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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 1-23).

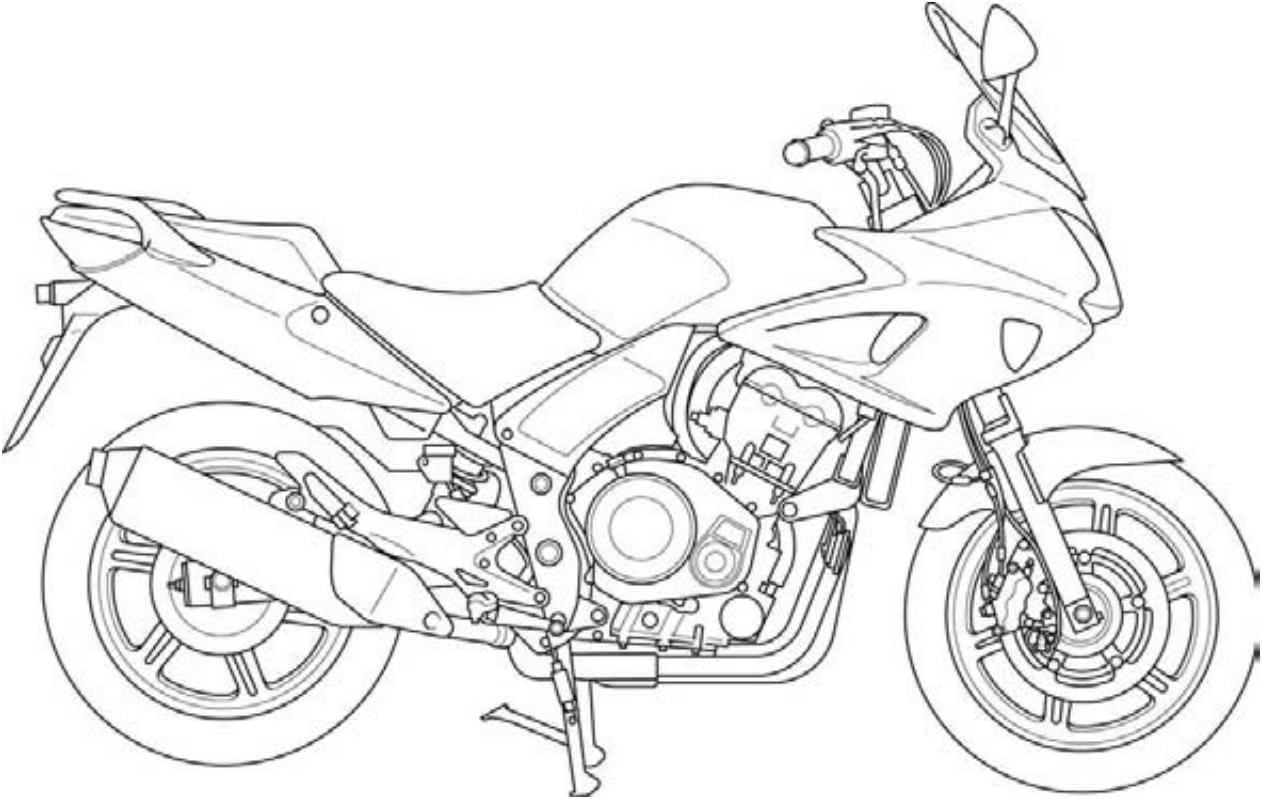
ABBREVIATION

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

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

MODEL IDENTIFICATION

CBF1000A Shown:

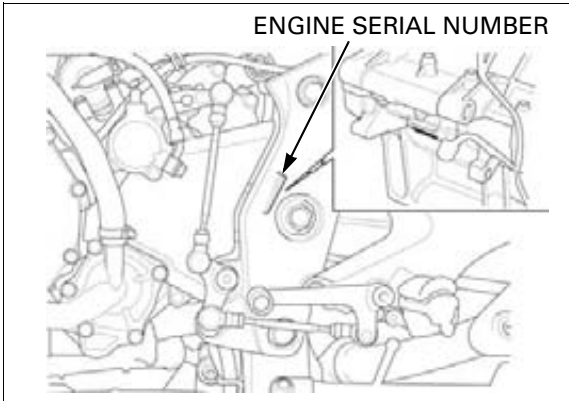


SERIAL NUMBERS

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

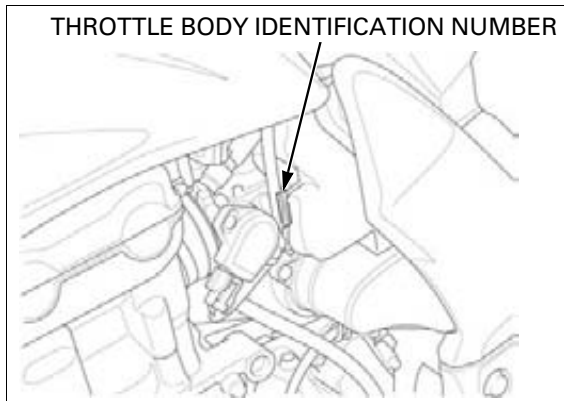


The engine serial number is stamped on the lower side of the lower crankcase.



GENERAL INFORMATION

The throttle body identification number is stamped on the intake side of the throttle body as shown.



LABELS

The Model Identification Label is located on left side of the frame tube.



The color label is attached as shown. When ordering color-coded parts, always specify the designated color code.



GENERAL SPECIFICATIONS

ITEM		SPECIFICATIONS
DIMENSIONS	Overall length	2,156 mm (84.9 in)
	Overall width	782 mm (30.8 in)
	Overall height	1,238 mm (48.7 in)
	Wheelbase	1,483 mm (58.4 in)
	Seat height	800 mm (31.5 in)
	Ground clearance	130 mm (5.1 in)
	Curb weight	CBF1000: CBF1000A:
	Maximum weight capacity	195 kg (430 lbs)
FRAME	Frame type	Diamond type
	Front suspension	Telescopic fork
	Front axle travel	108 mm (4.3 in)
	Rear suspension	Swingarm
	Rear axle travel	120 mm (4.7 in)
	Front tire size	120/70ZR17M/C (58W)
	Rear tire size	160/60ZR17M/C (69W)
	Front tire brand	Bridgestone Michelin
	Rear tire brand	Bridgestone Michelin
	Front brake	Hydraulic double disc
	Rear brake	Hydraulic single disc
	Caster angle	26° 00'
	Trail length	111 mm (4.4 in)
Fuel tank capacity	19.3 liter (5.1 US gal, 4.2 Imp gal)	
ENGINE	Cylinder arrangement	4 cylinders in-line, inclined 28° from vertical
	Bore and stroke	75.0 x 56.5 mm (2.95 x 2.22 in)
	Displacement	998.4 cm ³ (60.92 cu-in)
	Compression ratio	11.0 : 1
	Valve train	Chain driven, DOHC
	Intake valve opens:	at 1 mm (0.04 in) lift
	Intake valve closes:	at 1 mm (0.04 in) lift
	Exhaust valve opens:	at 1 mm (0.04 in) lift
	Exhaust valve closes:	at 1 mm (0.04 in) lift
	Lubrication system	Forced pressure and wet sump
	Oil pump type	Trochoid
	Cooling system	Liquid cooled
	Air filtration	Paper element
Engine dry weight	66.5 kg (146.6 lbs)	
Firing order	1 - 2 - 4 - 3	
FUEL DELIVERY SYSTEM	Type	PGM-FI (Programmed Fuel Injection)
	Throttle bore	36 mm (1.4 in)
DRIVE TRAIN	Clutch system	Multi-plate, wet
	Clutch operation system	Hydraulic operating
	Transmission	Constant mesh, 6-speeds
	Primary reduction	1.604 (77/48)
	Final reduction	2.687 (43/16)
	Gear ratio	1st 2.714 (38/14)
		2nd 1.941 (33/17)
		3rd 1.578 (30/19)
	4th 1.363 (30/22)	
	5th 1.217 (28/23)	
	6th 1.115 (29/26)	
	Gearshift pattern	1 - N - 2 - 3 - 4 - 5 - 6

GENERAL INFORMATION

ITEM		SPECIFICATIONS
ELECTRICAL	Ignition system	Computer-controlled digital transistorized with electric advance
	Starting system	Electric starter motor
	Charging system	Triple phase output alternator
	Regulator/rectifier	FET shorted/triple phase, full wave rectification
	Lighting system	Battery

LUBRICATION SYSTEM SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	After draining	2.7 liter (2.9 US qt, 2.4 Imp qt)	–
	After oil filter change	3.5 liter (3.7 US qt, 3.1 Imp qt)	–
	After disassembly	3.6 liter (3.8 US qt, 3.2 Imp qt)	–
Engine oil		Suggested oil: Honda "4-stroke motorcycle oil" or an equivalent Oil recommendation: API 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 (engine oil pressure) switch		510 kPa (5.2 kgf/cm ² , 74 psi) at 6,000 min ⁻¹ (rpm)/(80°C/176°F)	–
Oil pump	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15 – 0.21 (0.006 – 0.008)	0.35 (0.014)
	Side clearance	0.04 – 0.09 (0.002 – 0.004)	0.17 (0.007)

FUEL SYSTEM (PGM-FI) SPECIFICATIONS

ITEM	SPECIFICATIONS
Throttle body identification number	GQ3BA
Idle speed	1,200 ± 100 min ⁻¹ (rpm)
Throttle grip free play	2 – 6 mm (1/12 – 1/4 in)
IAT sensor resistance (at 20°C/68°F)	1 – 4 kΩ
ECT sensor resistance (at 20°C/68°F)	2.3 – 2.6 kΩ
Fuel injector resistance (at 20°C /68°F)	11.1 – 12.3 Ω
PAIR control solenoid valve resistance (at 20°C/68°F)	23 – 27 Ω
CKP sensor peak voltage (at 20°C/68°F)	0.7 V minimum
Manifold absolute pressure at idle	29 – 32 kPa (0.30 – 0.33 kgf/cm ² , 4.3 – 4.7 psi)
Fuel pressure at idle	343 kPa (3.5 kgf/cm ² , 50 psi)
Fuel pump flow (at 12 V)	189 cm ³ (6.4 US oz, 6.7 Imp oz) minimum/10 seconds

COOLING SYSTEM SPECIFICATIONS

ITEM	SPECIFICATIONS	
Coolant capacity	Radiator and engine	2.71 liter (2.86 US qt, 2.38 Imp qt)
	Reserve tank	0.30 liter (0.32 US qt, 0.26 Imp qt)
Radiator cap relief pressure		108 – 137 kPa (1.1 – 1.4 kgf/cm ² , 16 – 20 psi)
Thermostat	Begin to open	80 – 84 °C (176 – 183 °F)
	Fully open	90 °C (194 °F)
	Valve lift	8 mm (0.3 in) minimum
Recommended antifreeze		High quality ethylene glycol antifreeze containing corrosion protection inhibitors
Standard coolant concentration		1:1 mixture with distilled water

GENERAL INFORMATION

CYLINDER HEAD/VALVES SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Cylinder compression		1,098 kPa (11.2 kgf/cm ² , 159 psi) at 350 min ⁻¹ (rpm)	–
Valve clearance		IN	0.16 ± 0.03 (0.006 ± 0.001)
		EX	0.32 ± 0.03 (0.013 ± 0.001)
Camshaft	Cam lobe height	IN	34.62 – 34.70 (1.363 – 1.366)
		EX	34.58 – 34.66 (1.361 – 1.365)
	Runout		–
	Oil clearance		0.020 – 0.062 (0.0008 – 0.0024)
Valve lifter	Valve lifter O.D.		25.978 – 25.993 (1.0228 – 1.0233)
	Valve lifter bore I.D.		26.010 – 26.026 (1.0240 – 1.0246)
Valve, valve guide	Valve stem O.D.	IN	4.475 – 4.490 (0.1762 – 0.1768)
		EX	4.465 – 4.480 (0.1758 – 0.1764)
	Valve guide I.D.		4.500 – 4.512 (0.1772 – 0.1776)
	Stem-to-guide clearance	IN	0.010 – 0.037 (0.0004 – 0.0015)
		EX	0.020 – 0.047 (0.0008 – 0.0019)
	Valve guide projection above cylinder head		16.0 – 16.3 (0.63 – 0.64)
	Valve seat width		0.90 – 1.10 (0.035 – 0.043)
Valve spring free length		39.55 (1.557)	
Cylinder head warpage		–	

CLUTCH/STARTER CLUTCH SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Specified clutch fluid		DOT 4 brake fluid	–
Clutch master cylinder	Master cylinder I.D.	12.700 – 12.743 (0.5000 – 0.5017)	12.755 (0.5022)
	Master piston O.D.	12.657 – 12.684 (0.4983 – 0.4994)	12.645 (0.4978)
Clutch	Spring free length	58.2 (2.29)	55.7 (2.19)
	Disc A thickness	3.72 – 3.88 (0.146 – 0.153)	3.4 (0.13)
	Disc B thickness	3.22 – 3.38 (0.127 – 0.133)	2.9 (0.11)
	Plate warpage	–	0.30 (0.012)
Clutch outer guide A (Without ID mark)	I.D.	27.993 – 28.003 (1.1021 – 1.1025)	28.012 (1.1028)
	O.D.	35.004 – 35.012 (1.3781 – 1.3784)	34.994 (1.3777)
Clutch outer guide B (With ID mark)	I.D.	27.993 – 28.003 (1.1021 – 1.1025)	28.012 (1.1028)
	O.D.	34.996 – 35.004 (1.3778 – 1.3781)	34.986 (1.3774)
Primary driven gear I.D.	A	41.008 – 41.016 (1.6145 – 1.6148)	41.026 (1.6152)
	B	41.000 – 41.008 (1.6142 – 1.6145)	41.018 (1.6149)
Oil pump drive sprocket guide	I.D.	28.000 – 28.021 (1.1024 – 1.1032)	28.030 (1.1035)
	O.D.	34.975 – 34.991 (1.3770 – 1.3776)	34.965 (1.3766)
Oil pump drive sprocket I.D.		35.025 – 35.145 (1.3789 – 1.3837)	35.155 (1.3841)
Mainshaft O.D. at clutch outer guide		27.980 – 27.990 (1.1016 – 1.1020)	27.96 (1.101)
Mainshaft O.D. at oil pump drive sprocket guide		27.980 – 27.990 (1.1016 – 1.1020)	27.96 (1.101)
Starter idle gear	Gear I.D.	10.013 – 10.035 (0.3942 – 0.3951)	10.05 (0.396)
	Shaft O.D.	9.991 – 10.000 (0.3933 – 0.3937)	9.98 (0.393)
Starter driven gear boss O.D.		45.657 – 45.673 (1.7975 – 1.7981)	45.642 (1.7969)

TRANSMISSION/GEARSHIFT LINKAGE SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Shift fork	I.D.	12.000 – 12.018 (0.4724 – 0.4731)	12.03 (0.474)
	Claw thickness	5.93 – 6.00 (0.233 – 0.236)	5.9 (0.23)
Shift fork shaft O.D.		11.957 – 11.968 (0.4707 – 0.4712)	11.95 (0.470)
Transmission	Gear I.D.	M5, M6	31.000 – 31.025 (1.2205 – 1.2215)
		C1	28.000 – 28.021 (1.1024 – 1.1032)
		C2, C3, C4	33.000 – 33.025 (1.2992 – 1.3002)
	Gear busing O.D.	M5, M6	30.955 – 30.980 (1.2187 – 1.2197)
		C2	32.955 – 32.980 (1.2974 – 1.2984)
		C3, C4	32.950 – 32.975 (1.2972 – 1.2982)
	Gear-to-bushing clearance	M5, M6	0.020 – 0.070 (0.0008 – 0.0028)
		C2	0.020 – 0.070 (0.0008 – 0.0028)
		C3, C4	0.025 – 0.075 (0.0010 – 0.0030)
	Gear bushing I.D.	M5	27.985 – 28.006 (1.1018 – 1.1026)
		C2	29.985 – 30.006 (1.1018 – 1.1026)
	Mainshaft O.D.	at M5	27.967 – 27.980 (1.1011 – 1.1016)
	Countershaft O.D.	at C2	29.967 – 29.980 (1.1798 – 1.1803)
	Bushing to shaft clearance	M5	0.005 – 0.039 (0.0002 – 0.0015)
C2		0.005 – 0.039 (0.0002 – 0.0015)	

CRANKCASE/CRANKSHAFT/BALANCER/PISTON/CYLINDER SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Crankshaft	Connecting rod side clearance	0.05 – 0.20 (0.002 – 0.008)	0.25 (0.098)	
	Crankpin bearing oil clearance	0.030 – 0.052 (0.0012 – 0.0020)	0.06 (0.002)	
	Main journal bearing oil clearance	0.019 – 0.037 (0.0007 – 0.0015)	0.05 (0.002)	
	Runout	–	0.05 (0.002)	
Piston, piston rings	Piston O.D. at 9.0 (0.35) from bottom	74.960 – 74.980 (2.9512 – 2.9520)	74.895 (2.9486)	
	Piston pin bore I.D.	17.002 – 17.008 (0.6694 – 0.6696)	17.030 (0.6705)	
	Piston pin O.D.	16.994 – 17.000 (0.6690 – 0.6693)	16.980 (0.6685)	
	Piston-to-piston pin clearance	0.002 – 0.014 (0.0001 – 0.0006)	0.04 (0.002)	
	Piston ring end gap	Top	0.22 – 0.32 (0.009 – 0.013)	0.52 (0.020)
		Second	0.48 – 0.63 (0.019 – 0.025)	0.82 (0.032)
		Oil (side rail)	0.2 – 0.7 (0.01 – 0.03)	1.0 (0.04)
Piston ring-to-ring groove clearance	Top	0.050 – 0.085 (0.0020 – 0.0033)	0.125 (0.0049)	
	Second	0.015 – 0.050 (0.0006 – 0.0020)	0.075 (0.0030)	
Cylinder	I.D.	75.000 – 75.015 (2.9528 – 2.9533)	75.15 (2.959)	
	Out of round	–	0.10 (0.004)	
	Taper	–	0.10 (0.004)	
	Warpage	–	0.10 (0.004)	
Cylinder-to-piston clearance		0.020 – 0.055 (0.0008 – 0.0022)	0.10 (0.004)	
Connecting rod small end I.D.		17.030 – 17.042 (0.6705 – 0.6709)	17.048 (0.6712)	
Connecting rod-to-piston pin clearance		0.030 – 0.046 (0.0012 – 0.0018)	0.07 (0.003)	

GENERAL INFORMATION

FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		–	1.5 (0.06)
Cold tire pressure	Driver only	250 kPa (2.50 kgf/cm ² , 36 psi)	–
	Driver and passenger	250 kPa (2.50 kgf/cm ² , 36 psi)	–
Axle runout		–	0.2 (0.008)
Wheel rim runout	Radial	–	2.0 (0.08)
	Axial	–	2.0 (0.08)
Wheel balance weight		–	60 g (2.1oz) max.
Fork	Spring free length	358.8 (14.13)	352 (13.9)
	Fork pipe runout	–	0.20 (0.008)
	Recommended fork fluid	Honda ULTRA CUSHION OIL 10W or equivalent	–
	Fluid level	129 (5.1)	–
	Fluid capacity	437 ± 2.5 cm ³ (14.8 ± 0.08 US oz, 15.4 ± 0.09 Imp oz)	–
Steering head bearing pre-load		9.8 – 13.7 N (1.0 – 1.4 kgf, 2.2 – 3.1 lbf)	–

REAR WHEEL/SUSPENSION SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Minimum tire tread depth		–	2.0 (0.08)	
Cold tire pressure	Driver only	290 kPa (2.90 kgf/cm ² , 42 psi)	–	
	Driver and passenger	290 kPa (2.90 kgf/cm ² , 42 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 (2.1 oz) max.	
Drive chain	Size/link	DID	DID50VA8/120 links	–
		RK	RK50HFOZ5/120 links	–
	Slack	20 – 30 (4/5 – 1-1/5)	–	
Shock absorber spring pre-load adjuster standard position		Position 3	–	

HYDRAULIC BRAKE SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Front	Specified brake fluid	DOT 4	–	
	Brake disc thickness	4.5 (0.18)	3.5 (0.14)	
	Brake disc runout	–	0.30 (0.012)	
	Master cylinder I.D.	12.700 – 12.743 (0.5000 – 0.5017)	12.755 (0.5022)	
	Master piston O.D.	12.657 – 12.684 (0.4983 – 0.4994)	12.650 (0.4980)	
	Caliper cylinder I.D.	CBF1000A:	22.650 – 22.700 (0.8917 – 0.8937)	22.710 (0.8941)
		CBF1000:	25.400 – 25.450 (1.0000 – 1.0020)	25.460 (1.0024)
	Caliper piston O.D.	CBF1000A:	22.585 – 22.618 (0.8892 – 0.8905)	22.560 (0.8882)
CBF1000:		25.318 – 25.368 (0.9968 – 0.9987)	25.310 (0.9965)	
Rear	Specified brake fluid	DOT 4	–	
	Brake disk thickness	CBF1000A:	6.0 (0.24)	5.0 (0.20)
		CBF1000:	5.0 (0.20)	4.0 (0.16)
	Brake disc runout	–	0.30 (0.012)	
	Master cylinder I.D.	CBF1000A:	17.460 17.503 (0.6874 0.6891)	17.515 (0.6896)
		CBF1000:	14.000 – 14.043 (0.5512 – 0.5529)	14.055 (0.5533)
	Master piston O.D.	CBF1000A:	17.417 – 17.444 (0.6857 – 0.6868)	17.405 (0.6852)
		CBF1000:	13.957 – 13.984 (0.5495 – 0.5506)	13.945 (0.5490)
	Caliper cylinder I.D.	CBF1000A:	25.400 – 25.450 (1.0000 – 1.0020)	25.460 (1.0024)
		CBF1000:	38.180 – 38.230 (1.5031 – 1.5051)	38.24 (1.506)
	Caliper piston O.D.	CBF1000A:	25.318 – 25.368 (0.9968 – 0.9987)	25.310 (0.9965)
		CBF1000:	38.098 – 38.148 (1.4999 – 1.5019)	38.09 (1.500)

BATTERY/CHARGING SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS	
Battery	Capacity	12 V – 8.6 Ah	
	Current leakage	0.5 mA max.	
	Voltage (20°C/68°F)	Fully charged	13.0 – 13.2 V
		Needs charging	Below 12.4 V
	Charging current	Normal	0.9 A/5 – 10 h
Quick		4.5 A/1 h	
Alternator	Capacity	0.344 kW/5,000 min ⁻¹ (rpm)	
	Charging coil resistance (20°C/68°F)	0.1 – 1.0 Ω	

IGNITION SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS
Spark plug	NGK	CR8EH-9
	DENSO	U24FER9
Spark plug gap		0.80 – 0.90 mm (0.031 – 0.035 in)
Ignition coil peak voltage		100 V minimum
CKP sensor peak voltage		0.7 V minimum
Ignition timing ("F" mark)		5° BTDC at idle

ELECTRIC STARTER SPECIFICATIONS

Unit: mm (in)

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

GENERAL INFORMATION**LIGHTS/METERS/SWITCHES SPECIFICATIONS**

ITEM		SPECIFICATIONS	
Bulbs	Headlight	Hi	12 V – 55 W
		Lo	12 V – 55 W
	Position light		12 V – 5 W x 2
	Brake/tail light		12 V – 21/5 W
	Turn signal light		12 V – 21 W x 4
	Instrument light		LED
	Turn signal indicator		LED
	High beam indicator		LED
	Oil pressure indicator		LED
	Neutral indicator		LED
	Temp. indicator		LED
	Malfunction indicator lamp (MIL)		LED
	Immobilizer indicator		LED
	ABS indicator (CBF1000A)		LED
Fuse	Main fuse		30 A
	PGM-FI/IGN fuse		20 A
	Sub fuse		10 A x 3, 20 A x 2
	ABS main fuse (CBF1000A)		10 A
	ABS fail-safe relay fuse (CBF1000A)		30 A
	ABS motor fuse (CBF1000A)		30 A
Tachometer peak voltage		10.5 V minimum	
ECT sensor resistance	80 °C (176 °F)		2.1 – 2.6 kΩ
	120 °C (248 °F)		0.65 – 0.73 kΩ

STANDARD TORQUE VALUES

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

ENGINE & FRAME TORQUE VALUES

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

ENGINE

MAINTENANCE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Spark plug	4	10	16 (1.6, 12)	Apply grease to the threads. Apply oil to the threads and O-ring.
Timing hole cap	1	45	18 (1.8, 13)	
Engine oil filter cartridge	1	20	26 (2.7, 19)	
Oil filter boss	1	20	See page 4-16	Apply locking agent.
Engine oil drain bolt	1	12	30 (3.1, 22)	

LUBRICATION SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Oil pump assembly bolt	3	6	8 (0.8, 5.9)	CT bolt

FUEL SYSTEM (PGM-FI)

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
ECT/thermo sensor	1	12	23 (2.3, 17)	
Insulator band screw (Throttle body side)	4	5	See page 6-72	
Insulator band screw (Cylinder head side)	4	5	See page 6-67	
Fuel rail mounting bolt	4	6	5.1 (0.5, 3.8)	

COOLING SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Coolant drain bolt	1	6	12 (1.2, 9)	CT bolt
Water pump assembly bolt	2	6	12 (1.2, 9)	CT bolt

ENGINE REMOVAL/INSTALLATION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Drive sprocket bolt	1	10	54 (5.5, 40)	

GENERAL INFORMATION

CYLINDER HEAD/VALVES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cylinder head mounting bolt	10	9	51 (5.2, 38)	Apply molybdenum oil solution to the threads and seating surface.
Camshaft holder flange bolt	20	6	12 (1.2, 9)	
Cylinder head sealing bolt	2	18	28 (2.9, 21)	Apply locking agent.
Cylinder head cover bolt	4	6	10 (1.0, 7)	
PAIR reed valve cover bolt	4	6	12 (1.2, 9)	Apply locking agent.
Cam sprocket bolt	4	7	20 (2.0, 15)	Apply locking agent.
Cam chain tensioner pivot bolt	1	6	10 (1.0, 7)	Apply locking agent.
Cam chain guide torx bolt	1	6	12 (1.2, 9)	Apply locking agent.
Exhaust pipe stud bolt	8	8	See page 3-13	

CLUTCH/STARTER CLUTCH

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Clutch center lock nut	1	25	128 (13.1, 94)	Apply oil to the threads and seating surface. Stake.
Clutch spring bolt	5	6	12 (1.2, 9)	
Oil pump driven sprocket bolt	1	6	15 (1.5, 11)	Apply locking agent.
Right crankcase cover rubber damper set plate bolt	1	6	12 (1.2, 9)	Apply locking agent. CT bolt
Starter clutch outer mounting bolt	1	10	83 (8.5, 61)	Apply oil to the threads and seating surface.

ALTERNATOR

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Stator wire clamp flange bolt	1	6	12 (1.2, 9)	CT bolt
Flywheel flange bolt	1	10	103 (10.5, 76)	Apply oil to the threads and seating surface.
Stator mounting socket bolt	4	6	12 (1.2, 9)	

TRANSMISSION/GEARSHIFT LINKAGE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Transmission holder flange bolt	6	8	29 (3.0, 21)	
Countershaft bearing set plate bolt	1	6	12 (1.2, 9)	Apply locking agent.
Mainshaft bearing set plate bolt	3	6	12 (1.2, 9)	Apply locking agent.
Shift drum center socket bolt	1	8	23 (2.3, 17)	Apply locking agent.
Shift drum stopper arm pivot bolt	1	6	12 (1.2, 9)	
Gearshift spindle return spring pin	1	8	23 (2.3, 17)	
Shift drum bearing setting bolt	2	6	12 (1.2, 9)	Apply locking agent.
Gearshift cam bolt	1	6	12 (1.2, 9)	Apply locking agent.

GENERAL INFORMATION

CRANKCASE/CRANKSHAFT/BALANCER/PISTON

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Crankcase 7 mm bolt	12	7	18 (1.8, 13)	
8 mm bolt	6	8	24 (2.4, 18)	
9 mm bolt (main journal bolt)	10	9	See page 13-23	
Lower crankcase sealing bolt	1	22	59 (6.0, 44)	Apply locking agent.
Lower crankcase socket bolt	1	10	12 (1.2, 9)	Apply locking agent.
Lower crankcase sealing bolt	1	20	30 (3.1, 22)	Apply locking agent.
Lower crankcase socket bolt	1	8	23 (2.3, 17)	Apply locking agent.
Connecting rod bolt (new bolt)	8	8	See page 13-23	Apply oil to the threads and seating surface.
Connecting rod bolt (retightening)	8	8	See page 13-13	Apply oil to the threads and seating surface.

ELECTRIC STARTER

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Starter motor terminal nut	1	6	12 (1.2, 9)	

LIGHTS/METERS/SWITCHES

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 wire terminal bolt	1	4	2 (0.2, 1.5)	
Neutral switch	1	10	12 (1.2, 9)	

GENERAL INFORMATION

FRAME

FRAME/BODY PANELS/EXHAUST SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Exhaust pipe joint nut	8	7	20 (2.0, 15)	
Side stand pivot bolt	1	10	15 (1.5, 11)	
Side stand pivot nut	1	10	39 (4.0, 29)	
Grab rail mounting bolt	4	8	27 (2.8, 20)	
Front fender mounting bolt (front)	2	6	12 (1.2, 9)	
Front fender mounting bolt (rear)	2	6	12 (1.2, 9)	
Rearview mirror mounting bolt	4	6	14 (1.4, 10)	

MAINTENANCE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Drive chain adjuster lock nut	2	8	21 (2.1, 15)	

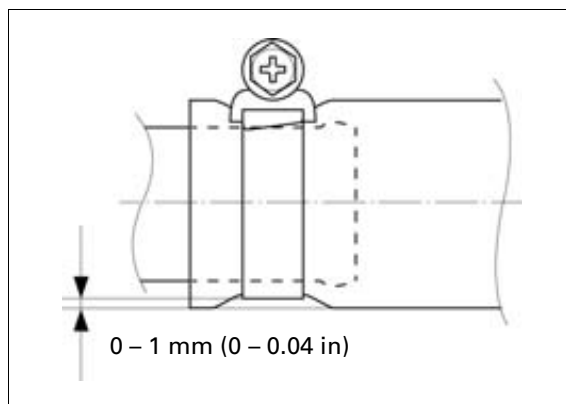
FUEL SYSTEM (PGM-FI)

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Fuel tank rear mounting nut	1	6	12 (1.2, 9)	
Fuel filler cap mounting bolt	3	4	1.8 (0.2, 1.3)	
Fuel feed hose banjo bolt	1	12	22 (2.2, 16)	
Fuel pump mounting nut	6	6	12 (1.2, 9)	
O ₂ sensor	1	18	44 (4.5, 32)	See page 6-56

COOLING SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cooling fan nut	1	5	2.7 (0.3, 2.0)	
Fan motor nut	3	5	5.1 (0.5, 3.8)	
Fan motor bracket mounting bolt	3	6	8.4 (0.9, 6.2)	Apply locking agent.

Radiator hose band:



ENGINE REMOVAL/INSTALLATION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Front engine hanger bolt	2	12	60 (6.1, 44)	
Rear engine hanger nut (upper)	1	12	60 (6.1, 44)	
Rear engine hanger nut (lower)	1	12	60 (6.1, 44)	
Swingarm pivot bracket nut	2	12	69 (7.0, 51)	
Gearshift arm pinch bolt	1	6	10 (1.0, 7)	

CLUTCH/STARTER CLUTCH

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)	Apply silicone grease to the sliding surface.
Clutch lever pivot nut	1	6	5.9 (0.6, 4.4)	
Clutch master cylinder holder bolt	2	6	12 (1.2, 9)	
Clutch master cylinder reservoir cap screw	2	4	1.5 (0.2, 1.1)	
Clutch switch mounting screw	1	4	1.2 (0.1, 0.9)	
Clutch hose oil bolt	2	10	34 (3.5, 25)	

FRONT WHEEL/SUSPENSION/STEERING

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS	
Steering stem adjusting lock nut	1	26	See page 14-34	Apply oil to the threads.	
Steering stem adjusting nut	1	26	25 (2.5, 18)		
Steering stem nut	1	24	103 (10.5, 76)		
Bottom bridge pinch bolt	2	10	39 (4.0, 29)		
Top bridge pinch bolt	2	8	22 (2.2, 16)		
Fork cap	2	37	22 (2.2, 16)		
Fork cap lock nut	2	10	19.6 (2.0, 14)		
Fork center bolt	2	8	20 (2.0, 15)		Apply locking agent.
Front axle pinch bolt	2	8	22 (2.2, 16)		
Front axle bolt	1	14	59 (6.0, 44)		
Front brake disc bolt	12	6	20 (2.0, 15)	ALOC bolt	
Front pulser ring mounting bolt (CBF1000A)	3	5	7 (0.7, 5.2)	ALOC bolt	

REAR WHEEL/SUSPENSION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Drive chain case mounting bolt	2	6	12 (1.2, 9)	
Rear axle nut	1	18	98 (10.0, 72)	U-nut
Rear brake disc bolt	4	8	42 (4.3, 31)	ALOC bolt
Driven sprocket nut	5	12	108 (11.0, 80)	
Shock absorber mounting nut	2	10	42 (4.3, 31)	U-nut
Shock arm nut	2	10	42 (4.3, 31)	U-nut
Shock link-to-frame nut	1	10	42 (4.3, 31)	U-nut
Swingarm pivot nut	1	18	98 (10.0, 72)	U-nut
Drive chain slider screw	2	5	6 (0.6, 4.4)	
Rear pulse ring mounting bolt (CBF1000A)	4	5	7 (0.7, 5.2)	ALOC bolt
Gearshift pedal pivot bolt	1	8	27 (2.8, 20)	

GENERAL INFORMATION

HYDRAULIC BRAKE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Brake hose oil bolt				
CBF1000A:	6	10	34 (3.5, 25)	
CBF1000:	5	10	34 (3.5, 25)	
Front brake caliper mounting bolt	4	8	30 (3.1, 22)	ALOC bolt
Caliper bleed valve				
CBF1000A:	5	8	5.4 (0.6, 4.0)	
CBF1000:	3	8	5.4 (0.6, 4.0)	
Brake pad pin	3	10	17 (1.7, 13)	
Pad pin plug (CBF1000)	2	10	2.5 (0.3, 1.8)	
Front brake caliper slide pin				
CBF1000A:	2	10	22 (2.2, 16)	Apply locking agent.
CBF1000:	2	8	22 (2.2, 16)	Apply locking agent.
Front brake caliper bracket pin				
CBF1000A:	2	10	12 (1.2, 9)	
CBF1000:	2	8	12 (1.2, 9)	
Rear brake caliper slide pin	1	12	27 (2.8, 20)	
Rear brake caliper bracket pin (CBF1000A)	1	8	12 (1.2, 9)	Apply locking agent.
Rear brake caliper bolt (CBF1000)	1	8	22 (2.2, 16)	
Front master cylinder holder bolt	2	6	12 (1.2, 9)	
Front master cylinder reservoir cap screw	2	4	1.5 (0.2, 1.1)	
Brake lever pivot bolt	1	6	1 (0.1, 0.7)	Apply silicone grease to the sliding surface.
Brake lever pivot nut	1	6	5.9 (0.6, 4.4)	
Front brake light switch screw	1	4	1.2 (0.1, 0.9)	
Rear master cylinder mounting bolt	2	6	12 (1.2, 9)	
Rear master cylinder reservoir hose joint screw	1	4	1.5 (0.2, 1.1)	Apply locking agent.
Rear master cylinder push rod lock nut	1	8	17 (1.7, 13)	
Rear master cylinder reservoir mounting bolt	1	6	10 (1.0, 7)	
Front brake hose clamp bolt				
CBF1000A:	4	6	10 (1.0, 7)	
CBF1000:	1	6	10 (1.0, 7)	
Front brake hose stay mounting bolt (CBF1000A)	1	6	10 (1.0, 7)	
Rear brake hose guide screw	2	5	4.2 (0.4, 3.1)	

ABS (Anti-lock Brake System)

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
ABS modulator lower mounting bolt	2	6	12 (1.2, 9)	ALOC bolt
ABS modulator left mounting bolt	1	6	10 (1.0, 7)	
Rear brake pipe stay bolt	1	6	12 (1.2, 9)	
Front brake hose joint bolt	2	6	10 (1.0, 7)	
Front wheel speed sensor mount- ing bolt	2	6	10 (1.0, 7)	
Rear wheel speed sensor mount- ing bolt	2	6	10 (1.0, 7)	
Speed sensor wire clamp bolt	2	6	10 (1.0, 7)	ALOC bolt
Brake pipe joint nut	12	10	17 (1.7, 13)	Apply brake fluid to the threads.
Proportional control valve mount- ing bolt	2	6	12 (1.2, 9)	

GENERAL INFORMATION

LIGHTS/METERS/SWITCHES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Ignition switch mounting bolt	2	8	25 (2.5, 18)	One-way bolt
License light mounting nut	2	5	1.8 (0.2, 1.3)	
Horn mounting bolt	1	8	32 (3.3, 24)	

OTHERS

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Footpeg holder mounting bolt	4	8	27 (2.8, 20)	
Footpeg lower plate bolt	4	5	5 (0.5, 3.7)	
Footpeg holder guard mounting nut	4	6	12 (1.2, 9)	
Gearshift pedal link pivot bolt	1	8	27 (2.8, 20)	
License light mounting nut	2	5	1.8 (0.2, 1.3)	
Front center cowl stay mounting nut	2	8	27 (2.8, 20)	
Side cowl stay mounting bolt	4	8	32 (3.3, 24)	

GENERAL INFORMATION

LUBRICATION & SEAL POINTS

ENGINE

MATERIAL	LOCATION	REMARKS
Liquid sealant (Three Bond 1207B or equivalent)	Crankcase mating surface Oil pan mating surface Right crankcase cover mating surface Alternator cover mating surface Oil pressure switch threads	See page 13-23 See page 5-7 See page 10-33 See page 11-5 See page 21-19
Liquid sealant (Three Bond 5211C or equivalent)	Cylinder head semi-circular cut-out	See page 9-31
Molybdenum disulfide oil (a mixture of 1/2 engine oil and 1/2 molybdenum disulfide grease)	Main journal bearing surface Piston pin sliding surface Connecting rod bearing surface Connecting rod small end inner surface Crankshaft thrust surface Camshaft lobes, journals and thrust surface Valve stem (valve guide sliding surface) Valve lifter outer sliding surface Clutch outer/primary driven gear sliding surface Clutch outer guide sliding surface Oil pump drive sprocket and collar sliding surface M3/4, C5, C6 shifter gear (shift fork grooves) Starter reduction gear shaft sliding surface Starter idle gear shaft sliding surface Water pump shaft thrust washer sliding surface Cylinder head mounting bolt threads and seating surface	Do not apply mating surface of the camshaft holder
Engine oil	Clutch joint piece sliding surface Clutch lifter rod outer surface Piston and piston ring sliding surface Oil strainer packing whole surface Clutch disc whole surface Starter one-way clutch sliding surface Flywheel bolt threads and seating surface Clutch center lock nut threads and seating surface Oil filter cartridge threads and O-ring surface Camshaft holder bolt threads and seating surface Starter clutch mounting bolt threads and seating surface Connecting rod bolt threads and seating surface Each gear teeth and rotating surface Each bearing rolling surface Each O-ring whole surface Other rotating area and sliding surface	
Multi-purpose grease	Timing hole cap threads Balancer damper rubber fitting area Each oil seal lips	

GENERAL INFORMATION

MATERIAL	LOCATION	REMARKS
Locking agent	Gearshift spindle cover bolt threads Lower crankcase 22 mm sealing bolt threads Lower crankcase 20 mm sealing bolt threads Lower crankcase 10 mm sealing bolt threads Lower crankcase 8 mm sealing bolt threads Cam chain guide A pivot bolt threads Cylinder head sealing bolt threads Cylinder head cover breather joint threads Oil pump driven sprocket bolt threads Shift drum bearing setting bolt threads Oil filter boss threads (stud side) Right crankcase cover damper rubber plate bolt threads Mainshaft/countershaft bearing set plate bolt threads Cam sprocket bolt threads Shift drum center bolt threads Cam chain tensioner pivot bolt threads Gearshift cam bolt threads	See page 12-10 Coating width: 6.5 ± 1 mm Coating width: 6.5 ± 1 mm Coating width: 6.5 ± 1 mm Coating width: 6.5 ± 1 mm Coating width: 6.5 ± 1 mm Coating width: 6.5 ± 1 mm Coating width: 6.5 ± 1 mm Coating width: 6.5 ± 1 mm Coating width: 6.5 ± 1 mm

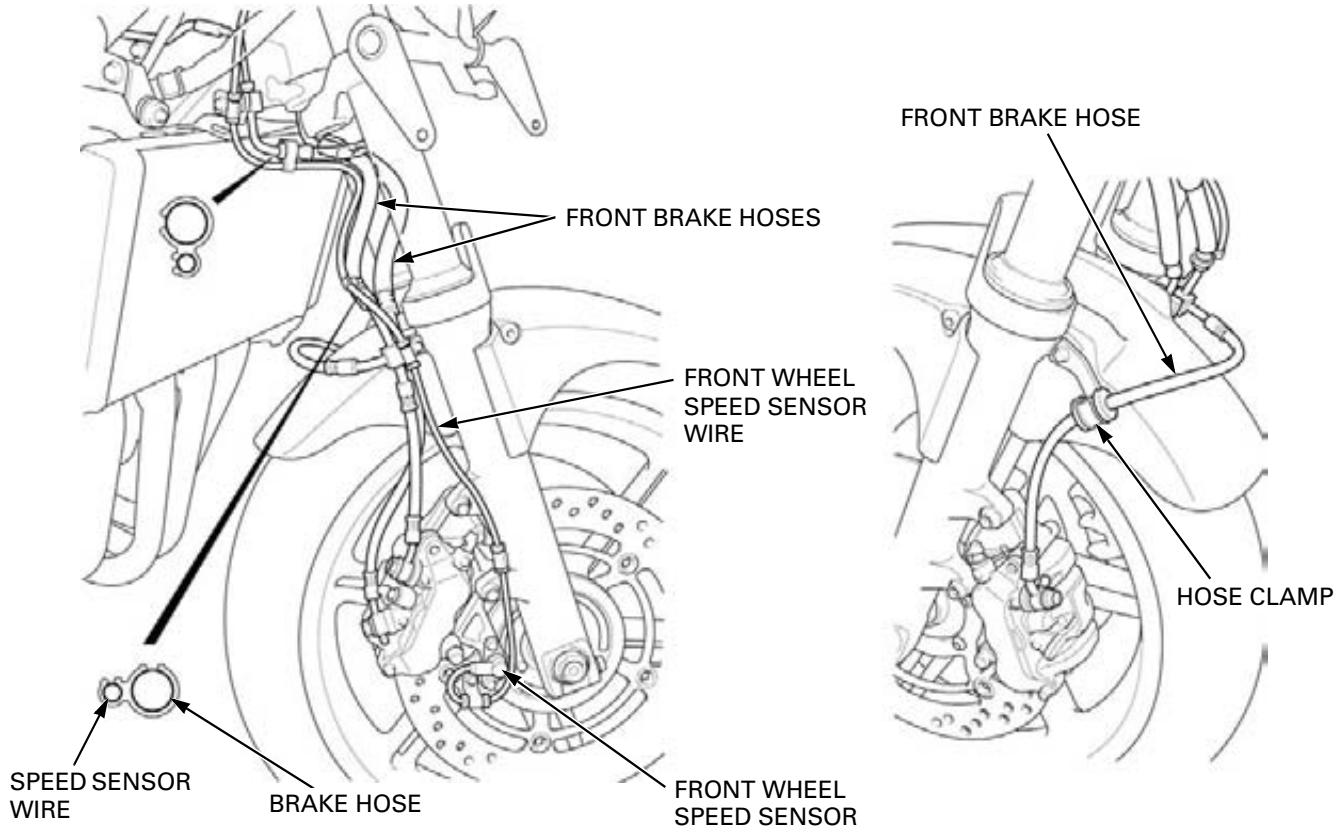
GENERAL INFORMATION

FRAME

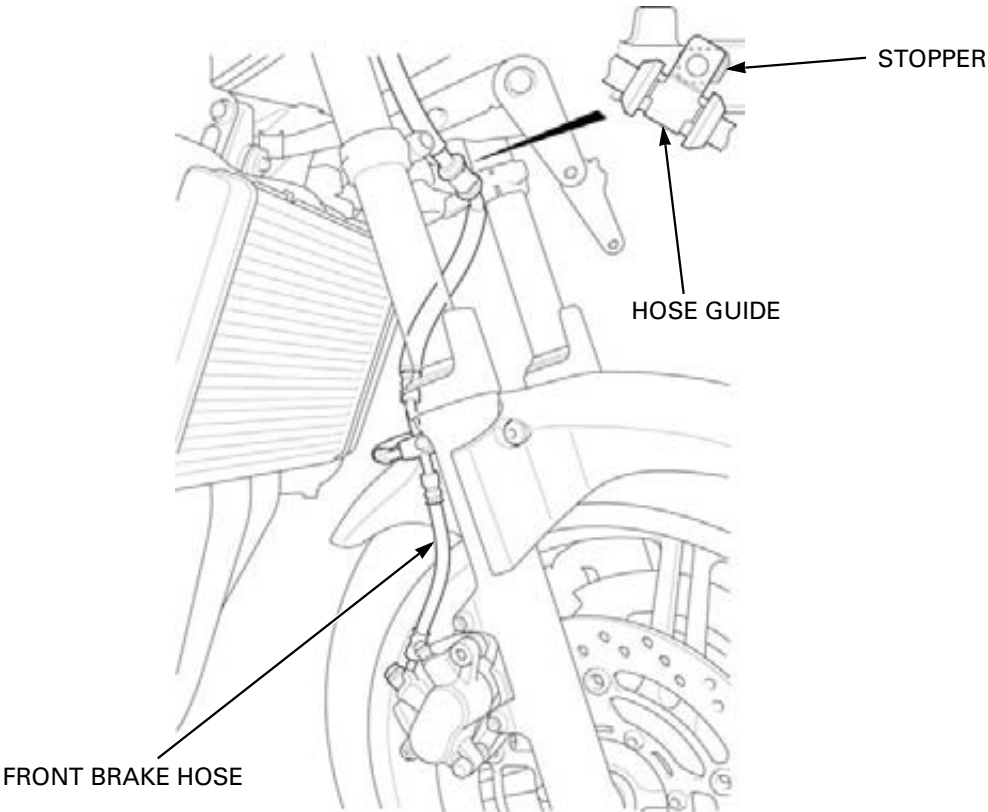
MATERIAL	LOCATION	REMARKS
Multi-purpose grease	Side stand pivot sliding area Center stand pivot sliding area Throttle cable end Driver footpeg sliding area Passenger footpeg sliding area Gearshift pedal pivot sliding area Rear brake pedal pivot sliding area Rear wheel hub O-ring and sleeve (driven flange contact area) Front wheel dust seal lips Rear wheel dust seal lips	
Lithium based multi-purpose grease with extreme pressure (Shell Alvania EP2 or equivalent)	Swingarm pivot bearings Swingarm pivot dust seal lips Shock arm and shock link needle bearings Shock arm and shock link dust seal lips Shock absorber pivot dust seal lips Shock absorber pivot needle bearing	
Urea based multi-purpose grease with extreme pressure agent (example: EXCELITE EP2 manufactured by KYODO YUSHI, Japan), Shell Stamina EP2 or equivalent	Upper and lower steering head bearing Steering head dust seal lips	Apply 3 – 5 g each
Molybdenum paste	Shock absorber spring adjuster cam sliding area	
Engine oil	Steering head bearing adjusting nut threads	
Cable lubricant	Throttle cable A, B casing inside	
Honda bond A, Honda hand grip cement, Cemedine #540 or equivalent	Handlebar grip rubber inside	
Silicone grease	Brake caliper main and sub slide pin sliding surfaces Brake caliper pin boot inside Front brake lever pivot Front brake lever-to-master piston contact area Rear master cylinder push rod-to-master piston contact area Rear master cylinder push rod boot inside Brake caliper dust seal Clutch lever pivot and master piston contact area Clutch lever joint piece-to-push rod contact area	Apply 0.4 g each Apply 0.1 g min. Apply 0.1 g min.
DOT 4 brake fluid	Master cylinder inner surface Brake master pistons and cups Brake caliper pistons and piston seals	
Fork fluid	Fork cap O-ring Fork dust seal and oil seal lips	
Locking agent	Rear master cylinder reservoir hose joint screw threads Fork socket bolt threads Front brake caliper main and sub slide pin bolt threads Rear brake caliper sub slide pin bolt threads	

CABLE & HARNESS ROUTING

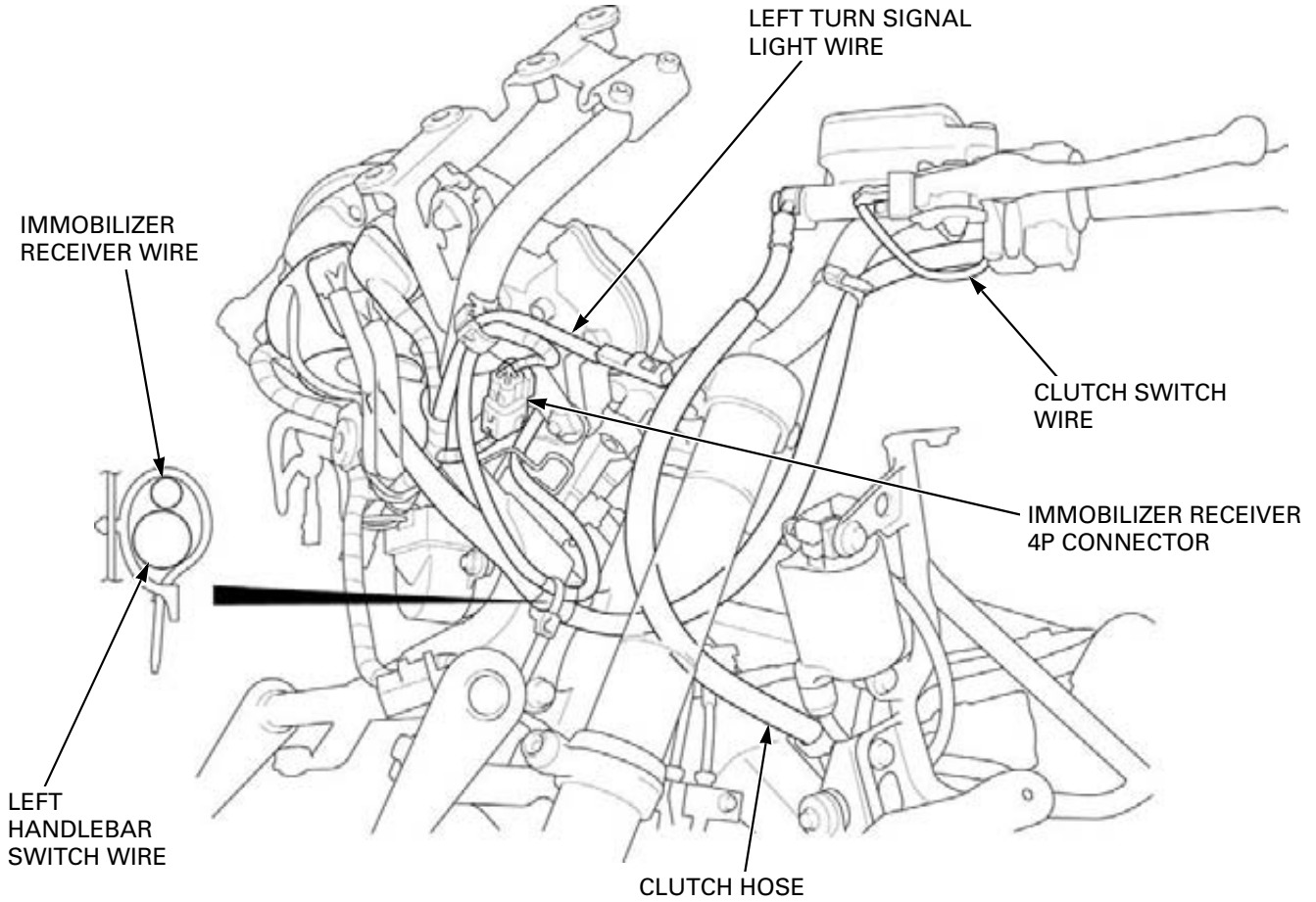
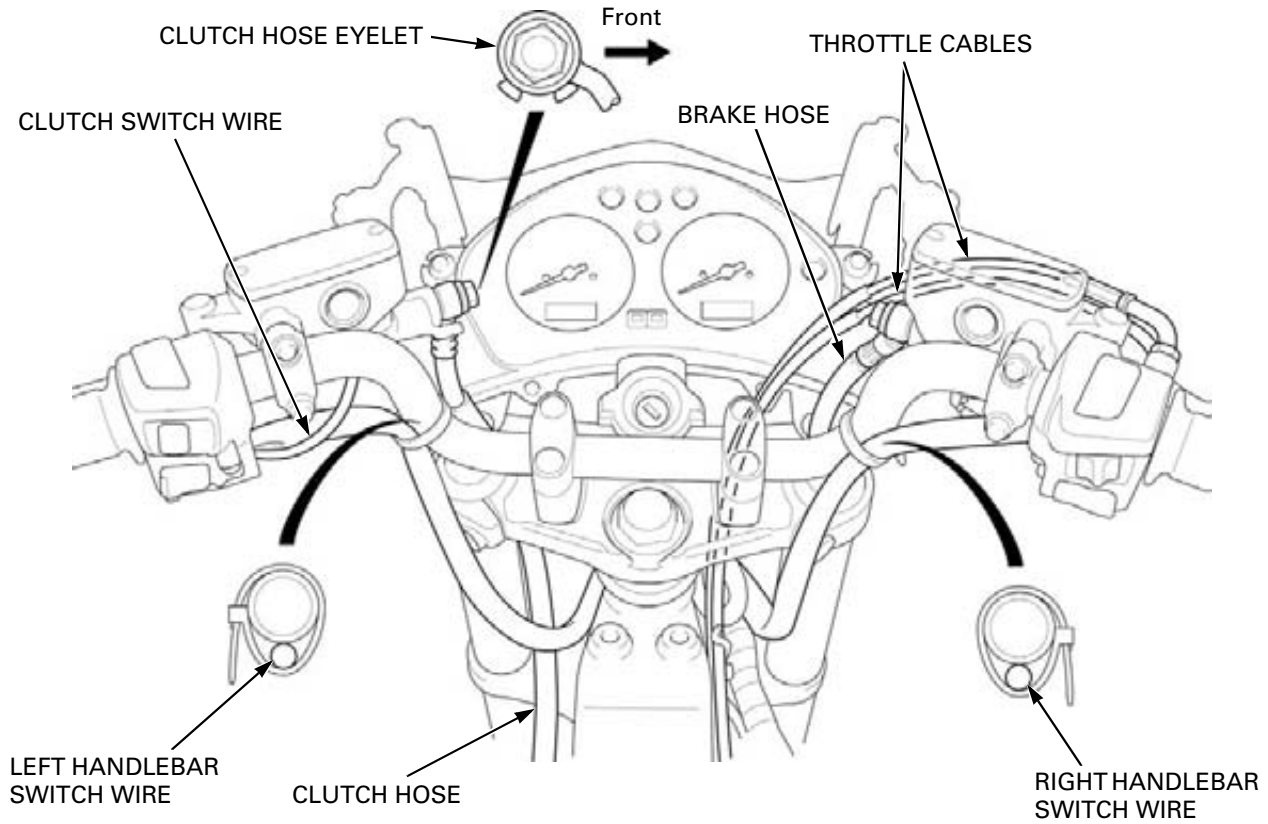
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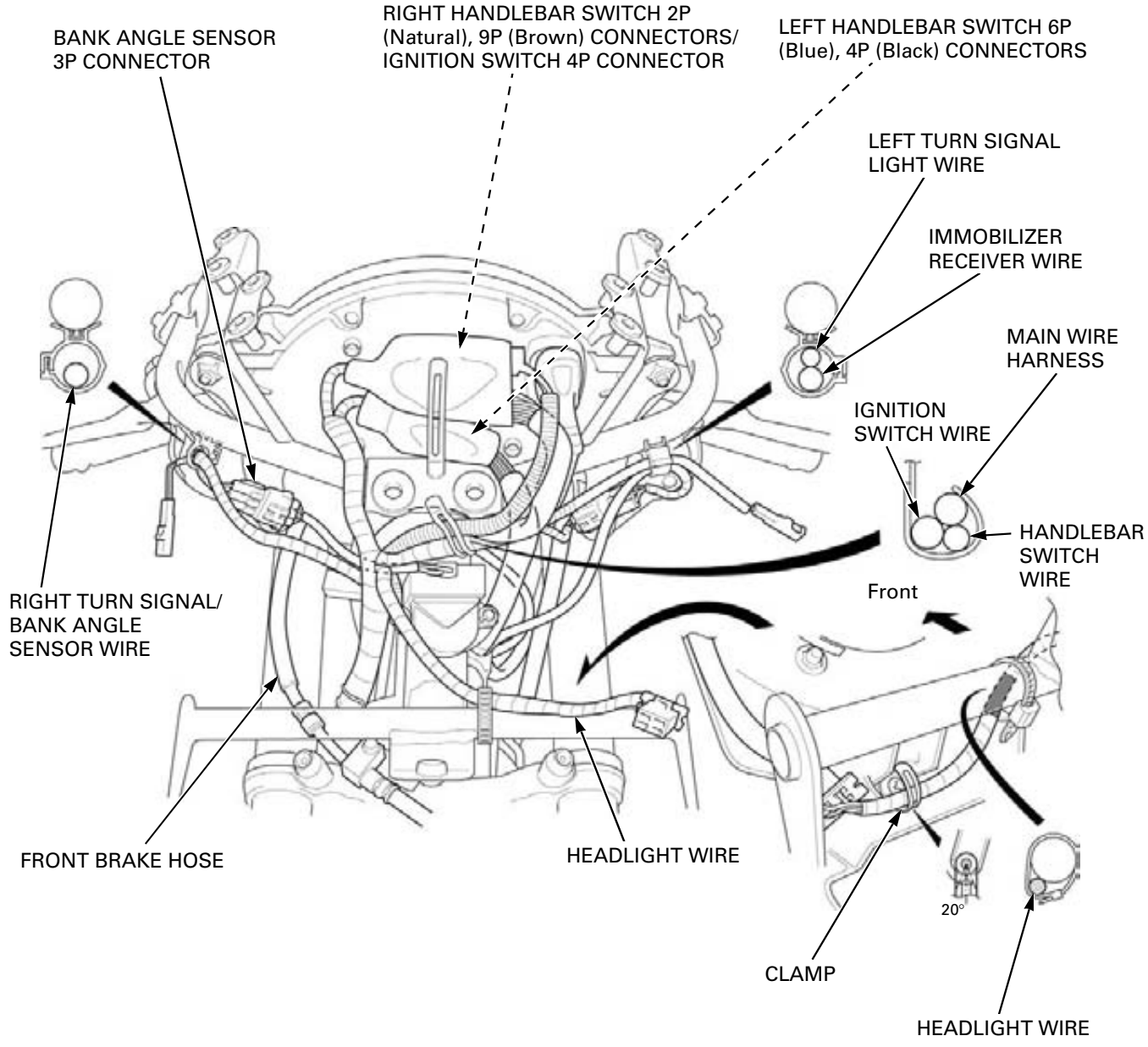


