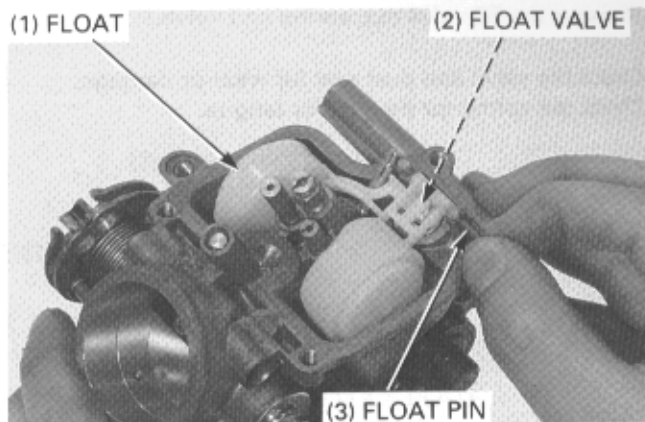
Remove the float pin, float and float valve.

Check the float for damage, deterioration 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.

A worn or contaminated valve does not seat properly and will eventually flood the carburetor.



**CAUTION**

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

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

**NOTE**

- The pilot screws are factory pre-set and should not be removed unless the carburetors are overhauled.

**CAUTION**

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

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

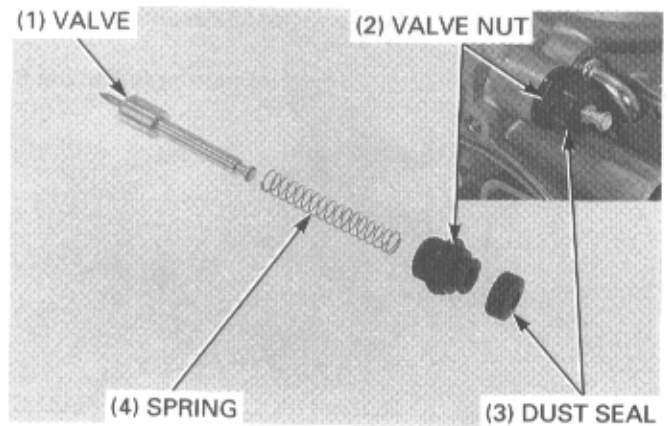
Remove the pilot screws and inspect them. Replace them if they are worn or damaged.

Check each jet for wear or damage. Clean the jets with non-flammable or high flash solvent and blow open with compressed air.

## FUEL SYSTEM

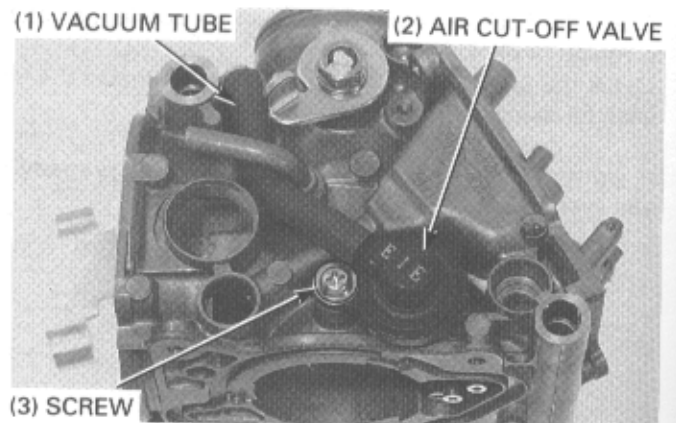
Remove the SE valve nut, spring and valve.

Check the valve and dust seal for wear or damage.  
Check the spring for damage or fatigue.



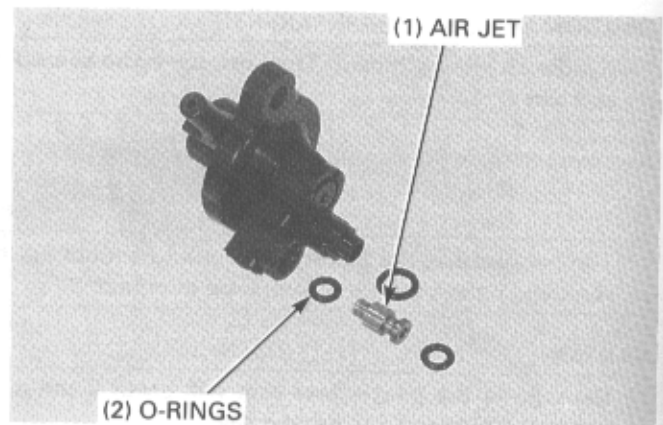
Disconnect the vacuum tube.

Remove the screw, air cut-off valve assembly, O-rings and air jet.



Visually check the following:

- the air jet for clogging or restriction
- the O-rings for damage.

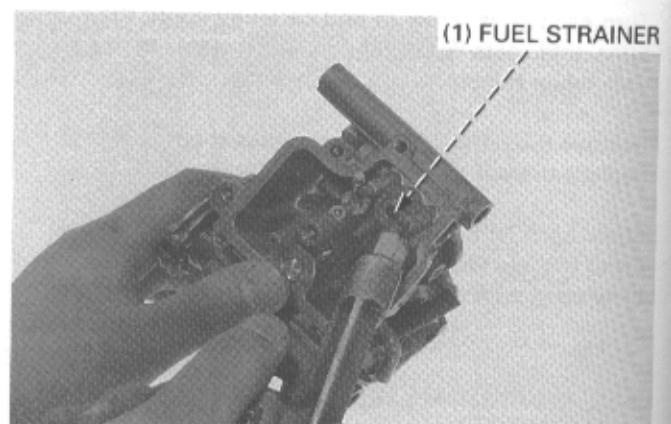


### CAUTION

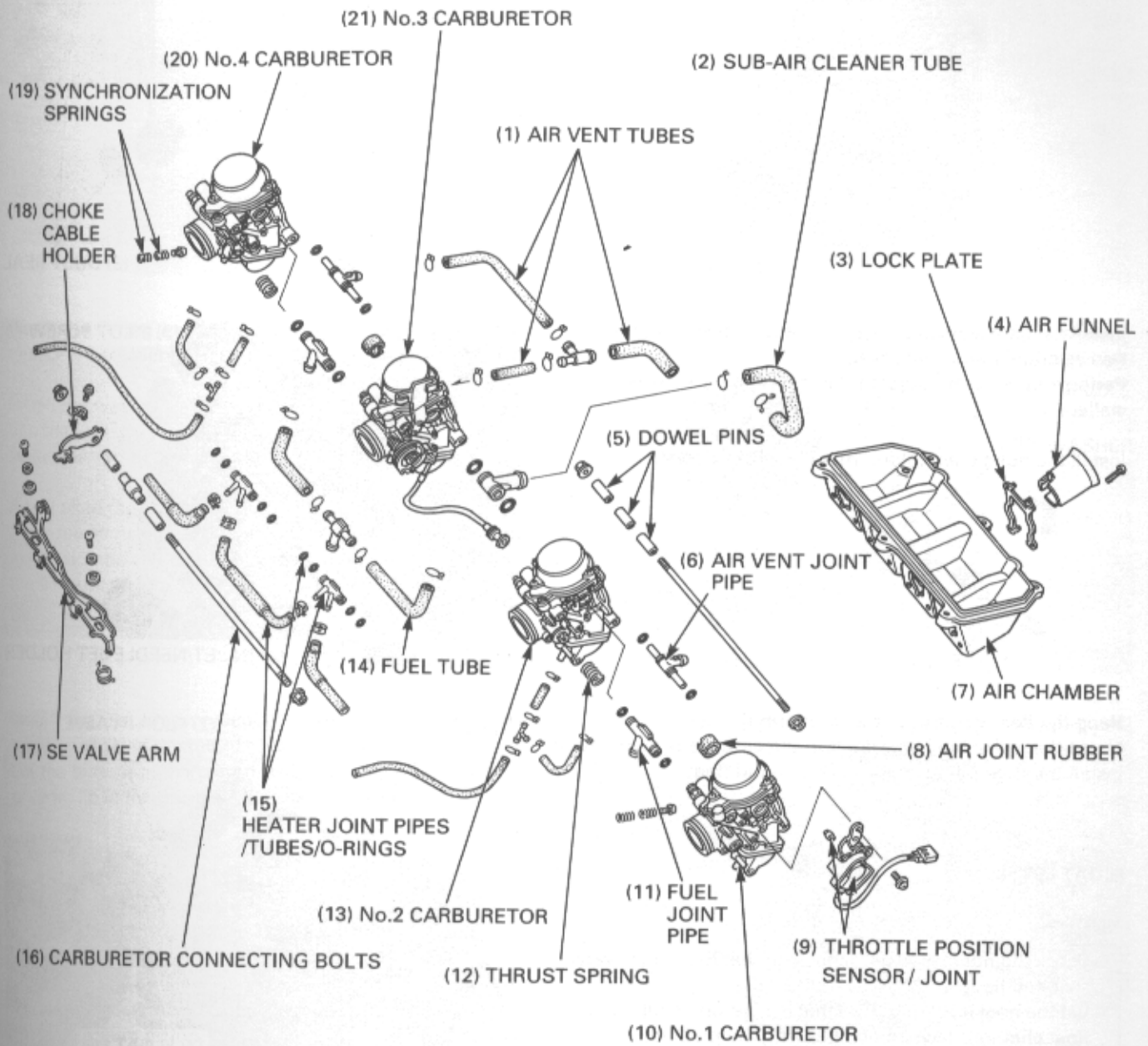
- **Cleaning the air and fuel passages with a piece of wire will damage the carburetor body.**

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

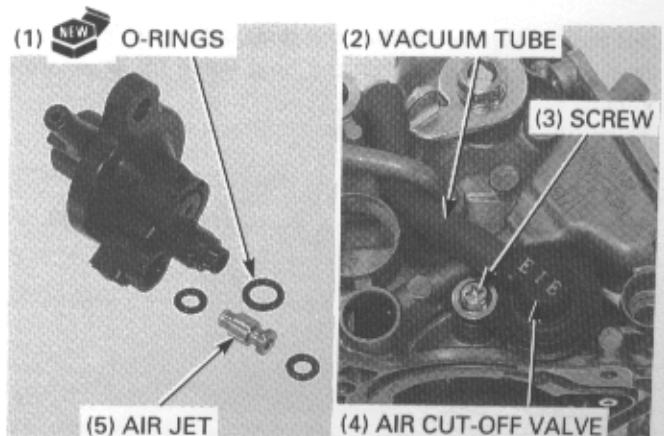
Clean the fuel strainer in the float valve using compressed air from the float valve seat side.



# CARBURETOR ASSEMBLY



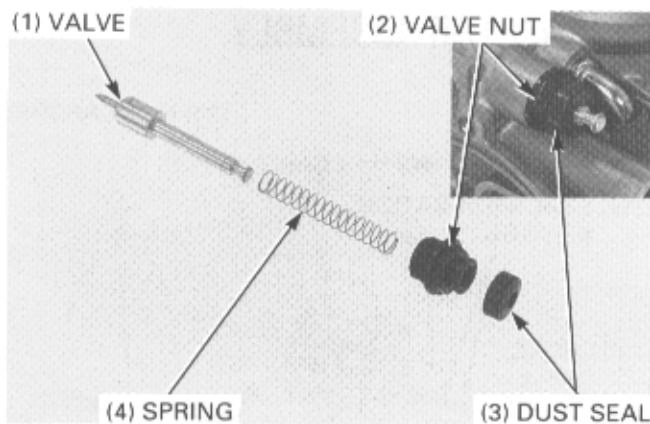
Install the new O-rings, air jet and air cut-off valve assembly to the carburetor body.  
 Install the screw and connect the vacuum tube.





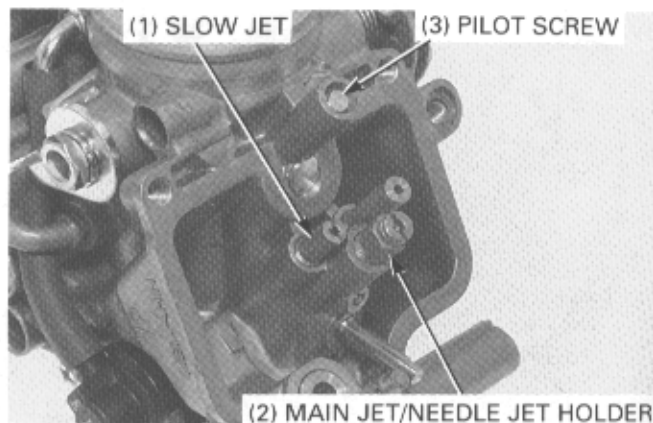
## FUEL SYSTEM

Install the SE valves and springs, valve nuts to the carburetor body.



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

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

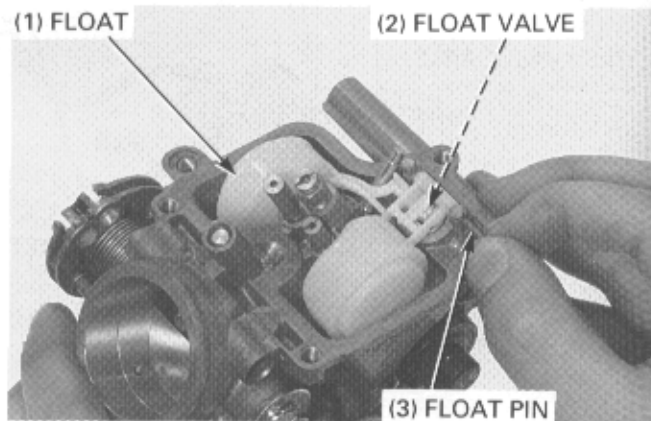


Hang the float valve onto the float arm lip. Install the float valve with float in the carburetor body, then install the float pin through the body and float.

### FLOAT LEVEL

#### NOTE

- Check the float level after checking the float valve, valve seat and float.
- Set the float level gauge so that it is perpendicular to the float chamber face and in line with the main jet.

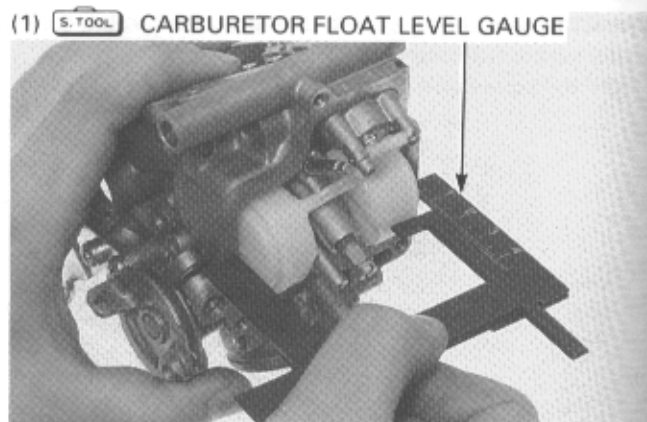


Set the carburetor so that the float valve just contacts the float arm lip. Be sure that the float valve tip is securely in contact with the valve seat. Make sure the float level with the float level gauge.

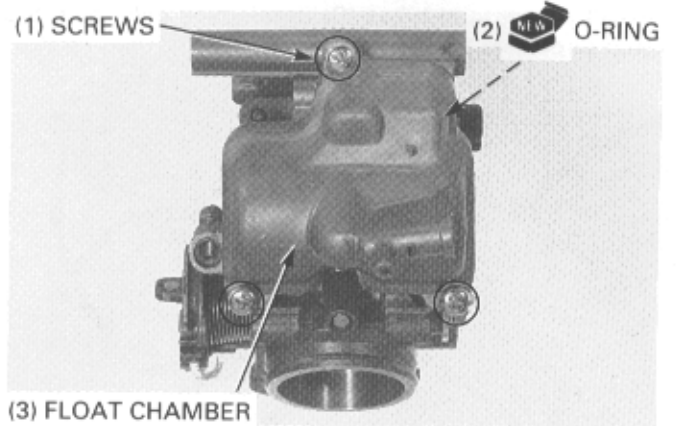
#### Tool:

Carburetor float level gauge      07401 - 001000

Float level: 13.7 mm (0.54 in)

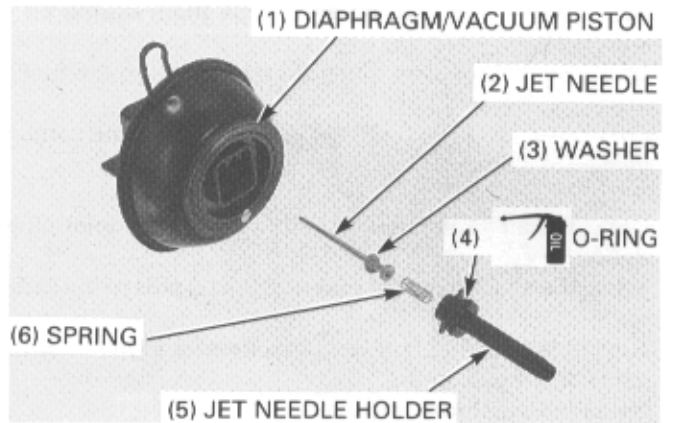


Install the new O-ring into the float chamber groove.  
Install the float chamber and tighten the three screws.



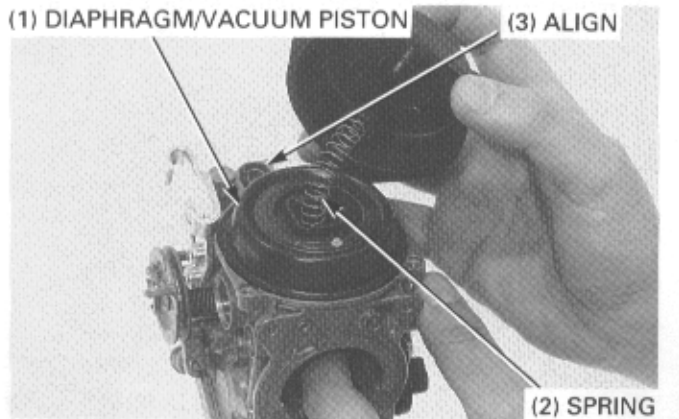
Check the O-ring on the jet needle holder for damage and replace if necessary.

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



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

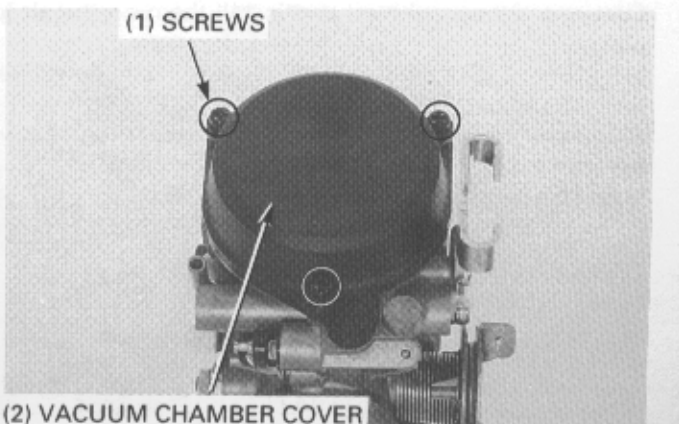
Install the diaphragm/vacuum piston into the carburetor body by aligning the tab of the diaphragm with the cavity.  
Lift the bottom of the piston with your finger to set the diaphragm lip in the groove in the carburetor body.



NOTE

- Be careful not to pinch the diaphragm, and to keep the spring straight when installing the chamber cover by compressing the spring.

Install the spring and chamber cover while the piston remains in place. Secure the cover with screws before releasing the vacuum piston.



Tighten the three chamber cover screws.

## FUEL SYSTEM

Install the vacuum tubes (California type only) and throttle stop screw (No.3 carburetor only).

Coat new O-rings with oil and install them on the air vent joint pipe.

Coat new O-rings with oil and install them on the fuel joint pipe.

Coat new O-rings with oil and install them on the carburetor heater joint pipe.

Install the air vent, fuel and carburetor heater joint pipes to the carburetor.

Install the air joint rubber pipe and dowel pins to the carburetor.

Assemble the No.1 and No.2 carburetors together with the joints and thrust spring.

Install the synchronization spring.

Assemble No.3 and No.4 carburetors in the same way.

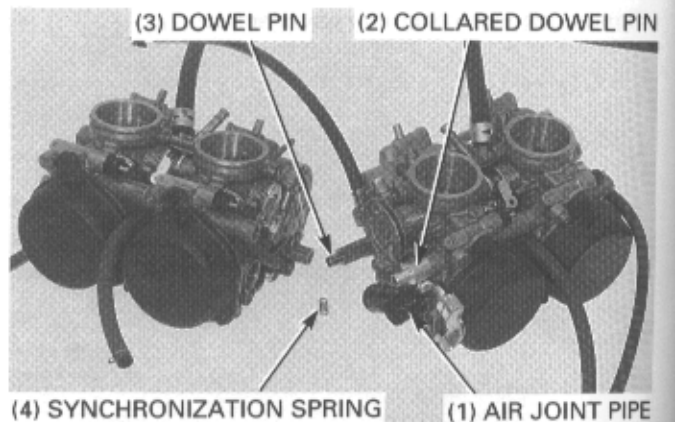
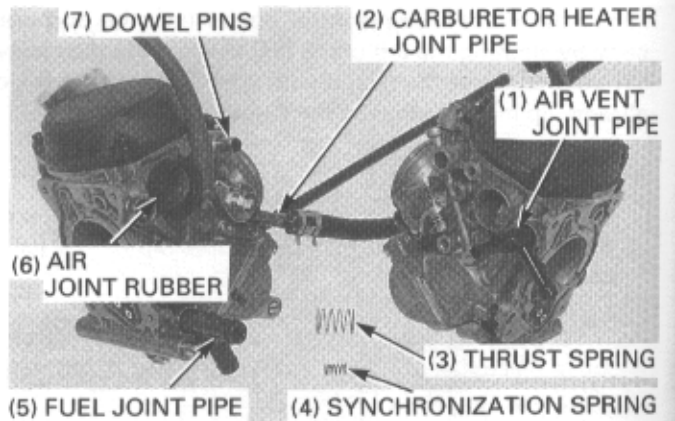
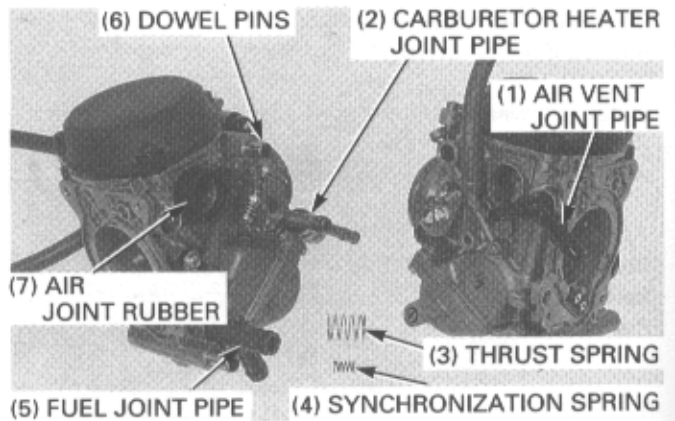
Coat new O-rings with oil and install them on the air joint pipe.

Install the air joint pipe, collared dowel pin and dowel pin to the carburetor.

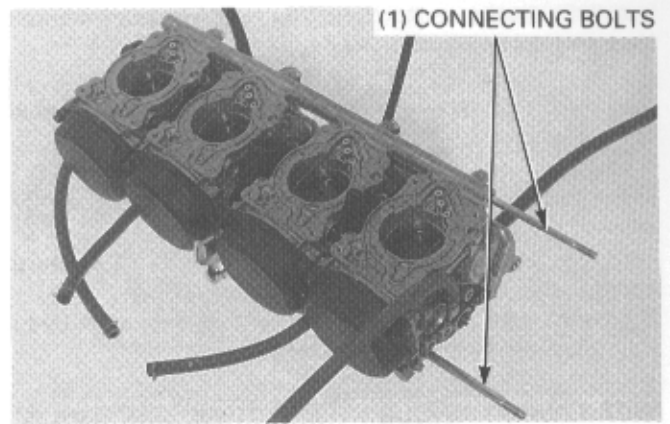
Assemble the No.1/2 and No.3/4 carburetors together with the joint.

Install the synchronization spring.

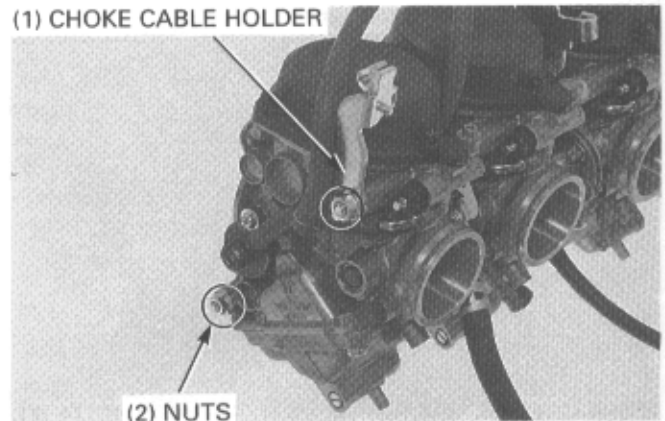
(1) VACUUM TUBE



Be sure there is no clearance at the joints of the carburetors. Install the carburetor connecting bolts.

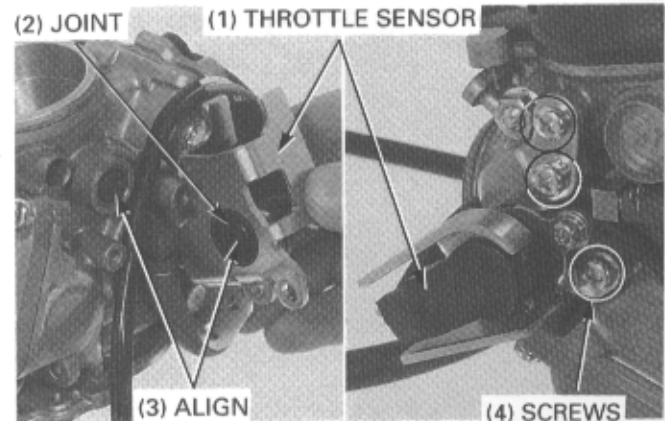


Install the choke cable holder. Install and tighten the connecting nuts gradually and alternately, be sure the bolt thread projections are equally high. Hold the nut and tighten the nut on other side.



Operate the throttle cable drum and check its operation for drag.

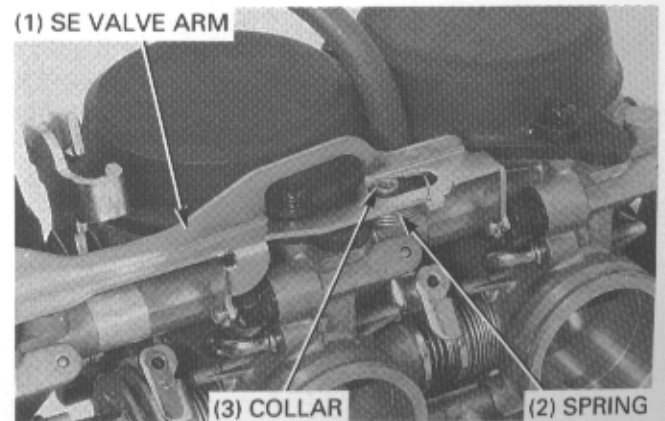
If you remove the throttle position sensor, install the throttle position sensor joint to the throttle position sensor. Install the throttle position sensor to the carburetor while aligning the throttle position sensor joint with the throttle shaft end-groove. Install and tighten the three screws.



NOTE

- When installing, route the throttle position sensor wire as shown.

Install the spring onto the No.2 carburetor body. Install the plastic collars onto the No.2 and No.4 carburetor bodies. Install the SE valve arm, aligning its cut-out with the SE valve groove.



## FUEL SYSTEM

Install the plastic washers and SE valve arm screws onto the No.2 and No.4 carburetor body.

Operate the SE valve arm and check its operation to ensure there is no drag.

Check and adjust the carburetor synchronization visually as follows:

Turn the throttle stop screw to align the No.3 carburetor throttle valve with the edge of the by-pass hole.

Align each throttle valve with the by-pass hole edge by turning the synchronization adjusting screw.

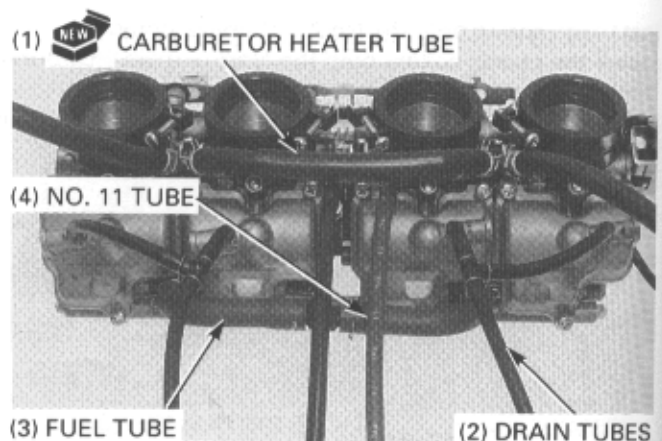
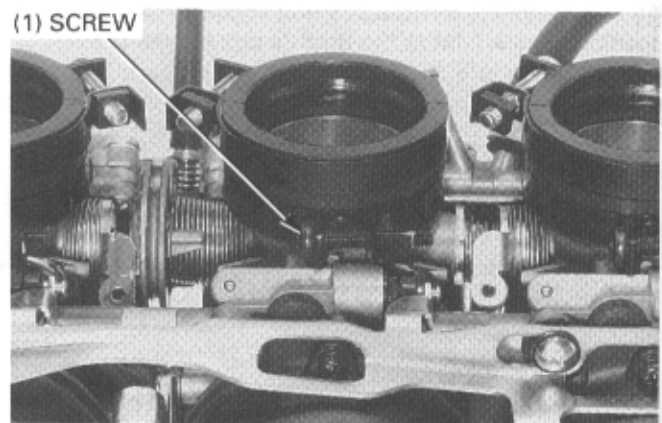
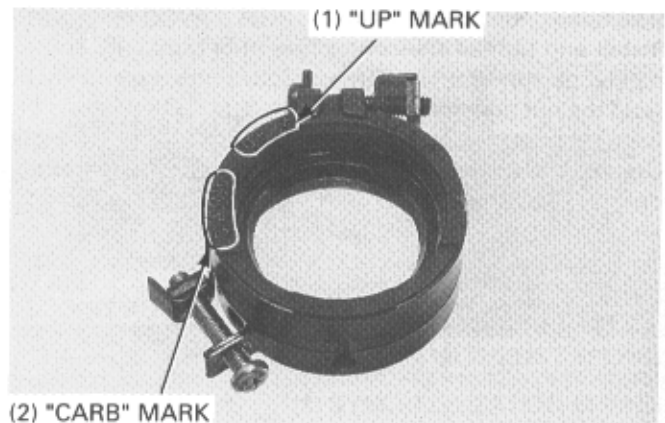
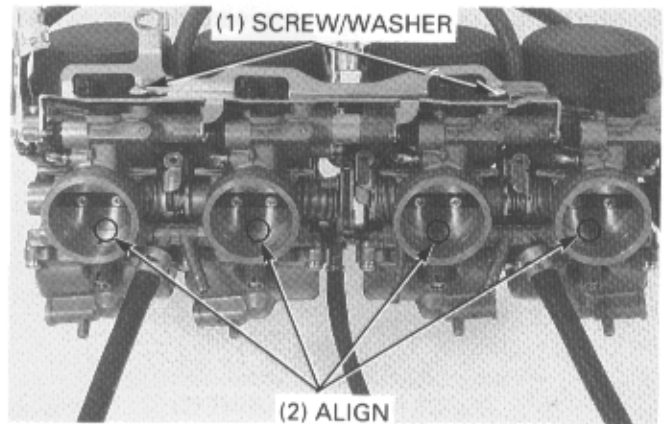
### NOTE

- Check carburetor synchronization (page 3-12) after installing the carburetor assembly.

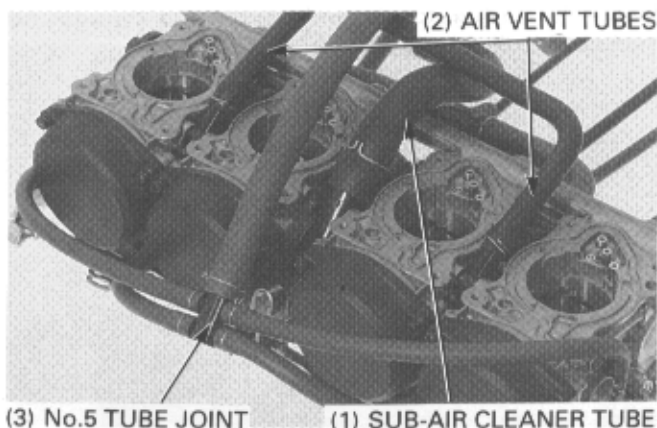
Install the carburetor insulators with the "CARB" mark facing toward the carburetor and with the "UP" mark facing up.

Tighten each insulator band screw.

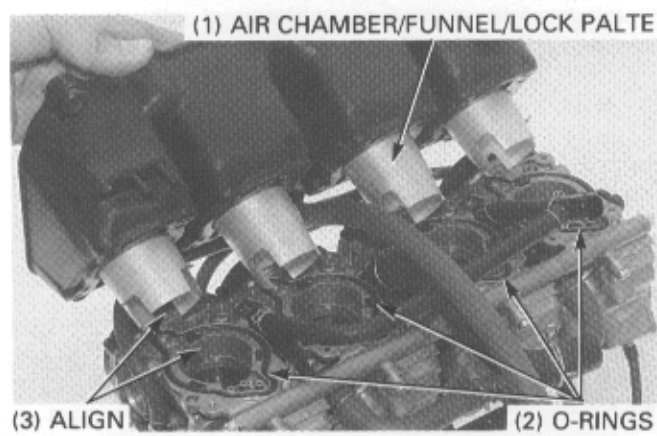
Connect the fuel tube to the fuel tube joints.  
Connect new carburetor heater tube to the heater tube joints.  
Connect the drain tubes to the carburetor float chambers.  
Connect the No.11 tube to the No.2 carburetor (California type only).



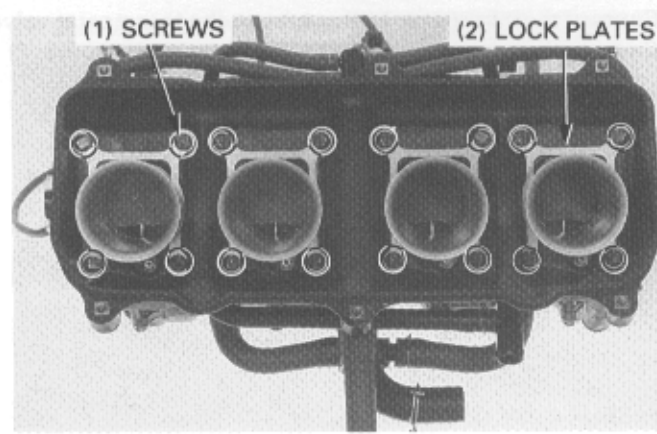
Connect the sub-air cleaner tube to the carburetor.  
 Connect the air vent tubes to the tube joints.  
 Connect the No.5 tube joint to the vacuum tubes (California type only).



Install the air funnels and new lock plates to the air chamber.  
 Check the O-ring for damage and replace if necessary.  
 Install the O-rings into the carburetor body grooves.  
 Align the cut out on the air funnel with the groove in the carburetor body, then install the air chamber and air funnel assembly.



Install and tighten the screws gradually and alternately.  
 Bend down the tabs of the lock plate.

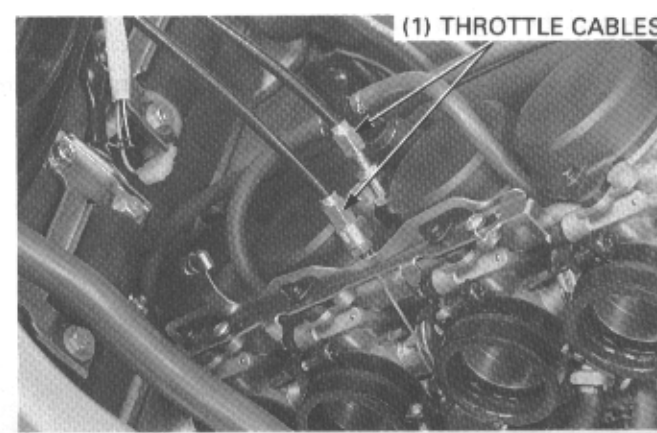


## CARBURETOR INSTALLATION

NOTE

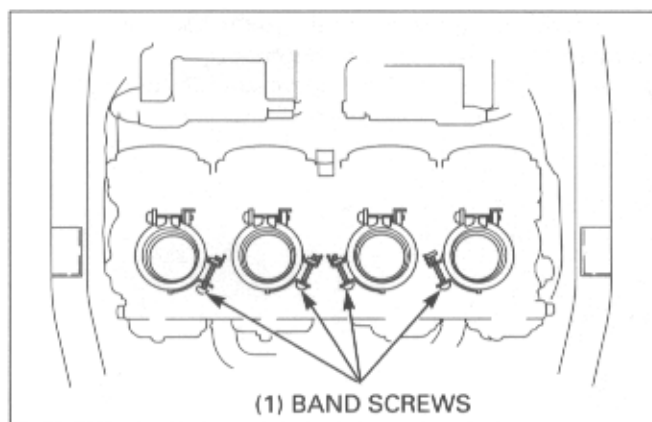
- Note the cables and tubes properly (page 1-20).

Connect the throttle cable ends to the throttle drum and install the throttle cables into the cable holder.



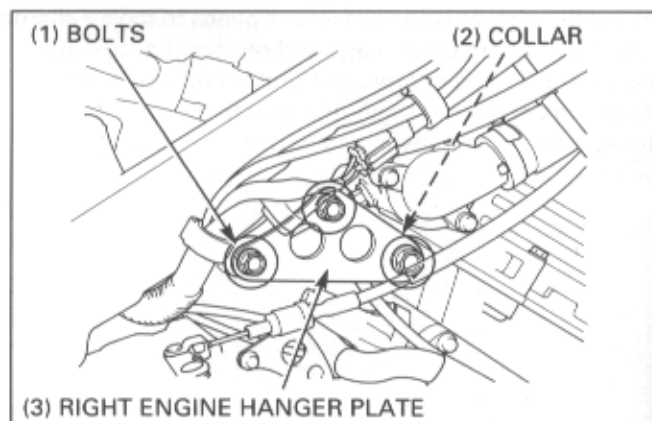
## FUEL SYSTEM

Install the carburetor assembly onto the cylinder head.  
Tighten each insulator band screw alternately.

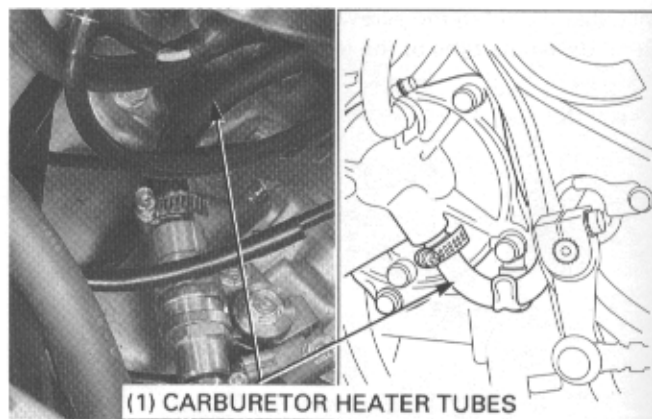


Install the right engine hanger plate and collar.  
Install and tighten the hanger plate bolts.

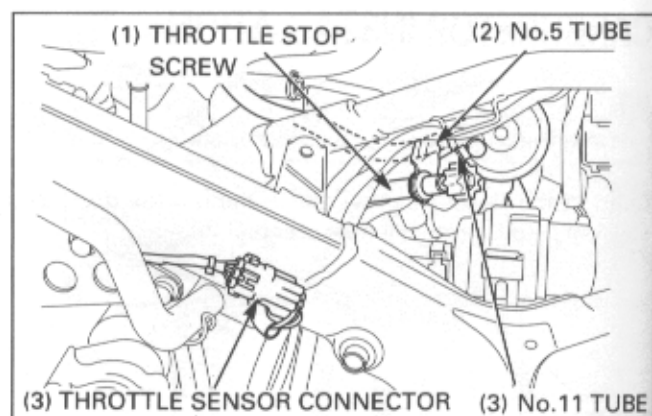
**Torque: 10 mm bolt: 45 N·m (4.5 kg·m, 33 lb·ft)**



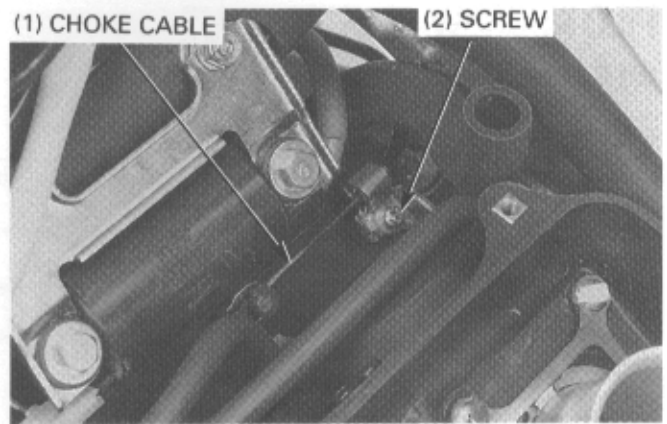
Connect the carburetor heater tube to the thermostat valve.  
Connect the carburetor heater tube to the water pump.



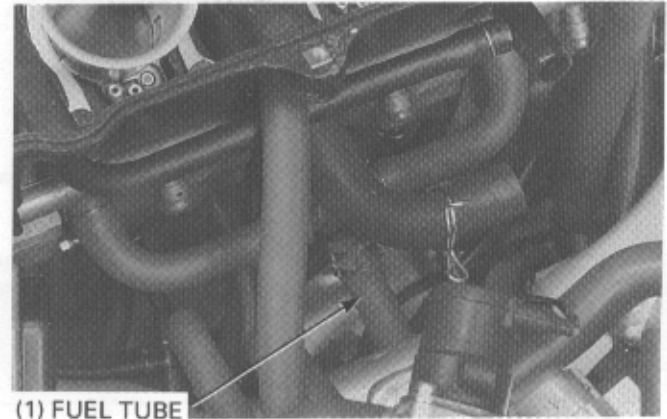
Connect the throttle position sensor connector.  
Install the throttle stop screw to the clamp.  
Connect the No.5 and No.11 tubes to the EVAP purge control valve (California type only).



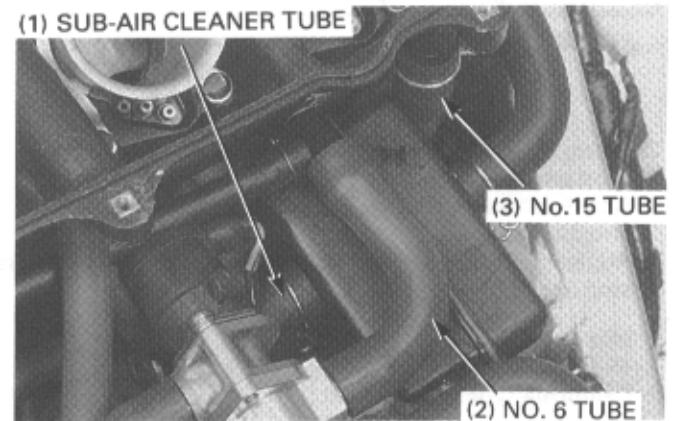
Connect the choke cable end to the SE valve arm and secure the choke cable with the cable clamp.



Connect the fuel tube to the tube joint.



Connect the sub-air cleaner tube to the sub-air cleaner.  
Connect the No.6 tube to the tube joint.  
Connect the No.15 tube to the air chamber (California type only).



Perform the following inspections and adjustment.

- Throttle operation (page 3-4).
- Carburetor choke (page 3-5).

Install the air cleaner base and air cleaner (page 5-5).

Perform the following inspections and adjustment.

- Carburetor synchronization and idle speed (page 3-12, 14).
- Pilot screw (page 5-22).



## 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.

Remove the side fairing (page 2-3).

### S. TOOL

**49-state and California type:**

**Pilot screw wrench**

**07KMA – MS60101 with**

**Pilot elbow wrench**

**07PMA – MZ20110**

**Canada type:**

**Pilot screw wrench**

**07908 – 4220201**

**or**

**U.S.A. only**

**Pilot screw wrench**

**07MMA – MT3010A with**

**Adjustable guide**

**07PMA – MZ2011A**

1. Turn each 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.**

**Initial opening :** 49-states type : 1 – 2/4 turns out  
: California type: 1 – 7/8 turns out  
: Canada type: 2 turns out

2. Warm up to the engine to operating temperature. Stop and go riding for 10 minutes is sufficient.
3. Attach a tachometer according to its manufacturer's instructions.
4. Adjust the idle speed to the specified rpm with the throttle stop screw.

### Idle Speed:

**49-state, Canada type: 1,200 ± 100 rpm**

**California type: 1,400 ± 100 rpm**

5. Turn No.3 carburetor pilot screw in or out slowly to obtain the highest engine speed.
6. Perform step 5 for all the carburetor pilot screws.
7. Lightly open the throttle 2-3 times, adjust the idle speed with the throttle stop screw.
8. Turn No.3 carburetor pilot screw in gradually until the engine speed drops 50 rpm.
9. Turn No.3 carburetor pilot screw counterclockwise to the final opening from the position in step 8.

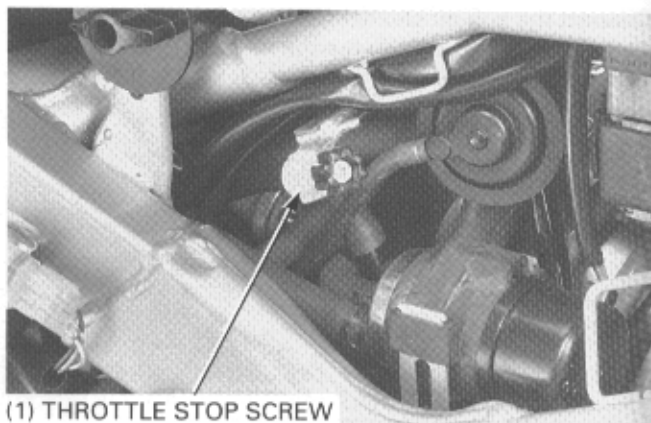
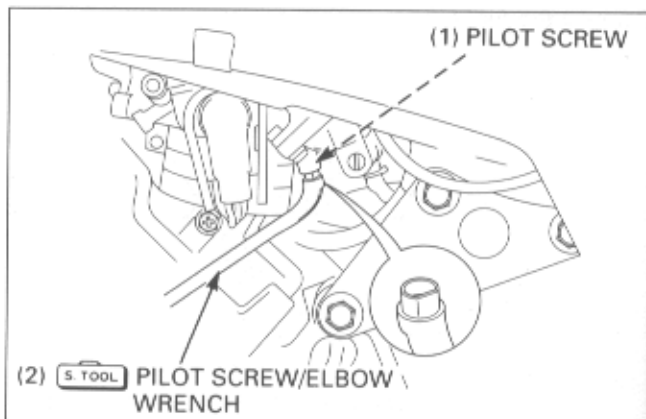
### Final opening:

**49 state type: 3/4 turns out**

**California type: 1 turns out**

**Canada type : 1 turns out**

10. Perform steps 8 and 9 for all the carburetor pilot screws.



## HIGH ALTITUDE ADJUSTMENT (U.S.A. only)

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

Remove the carburetor (page 5-5).

Remove the screws, float chambers and O-rings.

Replace the standard main jet with the high altitude type. Assemble and install the carburetor (page 5-19).

### 49 STATE TYPE

		Below 6,500 feet (2,000 m)	Above 6,500 feet (2,000 m)
Main jet	No.1,4 carburetor	#135	#130
	No.2,3 carburetor	#138	#132
Pilot screw opening		Factory preset	1/2 turn in

### CALIFORNIA TYPE

		Below 6,500 feet (2,000 m)	Above 6,500 feet (2,000 m)
Main jet		#135	#130
Pilot screw opening		Factory preset	1/2 turn in

Warm up the engine to operating temperature. Stop and go riding for 10 minutes is sufficient. Turn each pilot screw to the High Altitude Setting specified below.

**High Altitude Setting: 1/2 turn in**



Pilot screw wrench  
Pilot elbow wrench  
or  
U.S.A. only  
Pilot screw wrench  
Adjustable guide

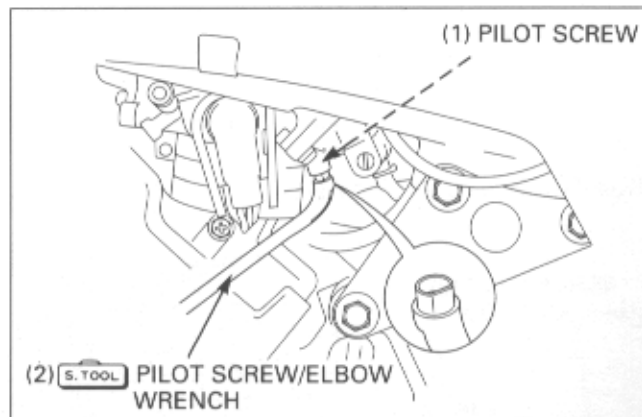
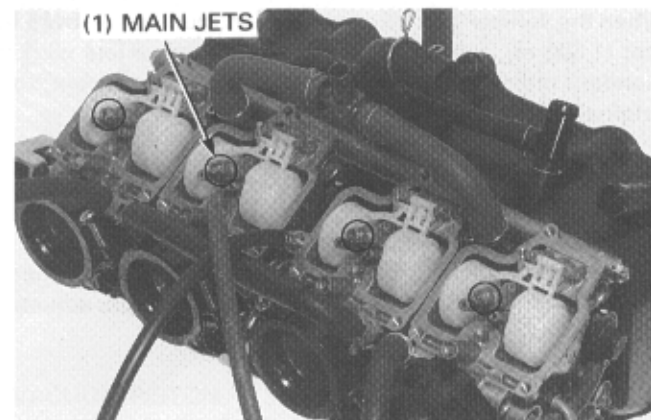
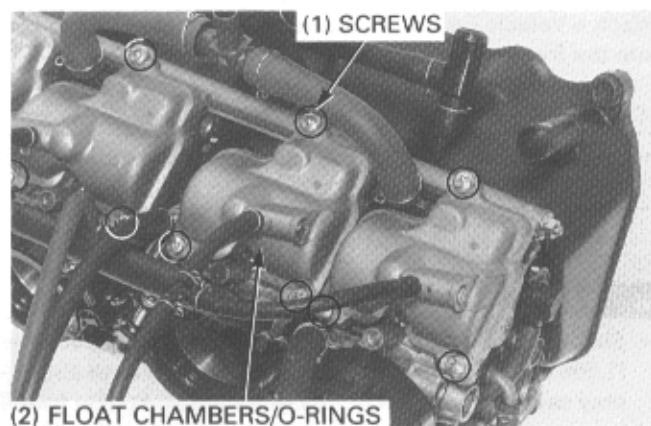
**07KMA – MS60101 with  
07PMA – MZ20110**

**07MMA – MT3010A with  
07PMA – MZ2011A**

Adjust the idle speed to 1,200 ± 100 rpm (California: 1,400 ± 100 rpm) with the throttle stop screw.

#### NOTE

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



## FUEL SYSTEM

Attach a Vehicle Emission Control Information Update Label onto the frame under the left side cover as shown.

### NOTE

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

### ⚠ WARNING

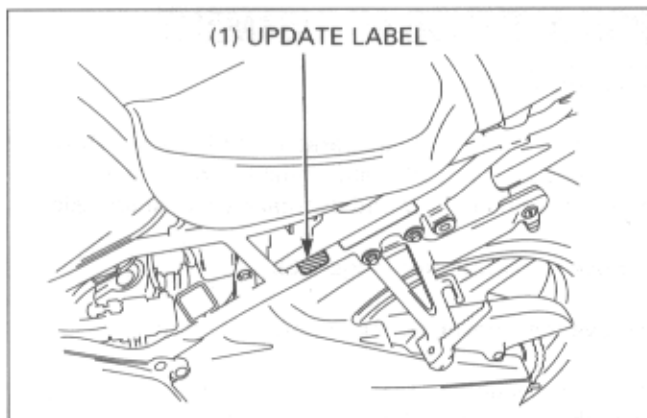
- Sustained operation at an altitude lower than 5,000 feet (1,500 m) with the carburetor adjusted for high altitude may cause the engine to idle roughly and stall in traffic. It may also cause engine damage due to overheating.

When the vehicle is to be operated continuously below 5,000 feet (1,500 m), replace the high altitude main jets with the standard main jets, turn the pilot screws 1/2 turns out, to its original low altitude setting.

Adjust the idle speed to  $1,200 \pm 100$  rpm (California:  $1,400 \pm 100$  rpm) with the throttle stop screw.

Be sure to make these adjustment at low altitude.

Remove the Vehicle Emission Control Update Label that is attached to the frame under the left side cover after adjusting for the low altitude.



VEHICLE EMISSION CONTROL INFORMATION UPDATE  
- HONDA MOTOR CO., LTD

THIS VEHICLE HAS BEEN ADJUSTED TO  
IMPROVE EMISSION CONTROL PERFORMANCE  
WHEN OPERATED AT HIGH ALTITUDE.

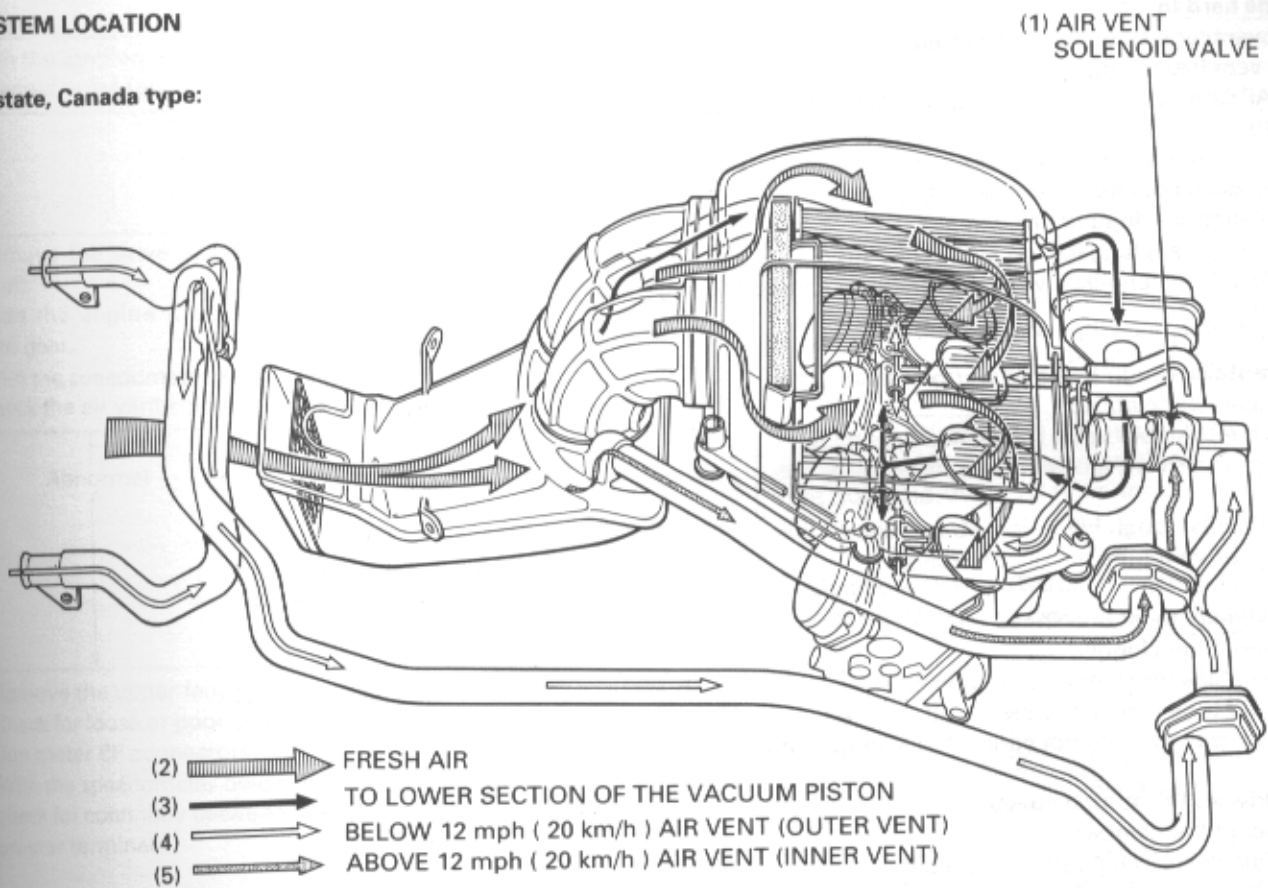


ALTITUDE PERFORMANCE ADJUSTMENT INSTRUCTIONS  
ARE AVAILABLE AT YOUR AUTHORIZED HONDA DEALER.

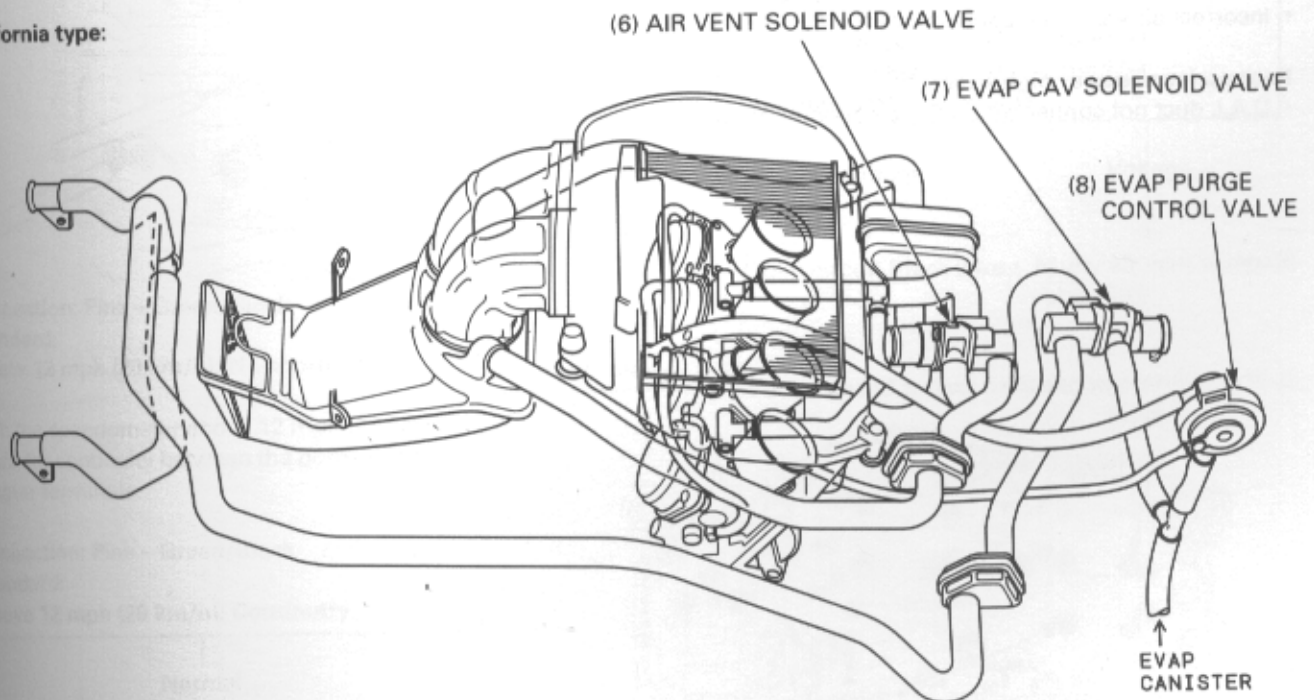
# DIRECT AIR INTAKE (D.A.I.) SYSTEM

## SYSTEM LOCATION

49 state, Canada type:



California type:



## FUEL SYSTEM

---

### TROUBLESHOOTING

#### Engine hard to start

- Air vent tube clogged or restricted
- Air vent filter clogged
- EVAP CAV solenoid valve faulty (California type only, page 5-28).

#### Engine does not idle

- Air vent tube clogged or restricted
- Air vent filter clogged
- EVAP CAV solenoid valve faulty (California type only, page 5-28).

#### Engine stalls, rough idling at warm engine

- Air vent filter clogged
- Air vent solenoid valve faulty (see next page)
- Incorrect air vent tube connections

#### Engine stalls, rough idling in a strong wind

- Outer air vent tube out of connection

#### Poor driveability at low speed

- Air vent filter clogged
- Sub-air cleaner clogged or restricted
- Air vent tube clogged or restricted
- Sub-air cleaner tube not connected, clogged or restricted

#### Poor driveability at high speed

- Air vent filter clogged
- Sub-air cleaner clogged or restricted
- Air vent tube clogged or restricted
- Sub-air cleaner tube not connected, clogged or restricted
- Air vent solenoid valve faulty (see next page)
- Incorrect air vent tube connections

#### Poor performance at high speed

- D.A.I. duct not connected on the air cleaner housing

**Air vent solenoid valve inspection (49 state, Canada type)**

With the ignition switch ON, check the air vent solenoid valve (page 5-32).

Abnormal

Normal

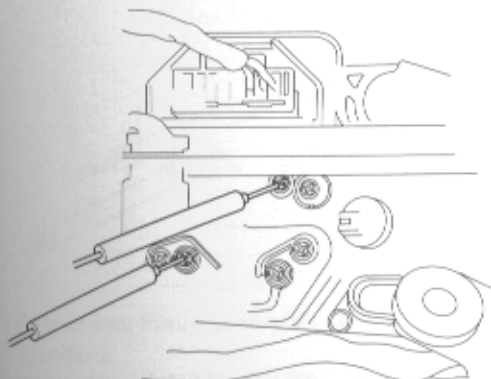
Remove the drive sprocket from the counter shaft.  
Start the engine then shift the transmission into gear.  
With the speedometer above 12 mph (20 km/h), check the air vent solenoid valve (page 5-32).

Abnormal

Normal

- Air vent solenoid valve (D.A.I. system) is Normal

Remove the upper fairing (page 2-4).  
Check for loose or poor contact of the combination meter 8P connectors.  
With the speedometer below 12 mph (20 km/h), check for continuity between the bottom speedometer terminals.



Connection: Pink - Green/Black  
Standard:  
Below 12 mph (20 km/h): No continuity

With the speedometer above 12 mph (20 km/h), check for continuity between the bottom speedometer terminals.

Connection: Pink - Green/Black  
Standard:  
Above 12 mph (20 km/h): Continuity

Normal

(Continue the following page)

With the ignition switch ON, measure the voltage between the connector terminals at the air vent solenoid valve connector (page 5-33).

Connection: Orange/Black (+) - Green (-)  
Standard: Battery voltage

No voltage

Voltage

- Faulty air vent solenoid valve

With the ignition switch ON, measure the voltage between the connector terminals at the air vent solenoid valve relay connector (page 5-33).

Connection: Orange/Black (+) - ground (-)  
Standard: Battery voltage

No voltage

Voltage

- Open circuit Orange/Black wire

With the ignition switch ON, measure the voltage between the connector terminals at the air vent solenoid valve relay connector (page 5-33).

Connection: Black 1 (+) - ground (-)  
: Black 2 (+) - ground (-)  
Standard: Battery voltage

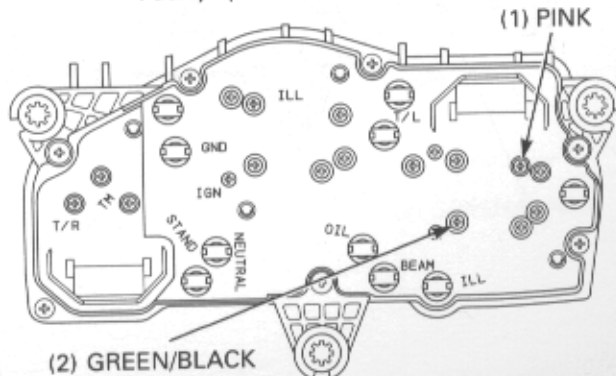
No voltage

Voltage

- Open circuit Black wire • Faulty air vent solenoid valve relay

Abnormal

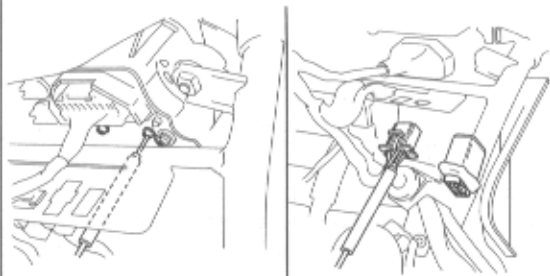
- Faulty speed sensor or speedometer (page 18-3)



# FUEL SYSTEM

(From the previous page)

With the ignition switch OFF, check for continuity between the Pink wire of the air vent solenoid valve relay and Pink terminal of the speedometer.



**Connection: Pink - Pink**  
**Standard: Continuity**

Abnormal

With the ignition switch ON, measure the voltage between the connector terminals at the air vent solenoid valve relay connector (page 5-33).

**Connection: Black 1 (+) - ground (-)**  
**: Black 2 (+) - ground (-)**  
**Standard: Battery voltage**

No voltage

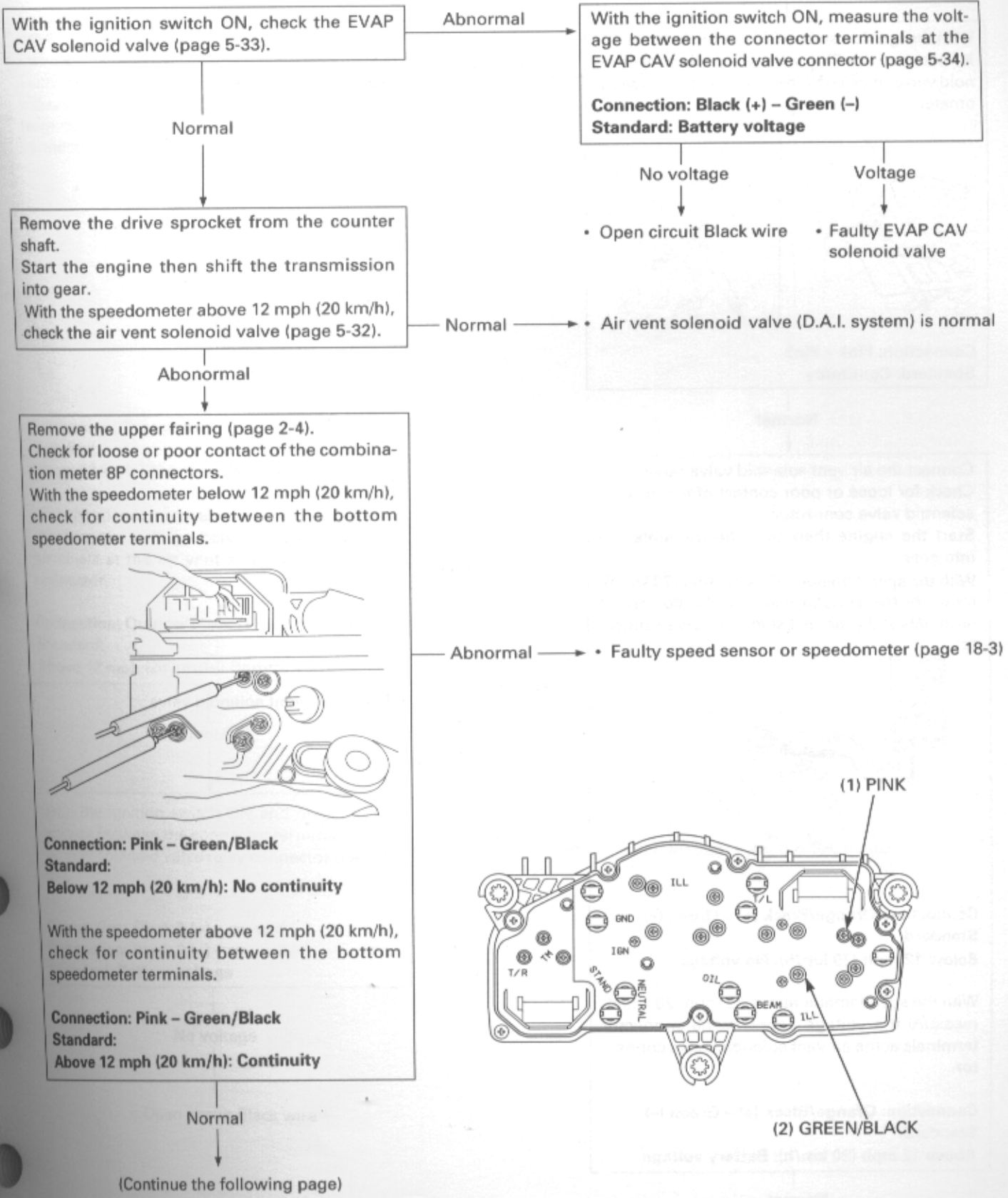
Voltage

- Open circuit Black wire
- Faulty air vent solenoid valve relay

Abnormal

- Open circuit Pink wire

**Air vent solenoid valve/EVAP CAV solenoid valve inspection (California type)**



With the ignition switch ON, check the EVAP CAV solenoid valve (page 5-33).

Abnormal

With the ignition switch ON, measure the voltage between the connector terminals at the EVAP CAV solenoid valve connector (page 5-34).

**Connection: Black (+) - Green (-)**  
**Standard: Battery voltage**

No voltage

Voltage

- Open circuit Black wire
- Faulty EVAP CAV solenoid valve

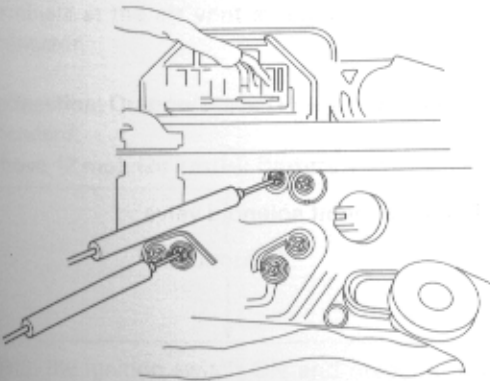
Remove the drive sprocket from the counter shaft. Start the engine then shift the transmission into gear. With the speedometer above 12 mph (20 km/h), check the air vent solenoid valve (page 5-32).

Normal

• Air vent solenoid valve (D.A.I. system) is normal

Abnormal

Remove the upper fairing (page 2-4). Check for loose or poor contact of the combination meter 8P connectors. With the speedometer below 12 mph (20 km/h), check for continuity between the bottom speedometer terminals.



Abnormal

• Faulty speed sensor or speedometer (page 18-3)

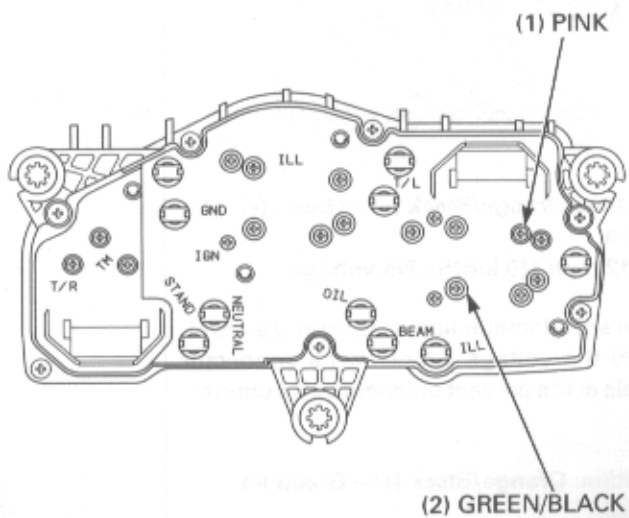
**Connection: Pink - Green/Black**  
**Standard:**  
**Below 12 mph (20 km/h): No continuity**

With the speedometer above 12 mph (20 km/h), check for continuity between the bottom speedometer terminals.

**Connection: Pink - Green/Black**  
**Standard:**  
**Above 12 mph (20 km/h): Continuity**

Normal

(Continue the following page)



(1) PINK

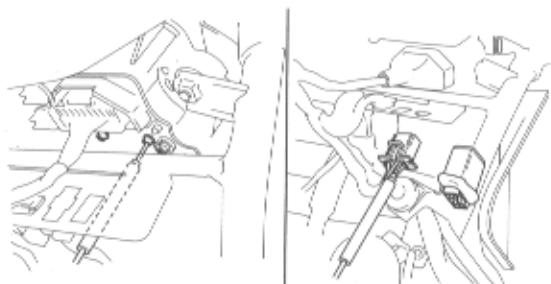
(2) GREEN/BLACK



## FUEL SYSTEM

(From the previous page)

With the ignition switch OFF, check for continuity between the Pink wire of the air vent solenoid valve relay and Pink terminal of the speedometer.



**Connection: Pink - Pink**  
**Standard: Continuity**

Abnormal

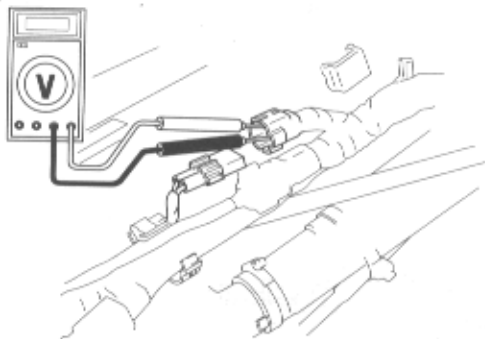
- Open circuit Pink wire

Normal

Connect the air vent solenoid valve relay. Check for loose or poor contact of the air vent solenoid valve connector.

Start the engine then shift the transmission into gear.

With the speedometer below 12 mph (20 km/h), measure the voltage between the connector terminals at the air vent solenoid valve connector.



**Connection: Orange/Black (+) - Green (-)**

**Standard:**

**Below 12 mph (20 km/h): No voltage**

With the speedometer above 12 mph (20 km/h), measure the voltage between the connector terminals at the air vent solenoid valve connector.

**Connection: Orange/Black (+) - Green (-)**

**Standard:**

**Above 12 mph (20 km/h): Battery voltage**

Abnormal

- Faulty air vent solenoid valve

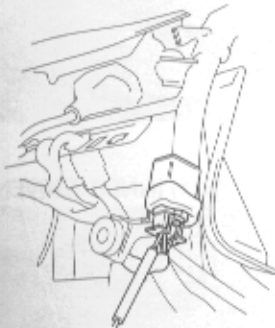
Normal

(Continue the following page)

(From the previous page)

Start the engine then shift the transmission into gear.

With the speedometer below 12 mph (20 km/h), measure the voltage between the connector terminals at the air vent solenoid valve relay connector.



Connection: Orange/Black (+) – ground (-)

Standard:

Below 12 mph (20 km/h): No voltage

With the speedometer above 18 mph (20 km/h), measure the voltage between the connector terminals at the air vent solenoid valve relay connector.

Connection: Orange/Black (+) – ground (-)

Standard:

Above 12 mph (20 km/h): Battery voltage

Normal

• Open circuit Orange/Black wire

Abnormal

With the ignition switch ON and measure the voltage between the connector terminals at the air vent solenoid valve relay connector (page 5-37).

Connection: Black 1 (+) – ground (-)

Connection: Black 2 (+) – ground (-)

Standard: Battery voltage

Voltage appeared

• Faulty air vent solenoid valve relay

No voltage

• Open circuit Black wire

## FUEL SYSTEM

### SUB-AIR CLEANER/TUBE

#### INSPECTION

Remove the fuel tank (page 2-4).  
Check the tubes between the D.A.I. duct, sub-air cleaner and carburetors for deterioration, damage or loose connections.  
Remove the sub-air cleaner and check it for clogging.

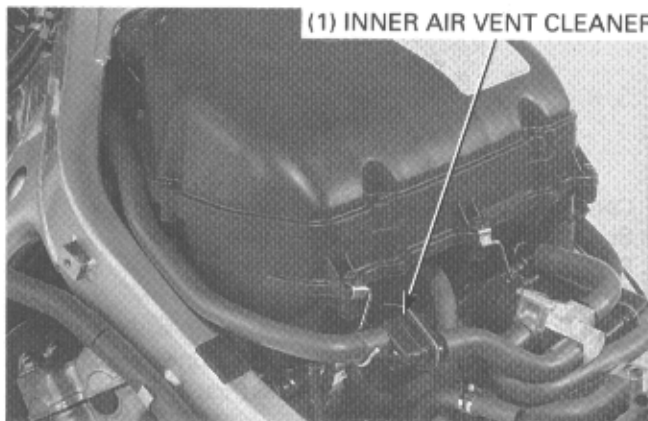


(1) SUB-AIR CLEANER

### INNER AIR VENT CLEANER/TUBE

#### INSPECTION

Remove the fuel tank (page 2-4).  
Check the tubes between the D.A.I. duct, air vent cleaner and air vent solenoid valve for deterioration, damage or loose connections.  
Remove the air vent cleaner and check it for clogging.

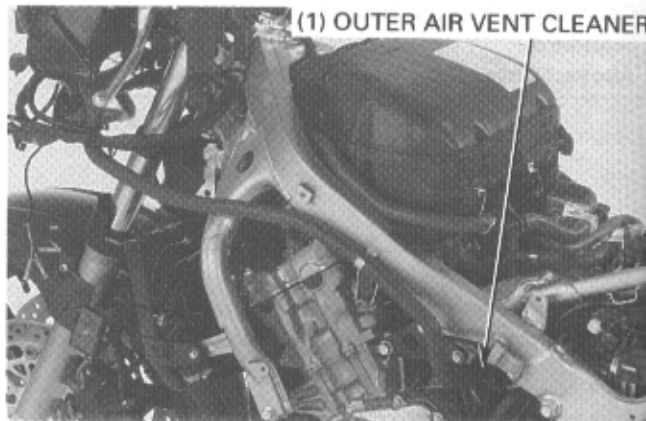


(1) INNER AIR VENT CLEANER

### OUTER AIR VENT CLEANER/TUBE

#### INSPECTION

Remove the upper fairing (page 2-4).  
Check the tubes between the outer air vent duct, air vent cleaner and air vent solenoid valve for deterioration, damage or loose connections.  
Remove the air vent cleaner and check it for clogging.



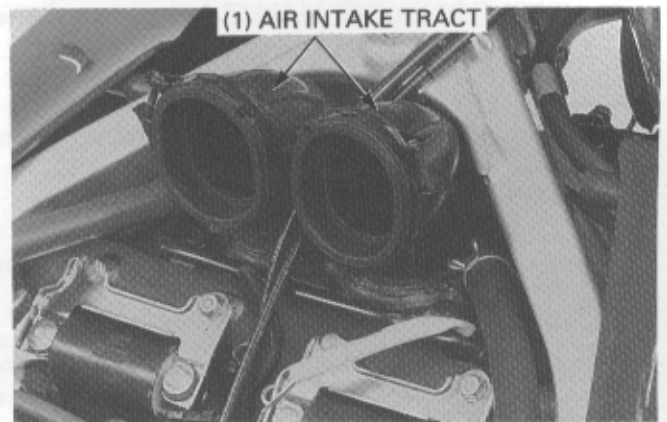
(1) OUTER AIR VENT CLEANER

**D.A.I. DUCT**

**INSPECTION**

Remove the fuel tank (page 2-4).

Check the air intake tract between the D.A.I. duct and air cleaner housing cover for signs of deterioration, damage or loose connections.

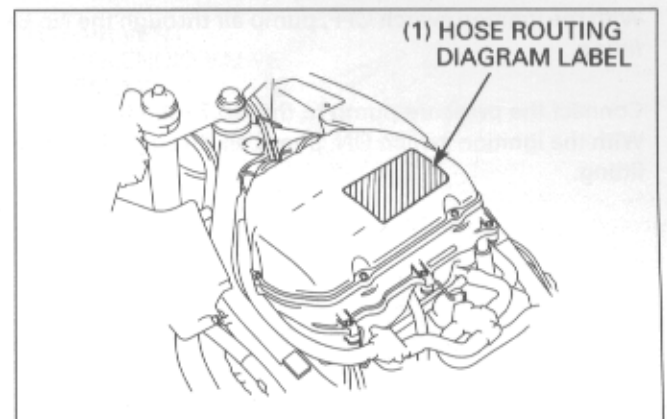


**HOSE ROUTING**

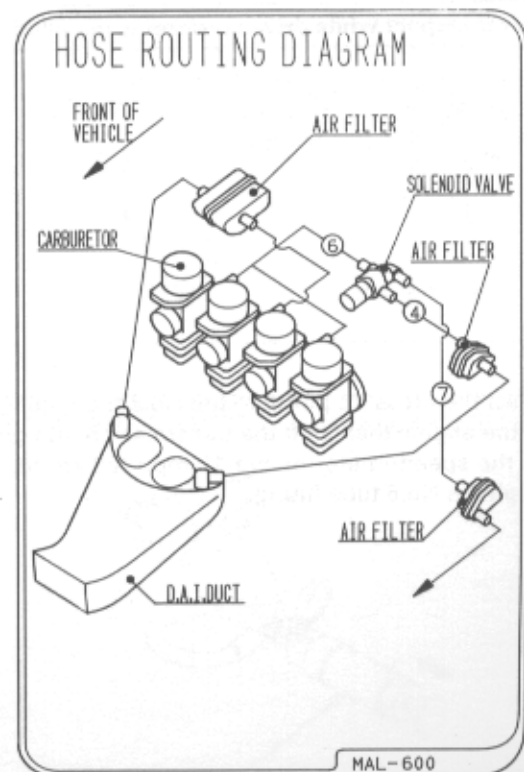
The Hose Routing Diagram Label (49 state, Canada type) is on the air cleaner housing cover.

The Vacuum Hose Routing Diagram Label (California type) is on the air cleaner housing cover (see page 1-31 and page 5-25).

Refer to tubing diagram for the hose connections.



49 state, Canada type:



## FUEL SYSTEM

### AIR VENT SOLENOID VALVE (49 state, Canada type)

#### OPERATION CHECK

Disconnect the No.4, 6, 7 tubes from the air vent solenoid valve.

Connect the pressure pump to the No.4 tube fitting.

#### Tool:

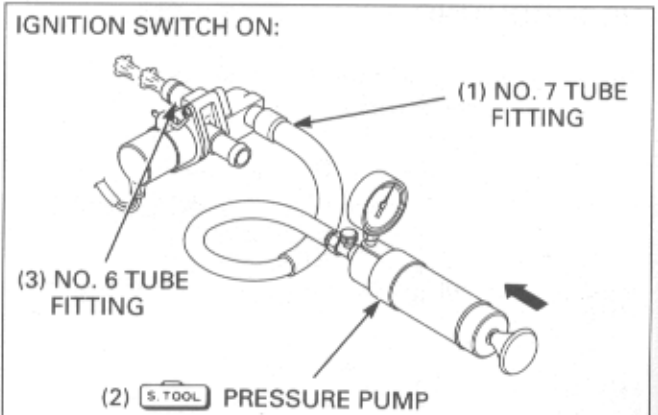
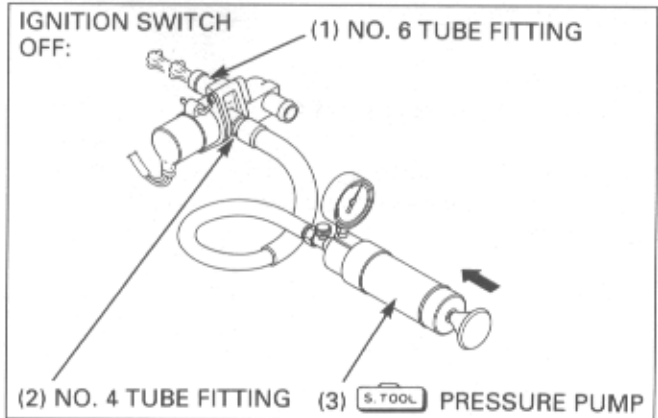
Pressure pump ST - AH - 255 - MC7 (U.S.A. only)

#### CAUTION

- Damage to the air vent solenoid valve may result from use of high pressure air source. Use a hand operated air pump only.

With the ignition switch OFF, pump air through the No.6 tube fitting.

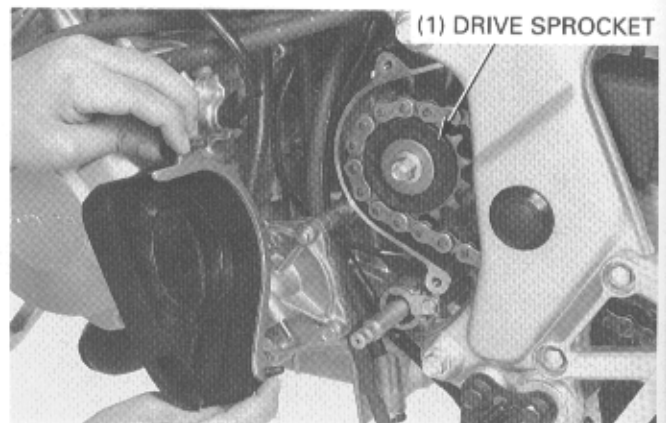
Connect the pressure pump to the No.7 tube fitting.  
With the ignition switch ON, pump air through the No.6 tube fitting.



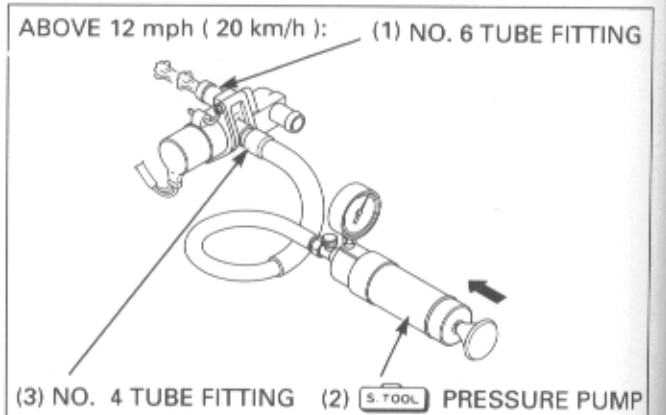
Remove the drive sprocket from the countershaft (page 7-3).

#### ▲ WARNING

- Never inspect while drive sprocket is installed.



Connect the pressure pump to the No.4 tube fitting.  
Start the engine then shift the transmission into gear.  
With the speedometer above 12 mph (20 km/h), pump air through the No.6 tube fitting.

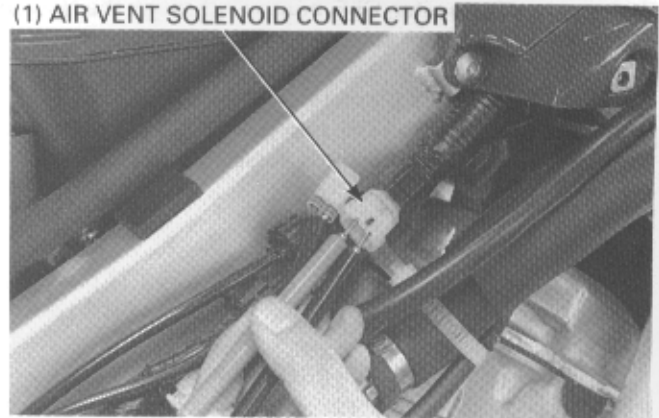


**AIR VENT SOLENOID VALVE VOLTAGE**

Disconnect the air vent solenoid valve connector.  
Check for loose or poor connection of the connector.  
Turn the ignition switch ON and measure the voltage between the connector terminals of the wire harness.

**Connection:** Orange/Black (+) – Green (-)  
**Standard:** Battery voltage

(1) AIR VENT SOLENOID CONNECTOR



**AIR VENT SOLENOID VALVE RELAY (49 state, Canada type)**

**AIR VENT SOLENOID VALVE RELAY VOLTAGE**  
Remove the upper fairing (page 2-4).

Check for loose or poor connection of the connector.

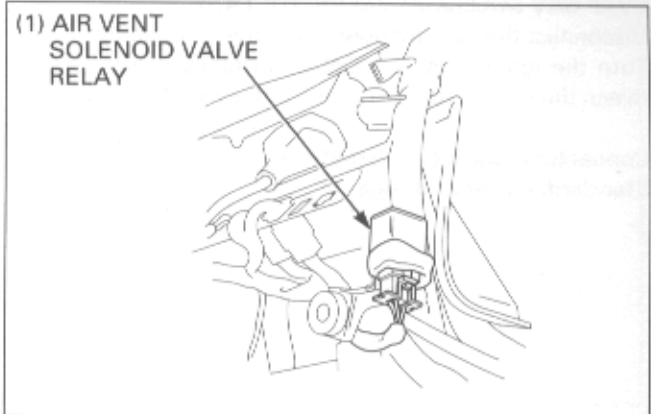
Turn the ignition switch ON and measure the voltage between the connector terminals at the air vent solenoid valve relay connector.

**Connection:** Orange/Black (+) – ground (-)  
**Standard:** Battery voltage

**Connection:** Black 1 (+) – ground (-)  
**Standard:** Battery voltage

**Connection:** Black 2 (+) – ground (-)  
**Standard:** Battery voltage

(1) AIR VENT SOLENOID VALVE RELAY



**EVAP CAV SOLENOID VALVE (California type)**

**OPERATION CHECK**

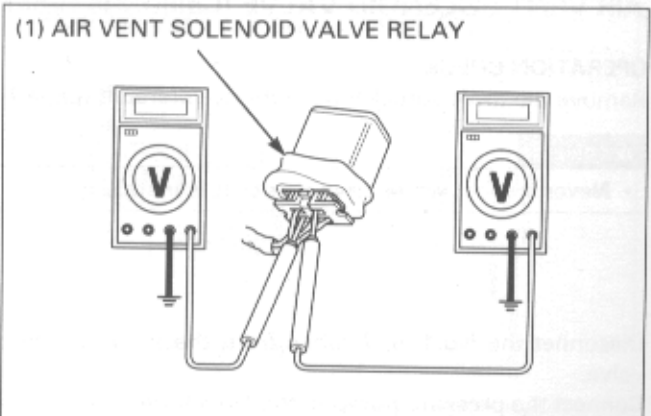
Disconnect the No.4, 8 tubes from the EVAP CAV solenoid valve.  
Connect the pressure pump to the No.4 tube fitting goes to EVAP canister.

**Tool:**  
Pressure pump                      ST – AH – 255 – MC7 (U.S.A. only)

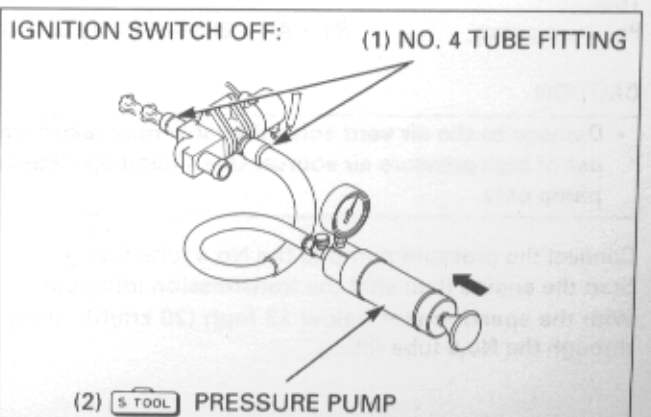
**CAUTION**

- Damage to the air vent solenoid valve may result from use of high pressure air source. Use a hand operated air pump only

(1) AIR VENT SOLENOID VALVE RELAY



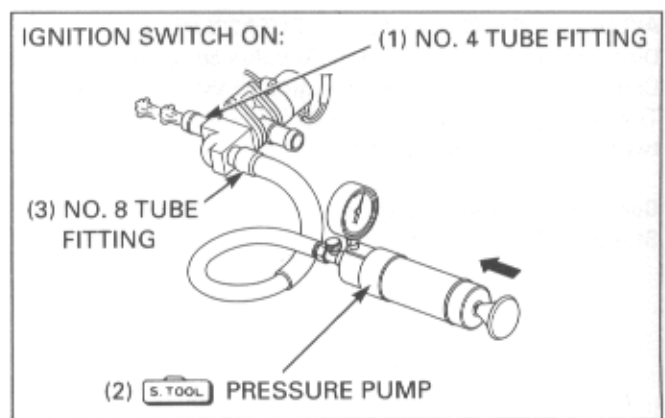
IGNITION SWITCH OFF: (1) NO. 4 TUBE FITTING



## FUEL SYSTEM

With the ignition switch OFF, pump air through the No.4 tube fitting goes to air vent solenoid valve.

Connect the pressure pump to the No.8 tube fitting.  
With the ignition switch ON, pump air through the No.4 tube fitting goes to air vent solenoid valve.

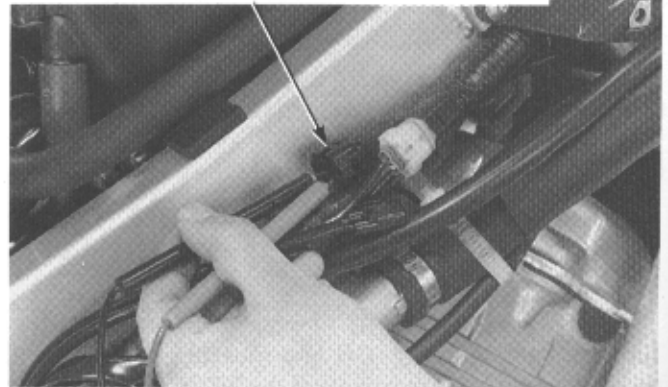


### EVAP CAV SOLENOID VALVE VOLTAGE

Disconnect the air vent solenoid valve connector.  
Turn the ignition switch ON and measure the voltage between the connector terminals of the wire harness.

**Connection:** Black (+) – Green (-)  
**Standard:** Battery voltage

(1) EVAP CAV SOLENOID VALVE CONNECTOR



### AIR VENT SOLENOID VALVE (California type)

#### OPERATION CHECK

Remove the drive sprocket from the countershaft (page 7-3).

#### ▲ WARNING

- Never inspect while drive sprocket is instaling.

Disconnet the No.4, 6, 7 tubes from the air vent solenoid valve.

Connect the pressure pump to the No.4 tube fitting.

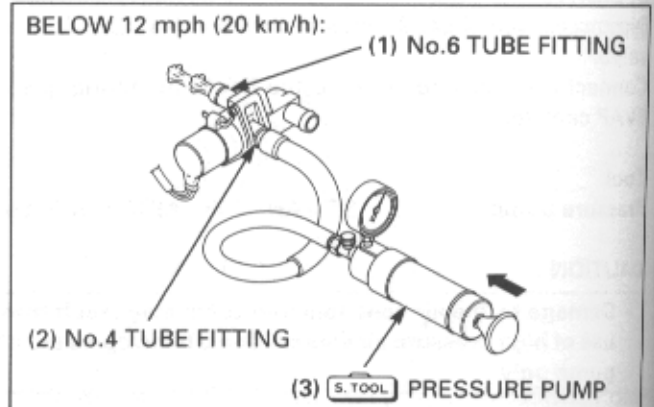
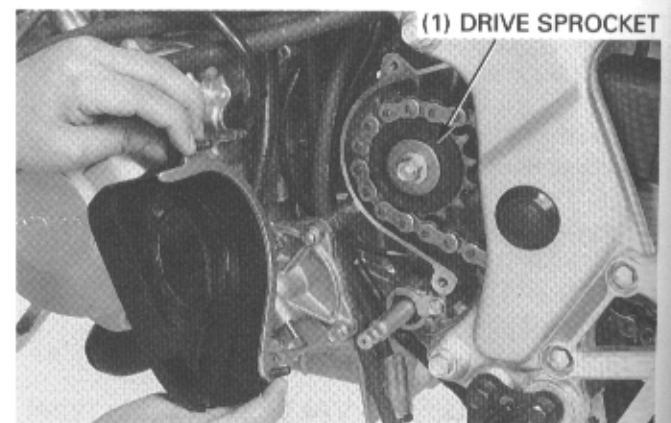
#### Tool:

Pressure pump ST - AH - 255 - MC7 (U.S.A. only)

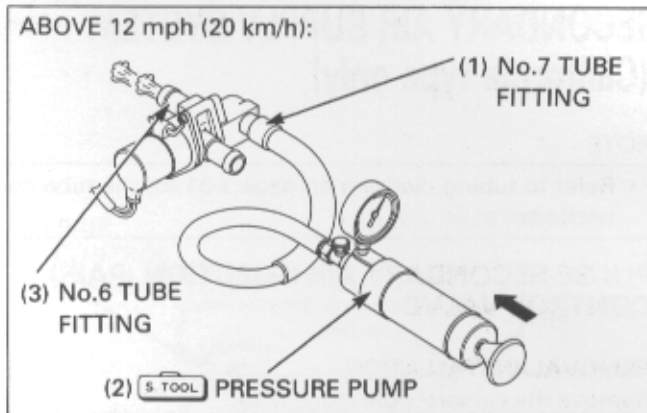
#### CAUTION

- Damage to the air vent solenoid valve may result from use of high pressure air source. Use a hand operated air pump only.

Connect the pressure pump to the No.4 tube fitting.  
Start the engine then shift the transmission into gear.  
With the speedometer below 12 mph (20 km/h), pump air through the No.6 tube fitting.



Connect the pressure pump to the No.7 tube fitting.  
 Start the engine then shift the transmission into gear.  
 With the speedometer above 12 mph (20 km/h), pump air through the No.6 tube fitting.

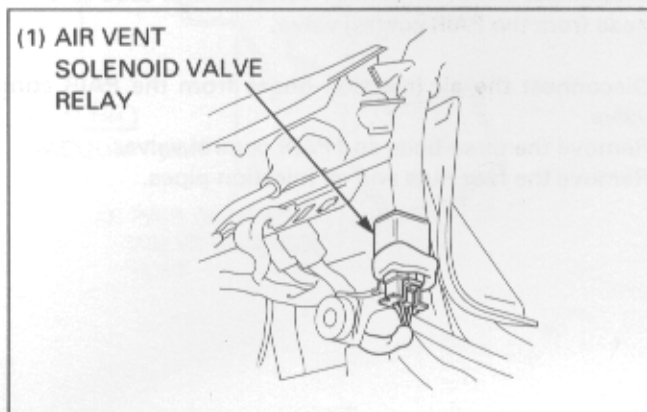


**AIR VENT SOLENOID VALVE RELAY (California type)**

**AIR VENT SOLENOID VALVE RELAY VOLTAGE**

Remove the upper fairing (page 2-4).

Check for loose or poor connection of the connector.

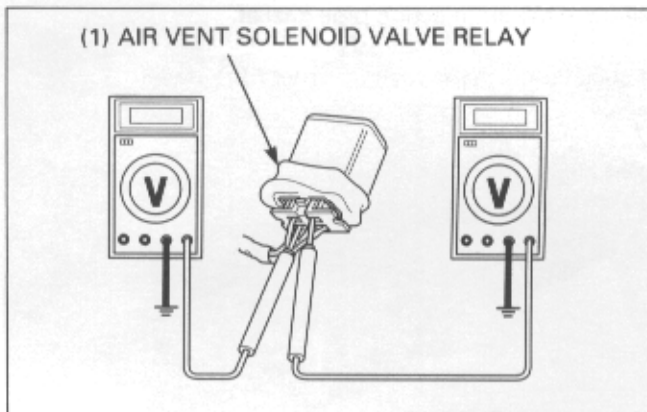


Turn the ignition switch ON and measure the voltage between the connector terminals at the air vent solenoid valve relay connector.

Connection: Orange/Black (+) – ground (-)  
 Standard: Battery voltage

Connection: Black 1 (+) – ground (-)  
 Standard: Battery voltage

Connection: Black 2 (+) – ground (-)  
 Standard: Battery voltage





## SECONDARY AIR SUPPLY SYSTEM (California type only)

### NOTE

- Refer to tubing diagram on page 1-31 for the tube connections.

### PULSE SECONDARY AIR INJECTION (PAIR) CONTROL VALVE

#### REMOVAL/INSTALLATION

Remove the exhaust pipe (page 2-10).

Disconnect the PAIR control valve control tube and No.15 hose from the PAIR control valve.

Disconnect the air injection hoses from the PAIR control valve.

Remove the three bolts and PAIR control valve.

Remove the four nuts and air injection pipes.

Remove the air injection pipe gasket.

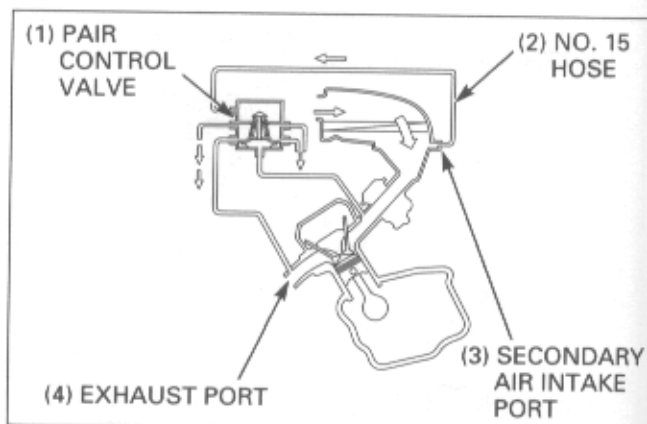
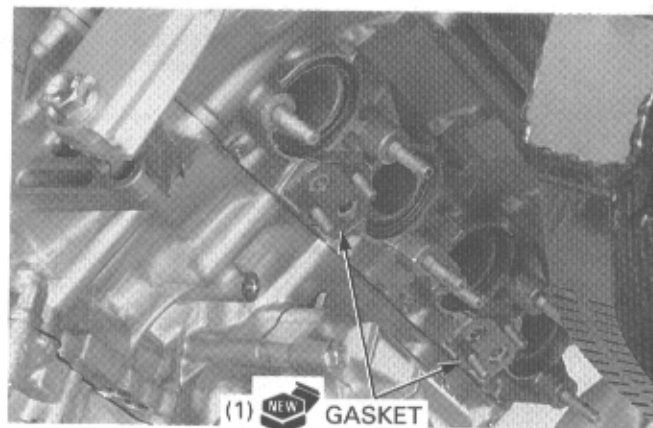
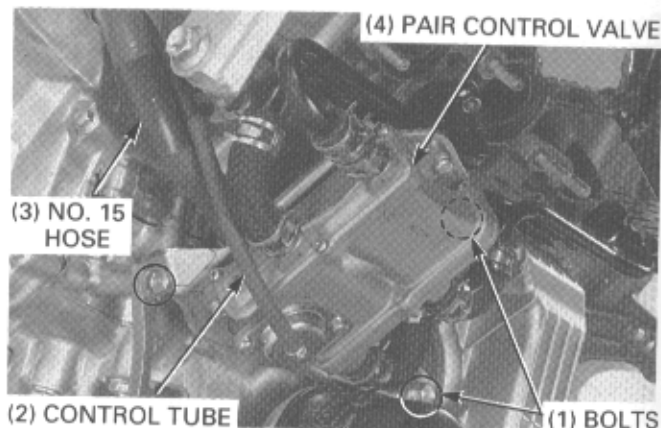
Installation is in the reverse order of removal.

#### INSPECTION

Start the engine and warm it to operating temperature. Stop the engine and remove the air cleaner (page 3-5).

Check the No.15 hose ports are clean and free of carbon deposits.

Check the PAIR check valves in the secondary air passage if the ports are carbon fouled.



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

Disconnect the PAIR control valve control tube from the PAIR control valve; install a plug to keep air from entering.

Connect the vacuum pump to the PAIR control valve.

**Tool:**

Vacuum pump **ST - AH - 260 - MC7 (U.S.A. only)**

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

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

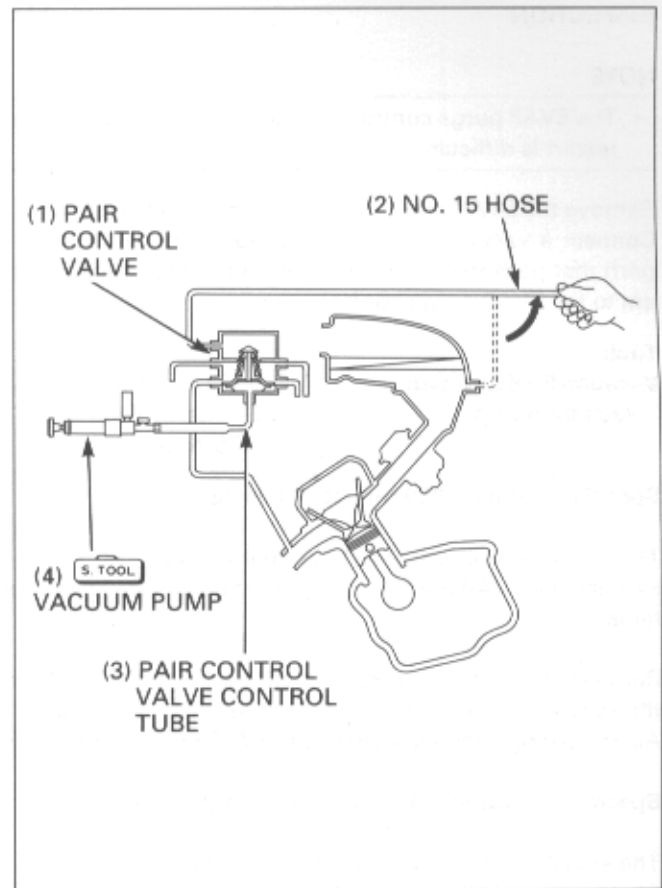
With the engine running, gradually apply vacuum to the PAIR control valve.

Check that the air intake port stops drawing air, and that the vacuum does not bleed.

**Specified vacuum: 40 mmHg (1.6 inHg)**

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

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



## EVAPORATIVE EMISSION CONTROL SYSTEM (California type only)

**NOTE**

- Refer to tubing diagram on page 1-31 for the tube connections.

### EVAPORATIVE EMISSION (EVAP) CANISTER

**REMOVAL/INSTALLATION**

Remove the side fairing (page 2-3).

Disconnect the No.2, No.1 and No.4 tube from the EVAP canister.

Remove the two bolts and EVAP canister.

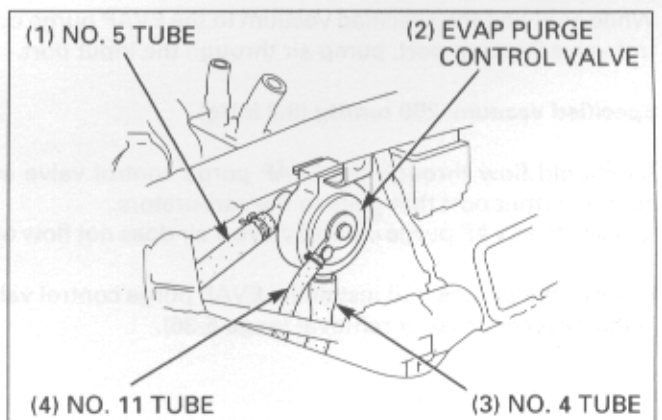
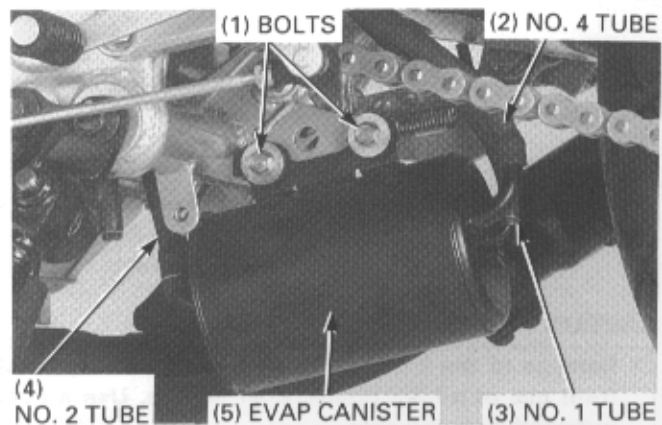
Installation is in the reverse order of removal.

### EVAPORATIVE EMISSION (EVAP) PURGE CONTROL VALVE

**REMOVAL/INSTALLATION**

Remove the EVAP purge control valve from the frame stay. Disconnect the No.11, No.5 and No.4 tube from their connections.

Installation is in the reverse order of removal.



## FUEL SYSTEM

### INSPECTION

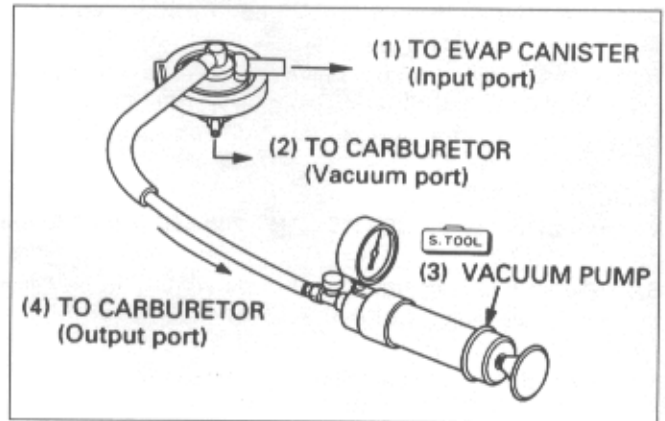
#### NOTE

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

Remove the EVAP purge control valve (see above). 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.

#### Tool:

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



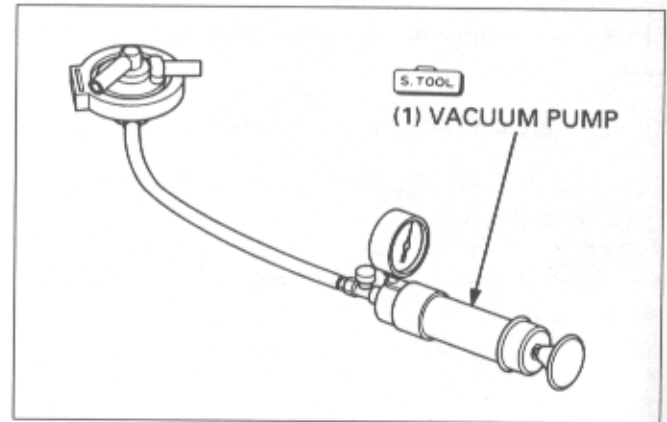
#### Specified vacuum: 250 mmHg (9.8 inHg)

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) which goes to the rear carburetor. Apply the specified vacuum to the EVAP purge control valve.

#### Specified vacuum: 250 mmHg (9.8 inHg)

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) which goes to EVAP canister.

#### Tool:

Vacuum/Pressure pump	A937X - 041- XXXXX or ST - AH - 255 - MC7 (U.S.A. only)
Pressure pump	

#### CAUTION

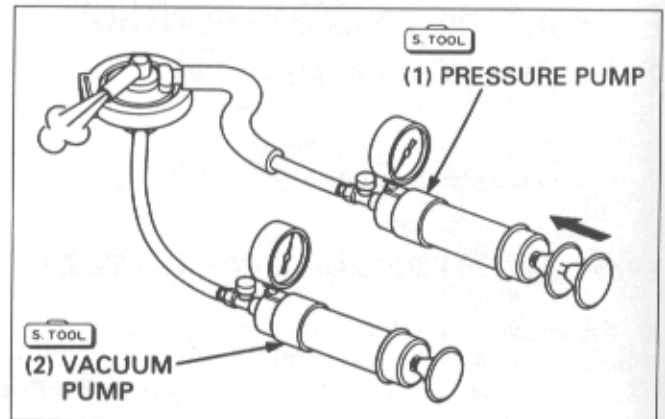
- Damage to the EVAP purge control valve may result from use of a high pressure air source. Use a hand operated air pump only.

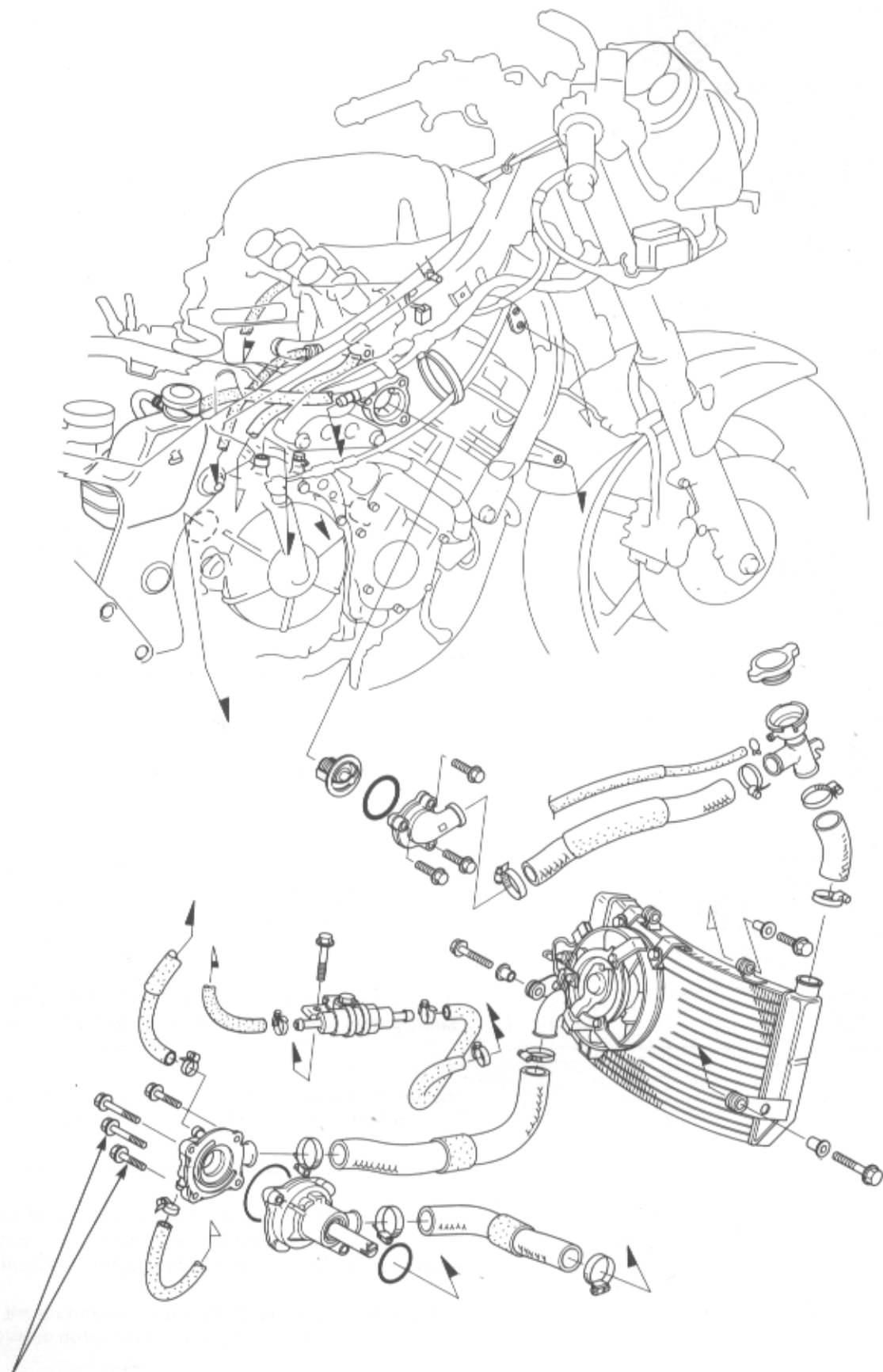
While applying the specified vacuum to the EVAP purge control valve vacuum port, pump air through the input port.

#### Specified vacuum: 250 mmHg (9.8 inHg)

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 (page 5-36).





13 N•m (1.3 kg-m, 9 lb-ft)

# 6. COOLING SYSTEM

SERVICE INFORMATION	6-1	THERMO VALVE	6-7
TROUBLESHOOTING	6-2	RADIATOR/COOLING FAN	6-8
SYSTEM TESTING	6-3	WATER PUMP	6-10
COOLANT REPLACEMENT	6-4	RADIATOR RESERVE TANK	6-12
THERMOSTAT	6-6		

## 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 services 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 18 for fan motor switch and thermo sensor inspection.

### SPECIFICATION

ITEM		SPECIFICATIONS
Coolant capacity	radiator and engine	2.4 ℓ (0.63 US gal, 0.53 Imp gal)
	reserve tank	0.35 ℓ (0.09 US gal, 0.08 Imp gal)
Radiator cap relief pressure		108 - 137 kPa (1.1 - 1.4 kg/cm <sup>2</sup> , 15.6 - 19.9 psi)
Thermostat	begins to open	80 - 84°C (176 - 183°F)
	fully open	95°C (203°F)
	valve lift	8.0 mm (0.31 in) minimum
Thermo valve starts to close		73 - 77°C (163 - 171°F)

### TORQUE VALUES

- Water pump bolt 13 N•m (1.3 kg-m, 9 lb-ft) CT bolt.
- Fan motor switch 10 N•m (1.0 kg-m, 7 lb-ft) Apply sealant to the threads.
- Thermosensor 10 N•m (1.0 kg-m, 7 lb-ft) Apply sealant to the threads. (Do not apply sealant to the sensor head.)

### TOOL

- Pressure pump ST-AH-255-MC7 (U.S.A. only)

### TROUBLESHOOTING

#### Engine temperature too high

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

#### Engine temperature too low

- Faulty temperature meter or thermosensor
- Thermostat stuck open
- Faulty cooling fan motor switch

#### Coolant leaks

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

## SYSTEM TESTING

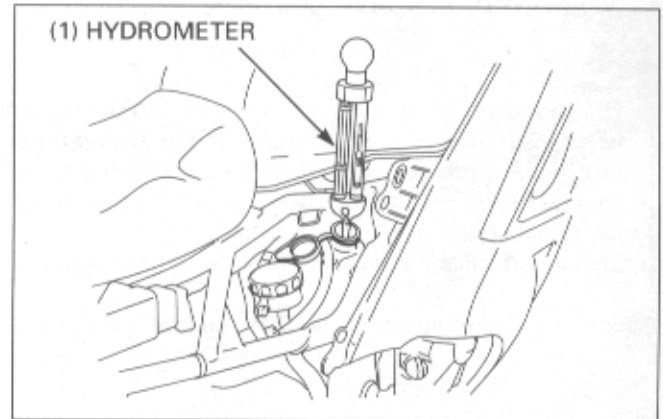
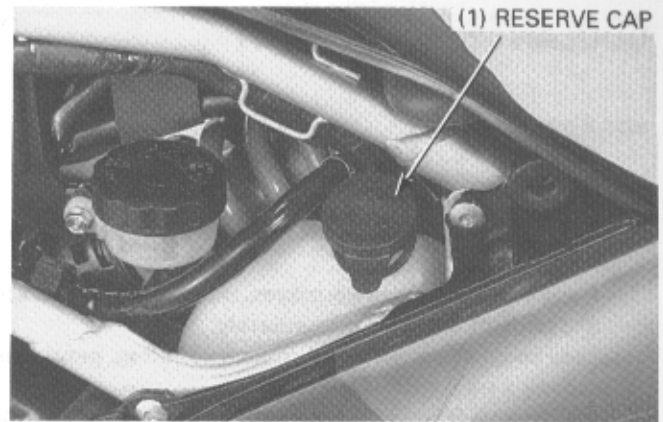
### COOLANT (HYDROMETER TEST)

Remove the side fairing (page 2-3).

Remove the reserve cap.

Check the coolant gravity using a hydrometer (refer to Section 5 of the Common Service Manual for "Coolant gravity chart". For maximum corrosion protection, a 50-50% solution of ethylene glycol and distilled water is recommended (page 6-4).

Look for contamination and replace the coolant if necessary.



### RADIATOR CAP/SYSTEM PRESSURE INSPECTION

#### ⚠ WARNING

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

Remove the upper fairing (page 2-4).

Remove the radiator cap.

#### NOTE

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

Pressure test the radiator cap. Replace the radiator cap if it does not hold pressure, or if relief pressure is too high or too low. It must hold specified pressure for at least 6 seconds.

#### Radiator cap relief pressure:

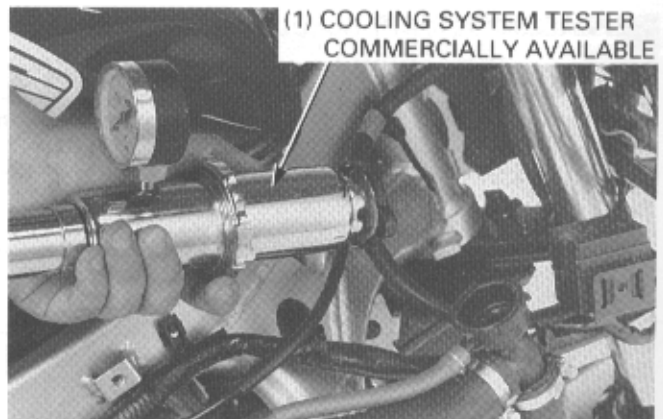
108 – 137 kPa (1.1 – 1.4 kg/cm<sup>2</sup>, 15.6 – 19.9 psi)

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

#### CAUTION

- Excessive pressure can damage the cooling system components. Do not exceed 137 kPa (1.4 kg/cm<sup>2</sup>, 19.9 psi).

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



## COOLANT REPLACEMENT

### PREPARATION

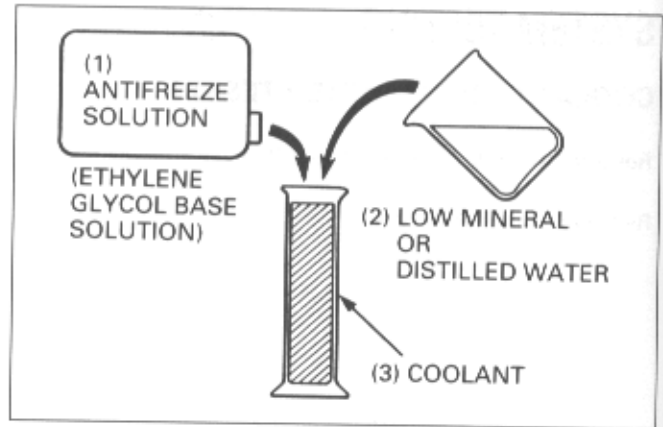
**⚠ WARNING**

- 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 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

**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 mixture: 50-50 (Distilled water and coolant)



### 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.

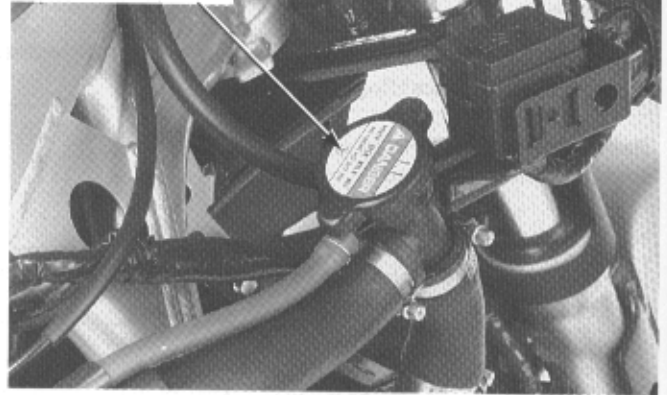
Remove the upper fairing (page 2-4).

Remove the radiator cap.

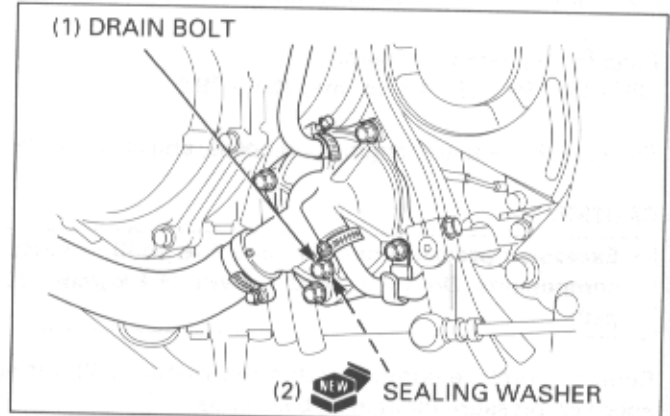
Remove the drain bolt on the water pump and drain the system coolant.

Reinstall the drain bolt with a new sealing washer.

(1) RADIATOR CAP



(1) DRAIN BOLT





Place a suitable container under the siphon tube joint of the reserve tank.

Disconnect the siphon tube from the reserve tank and drain the reserve coolant.

Empty the coolant and rinse the inside of the reserve tank with water.

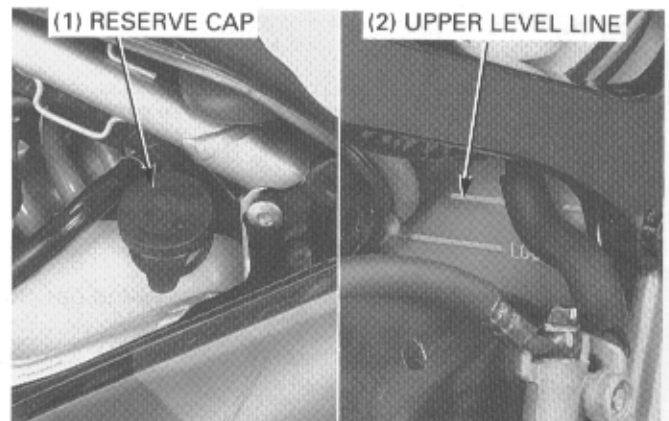
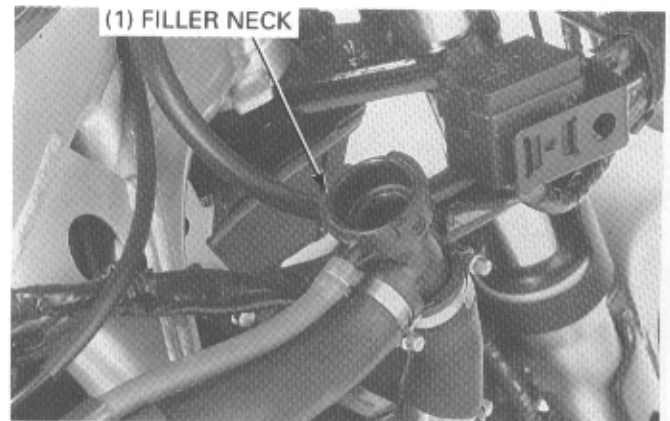
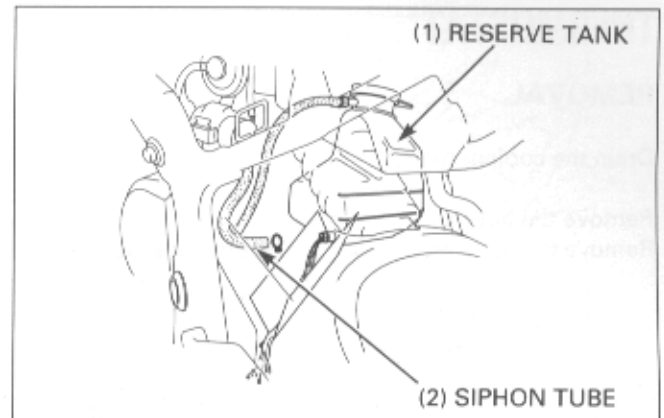
Reconnect the siphon tube.

