

2010-2013



**HONDA**

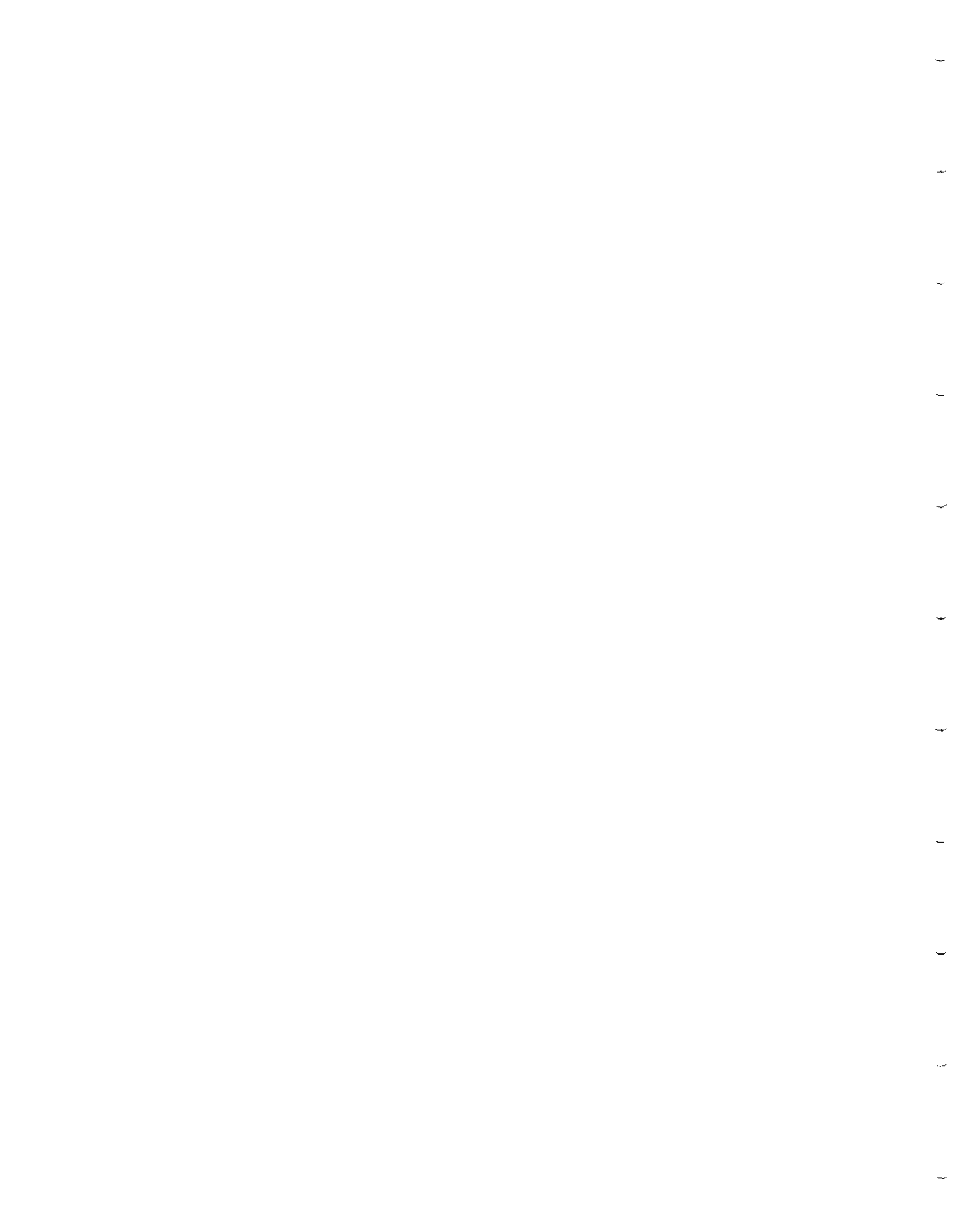
**SERVICE MANUAL**

**VT750C2/S**

**SHADOW SPIRIT™**

**VT750C2B**

**SHADOW PHANTOM™**



## How To Use This Manual

This manual describes the service procedures for the VT750C2/C2F/C2B/C2S-A.

**Note:** Information within this manual identified for the C2F model should also be used for the C2 model. **NEW**

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

Section 4 through 22 describe parts of the motorcycle, grouped according to location.

Follow the Maintenance Schedule 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.

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 Troubleshooting section 23.

Your safety, and the safety of others, is very important. To help you make informed decisions we have provided safety messages and other information throughout this manual. Of course, it is not practical or possible to warn you about all the hazards associated with servicing this vehicle.

You must use your own good judgement.

You will find important safety information in a variety of forms including:

- Safety Labels – on the vehicle
- Safety Messages – preceded by a safety alert symbol  and one of three signal words, DANGER, WARNING, or CAUTION.

These signal words mean:

**⚠ DANGER** You WILL be KILLED or SERIOUSLY HURT if you don't follow instructions.

**⚠ WARNING** You CAN be KILLED or SERIOUSLY HURT if you don't follow instructions.

**⚠ CAUTION** You CAN be HURT if you don't follow instructions.












- Instructions – how to service this vehicle correctly and safely.

As you read this manual, you will find information that is preceded by a **NOTICE** symbol. The purpose of this message is to help prevent damage to your vehicle, other property, or the environment.

## HOW TO USE THIS MANUAL

### 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 the recommend 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, NOGI #2 or equivalent). Example: <ul style="list-style-type: none"><li>• Molykote® BR-2 plus manufactured by Dow Corning U.S.A.</li><li>• Multi-purpose M-2 manufactured by Mitsubishi Oil, Japan</li></ul>
	Use molybdenum disulfide paste (containing more than 40% molybdenum disulfide, NOGI #2 or equivalent). Example: <ul style="list-style-type: none"><li>• Molykote® G-n Paste manufactured by Dow Corning U.S.A.</li><li>• Honda Moly 60 (U.S.A. only)</li><li>• Rocol ASP manufactured by Rocol Limited, U.K.</li><li>• Rocol Paste manufactured by Sumico Lubricant, Japan</li></ul>
	Use silicone grease.
	Apply a locking agent. Use a medium 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.

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**MEMO**

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## GENERAL INFORMATION

### 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 in the Cable and Harness Routing (page 1-26).

### ABBREVIATIONS

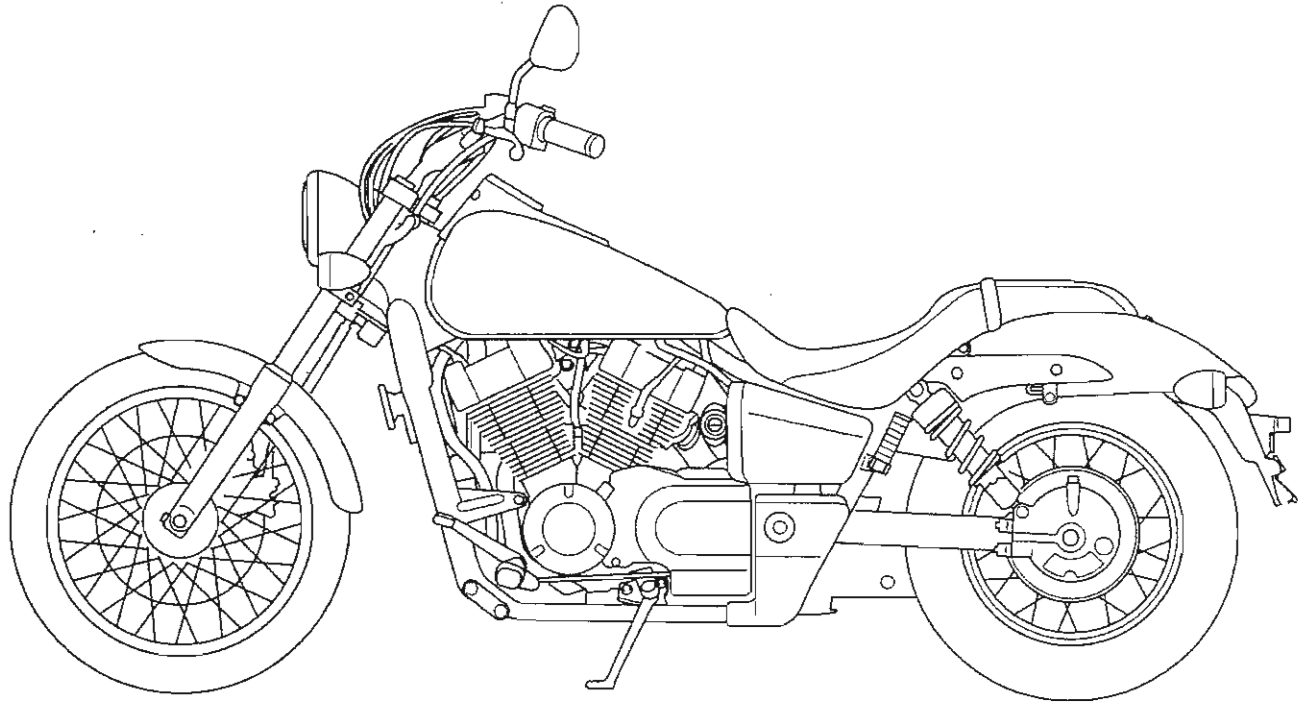
Throughout this manual, the following abbreviations are used to identify the respective parts or systems.

Abbrev. term	Full term
CKP sensor	Crankshaft Position sensor
DLC	Data Link Connector
DTC	Diagnostic Trouble Code
ECM	Engine Control Module
ECT sensor	Engine Coolant Temperature sensor
EEPROM	Electrically Erasable Programmable Read Only Memory
EOP switch	Engine Oil Pressure switch
HDS	Honda Diagnostic System
HISS	Honda Ignition Security System
IACV	Idle Air Control Valve
IAT sensor	Intake Air Temperature sensor
MAP sensor	Manifold Absolute Pressure sensor
MIL	Malfunction Indicator Lamp
PAIR	Pulse Secondary Air Injection
PGM-FI	Programmed Fuel Injection
SCS connector	Service Check Short connector
TP sensor	Throttle Position sensor
VS sensor	Vehicle Speed sensor

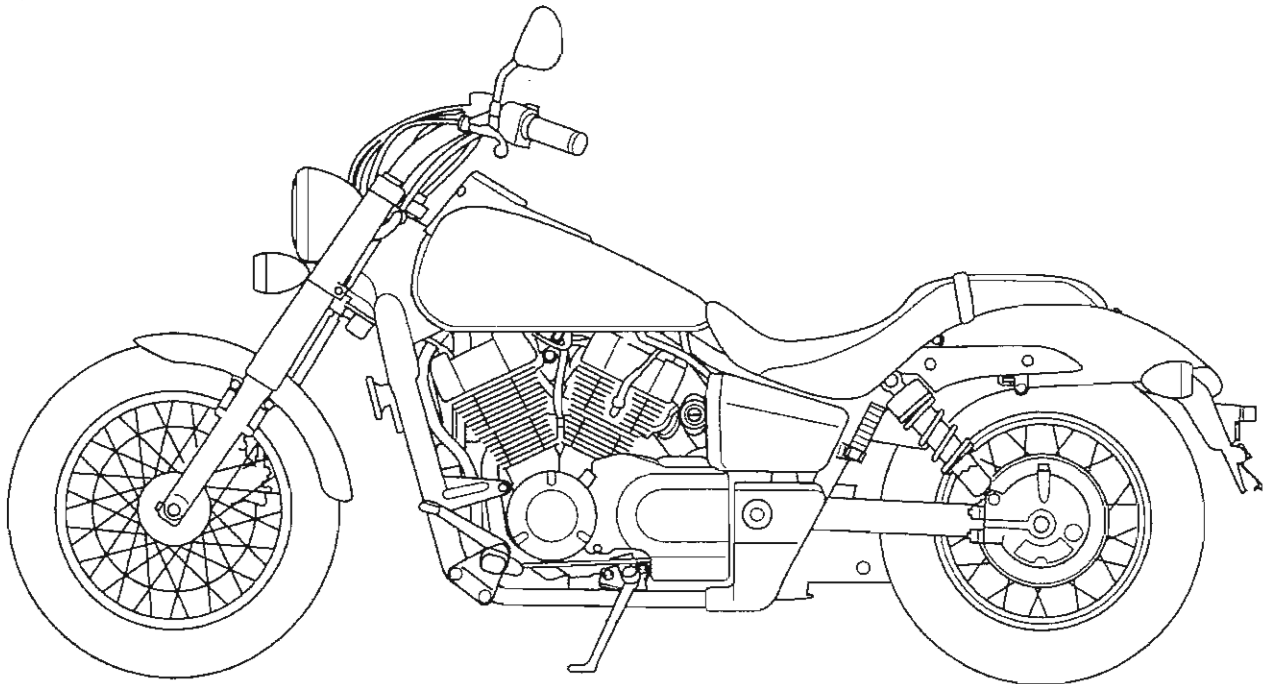


# MODEL IDENTIFICATION

VT750C2/C2F/C2S shown: **NEW**



VT750C2B (U.S.A.) shown:



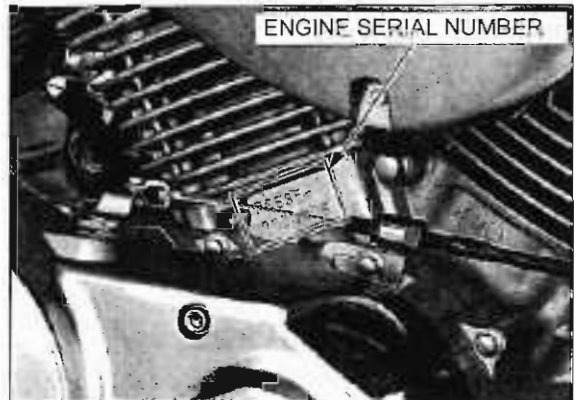
## GENERAL INFORMATION

### SERIAL NUMBERS

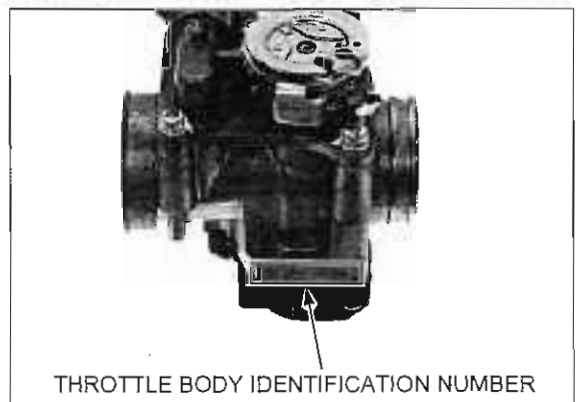
The Vehicle Identification Number (VIN) is stamped on the right side of the steering head.



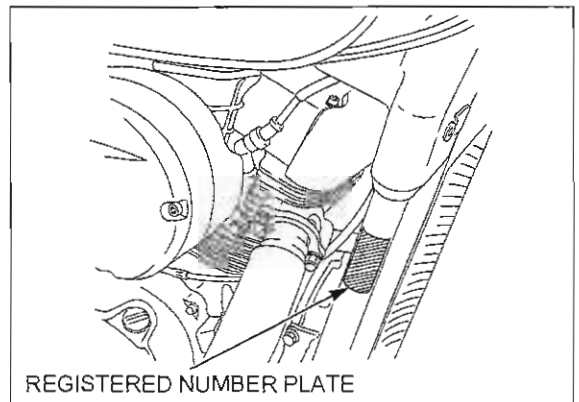
The engine serial number is stamped on the right side of the crankcase.



The throttle body identification number is stamped on the throttle position sensor side of the carburetor body.

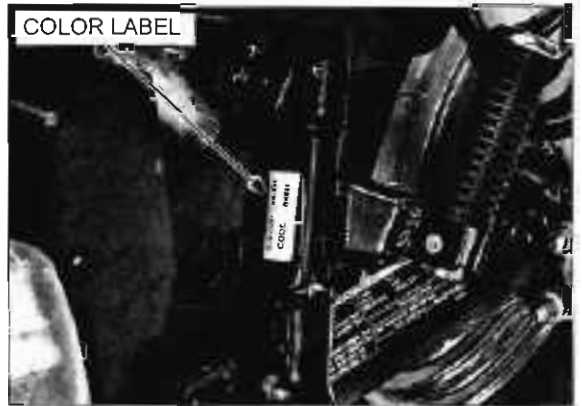


The safety certification label is attached on the right side of the frame down tube.

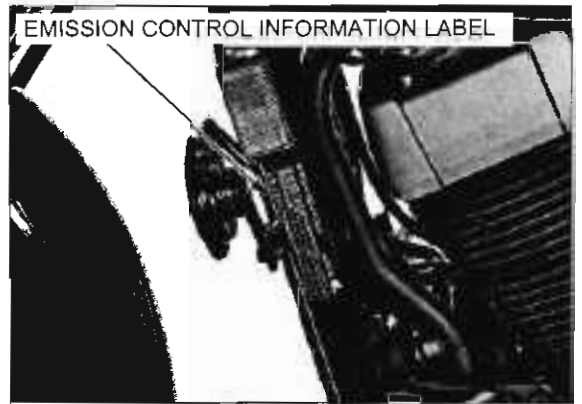


**LABEL**

The color label is attached to the frame, behind of the left side cover. When ordering color-coded parts, always specify the designated color code.



The Emission Control Information Label is attached on the left side of the frame down tube.



## GENERAL INFORMATION

## GENERAL SPECIFICATIONS

ITEM		SPECIFICATIONS	
DIMENSION	Overall length	VT750C2F/C2S: 2,430 mm (95.7 in) VT750C2B: 2,395 mm (94.3 in)	
	Overall width	VT750C2F/C2S: 835 mm (32.9 in) VT750C2B: 825 mm (32.5 in)	
	Overall height	VT750C2F/VT750C2S: 1,125 mm (44.3 in) VT750C2B: 1,090 mm (42.9 in)	
	Wheelbase	VT750C2F/C2S: 1,655 mm (65.2 in) VT750C2B: 1,640 mm (64.6 in)	
	Seat height	655 mm (25.8 in)	
	Footpeg height	277 mm (10.9 in)	
	Ground clearance	130 mm (5.1 in)	
	Curb weight	VT750C2F: 246 kg (542 lbs) VT750C2S: 251 kg (553 lbs) VT750C2B (Canada): 249 kg (549 lbs) VT750C2B (U.S.A.): 250 kg (551 lbs)	
	Maximum weight capacity	VT750C2F/C2S: 184 kg (406 lbs) VT750C2B (U.S.A.): 182 kg (401 lbs) VT750C2B (Canada): 186 kg (410 lbs)	
	FRAME	Frame type	Double cradle
		Front suspension	Telescopic fork
		Front axle travel	115 mm (4.5 in) VT750C2F/C2S: 117 mm (4.6 in) VT750C2B:
		Rear suspension	Swingarm
		Rear axle travel	90 mm (3.5 in)
Front tire size		90/90-21M/C 54S VT750C2F/C2S: 120/90-17M/C 64S VT750C2B: 160/80-15M/C 74S	
Rear tire size		160/80-15M/C 74S	
Tire brand (VT750C2F/C2S)		Front EXEDRA G701 (BRIDGESTONE) D404F (DUNLOP) Rear EXEDRA G702 (BRIDGESTONE) D404 (DUNLOP)	
Tire brand (VT750C2B)		Front G701 (BRIDGESTONE) D404FG (DUNLOP) M6002 (CHENG SHIN) Rear G702 (BRIDGESTONE) D404 (DUNLOP) M6011R (CHENG SHIN)	
Front brake		Hydraulic single disc	
Rear brake		VT750C2S: Hydraulic single disc VT750C2F/C2B: Internal expanding shoe VT750C2F/C2S: 34° 30' VT750C2B: 34° 00'	
Caster angle		34° 30'	
Trail length		VT750C2F/C2S: 158 mm (6.2 in) VT750C2B: 161 mm (6.3 in)	
Fuel tank capacity		14.0 liters (3.70 US gal, 3.08 Imp gal)	

## GENERAL INFORMATION

ITEM	SPECIFICATIONS
<b>ENGINE</b> Cylinder arrangement Bore and stroke Displacement Compression ratio Valve train Intake valve            opens  closes Exhaust valve        opens closes  Lubrication system Oil pump type Cooling system Air filtration Engine dry weight Firing order Cylinder number	2 cylinders 52° V transverse 79 x 76 mm (3.1 x 3.0 in) 745 cm <sup>3</sup> (45.4 cu-in) 9.6 : 1 Silent cam chain driven, OHC Front: 0° BTDC (at 1 mm lift) Rear: 5° ATDC (at 1 mm lift) 25° ABDC (at 1 mm lift) 35° BBDC (at 1 mm lift) Front: 0° ATDC (at 1 mm lift) Rear: 5° BTDC (at 1 mm lift) Forced pressure and wet sump Trochoid Liquid cooled Viscous paper element 70.8 kg (156.1 lbs) Front - 308° - Rear - 412° - Front Front: #2/Rear: #1
<b>FUEL DELIVERY SYSTEM</b> Type Throttle bore	PGM-FI 34 mm (1.3 in)
<b>DRIVE TRAIN</b> Clutch system Clutch operation system Transmission Primary reduction Secondary reduction Third reduction (Output drive reduction) Final reduction Gear ratio            1st 2nd 3rd 4th 5th  Gearshift pattern	Multi-plate, wet Cable operating Constant mesh, 5-speeds 1.763 (67/38) 0.821 (32/39) 1.059 (18/17) 3.091 (34/11) 2.400 (36/15) 1.550 (31/20) 1.174 (27/23) 0.960 (24/25) 0.852 (23/27) Left foot operated return system, 1 - N - 2 - 3 - 4 - 5
<b>ELECTRICAL</b> Ignition system  Starting system Charging system Regulator/rectifier  Lighting system	Computer-controlled digital transistorized with electric advance Electric starter motor Triple phase output alternator SCR shorted/triple phase full-wave rectification Battery

## GENERAL INFORMATION

# LUBRICATION SYSTEM SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	At draining	2.5 liters (2.6 US qt, 2.2 Imp qt)	–
	At oil filter change	2.6 liters (2.7 US qt, 2.3 Imp qt)	–
	At disassembly	3.2 liters (3.4 US qt, 2.8 Imp qt)	–
Recommended engine oil		Pro Honda GN4 4-stroke oil (U.S.A. and Canada) or an equivalent API service classification: SG or higher (except oils labeled as energy conserving on the circular API service label) Viscosity: SAE 10W-30 JASO T 903 standard: MA	–
Oil pressure at EOP switch		530 kPa (5.4 kgf/cm <sup>2</sup> , 77 psi) at 5,000 rpm/(80°C/176°F)	–
Oil pump rotor	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 – 0.08 (0.001 – 0.003)	0.10 (0.004)

# FUEL SYSTEM (PGM-FI) SPECIFICATIONS

ITEM		SPECIFICATIONS
Throttle body identification number	VT750C2F/C2S	GQB3A
	VT750C2B	GQ9KA
Engine idle speed		1,200 ± 100 rpm
Throttle grip freeplay		2 – 6 mm (1/16 – 1/4 in)
Fuel injector resistance (20°C/68°F)	Front	11 – 13 kΩ
	Rear	11 – 13 kΩ
PAIR control solenoid valve resistance (20°C/68°F)		23 – 27 Ω
Fuel pressure at idle		333 – 353 kPa (3.4 – 3.6 kgf/cm <sup>2</sup> , 48 – 51 psi)
Fuel pump flow (at 12 V)		50 cm <sup>3</sup> (1.7 US oz, 1.8 Imp oz) minimum/10 seconds

# COOLING SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS
Coolant capacity	Radiator and engine	1.58 liters (1.67 US qt, 1.39 Imp qt)
	Reserve tank	0.38 liter (0.40 US qt, 0.33 Imp qt)
Radiator cap relief pressure		108 – 137 kPa (1.1 – 1.4 kgf/cm <sup>2</sup> , 16 – 20 psi)
Thermostat	Begin to open	80 – 84°C (177 – 182°F)
	Fully open	95°C (203°F)
	Valve lift	8 mm (0.3 in) minimum at 95°C (203°F)
Recommended antifreeze		Pro Honda HP coolant or an equivalent high quality ethylene glycol antifreeze containing silicate-free corrosion inhibitors
Standard coolant concentration		1 : 1 (mixture with distilled water)

## CYLINDER HEAD/VALVE SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Cylinder compression at 400 rpm		1,373 ± 98 kPa (14.0 ± 1.0 kgf/cm <sup>2</sup> , 199 ± 14 psi)	-
Valve clearance	IN	0.15 ± 0.02 (0.006 ± 0.001)	-
	EX	0.20 ± 0.02 (0.008 ± 0.001)	-
Cam chain tensioner wedge B length		-	6 (0.2)
Camshaft	Cam lobe height	IN	37.188 – 37.348 (1.4641 – 1.4704)
		EX	37.605 – 37.765 (1.4805 – 1.4868)
	Runout	IN/EX	-
	Journal O.D.	IN/EX	21.959 – 21.980 (0.8645 – 0.8654)
	Oil clearance	IN/EX	0.020 – 0.141 (0.0008 – 0.0056)
Rocker arm, rocker arm shaft	Rocker arm shaft O.D.	IN/EX	11.966 – 11.984 (0.4711 – 0.4718)
	Rocker arm I.D.	IN/EX	12.000 – 12.018 (0.4724 – 0.4731)
	Rocker arm-to-shaft clearance		0.016 – 0.052 (0.0006 – 0.0020)
Valve, valve guide	Valve stem O.D.	IN	5.475 – 5.490 (0.2156 – 0.2161)
		EX	5.455 – 5.470 (0.2148 – 0.2154)
	Valve guide I.D.	IN	5.500 – 5.510 (0.2165 – 0.2169)
		EX	5.500 – 5.512 (0.2165 – 0.2170)
	Stem-to-guide clearance	IN	0.010 – 0.035 (0.0004 – 0.0014)
		EX	0.030 – 0.057 (0.0012 – 0.0022)
	Valve guide projection above cylinder head	IN	18.7 – 18.9 (0.736 – 0.744)
		EX	17.2 – 17.4 (0.68 – 0.69)
Valve seat width	IN/EX	0.90 – 1.10 (0.035 – 0.043)	
Valve spring	Free length	IN	42.14 (1.659)
		EX	46.11 (1.815)
Cylinder head warpage		-	0.10 (0.004)

## CYLINDER/PISTON SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Cylinder	I.D.	79.000 – 79.015 (3.1102 – 3.1108)	79.10 (3.114)	
	Out-of-round	-	0.06 (0.002)	
	Taper	-	0.06 (0.002)	
	Warpage	-	0.10 (0.004)	
Piston, piston pin, piston rings	Piston O.D. at 17 mm (0.7 in) from the bottom	78.97 – 78.99 (3.109 – 3.110)	78.90 (3.106)	
	Piston pin bore I.D.	18.002 – 18.008 (0.7087 – 0.7090)	18.05 (0.711)	
	Piston pin O.D.	17.994 – 18.000 (0.7084 – 0.7087)	17.98 (0.708)	
	Piston-to-piston pin clearance	0.002 – 0.014 (0.0001 – 0.0006)	0.04 (0.002)	
	Piston ring end gap	Top	0.15 – 0.25 (0.006 – 0.010)	0.4 (0.02)
		Second	0.25 – 0.40 (0.010 – 0.016)	0.6 (0.02)
		Oil (side rail)	0.20 – 0.80 (0.008 – 0.031)	1.0 (0.04)
	Piston ring-to-ring groove clearance	Top	0.025 – 0.055 (0.0010 – 0.0022)	0.08 (0.003)
Second		0.015 – 0.045 (0.0006 – 0.0018)	0.07 (0.003)	
Cylinder-to-piston clearance		0.010 – 0.045 (0.0004 – 0.0018)	0.10 (0.004)	
Connecting rod small end I.D.		18.016 – 18.034 (0.7093 – 0.7100)	18.07 (0.711)	
Connecting rod-to-piston pin clearance		0.016 – 0.040 (0.0006 – 0.0016)	0.06 (0.002)	

## GENERAL INFORMATION

### CLUTCH/GEARSHIFT LINKAGE SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Clutch lever freeplay		10 – 20 (3/8 – 13/16)	–	
Clutch	Spring free length	45.3 (1.78)	43.9 (1.73)	
	Disc thickness	Disc A	2.62 – 2.78 (0.103 – 0.109)	2.3 (0.09)
		End disc	2.92 – 3.08 (0.115 – 0.121)	2.6 (0.10)
	Plate warpage	–	0.30 (0.012)	
Clutch outer guide	I.D.	21.991 – 22.016 (0.8658 – 0.8668)	22.03 (0.867)	
	O.D.	31.959 – 31.975 (1.2582 – 1.2589)	31.92 (1.257)	
Mainshaft O.D. at clutch outer guide		21.967 – 21.980 (0.8648 – 0.8654)	21.95 (0.864)	
Clutch outer guide-to-mainshaft clearance		0.011 – 0.049 (0.0004 – 0.0019)	0.08 (0.003)	
Clutch outer I.D.		32.000 – 32.025 (1.2598 – 1.2608)	32.09 (1.263)	
Clutch outer-to-outer guide clearance		0.025 – 0.066 (0.0010 – 0.0026)	0.18 (0.007)	
Oil pump drive sprocket I.D.		32.025 – 32.145 (1.2608 – 1.2655)	32.16 (1.266)	
Oil pump drive sprocket-to-clutch outer guide clearance		0.050 – 0.186 (0.0020 – 0.0073)	0.23 (0.009)	

### ALTERNATOR/STARTER CLUTCH SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Starter driven gear	I.D.	37.000 – 37.025 (1.4567 – 1.4577)	37.10 (1.461)
	O.D.	57.749 – 57.768 (2.2736 – 2.2743)	57.73 (2.273)
Starter clutch outer I.D.		74.414 – 74.440 (2.9297 – 2.9307)	74.46 (2.931)



# CRANKSHAFT/TRANSMISSION SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Crankshaft	Connecting rod big end side clearance	0.05 – 0.20 (0.002 – 0.008)	0.30 (0.012)	
	Crankpin bearing oil clearance	0.028 – 0.052 (0.0011 – 0.0020)	0.07 (0.003)	
	Main journal oil clearance	0.020 – 0.038 (0.0008 – 0.0015)	0.07 (0.003)	
	Crankshaft runout	–	0.03 (0.001)	
	Main journal O.D.	52.982 – 53.000 (2.0859 – 2.0866)	52.976 (2.0857)	
Main journal I.D.		58.010 – 58.022 (2.2839 – 2.2843)	58.070 (2.2862)	
Shift fork, fork shaft	I.D.	13.000 – 13.018 (0.5118 – 0.5125)	13.03 (0.513)	
	Claw thickness	5.93 – 6.00 (0.233 – 0.236)	5.6 (0.22)	
	Fork shaft O.D.	12.966 – 12.984 (0.5105 – 0.5112)	12.90 (0.508)	
Shift drum O.D. at left end		11.966 – 11.984 (0.4711 – 0.4718)	11.94 (0.470)	
Shift drum journal I.D.		12.000 – 12.018 (0.4724 – 0.4731)	12.05 (0.474)	
Shift drum-to-shift drum journal clearance		0.016 – 0.052 (0.0006 – 0.0020)	0.09 (0.035)	
Transmission	Gear I.D.	M3, M5	28.000 – 28.021 (1.1024 – 1.1032)	28.04 (1.104)
		C1, C4	31.000 – 31.025 (1.2205 – 1.2215)	31.05 (1.222)
		C2	24.000 – 24.021 (0.9449 – 0.9457)	24.04 (0.946)
	Gear busing O.D.	M3, M5	27.959 – 27.980 (1.1007 – 1.1016)	27.94 (1.100)
		C1, C4	30.950 – 30.975 (1.2185 – 1.2195)	30.93 (1.218)
		C2	23.959 – 23.980 (0.9433 – 0.9441)	23.94 (0.943)
	Gear-to-bushing clearance	M3, M5, C2	0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
		C1, C4	0.025 – 0.075 (0.0010 – 0.0030)	0.11 (0.004)
	Gear bushing I.D.	M3	25.000 – 25.021 (0.9843 – 0.9851)	25.04 (0.986)
		C2	20.000 – 20.021 (0.7874 – 0.7882)	20.04 (0.789)
	Mainshaft O.D.	at M3 bushing	24.959 – 24.980 (0.9826 – 0.9835)	24.94 (0.982)
	Countershaft O.D.	at C2 bushing	19.980 – 19.993 (0.7866 – 0.7871)	19.96 (0.786)
	Bushing-to-shaft clearance	M3	0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
C2		0.007 – 0.041 (0.0003 – 0.0016)	0.07 (0.003)	
Output drive train	Output gear I.D.		24.000 – 24.021 (0.9449 – 0.9457)	24.04 (0.946)
	Output gear bushing	O.D.	23.959 – 23.980 (0.9433 – 0.9441)	23.70 (0.933)
		I.D.	20.020 – 20.041 (0.7882 – 0.7890)	20.06 (0.790)
	Output drive gear shaft O.D.		19.979 – 20.000 (0.7866 – 0.7874)	19.97 (0.786)
	Gear-to-bushing clearance		0.020 – 0.062 (0.0008 – 0.0024)	0.082 (0.0032)
	Gear bushing-to-shaft clearance		0.020 – 0.042 (0.0008 – 0.0017)	0.08 (0.003)
	Output gear damper spring free length		62.3 (2.45)	59 (2.3)
	Output drive gear backlash		0.08 – 0.23 (0.003 – 0.009)	0.40 (0.016)
Backlash difference between measurements		–	0.10 (0.004)	

# FINAL DRIVE SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Recommended final drive oil		Hypoid gear oil, SAE #80	–
Final drive oil capacity	At draining	160 cm <sup>3</sup> (5.4 US oz, 5.6 Imp oz)	–
	At disassembly	170 cm <sup>3</sup> (5.7 US oz, 6.0 Imp oz)	–
Final drive gear backlash		0.05 – 0.15 (0.002 – 0.006)	0.30 (0.012)
Backlash difference between measurements		–	0.10 (0.004)
Ring gear-to-stop pin clearance		0.30 – 0.60 (0.012 – 0.024)	–
Final drive gear assembly pre-load		0.2 – 0.4 N·m (2.0 – 4.1 kgf·m, 0.1 – 0.3 lbf·ft)	–

## GENERAL INFORMATION

### FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS (VT750C2F/C2S)

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		–	1.5 (0.06)
Cold tire pressure	Up to 90 kg (200 lbs) load	200 kPa (2.00 kgf/cm <sup>2</sup> , 29 psi)	–
	Up to maximum weight capacity	200 kPa (2.00 kgf/cm <sup>2</sup> , 29 psi)	–
Axle runout		–	0.2 (0.01)
Wheel rim runout	Radial	–	2.0 (0.08)
	Axial	–	2.0 (0.08)
Wheel balance weight		–	60 g max.
Fork	Spring free length	371.8 (14.64)	364.4 (14.35)
	Tube runout	–	0.2 (0.01)
	Recommended fork fluid	Pro Honda Suspension Fluid SS-8 (10W)	–
	Fluid level	100 (3.9)	–
	Fluid capacity	478 ± 2.5 cm <sup>3</sup> (16.2 ± 0.08 US oz, 16.8 ± 0.09 Imp oz)	–
Steering head bearing pre-load		8.5 – 12.7 N (0.9 – 1.3 kgf)	–

### FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS (VT750C2B)

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		–	1.5 (0.06)
Cold tire pressure	Up to 90 kg (200 lbs) load	200 kPa (2.00 kgf/cm <sup>2</sup> , 29 psi)	–
	Up to maximum weight capacity	200 kPa (2.00 kgf/cm <sup>2</sup> , 29 psi)	–
Axle runout		–	0.2 (0.01)
Wheel rim runout	Radial	–	2.0 (0.08)
	Axial	–	2.0 (0.08)
Wheel balance weight		–	60 g max.
Fork	Spring free length	367.8 (14.48)	360.4 (14.19)
	Tube runout	–	0.2 (0.01)
	Recommended fork fluid	Pro Honda Suspension Fluid SS-8 (10W)	–
	Fluid level	100 (3.9)	–
	Fluid capacity	474 ± 2.5 cm <sup>3</sup> (16.0 ± 0.08 US oz, 16.7 ± 0.09 Imp oz)	–
Steering head bearing pre-load		8.5 – 12.7 N (0.9 – 1.3 kgf)	–

### REAR WHEEL/BRAKE/SUSPENSION SPECIFICATIONS (VT750C2F/C2B)

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		–	2.0 (0.08)
Cold tire pressure	Up to 90 kg (200 lbs) load	200 kPa (2.00 kgf/cm <sup>2</sup> , 29 psi)	–
	Up to maximum weight capacity	250 kPa (2.50 kgf/cm <sup>2</sup> , 36 psi)	–
Axle runout		–	0.2 (0.01)
Wheel rim runout	Radial	–	2.0 (0.08)
	Axial	–	2.0 (0.08)
Wheel balance weight		–	70 g max.
Brake drum I.D.		180.0 – 180.3 (7.09 – 7.10)	181 (7.1)
Brake pedal height		75 mm (3.0 in) above the top of the foot-peg	–
Brake pedal freeplay		20 – 30 (13/16 – 1-3/16)	–
Shock absorber spring pre-load adjuster setting		2nd position	–

**REAR WHEEL/BRAKE/SUSPENSION SPECIFICATIONS (VT750C2S)**

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		-	2.0 (0.08)
Cold tire pressure	Up to 90 kg (200 lbs) load	200 kPa (2.00 kgf/cm <sup>2</sup> , 29 psi)	-
	Up to maximum weight capacity	250 kPa (2.50 kgf/cm <sup>2</sup> , 36 psi)	-
Axle runout		-	0.2 (0.01)
Wheel rim runout	Radial	-	2.0 (0.08)
	Axial	-	2.0 (0.08)
Wheel balance weight		-	70 g max.
Shock absorber spring pre-load adjuster setting		2nd position	-

**HYDRAULIC BRAKE SPECIFICATIONS (VT750C2F)**

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Recommended brake fluid		DOT 4	-
Front	Brake disc thickness	5.8 – 6.2 (0.23 – 0.24)	5.0 (0.20)
	Brake disc warpage	-	0.30 (0.012)
	Master cylinder I.D.	11.000 – 11.043 (0.4331 – 0.4348)	11.05 (0.435)
	Master piston O.D.	10.957 – 10.984 (0.4314 – 0.4324)	10.945 (0.4309)
	Caliper cylinder I.D.	27.000 – 27.050 (1.0630 – 1.0650)	27.060 (1.0654)
	Caliper piston O.D.	26.935 – 26.968 (1.0604 – 1.0617)	26.930 (1.0602)

**HYDRAULIC BRAKE SPECIFICATIONS (VT750C2B)**

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Recommended brake fluid		DOT 4	-
Front	Brake disc thickness	5.8 – 6.2 (0.23 – 0.24)	5.0 (0.20)
	Brake disc warpage	-	0.30 (0.012)
	Master cylinder I.D.	11.000 – 11.043 (0.4331 – 0.4348)	11.05 (0.435)
	Master piston O.D.	10.957 – 10.984 (0.4314 – 0.4324)	10.945 (0.4309)
	Caliper cylinder I.D.	25.400 – 25.450 (1.0000 – 1.0020)	25.460 (1.0024)
	Caliper piston O.D.	25.335 – 25.368 (0.9974 – 0.9987)	25.320 (0.9968)

**HYDRAULIC BRAKE SPECIFICATIONS (VT750C2S)**

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Recommended brake fluid		DOT 4	-	
Front	Brake disc thickness	4.8 – 5.2 (0.19 – 0.20)	4.0 (0.16)	
	Brake disc warpage	-	0.30 (0.012)	
	Master cylinder I.D.	11.000 – 11.043 (0.4331 – 0.4348)	11.05 (0.435)	
	Master piston O.D.	10.957 – 10.984 (0.4314 – 0.4324)	10.945 (0.4309)	
	Caliper cylinder I.D.	Upper	27.000 – 27.045 (1.0630 – 1.0650)	27.060 (1.0654)
		Middle	22.650 – 22.700 (0.8917 – 0.8934)	22.712 (0.8942)
		Lower	25.400 – 25.450 (1.0000 – 1.0020)	25.460 (1.0024)
	Caliper piston O.D.	Upper	26.935 – 26.968 (1.0604 – 1.0617)	26.930 (1.0602)
		Middle	22.585 – 22.618 (0.8892 – 0.8905)	22.573 (0.8887)
		Lower	25.318 – 25.368 (0.9968 – 0.9988)	25.310 (0.9965)
Rear	Push rod length	83 (3.3)	-	
	Brake disc thickness	5.8 – 6.2 (0.23 – 0.24)	5.0 (0.20)	
	Brake disc warpage	-	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.	38.180 – 38.230 (1.5031 – 1.5051)	38.24 (1.506)	
	Caliper cylinder O.D.	38.098 – 38.148 (1.4999 – 1.5019)	38.19 (1.499)	

## GENERAL INFORMATION

### BATTERY/CHARGING SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS	
Battery	Capacity	12 V – 11.2 Ah	
	Current leakage	1 mA max.	
	Voltage (20°C/68°F)	Fully charged	13.0 – 13.2 V
		Needs charging	Below 12.4 V
	Charging current	Normal	1.1 A/5 – 10 h
Quick		5.5 A/1.0 h	
Alternator	Capacity	0.39 kW/5,000 rpm	
	Charging coil resistance (20°C/68°F)	0.1 – 1.0 Ω	

### IGNITION SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS
Spark plug	Standard	DPR7EA-9 (NGK), X22EPR-U9 (DENSO)
	For extended high speed riding	DPR8EA-9 (NGK), X24EPR-U9 (DENSO)
Spark plug gap		0.8 – 0.9 mm (0.03 – 0.04 in)
Ignition coil primary peak voltage		100 V minimum
Ignition timing ("F"mark)		8° BTDC at idle
CKP sensor peak voltage (at 20°C/68°F)		0.7 V minimum

### ELECTRIC STARTER SPECIFICATIONS

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	12.5 (0.49)	6.5 (0.26)

### LIGHTS/METERS/SWITCHES SPECIFICATIONS (VT750C2F)

ITEM		SPECIFICATIONS
Bulbs	Headlight	12 V – 60/55 W
	Brake/tail light	12 V – 21/5 W
	License light	12 V – 5 W
	Front turn signal/position light	12 V – 21/5 W x 2
	Rear turn signal light	12 V – 21 W x 2
	Instrument light	LED x 4
	Turn signal indicator	LED
	High beam indicator	12 V – 3.4 W
	Fuel reserve indicator	12 V – 3.4 W
	Neutral indicator	LED
	Oil pressure indicator	LED
	Coolant temperature indicator	LED
	MIL	LED
Fuse	Main fuse	30 A
	FI fuse	15 A
	Sub fuse	10 A x 5, 20 A x 1
ECT sensor resistance	50°C (122°F)	6.8 – 7.4 kΩ
	80°C (176°F)	2.1 – 2.6 kΩ
	120°C (248°F)	0.6 – 0.7 kΩ

**LIGHTS/METERS/SWITCHES SPECIFICATIONS (VT750C2B)**

ITEM		SPECIFICATIONS
Bulbs	Headlight	12 V – 60/55 W
	Brake/tail light	12 V – 21/5 W
	License light	12 V – 5 W
	Front turn signal/position light	12 V – 21/5 W x 2
	Rear turn signal light	12 V – 21 W x 2
	Instrument light	LED x 6
	Turn signal indicator	12 V – 3.4 W
	High beam indicator	12 V – 3.4 W
	Fuel reserve indicator	12 V – 3.4 W
	Neutral indicator	LED
	Oil pressure indicator	LED
	Coolant temperature indicator	LED
	MIL	LED
Fuse	Main fuse	30 A
	FI fuse	15 A
	Sub fuse	10 A x 5, 20 A x 1
ECT sensor resistance	50°C (122°F)	6.8 – 7.4 kΩ
	80°C (176°F)	2.1 – 2.6 kΩ
	120°C (248°F)	0.6 – 0.7 kΩ

**LIGHTS/METERS/SWITCHES SPECIFICATIONS (VT750C2S)**

ITEM		SPECIFICATIONS
Bulbs	Headlight	12 V – 60/55 W
	Brake/tail light	12 V – 21/5 W
	License light	12 V – 5 W
	Front turn signal/position light	12 V – 21/5 W x 2
	Rear turn signal light	12 V – 21 W x 2
	Instrument light	LED x 6
	Turn signal indicator	LED
	High beam indicator	12 V – 3.4 W
	Fuel reserve indicator	12 V – 3.4 W
	Neutral indicator	LED
	Oil pressure indicator	LED
	Coolant temperature indicator	LED
	MIL	LED
	ABS indicator	LED
Fuse	Main fuse	30 A
	FI fuse	20 A
	Sub fuse	10 A x 6, 20 A x 1, 30 A x 2
ECT sensor resistance	50°C (122°F)	6.8 – 7.4 kΩ
	80°C (176°F)	2.1 – 2.6 kΩ
	120°C (248°F)	0.6 – 0.7 kΩ

## GENERAL INFORMATION

### STANDARD TORQUE VALUES

FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)	FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)
5 mm bolt and nut	5.2 (0.5, 3.8)	5 mm screw	4.2 (0.4, 3.1)
6 mm bolt and nut	10 (1.0, 7)	6 mm screw	9 (0.9, 6.6)
8 mm bolt and nut	22 (2.2, 16)	6 mm flange bolt (8 mm head, small flange)	9 (0.9, 6.6)
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	55 (5.6, 41)	6 mm flange bolt (10 mm head) and nut	12 (1.2, 9)
		8 mm flange bolt and nut	27 (2.8, 20)
		10 mm flange bolt and nut	39 (4.0, 29)

### ENGINE & FRAME TORQUE VALUES

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

#### ENGINE

##### FRAME/BODY PANELS/EXHAUST SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Left crankcase rear cover socket bolt	1	6	10 (1.0, 7)	See page 2-12
Exhaust pipe joint stud bolt	4	8	—	
Over head cover socket bolt	8	6	10 (1.0, 7)	

#### MAINTENANCE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Spark plug	4	12	18 (1.8, 13)	Apply grease to the threads Apply grease to the threads Apply engine oil to the threads and seating surface
Timing hole cap	1	14	10 (1.0, 7)	
Crankshaft hole cap	1	30	15 (1.5, 11)	
Valve adjusting screw lock nut	6	7	23 (2.3, 17)	
Engine oil filter cartridge	1	20	26 (2.7, 19)	Apply engine oil to the threads Apply locking agent to the threads
Oil filter boss (crankcase side)	1	20	18 (1.8, 13)	
Engine oil drain bolt	1	14	29 (3.0, 21)	
Alternator cover socket bolt	3	6	10 (1.0, 7)	

#### LUBRICATION SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
EOP switch	1	PT 1/8	12 (1.2, 9)	Apply sealant to the threads
EOP switch terminal screw	1	4	1.9 (0.2, 1.4)	
Oil pump assembly bolt	3	6	13 (1.3, 10)	

#### FUEL SYSTEM (PGM-FI)

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
PAIR check valve cover bolt	4	5	7 (0.7, 5.2)	
Insulator band screw (Throttle body side)	1	—	—	See page 5-53
Insulator band screw (Intake manifold side)	1	—	—	See page 5-58
Sensor unit torx screw	3	5	3.4 (0.3, 2.5)	
Fuel injector mounting bolt	2	5	5.1 (0.5, 3.8)	
IACV set plate torx screw	2	5	2.1 (0.2, 1.5)	
Throttle cable guide screw	2	5	3.4 (0.3, 2.5)	
ECT sensor	1	12	24.5 (2.5, 18)	

## GENERAL INFORMATION

### COOLING SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Water pump cover bolt	5	6	13 (1.3, 10)	

### CYLINDER HEAD/VALVE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cylinder head cover bolt	4	6	10 (1.0, 7)	Apply engine oil to the threads and seating surface Apply engine oil to the threads and seating surface Apply locking agent to the threads See page 8-24
Cylinder head bolt	4	8	23 (2.3, 17)	
Cylinder head nut	8	10	47 (4.8, 35)	
Cam sprocket bolt	4	7	23 (2.3, 17)	
Cam chain tensioner bolt	4	6	10 (1.0, 7)	
Camshaft holder bolt	6	8	23 (2.3, 17)	
Camshaft holder nut	4	8	23 (2.3, 17)	

### CYLINDER/PISTON

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cylinder stud bolt	2	8	-	See page 9-8
Cylinder stud bolt	6	10	-	See page 9-8
Cylinder stud bolt	2	12	-	See page 9-8

### CLUTCH/GEARSHIFT LINKAGE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Clutch lifter plate bolt	4	6	12 (1.2, 9)	Lock nut; replace with a new one and stake Apply engine oil to the threads and seating surface
Clutch center lock nut	1	18	128 (13.1, 94)	
Oil pump driven sprocket bolt	1	6	15 (1.5, 11)	Apply locking agent to the threads
Clutch cover socket bolt	5	6	10 (1.0, 7)	Apply engine oil to the threads and seating surface
Primary drive gear bolt	1	12	88 (9.0, 65)	
Gearshift spindle return spring pin	1	8	23 (2.3, 17)	
Gearshift spindle oil seal stopper plate bolt	1	6	13 (1.3, 10)	

### ALTERNATOR/STARTER CLUTCH

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Flywheel bolt	1	12	128 (13.1, 94)	Left hand threads Apply engine oil to the threads and seating surface
Stator socket bolt	3	6	12 (1.2, 9)	Apply locking agent to the threads
Starter one-way clutch outer socket bolt	6	8	30 (3.1, 22)	Apply locking agent to the threads
Stator wire holder socket bolt	1	6	12 (1.2, 9)	Apply locking agent to the threads

## GENERAL INFORMATION

### CRANKSHAFT/TRANSMISSION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Crankcase bolt	15	8	23 (2.3, 17)	
Gearshift cam plate bolt	1	6	12 (1.2, 9)	Apply locking agent to the threads
Crankpin bearing cap nut	4	8	33 (3.4, 24)	Apply engine oil to the threads and seating surface
Output gear case mounting bolt	3	8	31 (3.2, 23)	Apply sealant to the threads
Output drive gear assembly mounting bolt	2	8	31 (3.2, 23)	Apply engine oil to the threads and seating surface
Output driven gear assembly mounting socket bolt	4	8	31 (3.2, 23)	Apply engine oil to the threads and seating surface
Output drive gear bearing lock nut (inner)	1	30	73 (7.4, 54)	Lock nut; replace with a new one and stake Apply engine oil to the threads and seating surface
(outer)	1	64	98 (10.0, 72)	Lock nut; replace with a new one and stake Apply engine oil to the threads and seating surface
Output driven gear bearing lock nut (inner)	1	30	73 (7.4, 54)	Lock nut; replace with a new one and stake Apply engine oil to the threads and seating surface
(outer)	1	64	98 (10.0, 72)	Lock nut; replace with a new one and stake Apply engine oil to the threads and seating surface
Output drive gear shaft bolt	1	10	49 (5.0, 36)	

### ELECTRIC STARTER

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Starter motor cable terminal nut	1	6	10 (1.0, 7)	
Starter motor assembly bolt	2	5	4.9 (0.5, 3.6)	
Negative brush screw	1	5	3.7 (0.4, 2.7)	

### LIGHTS/METERS/SWITCHES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Neutral switch	1	10	12 (1.2, 9)	
VS sensor mounting bolt	1	6	9.8 (1.0, 7.2)	



**FRAME**

**FRAME/BODY PANELS/EXHAUST SYSTEM**

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Seat mounting socket bolt	2	8	26 (2.7, 19)	
Grab rail mounting bolt	6	10	64 (6.5, 47)	
Exhaust pipe joint nut	4	8	25 (2.5, 18)	
Muffler stay mounting bolt	4	8	44 (4.5, 32)	
Muffler mounting nut	2	10	44 (4.5, 32)	
Muffler bracket bolt	2	8	27 (2.8, 20)	

**MAINTENANCE**

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Air cleaner cover socket bolt	5	5	1.5 (0.2, 1.1)	
Final drive oil filler cap	1	30	12 (1.2, 9)	
Final drive oil drain bolt	1	8	12 (1.2, 9)	

**FUEL SYSTEM (PGM-FI)**

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Fuel tank mounting bolt	1	8	27 (2.8, 20)	
Air cleaner chamber mounting screw	1	5	1.1 (0.1, 0.8)	
Air cleaner chamber connecting tube band screw	1	4	0.7 (0.1, 0.5)	
O <sub>2</sub> sensor	2	18	44 (4.5, 32)	

**COOLING SYSTEM**

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Fan motor mounting bolt	3	5	5.1 (0.5, 3.8)	
Cooling fan mounting nut	1	5	2.7 (0.3, 2.0)	Apply locking agent to the threads
Radiator filler mounting bolt	2	6	10 (1.0, 7)	
Thermostat housing cover bolt	2	6	10 (1.0, 7)	
Water hose band screw	14	—	—	See page 6-10
Fan motor assembly mounting bolt	3	6	8.4 (0.9, 6.2)	

**ENGINE REMOVAL/INSTALLATION**

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Engine mounting nut	4	10	54 (5.5, 40)	
Engine hanger plate bolt	8	8	26 (2.7, 19)	
Main footpeg bracket mounting bolt	3	10	39 (4.0, 29)	
Main footpeg bracket mounting nut	1	10	39 (4.0, 29)	
Gearshift arm pinch bolt	1	6	12 (1.2, 9)	

**CLUTCH/GEARSHIFT LINKAGE**

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Gearshift pedal pivot bolt	1	10	39 (4.0, 29)	

## GENERAL INFORMATION

### FINAL DRIVE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Pinion retainer	1	64	108 (11.0, 80)	
Pinion retainer lock tab bolt	1	6	10 (1.0, 7)	
Pinion joint nut	1	16	108 (11.0, 80)	Apply locking agent to the threads
Dust guard plate bolt	1	6	10 (1.0, 7)	
Final gear case cover bolt	2	10	47 (4.8, 35)	Apply locking agent to the threads
Final gear case cover bolt	6	8	25 (2.5, 18)	
Final gear case assembly mounting nut	4	10	64 (6.5, 47)	
Final gear case stud bolt	4	10	-	See page 13-22
Rear shock absorber lower mounting bolt (left side)	1	8	22 (2.2, 16)	

### FRONT WHEEL/SUSPENSION/STEERING

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Clutch lever pivot bolt	1	6	1 (0.1, 0.7)	
Clutch lever pivot nut	1	6	6 (0.6, 4.4)	
Handlebar upper holder bolt	4	8	23 (2.3, 17)	
Handlebar lower holder nut	2	8	23 (2.3, 17)	
Front brake disc bolt	6	8	42 (4.3, 31)	ALOC bolt; replace with a new one
Spoke	52	BC4	4.2 (0.4, 3.1)	
Front axle bolt	1	14	59 (6.0, 44)	
Front axle pinch bolt	2	8	22 (2.2, 16)	
Fork center socket bolt	2	10	29.5 (3.0, 22)	Apply locking agent to the threads
Fork cap	2	38	22.1 (2.3, 16)	
Front fork cover bolt (VT750C2B)	2	6	12 (1.2, 9)	
	2	8	26 (2.7, 19)	
Tire valve nut	1	8V1	4 (0.4, 3.0)	
Fork top bridge pinch bolt (VT750CS)	2	8	22 (2.2, 16)	
Fork top bridge pinch bolt (VT750C2B/C2S)	2	8	27 (2.8, 20)	
Fork bottom bridge pinch bolt	2	10	49 (5.0, 36)	
Steering top thread	1	26	-	See page 14-42
Steering top thread lock nut	1	26	-	See page 14-43
Steering stem nut	1	24	103 (10.5, 76)	

### REAR WHEEL/BRAKE/SUSPENSION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Spoke	52	BC4	4.2 (0.4, 3.1)	
Tire valve nut	1	8V1	4 (0.4, 3.0)	
Rear brake disc bolt (VT750C2S)	6	8	42 (4.3, 31)	ALOC bolt; replace with a new one
Rear axle nut	1	18	88 (9.0, 65)	U-nut
Rear axle pinch bolt	1	8	27 (2.8, 20)	
Rear brake stopper arm nut (VT750C2F/C2B)	1	8	22 (2.2, 16)	
Rear brake arm pinch bolt (VT750C2F/C2B)	1	8	26 (2.7, 19)	
Rear shock absorber upper mounting bolt	2	8	26 (2.7, 19)	
Rear shock absorber lower mounting bolt (right side)	1	10	34 (3.5, 25)	
Stopper plate bolt	5	6	20 (2.0, 15)	ALOC bolt; replace with a new one
Swingarm left pivot bolt	1	30	103 (10.5, 76)	
Swingarm right pivot bolt	1	30	-	See page 15-32
Swingarm right pivot bolt lock nut	1	30	103 (10.5, 76)	

## GENERAL INFORMATION

### HYDRAULIC BRAKE (VT750C2F/C2B)

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Brake caliper bleed valve	1	8	5.5 (0.6, 4.1)	
Front master cylinder reservoir cap screw	2	4	1.5 (0.2, 1.1)	
Brake pad pin	1	10	18 (1.8, 13)	
Brake pad pin plug	1	10	2.5 (0.3, 1.8)	
Brake hose oil bolt	2	10	34 (3.5, 25)	
Brake lever pivot bolt	1	6	1 (0.1, 0.7)	
Brake lever pivot nut	1	6	6 (0.6, 4.4)	
Front brake light switch screw	1	4	1.2 (0.1, 0.9)	
Front master cylinder holder bolt	2	6	12 (1.2, 9)	
Front brake caliper bracket pin	1	8	12 (1.2, 9)	Apply locking agent to the threads
Front brake caliper pin	1	8	27 (2.8, 20)	Apply locking agent to the threads
Front brake caliper mounting bolt	2	8	30 (3.1, 22)	ALOC bolt; replace with a new one

### HYDRAULIC BRAKE (VT750C2S)

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Front brake caliper bleed valve	2	8	5.5 (0.6, 4.1)	
Front master cylinder reservoir cap screw	2	4	1.5 (0.2, 1.1)	
Front brake pad pin	1	10	18 (1.8, 13)	
Brake hose oil bolt	2	10	34 (3.5, 25)	
Brake lever pivot bolt	1	6	1 (0.1, 0.7)	
Brake lever pivot nut	1	6	6 (0.6, 4.4)	
Front brake light switch screw	1	4	1.2 (0.1, 0.9)	
Front master cylinder holder bolt	2	6	12 (1.2, 9)	
Front brake caliper bracket pin	1	8	12 (1.2, 9)	Apply locking agent to the threads
Front brake caliper pin	1	8	27 (2.8, 20)	Apply locking agent to the threads
Front brake caliper mounting bolt	2	8	30 (3.1, 22)	ALOC bolt; replace with a new one
Rear caliper stopper pin bolt	1	18	69 (7.0, 51)	ALOC bolt; replace with a new one
Rear caliper pin bolt	2	10	45 (4.6, 33)	
Rear brake caliper bleed valve	2	8	5.5 (0.6, 4.1)	
Rear brake pad pin	1	10	18 (1.8, 13)	
Rear brake pad pin plug	1	10	2.5 (0.3, 1.8)	
Rear master cylinder reservoir cap screw	2	4	1.5 (0.2, 1.1)	
Rear master cylinder push rod lock nut	1	8	18 (1.8, 13)	

### ABS (VT750C2S)

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Brake pipe joint nut	?	10	14 (1.4, 10)	Apply brake fluid to the threads

### BATTERY/CHARGING SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Battery case cover screw	1	6	1 (0.1, 0.7)	

## GENERAL INFORMATION

### LIGHTS/METERS/SWITCHES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Headlight unit mounting bolt	2	5	4.1 (0.4, 3.0)	ALOC bolt; replace with a new one
Brake/tail light mounting nut	3	6	6.3 (0.6, 4.6)	
Speedometer mounting socket bolt	2	6	10 (1.0, 7)	
Ignition switch mounting bolt	2	6	12 (1.2, 9)	
Ignition switch cover screw	1	4	1 (0.1, 0.7)	
Sidestand switch bolt	1	6	10 (1.0, 7)	
Fuel reserve sensor	1	18	23 (2.3, 17)	
Horn mounting bolt	1	8	21 (2.1, 15)	

### OTHERS

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Sidestand pivot bolt	1	10	9 (0.9, 6.6)	Apply grease to the sliding surface
Sidestand pivot lock nut	1	10	30 (3.1, 22)	
Sidestand bracket bolt	2	10	49 (5.0, 36)	
Tool box screw	2	4	2 (0.2, 1.5)	

# LUBRICATION & SEAL POINTS

## ENGINE

MATERIAL	LOCATION	REMARKS
Molybdenum disulfide oil (a mixture of 1/2 engine oil and 1/2 molybdenum disulfide grease)	Camshaft lobes and journal surface Valve stem (valve guide sliding surface) Rocker arm slipper surface Rocker arm shaft outer surface Crankpin bearing thrust surface Crankshaft main journals Clutch outer guide outer surface Transmission gear shift fork groove Transmission bushing sliding surface Connecting rod small end inner surface	
Engine oil	Piston outer surface Piston ring outer surface Piston pin outer surface Primary drive gear bolt threads and seating surface Flywheel bolt threads and seating surface Starter one-way clutch sprag Starter idle and reduction gear shaft outer surface Clutch center lock nut threads and seating surface Clutch lifter arm sliding surface of the right crankcase cover Clutch lifter arm sliding surface and slit Clutch discs and plates Cylinder wall Cylinder stud bolt threads Valve adjusting screw lock nut threads and seating surface Shift fork shaft whole surface Crankpin bearing cap nut threads and seating surface Output drive gear assembly mounting bolt threads and seating surface Output driven gear assembly mounting socket bolt threads and seating surface Output drive gear bearing lock nut (inner/outer) threads and seating surface Output driven gear bearing lock nut (inner/outer) threads and seating surface Cylinder head bolt/nut threads and seating surface Transmission gear tooth Engine oil filter cartridge threads Crankshaft main journal bearing surface Oil pipe seal Injector seal ring Each bearings rotating area Each O-rings	
Multi-purpose grease	Crankshaft hole cap threads Timing hole cap threads Each oil seal lips	
Liquid sealant (Three Bond 1207B or equivalent)	EOP switch threads Right and left crankcase mating surface Right crankcase cover mating surface Left crankcase cover mating surface Output gear case mounting bolt threads	Do not apply to the sealant to the head 3 – 4 mm (0.1 – 0.2 in)

## GENERAL INFORMATION

MATERIAL	LOCATION	REMARKS
Locking agent	Cam sprocket bolt threads Starter one-way clutch outer socket bolt threads Oil pump driven sprocket bolt threads Final gear case stud bolt threads (gear case side) Stator wire holder socket bolt threads  Gearshift cam plate bolt threads  Transmission bearing setting plate bolt threads  Cam chain tensioner setting plate bolt threads  Stator socket bolt threads  Oil filter boss crankcase side threads  Left crankcase cover bolt threads (marked "△")	Coating width: 6.5 ± 1 mm (0.26 ± 0.04 in) Coating width: 6.5 ± 1 mm (0.26 ± 0.04 in) Coating width: 6.5 ± 1 mm (0.26 ± 0.04 in) Coating width: 6.5 ± 1 mm (0.26 ± 0.04 in) Coating width: 6.5 ± 1 mm (0.26 ± 0.04 in) Coating width: 6.5 ± 1 mm (0.26 ± 0.04 in)
Pro Hondabond A, Pro Honda Handgrip Cement (U.S.A. only) or equivalent	Cylinder head cover-to-gasket groove	

FRAME

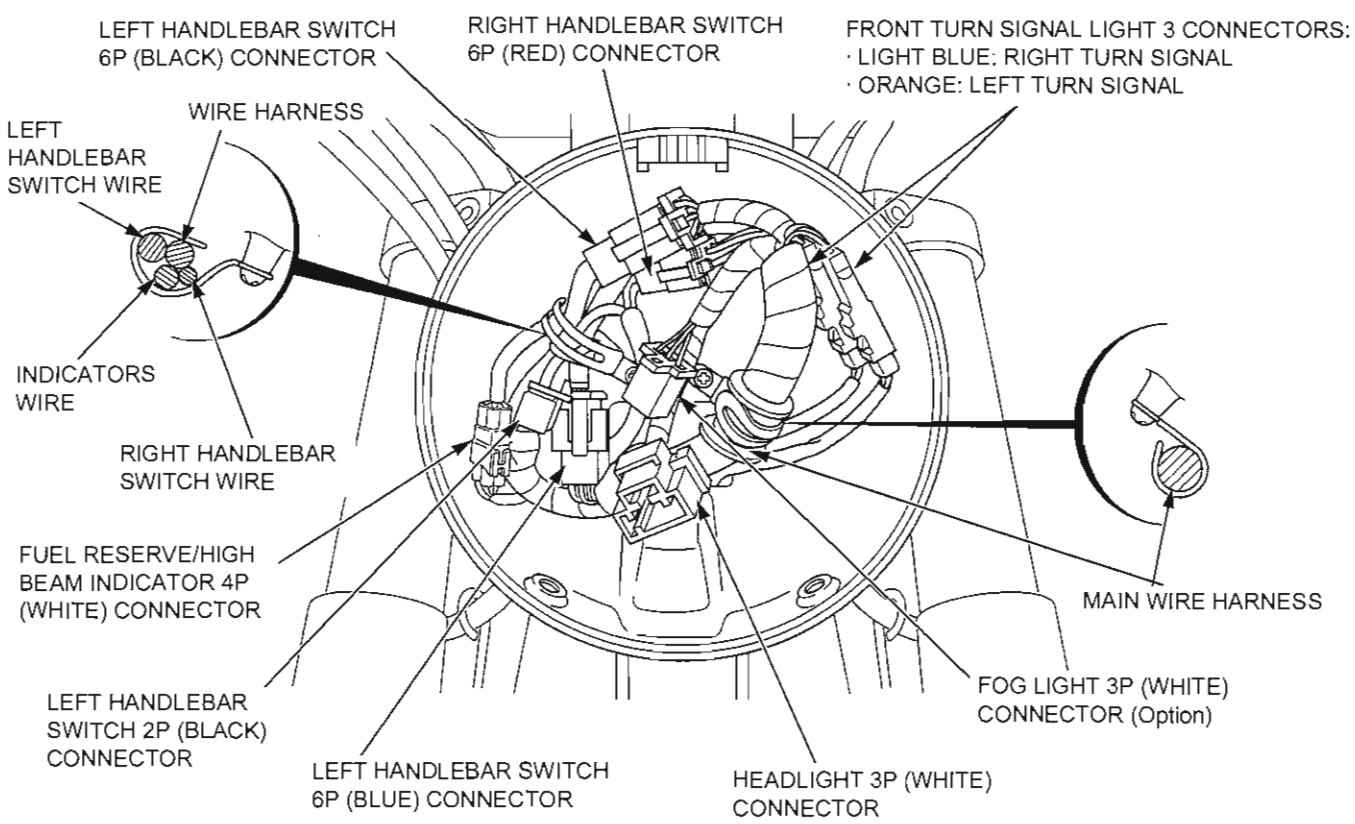
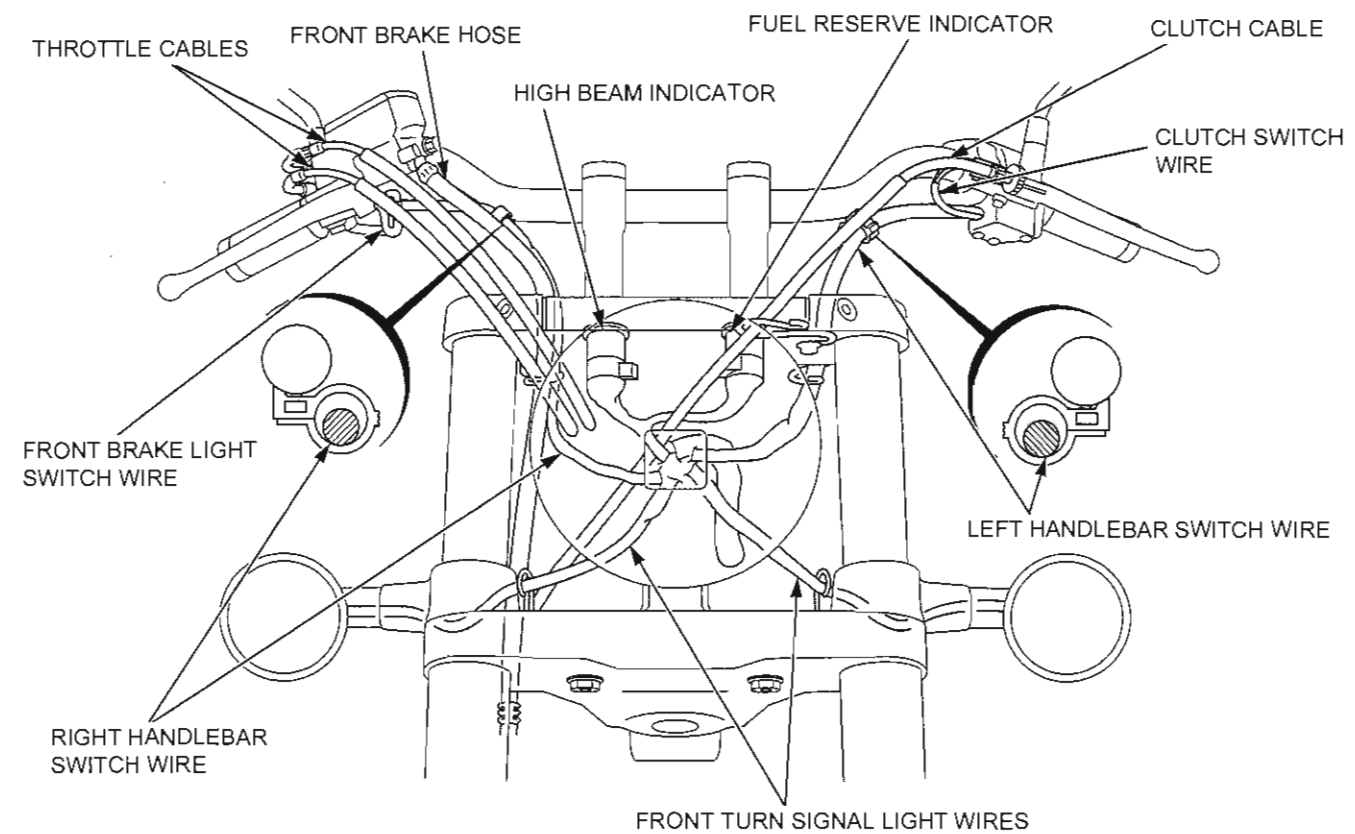
MATERIAL	LOCATION	REMARKS
Liquid sealant (Three Bond 1207B or equivalent)	Final gear case cover mating surface	
Multi-purpose grease	Sidestand pivot Main step sliding area Pillion step sliding area Throttle pipe flange groove and sliding surface Clutch lever pivot bolt sliding surface Gearshift spindle oil seal lips Gearshift pedal dust seal lips Front axle sliding surface Shock absorber mount inner surface Rear brake middle rod joint pivot and dust seal lips Rear brake cam sliding surface Brake shoe-to-anchor pin sliding surface Brake pedal pivot sliding surface Brake pedal dust seal lips Rear brake joint pins Front wheel dust seal lips Final gear case O-ring Final gear case oil seal lips	Apply 1 g  Spreading 0.2 – 0.3 g       Spreading 0.2 – 0.3 g Spreading 0.5 – 1.0 g
Urea based multi-purpose grease with extreme pressure agent (example: EXCELITE EP2 manufactured by KYODO YUSHI, Japan) or equivalent	Steering head bearings  Steering head bearing dust seal lips Swingarm pivot bearing needle rollers  Swingarm pivot dust seal lips	Apply 3 – 5 g for each bearing   Apply 1.0 – 1.5 g for each bearing
Molybdenum disulfide grease	Output drive gear and damper cam splines Final drive shaft oil seal lip Final drive shaft splines (universal joint side) Final drive pinion joint splines	Apply 1 g Apply 0.5 g Apply 1 g Apply 2 g
Molybdenum disulfide paste	Final driven flange (rear wheel hub mating surface) Final driven flange O-ring Final gear case O-ring guide and driven flange joint surface Thrust washer and rear wheel hub end (final driven flange side)	Apply 0.5 – 1.0 g  Apply 4 – 5 g Apply 2 – 3 g
Cable lubricant	Throttle cable outer inside Clutch cable outer inside	
Pro Hondabond A, Pro Honda Handgrip Cement (U.S.A. only) or equivalent	Handlebar grip inside Handlebar and throttle pipe outer surface (grip rubber contacting area)	
Engine oil	Steering top threads Rear brake cam felt seal	
Silicone grease	Brake lever pivot bolt sliding surface Brake lever-to-master piston contacting area Brake caliper and bracket pin boot inside Brake caliper dust seal	Apply 0.1 g Apply 0.1 g Apply 0.4 g
DOT 4 brake fluid	Brake master piston and cups Brake caliper piston and piston seals	
Pro Honda Suspension Fluid SS-8 (10W)	Fork dust seal and oil seal lips Fork cap O-ring	
Locking agent	Pinion joint nut threads Final gear case cover 10 mm bolt threads Fork center socket bolt threads Front brake caliper bracket pin threads Front brake caliper pin threads Final gear case stud bolt threads Cooling fan mounting nut threads	

**GENERAL INFORMATION**

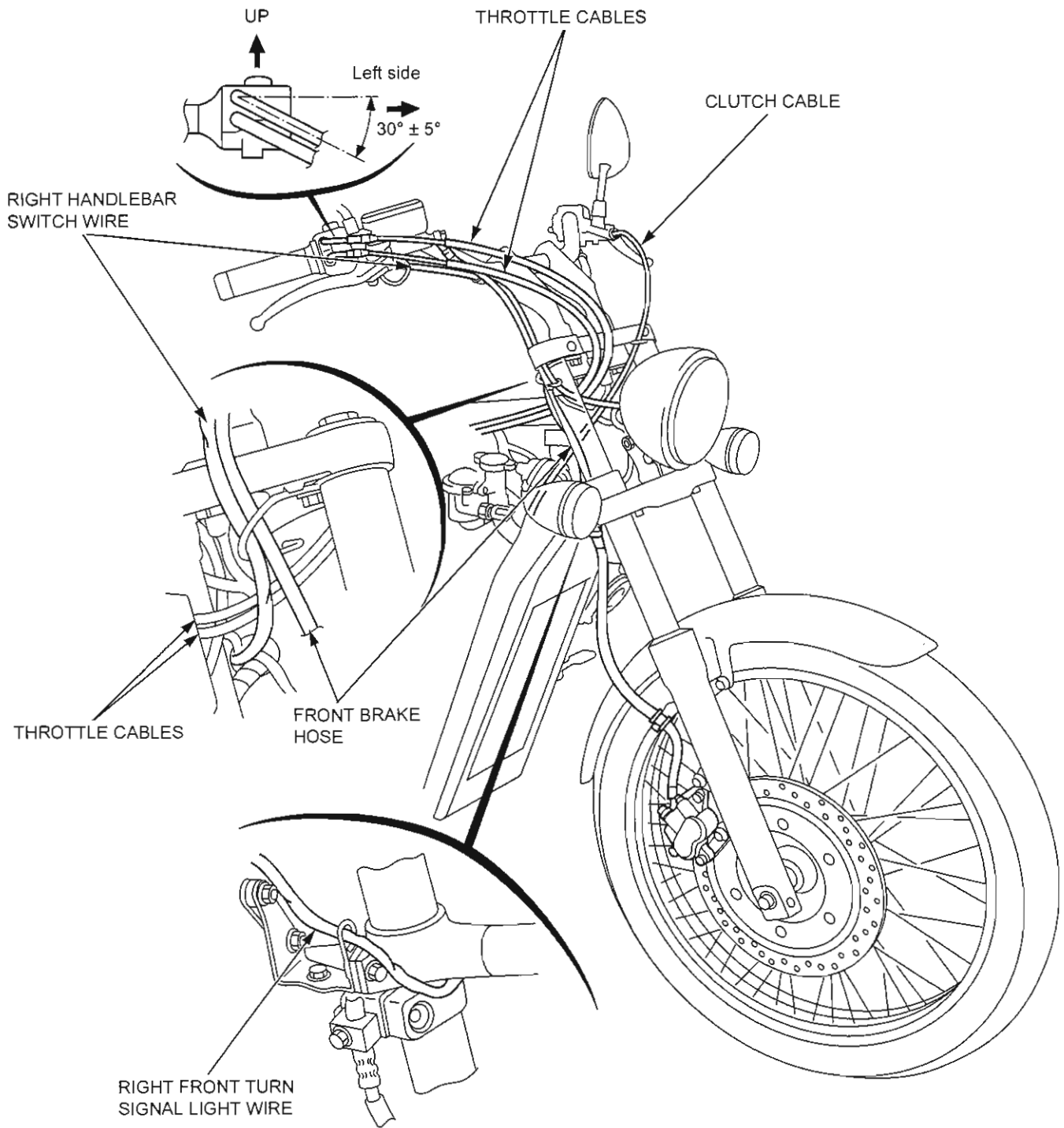
**CABLE & HARNESS ROUTING**

**VT750C2F**

VT750C2F type shown. VT750C2B and VT750C2S type illustrations that differ are shown later.

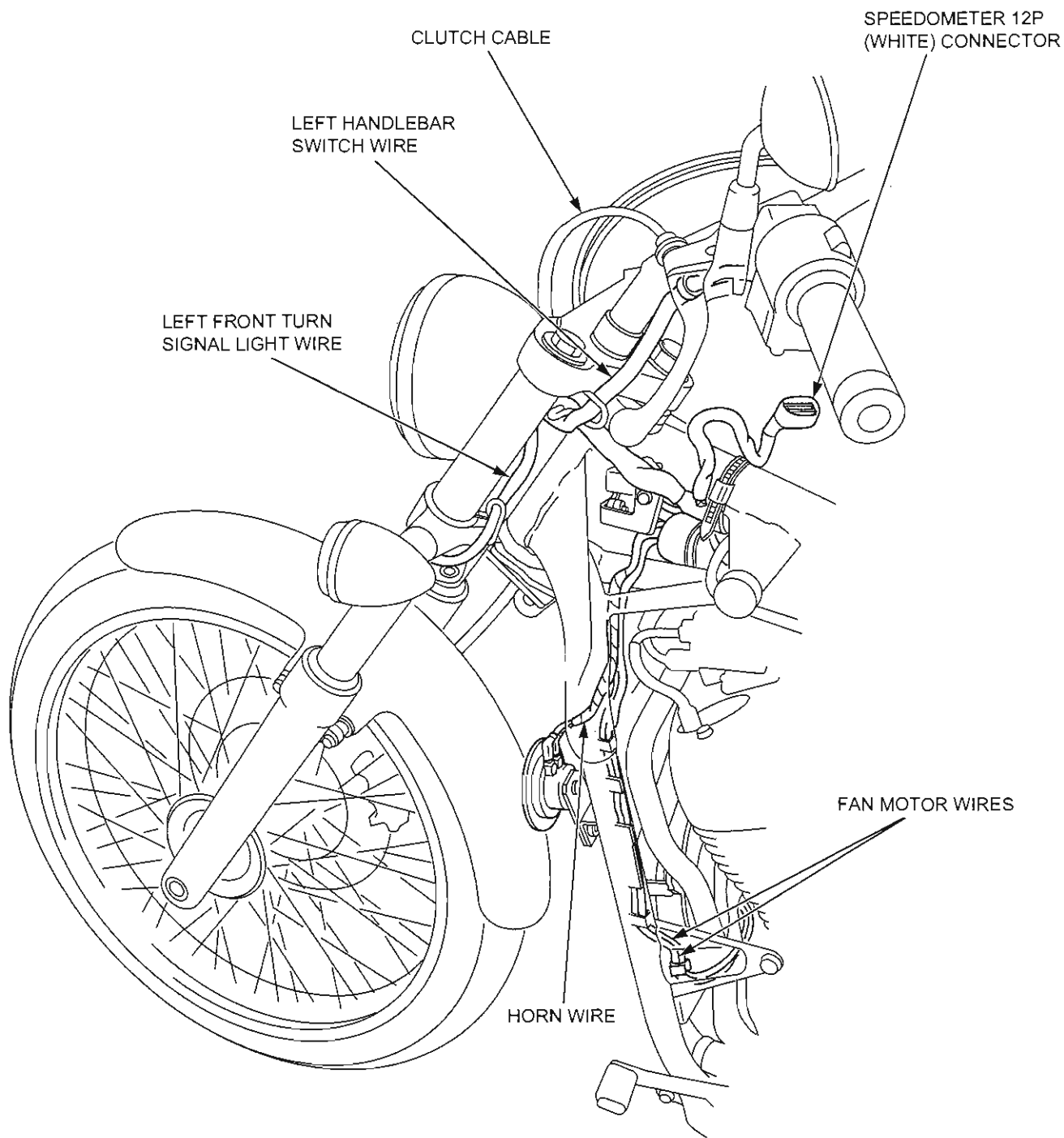




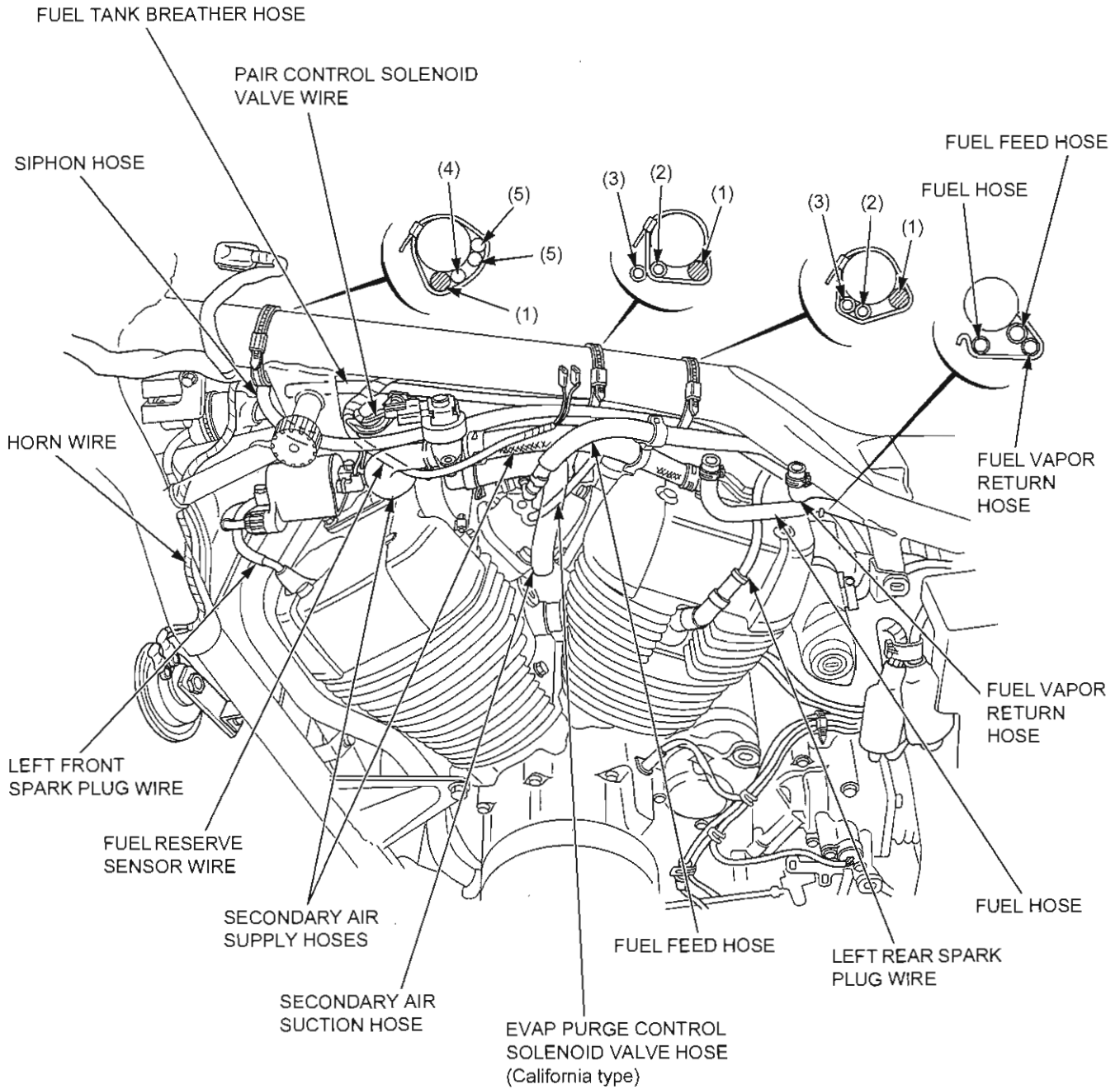


# GENERAL INFORMATION

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- (1) MAIN WIRE HARNESS
- (2) FUEL TANK BREATHER HOSE
- (3) SIPHON HOSE
- (4) BANK ANGLE SENSOR WIRE
- (5) THROTTLE CABLE



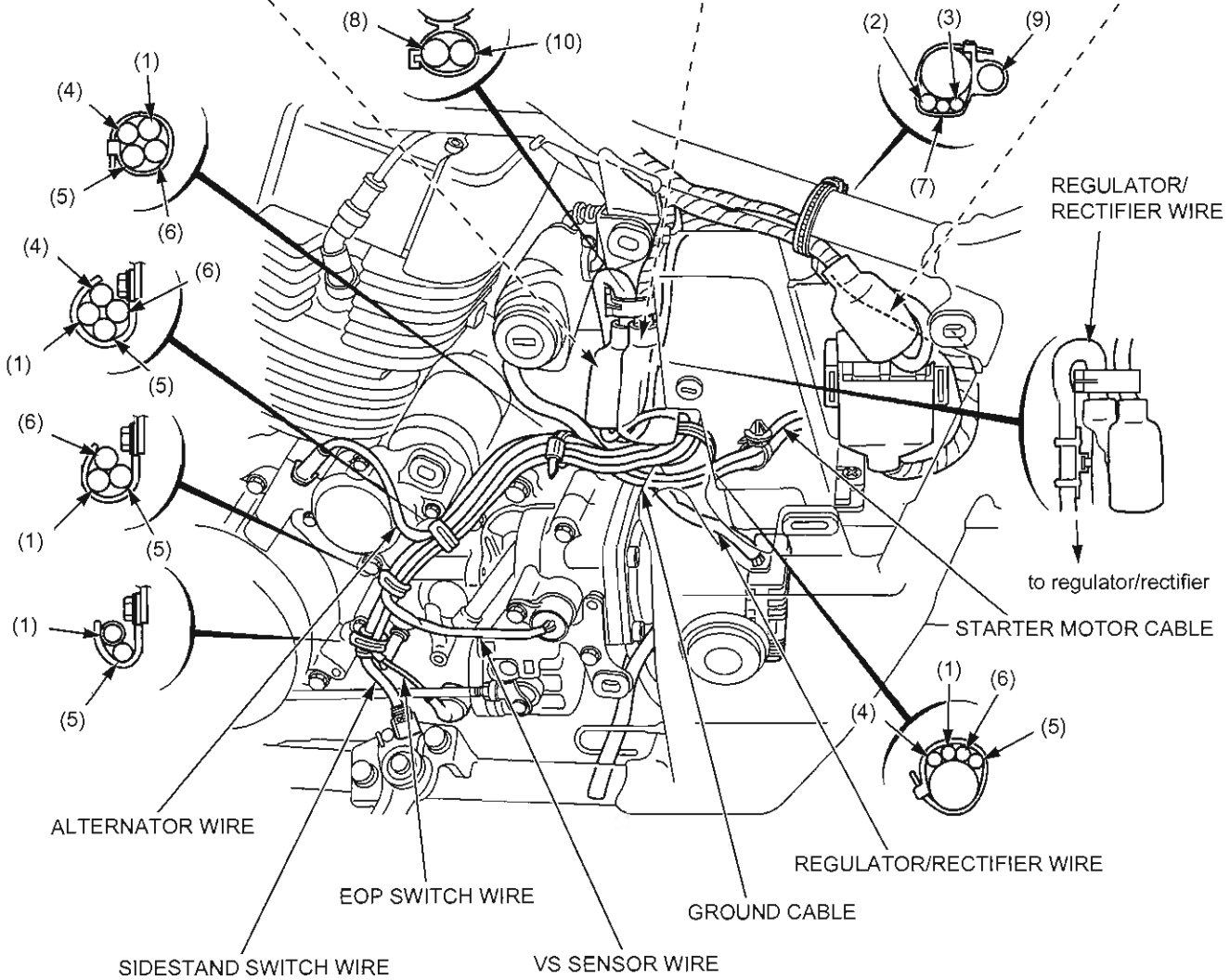
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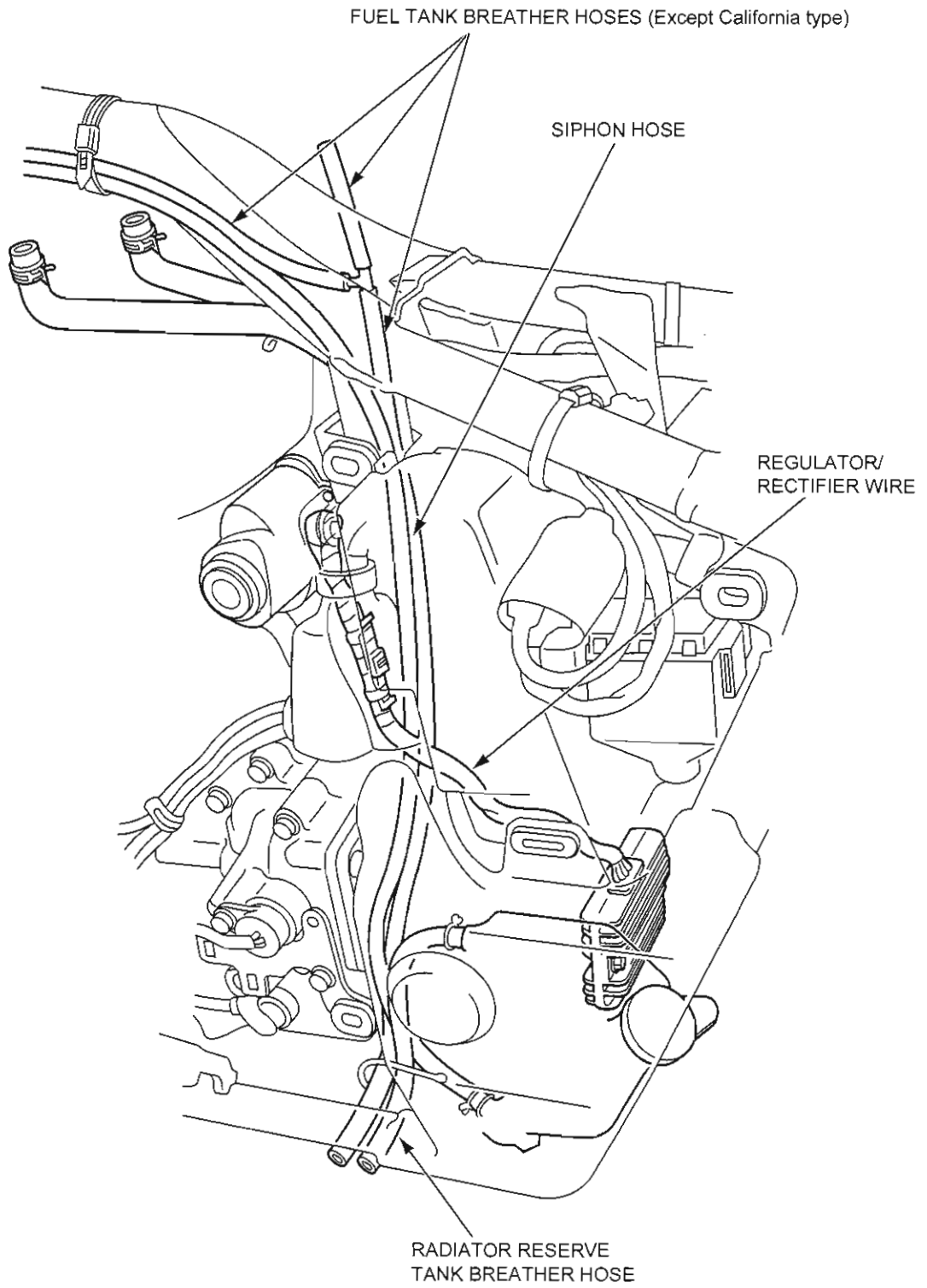
- (1) SIDESTAND SWITCH WIRE
- (2) IMMOBILIZER RECEIVER/IGNITION SWITCH WIRE
- (3) IGNITION SWITCH WIRE
- (4) ALTERNATOR WIRE
- (5) NEUTRAL/EOP SWITCH WIRE
- (6) VS SENSOR WIRE
- (7) IMMOBILIZER RECEIVER WIRE
- (8) REGULATOR/RECTIFIER WIRE
- (9) RELAY BOX WIRE
- (10) WIRE HARNESS of (1), (5), (6)

- INSIDE BOOT CONNECTORS:
- VS SENSOR 3P (WHITE)
  - SIDESTAND SWITCH 2P (GREEN)
  - NEUTRAL/EOP SWITCH 2P (BLACK)

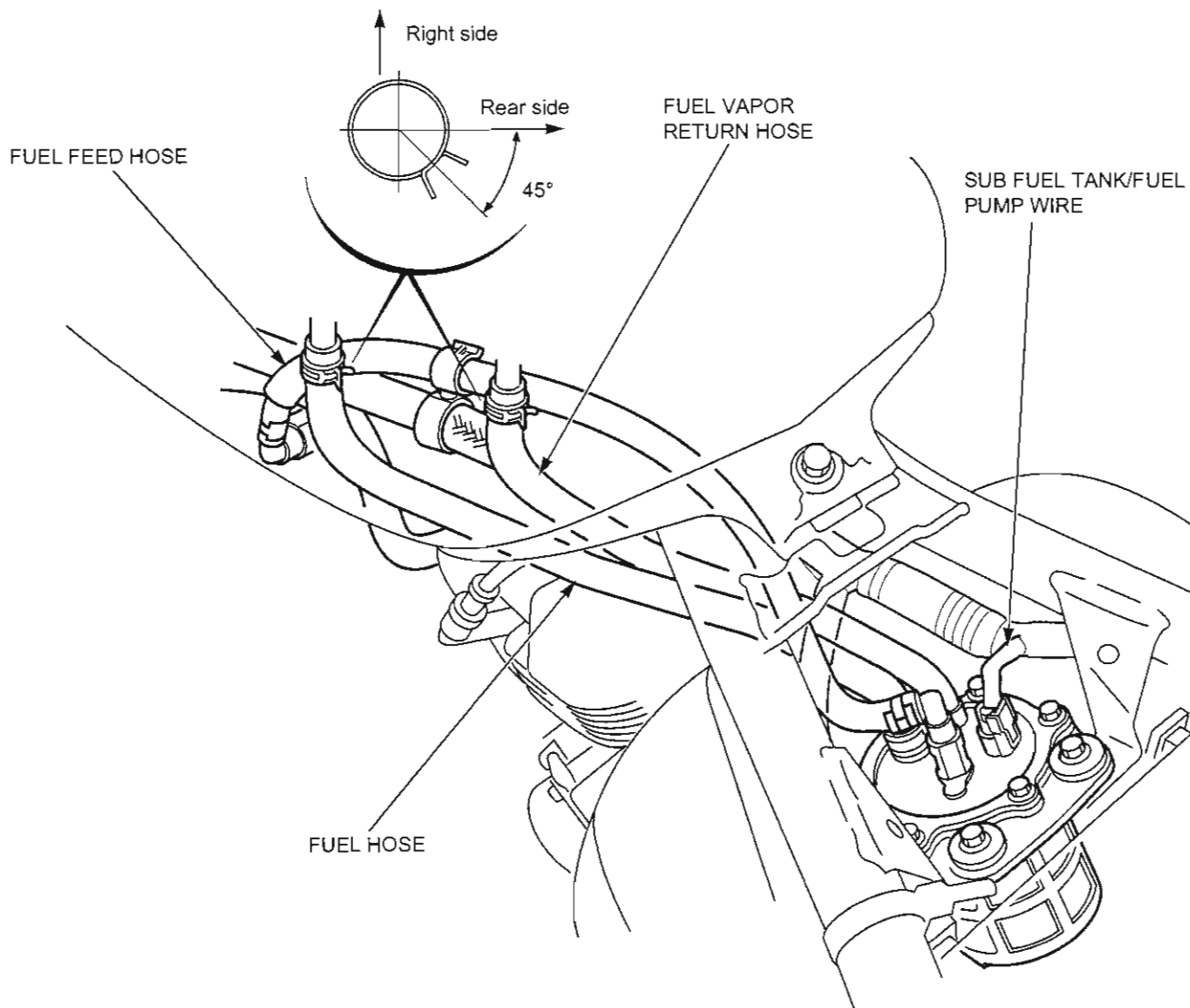
- INSIDE BOOT CONNECTORS:
- REGULATOR/RECTIFIER 2P (WHITE)
  - ALTERNATOR 3P (WHITE)

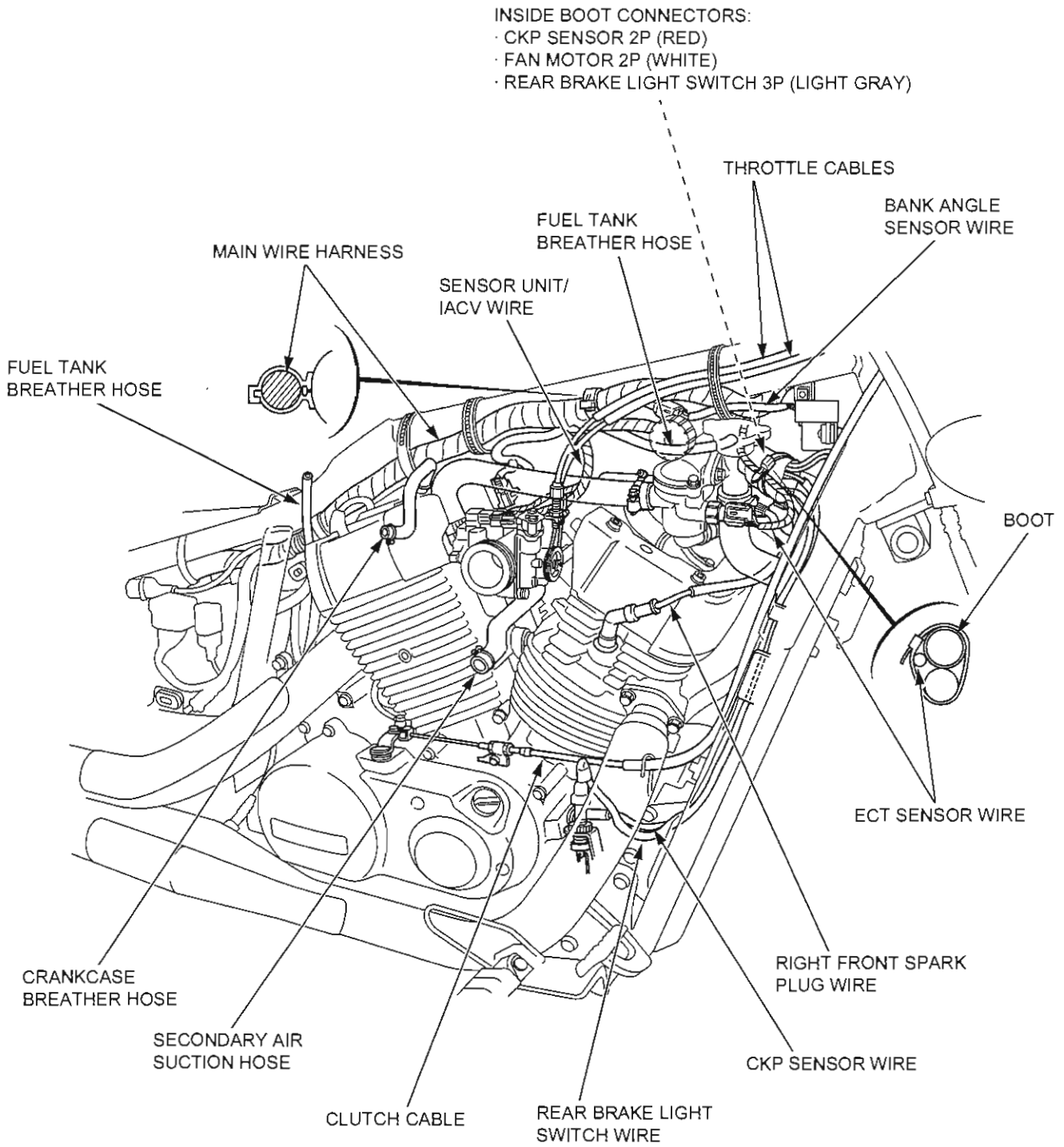
- INSIDE BOOT CONNECTORS:
- IGNITION SWITCH 2P (WHITE)





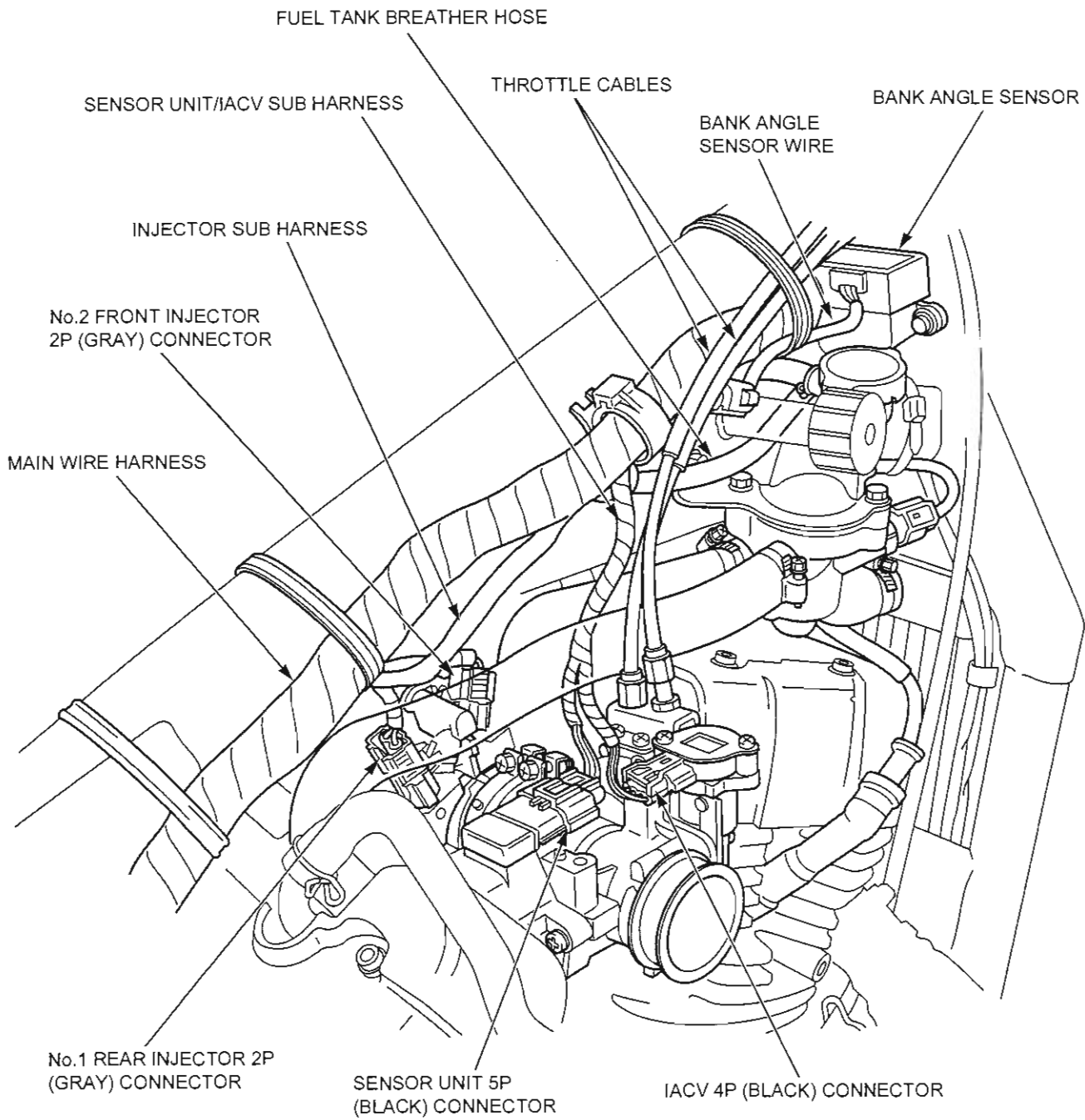
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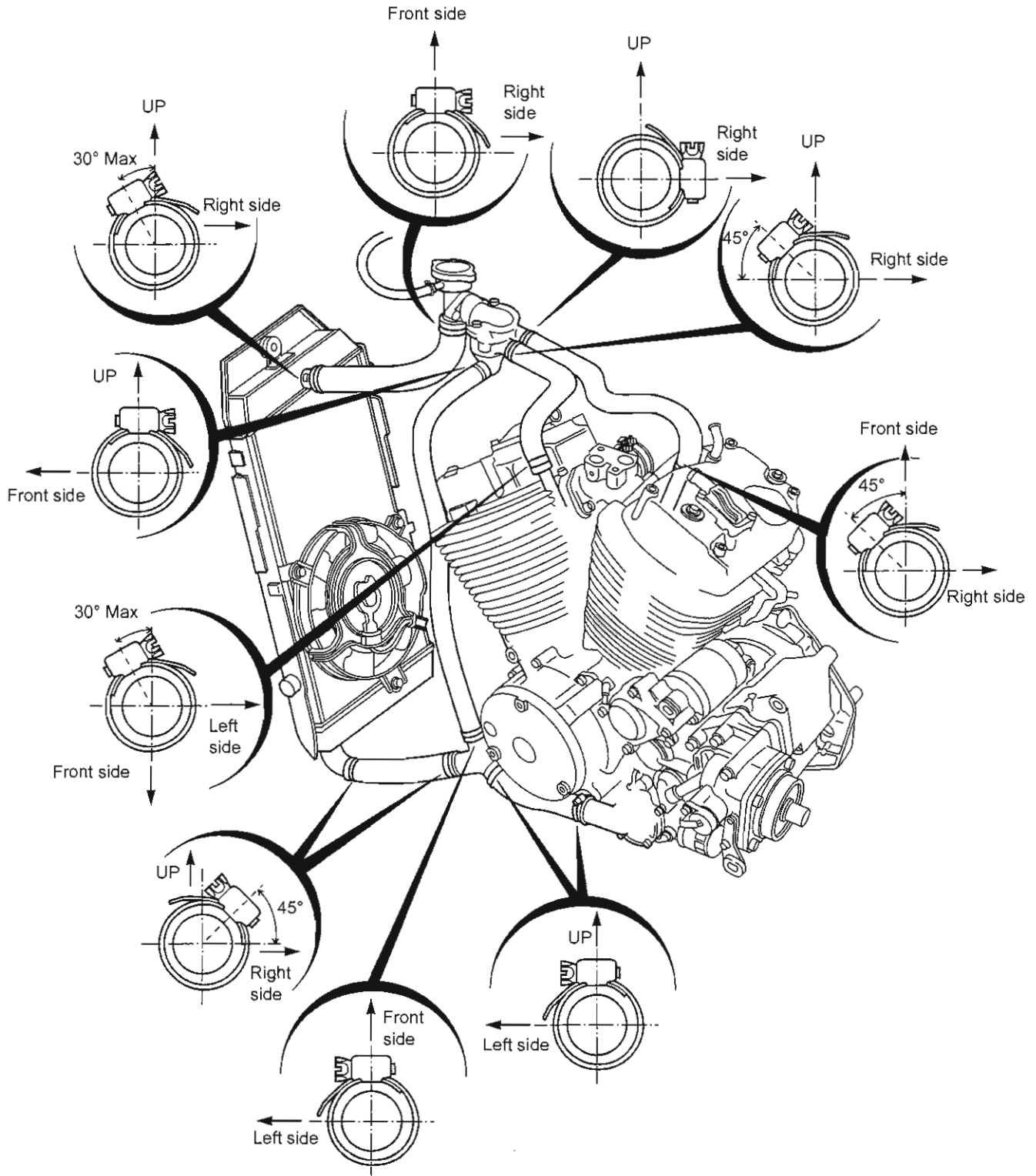


# GENERAL INFORMATION

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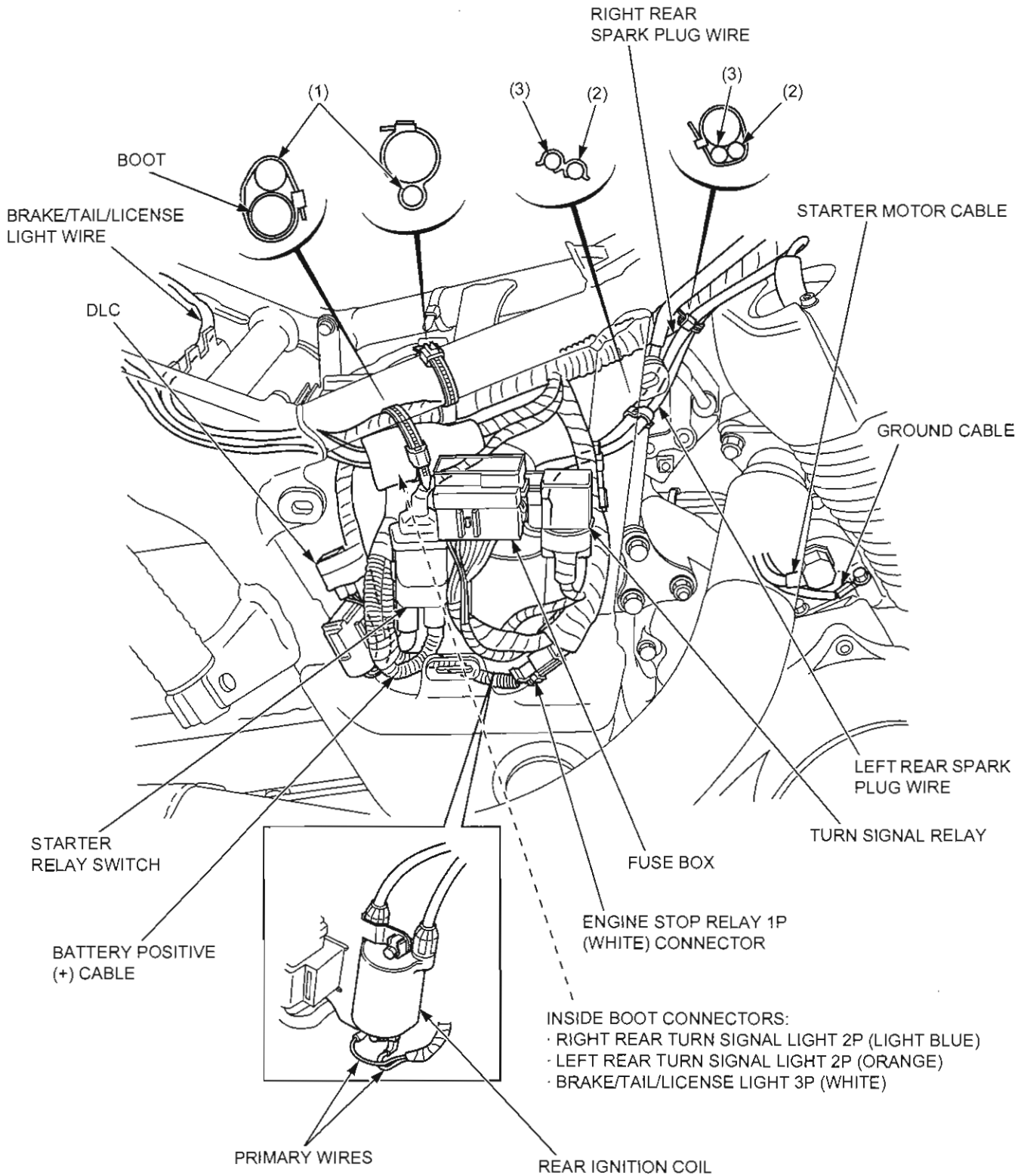


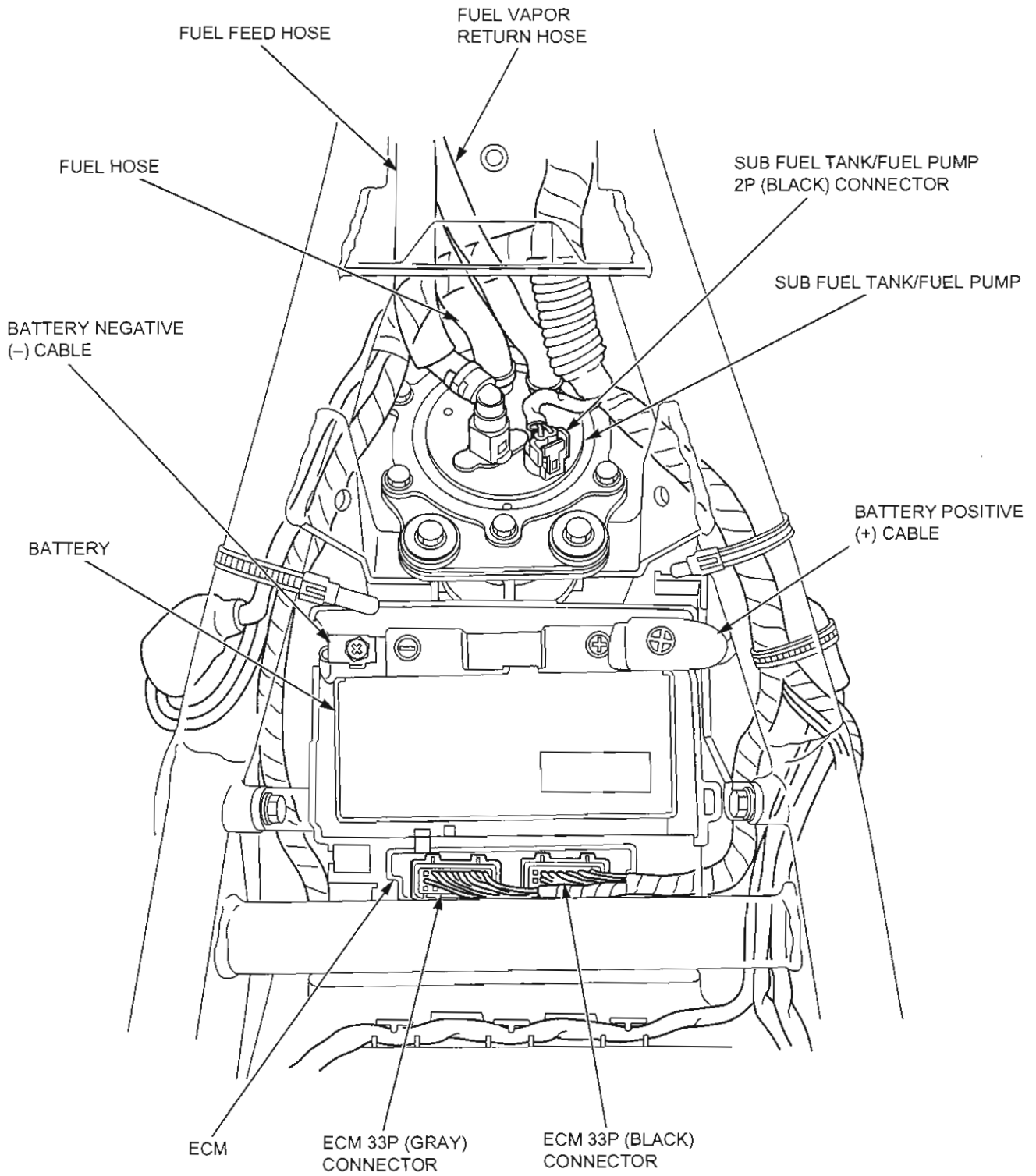




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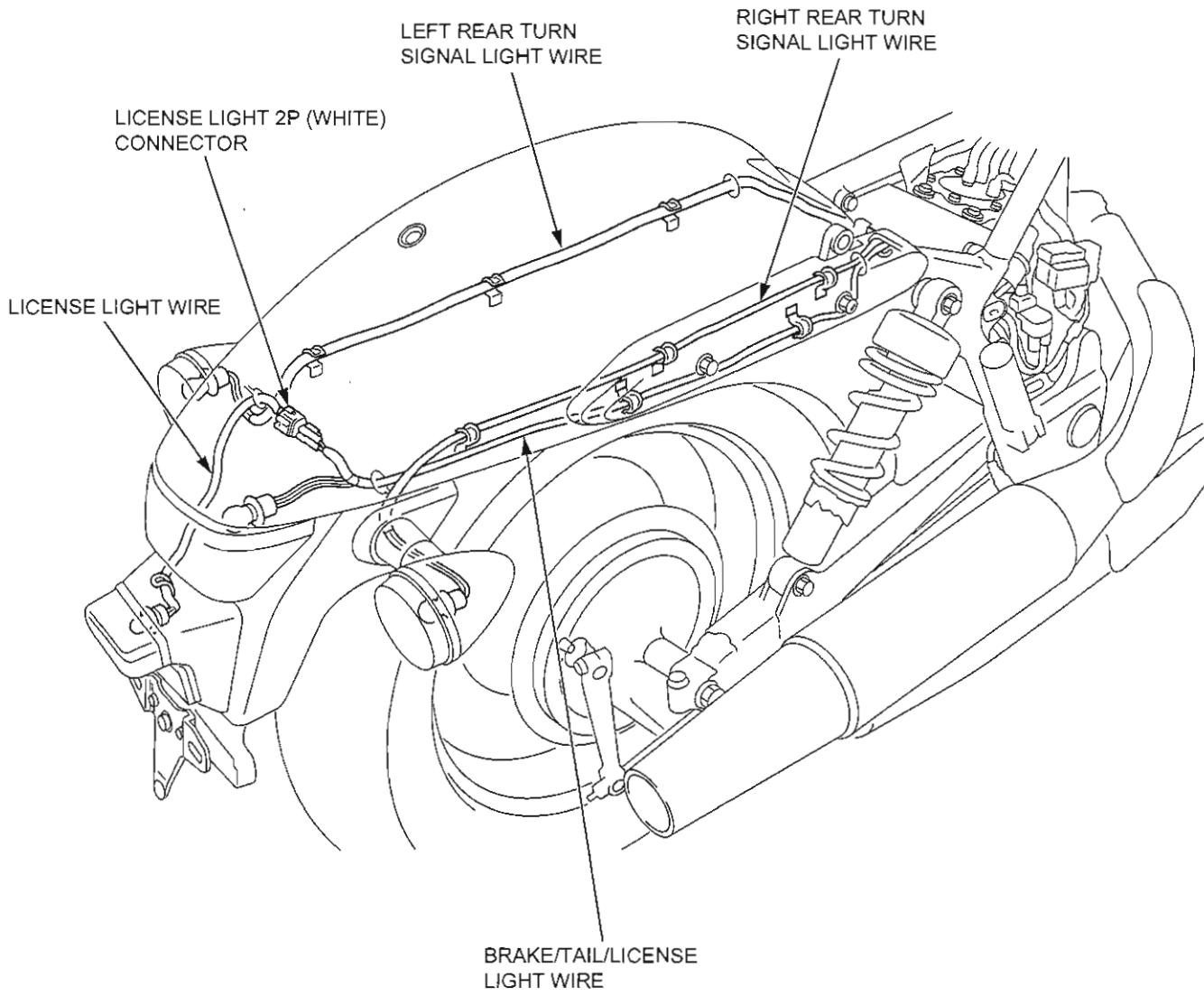
- (1) MAIN WIRE HARNESS
- (2) LEFT REAR SPARK PLUG WIRE
- (3) RIGHT REAR SPARK PLUG WIRE



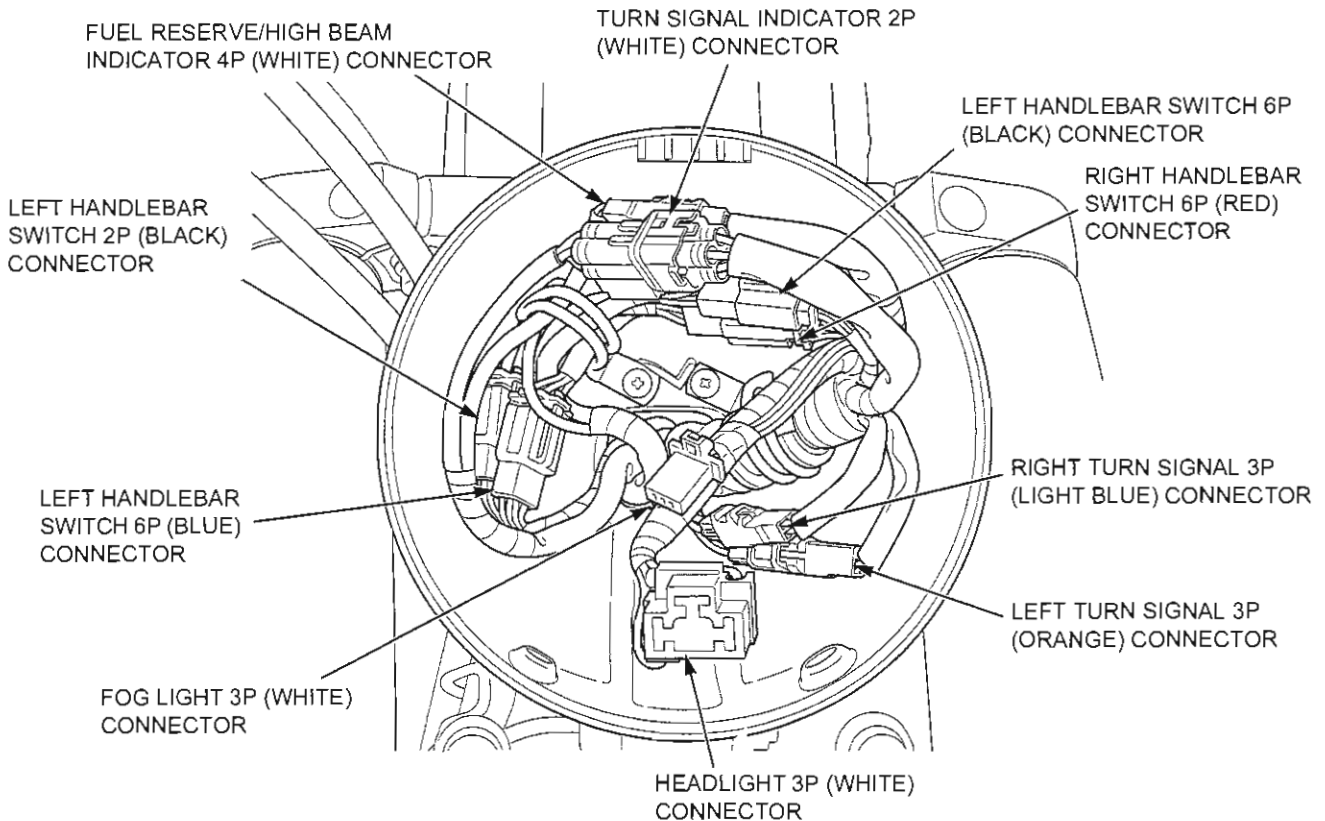
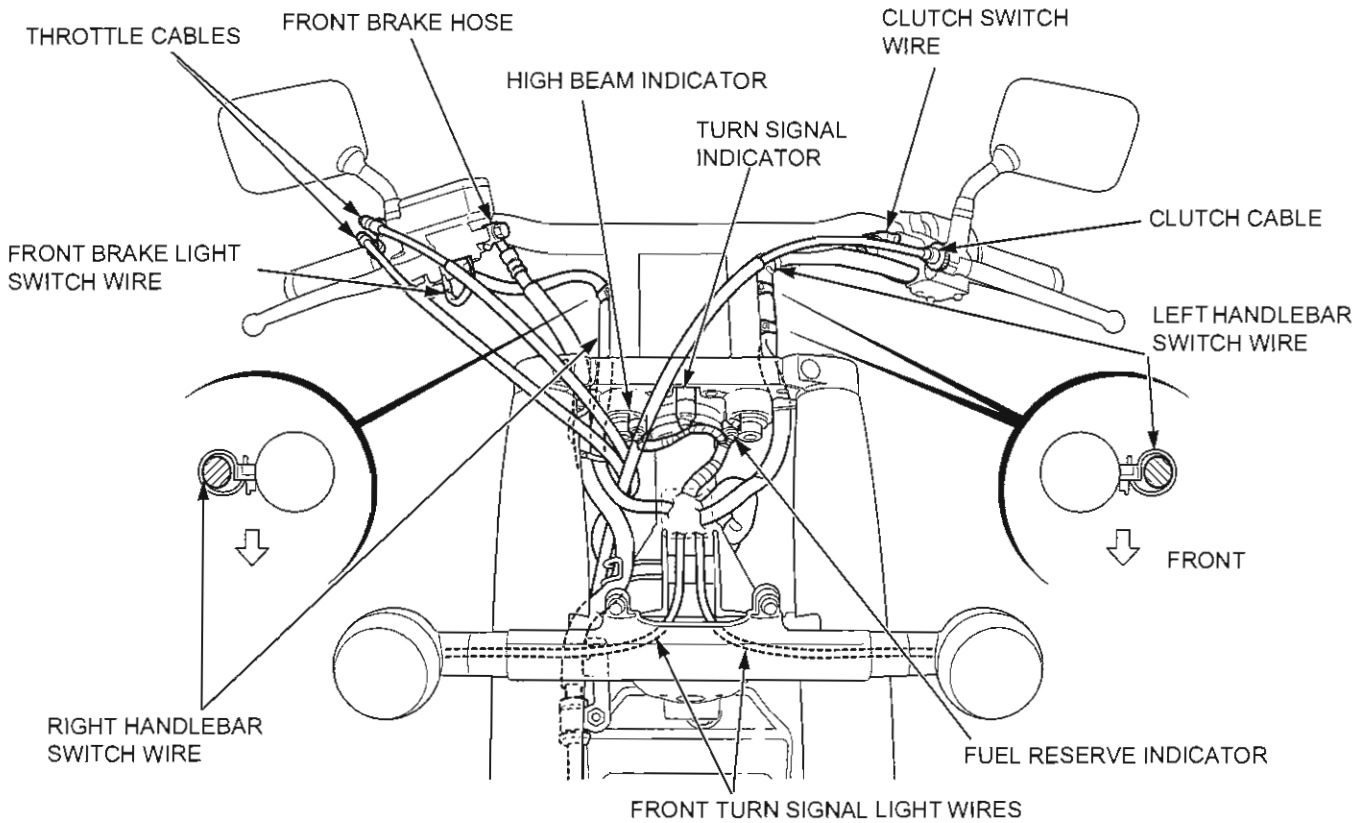


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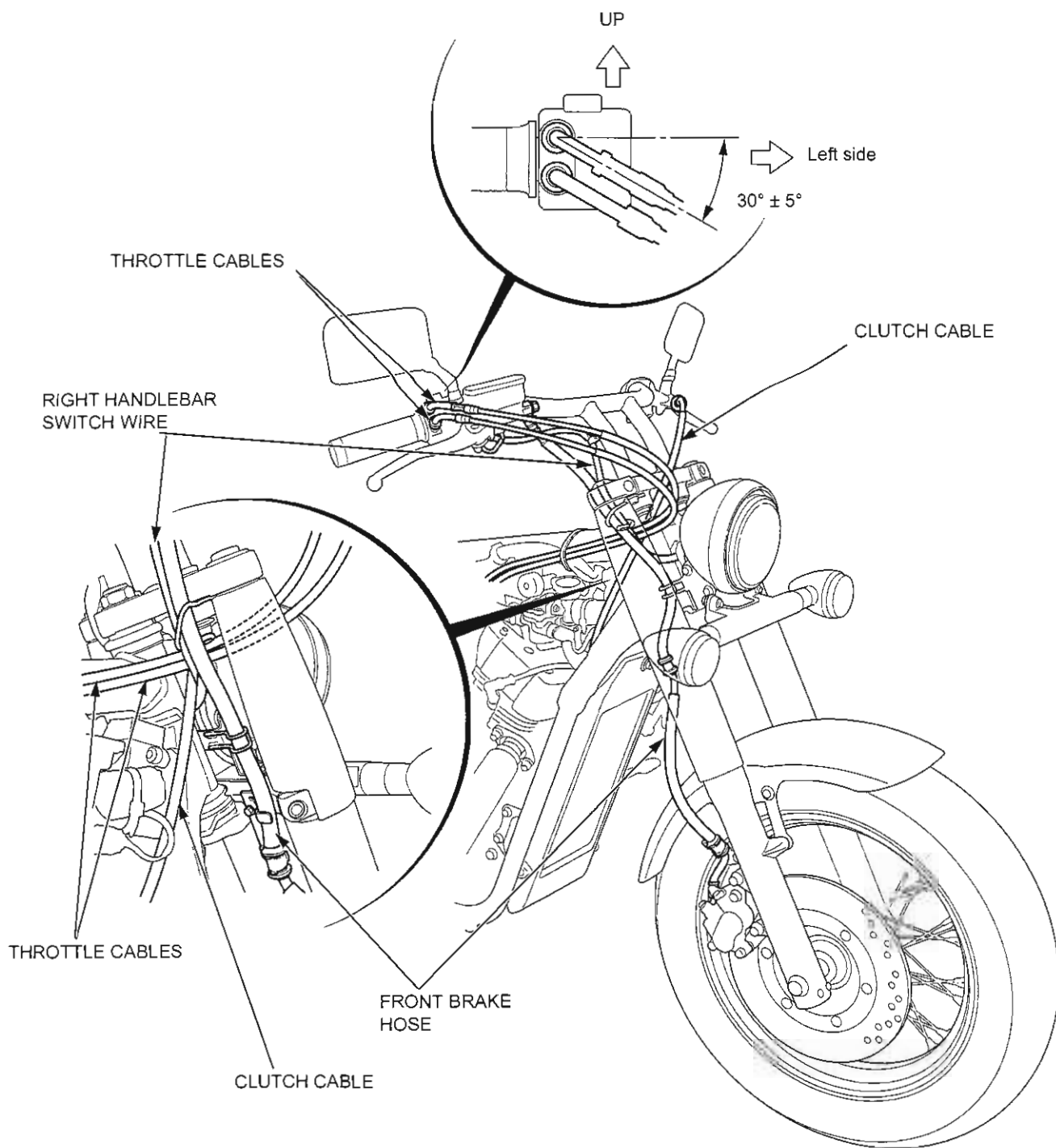
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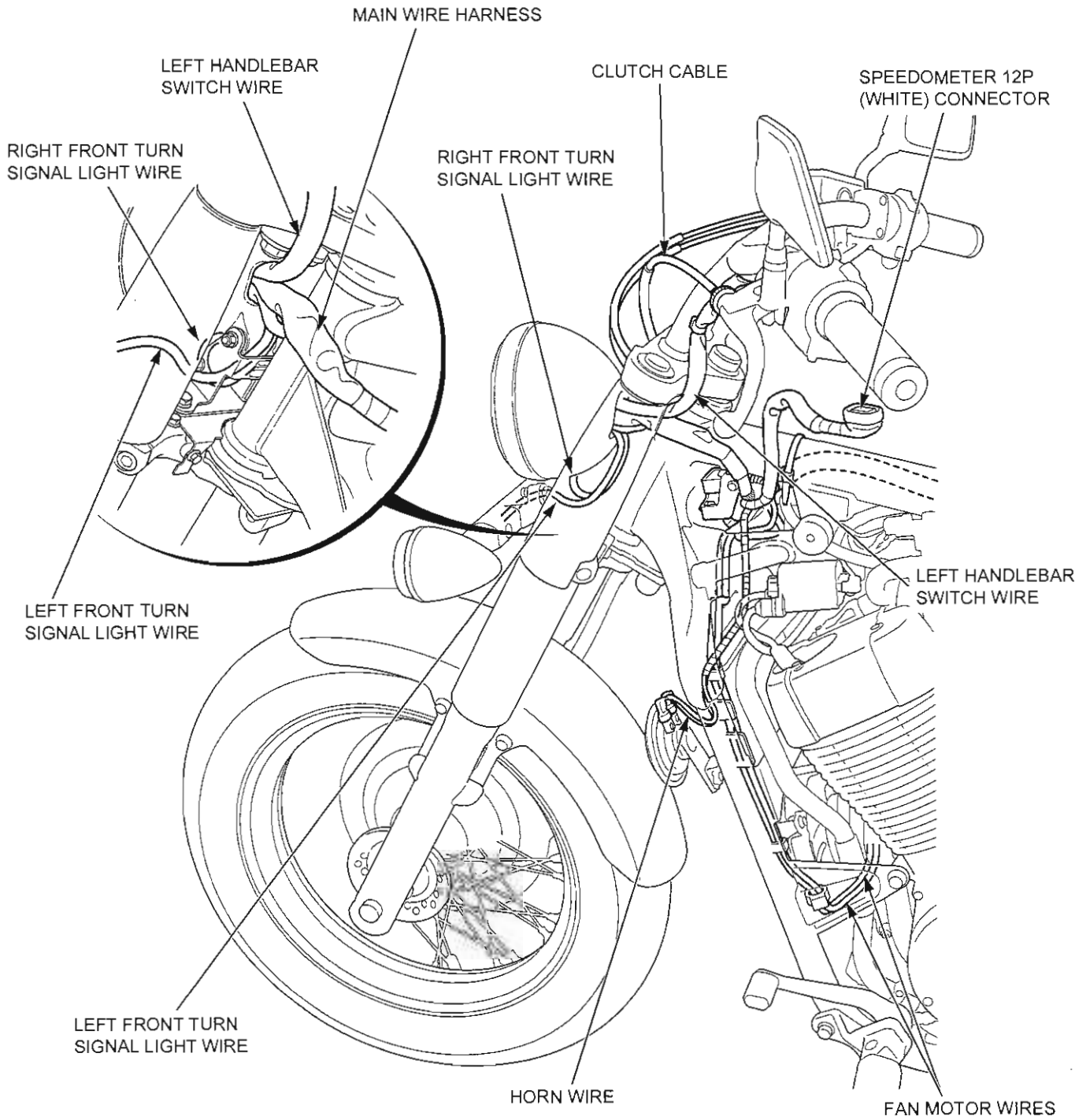


VT750C2B



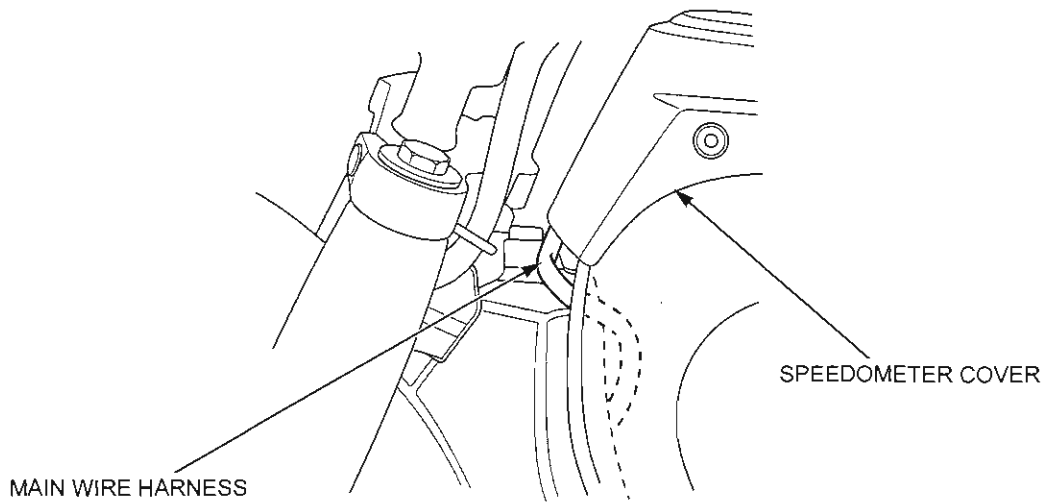
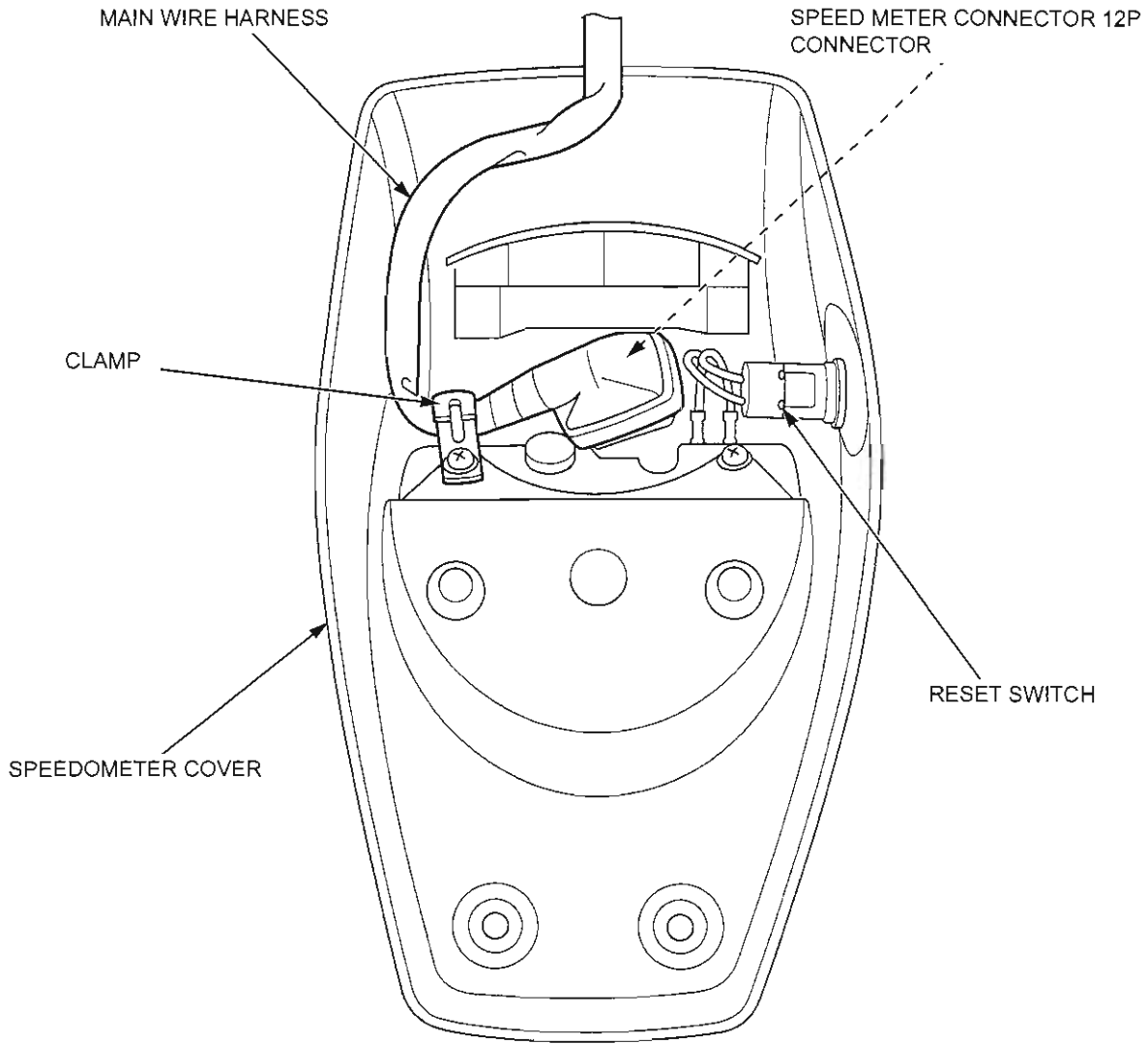
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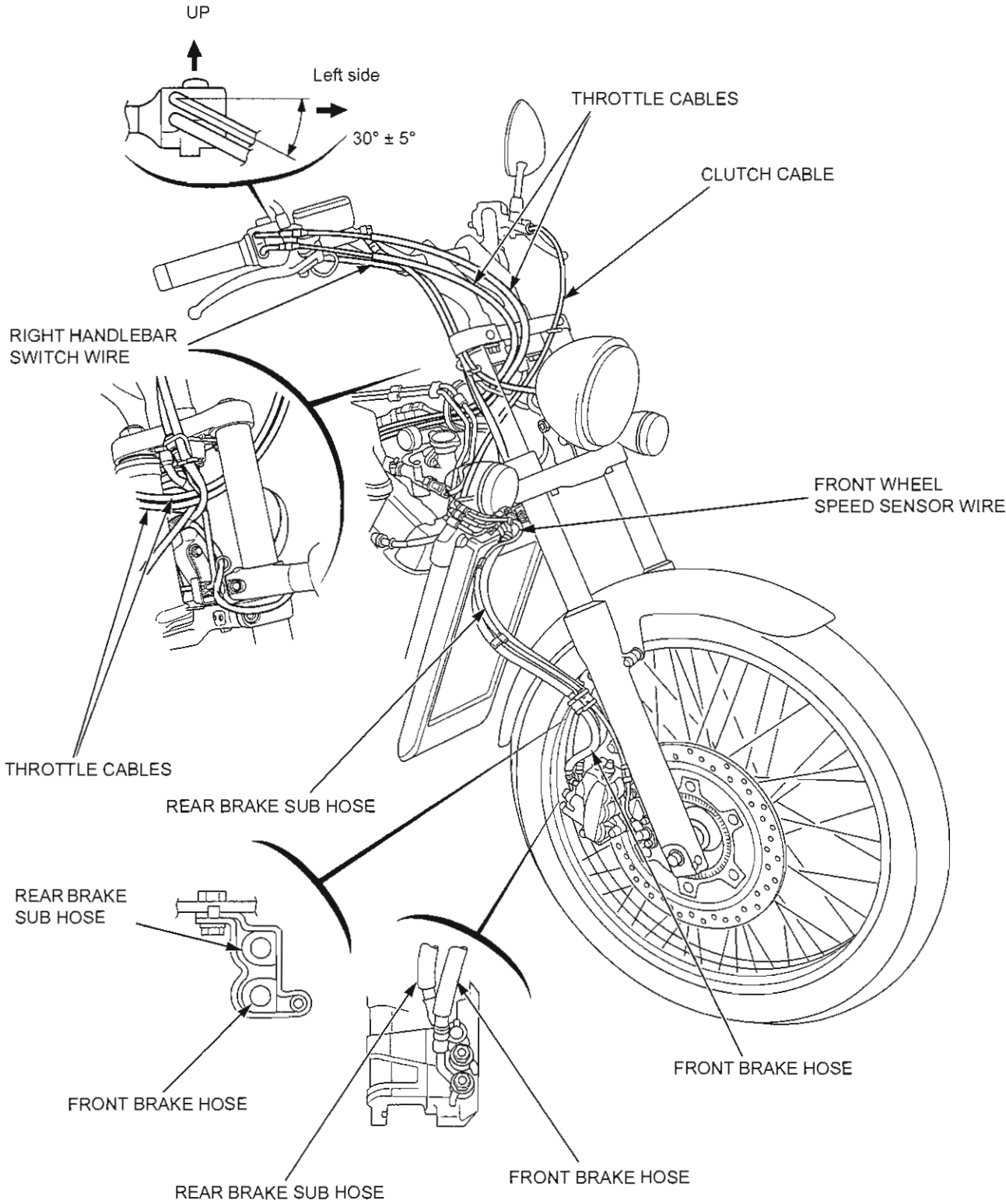
# GENERAL INFORMATION

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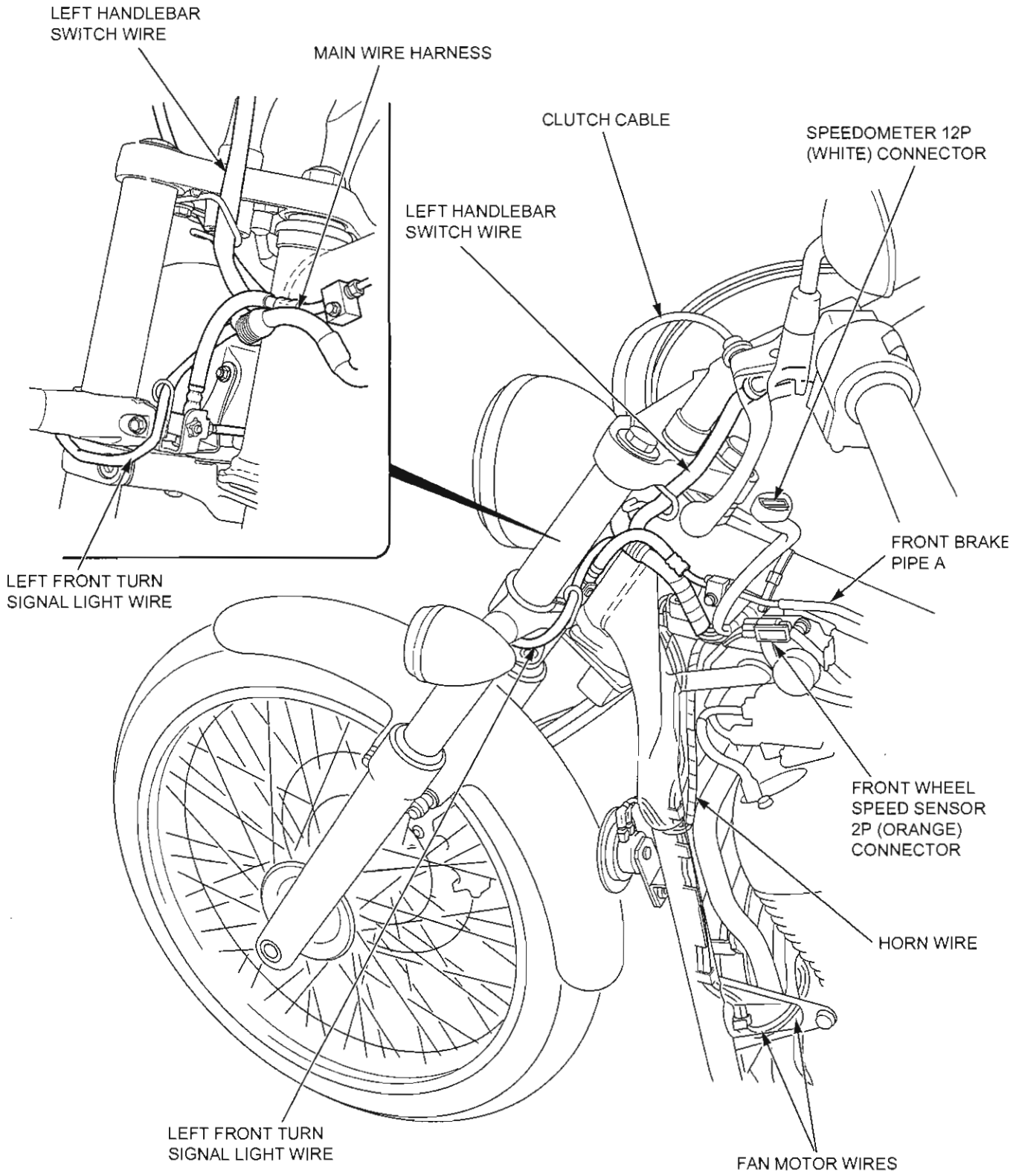




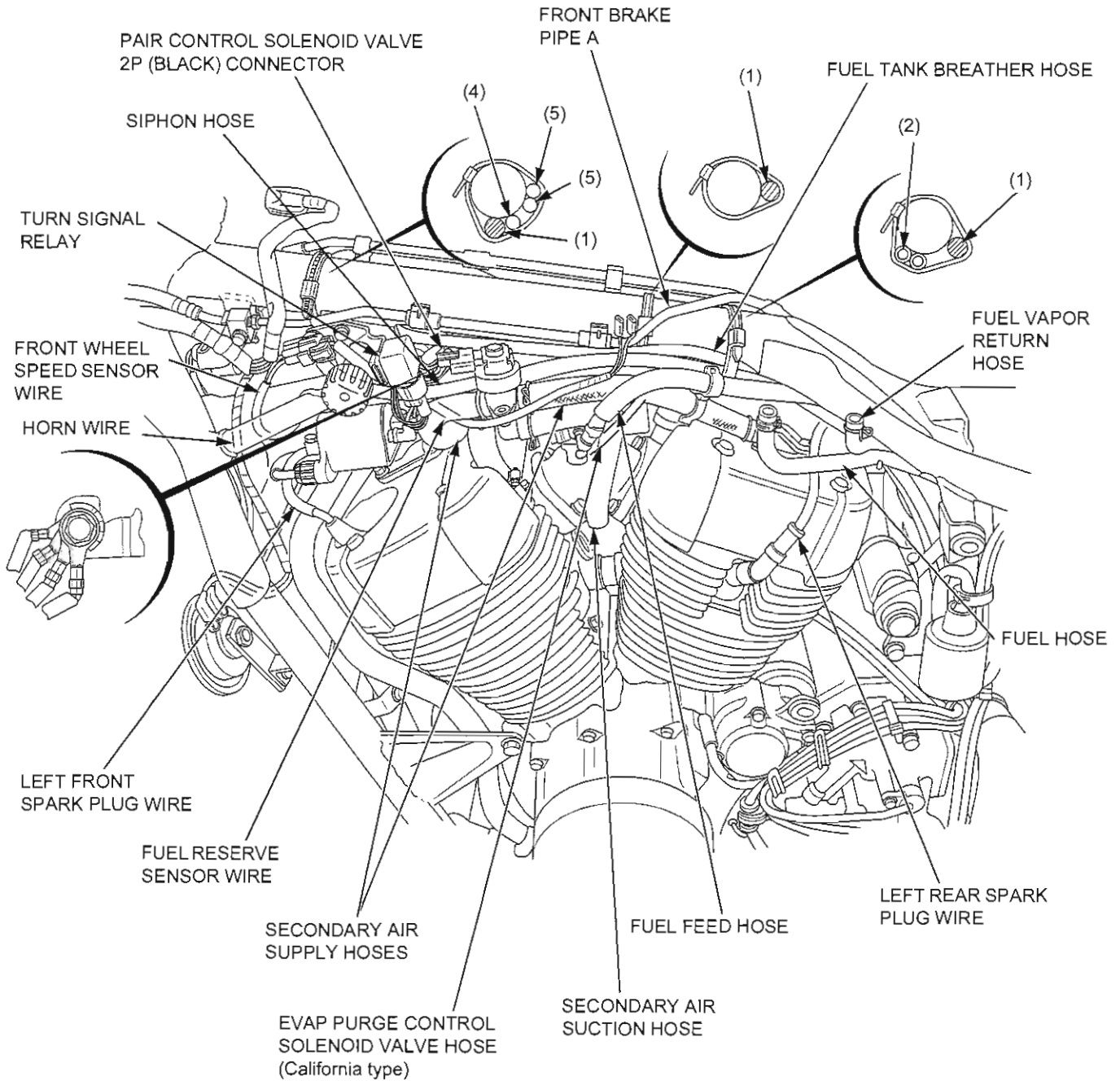
VT750C2S



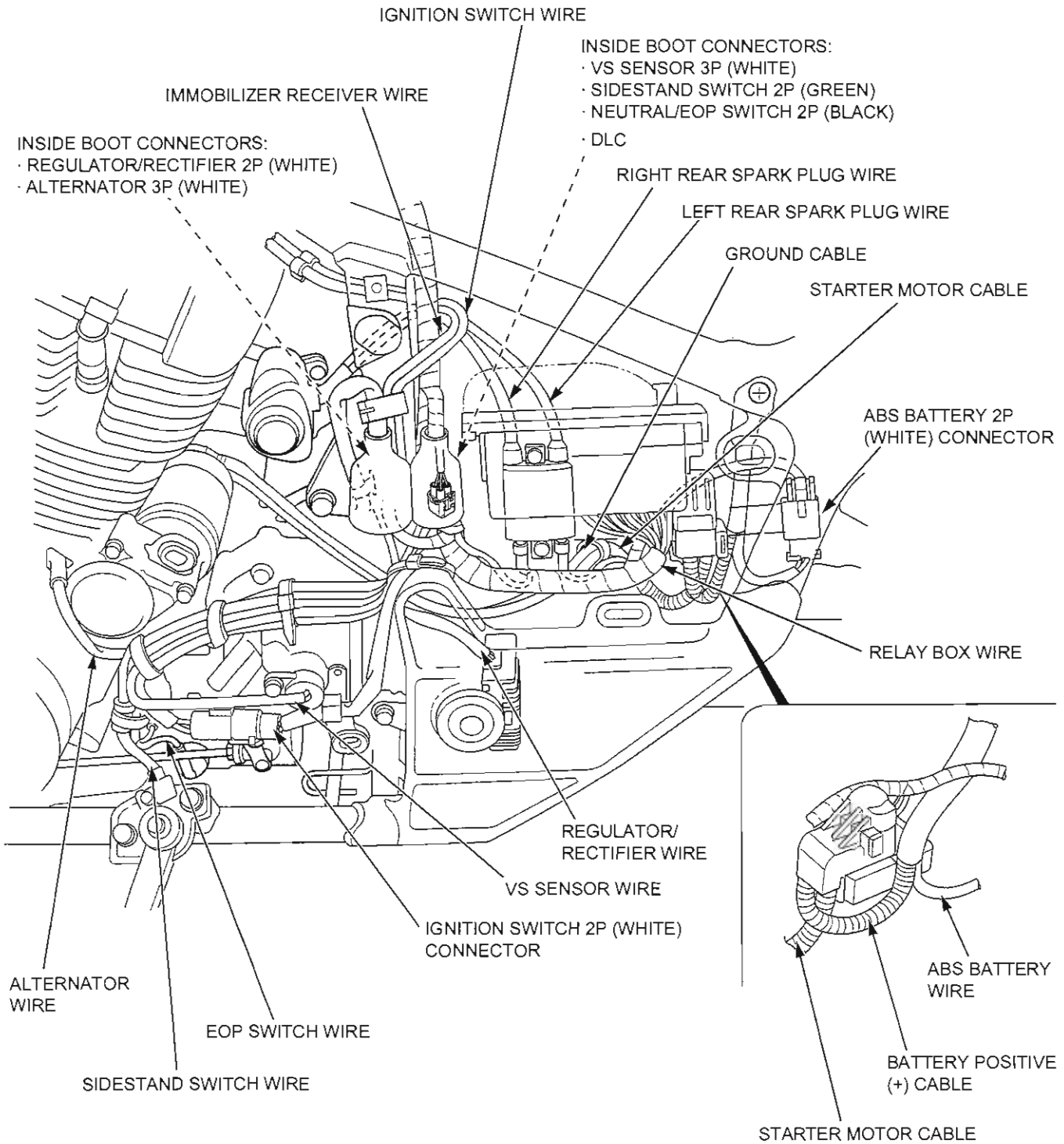
# GENERAL INFORMATION



- (1) MAIN WIRE HARNESS
- (2) FUEL TANK BREATHER HOSE
- (3) SIPHON HOSE
- (4) BANK ANGLE SENSOR WIRE
- (5) THROTTLE CABLE

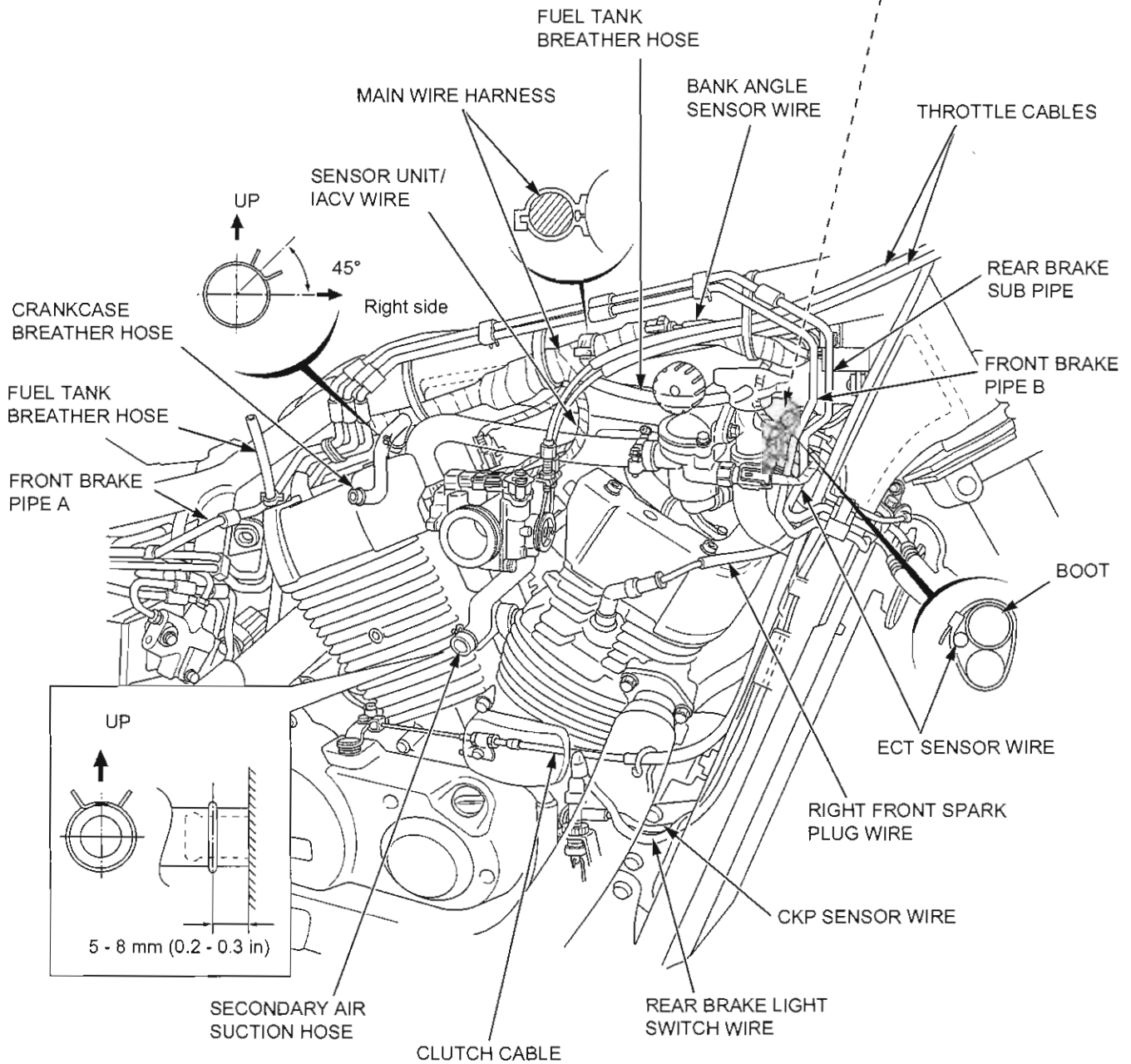


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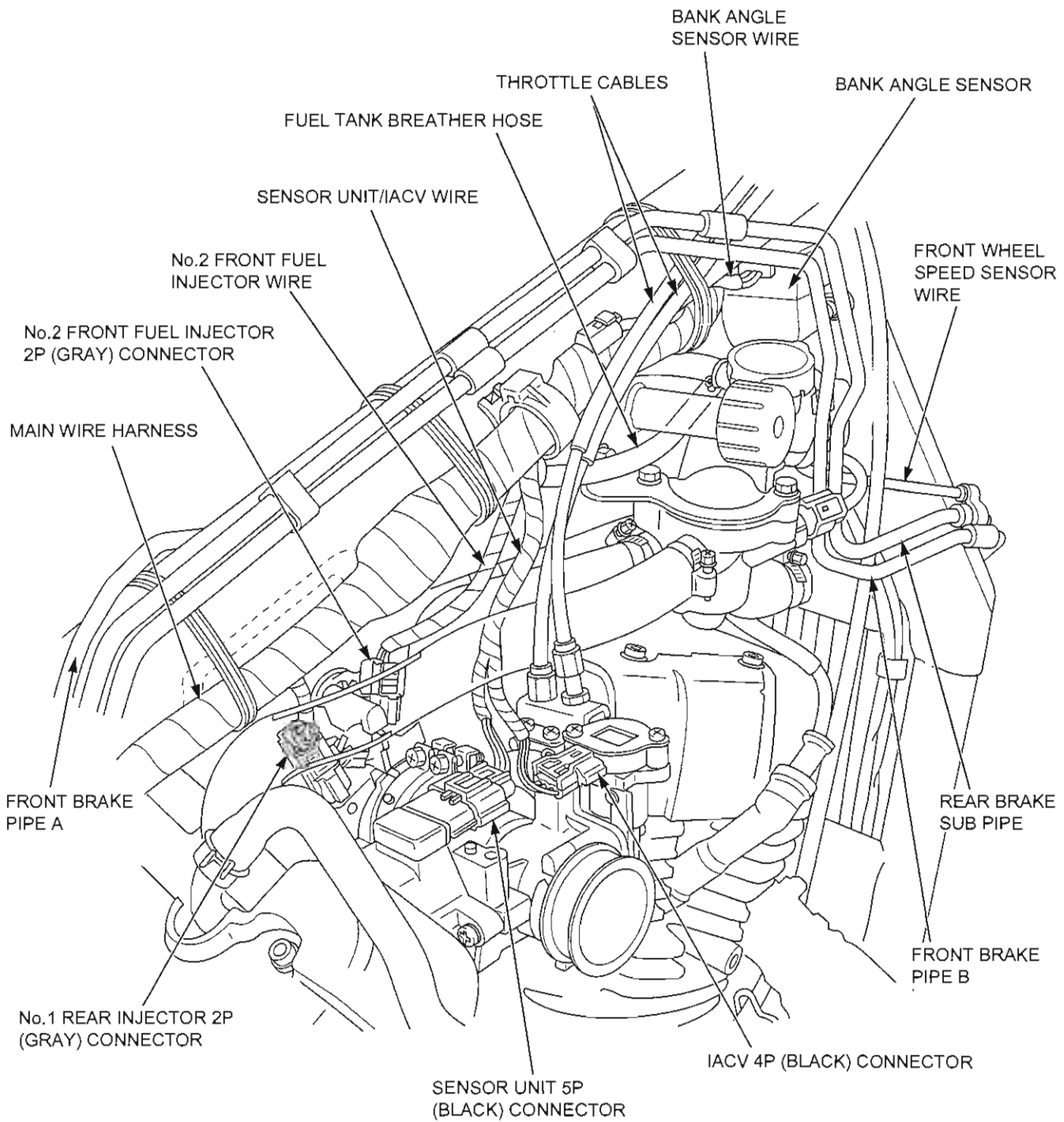


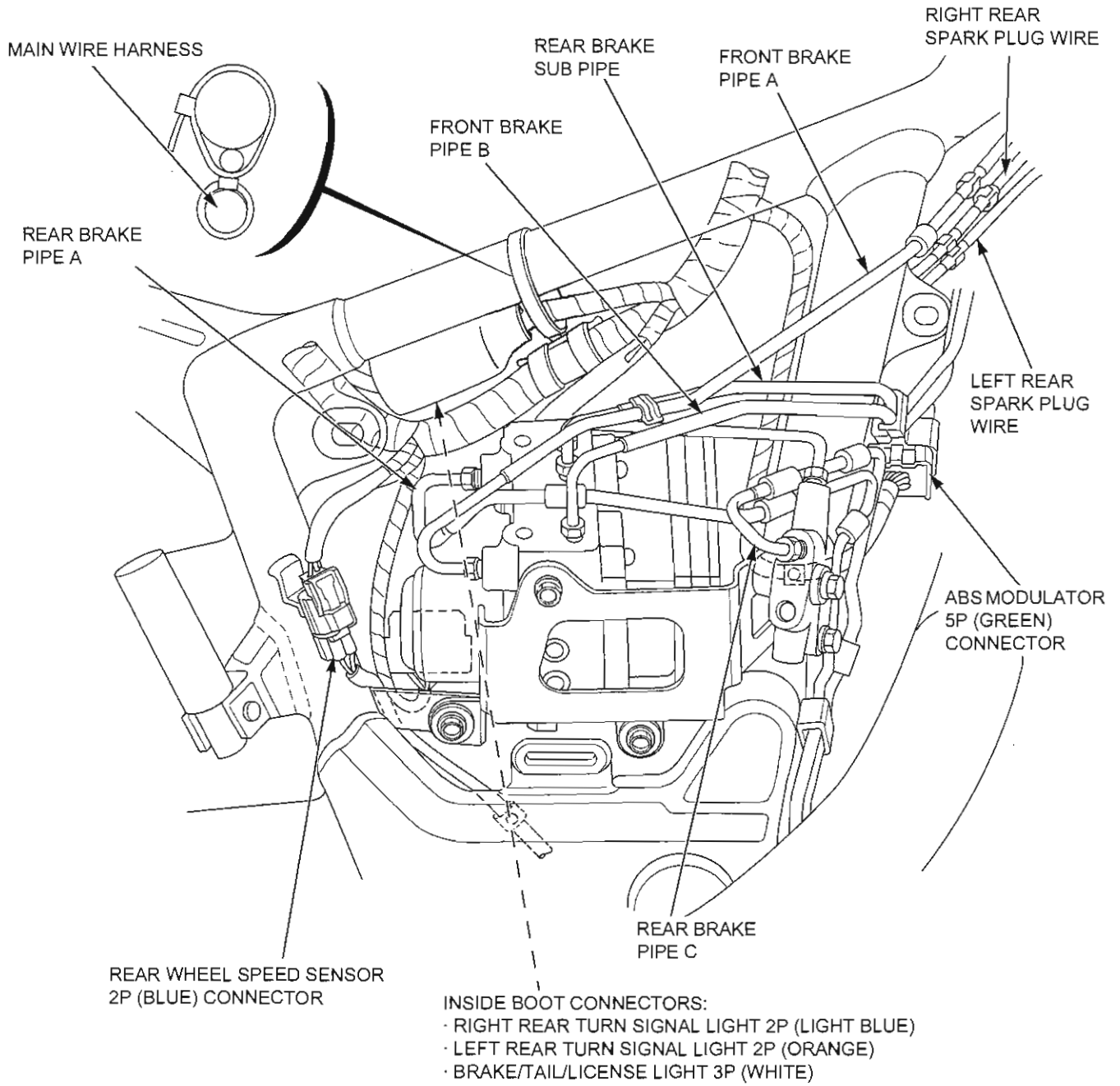
INSIDE BOOT CONNECTORS:

- CKP SENSOR 2P (RED)
- FAN MOTOR 2P (WHITE)
- REAR BRAKE LIGHT SWITCH 3P (LIGHT GRAY)

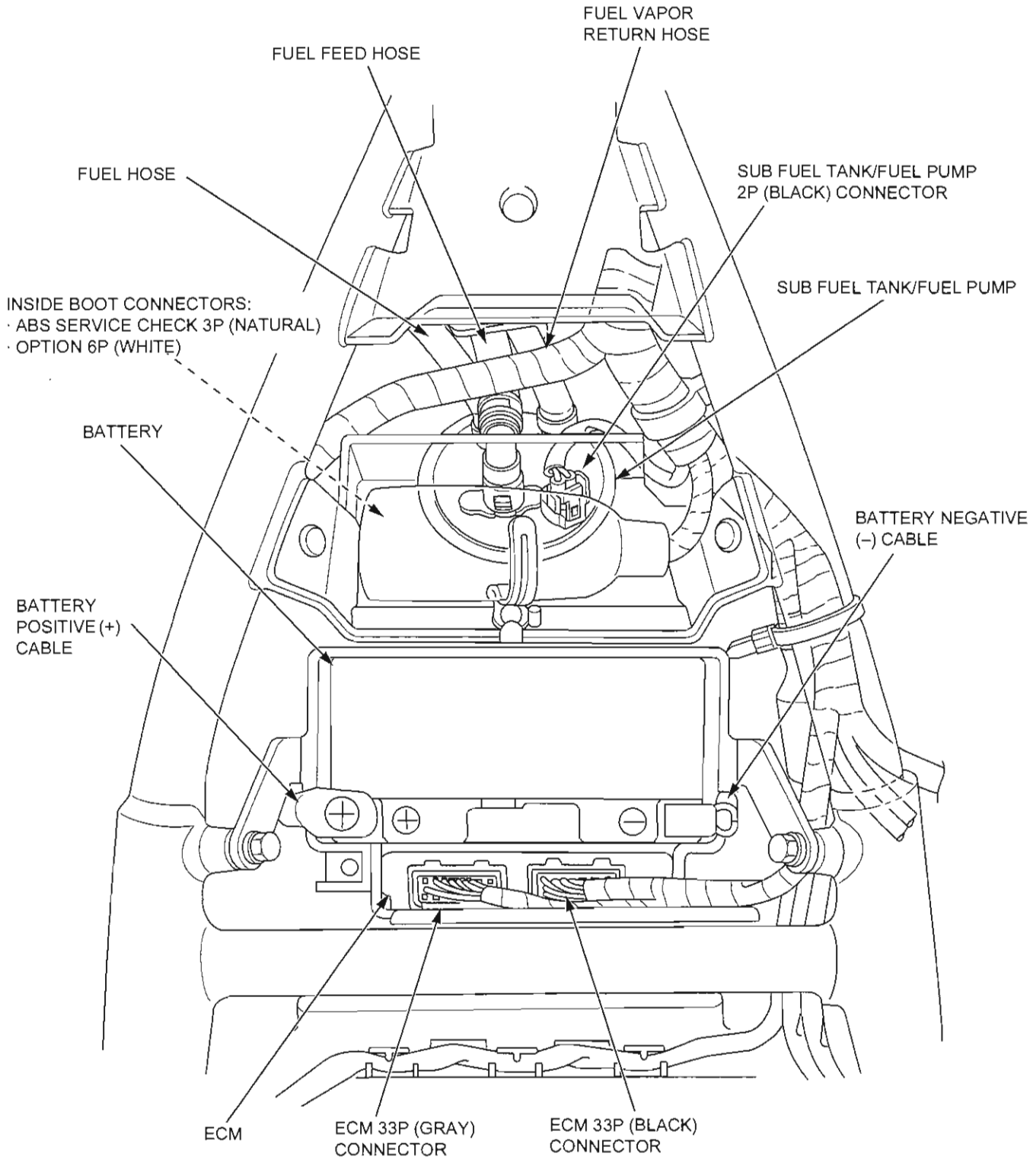


# GENERAL INFORMATION

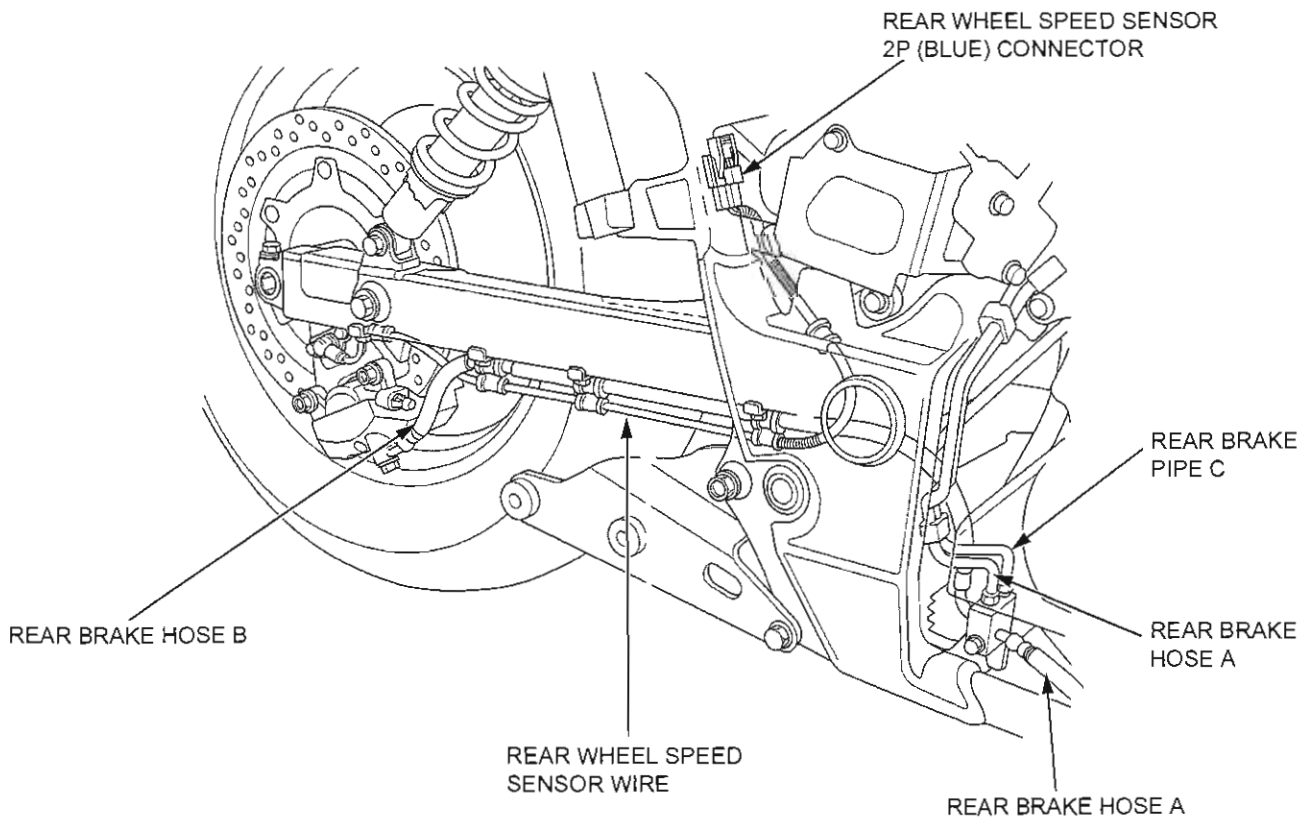
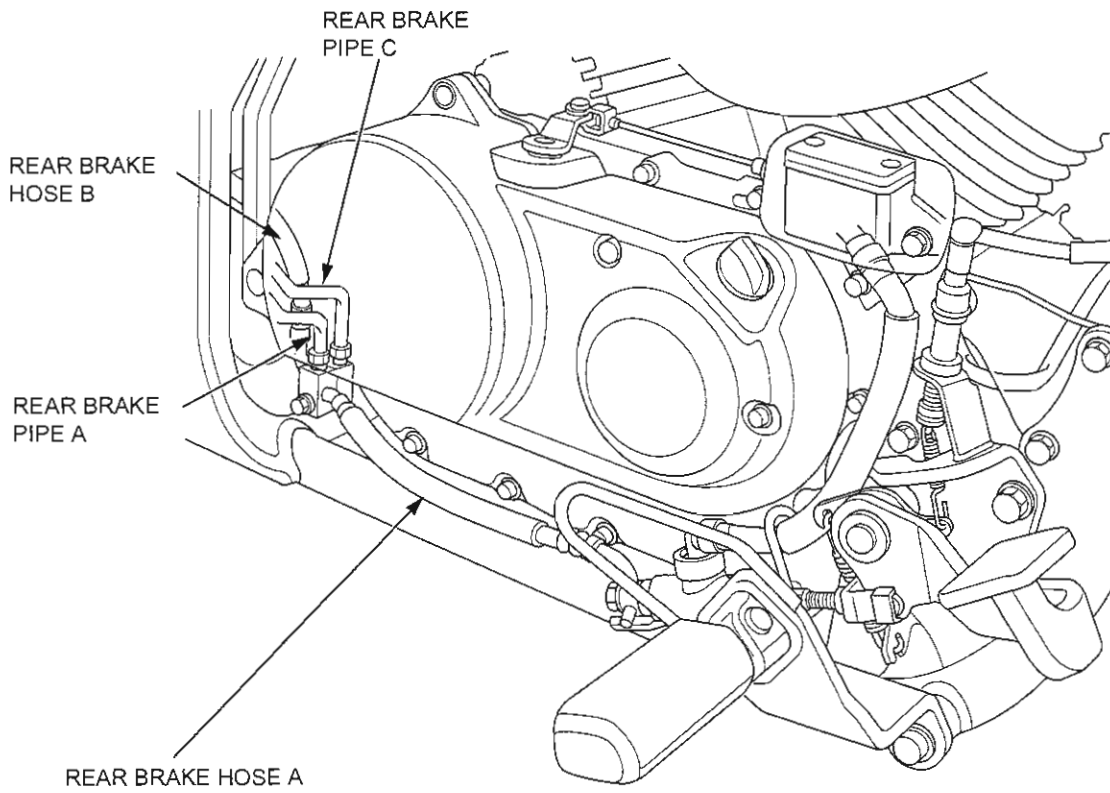




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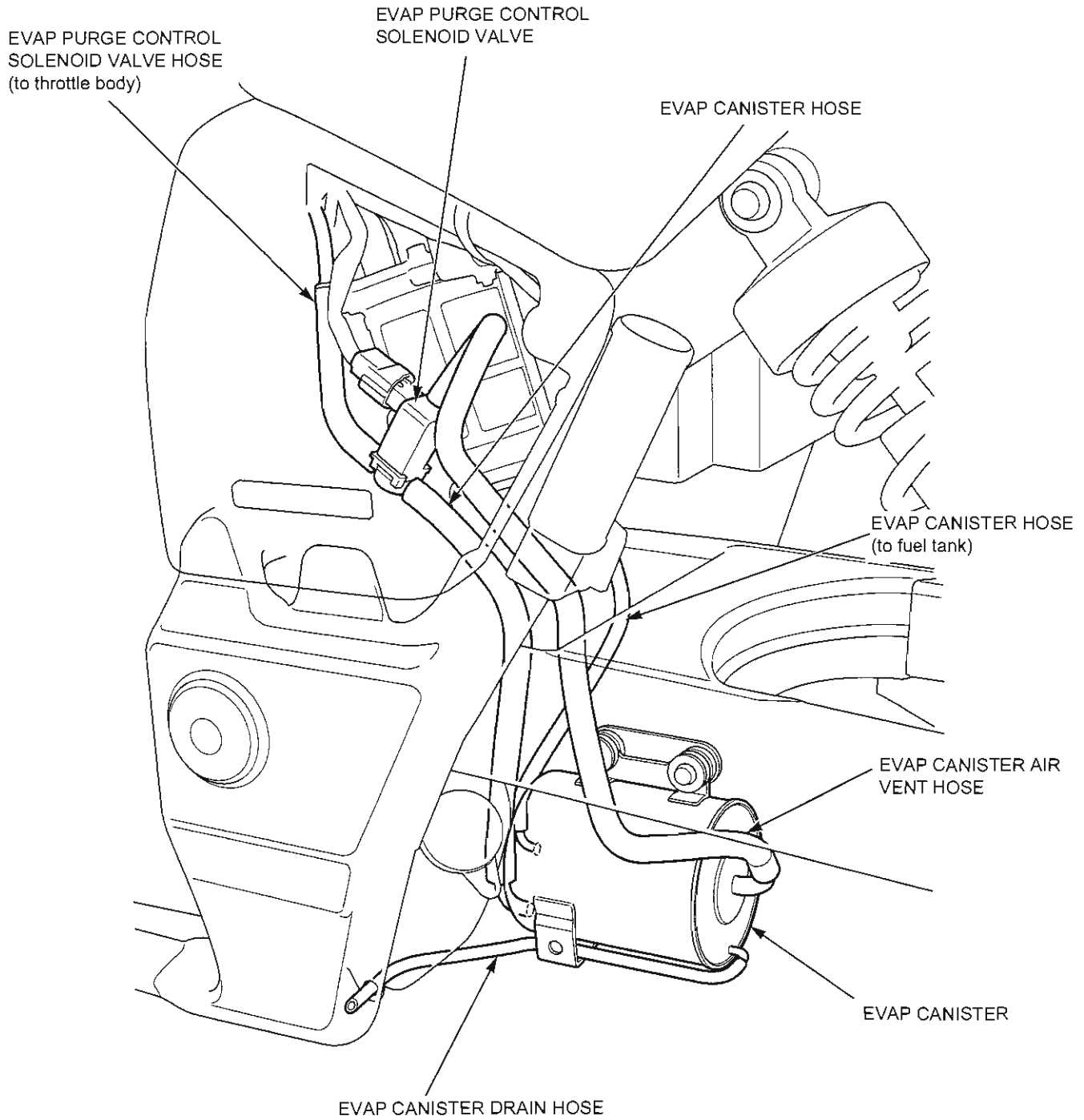






# GENERAL INFORMATION

## EVAP CONTROL SYSTEM (U.S.A. type only)



## EMISSION CONTROL SYSTEMS

### EXHAUST EMISSION REQUIREMENT

The U.S. Environmental Protection Agency (EPA), California Air Resources Board (CARB) and Transport Canada require manufacturers to certify that their motorcycles comply with applicable exhaust emissions standards during their useful life, when operated and maintained according to the instructions provided.

### NOISE EMISSION REQUIREMENT

The EPA also requires that motorcycles built after January 1, 1983 comply with applicable noise emission standards for one year or 6,000 km (3,730 miles) after the time of sale to the ultimate purchaser, when operated and maintained according to the instructions provided.

### WARRANTY COMPLIANCE

Compliance with the terms of the Distributor's Limited Warranty for Honda Motorcycle Emission Control System is necessary in order to keep the emission system warranty in effect.

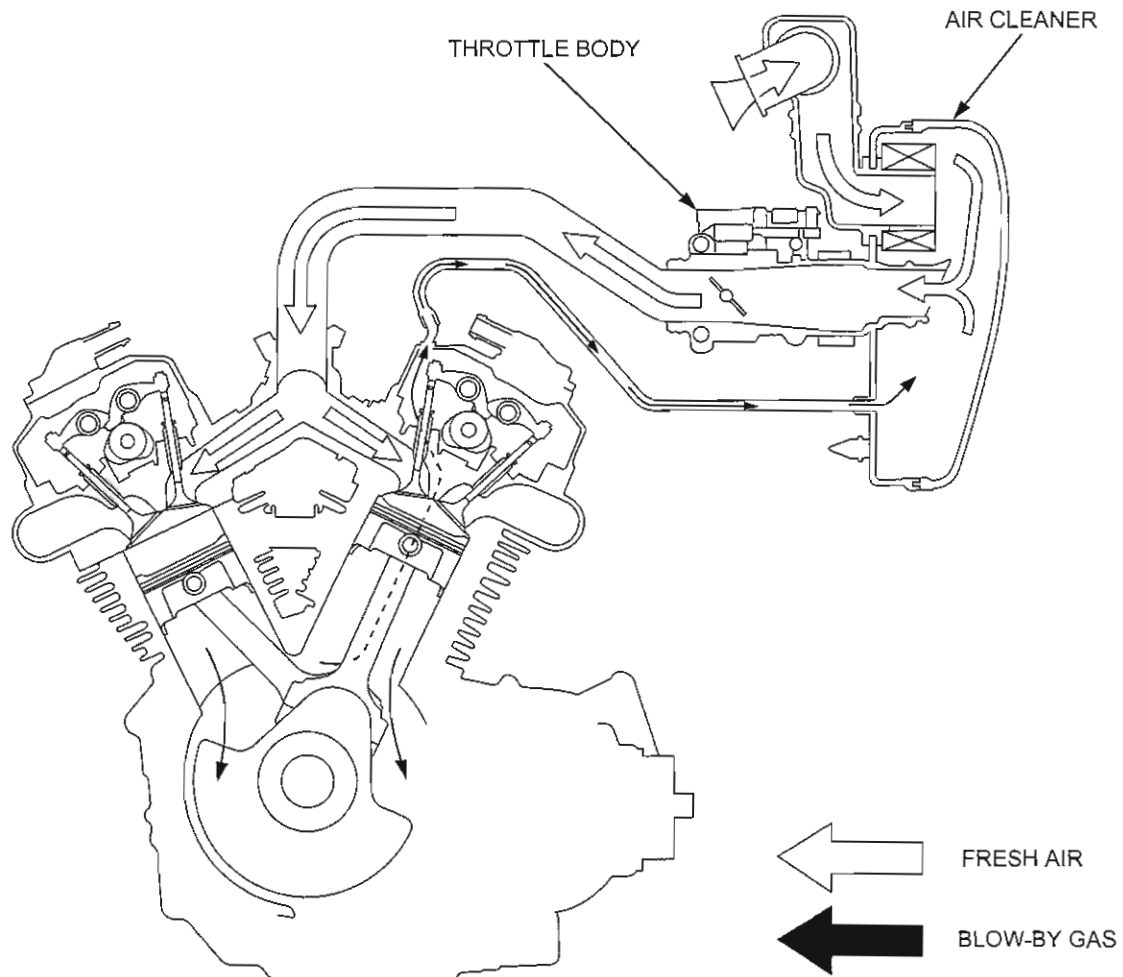
### SOURCE OF EMISSION

The combustion process produces carbon monoxide (CO), oxides of nitrogen (NO<sub>x</sub>) and hydrocarbons (HC). Control of carbon monoxide, oxides of nitrogen and hydrocarbons is very important because, under certain conditions, they react to form photochemical smog when subjected to sunlight. Carbon monoxide does not react in the same way, but is toxic. Fuel evaporation also produces HC emissions.

Honda Motor Co., Ltd. utilizes various systems, to reduce carbon monoxide, oxides of nitrogen 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 throttle body.



## GENERAL INFORMATION

### EXHAUST EMISSION CONTROL SYSTEM

The exhaust emission control system is composed of a pulse secondary air supply system and an oxidation catalytic converter PGM-FI system.

No adjustment should be made except idle speed adjustment with the throttle stop screw. The exhaust emission control system is separate from the crankcase emission control system.

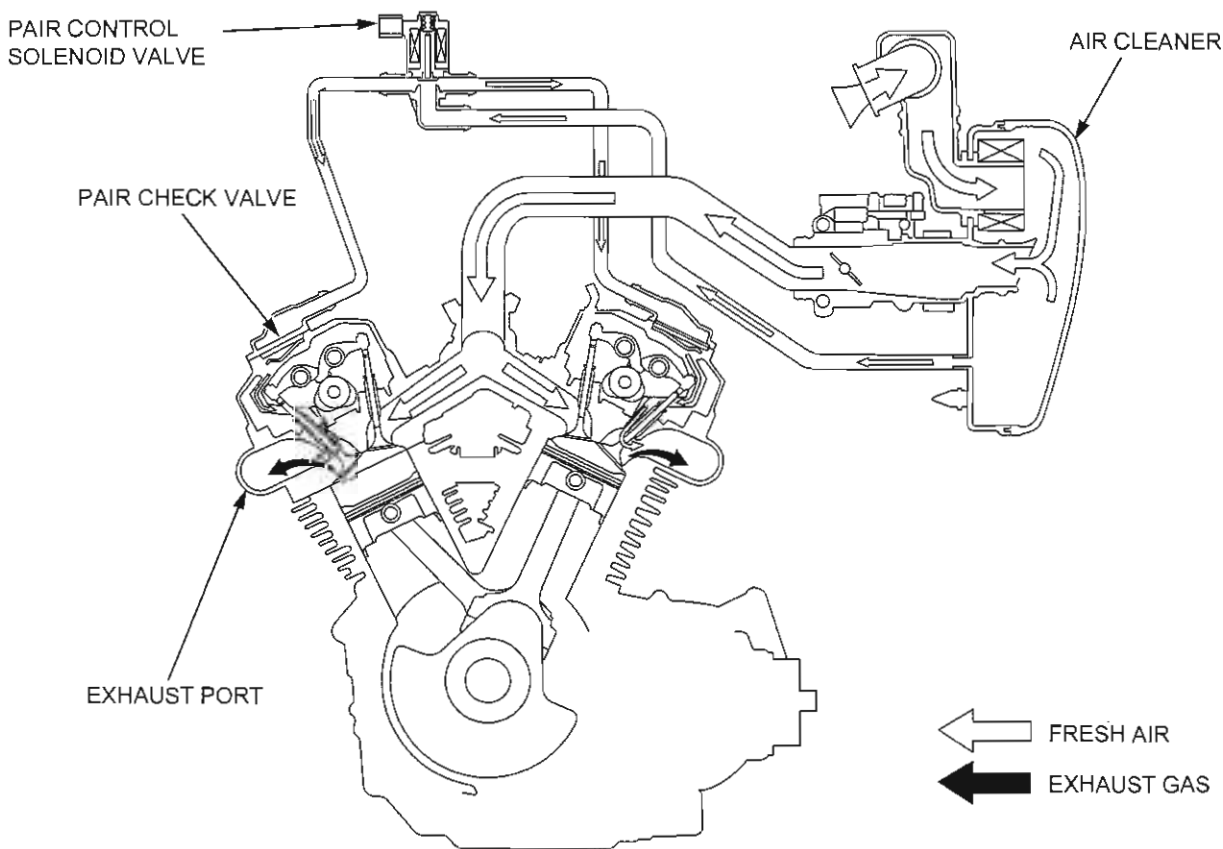
#### SECONDARY AIR SUPPLY SYSTEM

The pulse secondary air supply system introduces filtered air into the exhaust gases in the exhaust port. Fresh air is drawn into the exhaust port by the function of the PAIR (Pulse Secondary Air Injection) control solenoid valve.

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.

The reed valve prevents reverse air flow through the system. The PAIR control solenoid valve is operated by the solenoid valve. The solenoid valve is controlled by the ECM, and the fresh air passage is opened/closed according to the running condition (ECT/IAT/TP/MAP sensor and engine revolution).

No adjustments to the secondary air supply system should be made, although periodic inspection of the components is recommended.



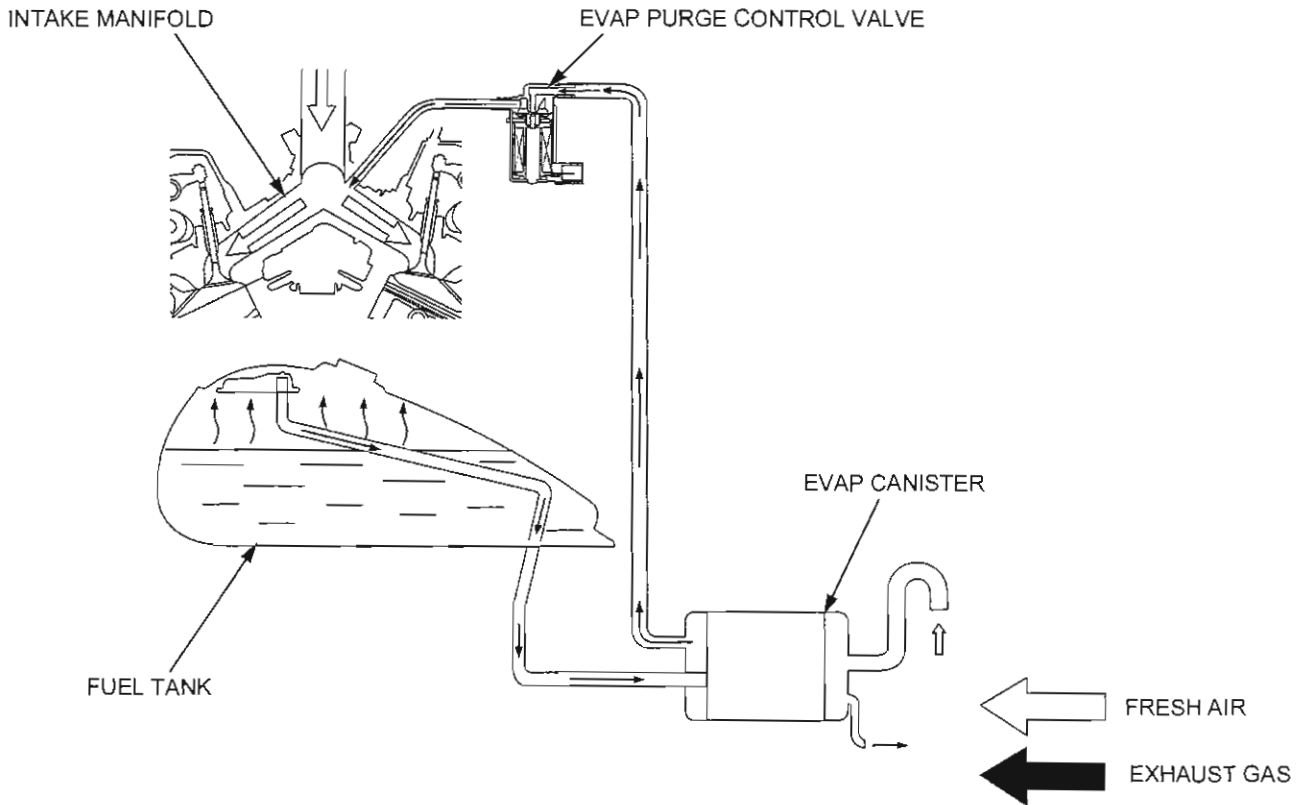
#### OXIDATION CATALYTIC CONVERTER

This motorcycle is equipped with an oxidation catalytic converter.

The oxidation catalytic converter is in the exhaust system. Through chemical reactions, it converts HC and CO in the engine's exhaust to carbon dioxide (CO<sub>2</sub>) and water vapor.

**EVAPORATIVE EMISSION CONTROL SYSTEM (U.S.A. TYPE)**

This model complies with California Air Resources Board (CARB) evaporative emission requirement. Fuel vapor from the fuel tank is routed into the evaporative emission (EVAP) canister where it is absorbed and stored while the engine is stopped. When the engine is running and the evaporative emission (EVAP) purge control solenoid valve is open, fuel vapor in the EVAP canister is drawn into the engine through the intake manifold.



**NOISE EMISSION CONTROL SYSTEM**

TAMPERING WITH THE NOISE CONTROL SYSTEM IS PROHIBITED: U.S. Federal law prohibits, or Canadian provincial law may prohibit the following acts or the causing thereof: (1) The removal or rendering inoperative by any person, other than for purposes of maintenance, repair or replacement, of any device or element of design incorporated into any vehicle for the purpose of noise control prior to its sale or delivery to the ultimate customer 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.

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

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

**FUEL PERMEATION EMISSION CONTROL SYSTEM**

This motorcycle complies with the Fuel Permeation Emission control regulation of the U.S. Environmental Protection Agency (EPA), California Air Resources Board (CARB), and Environment Canada (EC). The fuel tank, fuel hoses, and fuel vapor charge hoses used on this motorcycle incorporate fuel permeation control technologies. Tampering with the fuel tank, fuel hoses, or fuel vapor charge hoses to reduce or defeat the effectiveness of the fuel permeation technologies is prohibited by federal regulations.

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MEMO

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# 2. FRAME/BODY PANELS/EXHAUST SYSTEM

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# SERVICE INFORMATION

## GENERAL

- This section covers removal and installation of the body panels and exhaust system.
- Serious burns may result if the exhaust system is not allowed to cool before components are removed or serviced.
- Always replace the exhaust system gaskets with new ones after removing the exhaust system from the engine.
- When installing the exhaust system, loosely install all of the exhaust pipe fasteners. Always tighten the exhaust clamps first, then tighten the mounting fasteners.
- Always inspect the exhaust system for leaks after installation.

## TORQUE VALUES

Seat mounting socket 8 mm bolt	26 N·m (2.7 kgf·m, 19 lbf·ft)
Grab rail mounting bolt	64 N·m (6.5 kgf·m, 47 lbf·ft)
Left crankcase rear cover socket bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)
Exhaust pipe joint nut	25 N·m (2.5 kgf·m, 18 lbf·ft)
Muffler stay mounting bolt	44 N·m (4.5 kgf·m, 32 lbf·ft)
Muffler mounting nut	44 N·m (4.5 kgf·m, 32 lbf·ft)
Muffler bracket bolt	27 N·m (2.8 kgf·m, 20 lbf·ft)
Exhaust pipe joint stud bolt	See page 2-12
Over head cover socket bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)

## TROUBLESHOOTING

### Excessive exhaust noise

- Broken exhaust system
- Exhaust gas leak

### Poor performance

- Deformed exhaust system
- Exhaust gas leaks
- Clogged muffler



## SEAT

### REMOVAL/INSTALLATION

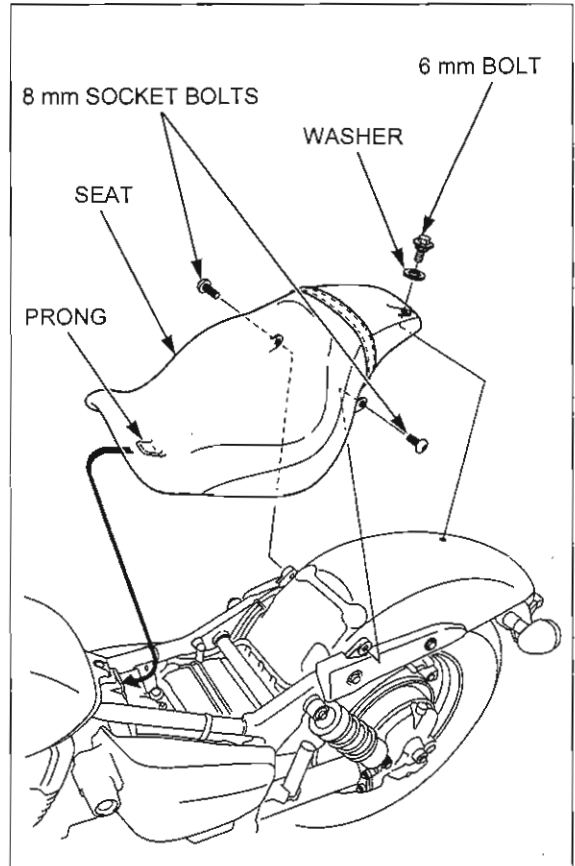
Remove the 8 mm socket bolts, 6 mm bolt, washer and seat by moving it rearward.

Install the seat by inserting its prong under the raised lip of the frame properly.

Install the washer, 6 mm bolt and tighten the 6 mm bolt securely.

Install and tighten the 8 mm socket bolts to the specified torque.

**TORQUE: 26 N-m (2.7 kgf-m, 19 lbf-ft)**



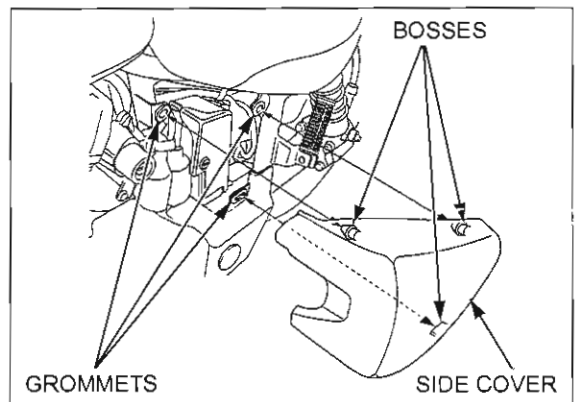
## SIDE COVER

### REMOVAL/INSTALLATION

*Be careful not to damage the side cover bosses.*

Remove the side cover by releasing its bosses from the frame grommets.

Install the side cover by inserting its bosses into the frame grommets.



## STEERING SIDE COVER

### REMOVAL/INSTALLATION

Remove the speedometer assembly (page 21-15).

Remove the bolts.

Remove the retaining clip by sliding it rearward.

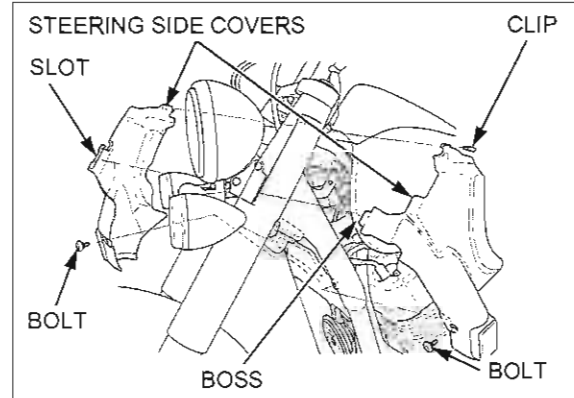
*Be careful not to damage the boss and slot.*

Remove the steering side covers by releasing the left cover boss from the right cover slot.

Installation is in the reverse order of removal.

#### NOTE:

After installation, check that the wire harness and cables do not interfere with handlebar rotation.



## LEFT CRANKCASE REAR COVER

### REMOVAL/INSTALLATION

Remove the B-clip and washer.

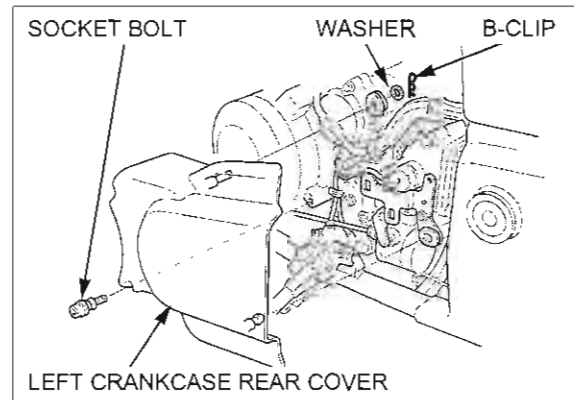
Remove the socket bolt and left crankcase rear cover by releasing its bosses from the grommets.

Check the B-clip for fatigue or damage, replace it if necessary.

Installation is in the reverse order of removal.

#### TORQUE:

Left crankcase rear cover socket bolt:  
10 N·m (1.0 kgf·m, 7 lbf·ft)



## OVER HEAD COVER

### REMOVAL/INSTALLATION

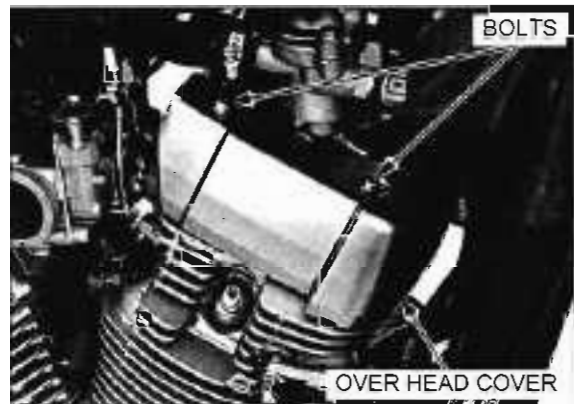
#### FRONT

Remove the following:

- Spark plug cap (page 3-7)
- Fuel tank (page 5-48)

*Right side only:* Remove the air cleaner housing (page 5-49).

Remove the socket bolts and front right over head cover.



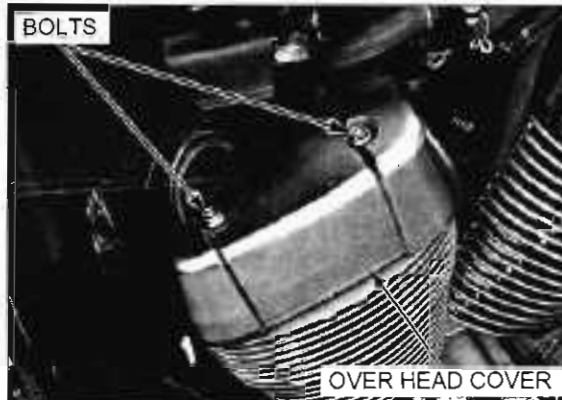
Remove the socket bolts and front left over head cover.

Installation is in the reverse order of removal.

**TORQUE:**

Front right/left over head cover socket bolt:

10 N·m (1.0 kgf·m, 7 lbf·ft)

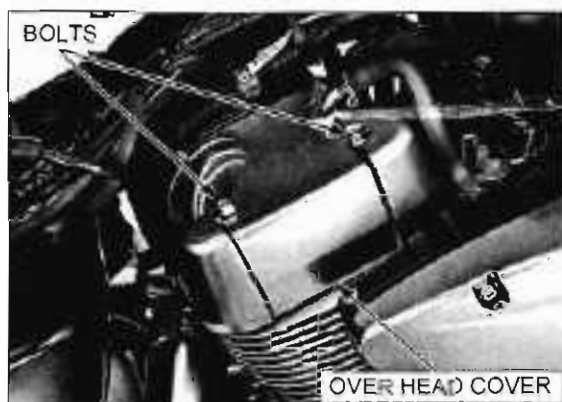


**REAR**

Remove the following:

- Spark plug cap (page 3-7)
- Fuel tank (page 5-48)

Remove the bolts and rear right over head cover.



Remove the socket bolts and rear left over head cover.

Installation is in the reverse order of removal.

**TORQUE:**

Rear right/left over head cover socket bolt:

10 N·m (1.0 kgf·m, 7 lbf·ft)



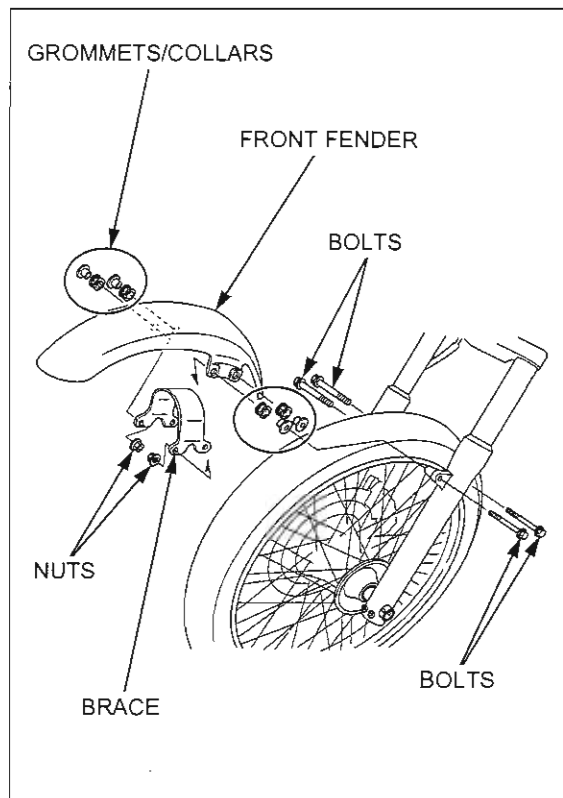
## FRONT FENDER (VT750C2F/C2S)

### REMOVAL/INSTALLATION

Remove the following:

- Bolts
- Nuts
- Collars
- Front fender brace
- Front fender
- Grommets

Installation is in the reverse order of removal.



## FRONT FENDER (VT750C2B)

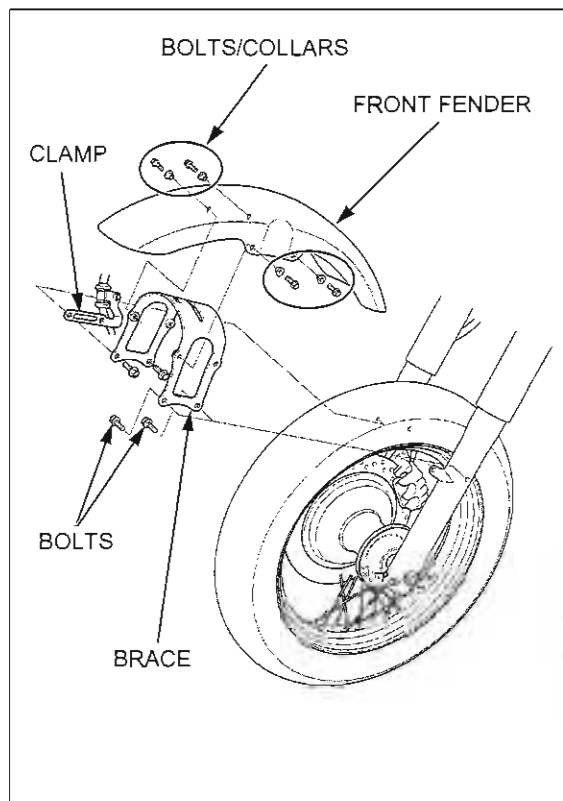
### REMOVAL/INSTALLATION

Remove the following:

- Bolts
- Collars
- Front fender
- Bolts
- Brake hose clamp
- Front fender brace

Installation is in the reverse order of removal.

- At installation, install the front fender brace with its "Fr" mark facing the front side.



## REAR FENDER

### REAR FENDER ASSEMBLY

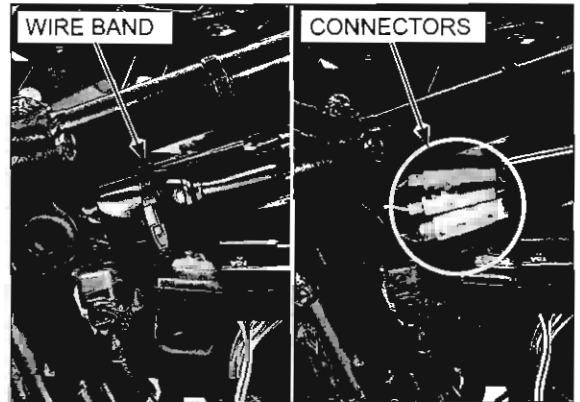
#### REMOVAL

Remove the following:

- Seat (page 2-3)
- Right side cover (page 2-3)

Release the wire band.

Disconnect the brake/tail/license light 3P and rear turn signal light 2P connectors.



Remove the following:

- Bolts
- Washers
- Grab rails
- Rear fender assembly

#### NOTE:

When removing the rear fender assembly, be careful not to damage the wires.

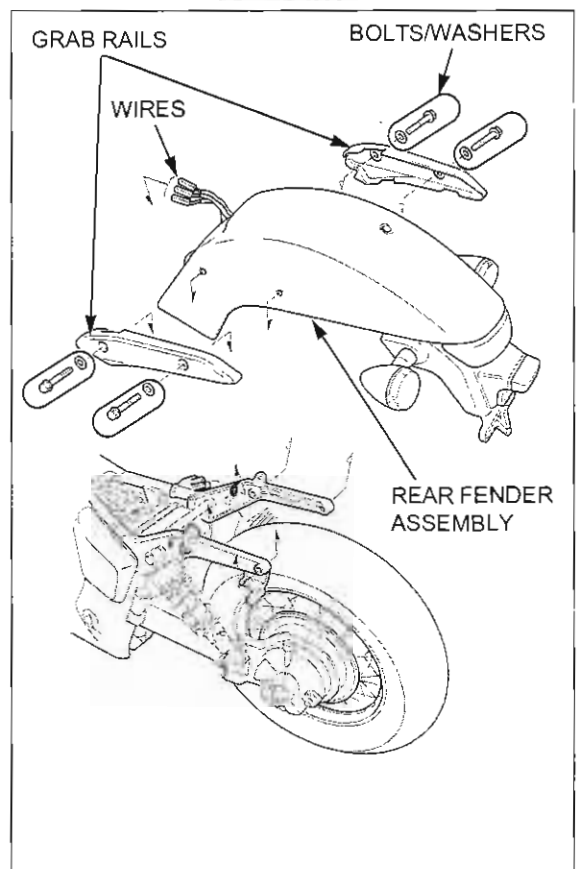
#### INSTALLATION

Installation is in the reverse order of removal.

#### TORQUE:

Grab rail mounting bolt:  
64 N·m (6.5 kgf·m, 47 lbf·ft)

*Route the wires properly (page 1-26).*



### REAR FRAME/REAR FENDER A

#### REMOVAL/INSTALLATION

Remove the rear fender assembly (page 2-7).

Release the rear frame bosses from the rear fender holes, then remove the rear frame/rear fender A.

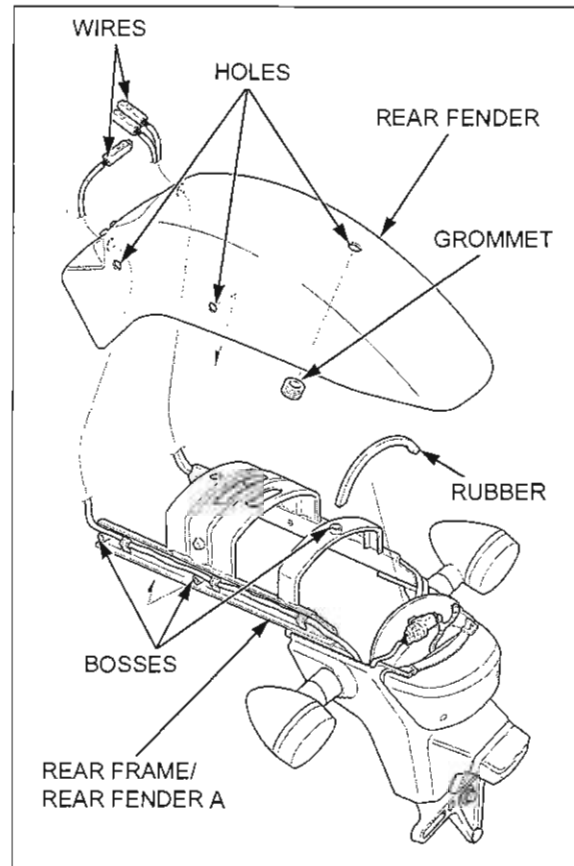
#### NOTE:

When removing the rear frame/rear fender A, be careful not to damage the wires.

Remove the rubber from the rear fender A.  
Remove the grommet from the rear fender.

Installation is in the reverse order of removal.

*Route the wires properly  
(page 1-26).*



## DISASSEMBLY/ASSEMBLY

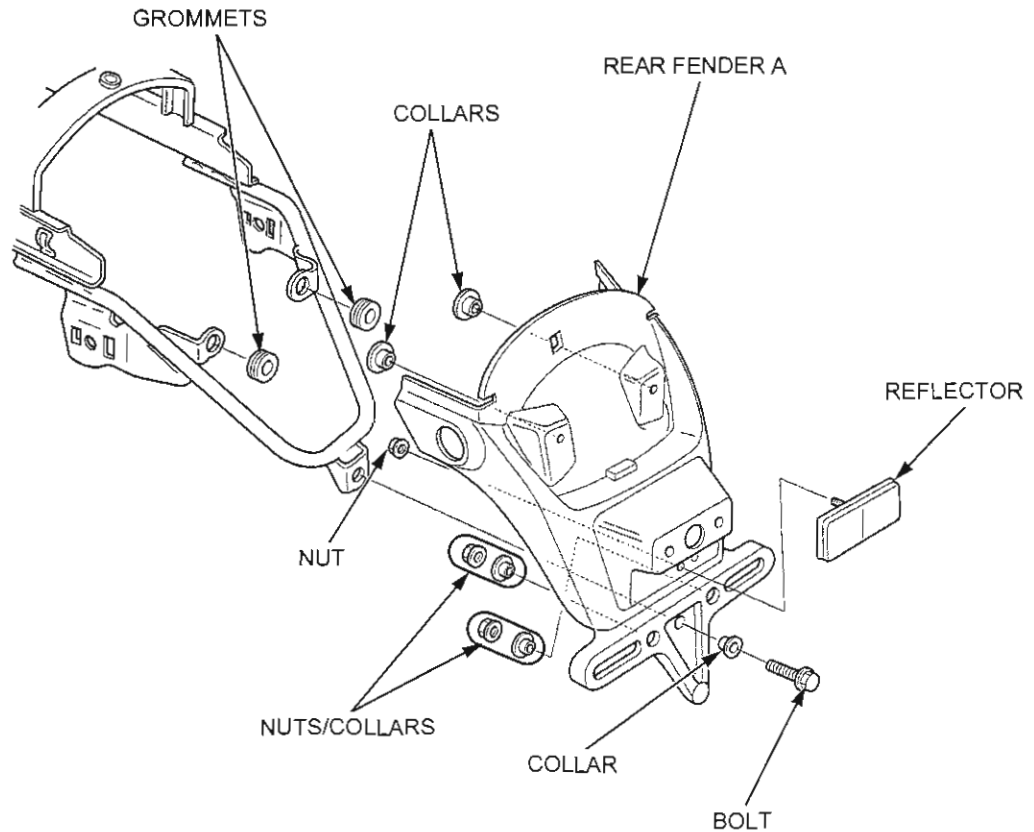
Remove the following:

- Rear frame/rear fender A (page 2-8)
- Rear turn signal lights (page 21-10)
- Brake/tail light (page 21-11)
- License light (page 21-12)

Remove the bolts, nuts, collars, grommet and the rear fender A.

Remove the nut and reflector from the rear fender A.

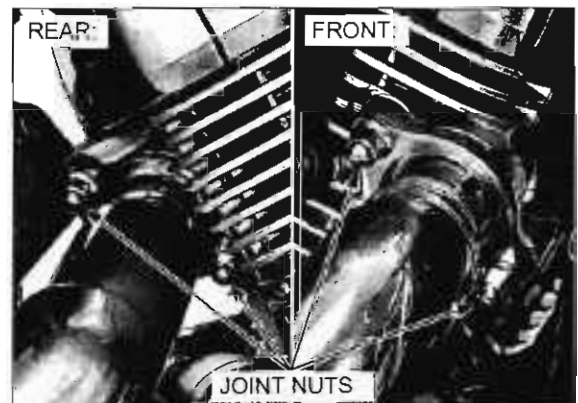
Assembly is in the reverse order of disassembly.



## EXHAUST SYSTEM

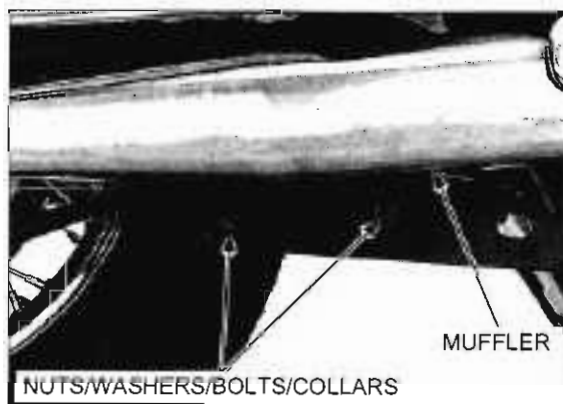
### REMOVAL

Remove the exhaust pipe joint nuts.

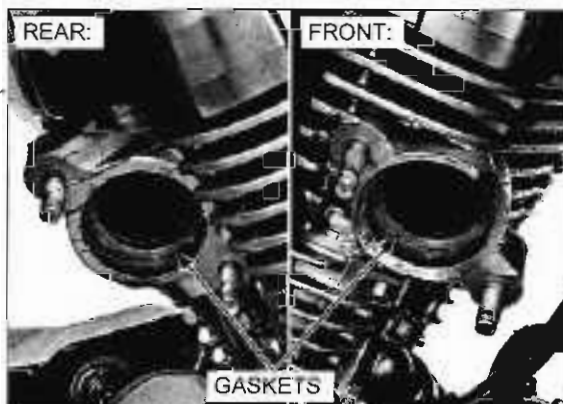


## FRAME/BODY PANELS/EXHAUST SYSTEM

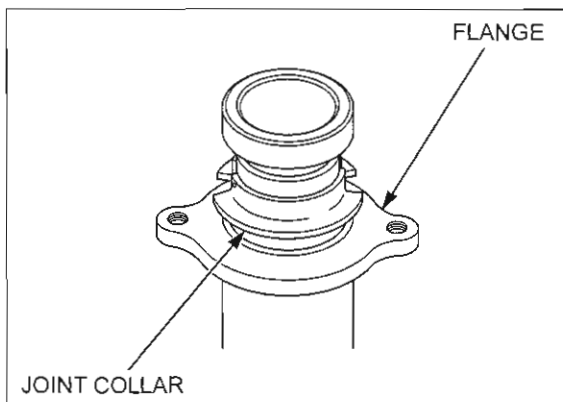
Remove the nuts, bolts, washers, collars and muffler assembly.



Remove the front and rear gaskets.



Remove the exhaust pipe joint collars and flanges.

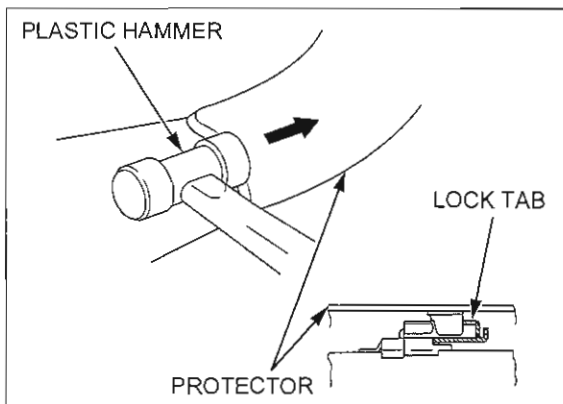


### DISASSEMBLY

*Rear muffler only:* Drive the rear exhaust pipe protector using a plastic hammer and break the lock tab (reverse side of the protector) and remove it.

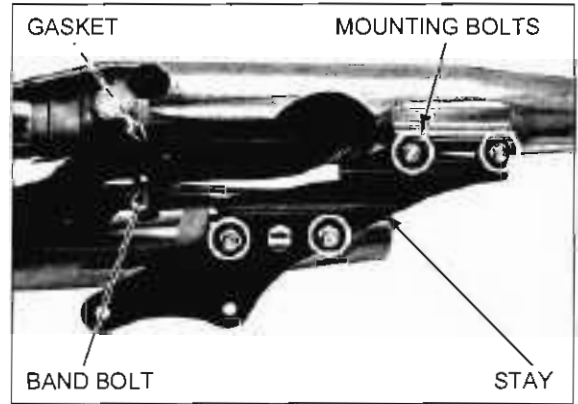
#### NOTE:

- The rear exhaust pipe protector can be removed without removing the exhaust system from the engine.
- Do not reuse the removed protector.

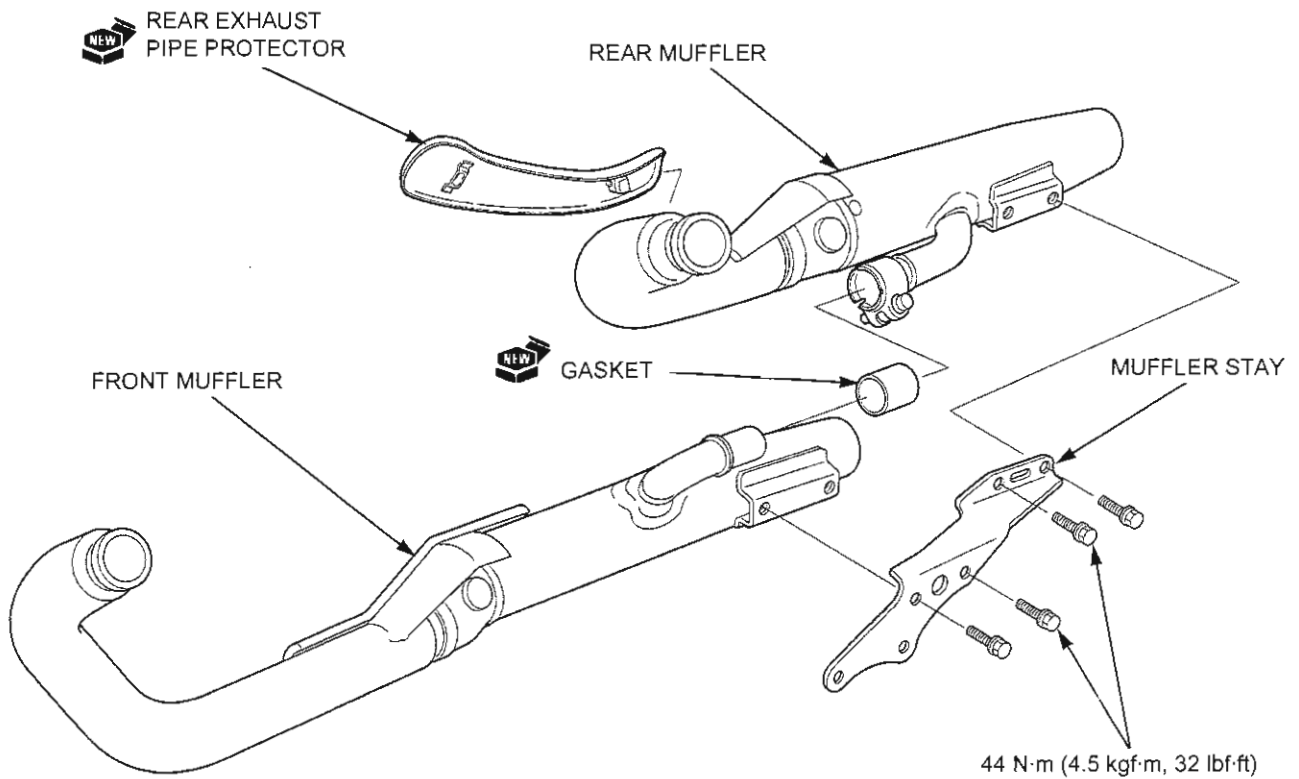




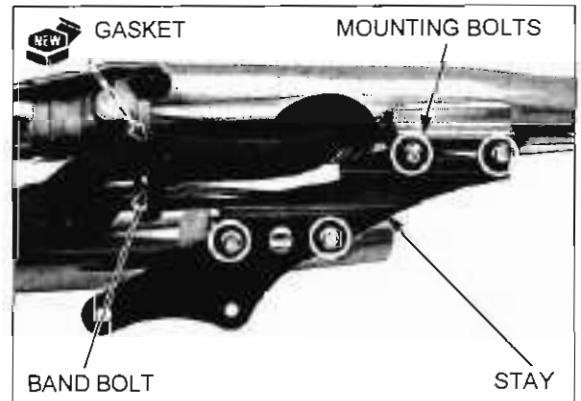
Loosen the muffler joint band bolt.  
Remove the mounting bolts, muffler stay and separate the mufflers.  
Remove the gasket.



## ASSEMBLY

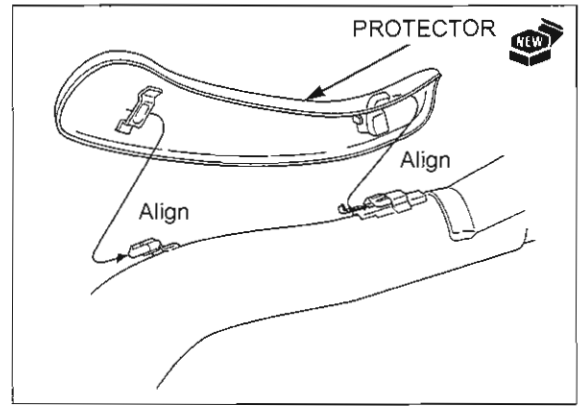


Install a new gasket onto the front muffler joint pipe.  
Assemble the front muffler and rear muffler.  
Install the muffler stay, mounting bolts and tighten the mounting bolts to the specified torque.  
**TORQUE: 44 N·m (4.5 kgf·m, 32 lbf·ft)**  
Tighten the muffler joint band bolt securely.

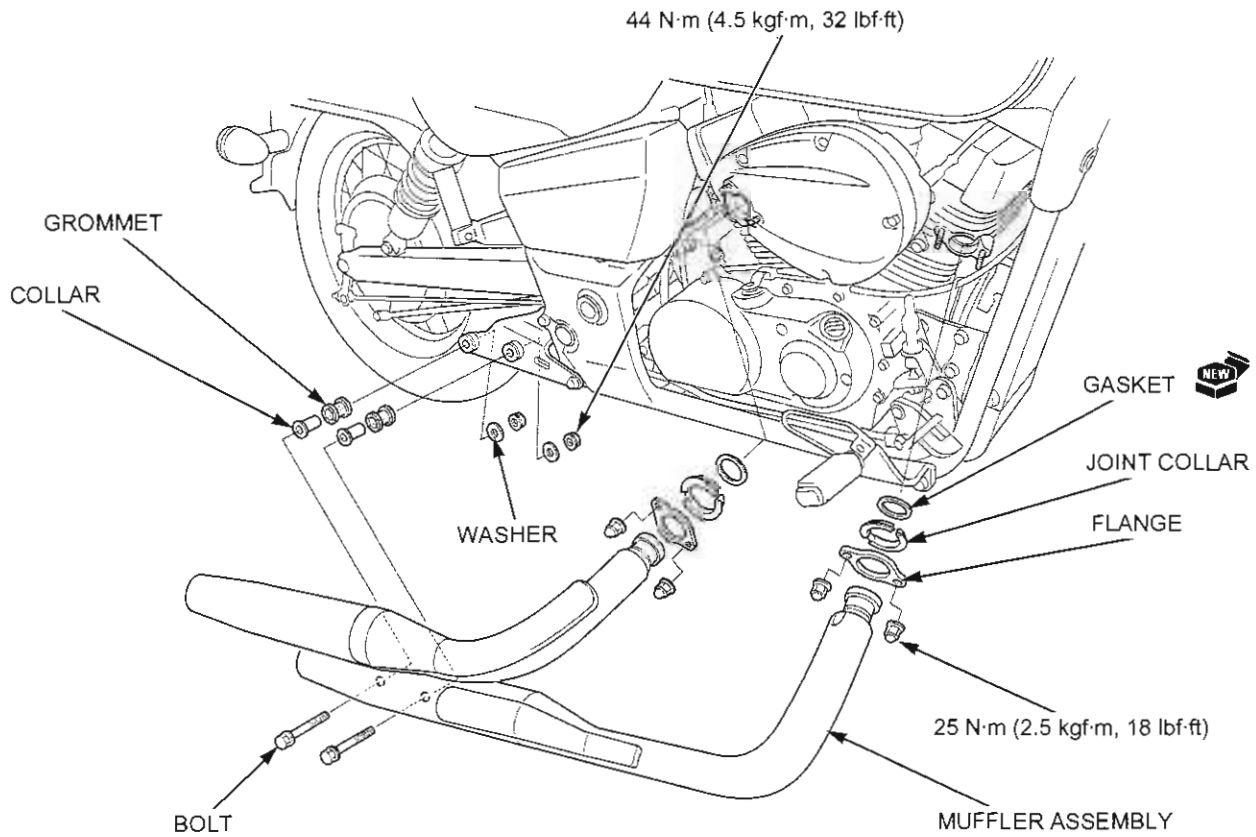


# FRAME/BODY PANELS/EXHAUST SYSTEM

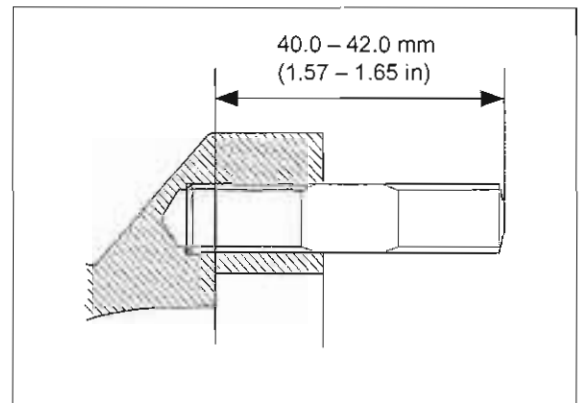
Rear muffler only: Install a new rear exhaust pipe protector.



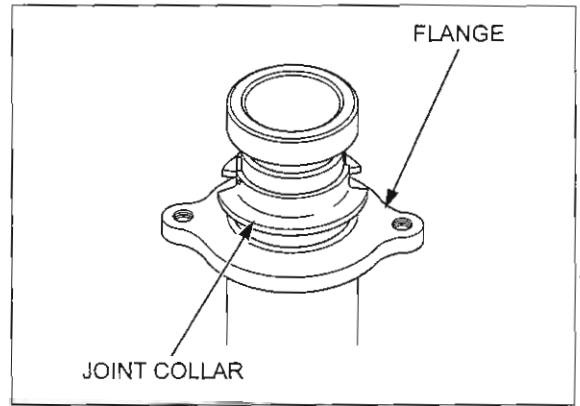
## INSTALLATION



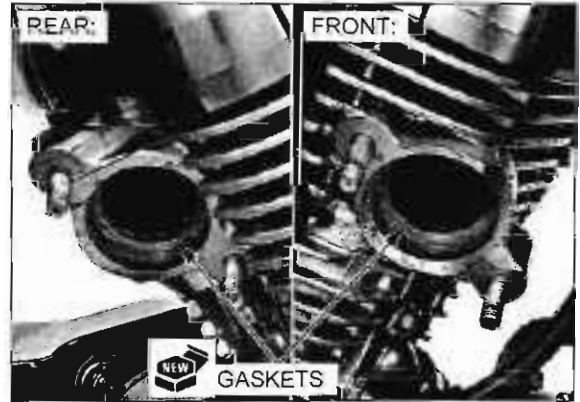
If the exhaust pipe joint stud bolts are loose, tighten them. Be sure to verify the distance from the top of the stud to the cylinder head as shown.



Install the flanges and exhaust pipe joint collars.



Install new gaskets.



Install the muffler assembly.

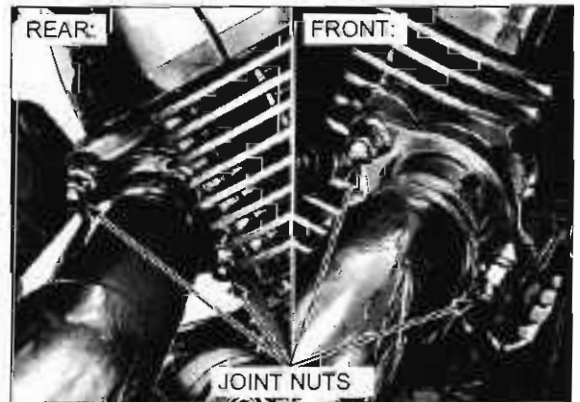
**NOTE:**

Inserting the rear exhaust pipe to the rear exhaust port first, then insert the front exhaust pipe to the front exhaust port.

Temporarily install the all fasteners.

Tighten the exhaust pipe joint nuts to the specified torque.

**TORQUE: 25 N·m (2.5 kgf·m, 18 lbf·ft)**

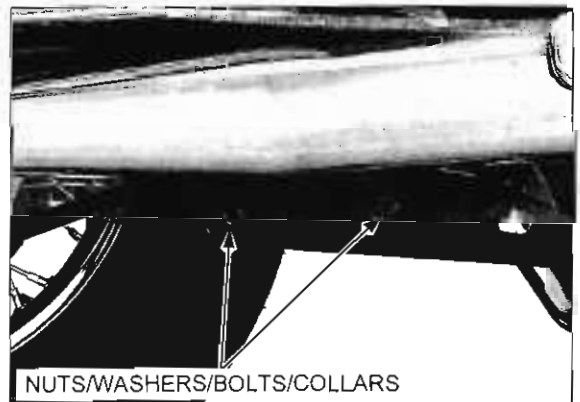


Tighten the muffler mounting nuts to the specified torque.

**TORQUE: 44 N·m (4.5 kgf·m, 32 lbf·ft)**

**NOTE:**

Always inspect the exhaust system for leaks after installation.



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MEMO

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THROTTLE OPERATION .....	3-5	BRAKE PADS WEAR (VT750C2S) .....	3-19
AIR CLEANER .....	3-6	BRAKE SYSTEM (VT750C2F/C2B) .....	3-20
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## MAINTENANCE

# SERVICE INFORMATION

## GENERAL

- Place the motorcycle on level ground before starting any work.
- Gasoline is extremely flammable and is explosive under certain conditions.
- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where the gasoline is stored can cause a fire or explosion.
- 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.

## SPECIFICATIONS

ITEM		SPECIFICATIONS	
Throttle grip freeplay		2 – 6 mm (1/16 – 1/4 in)	
Spark plug	Standard	DPR7EA-9 (NGK), X22EPR-U9 (DENSO)	
	For extended high speed riding	DPR8EA-9 (NGK), X24EPR-U9 (DENSO)	
Spark plug gap		0.8 – 0.9 mm (0.03 – 0.04 in)	
Valve clearance	IN	0.15 ± 0.02 mm (0.006 ± 0.001 in)	
	EX	0.20 ± 0.02 mm (0.008 ± 0.001 in)	
Recommended engine oil		Pro Honda GN4 4-stroke oil (U.S.A. and Canada) or an equivalent API service classification: SG or higher (except oils labeled as energy conserving on the circular API service label) Viscosity: SAE 10W-30 JASO T 903 standard: MA	
Engine oil capacity	At draining	2.5 liters (2.6 US qt, 2.2 Imp qt)	
	At oil filter change	2.6 liters (2.7 US qt, 2.3 Imp qt)	
	At disassembly	3.2 liters (3.4 US qt, 2.8 Imp qt)	
Engine idle speed		1,200 ± 100 min <sup>-1</sup> (rpm)	
Recommended antifreeze		Pro Honda HP coolant or equivalent high quality ethylene glycol antifreeze containing silicate-free corrosion inhibitors	
Recommended final drive oil		Hypoid gear oil, SAE #80	
Final drive oil capacity	At draining	160 cm <sup>3</sup> (5.4 US oz, 5.6 Imp oz)	
	At disassembly	170 cm <sup>3</sup> (5.7 US oz, 6.0 Imp oz)	
Recommended brake fluid		DOT 4	
Brake pedal height (VT750C2F/C2B)		75 mm (3.0 in) above the top of the footpeg	
Brake pedal freeplay (VT750C2F/C2B)		20 – 30 mm (13/16 – 1-3/16 in)	
Clutch lever freeplay		10 – 20 mm (3/8 – 13/16 in)	
Cold tire pressure	Up to 90 kg (200 lbs) load	Front	200 kPa (2.00 kgf/cm <sup>2</sup> , 29 psi)
		Rear	200 kPa (2.00 kgf/cm <sup>2</sup> , 29 psi)
	Up to maximum weight capacity	Front	200 kPa (2.00 kgf/cm <sup>2</sup> , 29 psi)
		Rear	250 kPa (2.50 kgf/cm <sup>2</sup> , 36 psi)
Tire size (VT750C2F/C2S)	Front	90/90-21M/C 54S	
	Rear	160/80-15M/C 74S	
Tire size (VT750C2B)	Front	120/90-17M/C 64S	
	Rear	160/80-15M/C 74S	
Tire brand (VT750C2F/C2S)	BRIDGESTONE	Front	EXEDRA G701
		Rear	EXEDRA G702
	DUNLOP	Front	D404F
		Rear	D404
Tire brand (VT750C2B)	BRIDGESTONE	Front	G701
		Rear	G702
	DUNLOP	Front	D404FG
		Rear	D404
Minimum tire tread depth	Front	1.5 mm (0.06 in)	
	Rear	2.0 mm (0.08 in)	

**TORQUE VALUES**

Spark plug	18 N·m (1.8 kgf·m, 13 lbf·ft)
Valve adjusting screw lock nut	23 N·m (2.3 kgf·m, 17 lbf·ft)
Timing hole cap	10 N·m (1.0 kgf·m, 7 lbf·ft)
Engine oil filter cartridge	26 N·m (2.7 kgf·m, 19 lbf·ft)
Engine oil drain bolt	29 N·m (3.0 kgf·m, 21 lbf·ft)
Final drive oil filler cap	12 N·m (1.2 kgf·m, 9 lbf·ft)
Final drive oil drain bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Front master cylinder reservoir cap screw	1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)
Rear master cylinder reservoir cap screw (VT750C2S)	1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)
Rear master cylinder push rod lock nut (VT750C2S)	18 N·m (1.8 kgf·m, 13 lbf·ft)
Air cleaner cover socket bolt	1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)
Crankshaft hole cap	15 N·m (1.5 kgf·m, 11 lbf·ft)
Alternator cover socket bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)
Spoke	4.2 N·m (0.4 kgf·m, 3.1 lbf·ft)

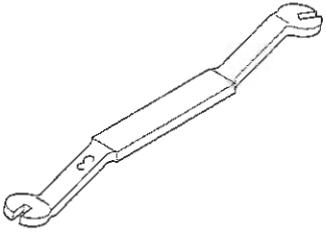
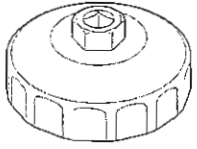
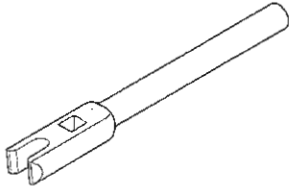
Apply engine oil to the threads and seating surface

Apply grease to the threads

Apply engine oil to the threads

Apply grease to the threads

**TOOLS**

<p>Valve adjusting wrench 07908-KE90000</p>  <p>or 07908-KE90100 (U.S.A. only) with 10-mm offset box wrench</p>	<p>Oil filter wrench 07HAA-PJ70101</p>  <p>or 07AMA-MFJA100 (U.S.A. only)</p>	<p>Spoke wrench 07JMA-MR60100</p> 
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## MAINTENANCE

# MAINTENANCE SCHEDULE

Perform the Pre-ride inspection in the Owner's Manual at each scheduled maintenance period.

I: Inspect and clean, adjust, lubricate or replace if necessary. C: Clean. R: Replace. A: Adjust. L: Lubricate.

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

ITEMS	FREQUENCY	ODOMETER READING (NOTE 1)								REFER TO PAGE	
		x 1,000 mi	0.6	4	8	12	16	20	24		
	NOTE	x 100 km	10	64	128	192	256	320	384		
EMISSION RELATED ITEMS	* FUEL LINE				I		I		I	3-5	
	* THROTTLE OPERATION				I		I		I	3-5	
	AIR CLEANER	NOTE 2				R			R	3-6	
	CRANKCASE BREATHER	NOTE 3			C	C	C	C	C	3-6	
	SPARK PLUG				I	R	I	R	I	3-7	
	* VALVE CLEARANCE			I		I		I		3-8	
	ENGINE OIL			INITIAL = 600 mi (1,000 km) or 1 month: R REGULAR = EVERY 8,000 mi (12,800 km) or 12 months: R							3-11
	ENGINE OIL FILTER			R		R		R		R	3-12
	RADIATOR COOLANT	NOTE 4				I		I		R	3-13
	* COOLING SYSTEM					I		I		I	3-13
* SECONDARY AIR SUPPLY SYSTEM					I		I		I	3-14	
* EVAPORATIVE EMISSION CONTROL SYSTEM	NOTE 5					I			I	3-15	
NON-EMISSION RELATED ITEMS	FINAL DRIVE OIL				I		I		R	3-15	
	BRAKE FLUID	NOTE 4			I	I	R	I	I	R	3-16
	BRAKE SHOES/PADS WEAR (VT750C2F/C2B)				I	I	I	I	I	3-19	
	BRAKE PAD WEAR (VT750C2S)				I	I	I	I	I	3-19	
	BRAKE SYSTEM			I		I		I		3-20	
	* BRAKE LIGHT SWITCH					I		I		3-22	
	* HEADLIGHT AIM					I		I		3-23	
	CLUTCH SYSTEM			I	I	I	I	I	I	3-23	
	SIDESTAND					I		I		3-24	
	* SUSPENSION					I		I		3-24	
* NUTS, BOLTS, FASTENERS			I		I		I		I	3-25	
** WHEELS/TIRES			I	I	I	I	I	I	I	3-25	
** STEERING HEAD BEARINGS			I		I		I		I	3-27	

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

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

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

### NOTES:

- At higher odometer reading, repeat at the frequency interval established here.
- Service more frequently when riding in unusually wet or dusty areas.
- Service more frequently when riding in rain or at full throttle.
- Replace every 2 years, or at indicated odometer interval, whichever comes first. Replacement requires mechanical skill.
- California type only.



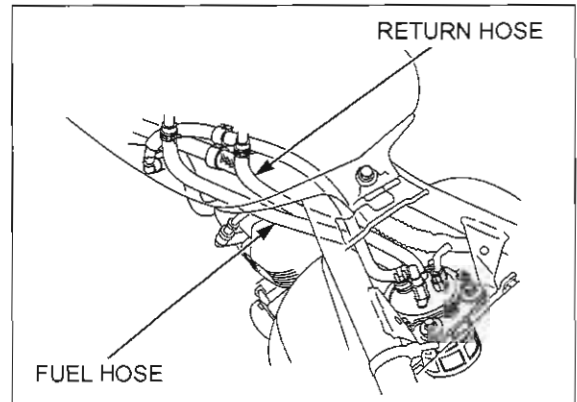
## FUEL LINE

Remove the seat (page 2-3).

Check the fuel line for deterioration, damage or leakage.

Also check the fuel hose and fuel vapor return hose (fuel tank to fuel pump).

Replace the fuel and fuel vapor return hoses if necessary.



## THROTTLE OPERATION

Check for any deterioration or damage to the throttle cables. Check 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.

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

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 freeplay and the throttle cable connection.

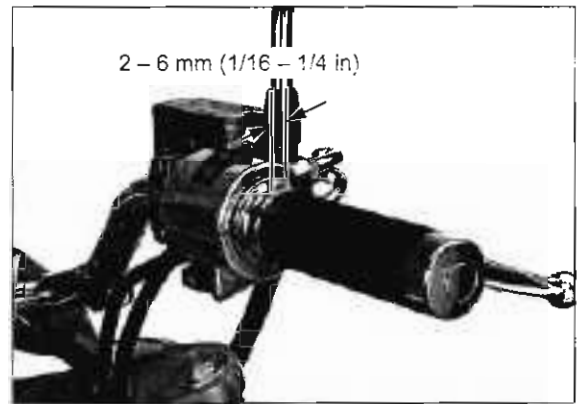
Measure the throttle grip freeplay at the throttle grip flange.

**FREEPLAY: 2 – 6 mm (1/16 – 1/4 in)**

Throttle grip freeplay can be adjusted at either end of the throttle cable.

Minor adjustment is made with the upper adjuster.

Loosen the lock nut, turn the adjuster as required. Tighten the lock nut while holding the adjuster.

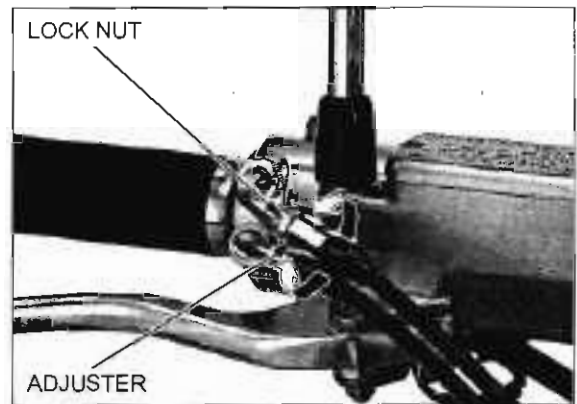


Major adjustment is made with the lower adjuster.