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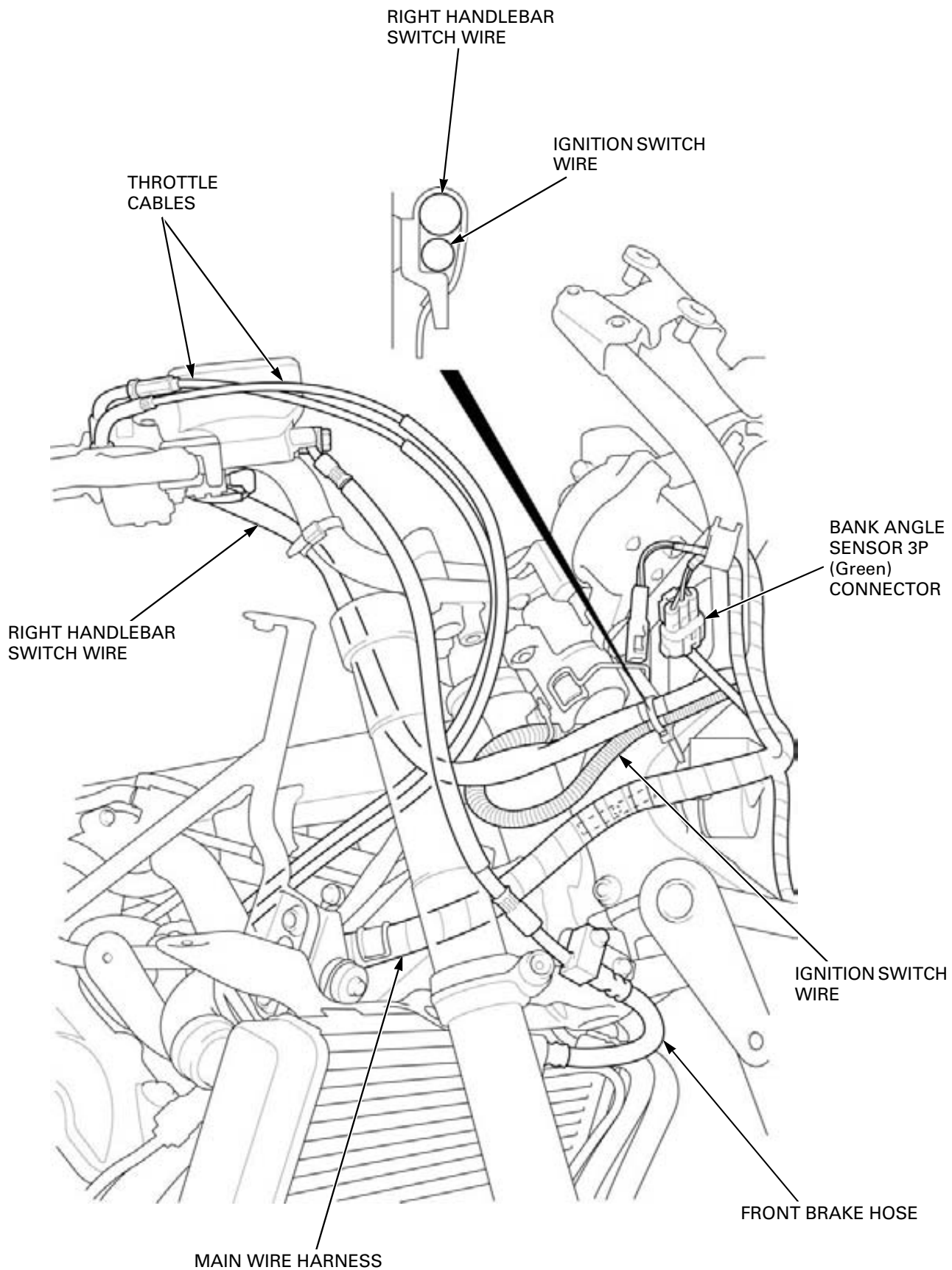


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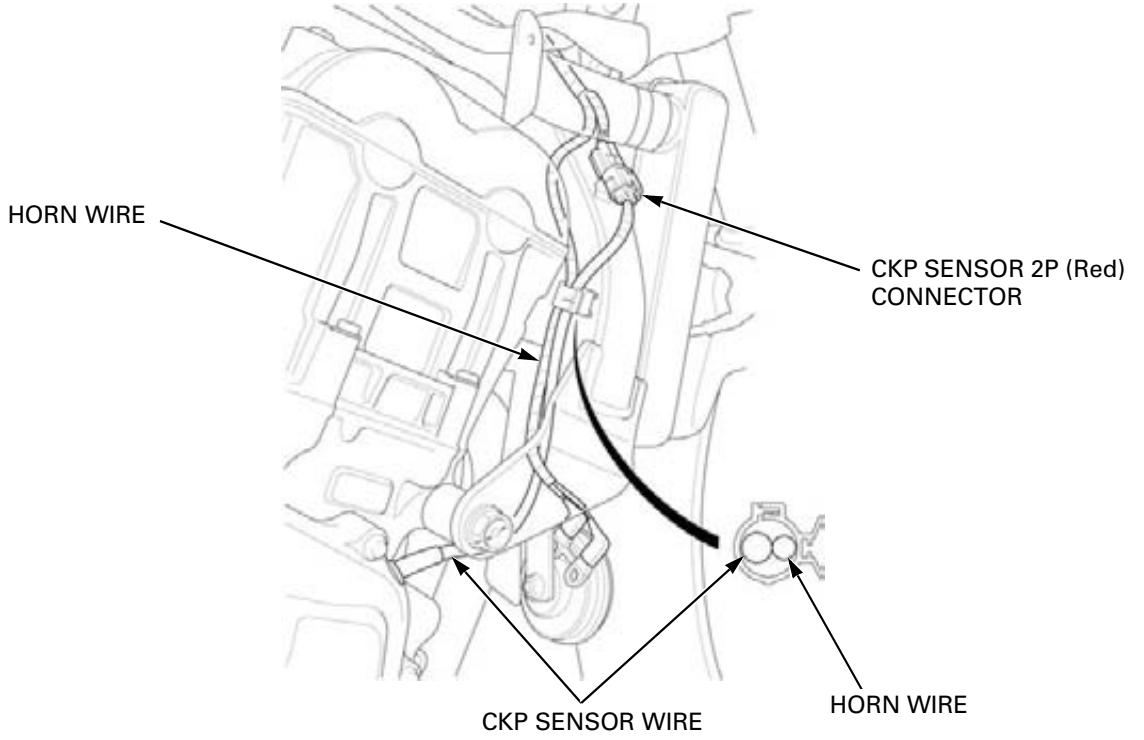
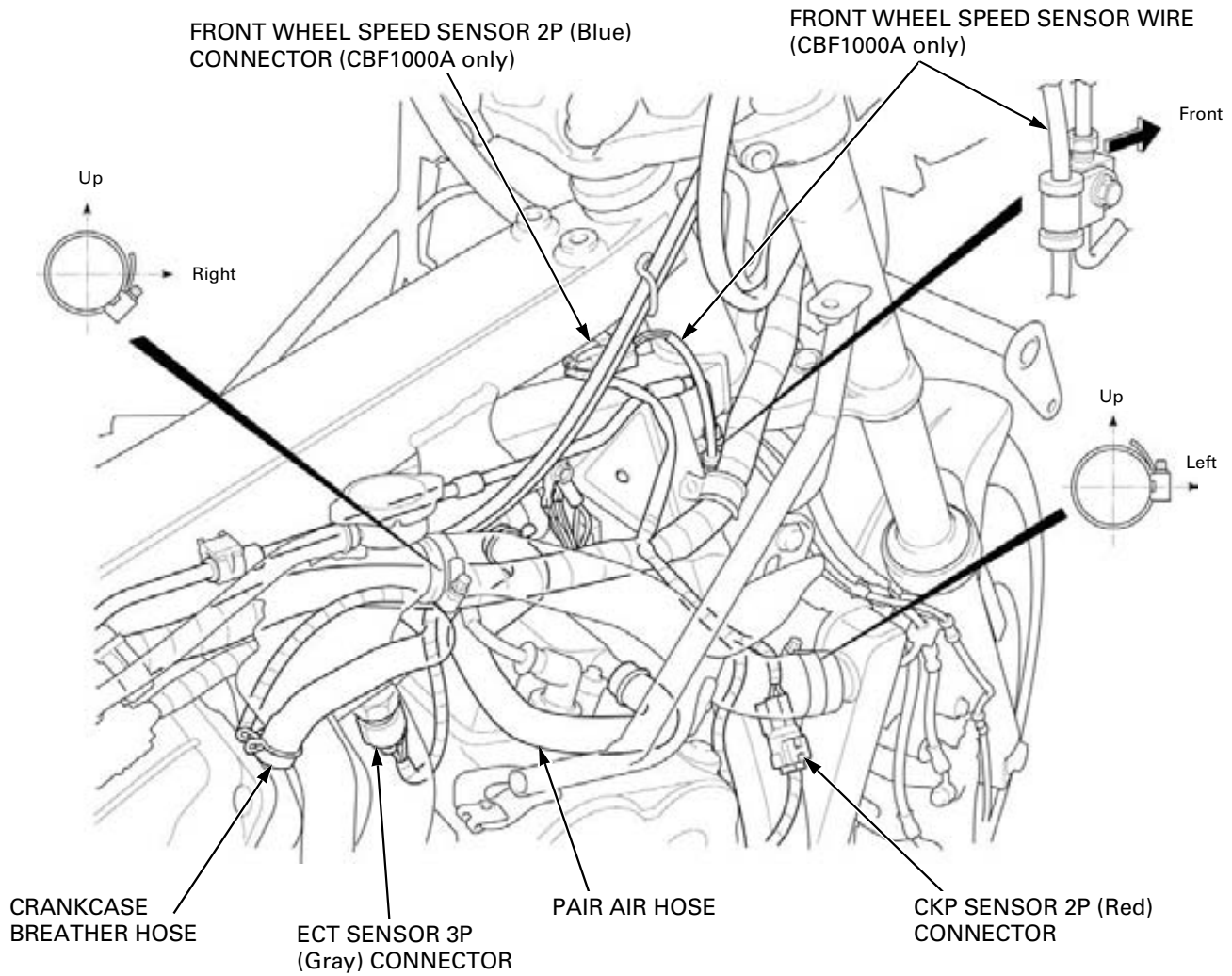




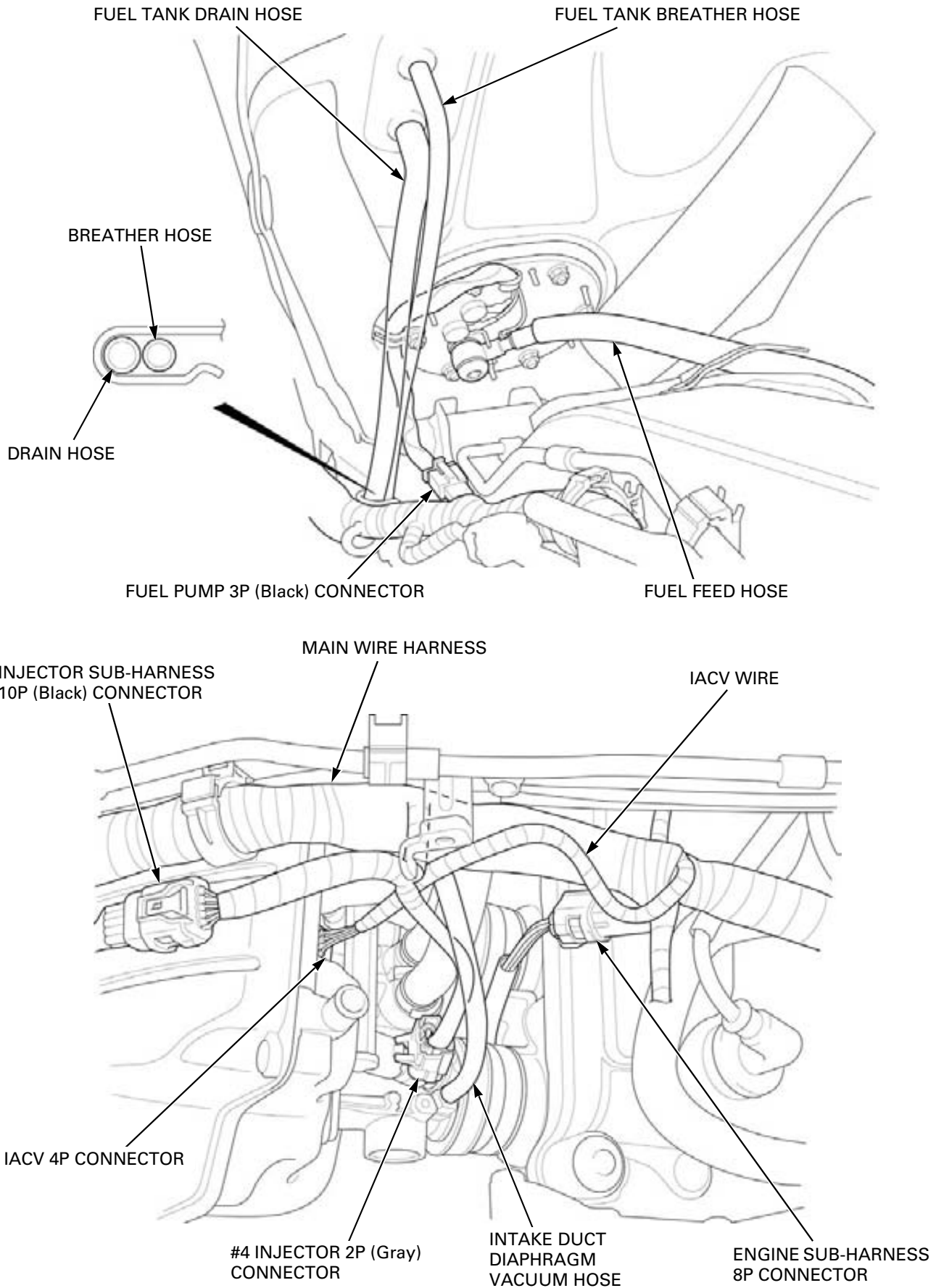
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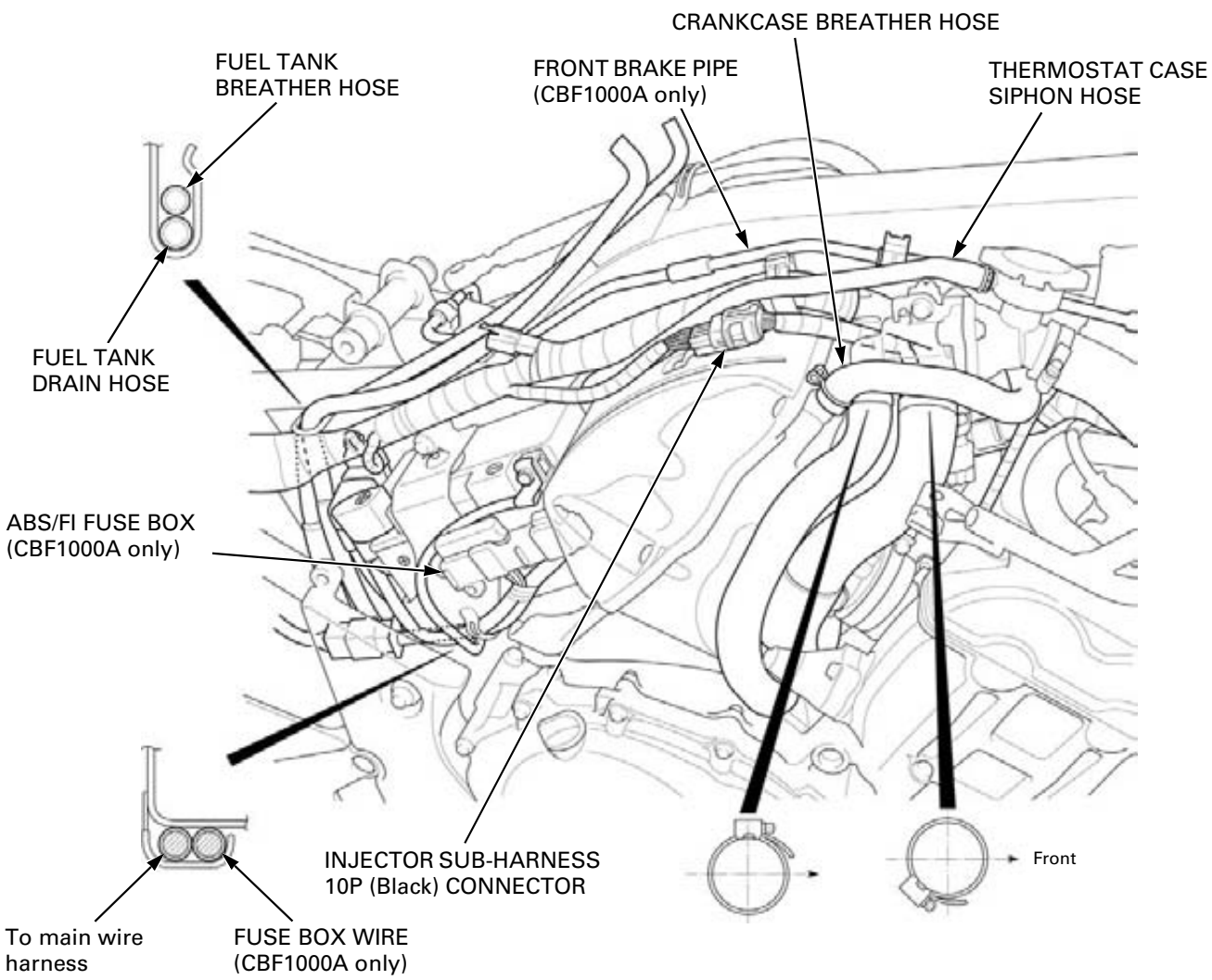


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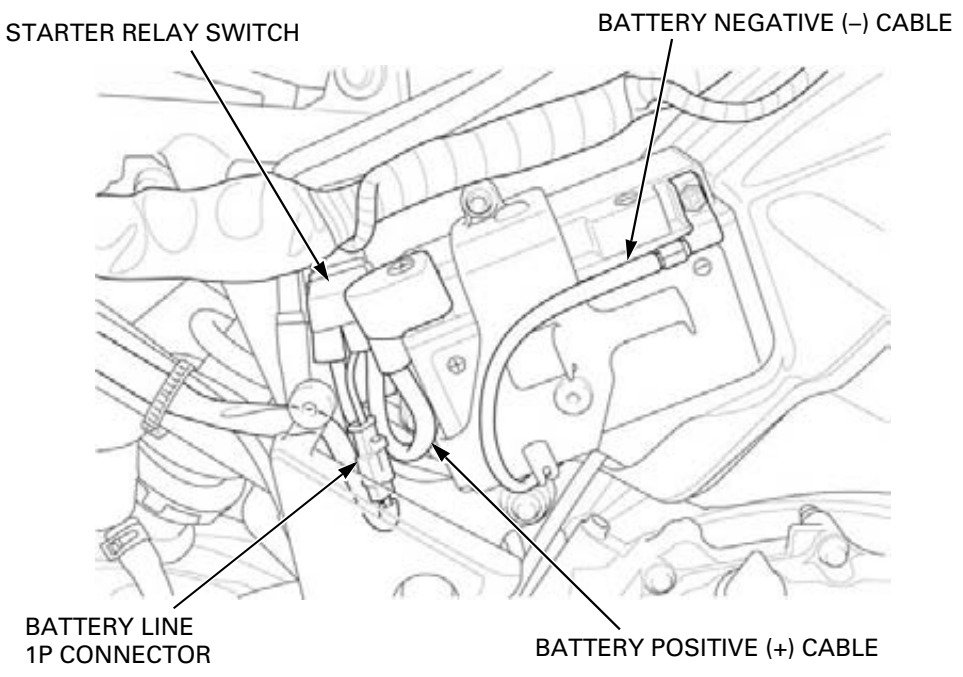


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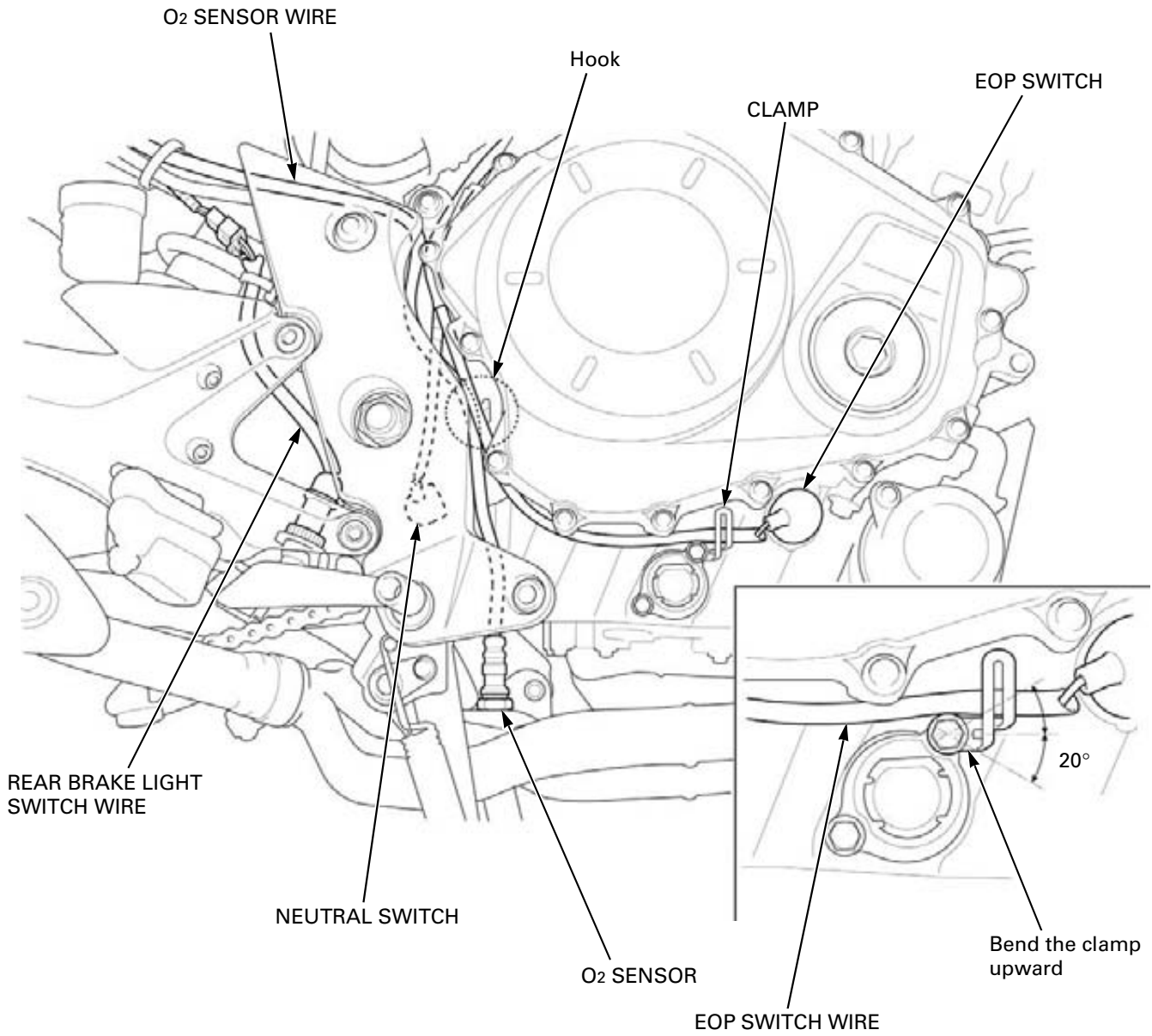


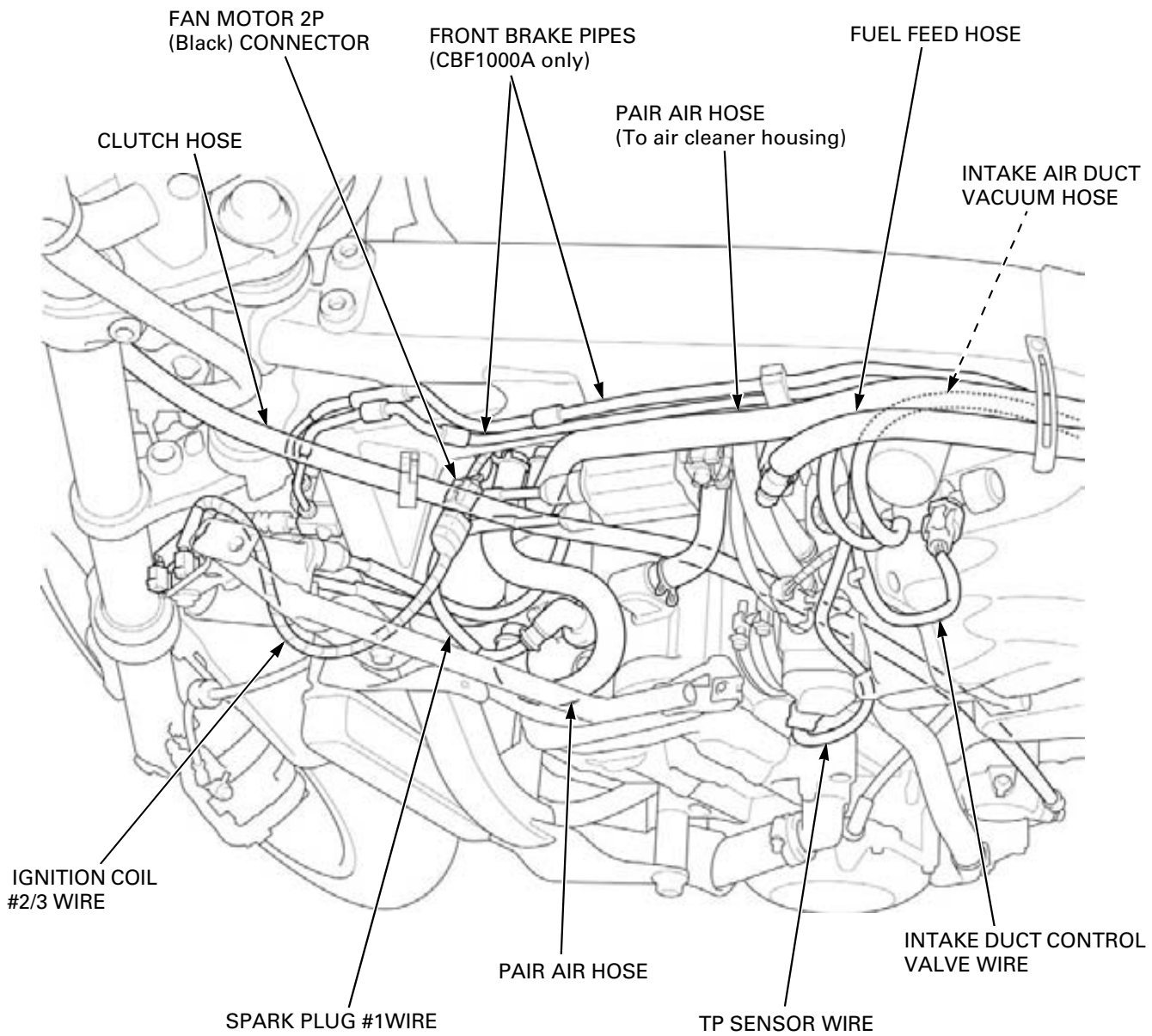


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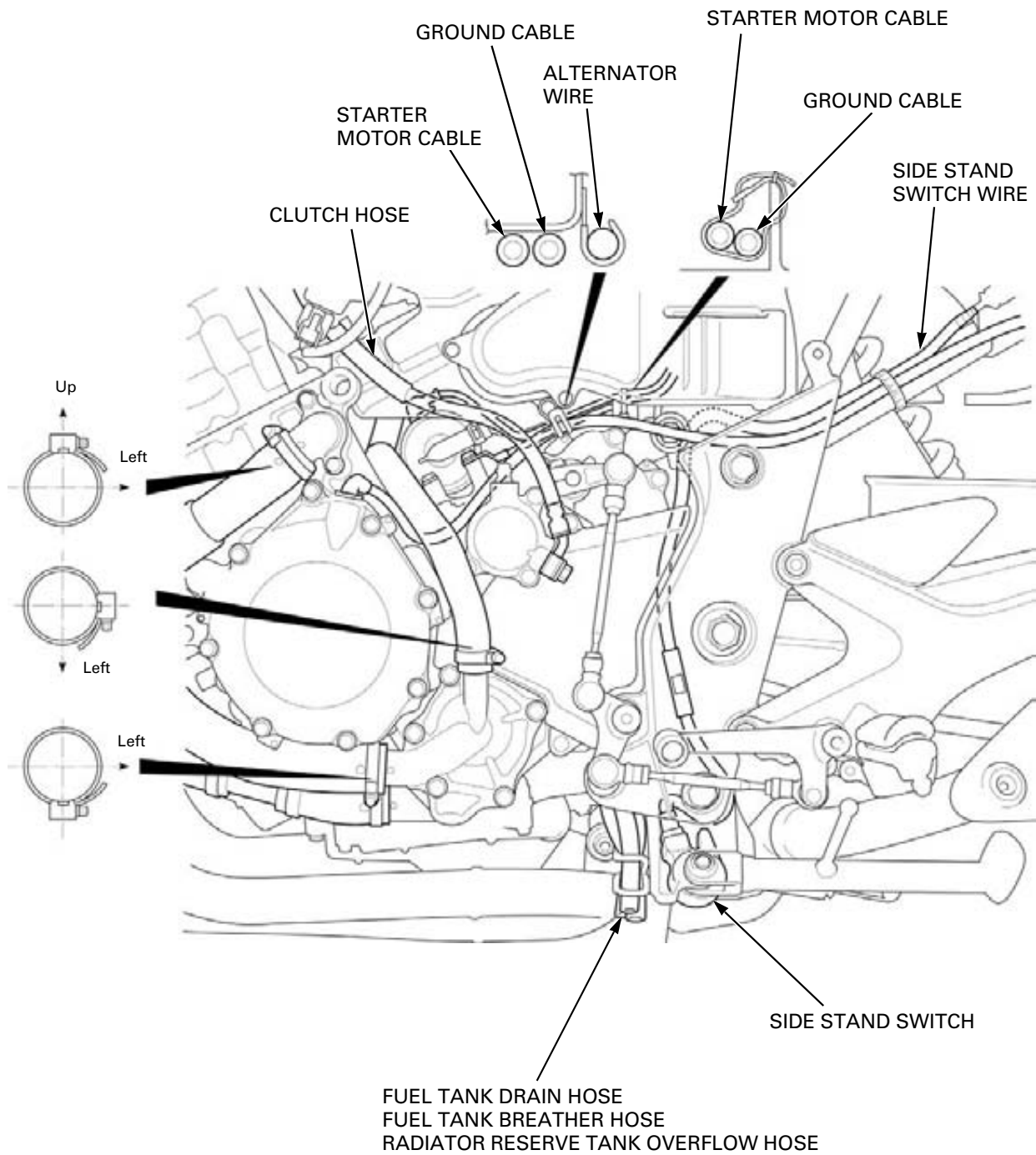


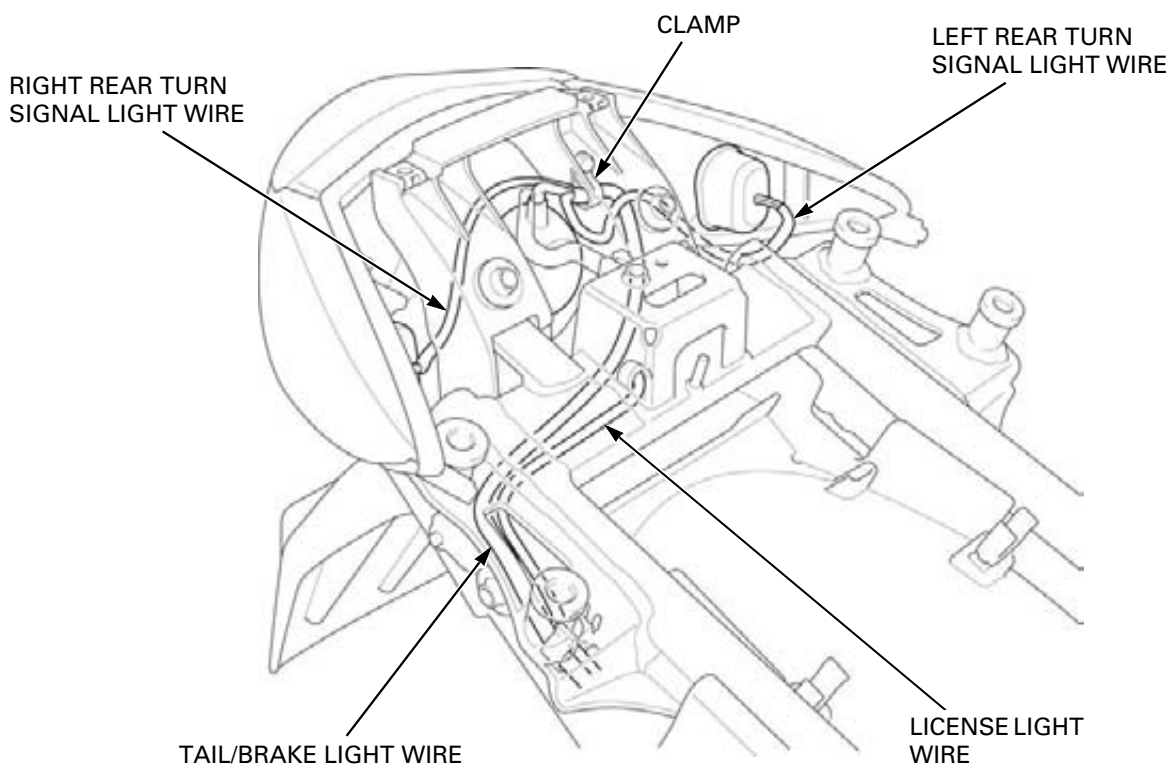
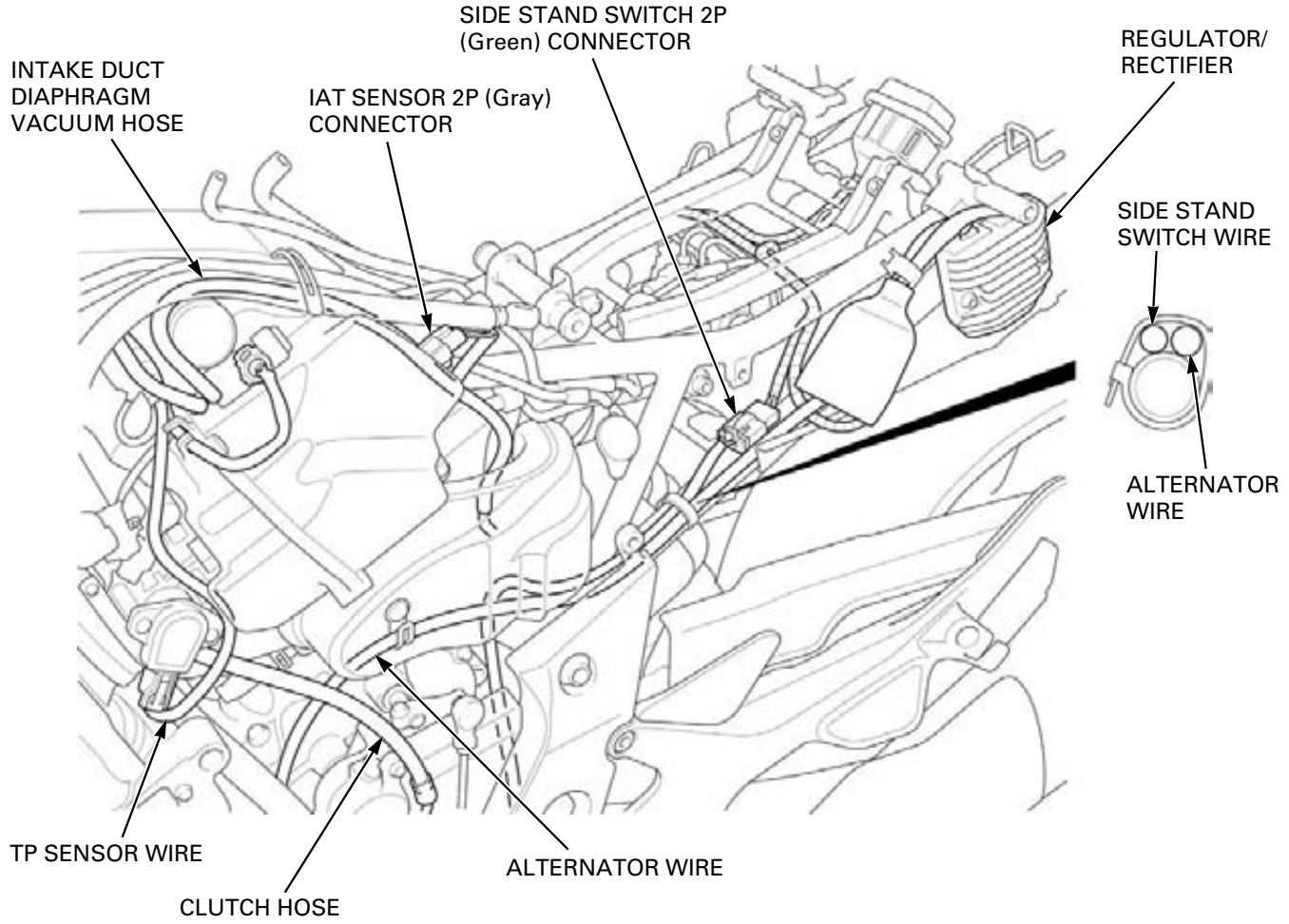
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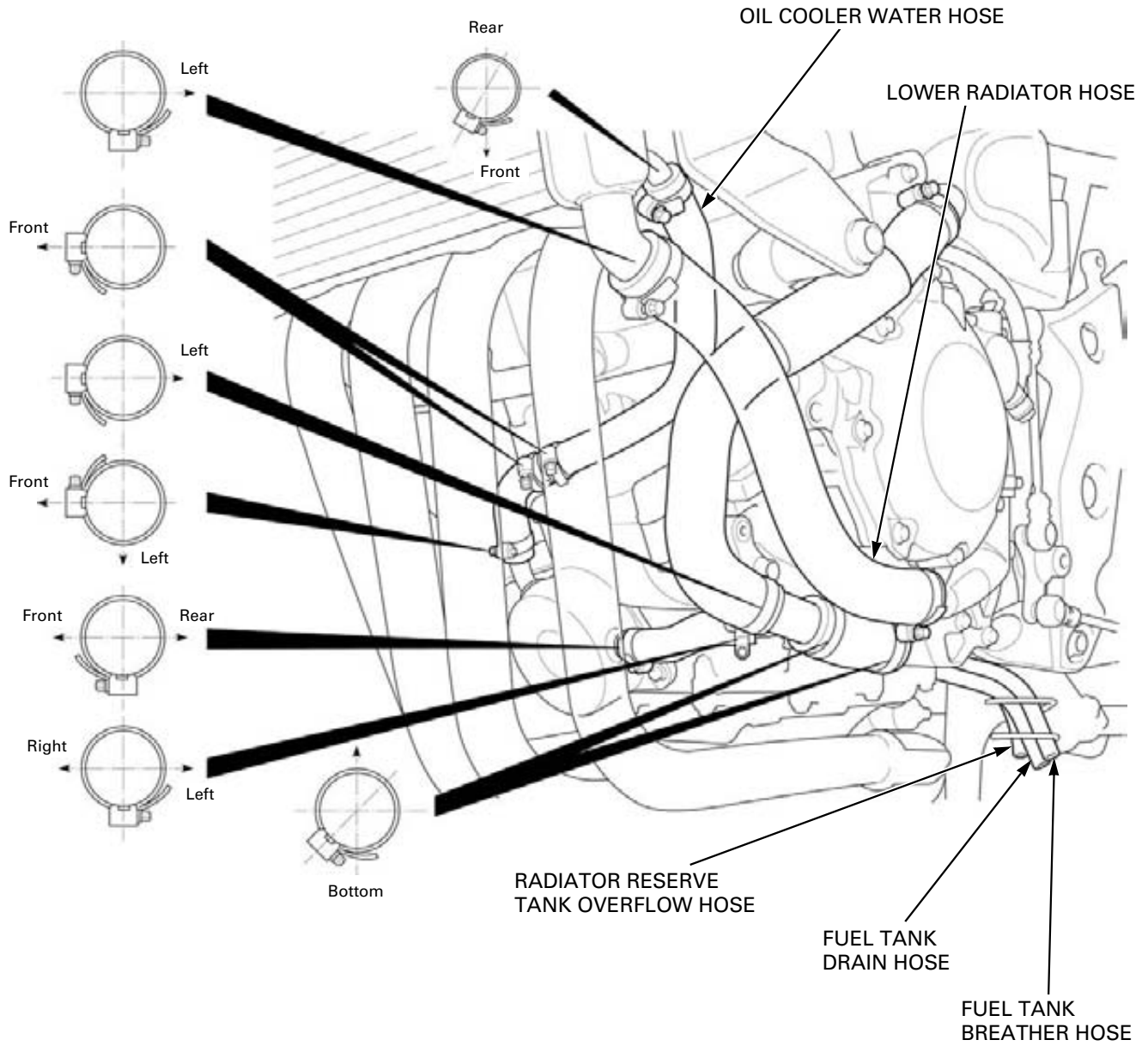


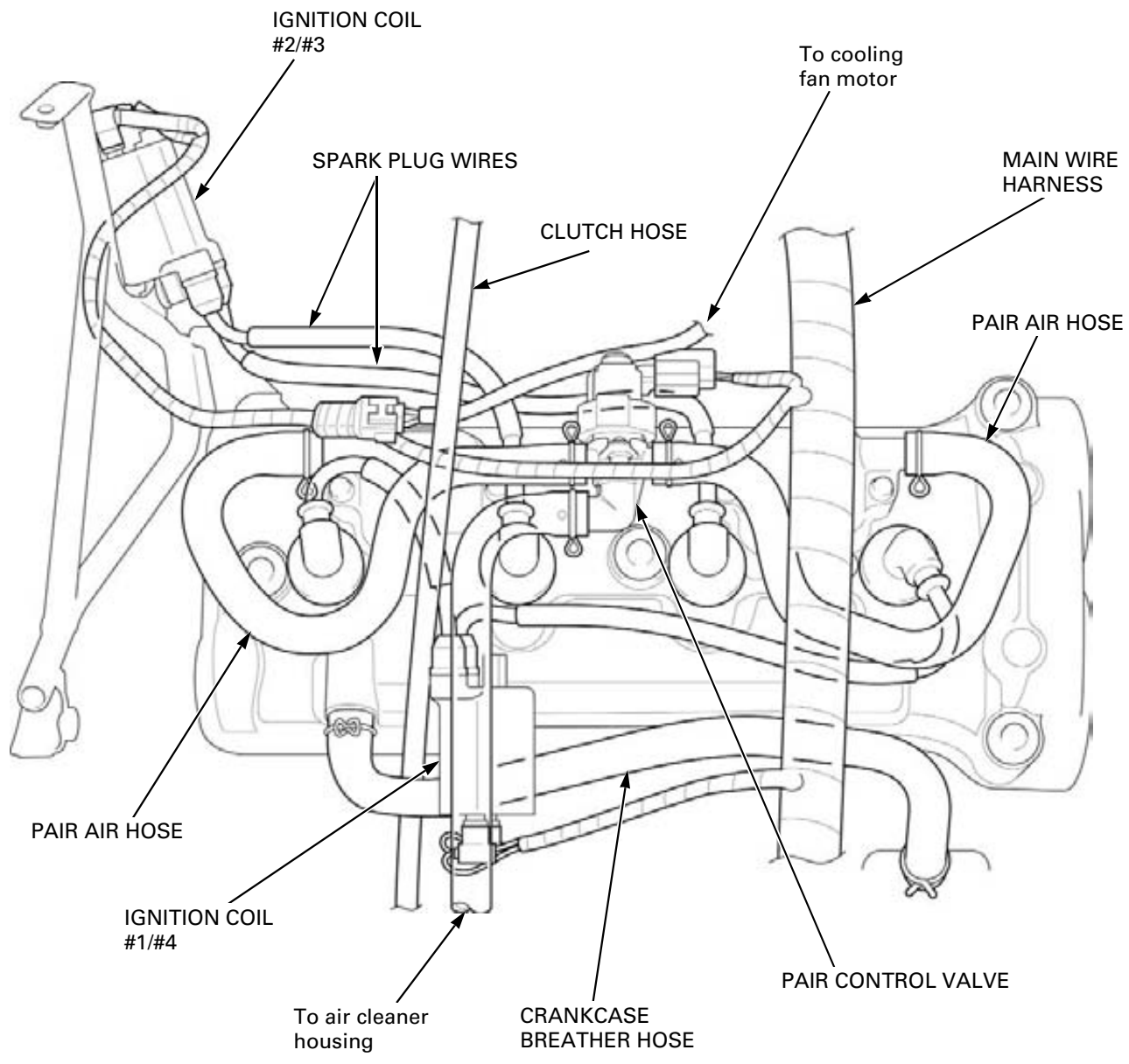
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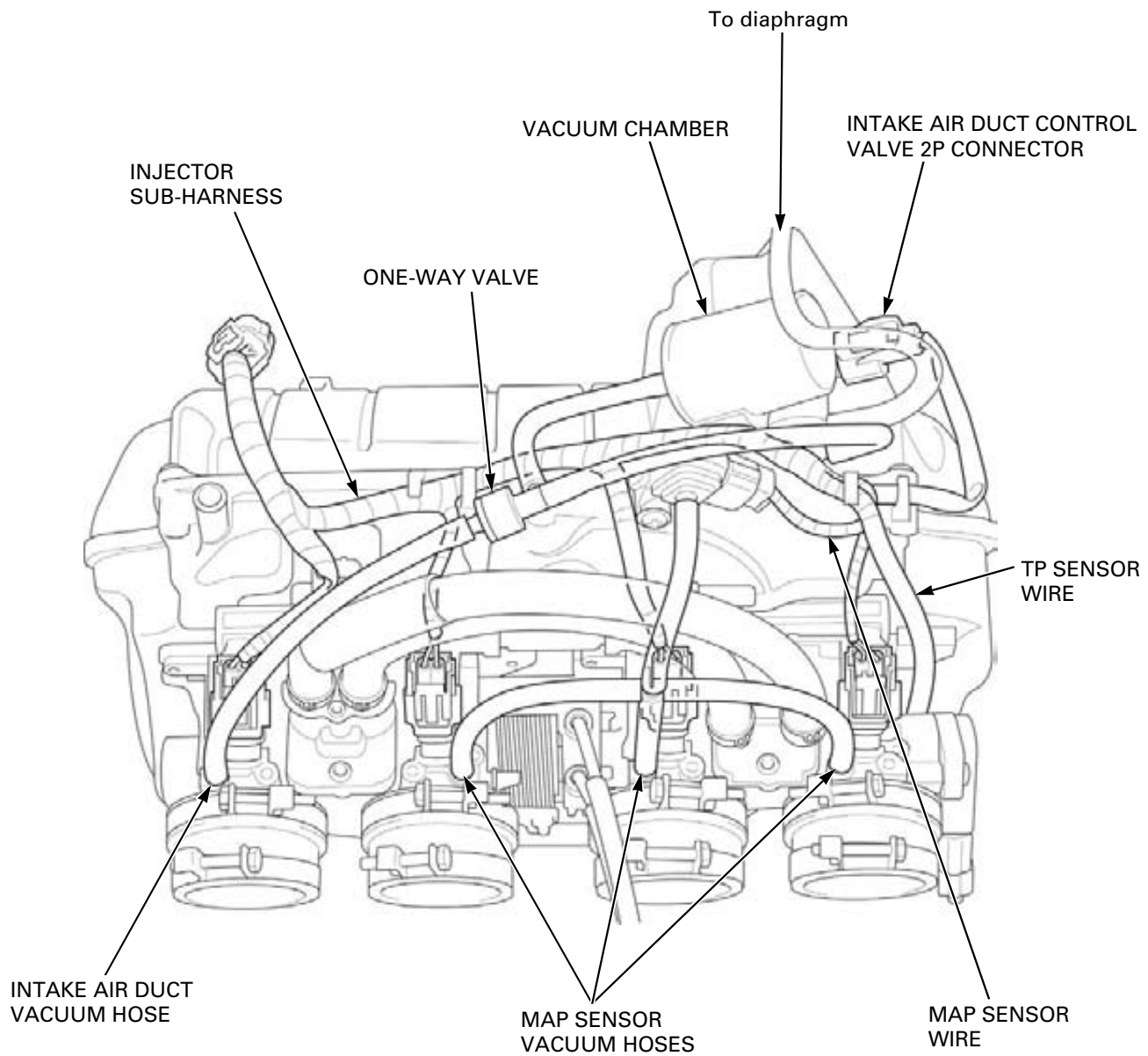