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

Remove the reserve cap and 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 let it 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. Reinstall the radiator cap.
4. Check the level of coolant in the reserve tank and fill to the upper level if it is low.



## COOLING SYSTEM

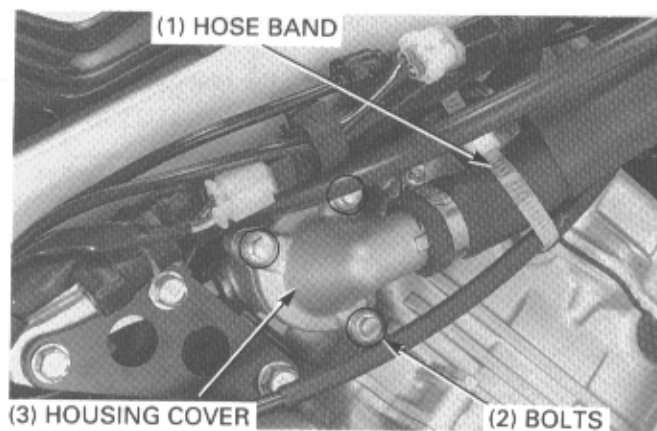
### THERMOSTAT

#### REMOVAL

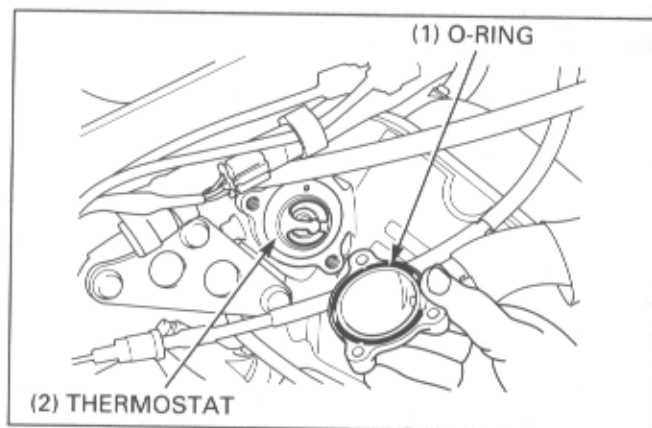
Drain the coolant (page 6-4).

Remove the hose band.

Remove the three cover bolts and thermostat housing cover.



Remove the O-ring from the cover groove.  
Remove the thermostat from the housing.



#### 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.

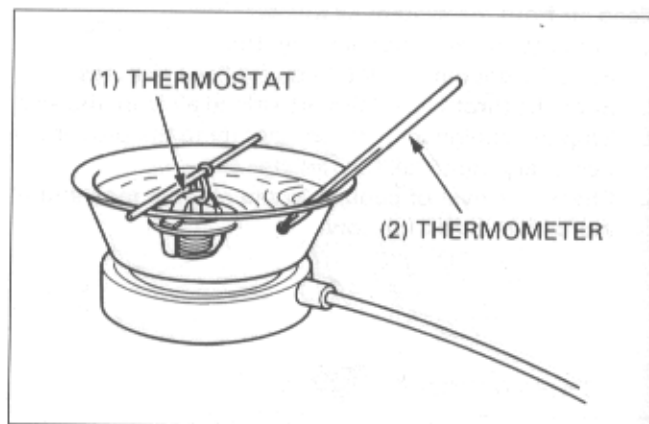
Suspend the thermostat in heated water to check its operation.

##### 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**

**NOTE**

- Install the thermostat with the motorcycle on the side stand .

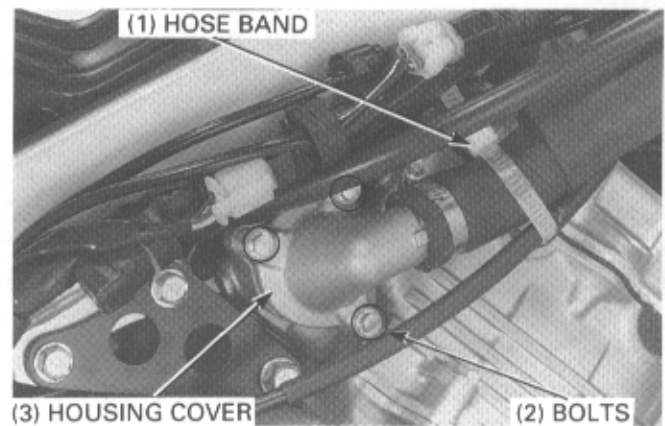
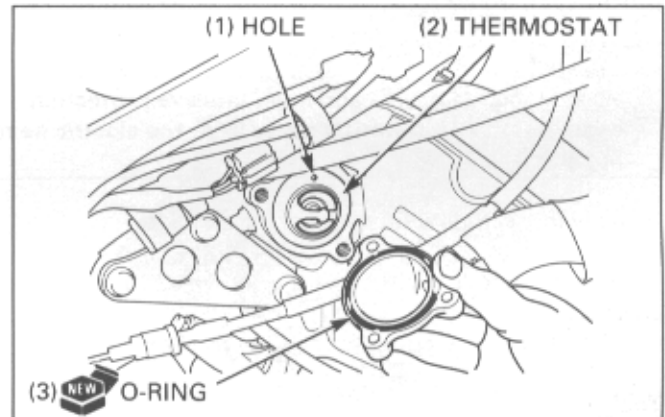
Install the thermostat into the housing with its hole facing up. Align the thermostat flange with the groove of the housing upper surface. Make sure the thermostat is securely installed.

Install a new O-ring in the thermostat housing cover groove.

Install the thermostat housing cover and tighten the bolts.

Install the hose band.

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



**THERMO VALVE**

**REMOVAL/INSTALLATION**

Drain the coolant (page 6-4).

Remove the fuel tank (page 2-4).

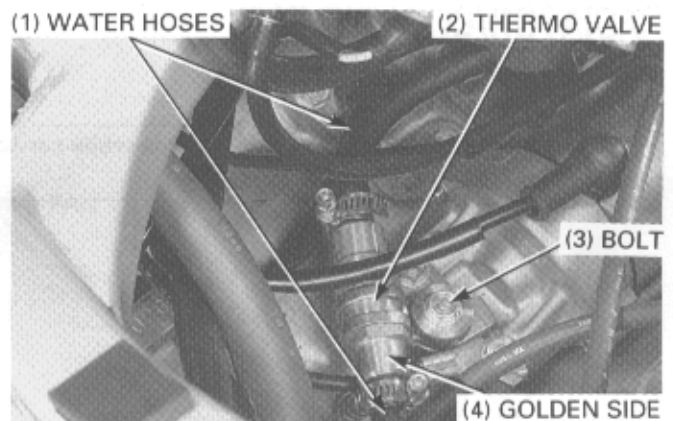
Disconnect the water hoses from the thermo valve. Remove the bolt and thermo valve.

Installation is in the reverse order of removal.

**NOTE**

- Connect the thermo valve with in-port (golden color side) toward the water hose which goes to the cylinder head.

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



## COOLING SYSTEM

### INSPECTION

#### ⚠ WARNING

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

Visually inspect the thermo valve for damage.

Connect a suitable tube to the thermo valve in-port (golden color side).

Connect a pressure pump to the tube as shown.

**Tool:**

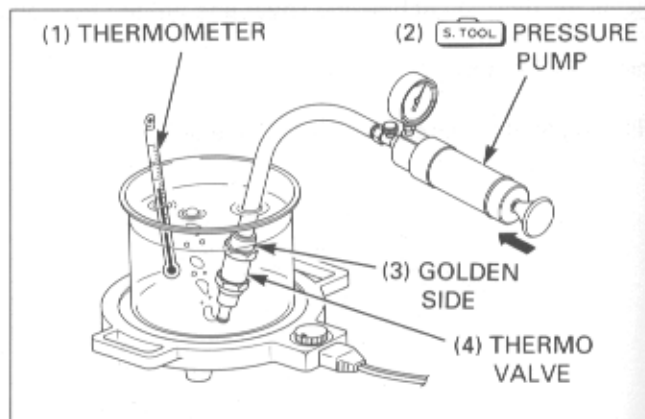
**Pressure pump:** ST-AH-255-MC7 (U.S.A. only)

Suspend the thermo valve completely in heated water. Be sure the thermo valve does not touch the bottom or sides of the container. Any contact can produce false readings.

Apply a light pressure to the thermo valve.

**Valve starts to close: 73 - 77°C (163 - 171°F)**

Replace the thermo valve if the passage is blocked at a temperature lower than those listed above, or if there is no restriction at a temperature higher than those listed.



## RADIATOR/COOLING FAN

#### CAUTION

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

### REMOVAL/INSTALLATION

Drain the coolant (page 6-4).

Remove the upper fairing (page 2-4).

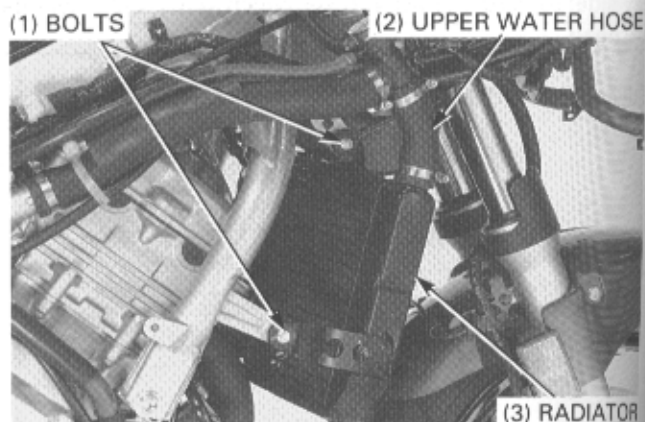
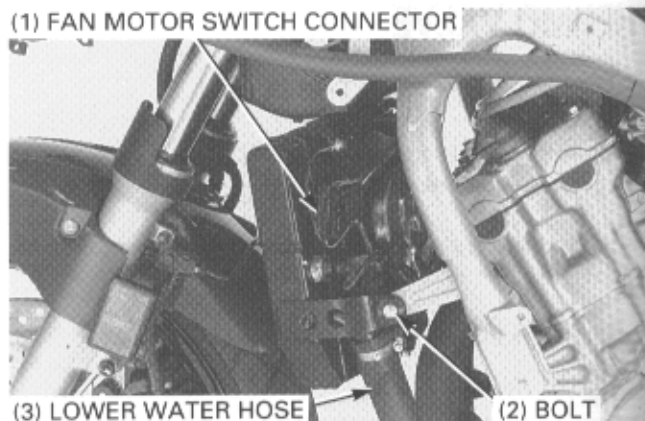
Disconnect the fan motor switch connector.

Disconnect the upper and lower water hoses from the radiator.

Remove the radiator mounting bolts and collars then remove the radiator by releasing the upper mounting grommet from the frame stay.

Install the radiator in the reverse order of removal.

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

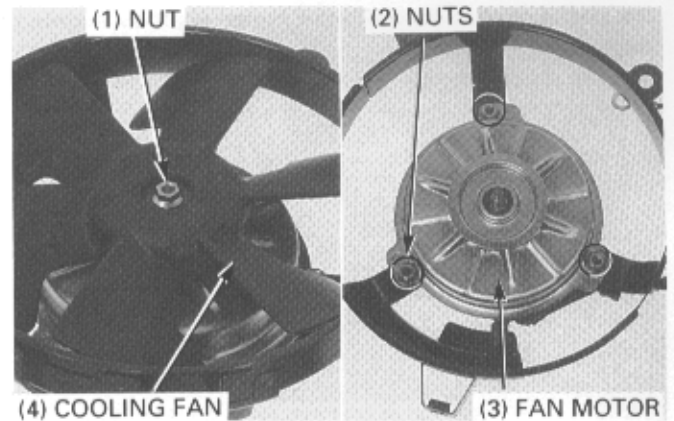
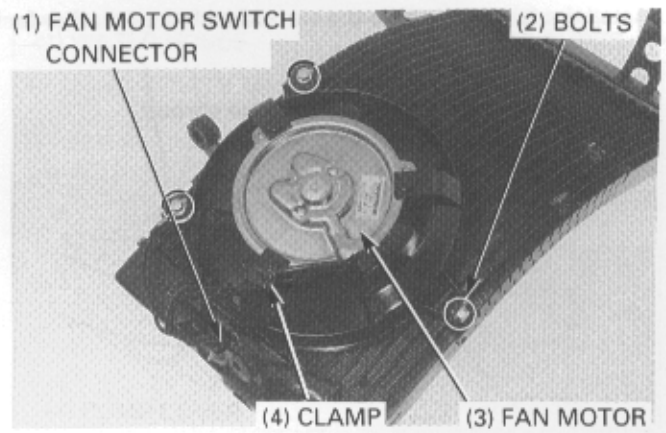


**DISASSEMBLY**

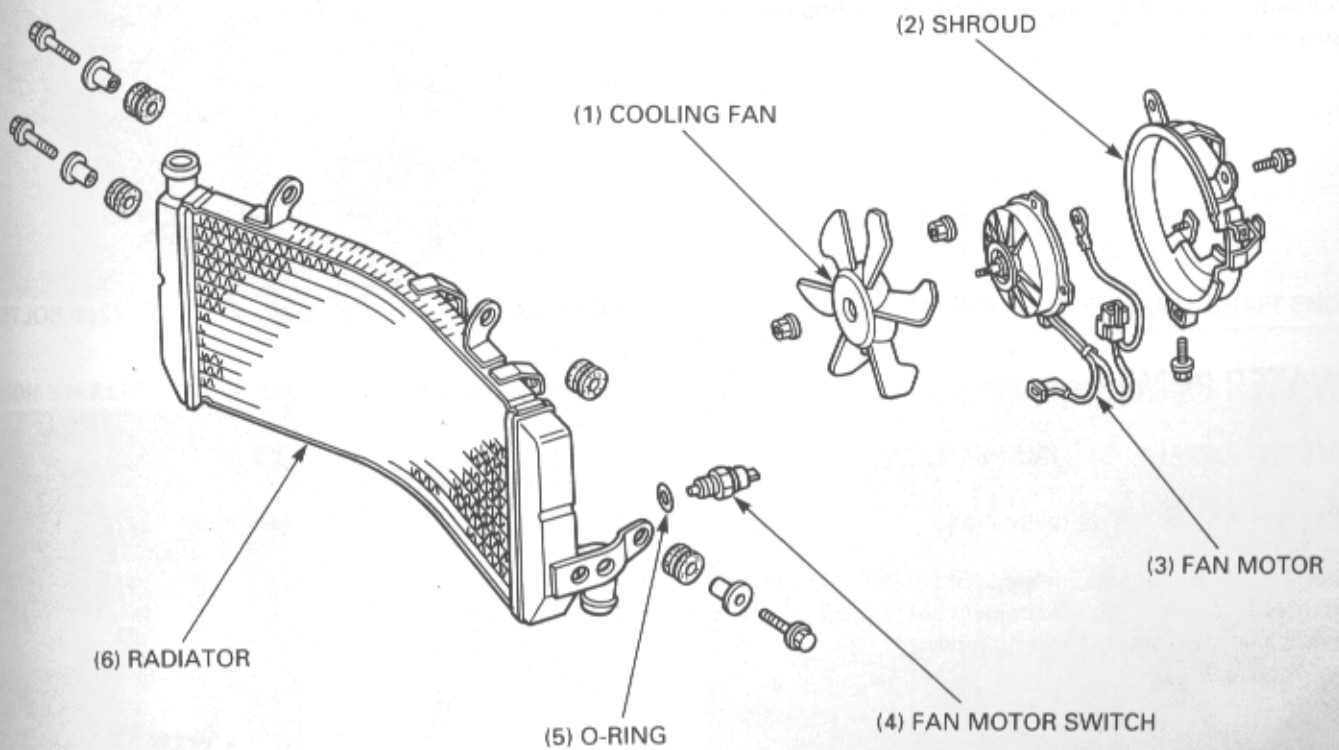
Disconnect the fan motor switch connector and remove the wire from the clamp.  
Remove the fan motor assembly by removing the three bolts and the ground terminal.

Remove the nut and the cooling fan.  
Remove the fan motor connector from the shroud.  
Remove the nuts and fan motor.

For fan motor switch information, refer to page 18-13).



**ASSEMBLY**

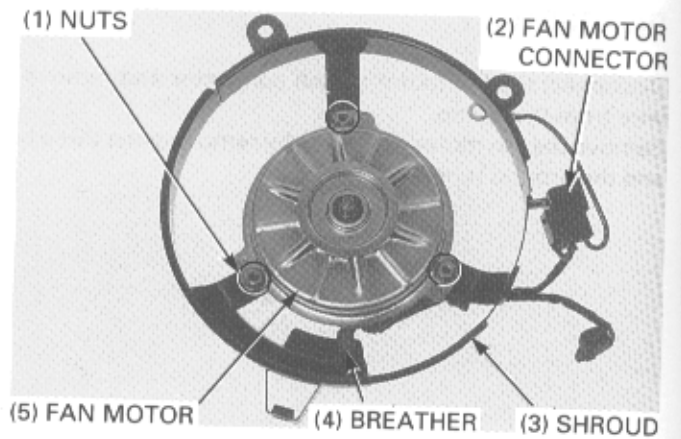


## COOLING SYSTEM

Install the fan motor onto the shroud with the breather facing down.

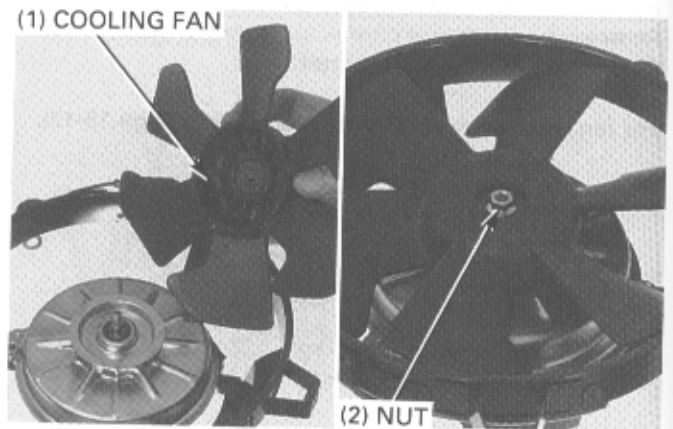
Install and tighten the nuts.

Install the fan motor connector to the shroud.



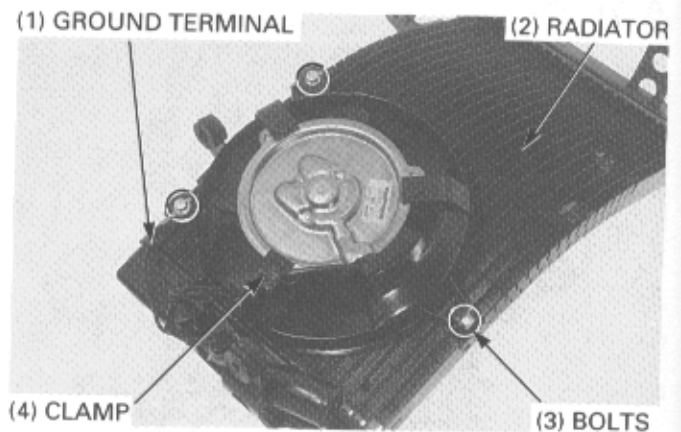
Install the cooling fan onto the motor shaft by aligning the flat surfaces.

Tighten the nut.



Install the fan motor assembly onto the radiator and tighten the mounting bolts with the ground terminal.

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



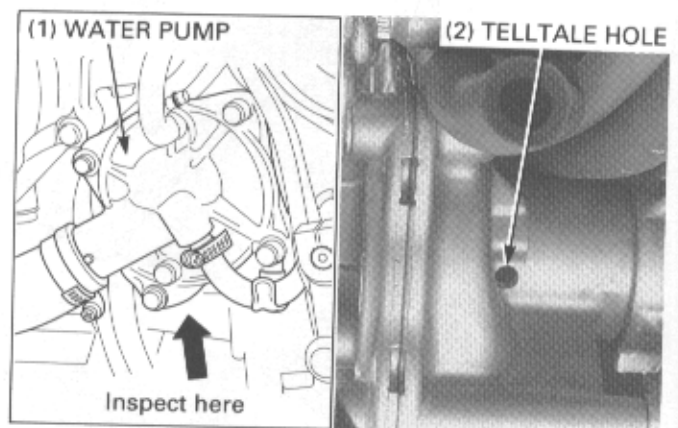
## WATER PUMP

### MECHANICAL SEAL INSPECTION

Remove the side fairing (page 2-3).

Inspect the telltale hole for signs of coolant leakage.

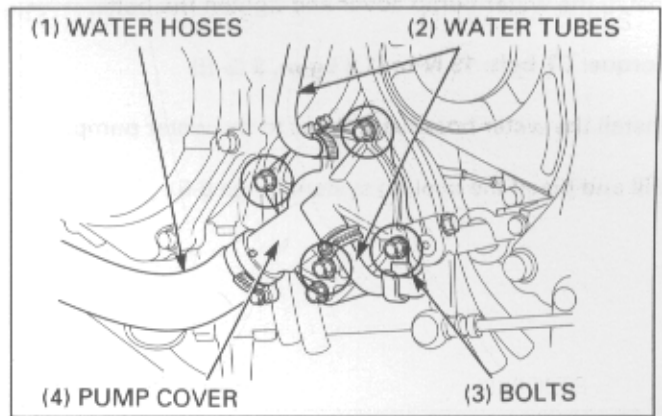
If there is leakage, the mechanical seal is defective and the water pump assembly must be replaced.



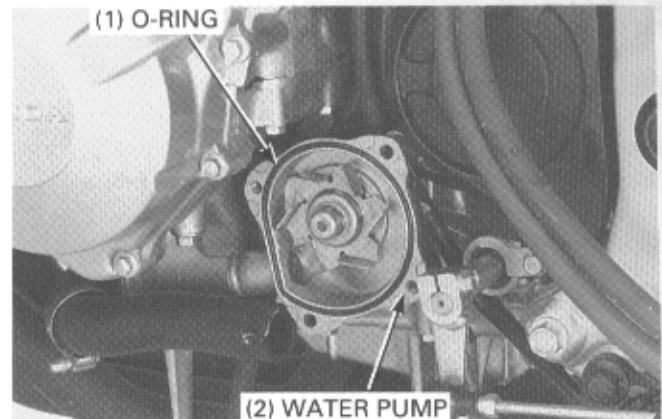
**REMOVAL**

Drain the coolant (page 6-4).

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



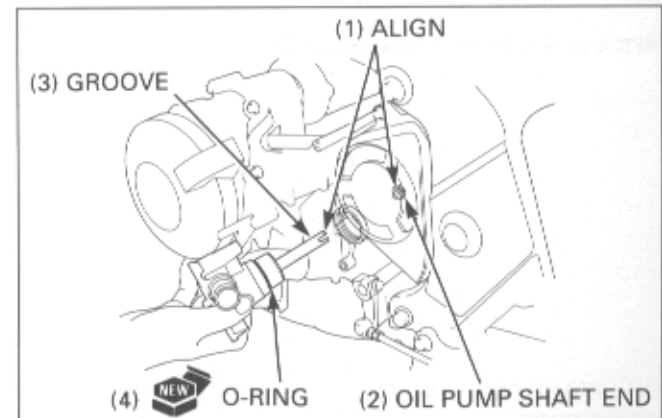
Remove the O-ring and water pump from the crankcase.



**INSTALLATION**

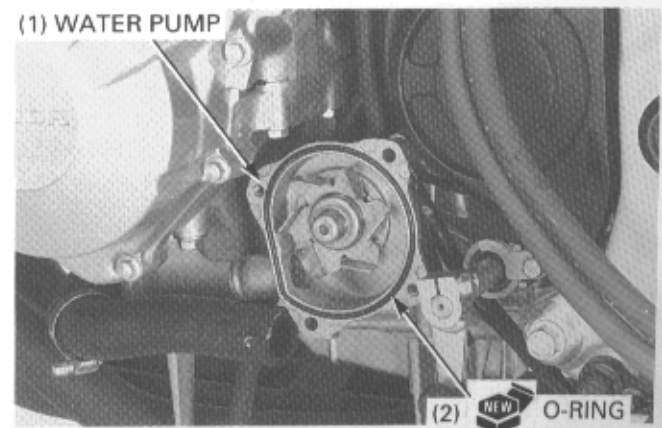
Apply engine oil to a new O-ring and install it onto the stepped portion of the water pump.

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



Align the mounting bolt holes in the water pump and crankcase and make sure the water pump is securely installed.

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



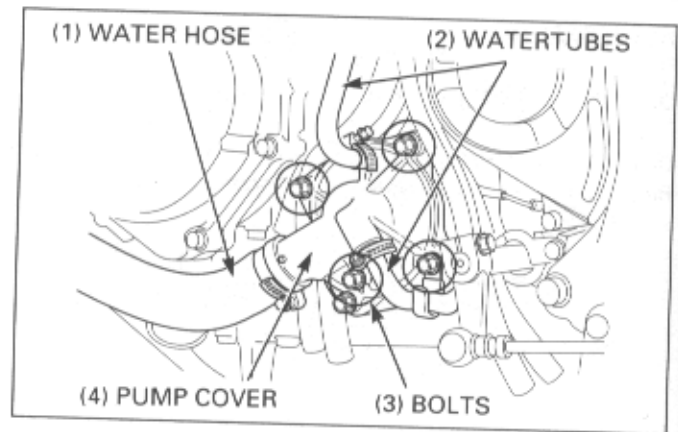
## COOLING SYSTEM

Install the water pump cover and tighten the bolts.

**Torque: CT bolt: 13 N·m (1.3 kg-m, 9 lb-ft)**

Install the water hoses and tubes to the water pump.

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



## RADIATOR RESERVE TANK

### REMOVAL/INSTALLATION

Remove the shock absorber (page 13-8).

Drain the coolant from the reserve tank (page 6-5).

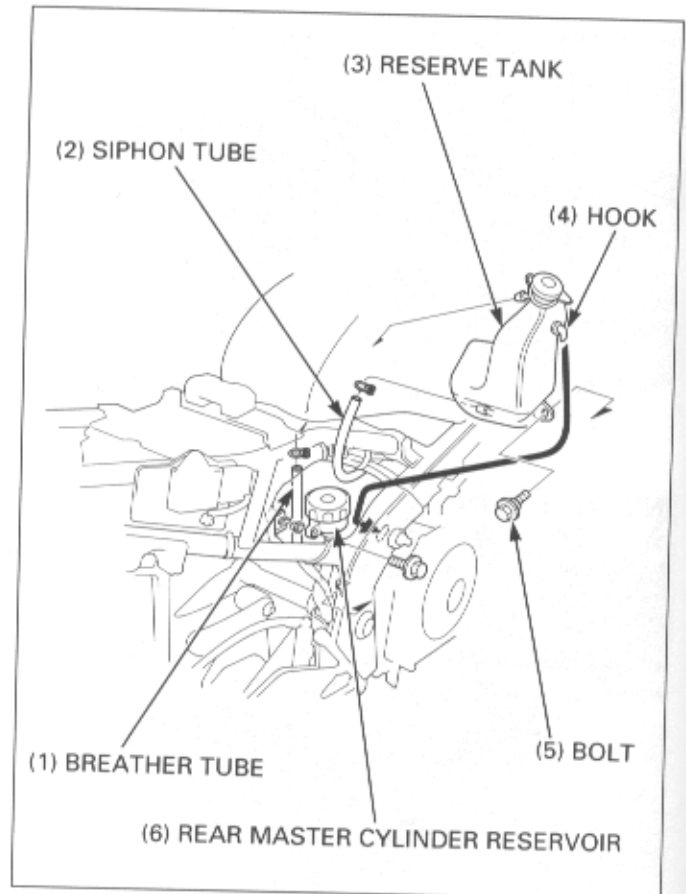
Remove the bolt and rear master cylinder reservoir.

Disconnect the breather tube and siphon tube.

Remove the mounting bolt and release the hook on the reserve tank from the oval hole in the frame by pivoting the tank rearward.

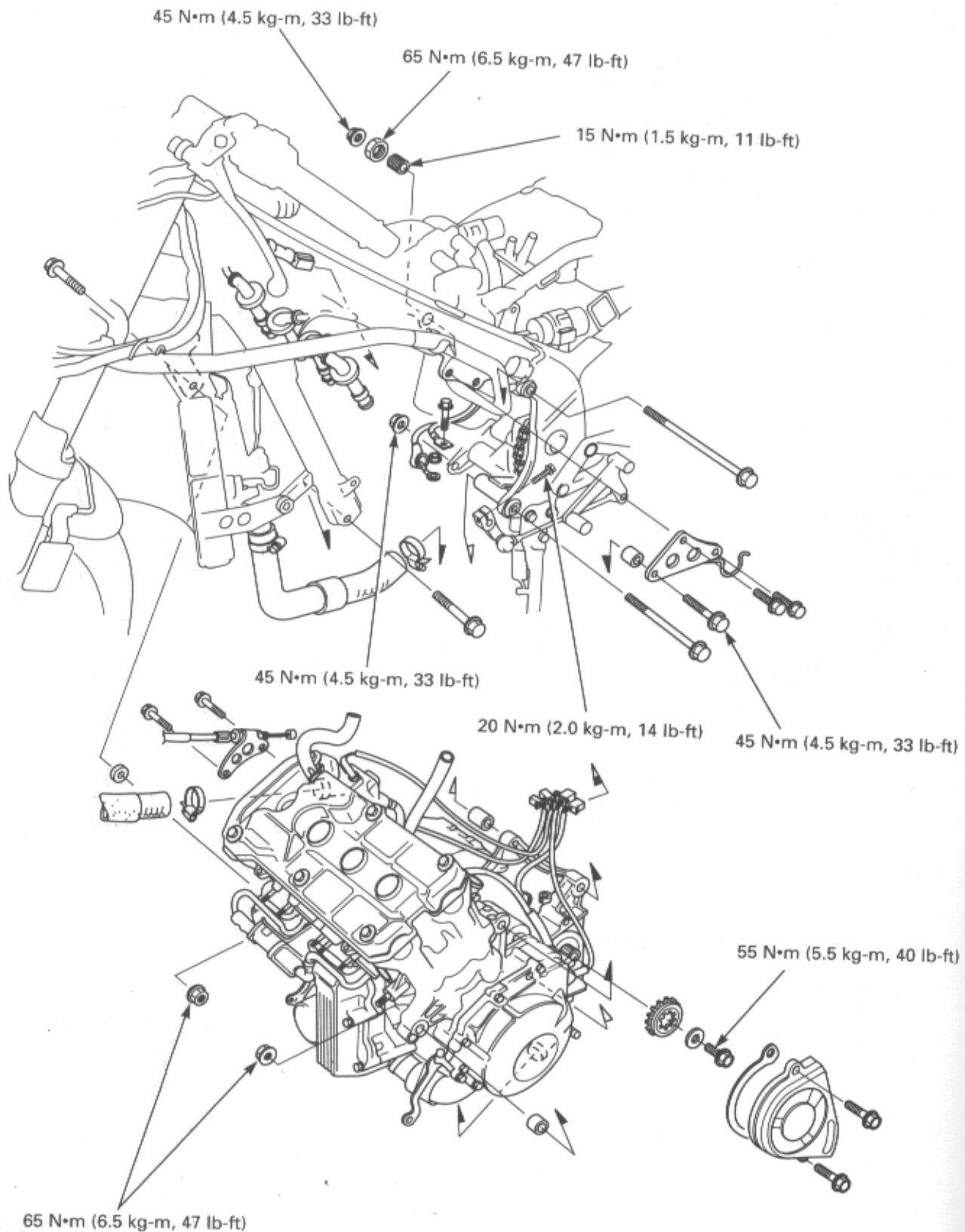
Install the removed parts in the reverse order of removal.

Fill the tank with coolant (page 6-5).





# ENGINE REMOVAL/INSTALLATION



# 7. ENGINE REMOVAL/INSTALLATION

SERVICE INFORMATION

7-1

ENGINE INSTALLATION

7-4

ENGINE REMOVAL

7-2

## SERVICE INFORMATION

### GENERAL

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

### CAUTION

- Do not support the engine using the oil cooler.

- When removing/installing the engine, tape the frame around the engine beforehand for frame protection. The following components require engine removal for service.

- Crankcase/Transmission (Section 10)
- Crankshaft/cylinder/Piston (Section 11)
- The following components can be serviced with the engine installed in the frame.
  - Oil pump (Section 4)
  - Carburetor (Section 5)
  - Water pump (Section 6)
  - Cylinder head/camshaft/valves (Section 8)
  - Clutch/gearshift linkage (Section 9)
  - Shift drum/shift fork (Section 10)
  - Alternator/flywheel (Section 15)
  - Ignition pulse generator (Section 16)
  - Starter motor/starter clutch (Section 17)

### SPECIFICATIONS

ITEM		SPECIFICATIONS
Engine dry weight	49 state, Canada type	61.9 kg (136.4 lb)
	California type	62.8 kg (138.4 lb)
Engine oil capacity at disassembly		4.2 ℓ (4.4 US qt, 3.7 Imp qt)
Coolant capacity (radiator and engine)		2.4 ℓ (0.63 US gal, 0.53 Imp gal)

### TORQUE VALUES

Front engine mounting nut	65 N•m (6.5 kg-m, 47 lb-ft)
Rear upper engine mounting nut	45 N•m (4.5 kg-m, 33 lb-ft)
Rear lower engine mounting nut	45 N•m (4.5 kg-m, 33 lb-ft)
Engine mounting adjust bolt	15 N•m (1.5 kg-m, 11 lb-ft)
Engine mounting lock nut	65 N•m (6.5 kg-m, 47 lb-ft)
Engine hanger plate bolt (10 mm)	45 N•m (4.5 kg-m, 33 lb-ft)
Drive sprocket bolt	55 N•m (5.5 kg-m, 40 lb-ft)

## ENGINE REMOVAL/INSTALLATION

### ENGINE REMOVAL

Drain the engine oil (page 3-11) and coolant (page 6-4).  
Turn the ignition switch OFF and disconnect the battery ground cable.

Remove the following:

- Exhaust system (Section 2)
- Carburetor (Section 5)
- Spark plug caps (page 3-6)

Disconnect the following:

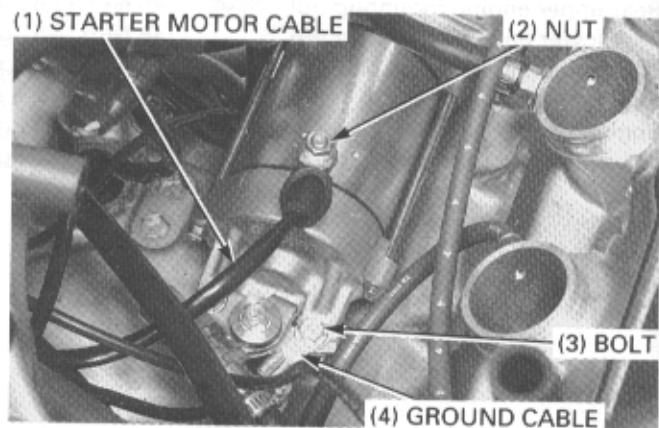
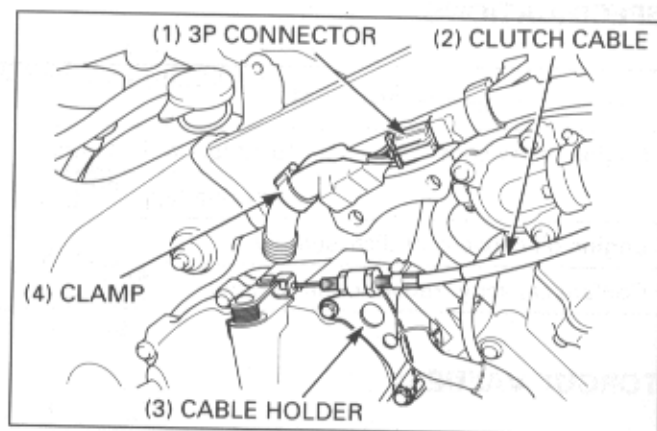
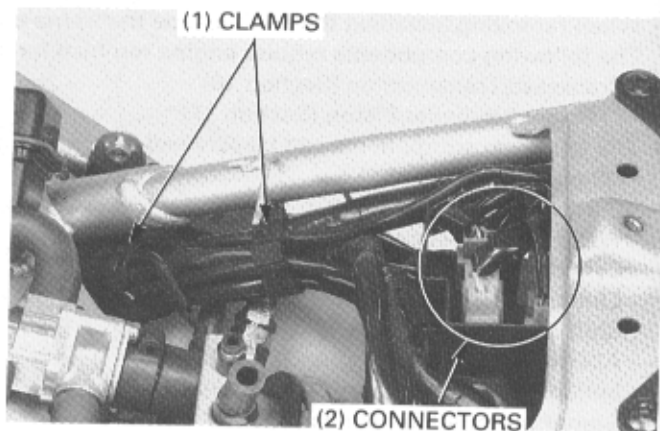
- Alternator 3P connector
- Ignition pulse generator 2P connector
- Oil pressure switch/neutral switch/thermosensor 3P connector

Remove the wires from the clamps.

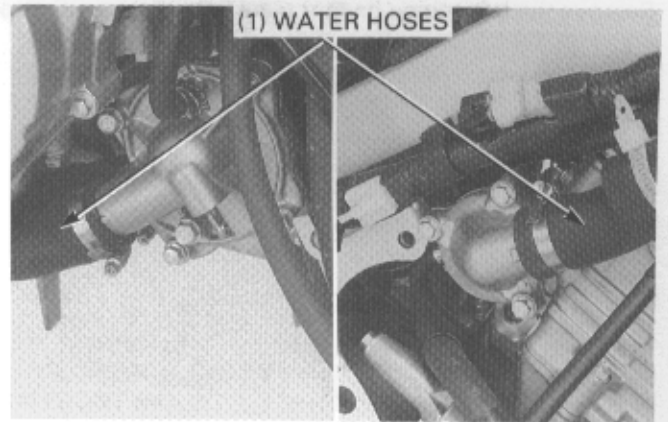
Disconnect the speed sensor 3P connector and remove the wire from the clamp.

Disconnect the clutch cable and remove the cable holder bolts and holder.

Remove the bolt and nut and disconnect the starter motor and ground cables.

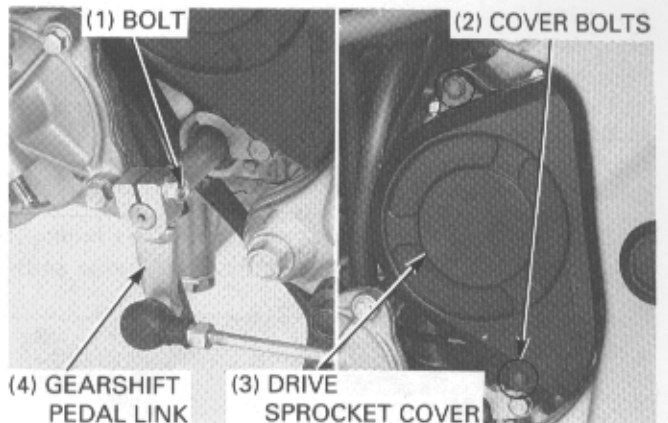


Remove the water hoses from the water pump and thermostat cover.



Remove the bolt and gearshift pedal link from the shift spindle.

Remove the drive sprocket cover bolts, cover and drive chain guide.

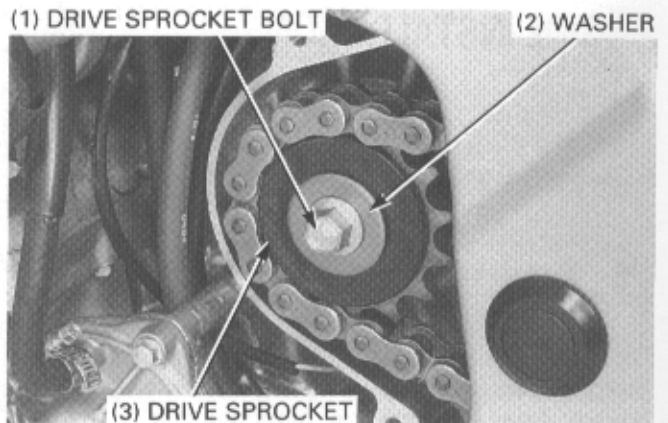


Loosen the drive sprocket bolt while applying the rear brake with the rear wheel on the ground.

Remove the drive sprocket bolt and washer.

Loosen the drive chain then remove the drive sprocket.

Support the motorcycle securely using a safety stand or hoist.



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.

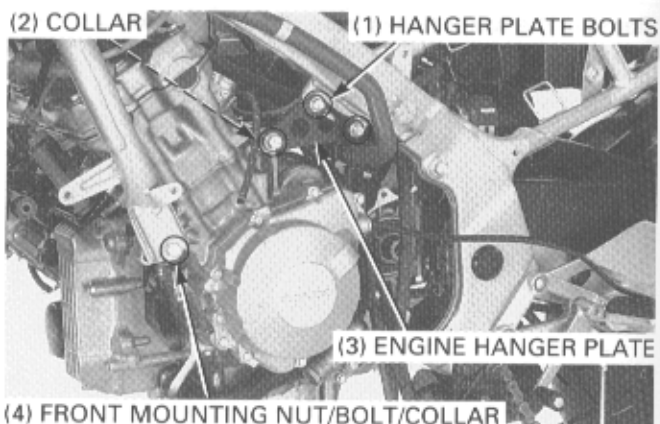
### CAUTION

- Do not use the oil cooler as a jacking point.

## ENGINE REMOVAL/INSTALLATION

Remove the left engine hanger plate bolts, hanger plate and collar.

Remove the left front mounting nut, bolt and collar.



Remove the rear upper engine mounting nut, bolt and collar. Hold the adjust bolt and loosen the lock nut.

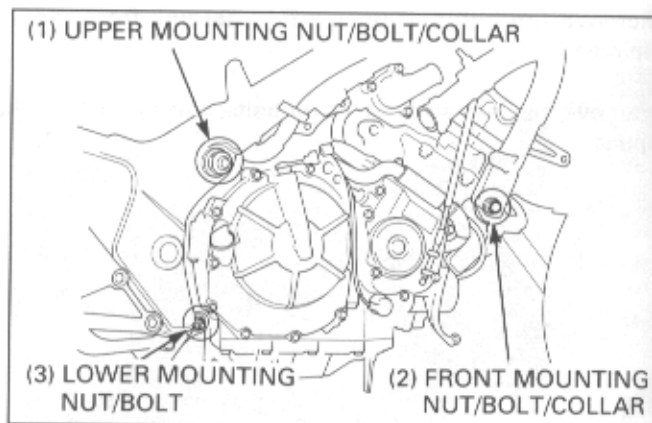
Remove the right front mounting nuts, bolts and collars.

Remove the rear lower mounting nut and bolt.

### CAUTION

- During engine assembly removal, hold the engine securely and be careful not to damage the frame and engine.

Remove the engine from the frame.



## ENGINE INSTALLATION

### CAUTION

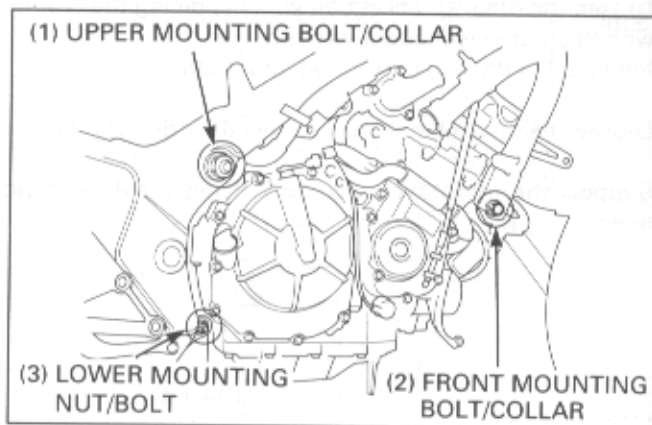
- Carefully align mounting points with the jack to prevent damage to engine, frame, wires and cables.

Use a floor jack or other adjustable support to carefully maneuver the engine into place.

Carefully align the bolt holes in the frame and engine then insert the rear lower mounting bolt from the left side. Loosely install the rear lower mounting nut.

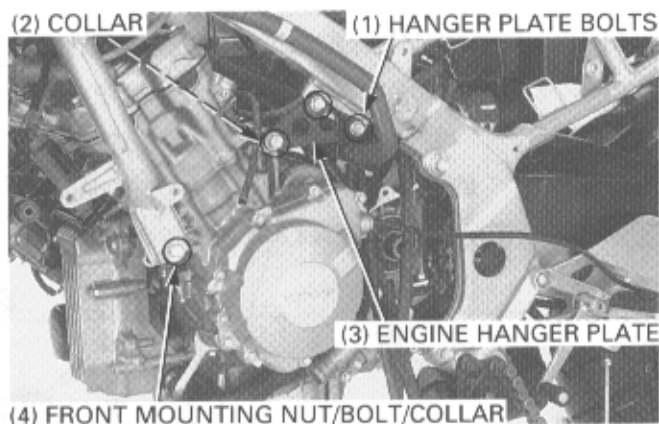
Install the collar (short) and right front mounting bolt. Loosely install the right front mounting nut.

Install the collar and rear upper mounting bolt.



Install the collar and left hanger plate.  
Loosely install the left hanger plate mounting bolts.

Install the collar (long) and left front mounting bolt.  
Loosely install the left front mounting nut.

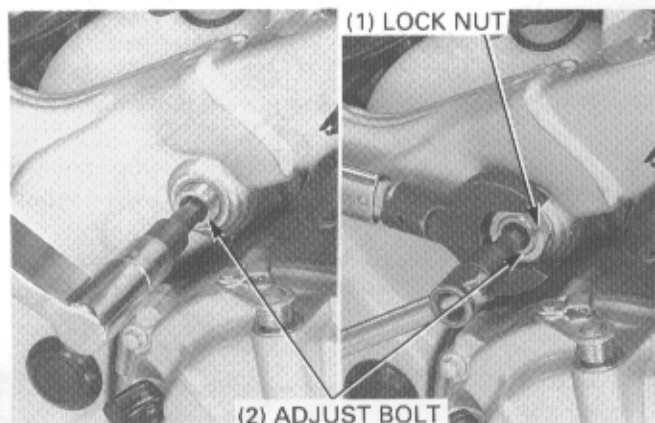


Push the rear upper engine mounting bolt so that you can tighten the adjust bolt with a hexagonal wrench.  
Tighten the adjust bolt to the specified torque.

**Torque: 15 N·m (1.5 kg-m, 11 lb-ft)**

Install the lock nut.  
Tighten the lock nut while holding the adjust bolt with a hexagonal wrench.

**Torque: 65 N·m (6.5 kg-m, 47 lb-ft)**

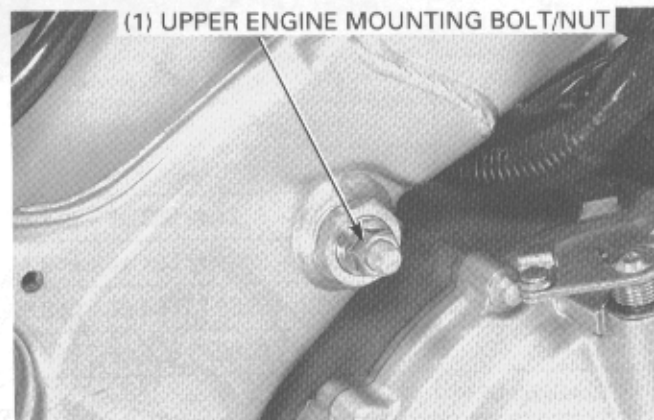


Push the rear upper engine mounting bolt fully and tighten the nut.

**Torque: 45 N·m (4.5 kg-m, 33 lb-ft)**

After tightening the rear upper mounting nut, tighten the other engine mounting nuts to the specified torque.

**Torque:**  
**Front engine mounting nut: 65 N·m (6.5 kg-m, 47 lb-ft)**  
**Rear lower engine mounting nut: 45 N·m (4.5 kg-m, 33 lb-ft)**  
**Engine hanger plate bolt (10 mm): 45 N·m (4.5 kg-m, 33 lb-ft)**



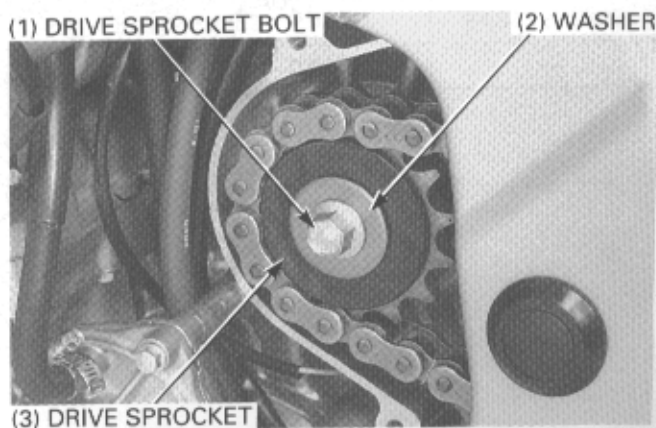
Install the removed parts at engine removal in the reverse order of removal.

**Torque:**  
**Drive sprocket bolt: 55 N·m (5.5 kg-m, 40 lb-ft)**  
**Gearshift pedal pinch bolt: 20 N·m (2.0 kg-m, 14 lb-ft)**

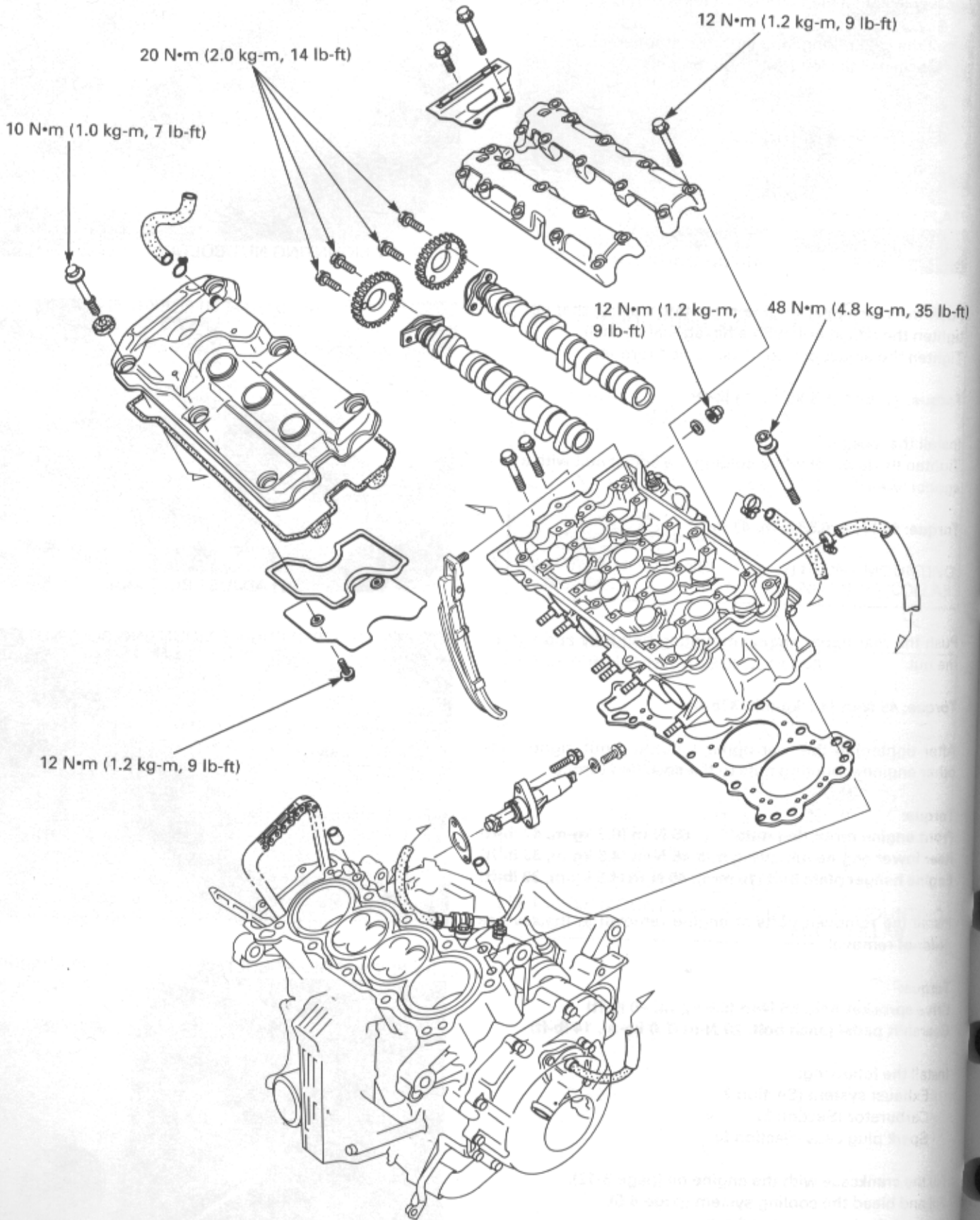
Install the following:

- Exhaust system (Section 2)
- Carburetor (Section 5)
- Spark plug caps (Section 3)

Fill the crankcase with the engine oil (page 3-12).  
Fill and bleed the cooling system (page 6-5).  
Connect the battery ground cable.



# CYLINDER HEAD/VALVES



# 8. CYLINDER HEAD/VALVES

SERVICE INFORMATION	8-1	VALVE GUIDE REPLACEMENT	8-14
TROUBLESHOOTING	8-3	VALVE SEAT INSPECTION/REFACING	8-15
CYLINDER COMPRESSION	8-4	CYLINDER HEAD ASSEMBLY	8-18
CAMSHAFT REMOVAL	8-5	CYLINDER HEAD INSTALLATION	8-19
CYLINDER HEAD REMOVAL	8-9	CAMSHAFT INSTALLATION	8-21
CYLINDER HEAD DISASSEMBLY	8-11		

## SERVICE INFORMATION

### GENERAL

- This section covers service of the cylinder head, valves, camshaft. 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 clean solvent and dry them using compressed air before inspection.
- Camshaft lubricating oil is fed through oil passages in the cylinder head. Clean the oil passages before assembling the cylinder head.
- Pour clean engine oil into the oil pockets in the cylinder head during assembly to lubricate the camshaft lobes.
- Be careful not to damage the mating surfaces when removing the head cover and cylinder head.

### SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT	
Cylinder compression			1,275 – 1,314 kPa (13.0 – 13.4 kg/cm <sup>2</sup> , 185 – 191 psi)	—	
Valve clearance		IN	0.16 ± 0.03 (0.006 ± 0.001)	—	
		EX	0.22 ± 0.03 (0.009 ± 0.001)	—	
Cylinder head warpage			—	0.10 (0.004)	
Camshaft	Cam lobe height	IN	49 state, Canada type	36.140 – 36.380 (1.4228 – 1.4323)	36.11 (1.422)
			California type	34.540 – 34.780 (1.3598 – 1.3698)	34.51 (1.359)
		EX	49 state, Canada type	35.300 – 35.540 (1.3898 – 1.3992)	35.27 (1.389)
			California type	33.580 – 33.820 (1.3220 – 1.3315)	33.55 (1.321)
	Runout		—	0.05 (0.002)	
	Oil clearance		0.02 – 0.062 (0.0008 – 0.0024)	0.1 (0.004)	
Journal O.D.		23.959 – 23.980 (0.9433 – 0.9441)	24.955 (0.9825)		
Camshaft holder I.D.			24.000 – 24.021 (0.9449 – 0.9457)	—	



## CYLINDER HEAD/VALVES

Unit: mm (in)

(cont'd)		ITEM		STANDARD	SERVICE LIMIT
Valve and valve guide	Valve stem O.D.	IN	3.975 – 3.990 (0.1565 – 0.1571)	3.965 (0.1561)	
		EX	3.965 – 3.980 (0.1561 – 0.1567)	3.955 (0.1557)	
	Valve guide I.D.	IN	4.000 – 4.012 (0.1575 – 0.1580)	4.04 (0.159)	
		EX	4.000 – 4.012 (0.1575 – 0.1580)	4.04 (0.159)	
	Stem-to-guide clearance	IN	0.010 – 0.037 (0.0004 – 0.0015)	0.075 (0.0029)	
		EX	0.020 – 0.047 (0.0008 – 0.0019)	0.085 (0.0033)	
	Valve guide projection above cylinder head	IN	13.1 – 13.3 (0.516 – 0.524)	—	
		EX	11.3 – 11.5 (0.445 – 0.453)	—	
Seat width	IN/EX	0.9 – 1.1 (0.035 – 0.043)	1.5 (0.06)		
Valve spring	Free length	Inner	31.92 (1.257)	30.62 (1.206)	
		Outer	35.36 (1.392)	33.86 (1.333)	
Valve lifter	O.D.		25.978 – 25.993 (1.0228 – 1.0233)	25.97 (1.022)	
	Bore I.D.		26.010 – 26.026 (1.0240 – 1.0246)	26.04 (1.025)	

## TORQUE VALUES

Cylinder head bolt	48 N•m (4.8 kg-m, 35 lb-ft) Apply molybdenum disulfide oil to the threads.
Spark plug	12 N•m (1.2 kg-m, 9 lb-ft)
Cylinder head cover bolt	10 N•m (1.0 kg-m, 7 lb-ft)
Camshaft holder bolt	12 N•m (1.2 kg-m, 9 lb-ft) Apply oil to the threads.
Cylinder head cover breather plate bolt	12 N•m (1.2 kg-m, 9 lb-ft) Apply locking agent to the threads.
Cylinder head stud bolt	26 N•m (2.6 kg-m, 19 lb-ft)
Cam sprocket bolt	20 N•m (2.0 kg-m, 14 lb-ft) Apply locking agent to the threads.
Cylinder head sealing bolt	33 N•m (3.3 kg-m, 24 lb-ft) Apply sealant to the threads.
Water hose joint	25 N•m (2.5 kg-m, 18 lb-ft)
Vacuum joint	2.5 N•m (0.25 kg-m, 1.8 lb-ft)
Cam chain tensioner slider cap nut	12 N•m (1.2 kg-m, 9 lb-ft)

## TOOLS

Valve spring compressor	07757 – 0010000
Valve spring compressor attachment	07959 – KM30101
Tappet hole protector	07HMG – MR70002 or equivalent see page 8-11.
Valve guide driver, 4 mm	07GMD – KT70100
Valve guide reamer, 4.008 mm	07MMH – MV90100 or 07MMH – MV9010A
Valve guide driver	07743 – 0020000
Valve seat cutter, 24.5 mm (EX 45°)	07780 – 0010100 — Equivalent commercially available in U.S.A.
27.5 mm (IN 45°)	07780 – 0010200 —
24 mm (EX 32°)	07780 – 0012500 —
27 mm (IN 32°)	07780 – 0013300 —
22 mm (EX 60°)	07780 – 0014202 —
26 mm (IN 60°)	07780 – 0014500 —
Cutter holder, 4.0 mm	07781 – 0010500 —
Compression gauge attachment	07RMJ – MY50100 or equivalent commercially available in U.S.A.

## TROUBLESHOOTING

- Engine top-end problems usually affect engine performance. These can be diagnosed by a compression test, or by tracing noises to the top-end with a sounding rod or stethoscope.
- If the performance is poor at low speeds, check for white smoke in the crankcase breather tube. If the tube is smoky, check for a seized piston ring.

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

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

### Compression too high

- Excessive carbon build-up in cylinder head or on top of piston

### Excessive smoke

- Worn valve stem or valve guide
- Damaged stem seal
- Faulty cylinder or piston (Section 11)

### Excessive noise

- Incorrect valve adjustment
- Sticking valve or broken valve spring
- Worn or damaged camshaft
- Loose, worn or damaged cam chain
- Worn or damaged cam chain tensioner
- Worn cam sprocket teeth
- Faulty cylinder or piston (Section 11)

### Rough idle

- Low cylinder compression

## CYLINDER HEAD/VALVES

### CYLINDER COMPRESSION

Warm up the engine to normal operating temperature.

Stop the engine, disconnect the 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.

Shift the transmission into neutral and turn the engine stop switch ON.

Insert the compression gauge. 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.

#### Tool:

**Compression gauge attachment**    07RMJ – MY50100

**Compression pressure:** 1,275 – 1,314 KPa (13.0 – 13.4 kg/cm<sup>2</sup>,  
185 – 191psi)

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.

(1)  TOOL COMPRESSION GAUGE ATTACHMENT



## CAMSHAFT REMOVAL

Remove the upper fairing (page 2-4).

Disconnect the fan motor connector.  
Remove the radiator mounting bolts.

Release the grommet on the left side radiator top from the boss.  
Release the hook on the filler neck from the hook.

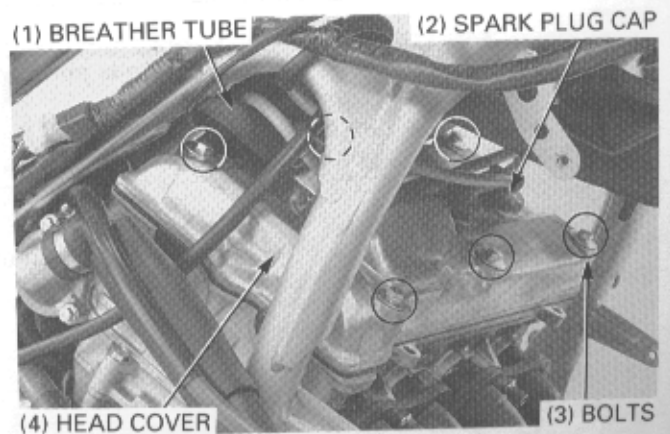
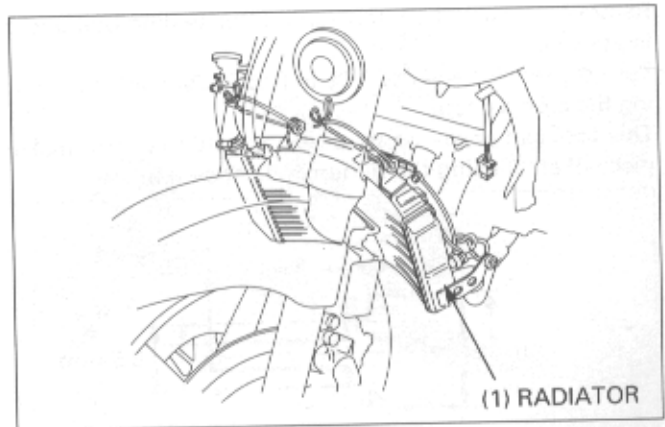
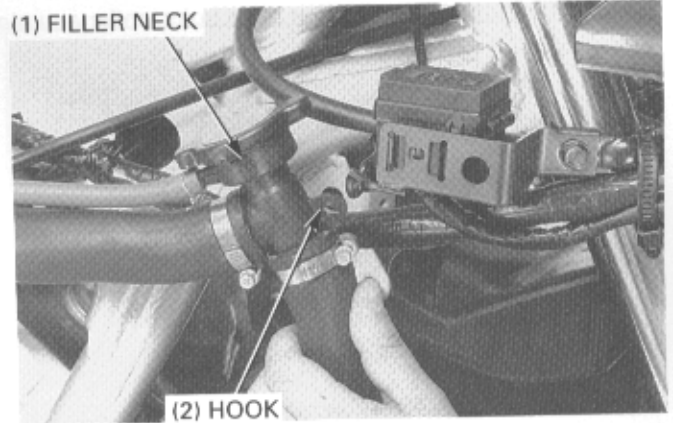
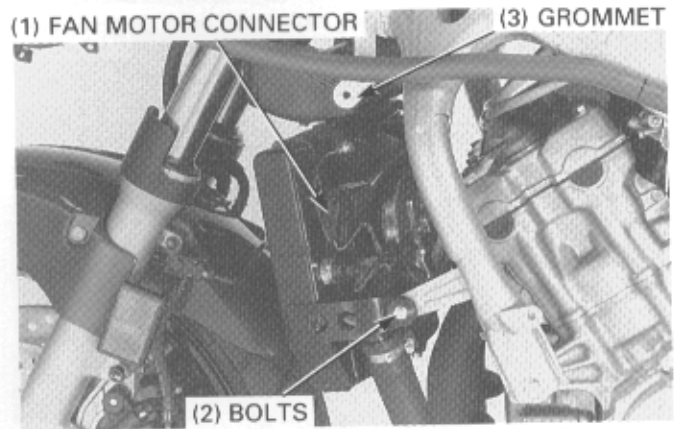
Move the radiator down without disconnecting the hoses and secure it with pieces of strings.

### CAUTION

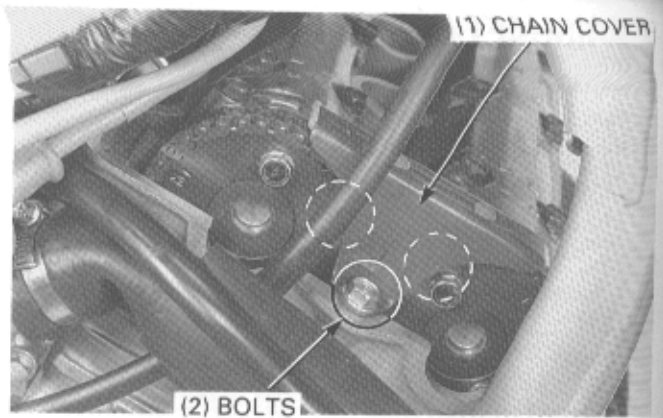
- Be careful not to damage the radiator fins.

Disconnect the spark plug caps and breather tube.

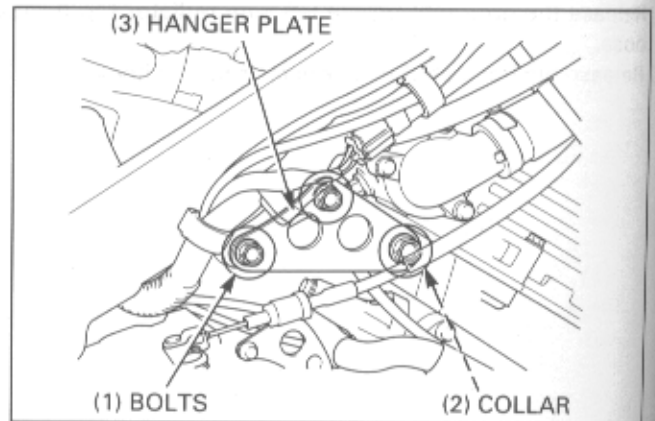
Remove the cylinder head cover mounting bolts and cylinder head cover.



Remove the three mounting bolts and cam chain cover.



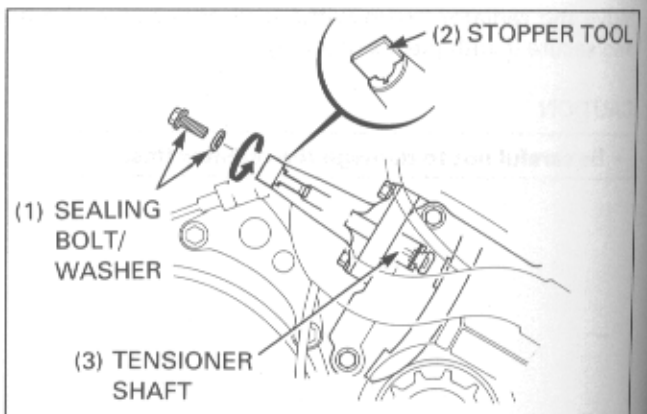
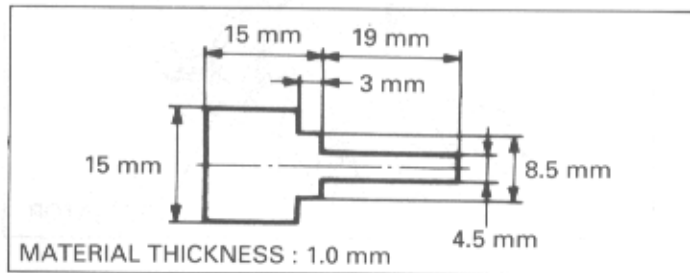
Remove the right engine hanger plate bolts, collar and plate.



Remove the cam chain tensioner lifter sealing bolt and sealing washer.

Turn the tensioner shaft fully in (clockwise) and secure it using the stopper tool.

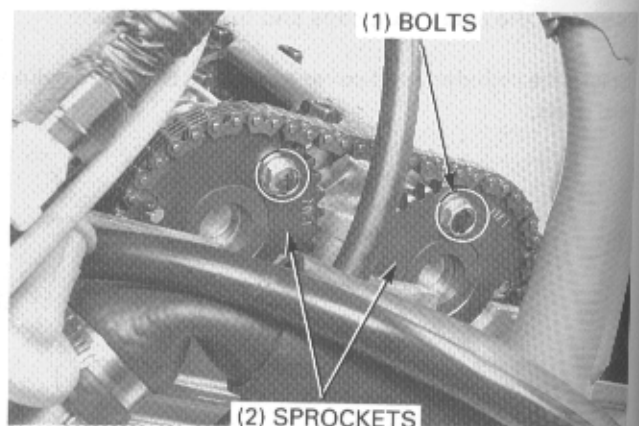
This tool can easily be made from a thin (1 mm thickness) piece of steel using the dimensions shown below.



**NOTE**

- Be careful not to let the cam sprocket bolts and cam sprockets fall into the crankcase.
- After removing the cam chain from the sprockets, suspend the cam chain with a piece of wire.

Remove the cam sprocket bolts.  
 Rotate the crankshaft clockwise one turn (360°) and remove the other cam sprocket bolts and cam sprockets.

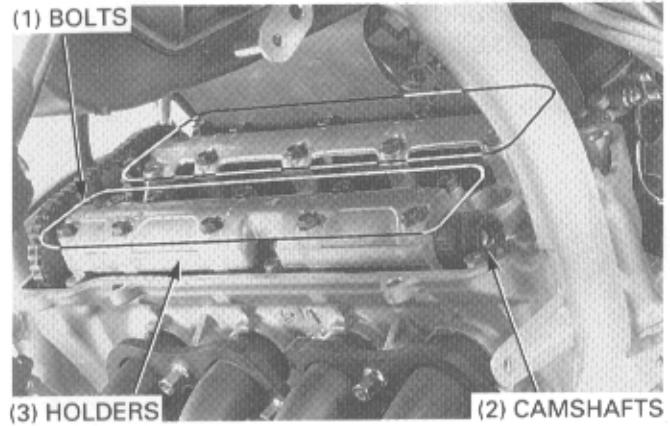


Loosen and remove the cam shaft holder bolts.

**CAUTION**

- From the outside to the inside, loosen the bolts in a crisscross pattern in several steps or the camshaft holder might break.

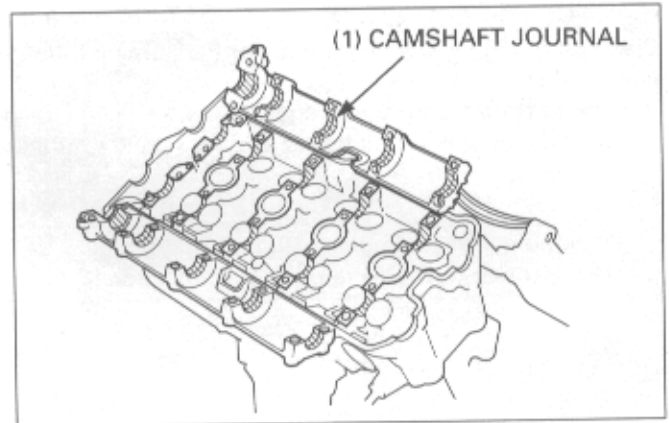
Remove the camshaft holders and camshafts.



**INSPECTION**

**CAMSHAFT JOURNAL**

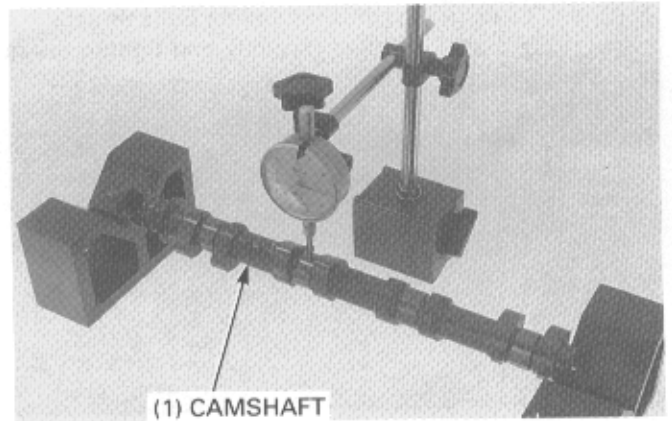
Inspect the camshaft journal surfaces for scoring or evidence of insufficient lubrication.



**CAMSHAFT RUNOUT**

Support both ends of the camshaft with V-blocks and check the camshaft runout with a dial indicator.

Service limit: 0.05 mm (0.002 in)



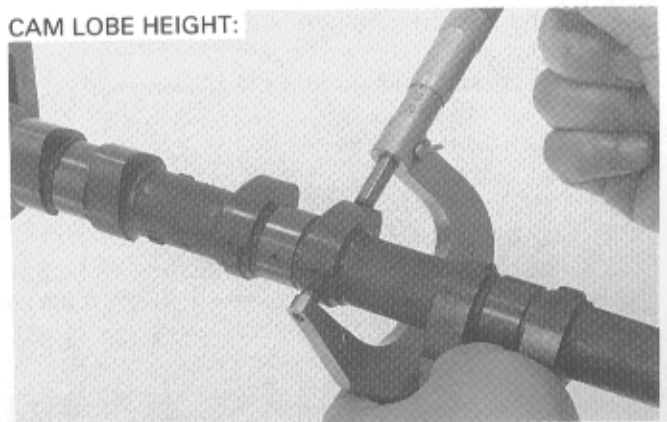
**CAM LOBE HEIGHT**

Measure the height of each cam lobe using a micrometer.

Service limit:

- |                            |                     |
|----------------------------|---------------------|
| IN: 49 state, Canada type: | 36.11 mm (1.422 in) |
| California type:           | 34.51 mm (1.359 in) |
| EX: 49 state, Canada type: | 35.27 mm (1.389 in) |
| California type:           | 33.55 mm (1.321 in) |

**CAM LOBE HEIGHT:**



## CYLINDER HEAD/VALVES

### CAMSHAFT JOURNAL O. D.

Measure the O.D. of each camshaft journal.

**Service limit: 24.955 mm (0.9825 in)**

### CAMSHAFT OIL CLEARANCE

Clean off any oil from the journals of the camshaft holders, head and camshafts.

Put the camshaft onto the cylinder head and lay a strip of plastigauge lengthwise on top of each camshaft journal.

#### NOTE

- Do not block any oil holes with the plastigauge.
- Do not rotate the camshaft during inspection.

Apply engine oil to the camshaft holder bolts threads. Install the camshaft holders carefully and tighten the bolts (page 8-22).

**Torque: 12 N·m (1.2 kg·m, 9 lb·ft)**

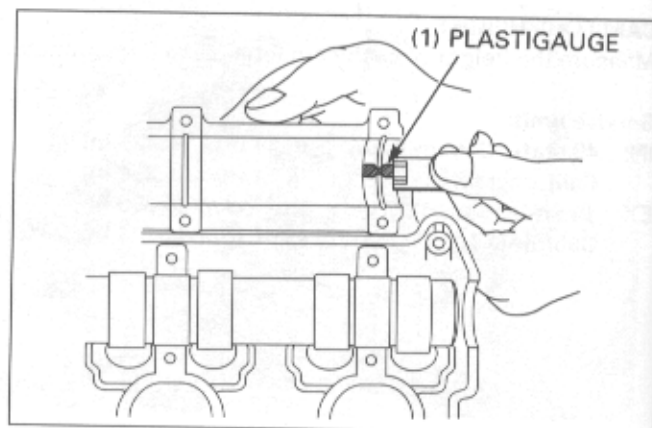
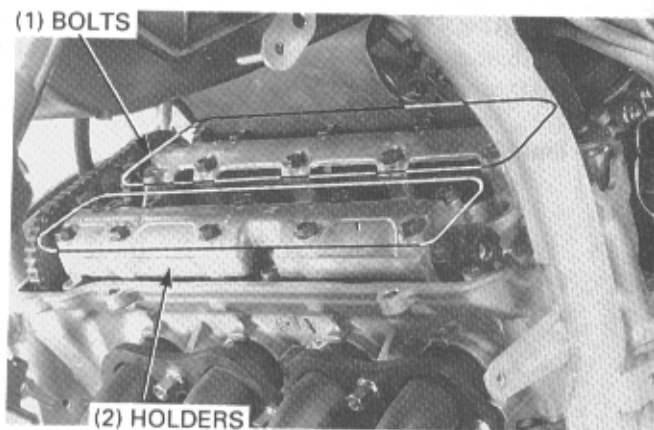
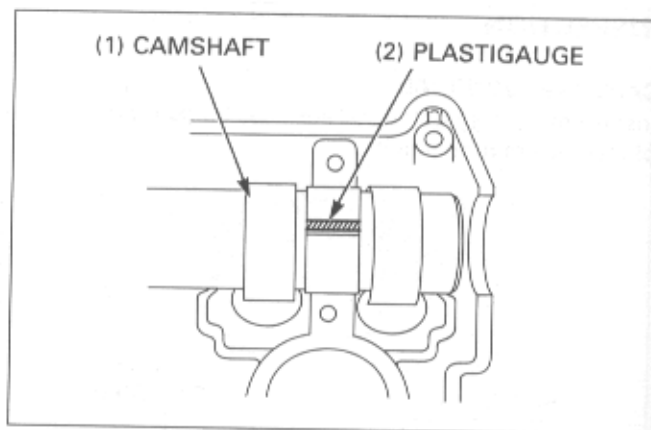
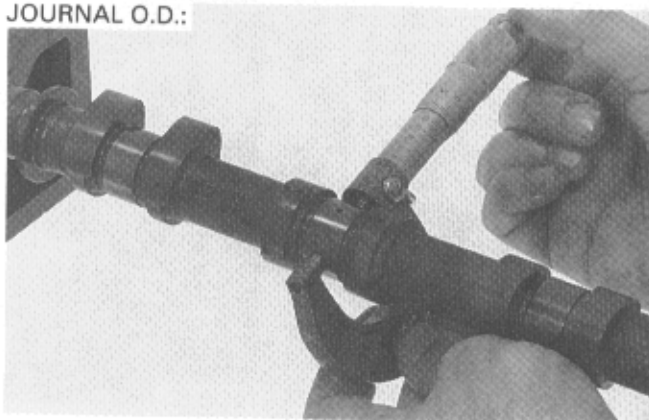
Remove the camshaft holders and measure the width of each plastigauge. The widest thickness determines the oil clearance.

**Service limit: 0.1 mm (0.004 in)**

When the service limit is exceeded, replace the camshaft and recheck the oil clearance.

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

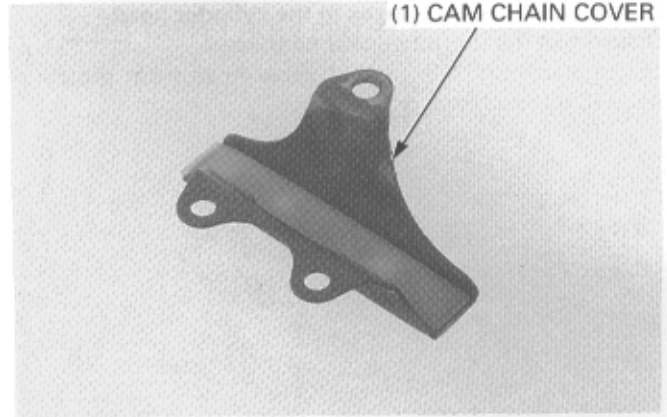
JOURNAL O.D.:



**CAM CHAIN COVER**

Check the cam chain cover for wear or damage; if it has excessive wear, replace it.

(1) CAM CHAIN COVER

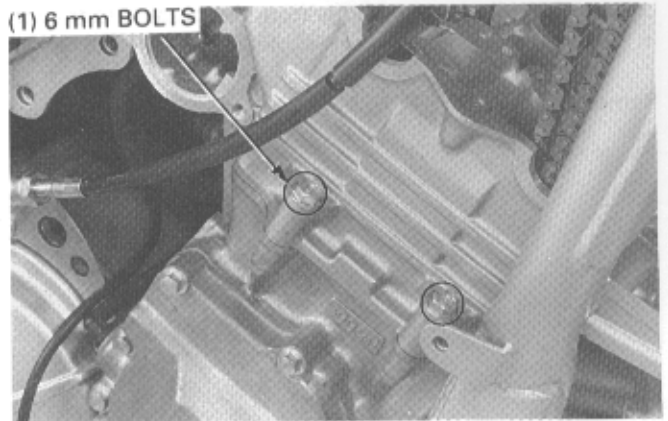


**CYLINDER HEAD REMOVAL**

- Remove the exhaust system (page 2-10).
- Remove the carburetor (page 5-5).
- Remove the radiator (page 6-8).
- Remove the thermostat (page 6-6).
- Remove the PAIR control valve (California type only; page 5-38).

Remove the cylinder head 6 mm bolts.

(1) 6 mm BOLTS



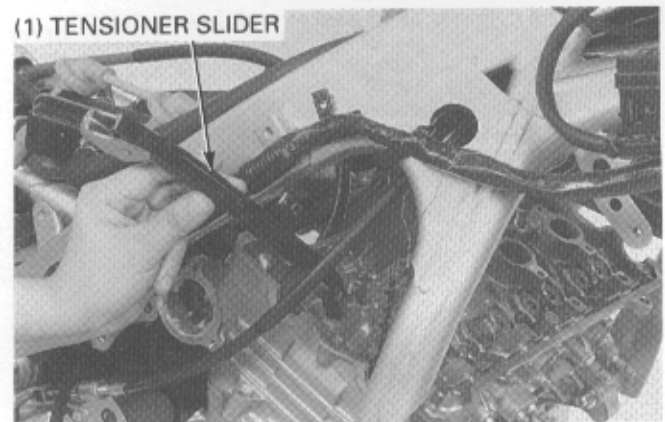
Remove the cap nut and sealing washer.

(1) CAP NUT/SEALING WASHER



Remove the cam chain tensioner slider.

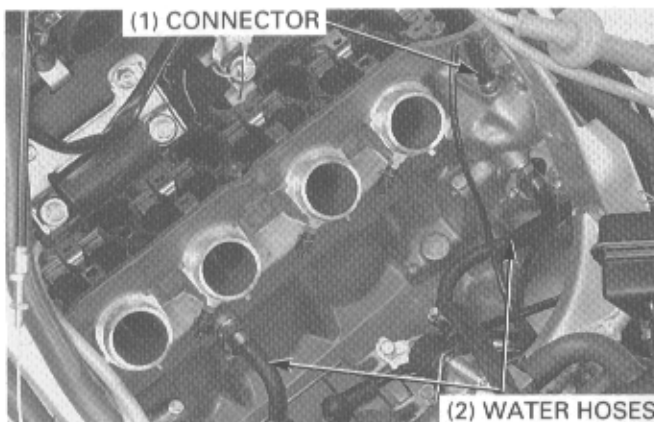
(1) TENSIONER SLIDER





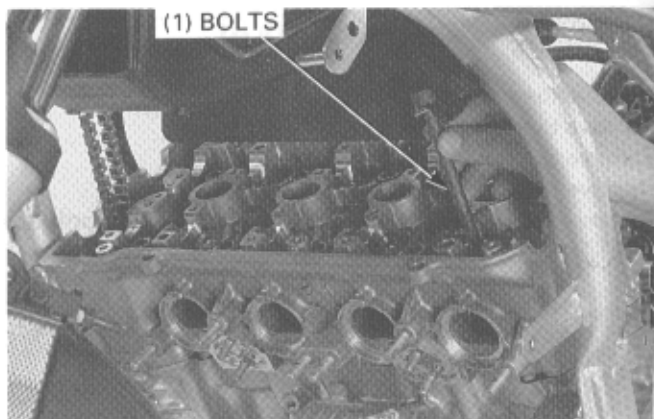
## CYLINDER HEAD/VALVES

Disconnect the water hoses to the cylinder head.  
Disconnect the thermosensor connector.  
Disconnect the PAIR control valve hose from the cylinder head (California type only).



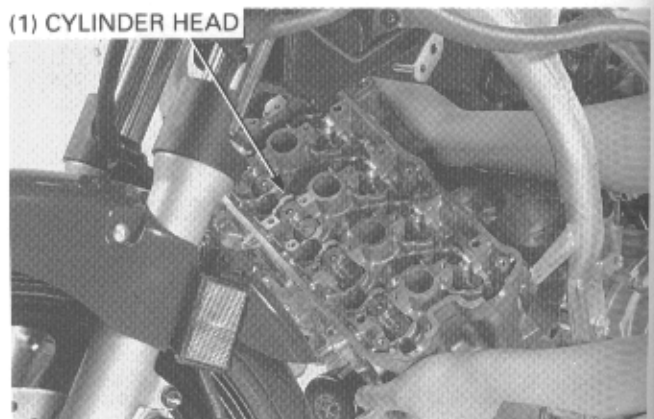
Loosen the cylinder head bolts from the outside to the inside in a crisscross pattern in several steps.

Remove the cylinder head bolts.

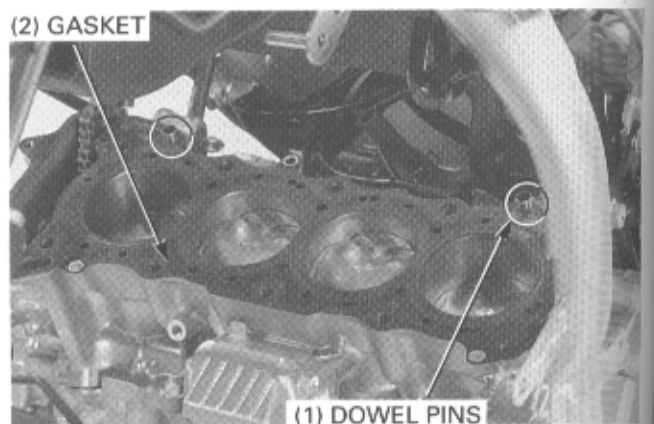


Remove the cylinder head assembly.

Suspend the cam chain with a piece of wire to prevent the chain from falling into the crankcase.



Remove the cylinder head gasket and dowel pins.



## CYLINDER HEAD DISASSEMBLY

**NOTE**

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

Remove the valve lifters and shims.

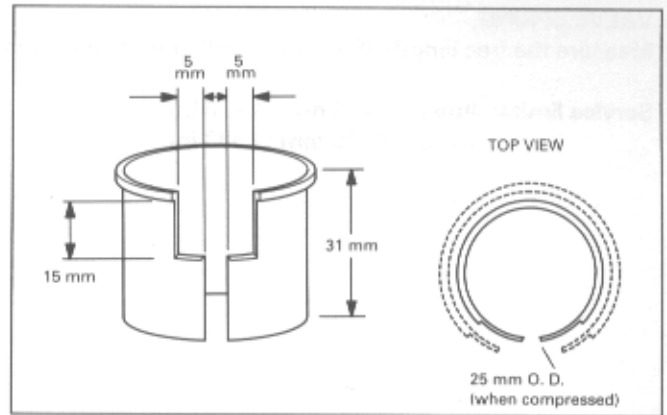
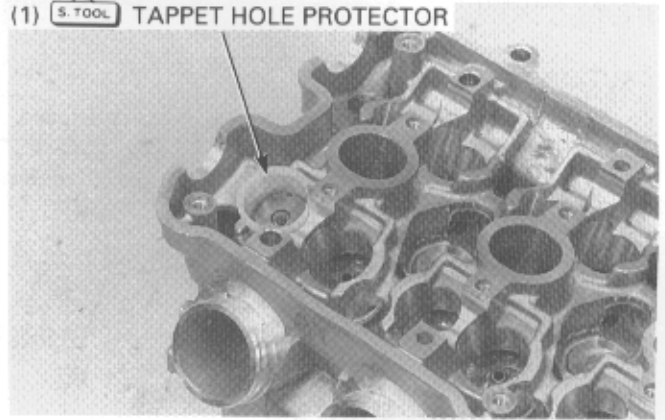
Install the tappet hole protector into the valve lifter sliding surface.

**Tool:**

**Tappet hole protector** 07HMG – MR70002

An equivalent tool can easily be made from a plastic 35 mm film container by using the measurements as shown.

(1) S. TOOL TAPPET HOLE PROTECTOR



Install the valve spring compressor onto the valve and compress the valve spring.

**CAUTION**

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

Remove the valve cotters.

**Tool:**

**Valve spring compressor attachment** 07959 – KM30101

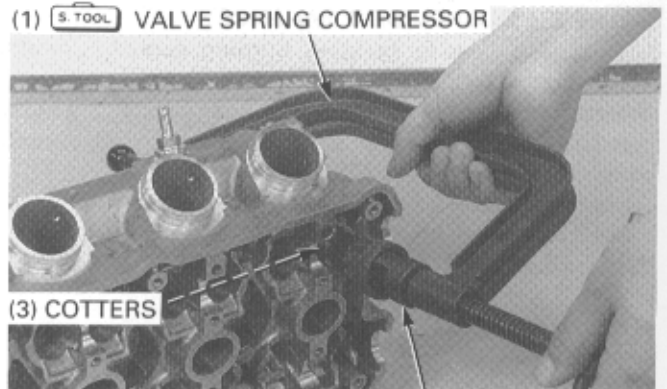
**Valve spring compressor** 07757 – 0010000

Remove the valve spring compressor, then remove the retainers, springs and valves.

Remove the stem seals, inner spring seats and outer spring seats if necessary.

Do not reuse a removed stem seal.

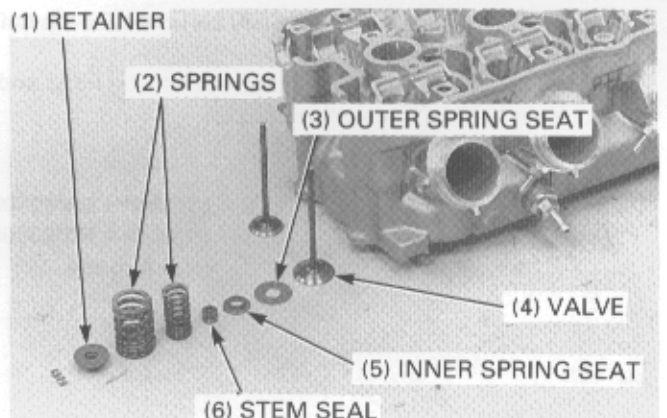
(1) S. TOOL VALVE SPRING COMPRESSOR



(3) COTTERS

(2) S. TOOL VALVE SPRING COMPRESSOR ATTACHMENT

(1) RETAINER



## CYLINDER HEAD/VALVES

### INSPECTION

#### CAUTION

- Avoid damaging the gasket and valve seat surfaces.

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

#### CYLINDER HEAD

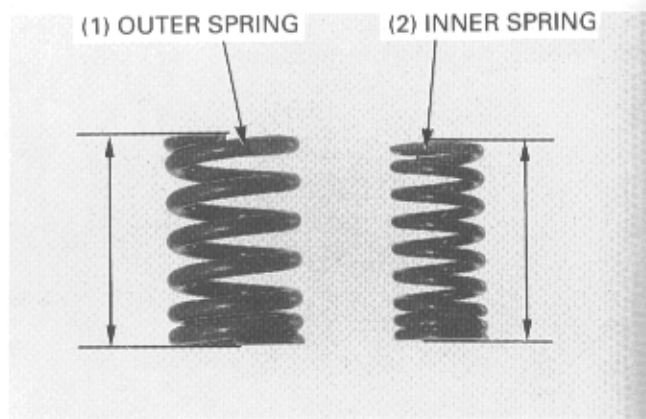
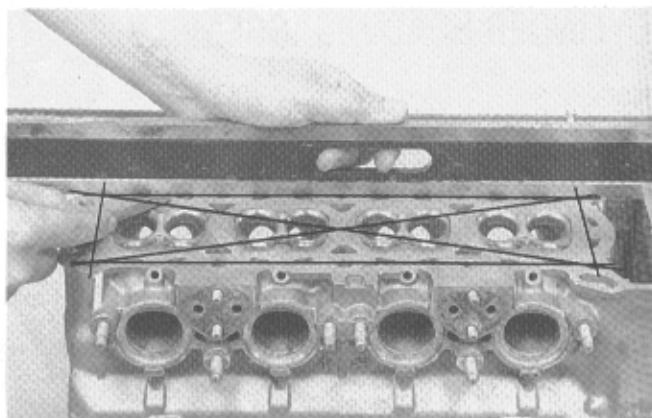
Check the spark plug hole and valve areas for cracks. Check the cylinder head for warpage with a straight edge and feeler gauge.

**Service limit: 0.1 mm (0.004 in)**

#### VALVE SPRING

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

**Service limits: Inner: 30.62 mm (1.206 in)**  
**Outer: 33.86 mm (1.333 in)**



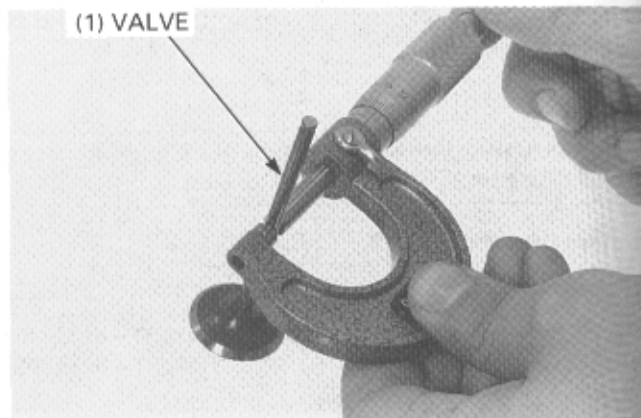
#### VALVE STEM-TO-GUIDE CLEARANCE

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: 3.965 mm (0.1561 in)**  
**EX: 3.955 mm (0.1557 in)**



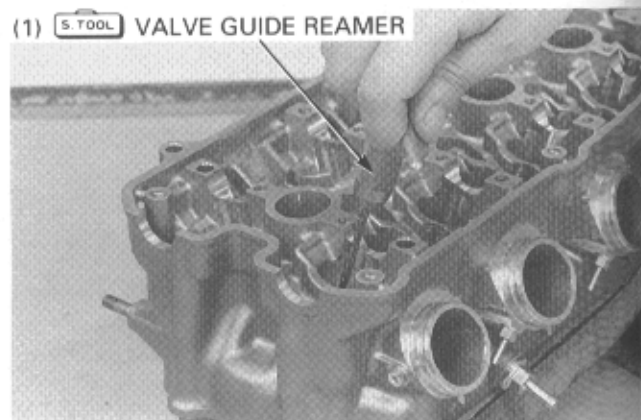
Ream the valve guide to remove any carbon build-up before measuring the guide.

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

#### Tool:

Valve guide reamer, 4.008 mm

07MMH - MV90100 or  
07MMH - MV9010A  
(U.S.A. only)



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

**Service limits: IN: 4.04 mm (0.159 in)**  
**EX: 4.04 mm (0.159 in)**

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

**Service limits: IN: 0.075 mm (0.0029 in)**  
**EX: 0.085 mm (0.0033 in)**

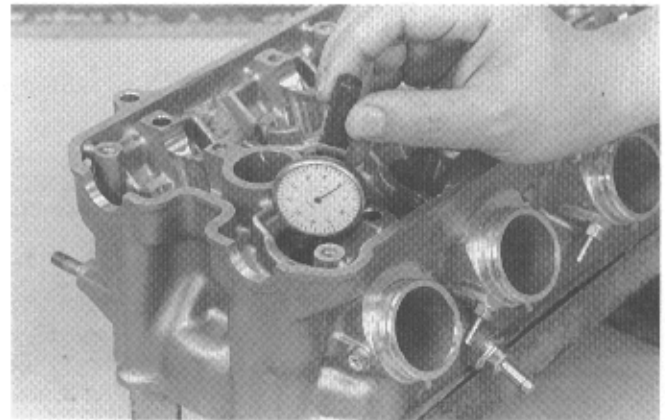
If the stem-to-guide clearance exceeds the service limit, determine if a new guide with standard dimensions would bring the clearance within tolerance.

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.

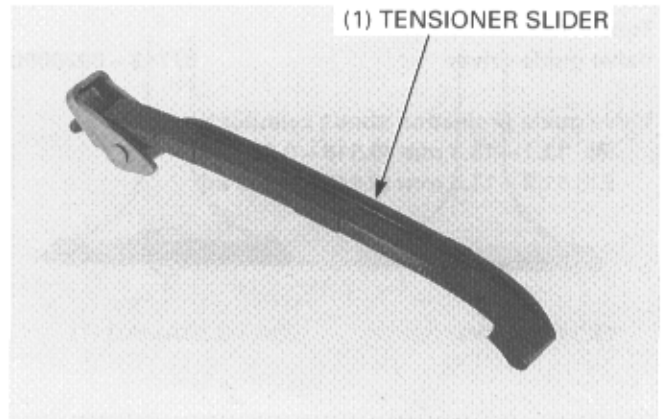
**NOTE**

- Inspect and reface the valve seats whenever the valve guides are replaced (page 8-14).



**CAM CHAIN TENSIONER SLIDER**

Check the cam chain tensioner slider for wear or damage. Inspect the pivot for binding during movement. If it has excessive wear or hard movement, replace it.



**VALVE LIFTER**

Inspect each valve lifter for scratches or abnormal wear. Measure each valve lifter O.D..

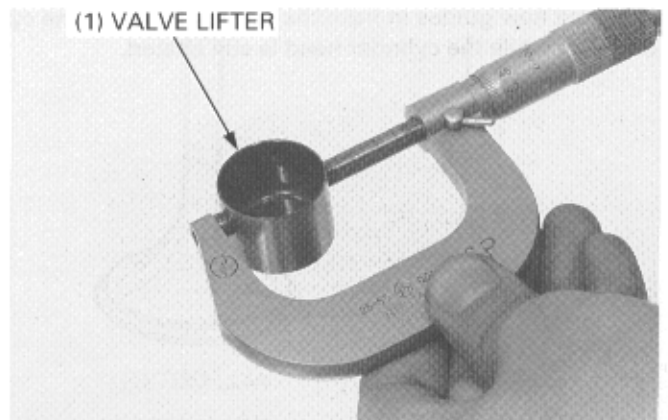
**Service limit: 25.97 mm (1.022 in)**

**VALVE LIFTER BORE**

Inspect each valve lifter for scratches or abnormal wear.

Measure each valve lifter bore I.D..

**Service limit: 26.04 mm (1.025 in)**



# 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.

**Tool:**  
Valve guide driver, 4 mm                      07GMD – KT70100

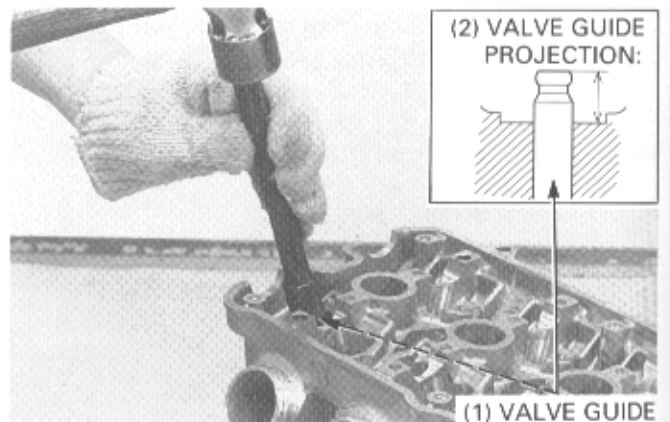
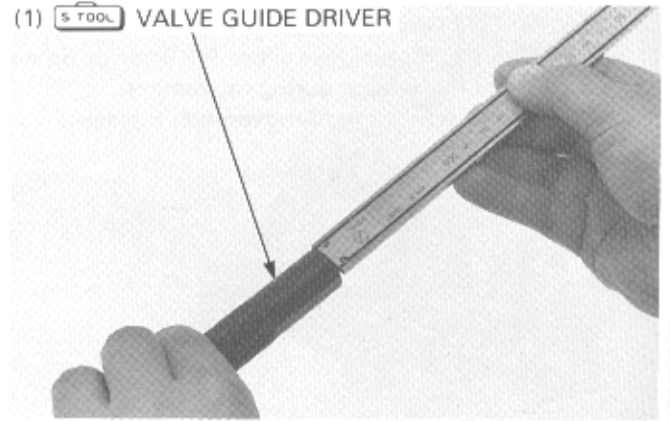
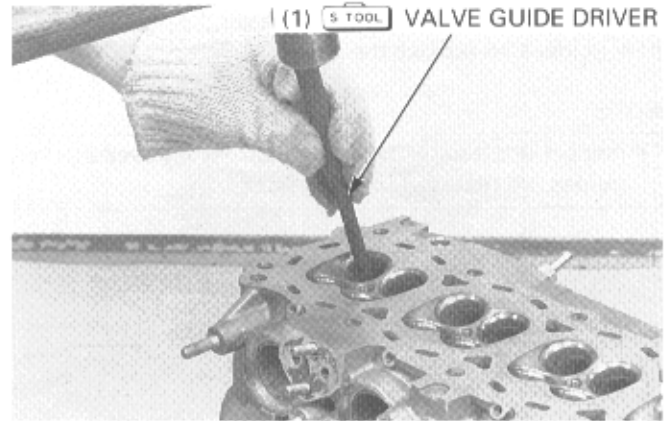
**CAUTION**  
• Be careful not to damage the cylinder head.

Adjust the valve guide driver to the valve guide height.

**Tool:**  
Valve guide driver                              07743 – 0020000

**Valve guide projection above cylinder head:**  
IN: 13.1 – 13.3 mm (0.516 – 0.524 in)  
EX: 11.3 – 11.5 mm (0.445 – 0.453 in)

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



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

**Tool:**

Valve guide reamer, 4.008 mm      07MMH – MV90100 or  
07MMH – MV9010A  
(U.S.A. only)

**NOTE**

- Take care not to tilt or lean the reamer in the guide while reaming. Otherwise, the valve is installed slanted, that causes oil leaks from the stem seal and improper valve seat contact and results in the valve seat refacing not able to be performed.
- 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 refacing the valve seat.

## VALVE SEAT INSPECTION/REFACING

### INSPECTION

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

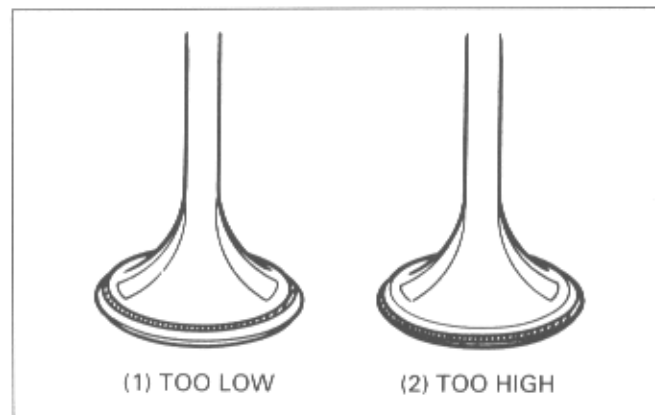
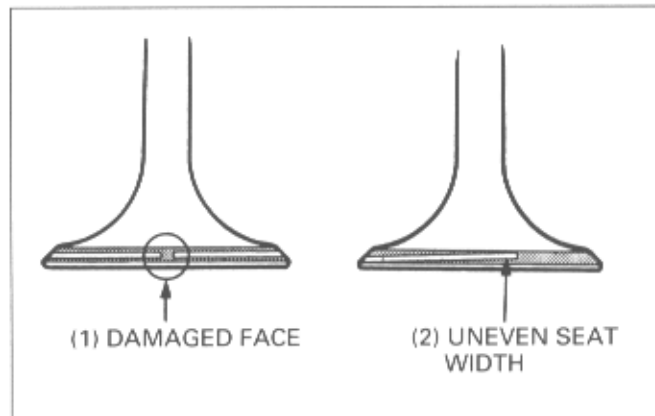
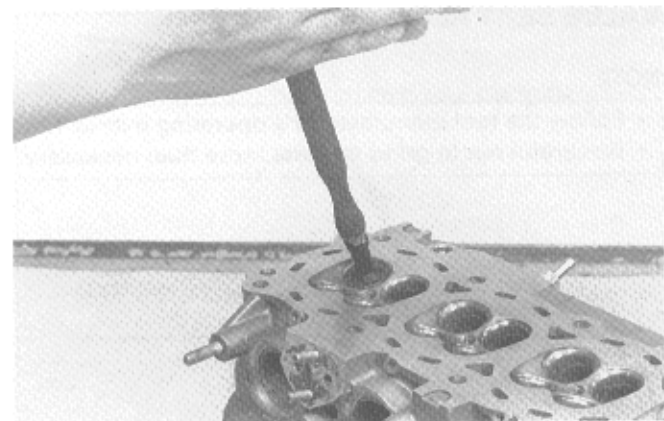
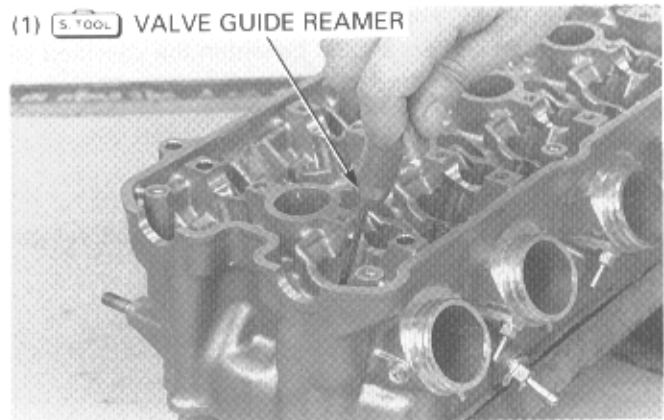
Apply a light coating of Prussian Blue to each valve face. Tap the valve against the valve seat several times using a hand-lapping tool, without rotating the valve, to make a clear pattern. Remove the valve and inspect the valve seat face.

**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.

(1)  VALVE GUIDE REAMER

## CYLINDER HEAD/VALVES

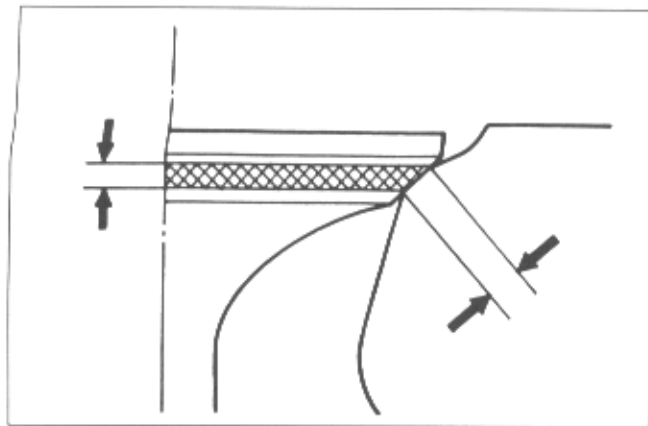
Inspect the width of valve seat.

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

**Standard: 0.9 – 1.1 mm (0.035 – 0.043 in)**

**Service limit: 1.5 mm (0.06 in)**

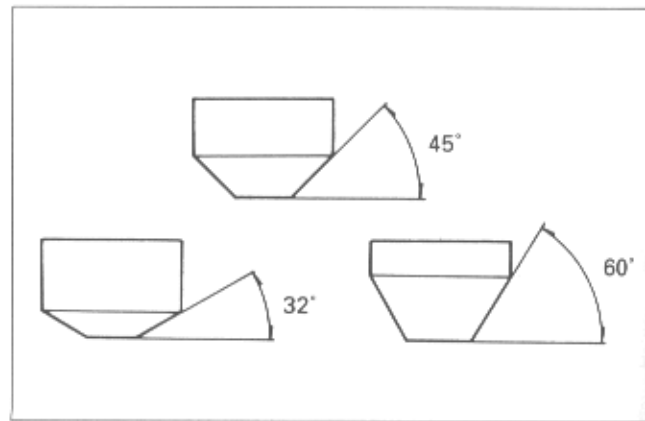
If the valve seat width is not within specification, reface the valve seat.



## VALVE SEAT REFACING

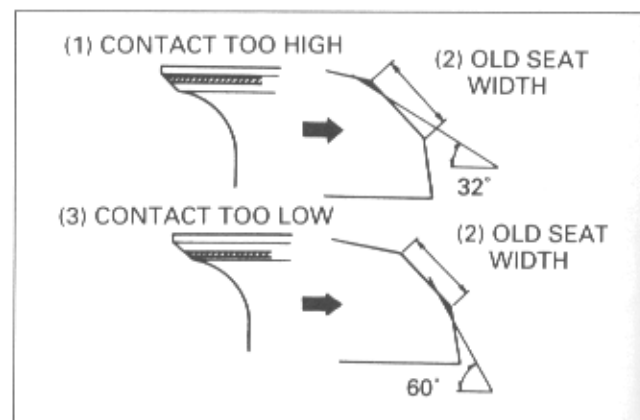
### NOTE

- Follow the tool 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.

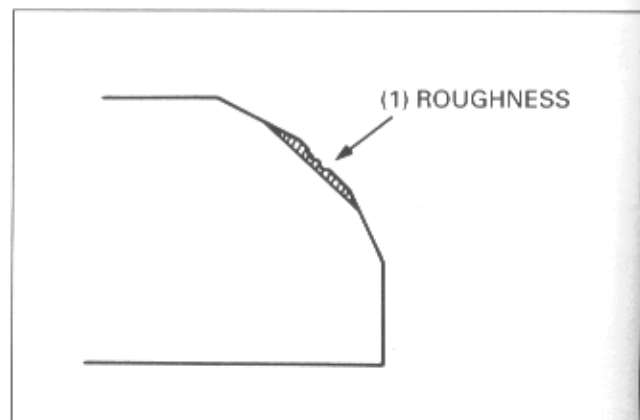
### Tools:

Valve seat cutter, 27.5 mm (45° IN) 07780 - 0010200

Valve seat cutter, 24.5 mm (45° EX) 07780 - 0010100

Valve seat cutter holder, 4.0 mm 07781 - 0010500

or equivalent commercially available in U.S.A.

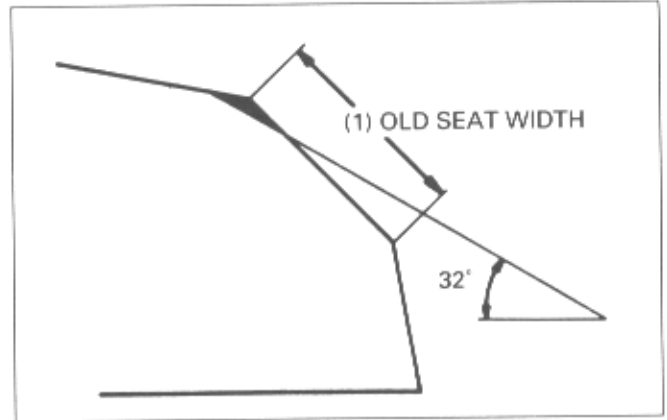


Using a 32° cutter, remove 1/4 of the existing valve seat material.

**Tools:**

- |                                   |                 |
|-----------------------------------|-----------------|
| Valve seat cutter, 27 mm (32° IN) | 07780 - 0013300 |
| Valve seat cutter, 24 mm (32° EX) | 07780 - 0012500 |
| Valve seat cutter holder, 4.0 mm  | 07781 - 0010500 |

or equivalent commercially available in U.S.A.

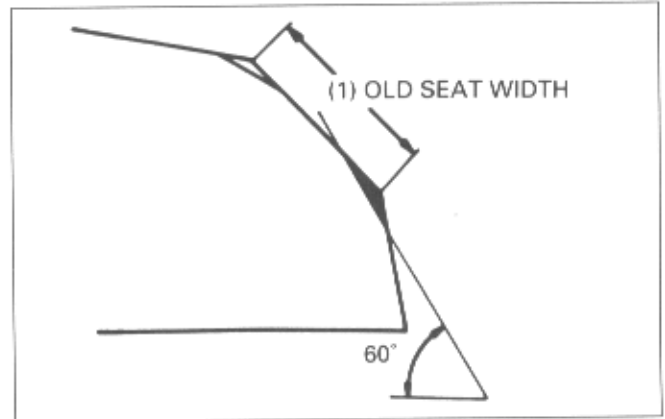


Using a 60° cutter, remove the bottom 1/4 of the old seat.

**Tools:**

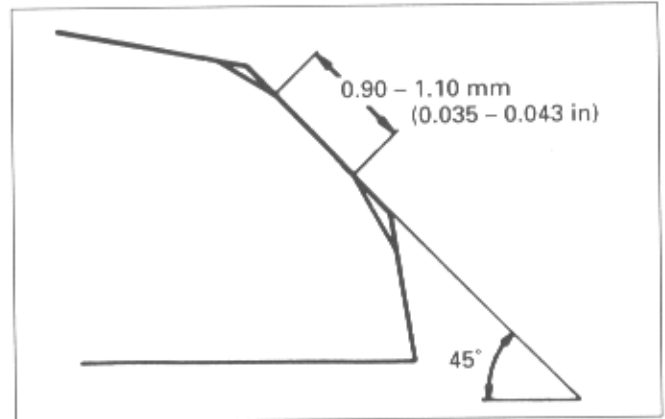
- |                                   |                 |
|-----------------------------------|-----------------|
| Valve seat cutter, 26 mm (60° IN) | 07780 - 0014500 |
| Valve seat cutter, 22 mm (60° EX) | 07780 - 0014202 |
| Valve seat cutter holder, 4.0 mm  | 07781 - 0010500 |

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.



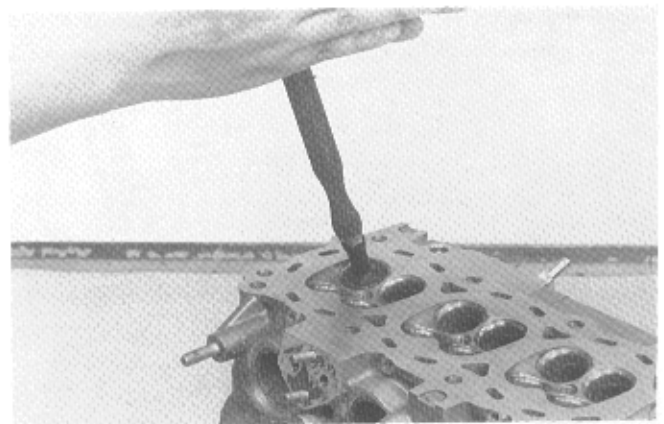
**CAUTION**

- 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.

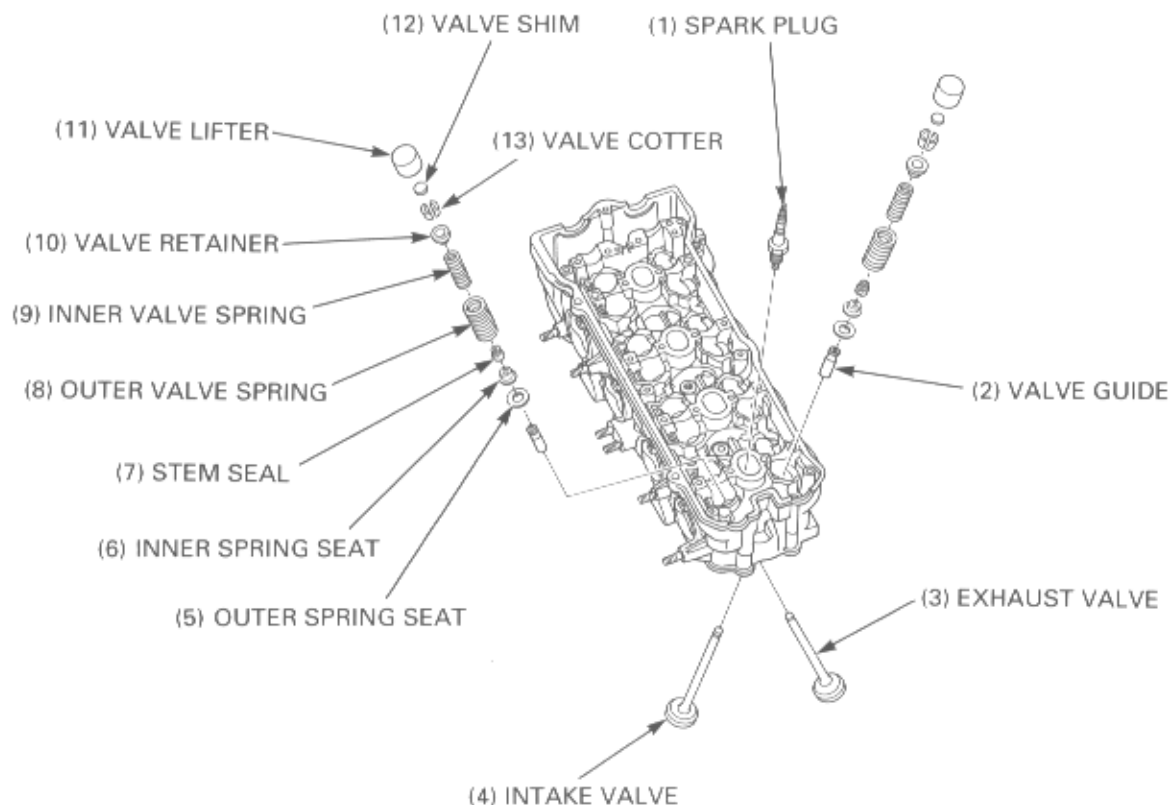
After lapping, wash any residual compound off the cylinder head and valve.

Recheck the seat contact after lapping.





# CYLINDER HEAD ASSEMBLY

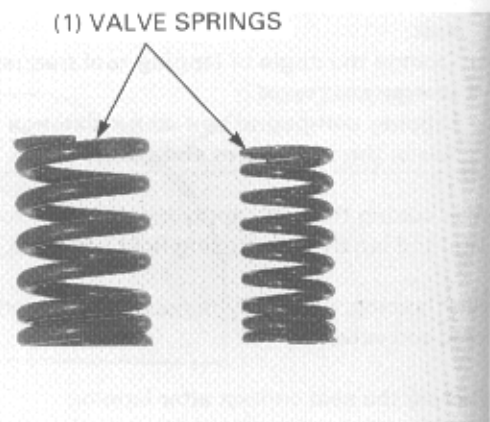


Install the outer spring seats, inner spring seats and new stem seals.  
Install the tappet hole protector into the valve lifter sliding surface.

**Tool:**  
**Tappet hole protector**                      **07HMG - MR70002**  
**or equivalent, see page 8-11**

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 installing.

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



Install the valve spring compressor onto the valve and compress the valve springs.

**CAUTION**

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

**NOTE**

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

Install the valve cotters.

**Tool:**

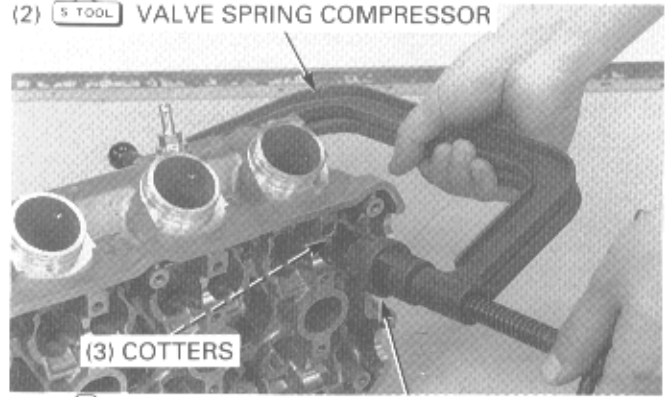
- Valve spring compressor attachment 07959 – KM30101
- Valve spring compressor 07757 – 0010000

**NOTE**

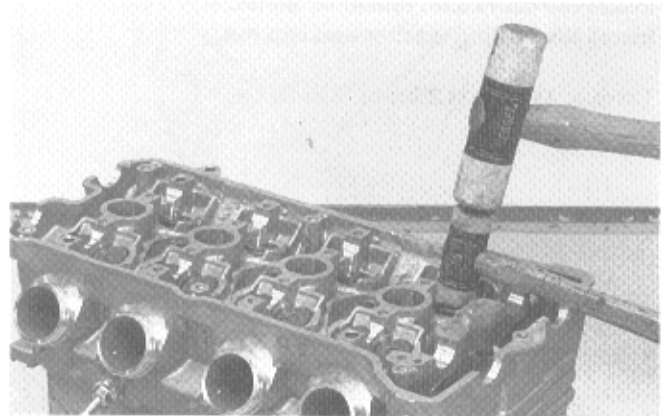
- Support the cylinder head so that the valve heads will not contact anything that causes damage.

Seat the cotters firmly using two soft hammers as shown. Hold one hammer on the valve stem and gently tap in with the other hammer.

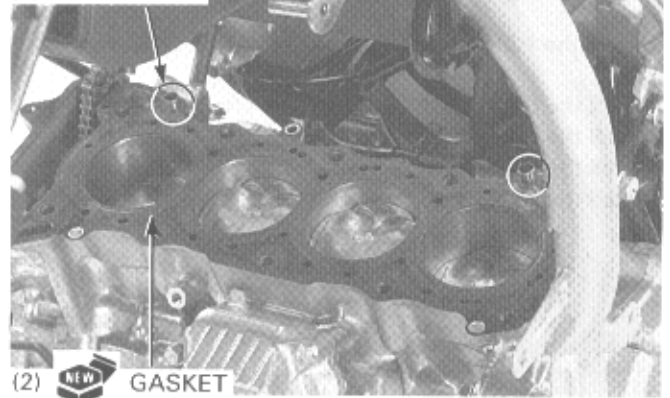
(2)  VALVE SPRING COMPRESSOR



(2)  VALVE SPRING COMPRESSOR ATTACHMENT

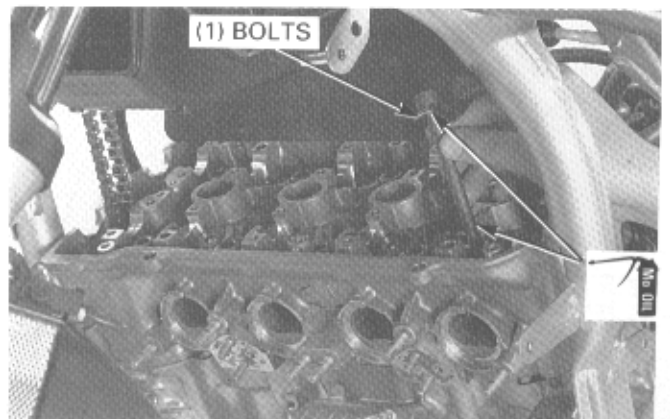


(1) DOWEL PINS



(2)  GASKET

(1) BOLTS



## CYLINDER HEAD INSTALLATION

Clean any gasket material from the cylinder mating surfaces.

Install the dowel pins and new gasket.

Install the cylinder head onto the cylinder.

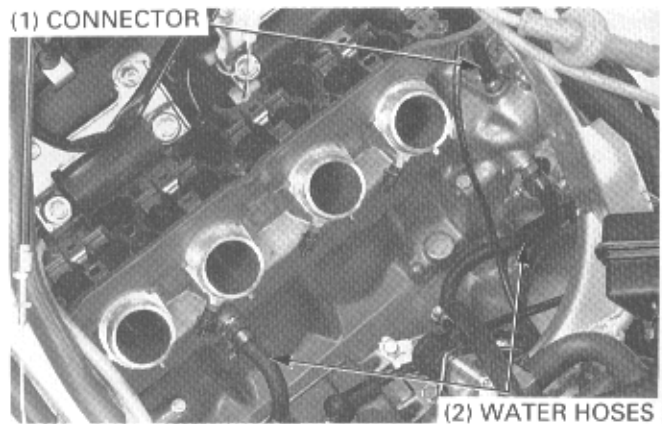
Apply molybdenum oil solution to the cylinder head bolt threads and seating surface.

Install and tighten the cylinder head bolts in a crisscross pattern in 2 – 3 steps.

**Torque: 48 N·m (4.8 kg·m, 35 lb·ft)**

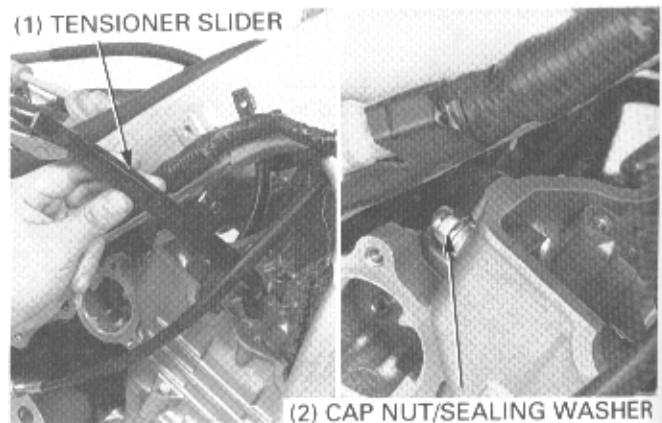
## CYLINDER HEAD/VALVES

Connect the thermosensor connector.  
Connect the water hoses to the cylinder head.



