

# HOW TO USE THIS MANUAL

This service manual describes the service procedures for the VTR1000F.

Follow the Maintenance Schedule (Section 3) recommendations to ensure that the vehicle is in peak operating condition.

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

Sections 1 and 3 apply to the whole motorcycle. Section 2 illustrates procedures for removal/installation of components that may be required to perform service described in the following sections. Section 4 through 19 describe parts of the motorcycle, grouped according to location.

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

Most sections start with an assembly or system illustration, service information and troubleshooting for the section.

The subsequent pages give detailed procedure.

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

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HONDA MOTOR CO., LTD.  
SERVICE PUBLICATION OFFICE

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## SYMBOLS

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

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

# IMPORTANT SAFETY NOTICE

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

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

**NOTE:** Gives helpful information.

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

## TYPE CODE

- Throughout this manual, the following abbreviations are used to identify individual type.

CODE	AREA TYPE
E	U.K.
G	Germany, Sweden, Finland
IIG	Germany (Type II)
F	France
ED	European direct sales (Belgium, Holland, Portugal)

CODE	AREA TYPE
SW	Switzerland
AR	Austria
IT	Italy, Spain
ND	North Europe (Denmark, Norway)
U	Australia

# 1. GENERAL INFORMATION

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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 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.

### 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 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 basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil. KEEP OUT OF REACH OF CHILDREN.***

### BRAKE DUST

Never use an air hose or dry brush to clean brake assemblies. Use a vacuum cleaner or alternate method to minimize the hazard caused by air borne 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

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### 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.**
- 

## SERVICE RULES

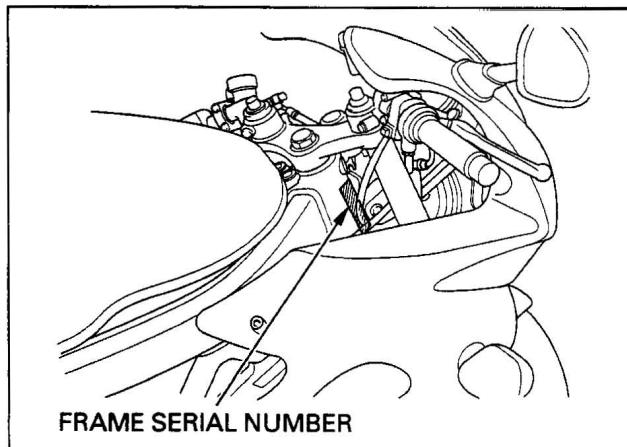
1. Use genuine HONDA or HONDA-recommended parts and lubricants or their equivalents. Parts that don't meet HONDA's design specifications may cause damage to the motorcycle.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing the motorcycle. Metric bolts, nuts and screws are not interchangeable with English fasteners.
4. Install new gaskets, O-rings, cotter pins, and lock plates when reassembling.
5. When tightening bolts or nuts, begin with the larger diameter or inner bolt first. Then tighten to the specified torque diagonally in incremental steps unless a particular sequence is specified.
6. Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
7. After reassembly, check all parts for proper installation and operation.
8. Route all electrical wires as shown on pages 1-18 through 1-24, Cable & Harness routing.

### BATTERY HYDROGEN GAS & ELECTROLYTE

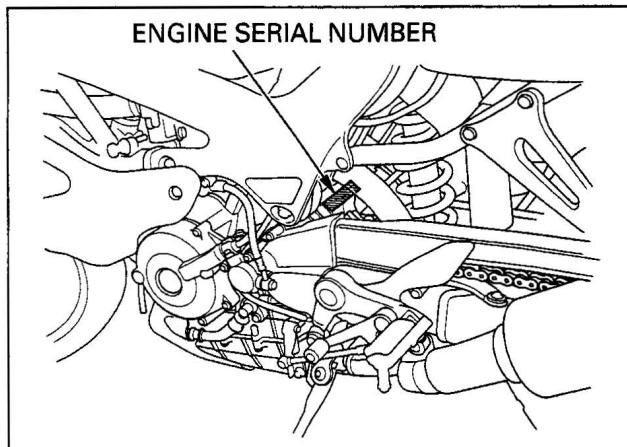
#### WARNING

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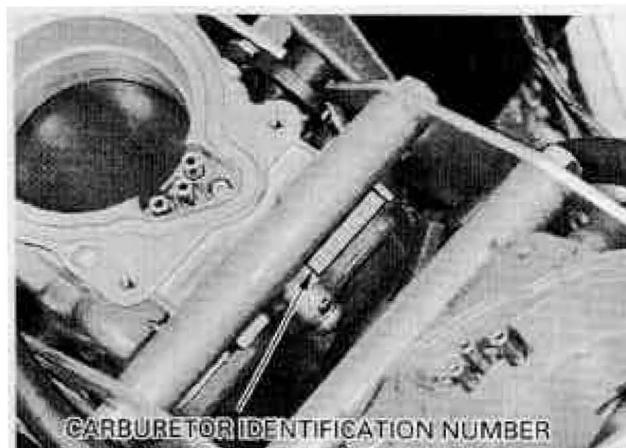
## MODEL IDENTIFICATION



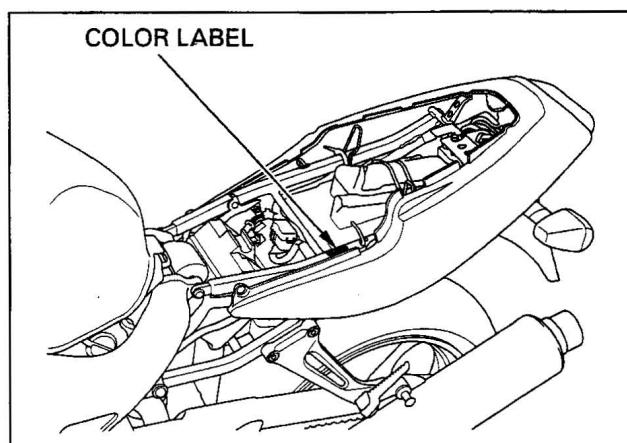
FRAME SERIAL NUMBER  
The frame serial number is stamped on the right side of the steering head.



ENGINE SERIAL NUMBER  
The engine serial number is stamped on the rear of the upper crankcase.



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



COLOR LABEL  
The color label is attached on the seat rail under the seat. When ordering color-coded parts, always specify the designated color code.

## GENERAL INFORMATION

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## SPECIFICATIONS

GENERAL		ITEM	SPECIFICATIONS
DIMENSIONS	Overall length	G, IIG, SW, AR, ND E, F, ED, U, IT	2,155 mm (84.8 in) 2,050 mm (80.7 in)
	Overall width		710 mm (28.0 in)
	Overall height		1,155 mm (45.5 in)
	Wheelbase		1,430 mm (56.3 in)
	Seat height		810 mm (31.9 in)
	Footpeg height		377 mm (14.8 in)
	Ground clearance		135 mm (5.3 in)
	Dry weight	Except SW, AR, IIG SW, AR, IIG	192 kg (423 lbs) 193 kg (425 lbs)
	Curb weight	Except SW, AR, IIG SW, AR, IIG	214 kg (472 lbs) 215 kg (474 lbs)
	Maximum weight capacity		188 kg (415 lbs)
FRAME	Frame type		Diamond
	Front suspension		Telescopic fork
	Front axle travel		109 mm (4.3 in)
	Front fork stroke		120 mm (4.7 in)
	Rear suspension		Swingarm
	Rear axle travel		124 mm (4.9 in)
	Front tire size		120/70ZR17 (58W)
	Rear tire size		180/55ZR17 (73W)
	Front tire brand		D204FK (DUNLOP), MACADAM 90X G (MICHELIN)
	Rear tire brand		D204K (DUNLOP), MACADAM 90X G (MICHELIN)
	Front brake		Hydraulic double disc
	Rear brake		Hydraulic single disc
	Caster angle		24°53'
ENGINE	Trail length		97 mm (3.8 in)
	Fuel tank capacity		16.0 l (4.23 US gal, 3.52 Imp gal)
	Cylinder arrangement		2 cylinders 90° V transverse
	Bore and stroke		98.0 × 66.0 mm (3.90 × 2.60 in)
	Displacement		995.7 cm³ (60.74 cu-in)
	Compression ratio		9.4 : 1
	Valve train		Chain driven, DOHC
	Intake valve	opens closes	20° BTDC (At 1 mm lift) 45° ABDC (At 1 mm lift)
	Exhaust valve	opens closes	50° BBDC (At 1 mm lift) 15° ATDC (At 1 mm lift)
	Lubrication system		Forced pressure and wet sump
	Oil pump type		Trochoid
	Cooling system		Liquid cooled
	Air filtration		Viscous paper element
	Engine dry weight		74.2 kg (163.6 lbs)
	Firing order		Front – 270° – Rear – 450° – Front

**GENERAL (Cont'd)**

ITEM		SPECIFICATIONS
CARBURETOR	Carburetor type Throttle bore	CV semi-downdraft 48 mm (1.9 in)
DRIVE TRAIN	Clutch system Clutch operation system Transmission Primary reduction Final reduction Gear ratio      1st 2nd 3rd 4th 5th 6th Gearshift pattern	Multi-plate, wet Hydraulic operating Constant mesh, 6-speeds 1.681 (74/44) 2.562 (41/16) 2.733 (41/15) 1.812 (29/16) 1.428 (30/21) 1.206 (35/29) 1.080 (27/25) 0.961 (25/26) Left foot operated return system, 1—N—2—3—4—5—6
ELECTRICAL	Ignition system Starting system Charging system Regulator/rectifier Lighting system	DC-CDI 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		STANDARD	SERVICE LIMIT
Engine oil capacity	After draining	3.7 ℥ (3.9 US qt, 3.3 Imp qt)	—
	After draining/filter change	3.9 ℥ (4.1 US qt, 3.4 Imp qt)	—
	After disassembly	4.5 ℥ (4.8 US qt, 4.0 Imp qt)	—
Recommended engine oil		Honda 4-stroke oil or equivalent motor oil API service classification SE, SF or SG Viscosity: SAE 10W-40	—
Oil pressure (at oil pressure switch)		588 kPa (6.0 kgf/cm <sup>2</sup> , 85 psi) at 5,000 min <sup>-1</sup> (rpm) / 176 °F (80 °C)	—
Oil pump	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15–0.21 (0.006–0.008)	0.35 (0.014)
	Side clearance	0.02–0.09 (0.001–0.004)	0.12 (0.005)

## FUEL SYSTEM

ITEM	SPECIFICATIONS
Carburetor identification number	Except G, SW, AR, IIG type
	G type
	SW type
	AR, IIG type
Main jet	Front: #175, Rear: #178
Slow jet	#45
Jet needle number	Except SW, AR, G type
	SW, AR, G type
Pilot screw opening	See page 5-18
Float level	16.6 ± 0.5 mm (0.65 ± 0.02 in)
Idle speed	Except SW, AR, IIG type
	AR, IIG type
	SW type
	1,100 ± 100 min <sup>-1</sup> (rpm)
	1,200 ± 100 min <sup>-1</sup> (rpm)
	1,200 ± 50 min <sup>-1</sup> (rpm)

## COOLING SYSTEM

ITEM	SPECIFICATIONS
Coolant capacity	Radiator and engine
	Reserve tank
Radiator cap relief pressure	108–137 kPa (1.1–1.4 kgf/cm <sup>2</sup> , 16–20 psi)
Thermostat	Begin to open
	Fully open
	Valve lift
	163–171 °F (73–77 °C)
	194 °F (90 °C)
	8 mm (0.3 in) minimum

Unit: mm (in)

<b>CYLINDER HEAD/VALVE</b>		<b>ITEM</b>	<b>STANDARD</b>	<b>SERVICE LIMIT</b>
Cylinder compression at 350 min <sup>-1</sup> (rpm)			1,128 kPa (11.5 kgf/cm <sup>2</sup> , 164 psi)	—
Valve clearance	IN	0.16 (0.006)	—	—
	EX	0.31 (0.012)	—	—
Camshaft	Cam lobe height	IN	40.080 – 40.240 (1.5779 – 1.5842)	39.780 (1.5661)
		EX	40.230 – 40.390 (1.5839 – 1.5902)	39.930 (1.5720)
Runout			—	0.05 (0.002)
Oil clearance			0.020 – 0.062 (0.0008 – 0.0024)	0.088 (0.0035)
Valve lifter	Valve lifter O.D.		33.978 – 33.993 (1.3377 – 1.3383)	33.97 (1.337)
	Valve lifter bore I.D.		34.010 – 34.026 (1.3390 – 1.3396)	34.04 (1.340)
Valve, valve guide	Valve stem O.D.	IN	5.975 – 5.990 (0.2352 – 0.2358)	5.965 (0.2348)
		EX	5.965 – 5.980 (0.2348 – 0.2354)	5.955 (0.2344)
	Valve guide I.D.	IN/EX	6.000 – 6.012 (0.2362 – 0.2367)	6.040 (0.2378)
	Stem-to-guide clearance	IN	0.010 – 0.037 (0.0004 – 0.0015)	0.075 (0.0030)
		EX	0.020 – 0.047 (0.0008 – 0.0019)	0.085 (0.0033)
Valve guide projection above cylinder head			14.0 – 14.2 (0.55 – 0.56)	—
Valve spring	Valve seat width	IN	1.1 – 1.3 (0.04 – 0.05)	1.7 (0.07)
		EX	1.3 – 1.5 (0.05 – 0.06)	1.9 (0.07)
Valve spring	Free length	Inner	37.0 (1.46)	36.0 (1.42)
		Outer	41.9 (1.65)	40.9 (1.61)
Cylinder head warpage			—	0.10 (0.004)

Unit: mm (in)

<b>CLUTCH/GEARSHIFT LINKAGE</b>		<b>ITEM</b>	<b>STANDARD</b>	<b>SERVICE LIMIT</b>
Specified clutch fluid			DOT 4 brake fluid	—
Clutch master cylinder	Cylinder I.D.		14.000 – 14.043 (0.5512 – 0.5529)	14.055 (0.5533)
	Piston O.D.		13.957 – 13.984 (0.5495 – 0.5506)	13.945 (0.5490)
Clutch	Spring free length		49.6 (1.95)	46.6 (1.83)
	Disc thickness		3.72 – 3.88 (0.146 – 0.153)	3.5 (0.14)
	Plate warpage		—	0.30 (0.012)
Clutch outer guide	I.D.		28.000 – 28.021 (1.1024 – 1.1032)	28.031 (1.1036)
	O.D.		34.975 – 34.991 (1.3770 – 1.3776)	34.965 (1.3766)
Mainshaft O.D. at clutch outer guide			27.980 – 27.993 (1.1016 – 1.1021)	27.970 (1.1012)

Unit: mm (in)

<b>ALTERNATOR/STARTER CLUTCH</b>		<b>ITEM</b>	<b>STANDARD</b>	<b>SERVICE LIMIT</b>
Starter driven gear boss O.D.			57.749 – 57.768 (2.2736 – 2.2743)	57.639 (2.2692)

## GENERAL INFORMATION

Unit: mm (in)

CRANKCASE/TRANSMISSION		STANDARD	SERVICE LIMIT
ITEM			
Shift fork	I.D.	12.000 – 12.021 (0.4724 – 0.4733)	12.03 (0.474)
	Claw thickness	5.93 – 6.00 (0.233 – 0.236)	5.9 (0.23)
Shift fork shaft	O.D.	11.957 – 11.968 (0.4707 – 0.4712)	11.95 (0.470)
Transmission	Gear I.D.	M5, M6 31.000 – 31.016 (1.2205 – 1.2211) C2, C3, C4 33.000 – 33.025 (1.2992 – 1.3002)	31.04 (1.222) 33.05 (1.301)
	Gear bushing O.D.	M5, M6 30.955 – 30.980 (1.2187 – 1.2197) C2, C3, C4 32.955 – 32.980 (1.2974 – 1.2984)	30.93 (1.218) 32.93 (1.296)
	Gear-to-bushing clearance	M5, M6 0.020 – 0.061 (0.0008 – 0.0024) C2, C3, C4 0.020 – 0.070 (0.0008 – 0.0028)	0.10 (0.004) 0.11 (0.004)
	Gear bushing I.D.	M5 27.985 – 28.006 (1.1018 – 1.1026) C2 29.985 – 30.006 (1.1805 – 1.1813)	28.02 (1.103) 30.02 (1.182)
	Mainshaft O.D.	at M5 27.967 – 27.980 (1.1011 – 1.1016)	27.94 (1.100)
	Countershaft O.D.	at C2 29.950 – 29.975 (1.1791 – 1.1801)	29.92 (1.178)
	Bushing-to-shaft clearance	M5 0.005 – 0.039 (0.0002 – 0.0015) C2 0.010 – 0.056 (0.0004 – 0.0022)	0.06 (0.002) 0.06 (0.002)

Unit: mm (in)

CRANKSHAFT/PISTON/CYLINDER		STANDARD	SERVICE LIMIT
ITEM			
Crankshaft	Connecting rod side clearance	0.10 – 0.30 (0.004 – 0.012)	0.40 (0.016)
	Crankpin bearing oil clearance	0.032 – 0.050 (0.0013 – 0.0020)	0.060 (0.0024)
	Main journal bearing oil clearance	0.020 – 0.038 (0.0008 – 0.0015)	0.048 (0.0019)
	Runout	_____	0.10 (0.004)
Piston, piston pin, piston ring	Piston O.D. at 20 (0.8) from bottom	97.965 – 97.985 (3.8569 – 3.8577)	97.900 (3.8543)
	Piston pin hole I.D.	24.002 – 24.008 (0.9450 – 0.9452)	24.03 (0.946)
	Piston pin O.D.	23.994 – 24.000 (0.9446 – 0.9449)	23.984 (0.9443)
	Piston-to-piston pin clearance	0.002 – 0.014 (0.0001 – 0.0006)	0.046 (0.0018)
	Piston ring end gap	Top 0.25 – 0.40 (0.010 – 0.016)	0.55 (0.022)
		Second 0.40 – 0.55 (0.016 – 0.022)	0.70 (0.028)
		Oil (side rail) 0.20 – 0.70 (0.008 – 0.028)	0.90 (0.035)
	Piston ring-to-ring groove clearance	Top 0.065 – 0.100 (0.0026 – 0.0039)	0.115 (0.0045)
		Second 0.035 – 0.070 (0.0014 – 0.0028)	0.085 (0.0033)
Cylinder	I.D.	98.005 – 98.025 (3.8585 – 3.8592)	98.100 (3.8622)
	Out of round	_____	0.10 (0.004)
	Taper	_____	0.10 (0.004)
	Warpage	_____	0.05 (0.002)
Cylinder-to-piston clearance		0.020 – 0.060 (0.0008 – 0.0024)	0.200 (0.0079)
Connecting rod small end I.D.		24.020 – 24.041 (0.9457 – 0.9465)	24.051 (0.9469)
Connecting rod-to-piston pin clearance		0.020 – 0.047 (0.0008 – 0.0019)	0.067 (0.0026)

Unit: mm (in)

**FRONT WHEEL/SUSPENSION/STEERING**

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		_____	1.5 (0.06)
Cold tire pressure	Driver only	250 kPa (2.50 kgf/cm <sup>2</sup> , 36 psi)	_____
	Driver and passenger	250 kPa (2.50 kgf/cm <sup>2</sup> , 36 psi)	_____
Axe runout		_____	0.20 (0.008)
Wheel rim runout	Radial	_____	2.0 (0.08)
	Axial	_____	2.0 (0.08)
Wheel balance weight		_____	60 g (2.1 oz) max.
Fork	Spring free length	309.9 (12.20)	303.7 (11.96)
	Tube runout	_____	0.20 (0.008)
	Recommended fluid	Fork fluid	_____
	Fluid level	130 (5.1)	_____
	Fluid capacity	448 ± 2.5 cm <sup>3</sup> (15.2 ± 0.08 US oz, 15.8 ± 0.09 Imp oz)	_____
Steering head bearing preload		1.0 – 1.6 kgf (2.2 – 3.3 lbf)	_____

Unit: mm (in)

**REAR WHEEL/SUSPENSION**

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		_____	2.0 (0.08)
Cold tire pressure	Driver only	290 kPa (2.90 kgf/cm <sup>2</sup> , 42 psi)	_____
	Driver and passenger	290 kPa (2.90 kgf/cm <sup>2</sup> , 42 psi)	_____
Axe runout		_____	0.20 (0.008)
Wheel rim runout	Radial	_____	2.0 (0.08)
	Axial	_____	2.0 (0.08)
Wheel balance weight		_____	60 g (2.1 oz) max.

Unit: mm (in)

**HYDRAULIC BRAKE**

ITEM		STANDARD	SERVICE LIMIT
Front	Specified brake fluid	DOT 4	_____
	Brake disc thickness	4.4 – 4.6 (0.17 – 0.18)	3.5 (0.14)
	Brake disc runout	_____	0.30 (0.012)
	Master cylinder I. D.	14.000 – 14.043 (0.5512 – 0.5529)	14.055 (0.5533)
	Master piston O. D.	13.957 – 13.984 (0.5495 – 0.5506)	13.945 (0.5490)
	Caliper cylinder I. D.	A 30.23 – 30.28 (1.190 – 1.192)	30.29 (1.193)
		B 27.000 – 27.050 (1.0630 – 1.0650)	27.060 (1.0654)
	Caliper piston O. D.	A 30.148 – 30.198 (1.1869 – 1.1889)	30.14 (1.187)
		B 26.918 – 26.968 (1.0598 – 1.0617)	26.91 (1.059)
Rear	Specified brake fluid	DOT 4	_____
	Brake disc thickness	4.8 – 5.2 (0.19 – 0.20)	4.0 (0.16)
	Brake disc runout	_____	0.30 (0.012)
	Master cylinder I. D.	14.000 – 14.043 (0.5512 – 0.5529)	14.055 (0.5533)
	Master piston O. D.	13.957 – 13.984 (0.5495 – 0.5506)	13.945 (0.5490)
	Caliper cylinder I. D.	38.18 – 38.23 (1.503 – 1.505)	38.24 (1.506)
	Caliper piston O. D.	38.098 – 38.148 (1.4999 – 1.5019)	38.09 (1.500)

## GENERAL INFORMATION

### BATTERY/CHARGING SYSTEM

ITEM		SPECIFICATIONS
Battery	Capacity	12 V – 10 AH
	Current leakage	0.1 mA max.
Voltage (68 °F/20 °C)	Fully charged	13.0 – 13.2 V
	Needs charging	Below 12.3 V
Charging current	Normal	1.2 A × 5 – 10 h
	Quick	5.0 A × 1.0 h
Alternator	Capacity	0.280 kW/5,000 min <sup>-1</sup> (rpm)
	Charging coil resistance (68 °F/20 °C)	0.2 – 0.5 Ω
Regulator/rectifier regulated voltage		13.5 – 15.5 V/5,000 min <sup>-1</sup> (rpm)

### IGNITION SYSTEM

ITEM		SPECIFICATIONS
Spark plug		DPR9EVX-9 (NGK)
Spark plug gap		0.80 – 0.90 mm (0.031 – 0.035 in)
Ignition coil primary peak voltage		100 V minimum
Ignition pulse generator peak voltage		0.7 V minimum
Ignition timing ("F" mark)		15° BTDC at idle
Engine coolant temperature (ECT) sensor resistance	At 68 °F (20 °C)	2 – 3 kΩ
	At 176 °F (80 °C)	200 – 400 Ω
Throttle sensor	Resistance (68 °F/20 °C)	4 – 6 kΩ
	Input voltage	4.7 – 5.3 V

Unit: mm (in)

### ELECTRIC STARTER

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	12.0 – 13.0 (0.47 – 0.51)	6.5 (0.26)

### LIGHTS/METERS/SWITCHES

ITEM		SPECIFICATIONS
Bulbs	Headlight (High/low beam)	12 V – 60/55 W
	Position light (Except U type)	12 V – 5 W
	Brake/tailight	12 V – 21/5 W × 2
	Turn signal light	12 V – 21 W × 4
	Instrument light	12 V – 1.7 W × 3
	Turn signal indicator	12 V – 1.7 W × 2
	High beam indicator	12 V – 1.7 W
	Neutral indicator	12 V – 1.7 W
	Oil pressure indicator	12 V – 1.7 W
	Side stand indicator	12 V – 1.7 W
Fuse	Main fuse	30 A
	Sub-fuse	10 A, 20 A
Thermosensor resistance	At 176 °F (80 °C)	47 – 57 Ω
	At 248 °F (120 °C)	14 – 18 Ω
Fan motor switch	Starts to close (ON)	208 – 216 °F (98 – 102 °C)
	Stops to open (OFF)	199 – 207 °F (93 – 97 °C)

## TORQUE VALUES

### STANDARD

FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)	FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)
5 mm bolt and nut	5 (0.5, 3.6)	5 mm screw	4 (0.4 , 2.9)
6 mm bolt and nut	10 (1.0, 7)	6 mm screw	9 (0.9 , 6.5)
8 mm bolt and nut	22 (2.2, 16)	6 mm flange bolt (8 mm head, small flange)	10 (1.0 , 7)
10 mm bolt and nut	34 (3.5, 25)	6 mm flange bolt (8 mm head, large flange)	12 (1.2 , 9)
12 mm bolt and nut	54 (5.5, 40)	6 mm flange bolt (10 mm head) and nut	12 (1.2 , 9)
		8 mm flange bolt and nut	23 (2.3 , 17)
		Engine Frame	26 (2.7 , 20)
		10 mm flange bolt and nut	39 (4.0 , 29)

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

NOTES: 1. Apply sealant to the threads.

2. Apply locking agent to the threads.

3. Replace with a new one.

4. Stake.

5. Apply oil to the threads and seating surface.

6. Apply engine oil to the O-ring.

7. U-nut.

8. ALOC bolt/screw: replace with a new one.

9. Apply grease to the threads.

### ENGINE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
<b>MAINTENANCE:</b>				
Spark plug	2	12	14 (1.4 , 10)	
Crankshaft hole cap	1	30	15 (1.5 , 11)	NOTE 9
Timing hole cap	1	14	10 (1.0 , 7)	NOTE 9
Engine oil filter cartridge	1	20	10 (1.0 , 7)	NOTE 5, 6
Engine oil drain bolt	1	12	29 (3.0 , 22)	
<b>LUBRICATION SYSTEM:</b>				
Oil pressure switch	1	PT 1/8	12 (1.2 , 9)	NOTE 1
Oil pressure switch terminal screw	1	4	2 (0.2 , 1.4)	
Oil pump bolt	2	6	12 (1.2 , 9)	
Oil filter boss	1	20	18 (1.8 , 13)	NOTE 2
<b>FUEL SYSTEM:</b>				
Carburetor insulator band bolt	4	5	1 (0.1 , 0.7)	
Vacuum joint	1	5	2 (0.25 , 1.8)	
Reed valve cover bolt	4	5	5 (0.52 , 3.8)	NOTE 2
<b>ENGINE MOUNTING:</b>				
Drive sprocket bolt	1	10	54 (5.5 , 40)	
<b>CYLINDER HEAD/VALVE:</b>				
Cylinder head cover bolt	8	6	10 (1.0 , 7)	
Breather plate bolt	4	6	12 (1.2 , 9)	NOTE 2
Cam sprocket bolt	4	7	20 (2.0 , 14)	NOTE 2
Camshaft holder bolt	16	7	21 (2.1 , 15)	NOTE 5
Cylinder head bolt	12	10	53 (5.4 , 39)	NOTE 5
Cylinder head sealing bolt	2	12	32 (3.3 , 24)	NOTE 2
Intake manifold vacuum port socket bolt	1	5	3 (0.34 , 2.5)	

## GENERAL INFORMATION

### ENGINE (Cont'd)

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
<b>CLUTCH/GEARSHIFT LINKAGE:</b>				
Clutch slave cylinder bleed valve	1	8	9 (0.9 , 6.5)	
Clutch bolt	5	6	12 (1.2 , 9)	
Clutch center lock nut	1	25	127 (13.0 , 94)	NOTE 4, 5
Oil pump driven sprocket bolt	1	6	15 (1.5 , 11)	NOTE 2
Gearshift cam bolt	1	8	23 (2.3 , 17)	NOTE 2
Gearshift spindle return spring pin	1	8	23 (2.3 , 17)	NOTE 2
Primary drive gear bolt	1	12	88 (9.0 , 65)	NOTE 5
<b>ALTERNATOR/STARTER CLUTCH:</b>				
Flywheel bolt	1	12	157 (16.0 , 116)	NOTE 5
Starter clutch bolt	6	8	23 (2.3 , 17)	NOTE 2
Alternator stator bolt	3	6	12 (1.2 , 9)	
<b>CRANKCASE/TRANSMISSION:</b>				
Cam chain tensioner bolt	2	8	23 (2.3 , 17)	NOTE 2
Cam chain guide bolt	2	8	23 (2.3 , 17)	NOTE 2
Crankcase flange bolt	1	10	39 (4.0 , 29)	
Crankcase special bolt	8	10	42 (4.3 , 31)	NOTE 5
Crankcase sealing bolt	1	15	29 (3.0 , 22)	NOTE 2
Crankcase sealing bolt	1	18	29 (3.0 , 22)	NOTE 2
Crankcase sealing bolt	1	22	29 (3.0 , 22)	NOTE 2
Crankcase sealing bolt	1	24	49 (5.0 , 36)	NOTE 2
<b>CRANKSHAFT/PISTON/CYLINDER:</b>				
Connecting rod bolt (standard)	4	9	29 (3.0 , 22) + 120°	NOTE 3, 5
(checking the oil clearance)	4	9	20 (2.0 , 14) + 120°	NOTE 3, 5
<b>IGNITION SYSTEM:</b>				
Ignition pulse generator bolt	2	6	12 (1.2 , 9)	
Engine coolant temperature (ECT) sensor	1	12	23 (2.3 , 17)	
<b>ELECTRIC STARTER:</b>				
Starter motor terminal nut	1	6	10 (1.0 , 7)	
<b>LIGHTS/METERS/SWITCHES:</b>				
Thermosensor	1	PT 1/8	12 (1.2 , 9)	
Neutral switch	1	10	12 (1.2 , 9)	NOTE 1

### FRAME

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
<b>FRAME/BODY PANELS/EXHAUST SYSTEM:</b>				
Exhaust pipe joint nut	4	7	12 (1.2 , 9)	
Muffler band bolt	2	8	26 (2.7 , 20)	
<b>ENGINE MOUNTING:</b>				
Front engine hanger nut	1	12	64 (6.5 , 47)	Page 7-7
Front engine hanger adjusting bolt	1	20	3 (0.3 , 2.2)	
Front engine hanger lock nut	1	20	54 (5.5 , 40)	
Center engine hanger bolt	2	10	39 (4.0 , 29)	
Left center engine hanger adjusting bolt	1	20	3 (0.3 , 2.2)	
Left center engine hanger lock nut	1	20	54 (5.5 , 40)	
Rear engine hanger nut	1	12	64 (6.5 , 47)	
Rear engine hanger adjusting bolt	1	22	3 (0.3 , 2.2)	
Rear engine hanger lock nut	1	22	54 (5.5 , 40)	
Shock link bracket nut	2	10	44 (4.5 , 33)	
<b>CLUTCH/GEARSHIFT LINKAGE:</b>				
Clutch reservoir mounting screw	1	4	1 (0.15 , 1.1)	NOTE 2
Clutch reservoir cap stopper plate screw	1	4	1 (0.12 , 0.9)	
Clutch lever pivot nut	1	6	6 (0.6 , 4.3)	
Clutch hose oil bolt	2	10	34 (3.5 , 25)	

**FRAME**

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
<b>FRONT WHEEL/SUSPENSION/STEERING:</b>				
Handlebar weight mounting screw	2	6	10 (1.0 , 7)	NOTE 8
Front master cylinder holder bolt	2	6	12 (1.2 , 9)	
Front axle bolt	1	14	59 (6.0 , 43)	
Front axle holder bolt	4	8	22 (2.2 , 16)	
Front brake disc bolt	12	6	20 (2.0 , 14)	
Fork cap	2	37	23 (2.3 , 17)	
Fork socket bolt	2	8	20 (2.0 , 14)	NOTE 2
Fork top bridge pinch bolt	2	8	23 (2.3 , 17)	
Fork bottom bridge pinch bolt	2	10	49 (5.0 , 36)	
Front brake hose clamp bolt (fork side)	2	6	10 (1.0 , 7)	
Steering stem nut	1	24	103 (10.5 , 76)	Page 13-27
Steering bearing adjustment nut	1	26	25 (2.5 , 18)	
Steering bearing adjustment nut lock nut	1	26		
Front brake hose clamp bolt (stem side)	1	6	10 (1.0 , 7)	
Front brake hose 3-way joint bolt	1	6	10 (1.0 , 7)	
<b>REAR WHEEL/SUSPENSION:</b>				
Rear axle nut	1	18	93 (9.5 , 69)	
Rear brake disc bolt	4	8	42 (4.3 , 31)	NOTE 8
Final driven sprocket nut	5	12	108 (11.0 , 80)	NOTE 7
Shock absorber upper mounting bolt	1	10	44 (4.5 , 33)	NOTE 8
Shock absorber lower mounting nut	1	10	44 (4.5 , 33)	NOTE 7
Shock arm-to-swingarm nut	1	10	44 (4.5 , 33)	NOTE 7
Shock arm-to-shock link nut	1	10	44 (4.5 , 33)	NOTE 7
Shock link-to-bracket nut	1	10	44 (4.5 , 33)	NOTE 7
Swingarm pivot nut	1	18	93 (9.5 , 69)	NOTE 7
Drive chain slider bolt	2	6	9 (0.9 , 6.5)	NOTE 8
Rear brake hose clamp screw	2	5	4 (0.43 , 3.1)	NOTE 8
<b>HYDRAULIC BRAKE:</b>				
Brake caliper bleed valve	3	8	6 (0.6 , 4.3)	
Pad pin plug	3	10	2 (0.25 , 1.8)	
Pad pin	3	10	18 (1.8 , 13)	
Brake hose oil bolt	5	10	34 (3.5 , 25)	
Front brake lever pivot nut	1	6	6 (0.6 , 4.3)	
Front brake fluid reservoir mounting nut	1	6	6 (0.6 , 4.3)	
Rear brake fluid reservoir mounting bolt	1	6	9 (0.9 , 6.5)	
Rear master cylinder mounting bolt	2	6	10 (1.0 , 7)	
Rear master cylinder joint nut	1	8	18 (1.8 , 13)	
Front brake caliper mounting bolt	4	8	30 (3.1 , 22)	NOTE 8
Front brake caliper assembly bolt	8	8	32 (3.3 , 24)	NOTE 2
Rear brake caliper bolt	1	8	23 (2.3 , 17)	
Rear brake caliper pin bolt	1	12	27 (2.8 , 20)	NOTE 2
<b>IGNITION SYSTEM:</b>				
Ignition coil mounting bolt	4	6	10 (1.0 , 7)	
<b>LIGHTS/METERS/SWITCHES:</b>				
Side stand switch bolt	1	6	10 (1.0 , 7)	
Ignition switch mounting bolt	2	8	25 (2.5 , 18)	
Fan motor switch	1	16	18 (1.8 , 13)	
<b>OTHERS:</b>				
Side stand pivot bolt	1	10	10 (1.0 , 7)	
Side stand pivot lock nut	1	10	29 (3.0 , 22)	
Side stand bracket bolt	1	10	44 (4.5 , 33)	
Passenger footpeg bracket bolt	4	8	26 (2.7 , 20)	
Bank sensor bolt	2	8	10 (1.0 , 7)	
Seat rail upper mounting bolt	2	10	39 (4.0 , 29)	
Seat rail lower mounting bolt	2	10	44 (4.5 , 33)	
Gearshift pedal pivot bolt	1	8	26 (2.7 , 20)	