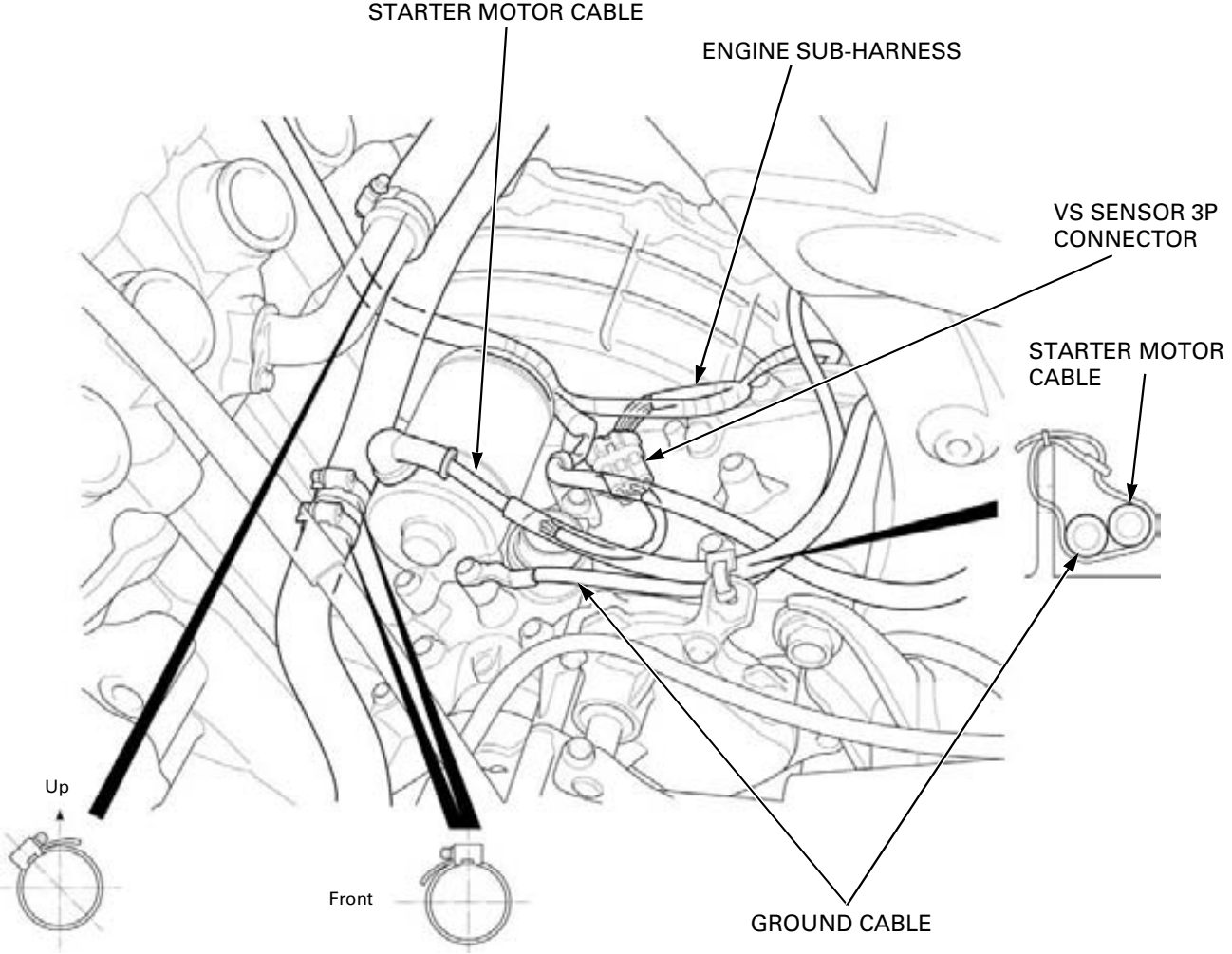
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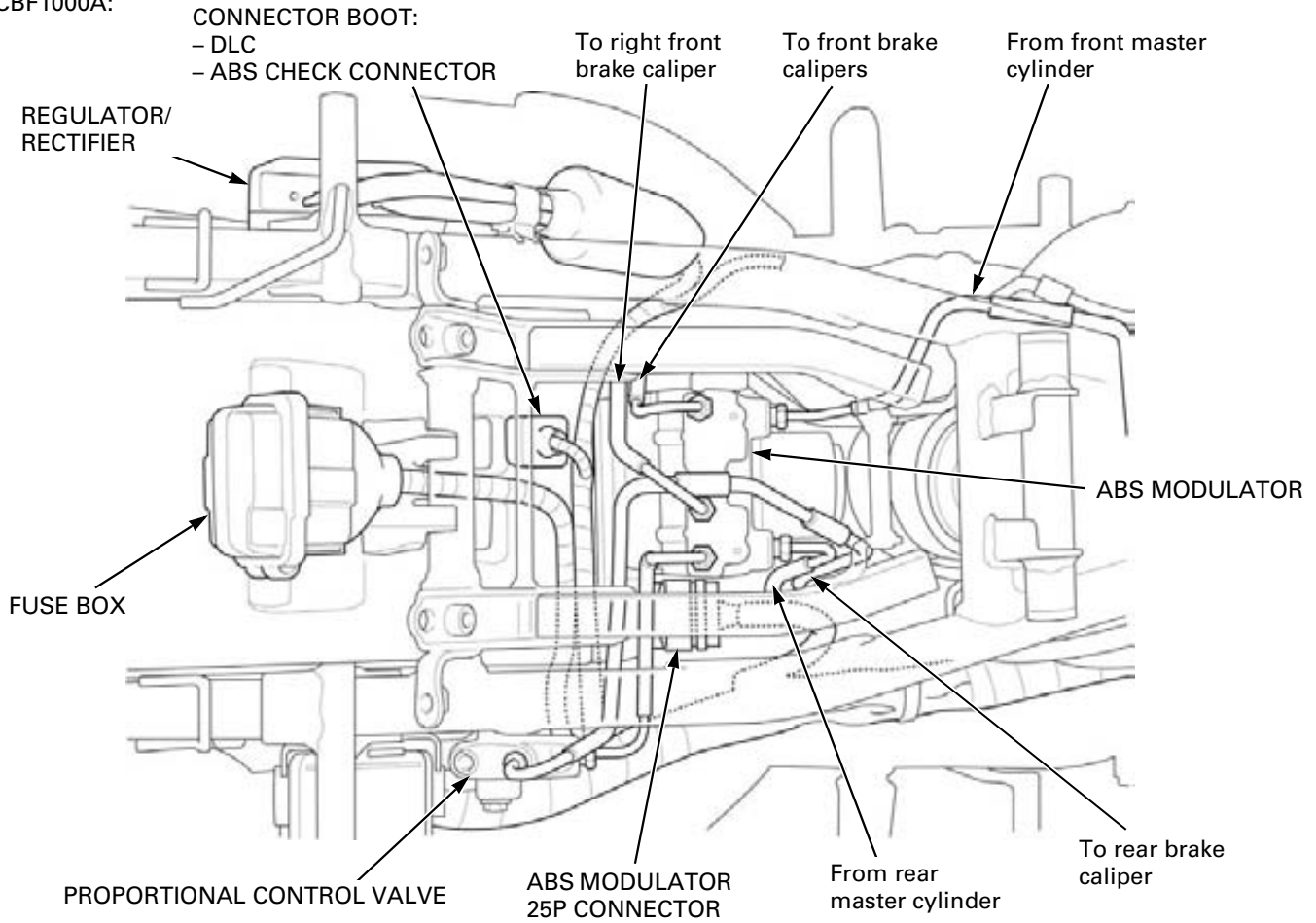
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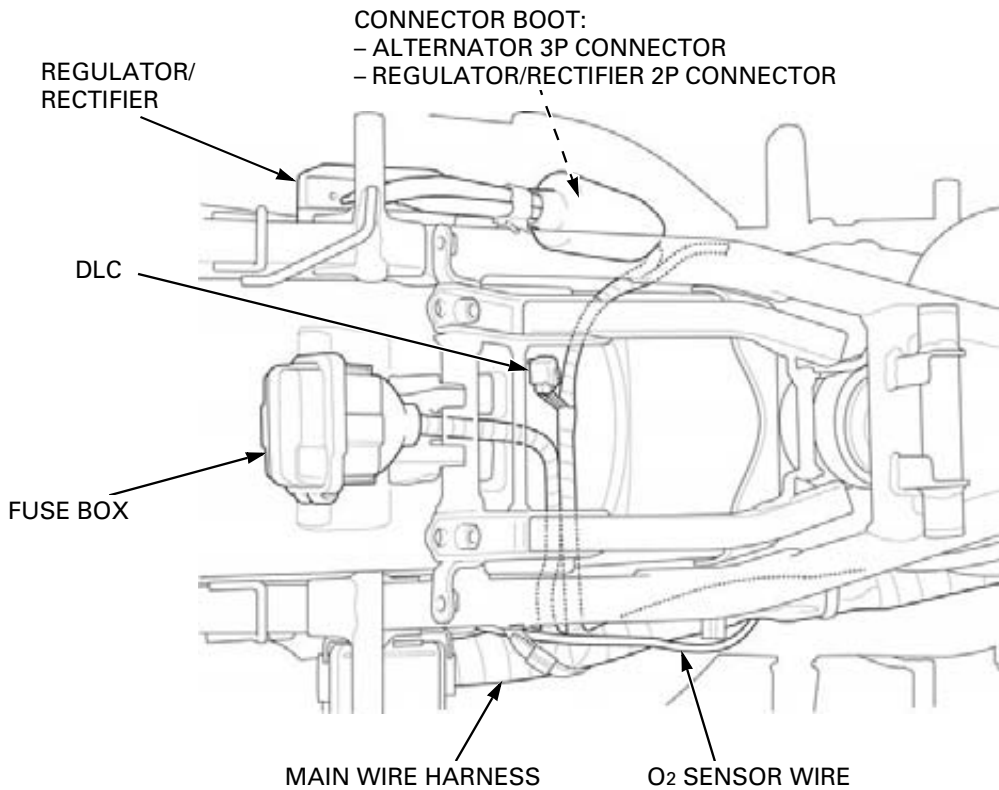


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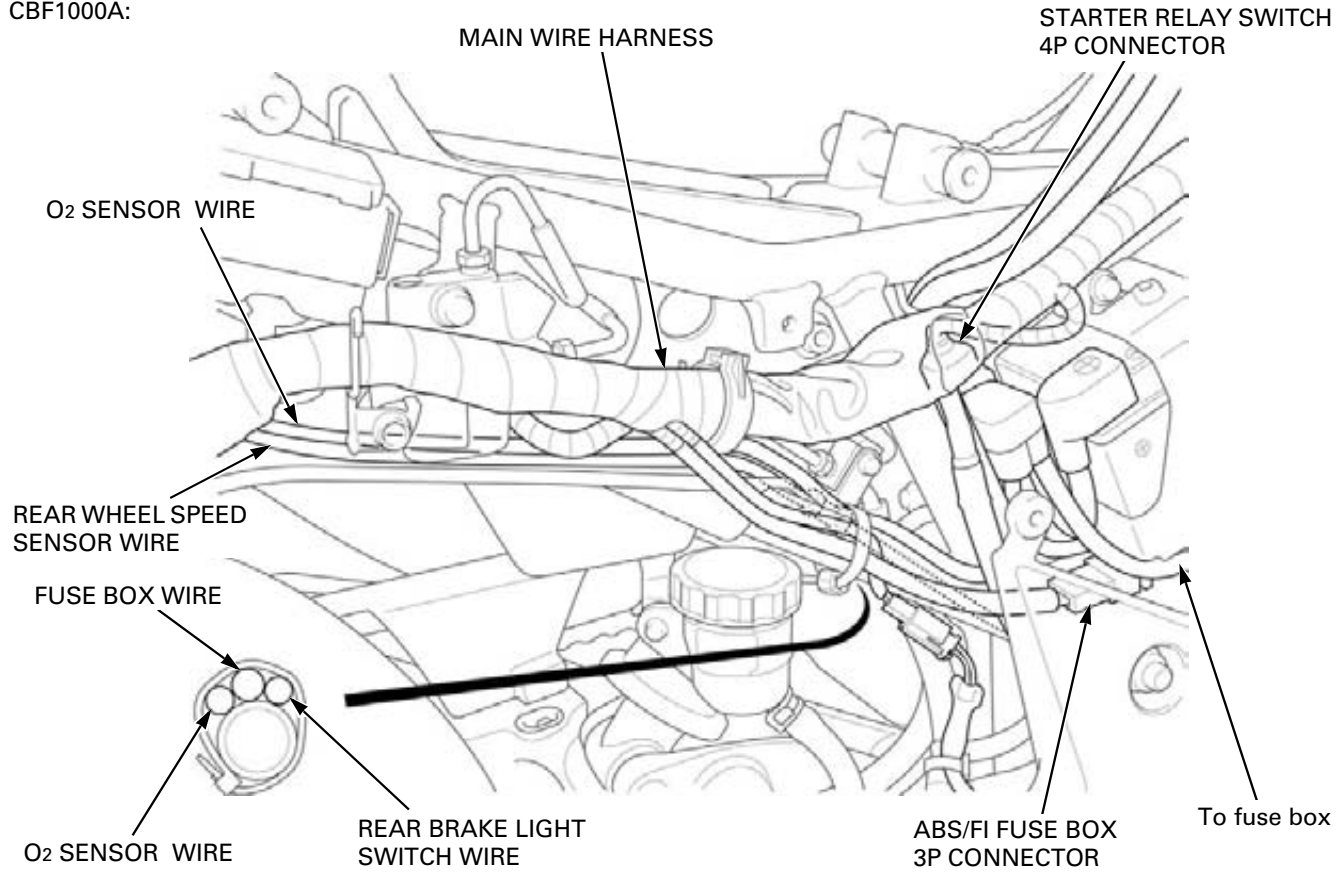
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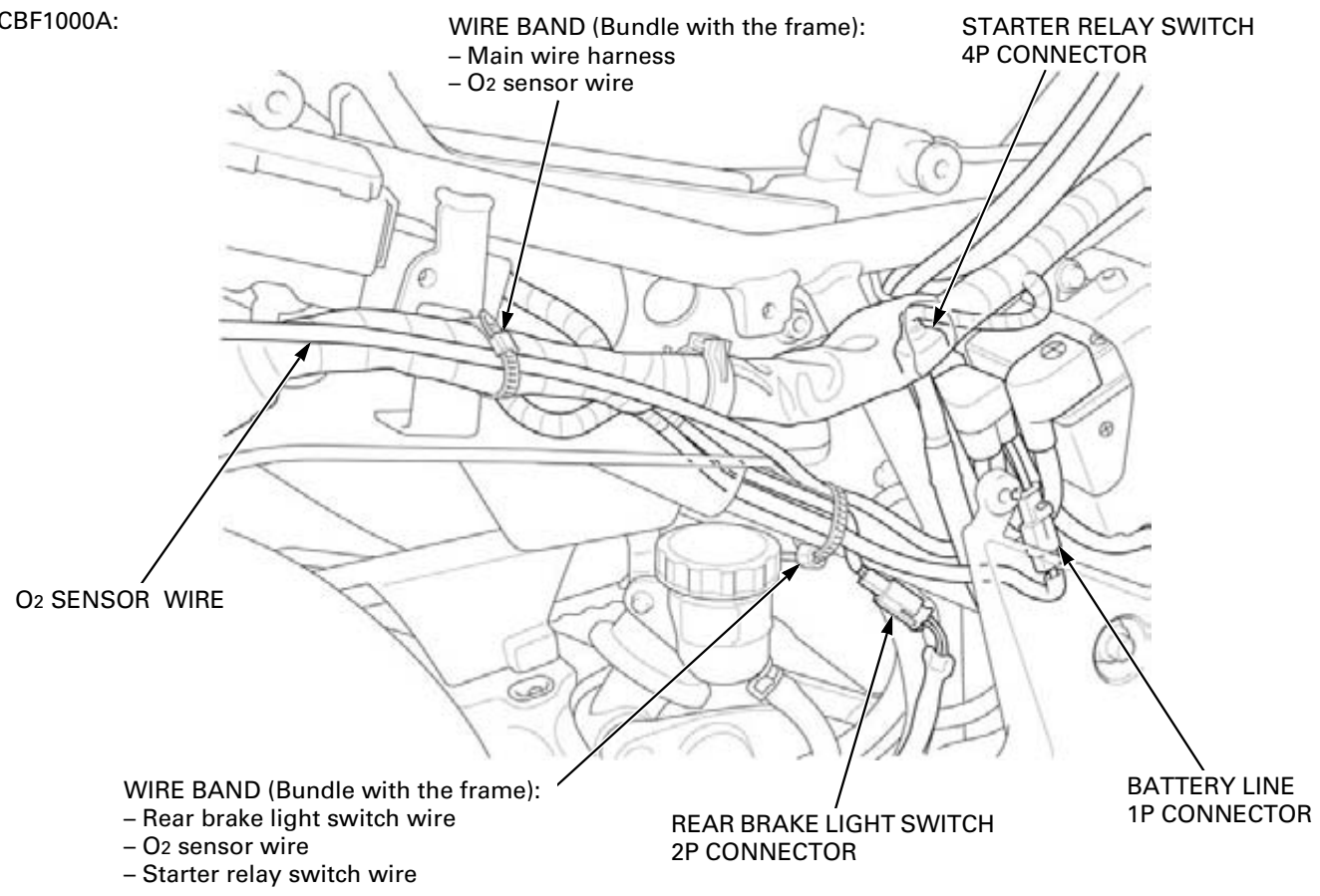
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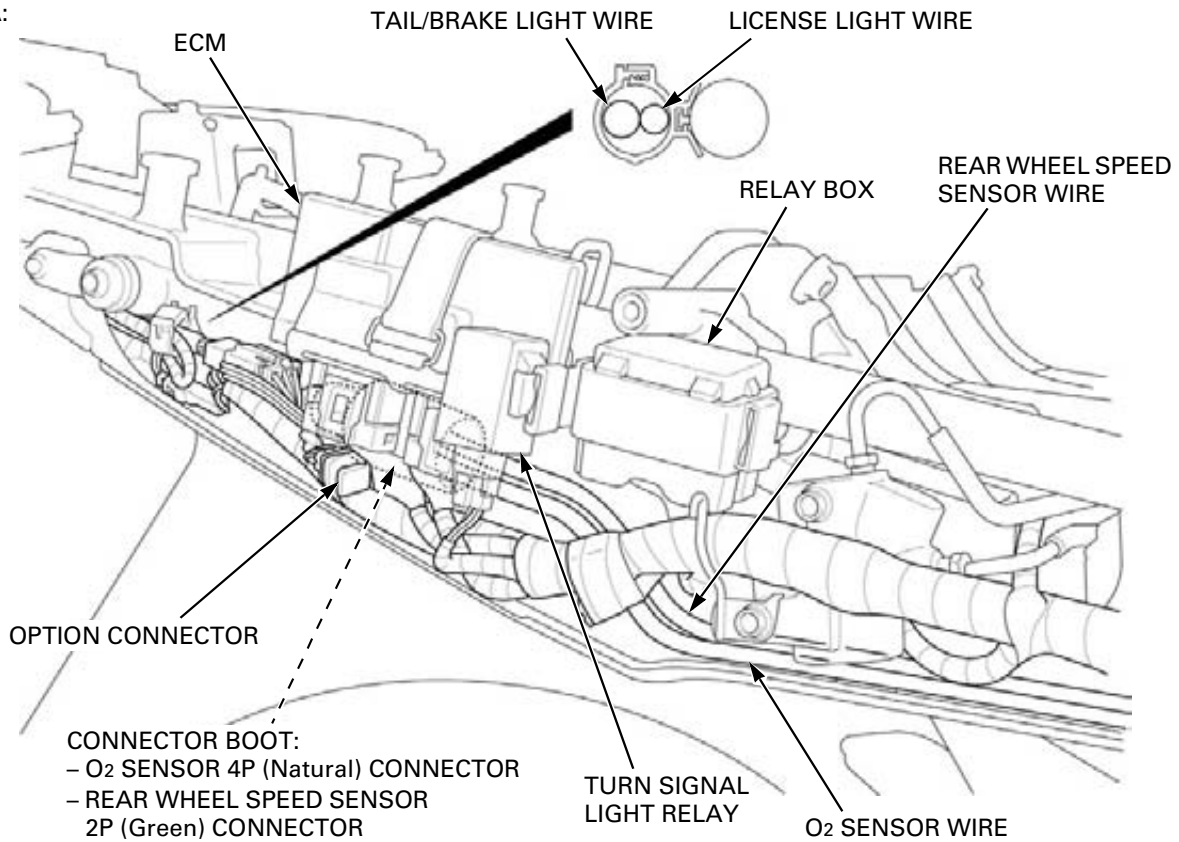


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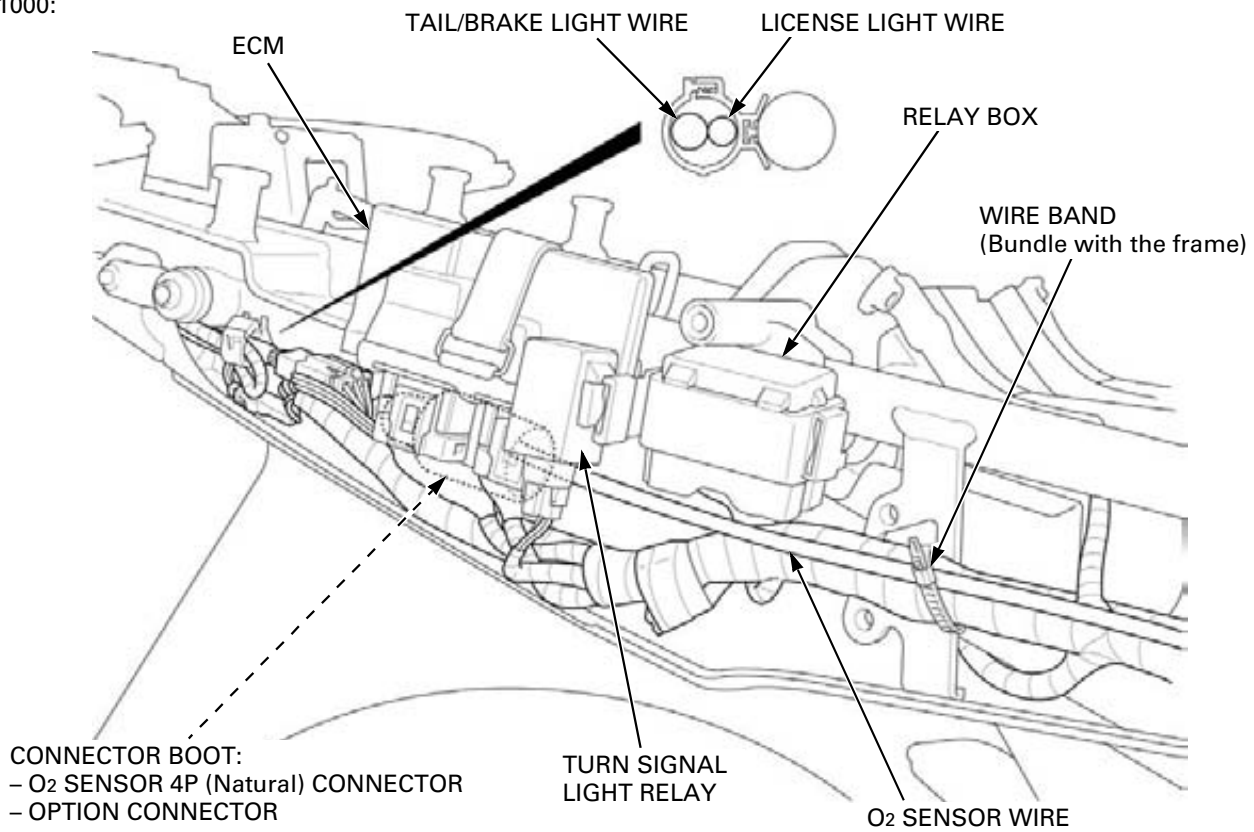


GENERAL INFORMATION

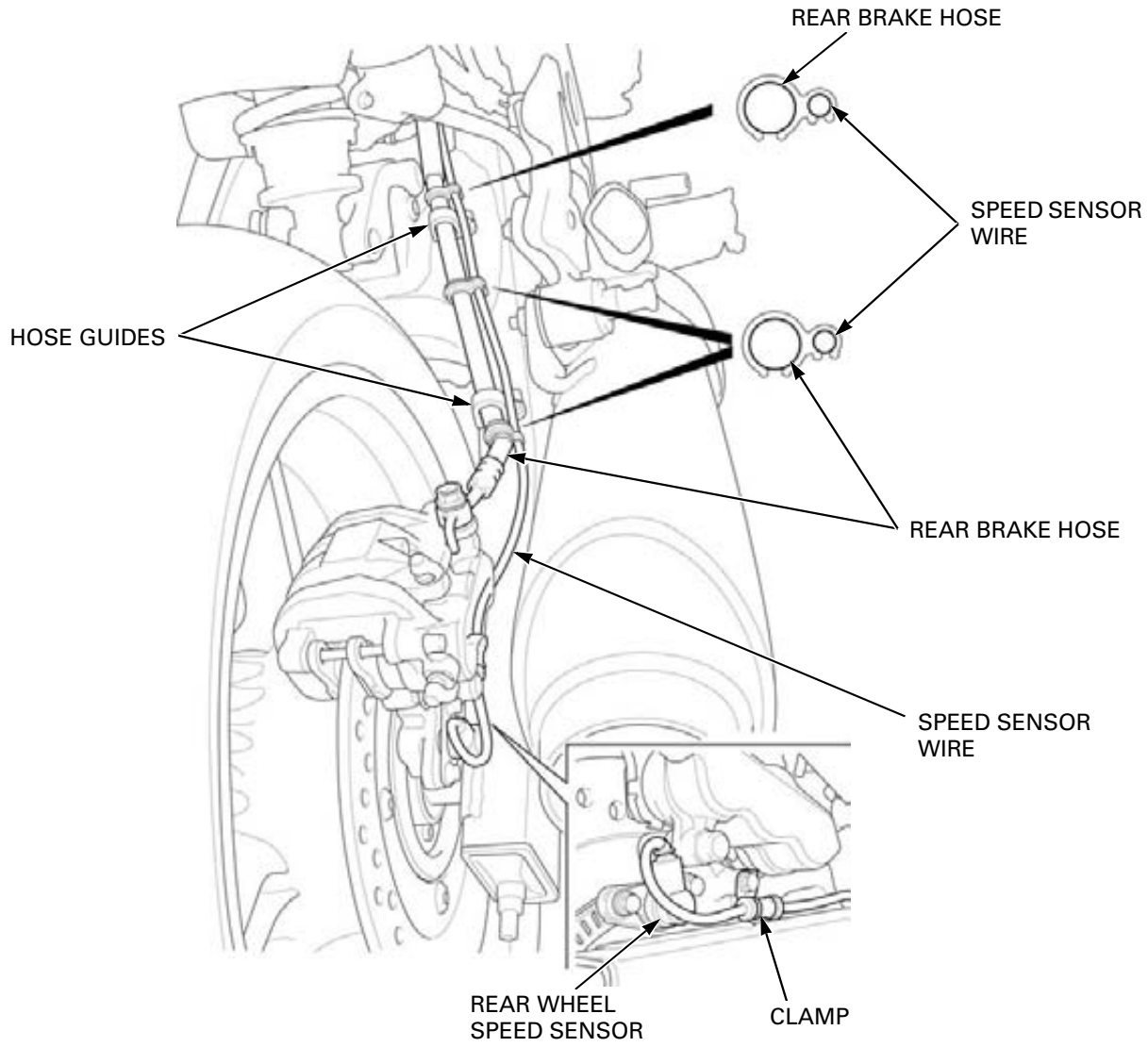
CBF1000A:



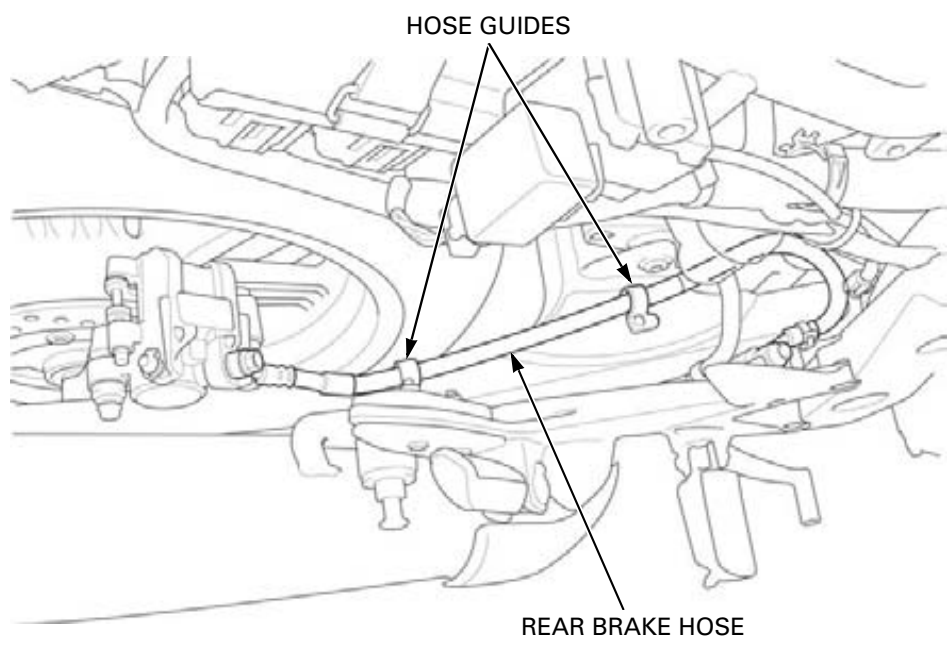
CBF1000:



CBF1000A:



CBF1000:



GENERAL INFORMATION

EMISSION CONTROL SYSTEMS

SOURCE OF EMISSIONS

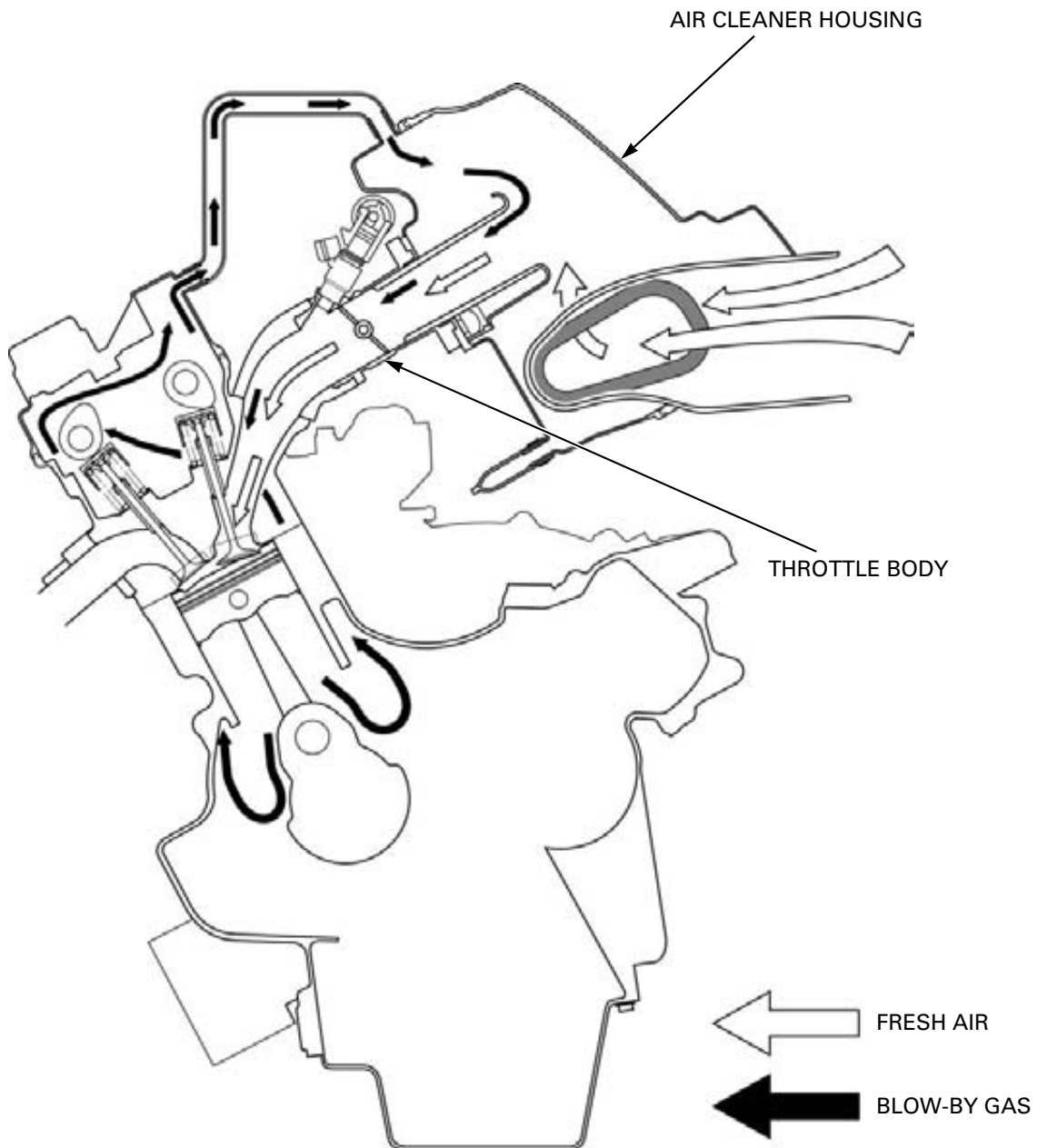
The combustion process produces carbon monoxide (CO), oxides of nitrogen (NO_x) and hydrocarbons (HC). Control of carbon monoxide, oxides of nitrogen and hydrocarbons is very important because, under certain conditions, they react to form photochemical smog when subject to sunlight. Carbon monoxide does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

Honda Motor Co., Ltd. utilizes various systems (page 1-43) 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.



EXHAUST EMISSION CONTROL SYSTEM

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

No adjustment should be made for the exhaust emission control system. The exhaust emission control system is separate from the crankcase emission control system.

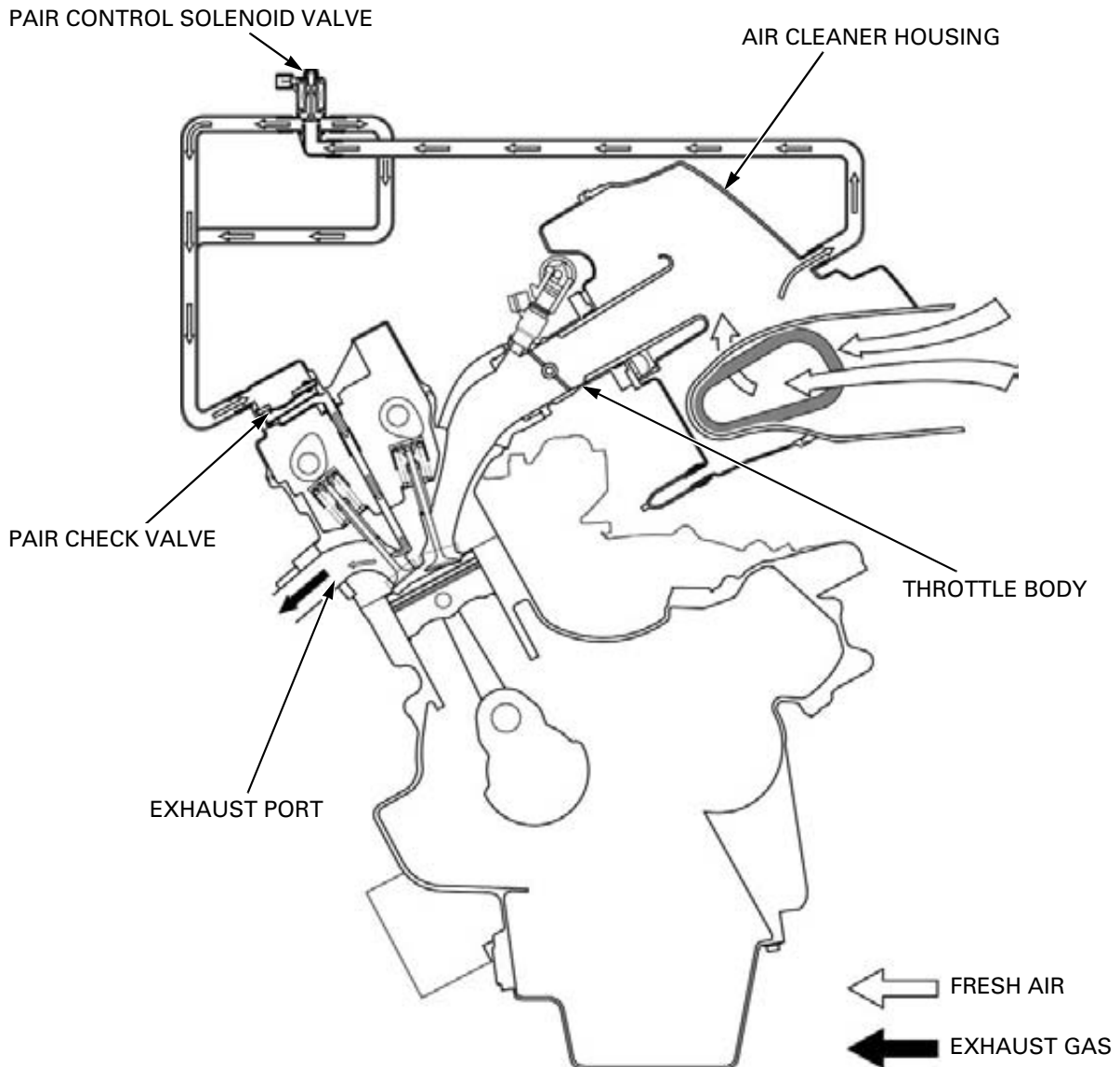
SECONDARY AIR SUPPLY SYSTEM

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 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 valve is operated by the solenoid valve. The solenoid valve is controlled by the PGM-FI unit, and the fresh air passage is opened/closed according the running condition.

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



THREE-WAY CATALYTIC CONVERTER

This motorcycle is equipped with a three-way catalytic converter.

The three-way catalytic converter is in the exhaust system. Through chemical reactions, they convert HC, CO and NOx in the engine's exhaust to carbon dioxide (CO₂), nitrogen (N₂) and water vapor.

No adjustment to these systems should be made although periodic inspection of the components is recommended.

GENERAL INFORMATION

NOISE EMISSION CONTROL SYSTEM

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

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.

2. TECHNICAL FEATURES

IACV (Idle Air Control Valve)..... 2-2

CAMSHAFT POSITION DETECTION WITH
MAP SENSOR..... 2-4

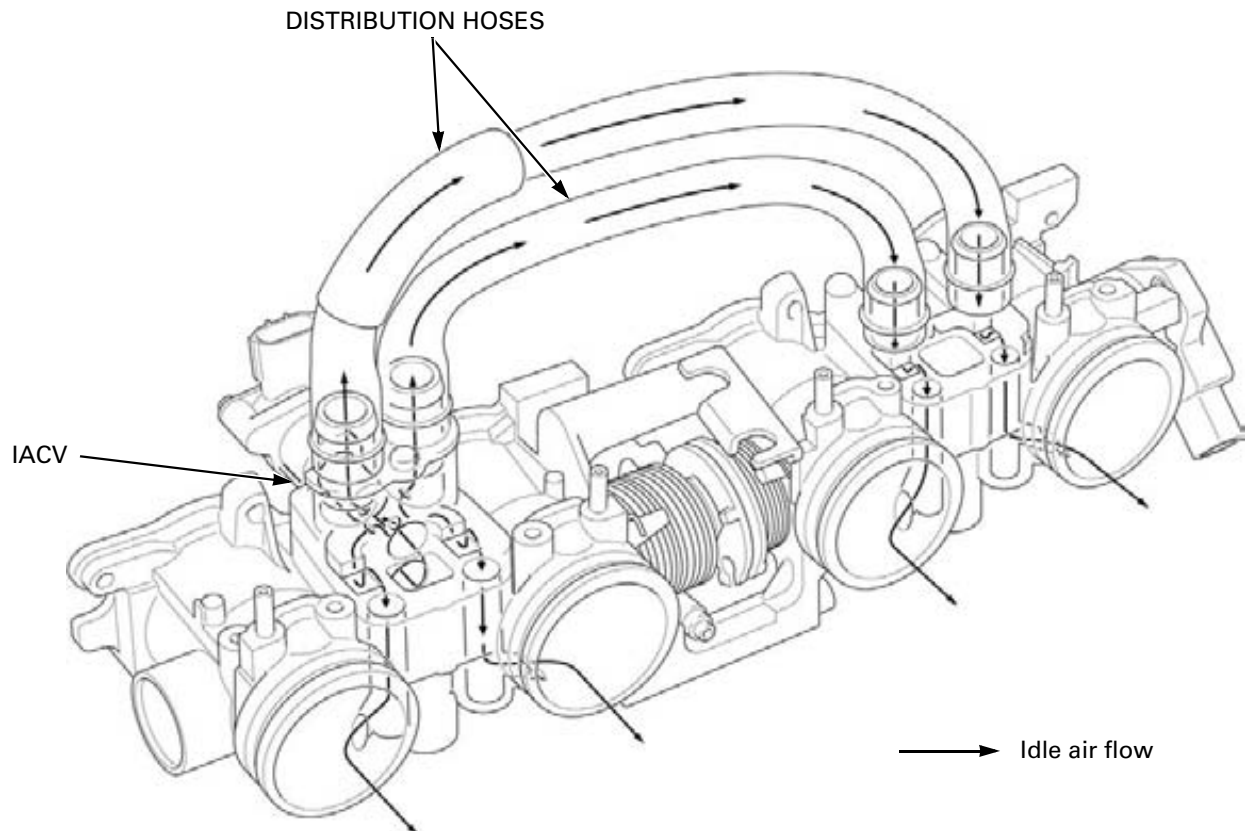
TECHNICAL FEATURES

IACV (Idle Air Control Valve)

SUMMARY

This motorcycle adopts an Idle Air Control system for the inline-four engine, this system is composed the IACV and distribution hoses onto the throttle body. The IACV consists of a step motor and a slide valve, and controls the amount of air bypassed around the closed throttle body. With the ignition switch on, the amount of inlet air is determined from information detected by the ECT sensor. During engine start-up or while maintaining idle (throttle valve closed), the amount of inlet air is corrected by various sensors' information.

This system eliminates the need for manual idle speed adjustment and the air screw adjustment for the throttle body synchronization.



OPERATION

The ECM controls the IACV when engine idling, so the ECM stops to control the IACV operation at closed position in case that the ECM detects the following condition:

- Throttle valve open
- Neutral switch OFF (in gear) and clutch switch OFF (release clutch lever)

When engine idling, from ignition switch ON to warming up, the ECM control the IACV step motor as following operations:

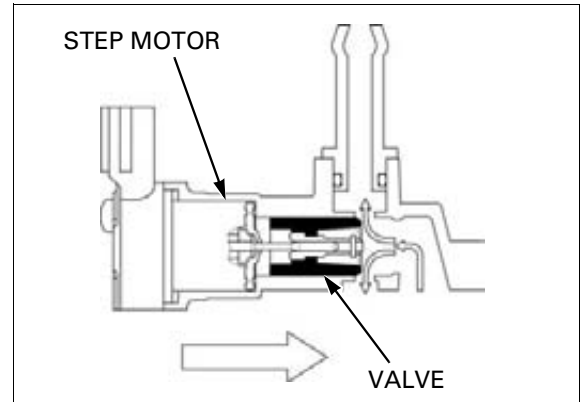
With the ignition switch ON

When the ignition switch ON, the IACV activates initial function, idle – open – idle position. There will be a step motor operating sound.

Start the engine – warming up

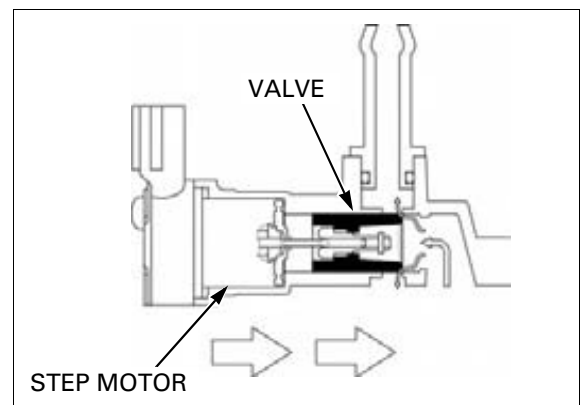
This optimizes the bypass opening with the throttle valve closed, and the corrected amount of inlet air passes through allowing proper engine start up.

After the engine has started, the ECM controls the IACV slide valve position and adjust the amount of inlet air in response to the engine coolant temperature.



After warming up – idling

When the ECM denotes the engine warming-up by the engine coolant temperature, it operates the step motor to move the slide valve to the closed position. This results in a reduced amount of bypassed air compared to the amount during engine warm-up, which allows proper engine idle to be maintained.



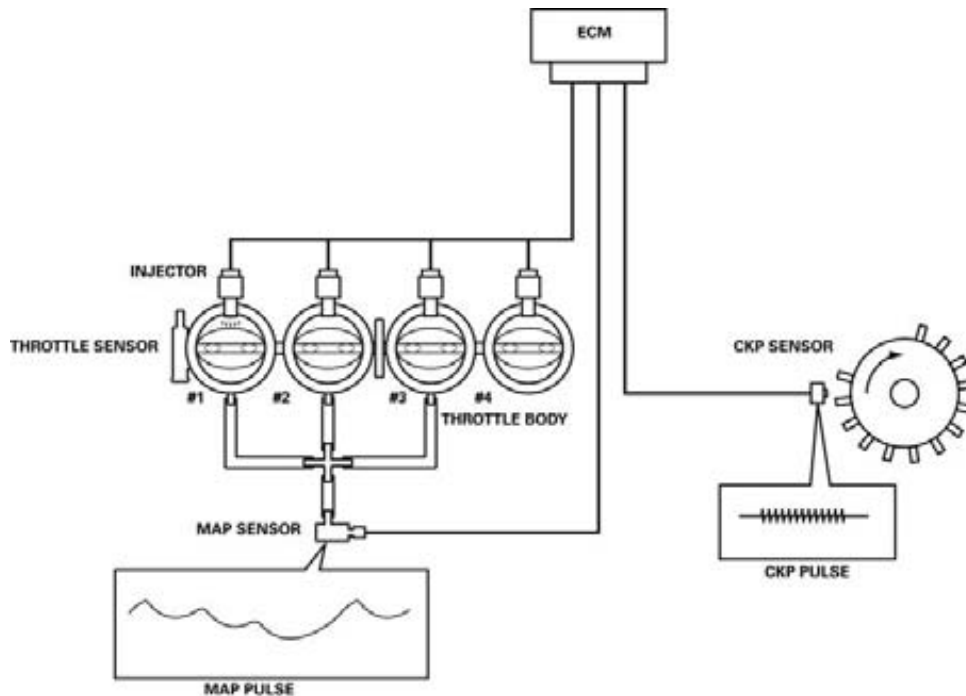
TECHNICAL FEATURES

CAMSHAFT POSITION DETECTION WITH MAP SENSOR

SUMMARY

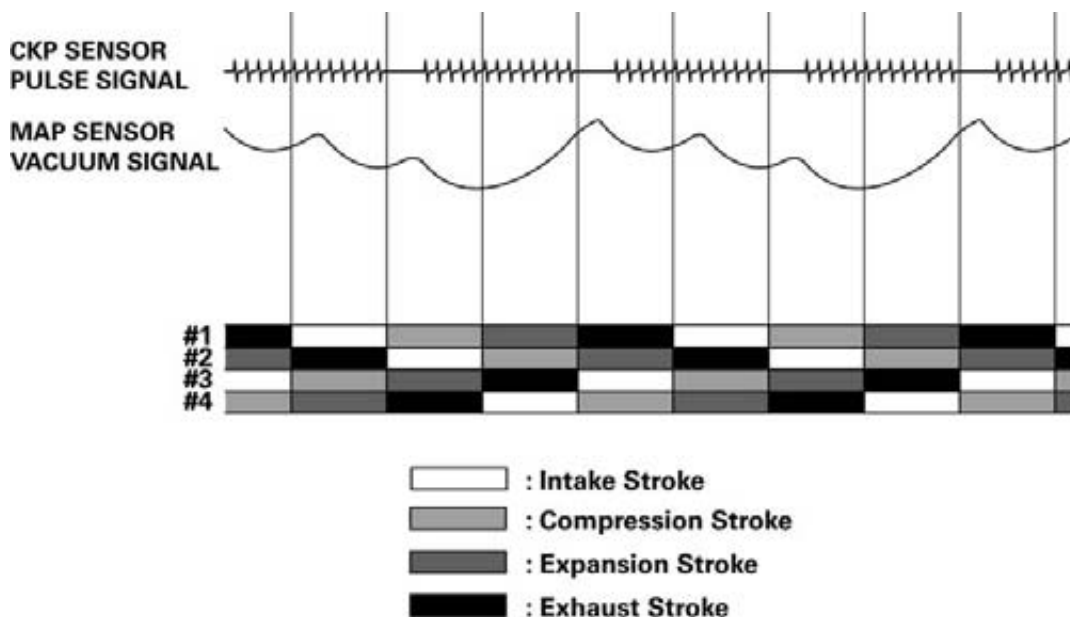
For PGM-FI, it is necessary to detect the stroke position not only of the crankshaft (TDC position) but also of the camshaft (TDC position in compression stroke). Existing PGM-FI for inline-4 engine, the system uses the CKP sensor and CMP sensor for the injection timing control. This motorcycle adopts the PGM-FI system that has the new detection system of the camshaft position. This PGM-FI system allows for the camshaft position detection with the MAP sensor and CKP sensor, and eliminates CMP sensor.

The detection system consists of the crankshaft rotor and CKP sensor for the crankshaft position (TDC position) detection, and MAP sensor connected to No.1, 2, 3 throttle manifold via vacuum hoses for the camshaft position (TDC position in compression stroke) detection.



DETECTION SYSTEM

The ECM always monitors the manifold pressure by the MAP sensor signal and figures it. In response to the camshaft position (TDC position in compression stroke), the MAP figure changes its wave profile. The ECM recognizes these wave profile repetition and combined with the CKP sensor, then detects the camshaft position.



3. FRAME/BODY PANELS/EXHAUST SYSTEM

SERVICE INFORMATION	3-2	FRONT CENTER COWL.....	3-7
TROUBLESHOOTING	3-2	REAR COWL	3-8
SEAT.....	3-3	FRONT FENDER	3-9
SEAT BRACKET	3-3	REAR FENDER	3-10
RIGHT/LEFT SIDE COVER.....	3-4	MUFFLER	3-12
WINDSCREEN.....	3-4	EXHAUST PIPE	3-13
METER PANEL	3-5	MAIN STAND (CBF1000A).....	3-15
RIGHT/LEFT FRONT COWLS.....	3-6	SIDE STAND	3-16
REARVIEW MIRROR.....	3-6		

SERVICE INFORMATION

GENERAL

- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.
- This section covers removal and installation of the body panels 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 pipe gaskets after removing the exhaust pipe 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. If you tighten the mounting fasteners first, the exhaust pipe may not seat properly.
- Always inspect the exhaust system for leaks after installation.

TORQUE VALUES

Exhaust pipe joint nut	20 N·m (2.0 kgf·m, 15 lbf·ft)
Side stand pivot bolt	15 N·m (1.5 kgf·m, 11 lbf·ft)
Side stand pivot nut	39 N·m (4.0 kgf·m, 29 lbf·ft)
Grab rail mounting bolt	27 N·m (2.8 kgf·m, 20 lbf·ft)
Front fender mounting bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Rearview mirror mounting bolt	14 N·m (1.4 kgf·m, 10 lbf·ft)

TROUBLESHOOTING

Excessive exhaust noise

- Broken exhaust system
- Exhaust gas leak

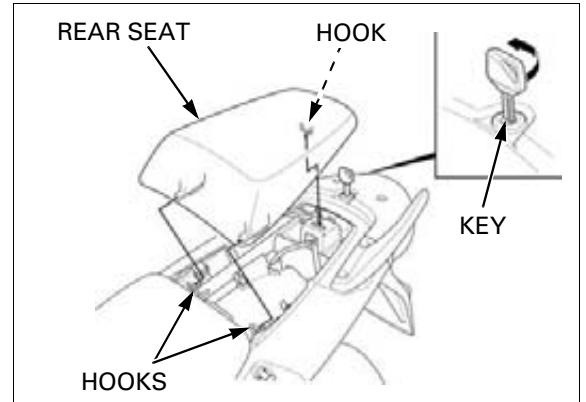
Poor performance

- Deformed exhaust system
- Exhaust gas leak
- Clogged muffler

SEAT

REMOVAL/INSTALLATION

Unhook the pillion seat with the ignition key.
Remove the rear seat.



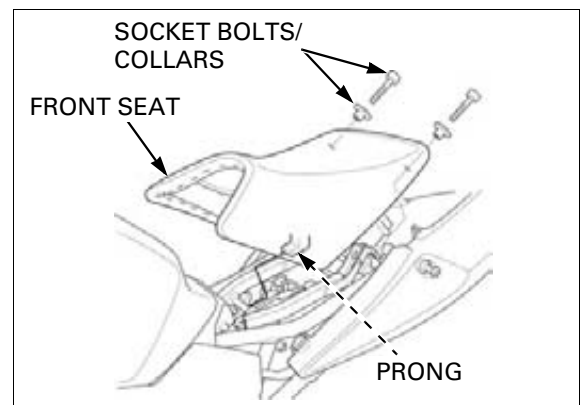
Remove the socket bolts and collars.
Remove the front seat backward while releasing the seat prong from the seat bracket.

Install the front seat while hooking the prong under the seat bracket cross pipe.

Install the collars and tighten the socket bolts.

Install the rear seat and push the seat forward, then down to lock it.

After installation, make sure that the seats are installed properly by moving them.



SEAT BRACKET

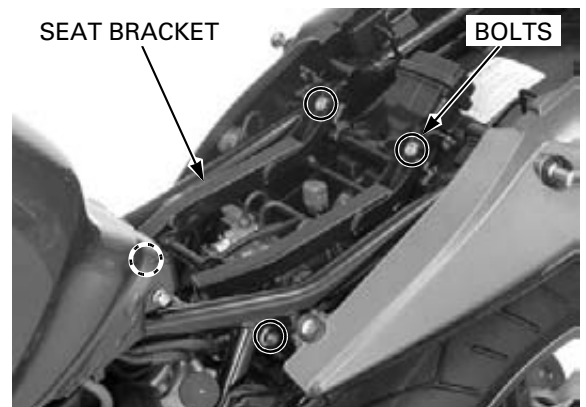
REMOVAL/INSTALLATION

Remove the side socket bolts, rear socket bolts and seat bracket.

If you wish the seat position upward or downward, you can choose low or high position. There are three bolt holes each mounting point. Middle bolt hole is standard position.

Install the seat bracket.

Install and tighten the side socket bolts (flange) and rear socket bolts securely.



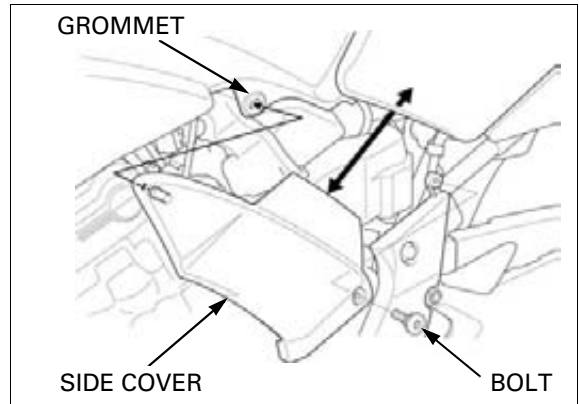
RIGHT/LEFT SIDE COVER

REMOVAL/INSTALLATION

Remove the side cover bolt.

Release the boss from the fuel tank grommet, then remove the side cover.

Install the side cover aligning its boss with the grommets in the fuel tank.



WINDSCREEN

REMOVAL/INSTALLATION

Be careful not to damage the bosses.

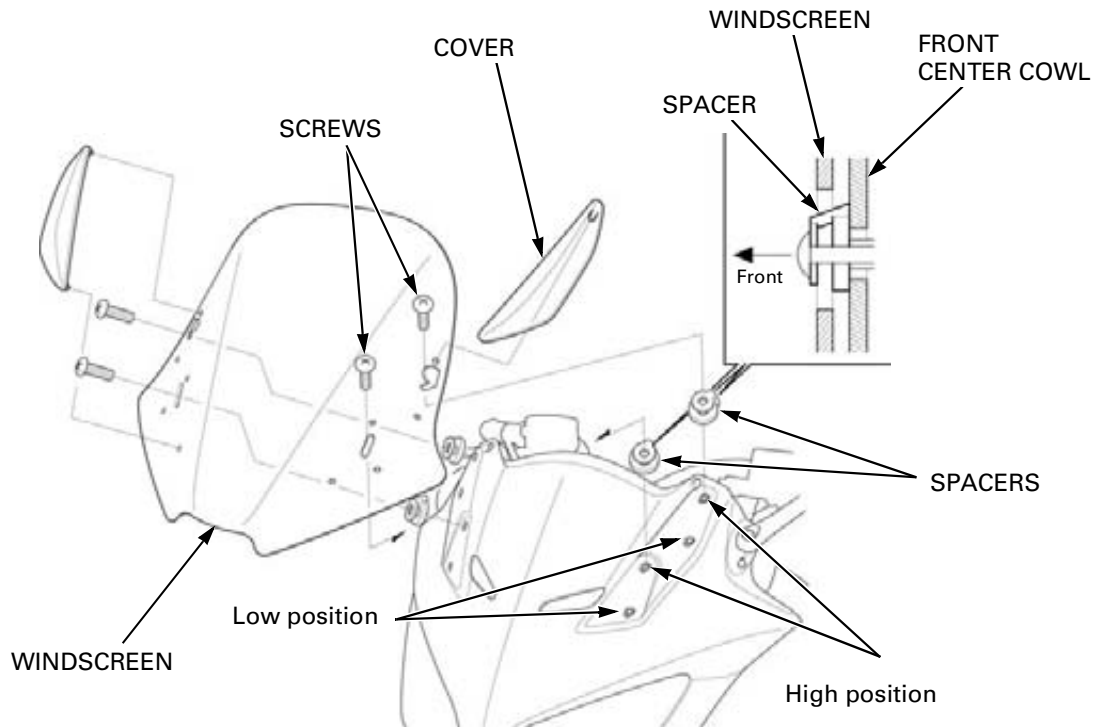
Remove the windscreen covers by pulling its bosses.

Remove the four screws and the windscreen.

Installation is in the reverse order of removal.

NOTE:

- Install the spacer onto the windscreen as shown.
- It is possible to select the windscreen high or low position.



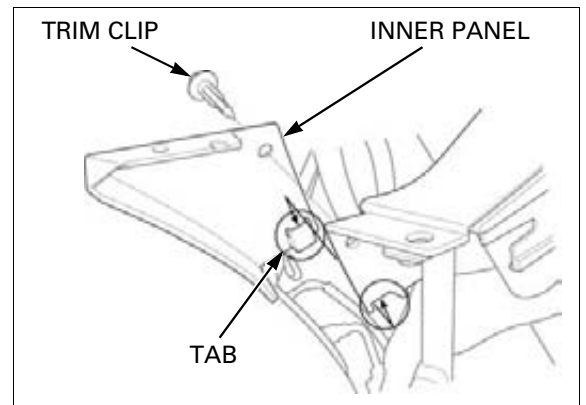
METER PANEL

REMOVAL/INSTALLATION

Remove the trim clip.

Unhook the tab of the inner panel from the front center cowl, then remove the inner panel.

Remove the other side inner panel.

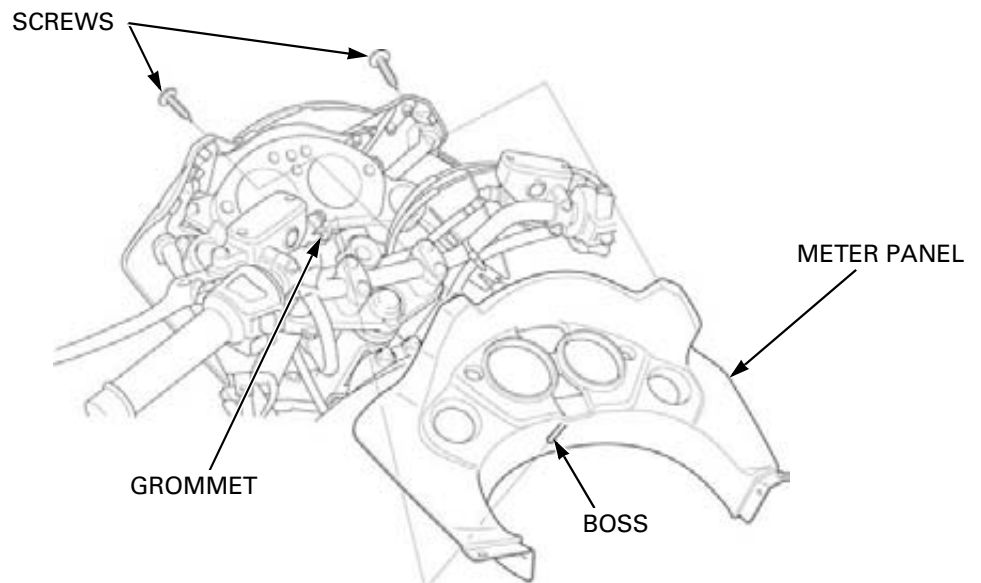


Remove the windscreen (page 3-4).