Install the cam chain tensioner slider.  
Install the sealing washer and cap nut.

**Torque: 12 N·m (1.2 kg·m, 9 lb·ft)**



Install the cylinder head 6 mm bolts.

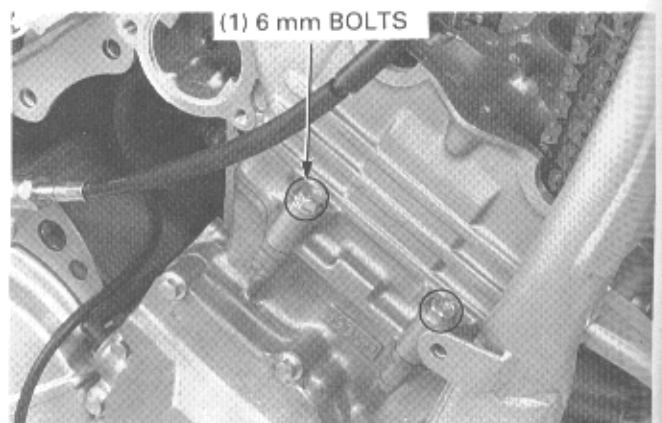
Install the PAIR control valve (California type only: page 5-34).

Install the thermostat (page 6-7).

Install the radiator (page 6-8).

Install the carburetor (page 5-19).

Install the exhaust system (page 2-10).



## CAMSHAFT INSTALLATION

Apply molybdenum disulfide oil to the valve lifters. Install the shims and valve lifters.

Align the T mark (notch mark) with the index mark on the ignition pulse generator rotor cover by turning the crankshaft clockwise.

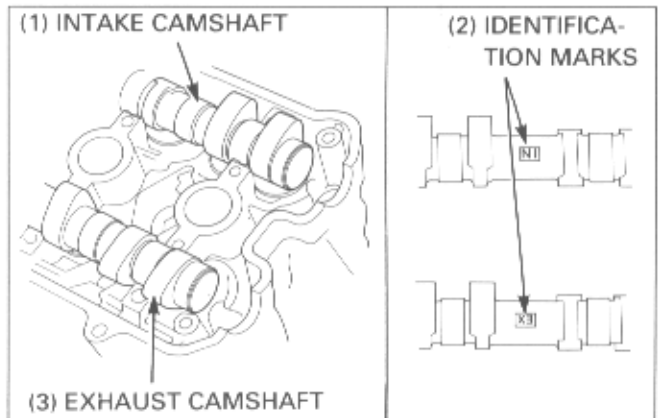
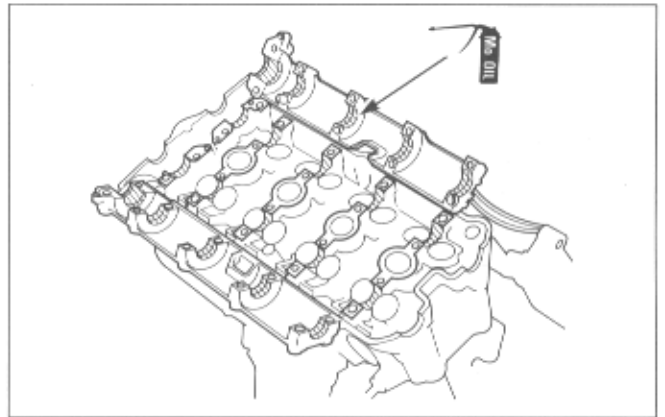
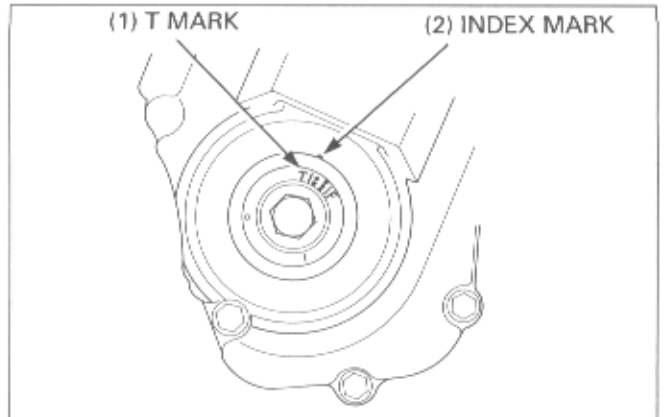
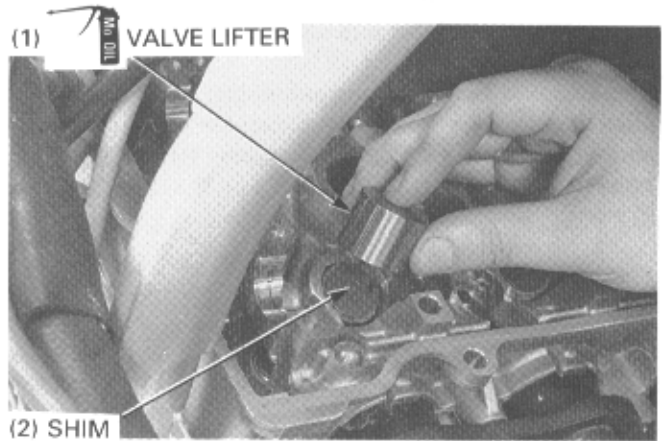
Apply molybdenum disulfide oil (a 50/50 mixture of engine oil and molybdenum disulfide grease) to the camshaft journals of the cylinder head and camshaft holders.

Install the camshafts onto the cylinder head with the cam lobes for the No.1 cylinder facing up as shown.

### NOTE

- Install each camshaft into the correct side. Each camshaft has an identification mark; "IN" is for the intake side and "EX" is for the exhaust side.

Apply molybdenum disulfide oil to the cam lobes and journals.



## CYLINDER HEAD/VALVES

Install the camshaft holders onto the camshafts.

Apply engine oil to the camshaft holder bolts threads. Install the longer bolts into the outer bolt holes and the shorter ones into the inner, and tighten the camshaft holder bolts in the numerical order casted on the camshaft holders in a criss-cross pattern in 2 or 3 steps.

**Torque: 12 N·m (1.2 kg-m, 9 lb-ft)**

### CAUTION

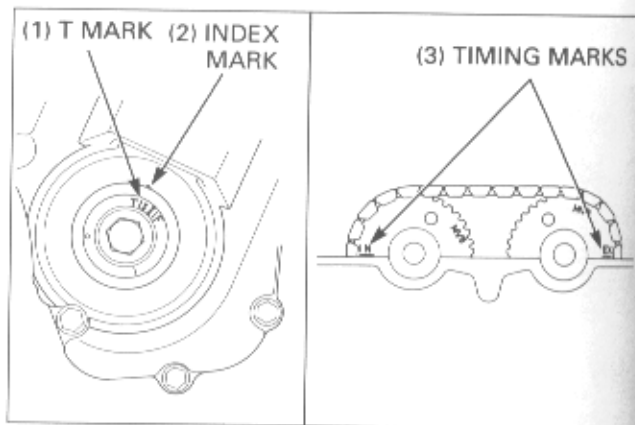
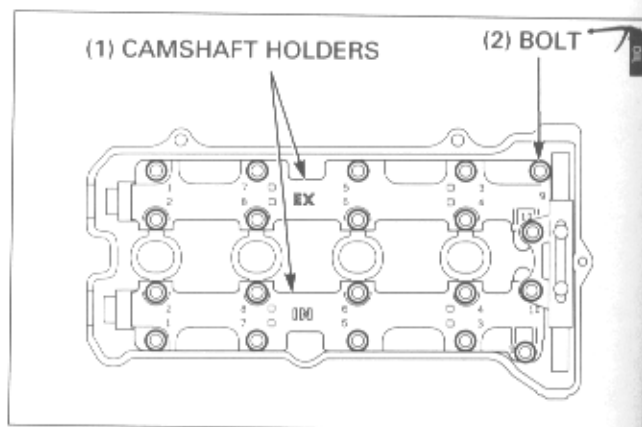
- Do not tighten the camshaft holder bolts all at one time. Tightening the camshaft holder bolts on only one-side might cause a camshaft holder to break .

Make sure that the T mark (notch mark) aligns with the index mark on the ignition pulse generator rotor cover.

Install the cam chain over the cam sprockets. Install the cam sprockets onto the cam shaft flange with the timing marks on the cam sprockets aligning with the cylinder head upper surface, facing opposite each other.

### NOTE

- Install each cam sprocket to the correct camshaft. Each cam sprocket has an identification mark; "IN" is for the intake side and "EX" is for the exhaust side .

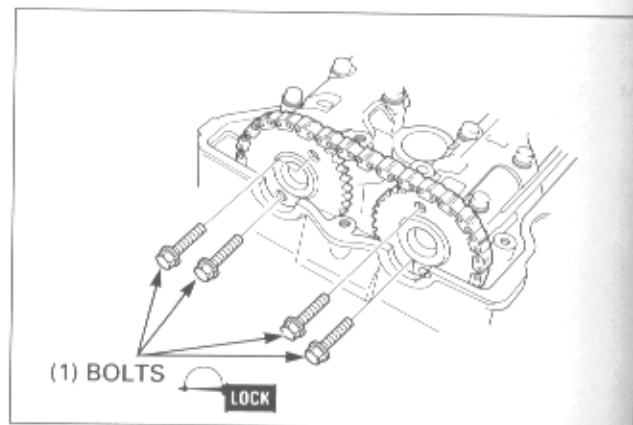


Before tightening the bolts, clean the old locking agent off the bolt threads and the bolt holes in the cam sprockets.

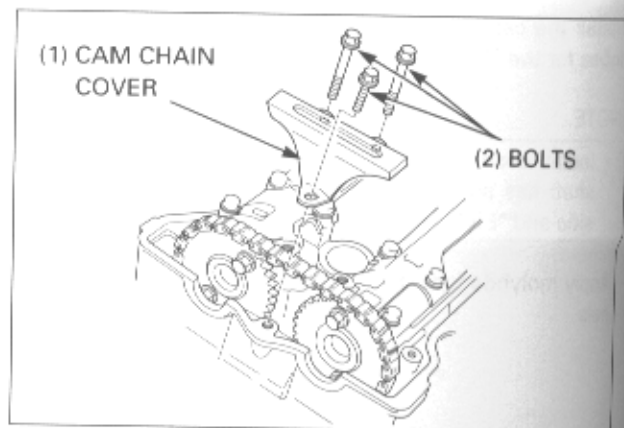
Apply a locking agent to the threads of the cam sprocket bolts and tighten the two bolts loosely. Turn the crankshaft clockwise 1/2 turn (180°) and tighten the first two bolts to the specified torque.

**Torque: 20 N·m (2.0 kg-m, 14 lb-ft)**

Turn the crankshaft clockwise 1/2 turn (180°) and tighten the first two bolts to the specified torque.

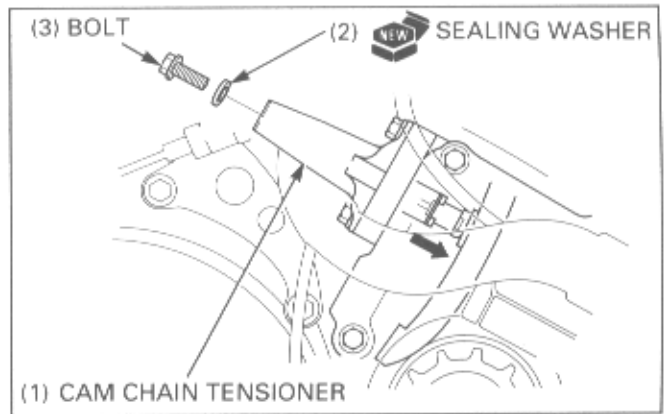


Install the cam chain cover and secure it with the bolts.



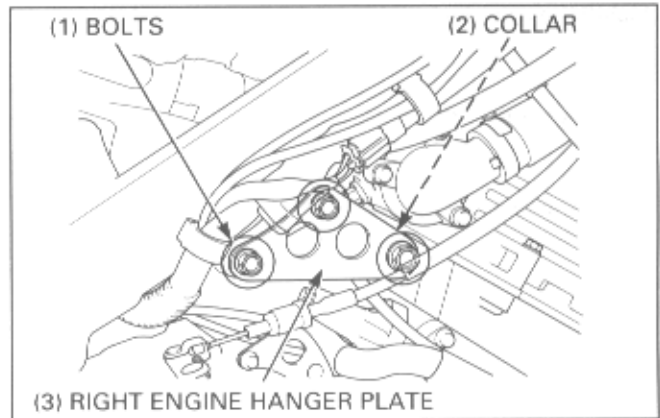
Remove the stopper tool.  
 Install the new sealing washer and cam chain tensioner sealing bolt.  
 Tighten the bolt securely.

Make sure the timing marks on the camshaft sprockets are level with the cylinder head upper edge.



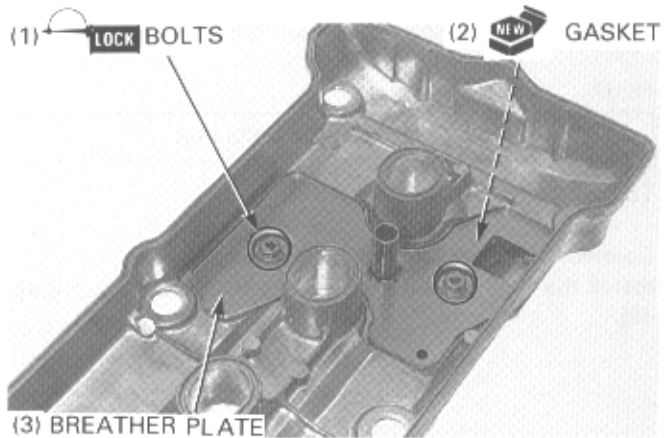
Install the right engine hanger plate and collar.  
 Install and tighten the hanger plate bolts.

Torque: 10 mm bolt : 45 N·m (4.5 kg-m, 33 lb-ft)

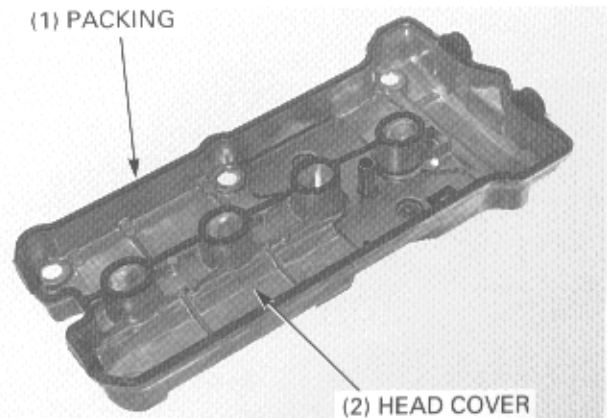


If you remove the head cover breather plate, replace the gasket with a new one.  
 Apply locking agent to the threads, and tighten the breather plate bolts.

Torque: 12 N·m (1.2 kg-m, 9 lb-ft)

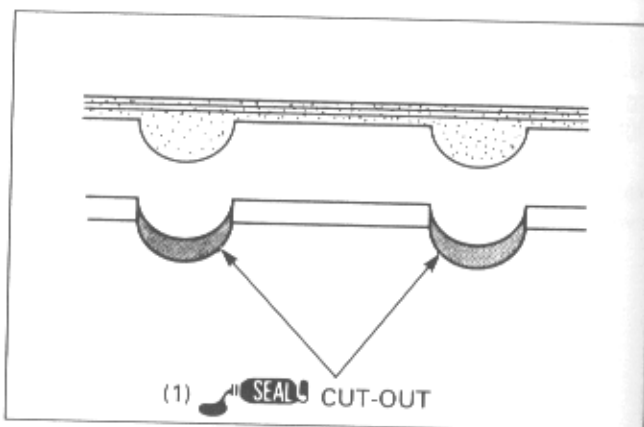


Apply Honda Bond A or equivalent to the cylinder head cover groove, then install the packing into the groove.



## CYLINDER HEAD/VALVES

Apply sealant to the semicircular cut-out on the cylinder head as shown.

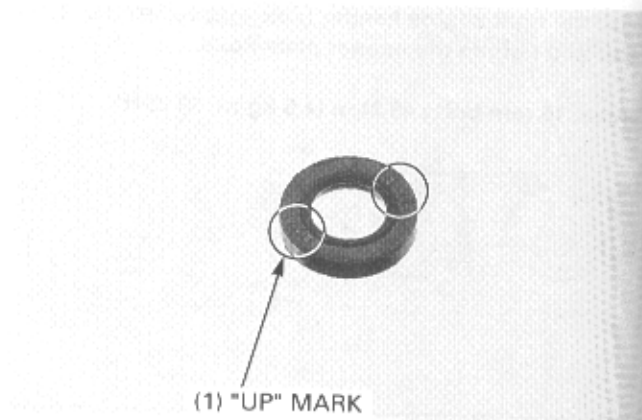


Install the cylinder head cover onto the cylinder head.

### NOTE

- Be sure that the gasket is seated properly, especially around the spark plug holes.

Install the new washer with its "UP" mark facing up.



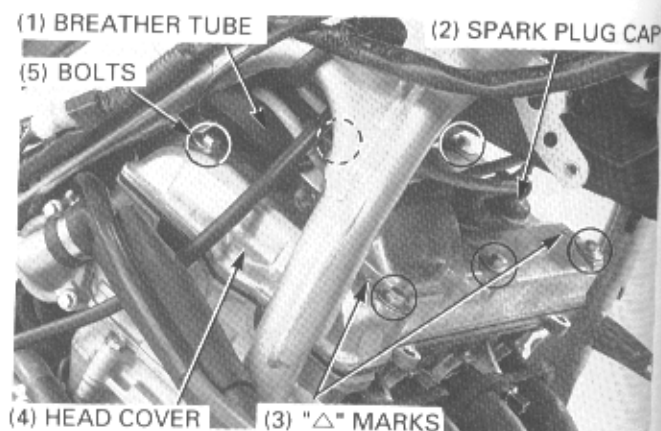
Install and tighten the head cover bolts in 2 – 3 steps.

### NOTE

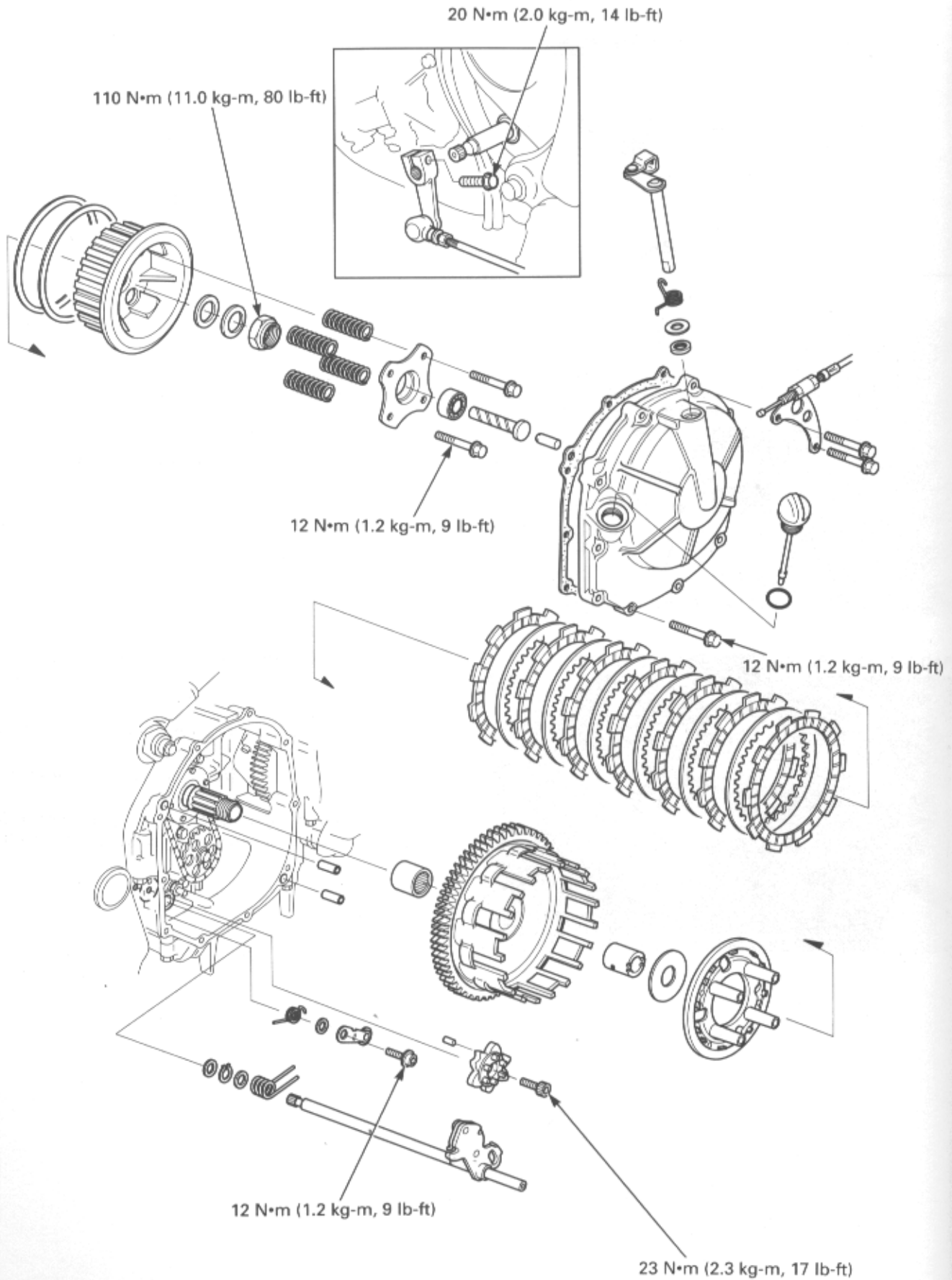
- Tighten the "△" marked side bolts first.

**Torque: 10 N·m (1.0 kg·m, 7 lb-ft)**

Connect the spark plug caps and breather tube.  
Install the ignition pulse generator rotor cover cap (page 3-10).



# CLUTCH/GEARSHIFT LINKAGE





# 9. CLUTCH/GEARSHIFT LINKAGE

SERVICE INFORMATION	9-1	GEARSHIFT LINKAGE	9-8
TROUBLESHOOTING	9-2	CLUTCH INSTALLATION	9-11
CLUTCH REMOVAL	9-3		

## SERVICE INFORMATION

### GENERAL

- The clutch and gearshift linkage parts can be serviced with the engine installed in the frame.
- Engine oil viscosity and level, and the use of oil additives have an effect on clutch disengagement. Oil additives of any kind are **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.
- The crankcase must be separated when the transmission requires service (section 10).

### SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Clutch lever free play		10 – 20 (3/8 – 3/4)	—
Clutch spring free length		49.7 (1.96)	48.3 (1.90)
Clutch disc thickness		2.92 – 3.08 (0.115 – 0.121)	2.60 (0.102)
Clutch plate warpage		—	0.30 (0.012)
Clutch outer guide	O.D.	34.975 – 34.991 (1.3770 – 1.3776)	34.965 (1.3766)
	I.D.	21.994 – 22.007 (0.8659 – 0.8664)	22.017 (0.8668)
Mainshaft O.D. at clutch outer guide		21.980 – 21.993 (0.8654 – 0.8659)	21.95 (0.864)

9

### TORQUE VALUES

Clutch center lock nut	110 N•m (11.0 kg-m, 80 lb-ft) Apply oil to the threads. Stake.
Gearshift spindle return spring pin	23 N•m (2.3 kg-m, 17 lb-ft)
Shift drum center bolt	23 N•m (2.3 kg-m, 17 lb-ft) Apply a locking agent to the threads.
Right crankcase cover bolt	12 N•m (1.2 kg-m, 9 lb-ft)
Gearshift pedal pinch bolt	20 N•m (2.0 kg-m, 14 lb-ft)
Clutch spring bolt	12 N•m (1.2 kg-m, 9 lb-ft)
Drum stopper arm bolt	12 N•m (1.2 kg-m, 9 lb-ft)

### TOOLS

Clutch center holder	07JMB – MN50300 or 07HGB – 001000A (U.S.A. only)
Pilot, 12 mm	07746 – 0040200
Attachment, 37 x 40 mm	07746 – 0010200
Attachment, 42 x 47 mm	07746 – 0010300
Pilot, 35 mm	07746 – 0040800
Attachment, 28 x 30 mm	07946 – 1870100

### TROUBLESHOOTING

#### Clutch lever too hard

- Damaged, kinked or dirty clutch cable
- Improperly routed clutch cable
- Damaged clutch lifter mechanism
- Faulty clutch lifter plate bearing

#### Clutch will not disengage or motorcycle creeps with clutch disengaged

- Too much clutch lever free play
- Warped plate
- Loose clutch lock nut
- Engine oil level too high, improper oil viscosity or oil additive used

#### Clutch slips

- Clutch lifter sticking
- Worn clutch discs
- Weak clutch springs
- No clutch lever free play
- Engine oil level too low or oil additive used

#### Hard to shift

- Improper clutch operation
- Incorrect engine oil viscosity
- Incorrect clutch adjustment
- Bent or damaged gearshift spindle
- Damaged shift drum cam grooves
- Bent shift forks or fork shaft (section 10)

#### Transmission jumps out of gear

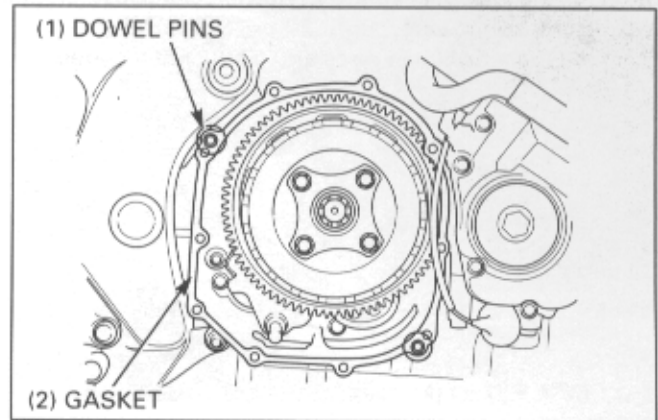
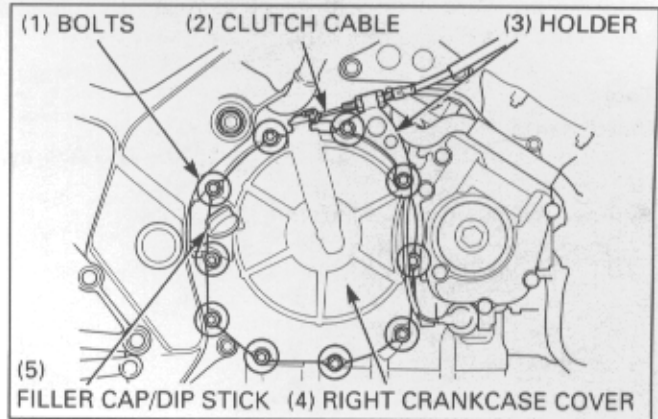
- Broken shift drum stopper arm
- Broken shift linkage return springs
- Damaged shift drum cam grooves
- Bent shift fork shaft (section 10)
- Worn or bent shift forks (section 10)
- Worn gear dogs or slots (section 10)

## CLUTCH REMOVAL

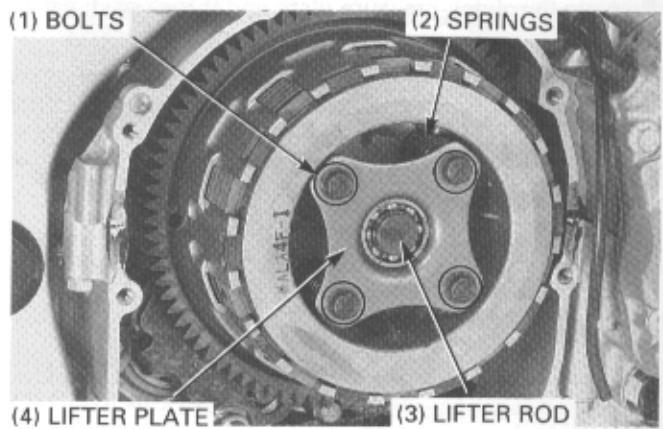
Remove the side fairings (page 2-3).  
 Drain the engine oil (page 3-11).

Remove the clutch cable holder bolt and disconnect the clutch cable from the clutch arm.  
 Remove the oil filler cap/dip stick.  
 Remove the bolts and right crankcase cover.

Remove the gasket and dowel pins.



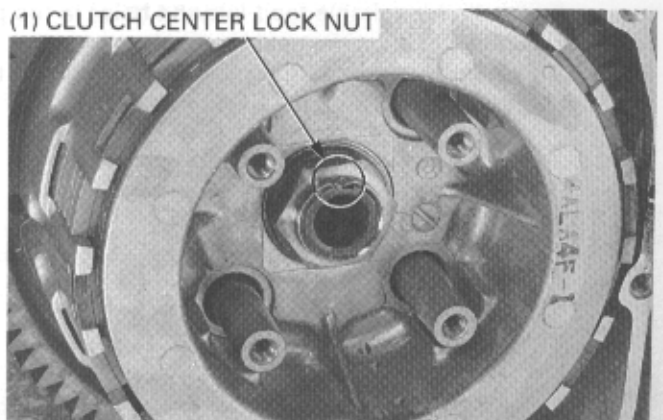
Loosen the clutch lifter plate bolts in a crisscross pattern in 2 or 3 steps.  
 Remove the bolts, lifter plate, springs and lifter rod.



### CAUTION

• Be careful not damage the mainshaft threads.

Unstake the clutch center lock nut.



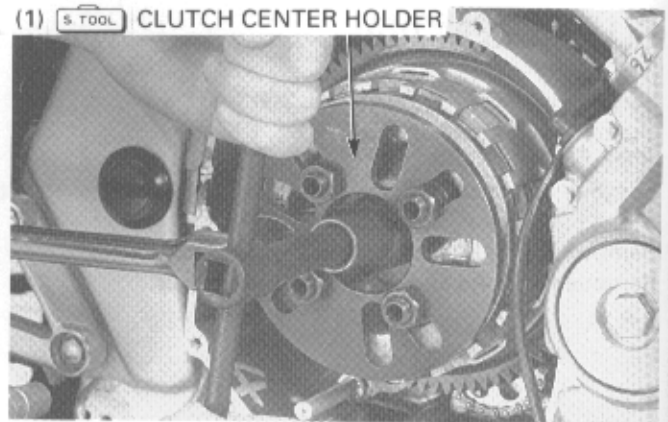
## CLUTCH/GEARSHIFT LINKAGE

Hold the pressure plate with the clutch center holder and loosen the clutch center lock nut.

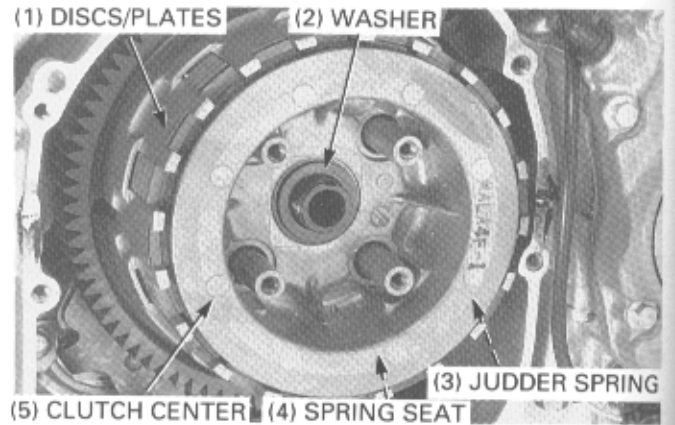
### Tool :

Clutch center holder      07JMB - MN50300 or  
   07HGB - 001000A (U.S.A. only)

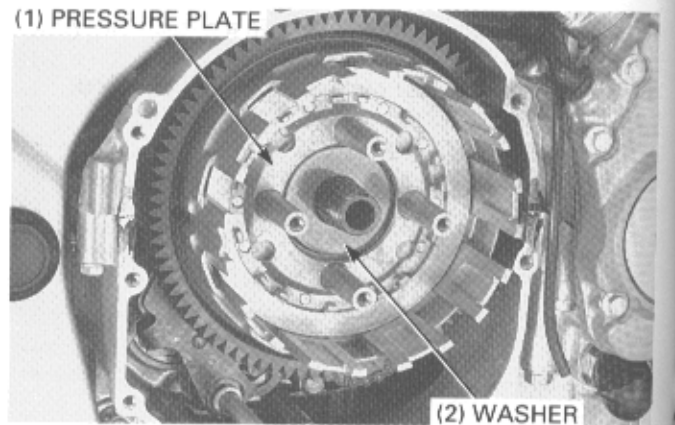
Remove the clutch center lock nut.



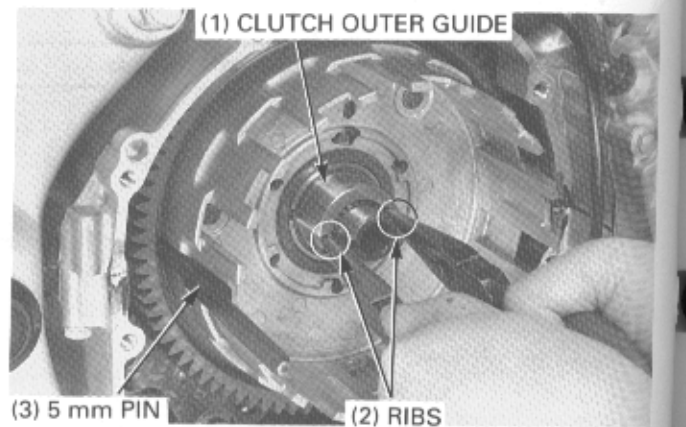
Remove the lock washer, thrust washer, clutch center, judder spring and spring seat.  
Remove the nine clutch discs and eight clutch plates.



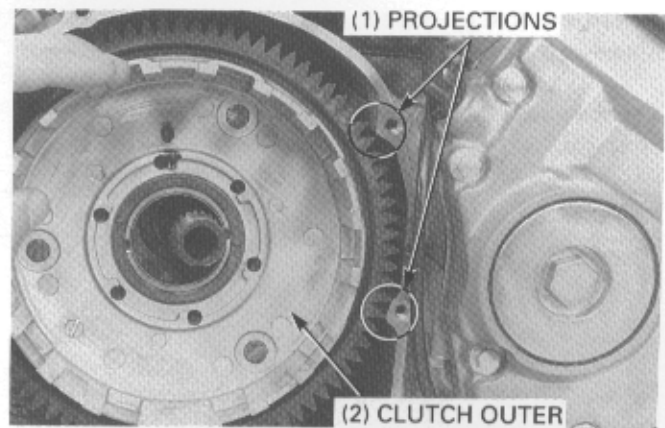
Remove the clutch pressure plate and thrust washer.



Insert a 5 mm pin (or suitable tool) into the holes in the primary driven gears to align the gear teeth.  
Pull the clutch outer guide out by pinching the ribs on the clutch outer guide and sliding the guide forward.



Align the projections of the crankcase with the teeth of the primary driven gears and remove the clutch outer from the mainshaft.

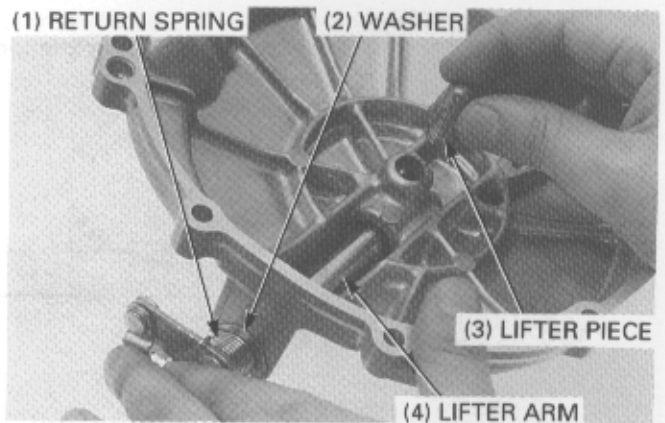


### INSPECTION

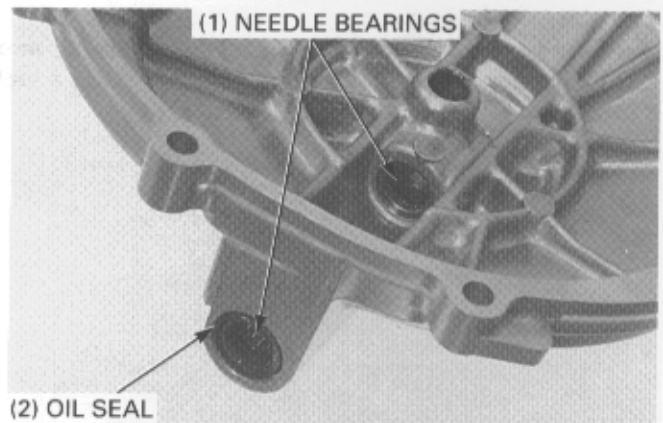
#### CLUTCH LIFTER PIECE/ARM

Remove the clutch lifter piece.  
Remove the clutch lifter arm, washer and return spring.

Check the spring for fatigue or damage.  
Check the lifter piece and lifter arm for damage or bending.

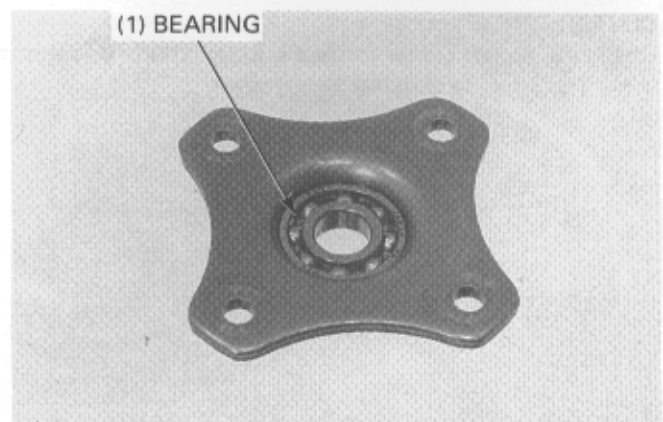


Check the needle bearings for wear, damage or loose fit.  
Check the oil seal for fatigue or damage.



#### LIFTER PLATE BEARING

Check the lifter plate bearing for damage.  
Turn the bearing inner race with your finger. The bearing should turn smoothly and quietly without play.  
Also check that the bearing outer race fits tightly in the plate.  
Replace the bearing if necessary.



## CLUTCH/GEARSHIFT LINKAGE

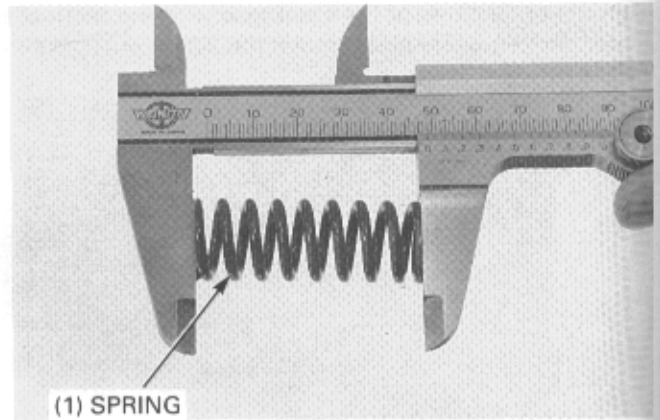
### CLUTCH SPRING

Measure the spring free length.

**Service limit: 48.3 mm (1.90 in)**

#### NOTE

- Replace the clutch springs as a set.



### CLUTCH DISC

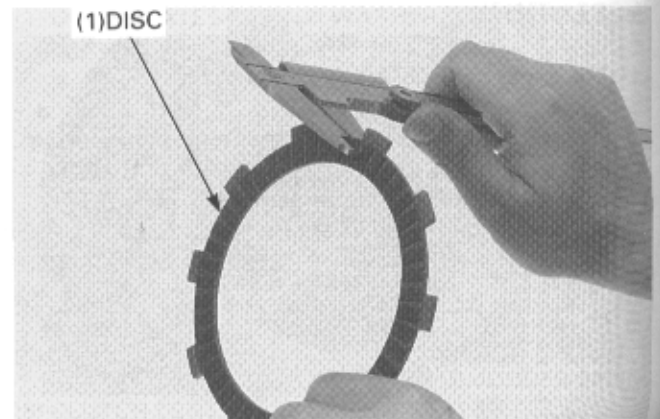
Check the clutch discs for signs of scoring or discoloration.

Measure the thickness of the discs.

**Service limit: 2.60 mm (0.102 in)**

#### NOTE

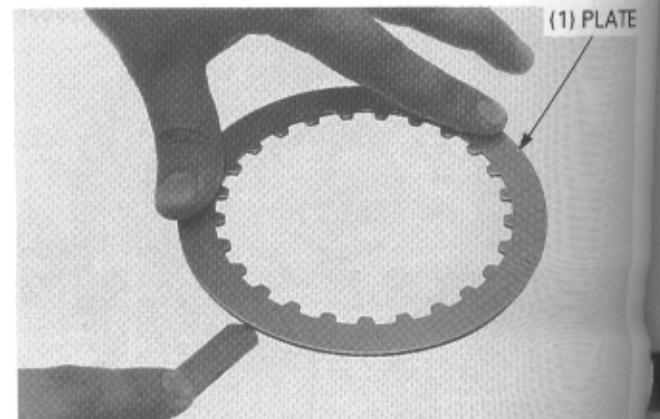
- Replace the discs and plates as a set.



### CLUTCH PLATE

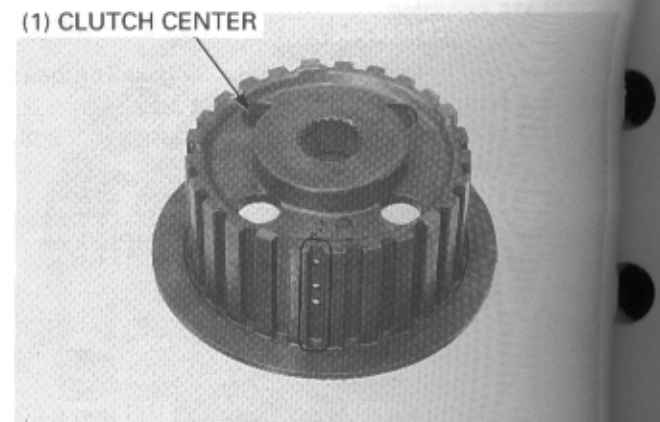
Check the plate for excessive warpage or discoloration. Check the plate warpage on a surface plate using a feeler gauge.

**Service limit: 0.30 mm (0.012 in)**



### CLUTCH CENTER

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

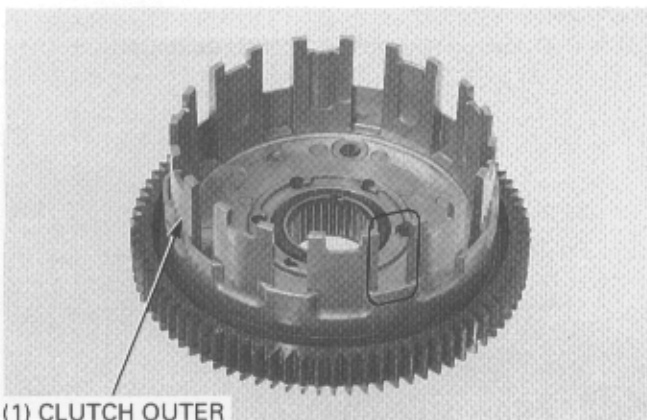


## CLUTCH OUTER

Check the clutch outer for nicks, indentations or abnormal wear made by the clutch discs.

Check the serrated teeth of the primary driven gear for wear or damage.

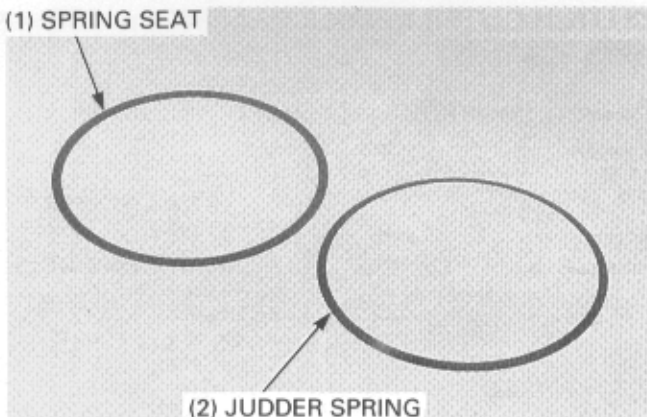
Check the needle bearing for wear or damage.



(1) CLUTCH OUTER

## JUDDER SPRING/SRING SEAT

Check the spring seat and judder spring for distortion, wear or damage.



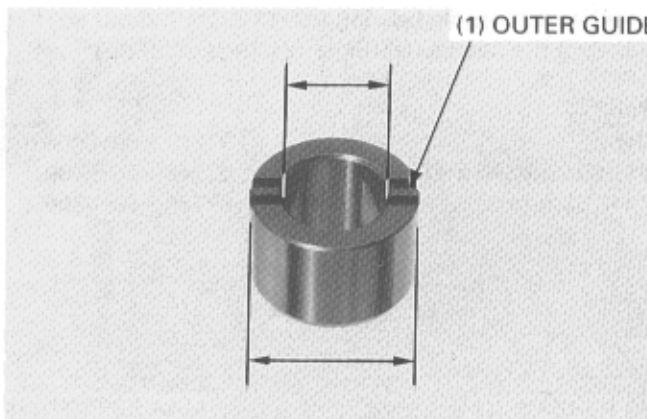
(1) SPRING SEAT

(2) JUDDER SPRING

## CLUTCH OUTER GUIDE

Measure the clutch outer guide.

Service limit: O.D.: 34.965 mm (1.3766 in)  
I.D.: 22.017 mm (0.8668 in)

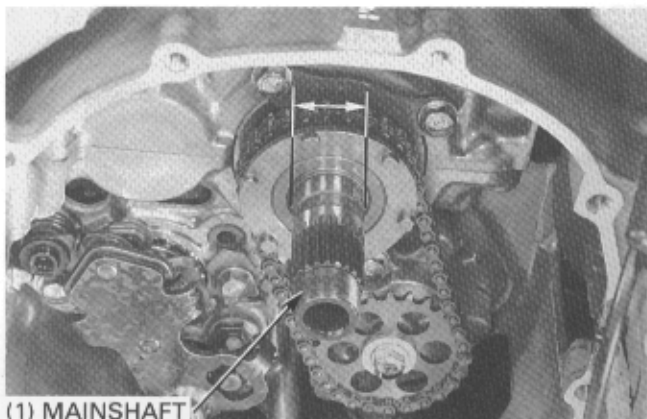


(1) OUTER GUIDE

## MAINSHAFT

Measure the mainshaft O.D. at the clutch outer guide.

Service limit: 21.95 mm (0.864 in)

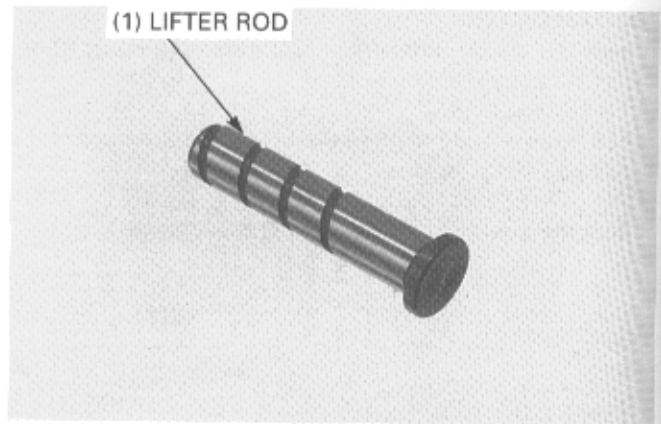


(1) MAINSHAFT

## CLUTCH/GEARSHIFT LINKAGE

### CLUTCH LIFTER ROD

Check the clutch lifter rod for wear or damage.

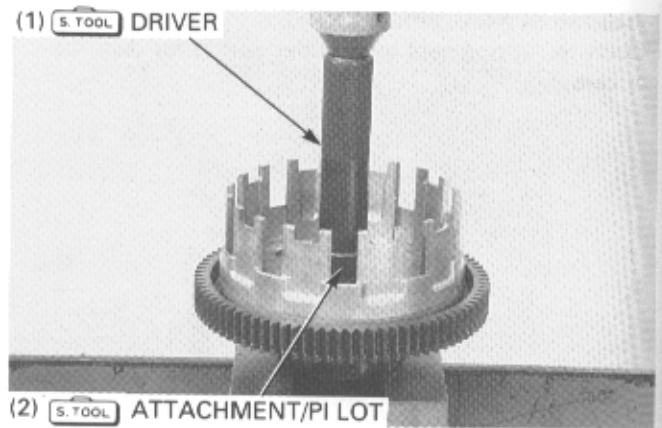


### CLUTCH OUTER NEEDLE BEARING REPLACEMENT

Press the needle bearing out of the clutch outer.

**Tool:**

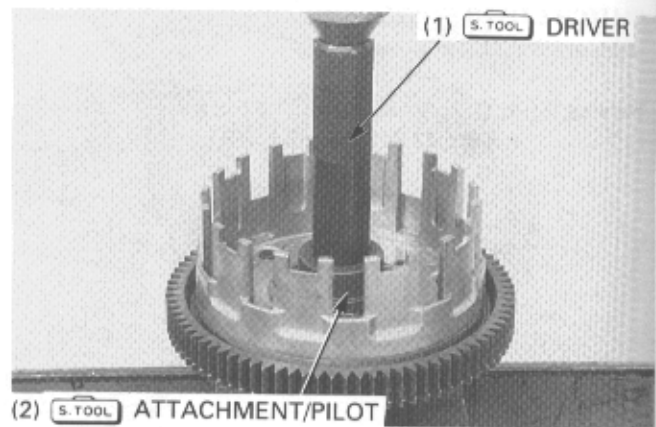
Driver	07749 - 0010000
Attachment, 37 x 40 mm	07746 - 0010200
Pilot, 35 mm	07746 - 0040800



Press a new needle bearing into the clutch outer so that the edges of the needle bearing and clutch outer are flush.

**Tool:**

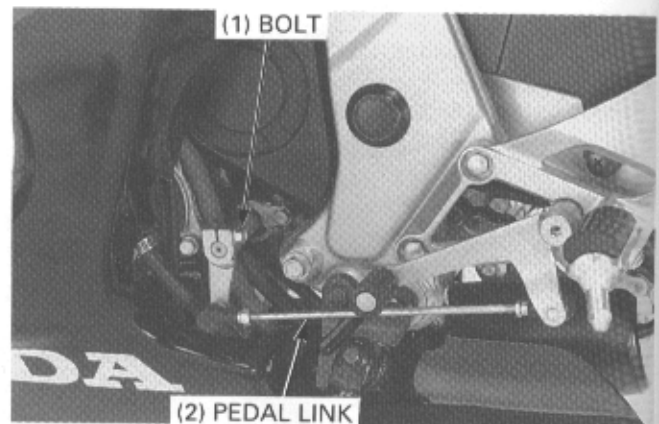
Driver	07749 - 0010000
Attachment, 42 x 47 mm	07746 - 0010300
Pilot, 35 mm	07746 - 0040800



## GEARSHIFT LINKAGE

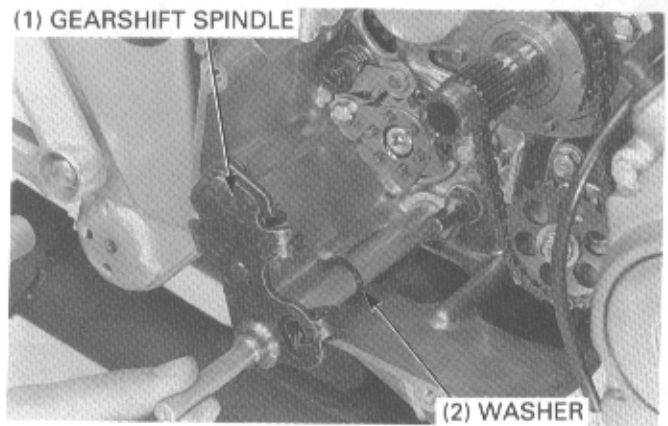
### REMOVAL

Remove the gearshift pedal pinch bolt and pedal link.  
Remove the clutch outer (page 9-3).

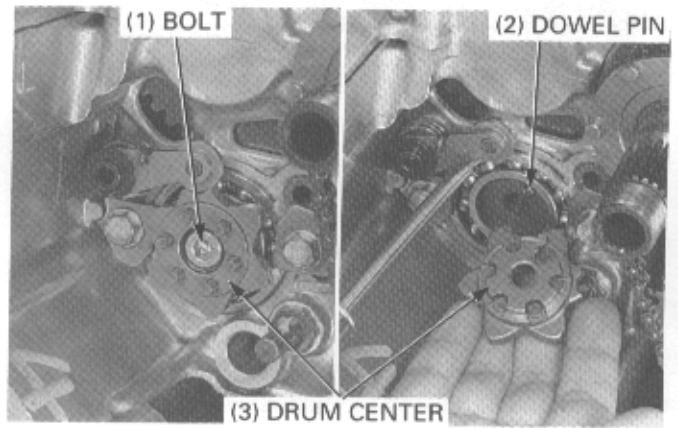




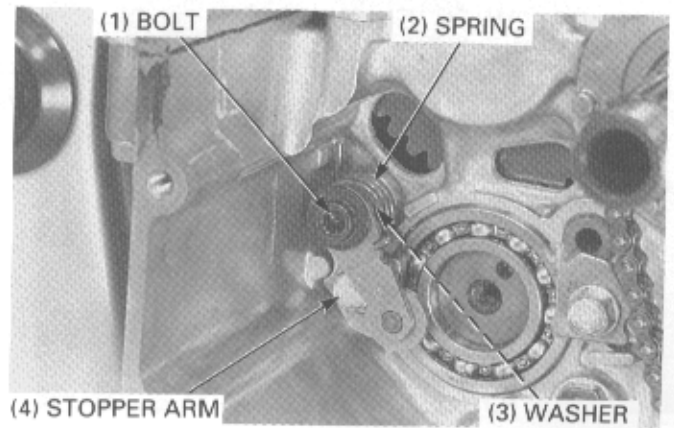
Remove the gearshift spindle assembly and washer.



Remove the shift drum center bolt, shift drum center and dowel pin.

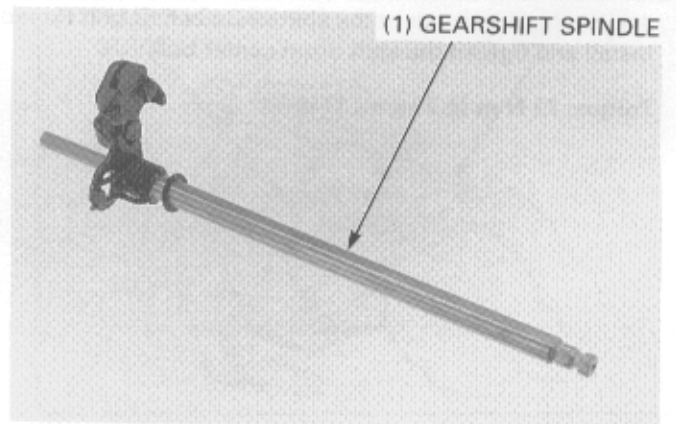


Remove the stopper arm bolt, stopper arm, washer and return spring.



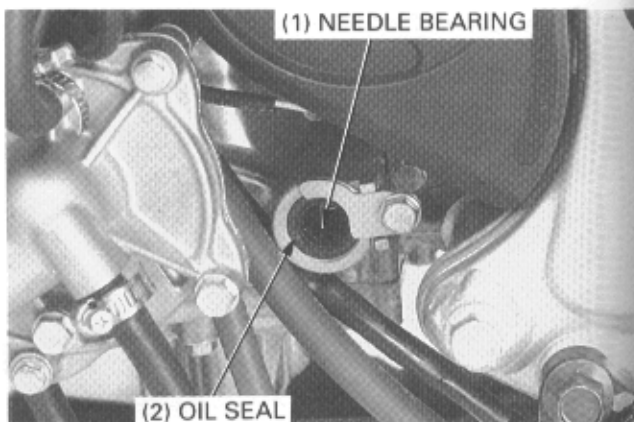
**INSPECTION**

Check the gear shift spindle for wear or damage.  
Check the return spring for fatigue or damage.



## CLUTCH/GEARSHIFT LINKAGE

Check the needle bearing for wear or damage.  
Check the oil seal for fatigue or damage.

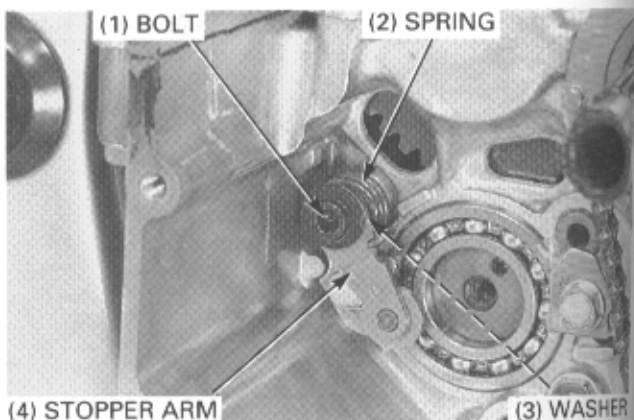


### INSTALLATION

Install the return spring, washer and stopper arm and tighten the stopper arm bolt.

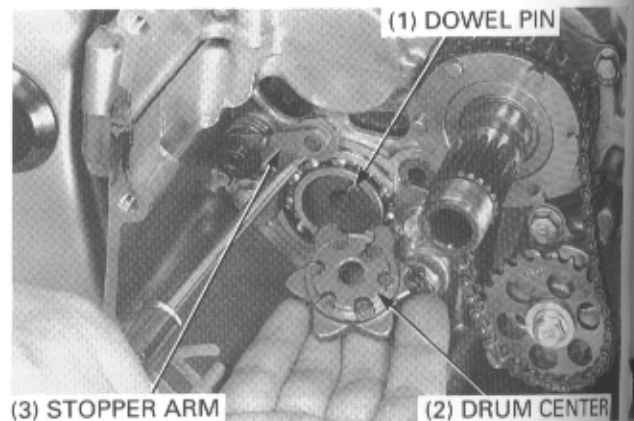
**Torque: 12 N·m (1.2 kg-m, 9 lb-ft)**

Check the stopper arm for proper operation.



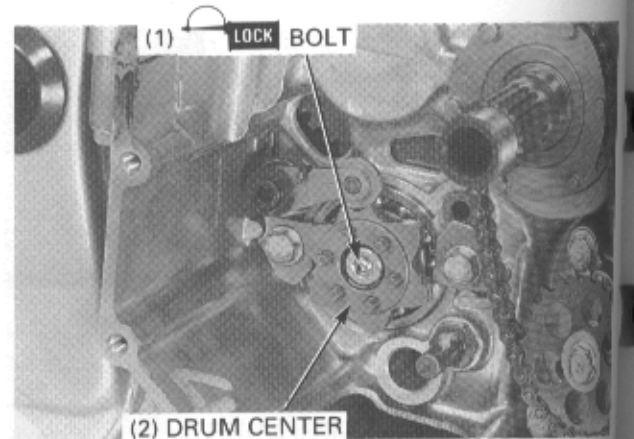
Install the dowel pin into the shift drum.

Move the stopper arm out of the way using a screw driver. Align the shift drum center hole with the dowel pin and slip it in to place.



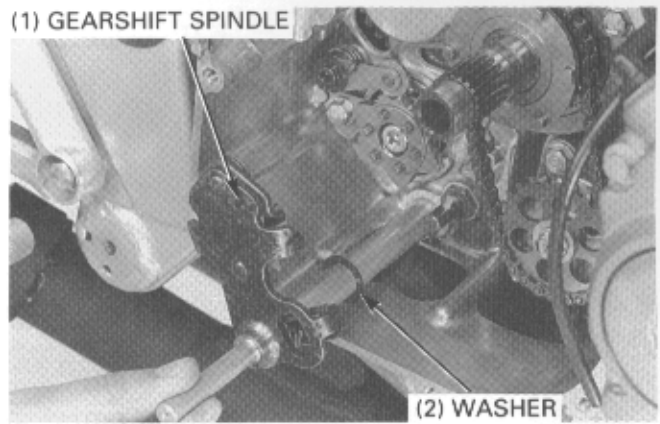
Apply a locking agent to the shift drum center bolt threads. Install and tighten the shift drum center bolt.

**Torque: 23 N·m (2.3 kg-m, 17 lb-ft)**



Install the gearshift spindle and washer.

(1) GEARSHIFT SPINDLE



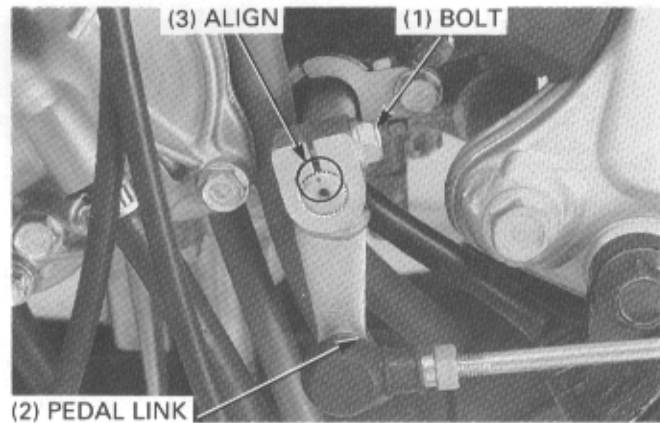
Install the gearshift pedal link by aligning the punch mark with the slit in the link.

Install and tighten the gearshift pedal pinch bolt.

**Torque: 20 N·m (2.0 kg-m, 14 lb-ft)**

Move the gearshift pedal and check the shift mechanism for proper, smooth operation.

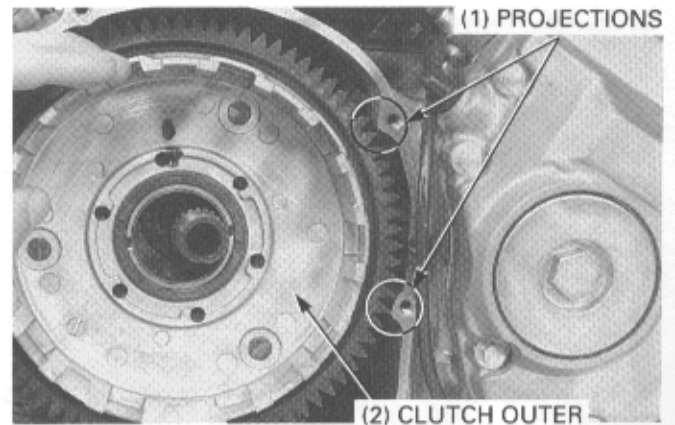
Install the clutch (see below).



## CLUTCH INSTALLATION

Apply molybdenum oil solution to the clutch outer needle bearing.

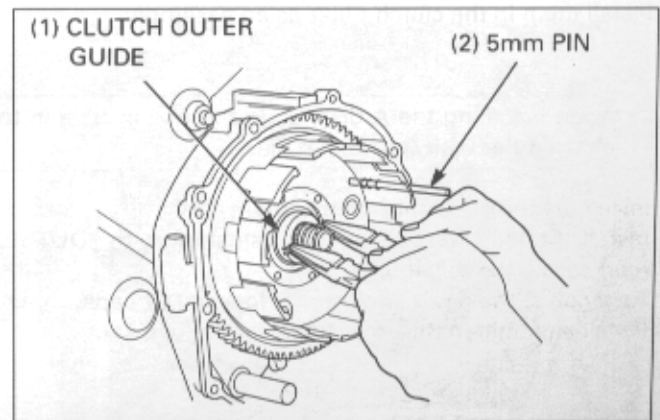
Install the clutch outer onto the mainshaft by positioning the projections of the crankcase between the teeth of the primary driven gears.



Line up the gear teeth of the primary driven gears with a 5 mm pin (or suitable tool).

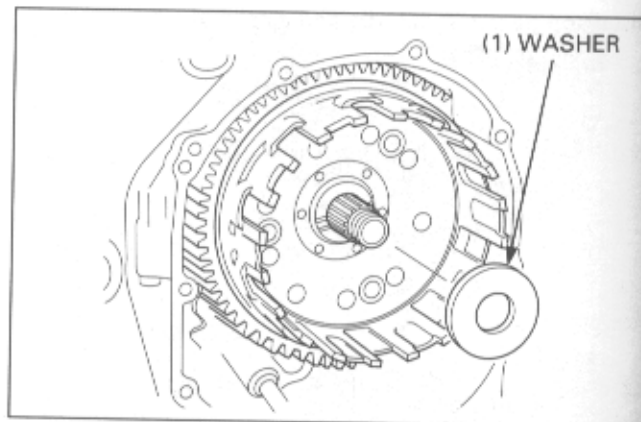
Apply molybdenum oil solution to the clutch outer guide. Install the clutch outer guide with the ribbed side facing out. Install the clutch outer, aligning the clutch outer holes with the oil pump driven sprocket while pushing in on the clutch outer lightly.

After installing the clutch outer guide, remove the 5 mm pin from the primary driven gears.



## CLUTCH/GEARSHIFT LINKAGE

Install the washer onto the mainshaft.



Coat the clutch discs with clean engine oil.

### NOTE

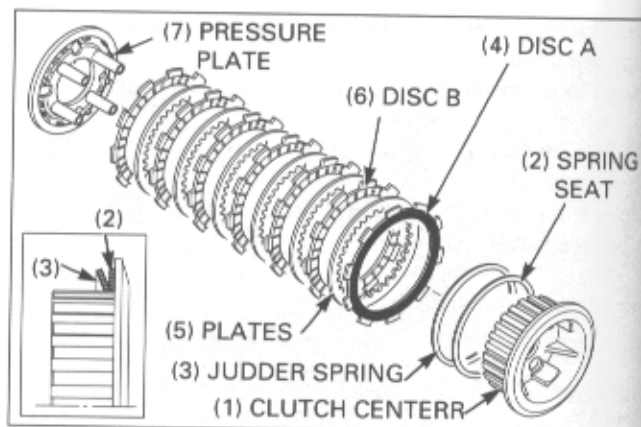
- Do not confuse the "A" and "B" clutch discs. The "A" disc is black and the "B" discs are brown.

Install the spring seat, judder spring and clutch disc A on the clutch center.

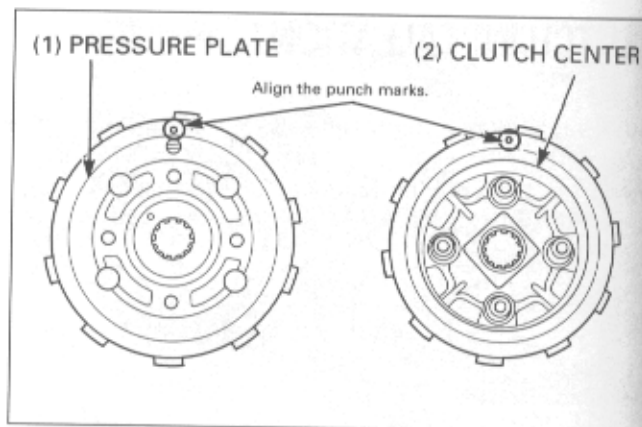
### NOTE

- Note the direction of the s seat, judder spring and disc A.

Install the B clutch discs and clutch plates on the clutch center.



Install the pressure plate to the clutch center aligning the punch marks on the clutch center and pressure plate.



Install them in the clutch outer as an assembly.

### NOTE

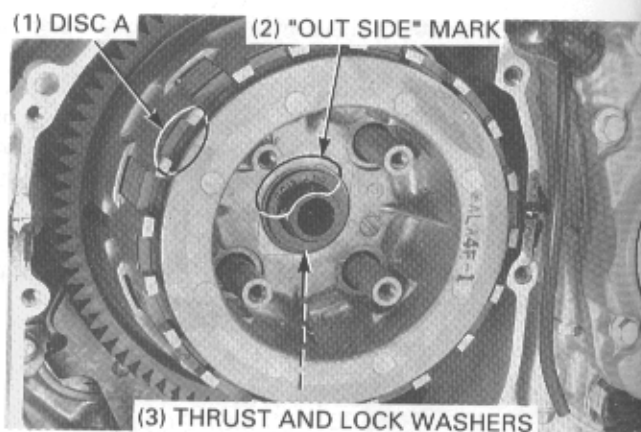
- When installing the A disc, align the end groove in the clutch outer with the tabs of disc.

Install the thrust washer on the mainshaft.

Install the lock washer on the mainshaft with "OUTSIDE" mark facing the outside.

Apply oil to the new clutch center lock nut threads.

Install and tighten the new clutch center lock nut.



Hold the pressure plate with the clutch center holder and tighten the lock nut.

Tool:

Clutch center holder      07JMB – MN50300 or  
 07HGB – 001000A (U.S.A. only)

Torque: 110 N·m (11.0 kg-m, 80 lb-ft)

Stake the lock nut into the mainshaft groove.

Install the springs onto the bosses of the pressure plate.

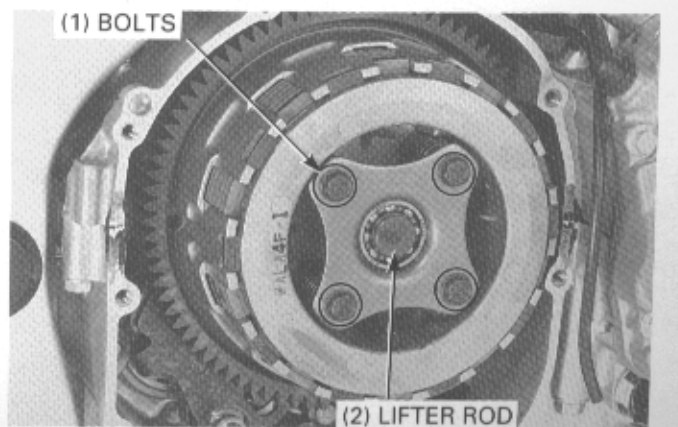
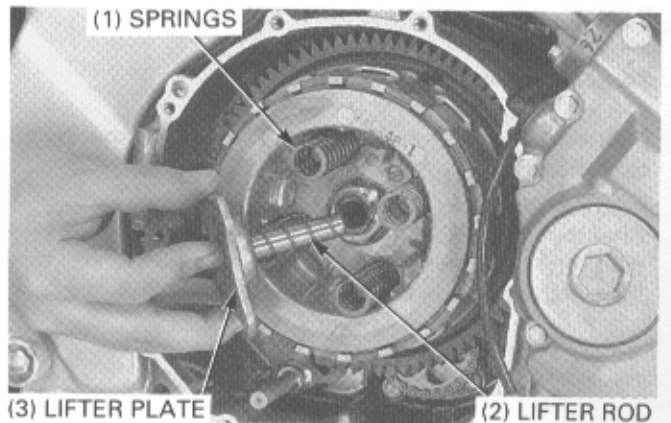
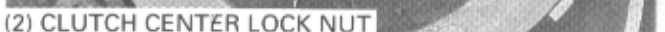
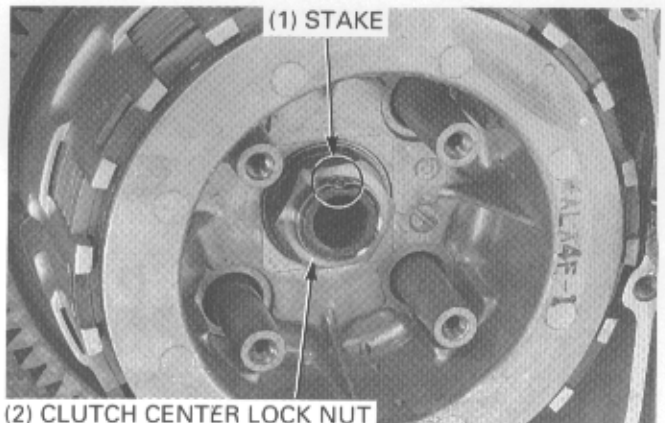
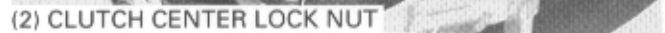
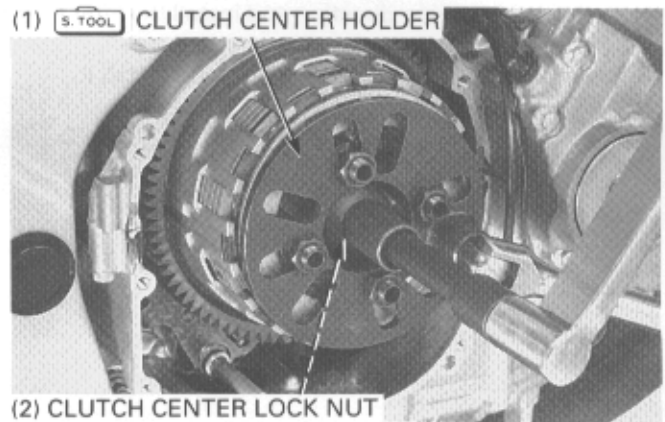
Assemble the clutch lifter rod and clutch lifter plate, and install the assembly to the clutch pressure plate.

Secure the lifter plate by tightening the bolts in a crisscross pattern in several steps.

Torque: 12 N·m (1.2 kg-m, 9 lb-ft)

NOTE

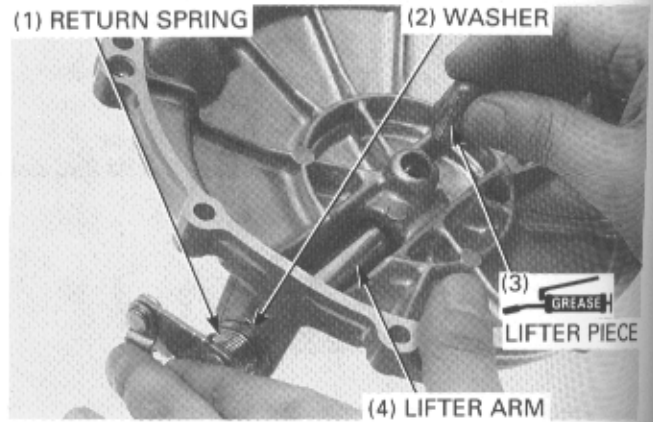
- If the clutch lifter rod comes out while tightening the clutch lifter plate bolts, push the rod all the way in to prevent the rod from being bent or damaged.



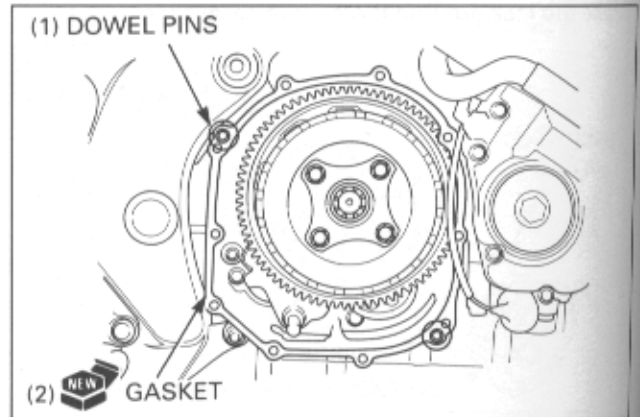
## CLUTCH/GEARSHIFT LINKAGE

Note the return spring direction and install the lifter arm with the spring and washer.

Apply grease to the clutch lifter piece and install it.



Install the dowel pins and new gasket.

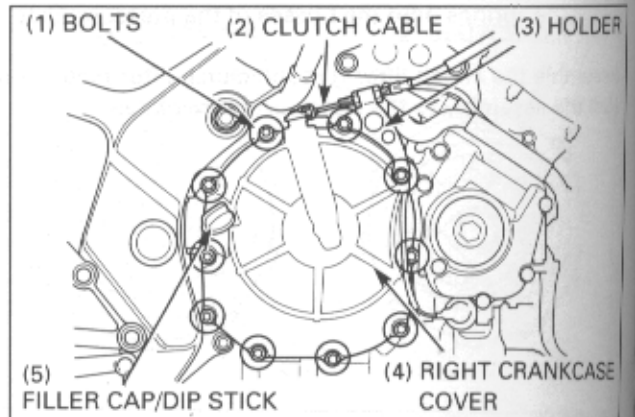


Install the right crankcase cover and bolts.

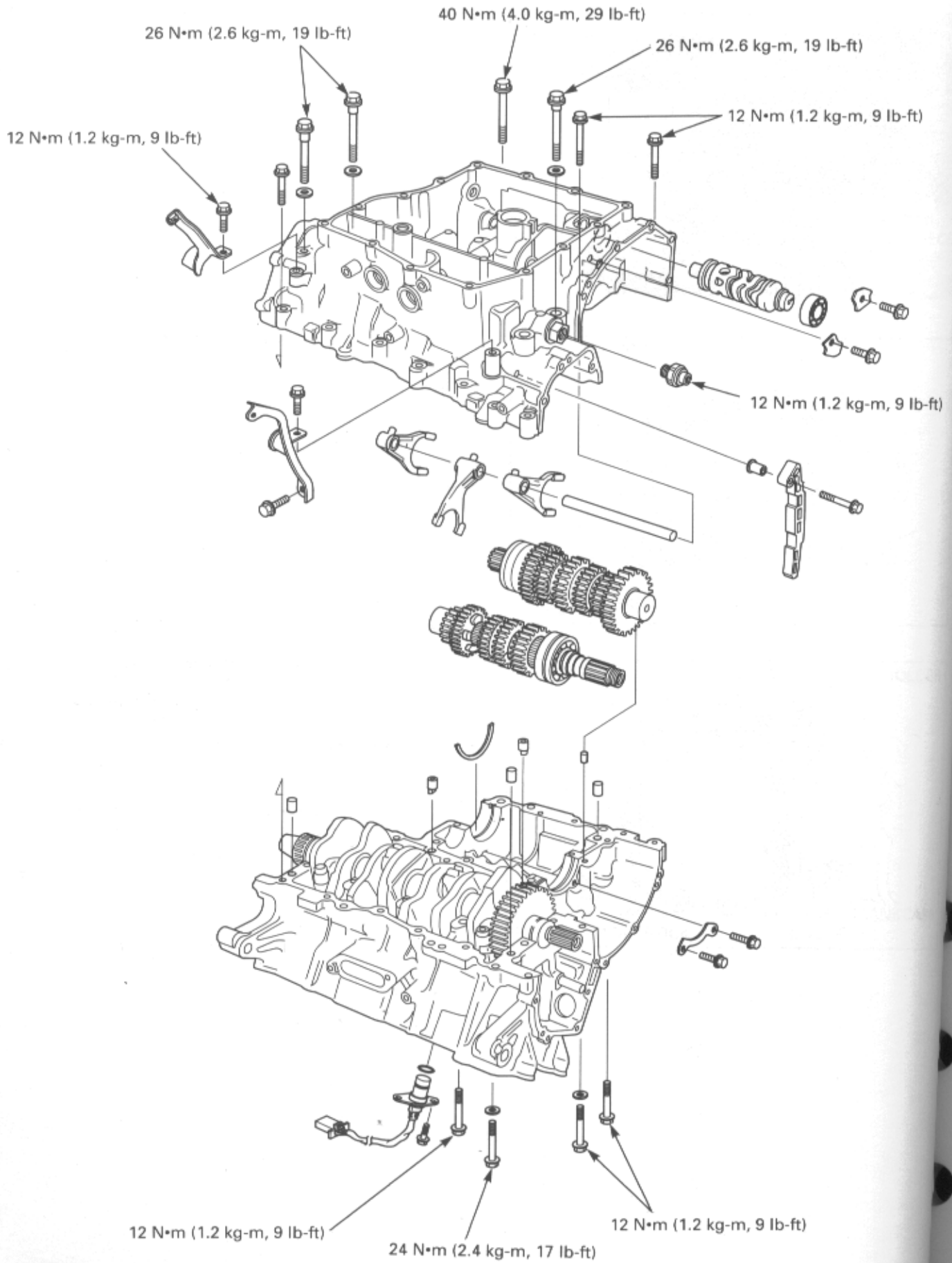
**Torque: 12 N·m (1.2 kg-m, 9 lb-ft)**

Connect the clutch cable to the clutch arm and install the cable holder.

After the clutch system has been serviced, fill the crankcase with the recommended engine oil (page 3-12) and perform the clutch adjustment (page 3-21).



# CRANKCASE/TRANSMISSION



• E  
• F  
SP  
Tra  
mis  
Shift  
fork/  
shaft

# 10. CRANKCASE/TRANSMISSION

<b>SERVICE INFORMATION</b>	<b>10-1</b>	<b>TRANSMISSION</b>	<b>10-4</b>
<b>TROUBLESHOOTING</b>	<b>10-2</b>	<b>CRANKCASE ASSEMBLY</b>	<b>10-12</b>
<b>CRANKCASE SEPARATION</b>	<b>10-3</b>		

## SERVICE INFORMATION

### GENERAL

- The crankcase halves must be separated to service the crankshaft, piston, cylinder and transmission (including the shift fork and shift drum). To service these parts, the engine must be removed from the frame (section 7).
- The following parts must be removed before separating the crankcase:
  - Oil pan, oil pump and oil cooler (Section 4)
  - Water pump (Section 6)
  - Cylinder head (Section 8)
  - Clutch and gearshift linkage (Section 9)
  - Left crankcase cover (Section 15)
  - Ignition pulse generator cover and rotor (Section 16)
  - Fly wheel (Section 17)
  - Starter motor and starter clutch (Section 17)
- Be careful not to damage the crankcase mating surface and crankshaft main journal bearings when servicing.
- Prior to assembling the crankcase halves, apply sealant to their mating surfaces. Wipe off excess sealant thoroughly.

**10**

### SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Trans- mission	Gear I.D.	M5, M6	28.000 – 28.021 (1.1024 – 1.1032)	28.04 (1.104)
		C2, C3, C4	31.000 – 31.025 (1.2205 – 1.2215)	31.04 (1.222)
	Gear bushing O.D.	M5, M6	27.959 – 27.980 (1.1007 – 1.1016)	27.94 (1.100)
		C2	30.959 – 30.980 (1.2189 – 1.2197)	30.94 (1.218)
		C3, C4	30.950 – 30.975 (1.2185 – 1.2195)	30.93 (1.218)
	Gear bushing I.D.	M5	24.985 – 25.006 (0.9837 – 0.9845)	25.016 (0.9849)
		C2	27.985 – 28.006 (1.1018 – 1.1026)	28.021 (1.1032)
	Gear-to-bushing clearance	at M5, M6 gear	0.020 – 0.062 (0.0008 – 0.0024)	—
		at C2, C3, C4 gear	0.020 – 0.070 (0.0008 – 0.0028)	—
	Mainshaft O.D.	at M5 gear bushing	24.967 – 24.980 (0.9830 – 0.9835)	24.960 (0.9827)
at clutch outer guide		21.980 – 21.993 (0.8654 – 0.8659)	21.95 (0.8694)	
Countershaft O.D.	at C2 gear bushing	27.967 – 27.980 (1.1011 – 1.1016)	27.96 (1.101)	
Gear bushing-to-shaft clearance	M5 gear	0.005 – 0.039 (0.0002 – 0.0015)	—	
	at C2 gear	0.005 – 0.039 (0.0002 – 0.0015)	—	
Shift fork/ shaft	Fork claw thickness	5.93 – 6.00 (0.233 – 0.236)	5.90 (0.232)	
	Fork I.D.	12.000 – 12.021 (0.4724 – 0.4733)	12.030 (0.4736)	
	Shaft O.D.	11.957 – 11.968 (0.4707 – 0.4712)	11.95 (0.470)	



## CRANKCASE/TRANSMISSION

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### TORQUE VALUES

Main journal bolt	26 N•m (2.6 kg-m, 19 lb-ft)	Apply oil to the threads.
Crankcase bolt	(6 mm)	12 N•m (1.2 kg-m, 9 lb-ft)
	(8 mm)	24 N•m (2.4 kg-m, 17 lb-ft)
	(10 mm)	40 N•m (4.0 kg-m, 29 lb-ft)
Sealing bolt	(20 mm)	30 N•m (3.0 kg-m, 22 lb-ft) Apply sealant to the threads.
	(14 mm)	25 N•m (2.5 kg-m, 18 lb-ft) Apply sealant to the threads.

### TOOLS

Inner driver.	07746 - 0030100
Attachment, 25 mm I.D.	07746 - 0030200

### TROUBLESHOOTING

#### Hard to shift

- Improper clutch adjustment
- Incorrect engine oil viscosity
- Improper clutch operation
- Bent shift forks
- Bent shift fork shaft
- Bent shift fork claw
- Damaged shift drum cam grooves
- Bent shift spindle

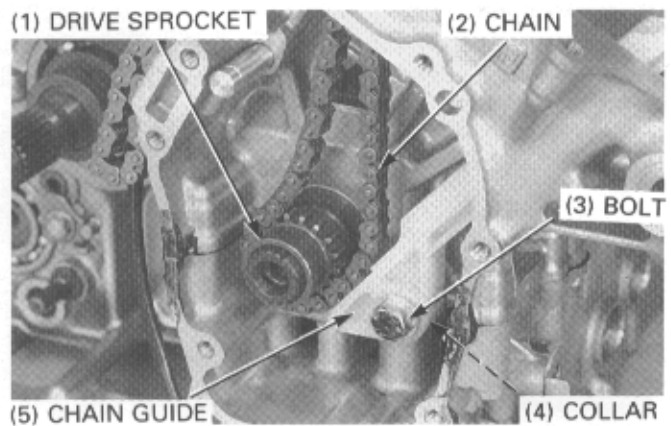
#### Transmission jumps out of gear

- Worn gear dogs or slots
- Bent fork shaft
- Broken shift drum stopper
- Worn or bent shift forks
- Broken shift linkage return spring
- Damaged shift drum cam grooves

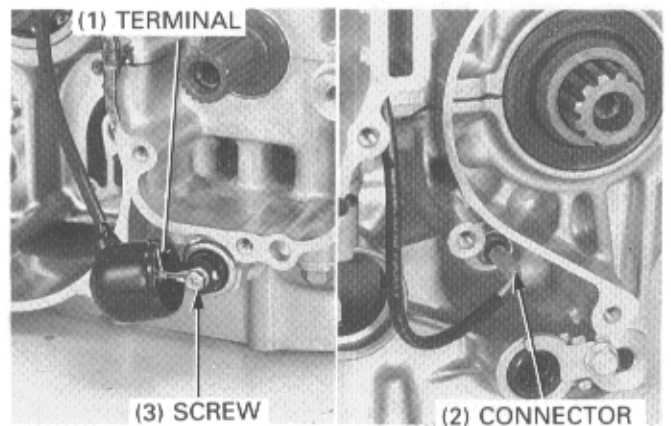
## CRANKCASE SEPARATION

Refer to Service Information (page 10-1) for removal of necessary parts before disassembling the crankcase.

Remove the bolt, collar and cam chain guide.  
Remove the cam chain and cam chain drive sprocket.



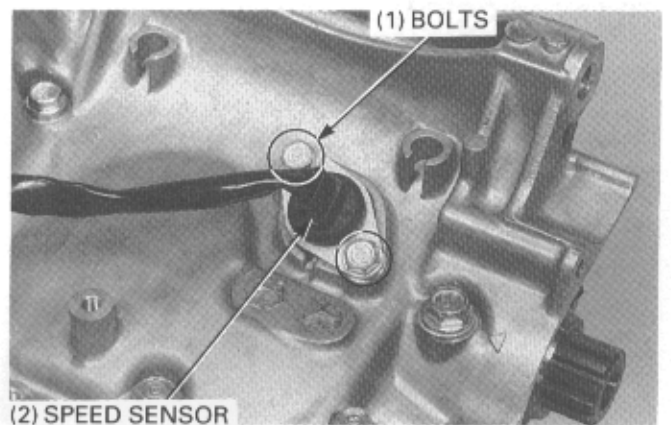
Remove the screw and oil pressure switch terminal.  
Disconnect the neutral switch connector.



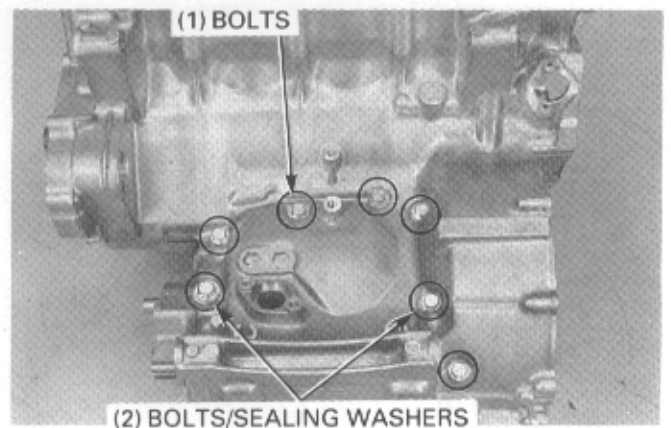
Remove the bolts and speed sensor.

### CAUTION

• Remove the speed sensor before separating the crankcase. Do not separate or assemble the crankcase with the speed sensor installed.

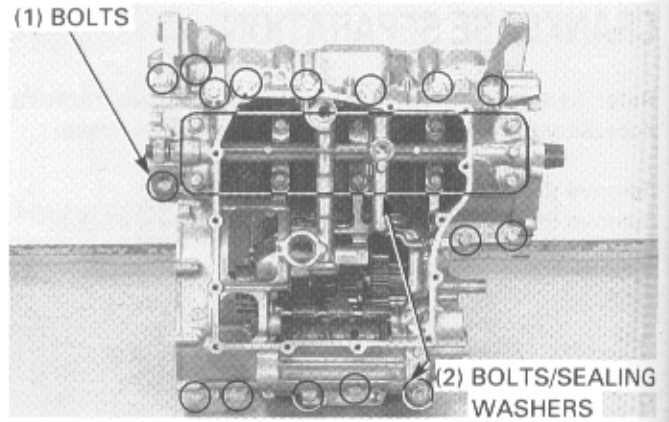


Remove the upper crankcase bolts and sealing washers.

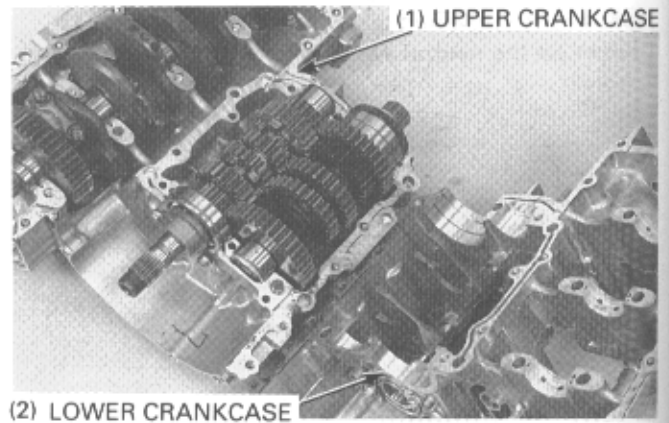


## CRANKCASE/TRANSMISSION

Turn the engine upside down.  
Loosen the lower crankcase bolts in a crisscross pattern from the outside to inside in several steps.  
Remove the bolts and sealing washers.



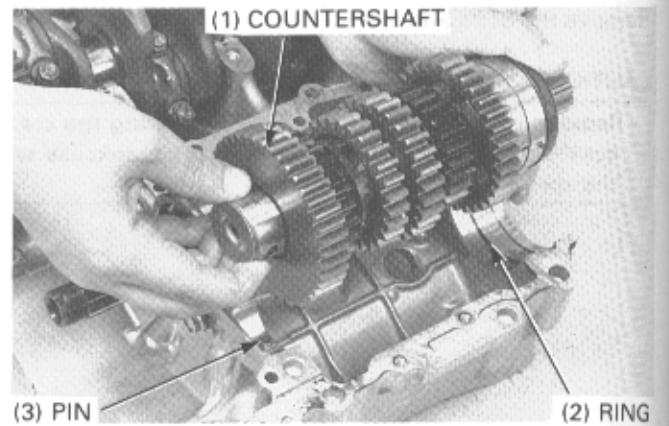
Remove the lower crankcase from the upper crankcase.  
Note the direction of the oil orifices.  
Remove the dowel pins and oil orifices.



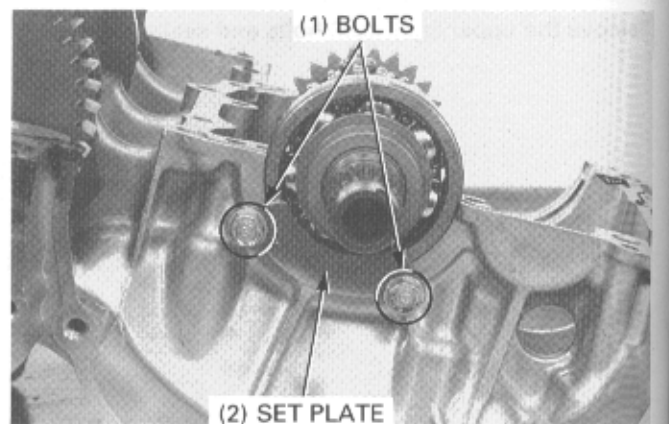
## TRANSMISSION

### REMOVAL

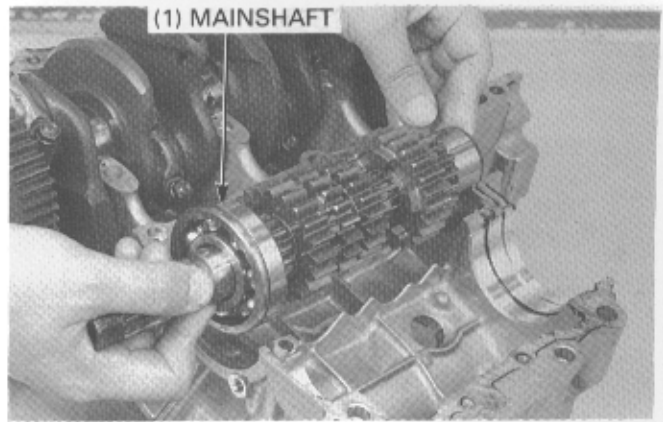
Remove the countershaft assembly.  
Note the location of the pin and bearing ring.



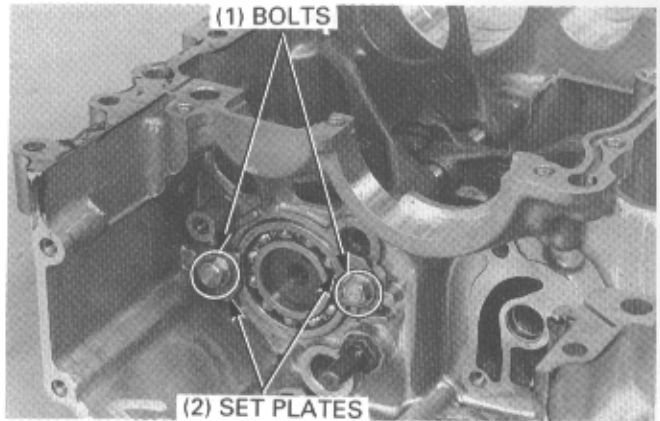
Remove the bolts and mainshaft set plate.



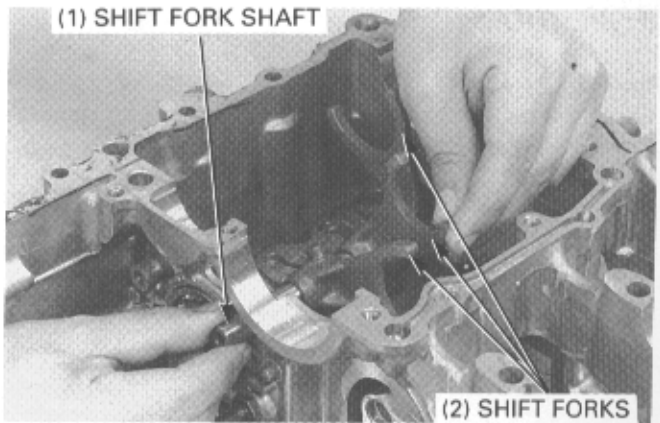
Remove the mainshaft assembly.



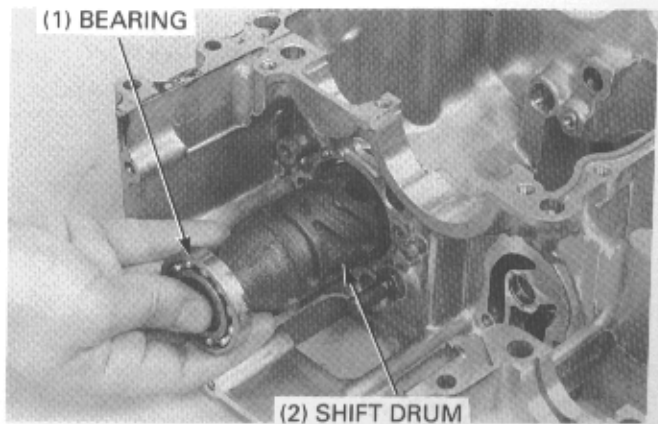
Remove the bolts and shift drum set plates.



Remove the shift fork shaft and shift forks.



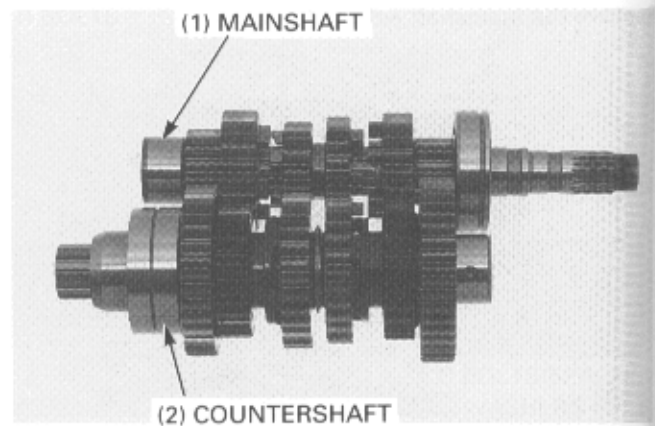
Remove the shift drum bearing and shift drum.



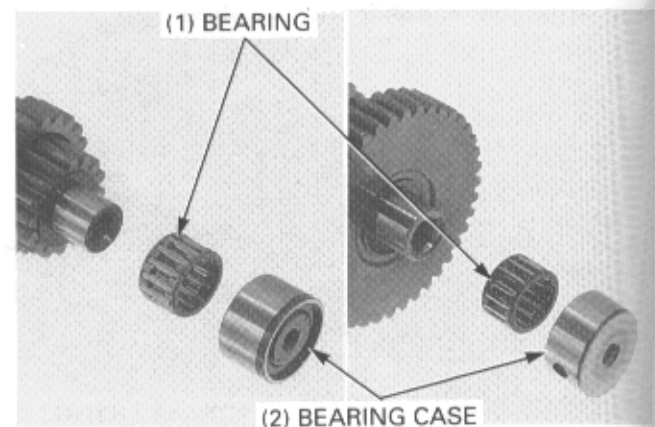
## CRANKCASE/TRANSMISSION

### TRANSMISSION DISASSEMBLY

Disassemble the mainshaft and countershaft.



Check the mainshaft and countershaft needle bearings for damage or excessive wear.



### INSPECTION

#### GEARS

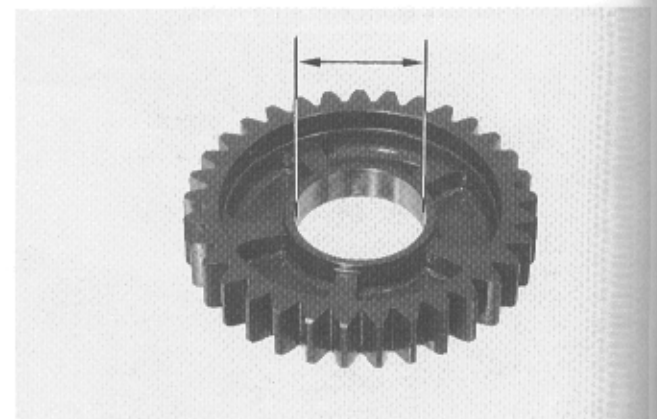
Check the gear dogs, dog holders and teeth for damage or excessive wear.

Measure the I.D. of each gear.

#### Service limits:

M5, M6: 28.04 mm (1.104 in)

C2, C3, C4: 31.04 mm (1.222 in)



#### BUSHINGS

Check the bushings for damage or excessive wear.  
Measure the O.D. of each bushing.

#### Service limits:

M5, M6: 27.94 mm (1.100 in)

C3, C4: 30.93 mm (1.218 in)

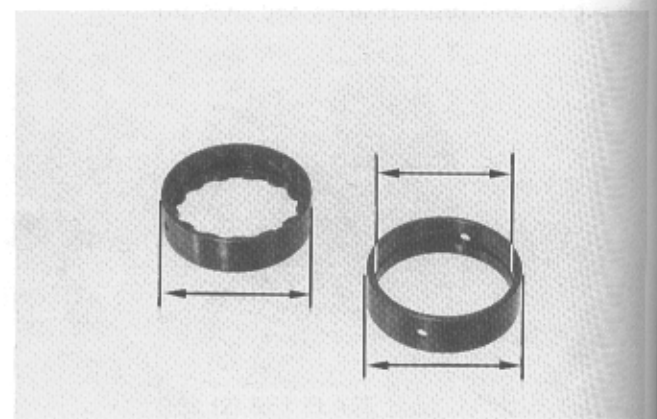
C2: 30.94 mm (1.218 in)

Measure the I.D. of each bushing.

#### Service limits:

M5: 25.016 mm (0.9849 in)

C2: 28.021 mm (1.1032 in)



**MAINSHAFT/COUNTERSHAFT**

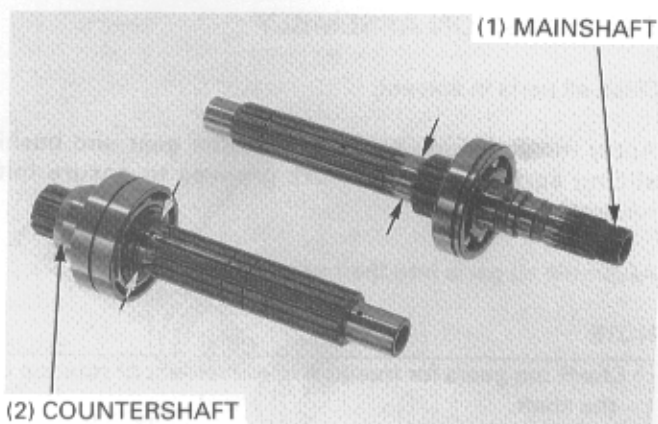
Check the spline grooves and sliding surfaces for damage or abnormal wear.

Measure the O.D. of the mainshaft and countershaft at the gear and bushing sliding areas.

**Service limits:**

**Mainshaft at M5 gear bushing: 24.960 mm (0.9827 in)**

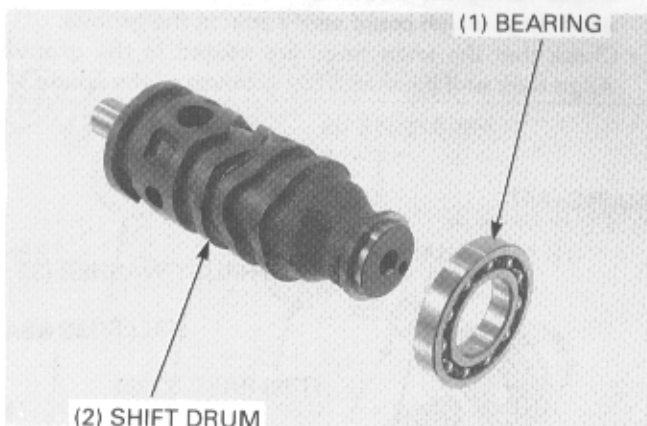
**Countershaft at C2 gear bushing: 27.96 mm (1.101 in)**



**SHIFT DRUM**

Inspect the shift drum end for scoring, scratches or evidence of insufficient lubrication.

Check the shift drum grooves for abnormal wear or damage.



**SHIFT FORK**

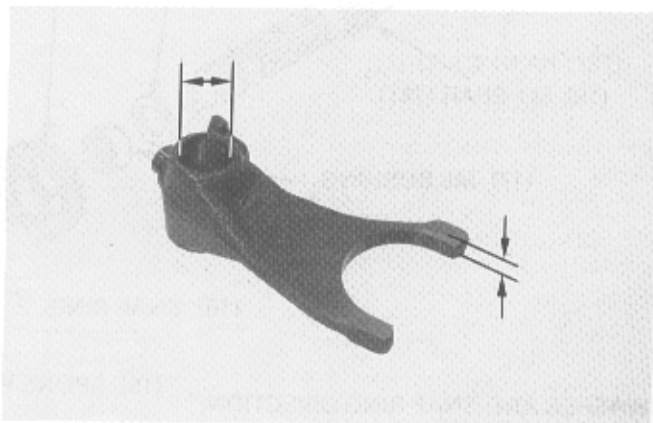
Check for abnormal wear or deformation.

Measure the shift fork I.D. and claw thickness.

**Service limits:**

**I.D: 12.030 mm (0.4736 in)**

**Claw thickness: 5.90 mm (0.232 in)**

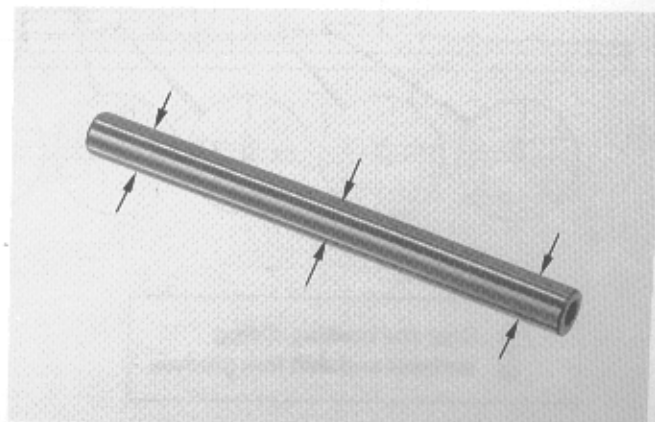


**SHIFT FORK SHAFT**

Check for abnormal wear or damage.

Measure the shift fork O.D.

**Service limits: 11.95 mm (0.470 in)**



# CRANKCASE/TRANSMISSION

## TRANSMISSION ASSEMBLY

Clean all parts in solvent.

Apply molybdenum oil solution to the gear and bushing sliding surface and shift fork grooves to ensure initial lubrication.

Assemble all parts into their original positions.

### NOTE

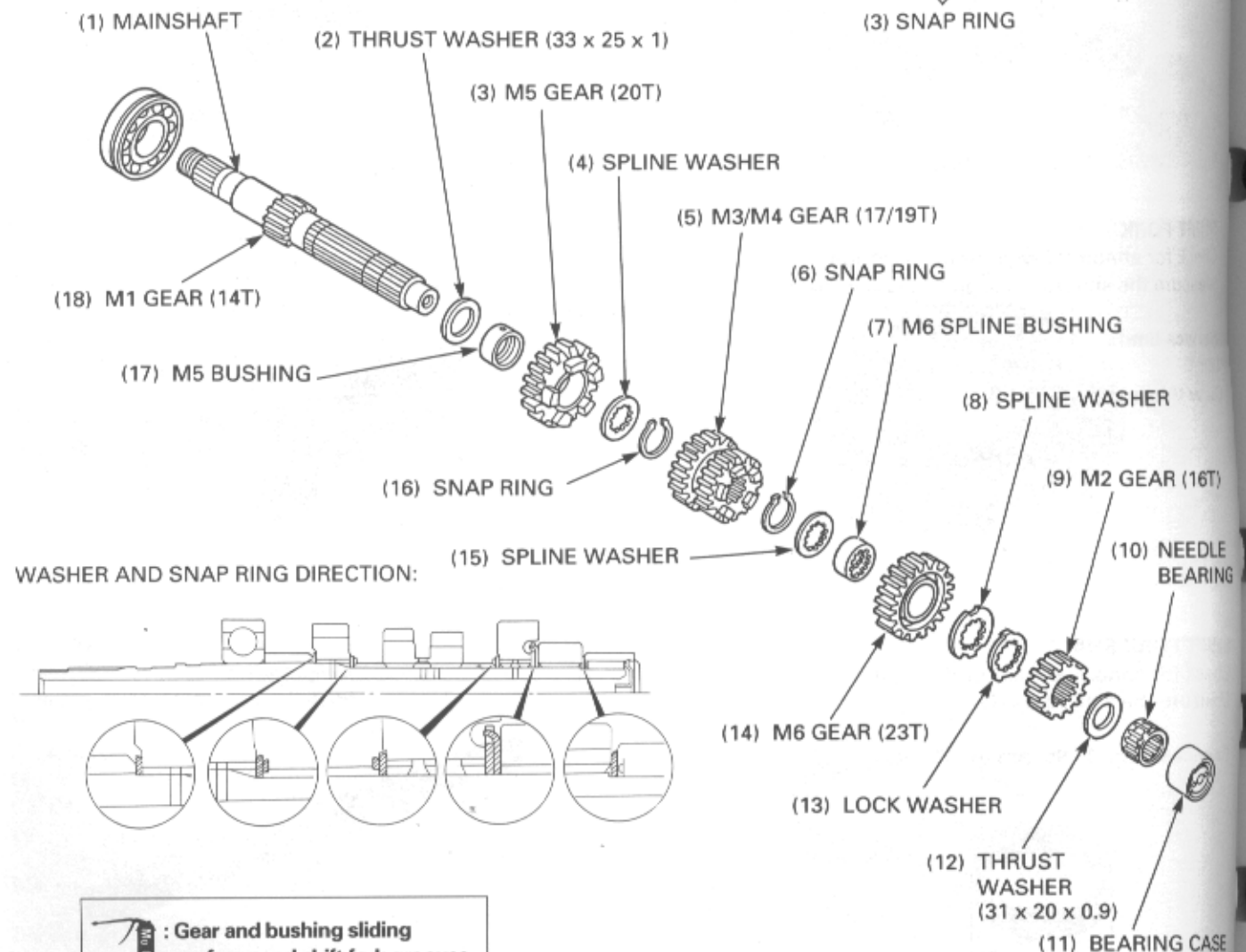
- Check the gears for freedom of movement or rotation on the shaft.
- Install the washers and snap rings with the chamfered edges facing the thrust load side. Do not reuse worn snap rings which could easily spin in the groove.
- Check that the snap rings are seated in the grooves. Align their end gaps with the grooves of the spline.


(1) CORRECT (2) INCORRECT



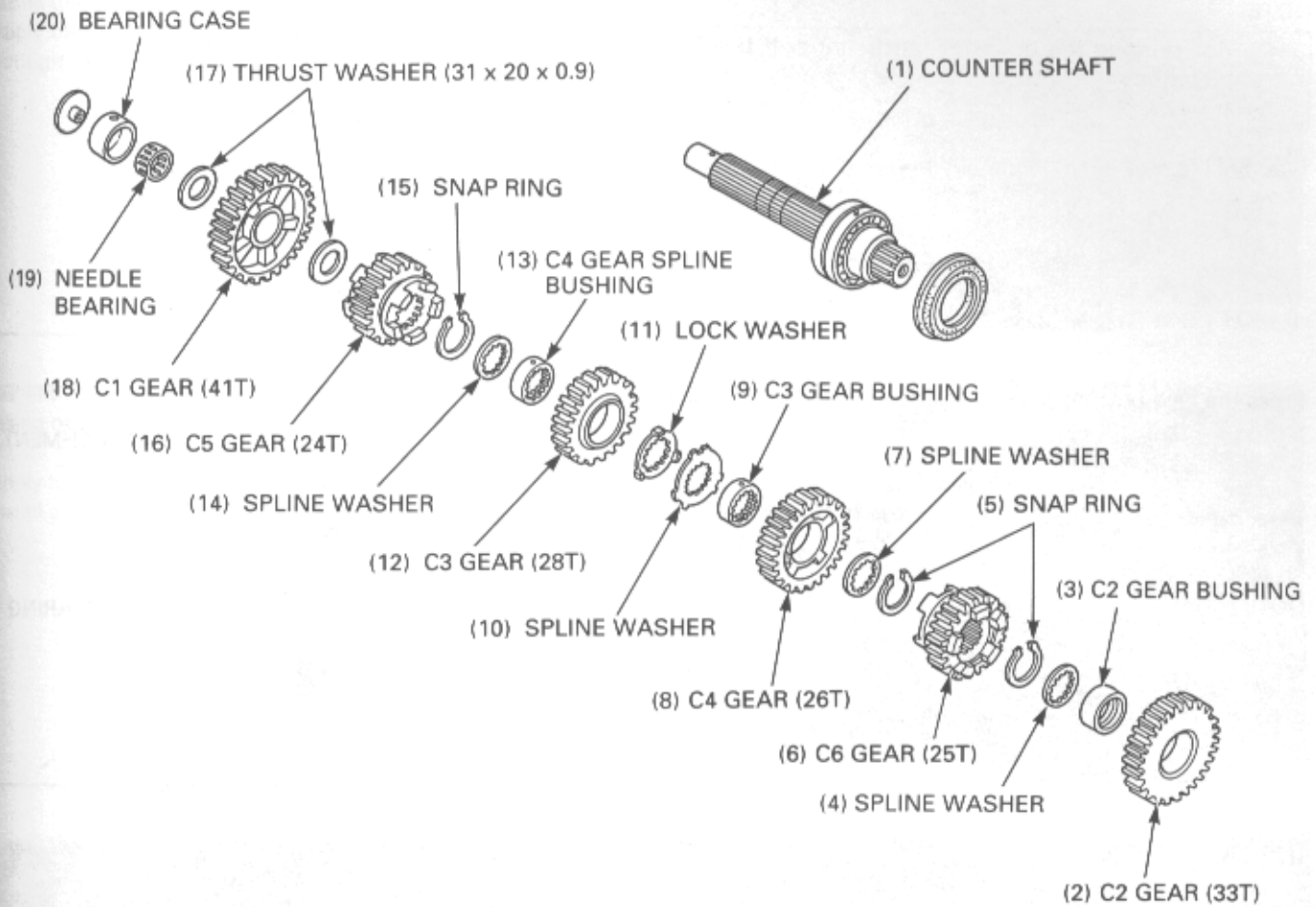
(3) SNAP RING

### MAINSHAFT

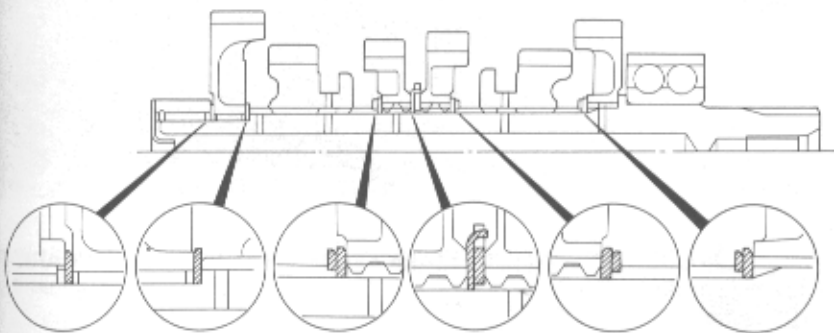



 : Gear and bushing sliding surfaces and shift fork grooves

COUNTERSHAFT



WASHER AND SNAP RING DIRECTION:



 : Gear and bushing sliding surfaces and shift fork grooves



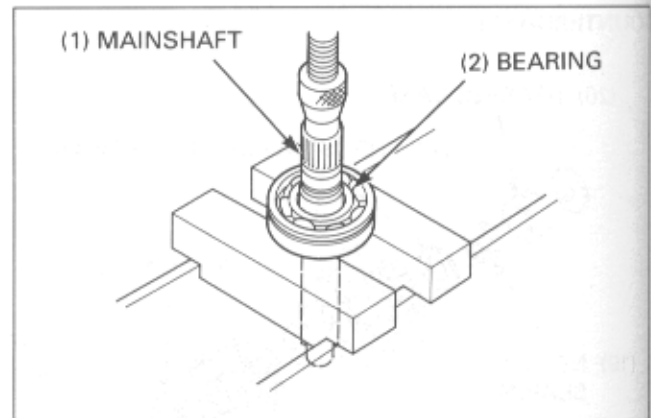
## CRANKCASE/TRANSMISSION

### MAINSHAFT BEARING REPLACEMENT

#### NOTE

- Do not remove the countershaft bearing. If bearing replacement is required, replace the countershaft assembly.

Remove the mainshaft bearing by pressing the mainshaft as shown.



Press the new bearing onto the mainshaft using the special tool.

#### Tools:

Inner driver

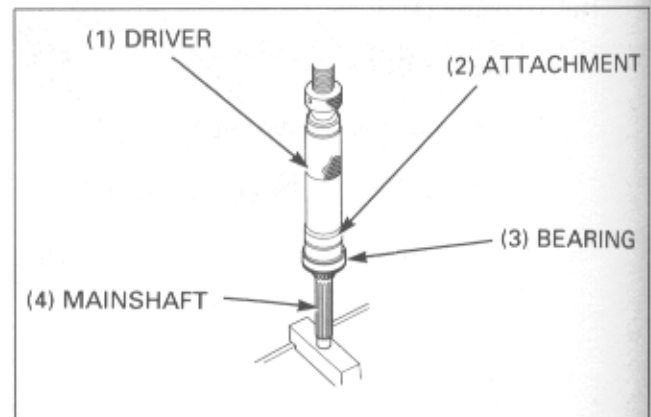
07746 - 0030100

Attachment, 25 mm I.D.

07746 - 0030200

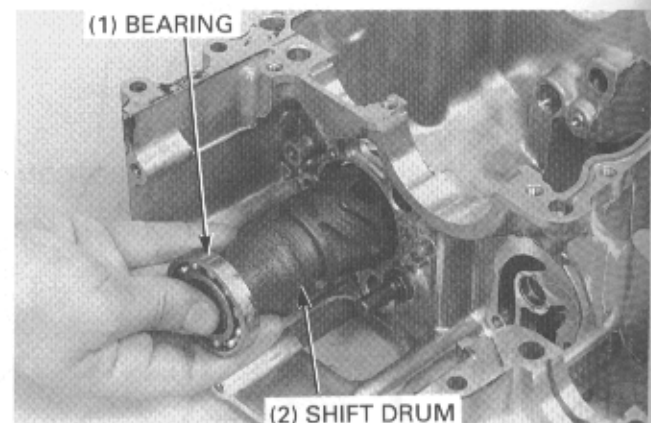
#### NOTE

- Install the bearing with its marking facing out.

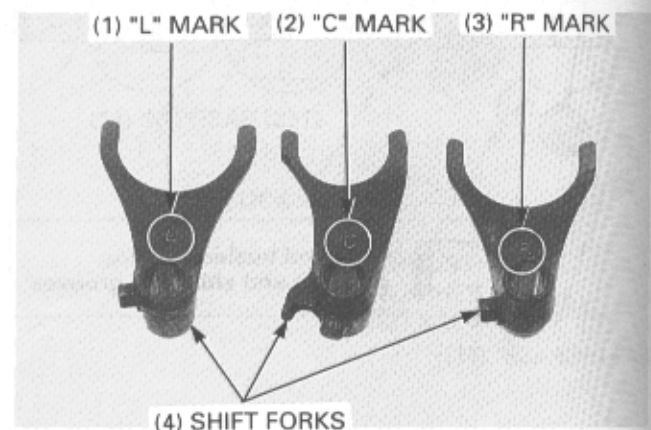


### INSTALLATION

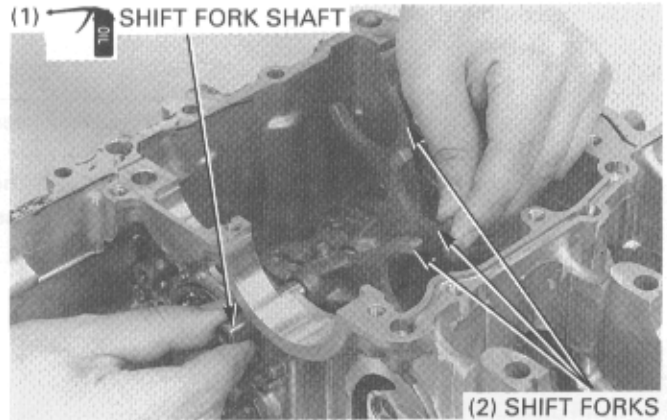
Install the shift drum and bearing into the lower crankcase.



Each shift fork has an identification mark; "R" is for the right shift fork, "L" is for the left shift fork and "C" is for the center shift fork.

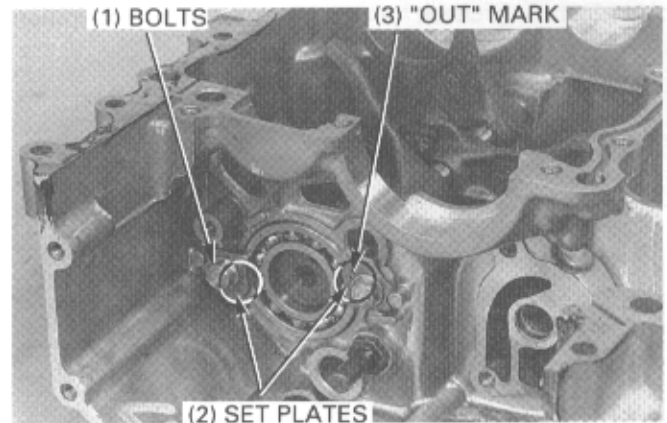


Install the shift forks, aligning the shift drum pins with the shift drum grooves. Be sure that the identification marks are facing the right side of the engine. Apply clean engine oil to the shift fork shaft and install it through the shift forks.

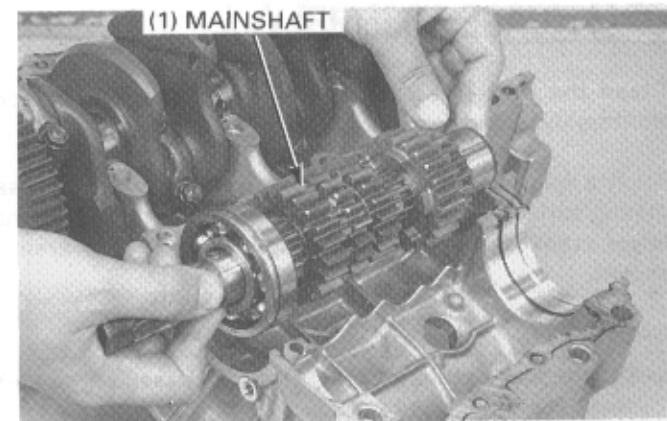


Install the shift drum bearing set plates with the "OUT" mark facing out as shown.

Apply locking agent to the threads of the set plate bolt. Install and tighten the set plate bolts.

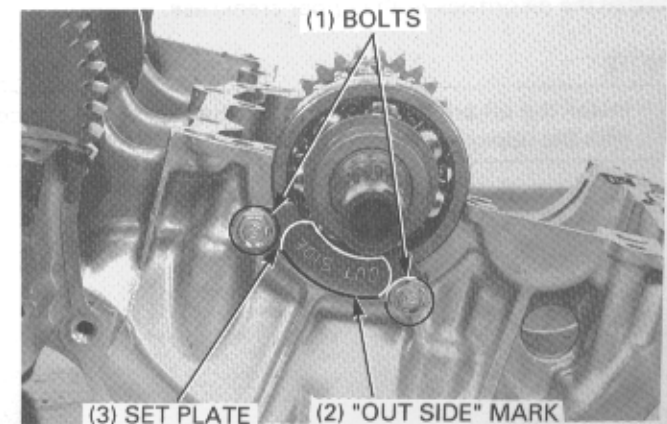


Install the mainshaft in the upper crankcase.



Install the mainshaft bearing set plate with the "OUTSIDE" mark facing out.

Apply locking agent to the threads of the set plate bolt. Install and tighten the set plate bolts.

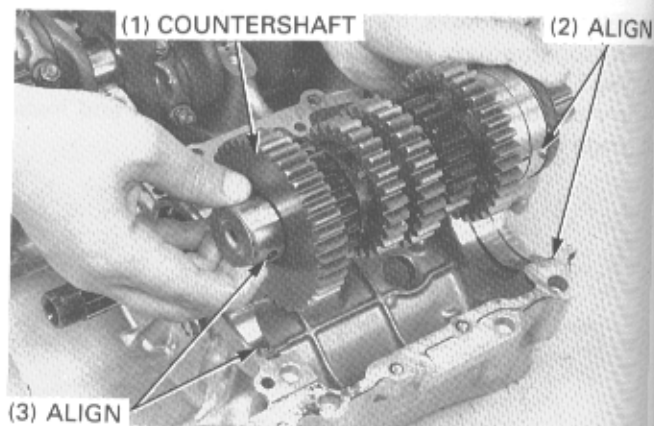


## CRANKCASE/TRANSMISSION

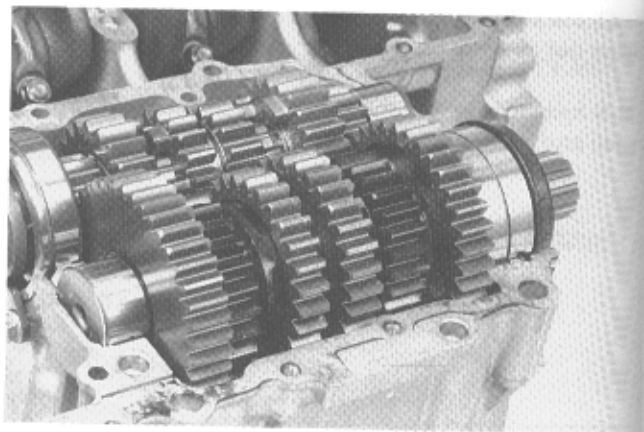
Install the countershaft assembly.

### NOTE

- Align the hole in the countershaft needle bearing case with the pin in the upper crankcase.
- Align the groove in the countershaft bearing with the stopper and pin on the bearing with the groove in the crankcase.



After installing, check for smooth transmission operation.



## CRANKCASE ASSEMBLY

Clean the upper and lower crankcase mating surfaces thoroughly, being careful not damage them.