Remove the air cleaner housing (page 5-49).

Loosen the lock nut, turn the adjuster as required. Tighten the lock nut while holding the adjuster.

Recheck the throttle operation and install the air cleaner housing (page 5-49).



### AIR CLEANER

**NOTE:**

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

Remove the socket bolts and air cleaner cover.



Remove the air cleaner element from the air cleaner housing.

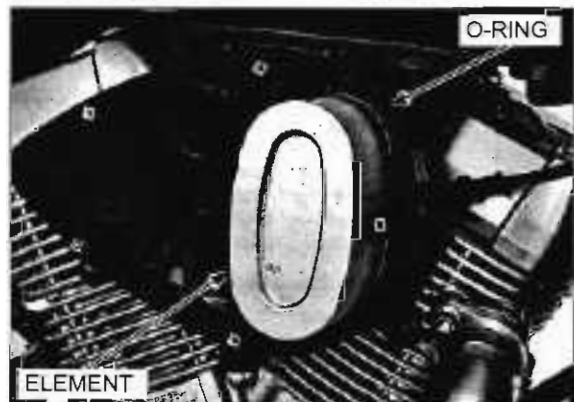
Make sure that the O-ring is installed in position and is in good condition, and replace it with a new one if necessary.

Replace the air cleaner element in accordance with the maintenance schedule (page 3-4) or any time it is excessively dirty or damaged.

Install the removed parts in the reverse order of removal.

**TORQUE:**

Air cleaner cover socket bolt:  
1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)



### CRANKCASE BREATHER

**NOTE:**

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

Remove the drain plug from the air cleaner housing and drain the deposits into a suitable container, then reinstall the drain plug securely.



# SPARK PLUG

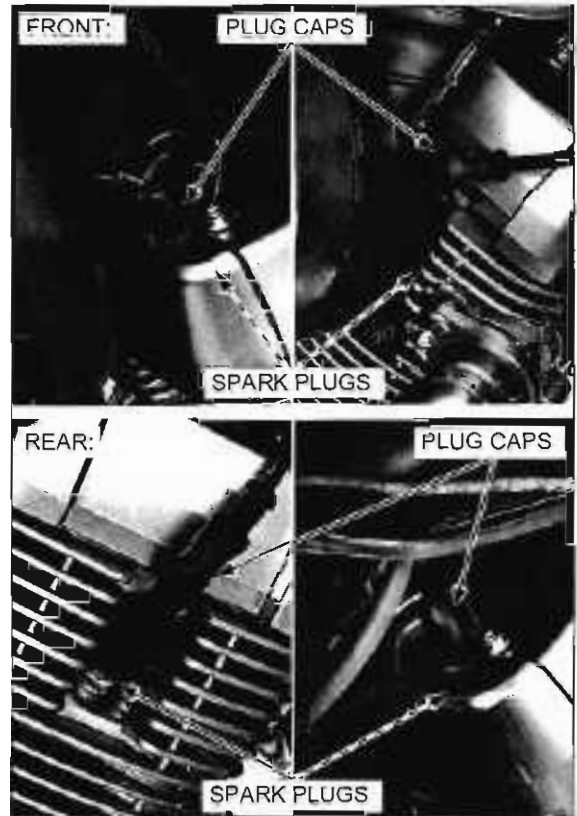
## REMOVAL

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 spark plugs, and be sure that no debris is allowed to enter into the combustion chamber.

Remove the spark plugs.



## INSPECTION

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

### RECOMMENDED SPARK PLUG:

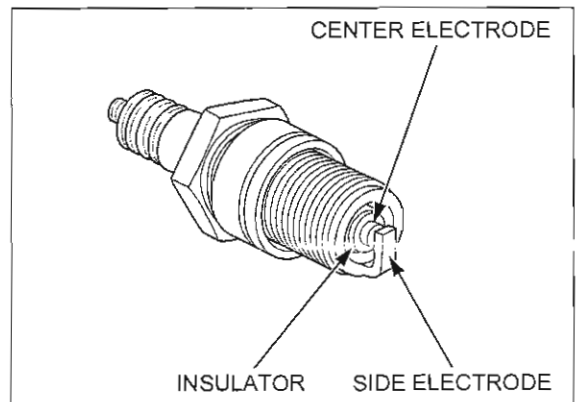
Standard:

DPR7EA-9 (NGK), X22EPR-U9 (DENSO)

For extended high speed riding:

DPR8EA-9 (NGK), X24EPR-U9 (DENSO)

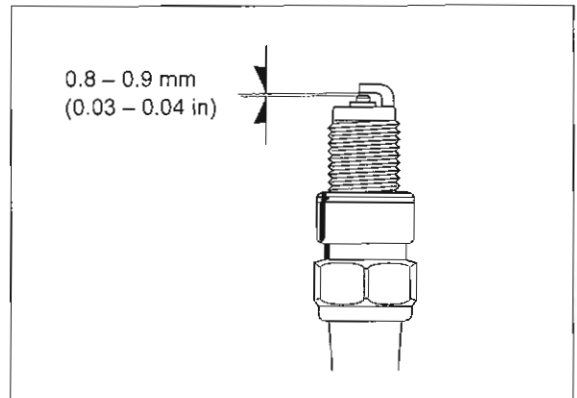
Clean the spark plug electrodes with a wire brush or special plug cleaner.



Check the spark plug gap between the center and side electrodes with a feeler gauge.

**SPARK PLUG GAP: 0.8 – 0.9 mm (0.03 – 0.04 in)**

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



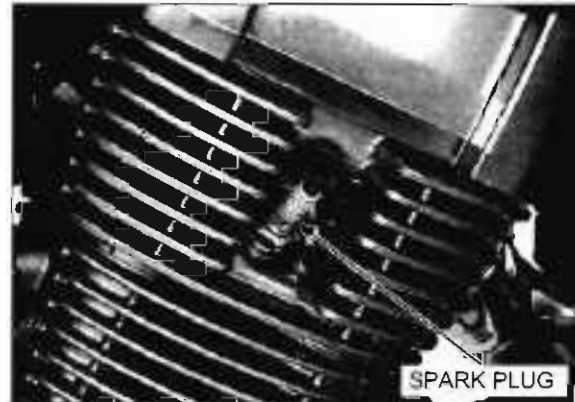
## MAINTENANCE

### INSTALLATION

Install and hand tighten the spark plug to the cylinder head, then tighten the spark plug to the specified torque.

**TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)**

Connect the spark plug caps.



## VALVE CLEARANCE

### INSPECTION

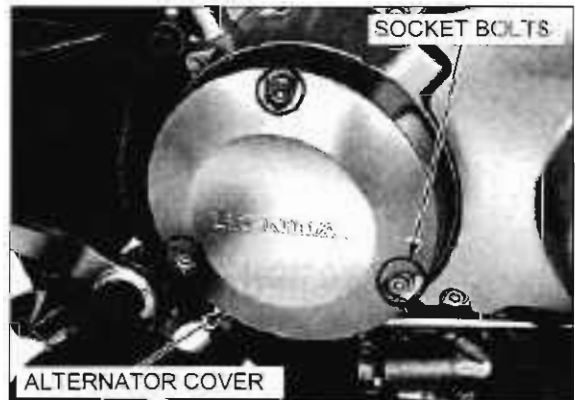
#### NOTE:

Check the engine idle speed (page 5-68) after the valve clearance inspection.

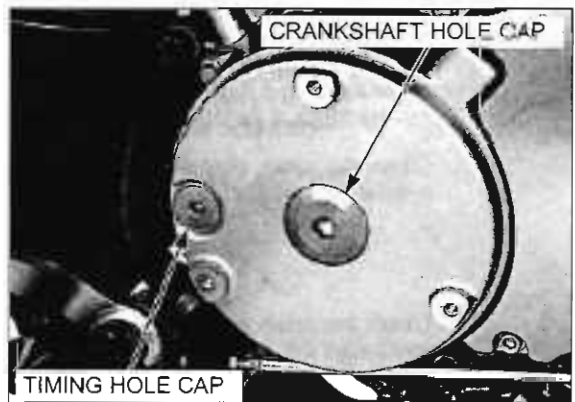
*Inspect and adjust the valve clearance while the engine is cold (below 35°C/95°F).*

Remove the cylinder head cover (page 8-6).

Remove the socket bolts and alternator cover.



Remove the timing and crankshaft hole caps.

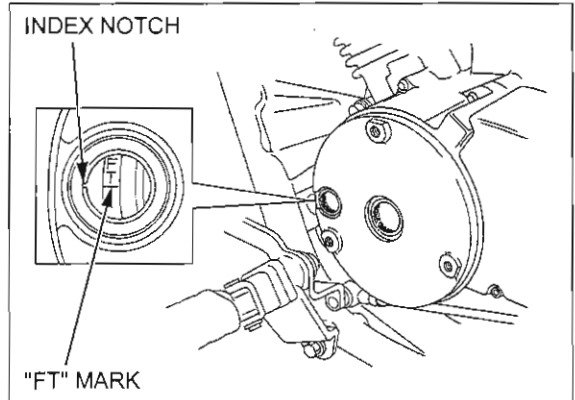


**FRONT**

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

Make sure the piston is at TDC (Top Dead Center) on the compression stroke.

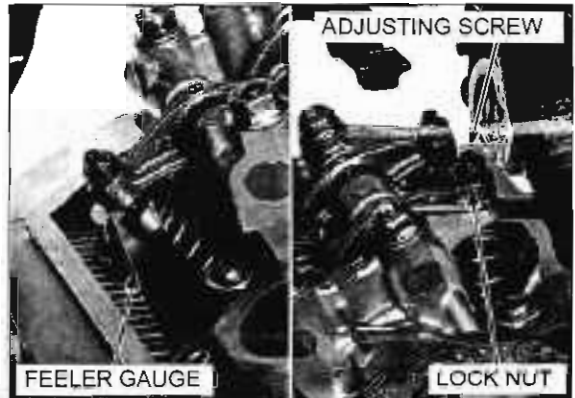
This position can be obtained by confirming that there is slack in the rocker arms. If there is no slack, rotate the crankshaft counterclockwise one full turn and align the "FT" mark with the index notch again.



When checking the valve clearance, slide the feeler gauge from the center toward the outside.

Check the valve clearances by inserting a feeler gauge between the valve adjusting screw and valve stem.

**VALVE CLEARANCES:**  
**IN:** 0.15 ± 0.02 mm (0.006 ± 0.001 in)  
**EX:** 0.20 ± 0.02 mm (0.008 ± 0.001 in)



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

**TOOL:**  
**Valve adjusting wrench** 07908-KE90000 with 10-mm offset box wrench

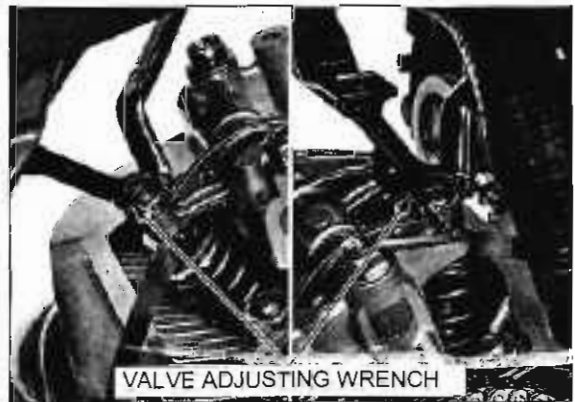
**U.S.A. TOOLS:**  
**Valve adjusting wrench, 4 mm** 07908-KE90100

Apply engine oil to the valve adjusting screw lock nut threads and seating surface.

Hold the valve adjusting screw and tighten the valve adjusting screw lock nut to the specified torque.

**TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)**

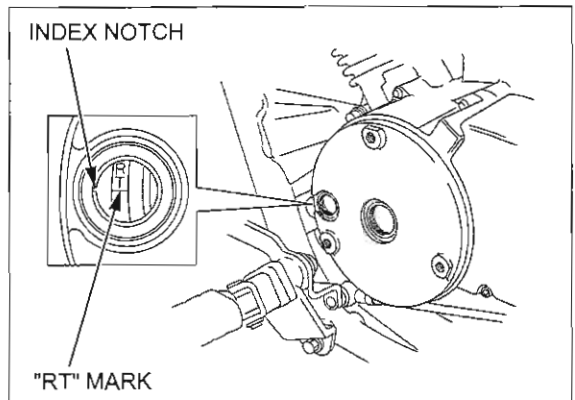
After tightening the valve adjusting screw lock nut, recheck the valve clearance.



**REAR**

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

Make sure the piston is at TDC (Top Dead Center) on the compression stroke.

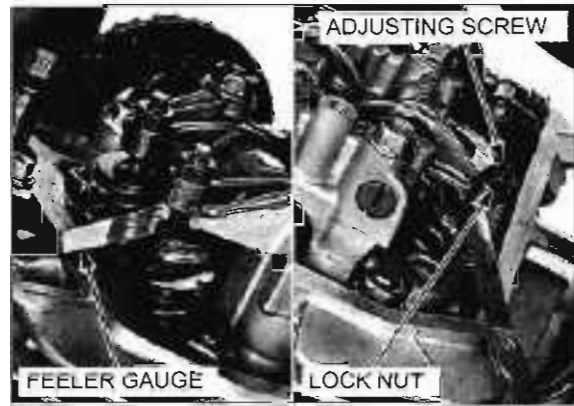


## MAINTENANCE

When checking the valve clearance, slide the feeler gauge from the center toward the outside.

Check the valve clearances by inserting a feeler gauge between the valve adjusting screw and valve stem.

**VALVE CLEARANCES:**  
**IN:**  $0.15 \pm 0.02$  mm ( $0.006 \pm 0.001$  in)  
**EX:**  $0.20 \pm 0.02$  mm ( $0.008 \pm 0.001$  in)



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

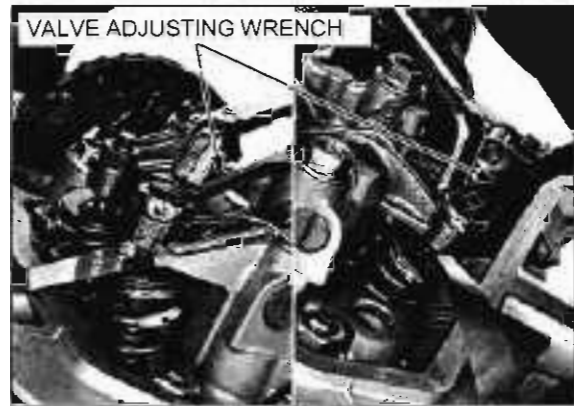
**TOOL:**  
Valve adjusting wrench 07908-KE90000  
with 10-mm offset  
box wrench

**U.S.A. TOOLS:**  
Valve adjusting wrench, 4 mm 07908-KE90100

Apply engine oil to the valve adjusting screw lock nut threads and seating surface.

Hold the valve adjusting screw and tighten the valve adjusting screw lock nut to the specified torque.

**TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)**



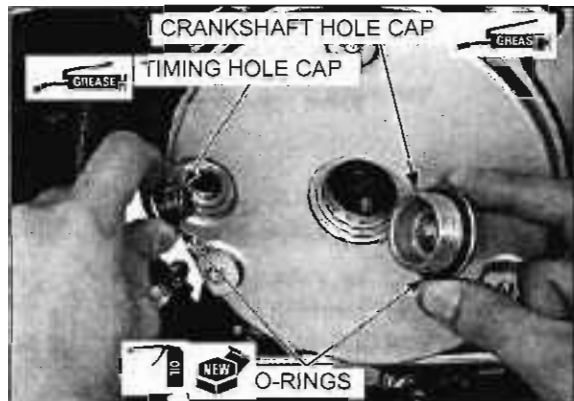
After tightening the valve adjusting screw lock nut, recheck the valve clearance.

Coat new O-rings with engine oil and install them into the timing and crankshaft hole cap grooves. Apply grease to the timing and crankshaft hole cap threads. Install the timing hole cap and tighten it to the specified torque.

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

Install the crankshaft hole cap and tighten it to the specified torque.

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



Install the alternator cover and tighten the socket bolts to the specified torque.

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

Install the cylinder head cover (page 8-30).

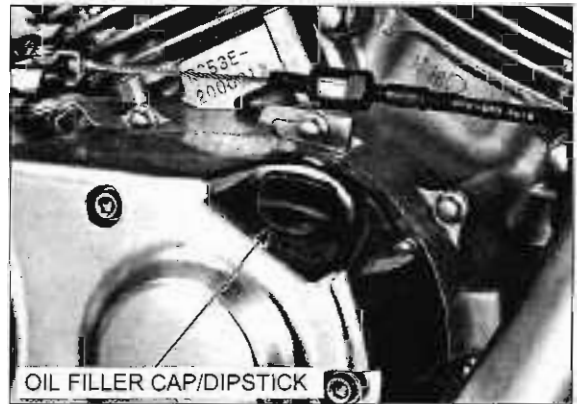


# ENGINE OIL

## OIL LEVEL CHECK

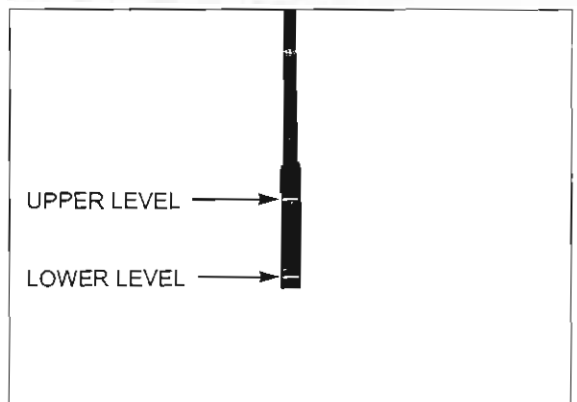
Start the engine, and let it idle for 3 – 5 minutes.  
 Stop the engine and wait 2 – 3 minutes.  
 Hold the motorcycle in an upright position.

Remove the oil filler cap/dipstick and wipe the oil from the dipstick with a clean cloth.  
 Insert the dipstick without screwing it in, remove it and check the oil level.



OIL FILLER CAP/DIPSTICK

If the oil level is below or near the lower level mark on the dipstick, add the recommended oil to the upper level mark.



## RECOMMENDED ENGINE OIL:

Pro Honda GN4 4-stroke oil (U.S.A. and Canada) or an equivalent

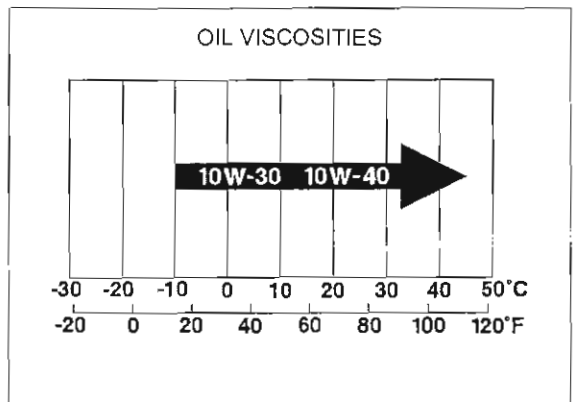
API service classification: SG or higher (except oils labeled as energy conserving on the circular API service label)

Viscosity: SAE 10W-30

JASO T 903 standard: MA

## NOTE:

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



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

Coat the O-ring with engine oil and install it.

Reinstall the oil filler cap/dipstick.

For engine oil change (page 3-12).



## MAINTENANCE

# ENGINE OIL FILTER

### NOTE:

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

Start the engine, warm it up and stop it.

Remove the oil filler cap/dipstick (page 3-11).

Remove the oil drain bolt, sealing washer and drain the oil.

Remove the oil filter cartridge using the special tool and let the remaining oil drain out.

### TOOL:

Oil filter wrench

07HAA-PJ70101  
or 07AMA-MFJA100  
(U.S.A. only)

Coat a O-ring with engine oil.

Apply engine oil to the threads of a new oil filter cartridge.

Install the oil filter cartridge and tighten it to the specified torque.

### TOOL:

Oil filter wrench

07HAA-PJ70101  
or 07AMA-MFJA100  
(U.S.A. only)

**TORQUE:** 26 N·m (2.7 kgf·m, 19 lbf·ft)

Install the oil drain bolt with a new sealing washer and tighten it to the specified torque.

**TORQUE:** 29 N·m (3.0 kgf·m, 21 lbf·ft)

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

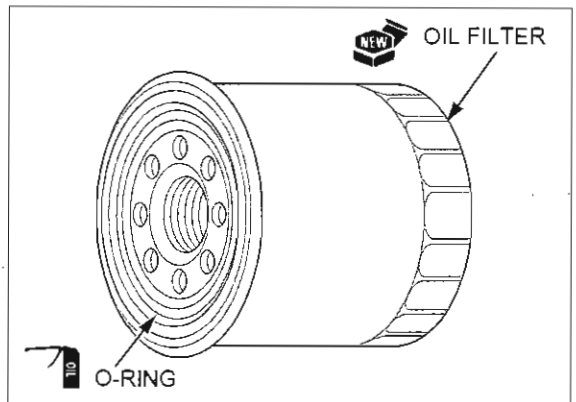
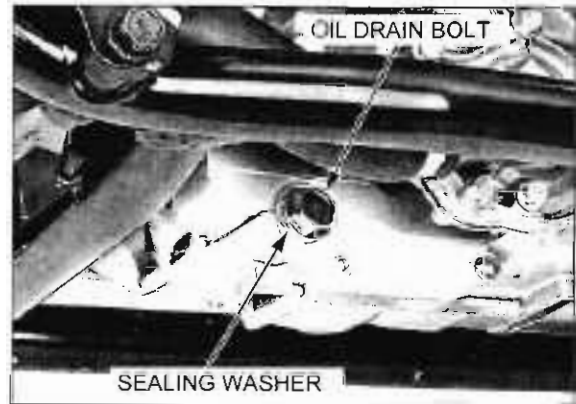
### OIL CAPACITY:

- 2.5 liters (2.6 US qt, 2.2 Imp qt) at draining
- 2.6 liters (2.7 US qt, 2.3 Imp qt) at oil filter change
- 3.2 liters (3.4 US qt, 2.8 Imp qt) at disassembly

Check the engine oil level (page 3-11).

Install the oil filler cap/dipstick (page 3-11).

Make sure there are no oil leaks.





## RADIATOR COOLANT

Check the coolant level of the reserve tank. The level should be between the "UPPER" and "LOWER" level lines with the motorcycle in an upright position.

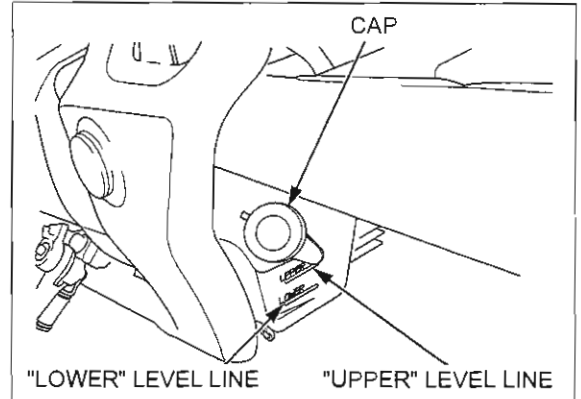
If the level is low, remove the reserve tank cap, and fill the tank to the "UPPER" level line with a 1 : 1 mixture of distilled water and antifreeze (coolant preparation: page 6-6).

### RECOMMENDED ANTIFREEZE:

**Pro Honda HP coolant or an equivalent high quality ethylene glycol antifreeze containing silicate-free corrosion inhibitors**

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

If the reserve tank becomes completely empty, there is a possibility of air getting into the cooling system. Be sure to remove any air from the cooling system (page 6-7).



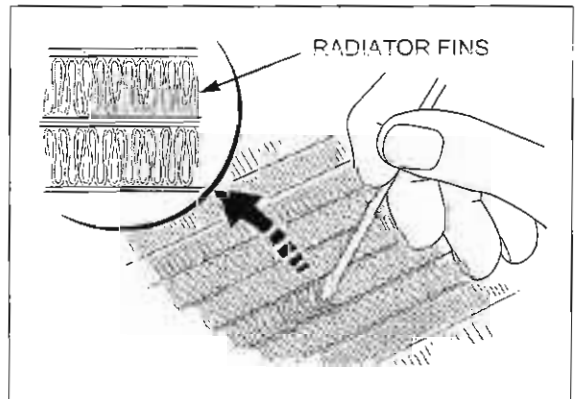
## COOLING SYSTEM

Check the radiator air passage for clogs or damage.



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

For radiator replacement (page 6-11).



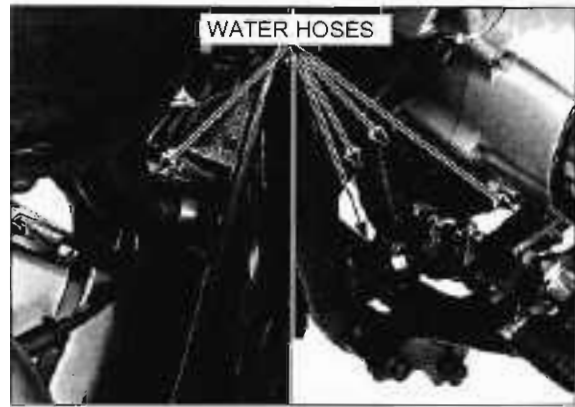
## MAINTENANCE

Remove the steering side covers (page 2-4).

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

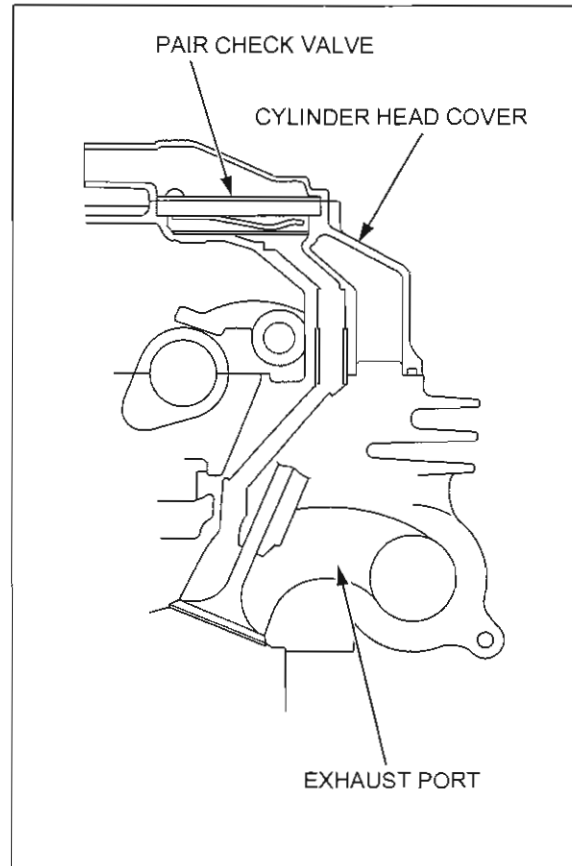
Check the radiator hoses for cracks or deterioration and replace if necessary.

Check that all water hose bands are tight (page 6-10).



## SECONDARY AIR SUPPLY SYSTEM

- This model is equipped with a built-in secondary air supply system. The pulse secondary air supply system is located on the cylinder head covers.
- The secondary air supply system introduces filtered air into exhaust gases in the exhaust port. The secondary air is drawn into the exhaust port whenever there is negative pressure pulse in the exhaust system. This charged secondary 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.



Remove the fuel tank (page 5-48).

*If the hoses show any signs of heat damage, inspect the PAIR check valves in the cylinder head covers for damage (page 5-72).*

Check the PAIR air supply hoses between the PAIR control solenoid valve and cylinder head cover for deterioration, damage or loose connections. Make sure that the hoses are not cracked.

Check the air suction hose between the air cleaner and PAIR control solenoid valve for deterioration, damage or loose connections.

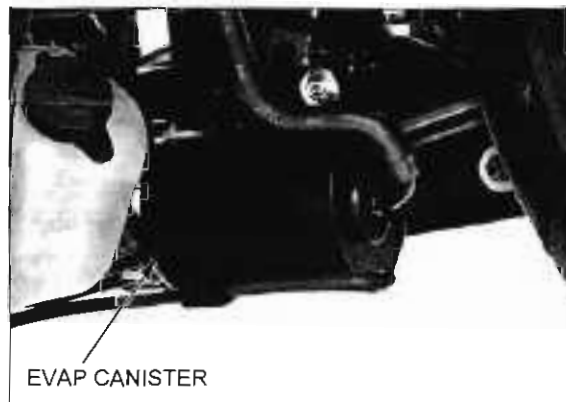
Make sure that the hoses are not kinked, pinched or cracked.



## EVAPORATIVE EMISSION CONTROL SYSTEM

Check the hoses between the fuel tank, EVAP canister, EVAP purge control valve for deterioration, damage or loose connections.

Check the EVAP canister for cracks or other damage.



## FINAL DRIVE OIL

### OIL LEVEL CHECK

Place the motorcycle on its sidestand on a level surface.

Remove the oil filler cap from the final gear case.



Check that the oil level is up to the lower edge of the oil filler hole.

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

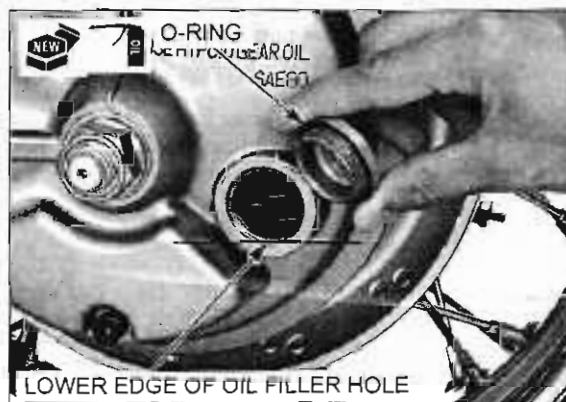
### RECOMMENDED FINAL DRIVE OIL:

**Hypoid gear oil, SAE #80**

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

Install and tighten the oil filler cap to the specified torque.

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



## MAINTENANCE

### OIL CHANGE

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

Remove the oil filler cap, drain bolt and sealing washer from the final gear case, slowly turn the rear wheel and drain the oil.

After the oil is completely drained, install the drain bolt with a new sealing washer and tighten it to the specified torque.

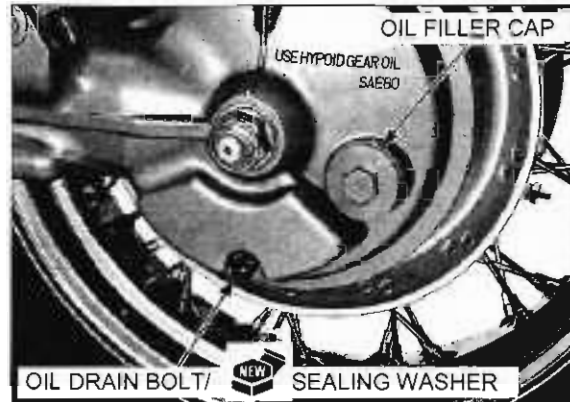
**TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)**

Fill the final gear case with the recommended final drive oil to the correct level (page 3-15).

#### OIL CAPACITY:

160 cm<sup>3</sup> (5.4 US oz, 5.6 Imp oz) at draining

170 cm<sup>3</sup> (5.7 US oz, 6.0 Imp oz) at disassembly



## BRAKE FLUID (VT750C2F/C2B)

### NOTICE

*Spilled fluid can damage painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.*

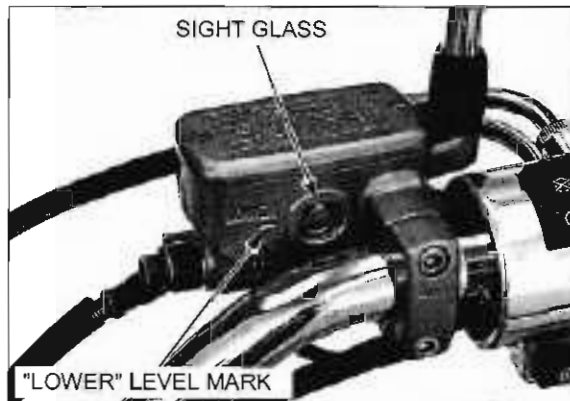
#### NOTE:

- 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.

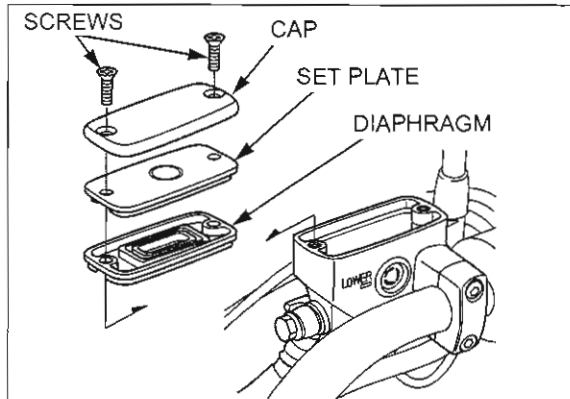
When the fluid level is low, check the brake pads for wear (page 3-19).

A low fluid level may be due to wear of the brake pads. If the brake pads are worn and the caliper pistons are pushed out, this accounts for a low reservoir level. If the brake pads are not worn and the fluid level is low, check the entire system for leaks (page 3-20).

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



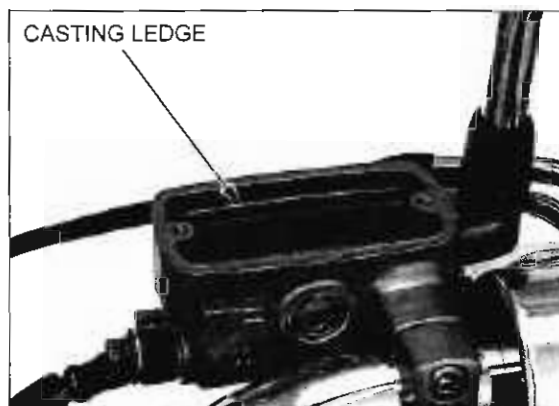
If the fluid level is near the "LOWER" level mark, remove the screws, reservoir cap, set plate and diaphragm.



Fill the reservoir with DOT 4 brake fluid from a sealed container to the casting ledge.

Install the diaphragm, set plate and reservoir cap, then tighten the cap screws to the specified torque.

**TORQUE: 1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)**



## BRAKE FLUID (VT750C2S)

### NOTICE

*Spilled fluid can damage painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.*

#### NOTE:

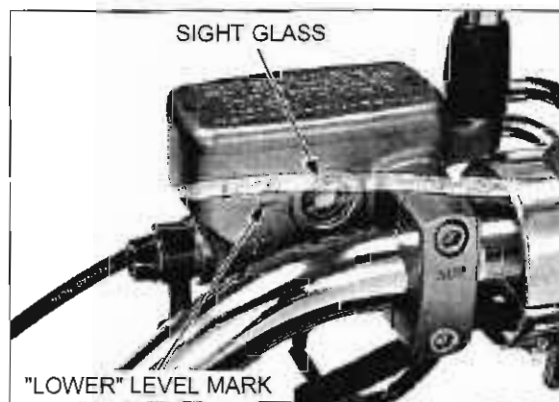
- Do not mix different types of fluid, as they are not compatible with each other.
- Do not allow foreign material to enter the system when filling the reservoir.

When the fluid level is low, check the brake pads for wear (page 3-19).

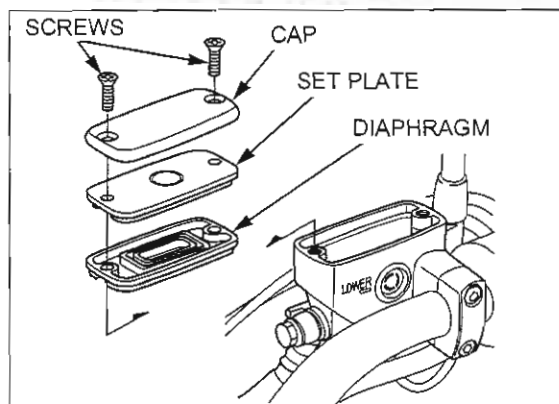
A low fluid level may be due to wear of the brake pads. If the brake pads are worn and the caliper pistons are pushed out, this accounts for a low reservoir level. If the brake pads are not worn and the fluid level is low, check the entire system for leaks (page 3-20).

### FRONT

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



If the fluid level is near the "LOWER" level mark, remove the screws, reservoir cap, set plate and diaphragm.

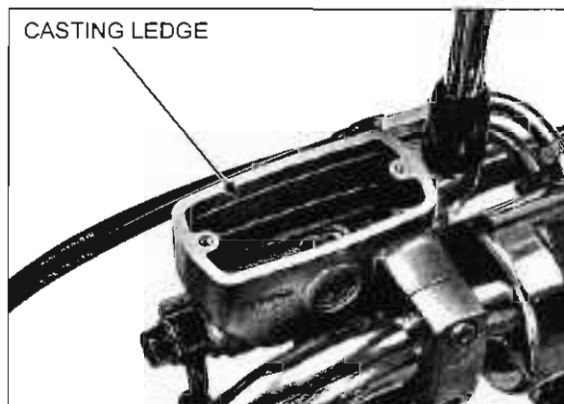


## MAINTENANCE

Fill the reservoir with DOT 4 brake fluid from a sealed container to the casting ledge.

Install the diaphragm, set plate and reservoir cap, then tighten the cap screws to the specified torque.

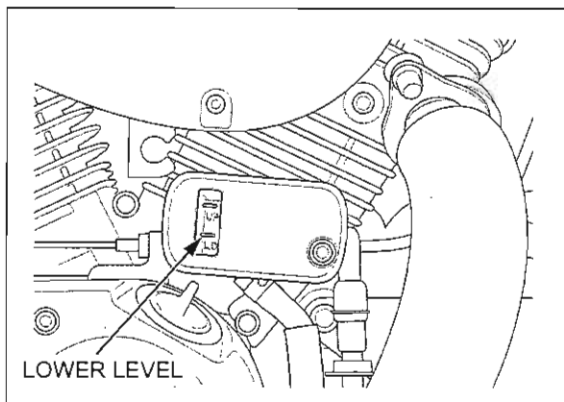
**TORQUE: 1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)**



## REAR

Support the motorcycle upright on a level surface.

Check the rear brake reservoir fluid level.



If the fluid level is near the "LOWER" level mark, remove the socket bolt and reservoir cover.

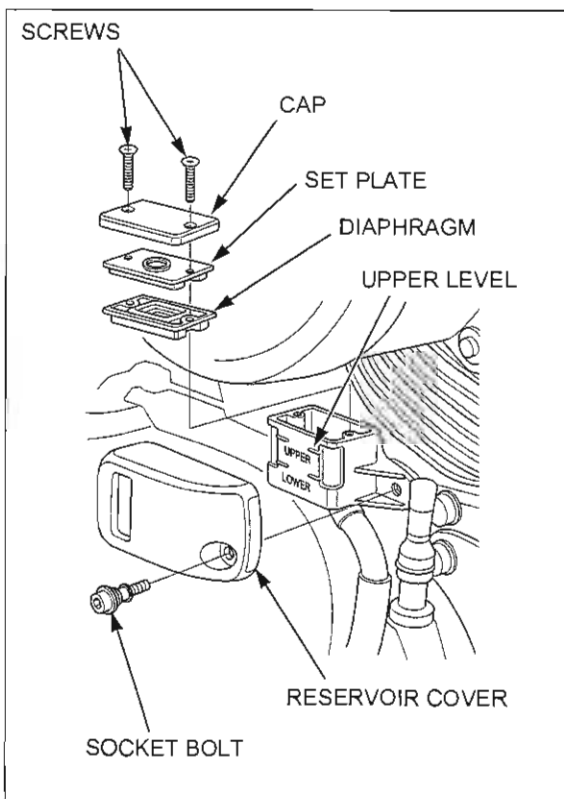
Remove the screws, reservoir cap, set plate and diaphragm.

Fill the reservoir with DOT 4 brake fluid from a sealed container to the casting ledge.

Install the diaphragm, set plate and reservoir cap, then tighten the cap screws to the specified torque.

**TORQUE: 1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)**

Install the reservoir cover and tighten the socket bolt securely.



## BRAKE SHOES/PADS WEAR (VT750C2F/C2B)

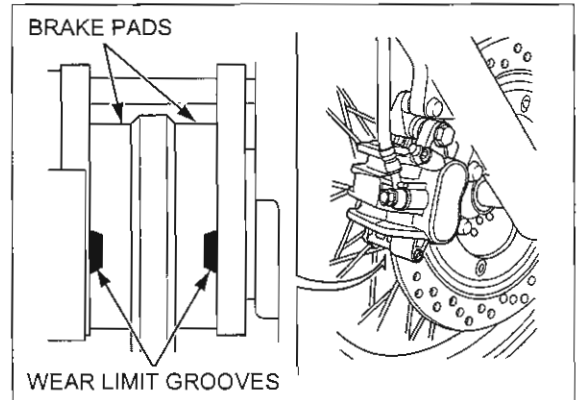
### FRONT BRAKE PADS

Check the brake pad for wear.

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

Replace the brake pads if either pad is worn to the wear limit grooves.

For brake pad replacement (page 16-16).



### REAR BRAKE SHOES

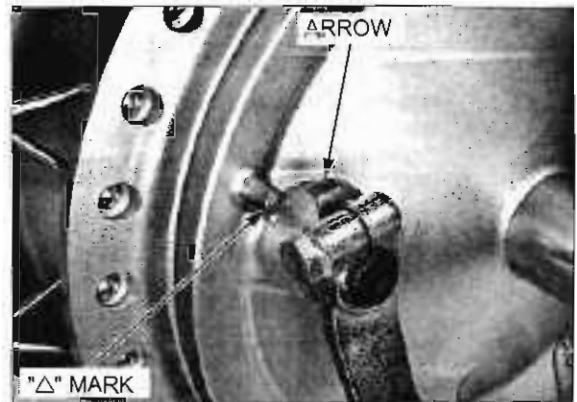
Check the indicator plate position when the brake pedal applied.

If the arrow on the indicator plate aligns with the "Δ" mark, inspect the brake drum (page 15-20).

If the brake drum I.D. is within the service limit, replace the brake shoes (page 15-20).

**NOTE:**

If no adjustment remains before the wear indicator limit is reached, this indicates excessive wear and the brake shoes need to be replaced.



## BRAKE PADS WEAR (VT750C2S)

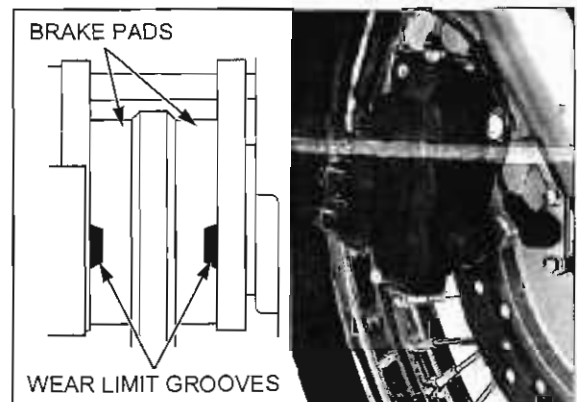
### FRONT BRAKE PADS

Check the brake pad for wear.

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

Replace the brake pads if either pad is worn to the wear limit grooves.

For brake pad replacement (page 16-16).



## MAINTENANCE

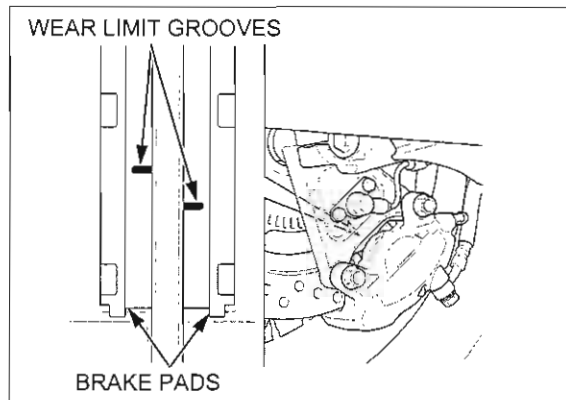
### REAR BRAKE PADS

Check the brake pad for wear.

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

Replace the brake pads if either pad is worn to the wear limit grooves.

For brake pad replacement (page 16-16).



### BRAKE SYSTEM (VT750C2F/C2B)

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

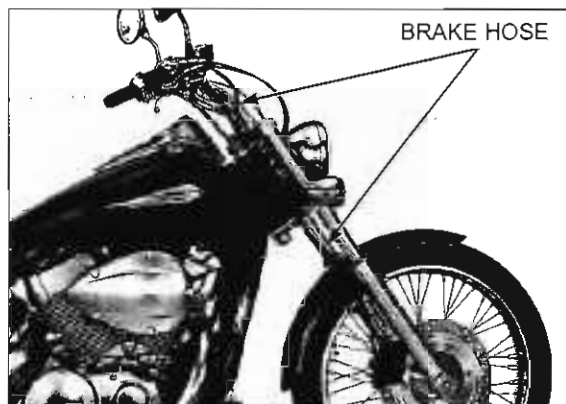
If the lever feels soft or spongy when operated, bleed the air from the system.

For air bleeding procedures (page 16-8).

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

Tighten any loose fittings.

Replace the hose and fittings as required.

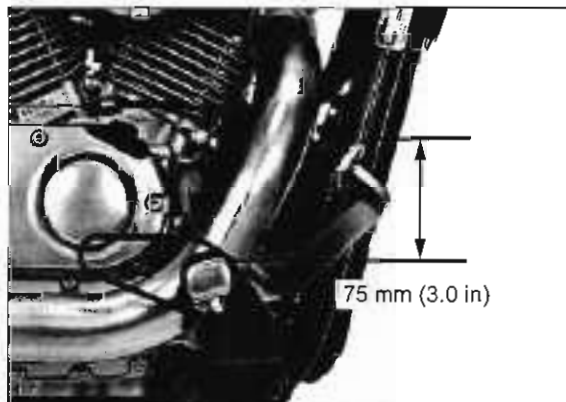


### BRAKE PEDAL HEIGHT

Check the brake pedal height.

#### BRAKE PEDAL HEIGHT:

75 mm (3.0 in) above the top of the footpeg



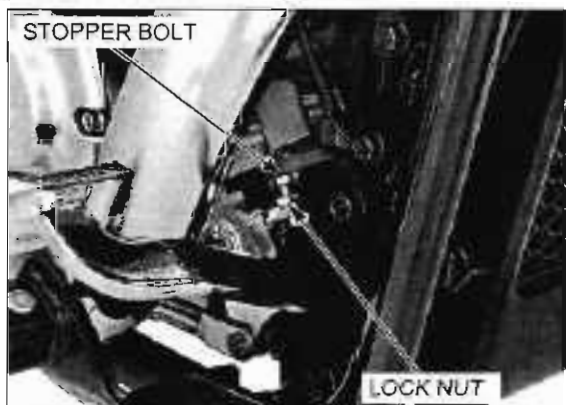
To adjust:

Loosen the lock nut and turn the stopper bolt as required.

Tighten the lock nut securely.

After adjusting the brake pedal height, check the following:

- Brake pedal freeplay (page 3-21)
- Rear brake light switch operation (page 3-22)





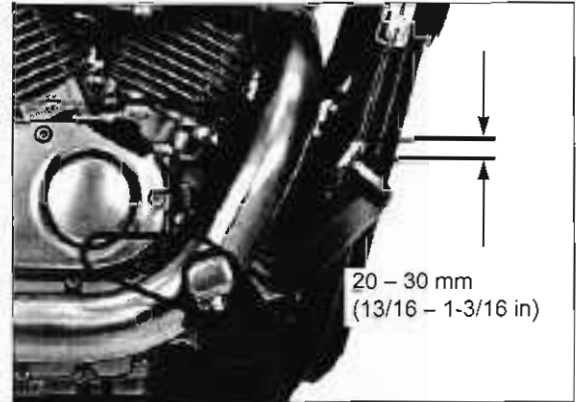
## BRAKE PEDAL FREEPLAY

**NOTE:**

Perform brake pedal freeplay adjustment after adjusting brake pedal height.

Check the brake pedal freeplay.

**FREEPLAY: 20 – 30 mm (13/16 – 1-3/16 in)**

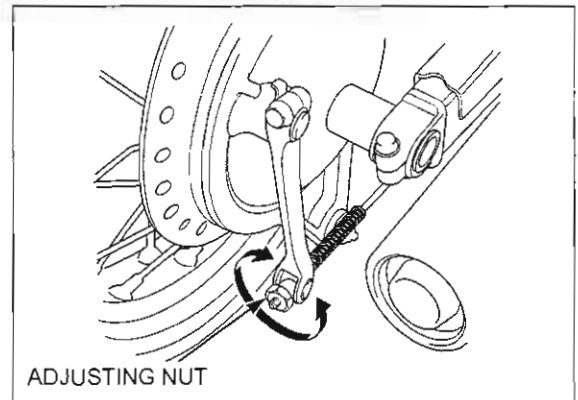


*Make sure the cut-out on the adjusting nut is seated on the joint pin.*

If necessary, adjust the brake pedal freeplay by turning the adjusting nut.

**NOTE:**

After adjusting the brake pedal freeplay, check the rear brake light switch operation (page 3-22).



## BRAKE SYSTEM (VT750C2S)

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

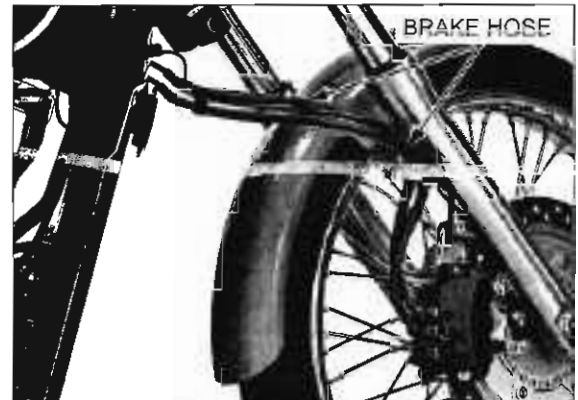
If the lever feels soft or spongy when operated, bleed the air from the system.

For air bleeding procedures (page 16-8).

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

Tighten any loose fittings.

Replace the hose and fittings as required.



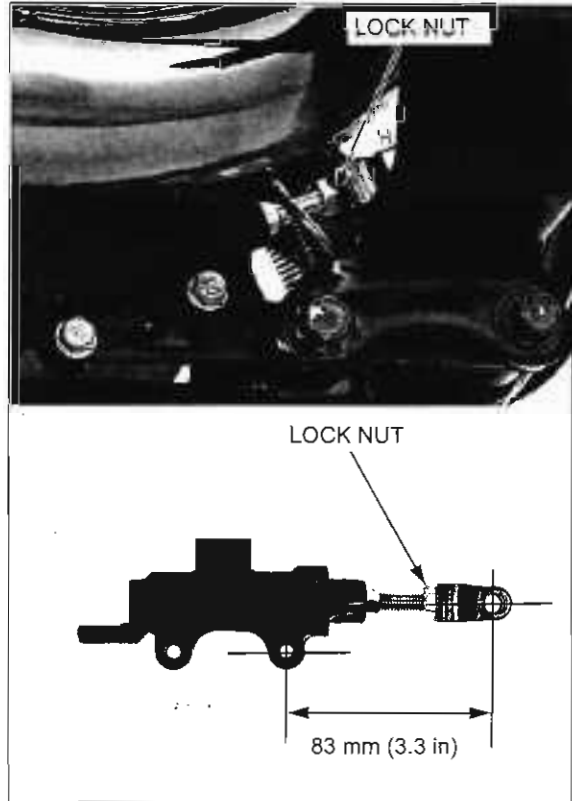
## MAINTENANCE

### BRAKE PEDAL HEIGHT ADJUSTMENT

Loosen the lock nut and turn the master cylinder push rod length as shown.

After adjustment, hold the adjusting bolt and tighten the lock nut.

**TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)**



### 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 not synchronized, either replace the switch unit or the malfunctioning parts of the system.
- Make the rear brake light switch adjustments after the brake pedal height adjustment and the brake pedal freeplay adjustment have been made.

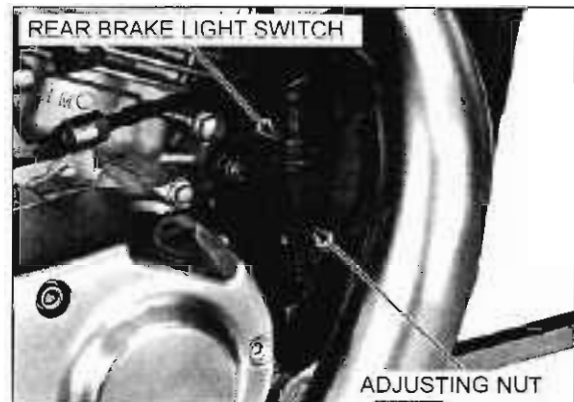
Check that the brake light comes on just prior to the brake actually being engaged.

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

*Do not turn the switch body while turning the adjusting nut.*

Hold the rear brake light switch body and turn the adjusting nut as required.

Recheck the rear brake light switch operation.



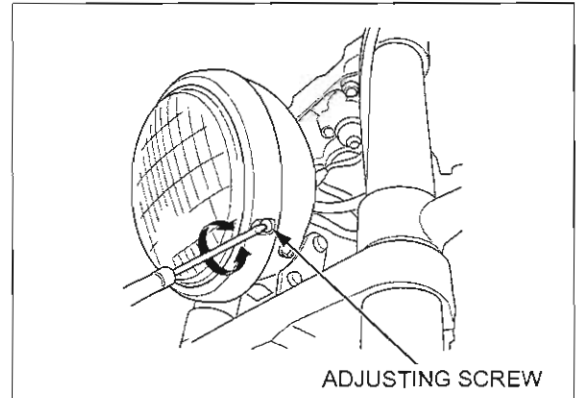
## HEADLIGHT AIM

**NOTE:**

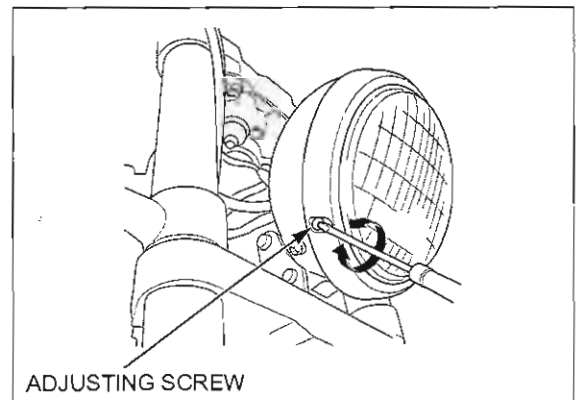
Adjust the headlight beam as specified by local laws and regulations.

Hold the motorcycle in an upright position.

Adjust horizontally by turning the horizontal adjusting screw.



Adjust vertically by turning the vertical adjusting screw.

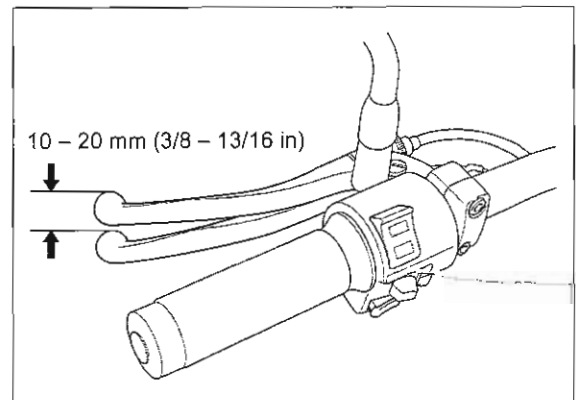


## CLUTCH SYSTEM

Inspect the clutch cable for kinks or damage, and lubricate the cable if necessary.

Measure the clutch lever freeplay at the end of the lever.

**FREEPLAY: 10 – 20 mm (3/8 – 13/16 in)**



## MAINTENANCE

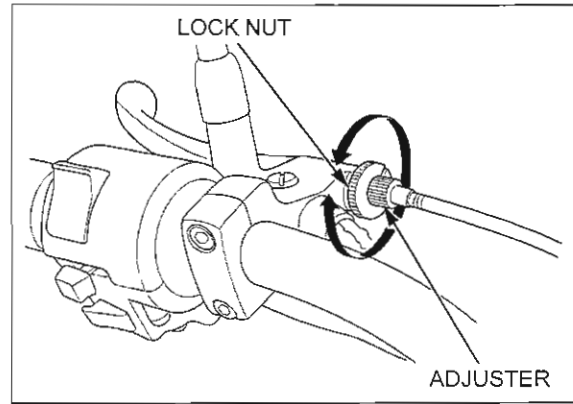
*The adjuster may be damaged if it is positioned too far out, leaving minimal thread engagement.*

Minor adjustment is made with the upper adjuster at the clutch lever.

Loosen the lock nut and turn the adjuster as required. Tighten the lock nut while holding the adjuster.

If the adjuster is threaded out near its limit and the correct freeplay cannot be obtained, turn the adjuster all the way in and back out one turn.

Tighten the lock nut and make major adjustment (page 3-24).



Major adjustment is made with the lower adjusting nut at the engine.

Loosen the lock nut and turn the adjusting nut as required.

After adjustment is complete, tighten the lock nut while holding the adjusting nut.

Check the clutch operation.

If the freeplay cannot be obtained, or the clutch slips during the test ride, disassemble and inspect the clutch (page 10-7).



## SIDESTAND

Hold the motorcycle in an upright position.

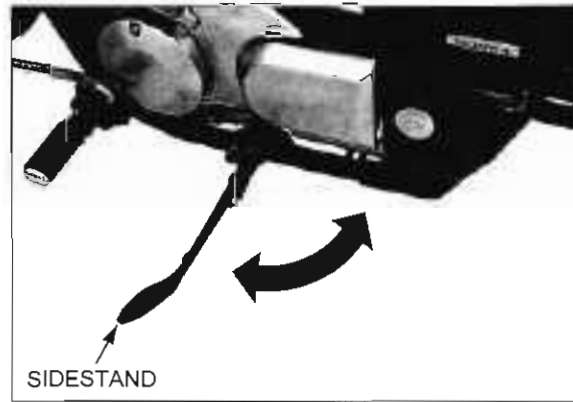
Check the sidestand spring for damage or loss of tension.

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

Check the sidestand ignition cut-off system:

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

If there is a problem with the system, check the sidestand switch (page 21-26).



## SUSPENSION

### FRONT SUSPENSION INSPECTION

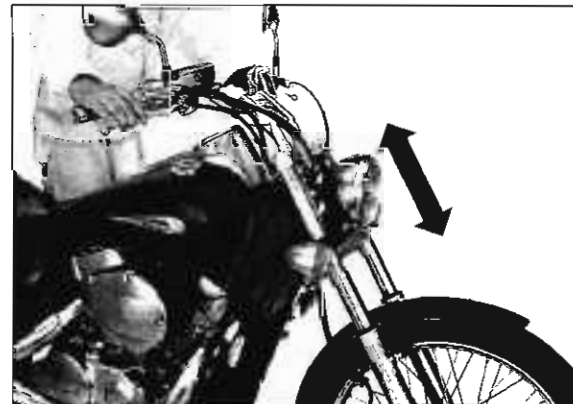
Check the action of the forks by applying the front brakes and compressing the front suspension several times.

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

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

For fork service (page 14-24).



## REAR SUSPENSION INSPECTION

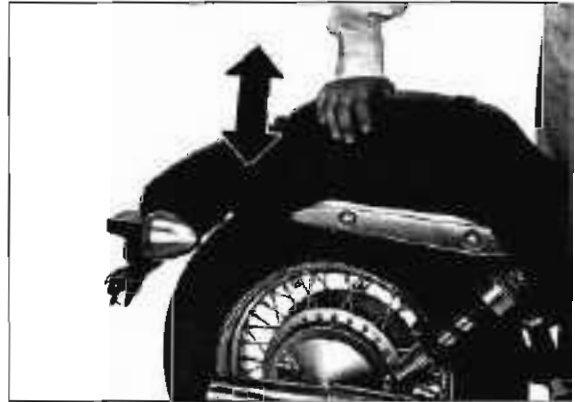
Check the action of the shock absorbers by compressing them several times.

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

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

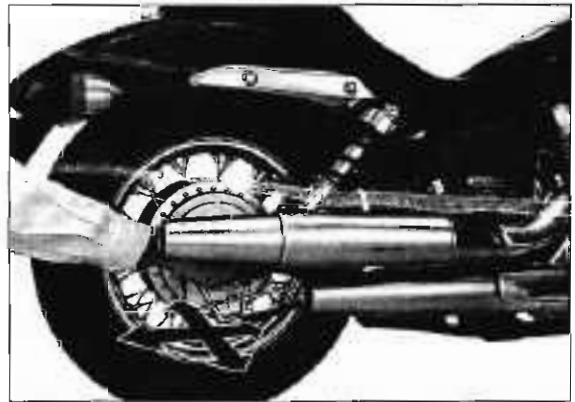
For shock absorber service (page 15-27).



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

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

Replace the bearings if any looseness is noted (page 15-28).



## NUTS, BOLTS, FASTENERS

Check that all chassis nuts and bolts are tightened to their correct torque values (page 1-16).

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

## WHEELS/TIRES

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

Hold the front fork leg and move the front wheel sideways forcefully to see if the wheel bearings are worn.

For front wheel service (page 14-17).

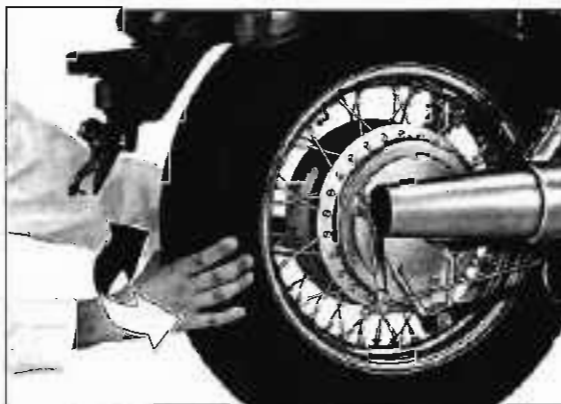


## MAINTENANCE

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

Hold the swingarm and move the rear wheel sideways with the force to see if the wheel bearings are worn.

For rear wheel service (page 15-7).



Inspect the spokes for looseness by tapping them with a screwdriver.

*Tap on the spokes and be sure that the same clear metallic sound can be heard on all spokes.*

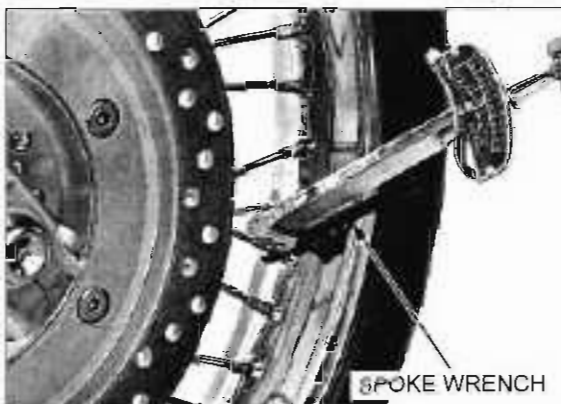
If a spoke does not sound clearly, or if it sounds different from the other spokes, tighten it to the specified torque.

**TOOL:**

**Spoke wrench**

**07JMA-MR60100**

**TORQUE: 4.2 N·m (0.4 kgf·m, 3.1 lbf·ft)**



Check the tire pressure with a tire pressure gauge when the tires are cold.

**RECOMMENDED TIRE PRESSURE:**

Up to 90 kg (200lbs) load:

Front: 200 kPa (2.00 kgf/cm<sup>2</sup>, 29 psi)

Rear: 200 kPa (2.00 kgf/cm<sup>2</sup>, 29 psi)

Up to maximum weight capacity:

Front: 200 kPa (2.00 kgf/cm<sup>2</sup>, 29 psi)

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



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

Check the front and rear wheels for trueness.

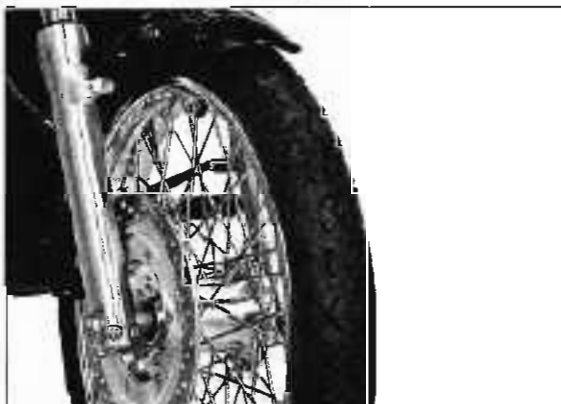
Measure the tread depth at the center of the tires.

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

**MINIMUM TIRE TREAD DEPTH:**

Front: 1.5 mm (0.06 in)

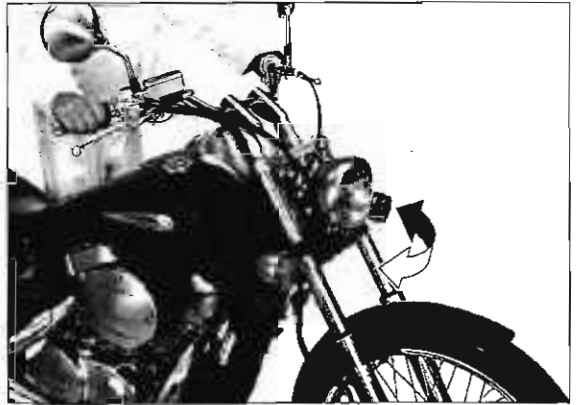
Rear: 2.0 mm (0.08 in)



## STEERING HEAD BEARINGS

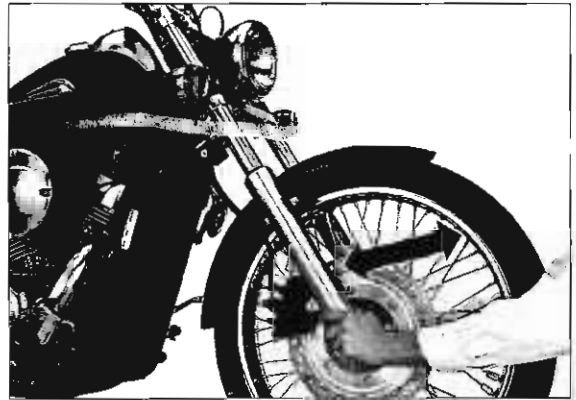
Support the motorcycle securely and raise the front wheel off the ground.

Check that the handlebar moves freely from side to side. Make sure the control cables do not interfere with the handlebar rotation.



Check for steering stem bearings by grabbing the fork legs and attempting to move the front fork side to side.

If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering head bearings (page 14-36).



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MEMO

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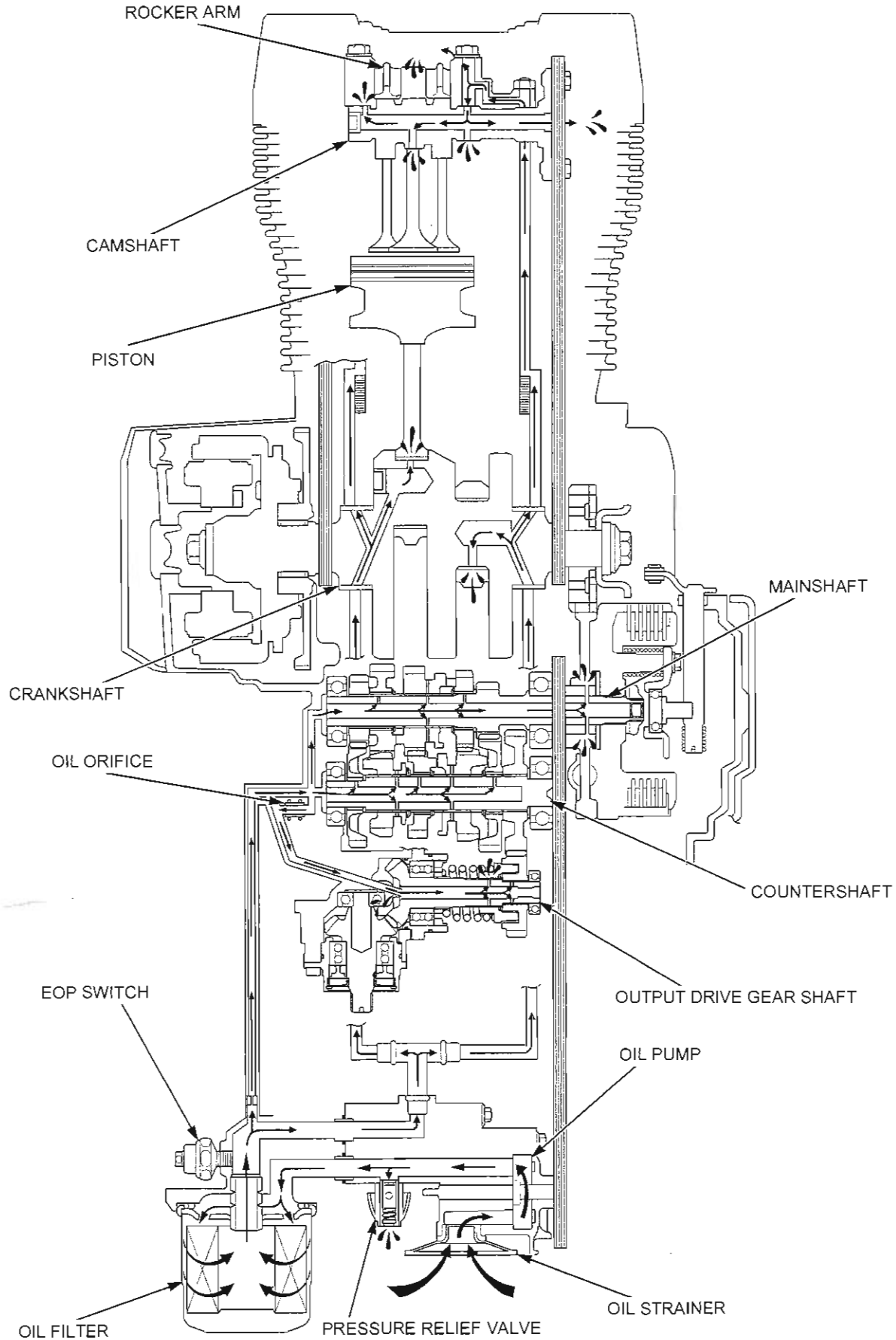
# 4. LUBRICATION SYSTEM

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LUBRICATION SYSTEM DIAGRAM .....	4-2	OIL PRESSURE INSPECTION .....	4-5
SERVICE INFORMATION .....	4-3	OIL PUMP .....	4-6
TROUBLESHOOTING.....	4-4		

# LUBRICATION SYSTEM

## LUBRICATION SYSTEM DIAGRAM



**SERVICE INFORMATION****GENERAL****⚠ CAUTION**

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

- The crankcase must be separated to service the oil pump.
- When removing and installing the oil pump, use care not to allow dust or dirt to enter the engine.
- If any portion of the oil pump is worn beyond the specified service limits, replace the oil pump as an assembly.
- After the oil pump has been installed, check that oil pressure is correct.
- For engine oil level check (page 3-11).
- For engine oil and filter change (page 3-12).
- For oil pressure indicator inspection (page 21-20).

**SPECIFICATIONS**

ITEM		STANDARD	Unit: mm (in) SERVICE LIMIT
Engine oil capacity	At draining	2.5 liters (2.6 US qt, 2.2 Imp qt)	—
	At oil filter change	2.6 liters (2.7 US qt, 2.3 Imp qt)	—
	At disassembly	3.2 liters (3.4 US qt, 2.8 Imp qt)	—
Recommended engine oil		Pro Honda GN4 4-stroke oil (U.S.A. and Canada) or an equivalent API service classification: SG or higher (except oils labeled as energy conserving on the circular API service label) Viscosity: SAE 10W-30 JASO T 903 standard: MA	—
Oil pressure at EOP switch		530 kPa (5.4 kgf/cm <sup>2</sup> , 77 psi) at 5,000 rpm/(80°C/176°F)	—
Oil pump rotor	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 – 0.08 (0.001 – 0.003)	0.10 (0.004)

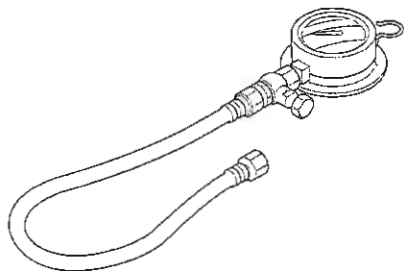
**TORQUE VALUES**

EOP switch	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply sealant to the threads
EOP switch terminal screw	1.9 N·m (0.2 kgf·m, 1.4 lbf·ft)	
Oil pump assembly bolt	13 N·m (1.3 kgf·m, 10 lbf·ft)	

## LUBRICATION SYSTEM

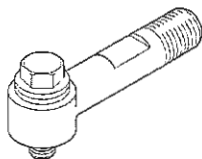
### TOOLS

Oil pressure gauge set  
07506-3000001



or equivalent commercially available

Oil pressure gauge attachment  
07510-4220100



or equivalent commercially available

## 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 and/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 INSPECTION

Remove the left crankcase rear cover (page 2-4).

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

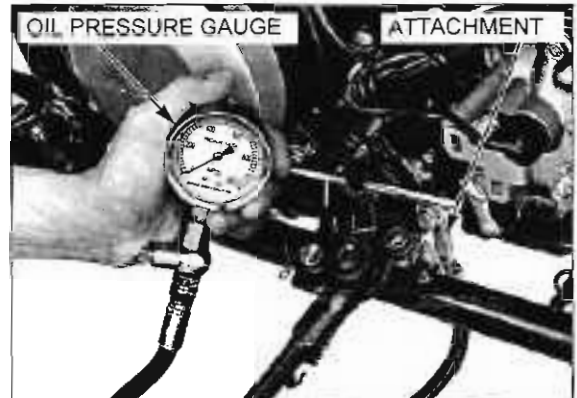
Remove the rubber cap and disconnect the EOP switch wire by removing the terminal screw.



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

**TOOLS:**

- |   |   |
|---|---|
| <p><b>Oil pressure gauge set</b></p>        | <p>07506-3000001<br/>or equivalent commercially available<br/>(Snap-On MT37A Gauge set)</p>             |
| <p><b>Oil pressure gauge attachment</b></p> | <p>07510-4220100<br/>or equivalent commercially available<br/>(Snap-On AT77AH Oil Pressure Adaptor)</p> |



Check the oil level and add the recommended engine oil if necessary (page 3-11).

Start the engine and check the oil pressure at 5,000 rpm.

**OIL PRESSURE:**

530 kPa (5.4 kgf/cm<sup>2</sup>, 77 psi) at 5,000 rpm (80°C/176°F)

Stop the engine.

*Do not apply sealant to the thread head 3 – 4 mm (0.1 – 0.2 in).*

Apply liquid sealant (Three Bond 1207B or equivalent) to the EOP switch threads as shown and tighten it to the specified torque.

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

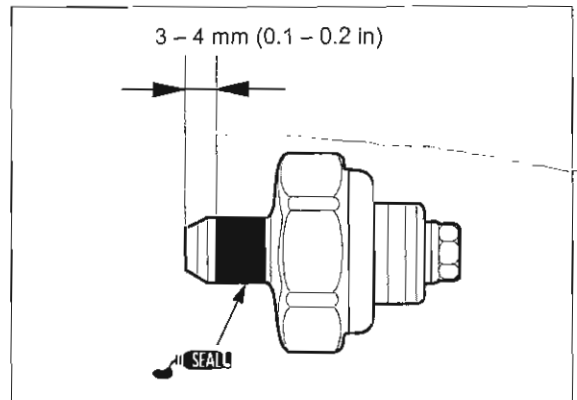
Connect the EOP switch wire and tighten the terminal screw to the specified torque.

**TORQUE: 1.9 N·m (0.2 kgf·m, 1.4 lbf·ft)**

Install the rubber cap.

Start the engine.

Check that the oil pressure indicator turns off after 1 or 2 seconds. If the oil pressure indicator stays on, stop the engine immediately and determine the cause (page 21-20).

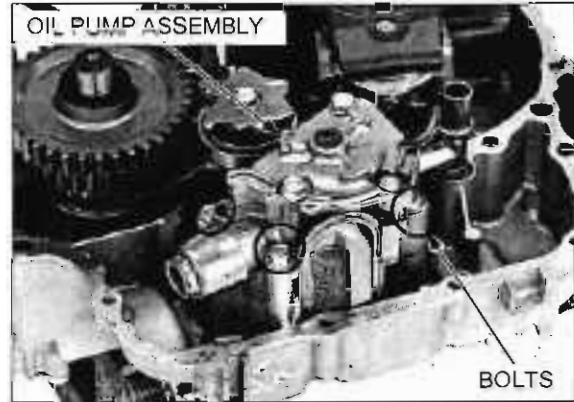


# OIL PUMP

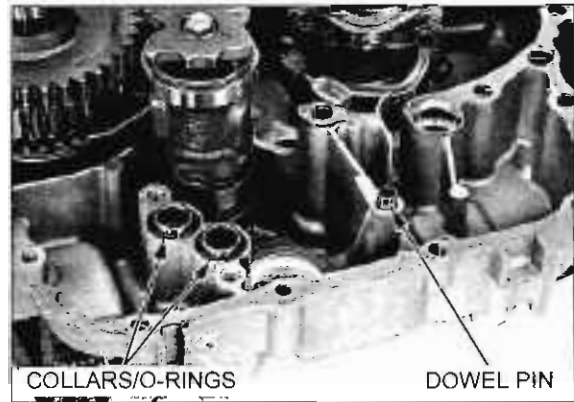
## REMOVAL

Separate the crankcase (page 12-9).

Remove the bolts and oil pump assembly from the left crankcase.



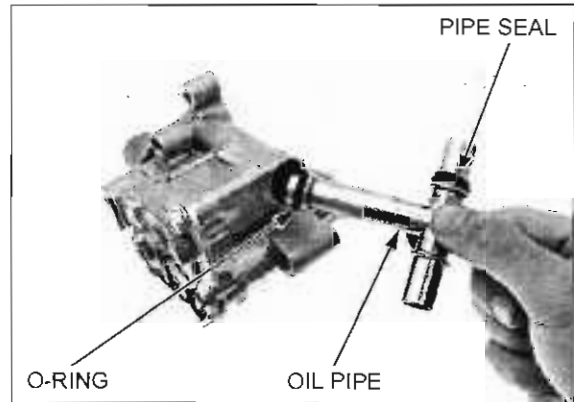
Remove the dowel pin, collars and O-rings.



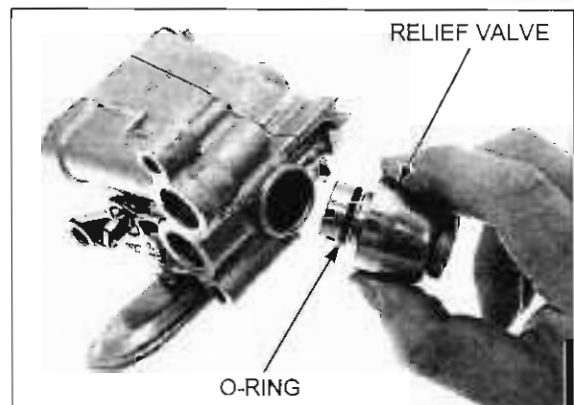
## DISASSEMBLY

### OIL PUMP BODY

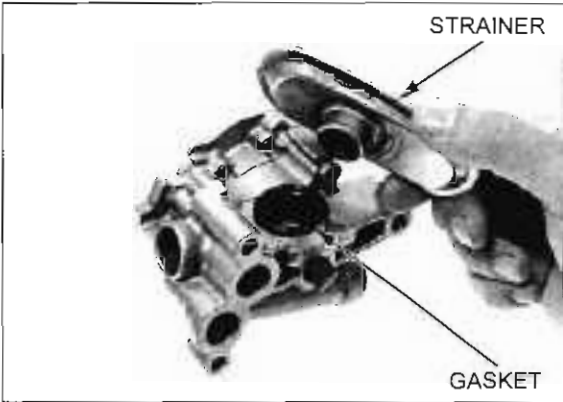
Remove the oil pipe, oil pipe seal and O-ring.



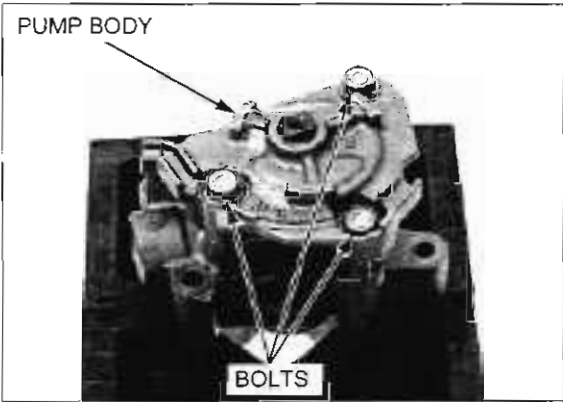
Remove the pressure relief valve and O-ring.



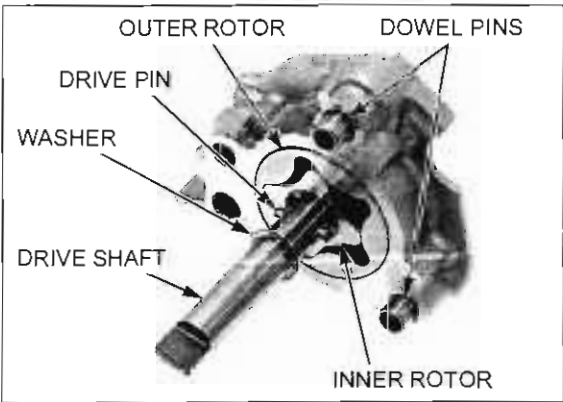
Remove the oil strainer and gasket.



Remove the assembly bolts and pump body from the pump cover.



Remove the dowel pins.  
Remove the washer, drive shaft, drive pin, inner and outer rotors.

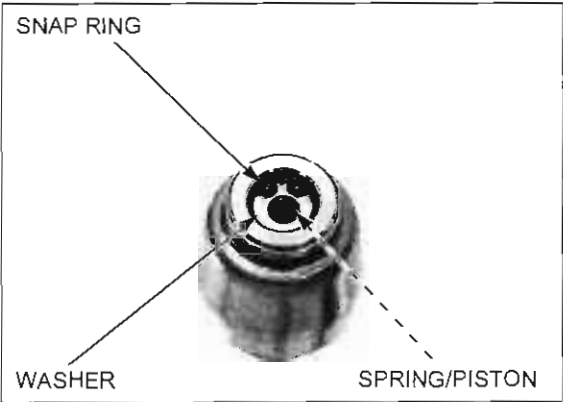


**PRESSURE RELIEF VALVE**

Check the operation of the pressure relief valve by pushing on the piston.

Remove the snap ring, washer, spring and piston from the pressure relief valve body.

*The snap ring is under spring pressure. Use care when removing it and wear eye and face protection. Be careful not to lose the disassembled parts.*



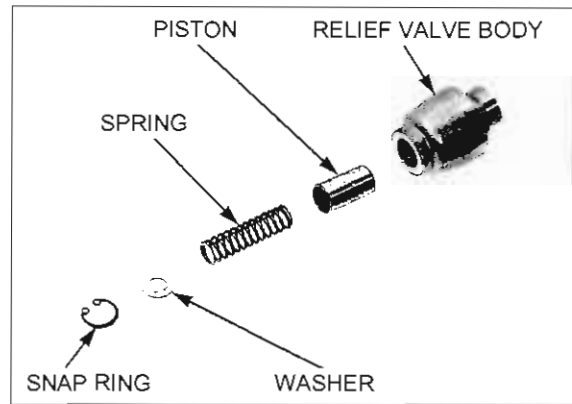
## LUBRICATION SYSTEM

Check the piston for wear, sticking or damage.  
Check the valve spring for wear or fatigue.  
Check the relief valve body for clogging or damage.

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

### NOTE:

- Install the snap ring with the chamfered edge facing the thrust load side.
- Do not reuse worn snap ring which could easily spin in the groove.
- Check that the snap ring is seated in the groove.



## INSPECTION

### NOTE:

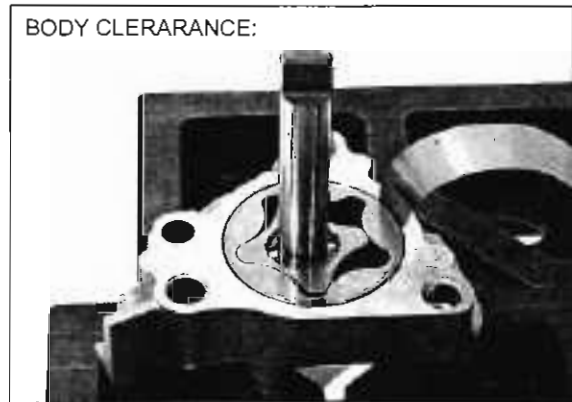
Measure each clearance at several points and use the largest reading to compare the service limit.

### BODY CLEARANCE

Temporarily assemble the inner rotor, outer rotor, drive pin and pump shaft into the pump body.

Measure the body clearance.

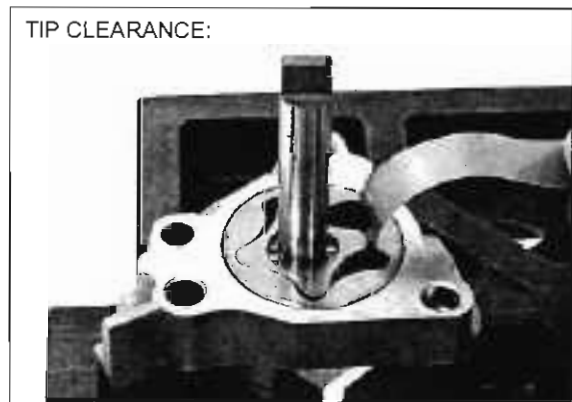
**SERVICE LIMIT: 0.35 mm (0.014 in)**



### TIP CLEARANCE

Measure the tip clearance.

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

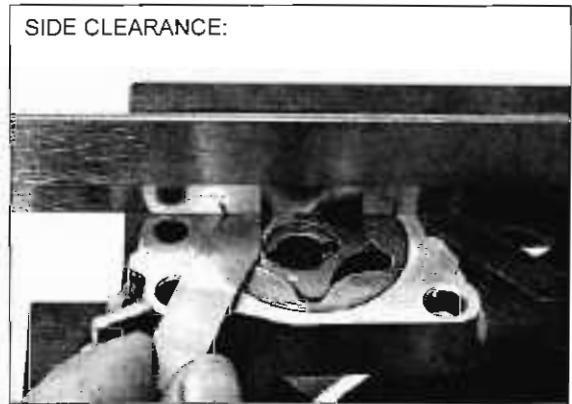




**SIDE CLEARANCE**

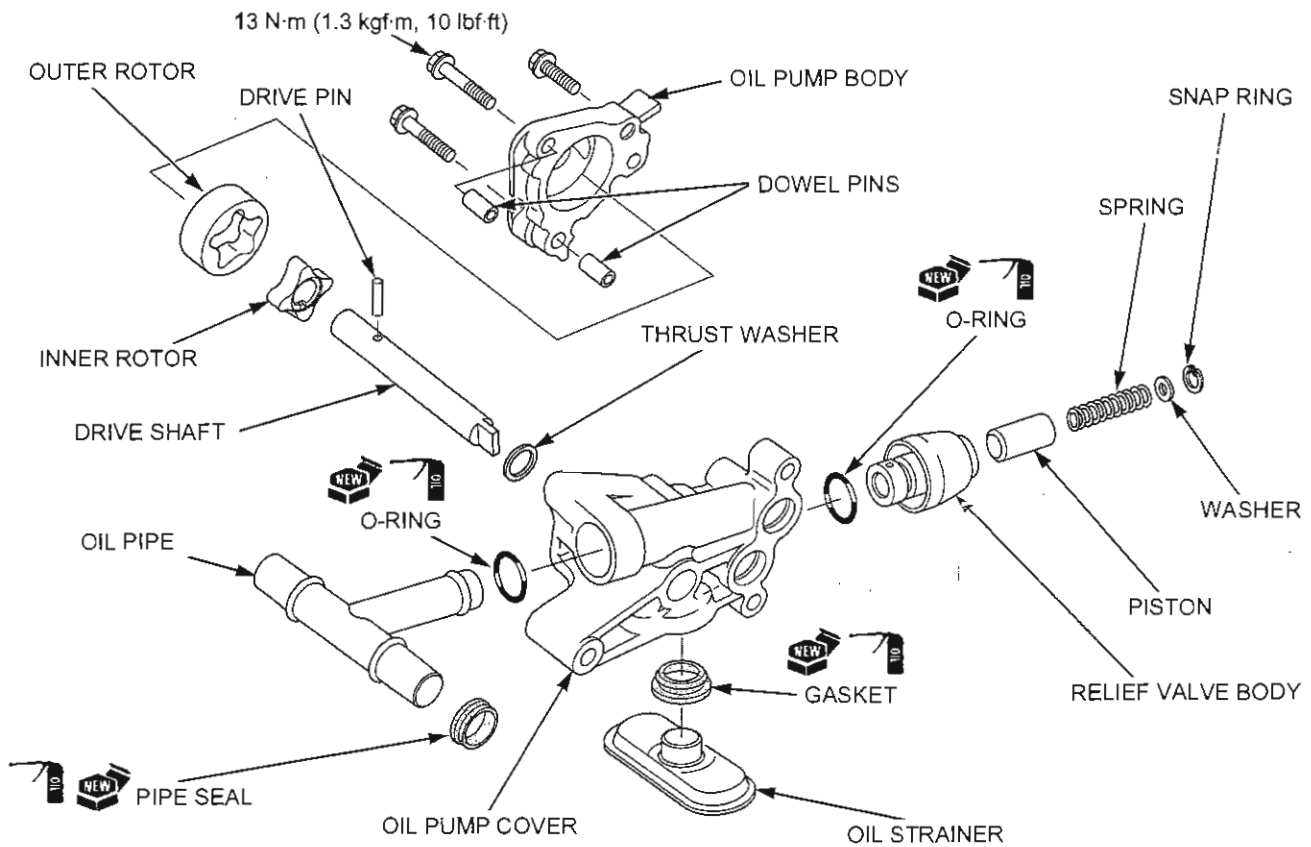
Measure the side clearance.

**SERVICE LIMIT: 0.10 mm (0.004 in)**



**OIL PUMP ASSEMBLY**

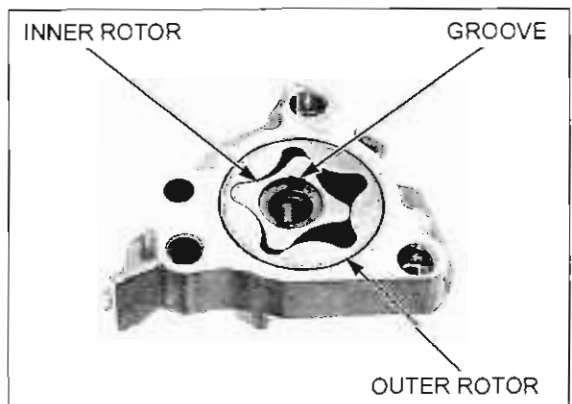
Dip all parts in clean engine oil.



Install the outer and inner rotors to the pump body.

**NOTE:**

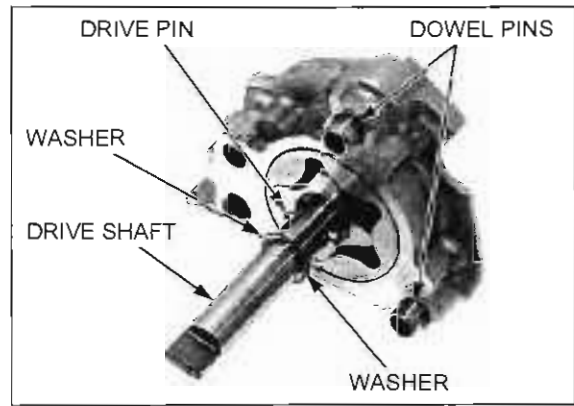
Install the inner rotor with the groove side facing the pump cover.



## LUBRICATION SYSTEM

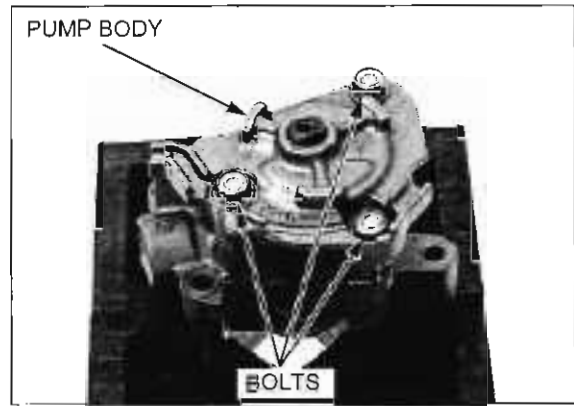
Install the drive shaft and drive pin by aligning the drive pin with the grooves in the inner rotor.

Place the washer into the inner rotor groove.  
Install the dowel pins to the pump body.



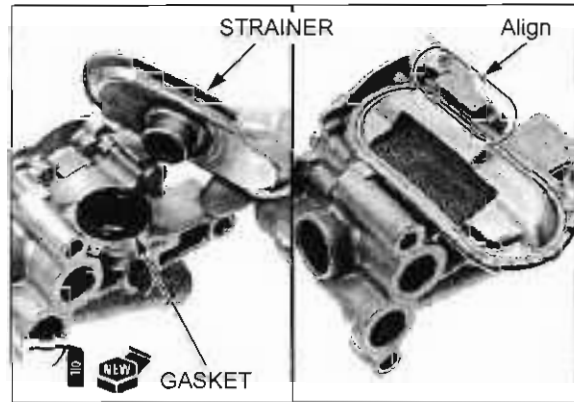
Install the pump cover on the pump body.  
Install and tighten the assembly bolts to the specified torque.

**TORQUE: 13 N·m (1.3 kgf·m, 10 lbf·ft)**



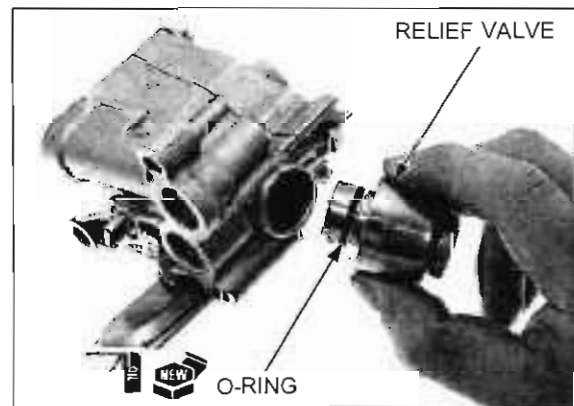
Clean the oil strainer.

Coat a new gasket with engine oil and install it to the pump body.  
Install the oil strainer to the pump cover by aligning its side end with the groove on the pump cover.



Coat a new O-ring with engine oil and install it to the pressure relief valve.

Install the pressure relief valve into the pump cover.

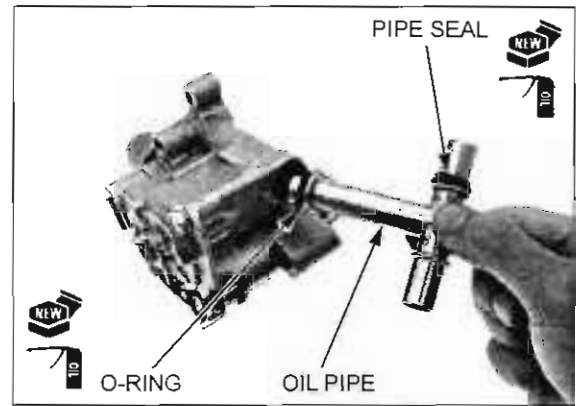


Coat a new oil pipe seal and new O-ring with engine oil, then install them to the oil pipe.

**NOTE:**

Install an O-ring with its tapered side facing out.

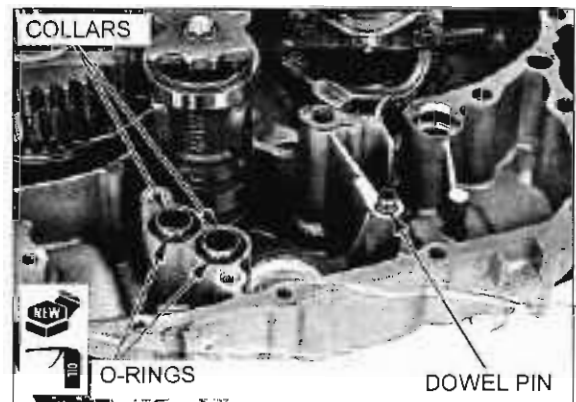
Install the oil pipe to the pump cover securely.



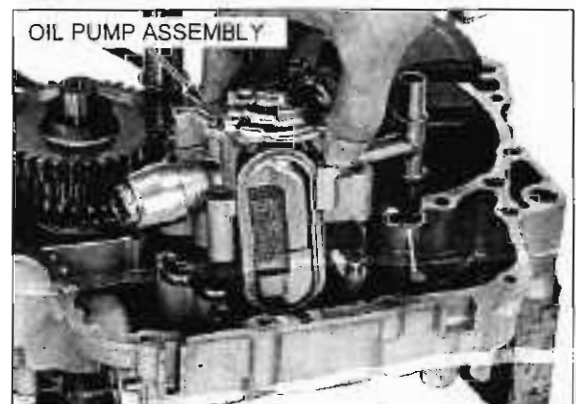
## INSTALLATION

Install the dowel pin and collars.

Coat new O-rings with engine oil and install them.



Install the oil pump assembly into the crankcase securely.



Install and tighten the bolts securely.

Assemble the crankcase (page 12-49).

Check the oil pressure (page 4-5).



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MEMO

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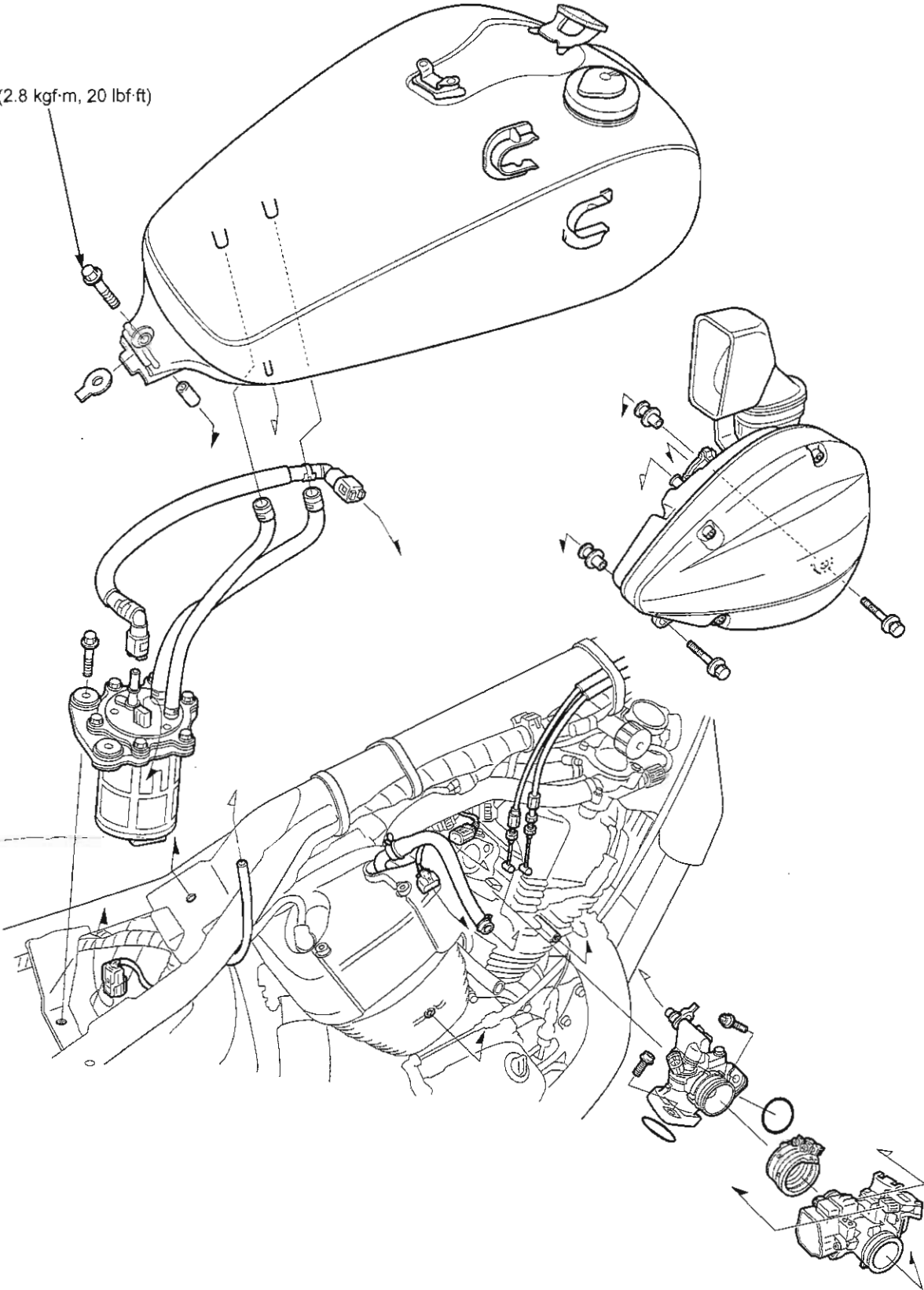
# 5. FUEL SYSTEM (PGM-FI)

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FUEL SYSTEM (PGM-FI)

COMPONENT LOCATION

27 N·m (2.8 kgf·m, 20 lbf·ft)



## SERVICE INFORMATION

### GENERAL

- Before disconnecting the fuel feed hose, relieve pressure from the system by disconnecting the quick connect fitting in the sub fuel tank/fuel pump (page 5-35).
- Bending or twisting the control cable will impair smooth operation and could cause the cable to stick or bend, 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.
- Do not snap the throttle valve from full open to full close after the throttle cable has been removed. It may cause incorrect idle operation.
- Seal the cylinder head intake port with tape or a clean cloth to keep dirt and debris from entering the intake port after the throttle body has been removed.
- Prevent dirt and debris from entering the throttle bore and air passages after the throttle body has been removed. Clean them using compressed air if necessary.
- The throttle body is factory pre-set. Do not disassemble in a way other than shown in this manual.
- Do not loosen or tighten the white painted bolts, nuts and screws of the throttle body loosening or tightening them can cause throttle valve and idle control failure.
- A faulty PGM-FI system is often related to poorly connected or corroded connectors. Check those connections before proceeding.
- When disassembling the PGM-FI parts, note the location of the O-rings. Replace them with new ones upon reassembly.
- Use a digital tester for PGM-FI system inspection.
- For fuel reserve sensor service (page 21-18).

### SPECIFICATIONS

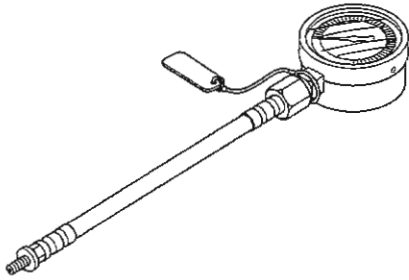
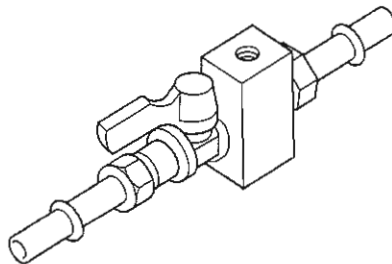
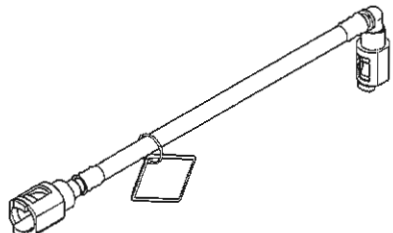
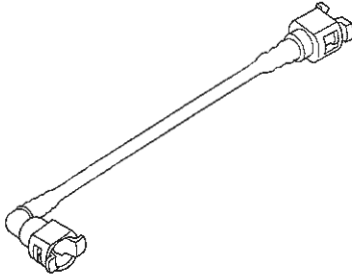


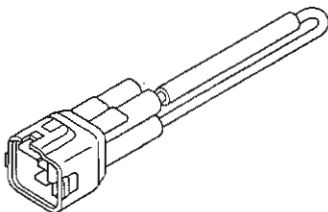
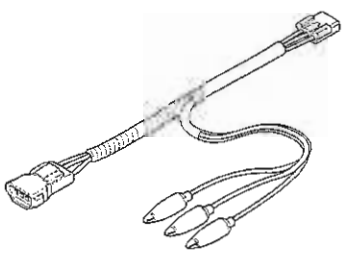
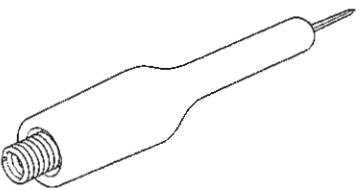
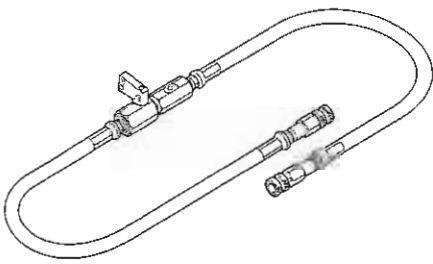
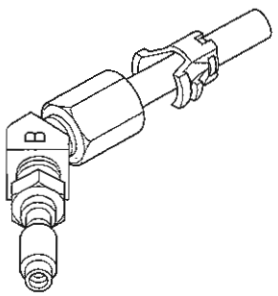
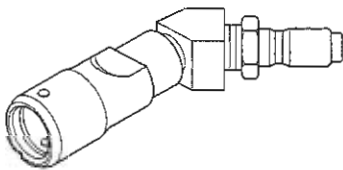
ITEM		SPECIFICATIONS
Throttle body identification number	VT750C2F/C2S	GQB3A
	VT750C2B	GQ9KA
Engine idle speed		1,200 ± 100 rpm
Throttle grip freeplay		2 – 6 mm (1/16 – 1/4 in)
Fuel injector resistance (20°C/68°F)	Front	11 – 13 kΩ
	Rear	11 – 13 kΩ
PAIR control solenoid valve resistance (20°C/68°F)		23 – 27 Ω
Fuel pressure at idle		333 – 353 kPa (3.4 – 3.6 kgf/cm <sup>2</sup> , 48 – 51 psi)
Fuel pump flow (at 12 V)		50 cm <sup>3</sup> (1.7 US oz, 1.8 Imp oz) minimum/10 seconds

### TORQUE VALUES

PAIR check valve cover bolt	7 N·m (0.7 kgf·m, 5.2 lbf·ft)
Air cleaner chamber mounting screw	1.1 N·m (0.1 kgf·m, 0.8 lbf·ft)
Air cleaner chamber connecting tube band screw	0.7 N·m (0.1 kgf·m, 0.5 lbf·ft)
ECT sensor	24.5 N·m (2.5 kgf·m, 18 lbf·ft)
IACV set plate torx screw	2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)
Throttle cable guide screw	3.4 N·m (0.3 kgf·m, 2.5 lbf·ft)
Fuel injector mounting bolt	5.1 N·m (0.5 kgf·m, 3.8 lbf·ft)
Sensor unit torx screw	3.4 N·m (0.3 kgf·m, 2.5 lbf·ft)
Insulator band screw (Throttle body side)	See page 5-53
Insulator band screw (Intake manifold side)	See page 5-58
Fuel tank mounting bolt	27 N·m (2.8 kgf·m, 20 lbf·ft)
Air cleaner cover socket bolt	1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)

# FUEL SYSTEM (PGM-FI)

## TOOLS

<p>Fuel pressure gauge 07406-0040004</p>  <p>or 07406-004000B (U.S.A. only)</p>	<p>Pressure gauge manifold 07ZAJ-S5A0111</p> 	<p>Hose attachment, 6 mm/9 mm 07ZAJ-S5A0130</p>  <p>Not available in U.S.A.</p>
<p>Hose attachment, 9 mm/9 mm 07ZAJ-S5A0120</p>  <p>Not available in U.S.A.</p>	<p>Attachment joint, 6 mm/9 mm 07ZAJ-S5A0150</p>  <p>Not available in U.S.A.</p>	<p>HDS pocket tester TDS 3557-0112-01 (U.S.A. only)</p> 
<p>SCS connector 070PZ-ZY30100</p> 	<p>Inspection test harness 07GMJ-ML80100</p> 	<p>Test probe 07ZAJ-RDJA110</p> 
<p>Fuel pressure manifold 07AMJ-HW3A100</p>  <p>U.S.A. only</p>	<p>Fuel adaptor male "B" 07AAJ-S6MA200</p>  <p>U.S.A. only</p>	<p>Fuel adaptor female "B" 07AAJ-S6MA400</p>  <p>U.S.A. only</p>



## PGM-FI SYMPTOM TROUBLESHOOTING

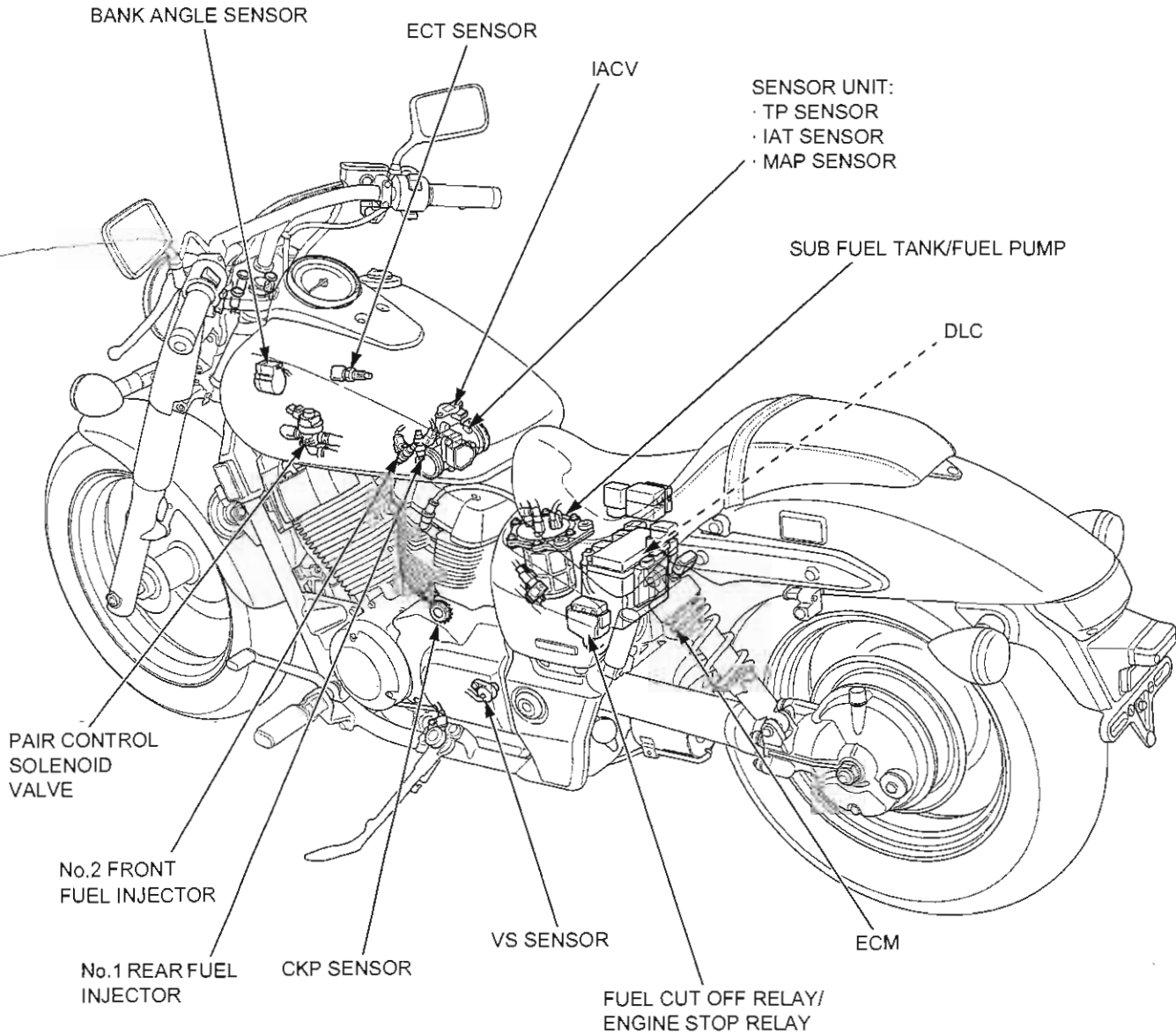
When the motorcycle has one of these symptoms, check the DTC or MIL blinking, refer to the DTC index (page 5-20) and begin the appropriate troubleshooting procedure. If there are no DTC/MIL blinking stored in the ECM memory, do the diagnostic procedure for the symptom, in sequence listed below, until you find cause.

Symptom	Diagnosis procedure	Also check for
Engine cranks but won't start (No DTC and MIL blinking)	<ol style="list-style-type: none"> <li>1. Crank the starter for more than 10 seconds and check the DTC (page 5-17) and execute the troubleshooting according to the DTC.</li> <li>2. Inspect the fuel supply system (page 5-35).</li> </ol>	<ul style="list-style-type: none"> <li>• No fuel to injector                             <ul style="list-style-type: none"> <li>– Clogged fuel filter</li> <li>– Pinched or clogged fuel feed hose</li> <li>– Pinched or clogged fuel tank breather hose</li> </ul> </li> <li>– Faulty fuel pump</li> <li>– Faulty fuel pump circuits</li> <li>• Intake air leak</li> <li>• Contaminated/deteriorated fuel</li> <li>• Faulty fuel injector</li> <li>• IACV stuck</li> <li>• Faulty ignition system</li> </ul>
Engine cranks but won't start (No fuel pump operation sound when the turning the ignition ON)	<ol style="list-style-type: none"> <li>1. ECM power/ground circuits malfunction (page 5-66)</li> <li>2. Inspect the fuel supply system (page 5-35).</li> </ol>	<ul style="list-style-type: none"> <li>• Open circuit in power input and/or ground wire of the ECM</li> <li>• Faulty bank angle sensor or related circuit</li> <li>• Faulty engine stop relay or related circuit</li> <li>• Faulty engine stop switch or related circuit</li> <li>• Blown FI fuse (15 A)</li> </ul>
Engine stalls, hard to start, rough idling	<ol style="list-style-type: none"> <li>1. Check the idle speed.</li> <li>2. Check the IACV.</li> <li>3. Inspect the fuel supply system (page 5-35).</li> <li>4. Inspect the battery charging system (page 18-9).</li> </ol>	<ul style="list-style-type: none"> <li>• Restricted fuel feed hose</li> <li>• Contaminated/deteriorated fuel</li> <li>• Intake air leak</li> <li>• Faulty IACV</li> <li>• Faulty MAP sensor</li> <li>• Restricted fuel tank breather hose</li> <li>• Faulty ignition system</li> <li>• Faulty battery charging system</li> </ul>
Afterburn when engine braking is used	Check the PAIR system (page 5-70).	<ul style="list-style-type: none"> <li>• Faulty PAIR system                             <ul style="list-style-type: none"> <li>– Faulty PAIR control solenoid valve</li> <li>– Faulty PAIR check valve</li> <li>– Clogged hose of the PAIR system</li> </ul> </li> <li>• Faulty ignition system</li> </ul>
Backfiring or misfiring during acceleration	Check the ignition system.	<ul style="list-style-type: none"> <li>• Faulty ignition system</li> </ul>
Poor performance (driveability) and poor fuel economy	<ol style="list-style-type: none"> <li>1. Inspect the fuel supply system (page 5-35).</li> <li>2. Inspect the air cleaner element (page 3-6).</li> </ol>	<ul style="list-style-type: none"> <li>• Pinched or clogged fuel feed hose</li> <li>• Faulty pressure regulator</li> <li>• Faulty injector</li> <li>• Faulty ignition system</li> <li>• Clogged air cleaner element</li> </ul>
Idle speed is below specifications or fast idle too low (No DTC and MIL blinking)	<ol style="list-style-type: none"> <li>1. Check the idle speed.</li> <li>2. Check the IACV.</li> </ol>	<ul style="list-style-type: none"> <li>• IACV stuck closed</li> <li>• Faulty fuel supply system</li> <li>• Faulty ignition system</li> <li>• Faulty MAP sensor</li> </ul>
Idle speed is above specifications or fast idle too high (No DTC and MIL blinking)	<ol style="list-style-type: none"> <li>1. Check the idle speed.</li> <li>2. Check the throttle operation and freeplay.</li> <li>3. Check the IACV.</li> </ol>	<ul style="list-style-type: none"> <li>• IACV stuck opened</li> <li>• Faulty ignition system</li> <li>• Intake air leak</li> <li>• Engine top end problem</li> <li>• Air cleaner condition</li> </ul>
MIL stays ON but no DTC set, or MIL never comes ON at all	Troubleshoot the MIL circuit.	<ul style="list-style-type: none"> <li>• Faulty MIL circuit</li> </ul>
MIL stays ON at all (No DTC set)	Inspect the DLC circuit.	<ul style="list-style-type: none"> <li>• Short circuit in DLC related wire</li> </ul>

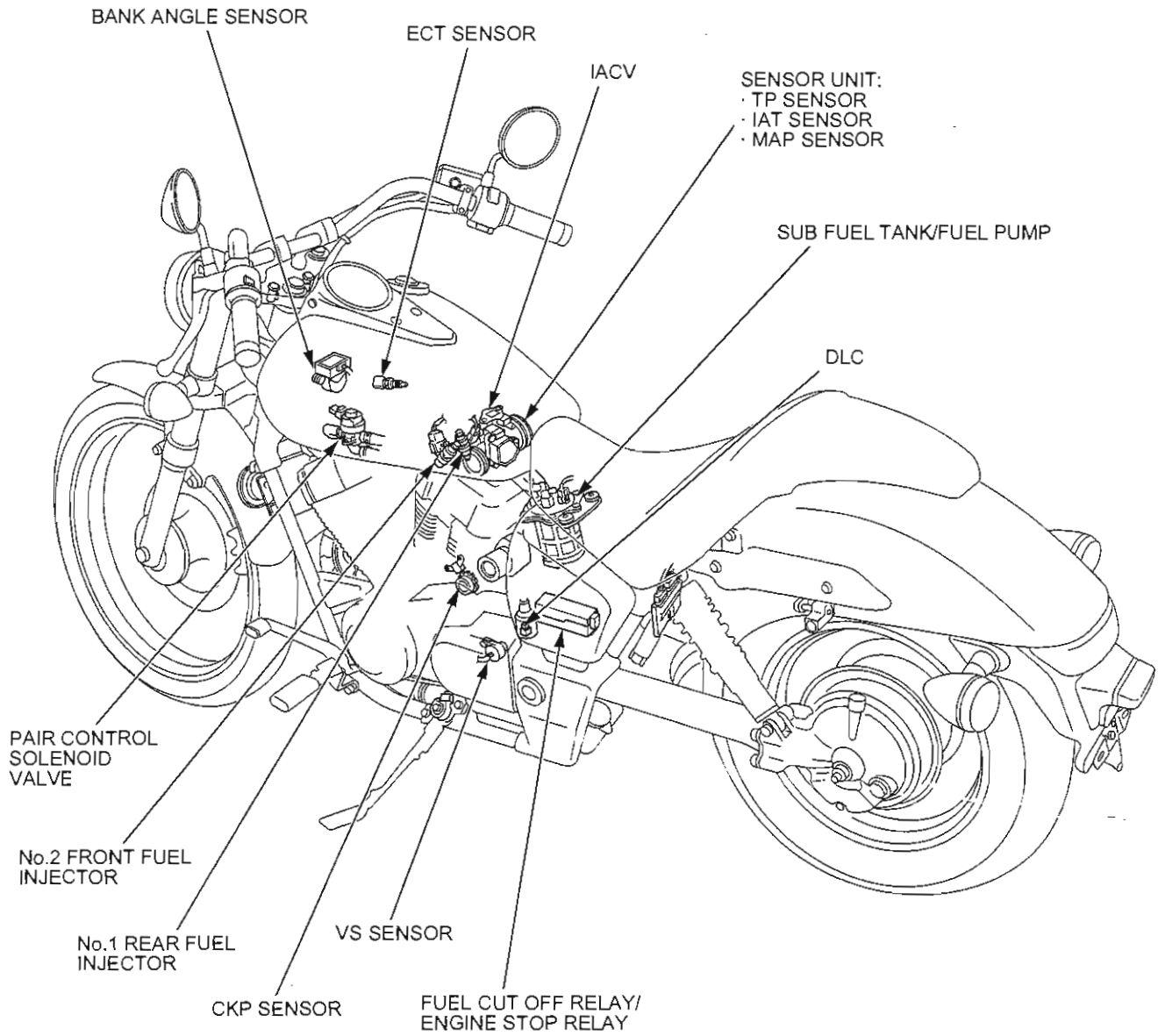
# FUEL SYSTEM (PGM-FI)

## PGM-FI SYSTEM LOCATION

VT750C2/C2B

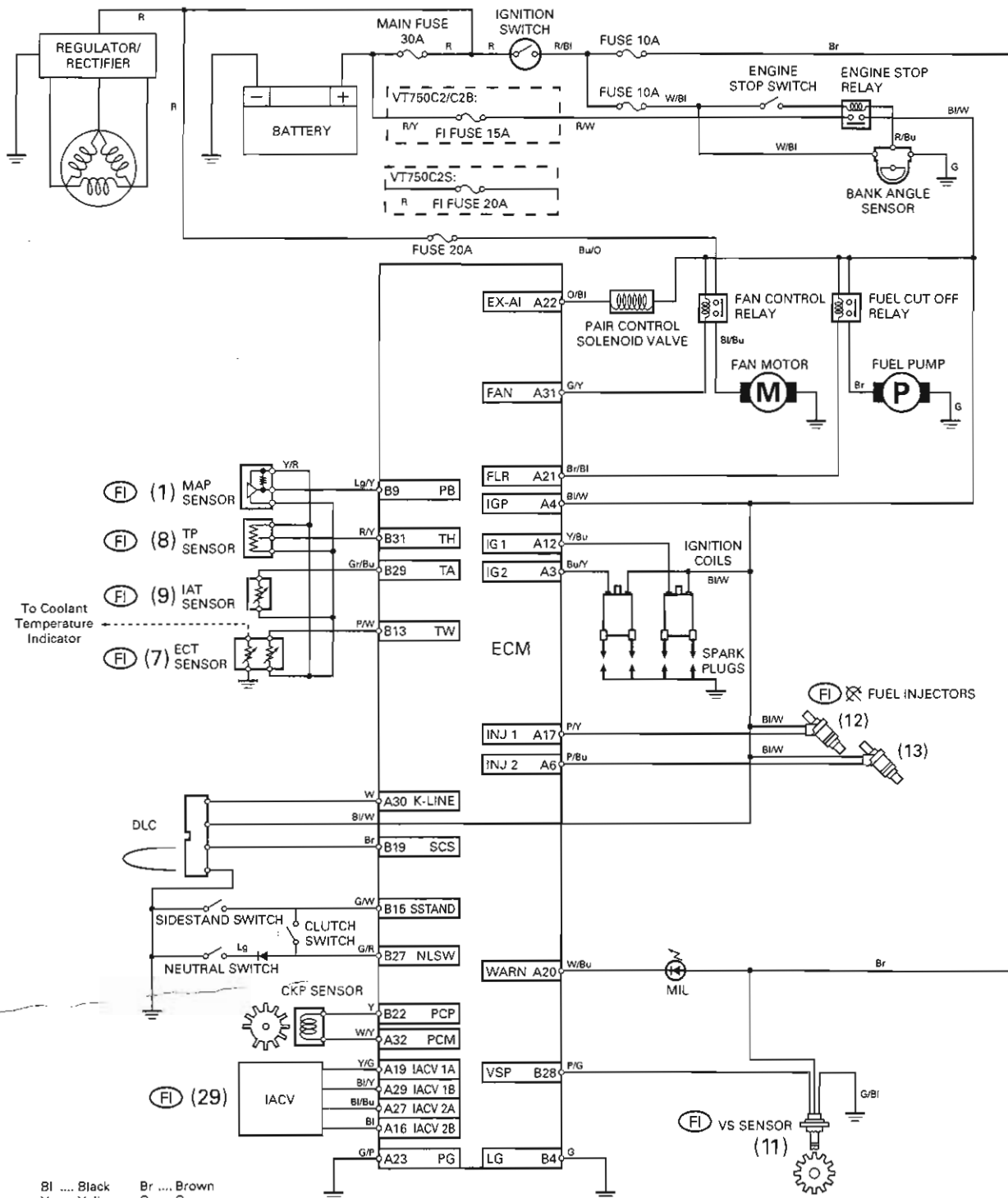


VT750C2S



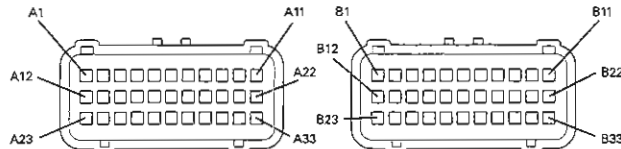
# FUEL SYSTEM (PGM-FI)

## PGM-FI SYSTEM DIAGRAM



To Coolant Temperature Indicator

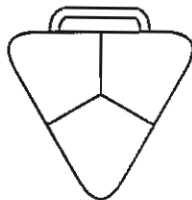
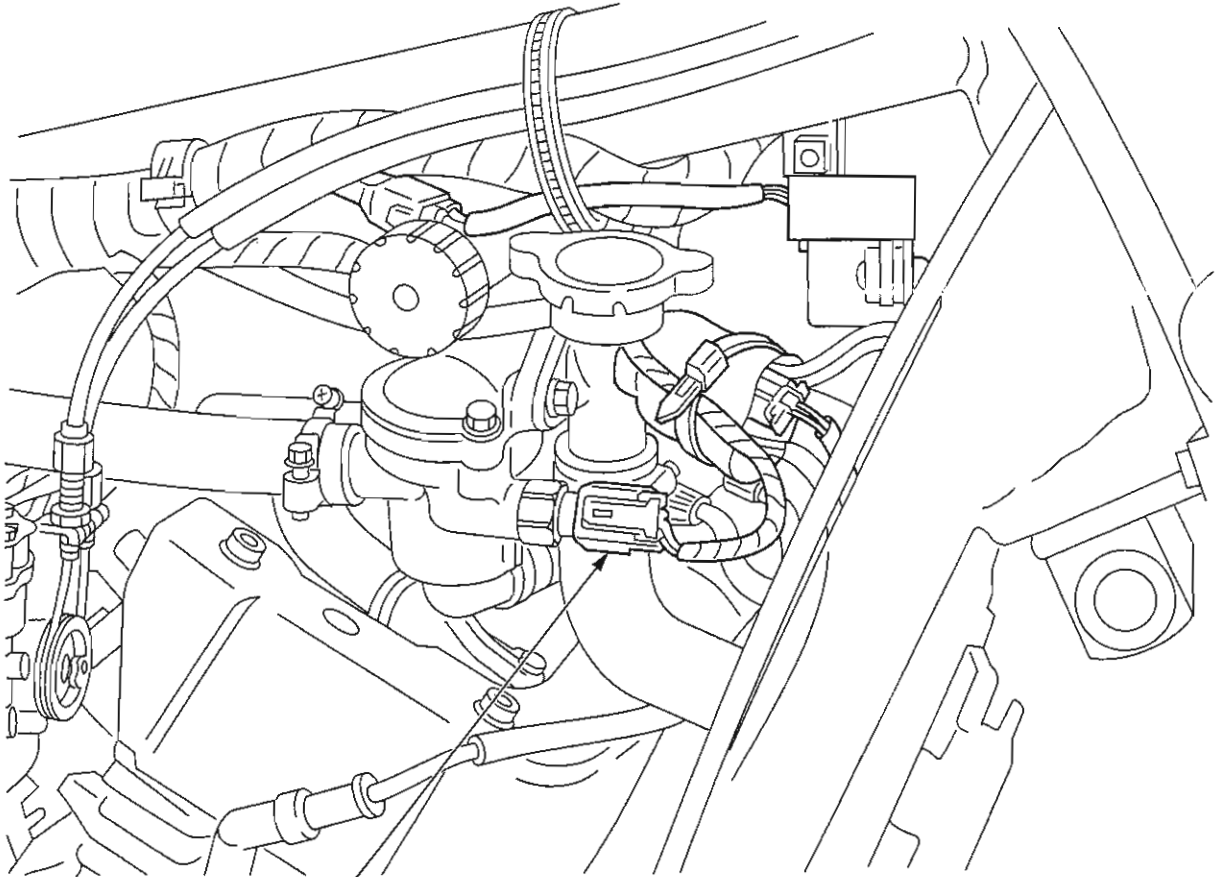
- Bl .... Black
- Y .... Yellow
- Bu .... Blue
- G .... Green
- R .... Red
- W .... White
- Br .... Brown
- O .... Orange
- Lg .... Light green
- P .... Pink
- Gr .... Gray



ECM 33P (Black) CONNECTOR A      ECM 33P (Gray) CONNECTOR B  
ECM side of male terminals

## CONNECTOR LOCATION

NOTE 1: Remove the steering side cover (page 2-3).



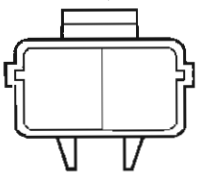
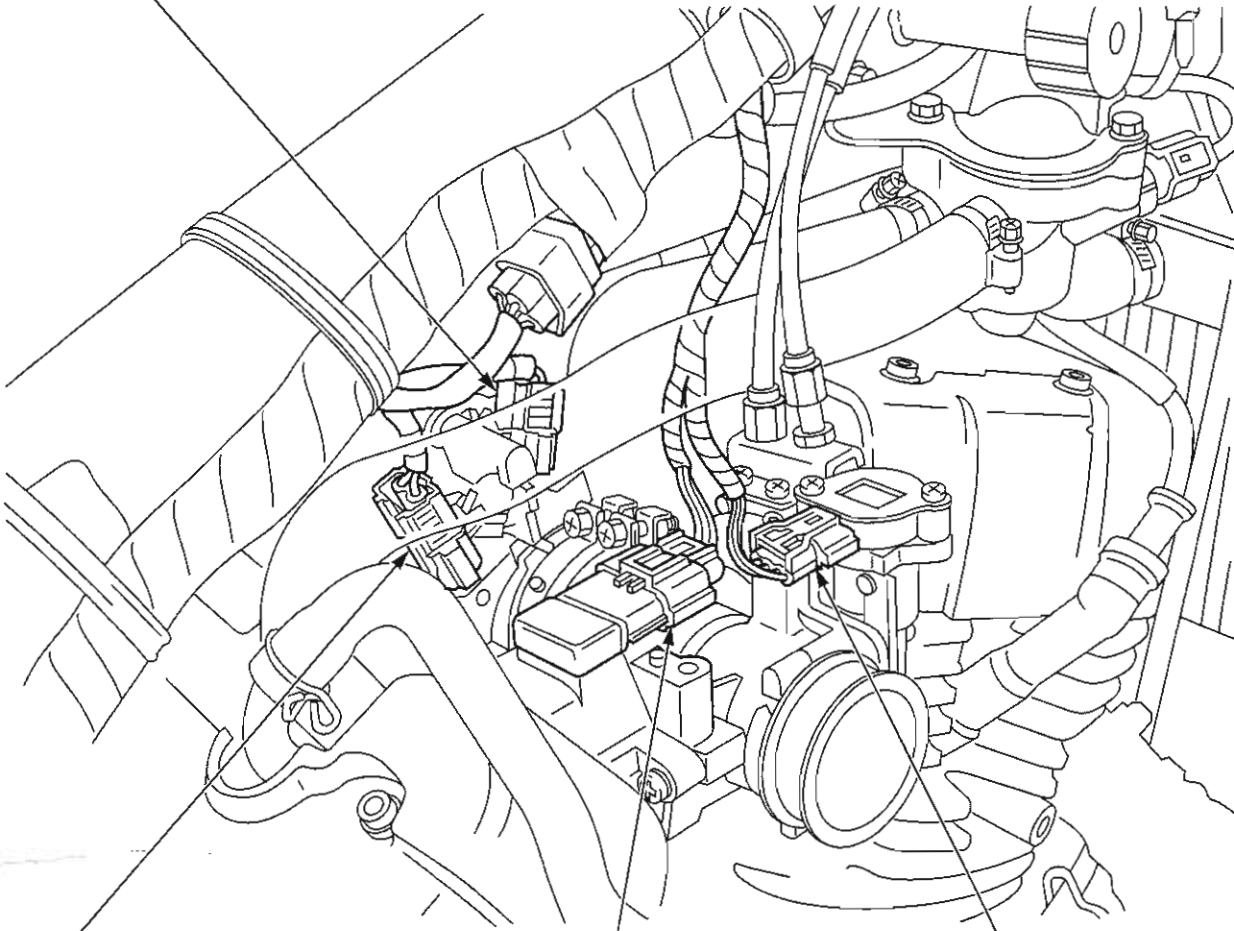
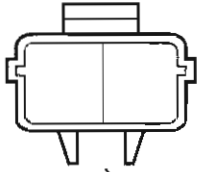
ECT SENSOR 3P (GRAY) CONNECTOR  
(NOTE 1)

## FUEL SYSTEM (PGM-FI)

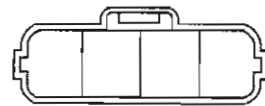
NOTE 1: Remove the air cleaner housing (page 5-49).

NOTE 2: Remove the fuel tank (page 5-48).

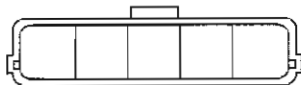
No.2 FRONT FUEL INJECTOR  
2P (GRAY) CONNECTOR (NOTE 2)



No.1 REAR FUEL INJECTOR  
2P (GRAY) CONNECTOR (NOTE 2)



IACV 4P (BLACK) CONNECTOR  
(NOTE 2)

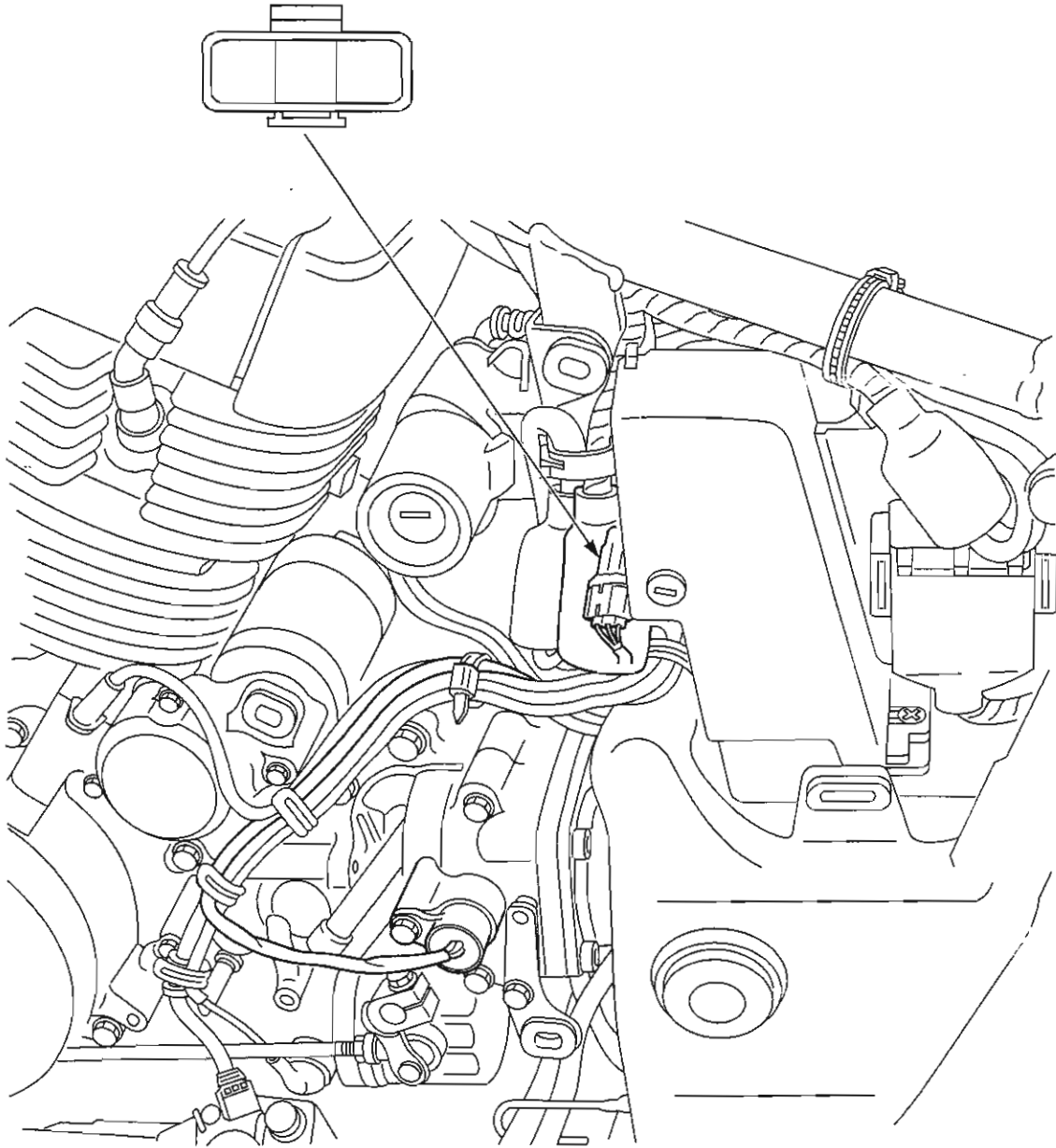


SENSOR UNIT 5P (BLACK) CONNECTOR  
(NOTE 1)

NOTE 1: Remove the left side cover (page 2-3).

VT750C2/C2B:

VS SENSOR 3P (WHITE) CONNECTOR  
(NOTE 1)

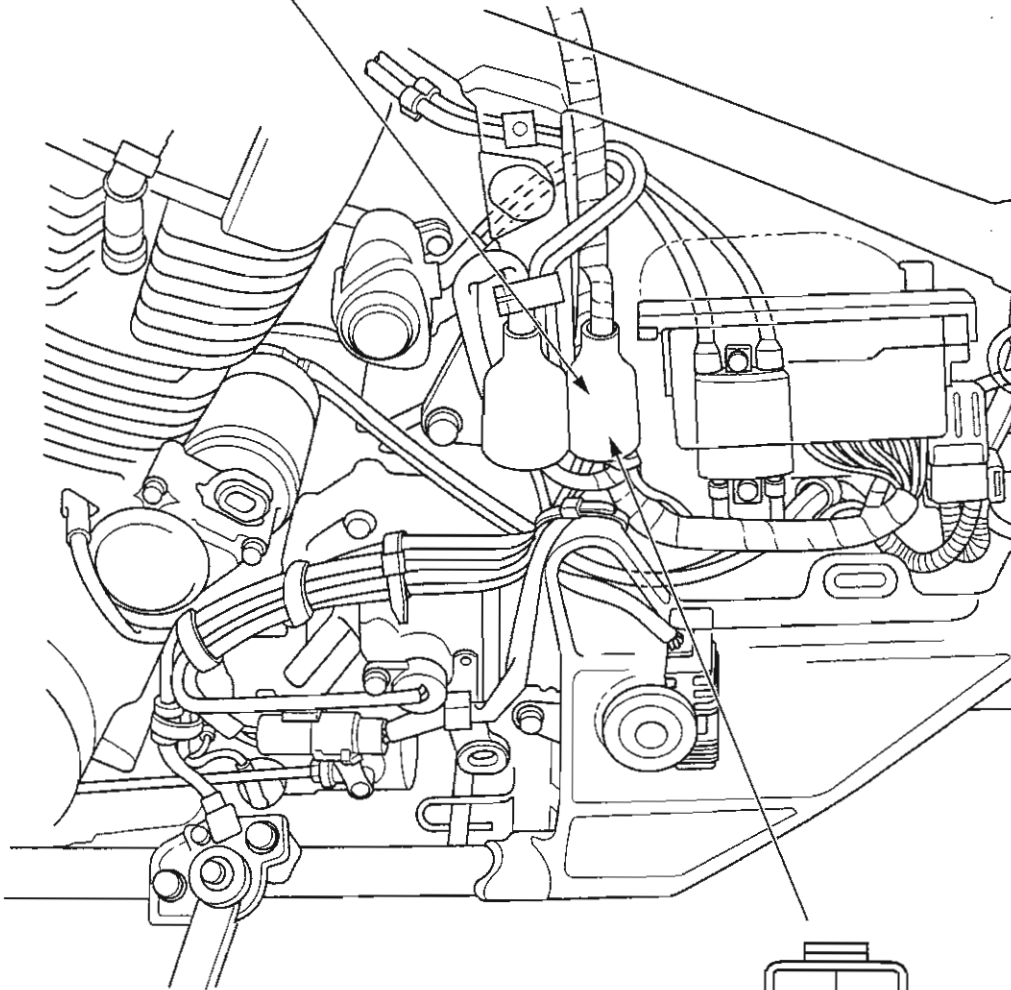
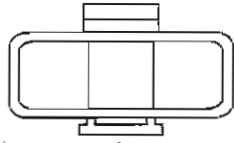


## FUEL SYSTEM (PGM-FI)

NOTE 1: Remove the left side cover (page 2-3).

VT750C2S:

VS SENSOR 3P (WHITE) CONNECTOR  
(NOTE 1)

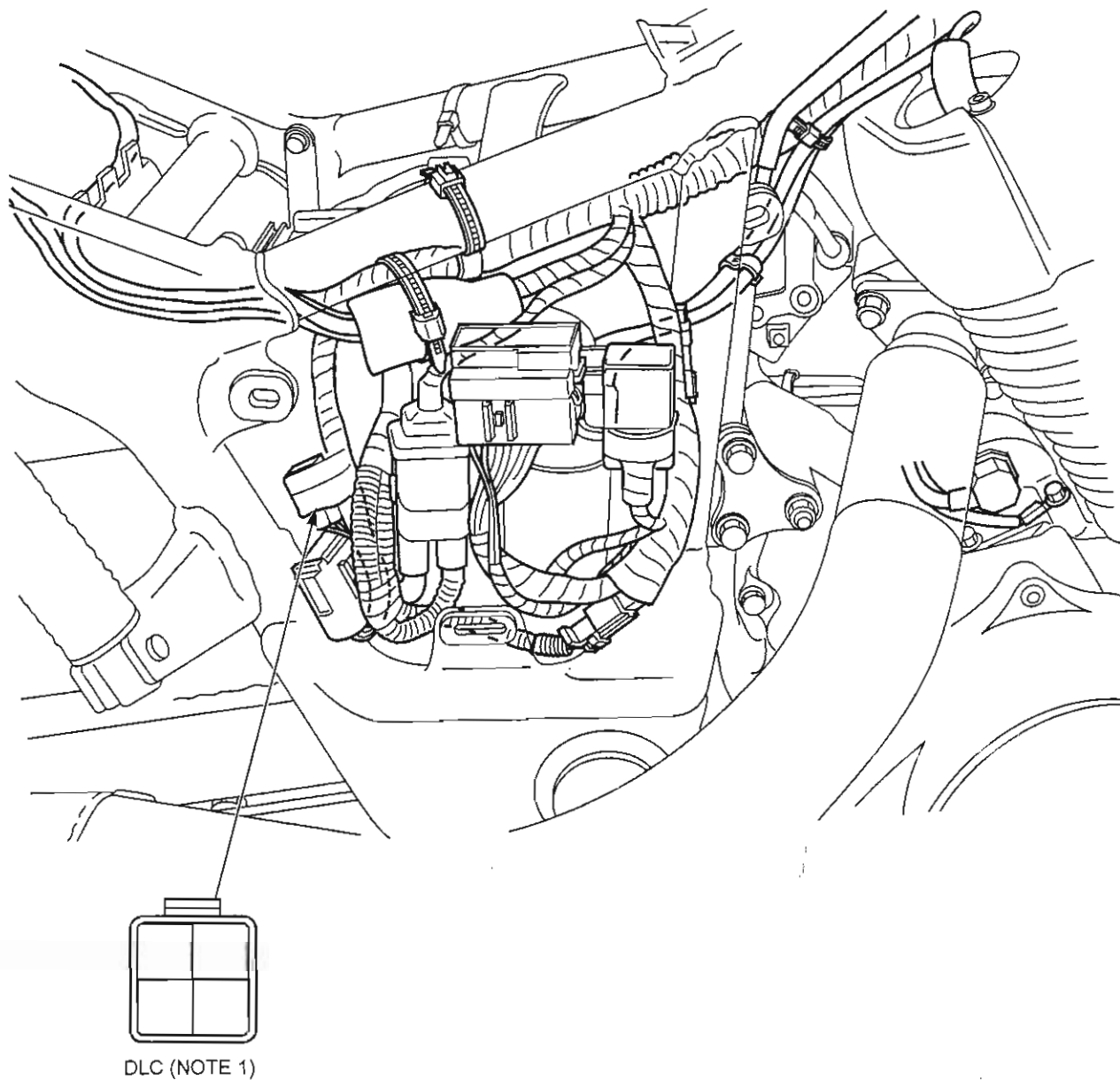


DLC (NOTE 1)



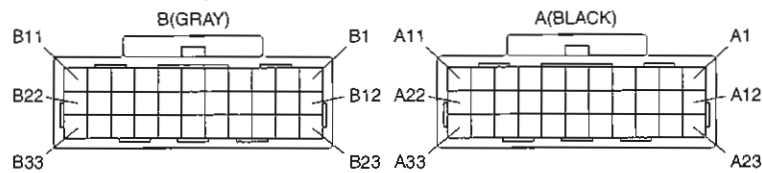
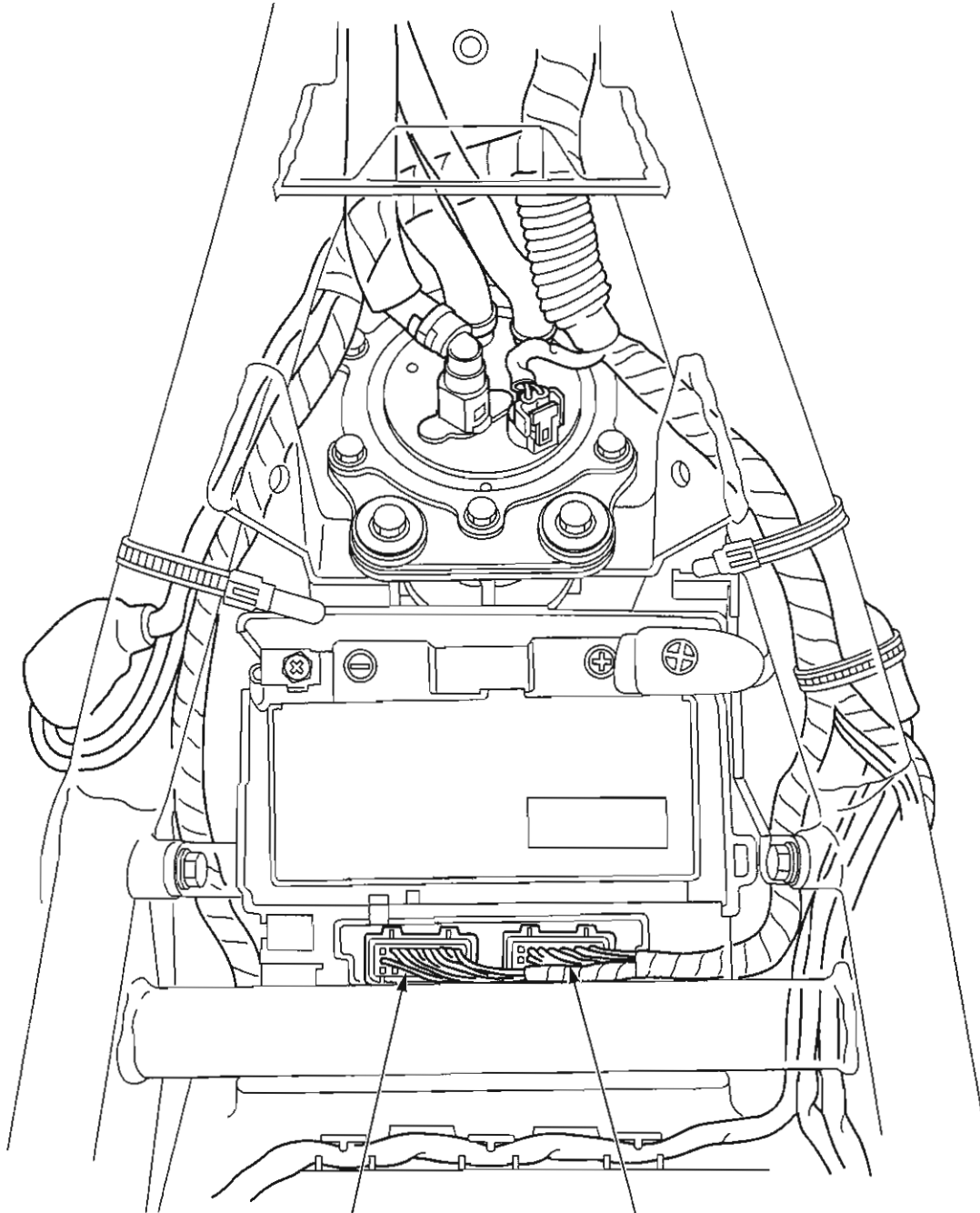
NOTE 1: Remove the right side cover (page 2-3).

VT750C2/C2B:



# FUEL SYSTEM (PGM-FI)

NOTE 1: Remove the ECM (page 5-67).



ECM 33P CONNECTORS (NOTE 1)

# PGM-FI TROUBLESHOOTING INFORMATION

## GENERAL TROUBLESHOOTING

### Intermittent Failure

The term "intermittent failure" means a system may have had a failure, but it checks OK now. If the MIL does not come on, check for poor contact or loose pins at all connectors related to the circuit that of the troubleshooting. If the MIL was on, but then went out, the original problem may be intermittent.

### Opens and Shorts

"Opens" and "Shorts" are common electrical terms. An open is a break in a wire or at a connection. A short is an accidental connection of a wire to ground or to another wire. In simple electronics, this usually means something will not work at all. With ECMs this can something mean something work, but not the way it's supposed to.

### If the MIL has come on

Refer to DTC READOUT (page 5-17).

### If the MIL did not stay on

If the MIL did not stay on, but there is a driveability problem, do the SYMPTOM TROUBLESHOOTING (page 5-5).

## SYSTEM DESCRIPTION

### SELF-DIAGNOSIS SYSTEM

The PGM-FI system is equipped with the self-diagnostic system. When any abnormality occurs in the system, the ECM turns on the MIL and stores a DTC in its erasable memory.

### FAIL-SAFE FUNCTION

The PGM-FI system is provided with a fail-safe function to secure a minimum running capability even when there is trouble in the system. When any abnormality is detected by the self-diagnosis function, running capability is maintained by pre-programmed value in the simulated program map. When any abnormality is detected in the injector(s), the fail-safe function stops the engine to protect it from damage.

### DTC (Diagnostic Trouble Code)

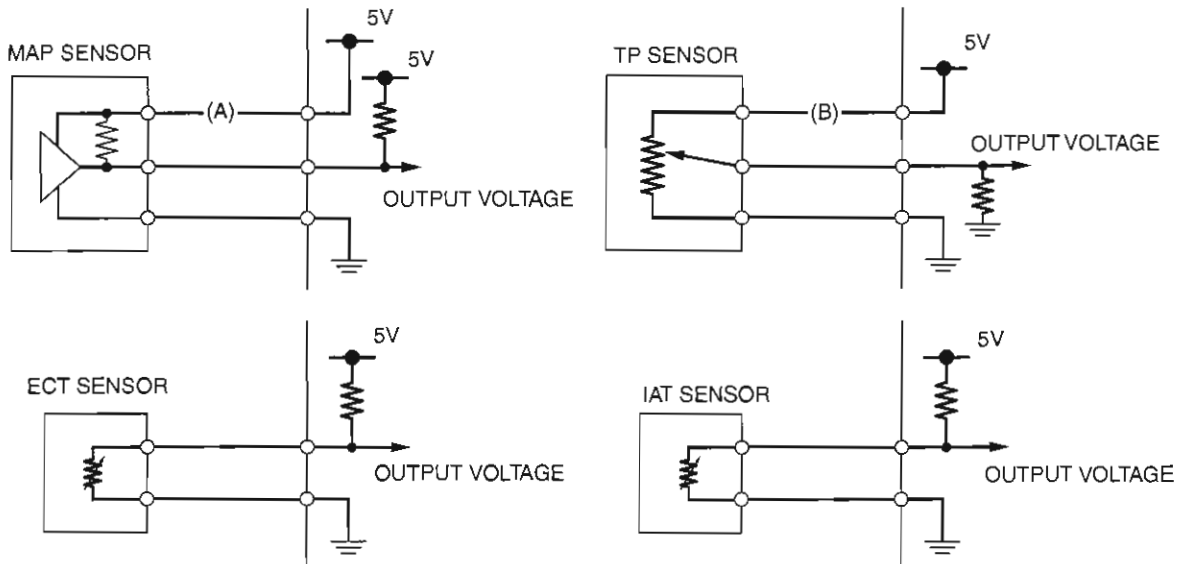
- The DTC is composed of a main code and a sub code and it is displayed as a hyphenated number when retrieved from the ECM with the HDS pocket tester.

The digits in front of the hyphen are the main code, they indicate the component of function failure.

The digits behind the hyphen are the sub code, they detail the specific symptom of the component or function failure.

For example, in the case of the TP sensor:

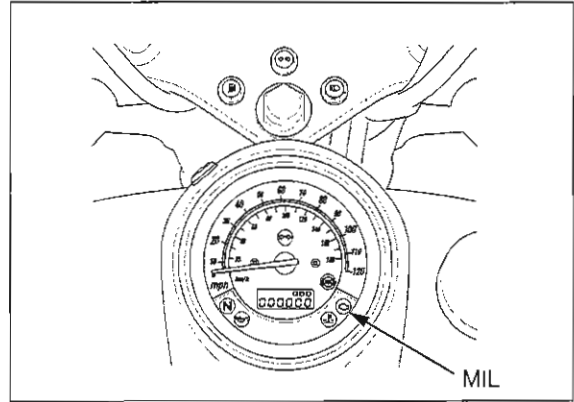
- DTC 08 - 1 = (TP sensor voltage) - (lower than the specified value)
  - DTC 08 - 2 = (TP sensor voltage) - (higher than the specified value)
  - The MAP, ECT, TP and IAT sensor diagnosis will be made according to the voltage output of the affected sensor. If a failure occurs, the ECM determines the Function Failure, compares the sensor voltage output to the standard value, and then outputs the corresponding DTC to the HDS pocket tester.
- For example:
- If the input voltage line (A) on the MAP sensor is opened, the ECM detects the output voltage is about 5 V, then the DTC 1-2 (MAP sensor circuit high voltage) will be displayed.
  - If the input voltage line (B) on the TP sensor is opened, the ECM detects the output voltage is 0 V, then the DTC 8-1 (TP sensor circuit low voltage) will be displayed.



## FUEL SYSTEM (PGM-FI)

### MIL Blink Pattern

- If the HDS pocket tester is not available, DTC can be read from the ECM memory by the MIL blink pattern.
- The number of MIL blinks is the equivalent of the main code of the DTC (the sub code cannot be displayed by the MIL).
- The MIL will blink the current DTC, in case the ECM detects the problem at present, when the ignition switch ON or idling with the sidestand down. The MIL will stay ON when the engine speed is over 2,000 min<sup>-1</sup> (rpm) or with the sidestand up.
- The MIL has two types of blinks, a long blink and short blink. The long blinking lasts for 1.3 seconds, the short blinking lasts for 0.5 seconds. One long blink is the equivalent of ten short blinks. For example, when two long blinks are followed by five short blinks, the MIL is 25 (two long blinks = 20 blinks, plus five short blinks).
- When the ECM stores more than one DTC, the MIL will indicate them by blinking in the order from the lowest number to highest number.



### MIL Check

When the ignition switch is turned to "ON" and engine stop switch "O", the MIL will stay on for a few seconds, then go off. If the MIL does not come on, troubleshoot the MIL circuit (page 5-34).

### CURRENT DTC/FREEZE DTC

The DTC is indicated in two ways according to the failure status.

- In case the ECM detects the problem at present, the MIL will come on and the MIL will start to blink as its DTC when the sidestand is lowered. It is possible to readout the MIL blink pattern as the current DTC.
- In case the ECM does not detect any problem at present but has a problem stored in its memory, the MIL will not light and blink. If it is necessary to retrieve the past problem, readout the freeze DTC by following the DTC readout procedure.

### HDS POCKET TESTER INFORMATION

- The HDS can readout the DTC, freeze data, current data and other ECM condition.

#### How to connect the HDS pocket tester (VT750C2/C2B)

Turn the ignition switch to "OFF".

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

Remove the dummy connector from the DLC.

Connect the HDS pocket tester to the DLC.

Turn the ignition switch to "ON" and engine stop switch "O", check the DTC and freeze data.

#### NOTE:

- Freeze data indicates the engine conditions when the first malfunction was detected.



#### How to connect the HDS pocket tester (VT750C2S)

Turn the ignition switch to "OFF".

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

Remove the dummy connector from the DLC.

Connect the HDS pocket tester to the DLC.

Turn the ignition switch to "ON" and engine stop switch "O", check the DTC and freeze data.

#### NOTE:

- Freeze data indicates the engine conditions when the first malfunction was detected.

### ECM reset

The HDS can reset the ECM data including the DTC, freeze data and some learning memory.





## FUEL SYSTEM (PGM-FI)

### CLEARING DTC

Connect the HDS pocket tester to the DLC (page 5-16).

Clear the DTC with the HDS while the engine is stopped.

To clear the DTC without HDS, refer to the following procedure.

#### How to clear the DTC with SCS connector (VT750C2/C2B)

1. Remove the right side cover (page 2-3).
2. Turn the ignition switch to "OFF".
3. Make sure the engine stop switch is turned to "O".

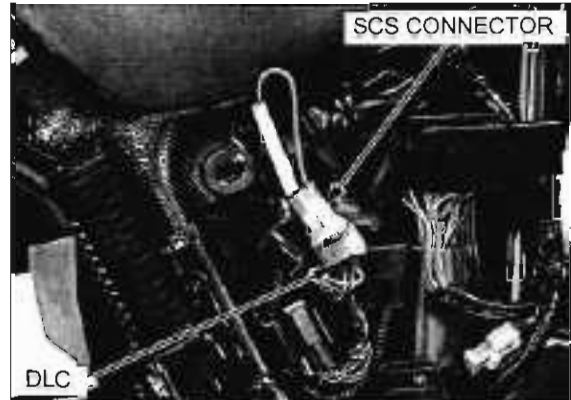
Remove the dummy connector and short the DLC terminals using the special tool.

#### TOOL:

**SCS connector**                      **070PZ-ZY30100**

**CONNECTION: Brown – Green**

4. Turn the ignition switch to "ON".
5. Remove the special tool from the DLC.
6. The MIL will light for approximately 5 seconds. While the MIL lights, short the DLC terminals again with the special tool. The self-diagnostic memory is erased if the malfunction indicator goes off and starts blinking.



#### NOTE:

- The DLC must be jumped while the MIL lights. If not, the MIL will not start blinking.
- Note that the self-diagnostic memory cannot be erased if the ignition switch is turned to "OFF" before the MIL starts blinking.

#### How to clear the DTC with SCS connector (VT750C2S)

1. Remove the left side cover (page 2-3).
2. Turn the ignition switch to "OFF".
3. Make sure the engine stop switch is turned to "O".

Remove the dummy connector and short the DLC terminals using the special tool.

#### TOOL:

**SCS connector**                      **070PZ-ZY30100**

**CONNECTION: Brown – Green**

4. Turn the ignition switch to "ON".
5. Remove the special tool from the DLC.
6. The MIL will light for approximately 5 seconds. While the MIL lights, short the DLC terminals again with the special tool. The self-diagnostic memory is erased if the malfunction indicator goes off and starts blinking.



#### NOTE:

- The DLC must be jumped while the MIL lights. If not, the MIL will not start blinking.
- Note that the self-diagnostic memory cannot be erased if the ignition switch is turned to "OFF" before the MIL starts blinking.

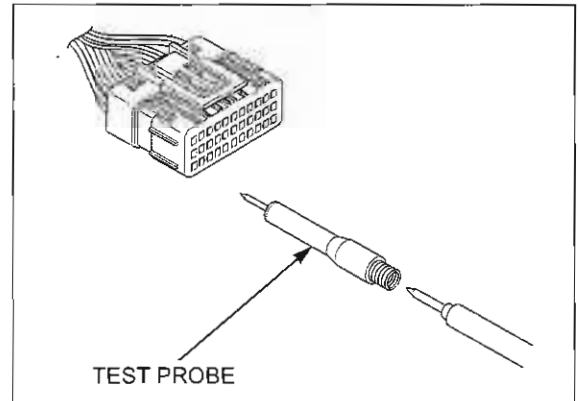
**CIRCUIT INSPECTION****INSPECTION AT ECM CONNECTOR**

- Always clean around and keep any foreign material away from the ECM connector before disconnecting it.
- A faulty PGM-FI system is often related to poorly connected or corroded connections. Check those connections before proceeding.
- In testing at ECM connector (wire side) terminal, always use the test probe. Insert the test probe into the connector terminal, then attach the digital multimeter probe to the test probe.

**TOOL:**

Test probe

07ZAJ-RDJA110



## FUEL SYSTEM (PGM-FI)

### DTC INDEX

DTC (MIL blinks)	Function Failure	Symptom/Fail-safe function	Refer to
1-1 (1)	MAP sensor circuit low voltage (less than 0.2 V) <ul style="list-style-type: none"><li>• Sensor unit (MAP sensor) or its circuit malfunction</li></ul>	<ul style="list-style-type: none"><li>• Engine operates normally</li><li>• Pre-Program value: 760 mmHg/1,013 hPa</li></ul>	5-21
1-2 (1)	MAP sensor circuit high voltage (more than 3.9 V) <ul style="list-style-type: none"><li>• Loose or poor contact of the sensor unit connector</li><li>• Sensor unit (MAP sensor) or its circuit malfunction</li></ul>	<ul style="list-style-type: none"><li>• Engine operates normally</li><li>• Pre-Program value: 760 mmHg/1,013 hPa</li></ul>	5-22
7-1 (7)	ECT sensor circuit low voltage (less than 0.08 V) <ul style="list-style-type: none"><li>• ECT sensor or its circuit malfunction</li></ul>	<ul style="list-style-type: none"><li>• Hard start at a low temperature</li><li>• Pre-Program value: 90°C/194°F</li><li>• Cooling fan turns on</li></ul>	5-23
7-2 (7)	ECT sensor circuit high voltage (more than 4.93 V) <ul style="list-style-type: none"><li>• Loose or poor contact of the ECT sensor connector</li><li>• ECT sensor or its circuit malfunction</li></ul>	<ul style="list-style-type: none"><li>• Hard start at a low temperature</li><li>• Pre-Program value: 90°C/194°F</li><li>• Cooling fan turns on</li></ul>	5-24
8-1 (8)	TP sensor circuit low voltage (less than 0.3 V) <ul style="list-style-type: none"><li>• Sensor unit (TP sensor) or its circuit malfunction</li></ul>	<ul style="list-style-type: none"><li>• Poor engine acceleration</li><li>• Pre-Program value: 0°</li></ul>	5-25
8-2 (8)	TP sensor circuit high voltage (more than 4.93 V) <ul style="list-style-type: none"><li>• Loose or poor contact of the sensor unit connector</li><li>• Sensor unit (TP sensor) or its circuit malfunction</li></ul>	<ul style="list-style-type: none"><li>• Poor engine acceleration</li><li>• Pre-Program value: 0°</li></ul>	5-27
9-1 (9)	IAT sensor circuit low voltage (less than 0.08 V) <ul style="list-style-type: none"><li>• Sensor unit (IAT sensor) or its circuit malfunction</li></ul>	<ul style="list-style-type: none"><li>• Engine operates normally</li><li>• Pre-program value: 35°C/77°F</li></ul>	5-27
9-2 (9)	IAT sensor circuit high voltage (more than 4.93 V) <ul style="list-style-type: none"><li>• Loose or poor contact of the sensor unit connector</li><li>• Sensor unit (IAT sensor) or its circuit malfunction</li></ul>	<ul style="list-style-type: none"><li>• Engine operates normally</li><li>• Pre-Program value: 35°C/77°F</li></ul>	5-28
11-1 (11)	VS sensor no signal <ul style="list-style-type: none"><li>• Loose or poor contact of the VS sensor connector</li><li>• VS sensor or its circuit malfunction</li></ul>	<ul style="list-style-type: none"><li>• Engine operates normally</li></ul>	5-29
12-1 (12)	No.1 (rear) injector circuit malfunction <ul style="list-style-type: none"><li>• Loose or poor contact of the injector connector</li><li>• Injector or its circuit malfunction</li></ul>	<ul style="list-style-type: none"><li>• Engine does not start</li><li>• Injectors, fuel pump and ignition shut down</li></ul>	5-31
13-1 (13)	No.2 (front) injector circuit malfunction <ul style="list-style-type: none"><li>• Loose or poor contact of the injector connector</li><li>• Injector or its circuit malfunction</li></ul>	<ul style="list-style-type: none"><li>• Engine does not start</li><li>• Injectors, fuel pump and ignition shut down</li></ul>	5-33
29-1 (29)	IACV circuit malfunction <ul style="list-style-type: none"><li>• Loose or poor contact of the IACV connector</li><li>• IACV or its circuit malfunction</li></ul>	<ul style="list-style-type: none"><li>• Engine stalls, hard to start, rough idling</li></ul>	5-33
33-2 (-)	ECM EEPROM malfunction	<ul style="list-style-type: none"><li>• Engine operates normally</li></ul>	5-34



## DTC TROUBLESHOOTING

### DTC 1-1 (MAP SENSOR LOW VOLTAGE)

#### 1. MAP Sensor System Inspection

Turn the ignition switch to "ON" and engine stop switch "O".

Check the MAP sensor with the HDS pocket tester.

**Is about 0 V indicated?**

**YES** – GO TO STEP 2.

**NO** – • Intermittent failure  
• Loose or poor contact on the sensor unit 5P connector

#### 2. MAP Sensor Input Voltage Inspection

Turn the ignition switch to "OFF".  
Disconnect the sensor unit 5P connector.

Turn the ignition switch to "ON" and engine stop switch "O".

Measure the voltage at the wire side.

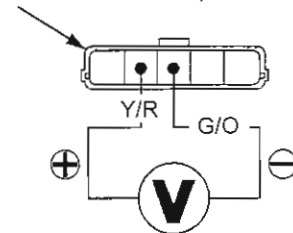
**CONNECTION: Yellow/red (+) – Green/orange (-)**

**Is the voltage within 4.75 – 5.25 V?**

**YES** – GO TO STEP 4.

**NO** – GO TO STEP 3.

SENSOR UNIT 5P CONNECTOR  
(Wire side of female terminal)



#### 3. MAP Sensor Input Line Inspection

Turn the ignition switch to "OFF".  
Disconnect the ECM 33P (Black) connector.

Check for continuity at the Yellow/red wire between the sensor unit 5P and ECM 33P (Black) connectors.

**CONNECTION: A9 – Yellow/red**

**TOOL:**

**Test probe 07ZAJ-RDJA110**

**Is there continuity?**

**YES** – Replace the ECM with a known good one, and recheck.

**NO** – Open circuit in Yellow/red wire

#### 4. MAP Sensor Output Line Short Circuit Inspection

Connect the ECM 33P (Black) connector.

Check for continuity between the sensor unit 5P connector terminal of the wire side and ground.

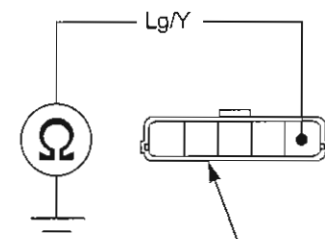
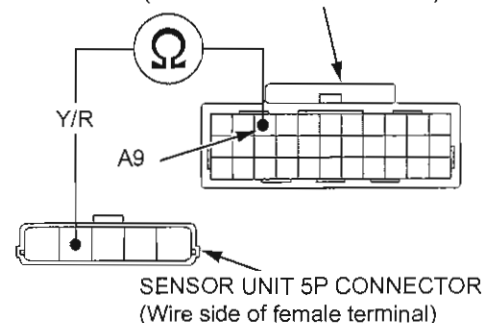
**CONNECTION: Light green/yellow – Ground**

**Is there continuity?**

**YES** – Short circuit in Light green/yellow wire

**NO** – GO TO STEP 5.

ECM 33P (BLACK) CONNECTOR  
(Wire side of female terminal)



SENSOR UNIT 5P CONNECTOR  
(Wire side of female terminal)

## FUEL SYSTEM (PGM-FI)

### 5. MAP Sensor Inspection

Replace the sensor unit with a known good one (page 5-51).  
Clear the DTC (page 5-18).  
Turn the ignition switch to "ON" and engine stop switch "O".

Check the MAP sensor with the HDS pocket tester.

**Is DTC 1-1 indicated?**

- YES** – Replace the ECM with a known good one, and recheck.  
**NO** – Faulty original sensor unit (MAP sensor)

### DTC 1-2 (MAP SENSOR HIGH VOLTAGE)

- Before starting the inspection, check for loose or poor contact on the sensor unit 5P connector and recheck the DTC.

#### 1. MAP Sensor System Inspection 1

Turn the ignition switch to "ON" and engine stop switch "O".

Check the MAP sensor with the HDS pocket tester.

**Is about 5 V indicated?**

- YES** – GO TO STEP 2.  
**NO** –
- Intermittent failure
  - Loose or poor contact on the sensor unit 5P connector

#### 2. MAP Sensor System Inspection 2

Turn the ignition switch to "OFF".

Disconnect the sensor unit 5P connector.  
Connect the sensor unit terminals at the wire side with a jumper wire.

**CONNECTION: Light green/yellow – Green/orange**

Turn the ignition switch to "ON" and engine stop switch "O".  
Check the MAP sensor with the HDS pocket tester.

**Is about 0 V indicated?**

- YES** – Faulty sensor unit (MAP sensor)  
**NO** – GO TO STEP 3.

#### 3. MAP Sensor Input Voltage Inspection

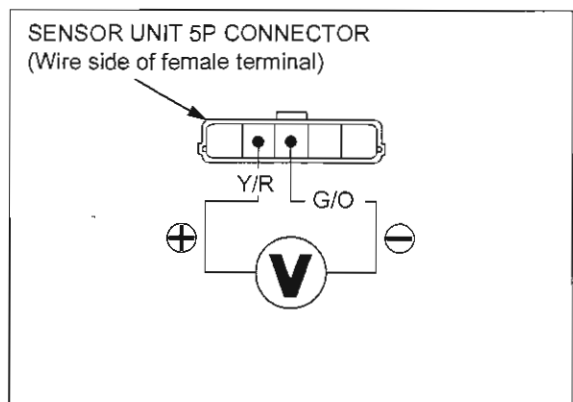
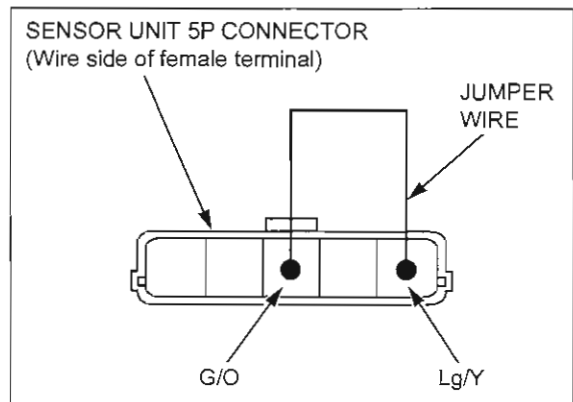
Turn the ignition switch to "OFF".  
Remove the jumper wire.

Turn the ignition switch to "ON" and engine stop switch "O".  
Measure the voltage at the wire side.

**CONNECTION: Yellow/red (+) – Green/orange (-)**

**Is the voltage within 4.75 – 5.25V?**

- YES** – GO TO STEP 4.  
**NO** –
- Open circuit in Green/orange wire
  - Open circuit in Yellow/red wire



4. MAP Sensor Output Line Open Circuit Inspection

Disconnect the ECM 33P (Gray) connector.  
Check for continuity at the Light green/yellow wire between the sensor unit 5P and ECM 33P (Gray) connectors.

**CONNECTION:** B9 – Light green/yellow

**TOOL:**

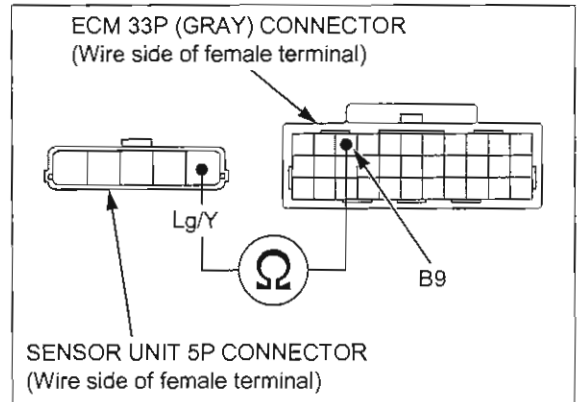
Test probe

07ZAJ-RDJA110

*Is there continuity?*

**YES** – Replace the ECM with a known good one, and recheck.

**NO** – Open circuit in Light green/yellow wire



DTC 7-1 (ECT SENSOR LOW VOLTAGE)

1. ECT Sensor System Inspection

Turn the ignition switch to "ON" and engine stop switch "O".

Check the ECT sensor with the HDS pocket tester.

*Is about 0 V indicated?*

**NO** – Intermittent failure

**YES** – GO TO STEP 2.

2. ECT Sensor Inspection

Turn the ignition switch to "OFF".

Disconnect the ECT sensor 3P (Gray) connector.

Turn the ignition switch to "ON" and engine stop switch "O".

Check the ECT sensor with the HDS pocket tester.

*Is about 0 V indicated?*

**NO** – GO TO STEP 3.

**YES** – GO TO STEP 4.

3. ECT Sensor Resistance Inspection

Turn the ignition switch to "OFF".

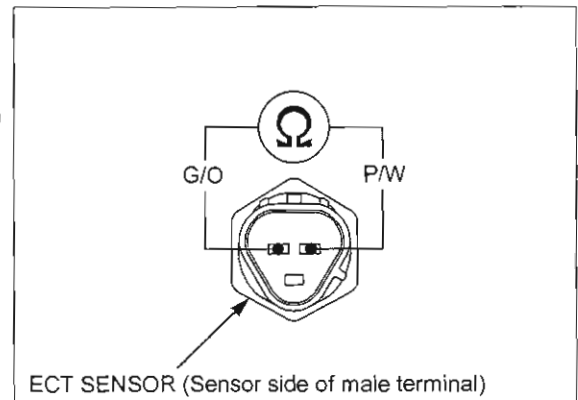
Measure the resistance at the ECT sensor terminals.

**CONNECTION:** Pink/white (+) – Green/orange (–)  
**STANDARD:** 2.3 – 2.6 kΩ (20°C/68°F)

*Is the resistance within 2.3 – 2.6 kΩ?*

**YES** – Replace the ECM with a known good one, and recheck.

**NO** – Faulty ECT sensor



## FUEL SYSTEM (PGM-FI)

### 4. ECT Sensor Short Circuit Inspection

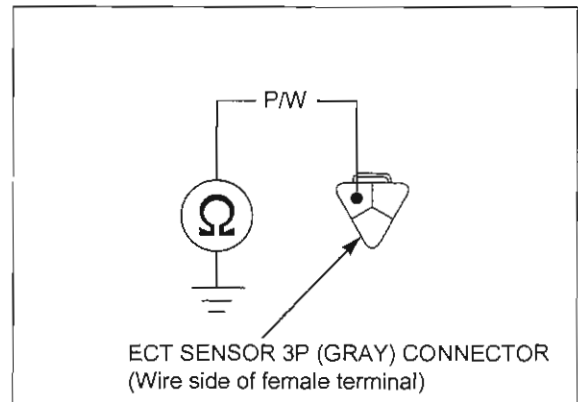
Check for continuity between the ECT sensor 3P (Gray) connector of the wire side and ground.

**CONNECTION: Pink/white – Ground**

*Is there continuity?*

**YES** – Short circuit in Pink/White wire

**NO** – Replace the ECM with a known good one, and recheck.



### DTC 7-2 (ECT SENSOR HIGH VOLTAGE)

- Before starting the inspection, check for loose or poor contact on the ECT sensor 3P connector and recheck the DTC.

#### 1. ECT Sensor System Inspection

Turn the ignition switch to "ON" and engine stop switch "O".

Check the ECT sensor with the HDS pocket tester.

*Is about 5 V indicated?*

**NO** – • Intermittent failure  
• Loose or poor contact on the ECT sensor 3P (Gray) connector

**YES** – GO TO STEP 2.

#### 2. ECT Sensor Inspection

Turn the ignition switch to "OFF".

Disconnect the ECT sensor 3P (Gray) connector. Connect the ECT sensor 3P connector of the wire side terminals with a jumper wire.

**CONNECTION: Pink/white – Green/orange**

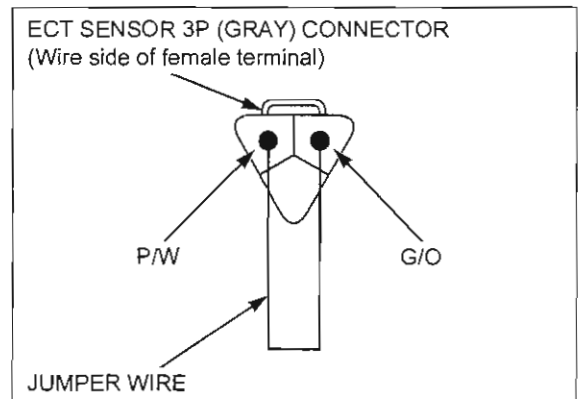
Turn the ignition switch to "ON" and engine stop switch "O".

Check the ECT sensor with the HDS pocket tester.

*Is about 0 V indicated?*

**YES** – Faulty ECT sensor

**NO** – GO TO STEP 3.



**3. ECT Sensor Open Circuit Inspection**

Turn the ignition switch to "OFF".  
Disconnect the jumper wire.

Disconnect the ECM 33P connectors.  
Check for continuity between the ECM and ECT sensor connectors of the wire side.

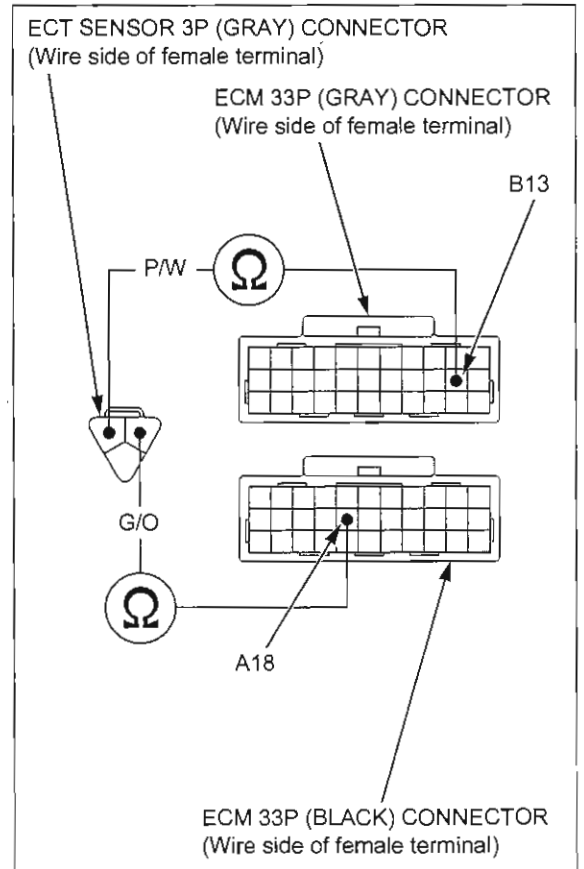
**CONNECTION: B13 – Pink/white  
A18 – Green/orange**

**TOOL:**  
Test probe 07ZAJ-RDJA110

*Is there continuity?*

**YES** – Replace the ECM with a known good one, and recheck.

**NO** – • Open circuit in Pink/white wire  
• Open circuit in Green/orange wire



**DTC 8-1 (TP SENSOR LOW VOLTAGE)**

• Before starting the inspection, check for loose or poor contact on the sensor unit 5P connector and recheck the DTC.

**1. TP Sensor System Inspection**

Turn the ignition switch to "ON" and engine stop switch "O".

Check the TP sensor with the HDS pocket tester when the throttle fully closed.

*Is about 0 V indicated?*

**YES** – GO TO STEP 2.

**NO** – • Intermittent failure  
• Loose or poor contact on the sensor unit 5P connector

**2. TP Sensor Input Voltage Inspection**

Turn the ignition switch to "OFF".  
Disconnect the sensor unit 5P connector.

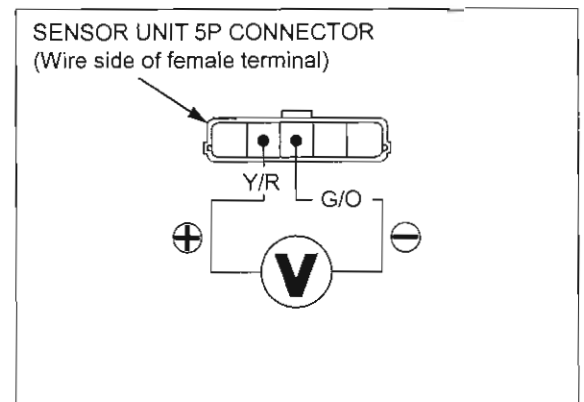
Turn the ignition switch to "ON" and engine stop switch "O".  
Measure the voltage at the wire side.

**CONNECTION: Yellow/red (+) – Green/orange (-)**

*Is the voltage within 4.75 – 5.25 V?*

**YES** – GO TO STEP 4.

**NO** – GO TO STEP 3.



## FUEL SYSTEM (PGM-FI)

### 3. TP Sensor Circuit Inspection

Turn the ignition switch to "OFF".  
Disconnect the ECM 33P (Black) connector.  
Check for continuity at the Yellow/red wire between the sensor unit 5P and ECM 33P (Black) connectors.

**CONNECTION: A9 – Yellow/red**

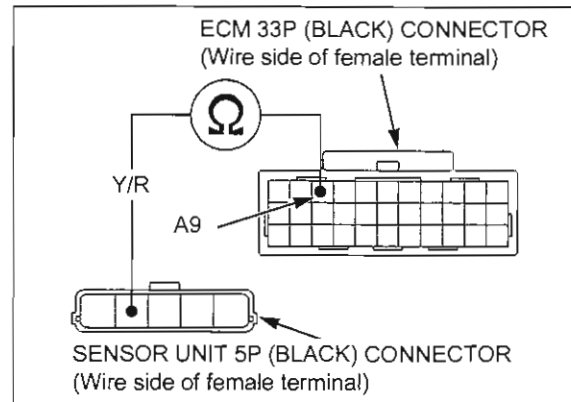
**TOOL:**

**Test probe 07ZAJ-RDJA110**

**Is there continuity?**

**YES** – Replace the ECM with a known good one, and recheck.

**NO** – Open circuit in Yellow/red wire



### 4. TP Sensor Output Line Open Circuit Inspection

Turn the ignition switch to "OFF".  
Disconnect the ECM 33P (Gray) connector.  
Check for continuity at the Red/yellow wire between the sensor unit 5P and ECM 33P (Gray) connectors.

**CONNECTION: B31 – Red/yellow**

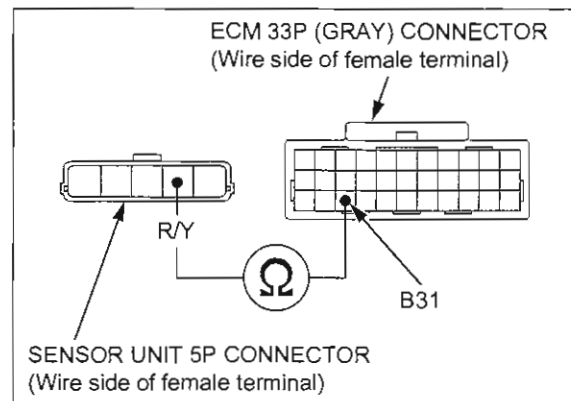
**TOOL:**

**Test probe 07ZAJ-RDJA110**

**Is there continuity?**

**YES** – GO TO STEP 5.

**NO** – Open circuit in Red/yellow wire



### 5. TP Sensor Output Line Short Circuit Inspection

Connect the ECM 33P (Gray) connector.  
Disconnect the sensor unit 5P connector.

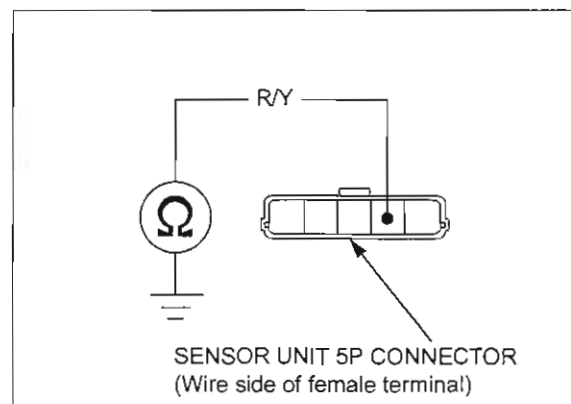
Check for continuity between the sensor unit 5P connector terminal of the wire side and ground.

**CONNECTION: Red/yellow – Ground**

**Is there continuity?**

**YES** – Short circuit in Red/yellow wire

**NO** – GO TO STEP 6.



### 6. TP Sensor Inspection

Replace the sensor unit with a known good one.  
Clear the DTC (page 5-18).  
Turn the ignition switch to "ON" and engine stop switch "O".

Check the TP sensor with the HDS pocket tester.

**Is DTC 8-1 indicated?**

**YES** – Replace the ECM with a known good one, and recheck.

**NO** – Faulty original sensor unit (TP sensor)

**DTC 8-2 (TP SENSOR HIGH VOLTAGE)**

**1. TP Sensor System Inspection**

Turn the ignition switch to "ON" and engine stop switch "O".

Check the TP sensor with the HDS pocket tester.

*Is about 5 V indicated?*

**YES** – GO TO STEP 2.

**NO** – Intermittent failure

**2. TP Sensor Input Voltage Inspection**

Turn the ignition switch to "OFF".

Disconnect the sensor unit 5P connector.

Turn the ignition switch to "ON" and engine stop switch "O".

Measure the voltage at the wire side.

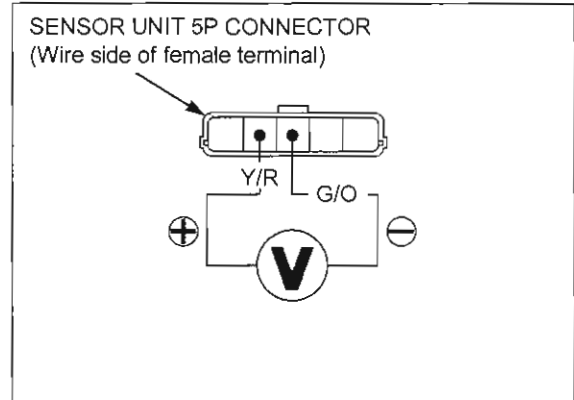
**CONNECTION:** Yellow/red (+) – Green/orange (-)

*Is the voltage within 4.75 – 5.25 V?*

**YES** – GO TO STEP 3.

**NO** –

- Open circuit in Green/orange wire
- Open circuit in Yellow/red wire



**3. TP Sensor Resistance Inspection**

Turn the ignition switch to "OFF".

Remove the throttle body (page 5-51).

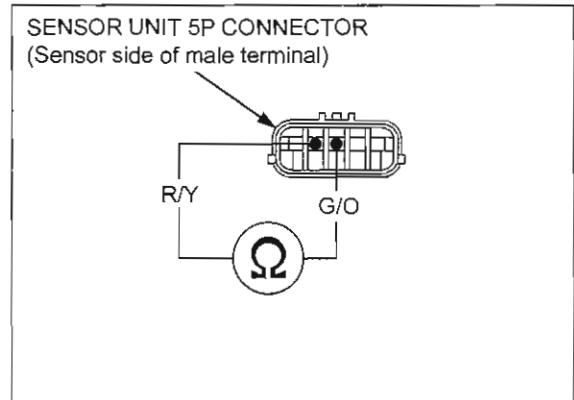
Measure the resistance at the sensor unit (TP sensor) side.

**CONNECTION:** Red/yellow – Green/orange

*Is the resistance within 0.5 – 1.5 kΩ?*

**YES** – Replace the ECM with a known good one, and recheck.

**NO** – Faulty sensor unit (TP sensor)



**DTC 9-1 (IAT SENSOR LOW VOLTAGE)**

**1. IAT Sensor System Inspection**

Turn the ignition switch to "ON" and engine stop switch "O".

Check the IAT sensor with the HDS pocket tester.

*Is about 0 V indicated?*

**YES** – GO TO STEP 2.

**NO** –

- Intermittent failure
- Loose or poor contact on the sensor unit 5P connector

## FUEL SYSTEM (PGM-FI)

### 2. IAT Sensor Inspection

Turn the ignition switch to "OFF".  
Disconnect the sensor unit 5P connector.

Turn the ignition switch to "ON" and engine stop switch "O".

Check the IAT sensor with the HDS pocket tester.

**Is about 0 V indicated?**

**YES** – GO TO STEP 3.

**NO** – Faulty sensor unit (IAT sensor)

### 3. IAT Sensor Output Line Short Circuit Inspection

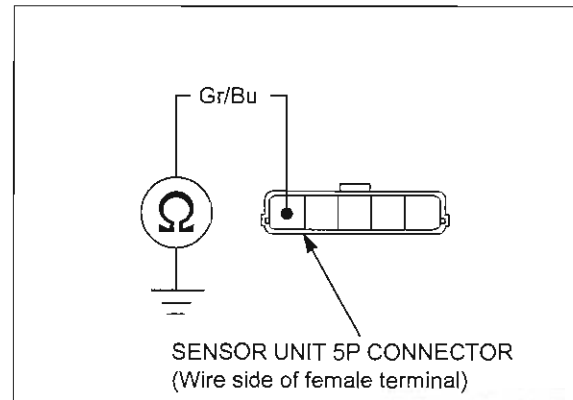
Turn the ignition switch to "OFF".  
Check for continuity between the sensor unit 5P connector terminal of the wire side and ground.

**CONNECTION: Gray/blue – Ground**

**Is there continuity?**

**YES** – Short circuit in Gray/blue wire

**NO** – Replace the ECM with a known good one, and recheck.



## DTC 9-2 (IAT SENSOR HIGH VOLTAGE)

- Before starting the inspection, check for loose or poor contact on the sensor unit 5P connector and recheck the DTC.

### 1. IAT Sensor System Inspection

Turn the ignition switch to "ON" and engine stop switch "O".

Check the IAT sensor with the HDS pocket tester.

**Is about 5 V indicated?**

**YES** – GO TO STEP 2.

**NO** – • Intermittent failure  
• Loose or poor contact on the sensor unit 5P connector

### 2. IAT Sensor Inspection

Turn the ignition switch to "OFF".

Disconnect the sensor unit 5P connector.  
Connect the sensor unit 5P connector terminals with a jumper wire.

**CONNECTION: Gray/blue – Green/orange**

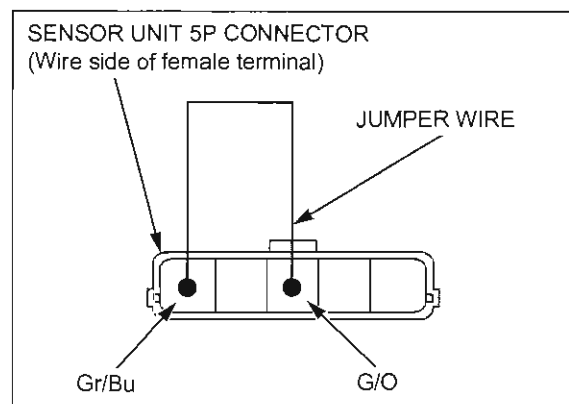
Turn the ignition switch to "ON" and engine stop switch "O".

Check the IAT sensor with the HDS pocket tester.

**Is about 0 V indicated?**

**YES** – Faulty sensor unit (IAT sensor)

**NO** – GO TO STEP 3.





3. IAT Sensor Output Line Inspection

Turn the ignition switch to "OFF".  
 Disconnect the ECM 33P connectors.  
 Check for continuity at the Gray/blue and Green/orange wire between the sensor unit 5P and ECM 33P connectors.

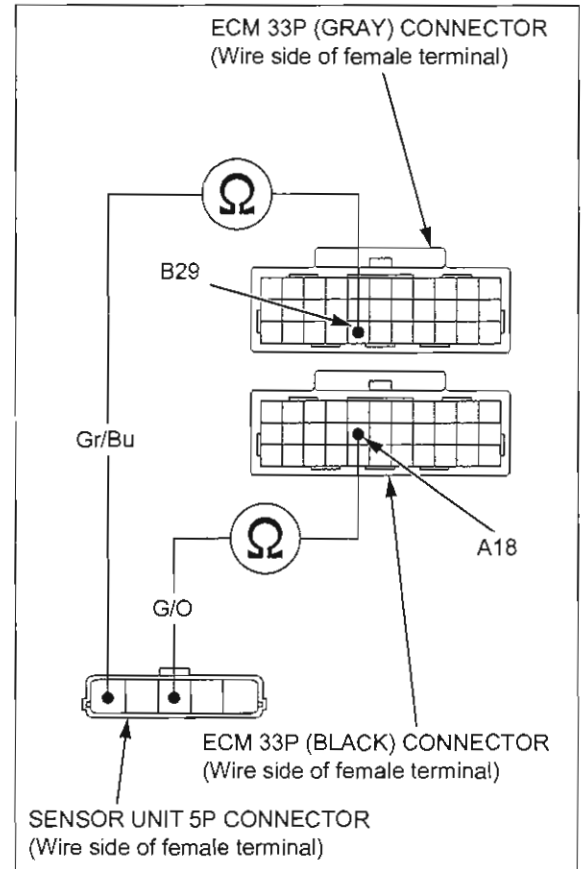
**CONNECTION:** B29 – Gray/blue  
 A18 – Green/orange

**TOOL:**  
 Test probe 07ZAJ-RDJA110

**Is there continuity?**

**YES** – Replace the ECM with a known good one, and recheck.

**NO** – • Open circuit in Gray/blue wire  
 • Open circuit in Green/orange wire



DTC 11-1 (VS SENSOR)

- Before starting the inspection, check for loose or poor contact on the VS sensor 3P connector and recheck the DTC.

1. VS Sensor System Inspection

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

Start the engine and shift the transmission into gear.

Check the VS sensor with the HDS pocket tester.

**Is the vehicle speed indicated normally?**

**YES** – GO TO STEP 2.

**NO** – GO TO STEP 3.

2. Recheck the DTC

Clear the DTC (page 5-18).

Test ride the motorcycle.

Stop the engine.

Turn the ignition switch to "ON" and engine stop switch "O".

Check the VS sensor with the HDS pocket tester.

**Is the DTC 11-1 indicated?**

**YES** – Replace the ECM with a known good one, and recheck.

**NO** – • Loose or poor contact on the ECM connectors  
 • Intermittent failure

## FUEL SYSTEM (PGM-FI)

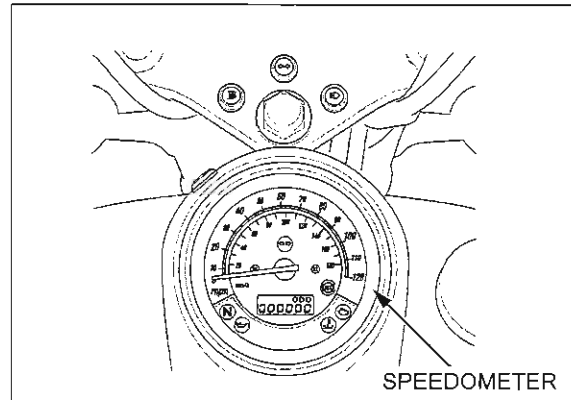
### 3. Speedometer Inspection

Check for operation of speedometer.

**Does the speedometer operate normally?**

**NO** – Inspect the speedometer (page 21-12)

**YES** – GO TO STEP 4.



### 4. VS Sensor Input Voltage Inspection

Turn the ignition switch to "OFF".

Disconnect the VS sensor 3P (White) connector.

Turn the ignition switch to "ON" and engine stop switch "O".

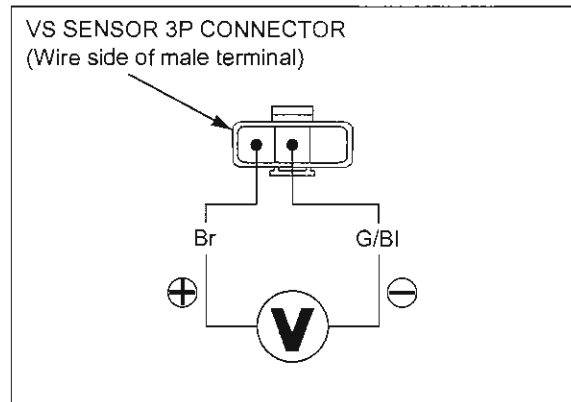
Measure the voltage at the VS sensor connector of the wire side.

**CONNECTION: Brown (+) – Green/black (-)**

**Does the battery voltage exist?**

**NO** – • Open or short circuit in Brown wire  
• Open circuit in Green/black wire

**YES** – GO TO STEP 5.



### 5. VS Sensor Signal Line Open Circuit Inspection

Turn the ignition switch to "OFF".

Disconnect the ECM 33P (Gray) connector.

Check for continuity between the ECM 33P (Gray) and VS sensor 3P connectors of the wire side.

**CONNECTION: B28 – Pink/green**

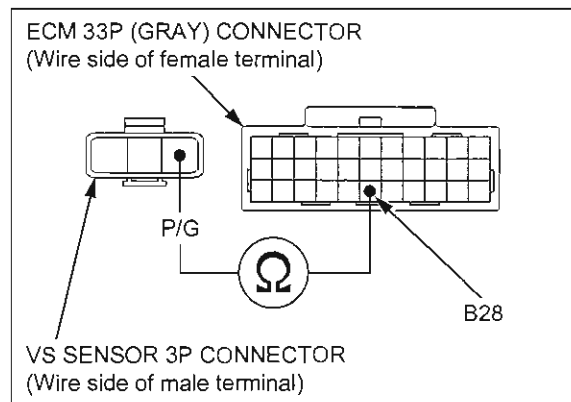
**TOOL:**

**Test probe** 07ZAJ-RDJA110

**Is there continuity?**

**NO** – Open circuit in Pink/green wire

**YES** – GO TO STEP 6.



### 6. VS Sensor Signal Line Short Circuit Inspection

Connect the ECM 33P (Gray) connector.

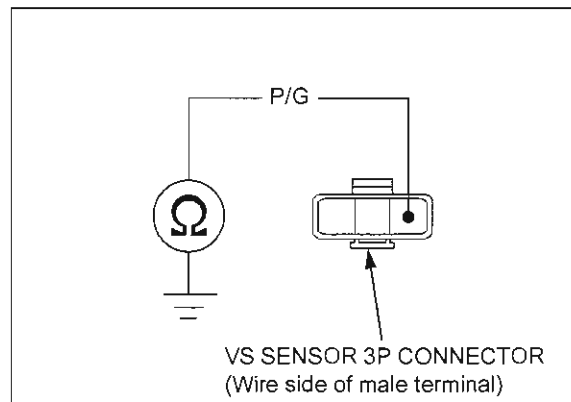
Check for continuity between the VS sensor 3P connector of the wire side and ground.

**CONNECTION: Pink/green – Ground**

**Is there continuity?**

**YES** – Short circuit in Pink/green wire

**NO** – Faulty VS sensor



**DTC 12-1 (No.1 REAR INJECTOR)**

- Before starting the inspection, check for loose or poor contact on the injector 2P connector and recheck the DTC.

DTC	INJECTOR	POWER INPUT LINE	SIGNAL LINE	SIGNAL AT ECM
12-1	No.1 Rear	Black/white	Pink/yellow	A17
13-1	No.2 Front	Black/white	Pink/blue	A6

**1. Injector System Inspection**

Clear the DTC (page 5-18).  
 Turn the ignition switch to "ON" and engine stop switch "O", start the engine and check the injector with the HDS pocket tester.

**Is the DTC 12-1 indicated?**

- NO** – • Intermittent failure  
 • Loose or poor contact on the injector 2P (Gray) connector

**YES** – GO TO STEP 2.

**2. Injector Input Voltage Inspection**

Turn the ignition switch to "OFF".  
 Disconnect the injector 2P (Gray) connector.  
 Turn the ignition switch to "ON" and engine stop switch "O".

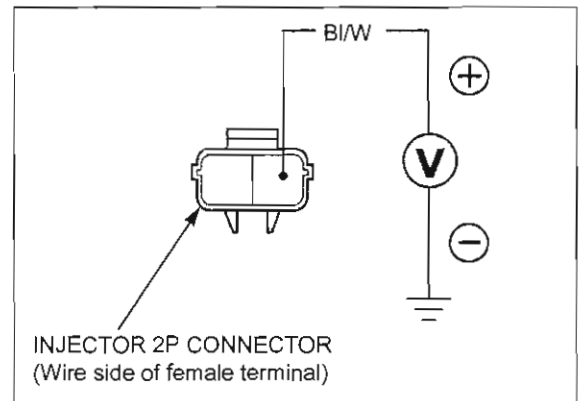
Measure the voltage between the injector 2P (Gray) connector of the wire side and ground.

**CONNECTION: Black/white (+) – Ground (-)**

**Does the battery voltage exist?**

- NO** – Open or short circuit in Black/white wire

**YES** – GO TO STEP 3.



## FUEL SYSTEM (PGM-FI)

### 3. Injector Signal Line Open Circuit Inspection

Turn the ignition switch to "OFF".

Disconnect the ECM 33P (Black) connector.

Check for continuity between the ECM 33P (Black) and injector 2P (Gray) connectors of the wire side.

**CONNECTION: No.1 Rear: A6 – Pink/blue  
No.2 Front: A17 – Pink/yellow**

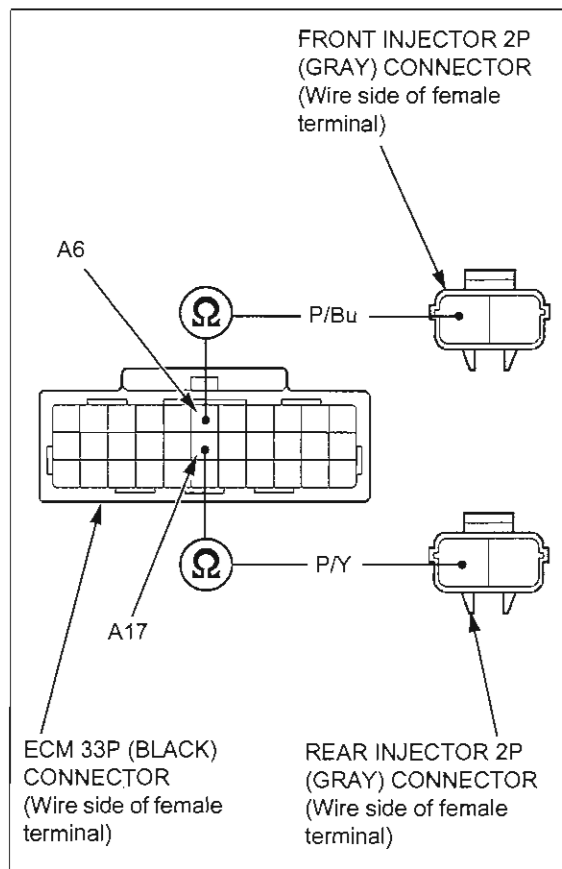
**TOOL:**

**Test probe 07ZAJ-RDJA110**

*Is there continuity?*

**NO** – Open circuit in SIGNAL line wire

**YES** – GO TO STEP 4.



### 4. Injector Signal Line Short Circuit Inspection

Connect the ECM 33P (Black) connector.

Check for continuity between the injector 2P (Gray) connector and ground.

**CONNECTION:**

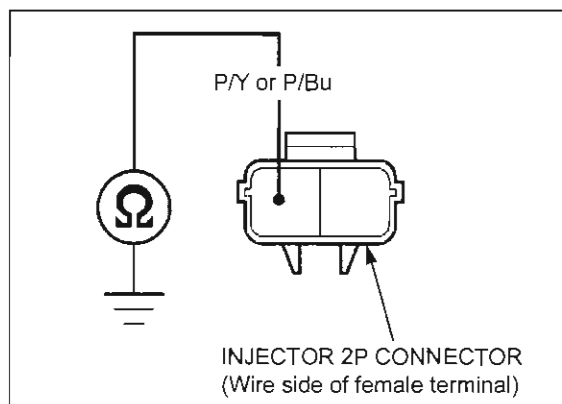
**No.1 Rear: Pink/blue – Ground**

**No.2 Front: Pink/yellow – Ground**

*Is there continuity?*

**YES** – Short circuit in SIGNAL line wire

**NO** – GO TO STEP 5.



### 5. Injector Resistance Inspection

Remove the sensor unit (page 5-52).

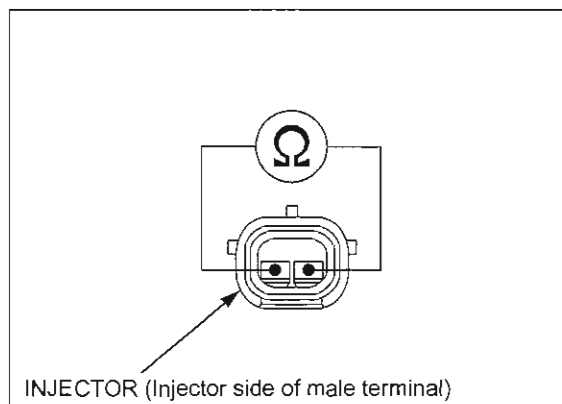
Measure the resistance of the injector connector terminals.

**STANDARD: 11 – 13 Ω (20°C/68°F)**

*Is the resistance within 11 – 13 Ω (20°C/68°F)?*

**NO** – Faulty injector

**YES** – Replace the ECM with a known good one, and recheck.



**DTC 13-1 (No.2 FRONT INJECTOR)**

See page 5-31

**DTC 29-1 (IACV)**

- Before starting the inspection, check for loose or poor contact on the IACV 4P connector and recheck the DTC.

**1. Recheck DTC**

Clear the DTC (page 5-18).  
Start the engine and recheck the DTC.

**Is the DTC 29-1 indicated?**

- NO** – • Intermittent failure  
• Loose or poor contact on the IACV 4P (Black) connector

**YES** – GO TO STEP 2.

**2. IACV Short Circuit Inspection**

Turn the ignition switch to "OFF".  
Disconnect the IACV 4P (Black) connector.

Check for continuities between the IACV 4P (Black) connector and ground.

- CONNECTION:** Black – Ground  
Black/blue – Ground  
Black/yellow – Ground  
Yellow/green – Ground

**Are there continuities?**

- YES** – • Short circuit in Black or Black/blue wire  
• Short circuit in Black/yellow or Yellow/green wire

**NO** – GO TO STEP 3.

**3. IACV Circuit Continuity Inspection**

Disconnect the ECM 33P (Black) connector.

Check for continuities between the ECM 33P (Black) and IACV 4P (Black) connectors.

- CONNECTION:** A19 – Yellow/green  
A27 – Black/blue  
A16 – Black  
A29 – Black/yellow

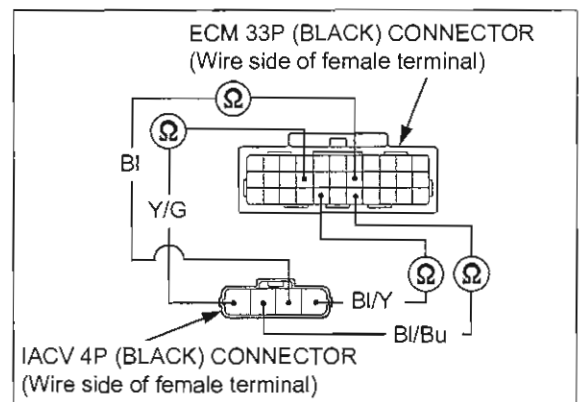
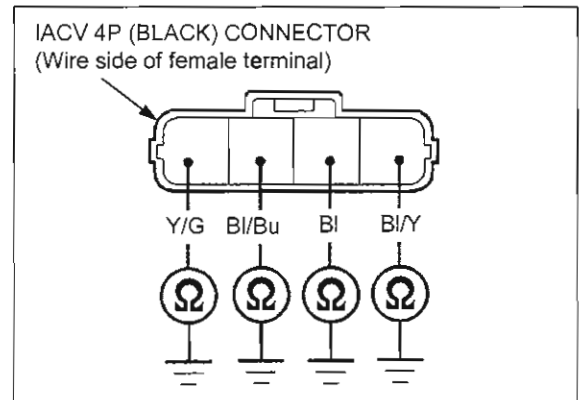
**TOOL:**

Test probe 07ZAJ-RDJA110

**Are there continuities?**

**YES** – GO TO STEP 4.

- NO** – • Open or loose contact in Yellow/green or Black/blue wire  
• Open or loose contact in Black or Black/yellow wire



## FUEL SYSTEM (PGM-FI)

### 4. IACV Resistance Inspection

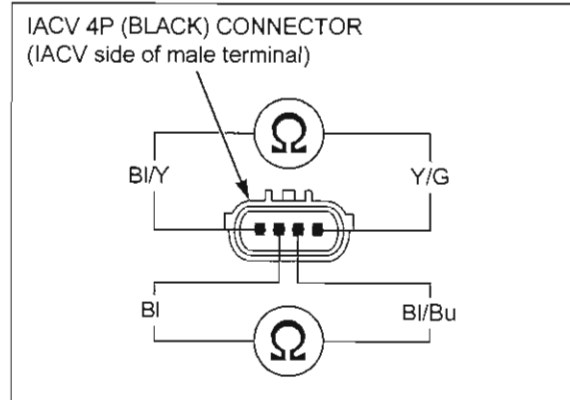
Measure the resistance at the IACV 4P (Black) connector terminals.

**CONNECTION:** Yellow/green – Black/yellow  
Black – Black/blue

**STANDARD:** 99 – 121  $\Omega$  (25°C/77°F)

*Is the resistance within 99 – 121  $\Omega$  (25°C/77°F)?*

- YES** – Replace the ECM with a known good one, and recheck.
- NO** – Faulty IACV



### DTC 33-2 (EEPROM)

#### 1. Recheck DTC

Clear the DTC (page 5-18).  
Turn the ignition switch to "ON" and engine stop switch "O".  
Recheck the ECM EEPROM.

*Is the DTC 29-1 indicated?*

- NO** – Replace the ECM with a known good one, and recheck.
- YES** – Intermittent failure

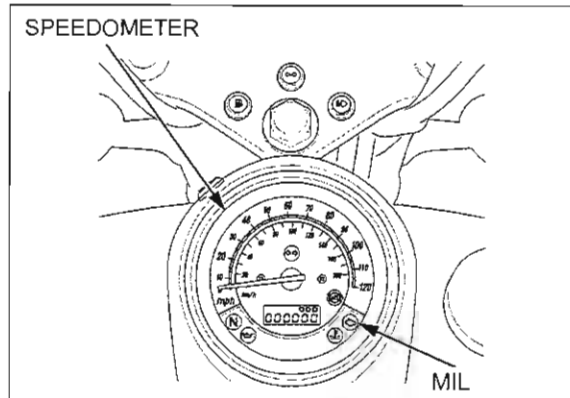
## MIL CIRCUIT INSPECTION

If the engine can be started but the MIL does not come on when the ignition switch to "ON" and engine stop switch "O", check as follows:

Check the speedometer function properly.

- If they do not function, check the speedometer power input line (page 21-12).
- If they function properly, check as follows:

Turn the ignition switch to "OFF".  
Disconnect the ECM 33P (Black) connector.



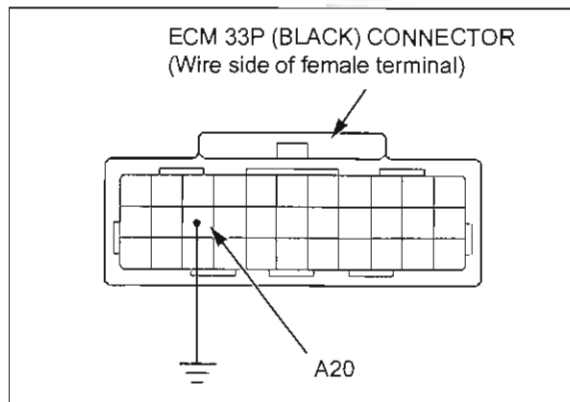
Ground the A20 terminal of the wire side connector with a jumper wire.

#### TOOL:

**Test probe** 07ZAJ-RDJA110

Turn the ignition switch to "ON" and engine stop switch "O", the MIL should come on.

- If the MIL come on, replace the ECM.
- If the MIL does not come on, check for open circuit in White/blue wire between the speedometer and ECM.  
If the wire is OK, replace the speedometer (page 21-12).



## FUEL LINE INSPECTION

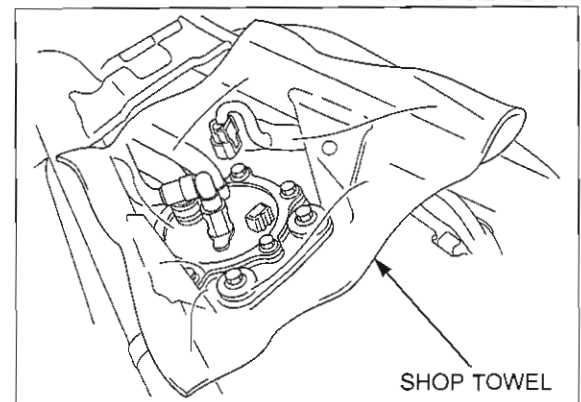
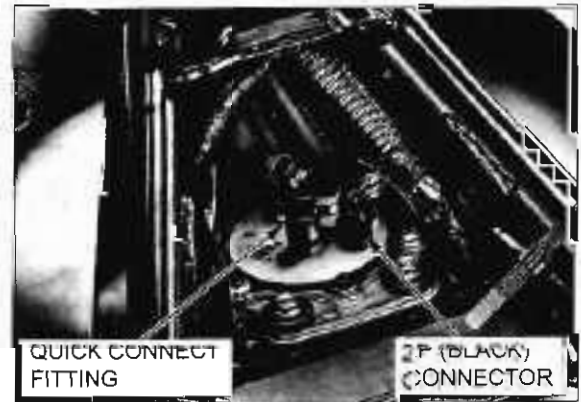
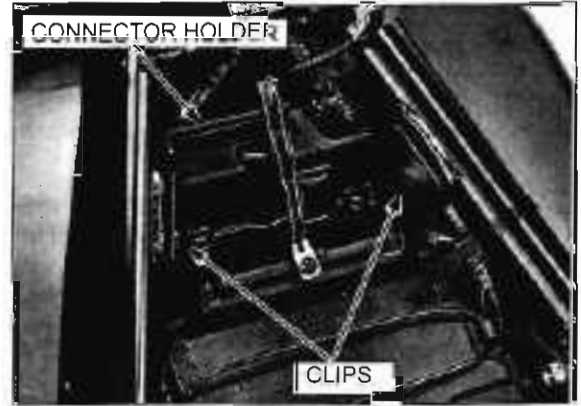
### FUEL PRESSURE RELIEVING/QUICK CONNECT FITTING REMOVAL

- Before disconnecting fuel feed hose, relieve pressure from the system as following procedures.
- Do not bend or twist fuel feed hose.

VT750C2S; Remove the connector boot.  
Remove the clips and connector holder.

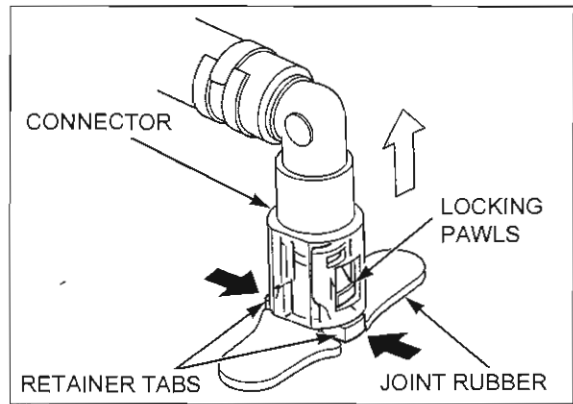
1. Turn the ignition switch to "OFF".  
Remove the seat (page 2-3) and disconnect the sub fuel tank/fuel pump 2P (Black) connector.
2. Start the engine, and let it idle until it stalls.
3. Turn the ignition switch to "OFF".
4. Disconnect the battery negative (-) cable (page 18-7).

5. Check the fuel quick connect fitting for dirt, and clean if necessary.  
Place a shop towel over the quick connect fitting.

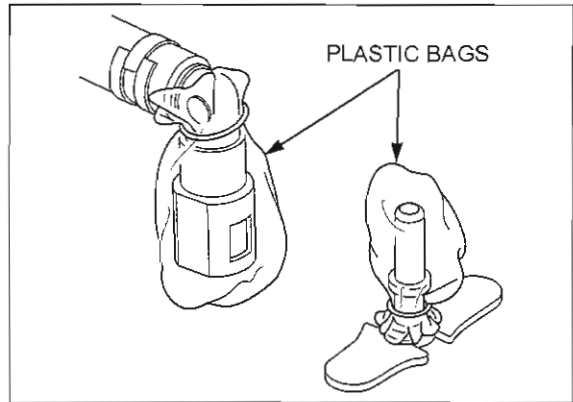


## FUEL SYSTEM (PGM-FI)

6. Hold the connector with one hand and squeeze the retainer tabs with the other hand release them from the locking pawls.  
Pull the connector off, then remove the retainer and joint rubber from the fuel pipe.
- Prevent the remaining fuel in the fuel feed hose from flowing out with a shop towel.
  - Be careful not to damage the hose or other parts.
  - Do not use tools.
  - If the connector does not move, keep the retainer tabs pressed down, and alternately pull and push the connector until it comes off easily.



7. To prevent damage and keep foreign matter out, cover the disconnected connector and fuel pipe with the plastic bags.

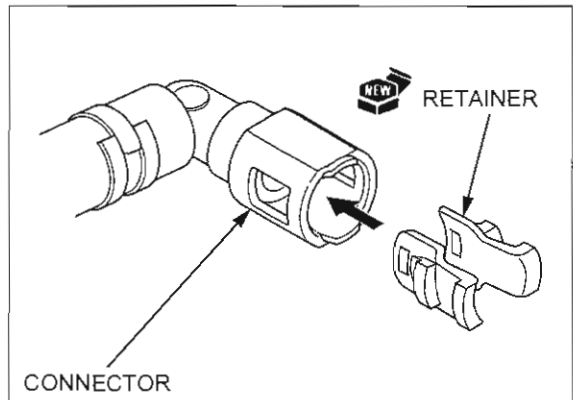


## QUICK CONNECT FITTING INSTALLATION

- Always replace the retainer of the quick connect fitting when the fuel feed hose is disconnected.
  - If any retainer needs replacing, use the same manufacturer's retainer as the ones being removed (The several manufactures feature different retainer specifications).
  - If any damage or cut-out on the joint rubber, replace it with a new one.
  - Do not bend or twist the fuel feed hose.
1. Insert a new retainer into the connector.

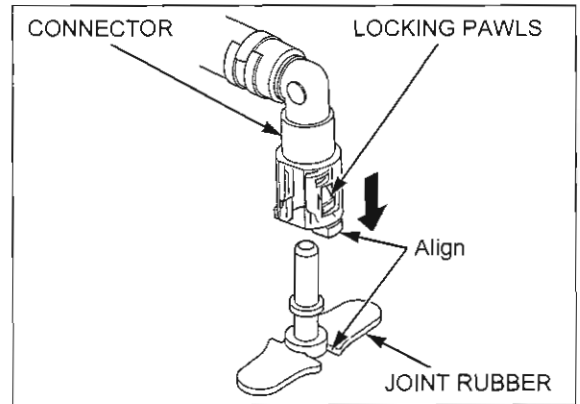
### NOTE:

- Align the new retainer locking pawls with the connector grooves.

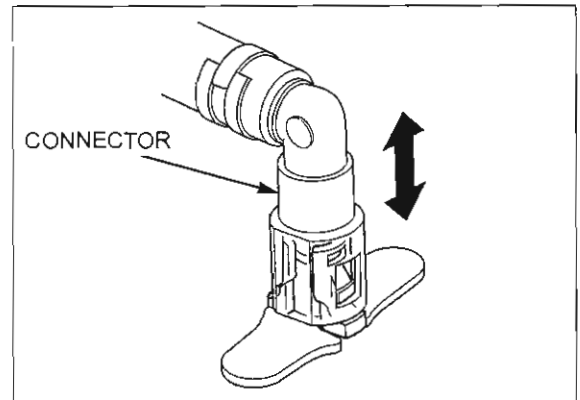




2. Set the joint rubber to the fuel pipe as shown.
3. Install the connector to the fuel pipe by aligning retainer tabs with joint rubber grooves. Then press the quick connect fitting onto the pipe until both retainer pawls lock with a "CLICK".  
If it is hard to connect, put a small amount of engine oil on the pipe end.



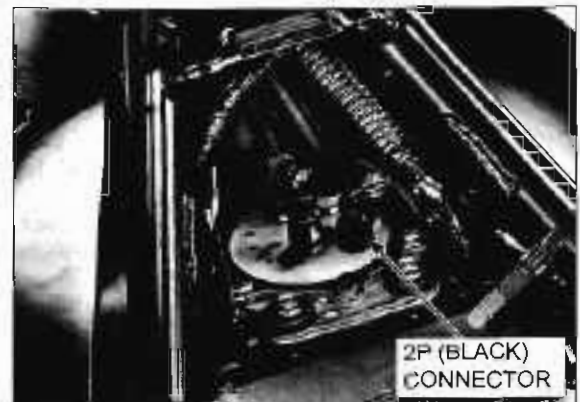
4. Make sure the connection is secure and that the pawls are firmly locked into place; check visually and by pulling the connector.



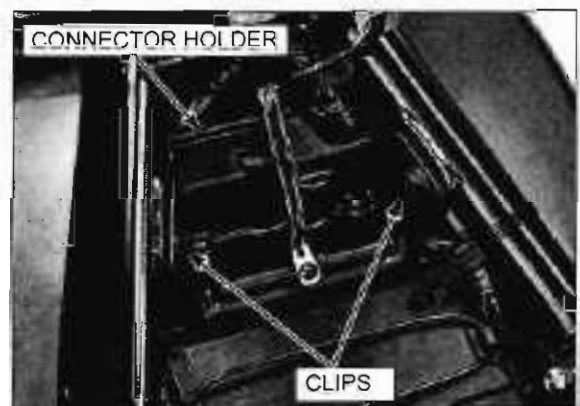
5. Connect the sub fuel tank/fuel pump 2P (Black) connector.
6. Connect the negative (-) cable to the battery.
7. Turn the ignition switch to "ON" and engine stop switch "O".

**NOTE:**

- Do not start the engine.  
The fuel pump will run for about 2 seconds, and fuel pressure will rise.  
Repeat 2 or 3 times, and check that there is no leakage in the fuel supply system.



- VT750C2S;** Install the connector holder and clips securely.  
Install the connector boot.  
Install the seat (page 2-3).



### FUEL PRESSURE TEST

Relieve the fuel pressure and disconnect the quick connect fitting from the sub fuel tank/fuel pump (page 5-35).

Attach the fuel pressure gauge, attachments, joint and manifold.

**TOOLS (not available in U.S.A.):**

- (1): Fuel pressure gauge 07406-0040004
- (2): Pressure gauge manifold 07ZAJ-S5A0111
- (3): Hose attachment, 6 mm/9 mm 07ZAJ-S5A0130
- (4): Hose attachment, 9 mm/9 mm 07ZAJ-S5A0120
- (5): Attachment joint, 6 mm/9 mm 07ZAJ-S5A0150

**U.S.A. TOOLS:**

- Fuel pressure gauge, 0 – 100 psi 07406-004000B
- Fuel pressure manifold 07AMJ-HW3A100
- Fuel adaptor male "B" 07AAJ-S6MA200
- Fuel adaptor female "B" 07AAJ-S6MA400

Temporarily connect the negative (-) cable to the battery.

Connect the sub fuel tank/fuel pump 2P (Black) connector.

Start the engine and let it idle.

Read the fuel pressure.

**STANDARD: 333 – 353 kPa (3.4 – 3.6 kgf/cm<sup>2</sup>, 48 – 51 psi)**

If the fuel pressure is higher than specified, replace the fuel pump assembly (faulty fuel pump or fuel pressure regulator).

If the fuel pressure is lower than specified, inspect the following:

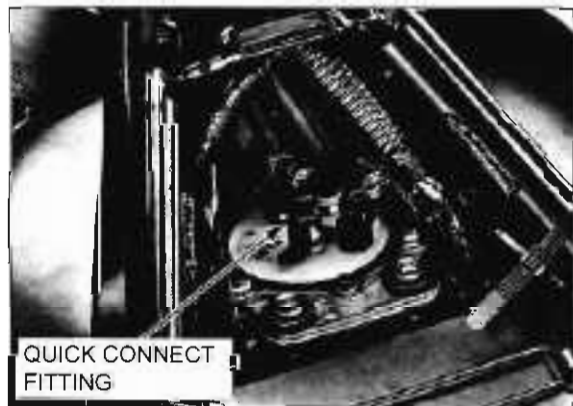
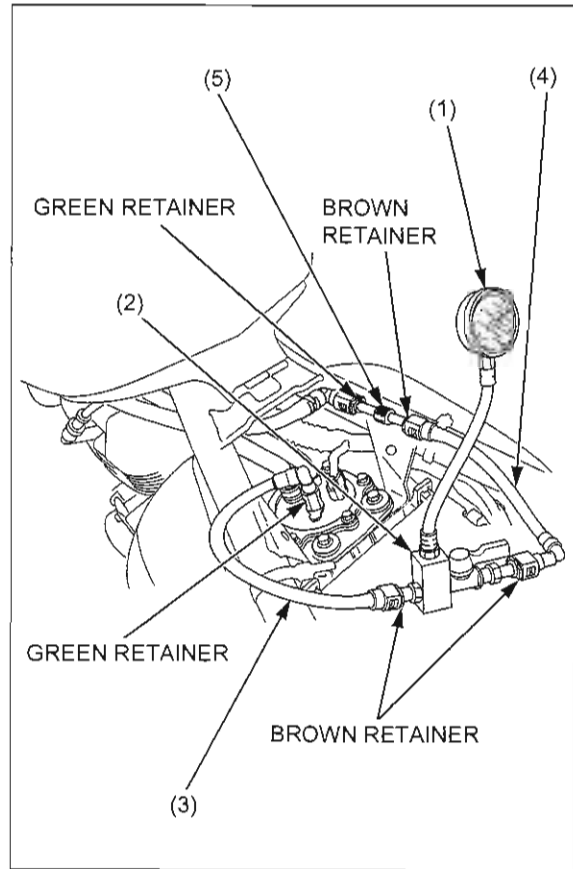
- Fuel line leaking
- Pinched or clogged fuel feed hose or fuel tank breather hose
- Sub fuel tank/fuel pump (page 5-40)
- Clogged fuel filter (Assembly of the sub fuel tank/fuel pump: page 5-40)

*Wrap a shop towel around the attachment to soak up any spilled fuel.*

After inspection, relieve the fuel pressure by disconnect the quick connect fitting from the sub fuel tank/fuel pump (page 5-35).

Remove the fuel pressure gauge, attachment, joint and manifold from the sub fuel tank/fuel pump.

Connect the quick connect fitting to the sub fuel tank/fuel pump (page 5-36).



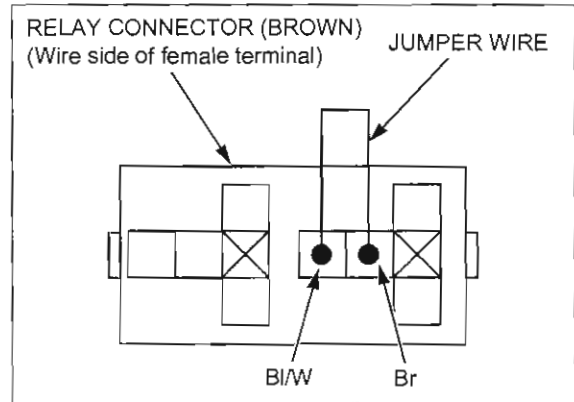
**FUEL FLOW INSPECTION**

Relieve the fuel pressure and disconnect the quick connect fitting from the sub fuel tank/fuel pump (page 5-35).

Remove the fuel cut off relay (page 5-46).

Turn the ignition switch to "OFF".

Connect the Brown and Black/white wire terminals of the wire side using a jumper wire.



Connect the hose attachment to the fuel pipe of the sub fuel tank/fuel pump.

**TOOL (not available in U.S.A.):**

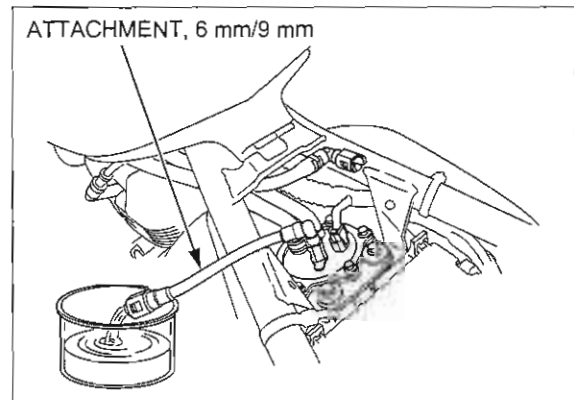
Hose attachment, 6 mm/9 mm 07ZAJ-S5A0130

**U.S.A. TOOLS:**

Fuel pressure manifold 07AMJ-HW3A100

Fuel adaptor female "B" 07AAJ-S6MA400

**Note:** The fuel pressure gauge must be installed for these test.



*Wipe spilled gasoline out of the container.*

Place the end of the hose into an approved gasoline container.

Temporarily connect the negative (-) cable to the battery.

Connect the sub fuel tank/fuel pump 2P (Black) connector.

Turn the ignition switch to "ON", engine stop switch "O" for 10 seconds.

Measure the amount of fuel flow.

**Amount of fuel flow:**

50 cm<sup>3</sup> (1.7 US oz, 1.8 Imp oz) minimum

/10 seconds at 12 V

If the fuel flow is less than specified, inspect the following:

- Fuel pump (page 5-40)
- Clogged fuel filter (Assembly of the fuel pump: page 5-41)

Connect the quick connect fitting to the sub fuel tank/fuel pump (page 5-36).

## SUB FUEL TANK/FUEL PUMP

### INSPECTION

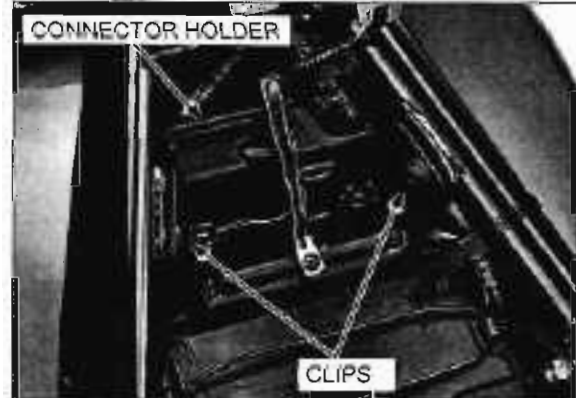
Turn the ignition switch to "ON", engine stop switch "O" and confirm that the fuel pump operates for a few seconds.

If the fuel pump does not operate, inspect as follows:

Turn the ignition switch to "OFF".

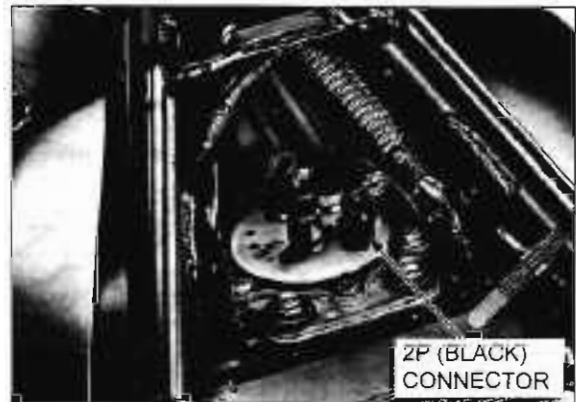
Remove the connector boot.

VT750C2S; Remove the clips and connector holder.



Remove the seat (page 2-3).

Disconnect the sub fuel tank/fuel pump 2P (Black) connector.



Turn the ignition switch to "ON", engine stop switch "O" and measure the voltage between the terminals.

**CONNECTION: Brown (+) – Green (-)**

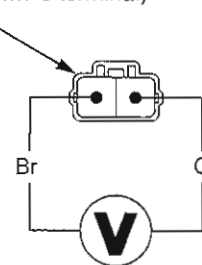
There should be battery voltage for a few seconds.

If there is battery voltage, replace the sub fuel tank/fuel pump assembly.

If there is no battery voltage, inspect the following:

- Open circuit in Brown wire and/or Green wire
- Sub fuse 10 A (METER)
- Sub fuse 10 A (IGN, START)
- Main fuse 30 A
- FI fuse 15 A
- Fuel cut off relay (page 5-46)
- Engine stop relay (page 5-65)
- Engine stop switch (page 21-23)
- Bank angle sensor (page 5-63)
- ECM (page 5-66)

FUEL PUMP 2P (BLACK) CONNECTOR  
(Wire side of female terminal)



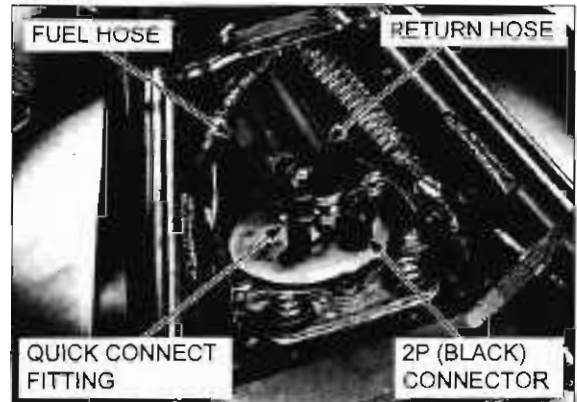
**REMOVAL**

- Do not disassemble the sub fuel tank/fuel pump.

Relieve the fuel pressure and disconnect the quick connect fitting from the sub fuel tank/fuel pump (page 5-35).

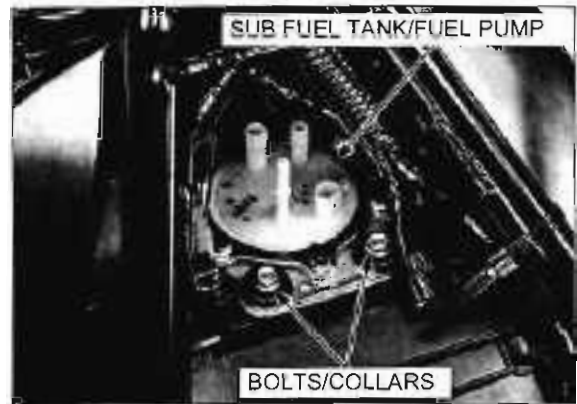
Remove the following:

- Fuel tank (page 5-48)
- Fuel vapor return hose
- Fuel hose



Remove the bolts, collars and sub fuel tank/fuel pump.

Check the sub fuel tank/fuel pump for damage, replace it if necessary.



**DISASSEMBLY**

NOTE:

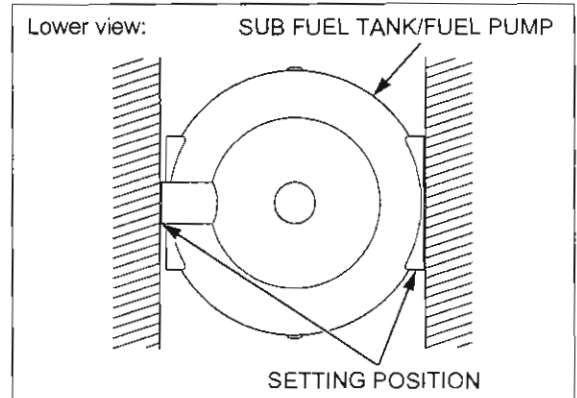
- To prevent dirt and debris from entering the fuel pump, always clean it before disassembly.
- Clean the inside of the sub fuel tank, fuel pump unit and fuel pump filter with clean gasoline. Never use commercially available carburetor cleaners.
- Always replace all O-rings with new ones when the fuel pump has been disassembled.
- Be careful not to damage the fuel pump unit wire.

*Do not over-tighten the vise on the sub fuel tank/fuel pump.*

Set the sub fuel tank/fuel pump in a vise with a piece of wood or soft jaws to prevent damage.

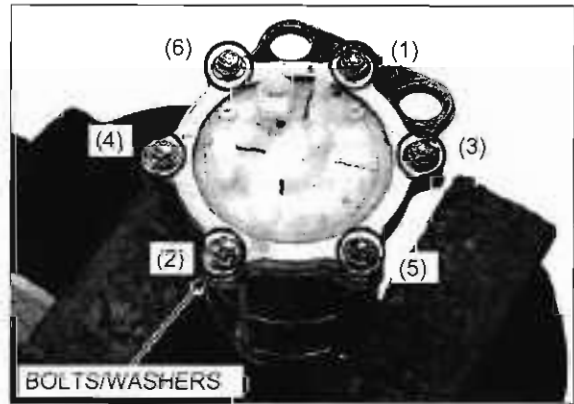
NOTE:

- Set the sub fuel tank/fuel pump in a vise as shown.



## FUEL SYSTEM (PGM-FI)

*Be careful not to drop the fuel pump unit.* Loosen the fuel pump assembly bolts in the specified sequence as shown and remove the bolts and spring washers.



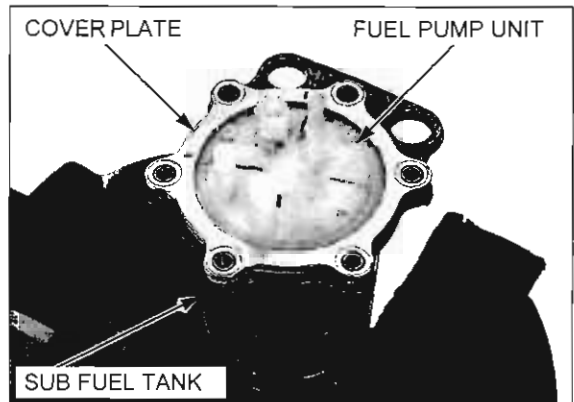
Remove the cover plate and fuel pump unit from the sub fuel tank.

**NOTE:**

- Be careful not to damage the fuel pump unit and fuel pump unit wire.

*Wipe excess gasoline out of the container.*

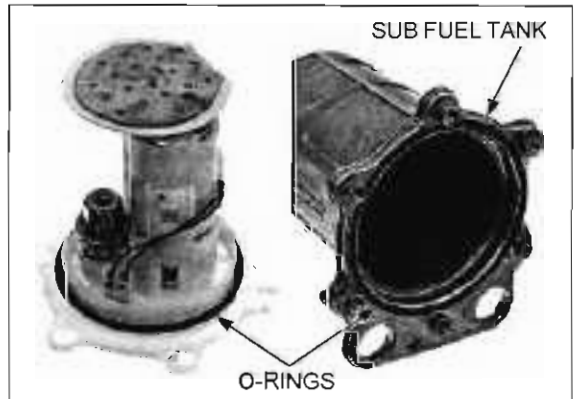
Drain the gasoline into an approved gasoline container.



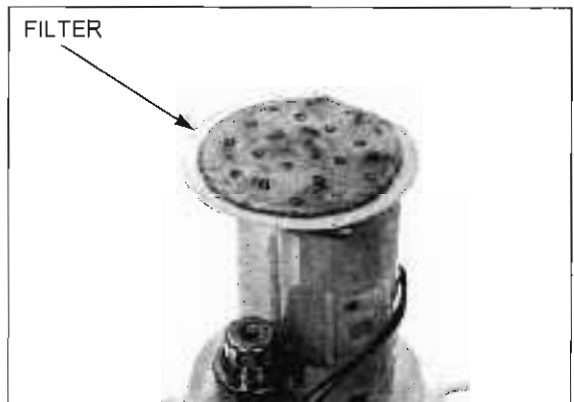
*Do not reuse the O-rings.*

Remove the O-rings.

Clean the inside of the sub fuel tank with clean gasoline.



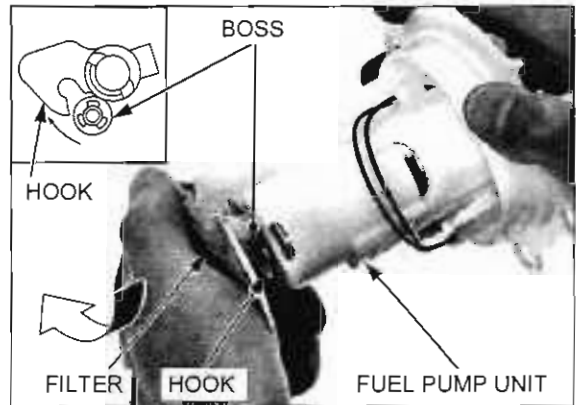
Visually inspect the fuel pump filter for dirt, debris or any clogging, and replace it if necessary.



**FUEL PUMP FILTER REPLACEMENT**

*Be careful not to damage the fuel pump filter and fuel pump unit.*

Hold the bottom face of the fuel pump filter. Disengage the fuel pump filter hook from the fuel pump unit boss by turning the fuel pump filter clockwise, then remove the fuel pump filter.

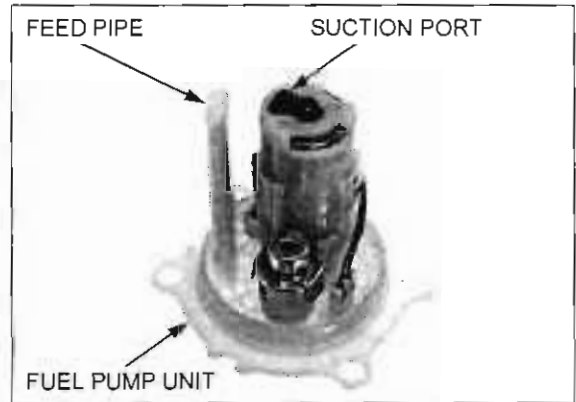


Before installing the fuel pump filter, check the fuel pump unit for dirt.

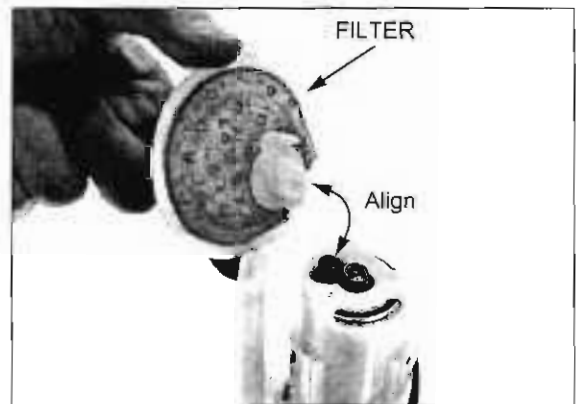
If necessary, clean the fuel pump unit with compressed air.

**NOTE:**

- Place a shop towel over the fuel pump unit to prevent dirt from entering the feed pipe and suction port.
- Do not blow compressed air directly into the feed pipe or suction port.



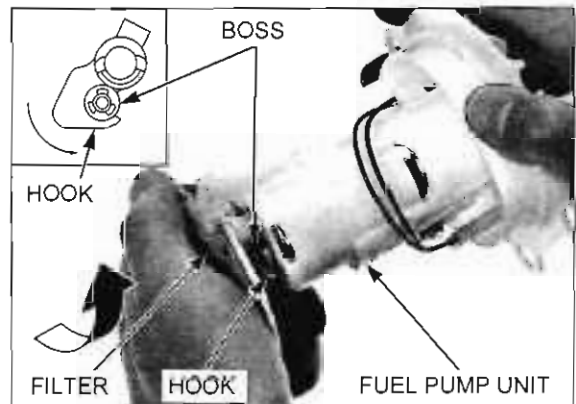
Install the fuel pump filter to the fuel pump unit while aligning the holes for the suction port.