Remove the two screws.

Pull the boss of the meter panel from the combination meter grommet, then remove the meter panel.

Install the meter panel and inner panels in the reverse order of removal.



RIGHT/LEFT FRONT COWLS

REMOVAL/INSTALLATION

Remove the following:

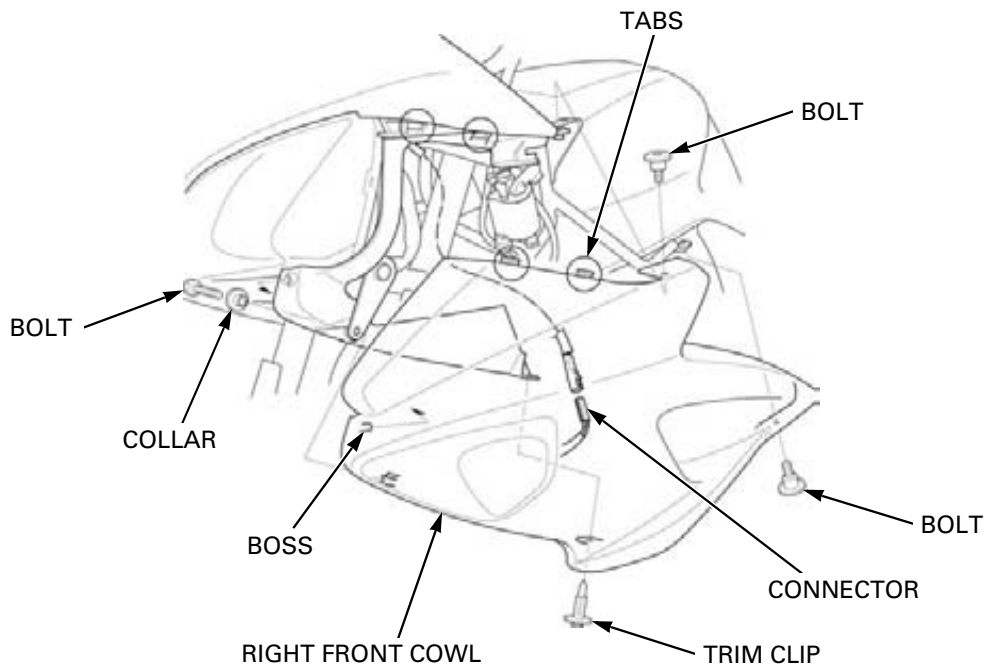
- Trim clip
- Bolt and collar
- Mounting bolts

Unhook the boss and tabs from the front center cowl, then disconnect the turn signal light wire connector.

Installation is in the reverse order of removal.

NOTE:

The illustration shows the right front cowl removal/installation. Remove and install the left front cowl in the same manner.



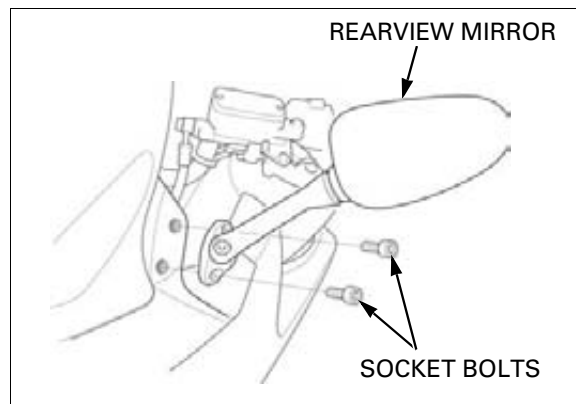
REARVIEW MIRROR

REMOVAL/INSTALLATION

Remove the socket bolts and rearview mirror.

Installation is in the reverse order of removal.

TORQUE: 14 N·m (1.4 kgf·m, 10 lbf·ft)



FRONT CENTER COWL

REMOVAL/INSTALLATION

Remove the following:

- Rearview mirror (page 3-6)
- Meter panel (page 3-5)
- Right and left front cowls (page 3-6)

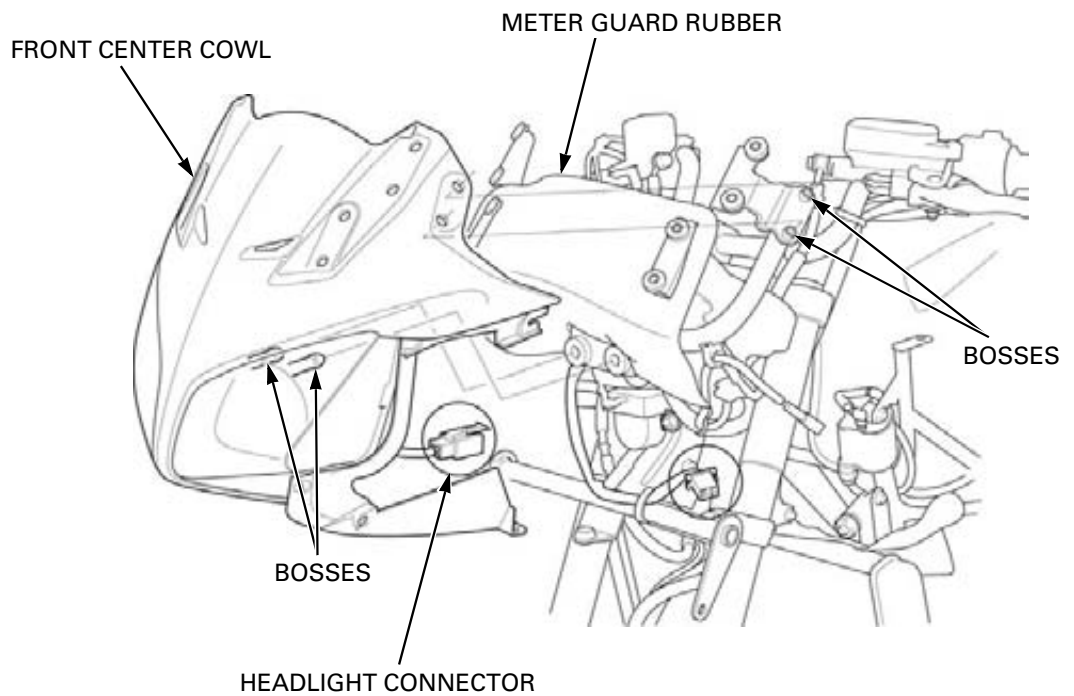
Release the rearview mirror mounting bosses from the front center cowl.

Remove the front center cowl by pulling its bosses from the grommet, then disconnect the headlight connector.

Remove the meter guard rubber from the front center cowl stay.

Installation is in the reverse order of removal.

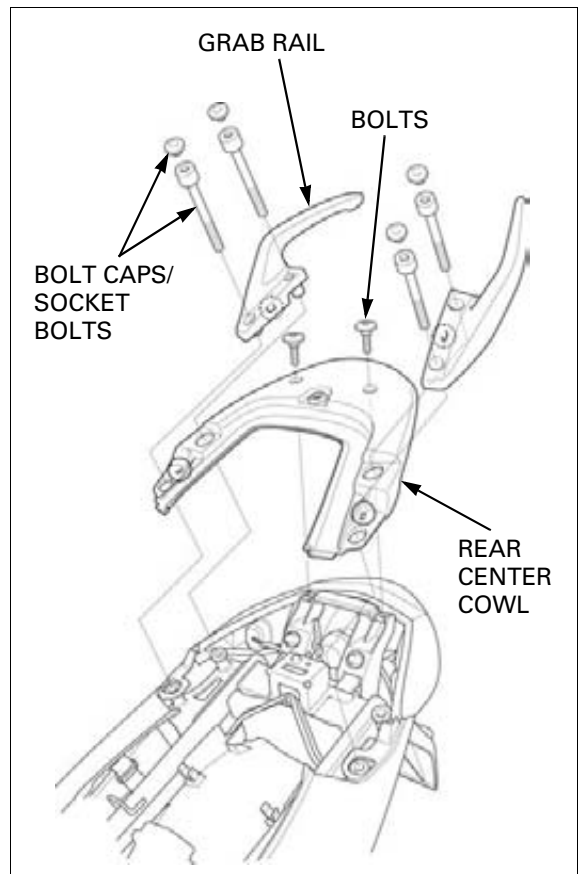
Be careful not to jam the guard rubber between the front center cowl and stay.



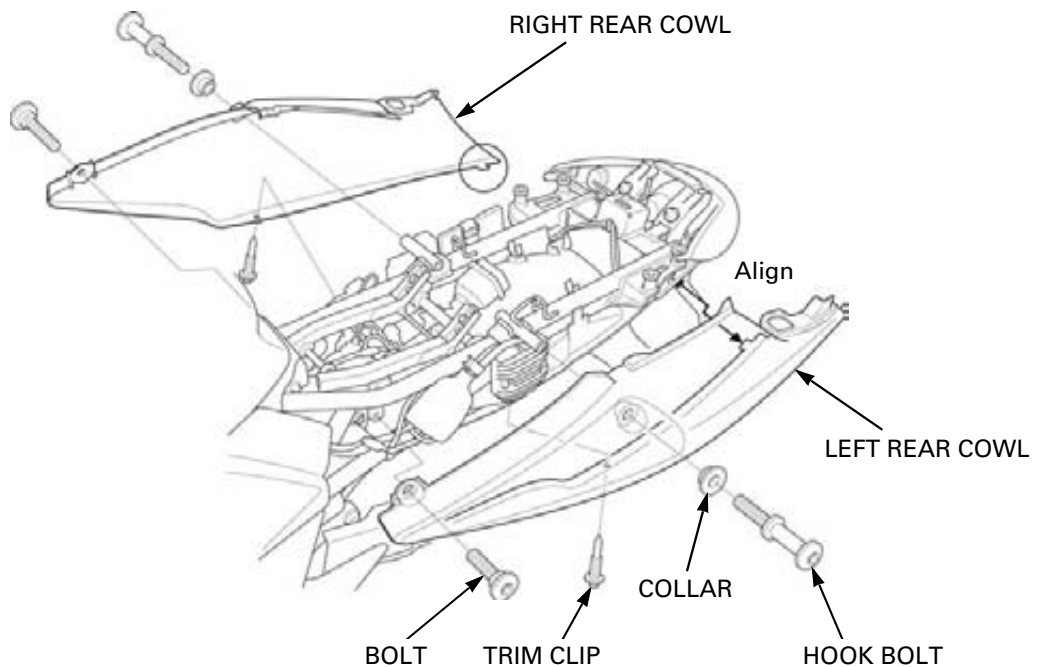
REAR COWL

REMOVAL

- Remove the seat (page 3-3).
- Remove the bolt caps.
- Remove the socket bolts and grab rails.
- Remove the bolts and rear center cowl.



- Remove the trim clip.
- Remove the bolt, hook bolt and collar.
- Carefully release the tab of the rear cowl, then remove.
- Remove the other side rear cowl in the same manner.



INSTALLATION

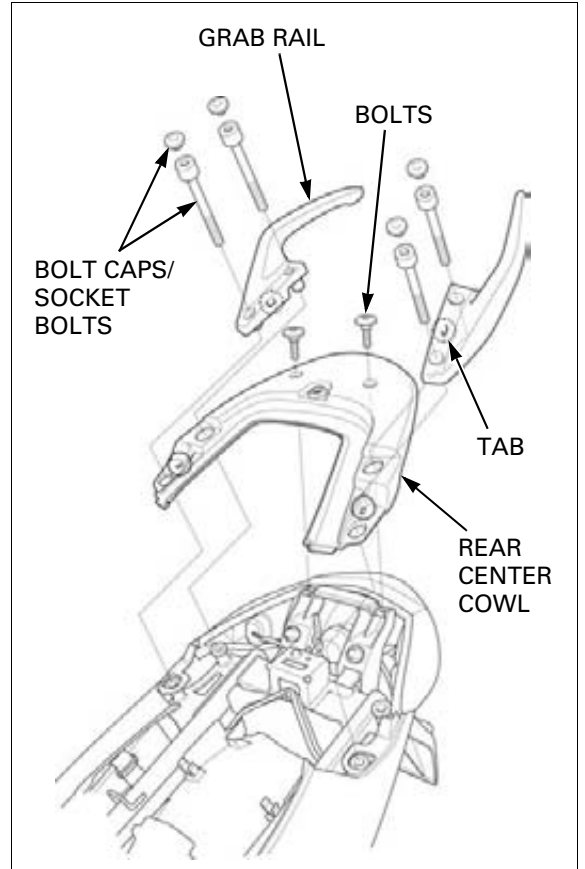
Installation is in the reverse order of removal.

Align the tab on the grab rail with the hole on the rear center cowl.

Install the grab rail and mounting socket bolts. Tighten the socket bolts to the specified torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)

Install the bolt caps securely.



FRONT FENDER

REMOVAL/INSTALLATION

Remove the front mounting bolts and rear mounting bolts (brake hose clamp bolts).

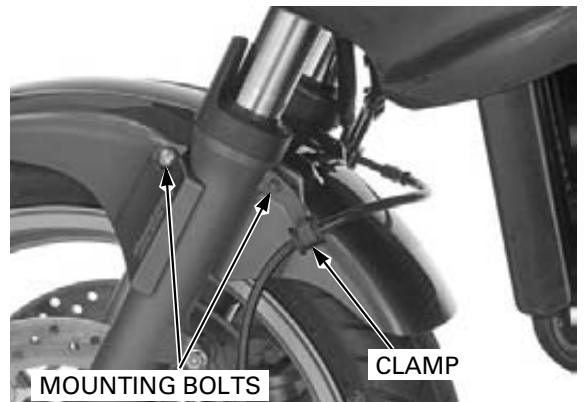
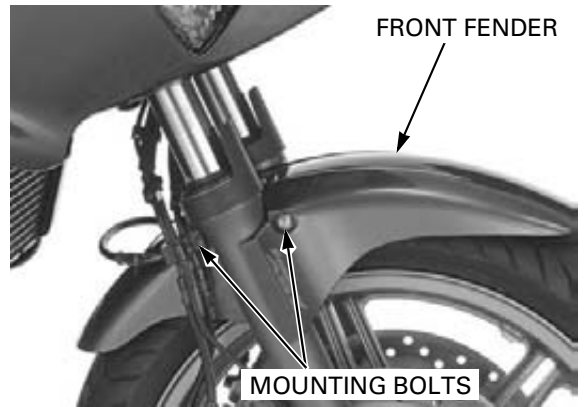
Remove the front fender forward.

Installation is in the reverse order of removal.

Tighten the front fender mounting bolts to the specified torque.

TORQUE:

**Front fender mounting bolt (front/rear):
12 N·m (1.2 kgf·m, 9 lbf·ft)**



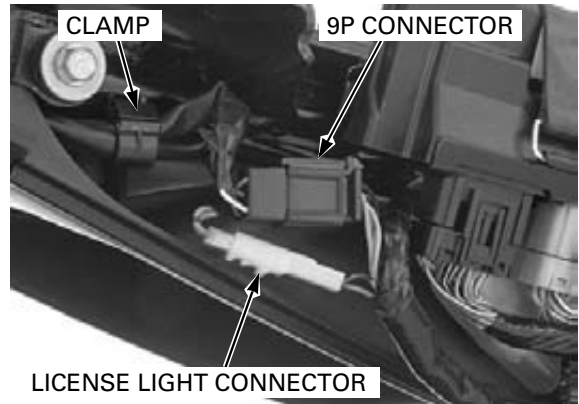
REAR FENDER

REMOVAL/INSTALLATION

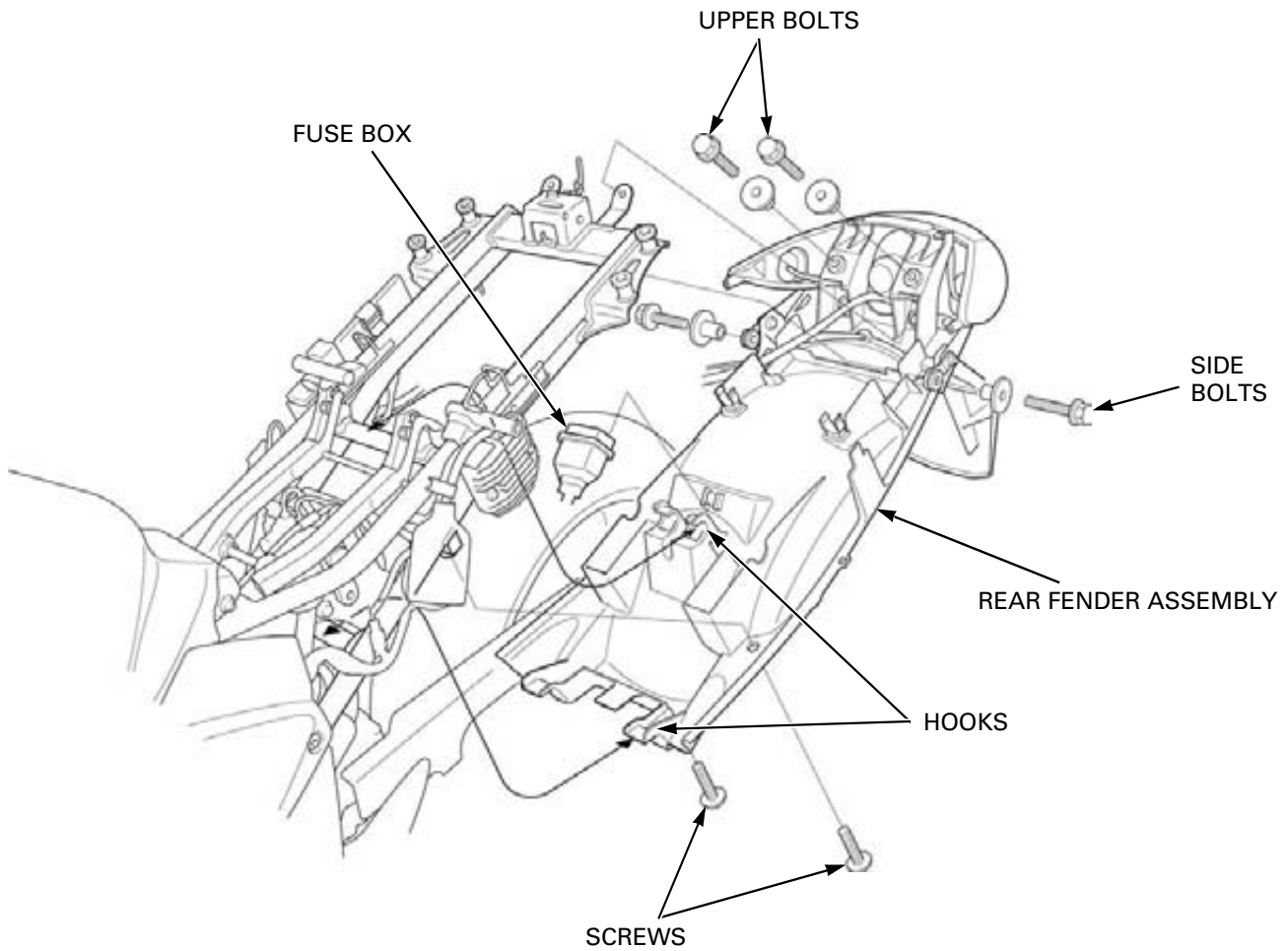
Remove the rear cowl (page 3-8).

Release the wires from the harness clamp.

Disconnect the tail/brake light 9P (Black) and license light 2P (White) connectors.



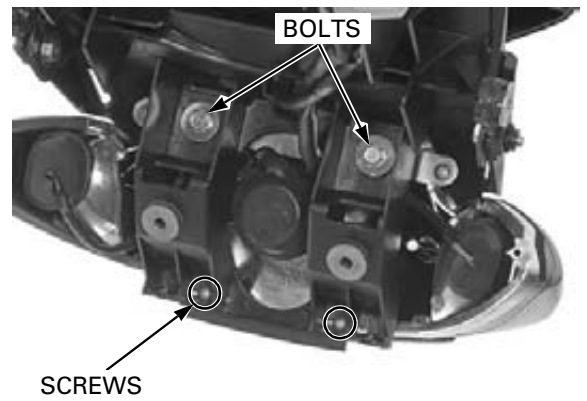
Remove the screws, upper bolts and side bolts.
Remove the fuse box from the rear fender.
Release the hooks from the frame, then remove the rear fender assembly.



FRAME/BODY PANELS/EXHAUST SYSTEM

Remove the screws and bolts.

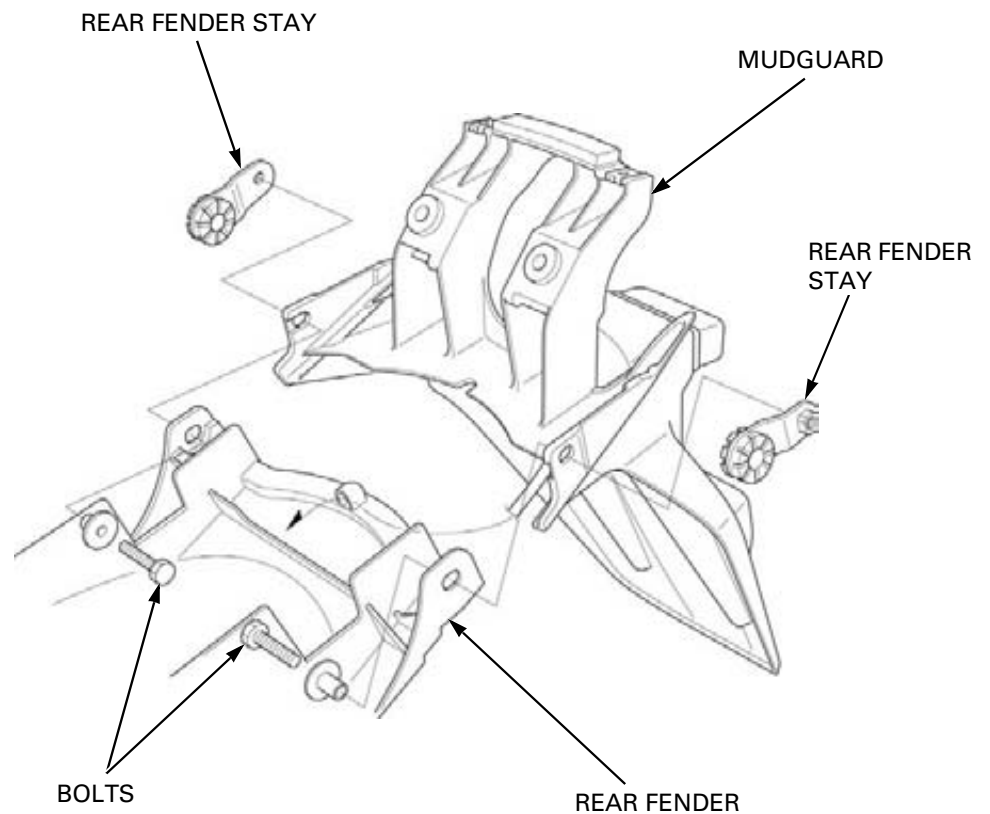
Remove the tail/brake light unit from the rear fender assembly.



Remove the bolts and rear fender stay.

Remove the mudguard from the rear fender.

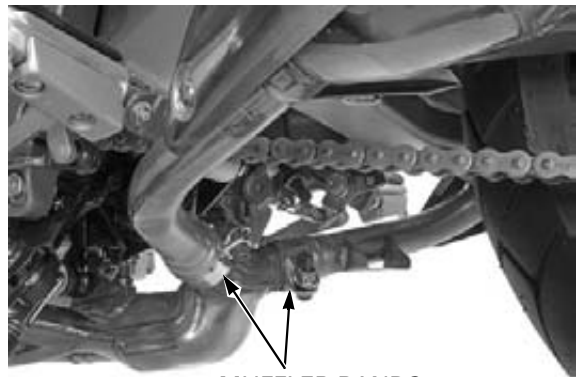
Assemble the rear fender and install it in the reverse order.



MUFFLER

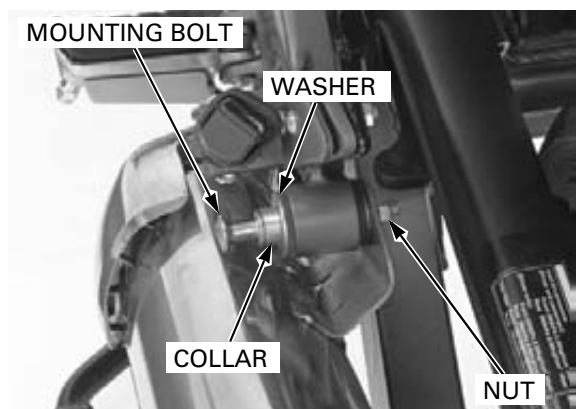
REMOVAL/INSTALLATION

Loosen the muffler band bolt.



MUFFLER BANDS

Hold the muffler mounting bolt and loosen the nut, then remove the mounting bolt, collar, washer, nut and the muffler.

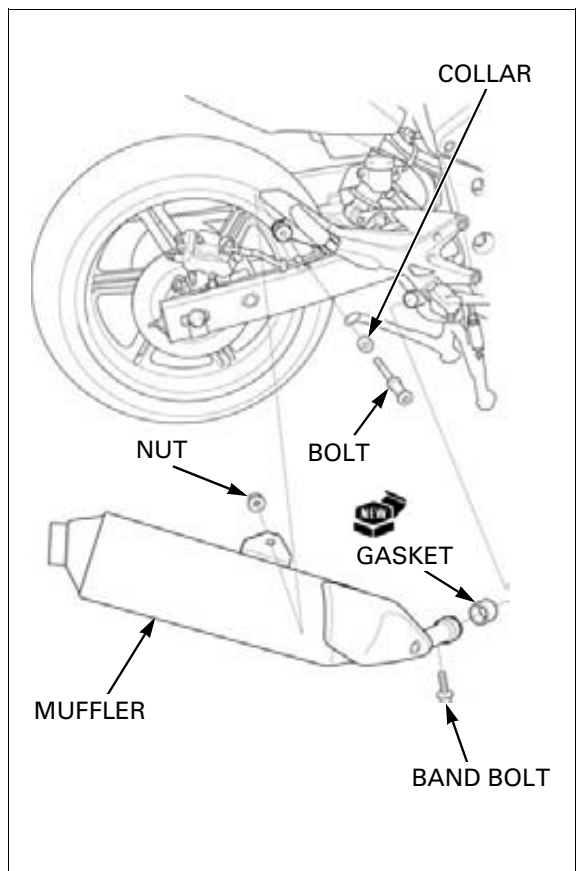


Always replace the gasket with a new one.

Remove the muffler gasket and replace it with new one.

Install the muffler in the reverse order of removal.

Tighten the muffler band bolts securely. Hold the muffler mounting bolts and tighten the nuts securely.



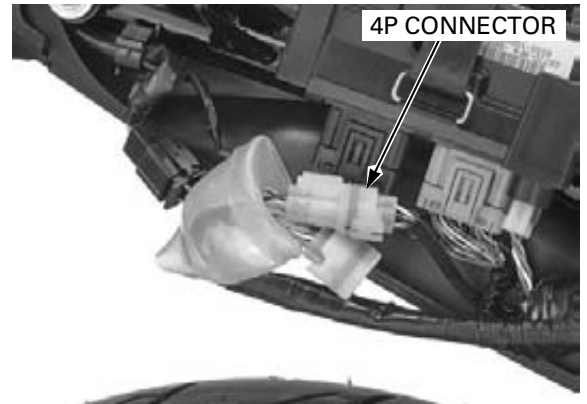
EXHAUST PIPE

REMOVAL

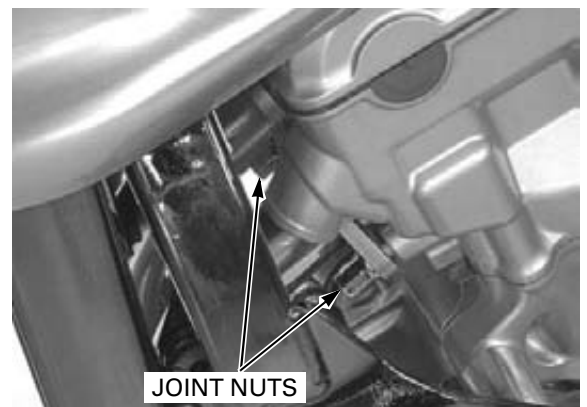
Remove the following:

- Right rear cowl (page 3-8)
- Mufflers (page 3-12)

Disconnect the O₂ sensor 4P (Natural) connector.



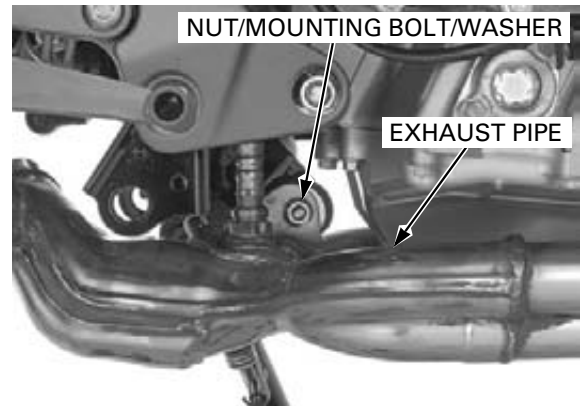
Remove the exhaust pipe joint nuts.



Remove the nut, mounting bolt and washer.

Remove the exhaust pipe with the O₂ sensor wire.

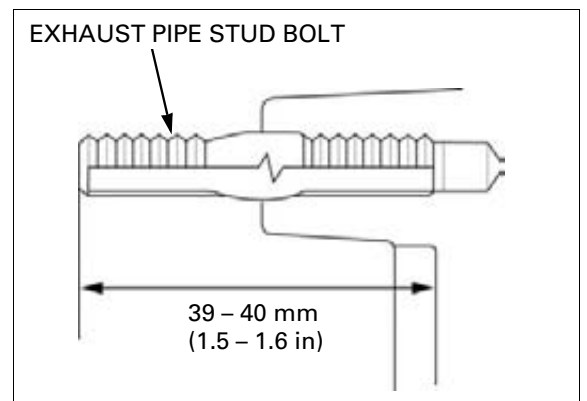
Carefully release the O₂ sensor wire from the frame.



INSTALLATION

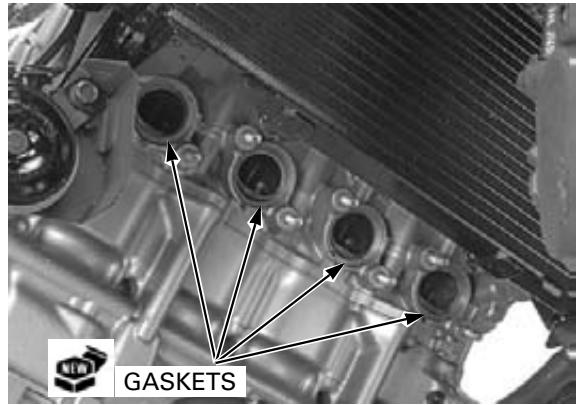
Check that the exhaust pipe stud bolt protrusion from the exhaust port is specified length as shown.

SPECIFIED LENGTH: 39 – 40 mm (1.5 – 1.6 in)



FRAME/BODY PANELS/EXHAUST SYSTEM

Always replace the gaskets with new ones. Install the new gaskets to the exhaust ports.

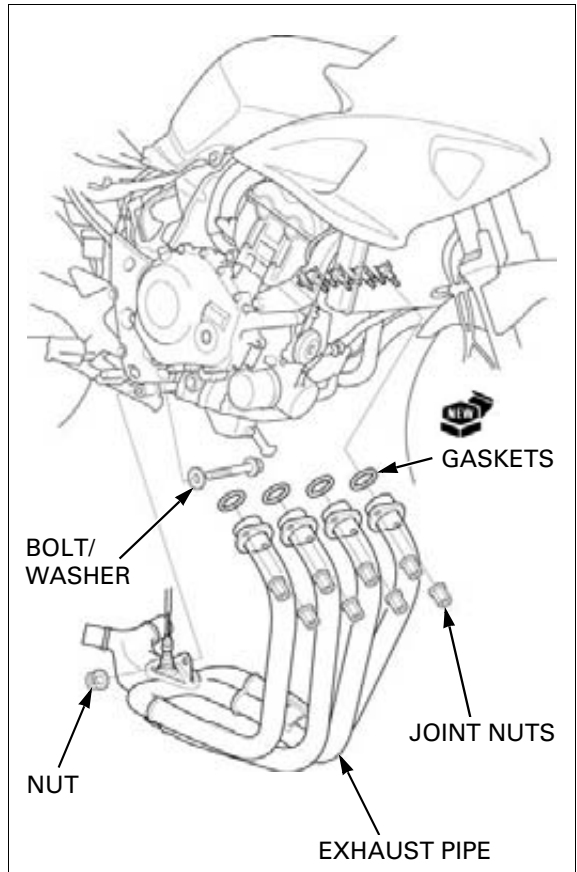


Refer to "CABLE & HARNESS ROUTING" (page 1-23) Route the O₂ sensor wire properly and install the exhaust pipe. Temporarily install the exhaust pipe joint nuts, exhaust pipe mounting bolt, washer and nut.

First tighten the exhaust pipe joint nuts to the specified torque.

TORQUE: 20 N-m (2.0 kgf-m, 15 lbf-ft)

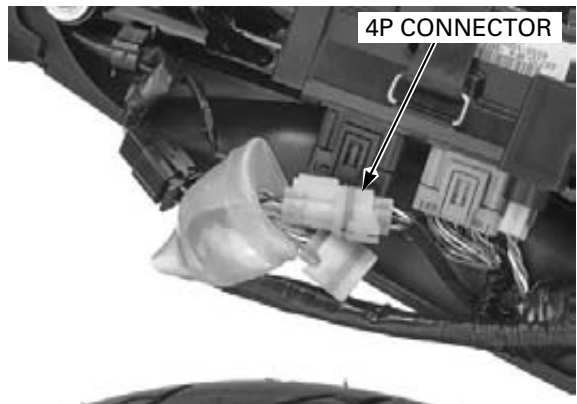
Hold the exhaust pipe mounting bolt and tighten the nut securely.



Connect the O₂ sensor 4P (Natural) connector and put the connector boot behind the ECM.

Install the following:

- Right rear cowl (page 3-9)
- Mufflers (page 3-12)



MAIN STAND (CBF1000A)

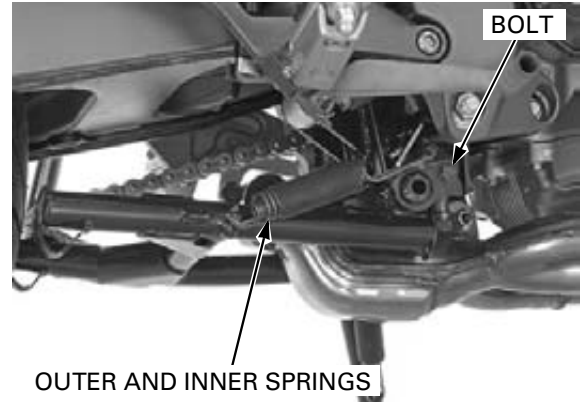
REMOVAL

Support the motorcycle securely using the side stand.

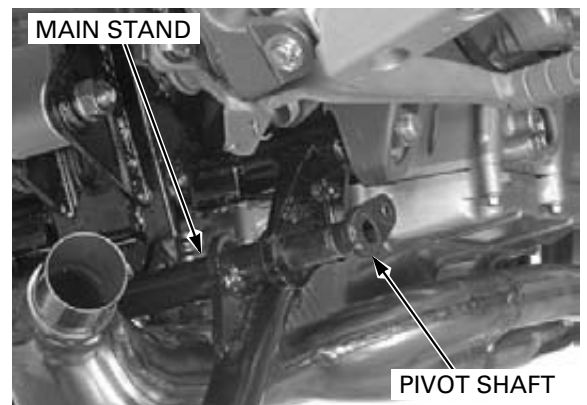
Remove the right and left mufflers (page 3-12).

Unhook the main stand springs (outer and inner).

Remove the pivot shaft mounting bolt.



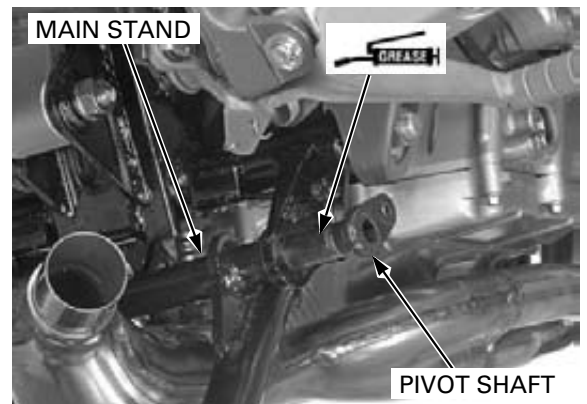
Pull the pivot shaft out and remove the main stand.



INSTALLATION

Apply multi-purpose grease to the pivot shaft sliding surfaces.

Install the main stand and pivot shaft.

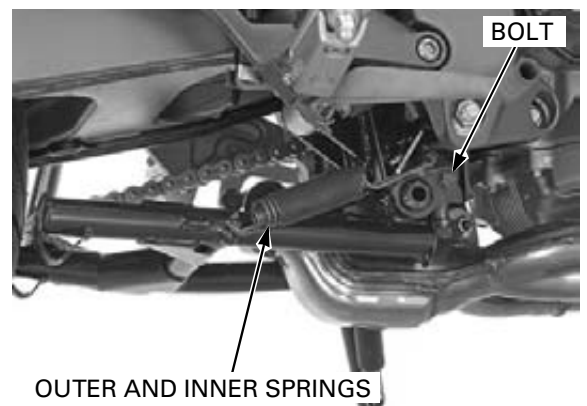


Install and tighten the pivot shaft mounting bolt.

Hook the main stand springs (outer and inner).

Install the right and left mufflers (page 3-12).

After installation, check the main stand operation.



SIDE STAND

REMOVAL/INSTALLATION

Support the motorcycle using the main stand (CBF1000A) or other support tool.

Remove the side stand switch (page 21-25).

Retract the side stand.

Unhook the side stand spring.

Hold the pivot bolt and loosen the pivot nut.

Remove the pivot nut, pivot bolt and side stand.

Installation is in the reverse order of removal.

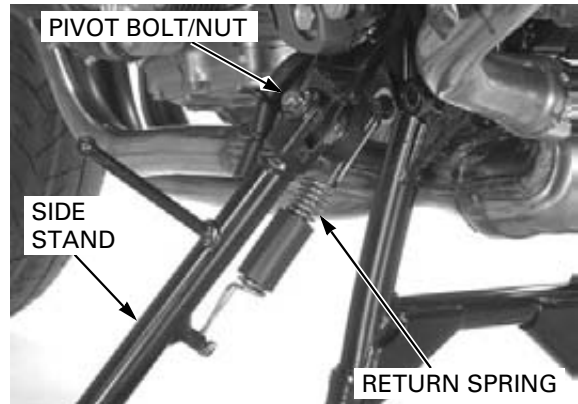
TORQUE:

Side stand pivot bolt:

15 N·m (1.5 kgf·m, 11 lbf·ft)

Side stand pivot nut:

39 N·m (4.0 kgf·m, 29 lbf·ft)



SERVICE INFORMATION	4-2	DRIVE CHAIN SLIDER	4-25
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CRANKCASE BREATHER	4-7	HEADLIGHT AIM	4-28
SPARK PLUG	4-8	CLUTCH SYSTEM	4-28
VALVE CLEARANCE.....	4-11	CLUTCH FLUID	4-29
ENGINE OIL/OIL FILTER	4-16	SIDE STAND	4-30
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DRIVE CHAIN	4-21	STEERING HEAD BEARINGS	4-32

MAINTENANCE

SERVICE INFORMATION

GENERAL

- Place the motorcycle on a level ground before starting any work.
- 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 and enclosed area.

SPECIFICATIONS

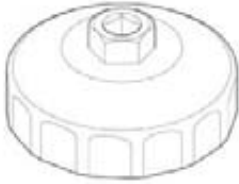
ITEM		SPECIFICATIONS	
Throttle grip free play		2 – 6 mm (1/12 – 1/4 in)	
Spark plug	NGK	CR8EH-9	
	DENSO	U24FER9	
Spark plug gap		0.80 – 0.90 mm (0.031 – 0.035 in)	
Valve clearance	IN	0.16 ± 0.03 mm (0.006 ± 0.001 in)	
	EX	0.32 ± 0.03 mm (0.013 ± 0.001 in)	
Engine oil capacity	After draining	2.7 liter (2.9 US qt, 2.4 Imp qt)	
	After oil filter change	3.5 liter (3.7 US qt, 3.1 Imp qt)	
Engine oil		Suggested oil: Honda "4-stroke motorcycle oil" or an equivalent Oil recommendation: API 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 idle speed		1,200 ± 100 min ⁻¹ (rpm)	
Drive chain slack		20 – 30 mm (4/5 – 1-1/5 in)	
Recommended brake fluid		DOT 4	
Recommended clutch fluid		DOT 4	
Tire size	Front	120/70ZR17M/C (58W)	
	Rear	160/60ZR17 M/C (69W)	
Tire brand	Bridgestone	Front	BT57F RADIAL U
		Rear	BT57R RADIAL E
	Michelin	Front	Pilot ROAD B
		Rear	Pilot ROAD A
Tire air pressure	Driver only	Front	250 kPa (2.50 kgf/cm ² , 36 psi)
		Rear	290 kPa (2.90 kgf/cm ² , 42 psi)
	Driver and passenger	Front	250 kPa (2.50 kgf/cm ² , 36 psi)
		Rear	290 kPa (2.90 kgf/cm ² , 42 psi)
Minimum tire tread depth	Front	1.5 mm (0.06 in)	
	Rear	2.0 mm (0.08 in)	

TORQUE VALUES

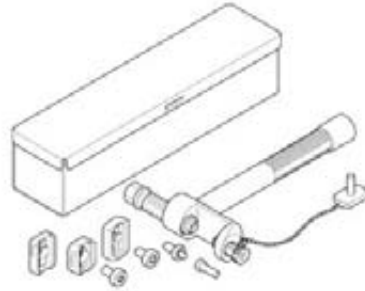
Spark plug	16 N·m (1.6 kgf·m, 12 lbf·ft)	
Timing hole cap	18 N·m (1.8 kgf·m, 13 lbf·ft)	Apply grease to the threads.
Engine oil filter cartridge	26 N·m (2.7 kgf·m, 19 lbf·ft)	Apply engine oil to the threads and O-ring.
Engine oil drain bolt	30 N·m (3.1 kgf·m, 22 lbf·ft)	
Drive chain adjuster lock nut	21 N·m (2.1 kgf·m, 15 lbf·ft)	
Rear axle nut	108 N·m (11.0 kgf·m, 80 lbf·ft)	U-nut
Air cleaner duct mounting screw	1.1 N·m (0.1 kgf·m, 0.8 lbf·ft)	
Rear master cylinder push rod lock nut	17 N·m (1.7 kgf·m, 13 lbf·ft)	
Oil filter boss	See page 4-18	Apply a locking agent to the threads.

TOOLS

Oil filter wrench
07HAA-PJ70101



Drive chain tool set
07HMH-MR10103



Cam chain tensioner holder
07ZMG-MCAA400



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	WHICHEVER COMES FIRST ↓	ODOMETER READING (NOTE 1)							REFER TO PAGE		
			↗	1	6	12	18	24	30		36	
			x 1,000 km	0.6	4	8	12	16	20		24	
			Months		6	12	18	24	30		36	
* FUEL LINE					I		I		I	4-5		
* THROTTLE OPERATION					I		I		I	4-6		
AIR CLEANER		NOTE 2				I			I	4-7		
CRANKCASE BREATHER		NOTE 3			C	C	C	C	C	4-7		
* SPARK PLUG					I		R		I	4-8		
* VALVE CLEARANCE							I			4-11		
ENGINE OIL				R		R		R		4-16		
ENGINE OIL FILTER				R		R		R		4-16		
RADIATOR COOLANT		NOTE 4				I		I		R	4-19	
* COOLING SYSTEM						I		I		I	4-19	
* SECONDARY AIR SUPPLY SYSTEM						I		I		I	4-20	
DRIVE CHAIN						EVERY 1,000 km (600 mi) I, L				4-21		
DRIVE CHAIN SLIDER							I		I		4-25	
BRAKE FLUID		NOTE 4				I	I	R	I	I	R	4-25
BRAKE PAD WEAR						I	I	I	I	I	I	4-26
BRAKE SYSTEM						I		I		I	I	4-27
* BRAKE LIGHT SWITCH							I		I		I	4-28
* HEADLIGHT AIM							I		I		I	4-28
CLUTCH SYSTEM						I	I	I	I	I	I	4-28
CLUTCH FLUID		NOTE 4				I	I	R	I	I	R	4-29
SIDE STAND							I		I		I	4-30
* SUSPENSION							I		I		I	4-30
* NUTS, BOLTS, FASTENERS						I		I		I		4-31
** WHEELS/TIRES							I		I		I	4-32
** STEERING HEAD BEARINGS						I		I		I		4-32

* 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 recommended these items be serviced only by an authorized Honda dealer

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

NOTES:

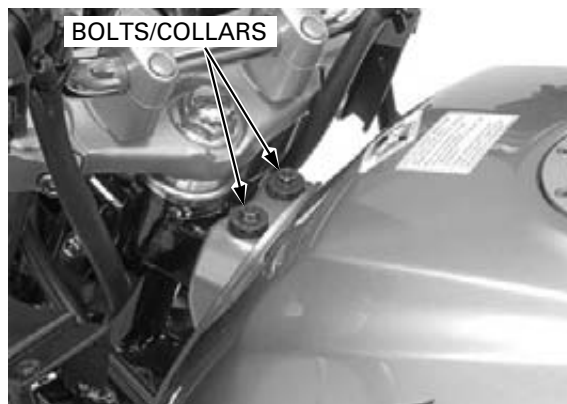
- At higher odometer reading, repeat at the frequency interval established here.
- Service more frequently when riding in unusually wet or dusty areas.
- Service more frequently when riding in rain or at full throttle.
- Replace every 2 years, or at indicated odometer interval, whichever comes first.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

FUEL LINE

Remove the following:

- Seat (page 3-3)
- Side covers (page 3-4)
- Right and left front cowl (page 3-6)
- Inner panel (page 3-5)

Remove the fuel tank front mounting bolts and collars.



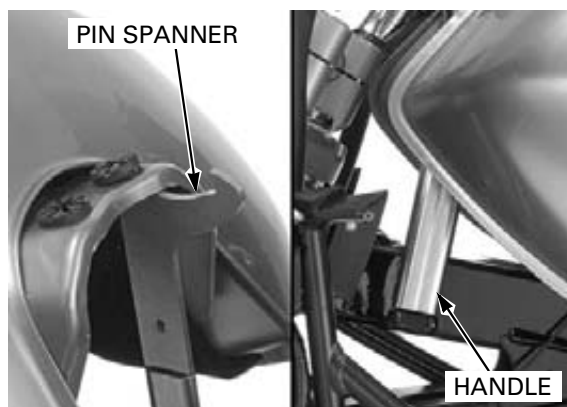
Hold the fuel tank rear pivot bolt and loosen the nut.



Lift the fuel tank and support it using the equipped tools (pin spanner and handle) as shown.

NOTE:

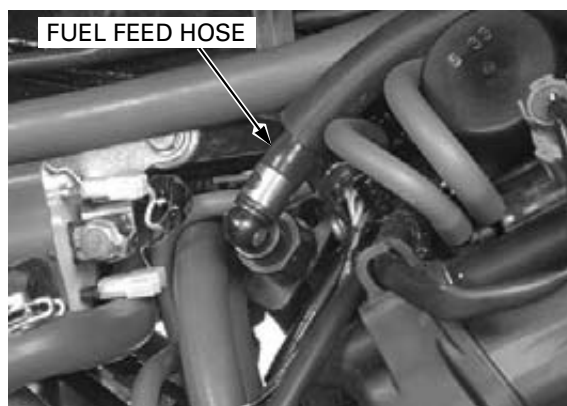
- Support the fuel tank mounting bolt hole with the pin spanner and hook the handle on the stay of the frame.



Check the fuel lines for deterioration, damage or leakage. Replace the fuel line if necessary (page 6-51).

Check the fuel rails and injectors for damage or leakage. Replace them if necessary (page 6-73).

Check the fuel pump mounting area for leakage. Replace the fuel pump packing if necessary (page 6-55).



MAINTENANCE

Remove a support tools, then lower the fuel tank.

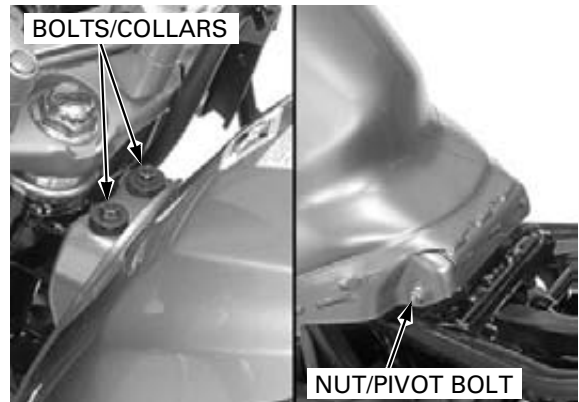
NOTICE

- Route the hoses, wires and harness properly (page 1-23).
- Be careful not to damage the harness and hoses.
- After installing the fuel tank, make sure the drain, breather and fuel hoses are not kinked or bound.
- Check the hose joints for loose or disconnection.



Install the fuel tank front mounting bolts and collars. Tighten the fuel tank mounting bolts and rear pivot nut securely.

Install the removed parts in the reverse order of removal.

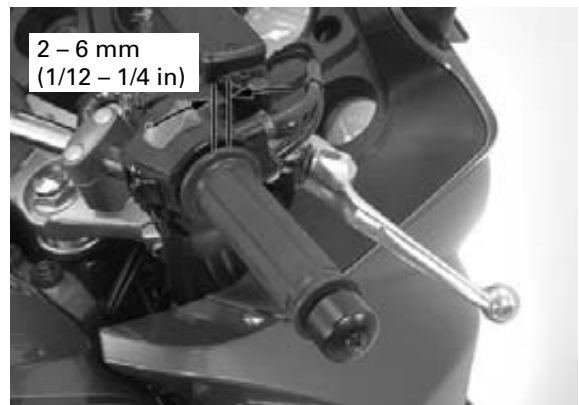


THROTTLE OPERATION

Check for smooth throttle grip full opening and automatic full closing in all steering positions. Check the throttle cables and replace them if they are deteriorated, kinked or damaged (page 6-69). Lubricate the throttle cables, if throttle operation is not smooth.

Measure the free play at the throttle grip flange.

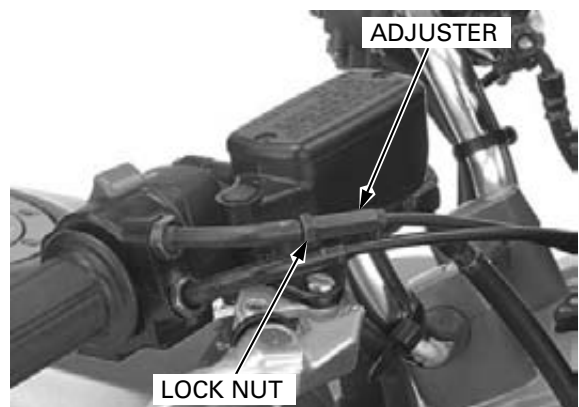
FREE PLAY: 2 – 6 mm (1/12 – 1/4 in)



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

Minor adjustment is made with the throttle grip side adjuster.

Adjust the free play by loosening the lock nut and turning the adjuster.



Major adjustment is made with the throttle body side adjuster.

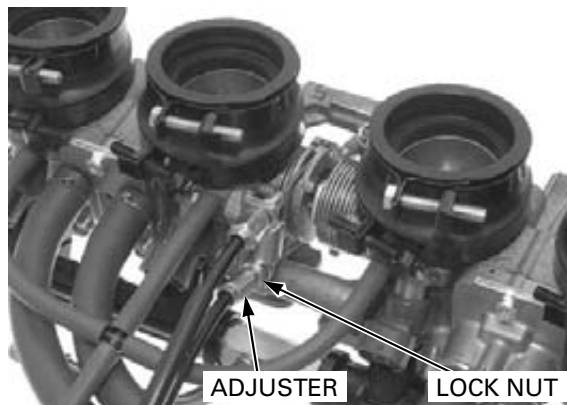
Remove the air cleaner housing (page 6-60).

Adjust the free play by loosening the lock nut and turning the adjuster.

After adjustment, tighten the lock nut securely.

Install the air cleaner housing and recheck the throttle operation (page 6-67).

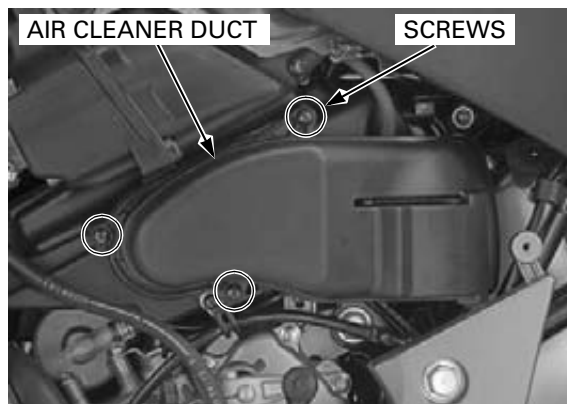
Replace any damaged parts, if necessary.



AIR CLEANER

Remove the left side cover (page 3-4).

Remove the screws and air cleaner duct.



Remove and inspect the air cleaner elements in accordance with the maintenance schedule (page 4-4).

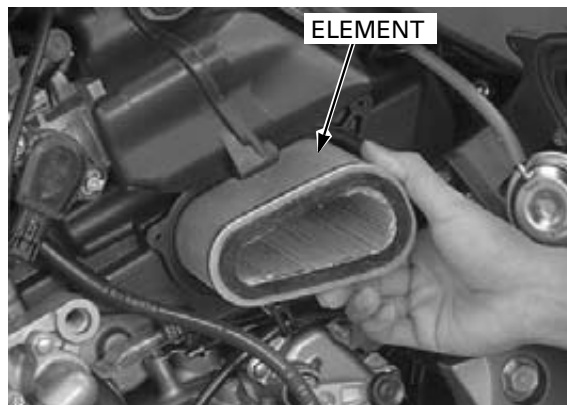
Clean the air cleaner element with the compressed air from outside of the element.

Install the air cleaner element with its opening facing out.

Install the removed parts in the reverse order of removal.

TORQUE:

**Air cleaner duct mounting screw:
1.1 N·m (0.1 kgf·m, 0.8 lbf·ft)**



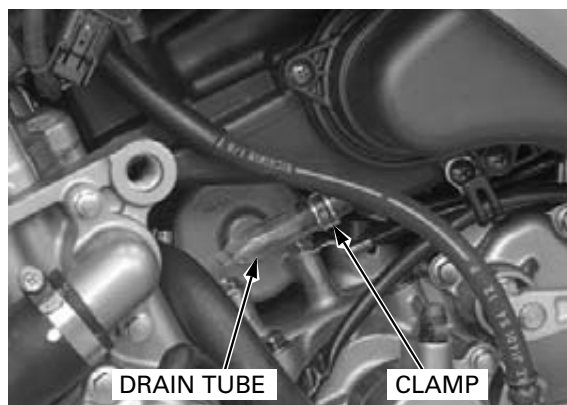
CRANKCASE BREATHER

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 tube.

Remove the left side cover (page 3-4).

Remove the crankcase breather drain tube and drain the deposits into a suitable container, then reinstall the drain tube with the tube clamp.