Apply a light but thorough coating of sealant to all crankcase mating surfaces except the main bearing journal bolt (8 mm lower crankcase bolt) areas and the oil passage area as shown.

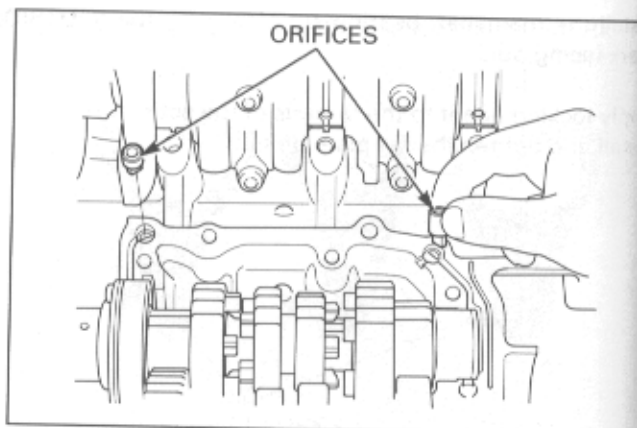
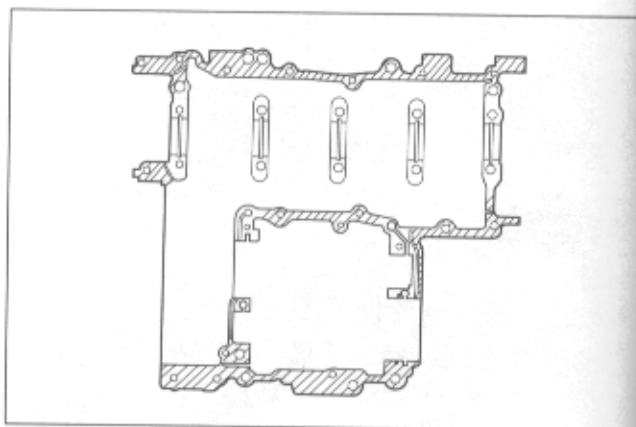
### CAUTION

- Do not apply sealant around the oil passage area and main bearing journal area.

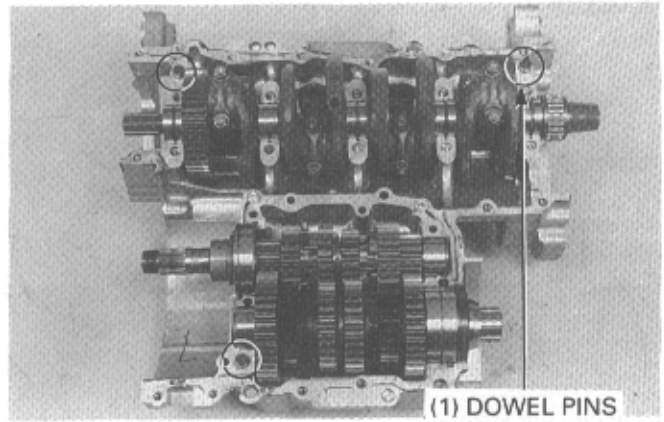
Install the oil orifices to the upper crankcase.

### NOTE

- Install the oil orifices, aligning the cutout on the orifice with the upper crankcase hole.

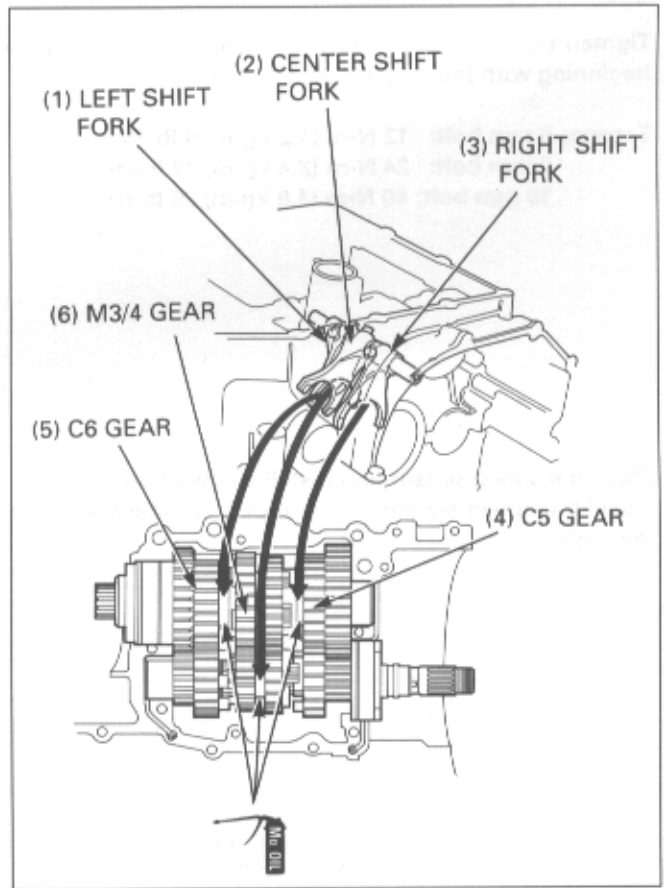


Install the dowel pins into the upper crankcase.



Assemble the crankcase halves, aligning the shift fork claws with the shifter gear grooves.

Check for smooth transmission operation.



## CRANKCASE/TRANSMISSION

Apply oil to the main journal bolt threads and seating surface.

Install the lower crankcase bolts and washers. From the inside to the outside, tighten the lower crankcase 8 mm bolts in a crisscross pattern in several steps.

**Torque: main journal bolt: 26 N·m (2.6 kg-m, 19 lb-ft)**

Install the remaining crankcase bolts and sealing washers as shown.

### NOTE

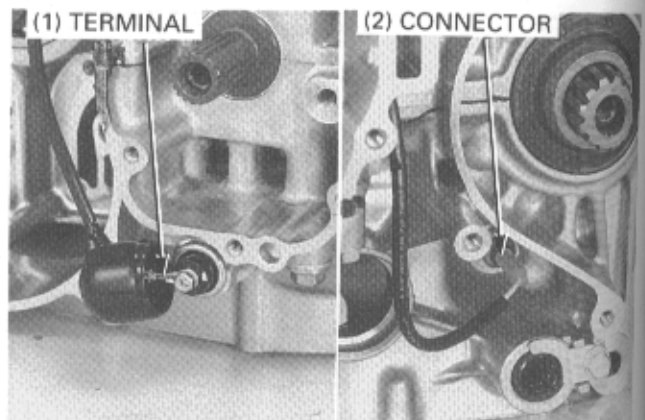
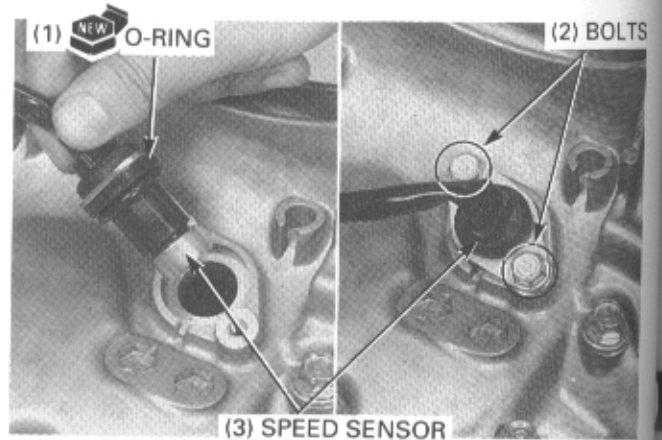
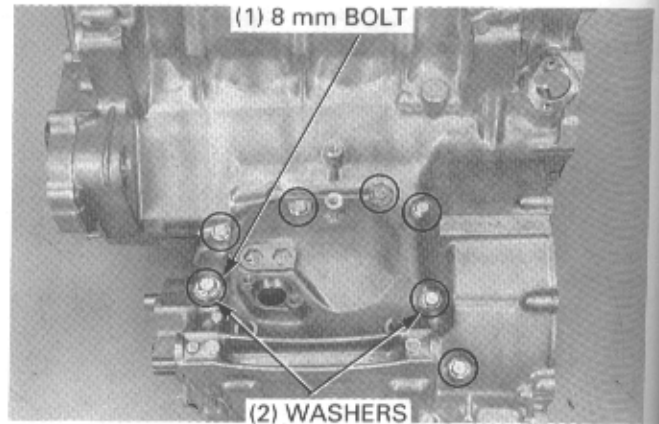
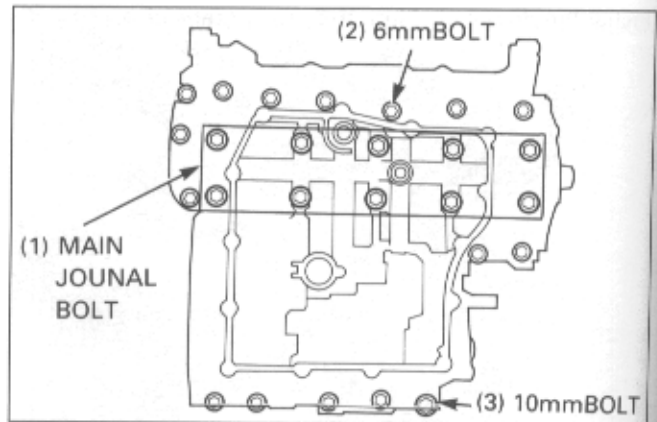
- Install the sealing washers to the bolt holes indicated by the "▲" marks.

Tighten the crankcase bolts in a gradual crisscross pattern, beginning with the larger diameter bolts first.

**Torque: 6 mm bolt: 12 N·m (1.2 kg-m, 9 lb-ft)**  
**8 mm bolt: 24 N·m (2.4 kg-m, 17 lb-ft)**  
**10 mm bolt: 40 N·m (4.0 kg-m, 29 lb-ft)**

Clean the speed sensor and install a new O-ring. Install the speed sensor to the upper crankcase and tighten the bolts.

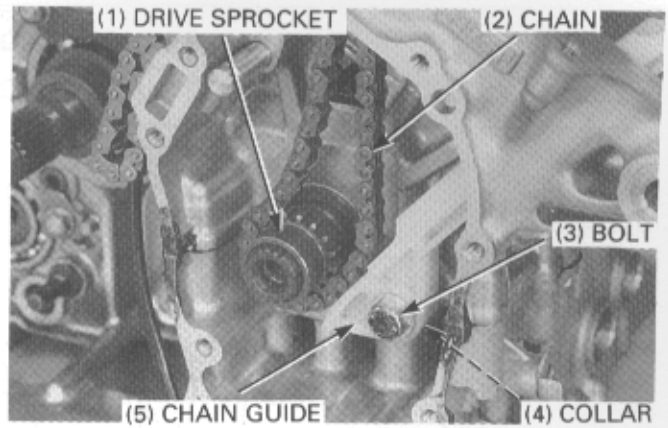
Connect the oil pressure switch terminal and neutral switch connector.



Install the cam chain drive sprocket aligning the groove with the wide teeth. Install the cam chains through the crankcase.

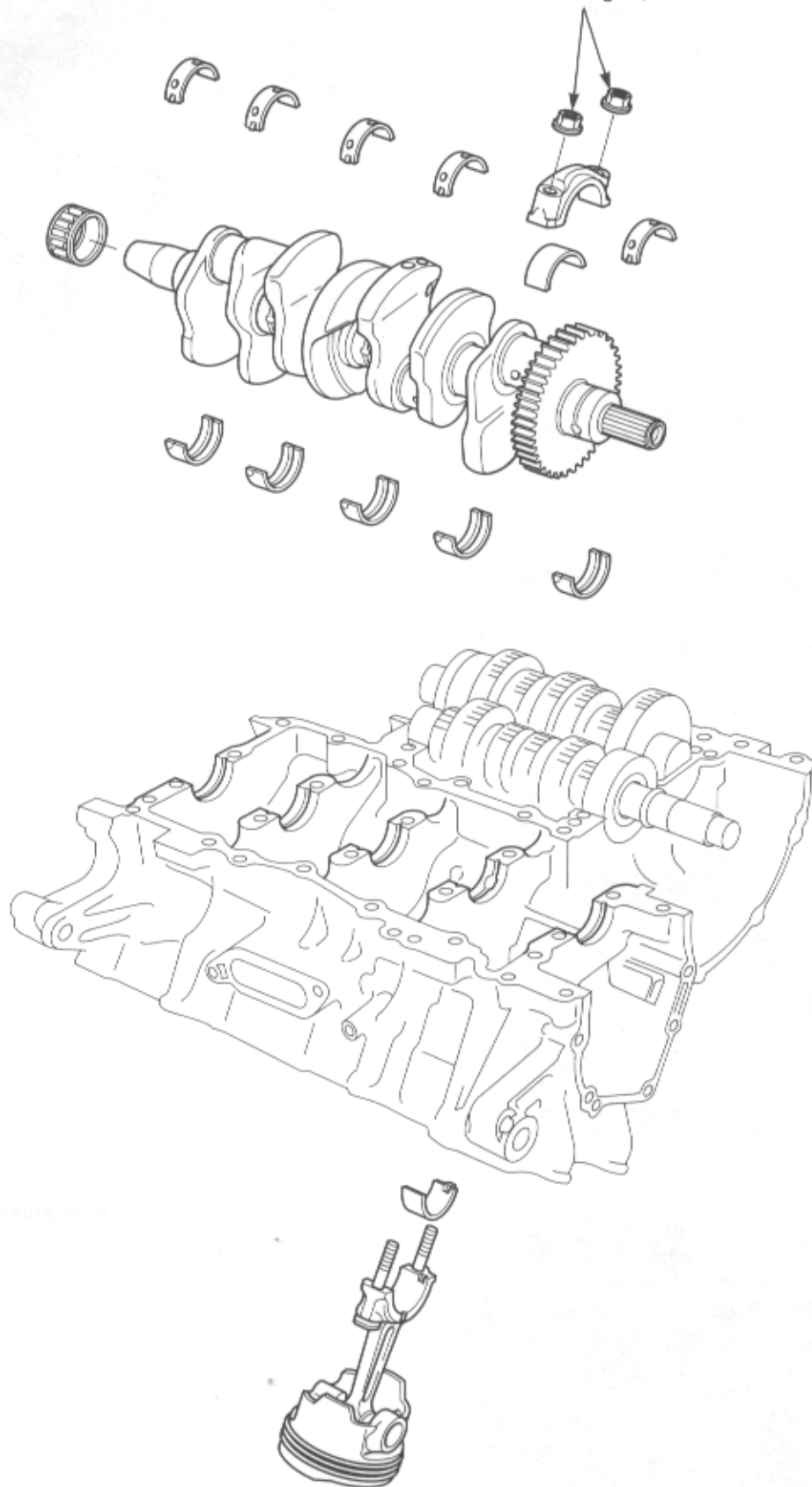
Install the cam chain guide, collar and bolt.

Reinstall the removed parts (page 10-1).



CYLINDER/PISTON/CRANKSHAFT

26 N•m (2.6 Kg-m, 19 lb-ft)



# 11. CYLINDER/PISTON/CRANKSHAFT

SERVICE INFORMATION	11-1	CRANKSHAFT	11-3
TROUBLESHOOTING	11-2	CYLINDER/PISTON/CONNECTING ROD	11-7

## SERVICE INFORMATION

### GENERAL

- The crankcase must be separated to service the crankshaft, piston, cylinder.
- Be careful not to damage the crankshaft main journal bearings while removing or installing the crankshaft.
- Be careful not to damage the cylinder bore while removing or installing the piston/connecting rod.
- Connecting rod and crankshaft bearing inserts are select fitted and are identified by color code. Select replacement bearings using the selection tables. After installing new bearings, recheck them with plastigauge to verify correct clearance.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their original locations.
- Apply molybdenum disulfide oil to the main journals and crankpins during assembly.
- When removing the piston, clean carbon and sludge from the top of the cylinder.

### SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Cylinder	I.D.	65.000 – 65.015 (2.5591 – 2.5596)	65.10 (2.563)	
	Taper	—	0.10 (0.004)	
	Out-of-round	—	0.10 (0.004)	
	Warpage	—	0.10 (0.004)	
Piston, piston ring and piston pin	Piston mark direction	"IN" mark facing to the intake side	—	
	Piston O.D.	64.970 – 64.990 (2.5579 – 2.5587) at 11 (0.4) from bottom of skirt	64.90 (2.555)	
	Piston pin hole I.D.	17.002 – 17.008 (0.6694 – 0.6696)	17.02 (0.670)	
	Cylinder-to-piston clearance	0.010 – 0.045 (0.0004 – 0.0018)	0.10 (0.004)	
	Piston pin O.D.	16.994 – 17.000 (0.6690 – 0.6693)	16.98 (0.669)	
	Piston-to-piston pin clearance	0.002 – 0.014 (0.0001 – 0.0006)	0.04 (0.0016)	
	Connecting rod-to-piston pin clearance	0.016 – 0.040 (0.0006 – 0.0016)	0.06 (0.0024)	
	Piston ring-to-ring groove clearance	Top	0.025 – 0.060 (0.0010 – 0.0024)	0.08 (0.003)
		Second	0.015 – 0.050 (0.0006 – 0.0020)	0.08 (0.003)
	Piston ring end gap	Top	0.20 – 0.35 (0.008 – 0.014)	0.5 (0.02)
		Second	0.35 – 0.50 (0.014 – 0.020)	0.7 (0.03)
		Oil (side rail)	0.2 – 0.7 (0.01 – 0.03)	1.0 (0.04)
	Piston ring mark	Top	"T" or "R" mark facing up	—
Second		"T" or "RN" mark facing up	—	



## CYLINDER/PISTON/CRANKSHAFT

(cont'd) Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Crankshaft, connecting rod	Connecting rod small end I.D.	17.016 – 17.034 (0.6699 – 0.6706)	17.04 (0.671)
	Connecting rod big end side clearance	0.10 – 0.25 (0.004 – 0.01)	0.30 (0.012)
	Crankshaft runout	—	0.05 (0.002)
	Crankpin oil clearance	0.028 – 0.052 (0.0011 – 0.0020)	0.06 (0.002)
	Main journal oil clearance	0.020 – 0.045 (0.0008 – 0.0018)	0.05 (0.002)

### TORQUE VALUES

Connecting rod bearing cap nut                      26 N•m (2.6 kg-m, 19 lb-ft) Apply oil to the threads and seating surface.

### TOOL

Inner driver    07746 – 0030100  
Attachment, 30 mm I.D.                              07746 – 0030300

## TROUBLESHOOTING

### Cylinder compression is too low, or engine is hard to start

- Blown cylinder head gasket
- Worn, stuck or broken piston ring
- Worn or damaged cylinder or piston

### Cylinder compression is too high, or engine overheats or knocks

- Carbon deposits on the cylinder head and/or piston

### Noise

- Worn cylinder, piston and/or piston ring
- Worn piston pin hole and piston pin
- Worn connecting rod small end

### Excessive smoke

- Worn, stuck or broken piston ring
- Improper installation of piston rings

### Excessive noise

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

### Engine vibration

- Excessive crankshaft runout

## CRANKSHAFT

### CAUTION

- During crankshaft service, be careful not to damage the main journal or connecting rod bearing inserts.

### REMOVAL

Separate the crankcase (page 10-3).

Before removing the crankshaft, check the big end side clearance.

Measure the clearance by inserting the feeler gauge between the crankshaft and connecting rod big end.

**Service limit: 0.30 mm (0.012 in)**

Remove the connecting rod bearing cap nuts and the bearing caps.

### NOTE

- Mark the bearing caps and bearings as you remove them to indicate the correct cylinder and position on the crankpins for reassembly.
- Tap the side of the cap lightly if the bearing cap is hard to remove.

Remove the crankshaft from the upper crankcase.

### INSPECTION

#### CRANKSHAFT RUNOUT

Place the crankshaft on a stand or V-blocks.

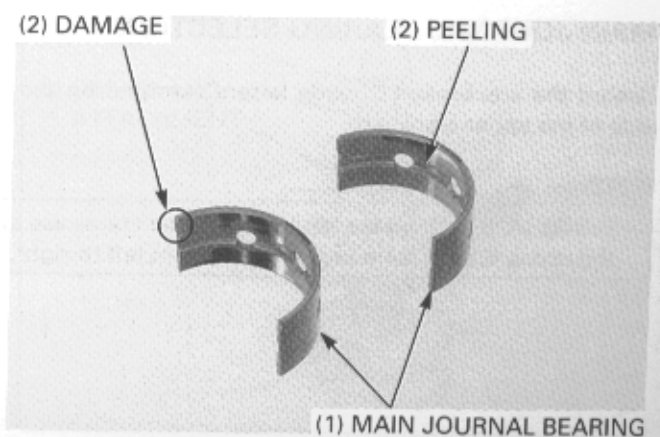
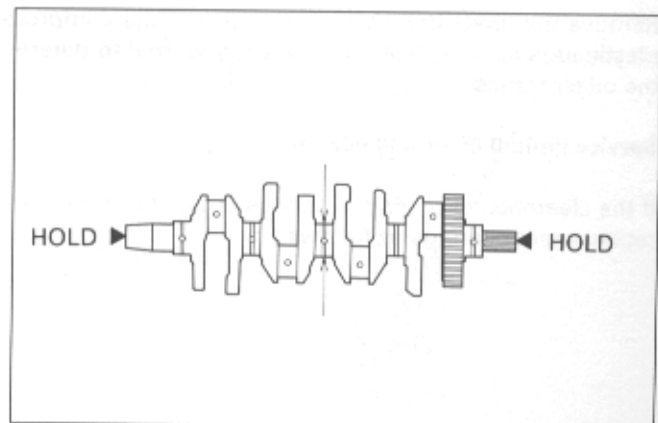
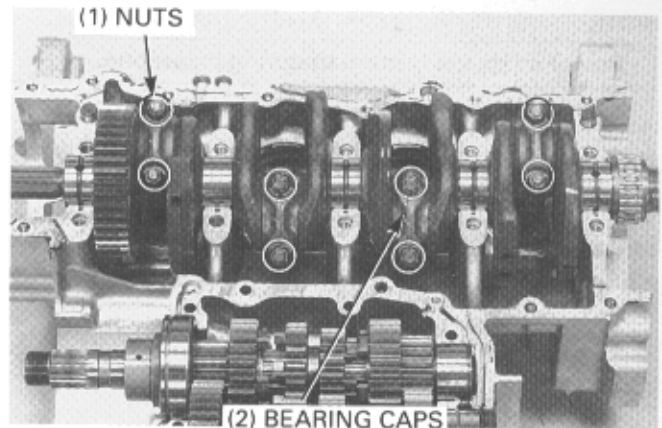
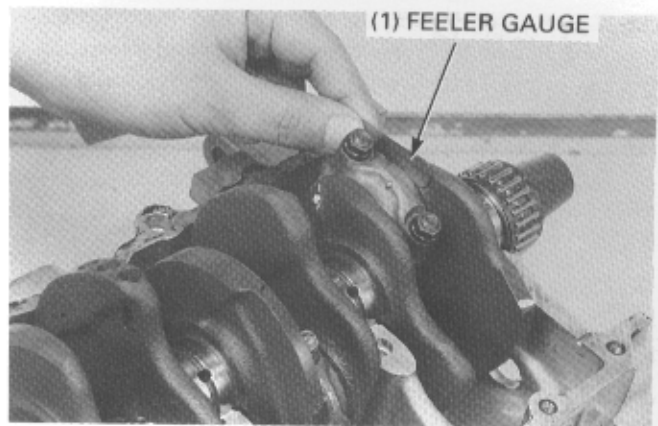
Set the indicator on the main journal.

Rotate the crankshaft two revolutions and read the runout.

**Service limit: 0.05 mm (0.002 in)**

#### MAIN JOURNAL BEARING INSPECTION

Inspect the bearing inserts for unusual wear, damage or peeling and replace if necessary.



## CYLINDER/PISTON/CRANKSHAFT

### OIL CLEARANCE INSPECTION

Clean off any oil from the bearing inserts and journals.  
Put a strip of plastigauge lengthwise on each journal avoiding the oil hole.

#### NOTE

- Do not rotate the crankshaft during inspection.

Assemble the crankcase halves (page 10-12).

Apply oil to the threads and seating surfaces of the main journal bolts.

Tighten the upper and lower crankcase bolts to the specified torque (page 10-14).

Remove the lower crankcase and measure the compressed plastigauge at its widest point on each journal to determine the oil clearance.

**Service limit: 0.05 mm (0.002 in)**

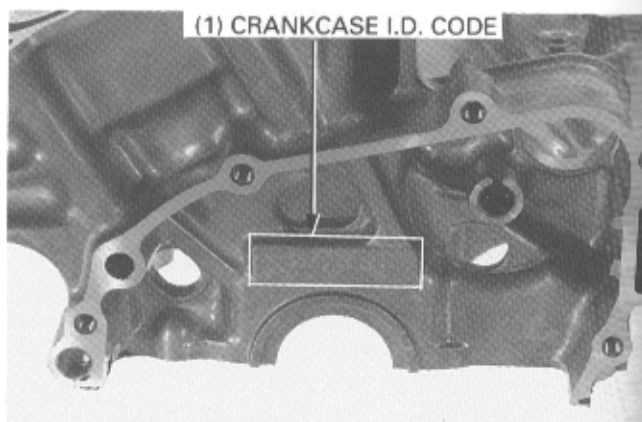
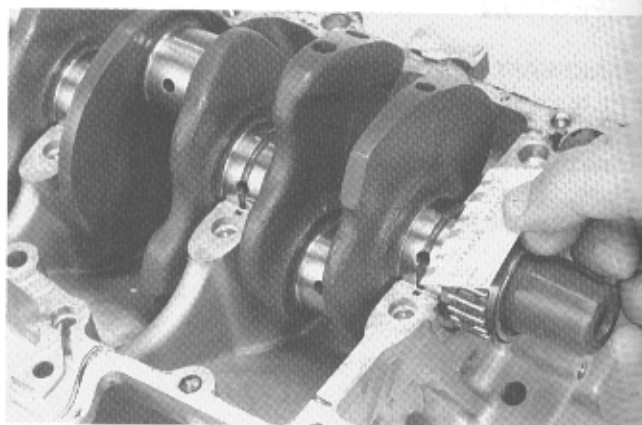
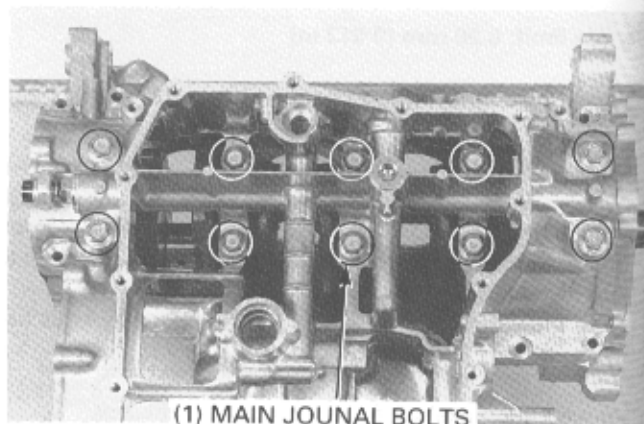
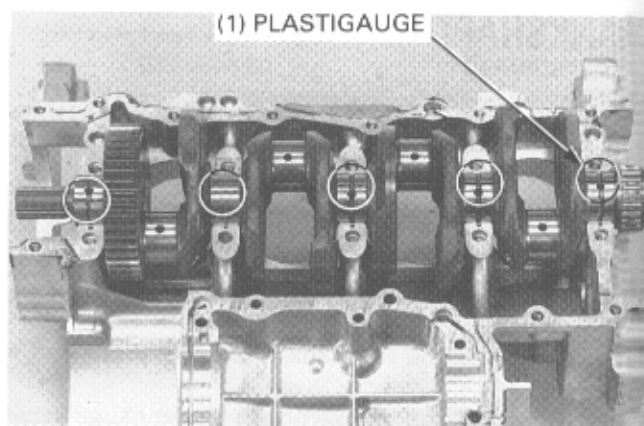
If the clearance exceeds the service limit, select the correct replacement bearings as follows.

### MAIN JOURNAL BEARING SELECTION

Record the crankcase I.D. code letters stamped on the left side of the upper crankcase.

#### NOTE

- Letters (A, B or C) on the left side of upper crankcase are the codes for the main journal I.D.s from left to right.



Record the corresponding main journal O.D. code numbers from the crank weight.

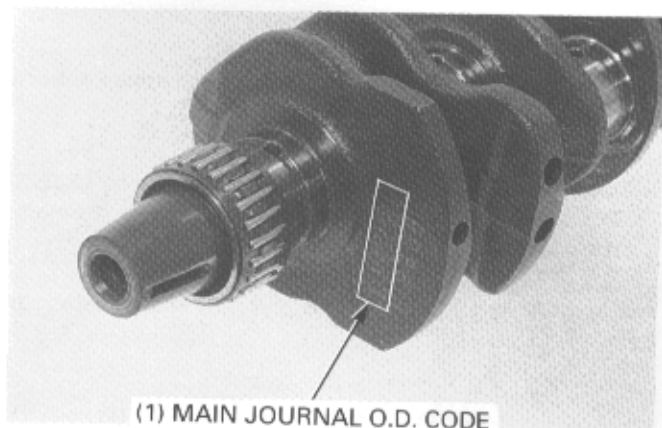
NOTE

- Numbers (1 or 2) on the crank weight are the codes for the main journal O.D.s from the left to right.

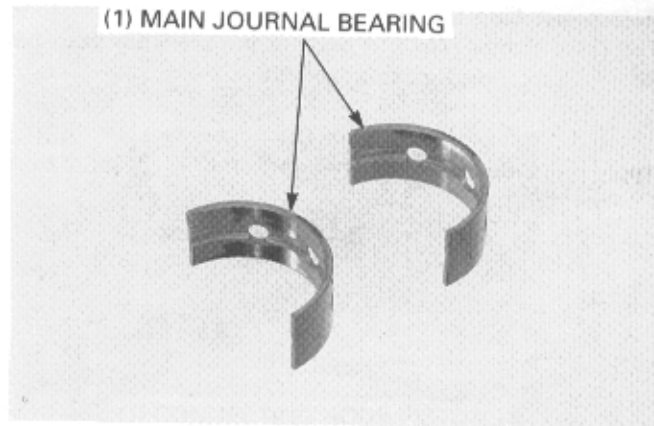
Cross reference the case and journal codes to determine the replacement bearing color code.

Main journal O. D. code	Crankcase I.D. code	A	B	C
		36.000-36.007 mm (1.4173-1.4176 in)	36.007-36.014 mm (1.4176-1.4179 in)	36.014-36.021 mm (1.4179-1.4181 in)
1	32.993 – 33.000 mm (1.2989 – 1.2992 in)	D (Pink)	C (Yellow)	B (Green)
2	32.986 – 32.993 mm (1.2986 – 1.2989 in)	C (Yellow)	B (Green)	A (Brown)

- A: Brown : 1.507 – 1.511 mm (0.0593 – 0.0595 in)
- B: Green : 1.503 – 1.507 mm (0.0592 – 0.0593 in)
- C: Yellow : 1.499 – 1.503 mm (0.0590 – 0.0592 in)
- D: Pink : 1.495 – 1.499 mm (0.0589 – 0.0590 in)



(1) MAIN JOURNAL BEARING

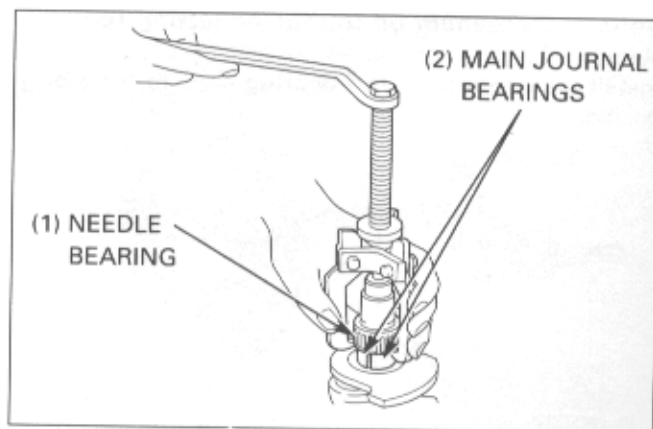


**STARTER CLUTCH NEEDLE BEARING REPLACEMENT**

Remove the needle bearing with a commercially available universal bearing puller.

CAUTION

- To protect the crankshaft main journal from the bearing puller claws, cover the mainshaft journal properly; worn main journal bearings are usable as protectors.



Drive a new needle bearing onto the crankshaft.

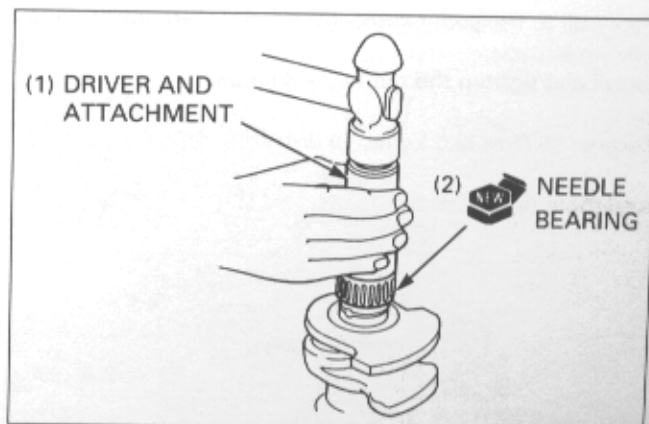
Tools :

Inner driver

07746 – 0030100

Attachment, 30 mm ID.

07746 – 0030300



## CYLINDER/PISTON/CRANKSHAFT

### INSTALLATION

Install the main journal bearings into the upper and lower crankcase.

### CAUTION

- The bearing tabs should be aligned with the grooves in the case.

Apply molybdenum oil to the upper and lower main journal bearing surfaces.

Before installing the crankshaft, position all the pistons at Top Dead Center (TDC) to prevent the crankpin from being damaged by the connecting rod bolts.

Install the crankshaft into the upper crankcase. Apply molybdenum oil to the crankshaft main journals and crankpin journals.

Apply molybdenum oil to the connecting rod bearing surface.

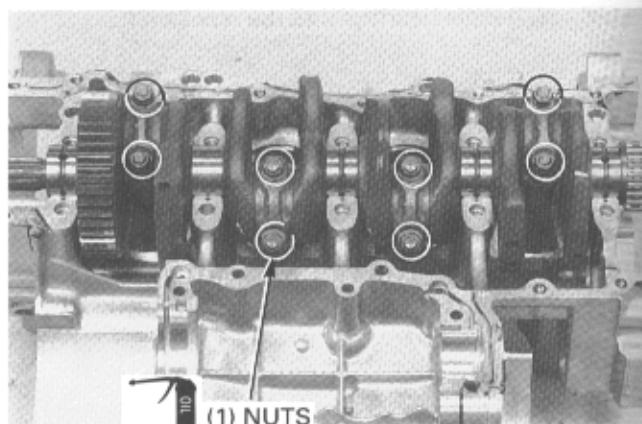
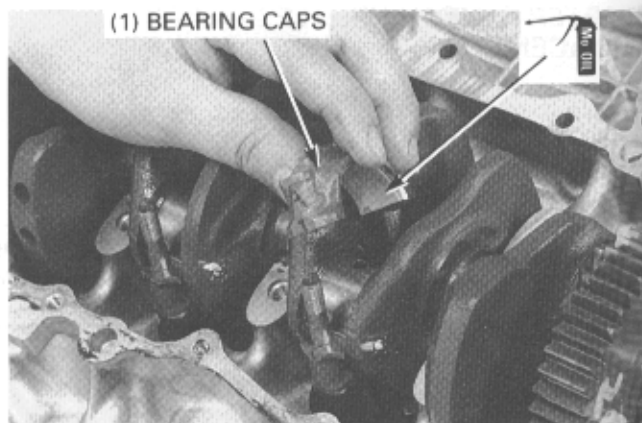
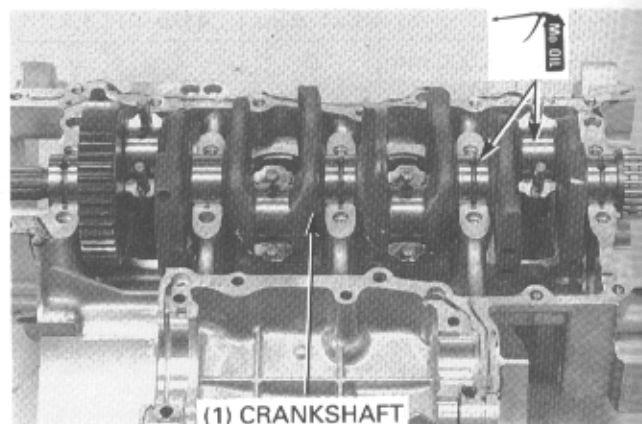
Install the connecting rod bearing caps to their original position.

Apply oil to the connecting rod bearing cap nut threads and seating surface.

Install and tighten the nut in 2 – 3 steps.

**Torque: 26 N·m (2.6 kg·m, 19 lb-ft)**

Assemble the crankcase (page 10-12).



## CYLINDER/PISTON/CONNECTING ROD

### CAUTION

- When servicing the piston and connecting rod, be careful not to damage the main journal or connecting rod bearing inserts.

### REMOVAL

Remove the crankshaft (page 11-3).

Push the connecting rods and piston out through the top of the cylinder bores.

### CAUTION

- Do not try to remove the connecting rod/piston assembly from the bottom of the cylinder; the assembly will be locked so that the oil ring expands in the gap between the cylinder liner and the upper crankcase.

### NOTE

- Mark the bearing caps and bearings as you remove them to indicate the correct cylinder and position on the crankpins for reassembly.

Remove the piston pin clips, push the piston pin out and remove the piston.

### NOTE

- Mark the piston pins to ensure the original reassembly.

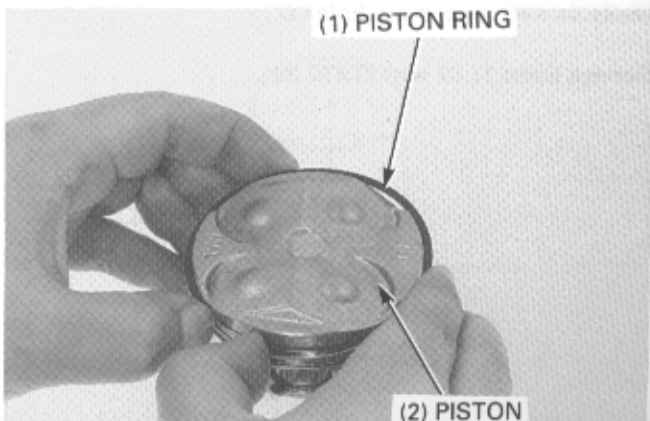
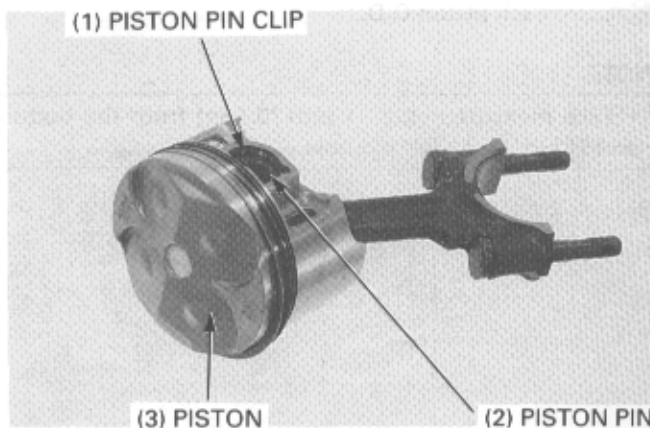
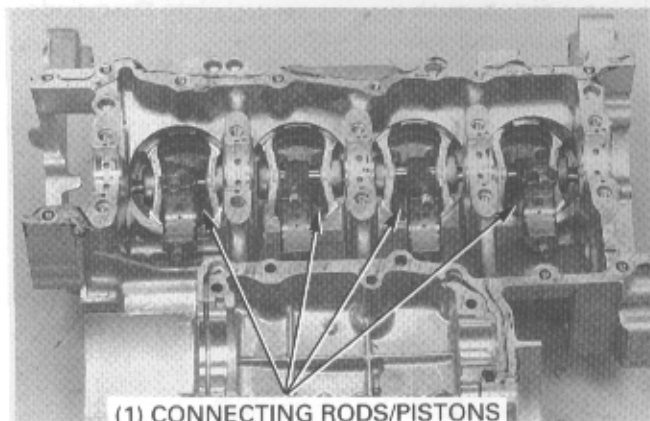
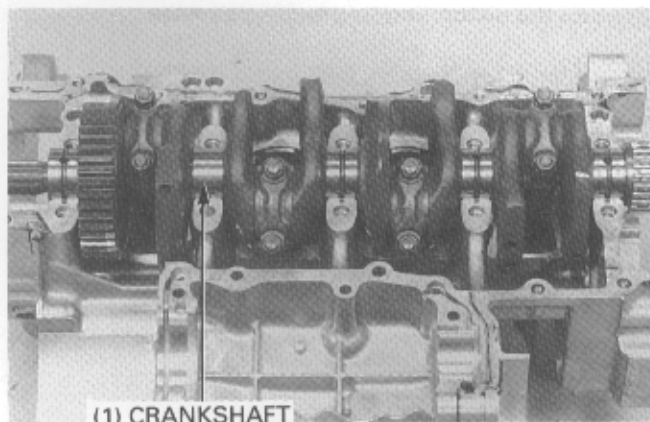
### INSPECTION

#### PISTON

Remove the piston rings and mark them to indicate the correct cylinder and piston position.

Clean the piston crown, removing all carbon deposits.

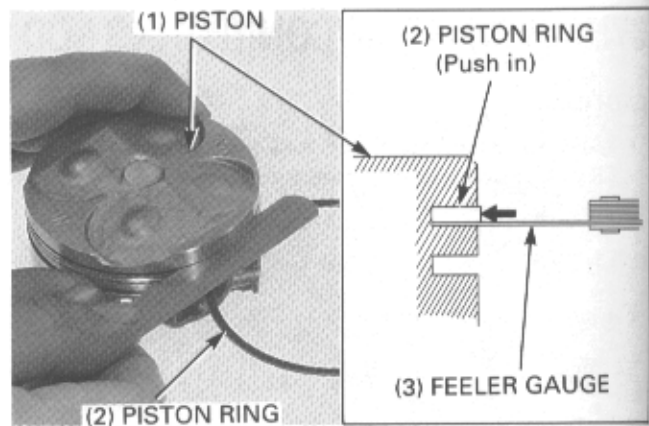
Inspect the piston for cracks or other damage. Inspect the ring grooves for excessive wear and carbon build-up.



## CYLINDER/PISTON/CRANKSHAFT

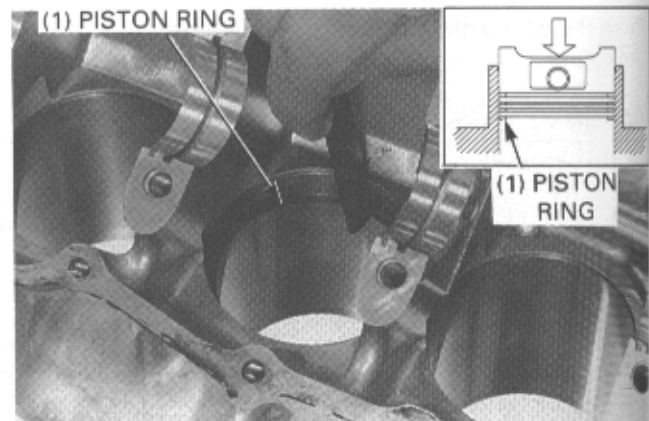
Measure the piston ring-to-groove clearance.

**Service limit: Top/second: 0.08 mm (0.003 in)**



Using a piston, push the ring securely into the cylinder and measure the end gap.

**Service limit: Top: 0.5 mm (0.02 in)**  
**Second: 0.7 mm (0.03 in)**  
**Oil ring (side rail): 1.0 mm (0.04 in)**

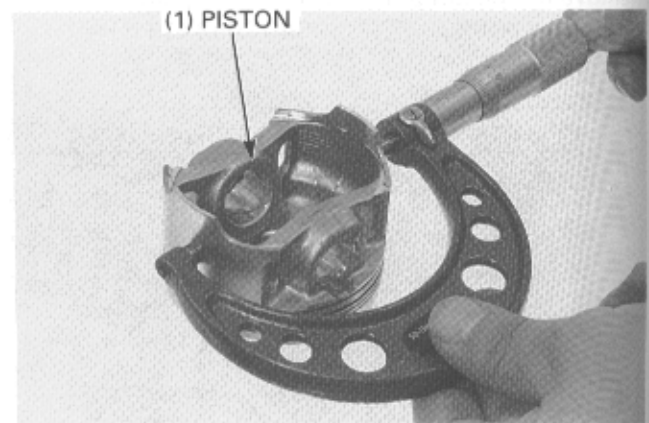


Measure each piston O.D..

### NOTE

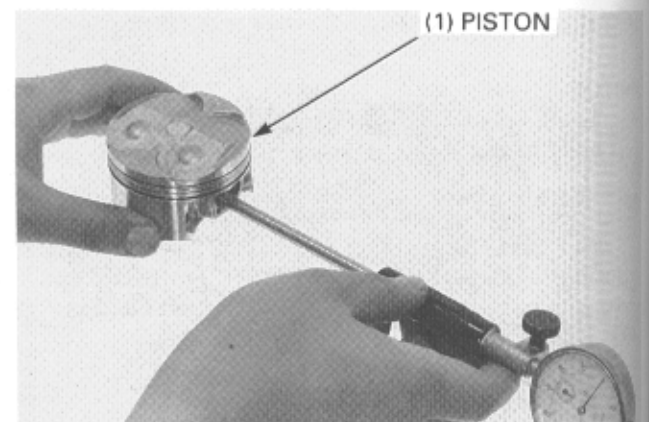
- Take measurements 11 mm (0.4 in) from the bottom, and 90° to the piston pin hole.

**Service limit: 64.90 mm (2.555 in)**



Measure each piston pin hole I.D..

**Service limit: 17.02 mm (0.670 in)**



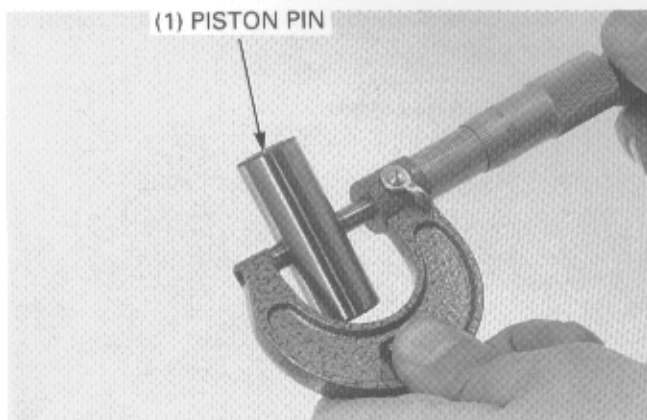
**PISTON PIN**

Measure each piston pin O.D..

**Service limit: 16.98 mm (0.669 in)**

Calculate the piston pin-to-piston clearance.

**Service limit: 0.04 mm (0.0016 in)**



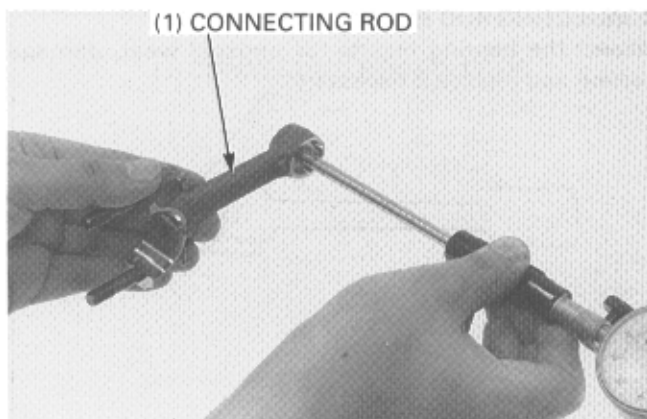
**CONNECTING ROD**

Measure each connecting rod small end I.D..

**Service limit: 17.04 mm (0.671 in)**

Calculate the connecting rod-to-piston pin clearance.

**Service limit: 0.06 mm (0.0024 in)**



**CYLINDER**

Inspect the cylinder walls for scratches and wear.

Measure and record the cylinder I.D. at three levels in both the X and Y axes. Take the maximum reading to determine the cylinder wear.

**Service limit: 65.10 mm (2.563 in)**

Calculate the piston-to-cylinder clearance. Take the maximum reading to determine the clearance.

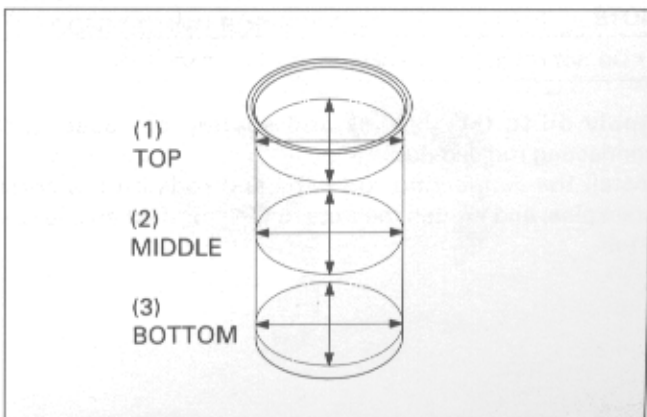
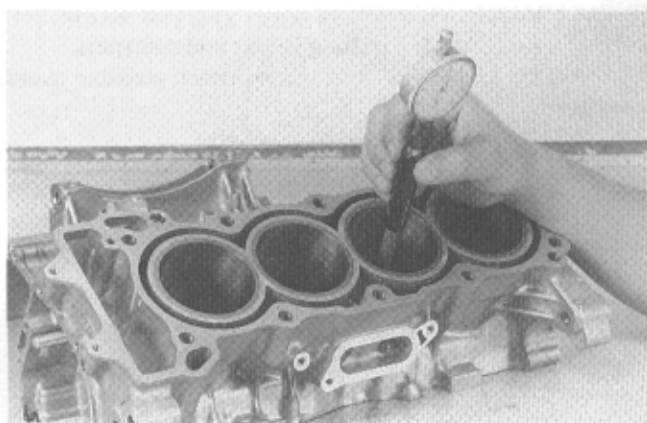
**Service limit: 0.10 mm (0.004 in)**

Measure the cylinder for out of round at three levels in an X and Y axis. Take the maximum reading to determine the out of round.

**Service limit: 0.10 mm (0.004 in)**

Measure the cylinder for taper at three levels in an X and Y axis. Take the maximum reading to determine the taper.

**Service limit: 0.10 mm (0.004 in)**

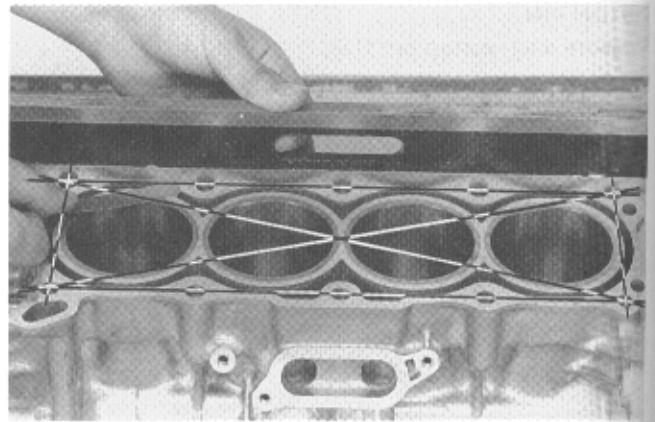




## CYLINDER/PISTON/CRANKSHAFT

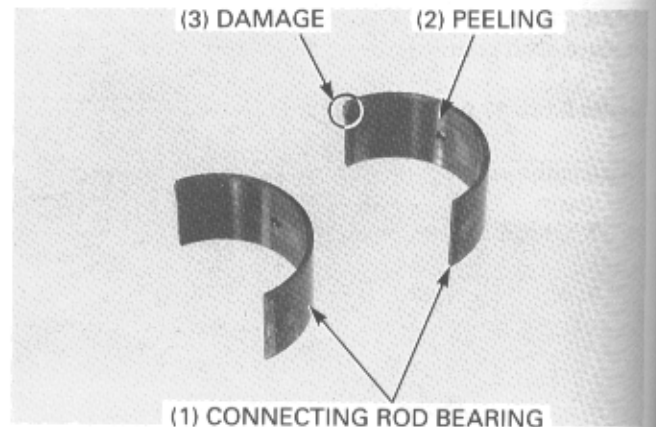
Check the cylinder for warpage by placing a straight edge and a feeler gauge.

**Service limit: 0.10 mm (0.004 in)**



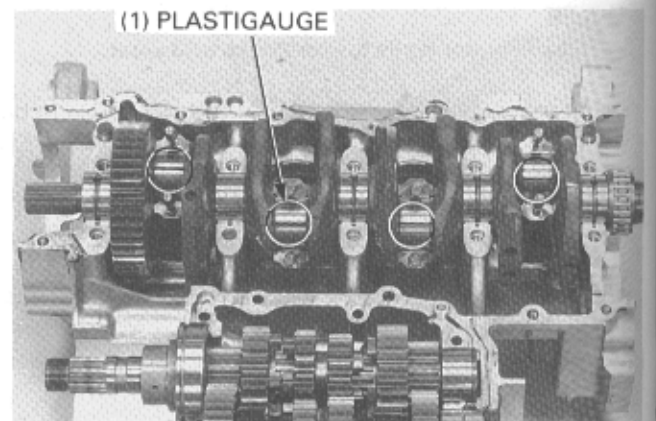
### CONNECTING ROD BEARING INSPECTION

Inspect the bearing inserts for unusual wear, damage or peeling and replace if necessary.



### OIL CLEARANCE INSPECTION

Clean off any oil from the bearing inserts and crankpins. Put a strip of plastigauge lengthwise on each crankpin avoiding the oil hole.

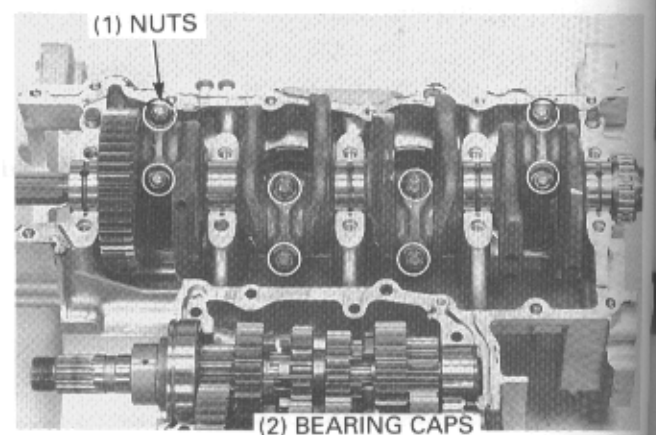


### NOTE

- Do not rotate the crankshaft during inspection.

Apply oil to the threads and seating surfaces of the connecting rod cap nuts.

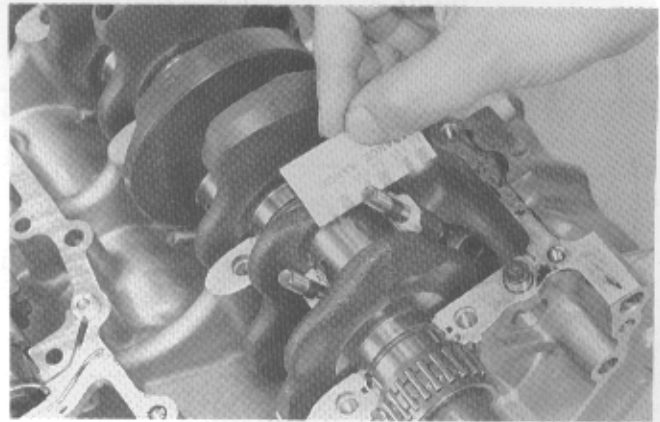
Install the connecting rod caps and rods on the correct crankpins, and tighten the nuts to the specified torque (page 11-6).



Remove the connecting rod cap 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 as follows.

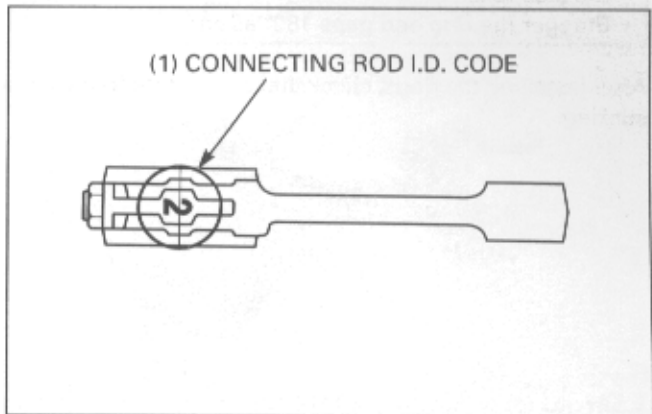


### CONNECTING ROD BEARING SELECTION

Record the connecting rod I.D. code numbers on the rods.

**NOTE**

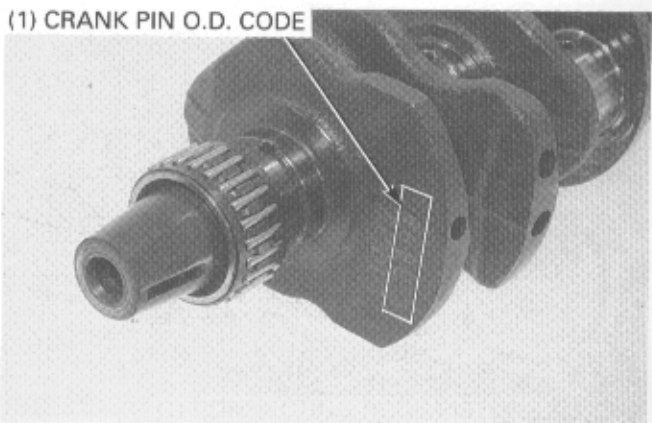
- Numbers (1 or 2) on the connecting rods are the codes for the connecting rod I.D.s.



Record the crankpin O.D. code letters from the crank weight.

**NOTE**

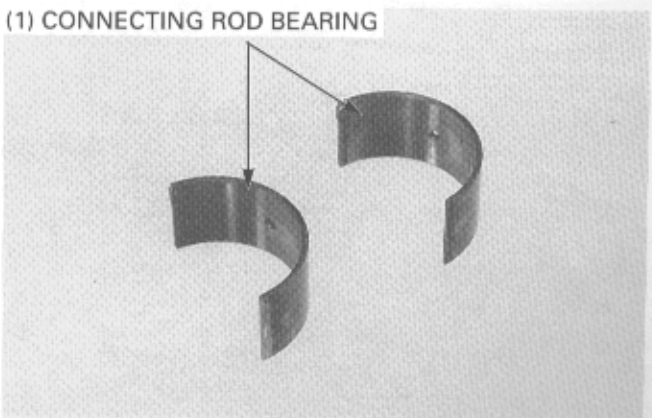
- Letters (A or B) on the left side of the crank weight are the codes for the crankpin O.D.s from left to right.



Cross reference the crankpin and rod codes to determine the replacement bearing color code.

Connecting I.D. code		1	2
		34.000-34.008 mm (1.3386-1.3389 in)	34.008-34.016 mm (1.3389-1.3392 in)
Crankpin O. D. code	A 31.492 – 31.500 mm (1.2989 – 1.2992 in)	C (Yellow)	B (Green)
B 31.484 – 31.492 mm (1.2986 – 1.2989 in)	B (Green)	A (Brown)	

- A: Brown : 1.244 – 1.248 mm (0.0489 – 0.0491 in)
- B: Green : 1.240 – 1.244 mm (0.0488 – 0.0489 in)
- C: Yellow : 1.236 – 1.240 mm (0.0486 – 0.0488 in)



# CYLINDER/PISTON/CRANKSHAFT

## INSTALLATION

### CAUTION

- Be careful not to damage the piston and rings during assembly.

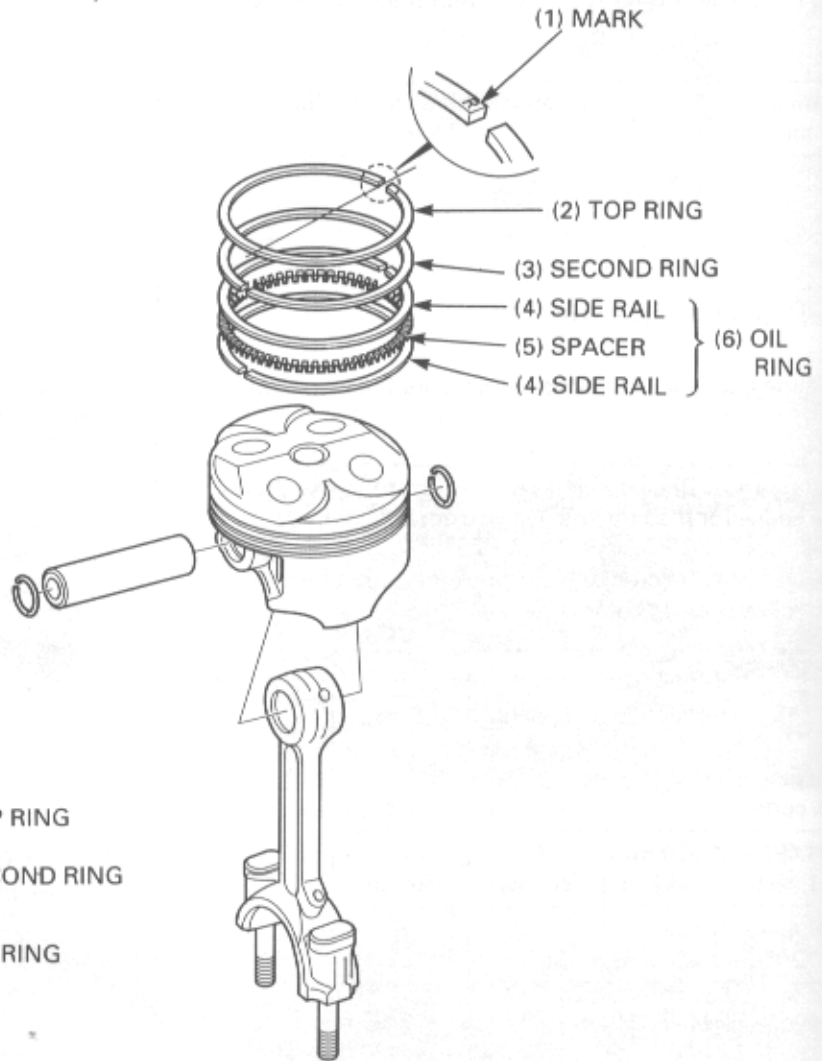
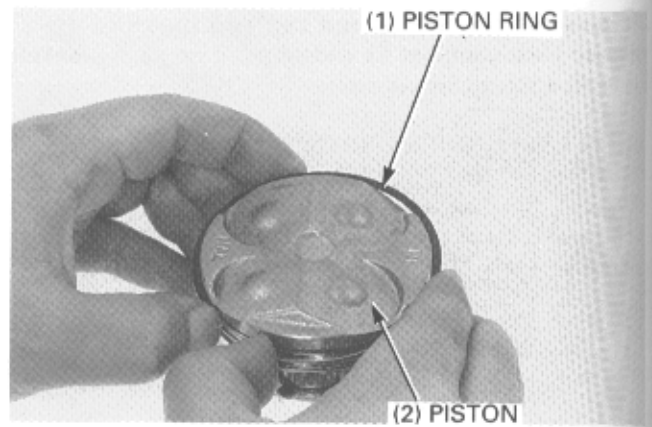
Clean the piston heads, ring lands and skirts.

Carefully install the piston rings onto the piston with the markings facing up.

### NOTE

- Do not confuse the top and second rings.
- To install the oil ring, install the spacer first, then install the side rails.
- Stagger the ring end gaps 180° as shown.

After installing the rings, check that they rotate freely without sticking.



Install the connecting rod bearing. Align the oil holes in the bearing and connecting rod, and align the bearing tabs with the grooves in the connecting rod and bearing cap.

Coat the connecting rod small end and bearings with molybdenum oil.

Apply oil to the piston pin outer surface.

Assemble the pistons and connecting rods with the oil hole in the connecting rod facing the intake side ("IN" mark side). Install piston pin through the piston and connecting rod.

Install new piston pin clips.

**NOTE**

- Make sure that the piston pin clips are seated properly and their end gaps are not aligned with the cutouts in the piston.

Apply engine oil to the cylinder wall, piston and piston ring outer surfaces.

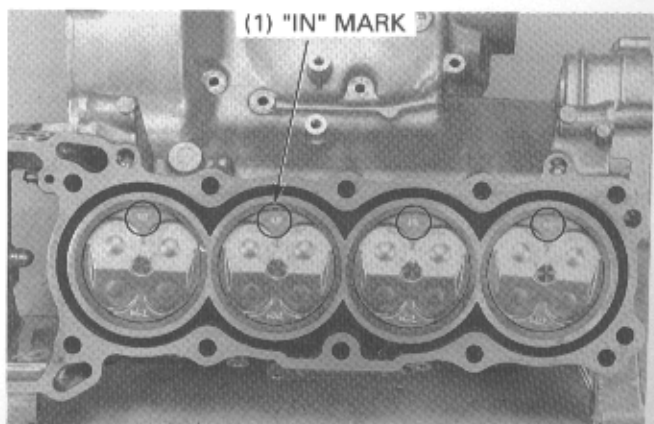
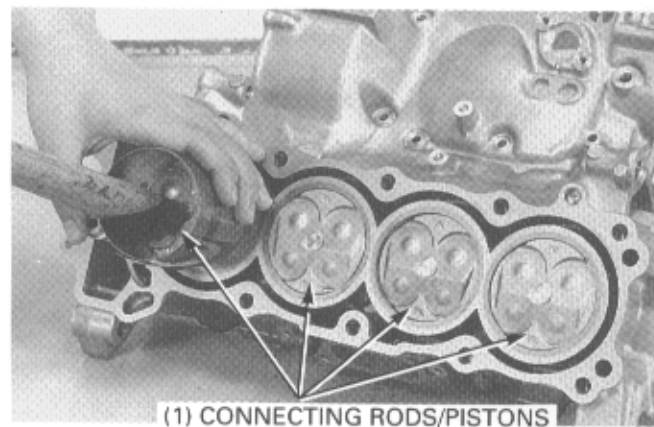
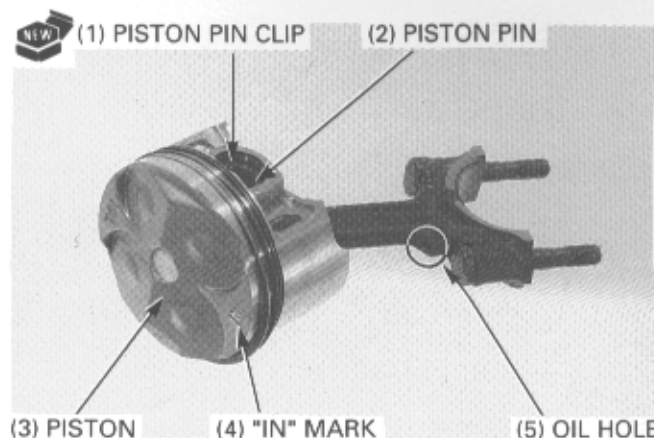
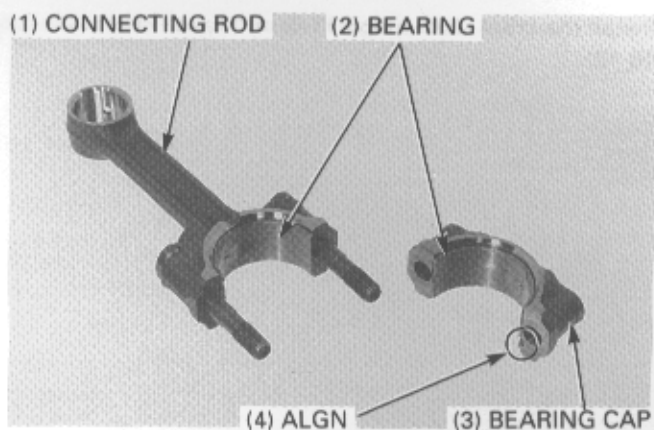
Install the connecting rod/piston assemblies into the cylinder from the top of the crankcase. Be sure each assembly is returned to its original position as noted during removal.

**CAUTION**

- Be careful not to damage the piston rings and cylinder wall. To prevent damaging the cylinder wall, slip short sections of rubber base over the rod bolts before installation.

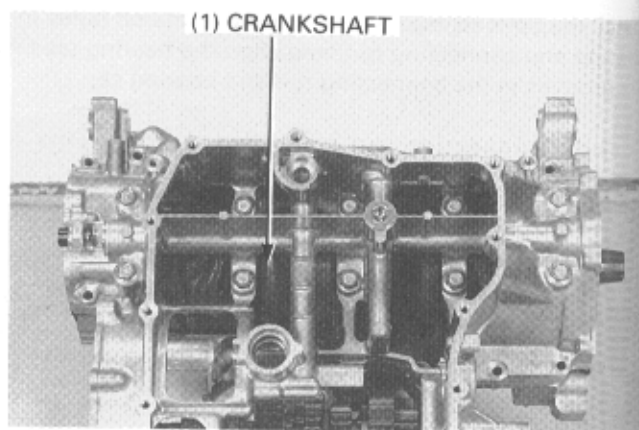
Compress the piston rings with a ring compressor and insert the connecting rod/piston assembly into the cylinder with the piston "IN" mark facing the intake side.

Make sure the piston "IN" marks are facing the intake side.

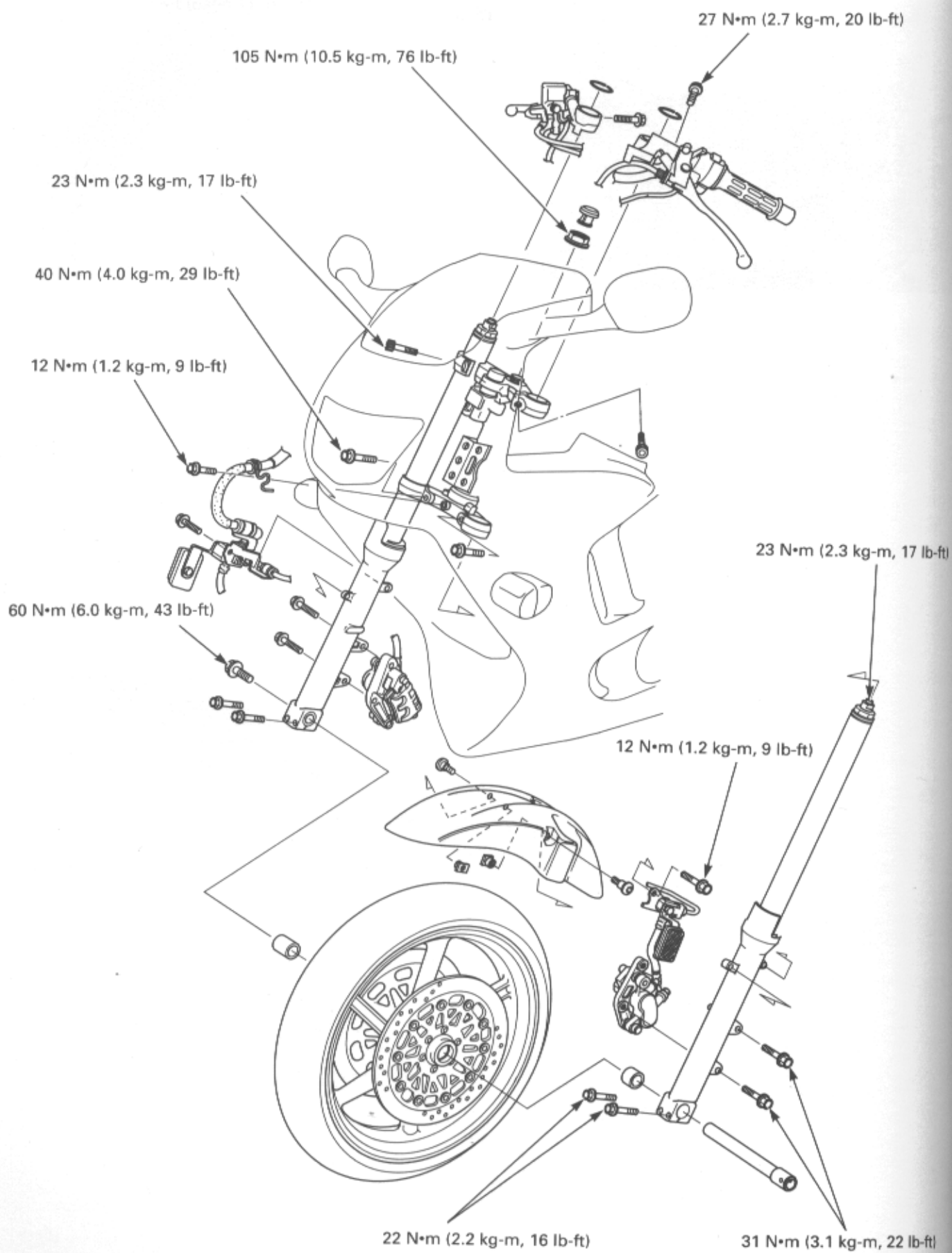


## CYLINDER/PISTON/CRANKSHAFT

Install the crankshaft (page 11-6) and lower crankcase (page 10-12).



# FRONT WHEEL/SUSPENSION/STEERING



# 12. FRONT WHEEL/SUSPENSION/STEERING

SERVICE INFORMATION	12-1	FRONT WHEEL	12-8
TROUBLESHOOTING	12-2	FORK	12-14
HANDLEBARS	12-3	STEERING STEM	12-22

## SERVICE INFORMATION

### GENERAL

#### ⚠ WARNING

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

### CAUTION

- Do not support the motorcycle using the oil cooler.

- When servicing the front wheel, support the motorcycle using a safety stand or hoist.
- Refer to Section 14 for brake system information.
- Tubeless tire removal, repair, and remounting procedures are covered in Section 16 of the Common Service Manual.
- Use only tires marked "TUBELESS" and tubeless valves on rims marked "TUBELESS TIRE APPLICABLE".

### 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	36 psi (2.50 kg/cm <sup>2</sup> , 250 kPa)	—
	Up to maximum weight capacity	36 psi (2.50 kg/cm <sup>2</sup> , 250 kPa)	—
Axle runout		—	0.2 (0.01)
Wheel rim runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Wheel balance weight		—	60 g (2.1 oz) max.
Fork spring free length		317.9 (12.5)	311.5 (12.3)
Fork spring direction		With tightly wound coil facing down	—
Fork tube runout		—	0.2 (0.008)
Recommended fork fluid		Pro Honda Suspension fluid SS-8	—
Fork fluid level		117 (4.61)	—
Fork fluid capacity		463 cc (15.7 US oz, 16.3 Imp oz)	—
Spring pre-load adjuster standard position		3rd groove	—
Rebound adjuster standard position		7 clicks out from full in	—
Steering stem bearing pre-load		0.15 – 0.20 kg-m (1.1 – 1.4 lb-ft)	—

## FRONT WHEEL/SUSPENSION/STEERING

### TORQUE VALUES

Handlebar pinch bolt	27 N•m (2.7 kg-m, 20 lb-ft)
Fork cap bolt	23 N•m (2.3 kg-m, 17 lb-ft)
Fork socket bolt	20 N•m (2.0 kg-m, 14 lb-ft) Apply locking agent to the threads.
Steering stem nut	105 N•m (10.5 kg-m, 76 lb-ft)
Steering adjustment nut	25 N•m (2.5 kg-m, 18 lb-ft) Apply oil to the threads.
Fork pinch bolt (upper)	23 N•m (2.3 kg-m, 17 lb-ft)
(lower)	40 N•m (4.0 kg-m, 29 lb-ft)
Front axle pinch bolt	22 N•m (2.2 kg-m, 16 lb-ft)
Front axle bolt	60 N•m (6.0 kg-m, 43 lb-ft)
Front brake disc bolt	20 N•m (2.0 kg-m, 14 lb-ft)
Front brake hose clamper bolt	12N•m (1.2 kg-m, 9 lb-ft)
Front brake pipe stay bolt	12N•m (1.2 kg-m, 9 lb-ft)

### TOOLS

Bearing remover shaft	07746 - 0050100	] or equivalent commercially available in U.S.A.
Bearing remover head, 20 mm	07746 - 0050600	
Attachment, 42 x 47 mm	07746 - 0010300	
Attachment, 52 x 55 mm	07746 - 0010400	
Pilot, 20 mm	07746 - 0040500	
Fork seal driver	07947 - KA50100	
Fork seal driver attachment	07947 - KF00100	
Steering stem socket	07916 - 3710101	— or 07916 - 3710100
Ball race remover	07953 - MJ10000	] or Attachment (07953 - MJ1000A or 07935 - MJ1000B), Driver (07949 - 3710001) and Attachment, 37 x 40 mm (07946 - 0010200)
- driver attachment	07953 - MJ10100	
- driver handle	07953 - MJ10200	
Ball race remover	07946 - 3710500	
Steering stem driver	07946 - MB00000	

## TROUBLESHOOTING

### Hard steering

- Faulty steering head bearings
- Damaged steering head bearings
- Insufficient tire pressure
- Steering head bearing adjustment nut is too tight
- Faulty tire

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

- Bent fork
- Bent front axle
- Wheel installed incorrectly
- Faulty steering head bearings
- Bent frame
- Worn wheel bearings
- Worn swingarm pivot components
- Unevenly adjusted damping and pre-load in each fork leg

### Front wheel wobbles

- Bent rims
- Worn wheel bearings
- Faulty tire
- Unbalanced tire and wheel

### Wheel turns hard

- Faulty wheel bearings
- Bent front axle

### Soft suspension

- Improper spring pre-load adjustment
- Weak springs
- Low fluid level in fork
- Low tire pressure

### Hard suspension

- Improper spring pre-load adjustment
- Incorrect fluid weight
- High fluid level in fork
- Bent fork sliders
- Clogged fluid passage
- High tire pressure

### Front suspension noisy

- Insufficient fluid in fork
- Loose fork fasteners



## HANDLEBARS

### RIGHT HANDLEBAR REMOVALS

Disconnect the front brake switch connectors.

**NOTE**

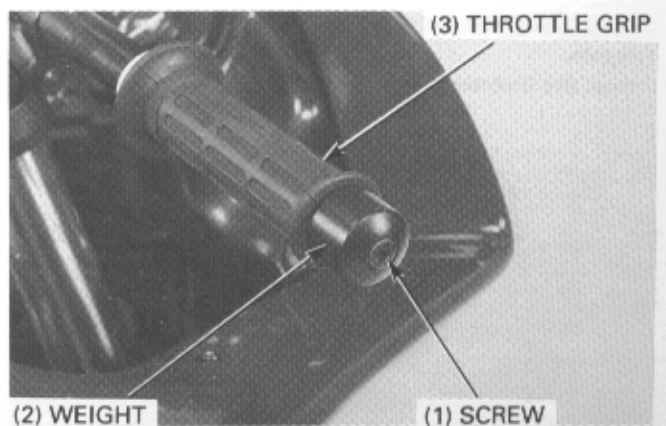
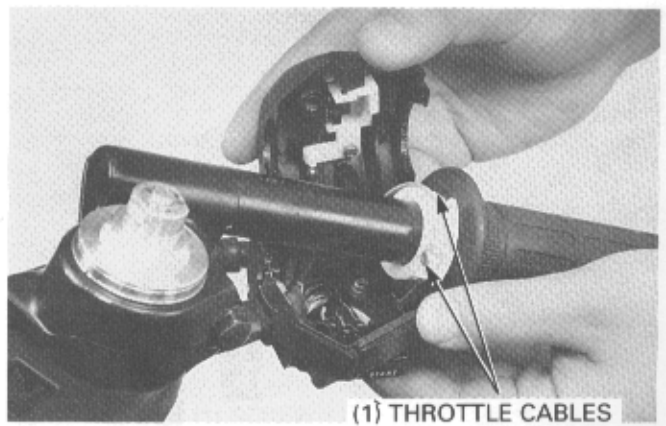
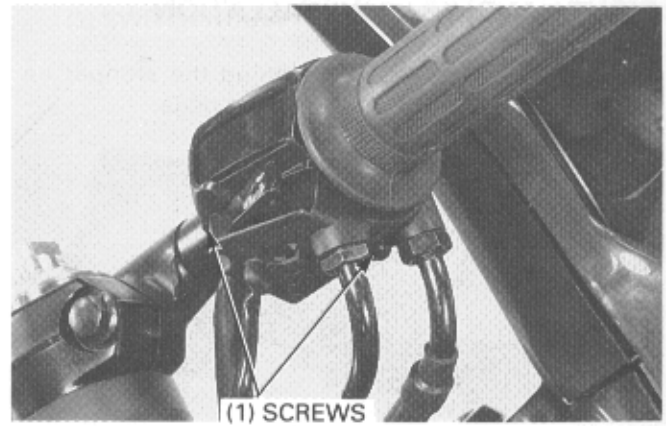
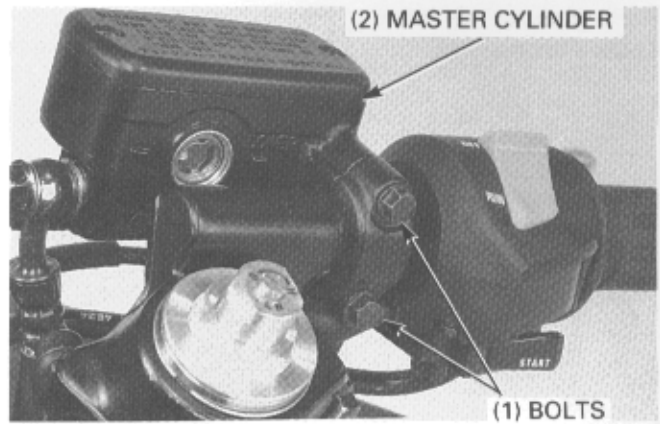
- Keep the master cylinder upright to prevent air from entering the hydraulic system.

Remove the two bolts, master cylinder holder and master cylinder from the handlebar.

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

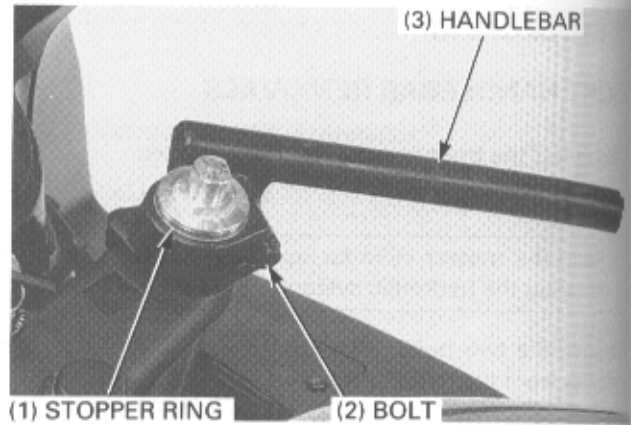
Disconnect the throttle cables from throttle grip flange.

Remove the screw, handlebar weight and throttle grip.



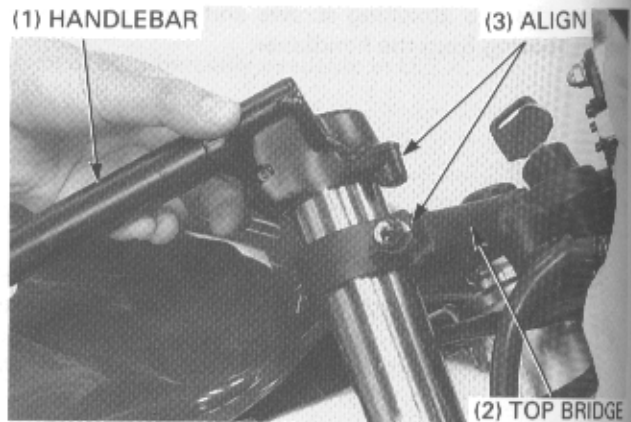
## FRONT WHEEL/SUSPENSION/STEERING

Remove the stopper ring.  
Loosen the handlebar pinch bolt and remove the handlebar.



### RIGHT HANDLEBAR INSTALLATION

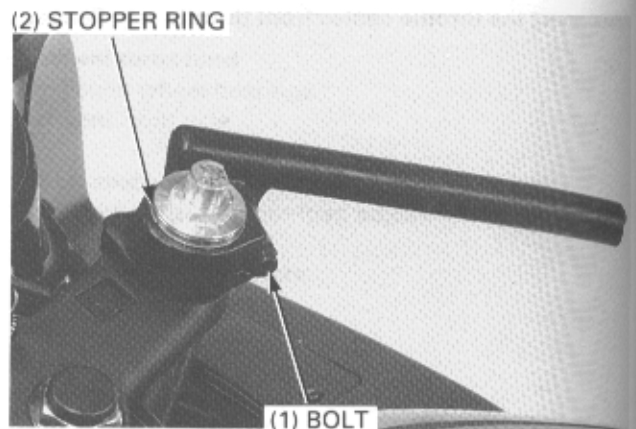
Install the right handlebar aligning the stopper on the handlebar with the groove in the top bridge.



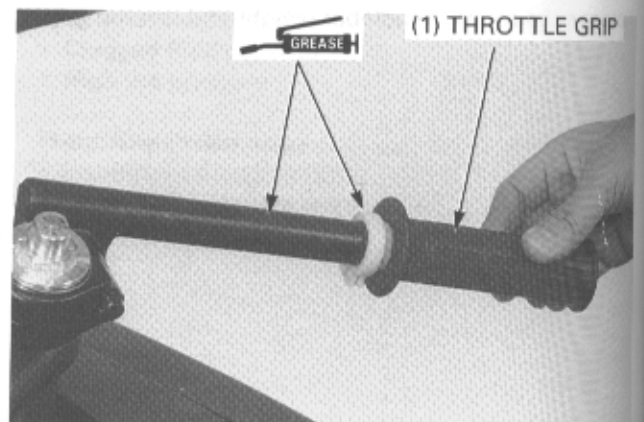
Tighten the handlebar pinch bolt.

**Torque: 27 N·m (2.7 kg·m, 20 lb·ft)**

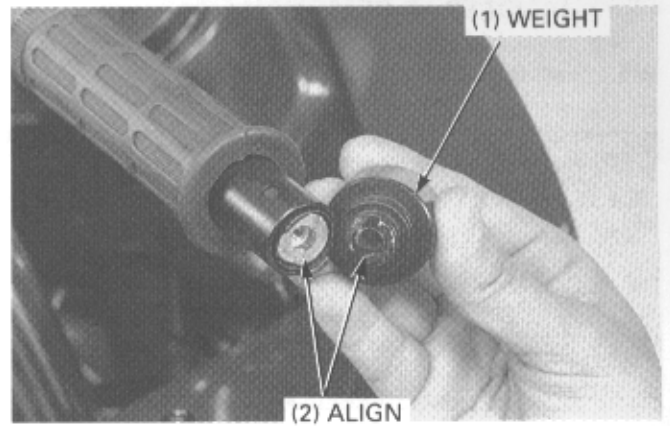
Install the stopper ring into the fork groove.



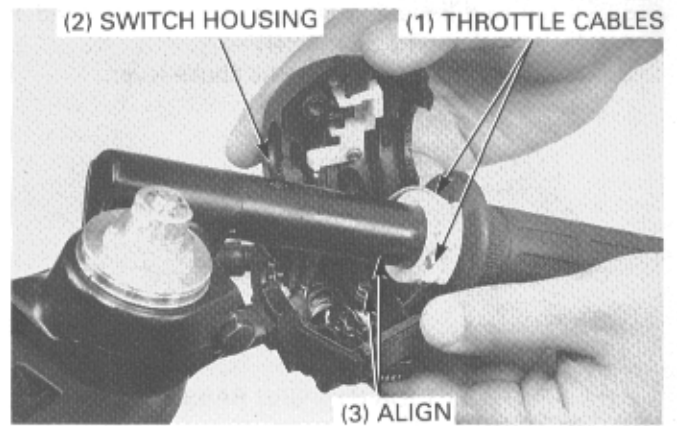
Apply grease to the throttle grip inner surface and flange groove.  
Install the throttle grip.



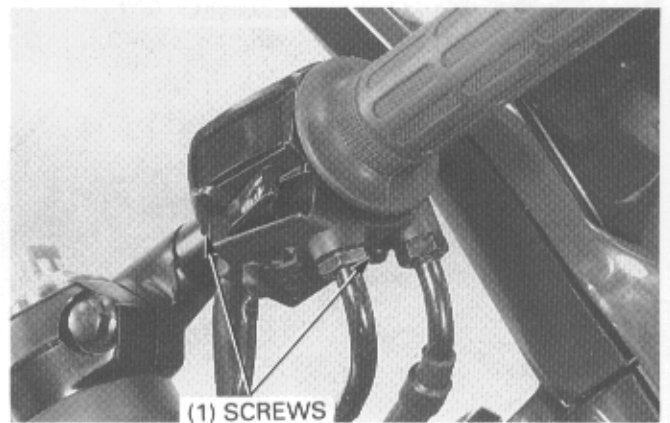
Install the handlebar weight aligning its boss with the handlebar.  
Clean and apply a locking agent to the screw threads.  
Tighten the screw.



Connect the throttle cables to the throttle grip flange.  
Install the handlebar switch housing onto the handlebar, aligning the locating pin with the hole in the handlebar.



Install the attaching screws and tighten the front screw first, then tighten the rear screw.

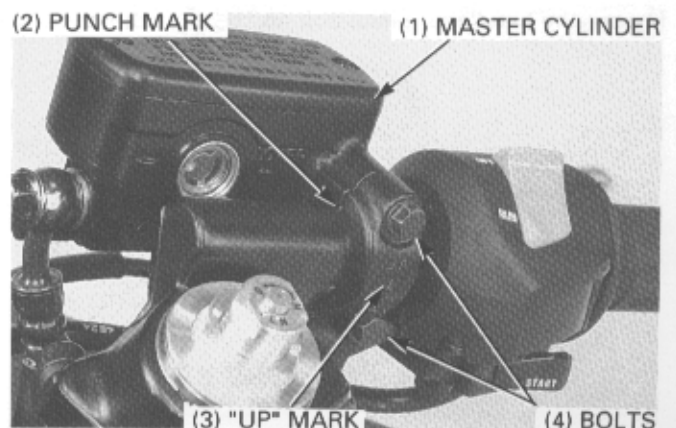


Install the master cylinder and holder with the "UP" mark facing up.  
Align the end of the master cylinder with the punch mark on the handlebar and tighten the upper bolt first, then tighten the lower bolt.

**Touque: 12 N·m (1.2 kg-m, 9 lb-ft)**

Connect the front brake switch connectors.

Check the throttle grip free play (page 3-4).

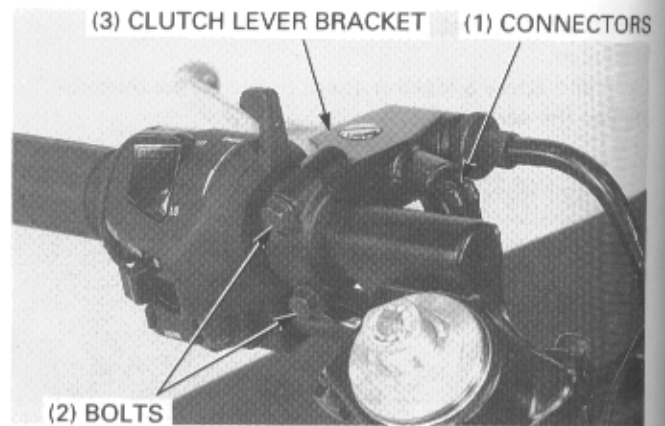


## FRONT WHEEL/SUSPENSION/STEERING

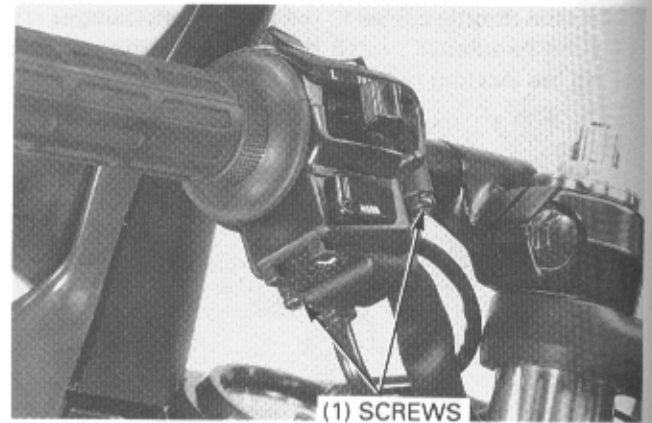
### LEFT HANDLEBAR REMOVAL

Disconnect the clutch switch connectors.

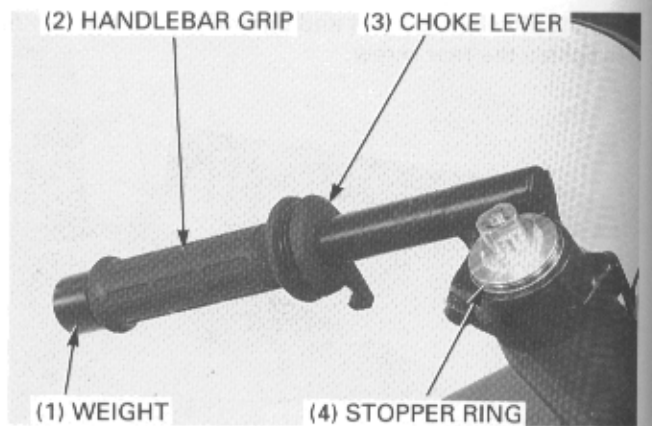
Remove the two bolts, clutch lever bracket holder and clutch lever bracket from the handlebar.



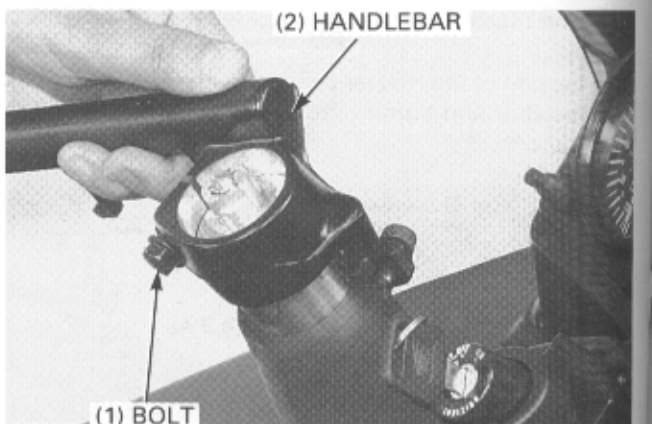
Remove the two attaching screws and the left handlebar switch housing from the handlebar.  
Disconnect the choke cable from the choke lever.



Remove the screw and handlebar weight.  
Remove the left handlebar grip and choke lever from the handlebar.  
Remove the stopper ring.

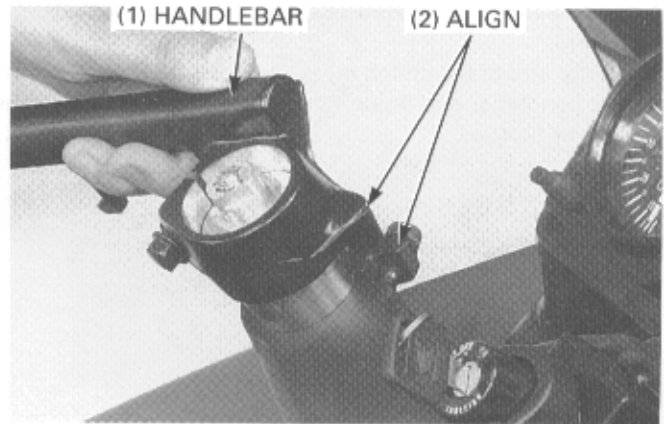


Loosen the handlebar pinch bolt and remove the handlebar.



**LEFT HANDLEBAR INSTALLATION**

Install the left handlebar aligning the stopper on the handlebar with the groove in the top bridge.

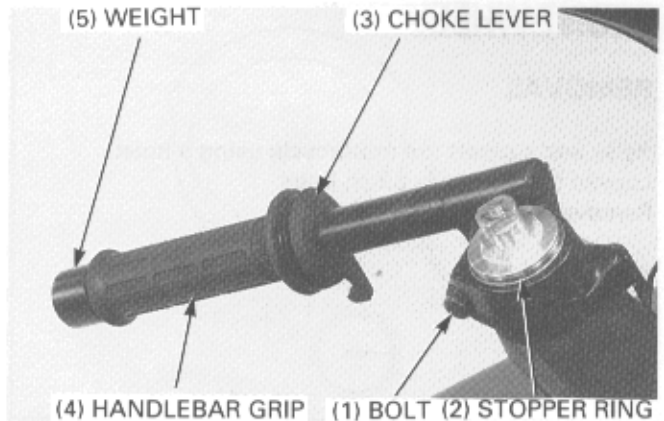


Tighten the handlebar pinch bolt.

**Torque: 27 N·m (2.7 kg-m, 20 lb-ft)**

Install the stopper ring into the fork groove.

Install the choke lever onto the handlebar.  
 Clean the inside surface of the left handlebar grip and the outside surface of the left handlebar.  
 Apply Honda Bond A or Honda Grip Cement (U.S.A. only) to the inside surface of the left handlebar grip and the outside surface of the left handlebar.  
 Wait 3 - 5 minutes and install the grip.  
 Rotate the grip for even application of the adhesive.

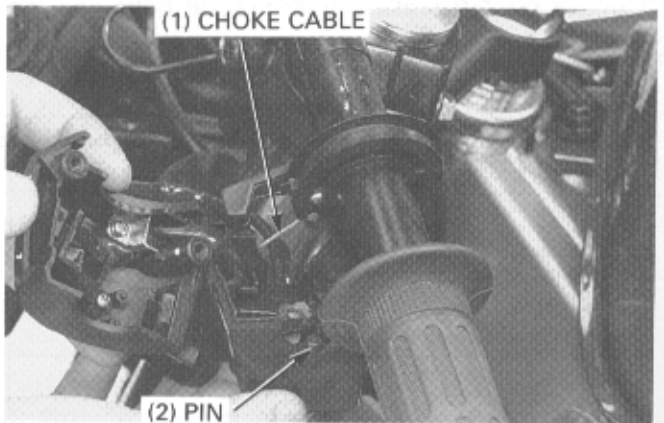


**NOTE**

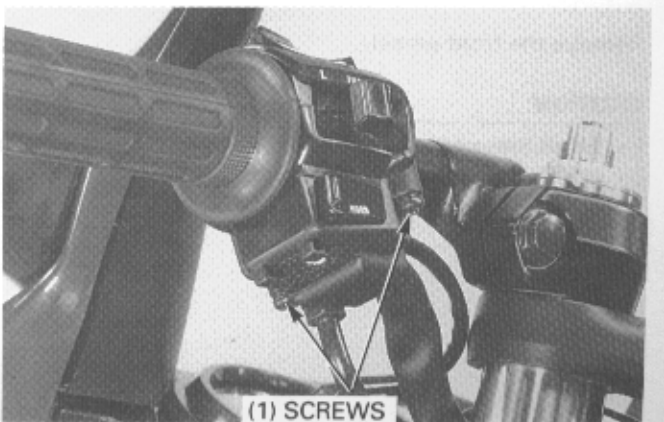
- Allow the adhesive to dry for an hour before using.

Install the handlebar weight aligning its boss with the handlebar.  
 Clean and apply a locking agent to the screw threads.  
 Tighten the screw.

Connect the choke cable to the choke lever.  
 Install the handlebar switch housing onto the handlebar, aligning the locating pin with the hole in the handlebar.



Install the attaching screws and tighten the front screw first, then tighten the rear screw.

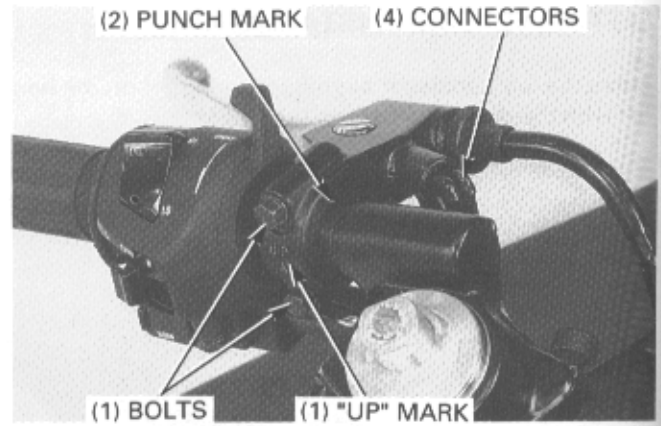


## FRONT WHEEL/SUSPENSION/STEERING

Install the clutch lever bracket and holder with the "UP" mark facing up.

Align the end of the clutch lever bracket with the punch mark on the handlebar and tighten the upper bolt first, then tighten the lower bolt.

Connect the clutch switch connectors.



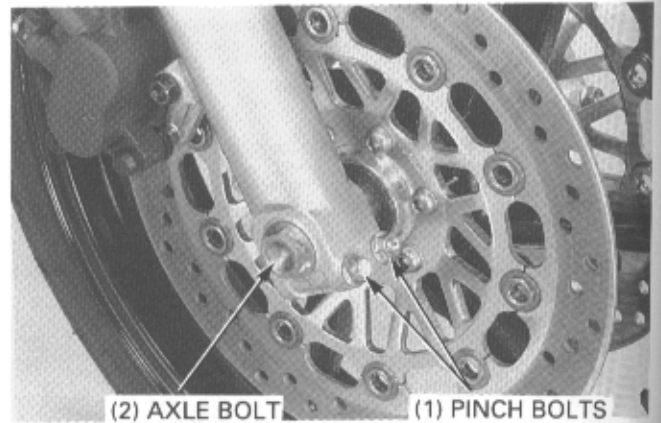
## FRONT WHEEL

### REMOVAL

Raise and support the motorcycle using a hoist.

Loosen the right axle pinch bolts.

Remove the axle bolt.



Remove the left brake caliper bracket bolts and the left caliper.

### CAUTION

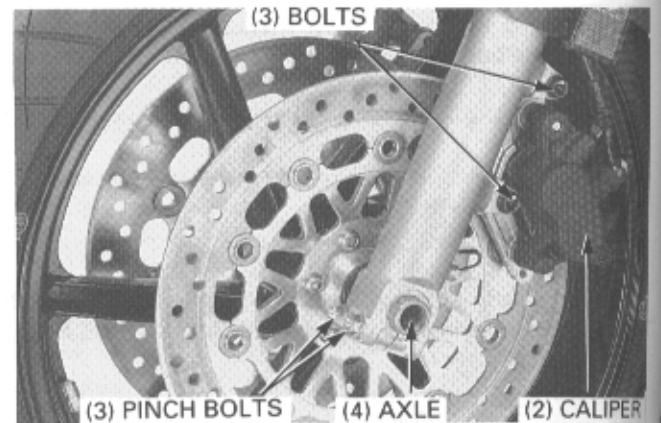
- Do not suspend the brake caliper from the brake hose. Do not twist the brake hose.

### NOTE

- Do not operate the front brake lever after removing the caliper and front wheel. To do so will cause difficulty in fitting the brake disc between the brake pads.

Loosen the left axle pinch bolts.

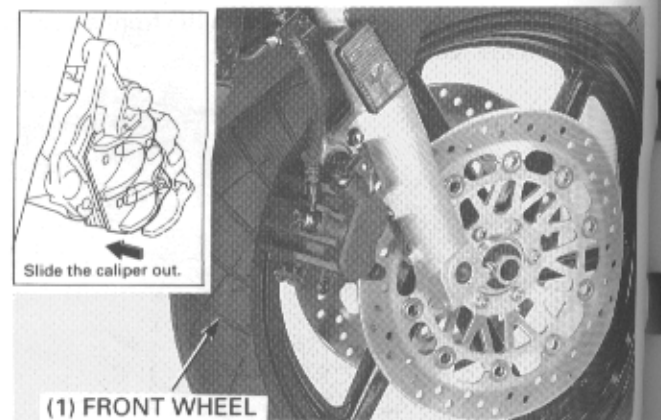
Pull the axle out.



Remove the front wheel.

### CAUTION

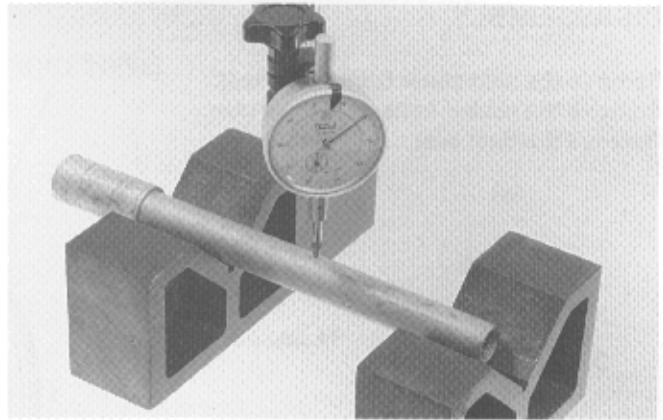
- When removing the wheel, slide the right brake caliper out so that the wheel rim clears.



**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)**

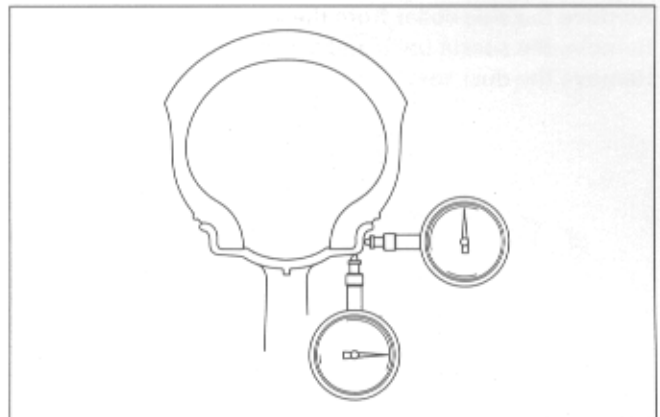
**WHEEL**

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)**

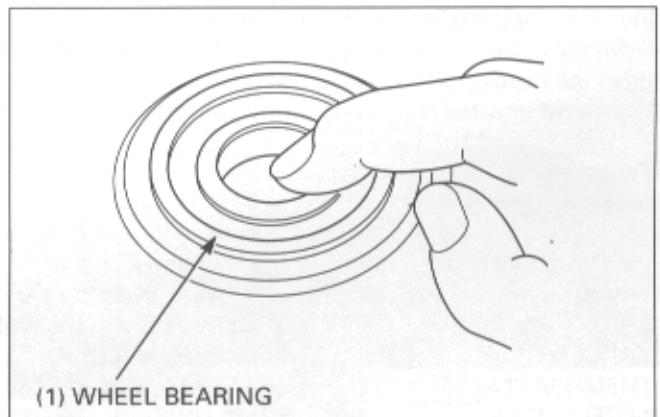
**WHEEL BEARING**

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

**NOTE**

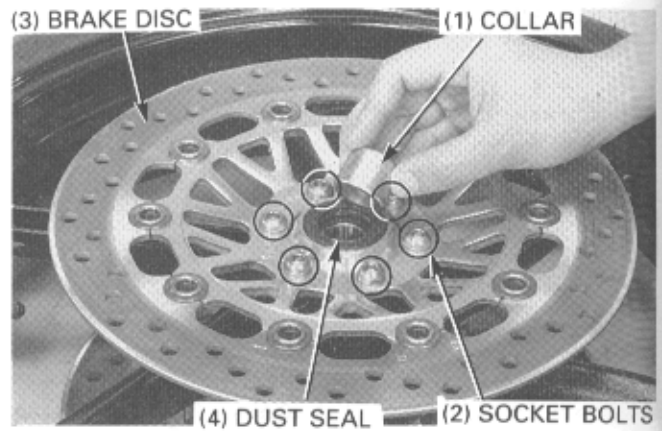
- Replace the wheel bearings in pairs.



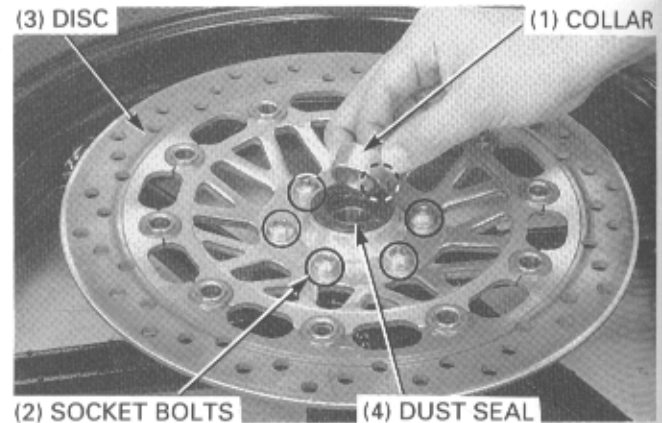
## FRONT WHEEL/SUSPENSION/STEERING

### DISASSEMBLY

Remove the side collar from the wheel.  
Remove the socket bolts and brake disc.  
Remove the dust seal.



Remove the side collar from the wheel.  
Remove the socket bolts and brake disc.  
Remove the dust seal.



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

#### Tools:

Bearing remover shaft

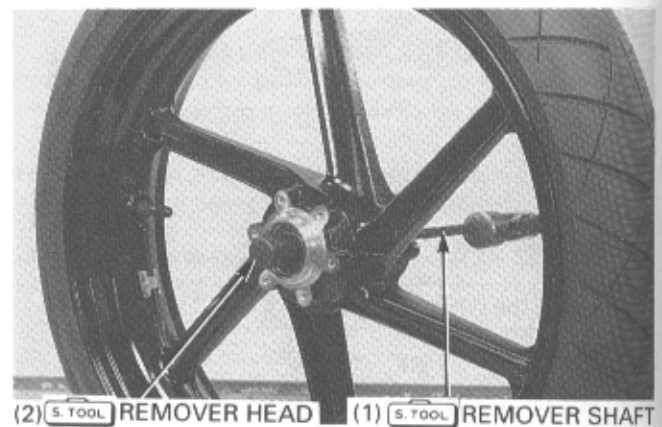
07746 - 0050100 or  
equivalent commercially  
available in U.S.A.

Bearing remover head, 20 mm

07746 - 0050600 or  
equivalent commercially  
available in U.S.A.

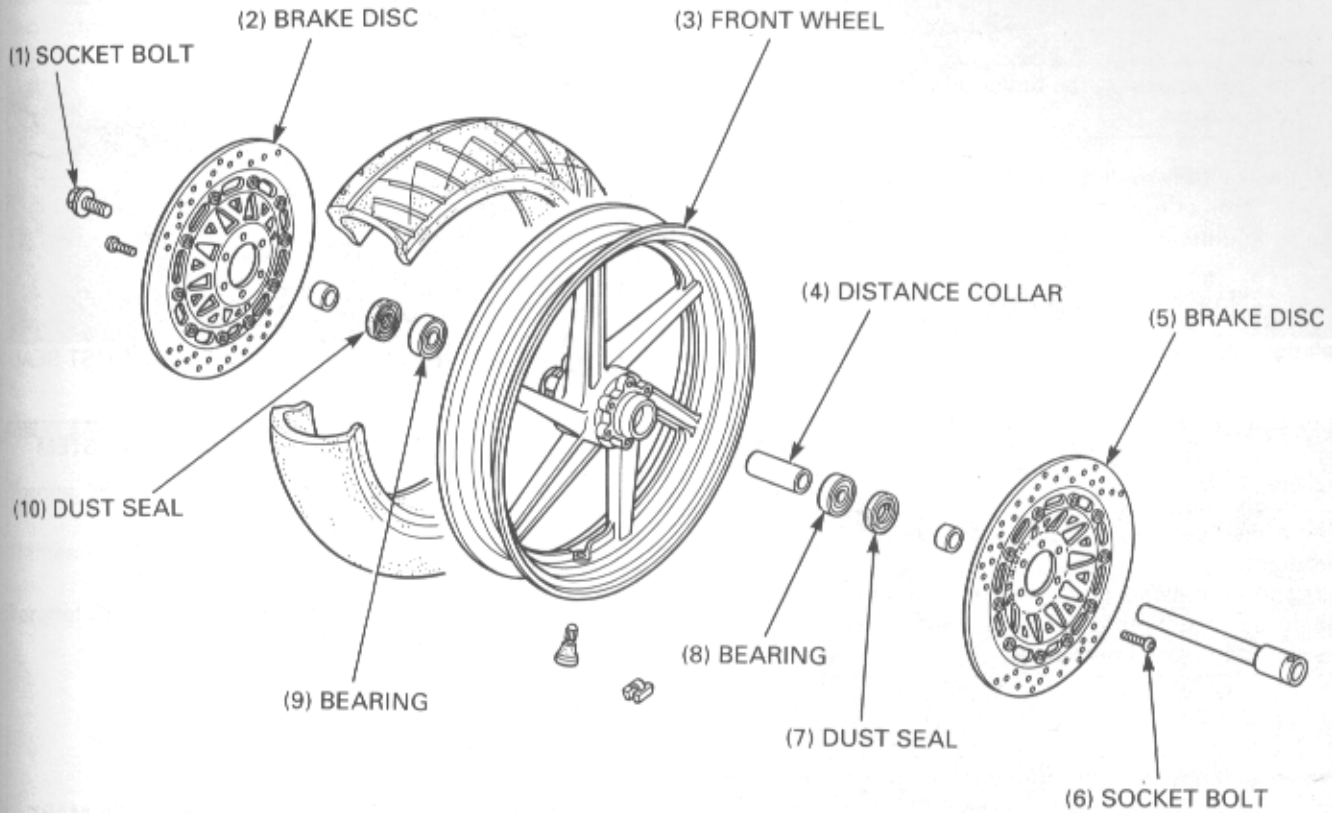
#### NOTE

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





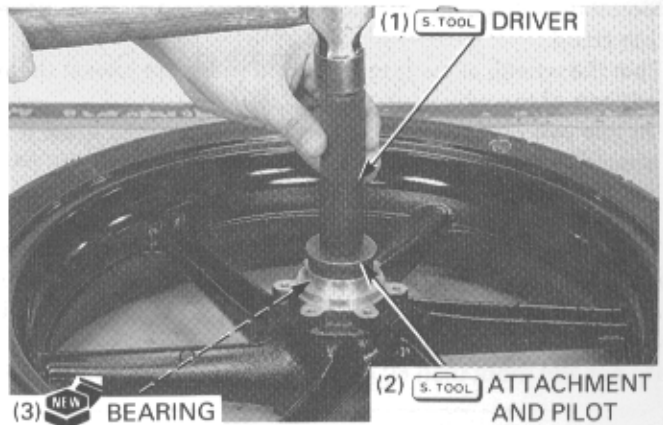
ASSEMBLY



Drive in a new right bearing squarely with the marking facing up until it is fully seated.  
 Install the distance collar.  
 Drive in a new left bearing squarely with the marking facing up until it is fully seated.

Tools:

Driver	07749 - 0010000
Attachment, 42 x 47 mm	07746 - 0010300
Pilot, 20 mm	07746 - 0040500



Apply grease to the new dust seal lip and install the dust seal into the left wheel hub.

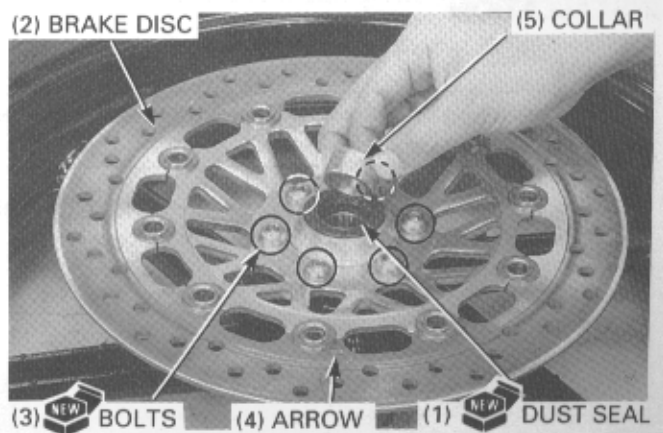
**WARNING**

• Do not get grease on the brake disc or stopping power will be reduced.

Install the left brake disc with the direction arrow pointing in the direction of rotation.  
 Install and tighten the new socket bolts.

Torque: 20 N·m (2.0 kg-m, 14 lb-ft)

Install the left side collar.



## FRONT WHEEL/SUSPENSION/STEERING

Apply grease to a new dust seal lip and install the dust seal into the right wheel hub.

### ⚠ WARNING

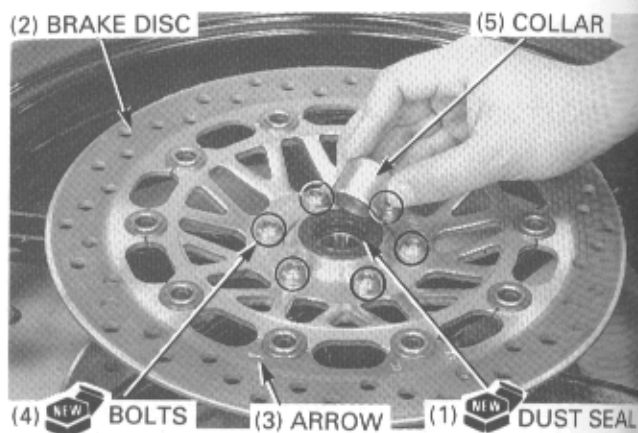
- Do not get grease on the brake disc or stopping power will be reduced.

Install the right brake disc with the direction arrow pointing in the direction of rotation.

Install and tighten the new socket bolts.

**Torque: 20 N·m (2.0 kg·m, 14 lb·ft)**

Install the side collar.



## WHEEL BALANCE

### NOTE

- The wheel balance must be checked when the tire is remounted.
- 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.

### ⚠ WARNING

- Wheel balance directly affects the stability, handling and overall safety of the motorcycle. Carefully check balance before reinstalling the wheel.

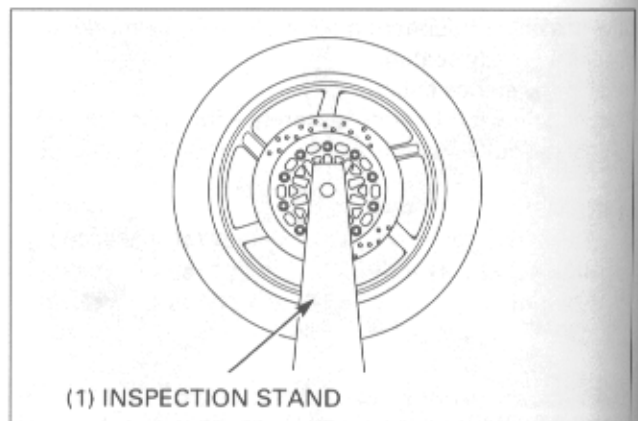
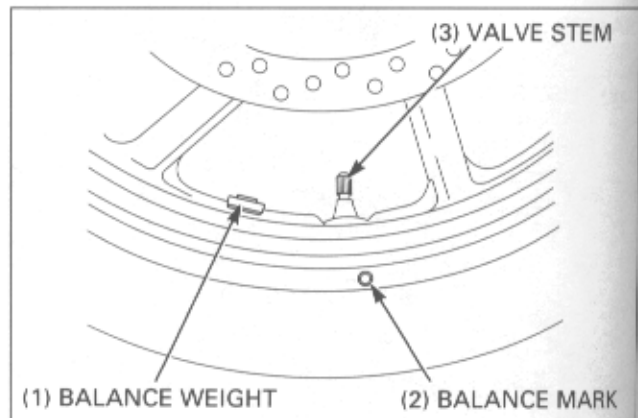
Mount the wheel, tire and brake disc assembly on an inspection stand.

Spin the wheel, allow it to stop, and mark the lowest (heaviest) part of the wheel with 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.

To balance the wheel, install balance 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 front wheel.

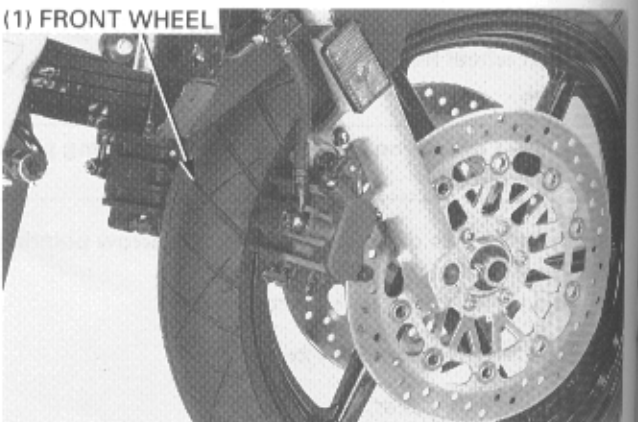


## INSTALLATION

### CAUTION

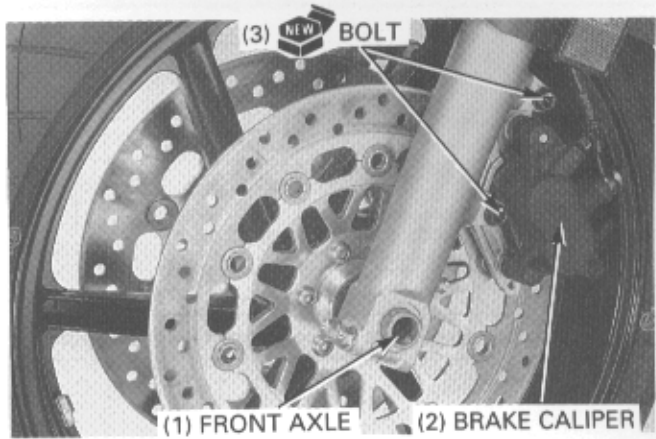
- When installing the wheel, slide the right brake caliper out so that the wheel rim clears.

Install the front wheel between the fork legs so that the brake disc is positioned between the pads, being careful not to damage the pads.



Apply a thin layer of grease to the front axle surface.  
 Install the front axle.  
 Install the left brake caliper and new bracket bolts.

**Torque: 31 N·m (3.1 kg-m, 22 lb-ft)**

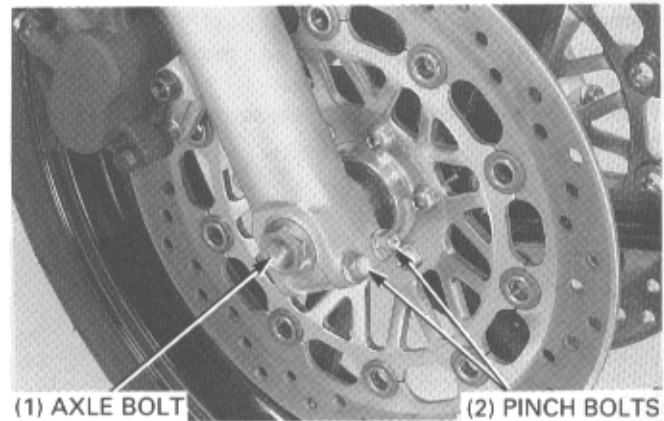


Install and tighten the axle bolt.

**Torque: 60 N·m (6.0 kg-m, 43 lb-ft)**

Tighten the right axle pinch bolts.

**Torque: 22 N·m (2.2 kg-m, 16 lb-ft)**



With the front brake applied, pump the front suspension up and down several times to seat the axle and check front brake operation.

Check the clearance between each surface of the left brake disc and left caliper bracket.

The clearance should be at least 0.7 mm (0.03 in) when measured with a feeler gauge.

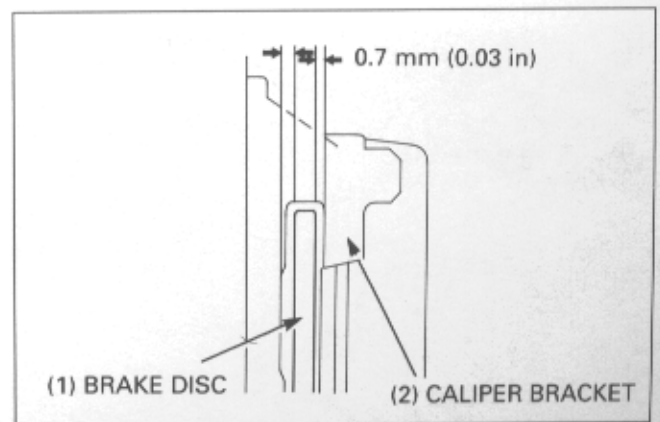
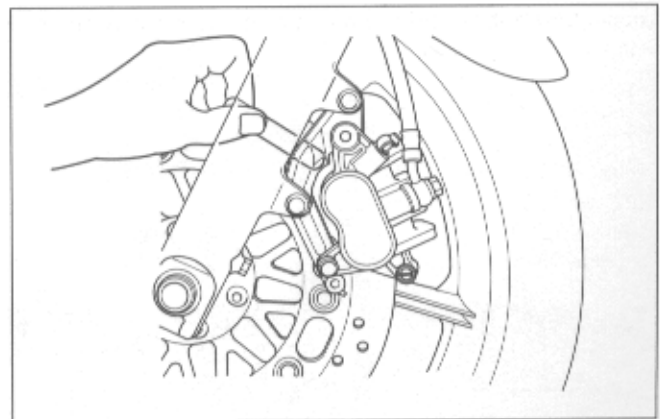
If the gauge inserts easily, tighten the left front axle pinch bolts.

**Torque: 22 N·m (2.2 kg-m, 16 lb-ft)**

If the feeler gauge cannot be installed easily, pull the left fork out or push it in until the gauge can be inserted.  
 Tighten the left front axle pinch bolts.

**Torque: 22 N·m (2.2 kg-m, 16 lb-ft)**

After installing the wheel, apply the brake several times, then recheck both discs for caliper bracket-to-disc clearance.



## FORK

### REMOVAL

Remove the front wheel (page 12-8).