## GENERAL INFORMATION

## TOOLS

DESCRIPTION	TOOL NUMBER	REF. SECTION
Oil filter wrench	07HAA-PJ70100	3
Drive chain tool set	07HMH-MR10103	3
Oil pressure gauge	07506-3000000	4
Oil pressure gauge attachment	07510-4220100	4
Float level gauge	07401-0010000	5
Pilot screw wrench (Except SW type)	07908-4220201	5
Pilot screw wrench (SW type)	07KMA-MN90100	5
Bearing remover set	07936-GE00000	6
— Bearing remover shaft	07936-GE00100	6
— Bearing remover, 10 mm	07936-GE00200	6
— Sliding weight	07741-0010201	6, 14
Driver	07749-0010000	6, 9, 13, 14
Attachment, 28 × 30 mm	07946-1870100	6
Pilot, 10 mm	07746-0040100	6
Mechanical seal driver attachment	07945-4150400	6
Lock nut wrench	07HMA-MR70200	7
Lock nut wrench	07VMA-MBB0100	7
Valve spring compressor	07757-0010000	8
Valve guide remover, 5.5 mm	07742-0010000	8
Valve guide driver	07743-0020000	8
Valve guide reamer	07VMH-MBB0200	8
Valve seat cutter, 40 mm (IN/EX 45° )	07780-0010500	8
Flat cutter, 38.5 mm (IN 32° )	07780-0012400	8
Flat cutter, 35 mm (EX 32° )	07780-0012300	8
Interior cutter, 37.5 mm (IN/EX 60° )	07780-0014100	8
Cutter holder, 6 mm	07VMH-MBB0100	8
Snap ring pliers	07914-3230001	9, 15
Clutch center holder	07742-0050002	9
Attachment, 32 × 35 mm	07746-0010100	9, 14
Pilot, 17 mm	07746-0040400	9, 14
Attachment, 37 × 40 mm	07746-0010200	9, 14
Attachment, 42 × 47 mm	07746-0010300	9, 13, 14
Gear holder	07724-0010100	9
Flywheel holder	07725-0040000	10
Rotor puller	07733-0020001	10
Inner driver C	07746-0030100	11
Attachment, 35 mm I.D.	07746-0030400	11
Bearing remover shaft	07746-0050100	13, 14
Bearing remover head, 20 mm	07746-0050600	13, 14
Pilot, 20 mm	07746-0040500	13, 14
Fork seal driver weight	07947-KA50100	13
Fork seal driver	07947-KF00100	13
Steering stem socket	07916-3710101	13
Ball race remover set	07946-KM90001	13
— Driver attachment A	07946-KM90100	13
— Driver attachment B	07946-KM90200	13
— Driver shaft assembly	07946-KM90300	13
— Bearing remover A	07946-KM90401	13
— Bearing remover B	07946-KM90500	13
— Assembly base	07946-KM90600	13
Steering stem driver	07946-MB00000	13

DESCRIPTION	TOOL NUMBER	REF. SECTION
Attachment, 52 × 55	07746-0010400	14
Pilot, 22 mm	07746-0041000	14
Pin driver	07GMD-KT80100	14
Attachment, 24 × 26 mm	07746-0010700	14
Driver shaft	07946-MJ00100	14
Needle bearing remover	07HMC-MR70100	14
Pilot, 28 mm	07746-0041100	14
Bearing remover, 17 mm	07936-3710300	14
Bearing remover handle	07936-3710100	14
Peak voltage adaptor	07HGJ-0020100	17
Inspection adaptor	07VMJ-0020100	17

## GENERAL INFORMATION

## LUBRICATION & SEAL POINTS

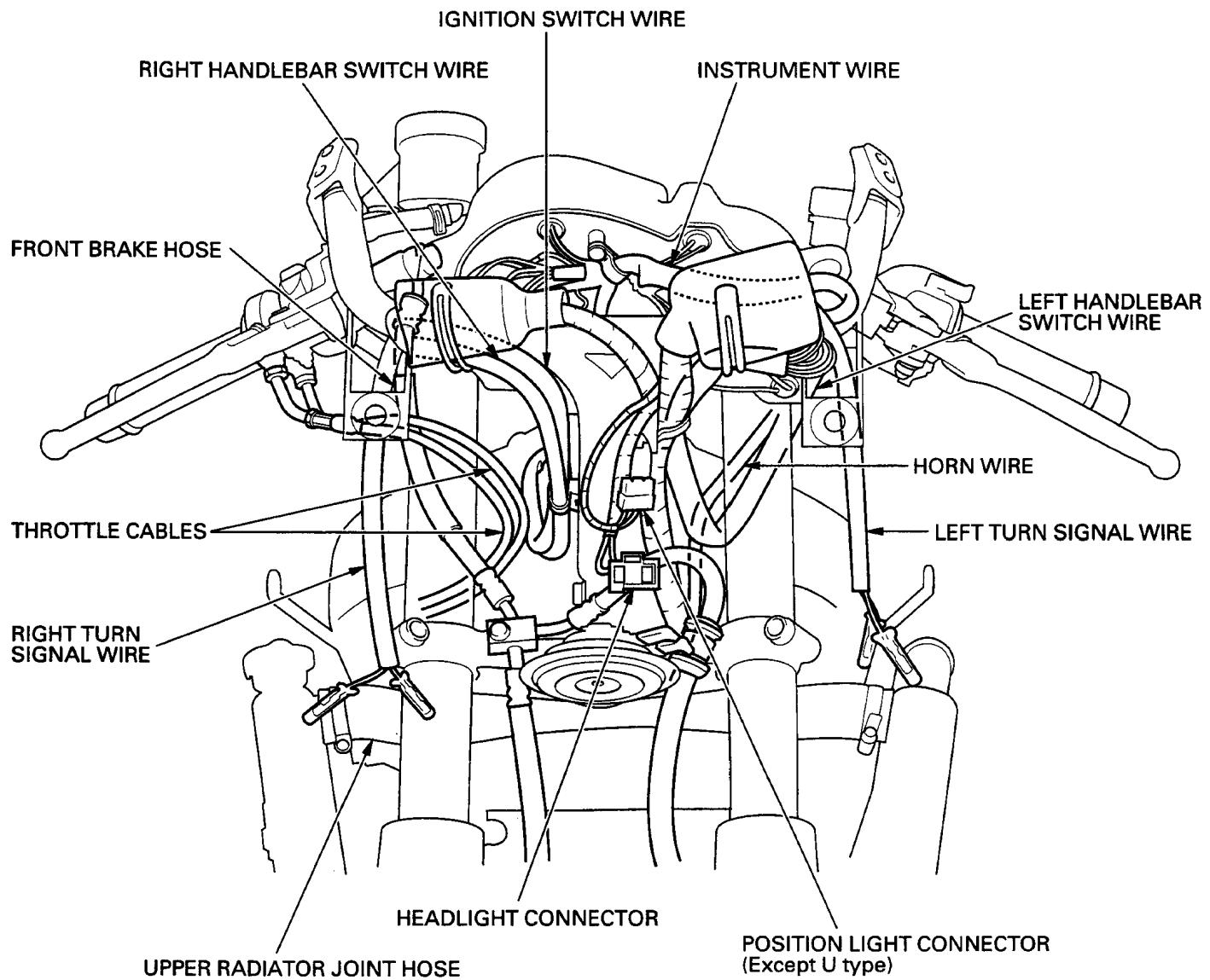
ENGINE	LOCATION	MATERIAL	REMARKS
	Crankcase mating surfaces Crankcase mating surfaces (right side) Crankcase mating surfaces (left side ) Oil pan mating surface Cylinder head semi-circular area Cylinder head cover gasket mating surface (cover side) Oil pressure switch threads Thermosensor threads Alternator stator wire grommet seating surface	Sealant	See page 11-10 See page 6-14 See page 10-3  Do not apply to the sensor head.
	Crankshaft main journal bearing sliding surface Crankpin bearing sliding surface Connecting rod small end inner surface Valve stem sliding surface Valve lifter outer surface Camshaft journals and cam lobes Clutch outer sliding surface M3/4, C5, C6 gear shift fork grooves Each gear teeth and sliding surface Other rotating and sliding area	Molybdenum oil solution (a mixture of 1/2 engine oil and 1/2 molybdenum disulfide grease)	
	Primary drive gear and sub gear sliding surface	Molybdenum disulfide grease	
	Engine oil filter cartridge threads and seating surface Camshaft holder bolt threads and seating surface Cylinder head bolt threads and seating surface Clutch disc lining surface Clutch center lock nut threads and seating surface Primary drive gear bolt threads and seating surface Flywheel bolt threads and seating surface Piston outer surface and piston pin hole Piston ring whole surface Connecting rod bolt threads and seating surface 10 mm crankcase special bolt threads and seating surface Each bearing rotating area Each O-ring whole surface	Engine oil	
	Timing hole cap threads Crankshaft hole cap threads Each oil seal lips	Multi-purpose grease	
	Oil pump driven sprocket bolt threads Oil filter boss threads Reed valve cover bolt threads Breather plate bolt threads Cam sprocket bolt threads Cylinder head 12 mm sealing bolt threads Gearshift cam bolt threads Starter clutch bolt threads Cam chain tensioner bolt threads Cam chain guide bolt threads Crankcase 15 mm sealing bolt threads Crankcase 18 mm sealing bolt threads Crankcase 24 mm sealing bolt threads Mainshaft bearing set plate bolt threads Shift drum bearing set plate bolt threads	Locking agent	

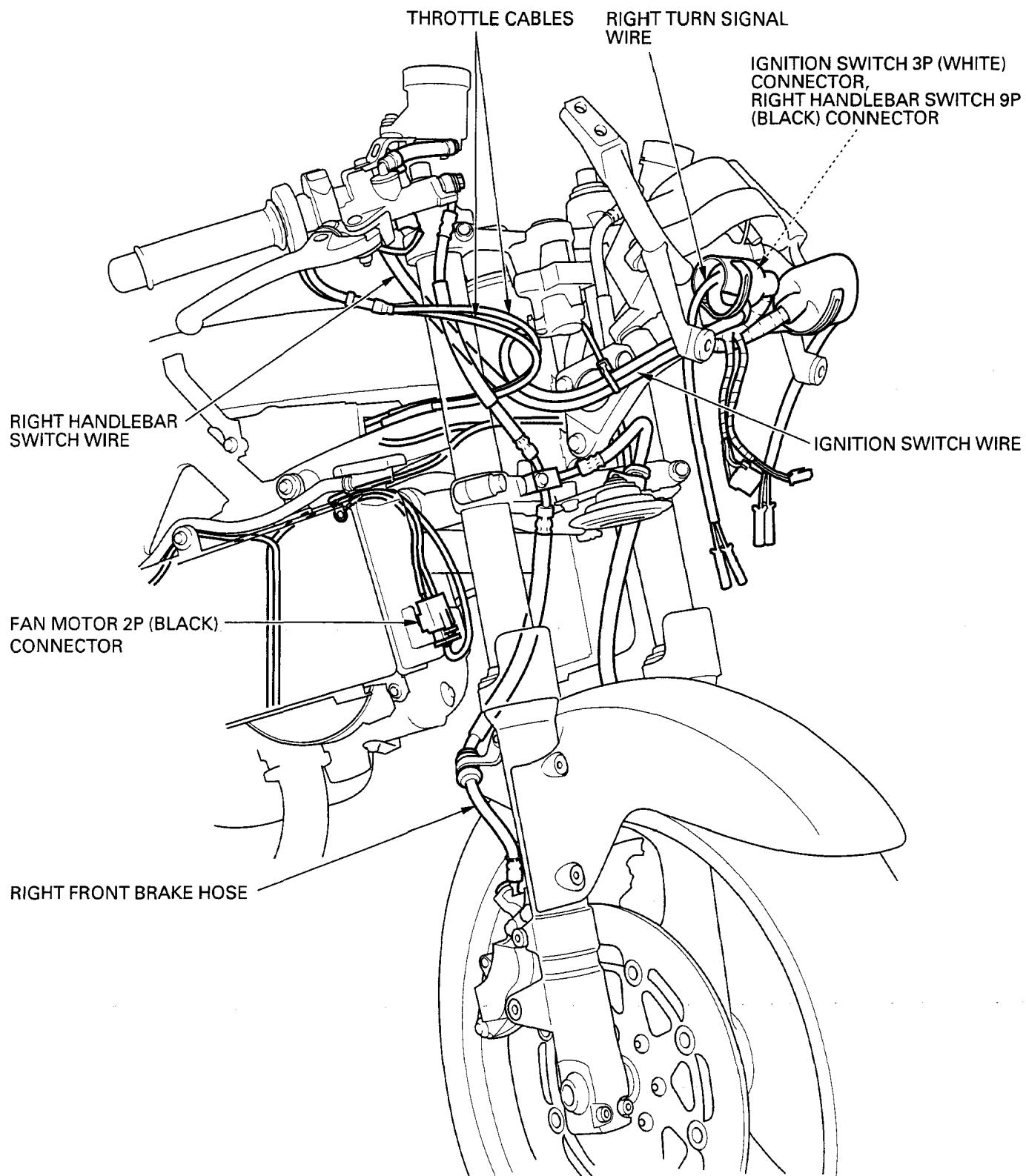
**FRAME**

LOCATION	MATERIAL	REMARKS
Front wheel dust seal lips Rear wheel dust seal lips Rear wheel side collar inner surfaces Driver footpeg sliding area Passenger footpeg sliding area Throttle grip pipe flange Seat catch hook sliding area Gearshift pedal link tie-rod ball joints Gearshift pedal pivot Rear brake pedal pivot	Multi-purpose grease	
Side stand pivot Steering head bearings Steering head bearing dust seal lips Shock absorber dust seal lips Shock absorber needle bearing Shock arm and link dust seal lips Shock arm and link needle bearings Swingarm pivot bearings Swingarm pivot dust seal lips	Molybdenum disulfide grease	
Shock absorber spring adjuster cam surface	Molybdenum disulfide past	
Throttle cable outer inside Choke cable outer inside	Cable lubricant	
Left handlebar grip rubber inside	Honda bond A or equivalent	
Steering bearing adjustment nut threads	Engine oil	
Front brake lever-to-master piston contacting area Front brake lever pivot Rear brake caliper pin bolt sliding surfaces Rear brake master piston-to-push rod contacting area Clutch lever pivot Clutch lever joint piece-to-push rod contacting area Clutch master piston-to-push rod contacting area	Silicone grease	
Brake master piston and cups Brake caliper piston and piston seals Clutch master piston and cups	DOT 4 brake fluid	
Fork dust seal and oil seal lips	Fork fluid	
Clutch fluid reservoir mounting screw threads Fork socket bolt threads Front brake caliper assembly bolt threads Rear brake caliper pin bolt threads	Locking agent	

## GENERAL INFORMATION

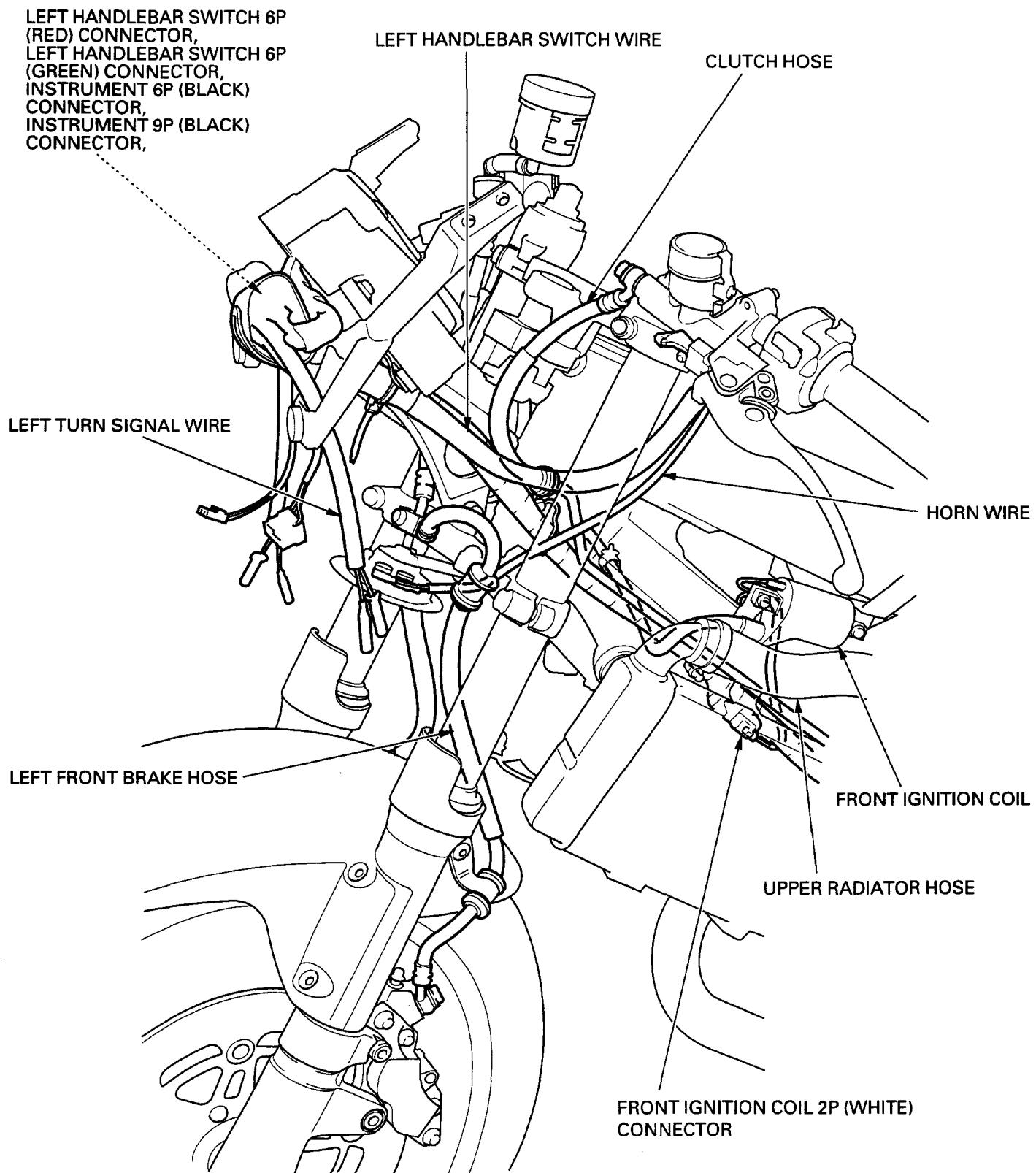
## CABLE & HARNESS ROUTING

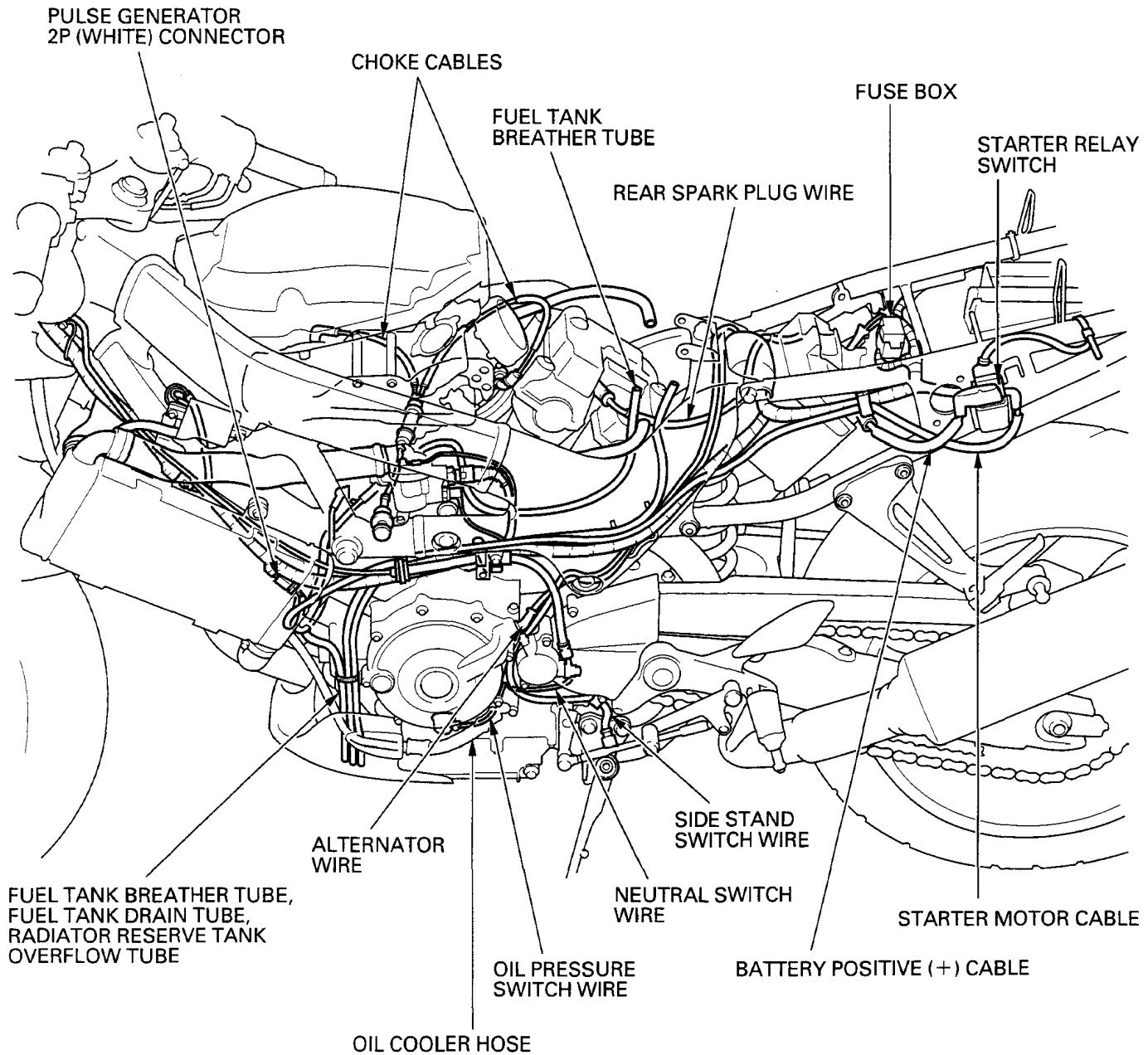


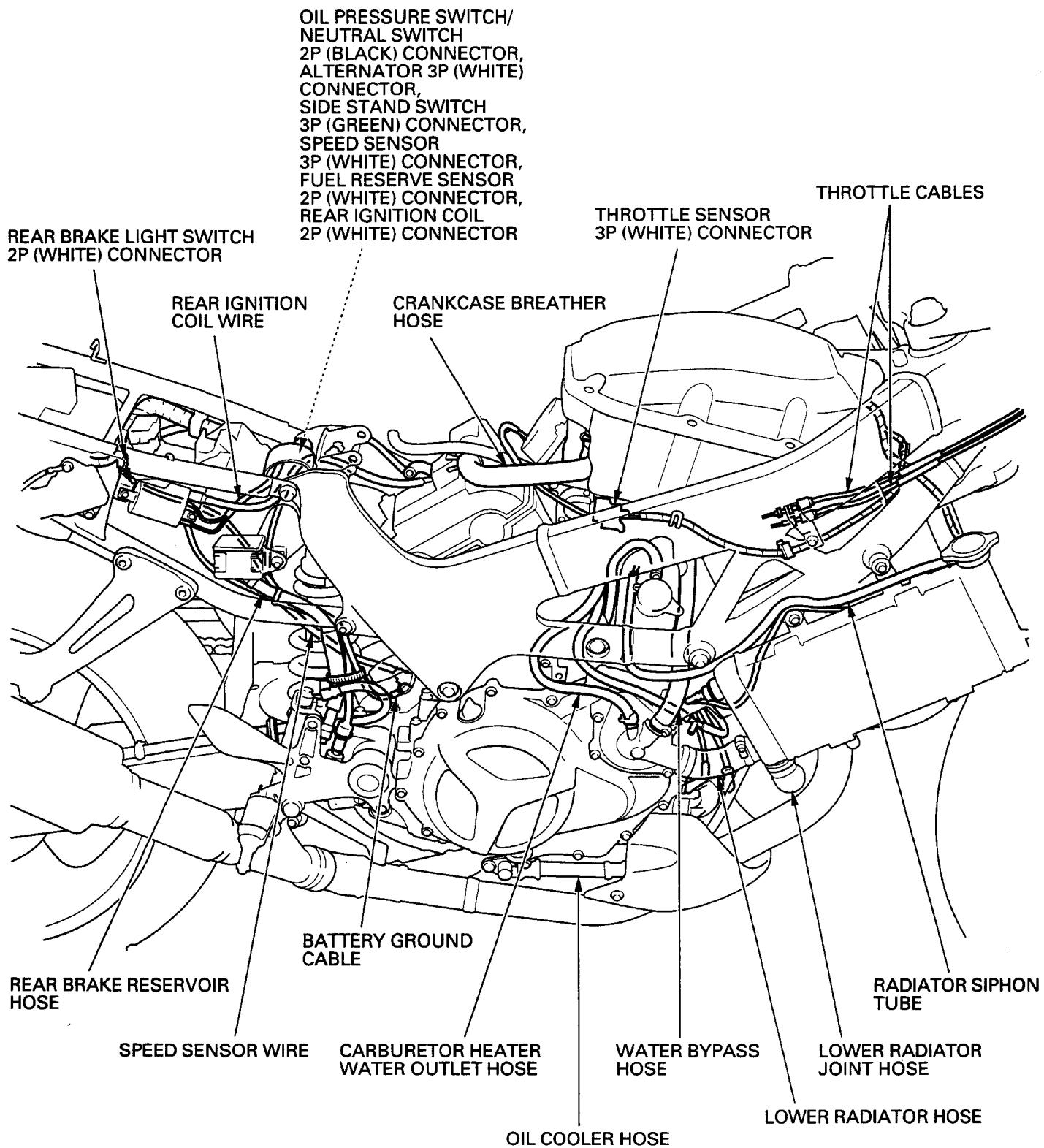


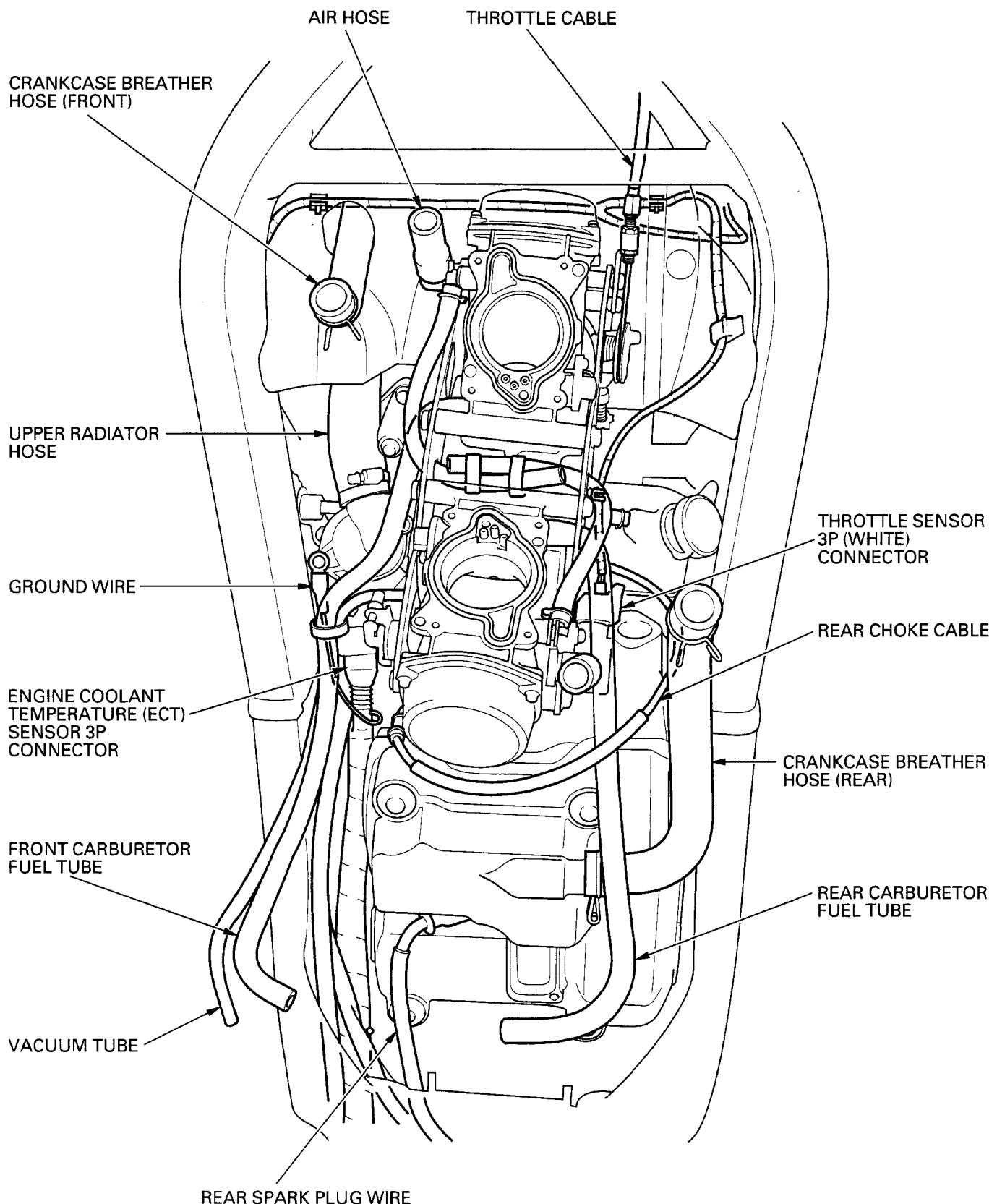
## GENERAL INFORMATION

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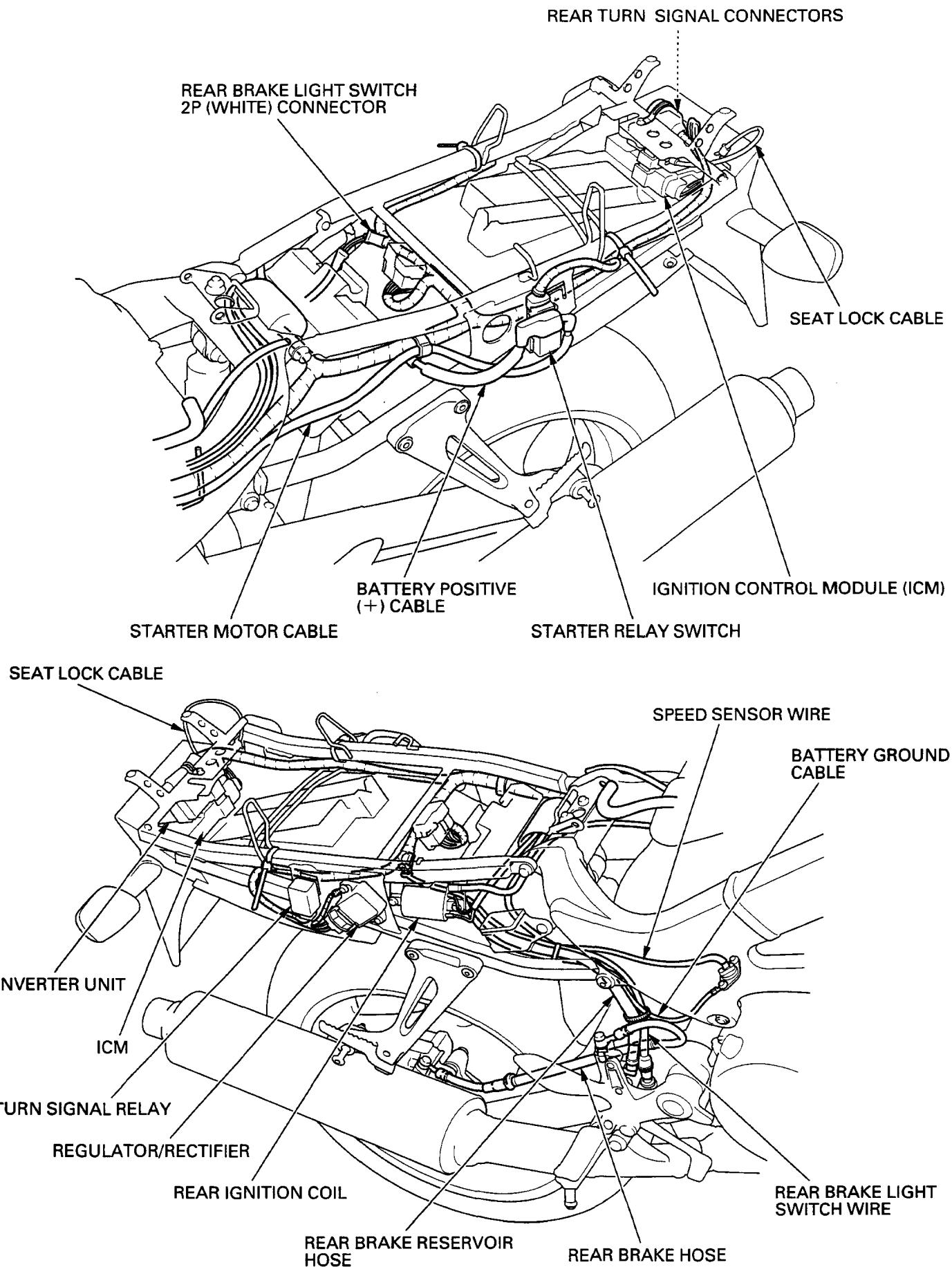