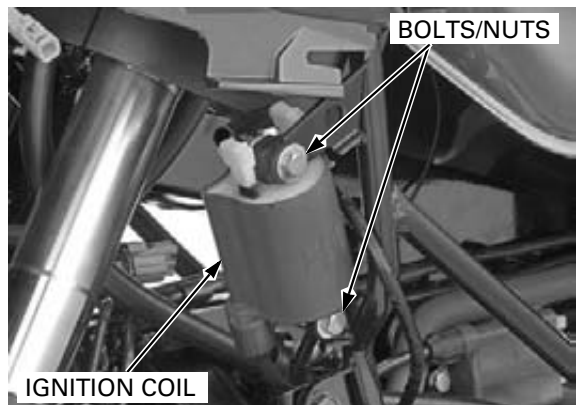
MAINTENANCE

SPARK PLUG

REMOVAL

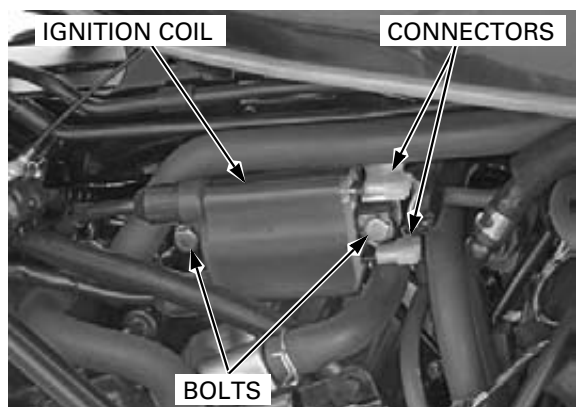
Lift and support the fuel tank (page 4-5).

Remove the ignition coil mounting bolts and nuts to disconnect the #2 and #3 spark plug caps.

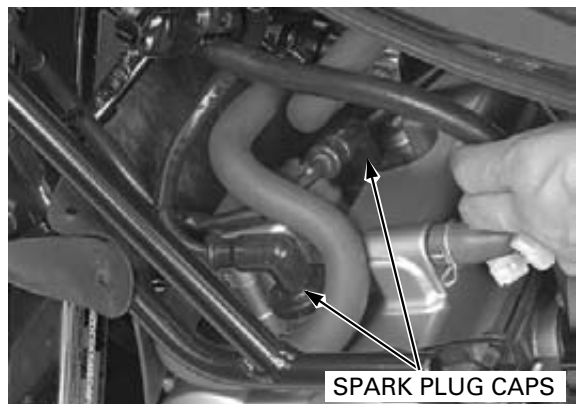


Disconnect the #1/#4 ignition coil connectors.

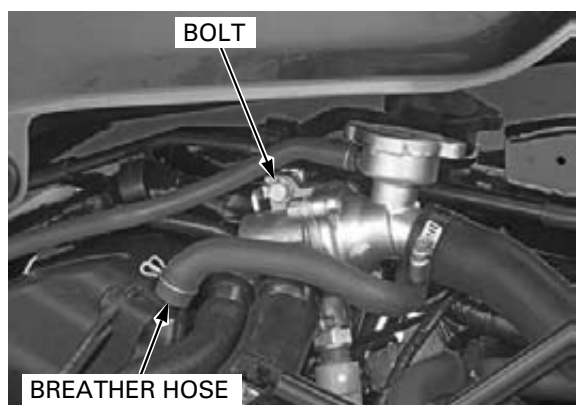
Remove the mounting bolts to disconnect the #1 and #4 spark plug caps.



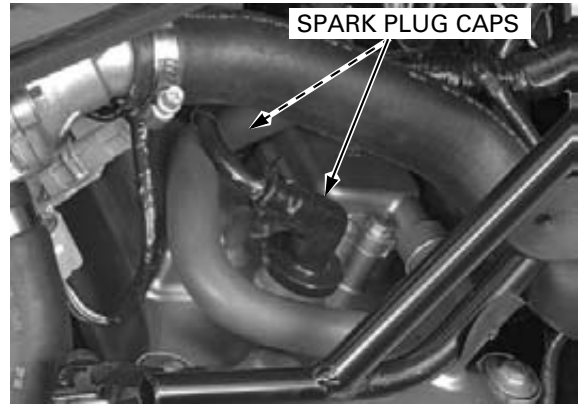
Disconnect the #1 and #2 spark plug caps.



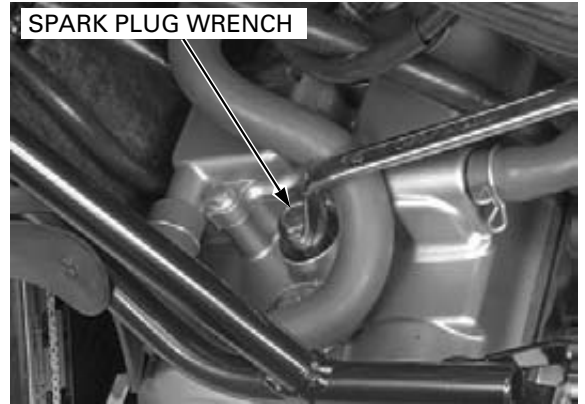
If the #3 spark plug cap is hard to be disconnected, disconnect the crankcase breather hose and remove the thermostat case mounting bolt.



Disconnect the #3 and #4 spark plug caps.



Remove the spark plugs using a equipped spark plug wrench or an equivalent tool.



INSPECTION

Check the insulator for cracks or damage, and the electrodes for wear, fouling or discoloration.

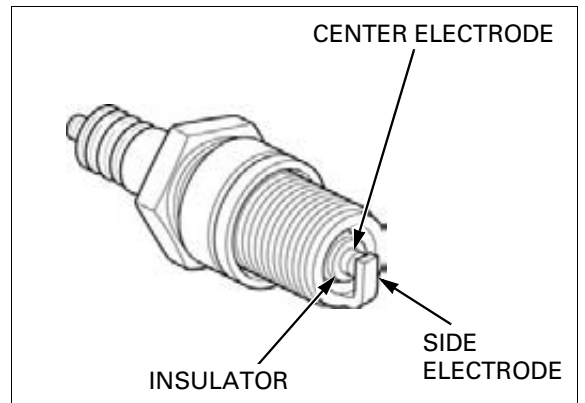
Replace the spark plugs if necessary.

SPECIFIED SPARK PLUG:

NGK: CR8EH-9

DENSO: U24FER9

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

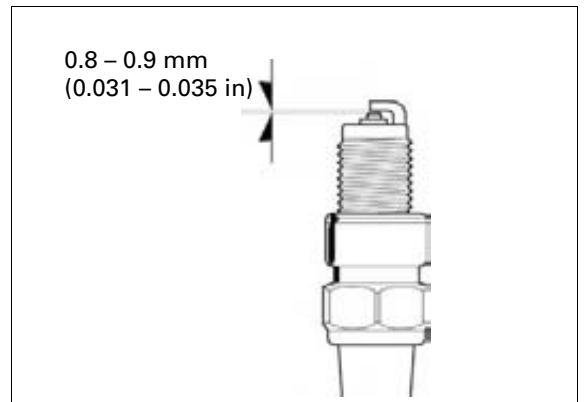


Check the gap between the center and side electrodes with a wire type feeler gauge.

SPARK PLUG GAP:

0.80 – 0.90 mm (0.031 – 0.035 in)

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



MAINTENANCE

INSTALLATION

For new spark plug; install and hand-tighten the spark plug, then tighten it about 1/2 turns after the sealing washer contacts the seat of the plug hole.

Thread each spark plug in by hand to prevent cross-threading, and tighten them using a spark plug wrench.

TORQUE: 16 N·m (1.6 kgf·m, 12 lbf·ft)

Refer to "Cable & Harness Routing" (page 1-23). Route the spark plug wires properly and connect the #3 and #4 spark plug caps.

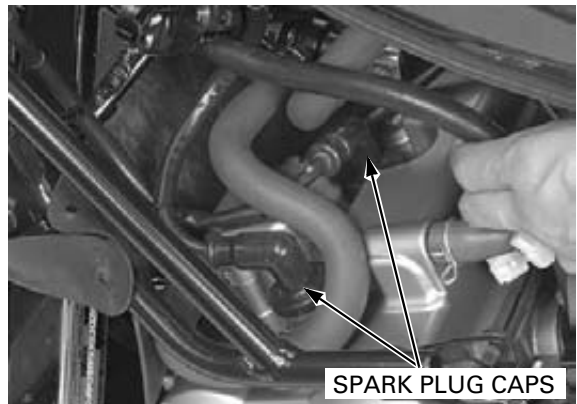
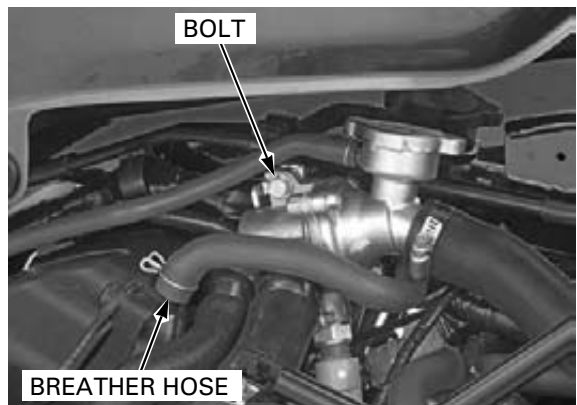
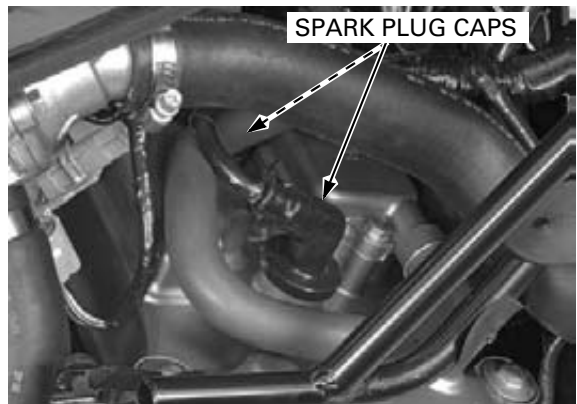
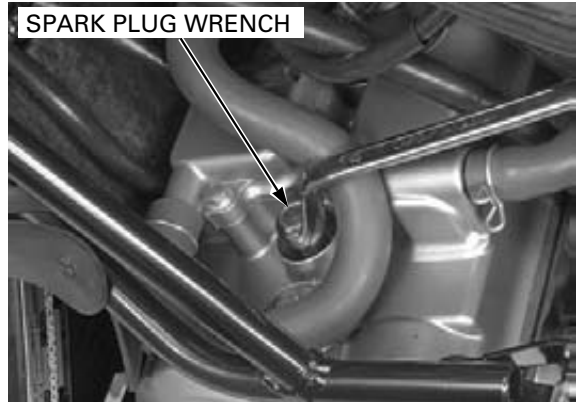
Route the spark plug wires properly and connect the #3 and #4 spark plug caps.

If the thermostat case is removed, install it onto the frame and tighten the mounting bolt.

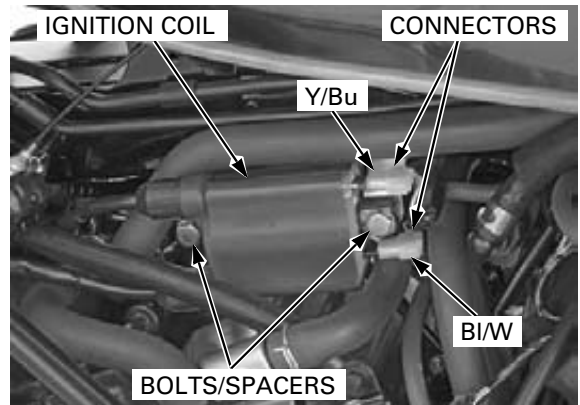
Connect the crankcase breather hose.

Refer to "Cable & Harness Routing" (page 1-23). Route the spark plug wires properly and connect the #1 and #2 spark plug caps.

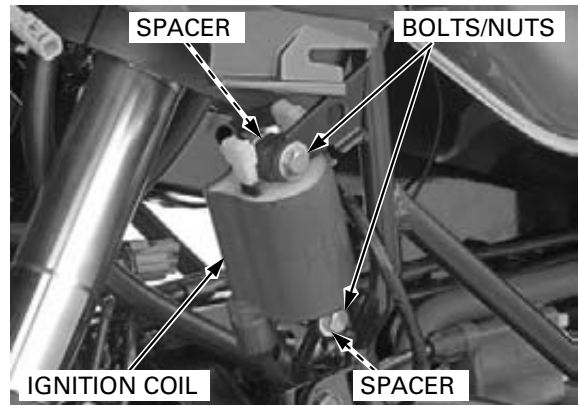
Route the spark plug wires properly and connect the #1 and #2 spark plug caps.



Install the #1/#4 ignition coil with the spacers, and tighten the mounting bolts.
Connect the ignition coil connectors.



Install the #2/#3 ignition coil with the spacers.
Install the mounting bolts, spacers and nuts, then tighten the nuts securely.
Install the removed parts in the reverse order.



VALVE CLEARANCE

INSPECTION

NOTE:

- Check the engine idle speed (page 6-76) 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 9-6).

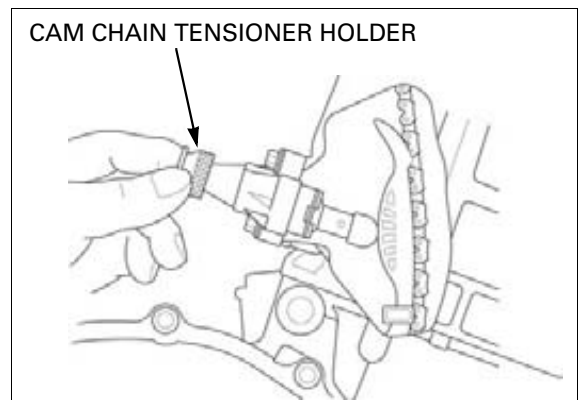
Remove the cam chain tensioner lifter sealing bolt and sealing washer.



Turn the tensioner lifter shaft fully in (clockwise) and secure it using the special tool to prevent damaging the cam chain.

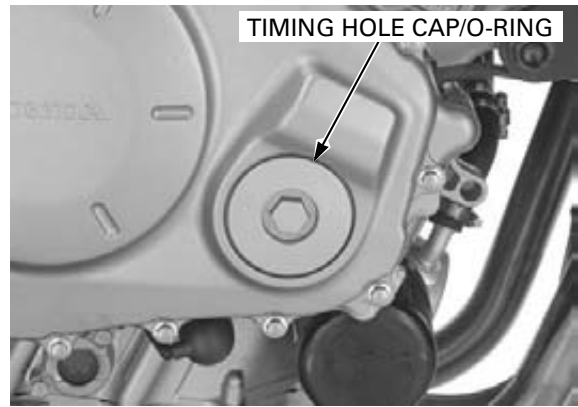
TOOL:

Cam chain tensioner holder 07ZMG-MCAA400

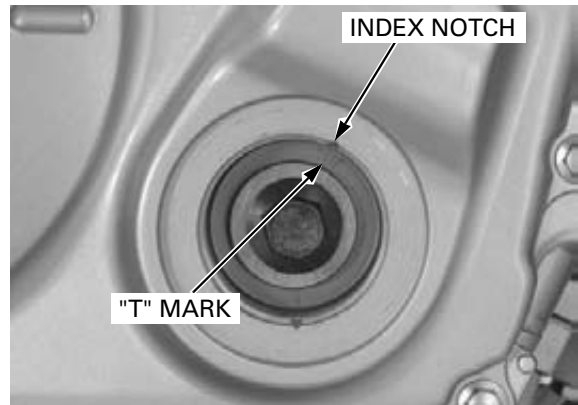


MAINTENANCE

Remove the timing hole cap and O-ring.

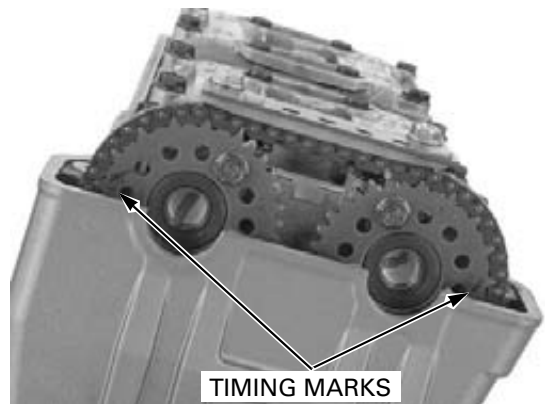


Turn the crankshaft clockwise, align the "T" mark on the starter clutch outer with the index notch on the right crankcase cover.



The timing marks ("IN" and "EX") on the cam sprockets must be flush with the cylinder head surface and facing outward as shown.

If the timing marks on the cam sprockets are facing inward, turn the crankshaft clockwise one full turn (360°) and realign the timing marks with the cylinder head surface so they are facing outward.

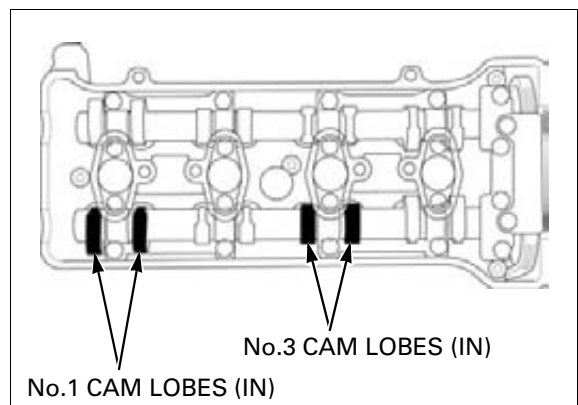


Insert the feeler gauge between the valve lifter and cam lobe.

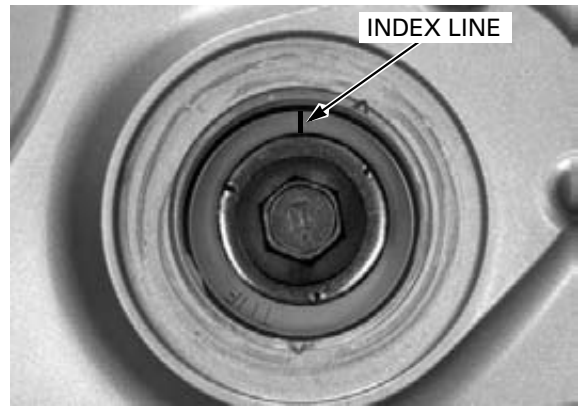
Check the valve clearance for the No.1 and No.3 cylinder intake valves using a feeler gauge.

VALVE CLEARANCE:
IN: 0.16 ± 0.03 mm (0.006 ± 0.001 in)

Record the clearance for each valve for reference in shim selection if adjustment is required.



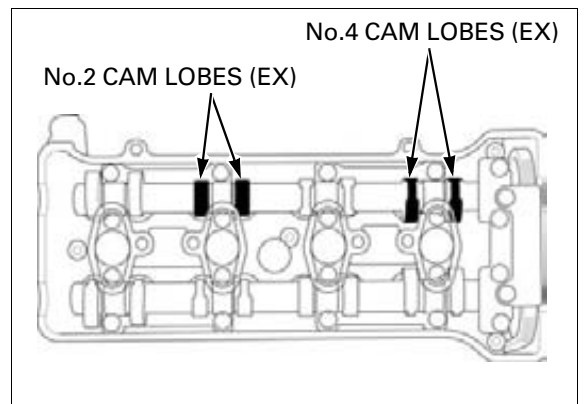
Turn the crankshaft clockwise 1/2 turn (180°), align the index line on the starter clutch outer so that it is facing up as shown.



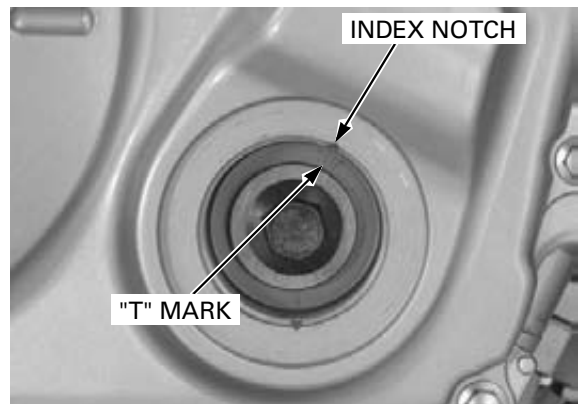
Record the clearance for each valve for reference in shim selection if adjustment is required.

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

VALVE CLEARANCE:
EX: 0.32 ± 0.03 mm (0.013 ± 0.001 in)



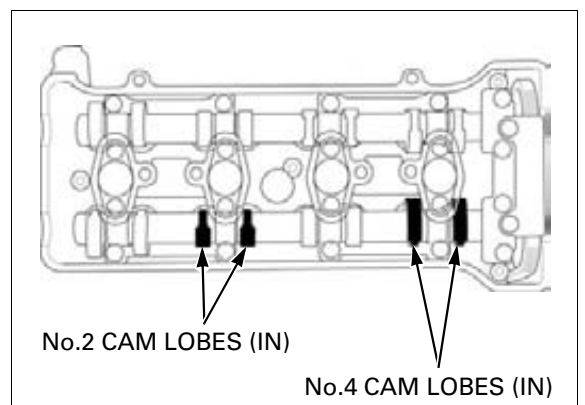
Turn the crankshaft clockwise 1/2 turn (180°), align the "T" mark on the starter clutch outer with the index notch on the right crankcase cover.



Record the clearance for each valve for reference in shim selection if adjustment is required.

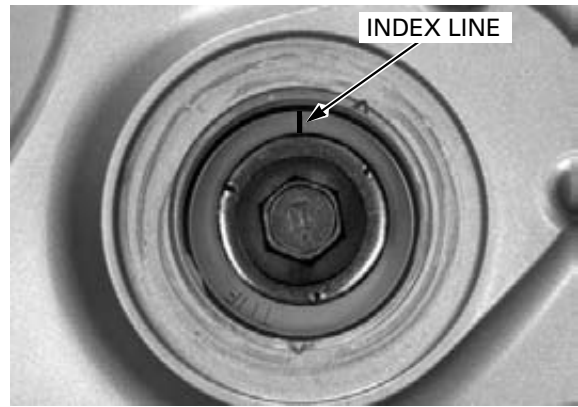
Check the valve clearance for the No.2 and No.4 cylinder intake valves using feeler gauge.

VALVE CLEARANCE:
IN: 0.16 ± 0.03 mm (0.006 ± 0.001 in)



MAINTENANCE

Turn the crankshaft clockwise 1/2 turn (180°), align the index line on the starter clutch outer so that it is facing up as shown.

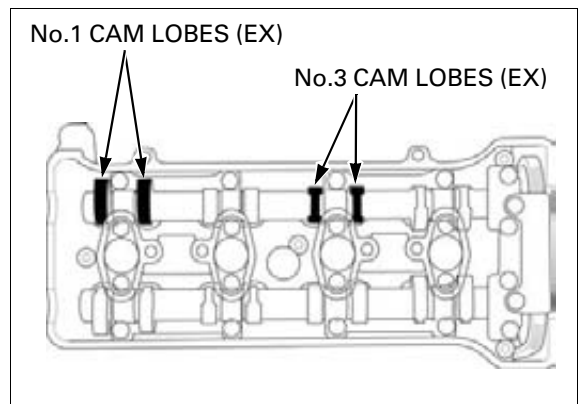


Record the clearance for each valve for reference in shim selection if adjustment is required.

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

VALVE CLEARANCE:

EX: 0.32 ± 0.03 mm (0.013 ± 0.001 in)



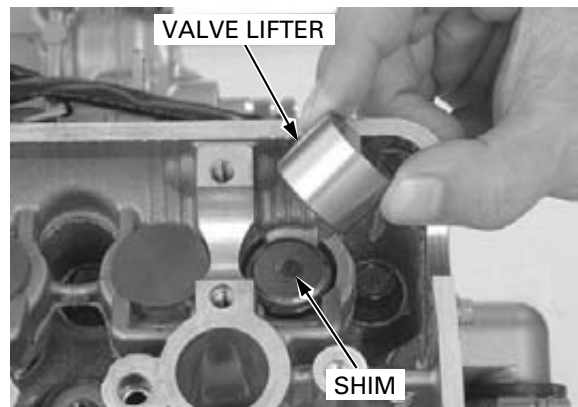
ADJUSTMENT

It is not necessary to remove the cam sprocket from the camshaft except when replacing the camshaft and/or cam sprocket.

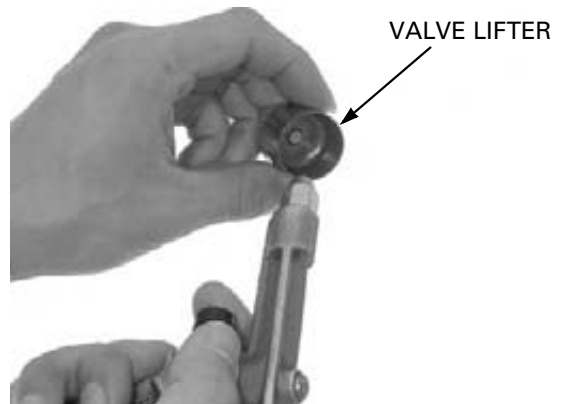
Remove the camshafts (page 9-8).

Remove the valve lifters and shims.

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



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



Measure the shim thickness and record it.

SHIM



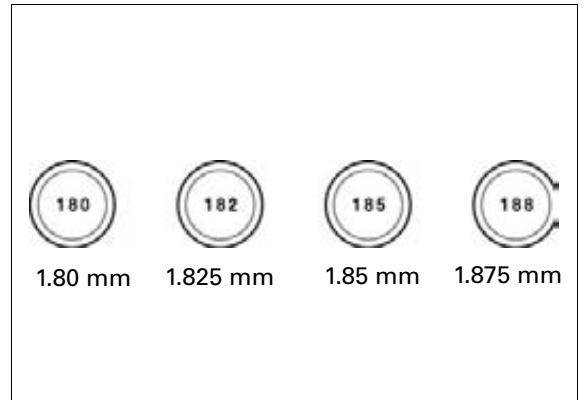
Sixty-nine different thickness shims are available from the thinnest 1.200 mm thickness shim to the thickest 2.900 mm thickness shim in intervals of 0.025 mm.

Calculate the new shim thickness using the equation below.

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

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

- Make sure of the correct shim thickness by measuring the shim by micrometer.
- Reface the valve seat if carbon deposit result in a calculated dimension of over 2.900 mm.



Install the shims and valve lifters in their original locations

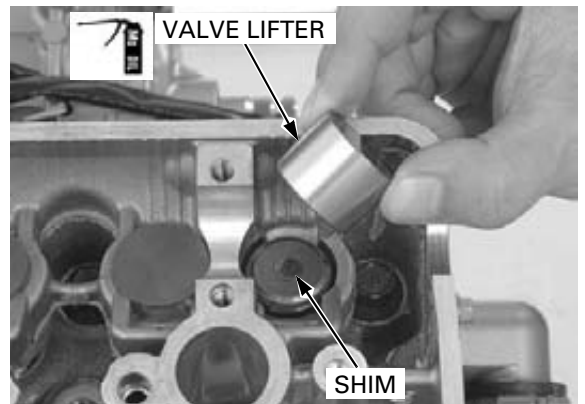
Install the newly selected shim on the valve spring retainer.

Apply molybdenum disulfide oil to the valve lifters. Install the valve lifters into the valve lifter holes.

Install the camshafts (page 9-25).

Rotate the camshafts by rotating the crankshaft clockwise several times.

Recheck the valve clearance.

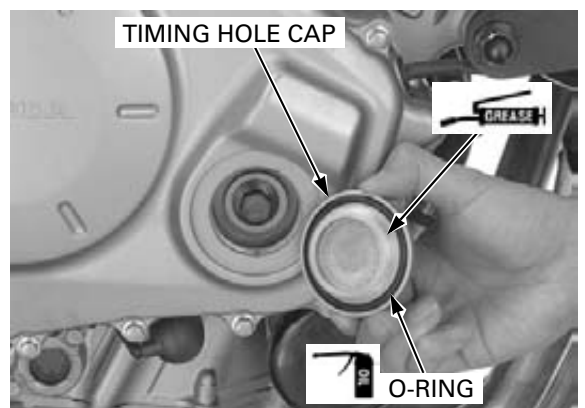


Check that the O-ring is in good condition, replace if necessary.

Apply oil to the timing hole cap O-ring. Apply grease the timing hole cap threads. Tighten the timing hole cap to the specified torque.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

Install the removed parts in the reverse order of removal.



MAINTENANCE

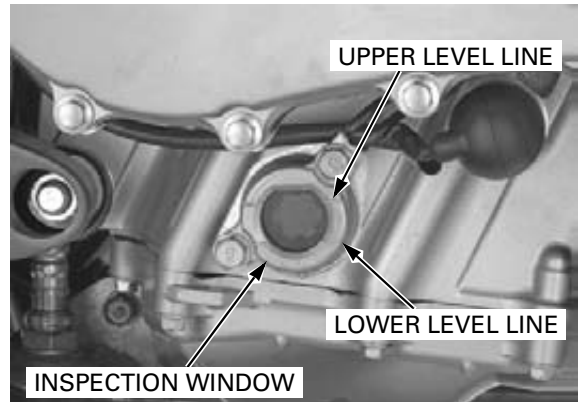
ENGINE OIL/OIL FILTER

OIL LEVEL INSPECTION

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.

Check the oil level through the inspection window.

If the level is below the lower level line, fill the crankcase with the recommended oil up to the upper level line as following procedures.



Remove the oil filler cap.



Fill the recommended engine oil up to the upper level line.

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

SUGGESTED OIL:

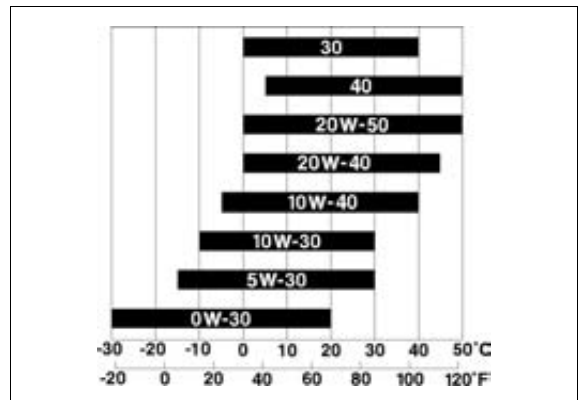
Honda "4-stroke motorcycle oil" or an equivalent
OIL RECOMMENDATION:

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

Viscosity: SAE 10W-30

JASO T 903 standard: MA

Reinstall the oil filler cap.



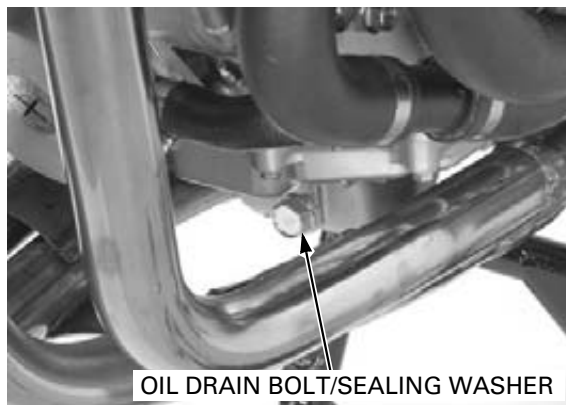
ENGINE OIL & FILTER CHANGE

Hold the motorcycle in an upright position.

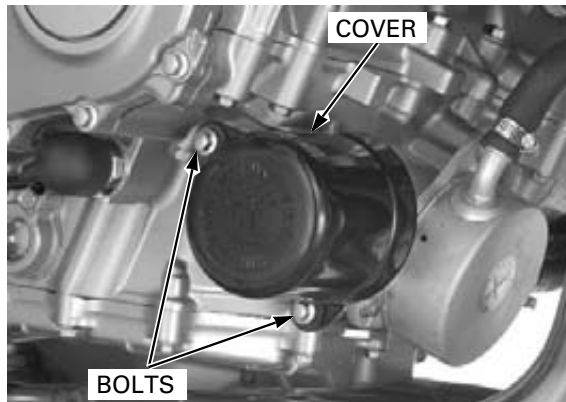
Remove the oil filler cap.



Remove the oil drain bolt and sealing washer, then drain the engine oil completely.

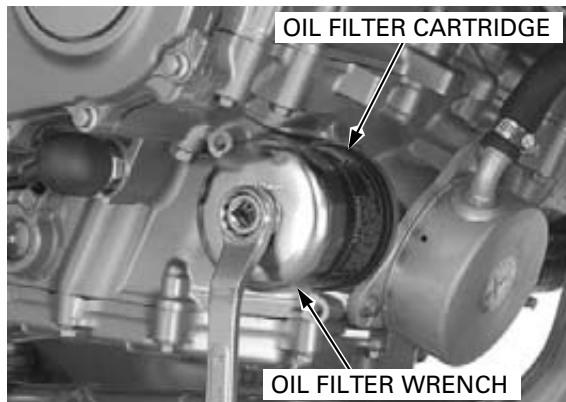


Remove the bolts and oil filter cover.



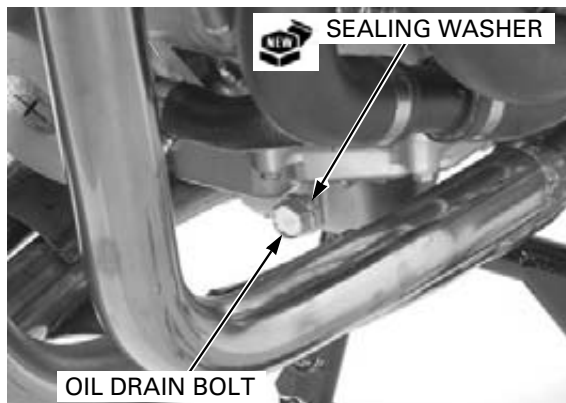
Remove and discard the oil filter cartridge using the special tool.

TOOL:
Oil filter wrench **07HAA-PJ70101**



Replace the sealing washer with new one. Install and tighten the oil drain bolt.

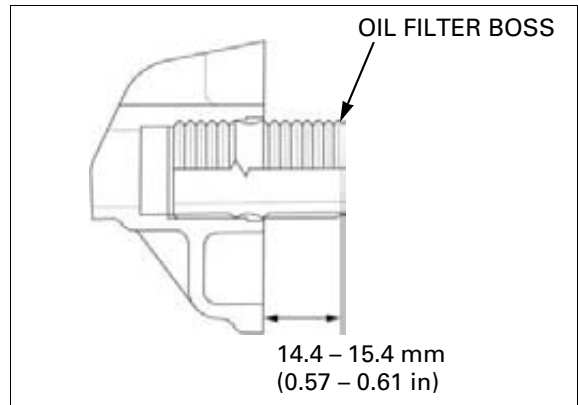
TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)



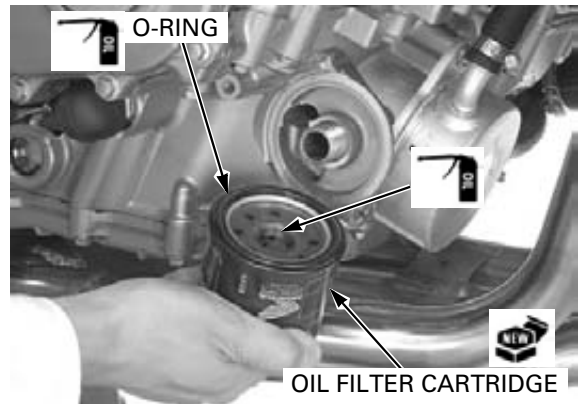
MAINTENANCE

Check that the oil filter boss protrusion from the crankcase is specified length as shown.

SPECIFIED LENGTH: 14.4 – 15.4 mm (0.57 – 0.61 in)



Apply clean engine oil to new oil filter cartridge threads and O-ring.

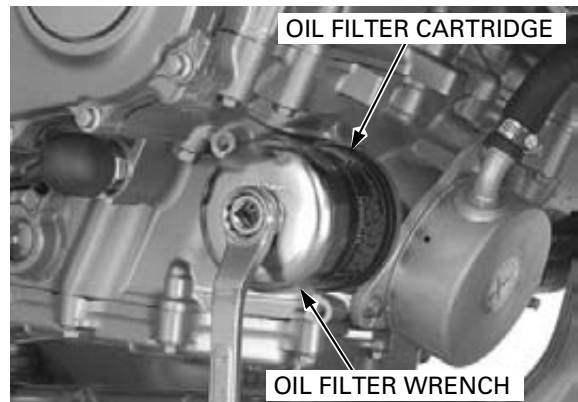


Install the oil filter and tighten it to the specified torque.

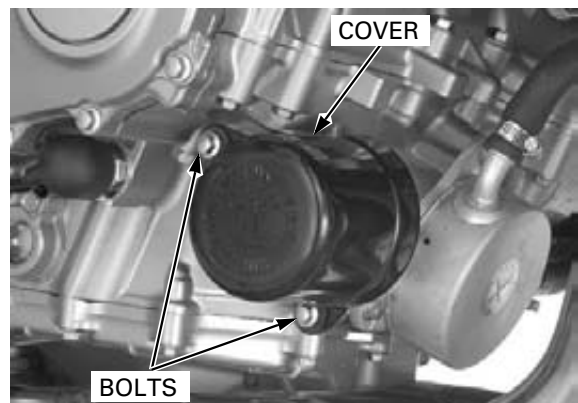
TOOL:

Oil filter wrench 07HAA-PJ70101

TORQUE: 26 N·m (2.7 kgf·m, 19 lbf·ft)



Install the oil filter cover and tighten the bolts securely.



Fill the crankcase with recommended engine oil (page 4-16).

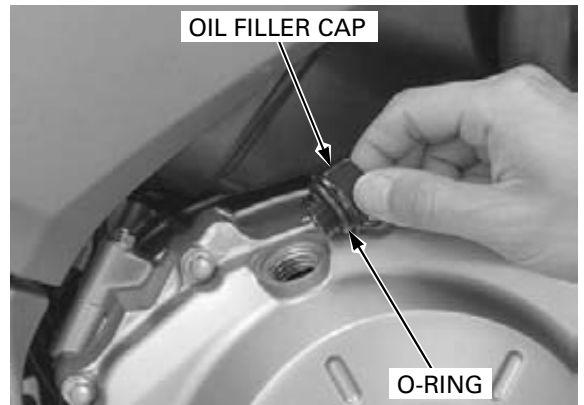
OIL CAPACITY:

- 2.7 liter (2.9 US qt, 2.4 Imp qt) after draining**
- 3.5 liter (3.7 US qt, 3.1 Imp qt) after oil filter change**

Check that the O-ring on the oil filler cap is in good condition, and replace it if necessary. Install the oil filler cap.

Recheck the oil level (page 4-16).

Make sure there are no oil leaks.

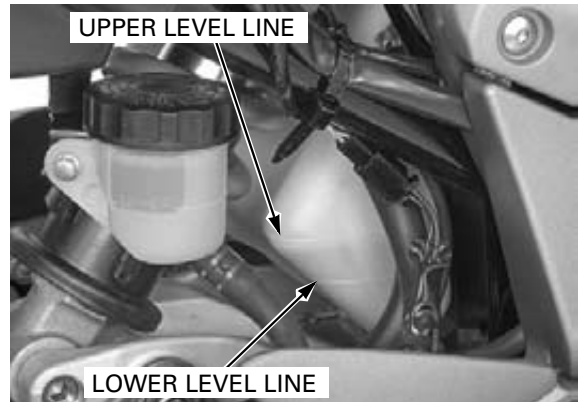


RADIATOR COOLANT

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

The level should be between the "UPPER" and "LOWER" level lines.

If necessary, add recommended coolant.



Remove the following:

- Seat (page 3-3)
- Left side cover (page 3-4)

Remove the reserve tank filler cap and fill to the "UPPER" level line with 1:1 mixture of distilled water and antifreeze.

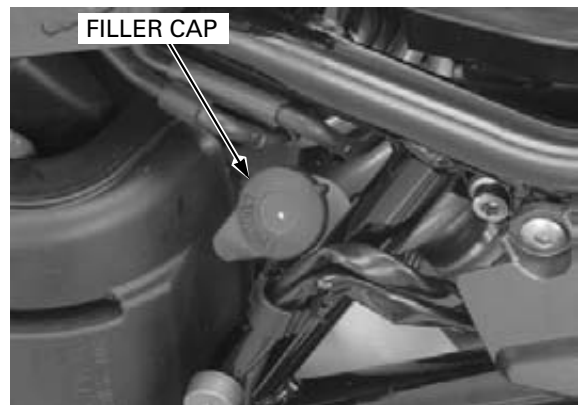
RECOMMENDED ANTIFREEZE:

High quality ethylene glycol antifreeze containing corrosion protection inhibitors.

Reinstall the filler cap.

Install the following:

- Left side cover (page 3-4)
- Seat (page 3-3)

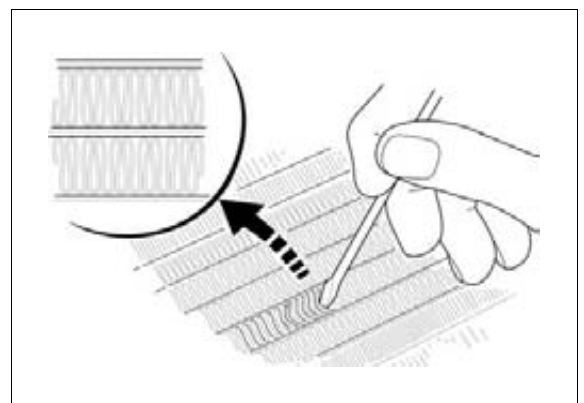


COOLING SYSTEM

Check the radiator air passages for clogging or damage.

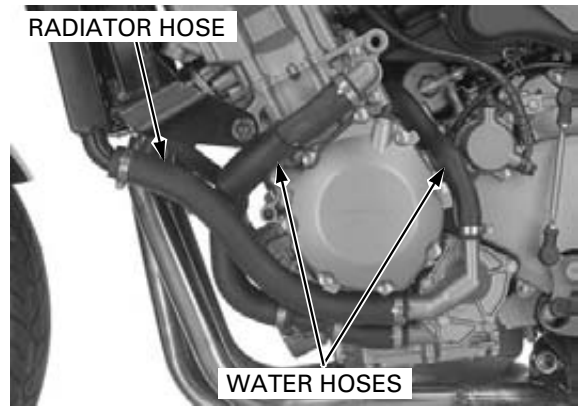
Straighten bent fins, and remove insects, mud or other obstructions with compressed air or low water pressure.

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



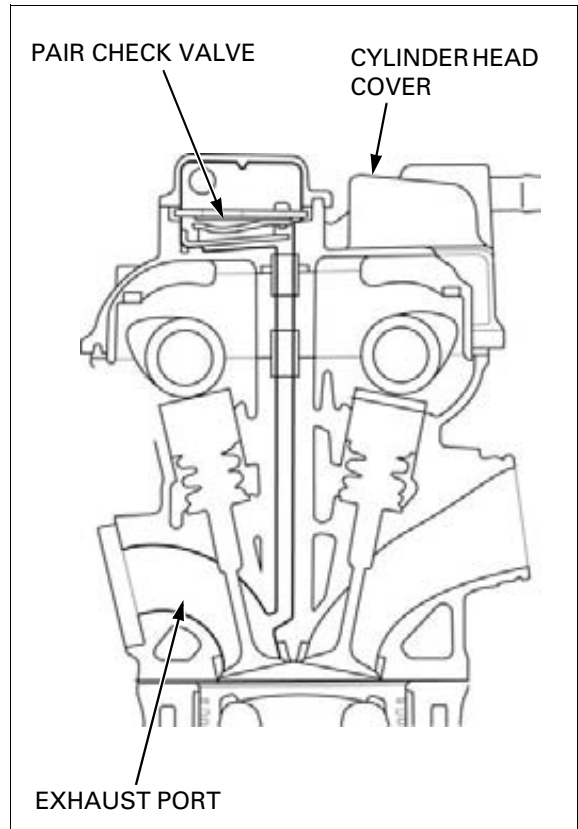
MAINTENANCE

Inspect the radiator hoses for cracks or deterioration, and replace them if necessary. Check the tightness of all hose clamps and fasteners.



SECONDARY AIR SUPPLY SYSTEM

- This model is equipped built-in secondary air supply system. The pulse secondary air supply system is located on the cylinder head cover.
- 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.

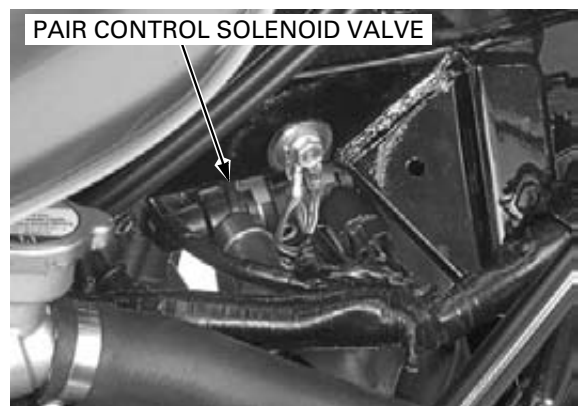


Lift and support the fuel tank (page 4-5).

If the hoses show any signs of heat damage, inspect the reed valves in the PAIR check valves for damage.

Check the PAIR (pulse secondary air injection) 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 housing and PAIR control solenoid valve for deterioration, damage or loose connections. Make sure that the hoses are not kinked, pinched or cracked.



DRIVE CHAIN

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

DRIVE CHAIN SLACK INSPECTION

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

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

CHAIN SLACK: 20 – 30 mm (4/5 – 1-1/5 in)

NOTICE

Excessive chain slack, 50 mm (2.0 in) or more, may damage the frame.

Lubricate the drive chain with #80 – 90 gear oil or chain lubricant designed specifically for use with O-ring chains. Wipe off the excess oil or chain lubricant.

ADJUSTMENT

Loosen the rear axle nut and both drive chain adjuster lock nuts.

Turn both adjusting nuts an equal number of turns until the correct drive chain slack is obtained. A scale is included on the adjusters. Be sure the reading on the scale is same for both sides.

Tighten the rear axle nut to the specified torque.

TORQUE: 108 N·m (11.0 kgf·m, 80 lbf·ft)

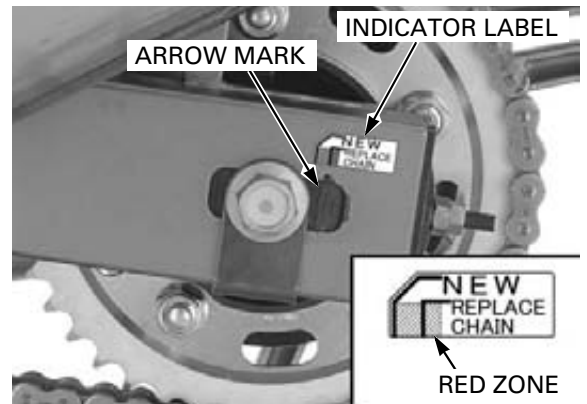
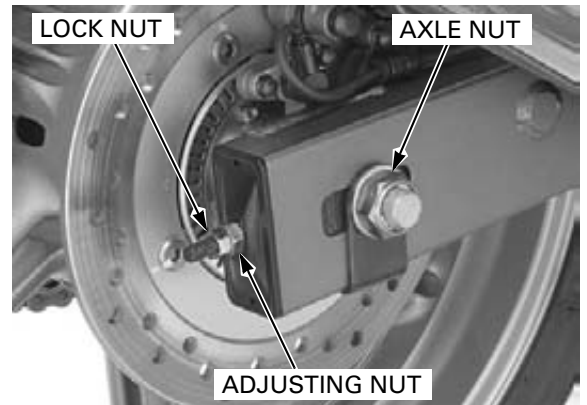
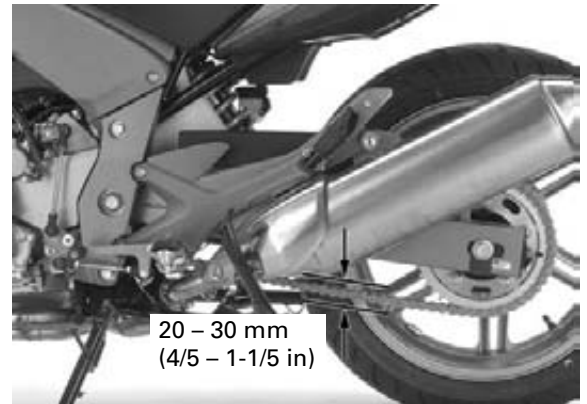
Tighten each adjuster lock nut while holding the adjusting nut.

TORQUE: 21 N·m (2.1 kgf·m, 15 lbf·ft)

Recheck the drive chain slack and free wheel rotation.

Check the index mark (arrow) on the left chain adjuster.

If the index mark (arrow) reaches the red zone of the wear indicator label, replace the drive chain with a new one.



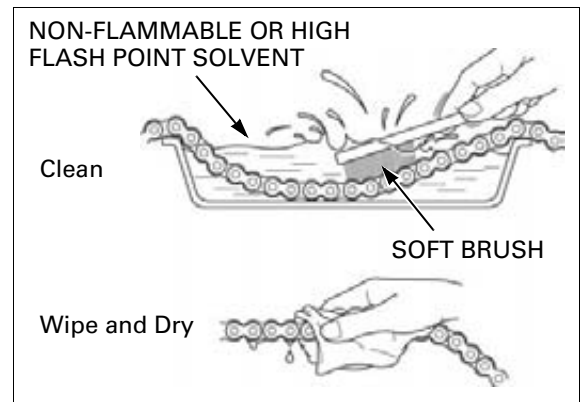
CLEANING AND LUBRICATION

Clean the chain with non-flammable or high flash point solvent and wipe it dry.

Be sure the chain has dried completely before lubricating.

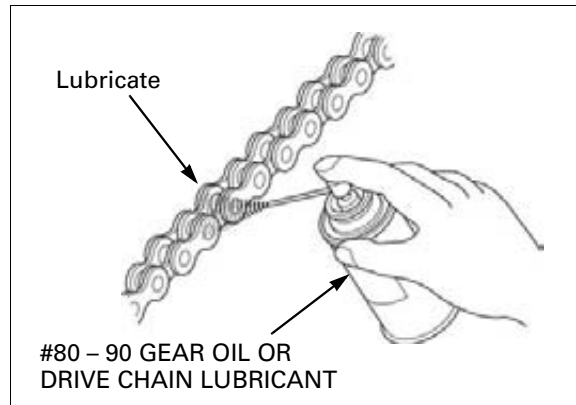
Inspect the drive chain for possible damage or wear. Replace any chain that has damaged rollers, loose fitting links, or otherwise appears unserviceable. Installing a new chain on badly worn sprockets will cause the new chain to wear quickly.

Inspect and replace sprocket as necessary.



MAINTENANCE

Lubricate the drive chain with #80 – 90 gear oil or drive chain lubricant designed specifically for use with O-ring chains. Wipe off the excess oil or chain lubricant.



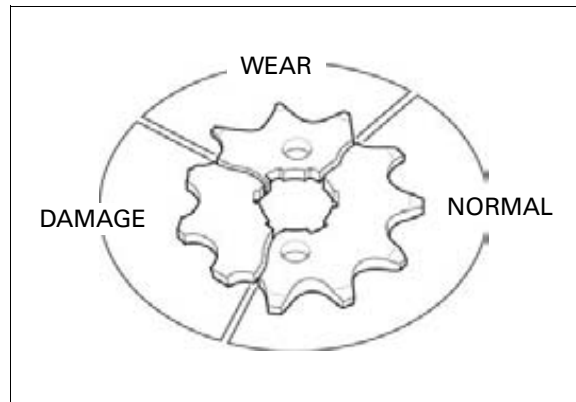
SPROCKET INSPECTION

Remove the left crankcase rear cover (page 12-7).

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

Never use a new drive chain on worn or damaged sprockets.

Both chain and sprockets must be in good condition, or the new replacement chain will wear rapidly.



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

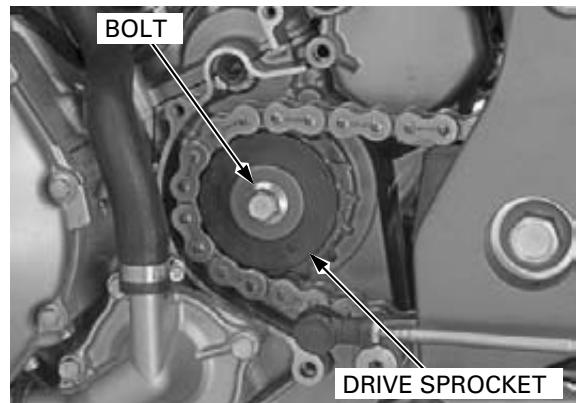
TORQUE:

Drive sprocket bolt:

54 N·m (5.5 kgf·m, 40 lbf·ft)

Final driven sprocket nut:

108 N·m (11.0 kgf·m, 80 lbf·ft)



REPLACEMENT

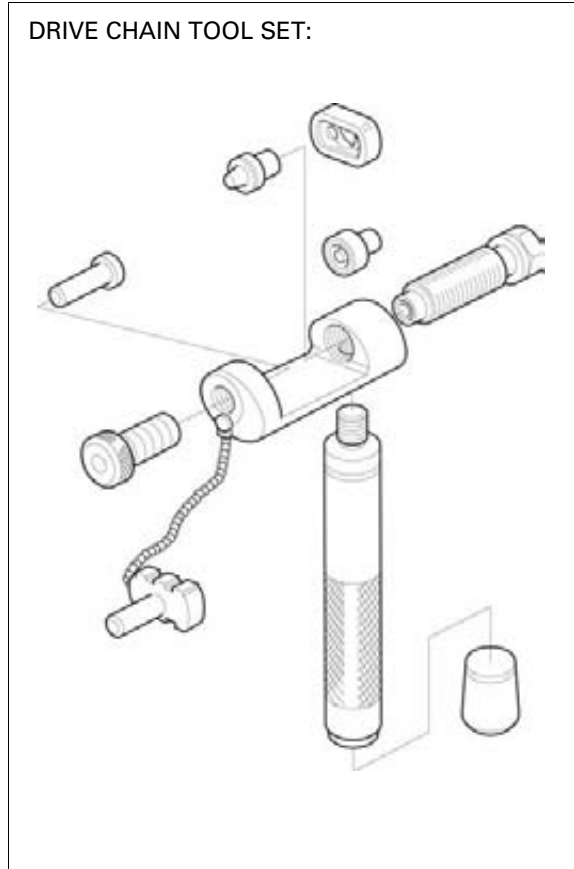
This motorcycle uses a drive chain with a staked master link.

Loosen the drive chain (page 4-21).

Assemble the special tool as shown.

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

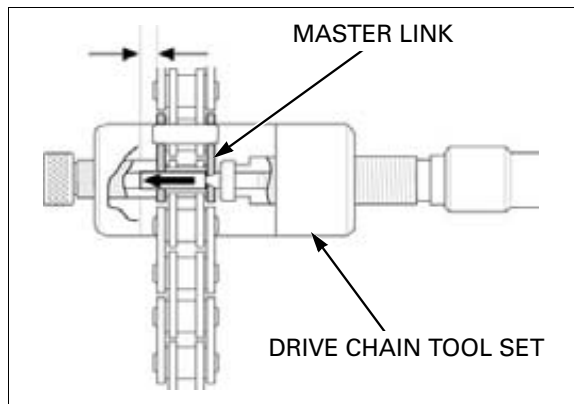
TOOL:
Drive chain tool set **07HMH-MR10103**



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

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

Remove the drive chain.

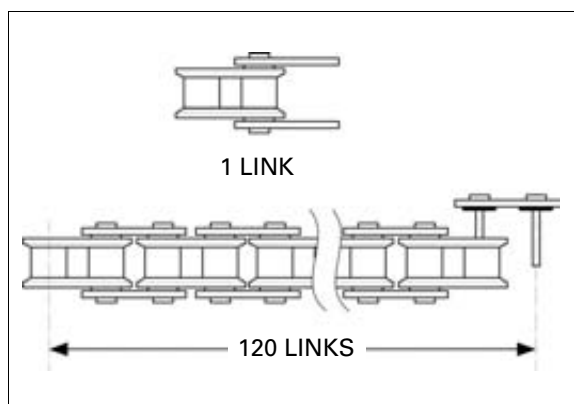


Include the master link when you count the drive chain links.