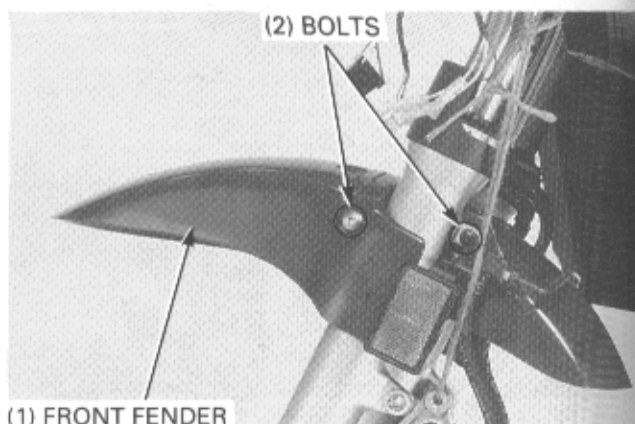
Remove the four bolts and the front fender.

### CAUTION

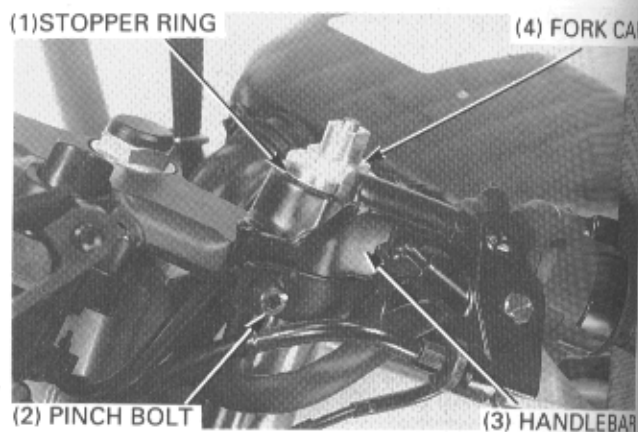
- Do not hang the brake caliper from the brake pipe.

Remove the stopper ring.  
Loosen the handlebar pinch bolt and remove the handlebar.  
Loosen the top bridge pinch bolt.  
When the fork is ready to be disassembled, loosen the fork cap, but do not remove it.

Loosen the bottom bridge pinch bolt and remove the fork.

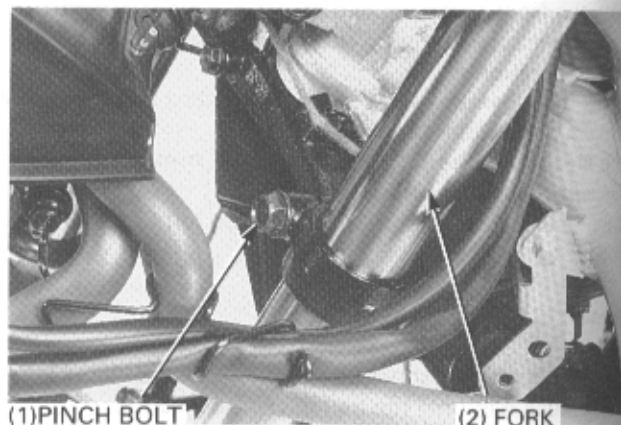


(1) FRONT FENDER



(2) PINCH BOLT

(3) HANDLEBAR



(1) PINCH BOLT

(2) FORK

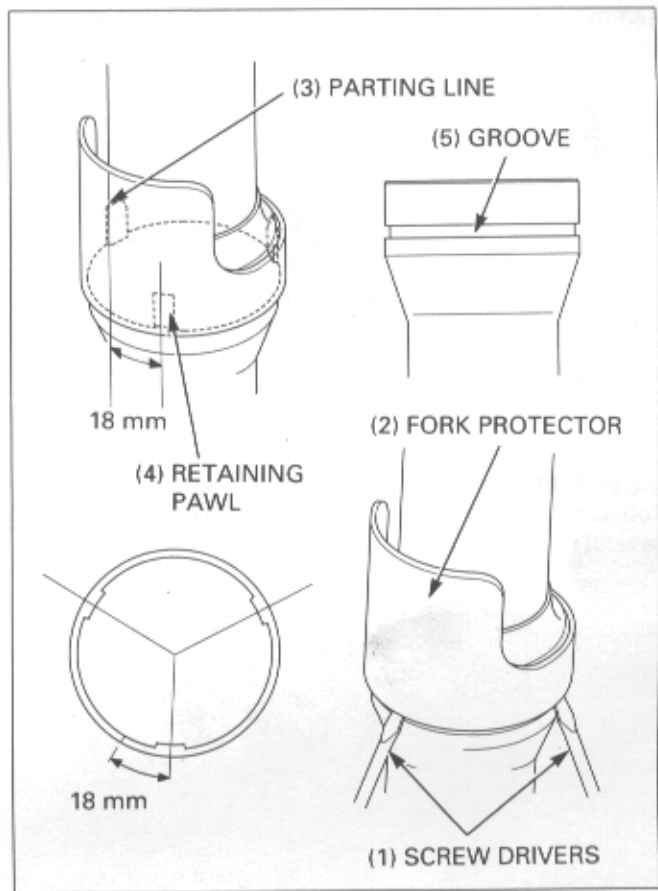
DISASSEMBLY

CAUTION

- Be careful not to scratch the fork slider or damage the dust seal.

You'll need two screwdrivers to remove the fork tube protector.

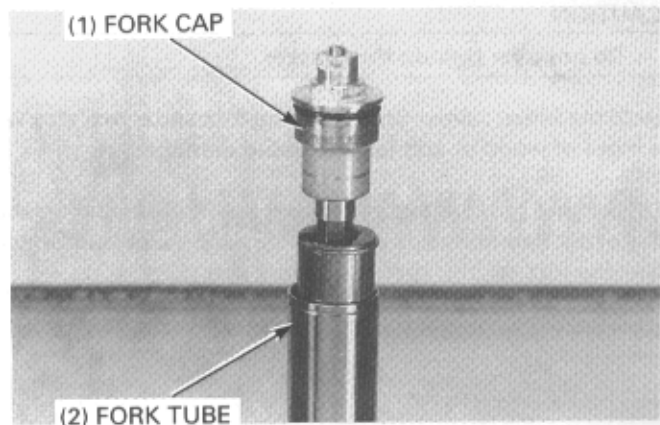
1. Insert a screwdriver between the fork tube and protector at a point where one of the three retaining pawls exists, then carefully pry up on the screwdriver placed against the groove of the fork slider.
2. Without disturbing the above setup, insert another screwdriver at any one of the two remaining pawls and pry up on the protector in the same manner.
3. Repeat the above procedure to remove the other protector from the other fork slider.



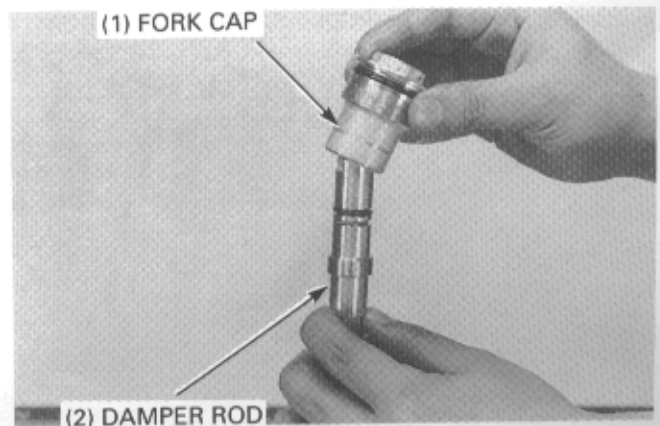
Remove the fork cap from the fork tube.

WARNING

- The fork cap is under spring pressure. Use caution when removing it.

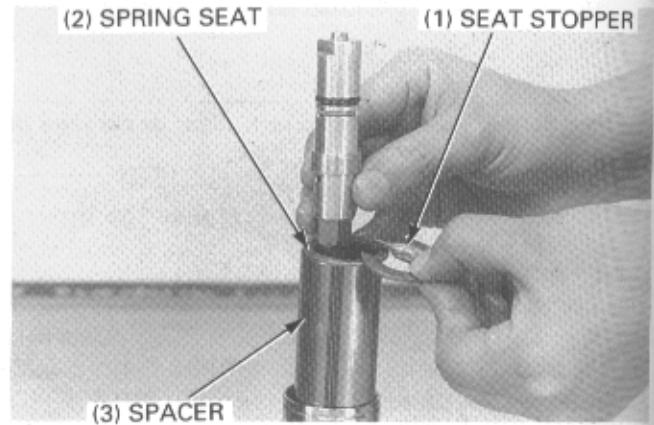


Remove the fork cap from the damper rod.

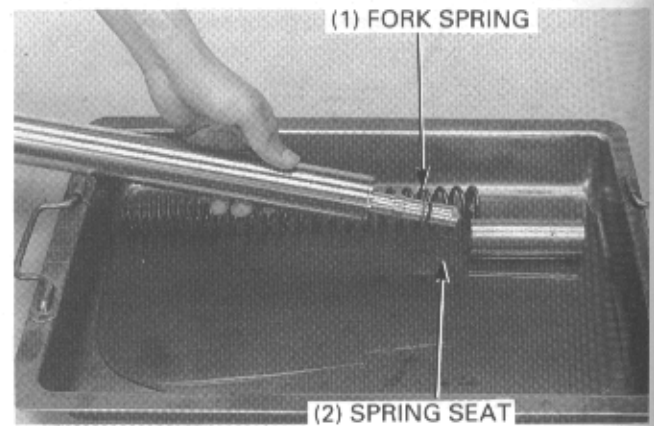


## FRONT WHEEL/SUSPENSION/STEERING

Remove the seat stopper, upper spring seat and spacer.



Remove the lower spring seat and fork spring.  
Pour out the fork fluid by pumping the fork tube up and down several times.



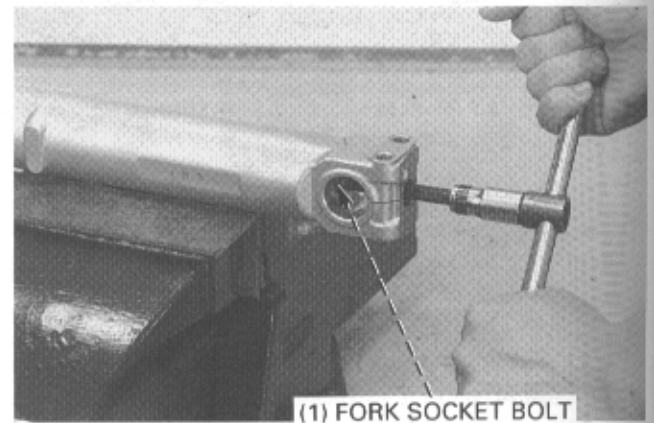
### CAUTION

- Do not over tighten the bracket.

Hold the brake caliper bracket of the fork slider in a vise with a piece of wood or soft jaws to avoid damage.

Loosen and remove the fork socket bolt and sealing washer. If the fork damper turns with the socket bolt, temporarily install the fork spring, spacer and fork cap.

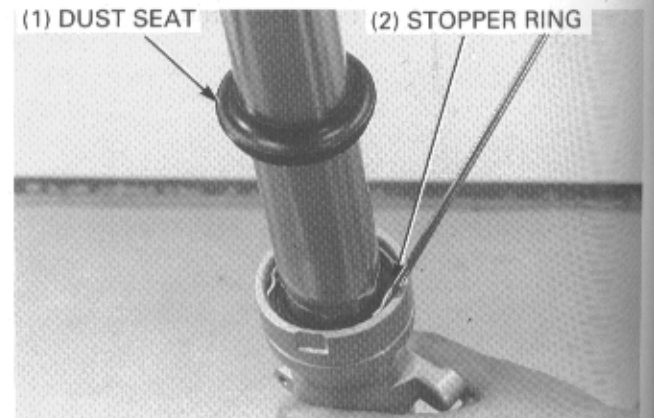
Remove the fork damper from the fork tube.



Remove the dust seal and stopper ring.

### CAUTION

- Be careful not to scratch the fork tube.



NOTE

- Check that the fork tube moves smoothly in the fork slider. If it does not, check the fork tube for bending or damage, and the bushings for wear or damage.

Using quick successive motions, pull the fork tube out of the fork slider.

Remove the oil lock piece from the fork slider.

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

NOTE

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

INSPECTION

FORK SPRING

Measure the fork spring free length.

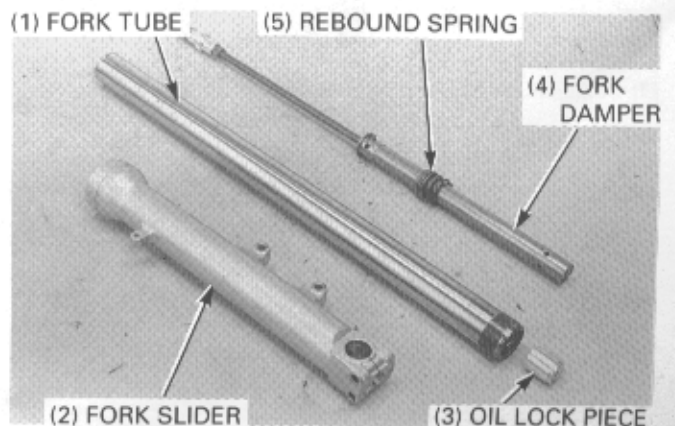
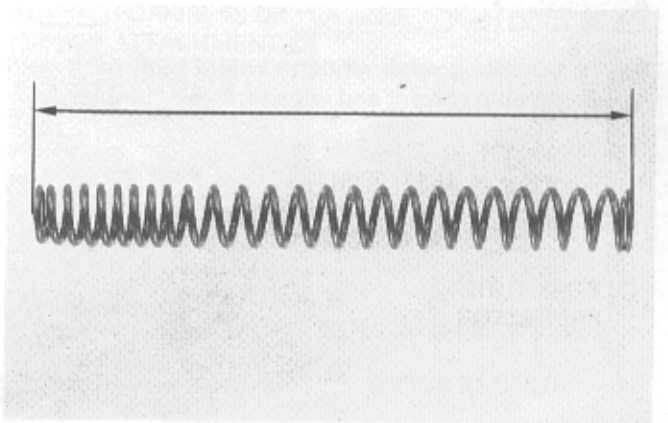
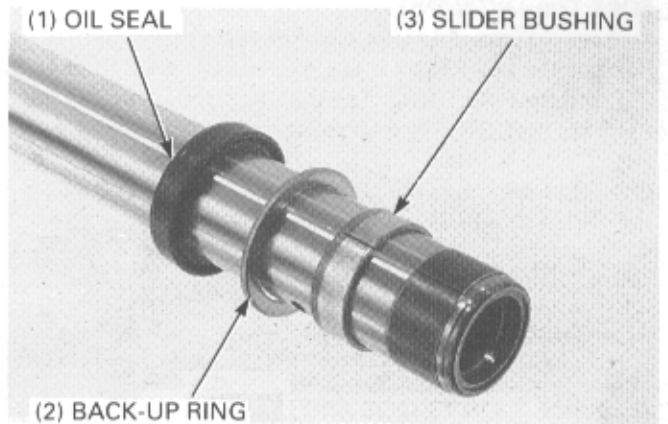
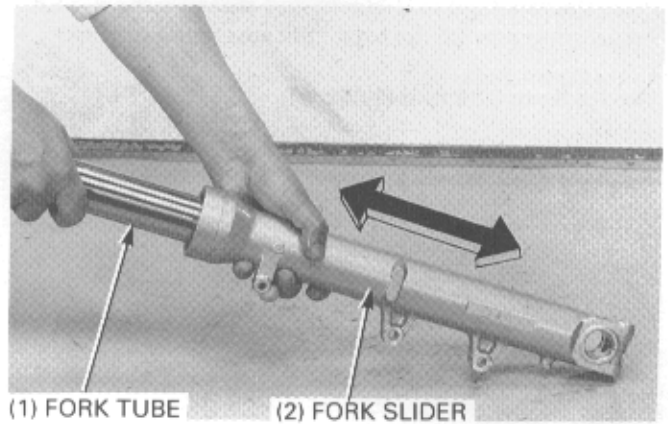
Service limit: 311.5 mm (12.3 in)

FORK TUBE/SLIDER/DAMPER

Check the fork tube, fork slider, oil lock piece and fork damper for score marks, and excessive or abnormal wear.

Check the rebound spring for fatigue or damage.

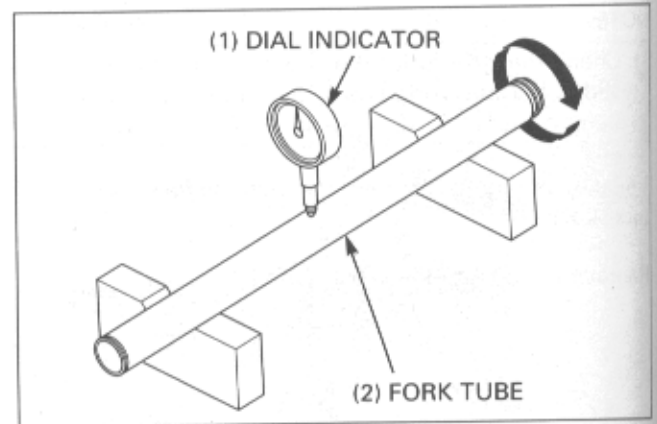
Replace the component if necessary.



## FRONT WHEEL/SUSPENSION/STEERING

Place the fork tube in V-blocks and measure the runout. Actual runout is 1/2 the total indicator reading.

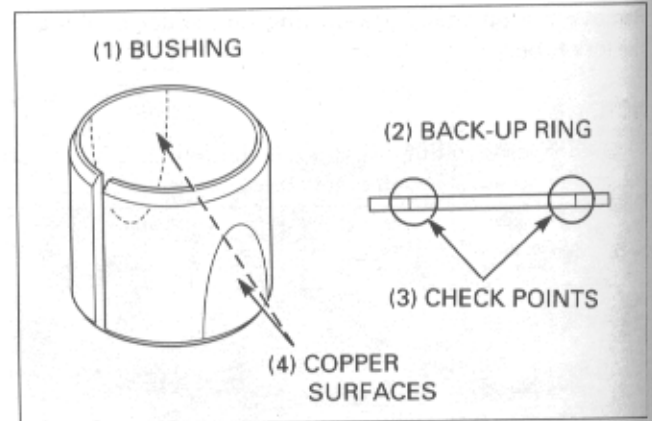
**Service limit: 0.20 mm (0.008 in)**



### FORK TUBE BUSHING

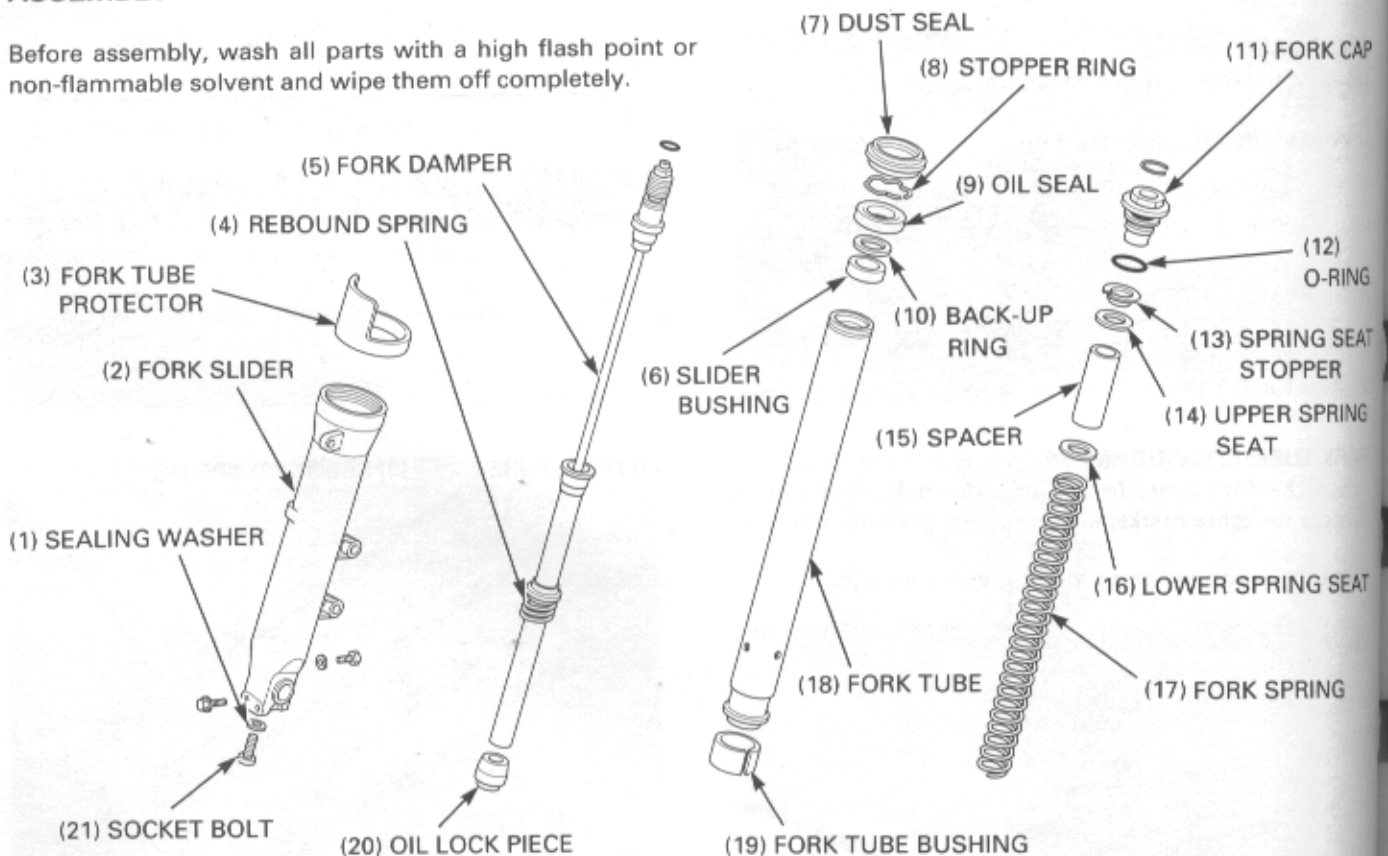
Visually inspect the slider and fork tube bushings. Replace the bushings if there is excessive scoring or scratching, or if the teflon is worn so that the copper surface appears on more than 3/4 of the entire surface.

Check the back-up ring; replace it if there is any distortion at the points shown.



### ASSEMBLY

Before assembly, wash all parts with a high flash point or non-flammable solvent and wipe them off completely.





## FRONT WHEEL/SUSPENSION/STEERING

Install a new fork tube bushing if the bushing has been removed.

Install the slider bushing and back-up ring onto the fork tube.

### NOTE

- Remove the burrs from the bushing mating surface, being careful not to peel off the coating.
- Coat the slider bushing and guide bushing with the recommended fork fluid.

Install the fork damper into the fork tube.

Install the oil lock piece onto the fork damper end.

Install the fork tube into the fork slider.

### CAUTION

- Do not over tighten the bracket.

Hold the brake caliper bracket in a vise with a piece of wood or soft jaws.

Apply locking agent to the fork socket bolt threads and install the socket bolt and new sealing washer into the fork damper. Tighten the fork socket bolt.

**Torque: 20 N·m (2.0 kg·m, 14 lb-ft)**

If the fork damper turns with the socket bolt, temporarily install the fork spring, spacer and fork cap.

Drive the slider bushing into the outer tube with the back-up ring.

### Tools:

Fork seal driver	07947 - KA50100
Fork seal driver attachment	07947 - KF00100

Wrap vinyl tape around the top of end of the fork tube to avoid damaging the oil seal lip.

Coat a new oil seal with fork fluid and install it over the fork tube with the marked side facing up.

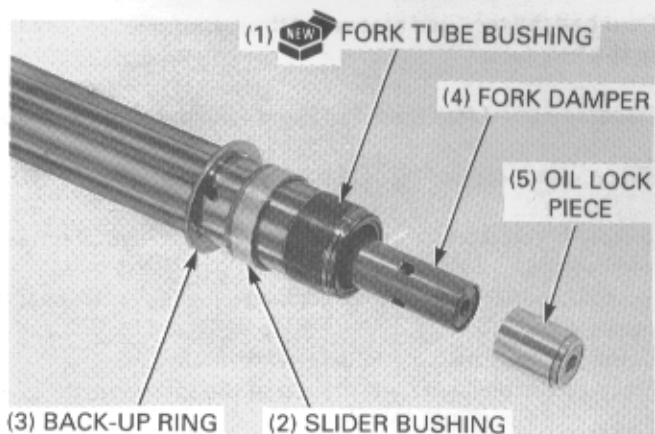
Drive the oil seal until the stopper ring groove is visible.

### Tools:

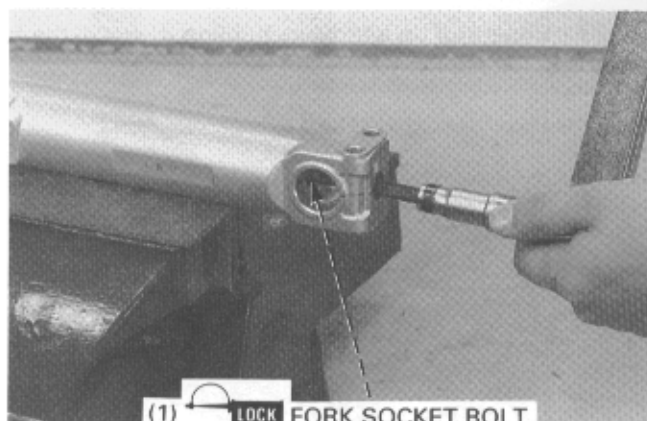
Fork seal driver	07947 - KA50100
Fork seal driver attachment	07947 - KF00100

Install the stopper ring into the groove in the fork slider.

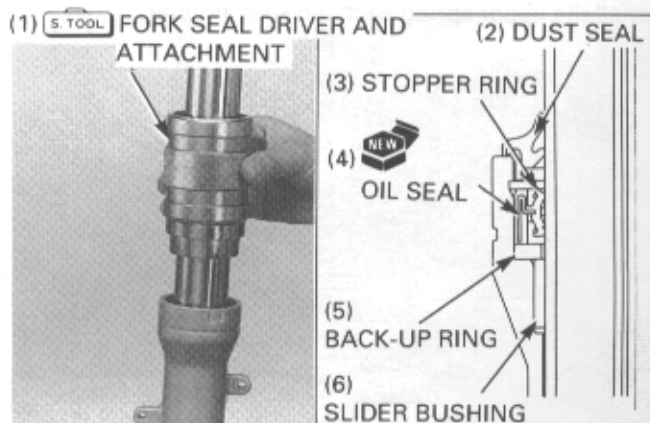
Apply fork fluid to the lip of a new dust seal and install the dust seal.



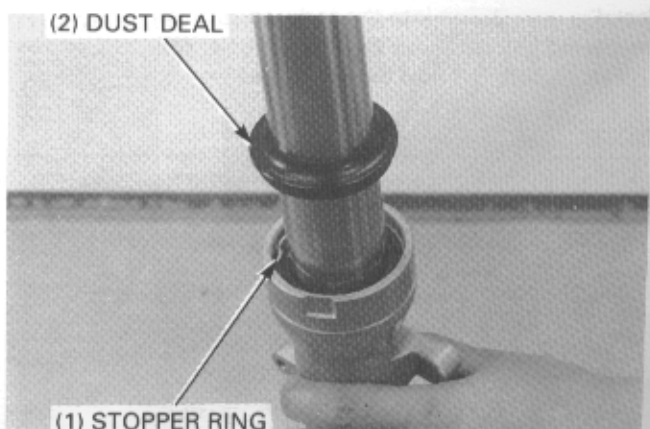
(3) BACK-UP RING (2) SLIDER BUSHING



(1) LOCK FORK SOCKET BOLT



(1) S TOOL FORK SEAL DRIVER AND ATTACHMENT (2) DUST SEAL (3) STOPPER RING (4) OIL SEAL (5) BACK-UP RING (6) SLIDER BUSHING



(2) DUST SEAL (1) STOPPER RING

## FRONT WHEEL/SUSPENSION/STEERING

Pour half the required amount of the recommended fork fluid in the fork tube.

**Recommended fork fluid: Pro Honda Suspension Fluid SS-8**

**Oil capacity: 463 cc (15.7 US oz, 16.3 Imp oz)**

Slowly pump the fork tube and damper rod several times to remove trapped air.

Pour additional oil up to the specified capacity and repeat the above step.

Compress the fork leg and damper rod fully.

Measure the oil level from the top of the fork tube.

**Oil level: 117 mm (4.61 in)**

Pull the damper rod up and while holding it, install the fork spring with the tightly wound end facing down.

Install the lower spring seat and spacer.

Install the upper spring seat and seat stopper.

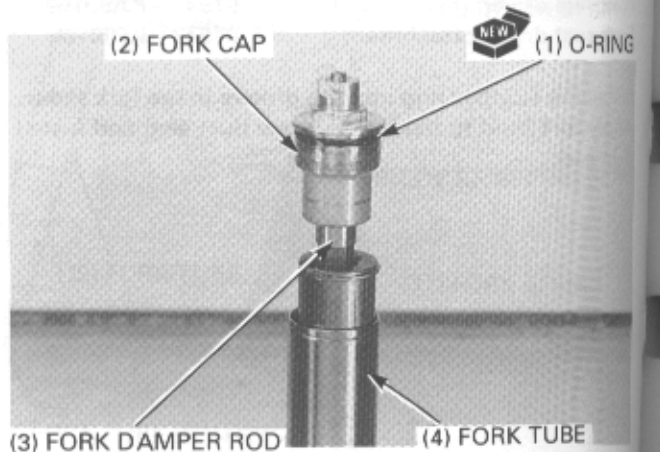
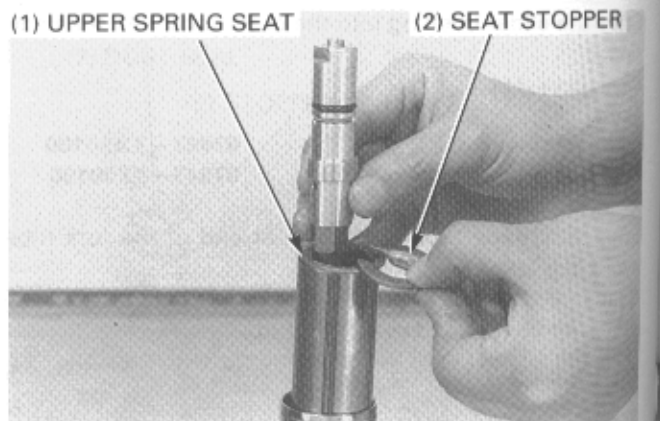
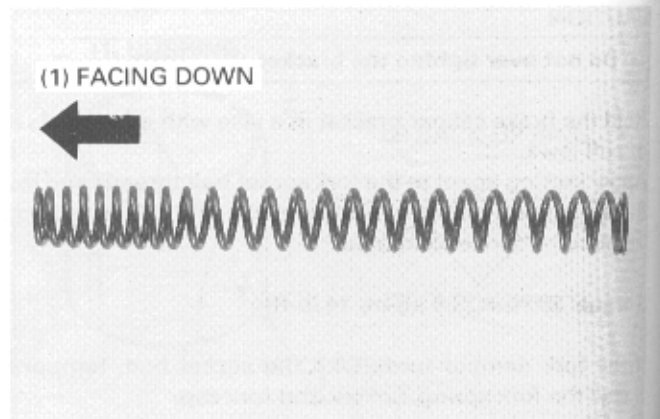
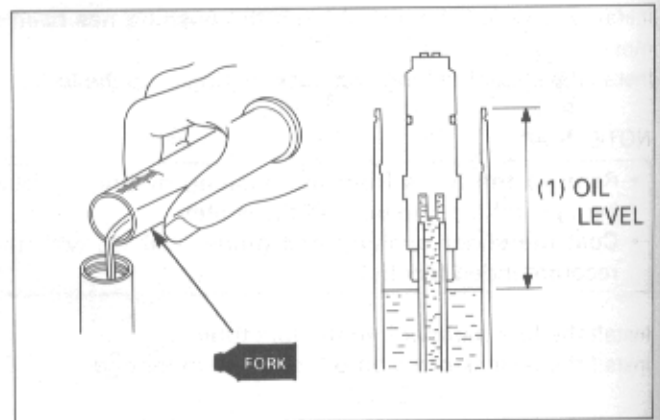
Install a new O-ring into the fork cap groove.

Install the fork cap onto the fork damper rod.

Install the fork cap into the fork tube.

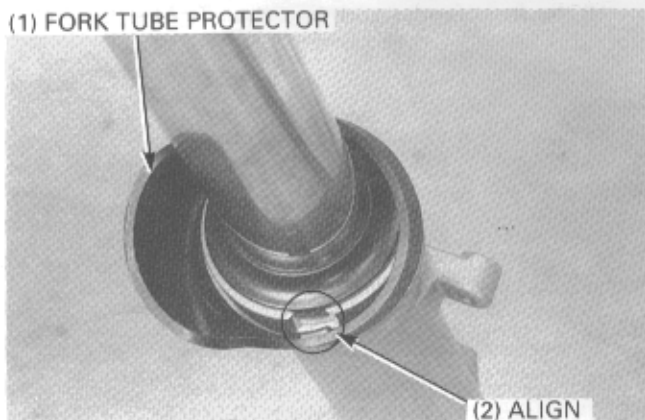
### NOTE

- Tighten the fork cap after installing the fork tube into the fork bridges.



Install the fork tube protector over the fork slider with the pawls aligned with the slider grooves as shown.

(1) FORK TUBE PROTECTOR

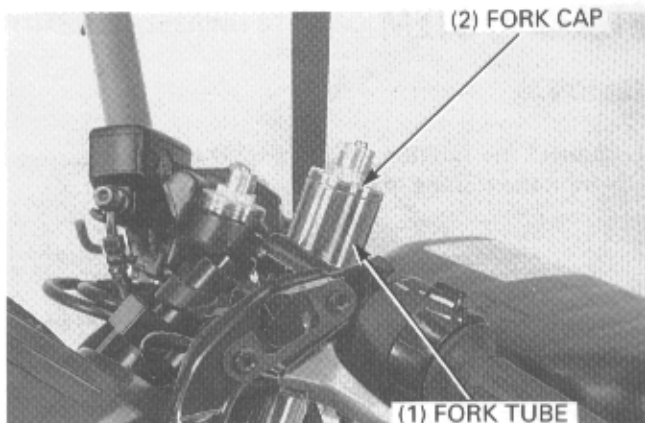


(2) ALIGN

**INSTALLATION**

Install the fork tube into the bottom and top bridge. Temporarily tighten the bottom bridge pinch bolt and tighten the fork cap to the specified torque.

**Torque: 23 N·m (2.3 kg-m, 17 lb-ft)**



(1) FORK TUBE

(2) FORK CAP

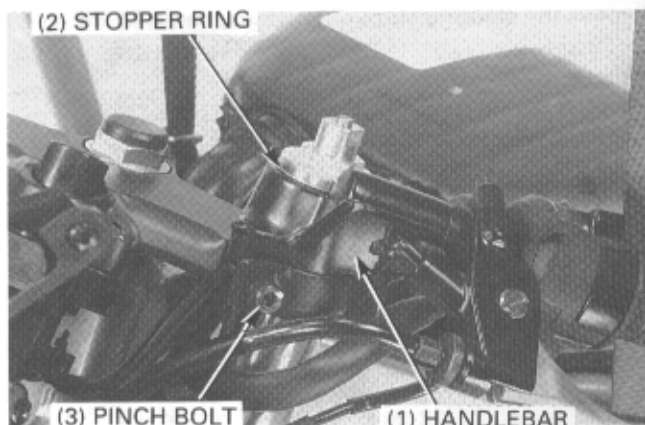
Loosen the bottom bridge pinch bolt. Install the handlebar (page 12- 7). Align the groove in the fork tube with the upper surface of the handlebar. Tighten the top bridge pinch bolt.

**Torque: 23 N·m (2.3 kg-m, 17 lb-ft)**

Tighten the handlebar pinch bolt.

**Torque: 27 N·m (2.7 kg-m, 20 lb-ft)**

Install the stopper ring to the fork tube groove.



(2) STOPPER RING

(3) PINCH BOLT

(1) HANDLEBAR

Tighten the bottom bridge pinch bolt.

**Torque: 40 N·m (4.0 kg-m, 29 lb-ft)**



(1) BOTTOM BRIDGE PINCH BOLT

## FRONT WHEEL/SUSPENSION/STEERING

Install the front fender and pipe stay. Tighten the bolts securely.

### Torque:

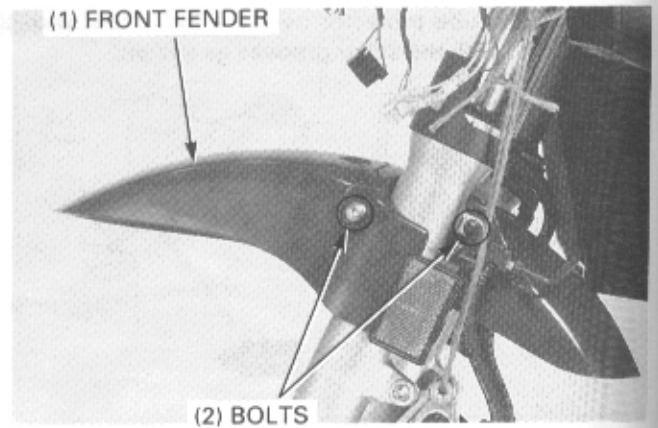
**Brake pipe stay bolt: 12 N·m (1.2 kg·m, 9 lb-ft)**

Install the front wheel (page 12-12).

With the front brake applied, compress the fork several times to check for proper fork operation.

Set the pre-load adjuster to standard position.

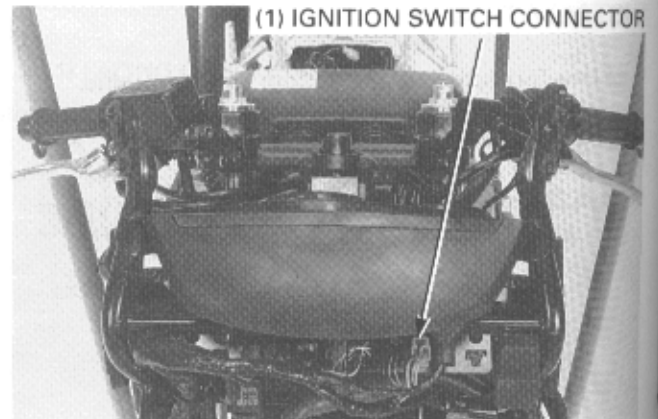
**Standard position: 3rd groove**



## STEERING STEM

### REMOVAL

Disconnect the ignition switch connector and remove the wire from the clamps (page 18-12).

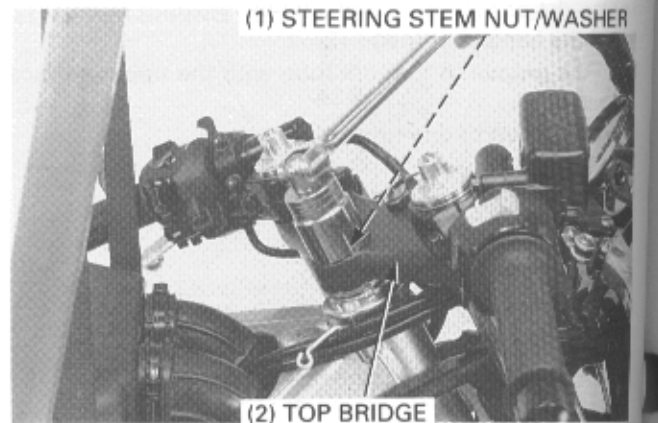


Remove the steering stem nut and washer.

Remove the following:

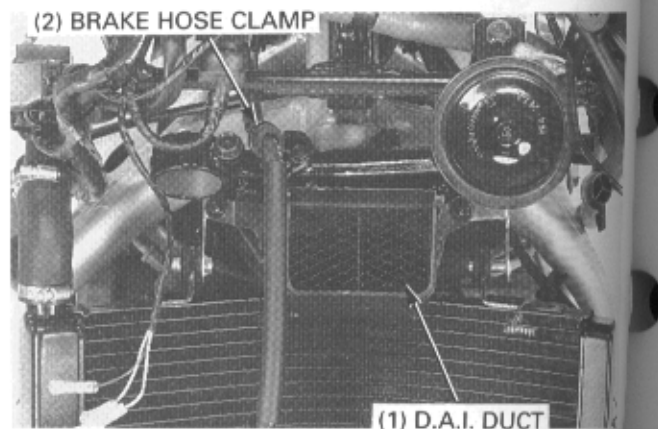
- upper fairing (page 2-4).
- front wheel (page 12-8).
- handlebar (page 12-3).
- fork legs (page 12-14).

Remove the top bridge.



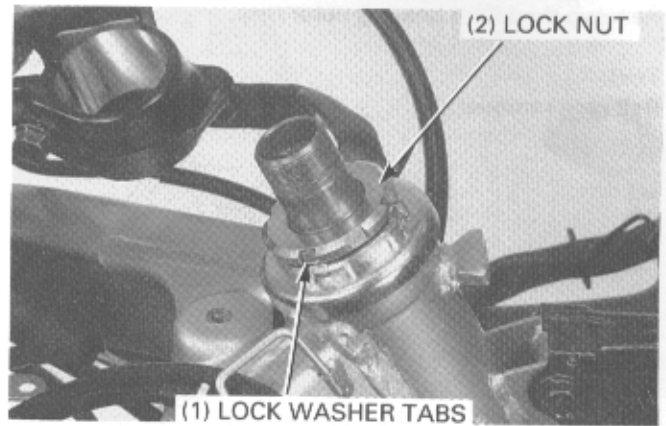
Remove the D.A.I. duct (page 5-4).

Remove the brake hose clamp from the steering stem.



## FRONT WHEEL/SUSPENSION/STEERING

Straighten the lock washer tabs, and remove the lock nut and lock washer.

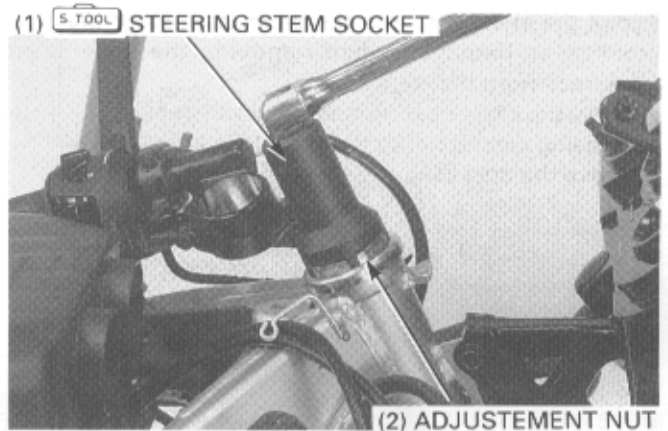


Loosen the steering bearing adjustment nut by holding the steering stem and remove the adjustment nut.

Tool:

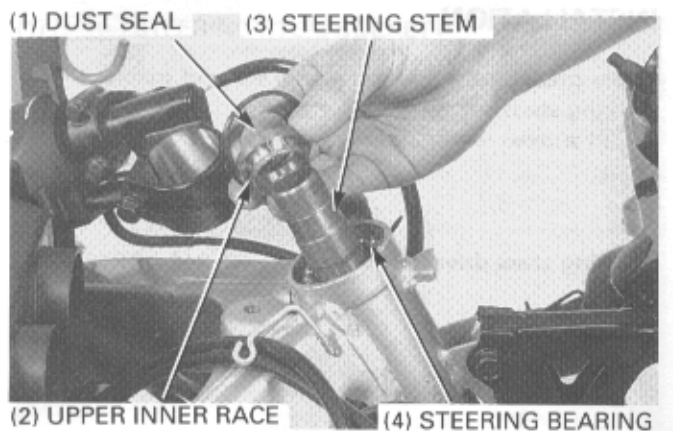
Steering stem socket

07916 - 3710101 or  
07916 - 3710100



Remove the dust seal, upper inner race and steering stem. Remove the upper and lower steering bearings.

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



### NOTE

- Always replace the bearings and races as a set.

Remove the upper bearing outer race.

Tool:

Ball race remover

07953 - MJ10000 or  
07953 - MJ1000A or  
07953 - MJ1000B



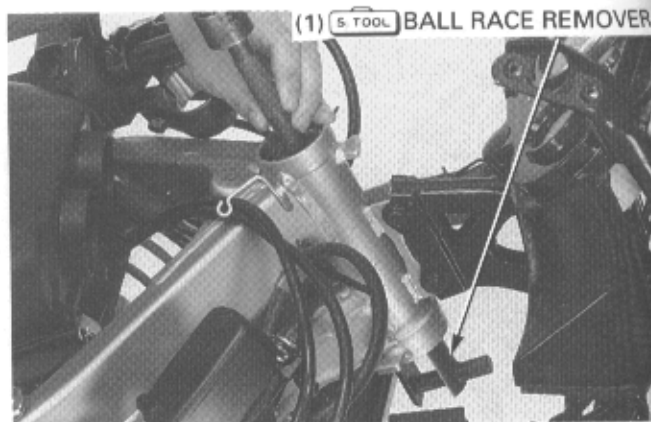
## FRONT WHEEL/SUSPENSION/STEERING

Remove the lower bearing outer race.

**Tool:**

**Ball race remover**

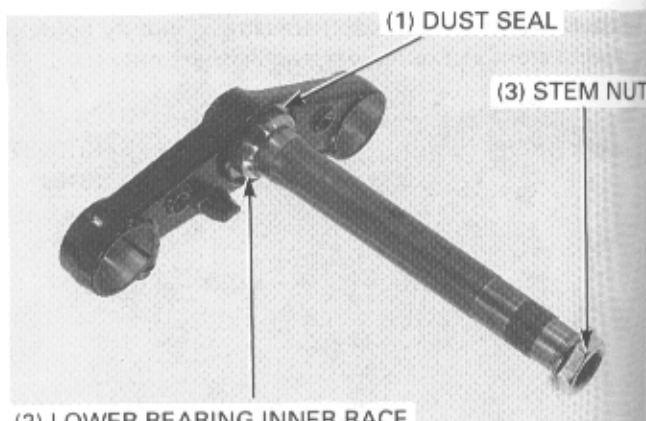
**07946 - 3710500**



Install the stem nut onto the stem to prevent the threads from being damaged when removing the lower bearing inner race from the stem.

Remove the lower bearing inner race with a chisel or equivalent tool, being careful not to damage the stem.

Remove the dust seal.



## INSTALLATION

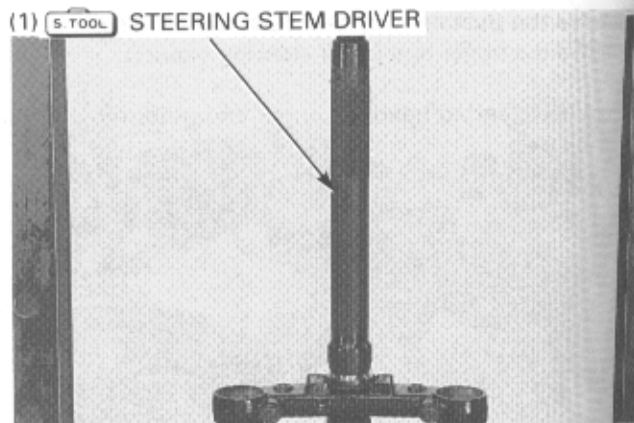
Apply grease to a new dust seal lip and install it over the steering stem.

Install a new lower bearing inner race using a hydraulic press.

**Tool:**

**Steering stem driver**

**07946 - MB00000**



Drive a new lower bearing outer race into the steering head pipe.

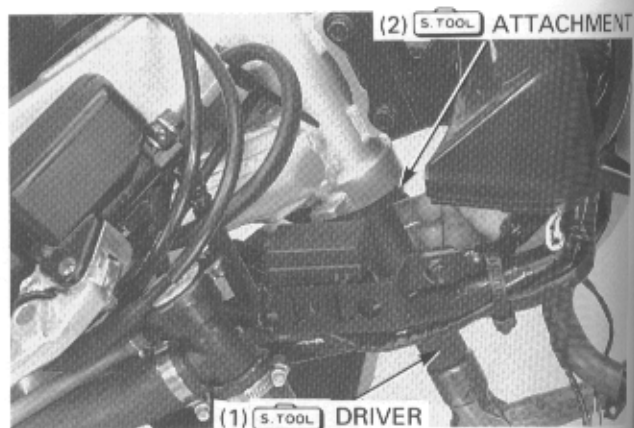
**Tools:**

**Driver**

**07949 - 0010000**

**Attachment 52 x 55 mm**

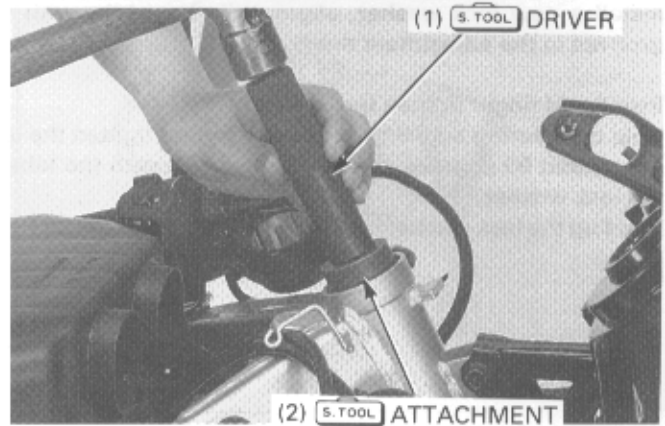
**07746 - 0010400**



Drive a new upper bearing outer race into the steering head pipe.

**Tools:**

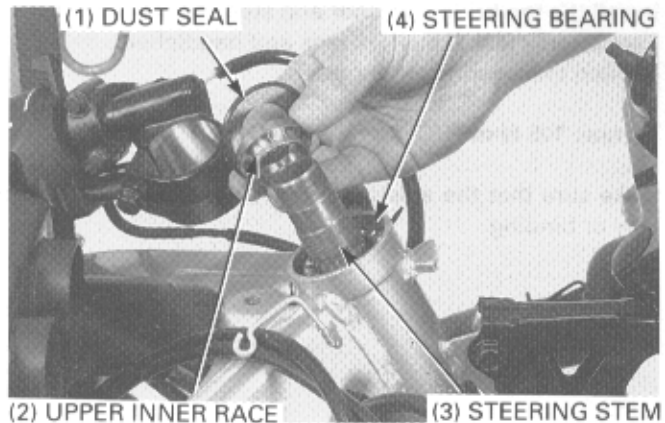
Driver 07949 - 0010000  
Attachment 42 x 47 mm 07746 - 0010300



Apply grease to each new steering bearing.  
Install the lower steering bearing onto the stem.

Apply grease to new upper dust seal lip.  
Apply oil to the steering bearing adjustment nut threads.

Insert the stem into the steering head pipe and install the upper steering bearing, inner race and new dust seal.

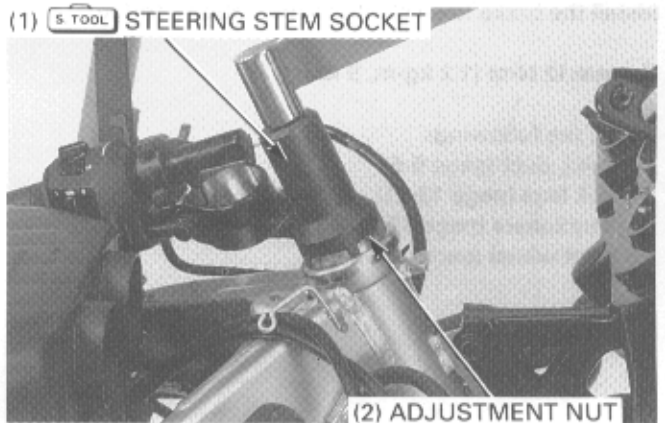


Apply oil to the steering adjustment nut threads.  
Install the steering adjustment nut and tighten it to the initial torque.

**Tool :**

Steering stem socket 07916 - 3710101 or 07916 - 3710100

Initial torque: 25 N·m (2.5 kg-m, 18 lb-ft)



Turn the steering stem lock-to-lock at least five times.  
Retighten the adjustment nut to the final torque.

Final torque: 31 N·m (3.1 kg-m, 22 lb-ft)



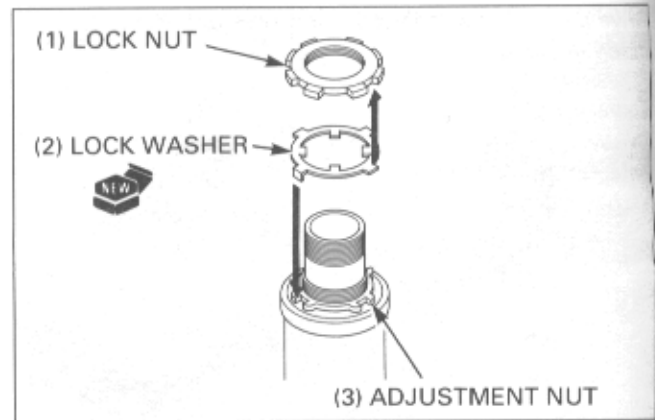
## FRONT WHEEL/SUSPENSION/STEERING

Install a new lock washer, aligning its bent tabs with the grooves in the adjustment nut.

Install and finger tighten the lock nut.

Hold the bearing adjustment nut and further tighten the lock nut, within 90 degrees, to align its grooves with the tabs of the lock washer.

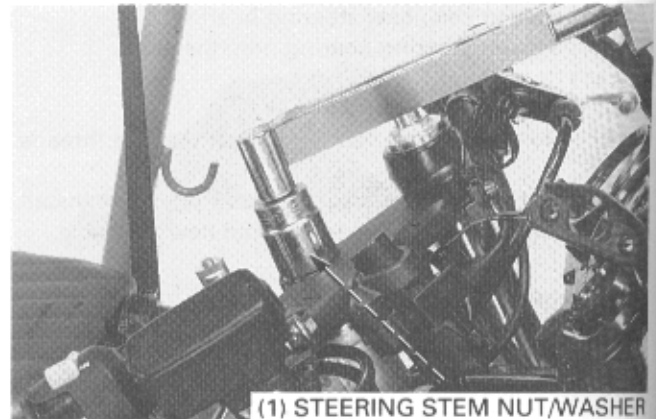
Bend up the lock washer tabs into the grooves of the lock nut.



Install the top bridge, washer and steering stem nut. Temporarily install the fork legs and handlebars. Tighten the steering stem nut.

**Torque: 105 N·m (10.5 kg-m, 76 lb-ft)**

Make sure that the steering stem moves smoothly without play or binding.

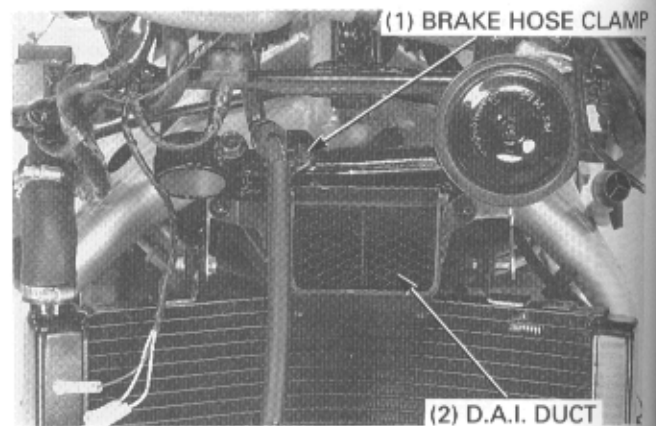


Install the brake hose clamp to the bottom bridge.

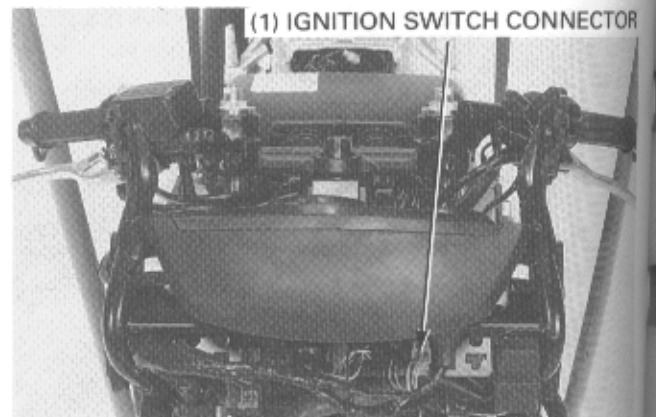
**Torque: 12 N·m (1.2 kg-m, 9 lb-ft)**

Install the following:

- D.A.I. duct (page 5-5).
- fork legs (page 12-21).
- handlebars (page 12-7).
- front wheel (page 12-12).



Connect the ignition switch connector (page 18-12).





**STEERING BEARING PRELOAD**

Raise the front wheel off the ground.  
 Position the steering stem to the straight ahead position.  
 Hook a spring scale to the fork tube between the fork top and bottom bridges.  
 Make sure that there is no cable or wire harness interference.  
 Pull the spring scale keeping the scale at a right angle to the steering stem.  
 Read the scale at the point where the steering stem just starts to move.

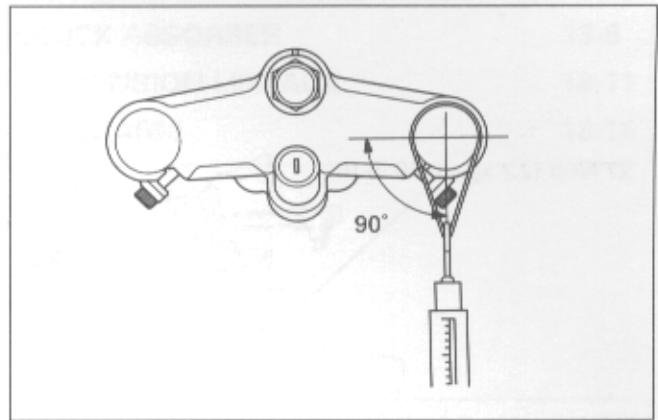
**Steering bearing preload: 0.15 – 0.20 kg-m (1.1 – 1.4 lb-ft)**

If the readings do not fall within the limits, readjust the steering bearing adjustment nut.

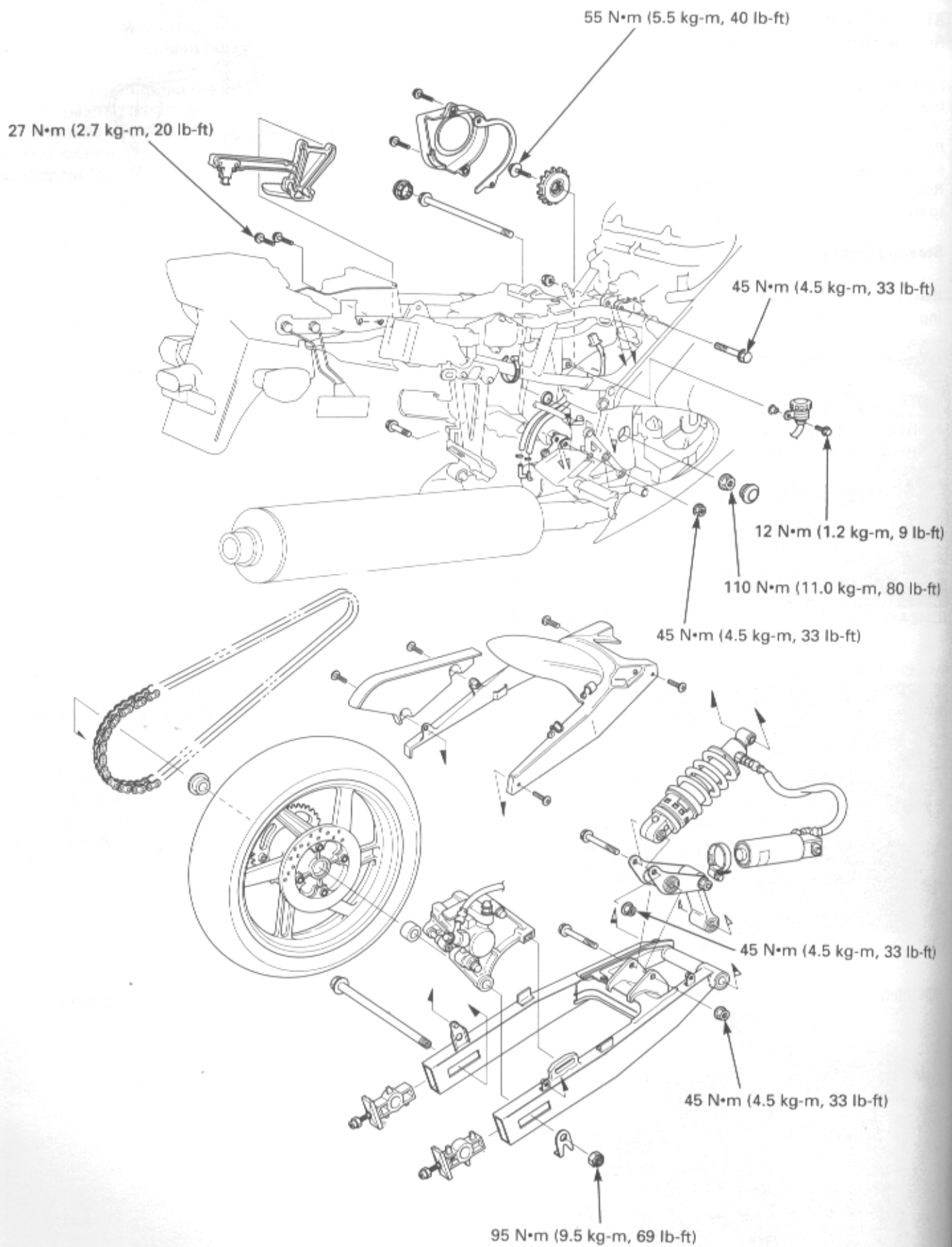
Install the removed parts in the reverse order of removal.

**NOTE**

- Route the hose, cables, and wire harnesses properly (page 1-20).



# REAR WHEEL/SUSPENSION



# 13. REAR WHEEL/SUSPENSION

SERVICE INFORMATION	13-1	SHOCK ABSORBER	13-8
TROUBLESHOOTING	13-2	SUSPENSION LINKAGE	13-11
REAR WHEEL	13-3	SWINGARM	13-16

## 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.
- The shock absorber contains nitrogen under high pressure. Do not bring the shock absorber near fire or heat.
- Before disposing of the shock absorber, release the nitrogen by pressing the valve core, then remove the valve from the shock absorber.

- When servicing the rear suspension linkage, swingarm or shock absorber, support the motorcycle using a safety stand or hoist.
- Refer to Section 14 for brake system information.
- Tubeless tire removal, repair, and remounting procedures are covered in Section 16 of the Common Service Manual.
- Balancing procedures are covered in Section 16 of the Common Service Manual. Do not add more than 60 grams (2.1 oz) to the wheel balance weight.
- Use only tires marked "TUBELESS" and tubeless valves on rims marked "TUBELESS TIRE APPLICABLE".
- Use only genuine Honda replacement bolts and nuts for all suspension pivot and mounting points.

### SPECIFICATIONS

Umit: mm (in)

13

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		—	2.0 (0.08)
Cold tire pressure	Up to 90 kg (200 lb) load	42 psi (2.90 kg/cm <sup>2</sup> , 290 kPa)	—
	Up to maximum weight capacity	42 psi (2.90 kg/cm <sup>2</sup> , 290 kPa)	—
Axle runout		—	0.2 (0.01)
Wheel balance weight	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Wheel balance weight		—	60g (2.1 oz) max.
Drive chain slack		15 – 25 (5/8 – 1)	—
Drive chain size/link	RK	RK50MFO/108	—
	DID	DID50V4/108	—
Drive chain slider thickness		—	To the indicator
Damper gas pressure/compressed gas		10 kg/cm <sup>2</sup> (980 kPa)/Nitrogen	—
Spring pre-load adjuster standard position		2nd	—
Rebound adjuster standard position		1 turn out from full in	—
Compression adjuster standard position		1 turn out from full in	—

## REAR WHEEL/SUSPENSION

### TORQUE VALUES

Drive chain adjuster lock nut	22 N•m (2.2 kg-m, 16 lb-ft)
Rear axle nut	95 N•m (9.5 kg-m, 69 lb-ft)
Shock absorber mounting nut	45 N•m (4.5 kg-m, 33 lb-ft)
Shock link nut (frame side)	45 N•m (4.5 kg-m, 33 lb-ft)
Shock link nut (shock arm side)	45 N•m (4.5 kg-m, 33 lb-ft)
Shock arm bolt	45 N•m (4.5 kg-m, 33 lb-ft)
Swingarm pivot nut	110 N•m (11.0 kg-m, 80 lb-ft)
Rear brake disc bolt	43 N•m (4.3 kg-m, 31 lb-ft)
Driven sprocket nut	90 N•m (9.0 kg-m, 65 lb-ft)

### TOOLS

Bearing remover shaft	07746 - 0050100	or equivalent commercially available in U.S.A.
Bearing remover head, 20 mm	07746 - 0050600	
Attachment, 32 x 35 mm	07746 - 0010100	
Attachment, 28 x 30 mm	07946 - 1870100	
Attachment, 42 x 47 mm	07746 - 0010300	
Pilot, 25 mm	07746 - 0040600	
Pilot, 20 mm	07746 - 0040500	
Attachment, 26 x 24 mm	07746 - 0010700	
Pilot, 17 mm	07746 - 0040400	
Driver shaft	07946 - MJ00100	
Bearing remover attachment	07LMC - KV30200	or driver (07949 - 3710001) and pilot, 22 mm (07746 - 0041000) (U.S.A.)
Pin driver	07GMD - KT80100	
Bearing remover	07936 - 3710300	
Remover handle	07936 - 3710100	
Remover sliding weight	07741 - 0010201	or 07936 - 3710200

## TROUBLESHOOTING

### Soft suspension

- Improper spring pre-load adjustment
- Improper compression damping adjustment
- Weak spring
- Oil and gas leakage from damper unit
- Low tire pressure

### Hard suspension

- Damaged shock absorber mount bearing
- Bent damper rod
- Damaged swingarm pivot bearings
- Bent swingarm pivot
- Incorrectly adjusted suspension
- High tire pressure

### Rear wheel wobbles

- Bent rim
- Worn rear wheel bearings
- Bent rear axle
- Faulty tire
- Unbalanced tire and wheel
- Low tire pressure
- Faulty swingarm pivot bearings

### Rear suspension noisy

- Faulty rear shock absorber
- Worn or damaged suspension linkage pivot bearings
- Loose fasteners

## REAR WHEEL

### REMOVAL

Raise the rear wheel off the ground and support the motorcycle using a hoist.

Remove the axle nut and washer.  
 Remove the rear brake caliper bracket bolt.  
 Release the brake hose from the clamp on the rear fender B and move the brake caliper upward.  
 Loosen the drive chain lock nuts and adjusting nuts.

### CAUTION

- Do not suspend the brake caliper from the brake hose.  
 Do not twist the brake hose.

### NOTE

- Do not operate the brake pedal after removing the caliper and rear wheel. To do so will cause difficulty in fitting the brake disc between the brake pads.

Push the rear wheel forward and remove the drive chain from the driven sprocket.  
 Remove the rear axle and rear wheel assembly.

### INSPECTION

#### AXLE

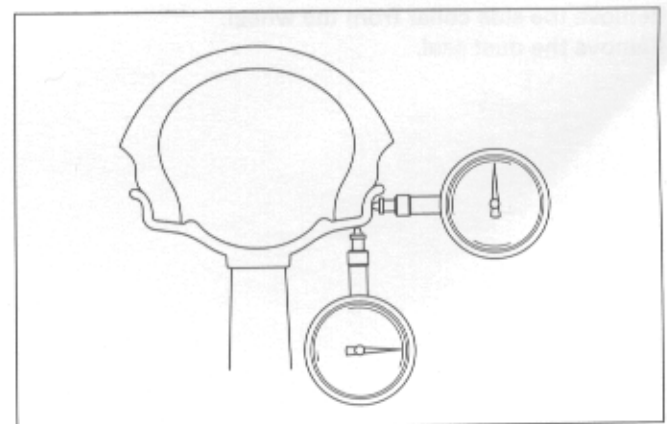
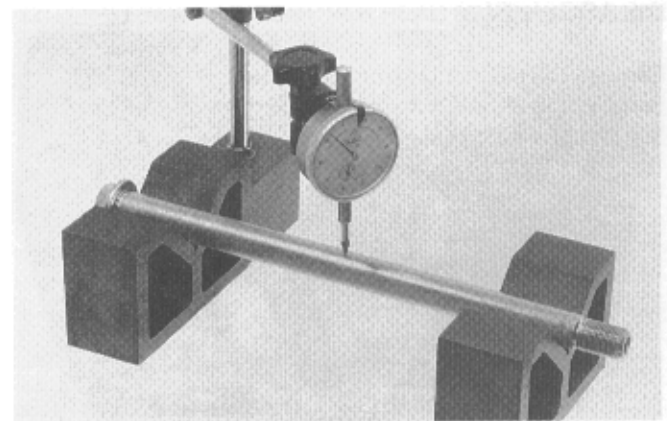
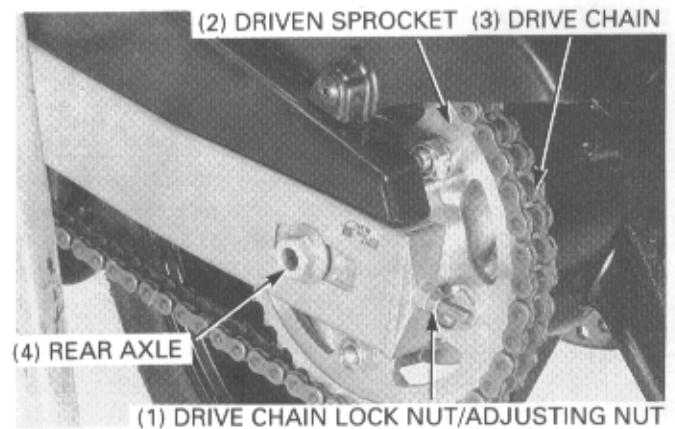
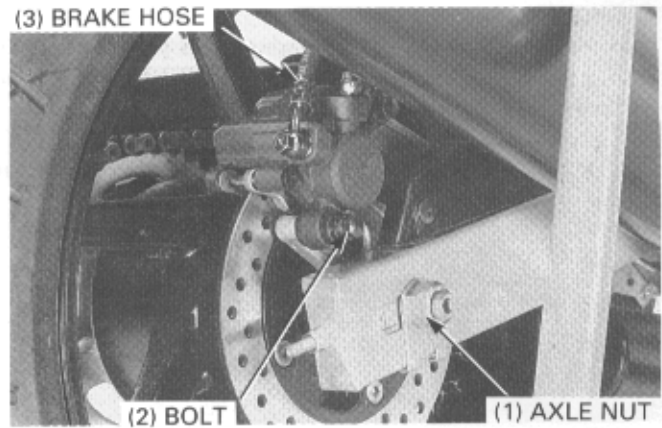
Place the axle in V-blocks and measure the runout.  
 Actual runout is 1/2 the total indicator reading.

**Service limit: 0.20 mm (0.01 in)**

#### WHEEL

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 limit: Radial: 2.0 mm (0.08 in)**  
**Axial: 2.0 mm (0.08 in)**



## REAR WHEEL/SUSPENSION

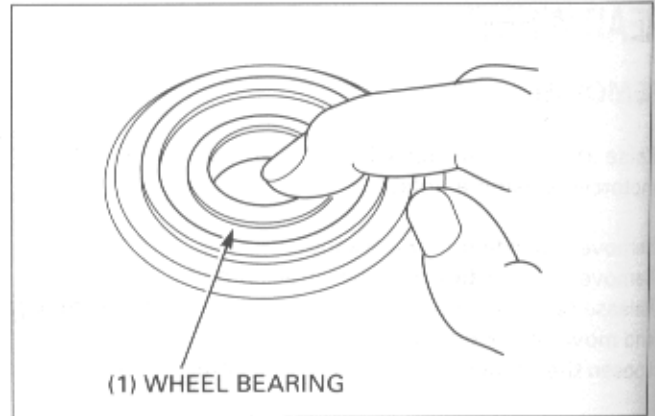
### WHEEL BEARING

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

#### NOTE

- Replace the wheel bearings in pairs.

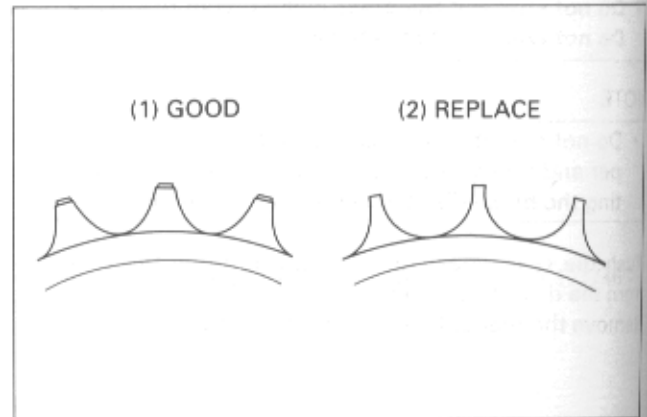


### DRIVEN SPROCKET

Check the condition of the driven sprocket teeth. Replace the sprocket if worn or distorted.

#### NOTE

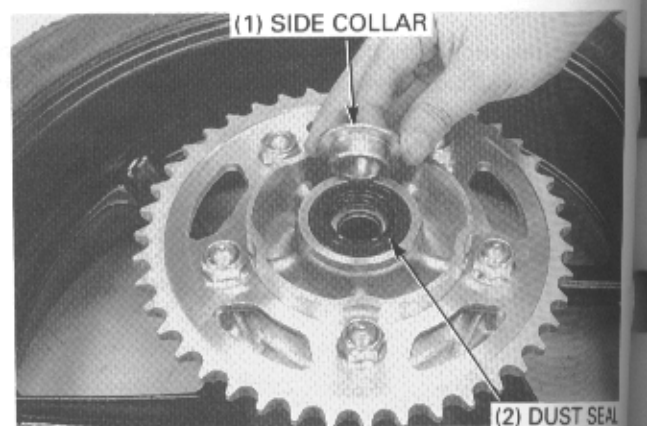
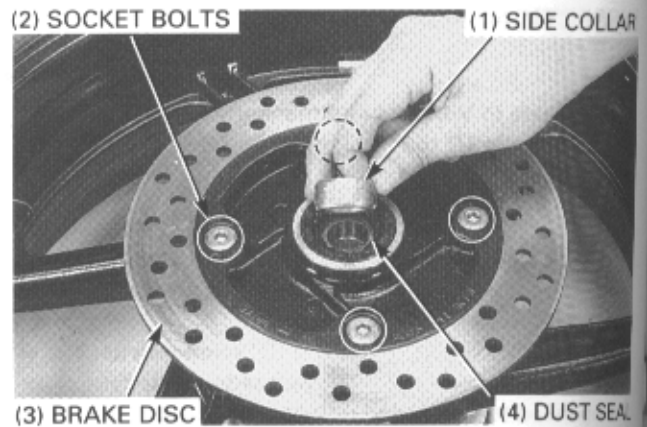
- The drive chain and drive sprocket must be inspected if the driven sprocket is worn or damaged. Never install a new drive chain on worn sprockets or a worn chain on new sprockets. Both chain and sprocket must be in good condition or the new replacement chain or sprockets will wear rapidly.



### DISASSEMBLY

Remove the side collar from the wheel.  
Remove the socket bolts and brake disc.  
Remove the dust seal.

Remove the side collar from the wheel.  
Remove the dust seal.



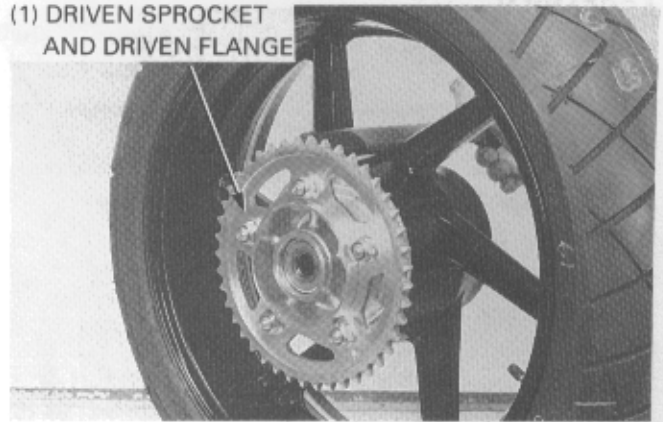
Remove the driven sprocket and driven flange together.

Replace the rear wheel dampers if they are damaged or deteriorated.

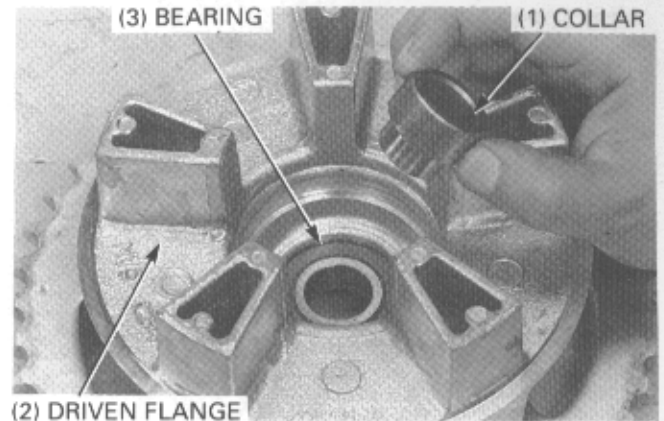
Check the O-ring for wear or damage. Replace if necessary.

Remove the rear wheel dampers.

(1) DRIVEN SPROCKET AND DRIVEN FLANGE

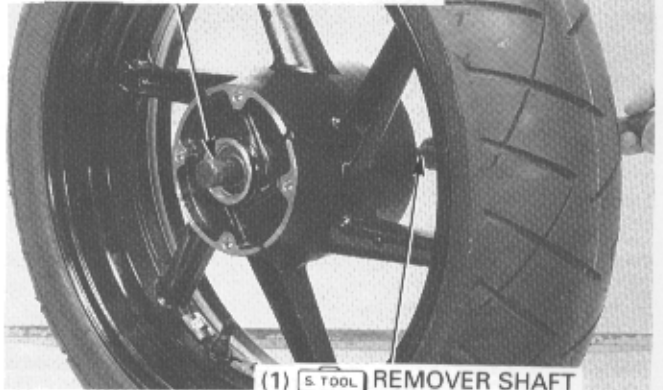


Remove the driven flange collar from the driven flange.  
Drive out the flange bearing.



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.

(2)  BEARING REMOVER HEAD



**Tools:**

**Bearing remover shaft**

**07746 - 0050100 or equivalent commercially available in U.S.A.**

**Bearing remover head, 20 mm**

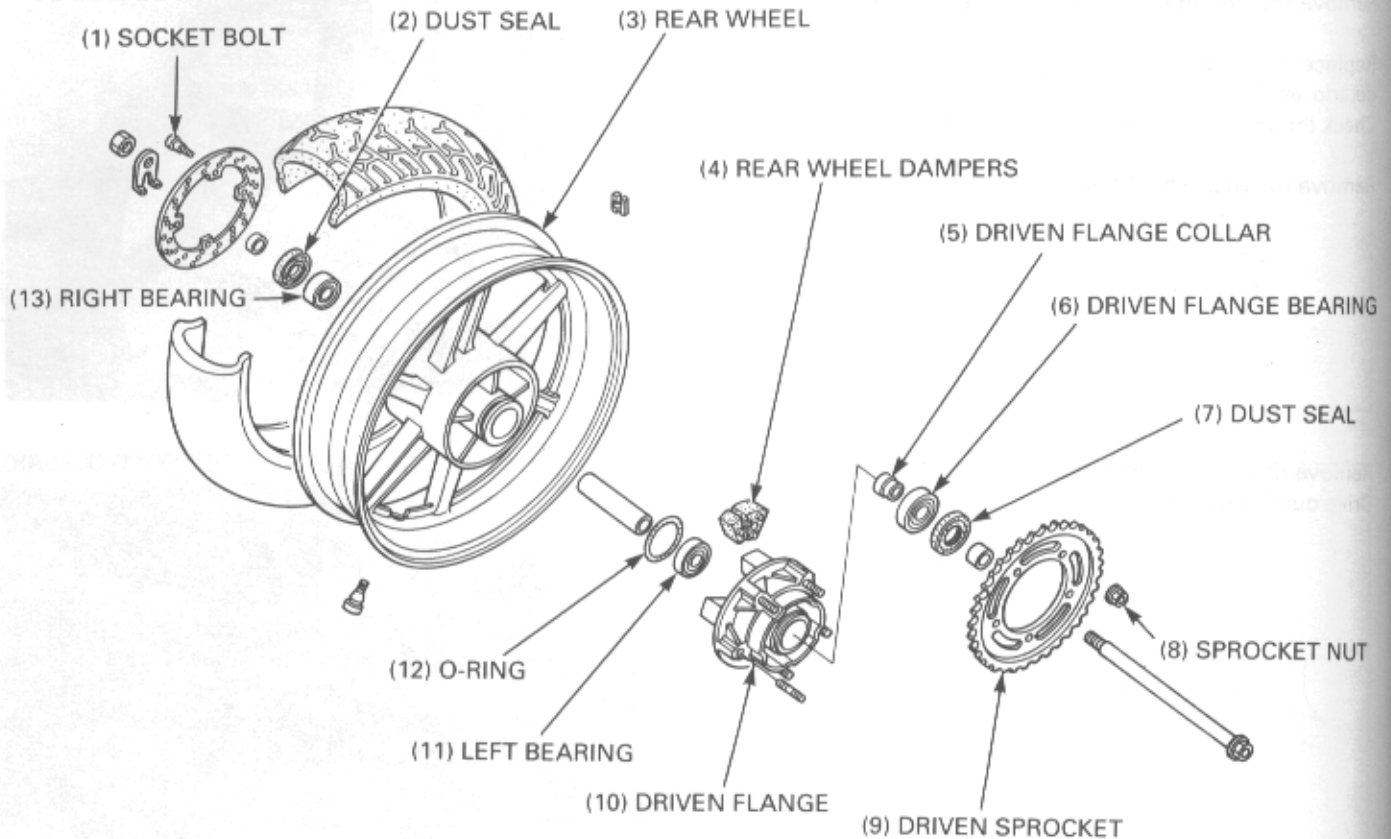
**07746 - 0050600 or equivalent commercially available in U.S.A.**

**NOTE**

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

## REAR WHEEL/SUSPENSION

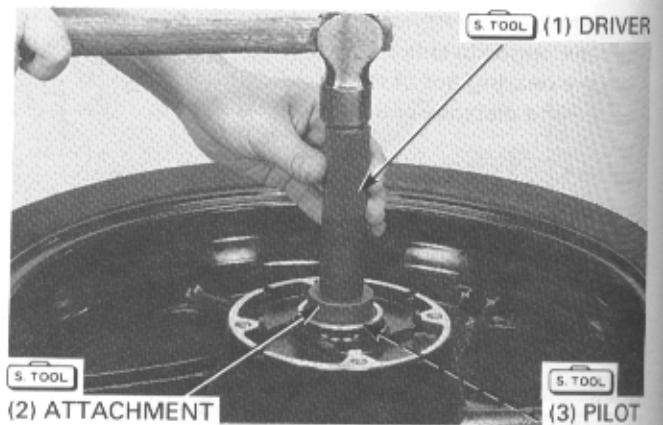
### ASSEMBLY



Drive in a new right bearing squarely with the marking facing up until it is fully seated.  
Install the distance collar.  
Drive in a new left bearing squarely with the marking facing up until it is seated.

#### Tools:

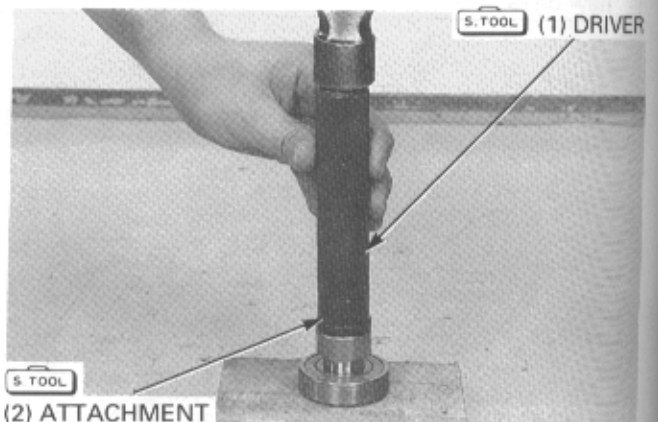
Driver	07749 - 0010000
Attachment, 42 x 47 mm	07746 - 0010300
Pilot, 20 mm	07746 - 0040500



Drive the driven flange collar into a new driven flange bearing.

#### Tools:

Driver	07749 - 0010000
Attachment, 28 x 30 mm	07946 - 1870100

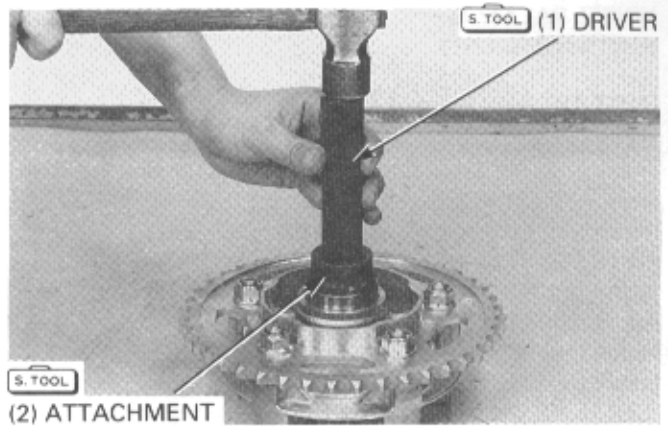




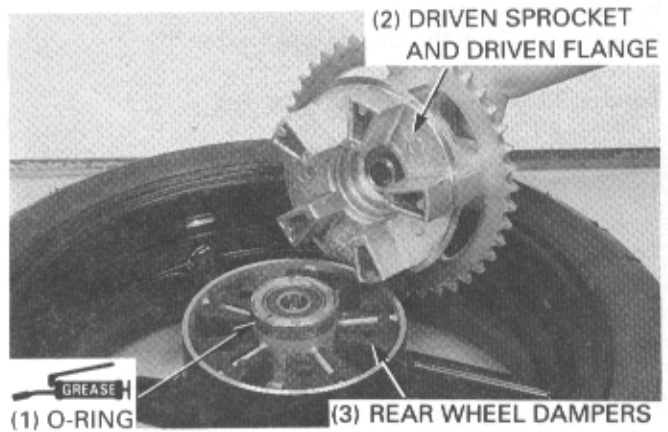
Drive the bearing into the driven flange.

**Tools:**

- |                        |                 |
|------------------------|-----------------|
| Driver                 | 07749 - 0010000 |
| Attachment, 42 x 47 mm | 07746 - 0010300 |



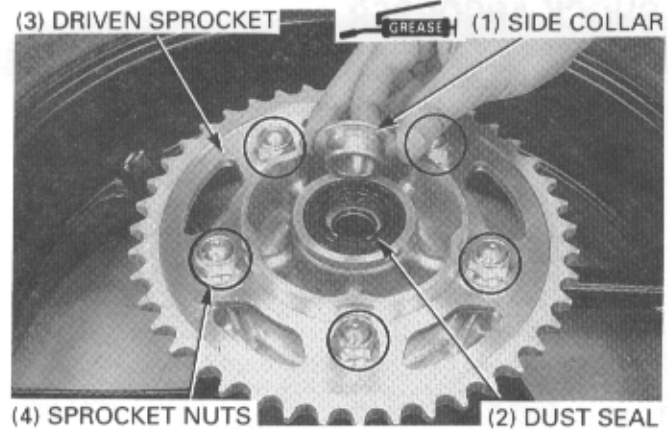
- Apply grease to the O-ring and groove in the wheel hub.
- Install the O-ring.
- Install the rear wheel dampers.
- Install the driven flange assembly.



- Apply grease to the dust seal lip and install the dust seal onto the wheel hub.
- Apply grease to the inside of the side collar and install the flanged side collar as shown.

- If the driven sprocket is removed, install the sprocket with the stamped side facing out.
- Tighten the driven sprocket nuts to the specified torque.

**Torque: 90 N·m (9.0 kg-m, 65 lb-ft)**



- Apply grease to the dust seal lip and install the dust seal onto the wheel hub.

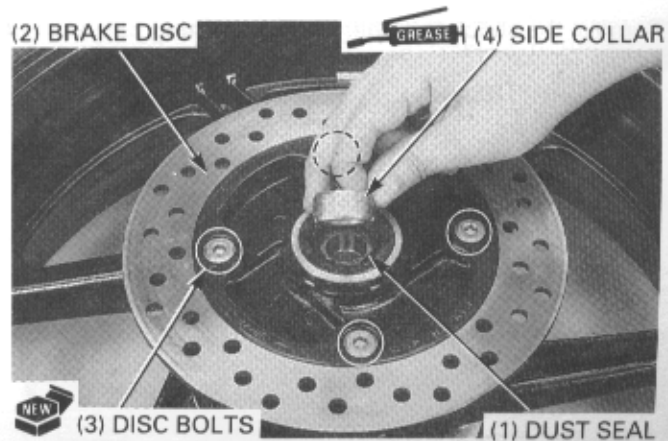
**WARNING**

Do not get grease on the brake disc or stopping power will be reduced.

- Install the brake disc with the stamped side facing out.
- Install and tighten the new disc bolts to the specified torque.

**Torque: 43 N·m (4.3 kg-m, 31 lb-ft)**

- Apply grease to the inside of the side collar and install the side collar.



## REAR WHEEL/SUSPENSION

### WHEEL BALANCE

Refer to page 12-12.

### INSTALLATION

Install the rear wheel, aligning the caliper bracket with the slide rail on the swingarm.

Install the drive chain over the drive sprocket.

Install the drive chain adjusters with the index mark side facing out.

Apply a thin layer of grease to the axle.

Install the rear axle from the left side.

Install the washer and axle nut.

Install the rear brake caliper, fitting the brake disc carefully between the brake pads.

Install and tighten the caliper bracket bolt.

**Torque: 23 N·m (2.3 kg-m, 17 lb-ft)**

Adjust the drive chain (page 3-16).

Tighten the rear axle nut.

**Torque: 95 N·m (9.5 kg-m, 69 lb-ft)**

## SHOCK ABSORBER

### REMOVAL

Raise the rear wheel off the ground and support the motorcycle using a hoist.

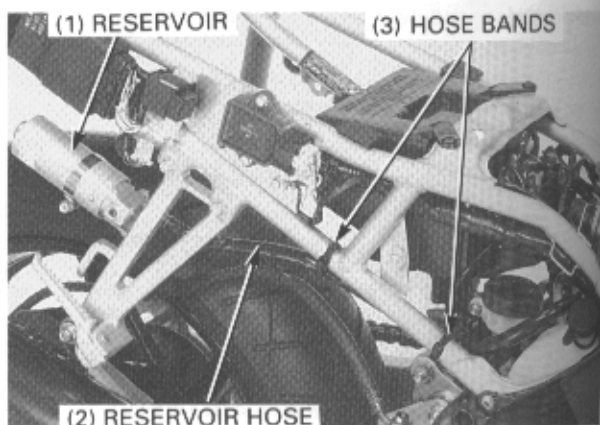
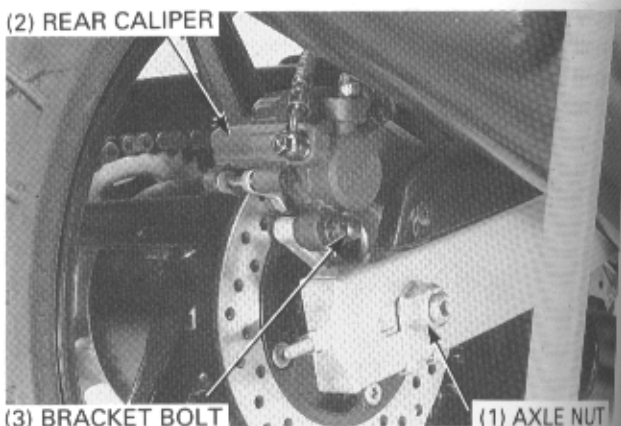
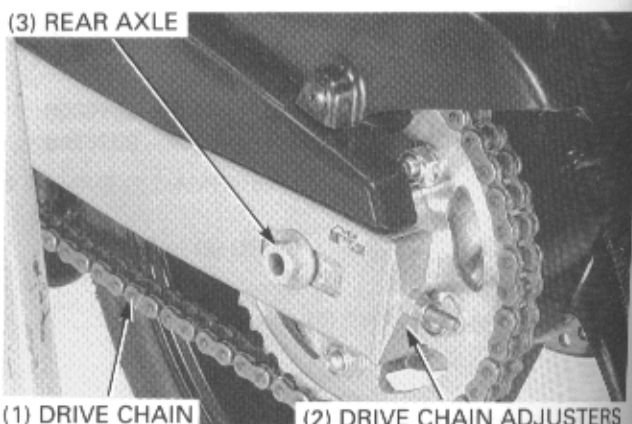
Remove the fuel tank (page 2-4).

Remove the rear fender B (page 2-9).

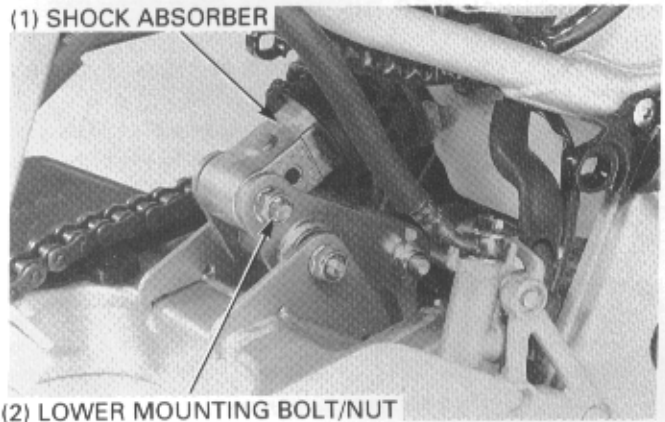
Remove the reservoir holder and reservoir from the stay.

Remove the hose bands from the frame.

Remove the shock absorber upper mounting bolt and nut.

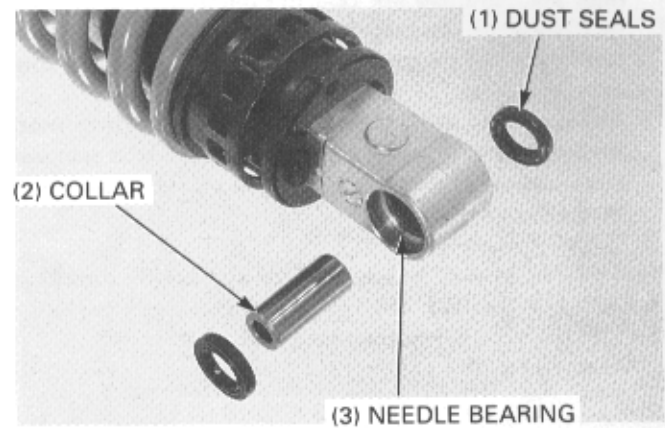


Remove the lower mounting bolt and nut from the shock absorber.  
Remove the shock absorber.



**INSPECTION**

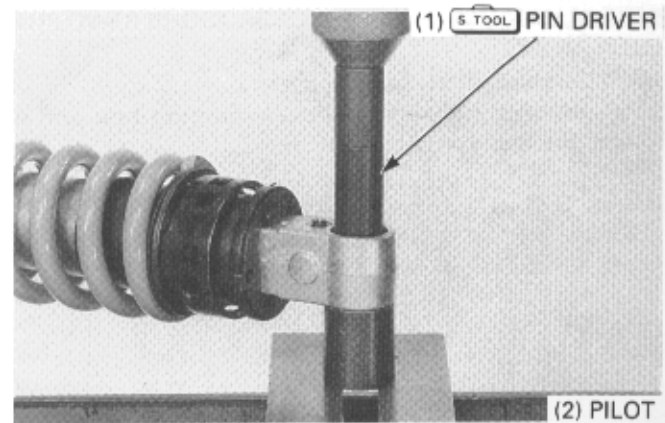
Remove the dust seals and collar and check them for wear, damage or fatigue.  
If the needle bearing is loose or damaged, replace it.



**NEEDLE BEARING REPLACEMENT**

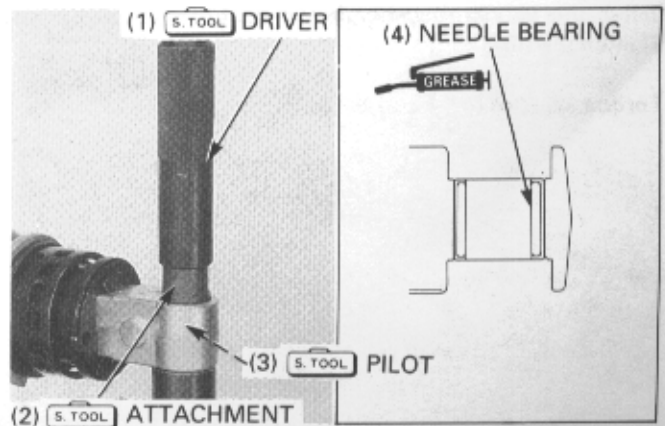
Remove the dust seals and collar from the lower joint.  
Hold the lower joint with a suitable tool.  
Press the needle bearing out of the lower joint.

**Tool:**  
**Pin driver** 07GMD - KT80100



Pack a new needle bearing with grease.  
Press the bearing into the lower joint until the bearing surface is flush with the joint surface as shown.

**Tools:**  
**Driver** 07749 - 0010000  
**Attachment, 24 x 26 mm** 07746 - 0010700  
**Pilot, 17 mm** 07746 - 0040400



## REAR WHEEL/SUSPENSION

### SHOCK ABSORBER DISPOSAL PROCEDURE

Center punch the center of the shock absorber reservoir cap to mark the drilling point.

Wrap the shock absorber reservoir inside a plastic bag.

Support the shock absorber reservoir in a vise as shown.

Through the open end of the bag, insert a drill motor with a sharp 2-3 mm (5/64-1/8 in) drill bit.

#### ⚠ WARNING

- Do not use a dull drill bit which could cause a build-up of excessive heat and pressure inside the damper, leading to explosion and severe personal injury.
- The shock absorber contains nitrogen gas and oil under high pressure. Do not drill the damper case pressure tank body, or you may drill into the oil chamber; oil escaping under high pressure may cause serious personal injury.
- Always wear eye protection to avoid getting metal shavings in your eyes when gas pressure is released. The plastic bag is only intended to shield you from the escaping gas.

Hold the bag around the drill motor and briefly run the drill motor inside the bag; this will inflate the bag with air from the motor and help keep the bag from getting caught in the bit when you start.

Remove the joint hose from the damper.

### INSTALLATION

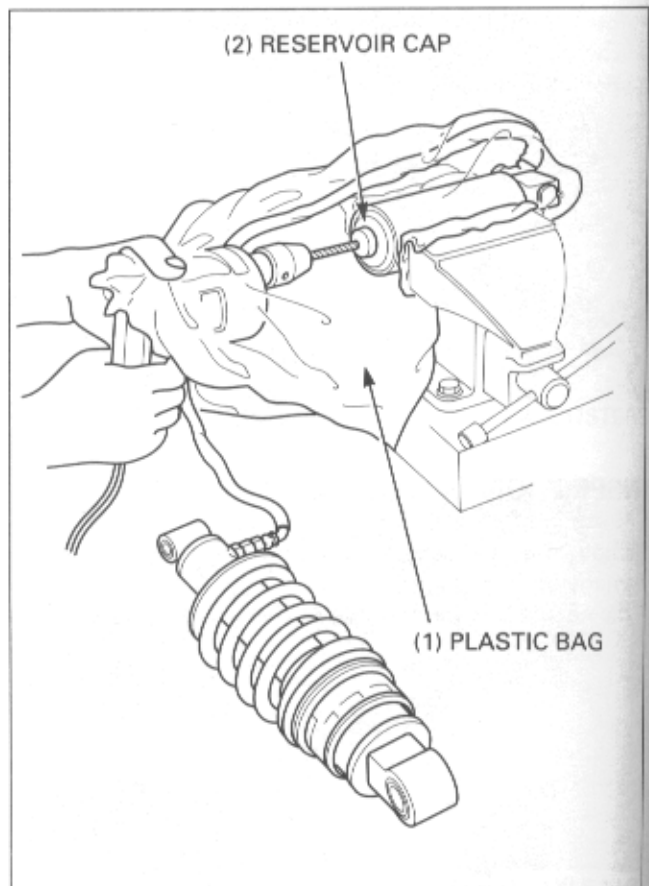
Install the shock absorber to the frame.

Install the shock absorber upper mounting bolt and nut. Tighten the nut.

**Torque: 45 N·m (4.5 kg-m, 33 lb-ft)**

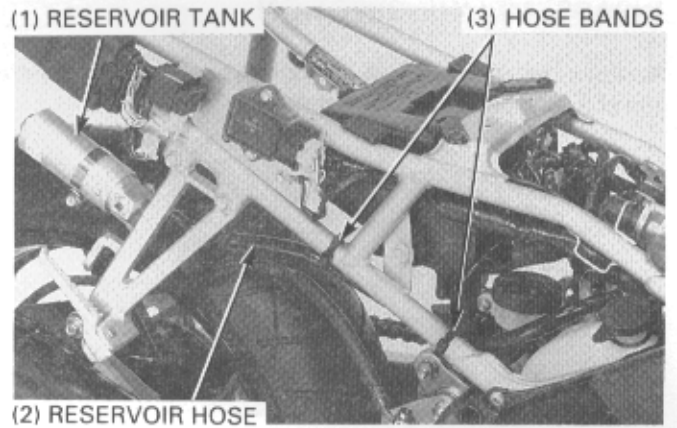
Install the shock absorber lower mounting bolt and nut. Tighten the nut.

**Torque: 45 N·m (4.5 kg-m, 33 lb-ft)**



Install the reservoir tank aligning the hose end with the cut off of the stay.  
 Install the reservoir holder and hose band.  
 Install the reservoir hose to the clamp.

Install the fuel tank (page 2-4).  
 Install rear fender B (page 2-9).

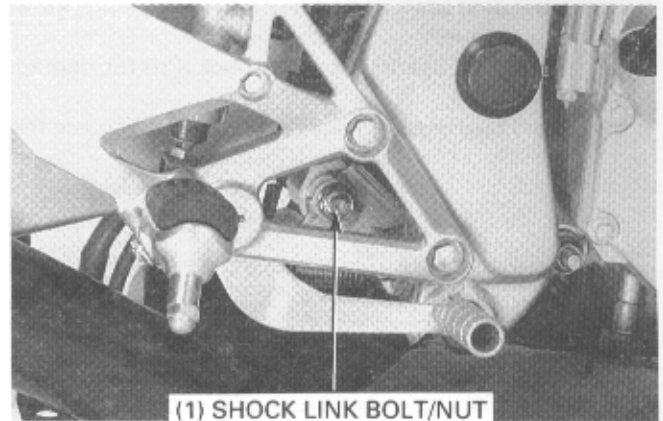


## SUSPENSION LINKAGE

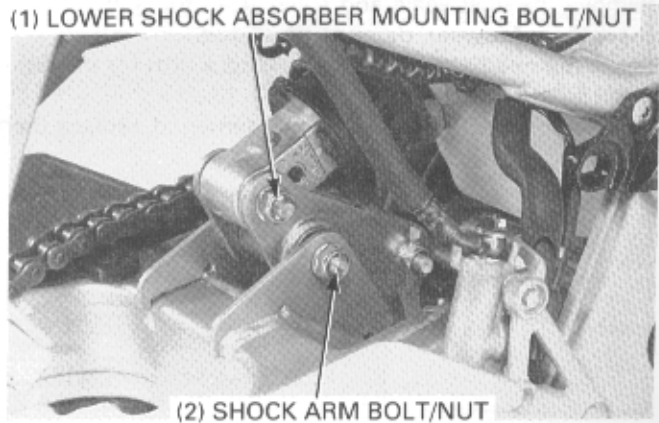
### REMOVAL

Raise the rear wheel off the ground and support the motorcycle using a hoist.

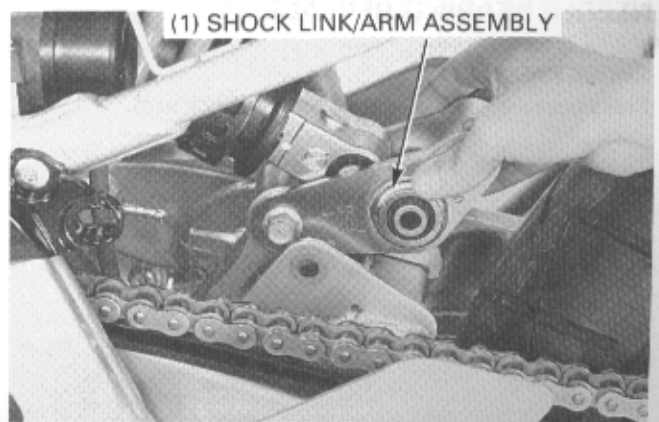
Remove rear fender B (page 2-9).  
 Remove the shock link bolt and nut (frame side).



Remove the lower shock absorber mounting bolt and nut.  
 Remove the shock arm bolt and nut (swingarm side).



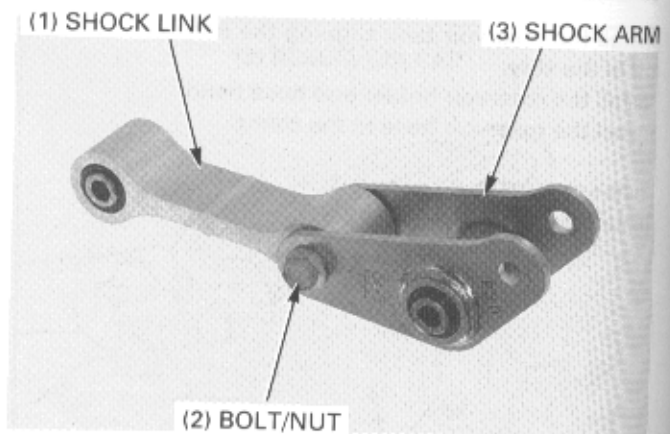
Remove the shock link/shock arm assembly.



## REAR WHEEL/SUSPENSION

### DISASSEMBLY/INSPECTION

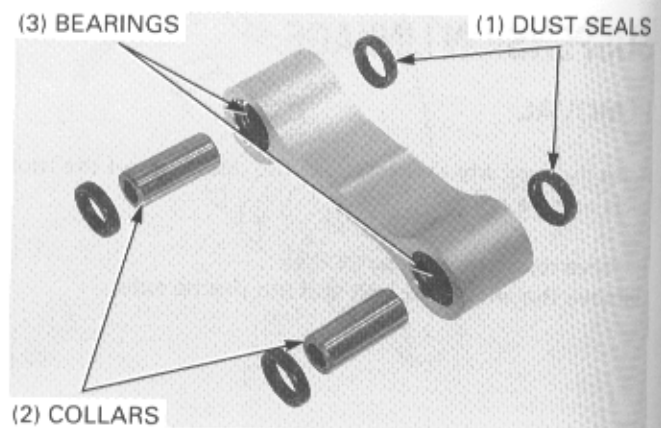
Remove the shock arm-to-shock link bolt, nut and separate the shock link from shock arm.



Remove the dust seals and collars and check them for wear, damage or fatigue.

Check the needle bearings of the shock arm for damage or loose fit.

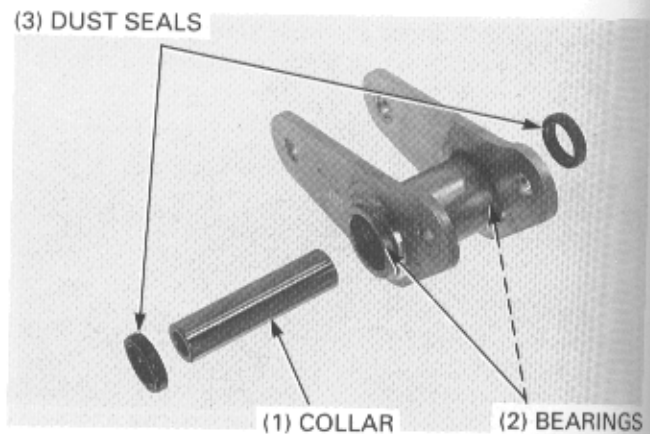
If the needle bearings are loose or damaged, replace them.



Remove the dust seals and collar from the shock arm and check them for wear, damage or fatigue.

Check the needle bearings of the shock arm for damage or loose fit.

If the needle bearings are loose or damaged, replace them.



### NEEDLE BEARING REPLACEMENT

#### SHOCK ARM

Press the needle bearing out of the shock arm.

#### Tool:

Pin driver

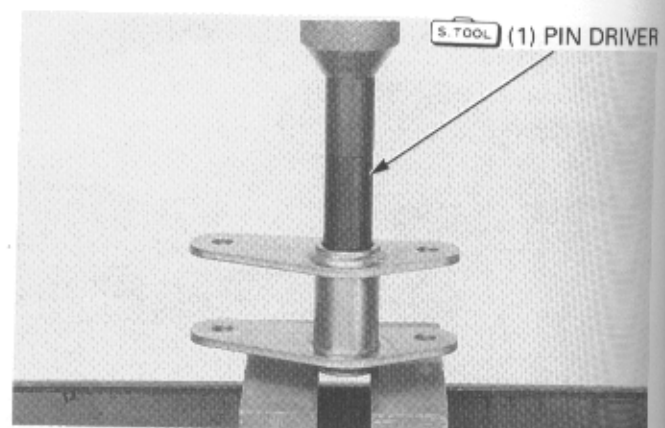
Driver

Pilot, 22 mm

07GMD - KT80100 or

07749 - 0010000

07746 - 0041000



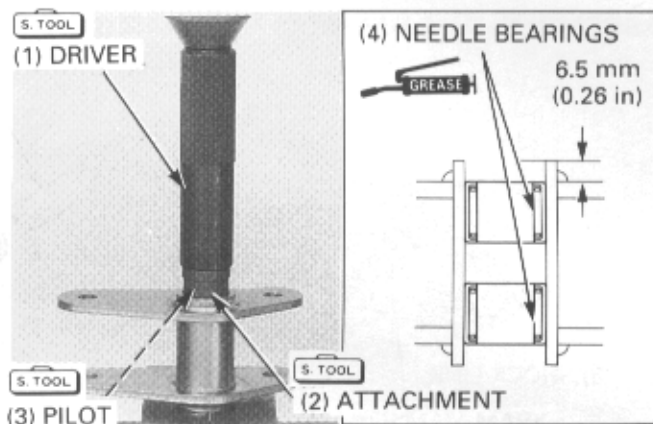
Press a new needle bearing into the shock arm so that the needle bearing outer surface is 6.5 mm (0.26 in) below the outer edge of the shock arm pivot bearing cavity.

**Tools:**

- Driver **07749 - 0010000**
- Attachment, 24 x 26 mm **07746 - 0010700**
- Pilot, 17 mm **07746 - 0040400**

**NOTE**

- Press the needle bearing in with the stamped side facing out.

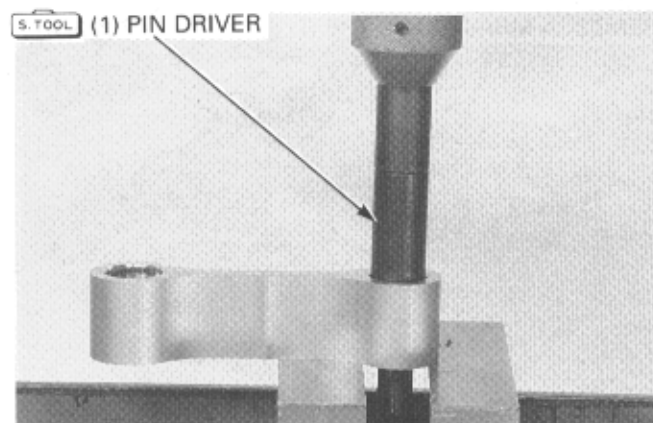


**SHOCK LINK**

Press the needle bearing out of the shock link.

**Tools:**

- Pin driver **07GMD - KT80100 or**
- Driver **07749 - 0010000**
- Pilot, 22 mm **07746 - 0041000**



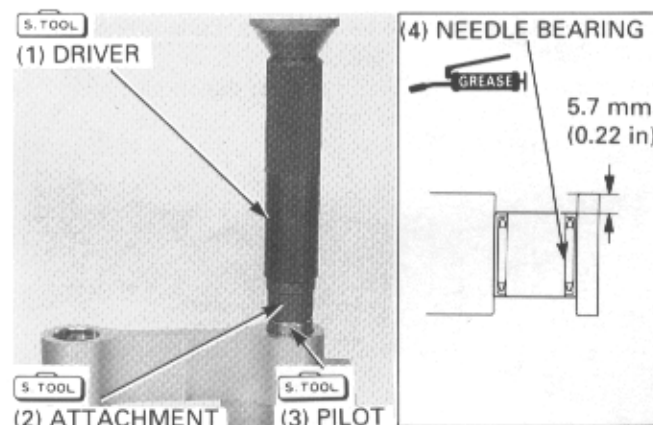
Press a new needle bearing into the shock link so that the needle bearing outer surface is 5.7 mm (0.22 in) below the outer edge of the shock link pivot bearing cavity.

**Tools:**

- Driver **07749 - 0010000**
- Attachment, 24 x 26 mm **07746 - 0010700**
- Pilot, 17 mm **07746 - 0040400**

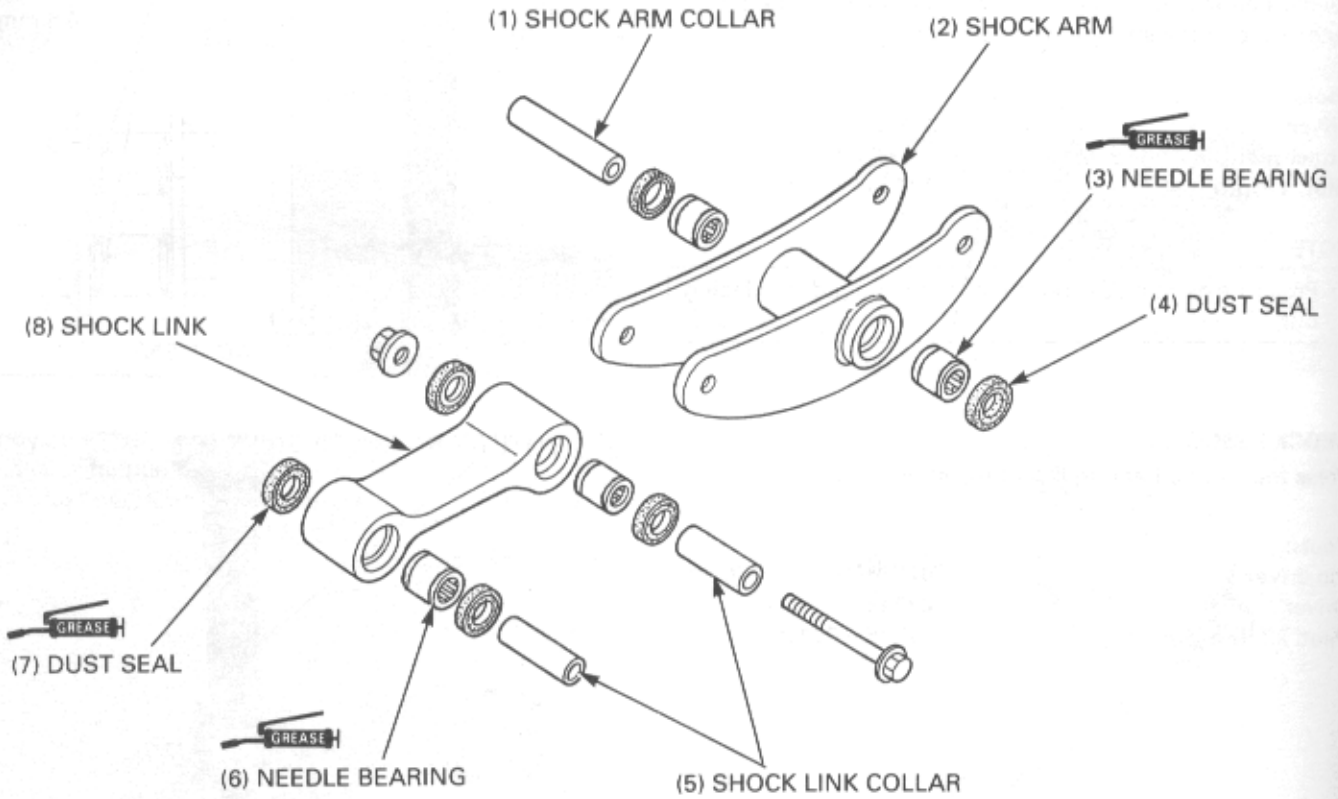
**NOTE**

- Press the needle bearing in with the stamped side facing out.

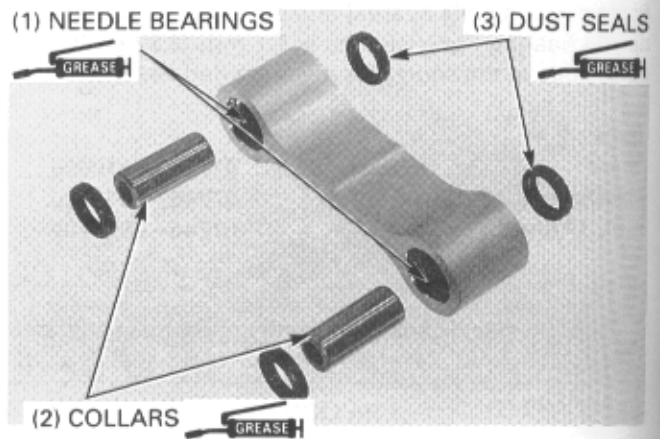


# REAR WHEEL/SUSPENSION

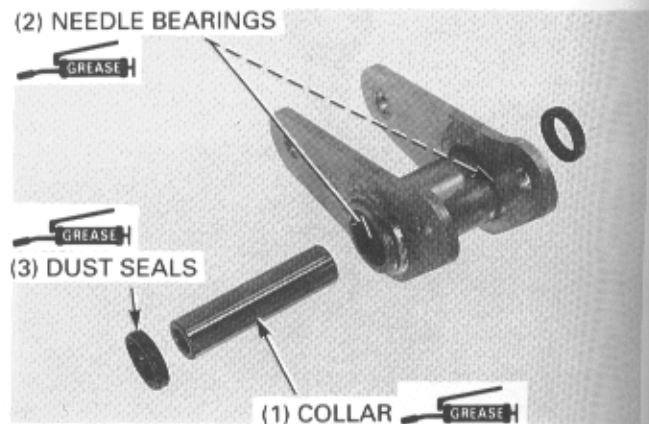
## ASSEMBLY



Apply grease to the needle bearings, collars and dust seal lips.  
Install the collars and dust seals into the shock link.



Apply grease to the needle bearings, collar and dust seal lips.  
Install the collar and dust seals into the shock arm.



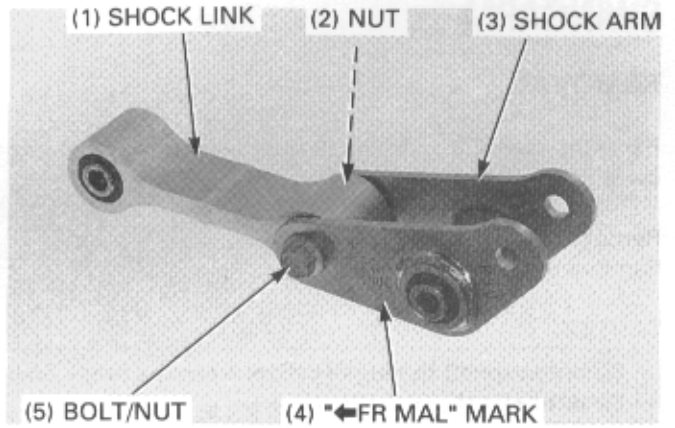


Install the shock link to the shock arm. Install the shock arm-to-link bolt and nut, tighten the nut.

**Torque: 45 N·m (4.5 kg-m, 33 lb-ft)**

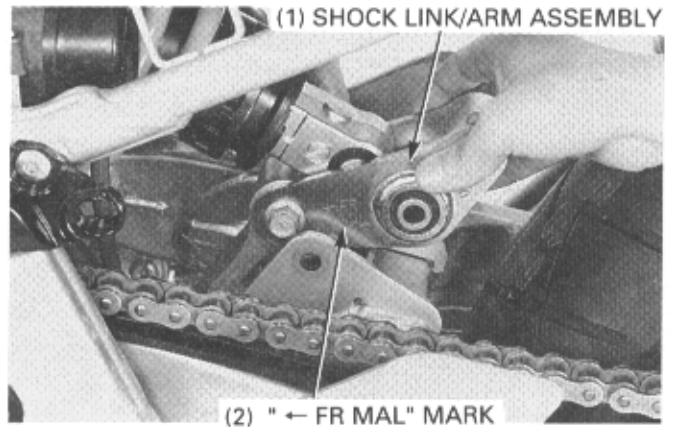
NOTE

- Insert the shock arm-to-shock link bolt from the "←FR MAL" mark side of the shock arm.



INSTALLATION

Install the shock link/shock arm assembly with the "←FR MAL" mark facing the left side.

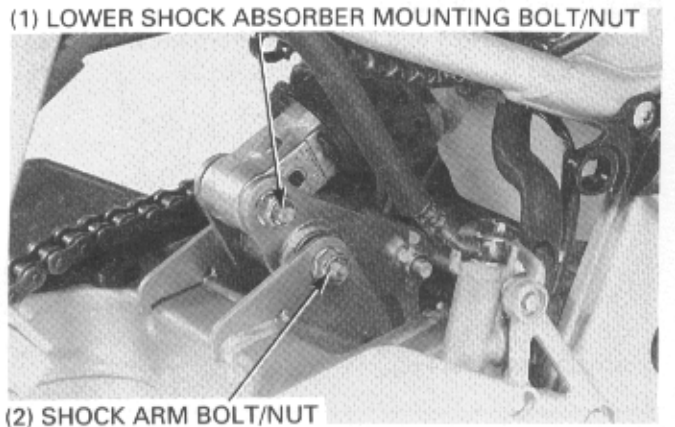


Install the lower shock absorber mounting bolt from the left side and tighten the nut.

**Torque: 45 N·m (4.5 kg-m, 33 lb-ft)**

Install the shock arm bolt from the left side and tighten the nut.

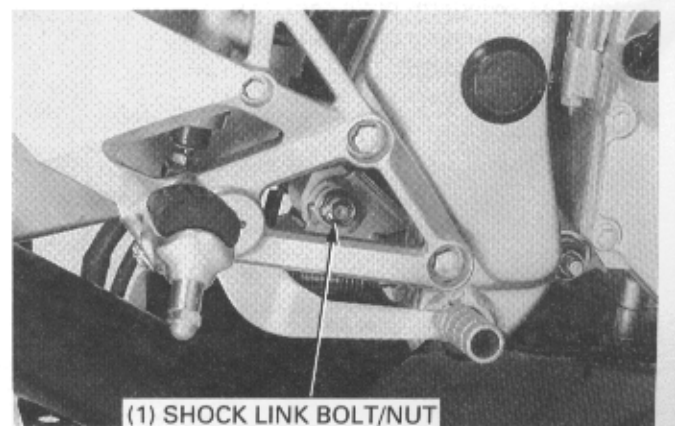
**Torque: 45 N·m (4.5 kg-m, 33 lb-ft)**



Install the shock link bolt from the left side and tighten the nut.

**Torque: 45 N·m (4.5 kg-m, 33 lb-ft)**

Install rear fender B (page 2-9).



## SWINGARM

### REMOVAL

Raise the rear wheel off the ground and support the motorcycle using a hoist.

Remove the rear wheel (page 13-3).

Remove rear fender B (page 2-9).

### CAUTION

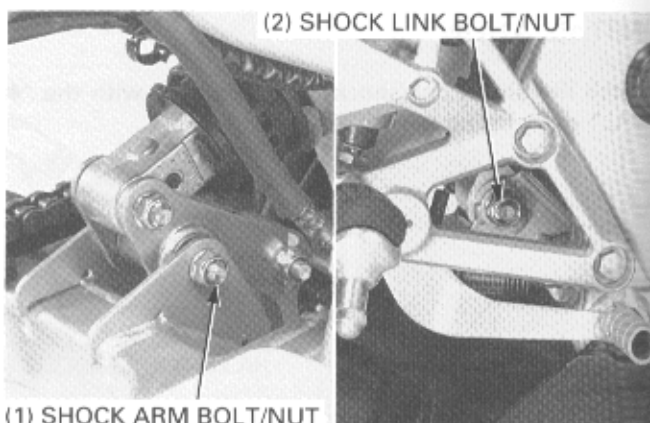
- Do not suspend the brake caliper from the brake hose. Do not twist the brake hose.

### NOTE

- Do not operate the front brake pedal after removing the caliper and rear wheel. To do so will cause difficulty in fitting the brake disc between the brake pads.

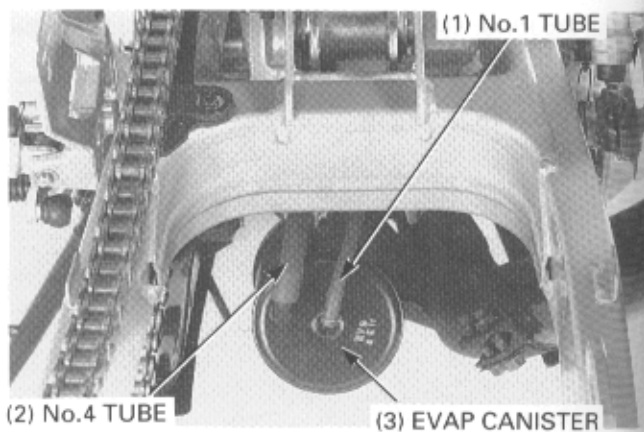
Remove the shock arm bolt and nut (swingarm side).