## GENERAL INFORMATION

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# EMISSION CONTROL SYSTEMS

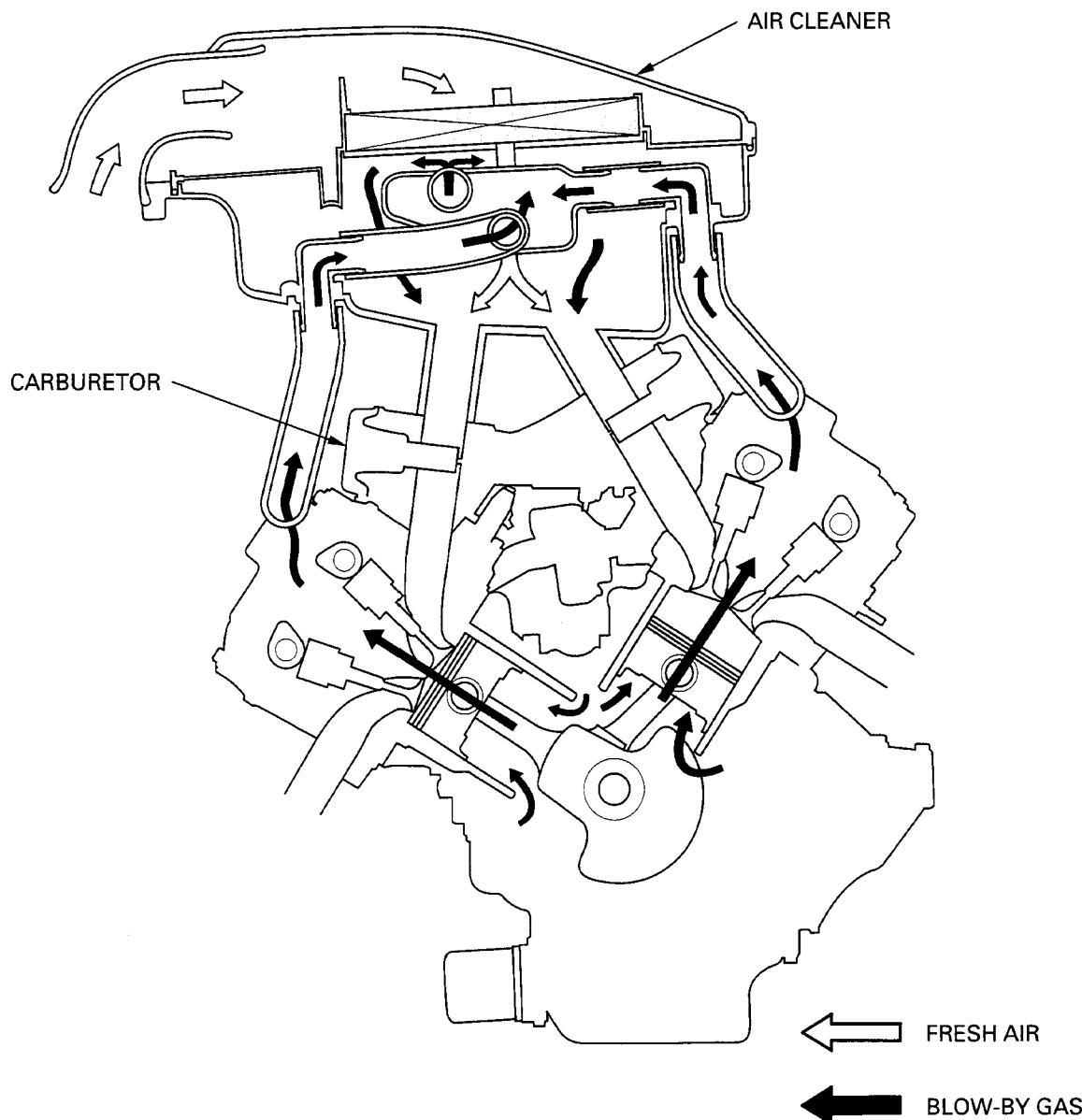
## SOURCE OF EMISSIONS

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

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

## CRANKCASE EMISSION CONTROL SYSTEM

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



## GENERAL INFORMATION

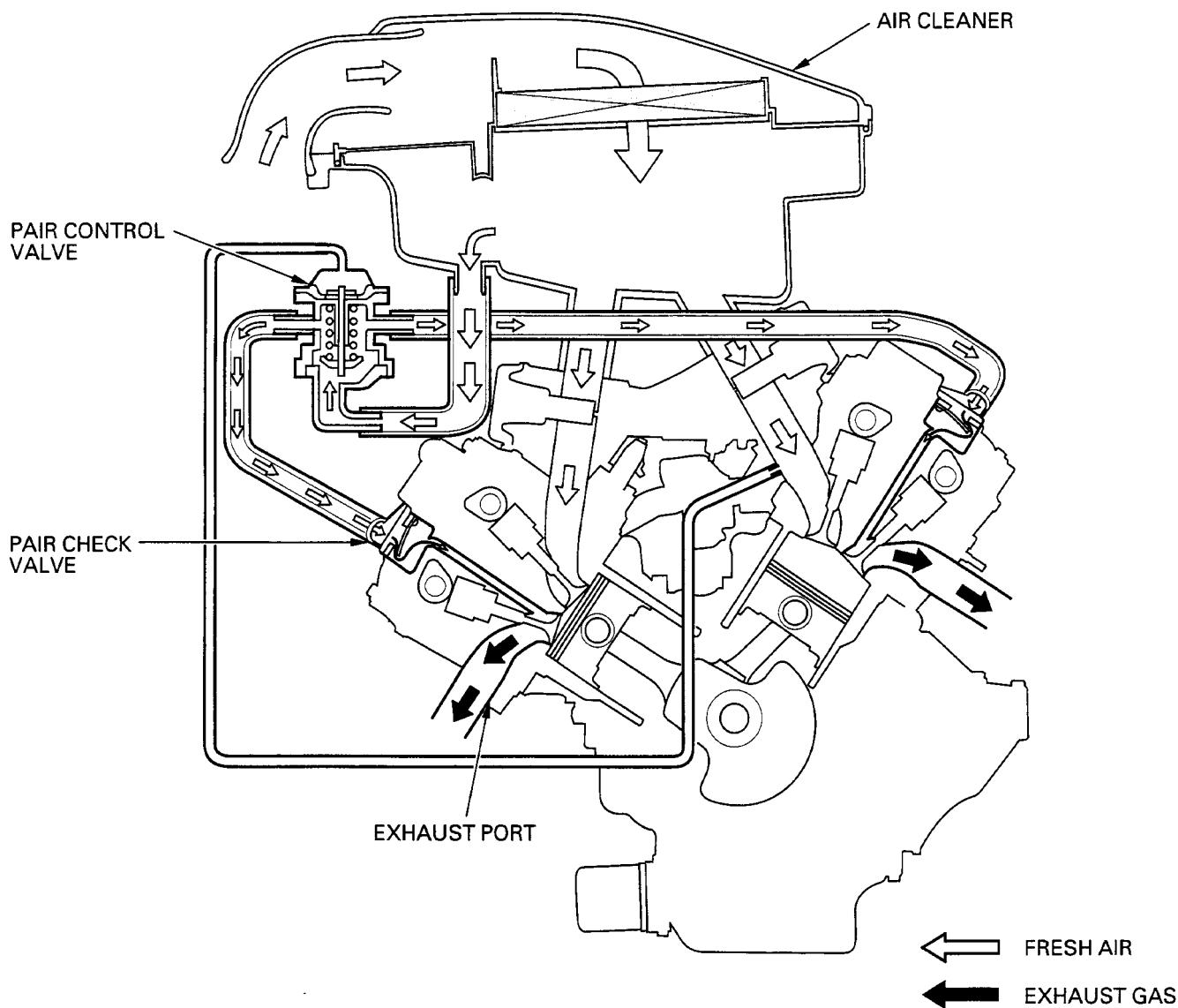
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### EXHAUST EMISSION CONTROL SYSTEM (PULSE SECONDARY AIR INJECTION SYSTEM) (SW, AR, IIG type only)

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

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

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



### NOISE EMISSION CONTROL SYSTEM (U type only)

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

# 2. FRAME/BODY PANELS/EXHAUST SYSTEM

2

SERVICE INFORMATION	2-1	FRONT FAIRING	2-3
TROUBLESHOOTING	2-1	ENGINE UNDER COVER	2-4
SEAT	2-2	FUEL TANK	2-4
SEAT COWL	2-2	EXHAUST SYSTEM	2-5

## SERVICE INFORMATION

### GENERAL

#### ⚠WARNING

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

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

### TORQUE VALUES

Exhaust pipe joint nut	12 N·m (1.2 kgf·m , 9 lbf·ft)
Muffler band bolt	26 N·m (2.7 kgf·m , 20 lbf·ft)

## TROUBLESHOOTING

#### Excessive exhaust noise

- Broken exhaust system
- Exhaust gas leaks

#### Poor performance

- Deformed exhaust system
- Exhaust gas leaks
- Clogged muffler

## SEAT

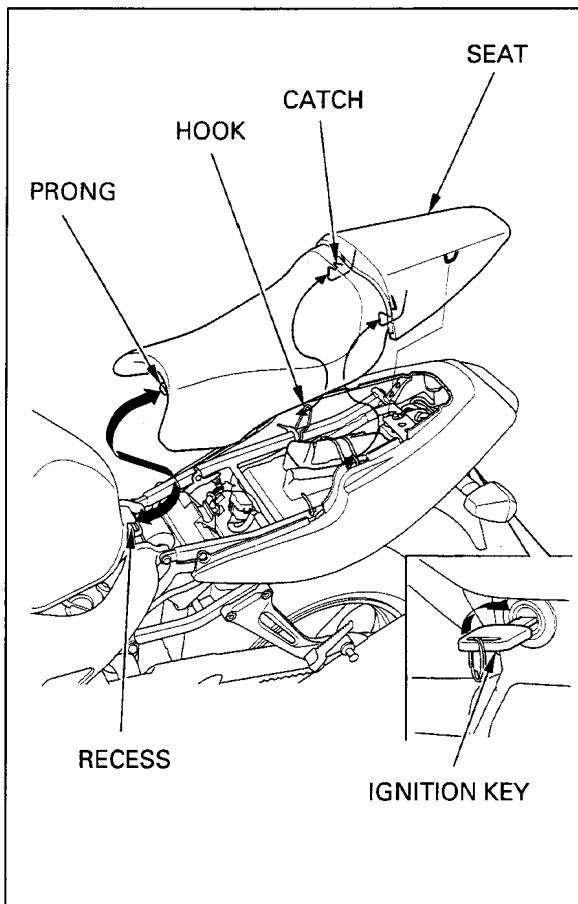
### REMOVAL

Unlock the seat with the ignition key.  
Pull the seat back and remove it.

### INSTALLATION

Install the seat, inserting the prong into the recess under the frame and the catches into the hooks of the frame.

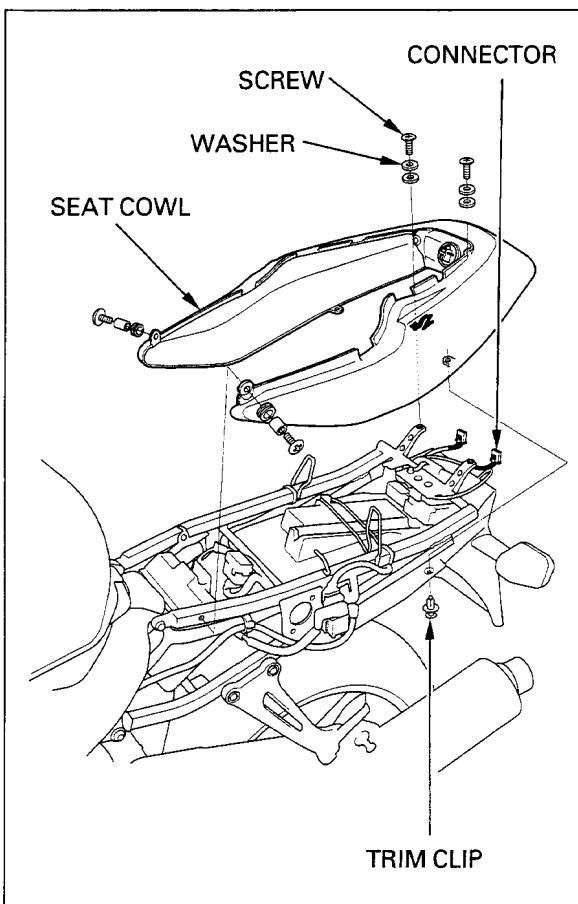
Push the seat forward, then down to lock it.



## SEAT COWL

Remove the seat.  
Disconnect the taillight connectors.  
Remove the two trim clips.  
Remove the four screws, washers and the seat cowl.

Install the seal cowl in the reverse order of removal.



# FRONT FAIRING

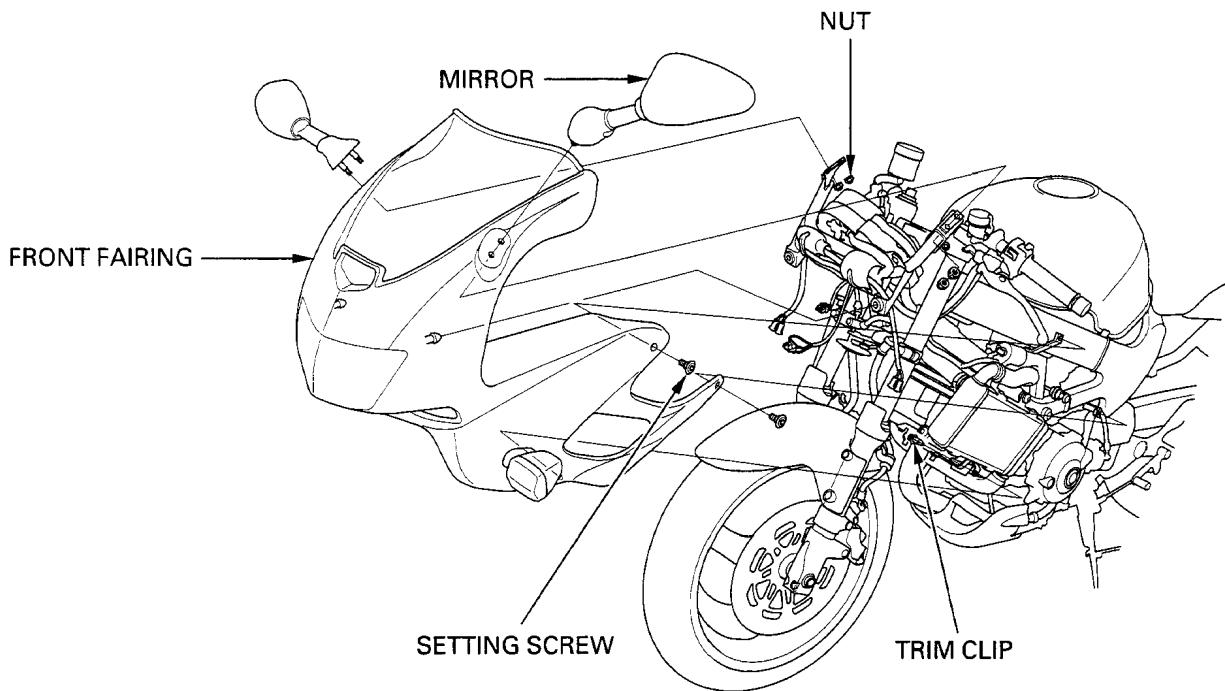
## REMOVAL

- Disconnect the front turn signal connectors.
- Remove the two trim clips.
- Remove the nuts and rear view mirrors.
- Remove the four setting bolts.
- Slide the front fairing forward, and disconnect the headlight connector and the position light connector (except U type).
- Remove the front fairing.

## INSTALLATION

- Install the front fairing, and connect the headlight and position light connectors.
- Insert the bosses of the front fairing into the grommets in the stay.

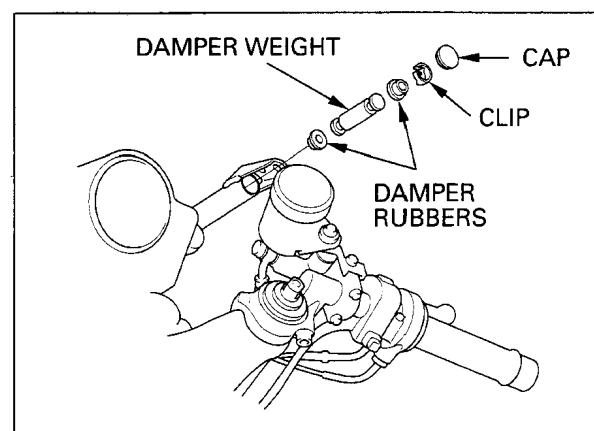
Install the removed parts in the reverse order of removal.



## DYNAMIC DAMPER REPLACEMENT

- Remove the cap from the fairing stay end.
- Push the clip tabs in and remove the damper weight and rubbers from the fairing stay.

Install a new dynamic damper and the cap into the fairing stay.



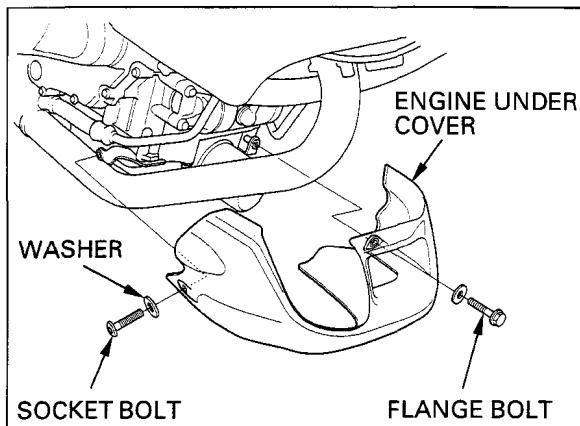
## ENGINE UNDER COVER

Remove the two bolts, washers and the engine under cover.

Install the engine under cover and tighten the bolts.

**NOTE:**

Use the socket bolt for the right side mounting.



## FUEL TANK

**WARNING**

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

Remove the seat (page 2-3).

Disconnect the fuel reserve sensor 2P connector.

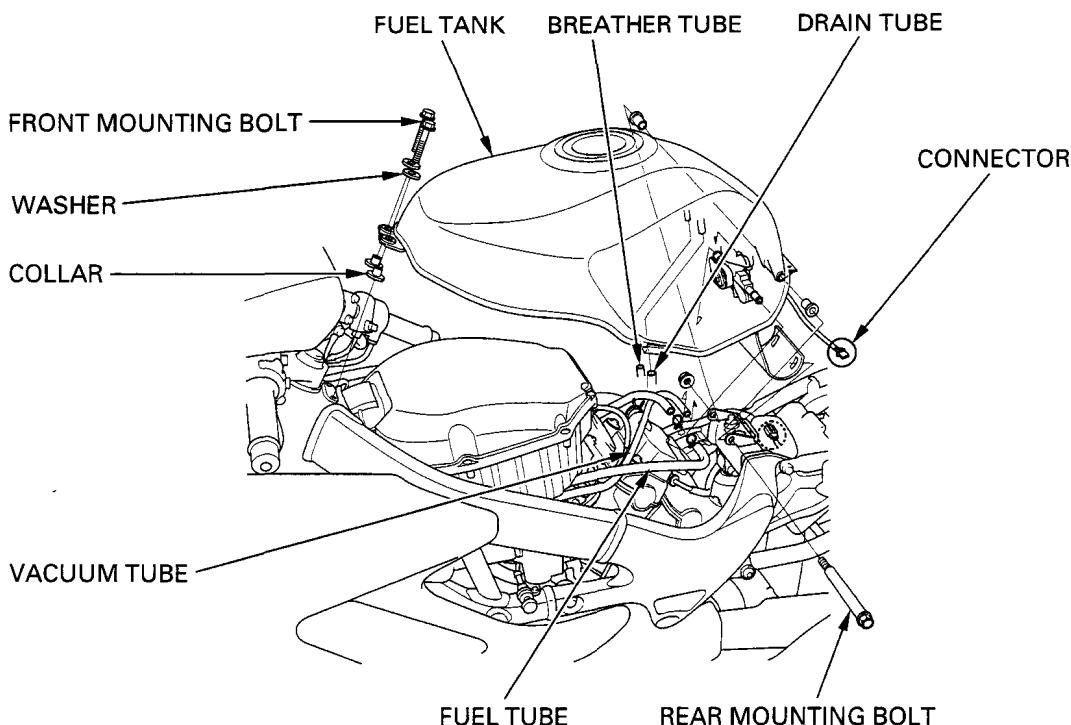
Remove the front mounting bolts and washers, and raise the front of the fuel tank.

Disconnect the fuel tubes and vacuum tube from the fuel valve.

Disconnect the fuel tank breather tube and drain tube from the fuel tank.

Remove the rear mounting nut, bolt and the fuel tank.

Install the fuel tank in the reverse order of removal.



# EXHAUST SYSTEM

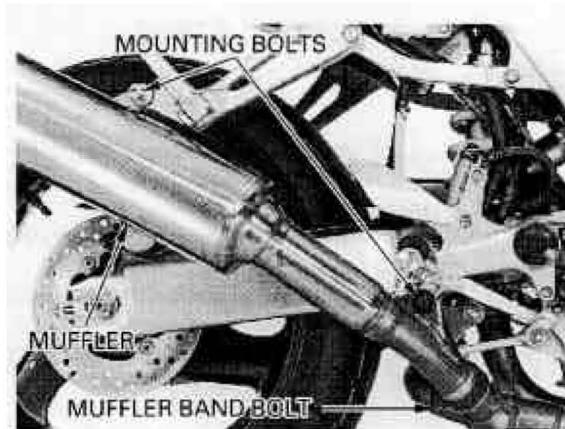
## REMOVAL

**WARNING**

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

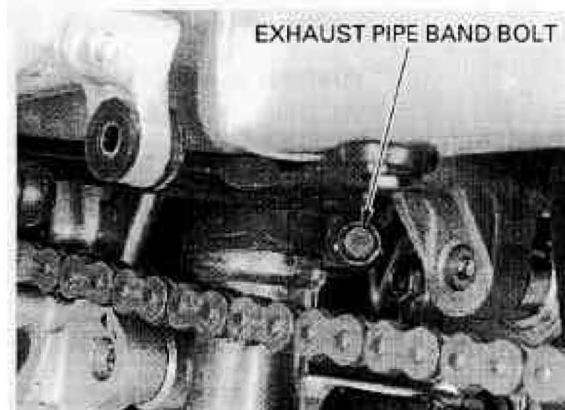
### MUFFLER

- Loosen the muffler band bolt.
- Remove the upper and lower muffler mounting bolts, washers and the muffler.
- Remove the muffler gasket.

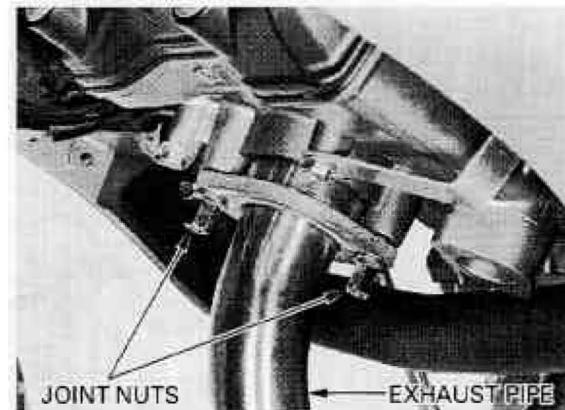


### EXHAUST PIPE

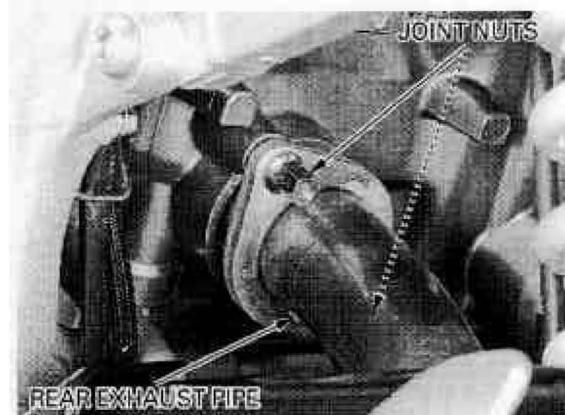
- Remove the left and right mufflers.
- Remove the engine under cover (page 2-4).
- Loosen the rear exhaust pipe band bolt.



- Remove the front exhaust pipe joint nuts and the exhaust pipe.
- Remove the front exhaust pipe joint gasket and the exhaust pipe gasket.



- Remove the rear exhaust pipe joint nuts and the rear exhaust pipe.
- Remove the rear exhaust pipe joint gasket.



**INSTALLATION****EXHAUST PIPE**

Install a new joint gasket and the rear exhaust pipe.  
Tighten the joint nuts.

**TORQUE:** 12 N·m (1.2 kgf·m , 9 lbf·ft)

Install a new gasket into the exhaust pipe.  
Install new joint gasket and the exhaust pipe onto  
the front cylinder head and rear exhaust pipe.  
Tighten the joint juts.

**TORQUE:** 12 N·m (1.2 kgf·m , 9 lbf·ft)

Tighten the rear exhaust pipe band bolt.

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

Install the engine under cover (page 2-4).

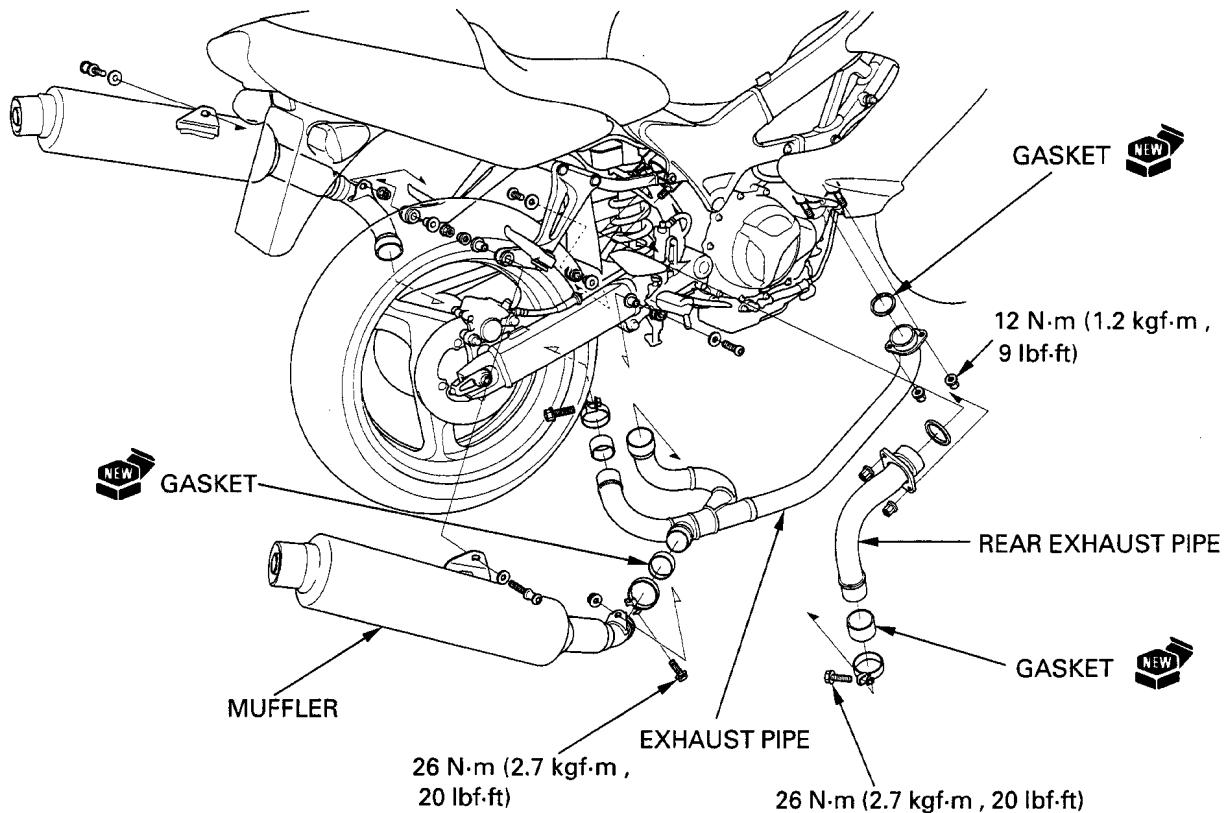
**MUFFLER**

Install the muffler onto the exhaust pipe, driver and passenger footpeg brackets, and temporarily tighten all bolts.

Tighten the muffler band bolt.

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

Tighten the muffler mounting bolts.



# 3. MAINTENANCE

3

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## SERVICE INFORMATION

### GENERAL

#### WARNING

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

## SPECIFICATIONS

ITEM		SPECIFICATIONS
Throttle grip free play		2–6 mm (1/12–1/4 in)
Spark plug		DPR9EVX-9 (NGK)
Spark plug gap		0.80–0.90 mm (0.031–0.035 in)
Valve clearance	Intake	0.16 mm (0.006 in)
	Exhaust	0.31 mm (0.012 in)
Recommended engine oil		Honda 4-stroke oil or equivalent motor oil API service classification: SE, SF or SG Viscosity: SAE 10W-40
Engine oil capacity	After draining	3.7 l (3.9 US qt, 3.3 Imp qt)
	After draining/filter change	3.9 l (4.1 US qt, 3.4 Imp qt)
	After disassembly	4.5 l (4.8 US qt, 4.0 Imp qt)
Carburetor vacuum difference		20 mm Hg (0.8 in Hg)

## MAINTENANCE

ITEM		SPECIFICATIONS		
Engine idle speed		1,100 $\pm$ 100 min <sup>-1</sup> (rpm)		
		AR, IIG type		
		1,200 $\pm$ 100 min <sup>-1</sup> (rpm)		
SW type		1,200 $\pm$ 50 min <sup>-1</sup> (rpm)		
Drive chain slack		30–40 mm (1.2–1.6 in)		
Recommended brake fluid		DOT 4		
Recommended clutch fluid		DOT 4 brake fluid		
Cold tire pressure	Driver only	Front	250 kPa (2.50 kgf/cm <sup>2</sup> , 36 psi)	
		Rear	290 kPa (2.90 kgf/cm <sup>2</sup> , 42 psi)	
	Driver and passenger	Front	250 kPa (2.50 kgf/cm <sup>2</sup> , 36 psi)	
		Rear	290 kPa (2.90 kgf/cm <sup>2</sup> , 42 psi)	
Tire size		Front	120/70ZR17 (58W)	
		Rear	180/55ZR17 (73W)	
Tire brand	DUNLOP	Front	D204FK	
		Rear	D204K	
	MICHELIN	Front	MACADAM 90X G	
		Rear	MACADAM 90X G	
Minimum tread depth		Front	1.5 mm (0.06 in)	
		Rear	2.0 mm (0.08 in)	

## TORQUE VALUES

Spark plug	14 N·m (1.4 kgf·m, 10 lbf·ft)	
Crankshaft hole cap	15 N·m (1.5 kgf·m, 11 lbf·ft)	Apply grease to the threads.
Timing hole cap	10 N·m (1.0 kgf·m, 7 lbf·ft)	Apply grease to the threads.
Oil filter cartridge	10 N·m (1.0 kgf·m, 7 lbf·ft)	Apply oil to the threads and O-ring.
Engine oil drain bolt	29 N·m (3.0 kgf·m, 22 lbf·ft)	
Vacuum port socket bolt	3 N·m (0.34 kgf·m, 2.5 lbf·ft)	
Rear axle nut	93 N·m (9.5 kgf·m, 69 lbf·ft)	
Rear reservoir mounting bolt	9 N·m (0.9 kgf·m, 6.5 lbf·ft)	
Clutch reservoir stopper plate screw	1 N·m (0.12 kgf·m, 0.9 lbf·ft)	

## TOOL

Oil filter wrench	07HAA-PJ70100
Drive chain tool set	07HMH-MR10103

# MAINTENANCE SCHEDULE

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

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

C: Clean

R: Replace

A: Adjust

L: Lubricate

The following Maintenance Schedule specifies all maintenance required to keep your motorcycle in peak operating condition. Maintenance work should be performed in accordance with standards and specifications of Honda by properly trained and equipped technicians. Your authorized Honda dealer meets all of these requirements.

ITEM	FREQUENCY	WHICHEVER COMES FIRST ↓ NOTE	ODOMETER READING (NOTE 1)								REFER TO PAGE	
			× 1,000 km	1	6	12	18	24	30	36		
			× 1,000 mi	0.6	4	8	12	16	20	24		
			MONTHS		6	12	18	24	30	36		
* 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	I	3-6	
* VALVE CLEARANCE							I				3-7	
ENGINE OIL				R	R	R	R	R	R	R	3-10	
ENGINE OIL FILTER				R	R	R	R	R	R	R	3-11	
* CARBURETOR SYNCHRONIZATION				I	I	I	I	I	I	I	3-12	
* ENGINE IDLE SPEED				I	I	I	I	I	I	I	3-13	
RADIATOR COOLANT		NOTE 3			I		I		R		3-13	
* COOLING SYSTEM					I		I		I	I	3-13	
* SECONDARY AIR SUPPLY SYSTEM		NOTE 4			I		I		I	I	3-14	
DRIVE CHAIN				Every 1,000 km (600 mi) I, L								3-14
DRIVE CHAIN SLIDER					I		I		I	I	I	3-18
BRAKE FLUID		NOTE 3		I	I	R	I	I	R			3-18
BRAKE PAD WEAR				I	I	I	I	I	I	I	I	3-19
BRAKE SYSTEM				I	I		I		I	I	I	3-20
* BRAKE LIGHT SWITCH					I		I		I	I	I	3-20
* HEADLIGHT AIM						I		I		I	I	3-21
CLUTCH SYSTEM						I		I		I	I	3-21
CLUTCH FLUID		NOTE 3		I	I	R	I	I	R			3-22
SIDE STAND						I		I		I	I	3-22
* SUSPENSION						I		I		I	I	3-23
* NUTS, BOLTS, FASTENERS				I	I		I		I	I	I	3-24
** WHEELS/TIRES						I		I		I	I	3-25
** STEERING HEAD BEARINGS				I	I		I		I	I	I	3-25

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

\* \* In the interest of safety, we recommend these items be serviced only by your authorized Honda dealer.

Honda recommends that your authorized Honda dealer should road test your motorcycle after each periodic maintenance is carried out.

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

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

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

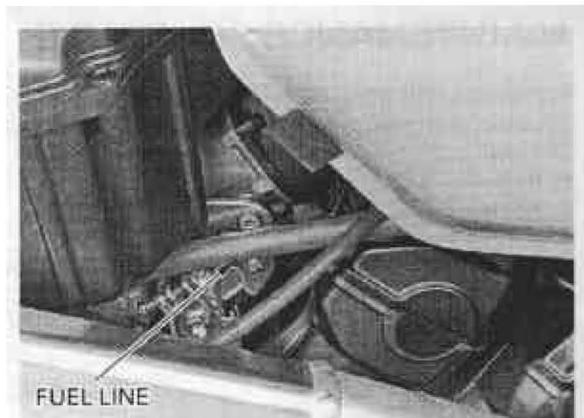
4. SW, AR and IIG type only.

### FUEL LINE

Remove the fuel tank front mounting bolts and raise the front of the fuel tank (page 2-4).

Check the fuel lines for deterioration, damage or leakage.

Replace the fuel lines if necessary.



### THROTTLE OPERATION

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

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

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

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

#### WARNING

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



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

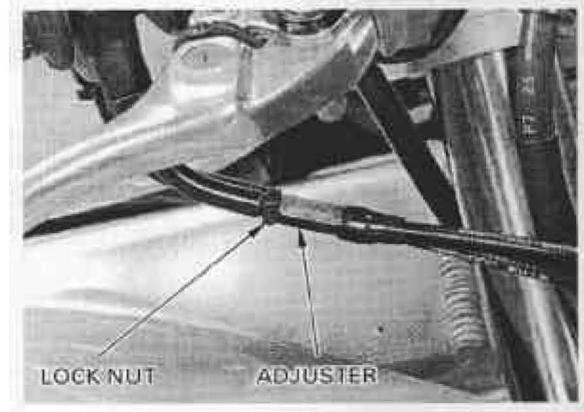
Measure the throttle grip free play at the throttle grip flange.