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

STANDARD LINKS: 120 LINKS

REPLACEMENT CHAIN
DID: DID50VA8-120LE
RK: RK50HFOZ5-120LE

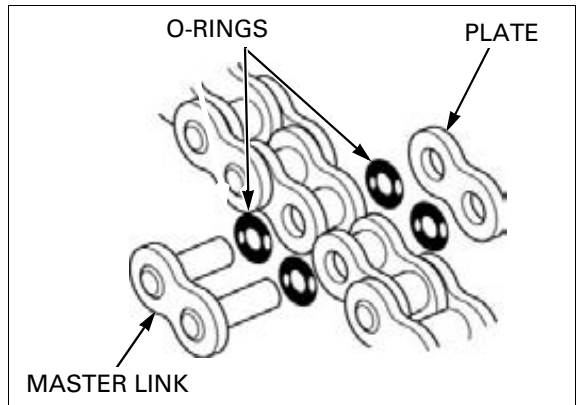


MAINTENANCE

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

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

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

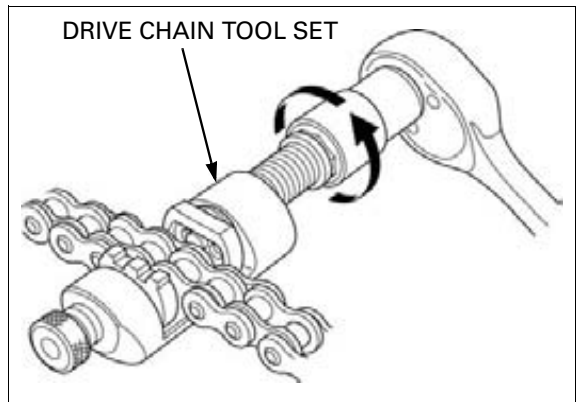


Assemble and set the drive chain tool set.

TOOL:

Drive chain tool set

07HMH-MR10103



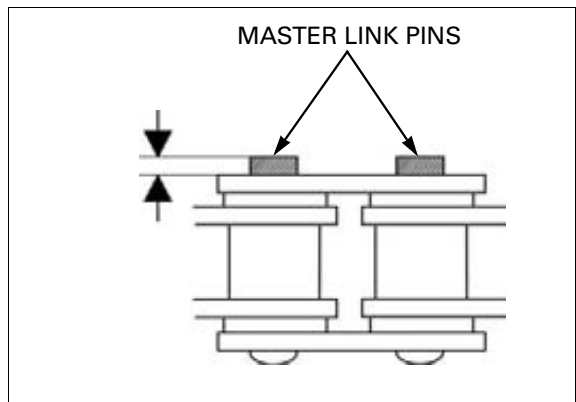
Make sure that the master link pins are installed properly.
Measure the master link pin length projected from the plate.

STANDARD LENGTH:

DID: 1.15 – 1.55 mm (0.045 – 0.061 in)

RK: 1.2 – 1.4 mm (0.05 – 0.06 in)

Stake the master link pins.

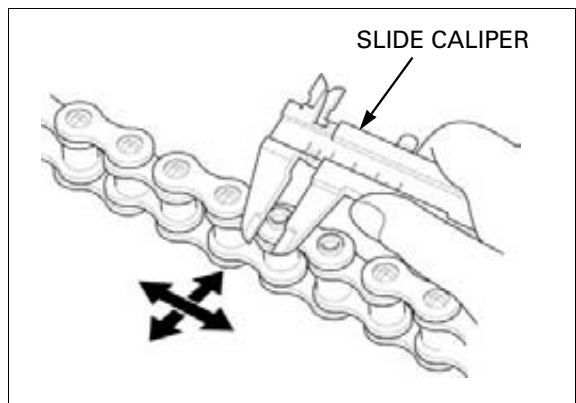


Make sure that the pins are staked properly by measuring the diameter of the staked area using a slide caliper.

DIAMETER OF THE STAKED AREA:

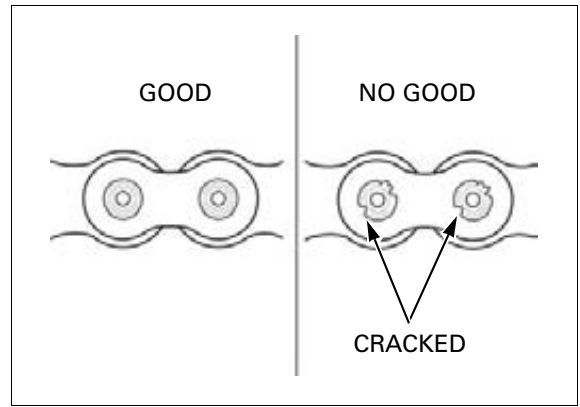
DID: 5.50 – 5.80 mm (0.217– 0.228 in)

RK: 5.30 – 5.70 mm (0.209 – 0.224 in)



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

After staking, check the staked area of the master link for cracks. If there is any cracking, replace the master link, O-rings and plate.

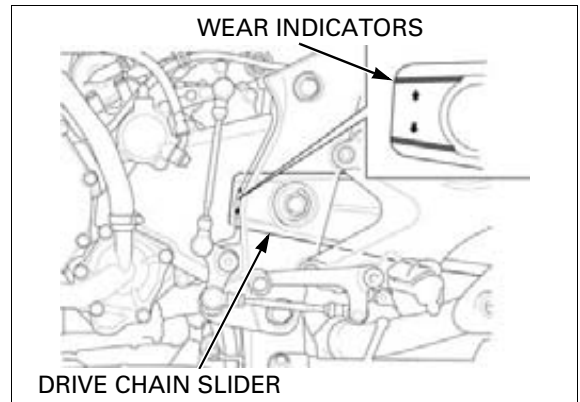


DRIVE CHAIN SLIDER

Remove the left crankcase rear cover (page 12-7).

Inspect the drive chain slider for excessive wear or damage.

If it is worn to the wear indicator, replace the drive chain slider (page 15-15).



BRAKE FLUID

NOTICE

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

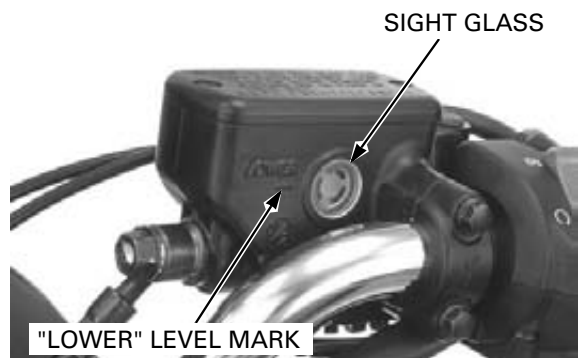
- Do not mix different types of fluid, as they are not compatible with each other.
- Do not allow foreign material to enter the system when filling the reservoir.

When the fluid level is low, check the brake pads for wear (page 4-26). A low fluid level may be due to wear of the brake pads. If the brake pads are worn, the caliper piston is pushed out, and this accounts for a low reservoir level.

If the brake pads are not worn and the fluid level is low, check entire system for leaks (page 4-27).

FRONT BRAKE

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



MAINTENANCE

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

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

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



REAR BRAKE

Support the motorcycle upright on a level surface.

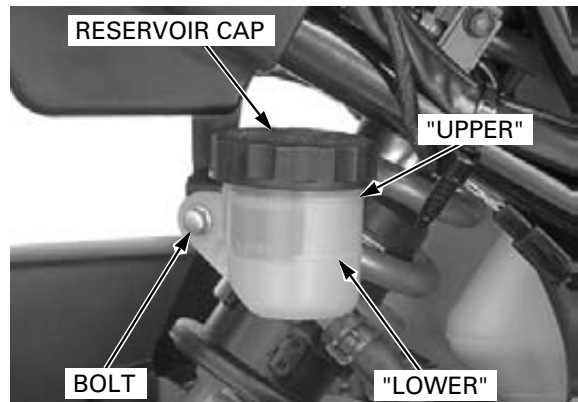
Check the fluid level in the rear brake reservoir.

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

Install the reservoir cap with the diaphragm and set plate.

Install the reservoir onto the frame and tighten the mounting bolt.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



BRAKE PAD WEAR

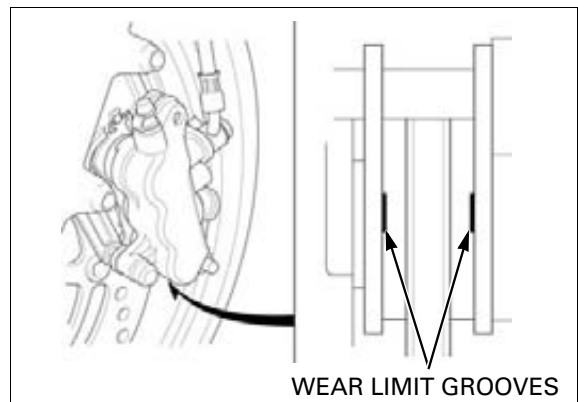
FRONT BRAKE PADS

Check the brake pads for wear.

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

For front brake pad replacement:

- CBF1000A (page 16-15)
- CBF1000 (page 16-16)



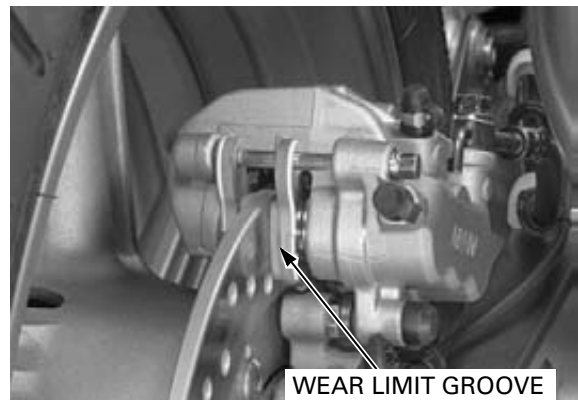
REAR BRAKE PADS

Check the brake pads for wear.

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

For rear brake pad replacement:

- CBF1000A (page 16-17)
- CBF1000 (page 16-18)



BRAKE SYSTEM

INSPECTION

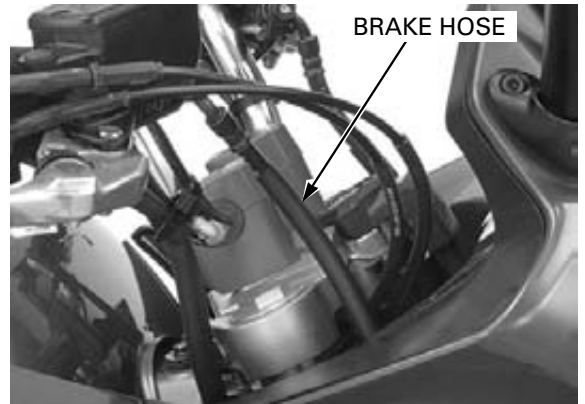
Firmly apply the brake lever or pedal, and check that no air has entered the system.

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

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

Refer the procedure for brake bleeding:

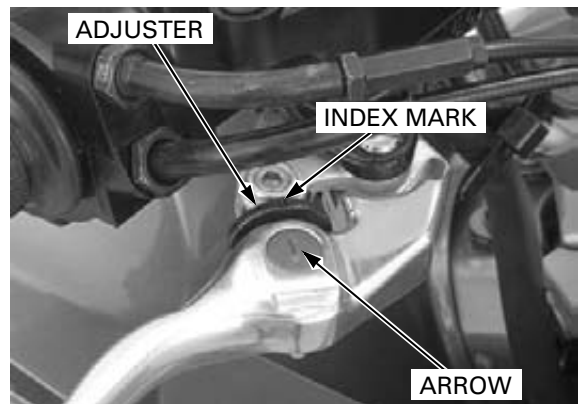
- CBF1000A (page 16-7)
- CBF1000 (page 16-13)



BRAKE LEVER ADJUSTMENT

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

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

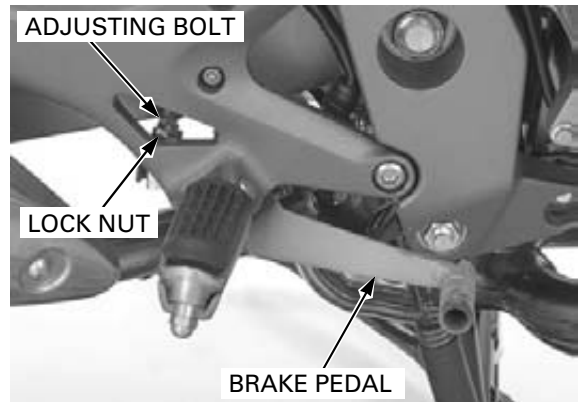


BRAKE PEDAL HEIGHT ADJUSTMENT

Loosen the lock nut and turn the master cylinder push rod to obtain the desired pedal height.

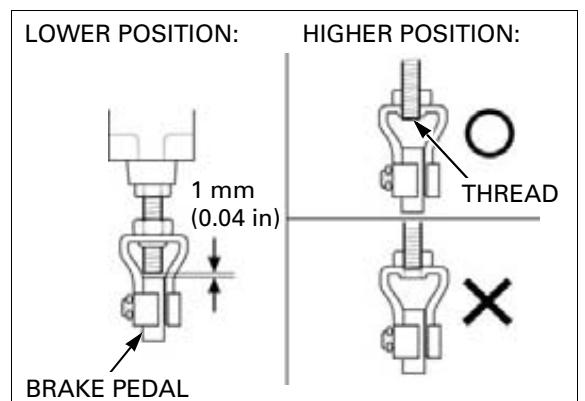
After adjustment, hold the adjusting bolt and tighten the lock nut.

TORQUE: 17 N·m (1.7 kgf·m, 13 lbf·ft)



If the brake pedal is adjusted to the lower position, make sure that the clearance between the lower end of the push rod and the brake pedal does not fall below 1 mm (0.04 in).

If the brake pedal is adjusted to the higher position, make sure that the lower end of the push rod thread is visible inside the joint.



MAINTENANCE

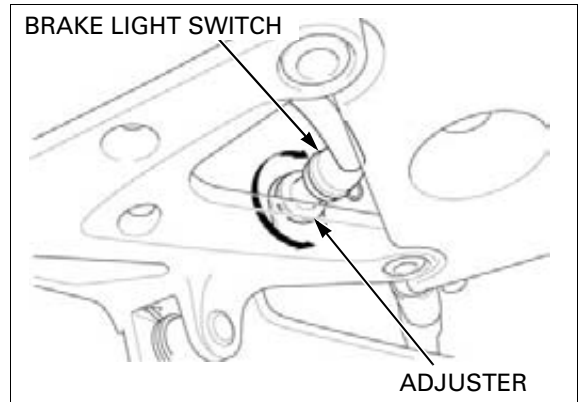
BRAKE LIGHT SWITCH

- The front brake light switch can not be adjusted.

Adjust the brake light switch so that the brake light comes on just prior to the brake actually being engaged.

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

Hold the switch body and turn the adjuster. Do not turn the switch body.



HEADLIGHT AIM

Place the motorcycle on a level surface.
Remove the front right/left side cowls (page 3-6).

Adjust the headlight aim as specified by local laws and regulations. Adjust the headlight aim vertically by turning the vertical beam adjusting knob. A clockwise rotation moves the beam up and counterclockwise rotation moves the beam down.

Adjust the headlight aim horizontally by turning the horizontal beam adjusting screw.

Left Headlight: A clockwise rotation moves the beam toward the right and counterclockwise rotation moves the beam toward the left side of the rider.

Right Headlight: A clockwise rotation moves the beam toward the left and counterclockwise rotation moves the beam toward the right side of the rider.

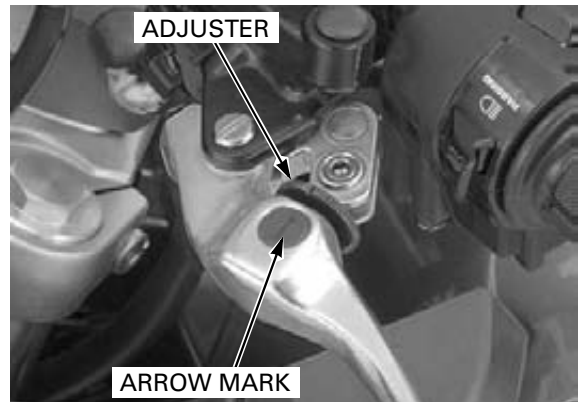
VERTICAL BEAM ADJUSTING KNOB

HORIZONTAL BEAM ADJUSTING SCREW

CLUTCH SYSTEM

CLUTCH LEVER ADJUSTMENT

Align the index mark on the adjuster with the arrow on the brake lever. The distance between the tip of the clutch lever and the grip can be adjusted by turning the adjuster.



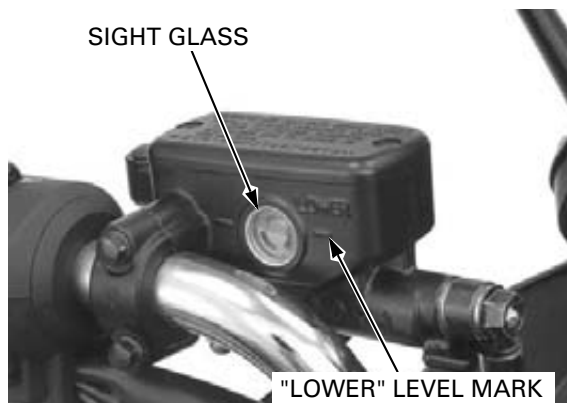
CLUTCH FLUID

NOTICE

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

- 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 entire system for leaks.

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



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

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

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



Firmly apply the clutch 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.

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

Refer the procedure for clutch fluid bleeding (page 10-6).



MAINTENANCE

SIDE STAND

Support the motorcycle on a level surface using the center stand (CBF1000A) or maintenance stand.

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

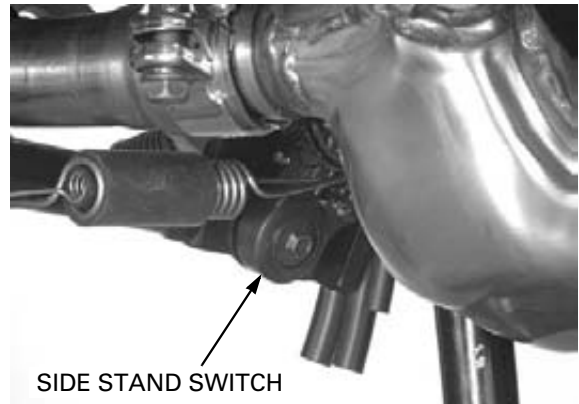
Check the side stand assembly for freedom of movement and lubricate the side stand pivot if necessary.



Check the side stand ignition cut-off system:

1. Sit astride the motorcycle and raise the side stand.
2. Start the engine with the transmission in neutral, then shift the transmission into gear, with the clutch lever squeezed.
3. Move the side stand full down.
4. The engine should stop as the side stand is lowered.

If there is a problem with the system, check the side stand switch (page 21-24).



SUSPENSION

FRONT SUSPENSION INSPECTION

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

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

Loose, worn or damaged suspension parts impair motorcycles stability and control.

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

Refer to the fork service (page 14-19).



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

Replace the steering head bearings if any looseness is noted.



REAR SUSPENSION INSPECTION

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

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



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

Replace the bearings if any looseness is noted.



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

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

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

Refer to the shock absorber service (page 15-13).



NUTS, BOLTS, FASTENERS

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

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

MAINTENANCE

WHEELS/TIRES

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

Check the wheel for trueness:

- Front wheel (page 14-13)
- Rear wheel (page 15-6)



Tire pressure should be checked when the tires are COLD.

RECOMMENDED TIRE PRESSURE AND TIRE SIZE:

		FRONT	REAR
Tire pressure kPa (kgf/cm ² , psi)		250 (2.50, 36)	290 (2.90, 42)
Tire size		120/70ZR17 M/C (58W)	160/60ZR17 M/C (73W)
Tire brand	Bridgestone	BT57F RADIAL U	BT57R RADIAL E
	Michelin	Pilot ROAD B	Pilot ROAD A



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

MINIMUM TREAD DEPTH:

FRONT: 1.5 mm (0.06 in)

REAR: 2.0 mm (0.08 in)

STEERING HEAD BEARINGS

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

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

Check that the handlebar moves freely from side to side.

If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering head bearings (page 14-30).

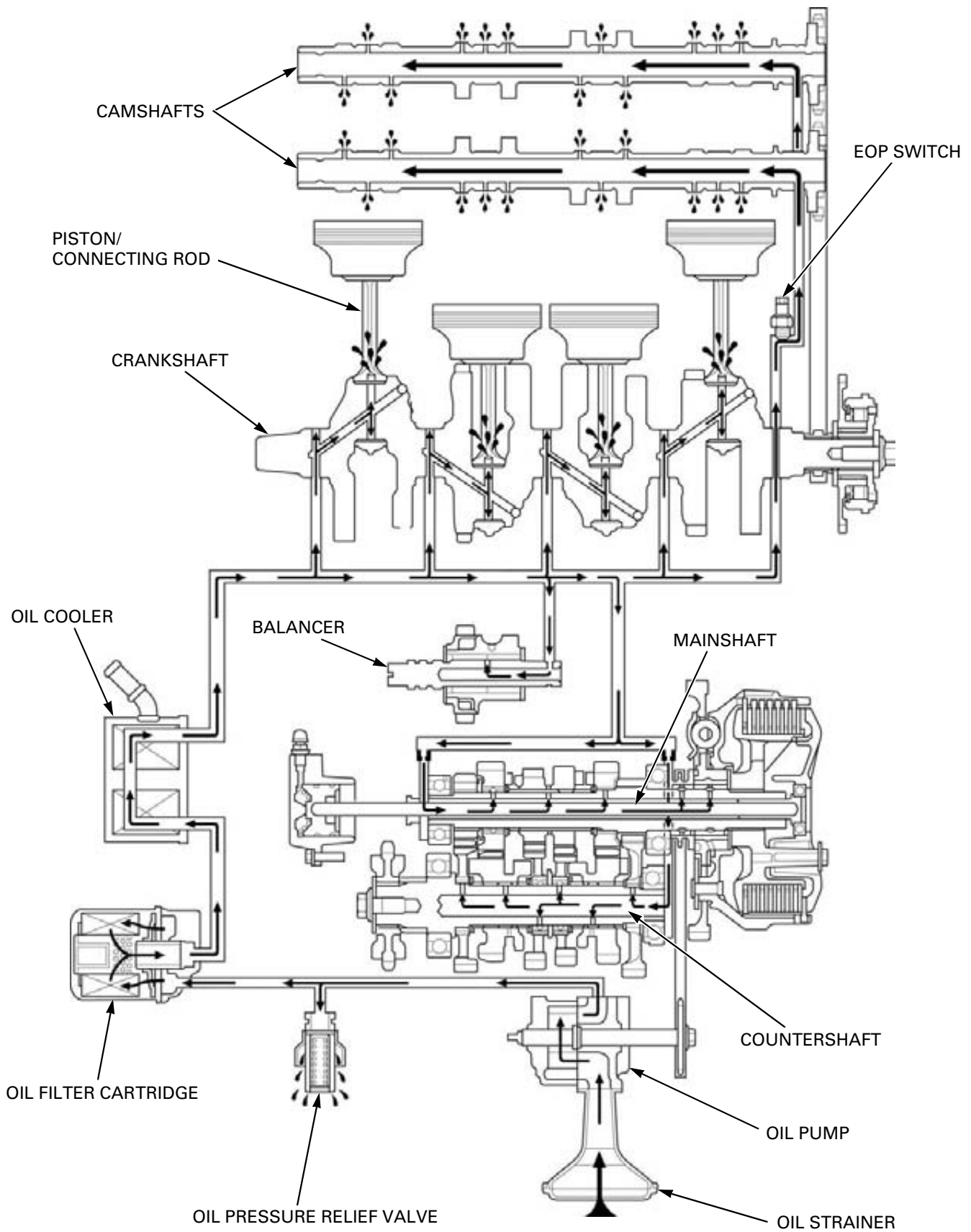


5. LUBRICATION SYSTEM

LUBRICATION SYSTEM DIAGRAM	5-2	OIL STRAINER/ PRESSURE RELIEF VALVE	5-6
SERVICE INFORMATION	5-3	OIL PUMP	5-8
TROUBLESHOOTING	5-4	OIL COOLER	5-12
OIL PRESSURE INSPECTION.....	5-5		

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 oil pump can be serviced with the engine installed in the frame.
- The service procedures in this section must be performed with the engine oil drained.
- 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 there are no oil leaks and that oil pressure is correct.

SPECIFICATIONS



ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	After draining	2.7 liter (2.9 US qt, 2.4 Imp qt)	–
	After oil filter change	3.5 liter (3.7 US qt, 3.1 Imp qt)	–
	After disassembly	3.6 liter (3.8 US qt, 3.2 Imp qt)	–
Engine oil		Suggested oil: Honda "4-stroke motorcycle oil" or an equivalent Oil recommendation: API 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 (engine oil pressure) switch		510 kPa (5.2 kgf/cm ² , 74 psi) at 6,000 min ⁻¹ (rpm)/(80°C/176°F)	–
Oil pump	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15 – 0.21 (0.006 – 0.008)	0.35 (0.014)
	Side clearance	0.04 – 0.09 (0.002 – 0.004)	0.17 (0.007)

TORQUE VALUES

- | | | |
|-------------------------------|-------------------------------|---------------------------------------|
| Oil pump assembly bolt | 8 N·m (0.8 kgf·m, 5.9 lbf·ft) | CT bolt |
| Oil pump driven sprocket bolt | 15 N·m (1.5 kgf·m, 11 lbf·ft) | Apply a locking agent to the threads. |

LUBRICATION SYSTEM

TOOLS

<p>Oil pressure gauge set 07506-3000001</p>  <p>or equivalent commercially available.</p>	<p>Oil pressure gauge attachment 07406-0030000</p>  <p>or equivalent commercially available.</p>
--	---

TROUBLESHOOTING

Oil level too low

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

Low oil pressure

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

No oil pressure

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

High oil pressure

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

Oil contamination

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

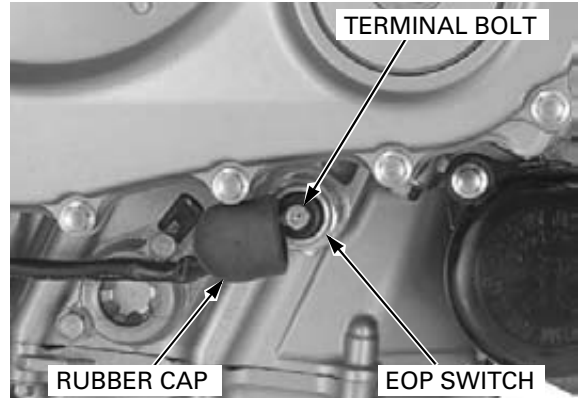
Oil emulsification

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

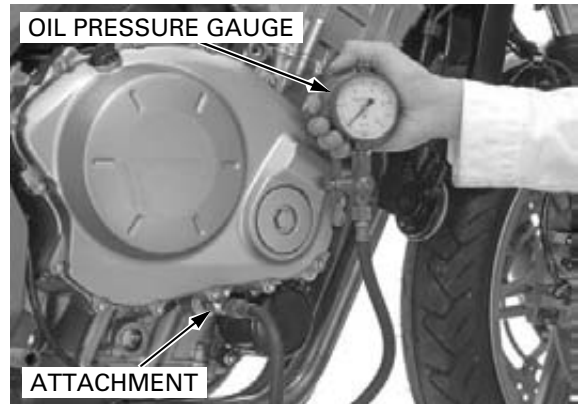
OIL PRESSURE INSPECTION

If the oil pressure indicator light remains on while the engine is running, check the indicator system before checking the oil pressure.

Remove the rubber cap from the EOP switch.
 Remove the terminal bolt and disconnect the EOP switch wire.
 Remove the EOP switch while holding the switch base.



Install the oil pressure gauge attachment to the switch base.
 Connect the oil pressure gauge to the oil pressure gauge attachment.



TOOLS:

- Oil pressure gauge set** **07506-3000001 or equivalent commercially available**
- Oil pressure gauge attachment** **07406-0030000 or equivalent commercially available**

Check the oil level and add the recommended oil if necessary (page 4-16).

Warm the engine to normal operating temperature (approximately 80°C/176°F) and increase the engine speed to 6,000 min⁻¹ (rpm) and read the oil pressure.

OIL PRESSURE:

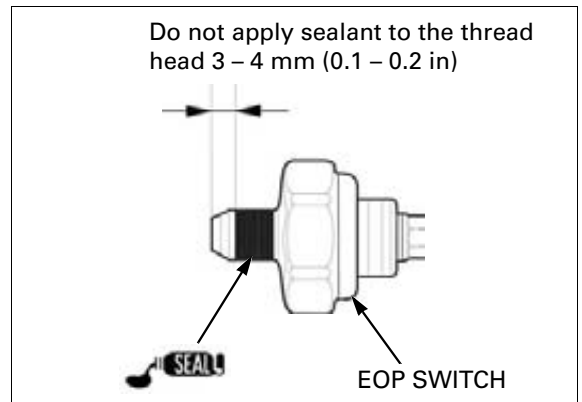
510 kPa (5.2 kgf/cm², 74 psi) at 6,000 min⁻¹ (rpm) / (80°C/176°F)

Stop the engine and remove the tools.

Apply a sealant (Three Bond 1207B) to the EOP switch threads as shown.

Install the EOP switch (page 21-19).

Check the oil level and add the recommended oil if the level is below the lower level line (page 4-16).

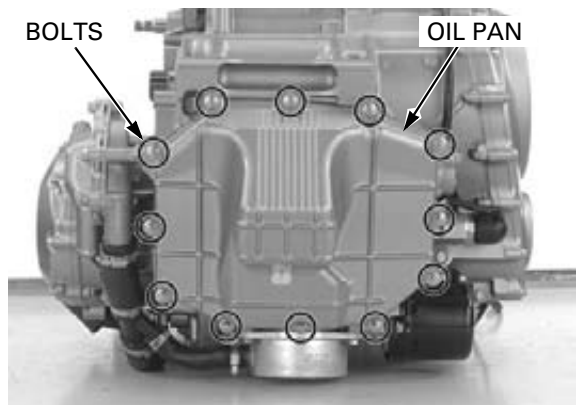


LUBRICATION SYSTEM

OIL STRAINER/PRESSURE RELIEF VALVE

REMOVAL

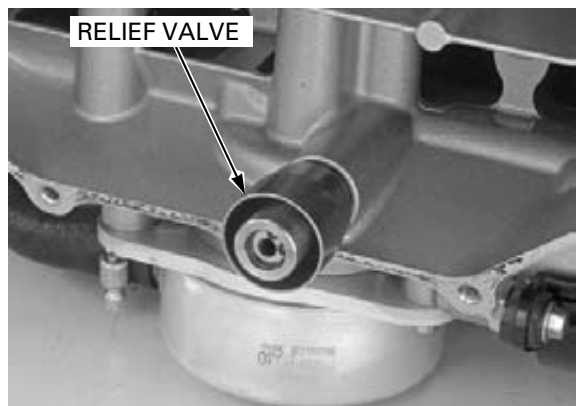
Drain the engine oil (page 4-16).
Remove the exhaust pipe (page 3-13).
Remove the flange bolts and the oil pan.



Remove the oil strainer and packing.
Clean the oil strainer screen.



Remove the pressure relief valve and O-ring.

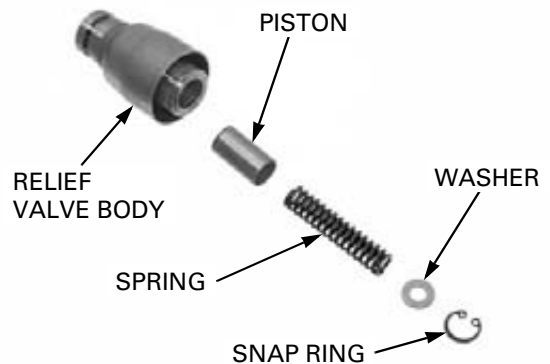


INSPECTION

Check the operation of the pressure relief valve by pushing on the piston.
Disassemble the relief valve by removing the snap ring.

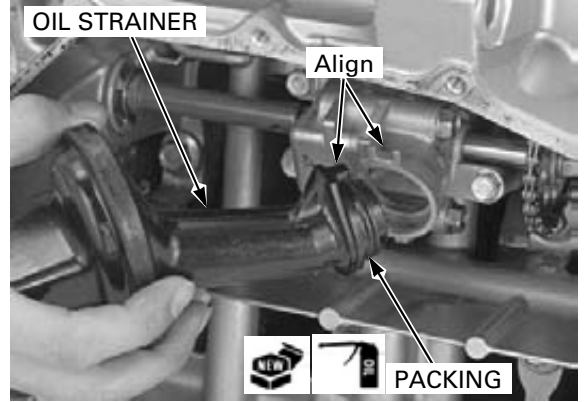
Inspect the piston for wear, unsmooth movement or damage.
Inspect the spring for fatigue or damage.

Assemble the relief valve in the reverse order of disassembly.

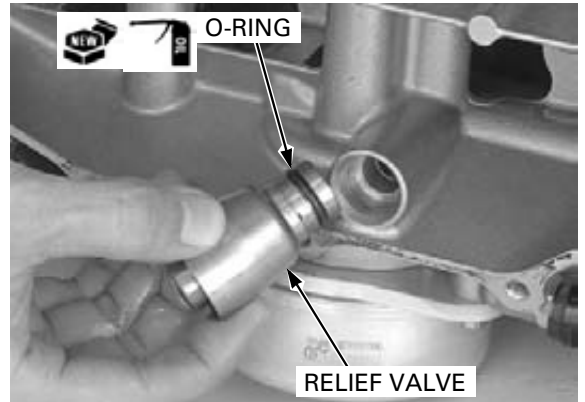


INSTALLATION

Apply oil to new packing and install it onto the oil strainer flange.
 Install the oil strainer into the oil pump while aligning the oil strainer boss with the groove of the oil pump.



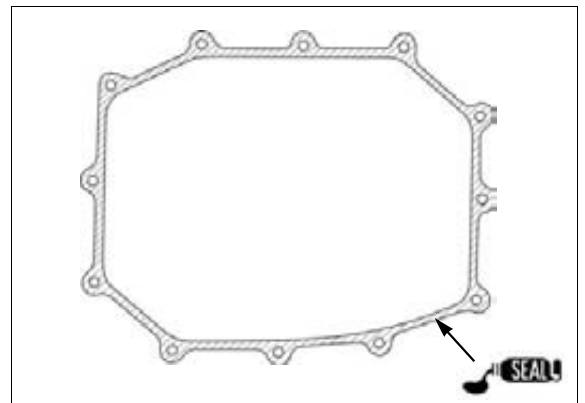
Apply oil to new O-ring and install it onto the relief valve.
 Install the relief valve into the crankcase.



Clean the oil pan mating surface thoroughly.

Do not apply more sealant than necessary.

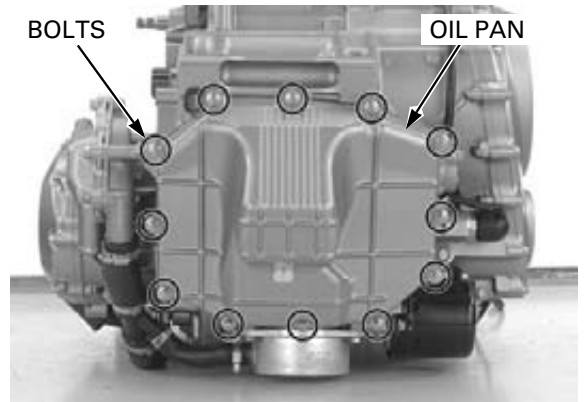
Apply sealant (Three Bond 1207B or an equivalent) to the mating surface.



Install the oil pan onto the lower crankcase.
 Install the flange bolts.
 Tighten the bolts in a crisscross pattern in two to three steps.

Install the exhaust pipe (page 3-13).
 Fill the crankcase with the recommended oil (page 4-16).

After installation, check that there are no oil leaks.



LUBRICATION SYSTEM

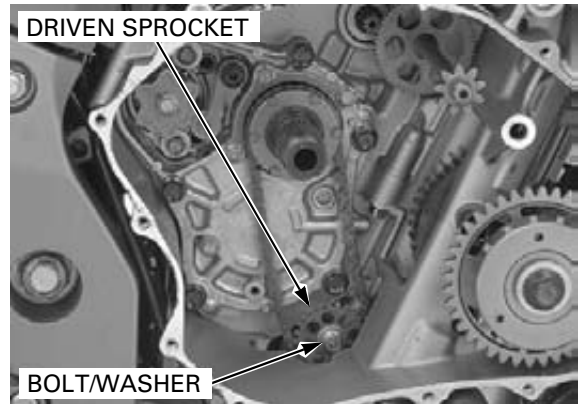
OIL PUMP

REMOVAL

Drain the engine oil (page 4-16).

Remove the clutch (page 10-17).

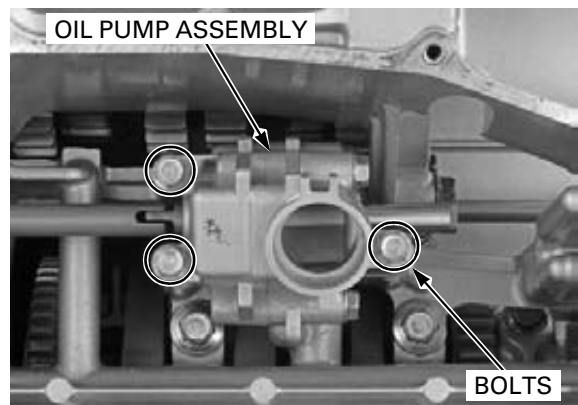
Remove the bolt/washer and oil pump driven sprocket.



Remove the oil pan (page 5-6).

Remove the following:

- Oil pump mounting bolts
- Oil pump assembly
- Dowel pins
- Oil pass collar/O-ring

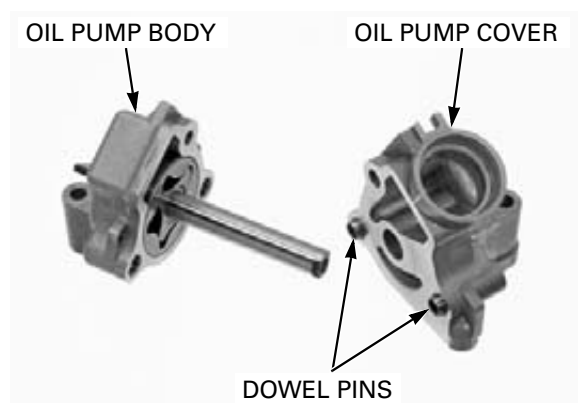


DISASSEMBLY

Remove the oil pump assembly bolts.

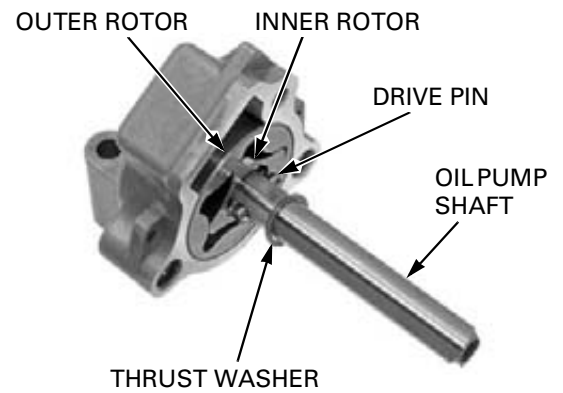


Remove the oil pump cover and dowel pins.



Remove the thrust washer, drive pin, oil pump shaft, outer rotor and inner rotor from the oil pump body.

Clean all disassembly parts thoroughly.



INSPECTION

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

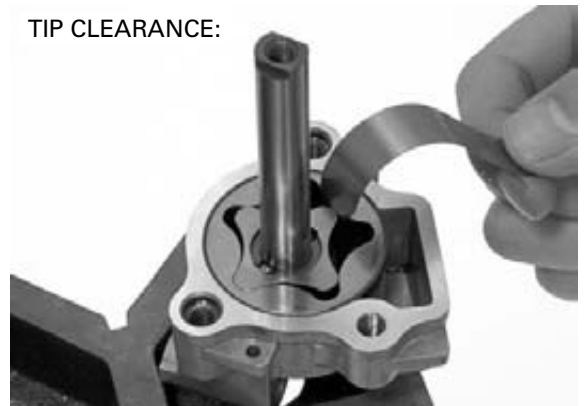
Temporarily install the outer and inner rotors into the oil pump body.

Temporarily install the drive pin and oil pump shaft.

Measure the rotor tip clearance.

SERVICE LIMIT: 0.20 mm (0.008 in)

TIP CLEARANCE:



Measure the pump body clearance.

SERVICE LIMIT: 0.35 mm (0.014 in)

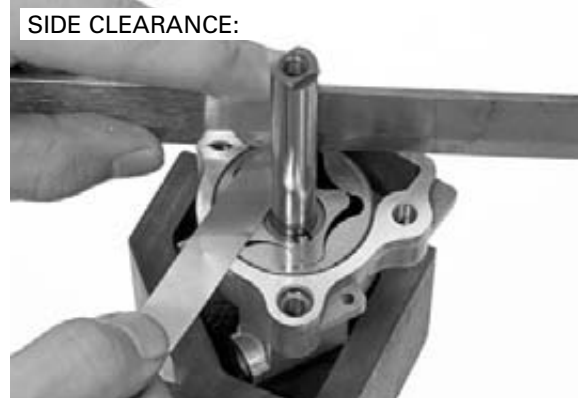
BODY CLEARANCE:



Measure the side clearance using a straight edge and feeler gauge.

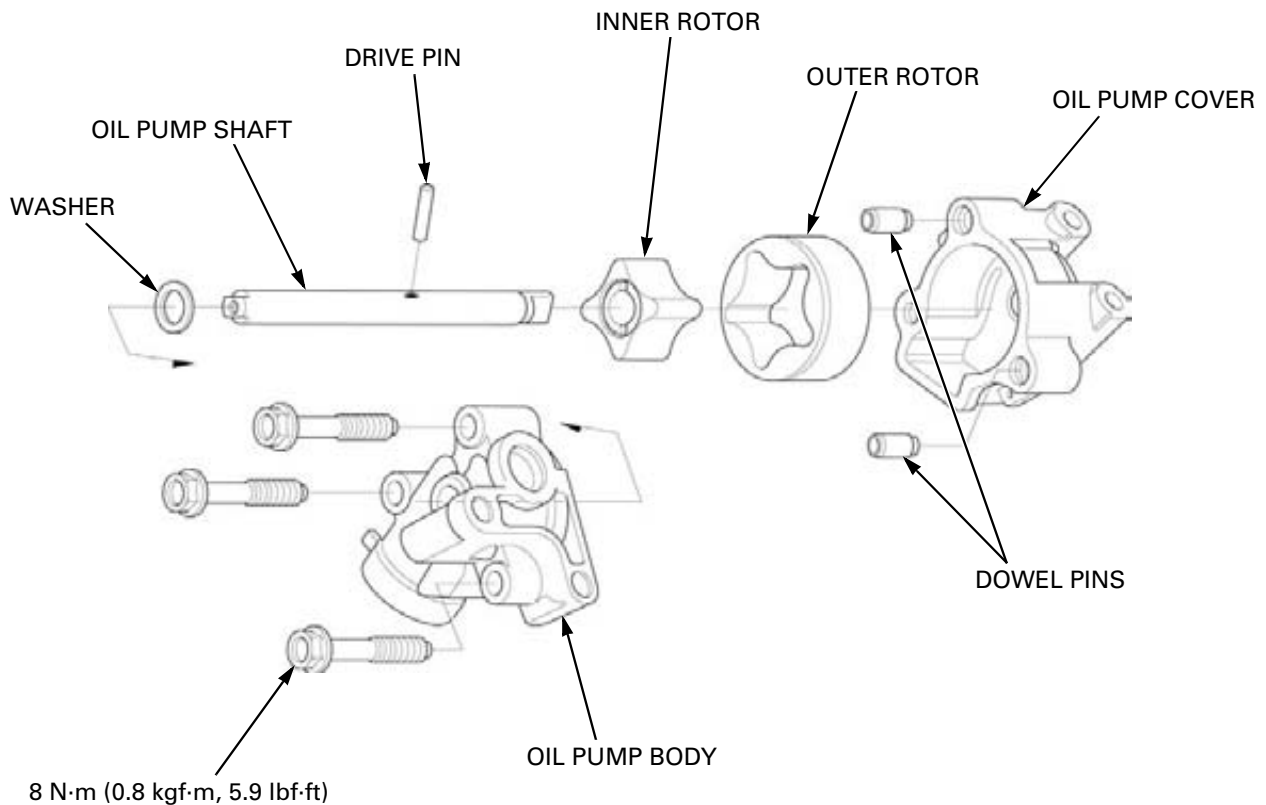
SERVICE LIMIT: 0.17 mm (0.007 in)

SIDE CLEARANCE:

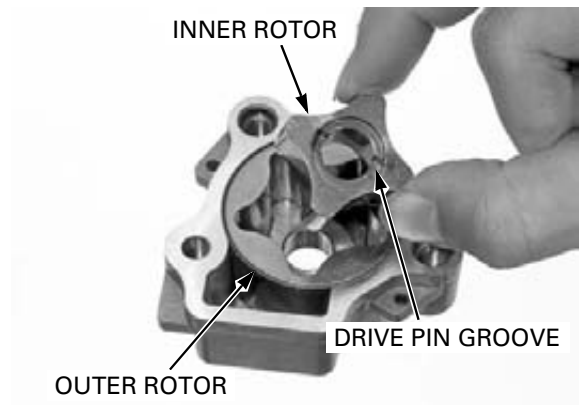


LUBRICATION SYSTEM

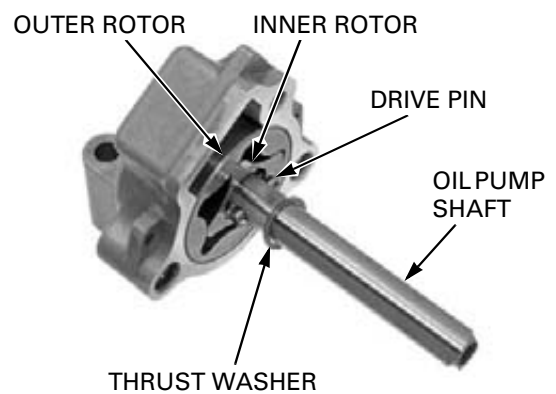
ASSEMBLY



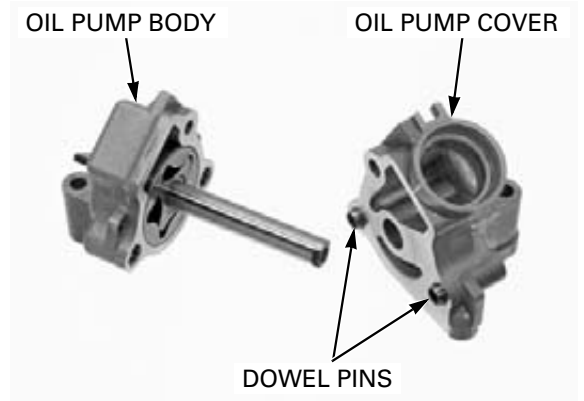
Dip all parts in clean engine oil.
Install the outer rotor into the oil pump body.
Install the inner rotor into the outer rotor with its drive pin groove facing the oil pump cover.



Install the oil pump shaft through the inner rotor and oil pump body.
Install the drive pin into the hole in the oil pump shaft and align the drive pin with the groove in the inner rotor.
Install the thrust washer.



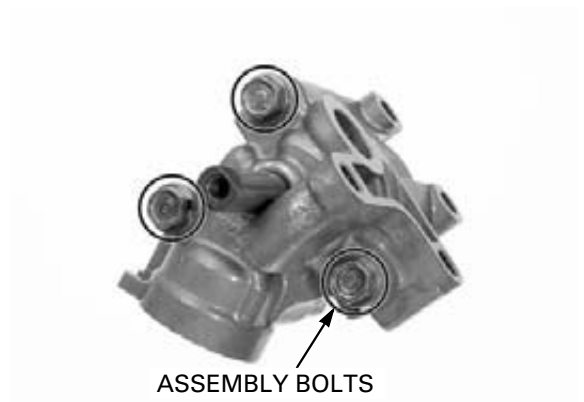
Install the dowel pins into the oil pump cover.
Install the oil pump cover to the oil pump body.



Install and tighten the oil pump assembly bolts to the specified torque.

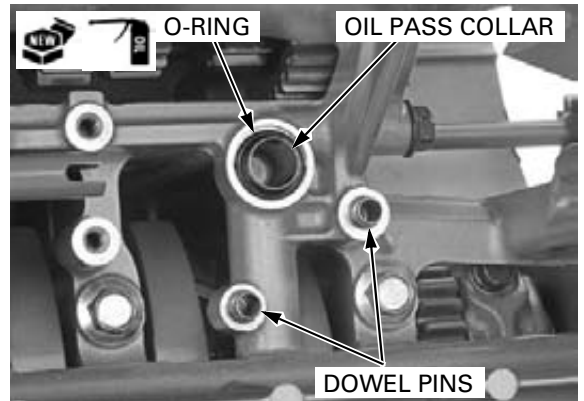
TORQUE: 8 N·m (0.8 kgf·m, 5.9 lbf·ft)

Check the oil pump operation by turning the pump shaft.
If necessary, reassemble the oil pump.

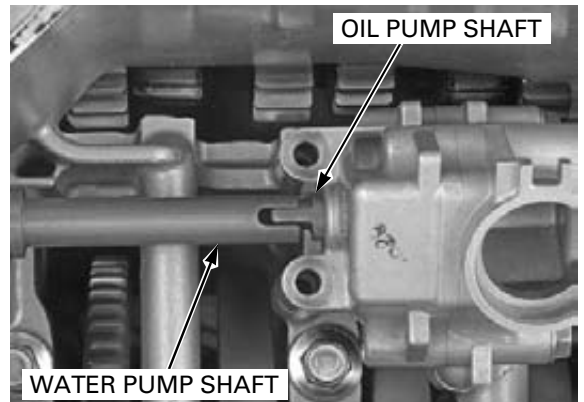


INSTALLATION

Install the dowel pins.
Apply oil to new O-ring and install it with the oil pass collar.

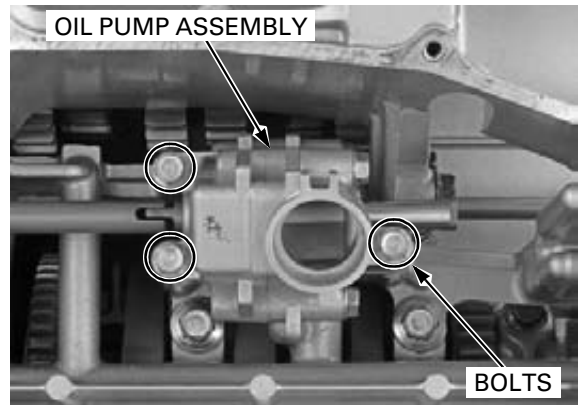


Install the oil pump assembly onto the crankcase while aligning the oil pump shaft lug with the water pump shaft groove by turning the oil pump shaft.



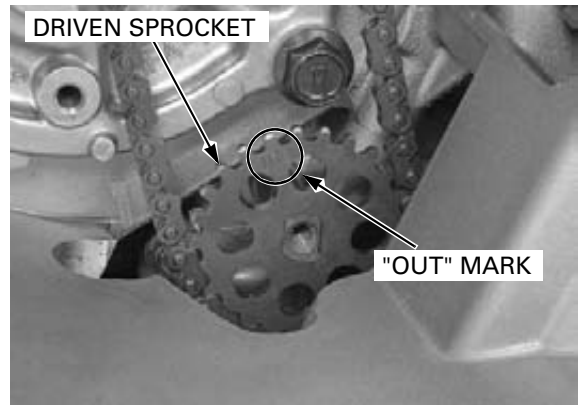
LUBRICATION SYSTEM

Install and tighten the flange bolts securely.



Apply oil to the oil pump driven sprocket and drive chain

Install the driven sprocket with its "OUT" mark facing out.



Apply a locking agent to the oil pump driven sprocket bolt threads.

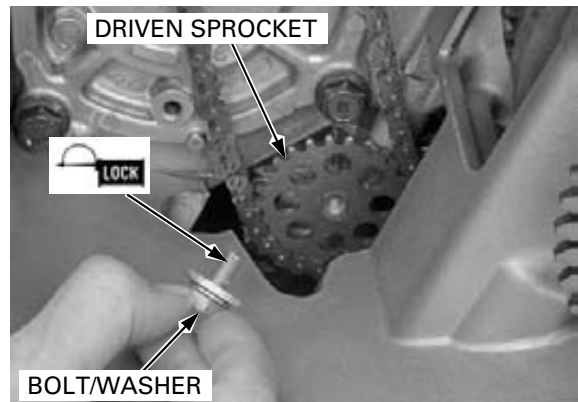
Install and tighten the driven sprocket bolt/washer to the specified torque.

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

Install the right crankcase cover (page 10-24).

After installation, fill the crankcase with the recommended oil (page 4-16) and check that there is no oil leaks.

Check the oil pressure (page 5-5).



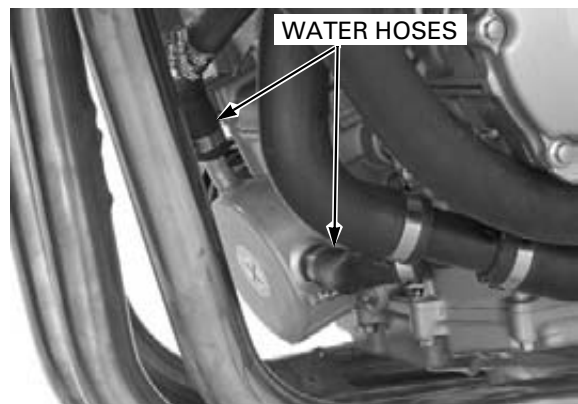
OIL COOLER

REMOVAL

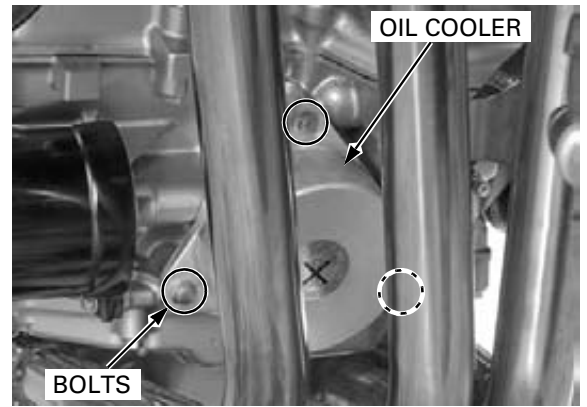
Drain the engine oil (page 4-16).

Drain the coolant from the system (page 7-7).

Loosen the hose band screws and disconnect the oil cooler water hoses from the oil cooler.

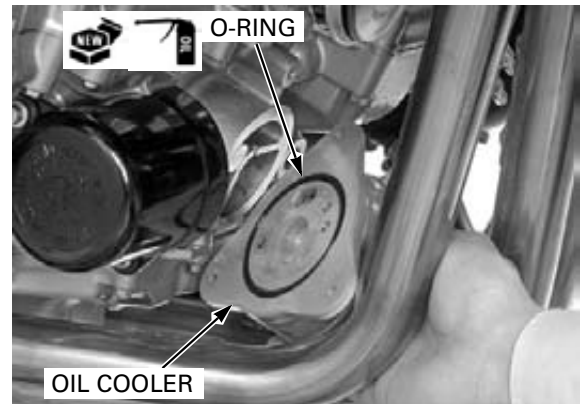


Remove the three bolts and the oil cooler.
Remove the O-ring from the oil cooler.
Check the oil cooler for damage.

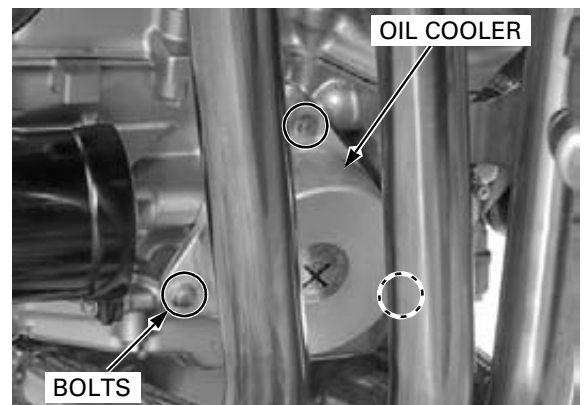


INSTALLATION

Coat a new O-ring with engine oil and install it into the oil cooler groove.

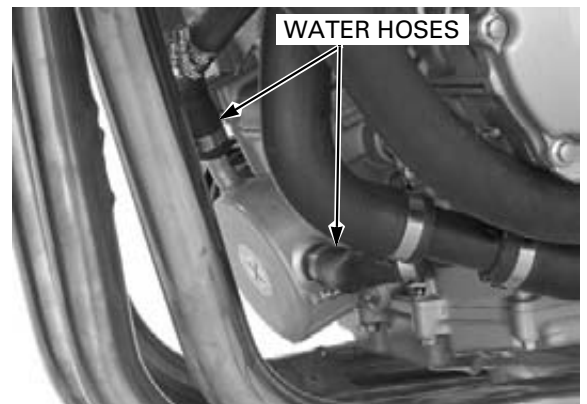


Install the oil cooler onto the crankcase.
Install and tighten the three bolts.