*Be careful not to damage the fuel pump filter and fuel pump unit.*

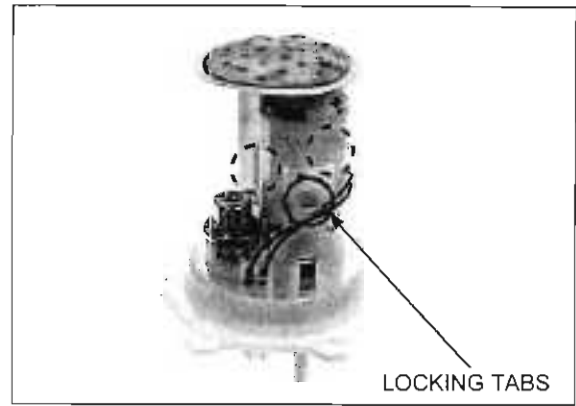
Hold the bottom face of the fuel pump filter and push in until it is fully seated on the fuel pump unit.

Engage the fuel pump filter hook to the fuel pump unit boss by turning the fuel pump filter counterclockwise.



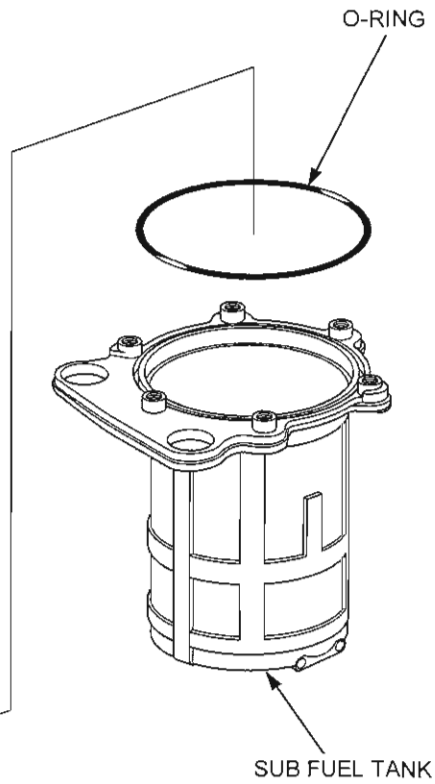
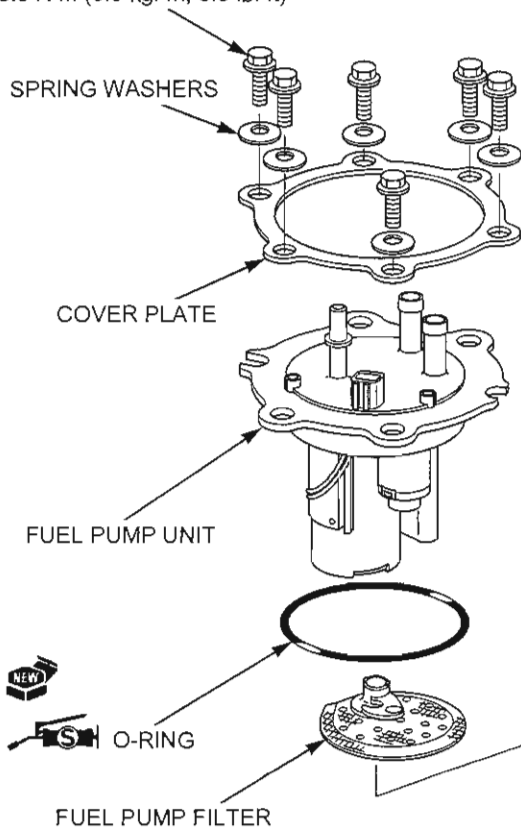
## FUEL SYSTEM (PGM-FI)

Make sure the fuel pump unit is securely connected and that the locking tabs are firmly locked into place.



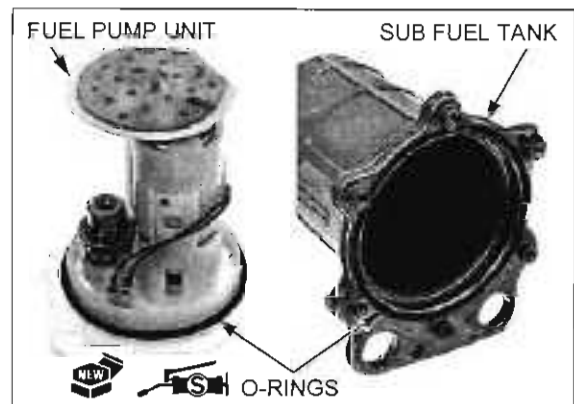
### ASSEMBLY

8.8 N·m (0.9 kgf·m, 6.5 lbf·ft)



Apply silicone grease to new O-rings.

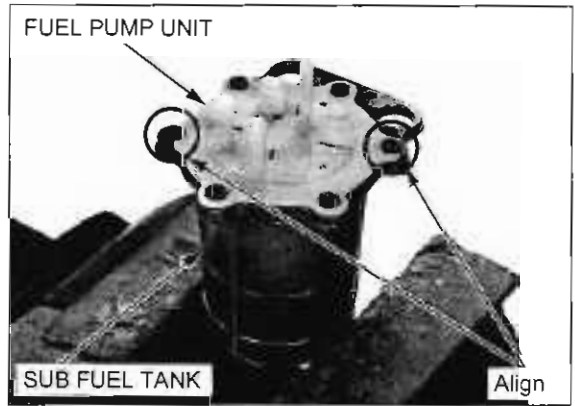
Install the O-rings onto the fuel pump unit and sub fuel tank.



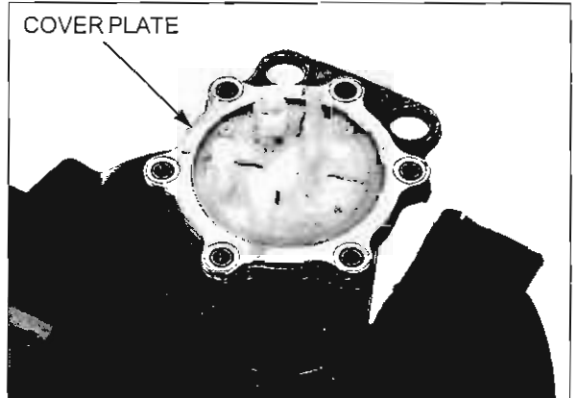


Set the sub fuel tank in a vise (page 5-41).

Install the fuel pump unit into the sub fuel tank while aligning the bosses of the sub fuel tank and fuel pump unit, making sure the fuel pump unit sits flush against the sub fuel tank.

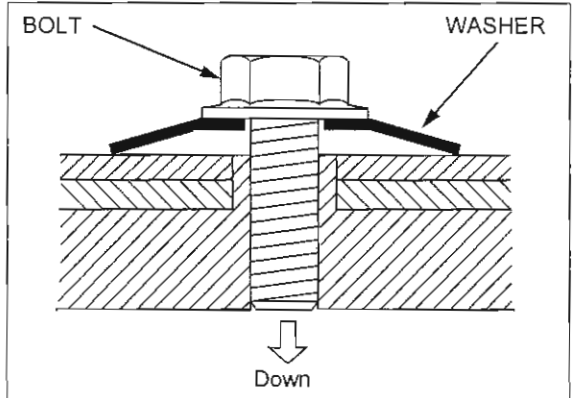


Install the cover plate with the chamfered edges facing up.



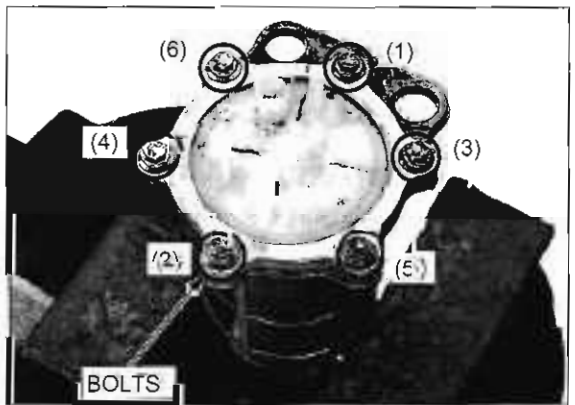
Install the spring washers to the fuel pump assembly bolts as shown.

Install the fuel pump assembly bolts.



*Be careful not to drop the fuel pump unit.* Tighten the fuel pump assembly bolts to the specified torque in the specified sequence as shown.

**TORQUE: 8.8 N·m (0.9 kgf·m, 6.5 lbf·ft)**

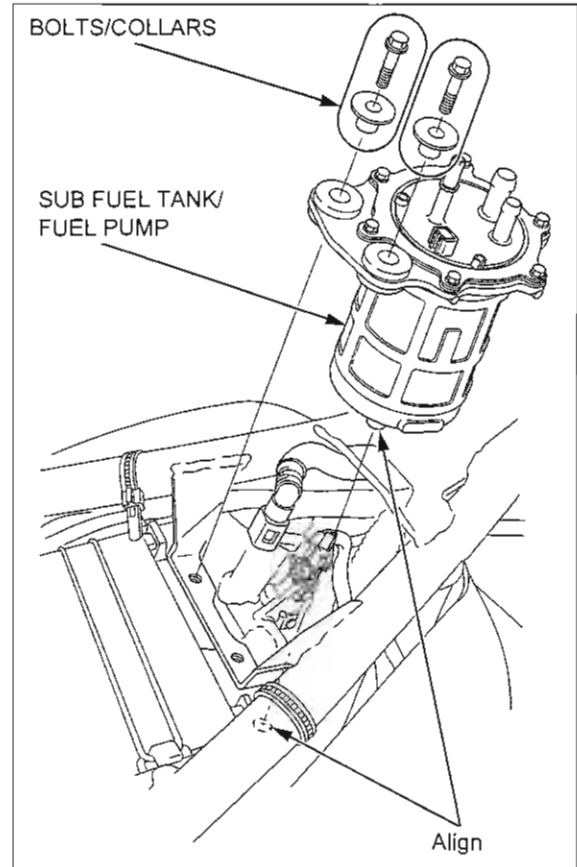


## FUEL SYSTEM (PGM-FI)

### INSTALLATION

Install the sub fuel tank/fuel pump into the frame by aligning its tab with the grommet of the frame.

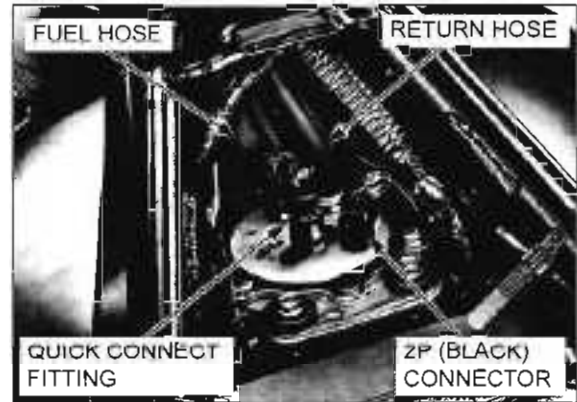
Install the collars and bolts.  
Tighten the bolts securely.



Connect the fuel hose and fuel vapor return hose to the sub fuel tank/fuel pump.

Install the fuel tank (page 5-48).

Connect the quick connect fitting to the sub fuel tank/fuel pump (page 5-36).



## FUEL CUT OFF RELAY

### INSPECTION (VT750C2/C2B)

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

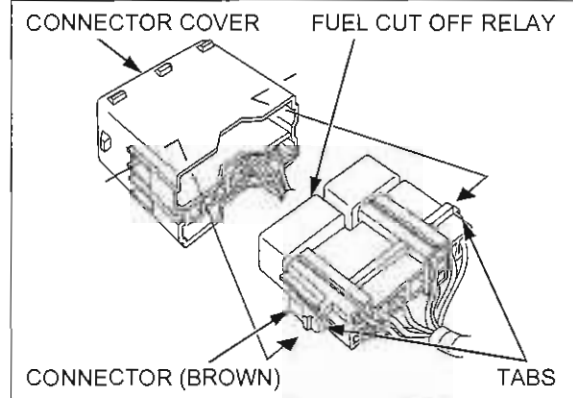
Remove the relay box.



## FUEL SYSTEM (PGM-FI)

Release the tabs and remove the relay connector (Brown) from the connector cover.

Disconnect the fuel cut off relay from the relay connector.



Connect the ohmmeter to the fuel cut off relay connector terminals.

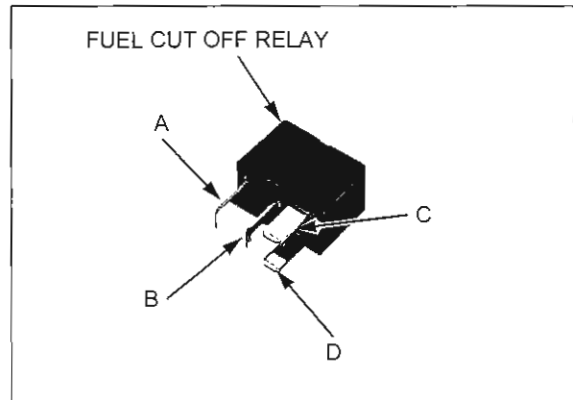
### CONNECTION: A - B

Connect the 12 V battery to the following fuel cut off relay connector terminals.

### CONNECTION: C - D

There should be continuity only when the 12 V battery is connected.

If there is no continuity when the 12 V battery is connected, replace the fuel cut off relay.

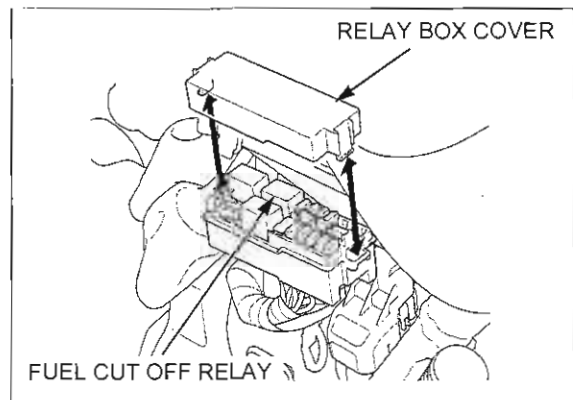


## INSPECTION (VT750C2S)

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

Remove the relay box cover.

Disconnect the fuel cut off relay from the relay box.



Connect the ohmmeter to the fuel cut off relay connector terminals.

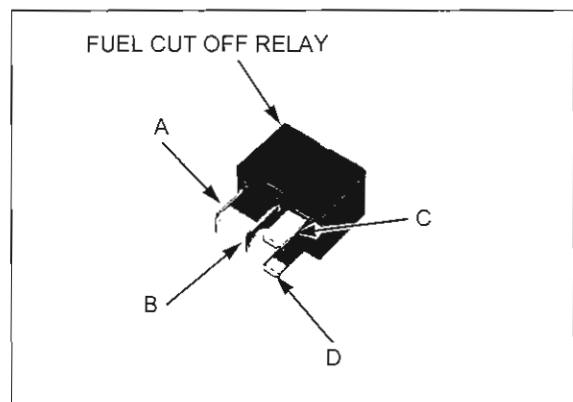
### CONNECTION: A - B

Connect the 12 V battery to the following fuel cut off relay connector terminals.

### CONNECTION: C - D

There should be continuity only when the 12 V battery is connected.

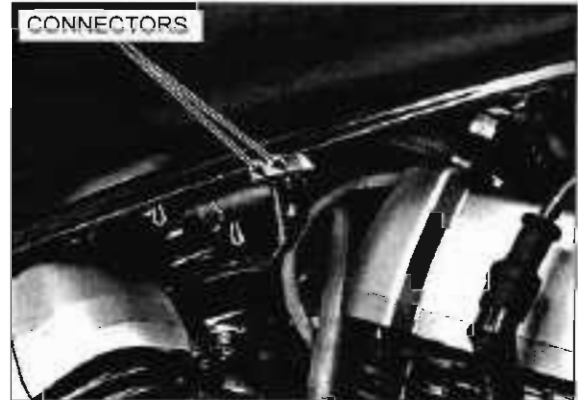
If there is no continuity when the 12 V battery is connected, replace the fuel cut off relay.



## FUEL TANK

### REMOVAL/INSTALLATION

Remove the speedometer assembly (page 21-15).  
Disconnect the fuel reserve sensor connectors.



Disconnect the fuel tank breather hose.  
Remove the fuel tank mounting bolt washer and collar.  
Remove the fuel tank by moving it rearward.



Disconnect the fuel hose and fuel vapor return hose from the fuel tank.  
Plug the fuel hose and fuel vapor return hose joint of the fuel tank.

Connect the fuel vapor return hose and fuel hose to the fuel tank.

Install the fuel tank by inserting its grooves over the mounting rubbers.

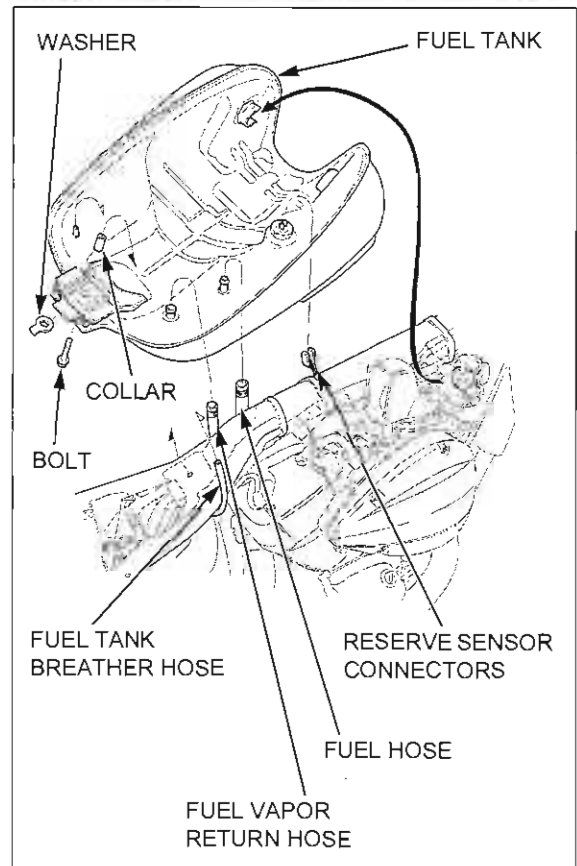
Install the collar and washer with the flat of the washer facing rearward.

Install and tighten the bolt to the specified torque.

**TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)**

Connect the fuel reserve sensor connectors.

Install the speedometer assembly (page 21-15).

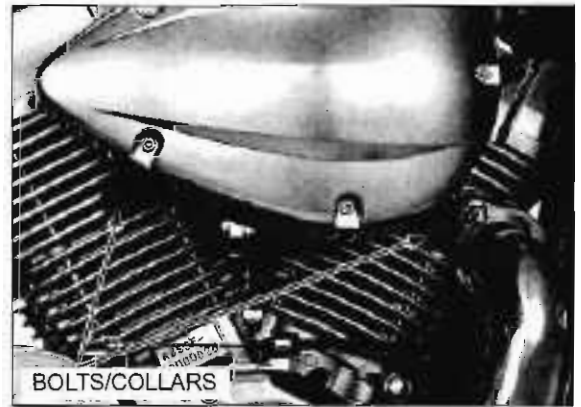


## AIR CLEANER HOUSING

### REMOVAL

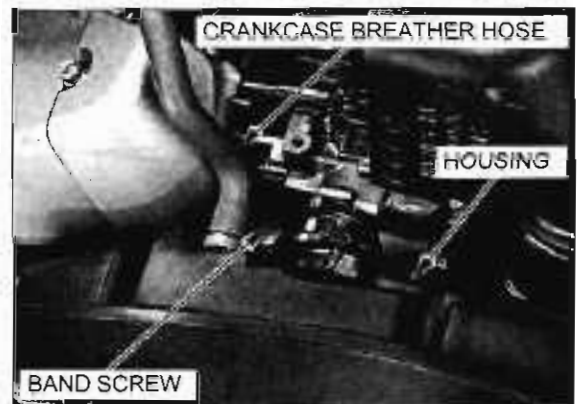
Remove the fuel tank (page 5-48).

Remove the air cleaner housing mounting bolts and collars.

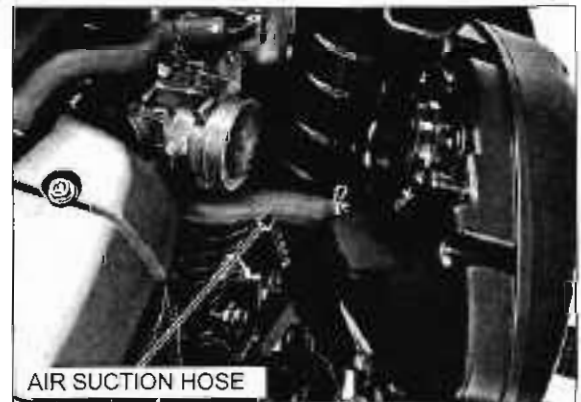


Disconnect the crankcase breather hose from the air cleaner housing.  
Loosen the air cleaner housing connecting tube band screw.

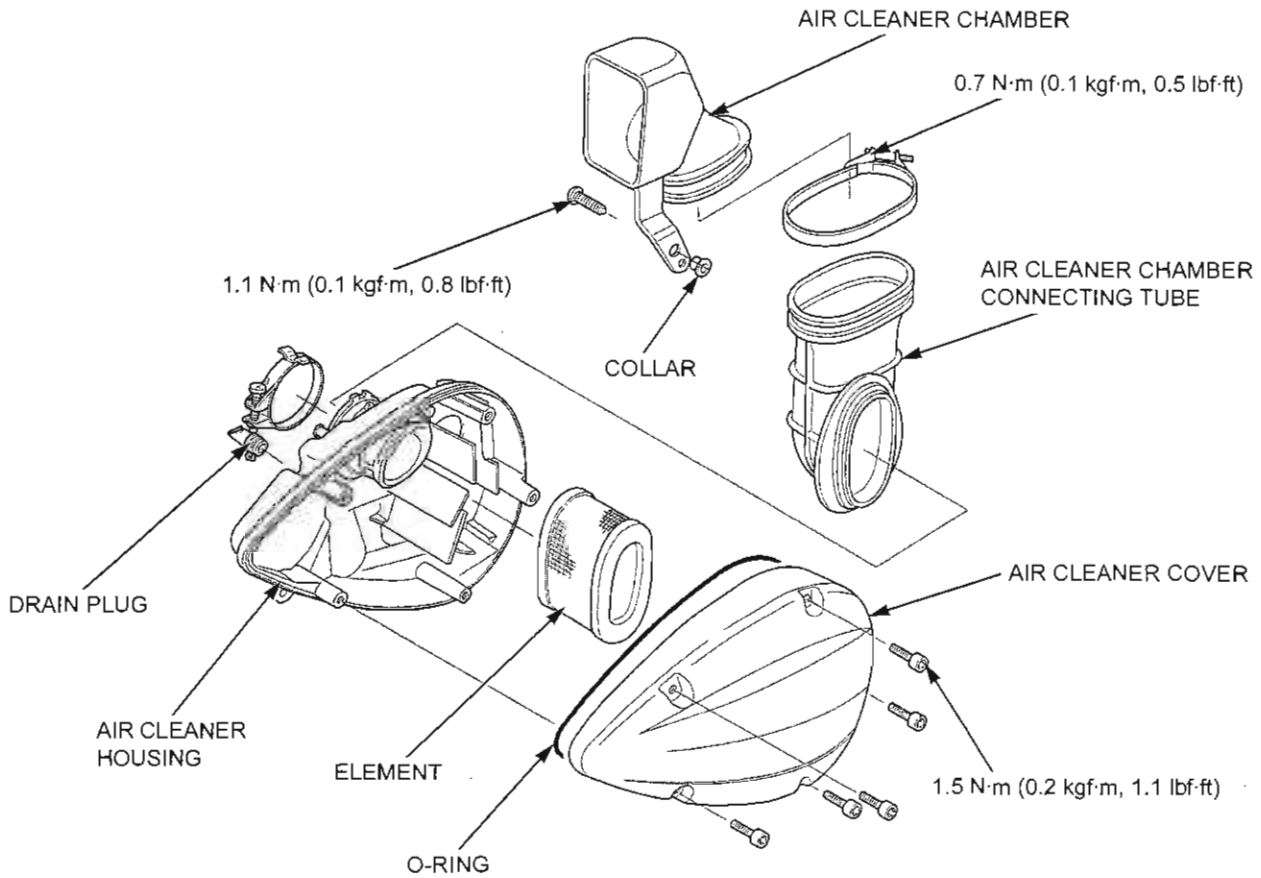
Remove the air cleaner housing.



Disconnect the PAIR air suction hose from the air cleaner housing.

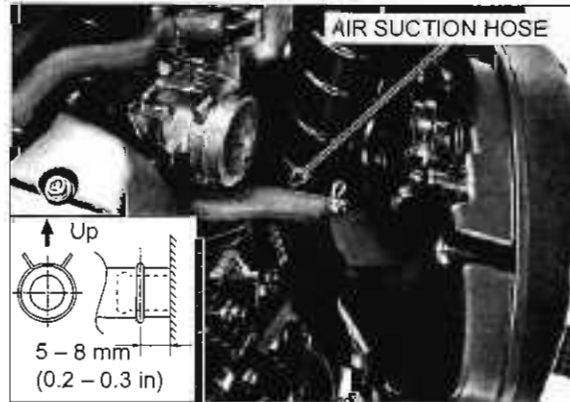


DISASSEMBLY/ASSEMBLY



INSTALLATION

Connect the PAIR air suction hose to the air cleaner housing as shown.



Connect the crankcase breather hose to the air cleaner housing.

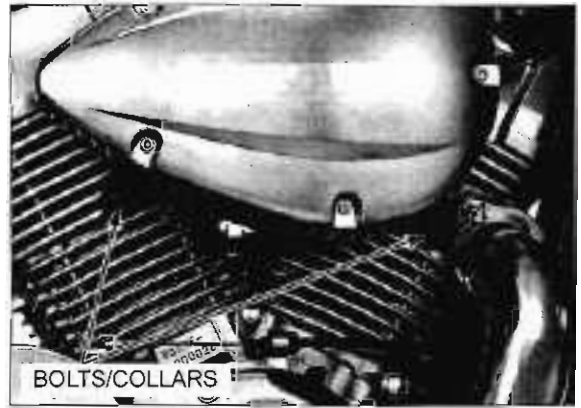
Connect the connecting tube to the throttle body.

Tighten the air cleaner housing connecting tube band screw securely.



Install the collars, air cleaner housing mounting bolts, and tighten the mounting bolts securely.

Install the fuel tank (page 5-48).



## THROTTLE BODY

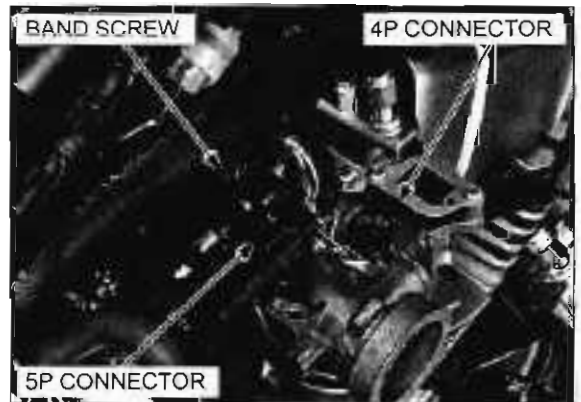
### REMOVAL

Remove the air cleaner housing (page 5-49).

Disconnect the IACV 4P and sensor unit 5P connectors.

Loosen the insulator band screw.

Remove the throttle body from the insulator.



Loosen the throttle cable lock nuts and adjusting nut then disconnect the throttle cables from the throttle drum and cable bracket.



## DISASSEMBLY/ASSEMBLY

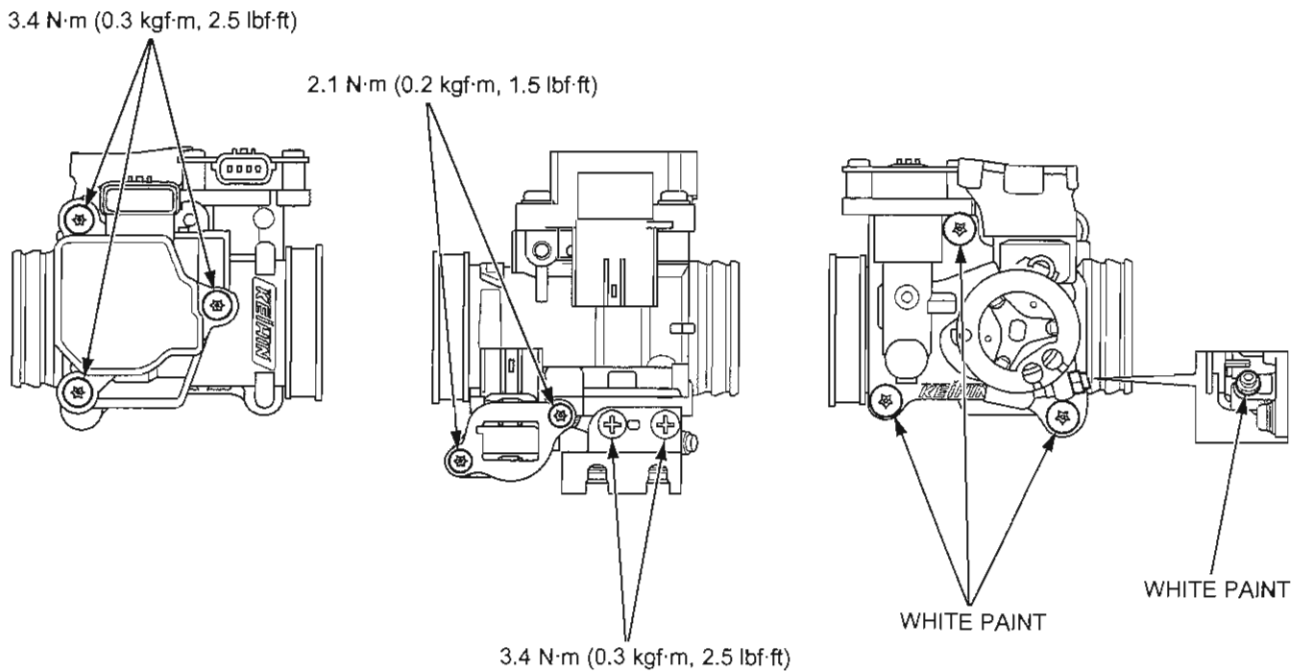
### NOTICE

- The throttle body is factory pre-set. Do not disassemble in a way other than shown in this manual.
- Do not snap the throttle valve from full open to full close after the throttle cable has been removed. It may cause incorrect idle operation.
- Do not damage the throttle body. It may cause incorrect throttle valve.
- Do not loosen or tighten the white painted bolts, nuts and screws of the throttle body. Loosening or tightening them can cause throttle and idle valve synchronization failure.

### NOTE:

- Perform the throttle valve fully closed reset procedure (page 5-54), if the sensor unit is removed from the throttle body.

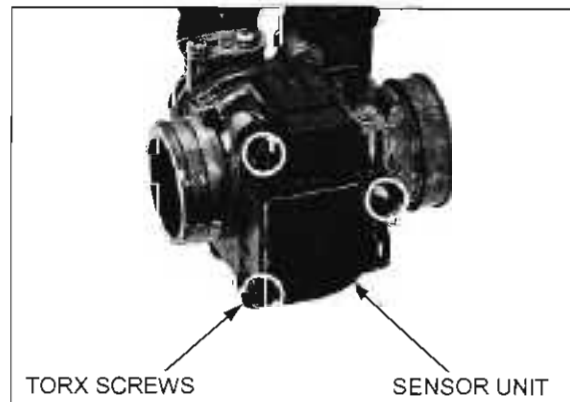
For IACV replacement (page 5-68).



If necessary, remove the torx screws and sensor unit from the throttle body.

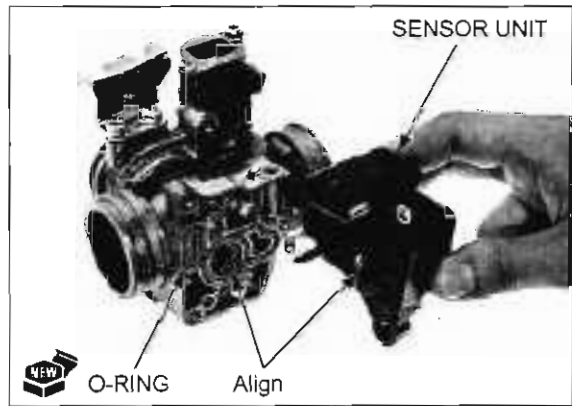
*Cleaning the air passages and sensor hole with a piece of wire will damage the throttle body.*

Blow open all air passages and sensor holes in the throttle body with compressed air.





Install a new O-ring into the groove of the throttle body.  
 Install the sensor unit while aligning TP sensor slot with the throttle valve shaft.  
 Tighten the torx screws to the specified torque.  
**TORQUE: 3.4 N·m (0.3 kgf·m, 2.5 lbf·ft)**



**INSTALLATION**

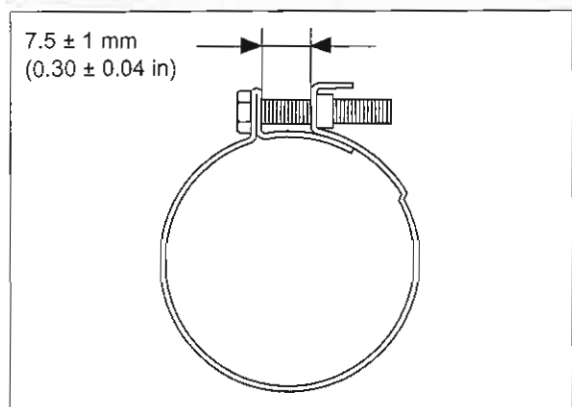
*Route the throttle cables properly (page 1-26).* Connect the throttle cables to the throttle drum and cable bracket.



Install the throttle body to the insulator by aligning its lug with the slot in the insulator.

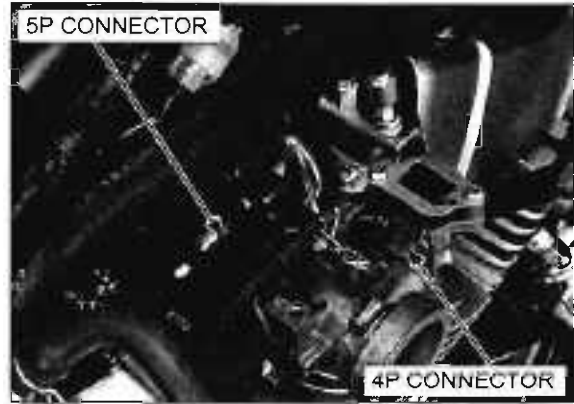


Tighten the insulator band screw so the insulator band distance is  $7.5 \pm 1$  mm ( $0.30 \pm 0.04$  in).



## FUEL SYSTEM (PGM-FI)

- Connect the sensor unit 5P and IACV 4P connectors.
- Adjust the throttle grip freeplay (page 3-5).
- Install the air cleaner housing (page 5-49).



### THROTTLE VALVE FULLY CLOSED POSITION RESET PROCEDURE (VT750C2/C2B)

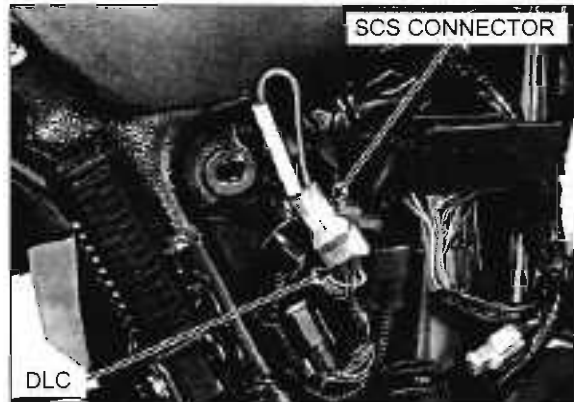
- If the sensor unit is removed, reset the throttle valve fully closed position as following procedure.

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

1. Clear the DTC (page 5-18).
2. Turn the ignition switch to "OFF".
3. Remove the dummy connector and short DLC terminals using the special tool.

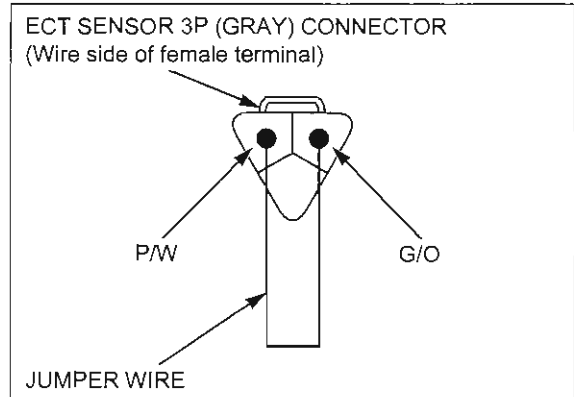
**TOOL:**

**SCS connector**                      070PZ-ZY30100



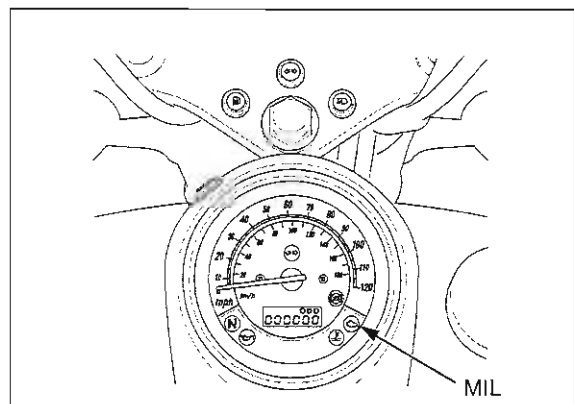
4. Disconnect the ECT sensor 3P (Gray) connector.  
Short the ECT sensor 3P (Gray) connector terminals of the wire side using the jumper wire.

**CONNECTION: Pink/white – Green/orange**



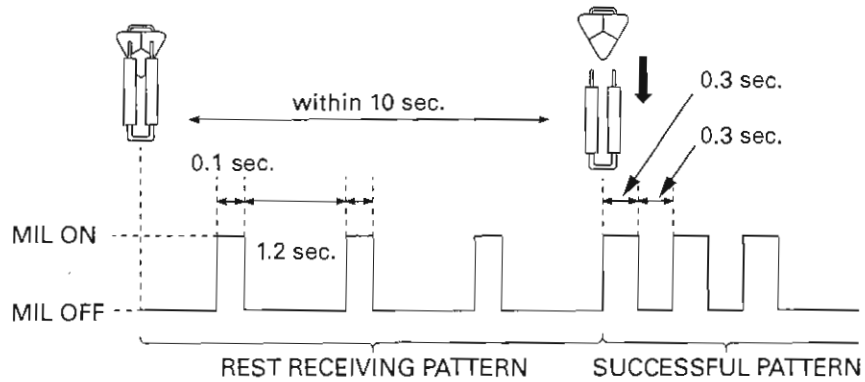
5. Turn the ignition switch to "ON" and engine stop switch "O".

Disconnect the jumper wire while the MIL blinking (10 seconds).



6. Check if the MIL blinks.

If the MIL begins short blink (0.3 seconds), the throttle valve fully closed position is reset.



If the MIL stays lit, the throttle valve fully closed position is not reset, repeat the reset procedure from step 1.

### THROTTLE VALVE FULLY CLOSED POSITION RESET PROCEDURE (VT750C2S)

- If the sensor unit is removed, reset the throttle valve fully closed position as following procedure.

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

1. Clear the DTC (page 5-18).
2. Turn the ignition switch to "OFF".
3. Remove the dummy connector and short DLC terminals using the special tool.

**TOOL:**

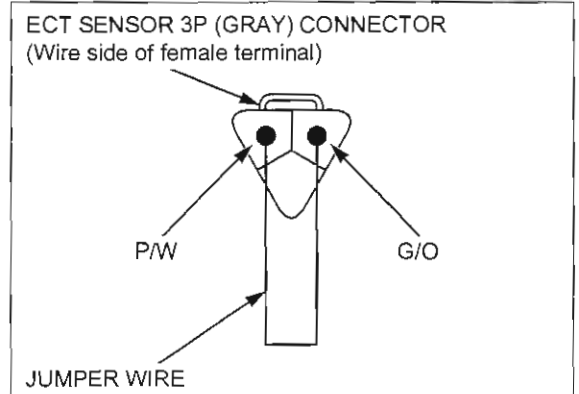
**SCS connector**                      070PZ-ZY30100



4. Disconnect the ECT sensor 3P (Gray) connector.

Short the ECT sensor 3P (Gray) connector terminals of the wire side using the jumper wire.

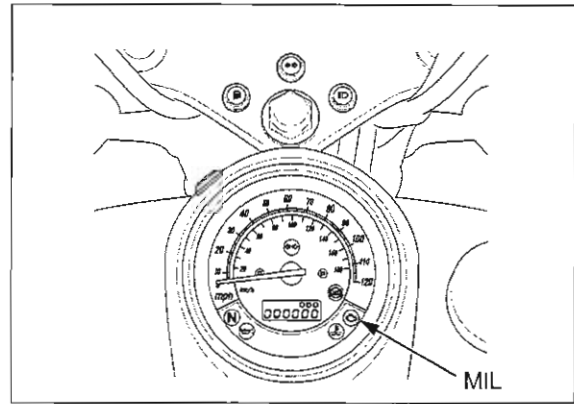
**CONNECTION: Pink/white – Green/orange**



## FUEL SYSTEM (PGM-FI)

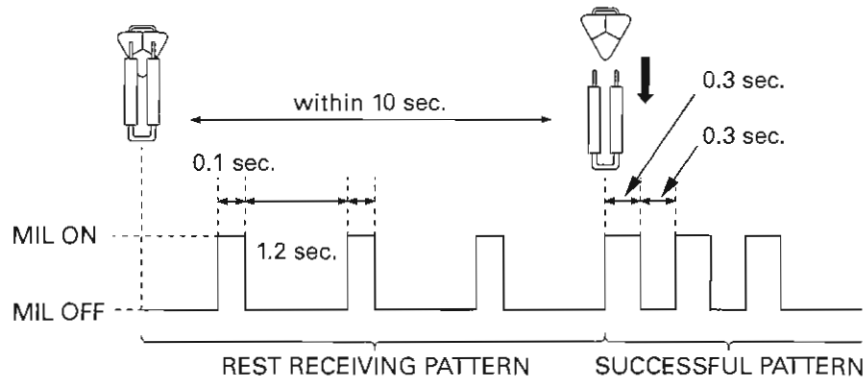
- Turn the ignition switch to "ON" and engine stop switch "O".

Disconnect the jumper wire while the MIL blinking (10 seconds).



- Check if the MIL blinks.

If the MIL begins short blink (0.3 seconds), the throttle valve fully closed position is reset.



If the MIL stays lit, the throttle valve fully closed position is not reset, repeat the reset procedure from step 1.

## INTAKE MANIFOLD

### REMOVAL

Relieve the fuel pressure and disconnect the quick connect fitting from the sub fuel tank/fuel pump (page 5-35).

Disconnect the fuel feed hose from the injector cap (page 5-59).

Remove the throttle body (page 5-51).

Loosen the insulator band screw and remove the insulator from the intake manifold.



Disconnect the injector 2P (Gray) connectors.

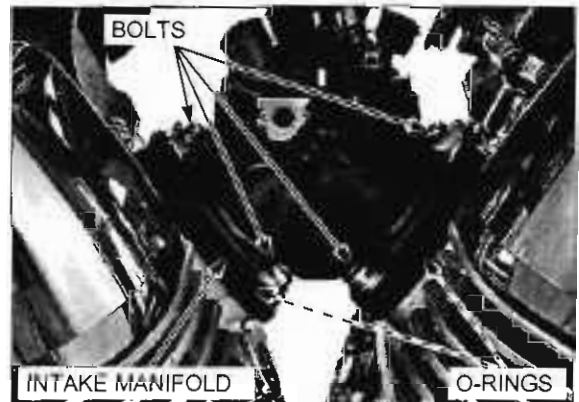
Disconnect the EVAP purge control solenoid valve hose.



Remove the bolts, intake manifold and O-rings.

Seal the intake ports of the cylinder heads with tape or clean cloths to keep dirt and debris from entering the engine.

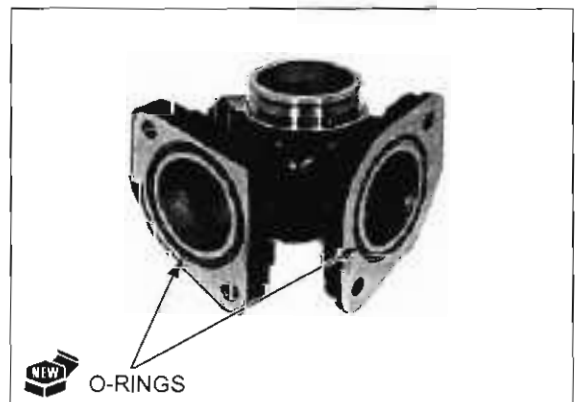
For the injector removal (page 5-58).



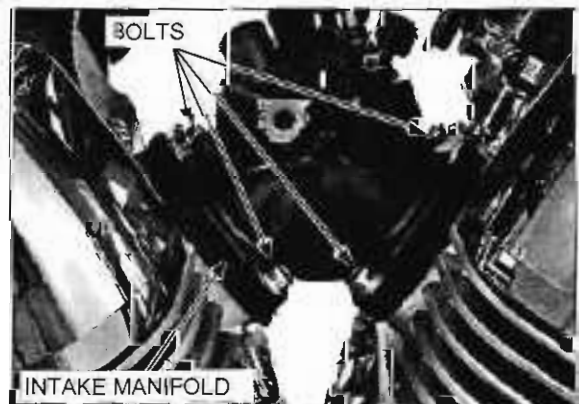
### INSTALLATION

Install new O-rings onto the intake manifold.

Install the injectors, if they are removed (page 5-58).



Install the intake manifold onto the cylinder heads.  
Install the bolts and tighten them.

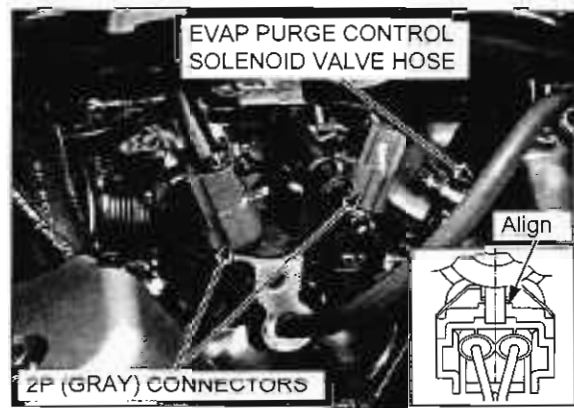


## FUEL SYSTEM (PGM-FI)

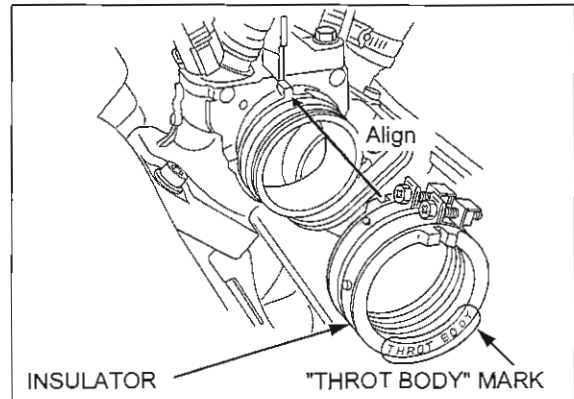
Connect the EVAP purge control solenoid valve hose.  
Connect the injector 2P (Gray) connectors.

### NOTE:

Align the tab of the injector cap with groove of the injector connector as shown.



Install the insulator with the "THROT BODY" mark facing the throttle body side, aligning its slot with the lug on the intake manifold.

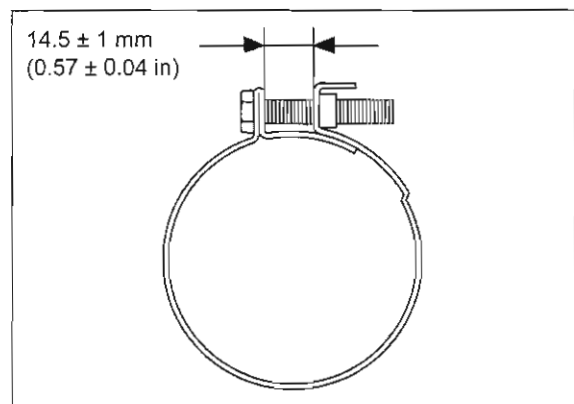


Tighten the insulator band screw so the insulator band distance is  $14.5 \pm 1$  mm ( $0.57 \pm 0.04$  in).

Connect the fuel feed hose to the injector cap (page 5-61).

Install the throttle body (page 5-51).

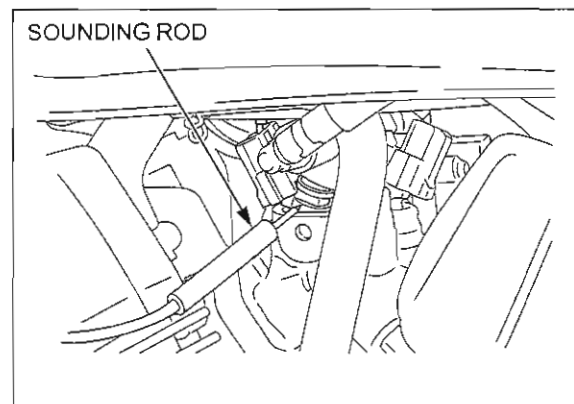
Connect the quick connect fitting to the sub fuel tank/fuel pump (page 5-36).



## INJECTOR

### INSPECTON

Start the engine and let it idle.  
Confirm the injector operating sounds with a sounding rod or stethoscope.



**REMOVAL**

Relieve the fuel pressure and disconnect the quick connect fitting from the sub fuel tank/fuel pump (page 5-35).

Clean around the injector base and fuel hose quick connector with compressed air before removing the injector, and be sure that no debris is allowed to enter into the intake manifold.

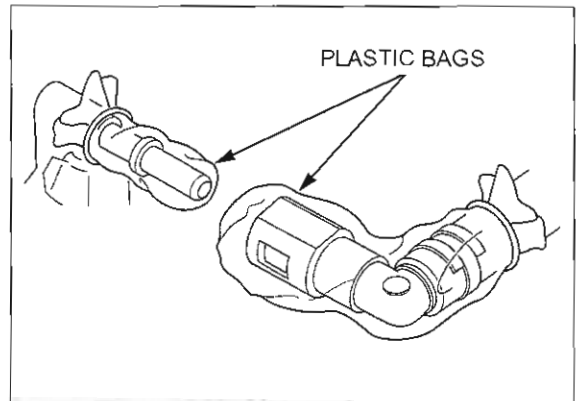
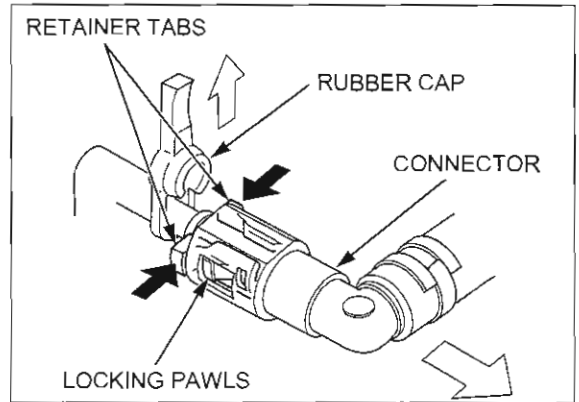
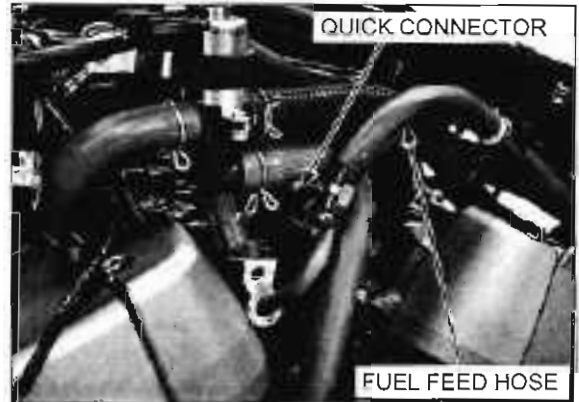
Disconnect the fuel feed hose quick connector as following procedures.

1. Slide and release the rubber cap from the retainer.
2. Hold the connector with one hand and squeeze the retainer tabs with the other hand release them from the locking pawls. Pull the connector off, then remove the rubber cap and retainer.

**NOTE:**

- Prevent the remaining fuel in the fuel feed hose from flowing out with a shop towel.
- Be careful not to damage the hose, pipe or other parts.
- Do not use tools.
- If the connector does not move, keep the retainer tabs pressed down, and alternately pull and push the connector until it comes off easily.

3. To prevent damage and keep foreign matter out, cover the disconnected connector and pipe end with the plastic bags.

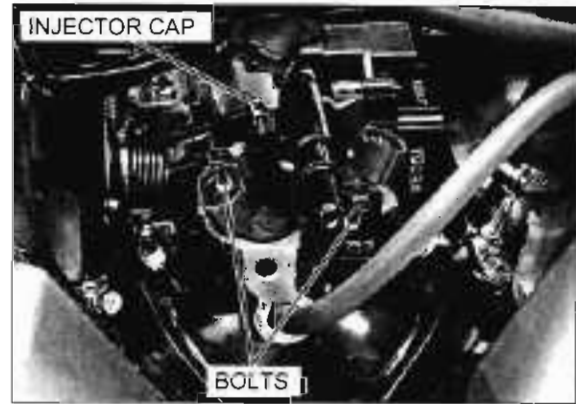


Disconnect the injector 2P (Gray) connectors.

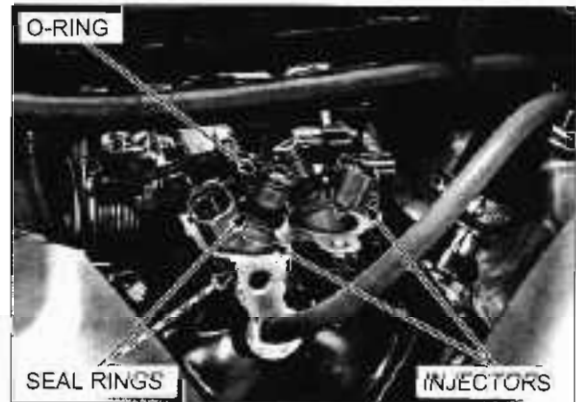


## FUEL SYSTEM (PGM-FI)

Remove the bolts and injector cap from the injectors.



Remove the injectors from the intake manifold.  
Remove the O-ring and seal ring.

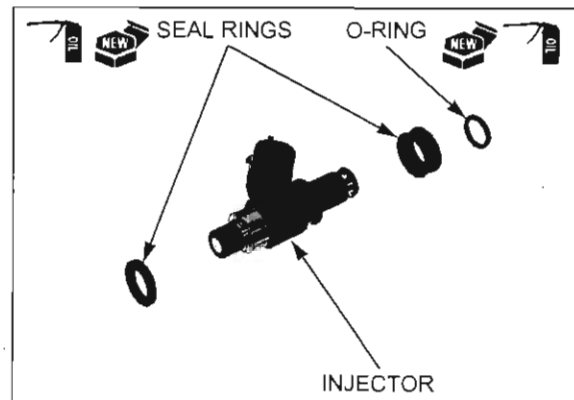


### INSTALLATION

Coat new O-rings and new seal rings with engine oil.

*Replace the O-ring and seal ring with new ones as a set.*

Install new O-rings and new seal rings, being careful not to damage.

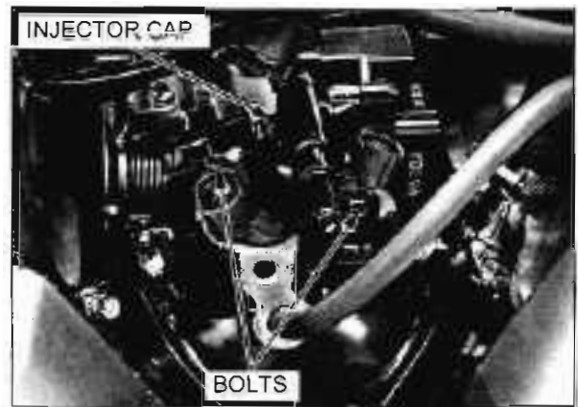


Install the injectors into the intake manifold, being careful not to damage the seal ring.



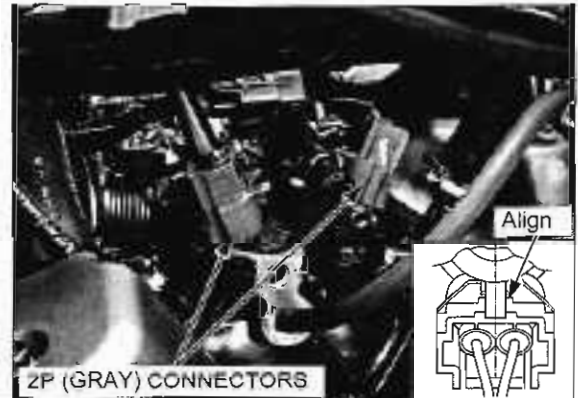


Install the injector cap to the injectors.  
 Install and tighten the bolts to the specified torque.  
**TORQUE: 5.1 N·m (0.5 kgf·m, 3.8 lbf·ft)**



Connect the injector 2P (Gray) connectors.

**NOTE:**  
 Align the tab of the injector cap with groove of the injector connector as shown.



Connect the fuel feed hose quick connector as following procedures.

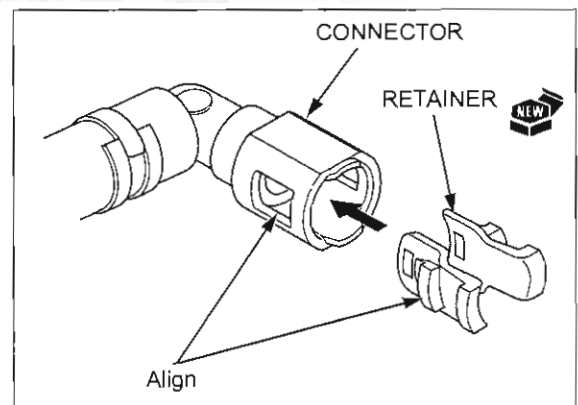


- Always replace the retainer of the quick connect fitting when the fuel feed hose is disconnected.
- If any retainer needs replacing, use the same manufacturer's retainer as the ones being removed (The service manufactures feature different retainer specifications).
- If any damage or cut-out on the rubber cap, replace it with a new one.
- Do not bend or twist the fuel feed hose.

1. Insert a new retainer into the connector.

**NOTE:**

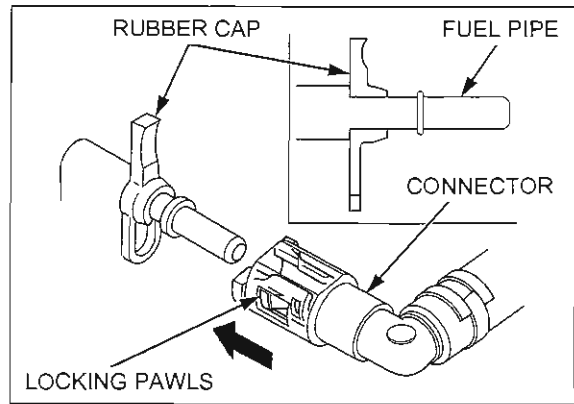
- Align the new retainer locking pawls with the connector grooves.



## FUEL SYSTEM (PGM-FI)

2. Install the rubber cap and seat it onto the fuel pipe flange as shown. Align the quick connect fitting with the pipe. Then press the quick connect fitting onto the pipe until both retainer pawls lock with a "CLICK".

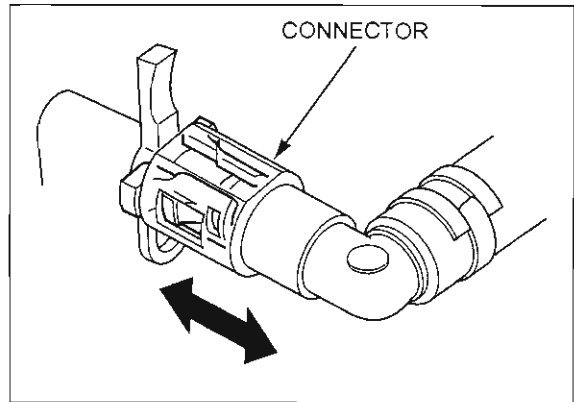
If it is hard to connect, put a small amount of engine oil on the pipe end.



3. Make sure the connection is secure and that the pawls are firmly locked into place; check visually and by pulling the connector.

Connect the quick connect fitting to the sub fuel tank/fuel pump (page 5-36).

Install the removed parts in the reverse order of removal.



## ECT SENSOR

### REMOVAL/INSTALLATION

Drain the coolant (page 6-6).

Remove the steering side covers (page 2-4).

*Replace the ECT sensor while the engine is cold.*

Disconnect the ECT sensor 3P (Gray) connector from the sensor.

Remove the ECT sensor and sealing washer.

*Always replace a sealing washer with a new one.*

Install a new sealing washer and ECT sensor. Tighten the ECT sensor to the specified torque.

**TORQUE: 24.5 N·m (2.5 kgf·m, 18 lbf·ft)**

Connect the ECT sensor 3P (Gray) connector.

Install the steering side covers (page 2-4).

Fill the cooling system with recommended coolant (page 6-6).



# BANK ANGLE SENSOR

## INSPECTION

Support the motorcycle securely on a level surface.

Remove the following:

- Steering side covers (page 2-4)
- Fuel tank (page 5-48)

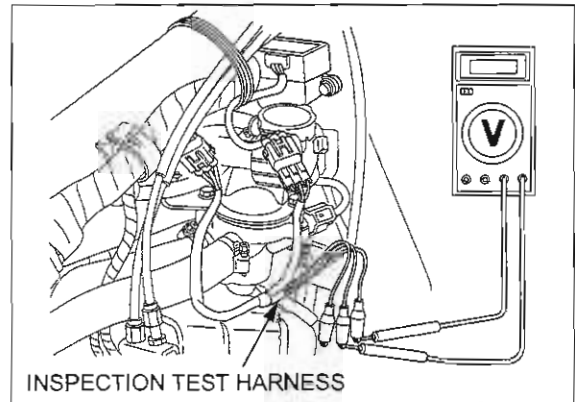
Disconnect the bank angle sensor 3P (Black) connector and connect the inspection test harness.

**TOOL:**

**Inspection test harness**                      **07GMJ-ML80100**

Turn the ignition switch to "ON" and engine stop switch "O".

Measure the voltage between the test harness terminals.

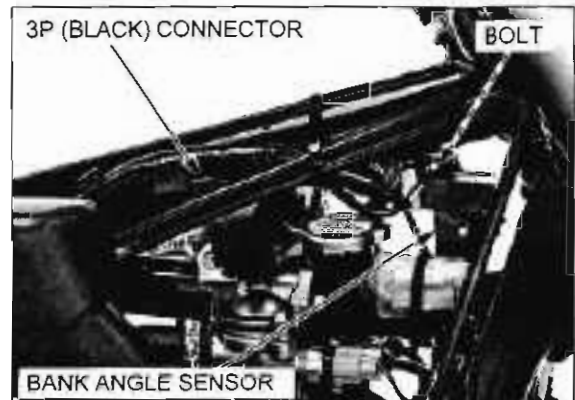


CONNECTION	STANDARD
White clip (+) – Red clip (-)	Battery voltage
Green clip (+) – Red clip (-)	0 – 1 V

Turn the ignition switch to "OFF".

*Do not disconnect the bank angle sensor connector during inspection.*

Remove the bolt and bank angle sensor/stay assembly.



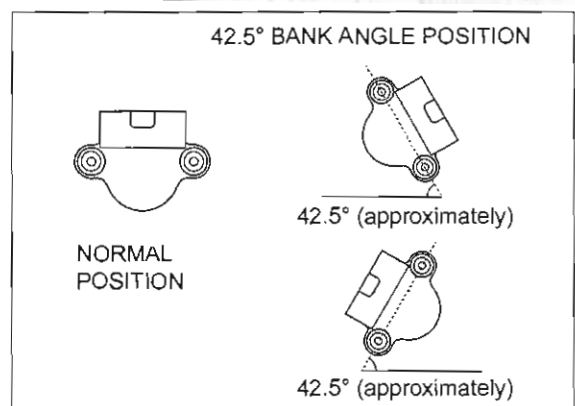
Place the bank angle sensor horizontal (normal position) as shown, and ignition switch to "ON" and engine stop switch "O".

Bank angle sensor is normal if the engine stop relay clicks and power supply is closed.

Incline the bank angle sensor approximately 42.5° to the left or right with keep the ignition switch to "ON" and engine stop switch "O".

Bank angle sensor is normal if the engine stop relay clicks and power supply is open.

If you repeat this test, first turn the ignition switch to "OFF", then turn the ignition switch to "ON".



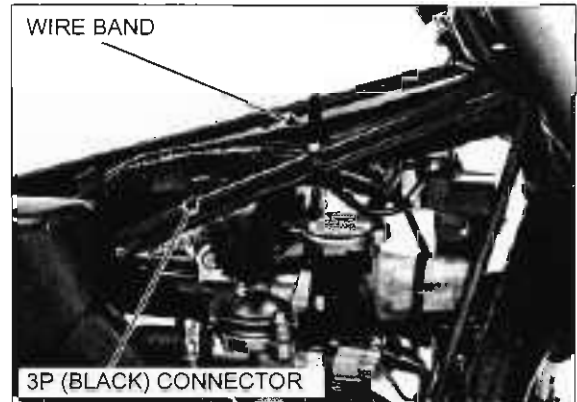
## FUEL SYSTEM (PGM-FI)

### REMOVAL/INSTALLATION

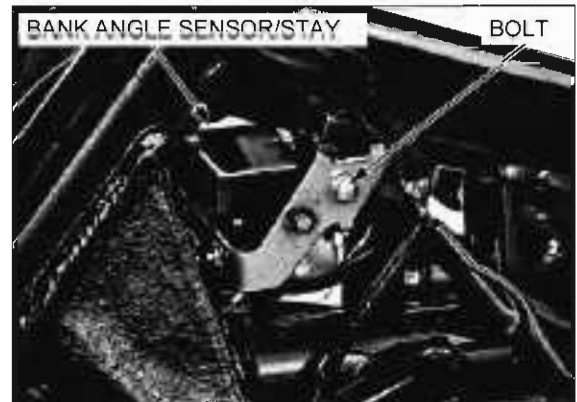
Remove the following:

- Fuel tank (page 5-48)
- Steering side covers (page 2-4)

Remove the wire band and disconnect the bank angle sensor 3P (Black) connector.



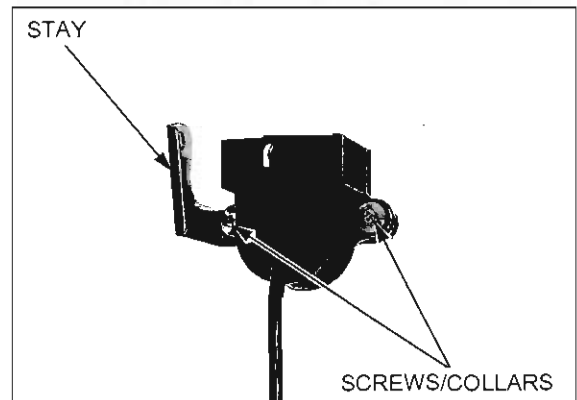
Remove the bolt and bank angle sensor/stay.



Remove the screws, collars and bank angle sensor from the stay.

Install the bank angle sensor to the stay.

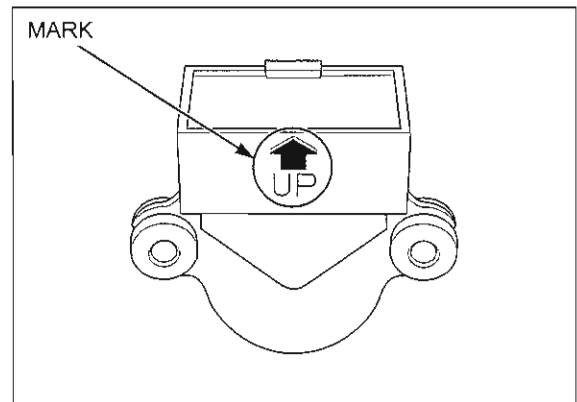
Install the collars, screws and tighten the screws securely.



Install the bank angle sensor with its "UP" mark facing up.

*Route the sensor wire properly (page 1-26).*

Install the removed parts in the reverse order of removal.



# ENGINE STOP RELAY

## INSPECTION (VT750C2/C2B)

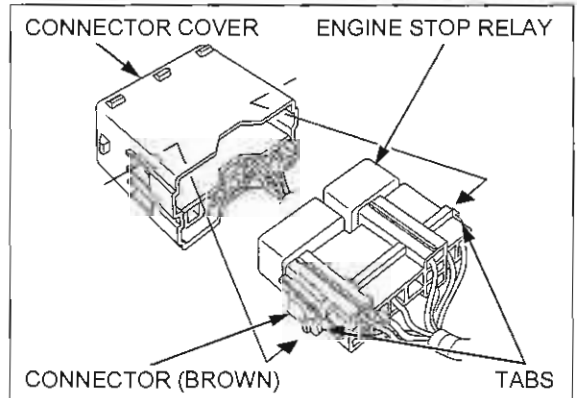
Remove the left side cover (page 2-3).

Remove the relay box.



Release the tabs and remove the relay connector (Brown) from the connector cover.

Remove the engine stop relay from the relay connector.



Connect the ohmmeter to the relay connector terminals.

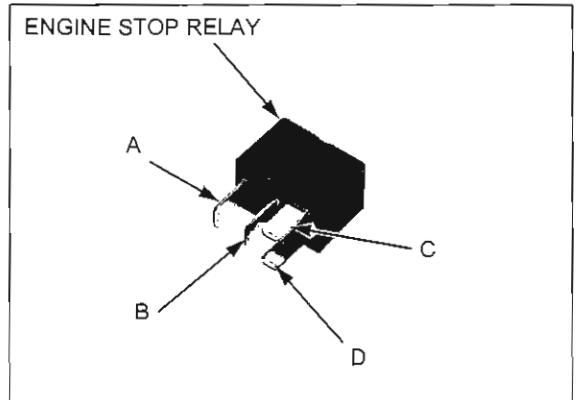
### CONNECTION: A - B

Connect the 12 V battery to the following relay connector terminals.

### CONNECTION: C - D

There should be continuity only when the 12 V battery is connected.

If there is no continuity when the 12 V battery is connected, replace the engine stop relay.

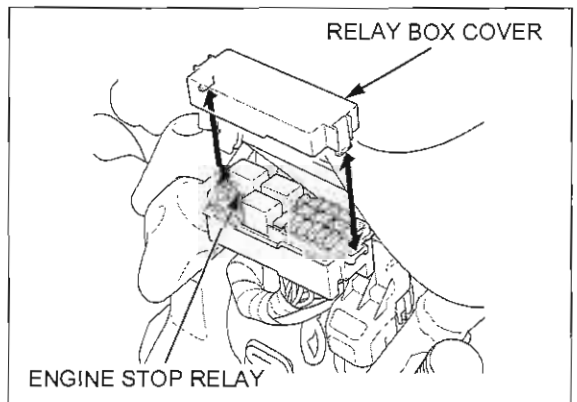


## INSPECTION (VT750C2S)

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

Remove the relay box cover.

Remove the engine stop relay from the relay connector.



## FUEL SYSTEM (PGM-FI)

Connect the ohmmeter to the relay connector terminals.

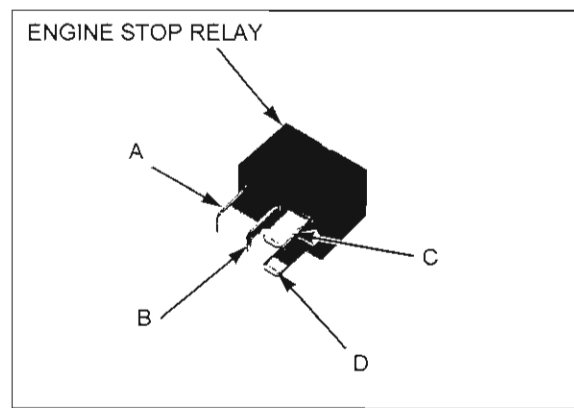
### CONNECTION: A – B

Connect the 12 V battery to the following relay connector terminals.

### CONNECTION: C – D

There should be continuity only when the 12 V battery is connected.

If there is no continuity when the 12 V battery is connected, replace the engine stop relay.



## ECM

### ECM POWER/GROUND LINE INSPECTION

Engine does not start (MIL does not blink)

#### 1. ECM Power Input Voltage Inspection

Disconnect the ECM 33P connectors (page 5-67).

Turn the ignition switch to "ON" and engine stop switch "O".

Measure the voltage at the ECM 33P (Black) connector terminals and ground.

**CONNECTION: A4 (+) – Ground (-)**

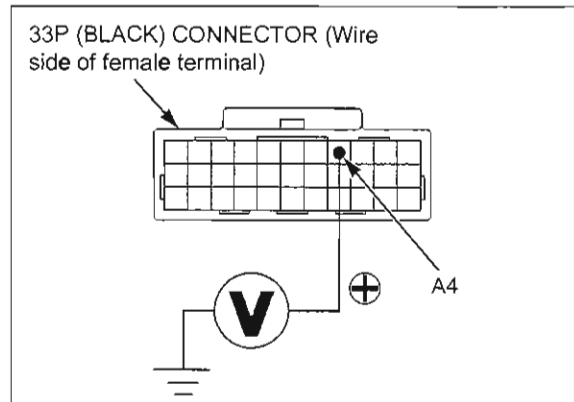
**TOOL:**

Test probe 07ZAJ-RDJA110

*Does the battery voltage exist?*

**YES** – GO TO STEP 2.

**NO** – GO TO STEP 3.



#### 2. ECM Ground Line Inspection

Turn the ignition switch to "OFF".

Check for continuity between the ECM 33P connector terminals and ground.

**CONNECTION: A23 – Ground**  
**B4 – Ground**

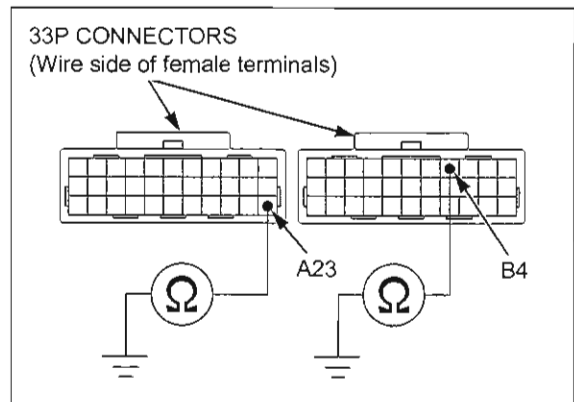
**TOOL:**

Test probe 07ZAJ-RDJA110

*Is there continuities?*

**YES** – Replace the ECM with a known good one, and recheck.

**NO** – Open circuit in GROUND line



**3. Engine Stop Relay Inspection 1**

Turn the ignition switch to "OFF".  
Remove the engine stop relay from the relay connector (page 5-65).

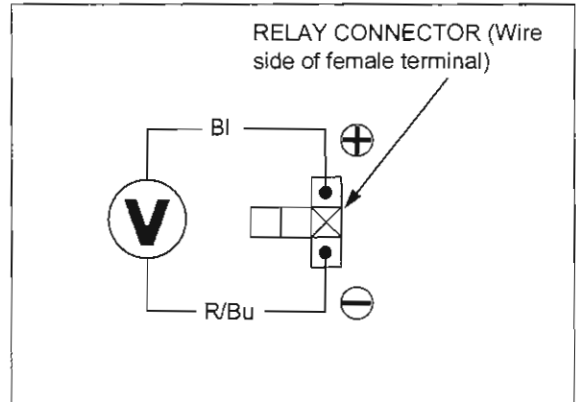
Turn the ignition switch to "ON" and engine stop switch "O".  
Measure the voltage at the engine stop relay terminals.

**CONNECTION:** Black (+) – Red/blue (–)

**Does the battery voltage exist?**

**NO** – Inspect the bank angle sensor (page 5-63)

**YES** – GO TO STEP 4.



**4. Engine Stop Relay Inspection 2**

Turn the ignition switch to "OFF".  
Jump the engine stop relay connector terminals.

**CONNECTION:** Black/white – Red/white

Turn the ignition switch to "ON" and engine stop switch "O".  
Measure the voltage at the ECM 33P (Black) connector terminals and ground.

**CONNECTION:** A4 (+) – Ground (–)

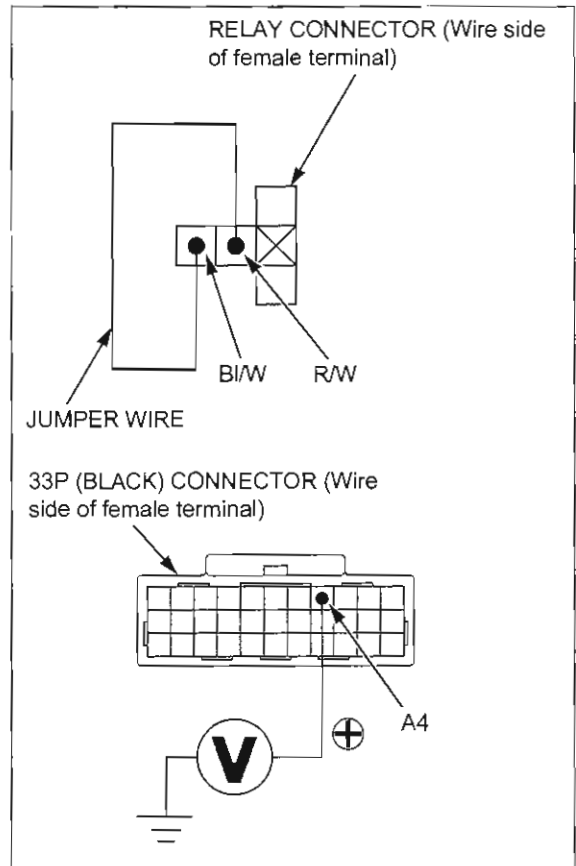
**TOOL:**

Test probe 07ZAJ-RDJA110

**Does the battery voltage exist?**

**YES** – • Inspect the engine stop relay (page 5-65)  
• Inspect the engine stop switch (page 21-22)

**NO** – • Open circuit in Black/white or Red/white wire between the battery and ECM  
• Faulty FI fuse (15 A)



**REMOVAL/INSTALLATION**

Remove the battery case cover (page 18-7).

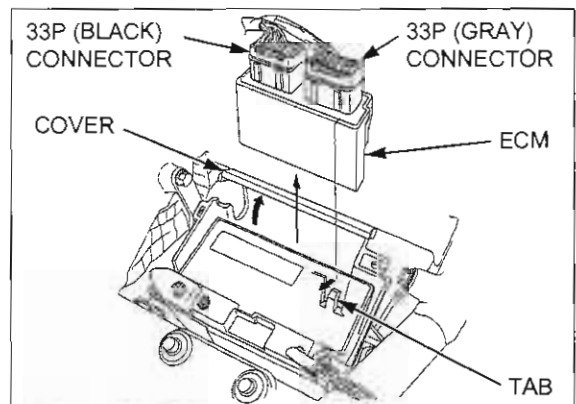
Turn the ignition switch to "OFF".

Open the cover.

Release the tab and remove the ECM.  
Disconnect the ECM 33P connectors.

Installation is in the reverse order of removal.

*Be careful not to damage the ECM and wire harnesses.*



### ENGINE IDLE SPEED

#### IDLE SPEED INSPECTION

NOTE:

- Inspect the idle speed after all other engine maintenance items have been performed and are within specifications.
- Before checking the idle speed, inspect following items.
  - No DTC and MIL blinking.
  - Spark plug condition (page 3-7).
  - Air cleaner condition (page 3-6).
- The engine must be warm for accurate idle speed inspection.
- This system eliminates the need for manual idle speed adjustment from the previous designs.
- Use a tachometer with graduations of 50 rpm smaller that will accurately indicate 50 rpm change.

Start the engine and warm it up to coolant temperature is 80°C (176°F).

Stop the engine and connect a tachometer according to its manufacturer's instructions.

Start the engine and let it idle. Check the idle speed.

#### ENGINE IDLE SPEED: 1,200 ± 100 rpm

If the idle speed is out of the specification, check the following:

- Throttle operation and throttle grip freeplay (page 3-5).
- Intake air leak or engine top-end problem (page 8-5).
- IACV operation (page 5-68).

## IACV

#### INSPECTION

Remove the air cleaner housing (page 5-49).

The IACV is installed on the throttle body and is operated by the step motor. When the ignition switch is turned to "ON", the IACV operates for a few seconds.

Check the step motor operating (beep) sound with the ignition switch turned to "ON".





The IACV operation can be checked visually as following:

- Remove the IACV (page 5-68) from the throttle body with its 4P (Black) connector connected, then turn the ignition switch to "ON".



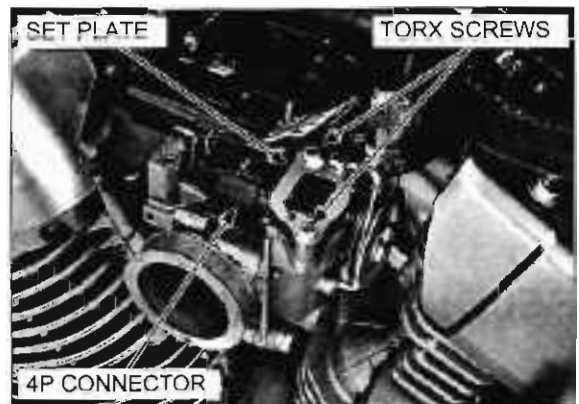
### REMOVAL

- Always clean the throttle body before the IACV removal to prevent dirt and debris from entering the IACV passage.

Remove the air cleaner housing (page 5-49).

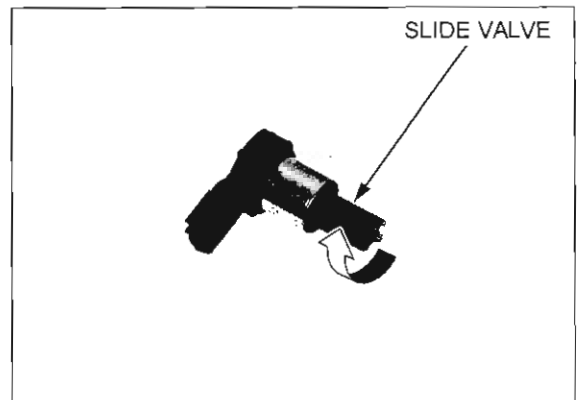
Disconnect the IACV 4P connector.

Remove the torx screws, set plate and IACV.



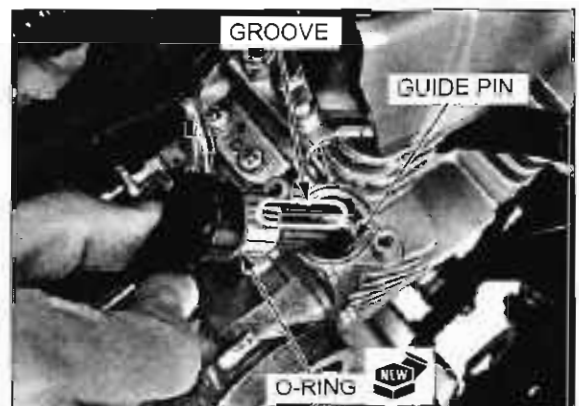
### INSTALLATION

Turn the slide valve clockwise until lightly seated on IACV.



Install a new O-ring to the IACV.

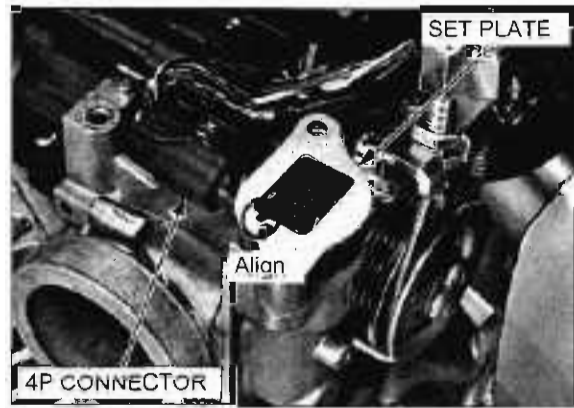
Install the IACV into the throttle body while aligning the valve slit with the guide pin in the throttle body.



## FUEL SYSTEM (PGM-FI)

Install the set plate while aligning its groove with the boss of the IACV.

Connect the IACV 4P connector.



Install and tighten the torx screws to the specified torque.

**TORQUE: 2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)**

Install the air cleaner housing (page 5-49).



## SECONDARY AIR SUPPLY SYSTEM

### SYSTEM INSPECTION

Start the engine and warm it up to coolant temperature is 80°C (176°F).

Stop the engine.

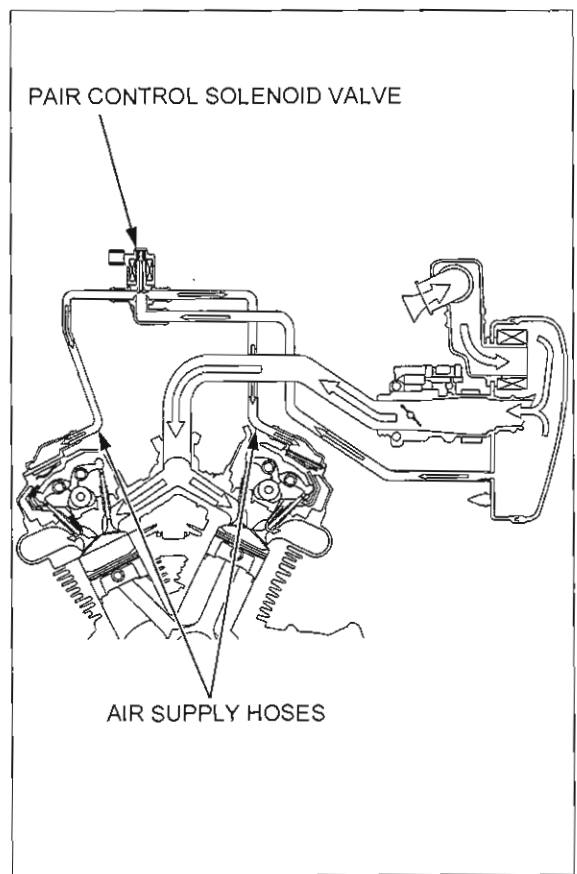
Remove the air cleaner cover (page 3-6).

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

Check the PAIR check valve if the port is carbon fouled (page 5-72).



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 clogs and PAIR control solenoid valve (page 5-71).

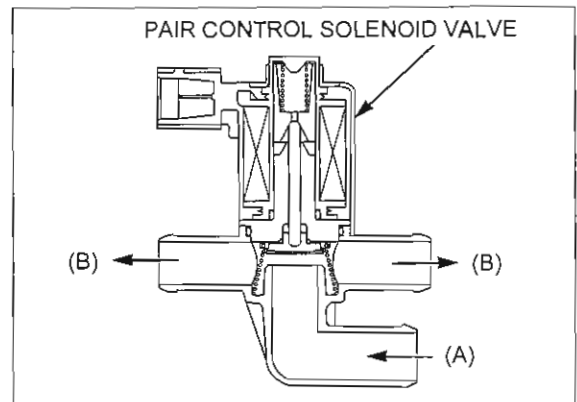


**PAIR CONTROL SOLENOID VALVE**

**INSPECTION**

Remove the PAIR control solenoid valve (page 5-72).

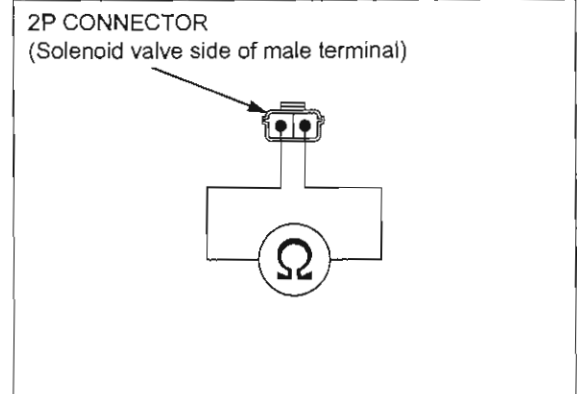
Check that air does not flow (A) to (B) when the 12 V battery is connected to the PAIR control solenoid valve terminals. Air should flow (A) to (B) when there is no voltage applied to the PAIR control solenoid valve terminals.



Measure the resistance between the connector terminals.

**STANDARD: 23 – 27  $\Omega$  (20°C/68°F)**

If it is out of the standard, replace the PAIR control solenoid valve.



## FUEL SYSTEM (PGM-FI)

### REMOVAL/INSTALLATION

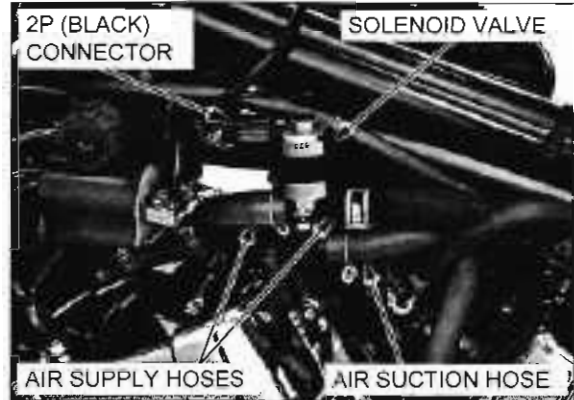
Remove the fuel tank (page 5-48).

Disconnect the PAIR control solenoid valve 2P (Black) connector.

Disconnect the air suction and air supply hoses from the PAIR control solenoid valve.

Remove the PAIR control solenoid valve from the stay of the frame.

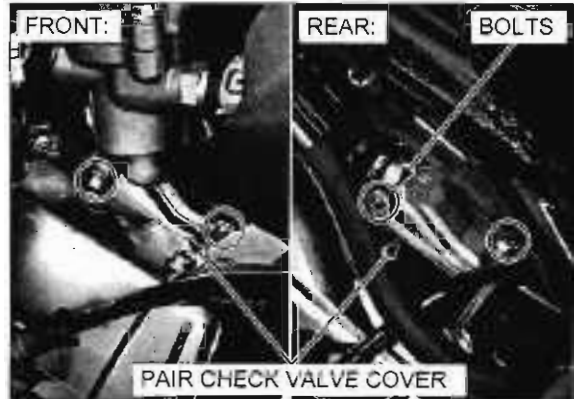
Installation is in the reverse order of removal.



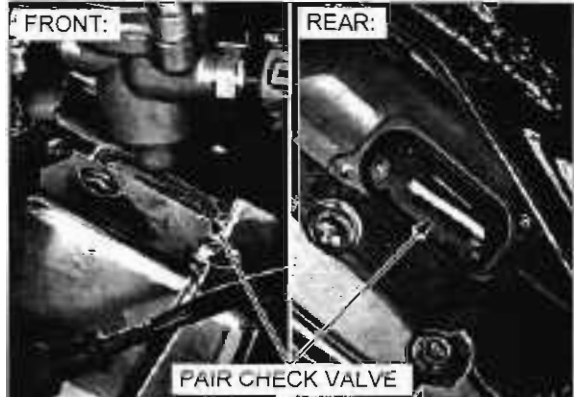
### PAIR CHECK VALVE INSPECTION

Remove the fuel tank (page 5-48).

Remove the bolts and PAIR check valve cover.



Remove the PAIR check valve from the cylinder head cover.



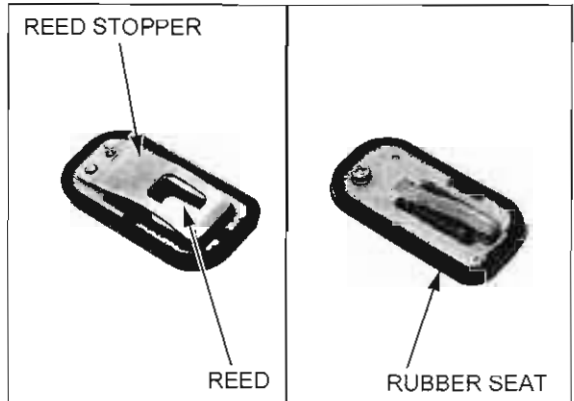
Check the reed for damage or fatigue. Replace if necessary.

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

Install the PAIR check valve in the reverse order of removal.

**TORQUE: 7 N·m (0.7 kgf·m, 5.2 lbf·ft)**

Install the fuel tank (page 5-48).

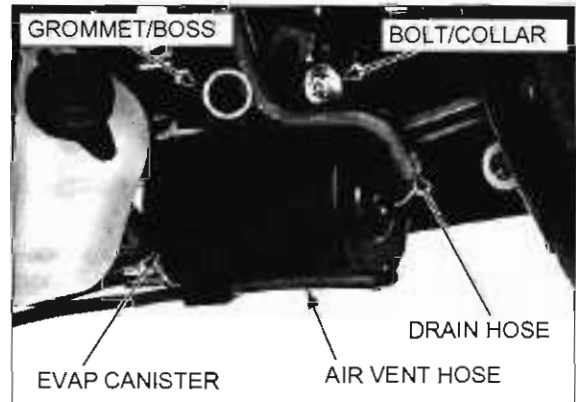


## EVAP CONTROL SYSTEM (California type only)

### EVAP CANISTER REMOVAL/INSTALLATION

Disconnect the EVAP canister air vent hose and EVAP canister drain hose.

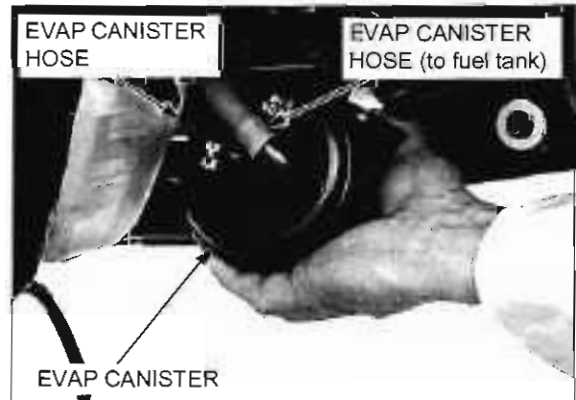
Remove the bolt and collar.  
Remove the grommet on the EVAP canister from the tab on the frame.



Disconnect the EVAP canister hose (to fuel tank) and EVAP canister hose.

Remove the EVAP canister.

Installation is in the reverse order of removal.



### EVAP PURGE CONTROL SOLENOID VALVE

#### REMOVAL/INSTALLATION

Support the motorcycle securely on a level surface.

Remove the following:

- Rear wheel (page 15-7)
- Rear fender (page 2-7)
- Starter relay switch (page 20-16)
- Battery (page 18-7)
- Rear ignition coil (page 19-9)
- ECM (page 5-67)

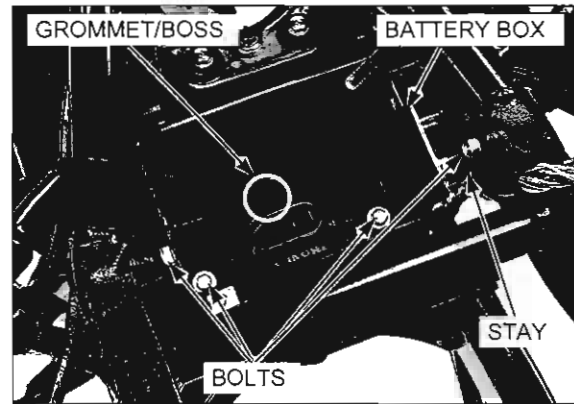
Remove the tool.

Remove the screws and tool box cover.



## FUEL SYSTEM (PGM-FI)

Remove the bolts.  
Release the tab on the battery box from the grommet on the stay.  
Remove the battery box and stay.



Disconnect the EVAP purge control solenoid valve hose (to throttle body) and EVAP canister hose.  
Disconnect the EVAP purge control solenoid valve 2P (Black) connector.

Remove the bolts and EVAP purge control solenoid valve.

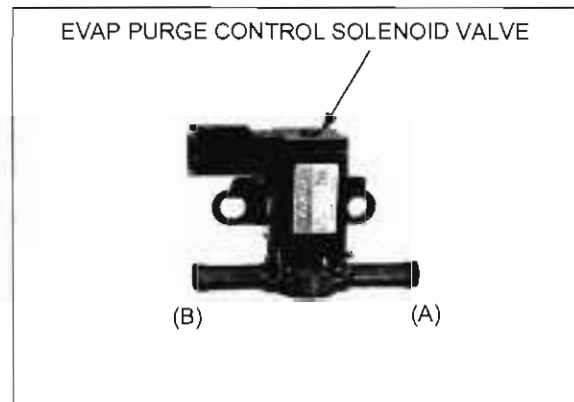
Installation is in the reverse order of removal.



### INSPECTION

Remove the EVAP purge control solenoid valve.

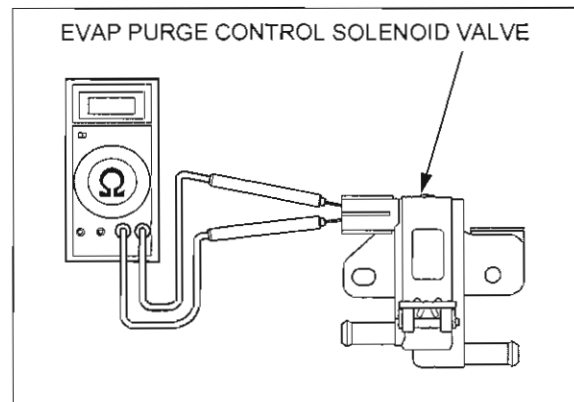
Check that the air should not flow (A) to (B), only when the 12 V battery is connected to the EVAP purge control solenoid valve terminals.



Check the resistance between the terminals of the EVAP purge control solenoid valve connector.

**STANDARD: 30 – 34  $\Omega$  (20°C/68°F)**

If the resistance is out of specification, replace the EVAP purge control solenoid valve.



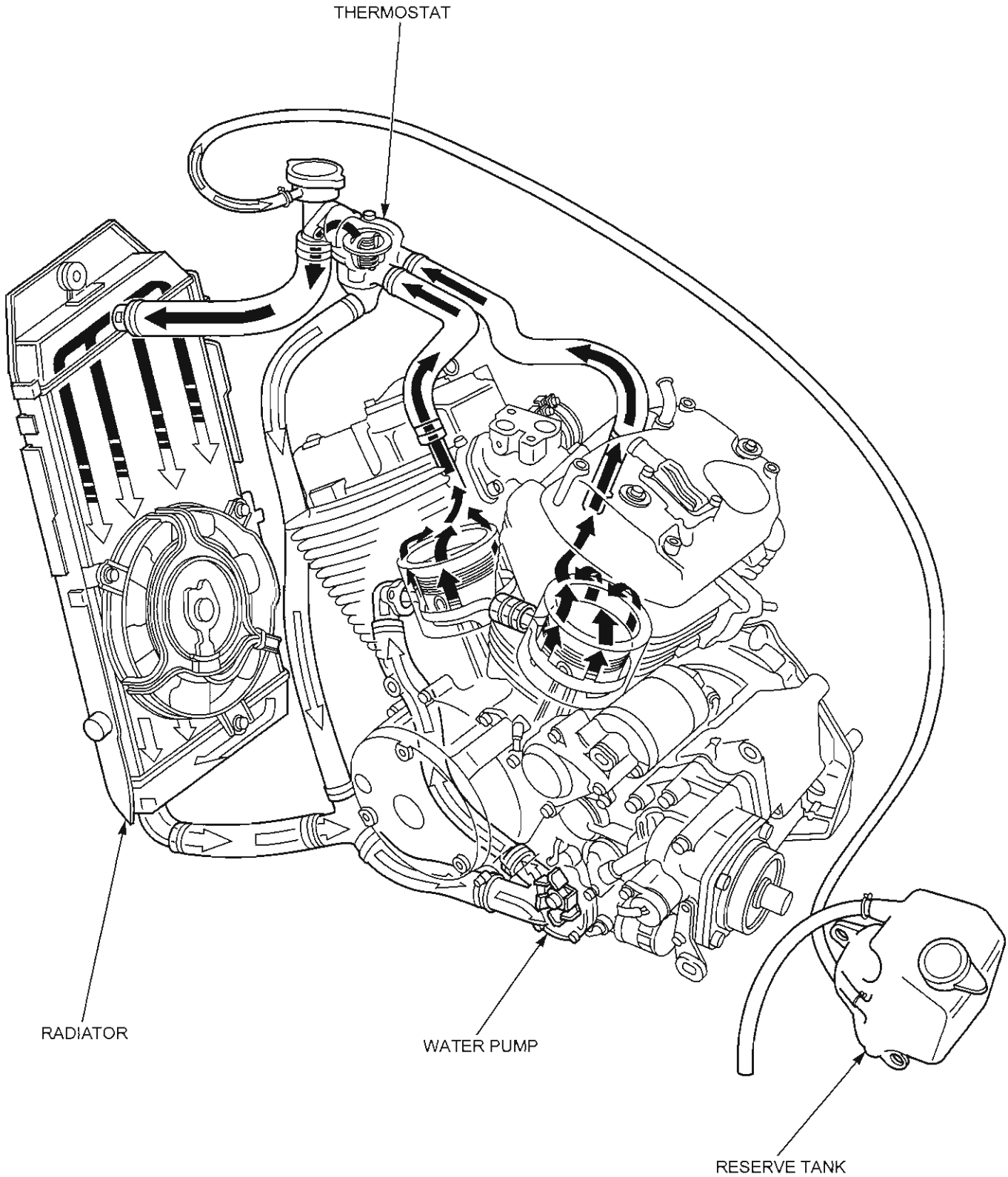
# 6. COOLING SYSTEM

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SYSTEM FLOW PATTERN.....	6-2	THERMOSTAT HOUSING.....	6-9
SERVICE INFORMATION.....	6-3	RADIATOR/COOLING FAN.....	6-11
TROUBLESHOOTING.....	6-4	WATER PUMP.....	6-15
SYSTEM TESTING.....	6-5	RADIATOR RESERVE TANK.....	6-17
COOLANT REPLACEMENT.....	6-6	FAN CONTROL RELAY.....	6-17
THERMOSTAT.....	6-8		

COOLING SYSTEM

SYSTEM FLOW PATTERN





# SERVICE INFORMATION

## GENERAL

### ⚠ WARNING

Removing the radiator cap while the engine is hot can allow the coolant to spray out, seriously scalding you. Always let the engine and radiator cool down before removing the radiator cap.

### NOTICE

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

- Add coolant at the reserve tank. Do not remove the radiator cap except to refill or drain the system.
- All cooling system service can be done with the engine in the frame.
- Avoid spilling coolant on painted surfaces.
- After servicing the system, check for leaks with a cooling system tester.
- For the ECT sensor inspection (page 21-18).

## SPECIFICATIONS

ITEM		SPECIFICATIONS
Coolant capacity	Radiator and engine	1.58 liters (1.67 US qt, 1.39 Imp qt)
	Reserve tank	0.38 liter (0.40 US qt, 0.33 Imp qt)
Radiator cap relief pressure		108 – 137 kPa (1.1 – 1.4 kgf/cm <sup>2</sup> , 16 – 20 psi)
Thermostat	Begin to open	80 – 84°C (177 – 182°F)
	Fully open	95°C (203°F)
	Valve lift	8 mm (0.3 in) minimum at 95°C (203°F)
Recommended antifreeze		Pro Honda HP coolant or an equivalent high quality ethylene glycol antifreeze containing silicate-free corrosion inhibitors
Standard coolant concentration		1 : 1 (mixture with distilled water)

## TORQUE VALUES

Radiator filler mounting bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Thermostat housing cover bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Fan motor mounting bolt	5.1 N·m (0.5 kgf·m, 3.8 lbf·ft)	
Cooling fan mounting nut	2.7 N·m (0.3 kgf·m, 2.0 lbf·ft)	Apply locking agent to the threads
Water pump cover bolt	13 N·m (1.3 kgf·m, 10 lbf·ft)	
Fan motor assembly mounting bolt	8.4 N·m (0.9 kgf·m, 6.2 lbf·ft)	
Water hose band screw	See page 6-10	

## COOLING SYSTEM

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### TROUBLESHOOTING

#### Engine temperature too high

- Faulty coolant temperature indicator or ECT sensor
- Thermostat stuck closed
- Faulty radiator cap
- Insufficient coolant
- Passages blocked in radiator, hoses or water jacket
- Air in system
- Faulty fan motor
- Faulty water pump

#### Engine temperature too low

- Thermostat stuck open

#### Coolant leaks

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

# SYSTEM TESTING

## COOLANT (HYDROMETER TEST)

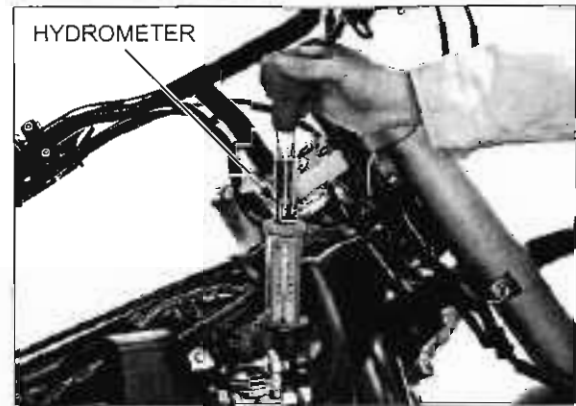
Remove the fuel tank (page 5-48).

Remove the radiator cap.



Test the coolant specific gravity using a hydrometer.

Look for contamination and replace the coolant if necessary.



COOLANT GRAVITY CHART

		Coolant temperature °C (°F)										
		0 (32)	5 (41)	10 (50)	15 (59)	20 (68)	25 (77)	30 (86)	35 (95)	40 (104)	45 (113)	50 (122)
Coolant ratio %	5	1.009	1.009	1.008	1.008	1.007	1.006	1.005	1.003	1.001	0.999	0.997
	10	1.018	1.017	1.017	1.016	1.015	1.014	1.013	1.011	1.009	1.007	1.005
	15	1.028	1.027	1.026	1.025	1.024	1.022	1.020	1.018	1.016	1.014	1.012
	20	1.036	1.035	1.034	1.033	1.031	1.029	1.027	1.025	1.023	1.021	1.019
	25	1.045	1.044	1.043	1.042	1.040	1.038	1.036	1.034	1.031	1.028	1.025
	30	1.053	1.052	1.051	1.049	1.047	1.045	1.043	1.041	1.038	1.035	1.032
	35	1.063	1.062	1.060	1.058	1.056	1.054	1.052	1.049	1.046	1.043	1.040
	40	1.072	1.070	1.068	1.066	1.064	1.062	1.059	1.056	1.053	1.050	1.047
	45	1.080	1.078	1.076	1.074	1.072	1.069	1.066	1.063	1.060	1.057	1.054
	50	1.086	1.084	1.082	1.080	1.077	1.074	1.071	1.068	1.065	1.062	1.059
	55	1.095	1.093	1.091	1.088	1.085	1.082	1.079	1.076	1.073	1.070	1.067
60	1.100	1.098	1.095	1.092	1.089	1.086	1.083	1.080	1.077	1.074	1.071	

## COOLING SYSTEM

### RADIATOR CAP/SYSTEM PRESSURE INSPECTION

Remove the radiator cap (page 6-5).

Wet the sealing surfaces of the cap, then install the cap onto the tester.

#### TOOLS:

Cooling system pressure tester SVTS4AH  
Cooling system adaptor OTCJ33984A

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

#### RADIATOR CAP RELIEF PRESSURE:

108 – 137 kPa (1.1 – 1.4 kgf/cm<sup>2</sup>, 16 – 20 psi)

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

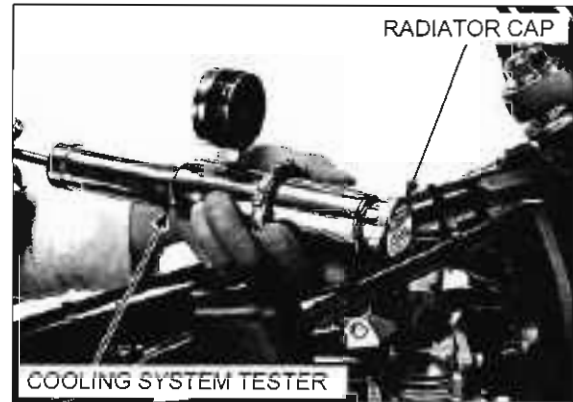
#### NOTICE

*Excessive pressure can damage the cooling system components. Do not exceed 137 kPa (1.4 kgf/cm<sup>2</sup>, 20 psi).*

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

Remove the tester and install the radiator cap.

Install the fuel tank (page 5-48).



## COOLANT REPLACEMENT

### PREPARATION

#### NOTE:

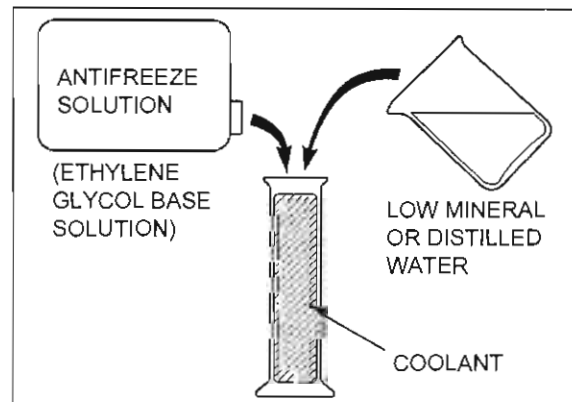
- The effectiveness of coolant decreases with the accumulation of rust or if there is a change in the mixing proportion during usage. Therefore, for best performance change the coolant regularly as specified in the maintenance schedule.
- Mix only distilled, low mineral water with the recommended antifreeze.

#### RECOMMENDED ANTIFREEZE:

High quality ethylene glycol antifreeze containing silicate-free corrosion inhibitors

#### STANDARD COOLANT CONCENTRATION:

1 : 1 (mixture with distilled water)



**REPLACEMENT/AIR BLEEDING**

**NOTE:**

When filling the system or reserve tank with coolant, or checking the coolant level, hold the motorcycle in an upright position.

Remove the fuel tank (page 5-48).

Remove the radiator cap.



Drain the coolant from the system by removing the drain bolt and sealing washer.

Reinstall the drain bolt with a new sealing washer and tighten it to the specified torque.

**TORQUE: 13 N·m (1.3 kgf·m, 10 lbf·ft)**



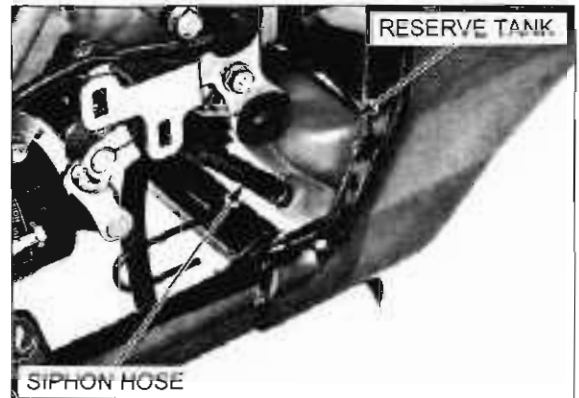
Remove the left crankcase rear cover (page 2-4).

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

Empty the coolant by removing the reserve tank (page 6-17) and rinse the inside of the reserve tank with water.

Install the following:

- Reserve tank (page 6-17)
- Left crankcase rear cover (page 2-4)



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

Install the fuel tank (page 5-48).

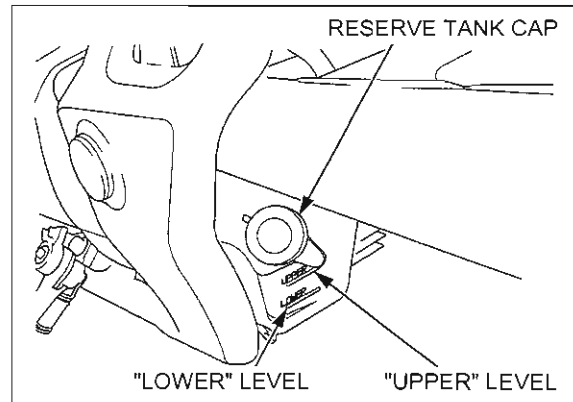
Bleed air from the system as follows:

1. Shift the transmission into neutral.  
Start the engine and let it idle for 2 – 3 minutes.
2. Snap the throttle three to four times to bleed air from the system.
3. Stop the engine, remove the fuel tank (page 5-48) and add the coolant up to the filler neck.
4. Install the radiator cap.



## COOLING SYSTEM

- Remove the reserve tank cap.
- Fill the reserve tank to the upper level line and install the tank cap.
- Install the fuel tank (page 5-48).



## THERMOSTAT

### REMOVAL

Drain the coolant from the system (page 6-7).

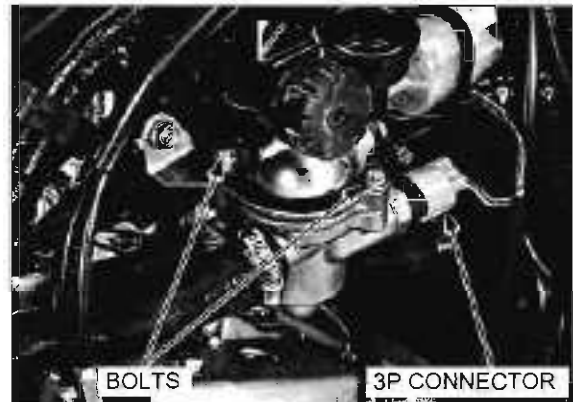
Remove the following:

- Steering side covers (page 2-4)
- Air cleaner housing (page 5-49)

Place a shop towel under the thermostat housing.

Disconnect the ECT sensor 3P connector.

Remove the thermostat housing cover bolts.



Pull out the thermostat housing and remove the O-ring and thermostat.



### THERMOSTAT INSPECTION

Visually inspect the thermostat for damage.  
Replace the thermostat if the valve stays open at room temperature.

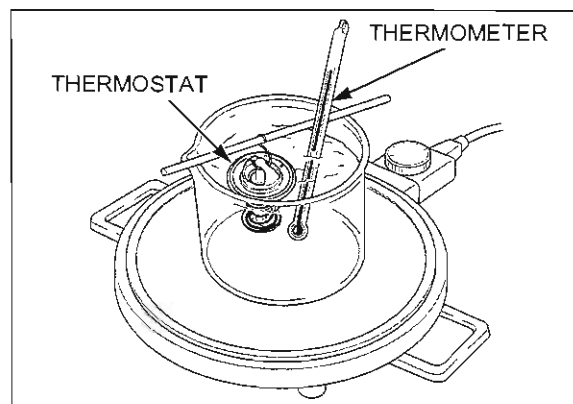
*Wear insulated gloves and adequate eye protection.  
Keep flammable materials away from the electric heating element.  
Do not let the thermostat or thermometer touch the pan, or you will get false readings.*

Heat a container of water with an electric heating element for 5 minutes.  
Suspend the thermostat in the heated water to check its operation.

**THERMOSTAT BEGIN TO OPEN:**  
80 – 84°C (177 – 182°F)

**VALVE LIFT:**  
8 mm (0.3 in) minimum at 95°C (203°F)

Replace the thermostat if the valve opens at a temperature other than those specified.



**INSTALLATION**

Install the thermostat by aligning its flange with the thermostat housing slot.



Install a new O-ring into the thermostat housing groove.



Install the thermostat housing to the cover and tighten the bolts to the specified torque.

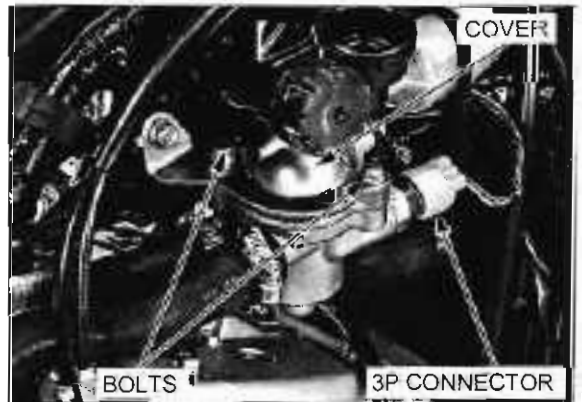
**TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)**

Connect the ECT sensor 3P connector.

Fill and bleed the cooling system (page 6-7).

Install the following:

- Air cleaner housing (page 5-49)
- Steering side covers (page 2-4)



**THERMOSTAT HOUSING**

**REMOVAL/INSTALLATION**

Drain the coolant from the system (page 6-7).

Remove the following:

- Steering side covers (page 2-4)
- Air cleaner housing (page 5-49)

Disconnect the ECT sensor 3P connector.

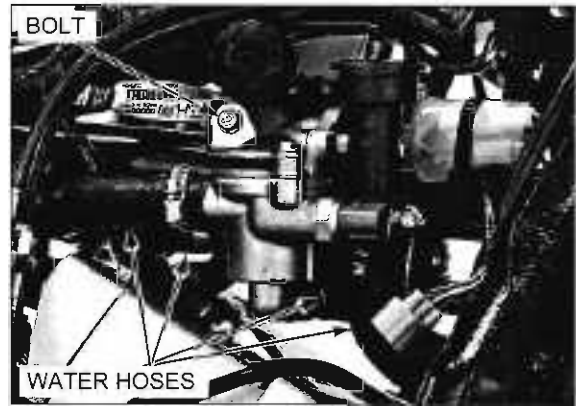
Disconnect the siphon hose.



## COOLING SYSTEM

Loosen the water hose band screws and disconnect the water hoses.

Remove the bolt and thermostat housing assembly.

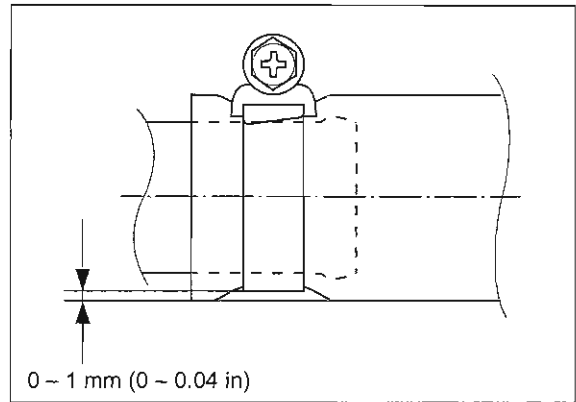


*Route the hoses and wires properly (page 1-26).*

Install the thermostat housing assembly in the reverse order of removal.

**NOTE:**

Tighten the water hose band screws to the specified range as shown.

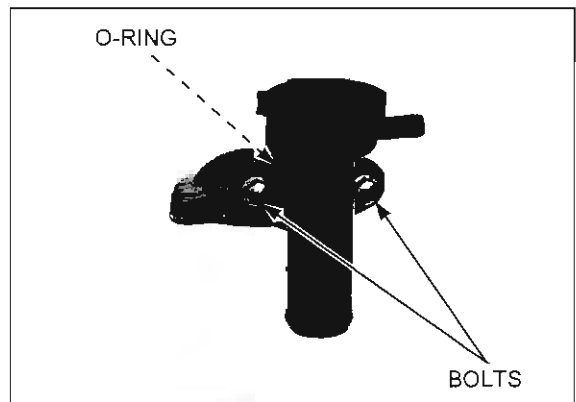


### DISASSEMBLY

Remove the following:

- Thermostat housing (page 6-9)
- Thermostat (page 6-8)
- ECT sensor (page 5-62)

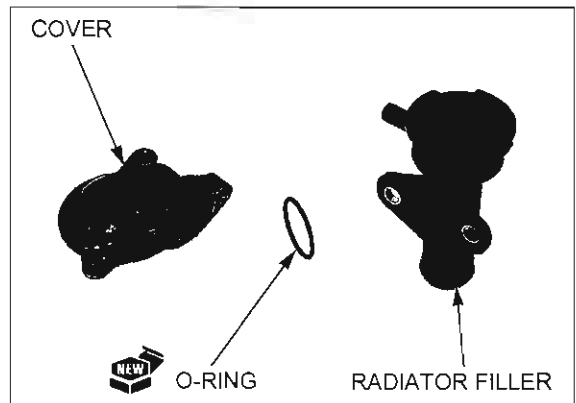
Remove the bolts and O-ring.



### ASSEMBLY

Install a new O-ring to the radiator filler.

Assemble the radiator filler and thermostat housing cover.



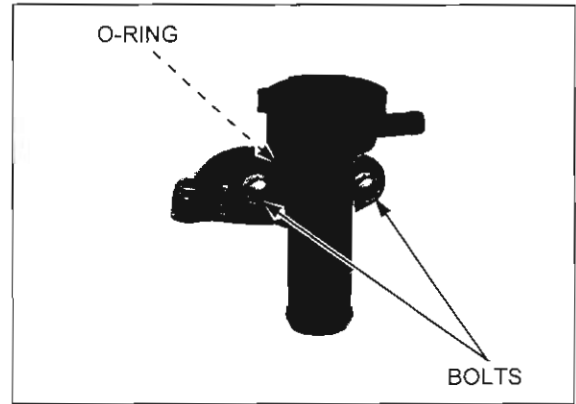


Install and tighten the bolts to the specified torque.

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

Install the following:

- ECT sensor (page 5-62)
- Thermostat (page 6-9)
- Thermostat housing (page 6-9)



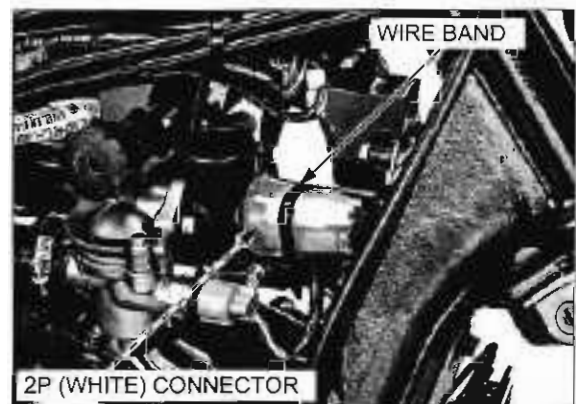
## RADIATOR/COOLING FAN

### REMOVAL

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

Drain the coolant from the system (page 6-7).  
Remove the steering side covers (page 2-4).

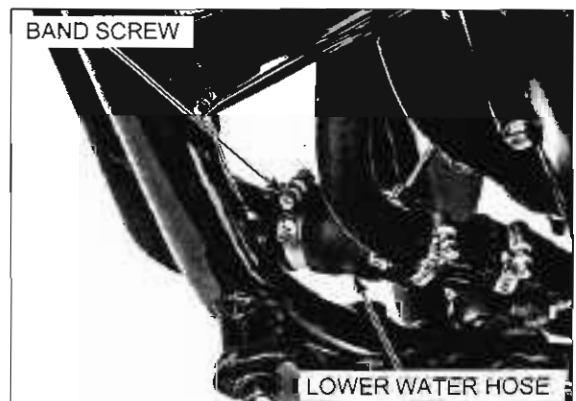
Remove the wire band and disconnect the fan motor 2P (White) connector.



Loosen the water hose band screw and disconnect the radiator upper water hose from the radiator.



Loosen the water hose band screw and disconnect the radiator lower water hose from the radiator.

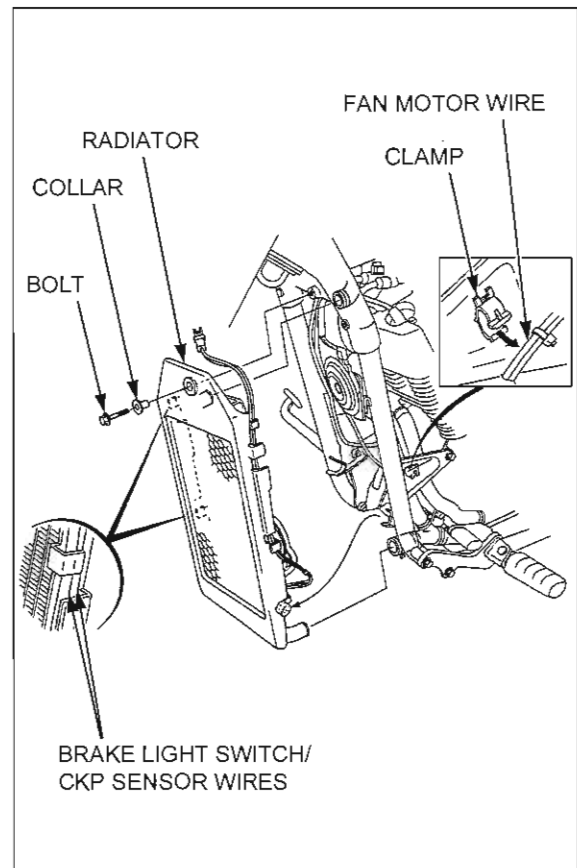


## COOLING SYSTEM

Remove the bolt and collar.

Release the rear brake light switch and CKP sensor wires from the radiator grill.

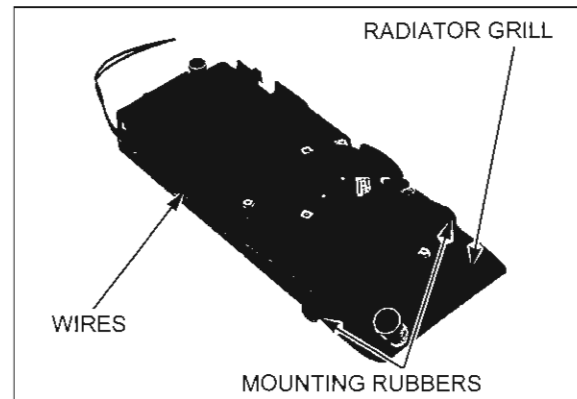
Release the fan motor wire from the clamp and remove the radiator.



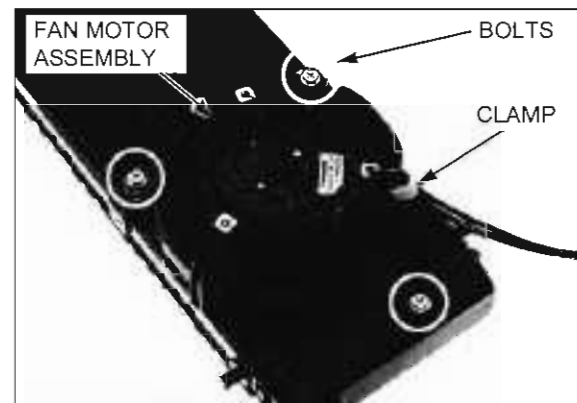
### DISASSEMBLY

Release the fan motor wires from the radiator grill.

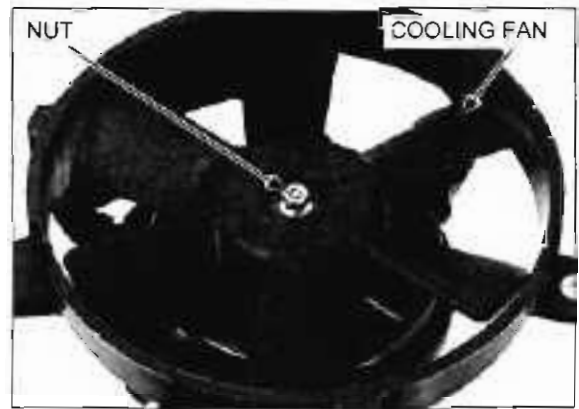
Remove the radiator mounting rubbers and radiator grill.



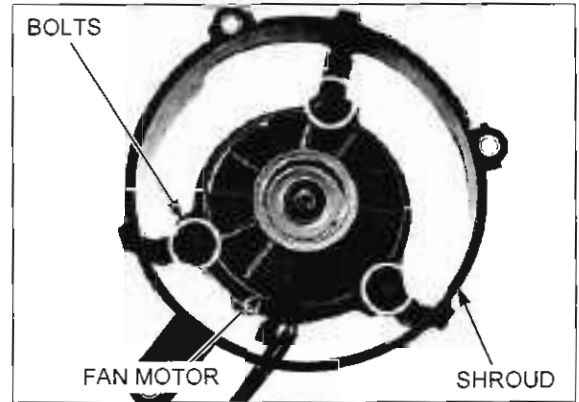
Remove the clamp, bolts and fan motor assembly.



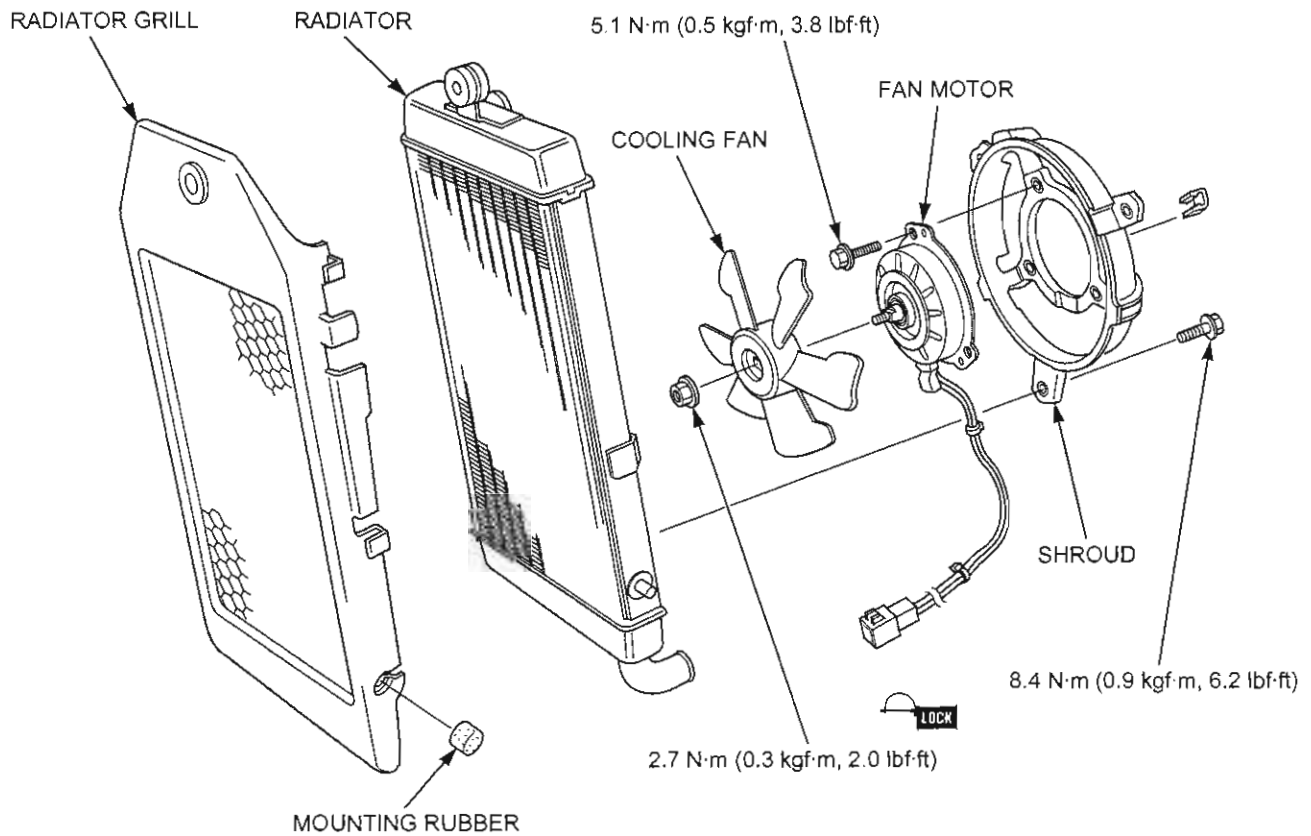
Remove the nut and cooling fan.



Remove the bolts and fan motor from the shroud.



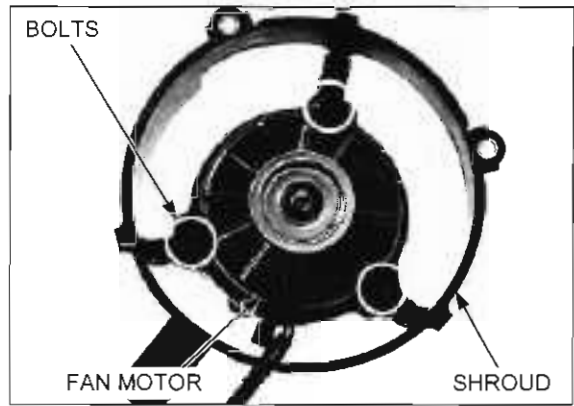
**ASSEMBLY**



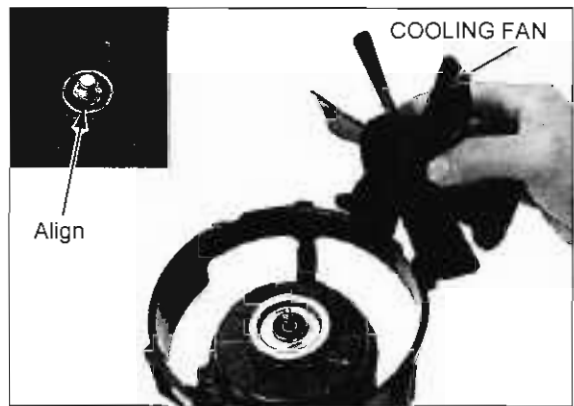
## COOLING SYSTEM

Install the fan motor on the shroud in the direction as shown and tighten the bolts to the specified torque.

**TORQUE: 5.1 N·m (0.5 kgf·m, 3.8 lbf·ft)**

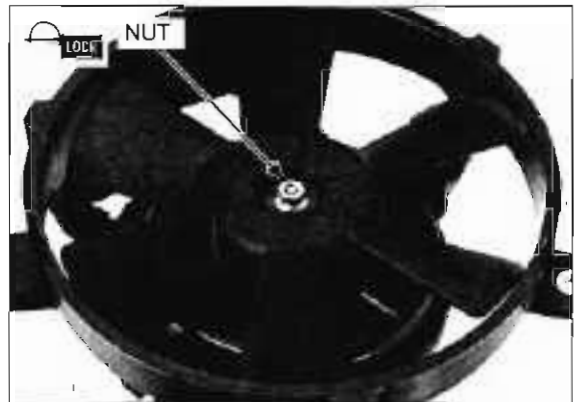


Install the cooling fan onto the motor shaft, aligning the flat surfaces.



Clean and apply locking agent to the nut threads. Tighten the nut to the specified torque.

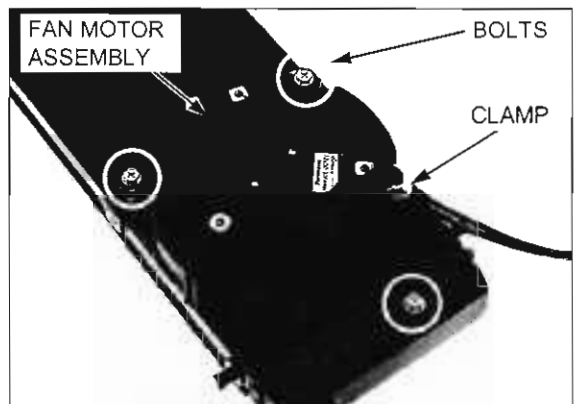
**TORQUE: 2.7 N·m (0.3 kgf·m, 2.0 lbf·ft)**



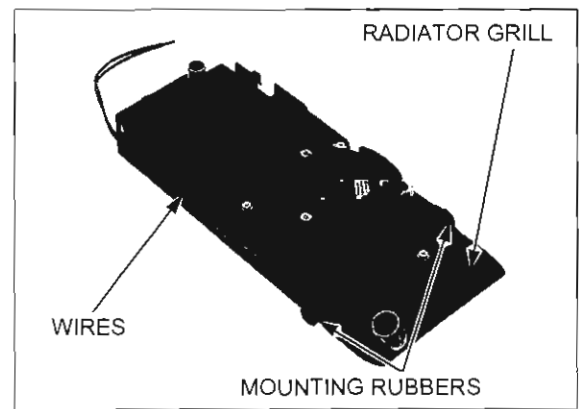
Install the fan motor assembly on the radiator and tighten the bolts with the ground terminal as shown.

**TORQUE: 8.4 N·m (0.9 kgf·m, 6.2 lbf·ft)**

Clamp the fan motor wires.



Install the radiator on the radiator grill.  
 Install the mounting rubbers.  
 Route the fan motor wires through the radiator grill.



## INSTALLATION

Install the radiator by inserting its mounting rubbers into the holder of the frame.

Route the rear brake light switch and CKP sensor wires through the radiator grill (page 1-26).

Connect the fan motor wire to the clamp.

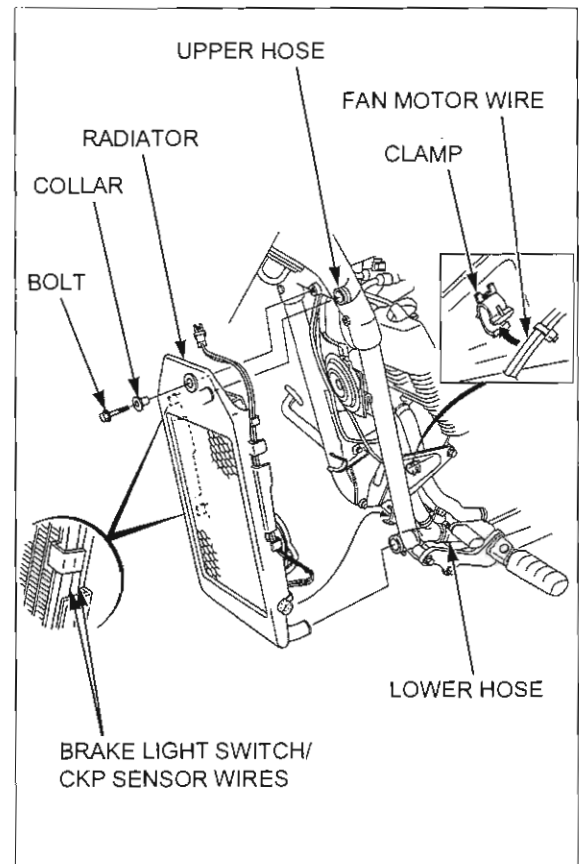
Install the collar, bolt and tighten the bolt.

Connect the radiator upper and lower water hoses (page 1-26).

Tighten the water hose band screws to the specified range (page 6-10).

Install the steering side covers (page 2-4).

Fill and bleed the cooling system (page 6-7).



## WATER PUMP

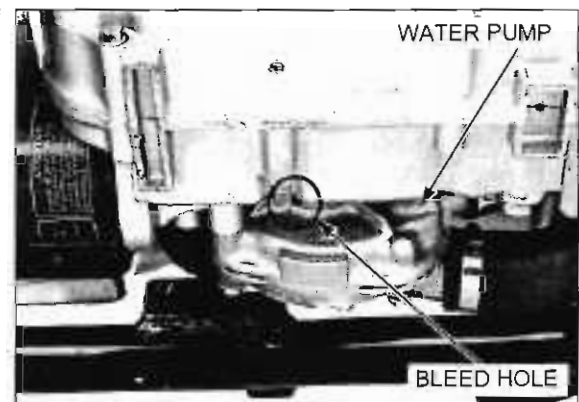
### MECHANICAL SEAL INSPECTION

Check the bleed hole of the water pump for signs of coolant leakage.

#### NOTE:

- A small amount of "weeping" from the bleed hole is normal.
- Make sure that there are no continuous coolant leakage from the bleed hole while operating the engine.

Replace the water pump as an assembly if necessary.



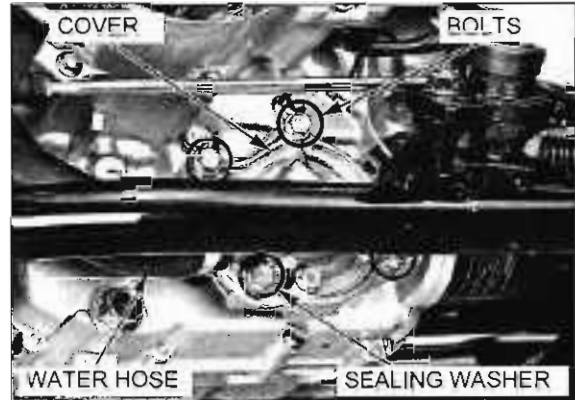
## COOLING SYSTEM

### REMOVAL

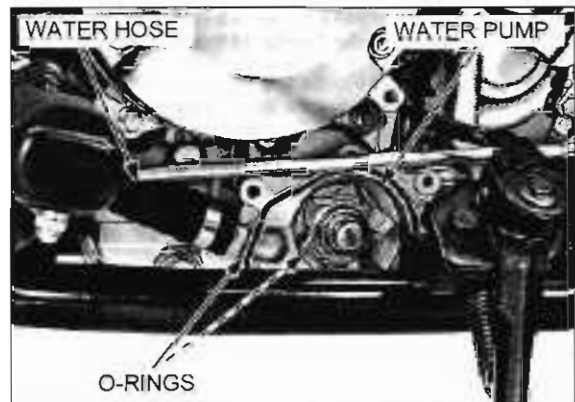
Drain the coolant from the system (page 6-7).

Loosen the water hose band screw and disconnect the water hose.

Remove the bolts, sealing washer and water pump cover.



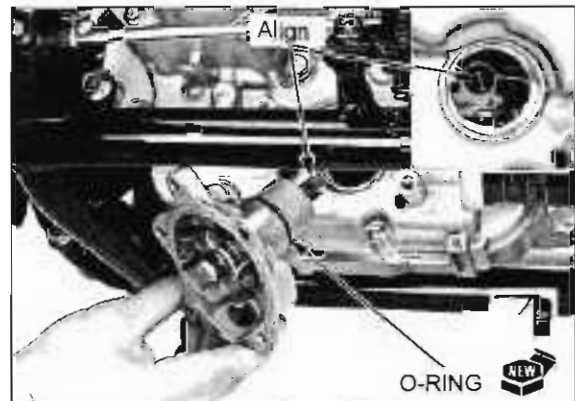
Disconnect the water hose.  
Remove the O-rings and water pump.



### INSTALLATION

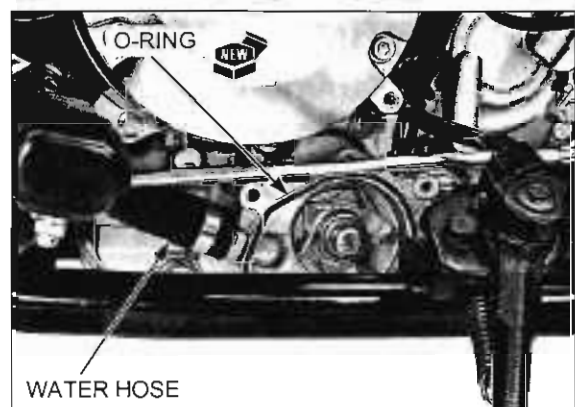
Coat a new O-ring with engine oil and install it onto the stepped section of the water pump.

Install the water pump while aligning its groove with the projection of the oil pump shaft.



Connect the water hose (page 1-26).  
Tighten the water hose band screw to the specified range (page 6-10).

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

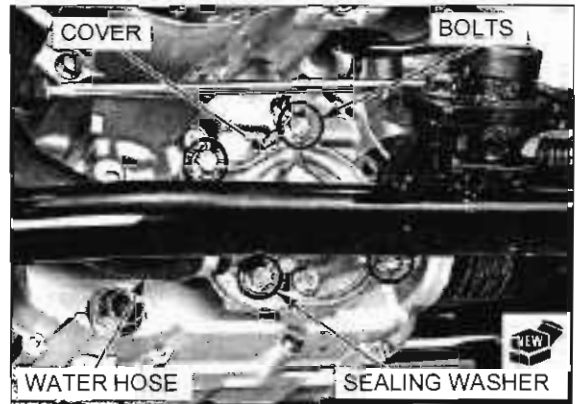


Align the bolt holes in the pump and crankcase, then install the water pump cover with the bolts and a new sealing washer.

Tighten the bolts to the specified torque in a crisscross pattern in several steps.

**TORQUE: 13 N·m (1.3 kgf·m, 10 lbf·ft)**

Connect the water hose (page 1-26).  
Tighten the water hose band screw to the specified range (page 6-10).



## RADIATOR RESERVE TANK

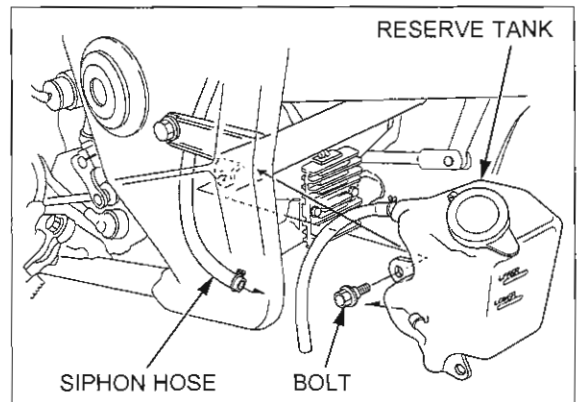
### REMOVAL/INSTALLATION

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

Remove the bolt and reserve tank.

Installation is in the reverse order of removal.

*Route the hoses properly (page 1-26).*



## FAN CONTROL RELAY

### SYSTEM INSPECTION

**The coolant temperature is low but the fan motor does not stop**

Remove the fan control relay (page 6-18) and turn the ignition switch to "ON".

If the fan motor stops, replace the fan control relay.

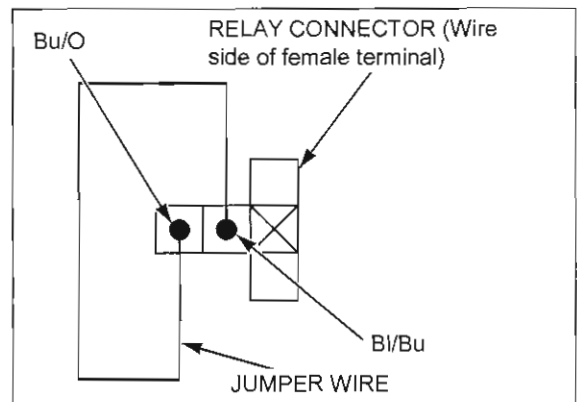
**The coolant temperature indicator comes on but the fan motor does not start**

Before testing, check for a blown sub fuse 20 A (FAN).

Remove the fan control relay (page 6-18).  
Jump the fan control relay terminals.

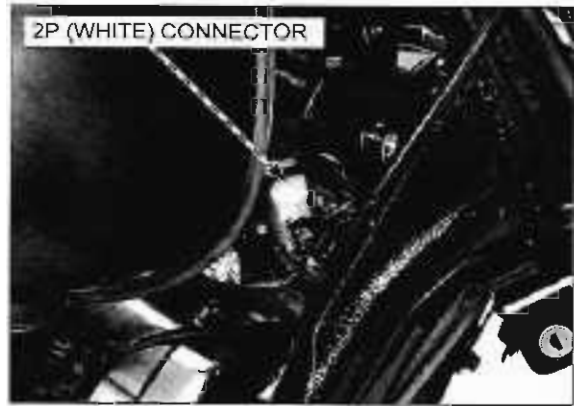
**CONNECTION: Black/blue – Blue/orange**

Turn the ignition switch to "ON" and check the fan motor.



## COOLING SYSTEM

- If the motor starts, replace the fan control relay.
- If the fan motor does not start, remove the steering side covers (page 2-4) and disconnect the fan motor 2P (White) connector.  
Measure the voltage between the Black/blue wire and ground.
  - If there is battery voltage, replace the fan motor (page 6-11).
  - If there is no voltage, check for an open circuit in the Green and Black/blue wires.



### INSPECTION (VT750C2F/C2B)

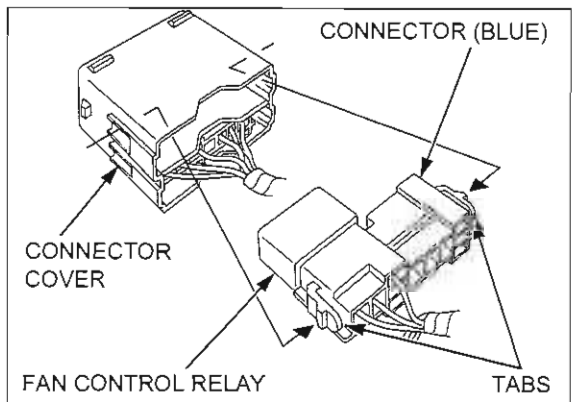
Remove the left side cover (page 2-3).

Remove the relay box from the battery box.



Release the tabs (Blue) and remove the relay connector from the connector cover.

Disconnect the fan control relay from the relay connector.



Connect the ohmmeter to the relay connector terminals.

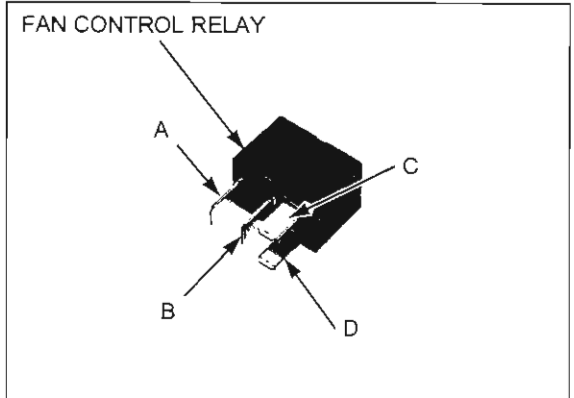
#### CONNECTION: A - B

Connect the 12 V battery to the following relay connector terminals.

#### CONNECTION: C - D

There should be continuity only when the 12 V battery is connected.

If there is no continuity when the 12 V battery is connected, replace the fan control relay.



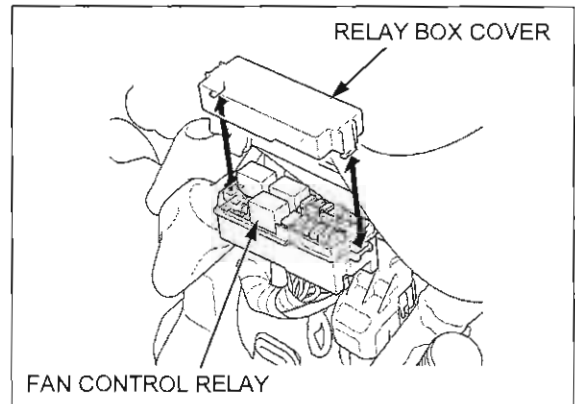


**INSPECTION (VT750C2S)**

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

Remove the relay box cover.

Disconnect the fan control relay from the relay connector.



Connect the ohmmeter to the relay connector terminals.

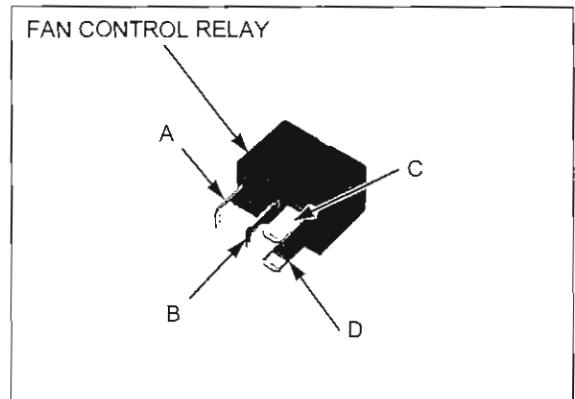
**CONNECTION: A - B**

Connect the 12 V battery to the following relay connector terminals.

**CONNECTION: C - D**

There should be continuity only when the 12 V battery is connected.

If there is no continuity when the 12 V battery is connected, replace the fan control relay.



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**MEMO**

# 7. ENGINE REMOVAL/INSTALLATION

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COMPONENT LOCATION .....7-2

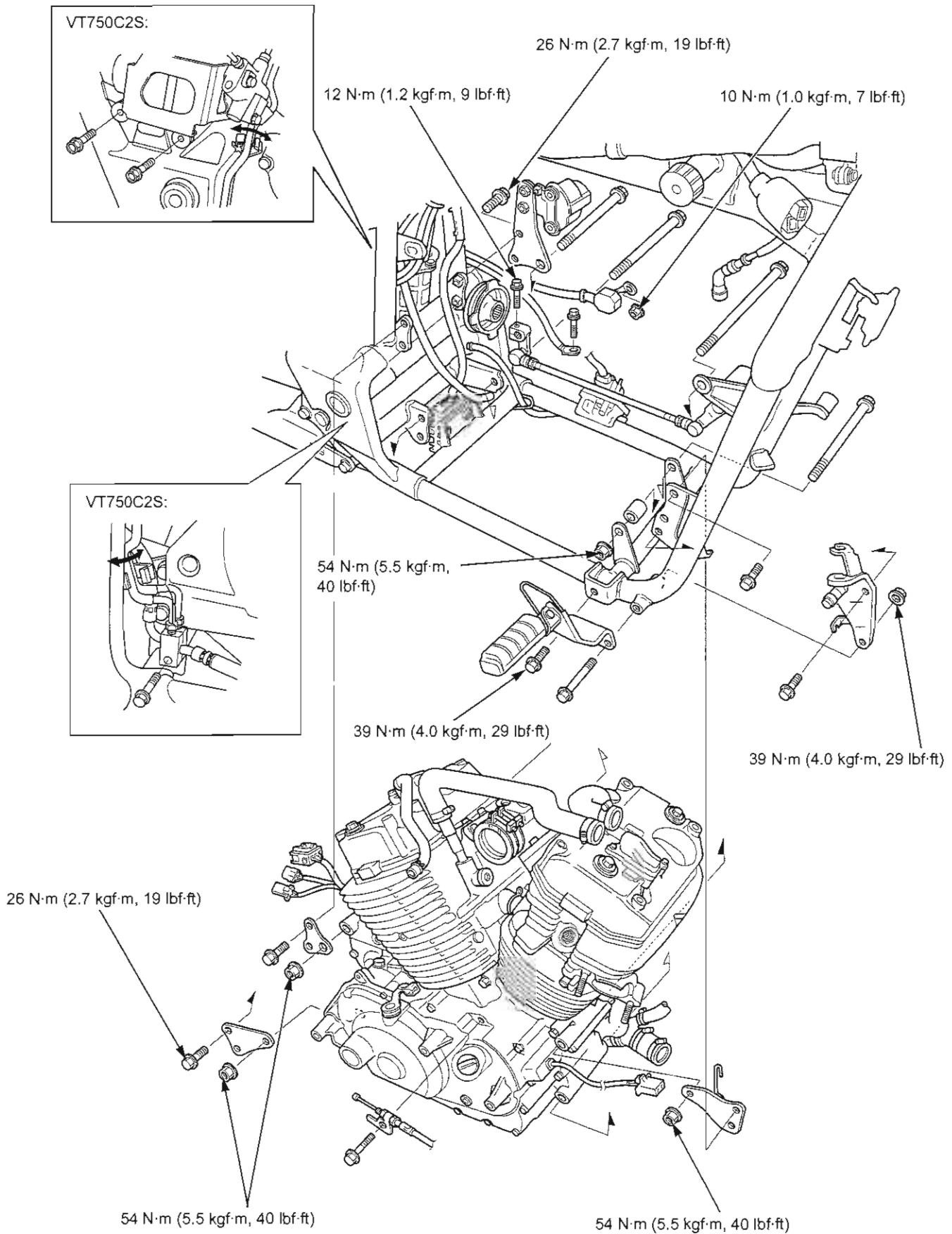
SERVICE INFORMATION .....7-3

ENGINE REMOVAL .....7-4

ENGINE INSTALLATION.....7-8

# ENGINE REMOVAL/INSTALLATION

## COMPONENT LOCATION



## SERVICE INFORMATION

### GENERAL

- A hoist or equivalent is required to support the motorcycle when removing and installing the engine.
- A floor jack or other adjustable support is required to support and maneuver the engine.
- When installing the engine, be sure to tighten the engine mounting fasteners to the specified torque in the specified sequence. If you make a mistake with the tightening torque or sequence, loosen all mounting fasteners, then tighten them again to the specified torque in the correct sequence.
- Do not support the engine using the engine oil filter or it will be damaged.
- When removing/installing the engine, tape the frame around the engine beforehand for frame protection.
- The following components require engine removal for servicing.
  - Cylinder head (page 8-13)
  - Cylinder/piston (page 9-4)
  - Crankshaft (page 12-10)
  - Transmission (Including gearshift drum/shift fork: page 12-20)
  - Output gear case (page 12-28)
  - Oil pump (page 4-6)
- The following components can be serviced with the engine in the frame.
  - Camshaft (page 8-7)
  - Throttle body (page 5-51)
  - Water pump (page 6-15)
  - Clutch/gearshift linkage (page 10-3)
  - Alternator/starter clutch (page 11-3)
  - Starter motor (page 20-7)

### SPECIFICATIONS

ITEM	SPECIFICATIONS
Engine dry weight	71.5 kg (157.6 lbs)
Engine oil capacity at disassembly	3.2 liters (3.4 US qt, 2.8 Imp qt)
Coolant capacity (radiator and engine)	1.58 liters (1.67 US qt, 1.39 Imp qt)

### TORQUE VALUES

Engine mounting nut	54 N·m (5.5 kgf·m, 40 lbf·ft)
Engine hanger plate bolt	26 N·m (2.7 kgf·m, 19 lbf·ft)
Starter motor cable terminal nut	10 N·m (1.0 kgf·m, 7 lbf·ft)
EOP switch terminal screw	1.9 N·m (0.2 kgf·m, 1.4 lbf·ft)
Main footpeg bracket mounting bolt	39 N·m (4.0 kgf·m, 29 lbf·ft)
Main footpeg bracket mounting nut	39 N·m (4.0 kgf·m, 29 lbf·ft)
Gearshift arm pinch bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)

## ENGINE REMOVAL/INSTALLATION

### ENGINE REMOVAL

Drain the engine oil (page 3-12).

Drain the coolant from the cooling system (page 6-7).

Remove the following:

- Fuel tank (page 5-48)
- Front ignition coil (page 19-8)
- Spark plug caps (page 3-7)
- Thermostat housing (page 6-9)
- Rear brake light switch (page 21-25)
- Brake pedal (page 15-24)
- Left crankcase rear cover (page 2-4)
- Exhaust system (page 2-9)
- Injectors (page 5-58)
- Throttle body (page 5-51)
- Radiator (page 6-11)
- Over head covers (page 2-4)
- Clutch cover (page 10-5)
- Alternator cover (page 3-8)

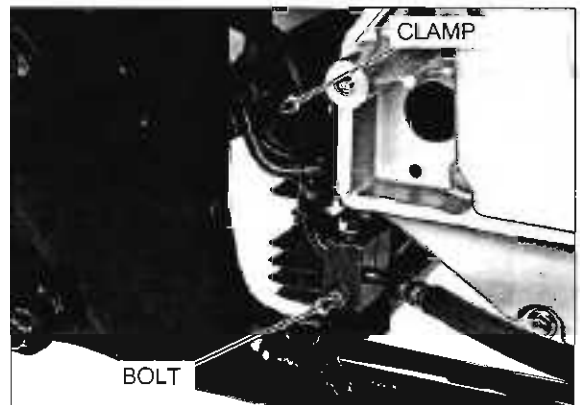
#### NOTE:

Wrap the intake manifold port with a shop towel or cover them with a piece of tape to prevent any foreign material from dropping into the engine.

VT750C2S; Remove the bolts/washers and brake hose clamp.

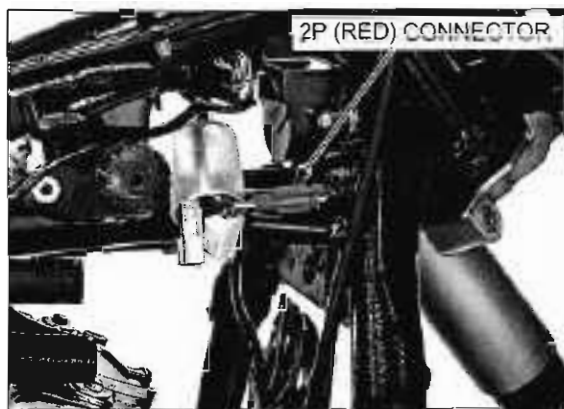


VT750C2S; Remove the bolt and brake hose clamp.

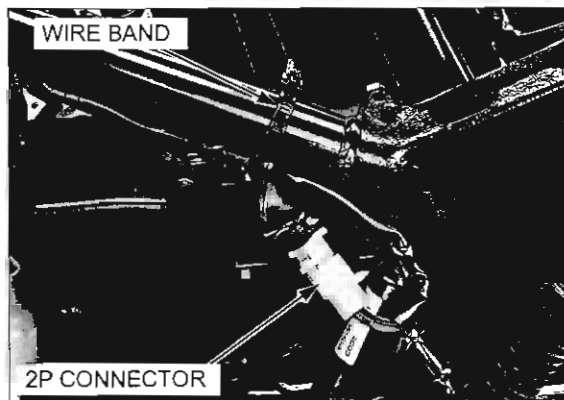


## ENGINE REMOVAL/INSTALLATION

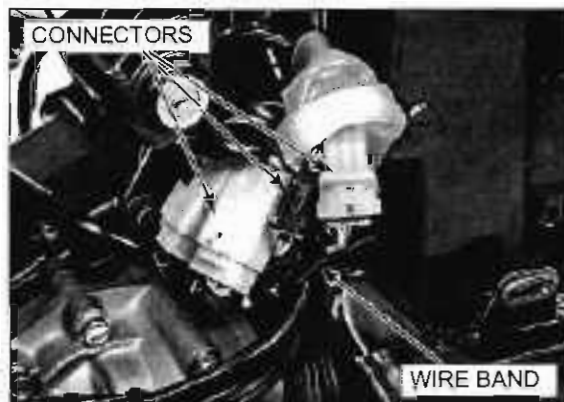
Disconnect the CKP sensor 2P (Red) connector.



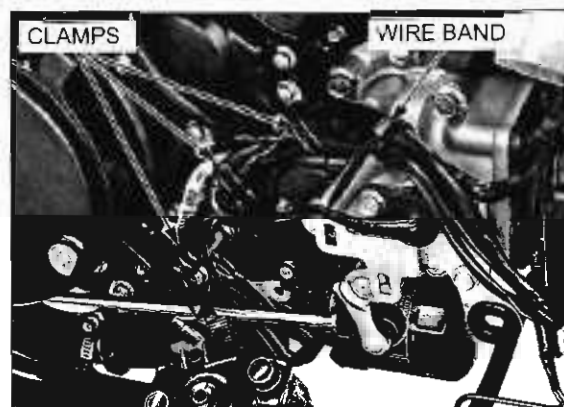
Release the wire band.  
Disconnect the ignition switch 2P connector.



Release the wire band.  
Disconnect the VS sensor 3P (White), alternator 3P (White) and EOP/neutral switch 2P (Black) connectors.

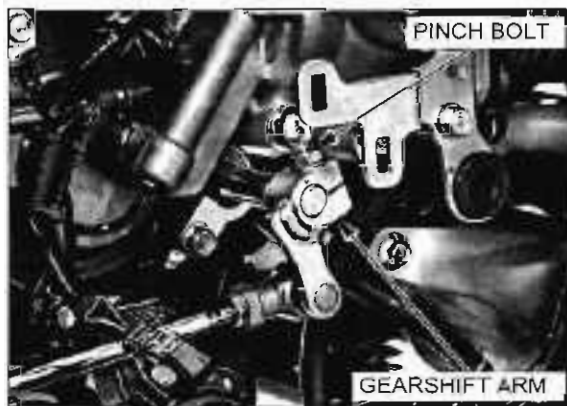


Release the wires from the clamps and wire band.



## ENGINE REMOVAL/INSTALLATION

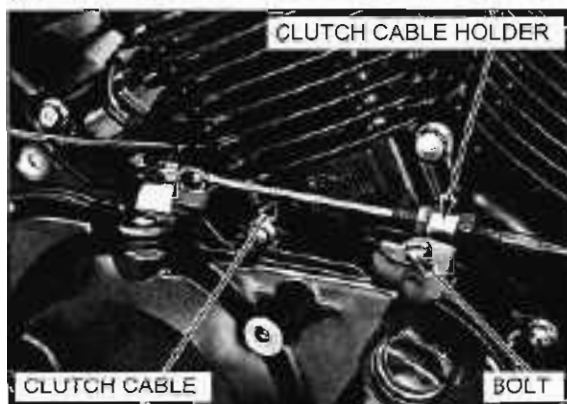
Remove the pinch bolt and gearshift arm.



Disconnect the secondary air supply hoses from the PAIR check valve covers.



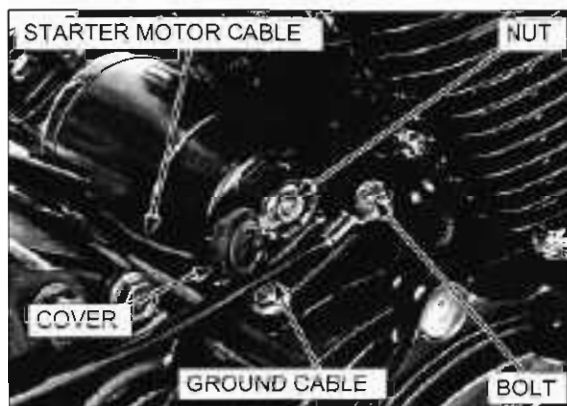
Remove the clutch cable holder by removing the bolt and disconnect the clutch cable end from the clutch lifter arm.



Open the terminal cover and remove the starter motor terminal nut.

Disconnect the starter motor cable.

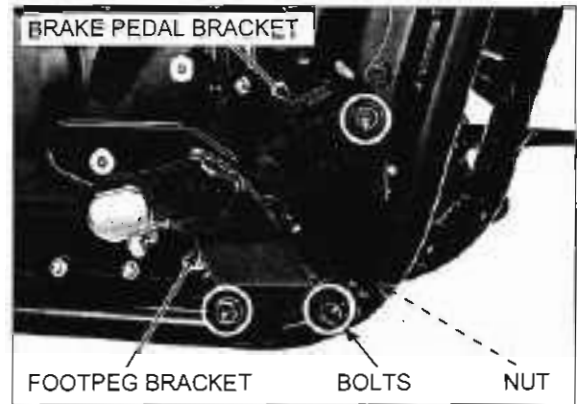
Remove the bolt and disconnect the ground cable.





## ENGINE REMOVAL/INSTALLATION

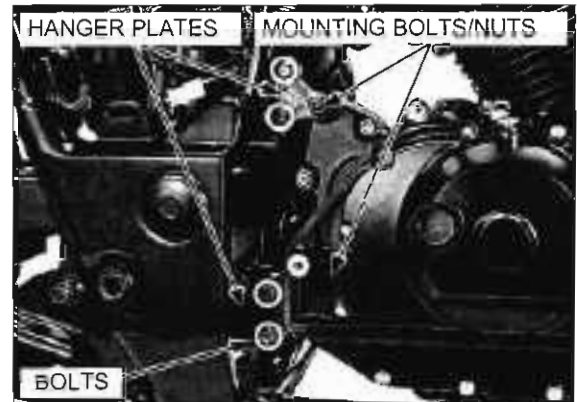
Remove the bolts, nut, right main footpeg and brake pedal brackets from the frame.



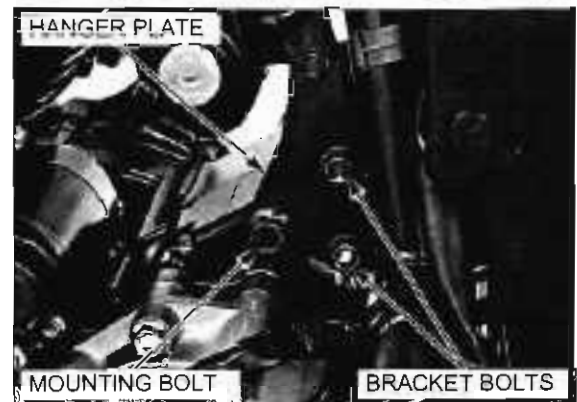
*The jack height must be continually adjusted to relieve stress for bolt removal.*

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

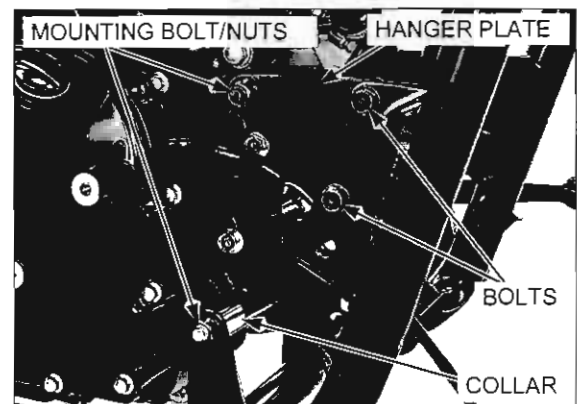
Remove the rear engine mounting nuts.  
Remove the bolts and right rear engine hanger plates.



Remove the rear engine mounting bolts.  
Remove the bolts and left rear engine hanger plate.



Remove the front engine mounting nuts.  
Remove the bolts and front engine hanger plate.  
Remove the engine mounting bolts and collar.

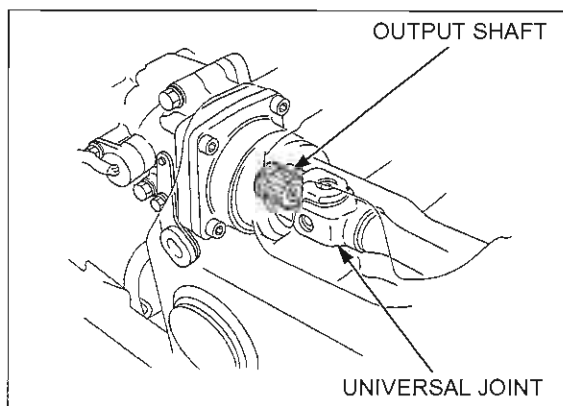


## ENGINE REMOVAL/INSTALLATION

Release the joint boot from the output gear case.

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

Move the engine forward and release the output shaft from the universal joint in the swingarm. Carefully maneuver the engine and remove it out of the frame to the right.

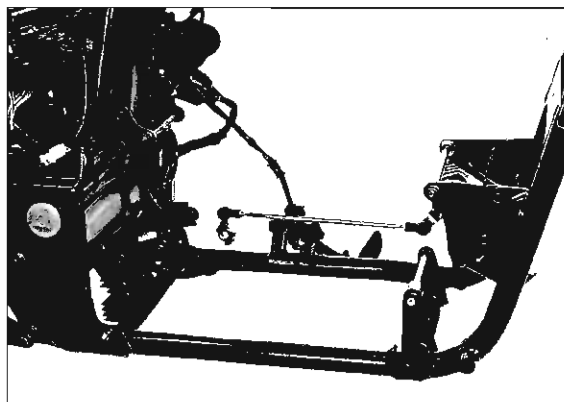


## ENGINE INSTALLATION

Note the direction of engine hanger bolts.

### NOTE:

- All the engine mounting bolts and nuts loosely install, then tighten the bolts and nuts to the specified torque in the specified sequence.
- Route the wires, hoses and cables properly (page 1-26).



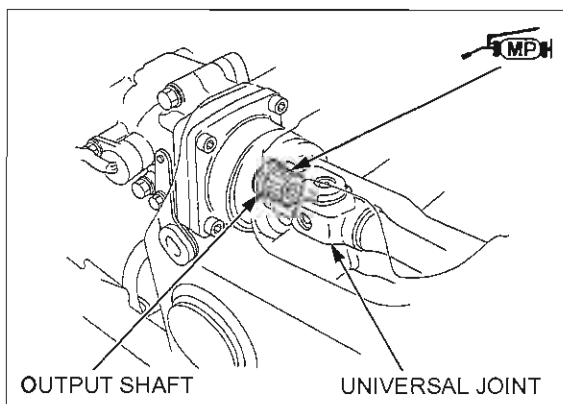
Apply 1 g of molybdenum disulfide paste to the output shaft splines (universal joint side).

*During engine installation, hold the engine securely and be careful not to damage the frame and engine.*

Using a floor jack or other adjustable support, carefully place the engine into the frame and maneuver it into place.

### NOTE:

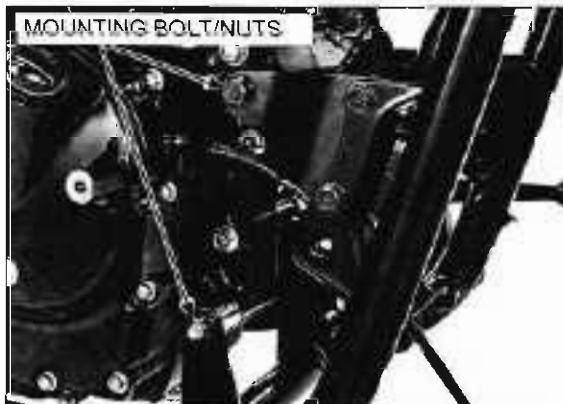
Engage the output shaft with the universal joint.



Loosely install the all engine hanger plates, mounting fasteners and collar.

Tighten the front lower, then front upper engine mounting nuts to the specified torque.

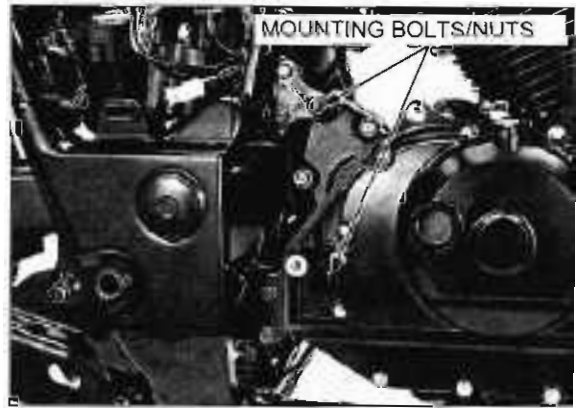
**TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)**



## ENGINE REMOVAL/INSTALLATION

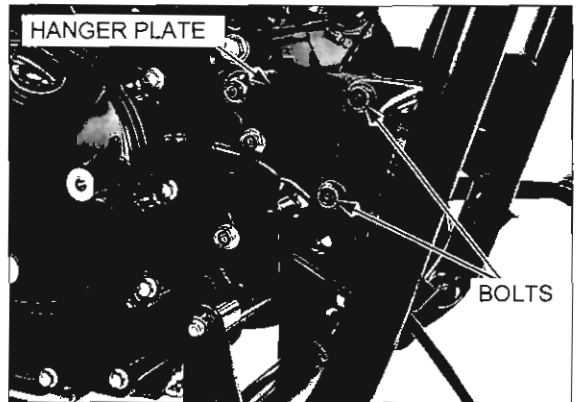
Tighten the rear lower, then rear upper engine mounting nuts to the specified torque.

**TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)**



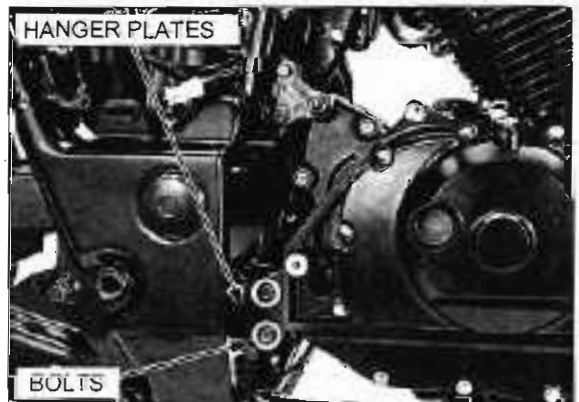
Tighten the front engine hanger plate bolts to the specified torque.

**TORQUE: 26 N·m (2.7 kgf·m, 19 lbf·ft)**



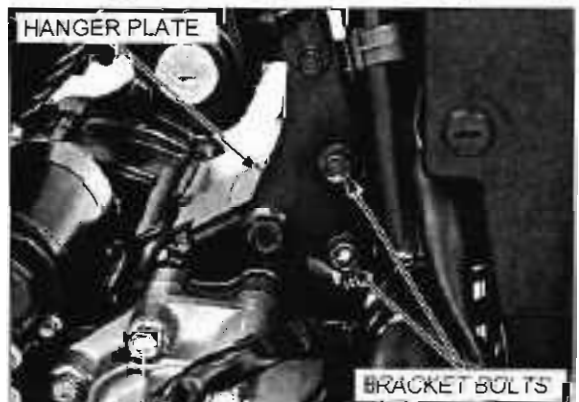
Tighten the right rear lower engine hanger plate bolts to the specified torque.

**TORQUE: 26 N·m (2.7 kgf·m, 19 lbf·ft)**



Tighten the left rear upper engine hanger plate bolts to the specified torque.

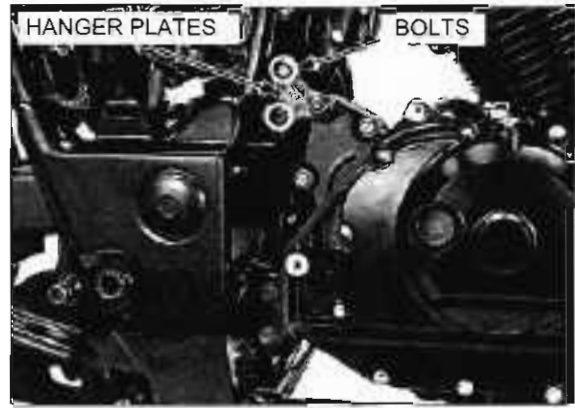
**TORQUE: 26 N·m (2.7 kgf·m, 19 lbf·ft)**



## ENGINE REMOVAL/INSTALLATION

Tighten the right rear upper engine hanger plate bolts to the specified torque.

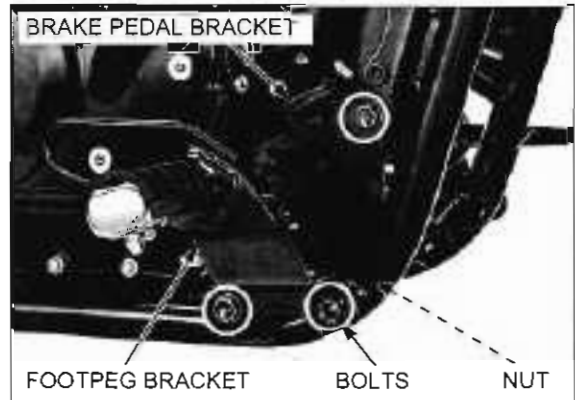
**TORQUE:** 26 N·m (2.7 kgf·m, 19 lbf·ft)



Install the right main footpeg and brake pedal brackets and tighten the bolts and nut to the specified torque.

**TORQUE:**

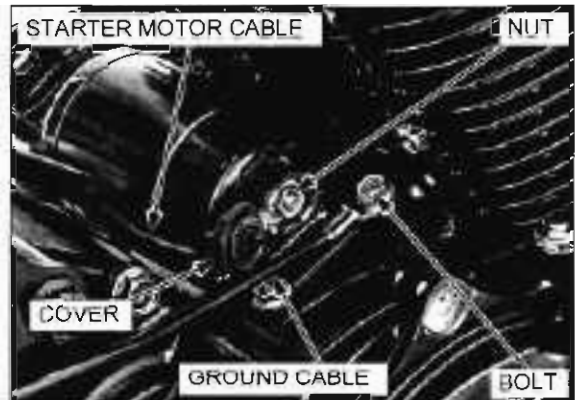
**Main footpeg bracket mounting bolt/nut:**  
39 N·m (4.0 kgf·m, 29 lbf·ft)



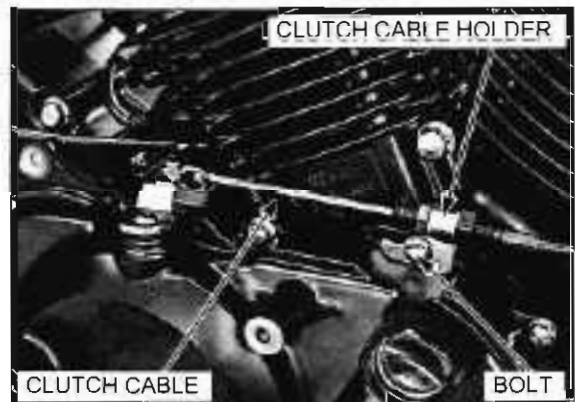
Connect the starter motor cable and tighten the terminal nut to the specified torque.

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

Connect the ground cable and tighten the bolt securely.  
Close the terminal cover securely.



Connect the clutch cable end to the clutch lifter arm.  
Install the clutch cable holder and bolt.  
Tighten the bolt securely.



## ENGINE REMOVAL/INSTALLATION

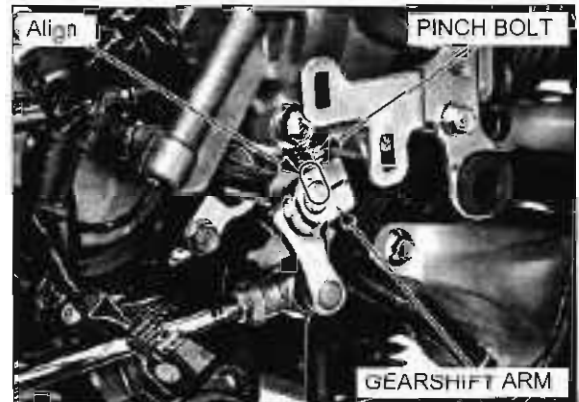
Connect the secondary air supply hoses to the PAIR check valve covers.



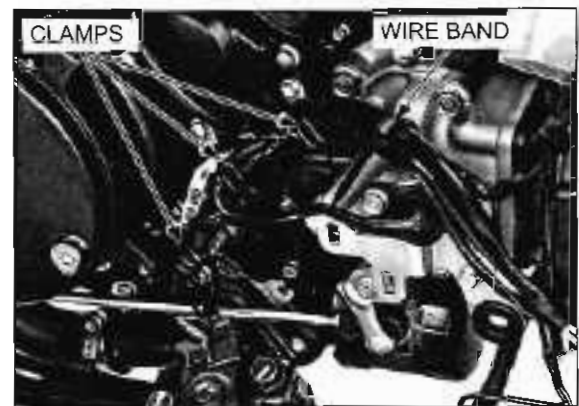
Install the gearshift arm to the gearshift spindle, aligning with the punch marks.

Tighten the gearshift arm pinch bolt to the specified torque.

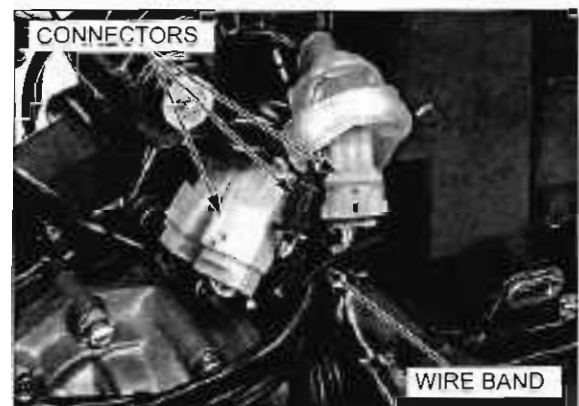
**TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)**



Clamp and bind the wires with the clamps and wire band.



Connect the VS sensor 3P (White), alternator 3P (White) and EOP/neutral switch 2P (Black) connectors. Bind the wires with the wire band.

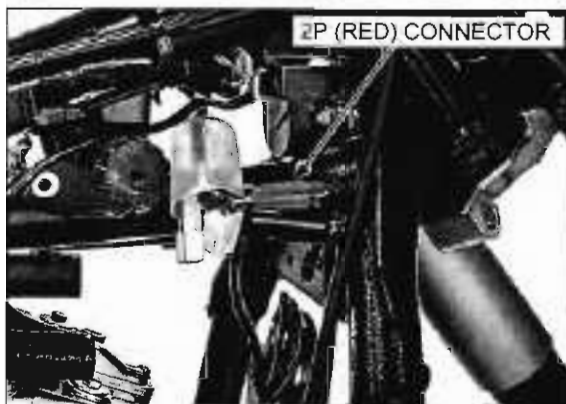


## ENGINE REMOVAL/INSTALLATION

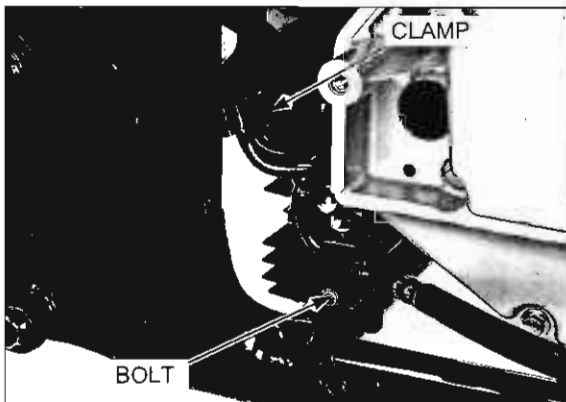
Connect the ignition switch 2P connectors.  
Bind the wires with the wire band.



Connect the CKP sensor 2P (Red) connector.  
Install the following:

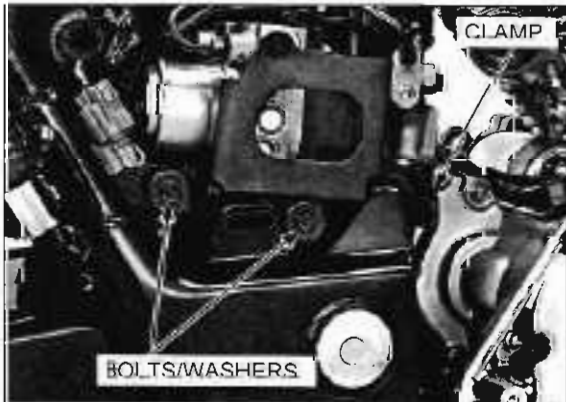


VT750C2S; Install the brake hose clamp and tighten the bolt securely.



VT750C2S; Install the brake hose clamp and tighten the bolts/washers securely.

- Radiator (page 6-15)
- Throttle body (page 5-51)
- Injectors (page 5-58)
- Exhaust system (page 2-12)
- Left crankcase rear cover (page 2-4)
- Spark plug caps (page 3-8)
- Thermostat housing (page 6-9)
- Rear brake light switch (page 21-25)
- Brake pedal (page 15-25)
- Over head covers (page 2-4)
- Clutch cover (page 10-22)
- Alternator cover (page 3-10)
- Front ignition coil (page 19-8)
- Fuel tank (page 5-48)



Fill the crankcase with engine oil (page 3-12).  
Fill and bleed the cooling system (page 6-7).  
Check the engine oil level (page 3-11).

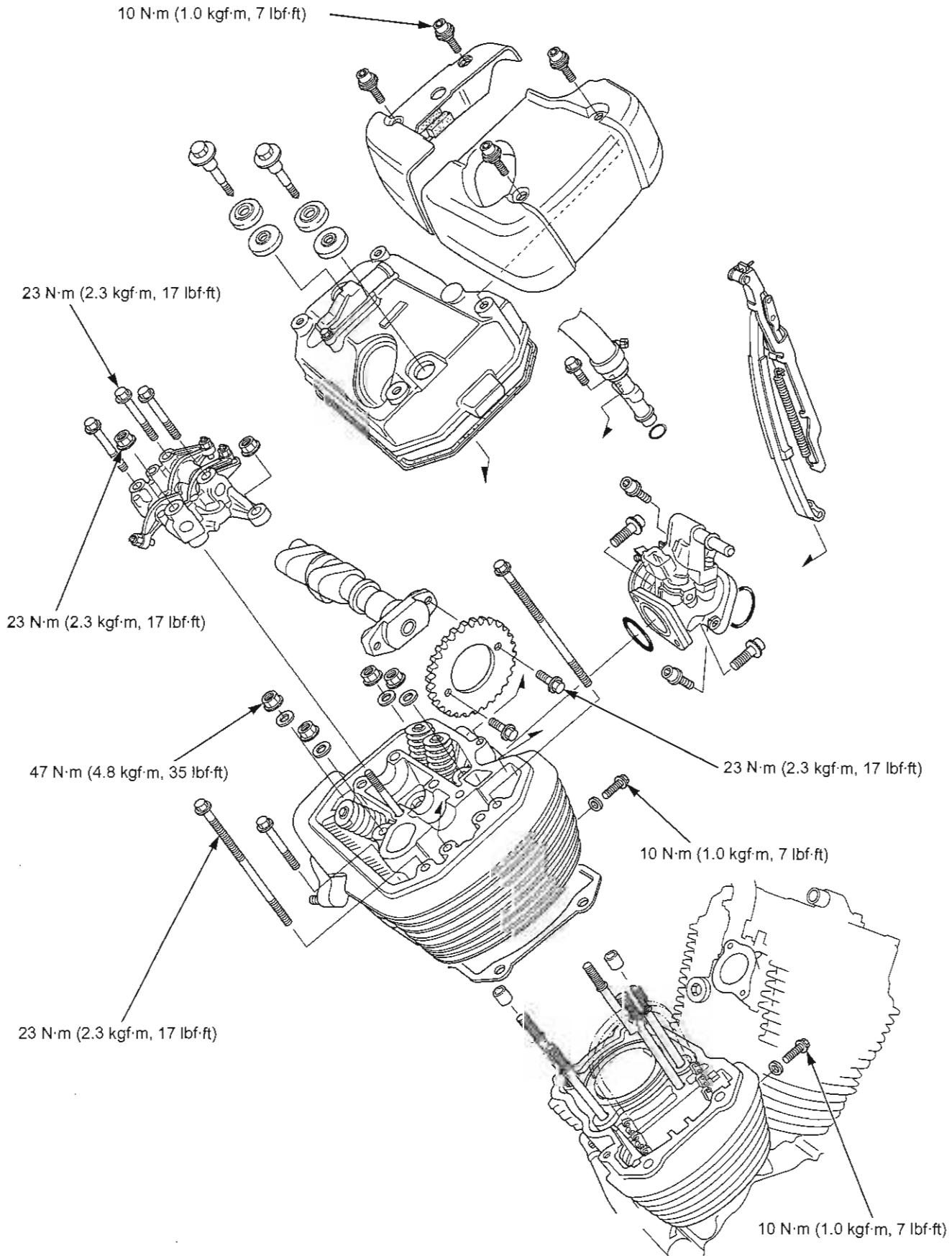
# 8. CYLINDER HEAD/VALVES

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COMPONENT LOCATION .....	8-2	CYLINDER HEAD DISASSEMBLY .....	8-14
SERVICE INFORMATION .....	8-3	VALVE GUIDE REPLACEMENT .....	8-17
TROUBLESHOOTING.....	8-5	VALVE SEAT INSPECTION/REFACING ...	8-18
CYLINDER COMPRESSION.....	8-6	CYLINDER HEAD ASSEMBLY .....	8-21
CYLINDER HEAD COVER REMOVAL .....	8-6	CYLINDER HEAD INSTALLATION .....	8-23
CAMSHAFT REMOVAL .....	8-7	CAMSHAFT INSTALLATION .....	8-25
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# CYLINDER HEAD/VALVES

## COMPONENT LOCATION





# SERVICE INFORMATION

## GENERAL

- This section covers service of the rocker arm, camshaft, cylinder head and valve.
- The rocker arm and camshaft services can be done with the engine installed in the frame. The cylinder head and valve service requires engine removal.
- Be careful not to damage the mating surfaces when removing the cylinder head cover and cylinder head. Do not strike the cylinder head cover and cylinder head too hard during removal.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their original locations.
- Clean all disassembled parts with cleaning solvent and dry them by blowing them off with compressed air before inspection.
- Camshaft and rocker arm lubricating oil is fed through oil passages in the cylinder head and camshaft holder. Clean the oil passages before assembling the cylinder head and cover.

## SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Cylinder compression at 400 rpm		1,373 ± 98 kPa (14.0 ± 1.0 kgf/cm <sup>2</sup> , 199 ± 14 psi)	-
Valve clearance	IN	0.15 ± 0.02 (0.006 ± 0.001)	-
	EX	0.20 ± 0.02 (0.008 ± 0.001)	-
Cam chain tensioner wedge B length		-	6 (0.2)
Camshaft	Cam lobe height	IN	37.188 – 37.348 (1.4641 – 1.4704)
		EX	37.605 – 37.765 (1.4805 – 1.4868)
	Runout	IN/EX	-
	Journal O.D.	IN/EX	21.959 – 21.980 (0.8645 – 0.8654)
	Oil clearance	IN/EX	0.020 – 0.141 (0.0008 – 0.0056)
Rocker arm, rocker arm shaft	Rocker arm shaft O.D.	IN/EX	11.966 – 11.984 (0.4711 – 0.4718)
	Rocker arm I.D.	IN/EX	12.000 – 12.018 (0.4724 – 0.4731)
	Rocker arm-to-shaft clearance		0.016 – 0.052 (0.0006 – 0.0020)
Valve, valve guide	Valve stem O.D.	IN	5.475 – 5.490 (0.2156 – 0.2161)
		EX	5.455 – 5.470 (0.2148 – 0.2154)
	Valve guide I.D.	IN	5.500 – 5.510 (0.2165 – 0.2169)
		EX	5.500 – 5.512 (0.2165 – 0.2170)
	Stem-to-guide clearance	IN	0.010 – 0.035 (0.0004 – 0.0014)
		EX	0.030 – 0.057 (0.0012 – 0.0022)
	Valve guide projection above cylinder head	IN	18.7 – 18.9 (0.736 – 0.744)
EX		17.2 – 17.4 (0.68 – 0.69)	
	Valve seat width	IN/EX	0.90 – 1.10 (0.035 – 0.043)
Valve spring	Free length	IN	42.14 (1.659)
		EX	46.11 (1.815)
Cylinder warpage		-	0.10 (0.004)

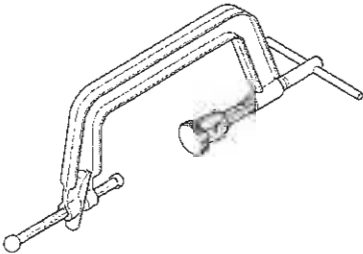
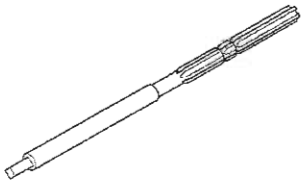
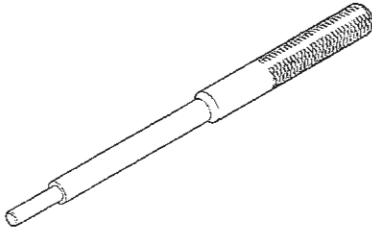


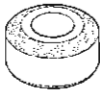
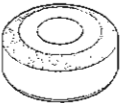

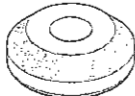
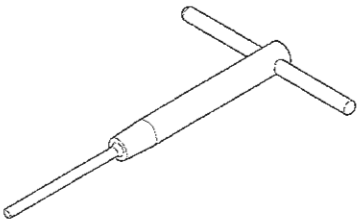

## TORQUE VALUES

Cylinder head cover bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)
Cylinder head 10 mm nut	47 N·m (4.8 kgf·m, 35 lbf·ft)
Cylinder head 8 mm bolt	23 N·m (2.3 kgf·m, 17 lbf·ft)
Cam sprocket bolt	23 N·m (2.3 kgf·m, 17 lbf·ft)
Cam chain tensioner bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)
Camshaft holder bolt	23 N·m (2.3 kgf·m, 17 lbf·ft)
Camshaft holder nut	23 N·m (2.3 kgf·m, 17 lbf·ft)
Rear PAIR check valve cover bolt	7 N·m (0.7 kgf·m, 5.2 lbf·ft)

Apply engine oil to the threads and seating surface  
 Apply engine oil to the threads and seating surface  
 Apply locking agent to the threads  
 See page 8-24

# CYLINDER HEAD/VALVES

## TOOLS

<p>Valve spring compressor 07757-0010000</p> 	<p>Valve guide reamer, 5.510 mm 07984-2000001</p>  <p>07984-200000D (U.S.A. only)</p>	<p>Valve guide driver, 5.5 mm 07742-0010100</p> 
<p>Seat cutter, 27.5 mm (45° IN) 07780-0010200</p>  <p>Equivalent commercially available in U.S.A.</p>	<p>Seat cutter, 35 mm (45° EX) 07780-0010400</p>  <p>Equivalent commercially available in U.S.A.</p>	<p>Flat cutter, 28 mm (32° IN) 07780-0012100</p>  <p>Equivalent commercially available in U.S.A.</p>
<p>Flat cutter, 35 mm (32° EX) 07780-0012300</p>  <p>Equivalent commercially available in U.S.A.</p>	<p>Interior cutter, 30 mm (60° IN) 07780-0014000</p>  <p>Equivalent commercially available in U.S.A.</p>	<p>Interior cutter, 37.5 mm (60° EX) 07780-0014100</p>  <p>Equivalent commercially available in U.S.A.</p>
<p>Cutter holder, 5.5 mm 07781-0010101</p>  <p>Equivalent commercially available in U.S.A.</p>	<p>Valve guide driver 07743-0020000</p>  <p>Not available in U.S.A.</p>	

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## **TROUBLESHOOTING**

Engine top-end problems usually affect engine performance. These can be diagnosed by a compression test, or by tracing top-end noise with a sounding rod or stethoscope.

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

- Valves
  - Incorrect valve adjustment
  - Burned or bent valves
  - Incorrect valve timing
  - Broken valve spring
  - Uneven valve seating
  - Valve stuck open
- Cylinder head
  - Leaking or damaged cylinder head gasket
  - Warped or cracked cylinder head
  - Loose spark plug
- Cylinder/piston problem (page 9-3)

### **Compression too high**

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

### **Excessive smoke**

- Worn valve stem or valve guide
- Damaged stem seal
- Cylinder/piston problem (page 9-3)

### **Excessive noise**

- Incorrect valve clearance
- Sticking valve or broken valve spring
- Excessive worn valve seat
- Worn or damaged camshaft
- Worn or damaged rocker arm and/or shaft
- Worn rocker arm follower or valve stem end
- Worn cam sprocket teeth
- Worn cam chain
- Worn or damaged cam chain tensioner
- Cylinder/piston problem (page 9-3)

### **Rough idle**

- Low cylinder compression

## CYLINDER HEAD/VALVES

### CYLINDER COMPRESSION

#### NOTE:

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.

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

Warm up the engine to normal operating temperature. Stop the engine, disconnect the spark plug caps and remove one spark plug at a time.

Shift the transmission into neutral.

Install a compression gauge into the spark plug hole.

Open the throttle all the way and crank the engine with the starter motor until the gauge reading stops rising.

The maximum reading is usually reached within 4 – 7 seconds.

#### Compression pressure:

**1,373 ± 98 kPa (14.0 ± 1.0 kgf/cm<sup>2</sup>, 199 ± 14 psi) at 400 rpm**

Low compression can be caused by:

- Blown cylinder head gasket
- Improper valve adjustment
- Valve leakage
- Worn piston ring or cylinder

High compression can be caused by:

- Carbon deposits in combustion chamber or on piston head

*To avoid discharging the battery, do not operate the starter motor for more than seven seconds.*



### CYLINDER HEAD COVER REMOVAL

#### FRONT

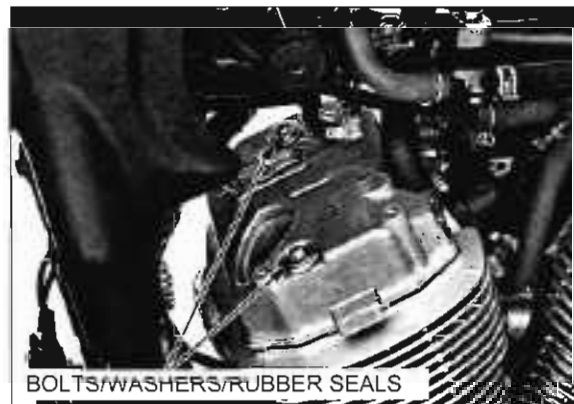
Remove the following:

- Over head covers (page 2-4)
- Ignition coil (page 19-8)
- PAIR check valve (page 5-72)

Remove the thermostat housing assembly bolt to get the clearance for cylinder head cover removal.

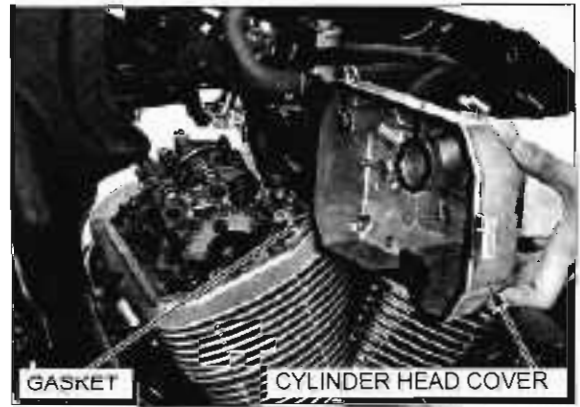


Remove the cylinder head cover bolts, washers and rubber seals.



*Be careful not to damage the wire harness and mating surfaces when removing the cylinder head cover.*

Remove the cylinder head cover and gasket.



**REAR**

Remove the following:

- Over head covers (page 2-4)
- PAIR check valve (page 5-72)

VT750C2S; Remove the mounting bolts and ignition switch (page 21-21).

Disconnect the crankcase breather hose from the cylinder head cover.

Remove the cylinder head cover bolts, washers and rubber seals.



*Be careful not to damage the wire harness and mating surfaces when removing the cylinder head cover.*

Remove the cylinder head cover and gasket.



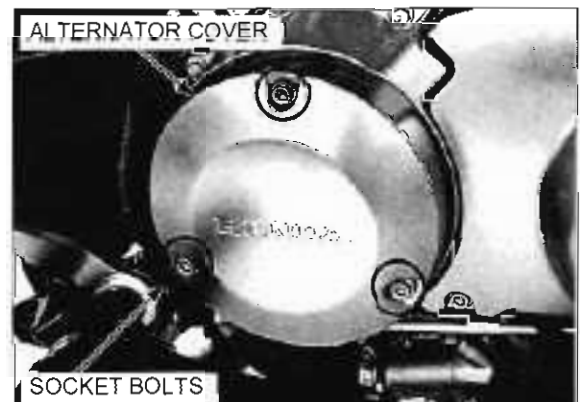
**CAMSHAFT REMOVAL**

NOTE:

- The front and rear camshafts service procedures are the same.

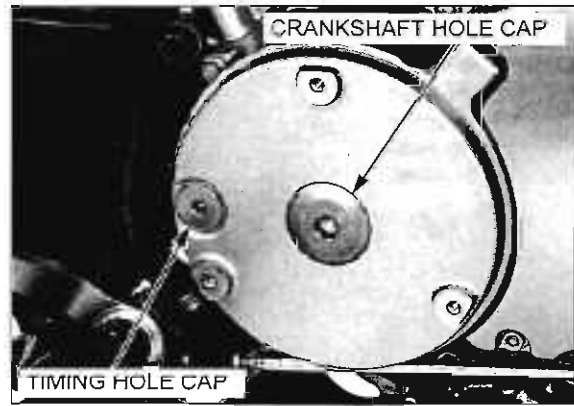
Remove the rear cylinder head cover (page 8-7).

Remove the socket bolts and alternator cover.

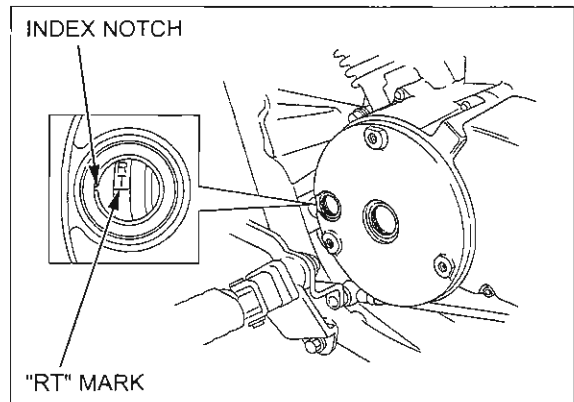


## CYLINDER HEAD/VALVES

Remove the crankshaft and timing hole caps from the left crankcase cover.



Turn the crankshaft counterclockwise and align the "RT" mark (front cylinder: "FT" mark) with the index notch on the left crankcase cover. Make sure the piston is at TDC (Top Dead Center) on the exhaust stroke so the piston is at TDC on the compression stroke when removing the camshaft holder.



Measure the cam chain tensioner wedge B length.

**SERVICE LIMIT: 6 mm (0.2 in)**

Replace the cam chain with a new one if the projection exceeds the service limit.

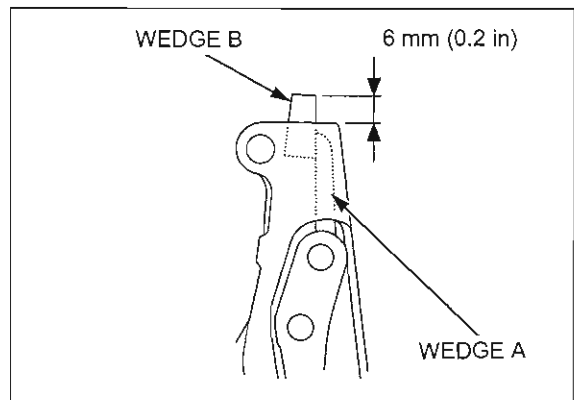
For the cam chain replacement, remove the following:

Front:

- Front camshaft
- Flywheel (page 11-5)

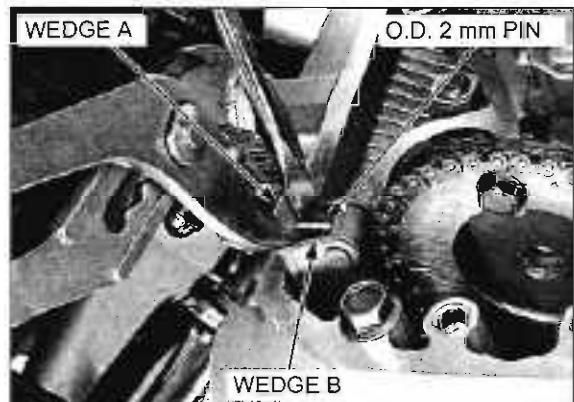
Rear:

- Rear camshaft
- Primary drive gear (page 10-12)



*Be careful not to let an O.D. 2 mm pin fall into the crankcase.*

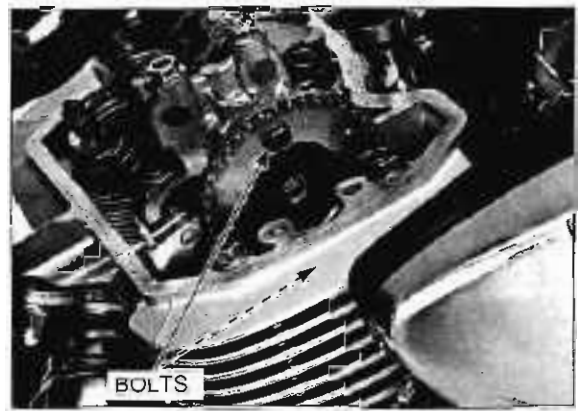
Install an O.D. 2 mm pin into the cam chain tensioner wedge A hole while pulling the wedge A straight up and pushing down the wedge B.



## CYLINDER HEAD/VALVES

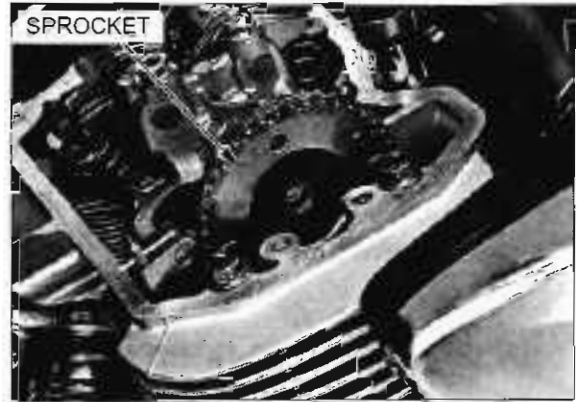
*Be careful not to let the cam sprocket bolts fall into the crankcase.*

Remove the cam sprocket bolt, turn the crankshaft counterclockwise one full turn (360°) and remove the other cam sprocket bolt.



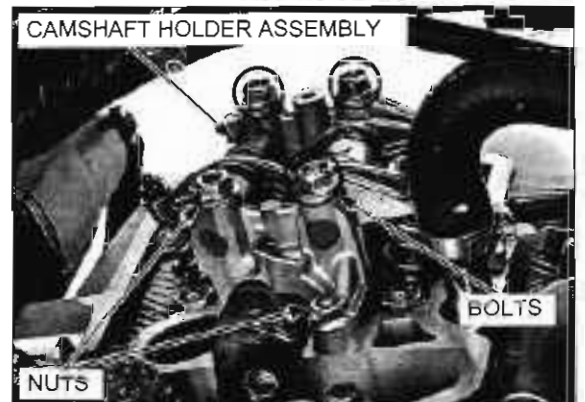
*Attach a piece of wire to the cam chain to prevent it from falling into the crankcase.*

Remove the cam sprocket from the camshaft flange surface.

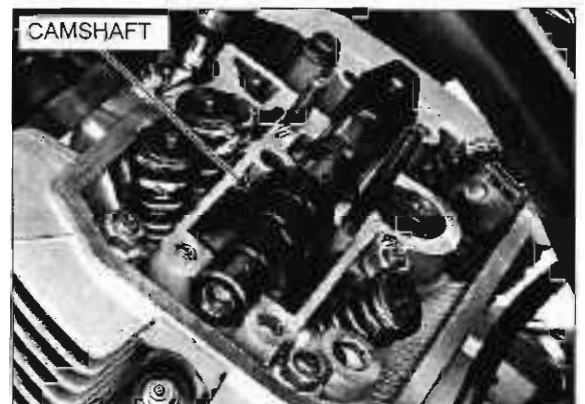


Make sure the piston is at TDC (Top Dead Center) on the compression stroke.

Loosen the bolts and nuts in a crisscross pattern in several steps, then remove them and camshaft holder assembly.



Remove the camshaft.



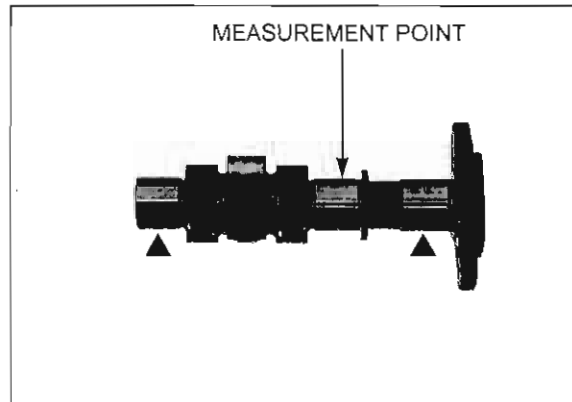
## CYLINDER HEAD/VALVES

### INSPECTION

#### CAMSHAFT RUNOUT

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

**SERVICE LIMIT: 0.05 mm (0.002 in)**



#### CAM LOBE HEIGHT

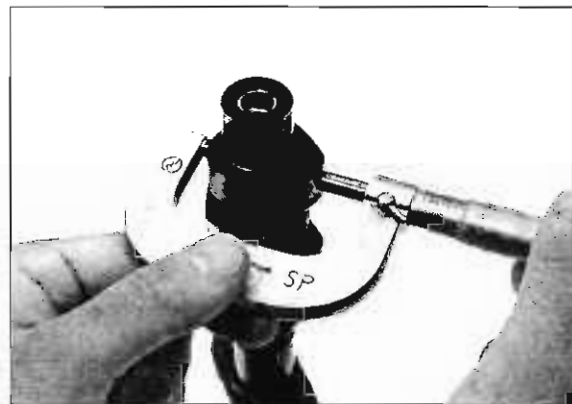
Check the cam lobe surfaces for scoring or evidence of insufficient lubrication.

Measure each cam lobe height.

**SERVICE LIMITS: IN: 37.16 mm (1.463 in)**  
**EX: 37.58 mm (1.480 in)**

#### NOTE:

Check the rocker arm if the cam lobe is worn or damaged.



#### CAMSHAFT JOURNAL

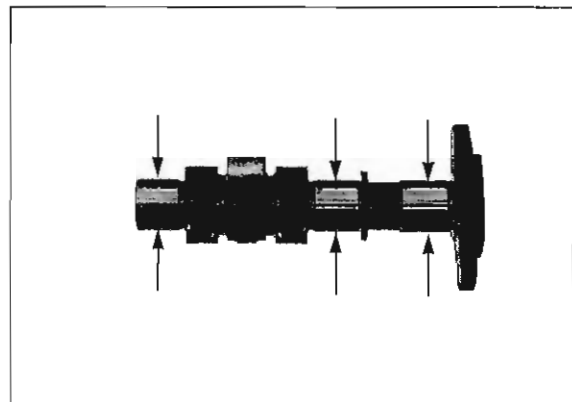
Check the camshaft journal surfaces for scoring or evidence of insufficient lubrication.

Measure the O.D. of each camshaft journal.

**SERVICE LIMIT: 21.90 mm (0.862 in)**

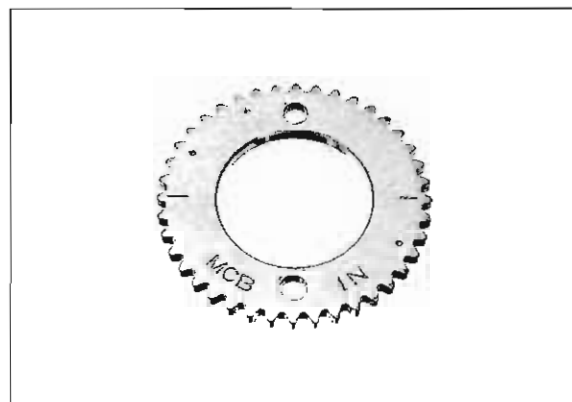
#### NOTE:

Check the oil passages and camshaft holder for wear or damage if the journal surface is worn or damaged.



#### CAM SPROCKET

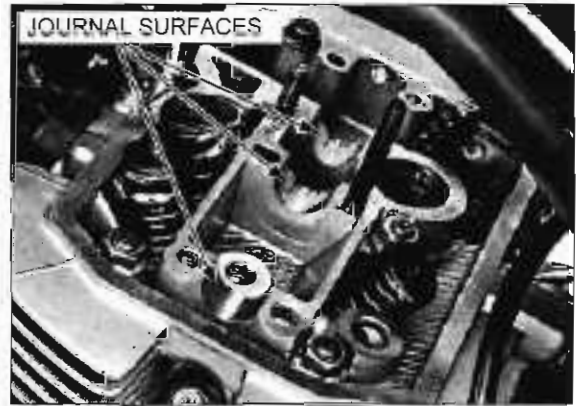
Check the cam sprocket for wear or damage.





## CYLINDER HEAD

Check the camshaft journal surfaces of cylinder head for scoring, scratches or evidence of insufficient lubrication.



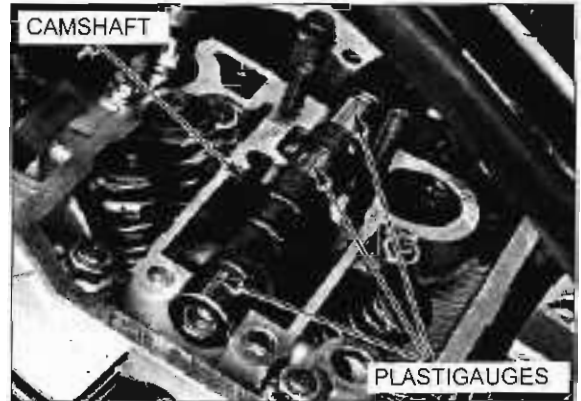
## CAMSHAFT OIL CLEARANCE

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

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

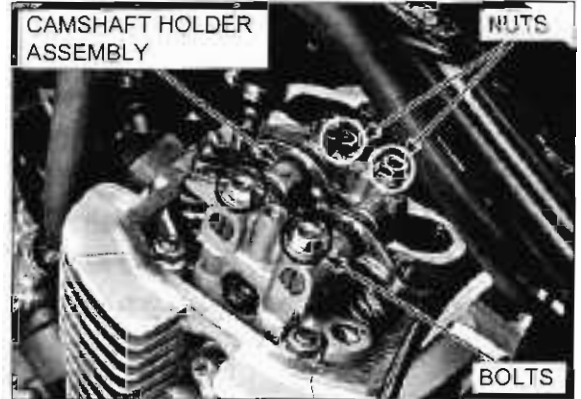
### NOTE:

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



Carefully install the camshaft holder and tighten the camshaft holder bolts and nuts to the specified torque in a crisscross pattern in several steps.

**TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)**



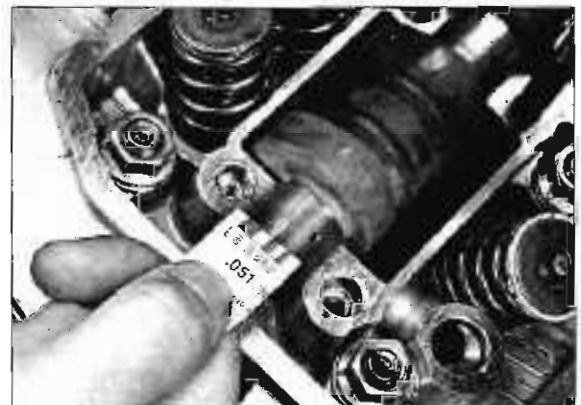
Remove the camshaft holder and measure the width of each plastigauge.

The widest thickness determines the oil clearance.

**SERVICE LIMIT: 0.16 mm (0.006 in)**

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

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



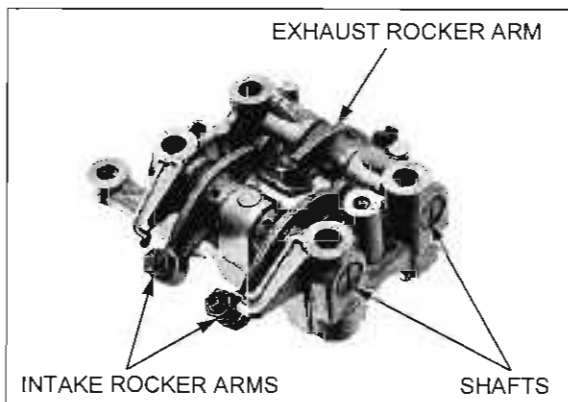
## CYLINDER HEAD/VALVES

### CAMSHAFT HOLDER DISASSEMBLY

#### NOTE:

The front and rear camshaft holders service procedures are the same.

Remove the rocker arm shafts, intake and exhaust rocker arms.



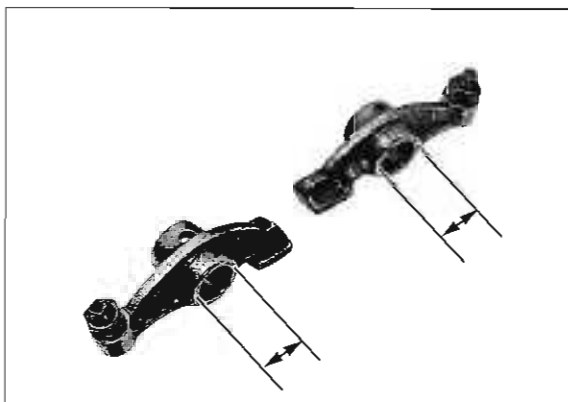
### ROCKER ARM INSPECTION

Check the sliding surface of the rocker arms for wear or damage where they contact the camshaft, or for clogged oil holes.

Check the contact surface of the valve adjusting screw for wear or damage.

Measure the I.D. of each rocker arm.

**SERVICE LIMIT: 12.05 mm (0.474 in)**



### ROCKER ARM SHAFT INSPECTION

Check the rocker arm shafts for wear or damage.

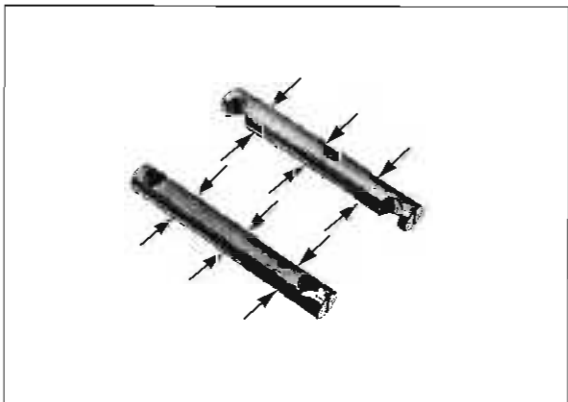
Measure each rocker arm shaft O.D.

**SERVICE LIMIT: 11.83 mm (0.466 in)**

Calculate the rocker arm-to-shaft clearance.

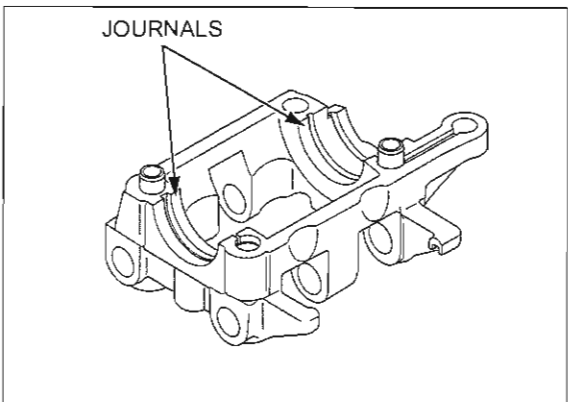
**SERVICE LIMIT: 0.07 mm (0.003 in)**

Replace the rocker arm and/or shaft if necessary.



### CAMSHAFT HOLDER INSPECTION

Check the camshaft journal surfaces of each camshaft holder for scoring, scratches or evidence of insufficient lubrication.



# CYLINDER HEAD REMOVAL

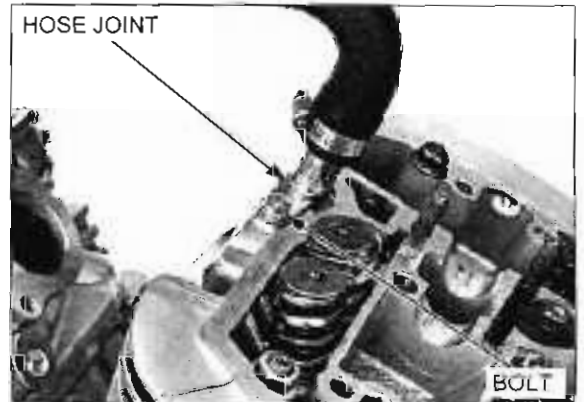
**NOTE:**

- The engine must be removed from the frame before servicing the cylinder head.
- The front and rear cylinder heads service procedures are the same.

Remove the following:

- Engine (page 7-4)
- Cylinder head cover (page 8-6)
- Camshaft (page 8-7)
- Intake manifold (page 5-56)

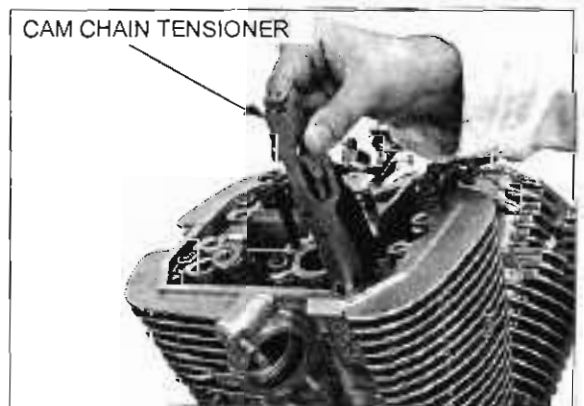
Remove the bolt and water hose joint from the cylinder.



Remove the cam chain tensioner bolts and sealing washers.



Remove the cam chain tensioner.



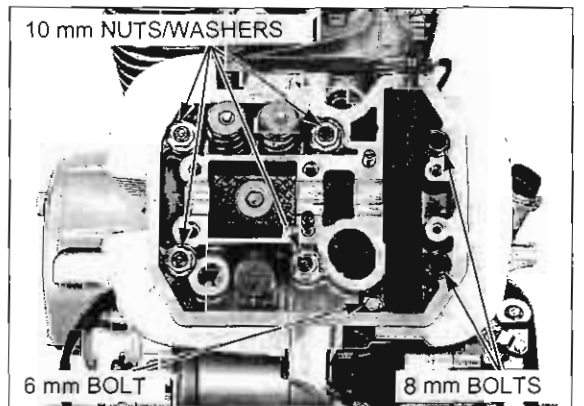
*Loosen the bolts and nuts in a crisscross pattern in several steps.*

Remove the following cylinder head bolts and nuts:

- 6 mm bolt
- 8 mm bolts
- 10 mm nuts/washers

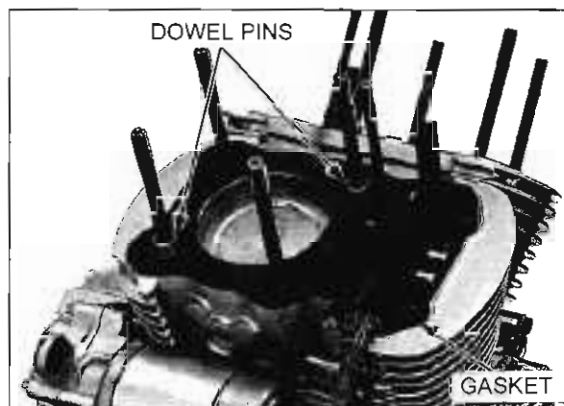
*Be careful not to damage the mating surface when removing the cylinder head.*

Remove the cylinder head.



## CYLINDER HEAD/VALVES

Remove the gasket and dowel pins.



Remove the cam chain guide.



## CYLINDER HEAD DISASSEMBLY

*Mark all parts during disassembly so they can be placed back in their original position.*

Remove the spark plugs (page 3-7).

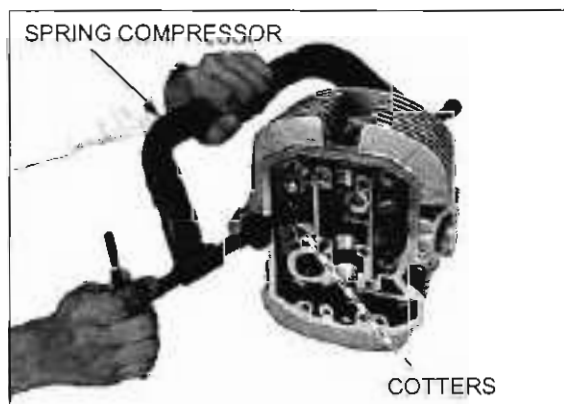
Remove the cotters using a special tool.

**TOOL:**

**Valve spring compressor 07757-0010000**

**NOTE:**

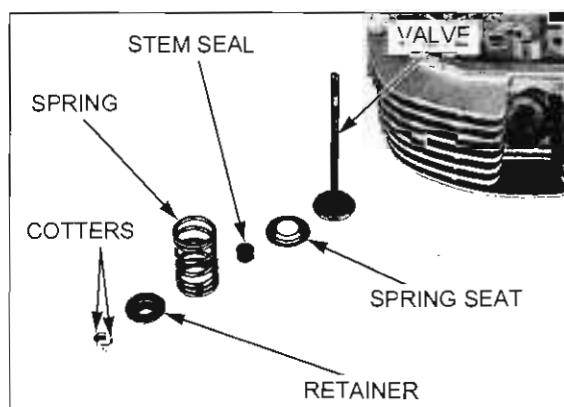
Compressing the valve spring more than necessary will cause loss of valve spring tension.



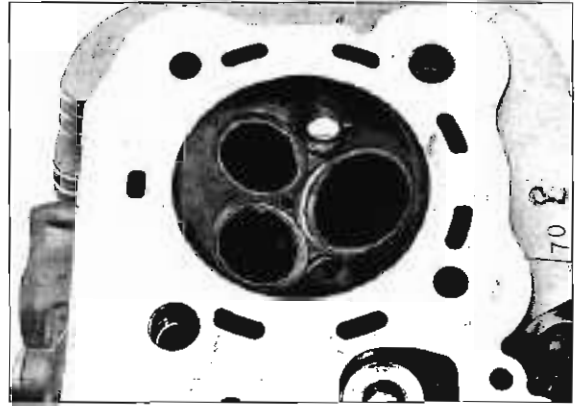
*Do not reuse the removed stem seal.*

Remove the valve spring compressor, then remove the retainer, spring and valve.

Remove the stem seal and spring seat.



Remove the carbon deposits from the combustion chamber and clean off the head gasket surface.  
Check the spark plug holes and valve areas for cracks.

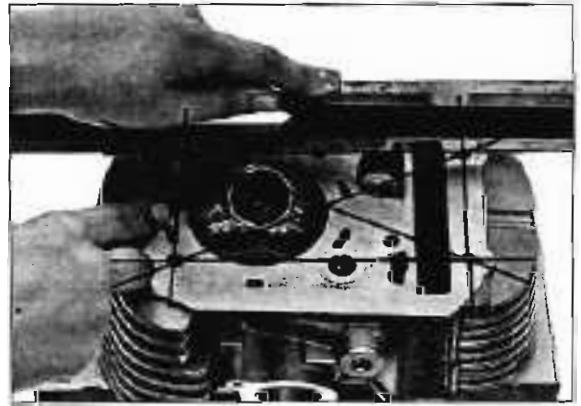


### INSPECTION

#### CYLINDER HEAD

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

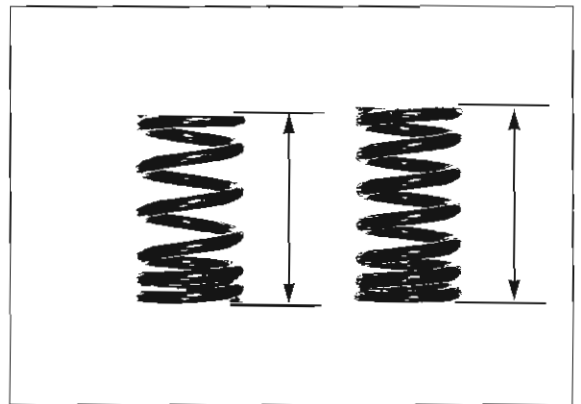
**SERVICE LIMIT: 0.10 mm (0.004 in)**



#### VALVE SPRING

Check the valve spring for fatigue or damage.  
Measure the free length of each valve spring.

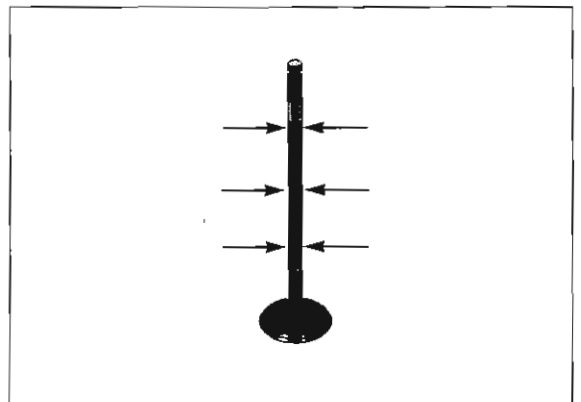
**SERVICE LIMITS: IN: 40.58 mm (1.598 in)**  
**EX: 44.72 mm (1.761 in)**



#### VALVE STEM

Check each valve for bending, burning, scratches or abnormal wear.  
Insert the valves in their original positions in the cylinder head. Check that each valve moves up and down smoothly without binding.  
Measure each valve stem O.D. and record it.

**SERVICE LIMITS: IN: 5.45 mm (0.215 in)**  
**EX: 5.41 mm (0.213 in)**



## CYLINDER HEAD/VALVES

### VALVE GUIDE

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

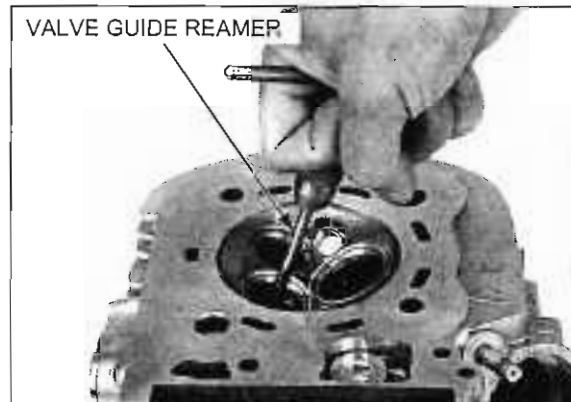
#### NOTE:

- Take care not to tilt or lean the reamer in the guide while reaming. Otherwise, the valves maybe installed slanted, causing oil leakage from the stem seal and improper valve seat contact. This may prevent valve seat refacing.
- Insert the reamer from the combustion chamber side of the head and always rotate the reamer clockwise.

#### TOOL:

Valve guide reamer  
5.510 mm (IN/EX)

07984-2000001  
or 07984-200000D  
(U.S.A. only)



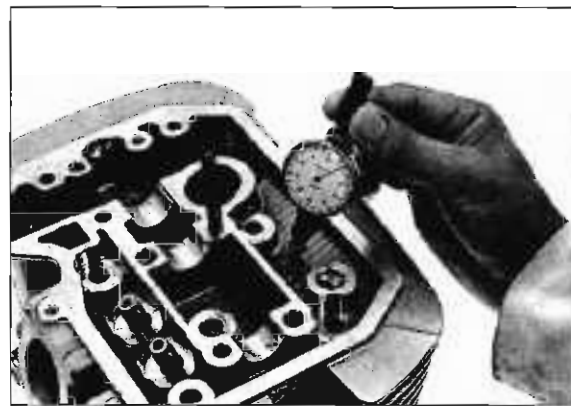
Measure each valve guide I.D. and record it.

**SERVICE LIMITS: IN: 5.56 mm (0.219 in)**  
**EX: 5.56 mm (0.219 in)**

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

**SERVICE LIMITS: IN: 0.10 mm (0.004 in)**  
**EX: 0.11 mm (0.004 in)**

If the stem-to-guide clearance exceeds the service limit, determine if a new guide with standard dimensions would bring the clearance within tolerance. If so, replace any guides as necessary and ream to fit. If the stem-to-guide clearance exceeds the service limit with a new guide, also replace the valve.

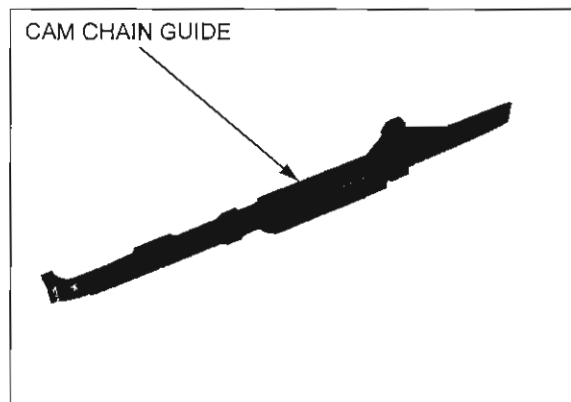


#### NOTE:

Inspect and reface the valve seats whenever the valve guides are replaced (page 8-18).

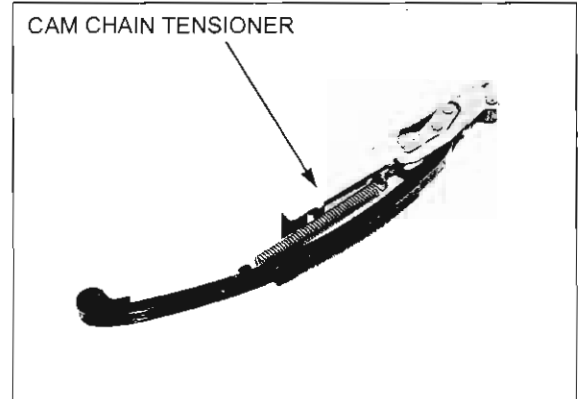
### CAM CHAIN GUIDE

Check the cam chain guide for wear or damage. Replace the cam chain guide if necessary.



**CAM CHAIN TENSIONER**

Check the cam chain tensioner for wear or damage.  
Replace the cam chain tensioner if necessary.



**VALVE GUIDE REPLACEMENT**

**NOTE:**

Refinish the valve seats whenever the valve guides are replaced to prevent uneven seating.

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

*Do not use a torch to heat the cylinder head; it may cause warping.*

Heat the cylinder head to 130 – 140°C (266 – 284°F) with a hot plate or oven. Do not heat the cylinder head beyond 150°C (302°F). Use temperature indicator sticks, available from welding supply stores, to be sure the cylinder head is heated to the proper temperature.

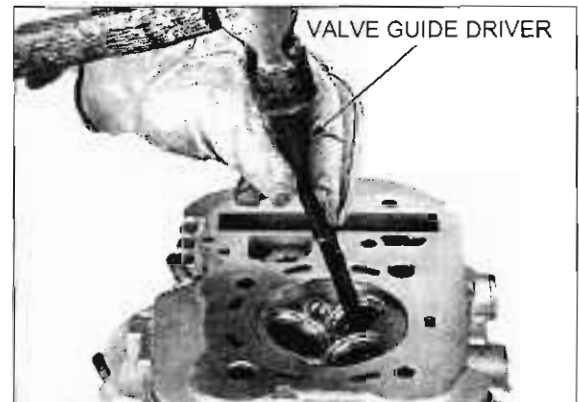
To avoid burns, wear insulated gloves when handling the heated cylinder head.

*Be careful not to damage the cylinder head.*

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

**TOOL:**

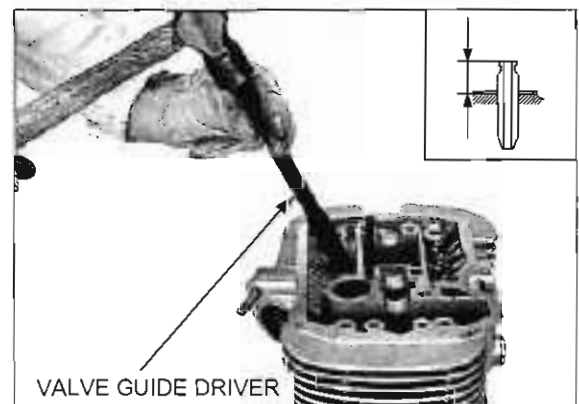
**Valve guide driver**  
5.5 mm (IN/EX) 07742-0010100



Adjust the valve guide driver to the valve guide height.

**TOOL:**

**Valve guide driver** 07743-0020000  
(Not available in U.S.A.)



**VALVE GUIDE PROJECTION ABOVE CYLINDER HEAD:**

**IN:** 18.7 – 18.9 mm (0.736 – 0.744 in)  
**EX:** 17.2 – 17.4 mm (0.68 – 0.69 in)

Drive new guides in from the camshaft side of the cylinder head to the valve guide height while the cylinder head is still heated.

**NOTE:**

U.S.A. only use the existing valve guide driver and install the guide to the specified height.

## CYLINDER HEAD/VALVES

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

### TOOL:

Valve guide reamer  
5.510 mm (IN/EX)

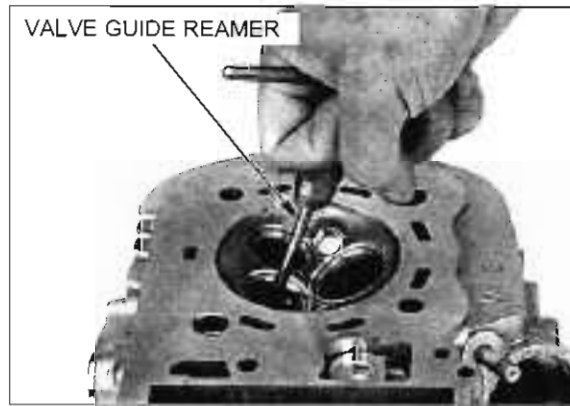
07984-2000001  
or 07984-200000D  
(U.S.A. only)

### NOTE:

- Take care not to tilt or lean the reamer in the guide while reaming. Otherwise, the valves maybe installed slanted, causing oil leakage from the stem seal and improper valve seat contact. This may prevent valve seat refacing.
- Insert the reamer from the combustion chamber side of the head and always rotate the reamer clockwise.

Clean the cylinder head thoroughly to remove any metal particles after reaming.

Reface the valve seat (page 8-19).

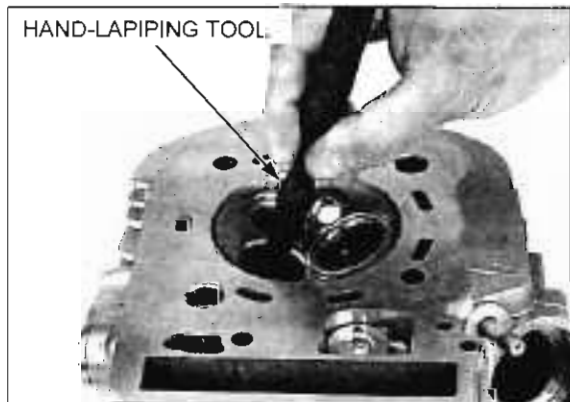


## VALVE SEAT INSPECTION/REFACING

### INSPECTION

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

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



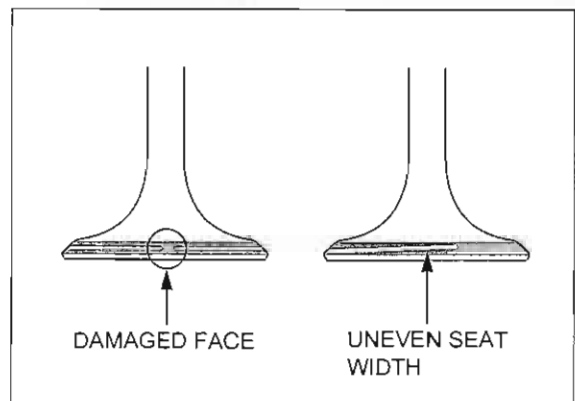
Remove the valve and inspect the valve seat face.

### NOTE:

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

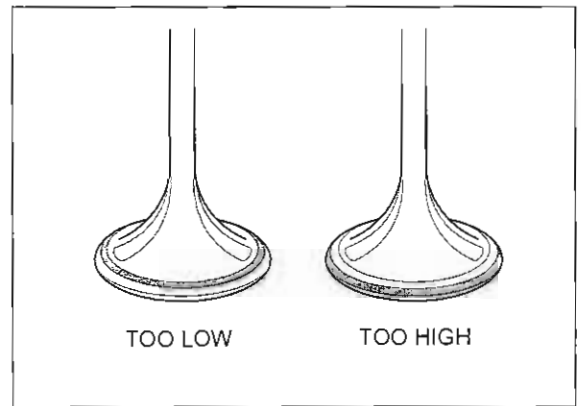
Inspect the valve seat face for:

- Damaged face:
  - Replace the valve and reface the valve seat.
- Uneven seat width:
  - Replace the valve and reface the valve seat.





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



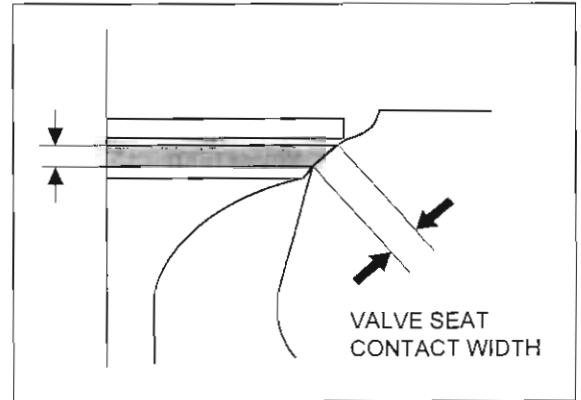
Inspect the width of the valve seat.

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

**STANDARD:** 0.90 – 1.10 mm (0.035 – 0.043 in)

**SERVICE LIMIT:** 1.5 mm (0.06 in)

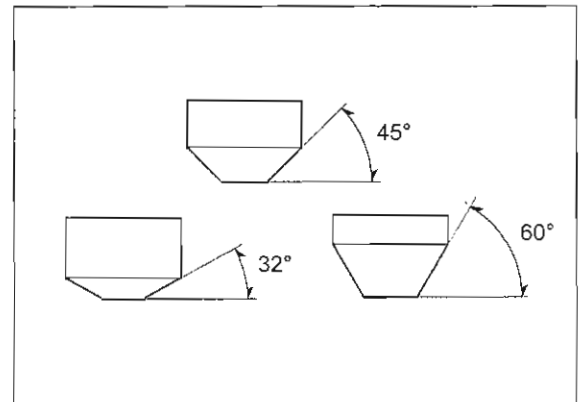
If the valve seat width is not within specification, reface the valve seat.



## VALVE SEAT REFACING

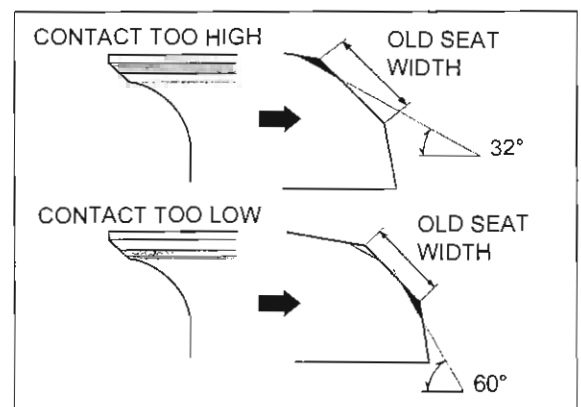
NOTE:

- Follow the refacing manufacturer's operating instructions.
- Reface the valve seat whenever the valve guide has been replaced.
- Be careful not to grind the seat more than necessary.