#### THROTTLE GRIP FREE PLAY:

2–6 mm (1/12–1/4 in)

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

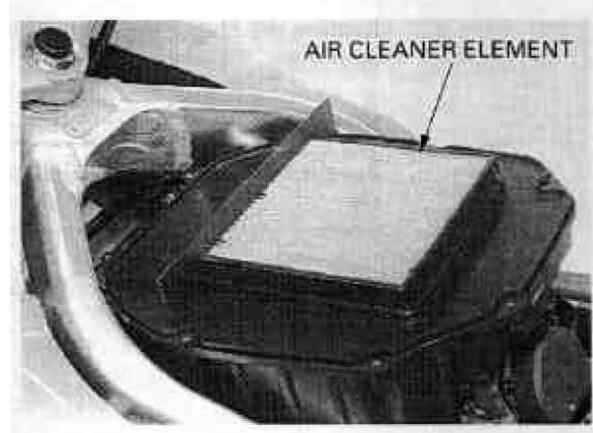
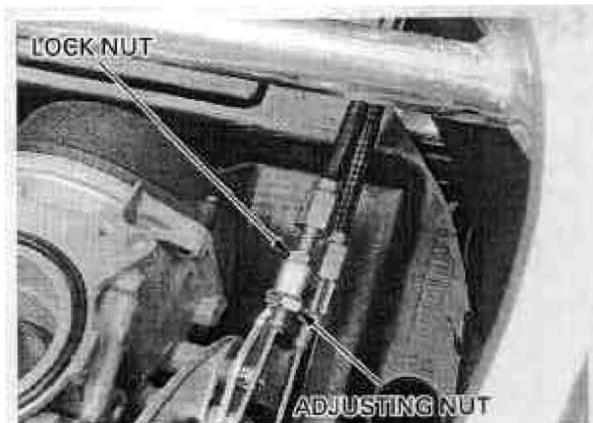
Loosen the lock nut, turn the adjuster as required and tighten the lock nut.



Major adjustments are made with the lower adjuster.

Remove the air cleaner housing (page 5-4). Loosen the lock nut, turn the adjusting nut as required and tighten the lock nut.

Recheck the throttle operation and install the air cleaner housing (page 5-4).



## CARBURETOR CHOKE

This model's choke system uses a fuel enriching circuit controlled by a starting enrichment (SE) valve. The SE valve opens the enriching circuit via a cable when the choke knob on the left side of the frame is pulled out.

Check for smooth choke knob operation. If operation is not smooth, check the cable condition (page 5-17).

## AIR CLEANER

### NOTE:

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

Remove the fuel tank (page 2-4).

Remove the eight air cleaner cover screws. Remove the air cleaner cover together with the element. Replace the element in accordance with the maintenance schedule or any time it is excessively dirty or damaged.

Install the air cleaner element and cover, and tighten the screws.

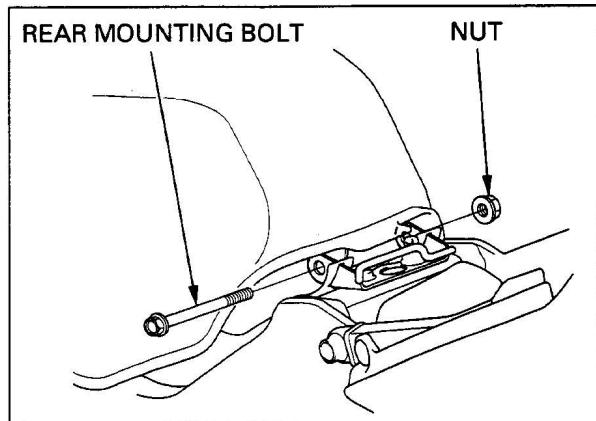
Install the fuel tank (page 2-4).

## MAINTENANCE

### SPARK PLUG

*Rear cylinder* Remove the seat (page 2-2).

Remove the fuel tank rear mounting nut and bolt.



*Rear cylinder* Raise the rear of the fuel tank and support it with the maintenance bar.

*Both cylinders* Disconnect the spark plug caps and clean around the spark plug bases.

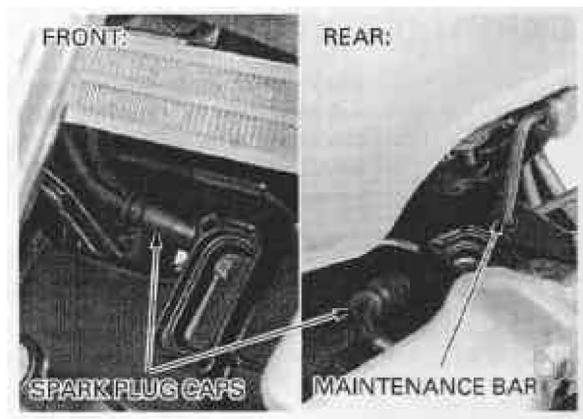
#### NOTE:

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

Remove the spark plugs.

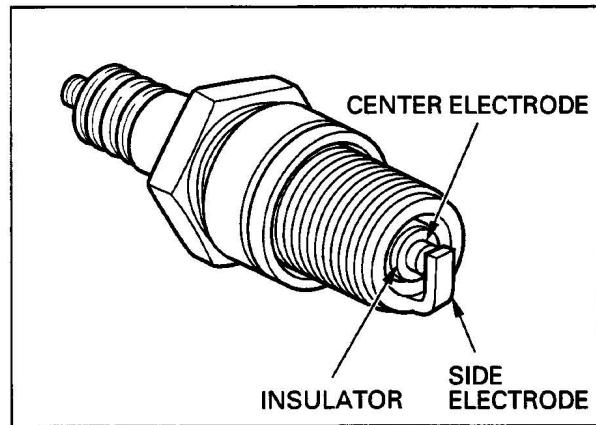
Check the insulator for cracks or damage, and the electrodes for wear, fouling or discoloration. Replace the plug if necessary.

If the electrode is contaminated with carbon deposits, clean the electrode using the spark plug cleaner.



#### CAUTION:

- This motorcycle's spark plug is equipped with platinum type electrodes. Do not use wire brush to clean the electrodes.
- The plug cleaner should be used with the air pressure of less than 6 kgf/cm<sup>2</sup> (85 psi) and for less than 20 seconds.

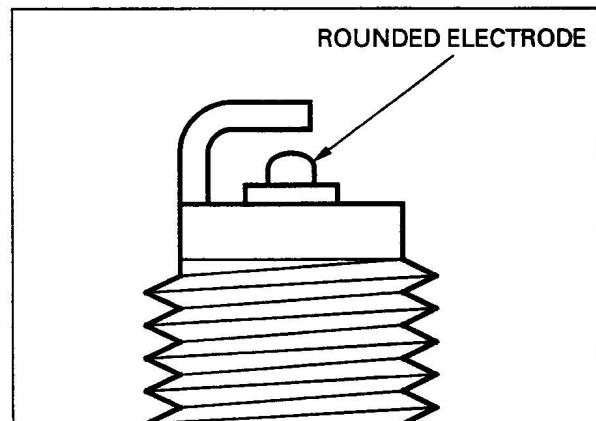


Replace the plug if the center electrode is rounded as shown.

#### NOTE:

Always use specified spark plugs on this motorcycle.

**SPECIFIED SPARK PLUG:** DPR9EVX-9 (NGK)



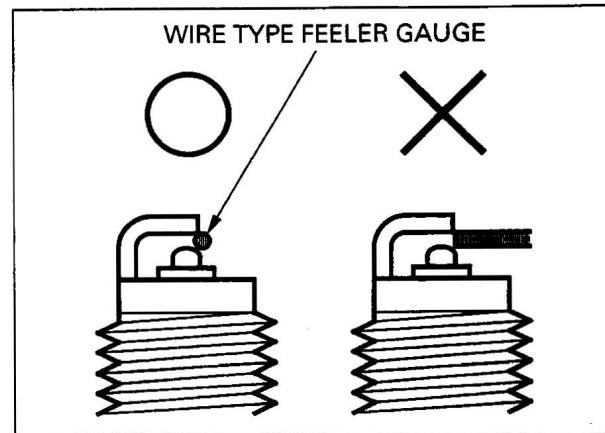
Measure the spark plug gap between the center and side electrodes with a wire-type feeler gauge.

**CAUTION:**

*To prevent damaging the platinum coating of the center electrode, use a wire type feeler gauge to check the spark plug gap.*

Make sure that the 1.0 mm (0.04 in) wire type feeler gauge cannot be inserted into the gap.

If the gauge can be inserted into the gap, replace the plug with a new one.



**CAUTION:**

*Do not adjust the spark plug gap. If the gap is out of specification, replace with a new one.*

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

Tighten the spark plug.

**TORQUE:** 14 N·m (1.4 kgf·m, 10 lbf·ft)

Install the removed part in the reverse order of removal.

## VALVE CLEARANCE

### INSPECTION

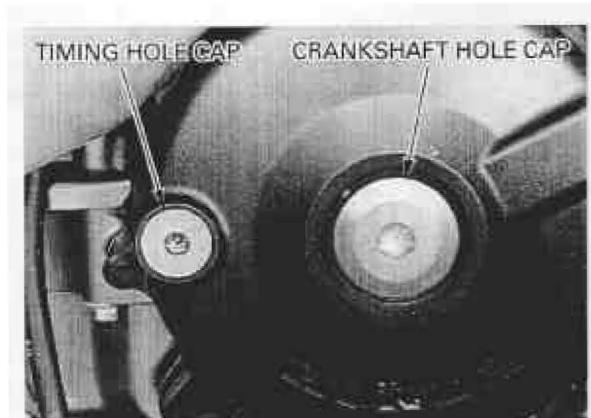
**NOTE:**

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

Remove the front and rear cylinder head covers (page 8-3).

Remove the timing hole cap and crankshaft hole cap.

Rotate the crankshaft counterclockwise and align the "FT" mark on the flywheel with the index mark on left crankcase cover.



## MAINTENANCE

The timing marks ("F-I" for intake and "F-E" for exhaust) on the front cylinder cam sprockets must be flush with the cylinder head surface and facing outward as shown.

If the timing marks are facing inward, rotate the crankshaft counterclockwise  $360^\circ$  (1 full turn) and align the "F T" mark with the index mark.

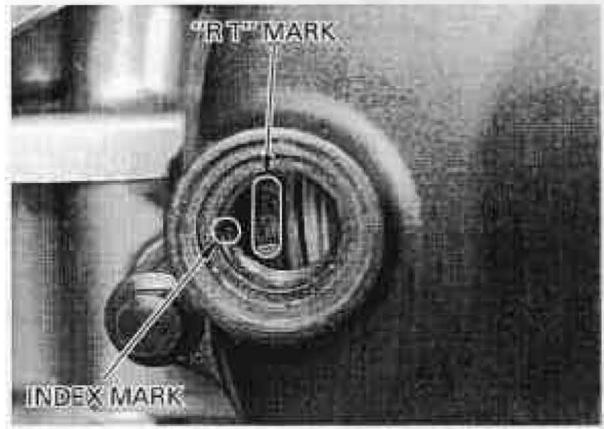


Measure the front cylinder valve clearance by inserting a feeler gauge between the valve lifter and cam lobe.

**VALVE CLEARANCES:** IN: 0.16 mm (0.006 in)  
EX: 0.31 mm (0.012 in)



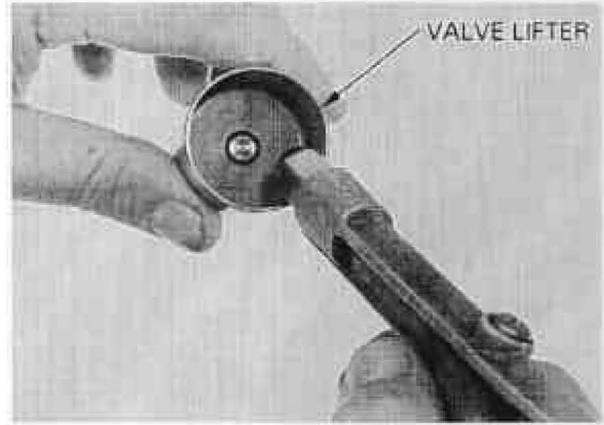
Rotate the crankshaft counterclockwise  $270^\circ$  and align the "R T" mark with index mark.  
Check the rear cylinder valve clearances.



## ADJUSTMENT

Remove the valve lifters and shims (page 8-4).

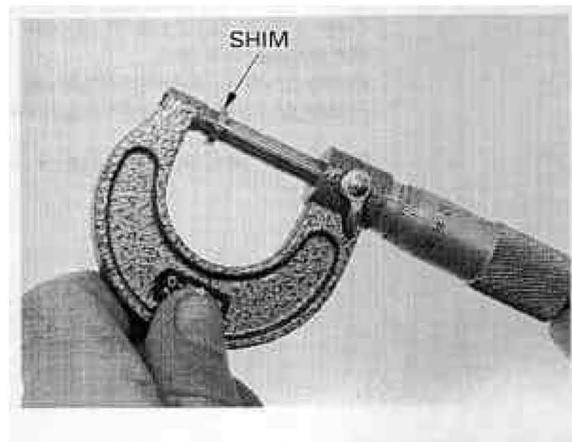
Clean the valve shim contact area in the valve lifter with compressed air.



Measure the shim thickness and record it.

**NOTE:**

Fifty-one different thickness shims are available from the thinnest (1.200 mm thickness) shim to the thickest (2.450 mm thickness) in intervals of 0.025 mm.



Calculate the new shim thickness using the equation below.

$$A = (B - C) + D$$

A: New shim thickness

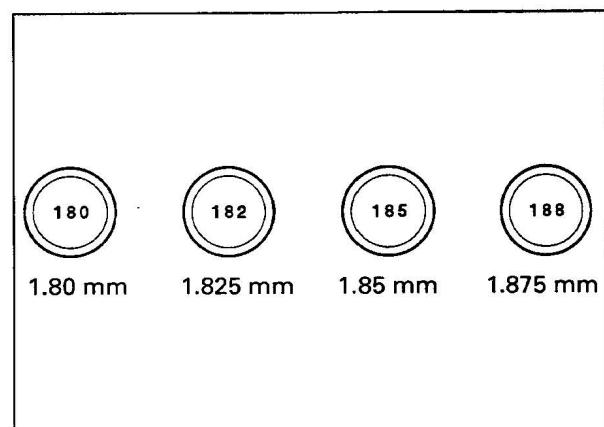
B: Recorded valve clearance

C: Specified valve clearance

D: Old shim thickness

**NOTE:**

- Make sure of the correct shim thickness by measuring the shim with the micrometer.
- Reface the valve seat if carbon deposits result in a calculated dimension of over 2.450 mm.



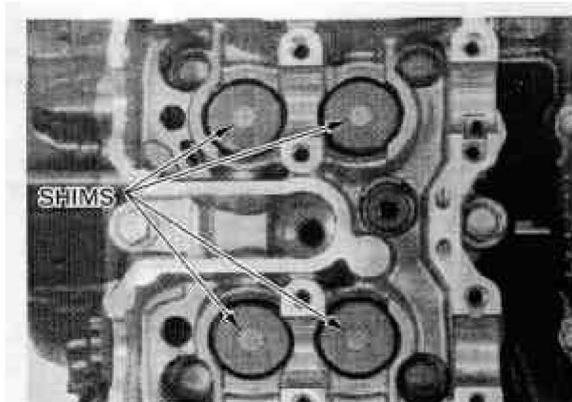
Install the newly selected shims on the valve retainers.

Install the valve lifters and camshafts (page 8-19).

Rotate the camshafts by rotating the crankshaft counterclockwise several times.

Recheck the valve clearances.

Install the cylinder head covers (page 8-23).

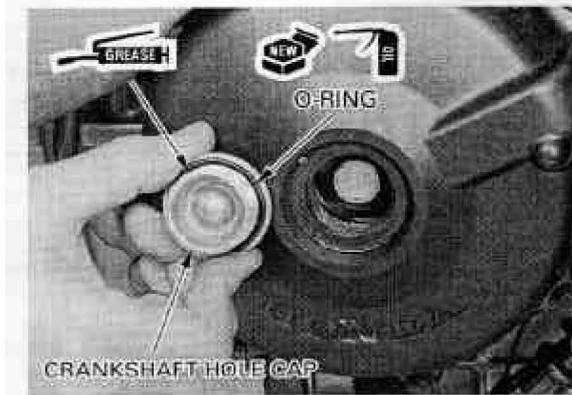


Coat a new O-ring with grease and install it onto the crankshaft hole cap.

Apply grease to the crankshaft hole cap threads.

Install and tighten the crankshaft hole cap.

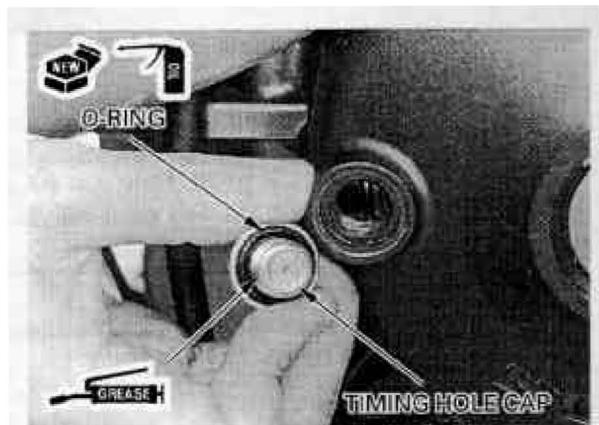
**TORQUE:** 15 N·m (1.5 kgf·m, 11 lbf·ft)



## MAINTENANCE

Coat a new O-ring with grease and install it onto the timing hole cap.  
Apply grease the timing hole cap threads.  
Install and tighten the timing hole cap.

**TORQUE:** 10 N·m (1.0 kgf·m , 7 lbf·ft)

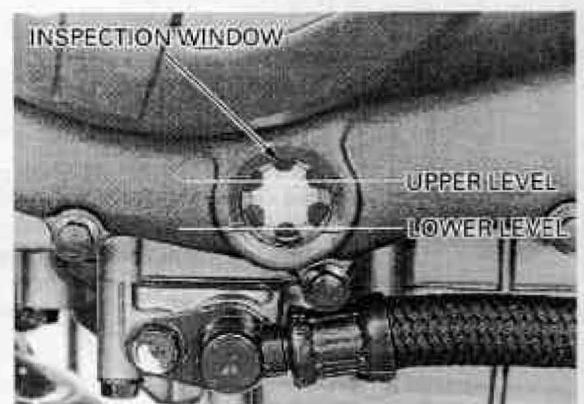


## ENGINE OIL

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

Stop the engine, support the motorcycle upright on a level surface.

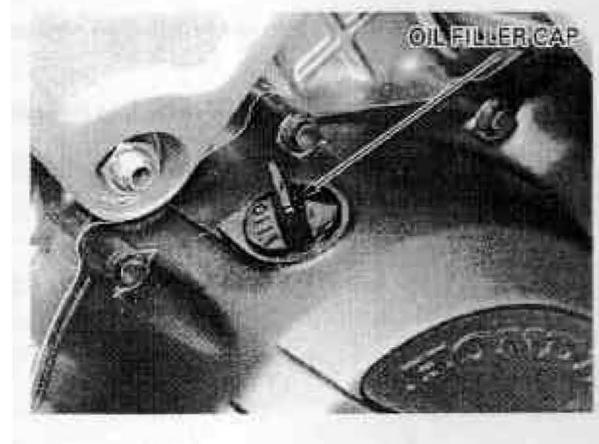
Wait for a few minutes and check that the oil level is between the upper and lower level marks in the inspection window.



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

### RECOMMENDED ENGINE OIL:

Honda 4-stroke oil or equivalent motor oil  
API service classification: SE, SF or SG  
Viscosity: SAE 10W-40

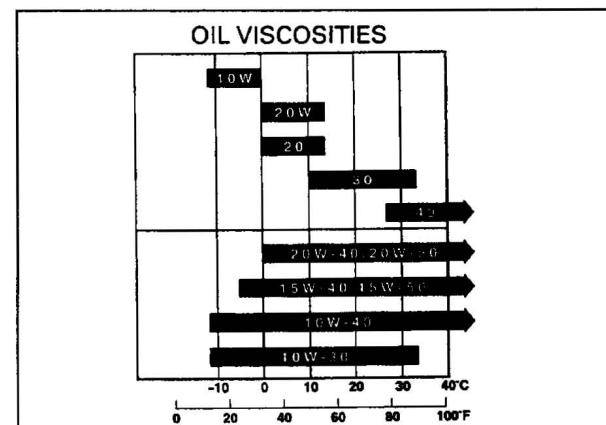


### NOTE:

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

Reinstall the filler cap.

For engine oil change, see next page.



## ENGINE OIL FILTER

### NOTE:

Change the oil with 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.**

Warm up the engine.

Stop the engine and remove the engine under cover (page 2-4).

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

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

### TOOL:

Oil filter wrench 07HAA-PJ70100

### CAUTION:

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

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

**TORQUE:** 10 N·m (1.0 kgf·m , 7 lbf·ft)

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

Install and tighten the drain bolt.

**TORQUE:** 29 N·m (3.0 kgf·m , 22 lbf·ft)

Fill the crankcase with the recommended oil (page 3-10).

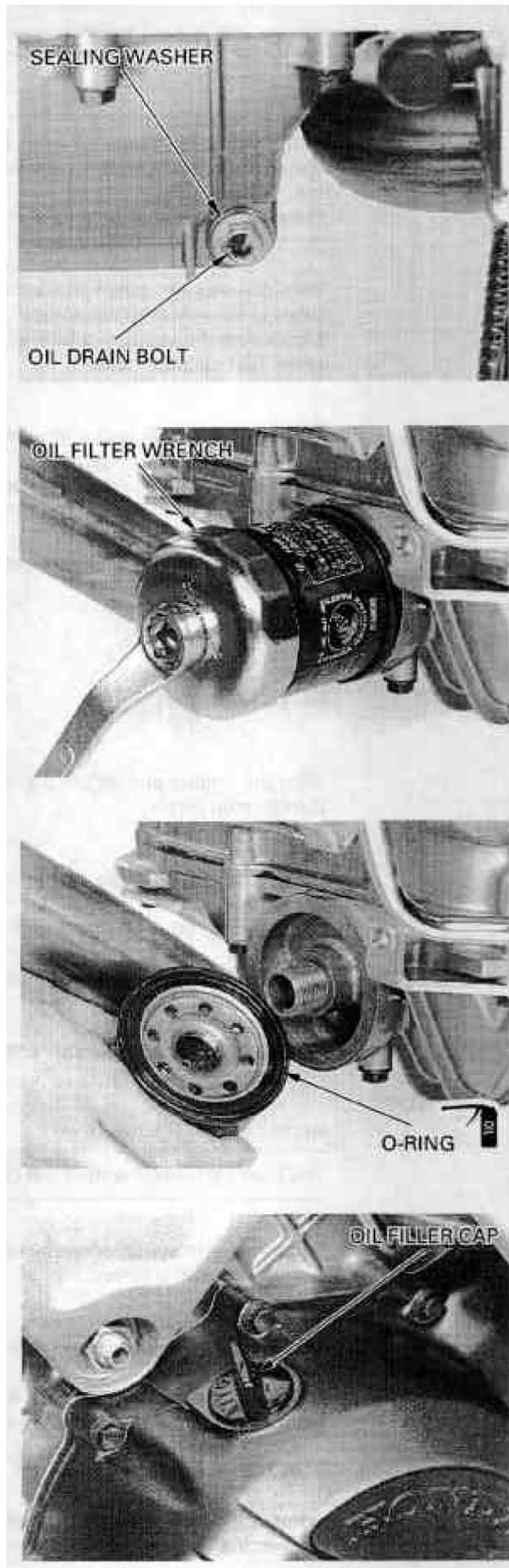
**OIL CAPACITY:** 3.9 ℥ (4.1 US qt , 3.4 Imp qt)  
after draining/filter change  
4.5 ℥ (4.8 US qt , 4.0 Imp qt)  
at disassembly

Reinstall the oil filler cap.

Check the engine oil level (page 3-9).

Make sure there are no oil leaks.

Install the engine under cover (page 2-4).



### CARBURETOR SYNCHRONIZATION

#### NOTE:

Perform this maintenance with the engine at normal operating temperature and transmission in neutral.

Place the motorcycle on a level surface.

Start the engine, pinch the vacuum tube using a tube clamp, and stop the engine.

Disconnect the vacuum tube from the vacuum joint of the rear cylinder head.

Remove the socket bolt and washer from the front cylinder head vacuum port.

Install the vacuum gauge attachment into the vacuum port.

Connect the vacuum gauge tubes to the attachment and vacuum joint.

Start the engine and adjust the idle speed with the throttle stop screw.

#### IDLE SPEED:

Except SW, AR, IIG type:  $1,100 \pm 100 \text{ min}^{-1}$  (rpm)

AR, IIG, type:  $1,200 \pm 100 \text{ min}^{-1}$  (rpm)

SW type:  $1,200 \pm 50 \text{ min}^{-1}$  (rpm)

Check the difference between the front and rear carburetors.

#### CARBURETOR VACUUM DIFFERENCE:

20 mm Hg (0.8 in Hg)

#### NOTE:

The base carburetor is the front carburetor.

Synchronize to specification by turning the synchronization adjusting screw.

Rev the engine up several times.

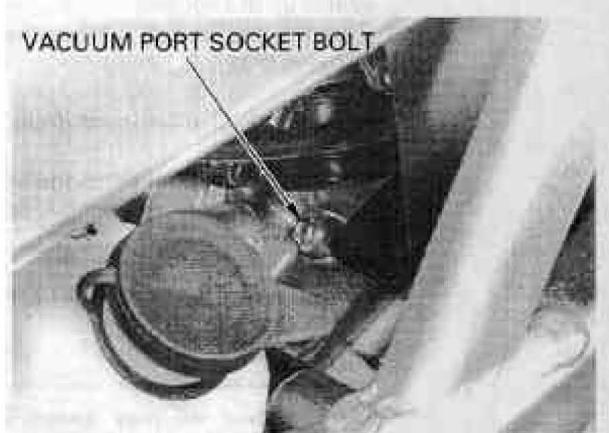
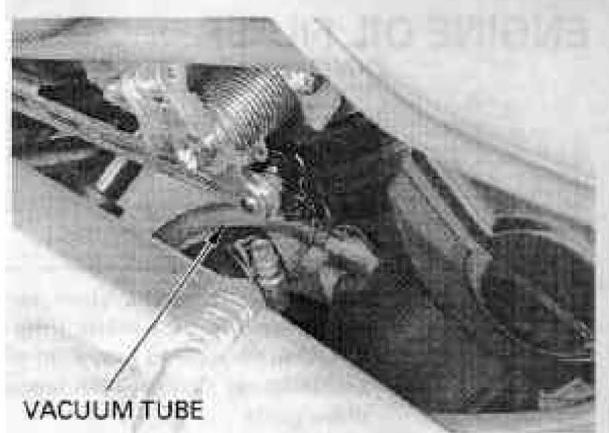
Recheck the idle speed and synchronization.

Remove the vacuum gauge and attachment.

Install and tighten the vacuum port socket bolt.

**TORQUE: 3 N·m (0.34 kgf·m , 2.5 lbf·ft)**

Remove the tube clamp from the vacuum tube and connect the vacuum tube to the vacuum joint.



## ENGINE IDLE SPEED

### NOTE:

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

Warm up the engine, shift the transmission into neutral and place the motorcycle on its side stand on a level surface.

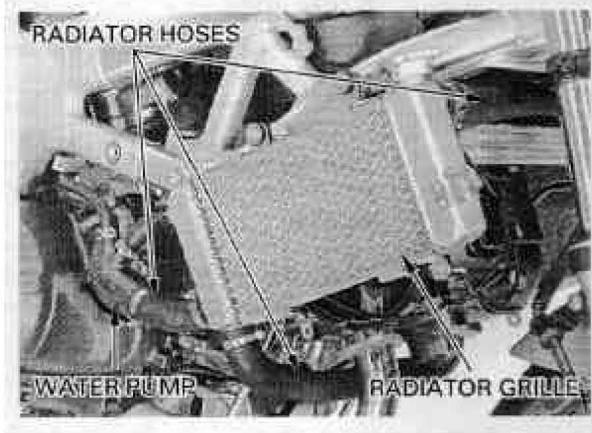
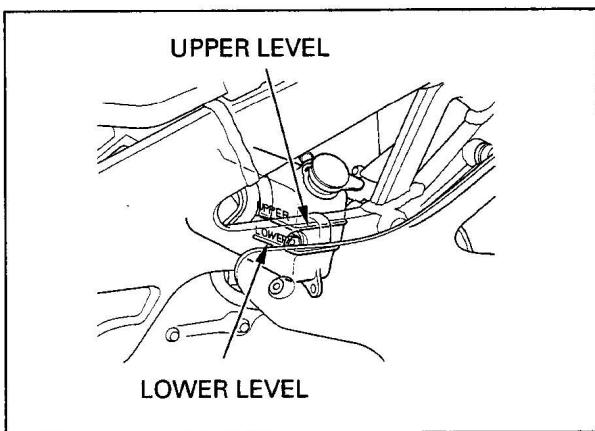
Check the idle speed and adjust by turning the throttle stop screw as required.

### IDLE SPEED:

**Except SW, AR, IIG type:**  $1,100 \pm 100 \text{ min}^{-1}$  (rpm)

**AR, IIG type:**  $1,200 \pm 100 \text{ min}^{-1}$  (rpm)

**SW type:**  $1,200 \pm 50 \text{ min}^{-1}$  (rpm)



## RADIATOR COOLANT

Check the coolant level of the reserve tank with the engine running at normal operating temperature.

The level should be between the "UPPER" and "LOWER" level lines with the motorcycle upright on a level surface.

If the level is low, remove the reserve tank cap and fill the tank to the "UPPER" level line with a 50/50 mixture of distilled water and antifreeze.

### 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 when the coolant level decreases very rapidly.

If reserve tank becomes completely empty, there is a possibility of air getting into the cooling system. Be sure to remove all air from the cooling system (page 6-6).

## COOLING SYSTEM

Remove the front fairing (page 2-3).

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

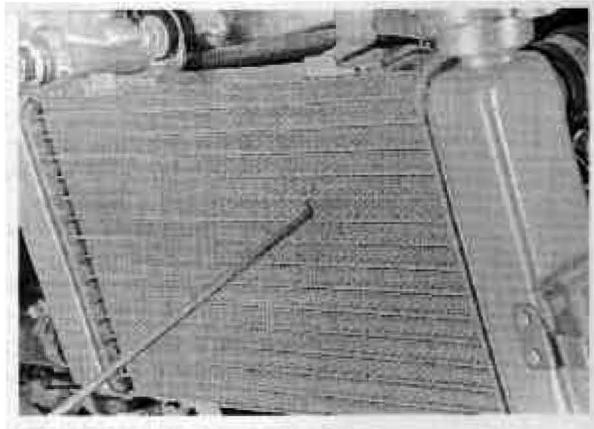
Check the radiator hoses for cracks or deterioration and replace if necessary.

Check that all hose clamps are tight.

Remove the radiator grille.

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

Install the radiator grille and front fairing (page 2-3).



## SECONDARY AIR SUPPLY SYSTEM

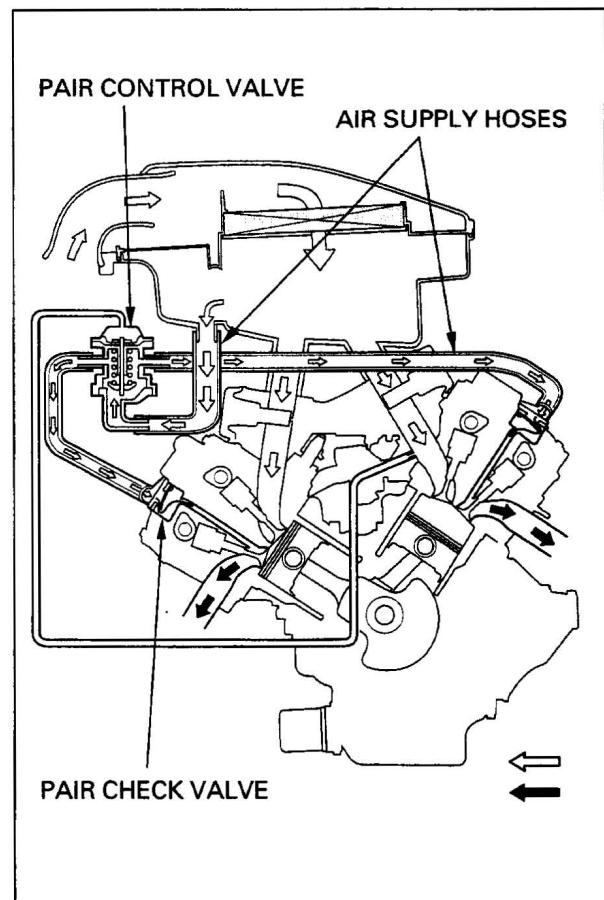
Check the air supply hoses between the pulse secondary air injection (PAIR) control valve and PAIR check valves for damage or loose connections.  
Check the air supply hoses for cracks or deterioration.

**NOTE:**

If the hoses show any signs of heat damage, inspect the PAIR check valves (page 5-20).

Check the vacuum tubes between the rear cylinder head vacuum joint and PAIR control valve for deterioration, damage or loose connections. Also check that the tubes are not kinked or pinched.

For PAIR control valve inspection, see page 5-19.



## DRIVE CHAIN

### CHAIN SLACK INSPECTION

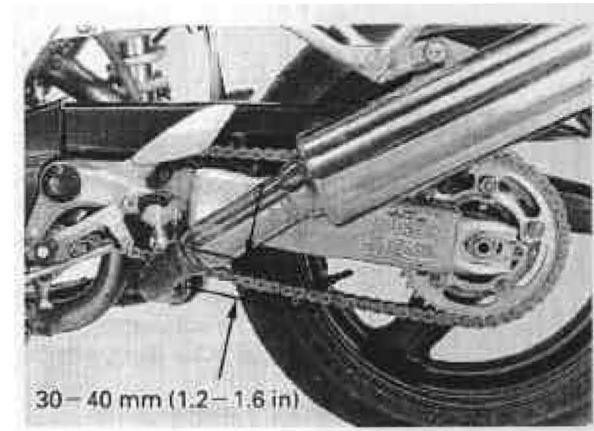
**WARNING**

*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.

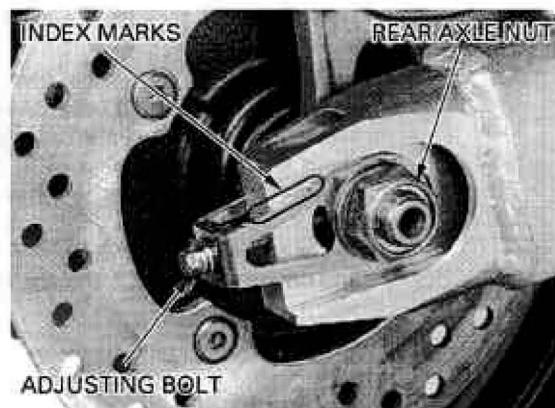
**CHAIN SLACK:** 30–40 mm (1.2–1.6 in)



## ADJUSTMENT

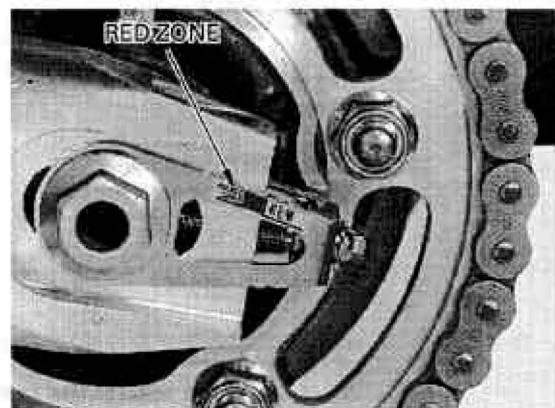
Loosen the rear axle nut.  
 Turn both adjusting bolts an equal number of turns until the correct drive chain slack is obtained.  
 Make sure the index marks on both adjusters are aligned with the rear end of the swingarm.  
 Tighten the rear axle nut.