Connect the oil cooler water hoses to the oil cooler and tighten the hose clamp screws securely.

Fill the crankcase with the recommended oil (page 4-16) and check that there is no oil leaks.
Fill the cooling system and bleed any air (page 7-7).

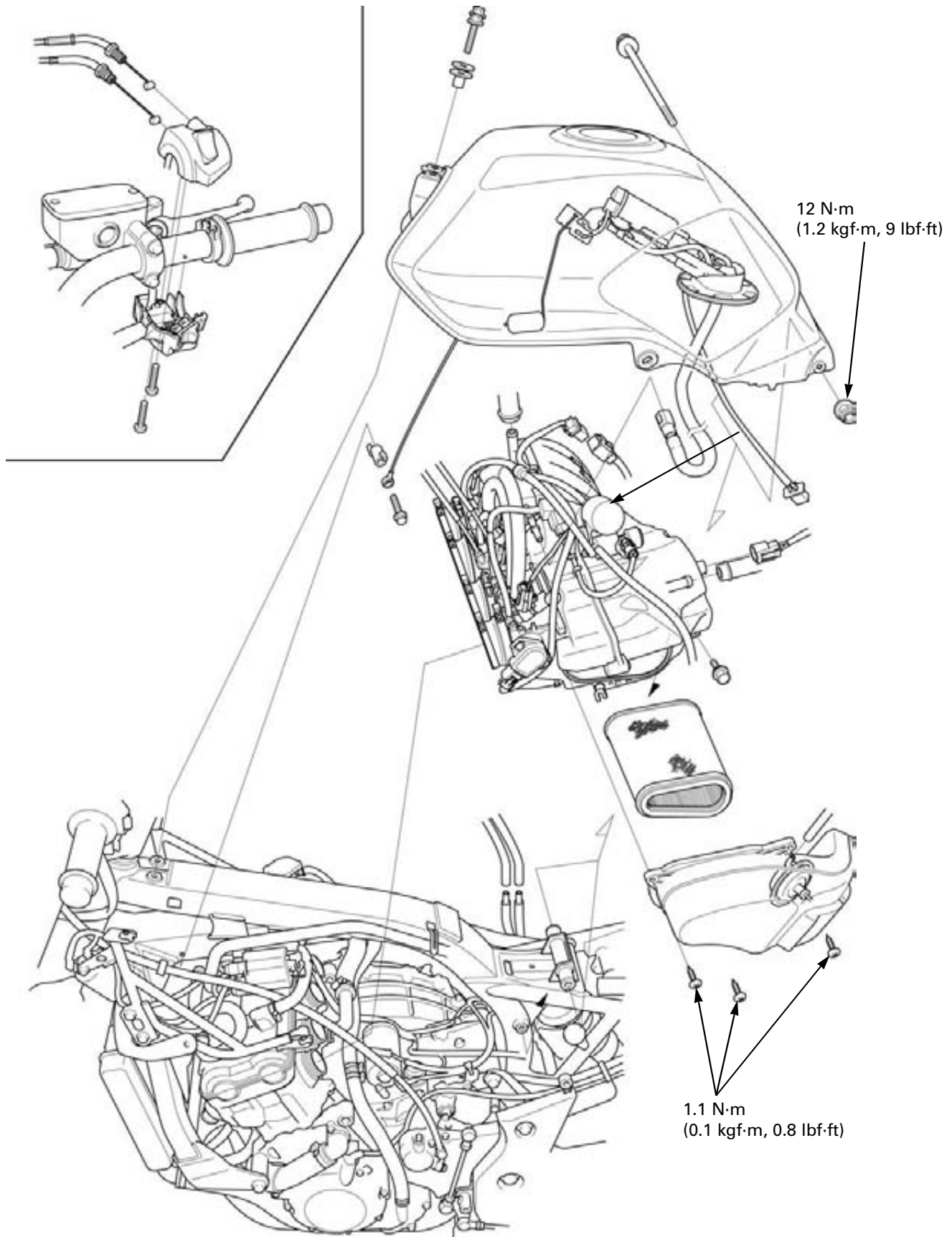


MEMO

6. FUEL SYSTEM (PGM-FI)

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		INTAKE AIR DUCT	6-86

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- 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.
- Before disconnecting the fuel feed hose, relieve fuel pressure from the system by disconnecting the quick connect fitting of the throttle body.
- Bending or twisting the control cables will impair smooth operation and could cause the cables to stick or bind, resulting in loss of vehicle control.
- Do not apply commercially available carburetor cleaners to the inside of the throttle bore.
- 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 intake manifold ports with tape or a clean cloth to keep dirt and debris from entering the engine after the throttle body has been removed.
- Do not damage the throttle body. It may cause incorrect throttle and idle valve synchronization.
- 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 and idle valve synchronization failure.
- The parts of the throttle body not shown in this manual should not be disassembled.
- Always replace the packing when the fuel pump is removed.
- A faulty PGM-FI system is often related to poorly connected or corroded connectors. Check those connections before proceeding.
- The VS sensor sends digital pulse signal to the ECM and computation. Refer to procedures for VS sensor inspection.
 - DTC troubleshooting
 - MIL troubleshooting
- When disassembling the fuel system parts, note the location of the O-rings. Replace them with new ones upon reassembly.
- Always replace the sealing washers when the banjo bolt in the fuel pump is removed or loosened.
- Use a digital tester for PGM-FI system inspection.
- Refer to the fuel level sensor inspection (page 21-20).

SPECIFICATIONS


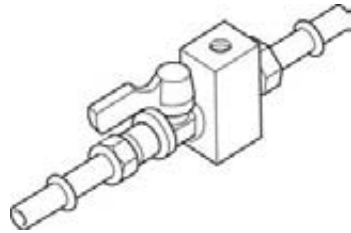


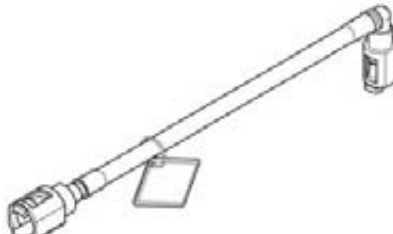


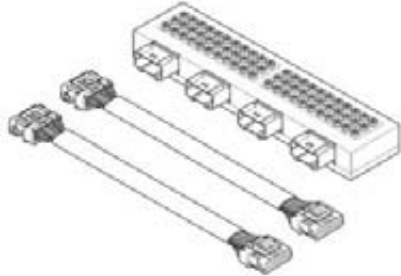
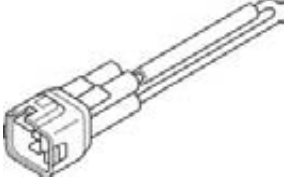


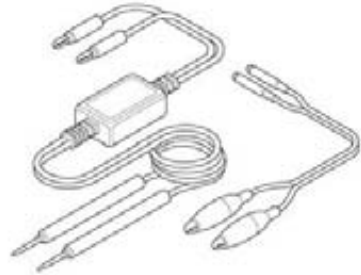
ITEM	SPECIFICATIONS
Throttle body identification number	GQ3BA
Idle speed	1,200 ± 100 min ⁻¹ (rpm)
Throttle grip free play	2 – 6 mm (1/12 – 1/4 in)
Intake air temperature sensor resistance (at 20°C/68°F)	1 – 4 kΩ
ECT sensor resistance (at 20°C/68°F)	2.3 – 2.6 kΩ
Fuel injector resistance (at 20°C /68°F)	11.1 – 12.3 Ω
PAIR control solenoid valve resistance (at 20°C/68°F)	23 – 27 Ω
CKP sensor peak voltage (at 20°C/68°F)	0.7 V minimum
Manifold absolute pressure at idle	29 – 32 kPa (0.30 – 0.33 kgf/cm ² , 4.3 – 4.7 psi)
Fuel pressure at idle	343 kPa (3.5 kgf/cm ² , 50 psi)
Fuel pump flow (at 12 V)	189 cm ³ (6.4 US oz, 6.7 Imp oz) minimum/10 seconds

TORQUE VALUES

Fuel rail mounting bolt	5.1 N·m (0.5 kgf·m, 3.8 lbf·ft)
ECT sensor	23 N·m (2.3 kgf·m, 17 lbf·ft)
O ₂ sensor	44 N·m (4.5 kgf·m, 32 lbf·ft)
Fuel feed hose banjo bolt	22 N·m (2.2 kgf·m, 16 lbf·ft)
Fuel pump mounting nut	12 N·m (1.2 kgf·m, 9 lbf·ft)

FUEL SYSTEM (PGM-FI)

TOOLS

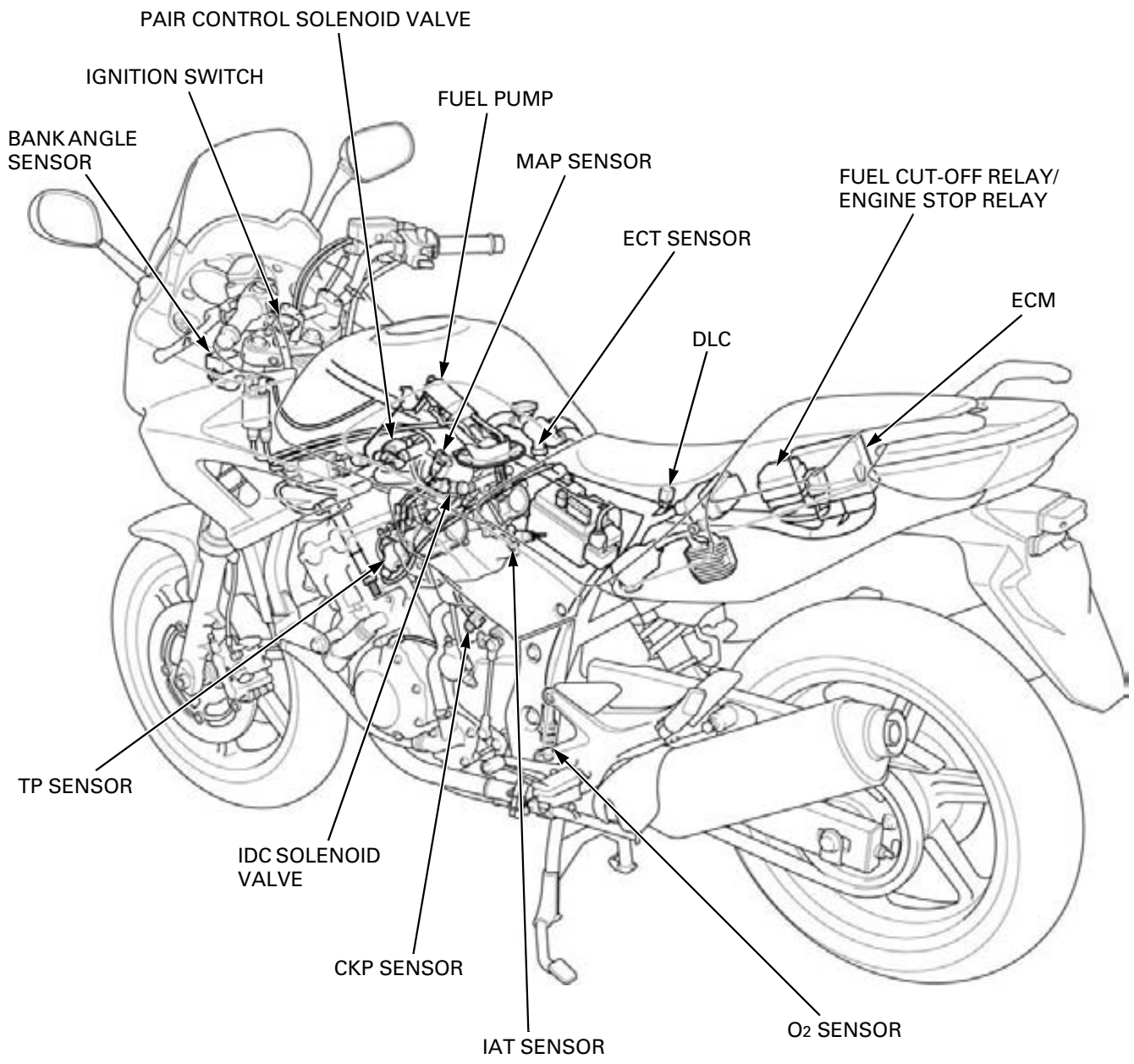
<p>Fuel pressure gauge 07406-0040004</p> 	<p>Pressure gauge manifold 07ZAJ-S5A0110</p> 	<p>Pressure gauge hose attachment C 07ZAJ-S7C0100</p> 
<p>Pressure gauge hose attachment A 07ZAJ-S5A0120</p> 	<p>Pressure gauge hose attachment B 07ZAJ-S5A0130</p> 	<p>Fuel attachment joint A 07ZAJ-S5A0150</p> 
<p>Fuel attachment joint B 07ZAJ-S7C0200</p> 	<p>ECM test harness 33P 070MZ-MCA0100</p> 	<p>SCS connector 070PZ-ZY30100</p> 
<p>Inspection test harness 07GMJ-ML80100</p> 	<p>Test probe 07ZAJ-RDJA110</p> 	<p>Imrie diagnostic tester (model 625) or Peak voltage adaptor 07HGJ-0020100</p>  <p>with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)</p>

PGM-FI SYMPTOM TROUBLESHOOTING

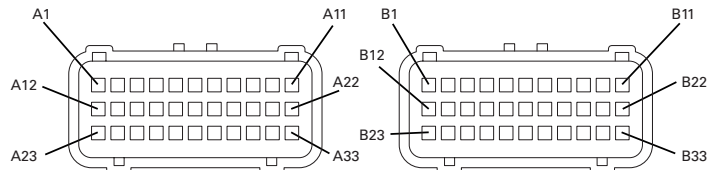
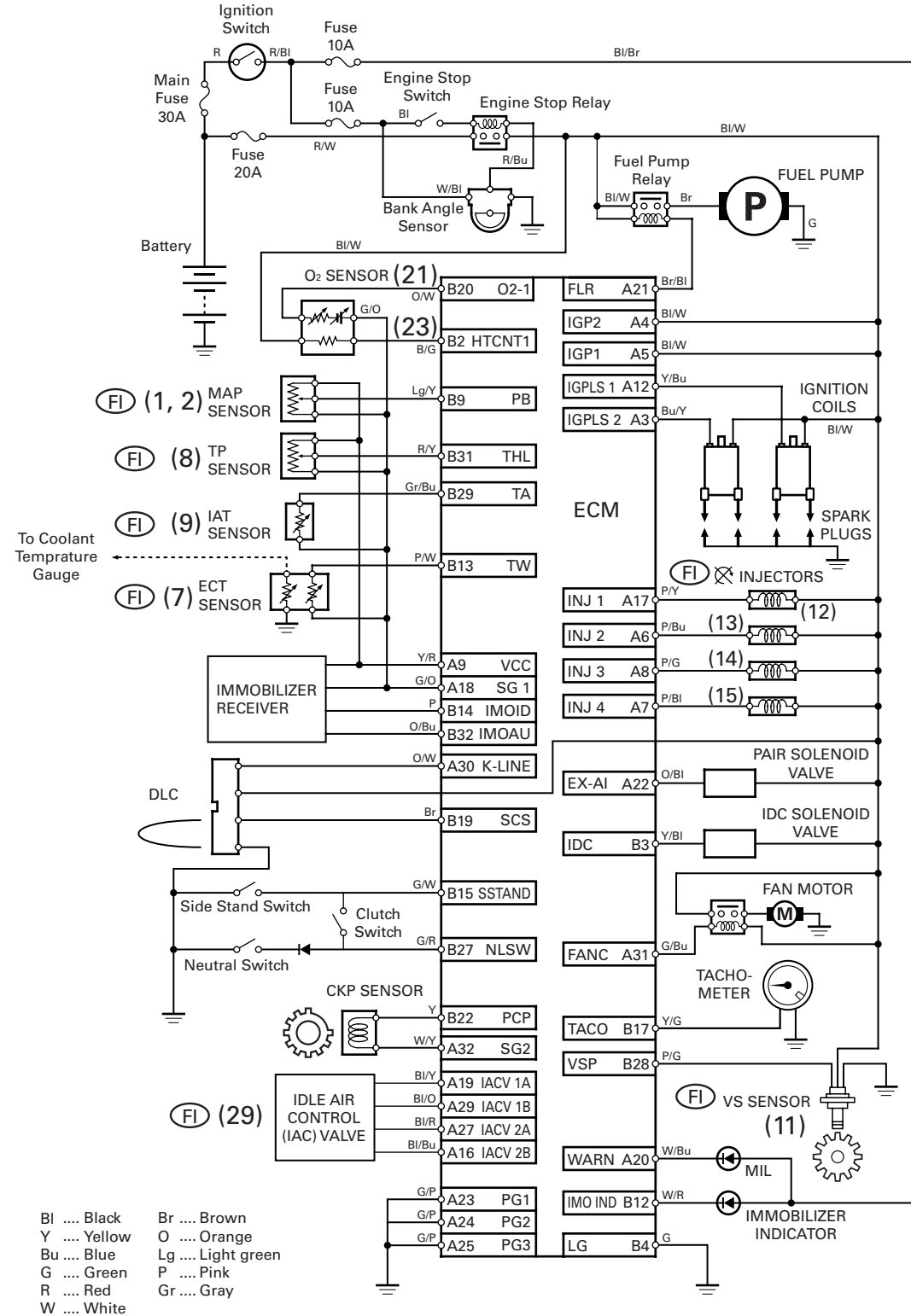
When the motorcycle has one of these symptoms, check the DTC or MIL blinking, refer to the DTC index (page 6-16) and begin the appropriate troubleshooting procedure. If there are no DTC/MIL blinking stored in the ECM memory, do the diagnostic procedure for the symptom, in sequence listed below, until 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"> 1. Crank the starter for more than ten seconds and check the DTC (page 6-13) and execute the troubleshooting according to the DTC. 2. Inspect the fuel supply system (page 6-51). 	<ul style="list-style-type: none"> • No fuel to injector <ul style="list-style-type: none"> – Clogged fuel filter – Pinched or clogged fuel feed hose – Pinched or clogged fuel tank breather tube – Faulty fuel pump – Faulty fuel pump circuits • Intake air leak • Contaminated/deteriorated fuel • Faulty fuel injector • IACV stuck • Faulty ignition system
Engine cranks but won't start (No fuel pump operation sound when the turning the ignition ON)	<ol style="list-style-type: none"> 1. ECM power/ground circuits malfunction (page 6-82) 2. Inspect the fuel supply system (page 6-51). 	<ul style="list-style-type: none"> • Open circuit in the power input and/or ground wire of the ECM • Faulty bank angle sensor or related circuit • Faulty FI/IGN relay or related circuit • Faulty engine stop switch or related circuit • Blown FI/IGN fuse (20 A) • Blown STARTER/BANK ANGLE SENSOR fuse (10 A)
Engine stalls, hard to start, rough idling	<ol style="list-style-type: none"> 1. Check the idle speed. 2. Check the IACV. 3. Inspect the fuel supply system (page 6-51). 	<ul style="list-style-type: none"> • Restricted fuel feed hose • Contaminated/deteriorated fuel • Intake air leak • Faulty IACV • Restricted fuel tank breather tube • Faulty ignition system
Afterburn when engine braking is used	Check the PAIR system (page 6-84).	<ul style="list-style-type: none"> • Faulty pulse secondary air injection (PAIR) system <ul style="list-style-type: none"> – Faulty PAIR control solenoid valve – Faulty PAIR check valve – Clogged hose of the PAIR system • Faulty ignition system
Backfiring or misfiring during acceleration	Check the ignition system.	<ul style="list-style-type: none"> • Faulty ignition system
Poor performance (driveability) and poor fuel economy	<ol style="list-style-type: none"> 1. MAP sensor and its hoses connection 2. Inspect the fuel supply system 	<ul style="list-style-type: none"> • Pinched or clogged fuel feed hose • Faulty pressure regulator (fuel pump) • Faulty injector • Faulty ignition system • MAP sensor • MAP sensor hose
Idle speed is below specifications or fast idle too low (No DTC and MIL blinking)	<ol style="list-style-type: none"> 1. Check the idle speed 2. Check the IACV 	<ul style="list-style-type: none"> • IACV stuck closed • Faulty fuel supply system • Faulty ignition system
Idle speed is above specifications or fast idle too high (No DTC and MIL blinking)	<ol style="list-style-type: none"> 1. Check the idle speed 2. Check the throttle operation and lever free play 3. Check the IACV 	<ul style="list-style-type: none"> • IACV stuck opened • Faulty ignition system • Intake air leak • Engine top end problem • Air cleaner condition
MIL stays ON but no DTCs set, or MIL never comes ON at all	Troubleshoot the MIL circuit (page 6-50).	<ul style="list-style-type: none"> • Faulty MIL circuit
MIL stays ON at all (No DTC set)	Inspect the DLC circuit.	<ul style="list-style-type: none"> • Short circuit in the DLC related wire

PGM-FI SYSTEM LOCATION



PGM-FI SYSTEM DIAGRAM



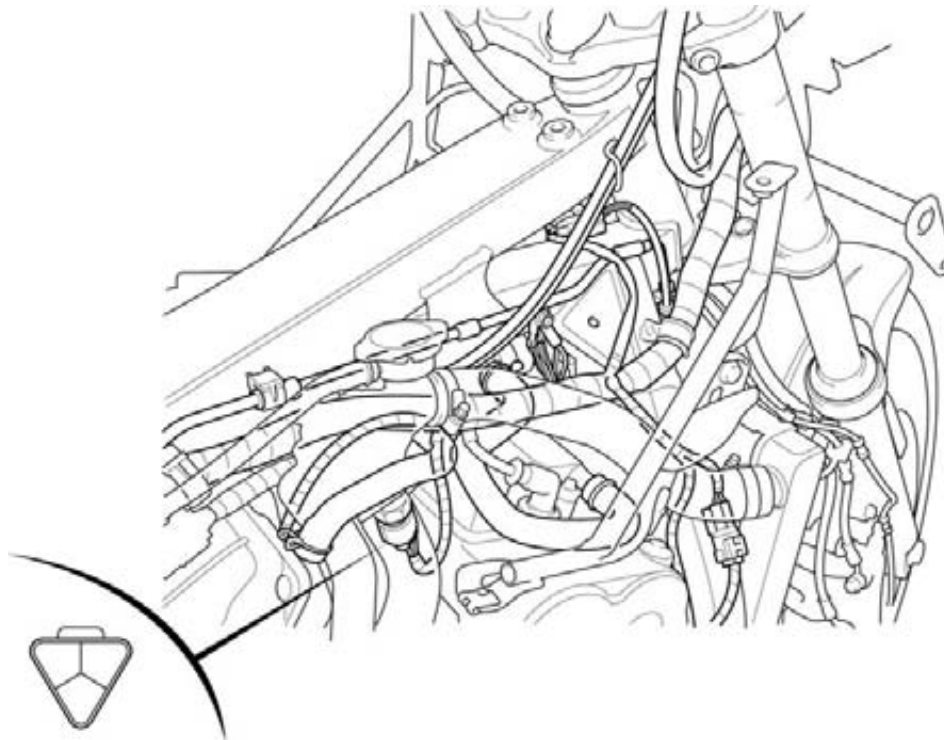
ECM 33P (Black) CONNECTOR A ECM 33P (Light gray) CONNECTOR B

ECM side of male terminals

FUEL SYSTEM (PGM-FI)

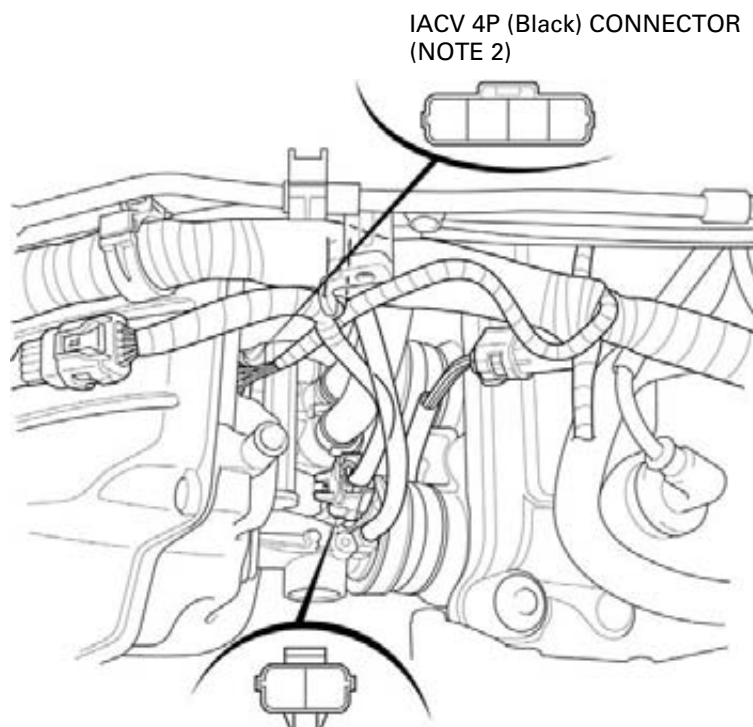
PGM-FI CONNECTOR LOCATIONS

NOTE 1: Lift and support the fuel tank (page 4-5), then remove the thermostat case mounting bolt.



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

NOTE 2: Remove the fuel tank (page 6-57).

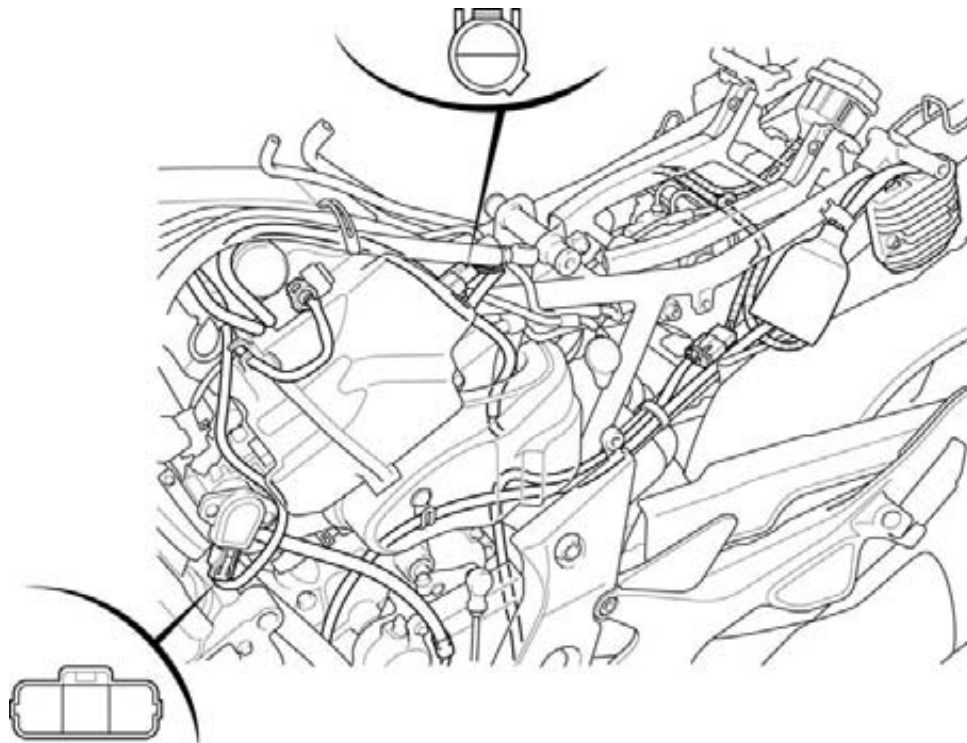


IACV 4P (Black) CONNECTOR
(NOTE 2)

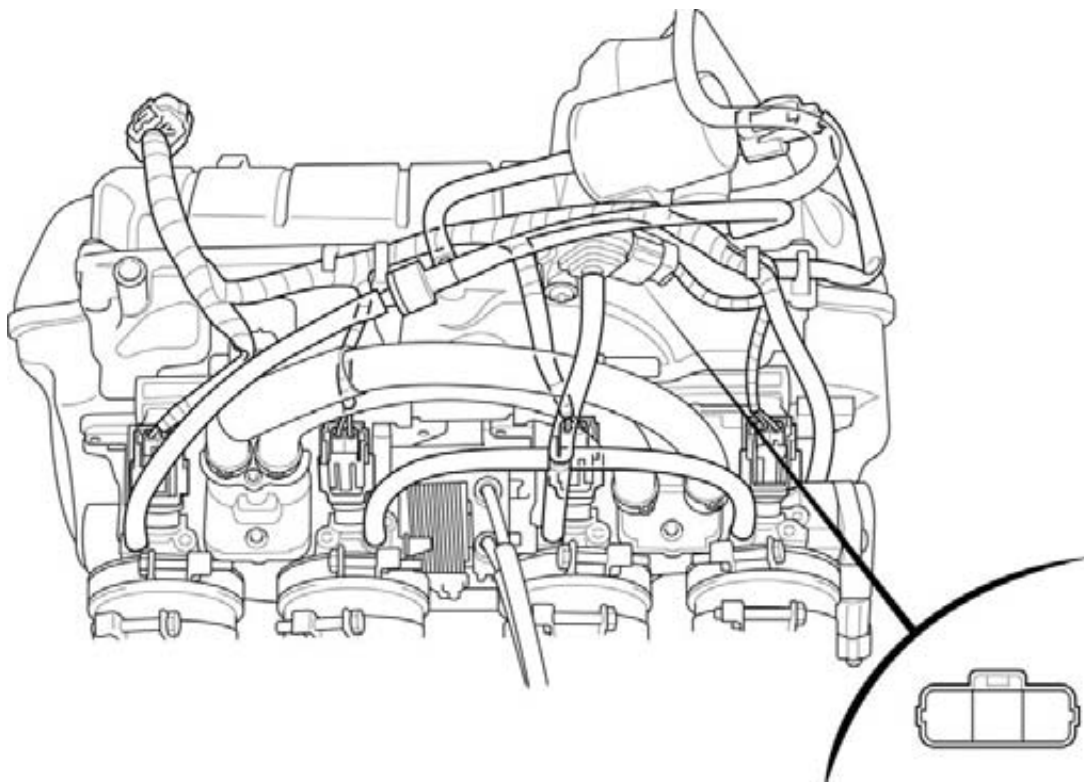
INJECTOR 2P (Gray) CONNECTORS
(NOTE 2)

NOTE 1: Remove the fuel tank (page 6-57).

TP SENSOR 2P (Gray) CONNECTOR
(NOTE 1)



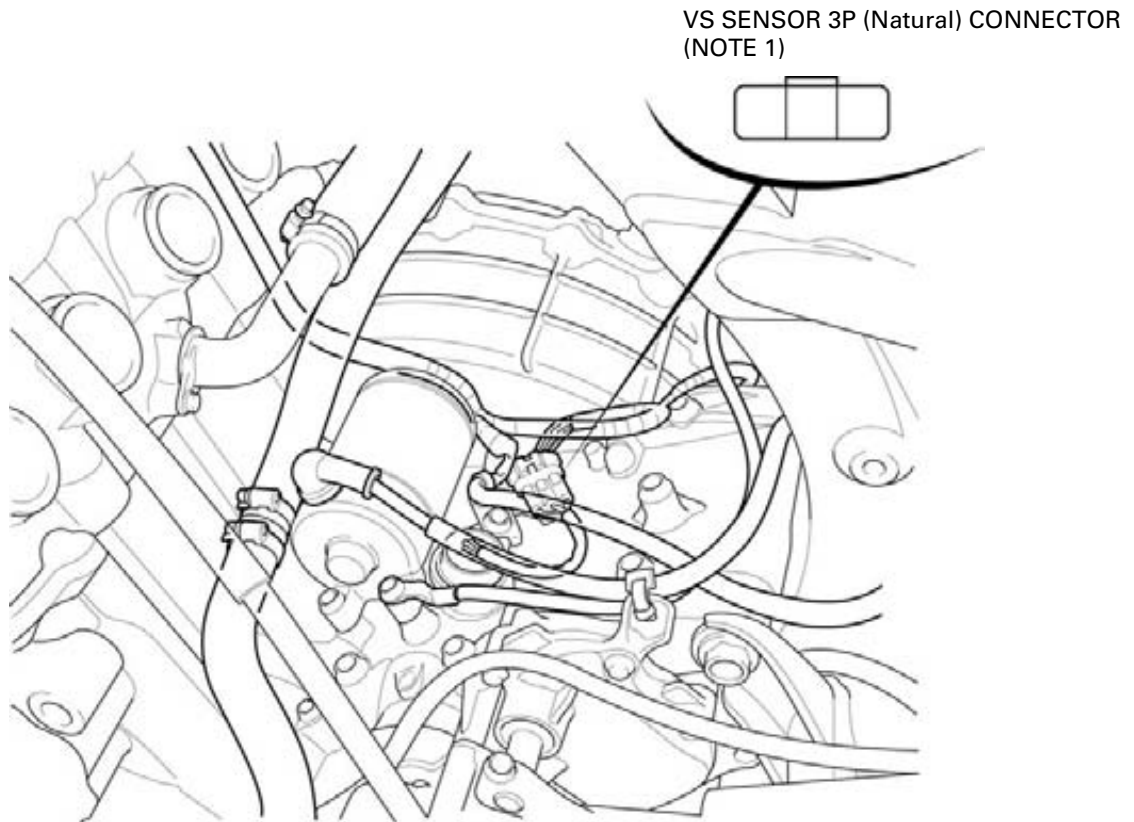
TP SENSOR 3P (Black) CONNECTOR



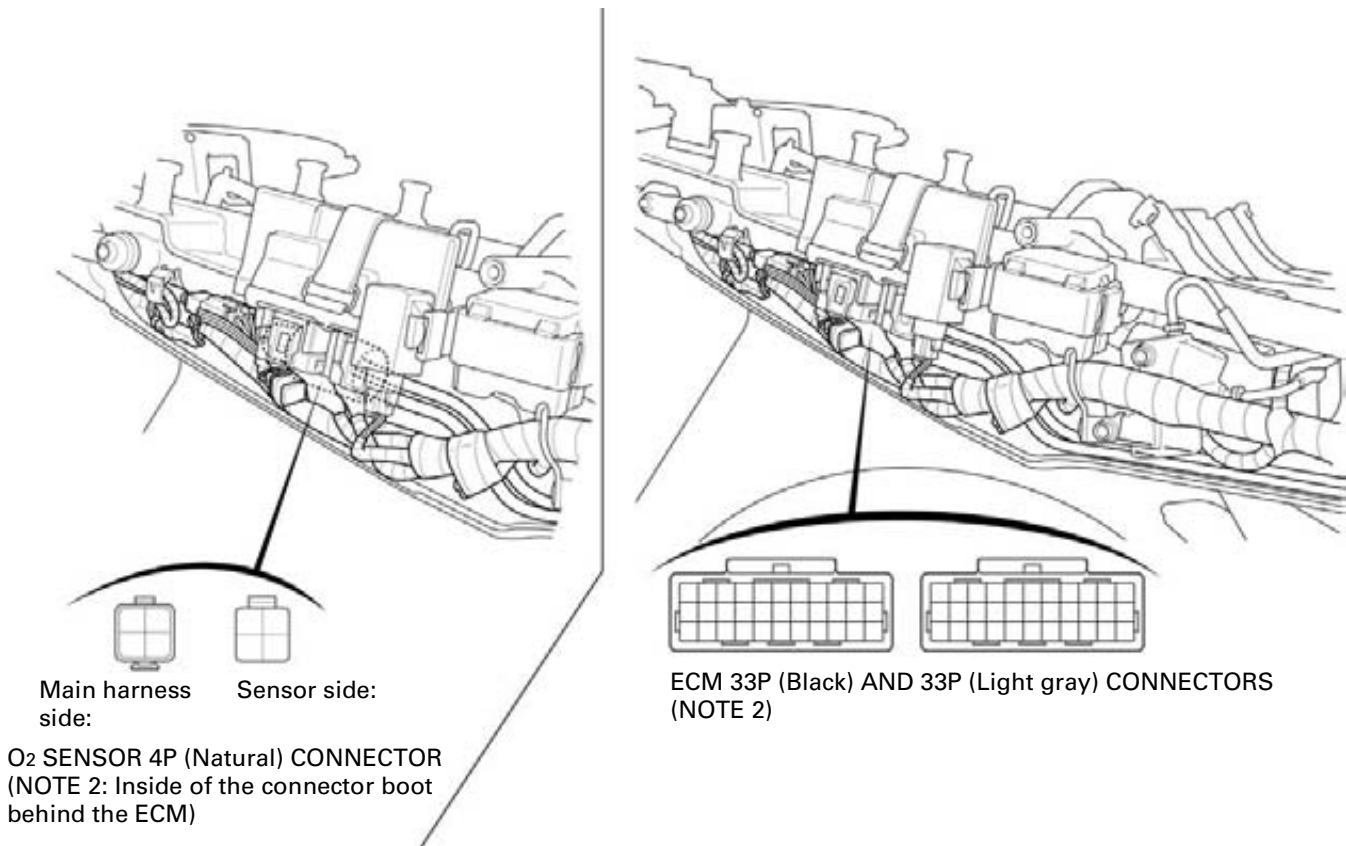
MAP SENSOR 3P (Black) CONNECTOR
(NOTE 1)

FUEL SYSTEM (PGM-FI)

NOTE 1: Remove the air cleaner housing (page 6-60).



NOTE 2: Remove the right rear cowl (page 3-8).



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 6-13).

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 6-5).

SYSTEM DESCRIPTION

SELF-DIAGNOSIS SYSTEM

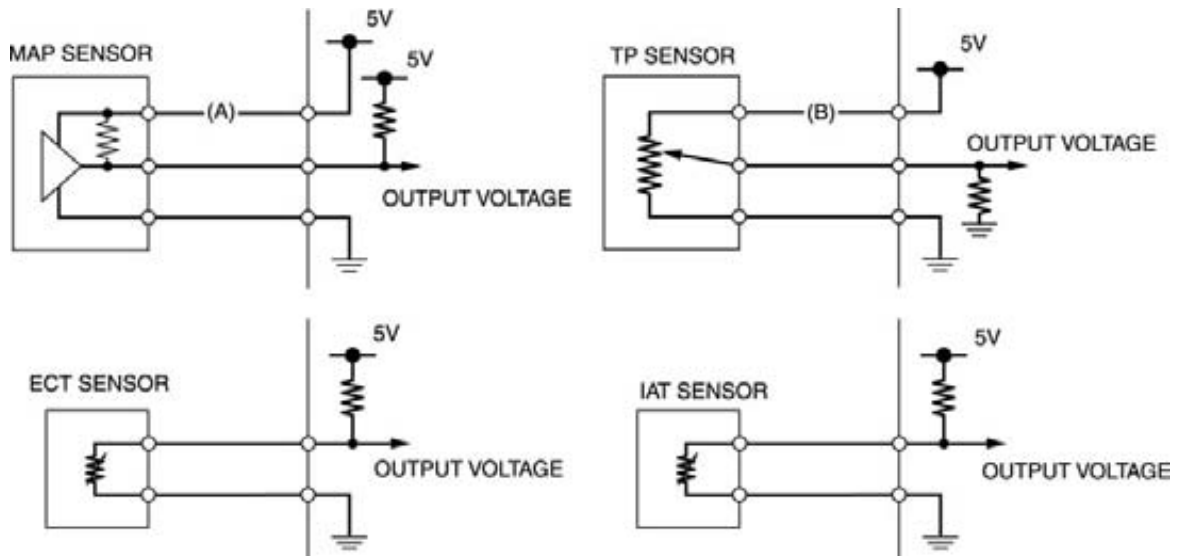
The PGM-FI system is equipped with the self-diagnostic system. When any abnormality occurs in the system, the ECM turns on the MIL and stores a DTC in its erasable memory.

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) and/or crankshaft position (CKP) sensor, the fail-safe function stops the engine to protect it from damage.

DTC (Diagnostic Trouble Code)

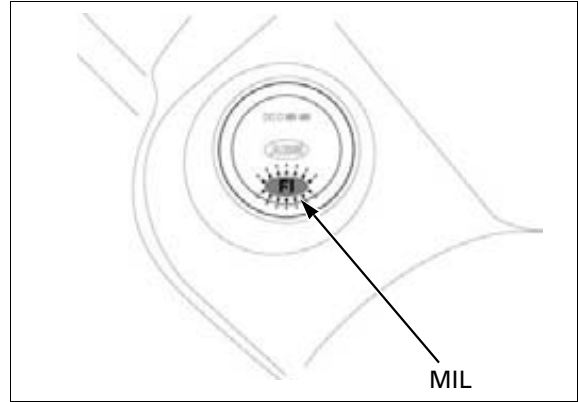
- The DTC is composed of a main code and a sub code and it is displayed as a hyphenated number when retrieved from the ECM with the HDS pocket tester.
 - The digits in front of the hyphen are the main code, they indicate the component of function failure.
 - The digits behind the hyphen are the sub code, 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, BARO, 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 side stand down. The MIL will stay ON when the engine speed is over 5,000 min⁻¹ (rpm) or with the side stand 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 ON and engine stop switch "⏏", the MIL will stay on for a few seconds, then go off. If the MIL does not come on, troubleshoot the MIL circuit (page 6-50).

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 side stand 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 (page 6-13).

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

Turn the ignition switch to OFF.
Remove the seats (page 3-3).

Remove the dummy connector from the DLC.
Connect the HDS pocket tester to the DLC.

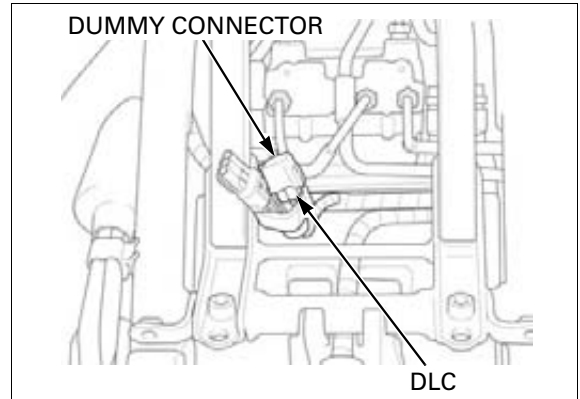
Turn the ignition switch ON and engine stop switch "C", check the DTC and freeze data.

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.



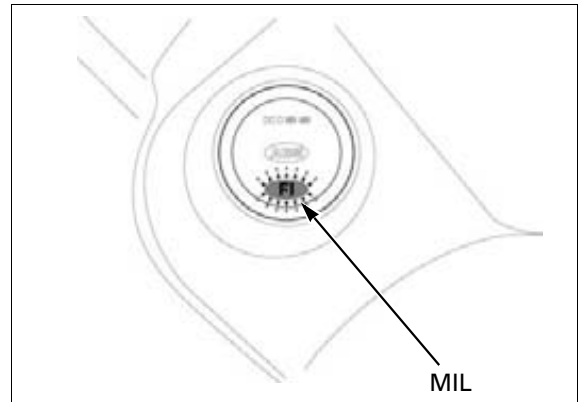
DTC READOUT

Start the engine and check the MIL.

- If the engine will not start, turn the starter motor for more than 10 seconds and check that the MIL blinks.
- When the ignition switch is turned ON, the MIL will stay on for a few seconds, then go off.

If the MIL stays on or blinks, connect the HDS Pocket Tester to the DLC (page 6-13).
Read the DTC, freeze data and follow the troubleshooting index (page 6-16).

To read the DTC with the MIL blinking, refer to the following procedure.



Reading DTC with the MIL

Turn the ignition switch to OFF.
Remove the seats (page 3-3).

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

TOOL:

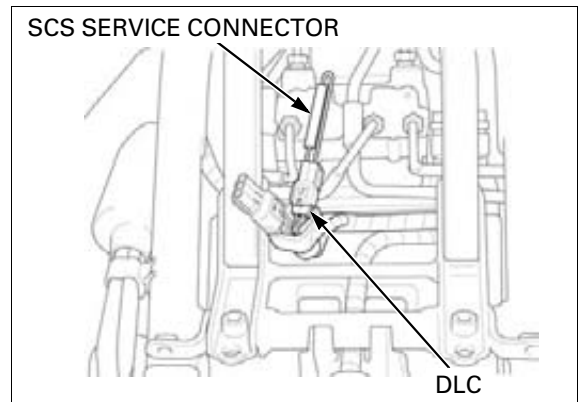
SCS connector 070PZ-ZY30100

CONNECTION: Brown – Green

Turn the ignition switch ON, read, note the MIL blinks and refer to the troubleshooting index (page 6-16).

NOTE:

If the ECM has any DTC in its memory, the MIL will start blinking.



FUEL SYSTEM (PGM-FI)

CLEARING DTC

Connect the HDS Pocket Tester to the DLC (page 6-13).

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

1. Remove the seats (page 3-3).
2. Turn the ignition switch to OFF.
3. Remove the dummy connector and short the Brown and Green wire terminals of the DLC using the special tool.

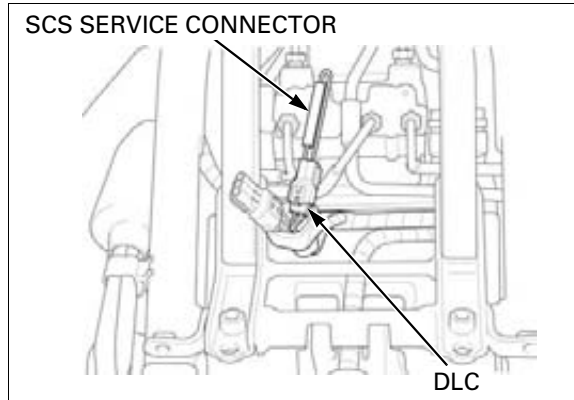
Make sure the engine stop switch is turned to "C".

TOOL:

SCS connector 070PZ-ZY30100

CONNECTION: Brown – Green

4. Turn the ignition switch to ON.
5. Remove the special tool wire 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.

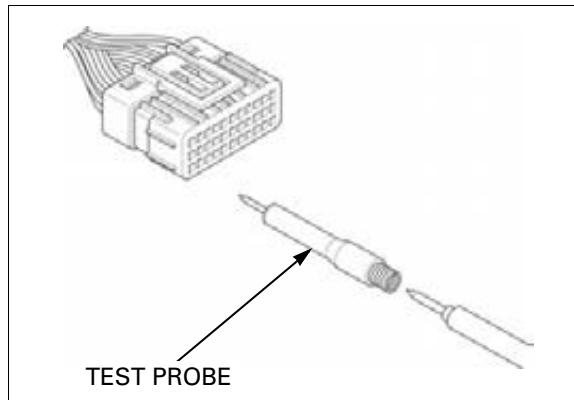
CIRCUIT INSPECTION

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 terminals. Check those connections before proceeding.
- In testing at ECM connector (wire harness 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

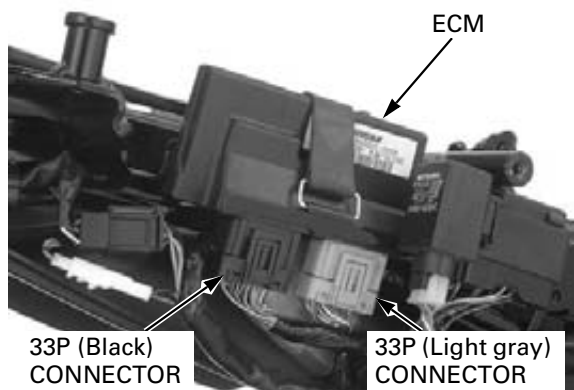


TEST HARNESS CONNECTION

Remove the right rear cowl (page 3-8).

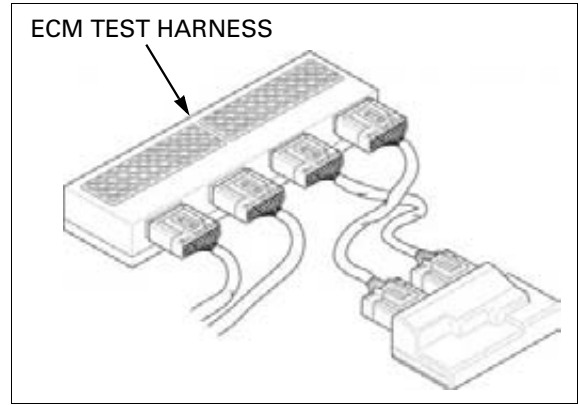
Turn the ignition switch to "OFF".

Disconnect the 33P connectors from the ECM.



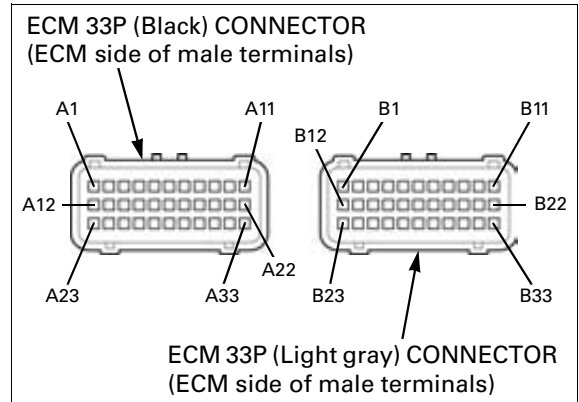
Connect the ECM test harness between the main wire harness and the ECM.

TOOL:
ECM test harness 33P 070MZ-MCA0100

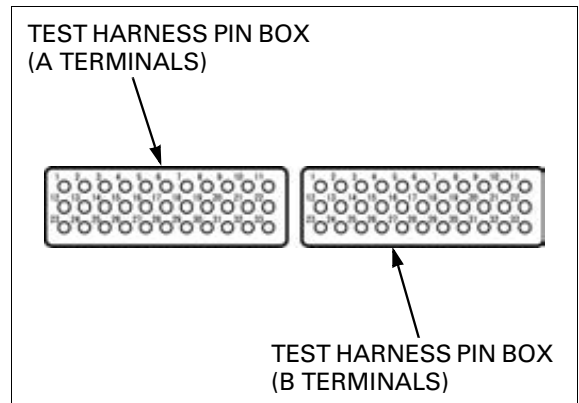


TEST HARNESS TERMINAL LAYOUT

The ECM connector terminals are numbered as shown in this illustration.



The ECM test harness terminals are same layout as for the ECM connector terminals as shown.



FUEL SYSTEM (PGM-FI)

DTC INDEX

DTC (MIL blinks)	Function Failure	Symptom/Fail-safe function	Refer to (DTC)	Refer to (MIL)
1-1 (1)	MAP sensor circuit low voltage (less than 0.2 V) • MAP sensor or its circuit malfunction	• Engine operates normally • Fail-safe value: 760 mmHg/ 1,013 hPa	6-17	6-35
1-2 (1)	MAP sensor circuit high voltage (more than 3.9 V) • Loose or poor contact of the MAP sensor connector • MAP sensor or its circuit malfunction	• Engine operates normally • Fail-safe value: 760 mmHg/ 1,013 hPa	6-18	
2-1 (2)	MAP sensor hose connection • Disconnection or poor connection of the MAP sensor hoses	• Engine operates normally	6-19	6-37
7-1 (7)	ECT sensor circuit low voltage (less than 0.07 V) • ECT sensor or its circuit malfunction	• Hard start at a low temperature • Fail-safe value: 85°C/185°F • Cooling fan turns on	6-20	6-38
7-2 (7)	ECT sensor circuit high voltage (more than 4.93 V) • Loose or poor contact of the ECT sensor connector • ECT sensor or its circuit malfunction	• Hard start at a low temperature • Fail-safe value: 85°C/185°F • Cooling fan turns on	6-21	
8-1 (8)	TP sensor circuit low voltage (less than 0.3 V) • TP sensor or its circuit malfunction	• Poor engine acceleration • Fail-safe value: 0°	6-23	6-40
8-2 (8)	TP sensor circuit high voltage (more than 4.93 V) • Loose or poor contact of the TP sensor connector • TP sensor or its circuit malfunction	• Poor engine acceleration • Fail-safe value: 0°	6-25	
9-1 (9)	IAT sensor circuit low voltage (less than 0.07 V) • IAT sensor or its circuit malfunction	• Engine operates normally • Fail-safe value: 28°C/82°F	6-26	6-42
9-2 (9)	IAT sensor circuit high voltage (more than 4.93 V) • Loose or poor contact of the IAT sensor connector • IAT sensor or its circuit malfunction	• Engine operates normally • Fail-safe value: 28°C/82°F	6-27	
11-1 (11)	VS sensor no signal • Loose or poor contact of the VS sensor connector • VS sensor or its circuit malfunction	• Engine operates normally	6-28	6-43
12-1 (12)	No. 1 injector circuit malfunction • Loose or poor contact of the injector connector • Injector or its circuit malfunction	• Engine does not start • Injectors, fuel pump and ignition shut down	6-29	6-45
13-1 (13)	No. 2 injector circuit malfunction • Loose or poor contact of the injector connector • Injector or its circuit malfunction	• Engine does not start • Injectors, fuel pump and ignition shut down	6-30	6-46
14-1 (14)	No. 3 injector circuit malfunction • Loose or poor contact of the injector connector • Injector or its circuit malfunction	• Engine does not start • Injectors, fuel pump and ignition shut down	6-30	6-46
15-1 (15)	No. 4 injector circuit malfunction • Loose or poor contact of the injector connector • Injector or its circuit malfunction	• Engine does not start • Injectors, fuel pump and ignition shut down	6-30	6-46
21-1 (21)	O ₂ sensor malfunction • Loose or poor contact of the O ₂ sensor connector • O ₂ sensor or its circuit malfunction	• Engine operates normally	6-31	6-47
23-1 (23)	O ₂ sensor heater circuit malfunction • Loose or poor contact of the O ₂ sensor heater connector • O ₂ sensor heater or its circuit malfunction	• Engine operates normally	6-32	6-48
29-1 (29)	IACV circuit malfunction • Loose or poor contact of the IACV connector • IACV or its circuit malfunction	• Engine stalls, hard to start, rough idling	6-33	6-49

DTC TROUBLESHOOTING

DTC 1-1 (MAP SENSOR LOW VOLTAGE)

1. MAP Sensor System Inspection

Turn the ignition switch ON and engine stop switch "G".
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 MAP sensor connector

2. MAP Sensor Input Voltage Inspection

Turn the ignition switch OFF.
Disconnect the MAP sensor 3P (Black) connector.

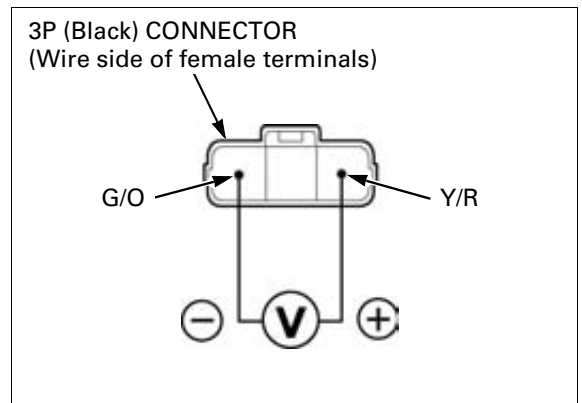
Turn the ignition switch ON and engine stop switch "G".
Measure the voltage at the wire harness side.

Connection: Yellow/red (+) – Green/orange (-)

Is the voltage within 4.75 – 5.25 V?

YES - GO TO STEP 4.

NO - GO TO STEP 3.



3. MAP Sensor Input Line Inspection

Turn the ignition switch OFF.
Disconnect the ECM 33P connectors.

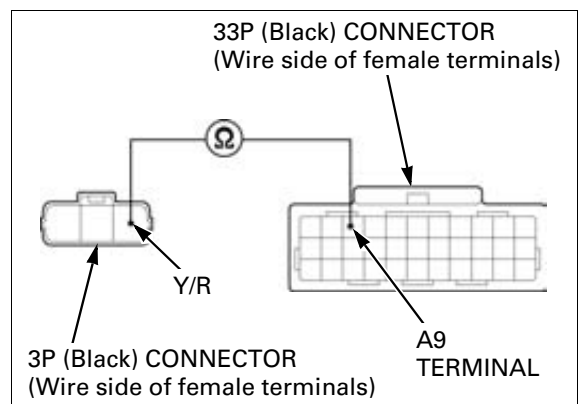
Check for continuity at the Yellow/red wire between the MAP sensor 3P (Black) connector terminal and the ECM 33P (Black) connector.

Connection: A9 – Yellow/red

Is there continuity?