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

If the contact area is too low on the valve, the seat must be raised using a 60° interior cutter.

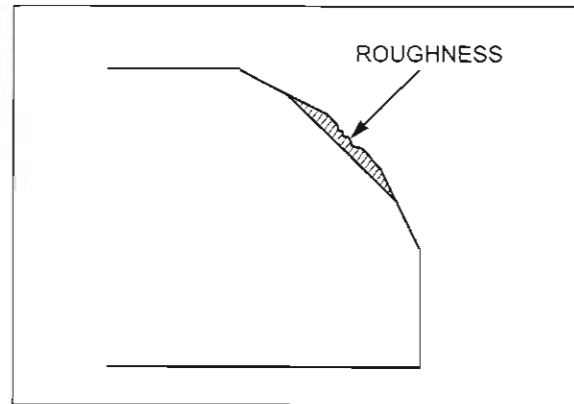


## CYLINDER HEAD/VALVES

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

### TOOLS:

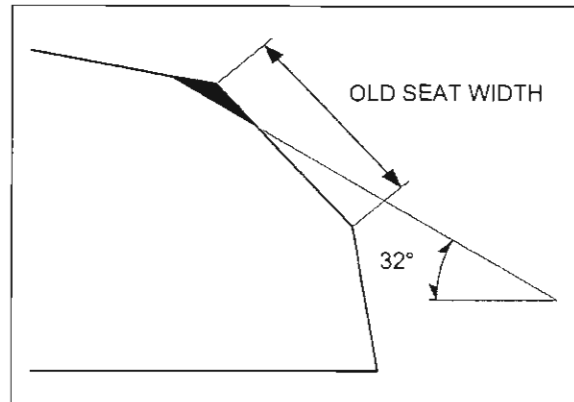
Seat cutter, 27.5 mm (IN)      07780-0010200  
Seat cutter, 35 mm (EX)      07780-0010400  
Cutter holder, 5.5 mm      07781-0010101  
Equivalent commercially available in U.S.A.



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

### TOOLS:

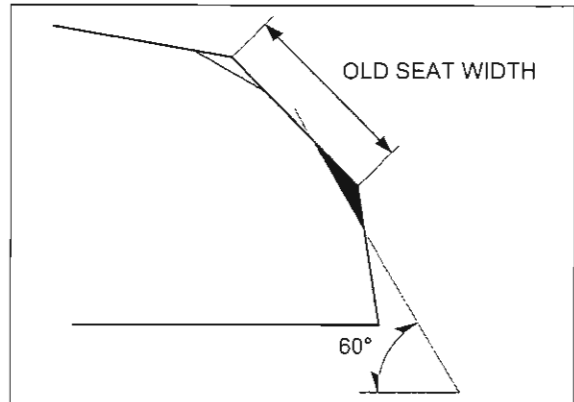
Flat cutter, 28 mm (IN)      07780-0012100  
Flat cutter, 35 mm (EX)      07780-0012300  
Cutter holder, 5.5 mm      07781-0010101  
Equivalent commercially available in U.S.A.



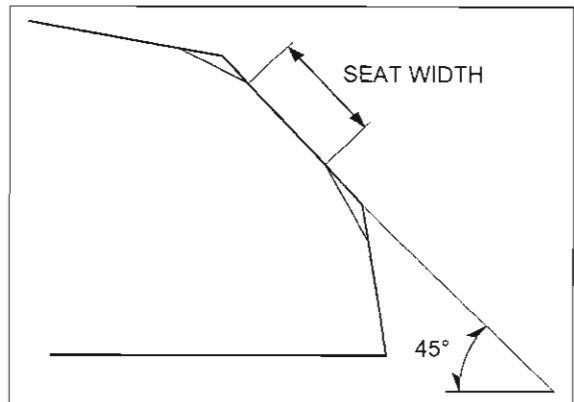
Using a 60° cutter, remove the bottom 1/4 of the old seat.

### TOOLS:

Interior cutter, 30 mm (IN)      07780-0014000  
Interior cutter, 37.5 mm (EX)      07780-0014100  
Cutter holder, 5.5 mm      07781-0010101  
Equivalent commercially available in U.S.A.



Using a 45° seat cutter, cut the seat to the proper width. Make sure that all pitting and irregularities are removed.

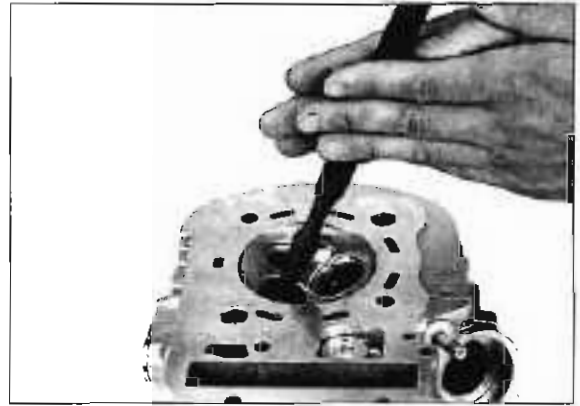


After cutting the seat, apply lapping compound to the valve face, and lap the valve using light pressure.

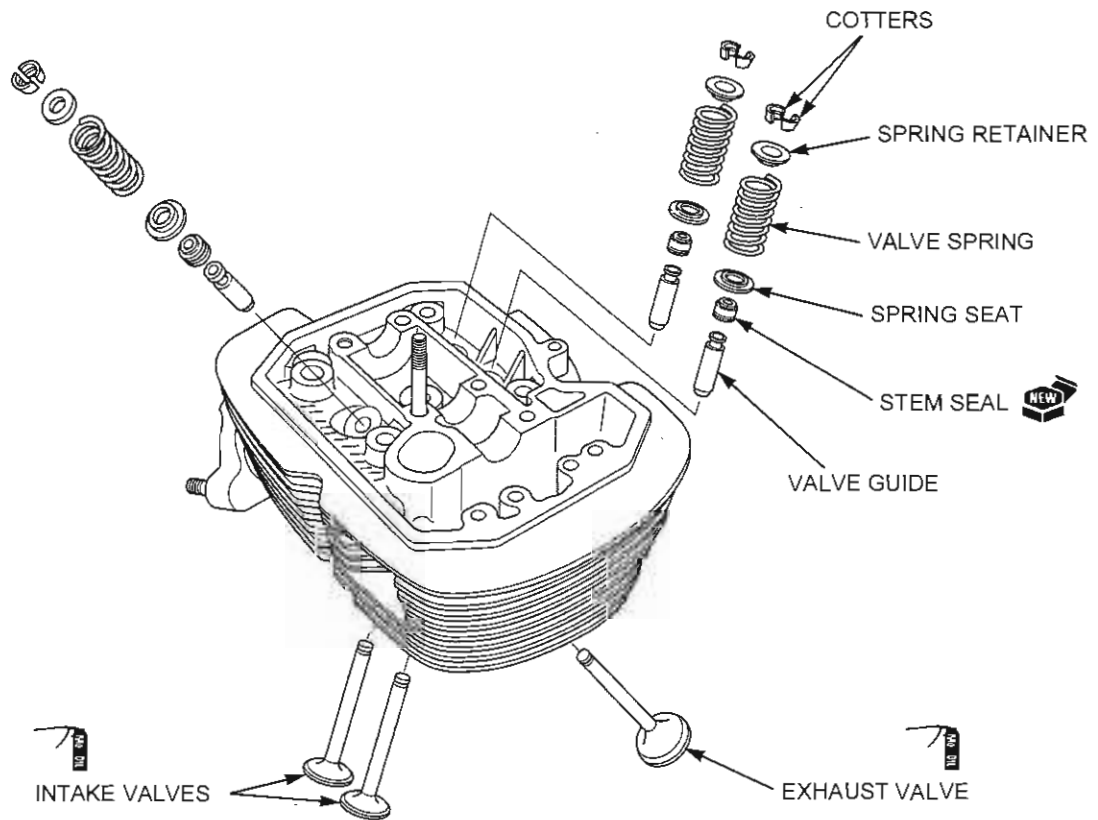
- Excessive lapping pressure may deform or damage the seat.
- Change the angle of lapping tool frequently to prevent uneven seat wear.
- Lapping compound can cause damage if it enters between the valve stem and guide.

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

Recheck the seat contact after lapping.



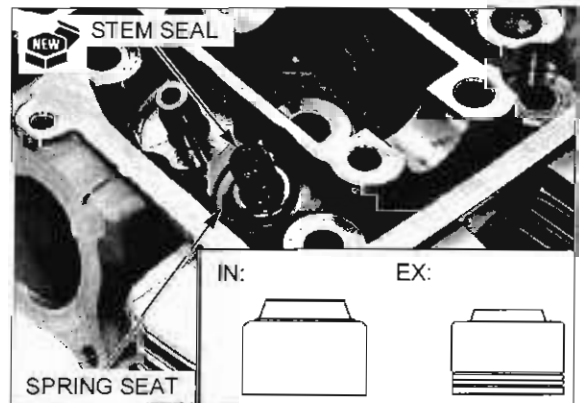
## CYLINDER HEAD ASSEMBLY



Blow out all of the oil passages in the cylinder head with compressed air.

*Exhaust stem seal has stopper rings.*

Install the spring seat and new stem seal.



## CYLINDER HEAD/VALVES

Lubricate the molybdenum disulfide oil to the valve guide sliding surface of the valve stem.

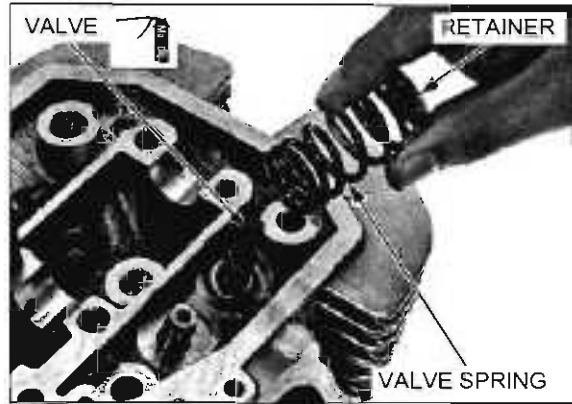
Install the valve into the valve guide.

**NOTE:**

- Exhaust valve spring has a larger O.D. than intake valve spring.
- To avoid damage to the stem seal, turn the valve slowly when installing the valve.

Install the valve spring with tightly wound coils facing the combustion chamber.

Install the spring retainer.



*Grease the cotters to ease installation.*

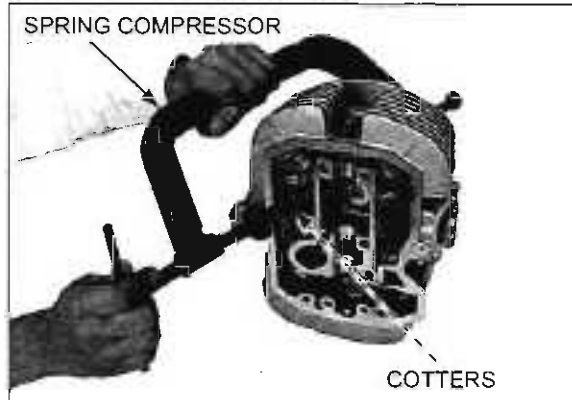
Install the cotters using a special tool.

**TOOL:**

**Valve spring compressor                    07757-0010000**

**NOTE:**

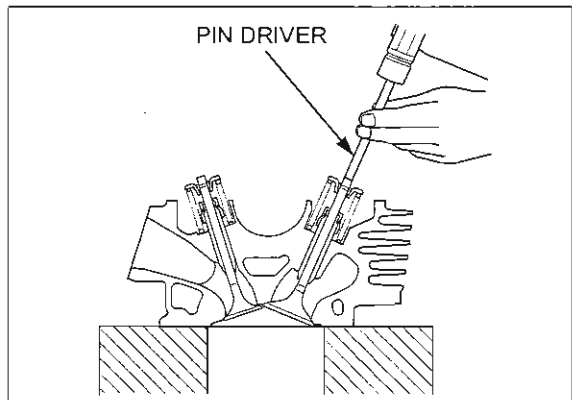
Compressing the valve springs more than necessary will cause loss of valve spring tension.



Support the cylinder head so the valve heads will not contact anything and possibly get damaged.

Tap the valve stems gently with a plastic hammer and pin driver to seat the cotters firmly as shown.

Install the spark plugs (page 3-8).



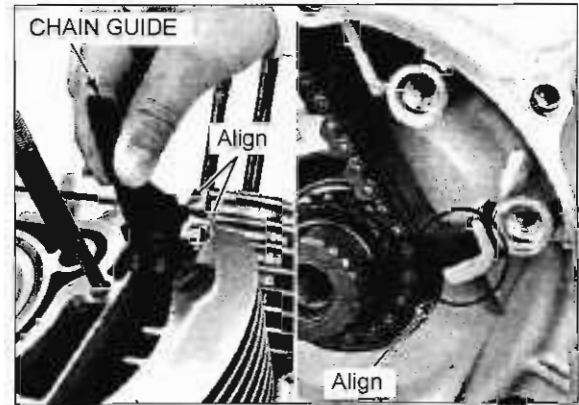
## CYLINDER HEAD INSTALLATION

### NOTE:

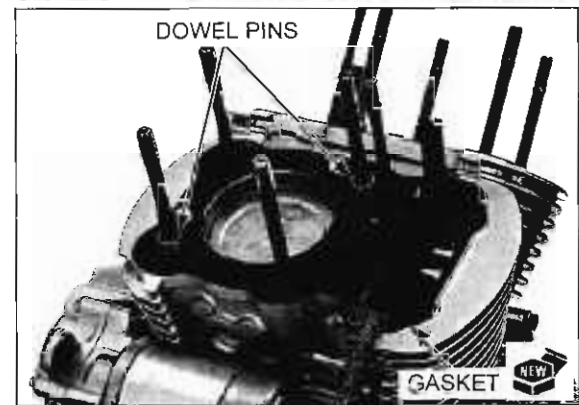
- The front and rear cylinder head service procedures are the same.
- Be careful not to damage the mating surfaces when cleaning the cylinder head mating surface.
- When cleaning the cylinder head mating surface, place the shop towel over the cylinder opening to prevent dust or dirt from entering the engine.

Clean the gasket mating surfaces of the cylinder and cylinder head thoroughly, being careful not to damage them.

Install the cam chain guide by aligning the guide end with the groove in the crankcase and the bosses with the groove in the cylinder.

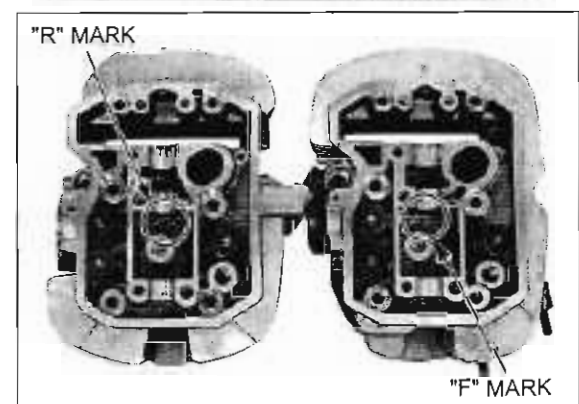


Install the dowel pins and a new gasket.



The cylinder heads are identified by marks on their oil pockets.

- "F": Front cylinder head
- "R": Rear cylinder head



## CYLINDER HEAD/VALVES

Install the cylinder head to the cylinder.

Apply engine oil to the cylinder head each bolts and nuts threads and seating surfaces.

Install and tighten the cylinder head 8 mm bolts, 10 mm nuts and washer to the specified torque.

### TORQUE:

10 mm nut: 47 N·m (4.8 kgf·m, 35 lbf·ft)

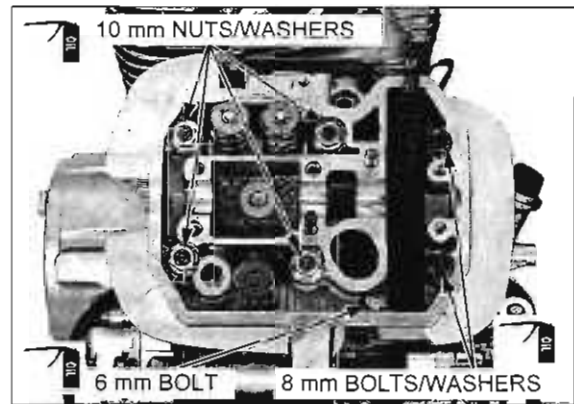
8 mm bolt: 23 N·m (2.3 kgf·m, 17 lbf·ft)

Install and tighten the 6 mm bolt securely.

### NOTE:

- Tighten all to hand-tight, then torque the larger fasteners before tightening the smaller fasteners.
- Tighten the bolts and nuts in a crisscross pattern in several steps.

Install the cam chain tensioner, aligning its end with the groove in the crankcase.



Tighten the tensioner bolts as follow:

1. Temporarily install the tensioner bolts with new sealing washers.
2. Tighten the cylinder head side cam chain tensioner bolt to the specified torque.

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

3. Tighten the cylinder side cam chain tensioner bolt to the specified torque.

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



Install a new O-ring to the water hose joint.

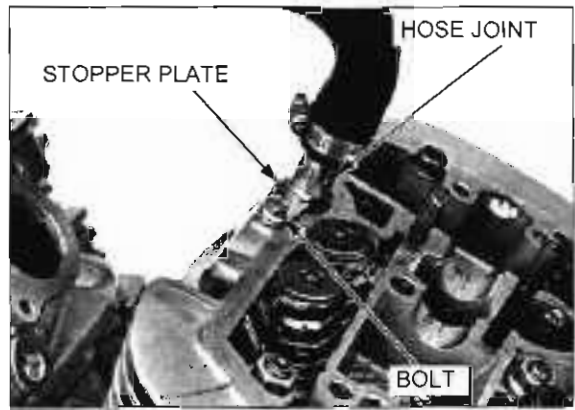


Install the water hose joint by aligning the bolt holes in the stopper plate and cylinder head.  
Install and tighten the bolt securely.

Install the engine into the frame (page 7-8).

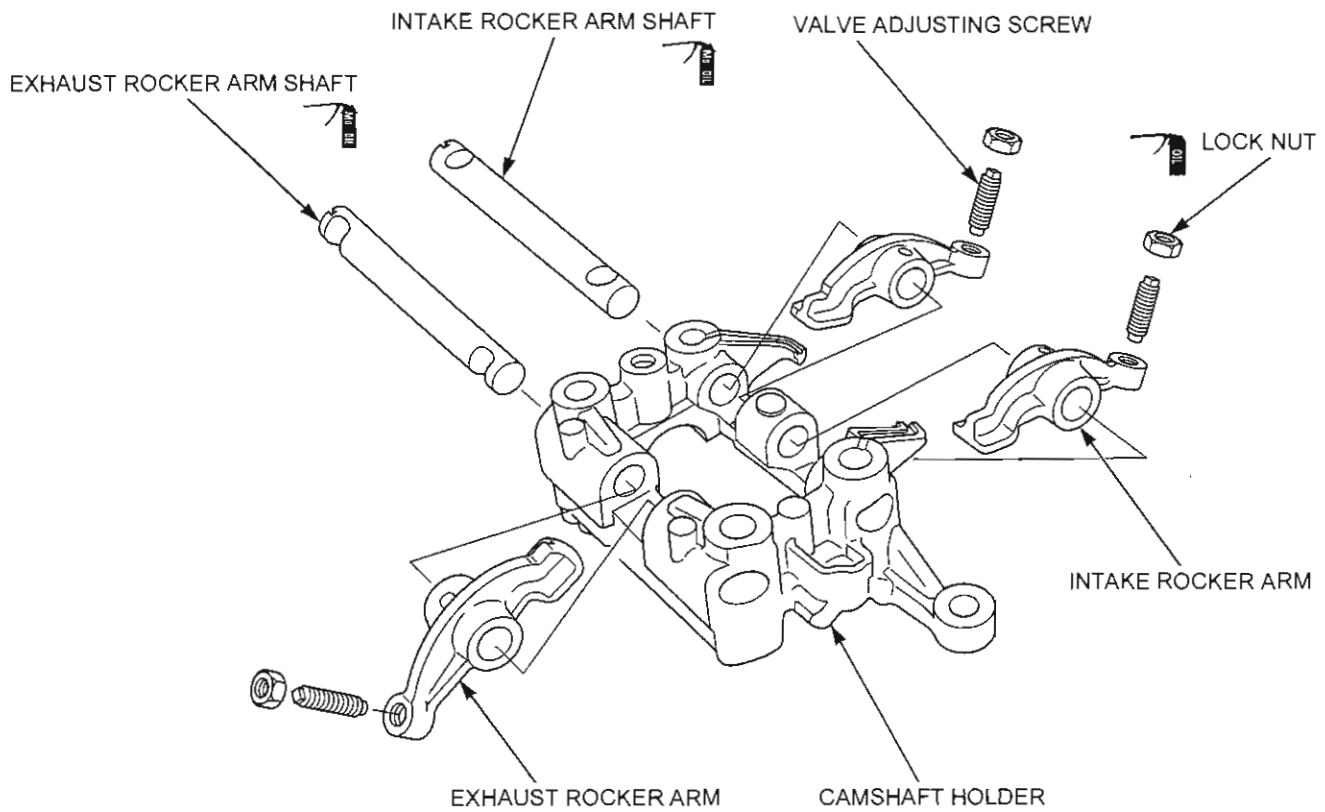
Install the following:

- Camshaft (page 8-25)
- Cylinder head cover (page 8-30)
- Intake manifold (page 5-56)

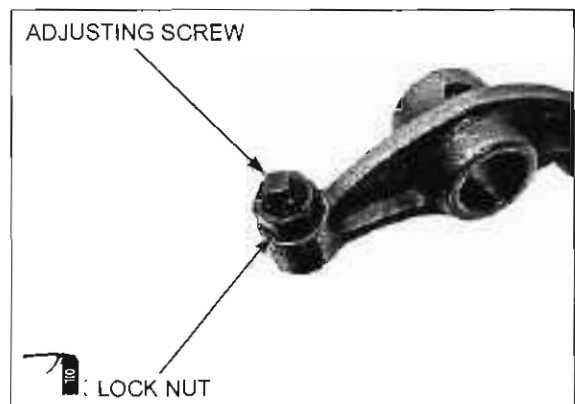


## CAMSHAFT INSTALLATION

### CAMSHAFT HOLDER ASSEMBLY



When disassembling the valve adjusting lock nut and adjusting screw, Apply engine oil to the valve adjusting screw lock nut threads and seating surface. Install the valve adjusting screw and lock nut.

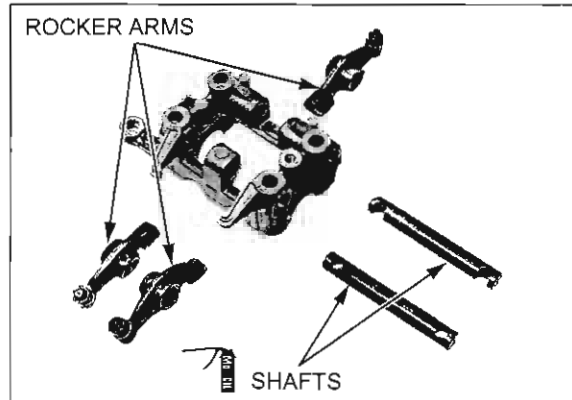


## CYLINDER HEAD/VALVES

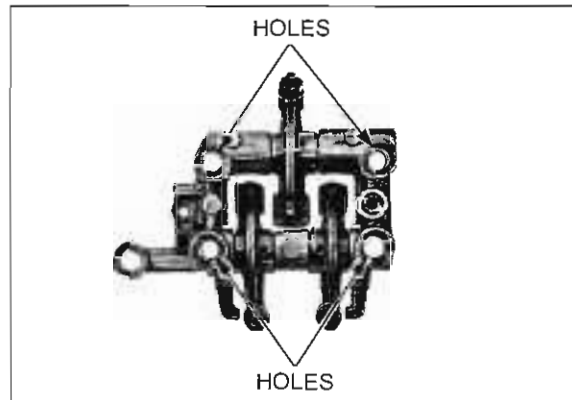
### NOTE:

- The exhaust rocker arm has larger slipper face than the intake rocker arm.
- The intake rocker arm shaft has two holes on each end.
- The exhaust rocker arm shaft has two grooves on each end.

Apply molybdenum disulfide oil solution to the rocker arm shaft outer surface.  
Install the rocker arms and shafts.



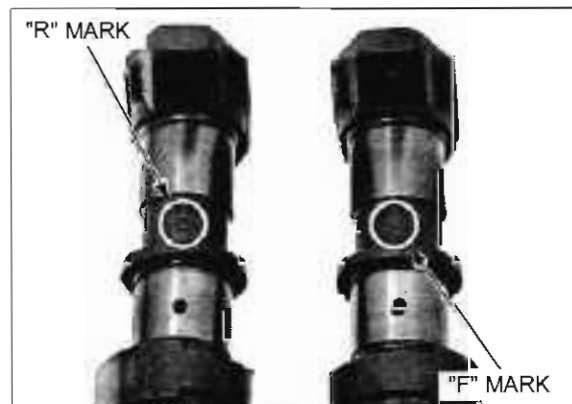
Align the intake rocker arm shaft holes with the camshaft holder holes.  
Align the exhaust rocker arm shaft grooves with the camshaft holder holes.



## CAMSHAFT TIMING PROCEDURE

### NOTE:

- The camshafts are identified by the stamped marks:  
"F": Front cylinder camshaft  
"R": Rear cylinder camshaft
- If both (front and rear) camshafts are removed, install the front cylinder camshaft first, then install the rear cylinder camshaft.
- If the rear cylinder head is not serviced, remove the rear cylinder head cover to check the camshaft position.
- If the front cylinder head is not serviced, remove the front cylinder head cover to check the camshaft position.





**FRONT CYLINDER TDC SETTING**

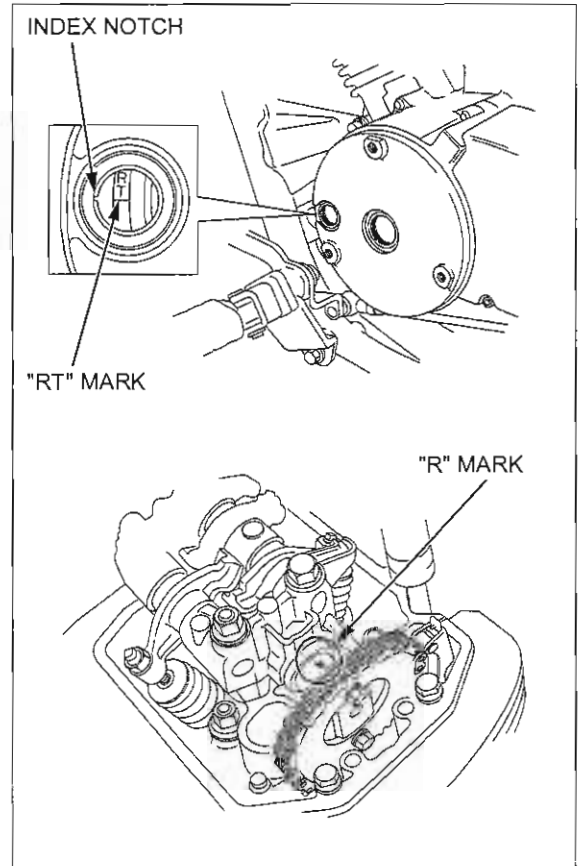
*If the rear cylinder has not been serviced, begin here.*

Remove the rear cylinder head cover (page 8-7) and check the rear cylinder camshaft position as follows:

Turn the crankshaft counterclockwise and align the "RT" mark on the flywheel with the index notch on the left crankcase cover, then check the identification mark "R" on the rear camshaft.

- If the "R" mark faces up, turn the crankshaft counterclockwise 1-1/7 (412°) turn (align the "FT" mark on the flywheel with the index notch) and begin installation of the front camshaft.
- If the "R" mark faces down (cannot be seen), turn the crankshaft counterclockwise 1/7 (52°) turn (align the "FT" mark with the index notch) and begin installation of the front camshaft.

Install the front camshaft (page 8-28).



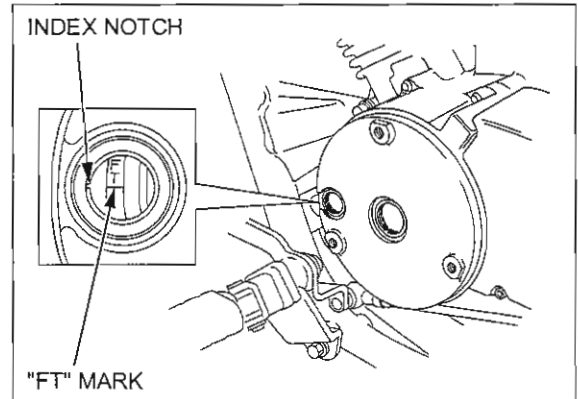
**BOTH CYLINDER TDC SETTING**

*If both camshafts have been serviced, begin installation of the front camshaft.*

Align the "FT" mark on the flywheel with the index notch on the left crankcase cover.

Install the front camshaft (page 8-28).

Set the rear cylinder at TDC (page 8-28).  
Install the rear camshaft (page 8-28).



## CYLINDER HEAD/VALVES

### REAR CYLINDER TDC SETTING

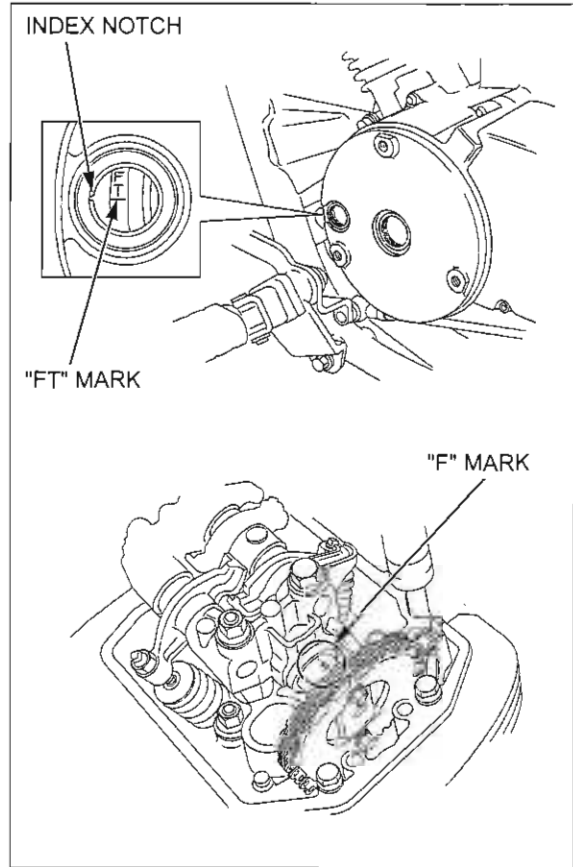
*If the front cylinder has not been serviced, begin here.*

Remove the front cylinder head cover (page 8-6) and check the front cylinder camshaft position as follows:

Turn the crankshaft counterclockwise and align the "FT" mark on the flywheel with the index notch on the left crankcase cover, then check the identification mark "F" on the front camshaft.

- If the "F" mark faces up, turn the crankshaft counterclockwise  $6/7$  ( $308^\circ$ ) turn (align the "RT" mark on the flywheel with the index notch) and begin installation of the rear camshaft.
- If the "F" mark faces down (cannot be seen), turn the crankshaft counterclockwise  $1-6/7$  ( $668^\circ$ ) turn (align the "RT" mark with the index notch) and begin installation of the rear camshaft.

Install the rear camshaft using the following procedure.



### CAMSHAFT INSTALLATION

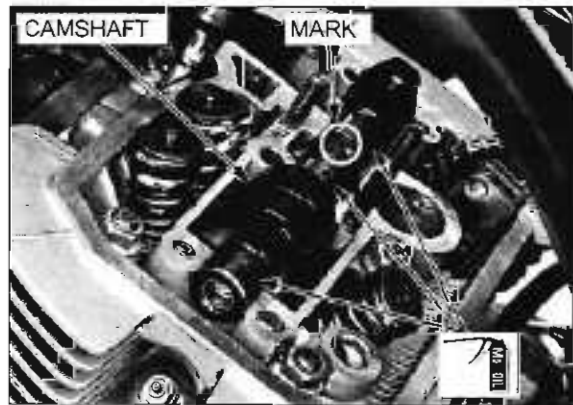
#### NOTE:

*The front and rear camshafts service procedures are the same.*

Make sure to follow the CAMSHAFT TIMING PROCEDURE (page 8-26) before installing the camshaft.

Lubricate the camshaft lobes and journal surfaces with molybdenum disulfide oil.

Install the camshaft with the camshaft identification mark (R: rear camshaft, F: front camshaft) facing up.

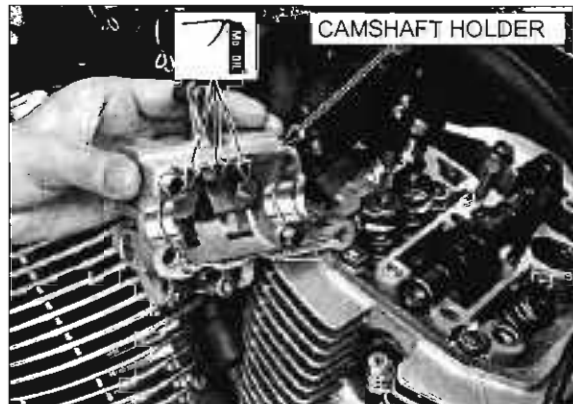


Lubricate each rocker arm slipper surface with molybdenum disulfide oil.

#### NOTE:

Before camshaft holder installation, loosen the valve adjusting screw and lock nut fully.

Install the camshaft holder assembly.

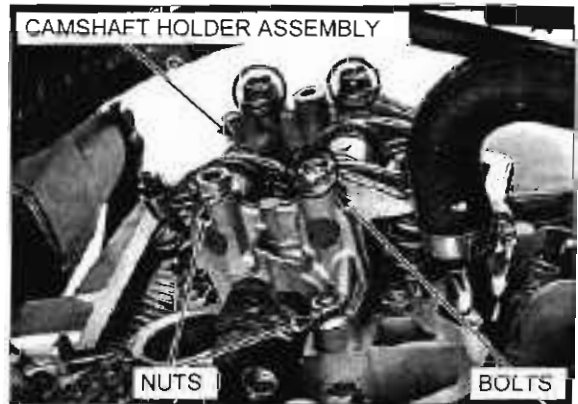


Install the camshaft holder bolts and nuts.  
Tighten the bolts and nuts to the specified torque in a crisscross pattern in several steps.

**TORQUE:**

Camshaft holder bolt: 23 N·m (2.3 kgf·m, 17 lbf·ft)

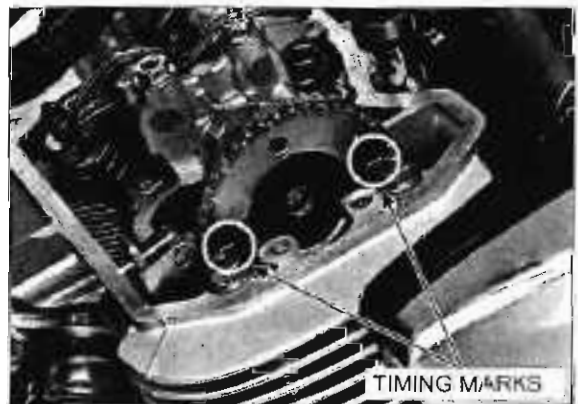
Camshaft holder nut: 23 N·m (2.3 kgf·m, 17 lbf·ft)



Install the cam sprocket to the cam chain with the "IN" mark facing inside.



Install the cam sprocket on the camshaft flange and check that the timing marks align with the upper surface of the cylinder head.



*Be careful not to let the cam sprocket bolts fall into the crankcase.*

Clean and apply a locking agent to the cam sprocket bolt threads.

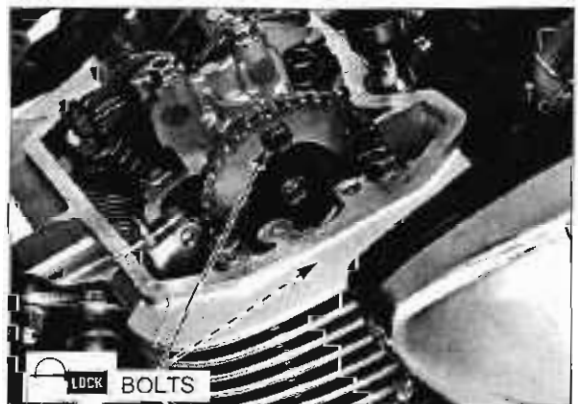
Align the cam sprocket bolt holes in the cam sprocket and camshaft.

Temporarily install the cam sprocket bolt.

Turn the crankshaft counterclockwise 360° and tighten the other sprocket bolt to the specified torque.

**TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)**

Turn the crankshaft counterclockwise 360° and tighten the other sprocket bolt to the specified torque.

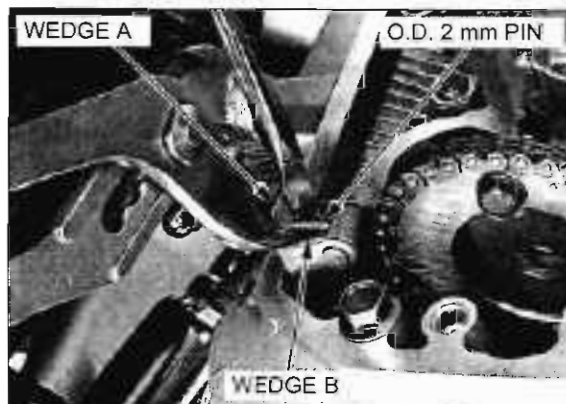


## CYLINDER HEAD/VALVES

Remove an O.D. 2 mm pin while holding cam chain tensioner wedge A and pushing down the wedge B.

### NOTE:

- Be careful not to let an O.D. 2 mm pin fall into the crankcase.
- Do not forget to remove an O.D. 2 mm pin before installing the cylinder head cover.



Fill the oil pockets in the cylinder head with engine oil.  
Adjust the valve clearance (page 3-8).



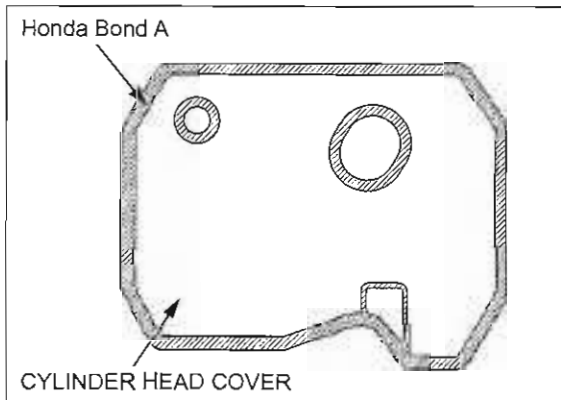
## CYLINDER HEAD COVER INSTALLATION

Clean the gasket groove and cylinder head mating surface of the cylinder head cover.

Check the gasket is in good condition, replace it if necessary.

Apply Honda Bond A or equivalent to the gasket groove of the cylinder head cover.

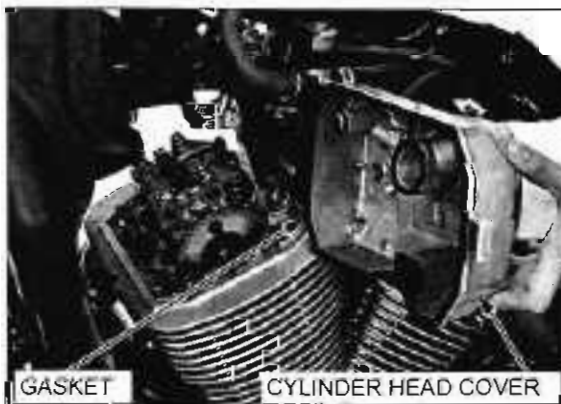
Install the gasket into the groove.



### FRONT

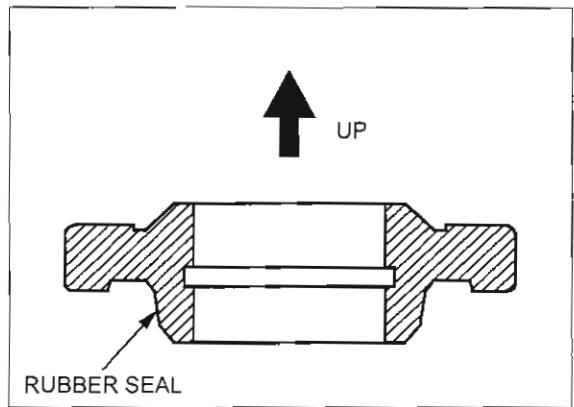
Clean the cylinder head cover mating surface of the cylinder head.

Install the front cylinder head cover on the front cylinder head.



Check the condition of the rubber seals, replace them if necessary.

Install the rubber seals onto the cylinder head cover in the direction as shown.



Install the washers.

Install and tighten the cylinder head cover bolts to the specified torque.

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



Set the thermostat housing assembly to its original position.

Install and tighten the bolt securely.

Install the following:

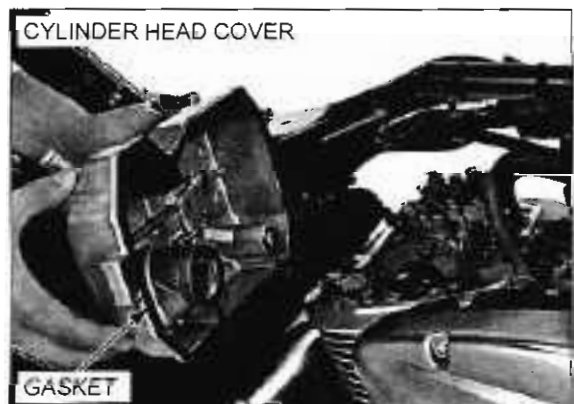
- PAIR check valve (page 5-72)
- Ignition coil (page 19-8)
- Over head covers (page 2-4)



### REAR

Clean the cylinder head cover mating surface of the cylinder head.

Install the rear cylinder head cover on the rear cylinder head.



## CYLINDER HEAD/VALVES

Install the rubber seals (page 8-31).  
Install the washers.  
Install and tighten the cylinder head cover bolts to the specified torque.

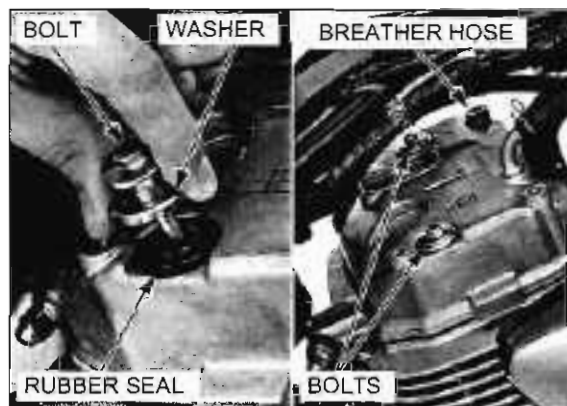
**TORQUE: 10 N·m (1.0 kgf-m, 7 lbf-ft)**

Connect the crankcase breather hose.

VT7510C2S; Install the ignition switch (page 21-21).

Install the following:

- PAIR check valve (page 5-72)
- Over head covers (page 2-4)



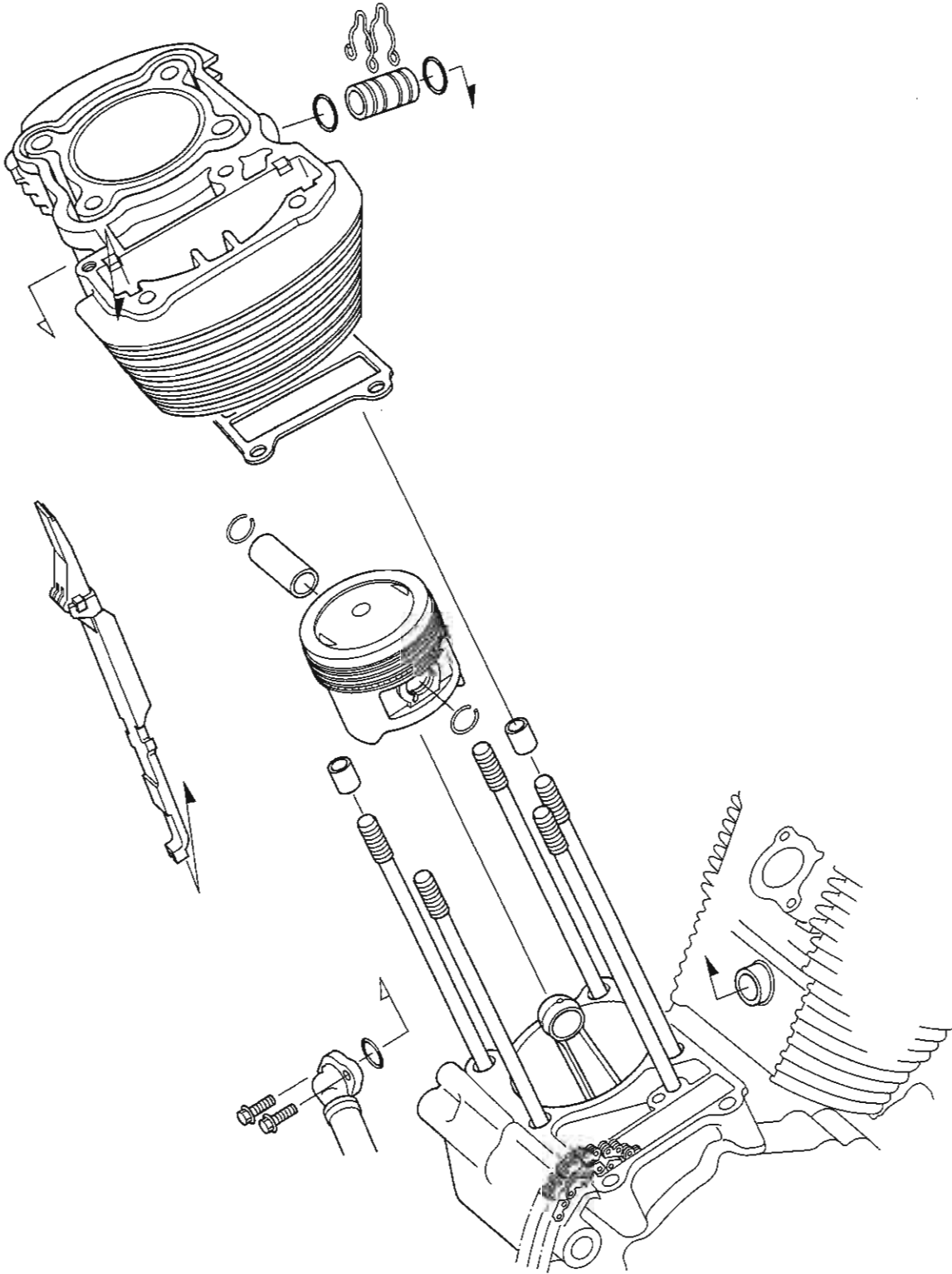
# 9. CYLINDER/PISTON

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COMPONENT LOCATION .....9-2  
SERVICE INFORMATION .....9-3  
TROUBLESHOOTING.....9-3

CYLINDER/PISTON REMOVAL .....9-4  
CYLINDER/PISTON INSTALLATION.....9-9

COMPONENT LOCATION





## SERVICE INFORMATION

### GENERAL

- This section covers service of the piston and cylinder. To service these parts, the engine must be removed from the frame.
- Take care not to damage the cylinder walls and pistons.
- Be careful not to damage the mating surfaces when removing the cylinder. Do not strike the cylinder too hard during removal.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their original locations.
- Clean all disassembled parts with cleaning solvent and dry them by blowing them off with compressed air before inspection.
- Camshaft and rocker arm lubricating oil is fed through oil passages in the cylinder. Clean the oil passages before installing the cylinder.

### SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Cylinder	I.D.	79.000 – 79.015 (3.1102 – 3.1108)	79.10 (3.114)	
	Out-of-round	–	0.06 (0.002)	
	Taper	–	0.06 (0.002)	
	Warpage	–	0.10 (0.004)	
Piston, piston pin, piston rings	Piston O.D. at 17 mm (0.7 in) from the bottom	78.97 – 78.99 (3.109 – 3.110)	78.90 (3.106)	
	Piston pin bore I.D.	18.002 – 18.008 (0.7087 – 0.7090)	18.05 (0.711)	
	Piston pin O.D.	17.994 – 18.000 (0.7084 – 0.7087)	17.98 (0.708)	
	Piston-to-piston pin clearance	0.002 – 0.014 (0.0001 – 0.0006)	0.04 (0.002)	
	Piston ring end gap	Top	0.15 – 0.25 (0.006 – 0.010)	0.4 (0.02)
		Second	0.25 – 0.40 (0.010 – 0.016)	0.6 (0.02)
		Oil (side rail)	0.20 – 0.80 (0.008 – 0.031)	1.0 (0.04)
	Piston ring-to-ring groove clearance	Top	0.025 – 0.055 (0.0010 – 0.0022)	0.08 (0.003)
Second		0.015 – 0.045 (0.0006 – 0.0018)	0.07 (0.003)	
Cylinder-to-piston clearance		0.010 – 0.045 (0.0004 – 0.0018)	0.10 (0.004)	
Connecting rod small end I.D.		18.016 – 18.034 (0.7093 – 0.7100)	18.07 (0.711)	
Connecting rod-to-piston pin clearance		0.016 – 0.040 (0.0006 – 0.0016)	0.06 (0.002)	

### TORQUE VALUES

Cylinder stud bolt (8 mm)	See page 9-8
Cylinder stud bolt (10 mm)	See page 9-8
Cylinder stud bolt (12 mm)	See page 9-8

## TROUBLESHOOTING

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

- Leaking cylinder head gasket
- Worn, stuck or broken piston ring
- Worn or damaged cylinder and piston

#### Compression too high, overheating or knocking

- Excessive carbon built-up on piston head or combustion chamber

#### Excessive smoke

- Worn cylinder, piston or piston rings
- Improper installation of piston rings
- Scored or scratched piston or cylinder wall

#### Abnormal noise

- Worn piston pin or piston pin bore
- Worn cylinder, piston or piston rings
- Worn connecting rod small end

## CYLINDER/PISTON REMOVAL

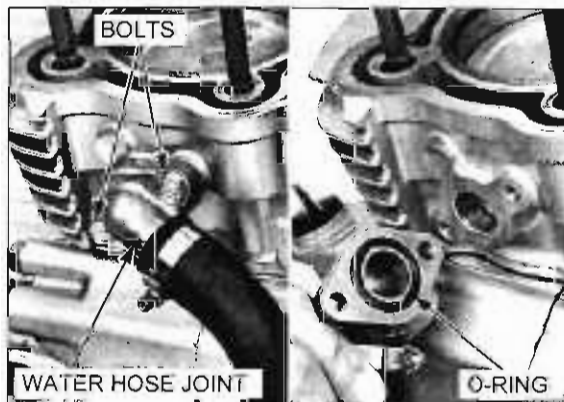
### CYLINDER REMOVAL

**NOTE:**

The front cylinder uses the same service procedure as the rear cylinder.

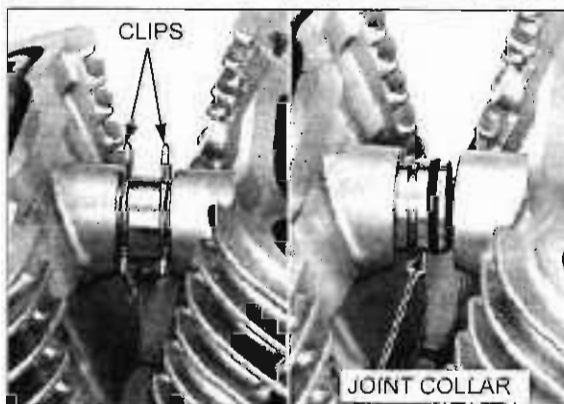
Remove the cylinder head (page 8-13).

*Front cylinder only:* Remove the bolts, water hose joint and O-ring.



Remove the retaining clips.

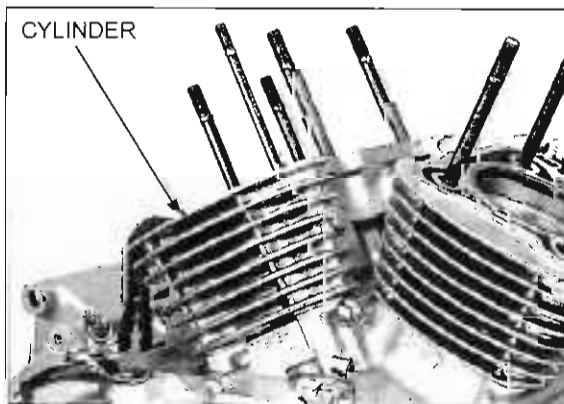
Slide the cylinder joint collar toward either the front or rear cylinder.



Lift the cylinder and remove it, being careful not to damage the piston with the stud bolts.

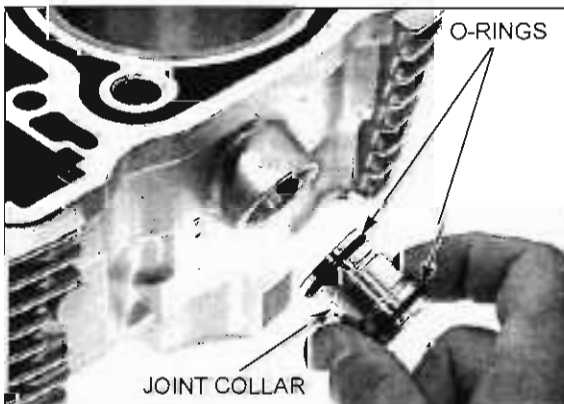
**NOTE:**

- Attach a piece of wire to the cam chain to prevent it from falling into the crankcase.
- Do not strike the cylinder too hard and do not damage the mating surface with a screwdriver.



Remove the joint collar from the cylinder.

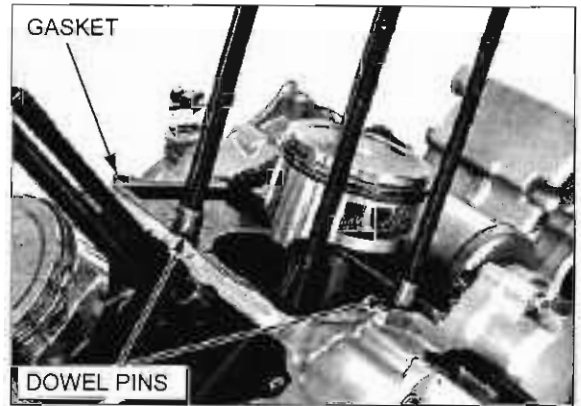
Remove the O-rings.



Remove the gasket and dowel pins.

*Be careful not to damage the gasket surface.*

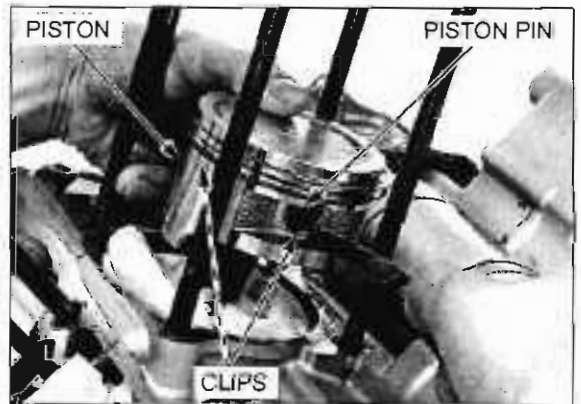
Clean off any gasket material from the cylinder mating surface.



**PISTON REMOVAL**

*Place a clean shop towel over the crankcase to prevent the piston pin clips from falling into the crankcase.*

Remove the piston pin clips with pliers. Push the piston pin out of the piston and connecting rod, and remove the piston.



*Do not damage the piston ring by spreading the ends too far.*

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



*Never use a wire brush; it will scratch the groove.*

Clean carbon deposits from the ring grooves with a used piston ring that will be discarded.



## CYLINDER/PISTON

### INSPECTION

#### PISTON/PISTON RING

*Always replace the piston rings as a set.*

Inspect the piston rings for smooth movement by rotating them. The rings should be able to move in their grooves without catching.

Push the ring until the outer surface of the piston ring is nearly flush with the piston and measure the ring-to-ring groove clearance.

#### SERVICE LIMITS:

Top: 0.08 mm (0.003 in)

Second: 0.07 mm (0.003 in)



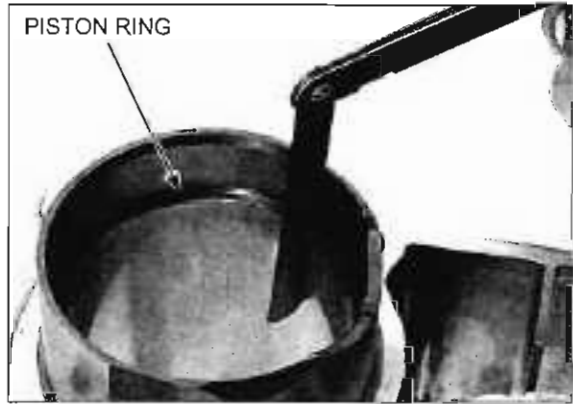
Insert the piston ring into the bottom of the cylinder squarely using the piston crown. Measure the piston ring end gap.

#### SERVICE LIMITS:

Top: 0.4 mm (0.02 in)

Second: 0.6 mm (0.02 in)

Oil (side rail): 1.0 mm (0.04 in)

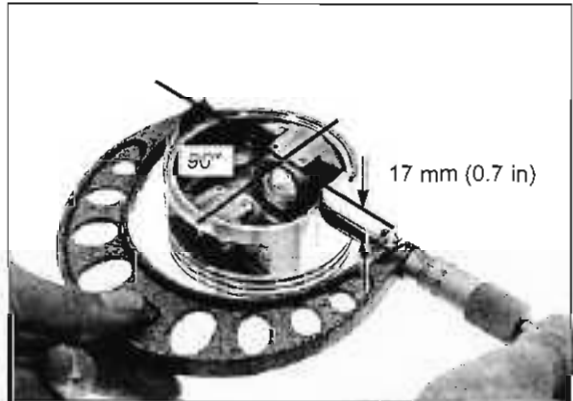


Measure the piston O.D. at a point 17 mm (0.7 in) from the bottom and 90° to the piston pin hole.

#### SERVICE LIMIT: 78.90 mm (3.106 in)

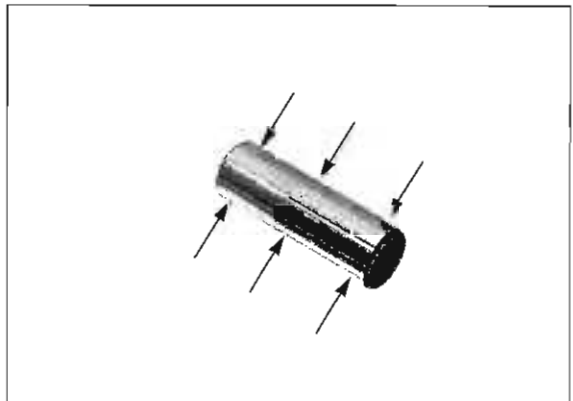
Compare this measurement against the maximum cylinder I.D. measurement and calculate the cylinder-to-piston clearance (page 9-7).

#### SERVICE LIMIT: 0.10 mm (0.004 in)



Measure the piston pin O.D. at three points.

#### SERVICE LIMIT: 17.98 mm (0.708 in)



Measure the piston pin bore I.D.

**SERVICE LIMIT: 18.05 mm (0.711 in)**

Calculate the piston-to-piston pin clearance.

**SERVICE LIMIT: 0.04 mm (0.002 in)**



**CONNECTING ROD**

Measure the connecting rod small end I.D.

**SERVICE LIMIT: 18.07 mm (0.711 in)**

Calculate the connecting rod-to-piston pin clearance.

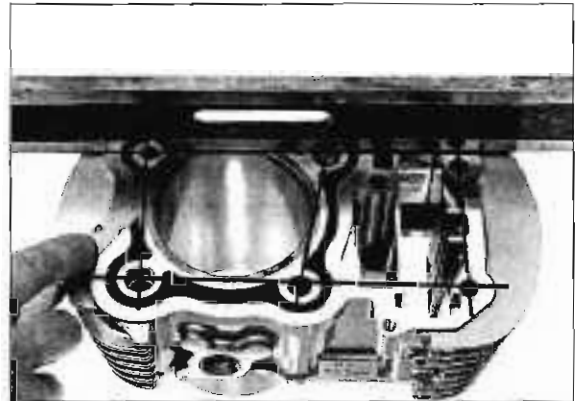
**SERVICE LIMIT: 0.06 mm (0.002 in)**



**CYLINDER**

Check the top of the cylinder for warpage with a straight edge and feeler gauge across the stud holes.

**SERVICE LIMIT: 0.10 mm (0.004 in)**

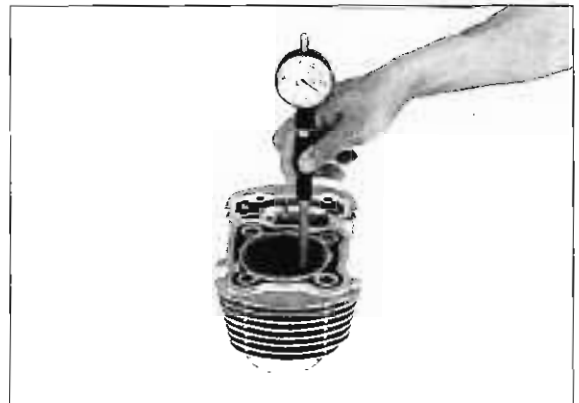


Check the cylinder wall for scratches or wear. Measure the cylinder I.D. at three levels on the X and Y axes. Take the maximum reading to determine the cylinder wear.

**SERVICE LIMIT: 79.10 mm (3.114 in)**

Calculate the cylinder-to-piston clearance.

**SERVICE LIMIT: 0.10 mm (0.004 in)**



## CYLINDER/PISTON

Calculate the cylinder taper and out-of-round at three levels on the X and Y axes. Take the maximum reading to determine the taper and out-of-round.

### SERVICE LIMITS:

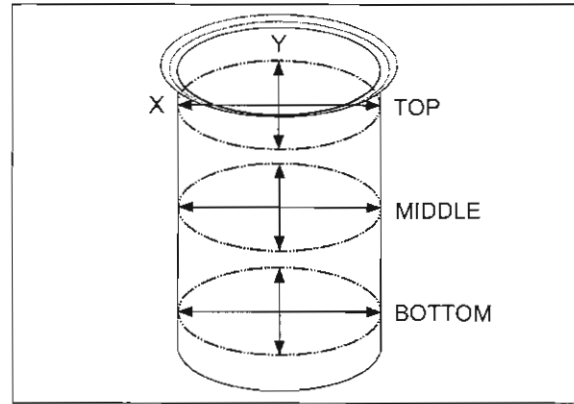
Taper: 0.06 mm (0.002 in)  
Out-of-round: 0.06 mm (0.002 in)

The cylinder must be rebored and an oversize piston fitted if the service limits are exceeded.

The following oversize pistons are available:

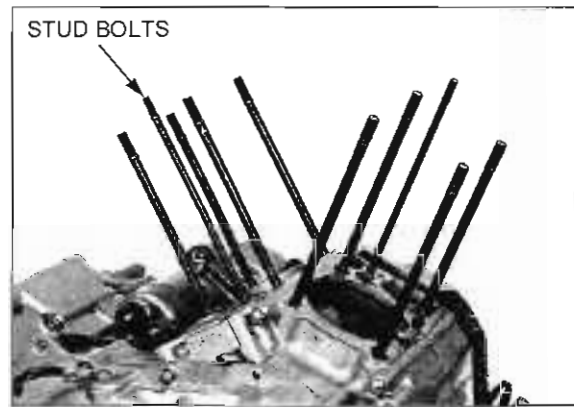
0.25 mm (0.010 in)  
0.50 mm (0.020 in)

The piston to cylinder clearance for the oversize piston must be: 0.010 – 0.045 mm (0.0004 – 0.0018 in).



## CYLINDER STUD BOLT REPLACEMENT

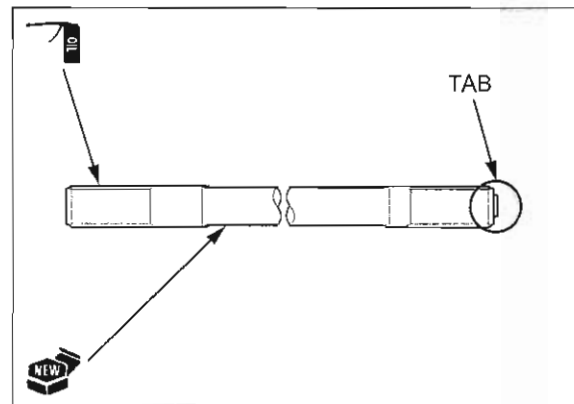
Thread two nuts onto the stud and tighten them together, and use a wrench on them to turn the stud bolt out.



Apply engine oil to the lower threads of a new stud bolt and install it.

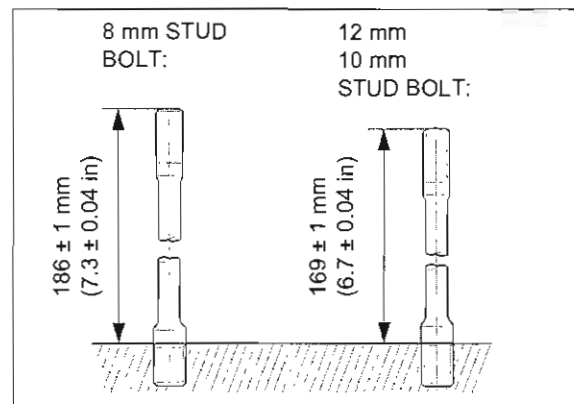
### NOTE:

Install the 8 mm and 10 mm stud bolts with its tab side facing the cylinder head side.



Be sure to verify the stud height from the crankcase surface.

Adjust the height if necessary.



## CYLINDER/PISTON INSTALLATION

### PISTON RING INSTALLATION

Apply engine oil to the piston and piston ring outer surface.

*Be careful not to damage the piston and rings.*

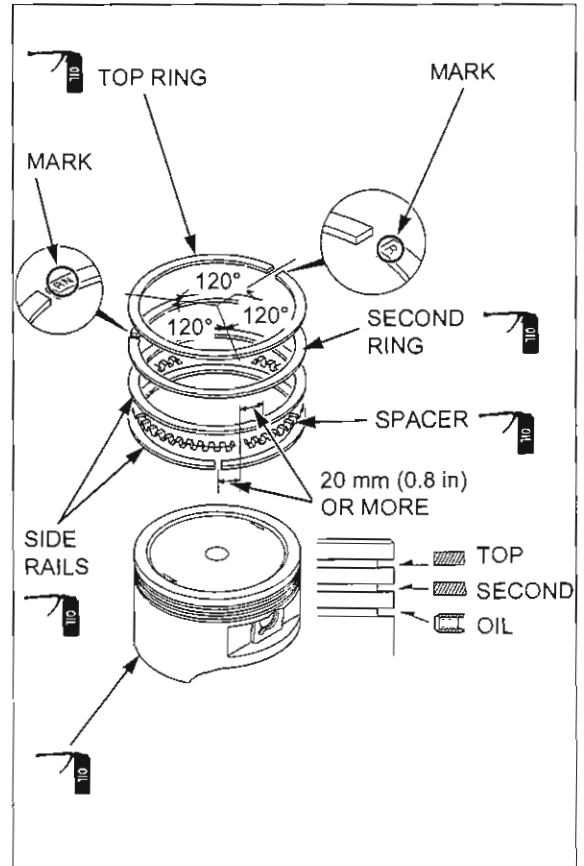
Carefully install the piston rings into the piston ring grooves with the markings facing up.

#### NOTE:

- Do not confuse the top and second rings.
- To install the oil ring, install the spacer first, then install the side rails.

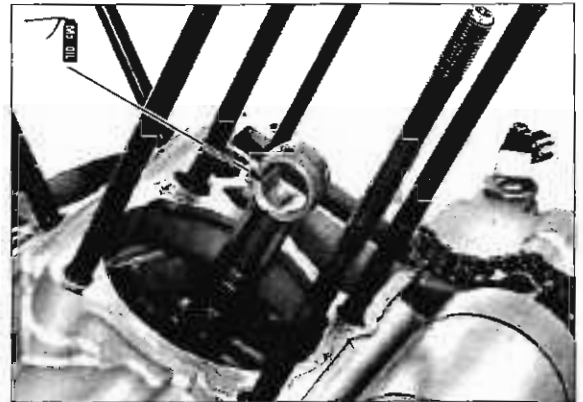
Stagger the piston ring end gaps 120° apart from each other.

Stagger the side rail end gaps as shown.



### PISTON INSTALLATION

Apply molybdenum disulfide oil to the connecting rod small end inner surface.

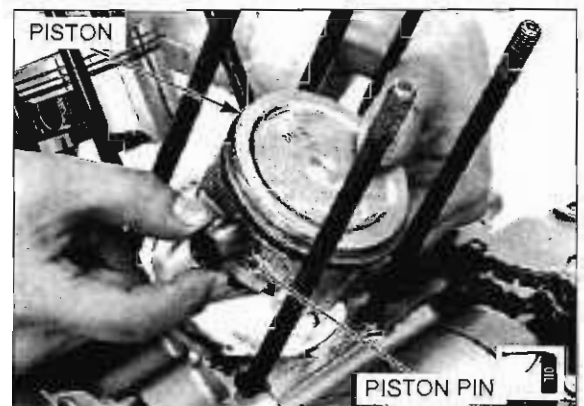


Place a clean shop towel over the crankcase to prevent the clip from falling into the crankcase.

Apply engine oil to the piston pin outer surface.

Install the piston.

Install the piston pin through the piston and connecting rod.

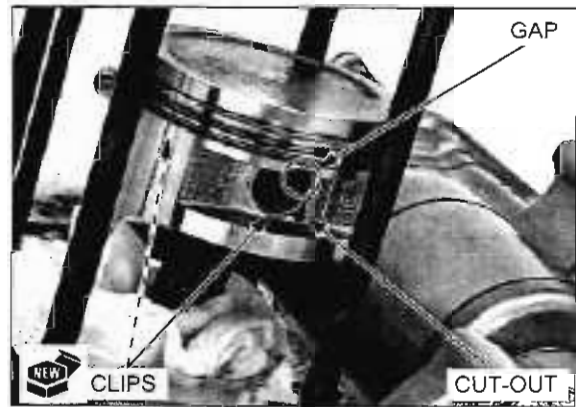


## CYLINDER/PISTON

Install new piston pin clips into the grooves in the piston pin hole.

**NOTE:**

- Make sure the piston pin clips are seated securely.
- Do not align the clip end gap with the piston cutout.

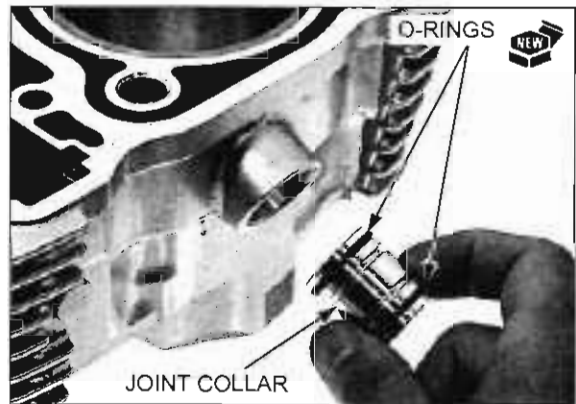


### CYLINDER INSTALLATION

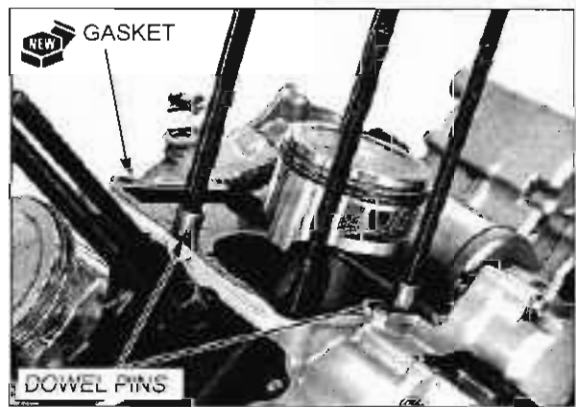
*The front cylinder uses the same service procedure as the rear cylinder.*

Clean the gasket surfaces of the cylinder and crankcase thoroughly, being careful not to damage them.

Install new O-rings to the joint collar.  
Install the joint collar to the cylinder.



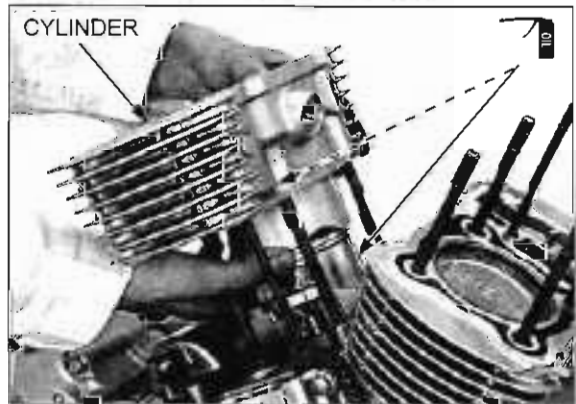
Install the dowel pins and a new gasket.



*Be careful not to damage the piston rings and cylinder wall.*

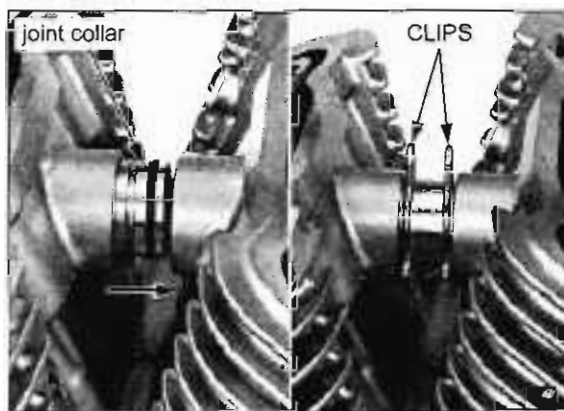
Apply engine oil to the cylinder wall, piston outer surface and piston rings.

Route the cam chain through the cylinder and install the cylinder over the piston while compressing the piston rings with your fingers.

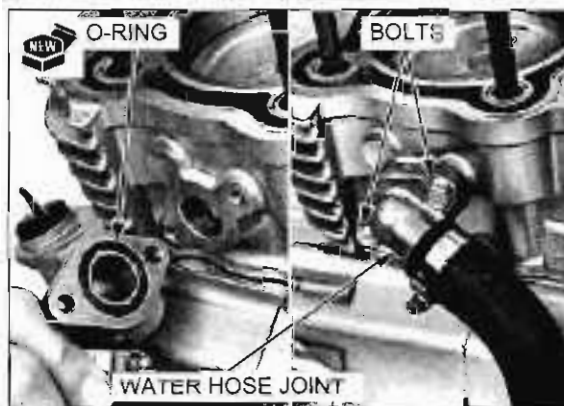




Slide the joint collar into the hole in the cylinder and connect it.  
Install the retaining clips into the joint collar grooves.



*Front cylinder only:* Install a new O-ring into the water hose joint groove.  
Install and tighten the hose joint bolts securely.  
Install the cylinder head (page 8-23).



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**MEMO**

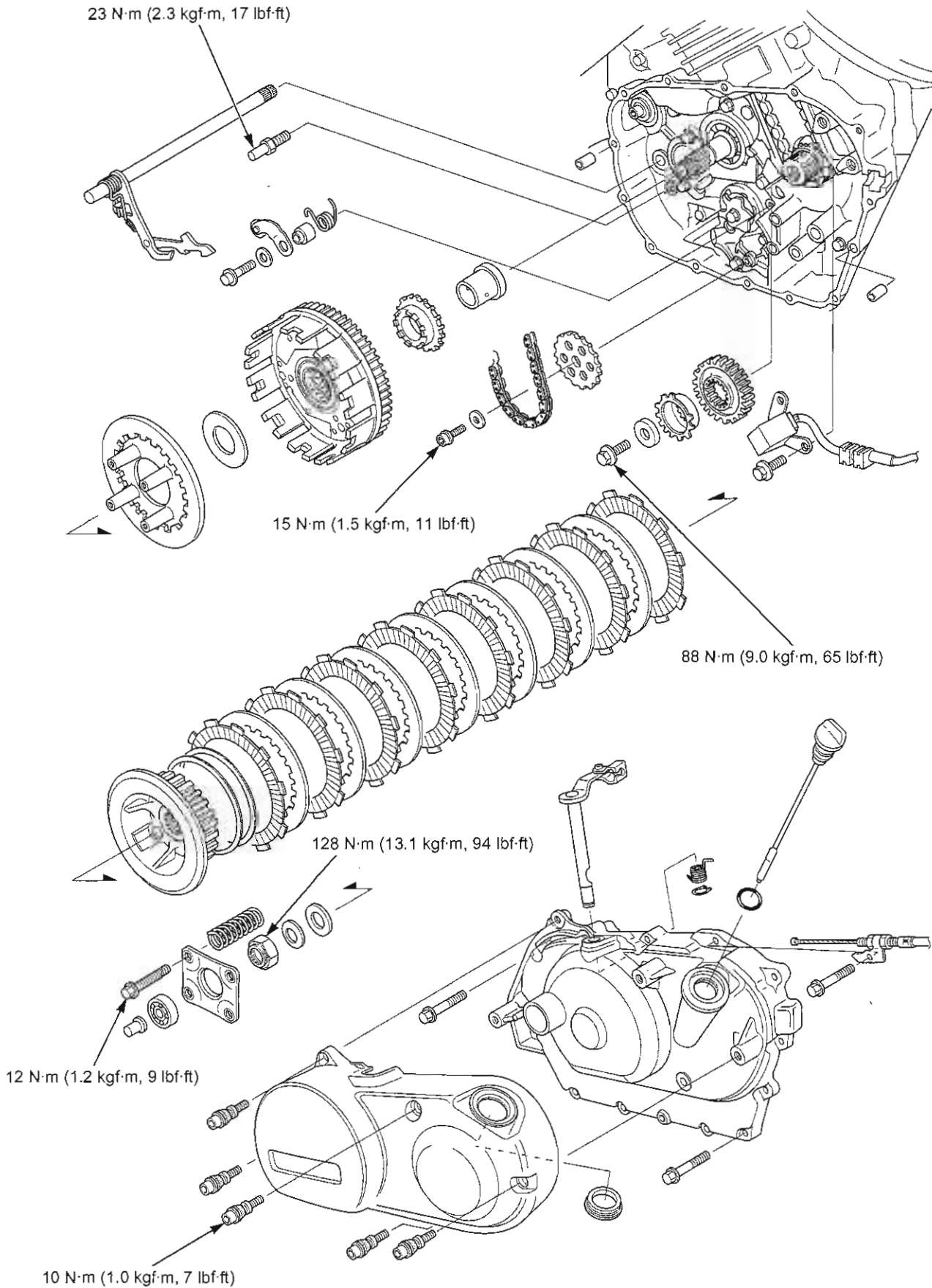
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# 10. CLUTCH/GEARSHIFT LINKAGE

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COMPONENT LOCATION .....	10-2	PRIMARY DRIVE GEAR .....	10-12
SERVICE INFORMATION .....	10-3	GEARSHIFT LINKAGE .....	10-14
TROUBLESHOOTING .....	10-4	CLUTCH INSTALLATION .....	10-18
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CLUTCH REMOVAL .....	10-7		

# CLUTCH/GEARSHIFT LINKAGE COMPONENT LOCATION



# SERVICE INFORMATION

## GENERAL

- The clutch and gearshift linkage can be serviced with the engine in the frame.
- Engine oil viscosity, oil level and the use of oil additives have an effect on clutch disengagement. Oil additives of any kind are specifically not recommended. When the clutch does not disengage or the motorcycle creeps with the clutch disengaged, inspect the engine oil and oil level before servicing the clutch system.

## SPECIFICATIONS

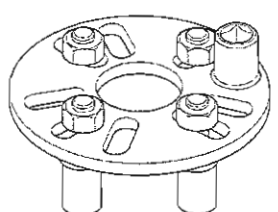
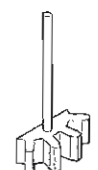
Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Clutch lever freeplay		10 – 20 (3/8 – 13/16)	–	
Clutch	Spring free length	45.3 (1.78)	43.9 (1.73)	
	Disc thickness	Disc A	2.62 – 2.78 (0.103 – 0.109)	2.3 (0.09)
		End disc	2.92 – 3.08 (0.115 – 0.121)	2.6 (0.10)
	Plate warpage	–	0.30 (0.012)	
Clutch outer guide	I.D.	21.991 – 22.016 (0.8658 – 0.8668)	22.03 (0.867)	
	O.D.	31.959 – 31.975 (1.2582 – 1.2589)	31.92 (1.257)	
Mainshaft O.D. at clutch outer guide		21.967 – 21.980 (0.8648 – 0.8654)	21.95 (0.864)	
Clutch outer guide-to-mainshaft clearance		0.011 – 0.049 (0.0004 – 0.0019)	0.08 (0.003)	
Clutch outer I.D.		32.000 – 32.025 (1.2598 – 1.2608)	32.09 (1.263)	
Clutch outer-to-outer guide clearance		0.025 – 0.066 (0.0010 – 0.0026)	0.18 (0.007)	
Oil pump drive sprocket I.D.		32.025 – 32.145 (1.2608 – 1.2655)	32.16 (1.266)	
Oil pump drive sprocket-to-clutch outer guide clearance		0.050 – 0.186 (0.0020 – 0.0073)	0.23 (0.009)	

## TORQUE VALUES

Clutch lifter plate bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Clutch center lock nut	128 N·m (13.1 kgf·m, 94 lbf·ft)	Lock nut; replace with a new one and stake Apply engine oil to the threads and seating surface
Clutch cover socket bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Primary drive gear bolt	88 N·m (9.0 kgf·m, 65 lbf·ft)	Apply engine oil to the threads and seating surface
Gearshift arm pinch bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Oil pump driven sprocket bolt	15 N·m (1.5 kgf·m, 11 lbf·ft)	Apply locking agent to the threads
Gearshift pedal pivot bolt	39 N·m (4.0 kgf·m, 29 lbf·ft)	
Gearshift spindle return spring pin	23 N·m (2.3 kgf·m, 17 lbf·ft)	
Gearshift spindle oil seal stopper plate bolt	13 N·m (1.3 kgf·m, 10 lbf·ft)	

## TOOLS

<p>Clutch center holder 07JMB-MN50301</p>  <p>or 07HGB-001010B and 07HGB-001020B (U.S.A. only)</p>	<p>Gear holder, 2.5 07724-0010100</p>  <p>or 07724-001A100 (U.S.A. only)</p>
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## CLUTCH/GEARSHIFT LINKAGE

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### TROUBLESHOOTING

#### Clutch lever too hard to pull in

- Damaged, kinked or dirty clutch cable
- Improperly routed clutch cable
- Damaged clutch lifter mechanism
- Faulty clutch lifter bearing

#### Clutch will not disengage or motorcycle creeps with clutch disengaged

- Too much clutch lever freeplay
- Warped clutch plates
- Loose clutch center lock nut
- Engine oil level too high, improper oil viscosity or oil additive used

#### Clutch slips

- No clutch lever freeplay
- Worn clutch discs
- Weak clutch springs
- Clutch lifter sticking
- Engine oil level too low or oil additive used

#### Hard to shift

- Improper clutch operation
- Incorrect engine oil viscosity
- Incorrect clutch adjustment
- Bent or damaged gearshift spindle
- Damaged gearshift cam
- Bent fork shaft or damaged shift forks and shift drum (page 12-21)

#### Transmission jumps out of gear

- Broken shift drum stopper arm
- Weak or broken gearshift spindle return springs
- Worn or damaged gearshift cam
- Bent fork shaft or worn shift forks and shift drum (page 12-21)
- Worn gear dogs or dog holes (page 12-21)

## RIGHT CRANKCASE COVER REMOVAL

Drain the engine oil (page 3-12).

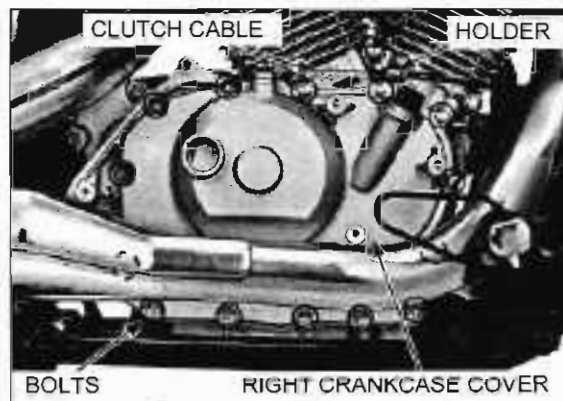
Remove the bolts, clutch cover and oil seal rubber.



Remove the bolts in a crisscross pattern in several steps.

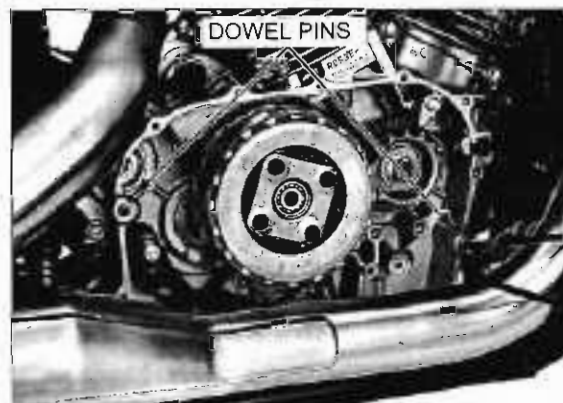
Remove the clutch cable holder and disconnect the clutch cable.

Remove the right crankcase cover.



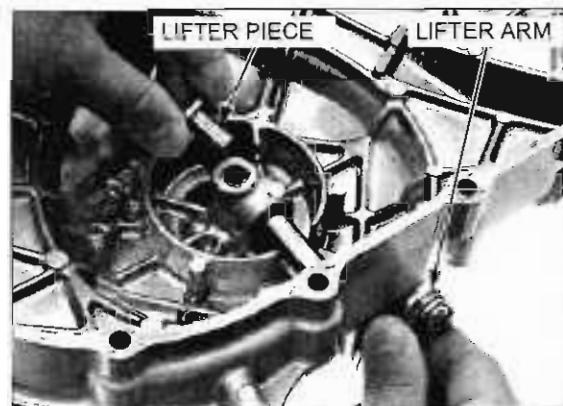
*Be careful not to damage the mating surface.*

Remove the dowel pins and clean off the sealant from the mating surface.



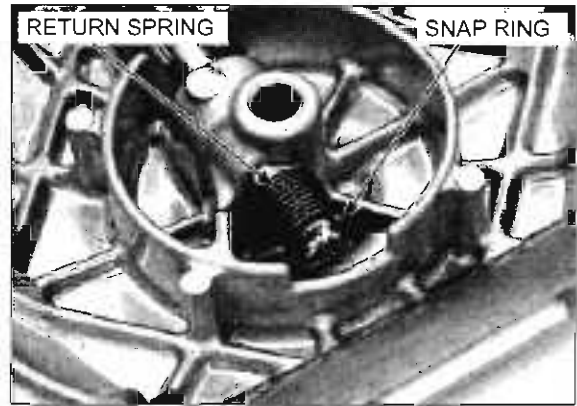
### DISASSEMBLY

Remove the clutch lifter piece while turning the clutch lifter arm clockwise.

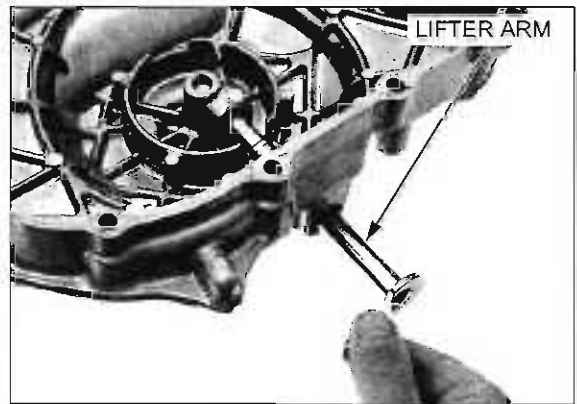


## CLUTCH/GEARSHIFT LINKAGE

Remove the snap ring and return spring from the clutch lifter arm.



Remove the clutch lifter arm from the right crankcase cover.



### INSPECTION

Check the oil seal for fatigue or damage.  
Check the lifter arm sliding surface of the right crankcase cover for wear, damage or loose fit.

Replace these parts if necessary.

#### NOTE:

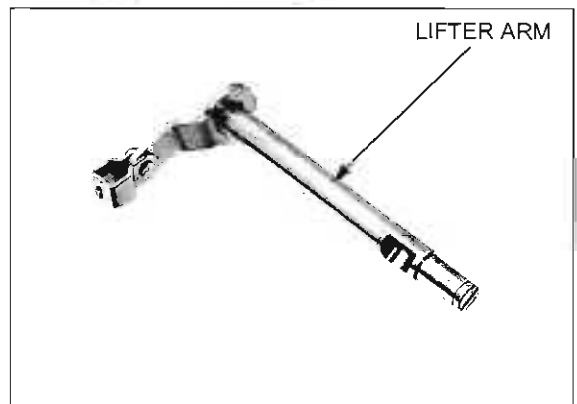
If the oil seal replacement is required, install the oil seal flash with the case surface.



Check the clutch lifter arm for wear, damage or bending.

Check the spring for fatigue or damage.

Replace these parts if necessary.

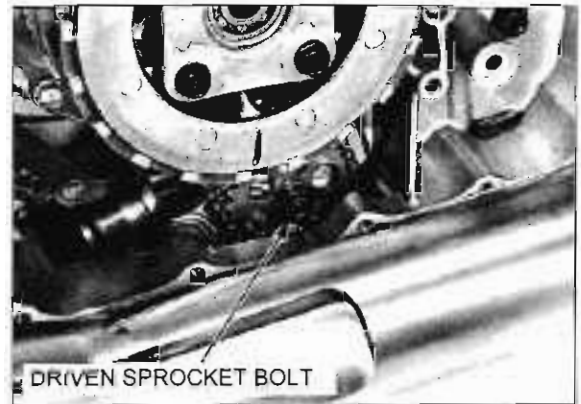




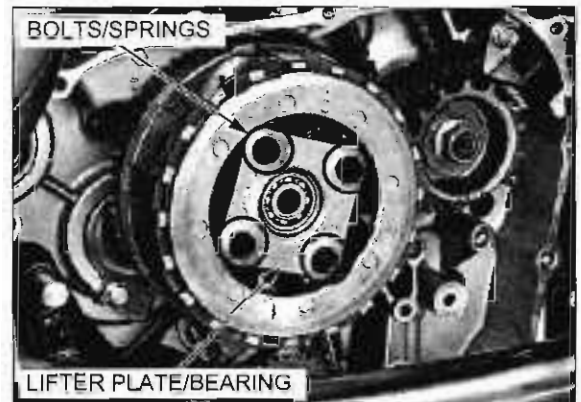
## CLUTCH REMOVAL

Remove the right crankcase cover (page 10-5).

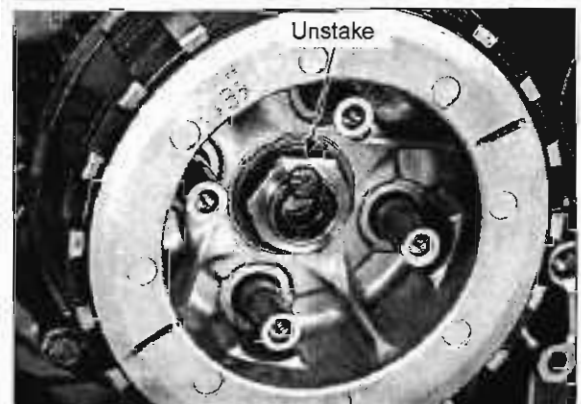
If the oil pump driven sprocket will be removed, loosen the driven sprocket bolt while the clutch is still installed.



Loosen the clutch lifter plate bolts in a crisscross pattern in several steps.  
Remove the lifter plate/bearing and clutch springs.



*Be careful not to damage the mainshaft threads.* Unstake the clutch center lock nut.

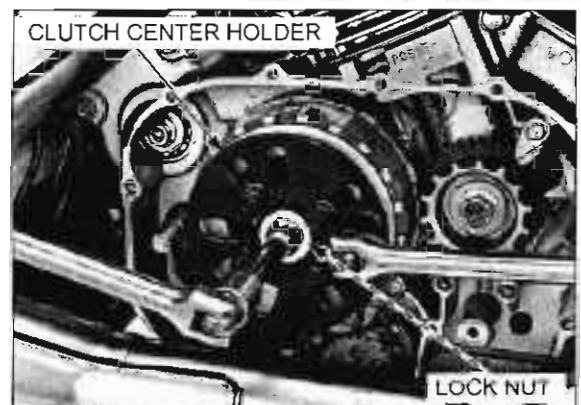


Hold the clutch center using a special tool and loosen the clutch center lock nut.

**TOOL:**  
Clutch center holder                      07JMB-MN50301

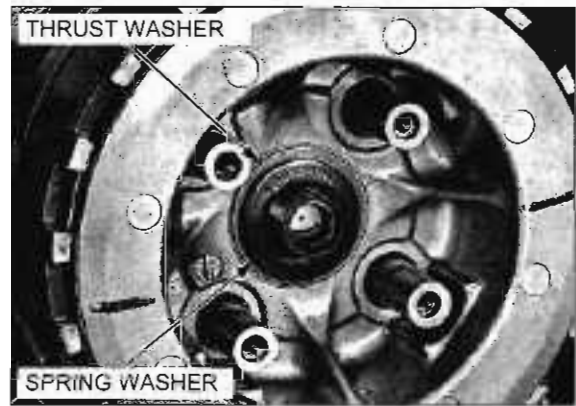
**USA TOOLS:**  
Clutch holder plater                      07HGB-001010B  
Clutch holder collars (set of 4)      07HGB-001020B

Remove the special tool and clutch center lock nut.



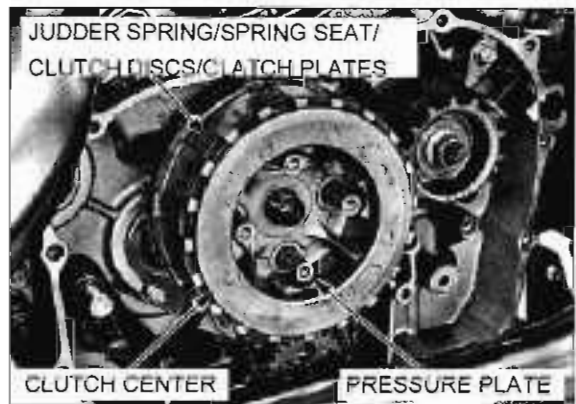
## CLUTCH/GEARSHIFT LINKAGE

Remove the spring washer and thrust washer.

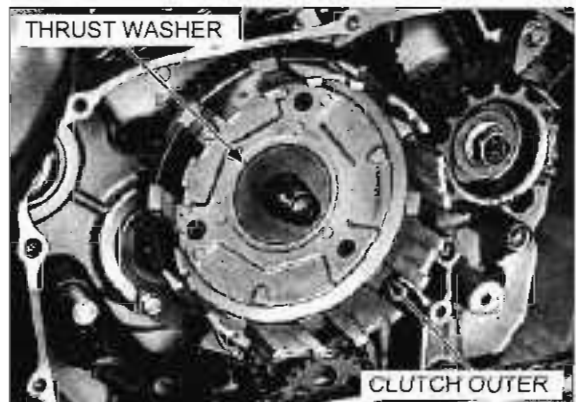


Remove the following:

- Clutch center
- Pressure plate
- End clutch disc
- Clutch plates
- Clutch disc A
- Judder spring
- Spring seat



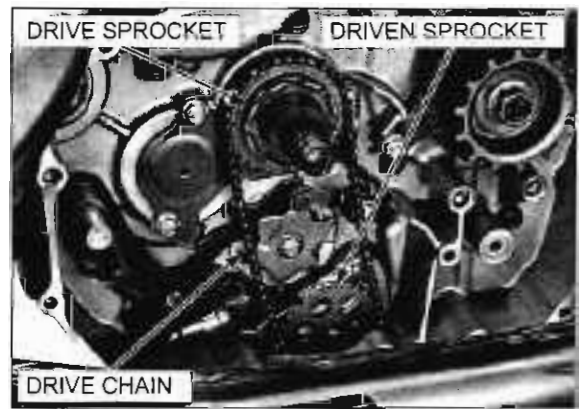
Remove the thrust washer and clutch outer.



Remove the oil pump driven sprocket bolt and washer.



Remove the oil pump drive sprocket, driven sprocket and drive chain as a set.



Remove the clutch outer guide.

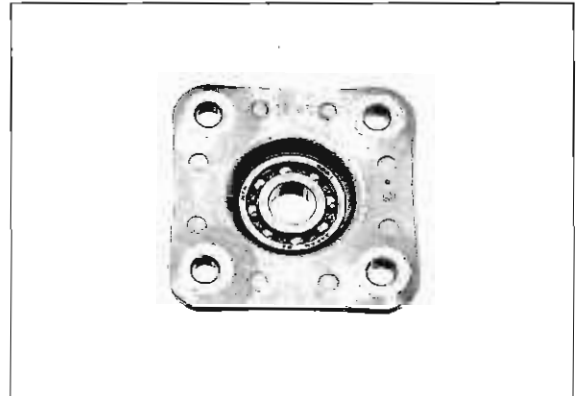


### INSPECTION

#### CLUTCH LIFTER BEARING

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

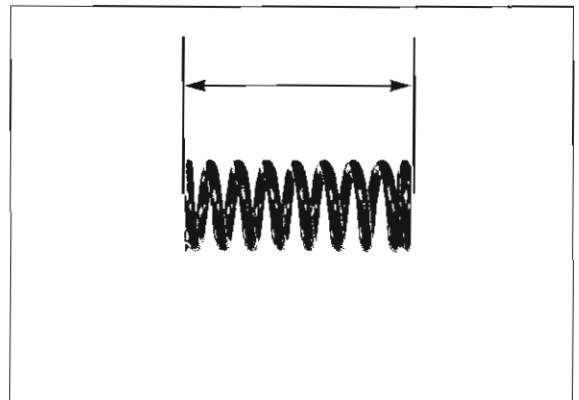
Remove and discard the bearing if the races do not turn smoothly and quietly, or if they fit loosely in the lifter plate.



#### CLUTCH SPRING

Replace the clutch springs as a set. Check the clutch spring free length.

**SERVICE LIMIT: 43.9 mm (1.73 in)**



## CLUTCH/GEARSHIFT LINKAGE

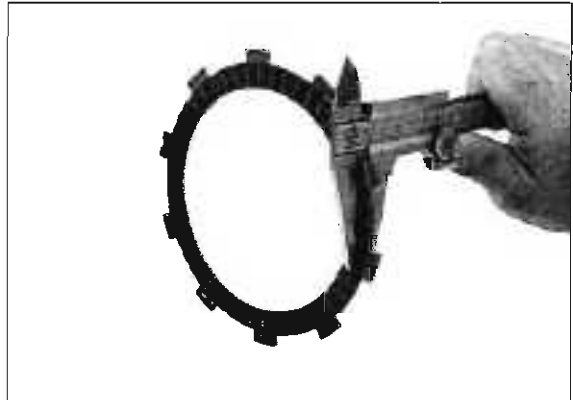
### CLUTCH DISC

Replace the clutch discs and plates as a set.

Replace the clutch discs for signs of scoring or discoloration.

Measure the clutch disc thickness.

**SERVICE LIMITS: Disc A: 2.3 mm (0.09 in)**  
**End disc: 2.6 mm (0.10 in)**



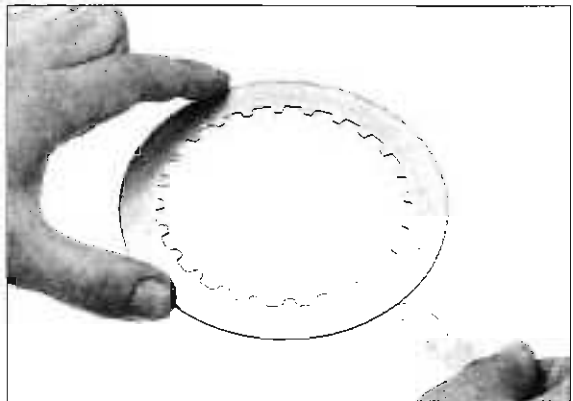
### CLUTCH PLATE

Replace the clutch discs and plates as a set.

Check the clutch plate for discoloration.

Check the clutch plate warpage on a surface plate using a feeler gauge.

**SERVICE LIMIT: 0.30 mm (0.012 in)**



### CLUTCH CENTER

Check the clutch center for nicks, indentations or abnormal wear caused by the clutch plates.

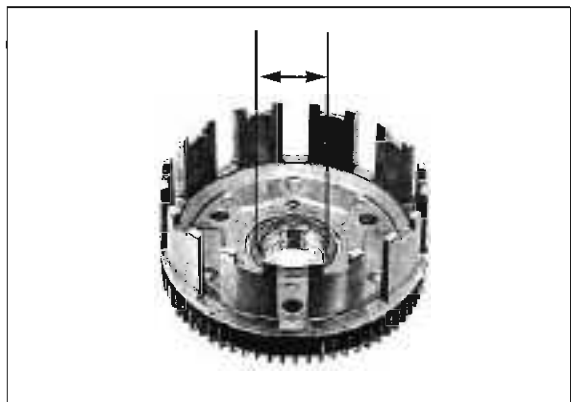


### CLUTCH OUTER

Check the slot in the clutch outer for nicks, indentations or abnormal wear caused by the clutch discs.

Measure the clutch outer I.D.

**SERVICE LIMIT: 32.09 mm (1.263 in)**



## CLUTCH OUTER GUIDE

Check the clutch outer guide for damage or abnormal wear.

Measure the clutch outer guide I.D.

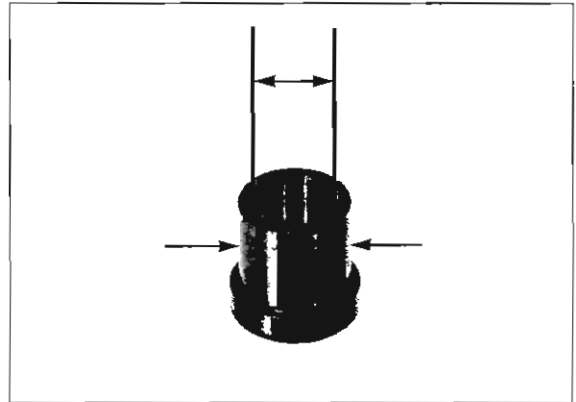
**SERVICE LIMIT: 22.03 mm (0.867 in)**

Measure the clutch outer guide O.D.

**SERVICE LIMIT: 31.92 mm (1.257 in)**

Calculate the clutch outer-to-outer guide clearance.

**SERVICE LIMIT: 0.18 mm (0.007 in)**



## OIL PUMP DRIVE SPROCKET

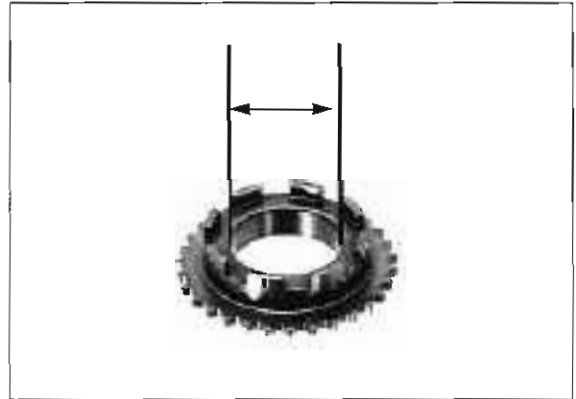
Check the oil pump drive sprocket for wear or damage.

Measure the I.D. of the drive sprocket.

**SERVICE LIMIT: 32.16 mm (1.266 in)**

Calculate the oil pump drive sprocket-to-clutch outer guide clearance.

**SERVICE LIMIT: 0.23 mm (0.009 in)**



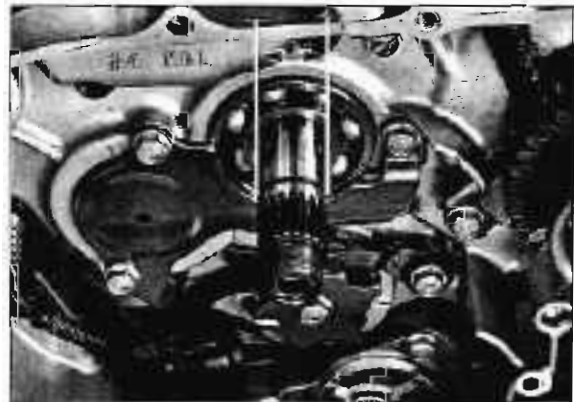
## MAINSHAFT

Measure the mainshaft O.D. at the clutch outer guide sliding surface.

**SERVICE LIMIT: 21.95 mm (0.864 in)**

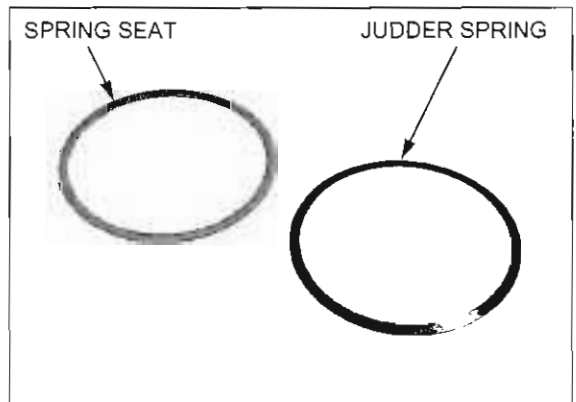
Calculate the clutch outer guide-to-mainshaft clearance.

**SERVICE LIMIT: 0.08 mm (0.003 in)**



## JUDDER SPRING/SPRING SEAT

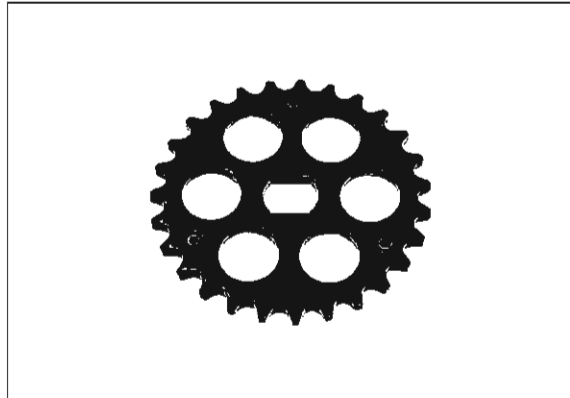
Check the spring seat and judder spring for distortion, wear or damage.



## CLUTCH/GEARSHIFT LINKAGE

### OIL PUMP DRIVEN SPROCKET

Check the oil pump driven sprocket for wear or damage.



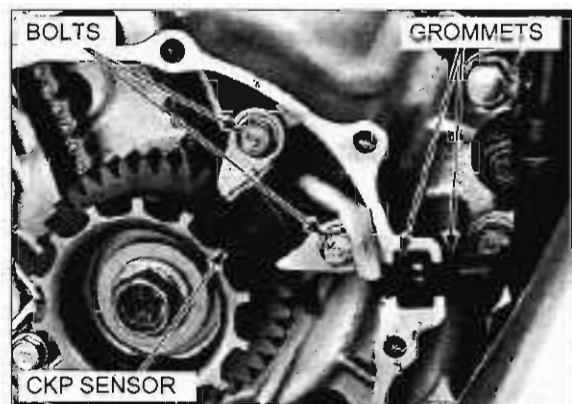
## PRIMARY DRIVE GEAR

### REMOVAL

Remove the clutch (page 10-7).

Remove the CKP sensor mounting bolts.

Remove the CKP sensor and grommets.



Temporarily install the clutch outer guide, oil pump drive sprocket and clutch outer onto the mainshaft (page 10-18).

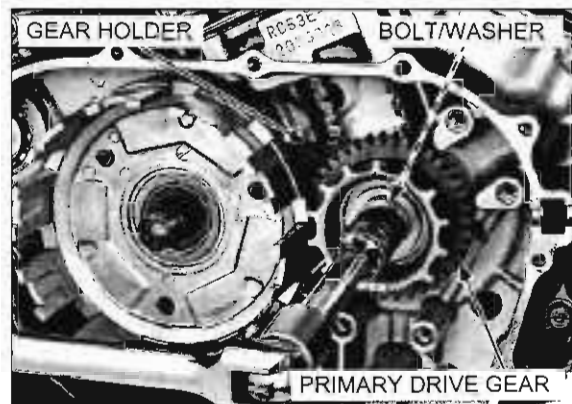
Hold the primary drive gear using a special tool and remove the primary drive gear bolt and washer.

#### TOOL:

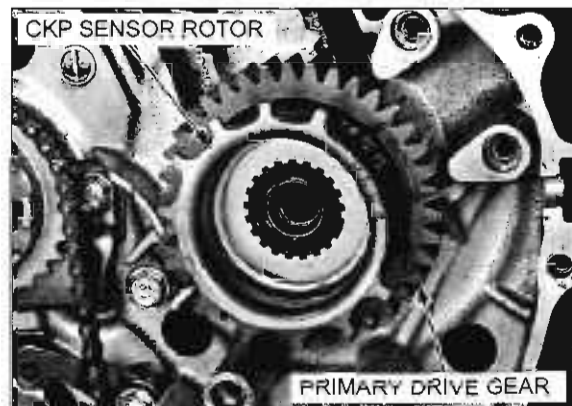
**Gear holder, 2.5**

**07724-0010100  
or 07724-001A100  
(U.S.A. only)**

Remove the gear holder and temporarily installed parts.



Remove the CKP sensor rotor and primary drive gear.



## INSPECTION

Check the CKP sensor rotor for wear or damage.



Check the primary drive gear for wear or damage.

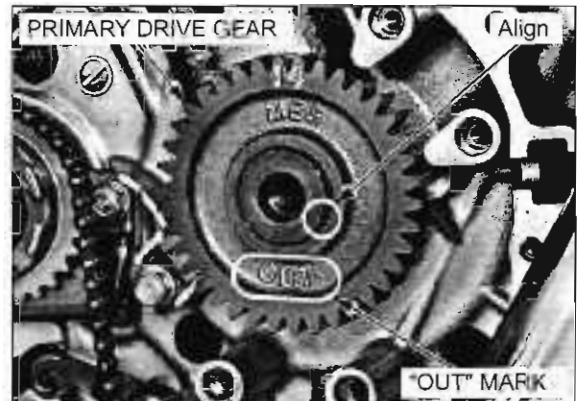


## INSTALLATION

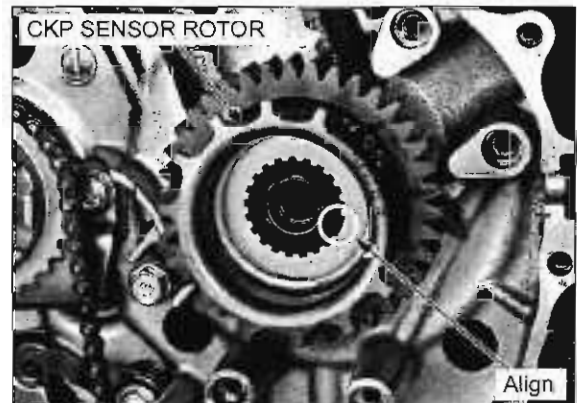
Install the primary drive gear on the crankshaft.

### NOTE:

- Install the primary drive gear, aligning its wide groove with the wide tooth of the crankshaft.
- Install the primary drive gear with its "OUT" mark facing out.



Install the CKP sensor rotor, aligning its wide groove with the wide tooth of the crankshaft.



## CLUTCH/GEARSHIFT LINKAGE

Temporarily install the clutch outer guide, oil pump drive sprocket and clutch outer onto the mainshaft.

Apply engine oil to the primary drive gear bolt threads and seating surface.

Install the washer and primary drive gear bolt.

Hold the primary drive gear using a special tool.

### TOOL:

Gear holder, 2.5

07724-0010100  
or 07724-001A100  
(U.S.A. only)

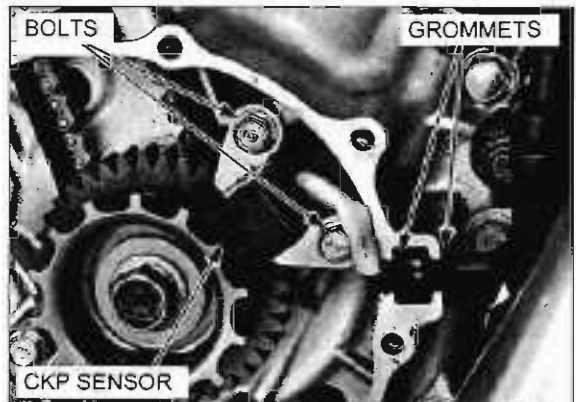
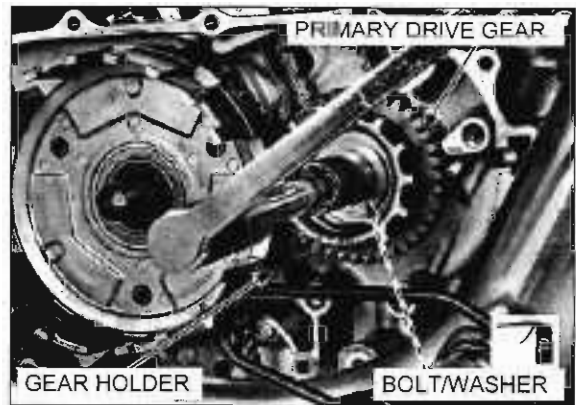
Tighten the bolt to the specified torque.

**TORQUE: 88 N·m (9.0 kgf·m, 65 lbf·ft)**

Remove the gear holder and temporarily installed parts.

Install the CKP sensor, wire grommets and tighten the bolts.

Install the clutch (page 10-18).



## GEARSHIFT LINKAGE

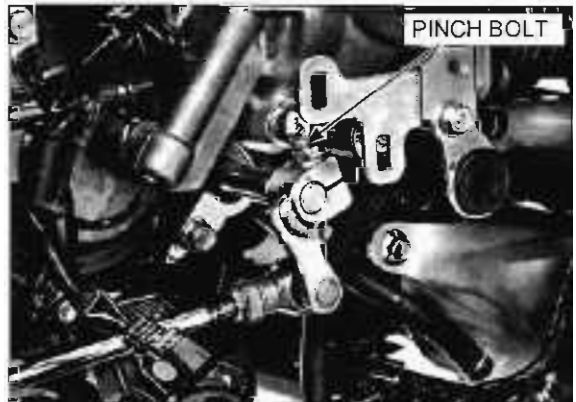
### REMOVAL

Remove the following:

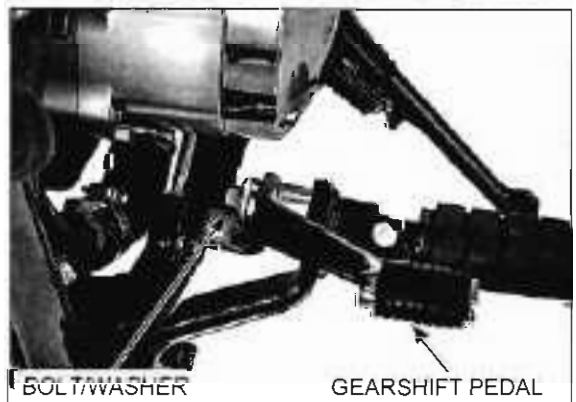
- Left crankcase rear cover (page 2-4)
- Clutch (page 10-7)

Remove the pinch bolt and gearshift arm from the spindle.

Clean the gearshift spindle.

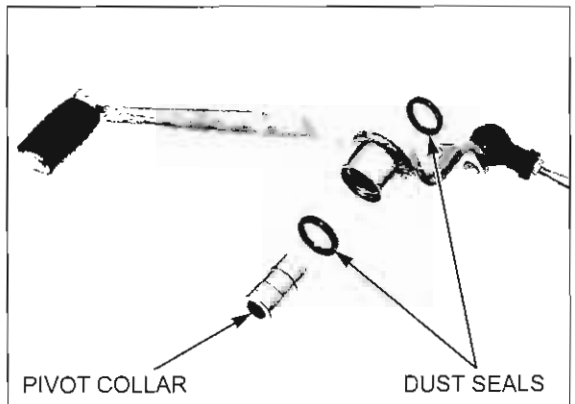


Remove the pivot bolt, washer and gearshift pedal.



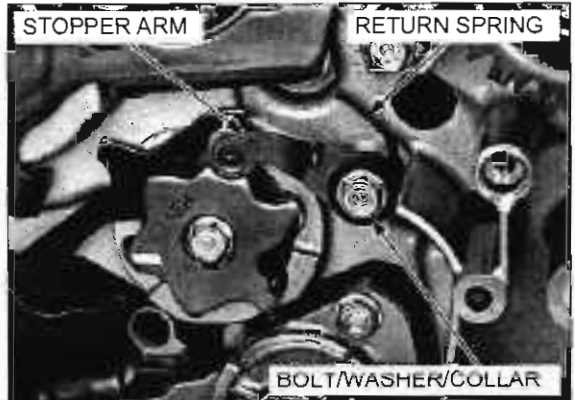


Remove the pivot collar and dust seals from the gearshift pedal.  
Check the dust seals for wear or damage.  
Replace the dust seal if necessary.



Remove the following:

- Bolt
- Washer
- Stopper arm
- Collar
- Return spring



Remove the gearshift spindle from the crankcase while unhooking the shifter arm from the gearshift cam plate.



## INSPECTION

Remove the bolt and stopper plate.

*Apply grease to the oil seal lips.*

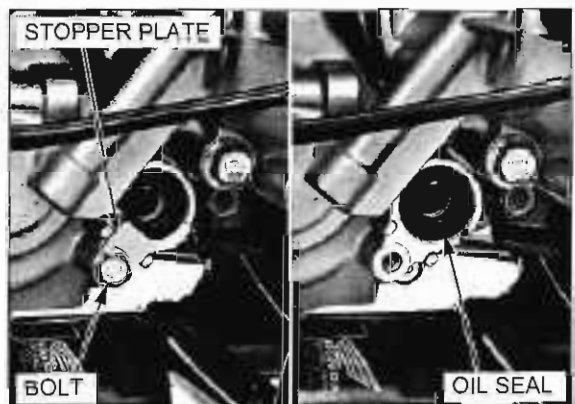
Check the gearshift spindle oil seal for deterioration or damage, replace it if necessary.

### NOTE:

Install the oil seal with its marked side facing out.

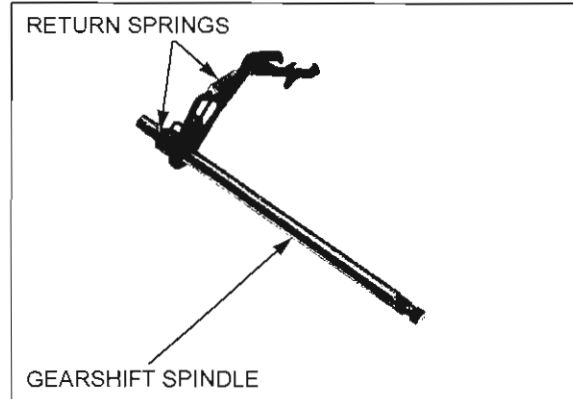
Install the stopper plate and tighten the bolt to the specified torque.

**TORQUE: 13 N·m (1.3 kgf·m, 10 lbf·ft)**

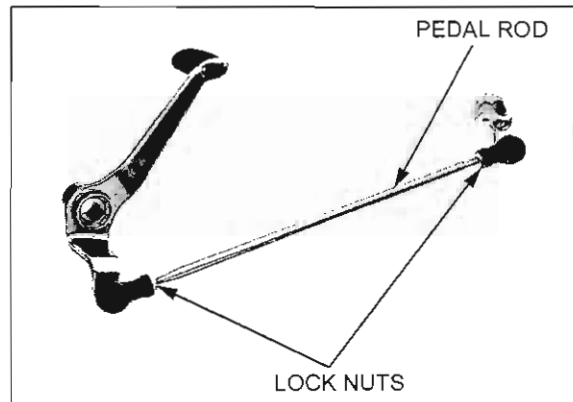


## CLUTCH/GEARSHIFT LINKAGE

Check the gearshift spindle for bend, wear or damage.  
Check the return springs for fatigue or damage.



Check the gearshift pedal rod for damage or loose lock nuts.  
Replace the rod if necessary.



### INSTALLATION

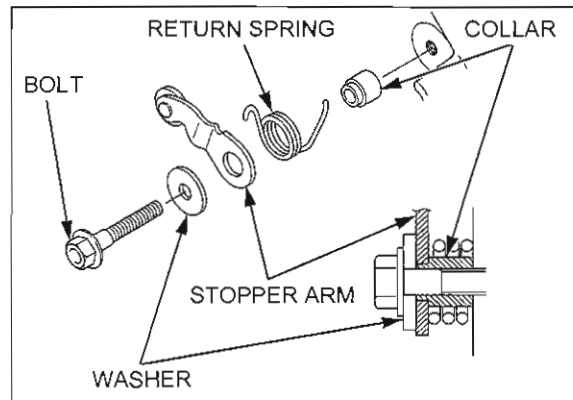
Install the gearshift spindle, aligning the return spring ends with the gearshift spindle return spring pin in the crankcase.

Hook the shifter arm to the gearshift cam plate.



Install the following:

- Collar
- Return spring
- Stopper arm
- Washer
- Bolt

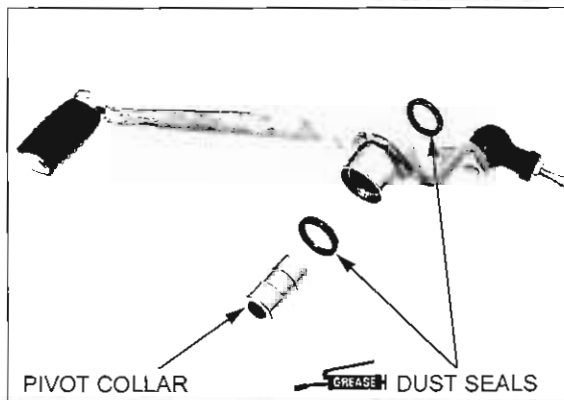


## CLUTCH/GEARSHIFT LINKAGE

Hold the stopper arm with the screwdriver, and tighten the bolt securely as shown.

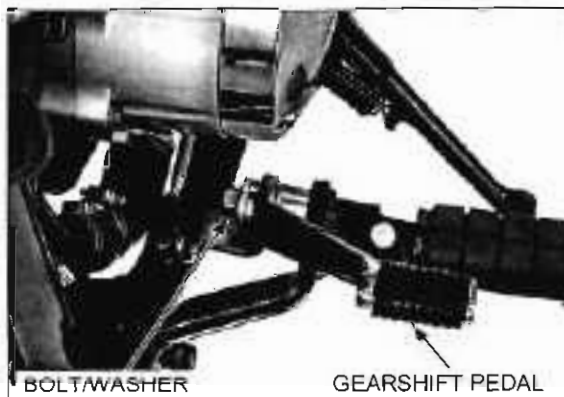


Apply grease to the dust seal lips. Install the dust seals and pivot collar to the gearshift pedal.



Install the gearshift pedal, washer and pivot bolt. Tighten the pivot bolt to the specified torque.

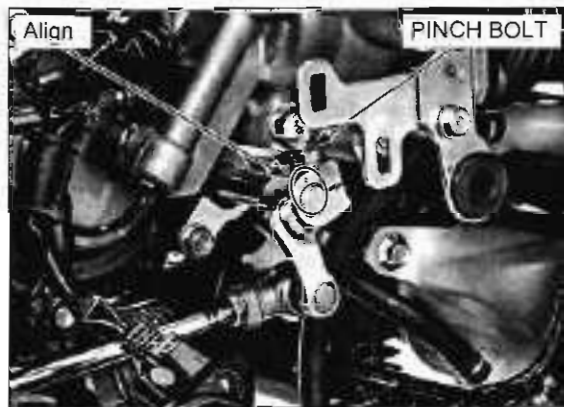
**TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)**



Install the gearshift arm to the spindle, aligning with the punch marks.

Tighten the pinch bolt to the specified torque.

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

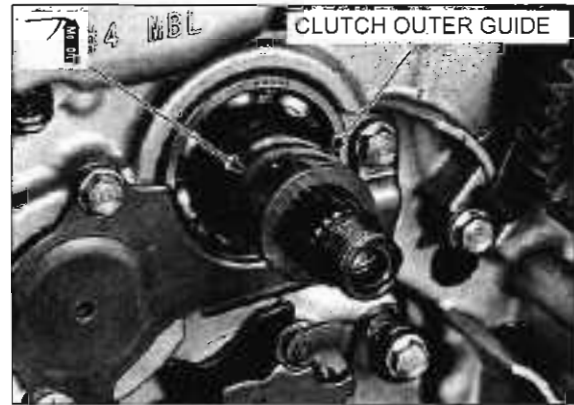


## CLUTCH/GEARSHIFT LINKAGE

### CLUTCH INSTALLATION

Apply molybdenum disulfide oil to the clutch outer guide outer surface.

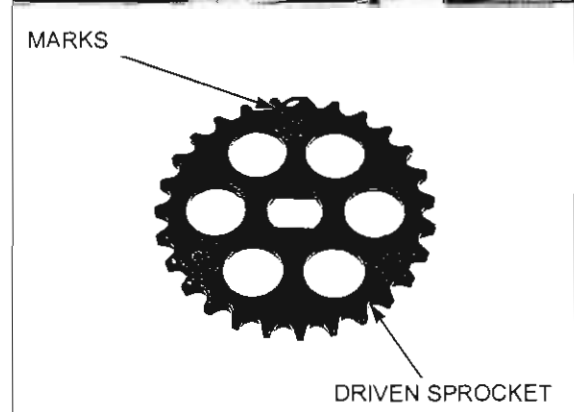
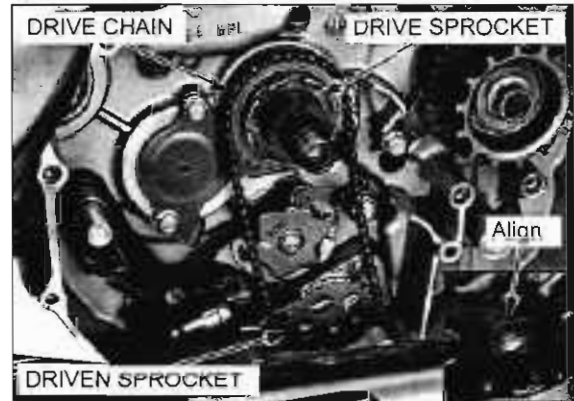
Install the clutch outer guide to the mainshaft.



Install the oil pump drive chain, drive sprocket and driven sprocket as a set.

**NOTE:**

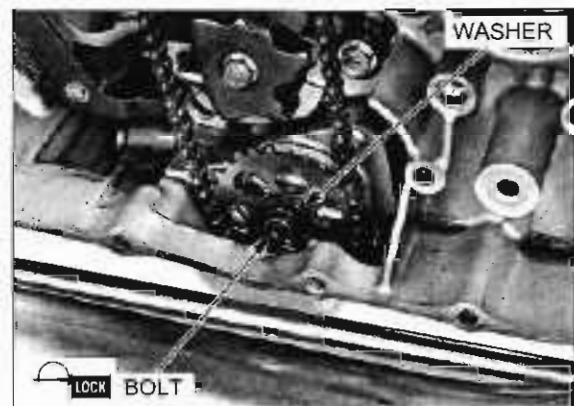
- Install the oil pump driven sprocket with the "O" marks side facing inside.
- Align the flat surfaces of the driven sprocket hole and oil pump shaft end.



Apply locking agent to the oil pump driven sprocket bolt threads and install the washer and bolt.

**NOTE:**

Tighten the driven sprocket bolt to the specified torque after installing the clutch.

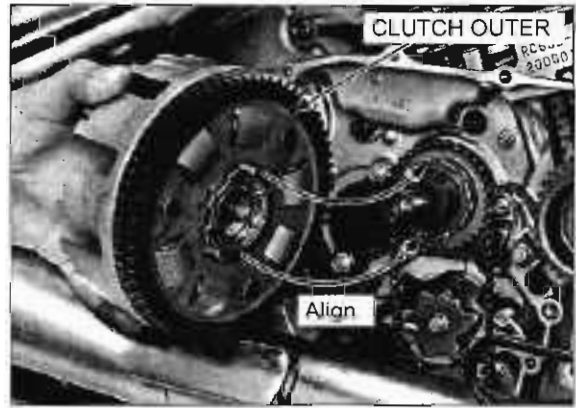


## CLUTCH/GEARSHIFT LINKAGE

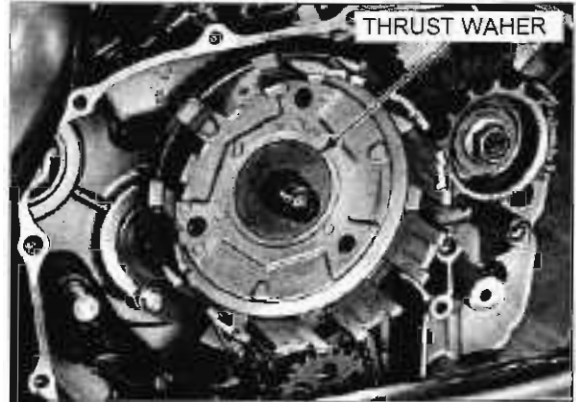
Install the clutch outer onto the mainshaft.

**NOTE:**

Align the grooves in the clutch outer with the bosses on the oil pump drive sprocket while turning the sprocket with the chain and pushing the clutch outer onto the mainshaft.



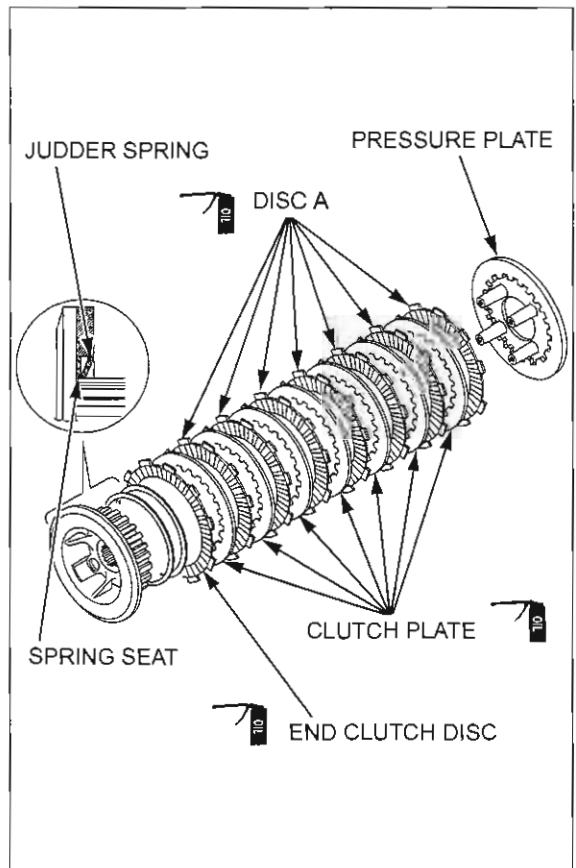
Install the thrust washer onto the mainshaft.



Coat the clutch discs and plates with engine oil.  
Install the spring seat and judder spring to the clutch center as shown.

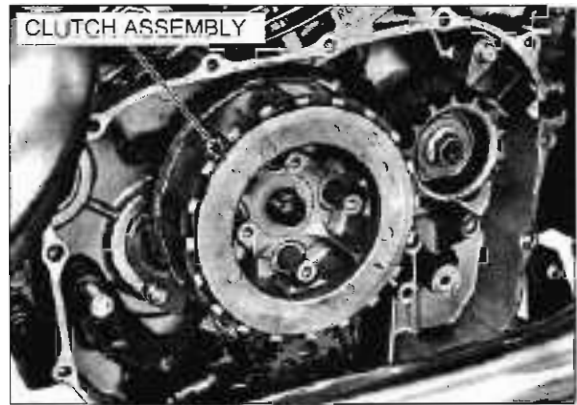
*End clutch disc has a larger I.D. than disc A.*

Install the end clutch disc.  
Install the seven clutch plates and seven discs A, starting with the clutch plate.  
Install the pressure plate.

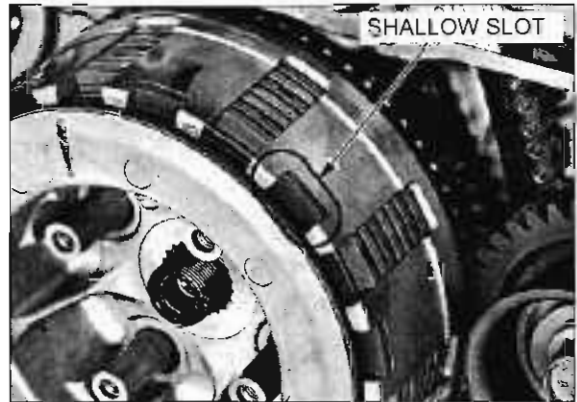


## CLUTCH/GEARSHIFT LINKAGE

Install the clutch assembly into the clutch outer.



Install the end clutch disc into the shallow slots of the clutch outer.



Install the thrust washer.

Install the spring washer with its "OUT SIDE" mark facing out.



Apply engine oil to the threads and seating surface of a new clutch center lock nut and install it onto the mainshaft.

Hold the clutch center using a special tool and tighten the lock nut to the specified torque.

### TOOL:

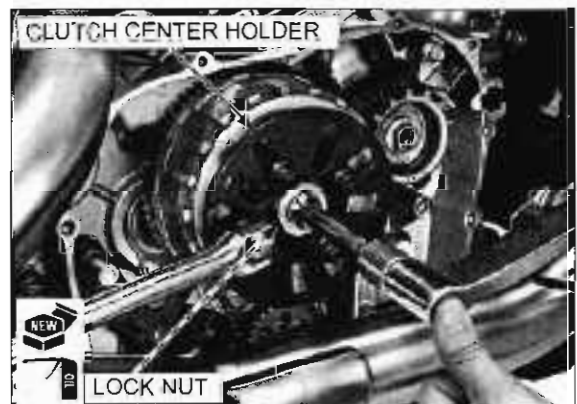
Clutch center holder 07JMB-MN50301

### USA TOOLS:

Clutch holder plater 07HGB-001010B

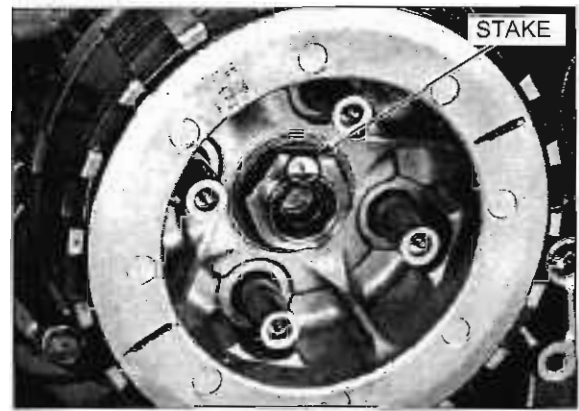
Clutch holder collars (set of 4) 07HGB-001020B

TORQUE: 128 N·m (13.1 kgf·m, 94 lbf·ft)



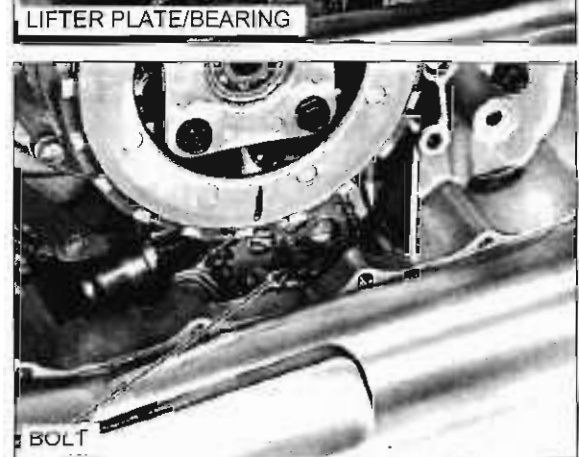
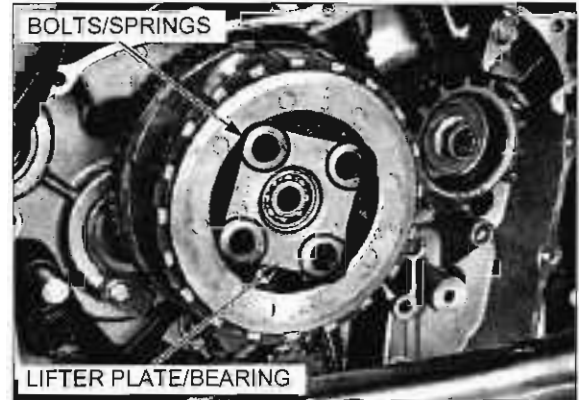
*Be careful not to damage the mainshaft threads.*

Stake the clutch center lock nut into the mainshaft groove.



Install the clutch springs, lifter plate/bearing and bolts. Tighten the bolts in a crisscross pattern in several steps to the specified torque.

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



If the oil pump driven sprocket is removed, tighten the oil pump driven sprocket bolt to the specified torque.

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

Install the right crankcase cover (page 10-21).



## RIGHT CRANKCASE COVER INSTALLATION

### ASSEMBLY

Apply engine oil to the clutch lifter arm sliding surface of the right crankcase cover.

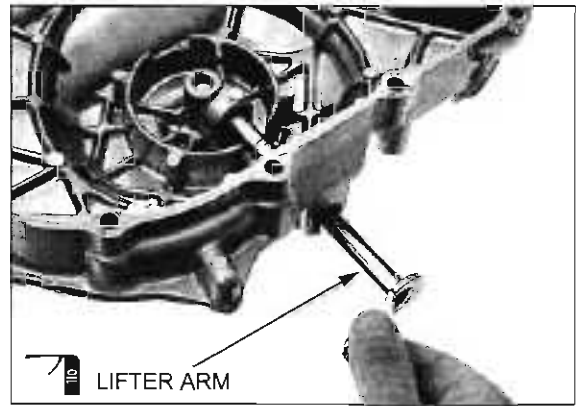
Apply grease to the oil seal lips.



## CLUTCH/GEARSHIFT LINKAGE

Apply engine oil to the clutch lifter arm sliding surface and slit.

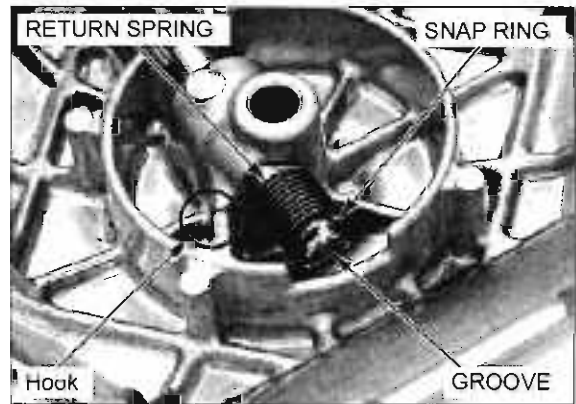
Install the clutch lifter arm.



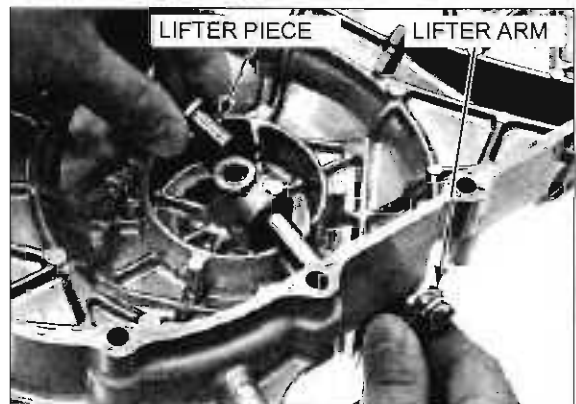
Install the return spring by inserting its short end into the clutch lifter arm groove.

Install the snap ring to the clutch lifter arm groove securely.

Hook the long spring end to the cover tab.

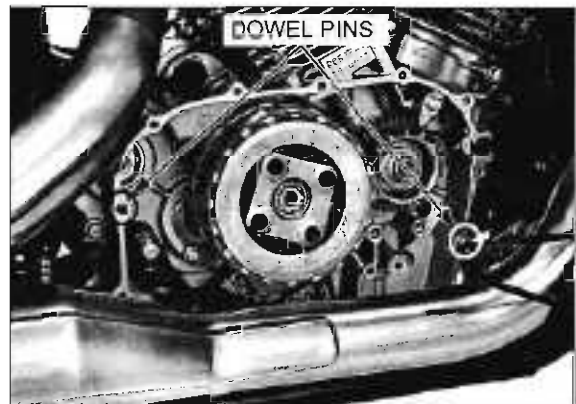


Install the clutch lifter piece, aligning the piece end with the groove in the clutch lifter arm by turning the clutch lifter arm clockwise.



## INSTALLATION

Install the dowel pins.



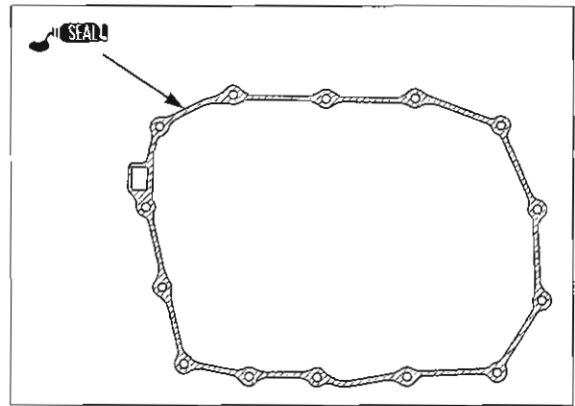


## CLUTCH/GEARSHIFT LINKAGE

*Be careful not to damage the mating surfaces.*

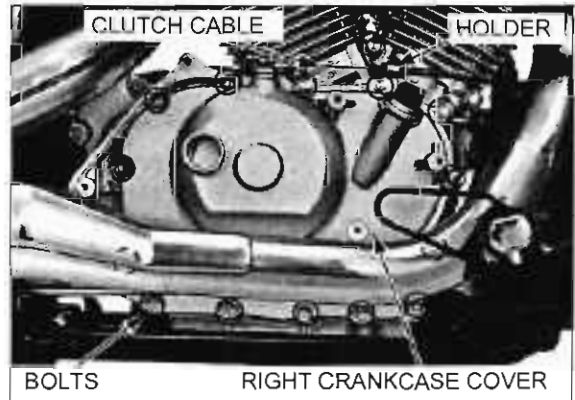
Clean the mating surfaces of the right crankcase and cover.

Apply liquid sealant (Three Bond 1207B or equivalent) to the right crankcase cover mating surface.



Connect the clutch cable.

Install the right crankcase cover, clutch cable holder and tighten the bolts in a crisscross pattern in several steps.

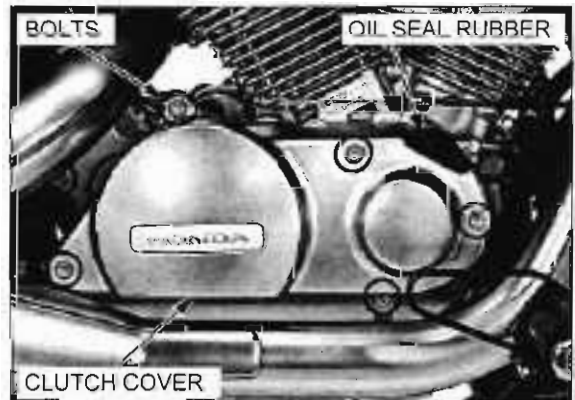


Install the oil seal rubber to the clutch cover with its small flange side facing up.

Install the clutch cover and tighten the bolts to the specified torque.

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

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



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MEMO

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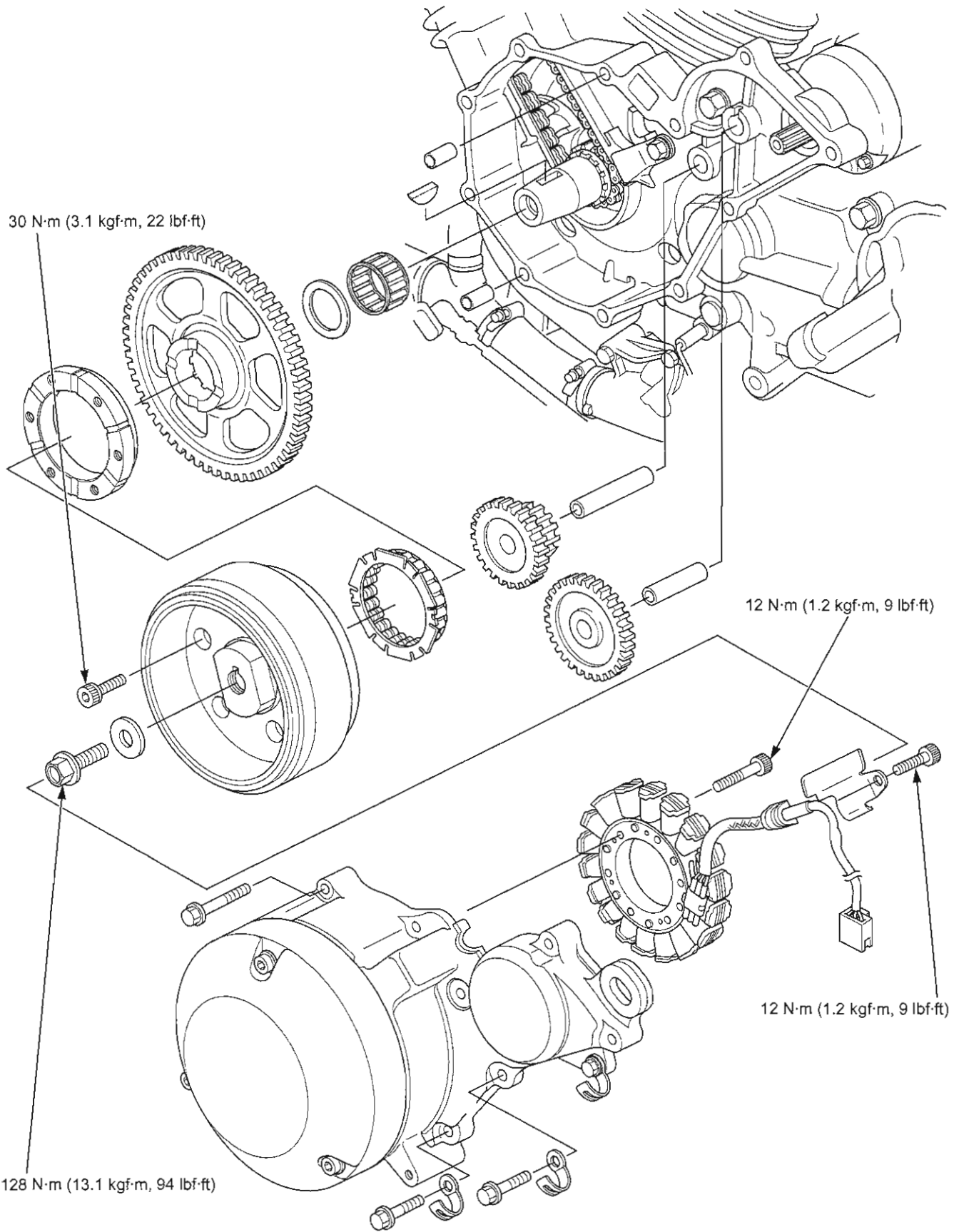
# 11. ALTERNATOR/STARTER CLUTCH

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COMPONENT LOCATION .....	11-2	STATOR REMOVAL .....	11-4
SERVICE INFORMATION .....	11-3	FLYWHEEL/STARTER CLUTCH .....	11-5
TROUBLESHOOTING.....	11-3	STATOR INSTALLATION.....	11-11

# ALTERNATOR/STARTER CLUTCH

## COMPONENT LOCATION



## SERVICE INFORMATION

### GENERAL

- This section covers service of the alternator stator and flywheel. All service can be done with the engine installed in the frame.
- For alternator inspection (page 18-10).
- For starter motor service (page 20-7).

### SPECIFICATIONS

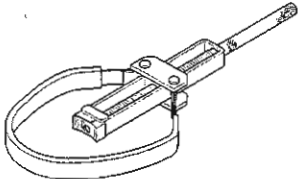
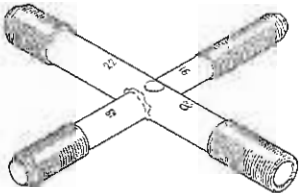
Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Starter driven gear	I.D.	37.000 – 37.025 (1.4567 – 1.4577)	37.10 (1.461)
	O.D.	57.749 – 57.768 (2.2736 – 2.2743)	57.73 (2.273)
Starter clutch outer I.D.		74.414 – 74.440 (2.9297 – 2.9307)	74.46 (2.931)

### TORQUE VALUES

Stator socket bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply locking agent to the threads Apply engine oil to the threads and seating surface Left hand threads
Flywheel bolt	128 N·m (13.1 kgf·m, 94 lbf·ft)	
Stator wire holder socket bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply locking agent to the threads Apply locking agent to the threads
Starter one-way clutch outer socket bolt	30 N·m (3.1 kgf·m, 22 lbf·ft)	

### TOOLS

<p>Flywheel holder 07725-0040001</p>  <p>Equivalent commercially available in U.S.A.</p>	<p>Rotor puller 07733-0020001</p>  <p>or 07933-3290001 (U.S.A. only)</p>
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### TROUBLESHOOTING

#### Starter motor turns, but engine does not turn

- Faulty starter clutch
- Damaged reduction gear
- Damaged starter idle gear

## ALTERNATOR/STARTER CLUTCH

### STATOR REMOVAL

Remove the following:

- Left side cover (page 2-3)
- Left crankcase rear cover (page 2-4)

Disconnect the alternator 3P (White) connector.  
Release the alternator wire from the wire bands.



Release the wires from the clamps.

Place a container under the left crankcase cover to catch the engine oil.

*Loosen the bolts in a crisscross pattern in several steps.*

Remove the bolts, clamps and left crankcase cover.

**NOTE:**

- The left crankcase cover (stator) is magnetically attached to the flywheel, be careful during removal.
- Be careful not to damage the alternator cover.



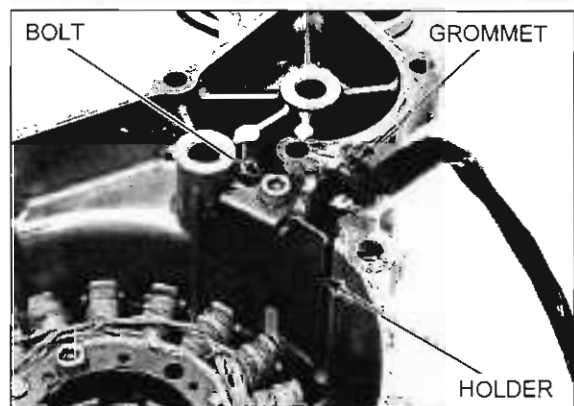
*Be careful not to damage the mating surface.*

Remove the dowel pins and clean off the sealant from the mating surface.

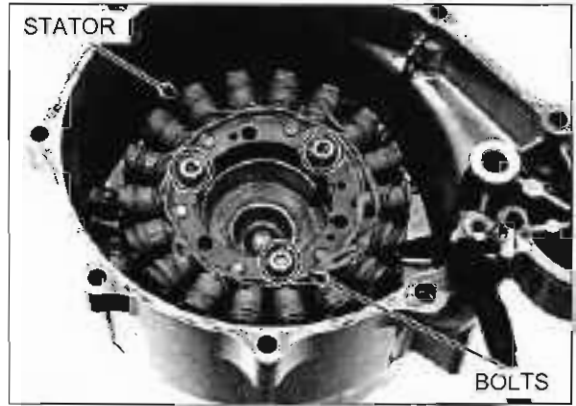


Remove the bolt and stator wire holder from the left crankcase cover.

Remove the wire grommet.



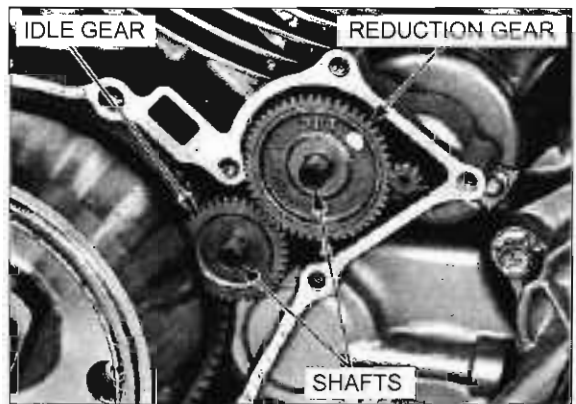
Remove the bolts and stator from the left crankcase cover.



## FLYWHEEL/STARTER CLUTCH

### FLYWHEEL REMOVAL

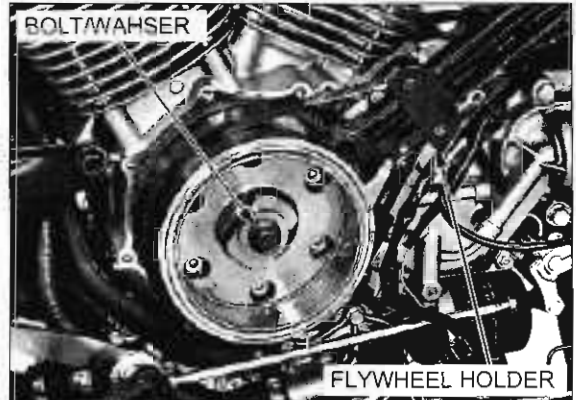
*For alternator charging coil inspection (page 18-10).* Remove the left crankcase cover (page 11-4).  
Remove the starter reduction gear and shaft.  
Remove the starter idle gear and shaft.



*The flywheel bolt has left hand threads.* Remove the flywheel bolt and washer while holding the flywheel using a special tool.

**TOOL:**  
Flywheel holder

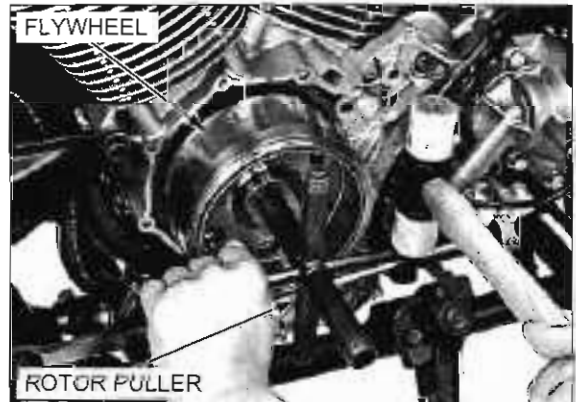
07725-0040001  
(Equivalent commercially available in U.S.A.)



Remove the flywheel using a special tool.

**TOOL:**  
Rotor puller

07733-0020001  
or 07933-3290001  
(U.S.A. only)

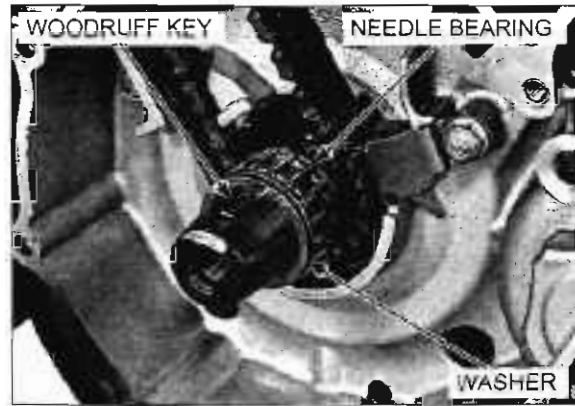


## ALTERNATOR/STARTER CLUTCH

Remove the washer, needle bearing and woodruff key from the crankshaft.

### NOTE:

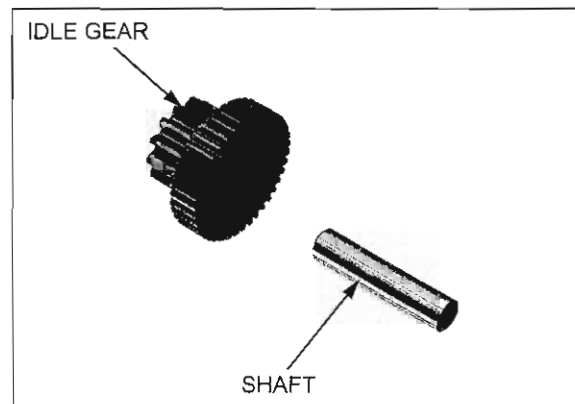
- During woodruff key removal, be careful not to damage the key groove and crankshaft.
- Do not lose the woodruff key.



## STARTER IDLE/REDUCTION GEAR INSPECTION

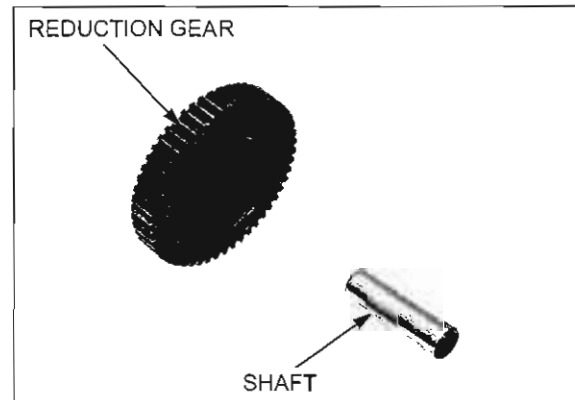
### STARTER IDLE GEAR/SHAFT

Check the starter idle gear and shaft for wear or damage.



### STARTER REDUCTION GEAR/SHAFT

Check the starter reduction gear and shaft for wear or damage.



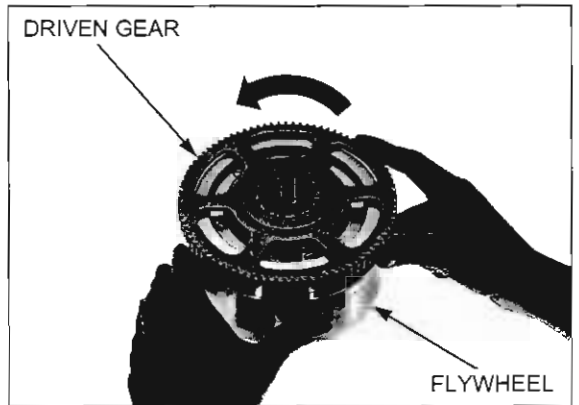


**STARTER DRIVEN GEAR/STARTER CLUTCH REMOVAL**

Check the operation of the one-way clutch by turning the starter driven gear.

You should be able to turn the driven gear counterclockwise smoothly, but the gear should not turn clockwise.

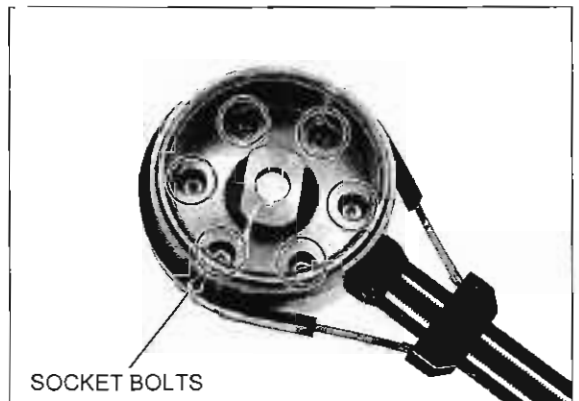
Remove the starter driven gear from the flywheel while turning the driven gear counterclockwise.



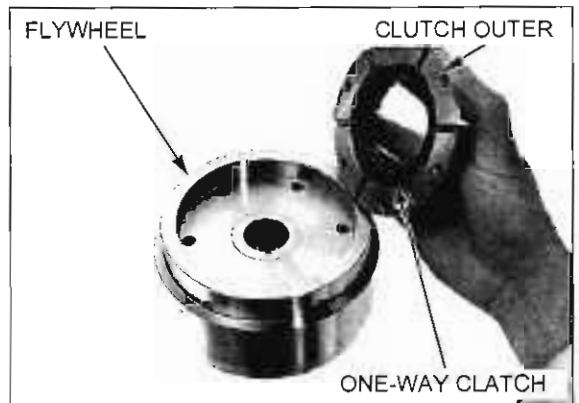
Remove the socket bolts while holding the flywheel using a special tool.

**TOOL:**  
Flywheel holder

**07725-0040001**  
(Equivalent commercially available in U.S.A.)



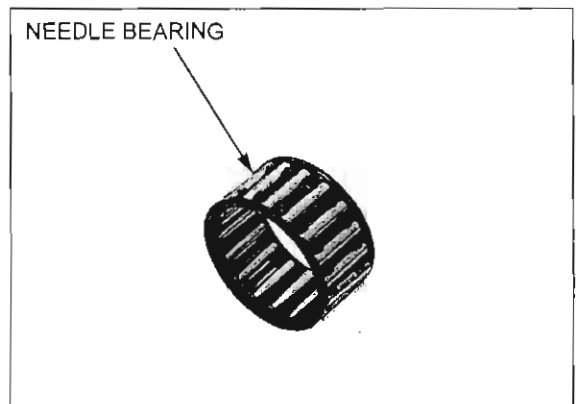
Remove the starter clutch outer/one-way clutch from the flywheel.



**STARTER CLUTCH INSPECTION**

**NEEDLE BEARING**

Check the needle bearing for abnormal wear or damage.



# ALTERNATOR/STARTER CLUTCH

## ONE-WAY CLUTCH/STARTER CLUTCH OUTER

Check the one-way clutch sprag for abnormal wear, damage or irregular movement.

### NOTE:

- Do not remove the one-way clutch from the clutch outer, unless it is necessary to replace with a new one.
- If the spring is removed from the one-way clutch groove, replace the one-way clutch assembly with a new one.

Check the starter clutch outer inner contact surface for wear or damage.

Measure the starter clutch outer I.D.

**SERVICE LIMIT: 74.46 mm (2.931 in)**

## STARTER DRIVEN GEAR

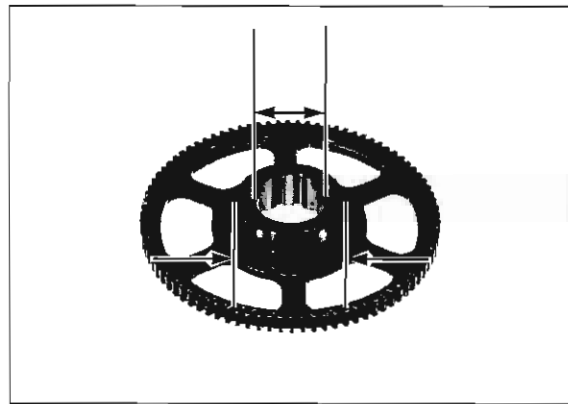
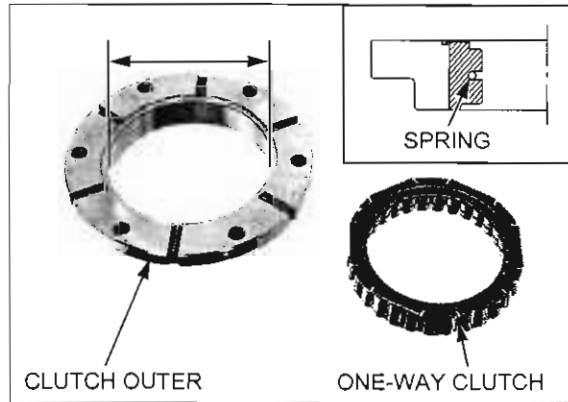
Check the one-way clutch sprag contact surface for wear or damage.

Measure the starter driven gear O.D.

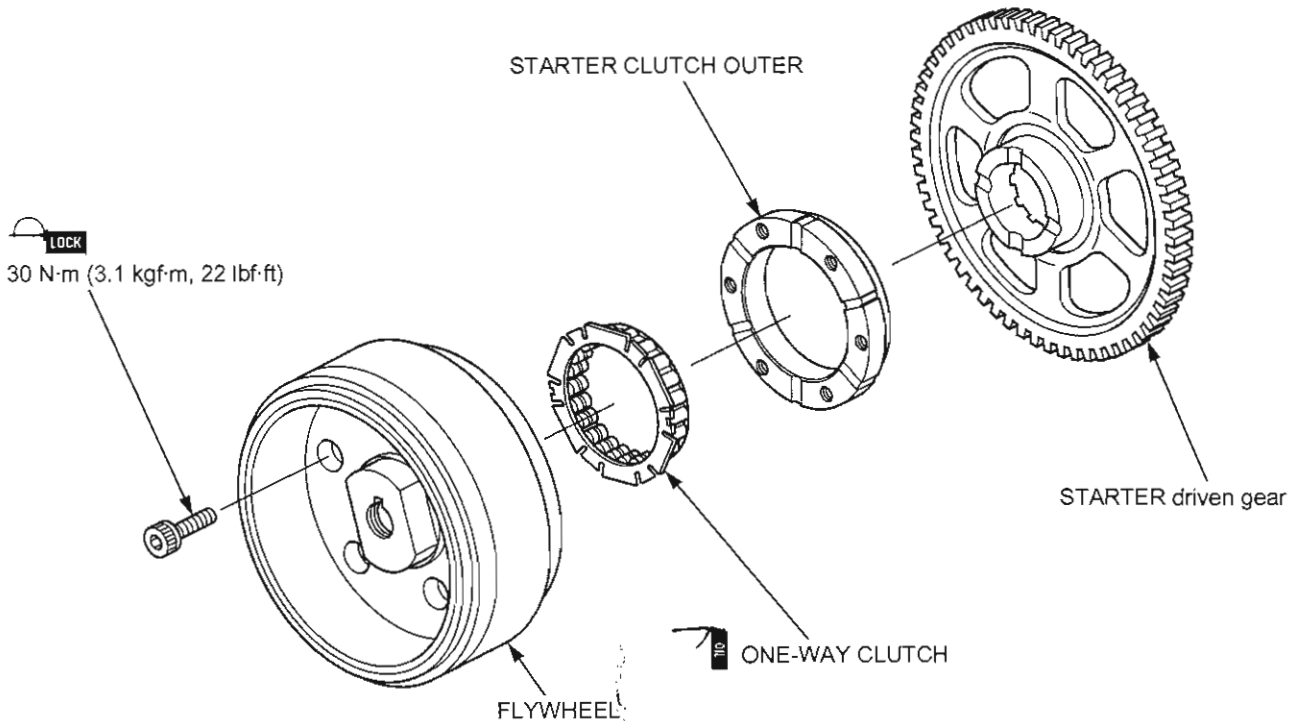
**SERVICE LIMIT: 57.73 mm (2.273 in)**

Measure the starter driven gear I.D.

**SERVICE LIMIT: 37.10 mm (1.461 in)**



## STARTER DRIVEN GEAR/STARTER CLUTCH INSTALLATION

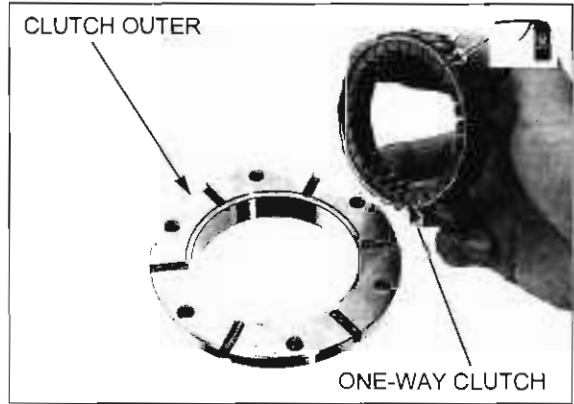


## ALTERNATOR/STARTER CLUTCH

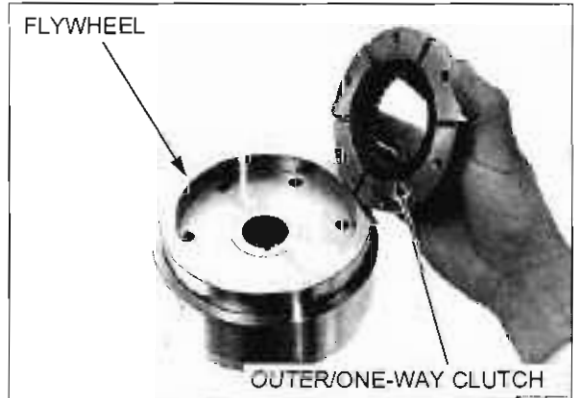
Clean the one-way clutch and apply engine oil to the sprag.  
Install the one-way clutch into the starter clutch outer with its flange side facing the flywheel.

**NOTE:**

If the spring is removed from the one-way clutch groove, replace the one-way clutch assembly with a new one.



Install the starter clutch outer/one-way clutch to the flywheel.



Hold the flywheel using a special tool.

**TOOL:**

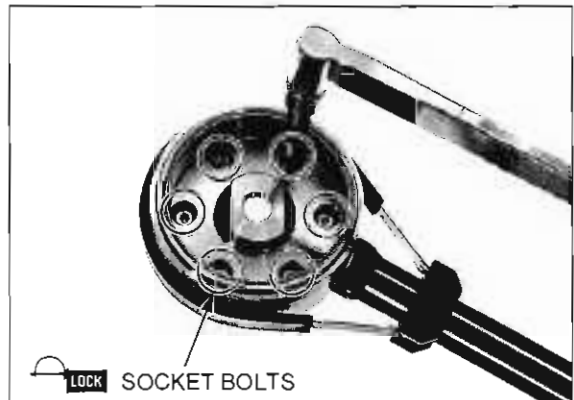
**Flywheel holder**

**07725-004001**  
**(Equivalent**  
**commercially**  
**available in U.S.A.)**

Clean and apply a locking agent to the socket bolt threads.

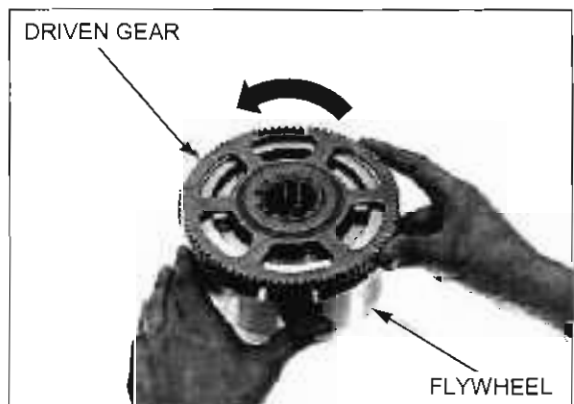
Install and tighten the socket bolts to the specified torque.

**TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)**



Install the starter driven gear to the flywheel while turning the driven gear counterclockwise.

Recheck the one-way clutch operation (page 11-7).



## ALTERNATOR/STARTER CLUTCH

### FLYWHEEL INSTALLATION

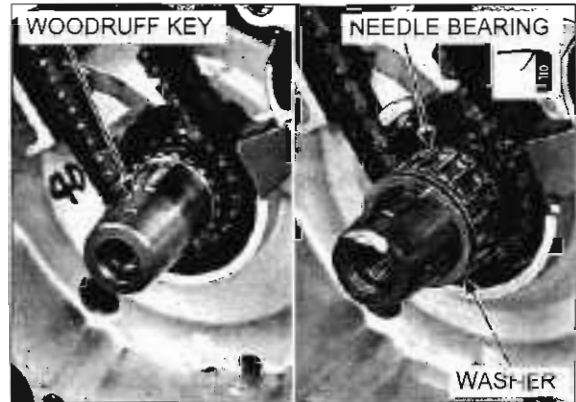
*During woodruff key installation, be careful not to damage the key groove or crankshaft.*

Install the woodruff key to the key groove of the crankshaft.

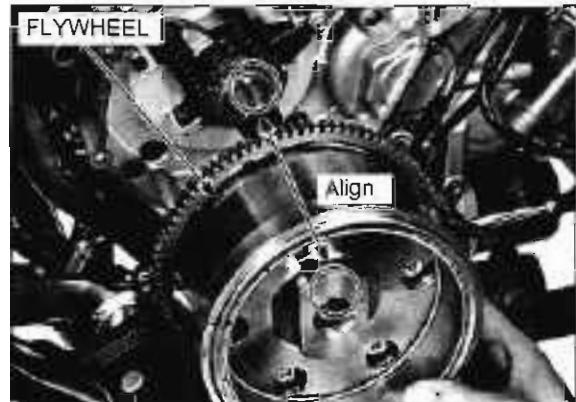
Apply engine oil to the needle bearing and install it to the crankshaft.

Install the washer to the crankshaft.

Wipe any oil off the mating surface of the crankshaft.



Wipe any oil off the mating surface of the flywheel. Install the flywheel to the crankshaft, aligning the key groove of the flywheel with the woodruff key on the crankshaft.



Hold the flywheel using a special tool.

#### TOOL:

**Flywheel holder**

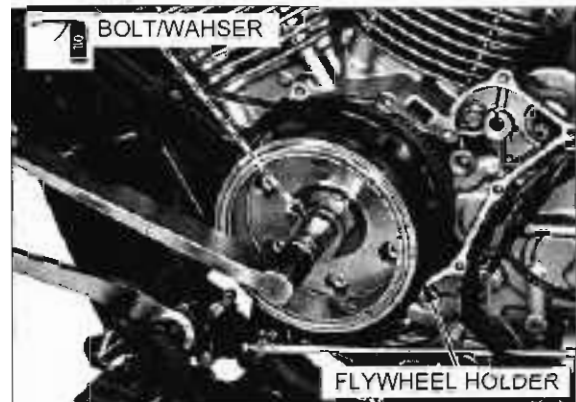
**07725-0040001**  
(Equivalent commercially available in U.S.A.)

Apply engine oil to the flywheel bolt threads and seating surface.

*The flywheel bolt has left hand threads.*

Install and tighten the flywheel bolt with the washer to the specified torque.

**TORQUE: 128 N·m (13.1 kgf·m, 94 lbf·ft)**



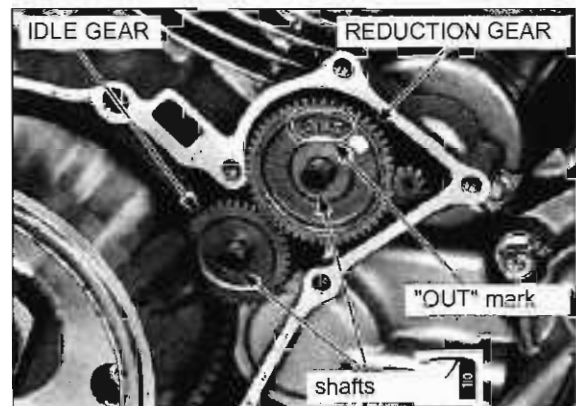
Apply engine oil to the starter reduction gear and starter idle gear shaft outer surface.

Install the starter reduction gear, idle gear and shafts to the left crankcase as an assembly.

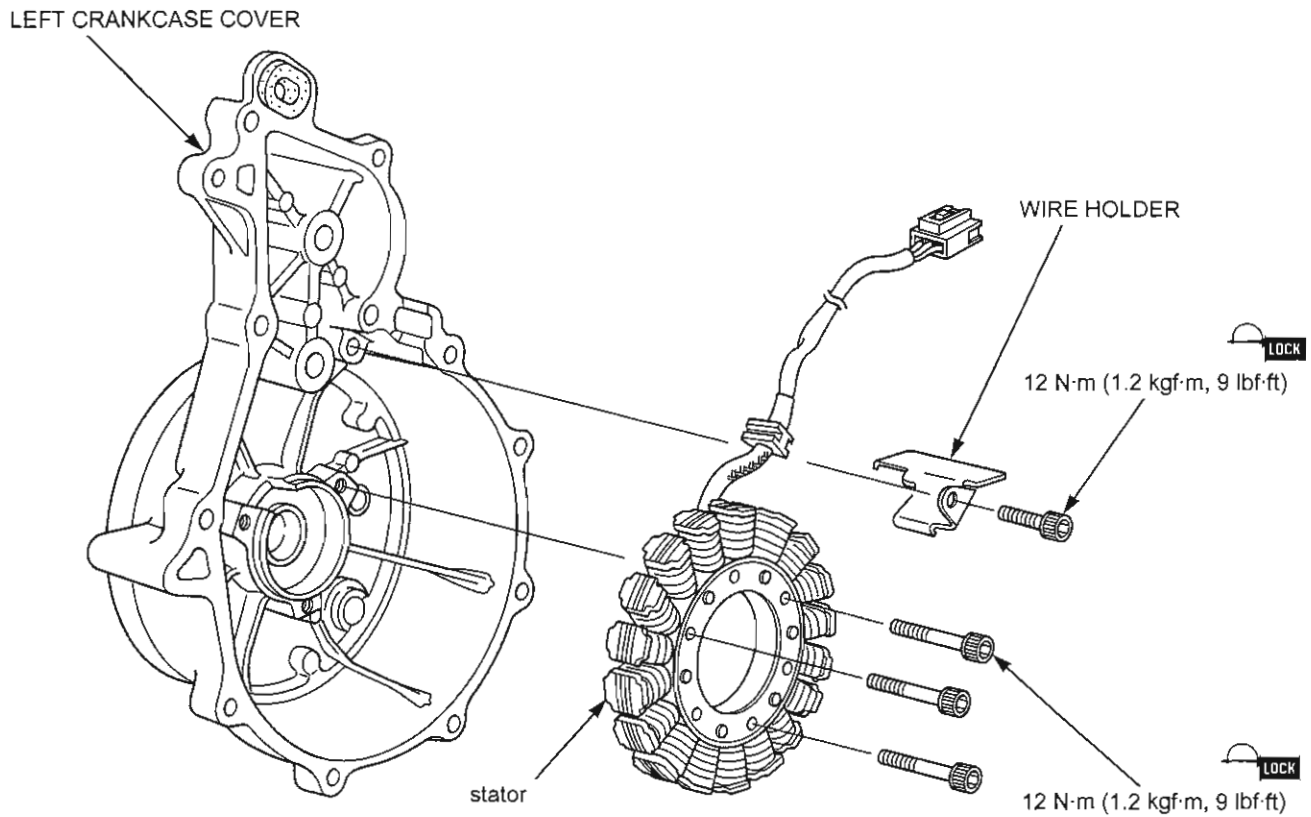
#### NOTE:

Install the starter reduction gear with its "OUT" mark facing out.

Install the stator and left crankcase cover (page 11-11).

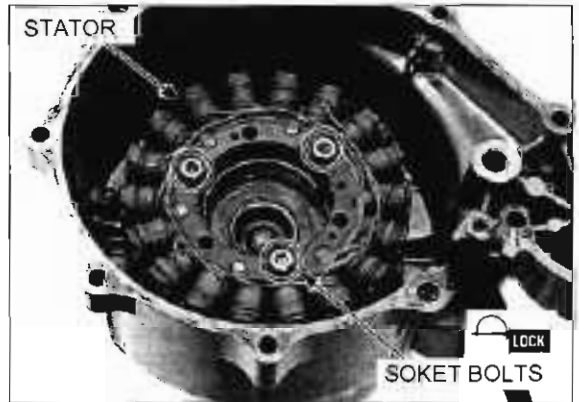


# STATOR INSTALLATION



Install the stator to the left crankcase cover.  
Clean and apply a locking agent to the bolt threads (page 1-23).  
Install and tighten the stator socket bolts to the specified torque.

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

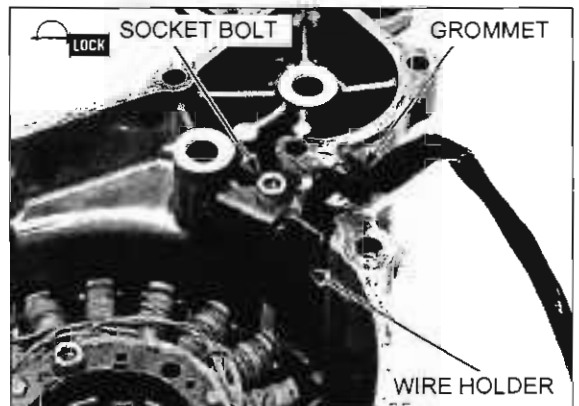


Install the grommet into the grooves in the left crankcase cover.

Clean and apply a locking agent to the bolt threads (page 1-23).

Install the wire holder to the left crankcase cover.  
Install and tighten the bolt to the specified torque.

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

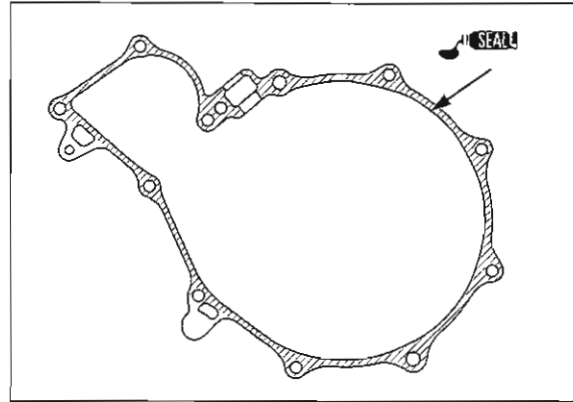


## ALTERNATOR/STARTER CLUTCH

Clean off the sealant from the left crankcase cover mating surface.

*Do not wipe off the excessive sealant by using the organic solvent.*

Apply liquid sealant (Three Bond 1207B or equivalent) to the left crankcase cover mating surface.



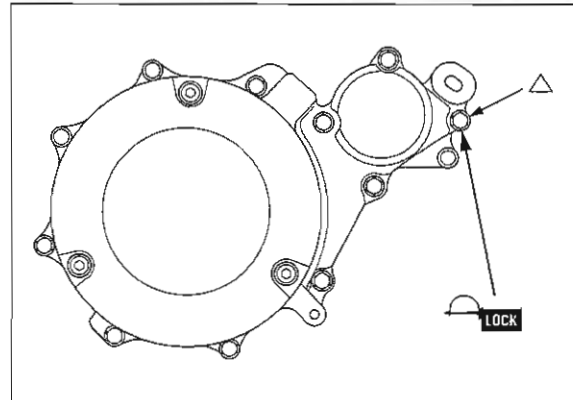
Install the dowel pins.



*The left crankcase cover (stator) is magnetically attracted to the flywheel, be careful during installation.*

Install the left crankcase cover.

Apply locking agent to the one left crankcase cover bolt (marked "△") threads as shown.



Install the clamps and left crankcase cover bolts. Tighten the left crankcase cover bolts in a crisscross pattern in several steps.

*Route the wires properly (page 1-26).*

Clamp the wires with the clamps.



## ALTERNATOR/STARTER CLUTCH

*Route the wires properly (page 1-26).* Clamp and bind the alternator wire with the clamp and wire bands.

Connect the alternator 3P (White) connector.

Install the following:

- Left crankcase rear cover (page 2-4)
- Left side cover (page 2-3)

Check the engine oil level (page 3-11).



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MEMO

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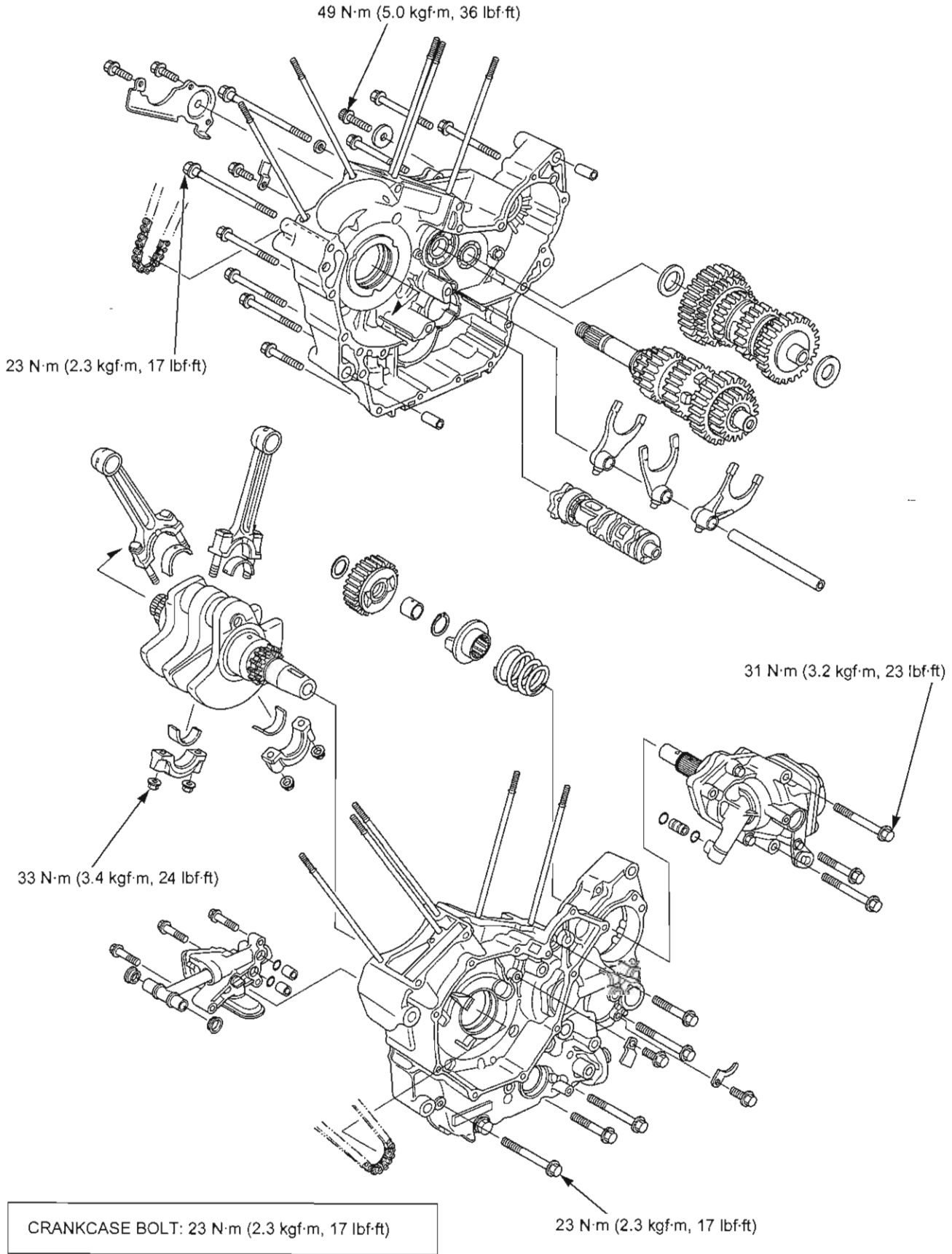
# 12. CRANKSHAFT/TRANSMISSION

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COMPONENT LOCATION.....	12-2	MAIN JOURNAL BEARING.....	12-16
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CRANKSHAFT/CONNECTING ROD.....	12-10	CRANKCASE ASSEMBLY.....	12-49
CRANKPIN BEARING.....	12-13		

# CRANKSHAFT/TRANSMISSION

## COMPONENT LOCATION



## SERVICE INFORMATION

### GENERAL

- The crankcase must be separated to service the following:
  - Oil pump
  - Crankshaft/connecting rod
  - Output gear
  - Transmission
- The following parts must be removed before separating the crankcase:
  - Oil filter cartridge (page 3-12)
  - Water pump (page 6-15)
  - Cylinder head (page 8-13)
  - Cylinder/piston (page 9-4)
  - Clutch (page 10-7)
  - Gearshift linkage (page 10-14)
  - Primary drive gear (page 10-12)
  - Flywheel (page 11-5)
  - Starter motor (page 20-7)
  - VS sensor (page 21-16)
  - Neutral switch (page 21-26)
  - EOP switch (page 4-5)
- Be careful not to damage the crankcase mating surfaces when servicing.
- Mark and store the connecting rods, bearing caps and bearing inserts to be sure of their correct locations for reassembly.
- The crankpin and main journal bearing inserts are select fit and are identified by color codes. Select replacement bearings from the code tables. After selecting new bearings, recheck the oil clearance. Incorrect oil clearance can cause major engine damage.
- Prior to assembling the crankcase halves, apply sealant to their mating surfaces. Wipe off excess sealant thoroughly.
- Whenever you replace the output driven/drive gears, bearings, bearing holder or gear case, perform the gear contact pattern and backlash inspection and adjust the shim. The extension lines from the gear engagement surfaces should intersect at one point.
- When using the lock nut wrench for the output gear case, use a deflecting beam type torque wrench 20 inches long. The lock nut wrench increases the torque wrench's leverage, so the torque wrench reading will be less than the torque actually applied to the lock nut. The specification given is the actual torque applied to the lock nut, not the reading on the torque wrench. Do not over tighten the lock nuts. The specification later in the text gives both actual and indicated.
- Protect the output gear case with a shop towel or soft jaws while holding it in vise. Do not clamp it too tightly as it could damage the gear case.

# CRANKSHAFT/TRANSMISSION

## SPECIFICATIONS

Unit: mm (in)

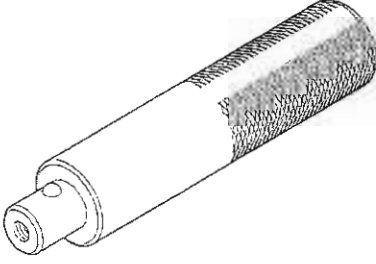
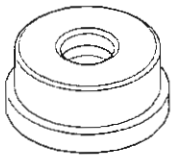
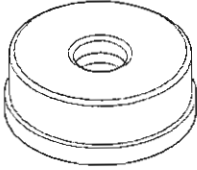
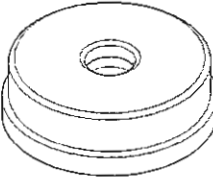



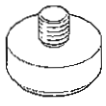
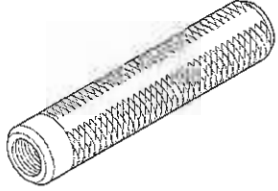
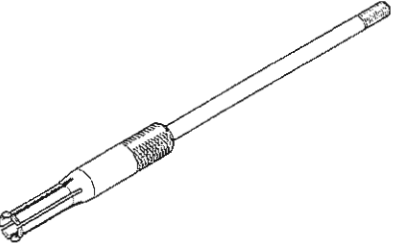
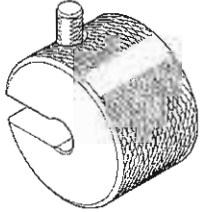
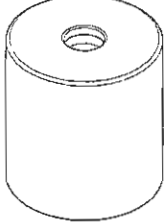
ITEM		STANDARD	SERVICE LIMIT	
Crankshaft	Connecting rod big end side clearance	0.05 – 0.20 (0.002 – 0.008)	0.30 (0.012)	
	Crankpin bearing oil clearance	0.028 – 0.052 (0.0011 – 0.0020)	0.07 (0.003)	
	Main journal oil clearance	0.020 – 0.038 (0.0008 – 0.0015)	0.07 (0.003)	
	Crankshaft runout	–	0.03 (0.001)	
	Main journal O.D.	52.982 – 53.000 (2.0859 – 2.0866)	52.976 (2.0857)	
Main journal I.D.		58.010 – 58.022 (2.2839 – 2.2843)	58.070 (2.2862)	
Shift fork, fork shaft	I.D.	13.000 – 13.018 (0.5118 – 0.5125)	13.03 (0.513)	
	Claw thickness	5.93 – 6.00 (0.233 – 0.236)	5.6 (0.22)	
	Fork shaft O.D.	12.966 – 12.984 (0.5105 – 0.5112)	12.90 (0.508)	
Shift drum O.D. at left end		11.966 – 11.984 (0.4711 – 0.4718)	11.94 (0.470)	
Shift drum journal I.D.		12.000 – 12.018 (0.4724 – 0.4731)	12.05 (0.474)	
Shift drum-to-shift drum journal clearance		0.016 – 0.052 (0.0006 – 0.0020)	0.09 (0.035)	
Transmission	Gear I.D.	M3, M5	28.000 – 28.021 (1.1024 – 1.1032)	28.04 (1.104)
		C1, C4	31.000 – 31.025 (1.2205 – 1.2215)	31.05 (1.222)
		C2	24.000 – 24.021 (0.9449 – 0.9457)	24.04 (0.946)
	Gear busing O.D.	M3, M5	27.959 – 27.980 (1.1007 – 1.1016)	27.94 (1.100)
		C1, C4	30.950 – 30.975 (1.2185 – 1.2195)	30.93 (1.218)
		C2	23.959 – 23.980 (0.9433 – 0.9441)	23.94 (0.943)
	Gear-to-bushing clearance	M3, M5, C2	0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
		C1, C4	0.025 – 0.075 (0.0010 – 0.0030)	0.11 (0.004)
	Gear bushing I.D.	M3	25.000 – 25.021 (0.9843 – 0.9851)	25.04 (0.986)
		C2	20.000 – 20.021 (0.7874 – 0.7882)	20.04 (0.789)
	Mainshaft O.D.	at M3 bushing	24.959 – 24.980 (0.9826 – 0.9835)	24.94 (0.982)
	Countershaft O.D.	at C2 bushing	19.980 – 19.993 (0.7866 – 0.7871)	19.96 (0.786)
	Bushing-to-shaft clearance	M3	0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
		C2	0.007 – 0.041 (0.0003 – 0.0016)	0.07 (0.003)
	Output drive train	Output gear I.D.		24.000 – 24.021 (0.9449 – 0.9457)
Output gear bushing		O.D.	23.959 – 23.980 (0.9433 – 0.9441)	23.70 (0.933)
		I.D.	20.020 – 20.041 (0.7882 – 0.7890)	20.06 (0.790)
Output drive gear shaft O.D.		19.979 – 20.000 (0.7866 – 0.7874)	19.97 (0.786)	
Gear-to-bushing clearance		0.020 – 0.062 (0.0008 – 0.0024)	0.082 (0.0032)	
Gear bushing-to-shaft clearance		0.020 – 0.042 (0.0008 – 0.0017)	0.08 (0.003)	
Output gear damper spring free length		62.3 (2.45)	59 (2.3)	
Output drive gear backlash		0.08 – 0.23 (0.003 – 0.009)	0.40 (0.016)	
Backlash difference between measurements		–	0.10 (0.004)	

**TOEQUE VALUES**

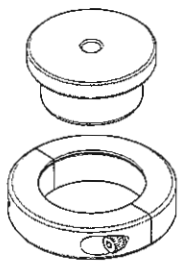
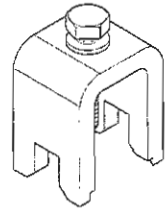
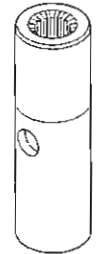
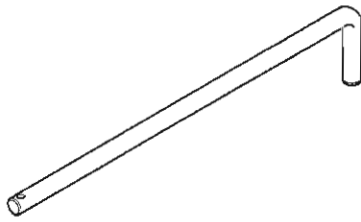
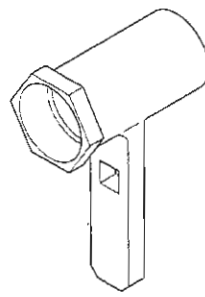
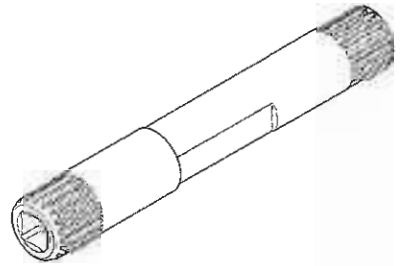
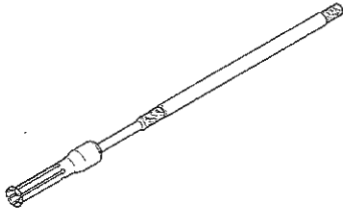
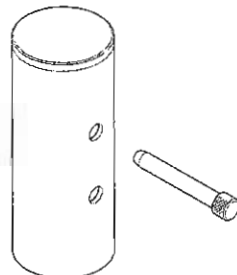
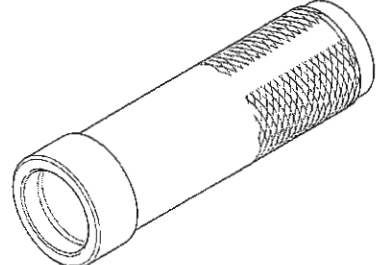
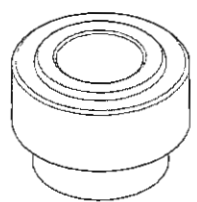
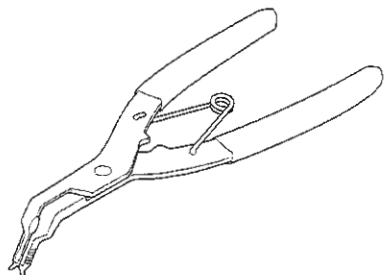
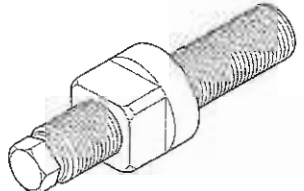
Crankcase bolt (8 mm)	23 N·m (2.3 kgf·m, 17 lbf·ft)	
Crankpin bearing cap nut	33 N·m (3.4 kgf·m, 24 lbf·ft)	Apply engine oil to the threads and seating surface
Gearshift cam plate bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply locking agent to the threads
Output gear case mounting bolt	31 N·m (3.2 kgf·m, 23 lbf·ft)	Apply sealant to the threads
Output drive gear assembly mounting bolt	31 N·m (3.2 kgf·m, 23 lbf·ft)	Apply engine oil to the threads and seating surface
Output drive gear bearing lock nut (inner)	73 N·m (7.4 kgf·m, 54 lbf·ft)	Lock nut; replace with a new one and stake Apply engine oil to the threads and seating surface
(outer)	98 N·m (10.0 kgf·m, 72 lbf·ft)	Lock nut; replace with a new one and stake Apply engine oil to the threads and seating surface
Output driven gear bearing lock nut (inner)	73 N·m (7.4 kgf·m, 54 lbf·ft)	Lock nut; replace with a new one and stake Apply engine oil to the threads and seating surface
(outer)	98 N·m (10.0 kgf·m, 72 lbf·ft)	Lock nut; replace with a new one and stake Apply engine oil to the threads and seating surface
Output driven gear shaft bolt	49 N·m (5.0 kgf·m, 36 lbf·ft)	
Output driven gear assembly mounting socket bolt	31 N·m (3.2 kgf·m, 23 lbf·ft)	Apply engine oil to the threads and seating surface

# CRANKSHAFT/TRANSMISSION

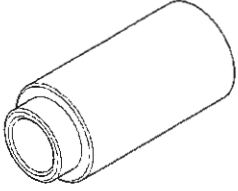
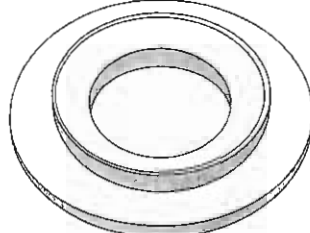
## TOOLS

<p>Driver 07749-0010000</p>  A long, cylindrical driver tool with a textured grip section and a small diameter end.	<p>Attachment, 42 x 47 mm 07746-0010300</p>  A circular attachment with a central hole and a textured outer ring.	<p>Attachment, 52 x 55 mm 07746-0010400</p>  A circular attachment with a central hole and a textured outer ring, larger than the 42 x 47 mm version.
<p>Attachment, 62 x 68 mm 07746-0010500</p>  A circular attachment with a central hole and a textured outer ring, the largest of the three.	<p>Pilot, 22 mm 07746-0041000</p>  A small cylindrical pilot tool with a threaded top.	<p>Pilot, 17 mm 07746-0040400</p>  A small cylindrical pilot tool with a threaded top, smaller than the 22 mm version.
<p>Pilot, 20 mm 07746-0040500</p>  A small cylindrical pilot tool with a threaded top.	<p>Pilot, 30 mm 07746-0040700</p>  A small cylindrical pilot tool with a threaded top.	<p>Remover handle 07936-3710100</p>  A long, cylindrical handle with a textured grip section.
<p>Bearing remover set, 20 mm 07936-3710600</p>  A long, thin tool with a handle and a small diameter end.	<p>Remover weight 07741-0010201</p>  A cylindrical weight with a central hole and a textured outer ring. <p>07936-371020A or 07936-3710200 (U.S.A. only)</p>	<p>Driver, 57 mm 070MF-MEG0100</p>  A cylindrical driver tool with a central hole and a textured outer ring.

# CRANKSHAFT/TRANSMISSION

<p>Metal installer set 070MF-MEG0200</p> 	<p>Damper spring compressor 07964-ME90000</p>  <p>Not available in U.S.A.</p>	<p>Shaft holder A 07PAB-0010100</p> 
<p>Holder handle 07PAB-0010400</p>  <p>Not available in U.S.A.</p>	<p>Lock nut wrench, 36 x 47.8 mm 07916-MB00002</p> 	<p>Differential inspection tool 07KMK-HC50101</p> 
<p>Bearing remover set, 17 mm 07936-3710300</p> 	<p>Oil seal driver 07965-KE80200</p> 	<p>Driver, 40 mm I.D. 07746-0030100</p> 
<p>Attachment, 30 mm I.D. 07746-0030300</p> 	<p>Snap ring pliers 07914-5670101</p>  <p>Equivalent commercially available in U.S.A.</p>	<p>Assembly bolt 07965-1660200</p> 

## CRANKSHAFT/TRANSMISSION

<p>Assembly collar 07965-1660302</p>  <p>or 07965-166030A (U.S.A. only)</p>	<p>Threaded adaptor 07965-KA30000</p> 	<p>Compressor seat 07967-9690200</p> 
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## TROUBLESHOOTING

### Excessive engine noise

- Worn main journal bearings
- Worn crankpin bearings
- Worn or damaged transmission gear
- Worn or damaged transmission bearings

### Excessive noise in side gear

- Worn or damaged output shaft and final drive shaft gears
- Worn or damaged output gear case bearing
- Incorrect adjusted shim

### Hard to shift

- Improper clutch operation (page 10-9)
- Incorrect engine oil viscosity
- Bent shift forks
- Bent shift fork shaft
- Bent shift fork claw
- Damaged shift drum cam grooves
- Bent gearshift spindle

### Transmission jumps out of gear

- Worn gear dogs or holes
- Worn gear shifter groove
- Bent shift fork shaft
- Broken shift drum stopper arm
- Worn or bent shift forks
- Broken drum stopper arm spring
- Broken gearshift spindle return spring



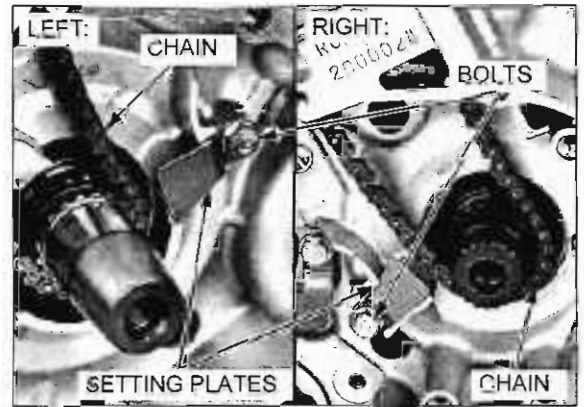
# CRANKCASE SEPARATION

Remove the engine from the frame (page 7-4).

Refer to Service Information (page 12-3) for removal of necessary parts before separating the crankcase.

Remove the bolts and cam chain tensioner setting plates.

Remove the cam chains.

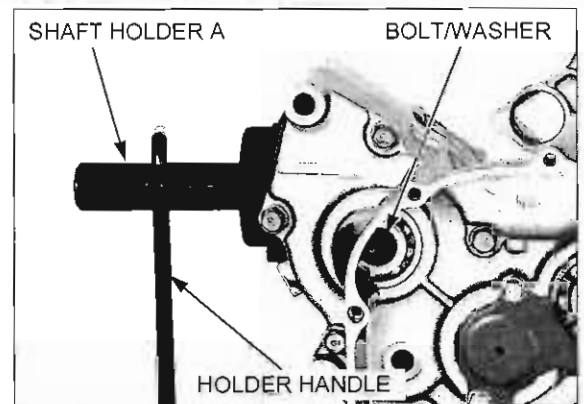


Hold the output driven gear shaft using the special tools, loosen the output drive gear shaft bolt and remove it with the washer.

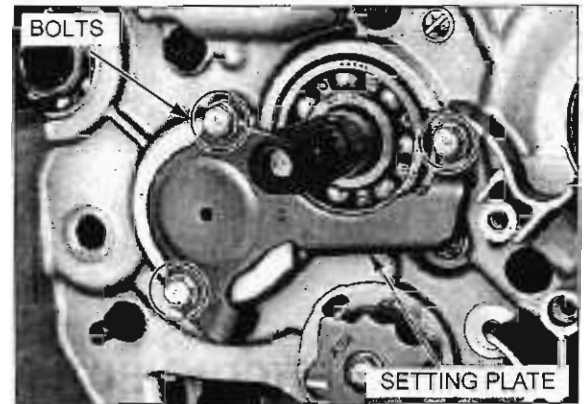
**TOOLS:**

Shaft holder A  
Holder handle

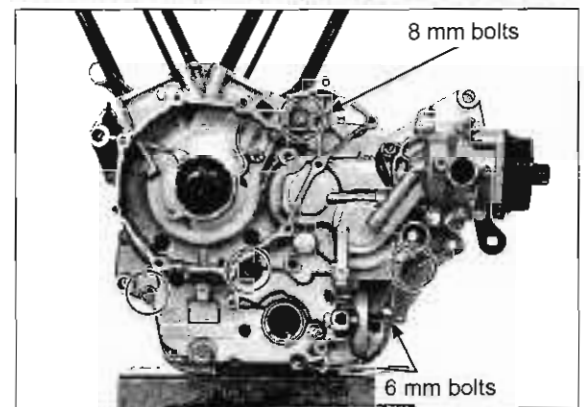
07PAB-0010100  
07PAB-0010400



Remove the bolts and bearing setting plate.



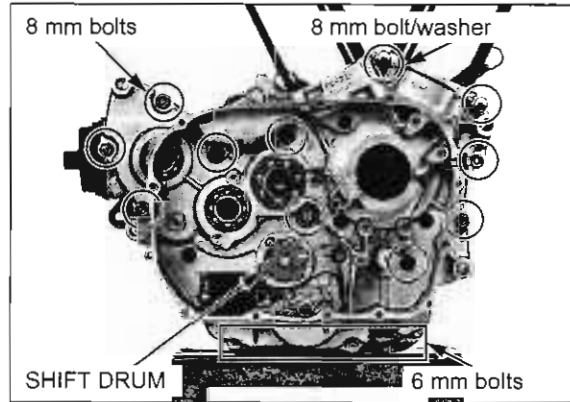
Loosen and remove the 6 mm and 8 mm bolts in a crisscross pattern in several steps.



## CRANKSHAFT/TRANSMISSION

Loosen and remove the 6 mm and 8 mm bolts with washer in a crisscross pattern in several steps.

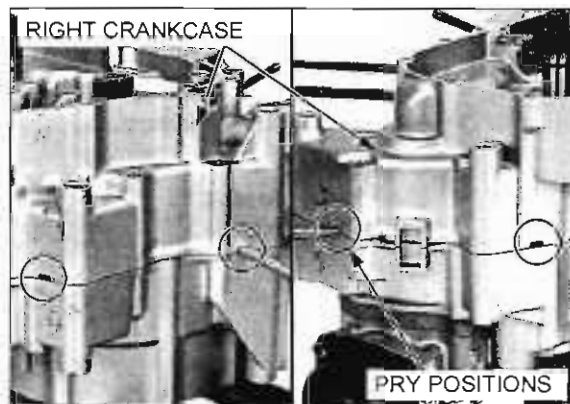
Turn the shift drum until the position as shown.



Place the crankcase with the left crankcase down and remove the right crankcase.

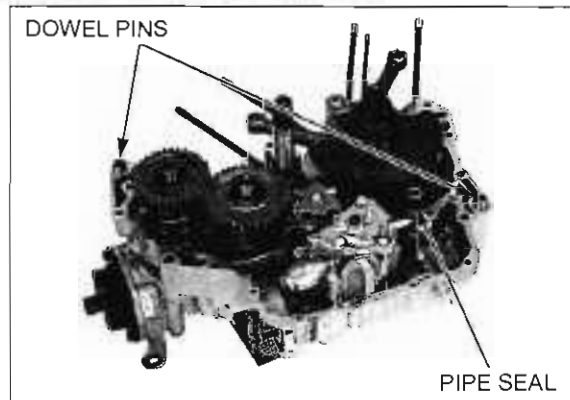
### NOTE:

- Separate the right crankcase from the left crankcase while prying at the points as shown.
- Separate the right crankcase from the left crankcase while tapping them at several locations with a soft hammer.



Remove the dowel pins and pipe seal.

Clean off the sealant from the left and right crankcase mating surfaces.



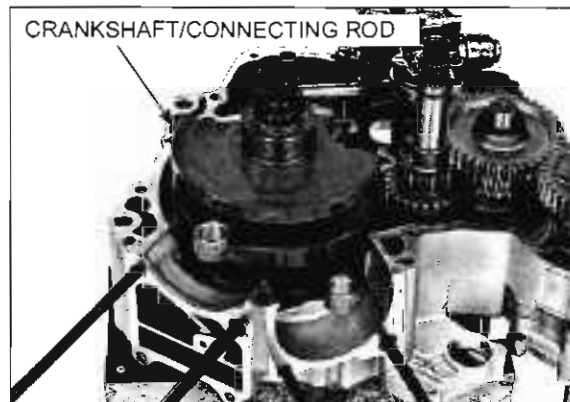
## CRANKSHAFT/CONNECTING ROD

### CRANKSHAFT REMOVAL

Separate the crankcase (page 12-9).

*During crankshaft and connecting rod service, be careful not to damage the main journal or crankpin bearing inserts.*

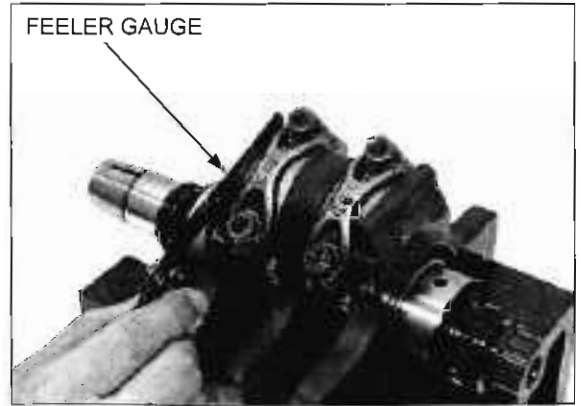
Remove the crankshaft/connecting rod from the left crankcase.



### SIDE CLEARANCE INSPECTION

Before removing the connecting rods, check the big end side clearance.  
Measure the side clearance by inserting the feeler gauge between the crankshaft and connecting rod big end.

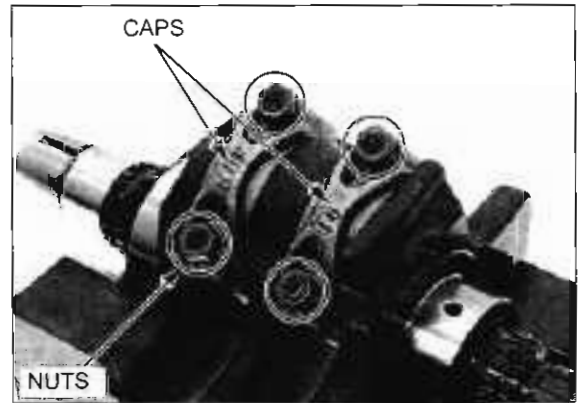
**SERVICE LIMIT: 0.30 mm (0.012 in)**



### CONNECTING ROD REMOVAL

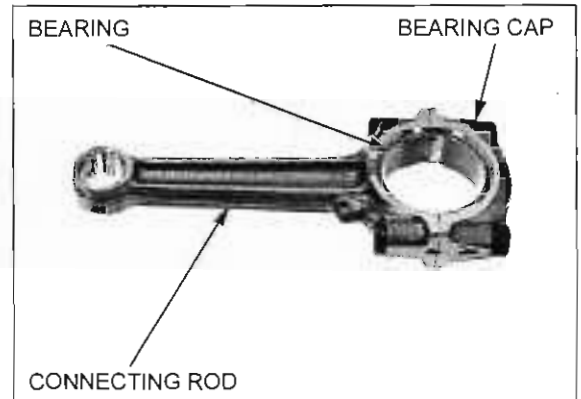
*Tap the side of the cap lightly if bearing cap is hard to remove.*

Remove the crankpin bearing cap nuts and the bearing caps.



Mark the rods, bearings and caps as you remove them to indicate the correct cylinder and position on the crankpins for reassembly.

For the connecting rod small end inspection (page 9-7).



## CRANKSHAFT/TRANSMISSION

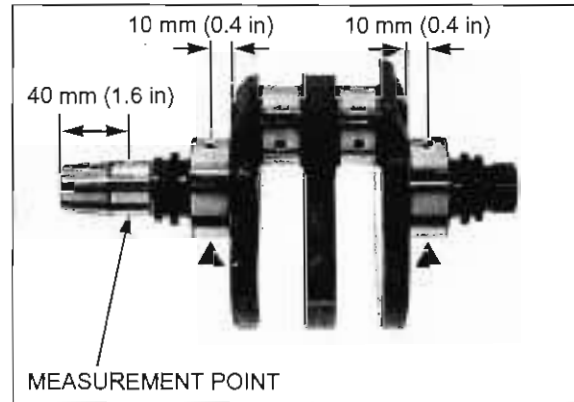
### CRANKSHAFT INSPECTION

Check the crankshaft journal surfaces for damage, discoloration or scratch.

### CRANKSHAFT RUNOUT

Place the crankshaft on a stand or V-blocks.  
Set a dial indicator on the main journals.  
Rotate the crankshaft two revolutions and read the runout.

**SERVICE LIMIT: 0.03 mm (0.001 in)**



### CONNECTING ROD INSTALLATION

#### NOTICE

*Do not interchange the bearing inserts. They must be installed in their original locations or the correct bearing oil clearance may not be obtained, resulting in engine damage.*

Wipe any oil from the connecting rod, cap and bearing inserts.

Install the bearing inserts on the connecting rods and caps by aligning the tab with the groove.

Apply molybdenum disulfide oil to the thrust surface of the crankpin bearings.

Install the rods and caps on the crankshaft by aligning the I.D. code on the rod and cap. Be sure each part is installed in its original position, as noted during removal.

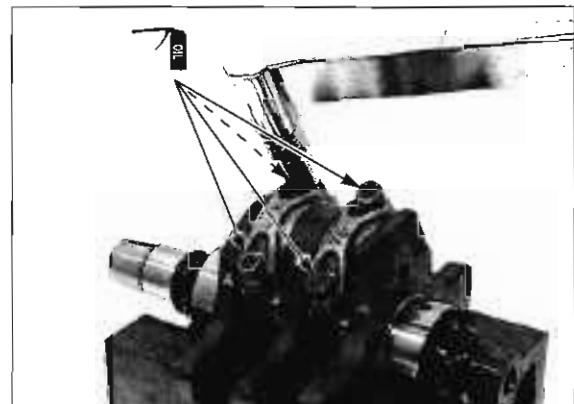
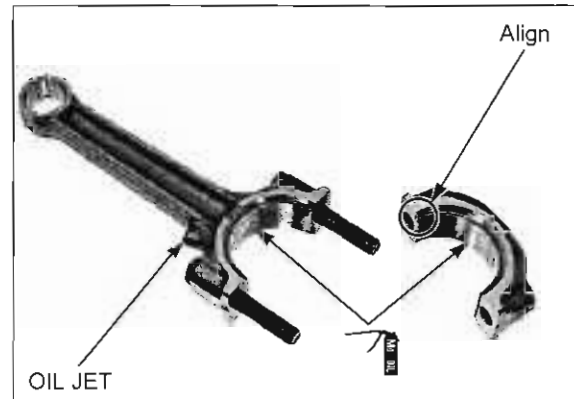
#### NOTE:

- Face the oil jet of front cylinder connecting rod to rearward (intake side) of the cylinder.
- Face the oil jet of rear cylinder connecting rod to rearward (exhaust side) of the cylinder.

Apply engine oil to the bearing cap nut threads and seating surface, then tighten them in several steps alternately.

**TORQUE: 33 N·m (3.4 kgf·m, 24 lbf·ft)**

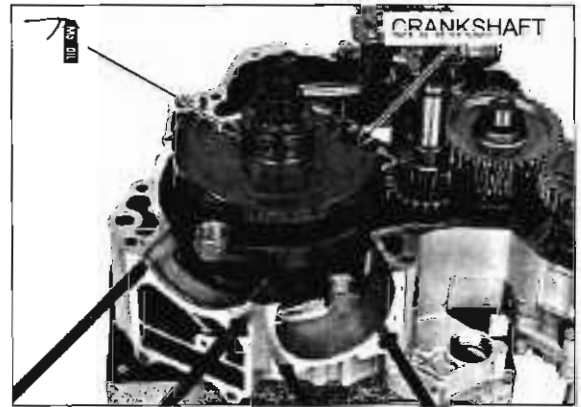
After tightening the nuts, check that the connecting rods move freely without binding.



**CRANKSHAFT INSTALLATION**

Apply molybdenum disulfide oil to the crankshaft main journals and install the crankshaft into the left crankcase.

Assemble the crankcase (page 12-49).



**CRANKPIN BEARING**

**NOTICE**

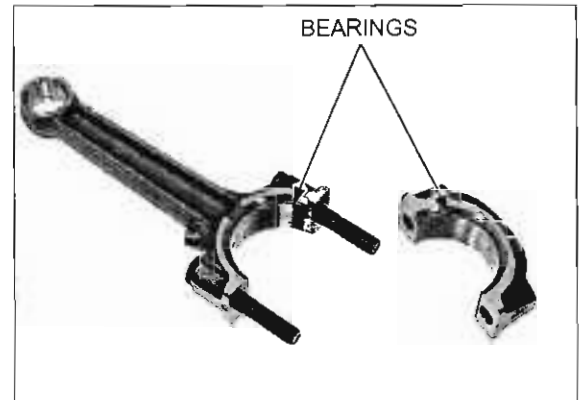
*Do not interchange the bearing inserts. They must be installed in their original locations or the correct bearing oil clearance may not be obtained, resulting in engine damage.*

Remove the connecting rod (page 12-11).

**BEARING INSPECTION**

Check the bearing inserts for unusual wear, damage or peeling and replace them if necessary.

Select the replacement bearing (page 12-14).

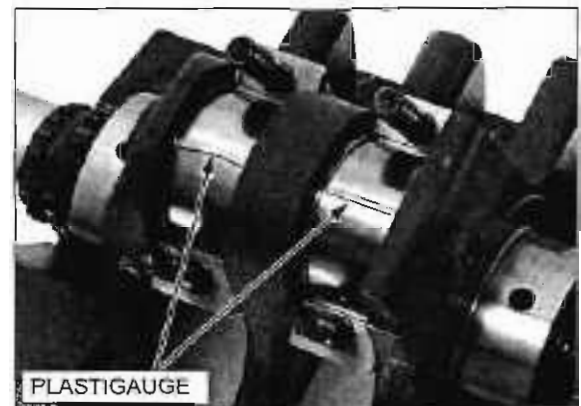


**OIL CLEARANCE INSPECTION**

Clean off any oil from the bearing inserts and crankpins.

Put a strip of plastigauge lengthwise on each crankpin avoiding the oil hole.

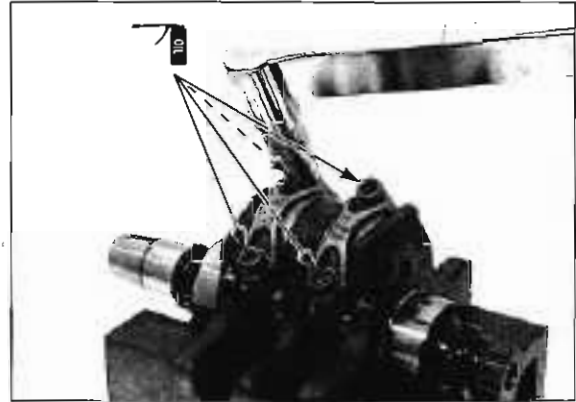
Carefully install the connecting rods and bearing caps on the correct crankpins.



## CRANKSHAFT/TRANSMISSION

*Do not rotate the crankshaft during inspection.* Apply engine oil to the threads and seating surfaces of the bearing cap nuts. Install the nuts and tighten them evenly.

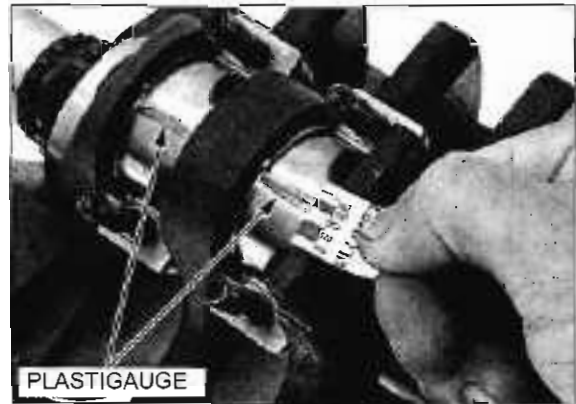
**TORQUE: 33 N·m (3.4 kgf·m, 24 lbf·ft)**



Remove the bearing caps and measure the compressed plastigauge at its widest point on each crankpin to determine the oil clearance.

**SERVICE LIMIT: 0.07 mm (0.003 in)**

If the clearance exceeds the service limit, select the correct replacement bearings as follows.

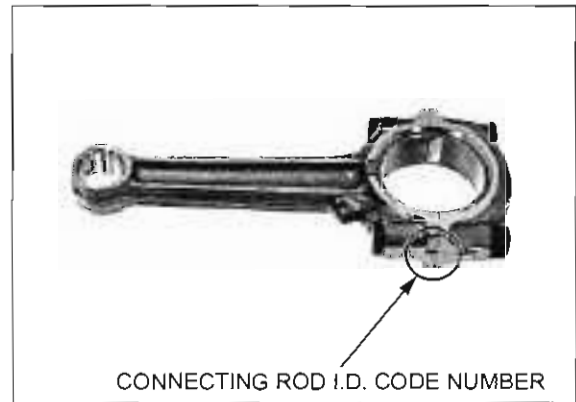


### BEARING SELECTION

Record the connecting rod I.D. code number.

**NOTE:**

Number 3 or 4 on the connecting rod is the code for the connecting rod I.D.

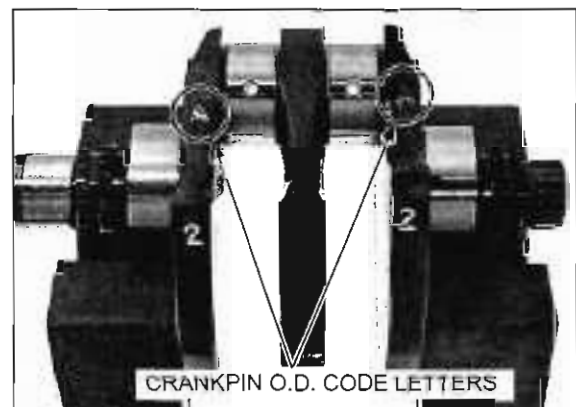


Record the crankpin O.D. code letter.

**NOTE:**

Letters A or B on each crank weight is the code for the crankpin O.D.

Cross reference the connecting rod and crankpin codes to determine the replacement bearing color code.



**CRANKPIN BEARING SELECTION TABLE:**

			CONNECTING ROD I.D. CODE	
			3	4
			43.000 – 43.008 mm (1.6929 – 1.6932 in)	43.008 – 43.016 mm (1.6932 – 1.6935 in)
CRANKPIN O.D. CODE	A	39.982 – 39.990 mm (1.5741 – 1.5744 in)	C (Pink)	B (Yellow)
	B	39.974 – 39.982 mm (1.5738 – 1.5741 in)	B (Yellow)	A (Green)

**BEARING THICKNESS:**

A (Green): Thick

B (Yellow): ↓

C (Pink): Thin

**NOTICE**

*After selecting new bearings, recheck the clearance with a plastigauge. Incorrect clearance can cause severe engine damage.*



## MAIN JOURNAL BEARING

### NOTICE

*Do not interchange the bearing inserts. They must be installed in their original locations or the correct bearing oil clearance may not be obtained, resulting in engine damage.*

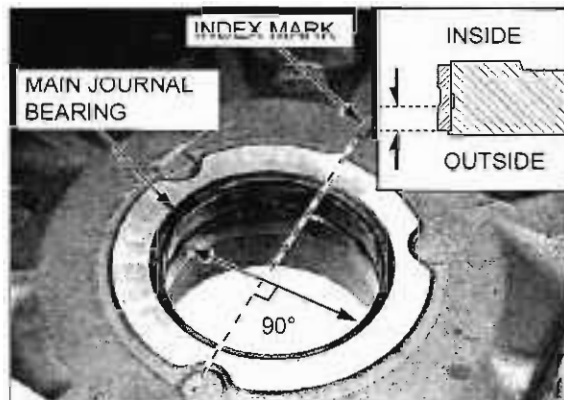
Remove the crankshaft (page 12-10).

### BEARING INSPECTION

Clean off any oil from the bearings.

Check the bearings for unusual wear, damage or peeling and replace them if necessary.

Measure and record the main journal bearing I.D. at between the bearing groove and crankcase outside end of the bearing, and 90 degrees to the index mark.



Clean off any oil from the crankshaft journals.

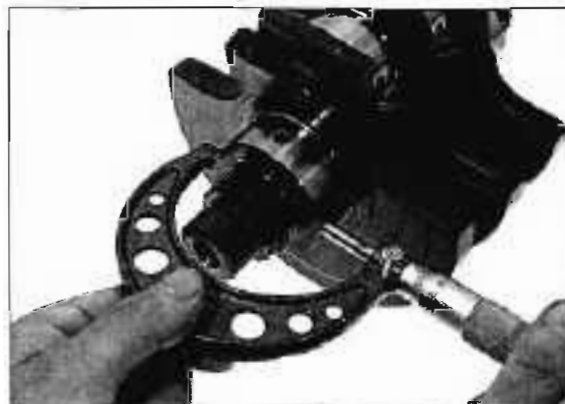
Measure and record the crankshaft main journal O.D.

**SERVICE LIMIT: 52.976 mm (2.0857 in)**

Calculate the main journal oil clearance.

**SERVICE LIMIT: 0.07 mm (0.003 in)**

If the clearance exceeds the service limit, select the bearing.



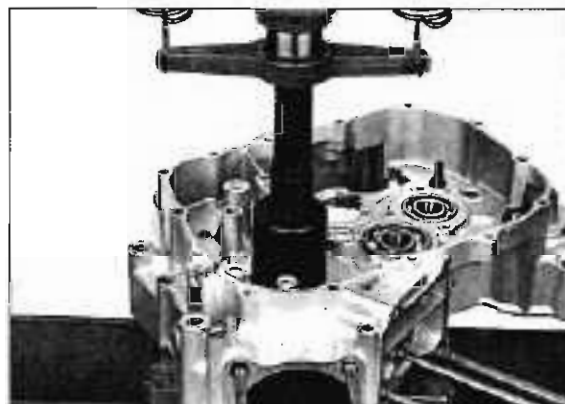
### BEARING SELECTION

Set a special tool and hydraulic press on the outside of the crankcase.

**TOOL:**

Driver, 57 mm

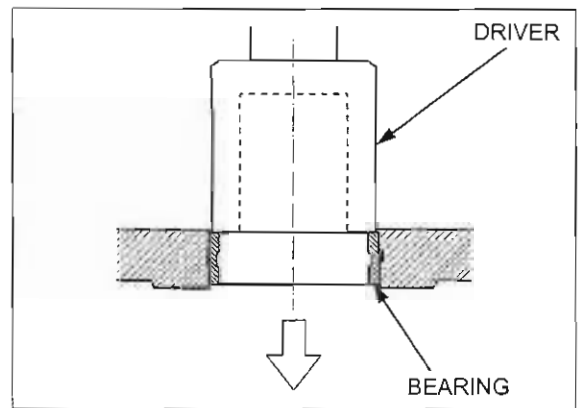
070MF-MEG0100





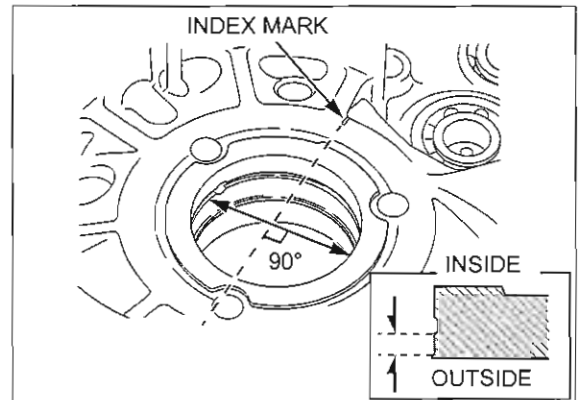
## CRANKSHAFT/TRANSMISSION

Press the main journal bearings toward the inside of the crankcase.



Measure and record the crankcase main journal I.D. at between the main journal groove and crankcase outside end, and 90 degrees to the index mark.

**SERVICE LIMIT: 58.070 mm (2.2862 in)**



Depending upon the results of the above measurements there are four possible scenarios for main journal bearing selection:

- Crankshaft and crankcase are replaced
- Crankcase only is replaced
- Crankshaft only is replaced
- Main journal bearings only are replaced

Carefully refer to the following instructions and tables for main journal bearing selection.

Record the bearing support I.D. code letter.

**NOTE:**

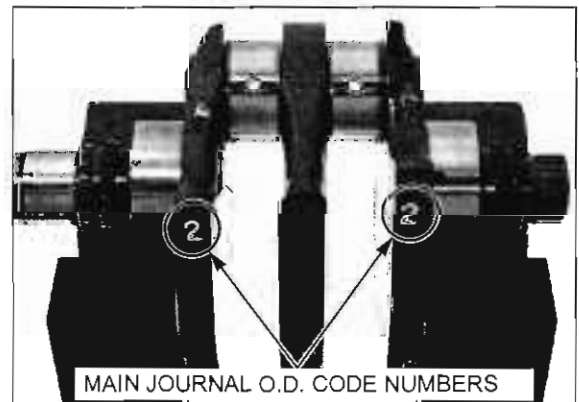
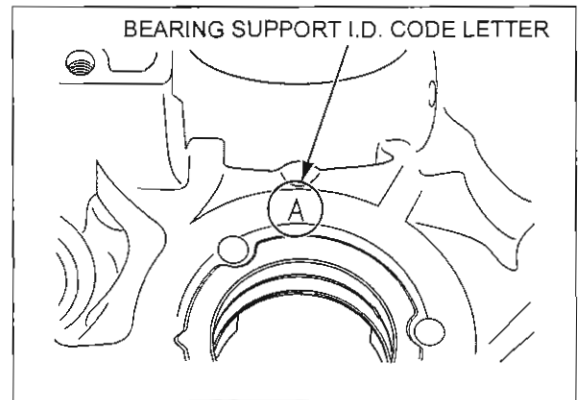
Letters A or B on each crankcase is the code for the crankcase I.D.

Record the main journal O.D. code number.

**NOTE:**

Letters 1, 2 or 3 on each crank weight is the code for crankshaft journal O.D.

Cross-reference the crankshaft and crankcase codes to determine the replacement bearing color.



## CRANKSHAFT/TRANSMISSION

In case the crankshaft and crankcase are replaced:

			MAIN JOURNAL O.D. CODE		
			1	2	3
			52.994 – 53.000 mm (2.0864 – 2.0866 in)	52.988 – 52.994 mm (2.0861 – 2.0864 in)	52.982 – 52.988 mm (2.0859 – 2.0861 in)
BEARING SUPPORT I.D. CODE	A	58.016 – 58.022 mm (2.2841 – 2.2843 in)	C (Brown)	B (Black)	A (Blue)
	B	58.010 – 58.016 mm (2.2839 – 2.2841 in)	D (Green)	C (Brown)	B (Black)

In case the crankcase only is replaced:

			MAIN JOURNAL O.D.			
			52.994 – 53.000 mm (2.0864 – 2.0866 in)	52.988 – 52.994 mm (2.0861 – 2.0864 in)	52.982 – 52.988 mm (2.0859 – 2.0861 in)	52.976 – 52.982 mm (2.0857 – 2.0859 in)
BEARING SUPPORT I.D. CODE	A	58.016 – 58.022 mm (2.2841 – 2.2843 in)	C (Brown)	B (Black)	A (Blue)	A (Blue)
	B	58.010 – 58.016 mm (2.2839 – 2.2841 in)	D (Green)	C (Brown)	B (Black)	A (Blue)

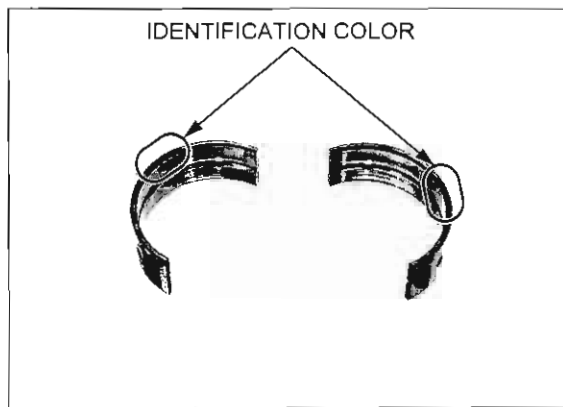
In case the crankshaft only is replaced:

		MAIN JOURNAL O.D. CODE		
		1	2	3
		52.994 – 53.000 mm (2.0864 – 2.0866 in)	52.988 – 52.994 mm (2.0861 – 2.0864 in)	52.982 – 52.988 mm (2.0859 – 2.0861 in)
MAIN JOURNAL I.D.	58.010 – 58.016 mm (2.2839 – 2.2841 in)	D (Green)	C (Brown)	B (Black)
	58.016 – 58.022 mm (2.2841 – 2.2843 in)	C (Brown)	B (Black)	A (Blue)
	58.022 – 58.034 mm (2.2843 – 2.2848 in)	B (Black)	A (Blue)	A (Blue)
	58.034 – 58.046 mm (2.2848 – 2.2853 in)	A (Blue)	O.S. G (Red)	O.S. G (Red)
	58.046 – 58.058 mm (2.2853 – 2.2857 in)	O.S. G (Red)	O.S. F (Pink)	O.S. F (Pink)
	58.058 – 58.070 mm (2.2857 – 2.2862 in)	O.S. F (Pink)	O.S. E (Yellow)	O.S. E (Yellow)

In case of main bearing replacement only:

		MAIN JOURNAL O.D.			
		52.994 – 53.000 mm (2.0864 – 2.0866 in)	52.988 – 52.994 mm (2.0861 – 2.0864 in)	52.982 – 52.988 mm (2.0859 – 2.0861 in)	52.976 – 52.982 mm (2.0857 – 2.0859 in)
BEARING SUPPORT I.D.	58.010 – 58.016 mm (2.2839 – 2.2841 in)	D (Green)	C (Brown)	B (Black)	A (Blue)
	58.016 – 58.022 mm (2.2841 – 2.2843 in)	C (Brown)	B (Black)	A (Blue)	A (Blue)
	58.022 – 58.034 mm (2.2843 – 2.2848 in)	B (Black)	A (Blue)	A (Blue)	O.S. G (Red)
	58.034 – 58.046 mm (2.2848 – 2.2853 in)	A (Blue)	O.S. G (Red)	O.S. G (Red)	O.S. F (Pink)
	58.046 – 58.058 mm (2.2853 – 2.2857 in)	O.S. G (Red)	O.S. F (Pink)	O.S. F (Pink)	O.S. E (Yellow)
	58.058 – 58.070 mm (2.2857 – 2.2862 in)	O.S. F (Pink)	O.S. E (Yellow)	O.S. E (Yellow)	O.S. E (Yellow)

**BEARING THICKNESS:**  
 O.S. E (Yellow): Thick  
 O.S. F (Pink): ↑  
 O.S. G (Red):  
 A (Blue): Middle  
 B (Black): ↑  
 C (Brown):  
 D (Green): Thin



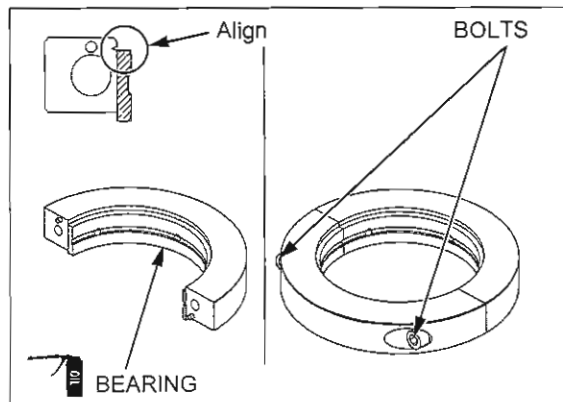
**BEARING INSTALLATION**

Apply engine oil to new bearing surface.  
 Set new bearings to the metal installer aligning its side edge with the metal installer grooves.

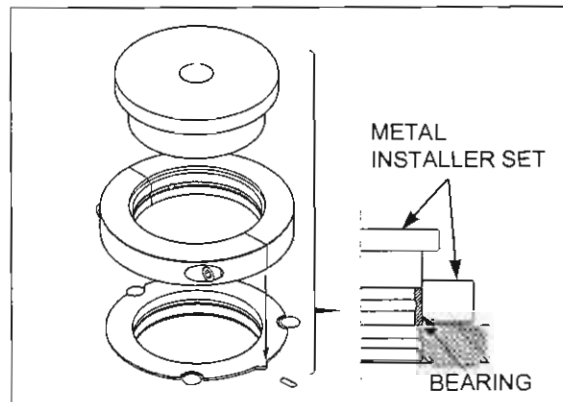
**TOOL:**  
**Metal installer set 070MF-MEG0200**

Tighten the bolts alternately in several steps to the specified torque.

**TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)**

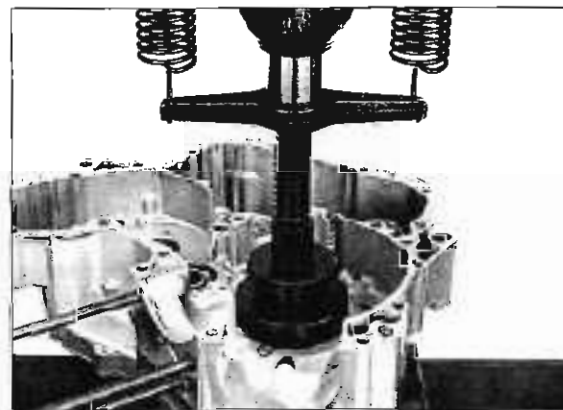


Set the bearings and special tools assembly on inside of the crankcase, fitting the bearing edge in the crankcase main journal.  
 Align the mating line of the bearings with the index mark on the crankcase as shown.



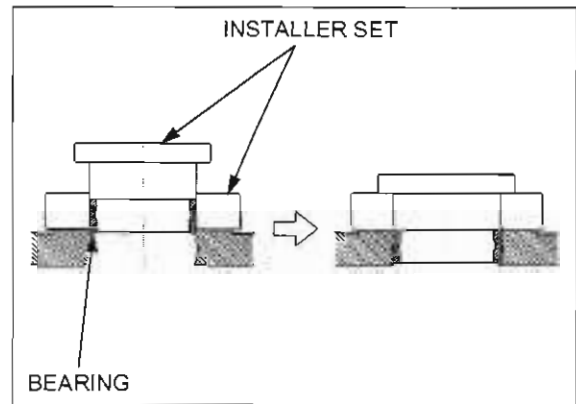
Set the hydraulic press.

**TOOL:**  
**Metal installer set 070MF-MEG0200**



## CRANKSHAFT/TRANSMISSION

Press the new bearings until the metal installer flange fully seated.



Make sure the bearing mating line aligns with the index mark on the crankcase.

Check the oil clearance (page 12-16).

- After selecting new bearings, recheck the clearance. Incorrect clearance can cause severe engine damage.

Install the crankshaft (page 12-13).

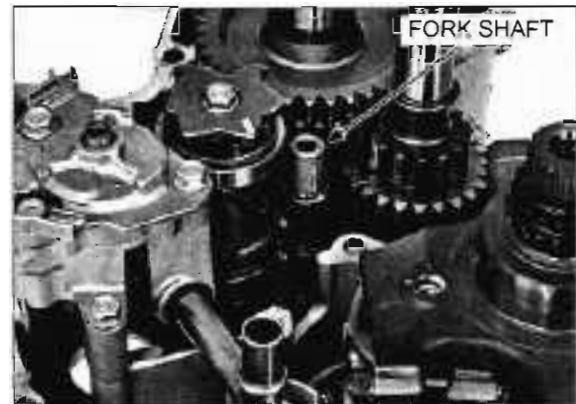


## TRANSMISSION

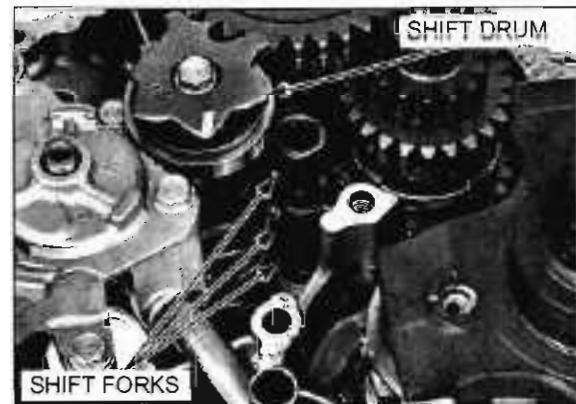
### REMOVAL

Separate the crankcase (page 12-9).

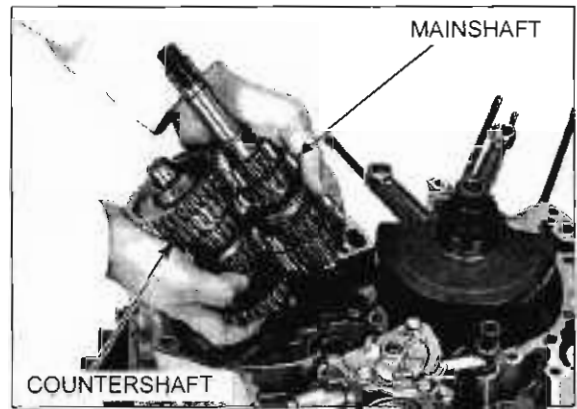
Remove the fork shaft from the shift forks.



Remove the shift forks and shift drum.

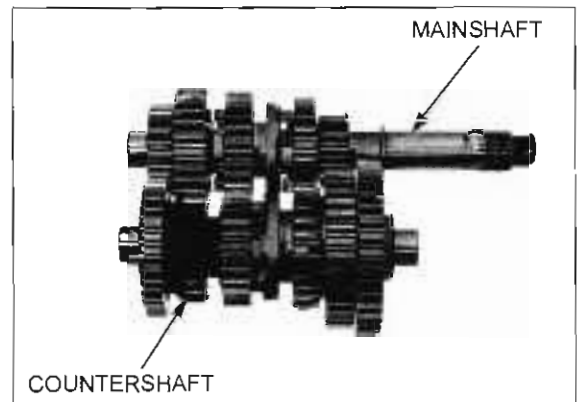


Remove the mainshaft and countershaft together.



## TRANSMISSION DISASSEMBLY

Disassemble the mainshaft and countershaft.



## INSPECTION

### GEARS

Check the gear dogs, dog slots and teeth for damage or excessive wear.



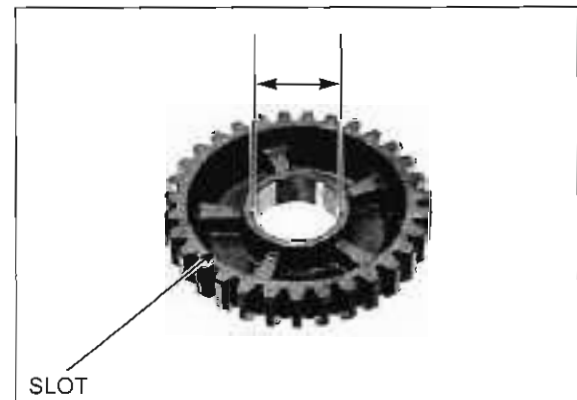
Measure the I.D. of each gear.

### SERVICE LIMITS:

M3, M5 gears: 28.04 mm (1.104 in)

C1, C4 gears: 31.05 mm (1.222 in)

C2 gear: 24.04 mm (0.946 in)



## CRANKSHAFT/TRANSMISSION

### BUSHINGS

Check the bushings for wear or damage.  
Measure the O.D. of each bushing.