**TORQUE:** 93 N·m (9.5 kgf·m , 69 lbf·ft)



Recheck the drive chain slack and free wheel rotation.

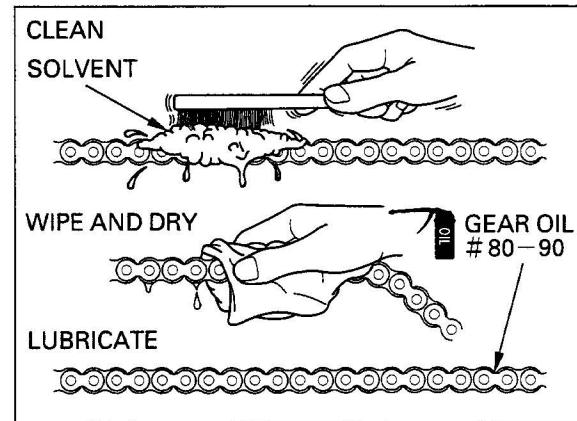
Check the drive chain wear indicator label attached on the left drive chain adjuster.  
 If the red zone of the indicator label reaches the end of the swingarm, replace the drive chain with a new one (page 3-16).



## CLEANING AND INSPECTION

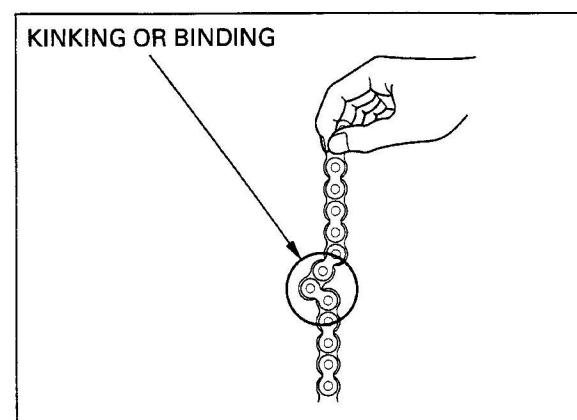
Clean the chain with a soft brush using a non-flammable or high flash point solvent and wipe it dry.  
 Be sure the chain has dried completely before lubricating.

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



## LUBRICATION

Lubricate the drive chain with #80-90 gear oil or equivalent chain lubricant designed for specifically for use on O-ring chains.  
 Some commercially available chain lubricants may contain solvents which could damage the O-rings.  
 Wipe off the excess chain lube.

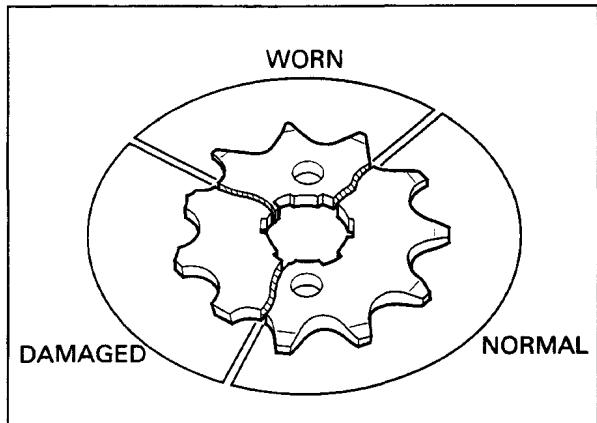


### SPROCKET INSPECTION

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

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

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



### REPLACEMENT

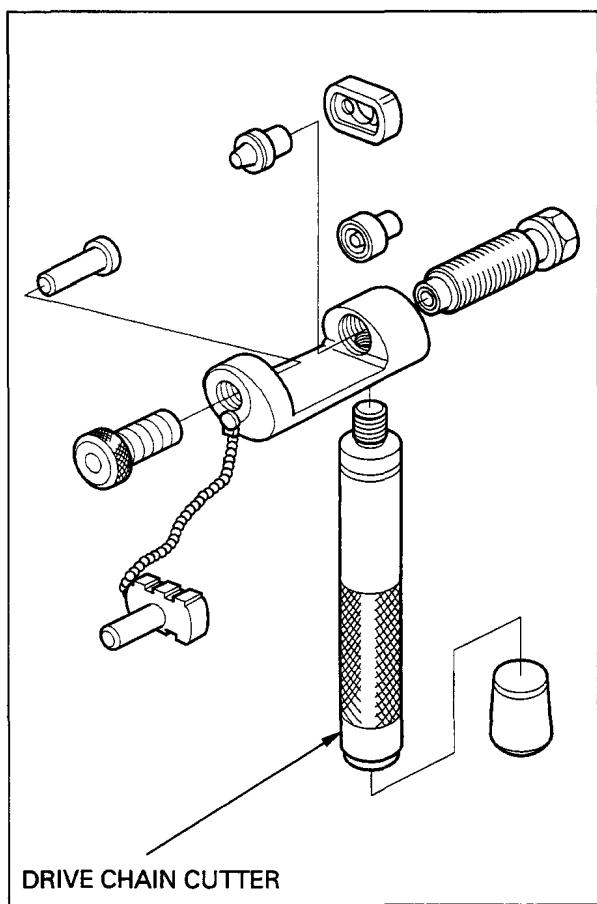
This motorcycle uses a drive chain with a staked master link.

Loosen the drive chain.  
Assemble the special tool.

**TOOL:**  
**Drive chain tool set**      07HMH-MR10103

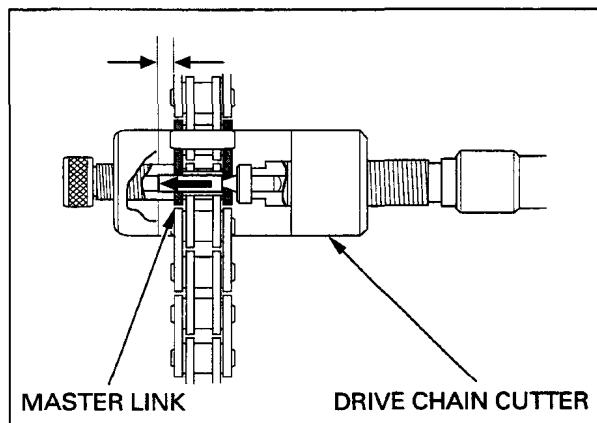
**NOTE:**

When using the special tool, follow the manufacturer's instruction.



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

Remove the drive chain.



Remove the excess drive chain links from the new drive chain with the drive chain tool set.

**NOTE:**

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

**SPECIFIED LINKS:** 102 links

**REPLACEMENT CHAIN:** DID 50ZVM  
RK50LFOZ2

Remove the drive sprocket cover (page 7-4).  
Install the new drive chain on the sprockets over the drive and driven sprockets.

Assemble the new master link, O-rings and master link plate with the drive chain tool set.

**NOTE:**

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

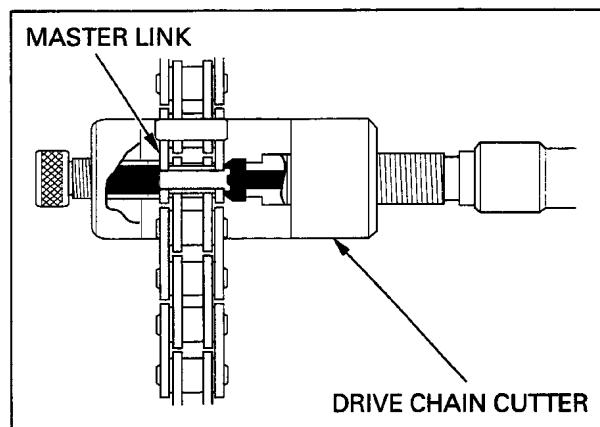
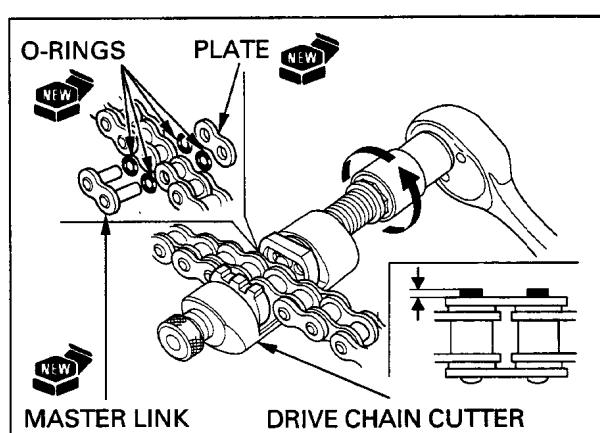
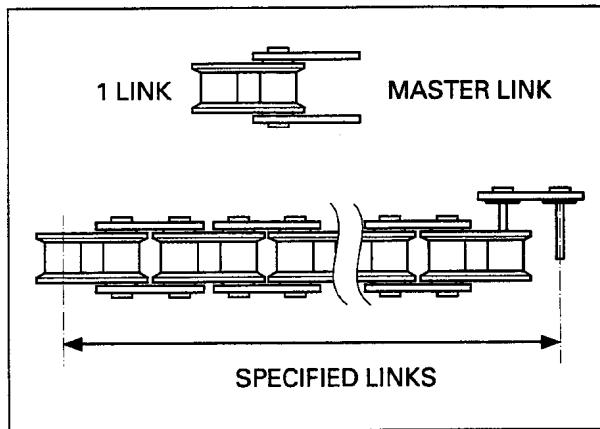
Measure the master link pin length projected from the plate.

**SPECIFIED LENGTH:**

DID: 1.30–1.50 mm (0.051–0.059 in)

RK: 1.20–1.40 mm (0.047–0.055 in)

Stake the master link pins with the drive chain tool set.

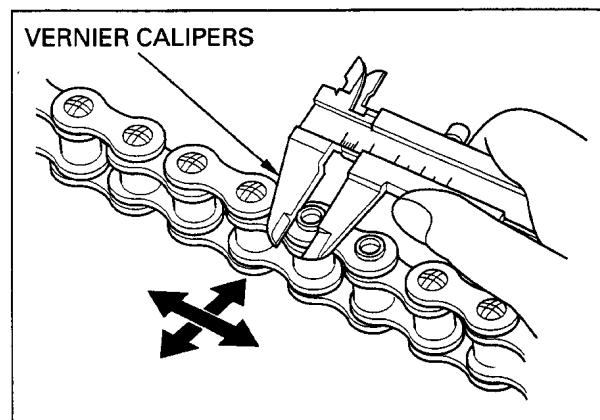


Make sure that the master link pins are staked properly by measuring the diameter of the staked area.

**DIAMETER OF THE STAKED AREA:**

DID: 5.50–5.80 mm (0.217–0.228 in)

RK: 5.45–5.85 mm (0.215–0.230 in)



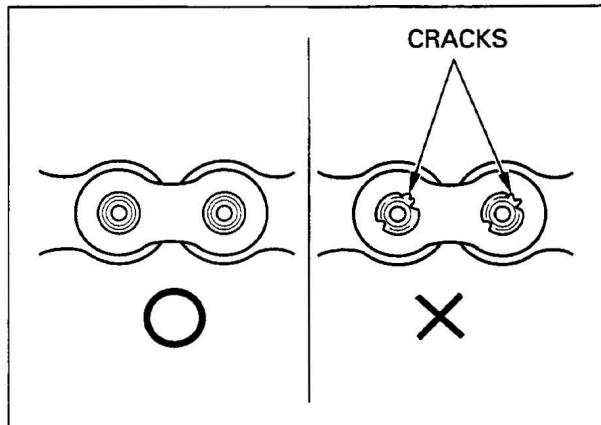
## MAINTENANCE

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.**

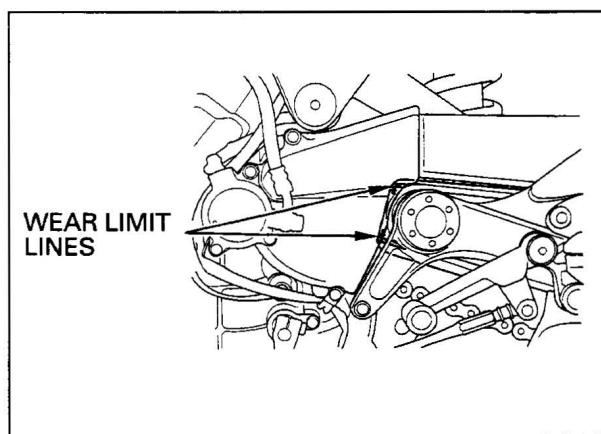
Install the drive sprocket cover (page 7-11).



## DRIVE CHAIN SLIDER

Check the drive chain slider for wear.  
Replace the chain slider if it is worn to the wear limit line.

Refer to section 14 for drive chain slider replacement.



## BRAKE FLUID

### CAUTION:

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

### NOTE:

When the fluid level is low, check the brake pads for wear (page 3-19). A low fluid level may be due to wear of the brake pads. If the brake pads are worn, the caliper pistons are pushed out, and this accounts for a low reservoir level.

If the brake pads are not worn and the fluid level is low, check entire system for leaks (page 3-20).

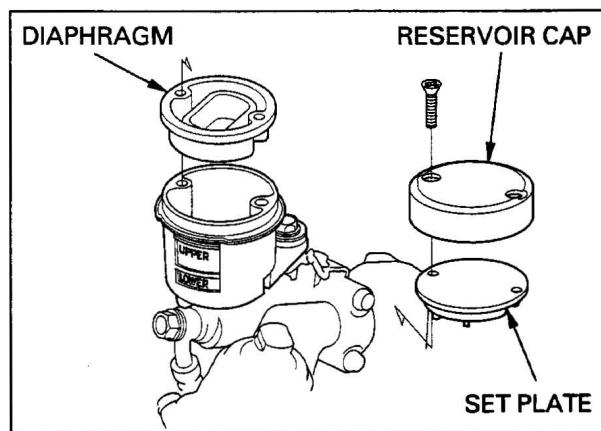


## FRONT BRAKE

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

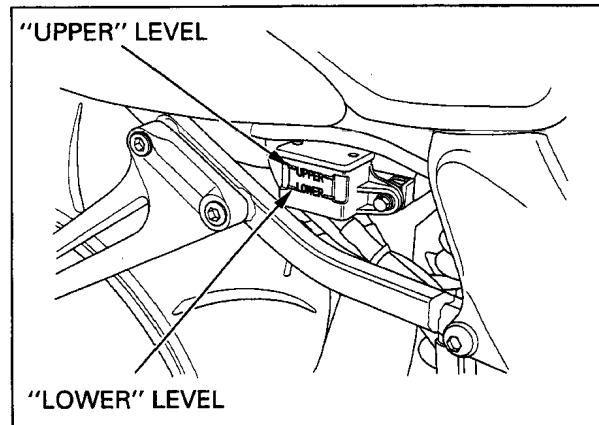
If the level is near the "LOWER" level line, remove the reservoir cap, set plate and diaphragm, and fill the reservoir with DOT 4 brake fluid from a sealed container to the "UPPER" level line.

Install the diaphragm, set plate and reservoir cap and tighten the cap screws.



## REAR BRAKE

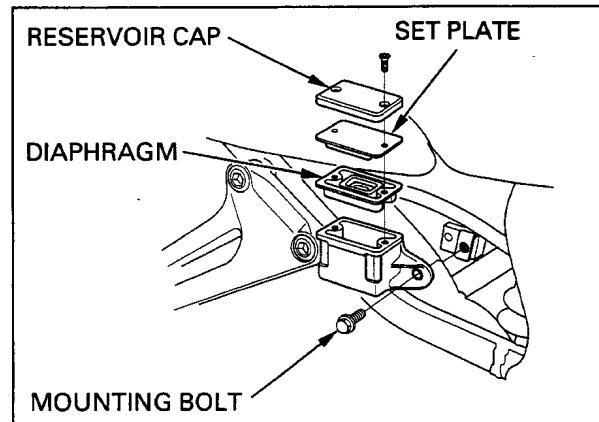
Place the motorcycle on a level surface, and support it upright.  
Check the fluid level in the rear brake reservoir.



If the level is near the "LOWER" level line, remove the reservoir mounting bolt, reservoir cap, set plate and diaphragm, and fill the reservoir with DOT 4 brake fluid from a sealed container to the upper level line.

Install the diaphragm, set plate and reservoir cap and tighten the cap screws.  
Install the reservoir onto the stay and tighten the mounting bolt.

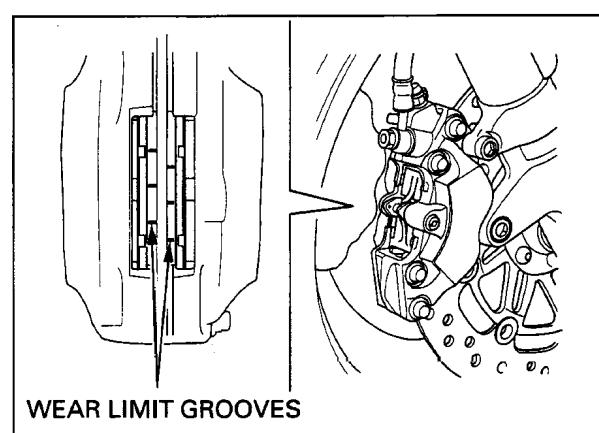
**TORQUE:** 9 N·m (0.9 kgf·m , 6.5 lbf·ft)



## BRAKE PAD WEAR

### FRONT BRAKE PAD

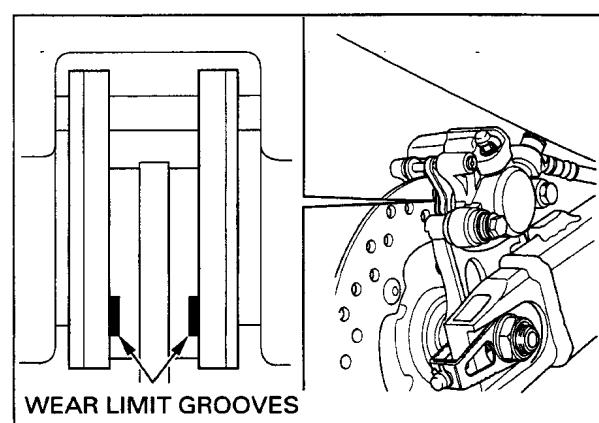
Check the brake pad for wear.  
Replace the brake pads if the wear limit groove of either pad is worn out.



### REAR BRAKE PAD

Check the brake pad for wear by looking from the rear side of the caliper.  
Replace the brake pads if either pad is worn to the bottom of the wear limit groove.

Refer to page 15-5 for brake pad replacement.



### BRAKE SYSTEM

Firmly apply the brake lever or pedal, and check that no air has entered the system.

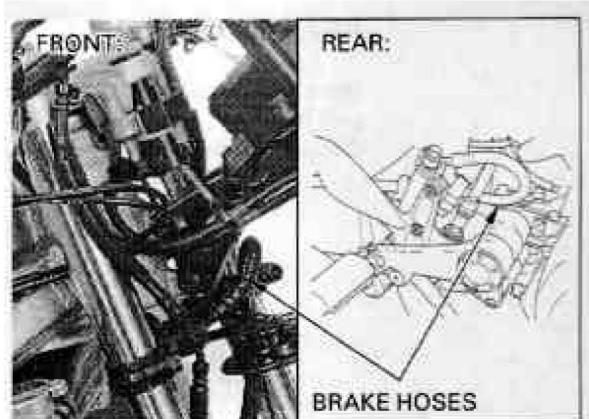
If the lever or pedal feels soft or spongy when operated, bleed the air from the system.

Refer to page 15-3 for air bleeding procedures.

Inspect the brake hoses, pipes and fittings for deterioration, cracks, damage or signs of leakage.

Tighten any loose fittings.

Replace hoses, pipes and fittings as required.



### BRAKE LEVER ADJUSTMENT

The distance between the tip of the brake lever and the grip can be adjusted by turning the adjuster.

**CAUTION:**

***Align the arrow on the brake lever with the index mark on the adjuster.***



### BRAKE PEDAL HEIGHT ADJUSTMENT

Loosen the lock nut and turn the push rod until the correct pedal height is obtained.



### BRAKE LIGHT SWITCH

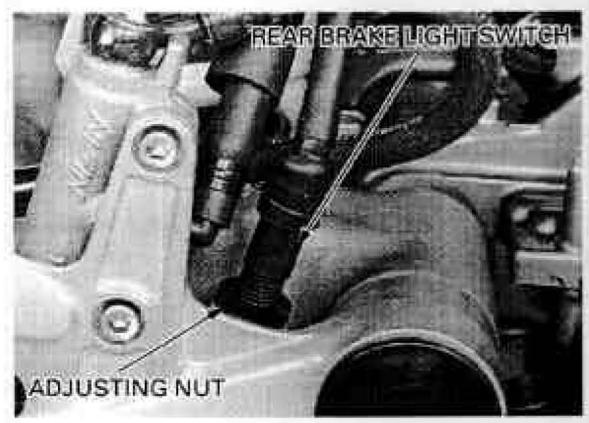
**NOTE:**

The brake light switch on the front brake master cylinder cannot be adjusted. If the front brake light switch actuation and brake engagement are off, either replace the switch unit or the malfunctioning parts of the system.

Check that the brake light comes on just prior to the brake actually being engaged.

If the light fails to come on, adjust the switch so that the light comes on at proper time.

Hold the switch body and turn the adjusting nut. Do not turn the switch body.



## HEADLIGHT AIM

### **WARNING**

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

### NOTE:

Adjust headlight beam as specified by local laws and regulations.

Adjust vertically by turning the vertical adjusting screw.

Adjust horizontally by turning the horizontal adjusting screw.



## CLUTCH SYSTEM

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

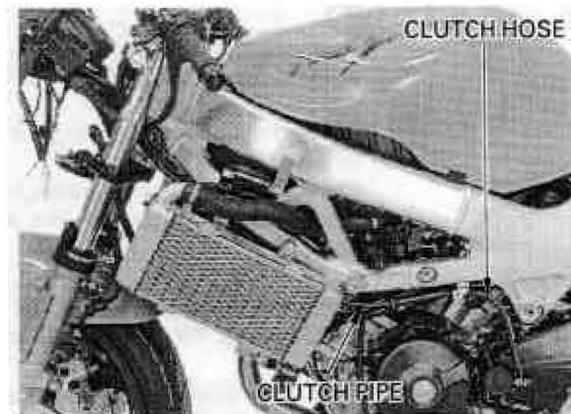
If the clutch is not disengaged properly, or the lever feels soft or spongy, bleed the air from the system.

Refer to page 9-4 for air bleeding procedures.

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

Tighten any loose fittings.

Replace hoses, pipe and fittings as required.

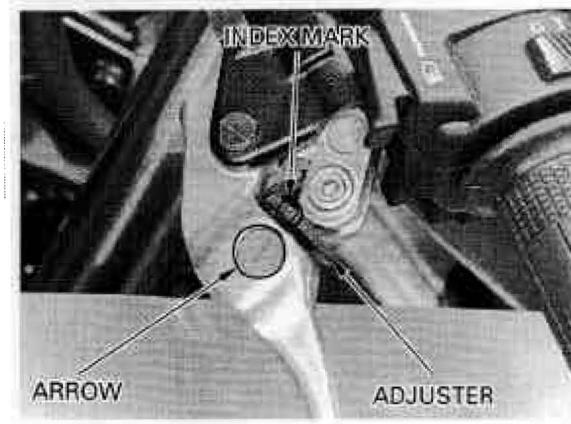


## CLUTCH LEVER ADJUSTMENT

The distance between the tip of the clutch lever and the grip can be adjusted by turning the adjuster.

### CAUTION:

*Align the arrow on the clutch lever with the index mark on the adjuster.*



## MAINTENANCE

### CLUTCH FLUID

#### CAUTION:

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

#### NOTE:

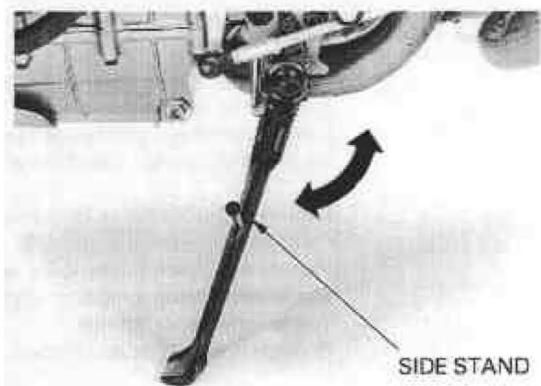
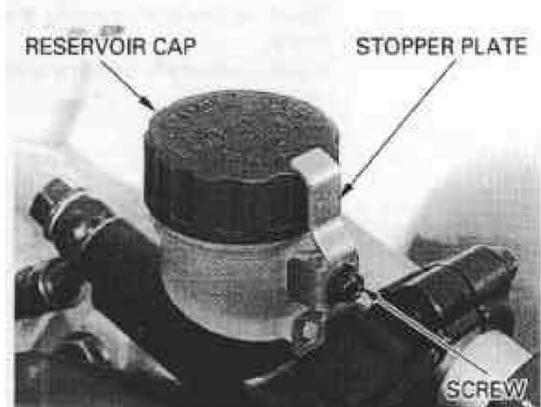
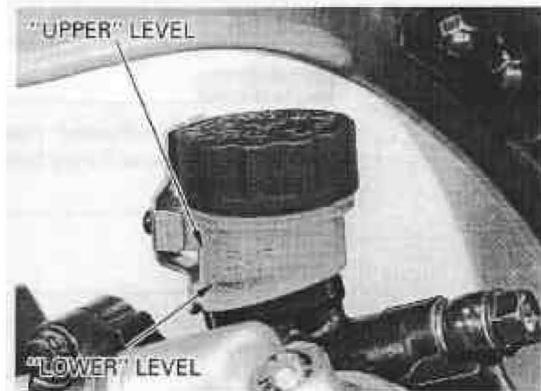
When the fluid level is low, check entire system for leaks (page 3-21).

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

If the level is near the "LOWER" level line, remove the screw, stopper plate, reservoir cap, set plate and diaphragm, and fill the reservoir with DOT 4 brake fluid from a sealed container to the "UPPER" level line.

Install the diaphragm, set plate, reservoir cap and stopper plate, and tighten the stopper plate screw.

**TORQUE:** 1 N·m (0.12 kgf·m, 0.9 lbf·ft)



### SIDE STAND

Support the motorcycle on a level surface.

Check the side stand spring for damage or loss of tension.

Check the side stand assembly for freedom of movement and lubricate the side stand pivot if necessary.

Check the side stand ignition cut-off system:

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

If there is a problem with the system, check the side stand switch (page 19-17).

# 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 SUSPENSION INSPECTION

Check the action of the forks by operating the front brakes and compressing the front suspension several times.

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

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

Refer to section 13 for fork service.

## FRONT SUSPENSION ADJUSTMENT

### SPRING PRELOAD

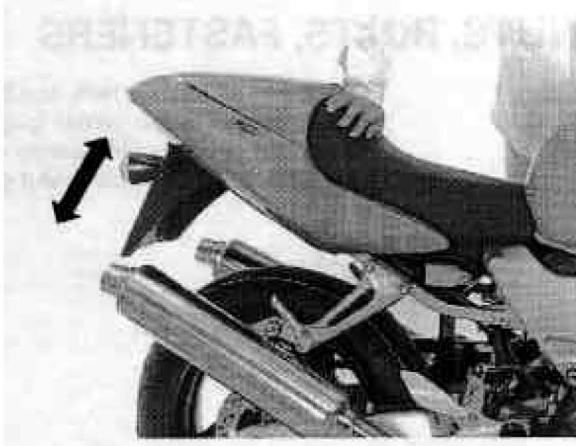
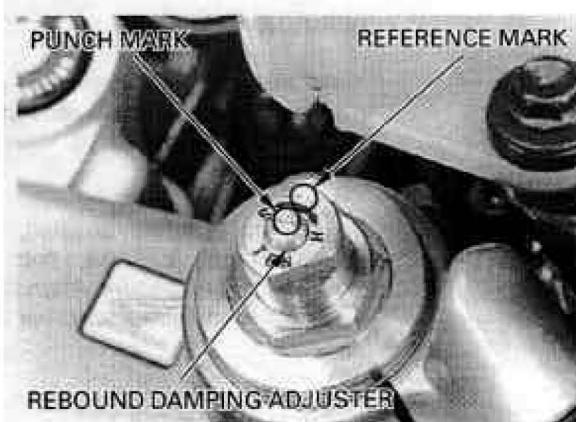
Turn the preload adjuster counterclockwise to reduce the spring preload, and turn it clockwise to increase the preload.

To set the standard position, align the 4th groove on the adjuster with the top surface of the fork cap.

### REBOUND DAMPING

Turn the rebound damping adjuster counterclockwise to reduce the rebound damping force, and turn it clockwise to increase the rebound damping force.

To set the standard position, turn the adjuster clockwise until it stops, then turn it counterclockwise approx. 1 turn. Align the punch mark on the adjuster with the reference mark.



## REAR SUSPENSION INSPECTION

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

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

Replace damaged components which cannot be repaired.

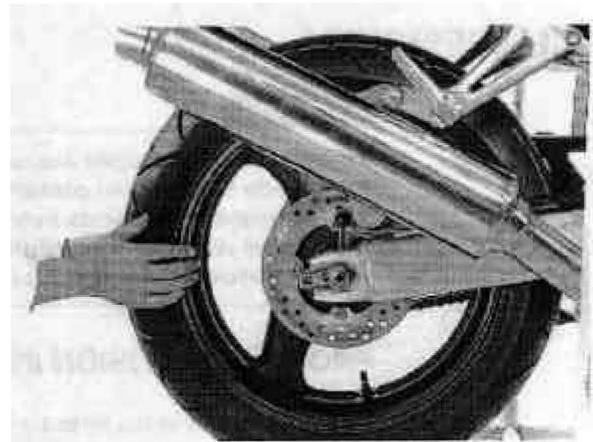
Tighten all nuts and bolts.

Refer to section 14 for shock absorber service.

Raise the rear wheel off the ground and support the motorcycle securely.

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

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



### REAR SUSPENSION ADJUSTMENT

#### SPRING PRELOAD

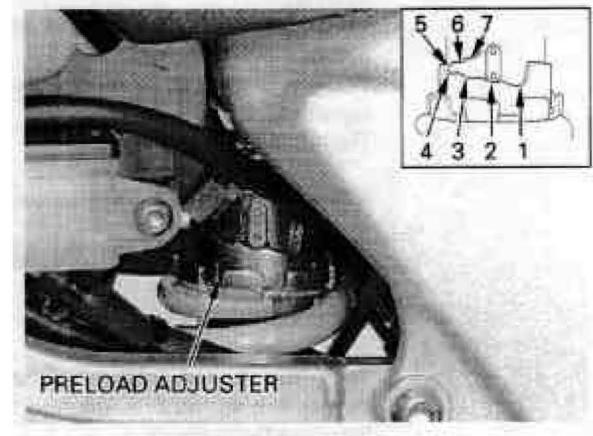
The spring preload adjuster has 7 positions.

To change the spring preload, turn the adjuster with the pin spanner.

Position 2 is the standard position.

Position 1 is for soft spring preload.

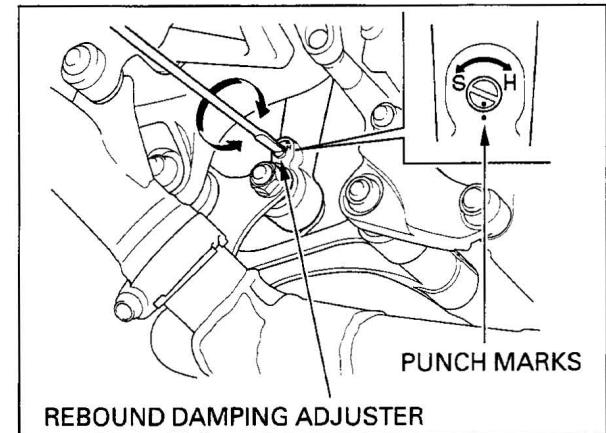
Positions 3 to 7 are for hard spring preload.



#### REBOUND DAMPING

Turn the rebound damping adjuster counter-clockwise to reduce the rebound damping force, and turn it clockwise to increase the rebound damping force.

To set the standard position, turn the adjuster clockwise until it stops, then turn it counter-clockwise approx. 1 turn. Align the punch marks on the adjuster and shock absorber lower joint.



### 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 the tires are **COLD**.

Check the tire pressure with the tire pressure gauge.

**RECOMMENDED TIRE PRESSURE:**

**Driver only:**

**Front:** 250 kPa (2.50 kgf/cm<sup>2</sup>, 36 psi)

**Rear:** 290 kPa (2.90 kgf/cm<sup>2</sup>, 42 psi)

**Driver and passenger:**

**Front:** 250 kPa (2.50 kgf/cm<sup>2</sup>, 36 psi)

**Rear:** 290 kPa (2.90 kgf/cm<sup>2</sup>, 42 psi)



Check the tires for cuts, embedded nails, or other damage.

Check the front and rear wheels for trueness (refer to section 13 and 14).

Measure the tread depth at the center of the tires.

Replace the tires when the tread depth reaches the following limits.

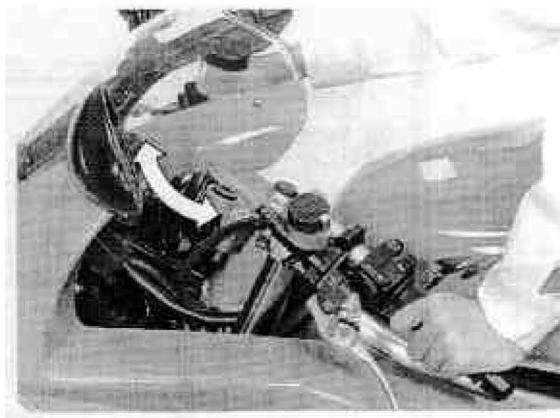
**MINIMUM TREAD DEPTH:** **Front:** 1.5 mm (0.06 in)

**Rear:** 2.0 mm (0.08 in)

## STEERING HEAD BEARINGS

**NOTE:**

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

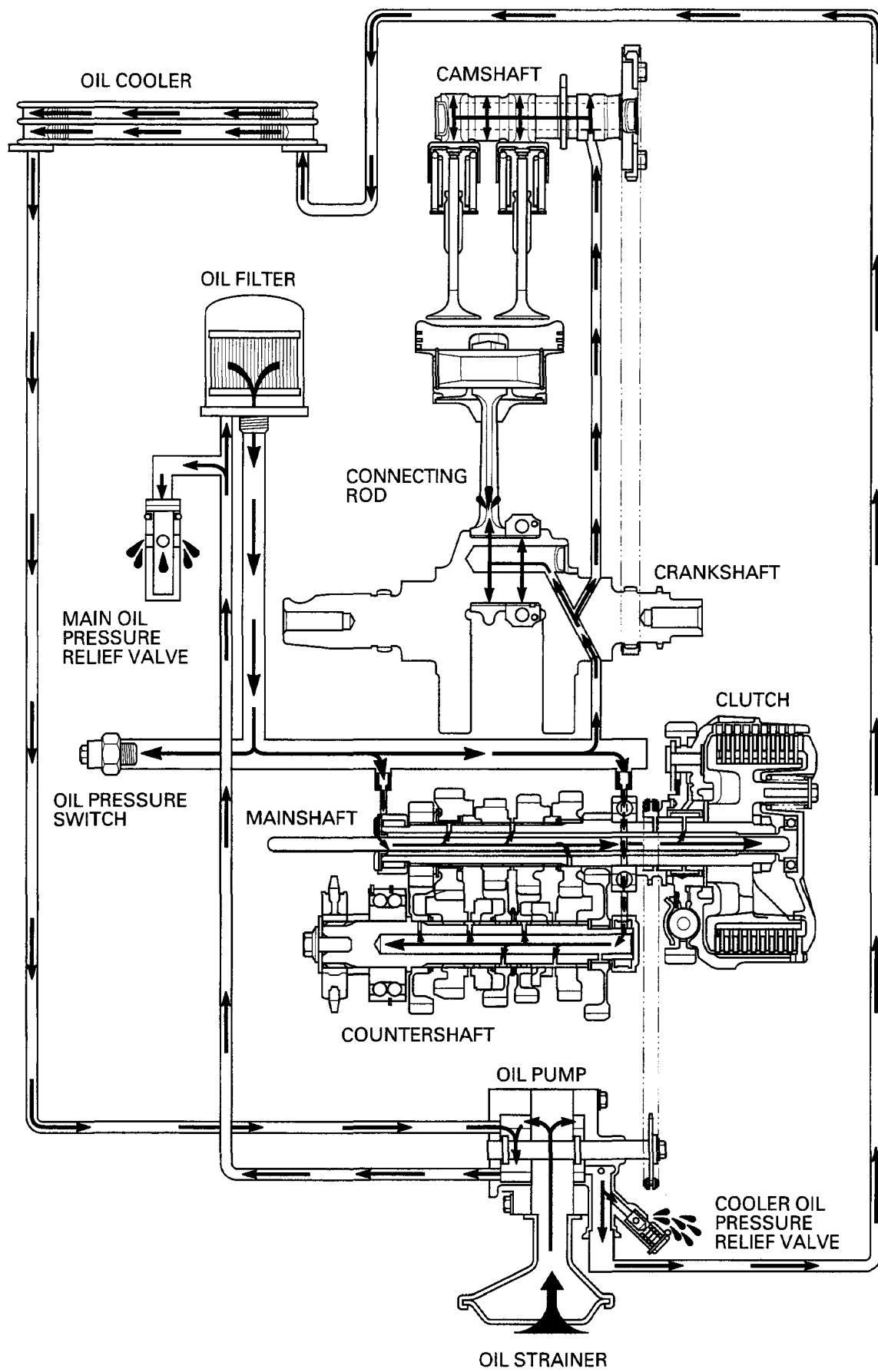


Raise the front wheel off the ground and support the motorcycle securely.