Remove the shock link bolt and nut (frame side).



### CALIFORNIA TYPE ONLY:

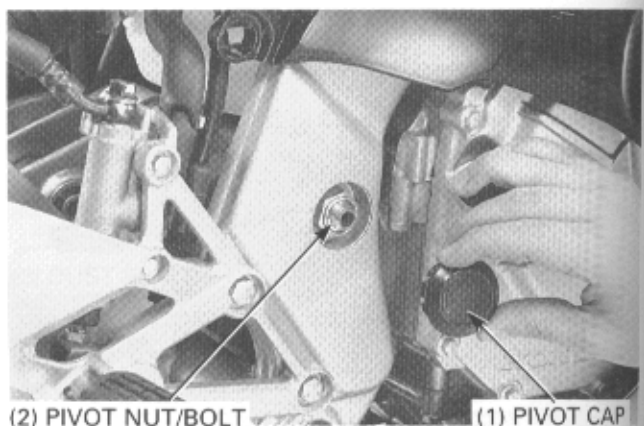
Disconnect the No.1 and No.4 tubes from the EVAP canister.



Remove the swingarm pivot caps.

Remove the swingarm pivot nut and bolt.

Remove the swingarm.



**DISASSEMBLY/INSPECTION**

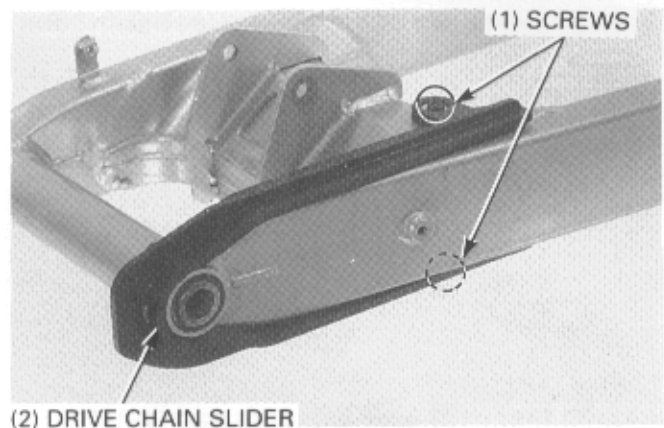
Remove the screws and drive chain slider from the swingarm.

Inspect the drive chain slider for excessive wear. Replace the drive chain slider if it is worn to the wear indicator.

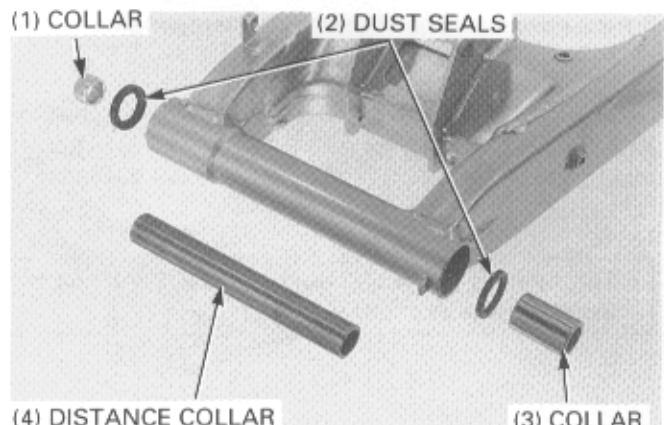
Remove the dust seal, left pivot collar and distance collar. Remove the dust seal and right pivot collar.

Check the dust seals and collars for damage or fatigue.

Check to make sure the ball bearings turn smoothly and quietly and fit tightly in the swing arm. Check the needle bearing for damage or loose fit. If the bearing is loose or damaged, replace it.



(2) DRIVE CHAIN SLIDER



(4) DISTANCE COLLAR

(3) COLLAR

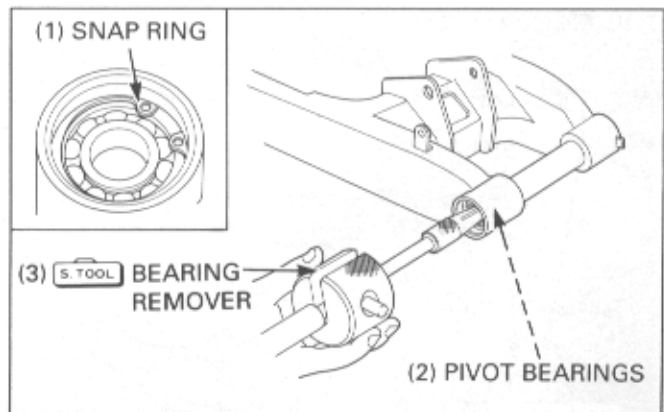
**PIVOT BEARING REPLACEMENT**

Remove the snap ring.

Remove the right pivot bearings (radial ball bearings) from the swingarm.

Tools:

- |                        |                                       |
|------------------------|---------------------------------------|
| Bearing remover        | 07936 - 3710300                       |
| Remover handle         | 07936 - 3710100                       |
| Remover sliding weight | 07741 - 0010201 or<br>07936 - 3710200 |



Press new radial ball bearings into the right swingarm pivot one at a time.

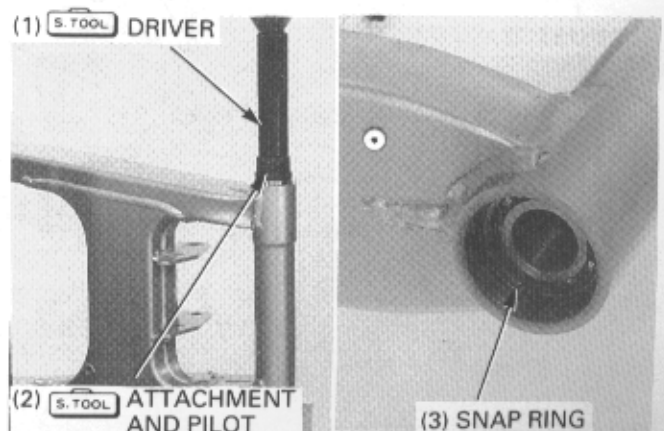
Tools:

- |                        |                 |
|------------------------|-----------------|
| Driver                 | 07749 - 0010000 |
| Attachment, 32 x 35 mm | 07746 - 0010100 |
| Pilot, 17 mm           | 07746 - 0040400 |

NOTE

• Install the bearings with the stamped side facing out.

Install the snap ring with the chamfered side facing in.



(2) S. TOOL ATTACHMENT AND PILOT

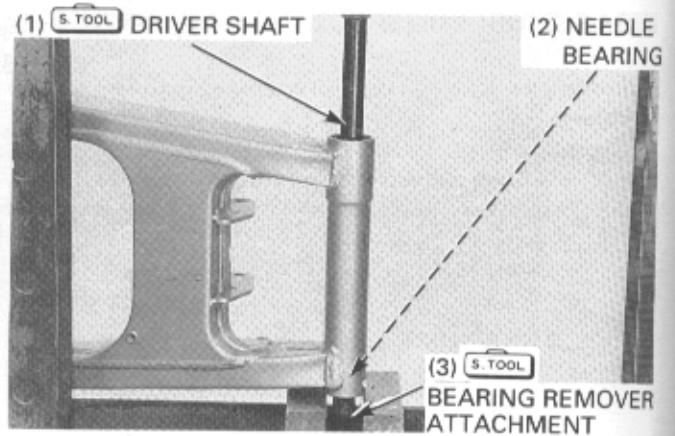
(3) SNAP RING

## REAR WHEEL/SUSPENSION

Press the needle bearing out of the left swingarm pivot.

### Tools:

Bearing remover attachment      07LMC - KV30200  
 Driver shaft                              07949 - MJ00100



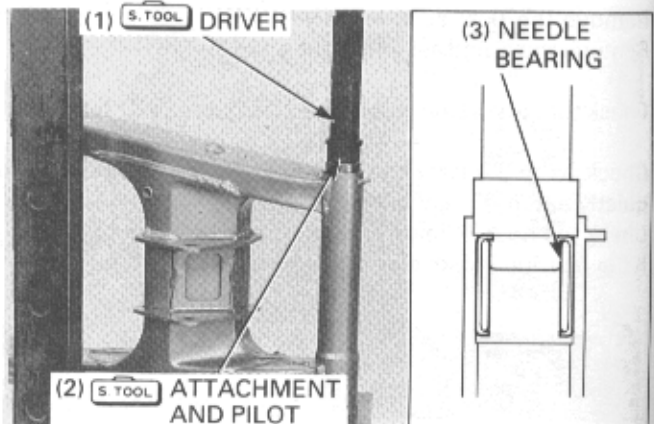
Press a new needle bearing with the stamped side facing out.

### Tools:

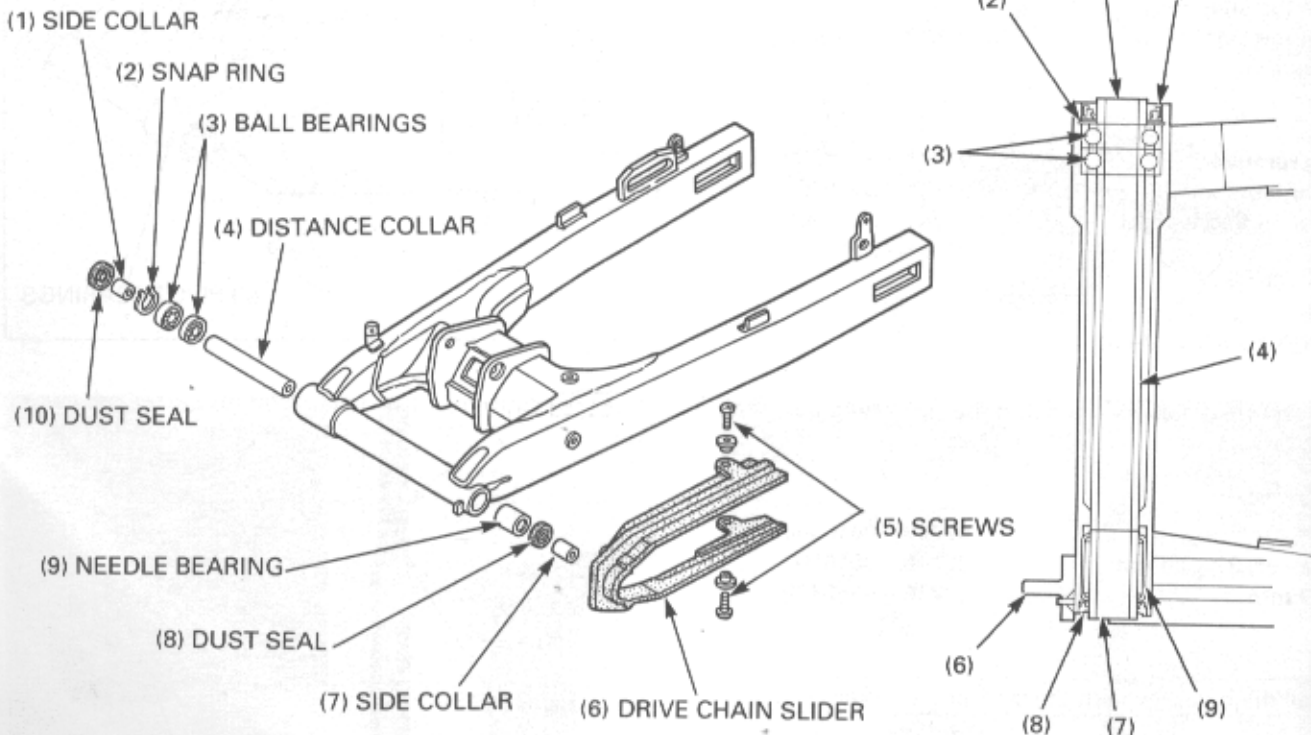
Driver    07749 - 0010000  
 Attachment, 32 x 35 mm                  07946 - 0010100  
 Pilot, 25 mm                                    07746 - 0040600

### NOTE

- The bearing surface should be flush with the pivot inside surface as shown.

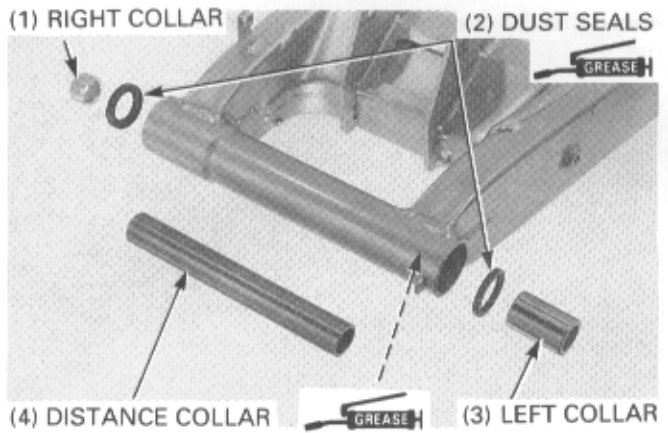


## ASSEMBLY



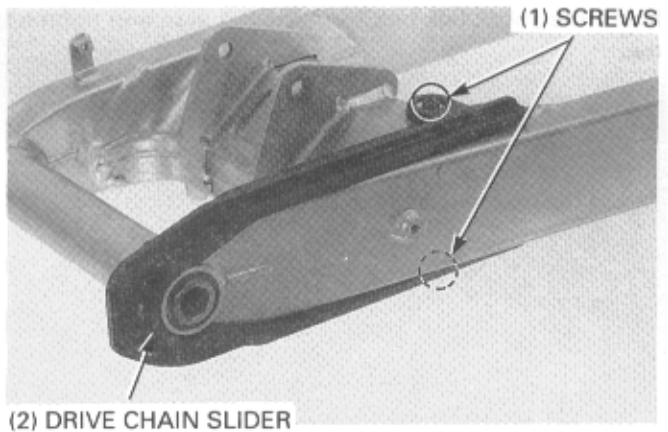
Apply grease to the dust seal lip and install the dust seal in the swingarm pivot.  
Install the right collar.

Apply grease to the needle bearing.  
Install the distance collar.  
Apply grease to the dust seal lip and install the dust seal in the swingarm pivot.  
Install the left collar.



Apply a locking agent to the drive chain slider screw threads.  
Install the drive chain slider to the swingarm and tighten the screws.

**Torque: 5.3 N·m (0.53 kg·m, 3.8 lb·ft)**

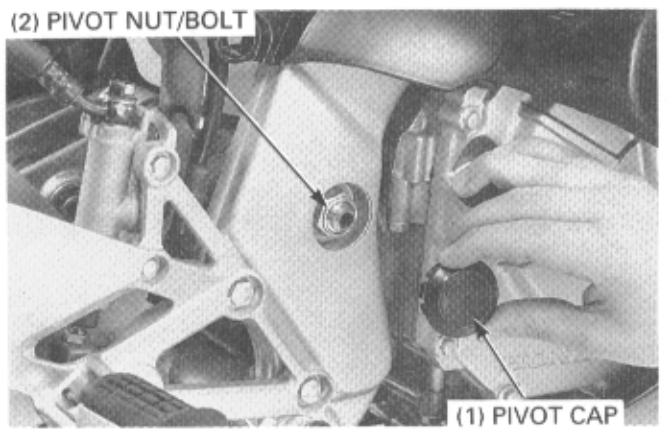


**INSTALLATION**

Install the swingarm to the frame.  
Install the swingarm pivot bolt and nut, tighten the nut.

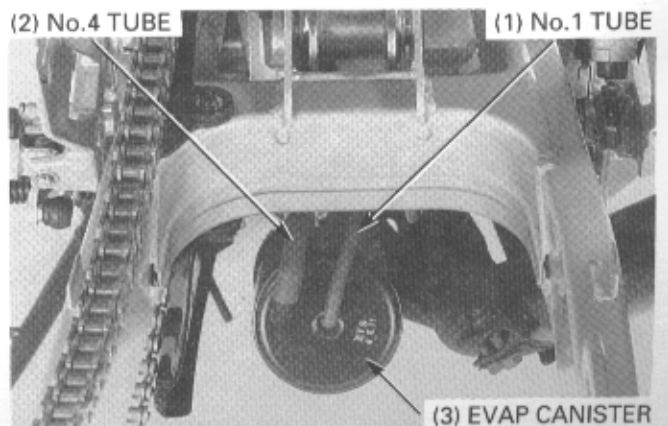
**Torque: 110 N·m (11.0 kg·m, 80 lb·ft)**

Install the swingarm pivot caps.



**CALIFORNIA TYPE ONLY:**

Connect the No.1 and No.4 tubes to the EVAP canister.



## REAR WHEEL/SUSPENSION

Install the shock arm bolt from the left side and tighten the nut.

**Torque: 45 N·m (4.5 kg-m, 33 lb-ft)**



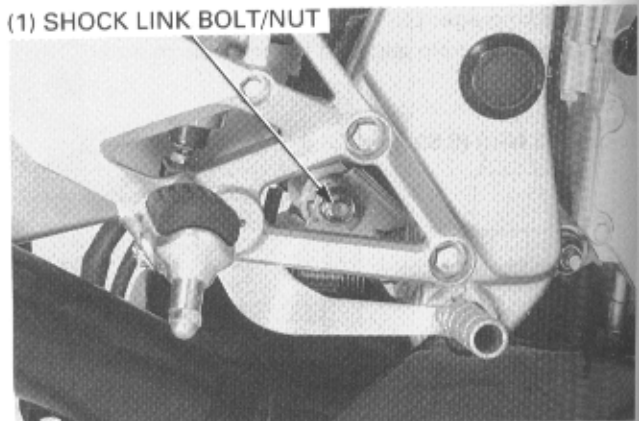
(1) SHOCK ARM BOLT/NUT

Install the shock link bolt from the left side and tighten the nut.

**Torque: 45 N·m (4.5 kg-m, 33 lb-ft)**

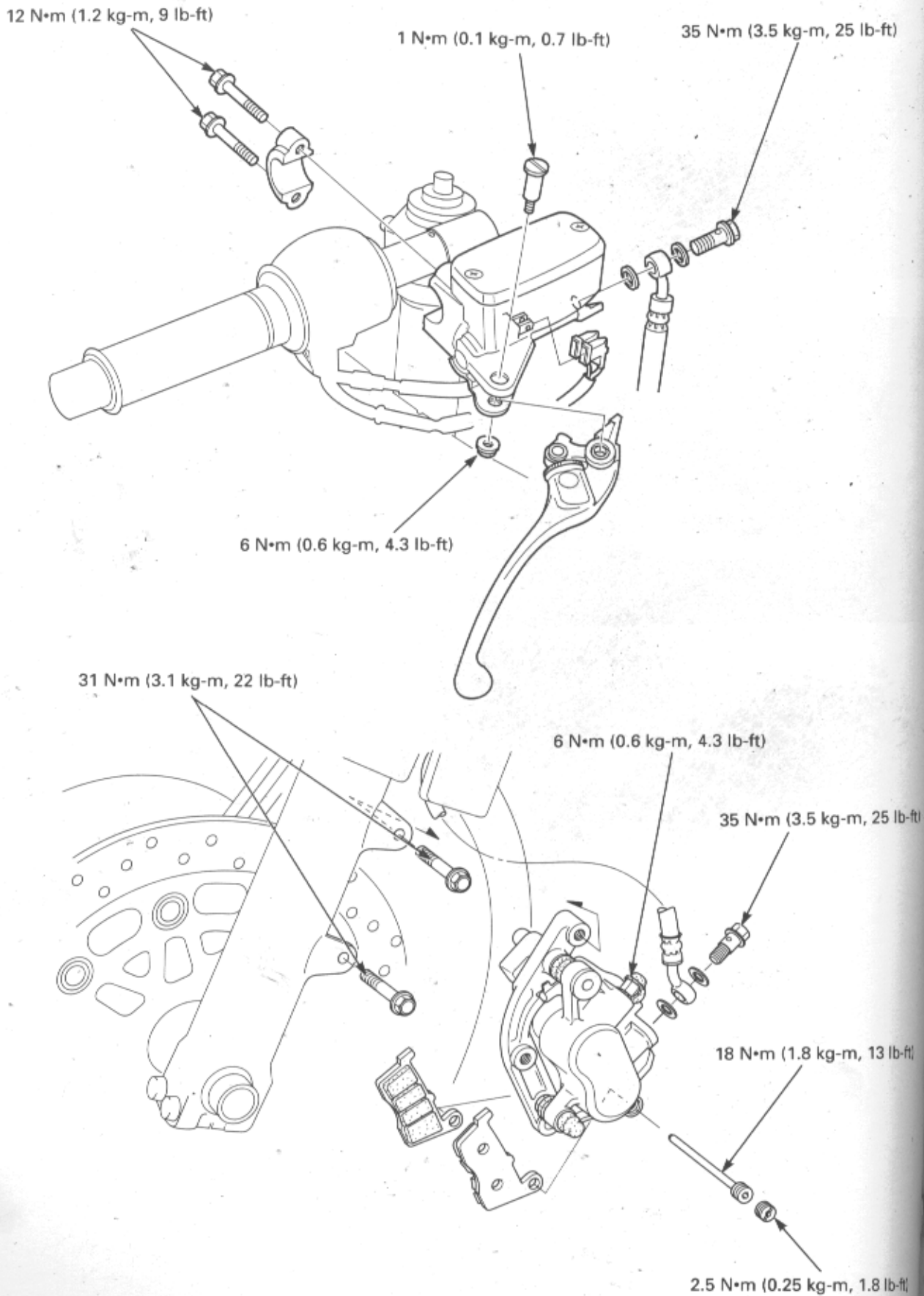
Install rear fender B (page 2-9).

Install the rear wheel (page 13-8).



(1) SHOCK LINK BOLT/NUT

# HYDRAULIC DISC BRAKE



# 14. HYDRAULIC DISC BRAKE

## SERVICE INFORMATION

## TROUBLESHOOTING

## BRAKE FLUID REPLACEMENT/ AIR BLEEDING

## BRAKE PAD/DISC

14-2

FRONT MASTER CYLINDER

14-8

14-3

FRONT CALIPER

14-11

14-4

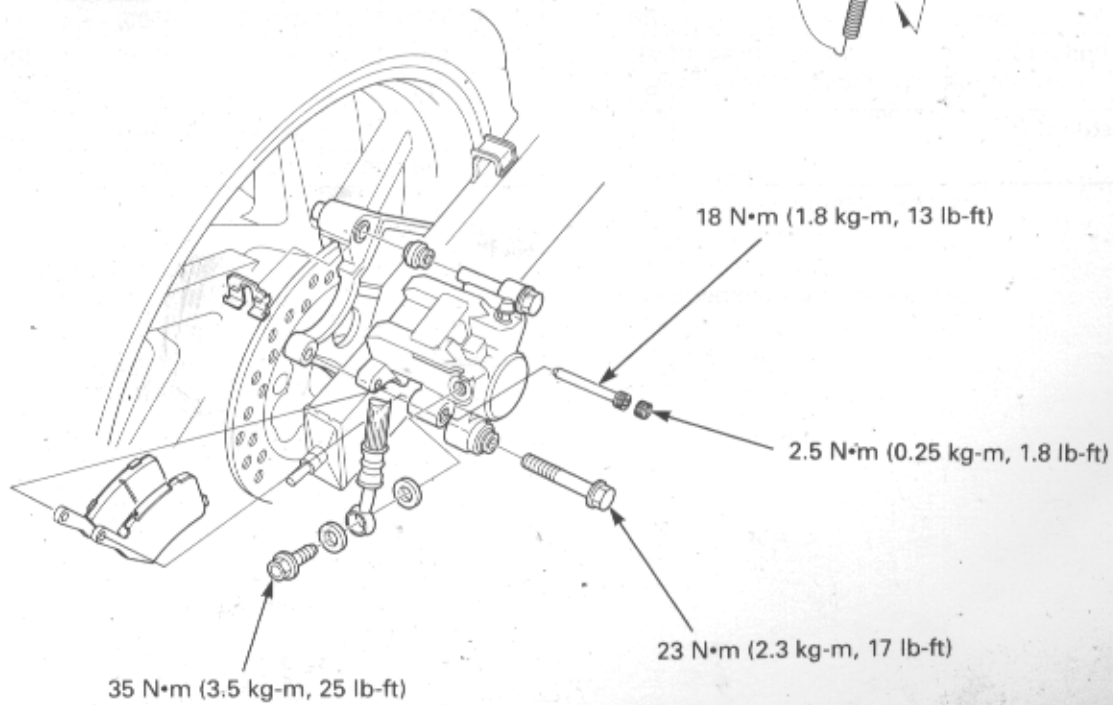
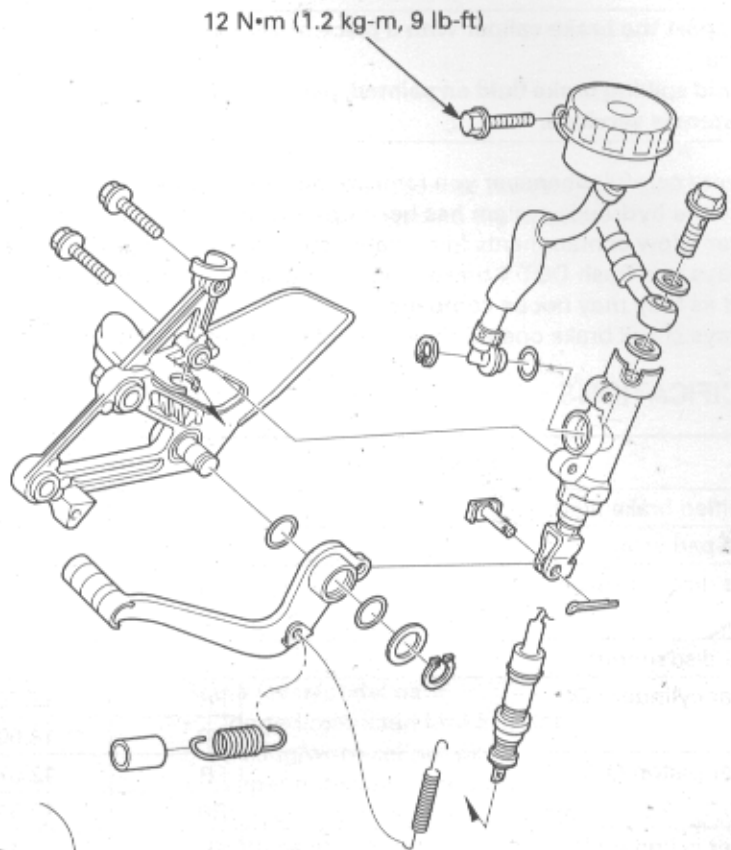
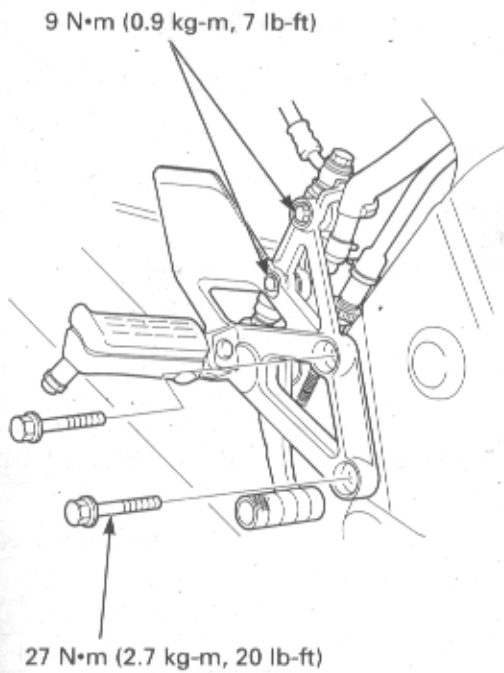
REAR MASTER CYLINDER

14-14

14-6

REAR CALIPER

14-19





## HYDRAULIC DISC BRAKE

### SERVICE INFORMATION

#### GENERAL

##### ▲ WARNING

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

#### 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.
  - Avoid spilling brake fluid on painted, plastic or rubber parts. Place a rag or shop towel over these parts whenever the system is serviced.
- Be very careful whenever you remove the reservoir cap: make sure the front reservoir is horizontal first.
  - Once the hydraulic system has been opened, or if the brakes feel spongy, the system must be bled.
  - Never allow contaminants (dirt, water, etc.) to get into an open reservoir.
  - 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 motorcycle.

#### SPECIFICATIONS

Umit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Specified brake fluid		DOT 4 brake fluid	—
Brake pad wear		—	To the groove
Brake disc thickness	FR	3.8 – 4.2 (0.15 – 0.17)	3.5 (0.14)
	RR	4.8 – 5.2 (0.19 – 0.20)	4.0 (0.16)
Brake disc runout		—	0.3 (0.012)
Master cylinder I.D.	FR	12.700 – 12.743 (0.5000 – 0.5017)	12.76 (0.502)
	RR	14.000 – 14.043 (0.5512 – 0.5529)	14.055 (0.5533)
Master piston O.D.	FR	12.675 – 12.684 (0.4983 – 0.4994)	12.65 (0.498)
	RR	13.957 – 13.984 (0.5495 – 0.5506)	13.945 (0.5490)
Caliper cylinder I.D.	FR	25.400 – 25.450 (1.0000 – 1.0020)	25.46 (1.002)
	RR	38.180 – 38.230 (1.5031 – 1.5051)	38.24 (1.506)
Caliper piston O.D.	FR	25.335 – 25.368 (0.9974 – 0.9987)	25.33 (0.997)
	RR	38.098 – 38.148 (1.4999 – 1.5019)	38.09 (1.500)

## TORQUE VALUES

Caliper bleed valve	6 N•m (0.6 kg-m, 4.3 lb-ft)
Pad pin	18 N•m (1.8 kg-m, 13 lb-ft)
Pad pin plug	2.5 N•m (0.25 kg-m, 1.8 lb-ft)
Brake hose bolt	35 N•m (3.5 kg-m, 25 lb-ft)
Brake lever pivot nut	6 N•m (0.6 kg-m, 4 lb-ft)
Brake lever pivot bolt	1 N•m (0.1 kg-m, 0.7 lb-ft)
Front reservoir cover screw	1.5 N•m (0.15 kg-m, 1.1 lb-ft)
Front brake light switch screw	1.2 N•m (0.12 kg-m, 0.9 lb-ft)
Front brake hose clamped bolt	12 N•m (1.2 kg-m, 9 lb-ft)
Front brake pipe stay bolt	12 N•m (1.2 kg-m, 9 lb-ft)
Brake pipe flare nut	17 N•m (1.7 kg-m, 12 lb-ft)
Brake pipe three way joint bolt	12 N•m (1.2 kg-m, 9 lb-ft)
Front brake caliper bracket bolt	31 N•m (3.1 kg-m, 22 lb-ft)
Front brake caliper pin bolt	23 N•m (2.3 kg-m, 17 lb-ft) Apply locking agent to the threads.
Front caliper bracket pin bolt	13 N•m (1.3 kg-m, 9 lb-ft) Apply locking agent to the threads.
Front master cylinder holder bolt	12 N•m (1.2 kg-m, 9 lb-ft)
Rear master cylinder mounting bolt	9 N•m (0.9 kg-m, 7 lb-ft)
Rear master cylinder reservoir bolt	12 N•m (1.2 kg-m, 9 lb-ft)
Rear brake caliper bracket bolt	23 N•m (2.3 kg-m, 17 lb-ft)
Rear brake caliper pin bolt	28 N•m (2.8 kg-m, 20 lb-ft)
Rear master cylinder push rod lock nut	18 N•m (1.8 kg-m, 13 lb-ft)

## TOOLS

Snap ring pliers

07914 - 3230001

## TROUBLESHOOTING

**Brake lever/pedal soft or spongy**

- Air in the hydraulic system
- Leaking hydraulic system
- Contaminated brake pad/disc
- Worn caliper piston seal
- Worn master cylinder piston cup
- Worn brake pad/disc
- Contaminated caliper
- Caliper not sliding properly
- Low 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

**Brakes drag**

- Contaminated brake pad/disc
- Misaligned wheel
- Worn brake pad/disc
- Warped/deformed brake disc
- Caliper not sliding properly
- Worn/broken return spring

## HYDRAULIC DISC BRAKE

### BRAKE FLUID REPLACEMENT/ AIR BLEEDING

#### ⚠ WARNING

- A brake disc or pad contaminated with brake fluid 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 level before removing the reservoir cap.

For the rear brake, remove the side cover (page 2-2).

Remove the reservoir cap, set plate and diaphragm.

Connect a bleed hose to the bleed valve.

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

#### BRAKE FLUID FILLING/BLEEDING

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

#### CAUTION

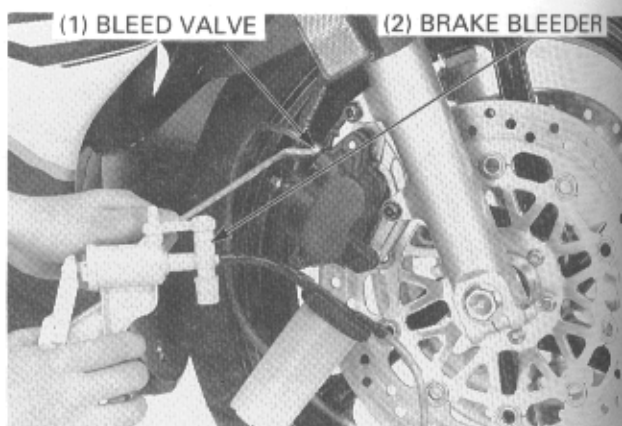
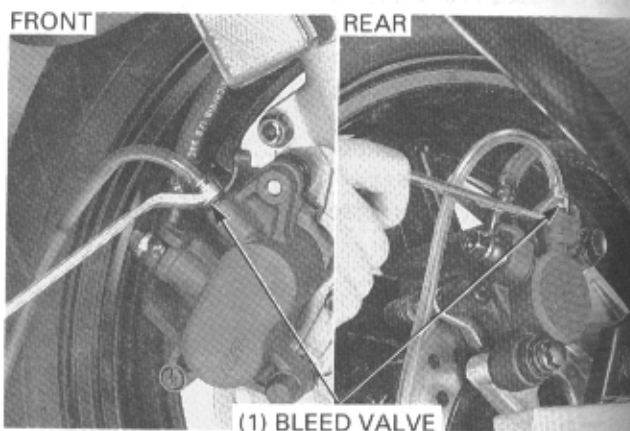
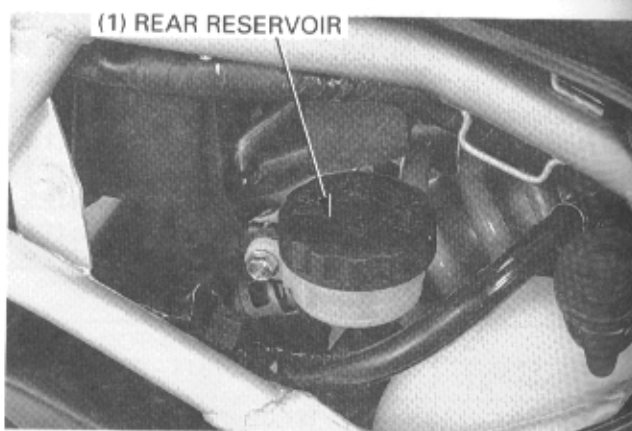
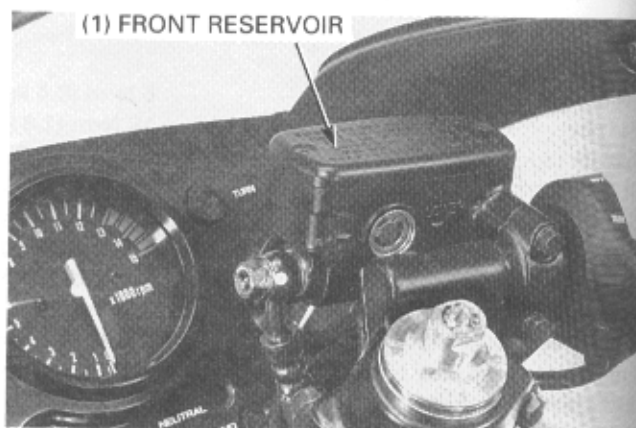
- Use only DOT 4 brake fluid from a sealed container.
- Do not mix different types of fluid. They are not compatible.

Connect a commercially available brake bleeder to the bleed valve.

Pump the brake bleeder and loosen the bleed valve. Add brake fluid when the fluid level in the reservoir is low.

#### NOTE

- Check the fluid level often while bleeding the brake to prevent air from being pumped into the system.
- When using a brake bleeding tool, follow the manufacturer's operating instructions.

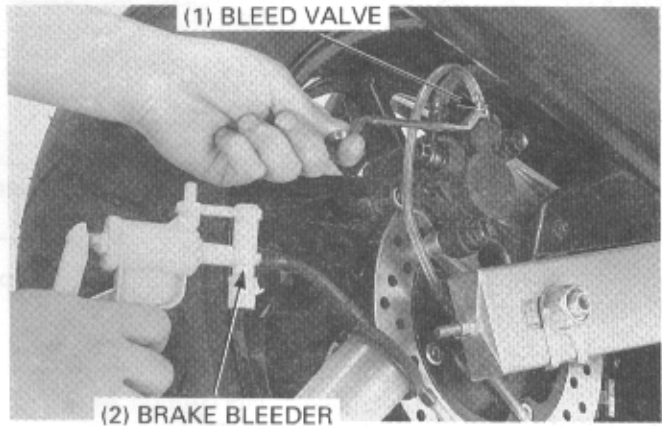


Repeat the above procedures until air bubbles do not appear in the plastic hose.

NOTE

- If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.

Close the bleed valve and operate the brake lever or pedal. If it still feels spongy, bleed the system again.



If a brake bleeder is not available, use the following procedure:

Pump up the system pressure with the brake lever or pedal until lever or pedal resistance is felt.

Connect a bleed hose to the bleed valve and bleed the system as follows:

1. Squeeze the brake lever or depress the brake pedal. Open the bleed valve 1/2 turn and then close it.

NOTE

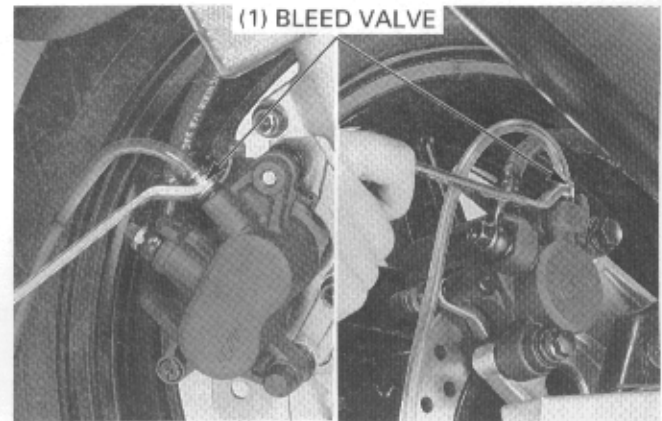
- Do not release the brake lever until the bleed valve has been closed.

2. Release the brake lever slowly and wait several seconds after it stops moving.

Repeat steps 1 and 2 until air bubbles do not appear in the bleed hose.

Tighten the bleed valve.

**Torque: 6 N·m (0.6 kg-m, 4.3 lb-ft)**



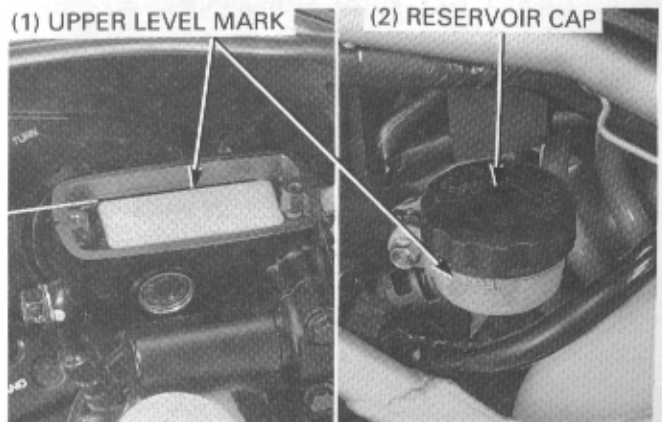
Fill the reservoir to the upper level mark with DOT 4 brake fluid from a sealed container.

Install the diaphragm, set plate and reservoir cap.

On the front brake, tighten the reservoir cap screws.

**Torque: 1.5 N·m (0.15 kg-m, 1.1 lb-ft)**

On the rear brake, install the side cover (page 2-2).



## HYDRAULIC DISC BRAKE

### BRAKE PAD/DISC

#### FRONT BRAKE PAD REPLACEMENT

##### NOTE

- Always replace the brake pads in pairs to ensure even disc pressure.

Push the caliper pistons all the way in by pushing the caliper body inward to provide clearance for the new pads.

Remove the pad pin plug and loosen the pad pin.

Remove the pad pin and the brake pads.

Make sure that the pad spring is installed in position.

Install new pads so that their ends rest on the pad retainer on the bracket properly.

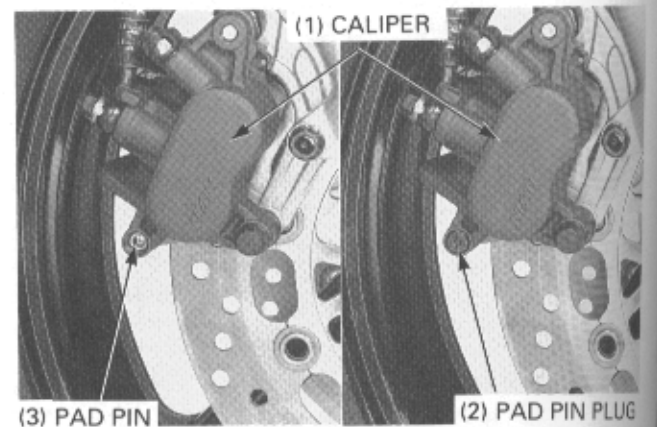
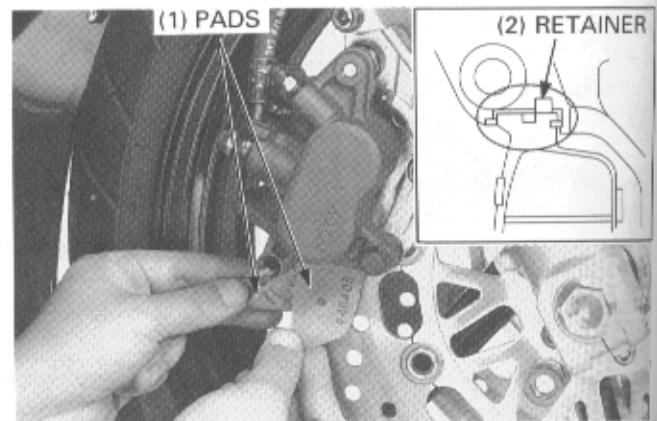
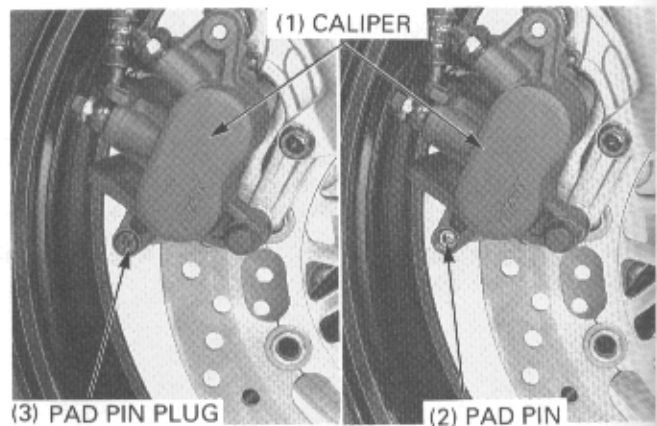
Install the pad pin by pushing the pads against the pad spring to align the pad pin holes in the pads and caliper. Tighten the pad pin.

**Torque: 18 N·m (1.8 kg-m, 13 lb-ft)**

Install and tighten the pad pin plug.

**Torque: 2.5 N·m (0.25 kg-m, 1.8 lb-ft)**

Operate the brake lever to seat the caliper pistons against the pads.

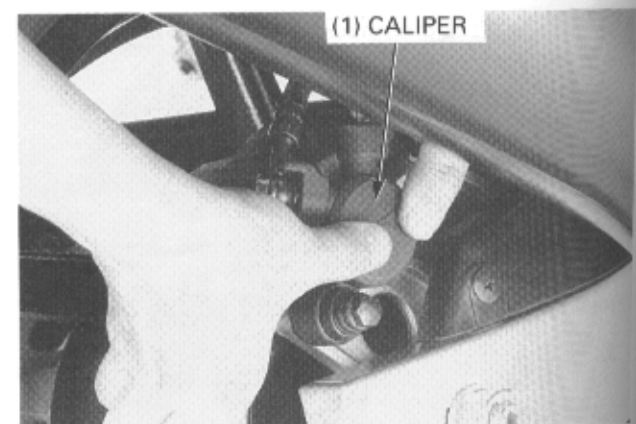


#### REAR BRAKE PAD REPLACEMENT

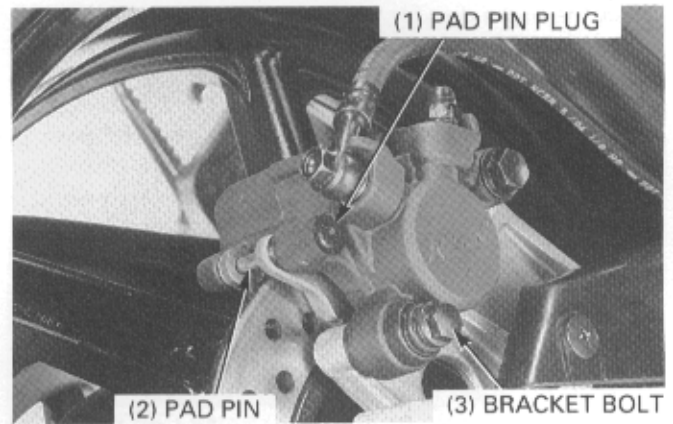
##### NOTE

- Always replace the brake pads in pairs to ensure even disc pressure.

Push the caliper piston all the way in by pushing the caliper body inward to provide clearance for the new pads.

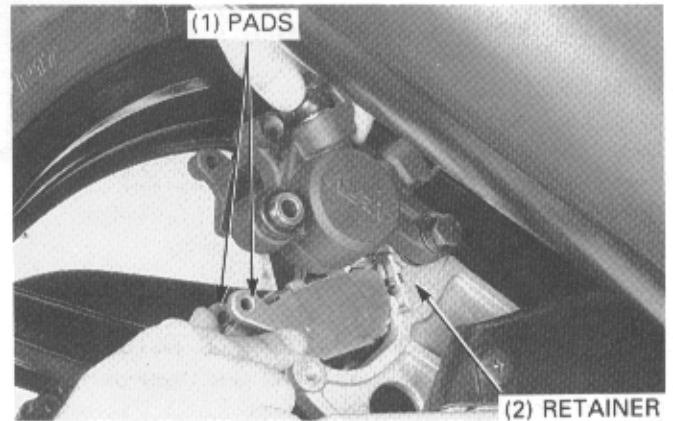


Remove the pad pin plug and pad pin.  
Remove the caliper bracket bolt.



Pivot the caliper up and remove the pads.

Install new pads so that their ends rest properly on the pad retainer on the bracket.



Lower the caliper and install the pad pin while pushing the pads against the pad spring.

Install and tighten the caliper bracket bolt.

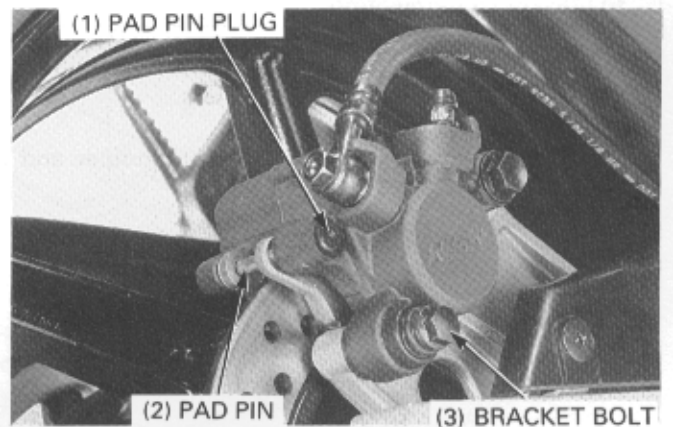
**Torque: 23 N·m (2.3 kg-m, 17 lb-ft)**

Tighten the pad pin plug.

**Torque: 18 N·m (1.8 kg-m, 13 lb-ft)**

Install and tighten the pad pin plug.

**Torque: 2.5 N·m (0.25 kg-m, 1.8 lb-ft)**



Depress the brake pedal to seat the caliper piston against the pads.

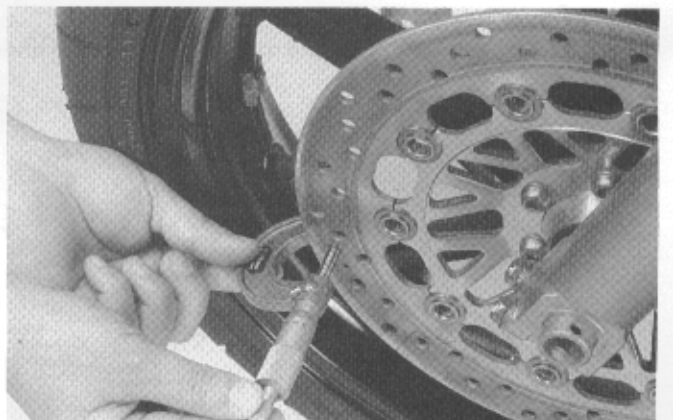
## BRAKE DISC INSPECTION

Visually inspect the disc for damage or cracks.

Measure the brake disc thickness at several points.

**Service limit: Front: 3.5 mm (0.14 in)**  
**Rear: 4.0 mm (0.16 in)**

Replace the brake disc if the smallest measurement is less than the service limit.



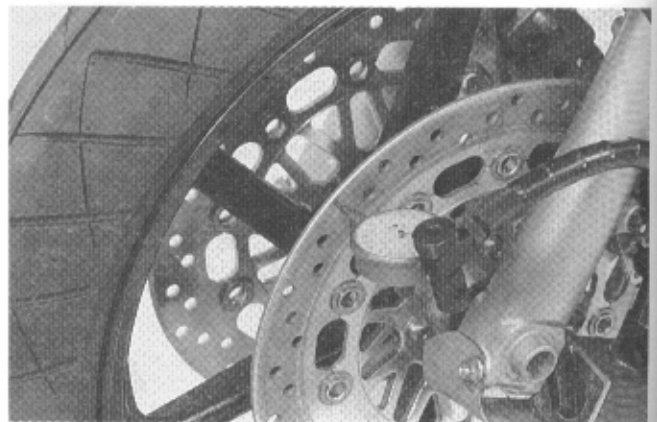
## HYDRAULIC DISC BRAKE

Check the brake disc for warpage.

**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

### DISASSEMBLY

Drain the brake fluid from the front hydraulic system (page 14-3).

Disconnect the front brake light switch connectors.

Remove the pivot nut, bolt and brake lever.

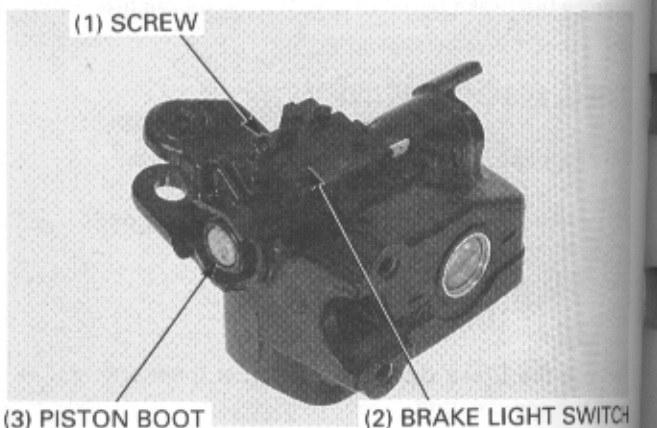
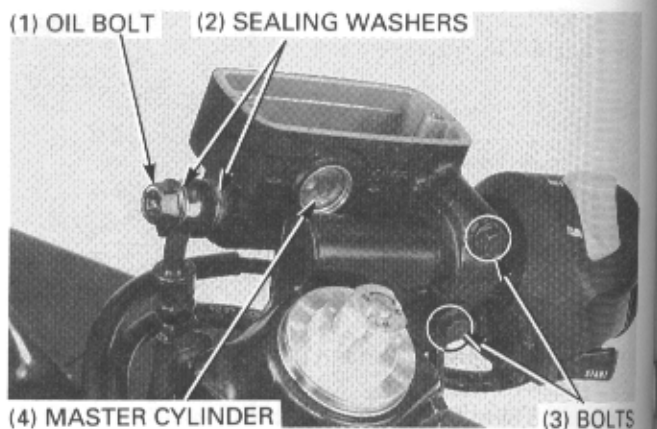
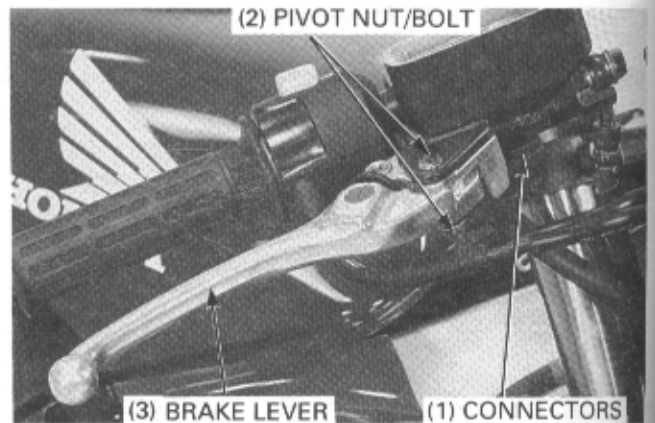
### CAUTION

- Avoid spilling brake fluid on painted, plastic or rubber parts. Place a rag or shop towel over these parts whenever the system is being serviced.
- When removing the oil bolt, cover the end of the hose to prevent contamination.

Disconnect the brake hose from the master cylinder by removing the oil bolt and sealing washers.

Remove the master cylinder holder bolts, holder and the master cylinder.

Remove the screw and the front brake light switch.  
Remove the piston boot from the master piston and cylinder.

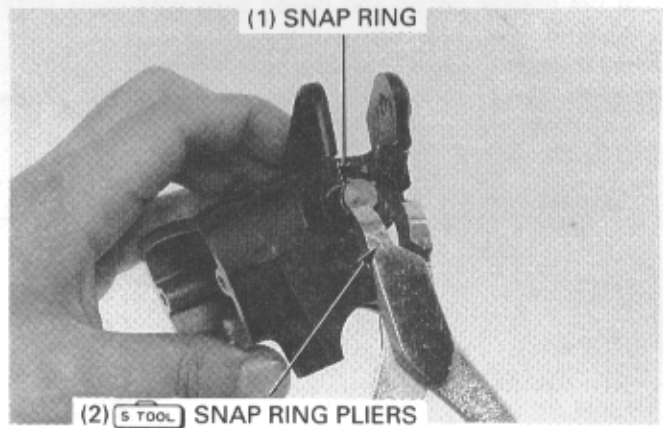


Remove the snap ring.

**Tool:**  
**Snap ring pliers** 07914 - 3230001

Remove the master piston and spring.

Clean the master cylinder, reservoir and master piston with clean brake fluid.



**INSPECTION**

Check the piston cups for wear, deterioration or damage.

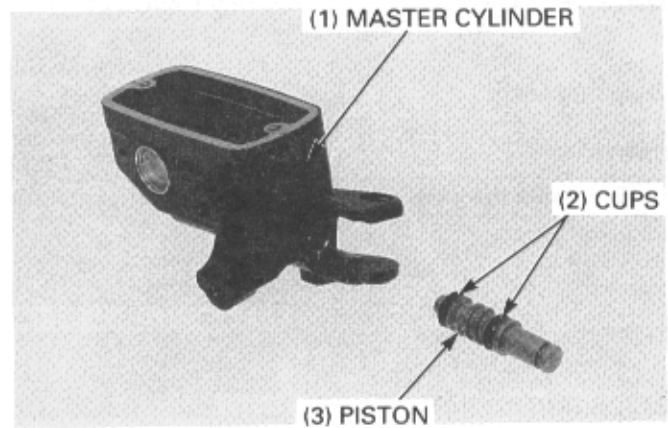
Check the master cylinder and piston for scoring or damage.

Measure the master cylinder I.D.

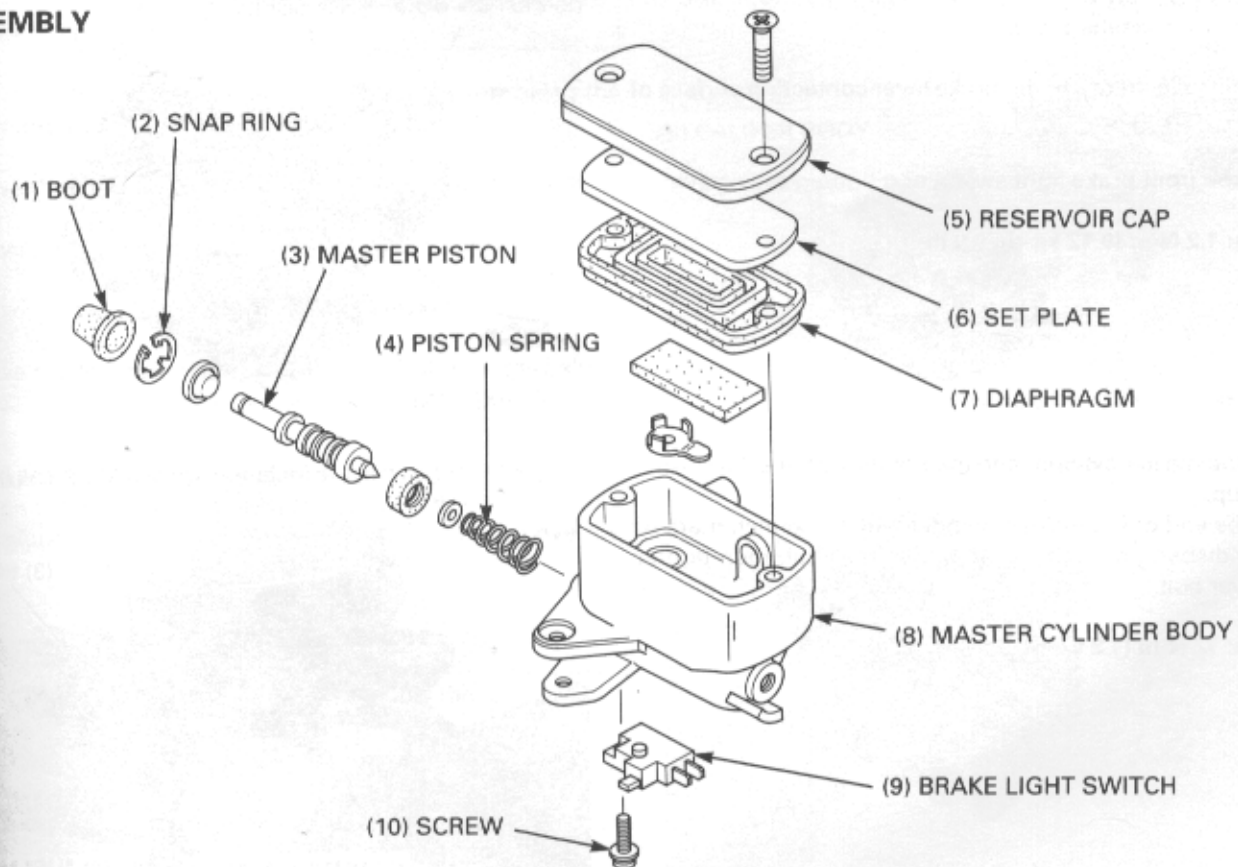
**Service limit: 12.76 mm (0.502 in)**

Measure the master piston O.D.

**Service limit: 12.65 mm (0.498 in)**



**ASSEMBLY**





## HYDRAULIC DISC BRAKE

Coat the master piston and piston cups with clean DOT 4 brake fluid.

Install the piston spring onto the piston end.

Install the piston spring and piston 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.

### Tool:

Snap ring pliers

07914 - 3230001

### CAUTION

- Be certain the snap ring is firmly seated in the groove.

Install the piston boot into the master cylinder and the groove in the master piston.

Apply silicone grease to the brake lever contacting surface of the master cylinder.

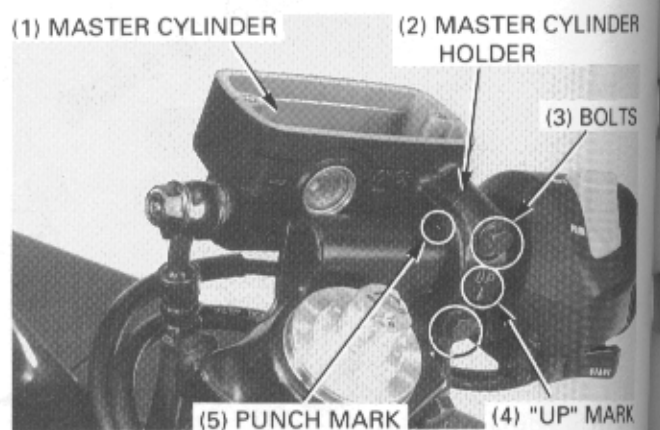
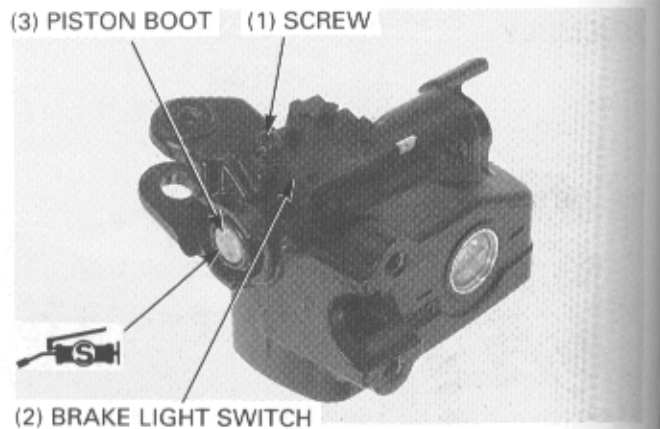
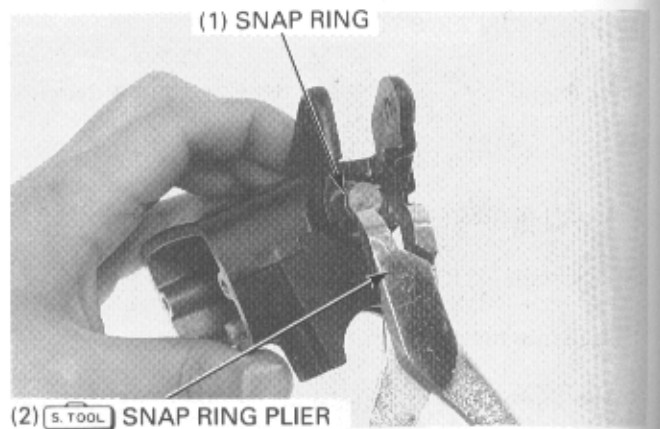
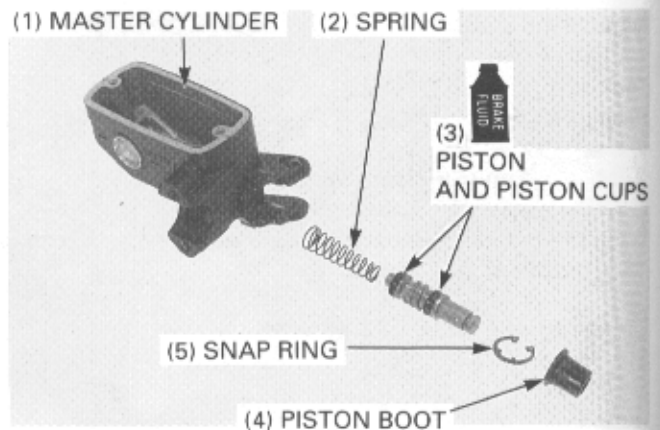
Install the front brake light switch and tighten the screw.

**Torque: 1.2 N·m (0.12 kg·m, 0.9 lb·ft)**

Install the master cylinder and the 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 kg·m, 9 lb·ft)**



Connect the brake hose to the master cylinder with the oil bolt and sealing washers and tighten the bolt.

**Torque: 35 N·m (3.5 kg-m, 25 lb-ft)**

Connect the brake light switch connectors.

Apply silicone grease to the brake lever pivot.  
Install the brake lever and pivot bolt, and tighten the bolt.

**Torque: 1 N·m (0.1 kg-m, 0.7 lb-ft)**

Install and tighten the brake lever pivot nut.

**Torque: 6 N·m (0.6 kg-m, 4.3 lb-ft)**

Fill and bleed the front hydraulic system (page 14-4).

## FRONT CALIPER

### DISASSEMBLY

Drain the brake fluid from the front hydraulic system (page 14-4).

Remove the brake pads (page 14-6).

#### CAUTION

- **Avoid spilling brake fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.**

Disconnect the brake hose from the caliper by removing the oil bolt and sealing washers.

Remove the front caliper mounting bolts and the caliper.

Remove the caliper bracket from the caliper body.

Remove the caliper pin boot from the bracket.

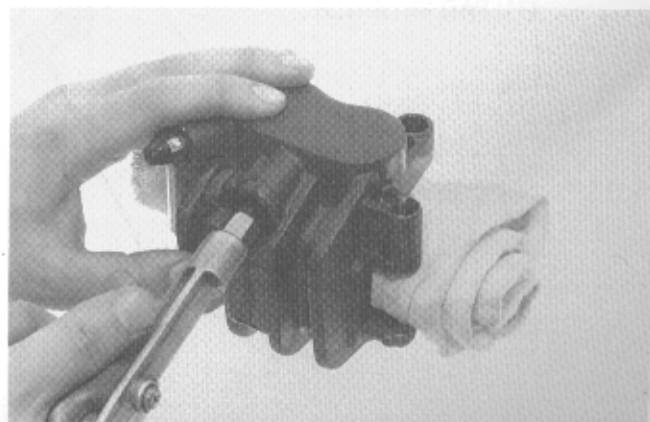
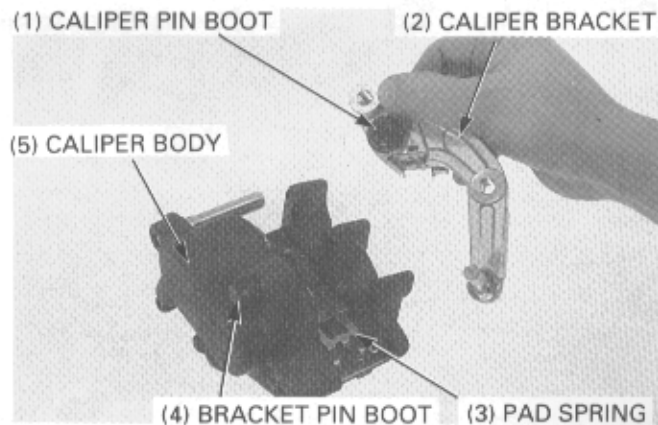
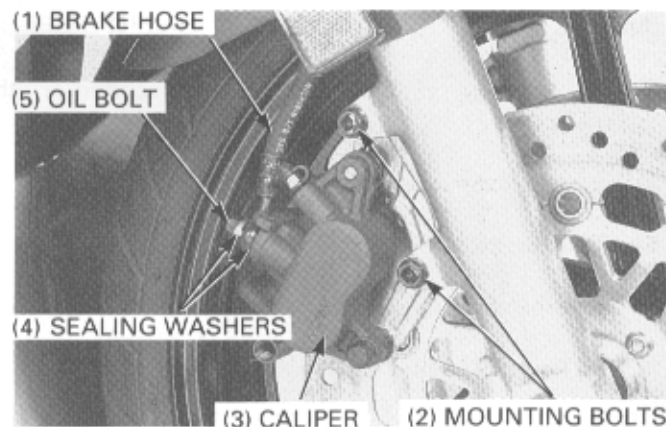
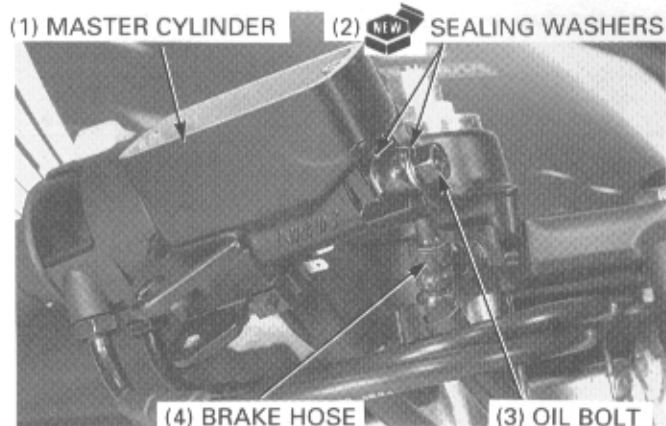
Remove the pad spring and bracket pin boot from the caliper body.

Place a shop towel over the pistons.

Position the caliper body with the pistons down and apply small squirts of air pressure to the fluid inlet to remove the pistons.

#### WARNING

- **Do not use high pressure air or bring the nozzle too close to the inlet.**



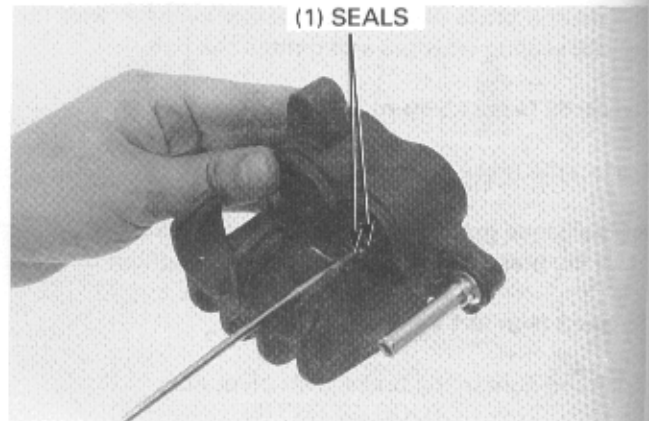
## HYDRAULIC DISC BRAKE

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

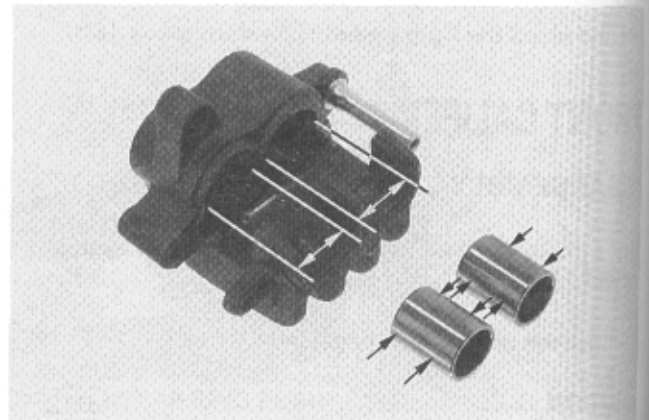
Check the caliper cylinder and pistons for scoring or other damage.

Measure the caliper cylinder I.D..

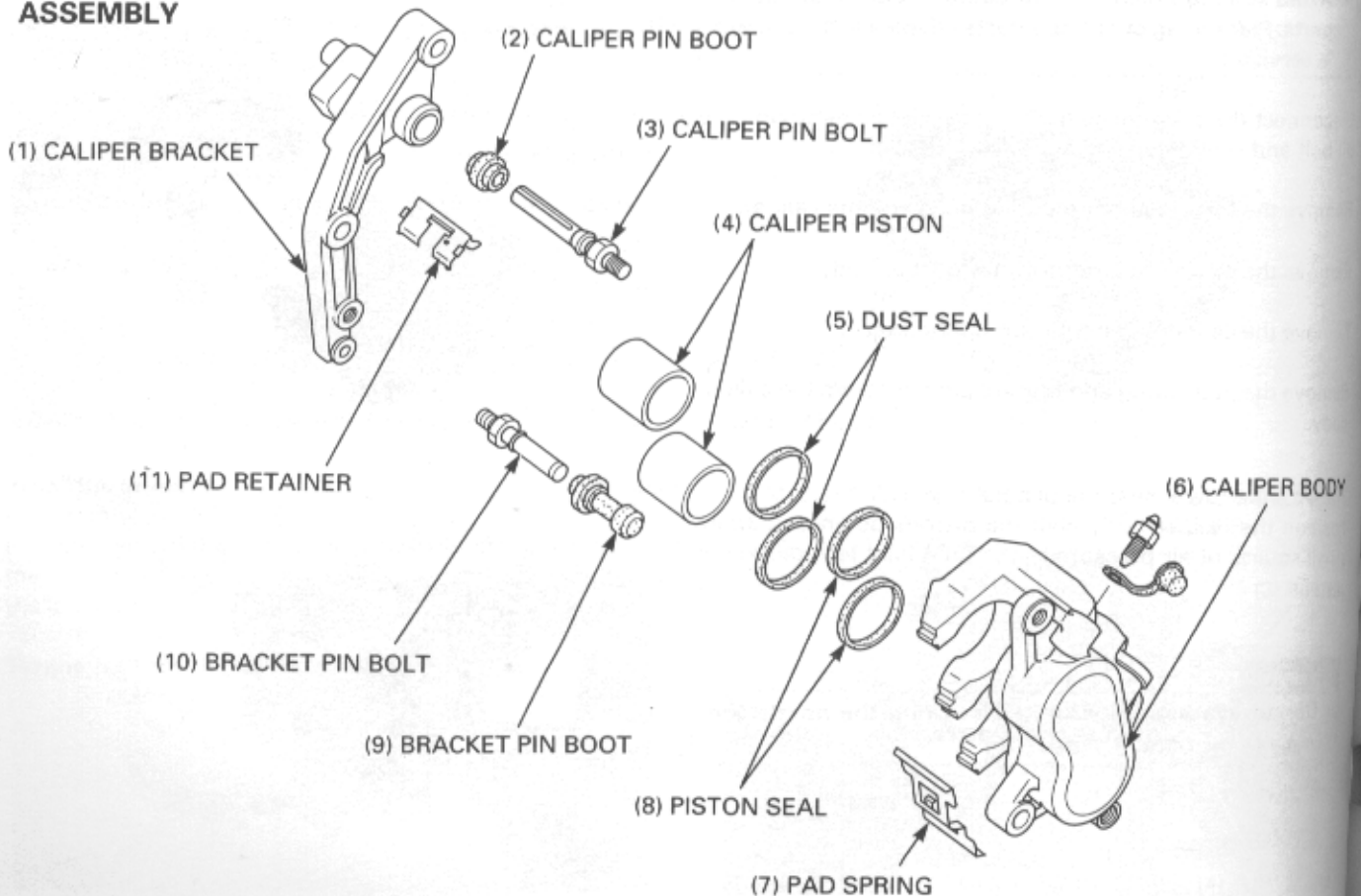
**Service limit: 25.46 mm (1.002 in)**

Measure the caliper piston O.D.

**Service limit: 25.33 mm (0.997 in)**



### ASSEMBLY



Coat new piston seals with clean brake fluid and install them in the seal grooves in the caliper.

Coat new dust seals with silicone grease and install them in the seal grooves in the caliper.

Coat the caliper pistons with clean brake fluid and install them into the caliper cylinder with the opening toward the pads.

Install the pad spring in the caliper body.

If the caliper and bracket pin boots are hard or deteriorated, replace them with new ones.

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.

Install the caliper assembly over the brake disc and onto the fork leg.

Install and tighten the new caliper mounting bolts.

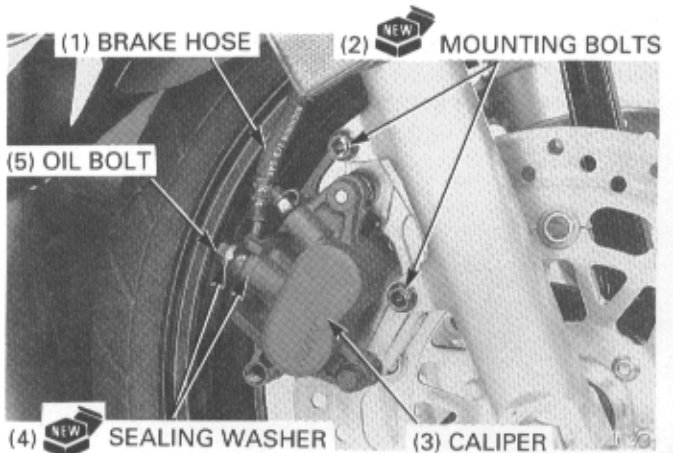
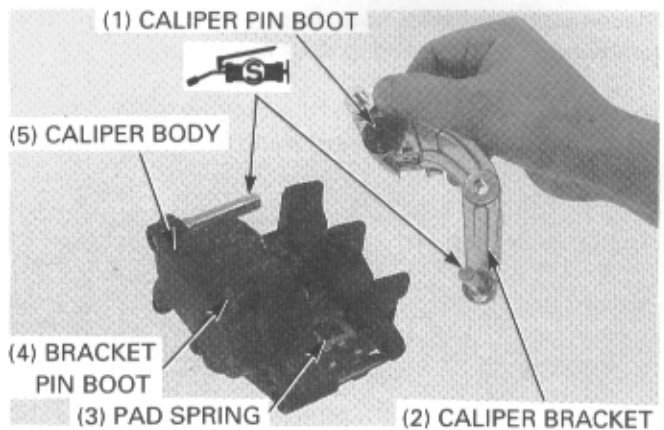
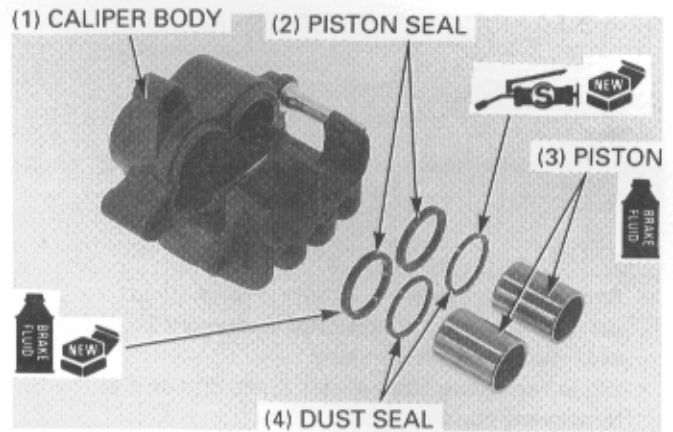
**Torque: 31 N·m (3.1 kg-m, 22 lb-ft)**

Connect the brake hose to the caliper with new sealing washers and the oil bolt.  
Tighten the oil bolt.

**Torque: 35 N·m (3.5 kg-m, 25 lb-ft)**

Install the brake pads (page 14-6).

Fill and bleed the front hydraulic system (page 14-4).



## REAR MASTER CYLINDER

### DISASSEMBLY

Drain the brake fluid from the rear hydraulic system (page 14-4).

#### CAUTION

- Avoid spilling brake fluid on painted, plastic or rubber parts. Place a rag or shop towel over these parts whenever the system is serviced.
- When removing the oil bolt, cover the end of the hose to prevent contamination.

Disconnect the brake hose from the master cylinder by removing the oil bolt and sealing washers.

Loosen the rear master cylinder mounting bolts. Remove the footpeg holder bolts and footpeg holder assembly.

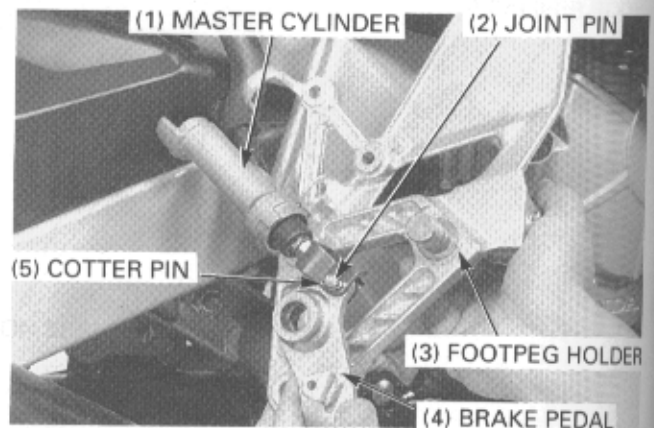
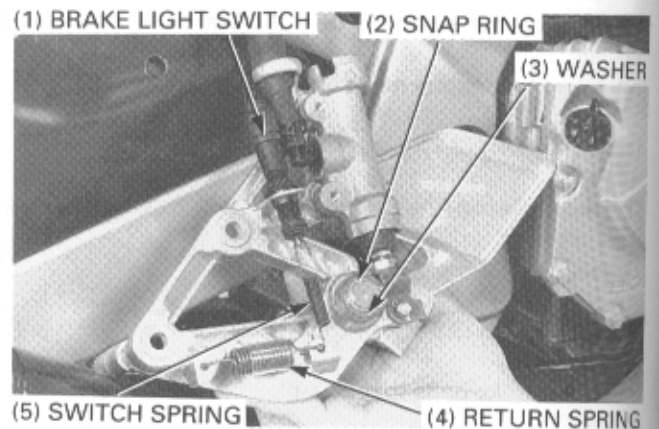
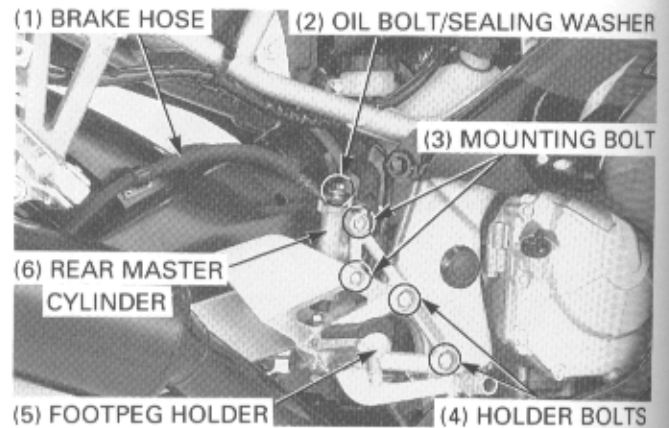
Remove the brake light switch spring and brake pedal return spring.

Remove the brake light switch.

Remove the snap ring and washer.

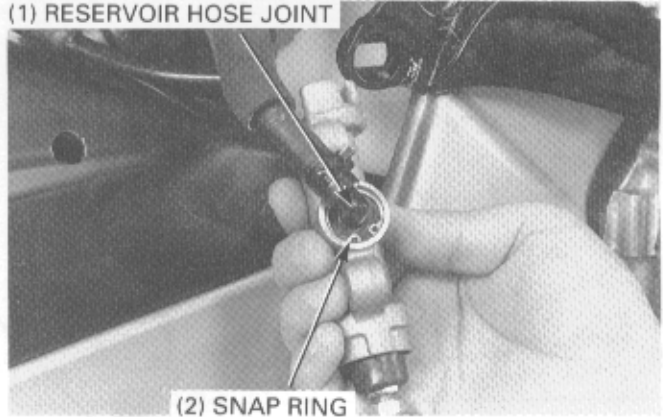
Remove the master cylinder mounting bolts and master cylinder/pedal from the footpeg holder.

Remove the cotter pin, joint pin and brake pedal from the master cylinder.



Remove the snap ring, reservoir hose joint and master cylinder.

(1) RESERVOIR HOSE JOINT



(2) SNAP RING

Remove the boot from the push rod groove and master cylinder.  
Remove the snap ring and push rod.

**Tool:**

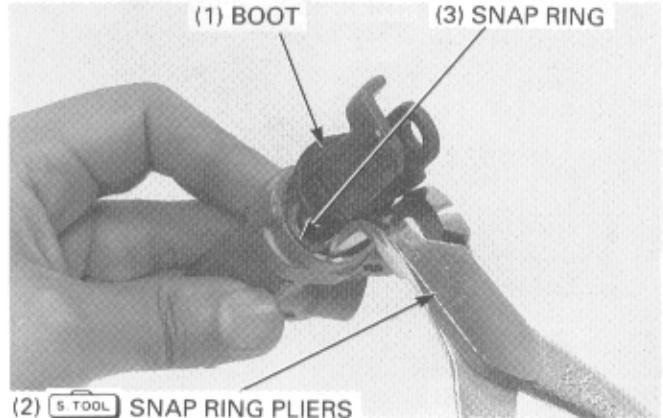
**Snap ring pliers** 07914 - 3230001

Remove the master piston and spring.

Clean the master cylinder and master piston in clean brake fluid.

(1) BOOT

(3) SNAP RING



(2)  SNAP RING PLIERS

**INSPECTION**

Check the piston cups for wear, deterioration or damage.

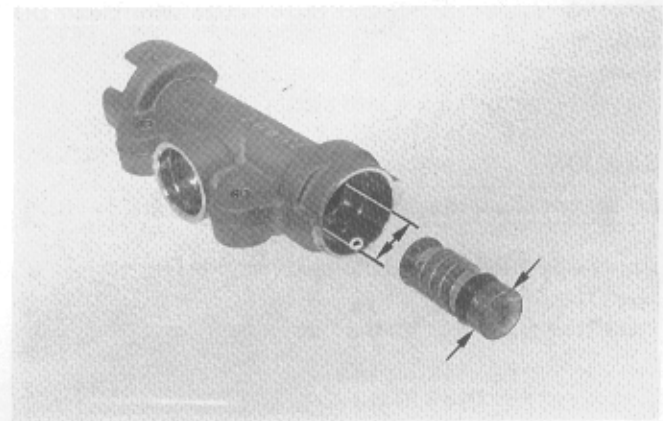
Check the master cylinder and piston for scoring or damage.

Measure the master cylinder I.D..

**Service limit: 14.005 mm (0.5533 in)**

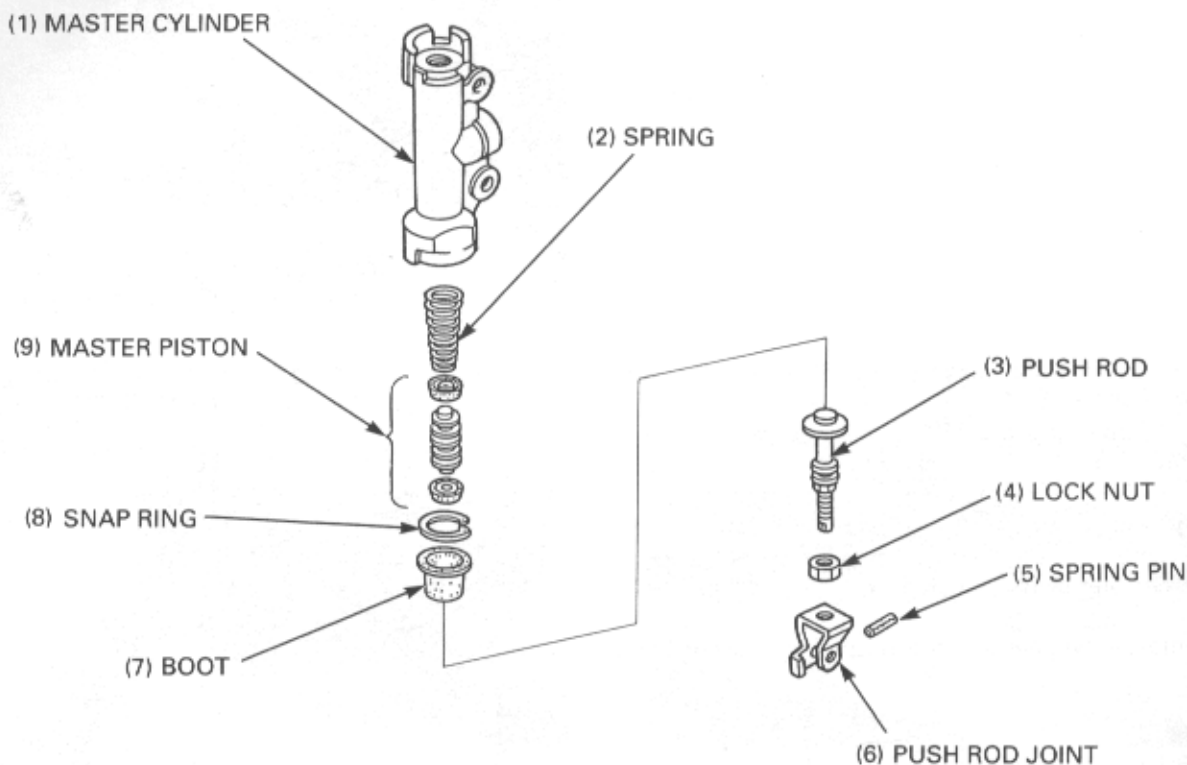
Measure the master piston O.D.

**Service limit: 13.945 mm (0.5490 in)**



# HYDRAULIC DISC BRAKE

## ASSEMBLY



Coat the master piston and piston cups with clean DOT 4 brake fluid.  
Install the piston spring onto the primary cup.  
Install the piston spring and piston into the master cylinder.

### CAUTION

- Do not allow the piston cup lips to turn inside out.

Apply silicone grease to the piston contacting surface of the push rod.  
Install the push rod into the master cylinder.

Install the snap ring into the groove in the master cylinder.

### Tool:

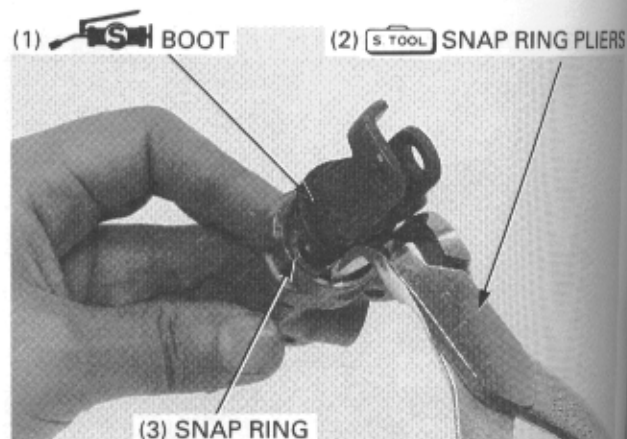
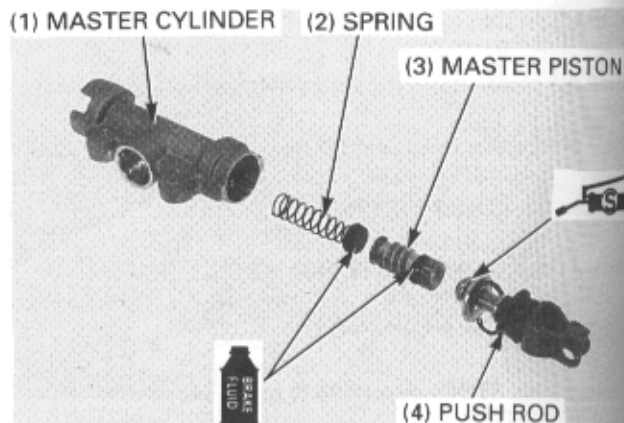
Snap ring pliers

07914 - 3230001

### CAUTION

- Be certain the snap ring is firmly seated in the groove.

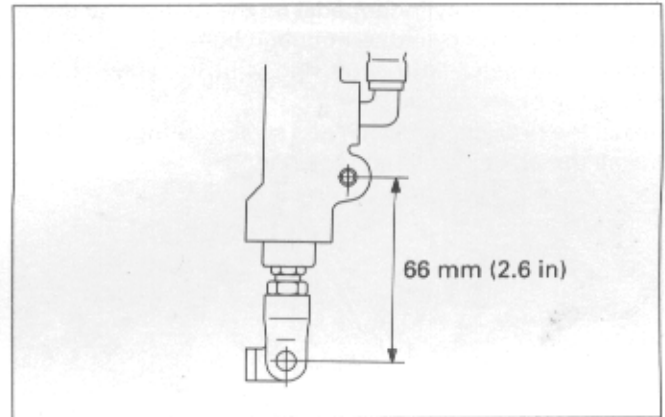
Apply silicone grease to the boot groove in the push rod and install the piston boot into the master cylinder and the groove in the push rod.



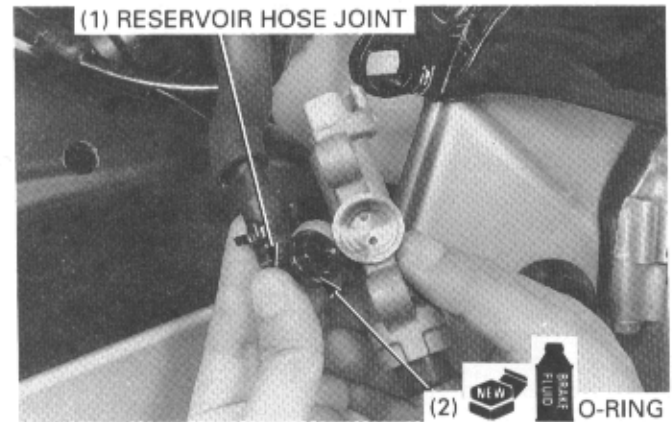
If the push rod joint is reinstalled, adjust the push rod length so that the distance from the center of the master cylinder lower mounting hole to the center of the joint pin hole is 66 mm (2.6 in).

After adjustment, tighten the lock nut.

**Torque: 18 N·m (1.8 kg-m, 13 lb-ft)**



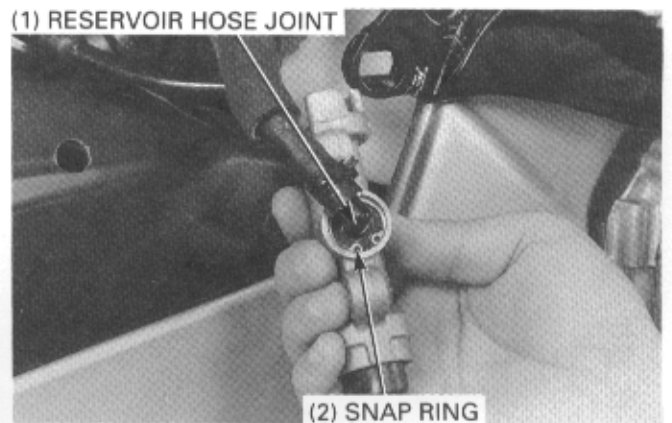
Coat a new O-ring with clean brake fluid and install it onto the reservoir hose joint.



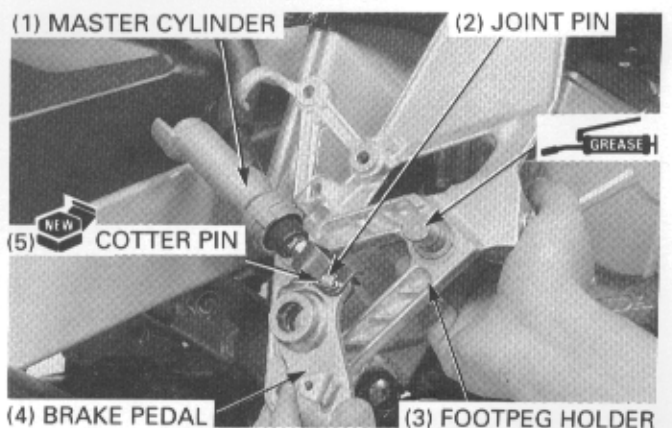
Connect the reservoir hose joint to the master cylinder. Install the snap ring into the groove in the master cylinder.

**CAUTION**

- Be certain the snap ring is firmly seated in the groove.



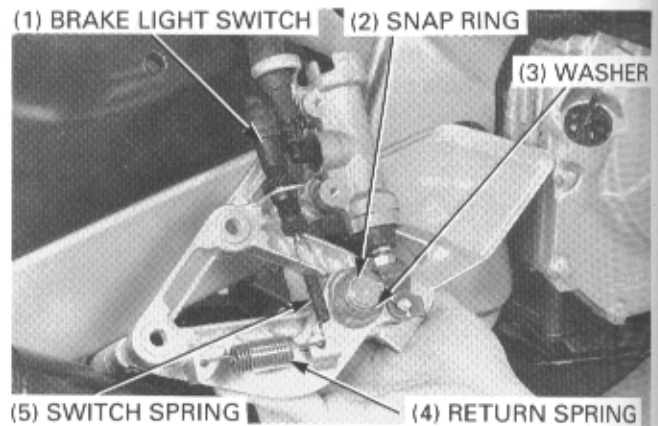
Connect the push rod to the brake pedal with the joint pin and secure the joint pin with a new cotter pin. Apply grease to the brake pedal pivot.





## HYDRAULIC DISC BRAKE

Install the master cylinder/pedal on the footpeg holder.  
Install the master cylinder mounting bolts.  
Install the washer and snap ring with the chamfered side facing the brake pedal.  
Install the brake light switch and switch spring.  
Install the brake pedal return spring.



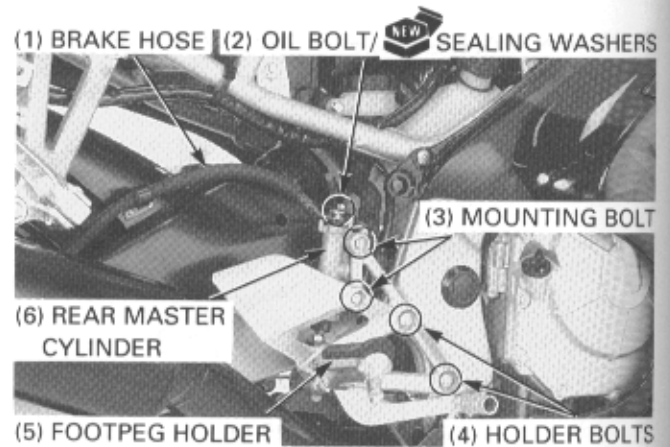
Install the footpeg holder assembly and tighten the bolts.  
Tighten the rear master cylinder mounting bolts.

**Torque: 9 N·m (0.9 kg-m, 7 lb-ft)**

Connect the brake hose to the master cylinder with the hose bolt and new sealing washers, and tighten the hose bolt.

**Torque: 35 N·m (3.5 kg-m, 25 lb-ft)**

Fill and bleed the rear hydraulic system (page 14-4).



## REAR CALIPER

### DISASSEMBLY

Drain the brake fluid from the rear hydraulic system (page 14-4).

#### CAUTION

- Avoid spilling brake fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.

Disconnect the brake hose from the caliper by removing the oil bolt and sealing washers.

Remove the brake pads (page 14-6).

Remove the caliper from the caliper bracket.

Remove the pad spring, collar 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

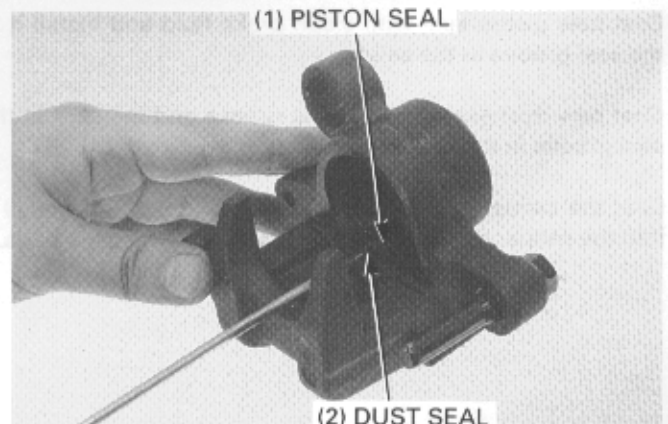
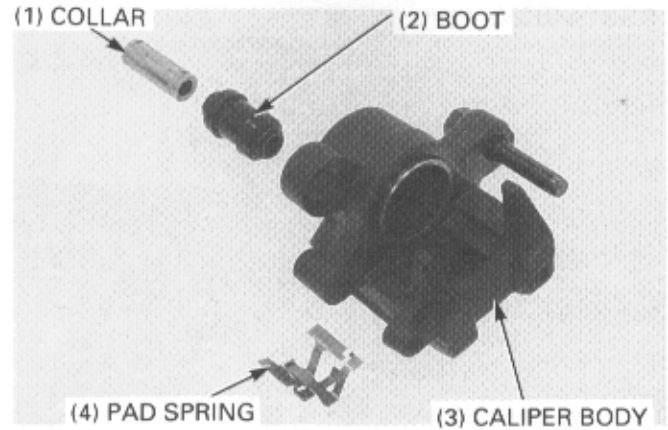
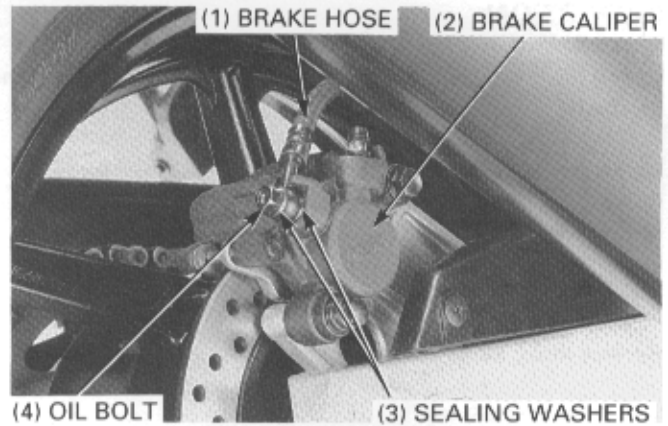
- Do not use high pressure air or bring the nozzle too close to the inlet.

Push the dust 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.



## HYDRAULIC DISC BRAKE

### INSPECTION

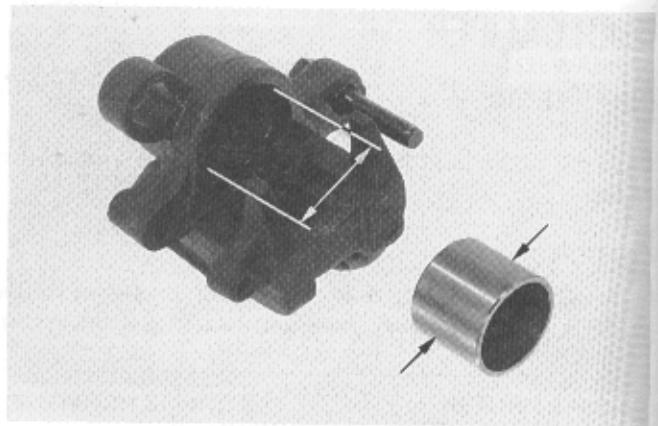
Check the caliper cylinder and pistons for scoring or other damage.

Measure the caliper cylinder I.D..

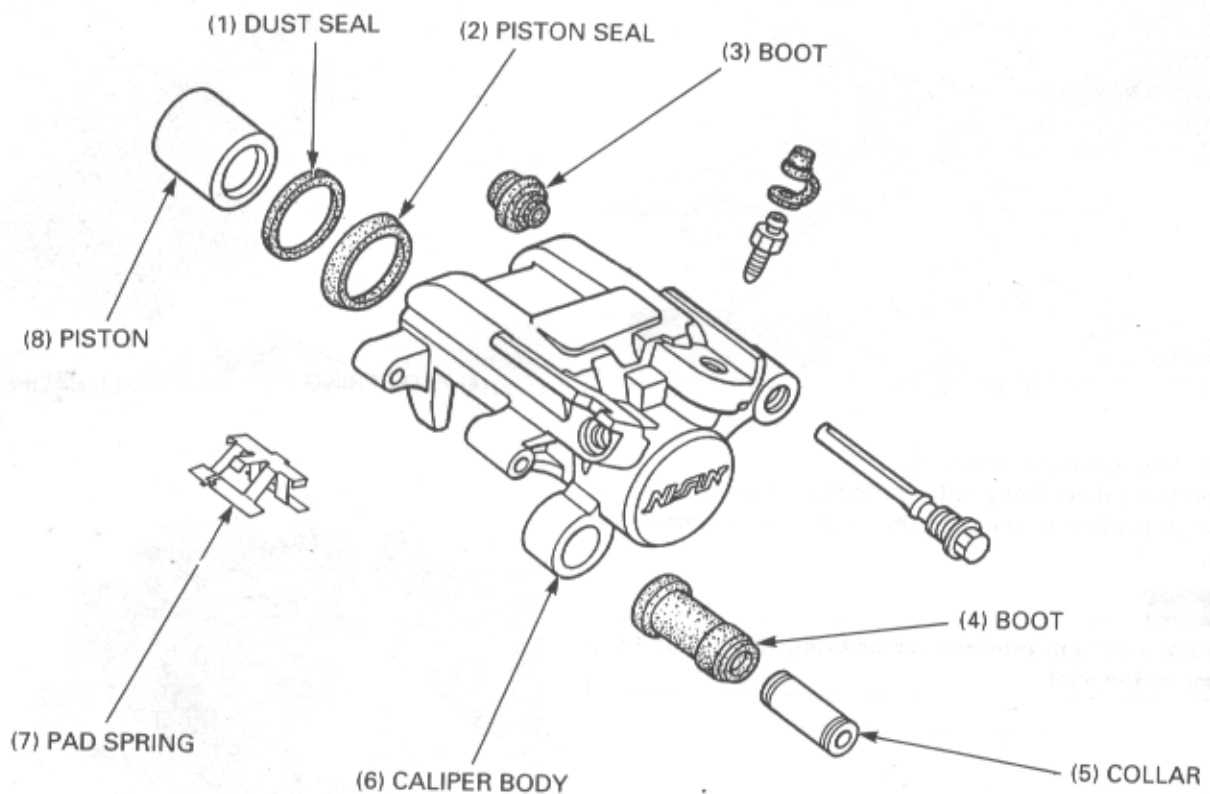
**Service limit: 38.24 mm (1.506 in)**

Measure the caliper piston O.D..

**Service limit: 38.09 mm (1.500 in)**



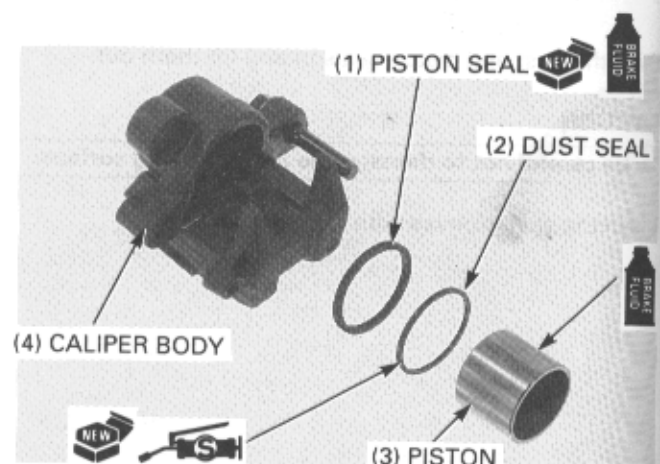
### ASSEMBLY



Coat new piston seal with clean brake fluid and install it in the seal groove in the caliper.

Coat new dust seal with silicone grease and install it in the seal groove in the caliper.

Coat the caliper piston with clean brake fluid and install it into the caliper cylinder with the opening toward the pads.



Install the pad spring in the caliper.

If the caliper and bracket pin boots are hard or deteriorated, replace them with new ones.

Apply silicone grease to the inside of the bracket pin boot. Install the bracket pin boot and collar into the caliper.

Install the caliper pin boot into the bracket.

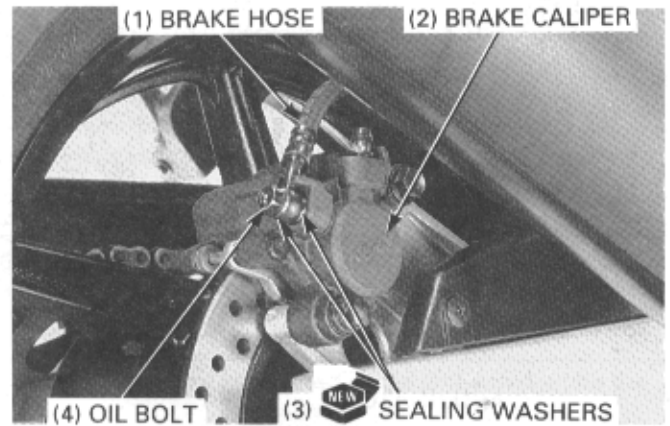
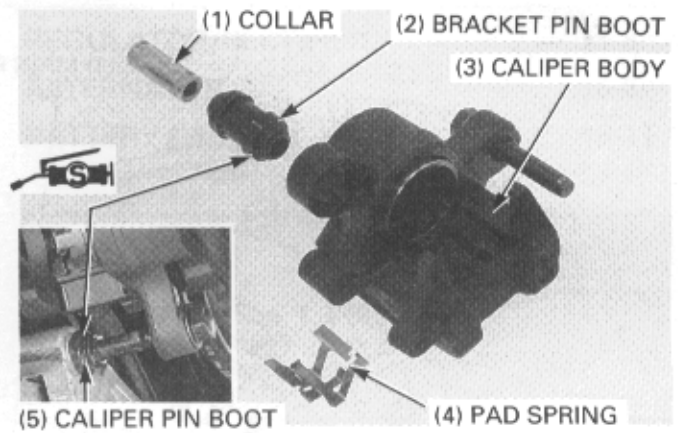
Apply silicone grease to the caliper pin and install the caliper onto the bracket.

Install the brake pads (page 14-7).

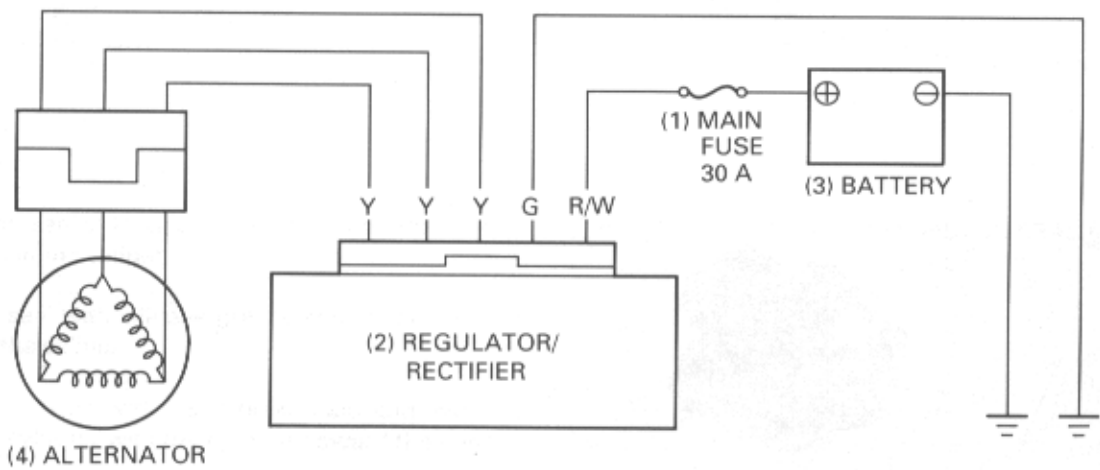
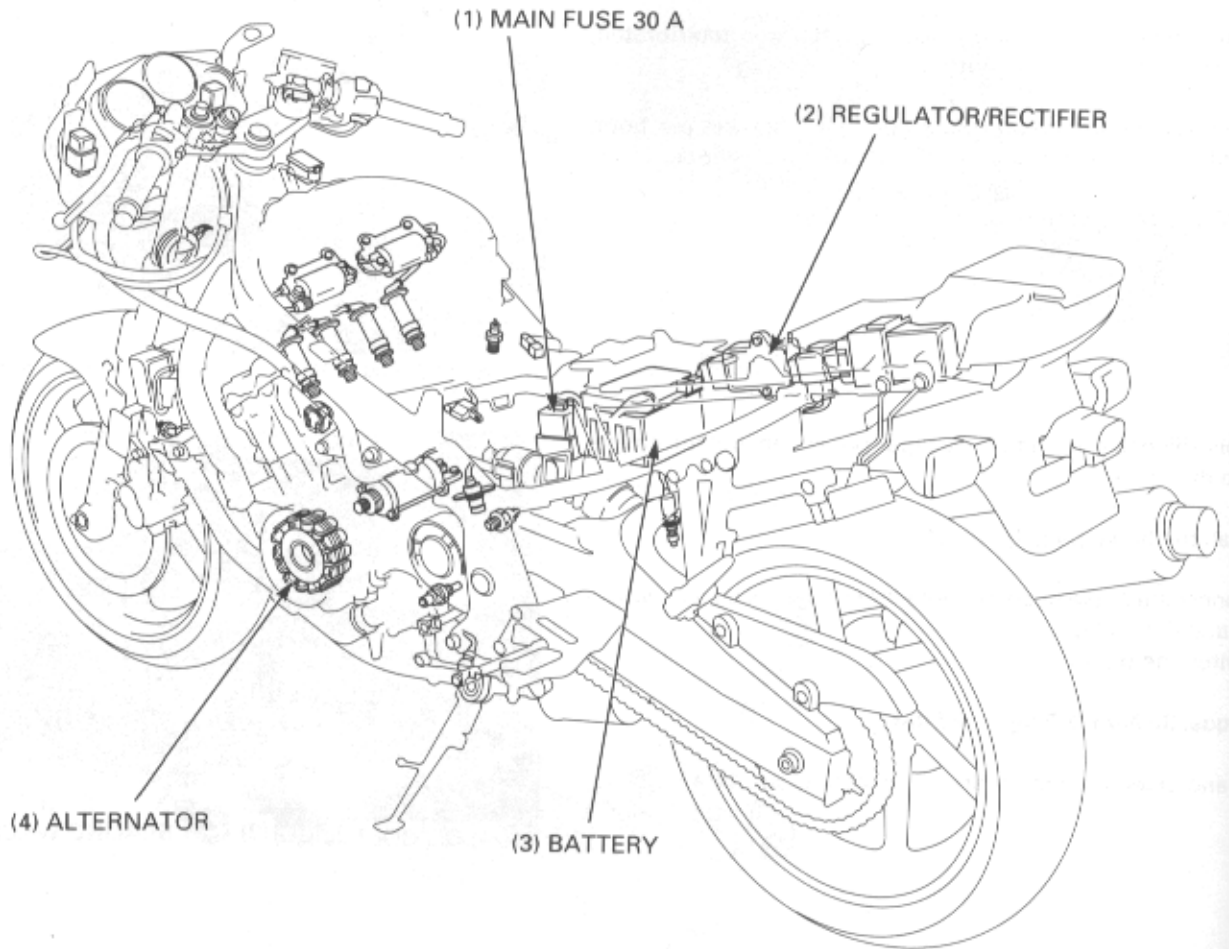
Connect the brake hose to the caliper with new sealing washers and the oil bolt. Tighten the oil bolt.

**Torque: 35 N·m (3.5 kg-m, 25 lb-ft)**

Fill and bleed the rear hydraulic system (page 14-4).



# CHARGING SYSTEM/ALTERNATOR



# 15. CHARGING SYSTEM/ALTERNATOR

SERVICE INFORMATION	15-1	REGULATOR/RECTIFIER	15-8
TROUBLESHOOTING	15-3	ALTERNATOR	15-8
BATTERY	15-5	BATTERY CASE	15-11
CHARGING SYSTEM INSPECTION	15-6		

## 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 on 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.

- 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 a current is present.

- For extended storage, remove the battery, give it a full charge and store it in a cool, dry space. For maximum service life, charge the stored battery every two weeks.
- For battery remaining in a stored motorcycle, disconnect the negative battery cable from the battery terminal.

### NOTE

- The maintenance-free battery must be replaced when it reaches the end of its service life.

### CAUTION

- The battery sealing caps should not be removed. Attempting to remove the sealing caps from the cells may damage the battery.
- The 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 the battery deteriorates after 2-3 years.
- Battery voltage may recover after battery charging, but under a heavy load, battery voltage will drop quickly and eventually the battery will be completely discharged. For this reason, the charging system is often suspected to be the problem. Battery overcharge often results in problems in the battery itself, which may appear to be an overcharge symptom. If one of the battery cells is shorted and the battery voltage does not increase, the regulator/rectifier supplies excess voltage to the battery. Under these conditions, the electrolyte level drops quickly.
- Before troubleshooting the charging system, check for proper use and maintenance of the battery. Check if the battery is frequently under a heavy load, such as having the headlight and taillight for long periods of time without riding the motorcycle.
- The battery will self-discharge when the motorcycle is not use. For this reason, charge the battery every two weeks to prevent sulfation from forming.
- Filling a new battery with electrolyte will produce some voltage, but in order to achieve 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 15-3).
- Alternator servicing may be done with the engine in the frame.

## CHARGING SYSTEM/ALTERNATOR

### SPECIFICATION

ITEM		SPECIFICATIONS	
Current leakage		1.2 mA maximum	
Alternator charging coil resistance (At 20°C/68°F)		0.1–1.0 $\Omega$	
Regulator/rectifier regulated voltage		13.0–15.5 V at 5,000 rpm	
Battery	Capacity	12V–8Ah	
	Charging rate	Normal	0.9 A/5–10 hr
		Quick	4.0 A/1.0 hr
	Voltage	Fully charged	Over 13.0 V
Needs charging		Below 12.3 V	

### TORQUE VALUS

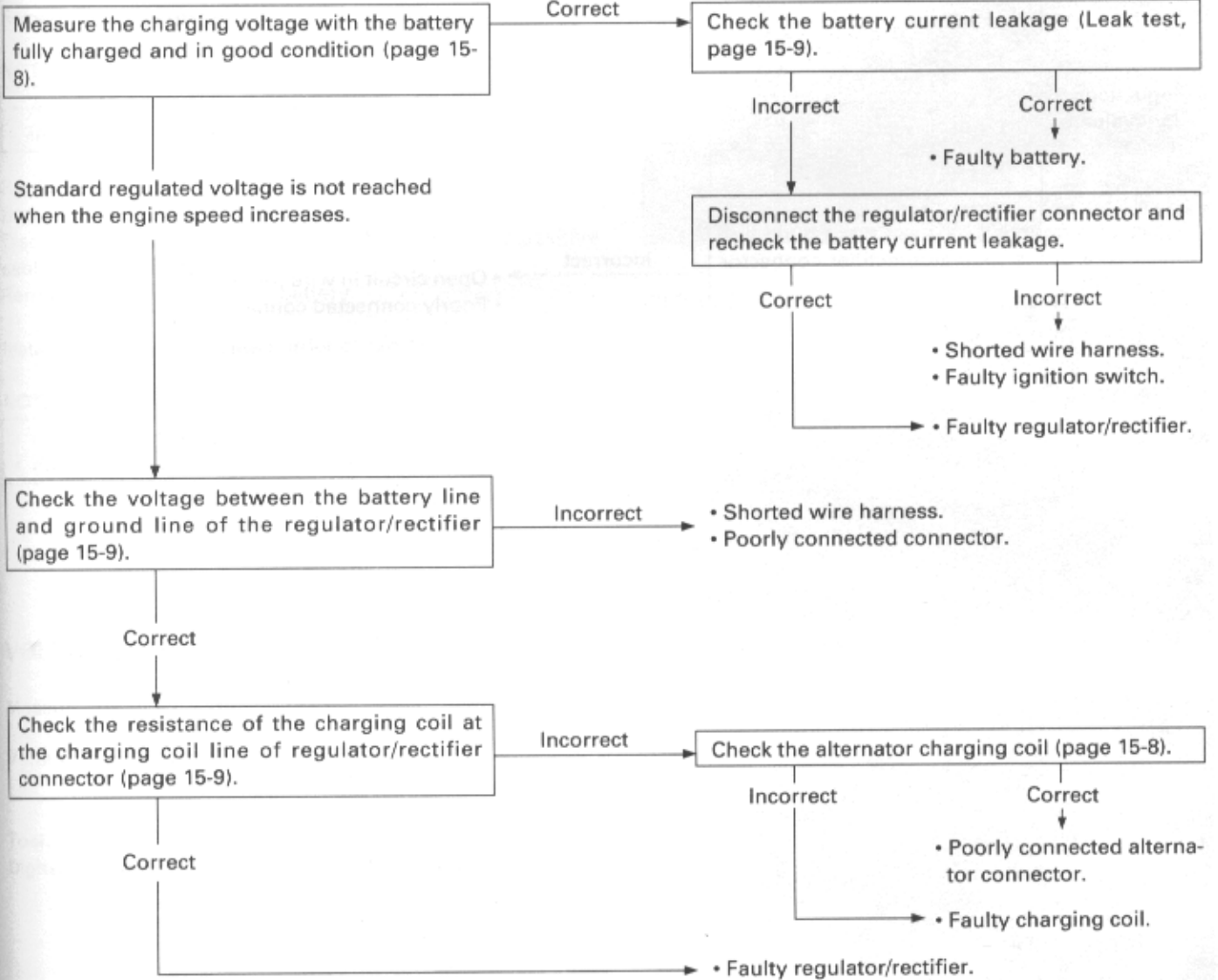
Stator bolt	12 N•m (1.2 kg-m, 9 lb-ft)
Stator wire clamp bolt	10 N•m (1.0 kg-m, 7 lb-ft)

### TOOLS

Digital multimeter	Commercially available
--------------------	------------------------

# TROUBLESHOOTING

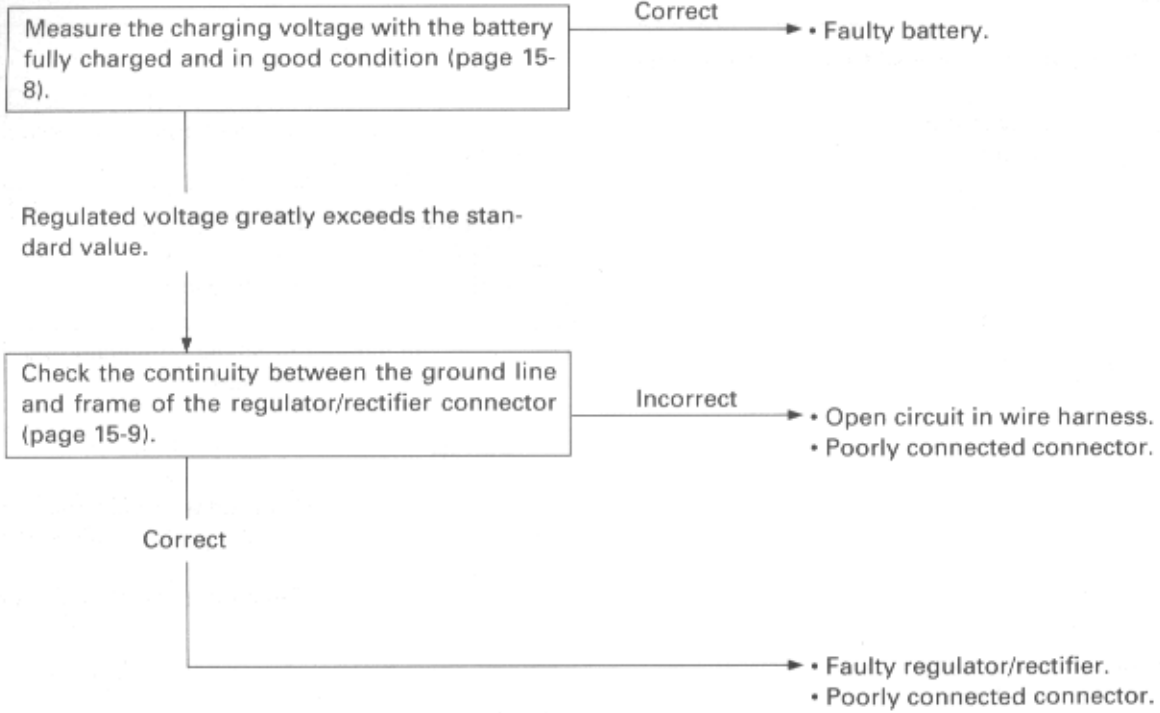
## 1. Battery undercharging (Voltage not raised to regulated voltage).





## CHARGING SYSTEM/ALTERNATOR

### 2. Battery overcharging (Regulated voltage too high).



## BATTERY

### REMOVAL/INSTALLATION

Remove the seat (page 2-2).

#### NOTE

- Always turn the ignition switch OFF before removing or installing the battery.

Remove the battery cover bolts and cover.  
Remove the battery positive cable cover.  
Disconnect the battery negative cable first, then the positive cable from the battery.  
Remove the tool kit and the battery.

Installation is in the reverse order of removal.

#### NOTE

- Apply clean grease to the battery terminals.
- Pull the cover over the positive terminal.

### VOLTAGE INSPECTION

Measure the battery voltage using a digital multimeter.

**Voltage: Fully charged: Over 13.0 V**  
**Under charged: Below 12.3 V**

#### Tool:

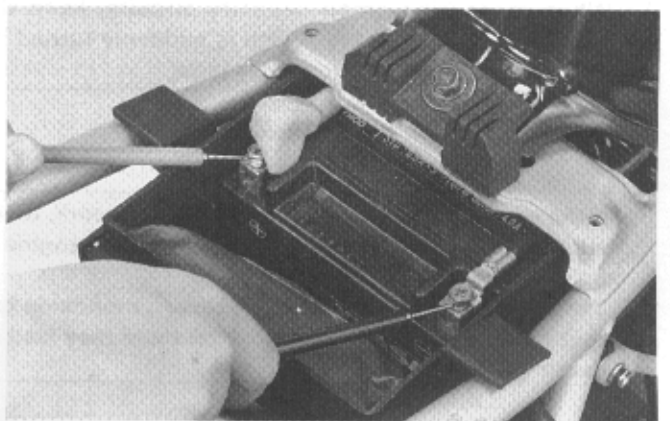
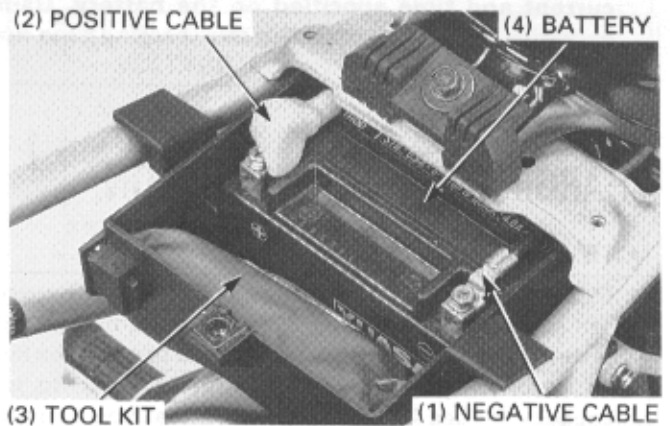
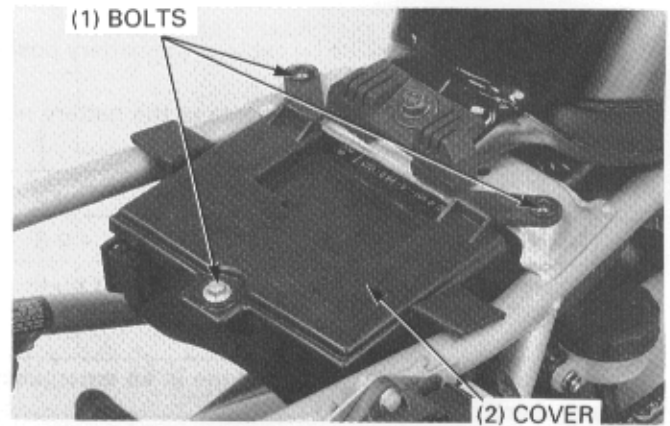
Digital multimeter

Commercially available

### BATTERY CHARGING

#### ⚠ WARNING

- The battery gives off explosive gases; keep sparks, flames, and cigarettes away. Provide adequate ventilation when charging.
- 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 on your eyes, flush with water for at least 15 minutes and call physician.
- 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.
- Turn power ON/OFF at the charger, not at the battery terminals.