#### SERVICE LIMITS:

M3, M5, gear bushings: 27.94 mm (1.100 in)

C1, C4 gear bushings: 30.93 mm (1.218 in)

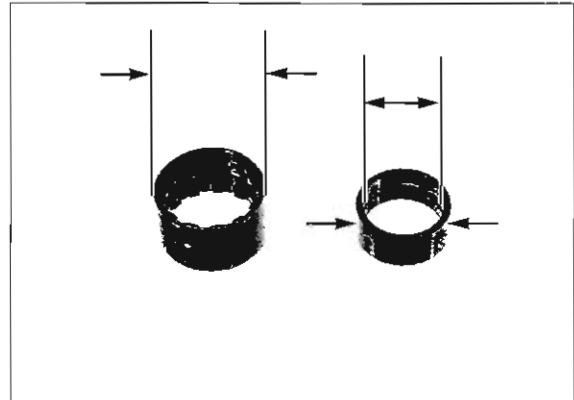
C2 gear bushing: 23.94 mm (0.943 in)

Measure the I.D. of each bushing.

#### SERVICE LIMITS:

M3 gear bushing: 25.04 mm (0.986 in)

C2 gear bushing: 20.04 mm (0.789 in)



### MAINSHAFT/COUNTERSHAFT

Check the spline grooves and sliding surfaces for abnormal wear or damage.

Measure the O.D. of the mainshaft and countershaft at the gear and bushing sliding areas.

#### SERVICE LIMITS:

Mainshaft (at M3 gear bushing):

24.94 mm (0.982 in)

Countershaft (at C2 gear bushing):

19.96 mm (0.786 in)

Calculate the gear-to-bushing and bushing-to-shaft clearance.

#### SERVICE LIMITS:

##### Gear-to-bushing

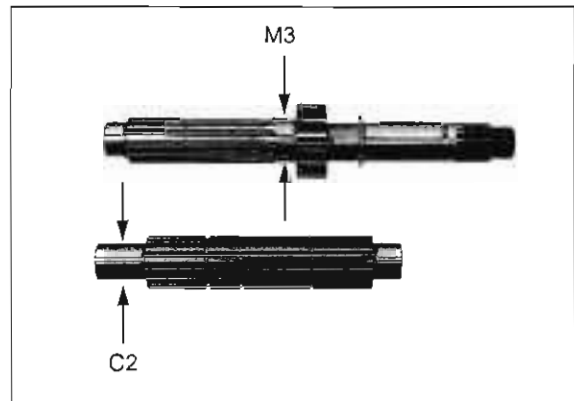
M3, M5, C2: 0.10 mm (0.004 in)

C1, C4: 0.11 mm (0.004 in)

##### Bushing-to-shaft

M3: 0.10 mm (0.004 in)

C2: 0.07 mm (0.003 in)



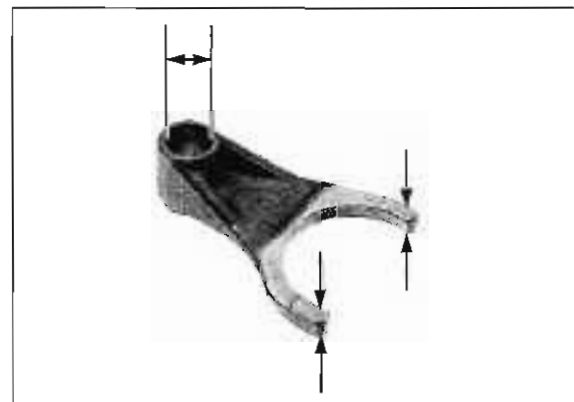
### SHIFT FORK

Check for deformation or abnormal wear.  
Measure the shift fork claw thickness.

**SERVICE LIMIT: 5.6 mm (0.22 in)**

Measure the shift fork I.D.

**SERVICE LIMIT: 13.03 mm (0.513 in)**

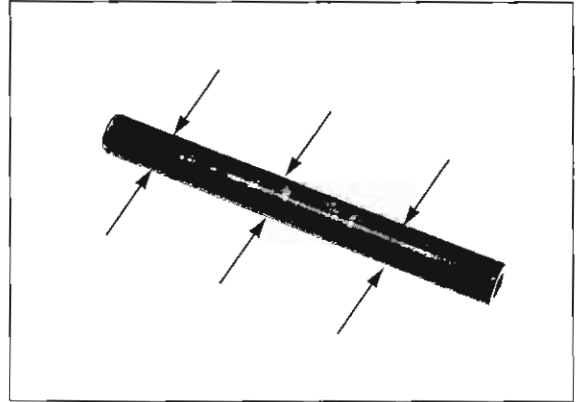


**SHIFT FORK SHAFT**

Check the shift fork shaft for bend, abnormal wear or damage.

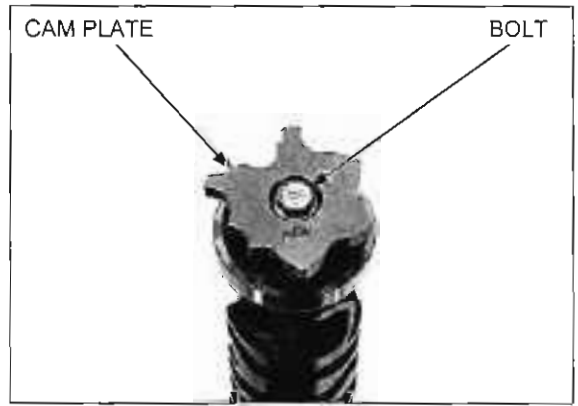
Measure the shift fork shaft O.D.

**SERVICE LIMIT: 12.90 mm (0.508 in)**

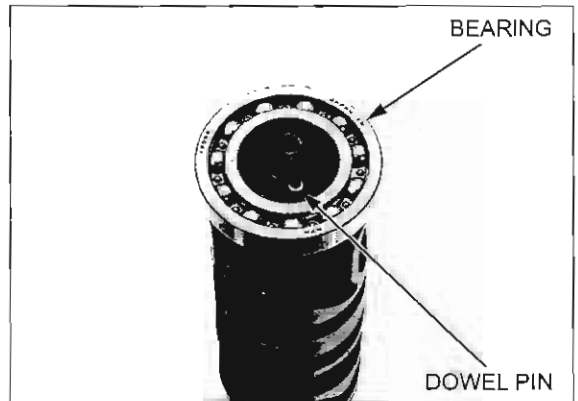


**SHIFT DRUM/SHIFT DRUM BEARING**

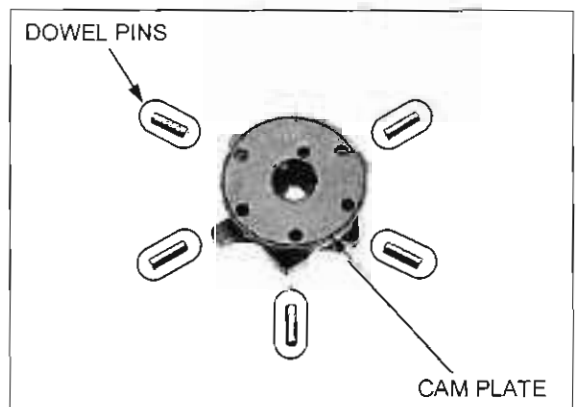
Remove the bolt and gearshift cam plate.



Remove the dowel pin and bearing.



Remove the dowel pins from the gearshift cam plate.

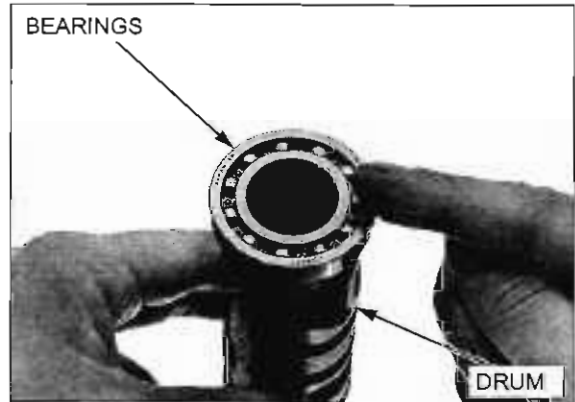


## CRANKSHAFT/TRANSMISSION

Temporarily install the bearing on the shift drum.  
Turn the outer race of the bearing with your finger.  
The bearing should turn smoothly and quietly.

Also check that the bearing inner race fits tightly on the shift drum.

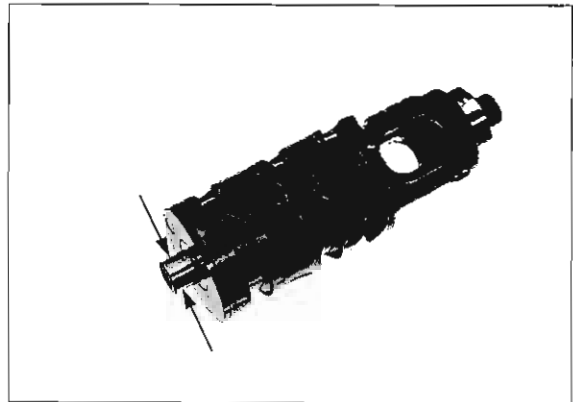
Remove and discard the bearing if the races do not turn smoothly, quietly, or if it fits loosely on the shift drum.



Check the shift drum end for scoring, scratches, or evidence of insufficient lubrication.  
Check the shift drum grooves for abnormal wear or damage.

Measure the shift drum O.D. at left end.

**SERVICE LIMIT: 11.94 mm (0.470 in)**



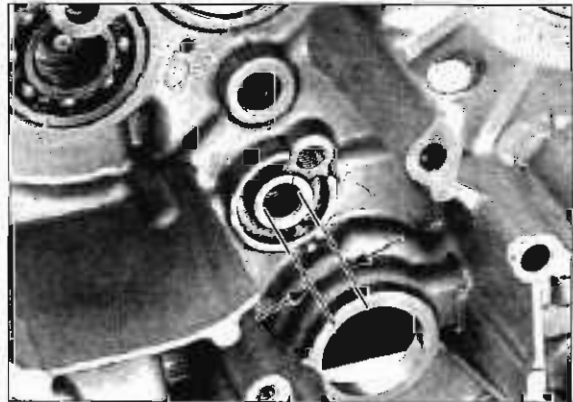
Check the shift drum journal in the left crankcase for excessive wear or damage.

Measure the shift drum journal I.D.

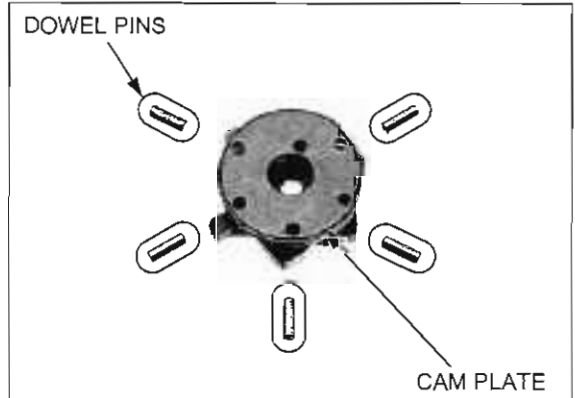
**SERVICE LIMIT: 12.05 mm (0.474 in)**

Calculate the shift drum-to-shift drum journal clearance.

**SERVICE LIMIT: 0.09 mm (0.035 in)**

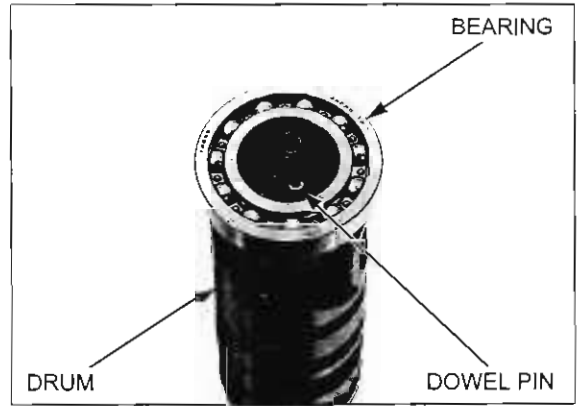


Install the dowel pins into the gearshift cam plate holes.

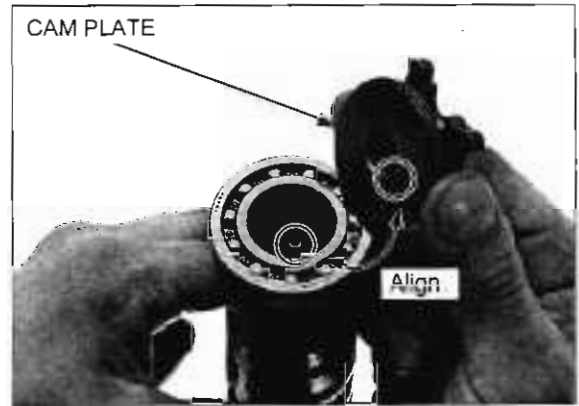




Install the bearing on the shift drum.  
Install the dowel pin into the shift drum hole.

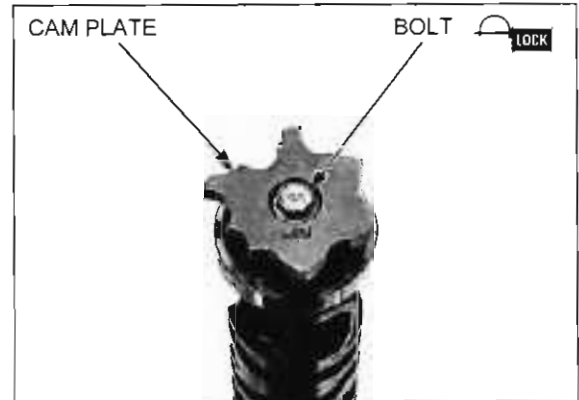


Install the gearshift cam plate by aligning its hole with the dowel pin.



Clean and apply a locking agent to the gearshift cam plate bolt (page 1-23).  
Install and tighten the bolt to the specified torque.

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



# CRANKSHAFT/TRANSMISSION

## TRANSMISSION ASSEMBLY

Clean all parts in solvent.

Apply engine oil to the all gear teeth.

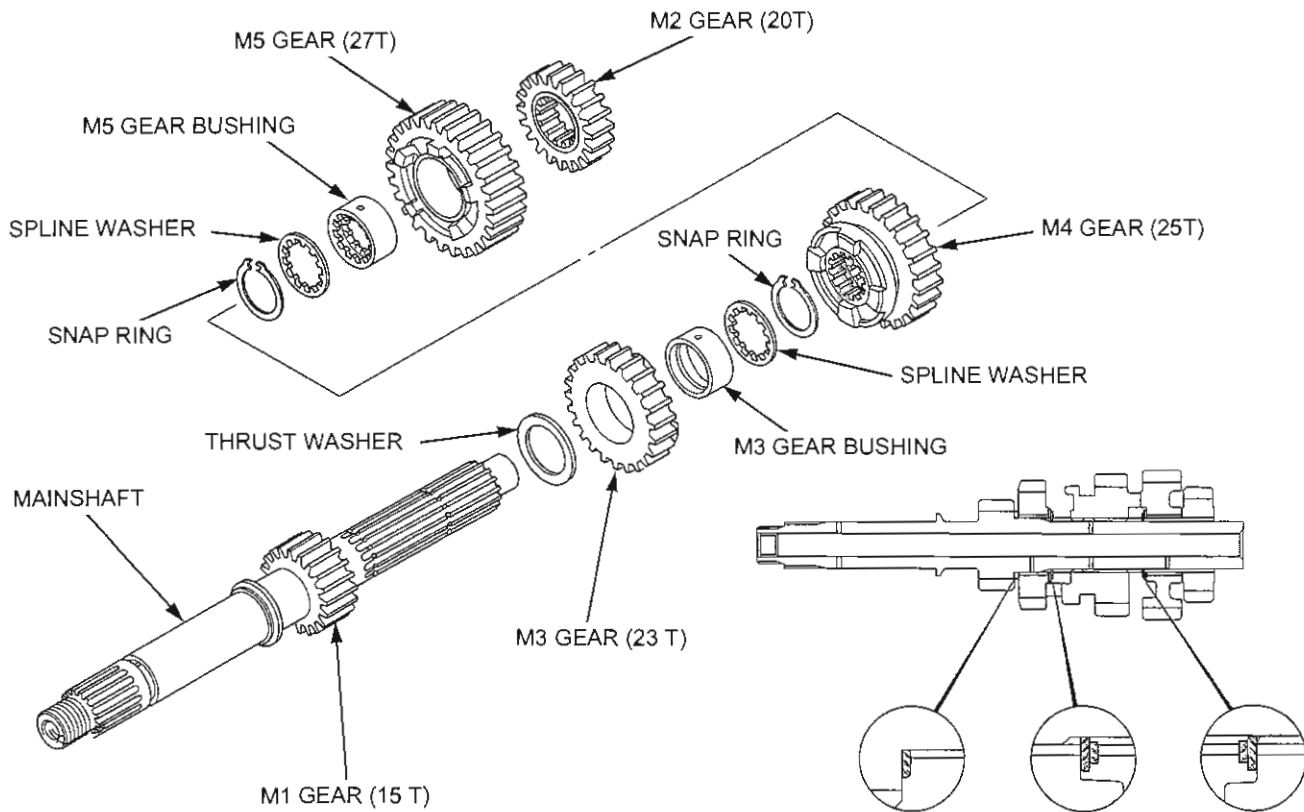
Apply molybdenum disulfide oil to the gear bushing sliding surface and shift fork grooves to ensure initial lubrication.

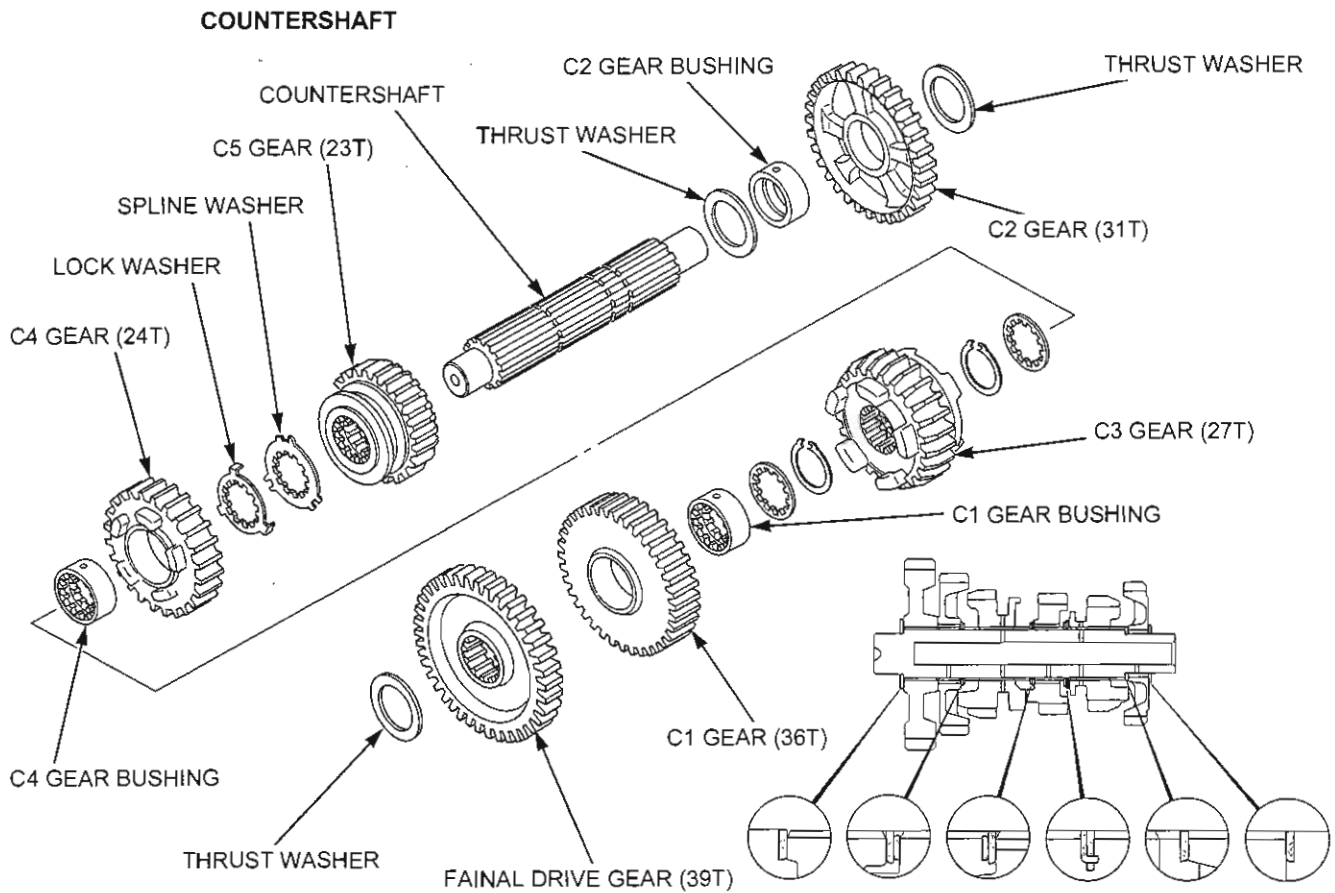
Assemble all parts into their original positions.

### NOTE:

- Check the gears for freedom of movement or rotation on the shaft.
- Install the washers and snap rings with the chamfered edges facing the thrust load side.
- Do not reuse a worn snap ring which could easily spin in the groove.
- Check that the snap rings are seated in the grooves and align their end gaps with the grooves of the spline.
- Align the lock washer tabs with the spline washer grooves.
- Align the oil holes in the M5 gear bushing and mainshaft, and C1, C4 gear bushing and countershaft.

### MAINSHAFT

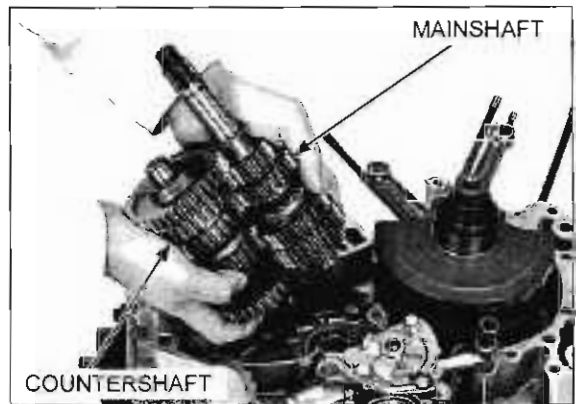




**INSTALLATION**

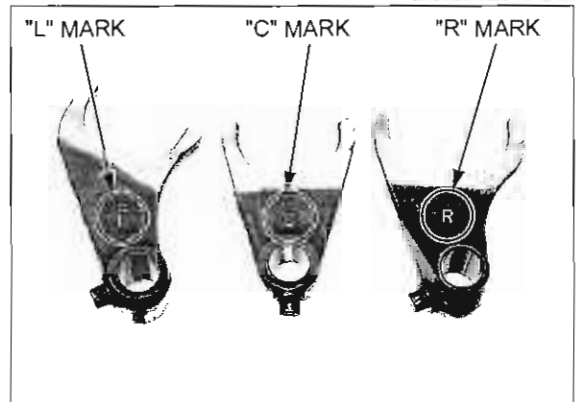
Install the mainshaft and countershaft together into the left crankcase.

Be sure to install the thrust washers of the countershaft both ends.



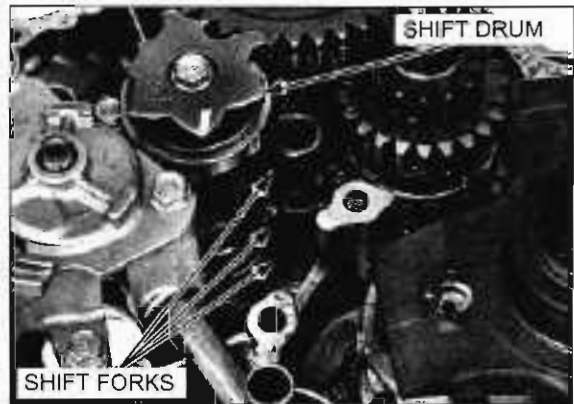
The shift forks have the following identification marks.

- "L": Left shift fork
- "C": Center shift fork
- "R": Right shift fork

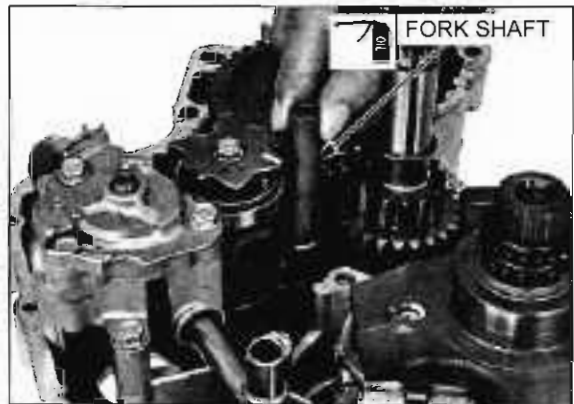


## CRANKSHAFT/TRANSMISSION

Install the shift forks into the shifter gear grooves with the markings facing up (right crankcase side).  
Install the shift drum by aligning the shift fork guide pins with the shift drum guide grooves.

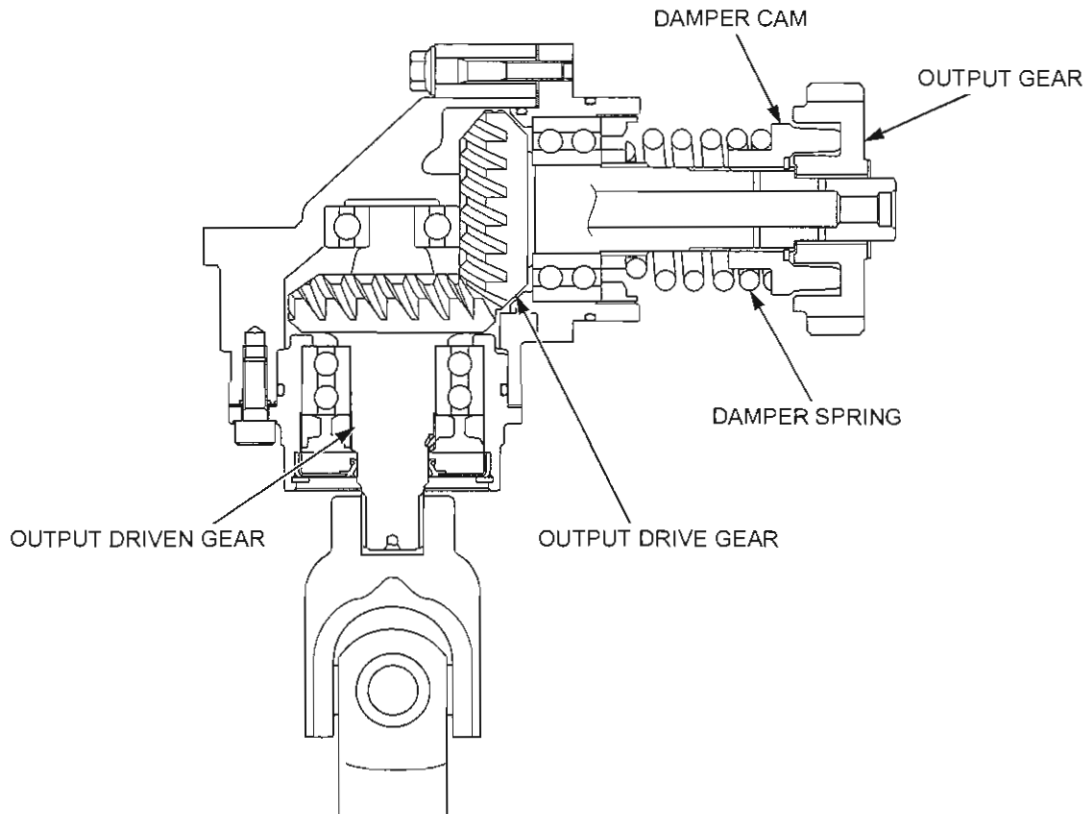


Apply engine oil to the shift fork shaft whole surface.  
Insert the shift fork shaft through the shift forks into the left crankcase.  
After installation, check for smooth transmission operation.  
Assemble the crankcase (page 12-49).



## OUTPUT GEAR

Description of the output gear assembly:



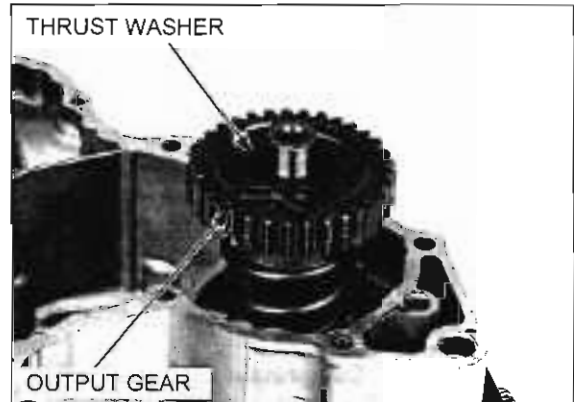
## REMOVAL

Separate the crankcase (page 12-9).

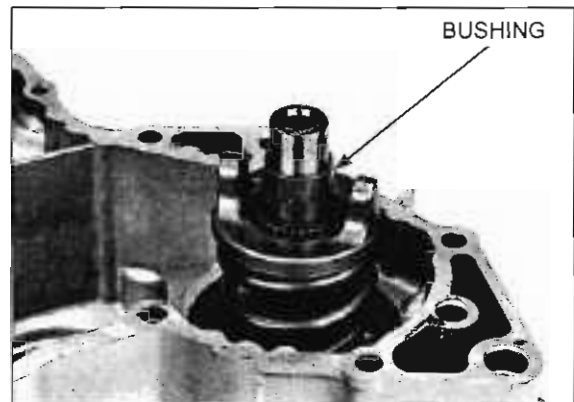
Remove the following:

- Crankshaft (page 12-10)
- Transmission (page 12-20)

Remove the thrust washer and output gear.



Remove the bushing from the output drive gear shaft.



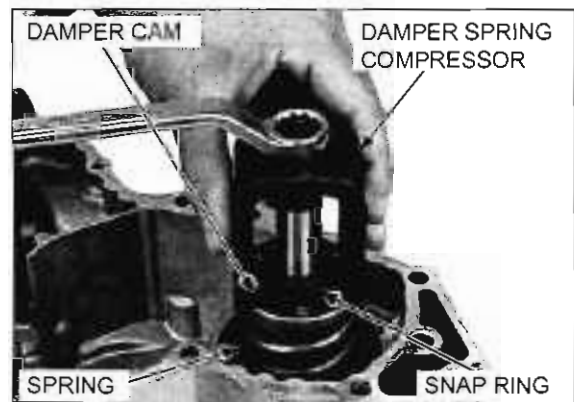
### Except U.S.A.:

Set the damper spring compressor onto the damper cam and output drive gear shaft.

Compress the damper spring by turning the compressor bolt clockwise until the snap ring can be removed.

### TOOLS:

Damper spring compressor      07964-ME90000  
Snap ring pliers                    07914-5670101



## CRANKSHAFT/TRANSMISSION

### U.S.A. only:

Place the threaded adaptor in the end of the output drive gear shaft and tighten the adaptor. Place the compressor seat over the threaded adaptor with the stepped side facing upward. Install the assembly bolt through the assembly collar and attach it to the threaded adaptor. Center the compressor seat with the damper cam then begin to tighten the 23 mm nut of the assembly bolt until the snap ring is visible so it can be removed.

### TOOLS:

Assembly bolt

Assembly collar

Compressor seat

Threaded adaptor

Snap ring pliers

07965-1660200

07965-166030A

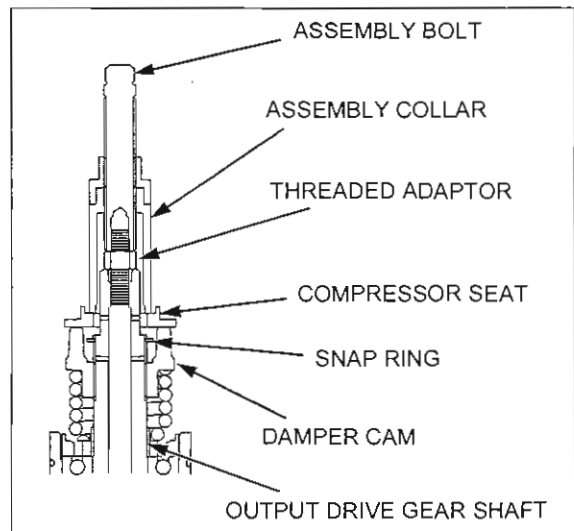
or 07965-1660302

07967-9690200

07965-KA30000

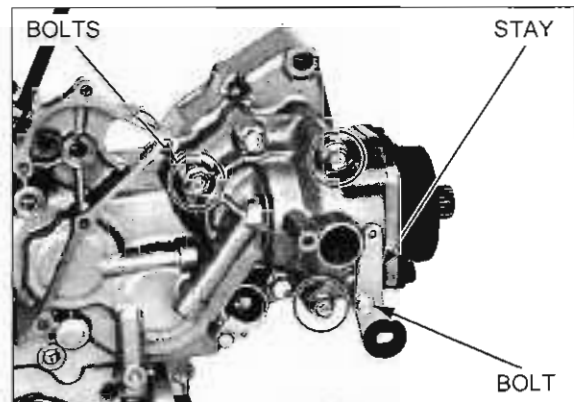
07914-5670101

(Equivalent commercially available in U.S.A.)

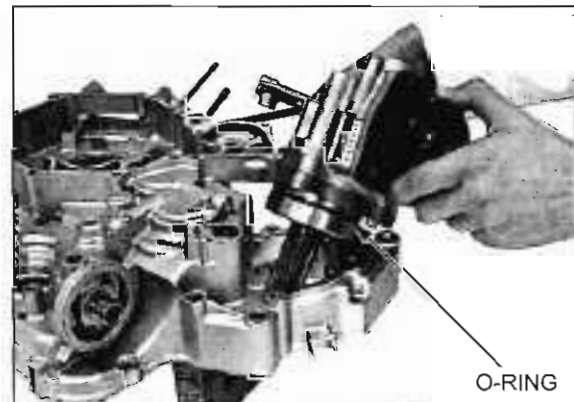


Remove the bolt and stay.

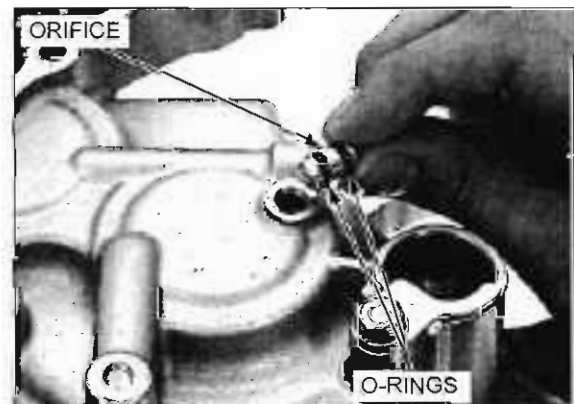
Remove the output gear case mounting bolts.



Remove the output gear case assembly and O-ring.



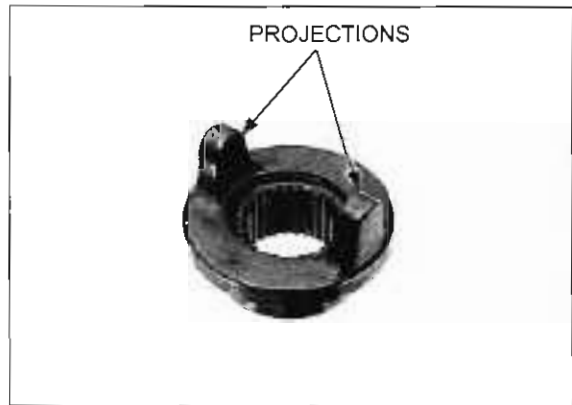
Remove the orifice and O-rings. Check the orifice for clog or damage. Replace it if necessary.



**INSPECTION**

**DAMPER CAM**

Check the projections of damper cam for damage or excessive wear.

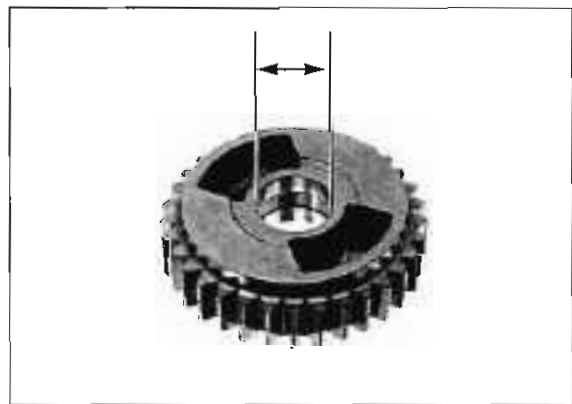


**OUTPUT GEAR**

Check the output gear teeth for damage or excessive wear, and the gear dog holes for damage.

Measure the output gear I.D.

**SERVICE LIMIT: 24.04 mm (0.946 in)**



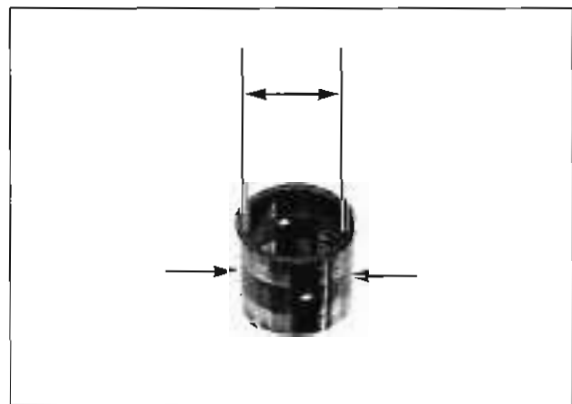
**BUSHING**

Check the output gear bushing for wear or damage.  
Measure the bushing I.D. and O.D.

**SERVICE LIMITS: O.D. 23.70 mm (0.933 in)**  
**I.D. 20.06 mm (0.790 in)**

Calculate the output gear-to-bushing clearance.

**SERVICE LIMIT: 0.082 mm (0.0032 in)**



**OUTPUT DRIVE GEAR SHAFT**

Measure the O.D. of the output drive gear shaft at the bushing sliding area.

**SERVICE LIMIT: 19.97 mm (0.786 in)**

Calculate the bushing-to-shaft clearance.

**SERVICE LIMIT: 0.08 mm (0.003 in)**

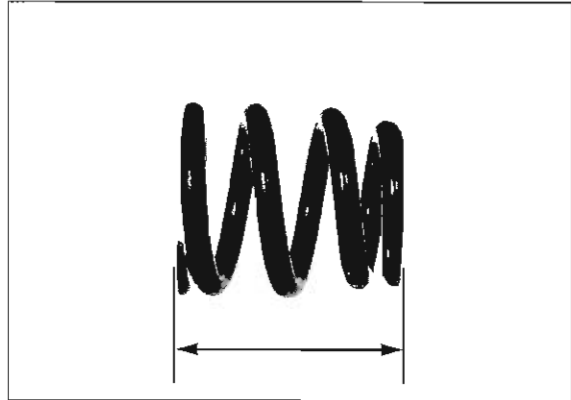


## CRANKSHAFT/TRANSMISSION

### DAMPER SPRING

Measure the damper spring free length.

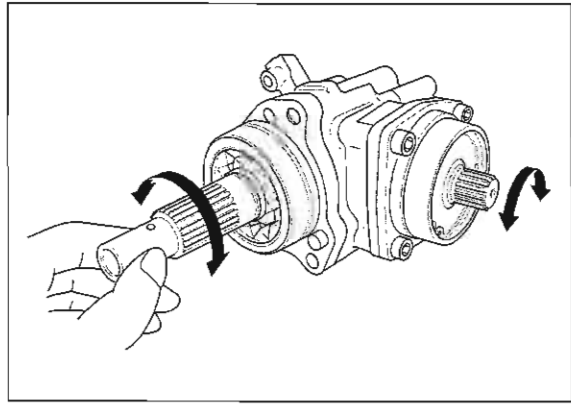
**SERVICE LIMIT: 59 mm (2.3 in)**



### OUTPUT GEAR CASE ASSEMBLY

Turn the output drive gear shaft and check that the output drive and driven gear shafts turn smoothly and quietly without binding.

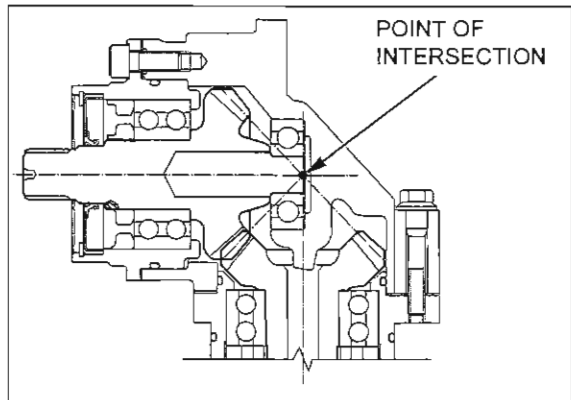
If the shafts do not turn smoothly or quietly, the gears and/or bearing may be damaged or faulty. They must be checked after disassembly; replace faulty parts/assemblies as required.



### BACKLASH INSPECTION/GEAR TOOTH CONTACT PATTERN CHECK

#### NOTE:

Perform the backlash inspection and contact pattern check whenever you replace the output driven/drive gears, bearings, bearing holder and gear case. The extension lines from the gear engagement surfaces should intersect at one point.





## BACKLASH INSPECTION

Set the output gear case in a vise with soft jaws.

Set a horizontal type dial indicator on the output driven gear, through the VS sensor hole.

Hold the output drive gear shaft with your hand and rotate the driven gear shaft until gear slack is taken up.

Turn the driven gear shaft back and forth to read backlash.

**STANDARD:** 0.08 – 0.23 mm (0.003 – 0.009 in)

**SERVICE LIMIT:** 0.40 mm (0.016 in)

Remove the dial indicator. Turn the driven gear shaft 120° and measure backlash. Repeat this procedure once more.

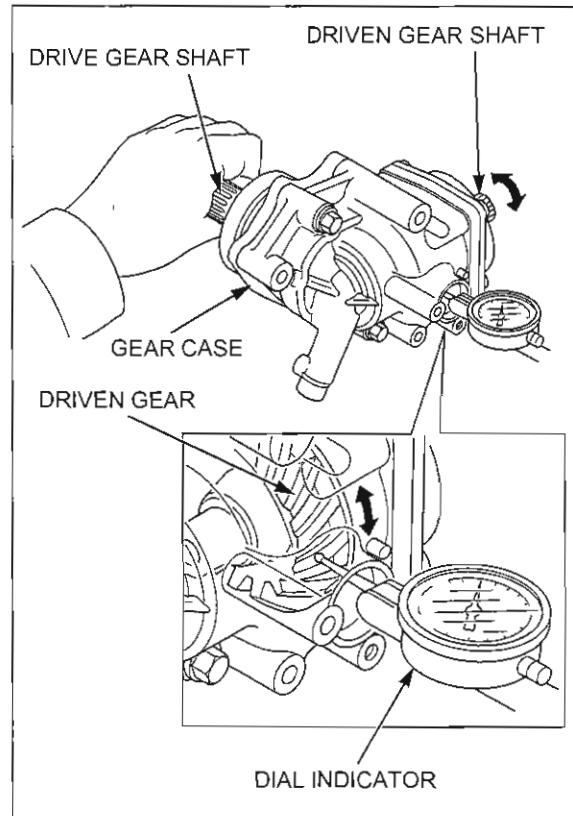
Compare the difference of the three measurements.

### Backlash difference between measurements

**SERVICE LIMIT:** 0.10 mm (0.004 in)

If the difference in measurements exceeds the service limit, it indicates that the bearing is not installed squarely or the case is deformed.

Inspect the bearings and case.



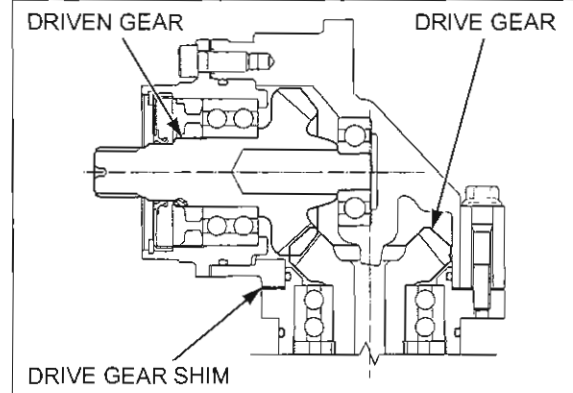
If the backlash is excessive, replace the output drive gear shim with a thinner one.

If the backlash is too small, replace the output drive gear shim with a thicker one.

Backlash is changed by about 0.06 – 0.07 mm (0.002 – 0.003 in) when shim thickness is changed by 0.10 mm (0.004 in).

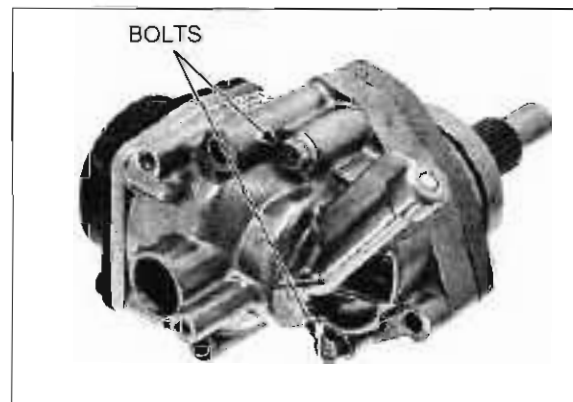
### OUTPUT DRIVE GEAR SHIMS:

- 0.30 mm (0.012 in)
- 0.35 mm (0.014 in)
- 0.40 mm (0.016 in)
- 0.45 mm (0.018 in)
- 0.50 mm (0.020 in) – Standard
- 0.55 mm (0.022 in)
- 0.60 mm (0.024 in)
- 0.65 mm (0.026 in)
- 0.70 mm (0.028 in)
- 0.75 mm (0.030 in)



### OUTPUT DRIVE GEAR SHIM REPLACEMENT

Remove the bolts and drive gear assembly from the gear case.



## CRANKSHAFT/TRANSMISSION

Remove the dowel pin, shim and O-ring from the bearing holder.

Select the replacement shim (page 12-33).

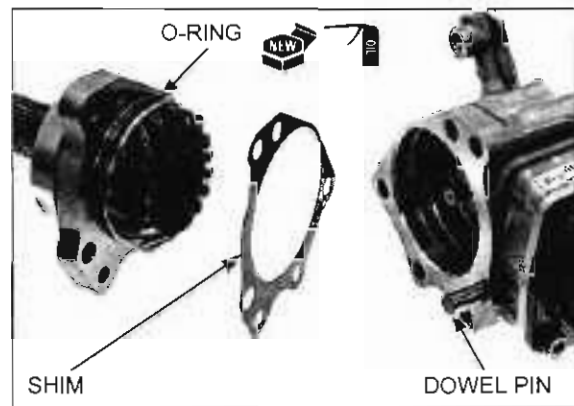
Coat a new O-ring with engine oil and install it into the bearing holder groove.

Install the dowel pin and shim.

Install the drive gear assembly into the gear case and tighten the bolts (page 12-44).

Recheck the backlash (page 12-32).

After backlash adjustment has been made, check the gear tooth contact pattern as described below.



### GEAR TOOTH CONTACT PATTERN CHECK

#### Description of the tooth:

COAST SIDE

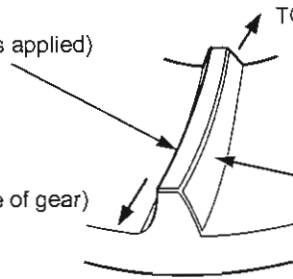
(contacts when engine brake is applied)

TOE (inside of gear)

HEEL (out side of gear)

DRIVE SIDE

(contacts when engine power is applied)



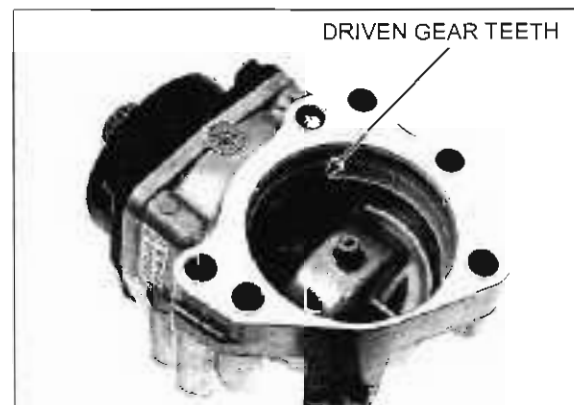
Remove the drive gear assembly from the gear case (page 12-33).

Apply a thin coat of Prussian Blue to the output driven gear teeth.

Reinstall the drive gear with the shim.

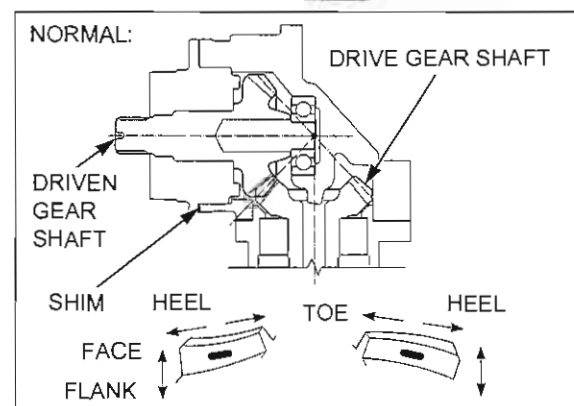
Rotate the drive gear shaft several times in the normal direction of rotation.

Remove the drive gear assembly and check the gear tooth contact pattern.

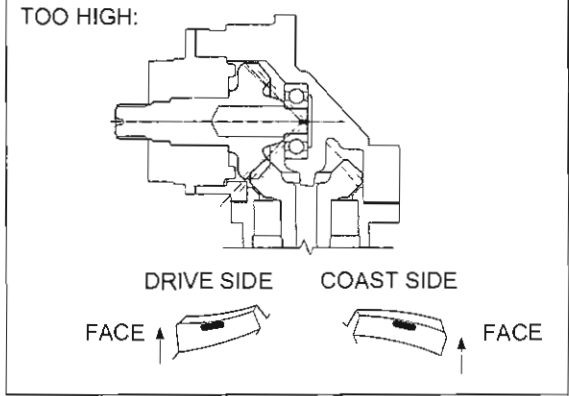


Contact is normal if Prussian Blue is transferred to the approximate center of each tooth and slightly to the toe.

If the pattern is not correct, remove and replace the output driven gear shim.



Replace the shim with a thinner one if the contact pattern is too high, toward the face.

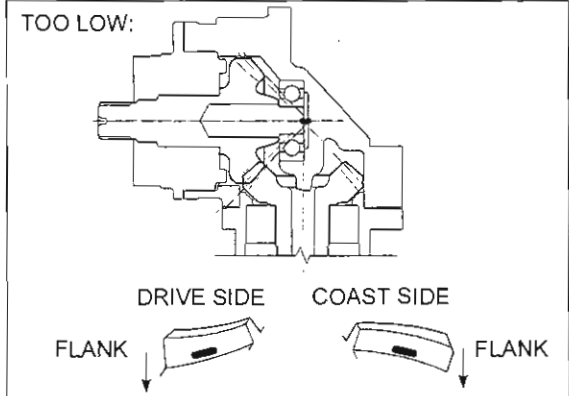


Replace the shim with a thicker one if the contact pattern is too low, toward the flank.

The pattern will shift about 1.5 – 2.0 mm (0.06 – 0.08 in) when the shim thickness is changed by 0.10 mm (0.04 in).

### OUTPUT DRIVEN GEAR SHIMS:

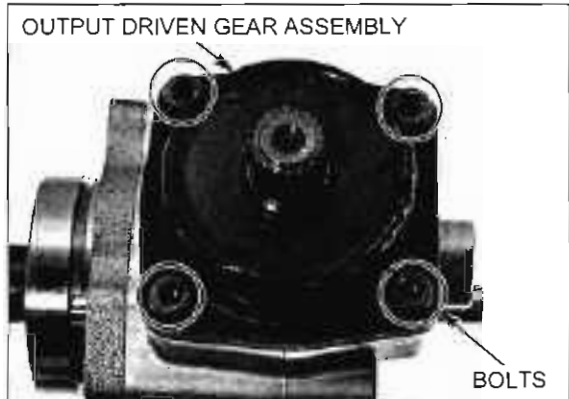
- 0.20 mm (0.008 in)
- 0.25 mm (0.010 in)
- 0.30 mm (0.012 in)
- 0.35 mm (0.014 in)
- 0.40 mm (0.016 in) – Standard
- 0.45 mm (0.018 in)
- 0.50 mm (0.020 in)
- 0.55 mm (0.022 in)
- 0.60 mm (0.024 in)



### OUTPUT DRIVEN GEAR SHIM REPLACEMENT

Hold the output gear case in a vise with soft jaws.

Remove the bolts and output driven gear assembly.



Remove the shim and O-ring from the bearing holder.

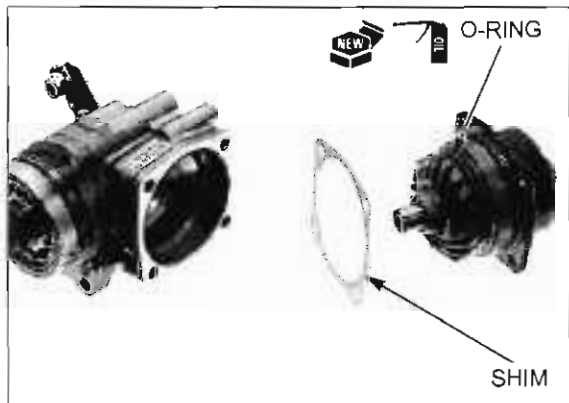
Select the replacement shim (page 12-35).

Coat a new O-ring with engine oil and install it into the bearing holder groove.

Install the shim.

Install the driven gear assembly to the gear case and tighten the bolts (page 12-41).

Recheck the contact pattern (page 12-34).

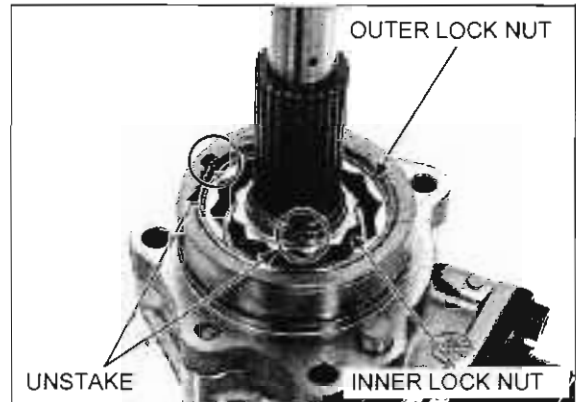


## CRANKSHAFT/TRANSMISSION

### OUTPUT DRIVE GEAR DISASSEMBLY

Hold the output gear case in a vise with soft jaws.

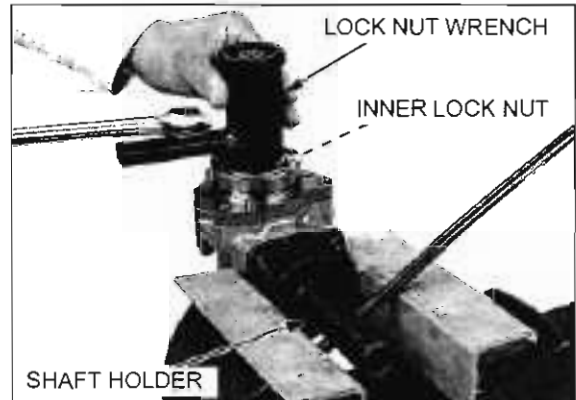
Unstake the bearing inner/outer race lock nuts.



Remove the bearing inner race lock nut using the special tools.

**TOOLS:**

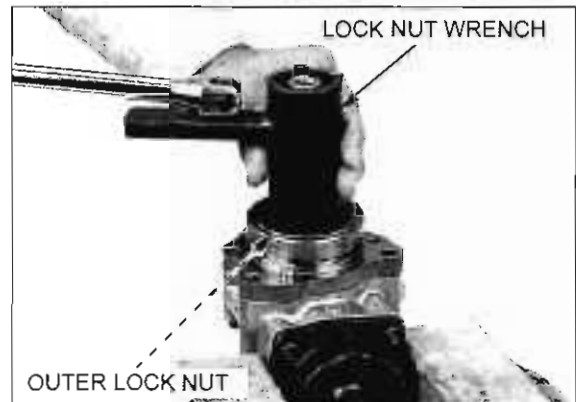
Shaft holder A 07PAB-0010100  
Holder handle 07PAB-0010400  
Lock nut wrench, 36 x 47.8 mm 07916-MB00002



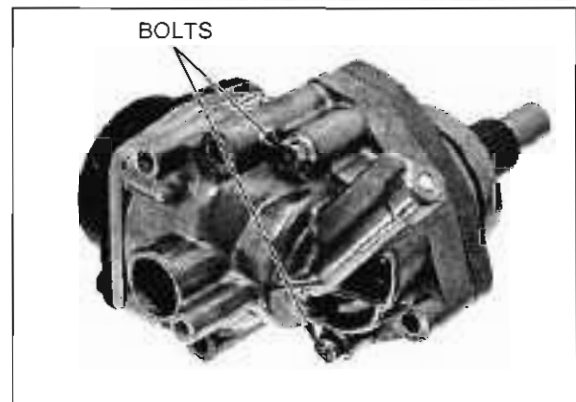
Remove the bearing outer race lock nut using a special tool.

**TOOL:**

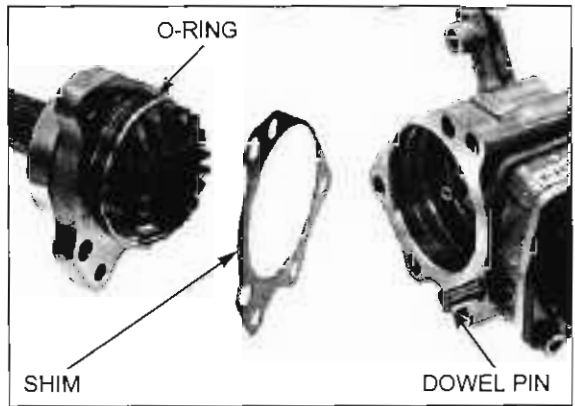
Lock nut wrench, 36 x 47.8 mm 07916-MB00002



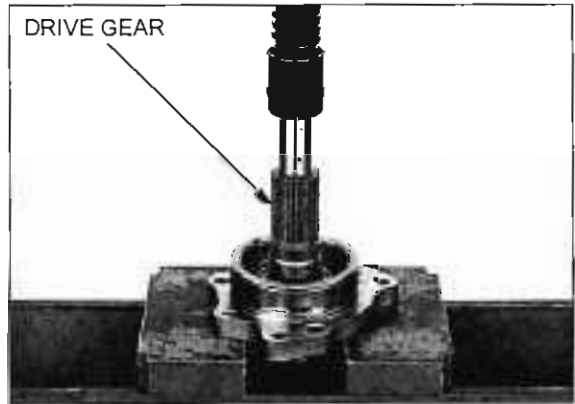
Remove the two bolts and drive gear assembly from the gear case.



Remove the dowel pin, shim and O-ring from the bearing holder.

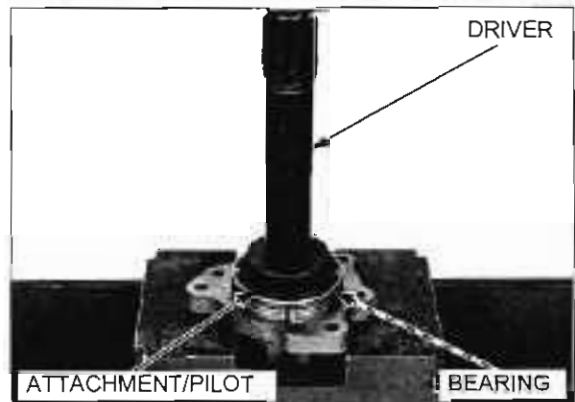


Press the drive gear out of the bearing using a hydraulic press.



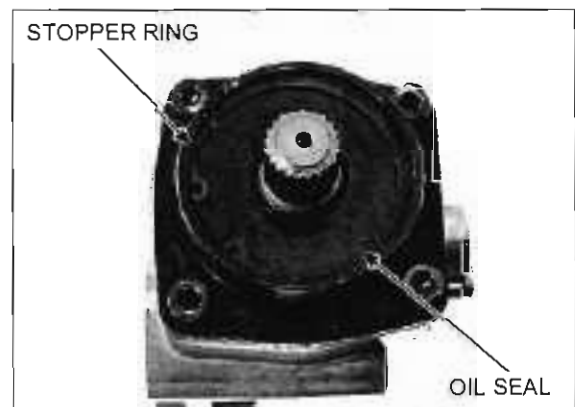
Press the drive gear bearing out of the bearing holder using the special tools and a hydraulic press.

- TOOLS:**
- |                        |               |
|------------------------|---------------|
| Driver                 | 07749-001000  |
| Attachment, 52 x 55 mm | 07746-0010400 |
| Pilot, 30 mm           | 07746-0040700 |



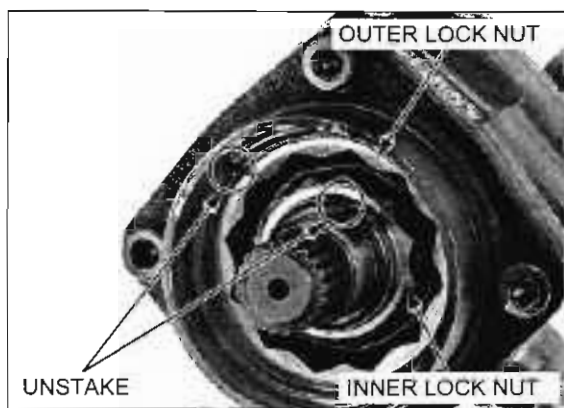
## OUTPUT DRIVEN GEAR DISASSEMBLY

Hold the output gear case in a vise with soft jaws.  
Remove the stopper ring and oil seal.



## CRANKSHAFT/TRANSMISSION

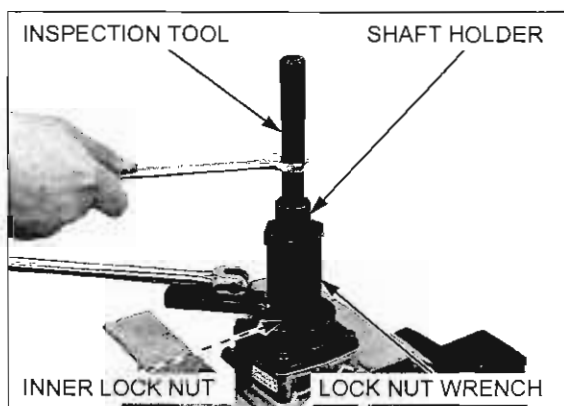
Unstake the bearing inner and outer race lock nuts.



Hold the driven gear shaft and remove the bearing inner race lock nut using the special tools.

**TOOLS:**

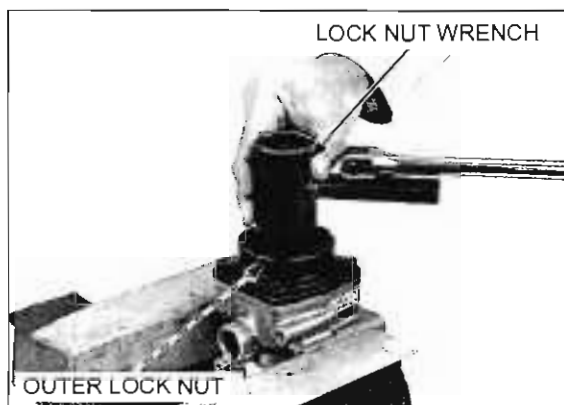
Shaft holder A 07PAB-0010100  
Lock nut wrench, 36 x 47.8 mm 07916-MB00002  
Differential inspection tool 07KMK-HC50101



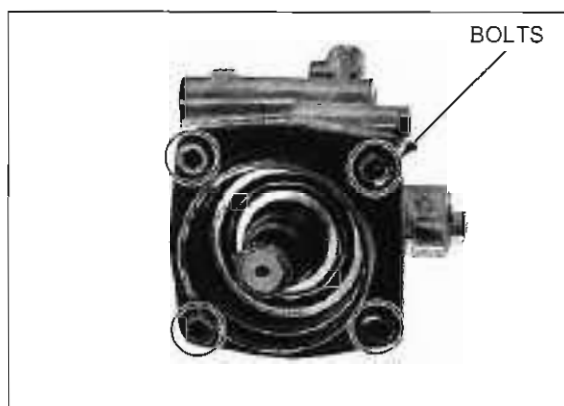
Remove the bearing outer race lock nut using a special tool.

**TOOL:**

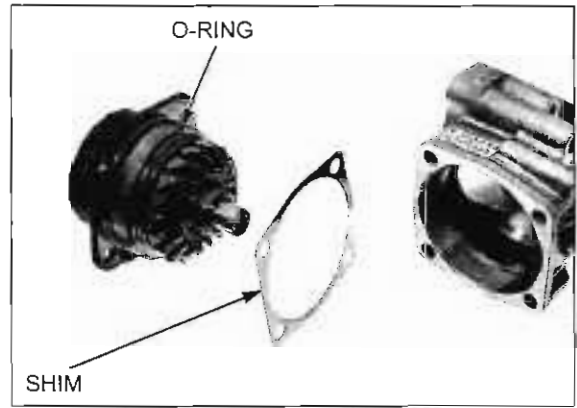
Lock nut wrench, 36 x 47.8 mm 07916-MB00002



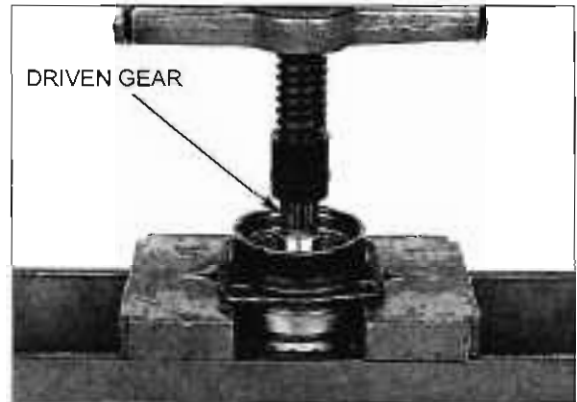
Remove the bolts and driven gear assembly from the gear case.



Remove the shim and O-ring from the bearing holder.



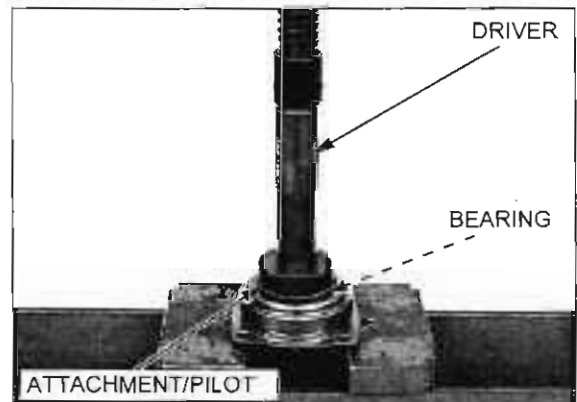
Press the driven gear out of the bearing using a hydraulic press.



Press the driven gear bearing out of the bearing holder using the special tools and a hydraulic press.

**TOOLS:**

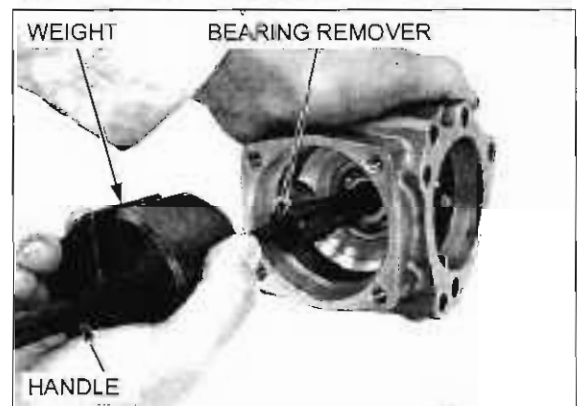
- |                        |               |
|------------------------|---------------|
| Driver                 | 07749-0010000 |
| Attachment, 52 x 55 mm | 07746-0010400 |
| Pilot, 30 mm           | 07746-0040700 |



Remove the driven gear case bearing using the special tools.

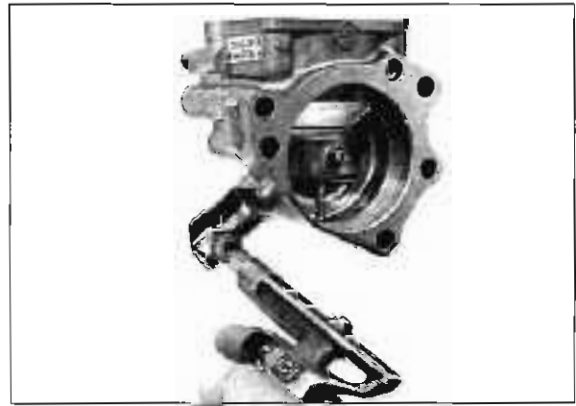
**TOOLS:**

- |                            |                  |
|----------------------------|------------------|
| Bearing remover set, 17 mm | 07936-3710300    |
| Remover handle             | 07936-3710100    |
| Remover weight             | 07741-0010201    |
|                            | or 07936-371020A |
|                            | or 07936-3710200 |
|                            | (U.S.A. only)    |

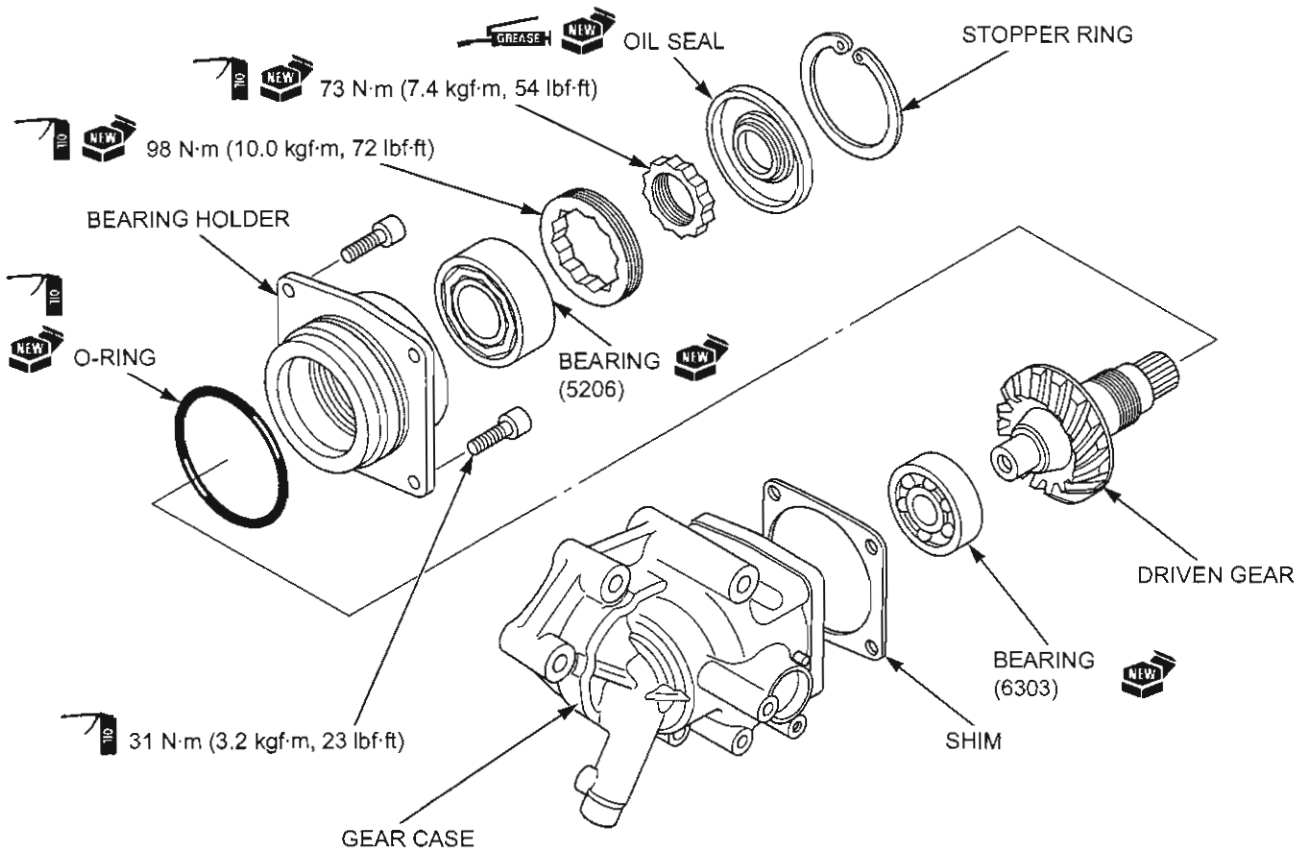


# CRANKSHAFT/TRANSMISSION

Blow oil passage in the output gear case with compressed air.



## OUTPUT DRIVEN GEAR ASSEMBLY

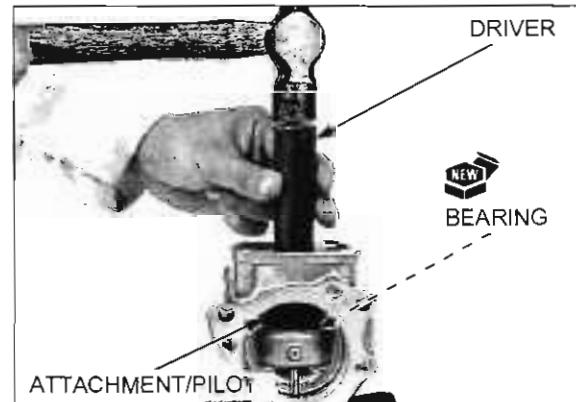


Drive a new bearing into the gear case with the marked side facing up until it is fully seated.

### TOOLS:

Driver  
Attachment, 42 x 47 mm  
Pilot, 17 mm

07749-0010000  
07746-0010300  
07746-0040400





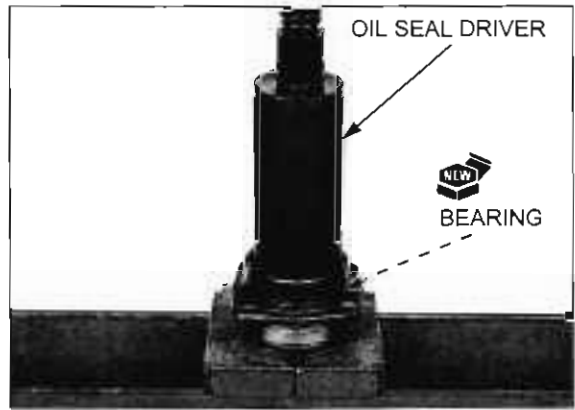
## CRANKSHAFT/TRANSMISSION

Press a new bearing into the bearing holder with the marked side facing up until it is fully seated and make sure it rotates freely after installation.

**TOOL:**

Oil seal driver

07965-KE80200



*If the output driven gear requires replacement, the driven and drive gear must be replaced as a set.*

Support the bearing inner race and press the output driven gear into the bearing holder using the special tools.

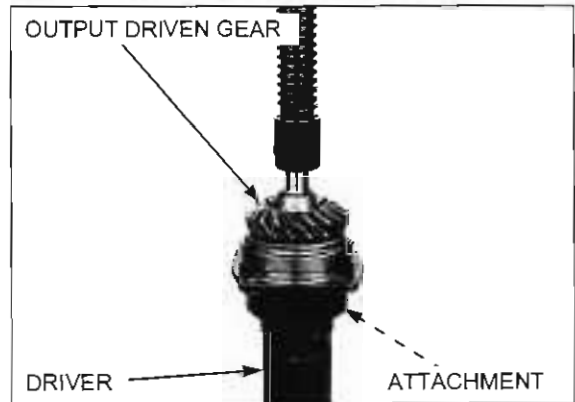
**TOOLS:**

Driver, 40 mm I.D.

07746-0030100

Attachment, 30 mm I.D.

07746-0030300

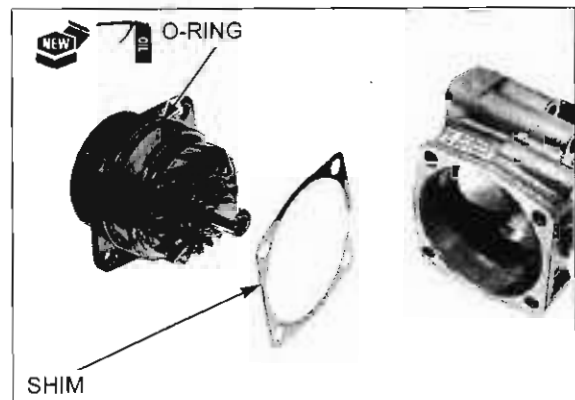


Coat a new O-ring with engine oil and install it into the bearing holder groove.

Install the shim.

**NOTE:**

When the bearing, gear, holder and/or case have been replaced, use the 0.40 mm (0.016 in) shim for initial reference.

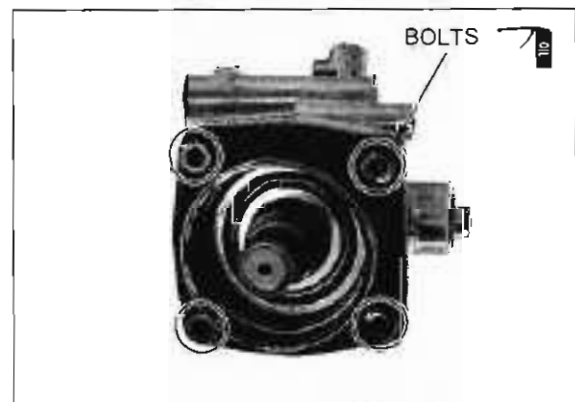


Hold the output gear case in a vise with soft jaws.

Install the driven gear assembly into the gear case, aligning with the bolt holes.

Apply engine oil to the threads and seating surface of the bolts and tighten them.

**TORQUE: 31 N·m (3.2 kgf·m, 23 lbf·ft)**



## CRANKSHAFT/TRANSMISSION

Apply engine oil to the threads and seating surface of a new bearing outer race lock nut and tighten it to the specified torque using a special tool.

### TOOL:

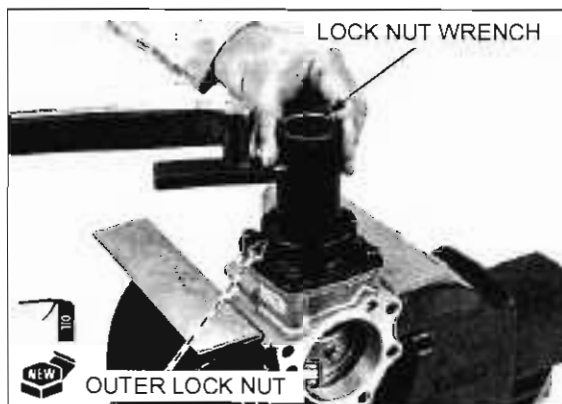
Lock nut wrench, 36 x 47.8 mm 07916-MB00002

Refer to torque wrench reading information, on page 12-3 "Service information".

### TORQUE:

Actual: 98 N·m (10.0 kgf·m, 72 lbf·ft)

Indicated: 89 N·m (9.1 kgf·m, 66 lbf·ft)



Apply engine oil to the threads and seating surface of a new inner race lock nut.

Hold the driven gear shaft and tighten it to the specified torque using the special tools.

### TOOLS:

Shaft holder A 07PAB-0010100

Lock nut wrench, 36 x 47.8 mm 07916-MB00002

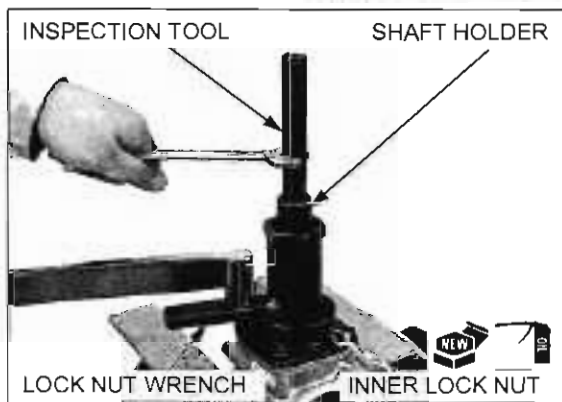
Differential inspection tool 07KMK-HC50101

Refer to torque wrench reading information, on page 12-3 "Service information".

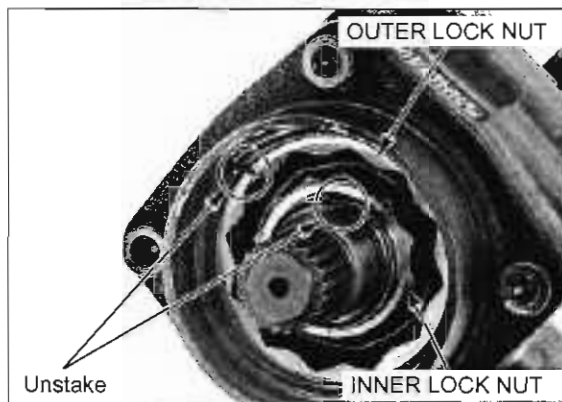
### TORQUE:

Actual: 73 N·m (7.4 kgf·m, 54 lbf·ft)

Indicated: 66 N·m (6.7 kgf·m, 49 lbf·ft)



Stake the bearing inner and outer race lock nuts.

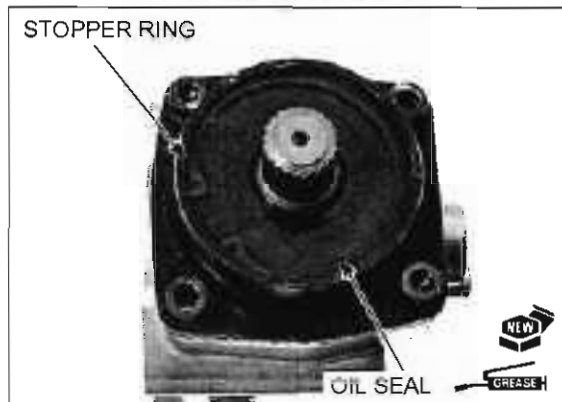


Pack grease into the seal lip cavity of a new oil seal and install it until the ring groove is visible so the stopper ring can be installed.

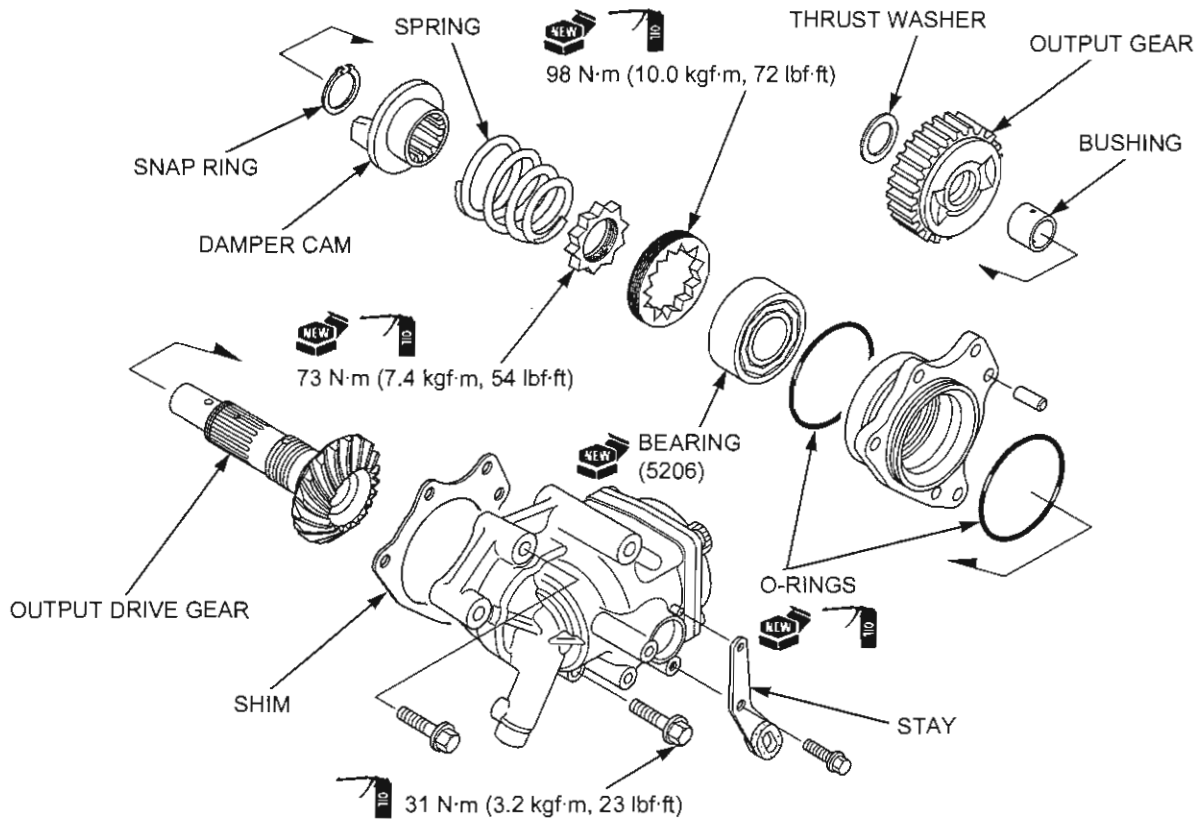
Install the stopper ring into the bearing holder groove securely.

### NOTE:

- Install the stopper ring with the chamfered edge facing the thrust load side.
- Do not reuse worn stopper ring which could easily spin in the groove.
- Check that the stopper ring is seated in the groove.



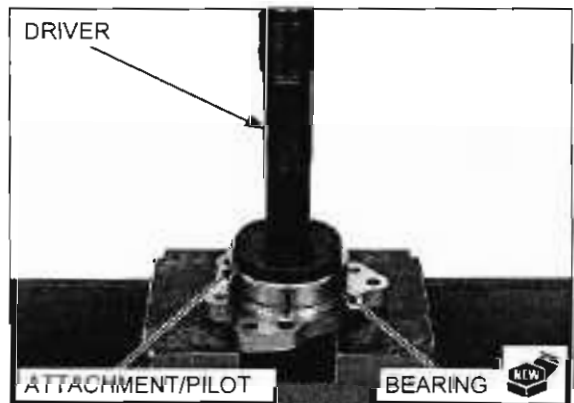
OUTPUT DRIVE GEAR ASSEMBLY



Press a new bearing into the bearing holder with the marked side facing up until it is fully seated.

**TOOLS:**

- |                        |               |
|------------------------|---------------|
| Driver                 | 07749-0010000 |
| Attachment, 62 x 68 mm | 07746-0010500 |
| Pilot, 30 mm           | 07746-0040700 |



*If the output drive gear requires replacement, the drive and driven gears must be replaced as a set.*

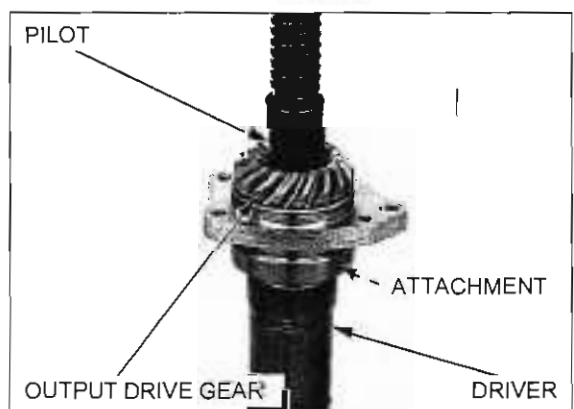
Support the bearing inner race and press the output drive gear using the special tools.

**TOOLS:**

- |                        |               |
|------------------------|---------------|
| Driver, 40 mm I.D.     | 07746-0030100 |
| Attachment, 30 mm I.D. | 07746-0030300 |
| Pilot, 22 mm           | 07746-0041000 |

**NOTE:**

- Place the pilot's threaded end into the drive shaft.
- If the bearing, gear, holder and/or case is replaced, a new shim must be selected (See page 12-33, Backlash Inspection).

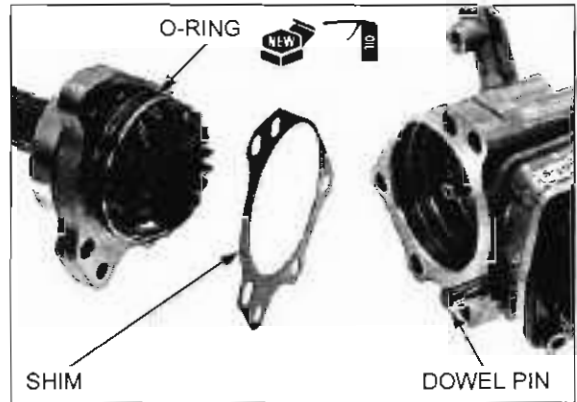


## CRANKSHAFT/TRANSMISSION

Coat a new O-ring with engine oil and install it into the bearing holder groove.  
Install the dowel pin and shim.

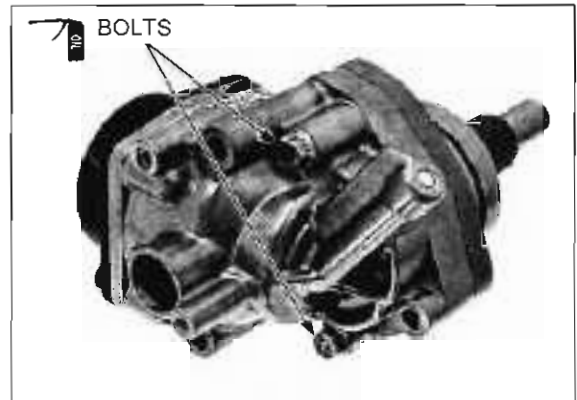
**NOTE:**

- When the bearing, gear, holder and/or case have been replaced, use the 0.50 mm (0.020 in) shim for initial reference.



Install the drive gear assembly into the gear case.  
Apply engine oil to the bolt threads and seating surface.  
Tighten the bolts to the specified torque.

**TORQUE: 31 N·m (3.2 kgf·m, 23 lbf·ft)**



Hold the gear case in a vise with soft jaws.

Apply engine oil to the threads and seating surface of a new bearing outer race lock nut and tighten it to the specified torque using a special tool.

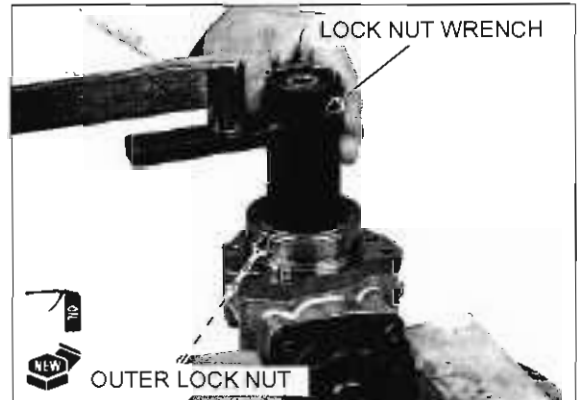
**TOOL:**

Lock nut wrench, 36 x 47.8 mm 07916-MB00002

**TORQUE:**

**Actual: 98 N·m (10.0 kgf·m, 72 lbf·ft)**

**Indicated: 89 N·m (9.1 kgf·m, 66 lbf·ft)**



*Refer to torque wrench reading information, on page 12-3 "Service information".*

Apply engine oil to the threads and seating surface of a new bearing inner race lock nut and tighten it to the specified torque using the special tools.

**TOOLS:**

Lock nut wrench, 36 x 47.8 mm 07916-MB00002

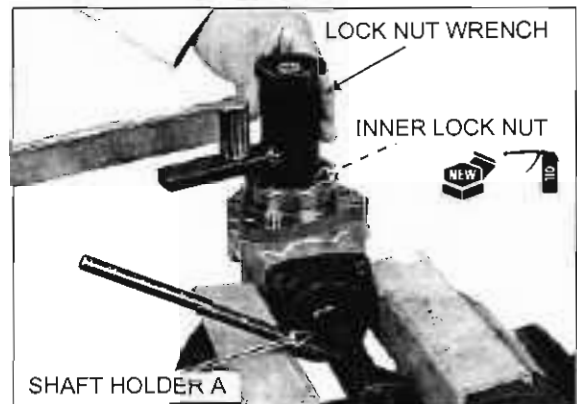
Shaft holder A 07PAB-0010100

Holder handle 07PAB-0010400

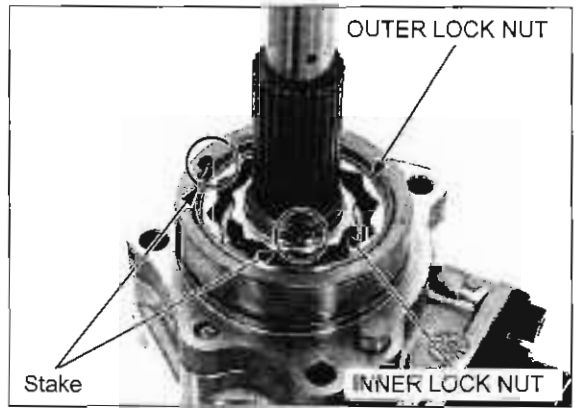
**TORQUE:**

**Actual: 73 N·m (7.4 kgf·m, 54 lbf·ft)**

**Indicated: 66 N·m (6.7 kgf·m, 49 lbf·ft)**

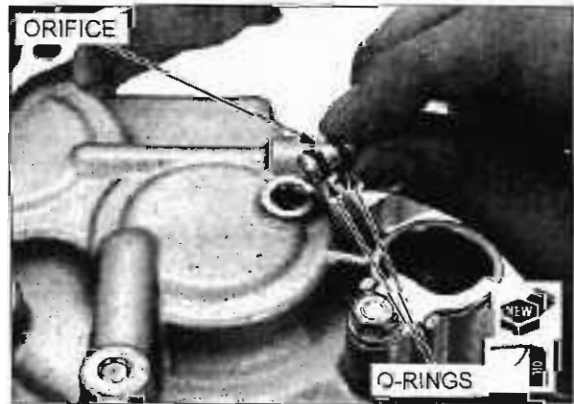


Stake the bearing inner and outer race lock nuts.



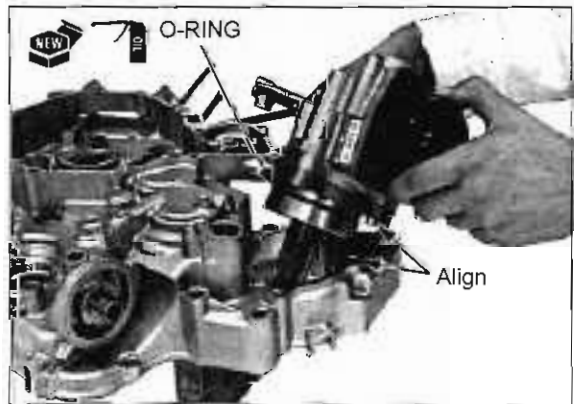
**INSTALLATION**

Coat new O-rings with engine oil and install them into the orifice grooves.  
Install the orifice into the crankcase.



Coat a new O-ring with engine oil and install it into the groove in the gear case.

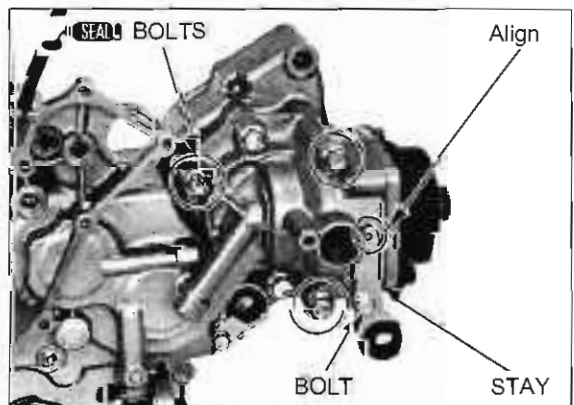
Install the output gear case assembly into the left crankcase by aligning the dowel pin with the crankcase hole.



Apply liquid sealant (Three Bond 1207B or equivalent) to the output gear case mounting bolt threads.  
Tighten the bolts to the specified torque.

**TORQUE: 31 N·m (3.2 kgf·m, 23 lbf·ft)**

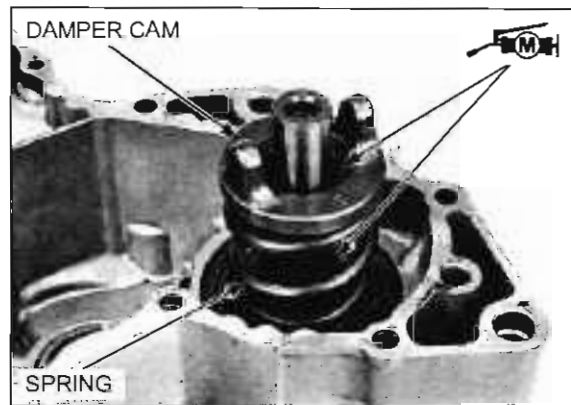
Install the stay, aligning its hole with the gear case boss and tighten the bolt securely.



## CRANKSHAFT/TRANSMISSION

Apply 1 g of molybdenum disulfide grease to the output drive gear and damper cam splines.

Install the damper spring over the output drive gear with the tightly wound coil facing the left crankcase.  
Install the damper cam onto the spring.



Install the snap ring on the damper cam.

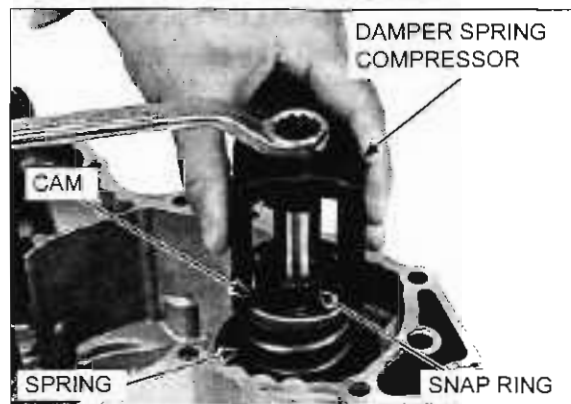
### Except U.S.A.

Set the damper spring compressor onto the damper cam and drive gear shaft.

Compress the damper spring by turning the compressor bolt clockwise until the snap ring groove is visible, then install the snap ring into the groove in the shaft.

### TOOL:

**Damper spring compressor**      07964-ME90000  
**Snap ring pliers**                      07914-5670101



### U.S.A. only:

Place the threaded adaptor in the end of the output drive gear shaft and tighten the adaptor.

Place the compressor seat over the threaded adaptor with the stepped side facing upward.

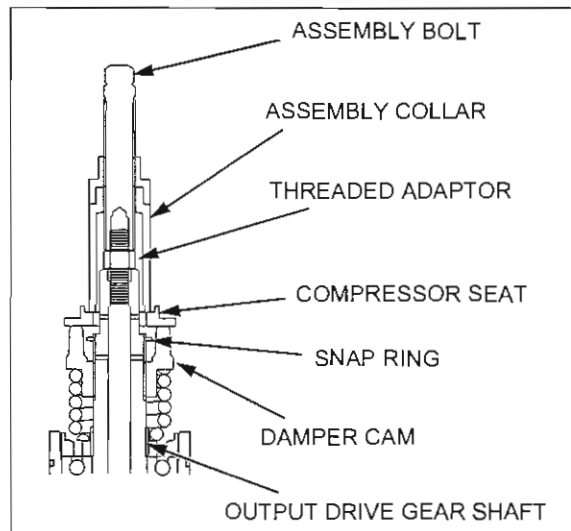
Install the assembly bolt through the assembly collar and attach it to the threaded adaptor.

Center the compressor seat with the damper cam, then begin to tighten the 23 mm nut of the assembly bolt until the snap ring is visible so snap ring can be installed into the groove.

Install the snap ring into the groove in the shaft.

### TOOLS:

**Assembly bolt**                              07965-1660200  
**Assembly collar**                        07965-166030A  
    or 07965-1660302  
**Compressor seat**                        07967-9690200  
**Threaded adaptor**                      07965-KA30000  
**Snap ring pliers**                        07914-5670101  
    (Equivalent  
    commercially  
    available in U.S.A.)



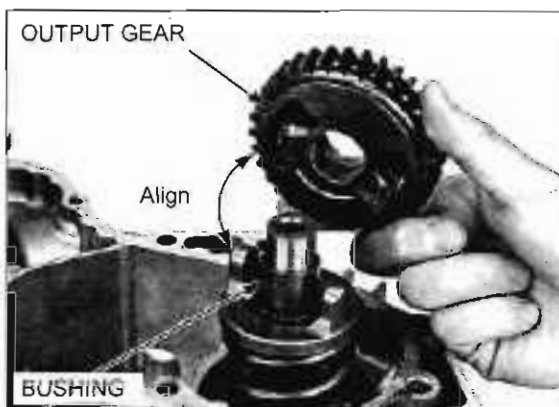
### NOTE:

- Install the snap ring with the chamfered edges facing the thrust load side.
- Do not reuse worn snap ring which could easily spin in the groove.
- Check that the snap ring is seated in the groove.

Loosen and remove the special tool.

Install the bushing into the output gear shaft.

Install the output gear onto the gear shaft by aligning the damper cam projections with the output gear holes.

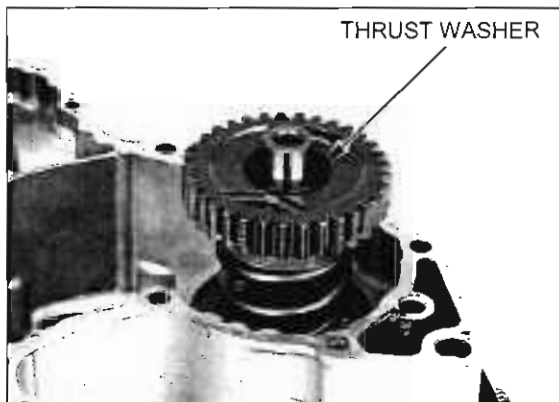


Install the thrust washer.

Install the following:

- Crankshaft (page 12-13)
- Transmission (page 12-27)
- Oil pump (page 4-11)

Assemble the crankcase (page 12-49).



## CRANKCASE BEARING REPLACEMENT

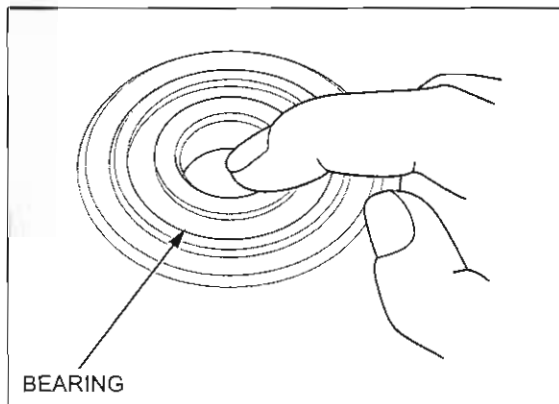
### INSPECTION

Remove the following:

- Crankshaft (page 12-10)
- Transmission (page 12-20)
- Output gear (page 12-29)
- Oil pump (page 4-6)

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

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



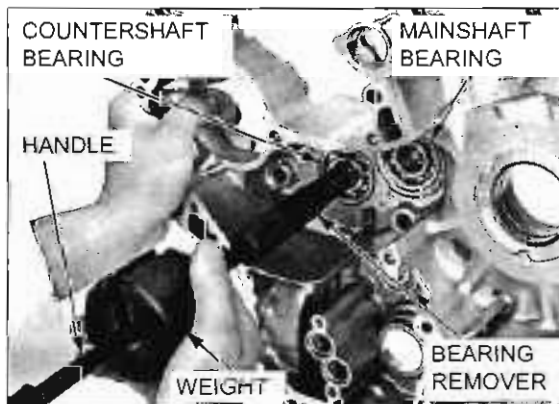
### LEFT CRANKCASE BEARINGS

Remove the mainshaft and countershaft bearings using the special tools.

#### TOOLS:

Bearing remover set, 20 mm  
Remover handle  
Remover weight

07936-3710600  
07936-3710100  
07741-0010201  
or 07936-371020A  
or 07936-3710200  
(U.S.A. only)



## CRANKSHAFT/TRANSMISSION

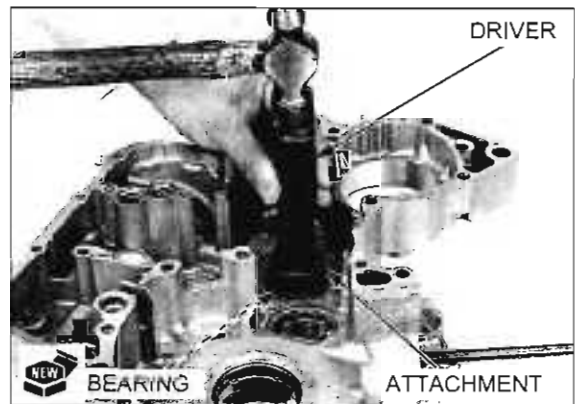
Remove the oil guide plate from the crankcase.  
Check the oil guide plate for clog or deformation.  
Install the oil guide plate into the crankcase.



Drive new bearings into the left crankcase with the marked side facing up until they are fully seated.

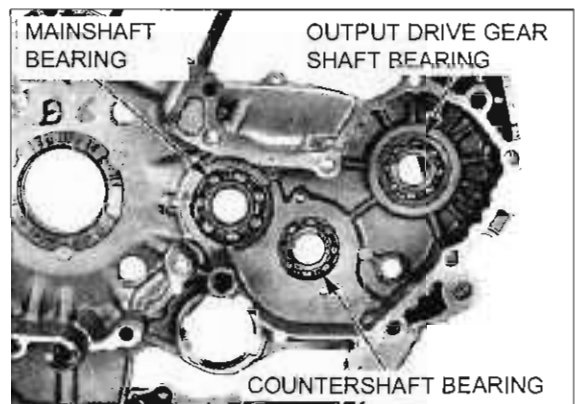
### TOOLS:

Driver	07749-0010000
Attachment, 42 x 47 mm	07746-0010300



## RIGHT CRANKCASE BEARINGS

Drive the bearings out of the right crankcase.



Drive new bearings into the right crankcase with the marked side facing up until they are fully seated.

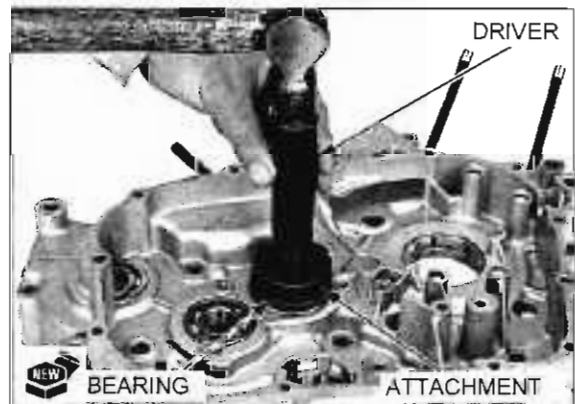
### TOOLS:

#### Mainshaft bearing:

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

#### Countershaft/output drive gear shaft bearings:

Driver	07749-0010000
Attachment, 42 x 47 mm	07746-0010300
Pilot, 20 mm	07746-0040500



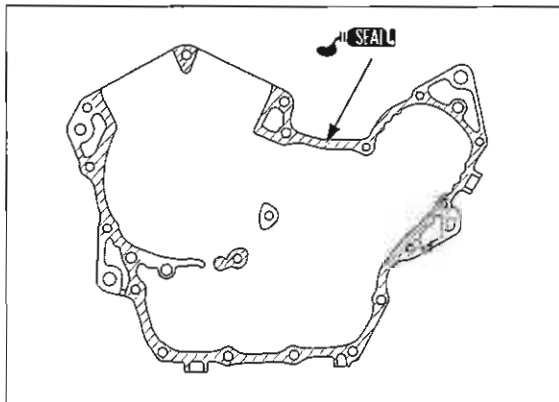


# CRANKCASE ASSEMBLY

Clean the left and right crankcase mating surfaces thoroughly, being careful not to damage them.

Make sure the all parts are installed in the left crankcase.

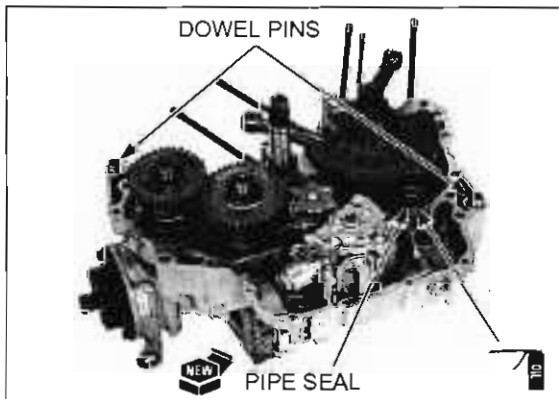
Apply liquid sealant (Three Bond 1207B or equivalent) to the right and left crankcase mating surfaces.



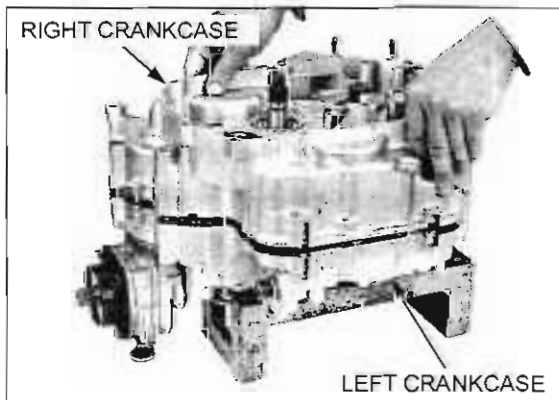
Install the two dowel pins into the left crankcase.  
Coat a new pipe seal with engine oil and install it to the oil pipe.

**NOTE:**

Install a new pipe seal with its tapered side facing out.



Install the right crankcase over the left crankcase.

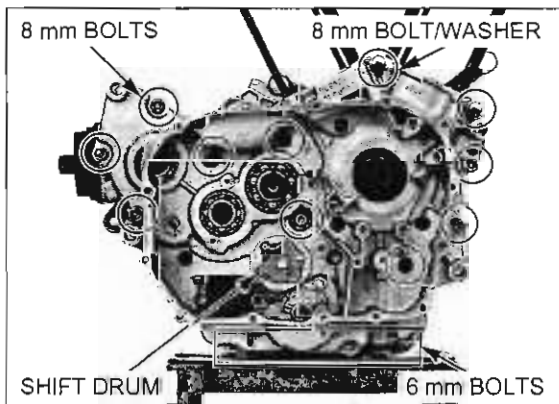


Turn the shift drum until the position as shown.  
Install the right crankcase bolts with the washer.  
Tighten the 8 mm bolts in a crisscross pattern in several steps.

**TORQUE:**

8 mm bolt: 23 N·m (2.3 kgf·m, 17 lbf·ft)

Tighten the 6 mm bolts securely.



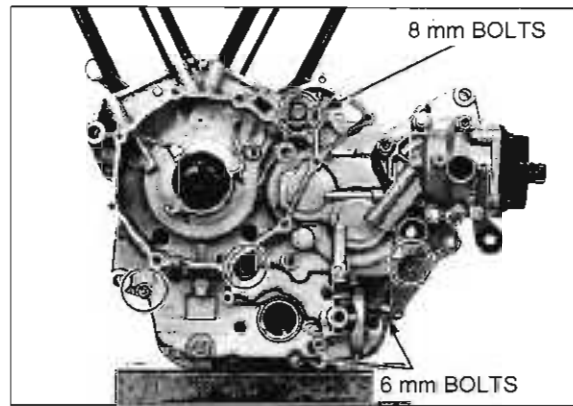
## CRANKSHAFT/TRANSMISSION

Install the left crankcase bolts and tighten the 8 mm bolts in a crisscross pattern in several steps.

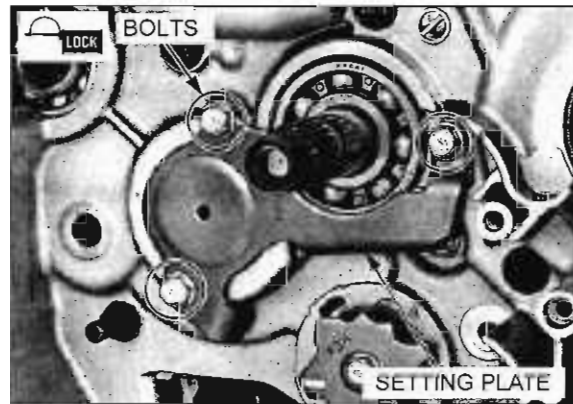
### TORQUE:

8 mm bolt: 23 N·m (2.3 kgf·m, 17 lbf·ft)

Tighten the 6 mm bolts securely.



Clean and apply locking agent to the bolt threads (page 1-23).  
Install the bearing setting plate and tighten the bolts.



Install and tighten the bolt with the washer by holding the output driven gear shaft using the special tools.

### TOOLS:

Shaft holder A

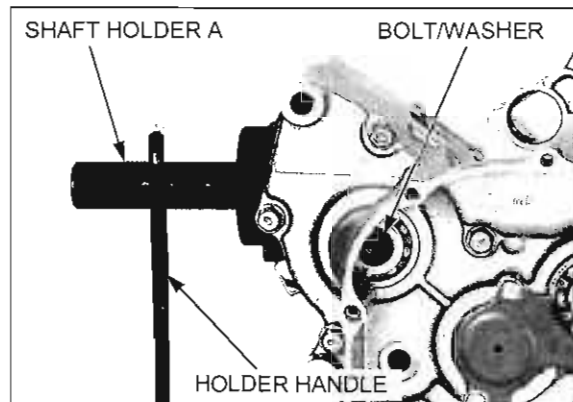
07PAB-0010100

Holder handle

07PAB-0010400

TORQUE: 49 N·m (5.0 kgf·m, 36 lbf·ft)

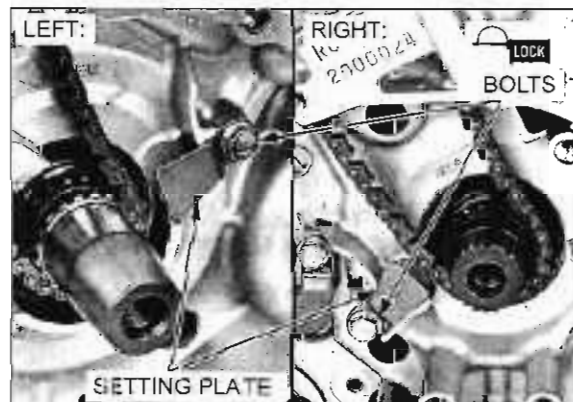
Recheck the all crankcase bolt torque values.



Install the cam chains.

Apply locking agent to the cam chain tensioner setting plate bolt threads (page 1-23).  
Install the cam chain tensioner setting plates and tighten the bolts.

Install the remaining parts (page 12-3).  
Install the engine into the frame (page 7-8).



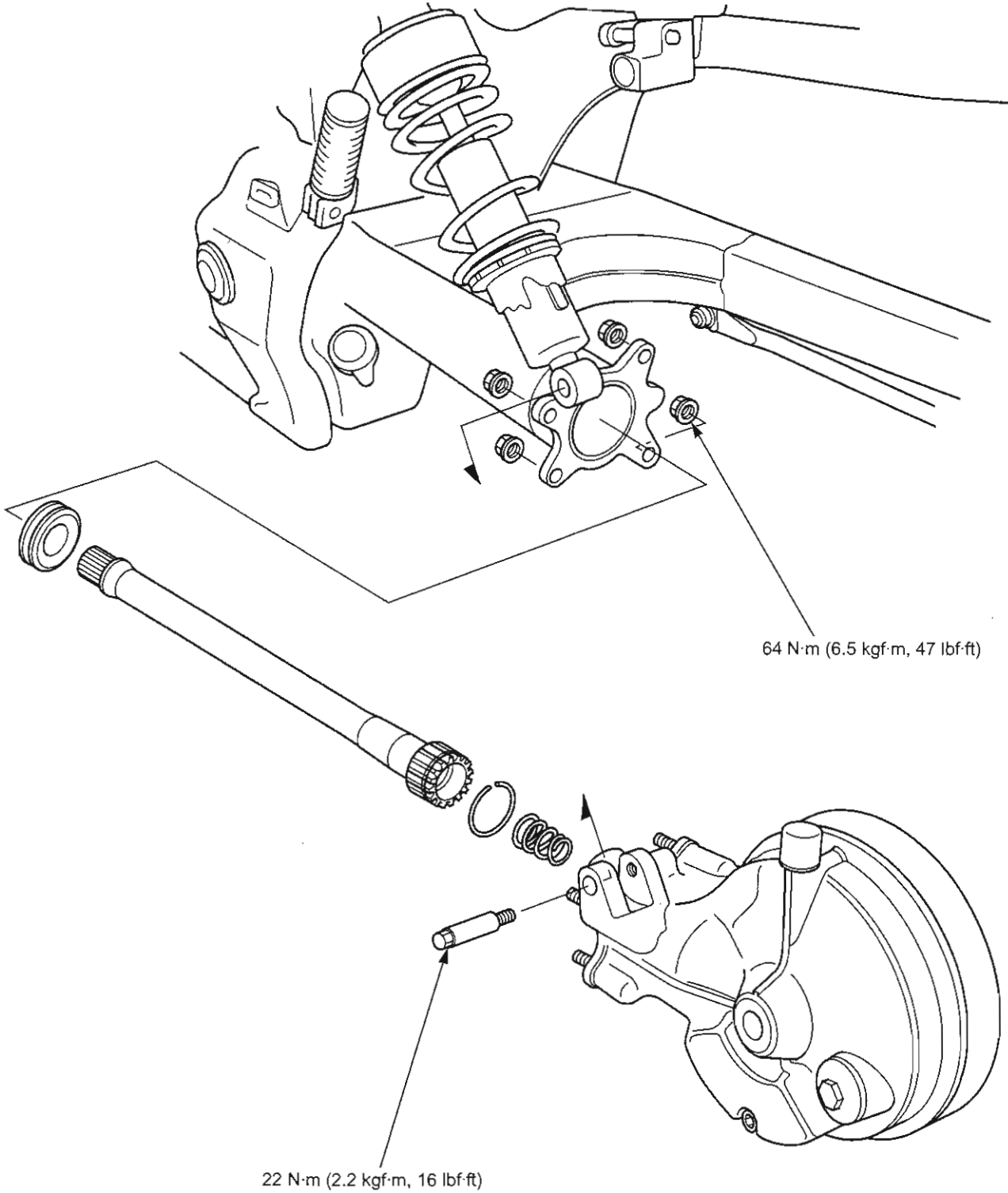
# 13. FINAL DRIVE

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COMPONENT LOCATION .....	13-2
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TROUBLESHOOTING.....	13-6
FINAL DRIVE REMOVAL.....	13-7

FINAL DRIVE DISASSEMBLY/ INSPECTION.....	13-8
FINAL DRIVE ASSEMBLY .....	13-17
FINAL DRIVE INSTALLATION.....	13-22

COMPONENT LOCATION



## SERVICE INFORMATION

### GENERAL

- The final drive gear assembly and final drive shaft must be removed together.
- Perform the gear contact pattern and backlash inspection whenever you replace the bearings, gears or gear case. The extension lines from the gear engagement surfaces should intersect at one point.
- Protect the gear case with a shop towel or soft jaws while holding it in a vise. Do not clamp the gear case too tightly or it could be damaged.
- Replace the ring and pinion gears as a set.

### SPECIFICATIONS

ITEM		STANDARD	SERVICE LIMIT
Recommended final drive oil		Hypoid gear oil, SAE #80	—
Final drive oil capacity	At draining	160 cm <sup>3</sup> (5.4 US oz, 5.6 Imp oz)	—
	At disassembly	170 cm <sup>3</sup> (5.7 US oz, 6.0 Imp oz)	—
Final drive gear backlash		0.05 – 0.15 (0.002 – 0.006)	0.30 (0.012)
Backlash difference between measurements		—	0.10 (0.004)
Ring gear-to-stop pin clearance		0.30 – 0.60 (0.012 – 0.024)	—
Final drive gear assembly pre-load		0.2 – 0.4 N·m (2.0 – 4.1 kgf·m, 0.1 – 0.3 lbf·ft)	—

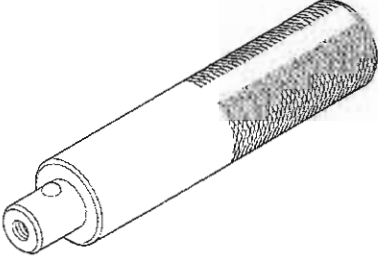
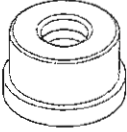
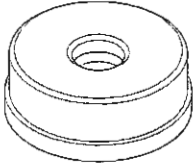
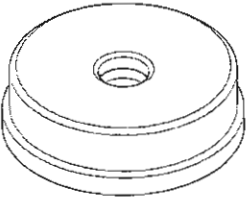
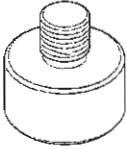
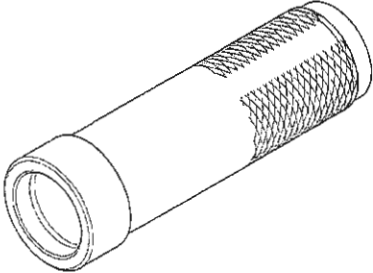
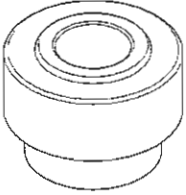
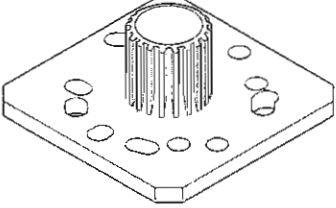
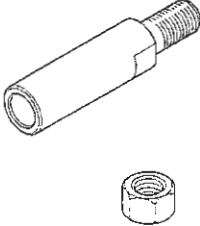

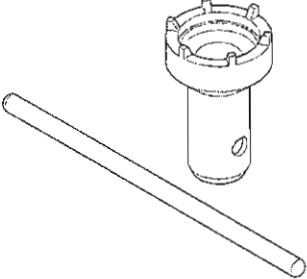
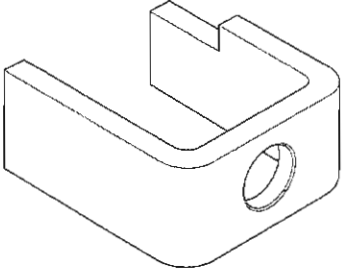
Unit: mm (in)

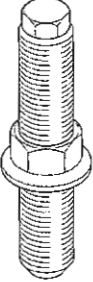
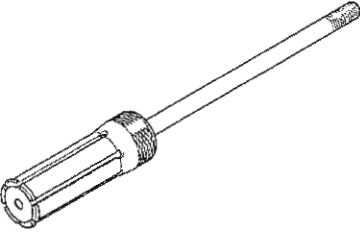
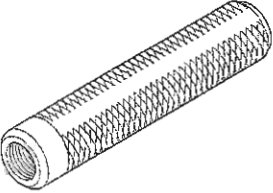
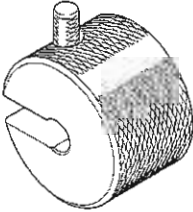
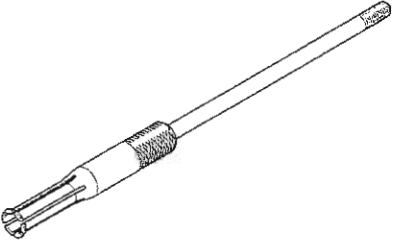
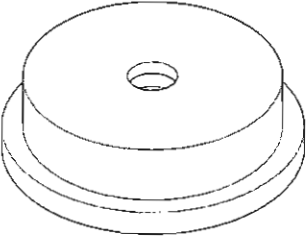
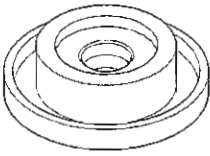
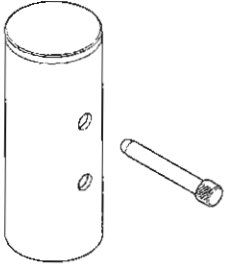
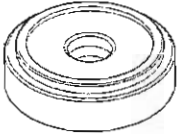
### TORQUE VALUES

Pinion retainer	108 N·m (11.0 kgf·m, 80 lbf·ft)	
Pinion retainer lock tab bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Pinion joint nut	108 N·m (11.0 kgf·m, 80 lbf·ft)	Apply locking agent to the threads
Dust guard plate bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Final gear case cover 10 mm bolt	47 N·m (4.8 kgf·m, 35 lbf·ft)	Apply locking agent to the threads
Final gear case cover 8 mm bolt	25 N·m (2.5 kgf·m, 18 lbf·ft)	
Final gear case assembly mounting nut	64 N·m (6.5 kgf·m, 47 lbf·ft)	
Rear shock absorber lower mounting bolt (left side)	22 N·m (2.2 kgf·m, 16 lbf·ft)	
Final gear case stud bolt	See page 13-22	

# FINAL DRIVE

## TOOLS

<p>Driver 07749-0010000</p> 	<p>Attachment, 32 x 35 mm 07746-0010100</p> 	<p>Attachment, 52 x 55 mm 07746-0010400</p> 
<p>Attachment, 72 x 75 mm 07746-0010600</p> 	<p>Pilot, 19 mm 07746-0041400</p> 	<p>Driver, 40 mm I.D. 07746-0030100</p> 
<p>Attachment, 25 mm I.D. 07746-0030200</p> 	<p>Pinion holder plate 07924-ME40010</p> 	<p>Collar set "C" 07924-ME40020</p> 
<p>Oil seal driver 070MF-MEG0300</p> 	<p>Retainer wrench 07910-MA10100</p>  <p>or 07914-4630100 (U.S.A. only)</p>	<p>Pinion puller base 07HMC-MM80110</p>  <p>or 07HMC-MM8011A (U.S.A. only)</p>

<p>Puller shaft 07931-ME40000</p>  <p>or 07931-ME4010B and 07931-HB3020A (U.S.A. only)</p>	<p>Bearing remover, 35 mm 07936-3710400</p> 	<p>Remover handle 07936-3710100</p> 
<p>Remover weight 07741-0010201</p>  <p>07936-371020A or 07936-3710200 (U.S.A. only)</p>	<p>Bearing remover, 20 mm 07936-3710600</p> 	<p>Bearing driver attachment 07GAD-SD40101</p> 
<p>Oil seal driver attachment 07LAD-SM40100</p>  <p>or 07LAD-SM4A100 (U.S.A. only)</p>	<p>Oil seal driver, 55.7 x 60.3 mm 07965-KE80200</p> 	<p>Attachment, 44 x 49.5 mm 07945-3330300</p> 

## FINAL DRIVE

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### TROUBLESHOOTING

#### Excessive noise

- Worn or scored ring gear shaft and driven flange
- Scored driven flange and wheel hub (page 15-9)
- Worn or scored drive pinion and splines
- Worn pinion and ring gears
- Excessive backlash between pinion and ring gears
- Oil level too low
- Worn or damaged pinion gear and/or pinion joint splines

#### Oil leak

- Clogged breather
- Oil level too high
- Damaged seals
- Loose case cover bolts

#### Excessive rear wheel backlash

- Worn drive shaft splines
- Excessive backlash between pinion and ring gears
- Worn driven flange and ring gear splines
- Excessive play in final drive case bearings
- Worn drive shaft, universal joint and/or pinion joint splines
- Excessive play or worn universal joint bearing

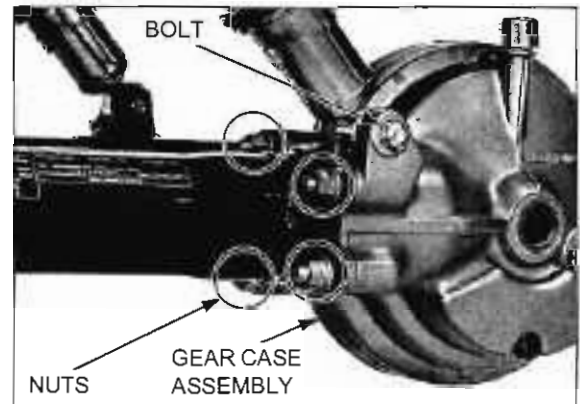


## FINAL DRIVE REMOVAL

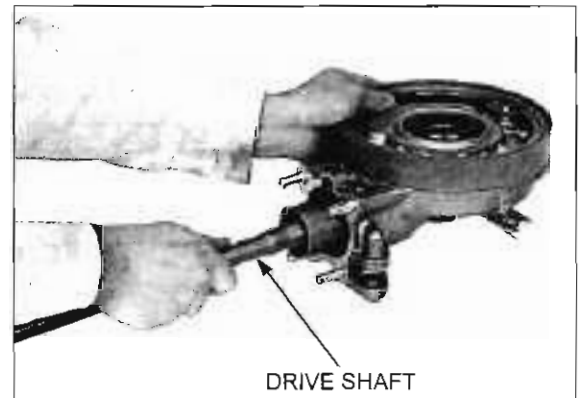
Drain the final drive oil (page 3-16).  
Remove the rear wheel (page 15-7).

Remove the left shock absorber lower mounting bolt.

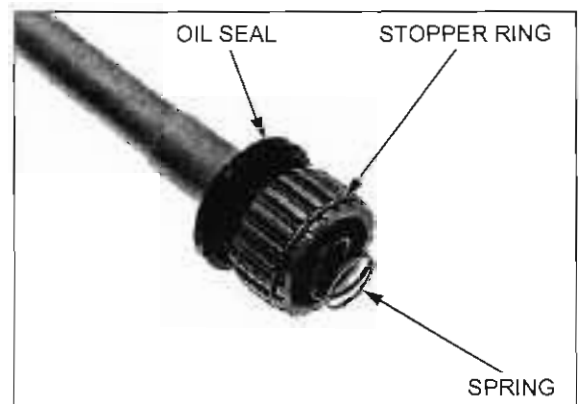
Remove the four mounting nuts and final drive gear case assembly.



Remove the drive shaft from the final drive gear case assembly by gently turning the drive shaft and pulling it.

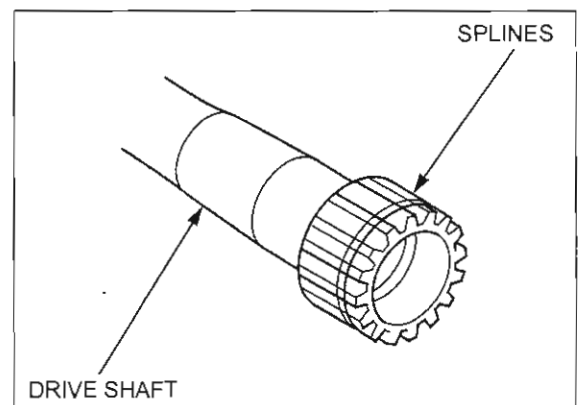


Remove the spring, oil seal and stopper ring from the drive shaft.



## INSPECTION

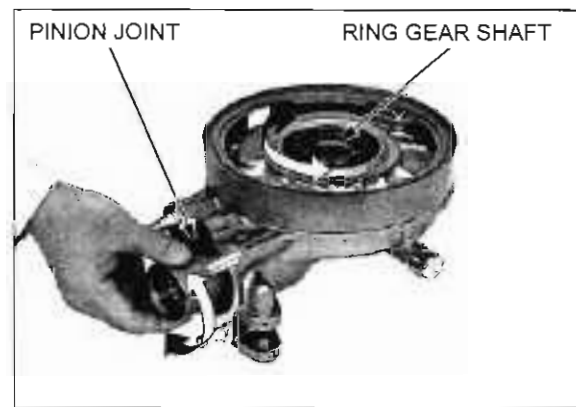
Check the splines of the drive shaft for wear or damage. If the splines of the drive shaft are damaged, check the universal joint splines also (page 15-30).



## FINAL DRIVE

Turn the pinion joint and check that the pinion and ring gears turn smoothly and quietly without binding.

If the gears do not turn smoothly or quietly, the gears and/or bearing may be damaged or faulty. They must be checked after disassembly; replace faulty parts/assemblies as required.

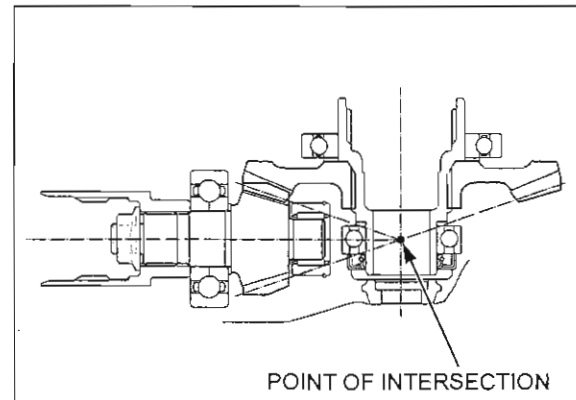


## FINAL DRIVE DISASSEMBLY/INSPECTION

### NOTE:

Perform the backlash inspection and contact pattern check whenever you replace the pinion gear, ring gear, bearings and gear case. The extension lines from the gear engagement surfaces should intersect at one point.

Remove the final drive and drive shaft (page 13-7).



## BACKLASH INSPECTION

Remove the oil filler cap.

*Do not over-tighten the vice on the final drive case.*

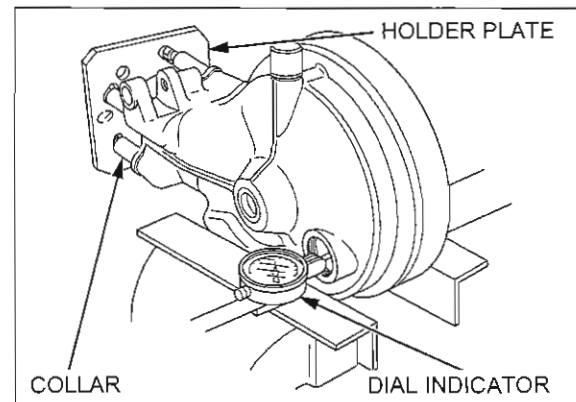
Hold the final drive gear case assembly in a vise with soft jaws.

Install the special tools onto the gear case and into the pinion joint to hold the pinion gear.

### TOOLS:

Pinion holder plate                      07924-ME40010  
Collar set "C"                            07924-ME40020

Set a horizontal type dial indicator on the ring gear, through the oil filler hole.



Turn the ring gear back and forth to read the backlash.

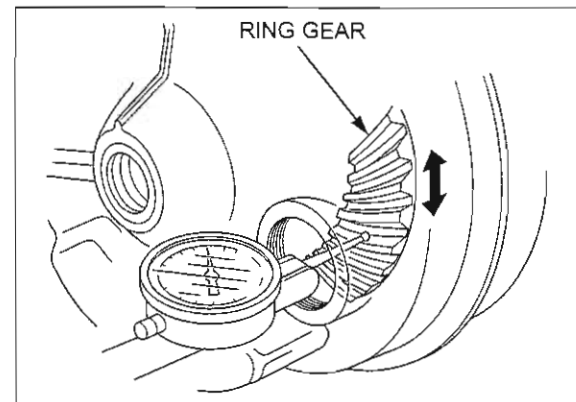
**STANDARD:** 0.05 – 0.15 mm (0.002 – 0.006 in)

**SERVICE LIMIT:** 0.30 mm (0.012 in)

Remove the dial indicator and special tools. Turn the ring gear 120° and measure the backlash. Repeat this procedure once more. Compare the difference of the three measurements.

**SERVICE LIMIT:** 0.10 mm (0.004 in)

If the difference in measurements exceeds the service limit, it indicates that the bearing is not installed squarely, or the case is deformed. Inspect the bearings and case.

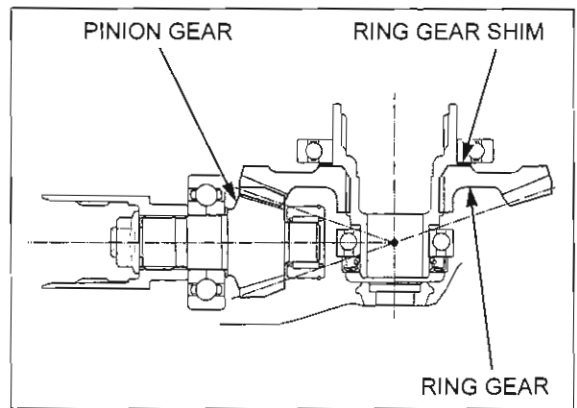


If the backlash is excessive, replace the ring gear shim with a thicker one.  
 If the backlash is too small, replace the ring gear shim with a thinner one.

**RING GEAR SHIMS:**

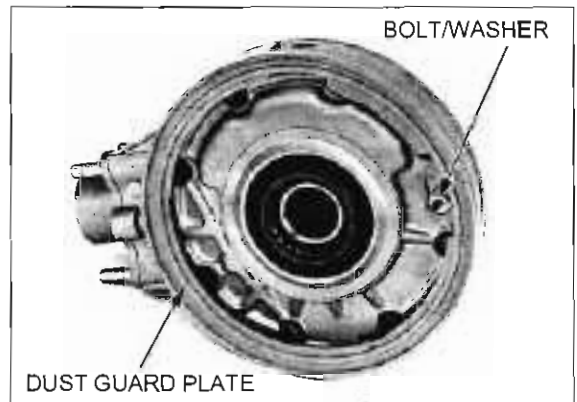
- A: 1.82 mm (0.072 in)
- B: 1.88 mm (0.074 in)
- C: 1.94 mm (0.076 in)
- D: 2.00 mm (0.079 in) – Standard
- E: 2.06 mm (0.081 in)
- F: 2.12 mm (0.083 in)
- G: 2.18 mm (0.086 in)
- H: 2.24 mm (0.088 in)
- I: 2.30 mm (0.091 in)

For ring gear shim replacement (page 13-11).



**FINAL GEAR CASE SEPARATION**

Remove the bolt, washer and the dust guard plate by turning it clockwise.

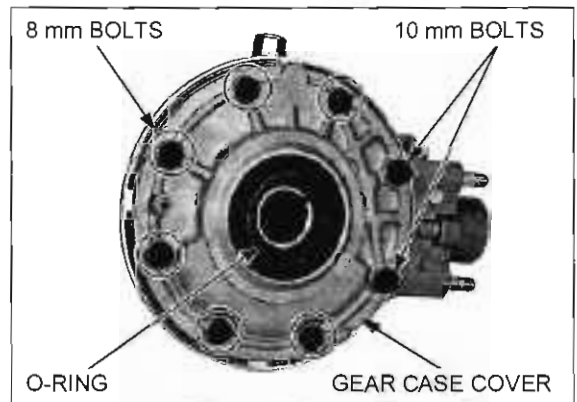


Remove the O-ring.

Loosen the cover bolts in a crisscross pattern in several steps and remove them.

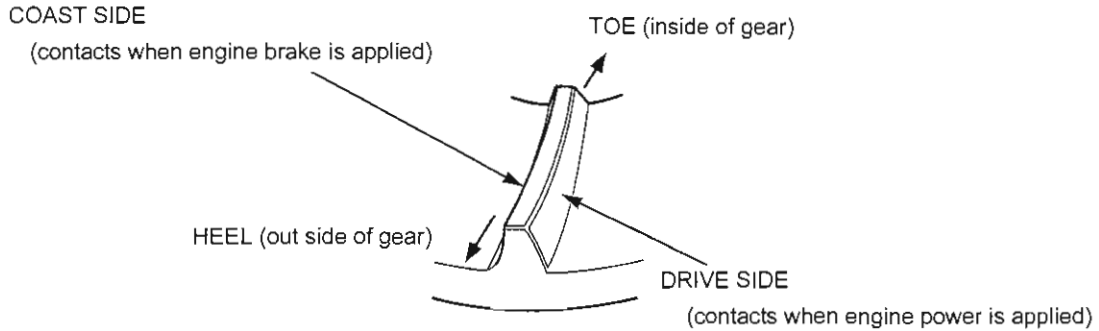
Pry the gear case cover and remove it from the case.

Remove the wave washer.



**GEAR TOOTH CONTACT PATTERN CHECK**

Description of the tooth:

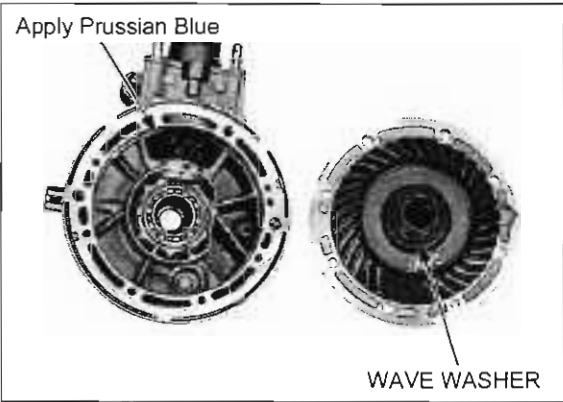


*Keep dust and dirt out of the case and cover.*

Clean the sealing material off the mating surfaces of the gear case and cover, being careful not to damage them.

Apply a thin coat of Prussian Blue to the pinion gear teeth.

Install the wave washer.



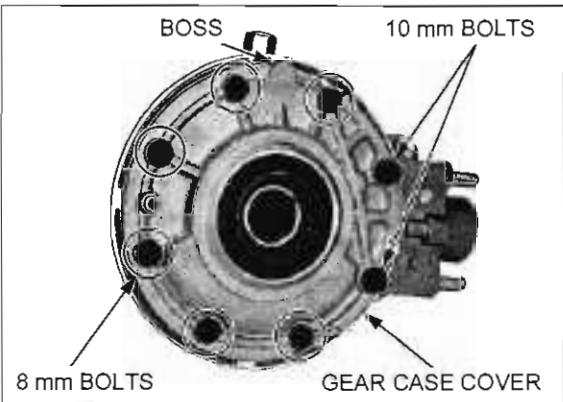
Install the case cover and tighten the bolts in a crisscross pattern in several steps until the cover evenly touches the gear case.

Tighten the two 10 mm bolts to the specified torque in several steps alternately.

**TORQUE: 47 N·m (4.8 kgf·m, 35 lbf·ft)**

Tighten the six 8 mm bolts to the specified torque in a crisscross pattern in several times.

**TORQUE: 25 N·m (2.5 kgf·m, 18 lbf·ft)**



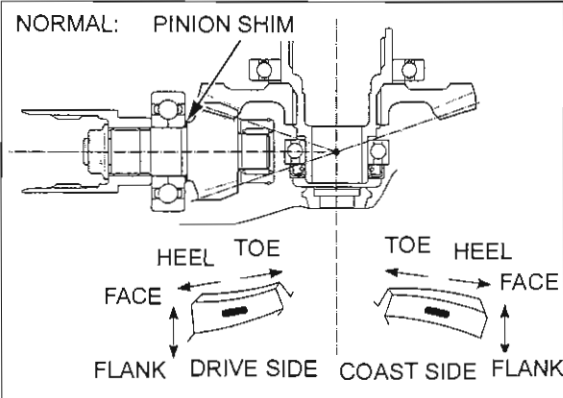
Remove the oil filler cap.

Rotate the ring gear several times in normal direction of rotation.

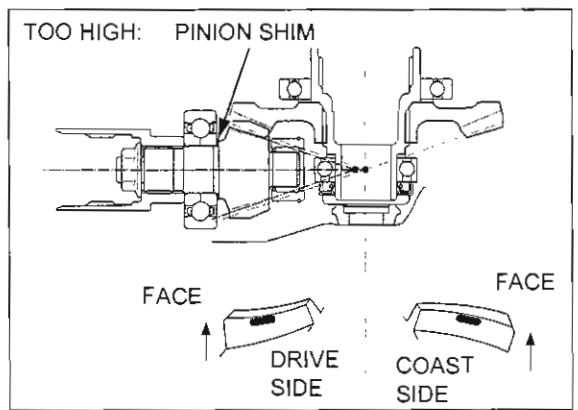
Check the gear tooth contact pattern through the oil filler hole.

Contact is normal if the Prussian Blue is transferred to the approximate center of each tooth and slightly towards the face.

If the patterns are not correct, remove and replace the pinion gear shim with a suitable one (page 13-14).



Replace the pinion gear shim with a thicker one if the contact pattern is too high, toward the face.

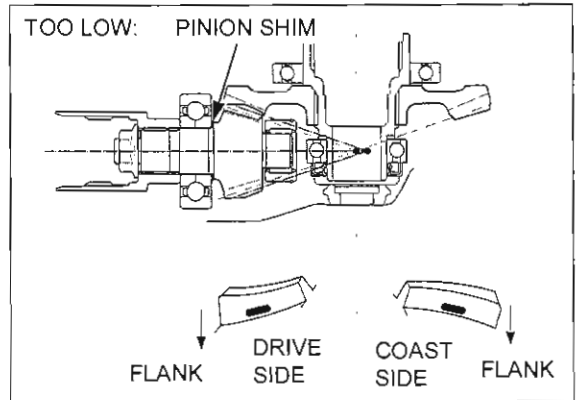


Replace the pinion gear shim with a thinner one if the contact pattern is too low, toward the flank.

The patterns will shift about 1.5 – 2.0 mm (0.06 – 0.08 in) when the thickness of the shim is changed by 0.1 mm (0.004 in).

**PINION GEAR SHIMS:**

- A: 1.82 mm (0.072 in)
- B: 1.88 mm (0.074 in)
- C: 1.94 mm (0.076 in)
- D: 2.00 mm (0.079 in) – Standard
- E: 2.06 mm (0.081 in)
- F: 2.12 mm (0.083 in)
- G: 2.18 mm (0.086 in)



For pinion gear shim replacement (page 13-14).

**RING GEAR REMOVAL/SHIM REPLACEMENT**

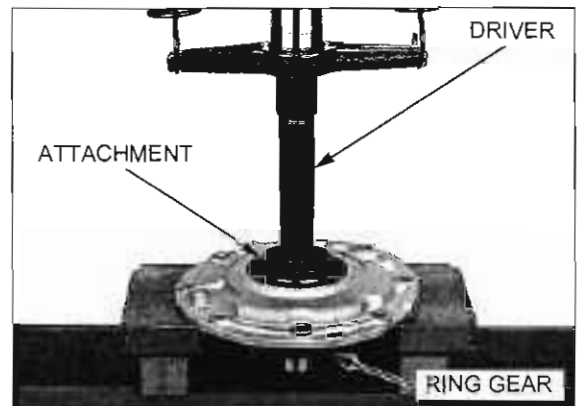
Remove the final gear case cover (page 13-9).

If the ring gear stays in the cover, remove it as follows:

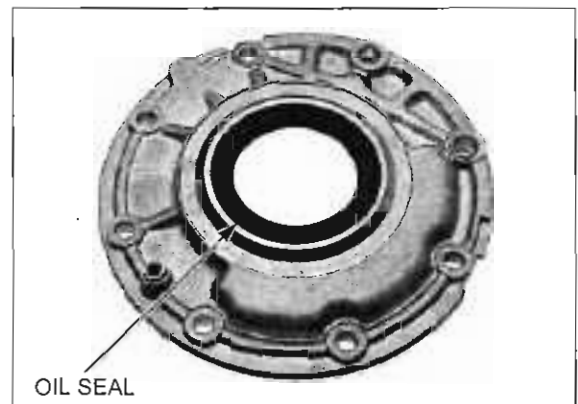
Press the ring gear out of the gear case cover using the special tools and hydraulic press.

**TOOLS:**

- Driver 07749-0010000
- Oil seal driver attachment 07LAD-SM40100 or 07LAD-SM4A100 (U.S.A. only)



Remove the oil seal.



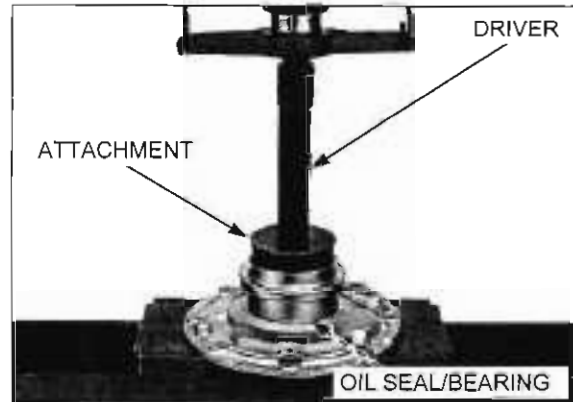
## FINAL DRIVE

If the bearing remained in the cover, remove it as follows:

Press the oil seal and bearing out of the cover using the special tools and hydraulic press.

**TOOLS:**

Driver	07749-0010000
Oil seal driver	070MF-MEG0300
Attachment, 72 x 75 mm	07746-0010600

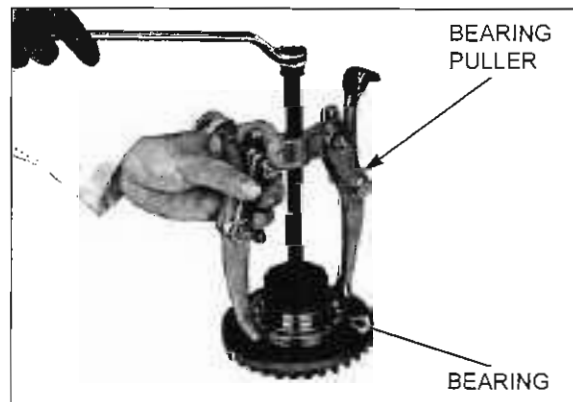


If the bearing remained on the ring gear, remove it as follows:

Remove the ring gear bearing using a commercially available bearing puller.

This bearing may not need to be replaced after removal. However, inspect the bearing for excessive play after removal.

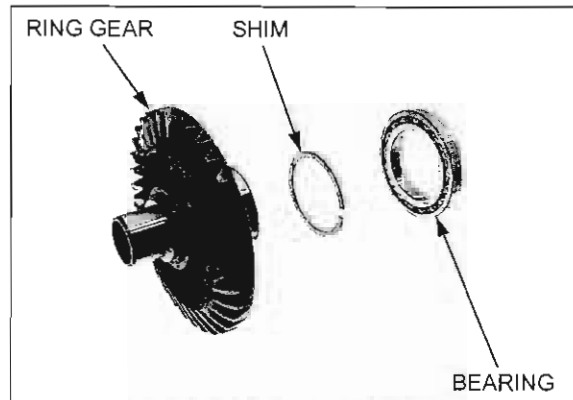
Replace it if necessary.



Select the replacement shim (page 13-9).

**NOTE:**

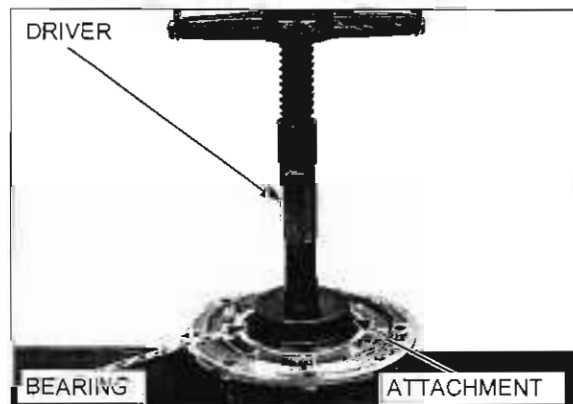
When the gear set, pinion bearing, ring gear bearing and/or gear case has been replaced, use a 2.00 mm (0.079 in) thickness shim for initial reference.



Press the ring gear bearing into the cover with the marked side facing inside until it is fully seated.

**TOOLS:**

Driver	07749-0010000
Bearing driver attachment	07GAD-SD40101



**PINION GEAR REMOVAL**

Hold the gear case in a vise with soft jaws.

Hold the pinion joint and remove the pinion joint nut using the special tools.

**TOOLS:**

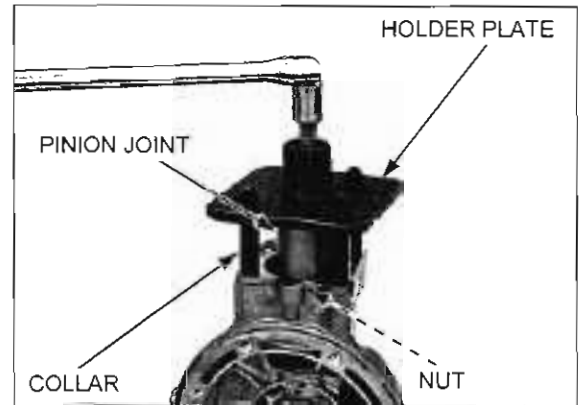
**Pinion holder plate**

**07924-ME40010**

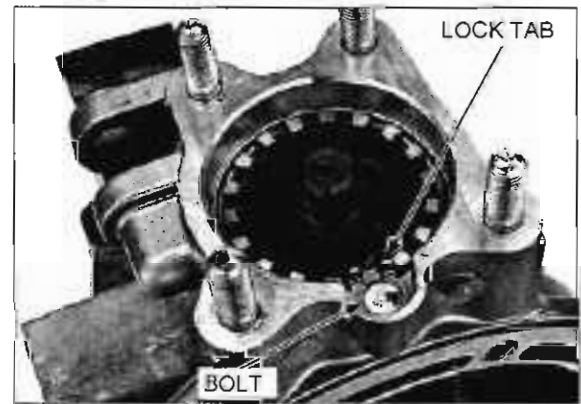
**Collar set "C"**

**07924-ME40020**

Remove the pinion joint.



Remove the bolt and retainer lock tab.

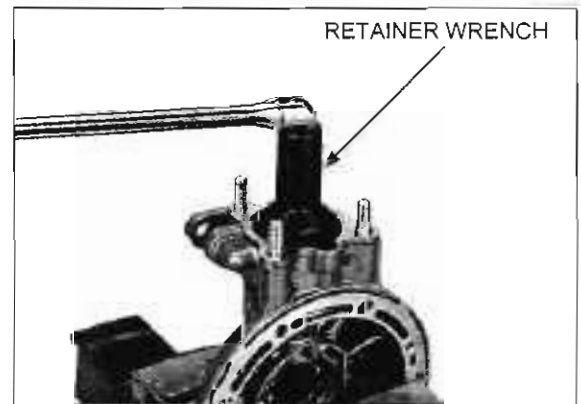


Remove the pinion retainer using the special tool.

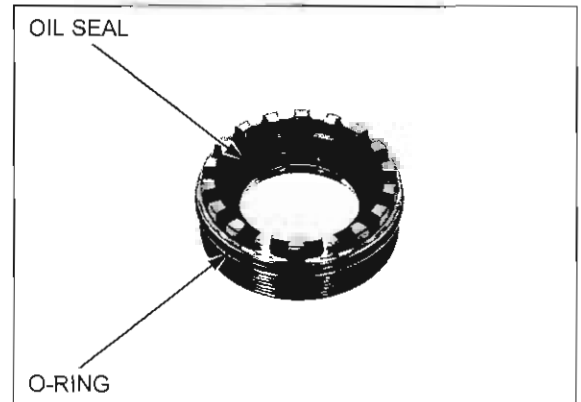
**TOOL:**

**Retainer wrench**

**07910-MA10100  
or 07910-4630100  
(U.S.A. only)**



Remove the O-ring and oil seal from the pinion retainer.



## FINAL DRIVE

Install the special tools onto the pinion gear shaft and gear case.

**TOOLS:**

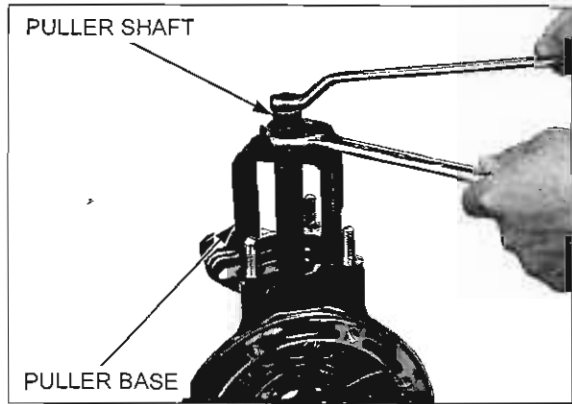
**Pinion puller base**

07HMC-MM80110 or  
07HMC-MM8011A  
(U.S.A. only)

**Puller shaft**

07931-ME40000 or  
07931-ME4010B  
and  
07931-HB3020A  
(U.S.A. only)

Pull the pinion gear assembly out of the gear case.  
Check the pinion gear needle bearing in the gear case for wear or damage.



### PINION GEAR BEARING REMOVAL/ SHIM REPLACEMENT

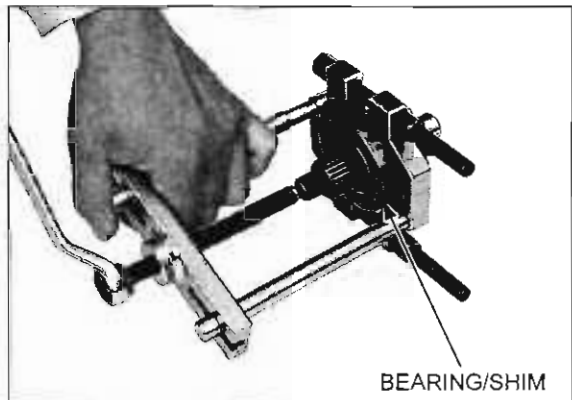
Pull the pinion gear bearing from the shaft with a commercially available bearing puller.

This bearing may not need to be replaced after removal. However, inspect the bearing for excessive play after removal.

Remove the pinion shim.

Replace it if necessary.

*Replace the pinion gear bearing and inner races as a set.*

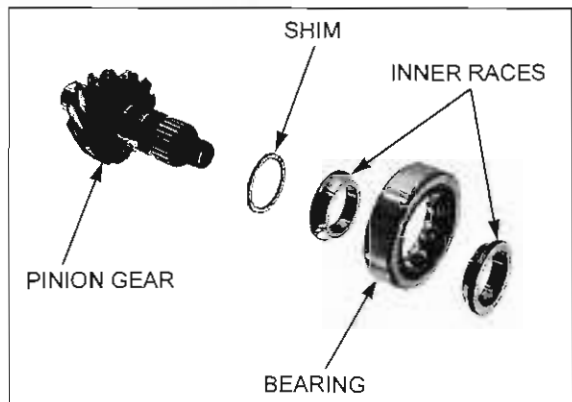


Select the replacement shim (page 13-11).

Install the shim, bearing and inner races onto the pinion gear.

**NOTE:**

When the gear set, pinion bearing, ring gear bearing and/or gear case has been replaced, use a 2.00 mm (0.079 in) thickness shim for initial reference.



Drive the bearing with the marked side facing up.

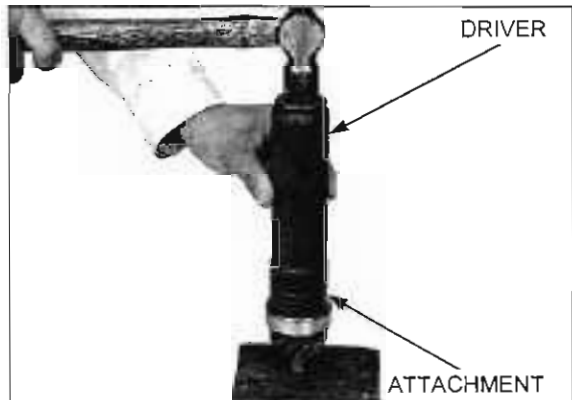
**TOOLS:**

**Driver, 40 mm I.D.**

07746-0030100

**Attachment, 25 mm I.D.**

07746-0030200





**CASE BEARING REPLACEMENT**

**RING GEAR CASE BEARING**

*Be sure to wear heavy gloves when handling the heated gear case.*

Heat the gear case to 80°C (176°F) evenly using a heat gun. Remove the ring gear case bearing from the gear case using the special tools.

**TOOLS:**

**Bearing remover, 35 mm**

**Remover handle**

**Remover weight**

07936-3710400

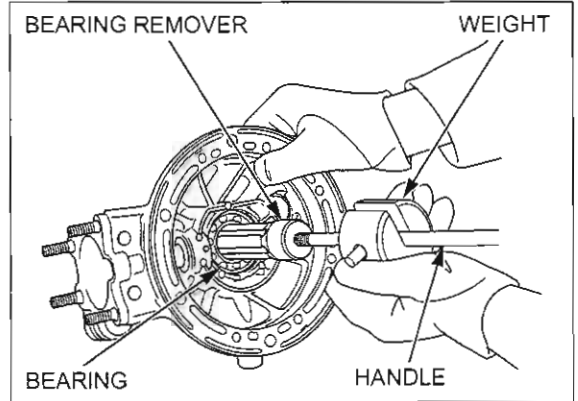
07936-3710100

07741-0010201 or

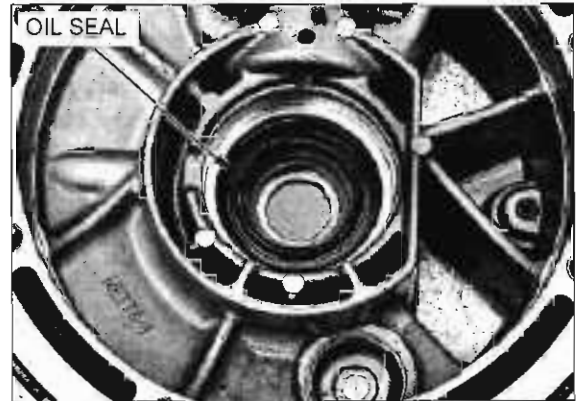
07936-371020A or

07936-3710200

(U.S.A. only)

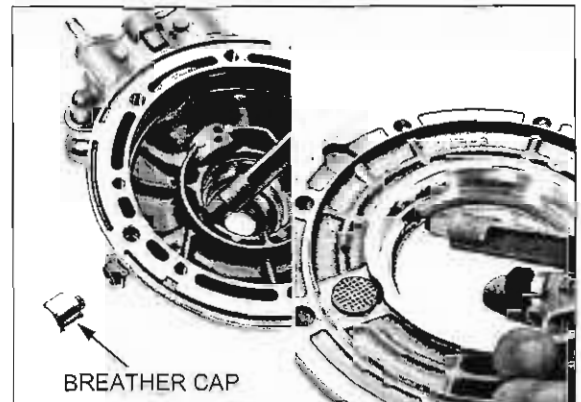


Remove the oil seal.



Remove the breather cap and blow compressed air through the hole.

Install the breather cap.



Apply grease to a new oil seal lips.

Drive the oil seal into the gear case with the marked side facing down until it is fully seated.

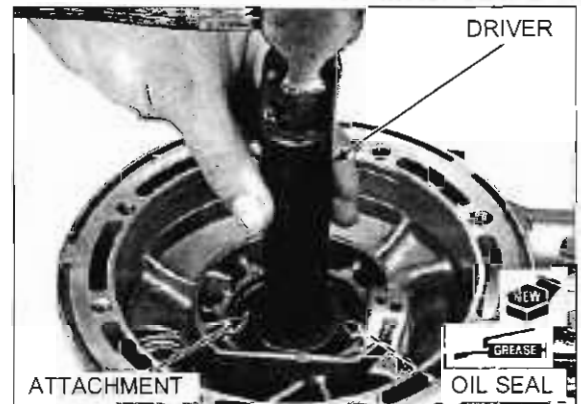
**TOOLS:**

**Driver**

**Attachment, 44 x 49.5 mm**

07749-0010000

07945-3330300

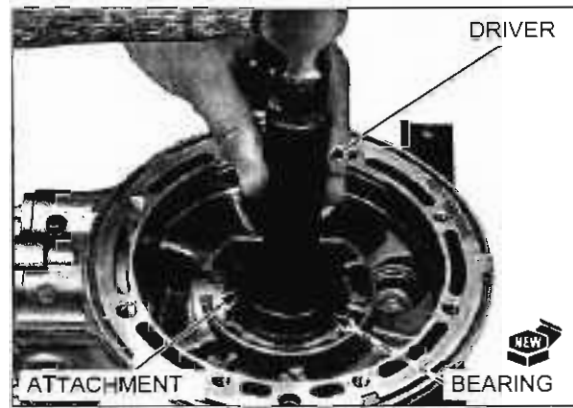


## FINAL DRIVE

Drive a new ring gear case bearing into the gear case with the marked side facing inside until it is fully seated using the special tools.

### TOOLS:

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

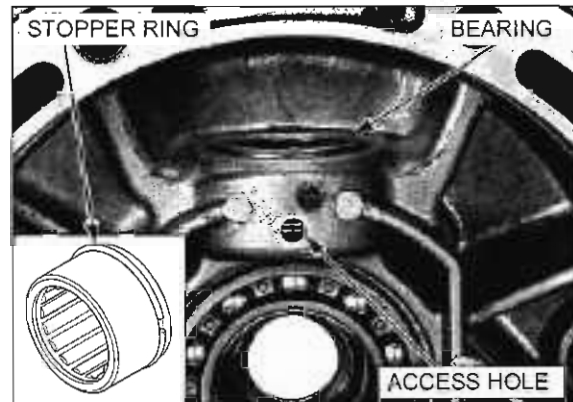


### PINION NEEDLE BEARING

Rotate the stopper ring until the end of the stopper ring appears in the access hole.

Strike gently near the end of the ring with a punch to bend the end upward.

Grasp the end of the ring with needle-nose pliers and pull the stopper ring out through the access hole.

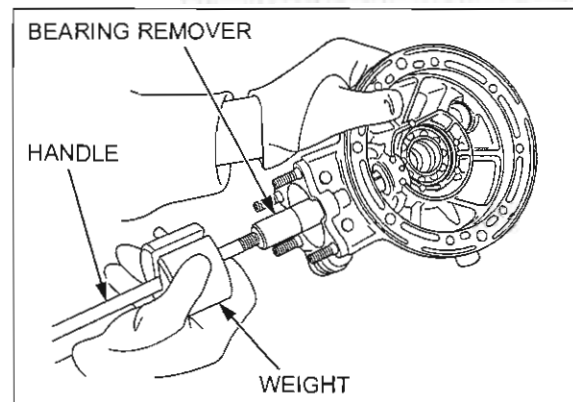


*Be sure to wear heavy gloves when handling the heated gear case.*

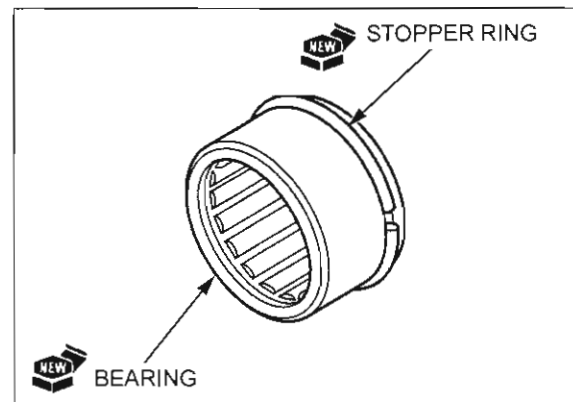
Heat the gear case to 80°C (176°F) and remove the needle bearing using the special tools.

### TOOLS:

Bearing remover, 20 mm 07936-3710600  
Remover handle 07936-3710100  
Remover weight 07741-0010201 or  
07936-371020A or  
07936-3710200 (U.S.A. only)



Install a new stopper ring into the groove of a new bearing securely.



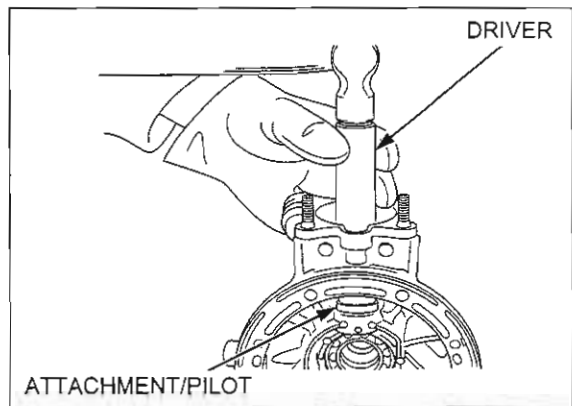
Place the needle bearing in a freezer.

Heat the gear case to 80°C (176°F).

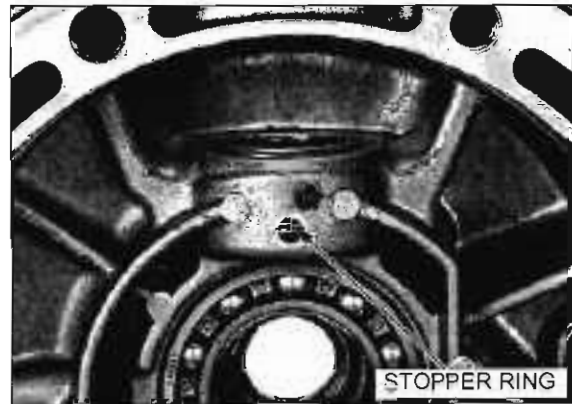
Remove the needle bearing from the freezer and drive it into the gear case with the marked side facing up until it is fully seated.

**TOOLS:**

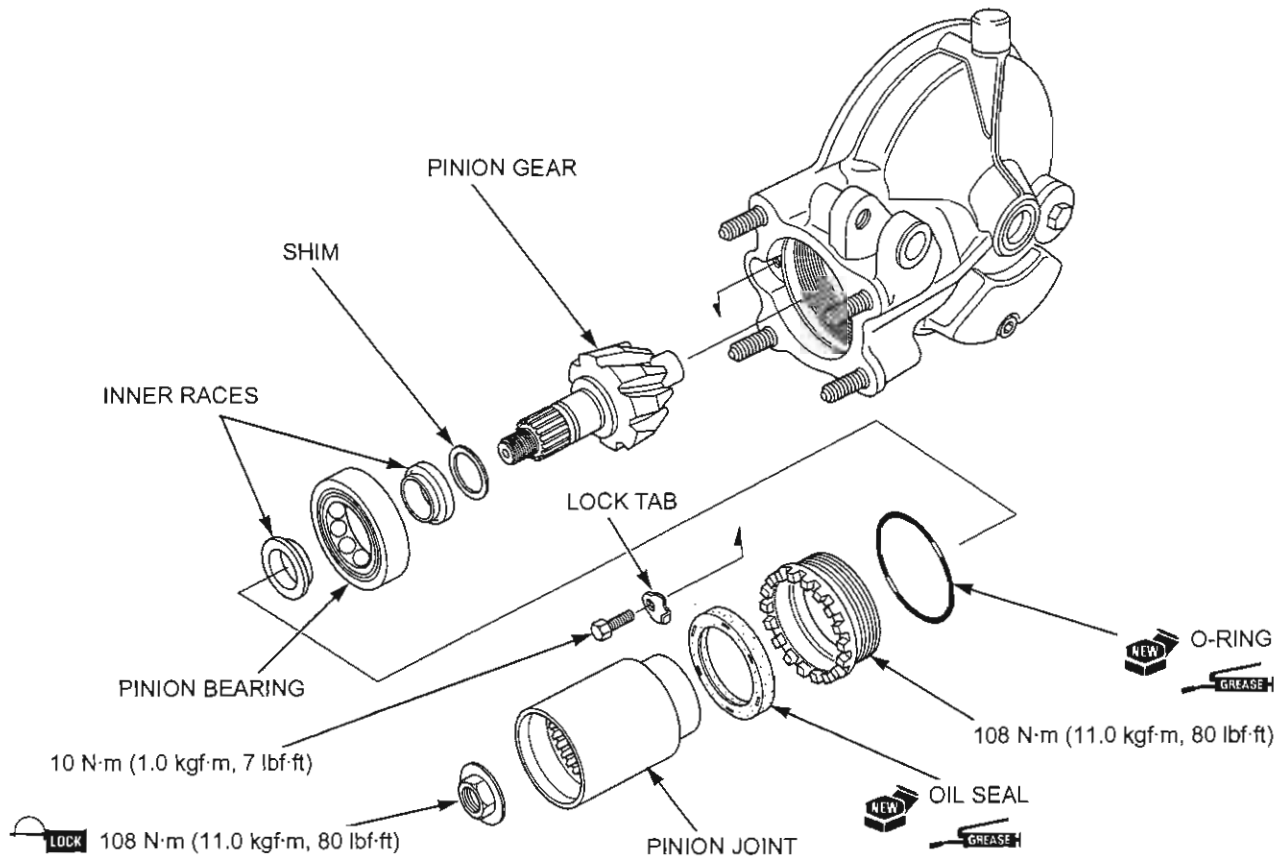
- |                               |               |
|-------------------------------|---------------|
| <b>Driver</b>                 | 07749-0010000 |
| <b>Attachment, 32 x 35 mm</b> | 07746-0010100 |
| <b>Pilot, 19 mm</b>           | 07746-0041400 |



Make sure the stopper ring is securely set in the groove of the gear case.



**FINAL DRIVE ASSEMBLY**  
**PINION GEAR INSTALLATION**

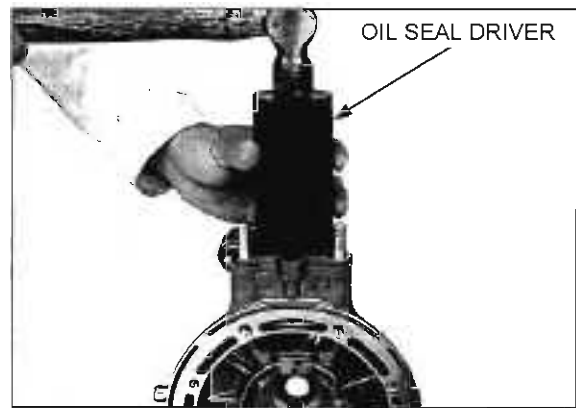


## FINAL DRIVE

Drive the pinion gear assembly into the gear case using the special tool.

**TOOL:**

Oil seal driver, 55.7 x 60.3 mm 07965-KE80200



Apply grease to a new oil seal lips.

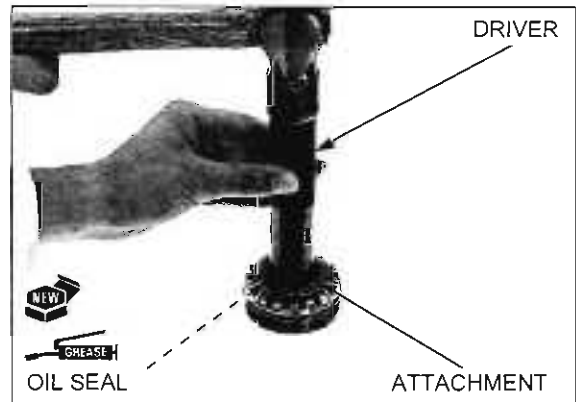
Drive the oil seal into the pinion retainer with the marked side facing up until it is fully seated.

**TOOLS:**

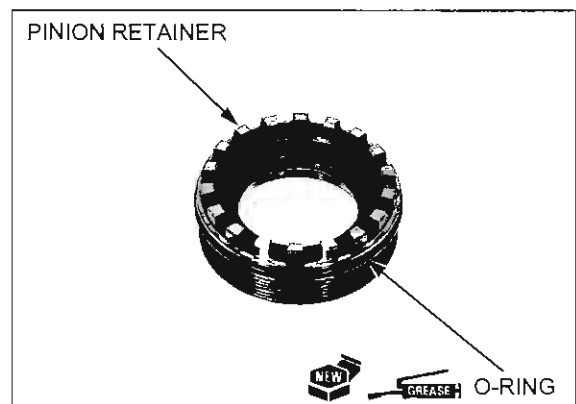
Driver 07749-0010000

Attachment, 44 x 49.5 mm 07945-3330300

Pack grease into the seal lip cavity.



Coat a new O-ring with grease and install it into the retainer groove.

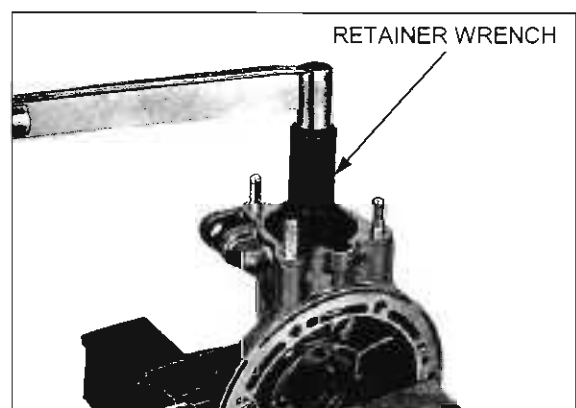


Hold the gear case in a vise with soft jaws. Install the pinion retainer into the gear case and tighten it to the specified torque using a special tool.

**TOOL:**

Retainer wrench 07910-MA10100 or  
07910-4630100  
(U.S.A. only)

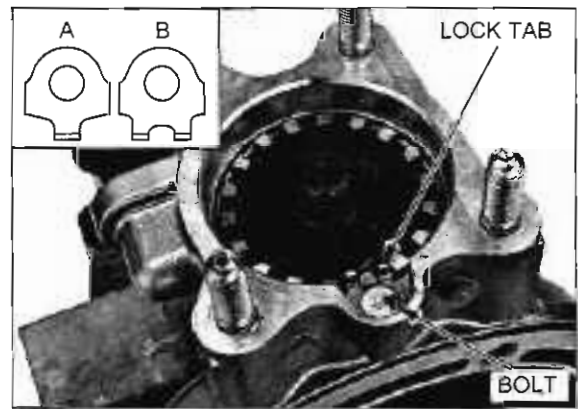
**TORQUE:** 108 N·m (11.0 kgf·m, 80 lbf·ft)



*The lock tab is available in the two types (A and B) as shown.*

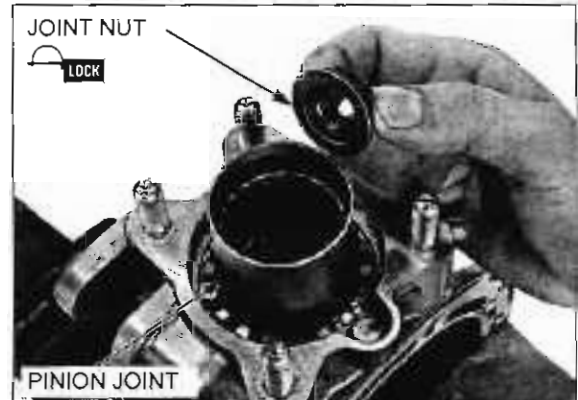
Install the lock tab with its tab facing up, depending on the position of the pinion retainer grooves in relation to the lock tab and tighten the bolt.

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



Clean the threads of the pinion gear shaft and pinion joint nut thoroughly.

Apply locking agent to the joint nut threads and install the pinion joint and joint nut onto the pinion gear shaft.



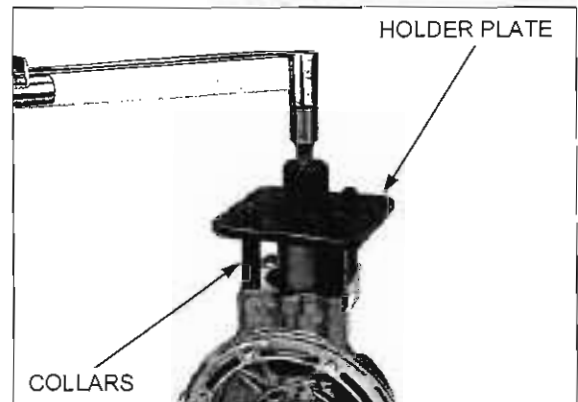
Hold the pinion joint with the special tools and tighten the pinion joint nut to the specified torque.

**TOOLS:**

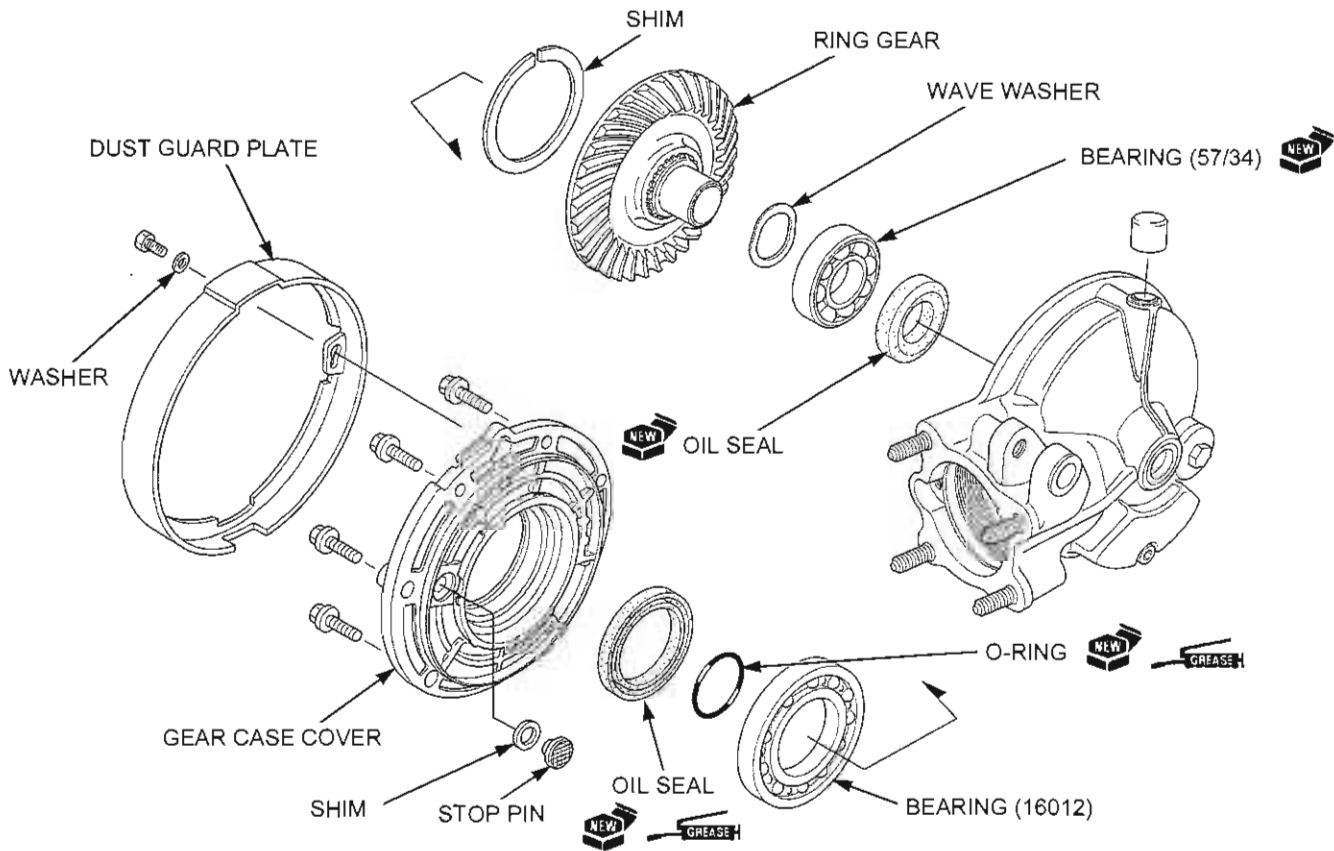
Pinion holder plate  
Collar set "C"

07924-ME40010  
07924-ME40020

**TORQUE: 108 N·m (11.0 kgf·m, 80 lbf·ft)**



RING GEAR INSTALLATION

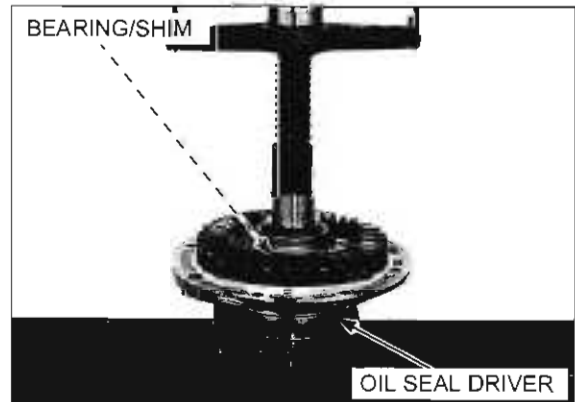


Install the shim onto the ring gear.  
Support the bearing inner race with the special tool and press the ring gear into the bearing using a hydraulic press.

**TOOL:**

Oil seal driver

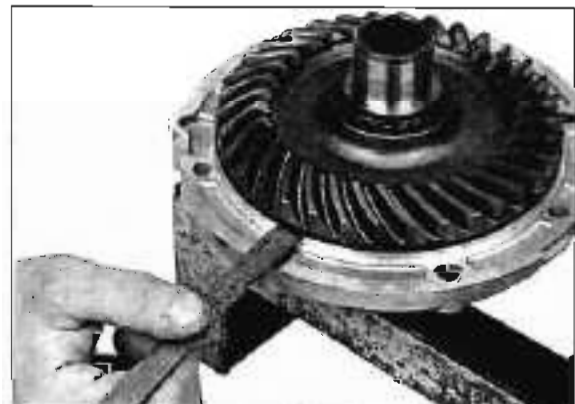
070MF-MEG0300



Measure the clearance between the ring gear and stop pin with a feeler gauge.

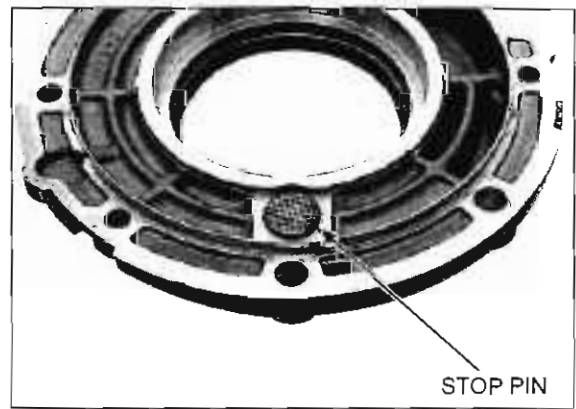
**CLEARANCE:** 0.30 – 0.60 mm (0.012 – 0.024 in)

Remove the ring gear if the clearance does not fall within the specification.



*Be sure to wear heavy gloves when handling the heated gear case.*

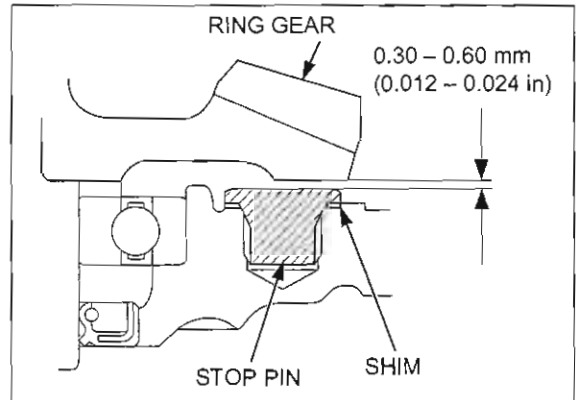
Heat the gear case cover to approximately 80°C (176°F). Heat the case cover evenly and slowly to prevent warpage. When the gear case cover is heated to the proper temperature, remove the stop pin by tapping the cover.



Select a stop pin shim to obtain the correct clearance.

**SHIM THICKNESS: A: 0.10 mm (0.004 in)**  
**B: 0.15 mm (0.006 in)**

Install the shim and drive the stop pin into the gear case cover.

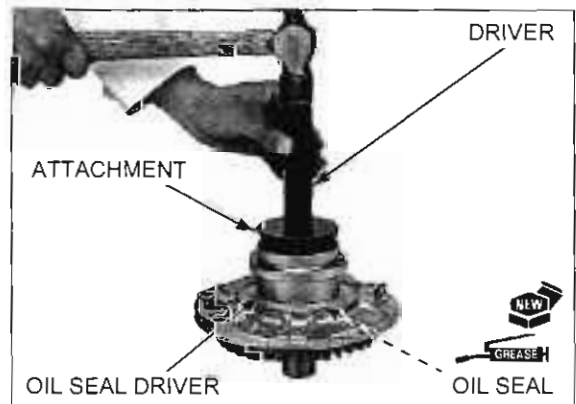


Apply grease to a new oil seal lips.

Install the oil seal until it is flush with the cover surface using the special tools.

**TOOLS:**

- |                        |               |
|------------------------|---------------|
| Driver                 | 07749-0010000 |
| Oil seal driver        | 070MF-MEG0300 |
| Attachment, 72 x 75 mm | 07746-0010600 |



## FINAL GEAR CASE ASSEMBLY

**NOTE:**

When the gear set, bearing and/or gear case has been replaced, check the following:

- Tooth contact pattern (page 13-10)
- Gear case backlash (page 13-8)

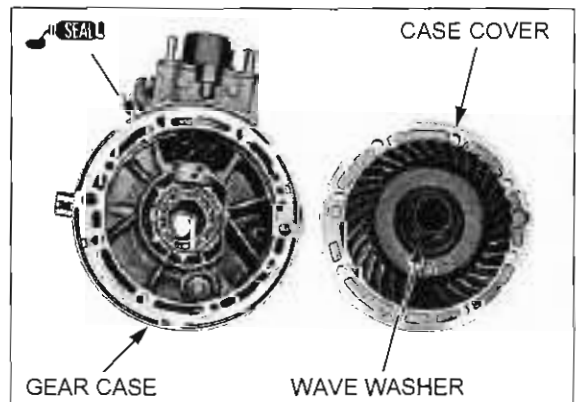
*Keep dust and dirt out of the case and cover.*

Clean the mating surface of the gear case and cover, being careful not to damage them.

Apply liquid sealant (Three Bond 1207B or equivalent) to the mating surface of the gear case.

Install the wave washer.

Install the case cover onto the gear case.



## FINAL DRIVE

Apply locking agent to the threads of the case cover 10 mm bolts.

Install the bolts, and tighten them in a crisscross pattern in several steps until the cover evenly touches the gear case.

Tighten the two 10 mm bolts to the specified torque in several steps alternately.

**TORQUE: 47 N·m (4.8 kgf·m, 35 lbf·ft)**

Tighten the six 8 mm bolts to the specified torque in a crisscross pattern in several steps.

**TORQUE: 25 N·m (2.5 kgf·m, 18 lbf·ft)**

Apply grease to a new O-ring.

Install the O-ring in the ring gear groove.

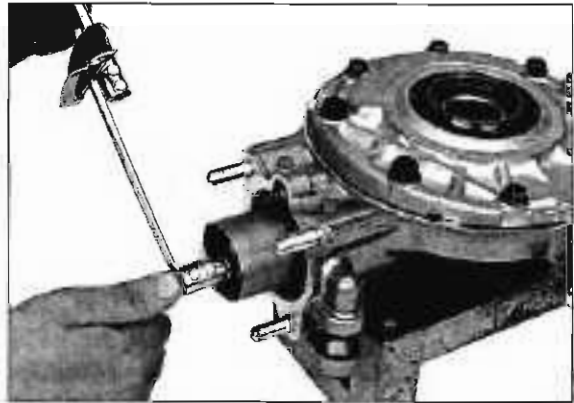
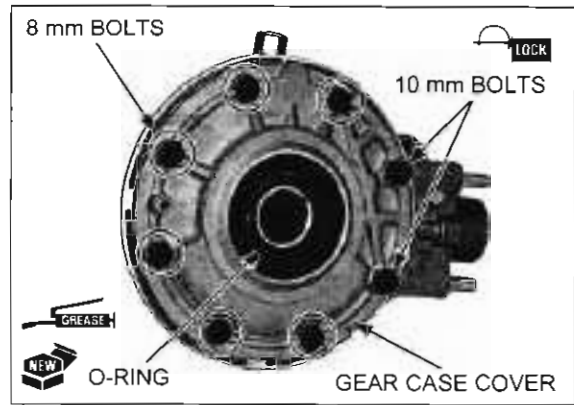
Check that the gear assembly turns smoothly without binding.

Measure the final gear assembly pre-load.

**STANDARD:**

**0.2 – 0.4 N·m (2.0 – 4.1 kgf·m, 1.2 – 3.6 lbf·in)**

If the preload reading does not fall within the specification, check the bearings for proper installation.

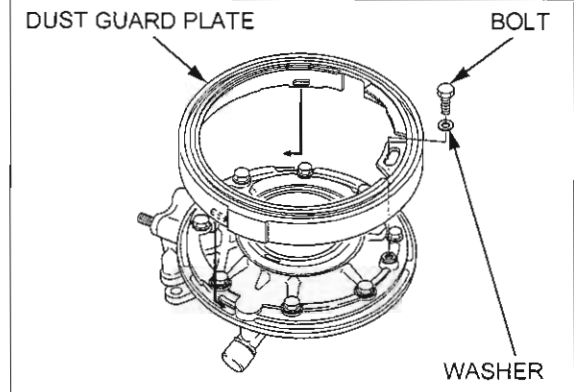


Install the dust guard plate, aligning its tabs with the cover grooves.

Turn the dust guard plate counterclockwise and install the bolt and washer.

Tighten the bolt to the specified torque.

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

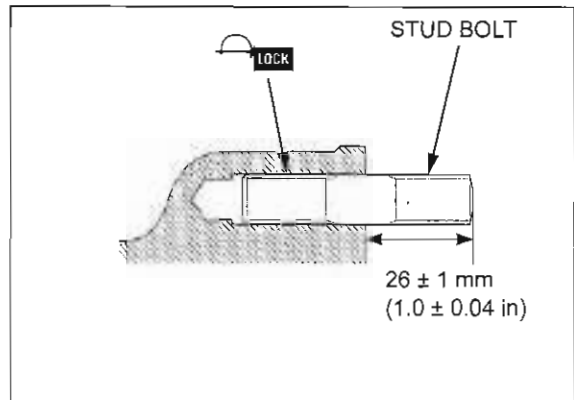


## FINAL DRIVE INSTALLATION

Check that the gear case stud bolts are tight.

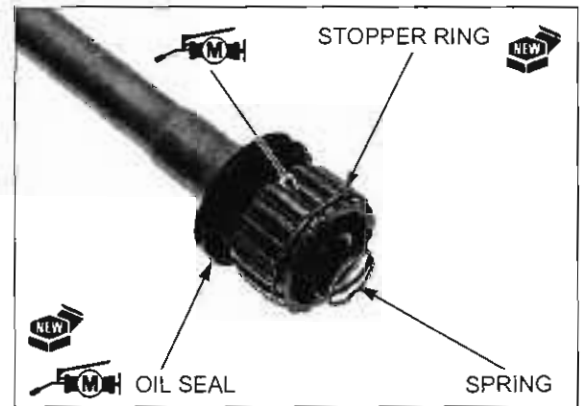
If any are loose, remove them, clean their threads with contact cleaner, then install them using a locking agent.

After installation, be sure to measure the distance from the top of each stud to the gear case surface as shown.





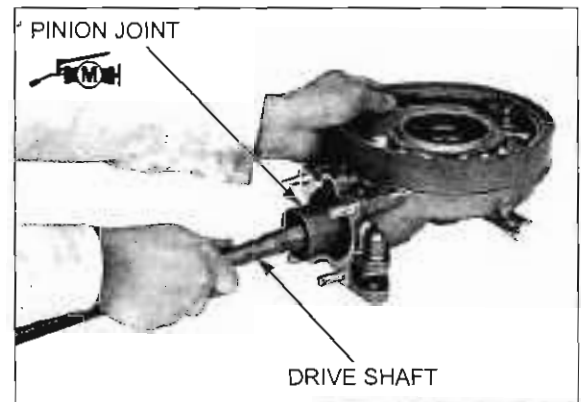
Install a new stopper ring into the drive shaft groove.  
 Install the spring into the drive shaft.  
 Apply 0.5 g of molybdenum disulfide grease to a new oil seal lips and install it onto the drive shaft.  
 Apply 1 g of molybdenum disulfide grease to the universal joint side splines of the drive shaft.



Apply 2 g or more of molybdenum disulfide grease to the pinion joint splines.

*Make sure the stopper ring is seated properly by pulling on the drive shaft lightly. Be careful not to damage the drive shaft oil seal.*

Install the drive shaft into the pinion joint until the stopper ring seats in the pinion joint spline groove.



Insert the final drive assembly into the swingarm and align the drive shaft splines with the universal joint splines.

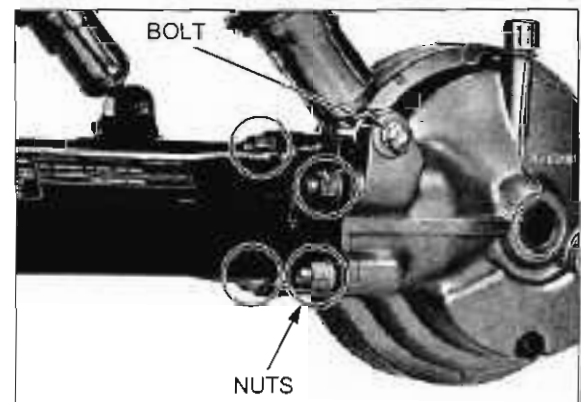
Install the gear case mounting nuts.  
 Tighten the gear case mounting nuts in a crisscross pattern in several steps.

**TORQUE: 64 N·m (6.5 kgf·m, 47 lbf·ft)**

Tighten the shock absorber lower mounting bolt to the specified torque.

**TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)**

Install the rear wheel (page 15-16).  
 Fill the gear case with the recommended final drive gear oil (page 3-16).



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MEMO

# 14. FRONT WHEEL/SUSPENSION/STEERING

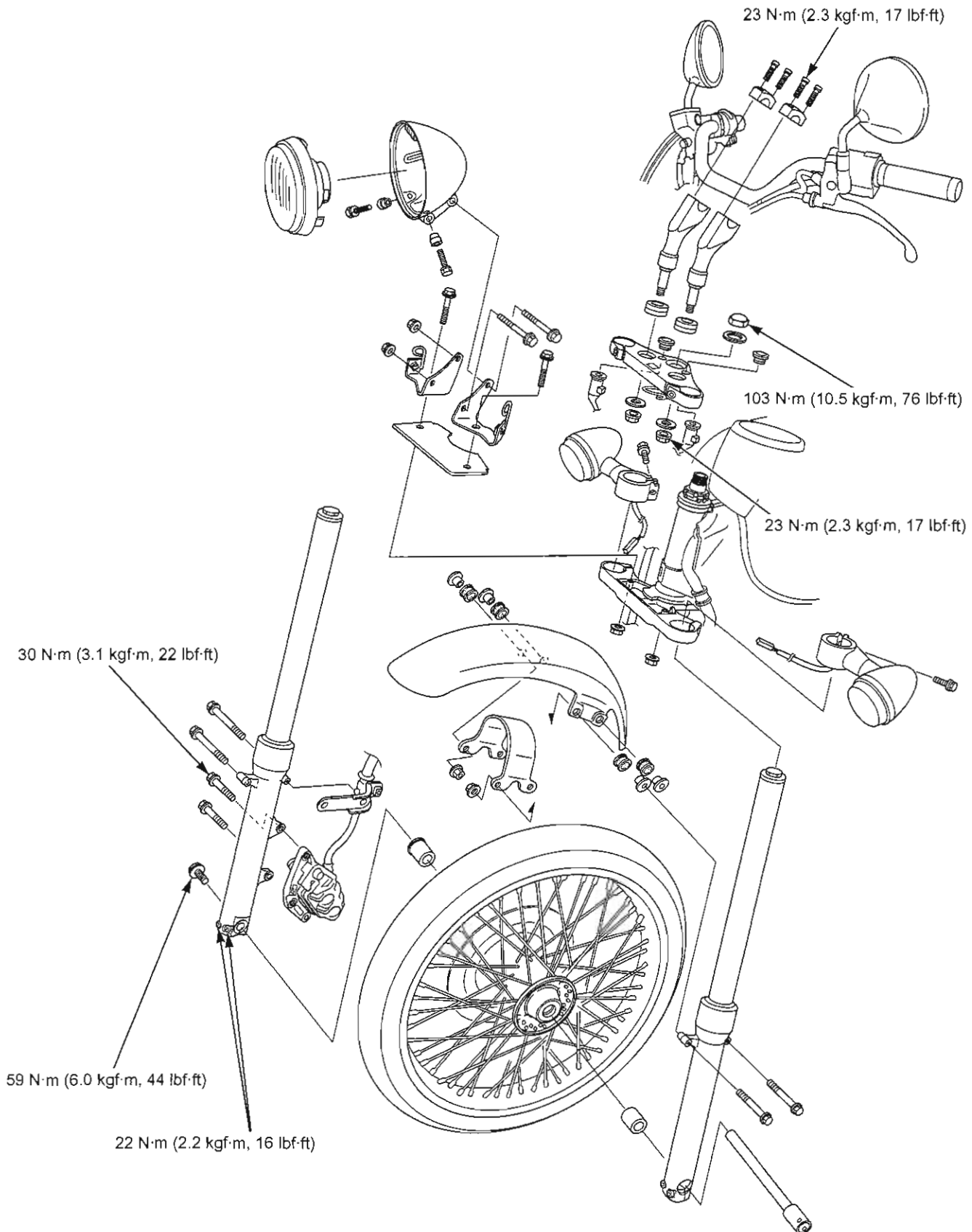
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COMPONENT LOCATION .....	14-2	FRONT WHEEL .....	14-17
SERVICE INFORMATION .....	14-5	FORK .....	14-24
TROUBLESHOOTING .....	14-8	STEERING STEM .....	14-36
HANDLEBAR .....	14-9		

FRONT WHEEL/SUSPENSION/STEERING

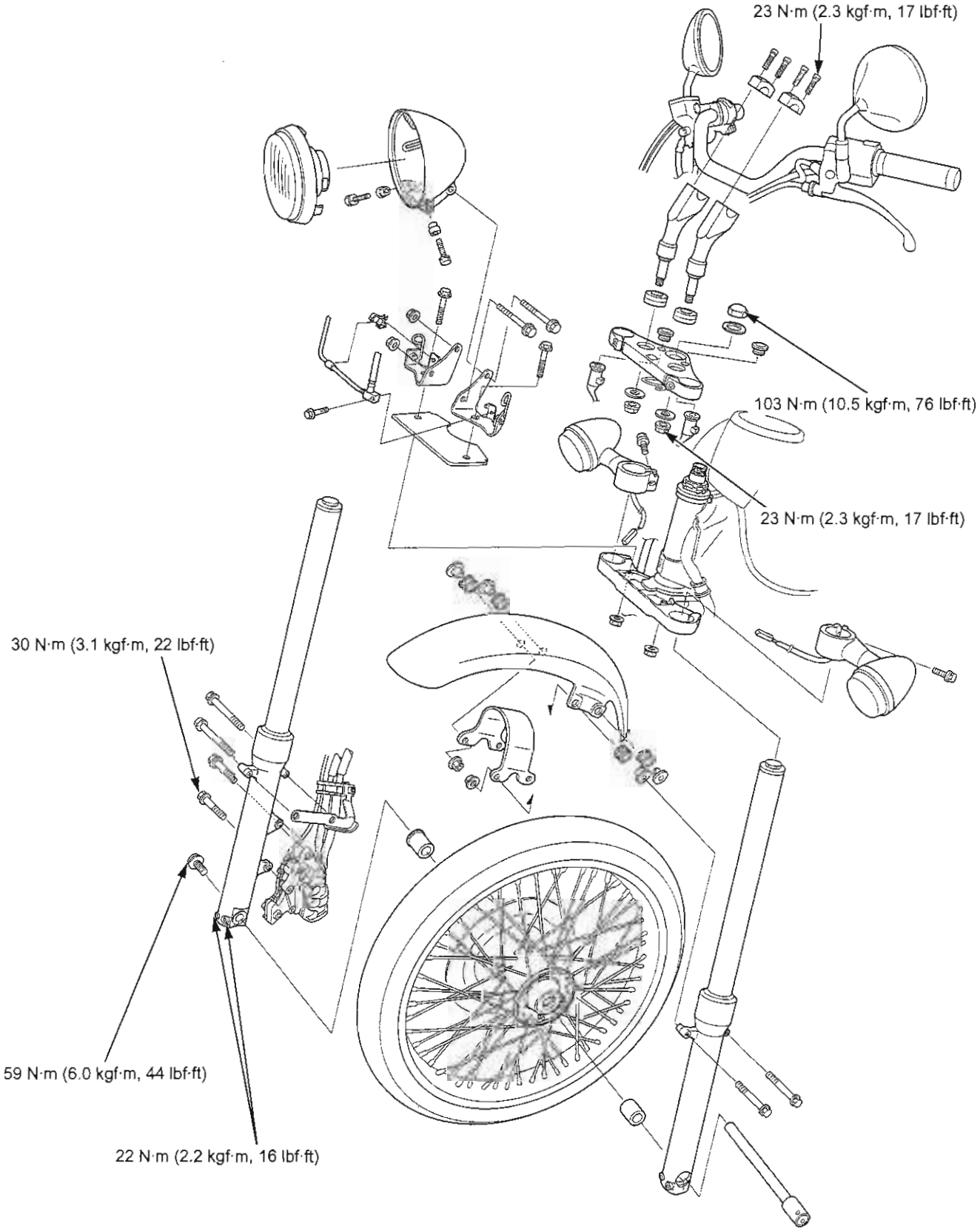
COMPONENT LOCATION

VT750C2F:



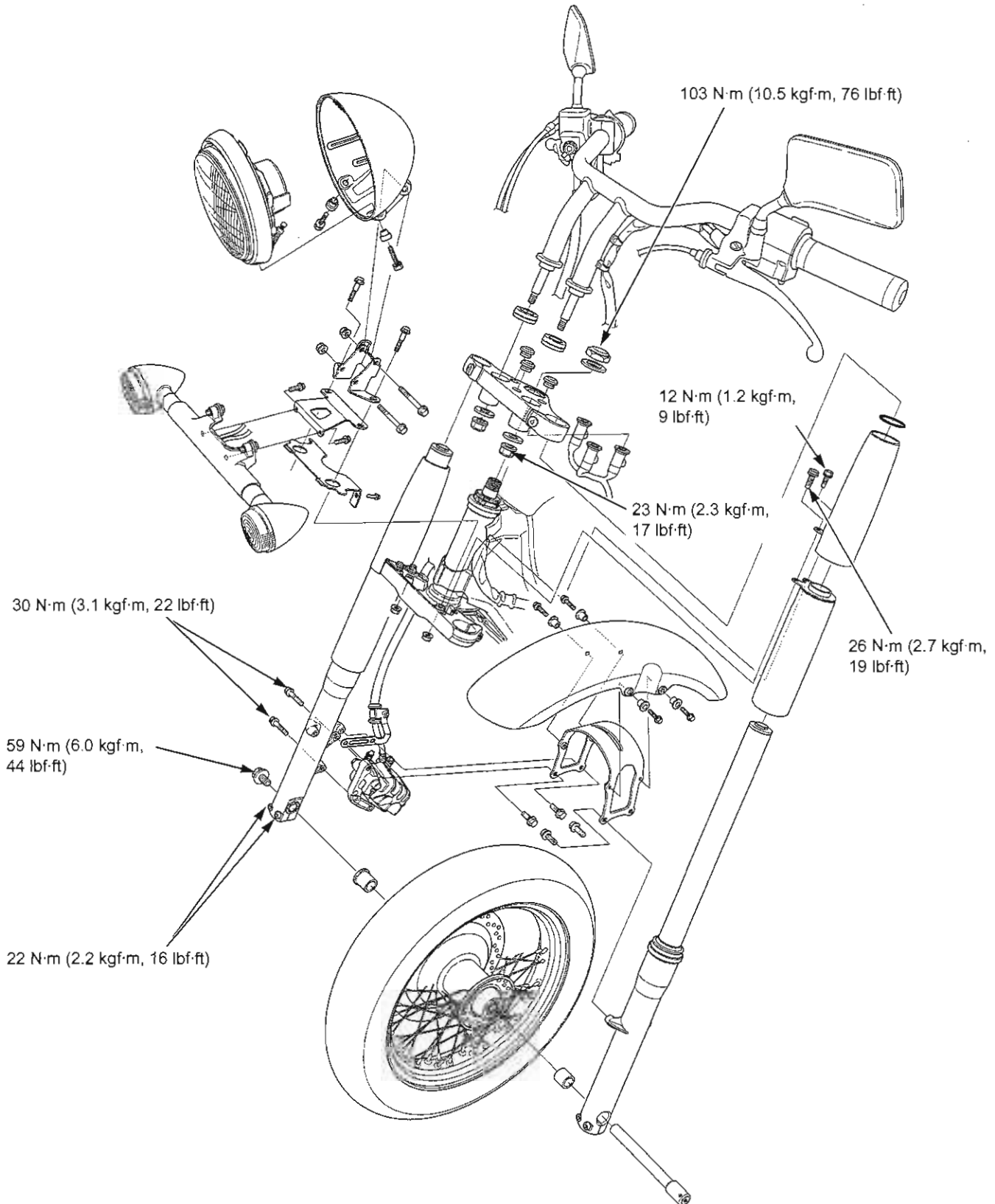
**FRONT WHEEL/SUSPENSION/STEERING**

**VT750C2S:**



# FRONT WHEEL/SUSPENSION/STEERING

VT750C2B:



## SERVICE INFORMATION

### GENERAL

- Riding on damaged rims impairs safe operation of the vehicle.
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- A hoist or equivalent is required to support the motorcycle when servicing the front wheel, fork and steering stem.
- For hydraulic brake system service (page 16-2).

### SPECIFICATIONS (VT750C2F/C2S)

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		—	1.5 (0.06)
Cold tire pressure	Up to 90 kg (200 lbs) load	200 kPa (2.00 kgf/cm <sup>2</sup> , 29 psi)	—
	Up to maximum weight capacity	200 kPa (2.00 kgf/cm <sup>2</sup> , 29 psi)	—
Axle runout		—	0.2 (0.01)
Wheel rim runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Wheel balance weight		—	60 g max.
Fork	Spring free length	371.8 (14.64)	364.4 (14.35)
	Tube runout	—	0.2 (0.01)
	Recommended fork fluid	Pro Honda Suspension Fluid SS-8 (10W)	—
	Fluid level	100 (3.9)	—
Fluid capacity		478 ± 2.5 cm <sup>3</sup> (16.2 ± 0.08 US oz, 16.8 ± 0.09 Imp oz)	—
Steering head bearing pre-load		8.5 – 12.7 N (0.9 – 1.3 kgf)	—

### SPECIFICATIONS (VT750C2B)

Unit: mm (in)

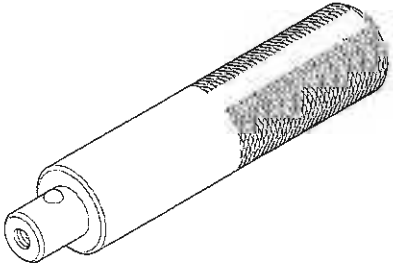
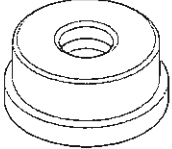
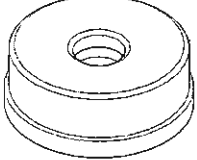

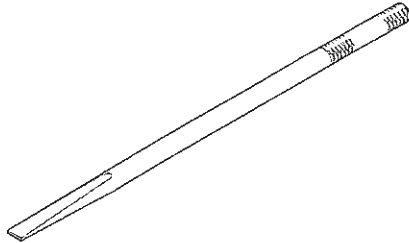
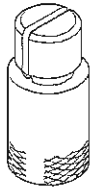
ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		—	1.5 (0.06)
Cold tire pressure	Up to 90 kg (200 lbs) load	200 kPa (2.00 kgf/cm <sup>2</sup> , 29 psi)	—
	Up to maximum weight capacity	200 kPa (2.00 kgf/cm <sup>2</sup> , 29 psi)	—
Axle runout		—	0.2 (0.01)
Wheel rim runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Wheel balance weight		—	60 g max.
Fork	Spring free length	367.8 (14.48)	360.4 (14.19)
	Tube runout	—	0.2 (0.01)
	Recommended fork fluid	Pro Honda Suspension Fluid SS-8 (10W)	—
	Fluid level	100 (3.9)	—
Fluid capacity		474 ± 2.5 cm <sup>3</sup> (16.0 ± 0.08 US oz, 16.7 ± 0.09 Imp oz)	—
Steering head bearing pre-load		8.5 – 12.7 N (0.9 – 1.3 kgf)	—

## FRONT WHEEL/SUSPENSION/STEERING

### TORQUE VALUES

Handlebar upper holder bolt (VT750C2F/C2S)	23 N·m (2.3 kgf·m, 17 lbf·ft)	
Handlebar lower holder nut	23 N·m (2.3 kgf·m, 17 lbf·ft)	
Front master cylinder holder bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Front brake disc bolt	42 N·m (4.3 kgf·m, 31 lbf·ft)	ALOC bolt; replace with a new one
Spoke	4.2 N·m (0.4 kgf·m, 3.1 lbf·ft)	
Front axle bolt	59 N·m (6.0 kgf·m, 44 lbf·ft)	
Front axle pinch bolt	22 N·m (2.2 kgf·m, 16 lbf·ft)	
Fork center socket bolt	29.5 N·m (3.0 kgf·m, 22 lbf·ft)	Apply locking agent to the threads
Fork cap	22.1 N·m (2.3 kgf·m, 16 lbf·ft)	
Fork top bridge pinch bolt (VT750C2F)	22 N·m (2.2 kgf·m, 16 lbf·ft)	
Fork top bridge pinch bolt (VT750C2B/C2S)	27 N·m (2.8 kgf·m, 20 lbf·ft)	
Fork bottom bridge pinch bolt	49 N·m (5.0 kgf·m, 36 lbf·ft)	
Front brake caliper mounting bolt	30 N·m (3.1 kgf·m, 22 lbf·ft)	ALOC bolt; replace with a new one
Steering top thread	See page 14-42	
Steering top thread lock nut	See page 14-43	
Steering stem nut	103 N·m (10.5 kgf·m, 76 lbf·ft)	
Clutch lever pivot bolt	1 N·m (0.1 kgf·m, 0.7 lbf·ft)	
Clutch lever pivot nut	6 N·m (0.6 kgf·m, 4.4 lbf·ft)	
Front fork cover bolt, 6 mm (VT750C2B)	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Front fork cover bolt, 8 mm (VT750C2B)	26 N·m (2.7 kgf·m, 19 lbf·ft)	

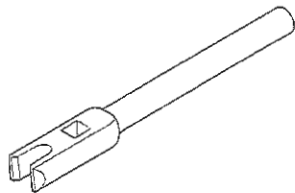
### TOOLS

<p>Driver 07749-0010000</p> 	<p>Attachment, 42 x 47 mm 07746-0010300</p> 	<p>Attachment, 52 x 55 mm 07746-0010400</p> 
<p>Pilot, 20 mm 07746-0040500</p> 	<p>Bearing remover shaft 07GGD-0010100</p> 	<p>Bearing remover head, 20 mm 07746-0050600</p> 

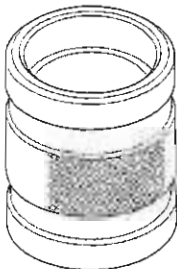


# FRONT WHEEL/SUSPENSION/STEERING

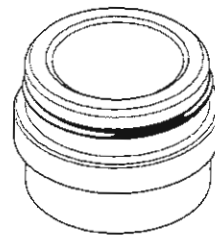
Spoke wrench  
07JMA-MR60100



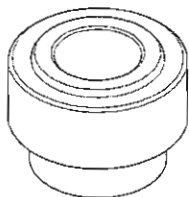
Slider weight  
07947-KA50100



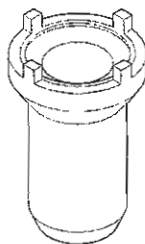
Driver attachment, 41 mm  
07947-KF00100



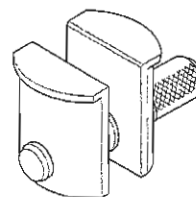
Attachment, 30 mm I.D.  
07746-0030300



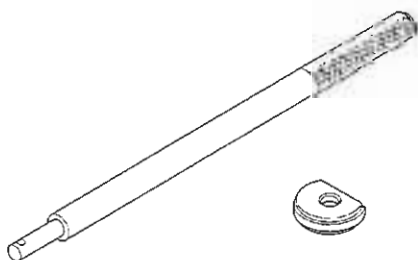
Steering stem socket  
07916-3710101



Bearing remover  
07946-3710500



Ball race remover set  
07953-MJ10000



07953-MJ1000B and a commercially available drift

# TROUBLESHOOTING

### Hard steering

- Steering top thread too tight
- Worn or damaged steering head bearings
- Bent steering stem
- Insufficient tire pressure
- Faulty tire

### Steers to one side or does not track straight

- Bent fork leg
- Damaged steering head bearings
- Loose steering top thread
- Bent frame
- Worn wheel bearings
- Bent front axle
- Worn swingarm pivot components (page 15-28)

### Front wheel wobbles

- Bent rim
- Worn wheel bearings
- Faulty tire
- Unbalanced tire and wheel
- Axle fastener not tightened properly

### Wheel hard to turn

- Faulty wheel bearings
- Bent axle
- Brake drag (page 16-7)

### Soft suspension

- Weak fork spring
- Low fluid level in fork
- Insufficient fluid weight (low viscosity)
- Low tire pressure

### Stiff suspension

- High tire pressure
- Bent fork tube
- Fork slider binds
- High fluid level in fork leg
- Incorrect fluid weight (high viscosity)
- Clogged fork fluid passage

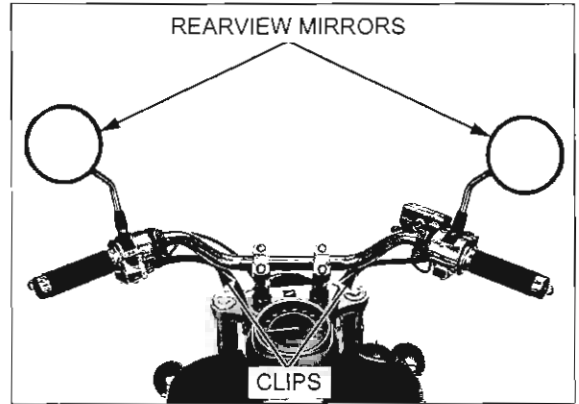
### Front suspension noise

- Loose fork fasteners
- Insufficient fluid weight (low viscosity)
- Worn slider or fork tube bushing

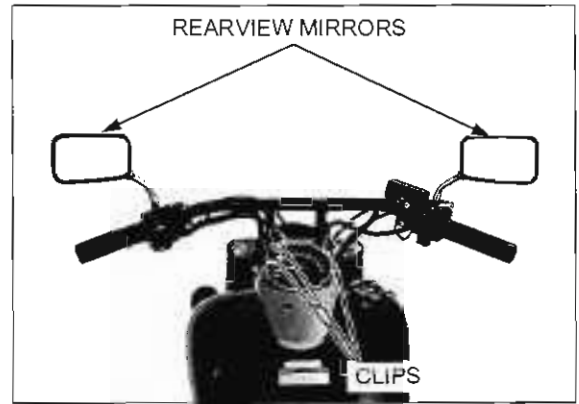
# HANDLEBAR

## REMOVAL

VT750C2F/C2S; Remove the rearview mirrors.  
Release the handlebar switch wires from the wire clips.

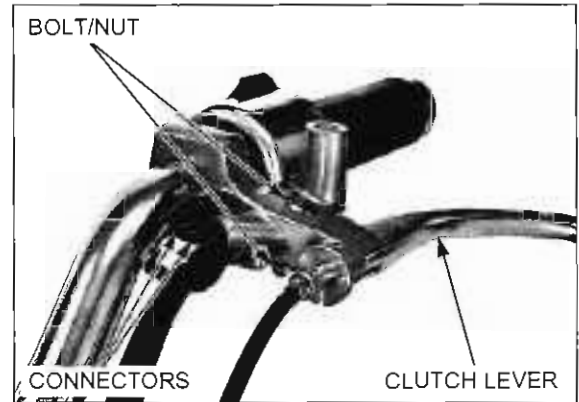


VT750C2B; Remove the rearview mirrors.  
Release the handlebar switch wires from the wire clips.

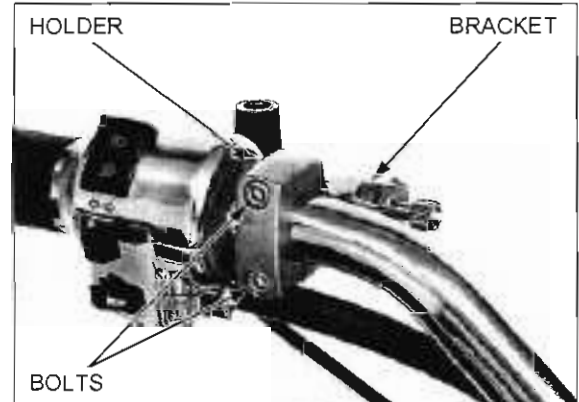


Remove the pivot bolt, nut and clutch lever from the clutch lever bracket.

Disconnect the clutch switch connectors from the clutch switch.

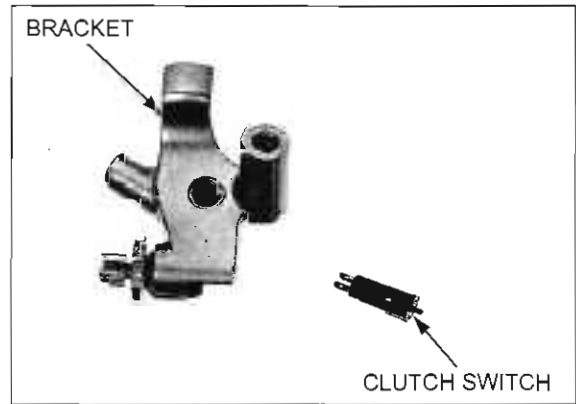


Remove the bolts, holder and clutch lever bracket.

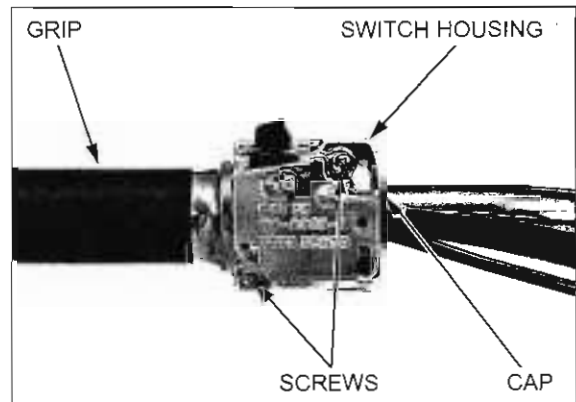


## FRONT WHEEL/SUSPENSION/STEERING

Remove the clutch switch from the clutch lever bracket.



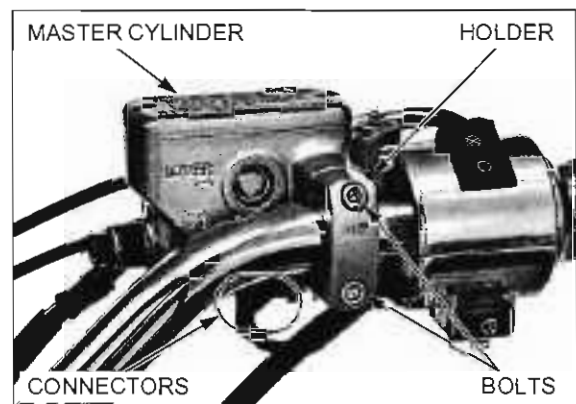
Remove the screws and left handlebar switch housing.  
Remove the left handlebar grip and housing cap.



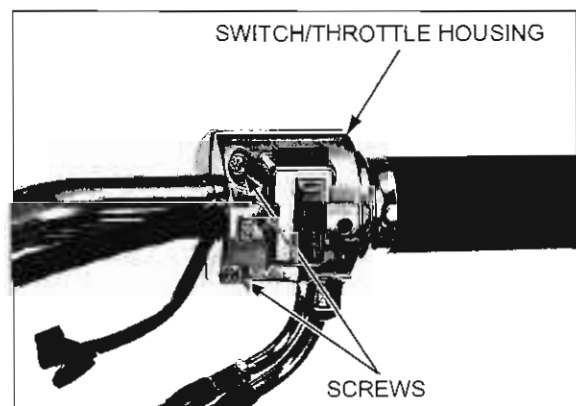
Disconnect the front brake light switch wire connectors from the switch.

*Keep the reservoir upright to prevent air from entering the hydraulic system.*

Remove the bolts, holder and master cylinder assembly.



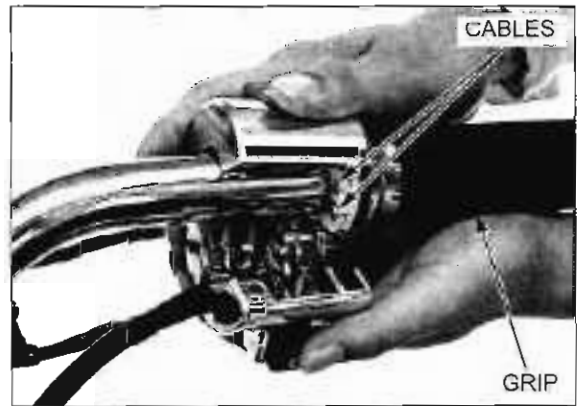
Remove the right handlebar switch/throttle housing screws.



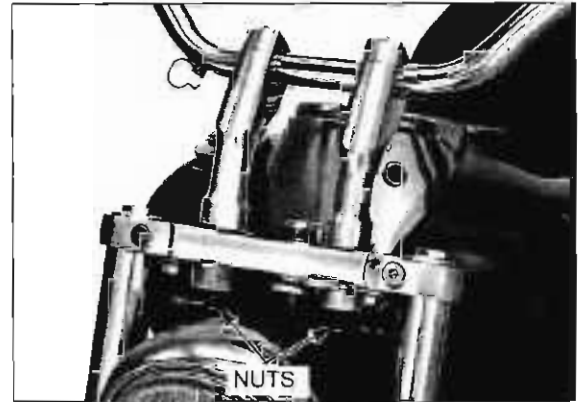
## FRONT WHEEL/SUSPENSION/STEERING

Disconnect the throttle cables from the throttle pipe and remove the throttle grip from the right handlebar.

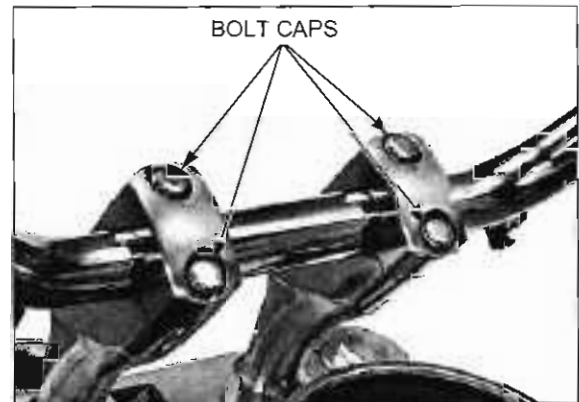
Remove the right handlebar switch/throttle housing from the handlebar.



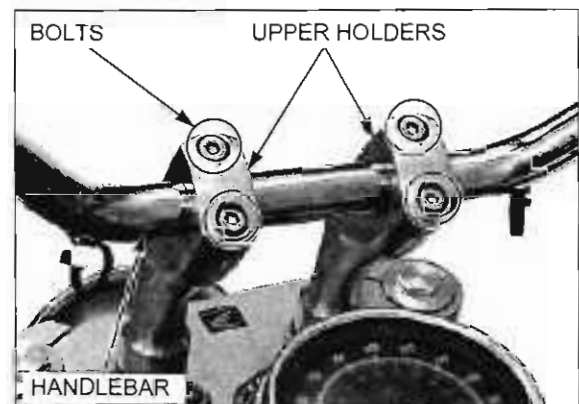
VT750C2F/C2S; Loosen the handlebar lower holder nuts.



VT750C2F/C2S; Remove the bolt caps.

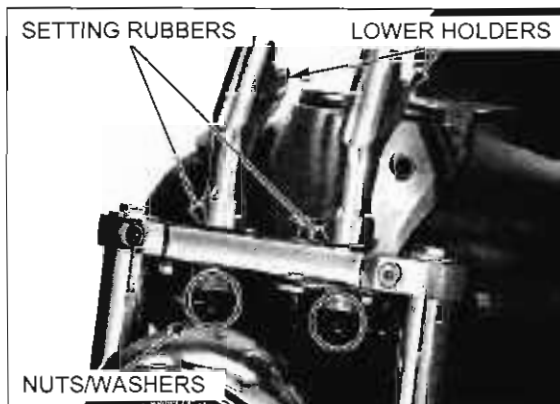


VT750C2F/C2S; Remove the bolts, upper holders and handlebar.

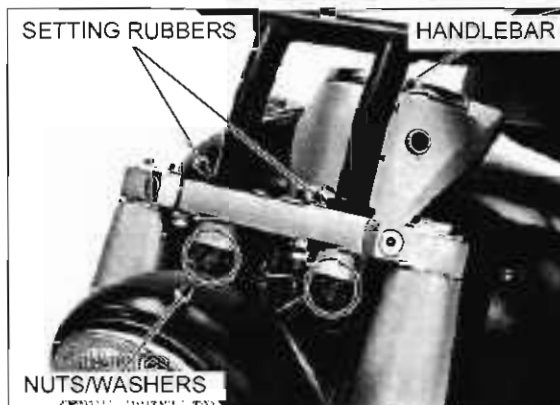


## FRONT WHEEL/SUSPENSION/STEERING

VT750C2F/C2S; Remove the lower holder nuts, washers, setting rubbers and handlebar lower holders.



VT750C2B; Remove the lower holder nuts, washers, setting rubbers and handlebar.

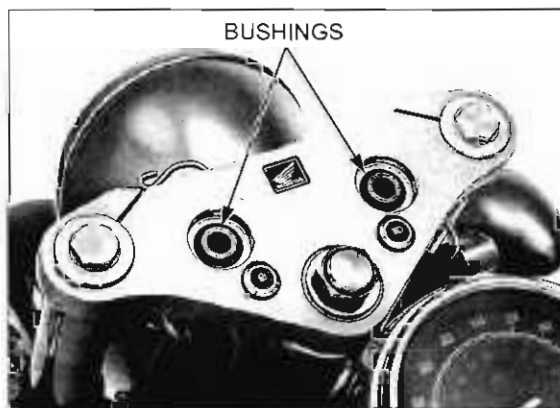


### INSTALLATION

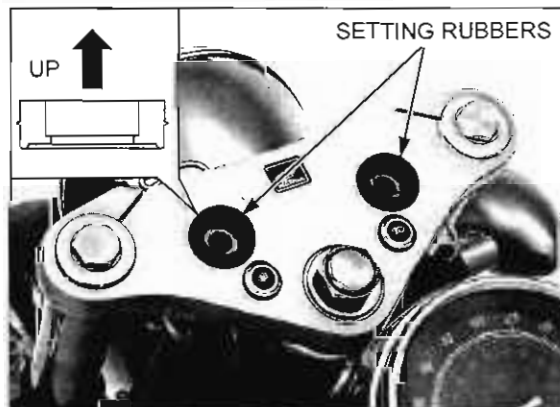
#### NOTE:

- Route the cable, hose and wires properly (page 1-26).

Check the bushings for abnormal wear or damage.

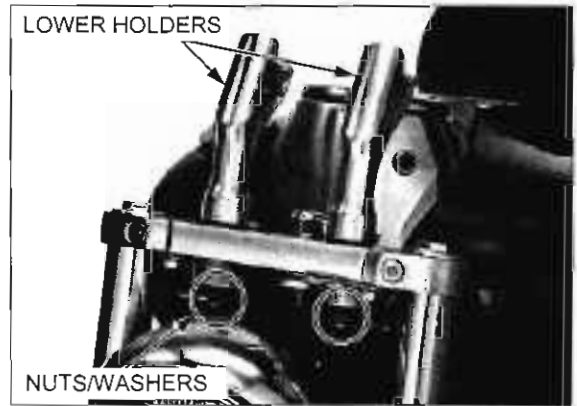


Install the setting rubbers onto the top bridge with its small I.D. side facing up as shown.



## FRONT WHEEL/SUSPENSION/STEERING

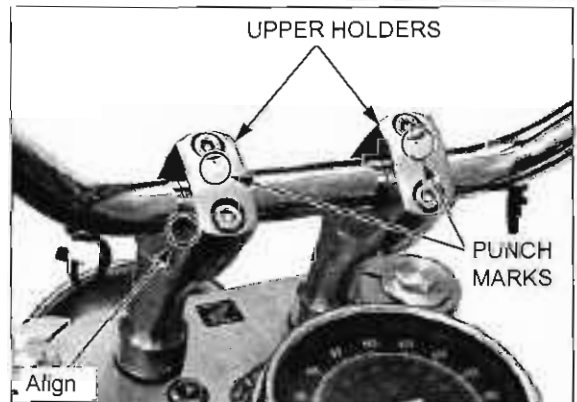
VT750C2F/C2S; Install the handlebar lower holders, washers and nuts onto the top bridge.



VT750C2F/C2S; Place the handlebar on the lower holders aligning the punch mark on the handlebar with the top surface of the lower holders. Install the upper holders with its punch mark facing forward.

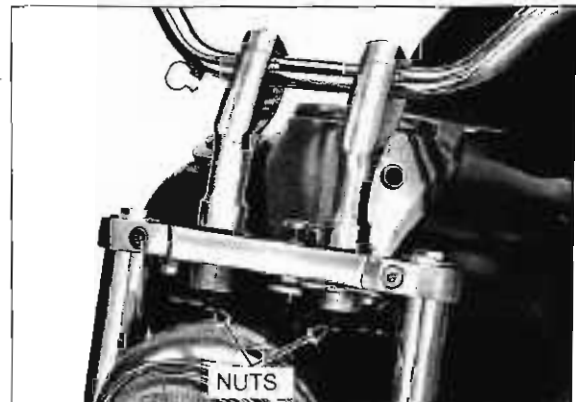
Tighten the front side bolts first, then the rear side bolts to the specified torque.

**TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)**



VT750C2F/C2S; Tighten the handlebar lower holder nuts to the specified torque.

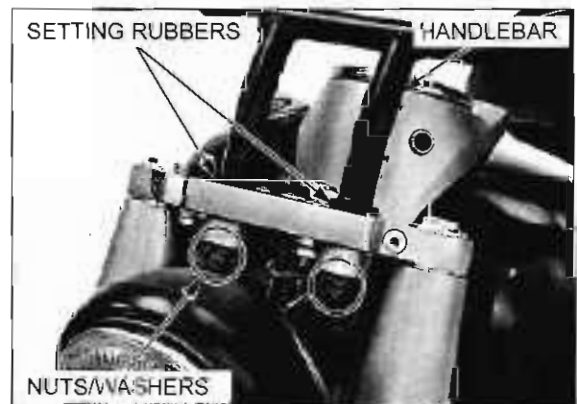
**TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)**



VT750C2B; Install the handlebar, washers and nuts onto the top bridge.

Tighten the handlebar lower holder nuts to the specified torque.

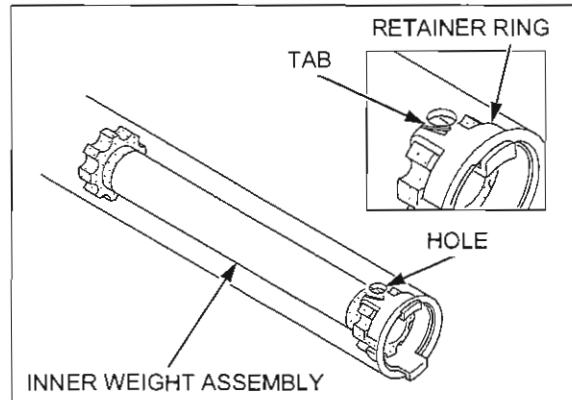
**TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)**



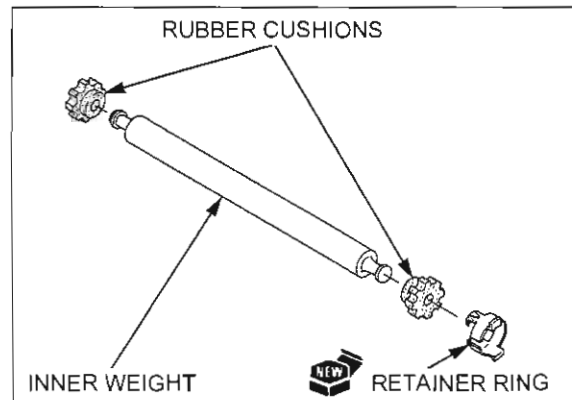
## FRONT WHEEL/SUSPENSION/STEERING

### INNER WEIGHT REMOVAL/INSTALLATION

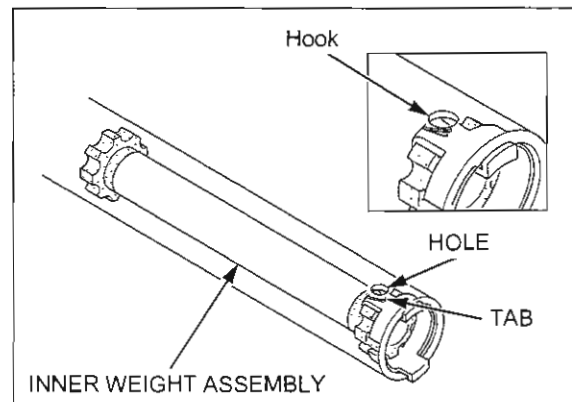
Remove the grip or throttle pipe from the handlebar.  
Straighten the weight retainer tabs by the screwdriver or punch.



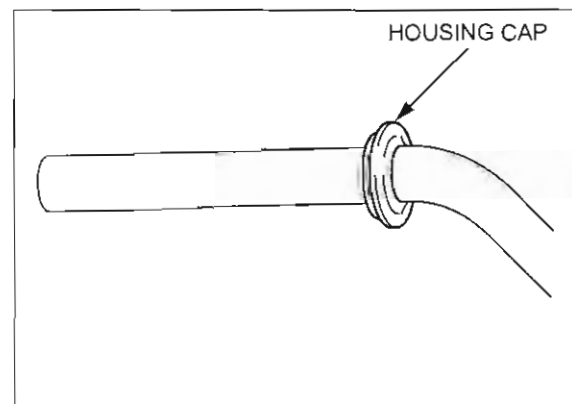
Remove the inner weight assembly from the handlebar.  
Discard the retainer ring.  
Check the rubber cushions for wear or damage.  
Install a new retainer ring onto the inner weight.



Insert the inner weight assembly into the handlebar by hooking the retainer ring tabs with the holes in the handlebar.



Install the housing cap onto the left side of the handlebar.



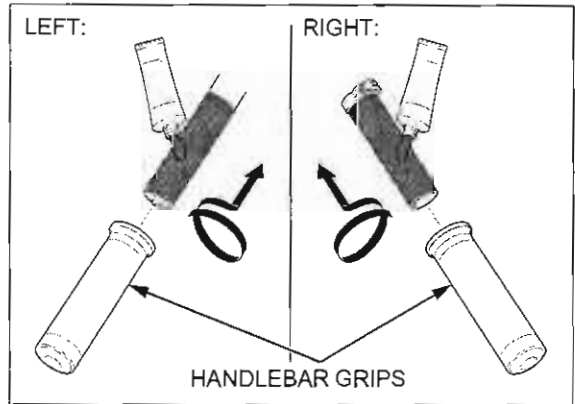


## FRONT WHEEL/SUSPENSION/STEERING

Clean the inside surface of the both handlebar grip and the outside surface of the handlebar and throttle pipe. Apply Honda Bond A or equivalent to the inside surface of the handlebar grip and to the outside surface of the handlebar and throttle pipe. Wait 3 – 5 minutes and install the grip.

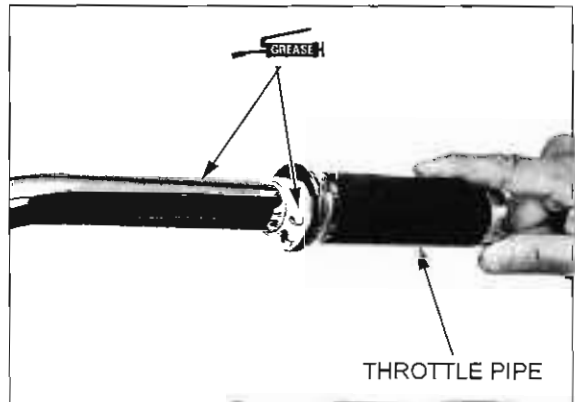
*Allow the adhesive to dry for 1 hour before using.*

Rotate the grip for even application of the adhesive.



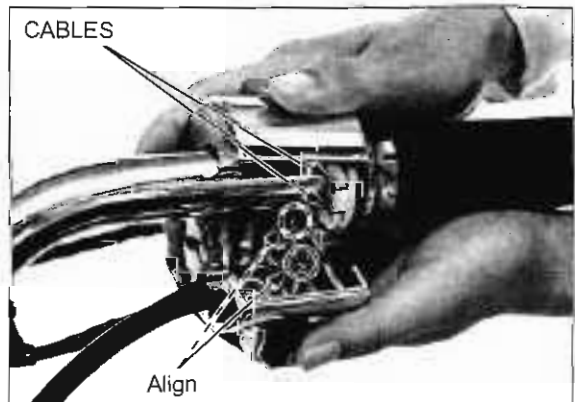
Apply grease 0.2 – 0.3 g to the throttle pipe flange groove and sliding surface.

Install the throttle pipe onto the handlebar.

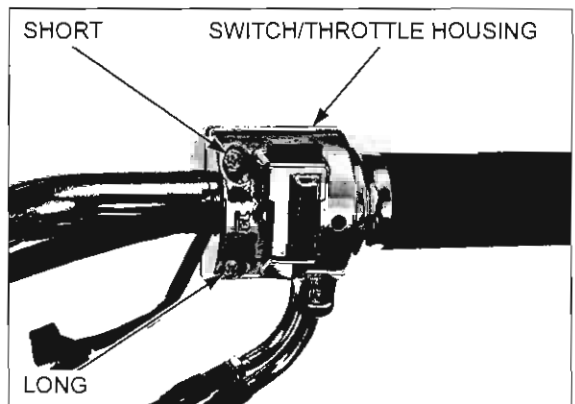


Connect the throttle cables to the throttle pipe flange.

Install the right handlebar switch/throttle housing with the two screws, aligning the locating pin with the hole in the handlebar.



Tighten the front long screw first, then tighten the rear short screw.

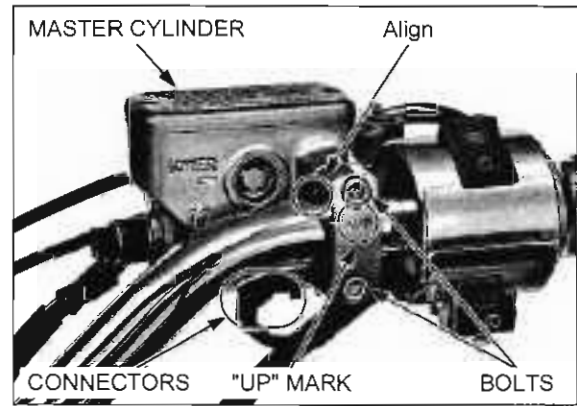


## FRONT WHEEL/SUSPENSION/STEERING

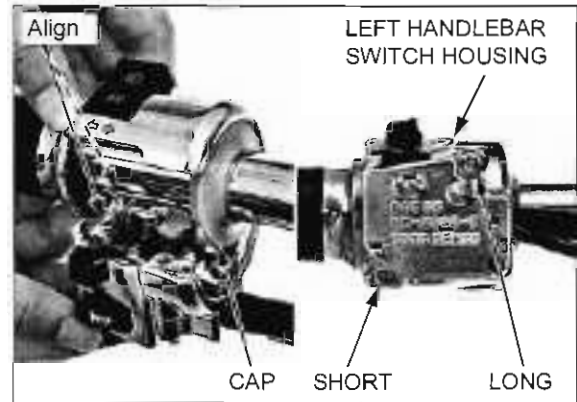
*Install the holder with its "UP" mark facing up.* Install the master cylinder, holder and bolts. Align the edge of the master cylinder with the punch mark on the handlebar and tighten the upper bolt first, then tighten the lower bolt.

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

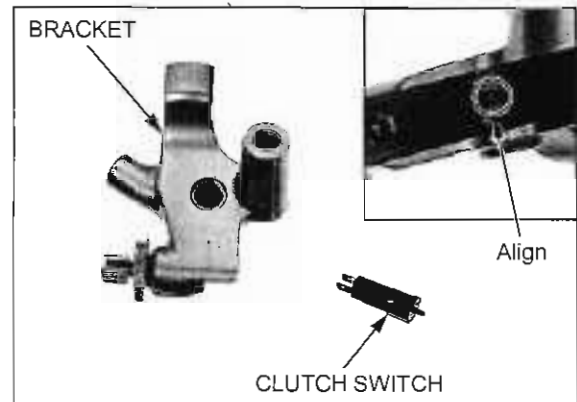
Connect the front brake light switch connectors.