Check that the handlebar moves freely from side to side.

If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering head bearings (section 13).

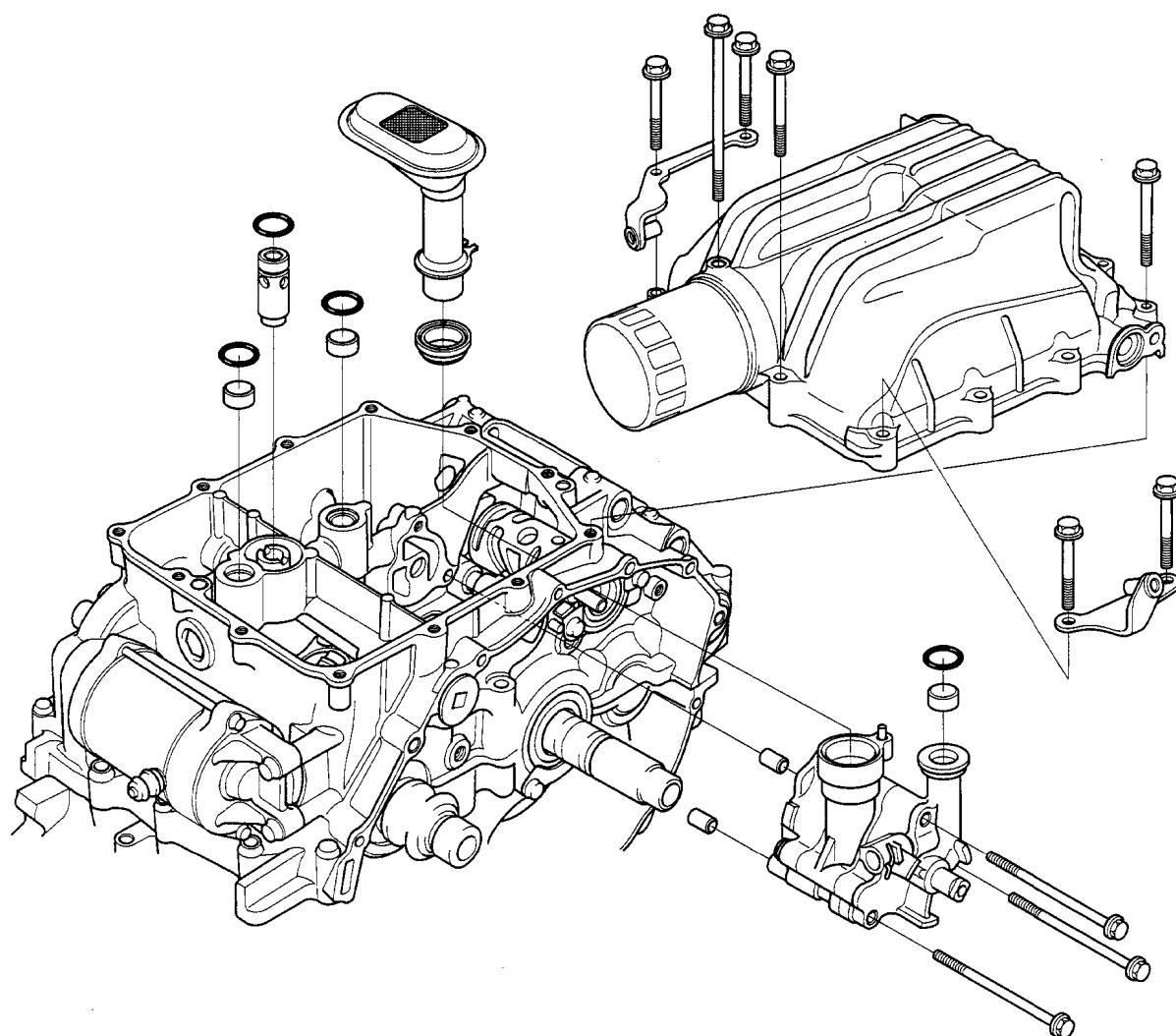
## LUBRICATION SYSTEM



# 4. LUBRICATION SYSTEM

SERVICE INFORMATION	4-2	OIL STRAINER/PRESSURE RELIEF VALVE	4-5
TROUBLESHOOTING	4-3	OIL PUMP	4-7
OIL PRESSURE CHECK	4-4	OIL COOLER	4-11

4



# 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. 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 oil pump can be serviced with the engine installed in the frame.
- For engine oil level check, see page 3-10.
- For engine oil and filter change, see page 3-11.
- For oil pressure indicator inspection, see page 19-13

## SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	After draining	3.7 ℥ (3.9 US qt, 3.3 Imp qt)	_____
	After draining/filter change	3.9 ℥ (4.1 US qt, 3.4 Imp qt)	_____
	After disassembly	4.5 ℥ (4.8 US qt, 4.0 Imp qt)	_____
Recommended engine oil		Honda 4-stroke oil or equivalent motor oil API service classification SE, SF or SG Viscosity: SAE 10W-40	_____
Oil pressure (at oil pressure switch)		588 kPa (6.0 kgf/cm <sup>2</sup> , 85 psi) at 5,000 min <sup>-1</sup> (rpm) / 80 °C (176 °F)	_____
Oil pump	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15–0.21 (0.006–0.008)	0.35 (0.014)
	Side clearance	0.02–0.09 (0.001–0.004)	0.12 (0.005)

## TORQUE VALUES

Oil pressure switch	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply sealant to the threads
Oil pressure switch terminal screw	2 N·m (0.2 kgf·m, 1.4 lbf·ft)	
Oil pump bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	

## TOOLS

Oil pressure gauge	07506-3000000
Oil pressure gauge attachment	07510-4220100

## TROUBLESHOOTING

### **Oil level too low**

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

### **Low oil pressure**

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

### **No oil pressure**

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

### **High oil pressure**

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

### **Oil contamination**

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

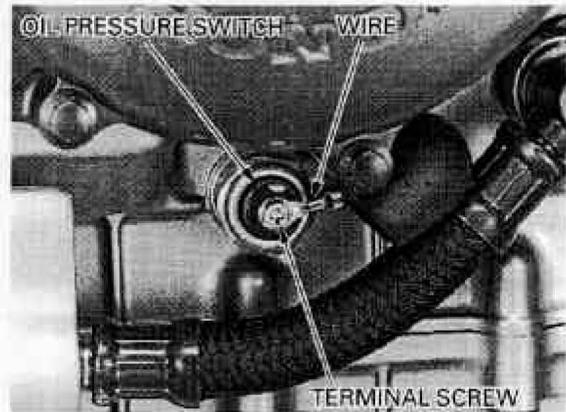
### **Oil emulsification**

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

## OIL PRESSURE CHECK

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

Stop the engine, remove the rubber cap and disconnect the oil pressure switch wire by removing the terminal screw.



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

### TOOLS:

**Oil pressure gauge** 07506-3000000

**Oil pressure gauge attachment** 07510-4220100

Check the oil level and add the recommended oil if necessary (page 3-10).

Start the engine and check the oil pressure.

**OIL PRESSURE:** 588 kPa (6.0 kgf/cm<sup>2</sup>, 85 psi)  
at 5,000 min<sup>-1</sup> (rpm) /80 °C (176 °F)

Stop the engine.

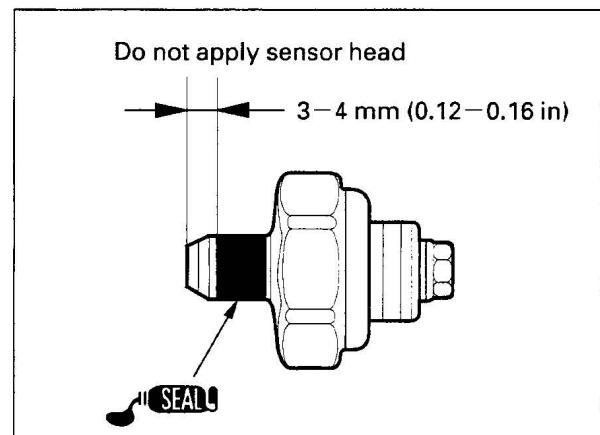
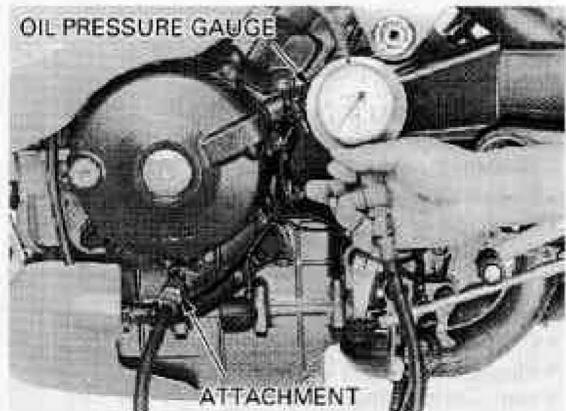
Apply sealant to the oil pressure switch threads as shown.

Remove the oil pressure gauge and attachment and install the oil pressure switch.

**TORQUE:** 12 N·m (1.2 kgf·m, 9 lbf·ft)

### CAUTION:

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

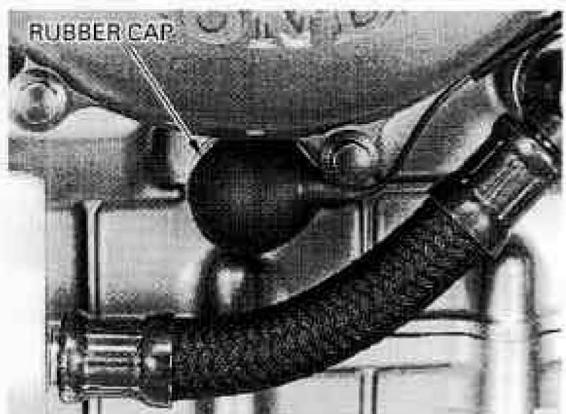


Connect the oil pressure switch cord and install the rubber cap.

Start the engine.

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

If the oil pressure indicator stays on, stop the engine and check the indicator system (page 19-13).

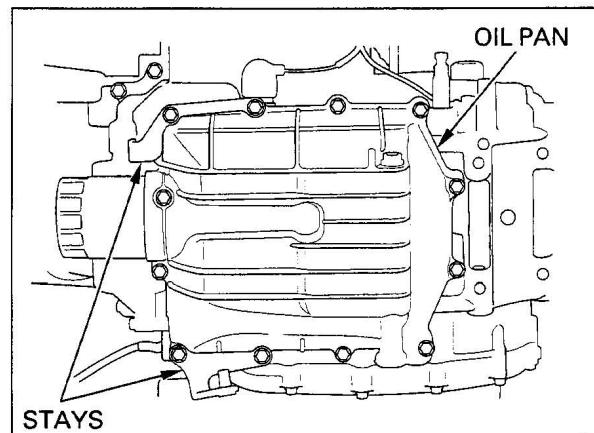


## OIL STRAINER/PRESSURE RELIEF VALVE

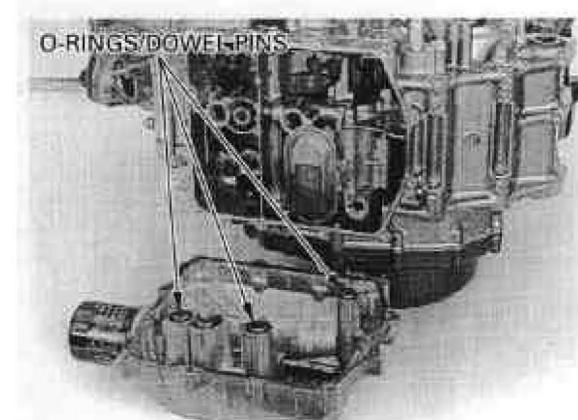
### OIL PAN REMOVAL

Drain the engine oil (page 3-10).  
Remove the exhaust pipe (page 2-5).

Remove the twelve oil pan mounting bolts, under cover stays and the oil pan.



Remove the dowel pins and O-rings.



### OIL STRAINER

Remove the oil strainer and seal rubber from the oil pump.

Clean the oil strainer screen thoroughly.

Coat a new seal rubber with oil and install it onto the strainer.

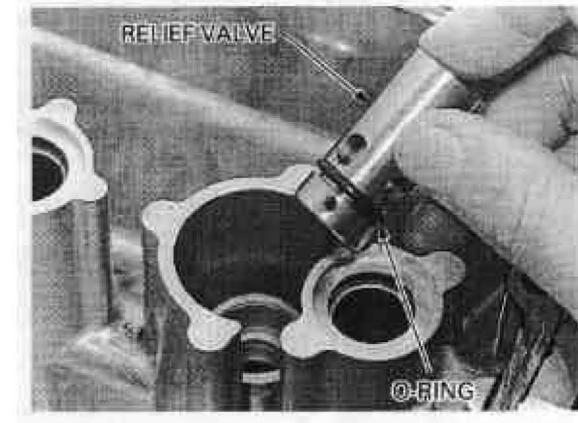
Install the strainer, aligning its groove with the pin on the oil pump.



### OIL PRESSURE RELIEF VALVE

Remove the oil pressure relief valve from the oil pan.

Remove the O-ring from the relief valve body.

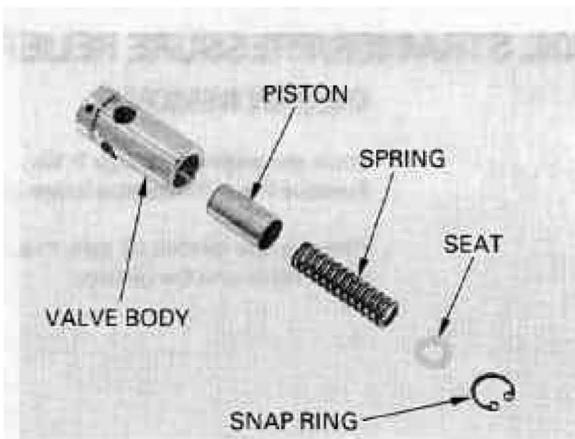


## LUBRICATION SYSTEM

Remove the snap ring, spring seat, spring and piston from the valve body.

Check the piston for wear, sticking or other damage.  
Check the spring for fatigue or damage.

Install the piston, spring and spring seat and secure them with the snap ring.



Coat a new O-ring with oil and install it into the relief valve body groove.

Install the relief valve into the oil pan.



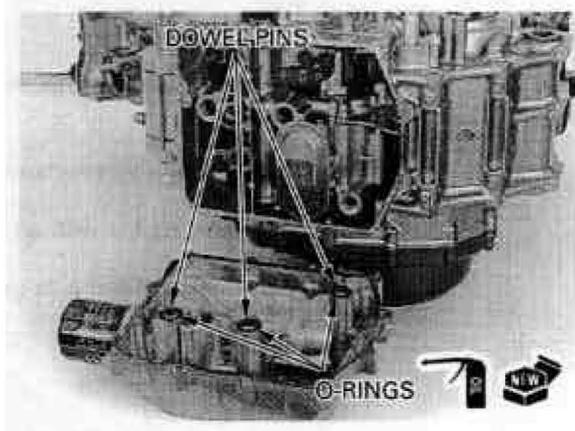
## OIL PAN INSTALLATION

Clean the oil pan mating surfaces thoroughly.

Apply sealant to the oil pan mating surface.

Install the dowel pins.

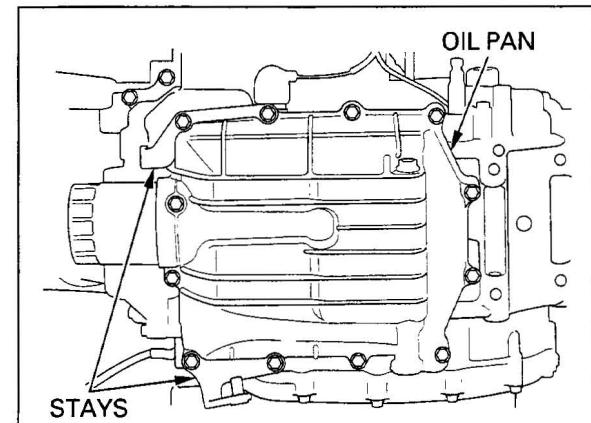
Coat new O-rings with oil and install them onto the dowel pins.



Install the oil pan and cover stays, and tighten the twelve bolts in a crisscross pattern in 2 or 3 steps.

Install the exhaust pipe (page 2-6).

Fill the crankcase with recommended engine oil (page 3-10).



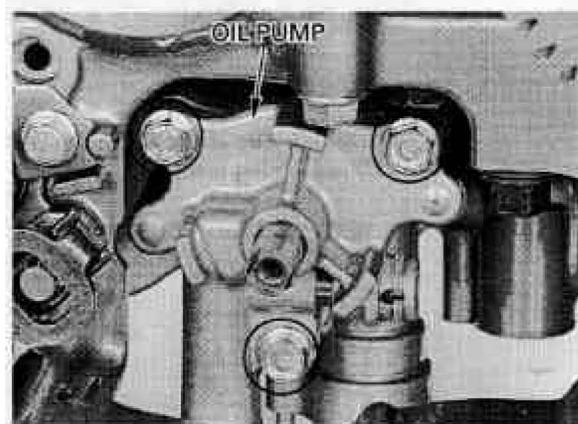
## OIL PUMP

### REMOVAL

Remove the oil pan and oil strainer (page 4-5). Remove the clutch and oil pump driven sprocket (page 9-12).

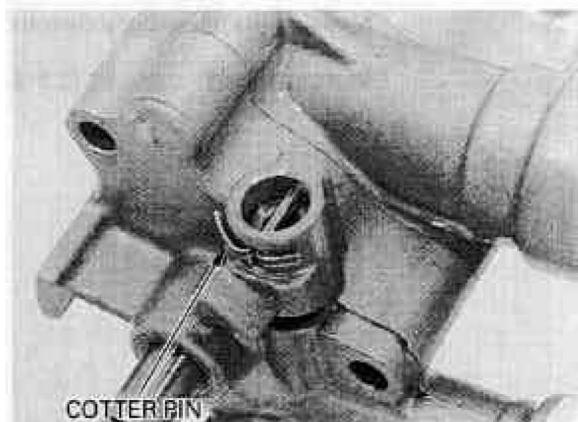
Remove the oil pump mounting bolts and the oil pump.

Remove the dowel pins.



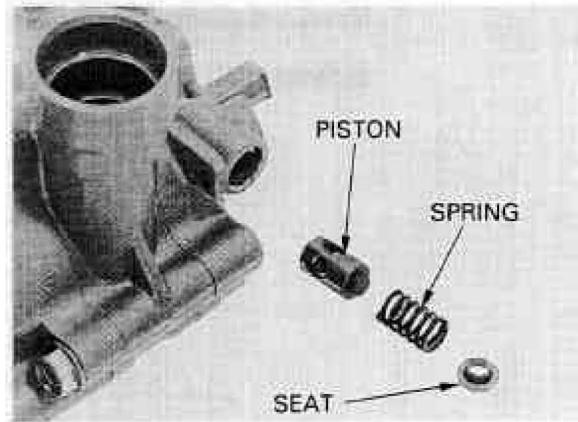
### COOLER PUMP RELIEF VALVE

Remove the cotter pin, spring seat, spring and piston.



Check the piston for wear, sticking or other damage. Check the spring for fatigue or damage.

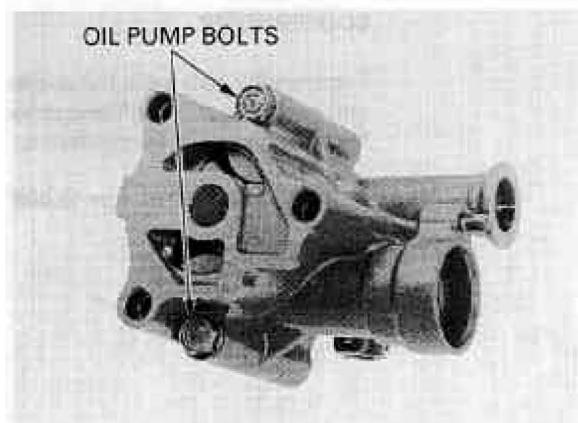
Install the piston, spring and spring seat and secure them with a new cotter pin.



### DISASSEMBLY

Remove the following:

- oil pump bolts
- cooler pump body
- dowel pins
- cooler pump outer and inner rotors
- drive pin
- main pump body
- pump shaft
- thrust washer
- drive pin
- main pump inner and outer rotors



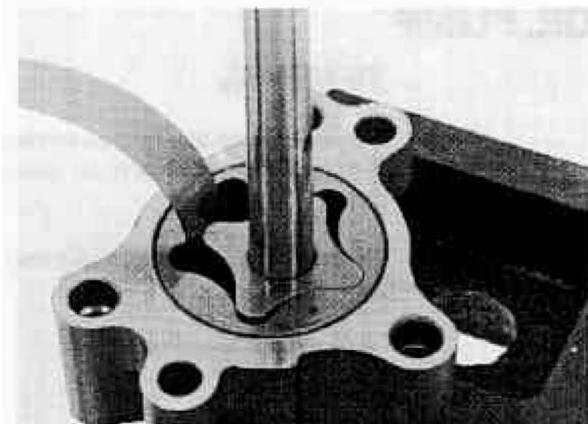
Clean the all disassembled parts thoroughly.

### INSPECTION

#### MAIN PUMP

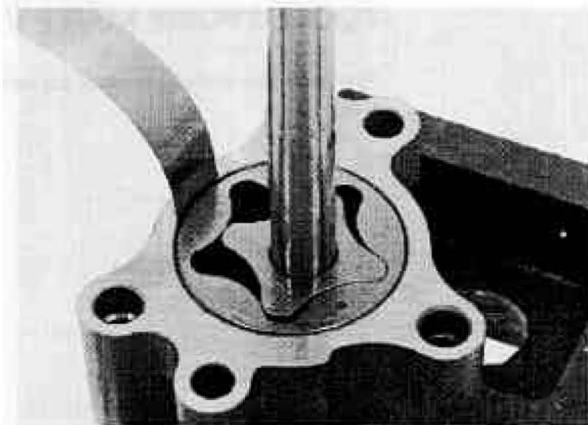
Temporarily assemble the main pump (page 4-9).  
Measure the rotor tip clearance.

**SERVICE LIMIT:** 0.20 mm (0.008 in)



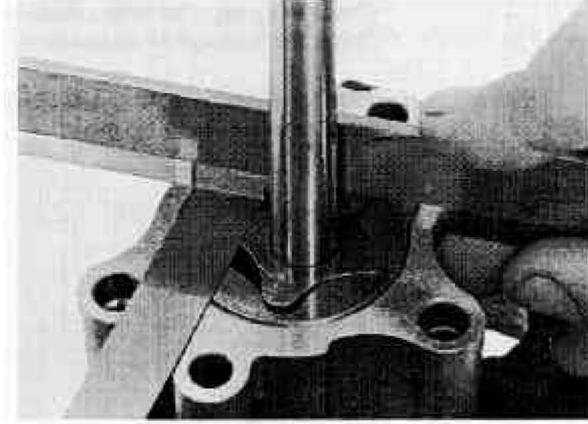
Measure the pump body clearance.

**SERVICE LIMIT:** 0.35 mm (0.014 in)



Measure the pump side clearance.

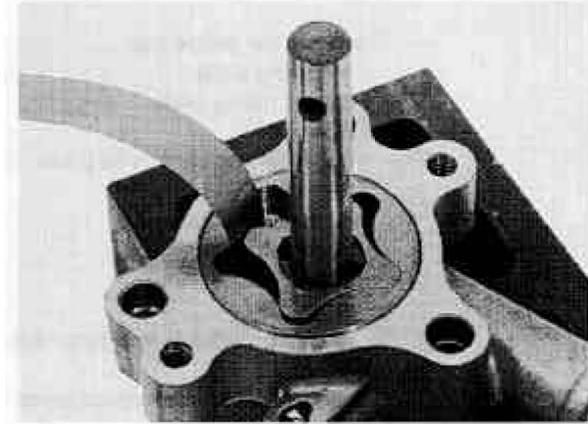
**SERVICE LIMIT:** 0.12 mm (0.005 in)



#### COOLER PUMP

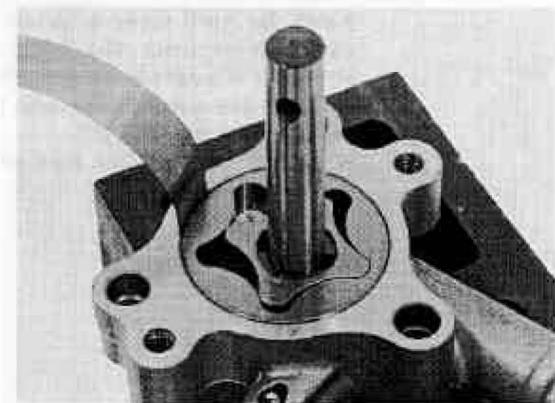
Temporarily assemble the cooler pump outer rotor, inner rotor, pump shaft and drive pin.  
Measure the rotor tip clearance.

**SERVICE LIMIT:** 0.20 mm (0.008 in)



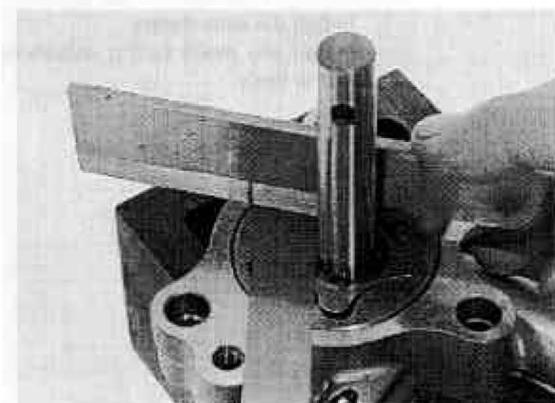
Measure the pump body clearance.

**SERVICE LIMIT:** 0.35 mm (0.014 in)



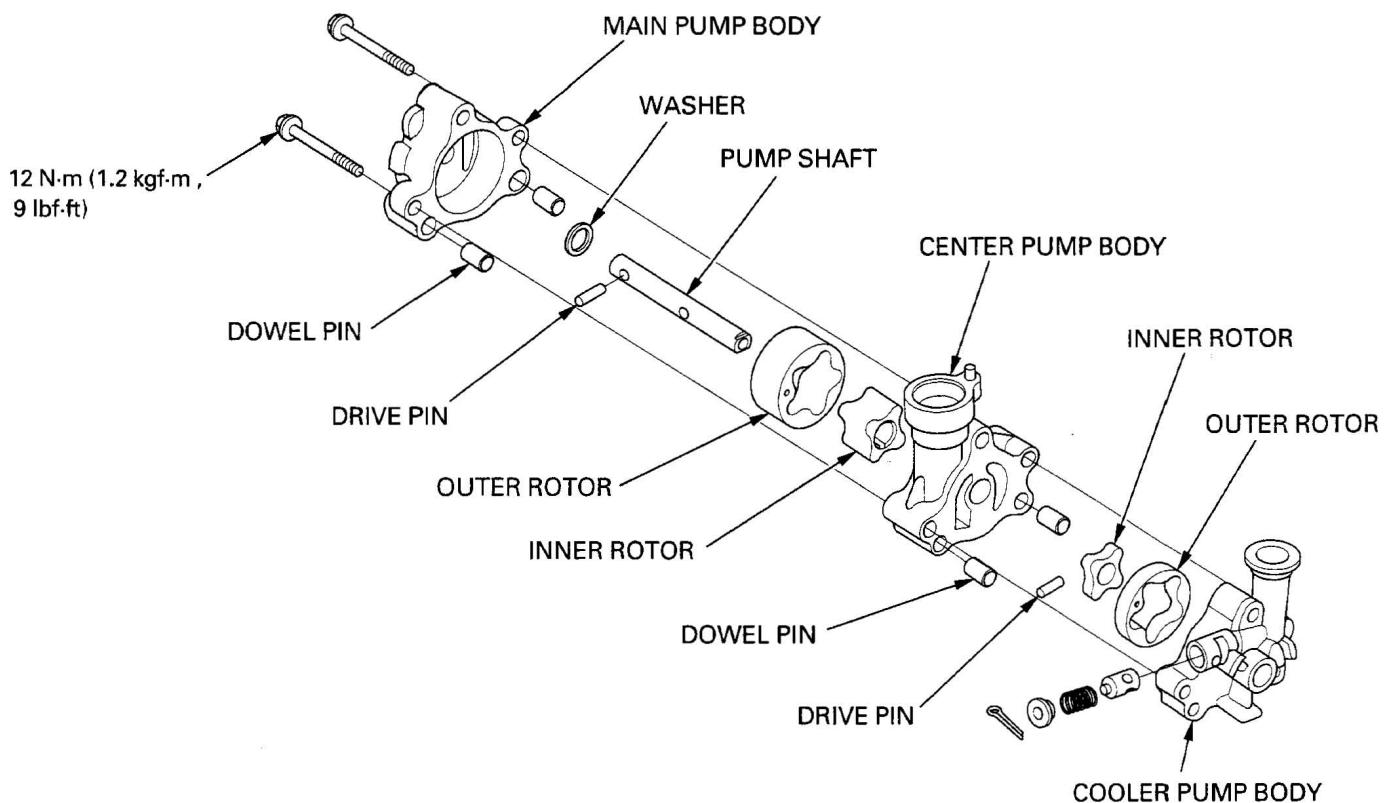
Measure the pump side clearance.

**SERVICE LIMIT:** 0.12 mm (0.005 in)



## ASSEMBLY

Dip all parts in clean engine oil.

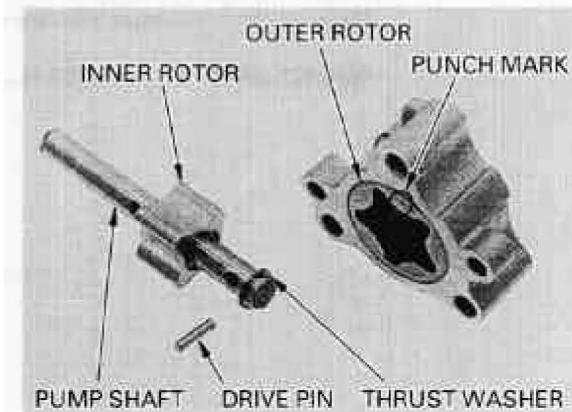


## LUBRICATION SYSTEM

Install the main pump outer rotor into the pump body with the punch mark facing out.

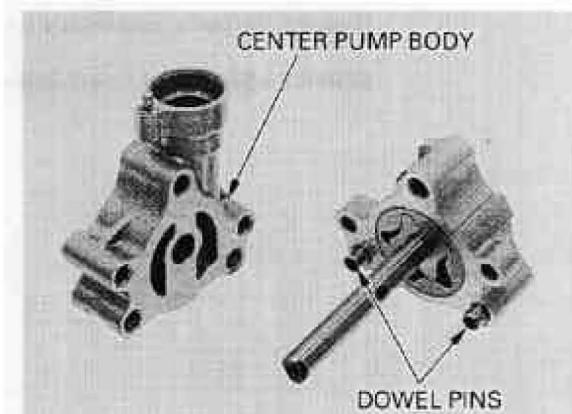
Install the drive pin into the pump shaft, and install the main pump inner rotor onto the shaft, aligning the slots with the drive pin.

Install the thrust washer, shaft and inner rotor into the main pump body.

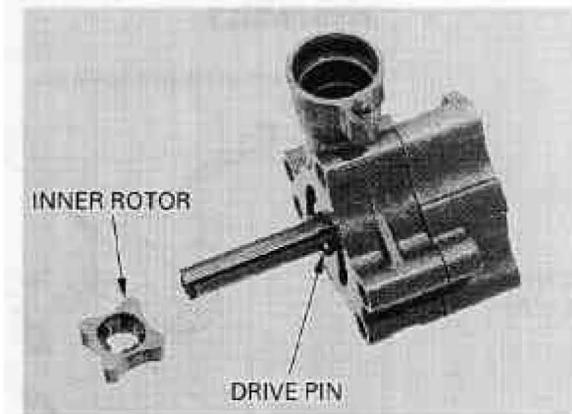


Install the dowel pins.

Install the main pump assembly onto the center pump body.



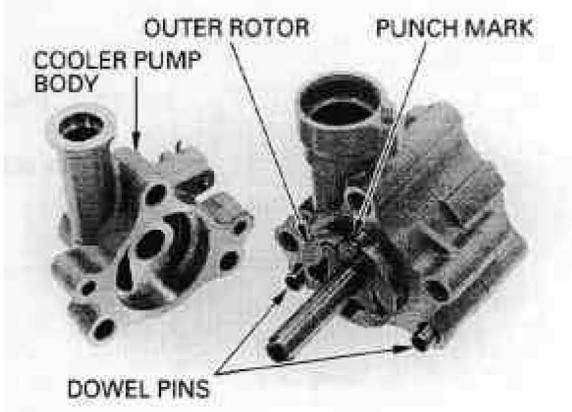
Install the drive pin into the pump shaft and install the cooler pump inner rotor onto the shaft, aligning the slots with the drive pin.