## CHARGING SYSTEM/ALTERNATOR

Remove the battery.

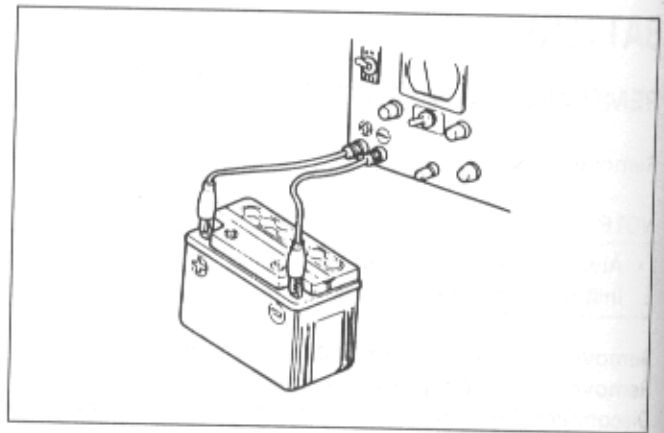
Connect the charger positive (+) cable to the battery positive (+) terminal.

Connect the charger negative (-) cable to the battery negative (-) terminal.

	Standard	Quick
Charging current	0.9 A	4.0 A
Charging time	5 hours	1 hour

### CAUTION

- **Quick-charging should only be done in an emergency; slow charging is preferred.**
- **For battery charging, do not exceed the charging current and time specified on the battery. Using excessive current or extending the charging time may damage the battery.**



## CHARGING SYSTEM INSPECTION

### NOTE

- Measuring circuits with a large capacity that exceeds the capacity of the tester may cause damage to the tester. Before starting each test, set the tester at the high capacity range first, then gradually down to low capacity ranges in order to ensure that you have the correct range and do not damage the tester.
- When measuring small capacity circuits, keep the ignition switch off. If the switch is suddenly turned on during a test, the tester fuse may blow.

## REGULATED 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.**

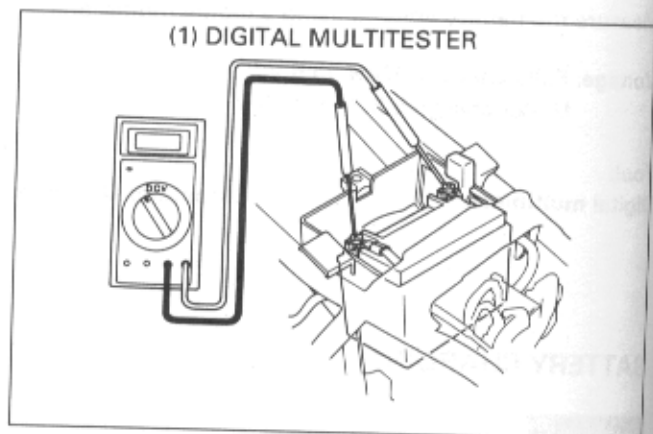
Install a fully charged battery.

Start the engine and warm it up to the operating temperature; stop the engine.

Connect the multimeter between the positive and negative terminals of the battery.

### CAUTION

- **To prevent short, make absolutely certain which are the positive and negative terminals or cable.**
- **Do not disconnect the battery or any cable in the charging system without first switching off the ignition switch. Failure to follow this precaution can damage the tester or electrical components.**



With the headlight ON (Lo beam), restart the engine. Measure voltage on the multimeter when the engine runs at 5,000 rpm.

**Regulated voltage: 13.0 – 15.5 V at 5,000 rpm**

The battery is normal if voltage reads the regulated voltage on the tester.

### NOTE

- The speed at which voltage starts to rise cannot be checked as it varies with the temperature and loads of the generator.

A frequently discharged battery is an indication that it is deteriorated even if it proves normal in the regulated voltage inspection.

The charging circuit may be abnormal if any of the following symptoms is encountered:

#### 1. Voltage not raised to regulated voltage (page 15-3)

- Open or shorted circuit in the charging system wire harness or poorly connected connector
- Open or shorted of the alternator
- Faulty regulator/rectifier

#### 2. Regulated voltage too high (page 15-4)

- Poorly grounded voltage regulator/rectifier
- Faulty battery
- Faulty regulator/rectifier

## CURRENT LEAKAGE TEST

Remove the battery cover (page 15-5).

Turn of the ignition switch, and disconnect the ground (-) cable from the battery.

Connect the ammeter (+) probe to the ground cable and the ammeter (-) probe to the battery (-) terminal.

With the ignition switch off, check for current leakage.

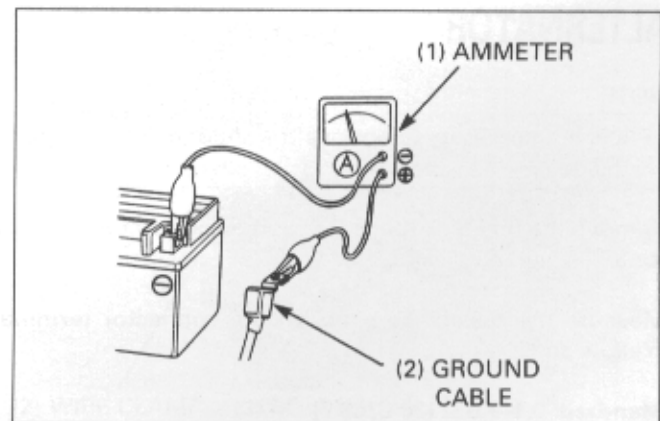
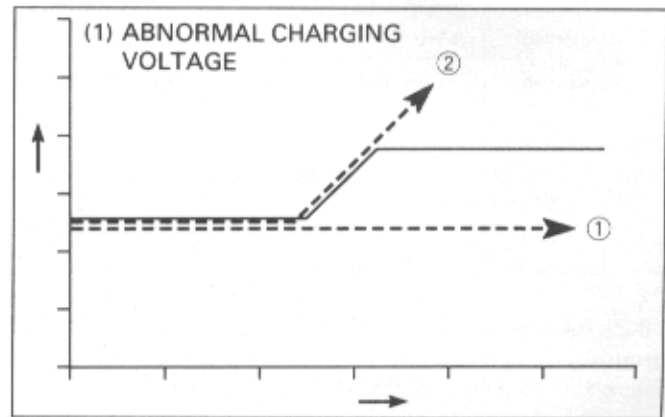
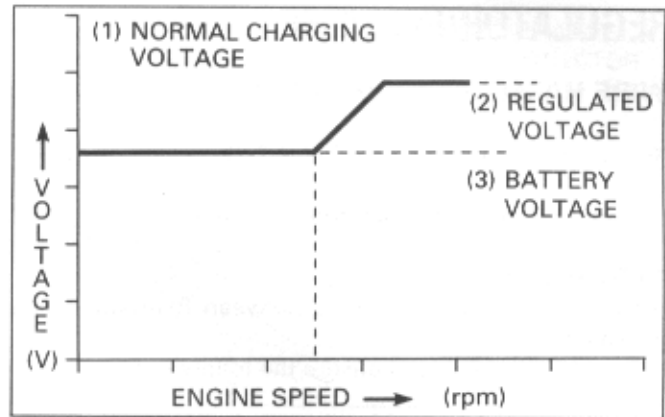
### NOTE

- When measuring current using a tester, set it to a high range, and then bring the range down to an appropriate level. Current flow higher 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: 1.2 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 SYSTEM/ALTERNATOR

### REGULATOR/RECTIFIER

#### WIRE HARNESS INSPECTION

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

Disconnect the regulator/rectifier connector.

#### BATTERY LINE

Make sure the battery voltage between Red/White (+) and Green (-).

If there are no voltage, measure the followings:

Item	Terminals	Specification
Battery charging line	Red/White (+) and ground (-)	Battery voltage should register.
Ground line	Green and ground	Continuity exists.

#### CHARGING LINE

Measure the resistance between the connector terminals (Yellow and Yellow).

**Standard: 0.1–1.0  $\Omega$  (20°C/68°F)**

Check for continuity between the Yellow wire terminals and ground.

There should be no continuity.

### ALTERNATOR

#### NOTE

- It is not necessary to remove the stator coil to complete this test.

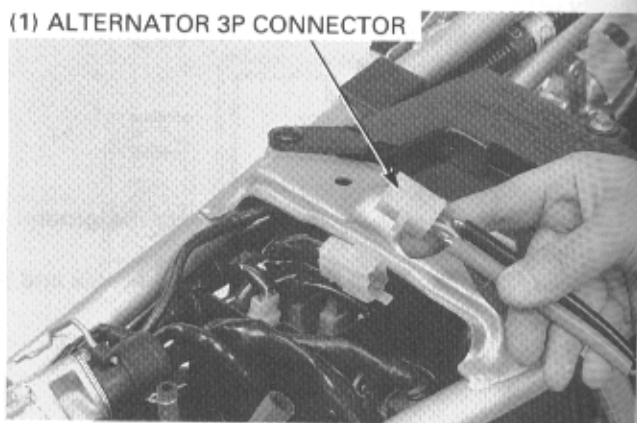
Remove the fuel tank (page 2-4) and disconnect the alternator 3P (White) connector.

Measure the resistance between the connector terminals (Yellow and Yellow).

**Standard: 0.1–1.0  $\Omega$  (20°C/68°F)**

Check for continuity between the yellow wire terminals and ground.

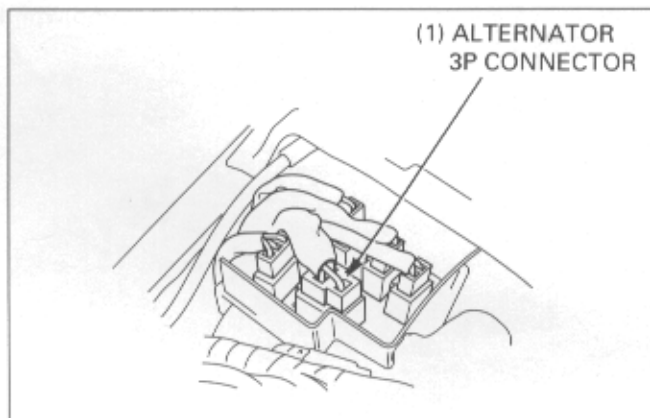
There should be no continuity.



**LEFT CRANKCASE COVER REMOVAL**

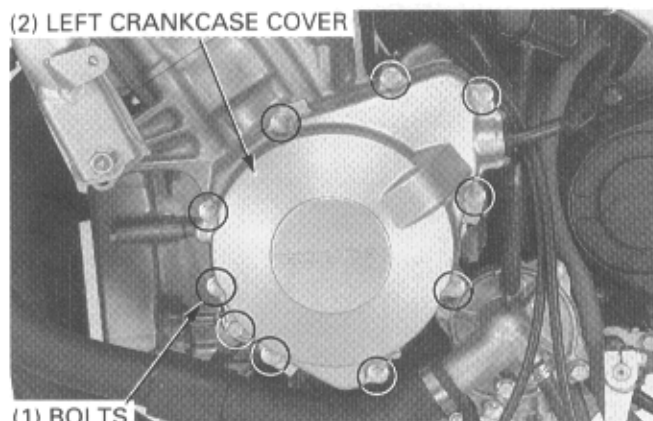
Remove the side fairing (page 2-3).

Disconnect the alternator 3P connector.



Remove the left crankcase cover bolts and left crankcase cover.

Remove the gasket and dowel pin.



**STATOR REMOVAL/INSTALLATION**

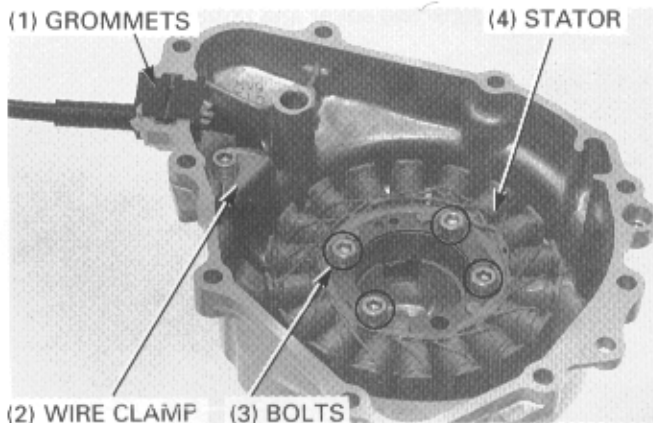
**NOTE**

- For flywheel removal and installation, refer to page 17-10 "FLYWHEEL/STARTER CLUTCH".

**REMOVAL**

Remove the clamp bolt and clamp.

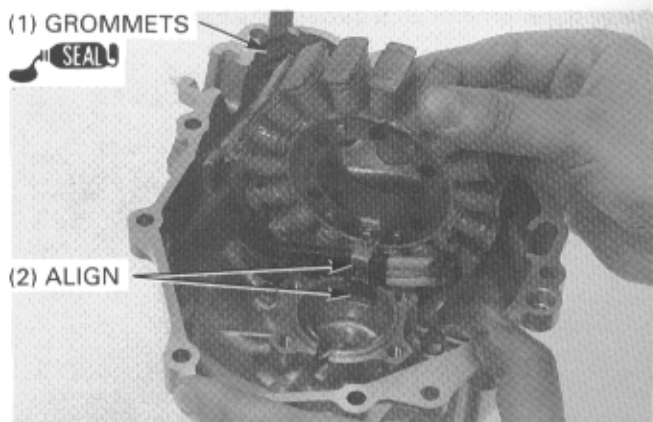
Remove the stator bolts and the wire grommets, then remove the stator from the left crankcase cover.



**INSTALLATION**

Place the stator in the left crankcase cover.

Apply liquid sealant to the wire grommets seating surface and install the grommets into grooves in the crankcase cover.



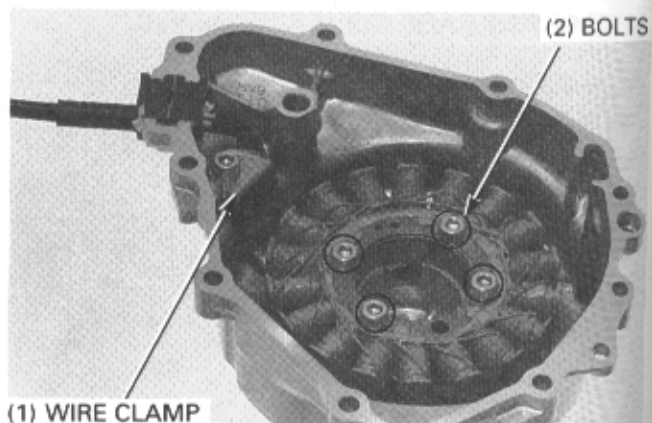
## CHARGING SYSTEM/ALTERNATOR

Route the wire properly and install the wire clamp with the bolt.

**Torque: 10 N·m (1.0 kg·m, 7 lb-ft)**

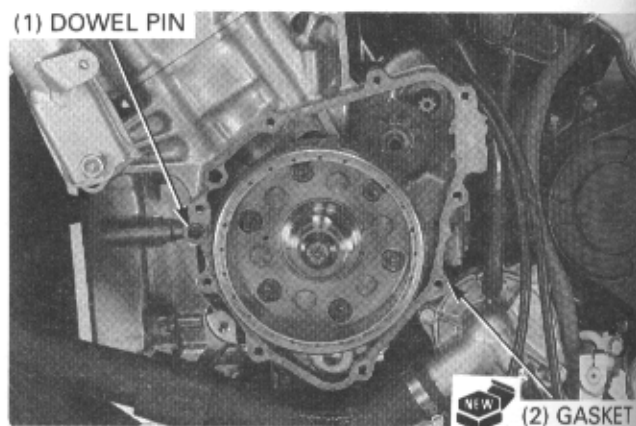
Install and tighten the stator bolts.

**Torque: 12 N·m (1.2 kg·m, 9 lb-ft)**

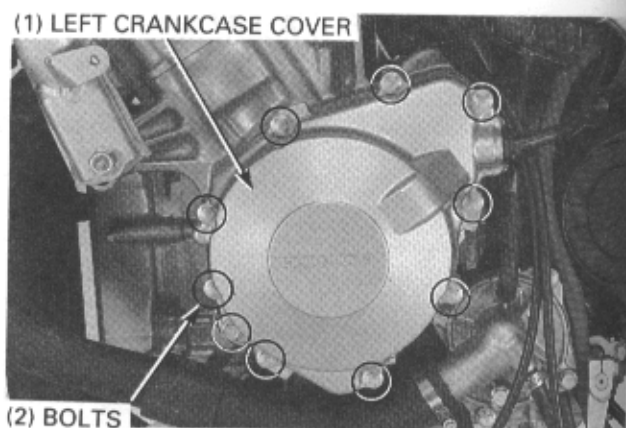


## LEFT CRANKCASE COVER INSTALLATION

Install the dowel pin and new gasket onto the crankcase.



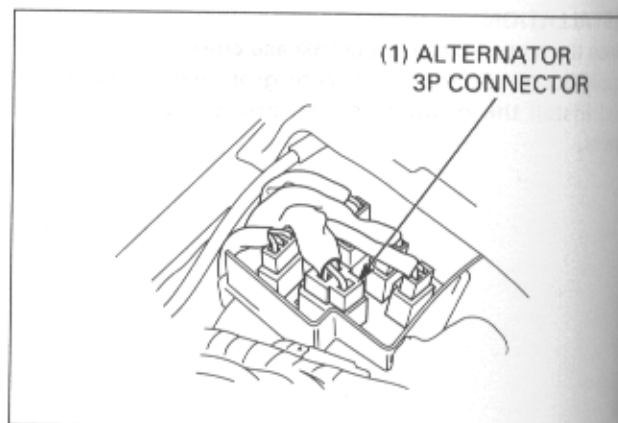
Install the left crankcase cover and tighten the cover bolts.



Route the alternator wire through the frame properly (page 1-20).

Connect the alternator 3P connector securely.

Install the side fairing and fuel tank (page 2-3, 4).



## BATTERY CASE

### REMOVAL/INSTALLATION

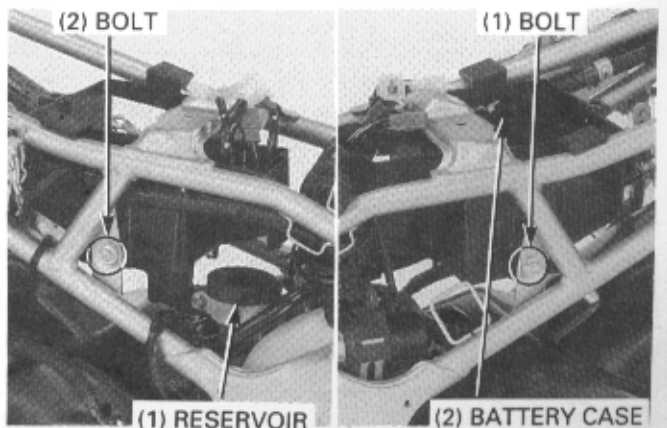
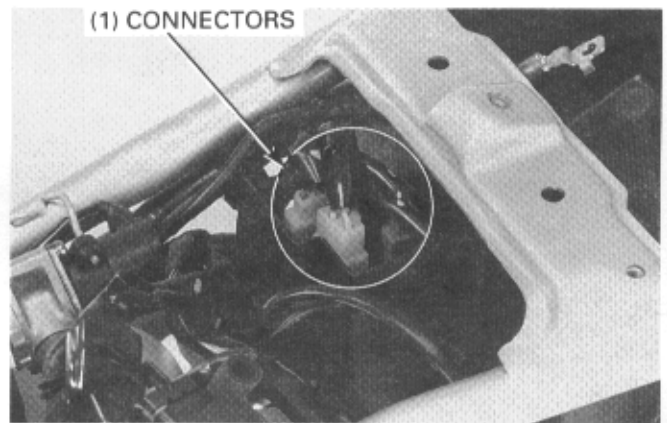
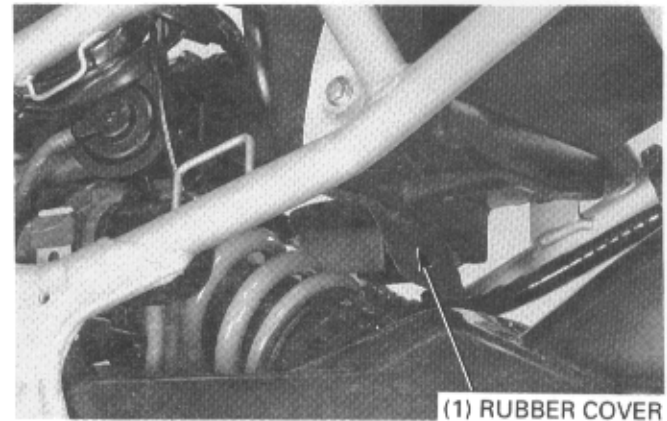
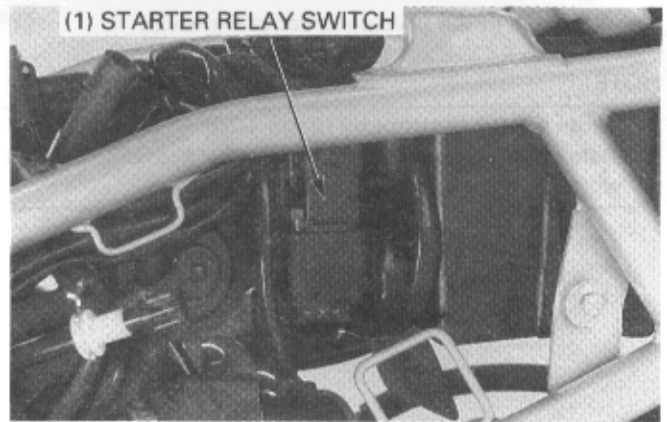
Remove the fuel tank (page 2-4).  
 Remove the side fairing (page 2-3).  
 Remove the battery (page 15-5).

Remove the starter relay switch.

Remove the rubber cover.

Disconnect the connectors.

Remove the rear master cylinder reservoir.  
 Remove the bolts and battery case.



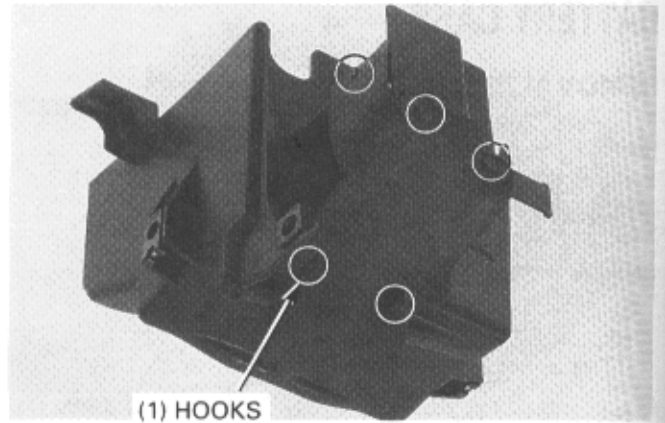


## CHARGING SYSTEM/ALTERNATOR

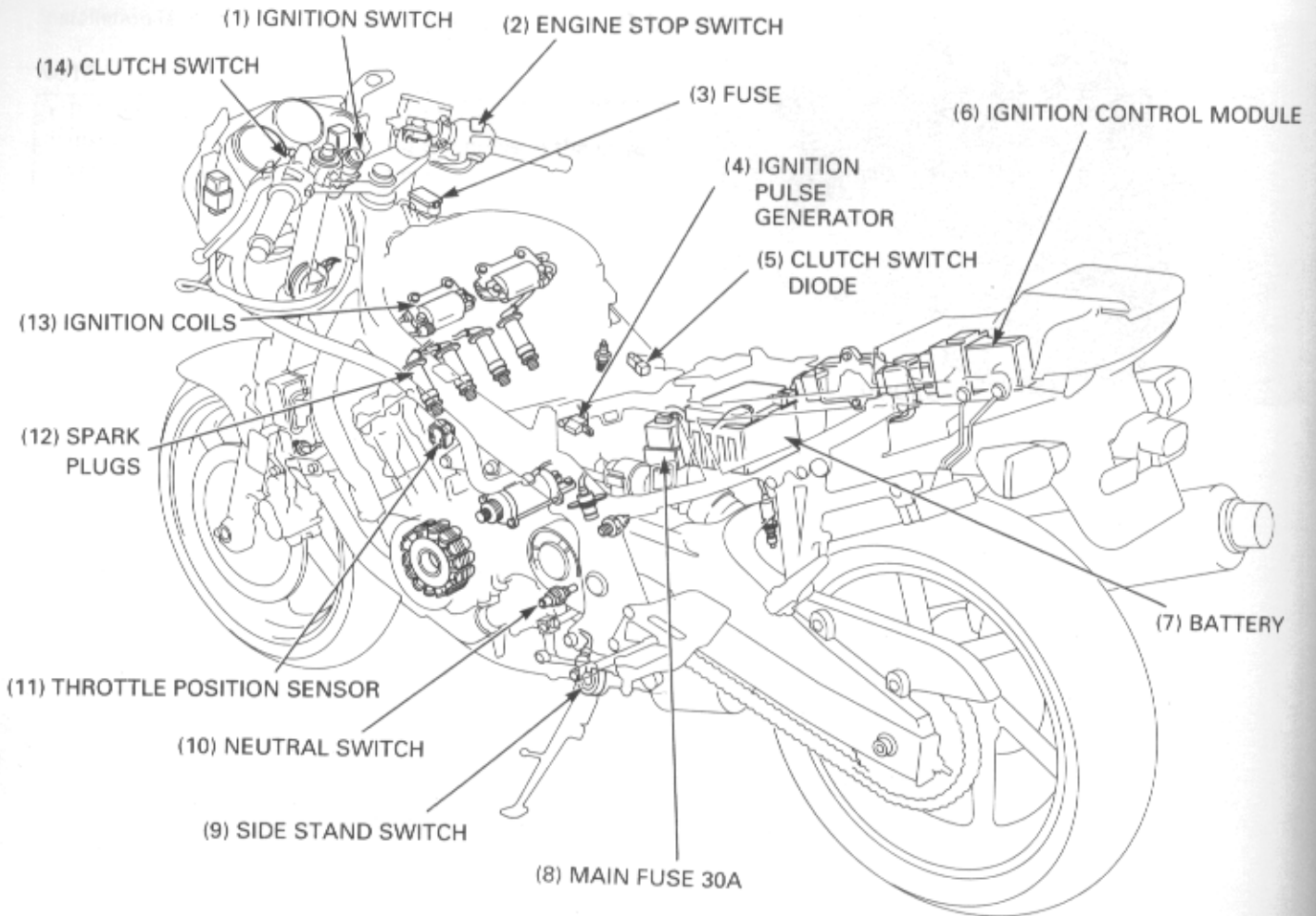
Installation is in the reverse order of removal.

### NOTE

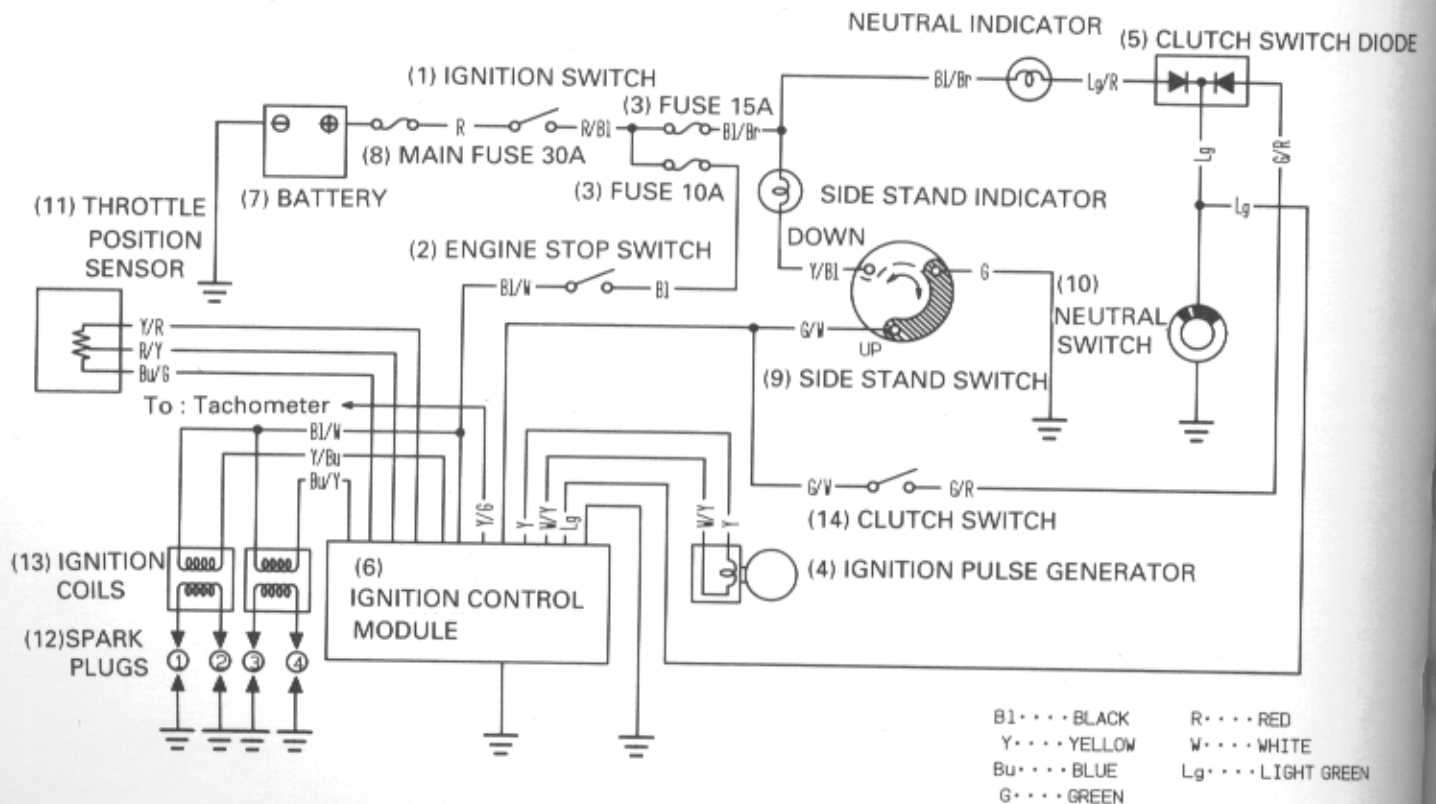
- Route the wires properly (page 1-20).
- Install the rubber cover, aligning the holes in the cover with the hooks on the battery case.



# IGNITION SYSTEM



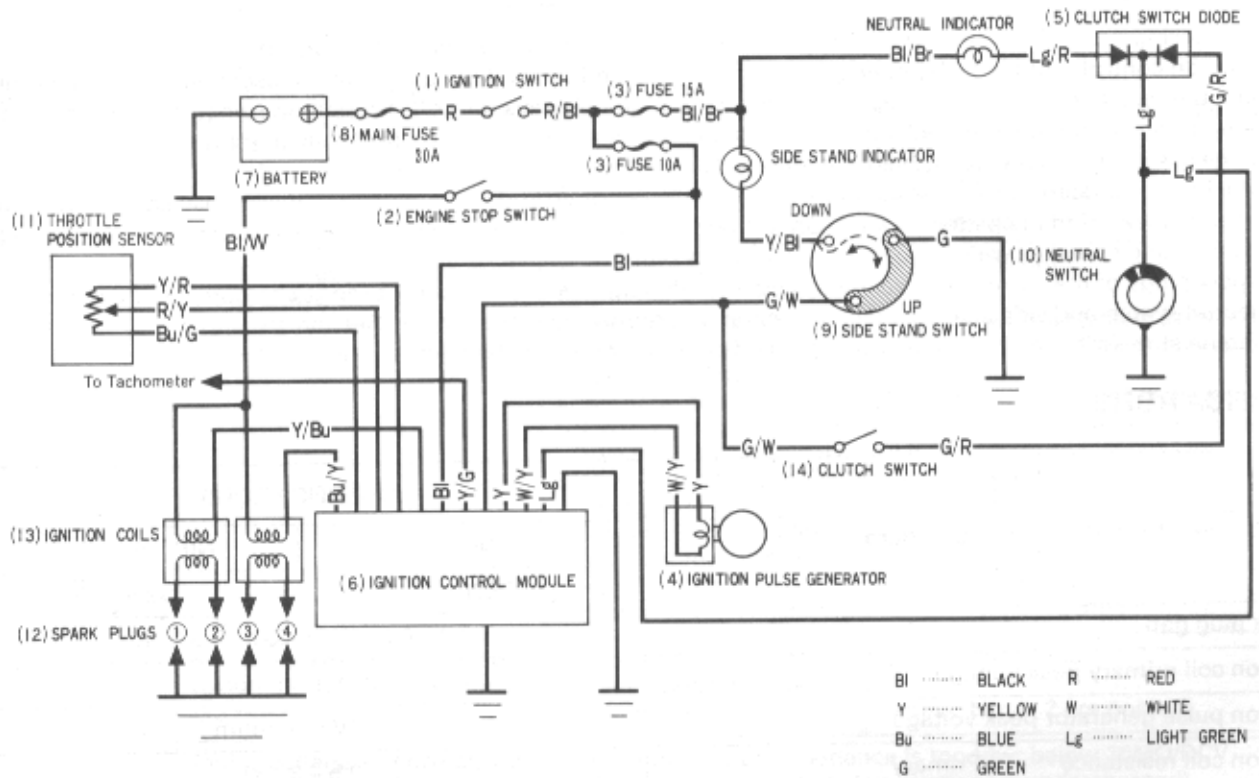
'95:



# 16. IGNITION SYSTEM

SERVICE INFORMATION	16-2	IGNITION PULSE GENERATOR	16-8
TROUBLESHOOTING	16-3	THROTTLE POSITION SENSOR	16-11
IGNITION SYSTEM INSPECTION	16-4	IGNITION TIMING	16-13
IGNITION COIL	16-7		

AFTER '95:



## 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 a current is present.

- When checking the ignition system, always follow the steps in the troubleshooting (page 16-3).
- The ignition control module (ICM) may be damaged if dropped. Also, if the connector is disconnected when current is flowing, the resulting excessive voltage may damage the unit. Always turn off the ignition switch before servicing.
- Ignition timing cannot be adjusted since the ignition control module is non-adjustable. If ignition timing is incorrect, check the system components and replace any faulty parts.
- A faulty ignition system is often related to poorly connected or corroded connectors. 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 a spark plug of an incorrect heat range can damage the engine.
- For neutral switch and side stand switch inspection and removal/installation see Section 18.
- For engine stop switch and ignition switch inspection and removal/installation see Section 18.

### SPECIFICATIONS

ITEM		SPECIFICATIONS	
Spark plug	Standard	NGK	NIPPONDENSO
		CR9EH9	U27FER9
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 coil resistance (At 20°C/68°F)	Primary	2.5 – 3.1 Ω	
	Secondary: with plug cap	21 – 25 kΩ	
	Secondary: without plug wire	11 – 15 kΩ	
Ignition pulse generator resistance (At 20°C/68°F)		460 – 580 Ω	
Ignition timing "F" mark	49 state, Canada type	10° BTDC at 1,200 ± 100 rpm	
	California type	5° BTDC at 1,400 ± 100 rpm	

### TORQUE VALUES

- |   |   |
|---|---|
| Ignition pulse generator rotor cover cap  | 18 N•m (1.8 kg-m, 13 lb-ft) Apply grease the threads. |
| Ignition pulse generator rotor cover bolt | 12 N•m (1.2 kg-m, 9 lb-ft)                            |
| Ignition pulse generator rotor bolt       | 60 N•m (6.0 kg-m, 43 lb-ft)                           |

### TOOLS

- |  |                     |
|--|---------------------|
| Imrie diagnostic tester (model 625) or                                 |                     |
| Peak voltage adaptor   | 07HGJ – 020100 with |
| Commercially available digital multimeter (impedance 10MΩ/DCV minimum) |                     |
| Inspection adaptor   | 07GMJ – ML80100     |

## 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 to the ignition coil secondary voltage).
- If there is no spark at either cylinders, temporarily exchange the ignition coil with the other good one and perform the spark test. If there is a 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. (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 Bl/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 cases when the initial voltage is normal while disconnecting ICM connectors.
	Initial voltage is normal, but it drops down to 2 – 4 V while cranking the engine.	1. Incorrect peak voltage adaptor connections. 2. Undercharged battery. 3. No voltage at the power source wire between Bl/W (+) and ground (-) of the ignition control module (ICM) connector or loosen ICM connection. 4. An open circuit or loose connection in G wire of the ICM. 5. Open circuits or loose connections in Bu/Y and Y/Bu 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"> <li>• Side stand switch line: G/W and G wire</li> <li>• Neutral switch line: Lg and Lg/R wire</li> </ul> 9. Faulty ICM (in cases when above No. 1 – 8 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 cases 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 10M $\Omega$ /DCV. 2. Cranking speed is too slow (battery is undercharged). 3. The sample timing of the tester and measured pulse were not synchronize (System is normal if measured voltage is over the standard voltage at least once). 4. Faulty ICM (in cases 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 M $\Omega$ /DCV. 2. Cranking speed is too slow (battery is undercharged). 3. The sample timing of the tester and measured ignition pulse were not synchronize (System is normal if measured voltage is over the standard voltage at least once). 4. Faulty ICM (in cases when above No. 1 – 3 are normal).
	No peak voltage.	1. Faulty peak voltage adaptor. 2. Faulty ignition pulse generator.

## IGNITION SYSTEM

### IGNITION SYSTEM INSPECTION

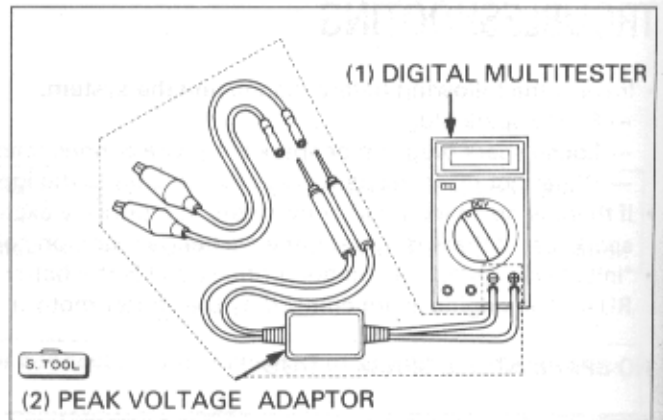
#### NOTE

- If there is no spark at either plug, check all connections for loose or poor contact before measuring each peak voltage.
- Use the recommended digital multimeter or commercially available digital multimeter with an impedance of 10 M $\Omega$ /DCV minimum.
- The display value differs depending upon the internal impedance of the multimeter.
- If using an Imrie diagnostic tester (model 625), follow the manufacturer's instructions.

Connect the peak voltage adaptor to the digital multimeter, or use the Imrie diagnostic tester.

#### Tools:

**Imrie diagnostic tester (model 625) or**  
**Peak voltage adaptor 07HGJ - 0020100 with**  
**Commercially available digital multimeter**  
**(impedance 10M $\Omega$ /DCV minimum)**



### IGNITION PRIMARY VOLTAGE INSPECTION

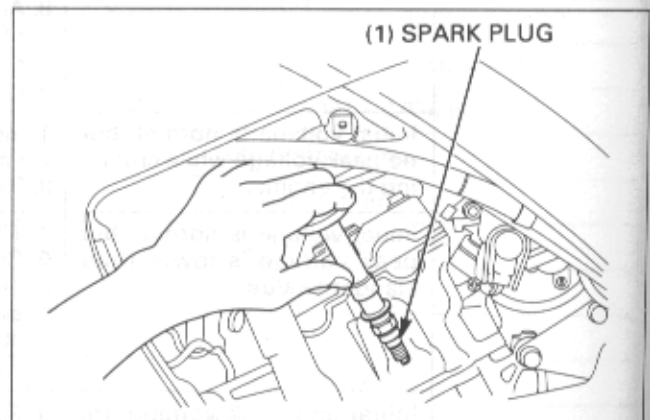
#### NOTE

- Check all system connections before the inspection. If the system is disconnected, an incorrect peak voltage will register.
- Check cylinder compression at each cylinder and check that the spark plugs are installed correctly in each cylinder.

Remove the maintenance cover (page 2-3).

Disconnect the spark plug caps from the spark plugs on the cylinder head.

Connect a good known spark plug to each spark plug cap and ground the spark plugs to the cylinder as done in a spark test.



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

Connect the peak voltage adaptor or Imrie tester to the ignition coil.

**NOTE**

- Do not disconnect the ignition coil primary wires.

**Tools:**

- Imrie diagnostic tester (model 625) or
- Peak voltage adaptor 07HGJ – 0020100 with
- Commercially available digital multimeter (impedance 10M $\Omega$ /DCV minimum)

**Connection:**

- No. 1, 4 ignition coil: Y/Bu terminal (+) – Body ground (-)
- No. 2, 3 ignition coil: Bu/Y terminal (+) – Body ground (-)

Turn the ignition switch "ON" and engine stop switch to "RUN".

Check for initial battery voltage.

If battery voltage is not present, follow the checks described in the troubleshooting chart on page 16-3.

Shift the transmission into neutral.

Crank the engine with the starter motor and read each ignition coil primary voltage.

**Peak voltage: 100 V minimum**

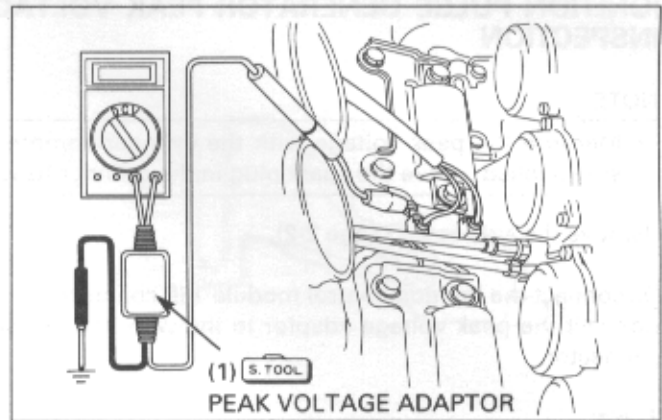
**⚠ WARNING**

- 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 the voltage is higher than the standard value.

If the peak voltage is lower than the standard value, follow the checks described in the troubleshooting chart on page 16-3.



## IGNITION SYSTEM

### IGNITION PULSE GENERATOR PEAK VOLTAGE INSPECTION

#### NOTE

- Measure the peak voltage with the cylinder compression applied. Leave the spark plug in the cylinder head.

Remove the side cover (page 2-2).

Disconnect the ignition control module 16P connector.  
Connect the peak voltage adaptor to the wire harness side connector.

#### Tools:

Imrie diagnostic tester (Model 625) or  
Peak voltage adaptor 07HGJ - 0020100 with  
Commercially available digital multimeter  
(impedance 10M $\Omega$ /DCV minimum)

**Connection: White/Yellow (+) - Yellow (-)**

Measure the ignition pulse generator peak voltage while cranking the engine with the starter motor.

**Peak voltage: 0.7 V minimum**

If the peak voltage is lower than standard value, perform the following procedure.

Disconnect the ignition pulse generator 2P (Red) connector.  
Measure the peak voltage at the ignition pulse generator 2P (Red) connector and record it.

**Connection: White/Yellow (+) - Yellow (-)**

**Peak voltage: 0.7 V minimum**

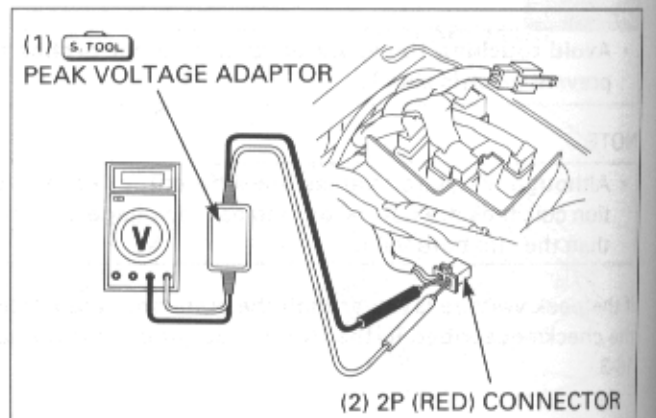
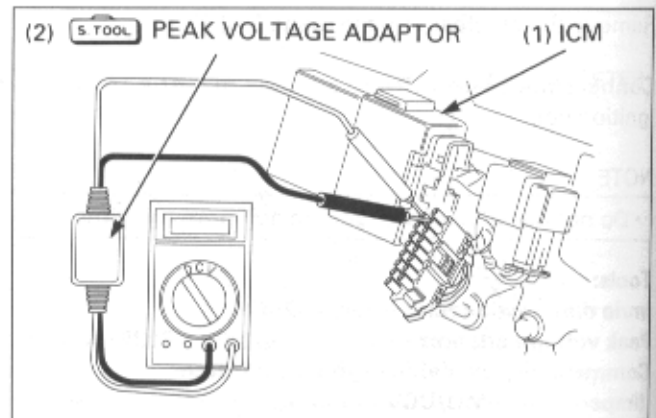
Compare their values at the ignition control module 16P connector and the ignition pulse generator 2P (Red) connector.

If the value at the ignition pulse generator is normal, but abnormal at the ignition control module:

- Open the circuit in the ignition pulse generator wires
- Loosen connection in the ignition pulse generator connector

If both values are abnormal:

- The ignition pulse generator is likely to be faulty. Check and perform troubleshooting per the chart on page 16-3.





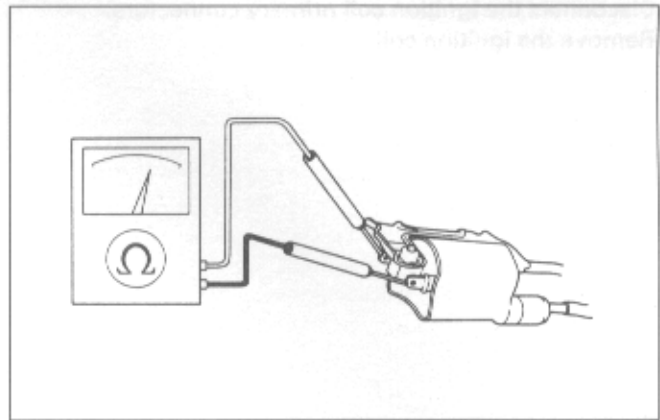
## IGNITION COIL

### INSPECTION

Remove the maintenance cover (page 2-3).  
Remove the air cleaner base (page 5-4).

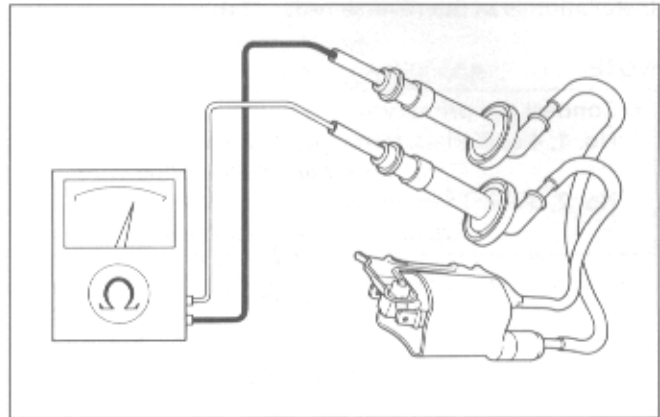
Measure the primary coil resistance at each terminal.

**Standard : 2.5 – 3.1  $\Omega$  (20°C/68° F)**



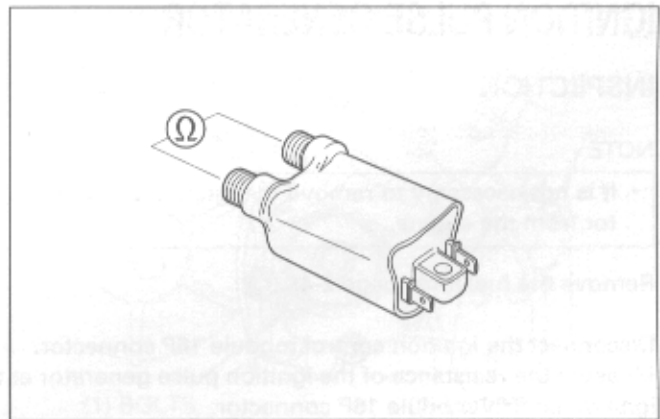
Disconnect the spark plug caps from the plugs and measure the secondary coil resistance between the spark plug caps.

**Standard : 21 – 25 k $\Omega$  (20°C/68° F)**



If the resistance is out of range, remove the spark plug wire from the ignition coil and measure the resistance as shown.

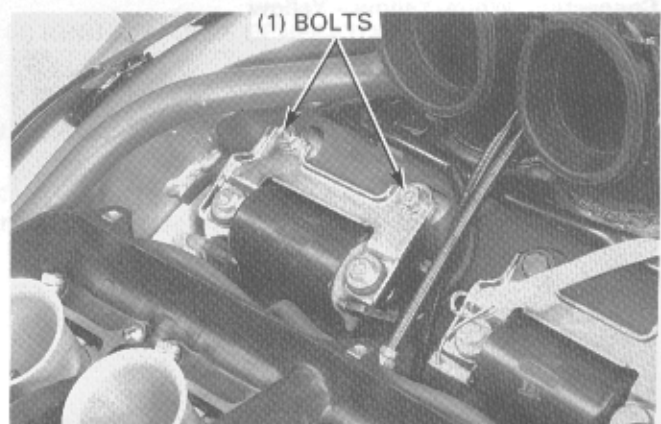
**Standard : 11 – 15 k $\Omega$  (20°C/68°F)**



### REMOVAL/ INSTALLATION

Remove the maintenance cover (page 2-3).  
Remove the air cleaner base (page 5-4).  
Remove the spark plug caps from the spark plug (page 3-8).

Remove the ignition coil mounting bolts.



## IGNITION SYSTEM

Disconnect the ignition coil primary connectors.  
Remove the ignition coil.

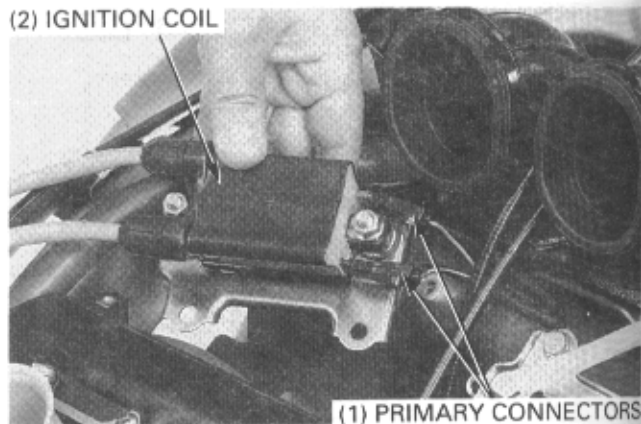
### NOTE

Installation is in the reverse order of removal.

### NOTE

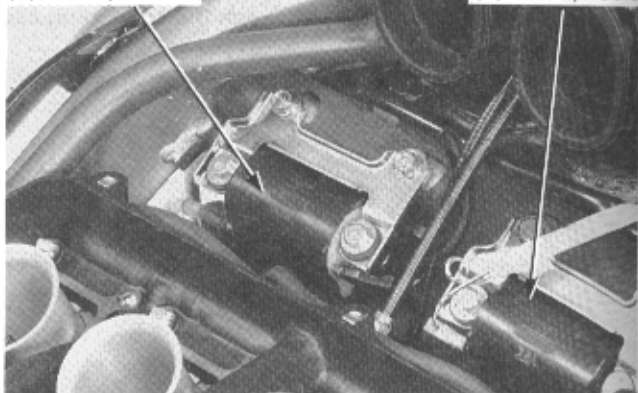
- Connect the primary wire terminals properly.  
No. 1, 4 coil: Black terminal – Black/White wire  
Green terminal – Yellow/Blue wire  
No. 2, 3 coil: Black terminal – Black/White wire  
Green terminal – Blue/Yellow wire

(2) IGNITION COIL



(1) PRIMARY CONNECTORS

(1) NO. 2,3 COIL



(2) NO. 1,4 COIL

## IGNITION PULSE GENERATOR

### INSPECTION

### NOTE

- It is not necessary to remove the ignition pulse generator from the engine.

Remove the fuel tank (page 2-4).

Disconnect the ignition control module 16P connector.  
Measure the resistance of the ignition pulse generator at the ignition control module 16P connector.

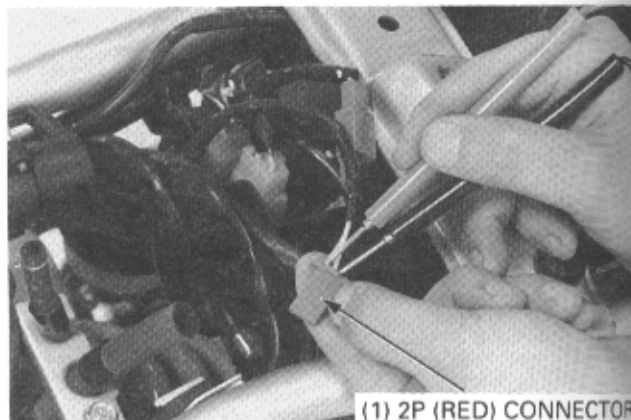
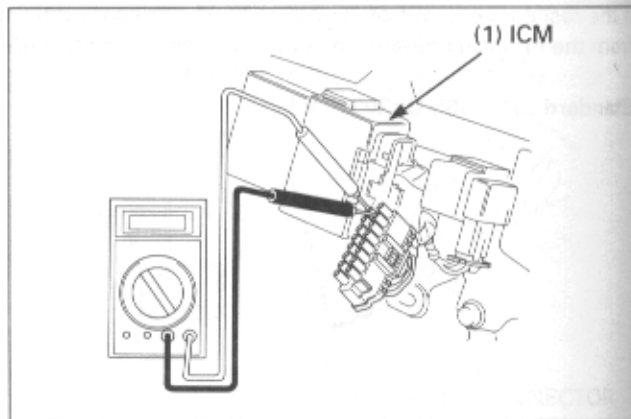
**Connection: White/Yellow – Yellow**

**Standard: 460 – 580  $\Omega$  (20°C/68°F)**

If the measurement is out of specified range, perform the following procedures:

Disconnect the ignition pulse generator 2P (Red) connector.  
Measure the resistance of the ignition pulse generator at the ignition pulse generator 2P (Red) connector.

**Standard: 460 – 580  $\Omega$  (20°C/68°F)**



(1) 2P (RED) CONNECTOR

Compare their values at the ignition control module 16P connector and the ignition pulse generator 2P (Red) connector.

If the value at the ignition pulse generator is normal, but abnormal at the ignition control module:

- Open circuit in the White/Yellow wire
- Open circuit in the Yellow wire
- Loosen connection in the ignition pulse generator 2P (Red) connector.

If the value at the ignition pulse generator is abnormal:

- Replace the ignition pulse generator

**REMOVAL**

Remove the side fairing (page 2-3).

Remove the fuel tank (page 2-4).

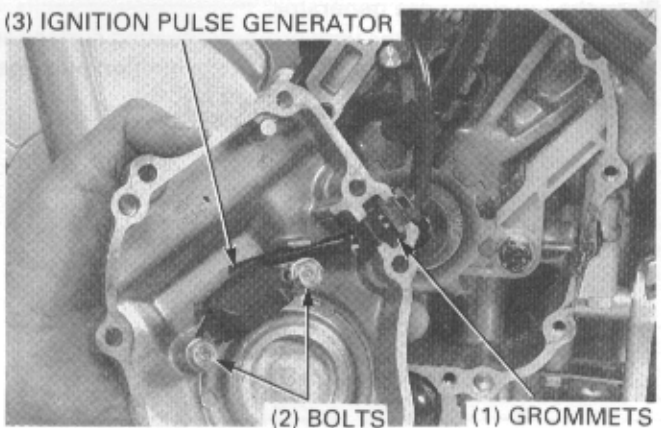
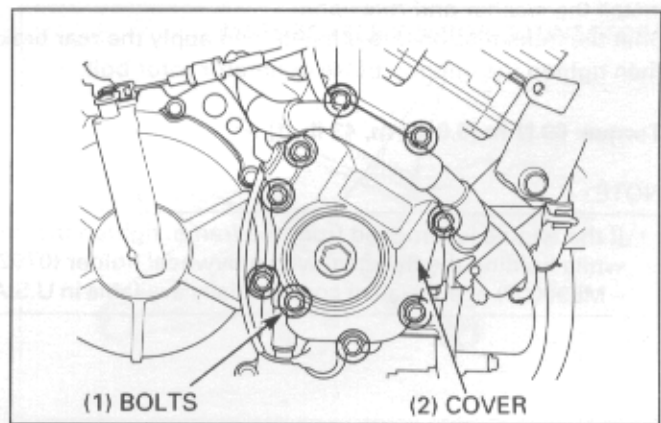
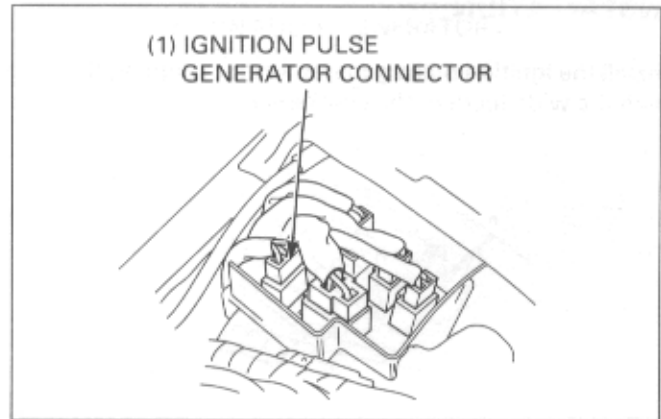
Disconnect the ignition pulse generator 2P (Red) connector.

Remove the ignition pulse generator rotor cover bolts and ignition pulse generator rotor cover.

Remove the gasket and dowel pins.

Remove the wire grommets from the cover.

Remove the mounting bolts and the ignition pulse generator.



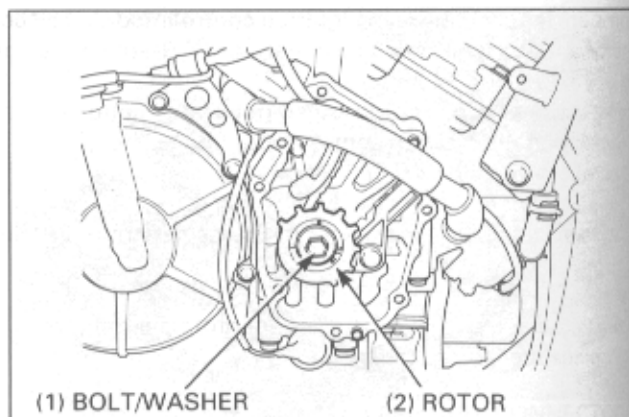
## IGNITION SYSTEM

Shift the transmission into 6th gear and apply the rear brake, then loosen the ignition pulse generator rotor bolt.

### NOTE

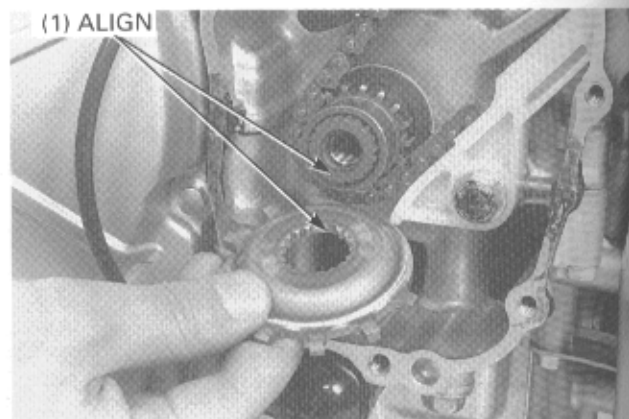
- If the engine is removed from the frame, remove the left crankcase cover (page 15-9) and loosen the bolt while holding the flywheel with a flywheel holder (07925-ME90000) or equivalent commercially available in U.S.A.

Remove the bolt, washer and ignition pulse generator rotor.



## INSTALLATION

Install the ignition pulse generator rotor, aligning the groove with the wide teeth of the crankshaft.



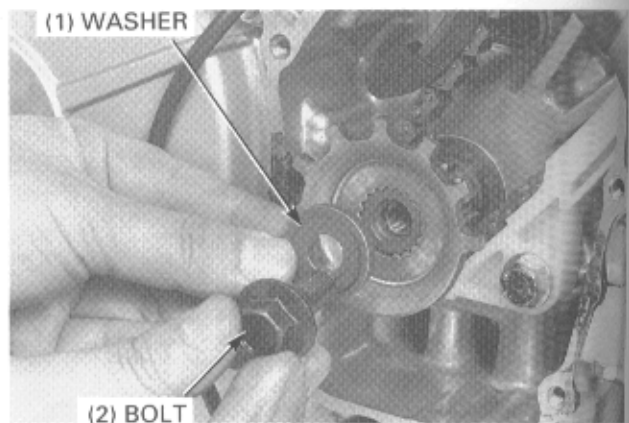
Install the washer and rotor bolt.

Shift the transmission into 6th gear and apply the rear brake, then tighten the ignition pulse generator rotor bolt.

**Torque: 60 N·m (6.0 kg·m, 43 lb·ft)**

### NOTE

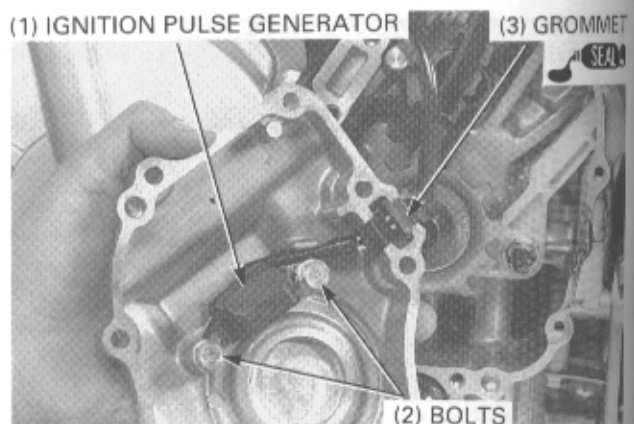
- If the engine is removed from the frame, tighten the bolt while holding the flywheel with a flywheel holder (07925-ME90000) or equivalent commercially available in U.S.A.



Place the ignition pulse generator.

Apply liquid sealant to the wire grommet seating surface and install the grommet into the groove in the ignition pulse generator rotor cover.

Install and tighten the mounting bolts.

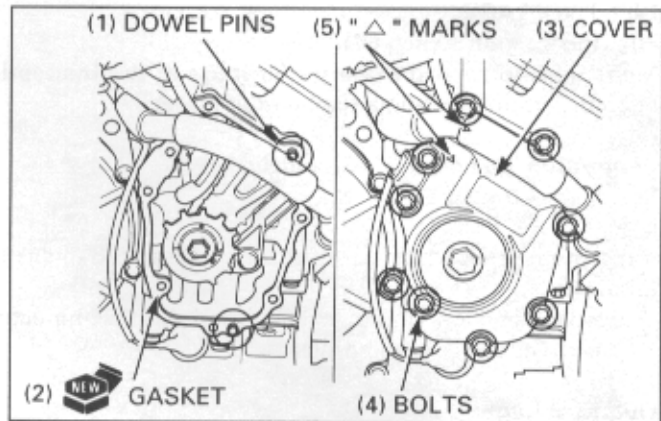


Install the dowel pins and new gasket to the crankcase.

Apply liquid sealant to the threads of the bolts indicated by "△" marks.

Install the ignition pulse generator rotor cover and tighten the cover bolts.

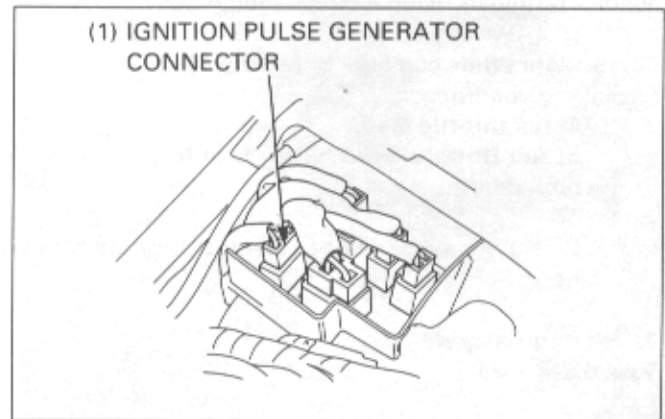
**Torque: 12 N·m (1.2 kg·m, 9 lb·ft)**



Connect the ignition pulse generator 2P (Red) connector.

Install the side fairing (page 2-3).

Install the fuel tank (page 2-4).

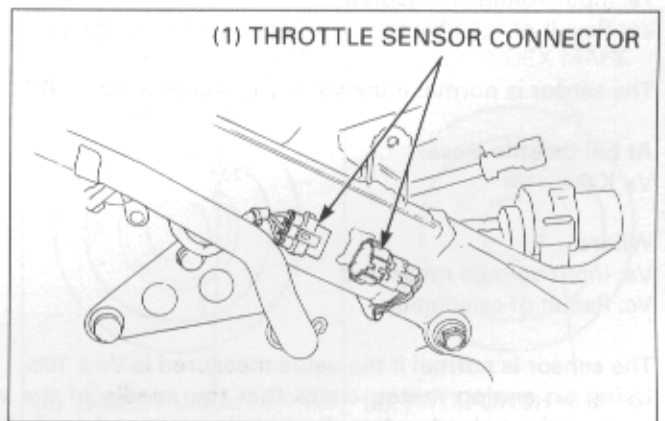


## THROTTLE POSITION SENSOR

### INSPECTION

Remove the side fairing (page 2-3).

Disconnect the throttle position sensor 3P connector.  
Check the connector for loose or corroded terminals.

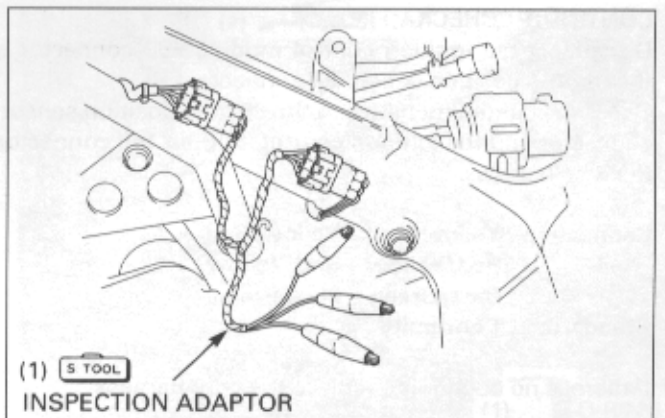


Connect the inspection adaptor between the throttle position sensor connectors.

**Tool:**

**Inspection adaptor**

**07GMJ - ML80100**



**INPUT VOLTAGE**

Turn the ignition switch ON.  
Measure and record the input voltage at the inspection adaptor terminals using a digital multimeter.

**Connection: Red clip (+) – Green clip (-)**  
**Standard: 4.5 – 5.5 V**

If the measurement is out of the specification, check the following:  
– Loose connection ignition control module 16P connector.  
– An open circuit in wire harness.

**Output voltage**

Measure and record the output voltage at the inspection adaptor terminals using a digital multimeter.

**Connection: White clip (+) – Green clip (-)**

**Measuring conditions:**

**At full throttle open**

**At full throttle close (with throttle stop screw fully turned out)**

Compare the measurement to the result of the following calculation.

**At full throttle open:**

$$V_a \times 0.824 = V_o$$

Where

V<sub>a</sub>: Input voltage measured

V<sub>o</sub>: Result of calculation

The sensor is normal if the value measured is V<sub>o</sub> ± 10%.

**At full throttle close:**

$$V_a \times 0.1 = V_c$$

Where

V<sub>a</sub>: Input voltage measured

V<sub>c</sub>: Result of calculation

The sensor is normal if the value measured is V<sub>c</sub> ± 10%.

Using an analog meter, check that the needle of the volt meter swings slowly when the throttle is opened gradually.

**CONTINUITY CHECK**

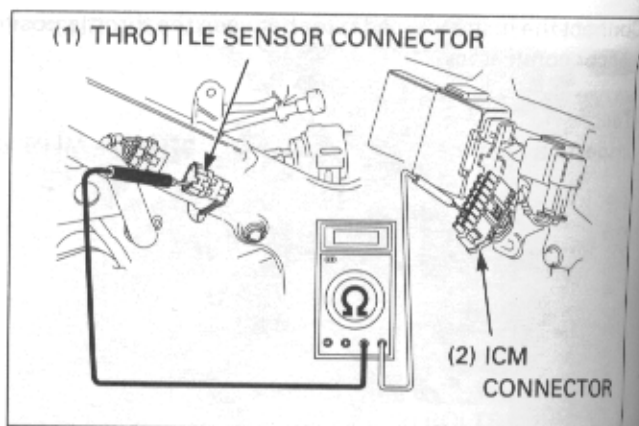
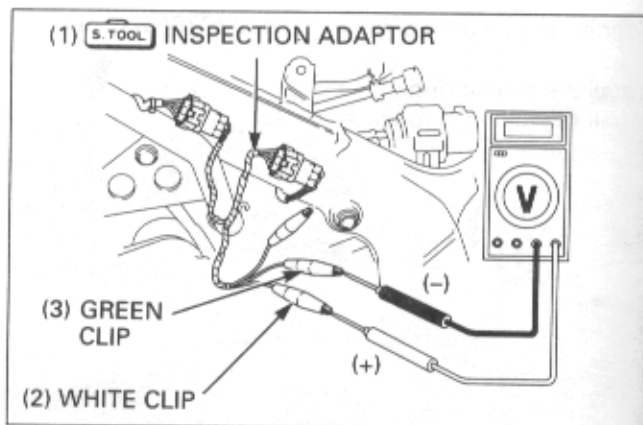
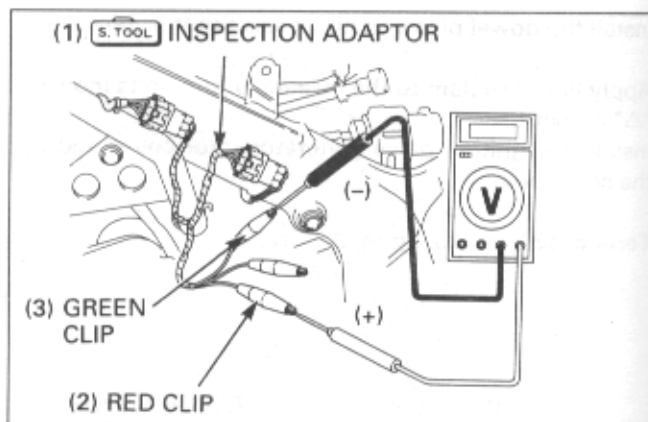
Disconnect the ignition control module 16P connector and the throttle position sensor 3P connector.

Check the continuity between the throttle position sensor 3P connector and the ignition control module 16P connector of the wire harness.

**Connection: Yellow/Red – Yellow/Red**  
**Red/Yellow – Red/Yellow**  
**Blue/Green – Blue/Green**

**Standard: Continuity**

If there is no continuity, replace the wire harness.



## IGNITION TIMING

Warm up the engine.

Stop the engine and connect a timing light to the spark plug wire.

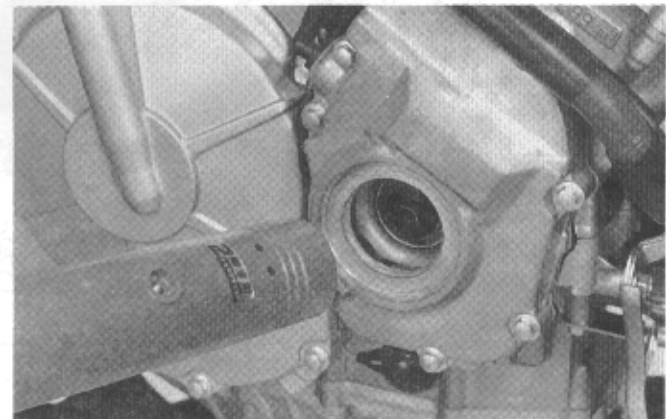
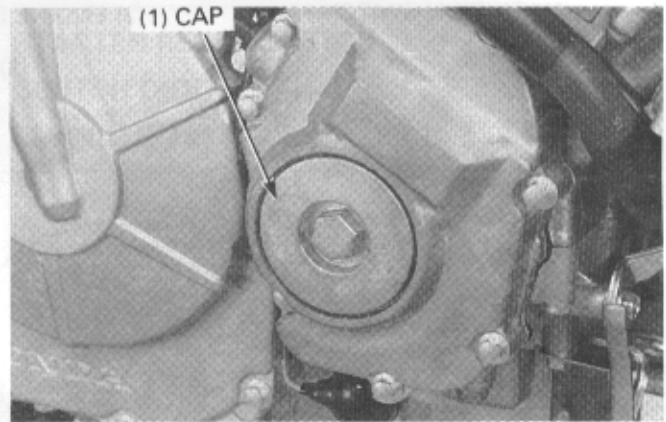
### NOTE

- Read the manufacturer's instructions for the timing light before operating.

Remove the following :

- Right side fairing (page 2-3)
- Ignition pulse generator rotor cover cap.

Start the engine and let it idle.



### 49-STATE AND CANADA TYPE:

The timing is correct if the F mark (three punch marks) align with the index mark on the ignition pulse generator rotor cover.

Increase the engine speed by rotating the throttle stop screw and make sure the F mark begins to move counterclockwise at approximately 1,500 rpm.

### CALIFORNIA TYPE:

The timing is correct if the F mark (two punch marks) align with the index mark on the ignition pulse generator rotor cover.

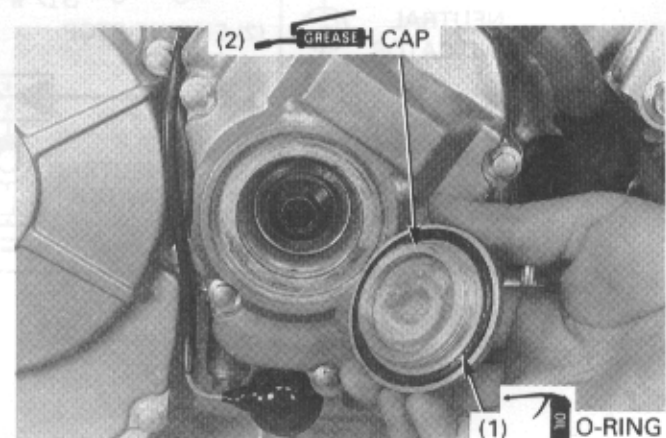
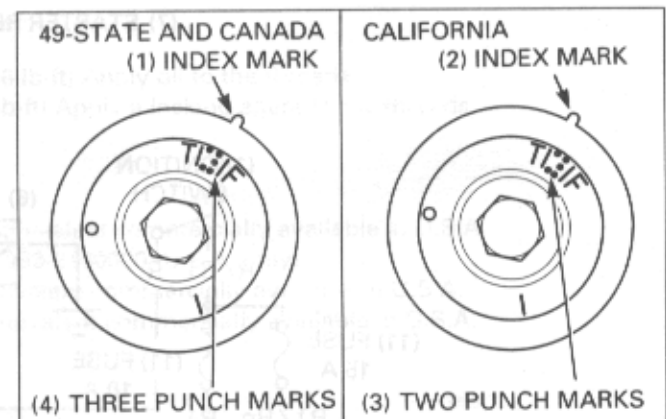
Increase the engine speed by rotating the throttle stop screw and make sure the F mark begins to move counterclockwise at approximately 1,500 rpm.

Check the ignition pulse generator rotor cover cap O-ring for damage or deterioration. Replace it with a new one if necessary.

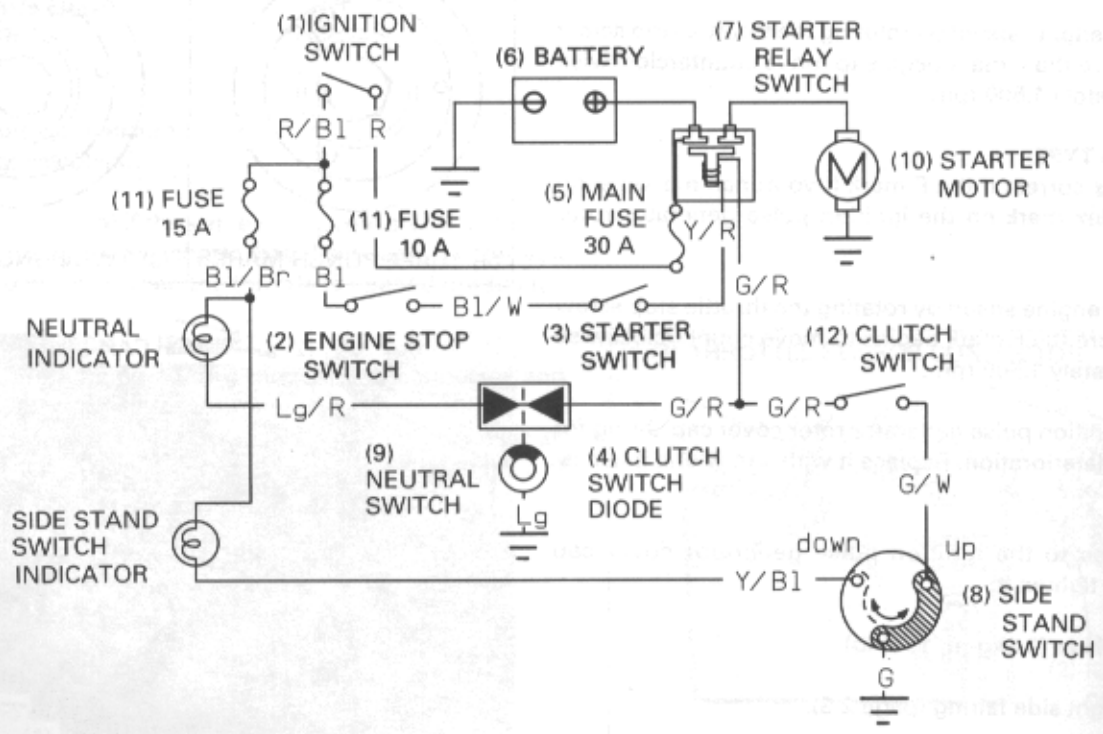
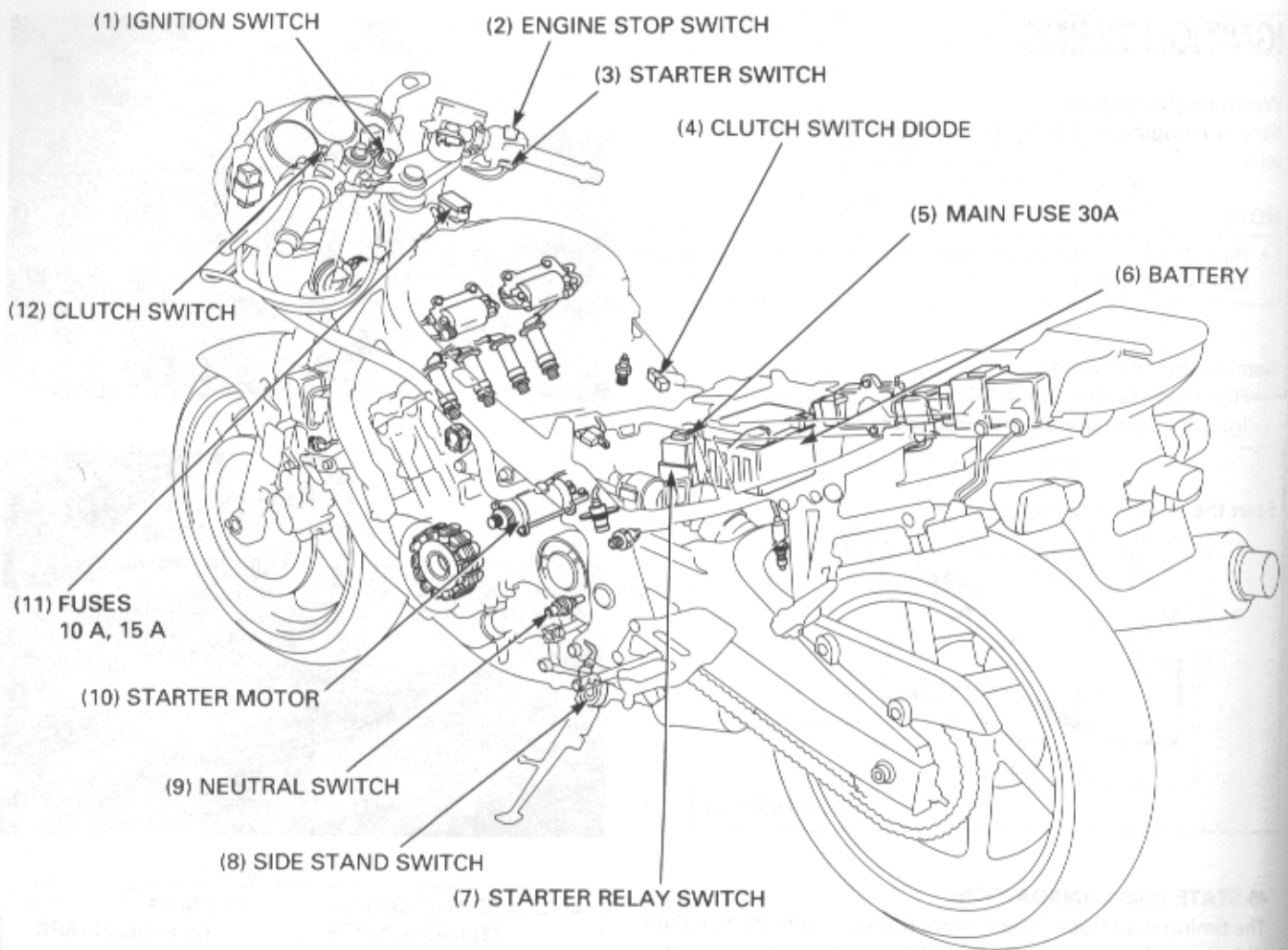
Apply grease to the ignition pulse generator cover cap threads and tighten it.

**Torque : 18 N·m (1.8kg-m, 13 ft-lb)**

Install the right side fairing (page 2-3).



# ELECTRIC STARTER/STARTER CLUTCH





# 17. ELECTRIC STARTER/STARTER CLUTCH

SERVICE INFORMATION	17-1	STARTER RELAY SWITCH	17-9
TROUBLESHOOTING	17-2	CLUTCH DIODE	17-10
STARTER MOTOR	17-4	FLYWHEEL/STARTER CLUTCH	17-10

## SERVICE INFORMATION

### GENERAL

#### ▲ WARNING

• Always turn the ignition switch OFF before servicing the starter motor. If not the motor could suddenly start, causing serious injury.

- A weak battery may be unable to turn the starter motor quickly enough, or supply adequate ignition current.
- If current continues to flow through the starter motor while the engine is not cranking over, the starter motor may be damaged.
- Always turn off the ignition switch before disconnecting any electrical components.
- For ignition, starter and clutch switch inspection, see Section 18.

### SPECIFICATIONS

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter driven gear O.D.	51.699 – 51.718 (2.0354 – 2.0361)	51.684 (2.0348)
Starter motor brush length	12.0 – 13.0 (0.47 – 0.51)	4.5 (0.18)

### TORQUE VALUES

- Flywheel bolt 105 N•m (10.5 kg-m, 76 lb-ft) Apply oil to the threads.  
 Starter clutch bolt 16 N•m (1.6 kg-m, 12 lb-ft) Apply a locking agent to the threads.

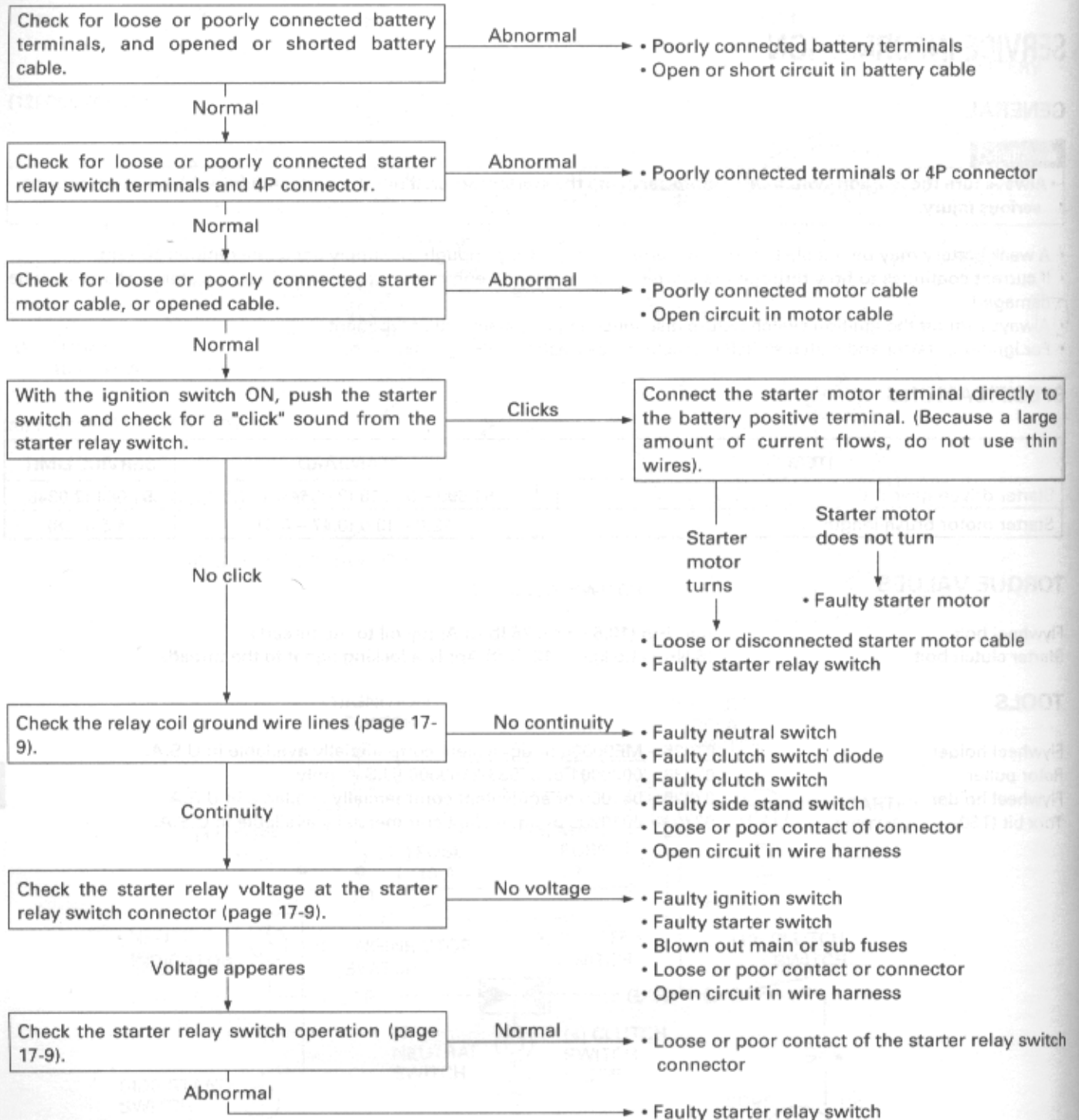
### TOOLS

- Flywheel holder 07925 – ME90000 or equivalent commercially available in U.S.A.  
 Rotor puller 07733 – 0020001 or 07933-2160000 (U.S.A. only)  
 Flywheel holder 07725 – 040000 or equivalent commercially available in U.S.A.  
 Torx bit (T30) 07703 – 0010200 or equivalent commercially available in U.S.A.

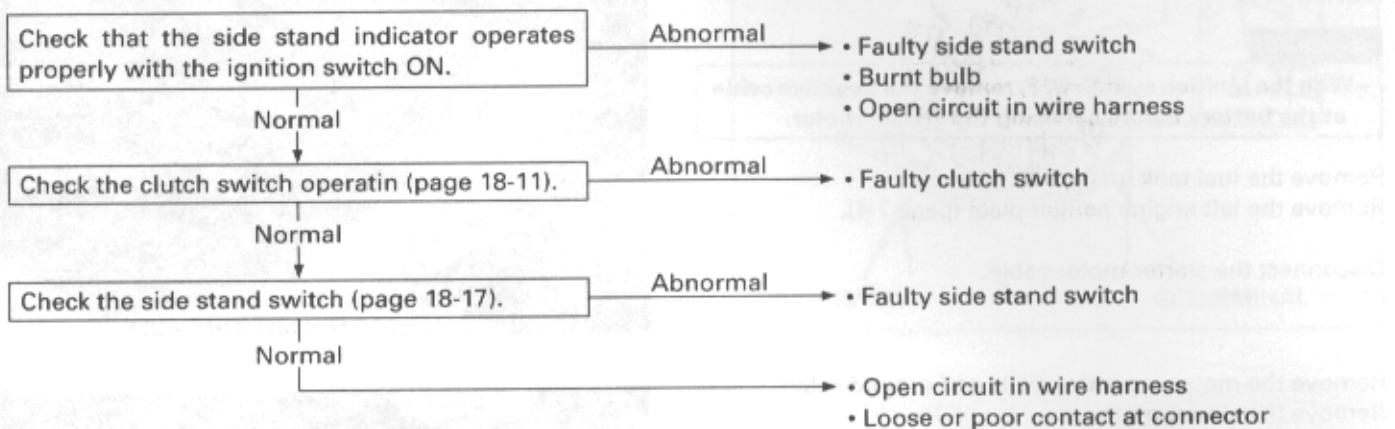
**TROUBLESHOOTING**

**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 turns when the transmission is in neutral, but does not turn with the transmission in any position except neutral. The side stand is up and the clutch lever is pulled in.



### Starter motor turns slowly

- Low specific gravity in 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
  - Terminals connected improperly
- Faulty starter clutch
- Damaged or faulty starter motor gears

### Starter relay switch "clicks", but engine does not turn over

- Crankshaft does not turn due to engine problems
- Excessive starter motor gear friction



## ELECTRIC STARTER/STARTER CLUTCH

### STARTER MOTOR

#### REMOVAL

##### ⚠ WARNING

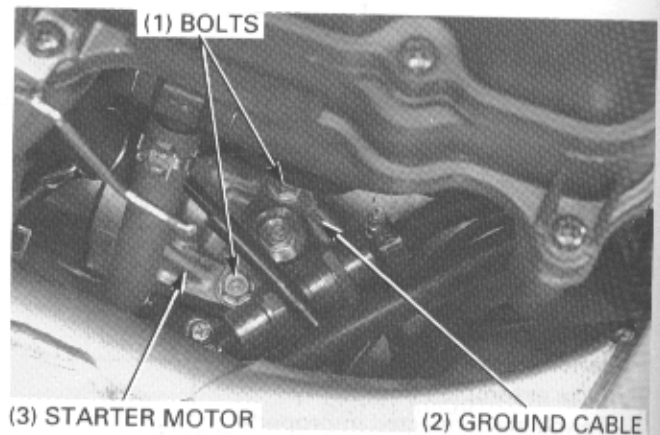
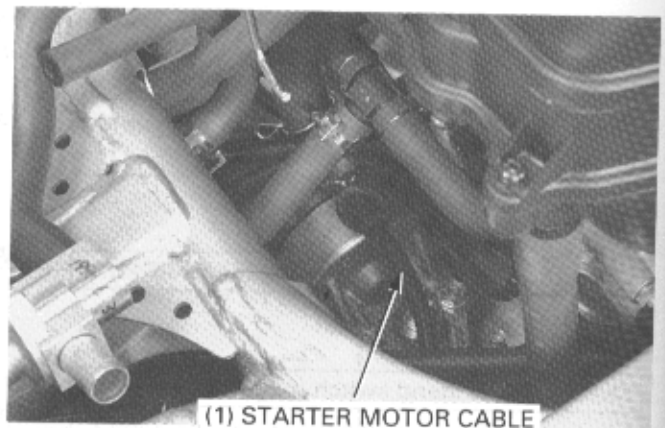
- With the ignition switch OFF, remove the negative cable at the battery before servicing the starter motor.

Remove the fuel tank (page 2-4).

Remove the left engine hanger plate (page 7-4).

Disconnect the starter motor cable.

Remove the motor mounting bolts and ground cable.  
Remove the starter motor.



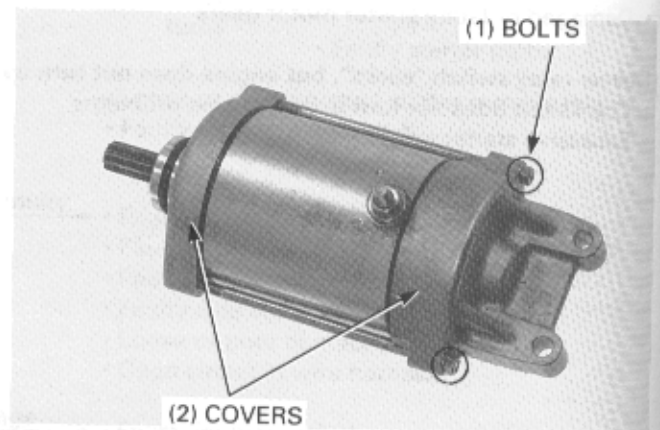
#### DISASSEMBLY

##### NOTE

- Record the location and number of shims.

Remove the following components:

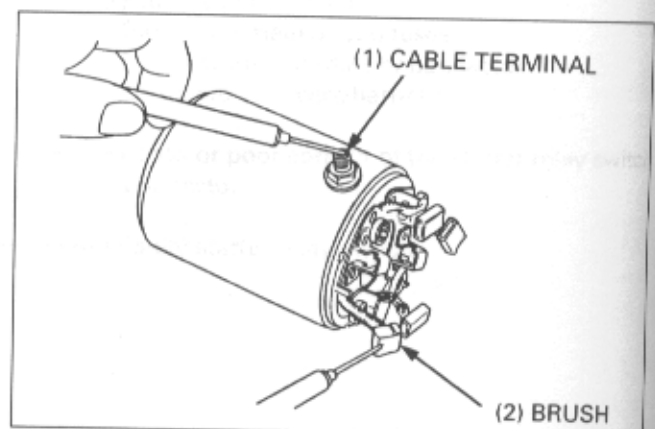
- motor case bolts
- front and rear covers
- armature



#### INSPECTION

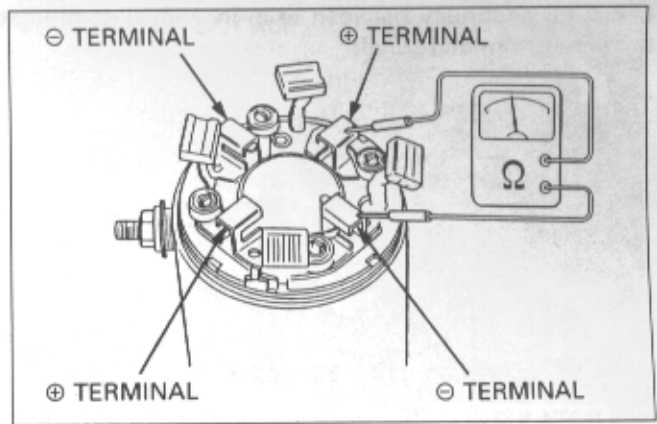
Check for continuity between the cable terminal and case.  
There should be no continuity.

Check for continuity between the cable terminal and brush.  
There should be continuity.



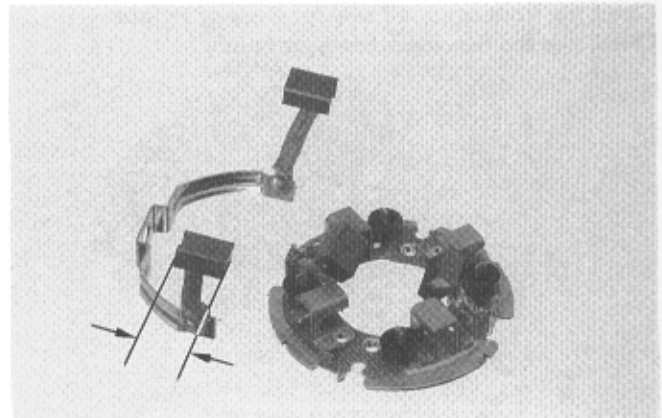
Check for continuity between (+) and (-) terminals of the brush holder.

There should be no continuity.



Measure each brush length.

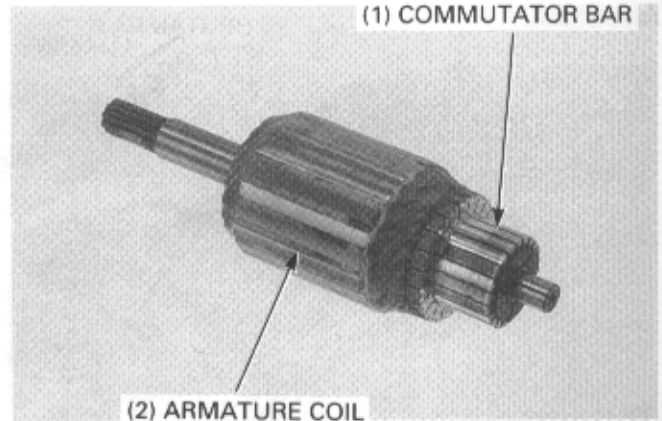
**Service limit: 4.5 mm (0.18 in)**



Inspect the commutator bars for discoloration. Bars discolored in pairs indicate grounded armature coil.

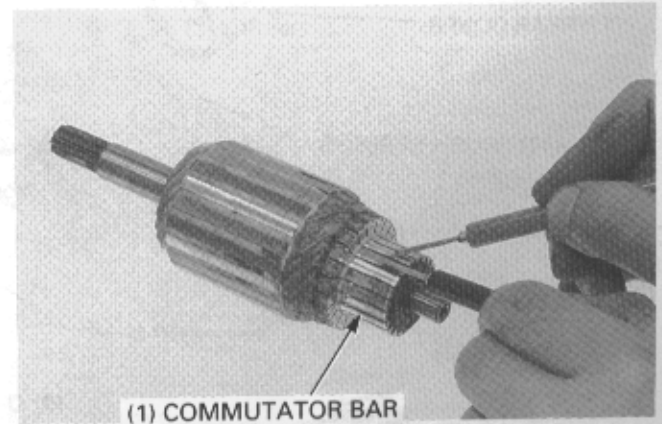
**NOTE**

- Do not use emery or sand paper on the commutator.



Check for continuity between pairs of commutator bars.

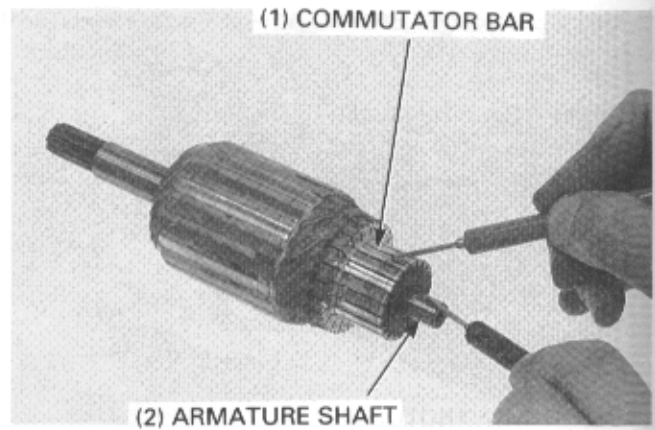
There should be continuity.



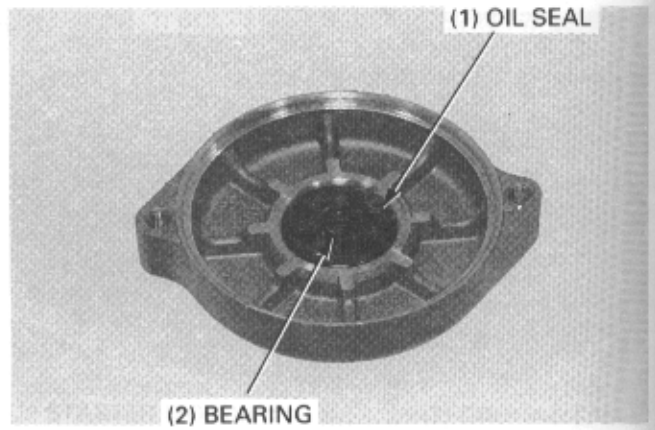
## ELECTRIC STARTER/STARTER CLUTCH

Check for continuity between each individual commutator bar and the armature shaft.

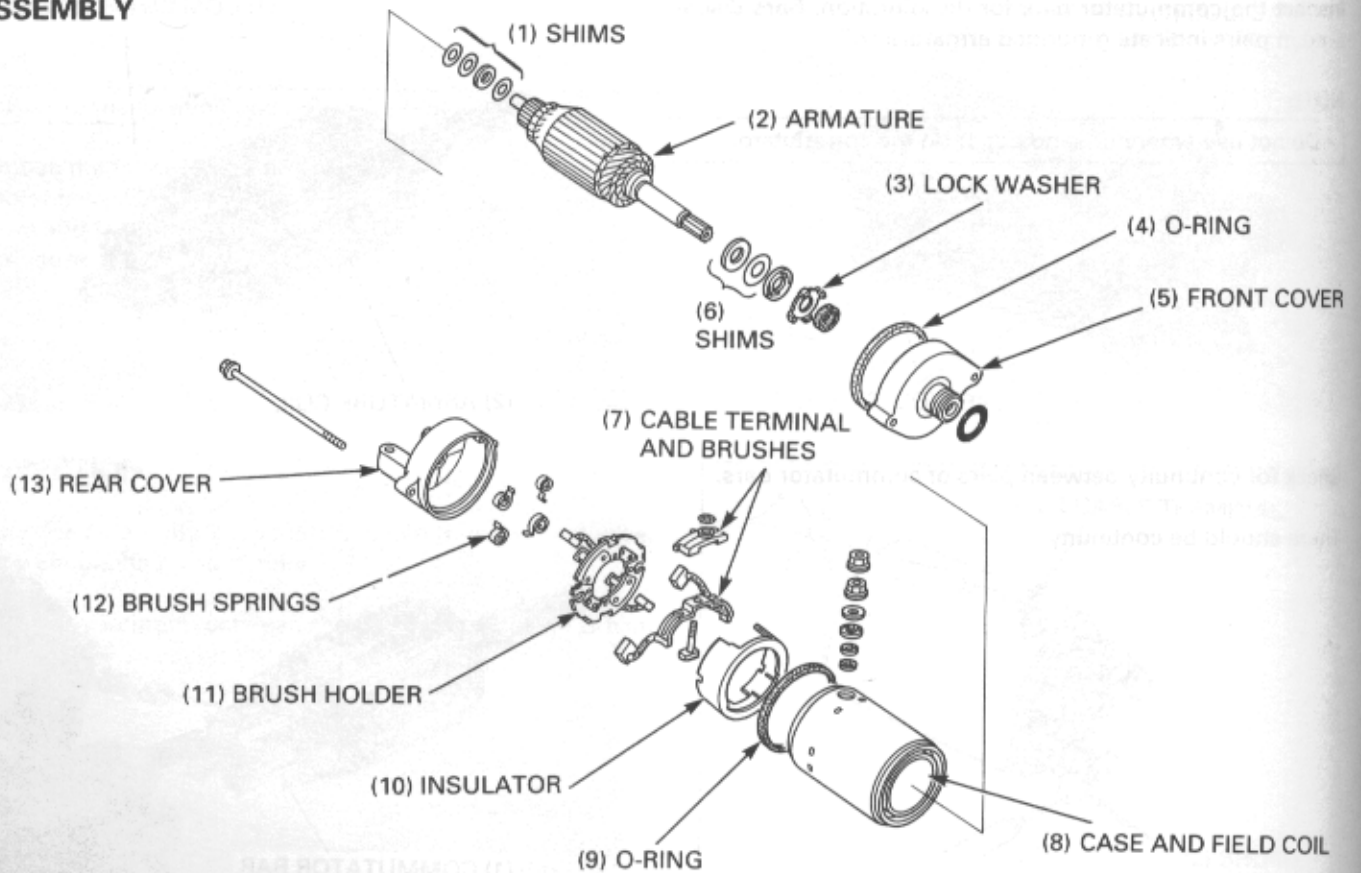
There should be no continuity.



Check the front cover oil seal for wear or fatigue. Check that the bearing rotates smoothly.



## ASSEMBLY

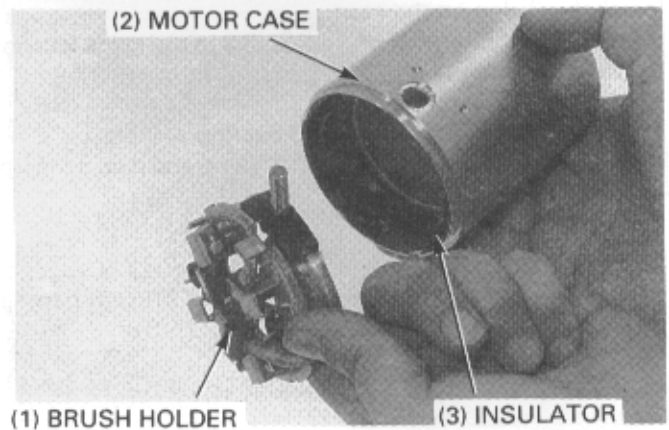


## ELECTRIC STARTER/STARTER CLUTCH

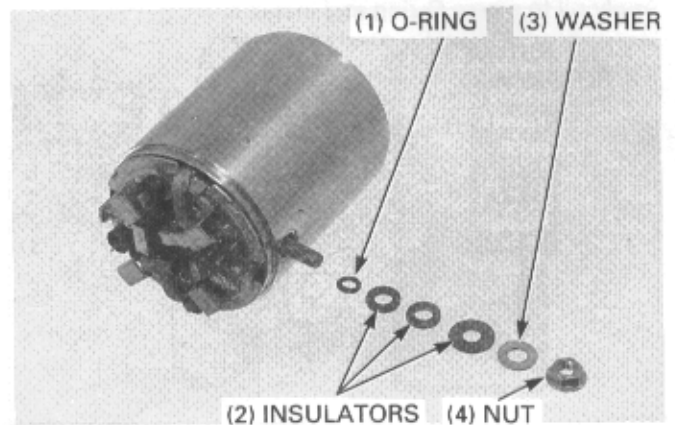
Set the brushes on the brush holder.  
Install the brush holder onto the motor case.

### NOTE

- Align the terminal holder plate with the motor case insulator.



Install the insulators, washer and nut to the cable terminal.

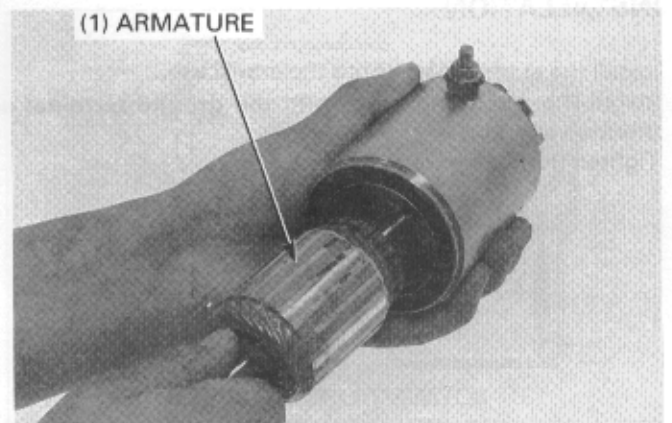


Push and hold the brush inside the brush holder and insert the armature through the brush holder.  
When installing the armature into the case, hold the armature tightly to keep the magnet from pulling the armature against the case.

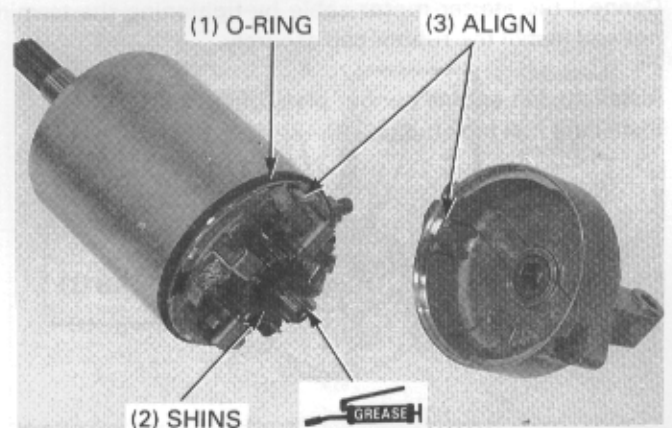
### CAUTION

- The coil may be damaged if the magnet pulls the armature against the case.

Set the brush springs.



Install the O-ring on the case.  
Install the same number of rear shims in the same locations as when disassembled.  
Apply a thin coat of grease to the armature shaft end.  
Install the rear cover aligning its groove with the brush holder tab.



## ELECTRIC STARTER/STARTER CLUTCH

Install the O-ring on the case.  
Install the same number of front shims in the same locations as when disassembled.

Apply grease to the seal lips and bearing.  
Install the lock washer on the front cover, and install the front cover to the case.

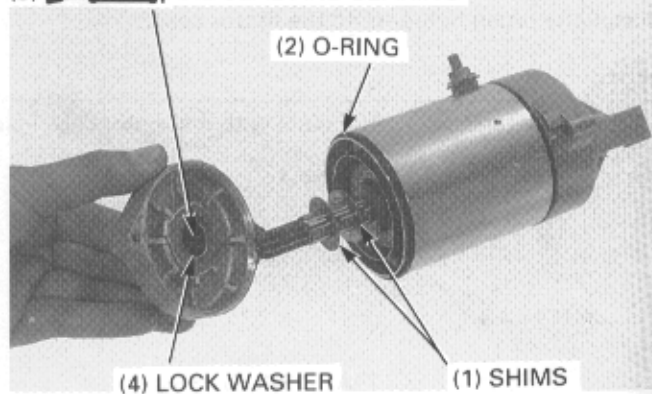
### CAUTION

- When installing the cover, take care to prevent damaging the oil seal lip with the shaft.

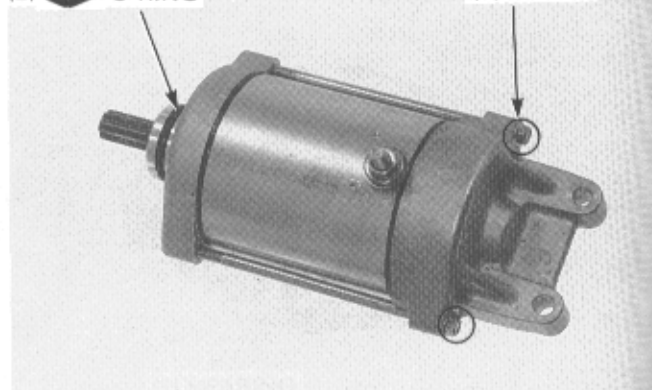
Align the marks on the case and front cover.

Install and tighten the starter motor case bolts.  
Apply oil to a new O-ring and install it.

(3) GREASE OIL SEAL AND BEARING



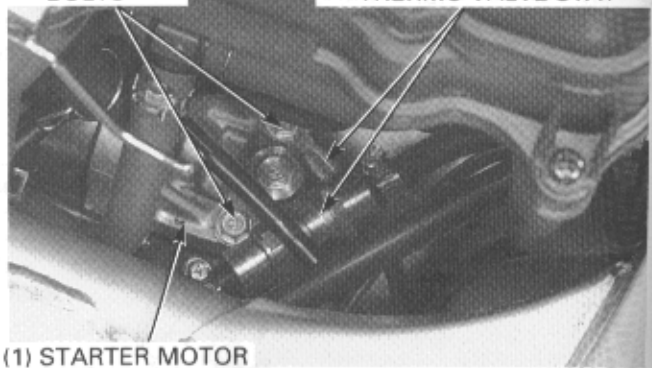
(2) NEW O-RING (1) BOLTS



## INSTALLATION

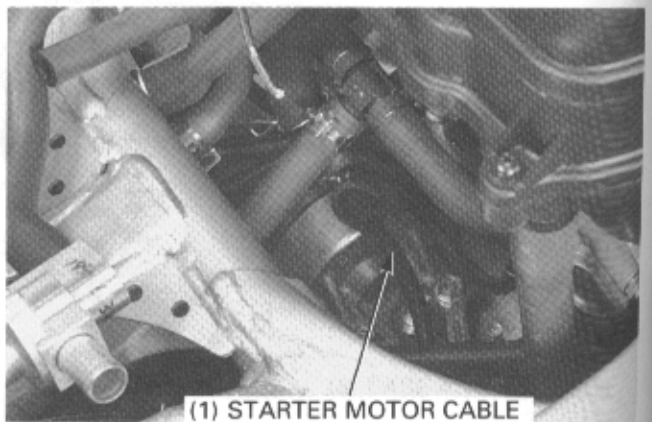
Install the starter motor onto the crankcase.  
Install the mounting bolts with the ground terminal and thermo valve stay.  
Tighten the mounting bolts.

(3) MOUNTING BOLTS (2) GROUND TERMINAL AND THERMO VALVE STAY



Connect the starter motor cable by tightening the terminal nut and install the rubber cap securely.

Install the left engine hanger plate (page 7-5).  
Install the fuel tank (page 2-4).





## STARTER RELAY SWITCH

### INSPECTION

Remove the seat (page 2-2).

Shift the transmission into neutral.  
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 relay 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

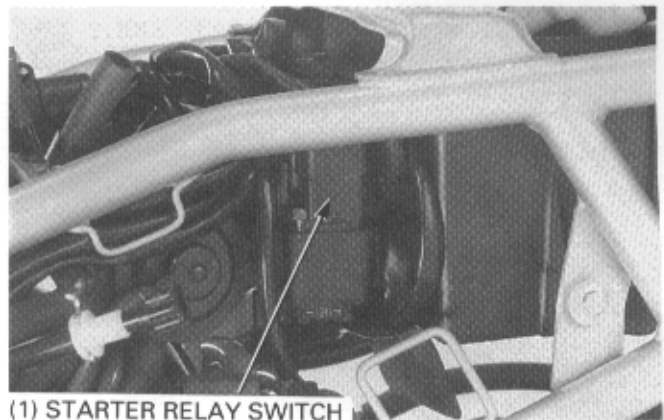
Connect the starter switch connector.  
Shift the transmission into neutral.  
Measure the voltage between the Yellow/Red (+) wire and ground at the starter relay switch connector.

If battery voltage appears only when the starter switch is pressed with the ignition switch ON, it is normal.

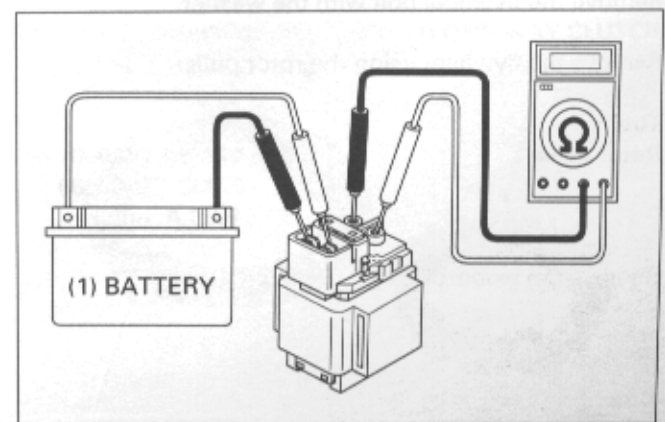
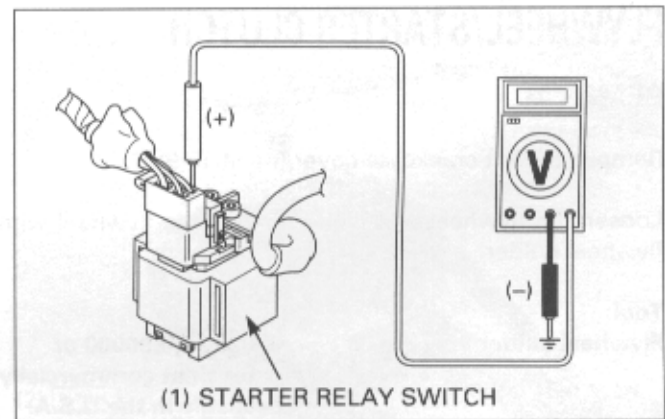
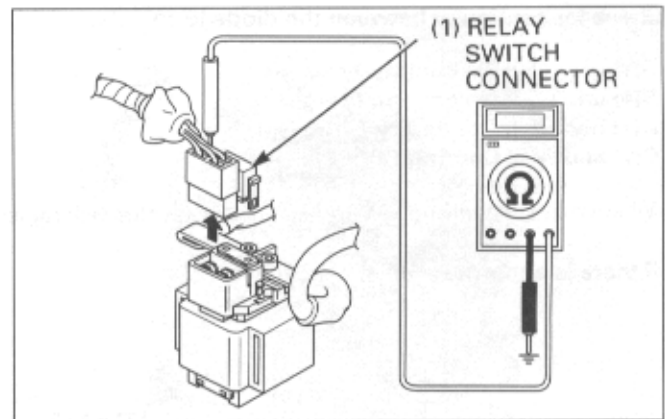
### OPERATION CHECK

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 large terminals while the battery is connected, and no continuity when the battery is disconnected.



(1) STARTER RELAY SWITCH



## ELECTRIC STARTER/STARTER CLUTCH

### CLUTCH DIODE

#### INSPECTION

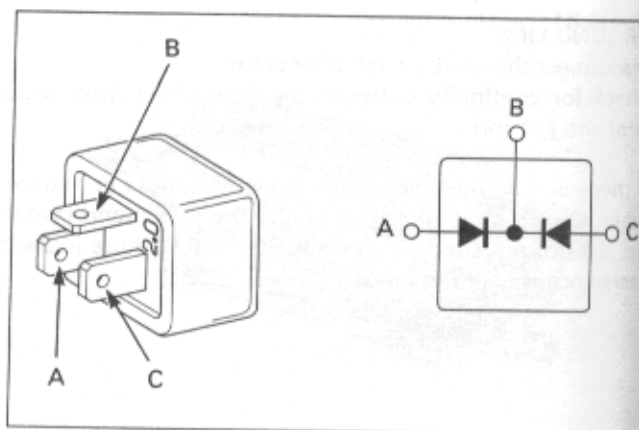
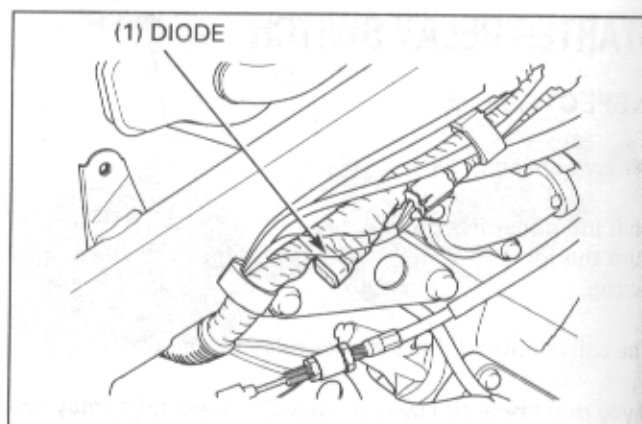
Remove the side fairing (page 2-3).  
Remove the tape and diode.

Check for continuity between the diode terminals.

**B(+) and A(-): No continuity**  
**B(+) and C(-): No continuity**  
**A(+) and B(-): Continuity**  
**C(+) and B(-): Continuity**

When there is continuity, a small resistance value will register.

If there is abnormal, replace the diode.



### FLYWHEEL/STARTER CLUTCH

#### REMOVAL

Remove the left crankcase cover (page 15-9).

Loosen the flywheel bolt while holding the flywheel with a flywheel holder.

**Tool:**

**Flywheel holder**

**07925 - ME90000 or  
equivalent commercially  
available in the U.S.A.**

Remove the flywheel bolt with the washer.

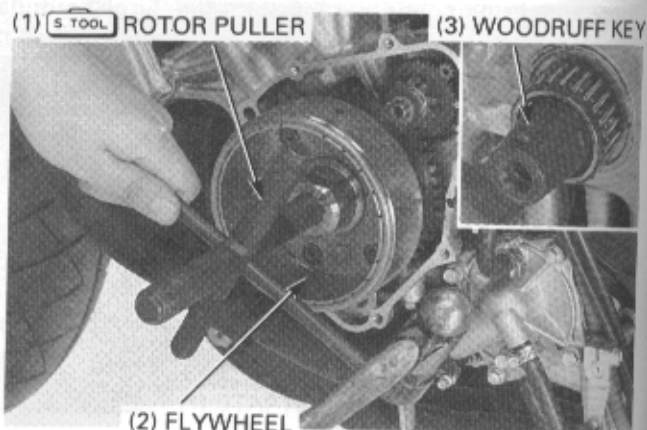
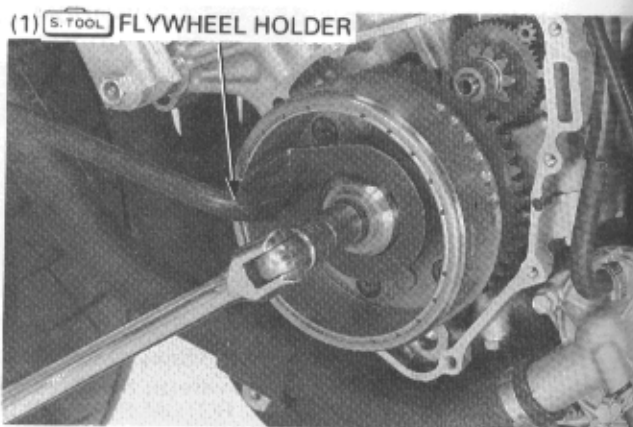
Remove the flywheel using the rotor puller.

**Tool:**

**Rotor puller**

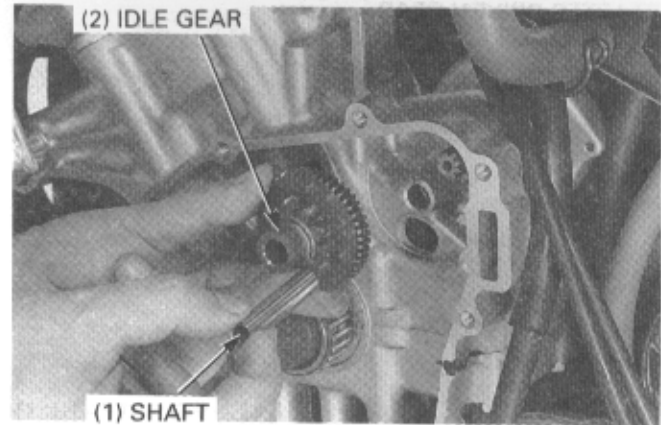
**07733 - 0020001 or  
07933 - 2160000  
(U.S.A. only)**

Remove the woodruff key.



## ELECTRIC STARTER/STARTER CLUTCH

Remove the starter idle gear shaft and idle gear.



### DISASSEMBLY

Remove the starter driven gear by turning it counterclockwise.



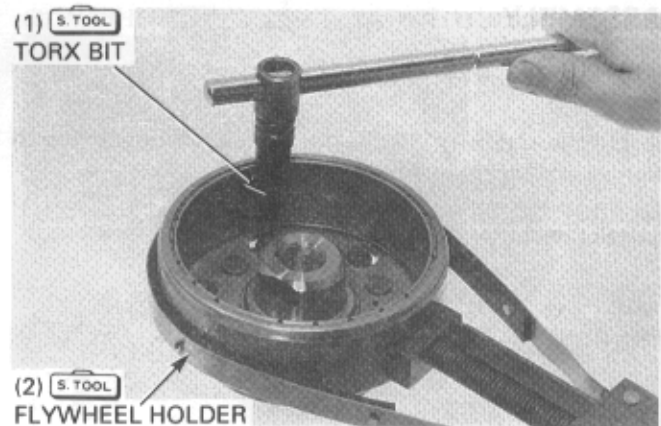
Remove the starter clutch bolts while holding the flywheel with a flywheel holder.

**Tools:**  
Flywheel holder  
Torx bit (T30)

07725 - 0040000 or  
07703 - 0010200  
equivalent  
commercially available

Remove the starter clutch.

After removing the starter clutch bolts, clean the locking agent residue off the bolts.