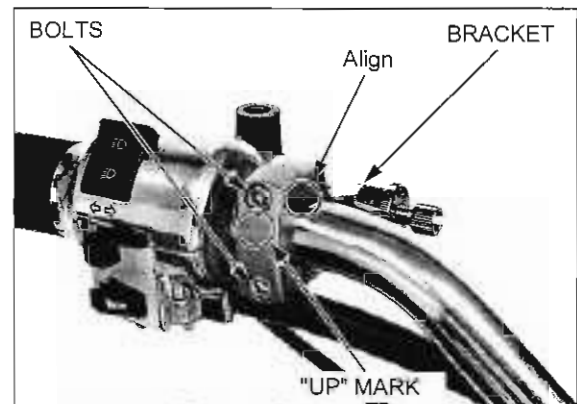
*Set the housing cap flange into the housing groove.* Install the left handlebar switch housing and screws, aligning the locating pin with the hole in the handlebar. Tighten the front short screw first, then tighten the rear long screw.



Install the clutch switch into the bracket, aligning the tab of the clutch switch and groove of the bracket.



*Install the holder with its "UP" mark facing up.* Install the clutch lever bracket, holder and bolts. Align the edge of the bracket with the punch mark on the handlebar and tighten the upper bolt first, then tighten the lower bolt securely.



## FRONT WHEEL/SUSPENSION/STEERING

Connect the clutch switch connectors.  
Connect the clutch cable on the clutch lever.

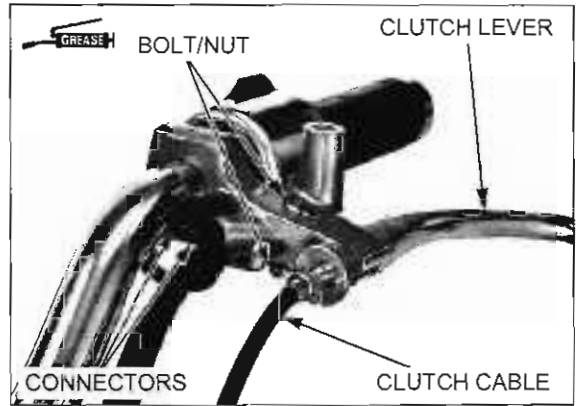
*Apply grease to the clutch lever pivot bolt sliding surface.*

Install the clutch lever onto the bracket and tighten the clutch lever pivot bolt to the specified torque.

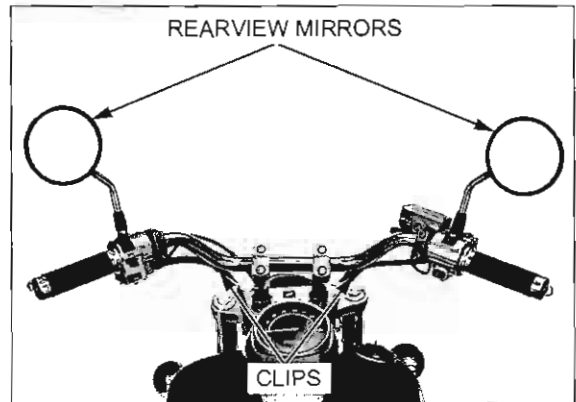
**TORQUE: 1 N·m (0.1 kgf·m, 8.4 lbf·in)**

Tighten the nut to the specified torque while holding the pivot bolt.

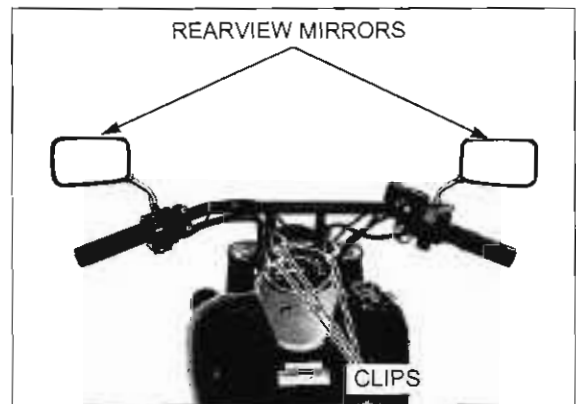
**TORQUE: 6 N·m (0.6 kgf·m, 4.4 lbf·ft)**



**VT750C2F/C2S;** Install the wire clips onto the tabs on the handlebar.  
Secure the switch wires with the wire clips.  
Install the rearview mirrors.  
Adjust the clutch lever freeplay (page 3-23).



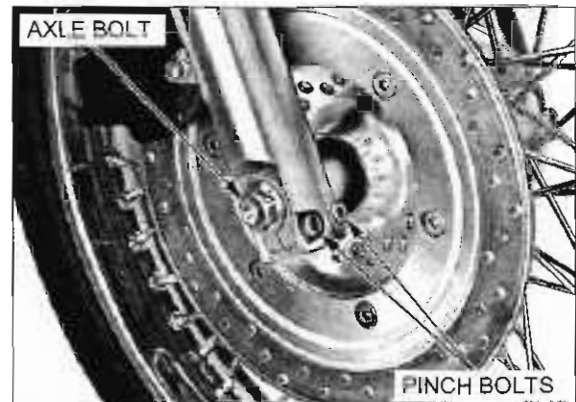
**VT750C2B;** Install the wire clips onto the tabs on the handlebar.  
Secure the switch wires with the wire clips.  
Install the rearview mirrors.  
Adjust the clutch lever freeplay (page 3-23).



## FRONT WHEEL

### REMOVAL

Remove the axle bolt and loosen the right axle pinch bolts.



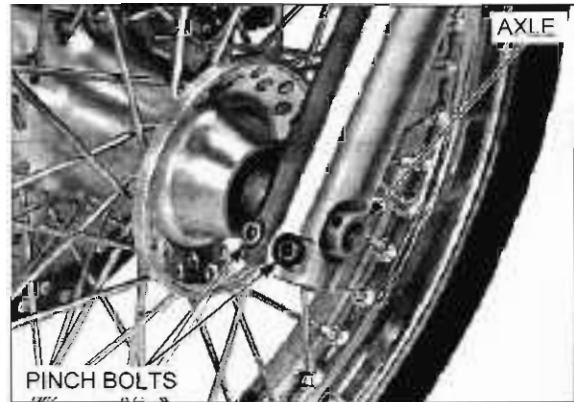
## FRONT WHEEL/SUSPENSION/STEERING

Loosen the left axle pinch bolts.

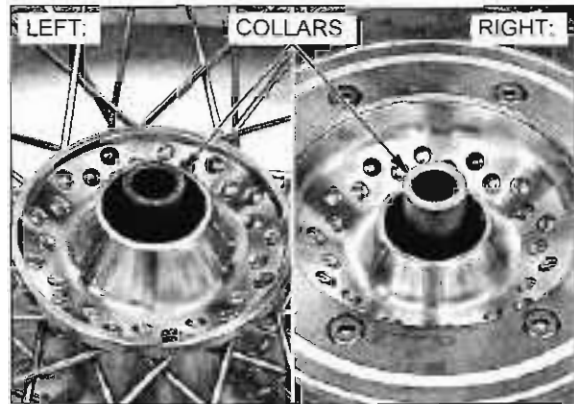
Support the motorcycle securely and raise the front wheel off the ground.

*Do not operate the brake lever/pedal (VT750C2S) after removing the wheel. To do so will cause difficulty in fitting the brake disc between the brake pads.*

Remove the axle and front wheel.



Remove the side collars.



### INSPECTION

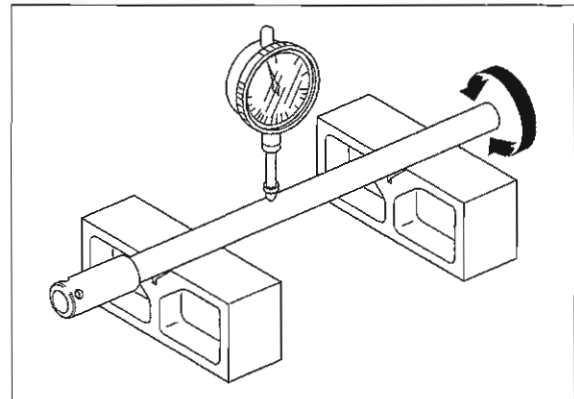
#### AXLE

Set the axle in V-blocks.

Turn the axle and measure the runout using a dial indicator.

Actual runout is 1/2 the total indicator reading.

**SERVICE LIMIT: 0.2 mm (0.01 in)**



#### WHEEL RIM

Check the rim runout by placing the wheel in a truing stand.

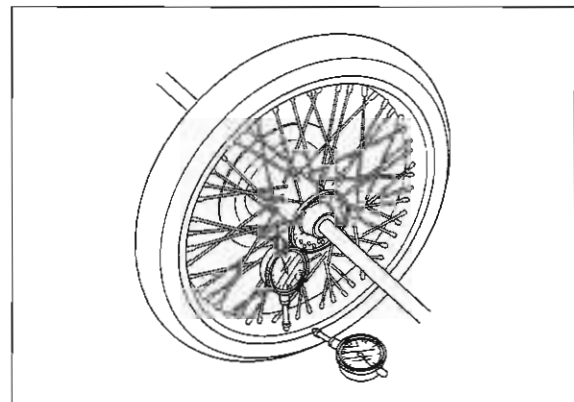
Spin the wheel slowly and read the runout using a dial indicator.

Actual runout is 1/2 the total indicator reading.

#### SERVICE LIMITS:

Radial: 2.0 mm (0.08 in)

Axial: 2.0 mm (0.08 in)

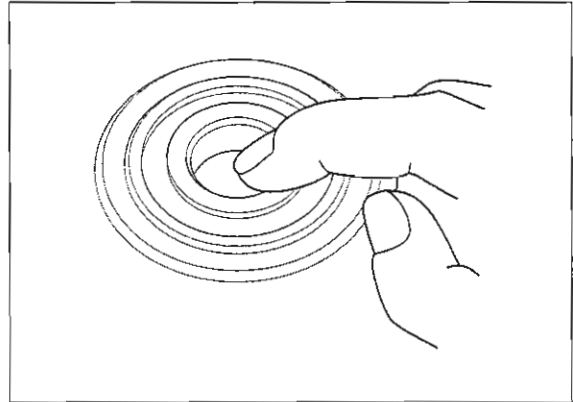


**WHEEL BEARING**

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

*Replace the wheel bearings in pairs.*

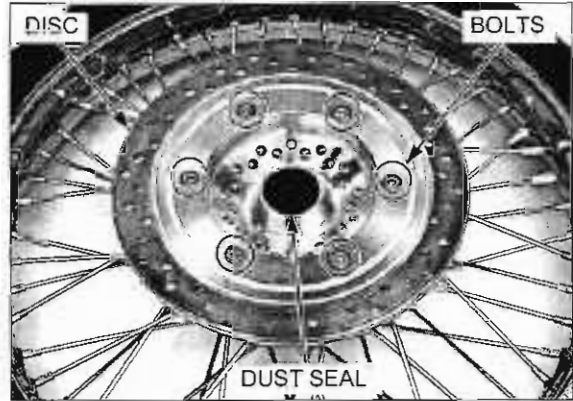
Remove and discard the bearings if the races do not turn smoothly and quietly, or if they fit loosely in the hub (page 14-19).



**DISASSEMBLY**

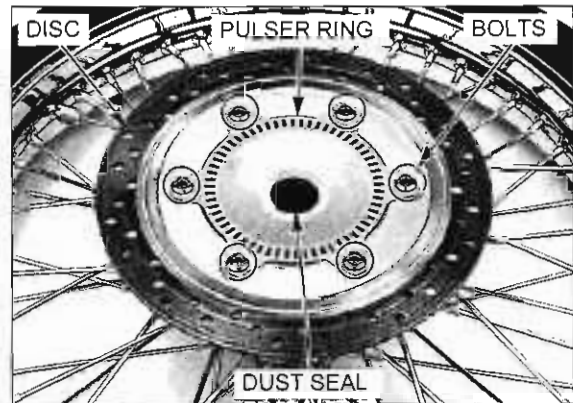
VT750C2F/C2B; Remove the dust seals from both sides of the hub.

*Do not reuse the bolts.* Remove the bolts in a crisscross pattern in several steps and remove the brake disc.



VT750C2S; Remove the bolts in a crisscross pattern in several steps and remove the pulser ring and brake disc. Remove the dust seals from both sides of the hub.

*Do not reuse the bolts.*

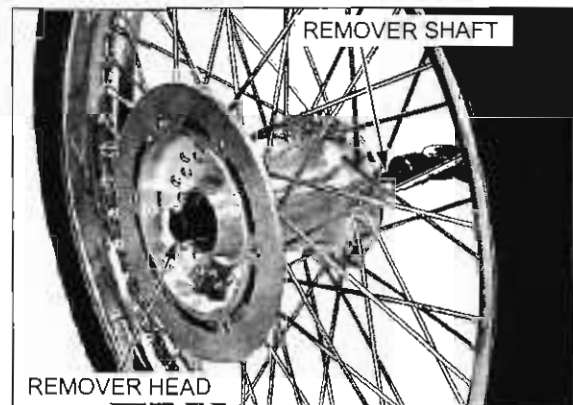


*Replace the wheel bearings in pairs. Do not reuse old bearing.*

Install the remover head into the bearing. From the opposite side of the wheel, install the remover shaft and drive the bearing out of the wheel hub. Remove the distance collar and drive out the other bearing.

**TOOLS:**

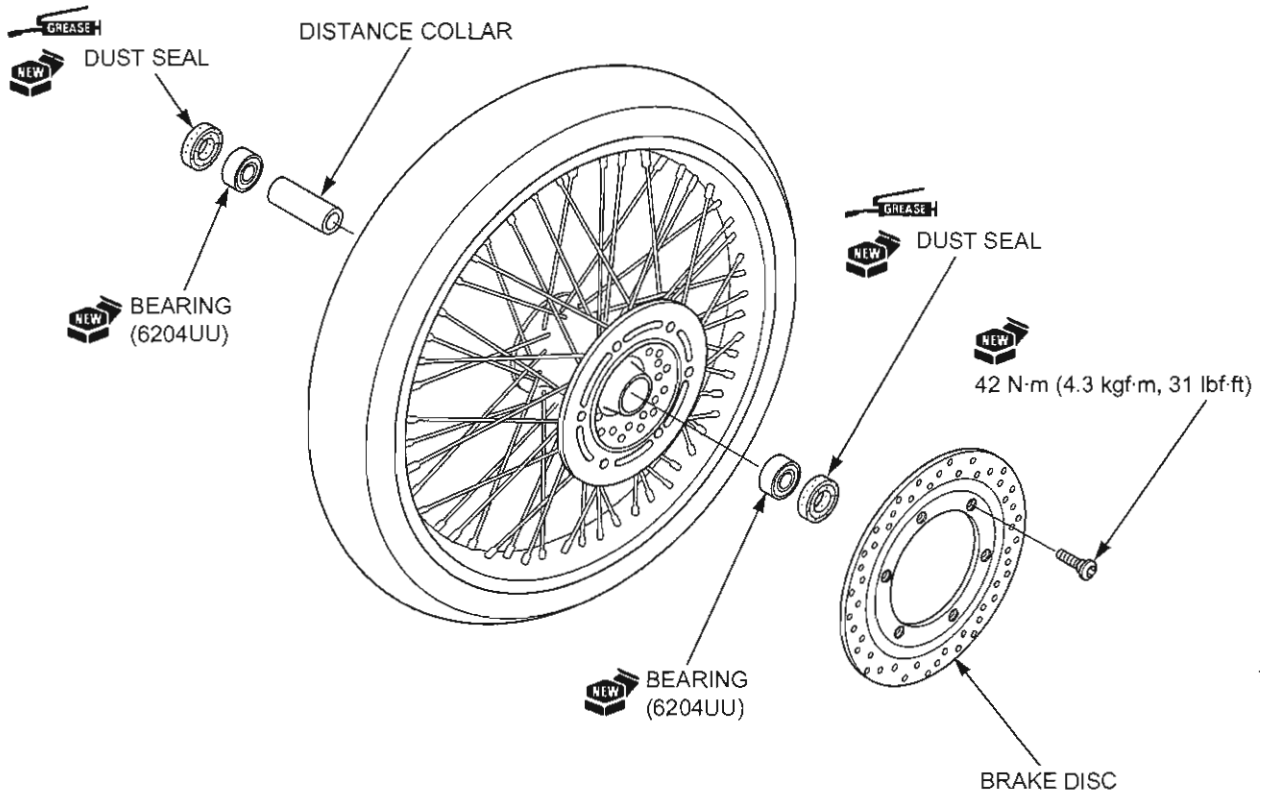
- Bearing remover shaft                    07GGD-0010100
- Bearing remover head, 20 mm        07746-0050600



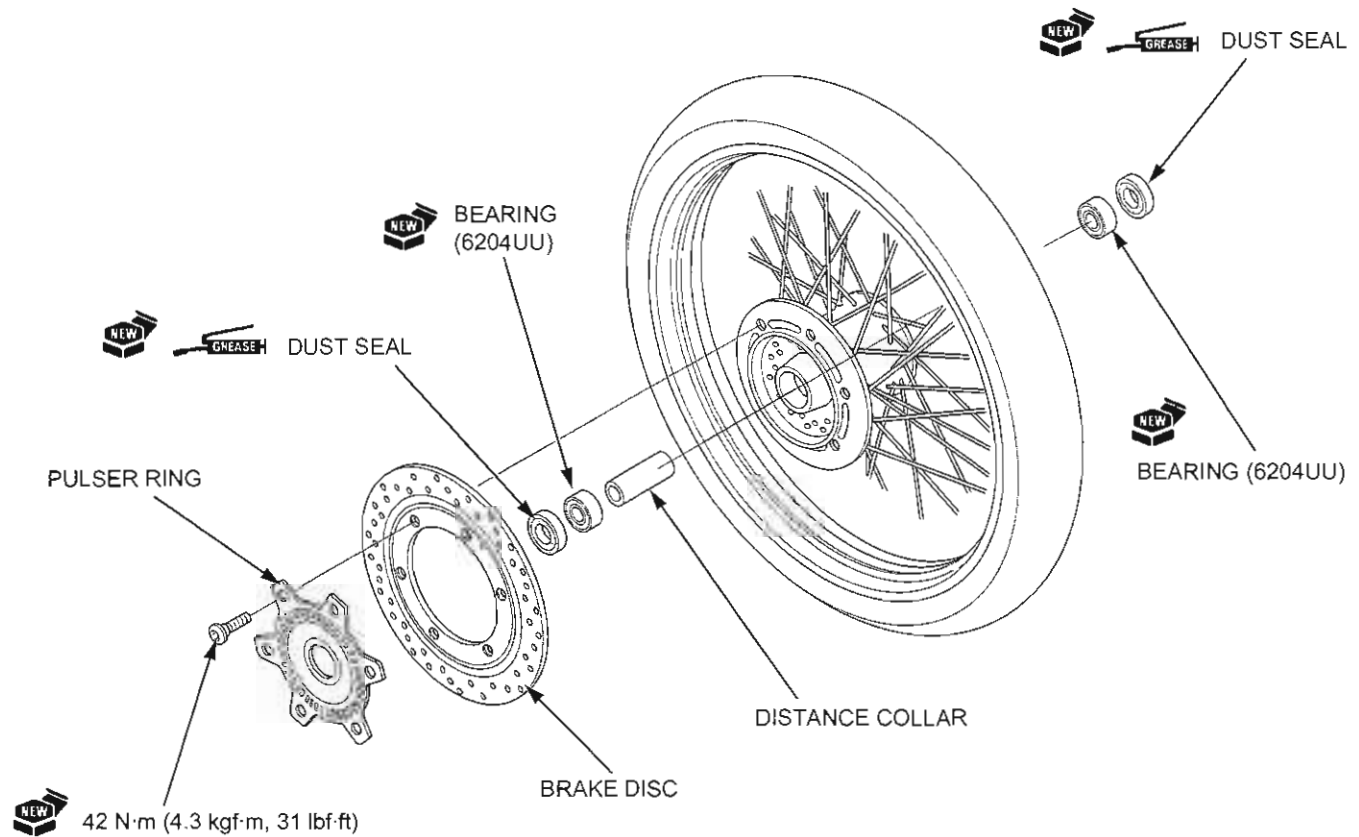
# FRONT WHEEL/SUSPENSION/STEERING

## ASSEMBLY

VT750C2F/C2B:



VT750C2S:



## FRONT WHEEL/SUSPENSION/STEERING

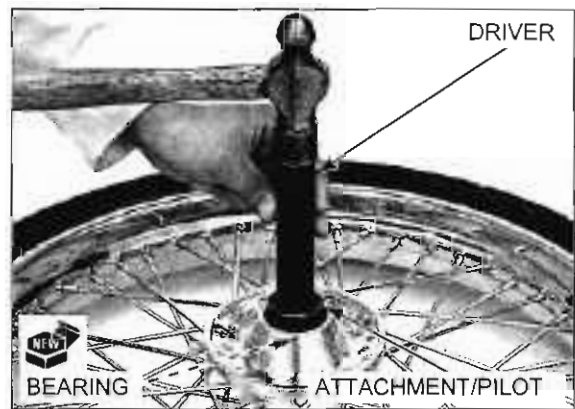
Drive in a new left bearing squarely with the marked side facing up until it is fully seated.

Install the distance collar.

Drive in a new right bearing squarely with the marked side facing up until it is seated on the collar.

### TOOLS:

Driver 07749-0010000  
Attachment, 42 x 47 mm 07746-0010300  
Pilot, 20 mm 07746-0040500



### WHEEL CENTER ADJUSTMENT

Measure the distance B (rim width) and calculate distance A as follows:

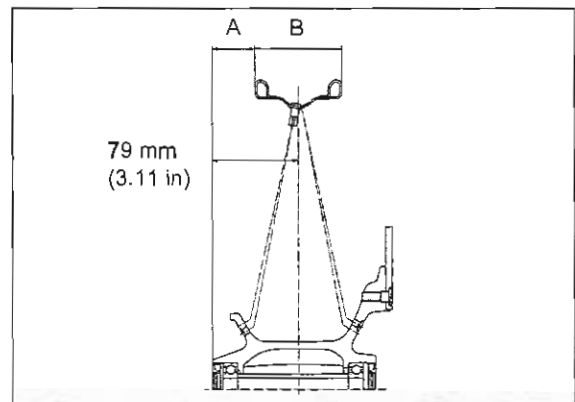
$$A = 79 \text{ mm (3.11 in)} - B/2$$

Adjust the rim position and distance A by tightening the spokes to the specified torque in several progressive steps.

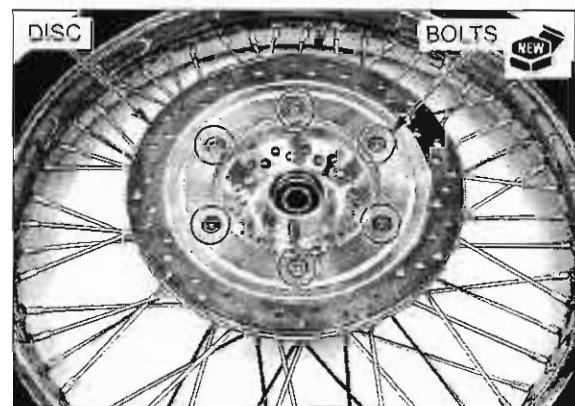
### TOOL:

Spoke wrench 07JMA-MR60100

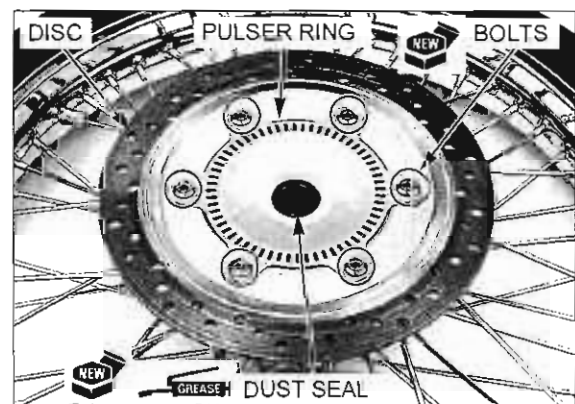
**TORQUE: 4.2 N-m (0.4 kgf-m, 3.1 lbf-ft)**



**VT750C2F/C2B;** Install the brake disc with the marked side facing out.  
*Do not get grease on the brake disc or stopping power will be reduced.* Install new bolts and tighten them in a crisscross pattern in several steps.  
**TORQUE: 42 N-m (4.3 kgf-m, 31 lbf-ft)**



**VT750C2S;** Apply grease to new dust seal lips and install the dust seals until they are flush with the wheel hub.  
Install the brake disc with the marked side facing out.  
Install the pulser ring.  
*Do not get grease on the brake disc or stopping power will be reduced.* Install new bolts and tighten them in a crisscross pattern in several steps.  
**TORQUE: 42 N-m (4.3 kgf-m, 31 lbf-ft)**

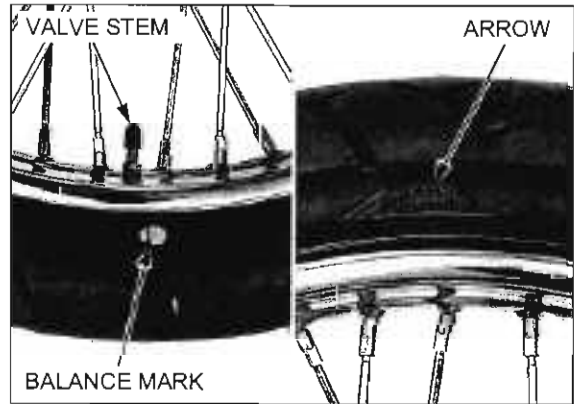


## FRONT WHEEL/SUSPENSION/STEERING

### WHEEL BALANCE

#### NOTE:

- Carefully check balance before installing the wheel.
- Mount the tire with the arrow mark facing in the direction of rotation.
- The wheel balance must be checked when the tire is remounted.
- For optimum balance, the tire balance mark (light mass point: a paint dot on the side wall) must be located next to the valve stem. Remount the tire if necessary.

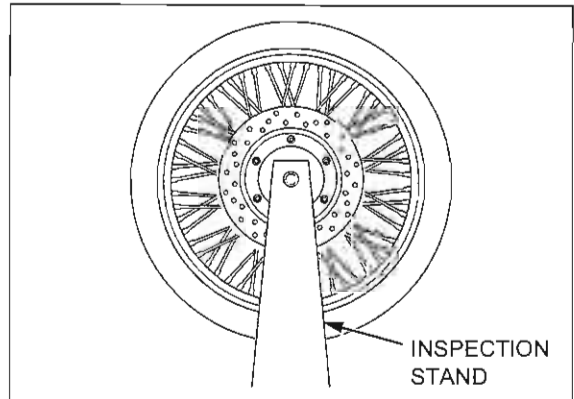


Mount the wheel, tire and brake disc assembly on an inspection stand.

Spin the wheel, allow it to stop, and mark the lowest (heaviest) part of the wheel with chalk.

Do this two or three times to verify the heaviest area.

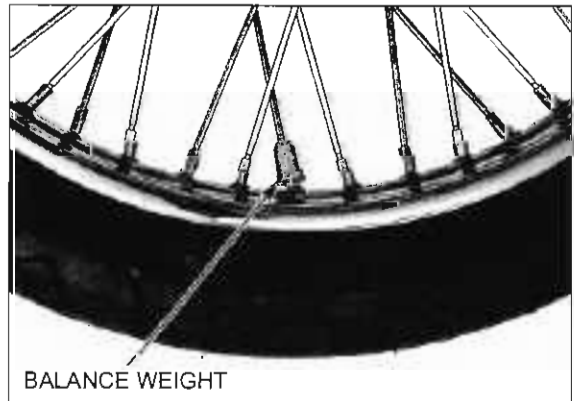
If the wheel is balanced, it will not stop consistently in the same position.



To balance the wheel, install a new balance weight on the lightest side of the spoke, on the side opposite the chalk marks. Add just enough weight so the wheel will no longer stop in the same position when it is spun. Do not add more than 60 g to the front wheel.

#### NOTE:

Never reuse the balance weight if once removed from the spoke.



Apply grease to new dust seal lips and install the dust seals until they are flush with the wheel hub.

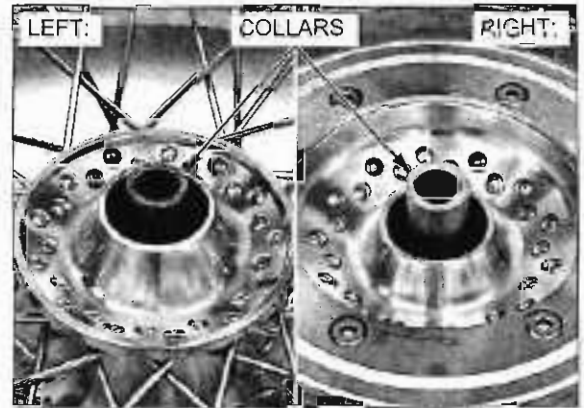




**INSTALLATION**

*Install the right side (disc side) collar with its flange side facing out.*

Install the side collars.



*Be careful not to damage the pads.*

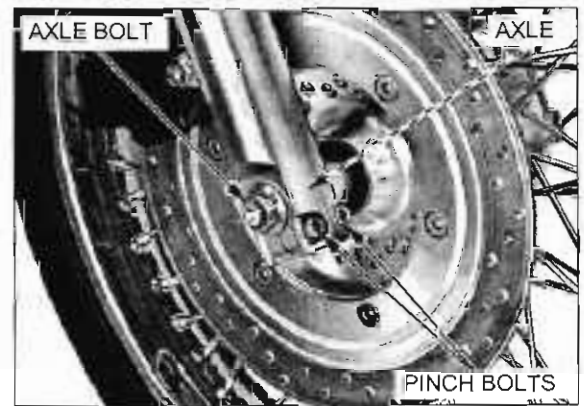
Place the front wheel between the fork legs so the brake disc is positioned between the brake pads.

Apply thin coat of grease to the axle sliding surface.  
Insert the axle from the left side.  
Tighten the axle bolt to the specified torque.

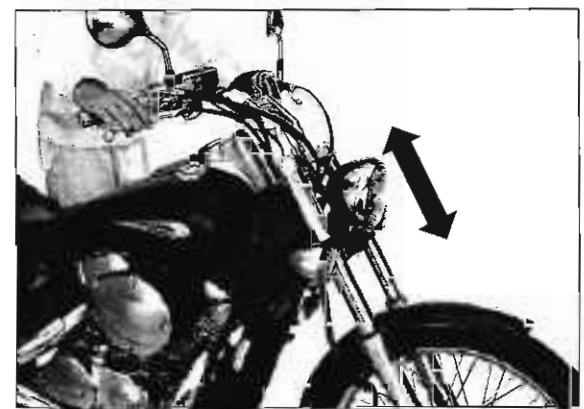
**TORQUE: 59 N·m (6.0 kgf·m, 44 lbf·ft)**

Tighten the right axle pinch bolts to the specified torque.

**TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)**

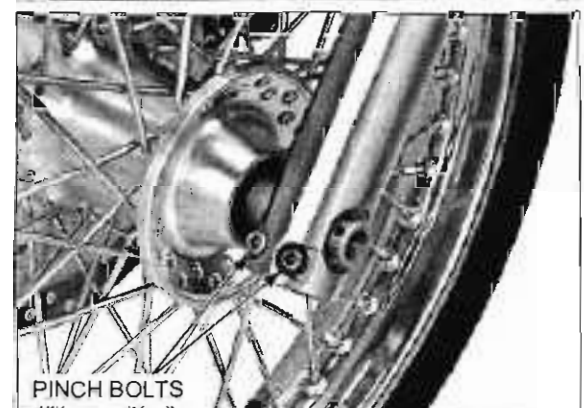


With the front brake applied, pump the forks up and down several times to seat the axle and check brake operation.



Tighten the left axle pinch bolts to the specified torque.

**TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)**



## FRONT WHEEL/SUSPENSION/STEERING

### FORK

#### REMOVAL (VT750C2F/C2S)

Remove the following:

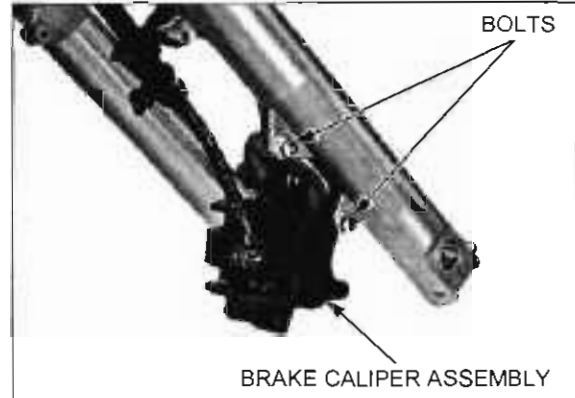
- Front wheel (page 14-17)
- Front fender (page 2-6)

*Right fork only:  
Do not reuse caliper  
mounting bolts.*

Remove the bolts and brake caliper assembly.

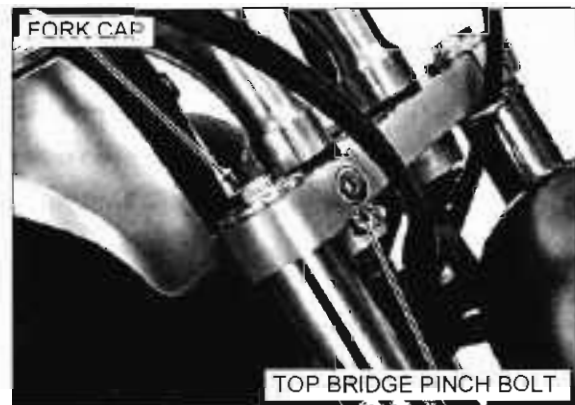
#### NOTE:

Support the brake caliper so it does not hang from the brake hose.

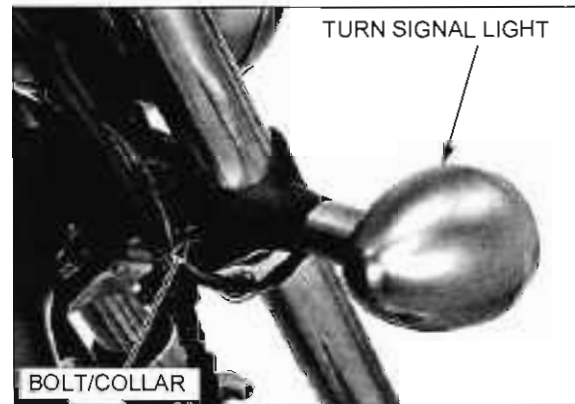


Loosen the top bridge pinch bolt.

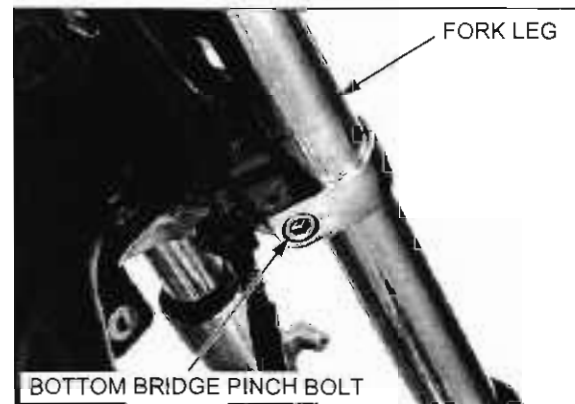
When the fork will be disassembled. Loosen the fork cap but do not remove yet.



Remove the bolt, collar and turn signal light.



Loosen the bottom bridge pinch bolt, then remove the fork leg.



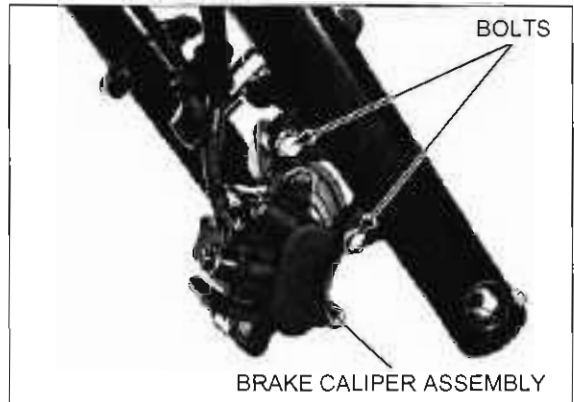
**REMOVAL (VT750C2B)**

VT750C2F; Remove the following:

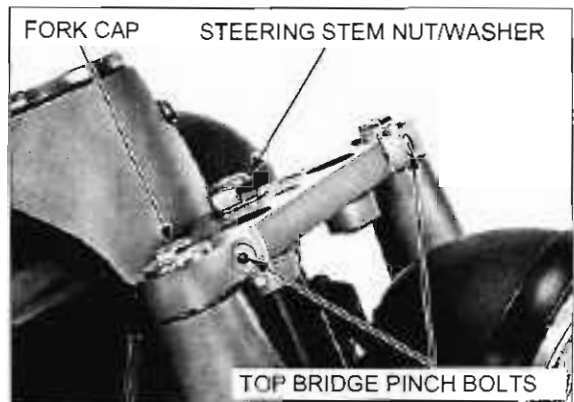
- Front wheel (page 14-17)
- Front fender (page 2-6)
- Handlebar (page 14-9)

*Right fork only:* Remove the bolts and brake caliper assembly.  
 Do not reuse caliper mounting bolts.

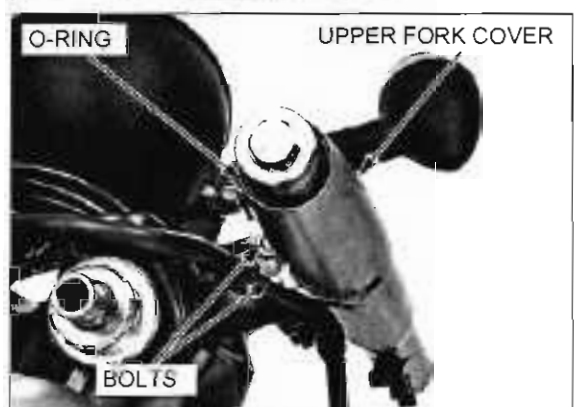
**NOTE:**  
 Support the brake caliper so it does not hang from the brake hose.



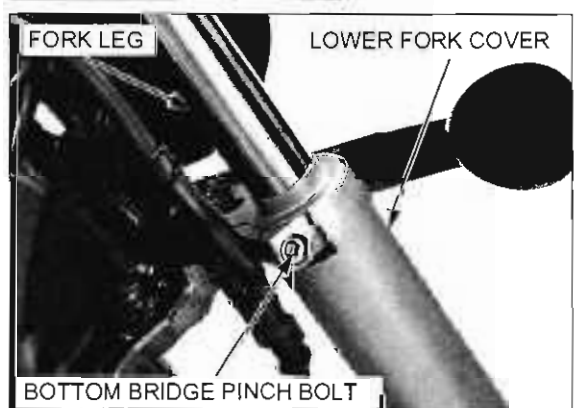
Loosen the top bridge pinch bolt.  
 When the fork will be disassembled. Loosen the fork cap but do not remove yet.  
 Remove the steering stem nut, washer and top bridge.



Remove the bolts and upper fork cover, collar and turn signal light.  
 Remove the O-ring.



Loosen the bottom bridge pinch bolt, then remove the fork leg.  
 Remove the lower fork cover.



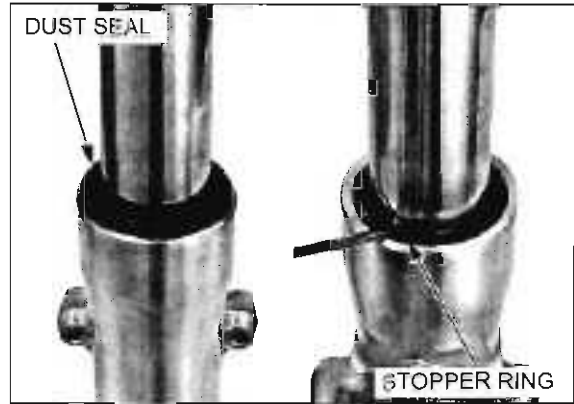
# FRONT WHEEL/SUSPENSION/STEERING

## DISASSEMBLY

Remove the dust seal.

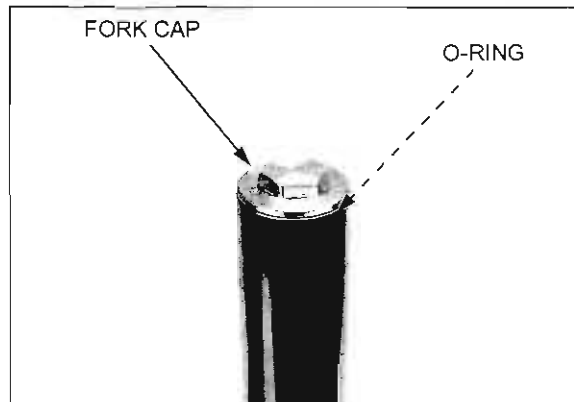
*Do not scratch the fork tube sliding surface.*

Remove the oil seal stopper ring.

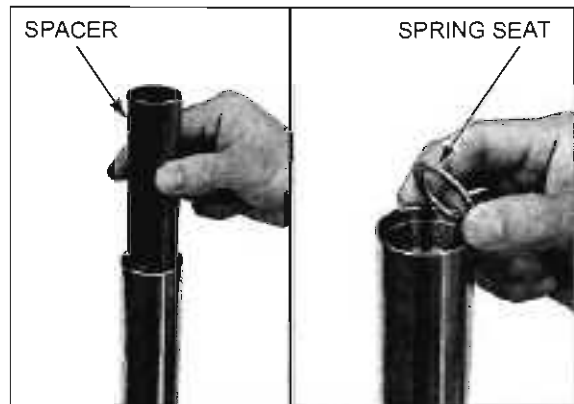


*The fork cap is under spring pressure; use care when loosening it.*

Remove the fork cap and O-ring.

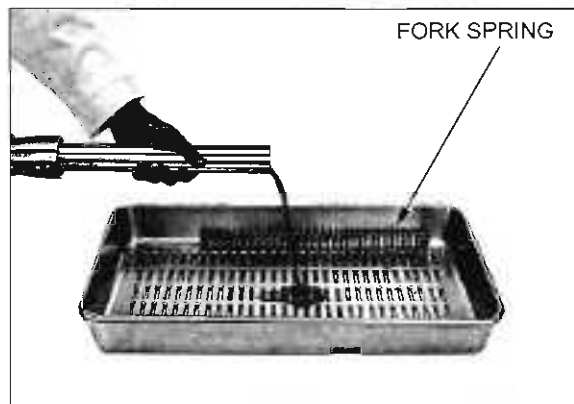


Remove the spacer and spring seat.



Remove the fork spring from the fork tube.

Pour out the fork fluid by pumping the fork tube several times.



## FRONT WHEEL/SUSPENSION/STEERING

*Do not over-tighten the vise on the fork slider.*

*If the fork piston turns with the fork center socket bolt, temporarily install the fork spring, spring seat, spacer and fork cap.*

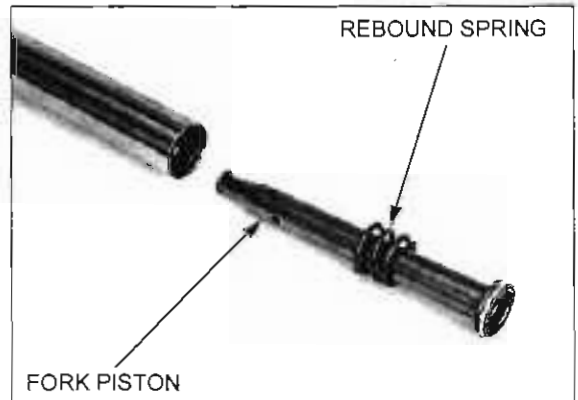
Hold the fork slider in a vise with soft jaws.

Remove the fork center socket bolt and sealing washer.

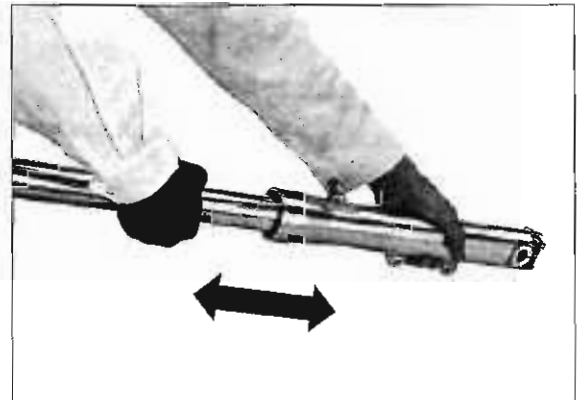


*Do not remove the fork piston ring, unless it is necessary to replace with a new one.*

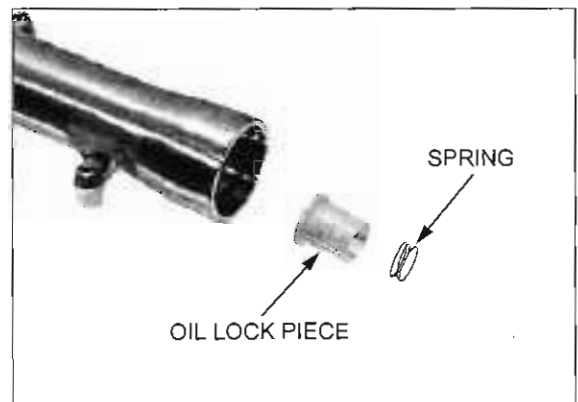
Remove the fork piston and rebound spring.



Using quick successive motions, pull the fork tube out of the fork slider.



Remove the spring and oil lock piece from the fork slider.



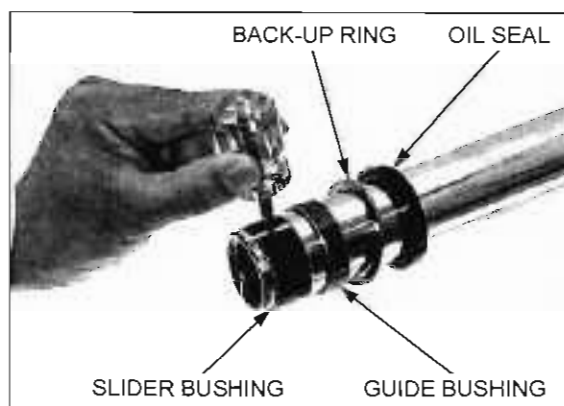
## FRONT WHEEL/SUSPENSION/STEERING

*Do not damage the slider bushing, especially the sliding surface. To prevent loss of tension, do not open the bushing more than necessary.*

Carefully remove the slider bushing by prying the slot with a screwdriver until the bushing can be pulled off by hand.

Remove the following:

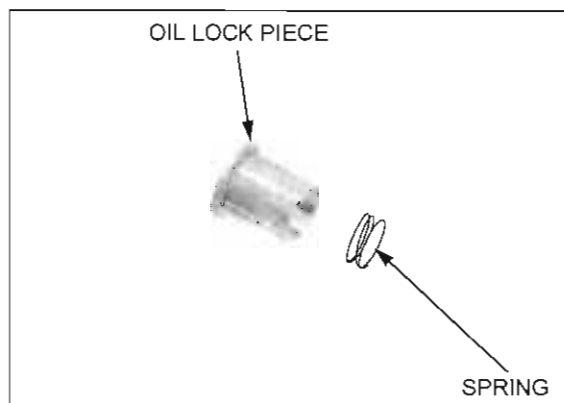
- Guide bushing
- Back-up ring
- Oil seal



### INSPECTION

#### OIL LOCK PIECE/SPRING

Check the oil lock piece for wear or damage.  
Check the spring for fatigue or damage.

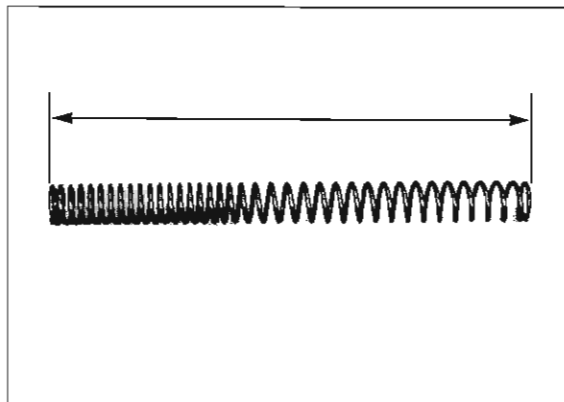


#### FORK SPRING

Measure the fork spring free length.

#### SERVICE LIMITS:

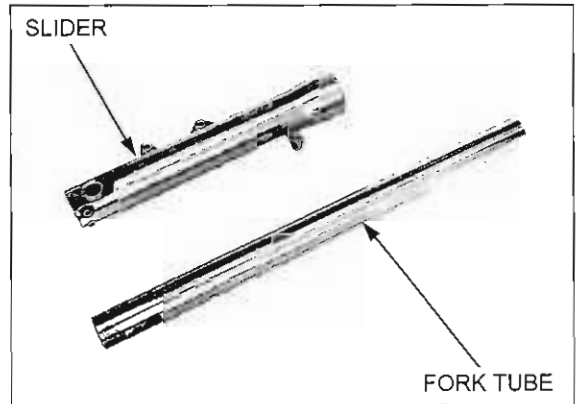
- VT750C2F/C2S: 364.4 mm (14.35 in)
- VT750C2B: 360.4 mm (14.19 in)



## FORK TUBE/SLIDER/PISTON

VT750C2F/C2S; Check the fork tube and fork slider for score marks, and excessive or abnormal wear.

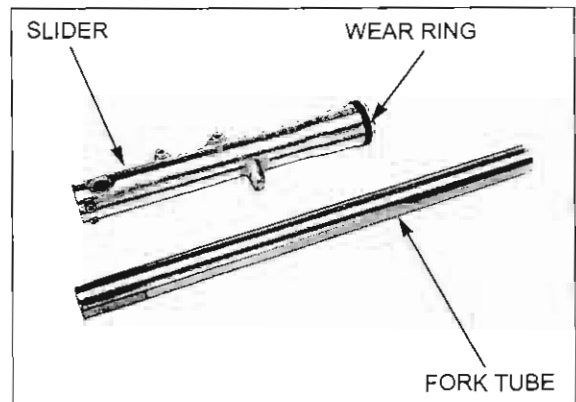
Replace any damaged component if necessary.



VT750C2B; Check the fork tube and fork slider for score marks, and excessive or abnormal wear.

Check the wear ring for wear or damage.

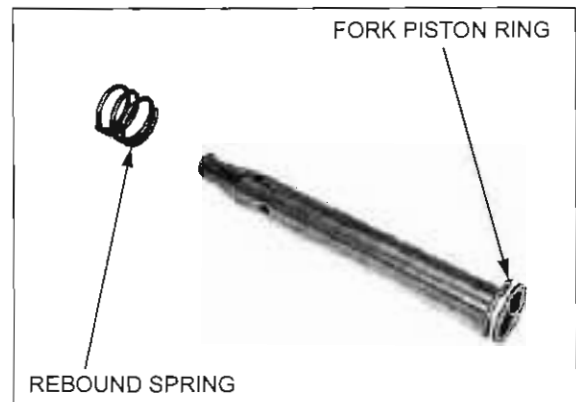
Replace any damaged component if necessary.



Check the fork piston for score marks, and excessive or abnormal wear.

Check the fork piston ring for wear or damage.  
Check the rebound spring for fatigue or damage.

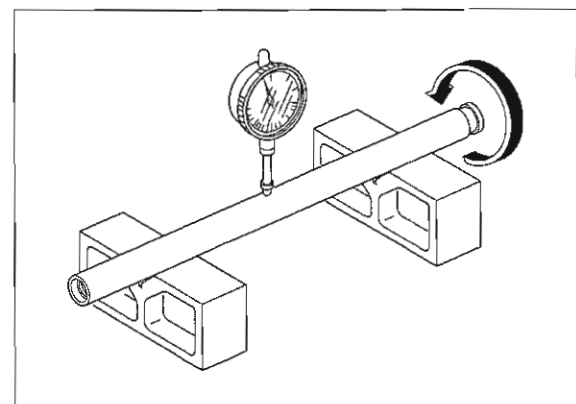
Replace any damaged component if necessary.



Set the fork tube in V-blocks and measure the fork tube runout with a dial indicator.

Actual runout is 1/2 the total indicator reading.

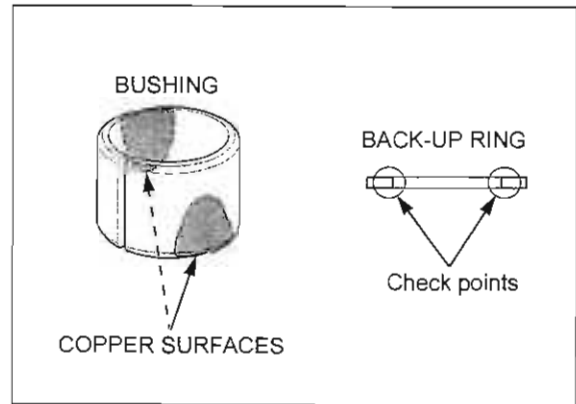
**SERVICE LIMIT: 0.2 mm (0.01 in)**



# FRONT WHEEL/SUSPENSION/STEERING

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

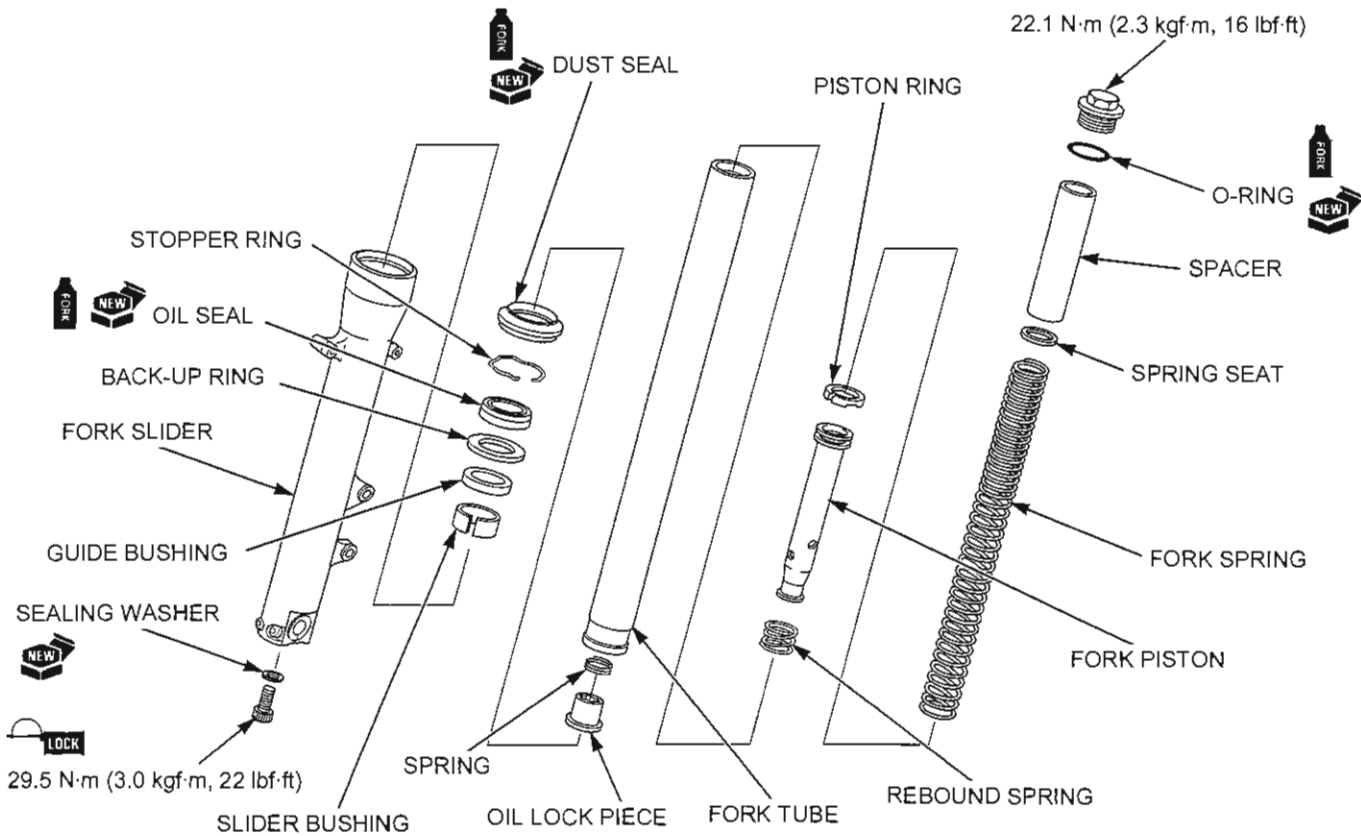
Check the back-up ring; replace it if there is any distortion at the points shown.



## ASSEMBLY

Before assembly, wash all parts with a high flash point or non-flammable solvent and wipe them off completely.

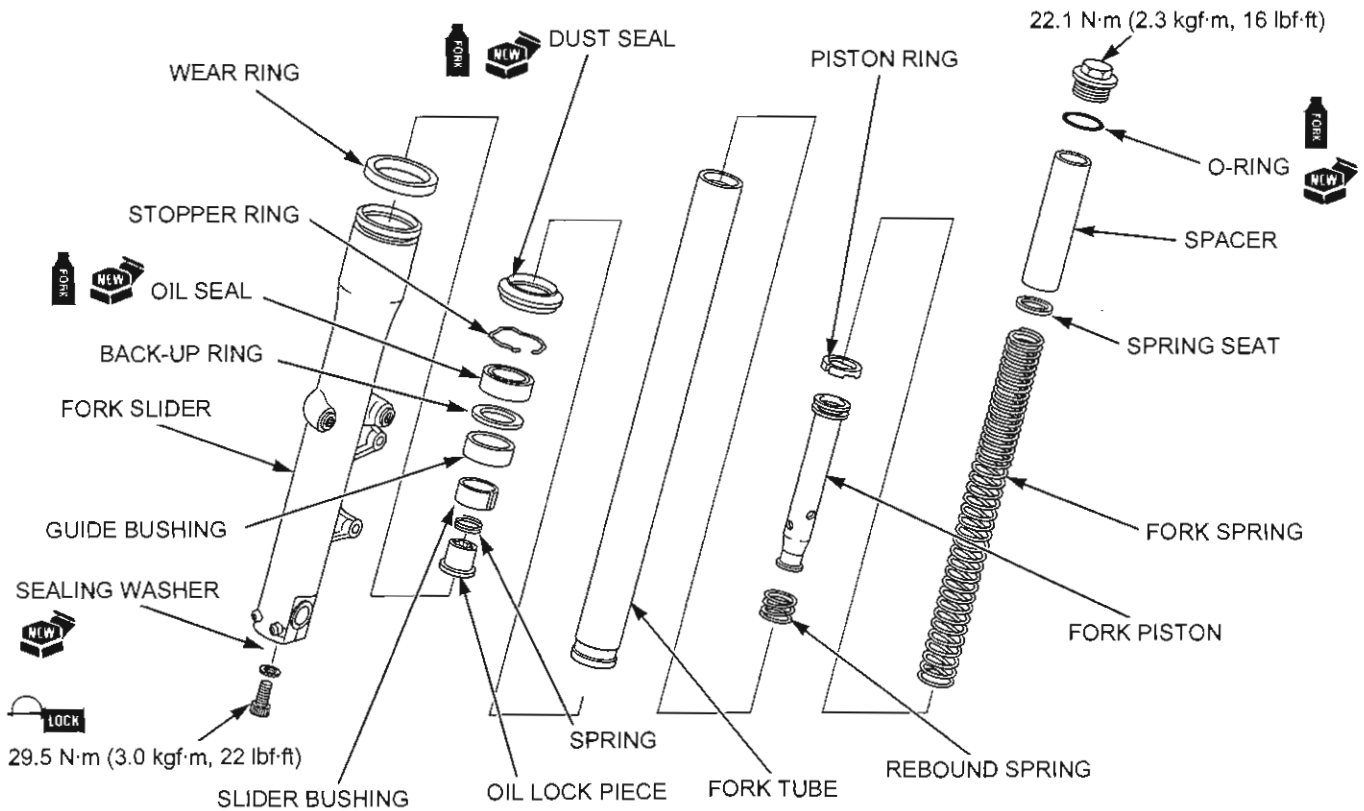
VT750C2F/C2S:





# FRONT WHEEL/SUSPENSION/STEERING

VT750C2B:



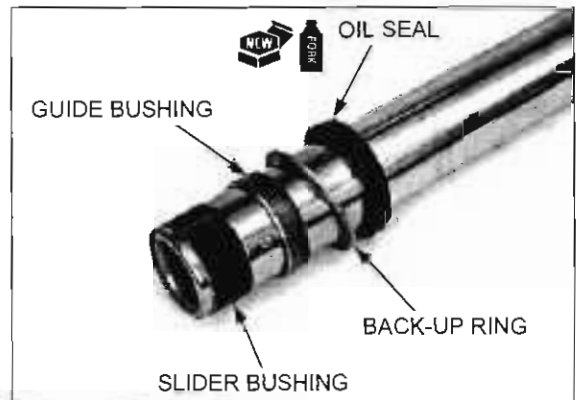
Do not open the bushing slit more than necessary.

Install the slider bushing being careful not to damage the coating of the bushing, if it has been removed.

Remove the burrs from the bushing mating surface, being careful not to peel off the coating.

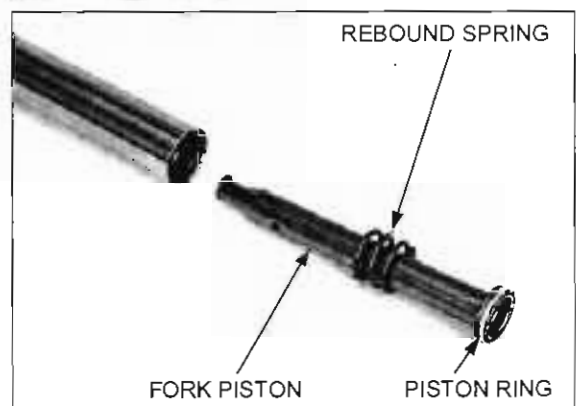
Install the oil seal with its marked side facing up.

Apply fork fluid to the new oil seal lips. Install the guide bushing, back-up ring and new oil seal onto the fork tube.



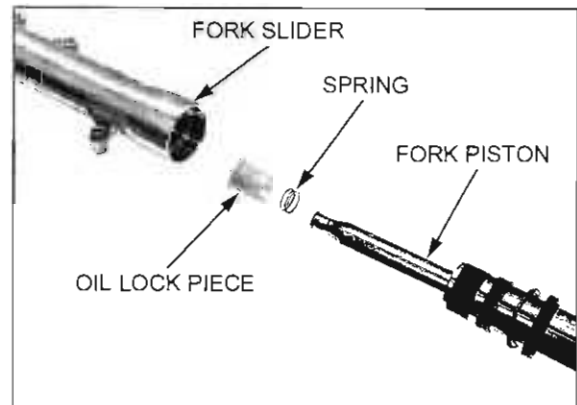
Install the rebound spring to the fork piston, then install them into the fork tube.

If the piston ring is removed, install a new piston ring into the fork piston groove.



## FRONT WHEEL/SUSPENSION/STEERING

Install the oil lock piece and spring to the fork piston end.  
Install the fork tube assembly into the fork slider.

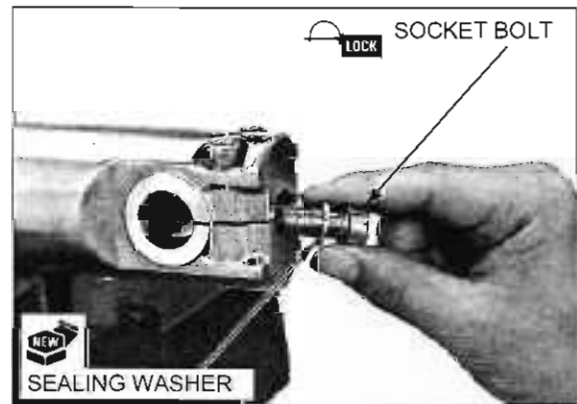


*Do not over-tighten the vise on the fork slider.*

Hold the fork slider in a vise with soft jaws.

Apply locking agent to the fork center socket bolt threads.

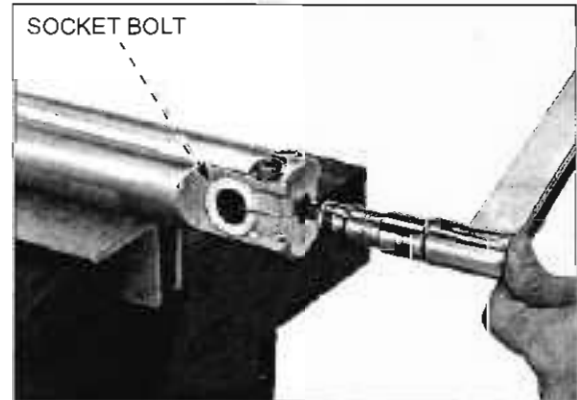
Install the socket bolt with a new sealing washer.



*If the fork piston turns with the fork center socket bolt, temporarily install the fork spring, spring seat, spacer and fork cap.*

Tighten the fork center socket bolt to the specified torque.

**TORQUE: 29.5 N·m (3.0 kgf·m, 22 lbf·ft)**



Drive the oil seal until the stopper ring groove is visible using the special tools.

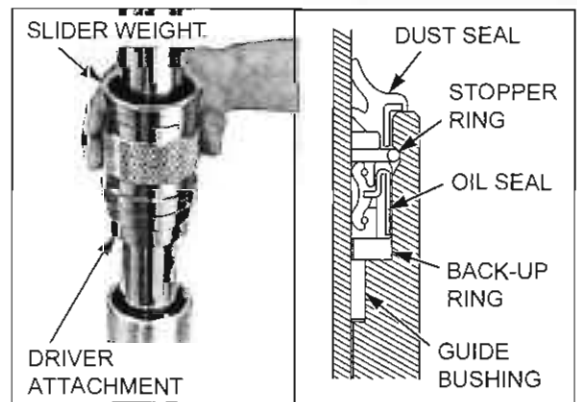
### TOOLS:

Slider weight

07947-KA50100

Driver attachment, 41 mm

07947-KF00100



Pour the specified amount of the recommended fork fluid into the fork tube.

**RECOMMENDED FORK FLUID:**

Pro Honda Suspension Fluid SS-8 (10W)

**FORK FLUID CAPACITY (VT750C2F/C2S):**

$478 \pm 2.5 \text{ cm}^3$  (16.2  $\pm$  0.08 US oz, 16.8  $\pm$  0.09 Imp oz)

**FORK FLUID CAPACITY (VT750C2B):**

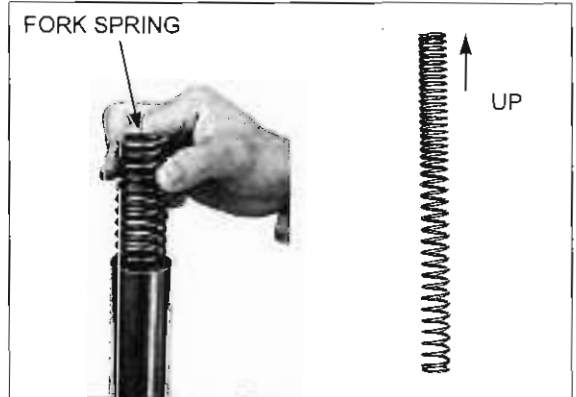
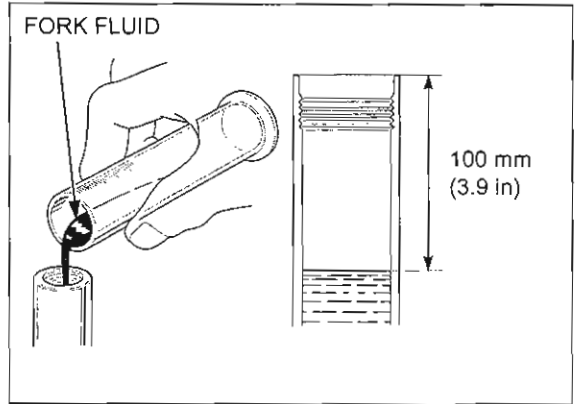
$474 \pm 2.5 \text{ cm}^3$  (16.0  $\pm$  0.08 US oz, 16.7  $\pm$  0.09 Imp oz)

Slowly pump the fork tube several times to remove any trapped air from the lower portion of the fork tube.

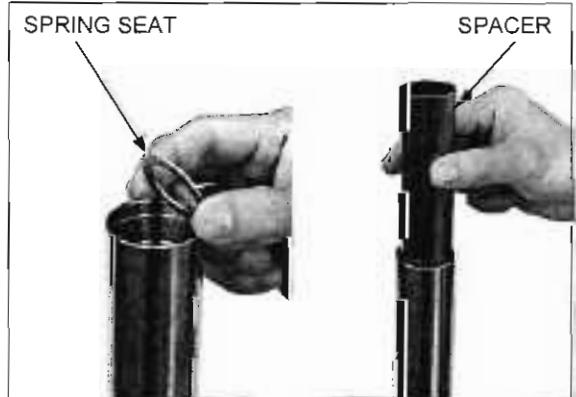
Compress the fork tube fully. Measure the fluid level from the top of the fork tube.

**FORK FLUID LEVEL: 100 mm (3.9 in)**

Pull the fork tube up and install the fork spring with the tightly wound coil side facing up.

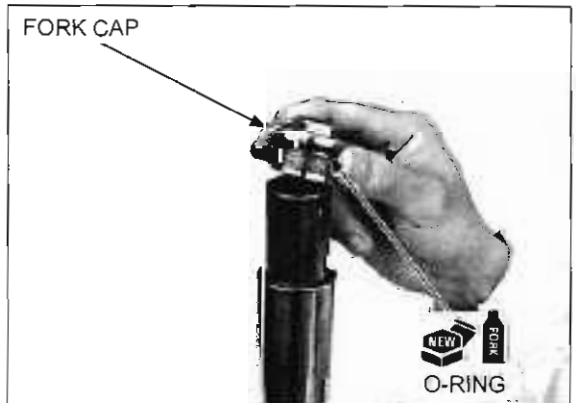


Install the spring seat and spacer.



Coat a new O-ring with fork fluid and install it into the fork cap groove.

Hold the fork cap securely and install it into the fork tube.

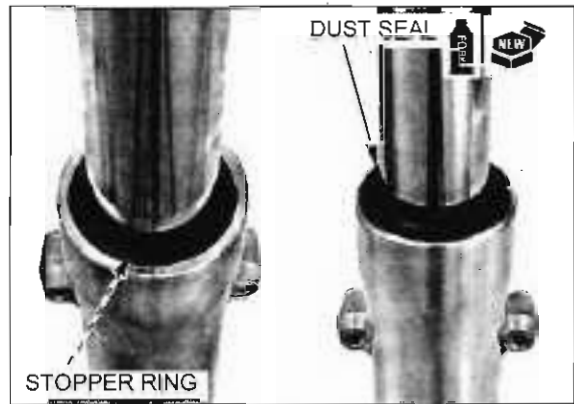


*Be careful not to cross-thread the fork cap. Tighten the fork cap after installing the fork leg into the steering stem and top bridge.*

## FRONT WHEEL/SUSPENSION/STEERING

Install the stopper ring into the groove into the fork slider, being careful not to scratch the fork tube sliding surface.

Coat a new dust seal lips with fork fluid and install it.



### INSTALLATION (VT750C2F/C2S)

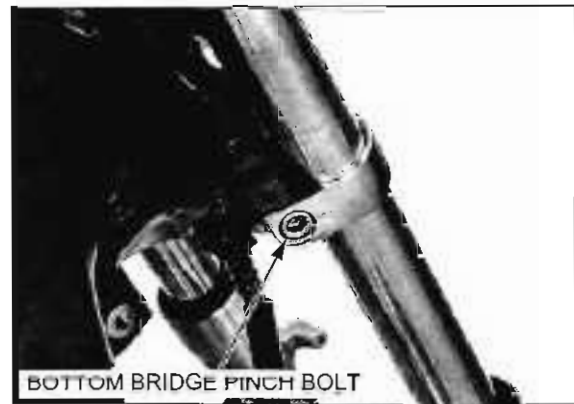
Install the fork leg into the steering stem and top bridge.

Align the fork tube top end surface with the top bridge as shown.

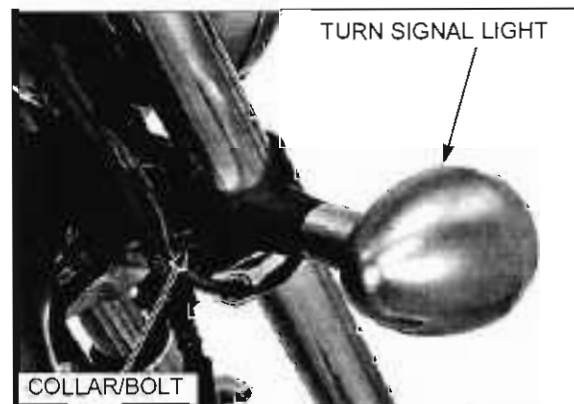


Tighten the bottom bridge pinch bolts to the specified torque.

**TORQUE: 49 N·m (5.0 kgf·m, 36 lbf·ft)**



Install the turn signal light, collar and bolt.  
Tighten the bolt securely.

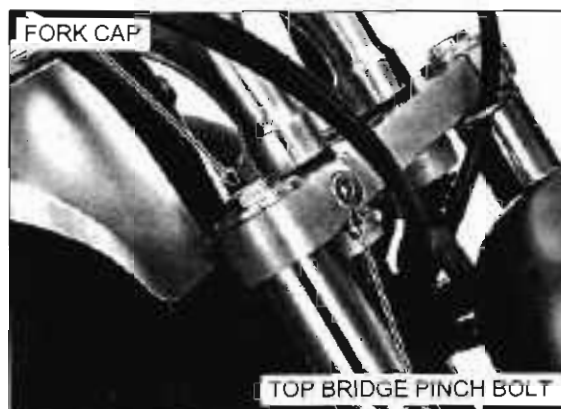


Tighten the top bridge pinch bolt to the specified torque.

**TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)**

Tighten the fork cap to the specified torque.

**TORQUE: 22.1 N·m (2.3 kgf·m, 16 lbf·ft)**

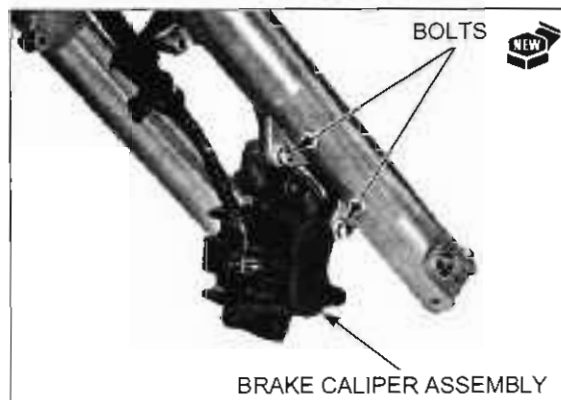


*Right fork only:* Install the brake caliper with new mounting bolts and tighten the bolts.

**TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)**

Install the following:

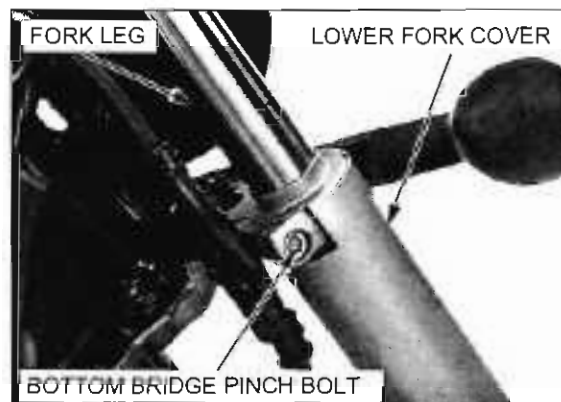
- Front fender (page 2-6)
- Front wheel (page 14-23)



### INSTALLATION (VT750C2B)

Install the lower fork cover and fork leg into the steering stem and top bridge.

Loosely tighten the bottom bridge pinch bolt lightly.



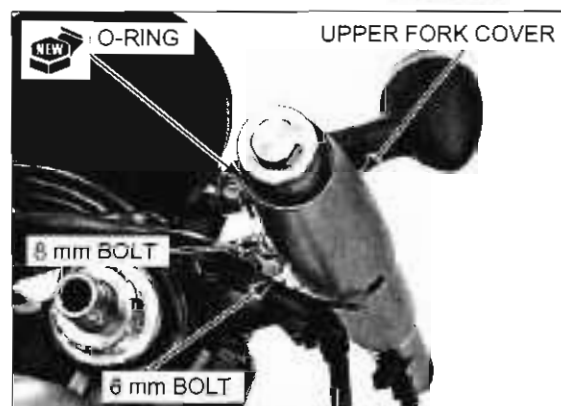
Install the upper fork cover, then tighten the 8 mm and 6 mm bolts to the specified torque.

**TORQUE:**

**8 mm bolt: 26 N·m (2.7 kgf·m, 19 lbf·ft)**

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

Install a new O-ring.



## FRONT WHEEL/SUSPENSION/STEERING

*Tighten the steering stem nut after tightening the top and bottom bridge pinch bolts.*

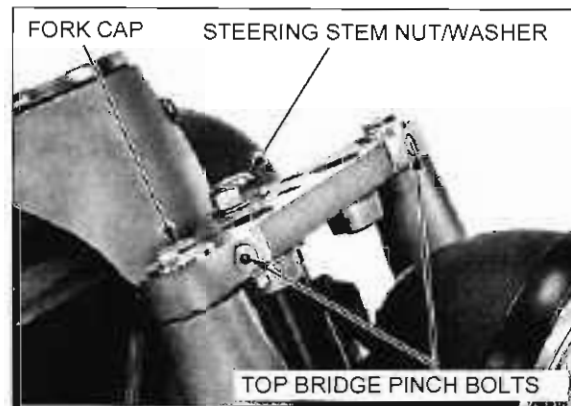
Install the top bridge, washer and steering stem nut.

Loosen the bottom bridge pinch bolts and align the fork tube top end surface with the top bridge as shown. Tighten the fork bridge pinch bolts to the specified torque.

### TORQUE:

Top bridge pinch bolt: 27 N·m (2.8 kgf·m, 20 lbf·ft)

Bottom bridge pinch bolt: 49 N·m (5.0 kgf·m, 36 lbf·ft)

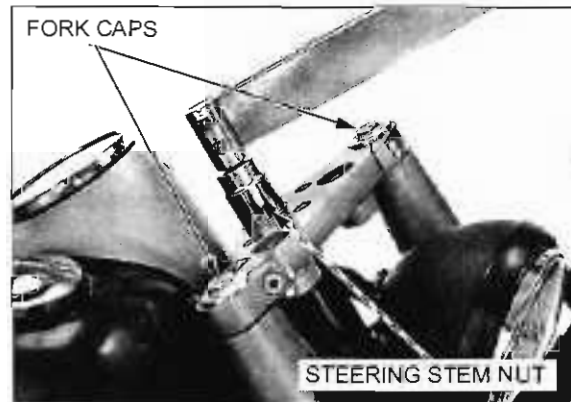


Tighten the steering stem nut to the specified torque.

TORQUE: 103 N·m (10.5 kgf·m, 76 lbf·ft)

Tighten the fork cap to the specified torque.

TORQUE: 22.1 N·m (2.3 kgf·m, 16 lbf·ft)

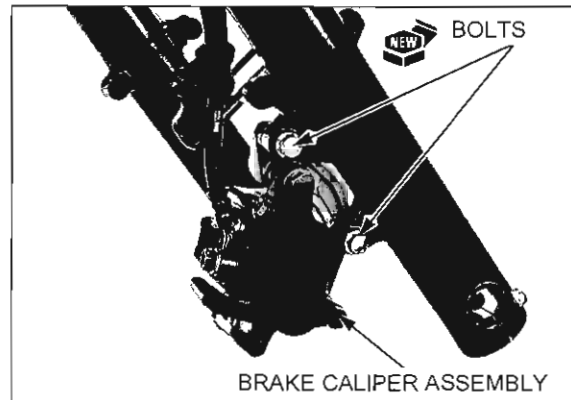


*Right fork only:* Install the brake caliper with new mounting bolts and tighten the bolts.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

Install the following:

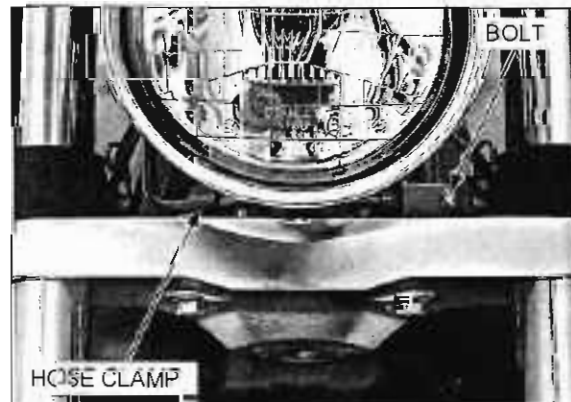
- Front fender (page 2-6)
- Front wheel (page 14-23)



## STEERING STEM

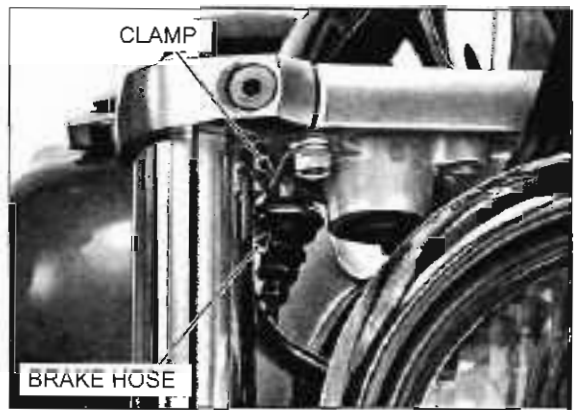
### REMOVAL (VT750C2F/C2S)

VT750C2S; Remove the bolt and brake hose clamp.



## FRONT WHEEL/SUSPENSION/STEERING

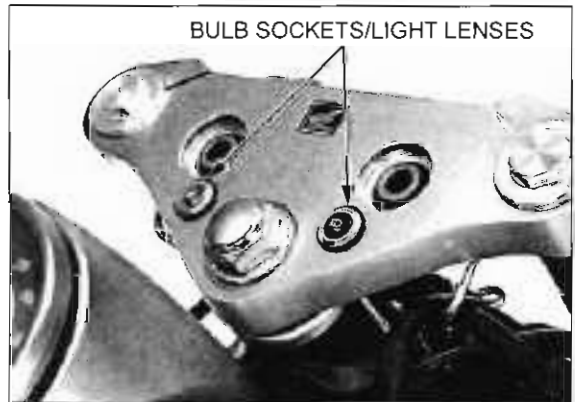
VT750C2S; Remove the brake hose from the clamp.



Remove the following:

- Handlebar (page 14-9)
- Front wheel (page 14-17)
- Front fender (page 2-6)
- Headlight case (page 21-7)
- Turn signal light (page 21-8)

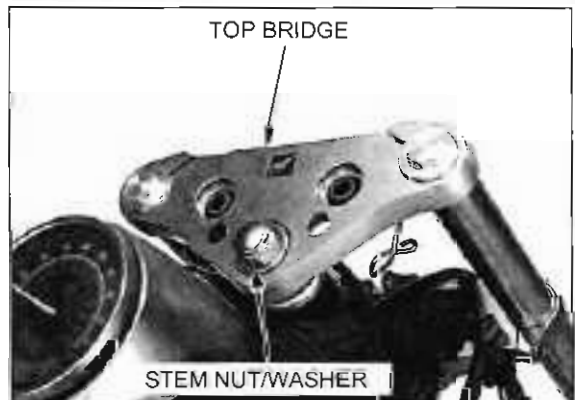
Remove the indicator light lenses and bulb sockets.



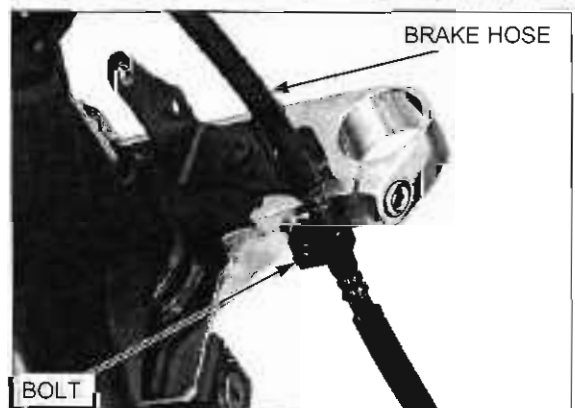
Remove the steering stem nut and washer.

Remove the fork legs (page 14-24).

Remove the top bridge.

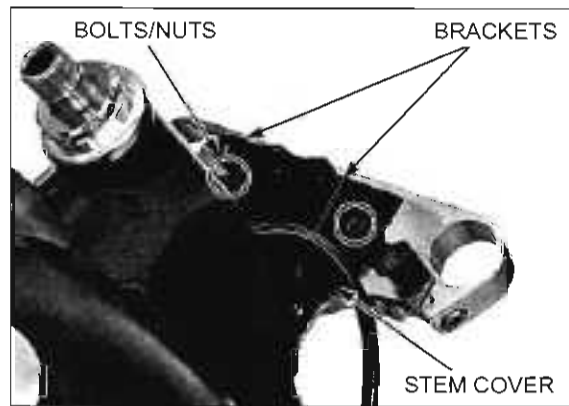


*Do not reuse the front brake hose mounting bolt.* Remove the mounting bolt and front brake hose.



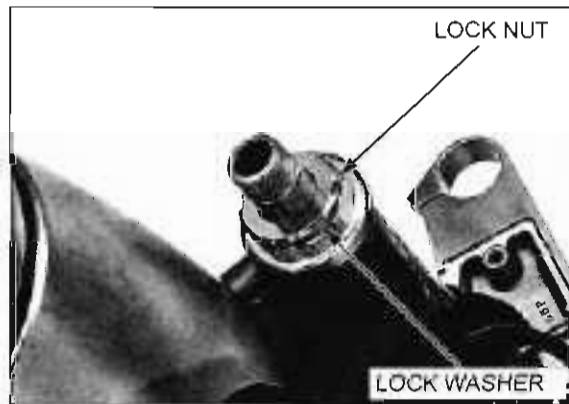
## FRONT WHEEL/SUSPENSION/STEERING

Remove the bolts, nuts, headlight case brackets and steering stem cover.



Straighten the lock washer tabs.

Remove the steering top thread lock nut and lock washer.

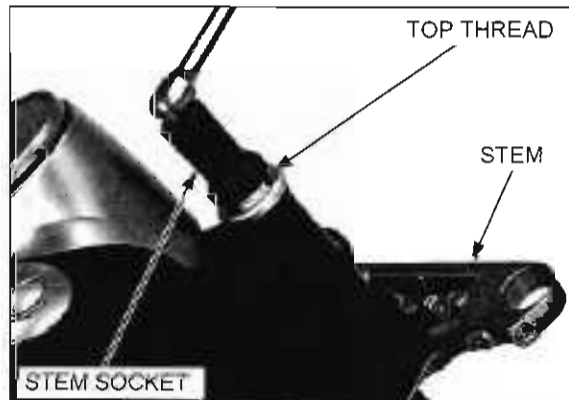


Loosen the steering top thread using the special tool.

**TOOL:**

**Steering stem socket**                      07916-3710101

While holding the steering stem, remove the steering top thread.



Remove the following:

- Steering stem
- Dust seal
- Upper inner race
- Upper steering head bearing
- Lower steering head bearing



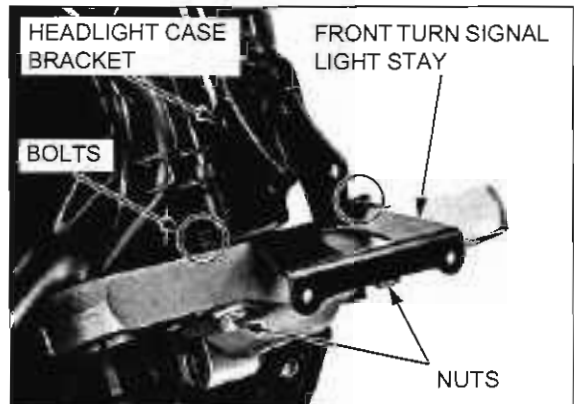


**REMOVAL (VT750C2B)**

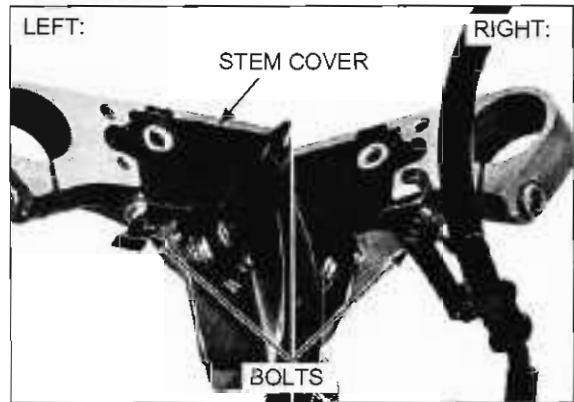
Remove the following:

- Front fork (page 14-25)
- Headlight case (page 21-7)
- Turn signal light (page 21-9)

Remove the bolts, nuts headlight case bracket and front turn signal light stay.

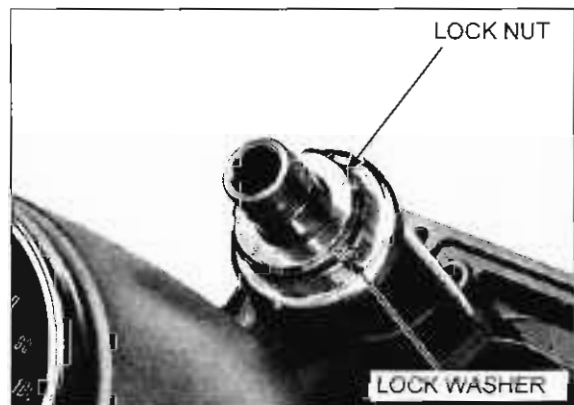


*Do not reuse the bolts.* Remove the bolts and steering stem cover.



Straighten the lock washer tabs.

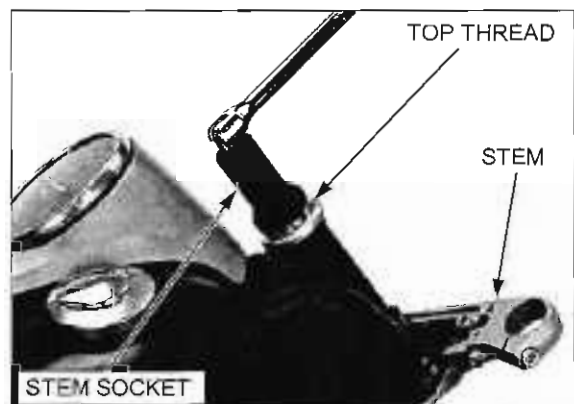
Remove the steering top thread lock nut and lock washer.



Loosen the steering top thread using the special tool.

**TOOL:**  
**Steering stem socket**                      07916-3710101

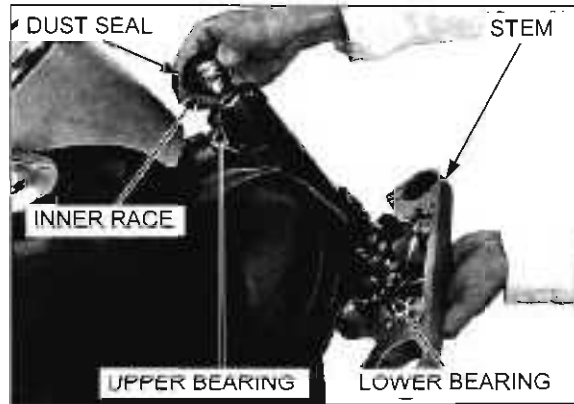
While holding the steering stem, remove the steering top thread.



## FRONT WHEEL/SUSPENSION/STEERING

Remove the following:

- Steering stem
- Dust seal
- Upper inner race
- Upper steering head bearing
- Lower steering head bearing



### BEARING REPLACEMENT

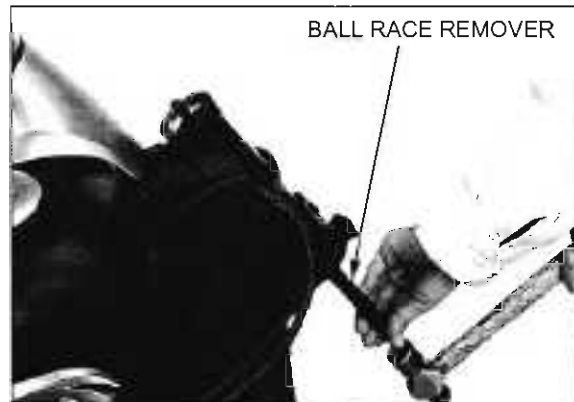
Remove the upper bearing outer race using the special tools.

#### TOOLS:

- |                              |                      |
|------------------------------|----------------------|
| <b>Ball race remover set</b> | <b>07953-MJ10000</b> |
| - Remover attachment         | 07953-MJ10100        |
| - Driver shaft               | 07953-MJ10200        |

#### U.S.A. TOOLS:

- |                                |                      |
|--------------------------------|----------------------|
| <b>Race remover attachment</b> | <b>07953-MJ1000B</b> |
|--------------------------------|----------------------|
- and a commercially available drift



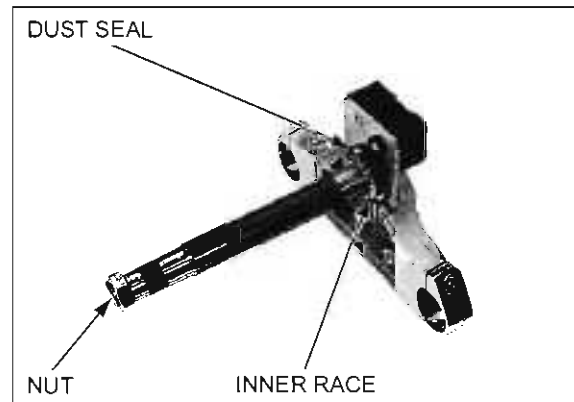
Remove the lower bearing outer race using the special tool and suitable shaft.

#### TOOL:

- |                        |                      |
|------------------------|----------------------|
| <b>Bearing remover</b> | <b>07946-3710500</b> |
|------------------------|----------------------|



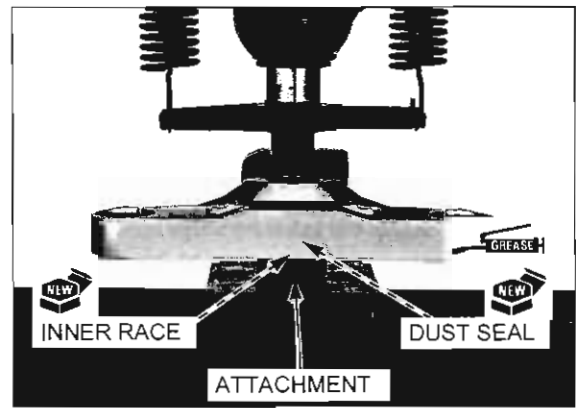
Install the steering stem nut onto the steering stem to prevent the threads from being damaged when removing the lower bearing inner race. Remove the lower bearing inner race with a chisel or equivalent tool, being careful not to damage the stem. Remove the dust seal.



## FRONT WHEEL/SUSPENSION/STEERING

Apply specified grease (page 1-23) to a new dust seal lip and install it onto the steering stem.  
Press a new lower bearing inner race using a special tool and hydraulic press.

**TOOL:**  
Attachment, 30 mm I.D. 07746-0030300

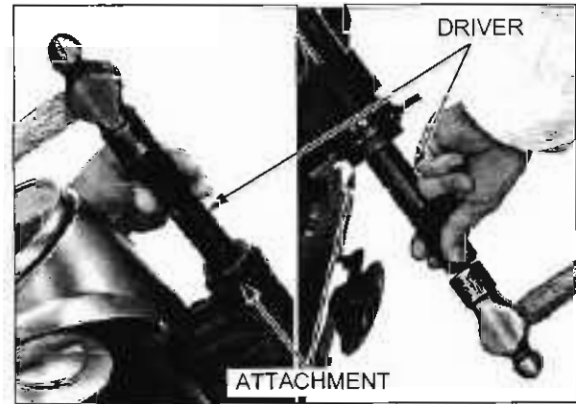


Drive in a new upper bearing outer race into the steering head pipe using the special tools.

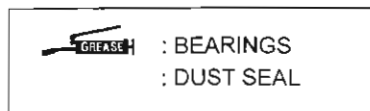
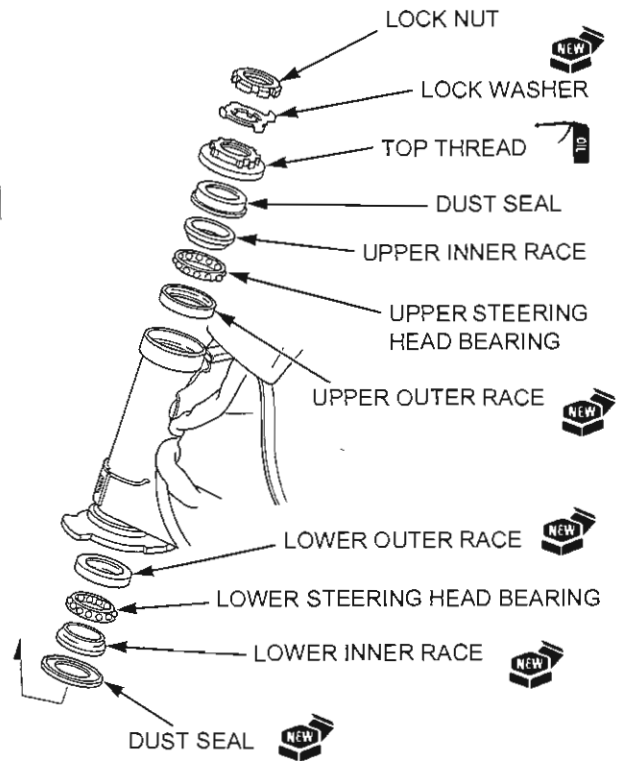
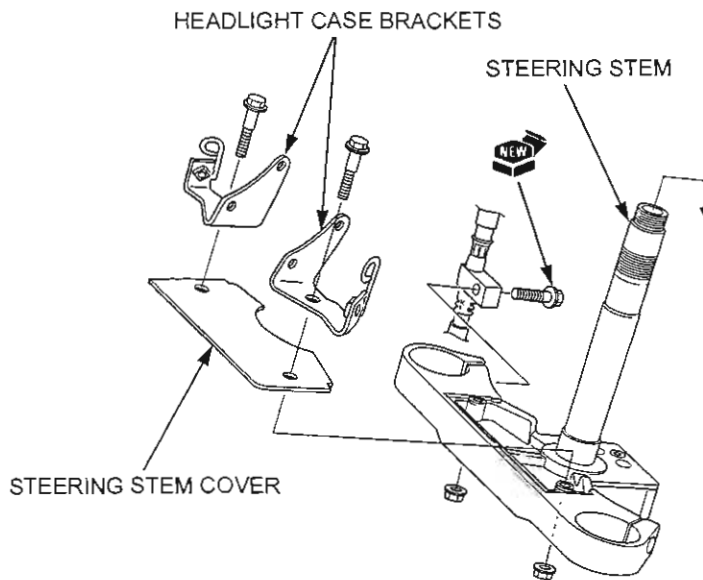
**TOOLS:**  
Driver 07749-0010000  
Attachment, 42 x 47 mm 07746-0010300

Drive in a new lower bearing outer race into steering head pipe using the special tools.

**TOOLS:**  
Driver 07749-0010000  
Attachment, 52 x 55 mm 07746-0010400



### INSTALLATION (VT750C2F/C2S)

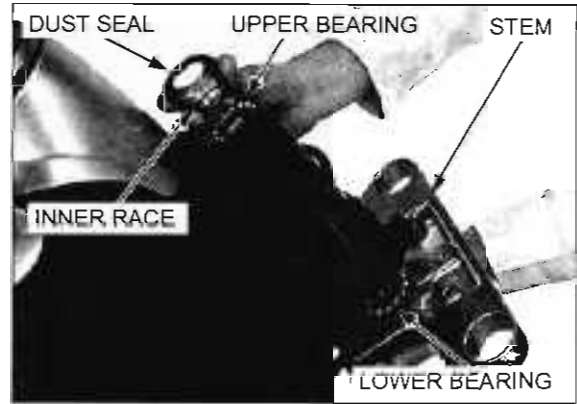


## FRONT WHEEL/SUSPENSION/STEERING

Apply 3 – 5 g of specified grease (page 1-23) to each new steering head bearing and fill it up. Install the lower steering head bearing onto the stem.  
Apply grease to a new upper dust seal lip.  
Apply engine oil to the threads of the steering top thread.

Insert the steering stem into the steering head pipe and install the following while holding the stem:

- Upper steering head bearing
- Upper inner race
- Dust seal
- Steering top thread

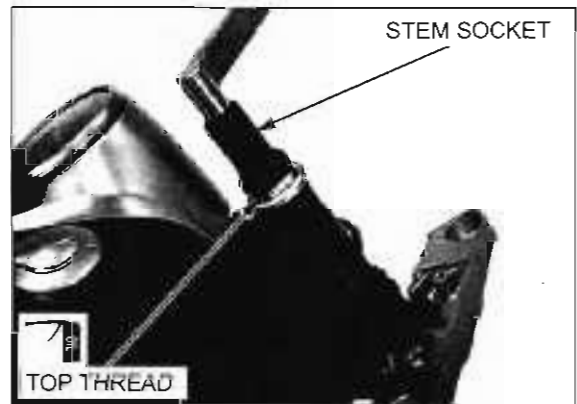


Tighten the steering top thread to the specified torque.

### TOOL:

Steering stem socket 07916-3710101

TORQUE: 25 N·m (2.5 kgf·m, 18 lbf·ft)



Turn the steering stem left and right, lock-to-lock five times to seat the bearings.



Retighten the steering top thread to the specified torque.

TORQUE: 25 N·m (2.5 kgf·m, 18 lbf·ft)



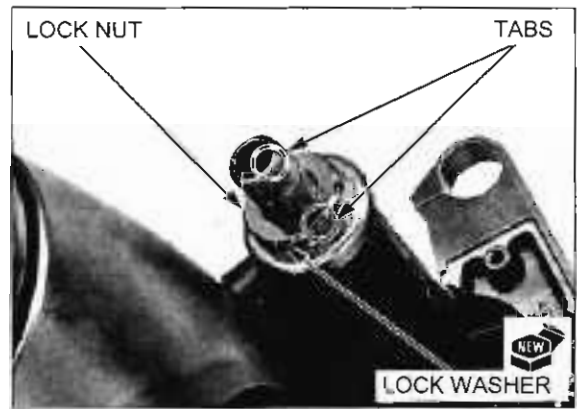
## FRONT WHEEL/SUSPENSION/STEERING

Install a new lock washer, aligning its bent tabs with the grooves in the steering top thread.

Install the lock nut until it contacts with the lock washer.

Further tighten the lock nut, within 90°, to align its grooves with the tabs of the lock washer.

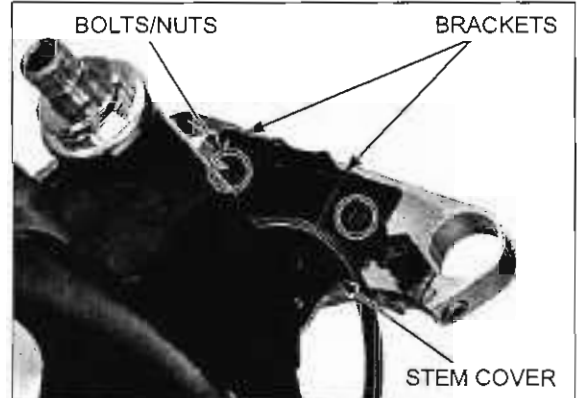
Bend up the lock washer tabs into the grooves of the lock nut.



Install the steering stem cover onto the steering stem.

*Tighten the nuts securely after installing the headlight case.*

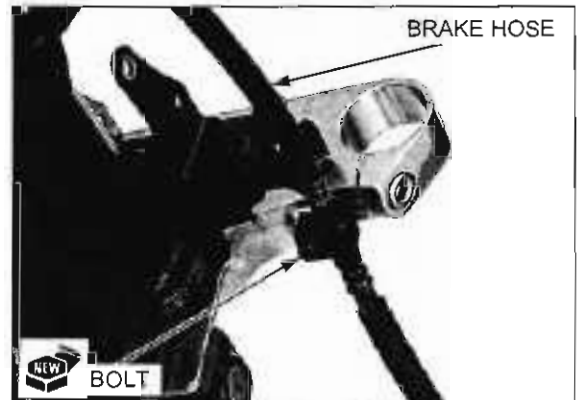
Temporarily install the headlight case bracket, bolts and nuts.



Clean and apply locking agent to the front brake hose bolt threads.

Install the front brake hose with a new mounting bolt.

Tighten the mounting bolt securely.



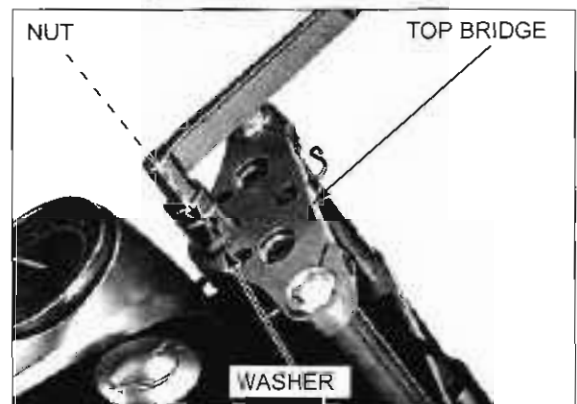
Install the top bridge, washer and stem nut.

Install the fork legs into the steering stem and top bridges (page 14-34).

Tighten the stem nut to the specified torque.

**TORQUE: 103 N·m (10.5 kgf·m, 76 lbf·ft)**

Turn the steering stem left and right, lock-to-lock several times to make sure the steering stem moves smoothly, without play or binding.



## FRONT WHEEL/SUSPENSION/STEERING

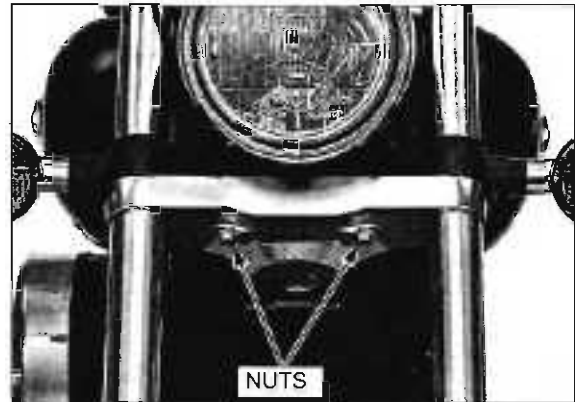
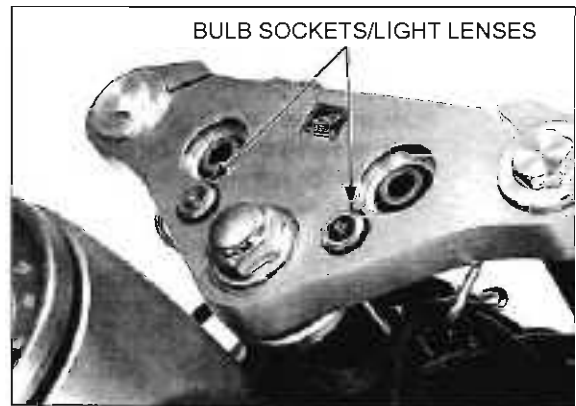
Install the bulb sockets and indicator light lenses (page 21-10).

*Route the hose, wires and cables into the cable guides properly (page 1-26).*

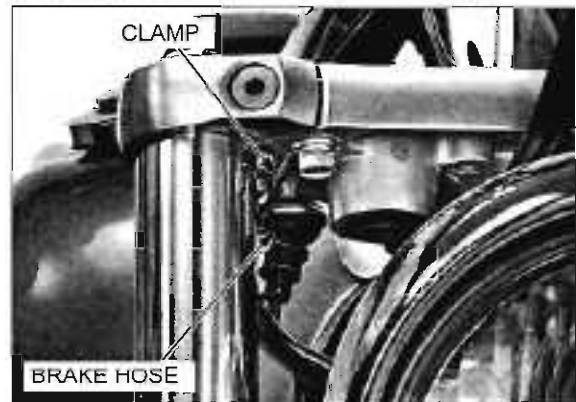
Install the following:

- Front wheel (page 14-23)
- Front fender (page 2-6)
- Handlebar (page 14-12)
- Headlight case (page 21-7)
- Turn signal light (page 21-8)

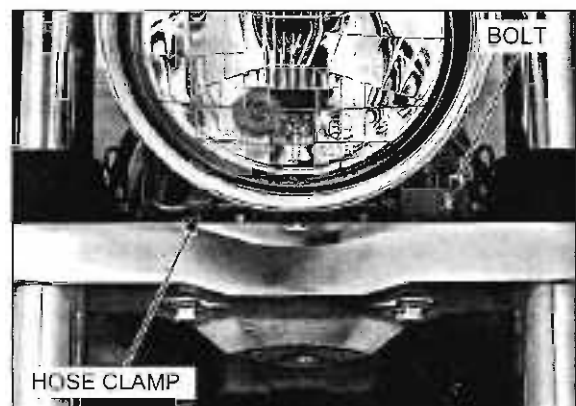
Tighten the headlight case bracket nuts securely.



VT750C2S; Install the brake hose to the clamp securely.



VT750C2S; Install the brake hose clamp and tighten the bolt securely.



## STEERING BEARING PRE-LOAD

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

Position the steering stem straight ahead.

*Make sure there is no cable, wire harness or hose interference.*

Hook a spring scale to the fork tube between the fork top and bottom bridges.

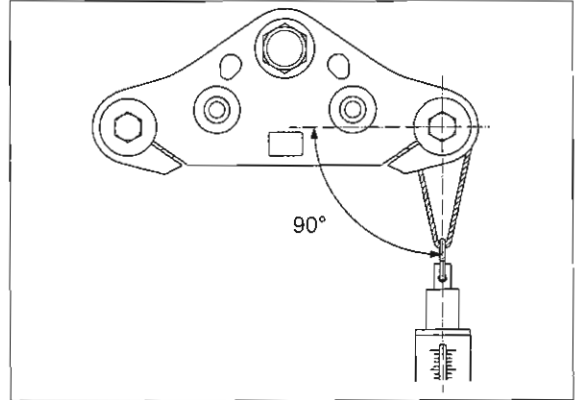
Pull the spring scale keeping it at a right angle to the steering stem.

Read the scale at the point where the steering stem just starts to move.

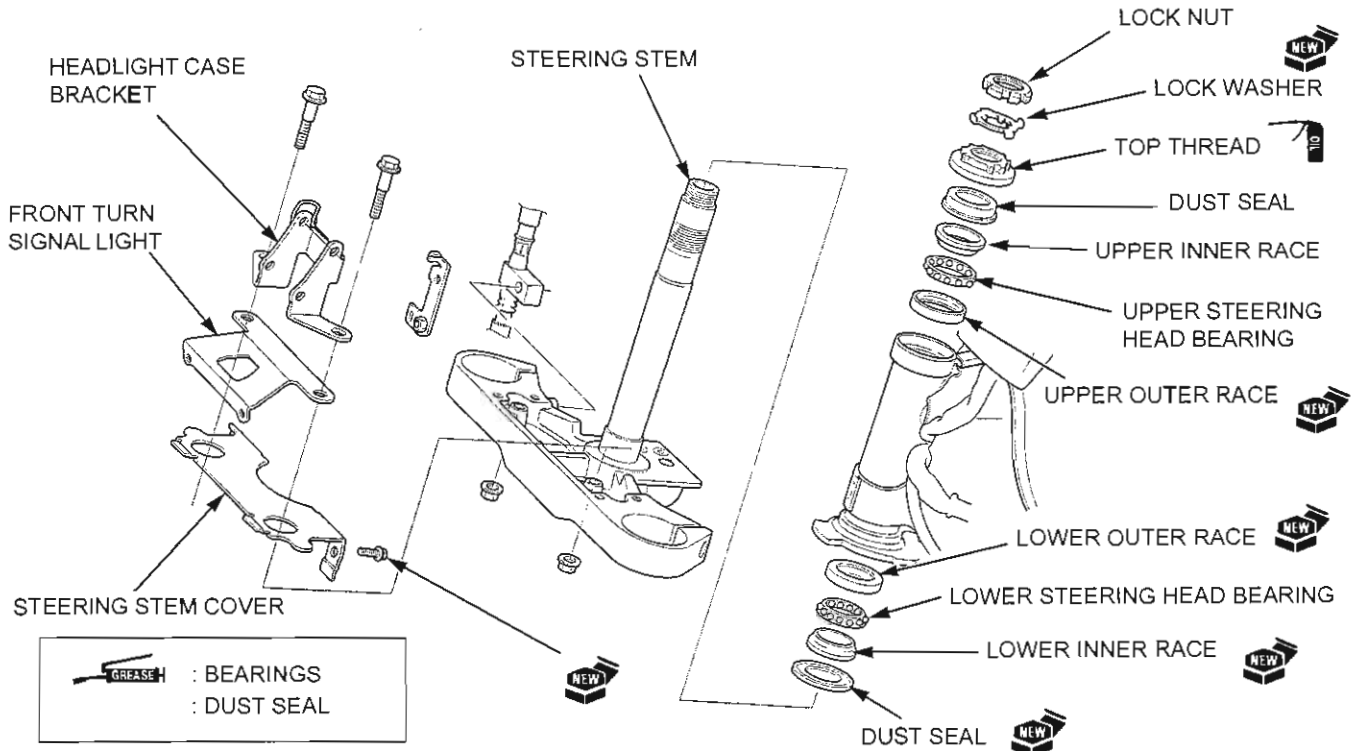
### STEERING BEARING PRE-LOAD:

**8.5 – 12.7 N (0.9 – 1.3 kgf)**

If the readings do not fall within the limits, readjust the steering top thread.



## INSTALLATION (VT750C2B)



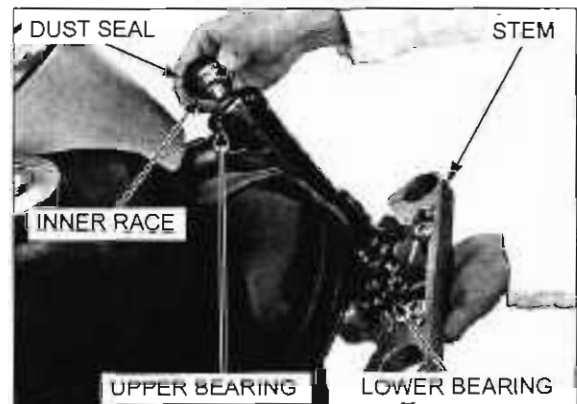
Apply 3 – 5 g of specified grease (page 1-23) to each new steering head bearing and fill it up. Install the lower steering head bearing onto the stem.

Apply grease to a new upper dust seal lip.

Apply engine oil to the threads of the steering top thread.

Insert the steering stem into the steering head pipe and install the following while holding the stem:

- Upper steering head bearing
- Upper inner race
- Dust seal
- Steering top thread



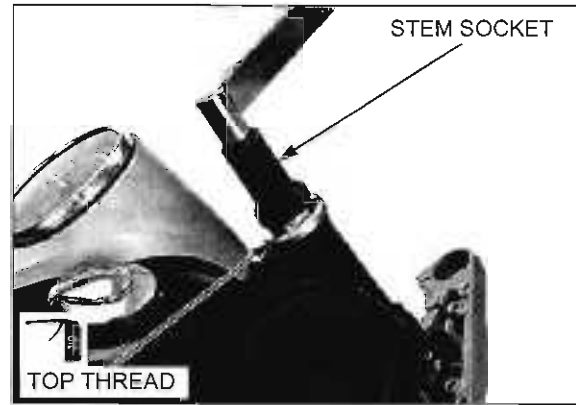
## FRONT WHEEL/SUSPENSION/STEERING

Tighten the steering top thread to the specified torque.

**TOOL:**

**Steering stem socket**                      07916-3710101

**TORQUE: 25 N·m (2.5 kgf·m, 18 lbf·ft)**



Turn the steering stem left and right, lock-to-lock five times to seat the bearings.



Retighten the steering top thread to the specified torque.

**TORQUE: 25 N·m (2.5 kgf·m, 18 lbf·ft)**

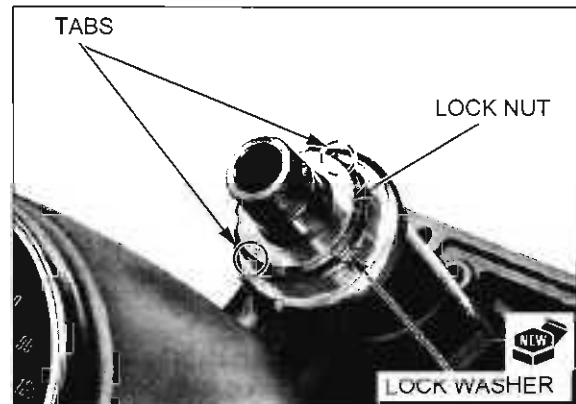


Install a new lock washer, aligning its bent tabs with the grooves in the steering top thread.

Install the lock nut until it contacts with the lock washer.

Further tighten the lock nut, within 90°, to align its grooves with the tabs of the lock washer.

Bend up the lock washer tabs into the grooves of the lock nut.





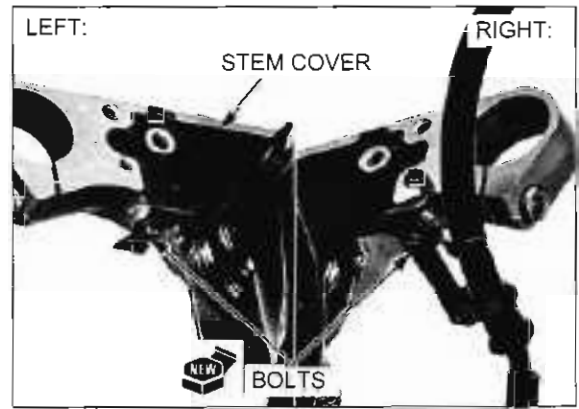
## FRONT WHEEL/SUSPENSION/STEERING

Install the steering stem cover, hose guide and new mounting bolts.

Tighten the mounting bolt securely.

### NOTE:

When installing the hose guide, align the hose guide tabs with the steering stem cover.



Install the front turn signal light stay, headlight case bracket, bolts and nuts.

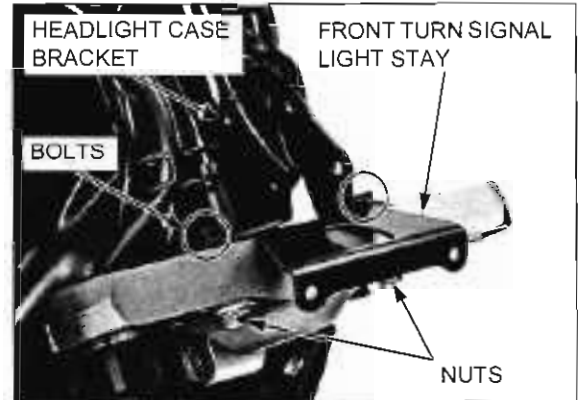
Tighten the nuts securely.

Install the fork legs into the bottom bridge (page 14-35).

Turn the steering stem left and right, lock-to-lock several times to make sure the steering stem moves smoothly, without play or binding.

Install the following:

- Headlight case (page 21-7)
- Turn signal light (page 21-9)



### STEERING BEARING PRE-LOAD

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

Position the steering stem straight ahead.

*Make sure there is no cable, wire harness or hose interference.*

Hook a spring scale to the fork tube between the fork top and bottom bridges.

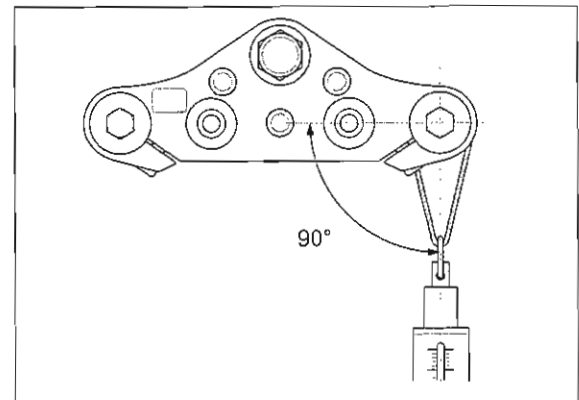
Pull the spring scale keeping it at a right angle to the steering stem.

Read the scale at the point where the steering stem just starts to move.

### STEERING BEARING PRE-LOAD:

**8.5 – 12.7 N (0.9 – 1.3 kgf)**

If the readings do not fall within the limits, readjust the steering top thread.



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MEMO

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# 15. REAR WHEEL/BRAKE/SUSPENSION

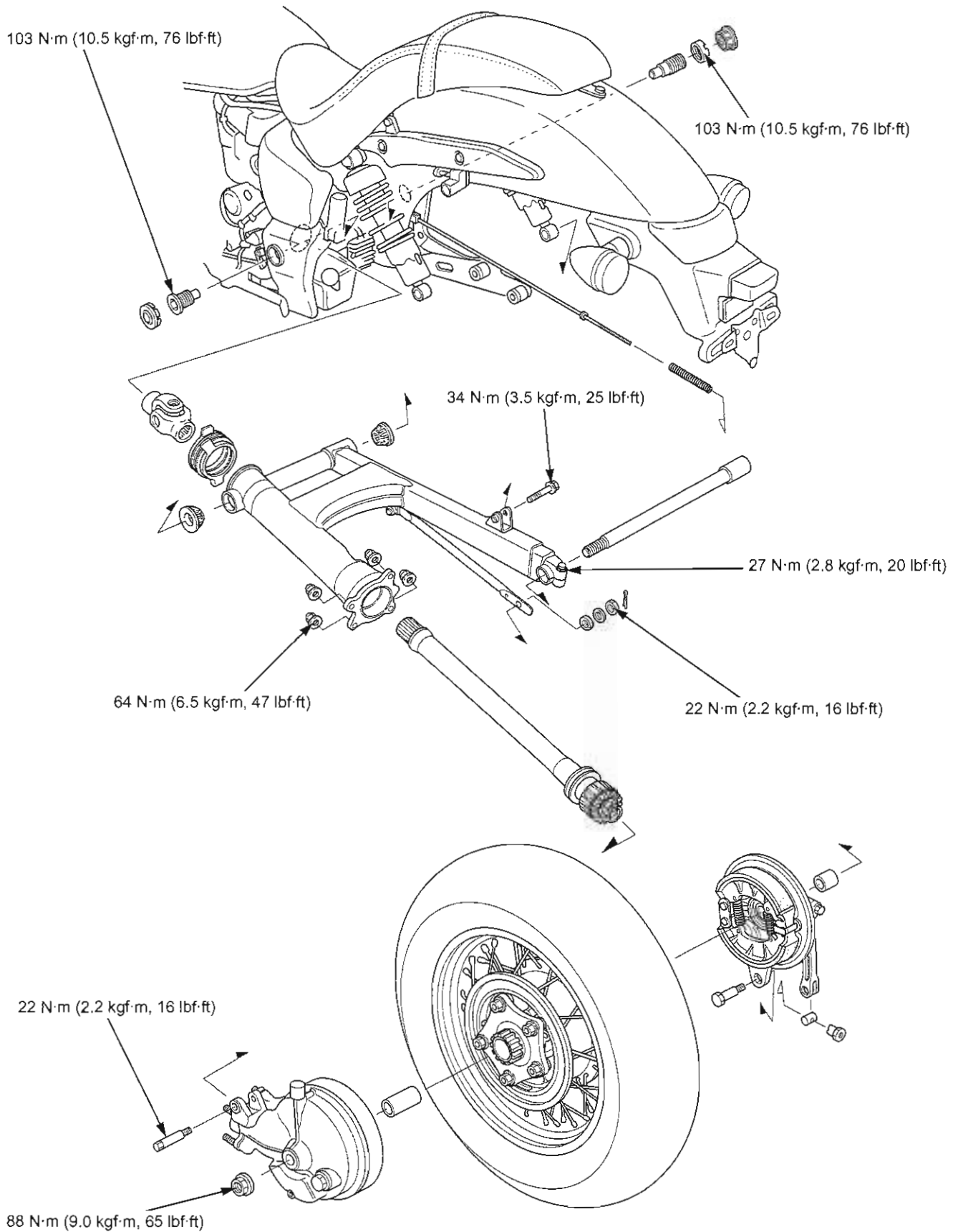
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COMPONENT LOCATION .....	15-2	REAR BRAKE (VT750C2F/C2B).....	15-20
SERVICE INFORMATION .....	15-4	BRAKE PEDAL (VT750C2F/C2B).....	15-24
TROUBLESHOOTING.....	15-6	SHOCK ABSORBER .....	15-27
REAR WHEEL .....	15-7	SWINGARM .....	15-28

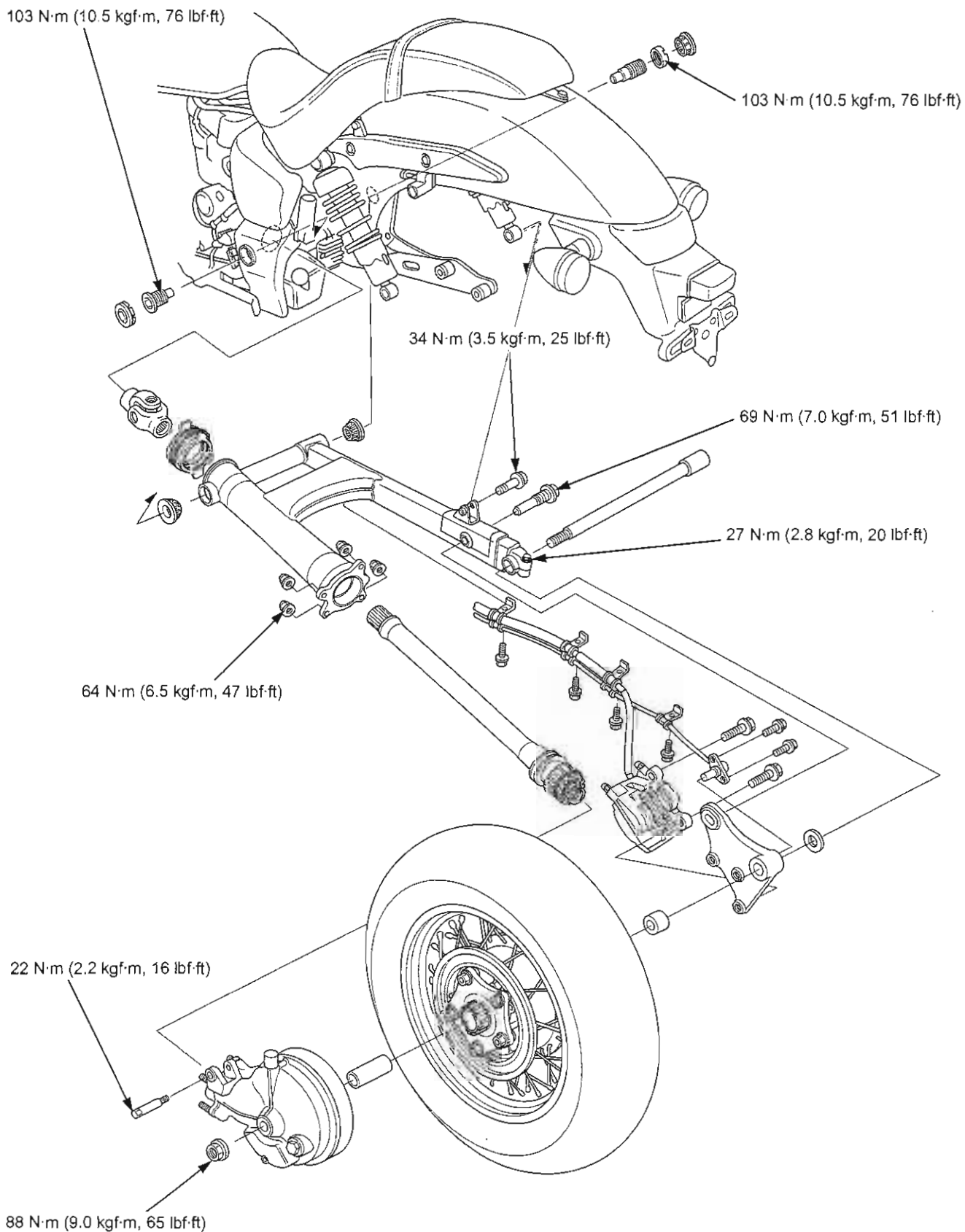
# REAR WHEEL/BRAKE/SUSPENSION

## COMPONENT LOCATION

VT750C2F/C2B



VT750C2S



## REAR WHEEL/BRAKE/SUSPENSION

### SERVICE INFORMATION

#### GENERAL

### ⚠ CAUTION

Frequent inhalation of brake shoe dust, regardless of material composition could be hazardous to your health.

- Avoid breathing dust particles.
  - Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.
- Riding on damaged rims impairs safe operation of the vehicle.
  - A hoist or equivalent is required to support the motorcycle when servicing the rear wheel, shock absorber, or swingarm.
  - Use only genuine Honda replacement bolts and nuts for all suspension pivot and mounting points.
  - When using the lock nut wrench for the adjusting bolt lock nut, use a deflecting beam type torque wrench 20 inches long. The lock nut wrench increases the torque wrench's leverage, so the torque wrench reading will be less than the torque actually applied to the swingarm right pivot lock nut. The specification given in the actual torque applied to the swingarm right pivot lock nut, not the reading on the torque wrench. Do not overtighten the lock nut. The specification later in the text gives both actual and indicated.

#### SPECIFICATIONS (VT750C2F/C2B)

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		—	2.0 (0.08)
Cold tire pressure	Up to 90 kg (200 lbs) load	200 kPa (2.00 kgf/cm <sup>2</sup> , 29 psi)	—
	Up to maximum weight capacity	250 kPa (2.50 kgf/cm <sup>2</sup> , 36 psi)	—
Axle runout		—	0.2 (0.01)
Wheel rim runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Wheel balance weight		—	70 g max.
Brake drum I.D.		180.0 – 180.3 (7.09 – 7.10)	181 (7.1)
Brake pedal height		75 mm (3.0 in) above the top of the foot-peg	—
Brake pedal freeplay		20 – 30 (13/16 – 1-3/16)	—
Shock absorber spring pre-load adjuster setting		2nd position	—

#### SPECIFICATIONS (VT750C2S)

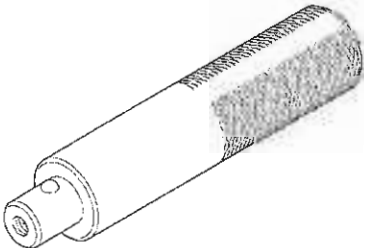
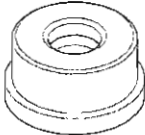
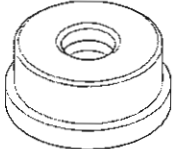

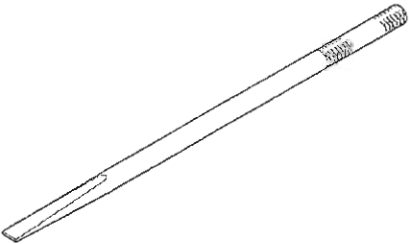
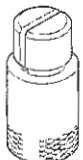
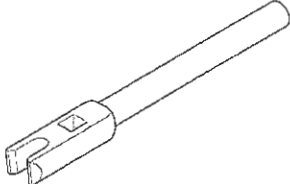
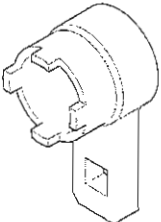
Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		—	2.0 (0.08)
Cold tire pressure	Up to 90 kg (200 lbs) load	200 kPa (2.00 kgf/cm <sup>2</sup> , 29 psi)	—
	Up to maximum weight capacity	250 kPa (2.50 kgf/cm <sup>2</sup> , 36 psi)	—
Axle runout		—	0.2 (0.01)
Wheel rim runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Wheel balance weight		—	70 g max.
Shock absorber spring pre-load adjuster setting		2nd position	—

**TORQUE VALUES**

Spoke	4.2 N·m (0.4 kgf·m, 3.1 lbf·ft)	
Rear brake disc bolt	42 N·m (4.3 kgf·m, 31 lbf·ft)	ALOC bolt; replace with a new one
Rear axle nut	88 N·m (9.0 kgf·m, 65 lbf·ft)	U-nut
Swingarm left pivot bolt	103 N·m (10.5 kgf·m, 76 lbf·ft)	
Swingarm right pivot bolt	See page 15-32	
Swingarm right pivot lock nut	103 N·m (10.5 kgf·m, 76 lbf·ft)	
Stopper plate bolt	20 N·m (2.0 kgf·m, 15 lbf·ft)	ALOC bolt; replace with a new one
Rear axle pinch bolt	27 N·m (2.8 kgf·m, 20 lbf·ft)	
Rear brake stopper arm nut (VT750C2F/C2B)	22 N·m (2.2 kgf·m, 16 lbf·ft)	
Rear brake arm pinch bolt (VT750C2F/C2B)	26 N·m (2.7 kgf·m, 19 lbf·ft)	
Rear shock absorber upper mounting bolt	26 N·m (2.7 kgf·m, 19 lbf·ft)	
Rear shock absorber lower mounting bolt (right side)	34 N·m (3.5 kgf·m, 25 lbf·ft)	
Rear shock absorber lower mounting bolt (left side)	22 N·m (2.2 kgf·m, 16 lbf·ft)	
Rear caliper stopper pin bolt (VT750C2S)	69 N·m (7.0 kgf·m, 51 lbf·ft)	ALOC bolt; replace with a new one

**TOOLS**

<p>Driver 07749-0010000</p> 	<p>Attachment, 37 x 40 mm 07746-0010200</p> 	<p>Attachment, 42 x 47 mm 07746-0010300</p> 
<p>Pilot, 20 mm 07746-0040500</p> 	<p>Bearing remover shaft 07GGD-0010100</p> 	<p>Bearing remover head, 20 mm 07746-0050600</p> 
<p>Spoke wrench 07JMA-MR60100</p> 	<p>Lock nut wrench 07908-4690003</p> 	

# TROUBLESHOOTING

### Soft suspension

- Incorrect suspension adjustment
- Weak shock absorber spring
- Oil leakage from damper unit
- Low tire pressure

### Stiff suspension

- Incorrect suspension adjustment
- Bent damper rod
- Damaged shock absorber rubber mounts
- Damaged swingarm pivot bearings
- High tire pressure

### Rear suspension noise

- Loose suspension fasteners
- Binding shock absorber case
- Worn shock absorber rubber mounts
- Faulty rear shock absorber

### Rear wheel wobbles

- Bent rim Unbalanced rear tire and wheel
- Insufficient tire pressure
- Faulty swingarm pivot bearings
- Axle fastener not tightened properly
- Faulty tire

### Rear wheel turns hard

- Faulty wheel bearings
- Bent axle
- Brake drag
- Final gear bearings damaged (page 13-8)

### Poor brake performance (VT750C2F/C2B)

- Improper brake adjustment
- Worn brake shoes
- Brake linings oily, greasy or dirty
- Worn brake cam
- Worn brake drum
- Brake arm serrations improperly engaged
- Brake shoes worn at cam contact area



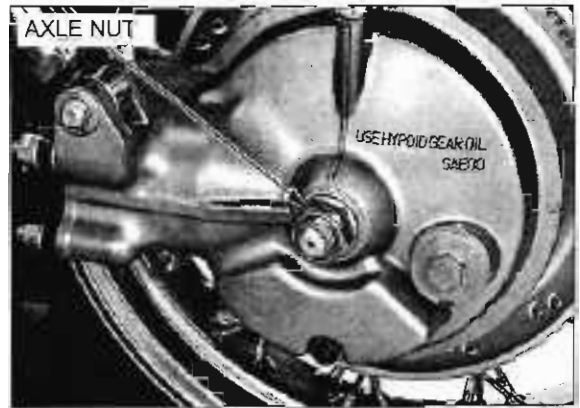
REAR WHEEL

REMOVAL (VT750C2F/C2B)

Remove the exhaust system (page 2-9).

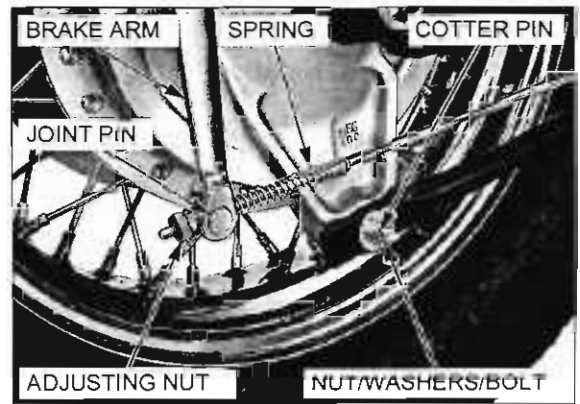
Remove the axle nut.

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



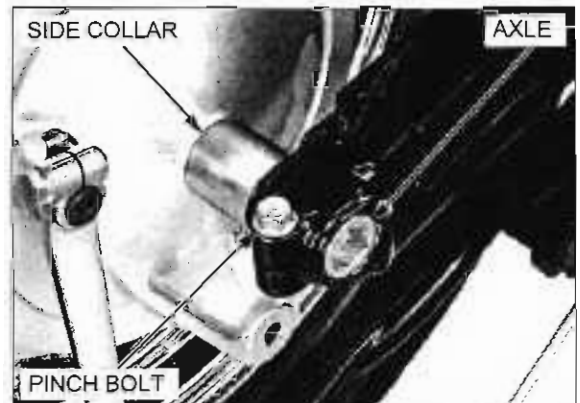
Remove the adjusting nut, joint pin and spring.

Remove the cotter pin, nut, washer, rubber washer and bolt.

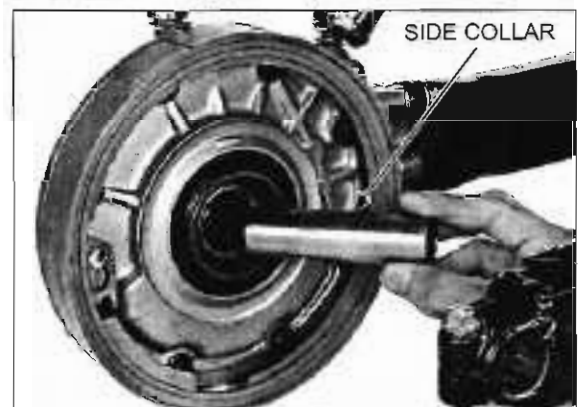


Loosen the pinch bolt and remove the axle and right side collar.

Move the rear wheel to the right to separate it from the final drive gear case and carefully remove the rear wheel out of the frame.



Remove the left side collar from the ring gear.



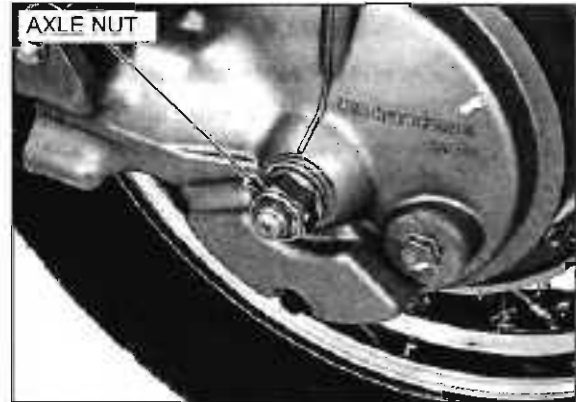
## REAR WHEEL/BRAKE/SUSPENSION

### REMOVAL (VT750C2S)

Remove the exhaust system (page 2-9).

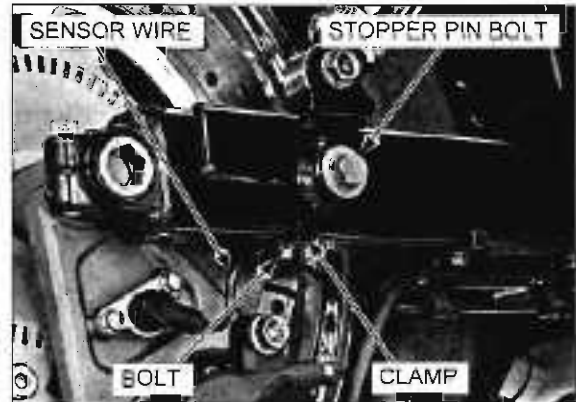
Remove the axle nut.

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



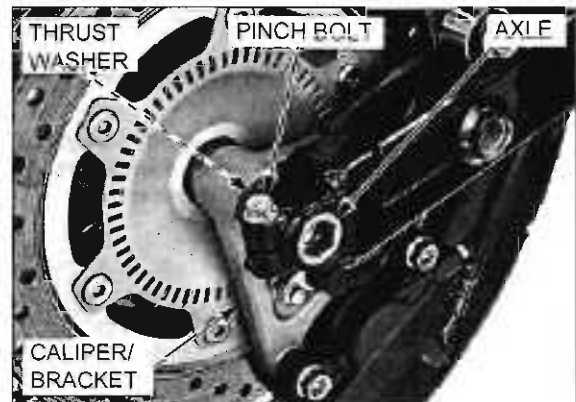
Remove the rear caliper stopper pin bolt.

Remove the bolt, clamp and rear wheel speed sensor wire.



Loosen the pinch bolt.

Remove the thrust washer and axle.

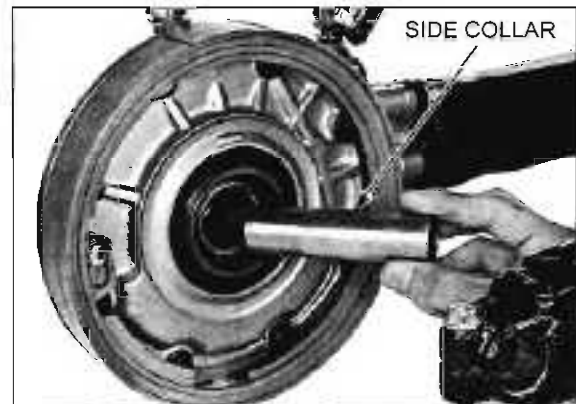


Remove the rear brake caliper/bracket from the rear brake disc.

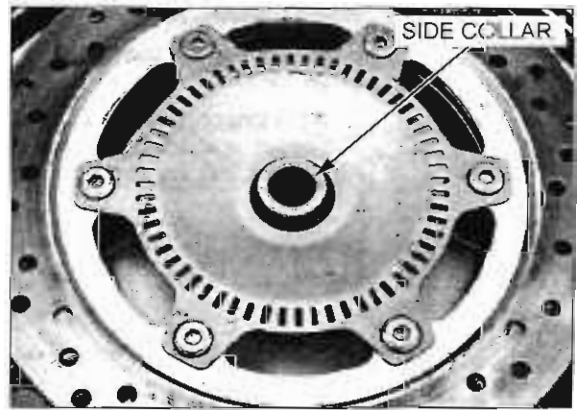
Move the rear wheel to the right to separate it from the final drive gear case and carefully remove the rear wheel out of the frame.

*Do not operate the brake lever/pedal after removing the wheel. To do so will cause difficulty in fitting the brake disc between the brake pads.*

Remove the left side collar from the ring gear.



Remove the right side collar from the right side of the hub.

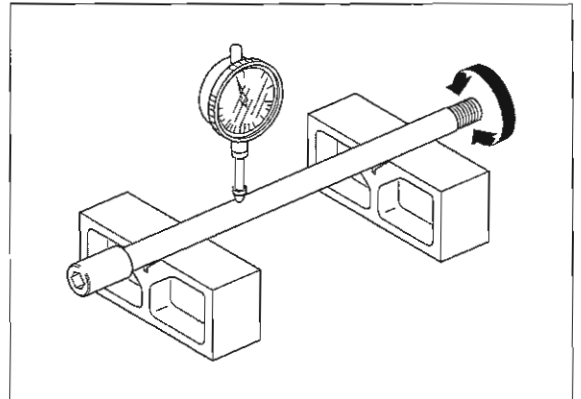


### INSPECTION

#### AXLE

Set the axle in V-blocks.  
Turn the axle and measure the runout using a dial indicator.  
Actual runout is 1/2 the total indicator reading.

**SERVICE LIMIT: 0.2 mm (0.01 in)**



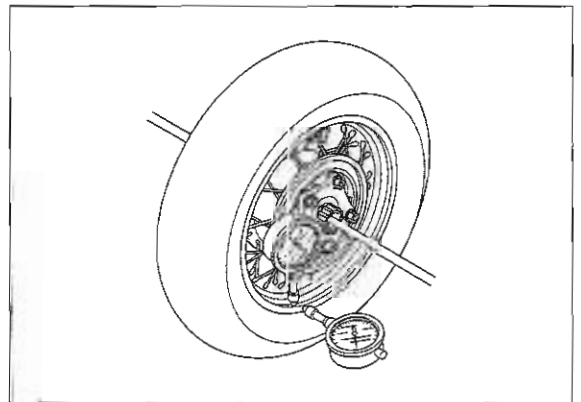
#### WHEEL RIM

Check the rim runout by placing the wheel in a truing stand.  
Spin the wheel slowly and read the runout using a dial indicator.  
Actual runout is 1/2 the total indicator reading.

#### SERVICE LIMITS:

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

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



#### FINAL DRIVEN FLANGE

Check the driven flange splines for wear or damage.  
If damaged, check the splines of the ring gear also.

#### WHEEL BALANCE

For wheel balance (page 14-22). Do not add balance weight more than 70 g to the rear wheel.



## REAR WHEEL/BRAKE/SUSPENSION

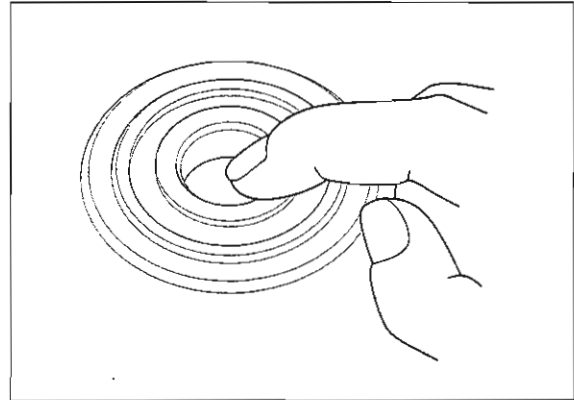
### WHEEL BEARING

Remove the brake panel and driven flange (page 15-10).

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

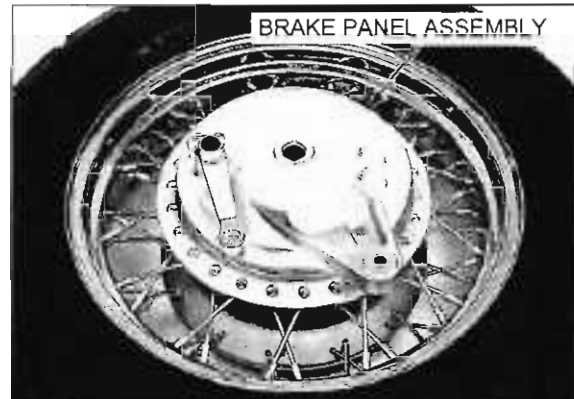
*Replace the wheel bearings in pairs.*

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



### DISASSEMBLY

VT750C2F/C2B; Remove the brake panel assembly from the right wheel hub.

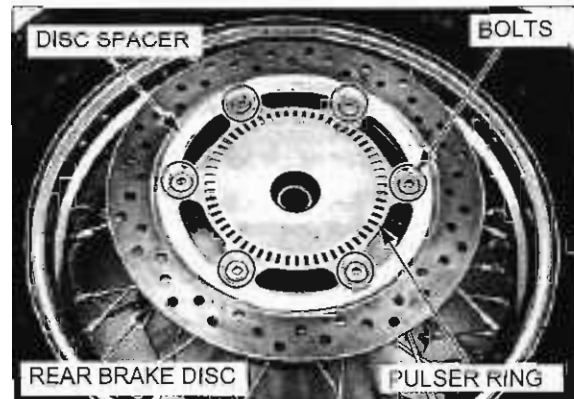


VT750C2S; Remove the bolts in a crisscross pattern in several steps and remove the pulser ring and brake disc.

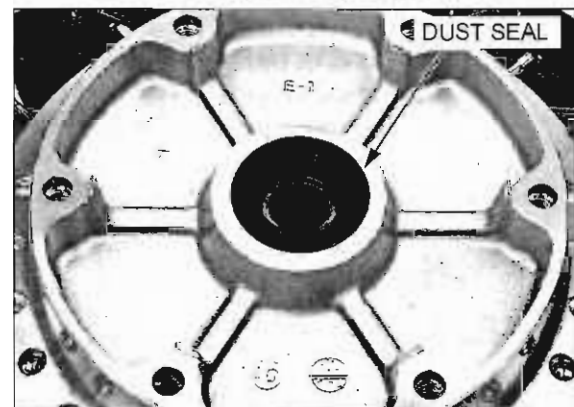
#### NOTE:

Do not reuse the bolts.

Remove the rear brake disc spacer.

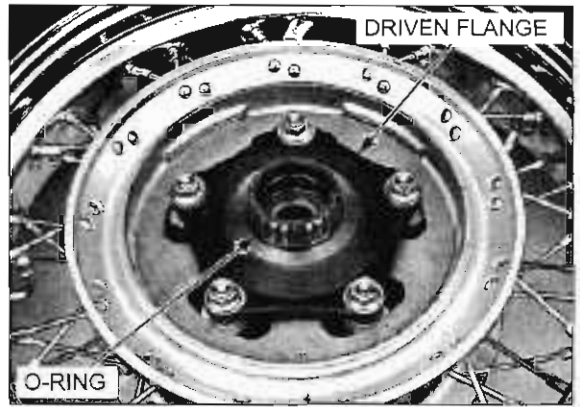


VT750C2S; Remove the dust seal from right side of the hub.



## REAR WHEEL/BRAKE/SUSPENSION

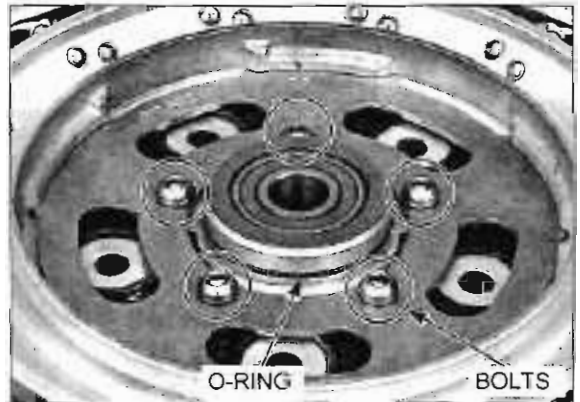
Remove the O-ring.  
Remove the final driven flange from the left wheel hub.



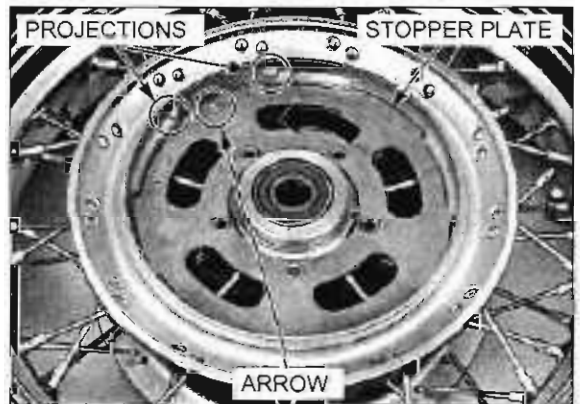
Remove the thrust washer.



*Do not reuse the bolts.* Remove the bolts in a crisscross pattern in several steps.  
Remove the O-ring.



Align the arrow on the stopper plate between the projections on the wheel hub by turning the stopper plate and remove the stopper plate.

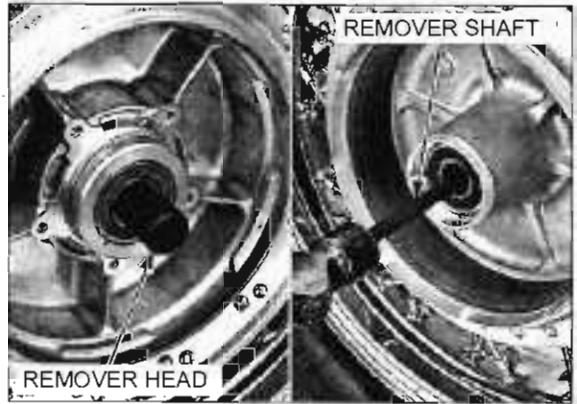
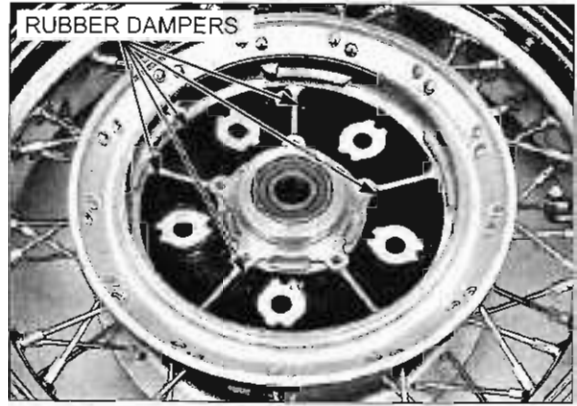


# REAR WHEEL/BRAKE/SUSPENSION

Remove the rubber dampers.

Replace the rubber dampers as a set.

Check the rubber dampers for deterioration or damage.



Replace the wheel bearings in pairs. Do not reuse old bearing.

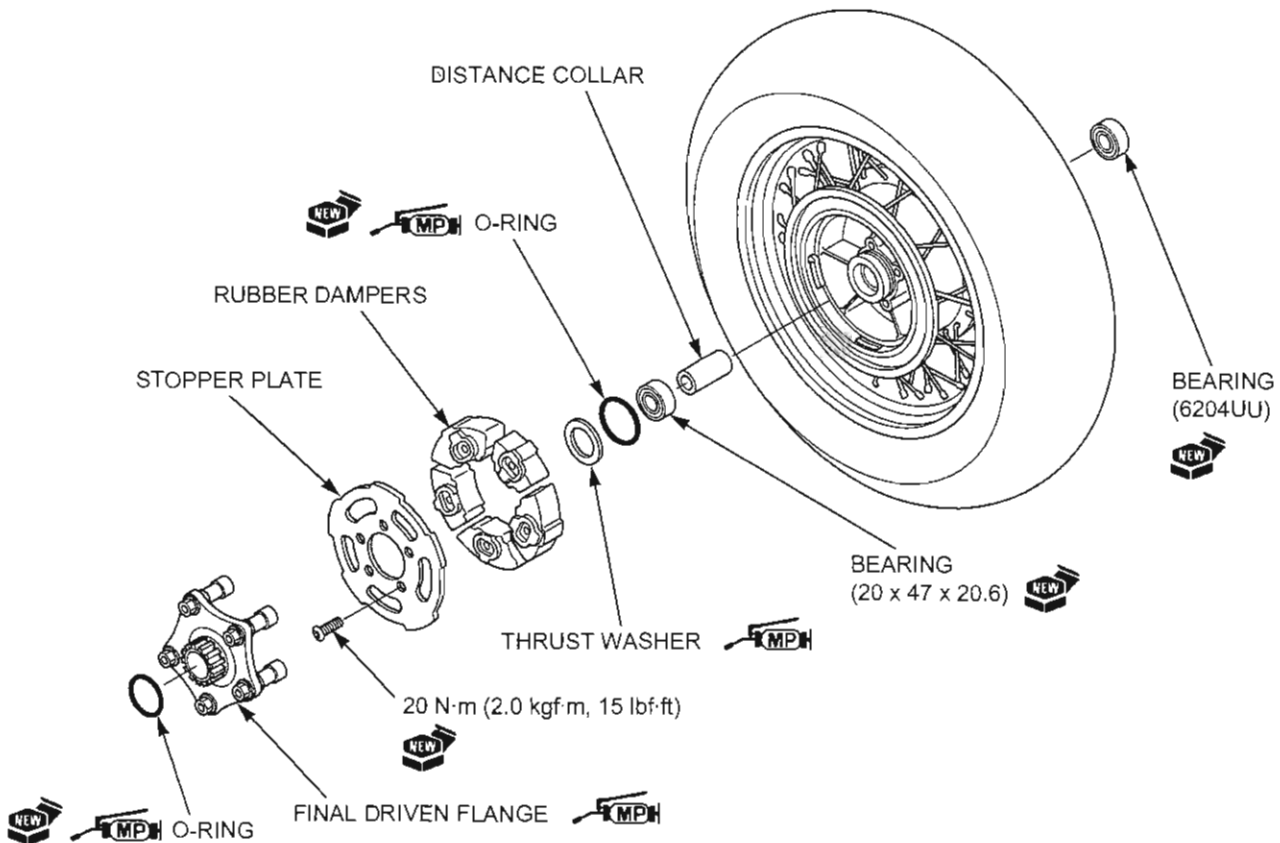
Install the remover head into the bearing. From the opposite side of the wheel, install the remover shaft and drive the bearing out of the wheel hub. Remove the distance collar and drive out the other bearing.

**TOOLS:**

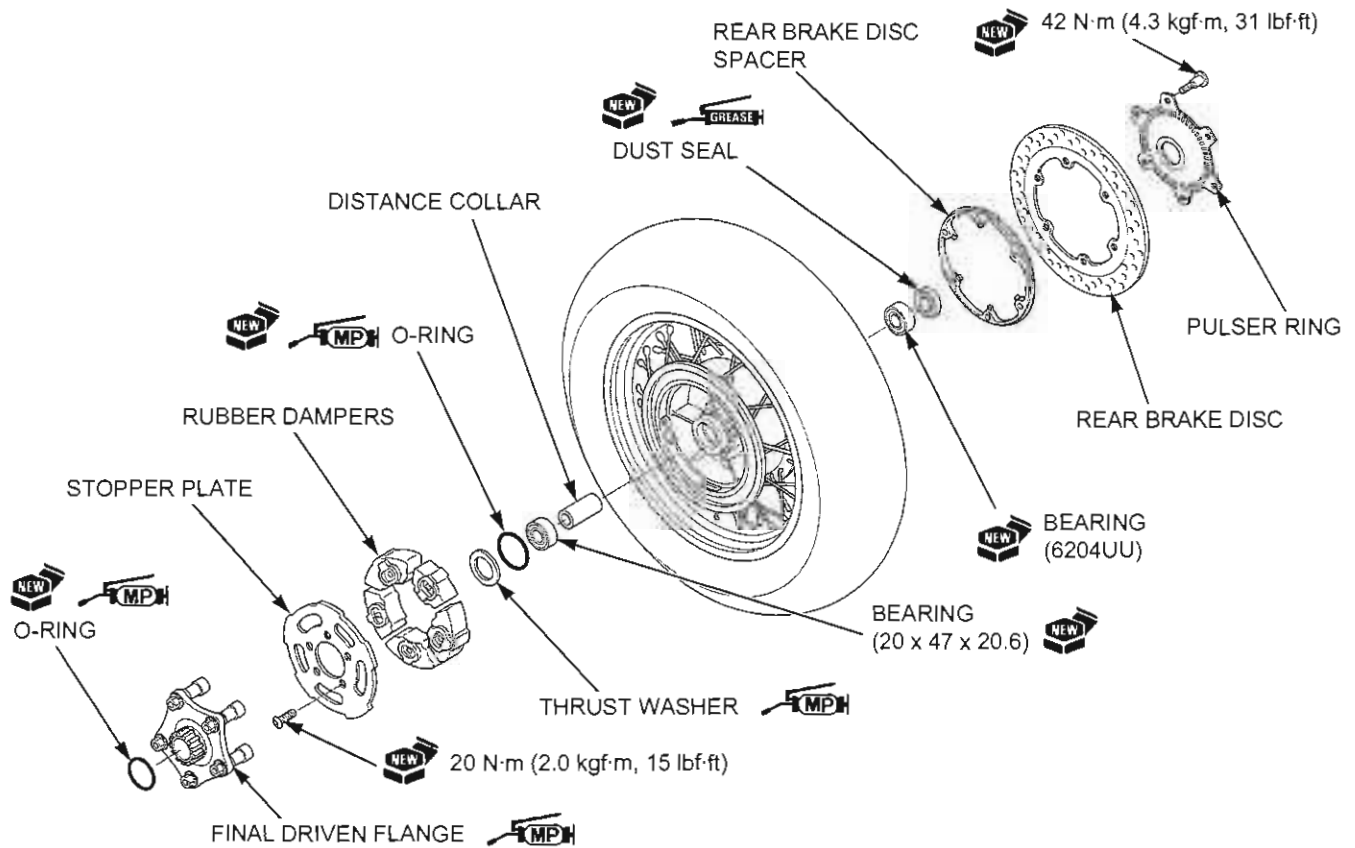
- Bearing remover shaft                    07GGD-0010100
- Bearing remover head, 20 mm        07746-0050600

**ASSEMBLY**

VT750C2F/C2B



VT750C2S



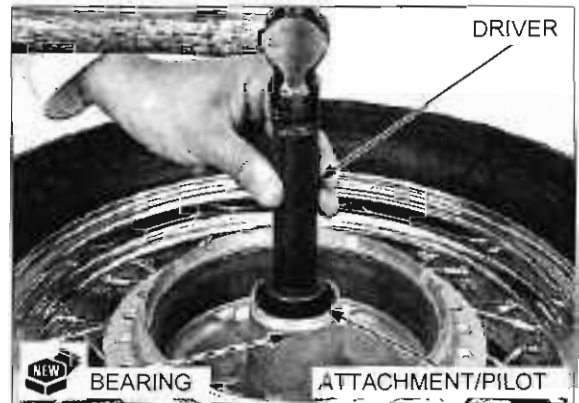
Drive in a new right bearing squarely with the marked side facing up until it is fully seated.

Install the distance collar.

Drive in a new left bearing squarely with the marked side facing up until it is fully seated.

**TOOLS:**

Driver	07749-0010000
Attachment, 42 x 47 mm	07746-0010300
Pilot, 20 mm	07746-0040500



**WHEEL CENTER ADJUSTMENT**

VT750C2F/C2B:

Measure the distance B (rim width) and calculate distance A as follows:

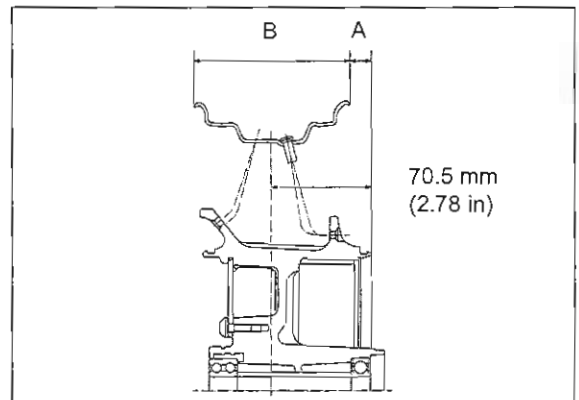
$$A = 70.5 \text{ mm (2.78 in)} - B/2$$

Adjust the rim position and distance A by tightening the spokes to the specified torque in several progressive steps.

**TOOL:**

Spoke wrench	07JMA-MR60100
--------------	---------------

**TORQUE:** 4.2 N·m (0.4 kgf·m, 3.1 lbf·ft)



## REAR WHEEL/BRAKE/SUSPENSION

VT750C2S:

Measure the distance B (rim width) and calculate distance A as follows:

$$A = 88.2 \text{ mm (3.47 in)} - B/2$$

Adjust the rim position and distance A by tightening the spokes to the specified torque in several progressive steps.

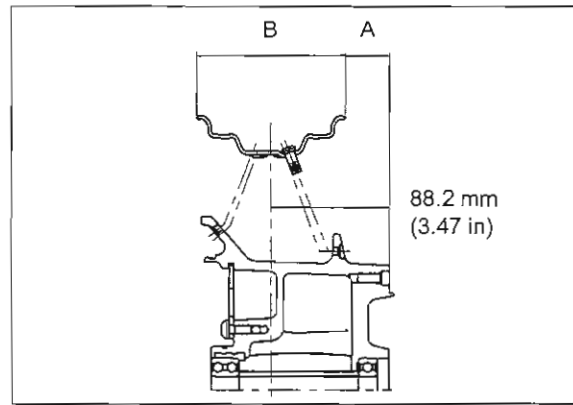
**TOOL:**

Spoke wrench

07JMA-MR60100

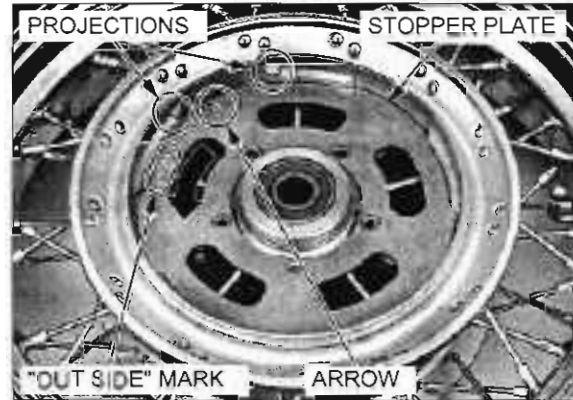
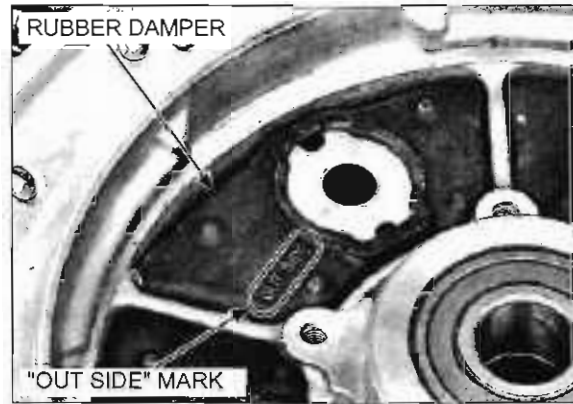
**TORQUE: 4.2 N·m (0.4 kgf·m, 3.1 lbf·ft)**

Install the rubber dampers with its "OUT SIDE" mark facing out.



*Install the stopper plate with the "OUT SIDE" mark facing up.*

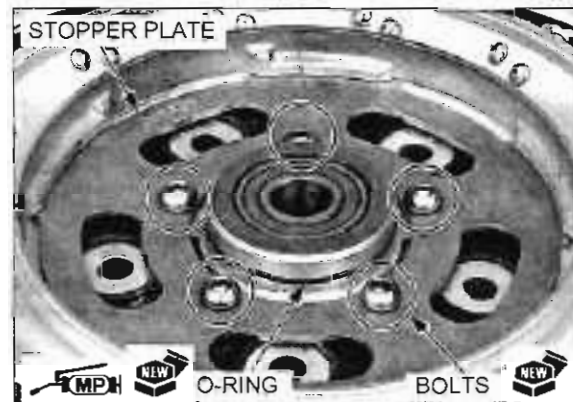
Install the stopper plate, aligning the arrow between the projections on the wheel hub. Align the bolt holes by turning the stopper ring.



Pack molybdenum disulfide paste into the O-ring groove in the wheel hub. Coat a new O-ring with molybdenum disulfide paste and install it into the left wheel hub groove.

Install and tighten new bolts to the specified torque.

**TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)**





## REAR WHEEL/BRAKE/SUSPENSION

Apply 2 – 3 g of molybdenum disulfide paste to the mating surface of the thrust washer and rear wheel hub end (driven flange side).

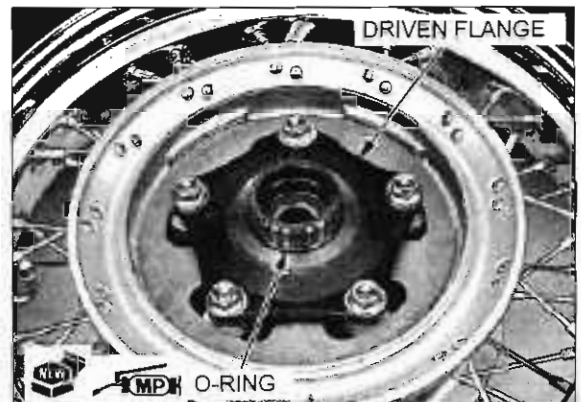


Apply 0.5 – 1.0 g of molybdenum disulfide paste to the rear wheel hub mating surface of the final driven flange.

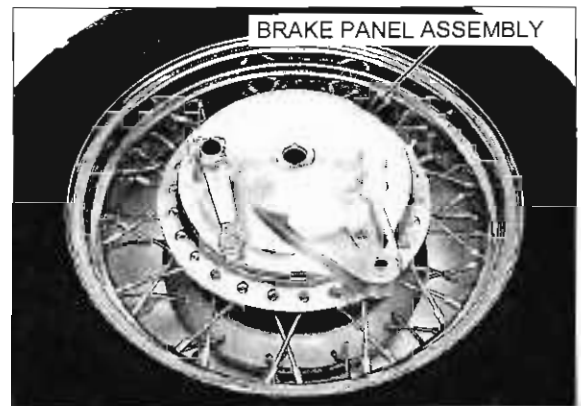


Coat a new O-ring with molybdenum disulfide paste and install it into the driven flange groove.

Install the driven flange into the left wheel hub.

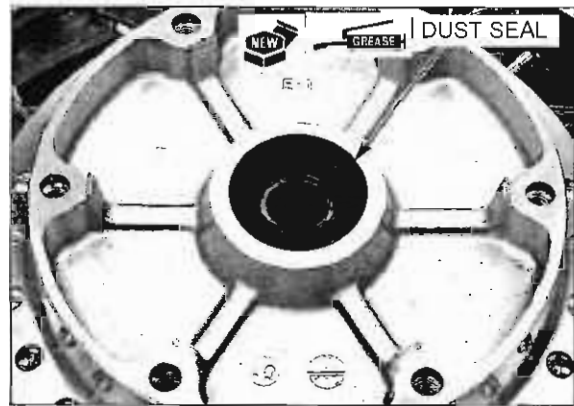


VT750C2F/C2B; Install the brake panel assembly into the right wheel hub.



## REAR WHEEL/BRAKE/SUSPENSION

VT750C2S; Apply grease to new dust seal lips and install the dust seal until it is flush with the wheel hub.



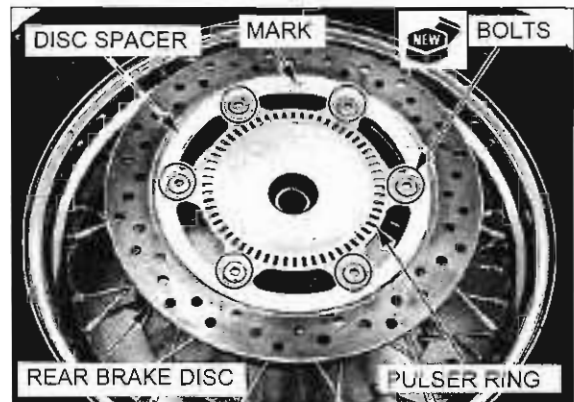
VT750C2S; Install the rear brake disc spacer to the right side of the hub.

Install the brake disc with the marked side facing out.  
Install the pulser ring.

*Do not get grease on the brake disc or stopping power will be reduced.*

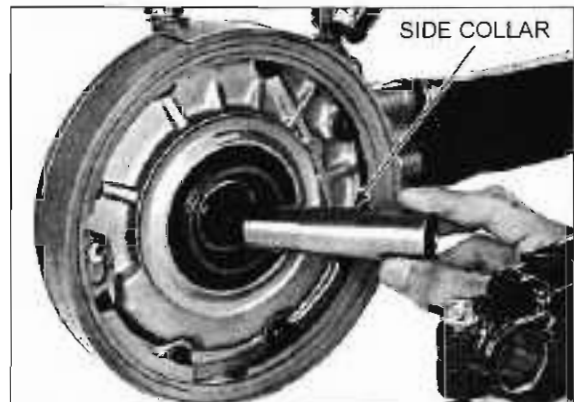
Install new bolts and tighten them in a crisscross pattern in several steps.

**TORQUE: 42 N·m (4.3 kgf·m, 31 lbf·ft)**



### INSTALLATION (VT750C2F/C2B)

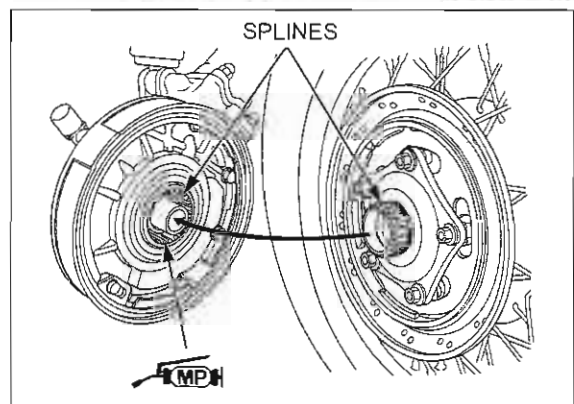
Install the left side collar into the ring gear.



Apply 4 – 5 g of molybdenum disulfide paste to the joint surface of the final gear case O-ring guide and driven flange.

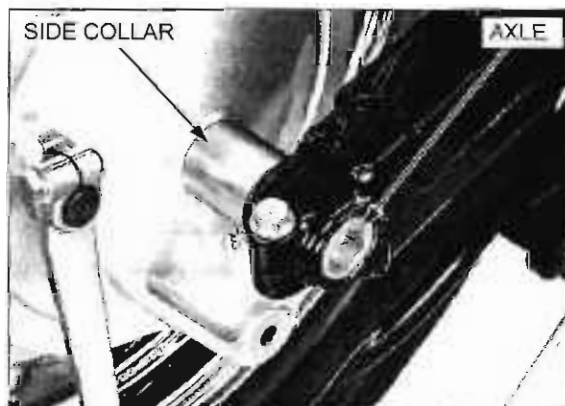
*Hold the wheel securely and be careful not to damage the gear case.*

Place the rear wheel into the swingarm and engage the driven flange spline with the ring gear spline.



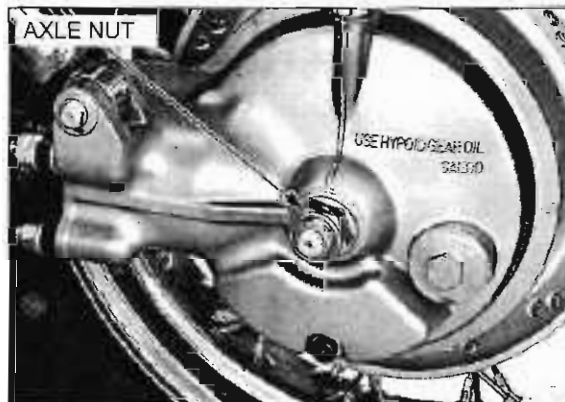
## REAR WHEEL/BRAKE/SUSPENSION

Install the right side collar and rear axle.

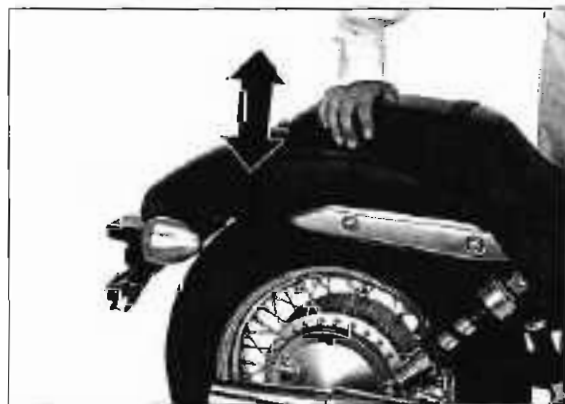


Install and tighten the axle nut to the specified torque while holding the axle.

**TORQUE: 88 N·m (9.0 kgf·m, 65 lbf·ft)**

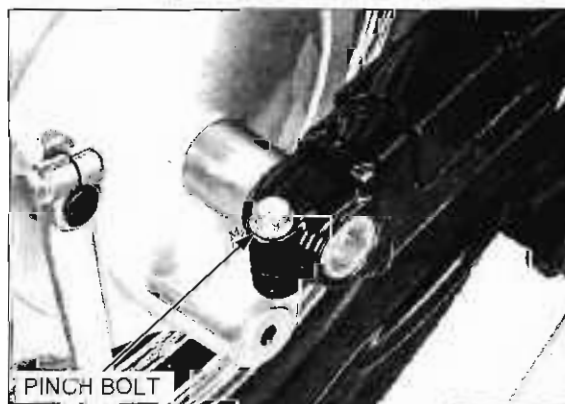


With the rear brake applied, pump the swingarm up and down several times to seat the axle.



Tighten the pinch bolt to the specified torque.

**TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)**

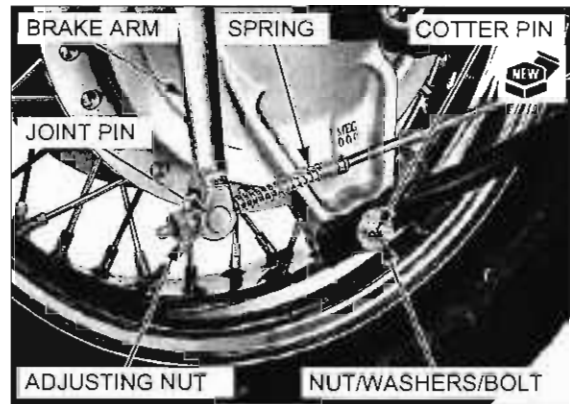


## REAR WHEEL/BRAKE/SUSPENSION

Connect the stopper arm to the brake panel with bolt, rubber washer, washer and nut. Tighten the nut to the specified torque.

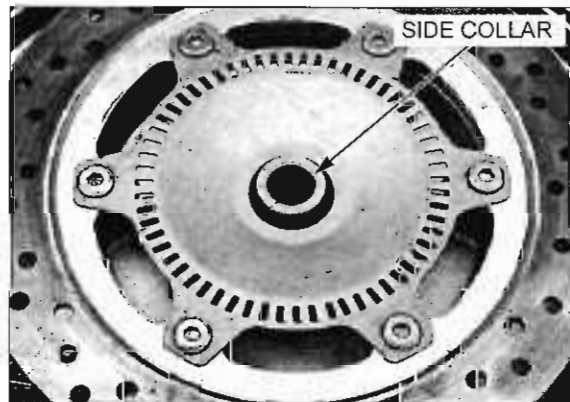
**TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)**

Install a new cotter pin.  
Install the spring, joint pin and adjusting nut.  
Install the exhaust system (page 2-12).  
Adjust the brake pedal freeplay (page 3-21).

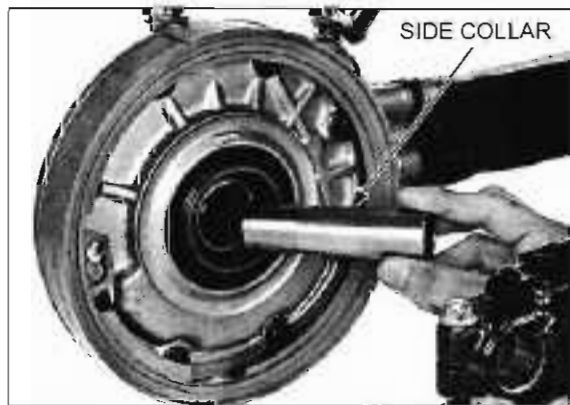


### INSTALLATION (VT750C2S)

Install the right side collar.

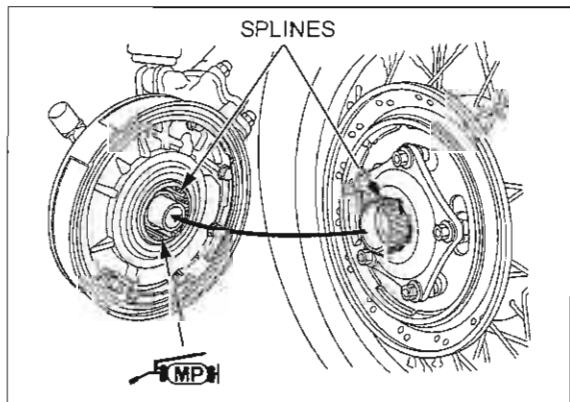


Install the left side collar into the ring gear.



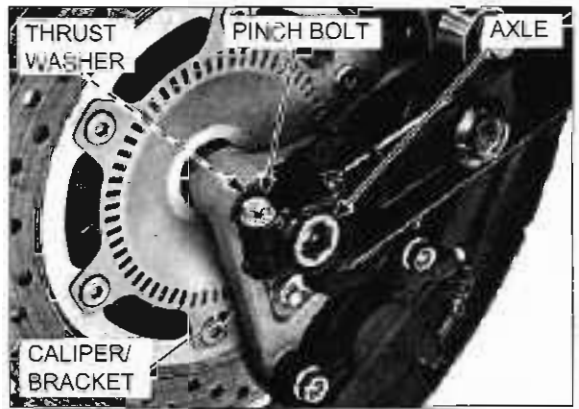
Apply 4 – 5 g of molybdenum disulfide paste to the joint surface of the final gear case O-ring guide and driven flange.

*Hold the wheel securely and be careful not to damage the gear case.* Place the rear wheel into the swingarm and engage the driven flange spline with the ring gear spline.



## REAR WHEEL/BRAKE/SUSPENSION

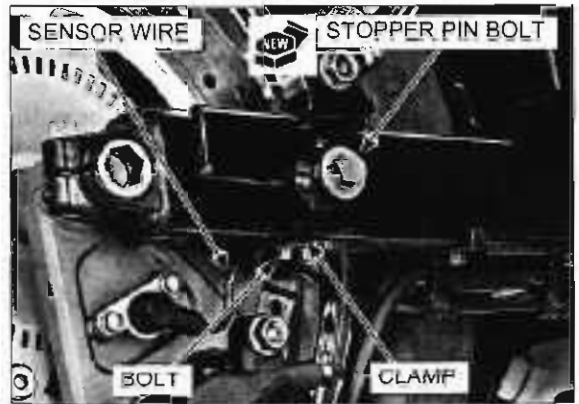
Install the rear brake caliper/bracket and thrust washer in position, and insert the rear axle through the swingarm, washer, caliper bracket, side collar, hub and final gear case.



Install new caliper stopper pin bolt.  
Tighten the rear caliper pin bolt to the specified torque.

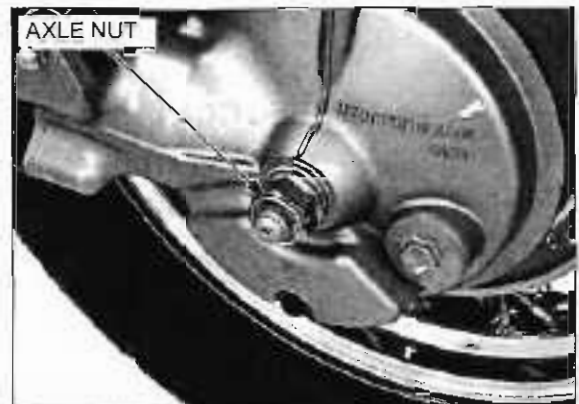
**TORQUE: 69 N·m (7.0 kgf·m, 51 lbf·ft)**

Install the rear wheel speed sensor wire and clamp.  
Install and tighten the bolt securely.



Install and tighten the axle nut to the specified torque while holding the axle.

**TORQUE: 88 N·m (9.0 kgf·m, 65 lbf·ft)**



With the rear brake applied, pump the swingarm up and down several times to seat the axle.

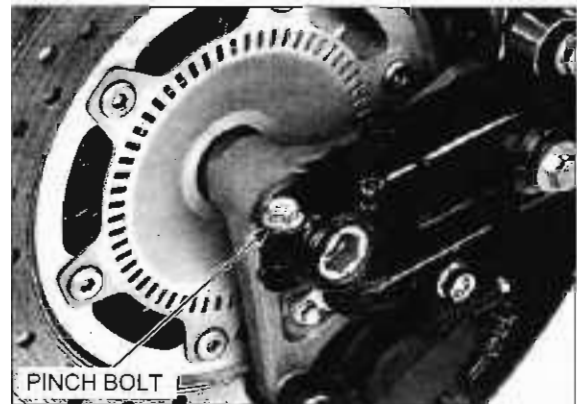


## REAR WHEEL/BRAKE/SUSPENSION

Tighten the pinch bolt to the specified torque.

**TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)**

Install the exhaust system (page 2-12).

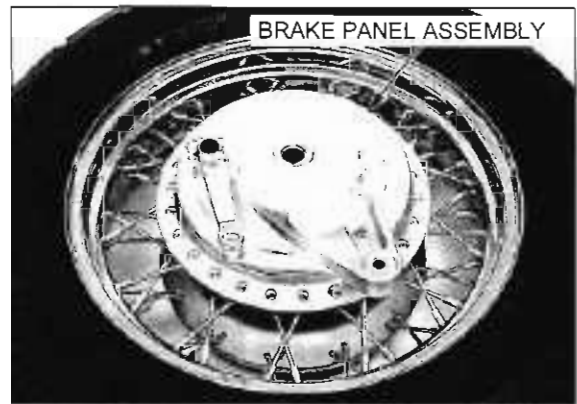


## REAR BRAKE (VT750C2F/C2B)

### REMOVAL

Remove the rear wheel (page 15-7).

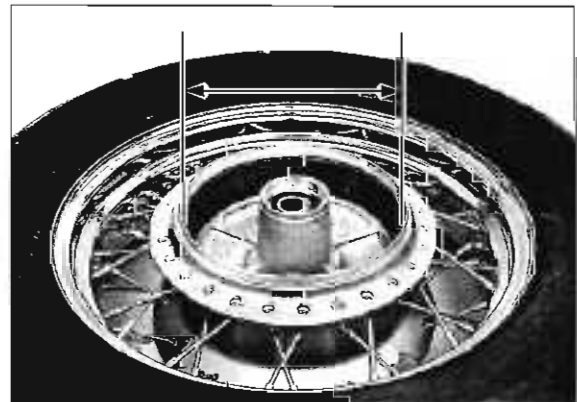
Remove the brake panel from the rear wheel.



### INSPECTION

Measure the brake drum I.D.

**SERVICE LIMIT: 181 mm (7.1 in)**

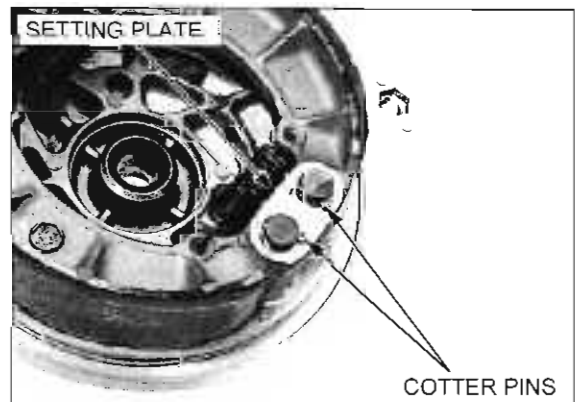


### DISASSEMBLY

Remove the cotter pins and setting plate.

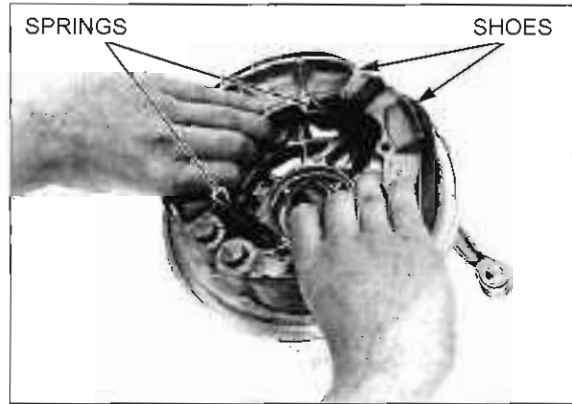
#### NOTE:

- Always replace the brake shoes as a set.
- When the brake shoes are reused, mark all parts before disassembly so they can be installed in their original locations.

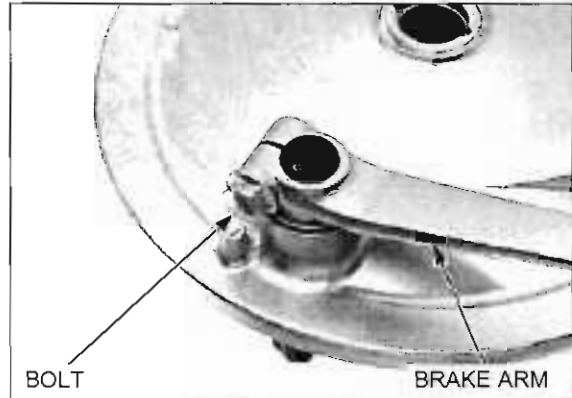


## REAR WHEEL/BRAKE/SUSPENSION

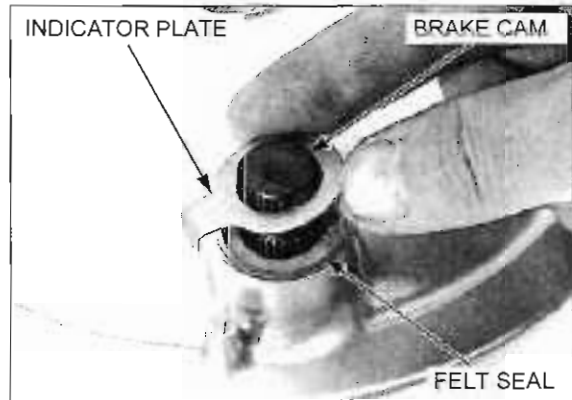
Remove the brake shoes and springs.



Remove the bolt and brake arm.

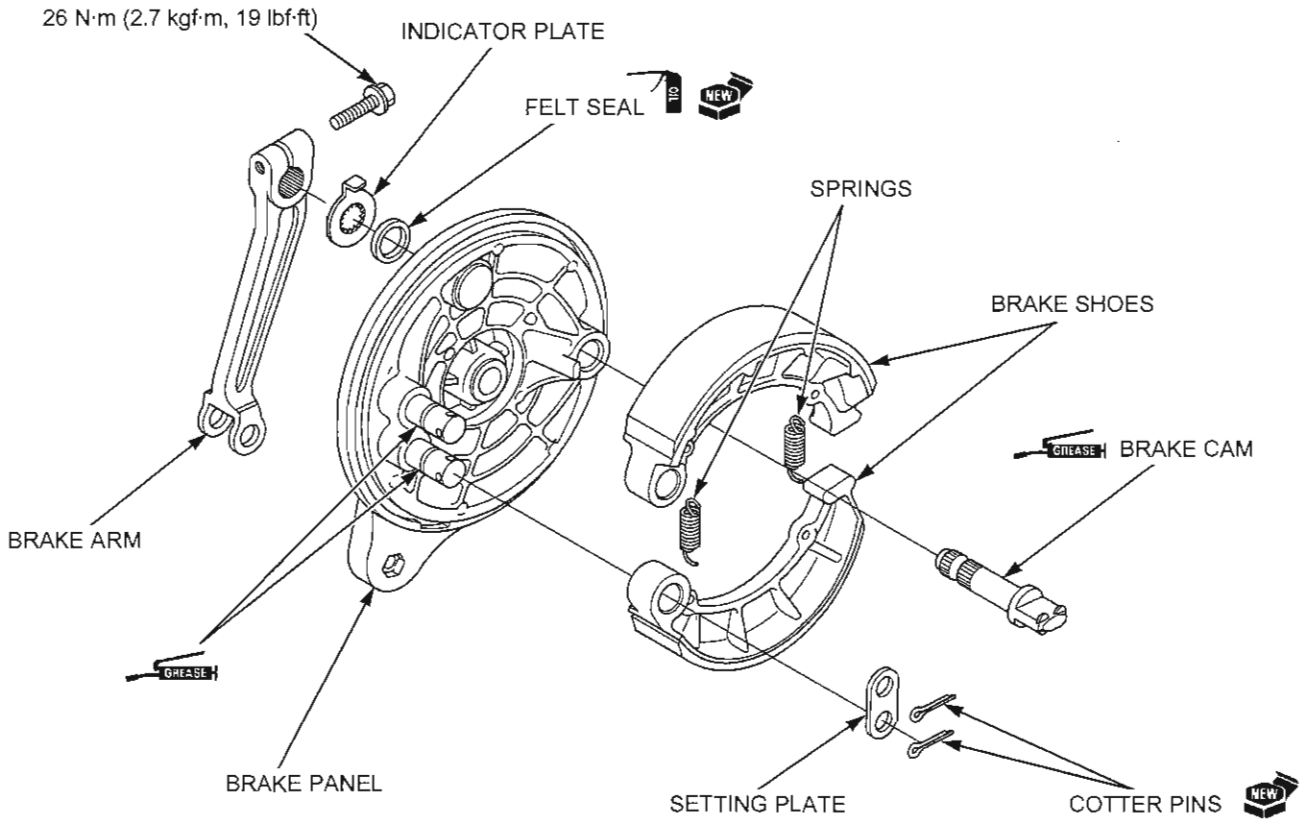


Remove the indicator plate, brake cam and felt seal.

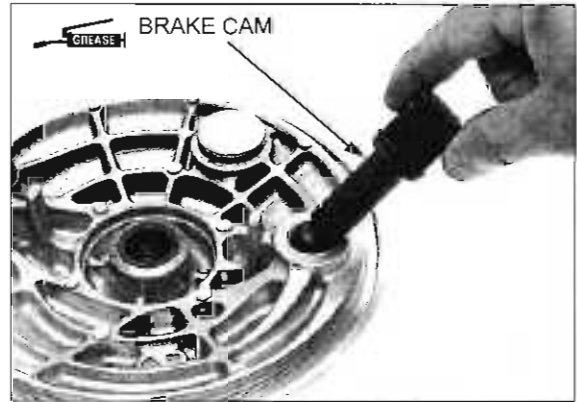


# REAR WHEEL/BRAKE/SUSPENSION

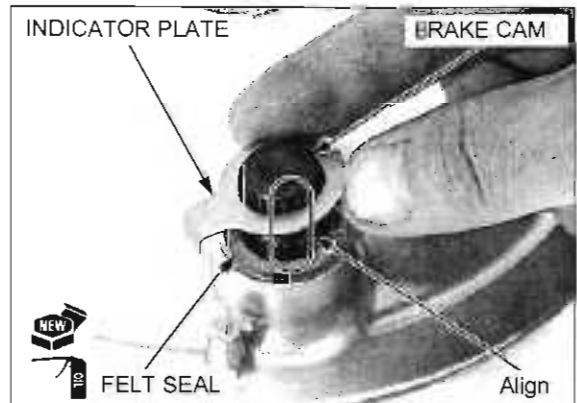
## ASSEMBLY



Apply 0.2 – 0.3 g of grease to the brake cam sliding surface.  
Install the brake cam into the brake panel.



Apply engine oil to a new felt seal and install it onto the brake panel.  
Install the wear indicator plate on the brake cam aligning its wide tooth with the wide groove on the brake cam.

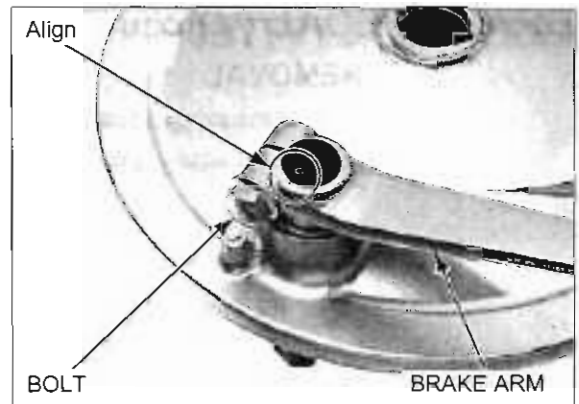




## REAR WHEEL/BRAKE/SUSPENSION

Install the brake arm aligning the punch marks of the arm and the brake cam.  
Install and tighten the brake arm pinch bolt to the specified torque.

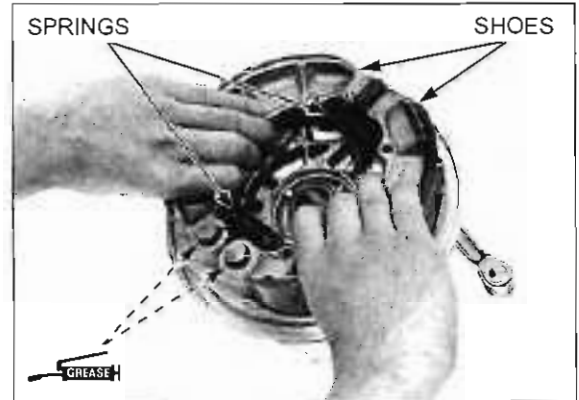
**TORQUE: 26 N·m (2.7 kgf·m, 19 lbf·ft)**



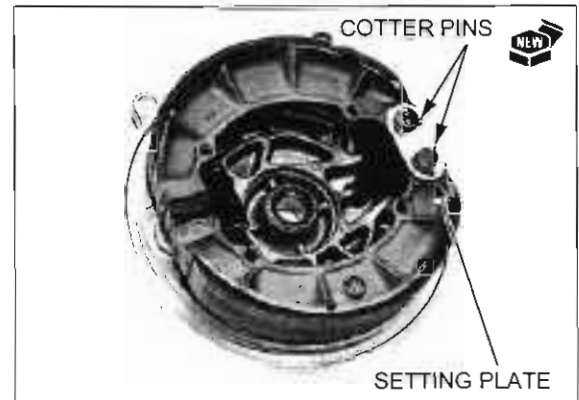
Apply 0.5 – 1.0 g of grease to the brake shoe-to-anchor pin sliding surface.  
Install the brake shoes and springs.

### NOTE:

- If the brake shoes are reused, the shoes and springs must be placed back in their original locations.
- Install the springs with their ends facing up.

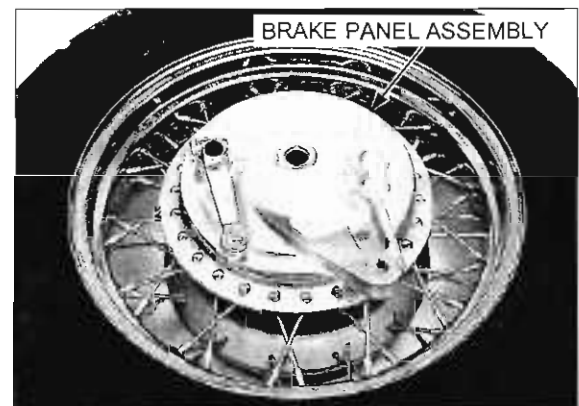


Install the setting plate and new cotter pins as shown.



## INSTALLATION

Install the brake panel into the wheel hub.  
Install the rear wheel (page 15-16).

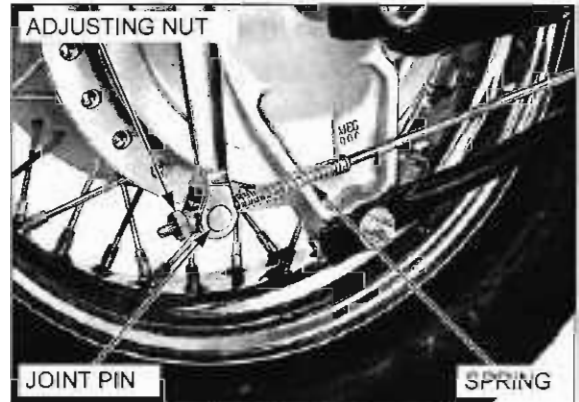


## BRAKE PEDAL (VT750C2F/C2B)

### REMOVAL

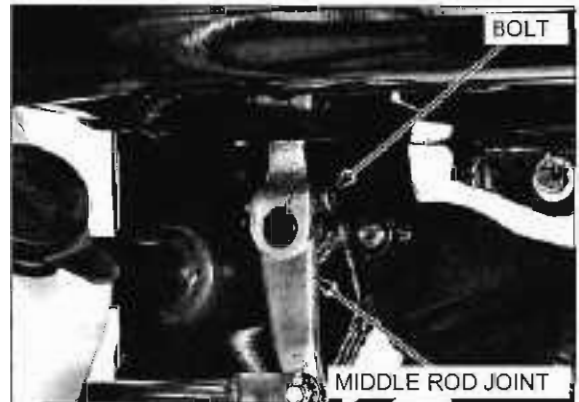
Remove the exhaust system (page 2-9).

Remove the adjusting nut, joint pin and spring.



*Do not reuse the middle rod joint pivot bolt.*

Remove the pivot bolt and middle rod joint.



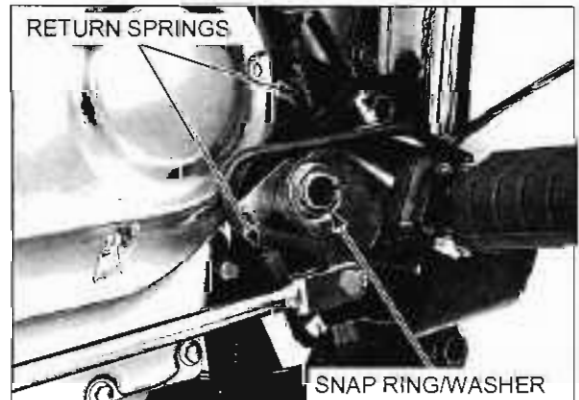
Remove the middle rod joint pivot and dust seals.

Check the dust seals for wear or damage.



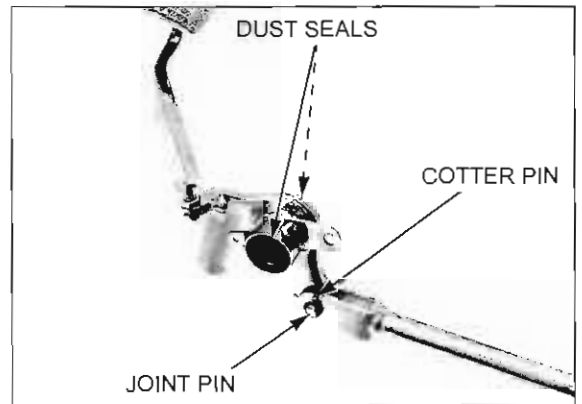
Unhook the brake pedal and rear brake light switch return springs.

Remove the snap ring, washer and brake pedal assembly.

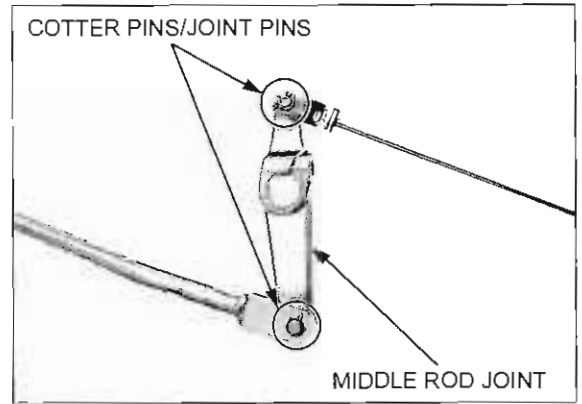


## REAR WHEEL/BRAKE/SUSPENSION

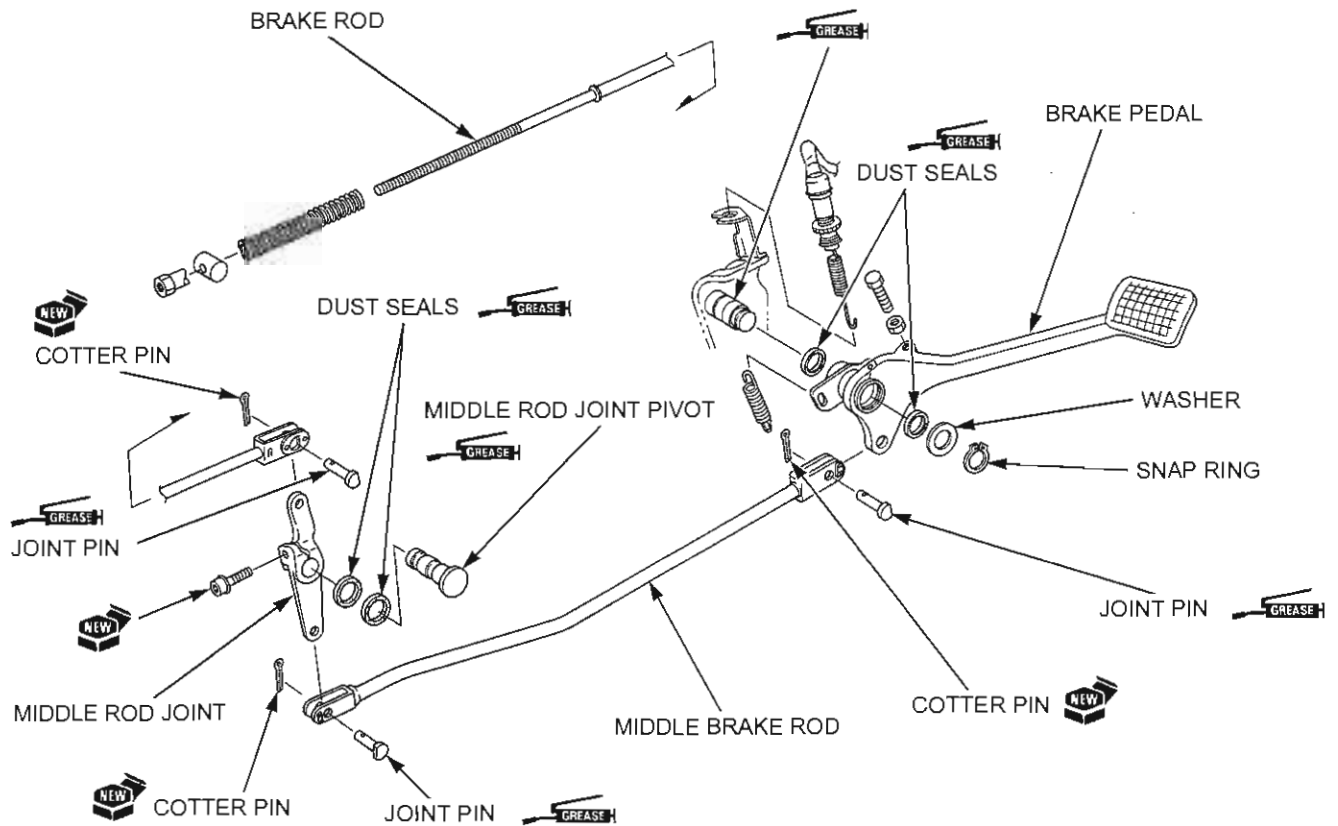
Remove the dust seals.  
Check the dust seals for wear or damage.  
Remove the cotter pin and joint pin.



Remove the cotter pins and joint pins.  
Check the brake pedal, rods, middle rod joint and pivot for wear or damage.  
Check the joint pins for wear or damage.  
Replace these parts if necessary.

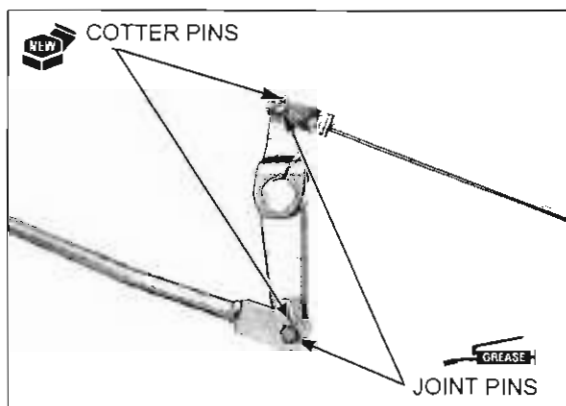


## INSTALLATION

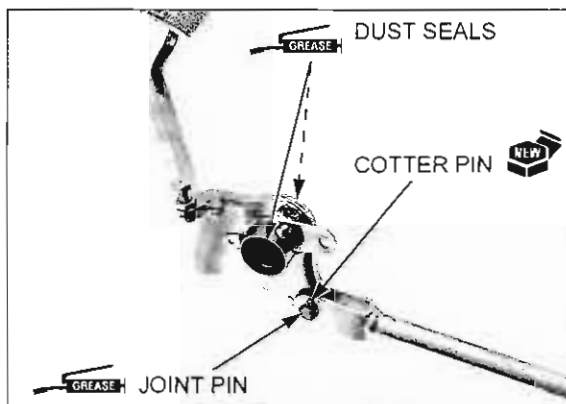


## REAR WHEEL/BRAKE/SUSPENSION

Apply grease to the joint pins.  
Install the brake rods, joint pins and new cotter pins to the middle rod joint.



Apply grease to the joint pin.  
Install the middle brake rod, joint pin and new cotter.  
Apply grease to the dust seal lips.  
Install the dust seals into the brake pedal.

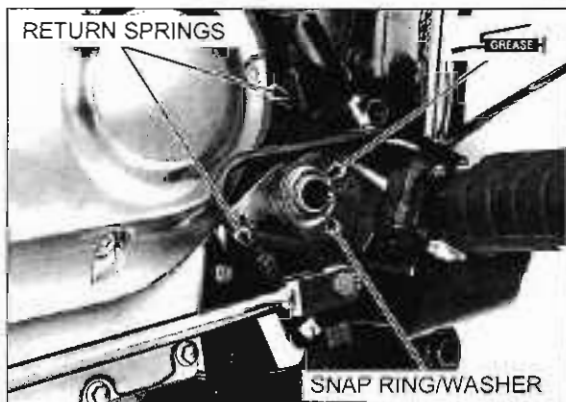


Apply grease to the brake pedal pivot sliding surface.  
Install the brake pedal assembly to the bracket properly.  
Install the washer and snap ring.

### NOTE:

- Install the washers and snap rings with the chamfered edges facing the thrust load side.
- Do not reuse worn snap ring which could easily spin in the groove.
- Check that the snap ring is seated in the grooves.

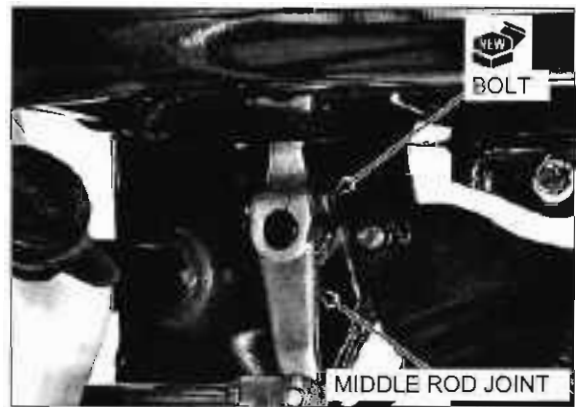
Hook the brake pedal and rear brake light switch return springs to the pedal.



Apply grease to the dust seal lips and middle rod joint pivot sliding surface.  
Install the dust seals and middle rod joint pivot.



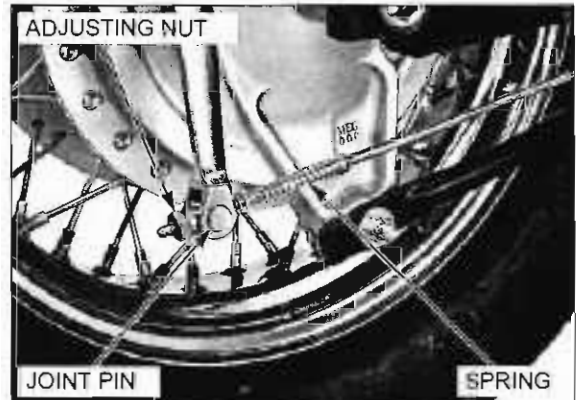
Install the middle rod joint with a new pivot bolt.  
Tighten the pivot bolt securely.



Install the spring, joint pin and adjusting nut.  
Install the exhaust system (page 2-12).

Adjust the following:

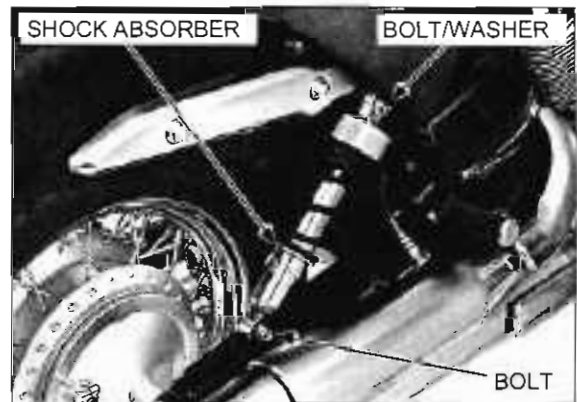
- Brake pedal freeplay (page 3-21)
- Brake pedal height (page 3-20)
- Rear brake light switch (page 3-22)



## SHOCK ABSORBER

Support the frame and swingarm securely using a hoist or equivalent.

Remove the mounting bolts, washers, and the shock absorber.



*Replace the shock absorber as an assembly.*

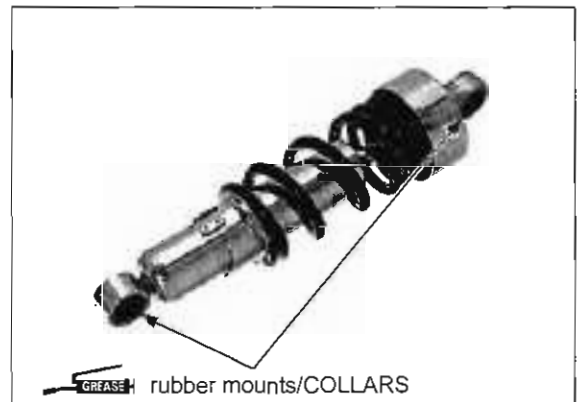
Check for deformation or oil leakage.  
Check the rubber mounts and collars for wear or damage, replace them if necessary.

Apply grease to the shock absorber mount inner surface.

Install the shock absorber in the reverse order of removal.

### TORQUE:

- Upper mounting bolt:**  
26 N·m (2.7 kgf·m, 19 lbf·ft)
- Lower mounting bolt (right side):**  
34 N·m (3.5 kgf·m, 25 lbf·ft)
- Lower mounting bolt (left side):**  
22 N·m (2.2 kgf·m, 16 lbf·ft)



## SWINGARM

### REMOVAL

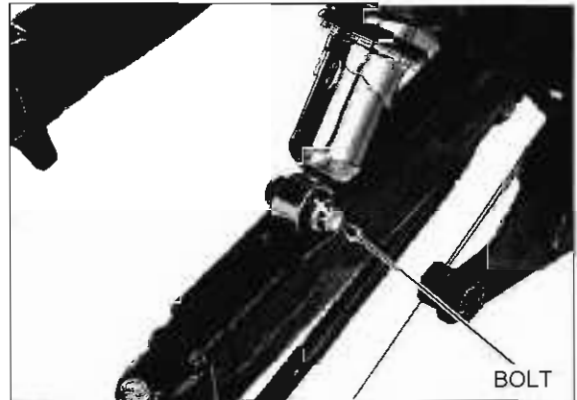
Remove the following (VT750C2F/C2B):

- Left crankcase rear cover (page 2-4)
- Rear wheel (page 15-7)
- Final drive gear case (page 13-7)

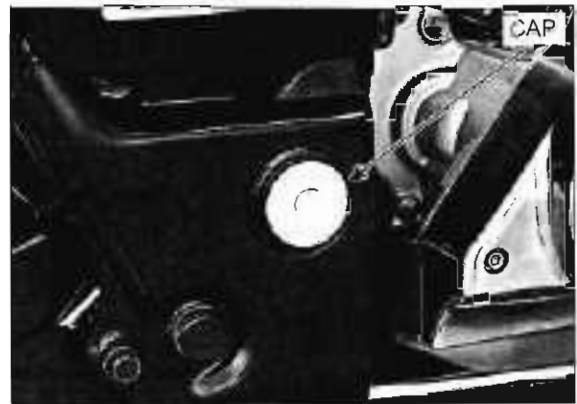
Remove the following (VT750C2S):

- Left crankcase rear cover (page 2-4)
- Rear wheel (page 15-8)
- Final drive gear case (page 13-7)
- Rear wheel speed sensor (page 17-25)

Remove the right shock absorber lower mounting bolt.



Remove the both pivot bolt caps.

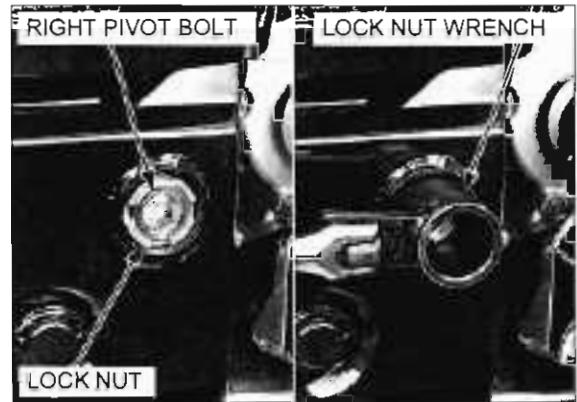


Loosen the right pivot lock nut using a special tool and remove it.

#### TOOL:

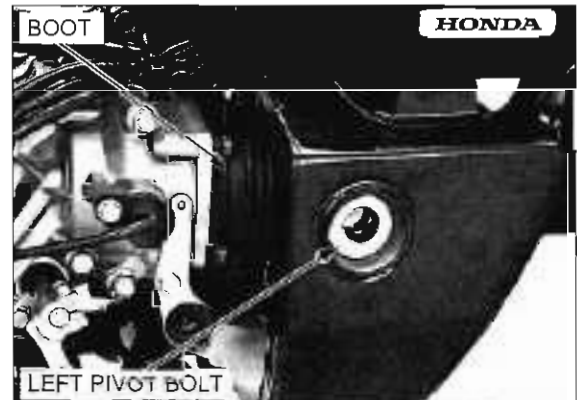
Lock nut wrench                      07908-4690003

Loosen the right pivot bolt, but do not remove it yet.

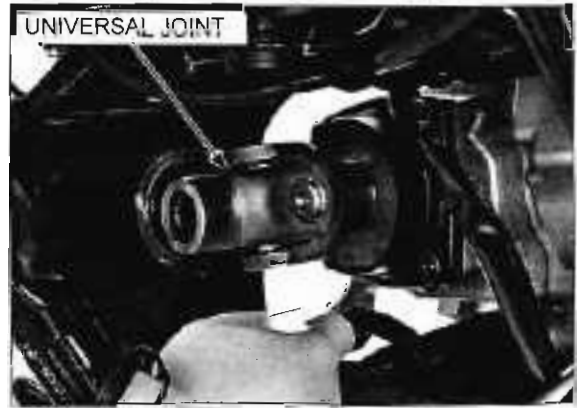


Loosen the left pivot bolt, but do not remove it yet.

Release the joint boot from the output gear case.  
Remove the left and right pivot bolts, and swingarm  
from the frame.

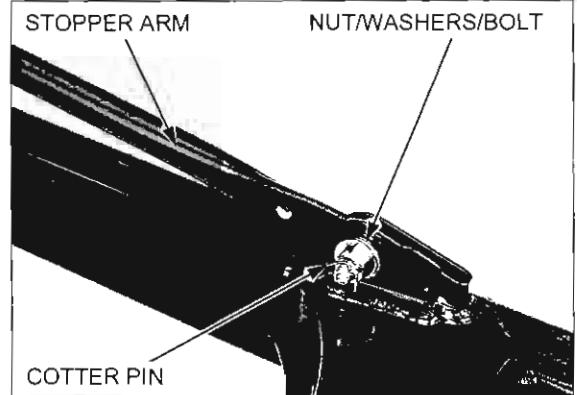


Remove the universal joint from the output shaft.



VT750C2F/C2B; Remove the following:

- Cotter pin
- Nut
- Washer
- Spring washer
- Bolt
- Stopper arm

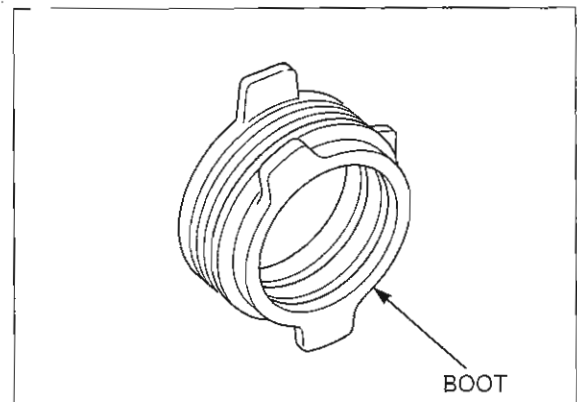


Remove the pivot bearings and joint boot.



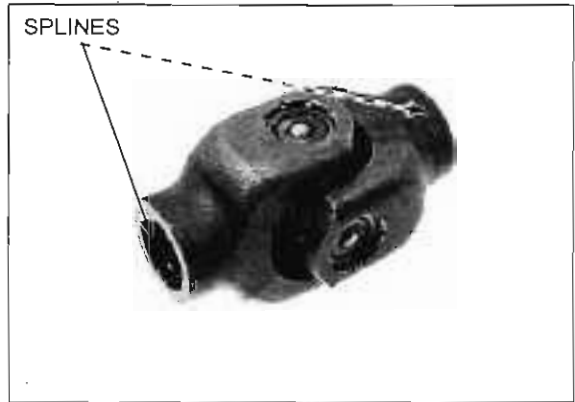
## INSPECTION

Check the boot for cuts or other damage.



## REAR WHEEL/BRAKE/SUSPENSION

Check that the universal joint moves smoothly without binding or noise.  
Check the splines for wear or damage.  
If damaged, check the splines of the output driven gear shaft and drive shaft also.



*Both bearings, outer races and grease holders must be replaced as a set if any part is damaged or worn.*

Check the bearings and dust seals for wear or damage.  
Check the outer races for wear or damage.  
Check the grease holders for damage or deformation.

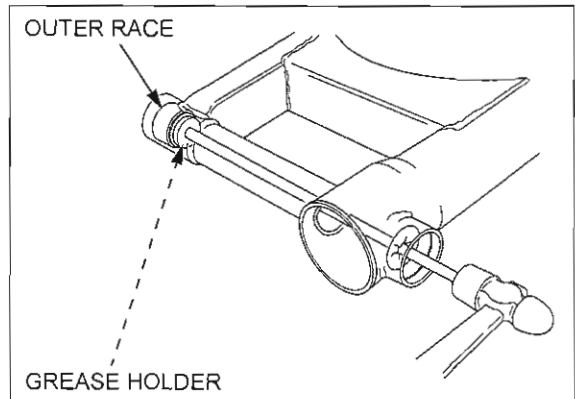


### PIVOT BEARING OUTER RACE REPLACEMENT

Punch or drill an appropriate hole into the grease holder.

Insert a suitable driver through the swingarm and drive the other outer race and grease holder out of the swingarm.

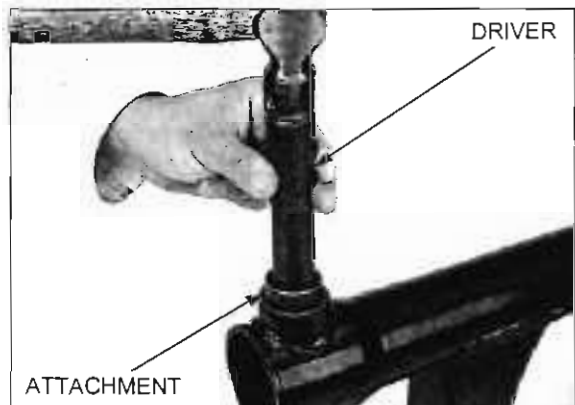
Drive the punched or drilled side outer race and grease holder out of the swingarm.



Install a new grease holder into the pivot.  
Drive in a new outer race squarely until it is fully seated.

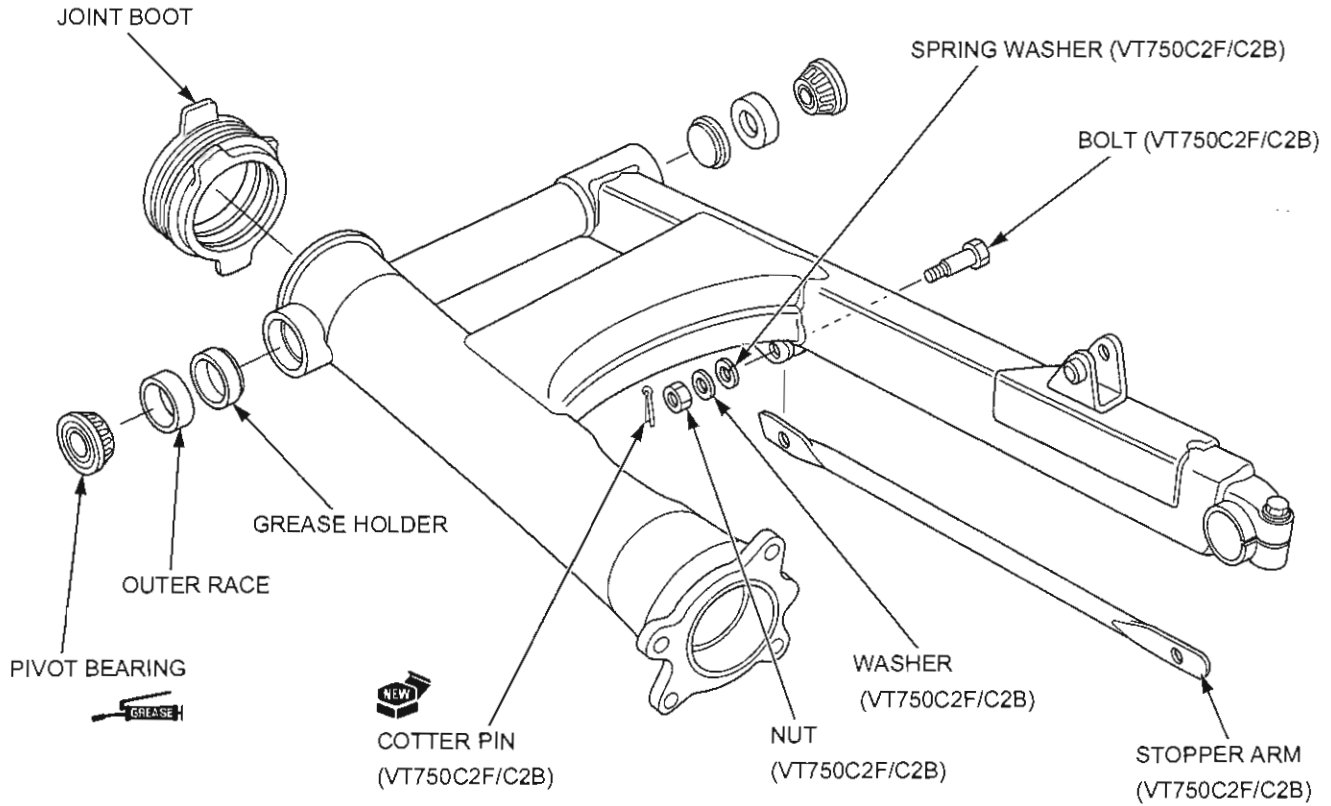
#### TOOLS:

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





INSTALLATION



Apply 1.0 – 1.5 g of specified grease (page 1-23) to the needle rollers and dust seal lips of each bearing. Install the pivot bearings into the swingarm pivots.



Install the joint boot into the swingarm groove properly with the "UP" mark facing up.

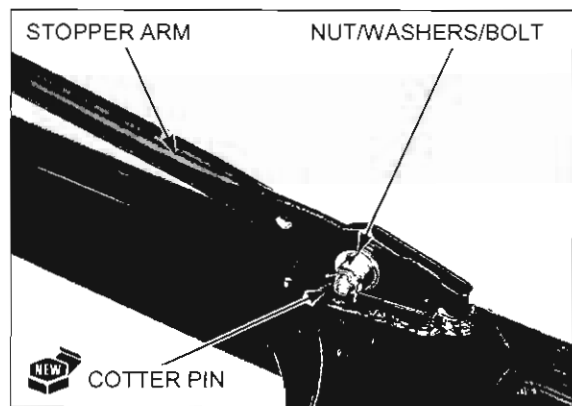


## REAR WHEEL/BRAKE/SUSPENSION

VT750C2F/C2B; Install the following:

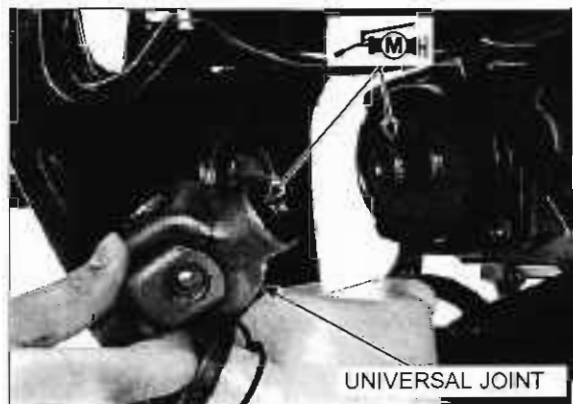
- Stopper arm
- Bolt
- Spring washer
- Washer
- Nut

Tighten the nut and install a new cotter pin.



Apply 1 g of molybdenum disulfide grease to the output shaft splines.

Install the universal joint onto the output shaft.



Set the swingarm into the frame and hold it.

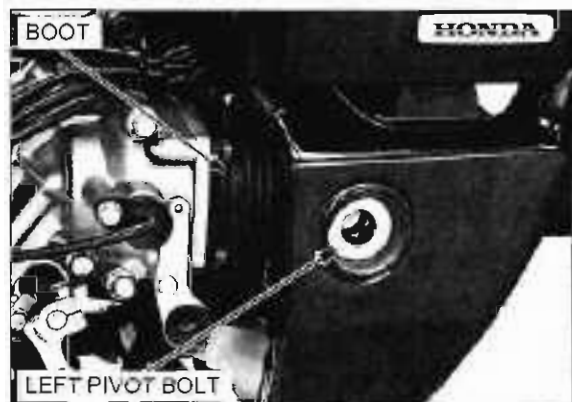
Install the joint boot over the output gear case.

*Carefully align the swingarm pivots with the pivot bolts.*

Install the left and right pivot bolts.

Tighten the left pivot bolt to the specified torque.

**TORQUE: 103 N·m (10.5 kgf·m, 76 lbf·ft)**



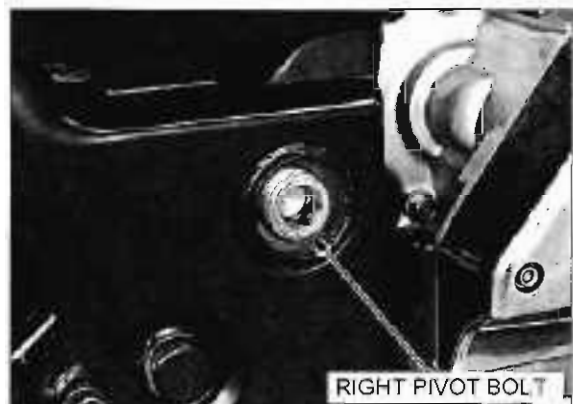
Temporarily tighten the right pivot bolt to the specified torque.

**TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)**

Move the swingarm up and down several times to seat the pivot bearings.

Loosen the right pivot bolt counterclockwise 1/4 turn (90°) and tighten it to the specified torque.

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

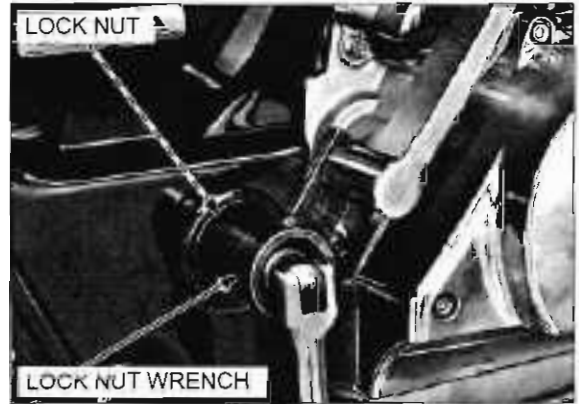


Install the right pivot lock nut.  
Tighten the lock nut using the special tool while holding the pivot bolt.

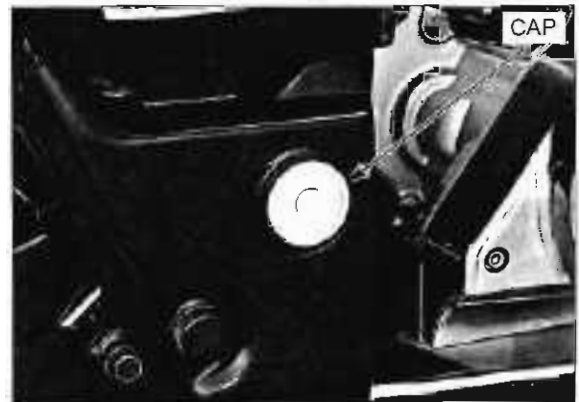
**TOOL:**  
**Lock nut wrench** 07908-4690003

*Refer to torque wrench reading information on page 15-4 "Service Information".*

**TORQUE:**  
**Actual:** 103 N·m (10.5 kgf·m, 76 lbf·ft)  
**Indicated:** 93 N·m (9.5 kgf·m, 69 lbf·ft)



Install the both pivot bolt caps.



Install and tighten the right shock absorber lower mounting bolt to the specified torque.

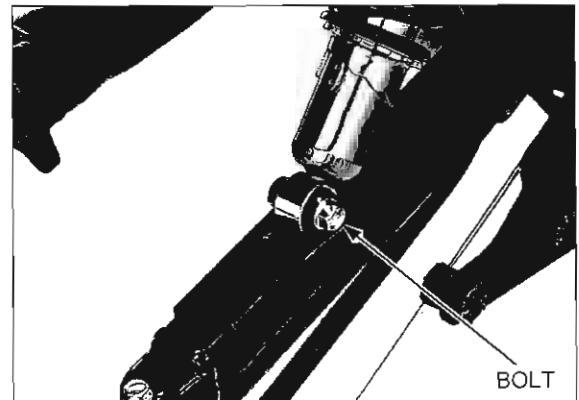
**TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)**

Install the following (VT750C2F/C2B):

- Final drive gear case (page 13-22)
- Rear wheel (page 15-16)
- Left crankcase rear cover (page 2-4)

Install the following (VT750C2S):

- Final drive gear case (page 13-22)
- Rear wheel (page 15-18)
- Left crankcase rear cover (page 2-4)
- Rear wheel speed sensor (page 17-25)



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**MEMO**

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# 16. HYDRAULIC BRAKE

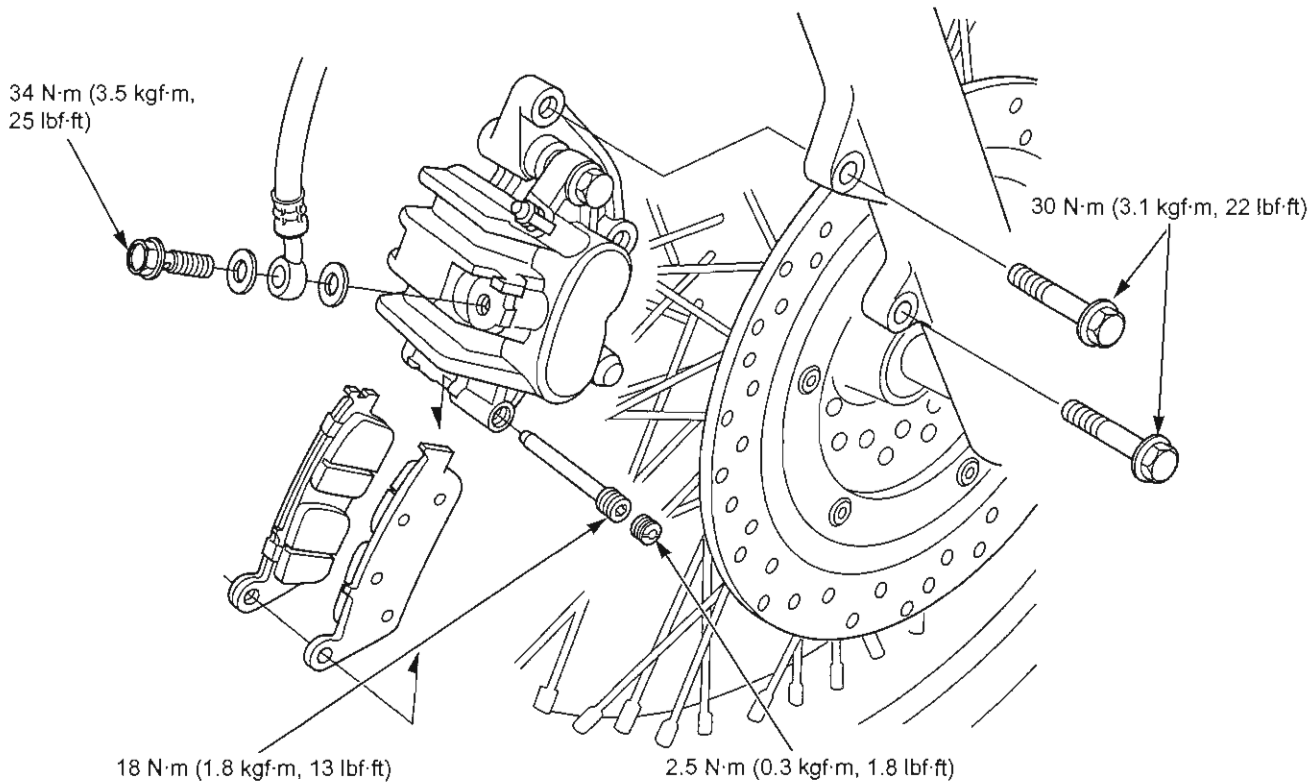
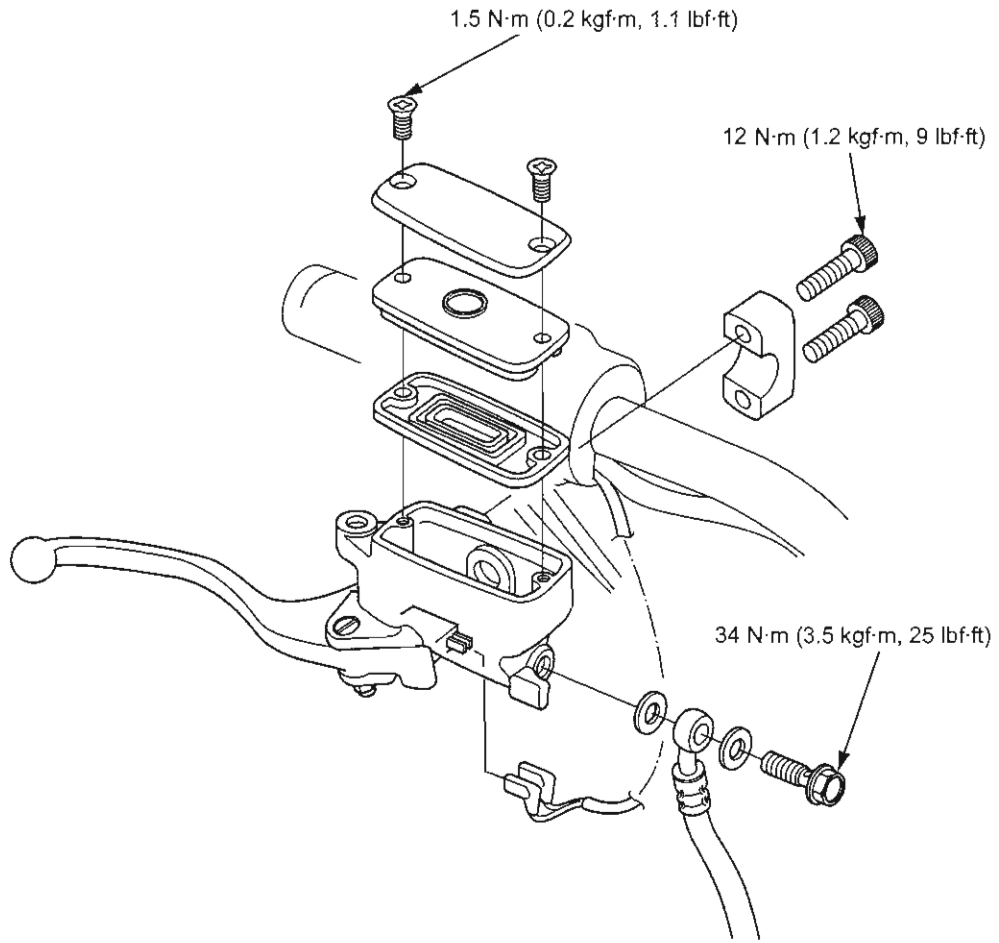
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COMPONENT LOCATION .....	16-2	FRONT MASTER CYLINDER .....	16-21
SERVICE INFORMATION .....	16-5	FRONT BRAKE CALIPER (VT750C2F/C2B) .....	16-25
TROUBLESHOOTING .....	16-7	FRONT BRAKE CALIPER (VT750C2S) ...	16-30
BRAKE FLUID REPLACEMENT/ AIR BLEEDING (VT750C2F/C2B) .....	16-8	REAR MASTER CYLINDER (VT750C2S) .....	16-34
BRAKE FLUID REPLACEMENT/ AIR BLEEDING (VT750C2S) .....	16-10	REAR BRAKE CALIPER (VT750C2S) .....	16-38
BRAKE PAD/DISC .....	16-16	BRAKE PEDAL (VT750C2S) .....	16-40

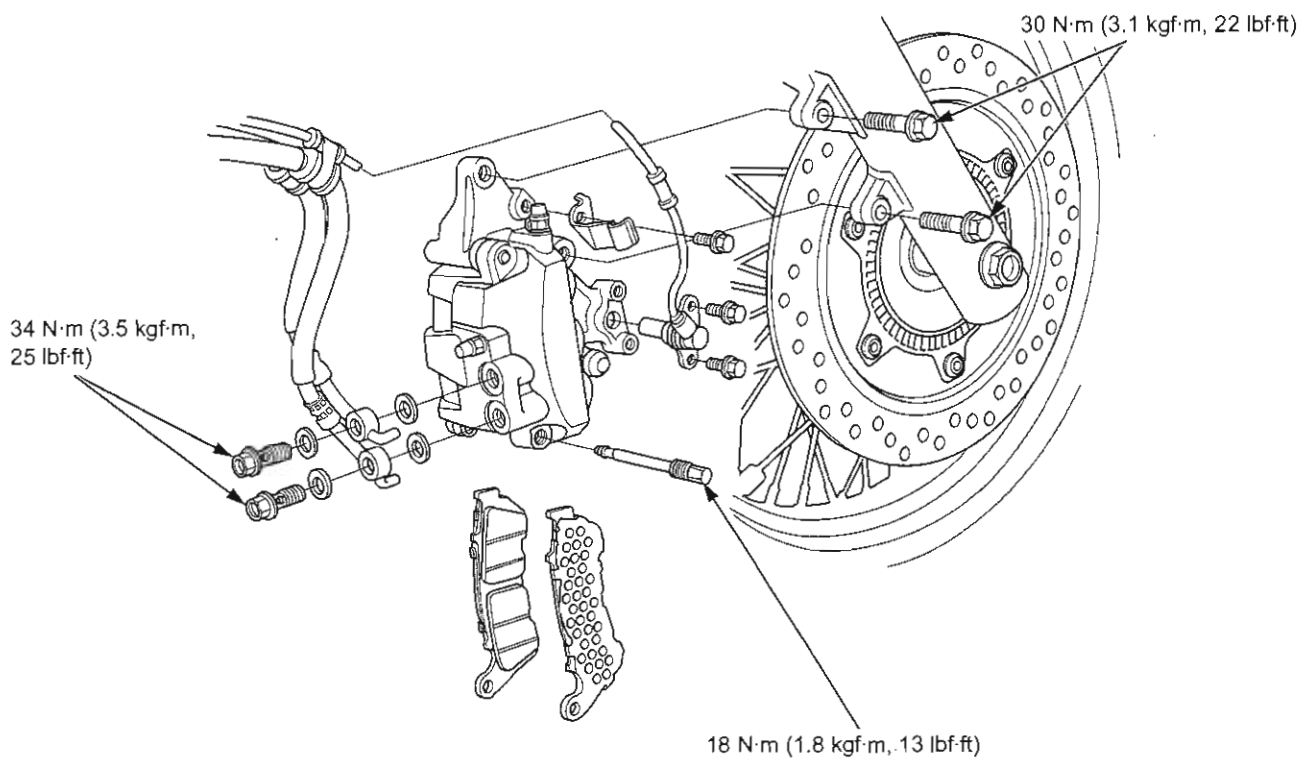
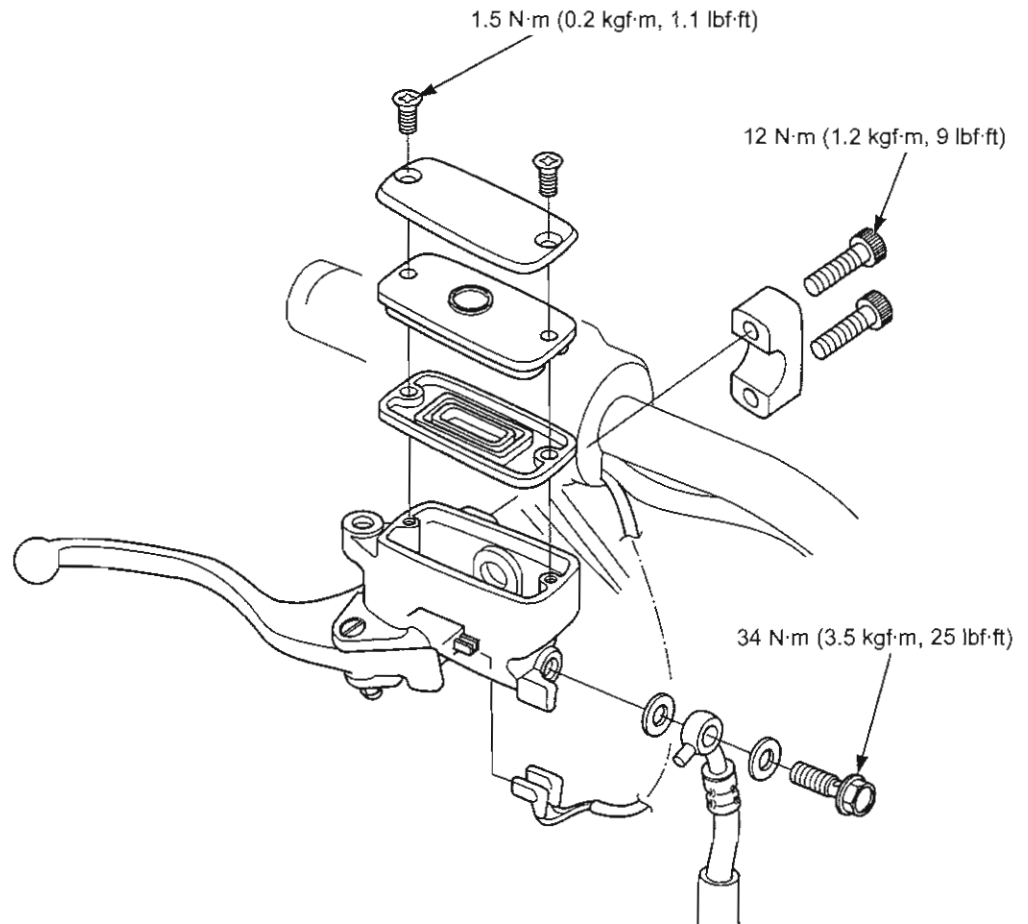
# HYDRAULIC BRAKE

## COMPONENT LOCATION

### FRONT (VT750C2F/C2B):

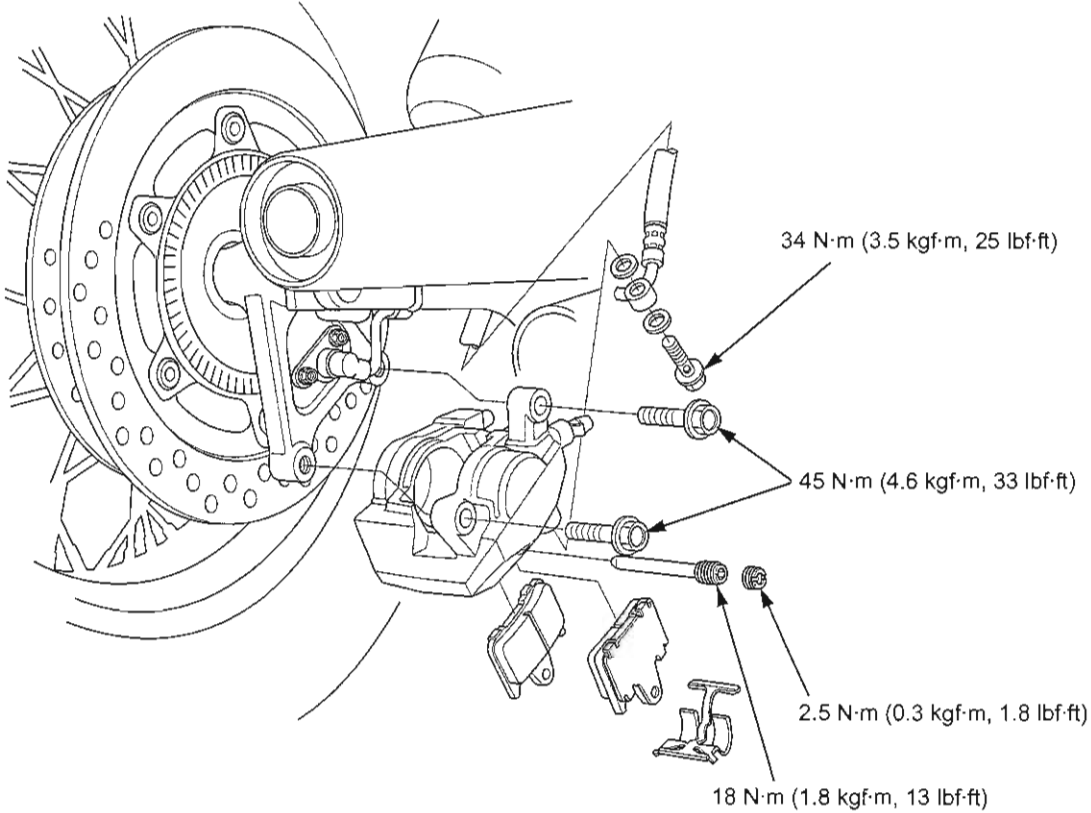
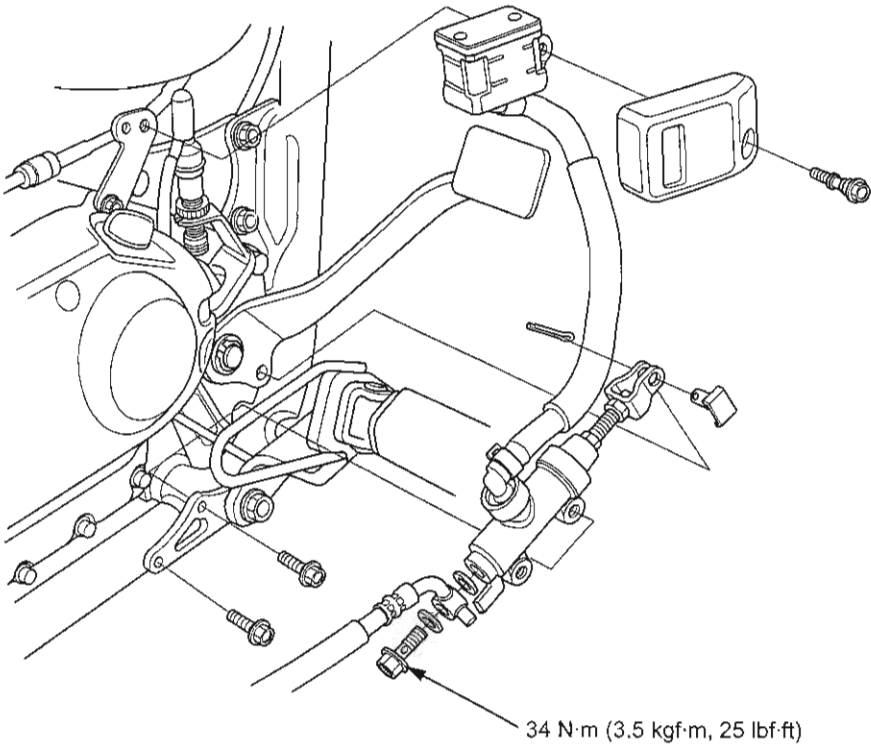


FRONT (VT750C2S):



**HYDRAULIC BRAKE**

**REAR (VT750C2S):**





## SERVICE INFORMATION

### GENERAL

#### ⚠ CAUTION

Frequent inhalation of brake pad dust, regardless of material composition could be hazardous to your health.

- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

#### NOTICE

Spilled brake fluid will severely damage instrument lenses and painted surfaces. It is also harmful to some rubber parts. Be careful whenever you remove the reservoir cap; make sure the front reservoir is horizontal first.

- This section covers service of the conventional brake components of the brake system. For Anti-lock Brake System (ABS) service, see page 17-7.
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Never allow contaminants (e.g., dirt, water) to enter an open reservoir.
- Once the hydraulic system has been opened, or if the brake feels spongy, the system must be bled.
- Always use fresh DOT 4 brake fluid from a sealed container when servicing the system. Do not mix different types of fluid as they may not be compatible.
- Always check brake operation before riding the motorcycle.

### SPECIFICATIONS (VT750C2F)

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Recommended brake fluid		DOT 4	—
Front	Brake disc thickness	5.8 – 6.2 (0.23 – 0.24)	5.0 (0.20)
	Brake disc warpage	—	0.30 (0.012)
	Master cylinder I.D.	11.000 – 11.043 (0.4331 – 0.4348)	11.05 (0.435)
	Master piston O.D.	10.957 – 10.984 (0.4314 – 0.4324)	10.945 (0.4309)
	Caliper cylinder I.D.	27.000 – 27.050 (1.0630 – 1.0650)	27.060 (1.0654)
	Caliper piston O.D.	26.935 – 26.968 (1.0604 – 1.0617)	26.930 (1.0602)

### SPECIFICATIONS (VT750C2B)

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Recommended brake fluid		DOT 4	—
Front	Brake disc thickness	5.8 – 6.2 (0.23 – 0.24)	5.0 (0.20)
	Brake disc warpage	—	0.30 (0.012)
	Master cylinder I.D.	11.000 – 11.043 (0.4331 – 0.4348)	11.05 (0.435)
	Master piston O.D.	10.957 – 10.984 (0.4314 – 0.4324)	10.945 (0.4309)
	Caliper cylinder I.D.	25.400 – 25.450 (1.0000 – 1.0020)	25.460 (1.0024)
	Caliper piston O.D.	25.335 – 25.368 (0.9974 – 0.9987)	25.320 (0.9968)

# HYDRAULIC BRAKE

## SPECIFICATIONS (VT750C2S)

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Recommended brake fluid		DOT 4	—	
Front	Brake disc thickness	4.8 – 5.2 (0.19 – 0.20)	4.0 (0.16)	
	Brake disc warpage	—	0.30 (0.012)	
	Master cylinder I.D.	11.000 – 11.043 (0.4331 – 0.4348)	11.05 (0.435)	
	Master piston O.D.	10.957 – 10.984 (0.4314 – 0.4324)	10.945 (0.4309)	
	Caliper cylinder I.D.	Upper	27.000 – 27.050 (1.0630 – 1.0650)	27.060 (1.0654)
		Middle	22.654 – 22.700 (0.8917 – 0.8934)	22.712 (0.8942)
		Lower	25.400 – 25.450 (1.0000 – 1.0012)	25.460 (1.0024)
	Caliper piston O.D.	Upper	26.935 – 26.968 (1.0604 – 1.0617)	26.930 (1.0602)
		Middle	22.585 – 22.618 (0.8892 – 0.8905)	22.573 (0.8887)
Lower		25.318 – 25.368 (0.9968 – 0.9988)	25.310 (0.9965)	
Rear	Push rod length	83 (3.3)	—	
	Brake disc thickness	5.8 – 6.2 (0.23 – 0.24)	5.0 (0.20)	
	Brake disc warpage	—	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.	38.180 – 38.230 (1.5031 – 1.5051)	38.24 (1.506)	
	Caliper piston O.D.	38.098 – 38.148 (1.4999 – 1.5019)	38.09 (1.499)	

## TORQUE VALUES (VT750C2F/C2B)

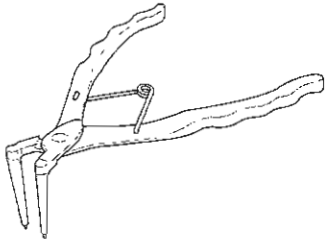
Brake caliper bleed valve	5.5 N·m (0.6 kgf·m, 4.1 lbf·ft)	
Front master cylinder reservoir cap screw	1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)	
Brake pad pin	18 N·m (1.8 kgf·m, 13 lbf·ft)	
Brake pad pin plug	2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)	
Brake hose oil bolt	34 N·m (3.5 kgf·m, 25 lbf·ft)	
Brake lever pivot bolt	1 N·m (0.1 kgf·m, 0.7 lbf·ft)	
Brake lever pivot nut	6 N·m (0.6 kgf·m, 4.4 lbf·ft)	
Front brake light switch screw	1.2 N·m (0.1 kgf·m, 0.9 lbf·ft)	
Front master cylinder holder bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Front brake caliper bracket pin	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Front brake caliper pin	27 N·m (2.8 kgf·m, 20 lbf·ft)	Apply locking agent to the threads
Front brake caliper mounting bolt	30 N·m (3.1 kgf·m, 22 lbf·ft)	Apply locking agent to the threads ALOC bolt; replace with a new one

## TORQUE VALUES (VT750C2S)

Front brake caliper bleed valve	5.5 N·m (0.6 kgf·m, 4.1 lbf·ft)	
Front master cylinder reservoir cap screw	1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)	
Front brake pad pin	18 N·m (1.8 kgf·m, 13 lbf·ft)	
Brake hose oil bolt	34 N·m (3.5 kgf·m, 25 lbf·ft)	
Brake lever pivot bolt	1 N·m (0.1 kgf·m, 0.7 lbf·ft)	
Brake lever pivot nut	6 N·m (0.6 kgf·m, 4.4 lbf·ft)	
Front brake light switch screw	1.2 N·m (0.1 kgf·m, 0.9 lbf·ft)	
Front master cylinder holder bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Front brake caliper bracket pin	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Front brake caliper pin	27 N·m (2.8 kgf·m, 20 lbf·ft)	Apply locking agent to the threads
Front brake caliper mounting bolt	30 N·m (3.1 kgf·m, 22 lbf·ft)	Apply locking agent to the threads ALOC bolt; replace with a new one
Rear caliper stopper pin bolt	69 N·m (7.0 kgf·m, 51 lbf·ft)	ALOC bolt; replace with a new one
Rear caliper pin bolt	45 N·m (4.6 kgf·m, 33 lbf·ft)	
Rear caliper assembly bolt	37 N·m (3.8 kgf·m, 27 lbf·ft)	Apply locking agent to the threads
Rear brake caliper bleed valve	5.5 N·m (0.6 kgf·m, 4.1 lbf·ft)	
Rear brake pad pin	18 N·m (1.8 kgf·m, 13 lbf·ft)	
Rear brake pad pin plug	2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)	
Rear master cylinder reservoir cap screw	1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)	
Rear master cylinder push rod lock nut	18 N·m (1.8 kgf·m, 13 lbf·ft)	

**TOOL**

Snap ring pliers  
07914-SA50001

**TROUBLESHOOTING****Brake lever soft or spongy**

- Air in hydraulic system
- Leaking hydraulic system
- Contaminated brake pads/disc
- Worn caliper piston seals
- Worn master cylinder piston cups
- Worn brake pads/disc
- Contaminated caliper
- Contaminated master cylinder
- Caliper not sliding properly
- Low brake fluid level
- Clogged fluid passage
- Warped/deformed brake disc
- Sticking/worn caliper pistons
- Sticking/worn master piston
- Bent brake lever (VT750C2F/C2B)
- Bent brake lever/pedal (VT750C2S)

**Brake lever hard**

- Clogged/restricted hydraulic system
- Sticking/worn caliper pistons
- Sticking/worn master piston
- Caliper not sliding properly
- Bent brake lever (VT750C2F/C2B)
- Bent brake lever/pedal (VT750C2S)

**Brake drag**

- Contaminated brake pads/disc
- Misaligned wheel
- Badly worn brake pads/disc
- Warped/deformed brake disc
- Caliper not sliding properly
- Clogged/restricted fluid passage
- Sticking caliper pistons

## HYDRAULIC BRAKE

# BRAKE FLUID REPLACEMENT/AIR BLEEDING (VT750C2F/C2B)

### NOTE:

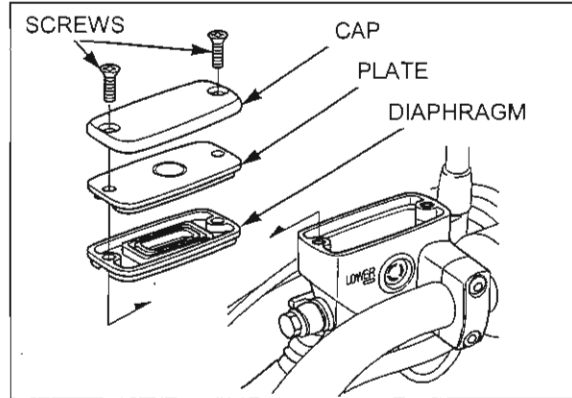
- Do not allow foreign material to enter the system when filling the reservoir.
- When using a commercially available brake bleeder, follow the manufacturer's operating instructions.

## BRAKE FLUID DRAINING

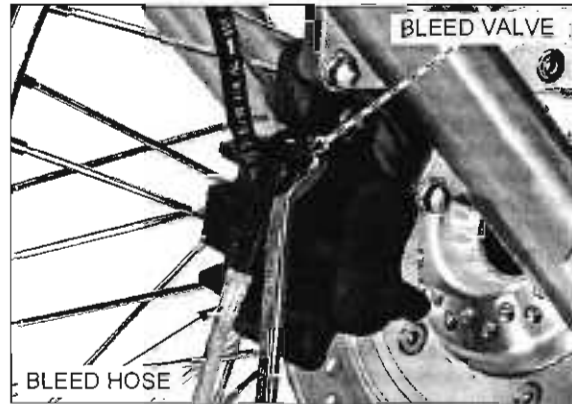
Turn the handlebar to the left until the front master cylinder reservoir is level before removing the reservoir cap.

Remove the following:

- Screws
- Reservoir cap
- Set plate
- Diaphragm



Connect a bleed hose to the bleed valve. Loosen the bleed valve and pump the brake lever until no more fluid flows out of the bleed valve. Tighten the bleed valve.



## BRAKE FLUID FILLING/BLEEDING

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

Connect a commercially available brake bleeder to the bleed valve.

Operate the brake bleeder and loosen the bleed valve. If an automatic refill system is not used, add brake fluid when the fluid level in the reservoir is low.

### NOTE:

- Check the fluid level often while bleeding to prevent air from being pumped into the system.
- When using a brake bleeding tool, follow the manufacturer's operating instructions.

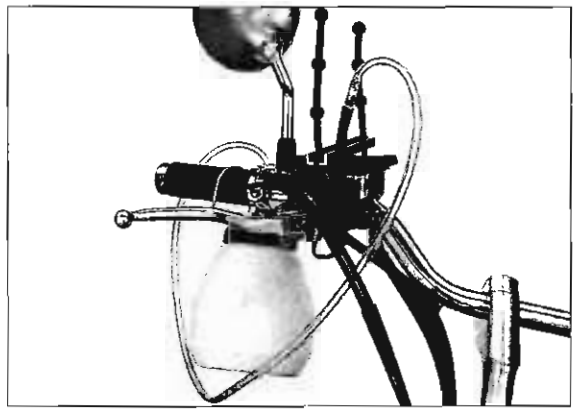


Perform the bleeding procedure until the system is completely flushed/bled.

**NOTE:**

- If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.

Close the bleed valve and operate the brake lever. If it is still spongy, bleed the system again.



If a brake bleeder is not available, use the following procedure:

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

Connect a bleed hose to the bleed valve.

Pressurize the system with the brake lever until lever resistance is felt.

1. Squeeze the brake lever, open the bleed valve 1/4 turn and then close it.

**NOTE:**

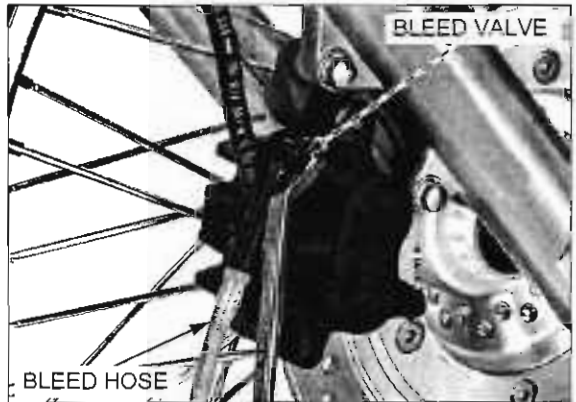
- Do not release the lever until the bleed valve has been closed.

2. Release the brake lever slowly and wait several seconds after it reaches the end of its travel.

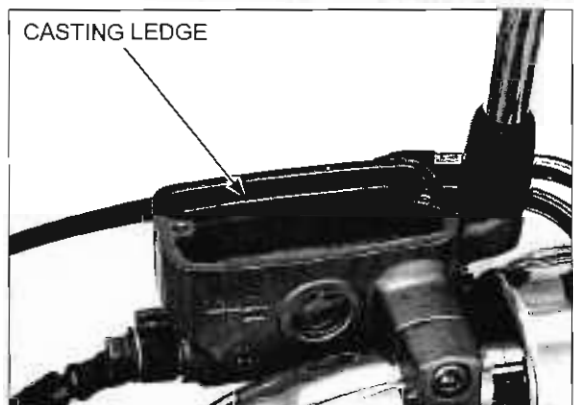
Repeat steps 1 and 2 until air bubbles do not appear in the bleed hose.

After bleeding the air completely, tighten the bleed valve to the specified torque.

**TORQUE: 5.5 N·m (0.6 kgf·m, 4.1 lbf·ft)**



Fill the reservoir to the casting ledge with DOT 4 brake fluid.



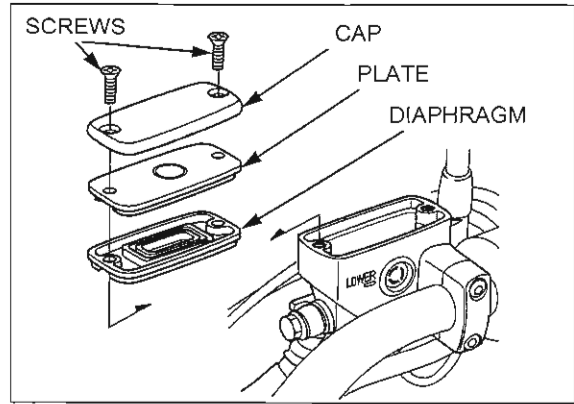
## HYDRAULIC BRAKE

Install the following:

- Diaphragm
- Set plate
- Reservoir cap
- Screws

Tighten the screws to the specified torque.

**TORQUE: 1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)**



## BRAKE FLUID REPLACEMENT/AIR BLEEDING (VT750C2S)

NOTE:

- Do not allow foreign material to enter the system when filling the reservoir.
- When using a commercially available brake bleeder, follow the manufacturer's operating instructions.

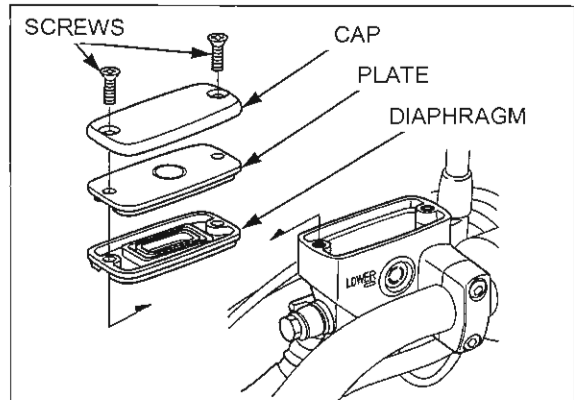
### BRAKE FLUID DRAINING

FRONT:

Turn the handlebar to the left until the front master cylinder reservoir is level before removing the reservoir cap.

Remove the following:

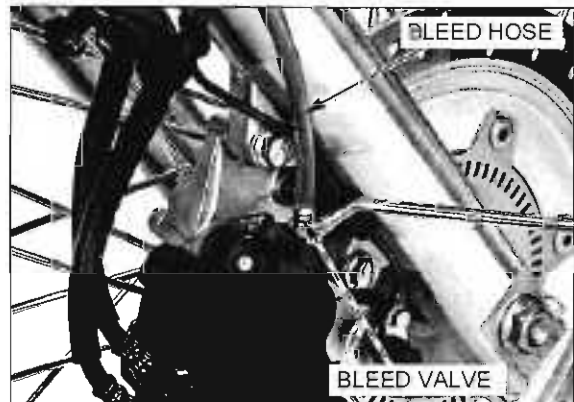
- Screws
- Reservoir cap
- Set plate
- Diaphragm



Connect a bleed hose to the front caliper upper bleed valve.

Loosen the upper bleed valve and pump the brake lever until no more fluid flows out of the upper bleed valve.

Tighten the upper bleed valve.

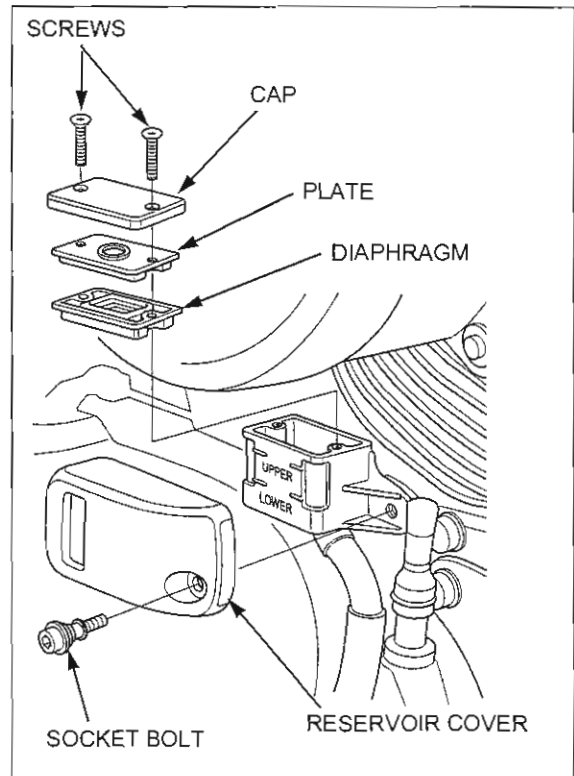


## REAR (COMBINED)

Support the motorcycle upright on a level surface.

Remove the following:

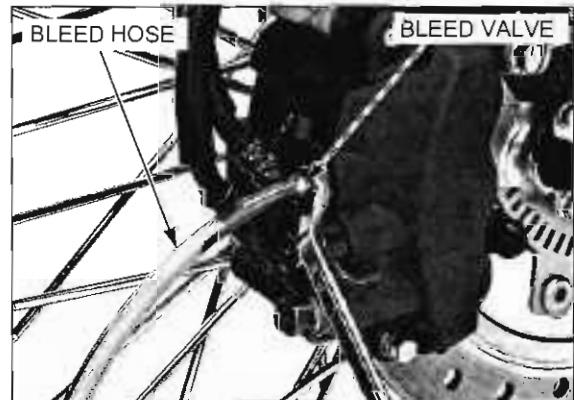
- Socket bolt
- Reservoir cover
- Screws
- Reservoir cap
- Set plate
- Diaphragm



Connect a bleed hose to the front caliper lower bleed valve.

Loosen the lower bleed valve and pump the brake pedal until no more fluid flows out of the lower bleed valve.

Tighten the lower bleed valve.



Connect a bleed hose to the rear caliper left bleed valve.

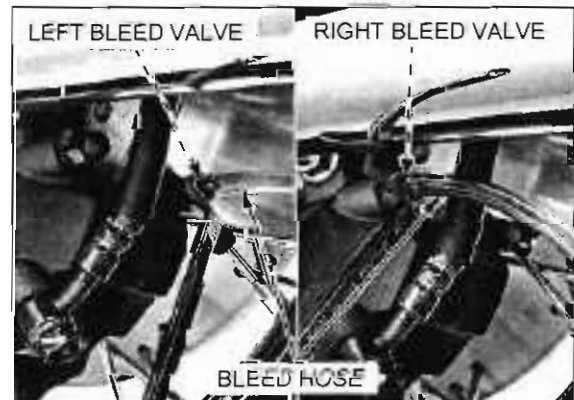
Loosen the left bleed valve and pump the brake pedal until no more fluid flows out of the left bleed valve.

Tighten the left bleed valve.

Connect a bleed hose to the rear caliper right bleed valve.

Loosen the right bleed valve and pump the brake pedal until no more fluid flows out of the right bleed valve.

Tighten the right bleed valve.



## HYDRAULIC BRAKE

### BRAKE FLUID FILLING/BLEEDING

#### FRONT: FLUID FEEDING/AIR BLEEDING

*Do not mix different types of fluid since they are not compatible.*

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

Connect a commercially available brake bleeder to the front caliper upper bleed valve.

Operate the brake bleeder and loosen the upper bleed valve.

If an automatic refill system is not used, add brake fluid when the fluid level in the reservoir is low.

#### NOTE:

- Check the fluid level often while bleeding to prevent air from being pumped into the system.
- When using a brake bleeding tool, follow the manufacturer's operating instructions.

Perform the bleeding procedure until the system is completely flushed/bled

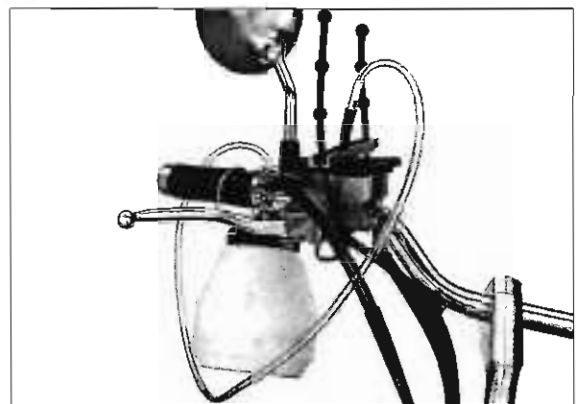
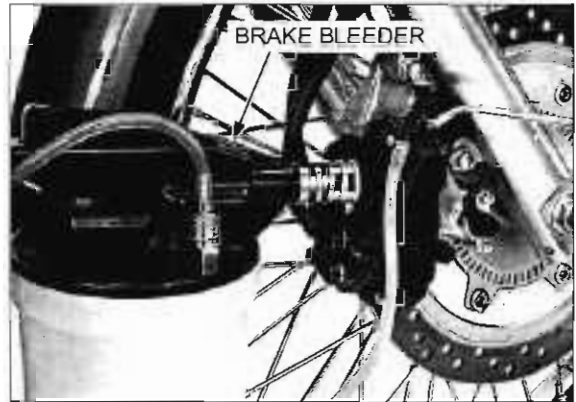
#### NOTE:

If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.

Close the bleed valve and operate the brake lever. If it is still spongy, bleed the system again.

After bleeding the air completely, tighten the bleed valve to the specified torque.

**TORQUE: 5.5 N·m (0.6 kgf·m, 4.1 lbf·ft)**



If a brake bleeder is not available, use the following procedure:

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

Connect a bleed hose to the upper bleed valve.

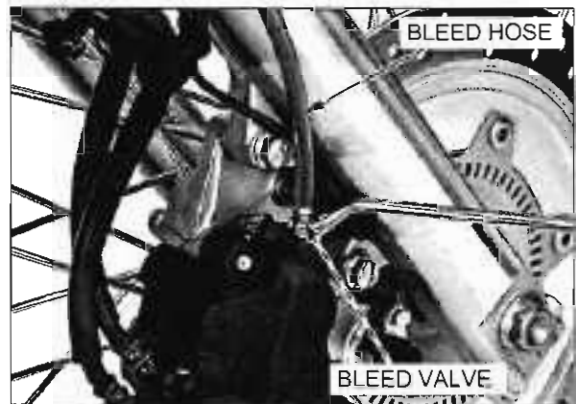
Pressurize the system with the brake lever until lever resistance is felt.

*Do not release the brake lever until the bleed valve has been closed.*

1. Squeeze the brake lever, open the front brake caliper upper bleed valve 1/4 turn and then close it.
2. Release the brake lever slowly until the upper bleed valve has been closed.
3. Repeat steps 1 and 2 until air bubbles do not appear in the bleed hose.

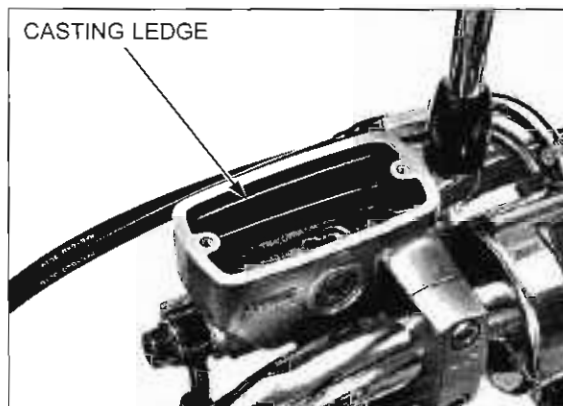
After bleeding the air completely, tighten the bleed valve to the specified torque.

**TORQUE: 5.5 N·m (0.6 kgf·m, 4.1 lbf·ft)**





Fill the reservoir to the casting ledge with DOT 4 brake fluid.

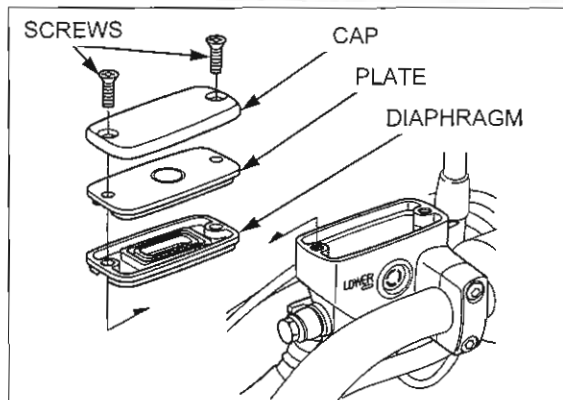


Install the following:

- Diaphragm
- Set plate
- Reservoir cap
- Screws

Tighten the screws to the specified torque.

**TORQUE: 1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)**



### REAR (COMBINED): FLUID FEEDING

Fill with the fluid and bleed air from the brake pedal line in the sequence as follow:

1. Front brake caliper lower bleed valve
2. Rear brake caliper left bleed valve
3. Rear brake caliper right bleed valve

*Do not mix different types of fluid since they are not compatible.*

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

Connect a commercially available brake bleeder to the front caliper lower bleed valve.

Operate the brake bleeder and loosen the lower bleed valve.

If an automatic refill system is not used, add brake fluid when the fluid level in the reservoir is low.



### NOTE:

- Check the fluid level often while bleeding to prevent air from being pumped into the system.
- When using a brake bleeding tool, follow the manufacture's operating instructions.

Perform the bleeding procedure until the system is completely flushed/bled

### NOTE:

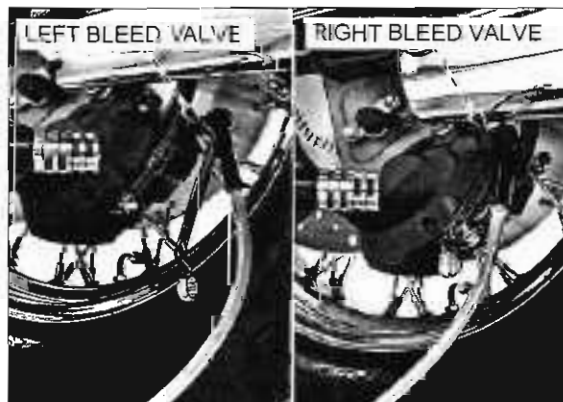
If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.

Close the bleed valve and operate the brake pedal. If it is still spongy, bleed the system again.

After bleeding the air completely, tighten the rear brake caliper left bleed valve to the specified torque.

**TORQUE: 5.5 N·m (0.6 kgf·m, 4.1 lbf·ft)**

Repeat the fluid feeding procedure about 2 - 3 times at rear brake caliper right bleed valve.

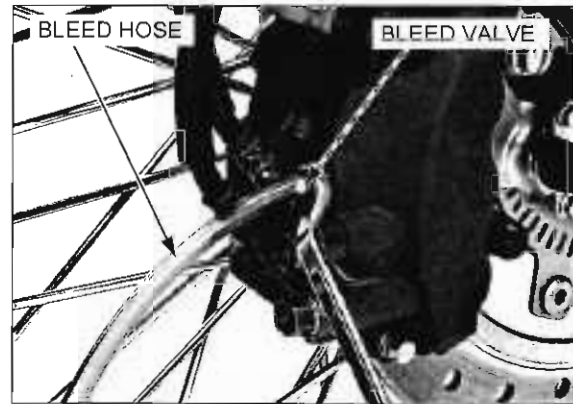


## HYDRAULIC BRAKE

If a brake bleeder is not available, use the following procedure:

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

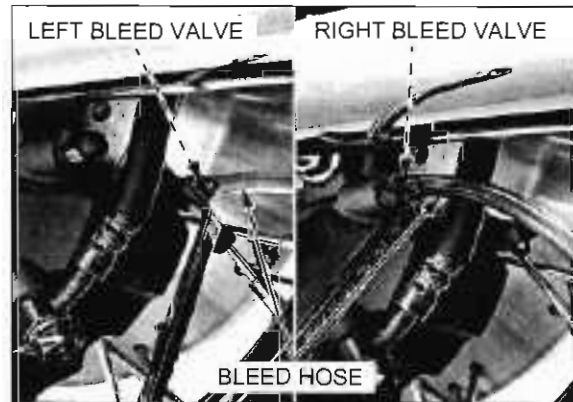
Connect a bleed hose to the lower bleed valve.



Pressurize the system with the brake pedal until pedal resistance is felt.

*Do not release the brake pedal until the bleed valve has been closed.*

1. Pump the brake pedal, open the rear brake caliper left bleed valve 1/4 turn and then close it.
2. Release the brake pedal slowly until the rear brake caliper left bleed valve has been closed.
3. Repeat steps 1 and 2 until air bubbles do not appear in the bleed hose.
4. Repeat the fluid feeding procedure at rear brake caliper right bleed valve.



After bleeding the air completely, tighten the bleed valve to the specified torque.

**TORQUE: 1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)**

Fill the reservoir to the casting ledge with DOT 4 brake fluid.

Install the following:

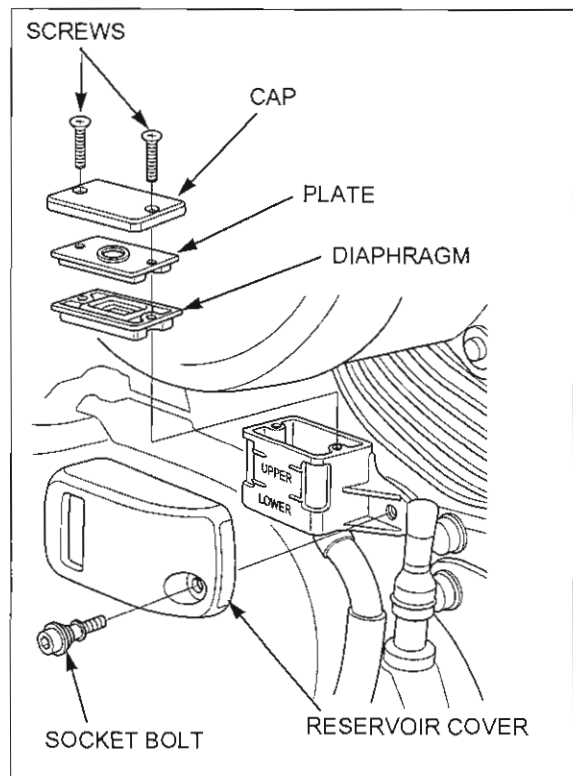
- Diaphragm
- Set plate
- Reservoir cap
- Screws

Tighten the screws to the specified torque.

**TORQUE: 1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)**

Install the reservoir cover.

Install and tighten the socket bolt securely.



**REAR (COMBINED): AIR BLEEDING**

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

Connect a commercially available brake bleeder to the front brake caliper lower bleed valve.

Operate the brake bleeder and loosen the lower bleed valve.

If an automatic refill system is not used, add brake fluid when the fluid level in the reservoir is low.

**NOTE:**

- Check the fluid level often while bleeding to prevent air from being pumped into the system.
- When using a brake bleeding tool, follow the manufacturer's operating instructions.

Perform the bleeding procedure until the system is completely flushed/bled

**NOTE:**

If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.

Close the bleed valve and operate the brake pedal. If it is still spongy, bleed the system again.

After bleeding the air completely, tighten the rear brake caliper left bleed valve to the specified torque.

**TORQUE: 5.5 N·m (0.6 kgf·m, 4.1 lbf·ft)**

Repeat the fluid feeding procedure about 2 - 3 times at rear brake caliper right bleed valve.

If a brake bleeder is not available, use the following procedure:

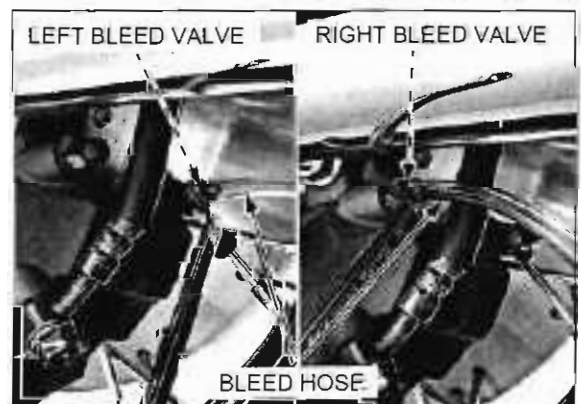
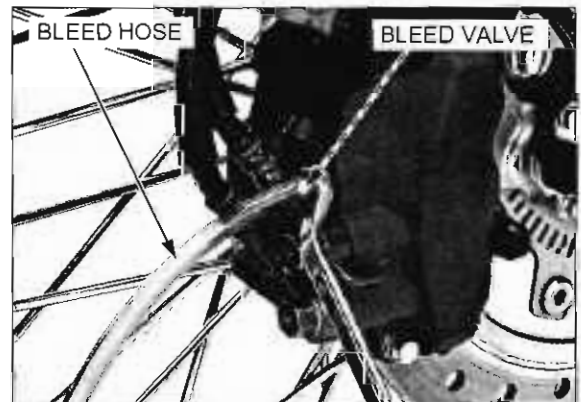
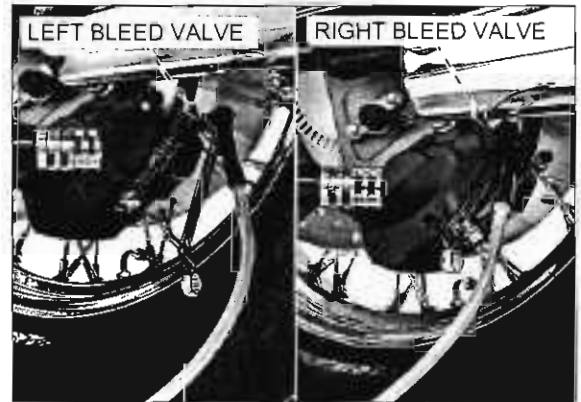
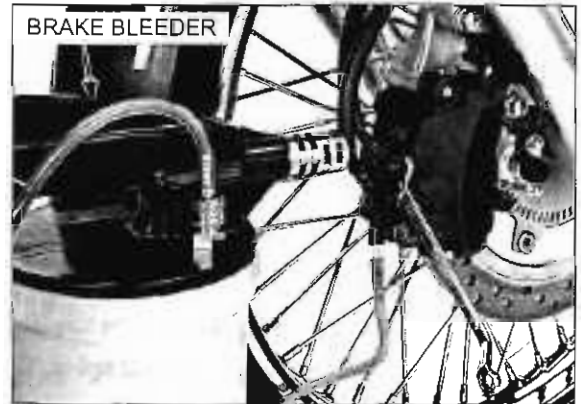
Fill the reservoir with DOT 4 brake fluid from a sealed container.

Connect a bleed hose to the lower bleed valve.

Pressurize the system with the brake pedal until strong pedal resistance is felt.

*Do not release the brake pedal until the bleed valve has been closed.*

1. Pump the brake pedal, open the rear brake caliper left bleed valve 1/4 turn and then close it.
2. Release the brake pedal slowly until the rear brake caliper left bleed valve has been closed.
3. Repeat steps 1 and 2 until air bubbles do not appear in the bleed hose.
4. Repeat the fluid feeding procedure at rear brake caliper right bleed valve.



## HYDRAULIC BRAKE

After bleeding the air completely, tighten the bleed valve to the specified torque.

**TORQUE: 1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)**

Fill the reservoir to the casting ledge with DOT 4 brake fluid.

Install the following:

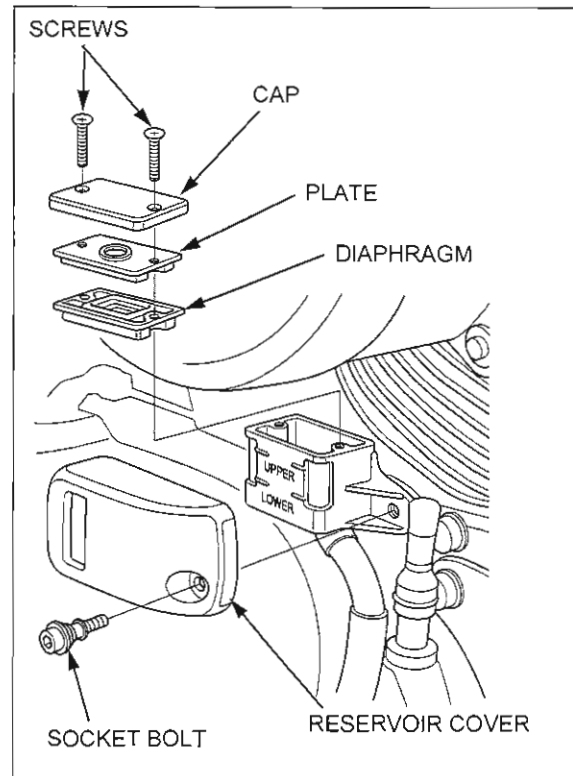
- Diaphragm
- Set plate
- Reservoir cap
- Screws

Tighten the screws to the specified torque.

**TORQUE: 1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)**

Install the reservoir cover.

Install and tighten the socket bolt securely.



## BRAKE PAD/DISC

### BRAKE PAD REPLACEMENT (VT750C2F/C2B)

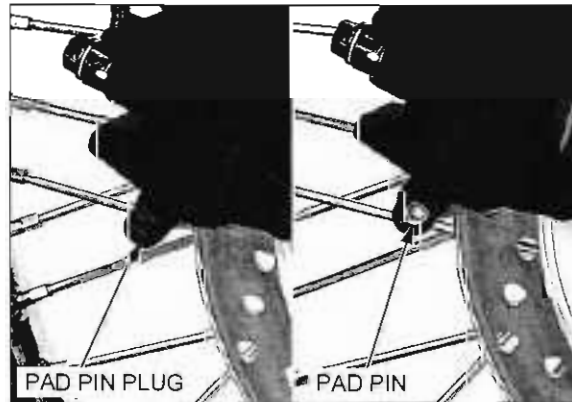
*Check the brake fluid level in the reservoir as this operation causes the level to rise.*

Push the caliper piston all the way in to allow installation of new brake pads.



Remove the pad pin plug and loosen the pad pin.

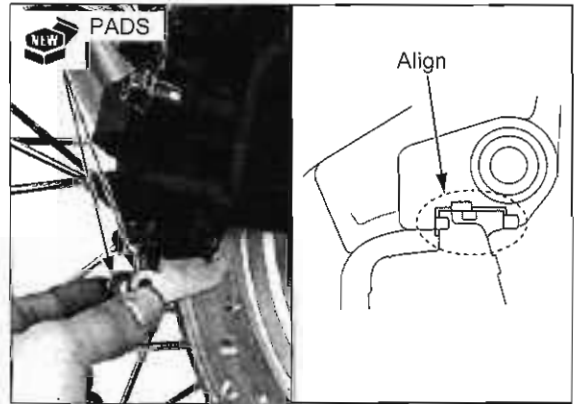
Pull the pad pin out of the caliper body while pushing in the pads against the pad spring.



Remove the brake pads.

*Make sure the pad spring is installed correctly. Always replace the brake pads in pairs to ensure even disc pressure.*

Install new brake pads into the caliper so their ends rest into the pad retainer on the bracket properly.



Install the pad pin by pushing in the pads against the pad spring to align the pad pin holes in the pads with the caliper body.

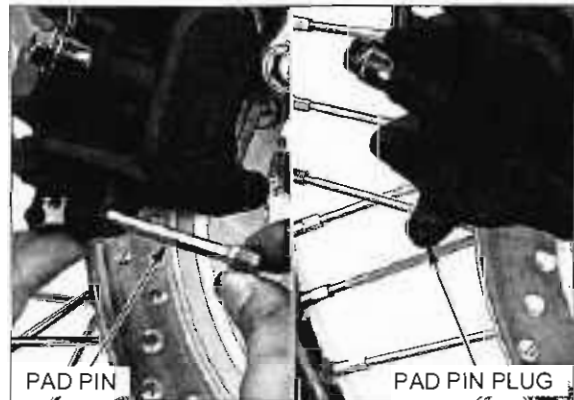
Tighten the pad pin to the specified torque.

**TORQUE: 18 N·m (1.8 kgf-m, 13 lbf-ft)**

Install the pad pin plug and tighten it to the specified torque.

**TORQUE: 2.5 N·m (0.3 kgf-m, 1.8 lbf-ft)**

Operate the brake lever to seat the caliper piston against the pads.

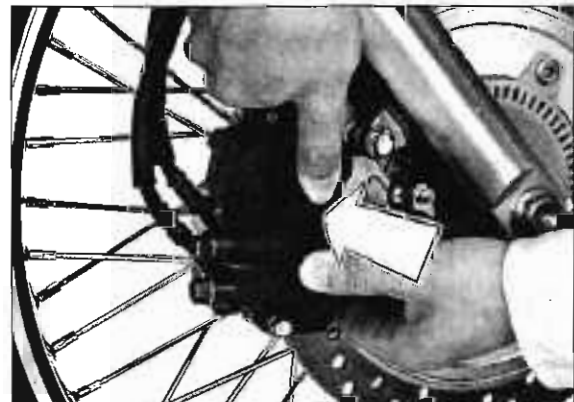


## BRAKE PAD REPLACEMENT (VT750C2S)

### FRONT:

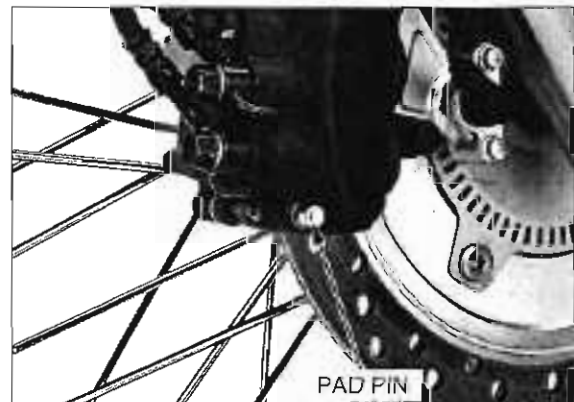
*Check the brake fluid level in the reservoir as this operation causes the level to rise.*

Push the caliper piston all the way in to allow installation of new brake pads.



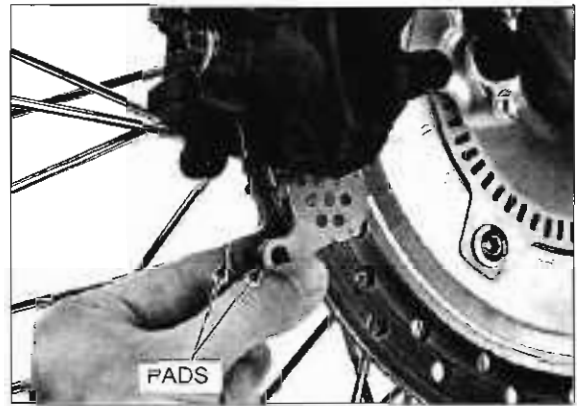
Loosen the pad pin.

Pull the pad pin out of the caliper body while pushing in the pads against the pad spring.



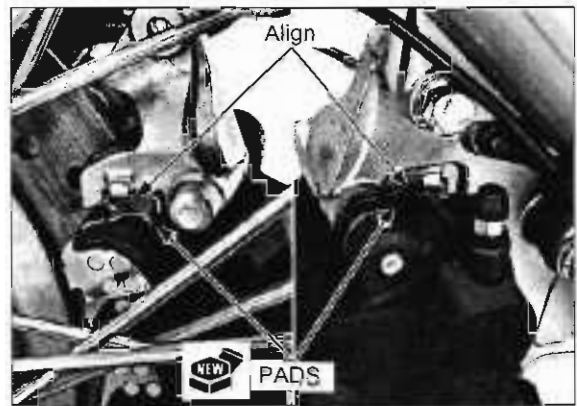
## HYDRAULIC BRAKE

Remove the brake pads.



*Make sure the pad spring is installed correctly. Always replace the brake pads in pairs to ensure even disc pressure.*

Install new brake pads into the caliper so their ends rest into the pad retainer on the bracket properly.



Apply silicone grease to the stopper ring on the pad pin. Install the pad pin by pushing in the pads against the pad spring to align the pad pin holes in the pads with the caliper body.

Tighten the pad pin to the specified torque.

**TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)**

Operate the brake lever to seat the caliper piston against the pads.



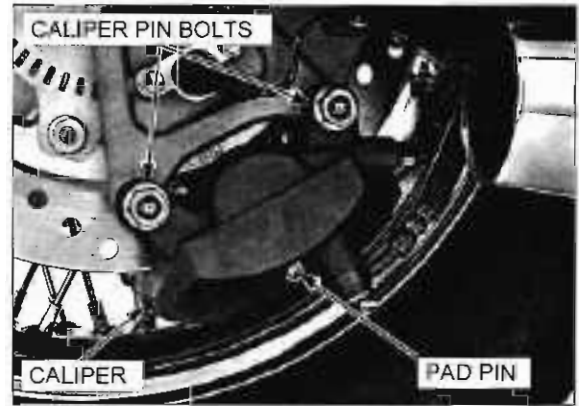
### REAR:

Remove the pad pin plug and loosen the pad pin.

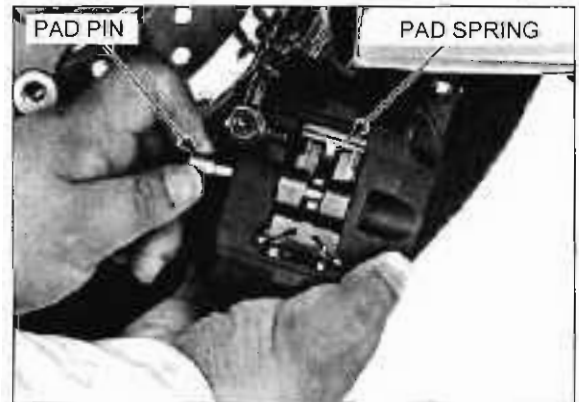


Loosen the pad pin.

Remove the rear caliper pin bolts and rear brake caliper.



Remove the pad pin and pad spring.

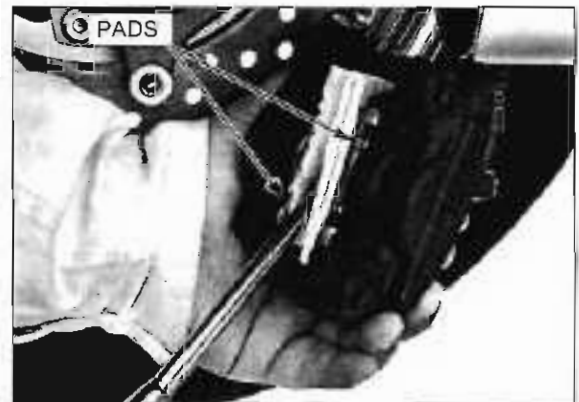


*Check the brake fluid level in the reservoir as this operation causes the level to rise.*

Push the caliper piston all the way in to allow installation of new brake pads.

Remove the brake pads.

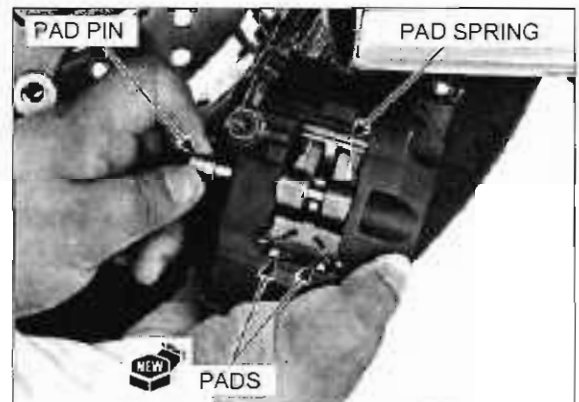
Clean the inside of the caliper especially around the caliper pistons.



*Make sure the pad spring is installed correctly. Always replace the brake pads in pairs to ensure even disc pressure.*

Install new brake pads into the caliper.

Install the pad pin by pushing in the pads against the pad spring to align the pad pin holes in the pads with the caliper body.



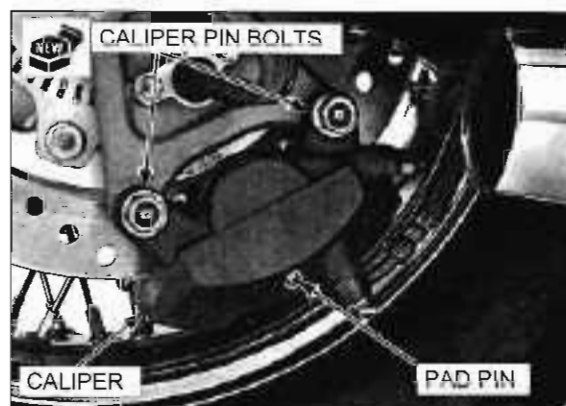
## HYDRAULIC BRAKE

Install and tighten the new rear brake caliper pin bolts to the specified torque.

**TORQUE: 45 N·m (4.6 kgf·m, 33 lbf·ft)**

Tighten the pad pin to the specified torque.

**TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)**



Install the pad pin plug and tighten it to the specified torque.

**TORQUE: 2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)**

Operate the brake pedal to seat the caliper piston against the pads.



## BRAKE DISC INSPECTION

Visually inspect the disc for damage or cracks.

Measure the brake disc thickness at several points.

**VT750C2F/C2B:**

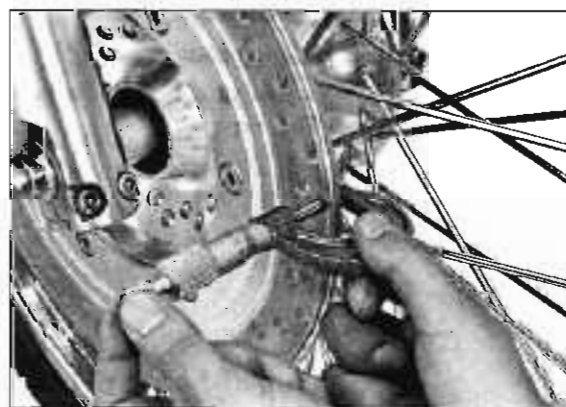
**SERVICE LIMIT: 5.0 mm (0.20 in)**

**VT750C2S:**

**SERVICE LIMITS:**

**FRONT: 4.0 mm (0.16 in)**

**REAR: 5.0 mm (0.20 in)**



Measure the brake disc warpage with a dial indicator.

**SERVICE LIMIT: 0.30 mm (0.012 in)**

Check the bearing for excessive play, if the warpage exceeds the service limit.

Replace the brake disc if the bearings are normal.

For brake disc replacement (page 14-19).





# FRONT MASTER CYLINDER

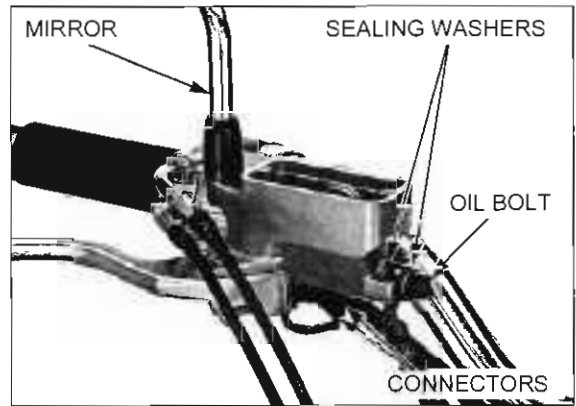
## DISASSEMBLY

Drain the brake fluid from the hydraulic system (page 16-8).

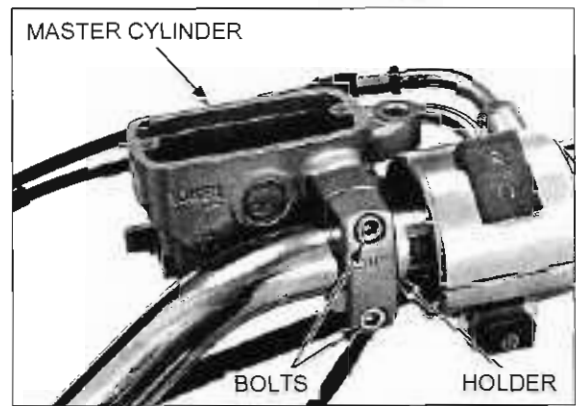
Remove the rearview mirror.

*When removing the oil bolt, cover the end of the hose to prevent contamination.*

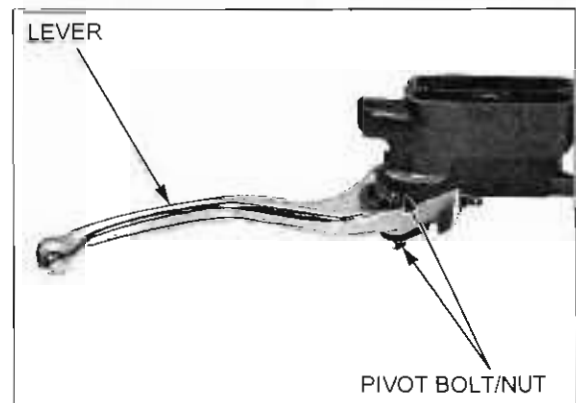
Remove the oil bolt and sealing washers. Disconnect the front brake light switch connectors.



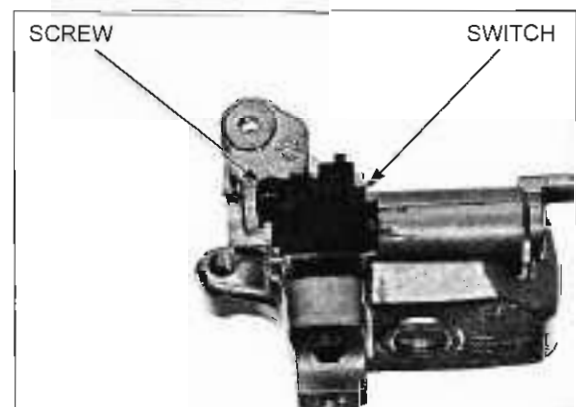
Remove the bolts, holder and master cylinder.



Remove the nut, pivot bolt and brake lever.

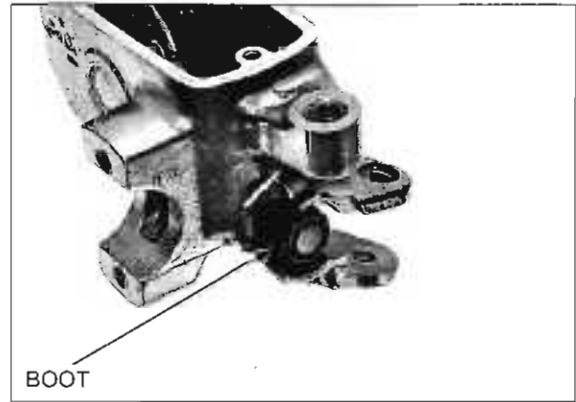


Remove the screw and front brake light switch.



## HYDRAULIC BRAKE

Remove the boot.

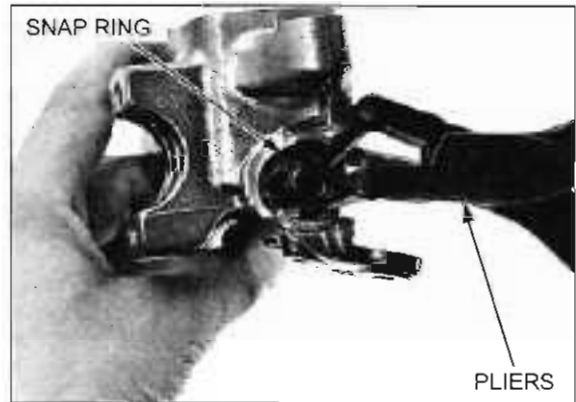


Remove the snap ring using a special tool.

**TOOL:**

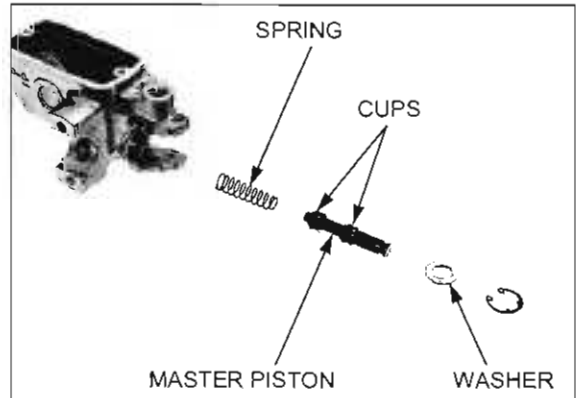
**Snap ring pliers**

**07914-SA50001**



Remove the washer, master piston and spring.

Clean the master cylinder, reservoir and master piston in clean brake fluid.



### INSPECTION

Check the master cylinder for abnormal scratches or damage.

Measure the master cylinder I.D.

**SERVICE LIMIT: 11.05 mm (0.435 in)**

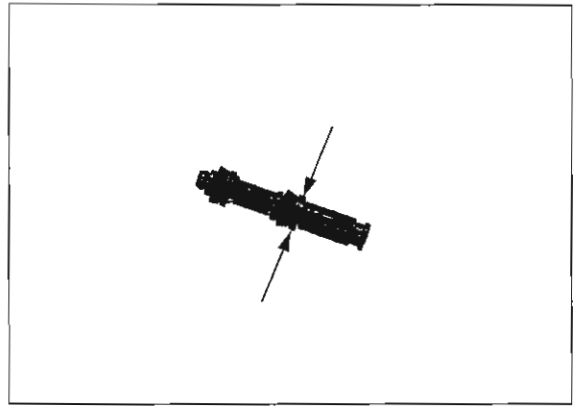


Check the piston cups and boot for wear, deterioration or damage.

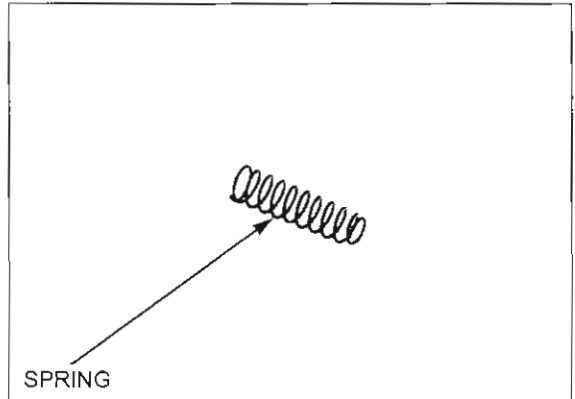
Check the master piston for abnormal scratches or damage.

Measure the master piston O.D.

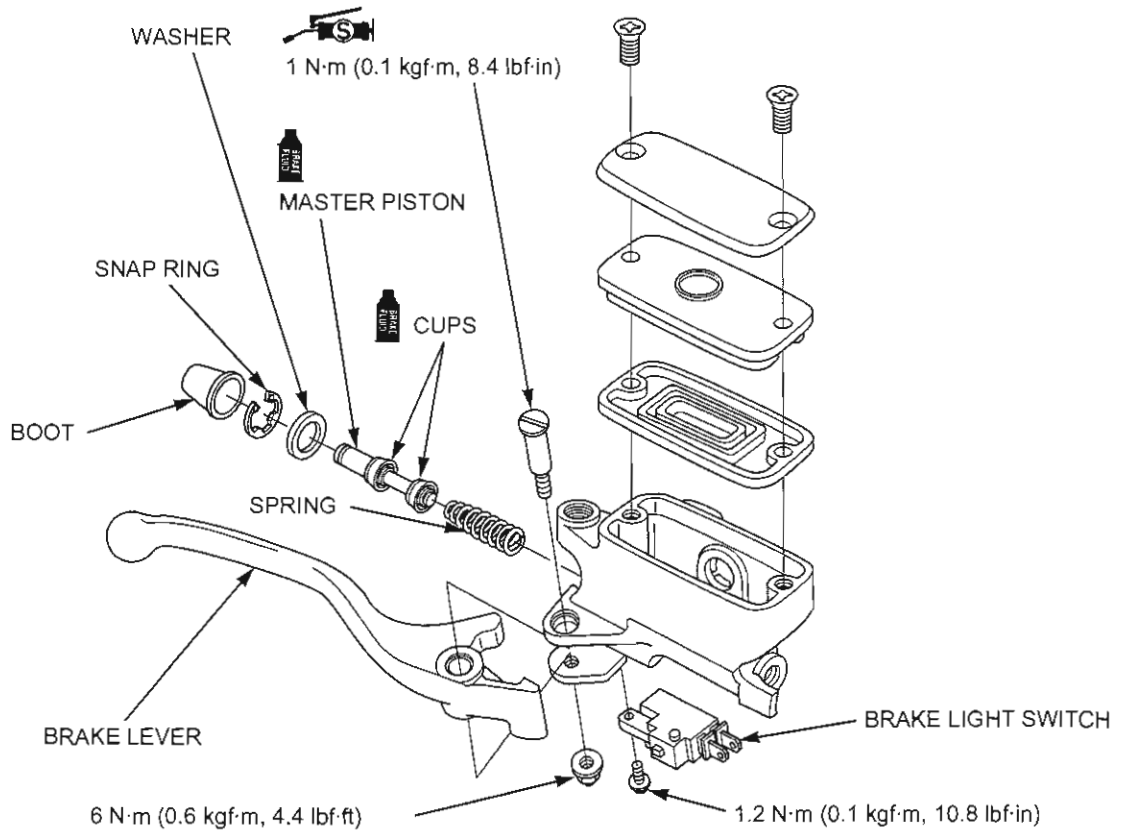
**SERVICE LIMIT: 10.945 mm (0.4309 in)**



Check the spring for fatigue or damage.



## ASSEMBLY



## HYDRAULIC BRAKE

### NOTE:

Replace the piston, spring, cups, washer and snap ring as a set.

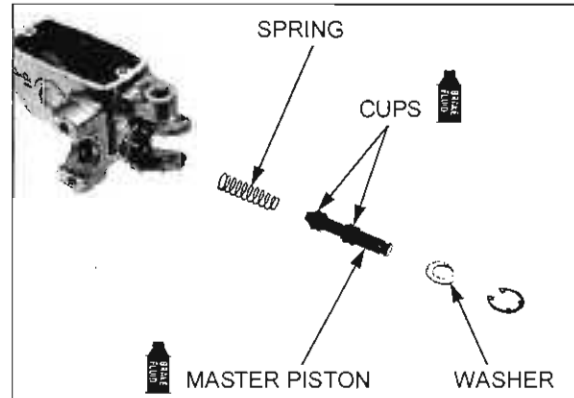
Coat the master piston and piston cups with clean brake fluid.

Install the spring onto the piston end.

Install the master piston/spring into the master cylinder.

Install the washer on the piston.

*Do not allow the piston cup lips to turn inside out.*



Install the snap ring into the groove in the master cylinder using a special tool.

### TOOL:

**Snap ring pliers**

**07914-SA50001**

- Install the snap ring and washer with the chamfered edges facing the thrust load side.
- Do not reuse worn snap ring which could easily spin in the groove.
- Check that the snap ring is seated in the grooves.

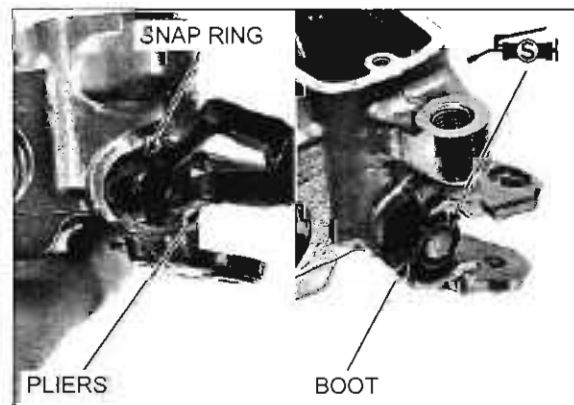
Install the boot into the master cylinder and piston groove.

Apply 0.1 g of silicone grease to the brake lever contacting area of the piston.

Install the brake light switch, aligning its boss with the groove of the master cylinder.

Install and tighten the screw to the specified torque.

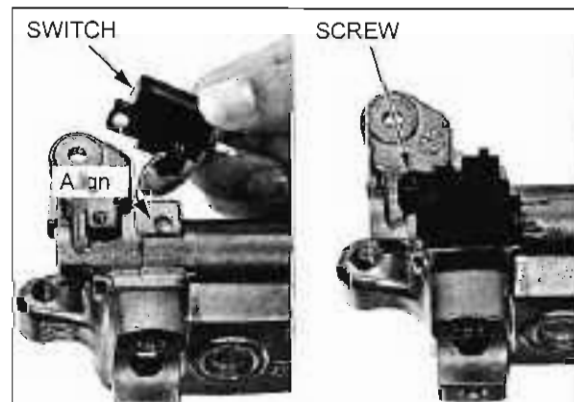
**TORQUE: 1.2 N·m (0.1 kgf·m, 10.8 lbf·in)**



Install the brake light switch, aligning its boss with the groove of the master cylinder.

Install and tighten the screw to the specified torque.

**TORQUE: 1.2 N·m (0.1 kgf·m, 10.8 lbf·in)**



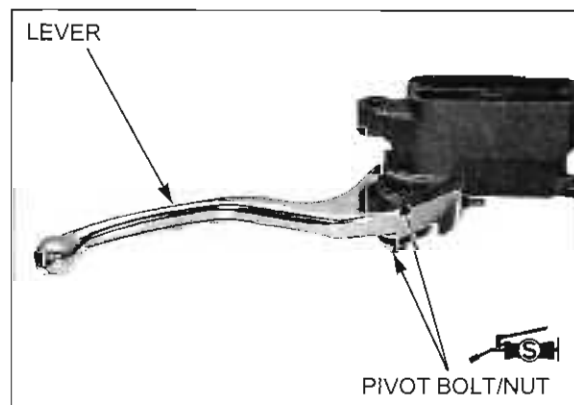
Apply 0.1 g of silicone grease to the brake lever pivot sliding surface.

Install the brake lever and pivot bolt, and tighten it to the specified torque.

**TORQUE: 1 N·m (0.1 kgf·m, 8.4 lbf·in)**

Tighten the nut to the specified torque while holding the pivot bolt.

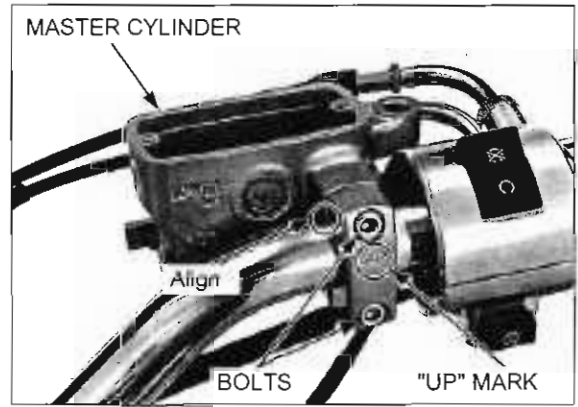
**TORQUE: 6 N·m (0.6 kgf·m, 4.4 lbf·ft)**



Install the holder with its "UP" mark facing up.

Install the master cylinder with the holder and two bolts. Align the edge of the master cylinder with the punch mark on the handlebar and tighten the upper bolt first, then tighten the lower bolt to the specified torque.

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



**VT750C2F;** Connect the brake hose to the master cylinder with the oil bolt and new sealing washers.

**NOTE:**

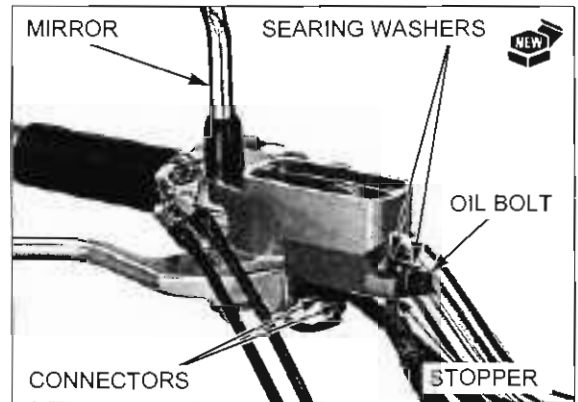
Be sure to rest the hose joint against the stopper. Tighten the oil bolt to the specified torque.

**TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)**

Install the rearview mirror.

Connect the brake light switch connectors.

Fill and bleed the hydraulic system (page 16-8).



**VT750C2B/C2S;** Connect the brake hose to the master cylinder with the oil bolt and new sealing washers.

**NOTE:**

Be sure to rest the hose joint stopper against the stopper on the master cylinder.

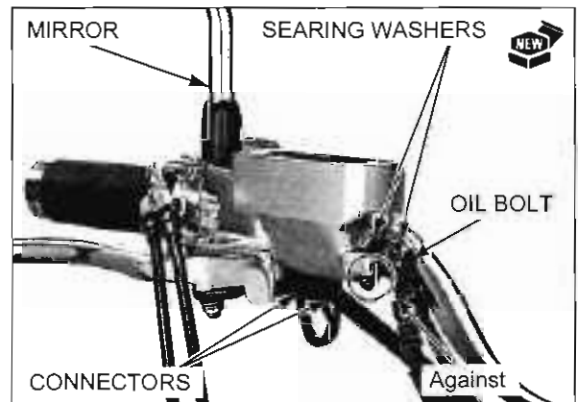
Tighten the oil bolt to the specified torque.

**TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)**

Install the rearview mirror.

Connect the brake light switch connectors.

Fill and bleed the hydraulic system (page 16-8).



## FRONT BRAKE CALIPER (VT750C2F/C2B)

### DISASSEMBLY

Drain the brake fluid from the hydraulic system (page 16-8).

Remove the brake pads (page 16-16).

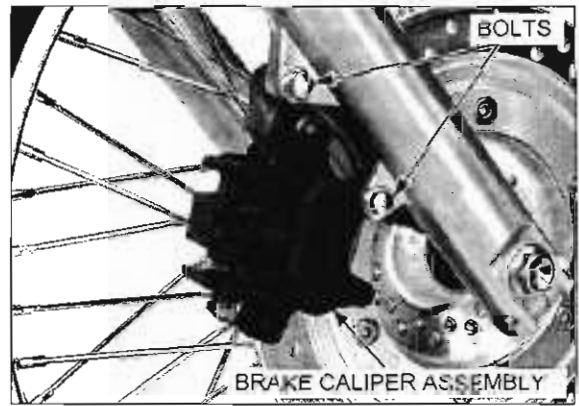
Remove the oil bolt and sealing washers.

When removing the oil bolt, cover the end of hose to prevent contamination.

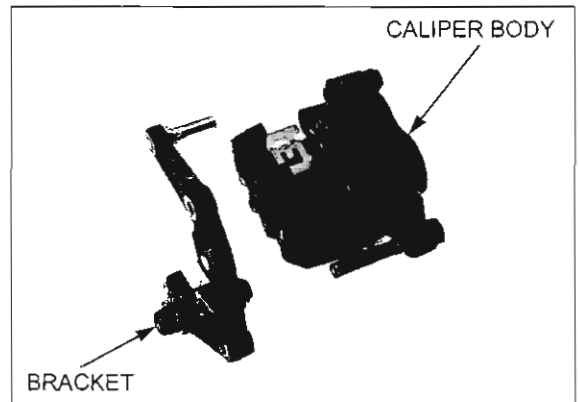


## HYDRAULIC BRAKE

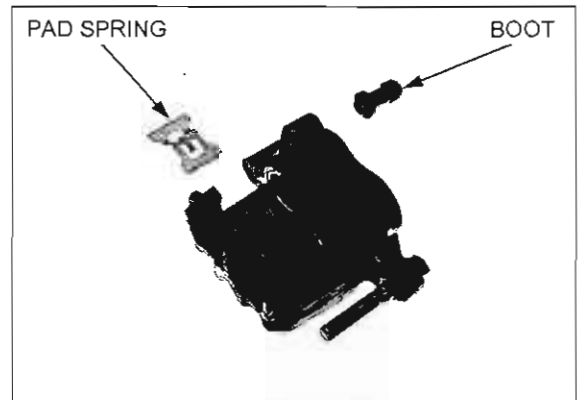
*Do not reuse the caliper mounting bolts.* Remove the mounting bolts and brake caliper assembly.



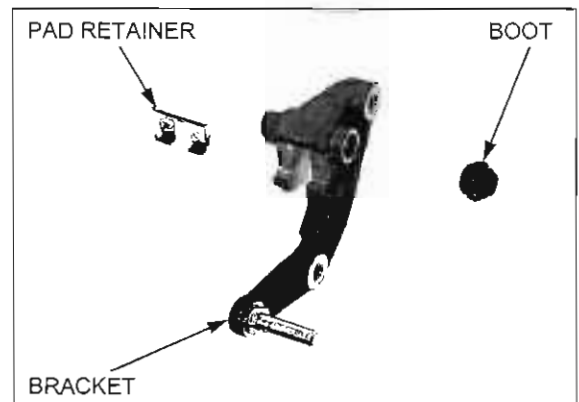
Remove the bracket from the caliper body.



Remove the bracket pin boot and pad spring from the caliper body.



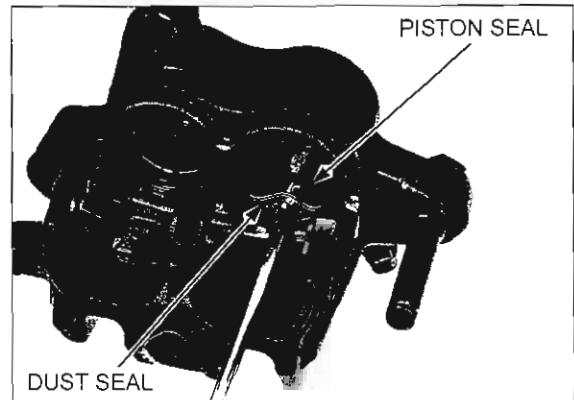
Remove the caliper pin boot and pad retainer from the bracket.  
Clean the retainer and bracket mating surfaces.



*Do not use high pressure air or bring the nozzle too close the inlet.* Place a shop towel over the pistons. Position the caliper body with the piston facing down and apply small squirts of air pressure to the fluid inlet to remove the pistons.



*Be careful not to damage the piston sliding surface.* Push the dust and piston seals in and lift them out. Clean the seal grooves, caliper cylinders and pistons with clean brake fluid.



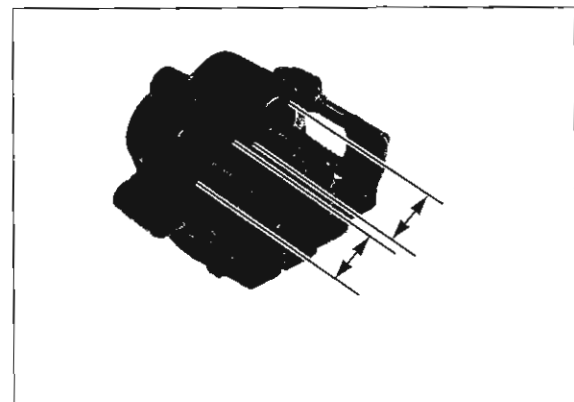
## INSPECTION

Check the caliper cylinders for scoring, scratches or damage.

Measure the caliper cylinder I.D.

**VT750C2F:**  
**SERVICE LIMIT: 27.060 mm (1.0654 in)**

**VT750C2B:**  
**SERVICE LIMIT: 25.460 mm (1.0024 in)**

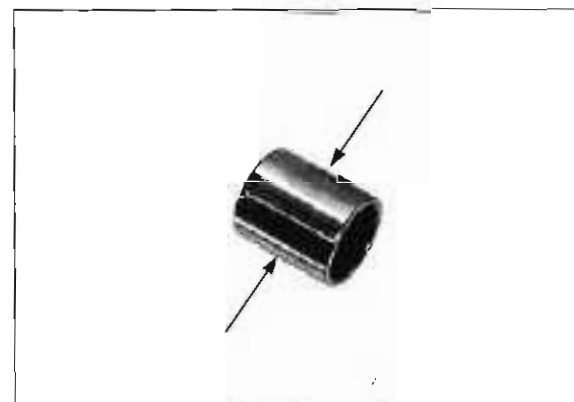


Check the caliper pistons for scoring, scratches or damage.

Measure the caliper piston O.D.

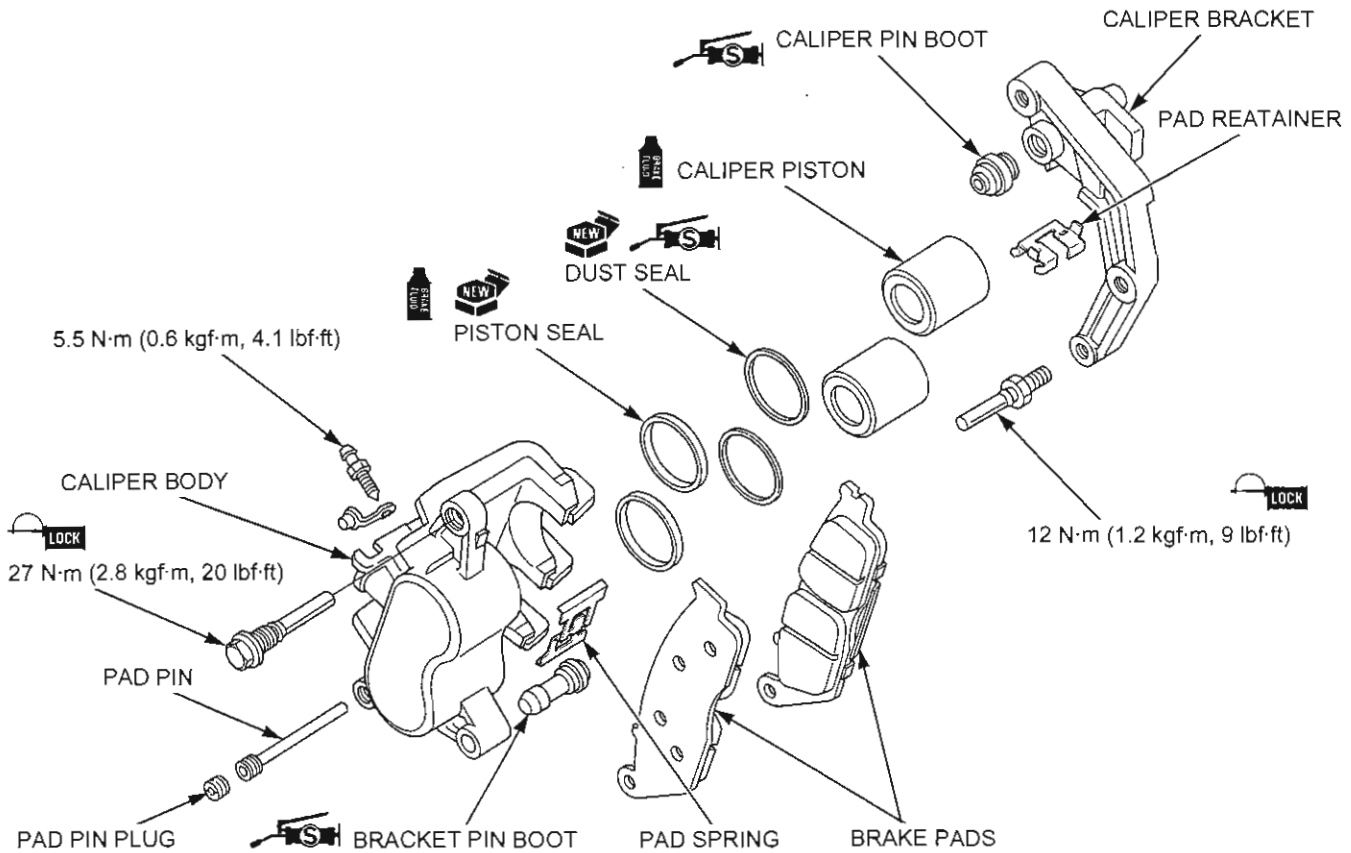
**VT750C2F:**  
**SERVICE LIMIT: 26.930 mm (1.0602 in)**

**VT750C2B:**  
**SERVICE LIMIT: 25.320 mm (0.9968 in)**



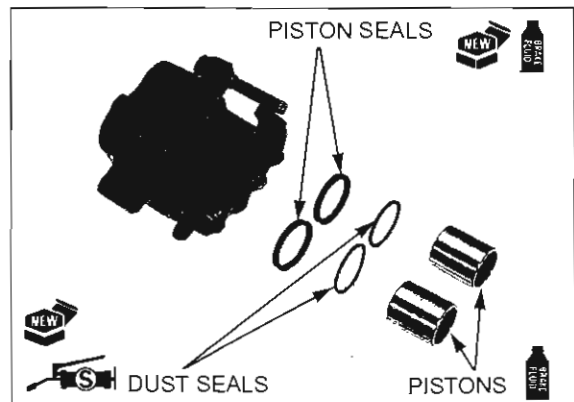
# HYDRAULIC BRAKE

## ASSEMBLY



Coat new piston seals with clean brake fluid, new dust seals with silicone grease and install them into the seal grooves in the caliper.

Coat the caliper pistons with clean brake fluid and install them into the caliper cylinders with the opening toward the pads.

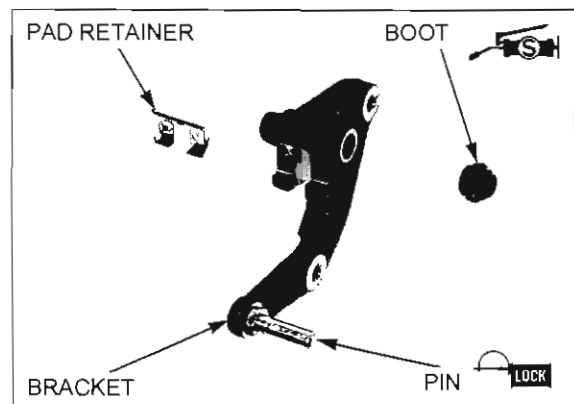


Check the caliper pin boot and replace it if it is hard, deteriorated or damaged.  
Apply 0.4 g of silicone grease to the inside of the caliper pin boot.  
Install the caliper pin boot in the bracket.

Apply Honda Bond A or equivalent to the pad retainer mating surface.  
Install the retainer onto the bracket.

If the bracket pin is removed, apply locking agent to the threads and tighten it.

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





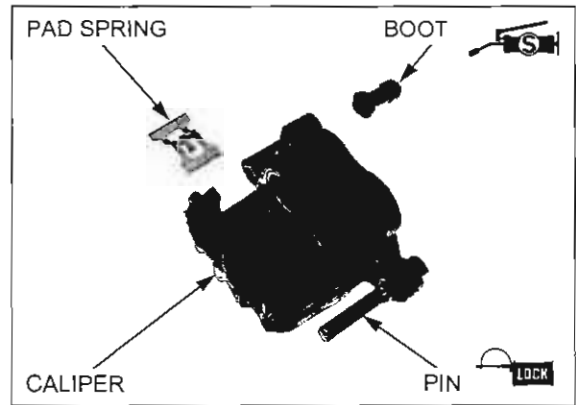
Check the bracket pin boot and replace it if it is hard, deteriorated or damaged.

Apply 0.4 g of silicone grease to the inside of the bracket pin boot.

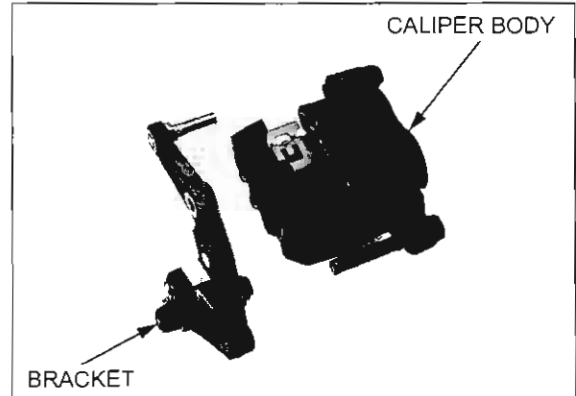
Install the bracket pin boot and pad spring in the caliper.

If the caliper pin is removed, apply locking agent to the threads and tighten it.

**TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)**



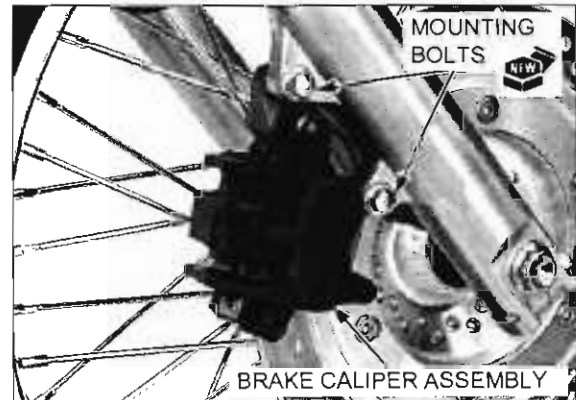
Install the caliper bracket to the caliper body.



Install the brake caliper assembly so the disc is positioned between the pads, being careful not to damage the pads.

Install new caliper mounting bolts and tighten them to the specified torque.

**TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)**



Connect the brake hose to the caliper body with the oil bolt and new sealing washers, and tighten the oil bolt to the specified torque.

**TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)**

Install the brake pads (page 16-16).

Fill and bleed the hydraulic system (page 16-8).



## HYDRAULIC BRAKE

### FRONT BRAKE CALIPER (VT750C2S)

#### DISASSEMBLY

Drain the brake fluid from the hydraulic system (page 16-8).

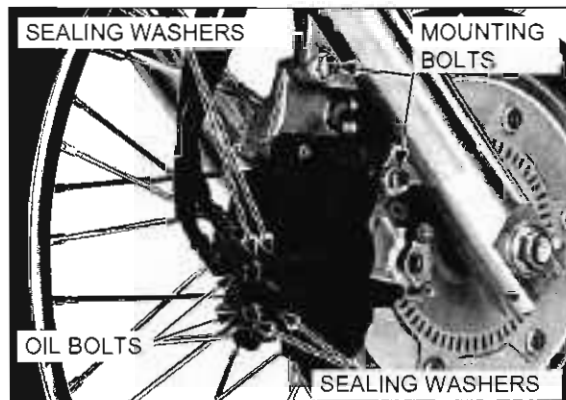
Remove the brake pads (page 16-16).

Remove the front wheel speed sensor (page 17-24).

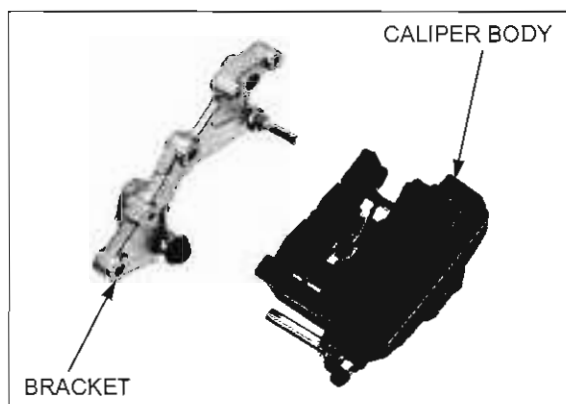
*When removing the oil bolts, cover the end of hoses to prevent contamination.*

Remove the oil bolts and sealing washers.

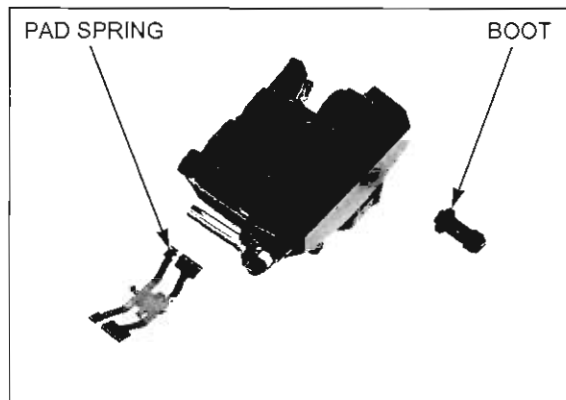
Remove the mounting bolts and brake caliper assembly.



Remove the bracket from the caliper body.

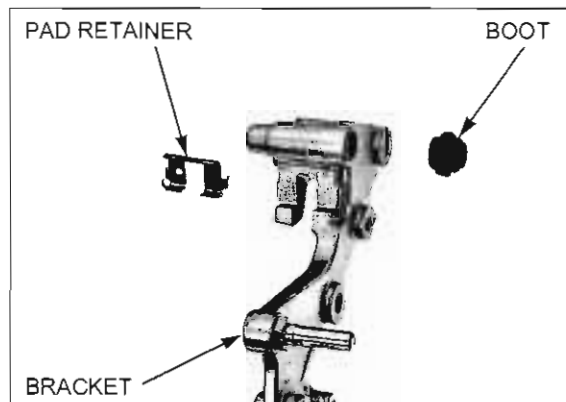


Remove the bracket pin boot and pad spring from the caliper body.



Remove the caliper pin boot and pad retainer from the bracket.

Clean the retainer and bracket mating surfaces.

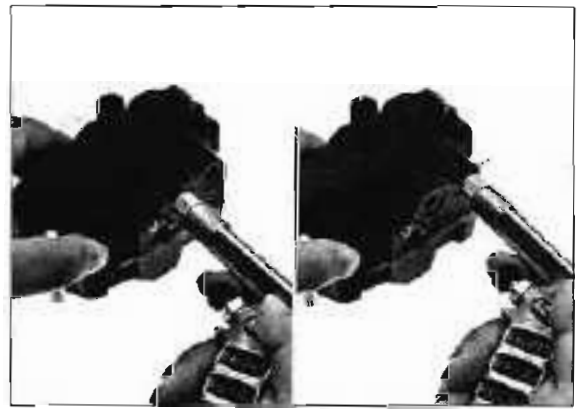


*Do not use high pressure air or bring the nozzle too close the inlet.*

Place a shop towel over the pistons. Position the caliper body with the piston facing down and apply small squirts of air pressure to the fluid inlet to remove the pistons.

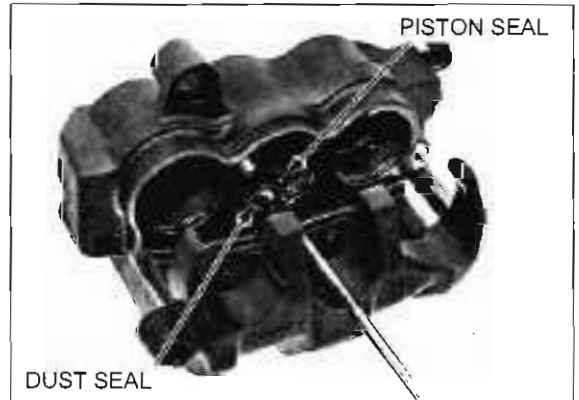
**NOTE:**

Mark the pistons to ensure correct reassembly.



*Be careful not to damage the piston sliding surface.*

Push the dust and piston seals in and lift them out. Clean the seal grooves, caliper cylinders and pistons with clean brake fluid.



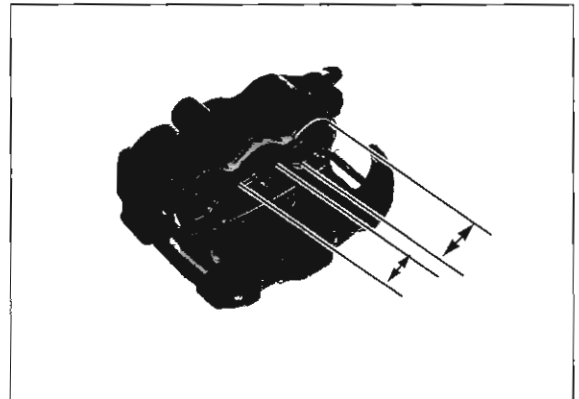
## INSPECTION

Check the caliper cylinders for scoring, scratches or damage.

Measure the caliper cylinder I.D.

**SERVICE LIMITS:**

- Upper: 27.060 mm (1.0654 in)
- Middle: 22.712 mm (0.8942 in)
- Lower: 25.460 mm (1.0024 in)

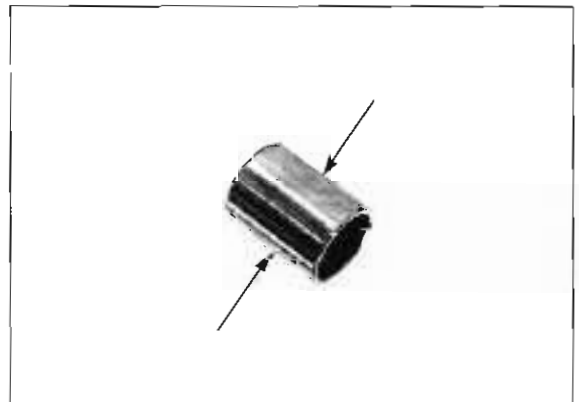


Check the caliper pistons for scoring, scratches or damage.

Measure the caliper piston O.D.

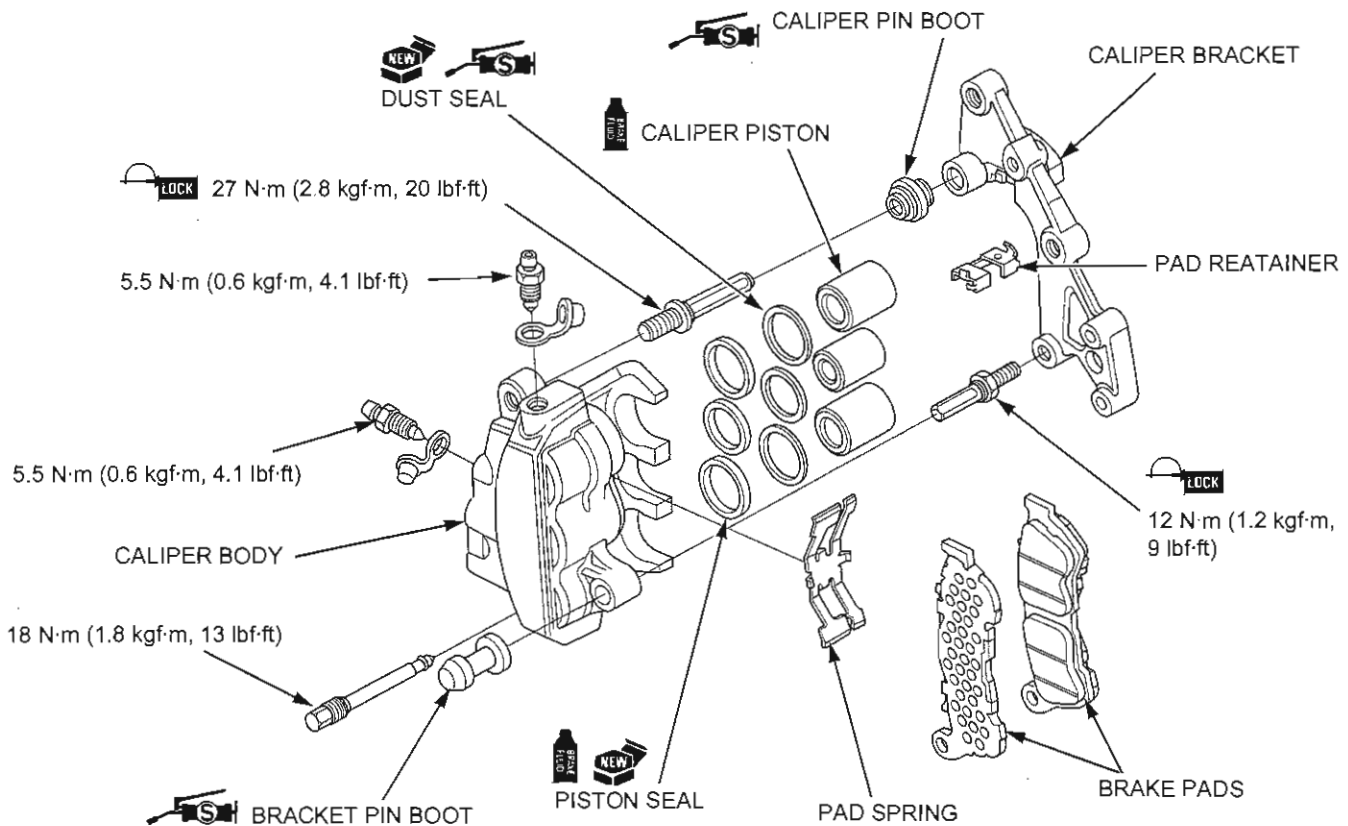
**SERVICE LIMITS:**

- Upper: 26.930 mm (1.0602 in)
- Middle: 22.573 mm (0.8887 in)
- Lower: 25.310 mm (0.9965 in)



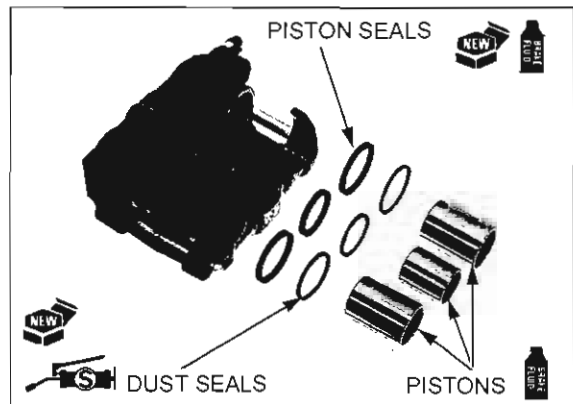
# HYDRAULIC BRAKE

## ASSEMBLY



Coat new piston seals with clean brake fluid, new dust seals with silicone grease and install them into the seal grooves in the caliper.

Coat the caliper pistons with clean brake fluid and install them into the caliper cylinders with the opening toward the pads.



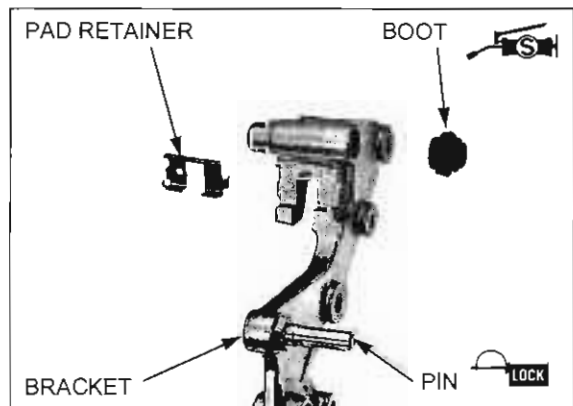
Check the caliper pin boot and replace it if it is hard, deteriorated or damaged.

Apply 0.4 g of silicone grease to the inside of the caliper pin boot. Install the caliper pin boot in the bracket.

Apply Honda Bond A or equivalent to the pad retainer mating surface. Install the retainer onto the bracket.

If the bracket pin is removed, apply locking agent to the threads and tighten it.

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



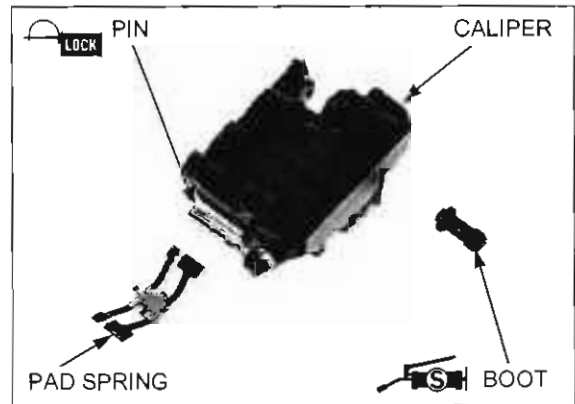
Check the bracket pin boot and replace it if it is hard, deteriorated or damaged.

Apply 0.4 g of silicone grease to the inside of the bracket pin boot.

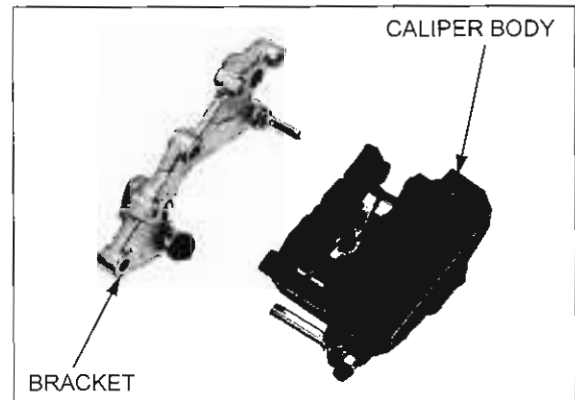
Install the bracket pin boot and pad spring in the caliper.

If the caliper pin is removed, apply locking agent to the threads and tighten it.

**TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)**



Install the caliper bracket to the caliper body.



Install the brake caliper assembly so the disc is positioned between the pads, being careful not to damage the pads.

Install new caliper mounting bolts and tighten them to the specified torque.

**TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)**

Connect the brake hoses to the caliper body with the oil bolts and new sealing washers.

**NOTE:**

Be sure to rest the hose joint stopper against the stopper on the master cylinder.

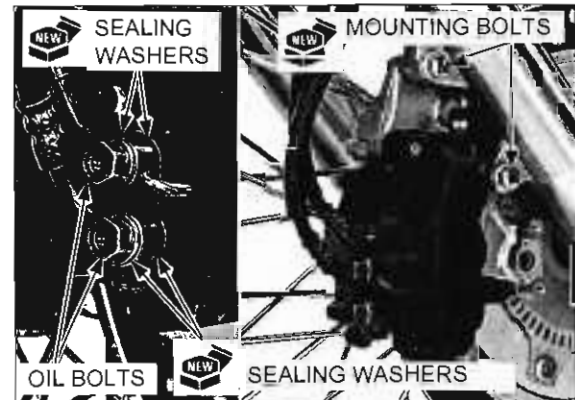
Tighten the oil bolts to the specified torque.

**TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)**

Install the front wheel speed sensor (page 17-24).

Install the brake pads (page 16-16).

Fill and bleed the hydraulic system (page 16-12).



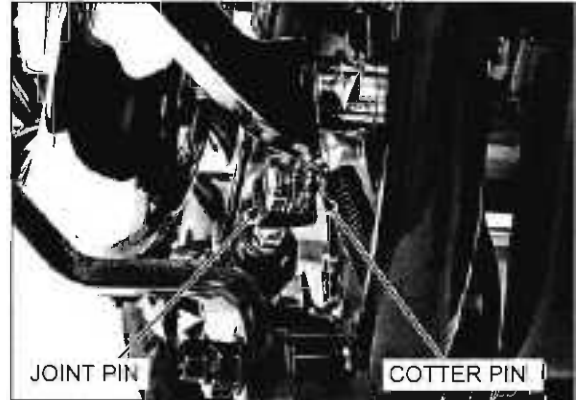
## HYDRAULIC BRAKE

### REAR MASTER CYLINDER (VT750C2S)

#### DISASSEMBLY

Drain the brake fluid from the hydraulic system (page 16-10).

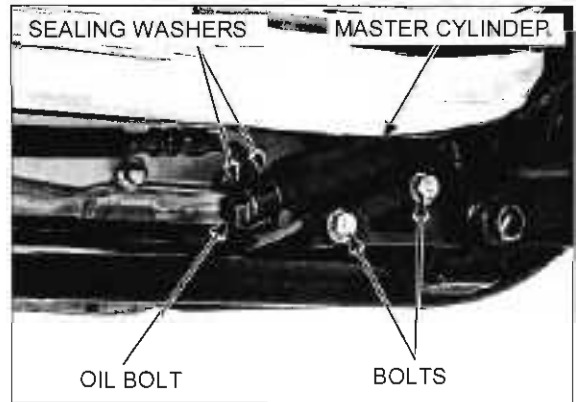
Remove the push rod from the brake pedal by removing the cotter pin and joint pin.



*When removing the oil bolt, cover the end of the hose to prevent contamination.*

Remove the oil bolt and sealing washers.

Remove the mounting bolts and rear master cylinder.



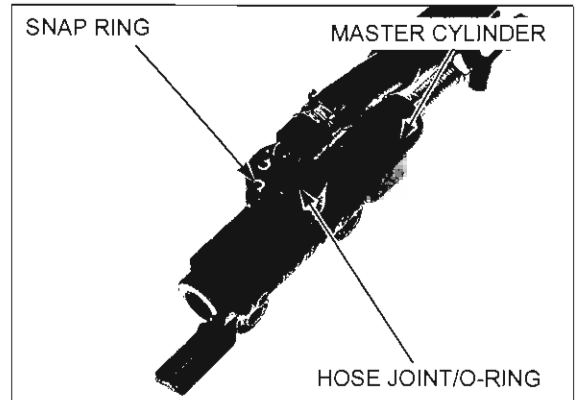
Remove the snap ring using a special tool.

**TOOL:**

**Snap ring pliers**

**07914-SA50001**

Remove the reservoir hose joint and O-ring from the rear master cylinder.



Remove the boot from the push rod groove and rear master cylinder.

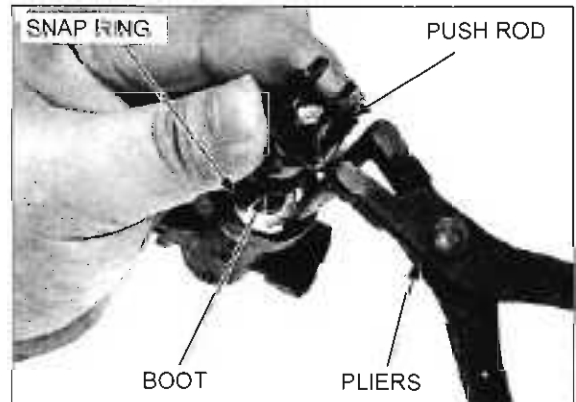
Remove the snap ring using a special tool.

**TOOL:**

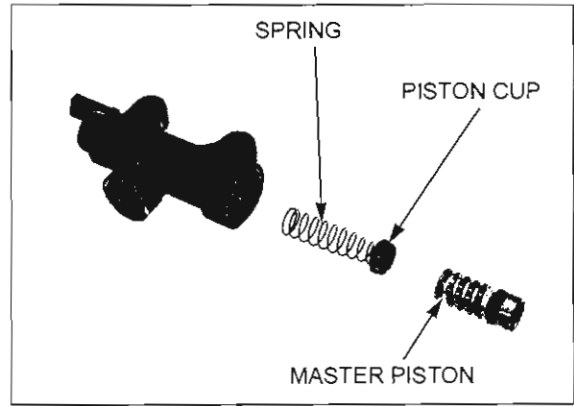
**Snap ring pliers**

**07914-SA50001**

Remove the push rod.



Remove the master piston, piston cup and spring.  
Clean the master cylinder, reservoir and master piston in clean brake fluid.  
Check the spring for fatigue or damage.

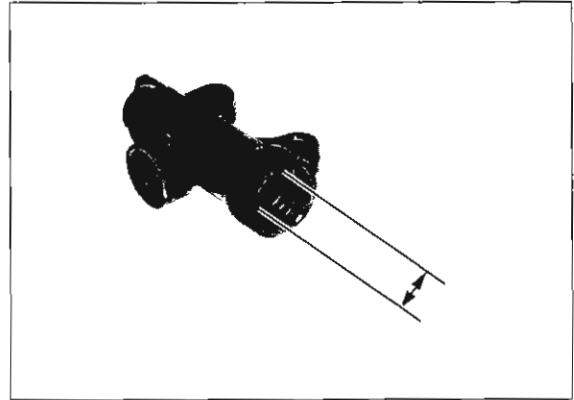


## INSPECTION

Check the master cylinder for abnormal scratches or damage.

Measure the master cylinder I.D.

**SERVICE LIMIT: 14.055 mm (0.5533 in)**

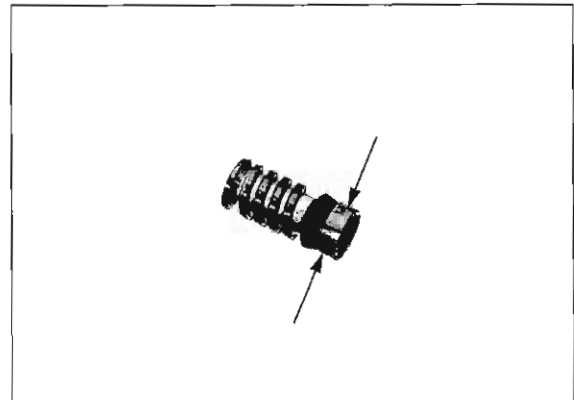


Check the piston cups and boot for wear, deterioration or damage.

Check the master piston for abnormal scratches or damage.

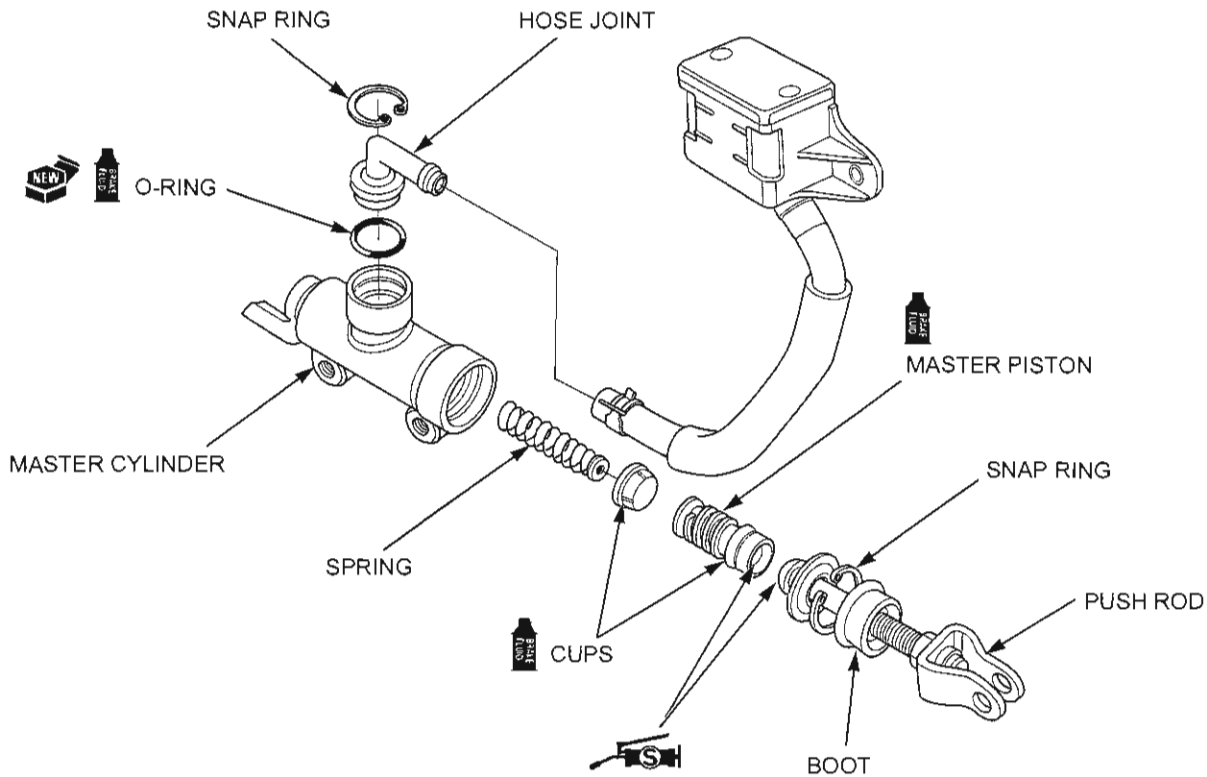
Measure the master piston O.D.

**SERVICE LIMIT: 13.945 mm (0.5490 in)**



# HYDRAULIC BRAKE

## ASSEMBLY



**NOTE:**

Replace the piston, spring, cups, washer and snap ring as a set.

Coat the master piston and piston cups with clean brake fluid.

Install the piston cup onto the spring.

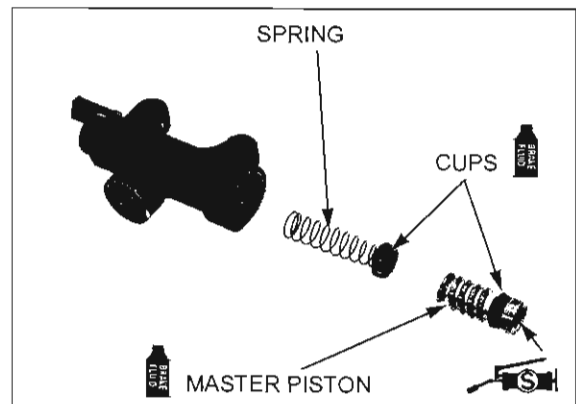
*Do not allow the piston cup lips to turn inside out.*

Install the spring/piston cup into the master cylinder.

Install the master piston/spring into the master cylinder.

Apply silicone grease to the piston contacting surface of the push rod.

Install the push rod into the master cylinder.



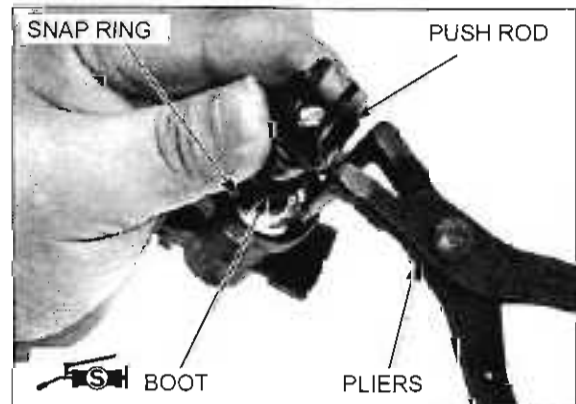
Install the snap ring into the groove in the master cylinder using a special tool.

**TOOL:**

**Snap ring pliers** **07914-SA50001**

- Install the snap ring with the chamfered edges facing the thrust load side.
- Do not reuse worn snap ring which could easily spin in the groove.
- Check that the snap ring is seated in the grooves.

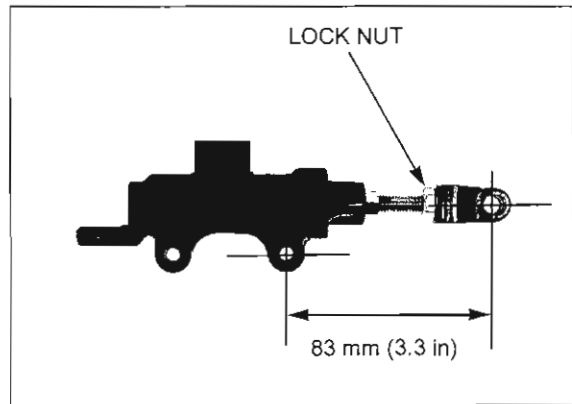
Apply 1 g of silicone grease to the boot groove in the push rod and install the piston boot into the master cylinder and the groove in the push rod.





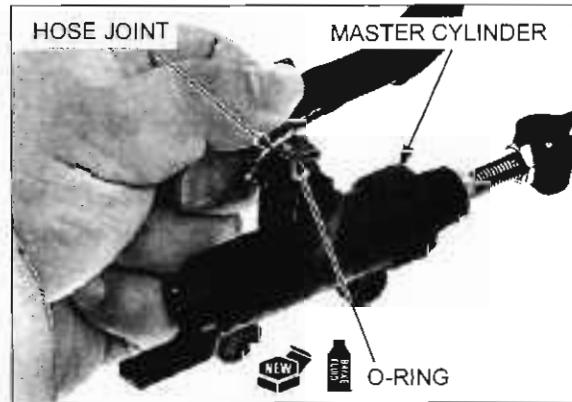
If the push rod is disassembled, adjust the push rod length as shown.  
After adjustment, tighten the lock nut to the specified torque.

**TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)**



Apply clean brake fluid to a new O-ring and install it to the reservoir hose joint.

Install the reservoir hose joint into the master cylinder.

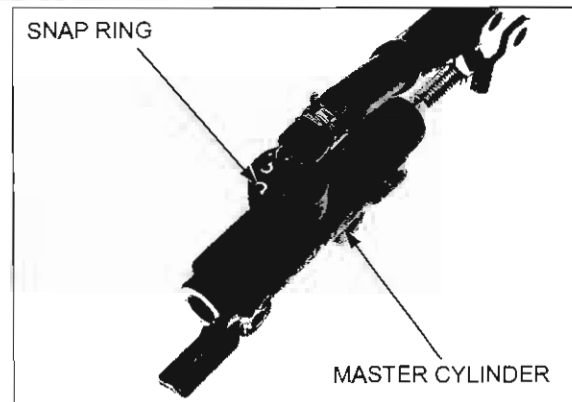


Install the snap ring into the master cylinder groove using a special tool.

**TOOL:**

Snap ring pliers

07914-SA50001

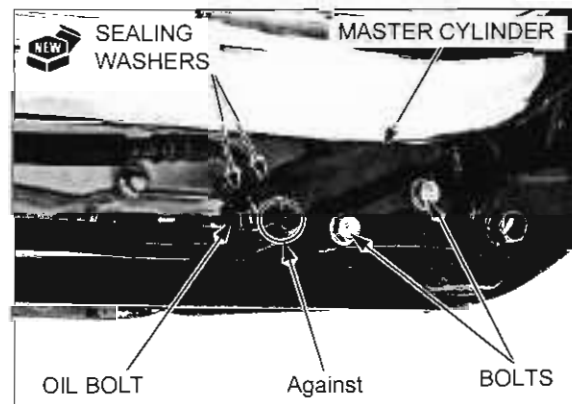


Install the master cylinder onto the frame and tighten the bolts securely.

*Be sure to rest the hose joint stopper against the stopper on the master cylinder.*

Connect the brake hose to the master cylinder with the oil bolt and new sealing washers.  
Tighten the oil bolt to the specified torque.

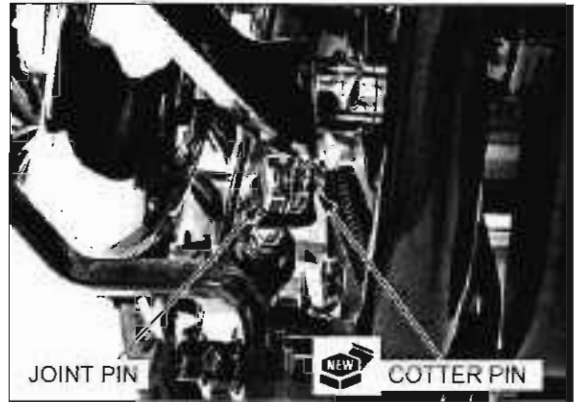
**TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)**



## HYDRAULIC BRAKE

Install the push rod to the brake pedal with the joint pin and secure the joint pin with a new cotter pin.

Fill and bleed the hydraulic system (page 16-12).



## REAR BRAKE CALIPER (VT750C2S)

### DISASSEMBLY

Drain the brake fluid from the hydraulic system (page 16-8).

*When removing the oil bolt, cover the end of hose to prevent contamination.*

Remove the oil bolt and sealing washers.

Remove the brake pads (page 16-16).



Place a shop towel between the pistons.

*Do not use high pressure air or bring the nozzle too close the inlet.*

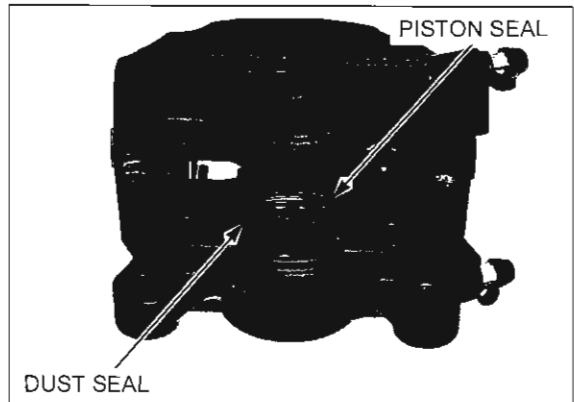
Apply small squirts of air pressure to the fluid inlet to remove the piston.



*Be careful not to damage the piston sliding surface.*

Push the dust and piston seals in and lift them out.

Clean the seal grooves, caliper cylinder and piston with clean brake fluid.

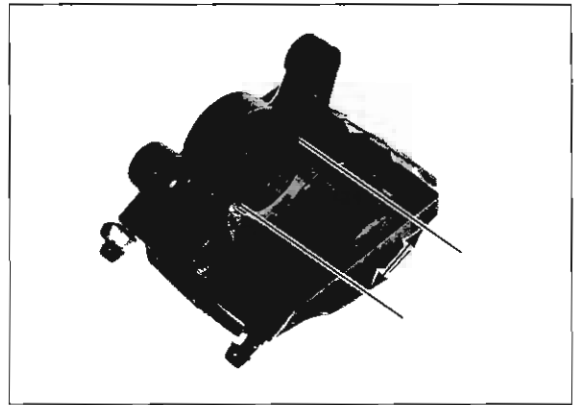


**INSPECTION**

Check the caliper cylinders for scoring, scratches or damage.

Measure the caliper cylinder I.D.

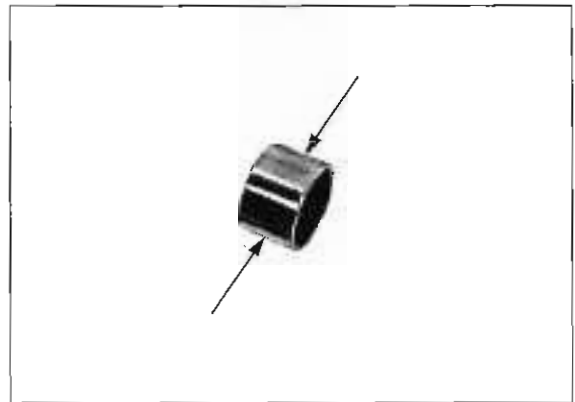
**SERVICE LIMIT: 38.24 mm (1.506 in)**



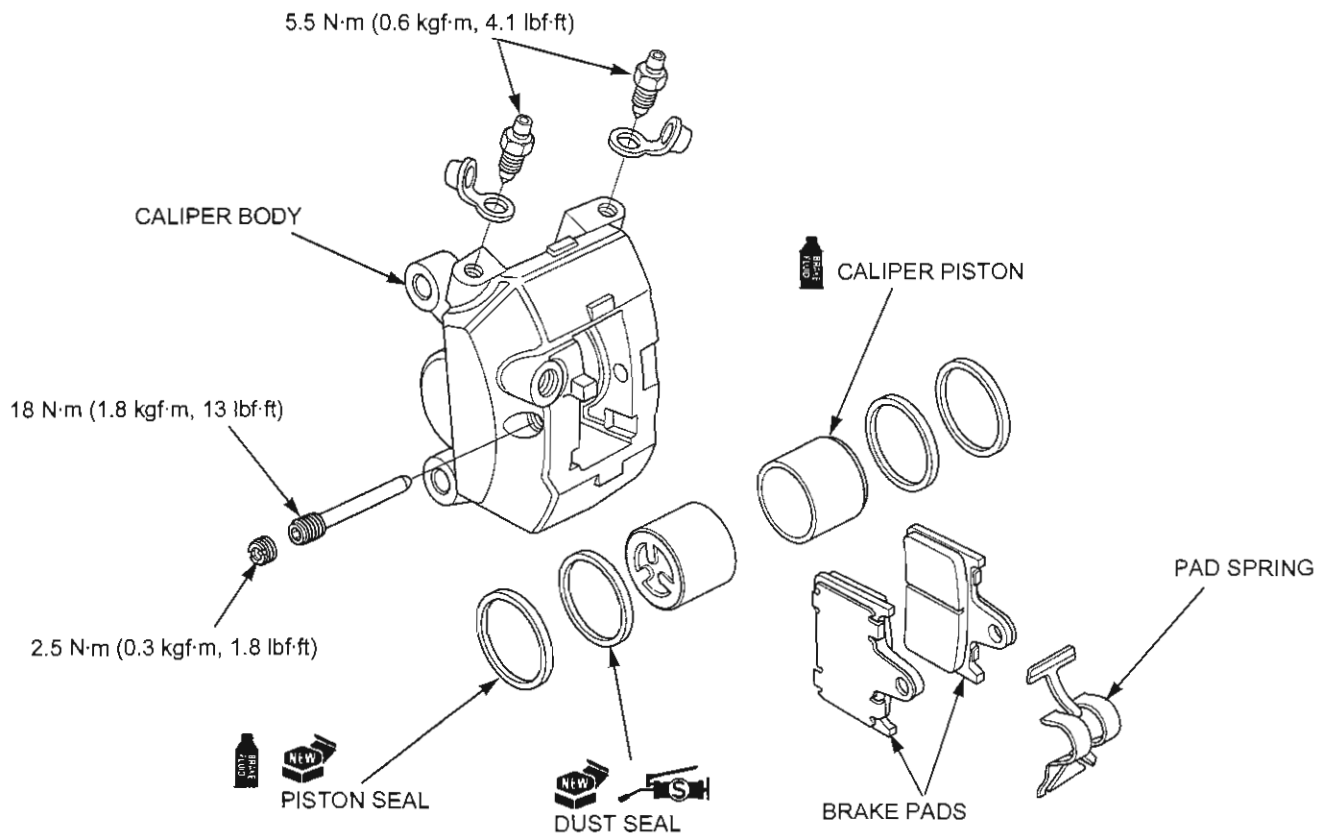
Check the caliper pistons for scoring, scratches or damage.

Measure the caliper piston O.D.

**SERVICE LIMIT: 38.09 mm (1.499 in)**



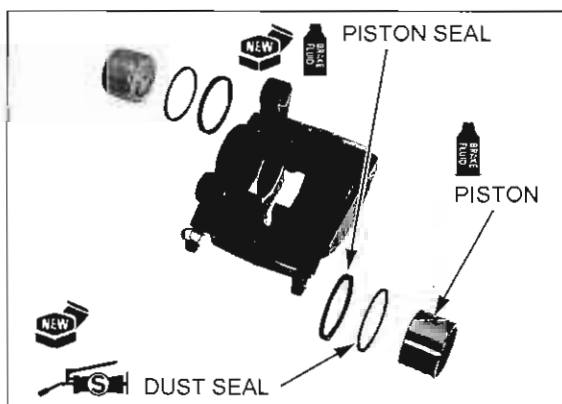
**ASSEMBLY**



## HYDRAULIC BRAKE

Coat new piston seals with clean brake fluid, new dust seals with silicone grease and install them into the seal grooves in the caliper.

Coat the caliper pistons with clean brake fluid and install them into the caliper cylinders with the opening toward the pads.



Install the brake pads (page 16-17).

Install the rear brake caliper onto the bracket.

Install and tighten the caliper pin bolts to the specified torque.

**TORQUE: 45 N·m (4.6 kgf·m, 33 lbf·ft)**

Connect the brake hose to the caliper body with the oil bolt and new sealing washers, and tighten the oil bolt to the specified torque.

**TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)**

Fill and bleed the hydraulic system (page 16-12).

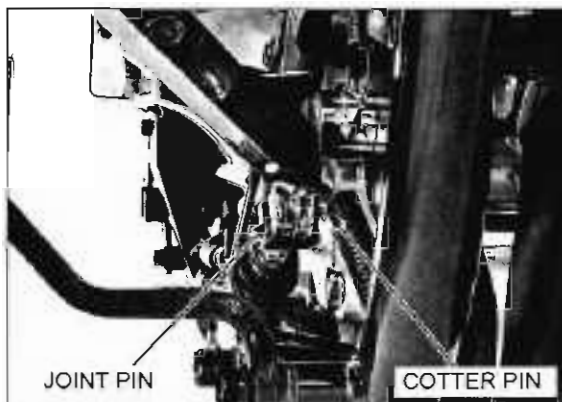


## BRAKE PEDAL (VT750C2S)

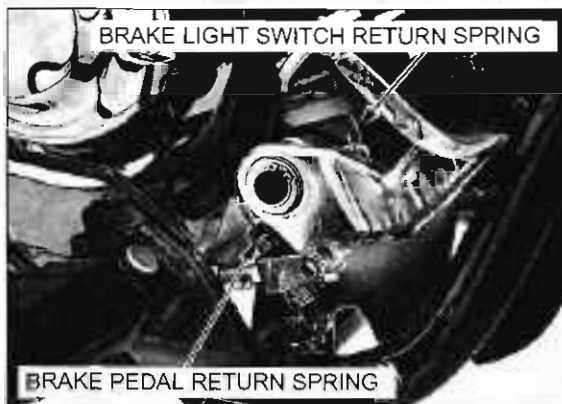
### REMOVAL

Remove the exhaust system (page 2-9).

Remove the push rod from the brake pedal by removing the cotter pin and joint pin.



Unhook the brake pedal and rear brake light switch return springs.

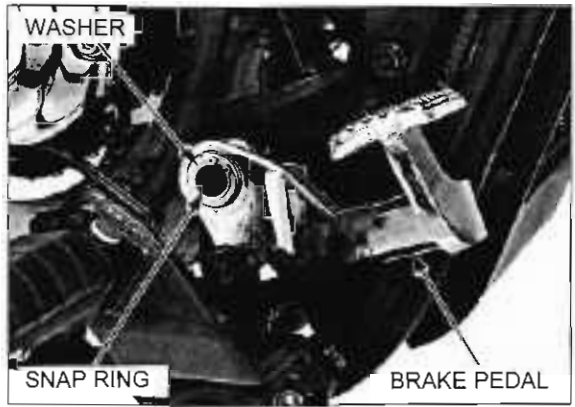


Remove the snap ring, washer and brake pedal assembly.

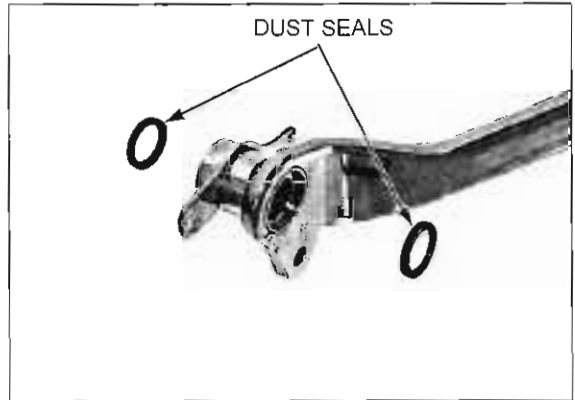
**TOOL:**

Snap ring pliers

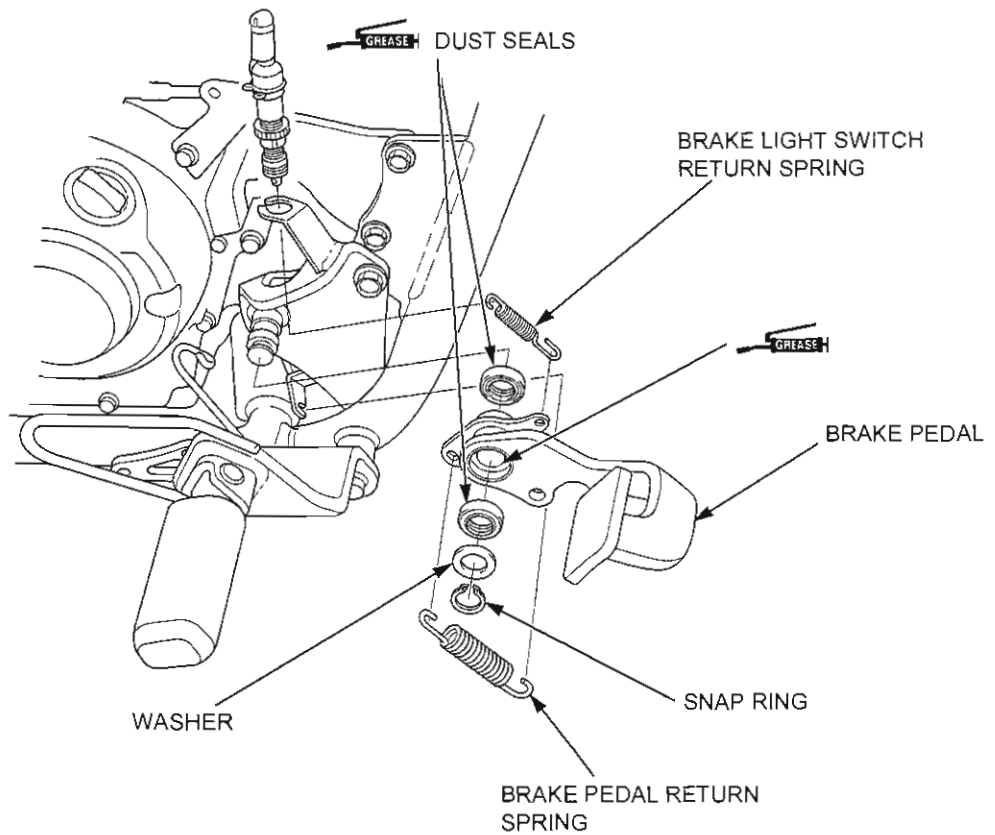
07914-SA50001



Remove the dust seals from the brake pedal.

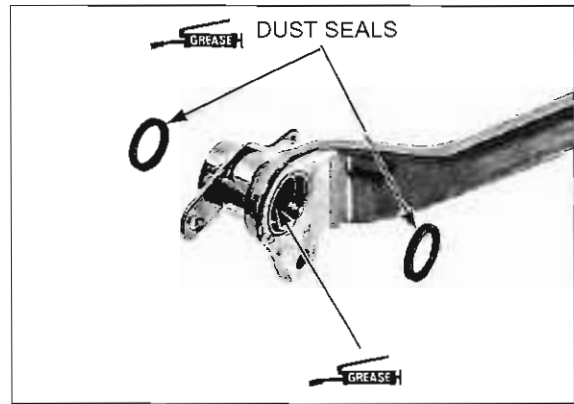


**INSTALLATION**



## HYDRAULIC BRAKE

Apply grease to the dust seal lips.  
Install the dust seals to the brake pedal pivot.  
Apply grease to the brake pedal pivot sliding surface.

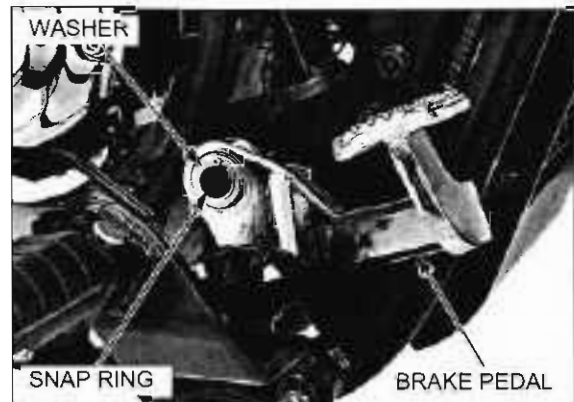


Install the brake pedal assembly to the bracket properly.  
Install the washer and snap ring.

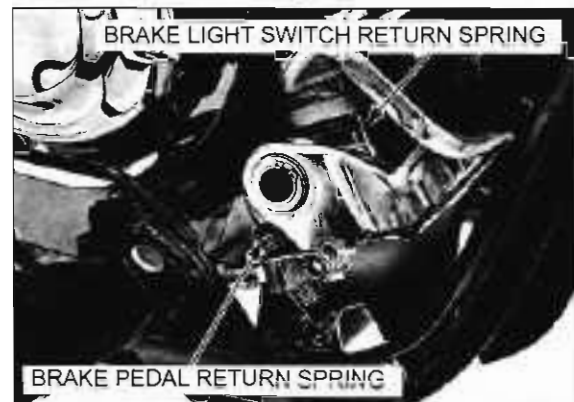
### TOOL:

**Snap ring pliers** 07914-SA50001

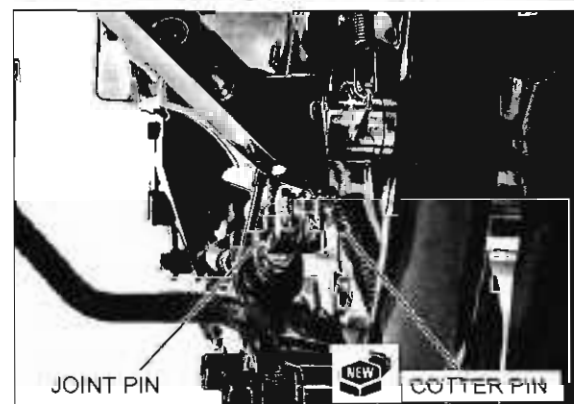
- Install the snap ring with the chamfered edges facing the thrust load side.
- Do not reuse worn snap ring which could easily spin in the groove.
- Check that the snap ring is seated in the grooves.



Hook the brake pedal and rear brake light switch return springs to the brake pedal.



Install the push rod to the brake pedal with the joint pin and secure the joint pin with a new cotter pin.  
Install the exhaust system (page 2-12).

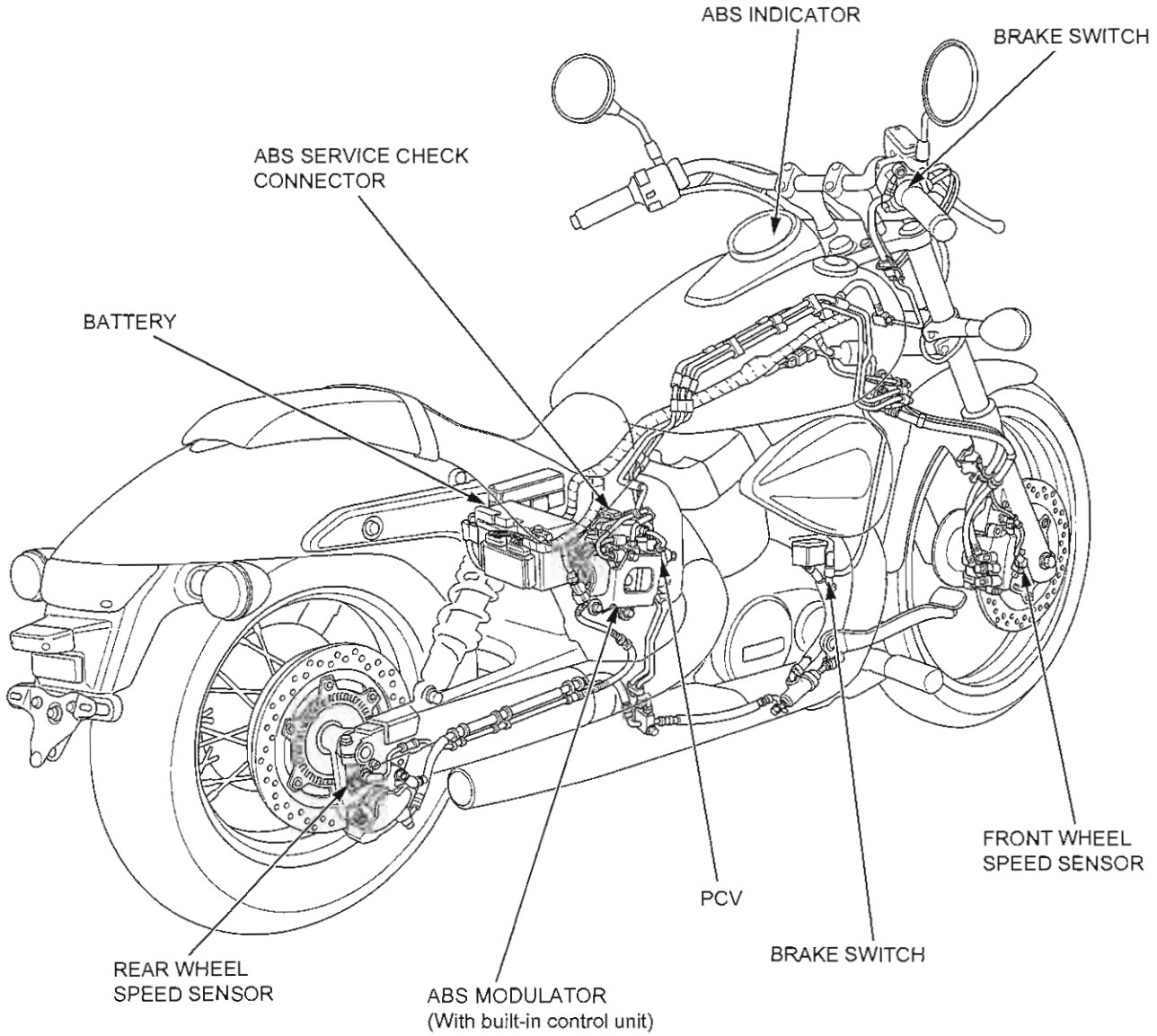


# 17. ANTI-LOCK BRAKE SYSTEM (ABS; VT750C2S)

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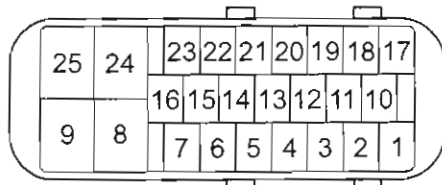
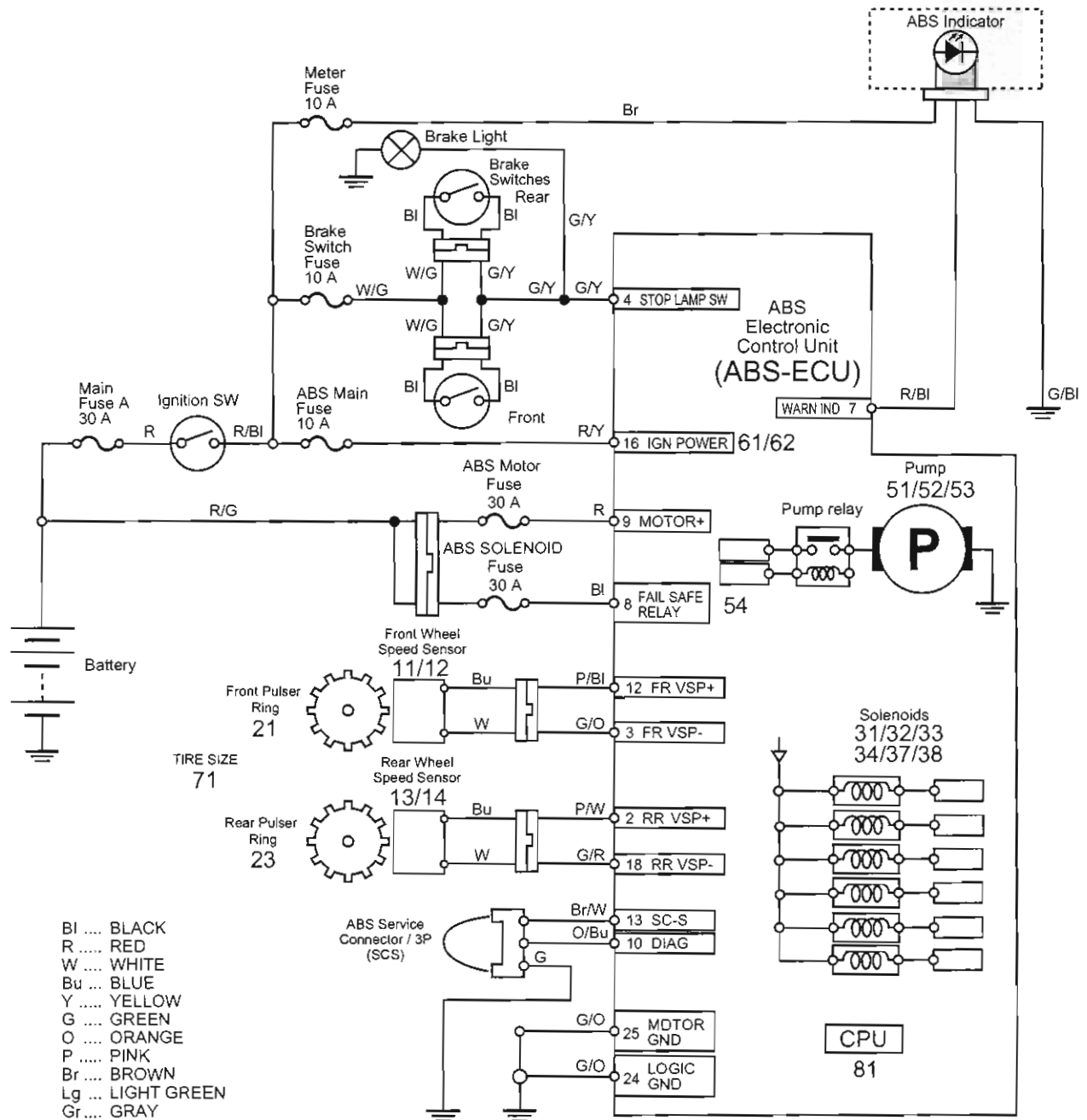
ABS SYSTEM LOCATION .....	17-2	ABS TROUBLESHOOTING .....	17-11
ABS SYSTEM DIAGRAM .....	17-3	ABS INDICATOR CIRCUIT TROUBLESHOOTING .....	17-21
SERVICE INFORMATION .....	17-4	WHEEL SPEED SENSOR .....	17-23
ABS CONNECTOR LOCATIONS .....	17-5	ABS MODULATOR/PCV .....	17-26
ABS TROUBLESHOOTING INFORMATION .....	17-7	PCV .....	17-28
ABS PROBLEM CODE INDEX .....	17-10		

ABS SYSTEM LOCATION





ABS SYSTEM DIAGRAM



ABS MODULATOR 25P CONNECTOR (Modulator side/male terminals)

## SERVICE INFORMATION

### GENERAL

- This section covers service of the Anti-lock Brake System (ABS). For conventional brake service, see (page 16-5).
- When the ABS control unit detects a problem, it stops the ABS function and switches back to the conventional brake operation, and the ABS indicator blinks or stays on. Take care during the test ride.
- Troubles not resulting from a faulty ABS (e.g. brake disc squeak, unevenly worn brake pad) cannot be recognized by the ABS diagnosis system.
- Read "ABS Troubleshooting information" carefully, inspect and troubleshoot the ABS system according to the Diagnostic Troubleshooting. Observe each step of the procedures one by one. Write down the problem code and probable faulty part before starting diagnosis and troubleshooting.
- After troubleshooting, erase the problem code and perform the pre-start self-diagnosis to be sure that the ABS indicator is operating normally.
- When the wheel speed sensor and/or pulser ring is replaced, check the clearance (air gap) between both components.
- The ABS control unit (ECU) is mounted on the modulator (the modulator with the built-in ECU). Do not disassemble the ABS modulator. Replace the ABS modulator as an assembly when the it is faulty.
- The ABS modulator may be damaged if dropped. Also if a connector is disconnected when current is flowing, the excessive voltage may damage the control unit. Always turn off the ignition switch before servicing.
- Be careful not to damage the wheel speed sensor and pulser ring when removing and installing the wheel.
- The following color codes are used throughout this section.

Bu = Blue	G = Green	Lg = Light Green	R = Red
Bl = Black	Gr = Gray	O = Orange	W = White
Br = Brown	Lb = Light Blue	P = Pink	Y = Yellow

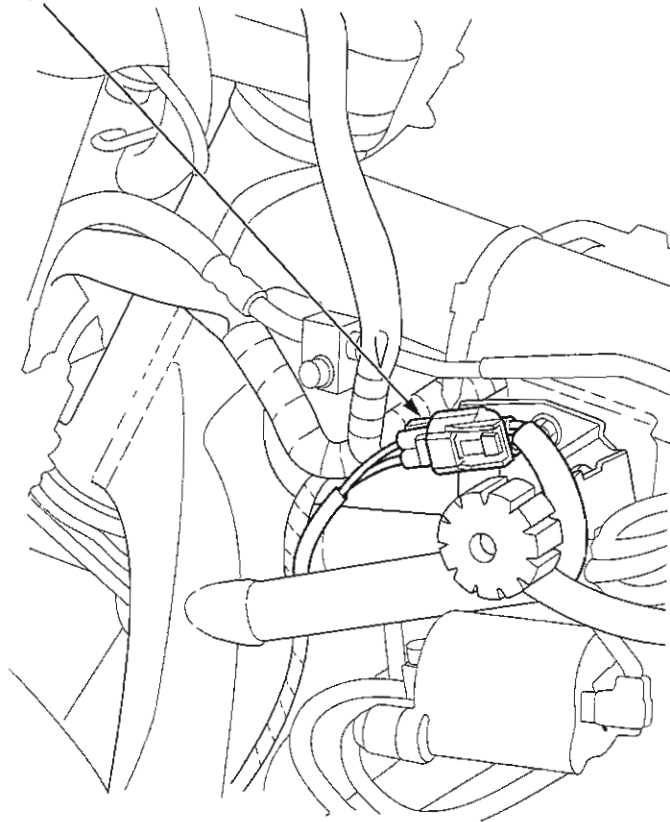
### TORQUE VALUES

Brake pipe joint nut	14 N·m (1.4 kgf·m, 10 lbf·ft)	Apply brake fluid to the threads.
----------------------	-------------------------------	-----------------------------------

## ABS CONNECTOR LOCATIONS

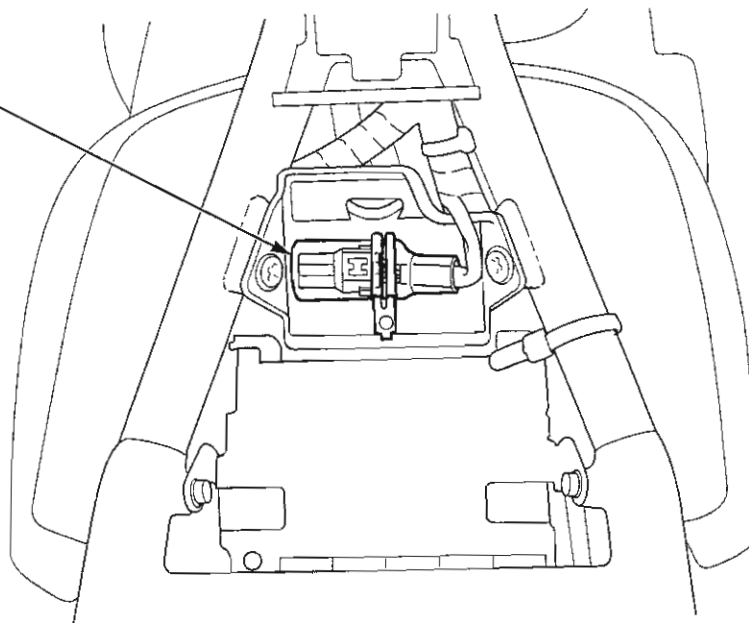
NOTE 1: Remove the fuel tank (page 5-48).

FRONT WHEEL SPEED SENSOR 2P  
(Green) CONNECTOR (NOTE 1)



NOTE 2: Remove the seat (page 2-3).

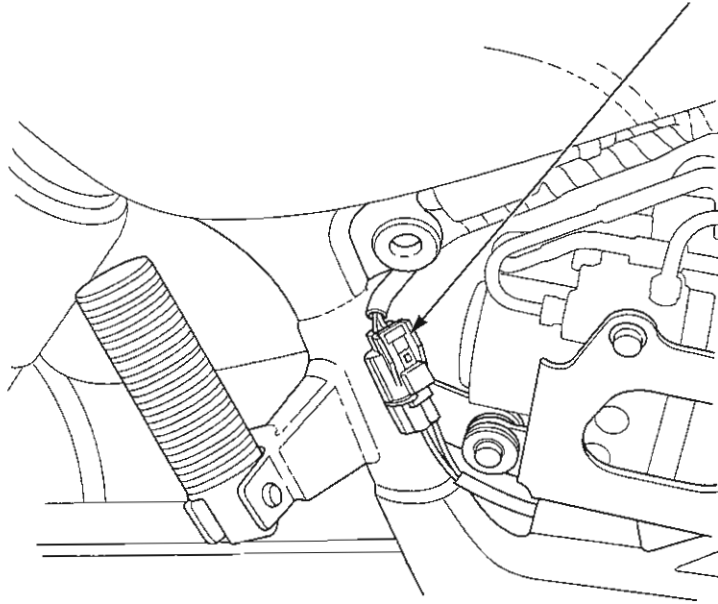
ABS SERVICE CHECK  
CONNECTOR (NOTE 2)



## ANTI-LOCK BRAKE SYSTEM (ABS; VT750C2S)

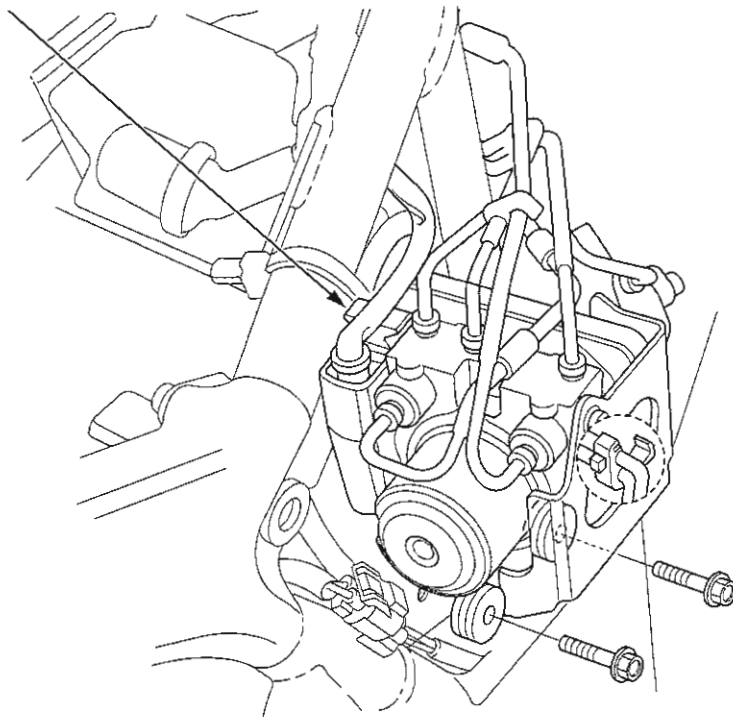
NOTE 3: Remove the right side cover (page 2-3).

REAR WHEEL SPEED SENSOR 2P  
(Blue) CONNECTOR (NOTE 3)



NOTE 4: Remove the right side cover and two bolts (page 2-3).

ABS MODULATOR 25P CONNECTOR  
(NOTE 4)



# ABS TROUBLESHOOTING INFORMATION

## SYSTEM DESCRIPTION

### ABS PRE-START SELF-DIAGNOSIS SYSTEM

The ABS pre-start self-diagnosis system diagnoses the electrical system as well as the operating status of the modulator. When there is any abnormality, the problem and the problematic part can be detected by outputting the problem code.

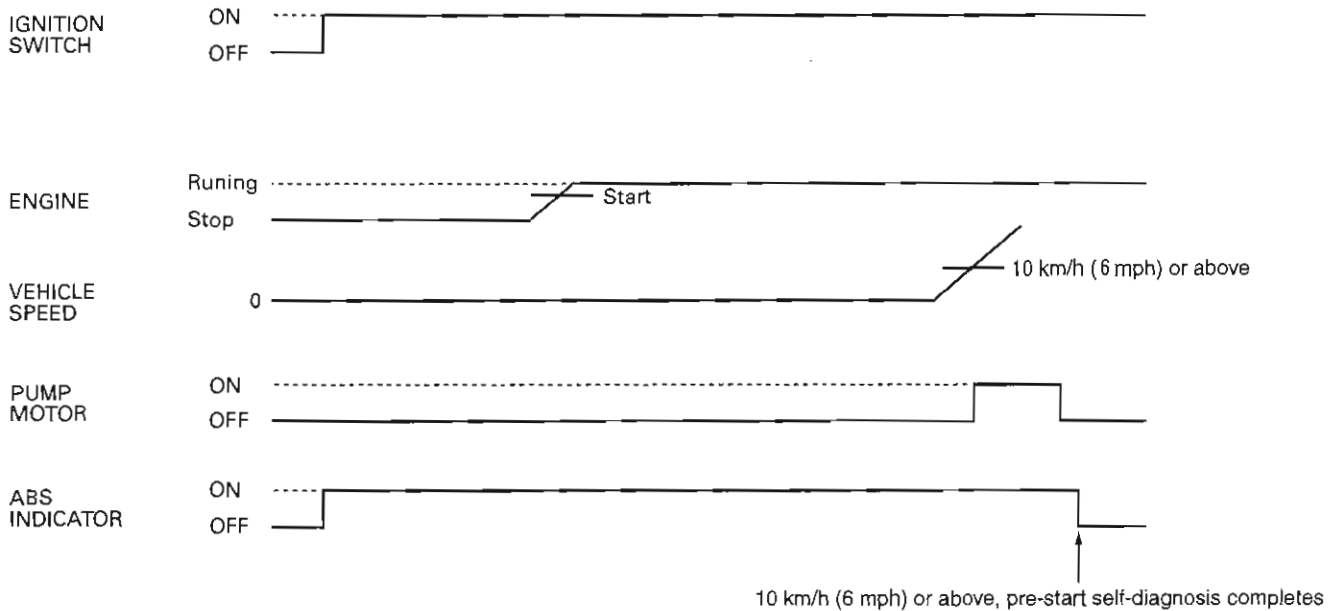
When the vehicle speed is approximately 10 km/h (6 mph) or more, the wheel speed sensor signal is sent to the ABS control unit, then the pre-start self-diagnosis system operates the pump motor (inside the modulator) and detects whether the hydraulic operation is normal, and it completes the pre-start self-diagnosis.

When the ABS is normal, the ABS indicator goes off just after a road speed of 10 km/h (6 mph) indicating that the diagnosis is completed.

If a problem is detected, the ABS indicator blinks or comes on and stays on to notify the rider of the problem. The self-diagnosis is also made while the motorcycle is running, and the indicator blinks when a problem is detected.

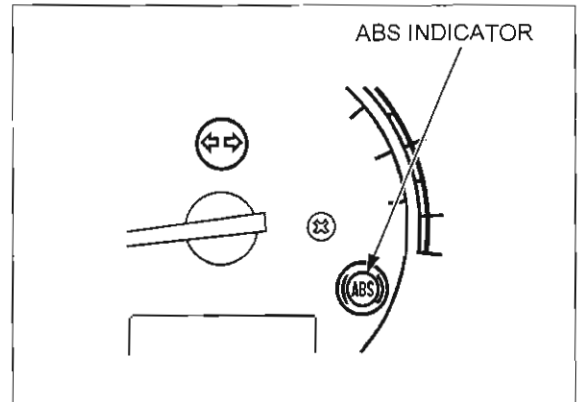
When the indicator blinks, the cause of the problem can be identified by retrieving the problem code following the specified retrieval procedure (page 17-8).

Pre-start self-diagnosis when normal:



### PRE-START SELF-DIAGNOSIS PROCEDURE (Daily check)

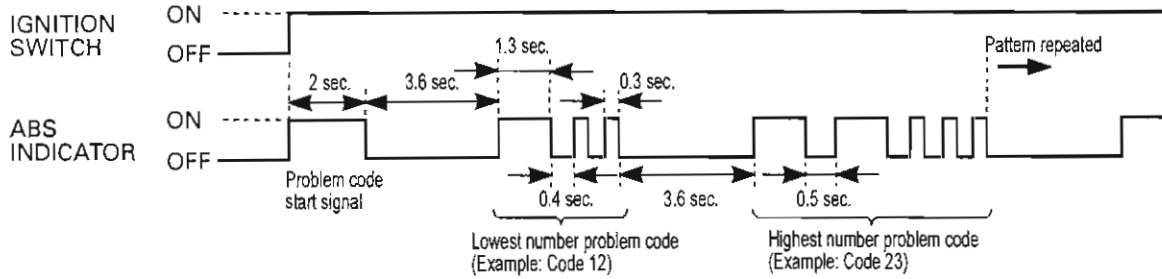
1. Turn the ignition switch to "ON".
2. Make sure the ABS indicator comes on.
3. Start the engine.
4. Ride the motorcycle and increase the vehicle speed to approximately 10 km/h (6 mph).
5. The ABS is normal if the ABS indicator goes off.



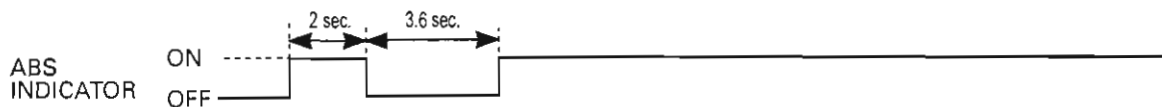
# ANTI-LOCK BRAKE SYSTEM (ABS; VT750C2S)

## PROBLEM CODE INDICATION PATTERN

- The ABS indicator indicates the problem code by blinking a specified number of times. The indicator has two types of blinks, a long blink and short blink. The long blink lasts for 1.3 seconds, the short blink lasts for 0.3 seconds. When a long blink occur, and two short blinks, that problem code is 12. Then, go to the troubleshooting and see problem code 12.
- When the ABS control unit stores some problem codes, the ABS indicator shows the problem codes in the order from the lowest number to highest number. For example, when the indicator indicates code 12, then indicates code 23, two failures have occurred.



When the problem code is not stored:



## PROBLEM CODE READOUT

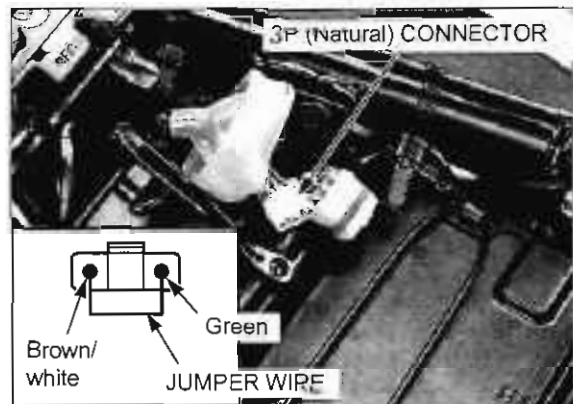
### NOTE:

- The problem code is not erased by turning the ignition switch to "OFF" while the problem code is being output. Note that turning the ignition switch to "ON" again does not indicate the problem code. To show the problem code again, repeat the problem code retrieval procedures from the beginning.
- After diagnostic troubleshooting, erase the problem code(s) and perform the pre-start self-diagnosis to be sure that there is no problem in the ABS indicator (indicator is operating normally).

1. Remove the seat (page 2-3).

Remove the dummy connector from the ABS service check 3P (Natural) connector. Short the wire terminals of the service check connector with a jumper wire with the ignition switch turned to "OFF".

**CONNECTION: Brown/white – Green**



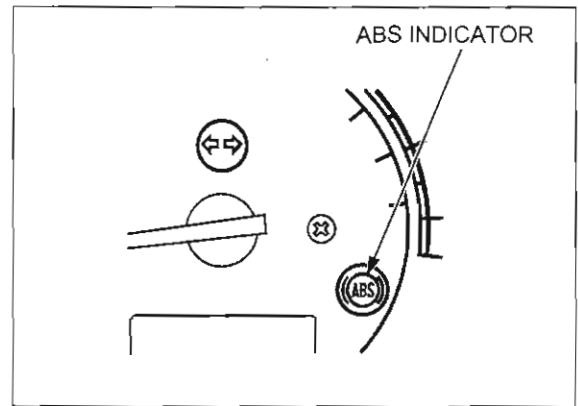
## ANTI-LOCK BRAKE SYSTEM (ABS; VT750C2S)

*Do not apply the front or rear brake during retrieval.*

- Turn the ignition switch to "ON". The ABS indicator should come on 2 seconds (start signal) (then goes off 3.6 seconds) and starts problem code indication.

The problem code is indicated by the number of the times of the indicator blinking.

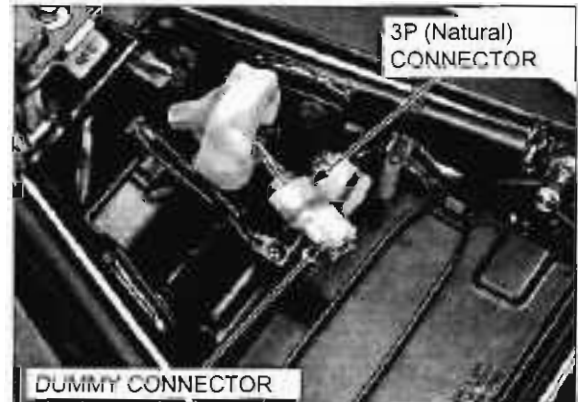
If the problem code is not stored, the ABS indicator stays on.



- Turn the ignition switch to "OFF" and remove the jumper wire.

Connect the 3P (Natural) connector to the dummy connector.

Install the seat (page 2-3).

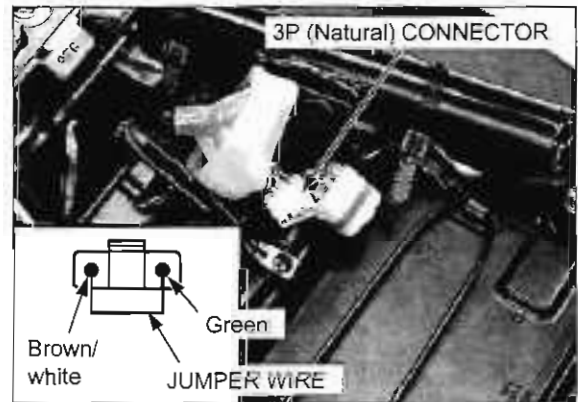


### CLEARING PROBLEM CODE

- Remove the seat (page 2-3).

Short the wire terminals of the service check connector with a jumper wire with the ignition switch turned to "OFF" in the same way as retrieval.

**CONNECTION: Green/red – Green**



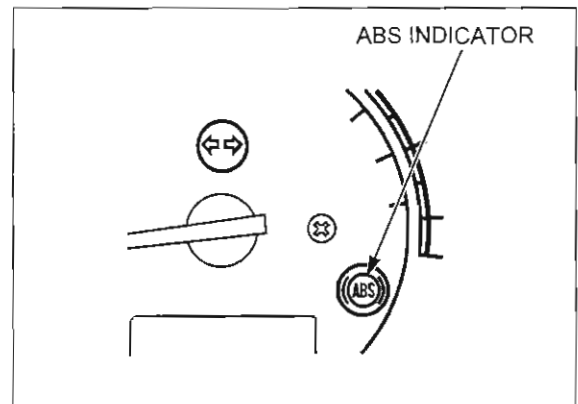
- Turn the ignition switch to "ON" while squeezing the brake lever. The ABS indicator should come on 2 seconds and go off.
- Release the brake lever immediately after the ABS indicator is off. The ABS indicator should come on.
- Squeeze the brake lever immediately after the ABS indicator is on. The ABS indicator should go off.
- Release the brake lever immediately after the ABS indicator is off.

When code erasure is complete, the ABS indicator blinks 2 times and stays on.

- Turn the ignition switch to "OFF".

Connect the 3P (Natural) connector to the dummy connector.

Install the seat (page 2-3).



## ANTI-LOCK BRAKE SYSTEM (ABS; VT750C2S)

### ABS PROBLEM CODE INDEX

**NOTE:**

- The ABS indicator might blink in the following cases. Correct the faulty part.
  - Incorrect tire pressure.
  - Tires not recommended for the motorcycle were installed (incorrect tire size).
  - Deformation of the wheel or tire.
- The ABS indicator might blink while riding under the following conditions. This is temporary failure. Erase the problem code and perform the pre-start self-diagnosis. The ABS is normal if the indicator goes off. Ask the rider for the riding conditions in detail when the motorcycle is brought in for inspection.
  - The motorcycle has continuously run bumpy roads.
  - The front wheel leaves the ground for a long time when riding (wheelie).
  - Only either the front or rear wheel rotates.
  - The ABS operates continuously.
  - The ABS control unit has been disrupted by an extremely powerful radio wave (electromagnetic interference).

Problem Code	Function failure	Detection		Symptom/Fail-safe function	Refer to
		A	B		
–	ABS indicator circuit malfunction • Indicator related wires			• ABS indicator never comes ON at all	17-21
				• ABS indicator stays ON at all	17-21
11	Front wheel speed sensor circuit malfunction • Wheel speed sensor or related wires	○	○	• Stops ABS operation	17-11
12	Front wheel speed sensor malfunction • Wheel speed sensor or related wires • Electrical noise/intermittent interruption		○	• Stops ABS operation	17-11
13	Rear wheel speed sensor circuit malfunction • Wheel speed sensor or related wires	○	○	• Stops ABS operation	17-13
14	Rear wheel speed sensor malfunction • Wheel speed sensor or related wires • Electrical noise/intermittent interruption		○	• Stops ABS operation	17-13
21	Front wheel speed sensor pulse • Pulser ring or wheel speed sensor		○	• Stops ABS operation	17-11
23	Rear wheel speed sensor pulse • Pulser ring or wheel speed sensor		○	• Stops ABS operation	17-13
31	Solenoid valve malfunction			• Stops ABS operation	17-15
32					
33					
34		○	○		
37					
38					
41	Front wheel lock		○	• Stops ABS operation	17-11
42	• Riding condition (wheelie) • Wheel speed sensor or related wires				
43	Rear wheel lock • Riding condition • Wheel speed sensor or related wires		○	• Stops ABS operation	17-13
51	Motor lock	○	○	• Stops ABS operation	17-15
52	Motor stuck OFF	○	○	• Stops ABS operation	
53	Motor stuck ON	○	○	• Stops ABS operation	
54	Fail-safe relay circuit malfunction	○	○	• Stops ABS operation	17-17
61	Power supply voltage low	○	○	• Stops ABS operation	17-19
62	Power supply voltage high	○	○	• Stops ABS operation	
71	Incorrect tire size		○	• Stops ABS operation	17-20
81	CPU (ABS control unit) malfunction	○	○	• Stops ABS operation	17-20

(A) Pre-start self-diagnosis (page 17-7)

(B) Ordinary self-diagnosis: diagnoses while the motorcycle is running (after pre-start self-diagnosis)



## ABS TROUBLESHOOTING

**NOTE:**

- Perform inspection with the ignition switch turned to "OFF", unless otherwise specified.
- Refer to the ABS Connector Locations (page 17-5). All connector diagrams in the troubleshooting are viewed from the terminal side.
- Use a fully charged battery. Do not diagnose with a charger connected to the battery.
- When the ABS modulator assembly is detected to be faulty, recheck the wire harness and connector connections closely before replacing it.
- After troubleshooting, erase the problem code (page 17-9).  
Test ride the motorcycle above 30 km/h (19 mph) and check the other problem code by retrieving the self-diagnosis system (page 17-8).

### PROBLEM CODE 11, 12, 21, 41 or 42 (Front Wheel Speed Sensor)

**NOTE:**

- The ABS indicator might blink under unusual riding or conditions (page 17-10). This is temporary failure. Erase the problem code and perform the pre-start self-diagnosis before troubleshooting. The ABS is normal if the indicator goes off.
- If the problem code 41 is indicated, check the front brake for drag.

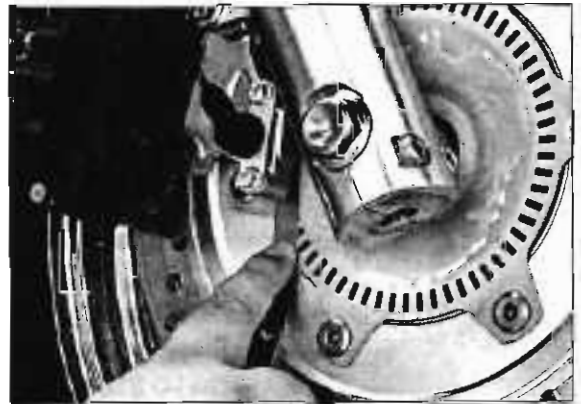
**1. Speed Sensor Air Gap Inspection**

Measure the air gap between the wheel speed sensor and pulser ring (page 17-23).

*Is the air gap correct?*

**YES** – GO TO STEP 2.

**NO** – Check each part for deformation and looseness and correct accordingly. Recheck the air gap.



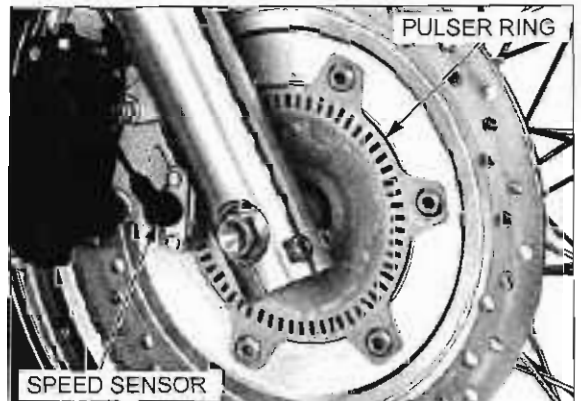
**2. Speed Sensor Condition Inspection**

Inspect the area around the speed sensor:  
Check that there is iron or other magnetic deposits between the pulser ring and wheel speed sensor, and the pulser ring slots for obstructions.  
Check installation condition of the pulser ring or wheel speed sensor for looseness.  
Check the pulser ring and sensor tip for deformation or damage (e.g., chipped pulser ring teeth).

*Are the sensor and pulser ring in good condition?*

**YES** – GO TO STEP 3.

**NO** – Remove any deposits. Install properly or replace faulty part.



## ANTI-LOCK BRAKE SYSTEM (ABS; VT750C2S)

### 3. Speed Sensor Line Short Circuit Inspection (at control unit side)

Remove the seat (page 2-3).

Disconnect the ABS modulator 25P connector and the speed sensor 2P (Green) connector.

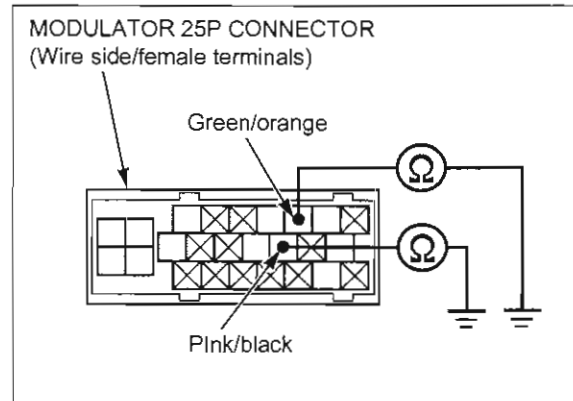
Check for continuity between the Green/orange wire terminal of the connector and ground, and between the Pink/black wire terminal of the connector and ground.

**CONNECTION: Green/orange – Ground**  
**Pink/black – Ground**

*Is there continuity?*

**YES** – Short circuit in wire between the ABS modulator and speed sensor.

**NO** – GO TO STEP 4.



### 4. Speed Sensor Line Open Circuit Inspection

Remove the fuel tank (page 5-48).

Short the Pink/black and Green/orange wire terminals of the ABS modulator 25P connector with a jumper wire.

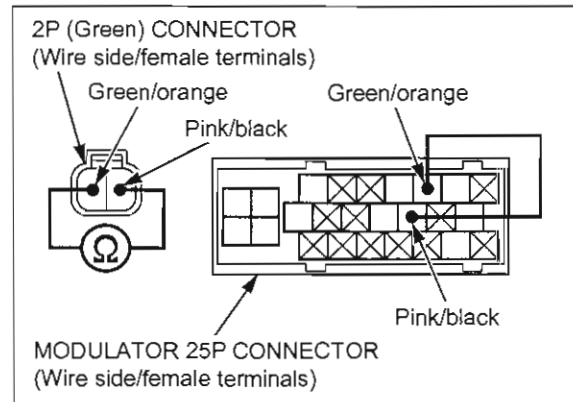
Check for continuity between the terminals of the wire harness side sensor 2P (Green) connector.

**CONNECTION: Green/orange – Pink/black**

*Is there continuity?*

**YES** – GO TO STEP 5.

**NO** – Open circuit in wire between the ABS modulator and speed sensor.



### 5. Speed Sensor Line Short Circuit Inspection (at sensor side)

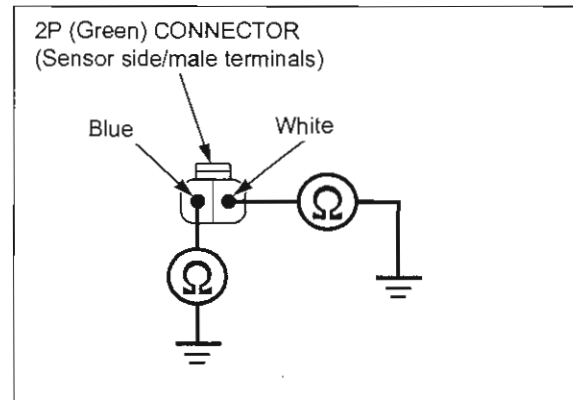
Check for continuity between each terminal (Blue and White) of the sensor side 2P (Green) connector and ground in the same way as the previous step.

**CONNECTION: Blue – Ground**  
**White – Ground**

*Is there continuity?*

**YES** – Faulty front wheel speed sensor.

**NO** – GO TO STEP 6.

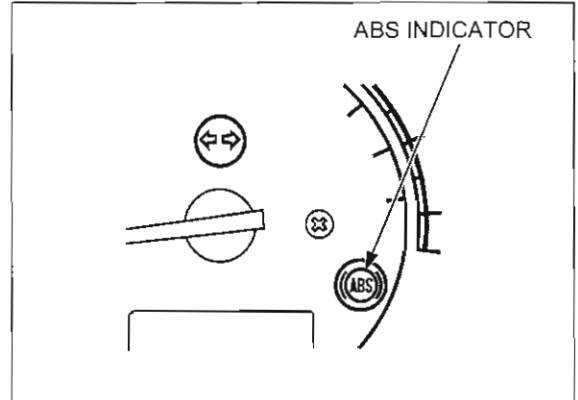


**6. Failure Reproduction with a New Speed Sensor**

Replace the front wheel speed sensor with a new one (page 17-24).  
 Connect the ABS modulator 25P connector.  
 Erase the problem code (page 17-9).  
 Test ride the motorcycle above 30 km/h (19 mph).  
 Retrieve the problem code (page 17-8).

**Does the indicator blink?**

- YES** – Faulty ABS modulator.
- NO** – Faulty removed wheel speed sensor.



**PROBLEM CODE 13, 14, 23 or 43 (Rear Wheel Speed Sensor)**

**NOTE:**

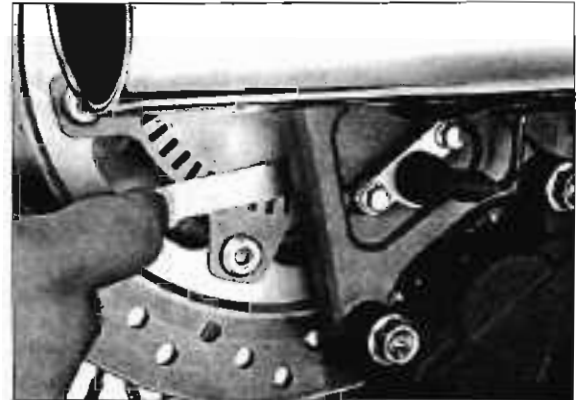
- The ABS indicator might blink under unusual riding or conditions (page 17-10). This is temporary failure. Erase the problem code and perform the pre-start self-diagnosis before troubleshooting. The ABS is normal if the indicator goes off.
- If the problem code 43 is indicated, check the rear brake for drag.

**1. Speed Sensor Air Gap Inspection**

Measure the air gap between the speed sensor and pulser ring (page 17-23).

**Is the air gap correct?**

- YES** – GO TO STEP 2.
- NO** – Check each part for deformation and looseness and correct accordingly. Recheck the air gap.

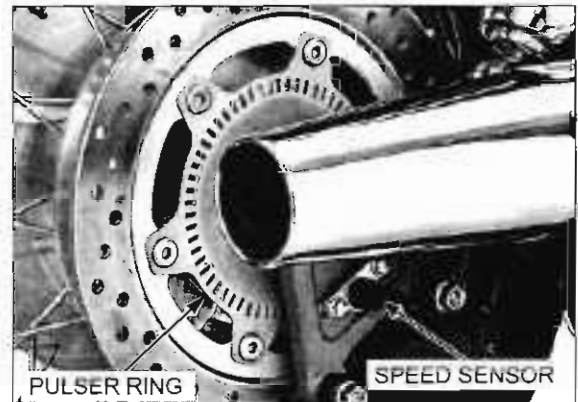


**2. Speed Sensor Condition Inspection**

Inspect the area around the speed sensor:  
 Check that there is iron or other magnetic deposits between the pulser ring and wheel speed sensor, and the pulser ring slots for obstructions.  
 Check installation condition of the pulser ring or wheel speed sensor for looseness.  
 Check the pulser ring and sensor tip for deformation or damage (e.g., chipped pulser ring teeth).

**Are the sensor and pulser ring in good condition?**

- YES** – GO TO STEP 3.
- NO** – Remove any deposits. Install properly or replace faulty part.



## ANTI-LOCK BRAKE SYSTEM (ABS; VT750C2S)

### 3. Speed Sensor Line Short Circuit Inspection (at control unit side)

Remove the following:

- Seat (page 2-3)
- Left side cover (page 2-3)

Disconnect the ABS modulator 25P connector and the speed sensor 2P (Blue) connector.

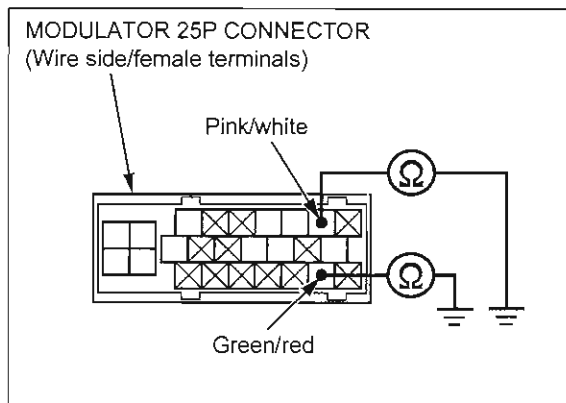
Check for continuity between the Pink/white wire terminal of the connector and ground, and between the Green/red wire terminal of the connector and ground.

**CONNECTION: Pink/white – Ground  
Green/red – Ground**

*Is there continuity?*

**YES** – Short circuit in wire between the ABS modulator and speed sensor.

**NO** – GO TO STEP 4.



### 4. Speed Sensor Line Open Circuit Inspection

Short the Pink/white and Green/red wire terminals of the ABS modulator 25P connector with a jumper wire.

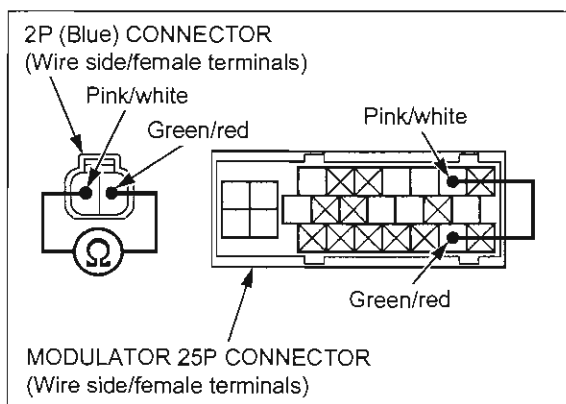
Check for continuity between the terminals of the wire harness side sensor 2P (Blue) connector.

**CONNECTION: Pink/white – Green/red**

*Is there continuity?*

**YES** – GO TO STEP 5.

**NO** – Open circuit in wire between the ABS modulator and speed sensor.



### 5. Speed Sensor Line Short Circuit Inspection (at sensor side)

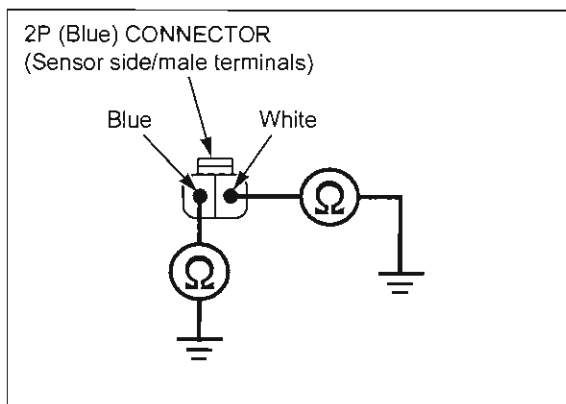
Check for continuity between each terminal (Blue and White) of the sensor side 2P (Blue) connector and ground in the same way as the previous step.

**CONNECTION: Blue – Ground  
White – Ground**

*Is there continuity?*

**YES** – Faulty rear wheel speed sensor.

**NO** – GO TO STEP 6.

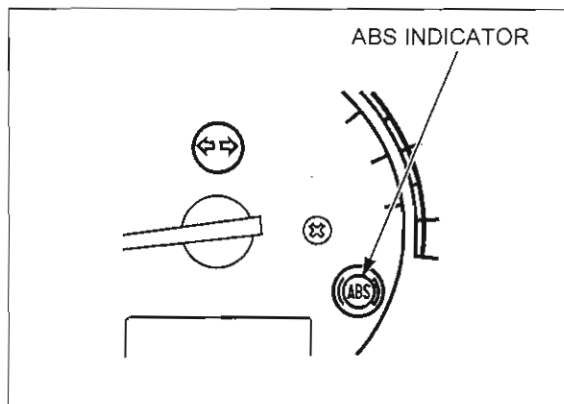


6. Failure Reproduction with a New Speed Sensor

Replace the rear wheel speed sensor with new one (page 17-25).  
 Connect the ABS modulator 25P connector.  
 Erase the problem code (page 17-9).  
 Test ride the motorcycle above 30 km/h (19 mph).  
 Retrieve the problem code (page 17-8).

**Does the indicator blink?**

- YES – Faulty ABS modulator.
- NO – Faulty removed wheel speed sensor.



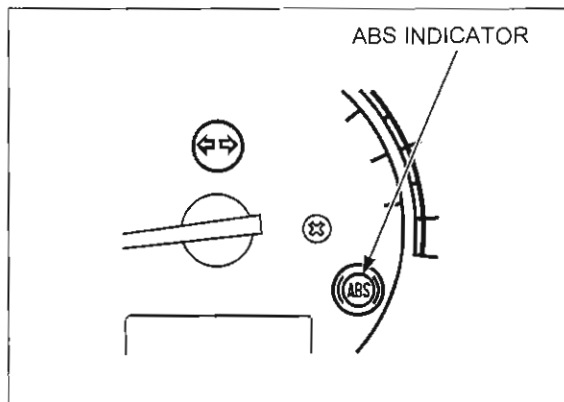
**PROBLEM CODE 31, 32, 33, 34, 37 or 38 (Solenoid Valve)**

1. Failure Reproduction

Erase the problem code (page 17-9).  
 Test ride the motorcycle above 30 km/h (19 mph).  
 Retrieve the problem code (page 17-8).

**Does the indicator indicate the code "31, 32, 33, 34, 37 or 38"?**

- YES – Faulty ABS modulator.
- NO – Normal (problem code is not stored; temporary failure).



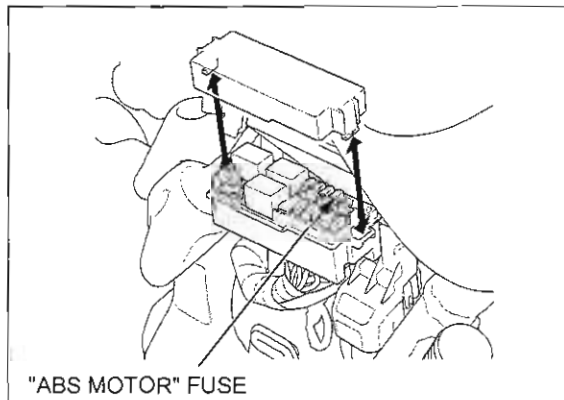
**PROBLEM CODE 51, 52 or 53 (Pump Motor)**

1. Fuse Inspection

Remove the left side cover (page 2-3).  
 Check the "ABS MOTOR" fuse (30A) in the ABS fuse box for blown.

**Is the fuse blown?**

- YES – GO TO STEP 2.
- NO – GO TO STEP 3.



## ANTI-LOCK BRAKE SYSTEM (ABS; VT750C2S)

### 2. Motor Power Input Line Short Circuit Inspection

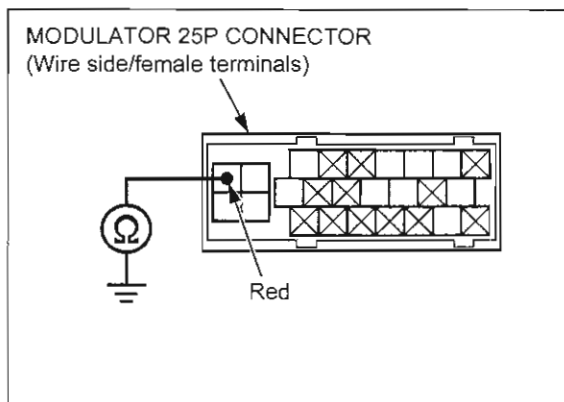
Disconnect the ABS modulator 25P connector.  
Check for continuity between the Red wire terminal of the 25P connector and ground with "ABS MOTOR" fuse removed.

**CONNECTION:** Red – Ground

*Is there continuity?*

**YES** – Short circuit in Red wire between the fuse box and ABS modulator.

**NO** – Temporary failure (install a spare fuse and recheck from the first step).



### 3. Motor Power Input Line Open Circuit Inspection (at control unit side)

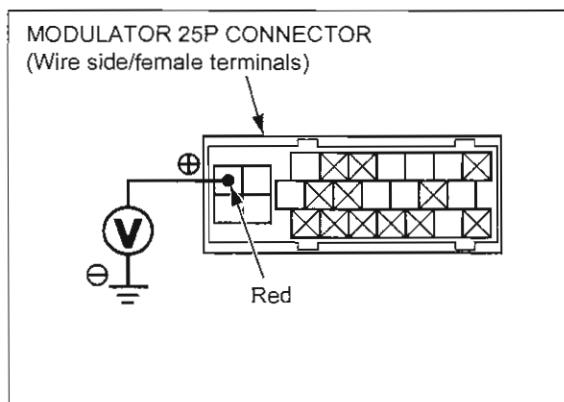
Install the "ABS MOTOR" fuse.  
Disconnect the ABS modulator 25P connector.  
Measure the voltage between Red wire terminal (+) of the 25P connector and ground (-). There should be battery voltage at all times.

**CONNECTION:** Red (+) – Ground (-)

*Is there battery voltage?*

**YES** – GO TO STEP 5.

**NO** – GO TO STEP 4.



### 4. Motor Power Input Line Open Circuit Inspection (at battery side)

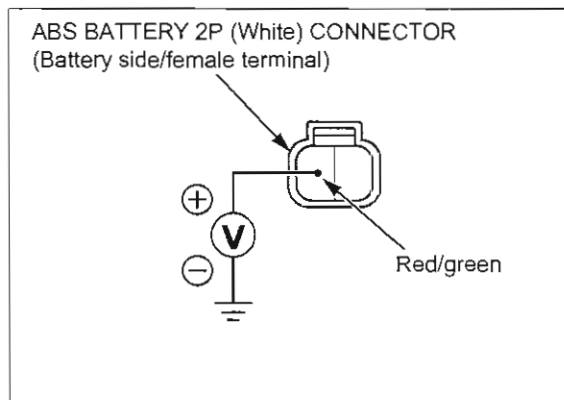
Disconnect the ABS battery 2P (White) connector.  
Measure the voltage between Red/green wire terminal (+) of the battery side 2P (White) connector and ground (-). There should be battery voltage at all times.

**CONNECTION:** Red/green (+) – Ground (-)

*Is there battery voltage?*

**YES** – Open circuit in Red/green wire between the fuse box 2P (White) connector and control unit.

**NO** – Open circuit in Red/green wire between the battery and ABS battery 2P (White) connector.

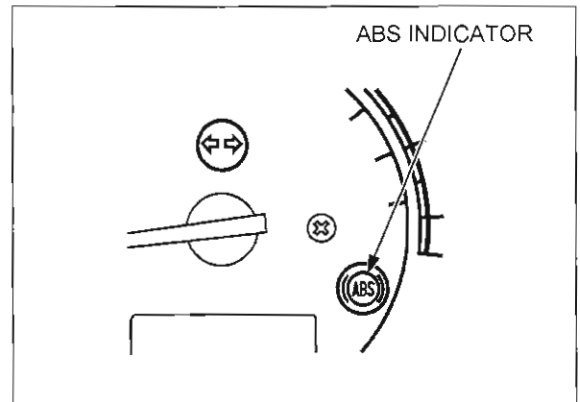


## 5. Failure Reproduction

Connect the ABS modulator 25P connector.  
 Erase the problem code (page 17-9).  
 Test ride the motorcycle above 30 km/h (19 mph).  
 Retrieve the problem code (page 17-8).

**Does the indicator indicate the code "51, 52, or 53"?**

- YES** – Faulty ABS modulator.
- NO** – Normal (problem code is not stored; temporary failure).



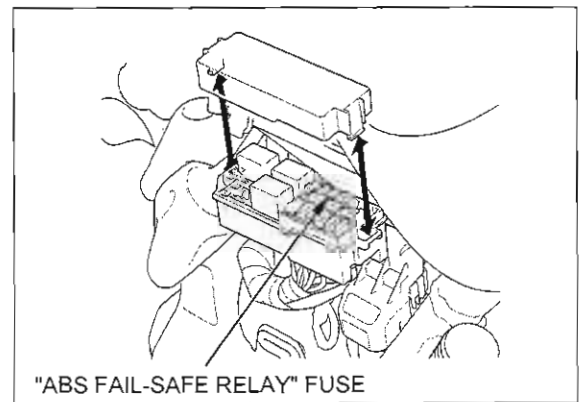
## PROBLEM CODE 54 (Fail-safe Relay)

### 1. Fuse Inspection

Remove the left side cover (page 2-3).  
 Check the "ABS FAIL-SAFE RELAY" fuse (20A) in the ABS fuse box for blown.

**Is the fuse blown?**

- YES** – GO TO STEP 2.
- NO** – GO TO STEP 3.



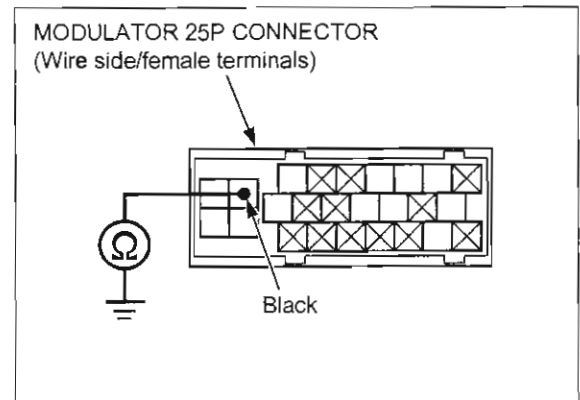
### 2. Relay Power Input Line Short Circuit Inspection

Disconnect the ABS modulator 25P connector.  
 Check for continuity between the Black wire terminal of the 25P connector and ground with "ABS FAIL-SAFE RELAY" fuse removed.

**CONNECTION: Black – Ground**

**Is there continuity?**

- YES** – Short circuit in Black wire between the fuse box and ABS modulator.
- NO** – Temporary failure (install a spare fuse and recheck from the first step).



## ANTI-LOCK BRAKE SYSTEM (ABS; VT750C2S)

### 3. Relay Power Input Line Open Circuit Inspection (at control unit side)

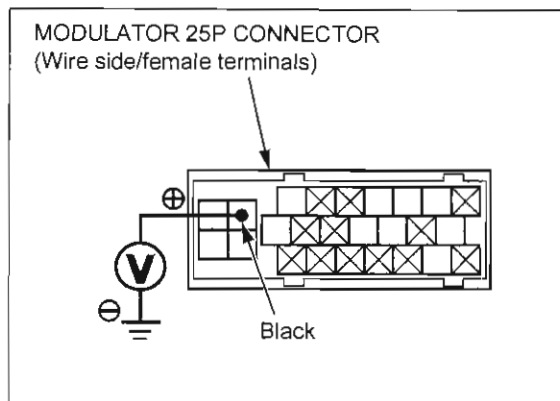
Install the "ABS FAIL-SAFE RELAY" fuse.  
Disconnect the ABS modulator 25P connector.  
Measure the voltage between Red wire terminal (+)  
of the 25P connector and ground (-). There should  
be battery voltage at all times.

**CONNECTION: Black (+) – Ground (-)**

**Is there battery voltage?**

**YES** – GO TO STEP 5.

**NO** – GO TO STEP 4.



### 4. Relay Power Input Line Open Circuit Inspection (at fuse box side)

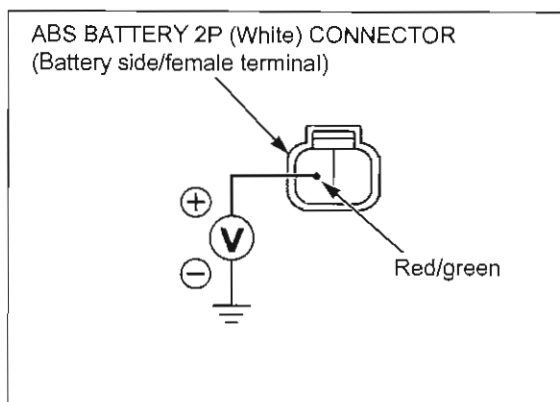
Disconnect the ABS battery 2P (White) connector.  
Measure the voltage between Red/green wire  
terminal (+) of the battery side 2P (White) connector  
and ground (-). There should be battery voltage at  
all times.

**CONNECTION: Red/green (+) – Ground (-)**

**Is there battery voltage?**

**YES** – Open circuit in Red/green wire between  
the ABS battery 2P (White) connector and  
control unit.

**NO** – Open circuit in Red/green wire between  
the battery and ABS battery 2P (White)  
connector.



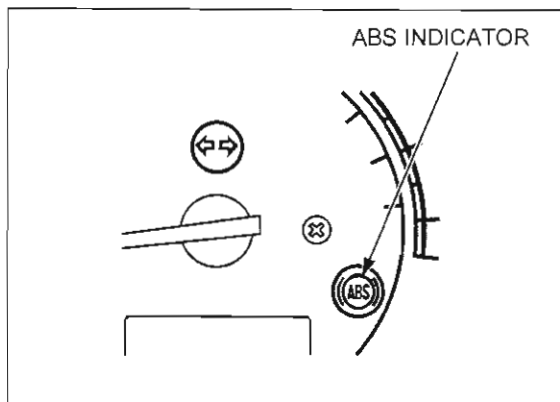
### 5. Failure Reproduction

Connect the ABS modulator 25P connector.  
Erase the problem code (page 17-9).  
Test ride the motorcycle above 30 km/h (19 mph).  
Retrieve the problem code (page 17-8).

**Does the indicator indicate the code "54"?**

**YES** – Faulty ABS modulator.

**NO** – Normal (problem code is not stored;  
temporary failure).





**PROBLEM CODE 61 or 62 (Power Circuit)**

**1. Fuse Inspection**

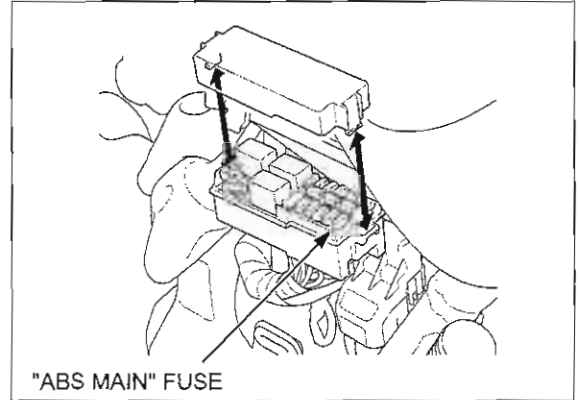
Remove the left side cover (page 2-3).

Check the "ABS MAIN" fuse (10A) in the ABS main fuse box for blown.

**Is the fuse blown?**

**YES** – GO TO STEP 2.

**NO** – GO TO STEP 3.



**2. Power Input Line Short Circuit Inspection**

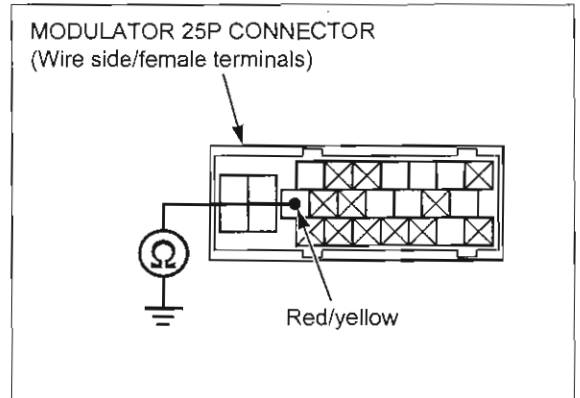
Disconnect the ABS modulator 25P connector. Check for continuity between the Red/yellow wire terminal of the 25P connector and ground with "ABS MAIN" fuse removed.

**CONNECTION: Red/yellow – Ground**

**Is there continuity?**

**YES** – Short circuit in Red/yellow wire between the fuse box and ABS modulator.

**NO** – Temporary failure (install a spare fuse and recheck from the first step).



**3. Power Input Line Open Circuit Inspection**

Install the "ABS MAIN" fuse.

Measure the voltage between the Red/yellow wire terminal of the ABS modulator 25P connector and ground.

There should be battery voltage with the ignition switch turned to "ON".

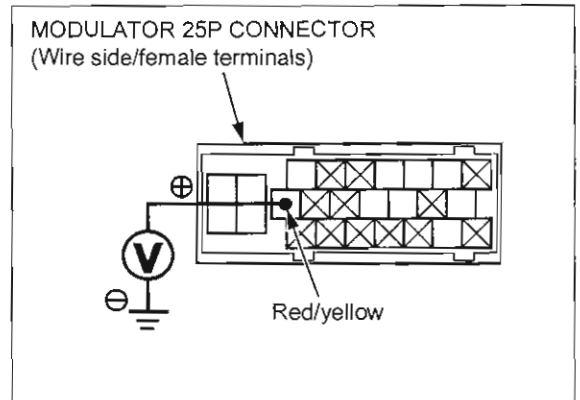
**CONNECTION: Red/yellow (+) – Ground (-)**

**Is there battery voltage?**

**YES** – GO TO STEP 4.

**NO** –

- Open circuit in Black or Red/yellow wire between the ignition switch and ABS modulator.
- If the wire is OK, check the charging system.



## ANTI-LOCK BRAKE SYSTEM (ABS; VT750C2S)

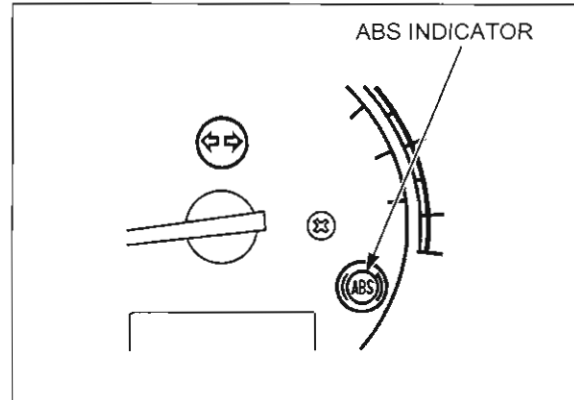
### 4. Failure Reproduction

Connect the ABS modulator 25P connector.  
Erase the problem code (page 17-9).  
Test ride the motorcycle above 30 km/h (19 mph).  
Retrieve the problem code (page 17-8).

**Does the indicator indicate the code "61 or 62"?**

**YES** – Faulty ABS modulator.

**NO** – Normal (problem code is not stored; temporary failure).



### PROBLEM CODE 71 (Tire Size)

#### NOTE:

- Check the following and correct the faulty part.
  - Incorrect tire pressure.
  - Tires not recommended for the motorcycle were installed (incorrect tire size).
  - Deformation of the wheel or tire.

### 1. Failure Reproduction

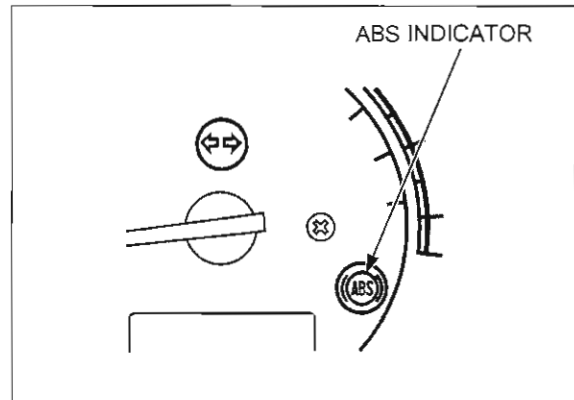
If the above items are normal, recheck the problem code indication:

Erase the problem code (page 17-9).  
Test ride the motorcycle above 30 km/h (19 mph).  
Retrieve the problem code (page 17-8).

**Does the indicator indicate the code "71"?**

**YES** – Faulty ABS modulator.

**NO** – Normal (problem code is not stored; temporary failure).



### PROBLEM CODE 81 (CPU; ABS Control Unit)

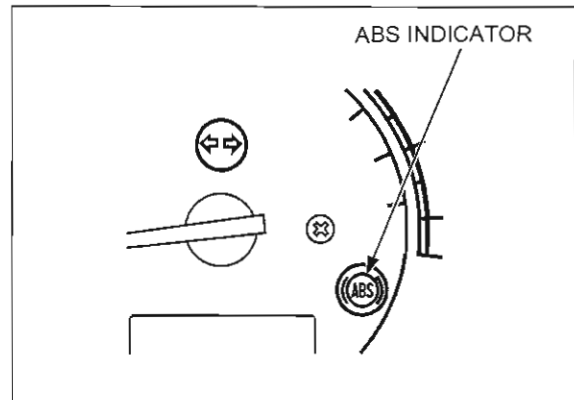
### 1. Failure Reproduction

Erase the problem code (page 17-9).  
Test ride the motorcycle above 30 km/h (19 mph).  
Retrieve the problem code (page 17-8).

**Does the indicator indicate the code "81"?**

**YES** – Faulty ABS modulator.

**NO** – Normal (problem code is not stored; temporary failure).



## ABS INDICATOR CIRCUIT TROUBLESHOOTING

**ABS INDICATOR DOES NOT COME ON** (when the ignition switch turned to "ON")

### 1. Combination Meter Power/Ground Line Inspection

Check the speedometer power and ground lines (page 21-13).

*Are the wires normal?*

**YES** – GO TO STEP 2.

**NO** – Open circuit in related wires.

### 2. Indicator Operation Inspection

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

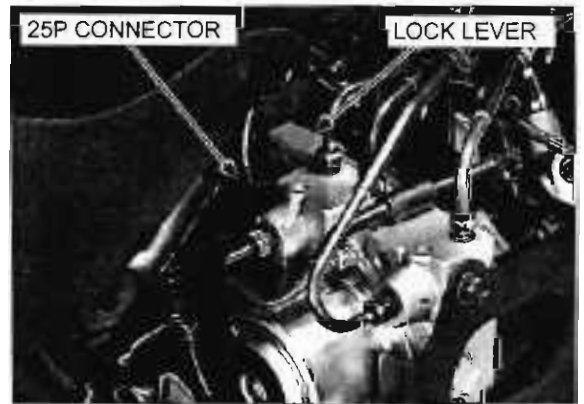
Pull the lock lever up and disconnect the ABS modulator 25P connector.

Turn the ignition switch to "ON" and check the ABS indicator.

*Does the indicator come on?*

**YES** – Faulty ABS modulator.

**NO** – GO TO STEP 3.



### 3. Indicator Signal Line Short Circuit Inspection

Remove the speedometer (page 21-15).

Remove the combination meter 16P connector dust cover.

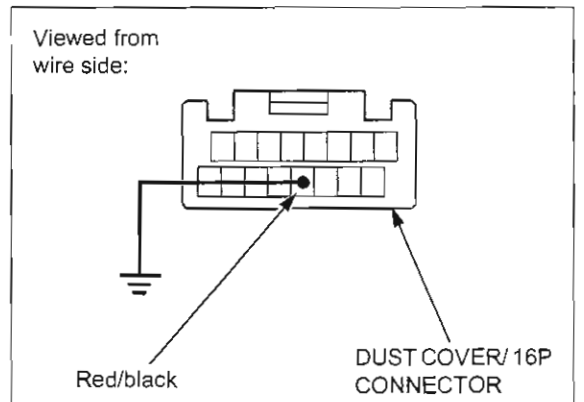
With the 16P connector connected, check for continuity between the Red/black wire terminal of the harness side connector and ground.

**CONNECTION: Red/black – Ground**

*Is there continuity?*

**YES** – Short circuit in Red/black wire between the combination meter and ABS modulator.

**NO** – Faulty combination meter.



**ABS INDICATOR STAYS ON** (Indicator does not go off when the motorcycle is running, and Problem Code is not indicated by the retrieval procedure)

### 1. Fuse Inspection

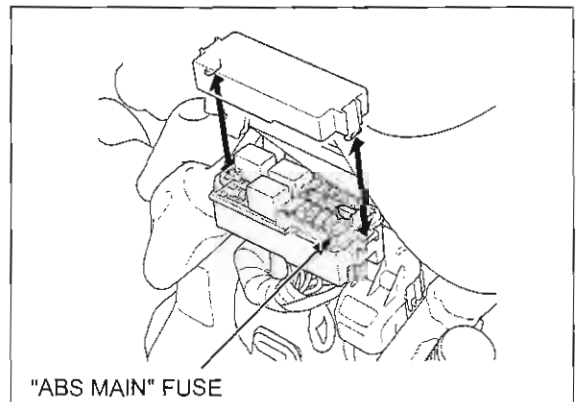
Remove the left side cover (page 2-3).

Check the "ABS MAIN" fuse (10A) in the ABS main fuse box for blown.

*Is the fuse blown?*

**YES** – GO TO STEP 2.

**NO** – GO TO STEP 3.



## ANTI-LOCK BRAKE SYSTEM (ABS; VT750C2S)

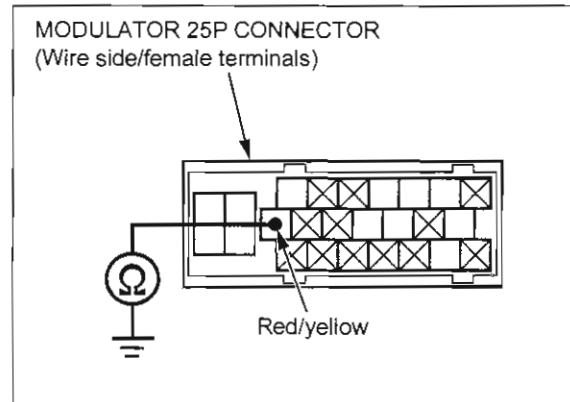
### 2. Power Input Line Short Circuit Inspection

Disconnect the ABS modulator 25P connector.  
Check for continuity between the Red/yellow wire terminal of the 25P connector and ground with "ABS MAIN" fuse removed.

**CONNECTION: Red/yellow – Ground**

*Is there continuity?*

- YES** – Short circuit in Red/yellow wire between the fuse box and ABS modulator.
- NO** – Temporary failure (install a spare fuse and recheck from the first step).



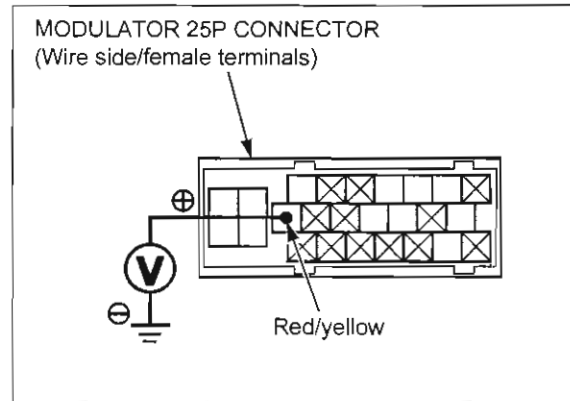
### 3. Power Input Line Open Circuit Inspection

Install the "ABS MAIN" fuse.  
Measure the voltage between the Red/blue wire terminal of the ABS modulator 25P connector and ground.  
There should be battery voltage with the ignition switch turned to "ON".

**CONNECTION: Red/yellow (+) – Ground (-)**

*Is there battery voltage?*

- YES** – GO TO STEP 4.
- NO** – • Open circuit in Red/yellow wire between the ABS main fuse box and ABS modulator.  
• If the wire is OK, check the charging system.



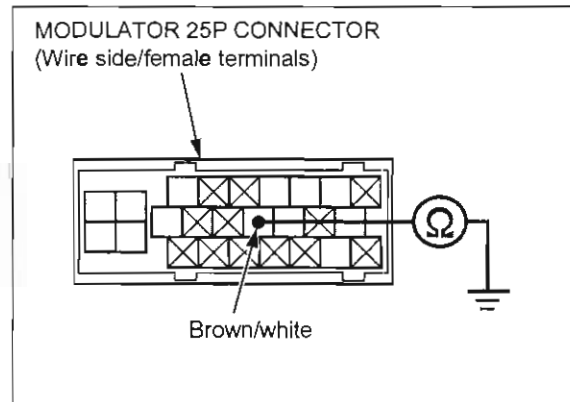
### 4. Service Check Line Short Circuit Inspection

Check for continuity between the Brown/white wire terminal of the ABS modulator 25P connector and ground.

**CONNECTION: Brown/white – Ground**

*Is there continuity?*

- YES** – Short circuit in Brown/white wire between the service check connector and ABS modulator.
- NO** – GO TO STEP 5.

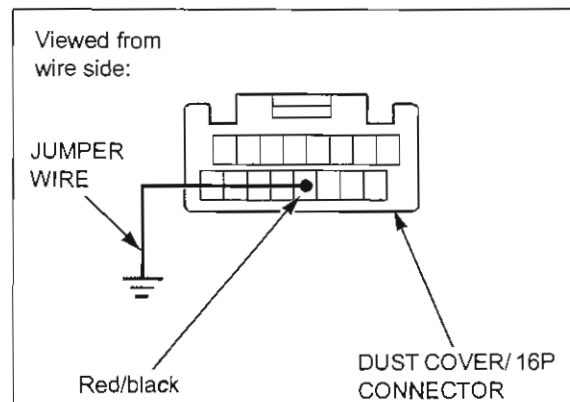


### 5. Indicator Operation Inspection

Remove the speedometer (page 21-15).  
Remove the combination meter 16P connector dust cover.  
With the 16P connector connected, short the Red/black wire terminal of the 16P connector and ground with a jumper wire.  
Check the ABS indicator with the ignition switch turned to "ON".

*Does it go off?*

- YES** – GO TO STEP 6.
- NO** – Faulty combination meter.



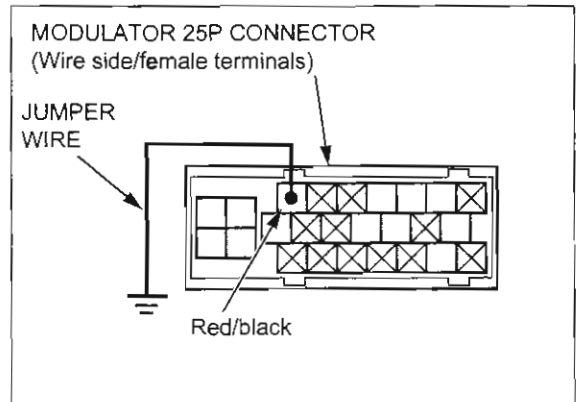
**6. Indicator Signal Line Open Circuit Inspection**

Remove the jumper wire from the combination meter 16P connector.  
Short the Red/black wire terminal of the ABS modulator 25P connector and ground with a jumper wire.  
Check the ABS indicator with the ignition switch turned to "ON".

*Does it go off?*

**YES** – GO TO STEP 7.

**NO** – Open circuit in White/black wire between the combination meter and ABS modulator.



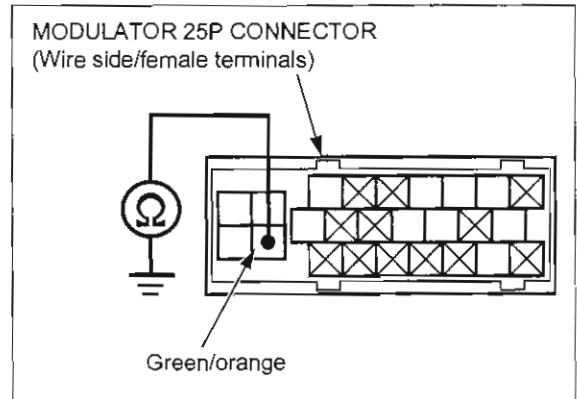
**7. Logic Ground Line Open Circuit Inspection**

Remove a jumper wire from the ABS modulator 25P connector.  
Check for continuity between the Green/orange wire terminal of the ABS modulator 25P connector and ground.

*Is there continuity?*

**YES** – Faulty ABS modulator.

**NO** – Open circuit in Green/orange wire between the ABS modulator and ground.



**WHEEL SPEED SENSOR**

**AIR GAP INSPECTION**

Support the motorcycle securely using a hoist or equivalent and raise the wheel off the ground.

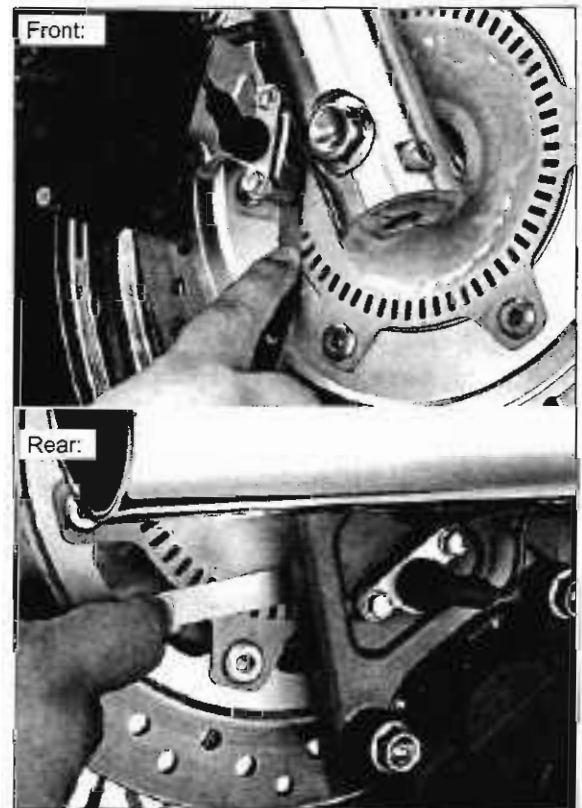
Measure the clearance (air gap) between the sensor and pulser ring at several points by turning the wheel slowly.

It must be within specification.

**STANDARD: 0.4 – 1.2 mm (0.01 - 0.05 in)**

The sensor air gap cannot be adjusted.

If it is not within specification, check each installation part for deformation, looseness and damage.



## ANTI-LOCK BRAKE SYSTEM (ABS; VT750C2S)

### REPLACEMENT

#### FRONT WHEEL SPEED SENSOR

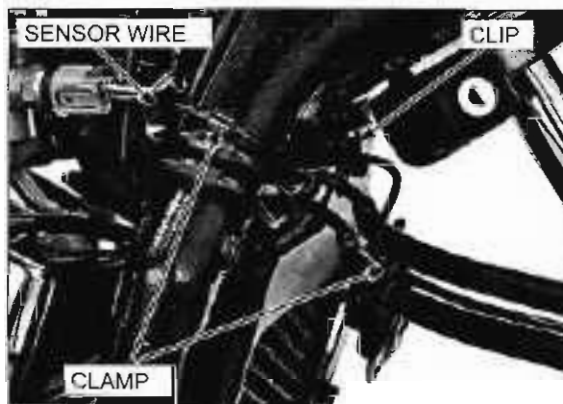
Remove the fuel tank (page 5-48).

Disconnect the front wheel speed sensor 2P (Green) connector.



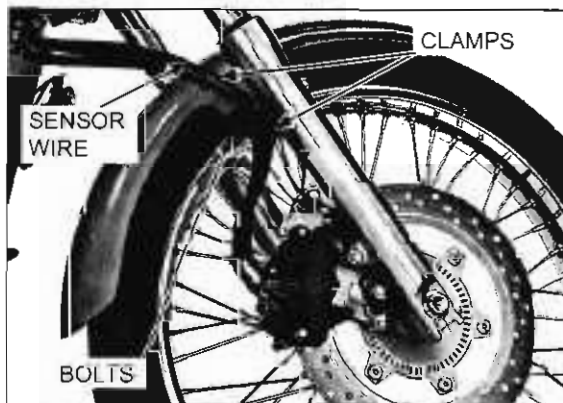
Release the sensor wire clip from the radiator.

Release the sensor wire from the wire clamps.



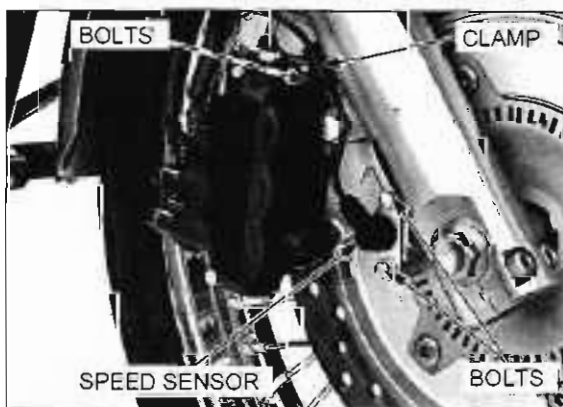
Remove the bolt and release the sensor wire from the brake hose clamp.

Release the sensor wire from the wire clamp.



Remove the bolt and wire clamp.

Remove the wheel speed sensor mounting bolts and guide.



## ANTI-LOCK BRAKE SYSTEM (ABS; VT750C2S)

Remove the wheel speed sensor from the caliper bracket.

Clean around the mounting area of the caliper bracket thoroughly, and be sure that no foreign material is allowed to enter the mounting hole.

*Route the sensor wire properly (page 1-43).*

Install a new speed sensor in the reverse order of removal.

After installation, check the air gap (page 17-23).

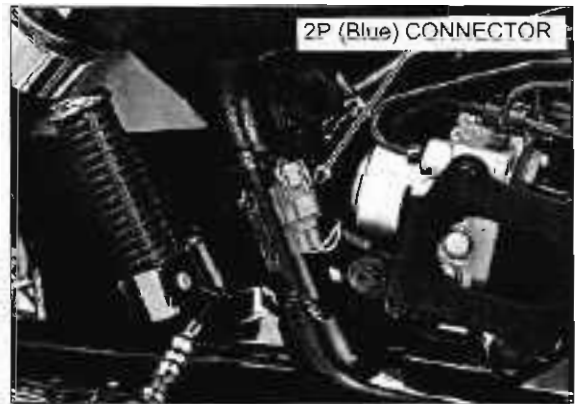


### REAR WHEEL SPEED SENSOR

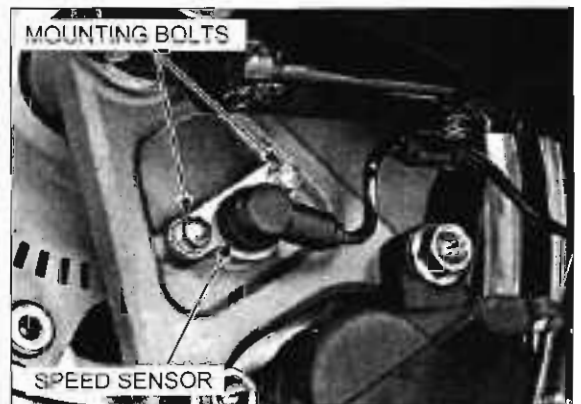
Remove the right side cover (page 2-3).

Disconnect the rear wheel speed sensor 2P (Blue) connector.

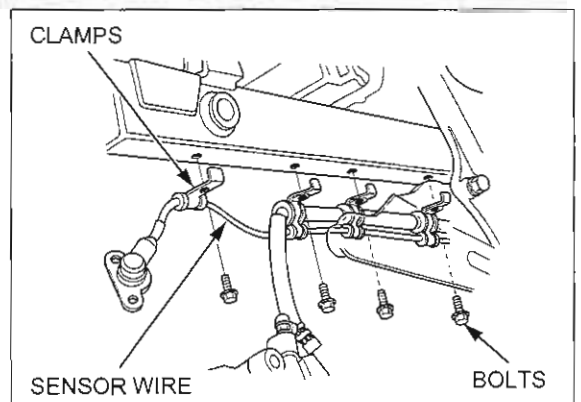
Release the sensor wire from the frame clamp and remove the wire clip from the brake pipe stay.



Remove the mounting bolts and rear wheel speed sensor.



Remove the bolts, sensor wire and clamps.



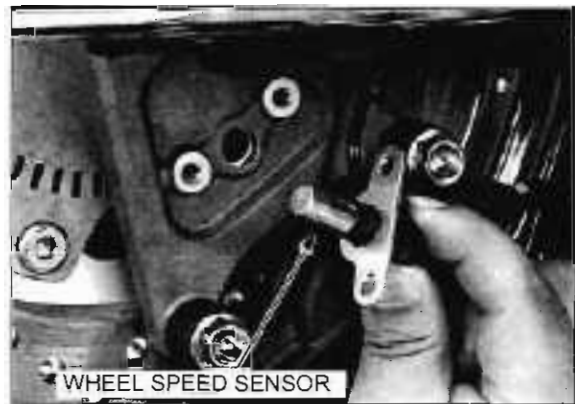
## ANTI-LOCK BRAKE SYSTEM (ABS; VT750C2S)

Clean around the mounting area of the caliper bracket thoroughly, and be sure that no foreign material is allowed to enter the mounting hole.

*Route the sensor wire properly (page 1-43).*

Install a new speed sensor in the reverse order of removal.

After installation, check the air gap (page 17-23).



## ABS MODULATOR/PCV

### REMOVAL

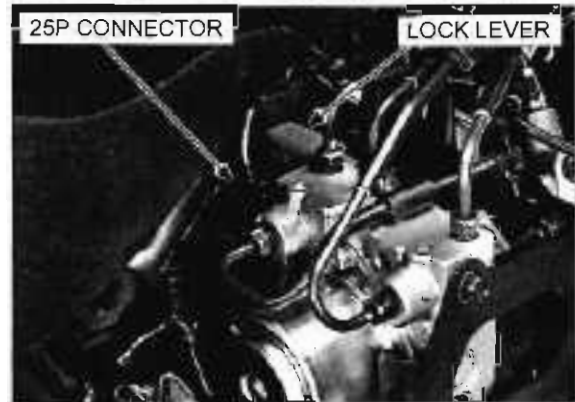
Drain the brake fluid from the front and rear hydraulic systems.

Remove the side cover (page 2-3).

Remove the ABS modulator/PCV stay mounting bolts/washers.

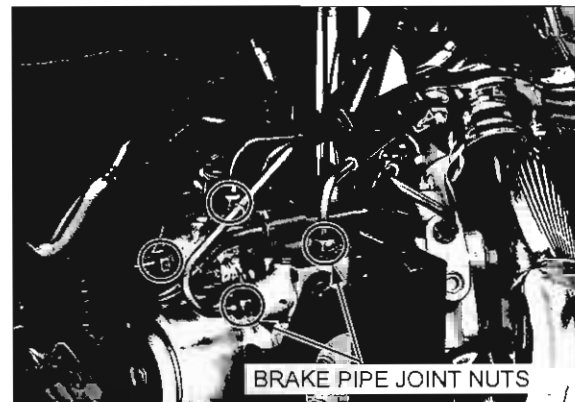


Pull the lock lever up and disconnect the ABS modulator 25P connector.



*When loosening the joint nuts, cover the end of the brake pipes to prevent contamination.*

Loosen the brake pipe joint nuts and disconnect the brake pipes.

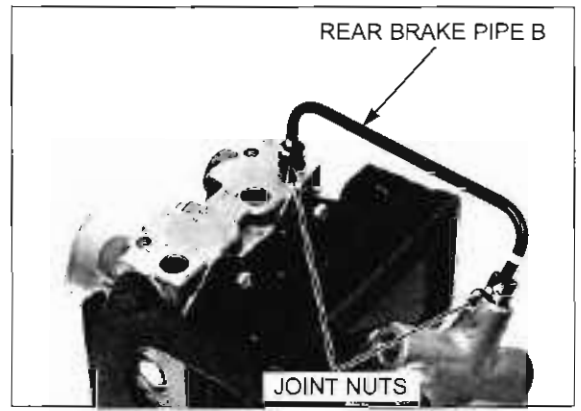




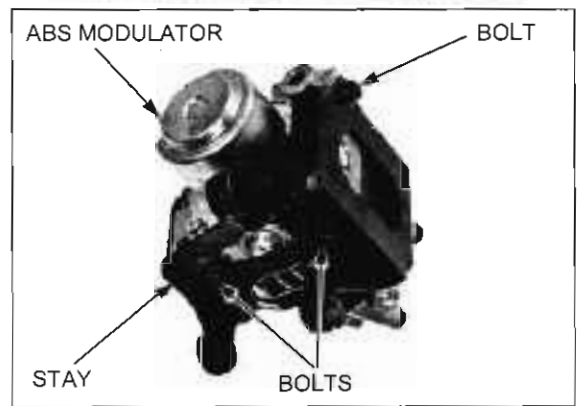
# ANTI-LOCK BRAKE SYSTEM (ABS; VT750C2S)

Be careful not to bend or damage the brake pipes during removal.

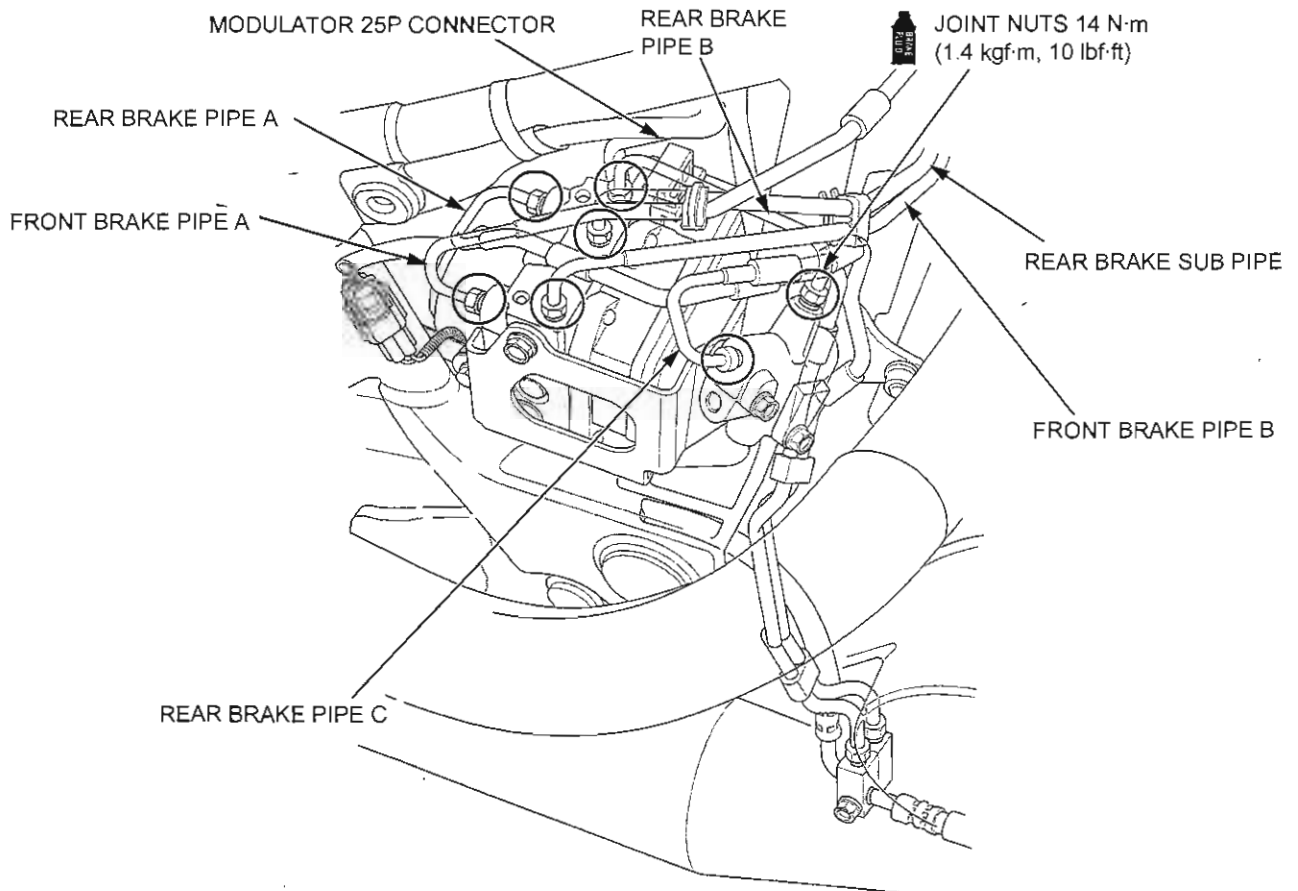
Loosen the PCV connecting pipe joint nuts and remove the rear brake pipe B.



Remove the modulator mounting bolts and ABS modulator from the stay.

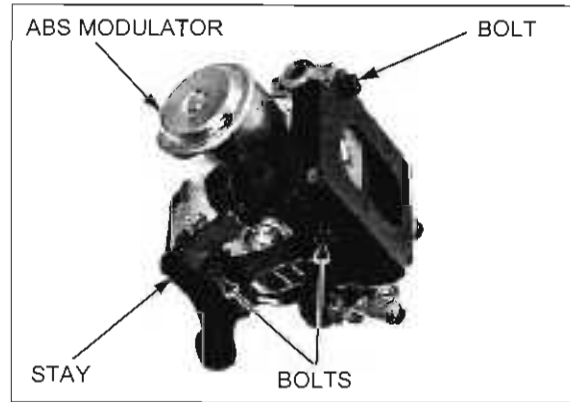


## INSTALLATION



## ANTI-LOCK BRAKE SYSTEM (ABS; VT750C2S)

Tighten the modulator mounting bolt and side mounting bolt securely.



Installation is in the reverse order of removal by loosely tightening all the fasteners.

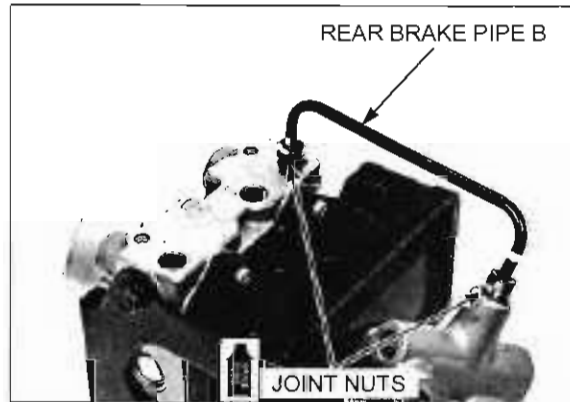
### NOTE:

- Apply brake fluid to the PCV connecting pipe joint nut and brake pipe joint nut threads.

Tighten the PCV connecting pipe joint nuts to the specified torque.

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

Tighten the modulator mounting bolt and side mounting bolt securely.



Tighten the brake pipe joint nuts to the specified torque.

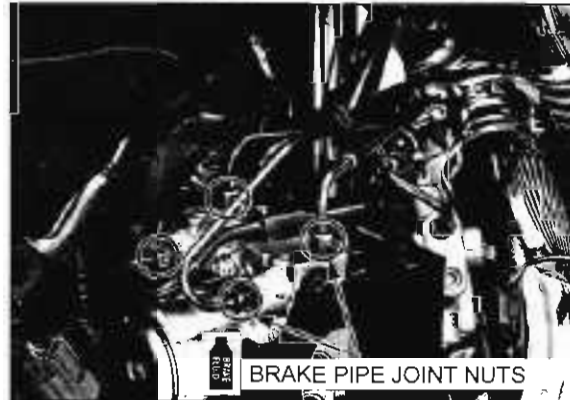
**TORQUE: 14 N·m (1.4 kgf·m, 10 lbf·ft)**

Connect the ABS modulator 25P connector.

Install and tighten the ABS modulator/PCV stay mounting bolts/washers securely.

Fill and bleed the hydraulic systems (page 16-12).

Install the right side cover (page 2-3).



## PCV

### REMOVAL/INSTALLATION

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

Drain the brake fluid from the front and rear hydraulic systems (page 16-10).

Remove the brake pipe joint nuts.

Remove the mounting bolts and the PCV.

Installation is in the reverse order of removal.

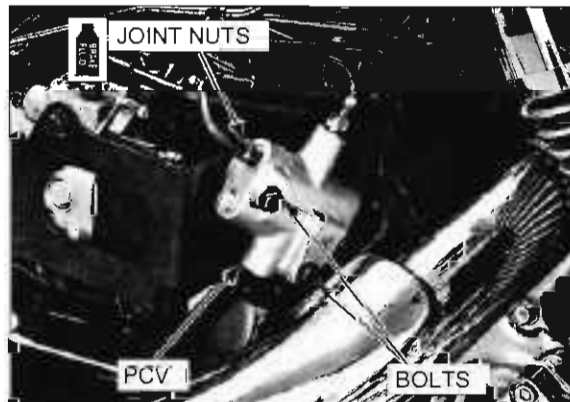
### NOTE:

- Apply brake fluid to the brake pipe joint nut threads.