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

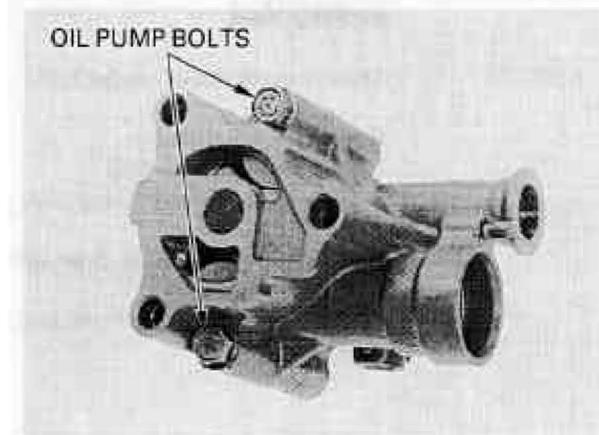
Install the dowel pins.

Install the cooler pump body onto the center pump body.



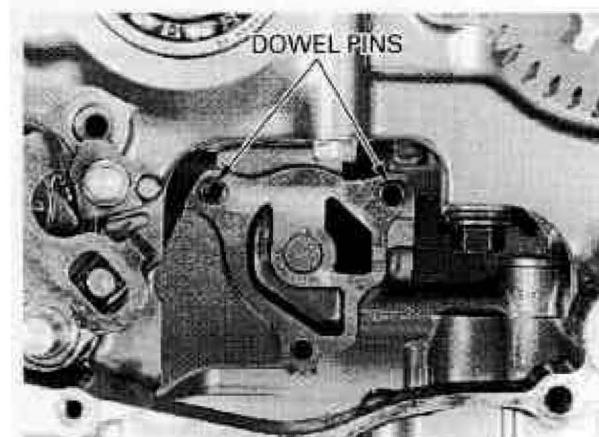
Install the oil pump bolts and tighten them.

**TORQUE:** 12 N·m (1.2 kgf·m, 9 lbf·ft)



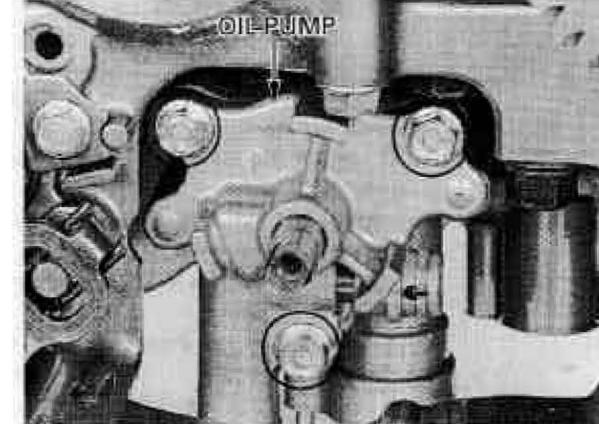
## INSTALLATION

Install the dowel pins.



Install the oil pump and tighten the mounting bolts securely.

Install the clutch (page 9-17).  
Install the oil pan (page 4-6).



## OIL COOLER

### INSPECTION

Remove the front fairing (page 2-3).

Check the oil cooler pipe joints and seams for leaks.  
Check the oil cooler air passage for clogging or damage.

Straighten bent fins with a small, flat blade screwdriver and remove insects, mud or other obstructions with compressed air or low pressure water.



## REMOVAL

Drain the engine oil (page 3-10).

Remove the following:

- front fairing (page 2-3)
- engine under cover (page 2-4)

Remove the oil cooler pipe joint bolts and joints from the oil cooler.

Remove the mounting bolts and the oil cooler from the bracket.



Remove the oil hose joint bolts and joints from the engine, then remove the oil hoses/pipes.



## INSTALLATION

Install the oil hoses/pipes.

Coat new O-rings with oil and install them onto the oil hose joints.

Connect the oil hose joints to the engine and tighten the bolts.

Install the oil cooler onto the bracket and tighten the mounting bolts.

Coat new O-rings with oil and install them onto the oil pipe joints.

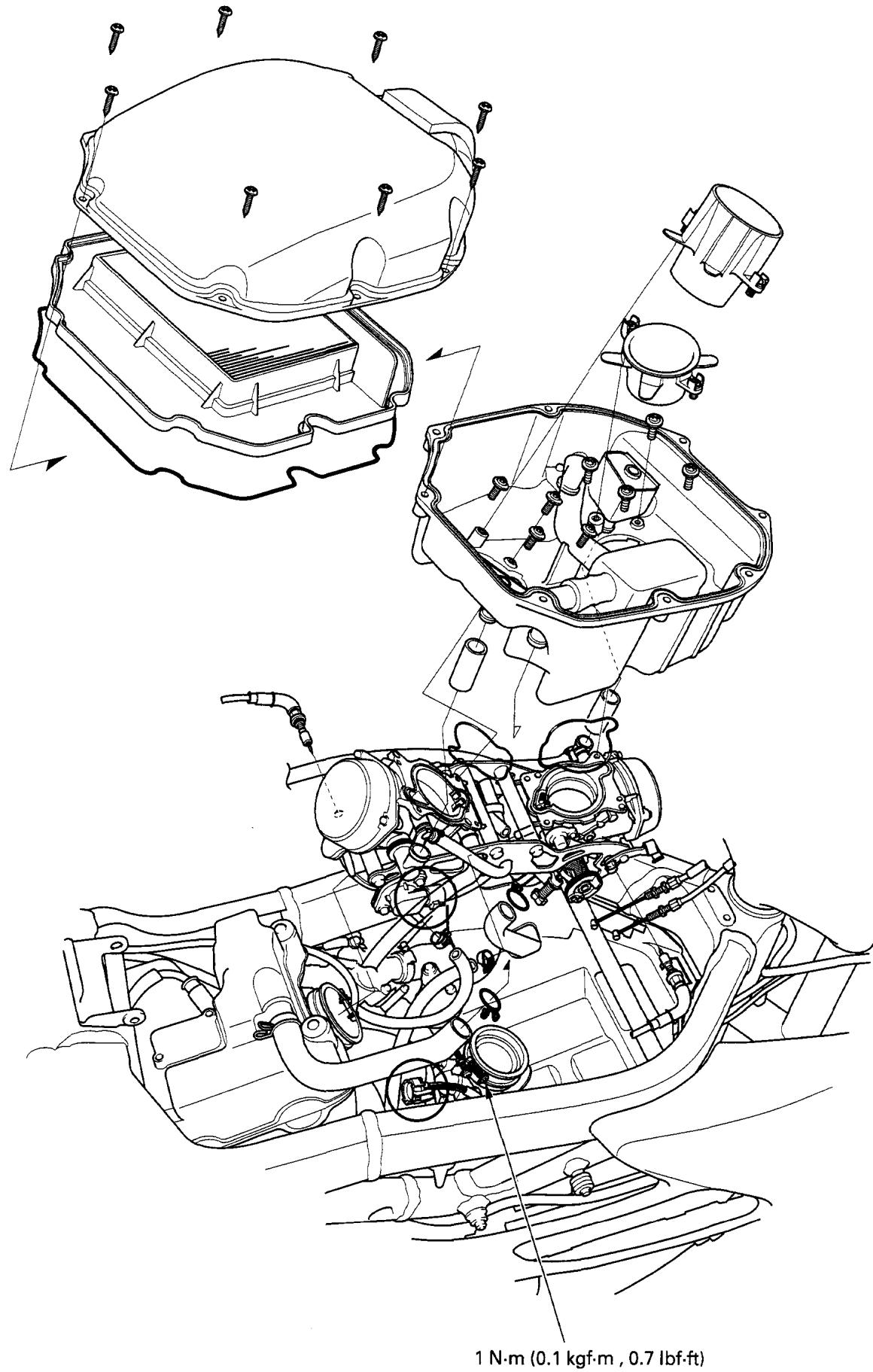
Connect the oil pipe joints to the oil cooler and tighten the bolts.



Install the removed parts in the reverse order of removal.

Fill the crankcase with recommended engine oil (page 3-10)





# 5. FUEL SYSTEM

SERVICE INFORMATION	5-1	CARBURETOR ASSEMBLY	5-10
TROUBLESHOOTING	5-3	CARBURETOR COMBINATION	5-13
AIR CLEANER HOUSING	5-4	CARBURETOR INSTALLATION	5-16
CARBURETOR REMOVAL	5-5	CHOKE SYSTEM	5-17
CARBURETOR SEPARATION	5-6	PILOT SCREW ADJUSTMENT	5-18
CARBURETOR DISASSEMBLY/ INSPECTION	5-7	SECONDARY AIR SUPPLY SYSTEM (SW, AR, IIG type only)	5-19

5

## SERVICE INFORMATION

### GENERAL

#### **WARNING**

- *Gasoline is extremely flammable and is explosive under certain conditions. KEEP OUT OF REACH OF CHILDREN.*
- *If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and may 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 cable 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.*

- For fuel tank removal and installation, see page 2-4.
- Before disassembling the carburetors, place an approved fuel container under the float chambers, loosen the drain screws and drain the carburetors.
- After removing the carburetors, cover the intake ports of the cylinder heads with shop towels to prevent any foreign material from dropping into the engine.
- When disassembling the fuel system parts, note the locations of the O-rings. Replace them with new ones on reassembly.
- The vacuum chamber and float chamber can be serviced with the carburetors combined.
- For carburetor synchronization, see page 3-12.

#### NOTE:

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

## FUEL SYSTEM

### SPECIFICATIONS

ITEM		SPECIFICATIONS
Carburetor identification number	Except G, SW, AR, IIG type	VPT0B
	G type	VPT0A
	SW type	VPT2B
	AR, IIG type	VPT2C
Main jet		Front: # 175, Rear: # 178
Slow jet		# 45
Jet needle number	Except SW, AR, G type	Front: A1UD, Rear: A1UC
	SW, AR, G type	Front: A1UF, Rear: A1UE
Pilot screw opening		See page 5-18
Float level		$16.6 \pm 0.5 \text{ mm} (0.65 \pm 0.02 \text{ in})$
Idle speed	Except SW, AR, IIG type	$1,100 \pm 100 \text{ min}^{-1} (\text{rpm})$
	AR, IIG type	$1,200 \pm 100 \text{ min}^{-1} (\text{rpm})$
	SW type	$1,200 \pm 50 \text{ min}^{-1} (\text{rpm})$

### TORQUE VALUES

Carburetor insulator band bolt

1 N·m (0.1 kgf·m , 0.7 lbf·ft)

Reed valve cover bolt

5 N·m (0.52 kgf·m , 3.8 lbf·ft) Apply locking agent to the threads.

### TOOL

Float level gauge 07401-0010000

Pilot screw wrench 07908-4220201 (Except SW type)

07KMA-MN90100 (SW type)

# TROUBLESHOOTING

## Engine cranks but won't start

- No fuel in tank
- No fuel to carburetor
  - Clogged fuel strainer
  - Clogged fuel line
  - Clogged fuel valve vacuum tube
  - Disconnected fuel valve vacuum tube
  - Clogged fuel tank breather tube
- Too much fuel getting to the engine
  - Clogged air cleaner
  - Flooded carburetor
- Intake air leak
- Contaminated/deteriorated fuel
- Improper choke operation
- Improper throttle operation
- No spark at plug (faulty ignition system-section 17)

## Lean mixture

- Clogged fuel jets
- Faulty float valve
- Float level too low
- Restricted fuel line
- Clogged carburetor air vent tube
- Restricted fuel tank breather tube
- Intake air leak
- Faulty vacuum piston

## Rich mixture

- Starting enrichment valve open
- Clogged air jets
- Faulty float valve
- Float level too high
- Dirty air cleaner
- Faulty vacuum piston

## Engine stalls, hard to start, rough idling

- Restricted fuel line
- Fuel mixture too lean/rich
- Contaminated/deteriorated fuel
- Intake air leak
- Misadjusted idle speed
- Misadjusted pilot screw
- Restricted fuel tank breather tube
- Clogged air cleaner
- Clogged slow circuit
- Starting enrichment valve open
- Faulty ignition system (section 17)

## Afterburn when engine braking is used

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

## Backfiring or misfiring during acceleration

- Lean mixture
- Faulty ignition system (section 17)

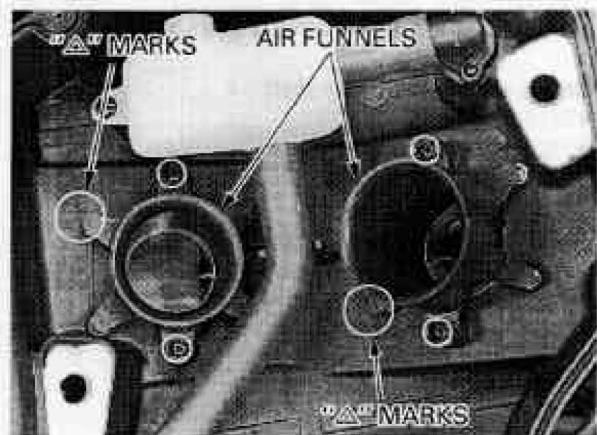
## Poor performance (driveability) and poor fuel economy

- Clogged fuel system
- Faulty ignition system (section 17)

**AIR CLEANER HOUSING****REMOVAL/INSTALLATION**

Remove the air cleaner element (page 3-5).

Remove the screws and air funnels.



Remove the eight air cleaner housing mounting screws.

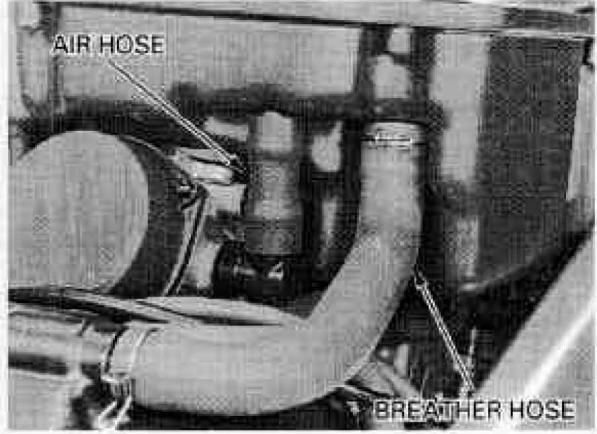
**CAUTION:**

***Do not overtighten the screws when installing, as the threaded holes in the carburetors will be stripped.***



Disconnect the front and rear crankcase breather hoses and air hoses from the air cleaner housing.

Remove the air cleaner housing.



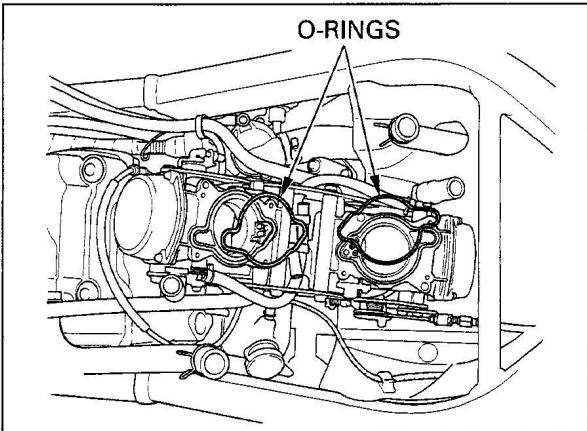
Remove the O-rings.

Install new O-rings into the carburetor grooves.

Install the removed parts in the reverse order of removal.

**NOTE:**

- Note that the rear air funnel is longer than the front air funnel.
- Install the air funnels with the “△” marks on the air funnel and air cleaner housing aligned.



## CARBURETOR REMOVAL

Drain the coolant (page 6-5).  
Remove the air cleaner housing (page 5-4).

**NOTE:**

When the carburetors will not be serviced, remove the carburetor assembly with the air cleaner housing attached to prevent the threaded holes in the carburetor from damaging.

Disconnect the throttle sensor 3P (white) connector.  
ED, G type: Remove the throttle sensor wire from the clamp.

Loosen the carburetor insulator band bolts.

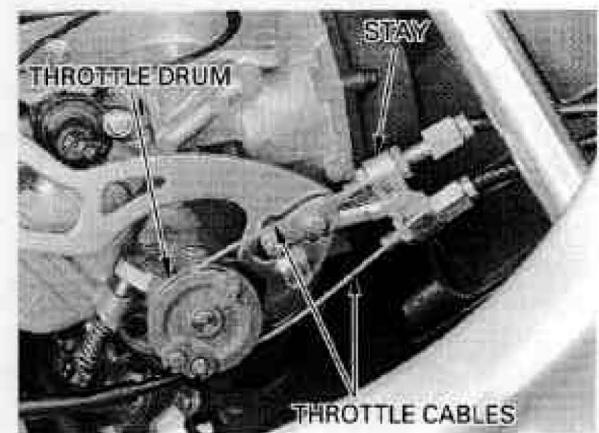
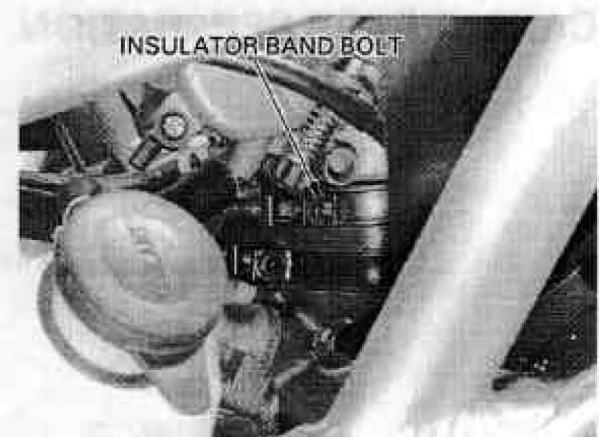
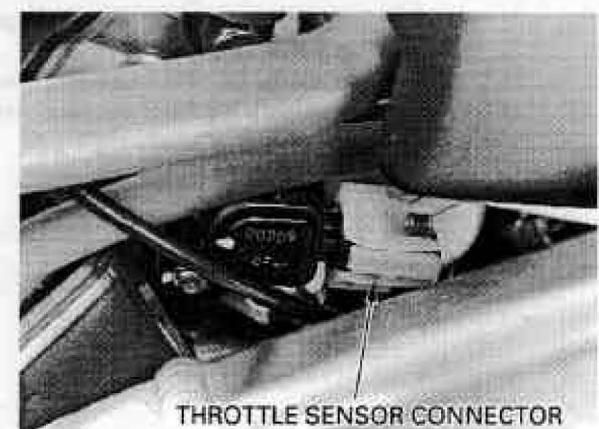
**NOTE:**

Insert the screwdriver through the hole in the heat guard to loosen the front carburetor insulator band bolt.

Remove the carburetor assembly from the insulators.

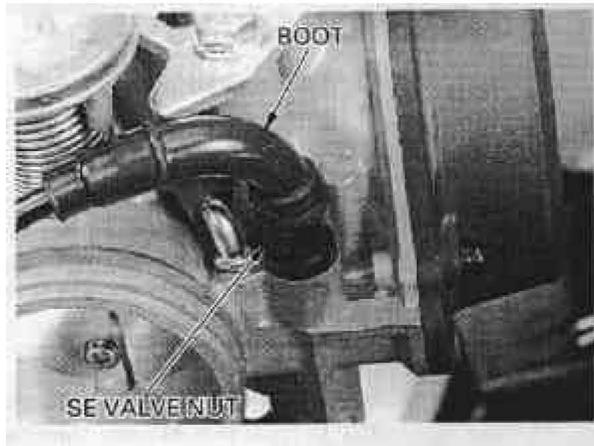
Remove the throttle cables from the cable stay and disconnect them from the throttle drum.

Disconnect the water inlet and outlet hoses from the carburetor heaters.



Slide off the boots from the starting enrichment (SE) valve nuts.

Loosen the SE valve nuts and disconnect the choke cables from the front and rear carburetors.

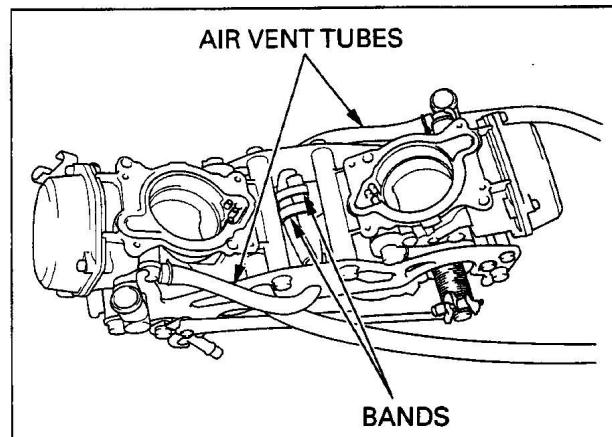


## CARBURETOR SEPARATION

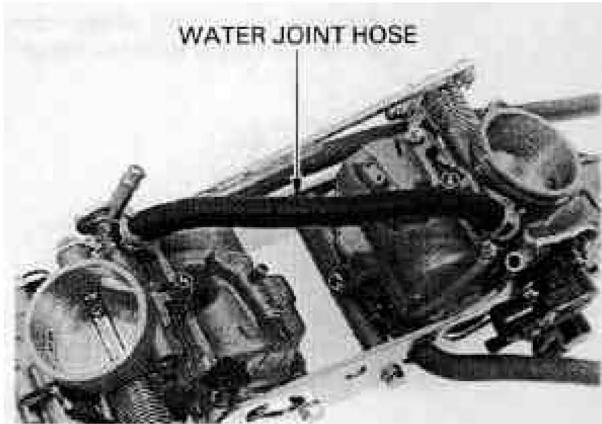
### NOTE:

The vacuum chamber can be serviced without separating the carburetors.

Remove the air vent tubes and tube bands.



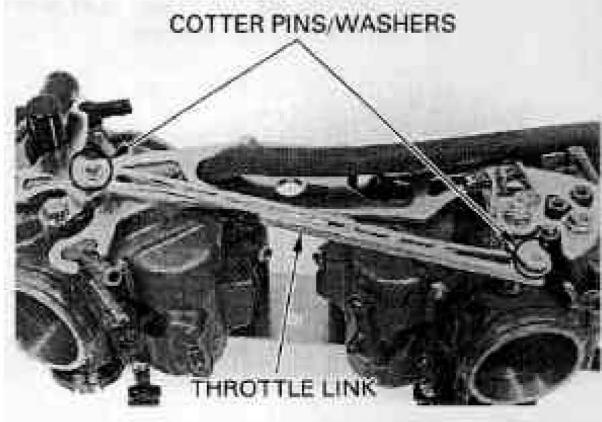
Remove the water joint hose.



Remove the cotter pins, washers and throttle link.

### CAUTION:

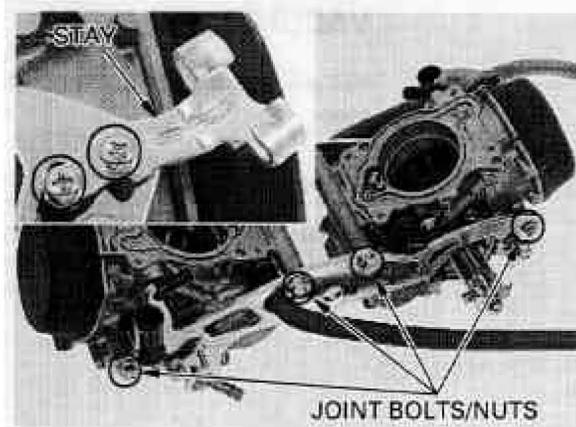
**Be careful not to bend or damage the throttle arm and link.**



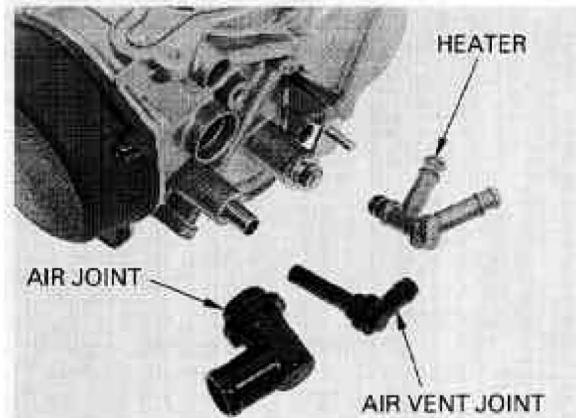
Remove the cable stay from the front carburetor.  
 Remove the four nut and joint bolts, and separate the carburetors.  
 Remove the set plates, dowel pins and fuel tubes.

**CAUTION:**

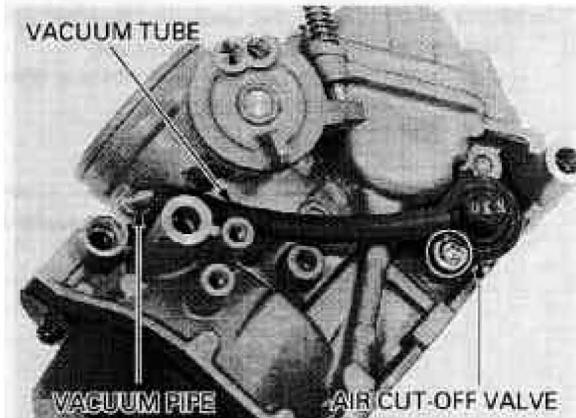
*Do not remove the throttle sensor from the set plate unless it requires replacement.  
 It can cause the throttle sensor getting out of position resulting in improper ignition timing.*



Remove the air joint, air vent joint and carburetor heater from each carburetor.

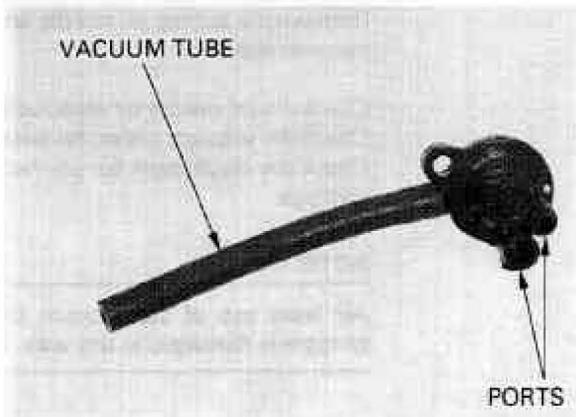
**CARBURETOR DISASSEMBLY/INSPECTION****AIR CUT-OFF VALVE**

Disconnect the vacuum tube from the vacuum pipe.  
 Remove the attaching screw, washer and the air cut-off valve.  
 Remove the O-rings and joint pipe.



Apply vacuum to the vacuum tube of the valve.

The vacuum should maintained.  
 Air should not flow through the valve ports when the vacuum is applied, and should flow when the vacuum is not applied.



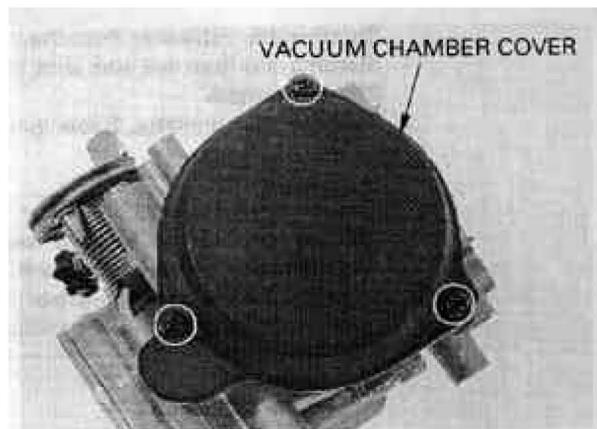
## VACUUM CHAMBER

Remove the three screws and the vacuum chamber cover.

**NOTE:**

As the compression spring is very long, it will jump out of the carburetor when the cover is removed.

Remove the compression spring and diaphragm/vacuum piston from the carburetor body.



- Be careful not to damage the diaphragm.*
- Screw the vacuum chamber cover (4 mm) screw into the jet needle holder.
  - Pull the screw and remove the jet needle holder from the vacuum piston.

**CAUTION:**

***Do not remove the jet needle holder by pushing the jet needle.***

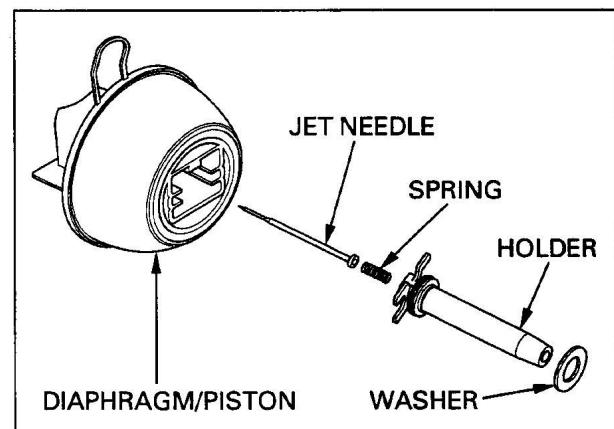


- Remove the washer and O-ring from the jet needle holder.
- Remove the spring, jet needle and washer from the vacuum piston.

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

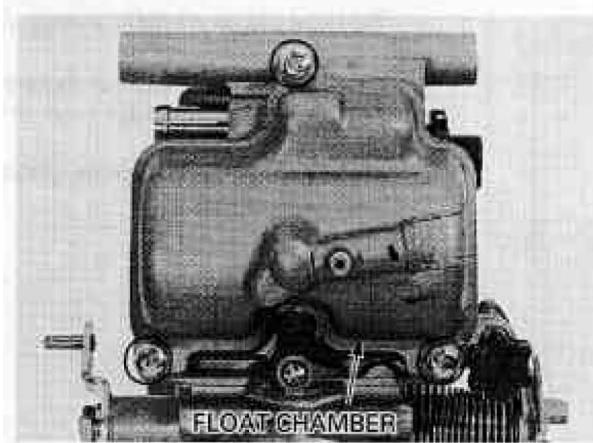
**NOTE:**

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



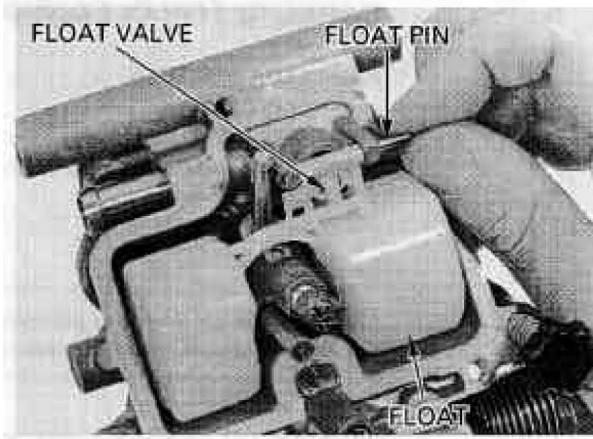
## FLOAT CHAMBER

Remove the three screws and the float chamber.



Remove the float pin, float and float valve.

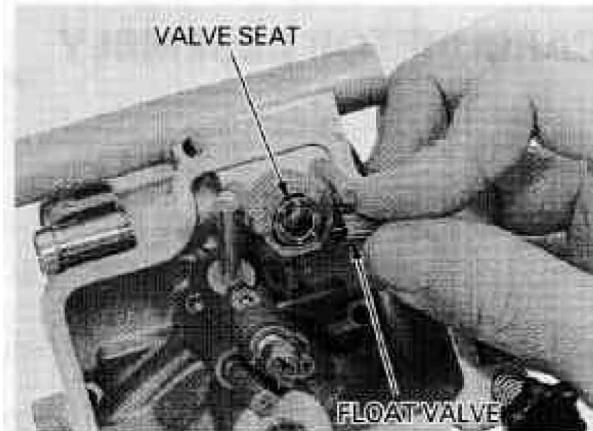
Check the float for damage or fuel in the float.



Check the float valve and valve seat for scoring, scratches, clogging or damage.

Check the tip of the float valve, where it contacts the valve seat, for stepped wear or contamination.

Check the operation of the float valve.



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

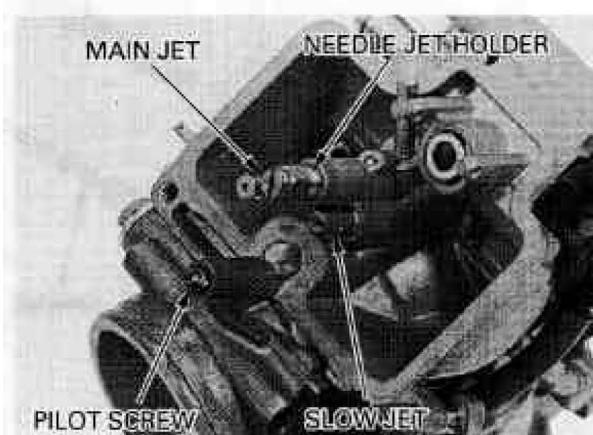
### CAUTION:

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

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

### CAUTION:

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

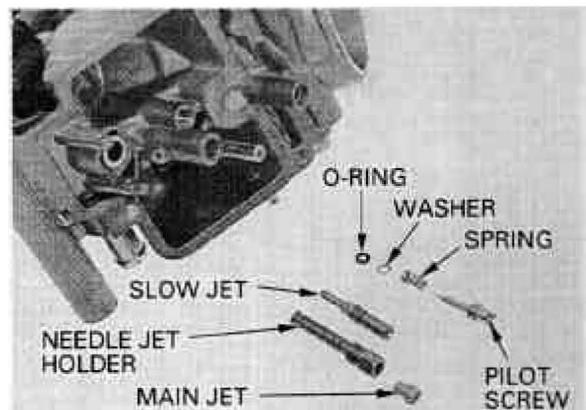


Remove the pilot screw, spring, washer and O-ring.

Check each jet for wear or damage.

Check the pilot screw for wear or damage.