### INSPECTION

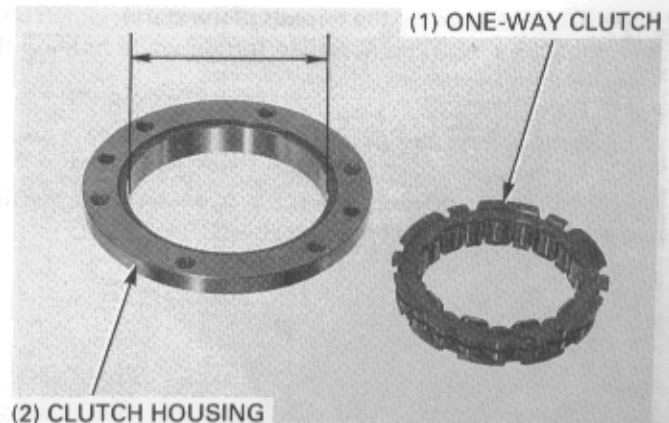
Assemble the one-way clutch, clutch housing and driven gear and check that the driven gear turns smoothly in one direction and locks up in the other direction.

#### ONE-WAY CLUTCH

Check the one-way clutch sprag for abnormal wear, damage or irregular movement.

#### CLUTCH HOUSING

Check the inner contact surface of the clutch outer for damage.

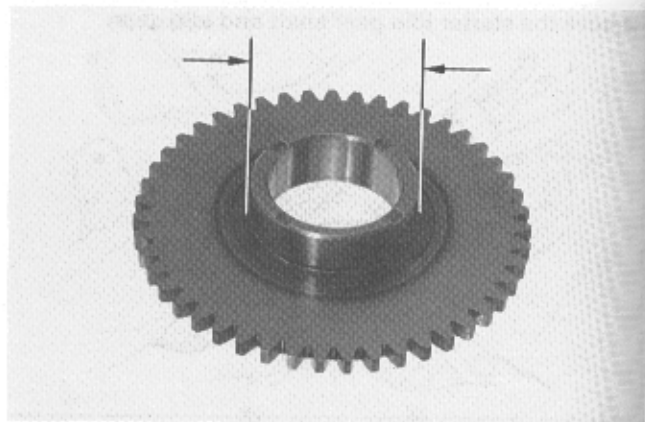


## ELECTRIC STARTER/STARTER CLUTCH

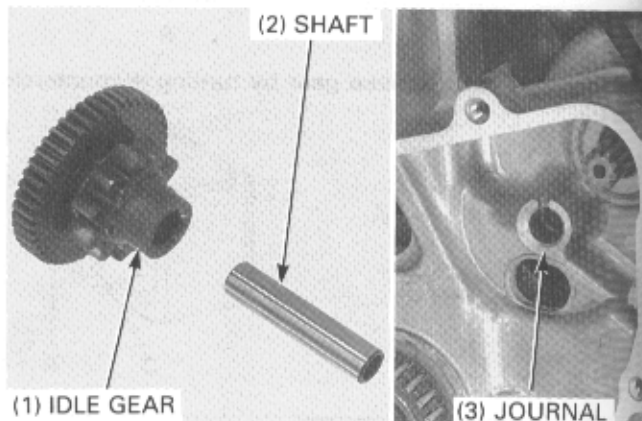
### STARTER DRIVEN GEAR

Check the roller contact surface for damage.  
Measure the driven gear O.D.

**Service limit: 51.684 mm (2.0348 in)**



Check the starter idle gear shaft, gear and shaft journal for wear or damage.

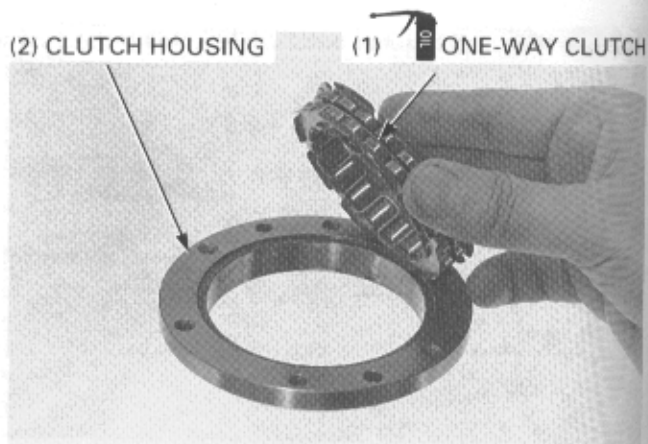


### ASSEMBLY

Apply engine oil to the one-way clutch.

Install the one-way clutch into the clutch housing with its flange side facing flywheel.

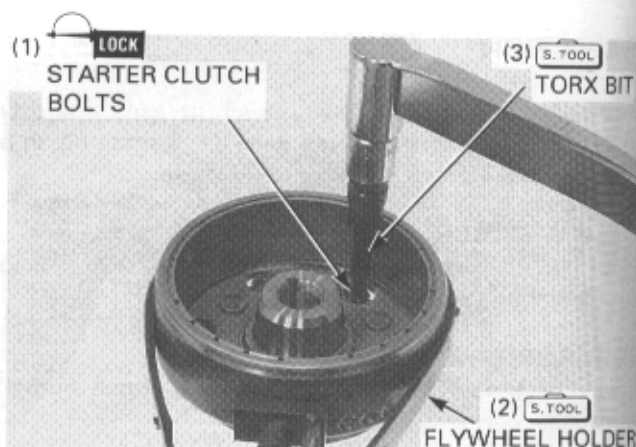
Install the starter clutch onto the flywheel.



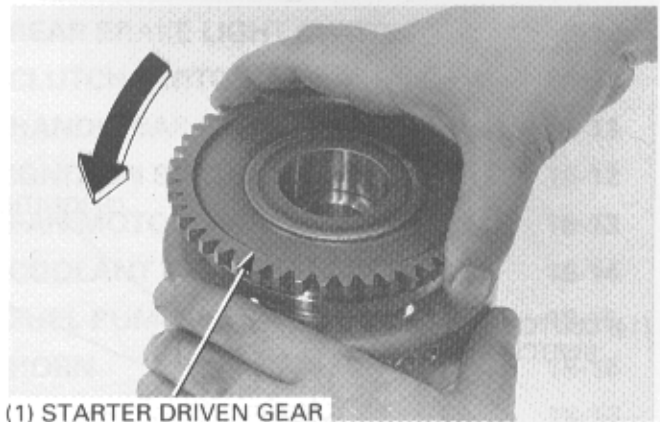
Apply a locking agent to the threads of the starter clutch bolts and tighten them to the specified torque while holding the flywheel with a flywheel holder.

**Torque : 16 N·m (1.6kg·m, 12 ft·lb)**

Install the starter driven gear to the flywheel while turning the starter driven gear counterclockwise.



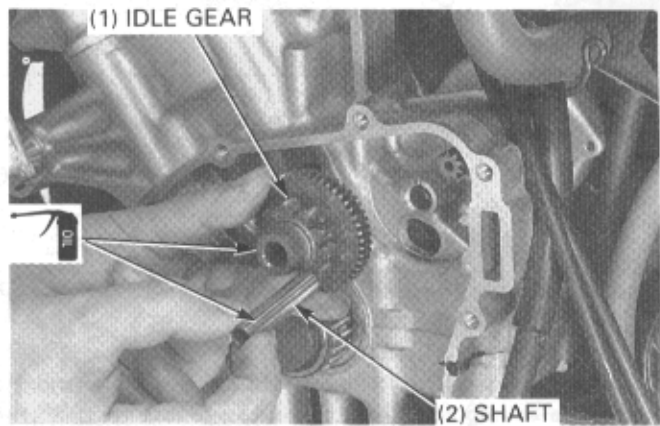
Install the starter driven gear to the flywheel while turning the driven gear counterclockwise.



(1) STARTER DRIVEN GEAR

**INSTALLATION**

Apply oil to the idle gear shaft outer surface. Install the starter idle gear shaft and idle gear.



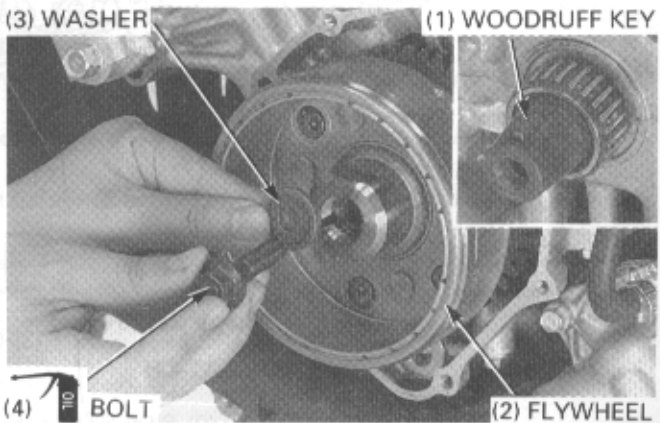
(1) IDLE GEAR

(2) SHAFT

Install the woodruff key in the crankshaft. Set the flywheel over the crankshaft by aligning its groove with the woodruff key and install the flywheel.

Apply oil to the flywheel bolt threads.

Install the flywheel bolt and washer.



(3) WASHER

(1) WOODRUFF KEY

(4) BOLT

(2) FLYWHEEL

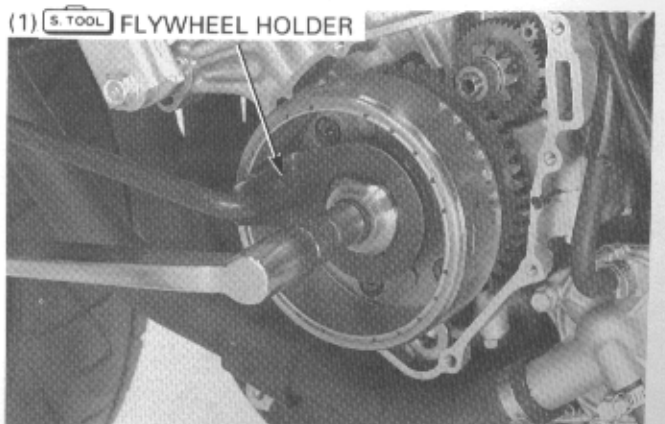
Tighten the flywheel bolt while holding the flywheel with a flywheel holder.

**Tool :**  
**Flywheel holder**

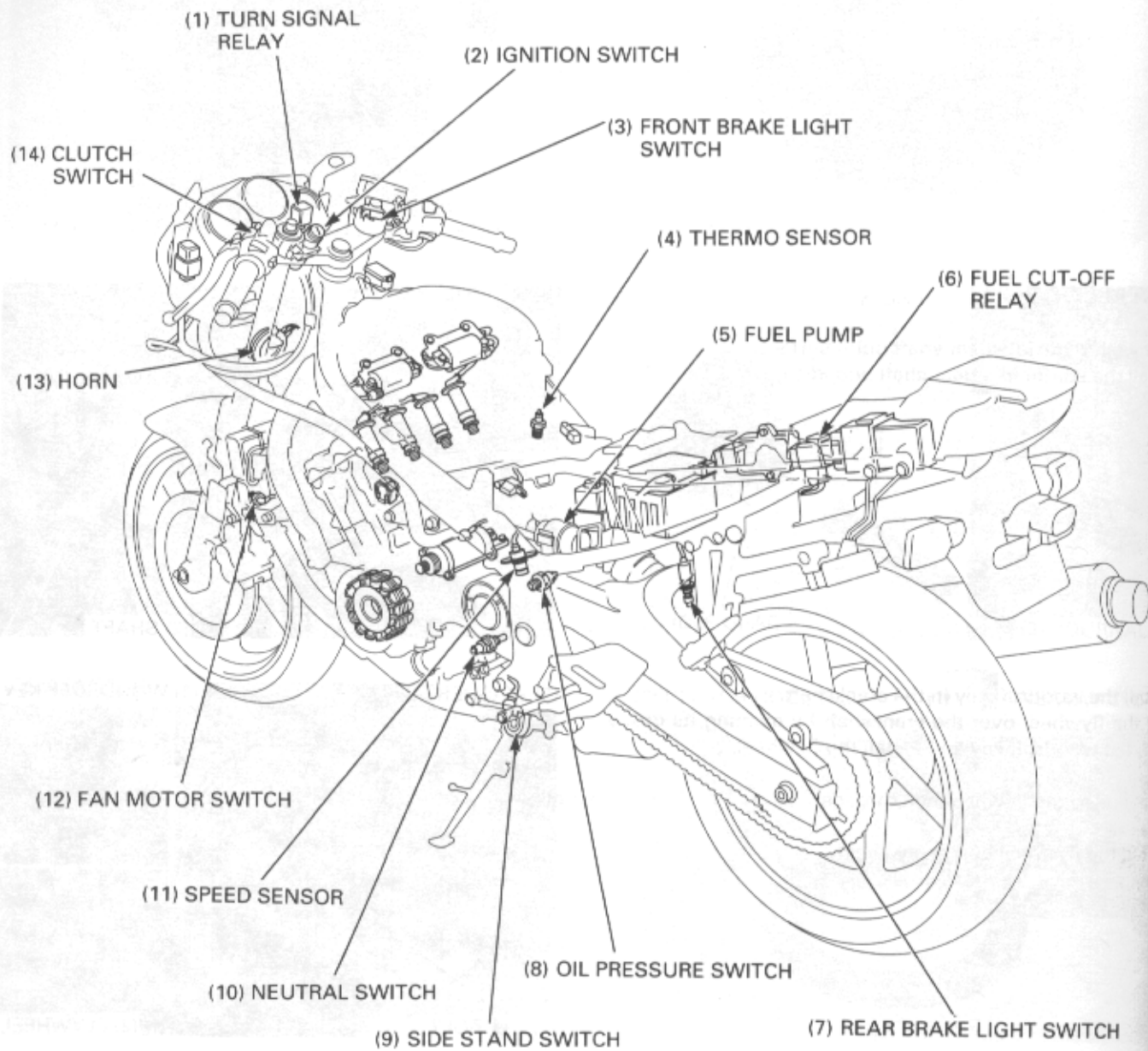
**07925 - ME90000 or equivalent commercially available in U.S.A.**

**Torque: 105 N-m (10.5 kg-m, 76 lb-ft)**

Install the left crankcase cover (page 15-10).



(1) S. TOOL FLYWHEEL HOLDER



# 18. LIGHTS/METERS/SWITCHS

SERVICE INFORMATION	18-1	REAR BRAKE LIGHT SWITCH	18-10
TROUBLESHOOTING	18-3	CLUTCH SWITCH	18-11
HEADLIGHT	18-5	HANDLEBAR SWITCH	18-11
TURN SIGNAL	18-5	IGNITION SWITCH	18-12
TAIL/BRAKE LIGHT	18-6	FAN MOTOR SWITCH	18-13
LICENSE LIGHT	18-6	COOLANT TEMPERATURE GAUGE	18-14
COMBINATION METER	18-7	FUEL PUMP	18-15
SPEED SENSOR	18-9	HORN	18-16
OIL PRESSURE SWITCH	18-10	TURN SIGNAL RELAY	18-16
NEUTRAL SWITCH	18-10	SIDE STAND SWITCH	18-17
FRONT BRAKE LIGHT SWITCH	18-10	SUB FUSE	18-18

## SERVICE INFORMATION

### GENERAL

#### ▲ WARNING

- The 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.
- Gasoline is extremely flammable and is explosive under certain conditions. KEEP OUT OF REACH OF CHILDREN.
- Use an electric heating element to heat the water/coolant mixture for the fan motor switch 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 fingerprints on the headlight bulb, as they may create hot spots on the bulb and cause it to break.
  - 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.
- All Plastic connectors have locking tabs that must be released before disconnecting, and must be aligned and engaged fully when reconnecting.
- Always turn off the ignition switch before disconnecting any electrical component.
- A continuity test can be made with switches installed on the motorcycle.
- Check the batter condition before performing any inspection that requires proper battery voltage.
- The following color codes are used 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

# LIGHTS/METERS/SWITCHES

## SPECIFICATIONS

ITEM		SPECIFICATIONS
Fuse	Main	30 A
	Sub	15 A X 1, 10 A X 3
Bulb	Headlight (high/low beam)	12 V - 60/55 W
	Brake/tail light	12 V - 32/3 cp
	License light	12 V - 4 cp
	Front turn signal/running light	12 V - 32/3 cp X 2
	Rear turn signal light	12 V - 32 cp X 2
	Instrument light	12 V - 1.7 W X 4
	High beam indicator	12 V - 1.7 W
	Turn signal indicator	12 V - 3 W X 2
	Neutral indicator	12 V - 1.7 W
	Side stand indicator	12 V - 1.7 W
	Oil pressure warning indicator	12 V - 1.7 W
Fuel pump flow capacity (min./minute)		700 cc (23.7 US oz, 24.6 Imp oz)
Coolant temperature sensor resistance	80°C/176°F	45 - 60 Ω
	120°C/248°F	10 - 20 Ω
Fan motor switch	Start to close (ON)	98 - 102°C (208 - 216°F)
	Stop to open (OFF)	93 - 97°C (199 - 207°F)

## TORQUE VALUES

Fan motor switch	10 N•m (1.0 kg-m, 7 lb-ft) Apply sealant to the threads.
Thermosensor	10 N•m (1.0 kg-m, 7 lb-ft) Apply sealant to the threads.
Oil pressure switch	12 N•m (1.2 kg-m, 9 lb-ft) Apply sealant to the threads.
Neutral switch	12 N•m (1.2 kg-m, 9 lb-ft) Apply sealant to the threads.
Ignition switch bolt	25 N•m (2.5 kg-m, 18 lb-ft)
Side stand switch bolt	10 N•m (1.0 kg-m, 7 lb-ft)



# TROUBLESHOOTING

## Speed Sensor/Speedometer

The odometer/trip meter operates normality, but the speedometer does not operate

- Faulty speedometer

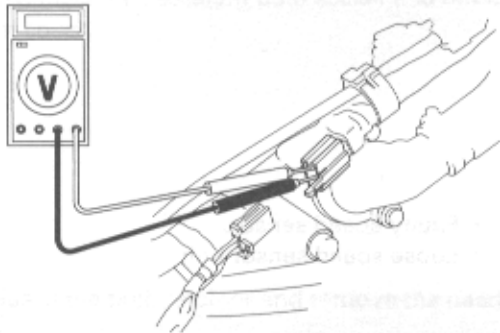
The speedometer operates normally, but the odometer/trip meter does not operate

- Faulty odometer/trip meter

The speedometer operates abnormally

- Check for the following before diagnosing:
  - blown main or sub fuses
  - loose or corroded terminals on the connectors
  - discharged battery

Remove the side fairing (page 2-4).  
Check for loose or poor contact of the speed sensor 3P (White) connector.  
With the ignition switch ON, measure the voltage at the speed sensor connector.



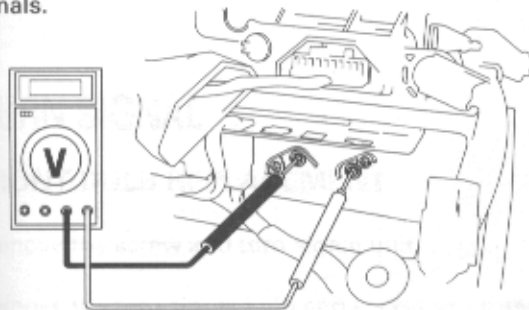
Connection: Green/Black and Black/Brown  
Standard: Battery voltage

Normal

Abnormal

- Loose or poor contact of related terminals.
- Open circuit in Black/Brown or Green/Black wires between the battery and speed sensor.

Remove the upper fairing (page 2-6).  
Check for loose or poor contact of the combination meter connectors.  
With the ignition switch ON, measure the voltage at the bottom of the speedometer terminals.

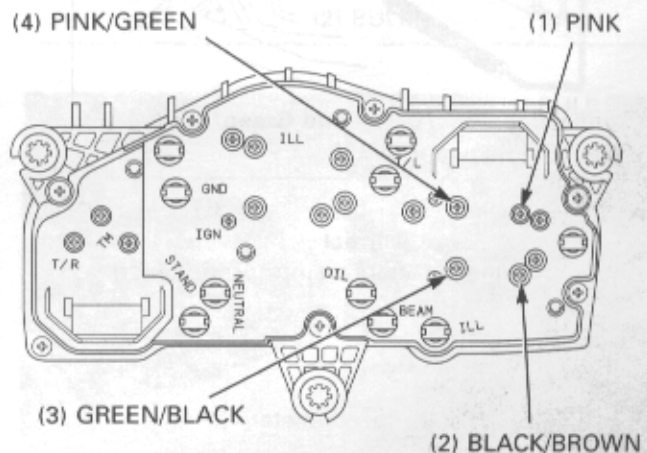


Connection: Green/Black and Black/Brown  
Standard: Battery voltage

Normal

Abnormal

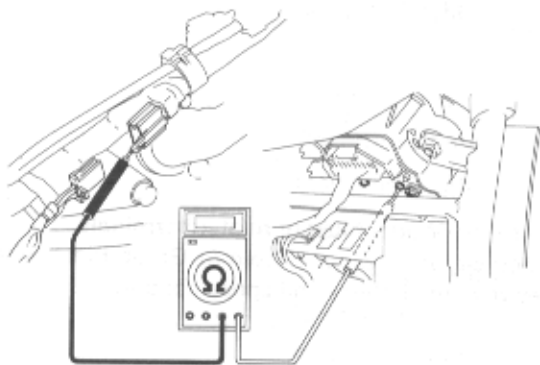
- Loose or poor contact of related terminals.
- Open circuit in Black/Brown or Green/Black wires between the battery and speedometer.



(Continued on the following page)

(From the previous page)

With the ignition switch OFF, check for continuity between the Pink/Green wire of the speed sensor and Pink/Green terminal of the speedometer.



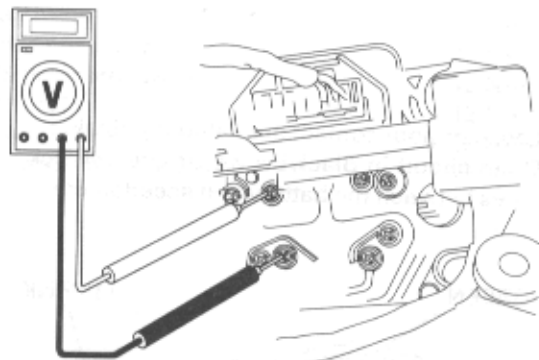
Standard: Continuity

Abnormal

- Open circuit or loose connection in Pink/Green wire.

Normal

Support the motorcycle using the hoist or other support to raise the rear wheel off the ground. Measure the output voltage (sensor signal) at the speedometer with the ignition switch ON while slowly turning the rear wheel with your hand.



Connection: Pink/Green and Green/Black  
Standard: Repeat 0 to 5 V

Abnormal

(No input voltage)

- Faulty speed sensor.
- Loose speed sensor bolt.

Normal

(Sensor signal registers on the speedometer)

Faulty speedometer

# HEADLIGHT

## BULB REPLACEMENT

**⚠ WARNING**

- The 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.

**CAUTION**

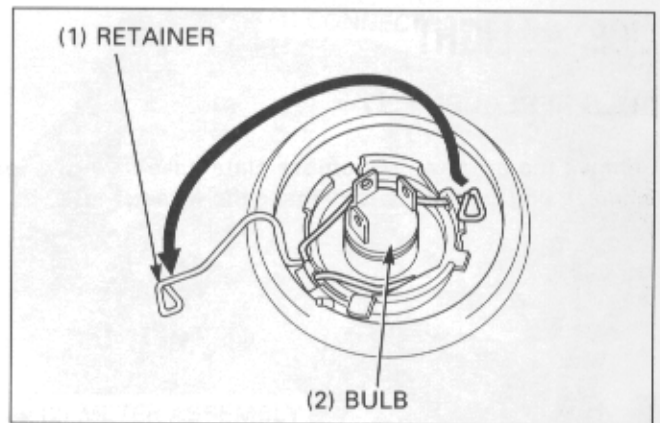
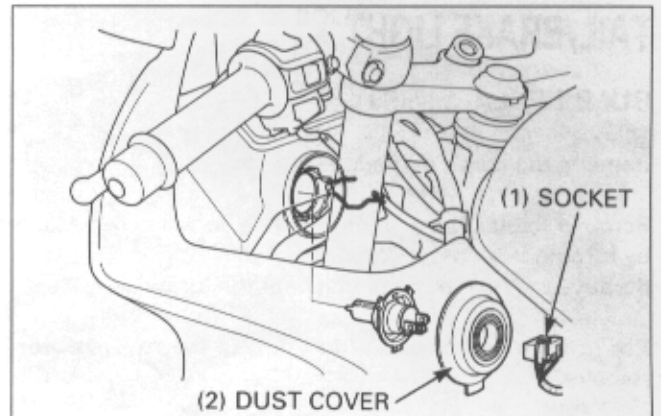
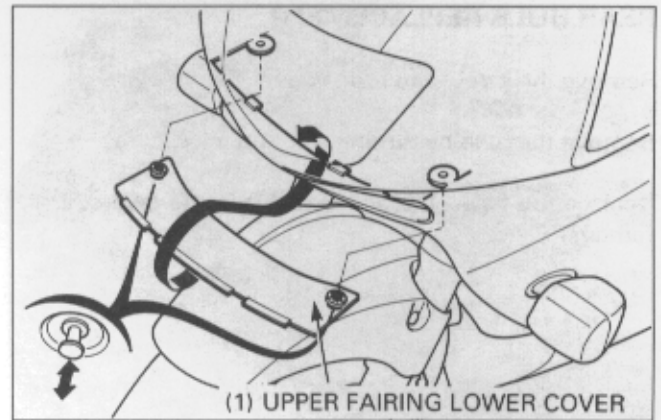
- Wear clean gloves while replacing the bulb. Do not put fingerprints on the headlight bulb, as they may create hot spots on the bulb and cause it to break.
- If you touch the bulb with your bare hands, clean it with a cloth moistened with alcohol to prevent its early failure.
- Be sure to install the dust cover after replacing the bulb.

Remove the upper fairing lower cover.

Disconnect the headlight bulb socket and remove the dust cover.

Release the bulb retainer and remove the headlight bulb.

Install a new bulb and the removed parts in the reverse order of removal.



# TURN SIGNAL

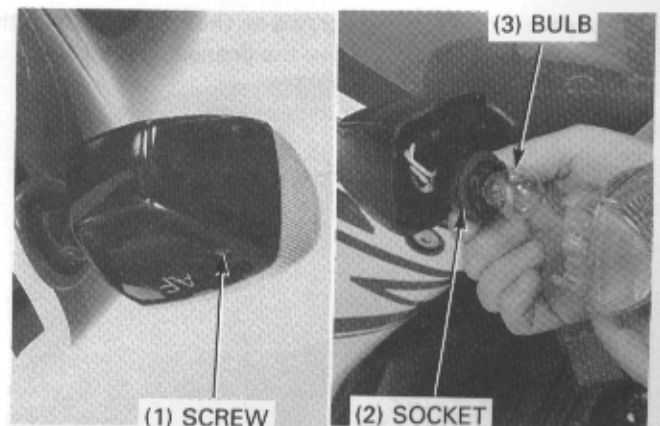
## FRONT BULB REPLACEMENT

Remove the screw and turn signal unit.

Remove the turn signal bulb and socket as an assembly by turning it counterclockwise.

Remove the bulb by turning it counterclockwise.

Replace the new bulb and install it in the reverse order of removal.



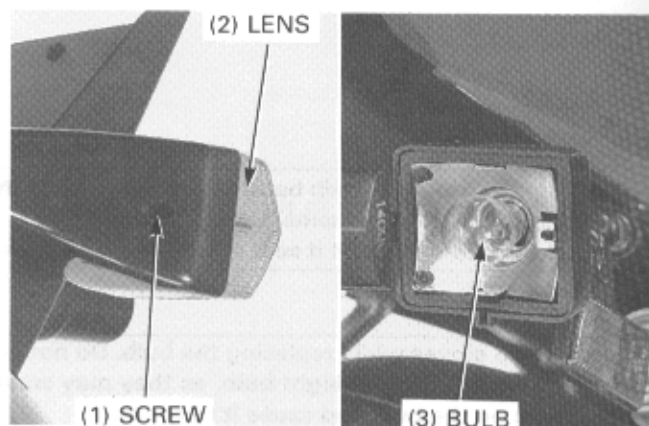
## LIGHTS/METERS/SWITCHES

### REAR BULB REPLACEMENT

Remove the screw and turn signal lens.

Remove the bulb by turning it counterclockwise.

Replace the new bulb and install it in the reverse order of removal.



### TAIL/BRAKE LIGHT

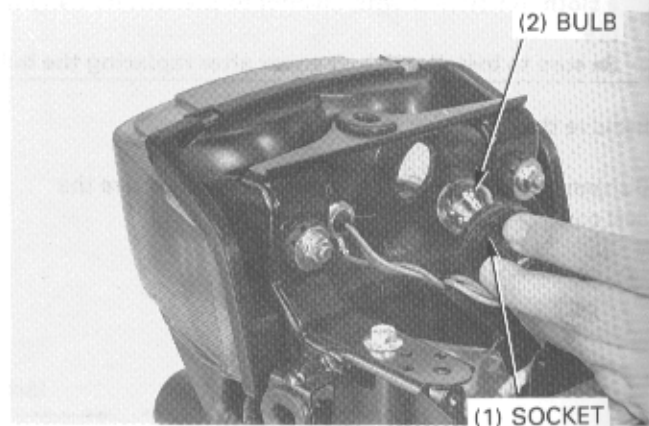
#### BULB REPLACEMENT

Remove the tail cowl (page 2-3).

Remove the tail/brake light bulb and socket as an assembly by turning it counterclockwise.

Remove the bulb by turning it counterclockwise.

Replace the new bulb and install it in the reverse order of removal.



### LICENSE LIGHT

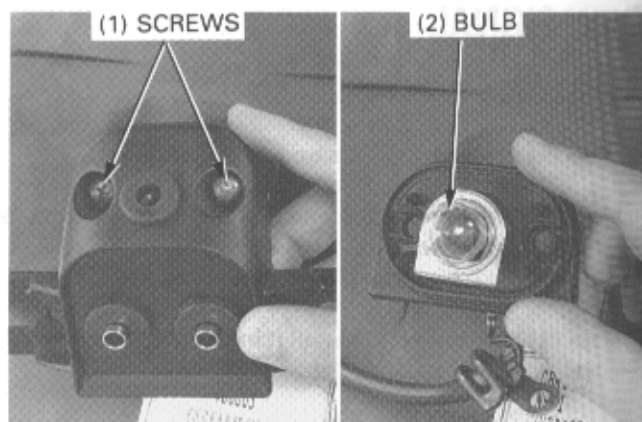
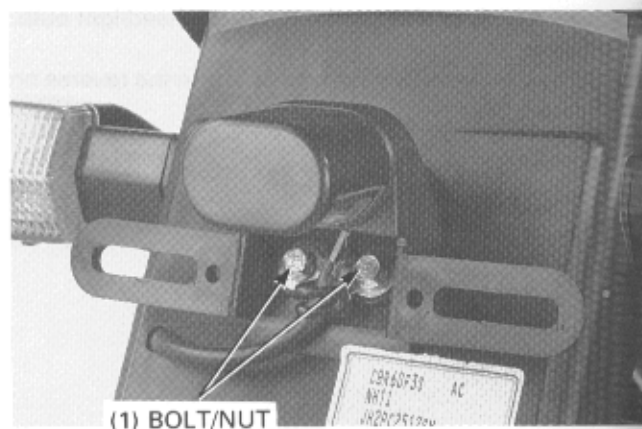
#### BULB REPLACEMENT

Remove the bolts, nuts, number plate base from the rear fender, being careful not to damage the wire harness.

Remove the lens attaching screws on the reverse side of the number plate base and remove the license light lens.

Remove the bulb by turning it counterclockwise.

Replace the new bulb and install it in the reverse order of removal.



## COMBINATION METER

### NOTE

- When checking the speedometer and speed sensor, follow the steps in the troubleshooting flow chart (page 18-3).

### BULB REPLACEMENT

Remove the upper fairing (page 2-4).

Remove the bulb socket by turning it counterclockwise. Remove the bulb and replace with a new one.

Install it in the reverse order of removal.

### REMOVAL

Remove the upper fairing (page 2-4).

Remove the rubber cap from the combination meter. Remove the meter mounting bolts and collars.

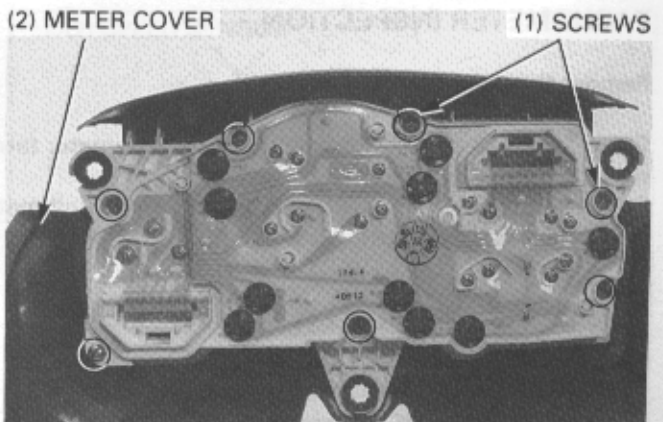
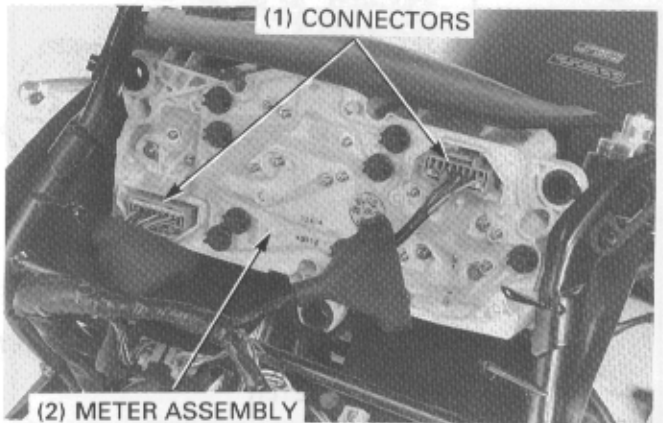
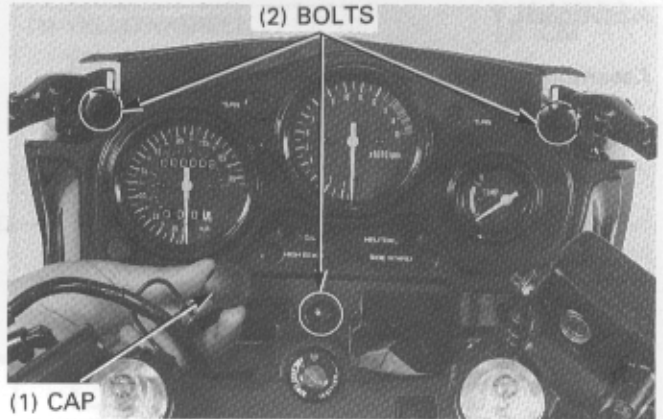
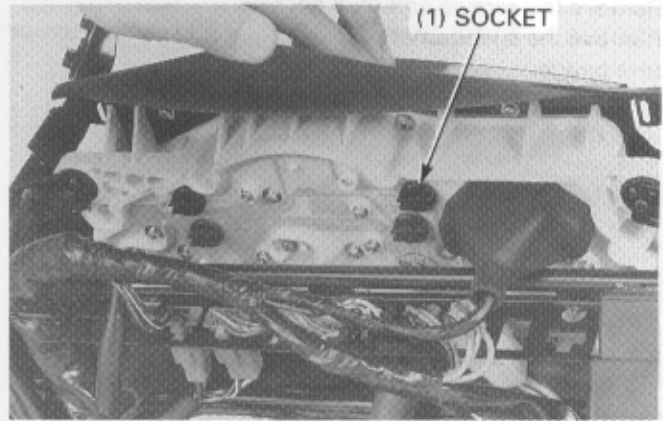
Raise the combination meter and disconnect the connectors. Remove the meter assembly.

### INSTALLATION

Installation is in the reverse order of removal.

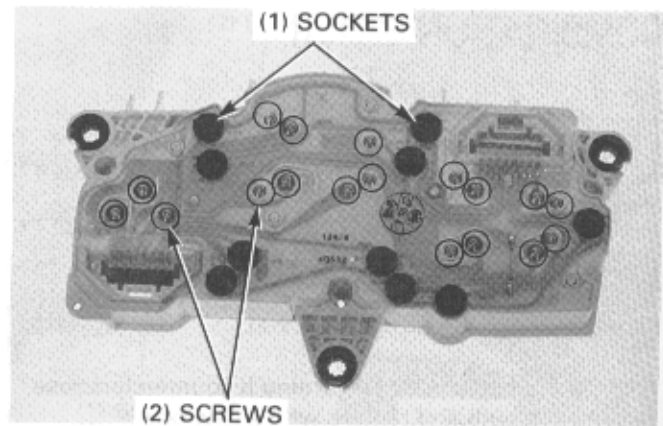
### DISASSEMBLY

Remove the screws and meter cover.



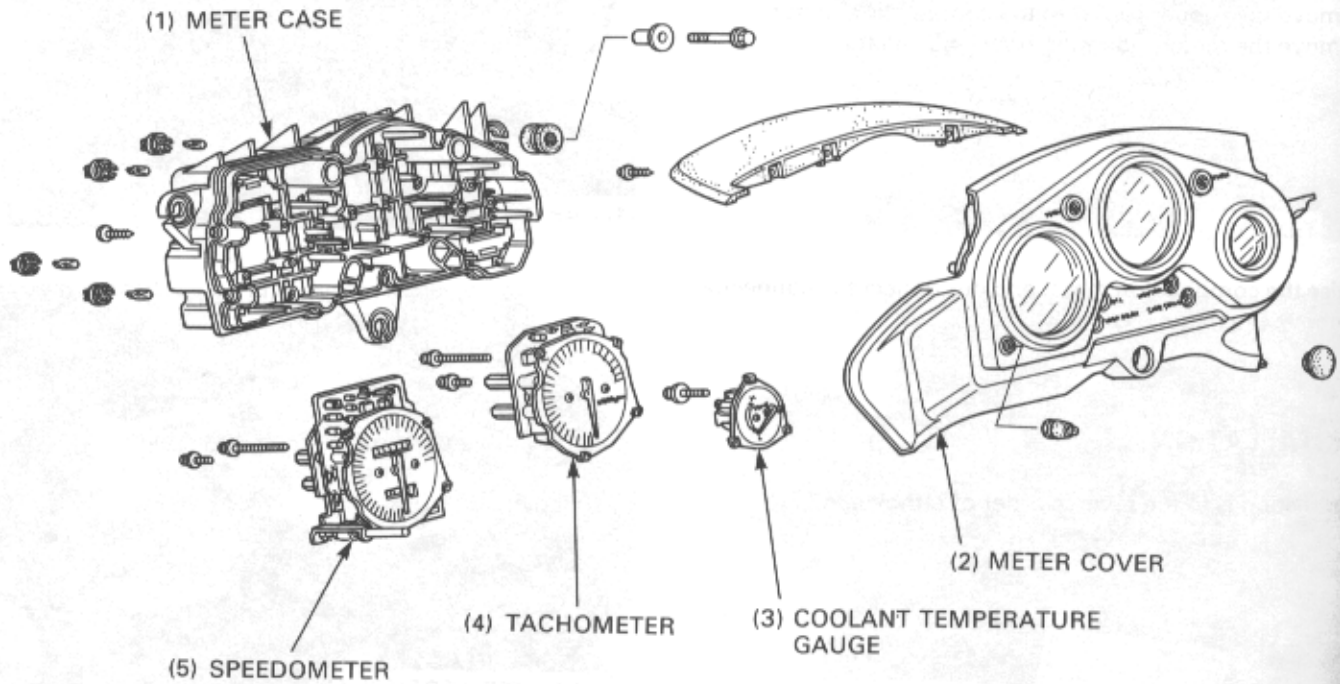
## LIGHTS/METERS/SWITCHES

Remove the screws and bulb sockets.  
Remove the speedometer, tachometer and coolant temperature gauge.



## ASSEMBLY

Assembly is in the reverse order of disassembly.



## TACHOMETER INSPECTION

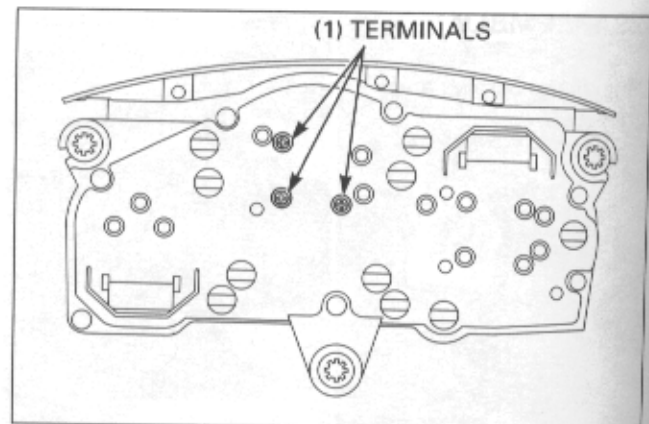
Remove the upper fairing (page 2-4).

Check for loose or poor contacts on the tachometer terminals.

Connect the peak voltage adaptor to the digital multimeter, or use the Imrie diagnostic tester (page 16-4).

### Tools:

Imrie diagnostic tester (model 625) or  
Peak voltage adaptor 07HGJ-0020100 with  
Commercially available digital multimeter  
(impedance 10M $\Omega$ /DCV minimum).



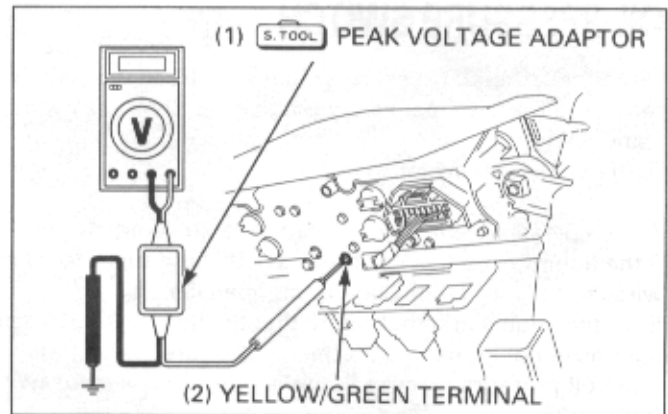
Connect the peak voltage adaptor to the tachometer terminal and ground.

**Connection: Yellow/Green (+) - ground (-)**

Start the engine and measure the tachometer input voltage.

**Peak voltage: 10.5 V minimum**

If the value is normal, replace the tachometer.  
If the value is below 10.5 V, replace the ignition control module (ICM).

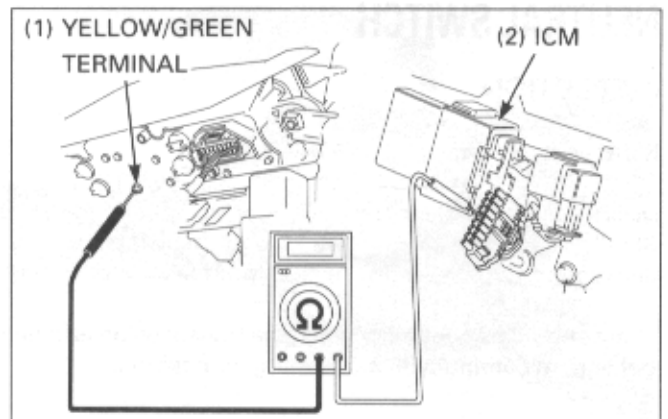


If the value is 0 V, perform the following procedure.  
Disconnect the ignition control module (ICM) 16P connector.

Check for continuity between the tachometer terminal and the ICM 16P connector Yellow/Green terminal.

If there is no continuity, check the wire harness for an open circuit.

If there is continuity, replace the ignition control module (ICM).



## SPEED SENSOR

### NOTE

- When checking the speedometer and speed sensor, follow the steps in the troubleshooting flow chart (page 18-3).

### REMOVAL/INSTALLATION

Remove the side fairing and fuel tank (page 2-3,4).

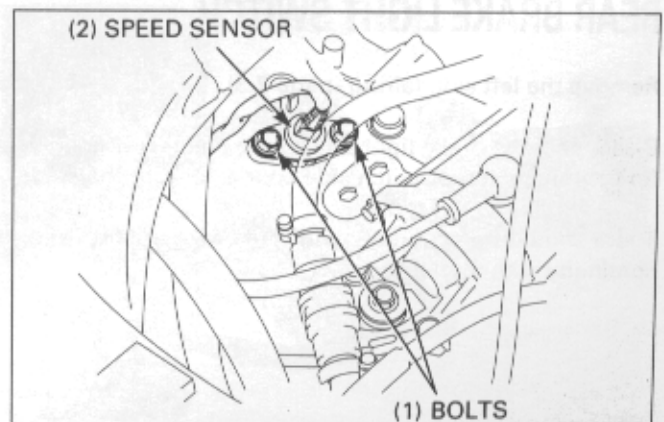
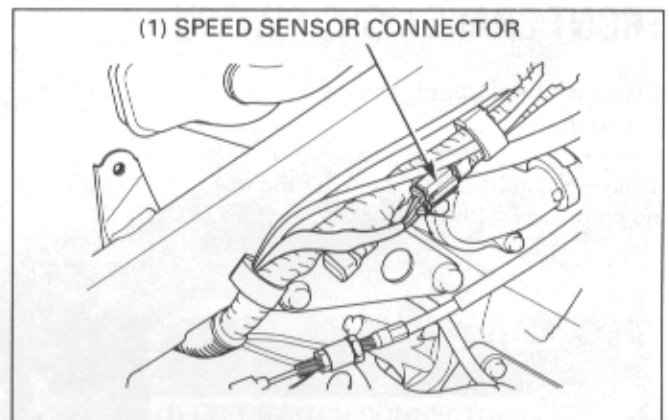
Disconnect the speed sensor 3P connector.

Remove the bolts and speed sensor.  
Remove the O-ring from the speed sensor.

### NOTE

- Use care not to allow dust and dirt to enter the engine.

Installation is in the reverse order of removal.



## OIL PRESSURE SWITCH

Disconnect the oil pressure switch wire from the switch by removing the terminal screw (page 4-3). Short it to ground using a jumper wire.

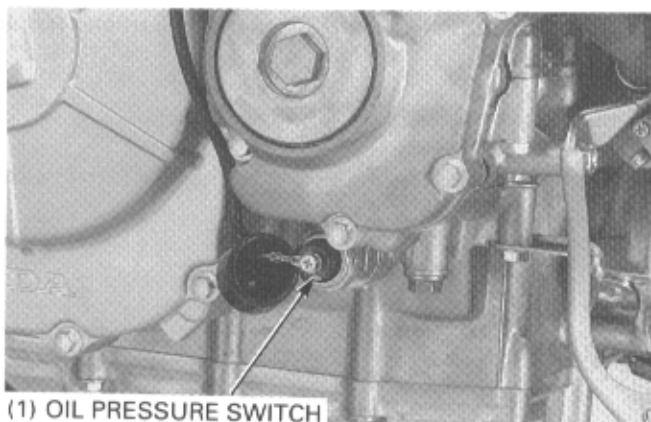
Turn the ignition switch "ON".

The oil pressure warning indicator should come on.

If the light dose not come on, check the sub-fuse (10 A) and wires for a loose connection or an open circuit.

Start the engine and make sure that the light gose out. If the light dose not go out, check the oil pressure (page 4-3).

If the oil pressure is normal, replace the oil pressure switch (page 4-3).



(1) OIL PRESSURE SWITCH

## NEUTRAL SWITCH

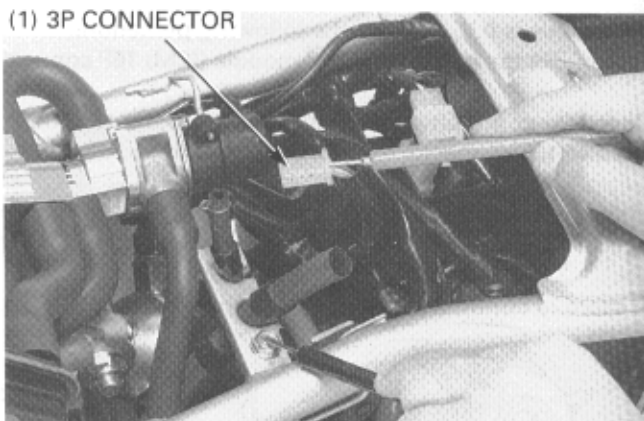
### INSPECTION

Remove the fuel tank (page 2-4).

Disconnect the 3P connector.

Shift the transmission into neutral and check for continuity between the Light green wire and ground.

There should be continuity when the transmission is in neutral and no continuity in any other gear position.

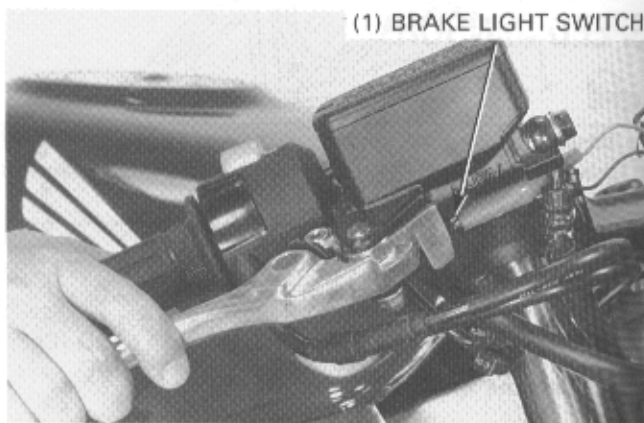


(1) 3P CONNECTOR

## FRONT BRAKE LIGHT SWITCH

Disconnect the front brake light switch wires and check for continuity.

There should be continuity with the front brake applied and no continuity with it released.



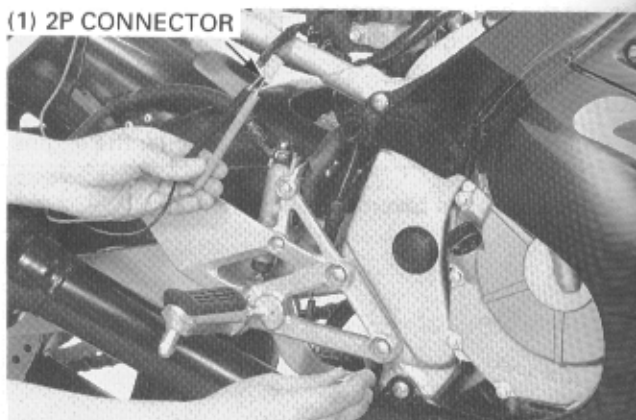
(1) BRAKE LIGHT SWITCH

## REAR BRAKE LIGHT SWITCH

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

Disconnect the brake light 2P (White) connector and check for continuity at the switch side connector terminals.

There should be continuity with the brake applied and no continuity with it released.



(1) 2P CONNECTOR



## CLUTCH SWITCH

Disconnect the clutch switch wires and check for continuity.

There should be continuity with the clutch lever applied and no continuity with it released.

## HANDLEBAR SWITCH

Check for continuity between the terminals. Continuity should exist between the color coded wires as shown in each chart.

### LEFT HANDLEBAR SWITCH

Remove the upper fairing (page 2-4). Disconnect the left handlebar connectors and single lead connectors.

#### DIMMER SWITCH

	Bu/W	W	Bu
Lo	○	○	
(N)	○	○	○
Hi	○		○

#### TURN SIGNAL SWITCH

	Gr	Lb	O	Bl/Br	Lb/W	O/W
R	○	○		○		○
N				○	○	○
L	○		○	○	○	

#### HORN SWITCH

	Lg	Bl/Br
Free		
Push	○	○

### RIGHT HANDLEBAR SWITCH

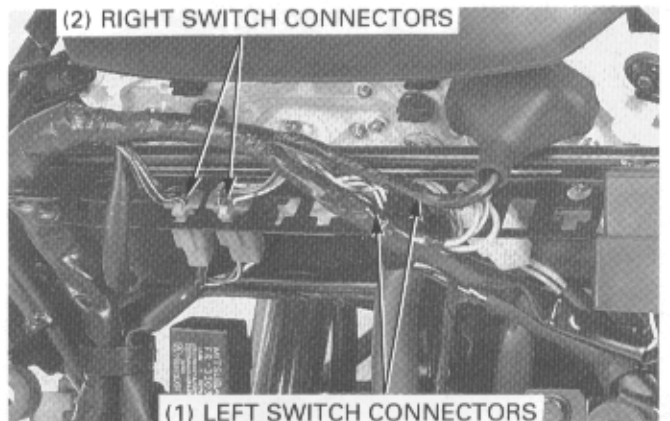
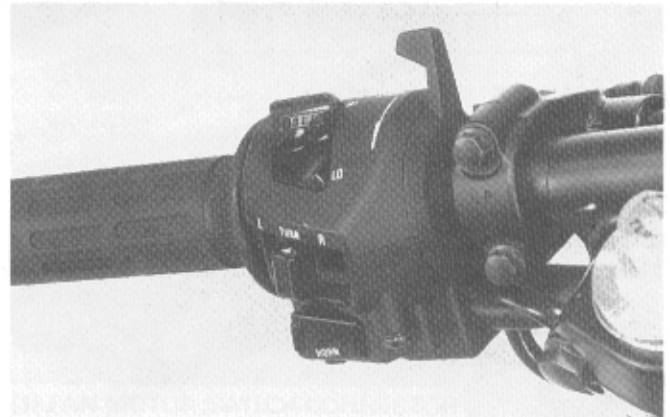
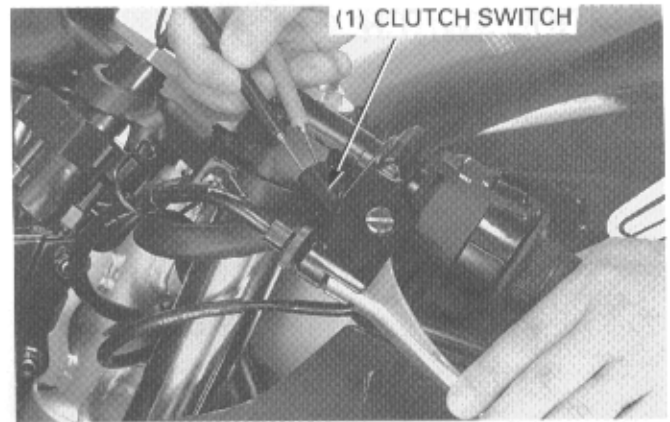
Disconnect the right handlebar connectors and single lead connector.

#### STARTER SWITCH

	Y/R	Bl/W	Bu/W	Bl/R
Free			○	○
Push	○	○		

#### ENGINE STOP SWITCH

	Bl	Bl/W
Off		
Run	○	○



## IGNITION SWITCH

### INSPECTION

Remove the upper fairing (page 2-4).

Disconnect the ignition switch 3P connector.  
Check for continuity between the terminals.  
Continuity should exist between the color coded wire as shown in chart.

	R	R/Bl	Bu/O
On	○	○	○
Off			
Lock			

### REMOVAL/INSTALLATION

Remove the upper fairing (page 2-4).

Disconnect the ignition switch 3P connector.  
Release the ignition switch wire from the clamp, band and guide.

Remove the bolts and ignition switch.

**Tool:**  
Torx bit (T40)

**07703 - 0010100 or  
equivalent commercially  
available in U.S.A.**

Install the ignition switch in the reverse order of removal.  
Install and tighten the new bolts.

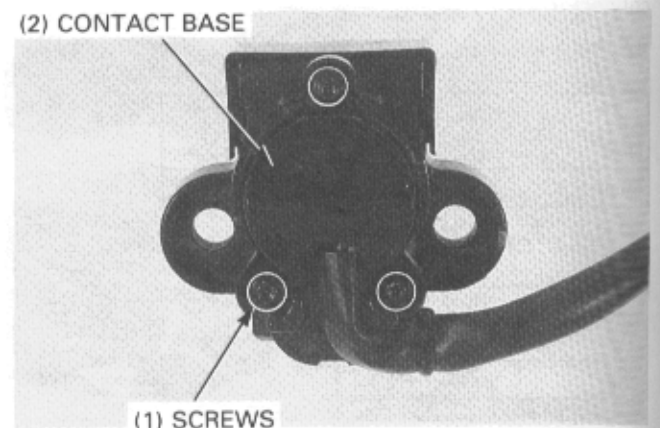
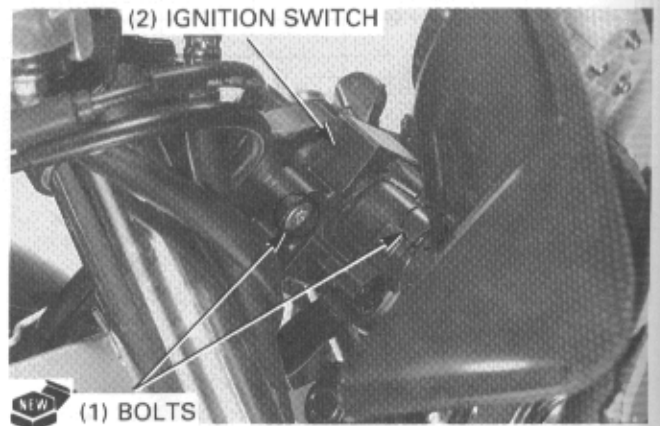
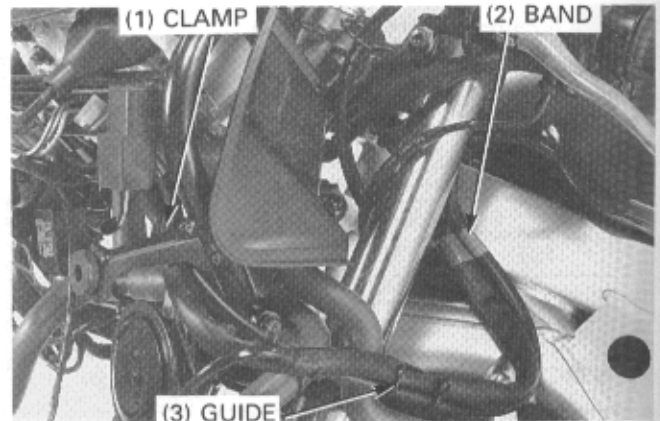
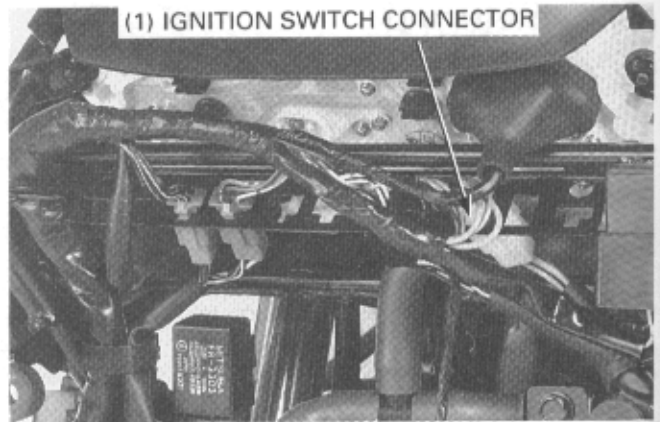
**Torque: 25 N·m (2.5 kg·m, 18 lb·ft)**

### DISASSEMBLY

Remove the three screws and pull the contact base out of the cylinder.

**Tool:**  
Torx bit (T10H)

**Commercially available**



**ASSEMBLY**

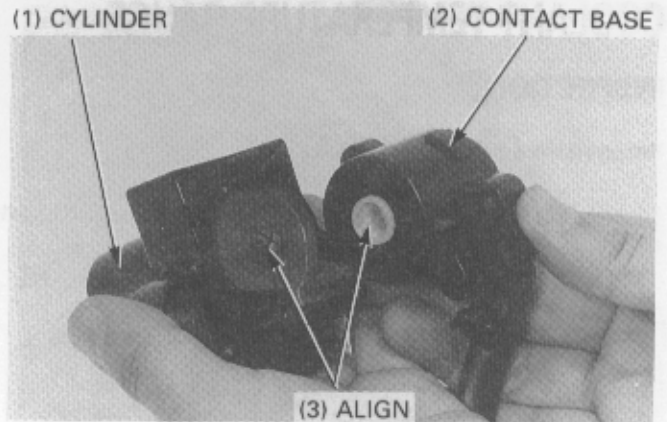
Install the contact base, aligning the hole of the base with the shaft of the cylinder.

Install and tighten the screws.

**Tool :**

**Torx bit (T10H)**

**Commercially available**



**FAN MOTOR SWITCH**

**INSPECTION**

Remove the side fairing (page 2-3).

**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 a shorted wire between the fan motor and switch.

If the fan motor stops, replace the fan motor switch.

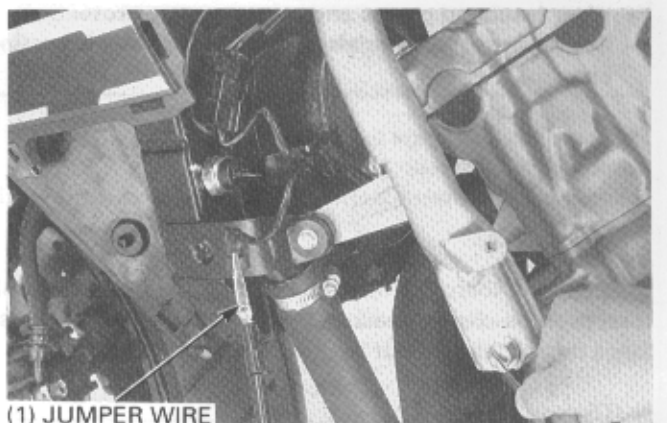
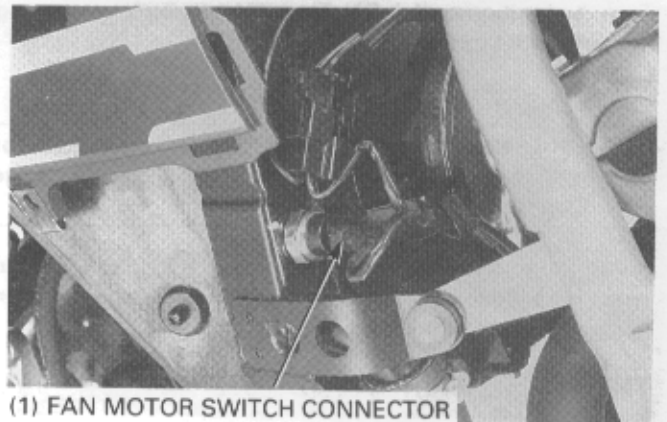
**Fan motor does not start**

Before testing, warm up the engine to operating temperature.

Disconnect the connector from the fan motor switch and ground the connector to the body 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 motor does not start, check for voltage between the fan motor switch connector and ground.

- Battery voltage:      Faulty fan motor
- No battery voltage: • Broken wire harness
- Blown sub fuse
- Faulty ignition switch
- Poor connection of the connector (between the ignition switch and fuse box)



**REMOVAL/INSTALLATION**

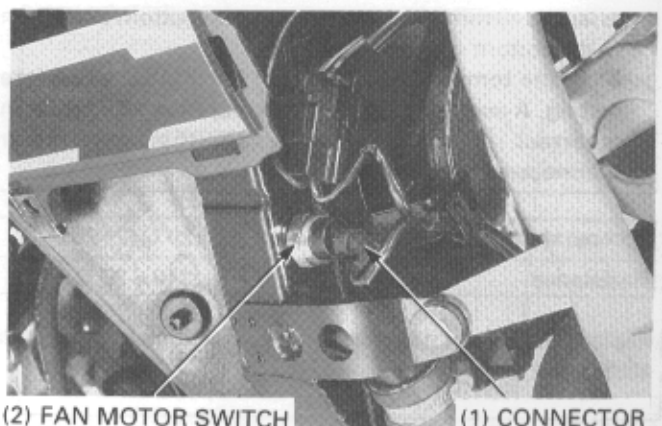
Remove the side fairing (page 2-3).  
Drain the coolant (page 6-4).

Disconnect the connector and remove the fan motor switch.

Install the new O-ring and apply sealant to the fan motor switch threads.

Install and tighten the switch.

**Torque: 10 N·m (1.0 kg-m, 7 lb-ft)**



# COOLANT TEMPERATURE GAUGE

## INSPECTION

Remove the fuel tank (page 2-4).

Disconnect the connector from the thermosensor and short it to body ground.

Turn the ignition switch ON. The coolant temperature gauge needle should move all the way to "H".

### CAUTION

- Do not leave the thermosensor wire grounded for longer than a few seconds or the temperature gauge will be damaged.

If the gauge does not move, check the sub fuse (15A) and wires for a loose connection or an open circuit; if normal, replace the gauge with a new one.

## THERMOSENSOR INSPECTION

### WARNING

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

Drain the coolant (page 6-4).  
 Remove the carburetor (page 5-5).  
 Disconnect the thermosensor connector and remove the thermosensor.

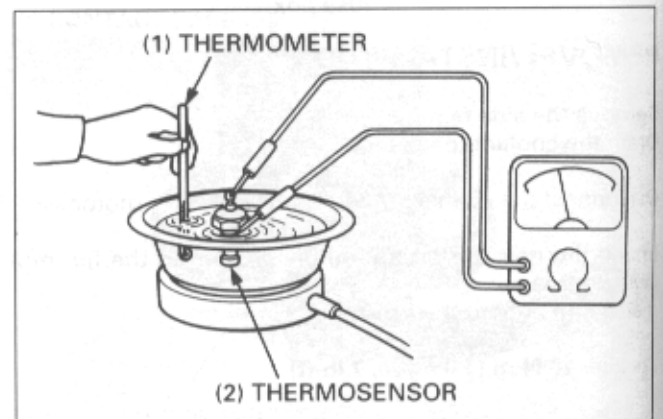
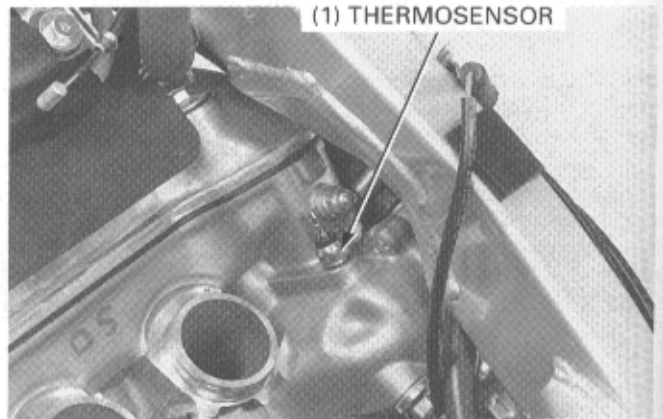
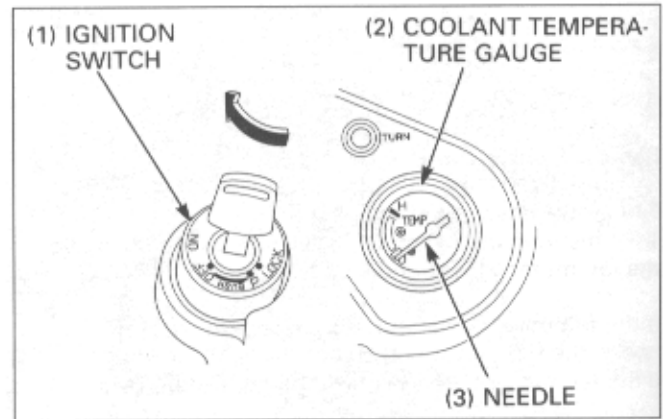
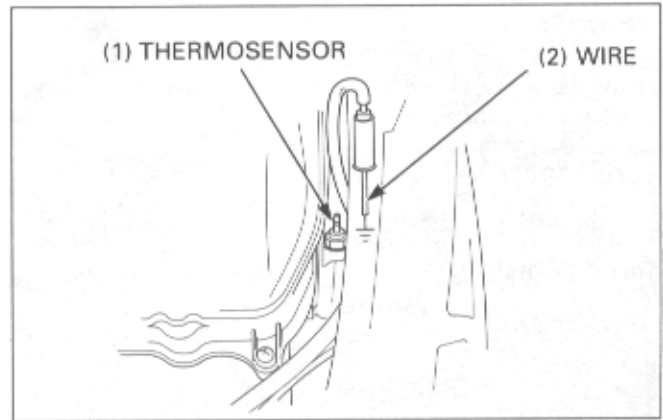
Suspend the thermosensor in a pan of coolant (50-50 mixture) over the electric heating element and measure the resistance through the sensor as the coolant heats up.

### NOTE

- Soak the thermosensor in coolant up to its threads with at least a 40 mm (1.57 in) gap 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.

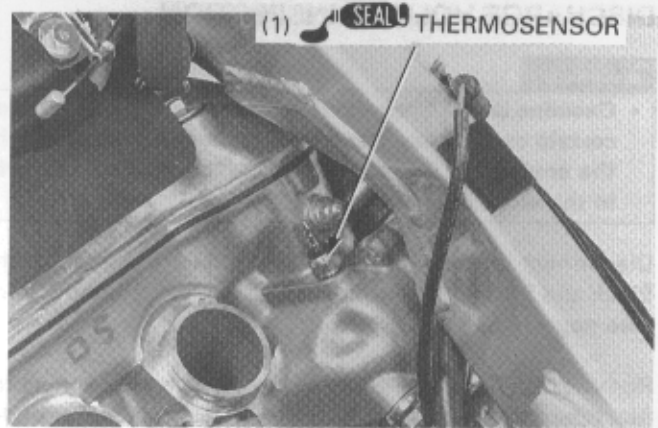
Temperature	80°C (176°F)	120°C (248°F)
Resistance	45 - 60 Ω	10 - 20 Ω

Replace the sensor 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 the thermosensor.

**Torque: 10 N·m (1.0 kg·m, 7 lb-ft)**



## FUEL PUMP

### SYSTEM INSPECTION

Turn the ignition switch OFF.  
Remove the side cover (page 2-2) and disconnect the fuel cut-off relay connector.

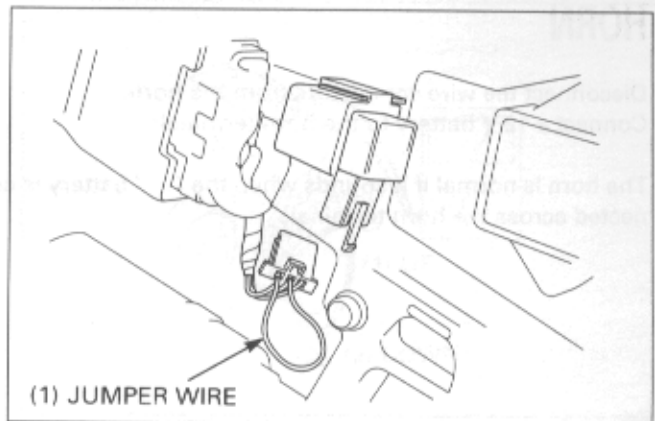
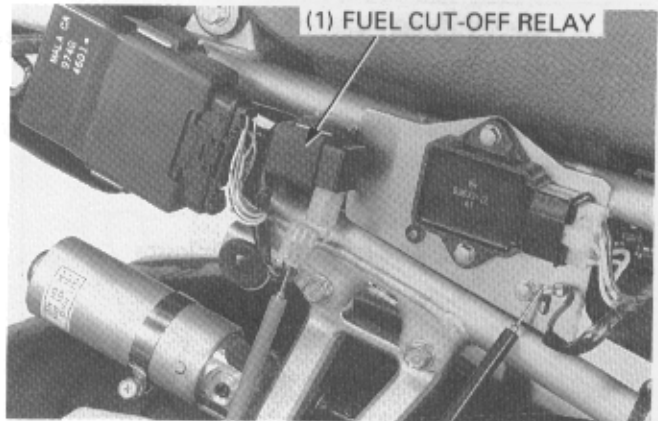
Check for battery voltage between the Black (+) terminal and ground (-).  
There should be battery voltage with the ignition switch ON.

If there is no voltage, check for an open circuit or loose connection in the Blue/Yellow wire.  
If there is battery voltage, check for continuity in the Black/Blue wire.

Check for continuity, between the Black/Blue wire and ground.

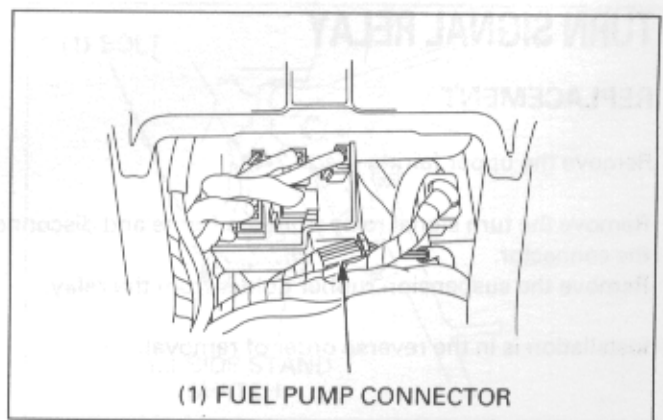
If there is continuity, replace the fuel cut-off relay.

If there is no continuity, short the Black and Black/Blue terminals at the relay connector with the suitable jumper wire.



Disconnect the fuel pump 2P (Black) connector and check for battery voltage between the Black/Blue (+) and Green (-) terminals with the ignition switch ON.

If there is battery voltage, replace the fuel pump.  
If there is no battery voltage, check for an open circuit or loose connection in the Black and Green wires.



### DISCHARGE VOLUME INSPECTION

**⚠ WARNING**

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

Disconnect the fuel cut-off relay connector and short the Black and Black/Blue terminals with a suitable jumper wire (see page 18-5).

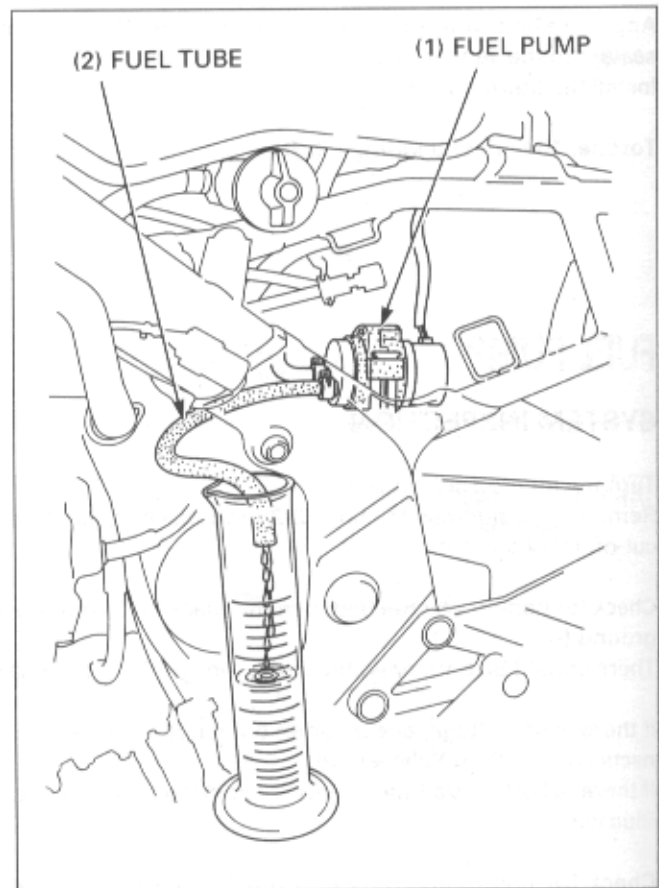
Remove the right side cover (page 2-2) and disconnect the fuel tube from the tube joint. Hold a graduated beaker under the fuel tube.

Turn the ignition switch ON and let the fuel flow into the beaker for 5 seconds, then turn the ignition switch OFF.

Multiply the amount in the beaker by 12 to determine the fuel pump flow capacity per minute.

**Fuel pump flow capacity:**

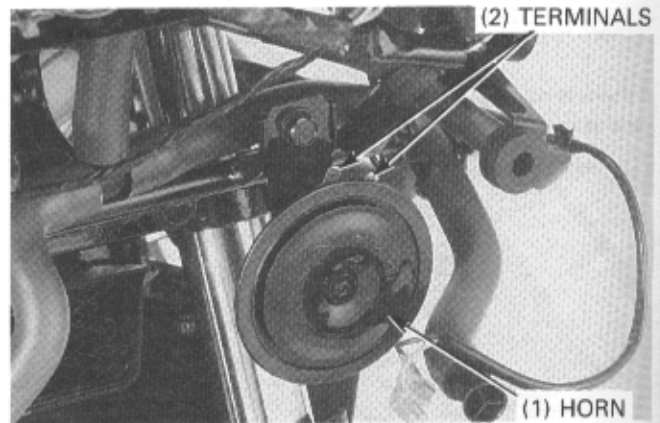
700 cc (23.7 US oz, 24.6 Imp oz) min./minute



### HORN

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

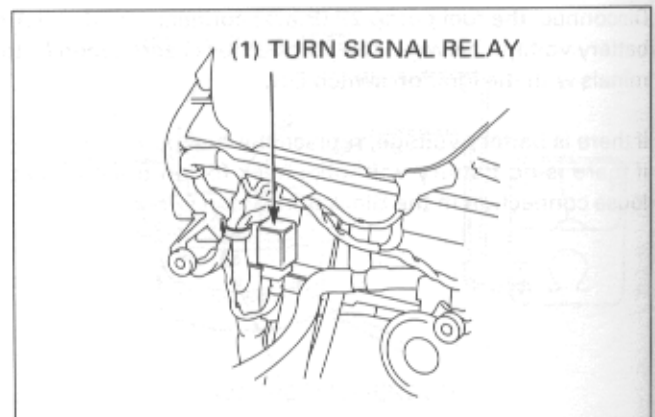
#### REPLACEMENT

Remove the upper fairing (page 2-4).

Remove the turn signal relay from the frame and disconnect the connector.

Remove the suspension rubber holder from the relay.

Installation is in the reverse order of removal.



**PERFORMANCE TEST**

Remove the turn signal relay (see page 18-16).  
Check for turn signal circuit connection before testing.

Connect the terminals as described below:

- Black/Brown: DC 12 V Positive (+)
- Green: DC 12 V Negative (-)
- Gray: Turn signal wire of one side; connect other side to ground (frame)

Check lighting ON and OFF properly.

If the turn signal relay fails this test, replace the relay with a new one.

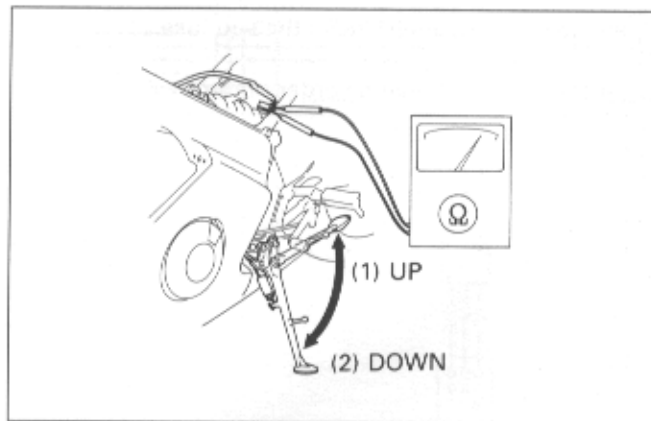
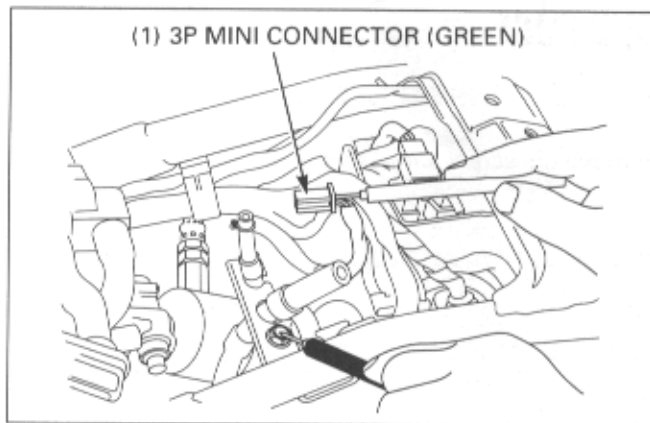
**SIDE STAND SWITCH**

**INSPECTION**

Remove the fuel tank (page 2-4).  
Disconnect the side stand switch 3P mini connector.

Check for continuity between each of the terminals as below. There should be continuity between the ○—○ positions on the chart below.

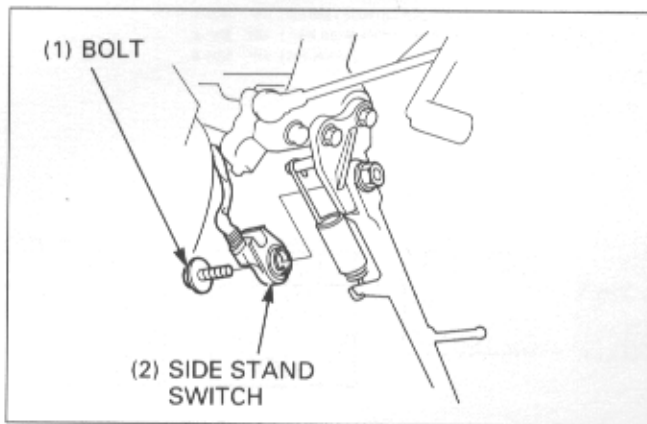
	Green/White	Yellow/Black	Green
Side stand down		○—○	○
Side stand up	○—○		○



**REMOVAL/INSTALLATION**

Remove the fuel tank (page 2-4).

Disconnect the side stand switch 3P mini connector (Green) and remove the bolt and side stand switch .



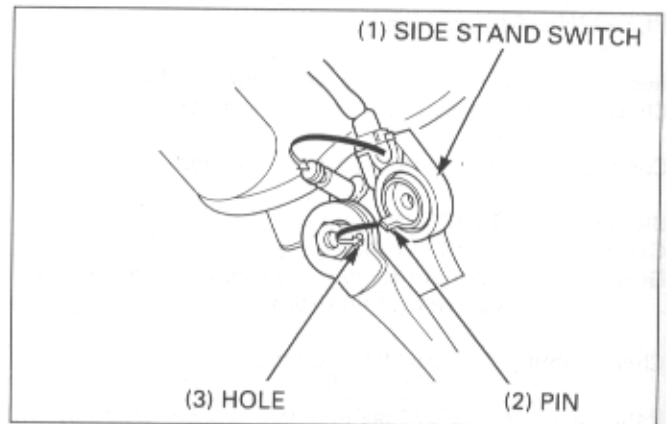
## LIGHTS/METERS/SWITCHES

Install the side stand switch aligning the pin on the switch with the hole in the side stand.

Secure the side stand switch with the bolt.

**Torque : 10 N·m (1.0 kg-m, 7 lb-ft)**

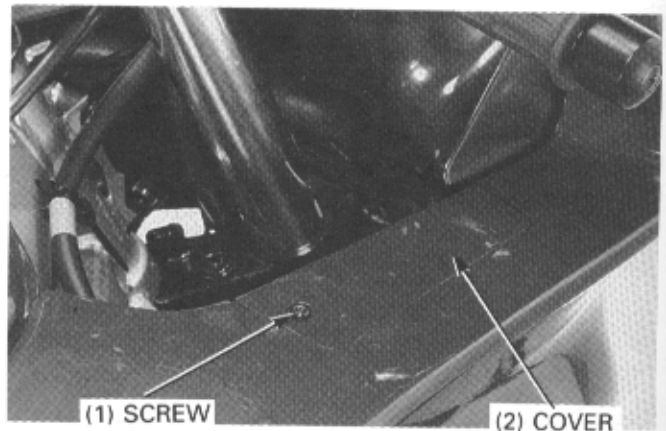
Install the removed parts in the reverse order of removal.



## SUB FUSE

### REMOVAL/INSTALLATION

Remove the screw and fuse box cover.



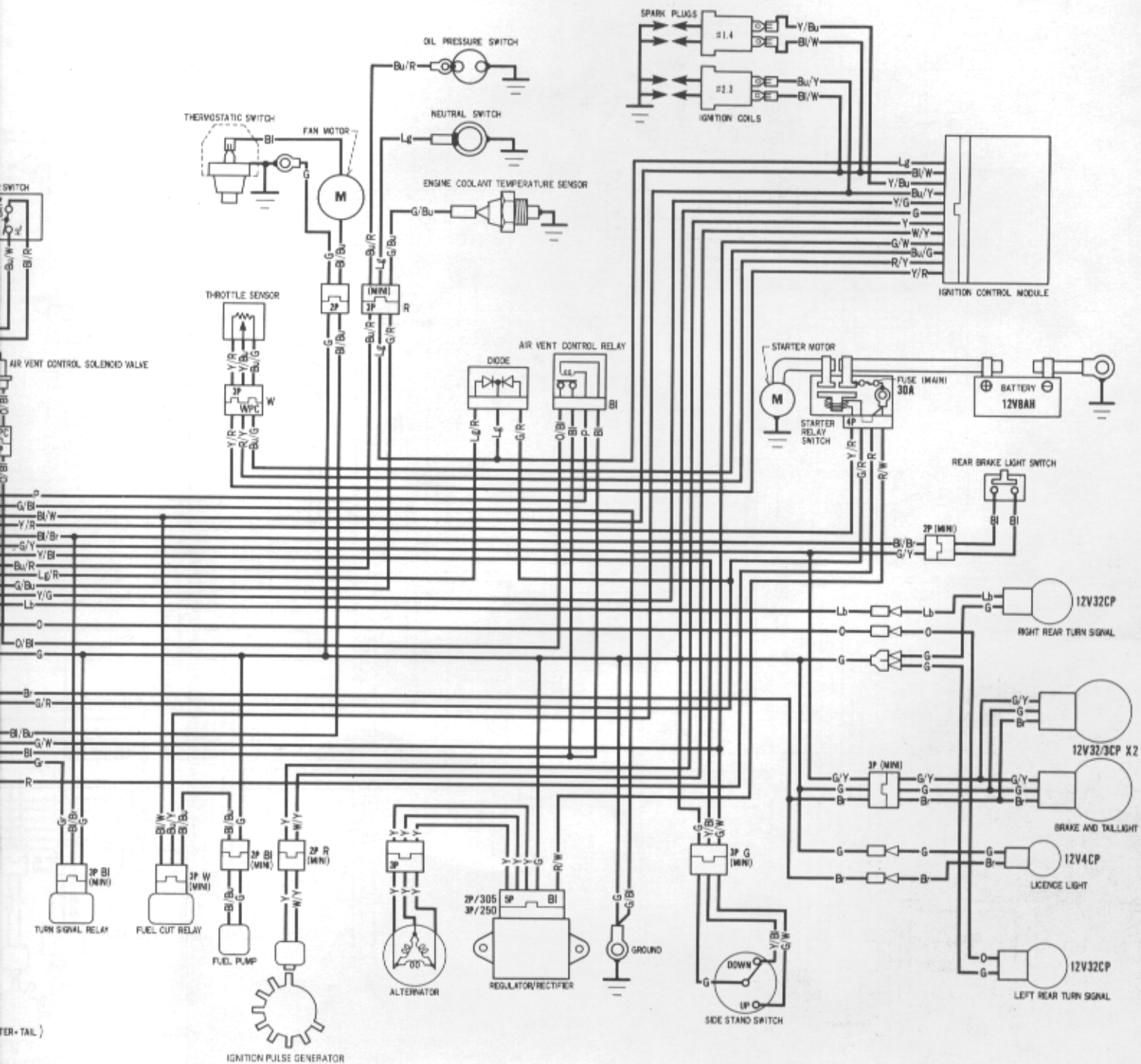
Open the fuse box and remove the sub fuse.

Installation is in the reverse order of removal.





# 19. WIRING DIAGRAMS



IG	BAT2
OFF	
RUN	

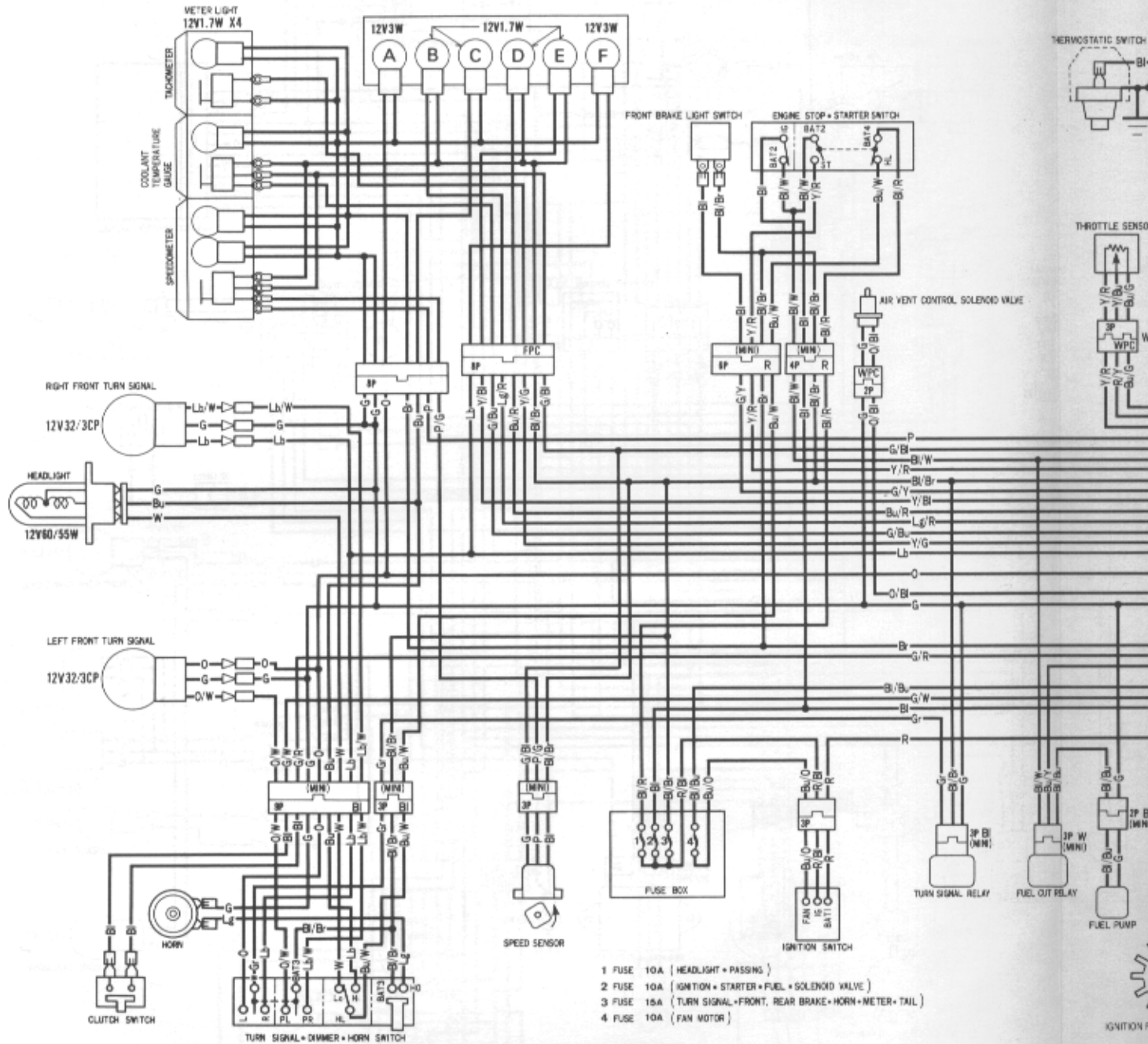
  

ST	BAT2	HL	BAT4
FREE			
PUSH			

0030Z-MAL-6700

# '95: 49 STATE, CANADA TYPE

- A LEFT TURN SIGNAL INDICATOR
- B NEUTRAL INDICATOR
- C HIGH BEAM INDICATOR
- D OIL PRESSURE LIGHT
- E SIDE STAND INDICATOR
- F RIGHT TURN SIGNAL INDICATOR



- 1 FUSE 10A (HEADLIGHT + PASSING)
- 2 FUSE 10A (IGNITION + STARTER + FUEL + SOLENOID VALVE)
- 3 FUSE 15A (TURN SIGNAL + FRONT, REAR BRAKE + HORN + METER + TAIL)
- 4 FUSE 10A (FAN MOTOR)

### SWITCH CONTINUITY

IGNITION SWITCH	FAN	IG	BAT1
ON	○	○	○
OFF			
LOCK			

TURN SIGNAL SWITCH	W	R	L	BAT3	PR	PL
R	○	○		○	○	○
N				○	○	○
L	○		○	○	○	○

DIMMER SWITCH	HL	Lo	Hi
Lo	○	○	
IN	○	○	○
Hi	○		○

HORN SWITCH	HO	BAT3
FREE		
PUSH	○	○

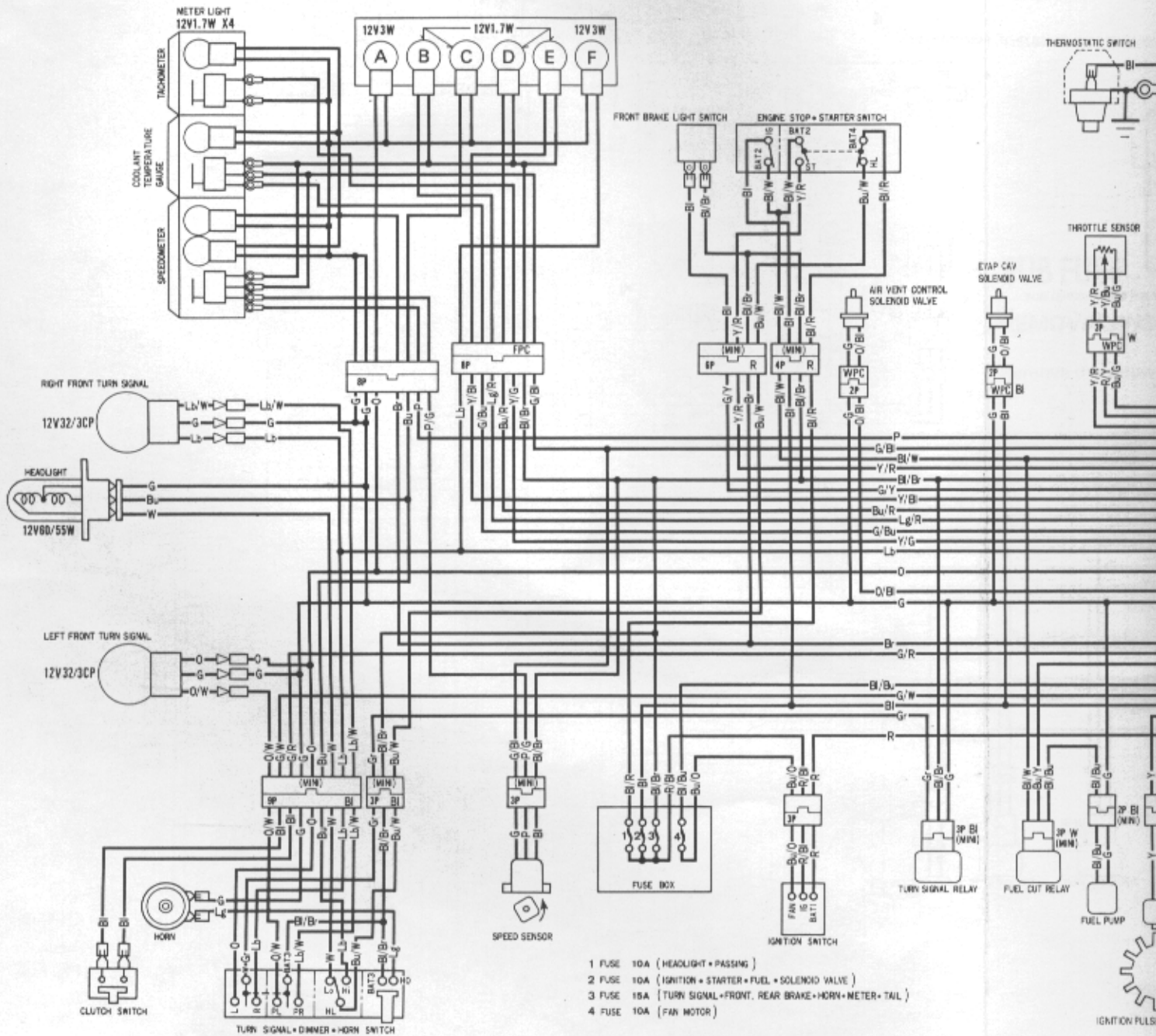
ENGINE STOP SWITCH	IG	BAT2
OFF		
RUN	○	○

STARTER SWITCH	ST	BAT2	HL
FREE			○
PUSH	○	○	○

# WIRING DIAGRAMS

## '95: CALIFORNIA TYPE

- A LEFT TURN SIGNAL INDICATOR
- B NEUTRAL INDICATOR
- C HIGH BEAM INDICATOR
- D OIL PRESSURE LIGHT
- E SIDE STAND INDICATOR
- F RIGHT TURN SIGNAL INDICATOR



**SWITCH CONTINUITY**

IGNITION SWITCH		FAN	IG	BAT1
ON	○	○	○	
OFF				
LOCK				

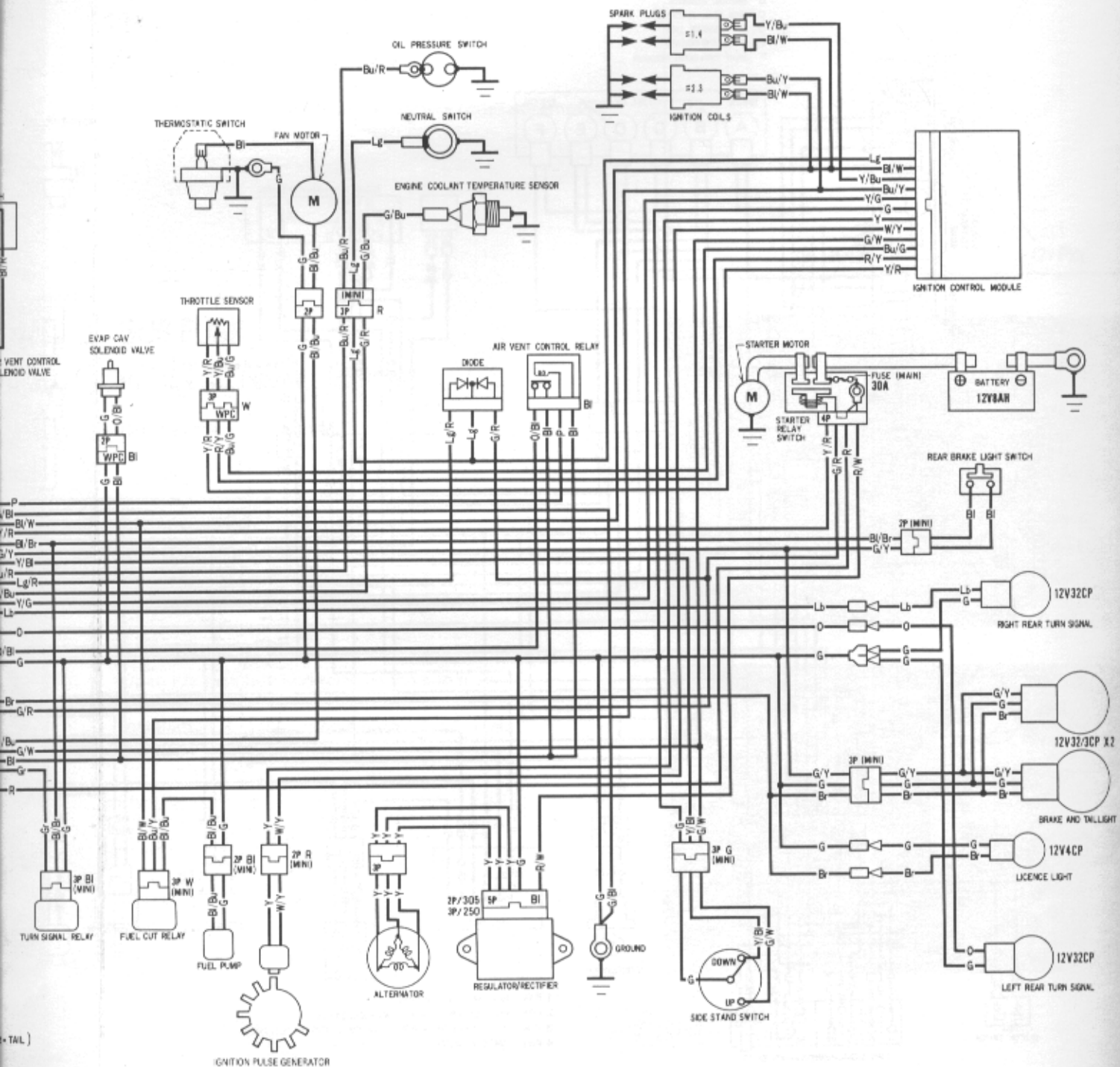
TURN SIGNAL SWITCH		W	R	L	BAT3	PR	PL
R	○						
N							
L	○						

DIMMER SWITCH		HL	Lo	Hi
Lo	○			
(N)				
Hi	○			

HORN SWITCH		HO	BAT3
FREE			
PUSH	○		

ENGINE STOP SWITCH		IG	BAT2
OFF			
RUN	○		

STARTER SWITCH		ST	BAT2	HL	B
FREE					
PUSH	○				



ENGINE STOP SWITCH

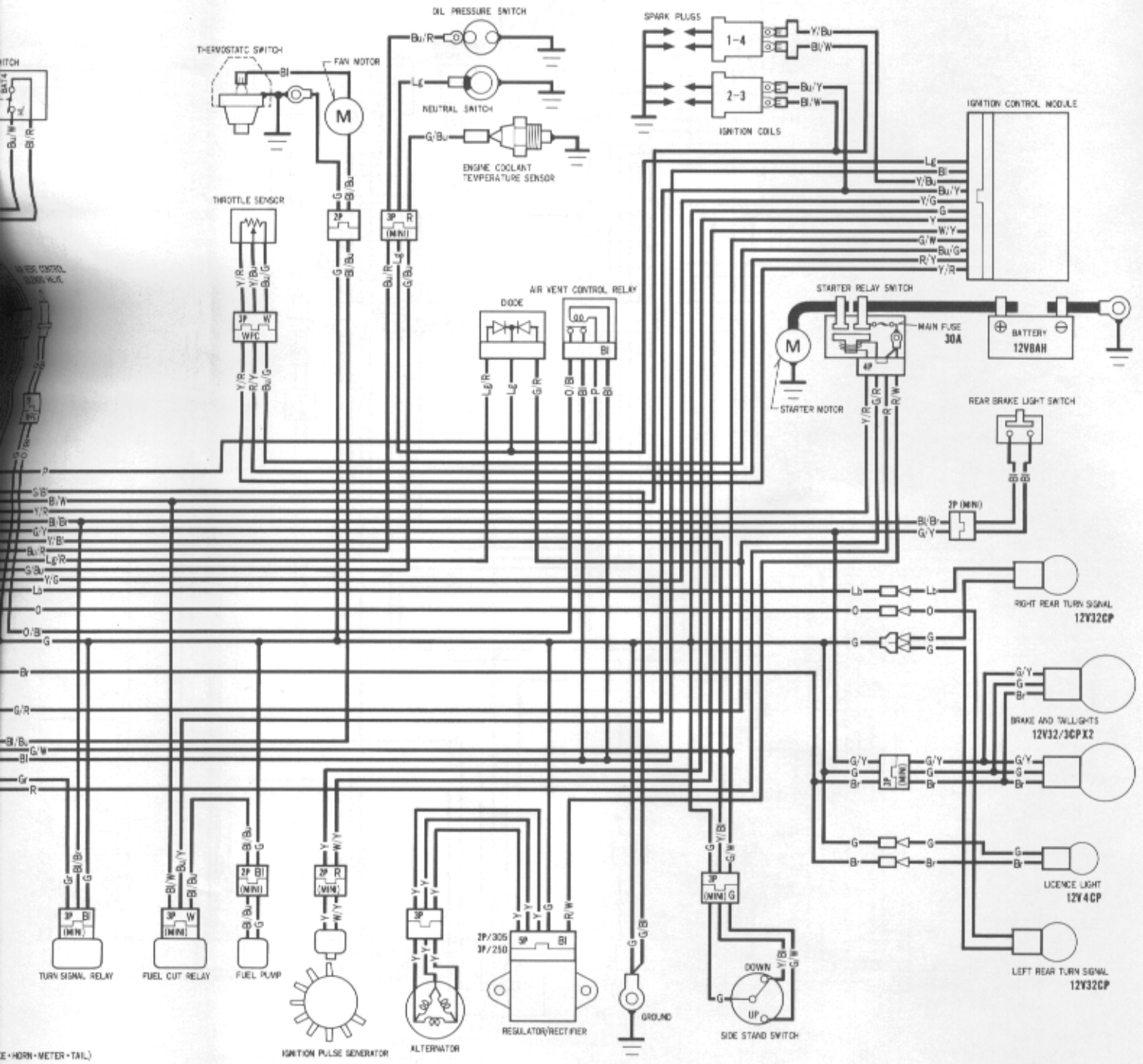
	IG	BAT2
OFF		
RUN	○	○

STARTER SWITCH

	ST	BAT2	HL	BAT4
FREE			○	○
PUSH	○			

0030Z-MAL-7700





12V32CP  
12V32CP

(E+HORN-METER-TAIL)  
(D VALVE)

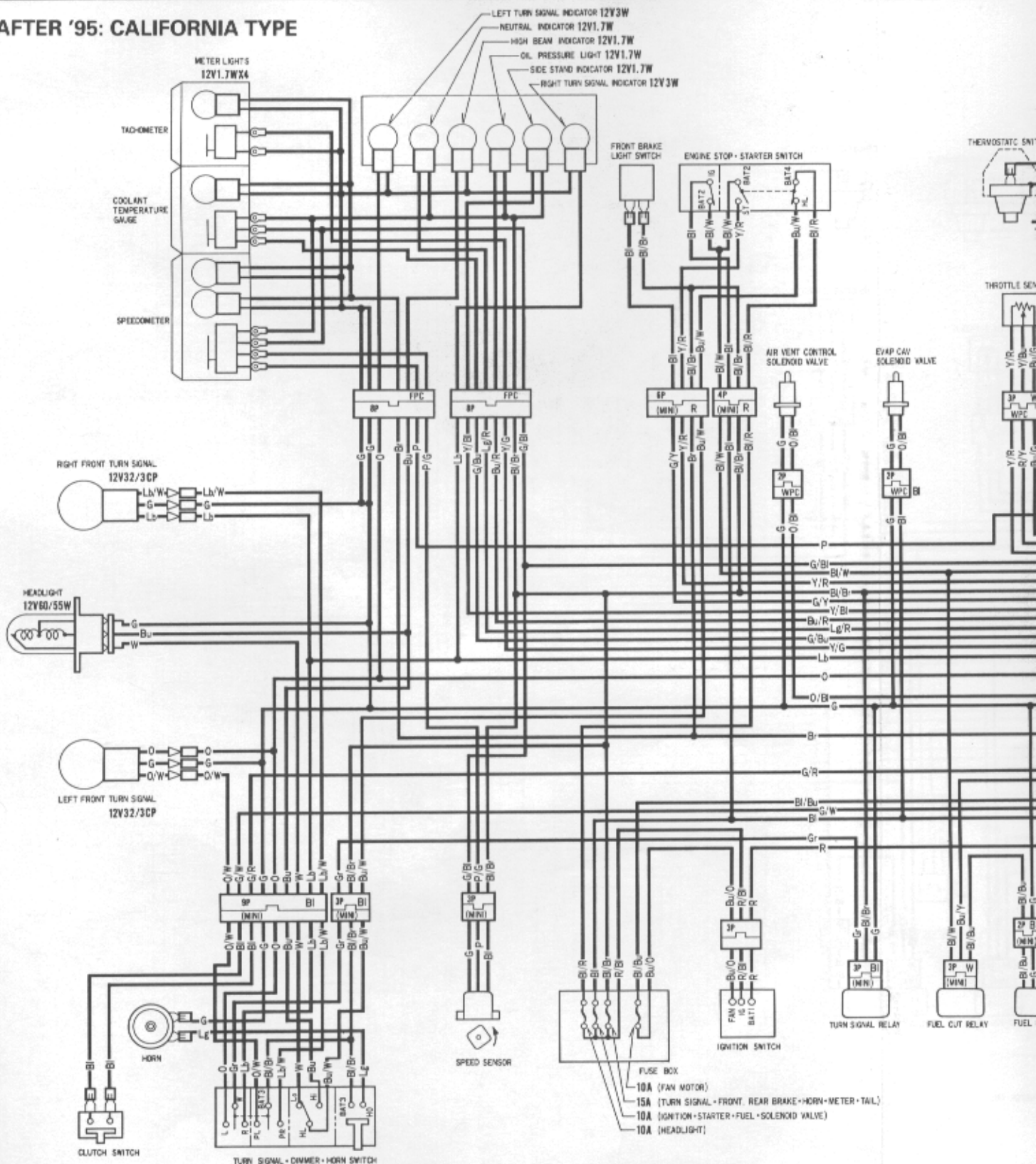
STOP SWITCH		STARTER SWITCH	
IG	BAT2	ST	BAT2
		HL	BAT4
FREE			
PUSH			

- Bl ..... BLACK
- Y ..... YELLOW
- Bu ..... BLUE
- G ..... GREEN
- R ..... RED
- W ..... WHITE
- Br ..... BROWN
- D ..... ORANGE
- Lb ..... LIGHT BLUE
- Lg ..... LIGHT GREEN
- P ..... PINK
- Gr ..... GRAY

0030Z-MAL-8900

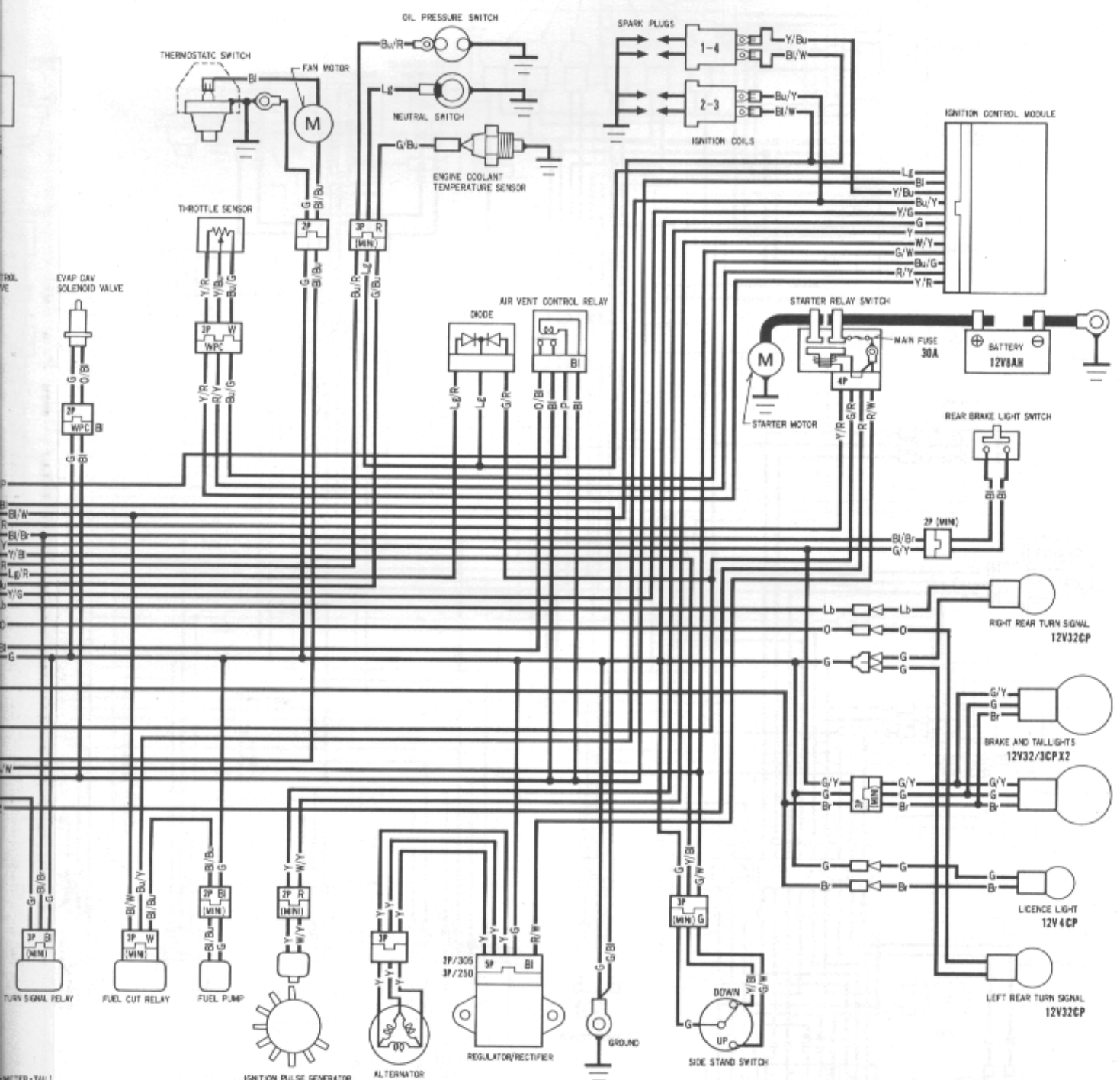
# WIRING DIAGRAMS

## AFTER '95: CALIFORNIA TYPE



SWITCH CONTINUITY

TURN SIGNAL SWITCH						DIMMER SWITCH			HORN SWITCH		IGNITION SWITCH			ENGINE STOP SWITCH		STARTER SWITCH							
	W	R	L	BAT3	PR	PL	HL	Lo	Hi	FREE	HO	BAT3	ON	OFF	LOCK	OFF	IG	BAT2	FREE	ST	BAT2	HL	BAT4
R	○	○		○	○	○		○			○		○	○			○				○		
N																							
L																							



IGNITION	STARTER SWITCH		
BAT2	ST	BAT2	BAT4
FREE			
PUSH			

- Bl ..... BLACK
- Y ..... YELLOW
- Bu ..... BLUE
- G ..... GREEN
- R ..... RED
- W ..... WHITE
- Br ..... BROWN
- O ..... ORANGE
- Ls ..... LIGHT BLUE
- Lg ..... LIGHT GREEN
- P ..... PINK
- Gr ..... GRAY

**0030Z-MAL-9200**

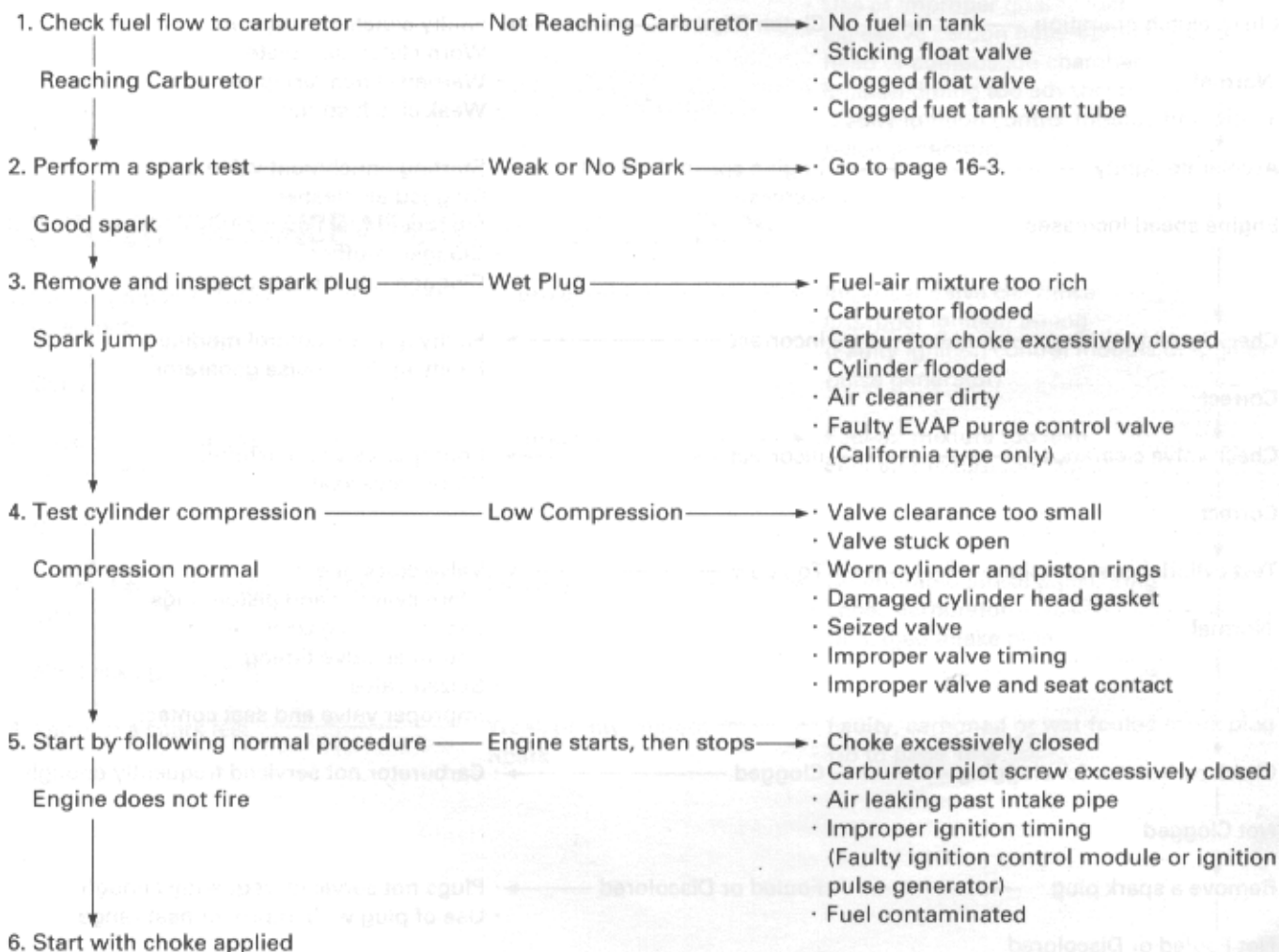


# 20. TROUBLESHOOTING

**ENGINE DOES NOT START OR IS HARD TO START** 20-1  
**ENGINE LACKS POWER** 20-2  
**POOR PERFORMANCE AT LOW AND LDLE SPEEDS** 20-3

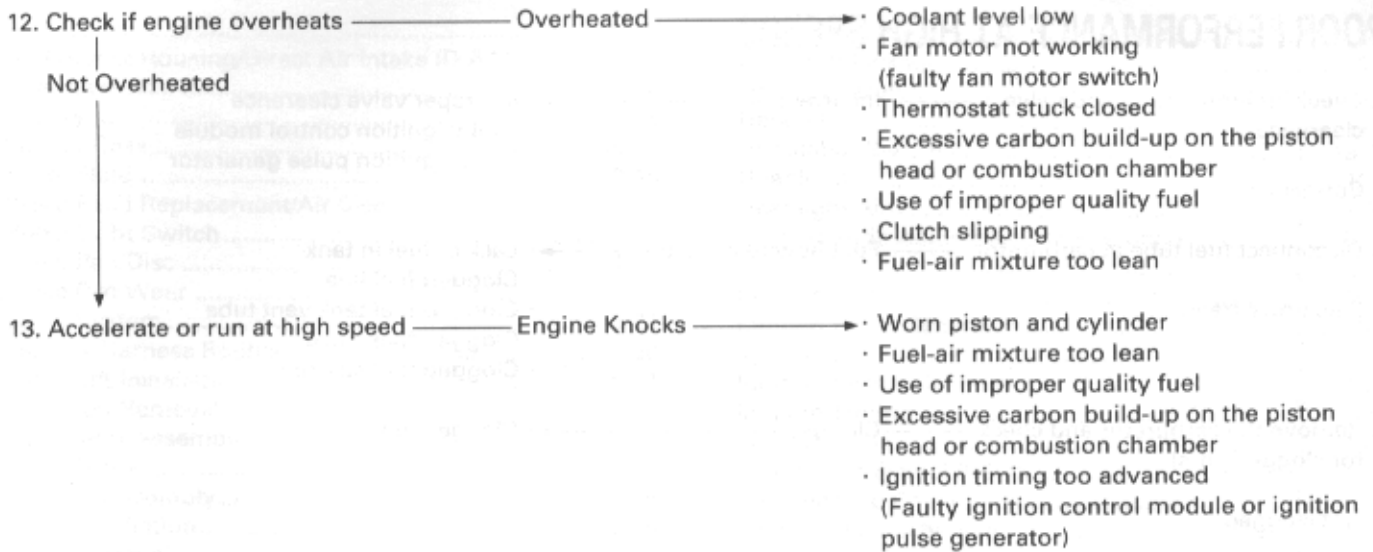
**POOR PERFORMANCE AT HIGH SPEEDS** 20-4  
**POOR HANDLING** 20-4

## ENGINE DOES NOT START OR IS HARD TO START

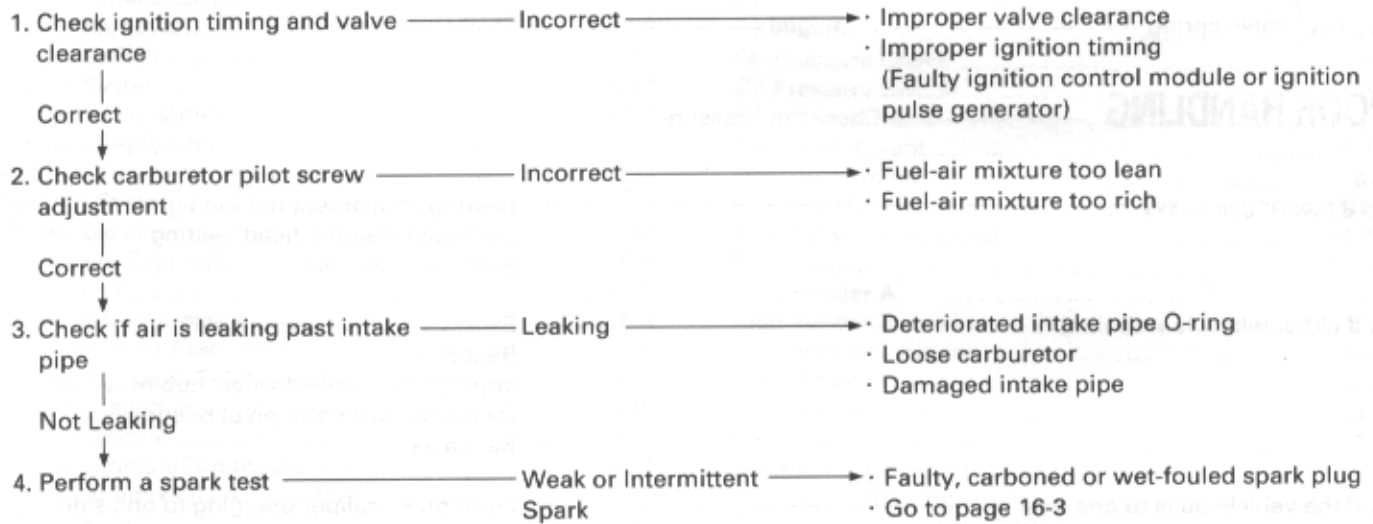


ENGINE LACKS POWER

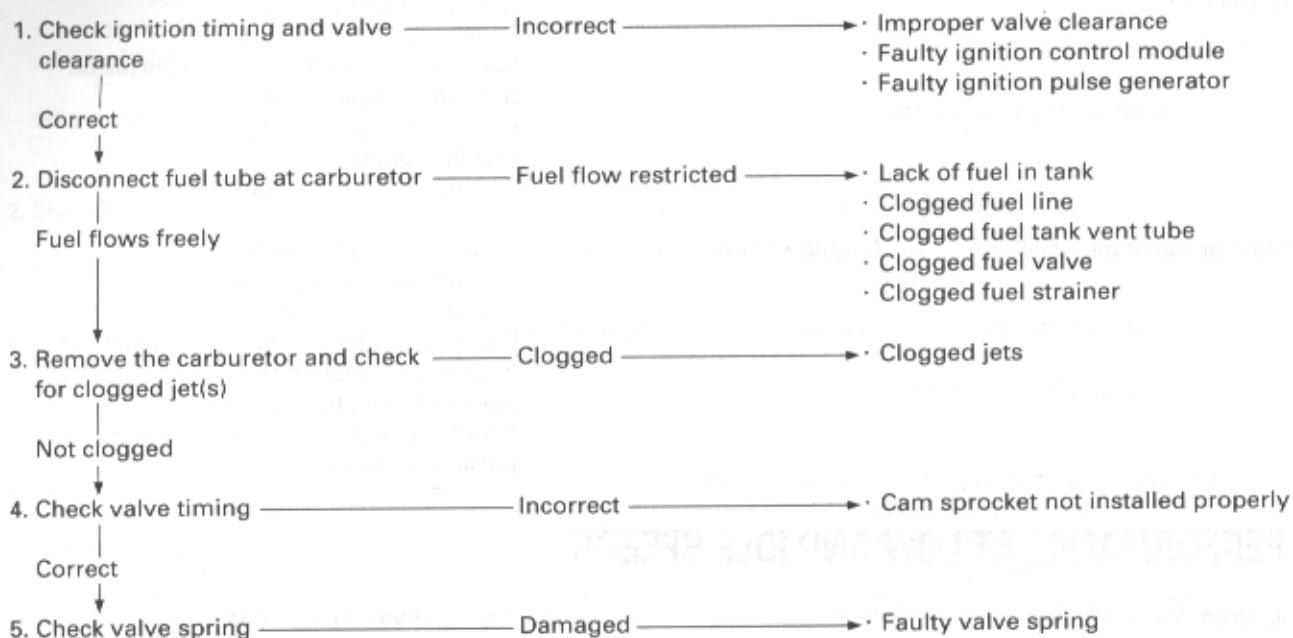




### POOR PERFORMANCE AT LOW AND IDLE SPEEDS



**POOR PERFORMANCE AT HIGH SPEEDS**



**POOR HANDLING**

→ Check tire pressure

1. If steering is heavy →
  - Bearing adjustment nut too tight
  - Damaged steering head bearing
  - Bent steering stem
  
2. If either wheel is wobbling →
  - Excessive wheel bearing play
  - Bent rim
  - Improperly installed wheel hub or wheel
  - Damaged swingarm pivot bearing
  - Bent axle
  
3. If the vehicle pulls to one side →
  - Front brake caliper dragging to one side
  - Front and rear wheels not aligned
  - Bent fork pipe(s)
  - Bent swingarm
  - Distorted frame

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