### TORQUE:

Brake pipe joint nut:

**14 N·m (1.4 kgf·m, 10 lbf·ft)**



# 18. BATTERY/CHARGING SYSTEM

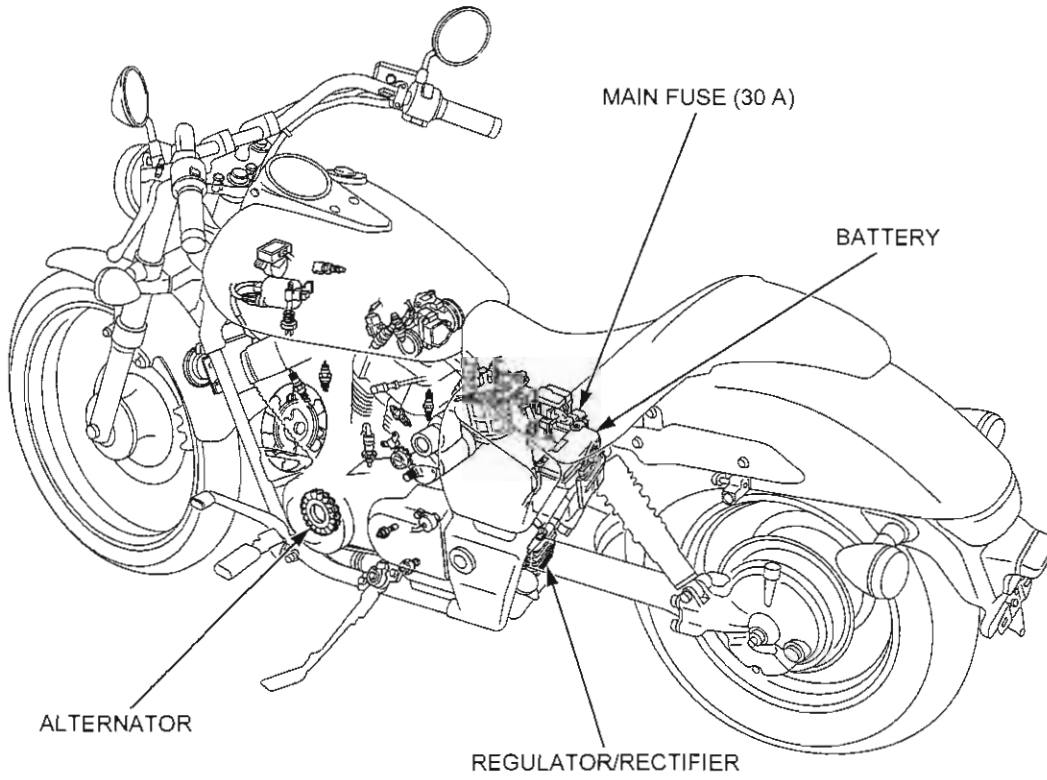
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SYSTEM LOCATION.....	18-2	BATTERY.....	18-7
SYSTEM DIAGRAM .....	18-3	CHARGING SYSTEM INSPECTION .....	18-8
SERVICE INFORMATION.....	18-4	REGULATOR/RECTIFIER .....	18-9
TROUBLESHOOTING.....	18-6	ALTERNATOR CHARGING COIL .....	18-10

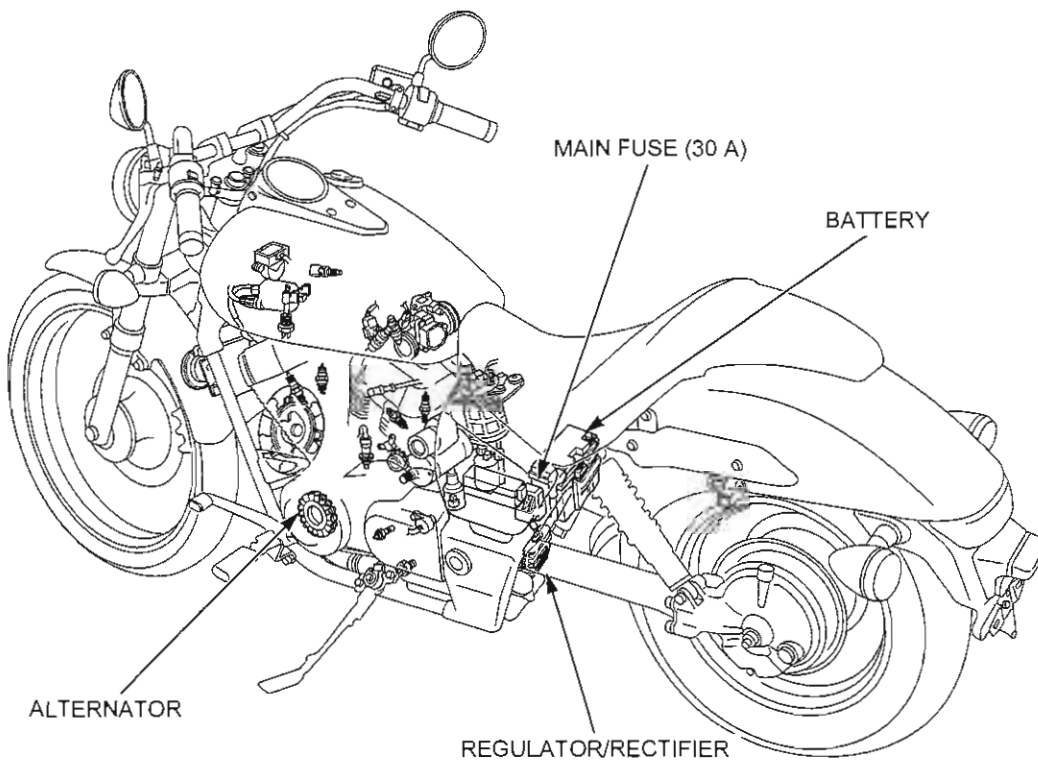
**BATTERY/CHARGING SYSTEM**

**SYSTEM LOCATION**

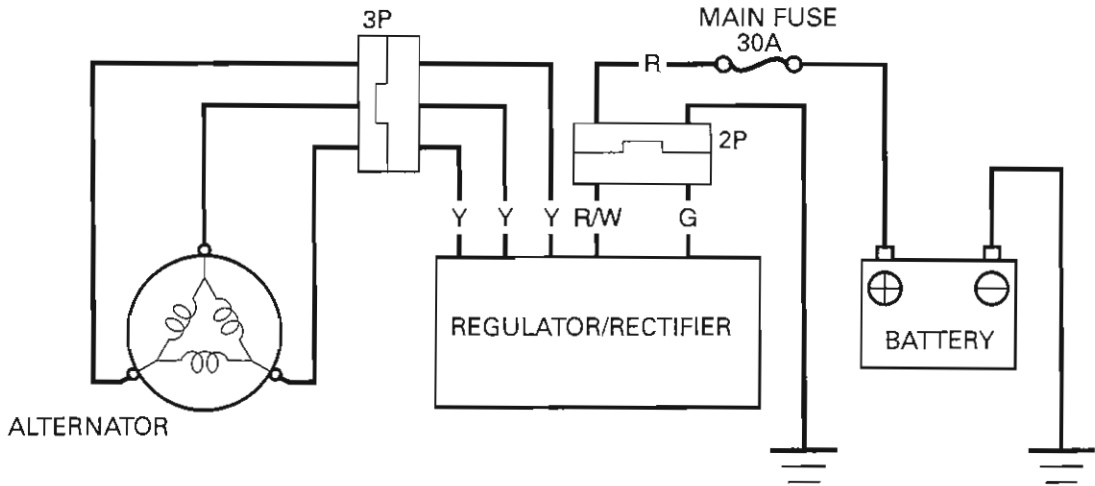
VT750C2F/C2B



VT750C2S



SYSTEM DIAGRAM



Y: Yellow  
G: Green  
R: Red  
W: White

## BATTERY/CHARGING SYSTEM

# SERVICE INFORMATION

## GENERAL

### ⚠ 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 call your local Poison Control Center or call a physician immediately.

### NOTICE

- *Always turn off the ignition switch before disconnecting any electrical component.*
- *Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is turned to "ON" and current is present.*
- For extended storage, remove the battery, give it a full charge, and store it in a cool, dry space.
- For a battery remaining in a stored motorcycle, disconnect the negative battery cable from the battery terminal.
- The maintenance free (MF) battery must be replaced when it reaches the end of its service life.
- The battery can be damaged if overcharged or undercharged, or if left to discharge for long period. These same conditions contribute to shortening the "life span" of the battery. Even under normal use, the performance of the battery deteriorates after 2 – 3 years.
- Battery voltage may recover after battery charging, but under heavy load, the battery voltage will drop quickly and eventually die out. For this reason, the charging system is often suspected as the problem. Battery overcharge often results from problems in the battery itself, which may appear to be an overcharging symptom. If one of the battery cells is shorted and battery voltage does not increase, the regulator/rectifier supplies excess voltage to the battery. Under these conditions, the electrolyte level goes down quickly.
- Before troubleshooting the charging system, check for proper use and maintenance of the battery. Check if the battery is frequently under heavy load, such as having the headlight and taillight ON for long periods of time without riding the motorcycle.
- The battery will self-discharge when the motorcycle is not in use. For this reason, charge the battery every 2 weeks to prevent sulfation from occurring.
- When servicing the charging system, always follow the steps in the troubleshooting flow chart (page 18-6).
- For alternator service (page 11-4).

### BATTERY CHARGING

- Turn power ON/OFF at the charger, not at the battery terminal.
- For battery charging, do not exceed the charging current and time specified on the battery. Using excessive current or extending the charging time may damage the battery.
- Quick charging should only be done in an emergency; slow charging is preferred.

### BATTERY TESTING

Refer to the battery tester's Operation Manual for the recommended battery tester for details about battery testing. The recommended battery tester puts a "load" on the battery so the actual battery condition of the load can be measured.

**Recommended Battery Tester: Micro404XL (U.S.A. only), BM-210 or equivalent**



### TROUBLESHOOTING

#### BATTERY IS DAMAGED OR WEAK

##### 1. BATTERY TEST

Remove the battery (page 18-7).

Check the battery condition using the recommended battery tester.

**RECOMMENDED BATTERY TESTER:** Micro 404XL (U.S.A. only), BM-210 or equivalent

*Is the battery good condition?*

**NO** – Faulty battery

**YES** – GO TO STEP 2.

##### 2. CURRENT LEAKAGE TEST

Install the battery (page 18-7).

Check the battery current leakage test (Leak test; page 18-8).

*Is the current leakage below 1 mA?*

**YES** – GO TO STEP 4.

**NO** – GO TO STEP 3.

##### 3. CURRENT LEAKAGE TEST WITHOUT REGULATOR/RECTIFIER CONNECTOR

Disconnect the regulator/rectifier connector and recheck the battery current leakage.

*Is the current leakage below 1 mA?*

**YES** – Faulty regulator/rectifier

**NO** – • Shorted wire harness  
• Faulty ignition switch

##### 4. ALTERNATOR CHARGING COIL INSPECTION

Check the alternator charging coil (page 18-10).

*Is the alternator charging coil resistance within 0.1 – 1.0  $\Omega$  (20°C/68°F)?*

**NO** – Faulty charging coil

**YES** – GO TO STEP 5.

##### 5. CHARGING VOLTAGE INSPECTION

Measure and record the battery voltage using a digital multimeter (page 18-8).

Start the engine.

Measure the charging voltage (page 18-9).

Compare the measurements to result of the following calculation.

**STANDARD: Measured BV < Measured CV < 15.5 V**

•BV = Battery Voltage (page 18-8)

•CV = Charging Voltage

*Is the measured charging voltage within the standard voltage?*

**YES** – Faulty battery

**NO** – GO TO STEP 6.

##### 6. REGULATOR/RECTIFIER SYSTEM INSPECTION

Check the voltage and resistance at the regulator/rectifier connector (page 18-9).

*Are the results of checked voltage and resistance correct?*

**YES** – Faulty regulator/rectifier

**NO** – • Open circuit in related wire  
• Loose or poor contacts of related terminal  
• Shorted wire harness



## BATTERY

### REMOVAL/INSTALLATION (VT750C2F/ C2B)

Remove the seat (page 2-3).

Remove the screw.

Remove the battery case cover by unhooking the battery case hooks.

With the ignition switch turned to "OFF", disconnect the battery negative (-) cable first, then disconnect the battery positive (+) cable.

Remove the battery from the battery case.

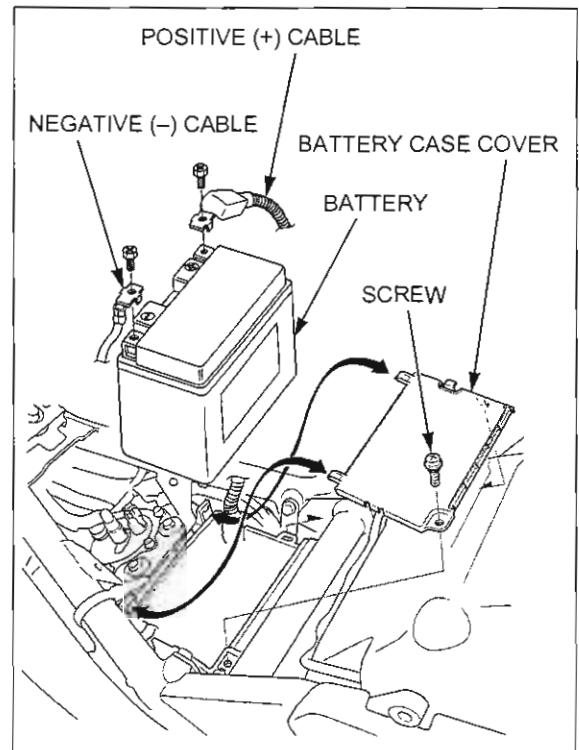
Install the battery in the reverse order of removal.

**NOTE:**

- Connect the positive (+) cable first, then connect the negative (-) cable.
- After connecting the battery cables, coat the terminals with grease.

**TORQUE:**

**Battery case cover screw:**  
1 N·m (0.1 kgf·m, 0.7 lbf·ft)



### REMOVAL/INSTALLATION (VT750C2S)

Remove the seat (page 2-3).

Remove the screw.

Remove the battery case cover by unhooking the battery case hooks.

With the ignition switch turned to "OFF", disconnect the battery negative (-) cable first, then disconnect the battery positive (+) cable.

Remove the battery from the battery case.

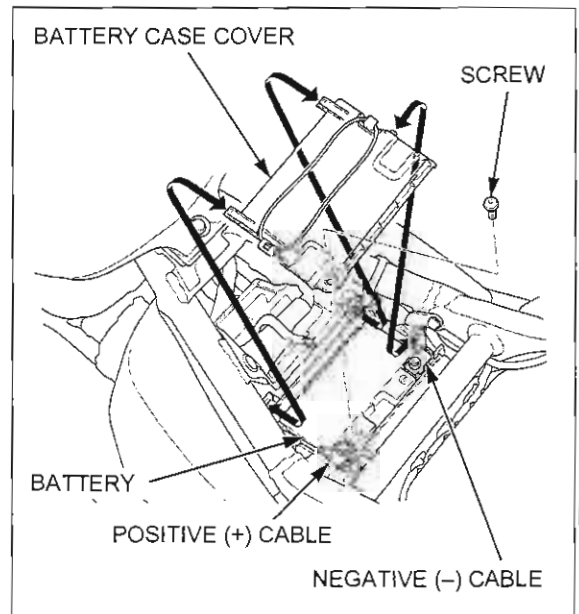
Install the battery in the reverse order of removal.

**NOTE:**

- Connect the positive (+) cable first, then connect the negative (-) cable.
- After connecting the battery cables, coat the terminals with grease.

**TORQUE:**

**Battery case cover screw:**  
1 N·m (0.1 kgf·m, 0.7 lbf·ft)



## BATTERY/CHARGING SYSTEM

### VOLTAGE INSPECTION

Remove the battery case cover (page 18-7).

Measure the battery voltage using a commercially available digital multimeter.

**VOLTAGE (20°C/68°F):**

Fully charged: 13.0 – 13.2 V

Needs charging: Below 12.4 V

**TOOL:**

Digital multimeter

Commercially  
available



## CHARGING SYSTEM INSPECTION

### CURRENT LEAKAGE TEST

Remove the battery case cover (page 18-7).

With the ignition switch turned to "OFF", disconnect the negative (-) cable from the battery.

Connect the ammeter (+) probe to the negative (-) cable and the ammeter (-) probe to the battery (-) terminal.

With the ignition switch turned to "OFF", check for current leakage.

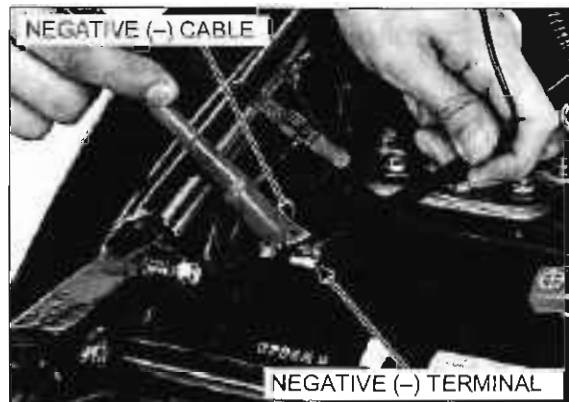
**NOTE:**

- When measuring current using a tester, set it to a high range, and then bring the range down to an appropriate level. Current flow higher than the range selected may blow the fuse in the tester.
- While measuring current, do not turn the ignition switch to "ON". A sudden surge of current may blow the fuse in the tester.

**SPECIFIED CURRENT LEAK-1 mA maximum  
AGE:**

If current leakage exceeds the specified value, a shorted circuit is the probable cause.

Locate the short by disconnecting connections one by one and measuring the current.



## CHARGING VOLTAGE INSPECTION

**NOTE:**

Make sure the battery is in good condition before performing this test.

Connect a tachometer.

Start the engine and warm it up to the operating temperature; then stop the engine.

Remove the battery case cover (page 18-7).

Connect the multimeter between the positive and negative terminals of the battery.

**NOTE:**

To prevent a short, make absolutely certain which are the positive and negative terminals or cable.

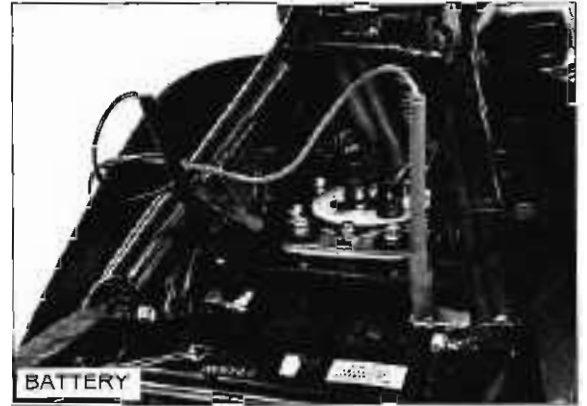
With the headlight on high beam, restart the engine. Measure the voltage on the multimeter when the engine runs at 5,000 rpm.

**STANDARD:**

Measured BV < Measured CV < 15.5 V

- BV = Battery Voltage (page 18-8)
- CV = Charging Voltage

*Do not disconnect the battery or any cable in the charging system without first switching off the ignition switch. Failure to follow this precaution can damage the tester or electrical components.*



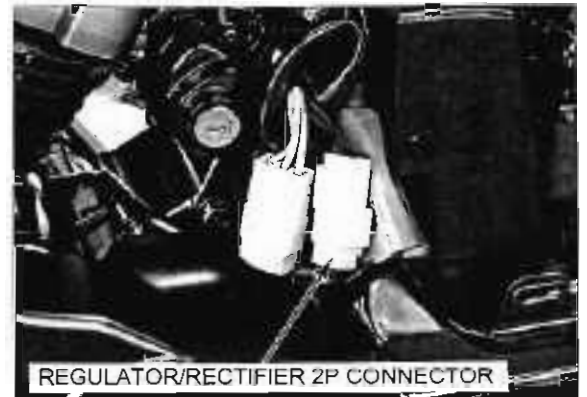
## REGULATOR/RECTIFIER

### WIRE HARNESS INSPECTION

#### BATTERY CHARGING LINE

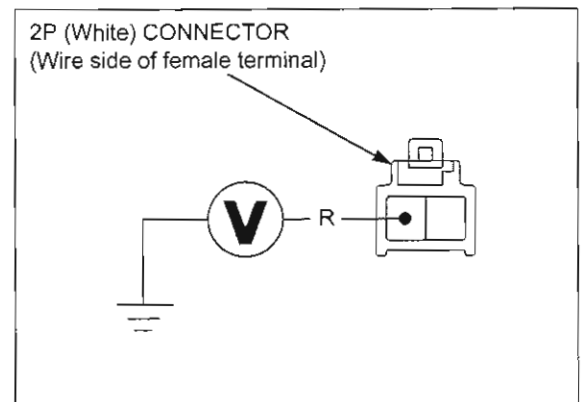
Remove the left side cover (page 2-3).

With the ignition switch turned to "OFF", disconnect the regulator/rectifier 2P (White) connector.



Measure the voltage between the Red wire terminal (+) of the wire side 2P (White) connector and ground (-). There should be battery voltage at all times.

2P (White) CONNECTOR  
(Wire side of female terminal)

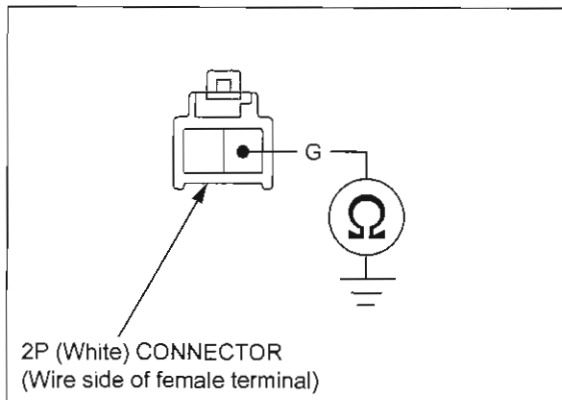


## BATTERY/CHARGING SYSTEM

### GROUND LINE

Check for continuity between the Green wire terminal of the wire side 2P (White) connector and ground. There should be continuity at all times.

If all components of the charging system are normal and there are no loose connection at the regulator/rectifier connector, replace the regulator/rectifier.



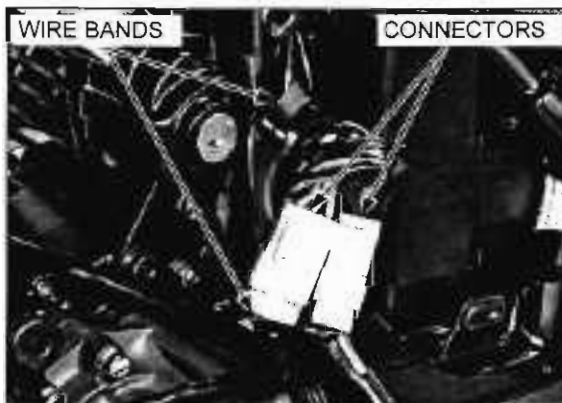
### REMOVAL/INSTALLATION

Remove the following:

- Left side cover (page 2-3)
- Left crankcase rear cover (page 2-4)

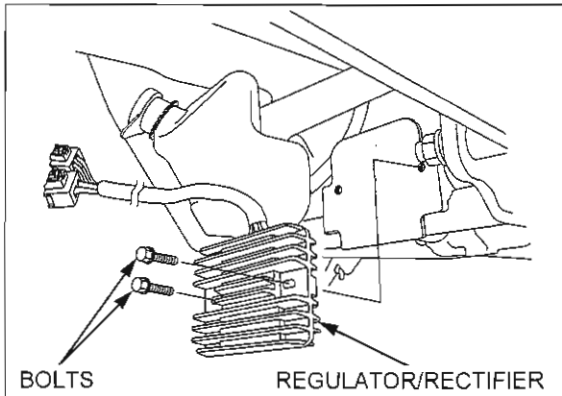
Release the wires from the wire bands.

With the ignition switch turned to "OFF", disconnect the regulator/rectifier 2P (White) connector and alternator 3P (White) connector.



Remove the bolts and regulator/rectifier.

Install the regulator/rectifier in the reverse order of removal.

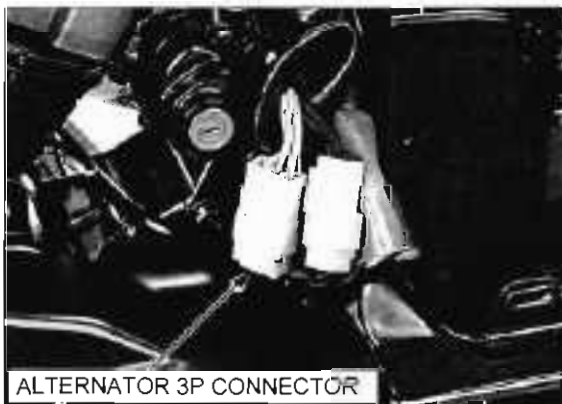


## ALTERNATOR CHARGING COIL

### INSPECTION

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

With the ignition switch turned to "OFF", disconnect the alternator 3P (White) connector.



## BATTERY/CHARGING SYSTEM

Measure the resistance between the Yellow wire terminals of alternator/stator side connector.

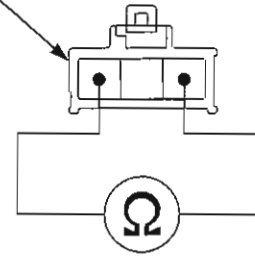
**STANDARD: 0.1 – 1.0  $\Omega$  at 20°C (68°F)**

Check for continuity between each wire terminals of the alternator/stator side connector and ground. There should be no continuity.

Replace the stator if the resistance is out of specification, or if any wire has continuity to ground.

For alternator/starter replacement (page 11-4).

3P CONNECTOR  
(Alternator/stator side of female terminal)



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MEMO

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# 19. IGNITION SYSTEM

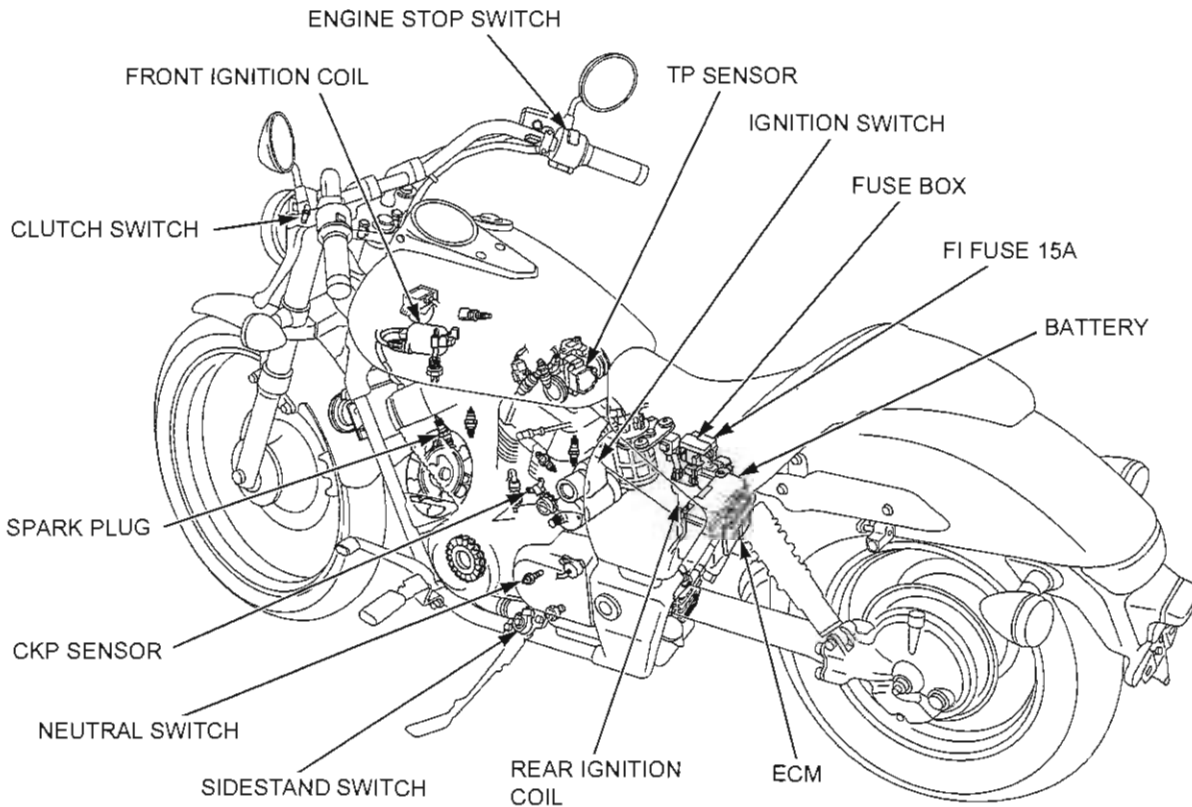
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SYSTEM LOCATION.....	19-2	IGNITION SYSTEM INSPECTION .....	19-6
SYSTEM DIAGRAM .....	19-3	IGNITION COIL .....	19-8
SERVICE INFORMATION .....	19-4	IGNITION TIMING .....	19-10
TROUBLESHOOTING.....	19-5		

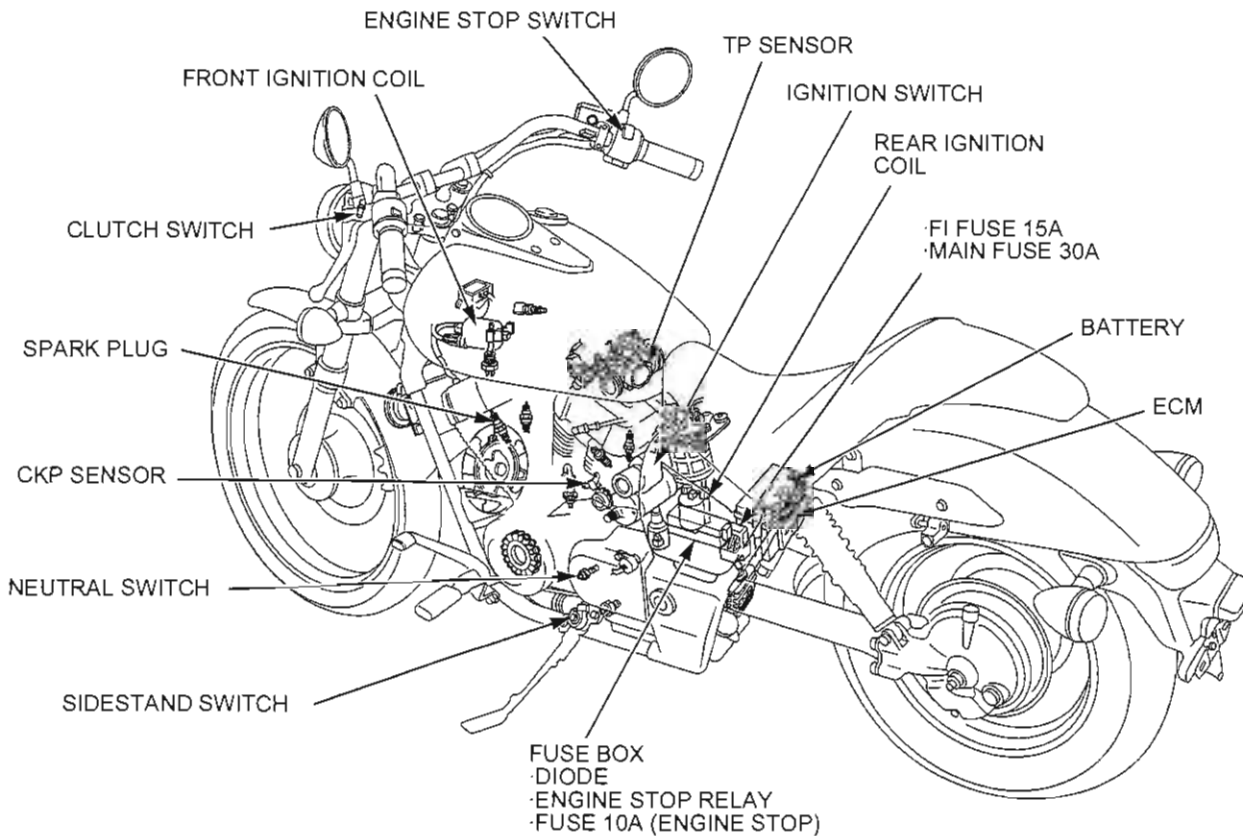
# IGNITION SYSTEM

## SYSTEM LOCATION

### VT750C2F/C2B



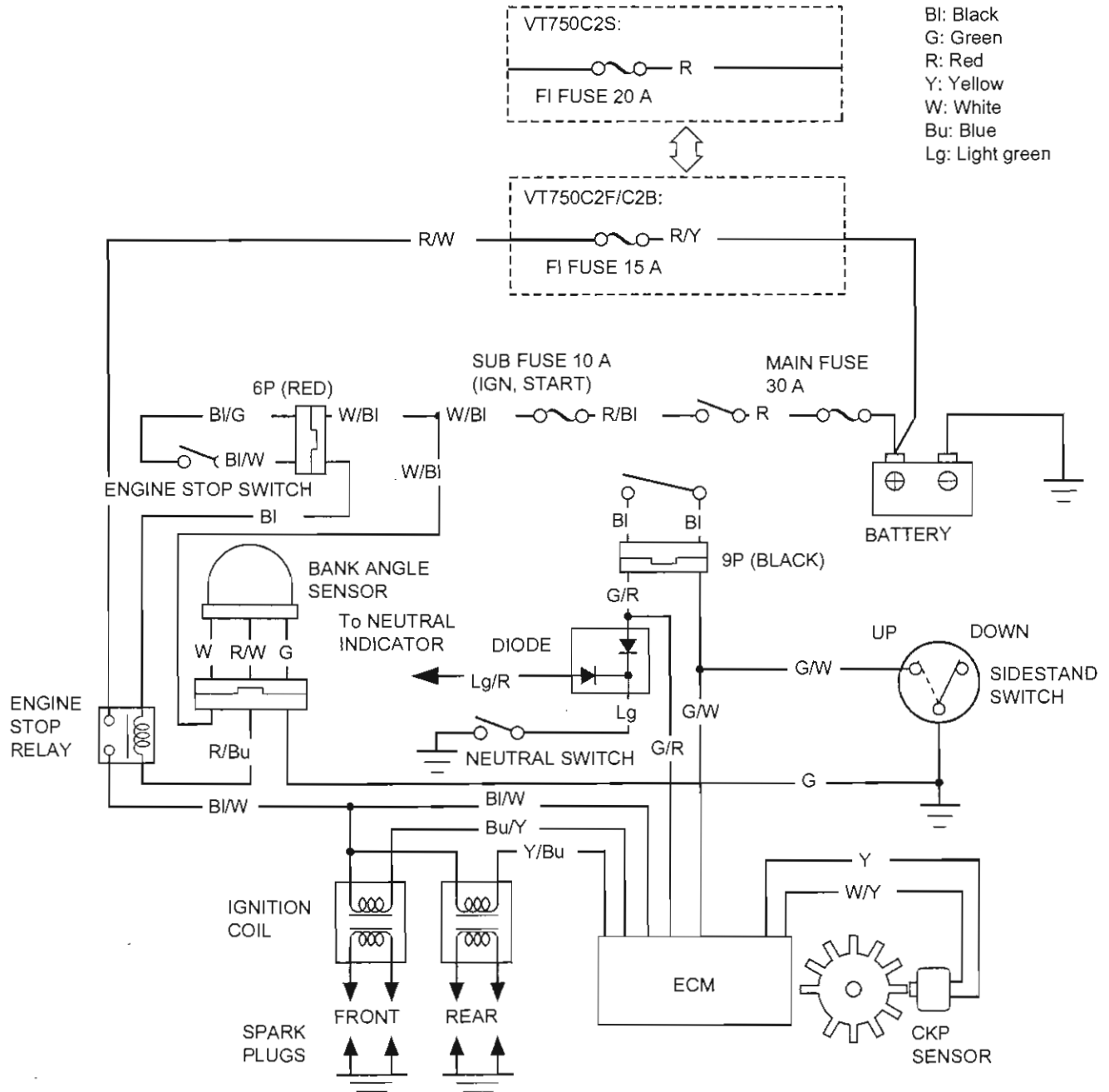
### VT750C2S





SYSTEM DIAGRAM

Bl: Black  
 G: Green  
 R: Red  
 Y: Yellow  
 W: White  
 Bu: Blue  
 Lg: Light green



## IGNITION SYSTEM

# SERVICE INFORMATION

## GENERAL

### NOTICE

- The ECM may be damaged if dropped. Also, if the connector is disconnected when current is flowing, the excessive voltage may damage the module. Always turn the ignition switch to "OFF" before servicing.
- Use spark plugs with the correct heat range. Using spark plugs with an incorrect heat range can damage the engine.
- Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is turned to "ON" and current is present.
- When servicing the ignition system, always follow the steps in the troubleshooting table on page 19-5.
- The ignition timing cannot be adjusted since the ECM is factory preset.
- A faulty ignition system is often related to poor connections. Check those connections before proceeding.
- Make sure the battery is adequately charged. Using the starter motor with a weak battery results in a slower engine cranking speed as well as no spark at the spark plugs.
- For spark plug inspection (page 3-7).
- Refer to the following components informations:
  - Ignition switch (page 21-21)
  - Engine stop switch (page 21-23)
  - Neutral switch (page 21-26)
  - Sidestand switch (page 21-26)
  - Diode (page 20-19)
  - ECM (page 5-66)
  - Bank angle sensor (page 5-63)
  - Engine stop relay (page 5-65)
  - Clutch switch (page 21-25)

## SPECIFICATIONS

ITEM		SPECIFICATIONS
Spark plug	Standard	DPR7EA-9 (NGK), X22EPR-U9 (DENSO)
	For extended high speed riding	DPR8EA-9 (NGK), X24EPR-U9 (DENSO)
Spark plug gap		0.8 – 0.9 mm (0.03 – 0.04 in)
Ignition coil primary peak voltage		100 V minimum
Ignition timing ("F"mark)		8° BTDC at idle
CKP sensor peak voltage (at 20°C/68°F)		0.7 V minimum

## TORQUE VALUES

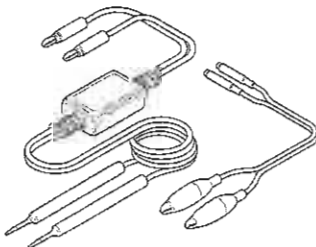
Alternator cover socket bolt  
Timing hole cap

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

Apply grease to the threads

## TOOLS

Peak voltage adaptor  
07HGJ-0020100

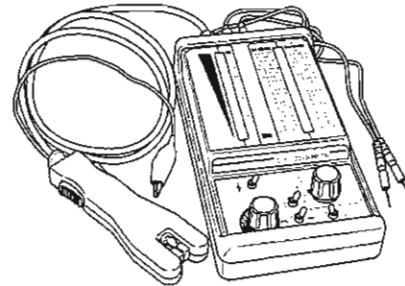


(not available in U.S.A.) with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)

Test probe  
07ZAJ-RDJA110



Peak voltage tester  
TMNTS91H (U.S.A. only)



## TROUBLESHOOTING

- Inspect the following before diagnosing the system.
  - Faulty spark plug
  - Loose spark plug cap or spark plug wire connection
  - Water in the spark plug cap (Leaking the ignition coil secondary voltage)
- If there is no spark at either cylinder, temporarily exchange the ignition coil with a known-good one and perform the spark test. If there is spark, the original ignition coil is faulty.
- "Initial voltage" of the ignition primary coil is the battery voltage with the ignition switch turned to "ON" and the engine stop switch at "O" (The engine is not cranked by the starter motor).

### No spark at spark plugs

UNUSUAL CONDITION		PROBABLE CAUSE (Check in numerical order)
Ignition coil primary voltage	No initial voltage with the ignition switch turned to "ON" and the engine stop switch at "O" (Other electrical components are normal).	1. Faulty engine stop relay. 2. An open circuit in Black/white wire between the ignition coil and engine stop relay. 3. Loose or poor connection of the primary terminal, or an open circuit in the primary coil. 4. Faulty ECM (in case when the initial voltage is normal with the ECM connector disconnected).
	Initial voltage is normal, but it drops by 2 – 4 V while cranking the engine.	1. Incorrect peak voltage adaptor connections (System is normal if measured voltage is over the specifications with reverse connections). 2. Battery is undercharged (Voltage drops largely when the engine is started). 3. No voltage between the Black/white (+) and body ground (–) at the ECM connector or loosen ECM connection. 4. An open circuit or loose connection in Green wire at the ECM. 5. An open circuit or loose connection in Blue/yellow or Yellow/blue wires between the ignition coils and ECM. 6. Faulty sidestand switch, clutch switch or neutral switch. 7. Loose or poor connection or an open circuit in No. 6 related wires. – Sidestand switch line: Green/white wire – Neutral switch line: Light green wire – Clutch switch line: Green/white wire 8. Faulty CKP sensor (Measure peak voltage). 9. Faulty ECM (in case when above No. 1 through 8 are normal).
	Initial voltage is normal but there is no peak voltage while cranking the engine.	1. Incorrect peak voltage adaptor connections (System is normal if measured voltage is over the specifications with reverse connections). 2. Faulty peak voltage adaptor. 3. Faulty CKP sensor (Measure peak voltage). 4. Faulty ECM (in case when above No. 1 and 2 are normal).
	Initial voltage is normal but peak voltage is lower than the standard value.	1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Cranking speed is too slow (Battery is undercharged). 3. The sampling timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the standard voltage at least once). 4. Faulty ECM (in case when above No. 1 through 3 are normal).
	Initial and peak voltages are normal but no spark jumps.	1. Faulty spark plug or leaking ignition coil secondary current ampere. 2. Faulty ignition coil(s).
CKP sensor	Peak voltage is lower than the standard value.	1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Cranking speed is too slow (Battery is undercharged). 3. The sampling timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the standard voltage at least once). 4. Faulty CKP sensor (in case when above No. 1 through 3 are normal).
	No peak voltage.	1. Faulty peak voltage adaptor. 2. Faulty CKP sensor.

## IGNITION SYSTEM

### IGNITION SYSTEM INSPECTION

#### NOTE:

- If no spark jumps at the plug, check all connections for loose or poor contact before measuring the peak voltage.
- Use recommended digital multimeter or commercially available digital multimeter with an impedance of 10 M $\Omega$ /DCV minimum.
- The display value differs depending upon the internal impedance of the multimeter.

Connect the peak voltage adaptor to the digital multimeter or use the peak voltage tester.

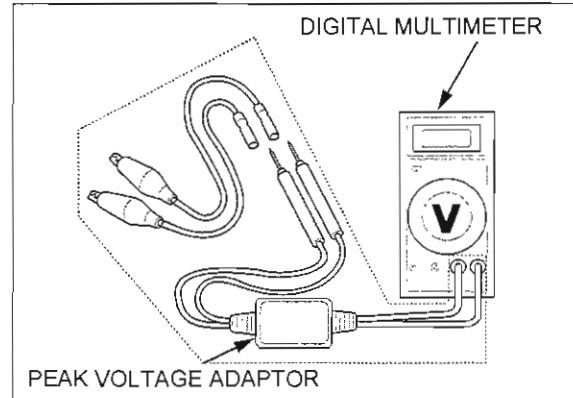
#### TOOL:

Peak voltage tester

TMNTS91H  
(U.S.A. only) or  
07HGJ-0020100  
(not available in  
U.S.A.)

Peak voltage adaptor

with commercially available digital multimeter (impedance 10 M $\Omega$ /DCV minimum)



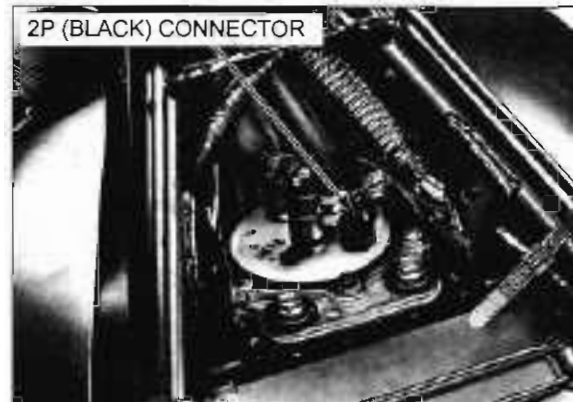
### IGNITION COIL PRIMARY PEAK VOLTAGE

#### NOTE:

- Check all system connections before performing this inspection. Loose connectors can cause incorrect readings.
- Check that the cylinder compression is normal for each cylinder and the spark plugs are installed correctly in each cylinder head.

Remove the seat (page 2-3).

Disconnect the sub fuel tank/fuel pump 2P (Black) connector.



Disconnect all spark plug caps from the spark plugs. Connect the known-good spark plugs to all spark plug caps and ground them to the cylinder heads as done in a spark test.





## IGNITION SYSTEM

Connect the peak voltage adaptor probes to the wire side ECM connector terminal.

### TOOL:

Peak voltage tester

Peak voltage adaptor

TMNTS91H  
(U.S.A. only) or  
07HGJ-0020100  
(not available in  
U.S.A.)

with commercially available digital multimeter (impedance 10 M $\Omega$ /DCV minimum)

**CONNECTION:** Yellow (+) – Body ground (-)

Turn the ignition switch to "ON" with the engine stop switch at "O".

Shift the transmission into neutral.

Crank the engine with the starter motor and measure the CKP sensor peak voltage.

**PEAK VOLTAGE: 0.7 V minimum**

If the voltage measured at the ECM connector is abnormal, measure the peak voltage at the CKP sensor connector.

Remove the steering side covers (page 2-4).

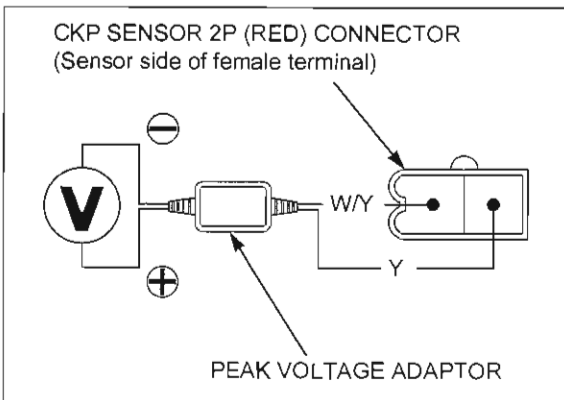
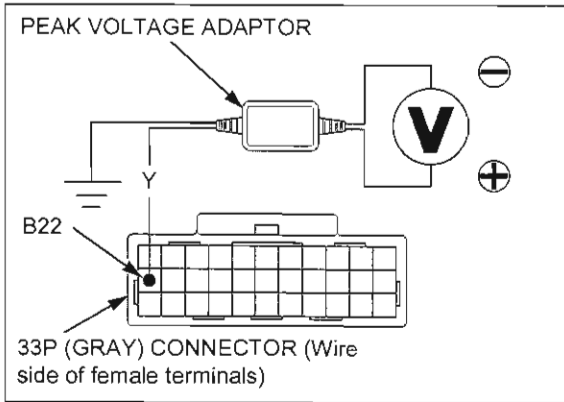
Turn the ignition switch to "OFF".

Disconnect the CKP sensor 2P (Red) connector and connect the peak voltage tester or adaptor probes to the connector terminals of the CKP sensor side.

In the same manner as at the ECM connector, measure the peak voltage and compare it to the voltage measured at the ECM connector.

- If the peak voltage measured at the ECM is abnormal and the one measured at the CKP sensor is normal, the wire harness has an open or short circuit, or loose connection.
- If the peak voltage is lower than standard value, follow the checks in the troubleshooting table (page 19-5).

Install the removed parts in the reverse order of removal.



## IGNITION COIL

### FRONT IGNITION COIL

#### REMOVAL/INSTALLATION

Remove the fuel tank (page 5-48).

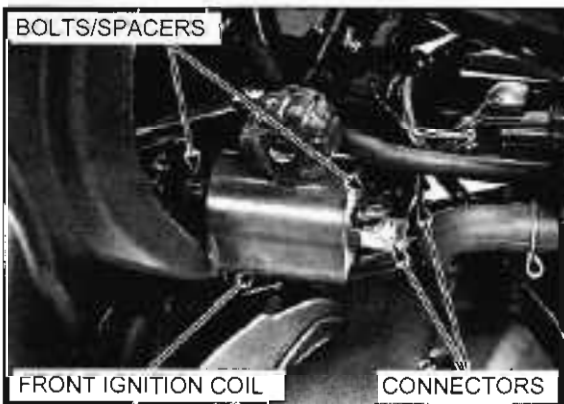
Disconnect the spark plug caps (page 3-7).

Disconnect the ignition coil primary wire connectors.

Remove the bolts, spacers and front ignition coil from the frame.

Install the front ignition coil in the reverse order of removal.

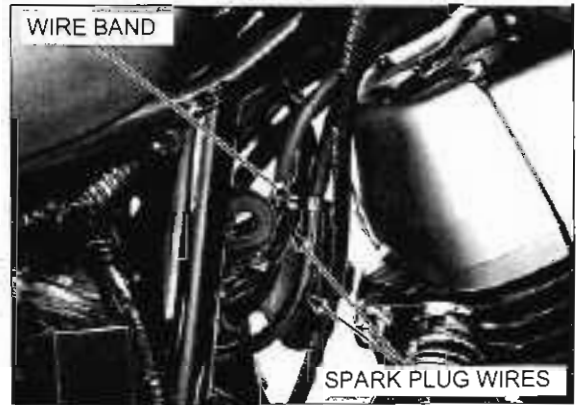
*Route the spark plug wires properly (page 1-26).*



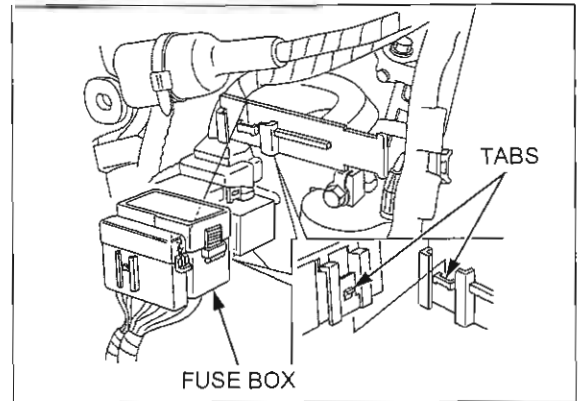
**REAR IGNITION COIL**

**REMOVAL/INSTALLATION (VT750C2F/C2B)**

Remove the turn signal relay (page 21-28).  
 Disconnect the spark plug caps (page 3-7).  
 Release the spark plug wires from the wire band.



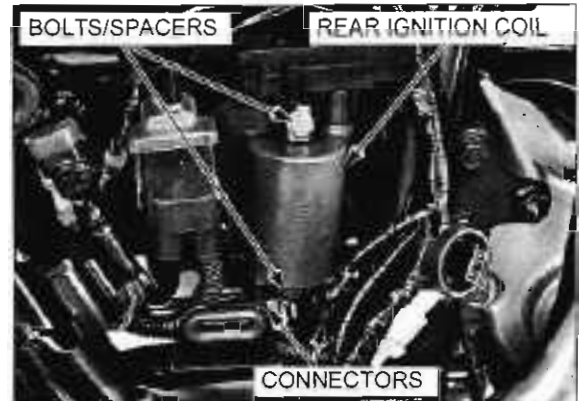
Remove the fuse box from the battery box stay by releasing their tabs.



Disconnect the ignition coil primary wire connectors.  
 Remove the bolts, spacers and rear ignition coil.

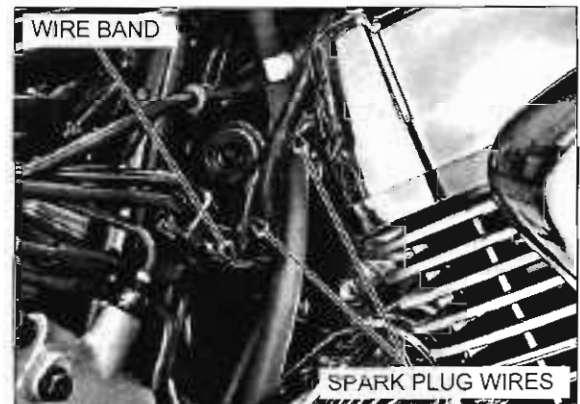
*Route the spark  
 plug wires properly  
 (page 1-26).*

Install the rear ignition coil in the reverse order of removal.



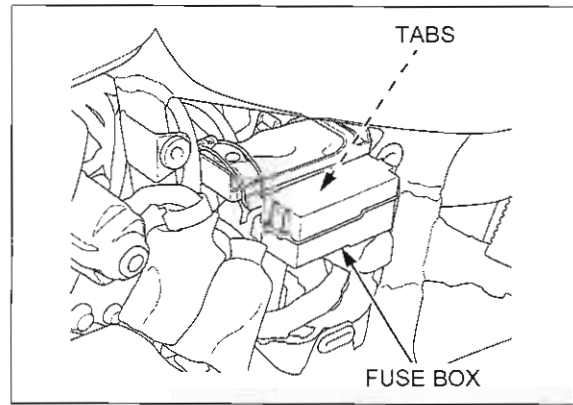
**REMOVAL/INSTALLATION (VT750C2S)**

Remove the right side cover (page 2-3).  
 Disconnect the spark plug caps (page 3-7).  
 Release the spark plug wires from the wire band.



## IGNITION SYSTEM

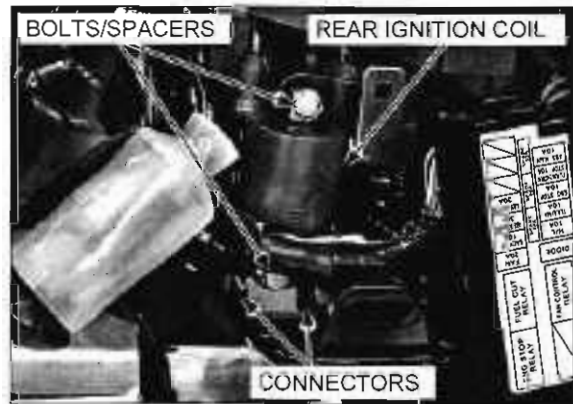
Remove the fuse box from the battery box stay by releasing their tabs.



Disconnect the ignition coil primary wire connectors. Remove the bolts, spacers and rear ignition coil.

*Route the spark plug wires properly (page 1-26).*

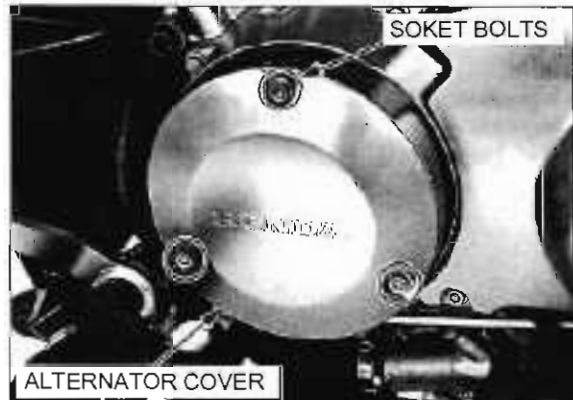
Install the rear ignition coil in the reverse order of removal.



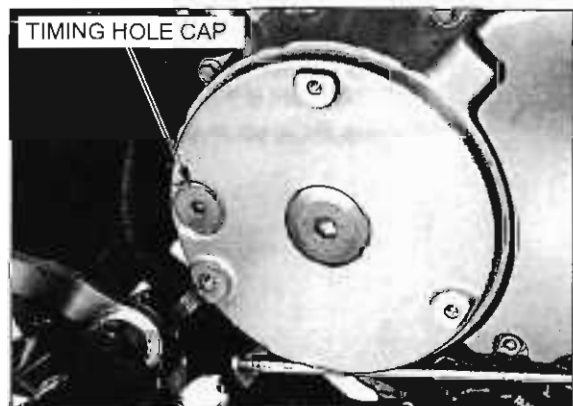
## IGNITION TIMING

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

Remove the socket bolts and alternator cover.



Remove the timing hole cap.



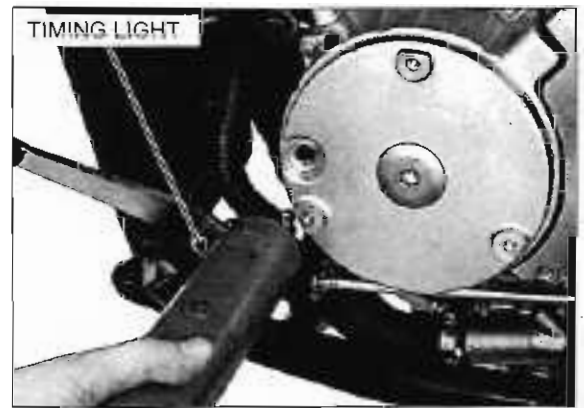


Connect a tachometer.

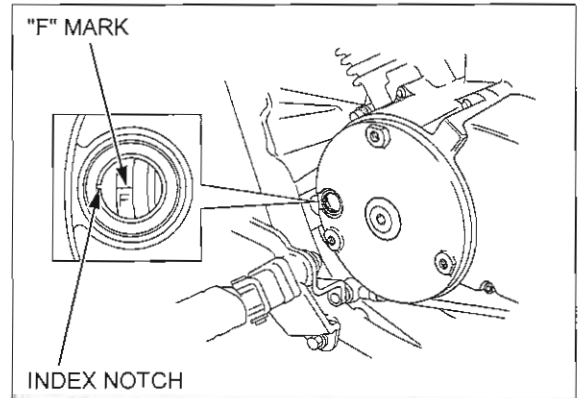
*Read the manufacturer's instructions for timing light operation.*

Connect the timing light to the front spark plug wire.  
Start the engine, let it idle and check the ignition timing.

**IDLE SPEED: 1,200 ± 100 rpm**

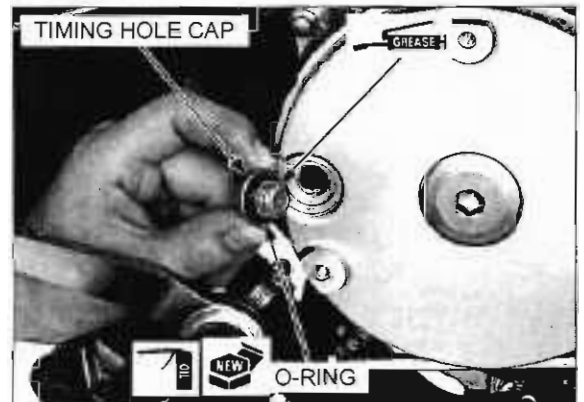


The timing is correct if the "F" mark on the flywheel aligns with the index notch on the left crankcase cover.



Coat a new O-ring with engine oil and install it into the timing hole cap groove.  
Apply grease to the threads of the timing hole cap.  
Install the timing hole cap and tighten it to the specified torque.

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



Install the alternator cover and tighten the socket bolts to the specified torque.

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



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MEMO

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# 20. ELECTRIC STARTER

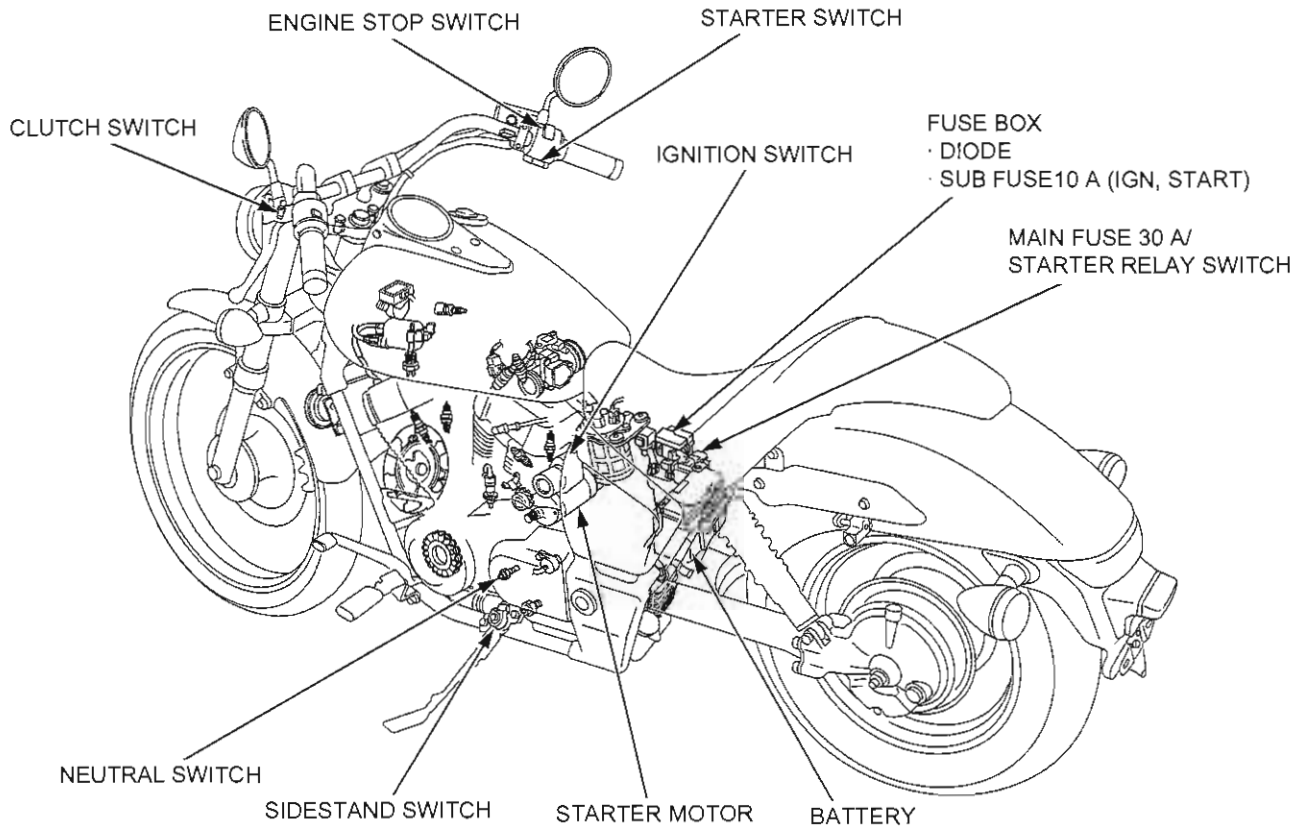
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SYSTEM LOCATION.....	20-2	STARTER MOTOR .....	20-7
SYSTEM DIAGRAM .....	20-3	STARTER RELAY SWITCH (VT750C2F/C2B).....	20-16
SERVICE INFORMATION .....	20-4	STARTER RELAY SWITCH (VT750C2S).....	20-17
TROUBLESHOOTING.....	20-5	DIODE .....	20-19

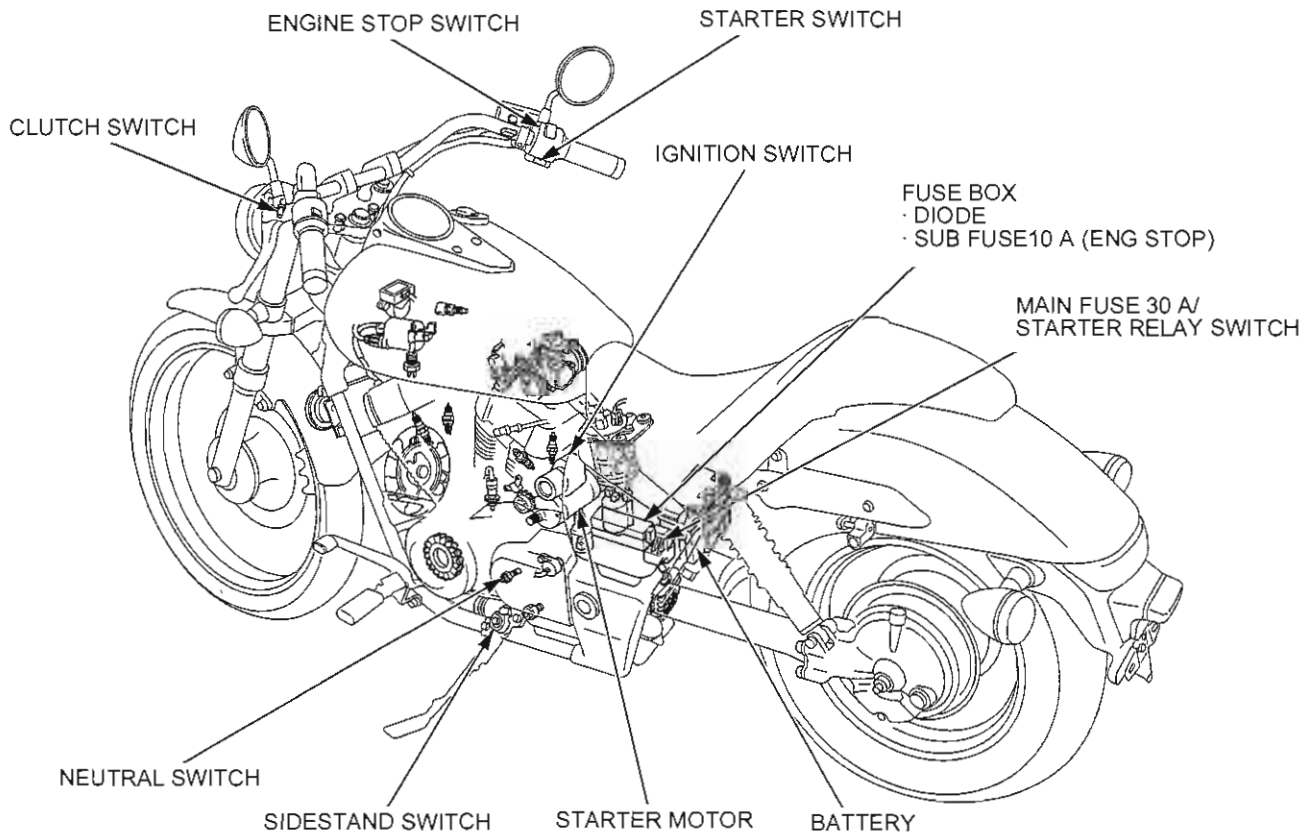
# ELECTRIC STARTER

## SYSTEM LOCATION

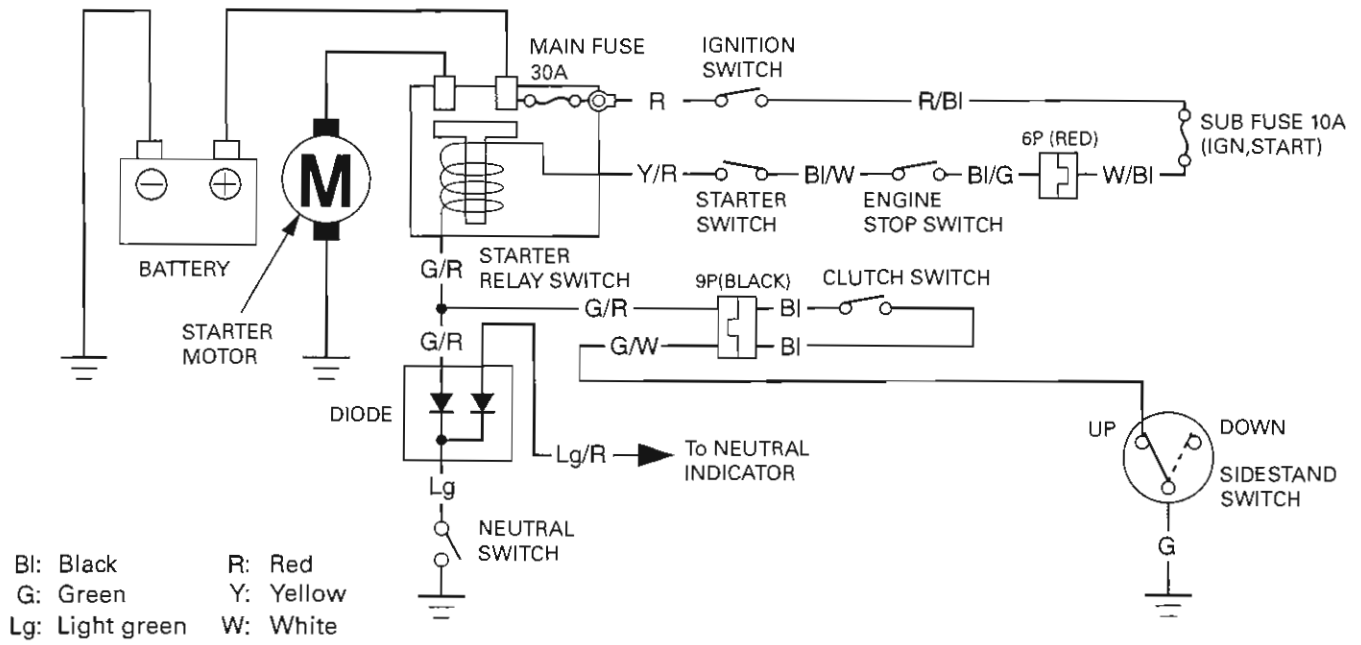
### VT750C2F/C2B



### VT750C2S



SYSTEM DIAGRAM



## ELECTRIC STARTER

# SERVICE INFORMATION

## GENERAL

### NOTICE

- If the current is kept flowing through the starter motor to turn it while the engine is not cranking over, the starter motor may be damaged.
- Always turn the ignition switch to "OFF" before servicing the starter motor. The motor could suddenly start, causing serious injury.
- The starter motor can be serviced with the engine in the frame.
- When checking the starter system, always follow the steps in the troubleshooting flow chart (page 20-5).
- A weak battery may be unable to turn the starter motor quickly enough, or supply adequate ignition current.
- Refer to the following components information:
  - Ignition switch (page 21-21)
  - Engine stop switch (page 21-23)
  - Starter switch (page 21-23)
  - Neutral switch (page 21-26)
  - Sidestand switch (page 21-26)
  - Clutch switch (page 21-25)

## SPECIFICATION

	Unit: mm (in)	
ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	12.5 (0.49)	6.5 (0.26)

## TORQUE VALUES

Starter motor cable terminal nut	10 N·m (1.0 kgf·m, 7 lbf·ft)
Starter motor assembly bolt	4.9 N·m (0.5 kgf·m, 3.6 lbf·ft)
Negative brush screw	3.7 N·m (0.4 kgf·m, 2.7 lbf·ft)

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## TROUBLESHOOTING

### Starter motor does not turn

#### 1. Fuse Inspection

Check for blown main fuse 30 A or sub fuse 10 A (IGN, START).

##### *Is the fuse blown?*

**YES** – Replace the fuse

**NO** – GO TO STEP 2.

#### 2. Battery Inspection

Make sure the battery is fully charged and in good condition (page 18-8).

##### *Is the battery in good condition?*

**YES** – GO TO STEP 3.

**NO** – Charge or replace the battery

#### 3. Starter Relay Switch Operation

Check the starter relay switch operation.

You should hear the relay "CLICK" when the starter switch button is depressed.

##### *Is there a "CLICK"?*

**YES** – GO TO STEP 4.

**NO** – GO TO STEP 5.

#### 4. Starter Motor Inspection

Apply battery voltage directly to the starter motor and check the operation.

##### *Does the starter motor turn?*

**YES** – • Poorly connected starter motor cable  
• Faulty starter relay switch (page 20-16)

**NO** – Faulty starter motor (page 20-7)

#### 5. Relay Coil Ground Lines Inspection

Disconnect the starter relay switch connector, and check the relay coil ground lines as below for continuity:

1. Green/red terminal – diode – neutral switch line (with the transmission in neutral and clutch lever released).
2. Green/red terminal – clutch switch – sidestand switch line (in any gear except neutral, and with the clutch lever pulled in and the sidestand up).

##### *Is there continuity?*

**NO** – • Faulty neutral switch (page 21-26)  
• Faulty diode (page 20-19)  
• Faulty clutch switch (page 21-25)  
• Faulty sidestand switch (page 21-26)  
• Loose or poor contact connector  
• Open circuit in wire harness

**YES** – GO TO STEP 6.

#### 6. Starter Relay Voltage Inspection

Connect the starter relay switch connector.

With the ignition switch to "ON" and engine stop switch button "O" and the starter switch button pushed, measure the voltage at the starter relay switch connector (between Yellow/red (+) and body ground (-)).

##### *Is there battery voltage?*

**NO** – • Faulty ignition switch (page 21-21)  
• Faulty starter switch (page 21-23)  
• Faulty engine stop switch (page 21-23)  
• Loose or poor contact connector  
• Open circuit in wire harness

**YES** – GO TO STEP 7.

## ELECTRIC STARTER

---

### 7. Starter Relay Switch Continuity Inspection

Remove the starter relay switch.

Connect the fully charged 12 V battery positive wire to the starter relay switch Yellow/red wire terminal and negative wire to the Green/red wire terminal.

Check for continuity between the starter relay switch large terminals while the battery connected.

**Is there continuity?**

**NO** – Faulty starter relay switch

**YES** – Loose or poor contact starter relay switch connector

**The starter motor turns when the transmission is in neutral, but does not turn with the transmission in any position except neutral, with the sidestand up and the clutch lever pulled in.**

#### 1. Clutch Switch Inspection

Check the clutch switch operation (page 21-25).

**Is the clutch switch operation normal?**

**NO** – Faulty clutch switch

**YES** – GO TO STEP 2.

#### 2. Sidestand Switch Inspection

Check the sidestand switch operation (page 21-26).

**Is the sidestand switch operation normal?**

**NO** – Faulty sidestand switch (page 21-26)

**YES** – • Open circuit in wire harness  
• Loose or poor contact connector

#### **Starter motor turns slowly**

- Low battery voltage
- Poorly connected battery terminal cable
- Poorly connected starter motor cable
- Faulty starter motor
- Poorly connected battery ground cable

#### **Starter motor turns, but engine does not turn**

- Starter motor is running backwards
  - Case assembled improperly
  - Terminals connected improperly
- Faulty starter clutch
- Damaged or faulty starter idle gear and/or reduction gear

#### **Starter relay switch "Clicks", but engine does not turn over**

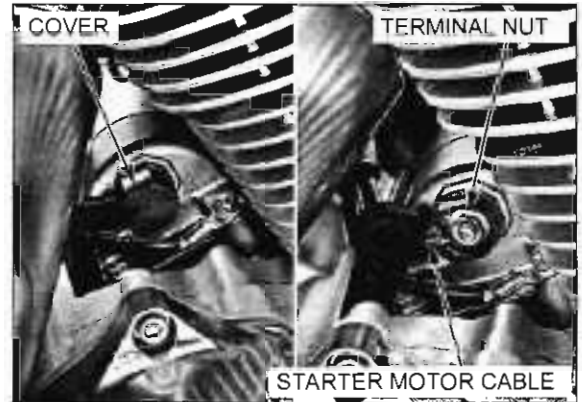
- Crankshaft does not turn due to engine problems



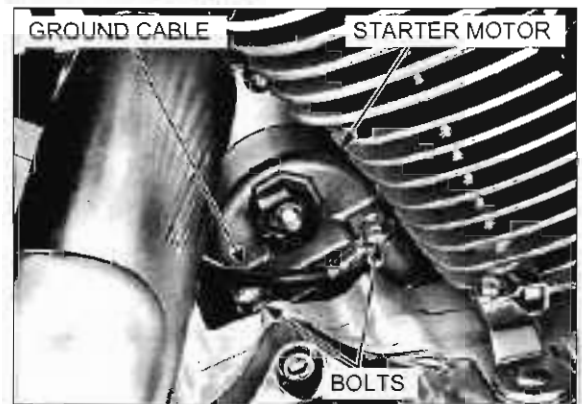
## STARTER MOTOR

### REMOVAL

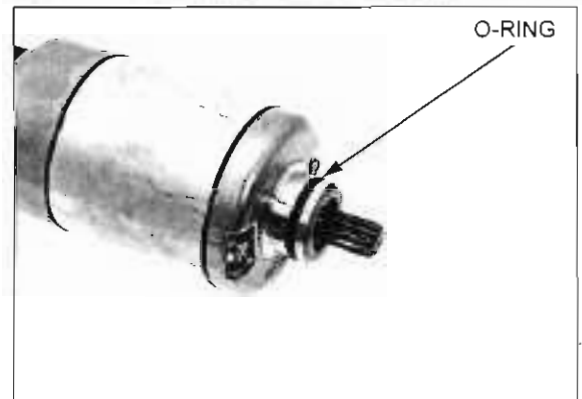
Disconnect the battery negative (-) cable (page 18-7).  
Open the terminal cover and remove the terminal nut.  
Disconnect the starter motor cable.



Remove the bolts and ground cable.  
Remove the starter motor from the crankcase.



Remove the O-ring from the starter motor.



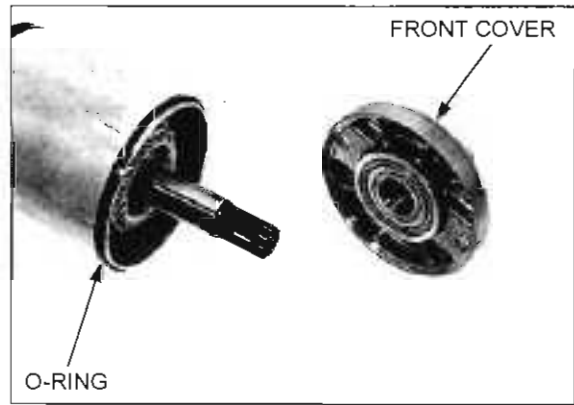
### DISASSEMBLY/INSPECTION

Remove the assembly bolts and O-rings.

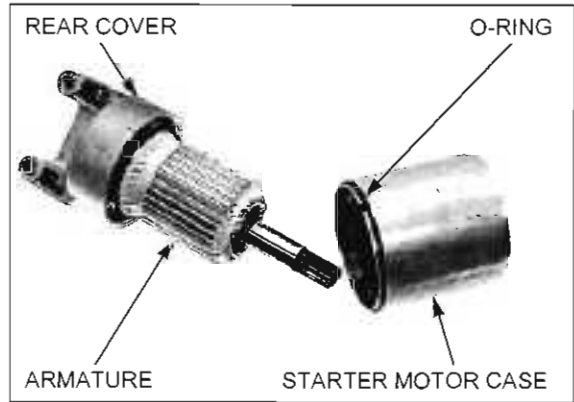


# ELECTRIC STARTER

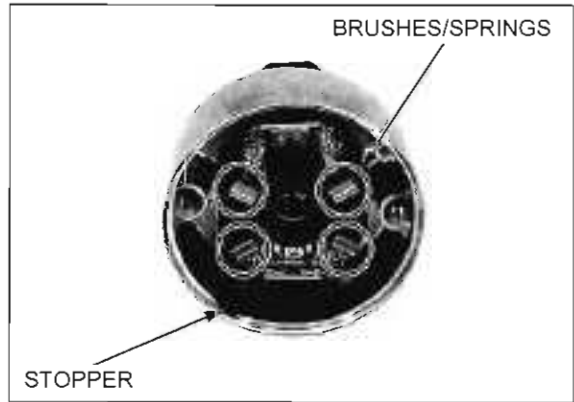
Remove the front cover and O-ring.



Remove the starter motor case and O-ring.  
Remove the armature from the rear cover.

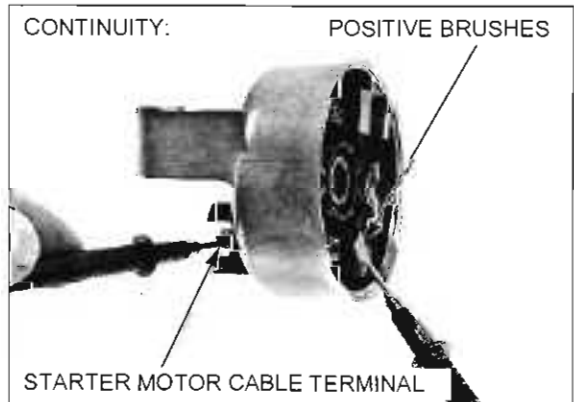


Remove the brushes and springs from the brush holder.  
Remove the stopper from the rear cover.



Check for continuity between starter motor cable terminal and positive brushes.

There should be continuity.

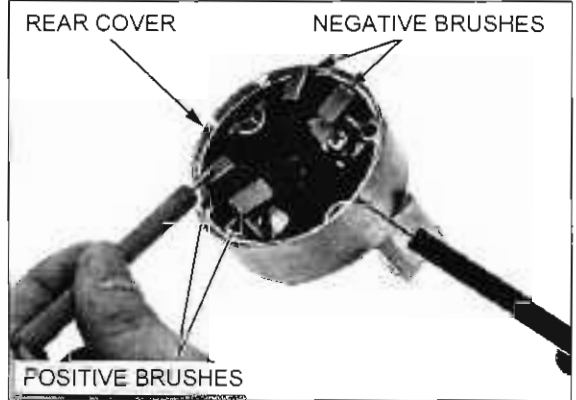


## ELECTRIC STARTER

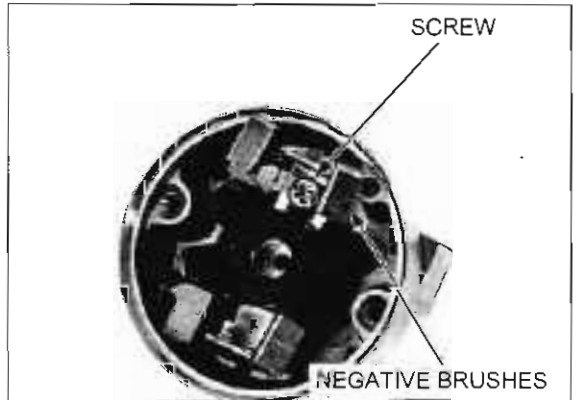
Check for continuity between positive brushes and rear cover.  
There should be no continuity.

Check for continuity between negative brushes and rear cover.  
There should be continuity.

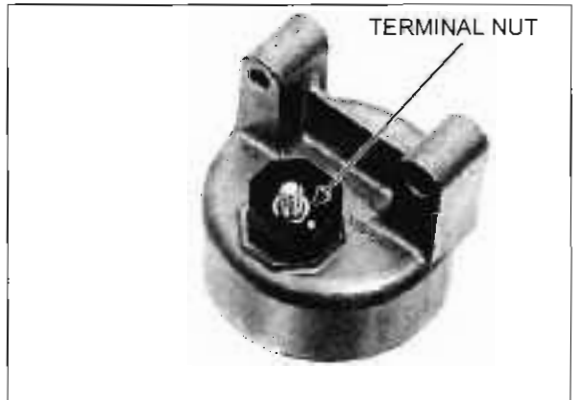
Check for continuity between positive and negative brushes.  
There should be no continuity.



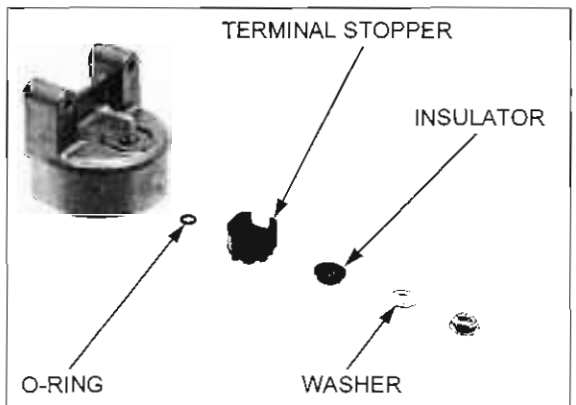
Remove the screw and negative brushes.



Remove the terminal nut.



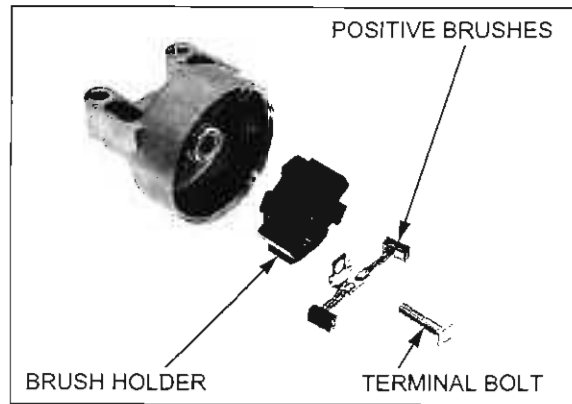
Remove the washer, insulator, terminal stopper and O-ring.



## ELECTRIC STARTER

Remove the terminal bolt, positive brushes and brush holder.

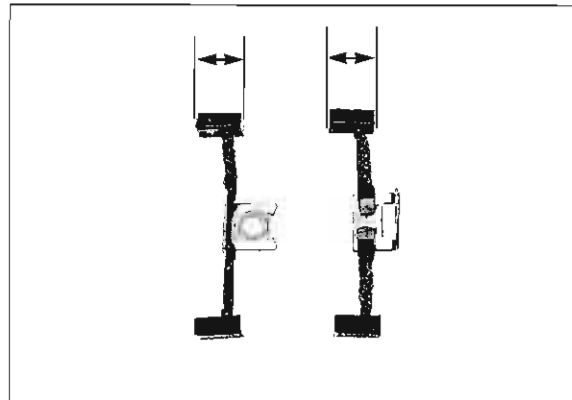
Check the brush holder for crack or damage.



### INSPECTION

Measure each brush length.

**SERVICE LIMIT: 6.5 mm (0.26 in)**



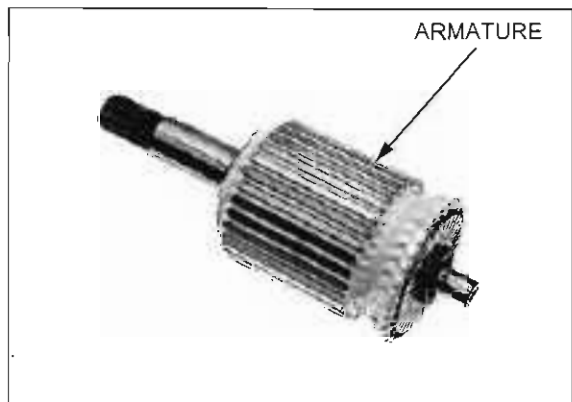
*Do not use emery or sand paper on the commutator.*

Check the commutator for damage or abnormal wear.

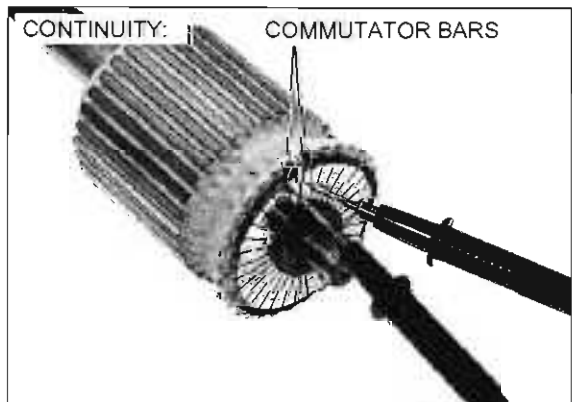
Check the commutator bar for discoloration.

Clean the metallic debris off between commutator bars.

Replace the armature with a new one if necessary.

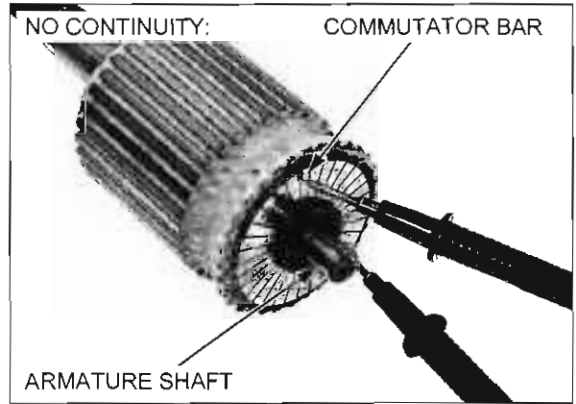


Check for continuity between pairs of commutator bars. There should be continuity.

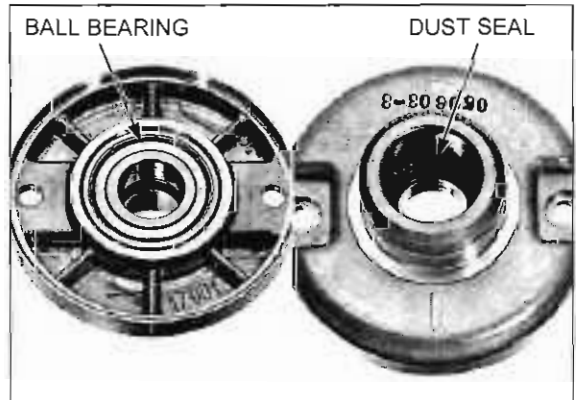


## ELECTRIC STARTER

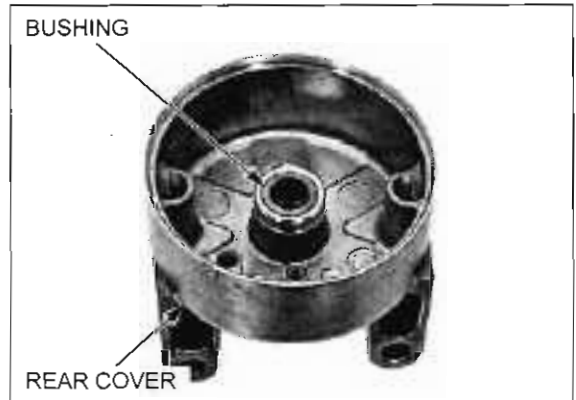
Check for continuity between each individual commutator bar and the armature shaft. There should be no continuity.



Check the dust seal and ball bearing for wear or damage. Check the ball bearing rotates smoothly.

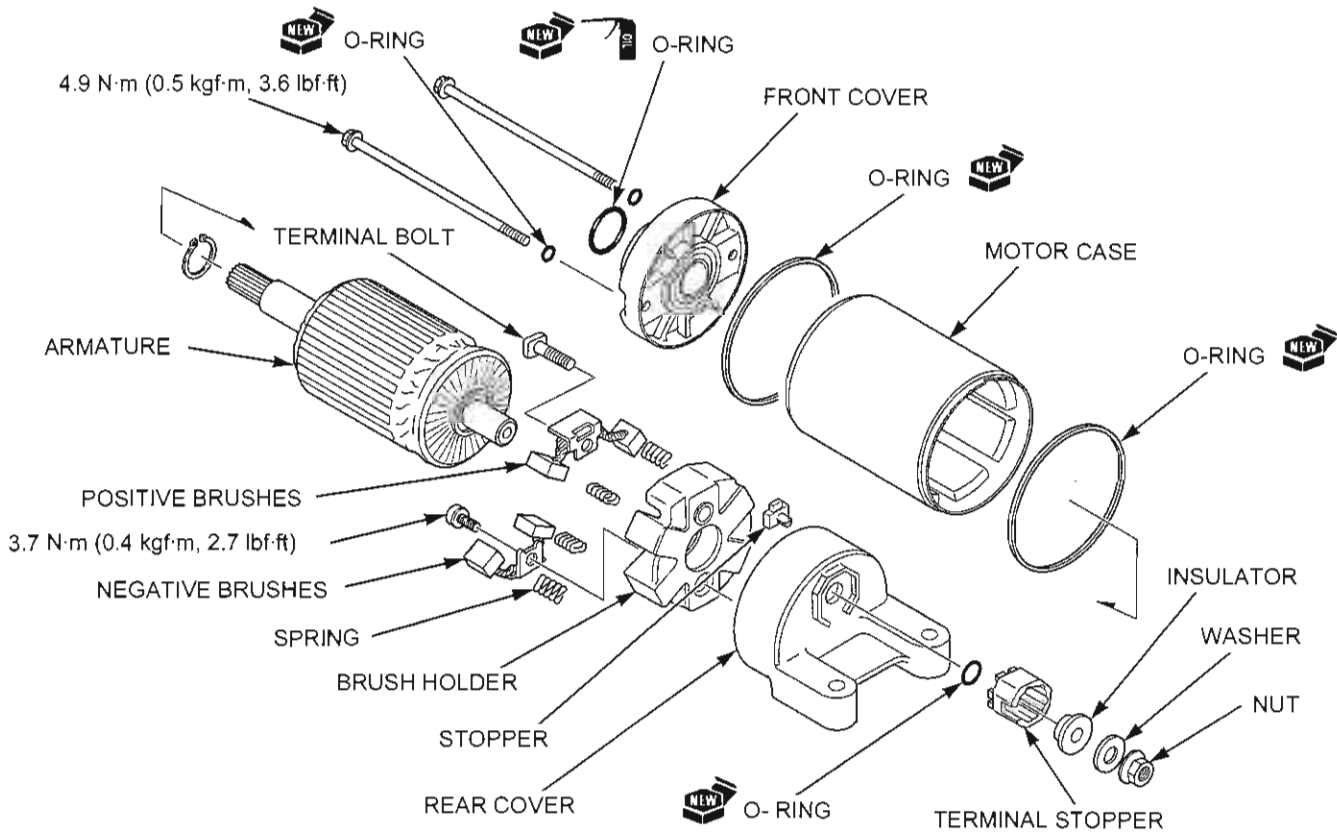


Check the bushing of the rear cover for wear or damage.

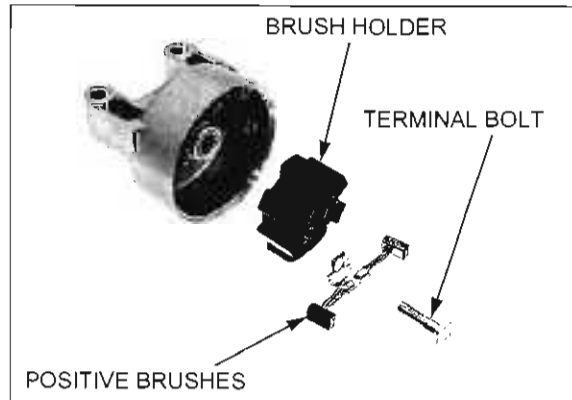


# ELECTRIC STARTER

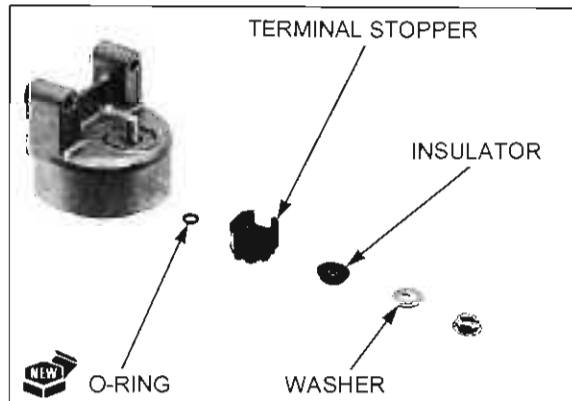
## ASSEMBLY



Install the brush holder, positive brushes and terminal bolt.

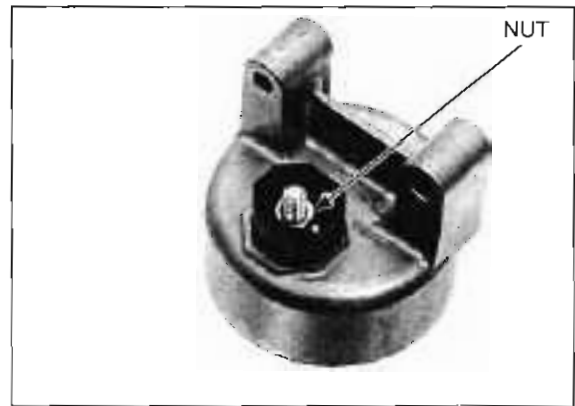


Install a new O-ring, terminal stopper, insulator and washer.



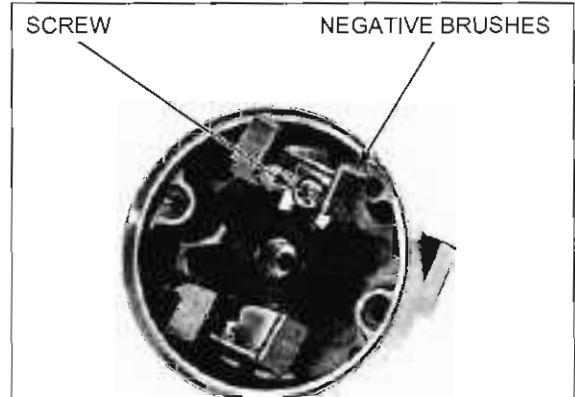
## ELECTRIC STARTER

Install and tighten the terminal nut securely.

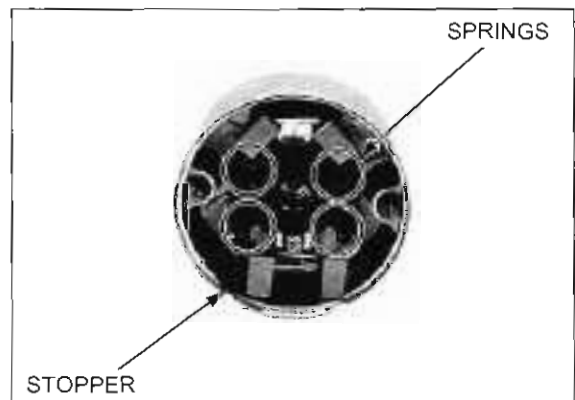


Install the negative brushes and tighten the screw to the specified torque.

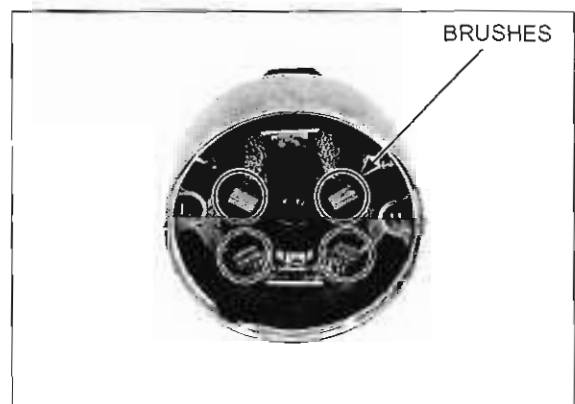
**TORQUE: 3.7 N·m (0.4 kgf·m, 2.7 lbf·ft)**



Install the brush springs to the brush holder grooves.  
Install the stopper to the rear cover.

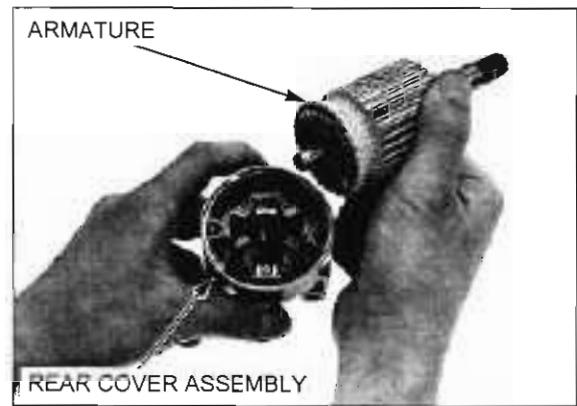


Install the brushes to the brush holder.



## ELECTRIC STARTER

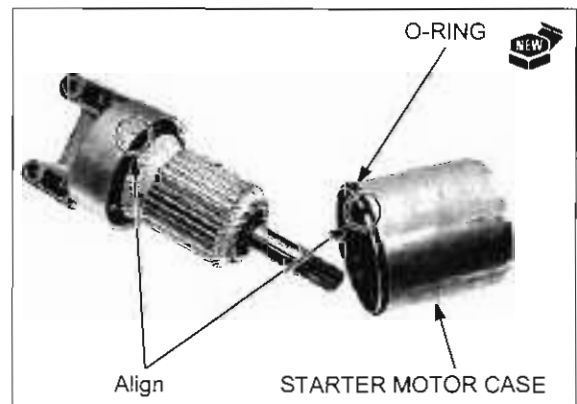
Install the armature to the rear cover assembly.



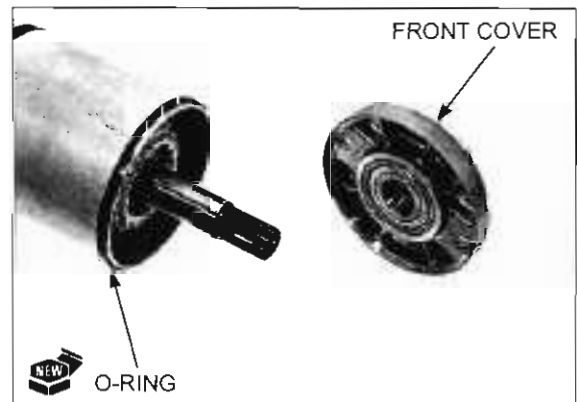
Install a new O-ring to the starter motor case.  
Install the starter motor case with its groove with the stopper on the rear cover assembly.

### NOTICE

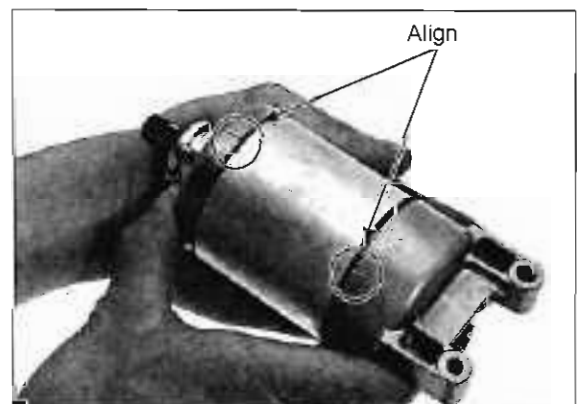
*The coil may be damaged if the magnet pulls the armature against the case.*



Install a new O-ring to the starter motor case.  
Install the front cover to the starter motor case.



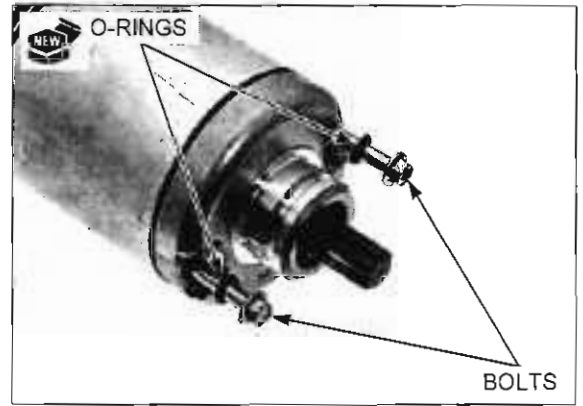
Align the index marks on the front cover, starter motor case and rear cover.





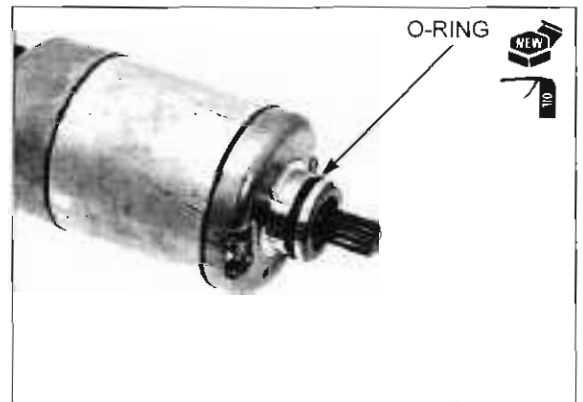
Install new O-rings to the assembly bolts.  
Install and tighten the assembly bolts to the specified torque.

**TORQUE: 4.9 N·m (0.5 kgf·m, 3.6 lbf·ft)**



## INSTALLATION

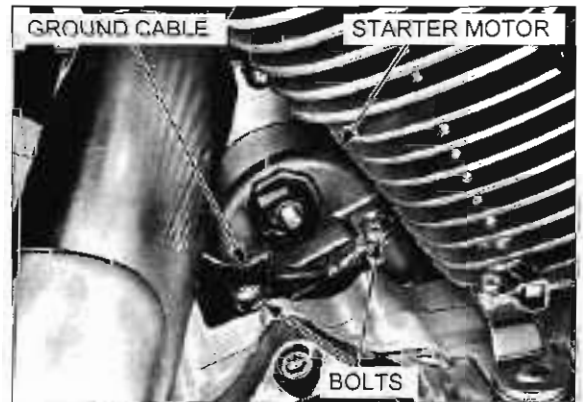
Apply engine oil to a new O-ring and install it to the starter motor groove.



Install the starter motor onto the crankcase from the right side.

*Route the cable properly (page 1-26).*

Connect the ground cable.  
Install and tighten the bolts securely.

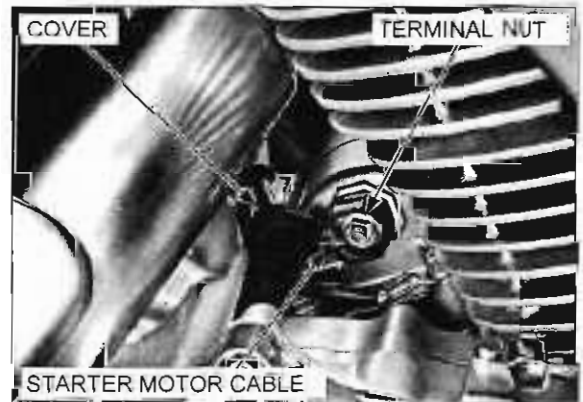


*Route the cable properly (page 1-26).*

Connect the starter motor cable.  
Install and tighten the terminal nut to the specified torque.

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

Close the terminal cover.  
Connect the battery negative (-) cable (page 18-7).



**STARTER RELAY SWITCH (VT750C2F/  
C2B)**

**INSPECTION**

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

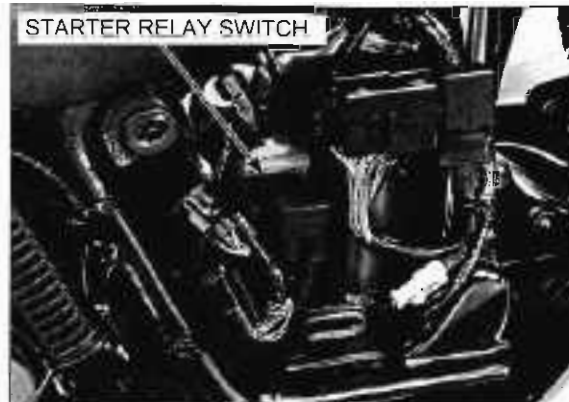
Shift the transmission into neutral.

Turn the ignition switch to "ON" with the engine stop switch at "O".

Push the starter switch button.

The coil is normal if the starter relay switch clicks.

If you do not hear the switch "CLICK", inspect the relay switch using the procedure below.



**STARTER RELAY VOLTAGE**

Pull out the starter relay switch from the battery box with the starter relay switch 4P connector connected.

Shift the transmission into neutral.

Turn the ignition switch to "ON" with the engine stop switch at "O".

Measure the voltage between the yellow/red wire terminal (+) and ground (-).

If the battery voltage appears when the starter switch button is pushed, the power supply circuit of the relay coil is normal.

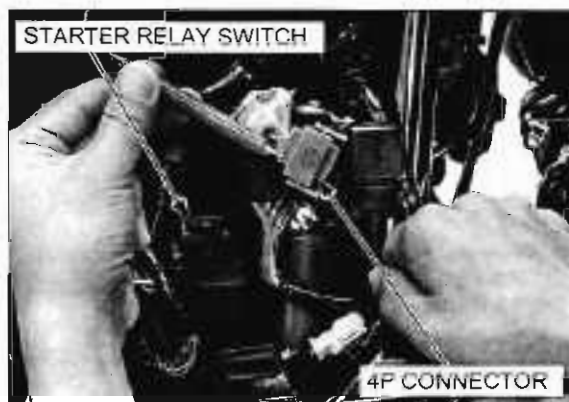


**GROUND LINE**

Disconnect the starter relay switch 4P connector.

Check for continuity between the Green/red wire (ground line) terminal and ground.

If there is continuity when the transmission is in neutral or when the clutch is disengaged and the sidestand is retracted, the ground circuit of the relay coil is normal. (In neutral, there is a slight resistance due to the diode.)



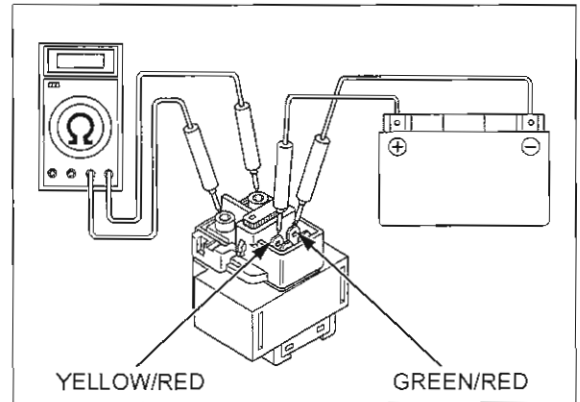
**OPERATION CHECK**

Remove the starter relay switch (page 20-17).

Connect an ohmmeter to the starter relay switch large terminals.

Connect a fully charged 12 V battery positive (+) wire to the starter relay switch Yellow/red terminal and negative (-) wire to the Green/red terminal.

There should be continuity between the cable terminals while the battery is connected, and no continuity when the battery is disconnected.



**REMOVAL/INSTALLATION**

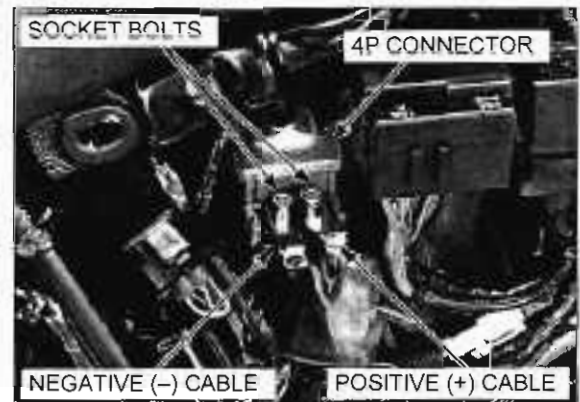
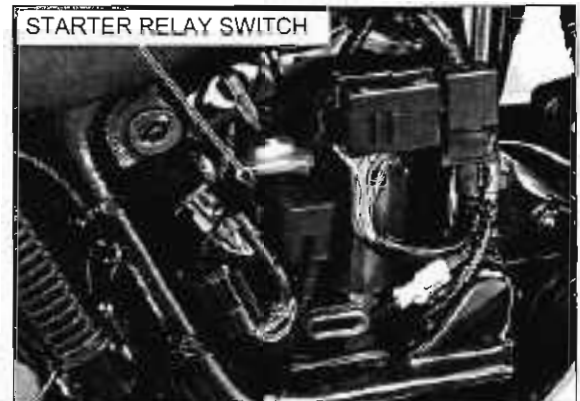
Remove the right side cover (page 2-3).

Turn the ignition switch to "OFF".

Disconnect the battery negative (-) cable (page 18-7).  
Pull out the starter relay switch from the battery box.

Disconnect the starter relay switch 4P connector.  
Remove the socket bolts and cables.

Installation is in the reverse order of removal.



**STARTER RELAY SWITCH (VT750C2S)**

**INSPECTION**

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

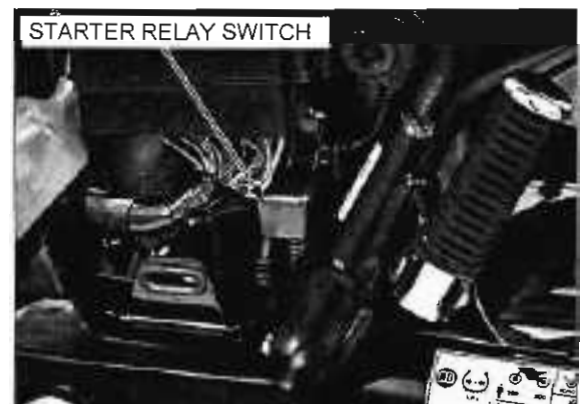
Shift the transmission into neutral.

Turn the ignition switch to "ON" with the engine stop switch at "O".

Push the starter switch button.

The coil is normal if the starter relay switch clicks.

If you do not hear the switch "CLICK", inspect the relay switch using the procedure below.

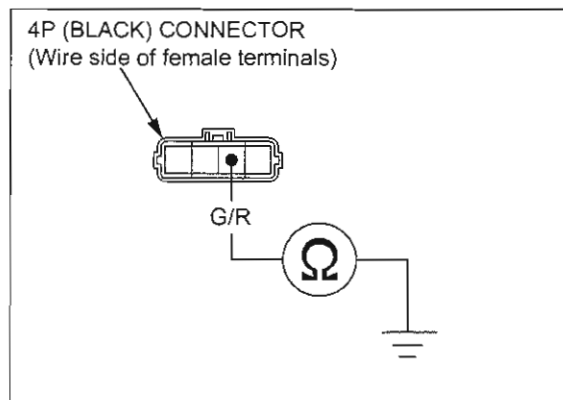


## ELECTRIC STARTER

### GROUND LINE

Remove the starter relay switch cover.  
Disconnect the starter relay switch 4P (Black) connector.  
Check for continuity between the Green/red wire (ground line) terminal and ground.

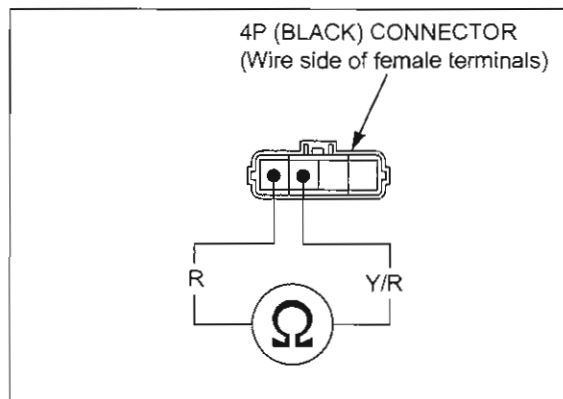
If there is continuity when the transmission is in neutral or when the clutch is disengaged and the sidestand is retracted, the ground circuit of the relay coil is normal. (In neutral, there is a slight resistance due to the diode.)



### INPUT LINE INSPECTION

Check for continuity between the Red terminal and Yellow/red terminal.

If there is no continuity when the ignition switch to "ON" and starter switch pushed, the input line is normal.



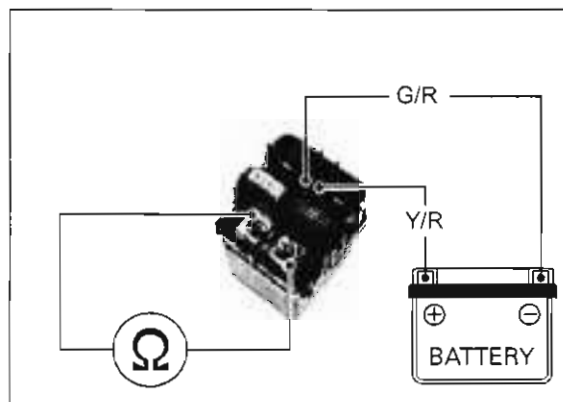
### OPERATION CHECK

Remove the starter relay switch (page 20-18).

Connect an ohmmeter to the starter relay switch large terminals.

Connect a fully charged 12 V battery positive (+) wire to the starter relay switch Yellow/red terminal and negative (-) wire to the Green/red terminal.

There should be continuity between the cable terminals while the battery is connected, and no continuity when the battery is disconnected.



### REMOVAL/INSTALLATION

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

Remove the fuse box (page 19-9).

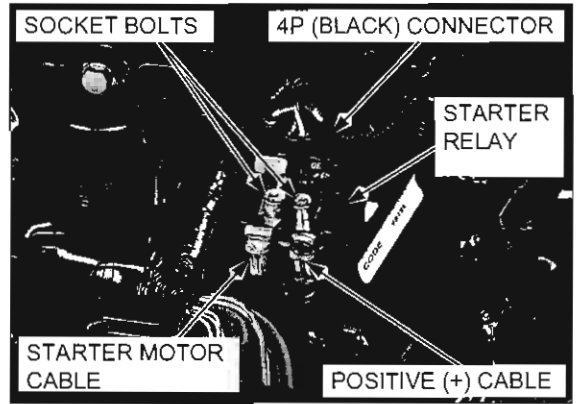
Turn the ignition switch to "OFF".

Remove the starter relay switch cover.

Disconnect the battery negative (-) cable (page 18-7).



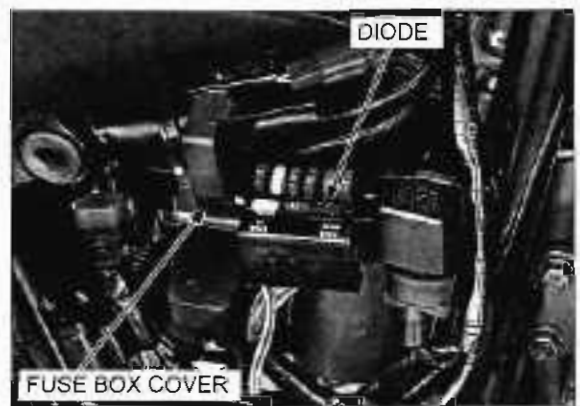
Disconnect the starter relay switch 4P (Black) connector.  
 Remove the socket bolts and cables.  
 Pull out the starter relay switch from the battery box.  
 Installation is in the reverse order of removal.



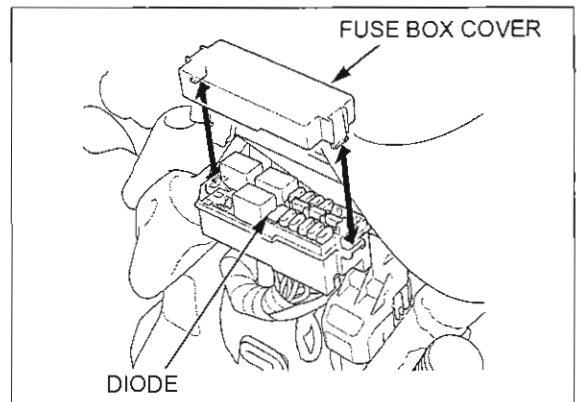
**DIODE**

**INSPECTION**

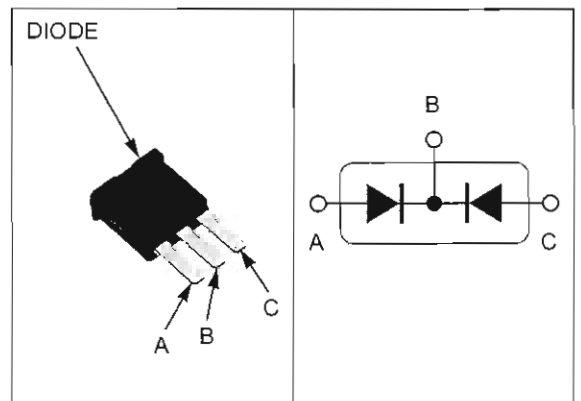
*VT750C2F/C2B;* Remove the right side cover (page 2-3).  
 Open the fuse box cover and remove the diode.



*VT750C2S;* Remove the left side cover (page 2-3).  
 Open the fuse box cover and remove the diode.



Check for continuity between the diode terminals.  
 When there is continuity, a small resistance value will register.  
 If there is continuity in one direction, the diode is normal.



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**MEMO**

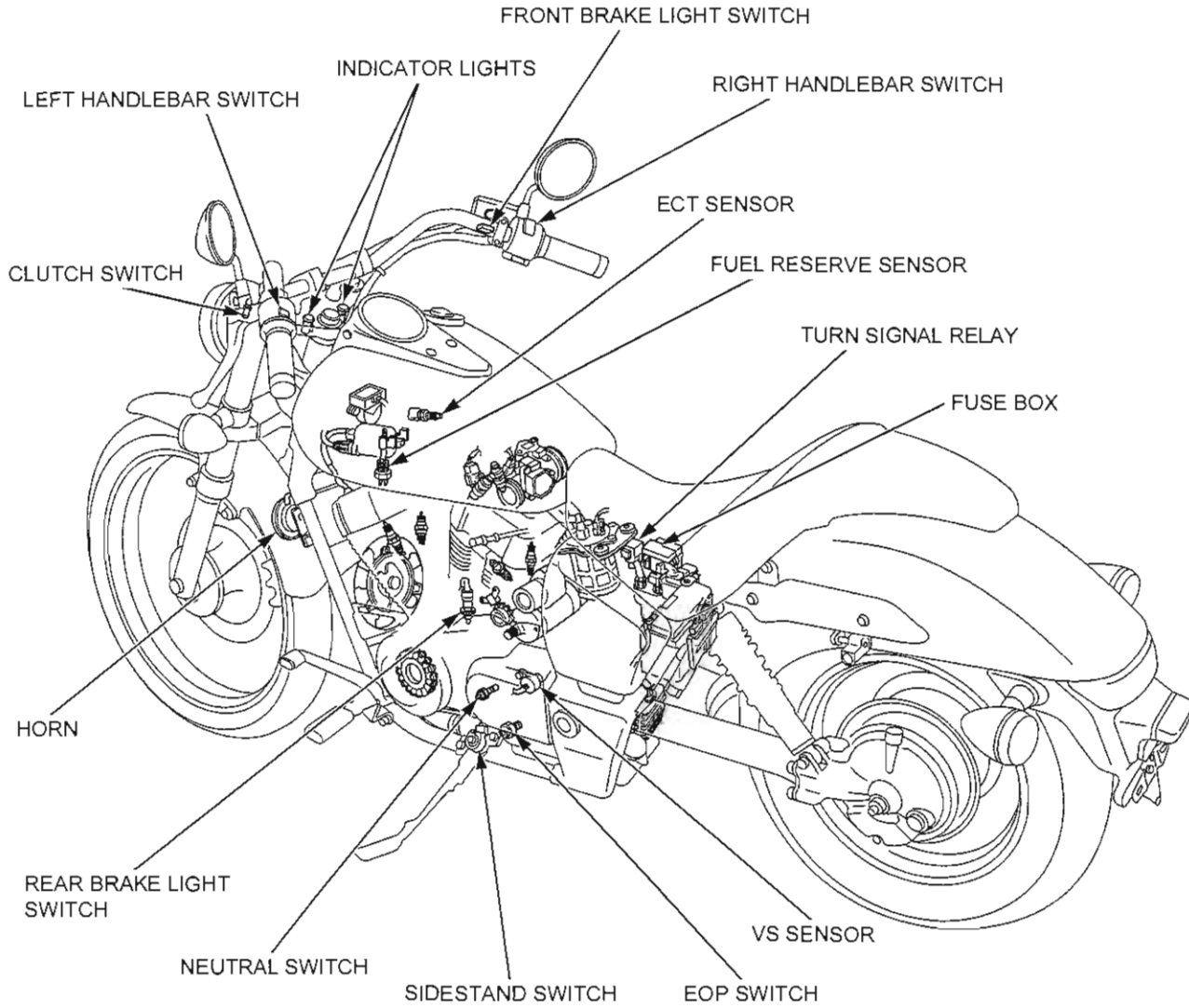
# 21. LIGHTS/METERS/SWITCHES

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SYSTEM LOCATION.....	21-2	FUEL RESERVE SENSOR .....	21-18
SERVICE INFORMATION .....	21-4	OIL PRESSURE INDICATOR .....	21-20
HEADLIGHT .....	21-7	IGNITION SWITCH.....	21-21
TURN SIGNAL/POSITION LIGHT.....	21-8	HANDLEBAR SWITCH.....	21-22
HIGH BEAM/FUEL RESERVE INDICATOR (VT750C2F/C2S) .....	21-10	BRAKE LIGHT SWITCH .....	21-24
HIGH BEAM/FUEL RESERVE/TURN SIGNAL INDICATOR (VT750C2B) .....	21-11	CLUTCH SWITCH .....	21-25
BRAKE/TAIL LIGHT.....	21-11	NEUTRAL SWITCH .....	21-26
LICENSE LIGHT.....	21-12	SIDESTAND SWITCH .....	21-26
SPEEDOMETER/VS SENSOR.....	21-12	HORN .....	21-28
COOLANT TEMPERATURE INDICATOR/ ECT SENSOR.....	21-17	TURN SIGNAL RELAY (VT750C2F/C2B).....	21-28
		TURN SIGNAL RELAY (VT750C2S) .....	21-29

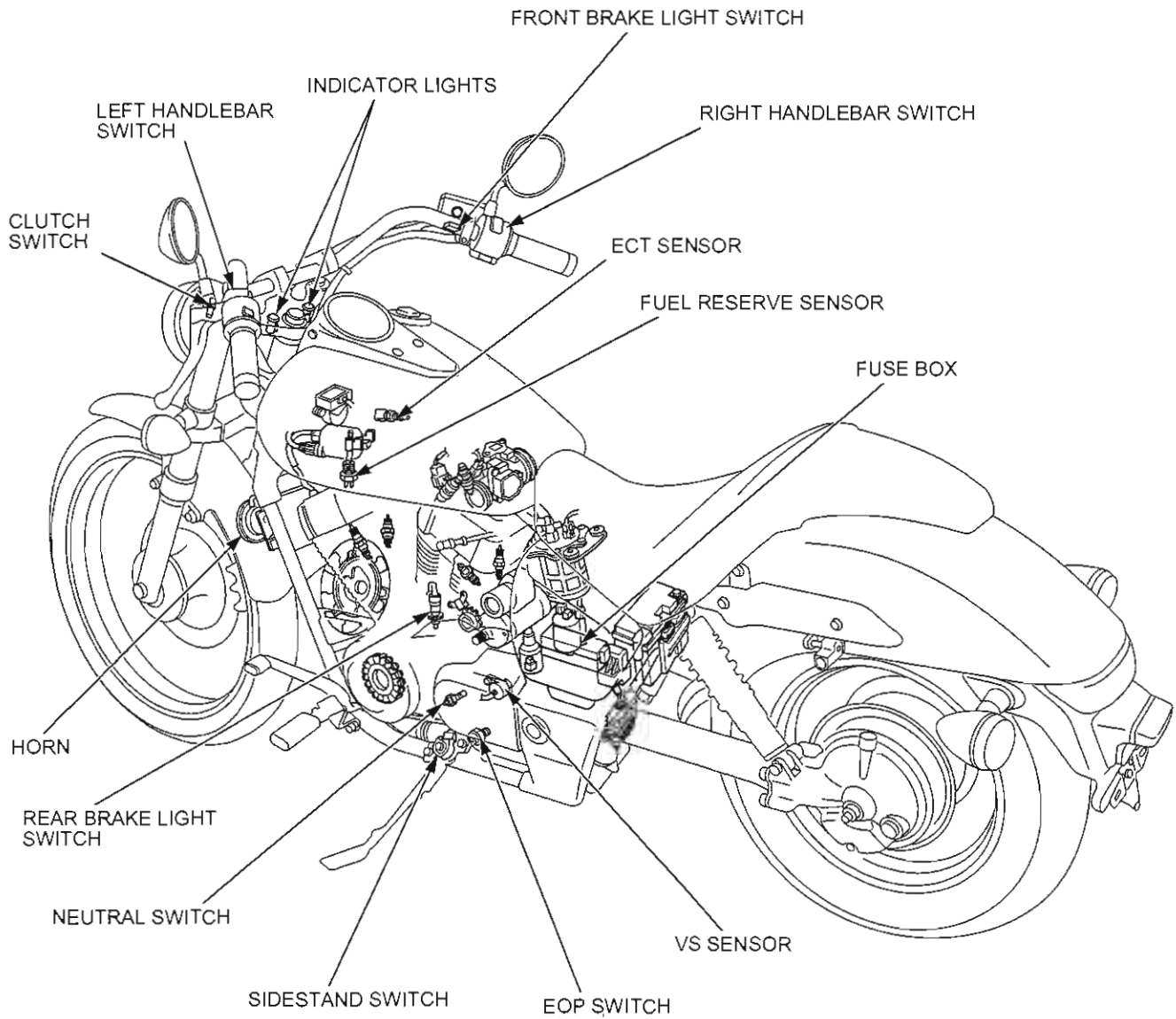
# SYSTEM LOCATION

VT750C2F/C2B





VT750C2S



## SERVICE INFORMATION

### GENERAL

#### NOTICE

- Note the following when replacing the halogen headlight bulb.
  - Wear clean gloves while replacing the bulb. Do not put fingerprints on the headlight bulb, as they may create hot spots on the bulb and cause it to fail.
  - If you touch the bulb with your bare hands, clean it with a cloth moistened with alcohol to prevent its early failure.
- Be sure to install the dust cover after replacing the bulb.
- A halogen headlight bulb becomes very hot while the headlight is on, and remains hot for a while after it is turned off. Be sure to let it cool down before servicing.
- Check the battery condition before performing any inspection that requires proper battery voltage.
- A continuity test can be made with the switches installed on the motorcycle.
- The following color codes used are indicated throughout this section.

Bu = Blue	G = Green	Lg = Light Green	R = Red
Bl = Black	Gr = Gray	O = Orange	W = White
Br = Brown	Lb = Light Blue	Y = Yellow	

### SPECIFICATIONS (VT750C2F)

ITEM		SPECIFICATIONS
Bulbs	Headlight	12 V – 60/55 W
	Brake/tail light	12 V – 21/5 W
	License light	12 V – 5 W
	Front turn signal/position light	12 V – 21/5 W x 2
	Rear turn signal light	12 V – 21 W x 2
	Instrument light	LED x 4
	Turn signal indicator	LED
	High beam indicator	12 V – 3.4 W
	Fuel reserve indicator	12 V – 3.4 W
	Neutral indicator	LED
	Oil pressure indicator	LED
	Coolant temperature indicator	LED
	MIL	LED
	Fuse	Main fuse
FI fuse		15 A
Sub fuse		10 A x 5, 20 A x 1
ECT sensor resistance	50°C (122°F)	6.8 – 7.4 kΩ
	80°C (176°F)	2.1 – 2.6 kΩ
	120°C (248°F)	0.6 – 0.7 kΩ

**SPECIFICATIONS (VT750C2B)**

ITEM		SPECIFICATIONS
Bulbs	Headlight	12 V – 60/55 W
	Brake/tail light	12 V – 21/5 W
	License light	12 V – 5 W
	Front turn signal/position light	12 V – 21/5 W x 2
	Rear turn signal light	12 V – 21 W x 2
	Instrument light	LED x 6
	Turn signal indicator	12 V – 3.4 W
	High beam indicator	12 V – 3.4 W
	Fuel reserve indicator	12 V – 3.4 W
	Neutral indicator	LED
	Oil pressure indicator	LED
	Coolant temperature indicator	LED
	MIL	LED
	HISS indicator	LED
Fuse	Main fuse	30 A
	FI fuse	15 A
	Sub fuse	10 A x 5, 20 A x 1
ECT sensor resistance	50°C (122°F)	6.8 – 7.4 kΩ
	80°C (176°F)	2.1 – 2.6 kΩ
	120°C (248°F)	0.6 – 0.7 kΩ

**SPECIFICATIONS (VT750C2S)**

ITEM		SPECIFICATIONS
Bulbs	Headlight	12 V – 60/55 W
	Brake/tail light	12 V – 21/5 W
	License light	12 V – 5 W
	Front turn signal/position light	12 V – 21 W x 2
	Rear turn signal light	12 V – 21 W x 2
	Instrument light	LED x 6
	Turn signal indicator	LED
	High beam indicator	12 V – 3.4 W
	Fuel reserve indicator	12 V – 3.4 W
	Neutral indicator	LED
	Oil pressure indicator	LED
	Coolant temperature indicator	LED
	MIL	LED
	HISS indicator	LED
	ABS	LED
	Fuse	Main fuse
FI fuse		20 A
Sub fuse		10 A x 6, 20 A x 1, 30 A x 1
ECT sensor resistance	50°C (122°F)	6.8 – 7.4 kΩ
	80°C (176°F)	2.1 – 2.6 kΩ
	120°C (248°F)	0.6 – 0.7 kΩ

## LIGHTS/METERS/SWITCHES

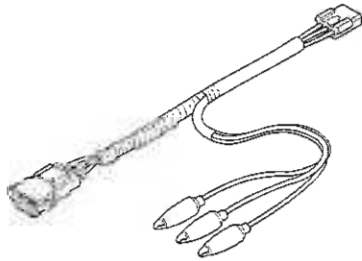
### TORQUE VALUES

Ignition switch mounting bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Ignition switch cover screw	1 N·m (0.1 kgf·m, 0.7 lbf·ft)
Neutral switch	12 N·m (1.2 kgf·m, 9 lbf·ft)
Sidestand switch bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)
Horn mounting bolt	21 N·m (2.1 kgf·m, 15 lbf·ft)
Speedometer mounting socket bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)
EOP switch terminal screw	1.9 N·m (0.2 kgf·m, 1.4 lbf·ft)
Headlight unit mounting bolt	4.1 N·m (0.4 kgf·m, 3.0 lbf·ft)
Brake/tail light mounting nut	6.3 N·m (0.6 kgf·m, 4.6 lbf·ft)
VS sensor mounting bolt	9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
Fuel reserve sensor	23 N·m (2.3 kgf·m, 17 lbf·ft)

ALOC bolt; replace with a new one

### TOOL

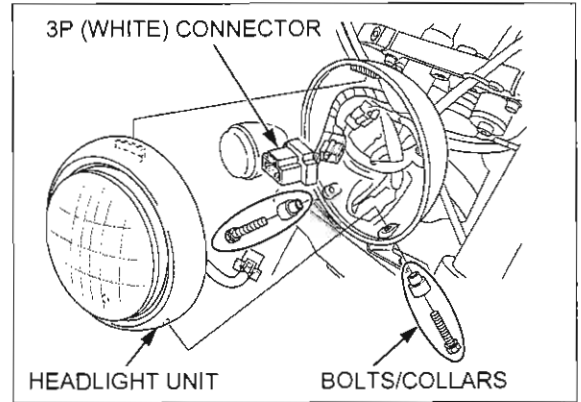
Inspection test harness  
07GMJ-ML80100



# HEADLIGHT

## BULB REPLACEMENT

VT750C2B; Remove the front turn signal light bolt (page 21-9).  
 Remove the bolts, collars and headlight unit from the headlight case.  
 Disconnect the headlight 3P (White) connector.

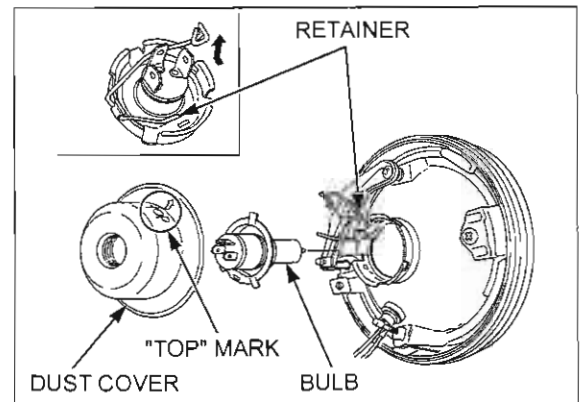


Remove the dust cover.  
 Unhook the retainer and remove the bulb.

### NOTICE

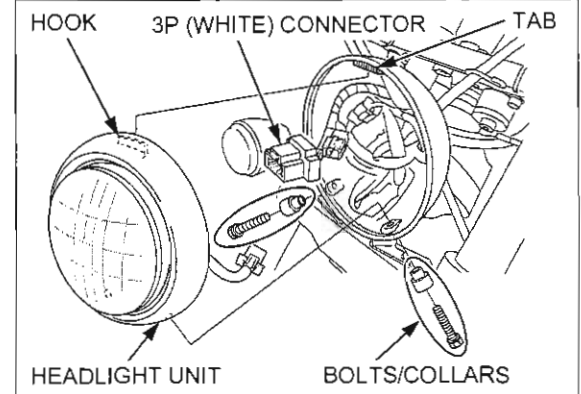
*Avoid touching the halogen headlight bulb. Finger prints can create hot spots that cause a bulb to break.*

Install a new bulb, aligning its tabs with the grooves in the headlight unit.  
 Hook the retainer.  
 Install the dust cover with its "TOP" mark facing up.



Connect the headlight 3P (White) connector.  
 Install the headlight unit into the headlight case by aligning the headlight unit hook with the headlight case tab.  
 Install the collars and bolts.  
 Tighten the bolts to the specified torque.

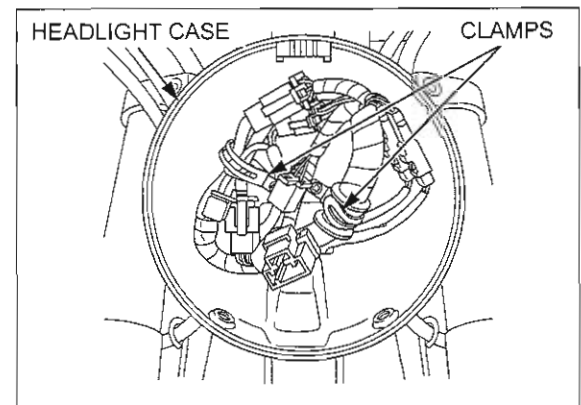
**TORQUE: 4.1 N-m (0.4 kgf-m, 3.0 lbf-ft)**



## HEADLIGHT CASE REMOVAL/INSTALLATION

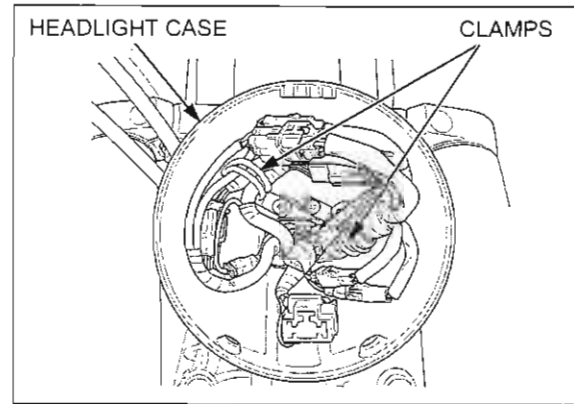
Remove the headlight unit (page 21-7).

VT750C2F/C2S; Release the wire harnesses from the clamps.  
 Remove the wire harnesses from the headlight case.



## LIGHTS/METERS/SWITCHES

VT750C2B; Release the wire harnesses from the clamps.  
Remove the wire harnesses from the headlight case.

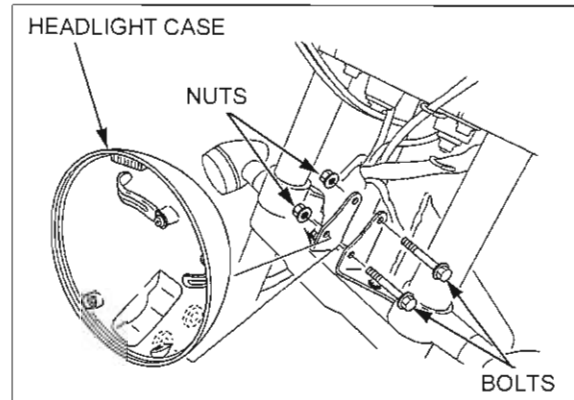


Remove the nuts, bolts and headlight case from the brackets.

*Route the wire harnesses properly (page 1-26).*

Install the headlight case in the reverse order of removal.

Adjust the headlight aim (page 3-23).



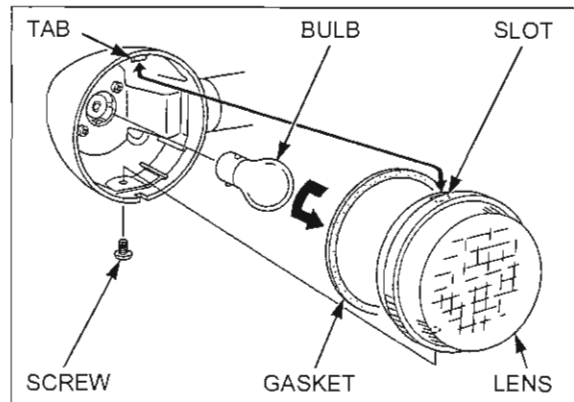
## TURN SIGNAL/POSITION LIGHT

### BULB REPLACEMENT

Remove the screw and turn signal light lens.  
While pushing the bulb in, turn it counterclockwise to remove it, and replace it with a new one.

Make sure the lens gasket is installed in position and is in good condition, and replace it with a new one if necessary.

Install the lens, aligning its slot with the tab of the turn signal light, and tighten the screw.



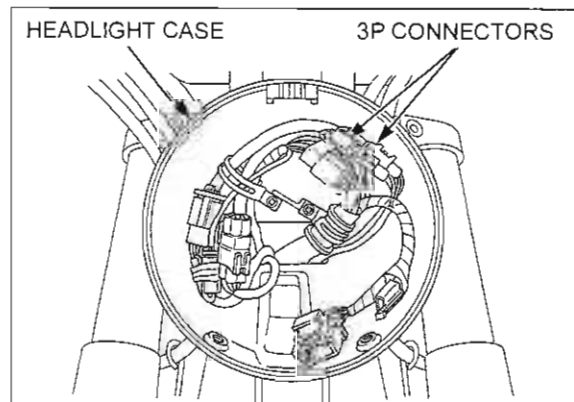
### REMOVAL/INSTALLATION

#### FRONT (VT750C2F/C2S)

Remove the headlight unit (page 21-7).

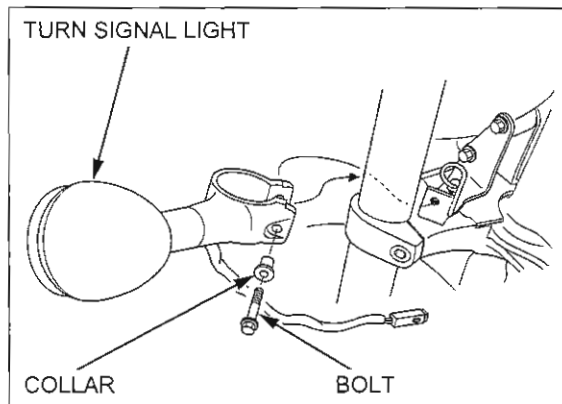
Disconnect the turn signal 3P connectors.

- Light blue: Right turn signal connector
- Orange: Left turn signal connector



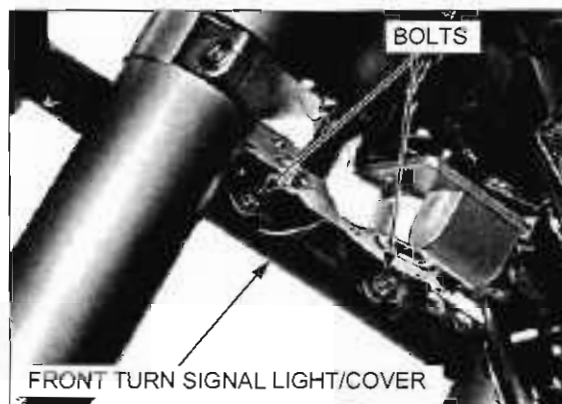
Remove the bolt, collar and turn signal light.  
 Installation is in the reverse order of removal.

*Route the turn signal wire properly (page 1-26).*



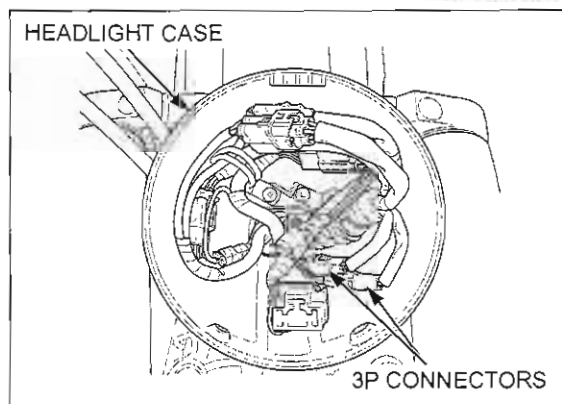
**FRONT (VT750C2B)**

Remove the bolts and front turn signal light/cover.



Remove the headlight unit (page 21-7).  
 Disconnect the turn signal 3P connectors.

- Light blue: Right turn signal connector
- Orange: Left turn signal connector

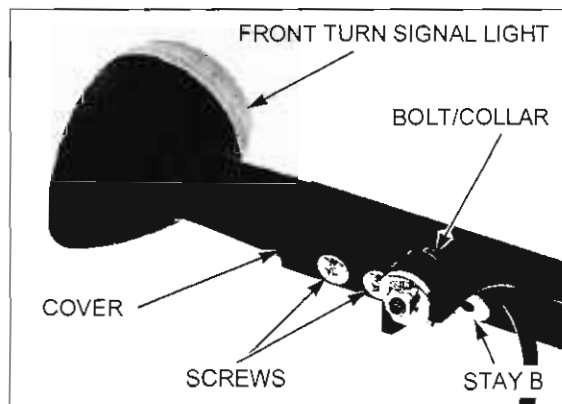


Remove the following:

- Screws
- Bolt
- Collar
- Stay B
- Cover
- Front turn signal light

*Route the turn signal wire properly (page 1-26).*

Installation is in the reverse order of removal.



## LIGHTS/METERS/SWITCHES

### REAR

Remove the rear frame/rear fender A (page 2-8).

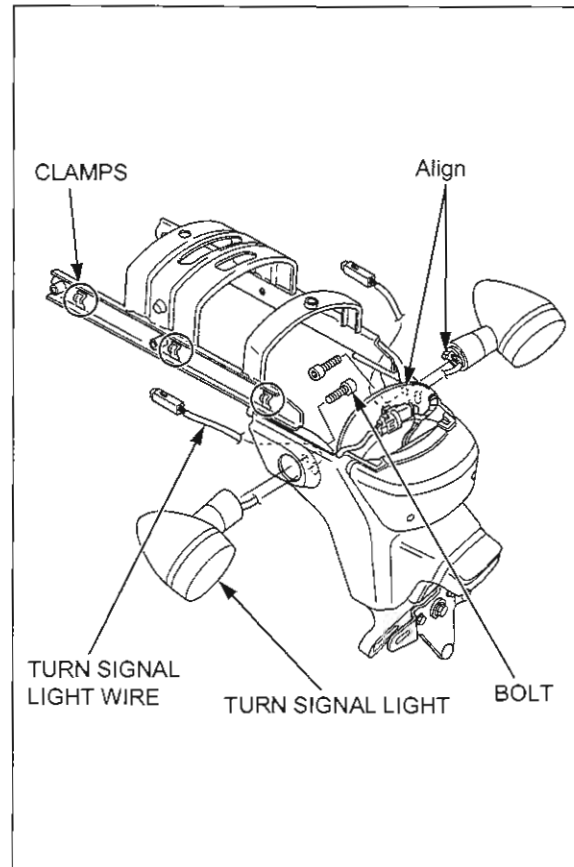
Release the turn signal light wire from the clamps of the rear frame.

Remove the bolt and turn signal light from the rear frame.

*Route the turn signal light wire properly (page 1-26).*

Install the turn signal light, aligning its tab with the rear frame slot and tighten the bolt.

Install the rear frame/rear fender A (page 2-8).



## HIGH BEAM/FUEL RESERVE INDICATOR (VT750C2F/C2S)

### BULB REPLACEMENT

Remove the indicator light lens.

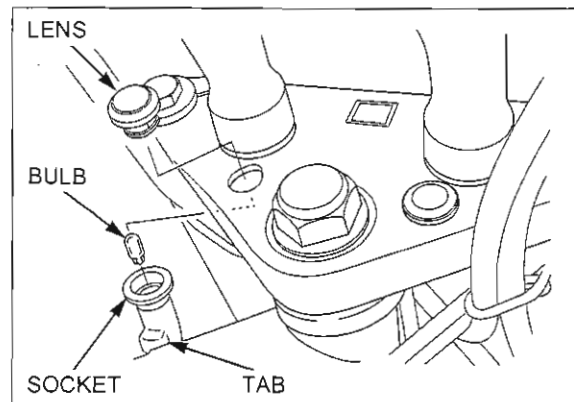
Pull down the bulb socket and remove it.

Remove the bulb and replace it with a new one.

Install the removed parts in the reverse order of removal.

#### NOTE:

- Install the bulb socket with its tab facing rearward.





## HIGH BEAM/FUEL RESERVE/TURN SIGNAL INDICATOR (VT750C2B)

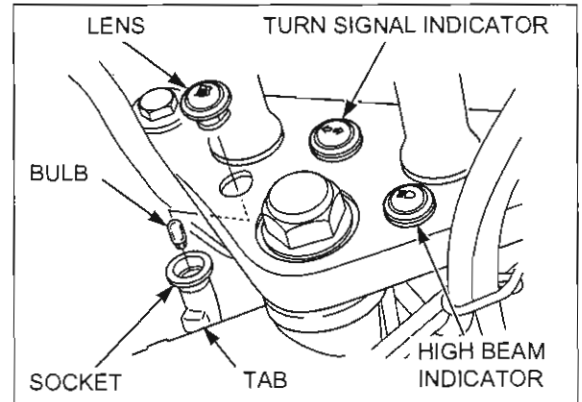
### BULB REPLACEMENT

Remove the indicator light lens.  
Pull down the bulb socket and remove it.  
Remove the bulb and replace it with a new one.

Install the removed parts in the reverse order of removal.

**NOTE:**

- Install the bulb socket with its tab facing rearward.



## BRAKE/TAIL LIGHT

### BULB REPLACEMENT

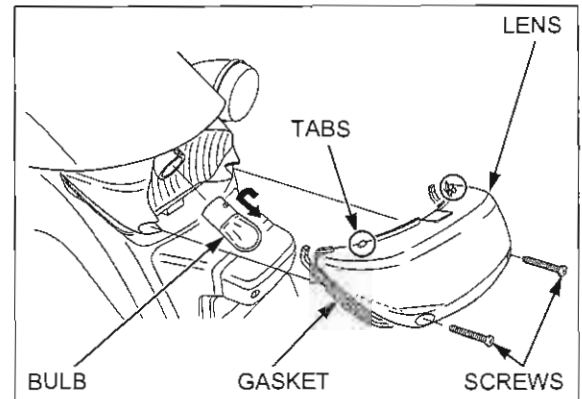
Remove the screws.

Remove the brake/tail light lens while pushing it down and release its tabs from the rear fender A.

While pushing in the bulb, turn it counterclockwise to remove it, and replace it with a new one.

Make sure that the lens gasket is installed in position and is in good condition, and replace it with a new one if necessary.

Install the removed parts in the reverse order of removal.



### REMOVAL/INSTALLATION

Remove the rear frame/rear fender A (page 2-8).

Release the brake/tail/license light wire from the clamps of the rear frame.

Disconnect the license light 2P connector and remove it from the rear fender A.

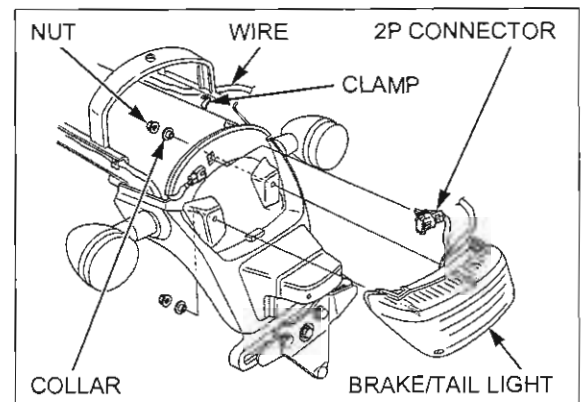
Remove the nuts, collars and brake/tail light.

Installation is in the reverse order of removal.

**TORQUE:**

**Brake/tail light mounting nut:**  
6.3 N·m (0.6 kgf·m, 4.6 lbf·ft)

*Route the wires properly (page 1-26).*



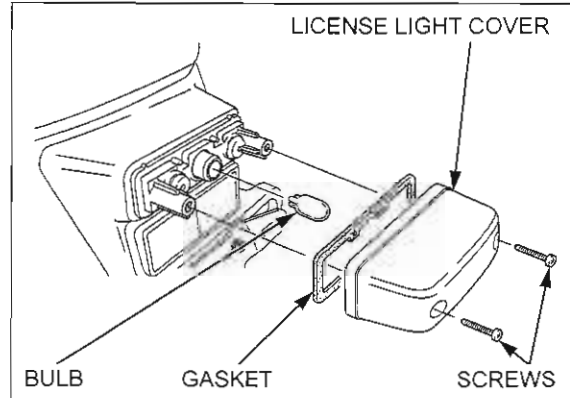
## LICENSE LIGHT

### BULB REPLACEMENT

Remove the screws and license light cover.

Remove the bulb and replace it with a new one. Make sure that the lens gasket is installed in position and is in good condition, and replace it with a new one if necessary.

Install the removed parts in the reverse order of removal.



## SPEEDOMETER/VS SENSOR

### POWER/GROUND LINE INSPECTION (VT750C2F/C2B)

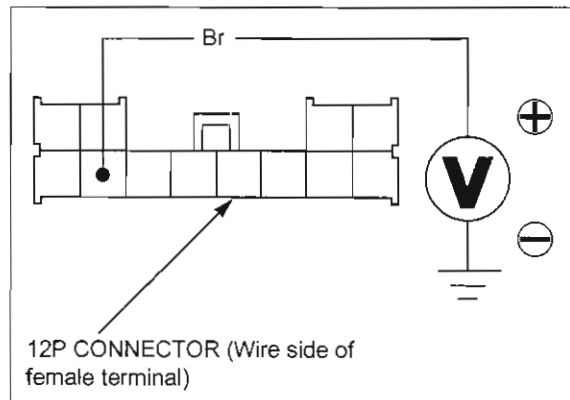
Remove the speedometer assembly (page 21-15).

#### POWER INPUT LINE

Measure the voltage between the Brown wire terminal (+) of the speedometer 12P connector and ground (-). There should be battery voltage with the ignition switch turned to "ON".

If there is no voltage, check the following:

- Open circuit in the Brown wire
- Blown sub fuse 10 A (METER)

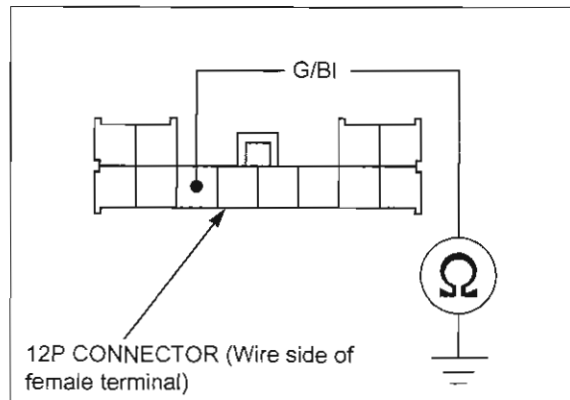


#### GROUND LINE

Check for continuity between the Green/black wire terminal and ground.

There should be continuity at all times.

If there is no continuity, check for an open circuit in the Green/black wire.



**BACK-UP VOLTAGE LINE**

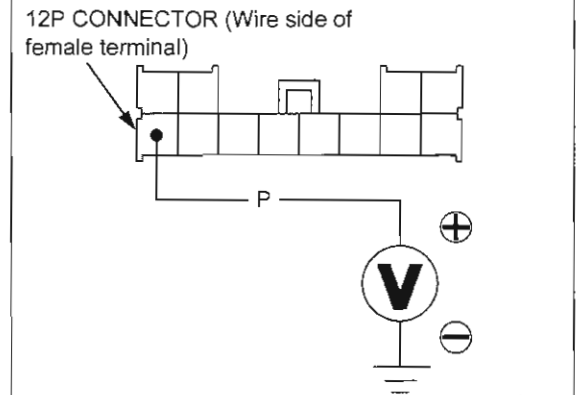
Check this line if the odometer/trip meter does not function.

Measure the voltage between the Pink wire terminal (+) and ground (-).

There should be battery voltage at all times.

If there is no voltage, check the following:

- Open circuit in the Pink wire
- Blown sub fuse 10 A (ODOMETER)
- Open circuit in the Red wire between the fuse box and battery



**POWER/GROUND LINE INSPECTION (VT750C2S)**

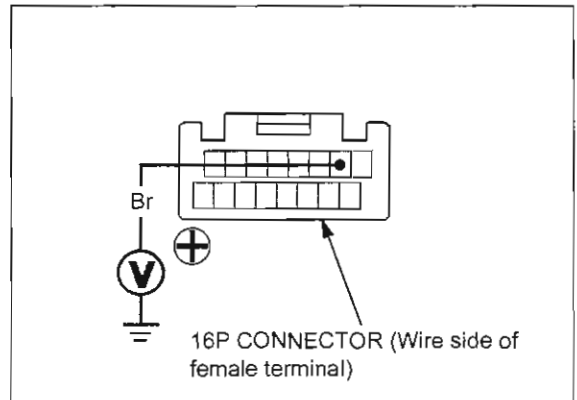
Remove the speedometer assembly (page 21-12).

**POWER INPUT LINE**

Measure the voltage between the Brown wire terminal (+) of the speedometer 16P connector and ground (-). There should be battery voltage with the ignition switch turned to "ON".

If there is no voltage, check the following:

- Open circuit in the Brown wire
- Blown sub fuse 10 A (METER)

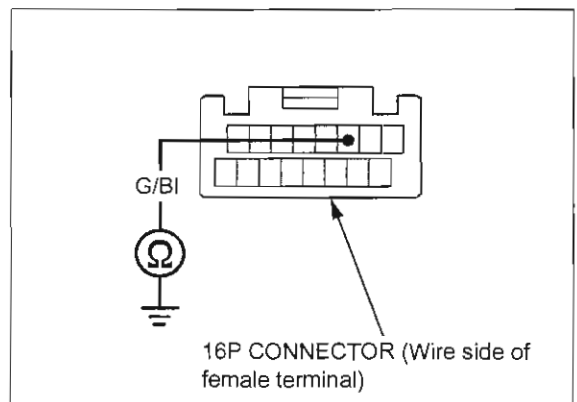


**GROUND LINE**

Check for continuity between the Green/black wire terminal and ground.

There should be continuity at all times.

If there is no continuity, check for an open circuit in the Green/black wire.



## LIGHTS/METERS/SWITCHES

### BACK-UP VOLTAGE LINE

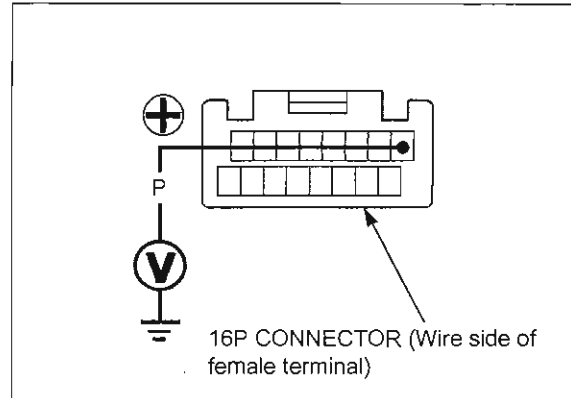
Check this line if the odometer/trip meter does not function.

Measure the voltage between the Pink wire terminal (+) and ground (-).

There should be battery voltage at all times.

If there is no voltage, check the following:

- Open circuit in the Pink wire
- Blown sub fuse 10 A (ODOMETER)
- Open circuit in the Red wire between the fuse box and battery



### SPEEDOMETER INSPECTION (VT750C2F/C2B)

#### Speedometer does not operate

Check that the indicators function properly.

If they do not function, check the power/ground line (page 21-12).

Remove the speedometer assembly (page 21-15).

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

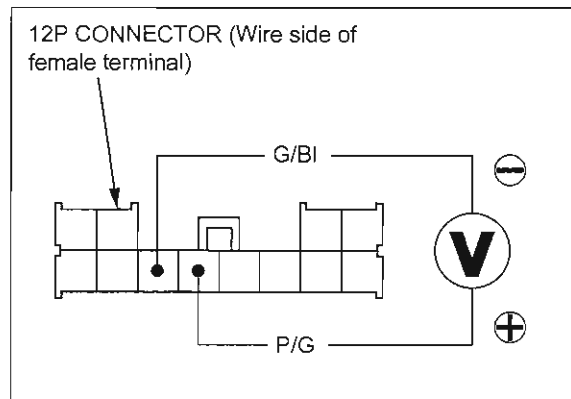
Shift the transmission into neutral and turn the ignition switch to "ON".

Measure the voltage between the Pink/green (+) and Green/black (-) wire terminals of the speedometer connector.

Slowly turn the rear wheel by hand.

There should be 0 V to 5 V pulse voltage.

- If pulse voltage appears, replace the speedometer.
- If pulse voltage does not appear, check the following:
  - Pink/green wire for an open or short circuit.
  - Green/black wire for an open circuit.If the wires are OK, check the VS sensor (page 21-16).



### SPEEDOMETER INSPECTION (VT750C2S)

#### Speedometer does not operate

Check that the indicators function properly.

If they do not function, check the power/ground line (page 21-13).

Remove the speedometer assembly (page 21-15).

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

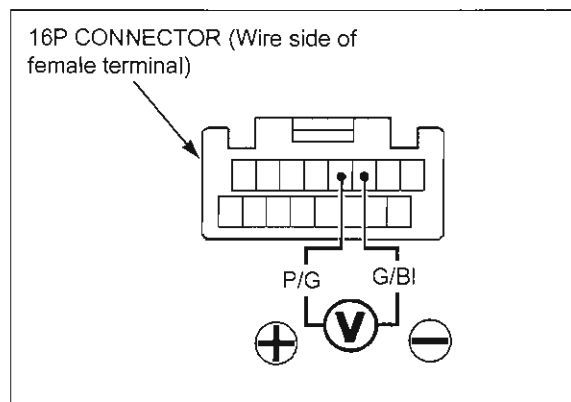
Shift the transmission into neutral and turn the ignition switch to "ON".

Measure the voltage between the Pink/green (+) and Green/black (-) wire terminals of the speedometer connector.

Slowly turn the rear wheel by hand.

There should be 0 V to 5 V pulse voltage.

- If pulse voltage appears, replace the speedometer.
- If pulse voltage does not appear, check the following:
  - Pink/green wire for an open or short circuit.
  - Green/black wire for an open circuit.If the wires are OK, check the VS sensor (page 21-16).

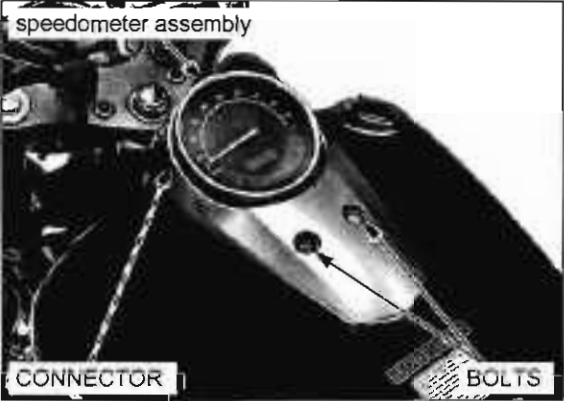


**SPEEDOMETER REMOVAL/  
INSTALLATION**

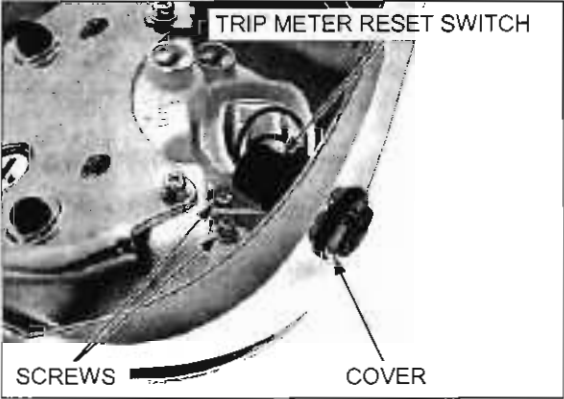
Remove the bolts and speedometer assembly from the fuel tank.

Slide the dust cover and disconnect the speedometer 12P connector (VT750C2F/C2B).

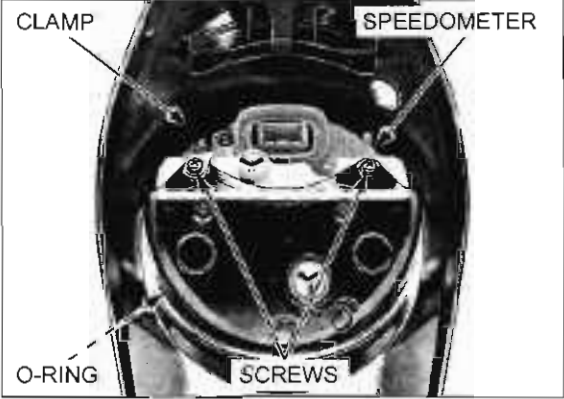
Slide the dust cover and disconnect the speedometer 16P connector (VT750C2S).



Remove the screws, switch cover and trip meter reset switch.

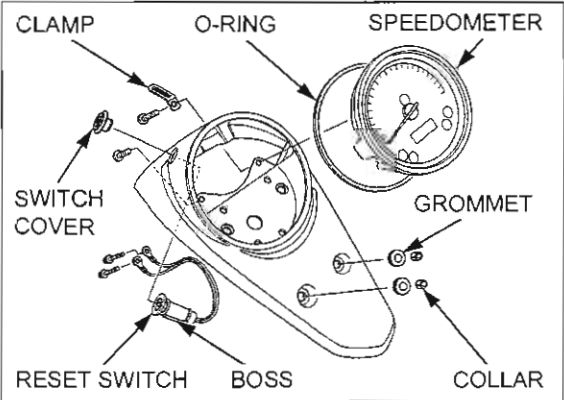


Remove the screws, clamp, speedometer and O-ring.  
Check the O-ring is in good condition, replace it if necessary.



Install the removed parts into the speedometer cover in the reverse order of removal.

**NOTE:**  
Install the reset switch with its boss facing down.



## LIGHTS/METERS/SWITCHES

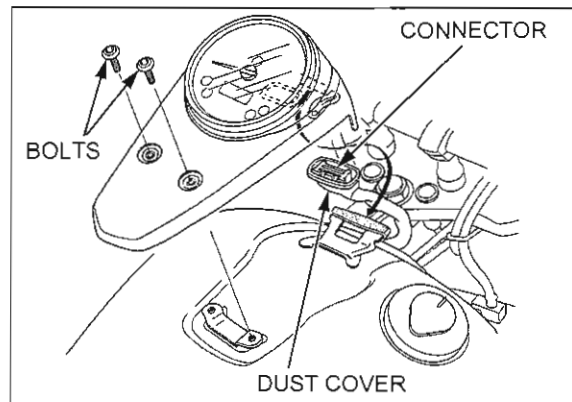
Connect the speedometer 12P connector and install the dust cover (VT750C2F/C2B).

Connect the speedometer 16P connector and install the dust cover (VT750C2S).

Install the speedometer assembly on the fuel tank, aligning the fuel tank tab with the meter slot.

Install and tighten the bolts to the specified torque.

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



### VS SENSOR INSPECTION

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

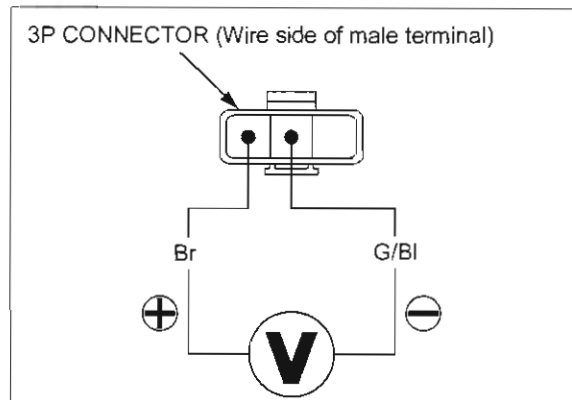
Disconnect the VS sensor 3P (White) connector.

Turn the ignition switch to "ON" and measure the voltage at the 3P (White) connector of the wire harness side.

**CONNECTION: Brown (+) – Green/black (-)**

There should be battery voltage.

If there is no voltage, check for an open circuit in the Brown and Green/black wires.



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

Connect the test harness between the VS sensor 3P (White) connector.

**TOOL:**

**Inspection test harness 07GMJ-ML80100**

Measure the voltage between the Red clip (+) and White clip (-).

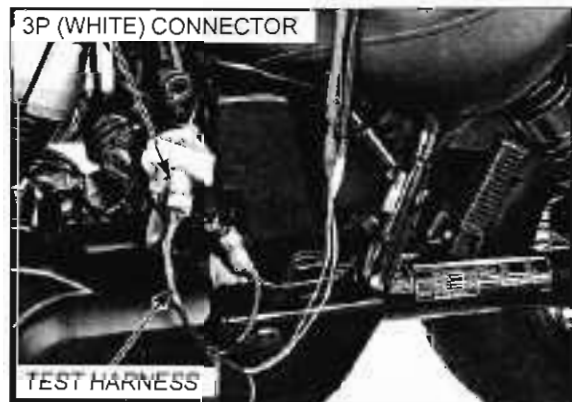
**CONNECTION: Red clip (+) – White clip (-)**

**STANDARD: Repeat 0 to 5 V**

Shift the transmission into neutral and turn the ignition switch to "ON".

Slowly turn the rear wheel by hand.

If pulse voltage does not appear, replace the VS sensor.



### VS SENSOR REPLACEMENT

Remove the following:

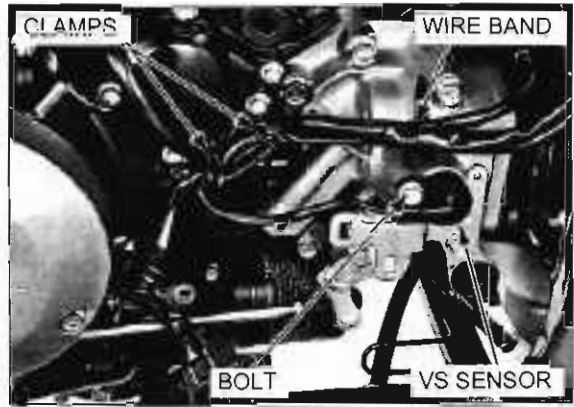
- Left side cover (page 2-3)
- Left crankcase rear cover (page 2-4)

Release the wire band and disconnect the VS sensor 3P (White) connector.



Release the VS sensor wire from the clamps and wire band.

Remove the bolt and VS sensor from the crankcase.



Coat a new O-ring with engine oil and install it into the VS sensor groove.

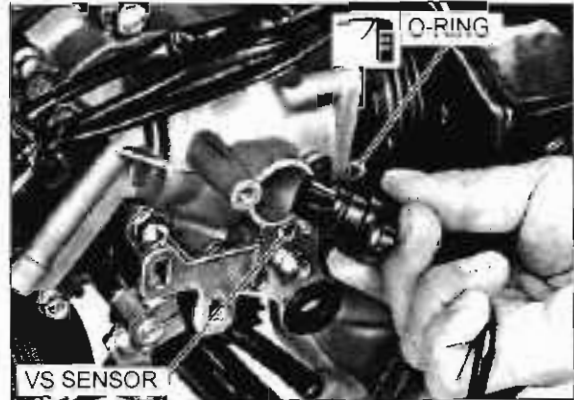
*Route the VS sensor wire properly (page 1-26).*

Install the VS sensor and mounting bolt.

Tighten the mounting bolt to the specified torque.

**TORQUE: 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)**

Install the removed parts in the reverse order of removal.



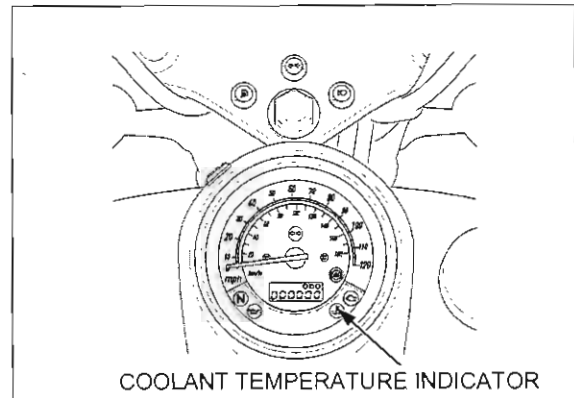
## COOLANT TEMPERATURE INDICATOR/ECT SENSOR

### INSPECTION

**The coolant temperature is too high, but the indicator does not come on**

Check that the neutral and oil pressure indicators function properly.

If they do not function, check the power input line of the speedometer (page 21-12).



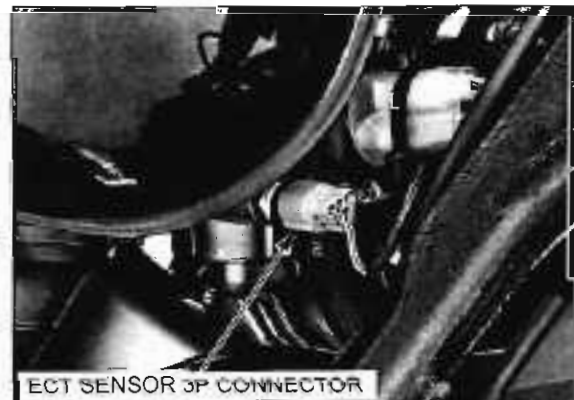
Remove the steering side covers (page 2-4).

Disconnect the ECT sensor 3P connector.

Ground the Green/blue wire of the ECT sensor 3P connector with a jumper wire.

Turn the ignition switch to "ON" and check the coolant temperature indicator.

- If the indicator comes on, inspect the ECT sensor (page 5-62).
- If the indicator does not come on, check for an open circuit in the Green/blue wire. If the wire is OK, replace the speedometer (page 21-15).



## LIGHTS/METERS/SWITCHES

The coolant temperature is low but the indicator comes on.

Disconnect the ECT sensor 3P connector.  
Turn the ignition switch to "ON" and check the coolant temperature indicator.

- If the indicator does not come on, inspect the ECT sensor (page 21-18).
- If the indicator comes on, check for a short circuit in the Green/blue wire. If the wire is OK, replace the speedometer (page 21-15).

### ECT SENSOR INSPECTION

Drain the coolant from the cooling system (page 6-7).  
Remove the ECT sensor (page 5-62).

*Wear insulated gloves and adequate eye protection.  
Keep flammable materials away from the burner.*

Heat the coolant (1 : 1 mixture) with an electric heating element.

Suspend the ECT sensor in heated coolant and check the continuity through the sensor as the coolant heats up.

#### NOTE:

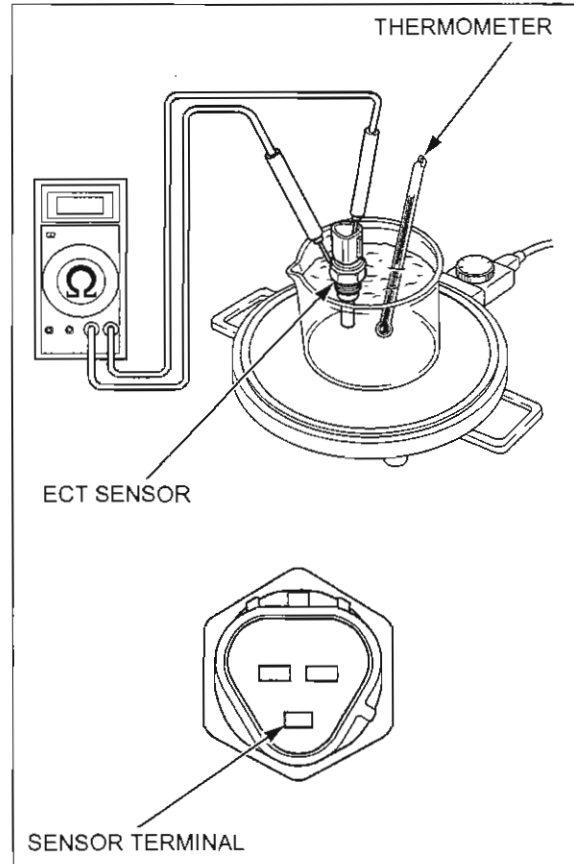
- Soak the ECT sensor in coolant up to its threads with at least 40 mm (1.6 in) from the bottom of the pan to the bottom of the sensor.
- Keep temperature constant for 3 minutes before testing. A sudden change of temperature will result in incorrect readings. Do not let the thermometer or ECT sensor touch the pan.

**CONNECTION: Green/blue – Body ground**

Temperature	50°C (122°F)	80°C (176°F)	120°C (248°F)
Resistance	6.8 – 7.4 kΩ	2.1 – 2.6 kΩ	0.6 – 0.7 kΩ

Replace the ECT sensor if it is out of specifications.

Install the ECT sensor (page 5-62).



## FUEL RESERVE SENSOR

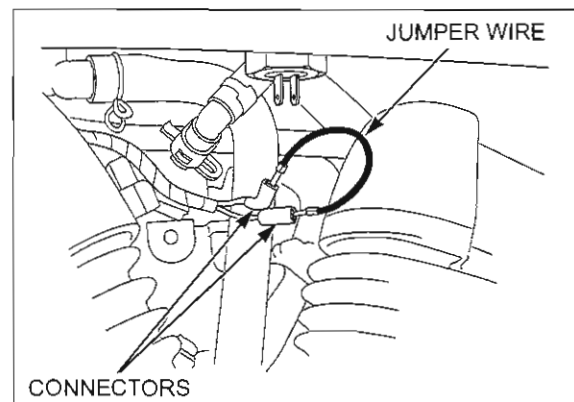
### INSPECTION

Fuel tank is empty, but the indicator does not come on

Disconnect the fuel reserve sensor connectors.  
Jump the Black/light green and Green wire terminals of the wire harness side using a jumper wire.

Turn the ignition switch to "ON" and check the fuel reserve indicator.

- If the indicator comes on, replace the fuel reserve sensor (page 21-19).
- If the indicator does not come on, check the voltage at the fuel reserve/high beam indicator 4P connector as follows.





Remove the headlight case (page 21-7).

Connect the fuel reserve sensor connectors.

Turn the ignition switch to "OFF".

Disconnect the fuel reserve/high beam indicator 4P (White) connector.

Turn the ignition switch to "ON", measure the voltage between the Brown (+) and Black/light green (-) wire terminals of the sensor side connector.

- If there is battery voltage, check for open circuit in Black/brown or Light green/red wire between the fuel reserve/high beam indicator 4P connector and fuel reserve indicator light. If the wire is OK, replace the fuel reserve indicator bulb (page 21-10).
- If there is no battery voltage, check for open circuit in Brown or Black/light green wire.

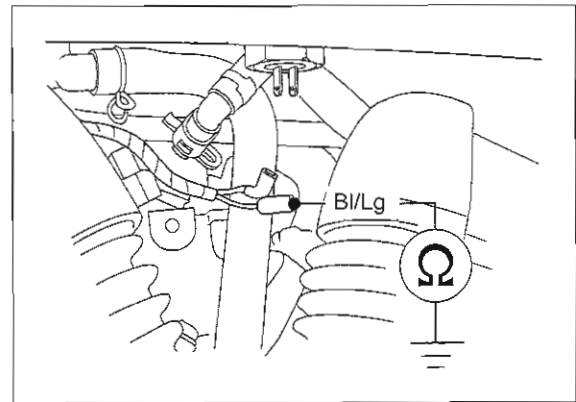
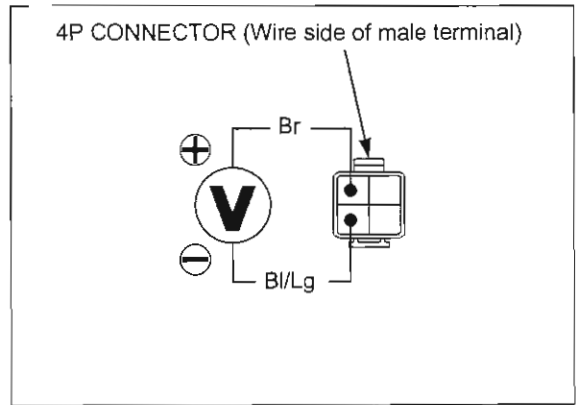
**Fuel left enough in the fuel tank, but the indicator stays on**

Turn the ignition switch to "OFF".

Disconnect the fuel reserve sensor connectors.

Check for continuity between the Black/light green wire and body ground.

- If there is continuity, check for short circuit in Black/light green wire.
- If there is no continuity, replace the fuel reserve sensor (page 21-19).

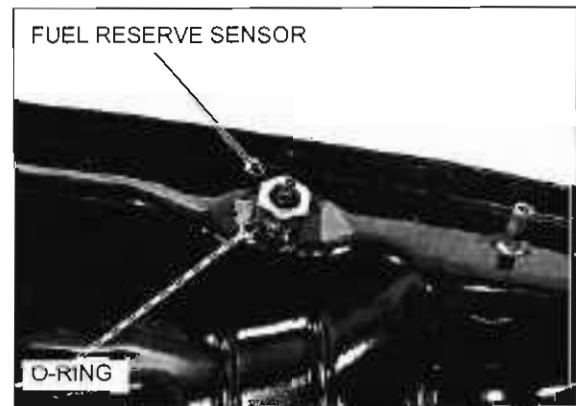


**REMOVAL/INSTALLATION**

Remove the fuel tank (page 5-48).

Drain the fuel into an approved fuel container.

Remove the fuel reserve sensor and O-ring.



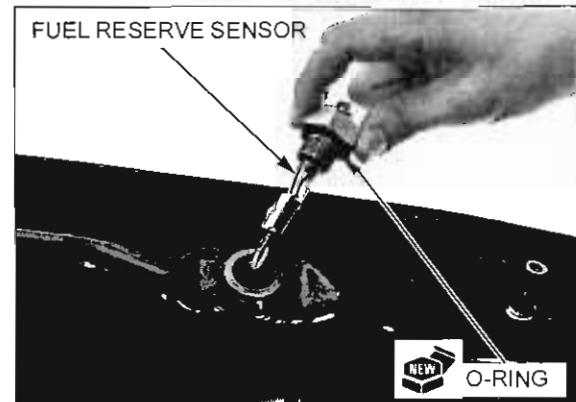
Install a new O-ring onto the fuel reserve sensor. Install and tighten the fuel reserve sensor to the specified torque.

**TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)**

Install the fuel tank (page 5-48).

**NOTE:**

After installing the fuel tank, check that there is no fuel leak.

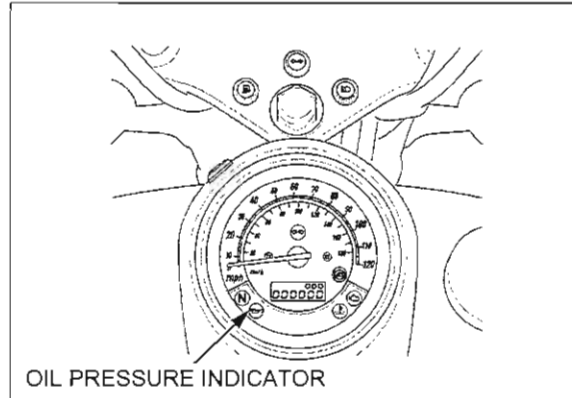


## OIL PRESSURE INDICATOR

### INSPECTION

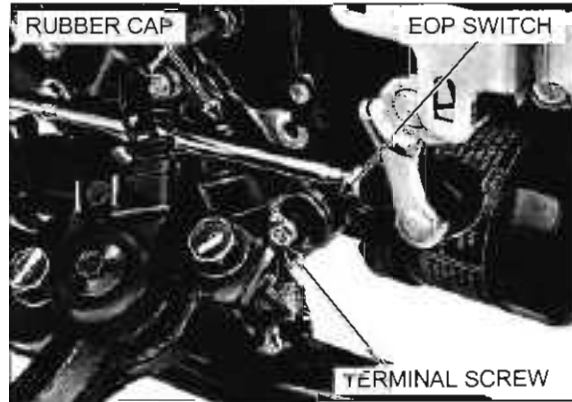
Indicator does not come on with the ignition switch turned to "ON"

Check that the neutral and coolant temperature indicators function properly.  
If they do not function properly, check the power input line of the speedometer (page 21-12).



Remove the left crankcase rear cover (page 2-4).  
Remove the rubber cap, and disconnect the EOP switch wire by removing the terminal screw.  
Ground the wire terminal.  
Turn the ignition switch to "ON" and check the oil pressure indicator.

- If the indicator comes on, replace the EOP switch.
- If the indicator does not come on, check for an open circuit in the Blue/red wire. If the wire is OK, replace the speedometer (page 21-15).



### Indicator stays on while the engine is running

Remove the rubber cap, and disconnect the EOP switch wire by removing the terminal screw.  
Check for continuity between the wire terminal and ground.

- If there is, check for a short circuit in the Blue/red wire.
- If there is no continuity, check the oil pressure (page 4-5).  
If the oil pressure is normal, replace the EOP switch.

After inspection, connect the EOP switch wire and tighten the terminal screw.

**TORQUE: 1.9 N·m (0.2 kgf·m, 1.4 lbf·ft)**

Install the rubber cap properly.  
Install the left crankcase rear cover (page 2-4).

# IGNITION SWITCH

## INSPECTION (VT750C2F/C2B)

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

Disconnect the ignition switch 2P (White) connector.

Check for continuity between the switch side connector terminals in each switch position.

Continuity should exist between the color coded wires as shown in the chart.

	IG	BAT1
ON	○	○
OFF		
COLOR	R/BI	R



## INSPECTION (VT750C2S)

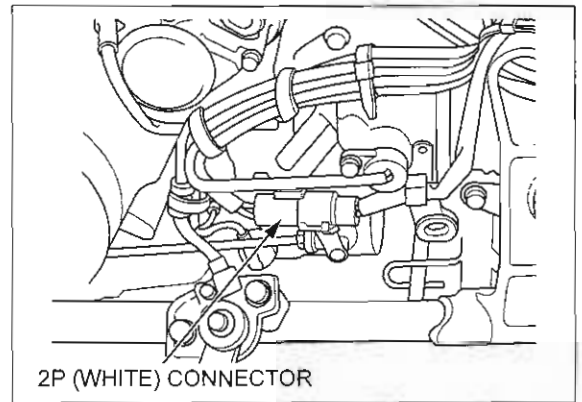
Remove the left crankcase rear cover (page 2-4).

Disconnect the ignition switch 2P (White) connector.

Check for continuity between the switch side connector terminals in each switch position.

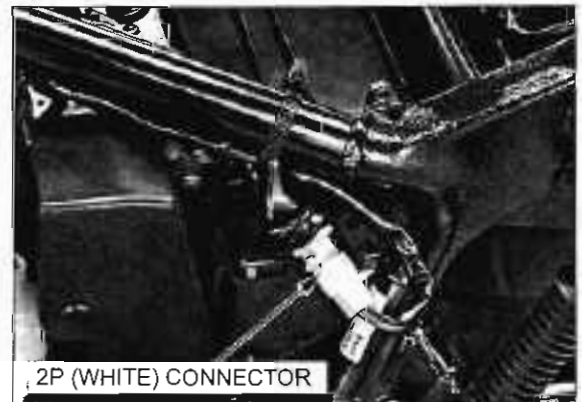
Continuity should exist between the color coded wires as shown in the chart.

	IG	BAT1
ON	○	○
OFF		
COLOR	R/BI	R

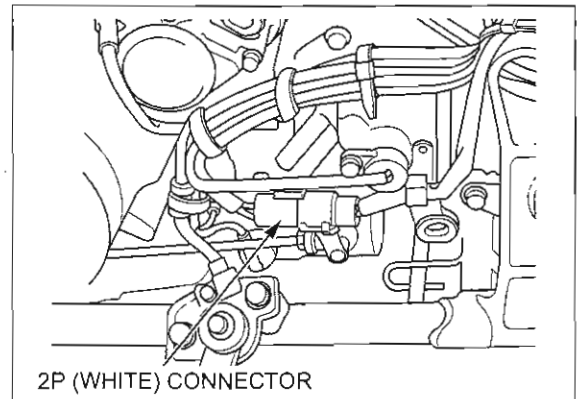


## REMOVAL/INSTALLATION

VT750C2F/C2B; Disconnect the ignition switch 2P (White) connector.

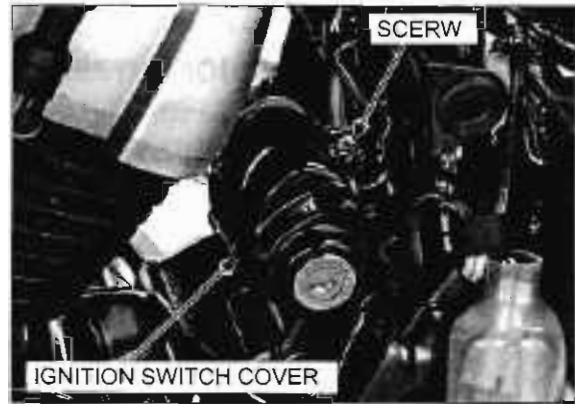


VT750C2S; Disconnect the ignition switch 2P (White) connector.

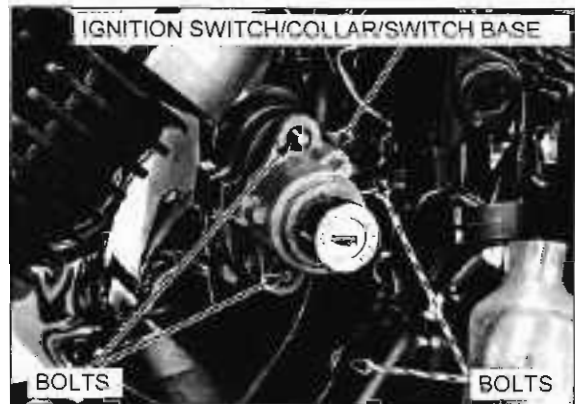


## LIGHTS/METERS/SWITCHES

Remove the screw and ignition switch cover.



Remove the bolts and ignition switch assembly. Remove the bolts, ignition switch, collar and switch base from the stay.



Install the switch base, ignition switch and collar to the stay.

*The ignition switch mounting bolt heads are broken by tighten them to the specified torque.*

Tighten new bolts to the specified torque.

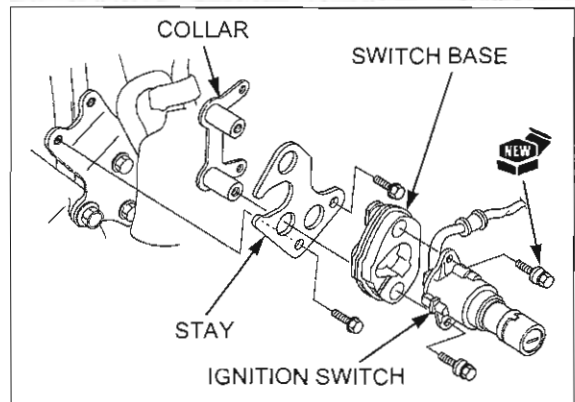
**TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)**

Install the ignition switch assembly to the frame. Install the ignition switch cover and tighten the screw.

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

Route the ignition switch wire properly (page 1-26). Connect the ignition switch 2P (White) connector.

Installation is in the reverse order of removal.



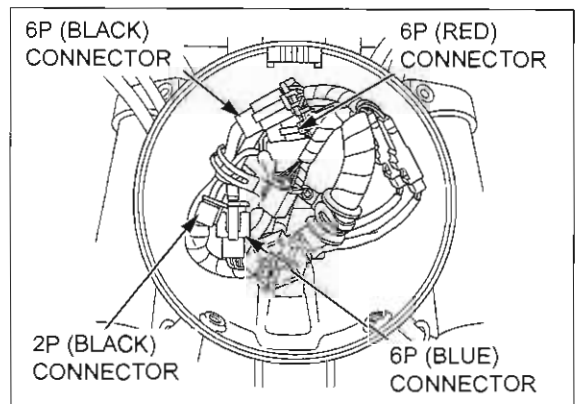
## HANDLEBAR SWITCH

VT750C2F/C2S; Remove the headlight unit (page 21-7).

Disconnect the following connectors:

- Left handlebar switch 6P (Black)
- Left handlebar switch 6P (Blue)
- Right handlebar switch 6P (Red)
- Dimmer switch 2P (Black)

Check for continuity between the connector terminals in each switch position. Continuity should exist between the color coded wires as shown in the charts.



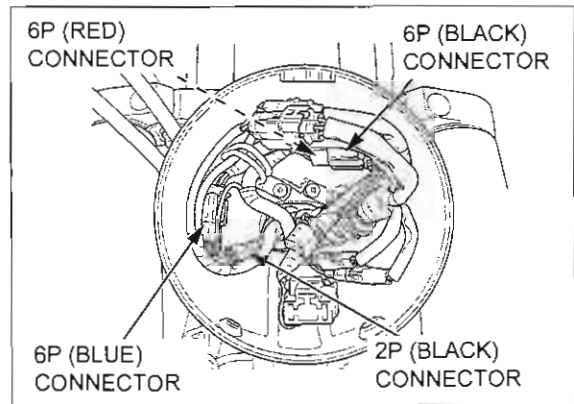
VT750C2B; Remove the headlight unit (page 21-7).

Disconnect the following connectors:

- Left handlebar switch 6P (Black)
- Left handlebar switch 6P (Blue)
- Right handlebar switch 6P (Red)
- Left handlebar switch 2P (Black)

Check for continuity between the connector terminals in each switch position.

Continuity should exist between the color coded wires as shown in the charts.



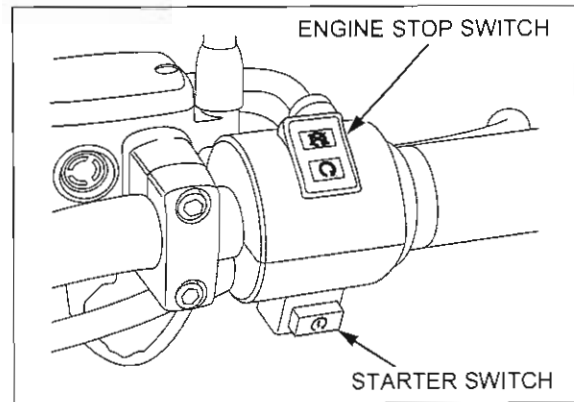
## RIGHT HANDLEBAR SWITCH

### ENGINE STOP SWITCH

	IG	BAT2
	○	○
COLOR	Bl/W	Bl/G

### STARTER SWITCH

	ST	IG	BAT1	HL
FREE			○	○
PUSH	○	○		
COLOR	Y/R	Bl/W	Bl/R	Bu/W



## LEFT HANDLEBAR SWITCH

### TURN SIGNAL SWITCH

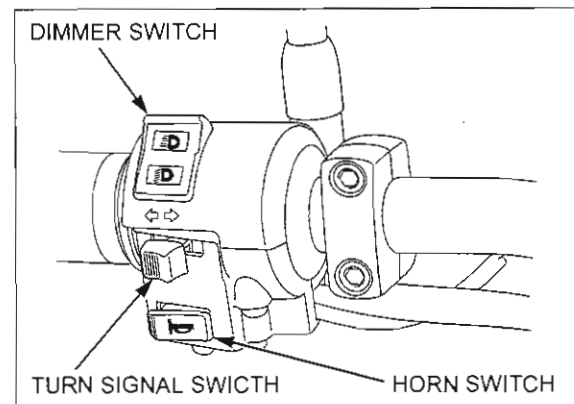
	W	R	L
R	○	○	
N			
L	○		○
COLOR	Gr	Lb	O

### HORN SWITCH

	Ho	BAT3
FREE		
PUSH	○	○
COLOR	Lg	W/G

### DIMMER SWITCH

	HL	Lo	Hi
Lo	○	○	
(N)	○	○	○
Hi	○		○
COLOR	Bu/W	W	Bu

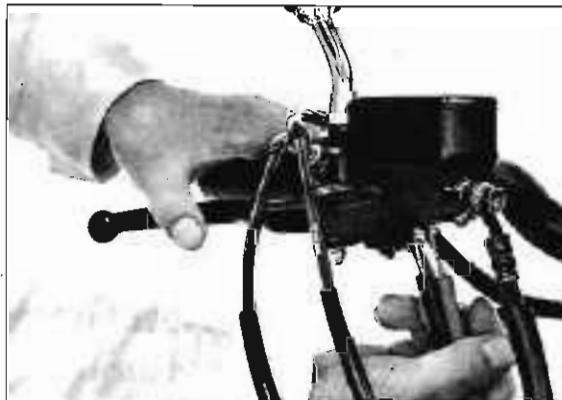


## BRAKE LIGHT SWITCH

### FRONT

Disconnect the brake light switch connectors and check for continuity between the switch terminals.

There should be continuity with the brake lever squeezed and no continuity with the lever released.



### REAR

Remove the steering side covers (page 2-4).

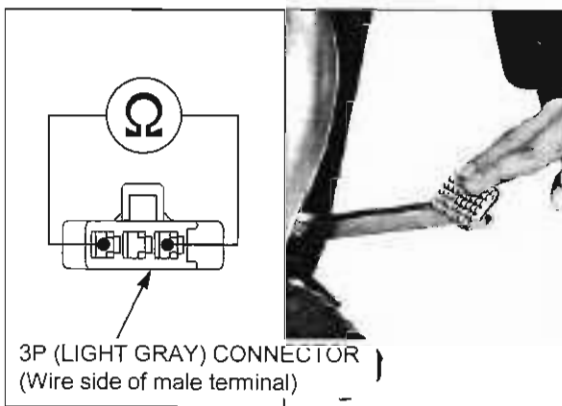
Disconnect the rear brake light switch 3P (Light gray) connector.



3P (LIGHT GRAY) CONNECTOR

Check for continuity between the switch side connector terminals.

There should be continuity with the brake pedal depressed and no continuity with the pedal released.

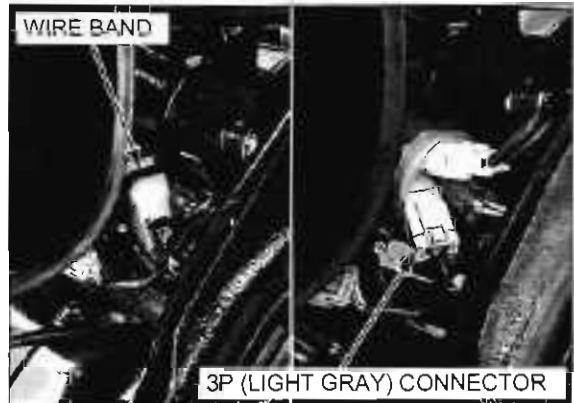


3P (LIGHT GRAY) CONNECTOR  
(Wire side of male terminal)

**REAR BRAKE LIGHT SWITCH  
REMOVAL/INSTALLATION**

Remove the steering side covers (page 2-4).

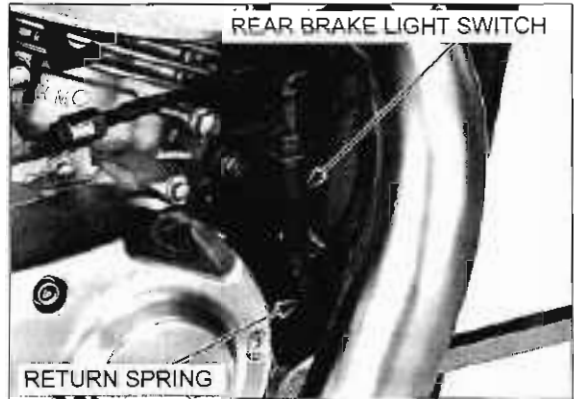
Remove the wire band and disconnect the rear brake light switch 3P (Light gray) connector.



Unhook the return spring and remove the rear brake light switch.

*Route the wire properly (page 1-26).*

Installation is in the reverse order of removal. Adjust the rear brake light switch (page 3-22).



**CLUTCH SWITCH**

Disconnect the clutch switch wire connectors and check for continuity between the switch terminals.

There should be continuity with the clutch lever squeezed and no continuity with the lever released.



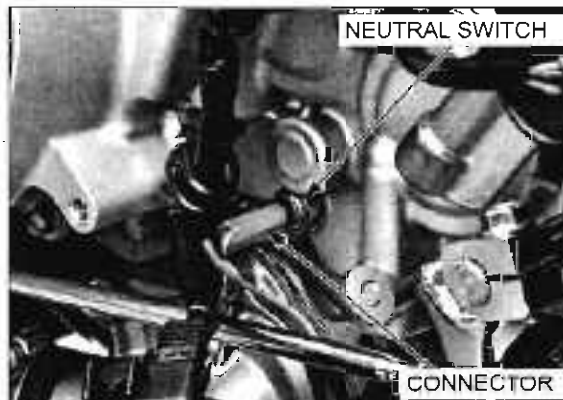
### NEUTRAL SWITCH

Remove the left crankcase rear cover (page 2-4).

#### INSPECTION

Disconnect the neutral switch connector.  
Check for continuity between the switch terminal and engine ground.

There should be continuity when the transmission is in neutral, and no continuity when the transmission is in gear except neutral.



#### REPLACEMENT

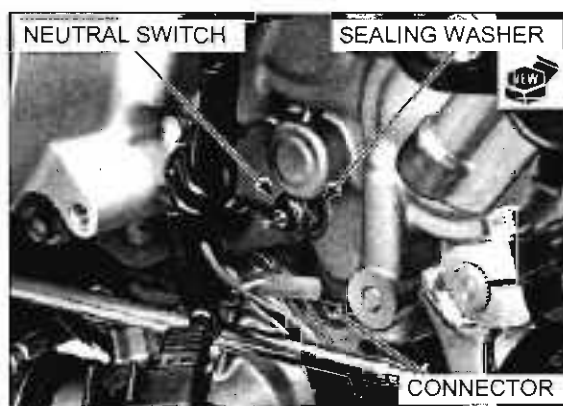
Disconnect the neutral switch connector.  
Remove the neutral switch with the sealing washer from the crankcase.

Install the neutral switch with a new sealing washer and tighten it.

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

Connect the neutral switch connector.

Install the left crankcase rear cover (page 2-4).



### SIDESTAND SWITCH

#### INSPECTION

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

Disconnect the sidestand switch 2P (Green) connector.  
Check for continuity between the switch side connector terminals.

There should be continuity with the sidestand retracted and no continuity with the sidestand lowered.





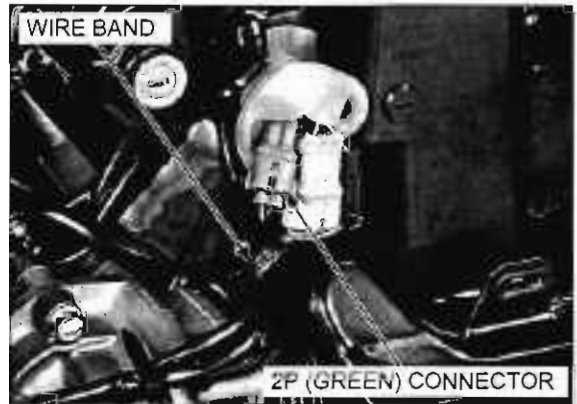
**REMOVAL/INSTALLATION**

Remove the following:

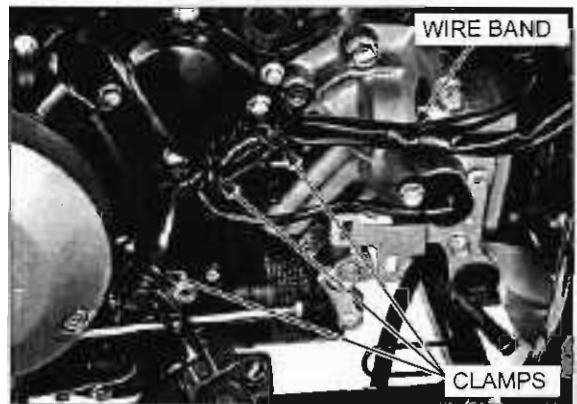
- Left side cover (page 2-3)
- Left crankcase rear cover (page 2-4)

Support the motorcycle securely.

Release the wire band and disconnect the sidestand switch 2P (Green) connector.

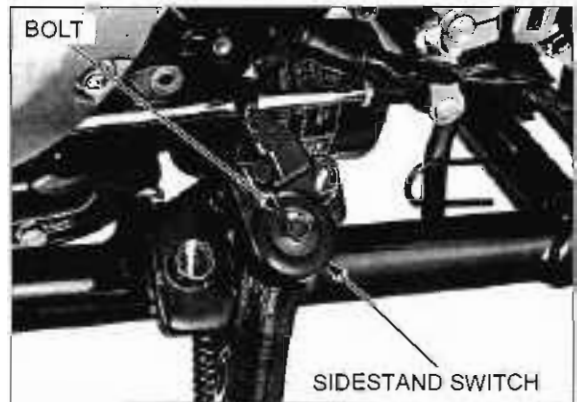


Release the sidestand switch wire from the wire band and clamps.

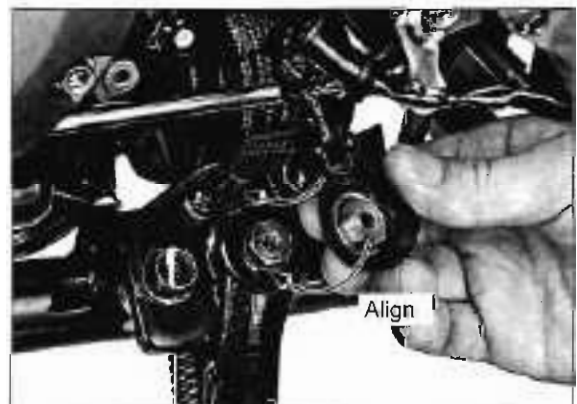


*Do not reuse the sidestand switch bolt.*

Remove the bolt and sidestand switch.



Install the sidestand switch by aligning its pin with the sidestand hole and switch groove with the bracket pin.



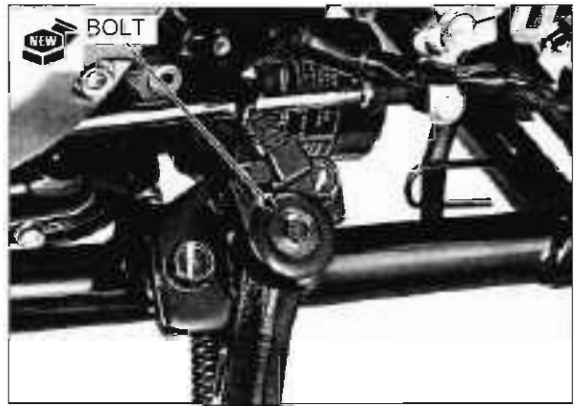
## LIGHTS/METERS/SWITCHES

Install a new sidestand switch bolt.  
Tighten the bolt to the specified torque.

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

*Route the sidestand  
switch wire properly  
(page 1-26).*

Install the removed parts in the reverse order of removal.

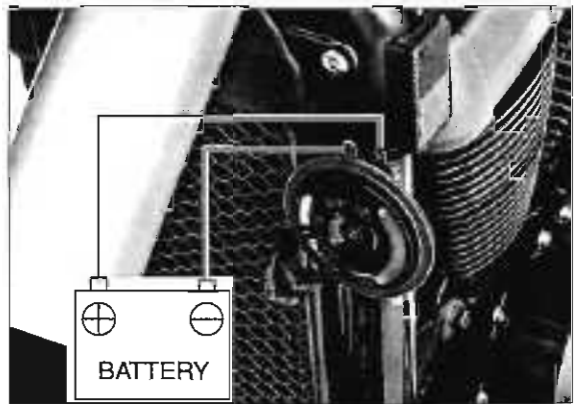


## HORN

### INSPECTION

Disconnect the connectors from the horn.  
Connect a 12 V battery to the horn terminals.

The horn is normal if it sounds when the 12 V battery is connected across the horn terminals.



### REMOVAL/INSTALLATION

Disconnect the connectors from the horn.

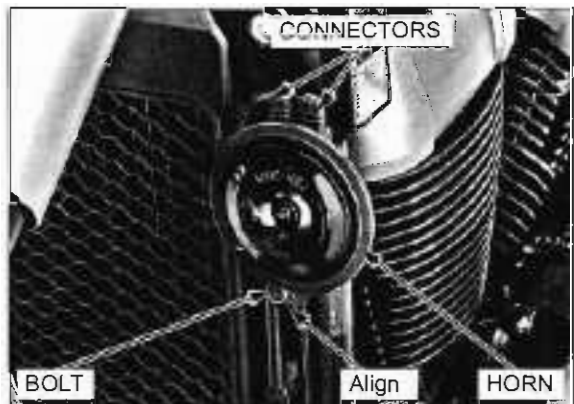
Remove the bolt and horn.

Install the horn to the frame, aligning its flat with the horn stay.

Install and tighten the bolt to the specified torque.

**TORQUE: 21 N·m (2.1 kgf·m, 15 lbf·ft)**

Connect the connectors.



## TURN SIGNAL RELAY (VT750C2F/C2B)

**Turn signal light does not blink**

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

Remove the turn signal relay from the stay.

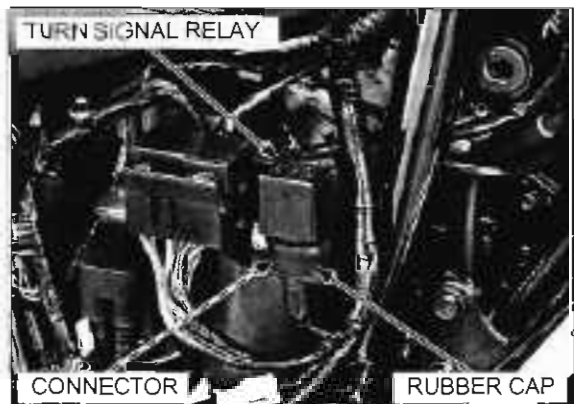
Slide the rubber cap and disconnect the connector.

Connect the White/green and Gray wire terminals of the wire side connector with a jumper wire.

Turn the ignition switch to "ON" and check the turn signal lights by operating the turn signal switch.

- If the light does not come on, check for an open circuit in the White/green and Gray wires.
- If the light comes on, check the connector terminals for loose or poor contact.

If the connector terminals are OK, replace the turn signal relay.



## TURN SIGNAL RELAY (VT750C2S)

Turn signal light does not blink

Remove the fuel tank (page 5-48).

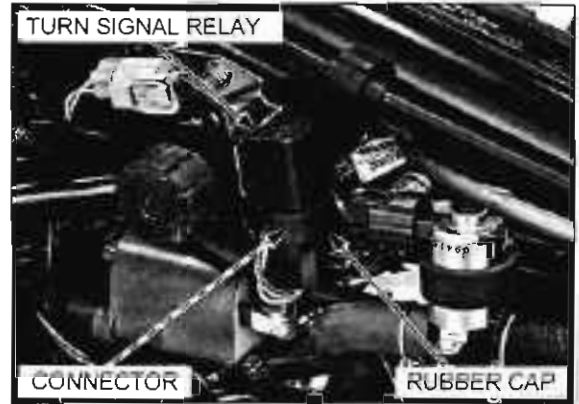
Remove the turn signal relay from the stay.

Slide the rubber cap and disconnect the connector.

Connect the White/green and Gray wire terminals of the wire side connector with a jumper wire.

Turn the ignition switch to "ON" and check the turn signal lights by operating the turn signal switch.

- If the light does not come on, check for an open circuit in the White/green and Gray wires.
  - If the light comes on, check the connector terminals for loose or poor contact.
- If the connector terminals are OK, replace the turn signal relay.



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MEMO

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# 22. WIRING DIAGRAMS

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VT750C2F.....22-3

VT750C2S .....22-5

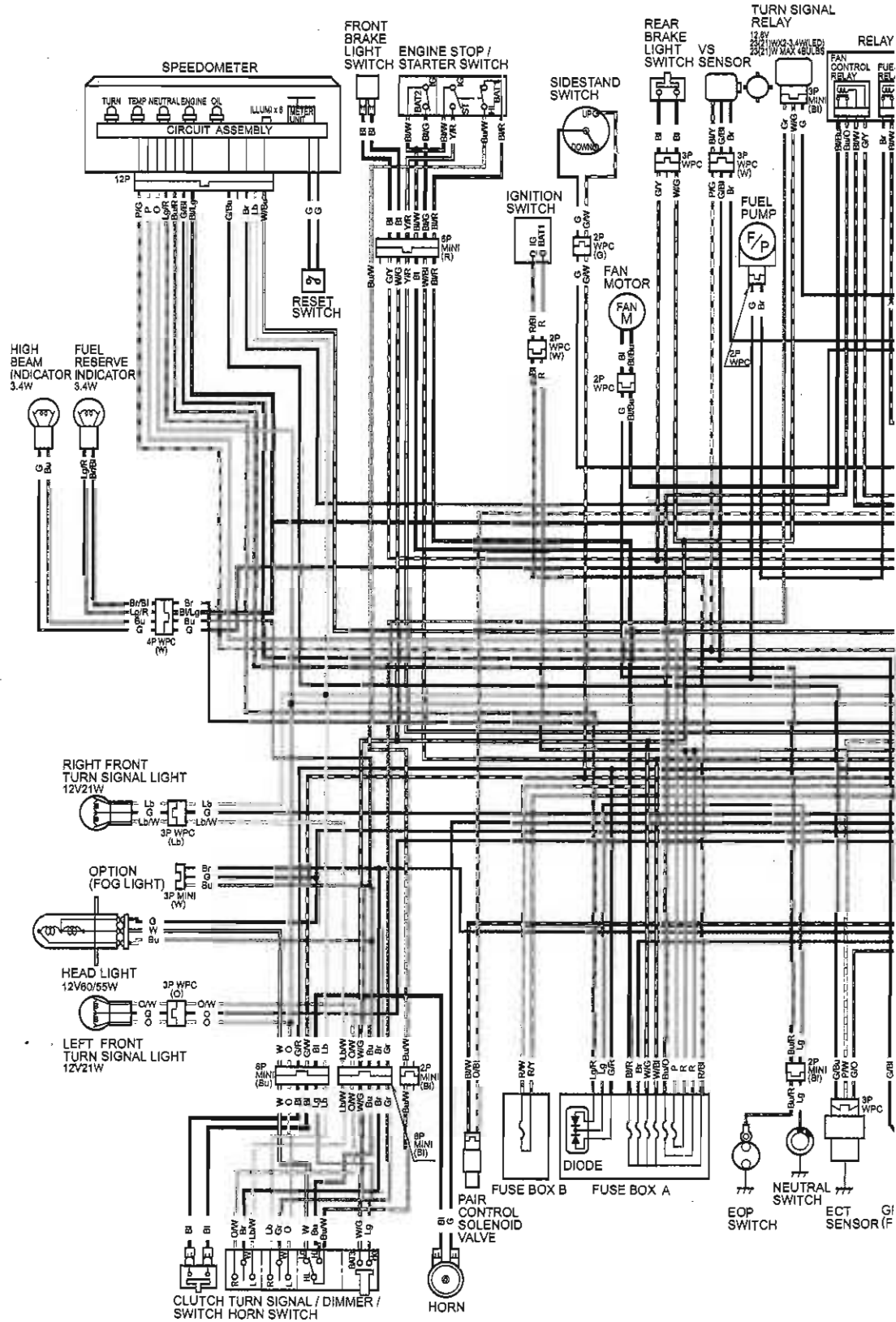
VT750C2B .....22-4

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**MEMO**

---

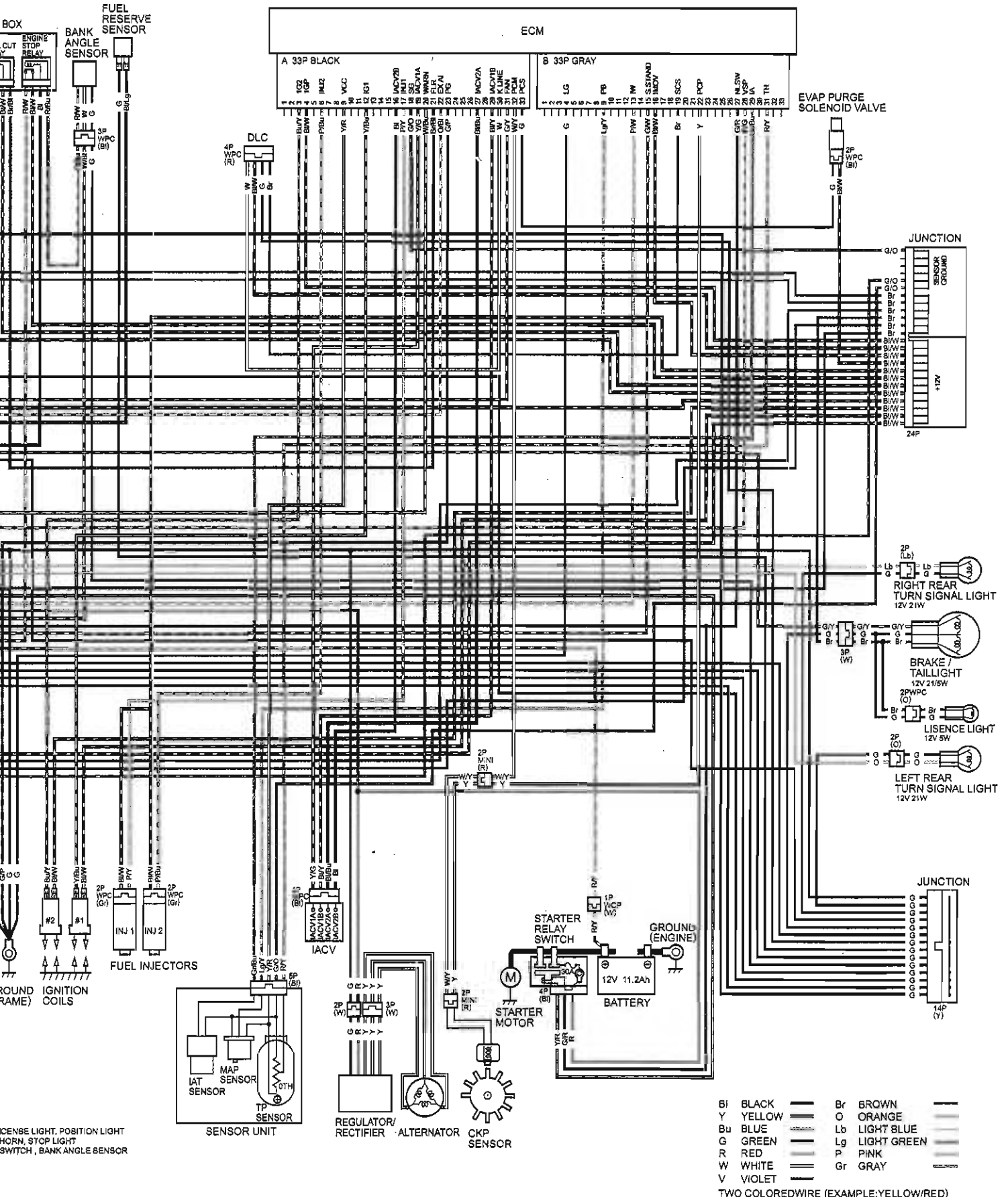
# VT750C2F



TURN SIGNAL SWITCH					DIMMER SWITCH			HORN SWITCH		ENGINE STOP SWITCH		STARTER SWITCH				IGNITION SWITCH			FUSE							
	W	R	L	PO	PR	PL		HL	Lo	HI		HO	BAT2		IG	BAT1		IO	BT	BAT1	HL					
R							Lo				PUSH			OFF			PUSH					ON				
N							(N)															OFF				
L							HI										LOCK									

FUSE	Rating	Component
A	10A	HEADLIGHT
B	10A	METER, TAIL LIGHT, L
C	10A	TURN SIGNAL LIGHT,
D	10A	STARTER MAGNETIC
E	20A	FAN
F	10A	ODOMETER
G	15A	FI

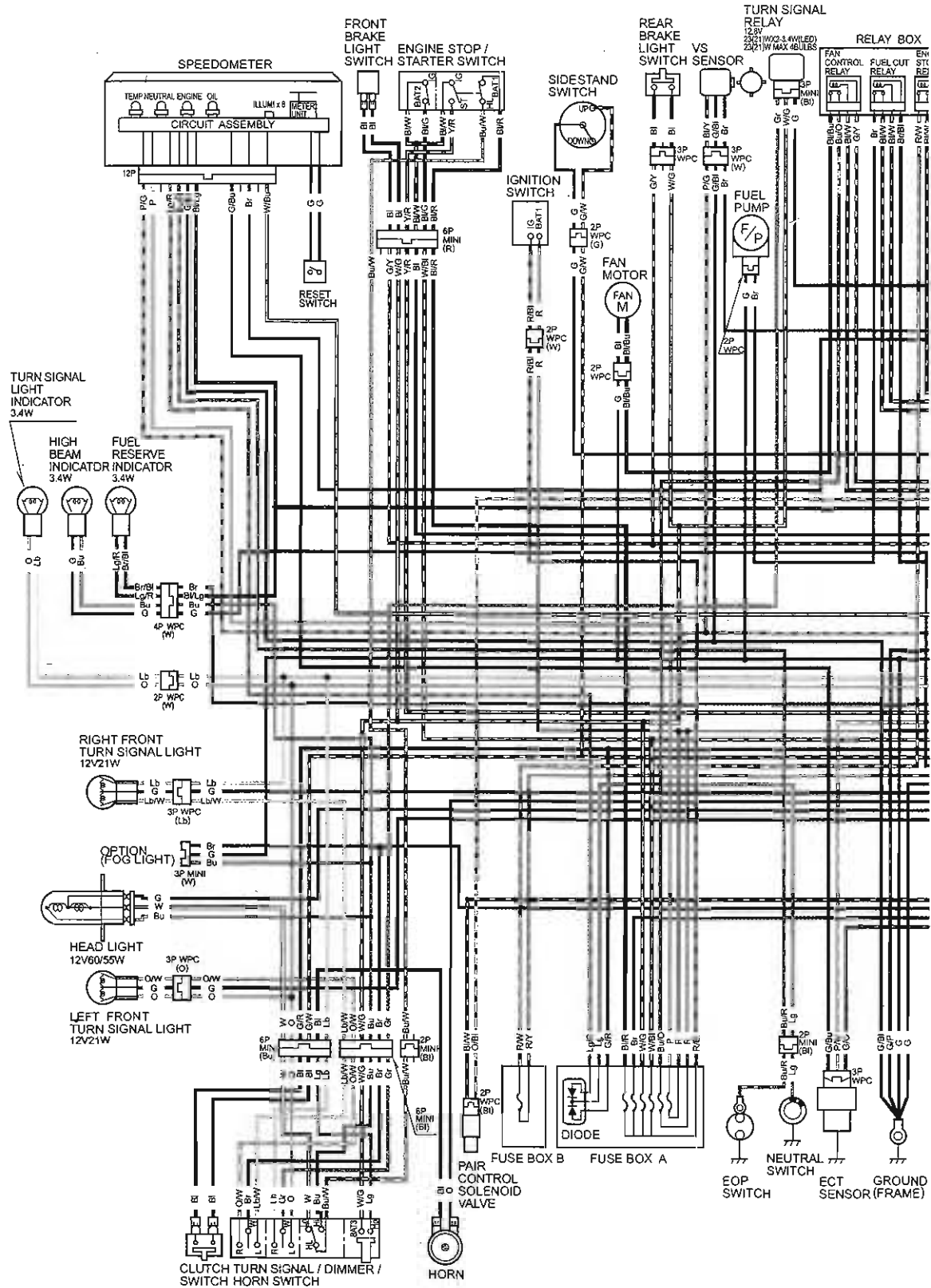


- |    |        |    |             |
|----|--------|----|-------------|
| Bl | BLACK  | Br | BROWN       |
| Y  | YELLOW | O  | ORANGE      |
| Bu | BLUE   | Lb | LIGHT BLUE  |
| G  | GREEN  | Lg | LIGHT GREEN |
| R  | RED    | P  | PINK        |
| W  | WHITE  | Gr | GRAY        |
| V  | VIOLET |    |             |
- TWO COLORED WIRE (EXAMPLE: YELLOW/RED)



# WIRING DIAGRAMS

## VT750C2B



W	R	L	PO	PR	PL
R	○	○	○	○	○
N					
L	○	○	○	○	○

HL	Lo	Hi
Lo	○	○
(N)	○	○
Hi	○	○

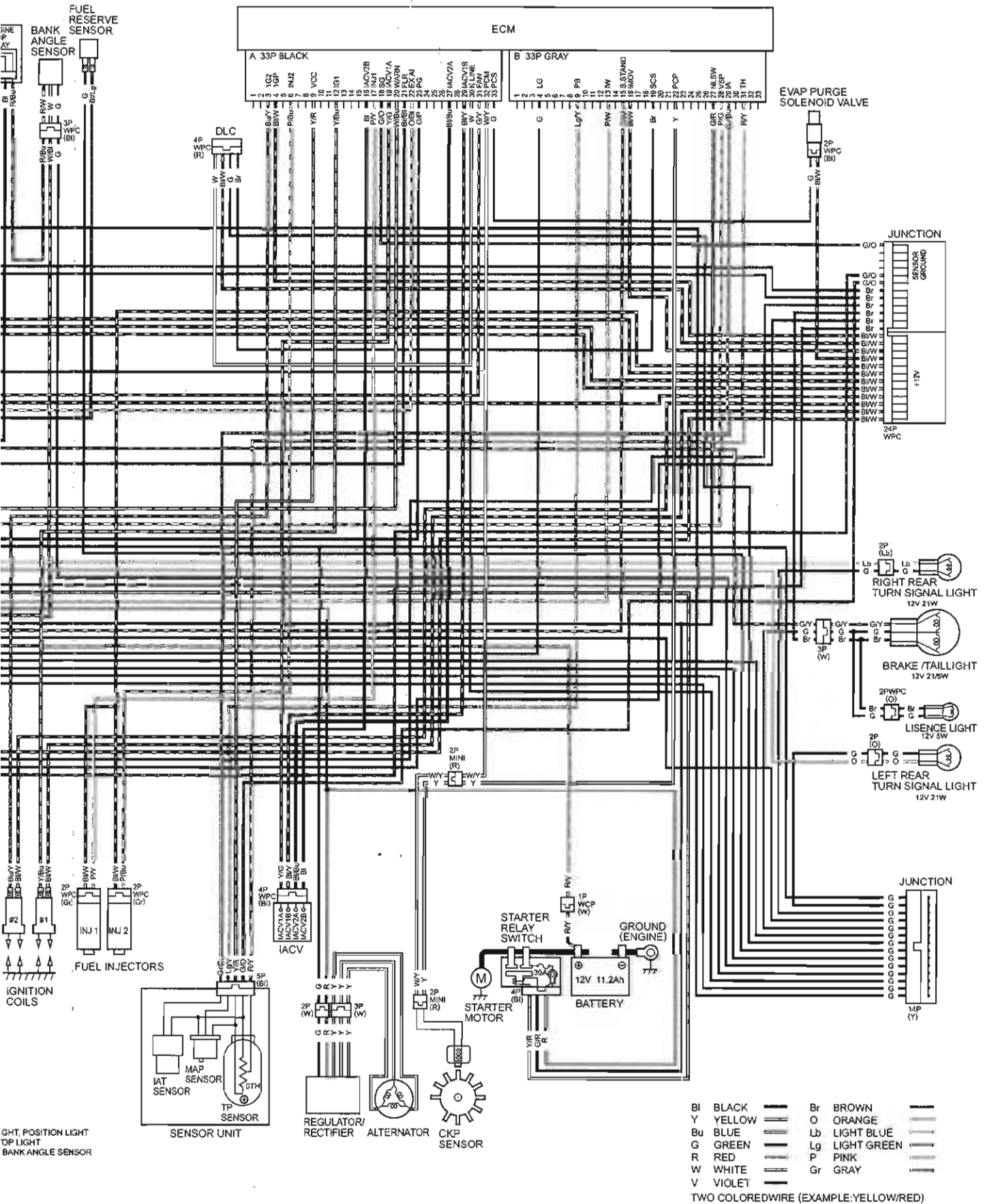
Ho	BAT1
FREE	○
PUSH	○

IG	BAT1	HL
OFF	○	○
FREE	○	○
PUSH	○	○

IG	ST	BAT1	HL
FREE	○	○	○
PUSH	○	○	○

BAT1	IG	KEY
ON	○	○
OFF	○	○
LOCK	○	○

A	B/W	10A	HEADLIGHT
B	Bf	10A	METER, TAIL LIGHT, LICENSE L
C	W/G	10A	TURN SIGNAL LIGHT, HORN, ST
D	W/Bi	10A	STARTER MAGNETIC SWITCH
E	Bu/O	20A	FAN
F	P	10A	ODOMETER
G	R/W	15A	F1



ECM

A 33P BLACK

B 33P GRAY

EVAP PURGE SOLENOID VALVE

JUNCTION

SENSORS GROUND  
+12V  
24P WPC

RIGHT REAR TURN SIGNAL LIGHT  
12V 21W

BRAKE /TAILLIGHT  
12V 21/5W

LICENSE LIGHT  
12V 5W

LEFT REAR TURN SIGNAL LIGHT  
12V 21W

JUNCTION

14P (Y)

STARTER RELAY SWITCH  
GROUND (ENGINE)  
BATTERY  
12V 11.2Ah

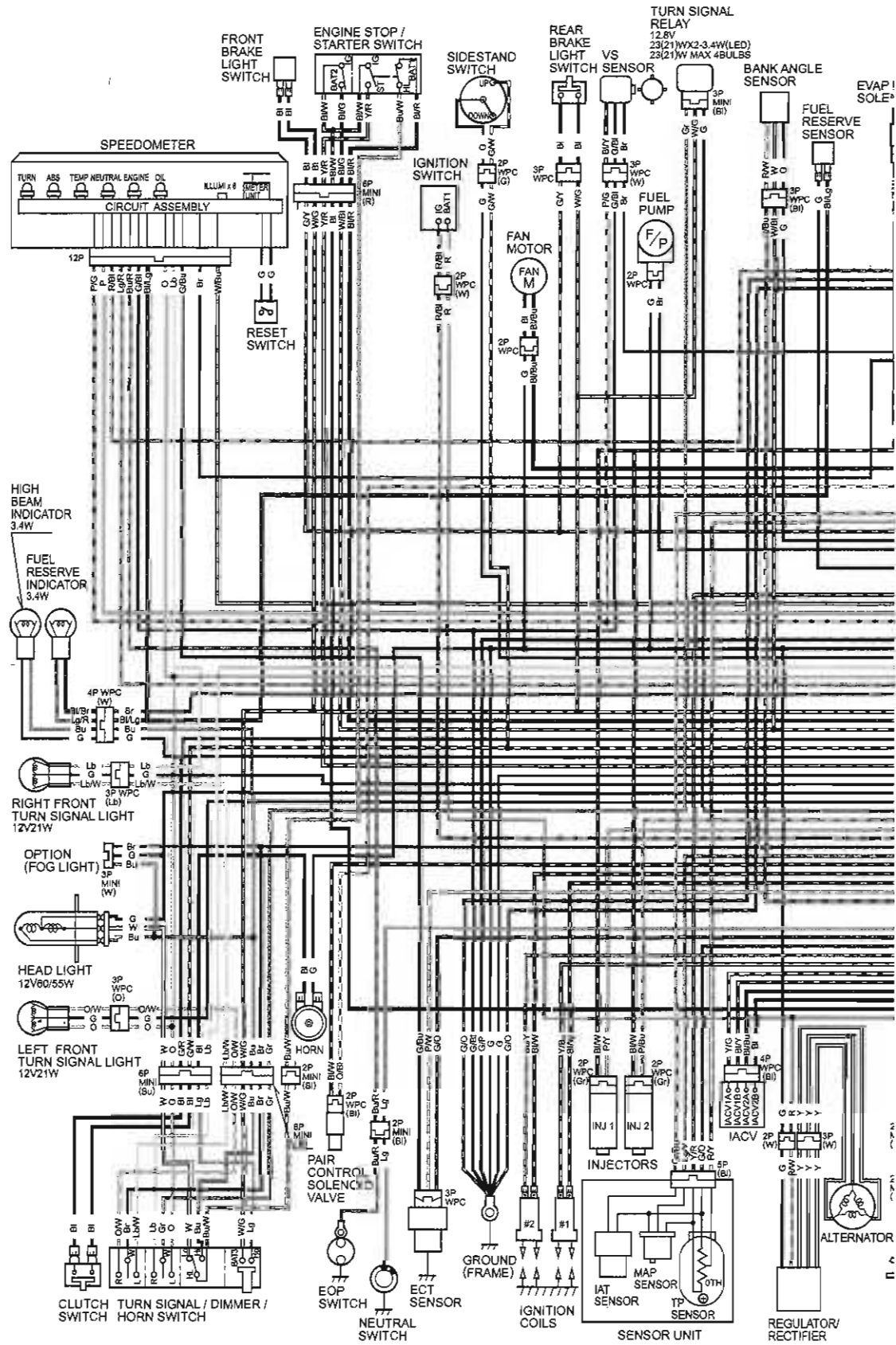
STARTER MOTOR

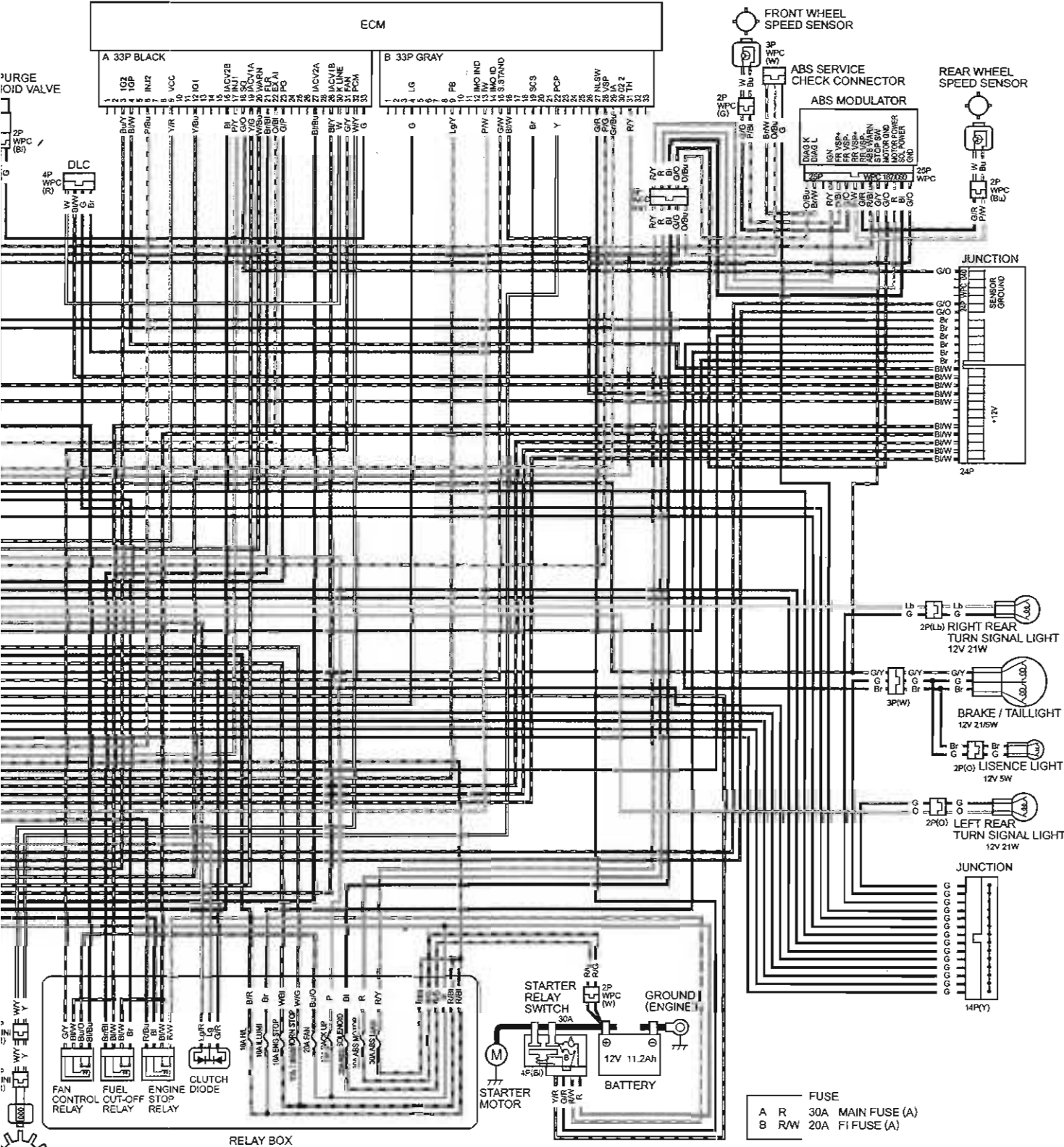
REGULATOR/RECTIFIER  
ALTERNATOR  
CKP SENSOR

SENSOR UNIT  
IAT SENSOR  
MAP SENSOR  
TP SENSOR

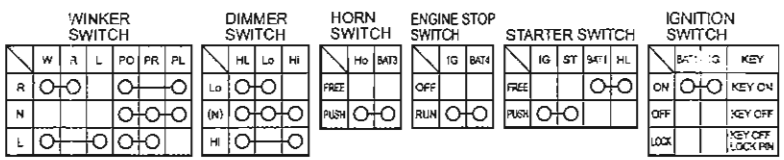
- BI BLACK
  - Y YELLOW
  - Bu BLUE
  - G GREEN
  - R RED
  - W WHITE
  - V VIOLET
  - Br BROWN
  - O ORANGE
  - Lb LIGHT BLUE
  - Lg LIGHT GREEN
  - P PINK
  - Gr GRAY
- TWO COLORED WIRE (EXAMPLE: YELLOW/RED)

# VT750C2S





- FUSE
- A R 30A MAIN FUSE (A)
  - B R/W 20A F1 FUSE (A)



- Bl BLACK
  - Y YELLOW
  - Bu BLUE
  - G GREEN
  - R RED
  - W WHITE
  - V VIOLET
  - Br BROWN
  - O ORANGE
  - Lb LIGHT BLUE
  - Lg LIGHT GREEN
  - P PINK
  - Gr GRAY
- TWO COLORED WIRE (EXAMPLE-YELLOW/RED)

# 23. TROUBLESHOOTING

---

ENGINE DOES NOT START OR IS HARD  
TO START .....23-2

ENGINE LACKS POWER .....23-3

POOR PERFORMANCE AT LOW AND  
IDLE SPEED .....23-5

POOR PERFORMANCE AT HIGH  
SPEED .....23-5

POOR HANDLING .....23-6

# ENGINE DOES NOT START OR IS HARD TO START

### 1. Spark Plug Inspection

Remove and inspect spark plugs.

**Is the spark plug in good condition?**

**YES** – • Incorrect spark plug heat range  
• Incorrect spark plug gap  
• Dirty air cleaner

**NO** – GO TO STEP 2.

### 2. Spark Test

Perform spark test.

**Is there weak or no spark?**

**YES** – • Faulty spark plug  
• Fouled spark plug  
• Loose or disconnected ignition system wires  
• Faulty CKP sensor  
• Faulty ignition coil  
• Faulty ECM  
• Faulty engine stop switch

**NO** – GO TO STEP 3.

### 3. Fuel Pump Inspection

Check for operation of the fuel pump and inspect the fuel flow.

**Is the fuel pump unit normal?**

**NO** – Faulty fuel pump unit

**YES** – GO TO STEP 4.

### 4. PGM-FI System Inspection

Check the PGM-FI system.

**Is the PGM-FI system normal?**

**NO** – Faulty PGM-FI system

**YES** – GO TO STEP 5.

### 5. Cylinder Compression

Test cylinder compression.

**Is the compression low?**

**YES** – • Valve stuck open  
• Worn cylinder and piston rings  
• Damaged cylinder head gasket  
• Seized valve  
• Improper valve timing

**NO** – GO TO STEP 6.

### 6. Engine Starting Condition

Start engine by following normal procedure.

**Does the engine start then stops?**

**YES** – • Leaking insulator or intake manifold  
• Improper ignition timing (Faulty ECM or CKP sensor)  
• Contaminated fuel  
• Faulty IACV

## ENGINE LACKS POWER

### 1. Drive Train Inspection

Raise wheel off the ground and spin it by hand.

**Does the wheel spin freely?**

- NO** – • Brake dragging  
• Worn or damaged wheel bearings  
• Final gear bearing damaged

**YES** – GO TO STEP 2.

### 2. Tire Pressure Inspection

Check tire pressure.

**Are the tire pressures low?**

- YES** – • Faulty tire valve  
• Punctured tire

**NO** – GO TO STEP 3.

### 3. Clutch Inspection

Accelerate rapidly from low to second.

**Does the engine speed change accordingly when the clutch is engaged?**

- NO** – • Clutch slipping  
• Worn clutch discs/plates  
• Warped clutch discs/plates  
• Weak clutch spring  
• Additive in engine oil

**YES** – GO TO STEP 4.

### 4. Engine Performance Inspection

Accelerate lightly.

**Does the engine speed increase?**

- NO** – • Dirty air cleaner  
• Restricted fuel flow  
• Clogged muffler

**YES** – GO TO STEP 5.

### 5. Spark Plug Inspection

Remove and inspect spark plugs.

**Is the spark plug fouled or discolored?**

- YES** – • Plugs not serviced frequently enough  
• Incorrect spark plug heat range  
• Incorrect spark plug gap

**NO** – GO TO STEP 6.

### 6. Engine Oil Inspection

Check oil level and condition.

**Is there correct level and good condition?**

- NO** – • Oil level too high  
• Oil level too low  
• Contaminated oil

**YES** – GO TO STEP 7.

## TROUBLESHOOTING

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### 7. Ignition Timing Inspection

Check ignition timing.

**Is the ignition timing correct?**

**NO** – • Faulty ECM  
• Faulty CKP sensor

**YES** – GO TO STEP 8.

### 8. Cylinder Compression Inspection

Test cylinder compression.

**Is the compression low?**

**YES** – • Valve clearance too small  
• Valve stuck open  
• Worn cylinder and piston rings  
• Damaged cylinder head gasket  
• Improper valve timing

**NO** – GO TO STEP 9.

### 9. Fuel pump Inspection

Inspect the fuel flow.

**Is the fuel pump unit normal?**

**NO** – Faulty fuel pump unit

**YES** – GO TO STEP 10.

### 10. PGM-FI System Inspection

Check the PGM-FI system.

**Is the PGM-FI System normal?**

**NO** – Faulty PGM-FI system

**YES** – GO TO STEP 11.

### 11. Lubrication Inspection

Remove cylinder head cover and inspect lubrication.

**Is the valve train lubricated properly?**

**NO** – • Clogged oil passage  
• Clogged oil filter  
• Faulty oil pump or oil pressure relief valve

**YES** – GO TO STEP 12.

### 12. Over Heating Inspection

Check for engine over heating.

**Is the engine over heating?**

**YES** – • Coolant level too low  
• Fan motor not working  
• Thermostat stuck closed  
• Excessive carbon build-up in combustion chamber  
• Wrong type of fuel  
• Clutch slipping

**NO** – GO TO STEP 13.

### 13. Engine Knocking Inspection

Accelerate or run at high speed.

**Is there knocking?**

**YES** – • Worn piston and cylinder  
• Wrong type of fuel  
• Excessive carbon build-up in combustion chamber  
• Ignition timing too advance (Faulty ECM)  
• Lean fuel mixture  
• Faulty CKP sensor

**NO** – Engine does not knock



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## POOR PERFORMANCE AT LOW AND IDLE SPEED

### 1. Intake Air Leak Inspection

Check the intake manifold gasket or insulator for leaks.

**Are these leaks?**

- YES** – • Loose insulator bands  
• Loose intake manifold mounting bolts  
• Damaged insulator  
• Faulty O-rings

**NO** – GO TO STEP 2.

### 2. Spark Test

Perform spark test.

**Is there weak or intermittent spark?**

- YES** – • Faulty spark plug  
• Fouled spark plug  
• Loose or disconnected ignition system wires  
• Faulty CKP sensor  
• Faulty ignition coil  
• Faulty engine stop switch  
• Faulty ECM

**NO** – GO TO STEP 3.

### 3. Fuel Pump Inspection

Inspect the fuel flow.

**Is the fuel pump unit normal?**

**NO** – Faulty fuel pump unit

**YES** – GO TO STEP 4.

### 4. Ignition Timing Inspection

Check ignition timing.

**Is the ignition timing correct?**

- NO** – • Faulty ECM  
• Faulty CKP sensor

**YES** – GO TO STEP 5.

### 5. PGM-FI System Inspection

Check the PGM-FI system

**Is the PGM-FI system normal?**

**NO** – Faulty PGM-FI system

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## POOR PERFORMANCE AT HIGH SPEED

### 1. Fuel Pump Inspection

Inspect the fuel flow.

**Is the fuel pump unit normal?**

**NO** – Faulty fuel pump unit

**YES** – GO TO STEP 2.

### 2. PGM-FI System Inspection

Check the PGM-FI system.

**Is the PGM-FI system normal?**

**NO** – Faulty PGM-FI system

**YES** – GO TO STEP 3.

### 3. Ignition Timing Inspection

Check ignition timing.

## TROUBLESHOOTING

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*Is the ignition timing correct?*

**NO** – • Faulty ECM  
• Faulty CKP sensor

**YES** – GO TO STEP 4.

### 4. Valve Timing Inspection

Check valve timing.

*Is the valve timing correct?*

**NO** – Cam sprockets not installed properly

**YES** – GO TO STEP 5.

### 5. Valve Spring Inspection

Check valve springs.

*Is the valve spring free length within specification?*

**NO** – Faulty valve spring

**YES** – GO TO STEP 6.

### 6. Camshaft Inspection

Remove and inspect the camshaft.

*Is the cam lobe height within specification?*

**NO** – Faulty camshaft

**YES** – Camshaft is OK

## POOR HANDLING

### **Steering is heavy**

- Steering top thread too tight
- Damaged steering head bearings
- Low tire pressure

### **Either wheel is wobbling**

- Excessive wheel bearing play
- Bent rim
- Improperly installed wheel hub
- Excessively worn swingarm pivot bearings
- Bent frame

### **Motorcycle pulls to one side**

- Front and rear wheels not aligned
- Bent fork
- Bent swingarm
- Bent axle
- Bent frame

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