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



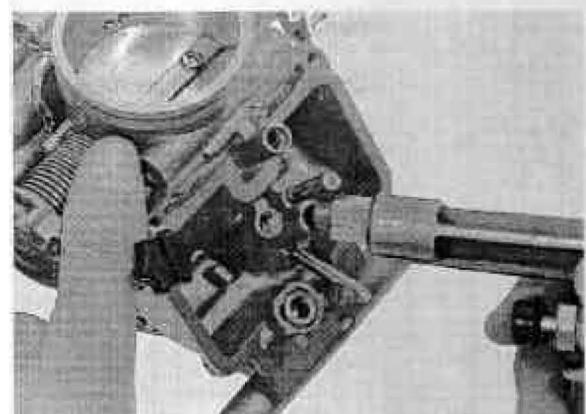
### CARBURETOR CLEANING

Remove the following:

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

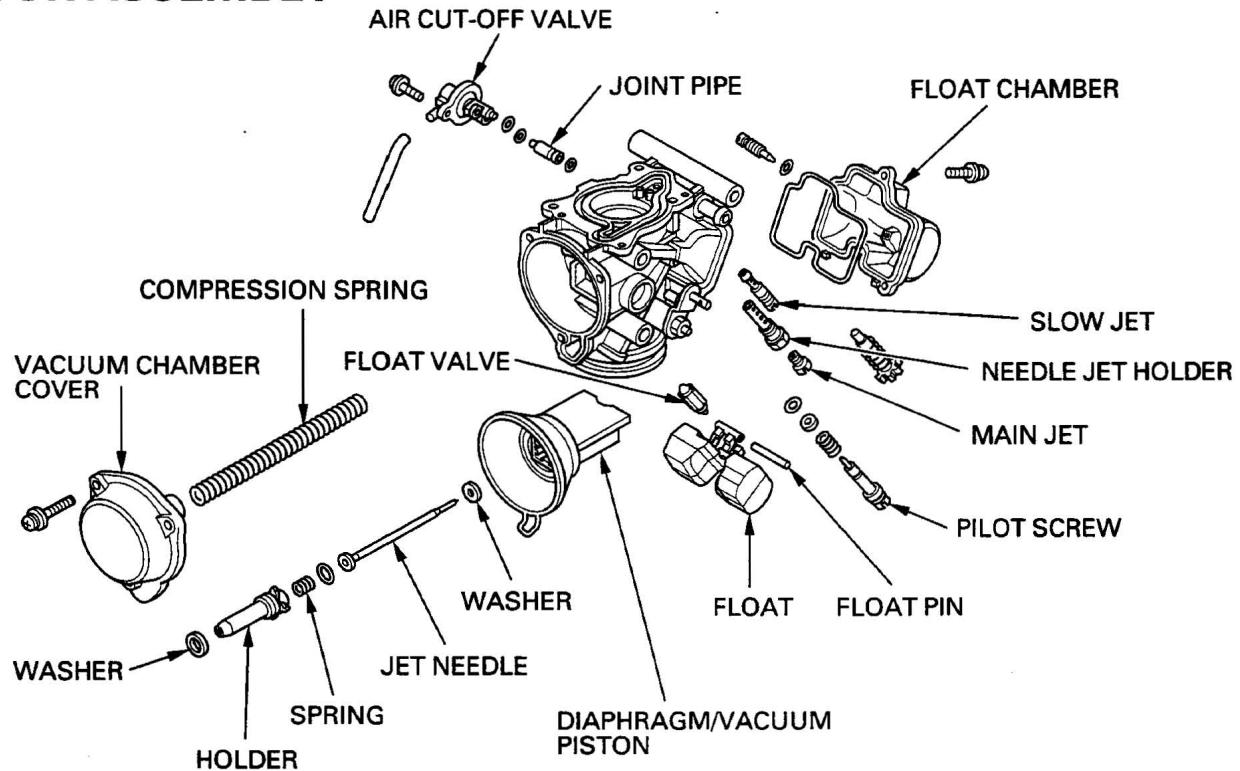
#### CAUTION:

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



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

### CARBURETOR ASSEMBLY



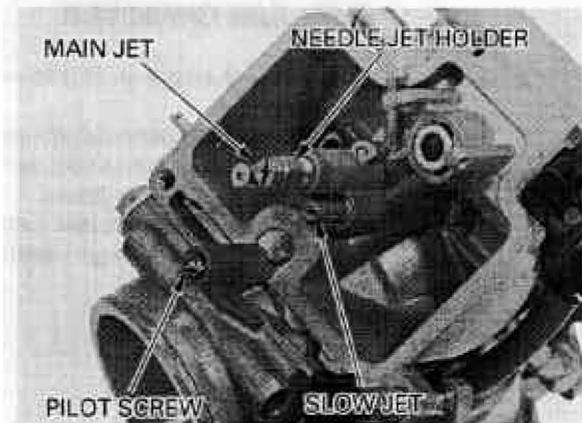
## FLOAT CHAMBER

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

### CAUTION:

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

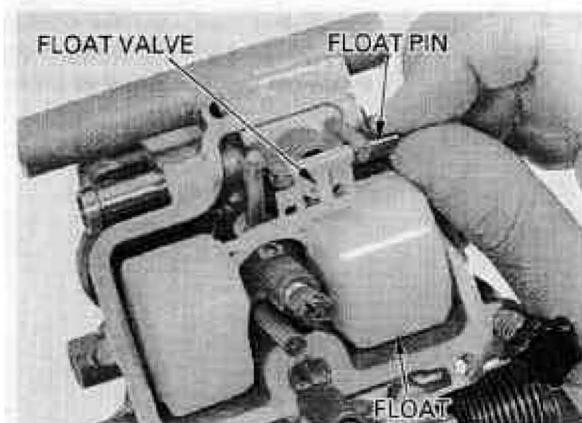
Install the needle jet holder, main jet and slow jet.



### CAUTION:

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

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



## FLOAT LEVEL INSPECTION

With the float valve seated and the float arm just touching the valve, measure the float level with the float level gauge.

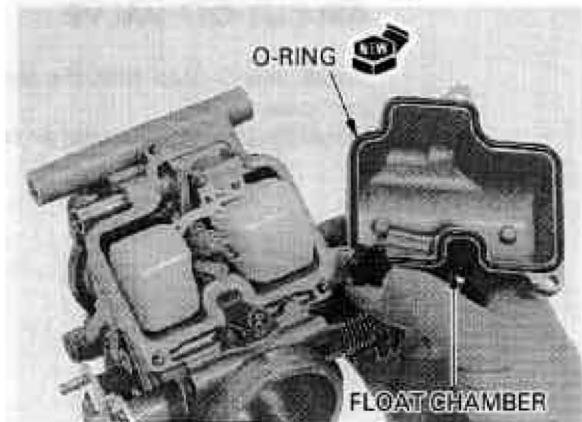
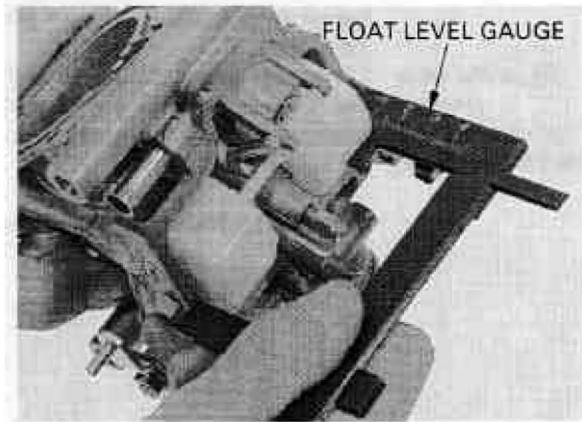
### TOOL:

Float level gauge 07401-0010000

**FLOAT LEVEL:**  $16.6 \pm 0.5$  mm ( $0.65 \pm 0.02$  in)

The float cannot be adjusted.  
Replace the float assembly if the float level is out of specification.

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



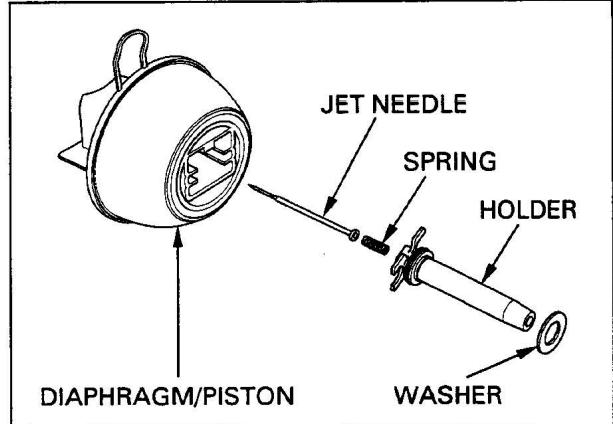
### VACUUM CHAMBER

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

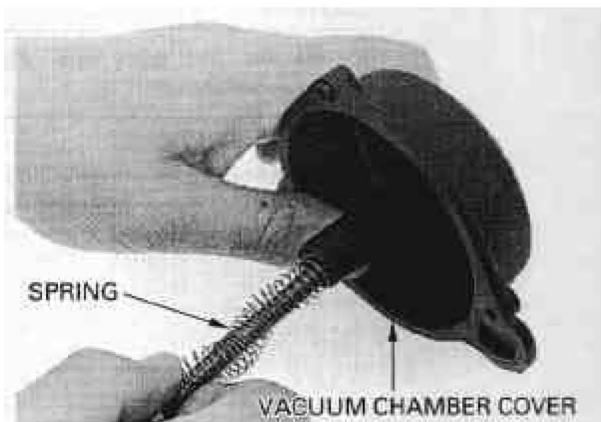
Install the washer onto the jet needle holder.

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

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



Install and compress the compression spring into the spring hole in the vacuum chamber cover using a screwdriver as a guide as shown.



Install the diaphragm/vacuum piston into the carburetor body.

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

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

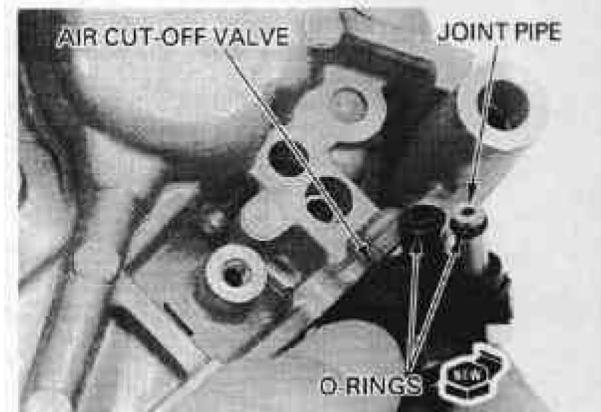
Install and tighten the three screws.



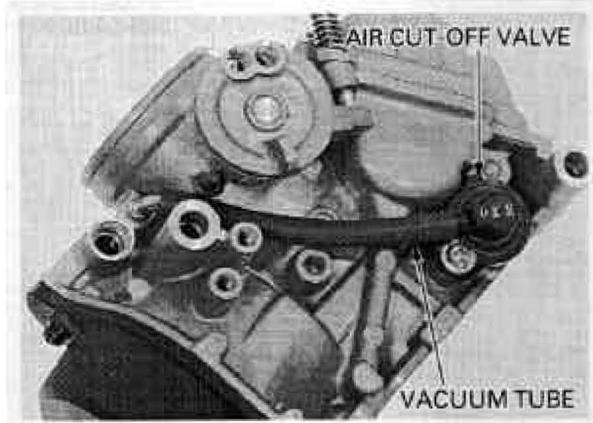
### AIR CUT-OFF VALVE

Install new O-rings onto the air cut-off valve and joint pipe.

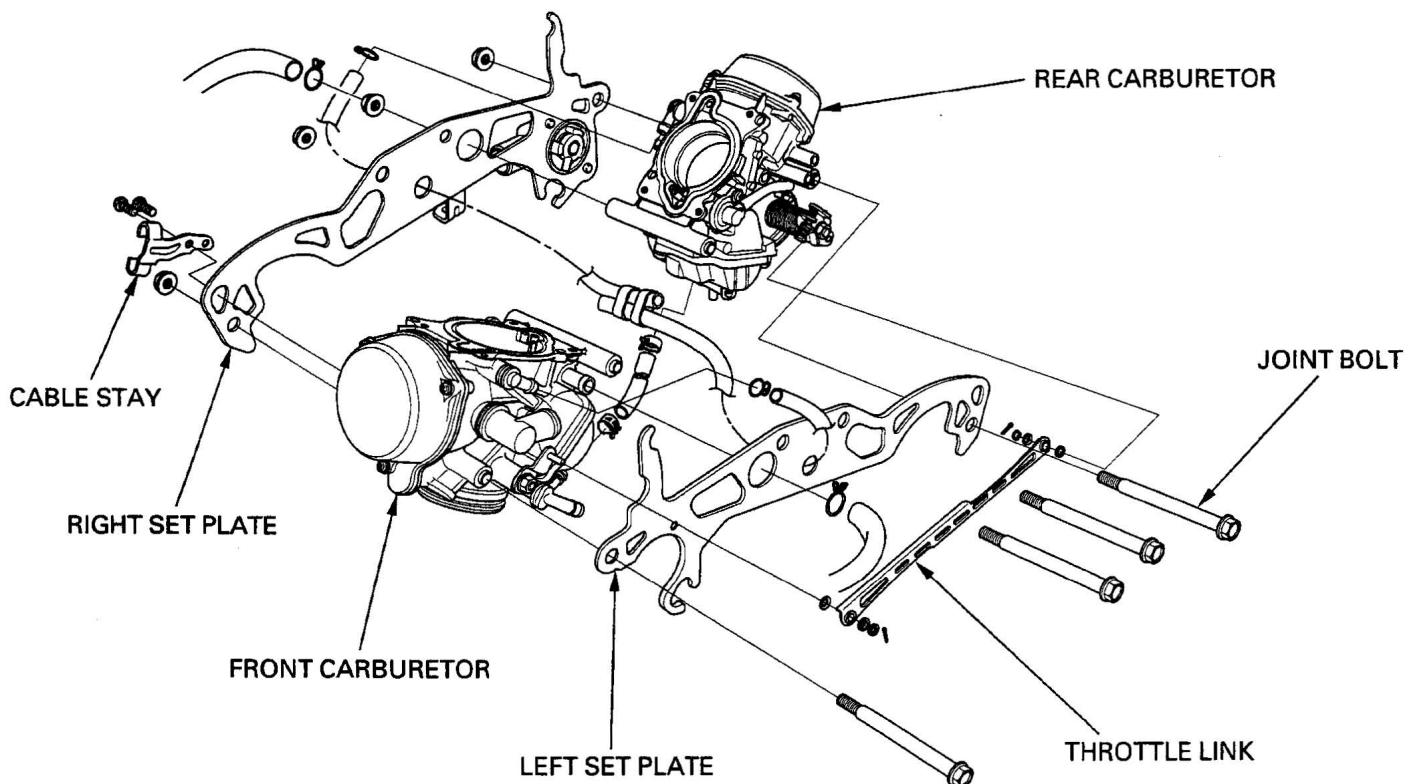
Install the joint pipe into the air cut-off valve.



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



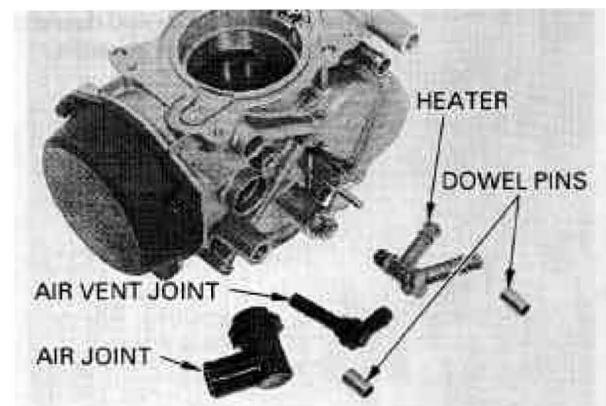
## CARBURETOR COMBINATION



### NOTE:

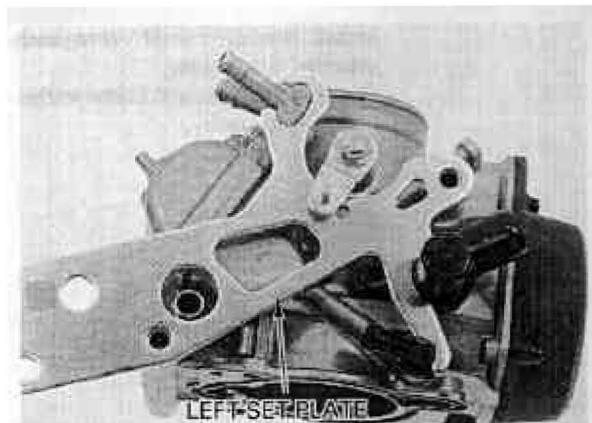
Always replace the O-rings with new ones.

Install the following onto each carburetor:  
 — carburetor heater with new O-rings  
 — air vent joint with a new O-ring  
 — air joint with a new O-ring  
 — dowel pins



## FUEL SYSTEM

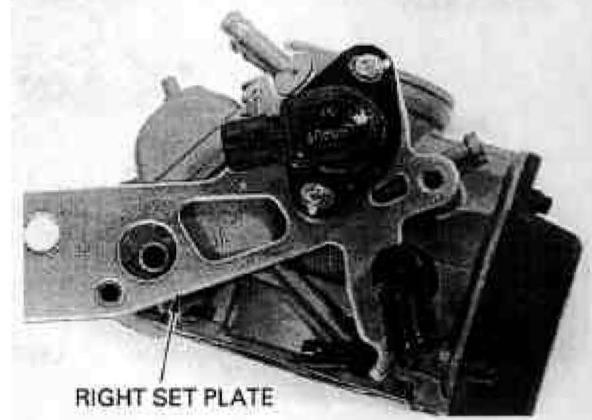
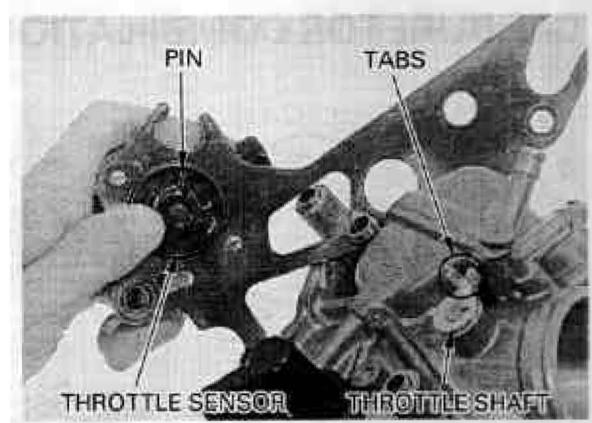
Install the left set plate onto the front carburetor as shown.



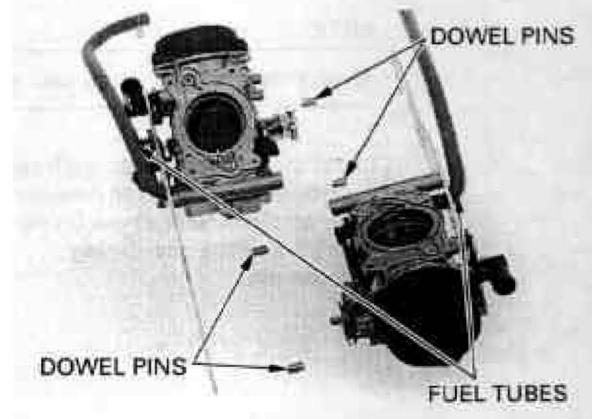
Install the right set plate onto the rear carburetor so that the pin of the throttle sensor is positioned between the tabs of the throttle shaft.

**CAUTION:**

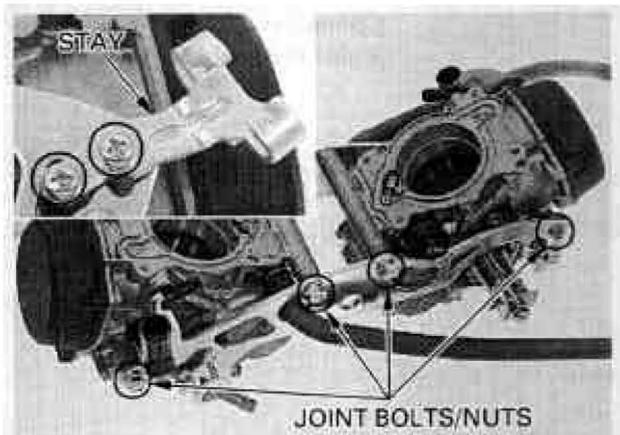
***Do not remove the throttle sensor from the set plate unless it requires replacement.  
It can cause the throttle sensor getting out of position resulting in improper ignition timing.***



Install the fuel tubes and dowel pins, and assemble the front and rear carburetors.



Install the four joint bolts and tighten the nuts.  
Install the cable stay onto the front carburetor and tighten the screws.

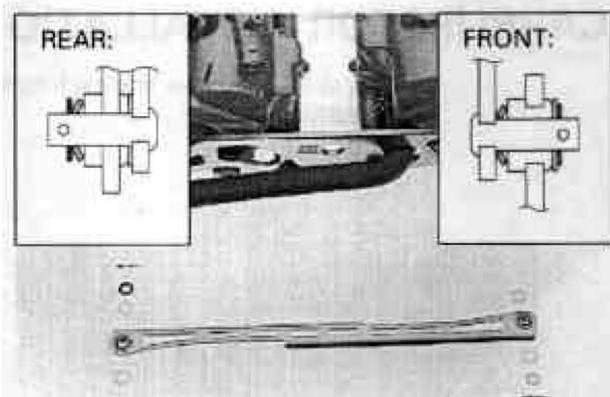


*Install the plastic cone washer with the concave side facing to the throttle link.*

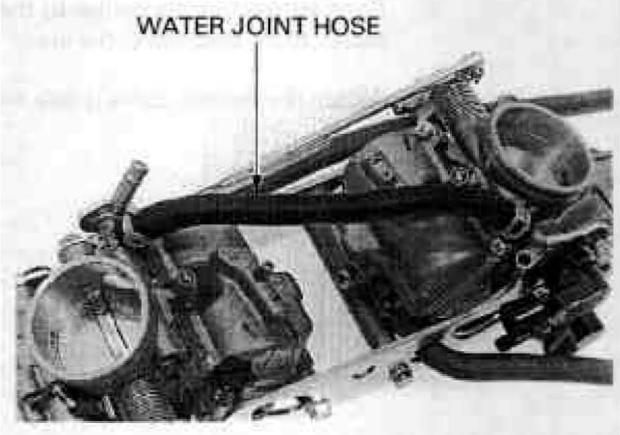
Install the following onto the throttle arm pin:  
Front carburetor:  
– plastic cone washer  
– throttle link  
– plastic plain washer  
– metallic washer  
– new cotter pin

Rear carburetor:  
– plastic plain washer  
– throttle link  
– plastic cone washer  
– metallic washer  
– new cotter pin

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

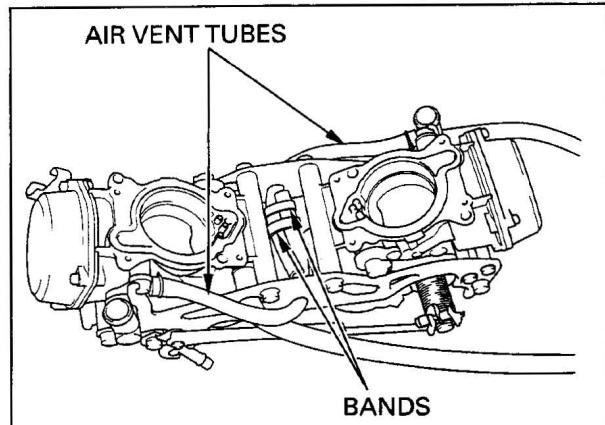


Connect the water joint hose to the front and rear carburetor heaters.



## FUEL SYSTEM

Connect the air vent tubes to the air vent joints and install the tube bands as shown.



## CARBURETOR INSTALLATION

Install the SE valve into each carburetor and tighten the SE valve nut.

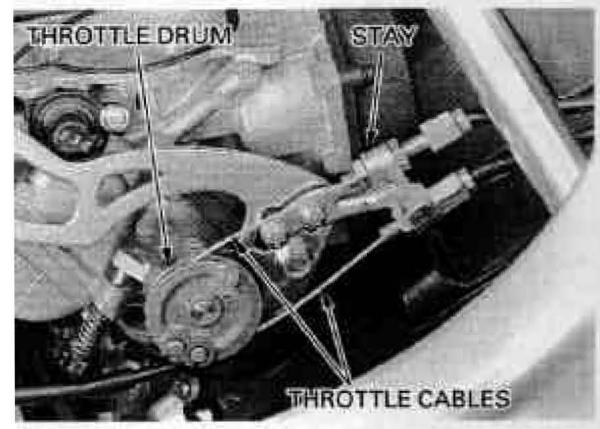


Connect the water inlet hose to the rear carburetor heater and the outlet hose to the front carburetor heater.



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

Adjust the throttle cable (page 3-4).

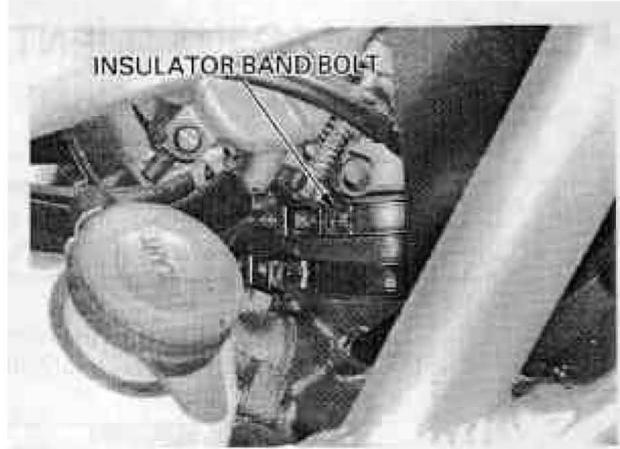


Install the carburetor assembly into the carburetor insulators and tighten the insulator band bolts.

**NOTE:**

Insert the screwdriver through the hole in the heat guard to tighten the front carburetor insulator band bolt.

**TORQUE:** 1 N·m (0.1 kgf·m , 0.7 lbf·ft)



Connect the throttle sensor 3P (white) connector.

Install the air cleaner housing (page 5-4).  
Fill and bleed the cooling system (page 6-5).



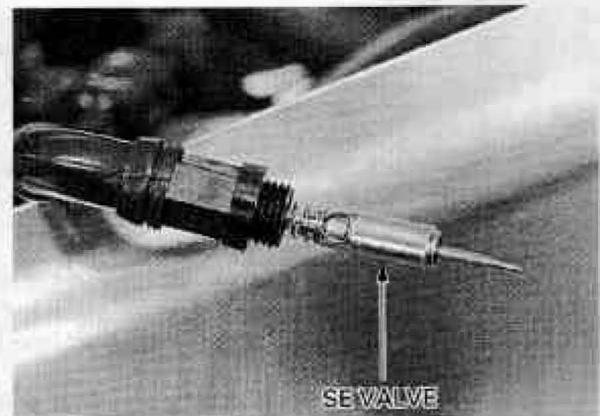
## CHOKE SYSTEM

Remove the carburetors (page 5-5).

Check the starting enrichment (SE) valve for scoring, scratches or wear.

Check the seat at the tip of the SE valve for stepped wear.

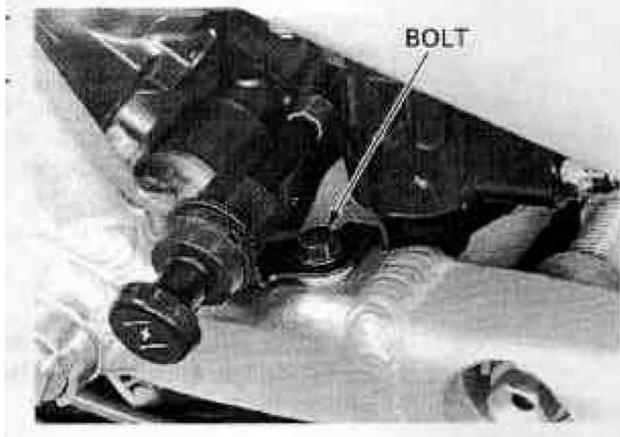
Replace the SE valve set if necessary.



Check the choke cables for frayed, kinked or other damage.

Remove the bolt and replace the choke cable assembly if necessary.

Install the carburetors (page 5-16).



# PILOT SCREW ADJUSTMENT

## IDLE DROP PROCEDURE

### NOTE:

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

1. Turn 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.***

### TOOL:

Pilot screw wrench      07908-4220201  
                                   (except SW type)  
                                   07KMA-MN90100  
                                   (SW type)

### INITIAL OPENING:

Except SW, AR, type: 1-5/8 turns out  
                                   SW, AR type: 2-3/4 turns out

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

### IDLE SPEED:

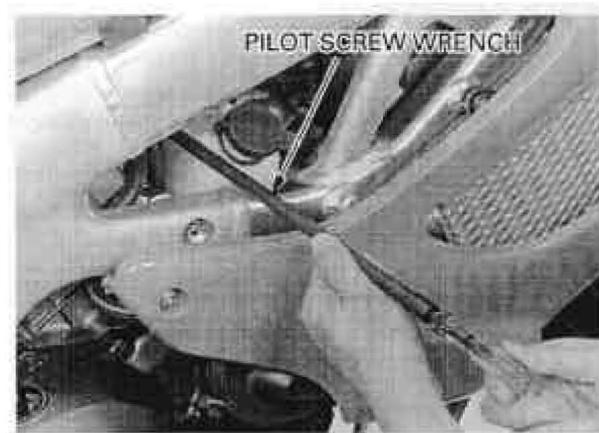
Except SW, AR, IIG type:  $1,100 \pm 100 \text{ min}^{-1}$  (rpm)  
                                   AR, IIG type:  $1,200 \pm 100 \text{ min}^{-1}$  (rpm)  
                                   SW type:  $1,200 \pm 50 \text{ min}^{-1}$  (rpm)

5. Turn the front carburetor pilot screw in or out slowly to obtain the highest engine speed.
6. Perform step 5 for rear carburetor pilot screw.
7. Lightly open the throttle 2 or 3 times, then adjust the idle speed with the throttle stop screw.
8. Turn the front carburetor pilot screw in until the engine speed drops by  $50 \text{ min}^{-1}$  (rpm).
9. Turn the front carburetor pilot screw out to the final opening from the position obtained in step 8.

### FINAL OPENING:

Front: 1 turn out  
                                   Rear: 1-1/4 turns out

10. Adjust the idle speed with the throttle stop screw.
11. Perform steps 8, 9 and 10 for the rear carburetor pilot screw.



## SECONDARY AIR SUPPLY SYSTEM (SW, AR, IIG type only)

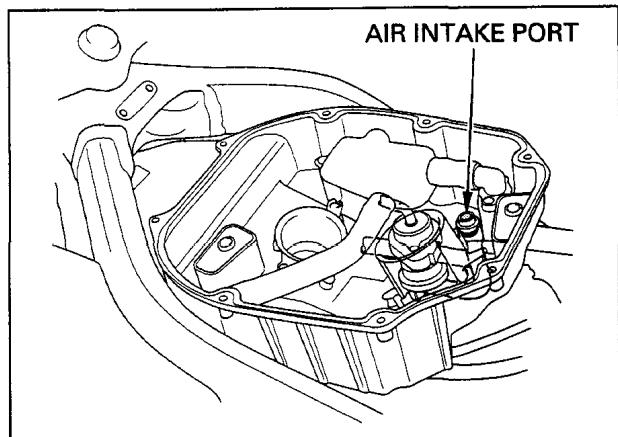
### SYSTEM INSPECTION

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

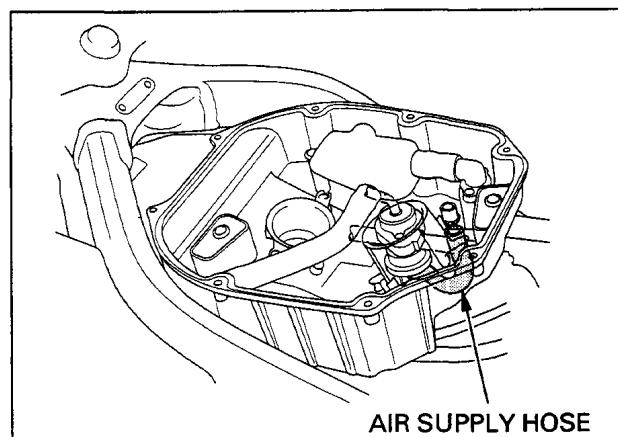
Remove the air cleaner element (page 3-6).

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

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



Disconnect the air supply (air cleaner housing-to-PAIR control valve) hose from the air cleaner housing.



Disconnect the PAIR control valve vacuum tube from the 3-way vacuum joint and plug the vacuum joint.

Connect a vacuum pump to the PAIR control valve vacuum tube.

Start the engine and open the throttle slightly to be certain that air is sucked in through the air supply hose.

If the air is not drawn in, check the air supply hoses for clogging.

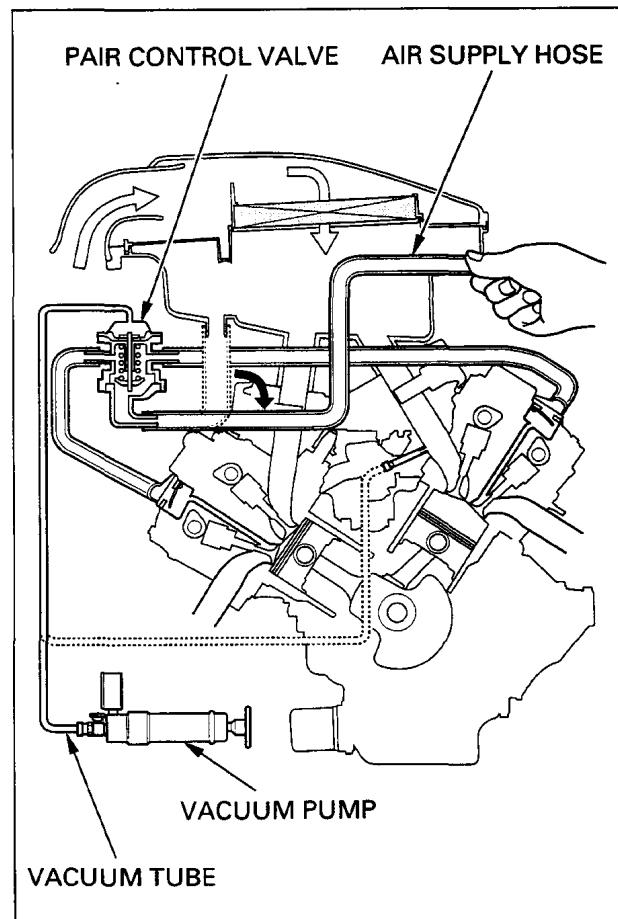
With the engine running, gradually apply vacuum to the PAIR control valve vacuum tube.

Check that the air supply hose stops drawing air, and that the vacuum does not bleed.

**SPECIFIED VACUUM:** 400 mm Hg (15.7 in Hg)

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

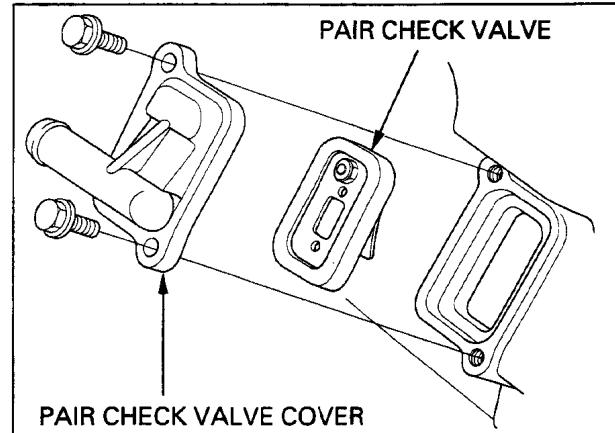
If afterburn occurs on deceleration, even when the secondary air supply system is normal, check the air cut-off valve.



### PAIR CHECK VALVE INSPECTION

For the rear cylinder PAIR check valve removal, remove the fuel tank (page 2-4).

Remove the bolts, PAIR check valve cover and PAIR check valve from the cylinder head cover.



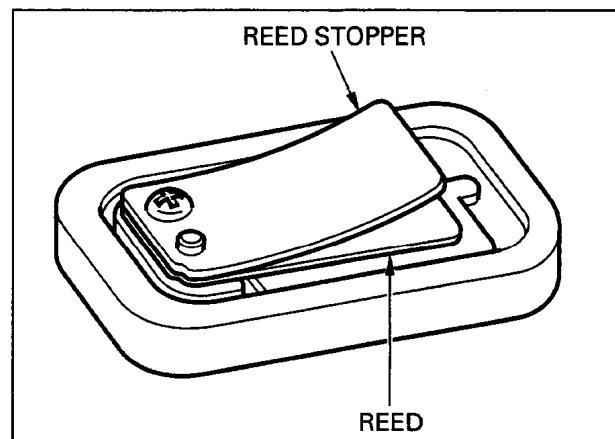
Check the reed for damage or fatigue. Replace if necessary.

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

Install the PAIR check valve and cover onto the cylinder head cover.

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

**TORQUE:** 5 N·m (0.52 kgf·m , 3.8 lbf·ft)



## COOLING SYSTEM

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