YES - Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 22-6)

NO - Open circuit in Yellow/red wire



4. MAP Sensor Output Line Short Circuit Inspection

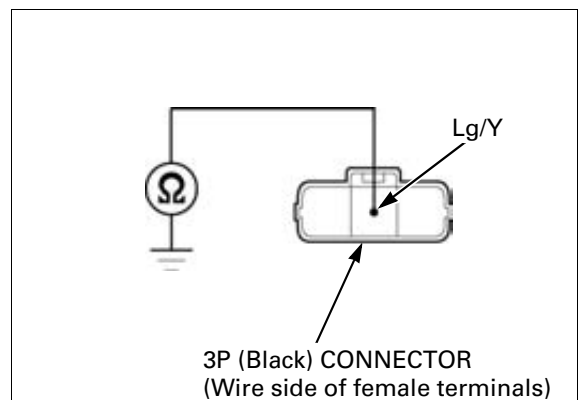
Check for continuity between the MAP sensor 3P (Black) connector terminal of the wire harness side and ground.

Connection: Light green/yellow – ground

Is there continuity?

YES - Short circuit in Light green/yellow wire

NO - GO TO STEP 5.



FUEL SYSTEM (PGM-FI)

5. MAP Sensor Inspection

Replace the MAP sensor with a known good one (page 6-78).

Reset the ECM (page 6-14).

Turn the ignition switch ON and engine stop switch "⏻".

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; refer to Key Registration Procedures (page 22-6)

NO – Faulty original MAP sensor

DTC 1-2 (MAP SENSOR HIGH VOLTAGE)

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

1. MAP Sensor System Inspection 1

Turn the ignition switch ON and engine stop switch "⏻".

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 MAP sensor connector

2. MAP Sensor System Inspection 2

Turn the ignition switch OFF.

Disconnect the MAP sensor 3P (Black) connector.

Connect the MAP sensor terminals at the wire harness side with a jumper wire.

Connection: Light green/yellow – Green/orange

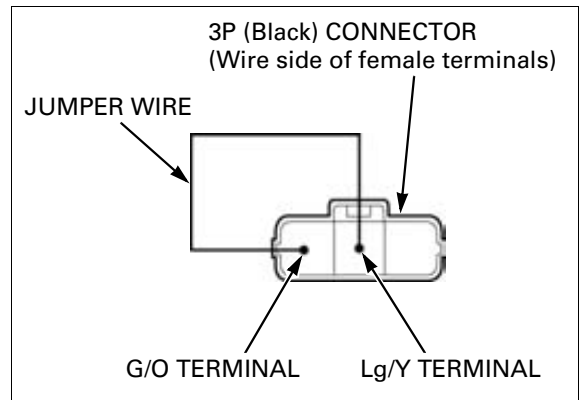
Turn the ignition switch ON and engine stop switch "⏻".

Check the MAP sensor with the HDS pocket tester.

Is about 0 V indicated?

YES – Faulty MAP sensor

NO – GO TO STEP 3.



3. MAP Sensor Input Voltage Inspection

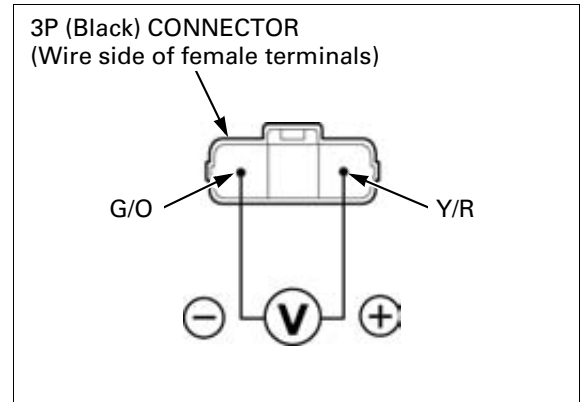
Turn the ignition switch OFF.
Remove the jumper wire.
Turn the ignition switch ON and engine stop switch "⏻".
Measure the voltage at the wire harness side.

Connection: Yellow/red (+) – Green/orange (-)

Is the voltage within 4.75 – 5.25 V?

YES – GO TO STEP 4.

NO – Open circuit in Gray/black wire



4. MAP Sensor Output Line Open Circuit Inspection

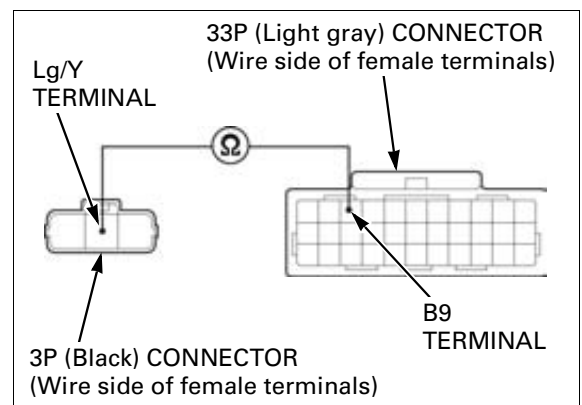
Disconnect the ECM 33P connectors.
Check for continuity at the Light green/yellow wire between the MAP sensor 3P (Black) connector terminal and the ECM 33P (Light gray) connector.

Connection: B9 – Light green/yellow

Is there continuity?

YES – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 22-6)

NO – Open circuit in Light green/yellow wire



DTC 2-1 (MAP SENSOR HOSE CONNECTION)

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

1. MAP Sensor System Inspection

Turn the ignition switch ON and engine stop switch "⏻".

Start the engine and check the MAP sensor with the HDS.
The MAP sensor voltage should be changed after engine started.

Is the MAP sensor voltage indicated normally?

YES – Intermittent failure

NO – GO TO STEP 2.

FUEL SYSTEM (PGM-FI)

2. MAP sensor hose inspection

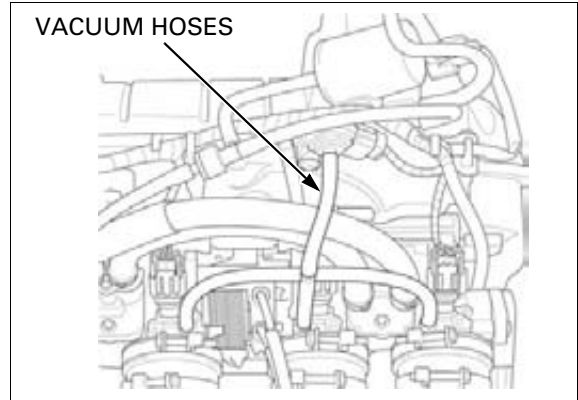
Turn the ignition switch OFF.

Check for connection and installation of the MAP sensor vacuum hose.

Is the MAP sensor vacuum hose connection correct?

YES – GO TO STEP 3.

NO – Correct the hose installation



3. MAP Sensor System Inspection

Replace the MAP sensor with a known good one (page 6-78).

Turn the ignition switch ON and engine stop switch "⏻".

Start the engine and check the MAP sensor with the HDS.

The MAP sensor voltage should be changed after engine started.

Is the MAP sensor voltage normally?

YES – Faulty original MAP sensor

NO – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 22-6)

DTC 7-1 (ECT SENSOR LOW VOLTAGE)

1. ECT Sensor System Inspection

Turn the ignition switch ON and engine stop switch "⏻".

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 OFF.

Disconnect the ECT sensor 3P (Gray) connector.

Turn the ignition switch ON and engine stop switch "⏻".

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 OFF.

Measure the resistance at the ECT sensor terminals.

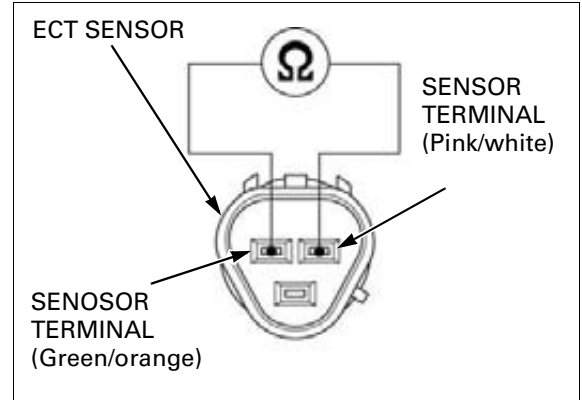
CONNECTION: Pink/white – Green/orange

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 new one, and recheck; refer to Key Registration Procedures (page 22-6)

No – Faulty ECT sensor.



4. ECT Sensor Short Circuit Inspection

Disconnect the ECM 33P connectors from the module.

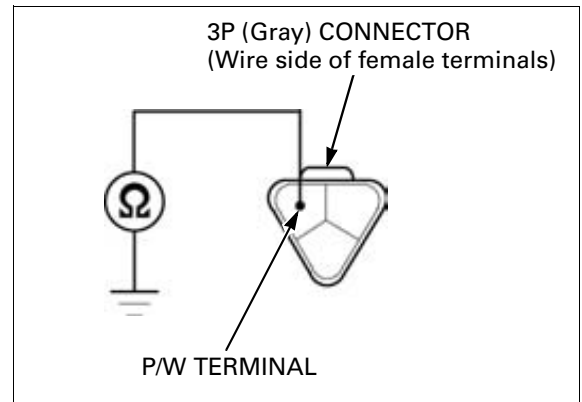
Check for continuity between the ECT sensor 3P (Gray) connector terminal of the wire harness side and ground.

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; refer to Key Registration Procedures (page 22-6)



DTC 7-2 (ECT SENSOR HIGH VOLTAGE)

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

1. ECT Sensor System Inspection

Turn the ignition switch ON and engine stop switch "⏏".

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.

FUEL SYSTEM (PGM-FI)

2. ECT Sensor Inspection

Turn the ignition switch OFF.

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

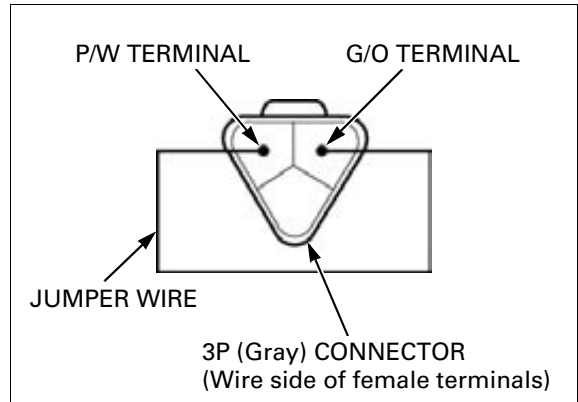
Connection: Pink/white – Green/orange

Turn the ignition switch ON and engine stop switch "G". Check the ECT sensor with the HDS pocket tester.

Is about 0 V indicated?

YES – Inspect the ECT sensor (page 21-16).

NO – GO TO STEP 3.



3. ECT Sensor Output Line Inspection

Turn the ignition switch OFF.

Remove the jumper wire.

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

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

TOOL:

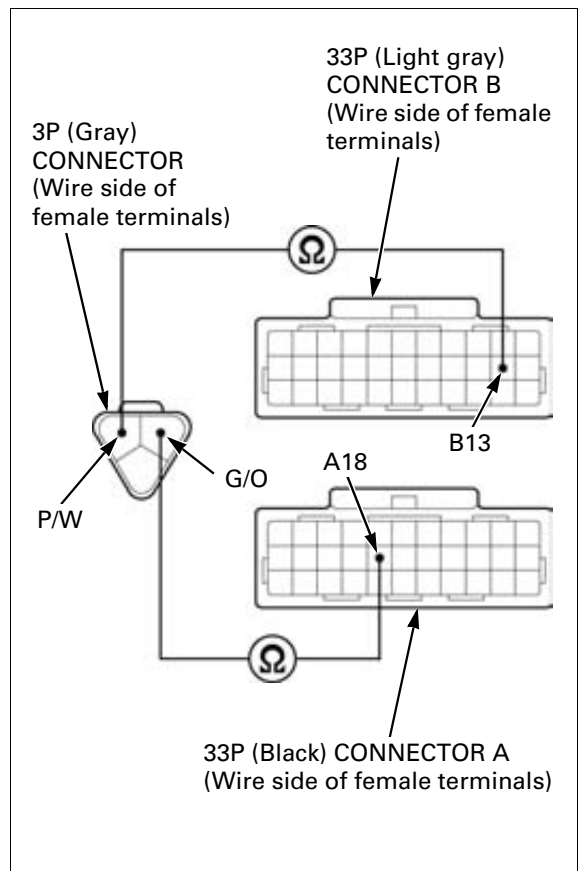
Test probe 07ZAJ-RDJA110

Are there continuity?

YES – Replace the ECM with new one, and recheck; refer to Key Registration Procedures (page 22-6)

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 TP sensor 3P (Black) connector and recheck the DTC.

1. TP Sensor System Inspection

Turn the ignition switch ON and engine stop switch "G".

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

Is about 0 V indicated?

YES – GO TO STEP 3.

NO – GO TO STEP 2.

2. TP Sensor Inspection

Check the TP sensor voltage is increasing uninterrupted when moving the throttle from fully closed to fully opened using the data list menu of the HDS pocket tester.

Does the voltage increase continuously?

- YES** –
- Intermittent failure
 - Loose or poor contact on the TP sensor connector

NO – Faulty TP sensor

3. TP Sensor Input Voltage Inspection

Turn the ignition switch OFF.
Disconnect the TP sensor 3P (Black) connector.

Turn the ignition switch ON and engine stop switch "G".

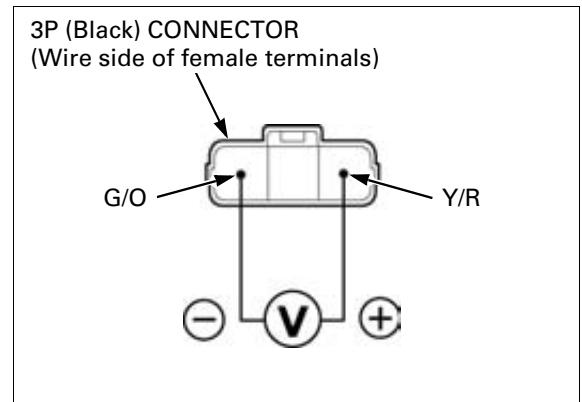
Measure the voltage at the wire harness side.

Connection: Yellow/red (+) – Green/orange (-)

Is the voltage within 4.75 – 5.25 V?

YES – GO TO STEP 5.

NO – GO TO STEP 4.



4. TP Sensor Circuit Inspection

Disconnect the ECM 33P connectors.

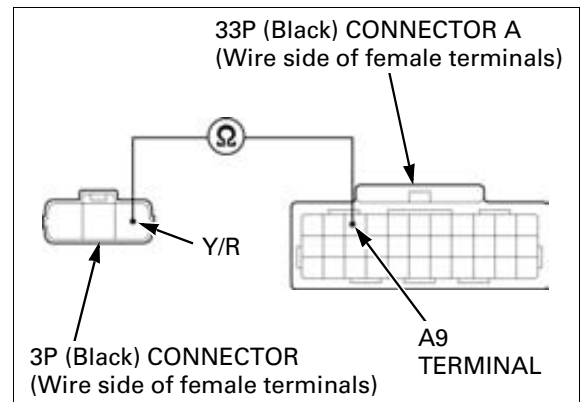
Check the continuity at the Yellow/red wire between the TP sensor 3P (Black) connector terminal and the ECM 33P (Black) connector.

Connection: A9 – Yellow/red

Is there continuity?

- YES** – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 22-6)

NO – Open circuit in Yellow/red wire



FUEL SYSTEM (PGM-FI)

5. TP Sensor Output Line Open Circuit Inspection

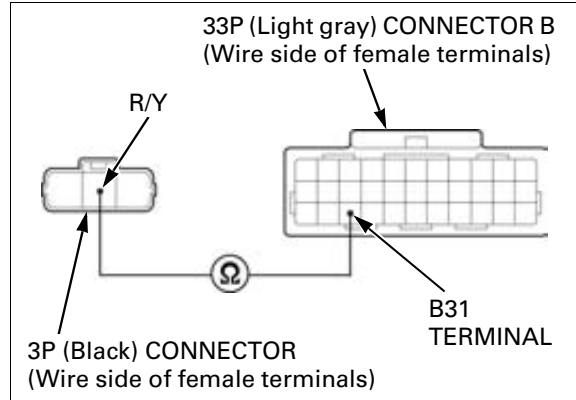
Check for continuity at the Red/yellow wire between the TP sensor 3P (Black) connector terminal and the ECM 33P (Light gray) connector.

Connection: B31 – Red/yellow

Is there continuity?

YES – GO TO STEP 6.

NO – Open circuit in Red/yellow wire



6. TP Sensor Output Line Short Circuit Inspection

Disconnect the TP sensor 3P (Black) connector.

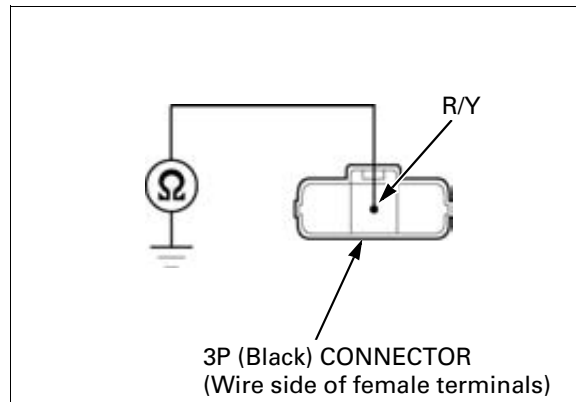
Check for continuity between the TP sensor 3P connector terminal of the wire harness side and ground.

Connection: Red/yellow – ground

Is there continuity?

YES – Short circuit in Red/yellow wire

NO – GO TO STEP 7.



7. TP Sensor Inspection

Replace the TP sensor with a known good one.

Reset the ECM (page 6-14).

Turn the ignition switch ON and engine stop switch "⏏".

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; refer to Key Registration Procedures (page 22-6)

NO – Faulty original TP sensor

DTC 8-2 (TP SENSOR HIGH VOLTAGE)

1. TP Sensor System Inspection

Turn the ignition switch ON and engine stop switch "⏻".

Check the TP sensor with the HDS pocket tester.

Is about 5 V indicated?

YES – GO TO STEP 3.

NO – GO TO STEP 2.

2. TP Sensor Inspection

Check the TP sensor voltage is increasing uninterrupted when moving the throttle from fully closed to fully opened using the data list menu of the HDS pocket tester.

Does the voltage increase continuously?

YES – • Intermittent failure
• Loose or poor contact on the TP sensor connector

NO – Faulty TP sensor

3. TP Sensor Resistance Inspection

Turn the ignition switch OFF.

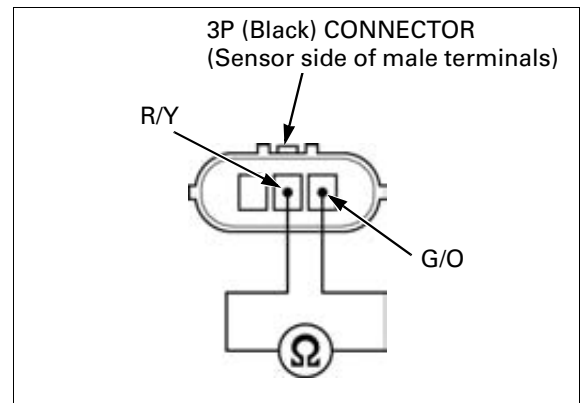
Disconnect the TP sensor 3P (Black) connector. Measure the resistance at the TP sensor side.

Connection: Red/yellow – Green/orange

Is the resistance within 0.5 – 1.5 kΩ?

YES – GO TO STEP 4.

NO – Faulty TP sensor



4. TP Sensor Input Voltage Inspection

Turn the ignition switch ON and engine stop switch "⏻".

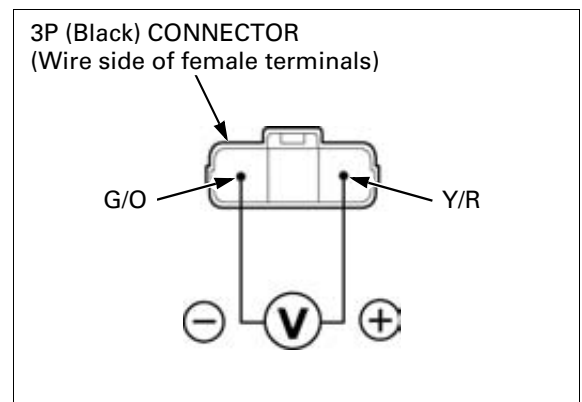
Measure the voltage at the wire harness side.

Connection: Yellow/red (+) – Green/orange (-)

Is the voltage within 4.75 – 5.25 V?

YES – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 22-6)

NO – Open circuit in Gray/black or wires



DTC 9-1 (IAT SENSOR LOW VOLTAGE)

1. IAT Sensor System Inspection

Turn the ignition switch ON and engine stop switch "C".

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 IAT sensor connector

2. IAT Sensor Inspection

Turn the ignition switch OFF.

Disconnect the IAT sensor 2P (Gray) connector.

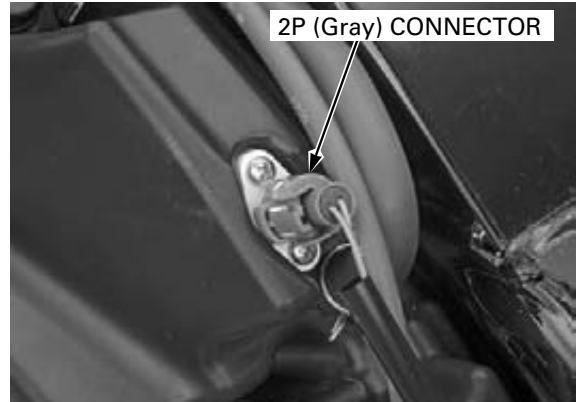
Turn the ignition switch ON and engine stop switch "C".

Check the IAT sensor with the HDS pocket tester.

Is about 0 V indicated?

YES – GO TO STEP 3.

NO – Faulty IAT sensor



3. IAT Sensor Output Line Short Circuit Inspection

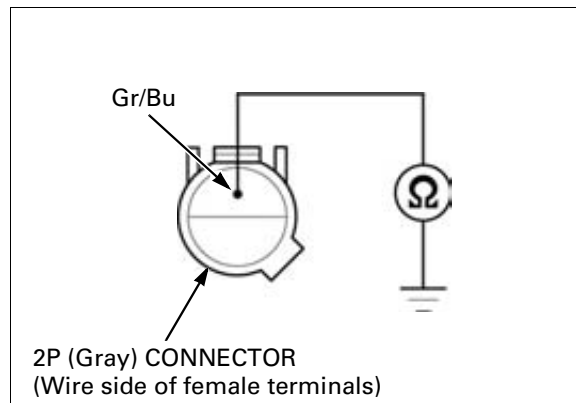
Check for continuity between the IAT sensor 2P (Gray) connector terminal of the wire harness side and ground.

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; refer to Key Registration Procedures (page 22-6)



DTC 9-2 (IAT SENSOR HIGH VOLTAGE)

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

1. IAT Sensor System Inspection

Turn the ignition switch ON and engine stop switch "G".

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 IAT sensor connector

2. IAT Sensor Inspection

Turn the ignition switch OFF.

Disconnect the IAT sensor 2P (Gray) connector. Connect the IAT sensor terminals with a jumper wire.

Connection: Gray/blue – Green/orange

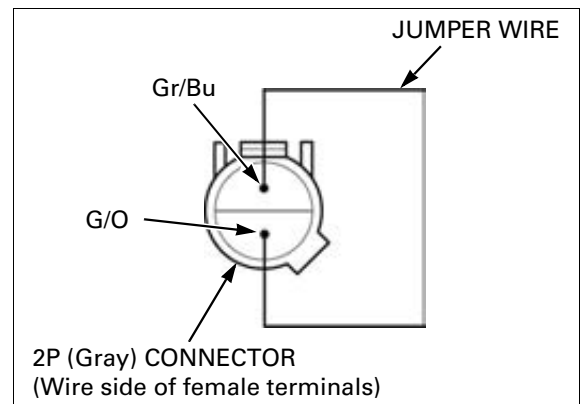
Turn the ignition switch ON and engine stop switch "G".

Check the IAT sensor with the HDS pocket tester.

Is about 0 V indicated?

YES – Faulty IAT sensor

NO – GO TO STEP 3.



3. IAT Sensor Output Line Inspection

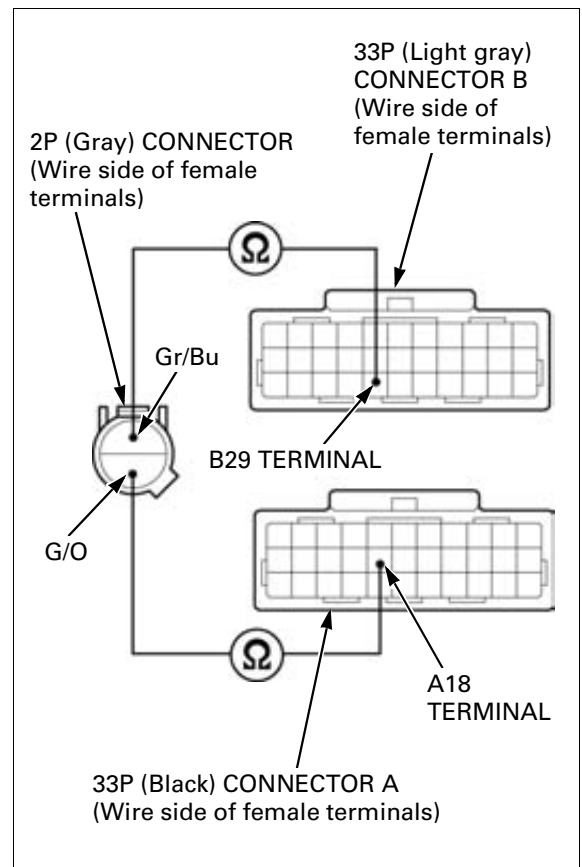
Disconnect the ECM 33P connectors.

Check the continuity at the Gray/blue and Green/orange wire between the IAT sensor 2P (Gray) connector terminals and the ECM 33P (Light gray) connectors.

Is there continuity?

YES – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 22-6)

- 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.
- If there is failure in the speed meter indication, check the VS sensor (page 21-14).

1. VS Sensor System Inspection

Test-ride the motorcycle and check the VS sensor with the HDS pocket tester.

Is the vehicle speed indicated normally?

- YES** –
- Intermittent failure
 - Loose or poor contact on the VS sensor connector

NO – GO TO STEP 2.

2. VS Sensor Input Voltage Inspection

Turn the ignition switch OFF.

Disconnect the VS sensor 3P connector.

Turn the ignition switch ON and engine stop switch "⊘".

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

Connection: Yellow/red (+) – Green/black (-)

Is there battery voltage?

- NO** –
- Open or short circuit in the Yellow/red wire
 - Open circuit in the Green/black wire

YES – GO TO STEP 3.

3. VS Sensor Pulse Line Open Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 33P connectors.

Check the continuity between the ECM 33P (Light gray) connector terminal and VS sensor 3P connector terminal of the wire harness side.

Connection: B28 – Pink/green

TOOL:

Test probe 07ZAJ-RDJA110

Is there continuity?

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

YES – GO TO STEP 4.

4. VS Sensor Pulse Line Short Circuit Inspection

Disconnect the combination meter connector.

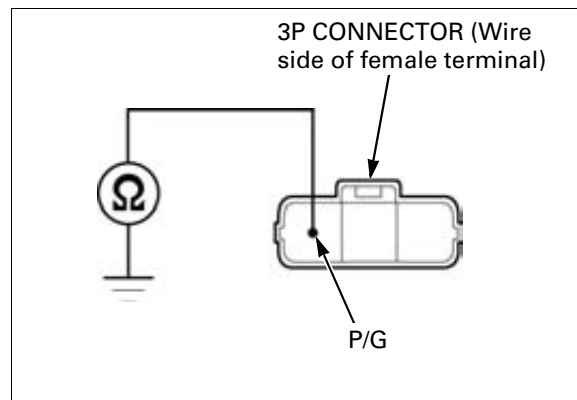
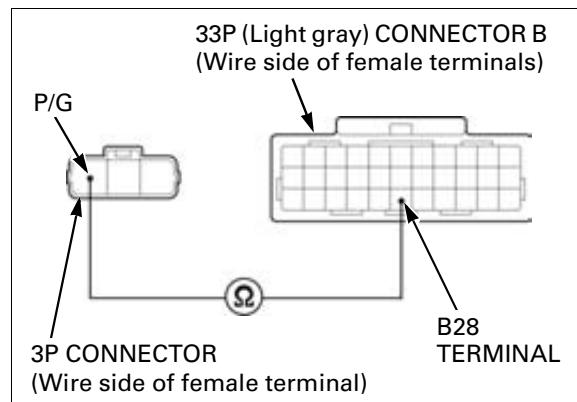
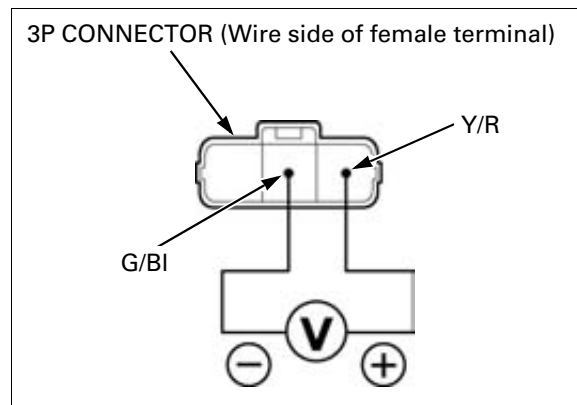
Check for continuity between the VS sensor 3P connector of the wire harness side and body ground.

Connection: Pink/green – ground

Is there continuity?

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

NO – Faulty VS sensor



DTC 12-1 (No.1 INJECTOR)

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

DTC	INJECTOR	POWER INPUT LINE	SIGNAL LINE	SIGNAL AT ECM
12-1	No.1	Black/White	Pink/yellow	A17
13-1	No.2	Black/White	Pink/blue	A6
14-1	No.3	Black/White	Pink/green	A8
15-1	No.4	Black/White	Pink/black	A7

1. Injector System Inspection

Reset the DTC (page 6-14).
Turn the ignition switch ON and engine stop switch "⏻", then 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 ON and engine stop switch "⏻".

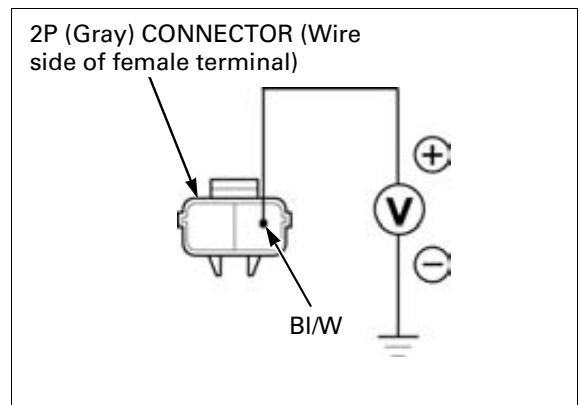
Disconnect the injector 2P (Gray) connectors. Measure the voltage between the injector 2P (Gray) connector of the wire harness side and ground.

Connection: Black/white (+) – Ground (-)

Does the battery voltage exist?

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

YES – GO TO STEP 3.



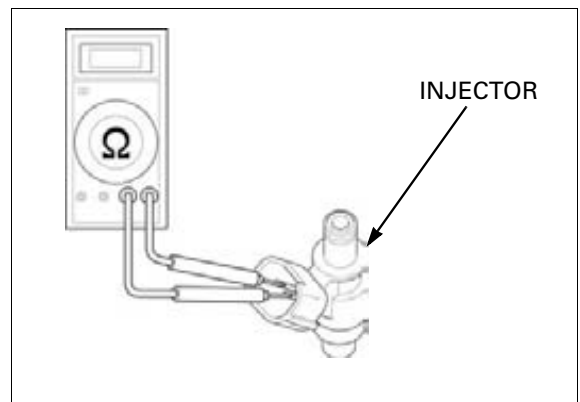
3. Injector Resistance Inspection

Measure the resistance of the injector connector terminals.

Is the resistance within 11.1 – 12.3 Ω (20°C/68°F)?

- NO** – Faulty injector

YES – GO TO STEP 4.



FUEL SYSTEM (PGM-FI)

4. Injector Signal Line Open Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 33P (Black) connector.
Check the continuity between the ECM 33P (Black) connector and injector 2P (Gray) connector of the wire harness side.

Connection: SIGNAL LINE – SIGNAL LINE

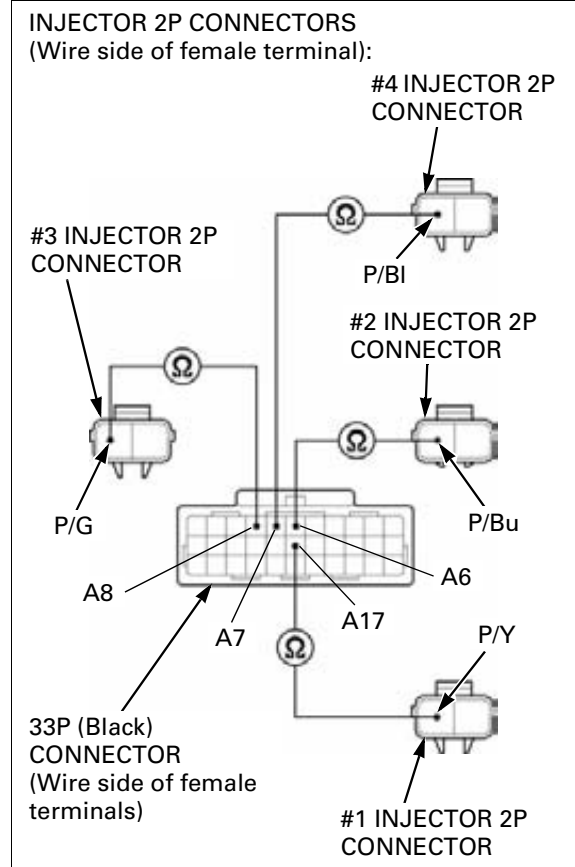
TOOL:

Test probe 07ZAJ-RDJA110

Is there continuity?

NO – Open circuit in SIGNAL line wire

YES – GO TO STEP 5.



5. Injector Signal Line Short Circuit Inspection

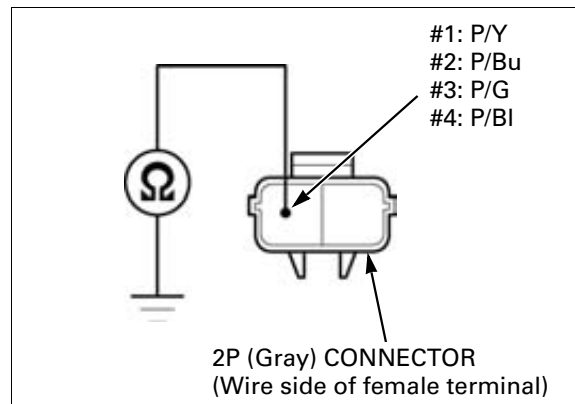
Check for continuity between the injector 2P (Gray) connector and ground.

Connection: SIGNAL LINE – Ground

Is there continuity?

YES – Short circuit in SIGNAL LINE wire

NO – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 22-6)



DTC 13-1 (No.2 INJECTOR)

(page 6-29)

DTC 14-1 (No.3 INJECTOR)

(page 6-29)

DTC 15-1 (No.4 INJECTOR)

(page 6-29)

DTC 21-1 (O₂ SENSOR)

- Before starting the inspection, check for loose or poor contact on the O₂ sensor 4P connector and recheck the DTC.

1. O₂ Sensor System Inspection

Start the engine and warm up the engine up to coolant temperature is 80 °C (176 °F).

Test-ride the motorcycle and check the O₂ sensor with the HDS pocket tester.

Is the DTC 21-1 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

2. O₂ Sensor Open Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 33P connectors and O₂ sensor 4P connector.

Check the continuity between the ECM 33P connector of the wire harness side and O₂ sensor 4P connector of the wire harness side.

Connection: A18 – Green/orange
B20 – Orange/white

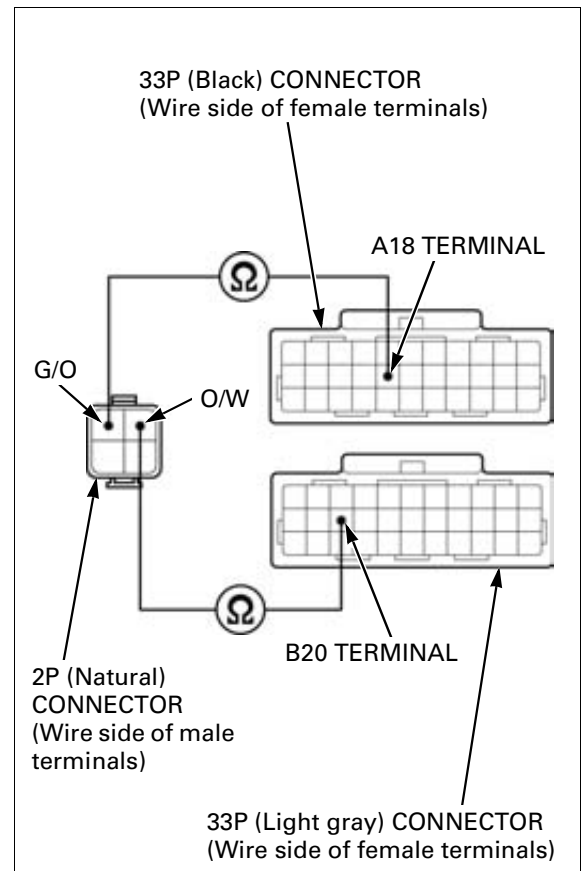
TOOL:

Test probe 07ZAJ-RDJA110

Are there continuity?

YES – GO TO STEP 3.

NO – • Open circuit in Green/orange wire
• Open circuit in Orange/white wire



3. O₂ Sensor Short Circuit Inspection

Connect the O₂ sensor 4P connector and disconnect the ECM connectors.

Check for continuity between the ECM 33P (Light gray) connector of the wire harness side and ground.

Connection: B20 – Ground

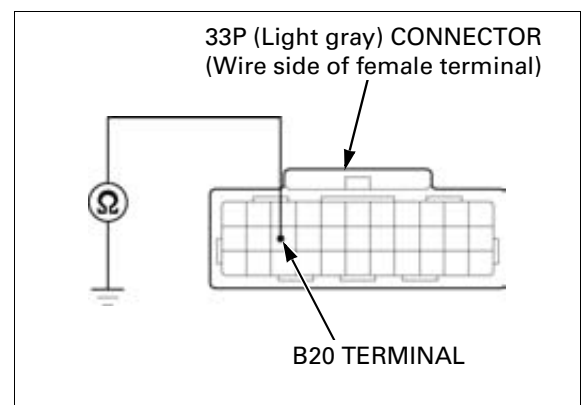
TOOL:

Test probe 07ZAJ-RDJA110

Is there continuity?

YES – Short circuit in the Orange/white wire

NO – GO TO STEP 4.



FUEL SYSTEM (PGM-FI)

4. O₂ Sensor Inspection

Replace the O₂ sensor with a known good one (page 6-86) and clear the DTC.

Start the engine and warm the engine up to coolant temperature is 80 °C (176 °C).

Test-ride the motorcycle and check the O₂ sensor with the HDS pocket tester.

Is the DTC 21-1 indicated?

YES – Faulty ECM. Replace it with new one and recheck

NO – Faulty original O₂ sensor

DTC 23-1 (O₂ SENSOR HEATER)

- Before starting the inspection, check for loose or poor contact on the O₂ sensor 4P connector and recheck the DTC.

1. O₂ Sensor Heater System Inspection

Reset the DTC (page 6-14).

Start the engine and check the O₂ sensor heater with the HDS pocket tester.

Is the DTC 23-1 indicated?

YES – GO TO STEP 2.

NO –

- Loose or poor contact on the O₂ sensor connector
- Intermittent failure

2. O₂ Sensor Heater Resistance Inspection

Turn the ignition switch OFF.

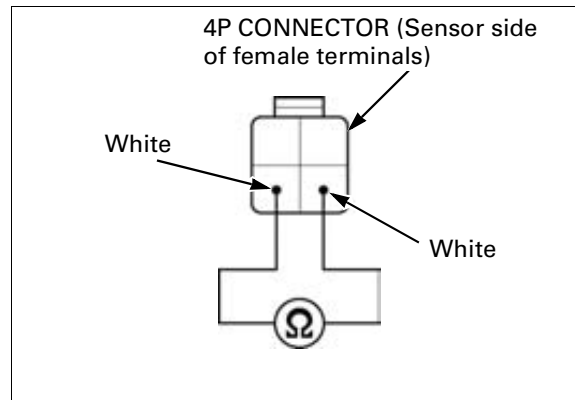
Disconnect the O₂ sensor 4P connector and measure the resistance at the O₂ sensor 4P connector terminals of the sensor side.

Connection: White – White

Is the resistance within 10 – 40 Ω (20°C/68°F)?

YES – GO TO STEP 3.

NO – Faulty O₂ sensor



3. O₂ Sensor Heater Power Input Line Inspection

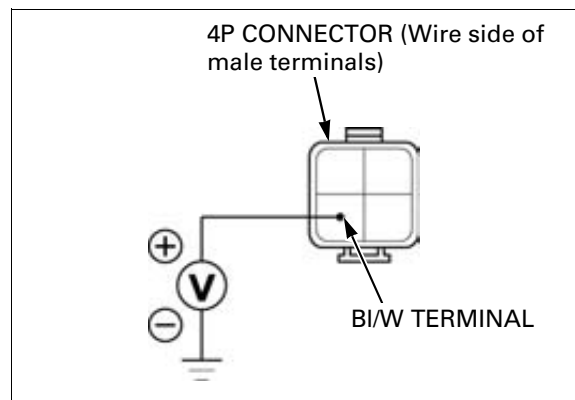
Turn the ignition switch ON, then measure the voltage between O₂ sensor 4P connector of the wire harness side and ground.

Connection: Black/white (+) – Ground (-)

Does the battery voltage exist?

YES – GO TO STEP 4.

NO – Open circuit in the Black/white wire



4. O₂ Sensor Heater Open Circuit Inspection

Turn the ignition switch OFF.

Disconnect the ECM 33P (Gray) connector. Check the continuity between the ECM 33P (Gray) connector and O₂ sensor 4P connector of the wire harness side.

Connection: B2 – Black/green

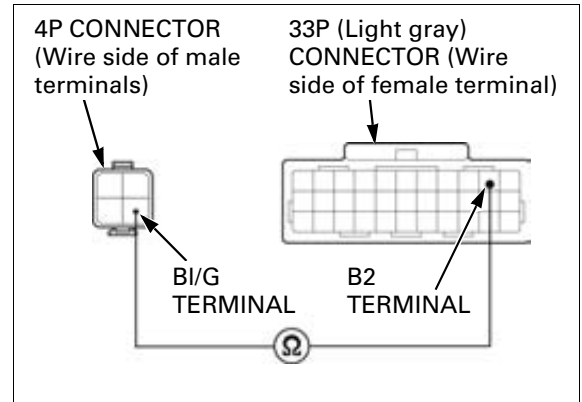
TOOL:

Test probe 07ZAJ-RDJA110

Is there continuity?

YES – GO TO STEP 5.

NO – Open circuit in Black/green wire



5. O₂ Sensor Heater Short Circuit Inspection 2

Connect the ECM 33P (Gray) connector.

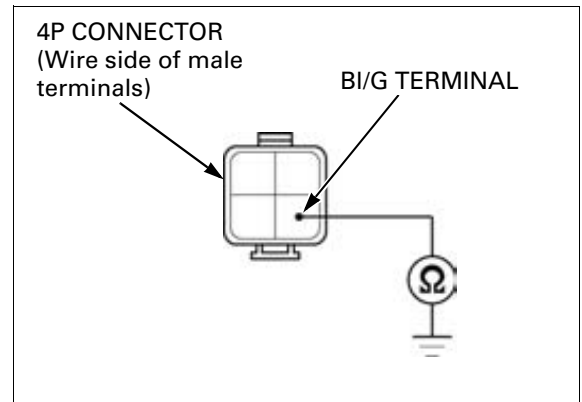
Check for continuity between the O₂ sensor heater 4P connector of the wire harness side and ground.

Connection: Black/green – Ground

Is there continuity?

YES – Short circuit in Black/green wire

NO – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 22-6)



DTC 29-1 (IACV)

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

1. Recheck DTC

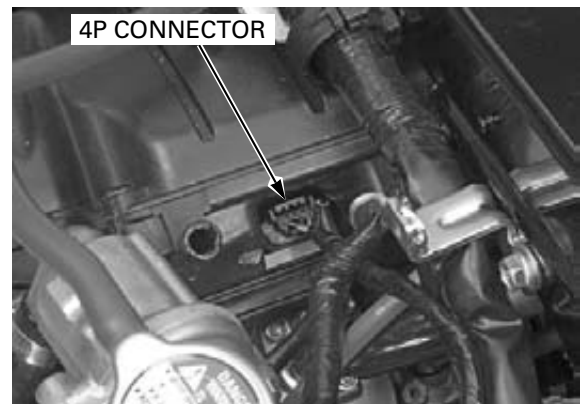
Clear the DTC.

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.



FUEL SYSTEM (PGM-FI)

2. IACV Short Circuit Inspection

Turn the ignition switch OFF.
Disconnect the IACV 4P connector.

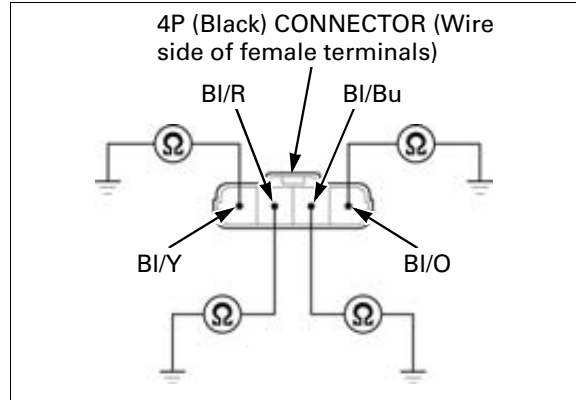
Check for continuities between the IACV 4P connector and ground.

Connection: Black/yellow – Ground
Black/red – Ground
Black/blue – Ground
Black/orange – Ground

Are there continuities?

YES – • Short circuit in Black/yellow or Black/orange wire
• Short circuit in Black/red or Black/blue wire

NO – GO TO STEP 3.



3. IACV Circuit Continuity Inspection

Disconnect the ECM 33P (Black) connector.
Check the continuities between the ECM 33P (Black) connector terminals and the IACV 4P connector terminals.

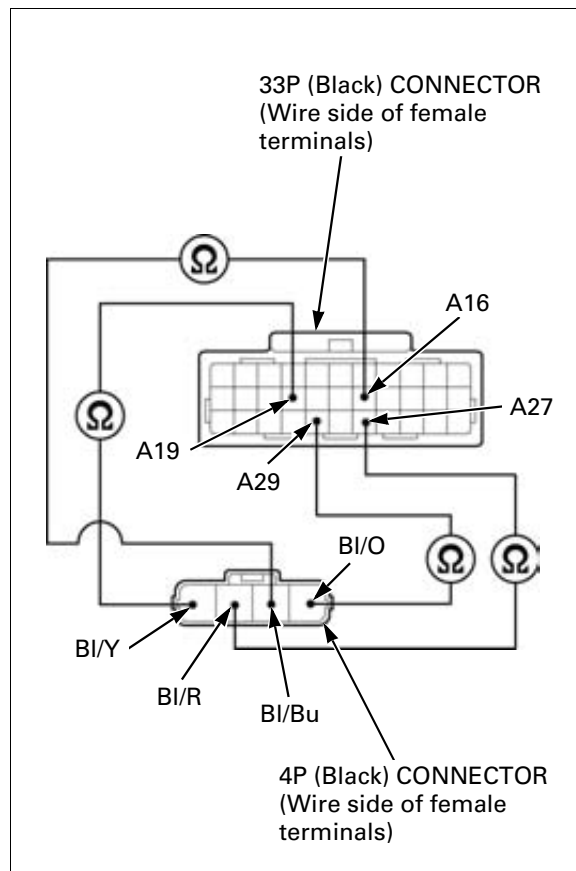
Connection: A19 – Black/yellow
A27 – Black/red
A16 – Black/blue
A29 – Black/orange

TOOL:
Test probe 07ZAJ-RDJA110

Are there continuities?

YES – GO TO STEP 4.

NO – • Open or loose contact in Black/yellow or Black/red wire
• Open or loose contact in Black/blue or Black/orange wire



4. IACV Resistance Inspection

Measure the resistance at the IACV 4P connector terminals.

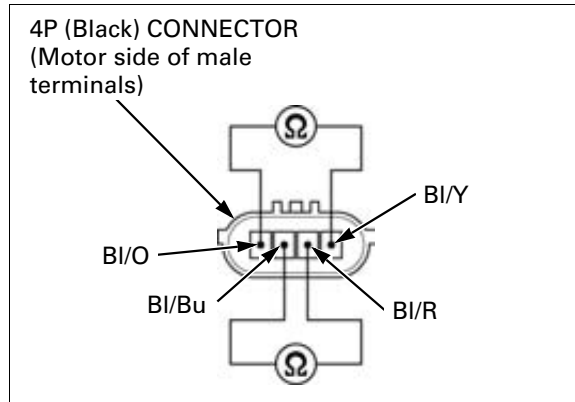
Connection: Black/yellow – Black/orange
Black/red – Black/blue

STANDARD: 120 – 140 Ω (20 °C/68 °F)

Is the resistance within 120 – 140 Ω (20°C/68°F)?

YES – Replace the ECM with new one, and recheck; refer to Key Registration Procedures (page 22-6)

NO – Faulty IACV



MIL TROUBLESHOOTING

MIL 1 BLINK (MAP SENSOR)

- Before starting the inspection, check for loose or poor contact on the MAP sensor 3P (Black) connector and recheck the MIL blinking.

1. MAP Sensor Output Voltage Inspection

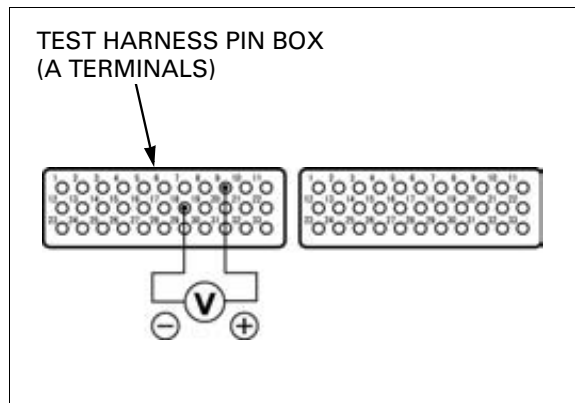
Turn the ignition switch OFF.
 Connect the ECM test harness to ECM connectors (page 6-14).
 Turn the ignition switch ON and engine stop switch "G".
 Measure the voltage at the test harness terminals.

Connection: A9 (+) – A18 (-)

Is the voltage within 1.7 – 2.4 V?

YES – • Intermittent failure
 • Loose or poor contact on the ECM connectors

NO – • About 5 V
 GO TO STEP 2.
 • About 0 V
 GO TO STEP 3.



2. MAP Sensor Output Line Inspection

Turn the ignition switch OFF.
 Disconnect the MAP sensor 3P (Black) connector.

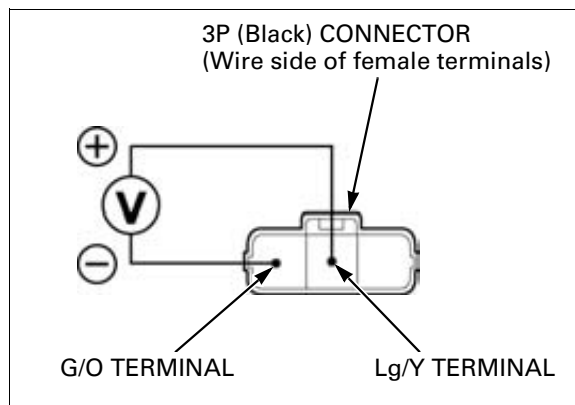
Turn the ignition switch ON and engine stop switch "G".
 Measure the voltage at the wire harness side.

Connection: Light green/yellow (+) – Green/orange (-)

Is the voltage within 4.75 – 5.25 V?

YES – Faulty MAP sensor

NO – • Open circuit in Light green/yellow wire
 • Open circuit in Green/orange wire



FUEL SYSTEM (PGM-FI)

3. MAP Sensor Input Voltage Inspection

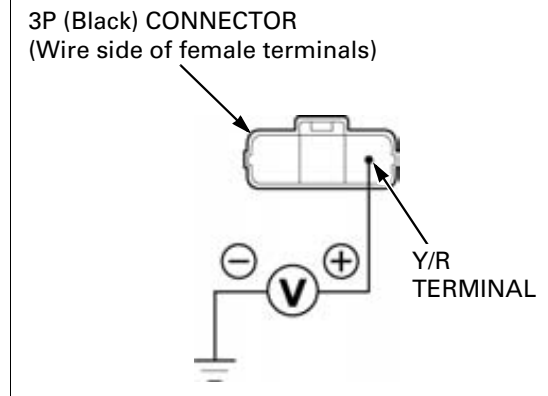
Measure the voltage at the wire harness side.

Connection: Yellow/red (+) – Ground (-)

Is the voltage within 4.75 – 5.25 V?

YES – GO TO STEP 4.

NO – GO TO STEP 5.



4. MAP Sensor Output Line Short Circuit Inspection

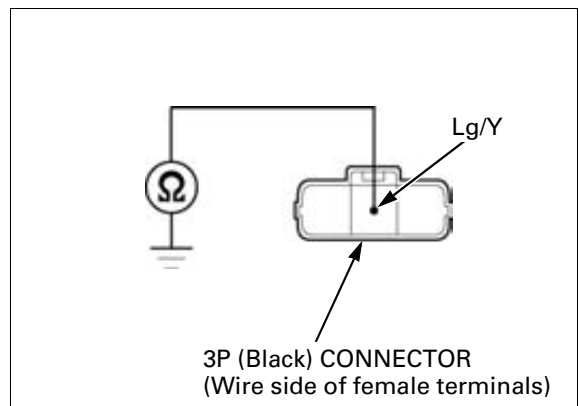
Check for continuity between the MAP sensor 3P (Black) connector terminal of the wire harness side and ground.

Connection: Light green/yellow – Ground

Is there continuity?

YES – Short circuit in Light green/yellow wire

NO – Faulty MAP sensor



5. MAP Sensor Input Line Inspection

Turn the ignition switch OFF.
Disconnect the ECM 33P connectors.

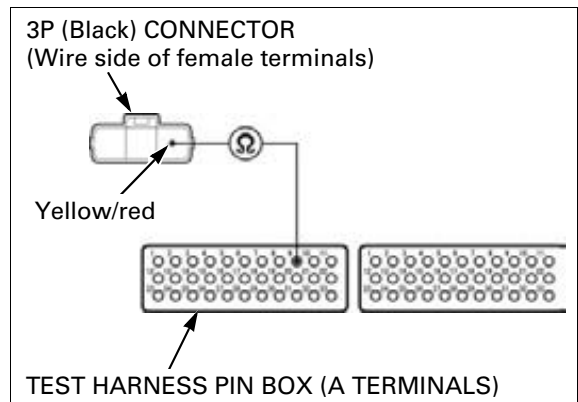
Check the continuity at the Yellow/red wire between the MAP sensor 3P (Black) connector terminal and test harness terminal.

Connection: A9 – Yellow/red

Is there continuity?

YES – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 22-6)

NO – Open circuit in Yellow/red wire



MIL 2 BLINKS (MAP SENSOR HOSE CONNECTION)

- Before starting the inspection, check for loose or poor contact on the MAP sensor 3P (Black) connector and recheck the MIL blinking.

1. MAP Sensor Hose Inspection

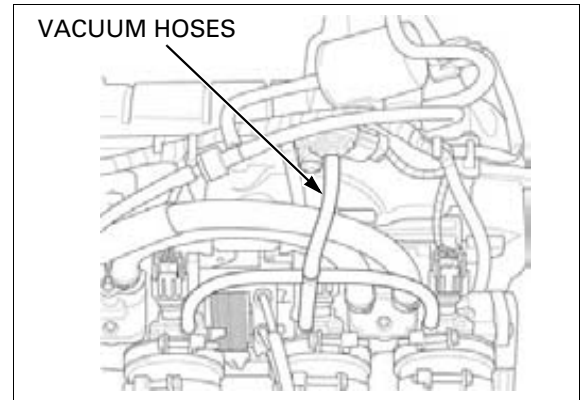
Turn the ignition switch OFF.

Check the connection and installation of the MAP sensor vacuum hoses.

Is the MAP sensor hose connection correct?

YES – GO TO STEP 2.

NO – Correct the hose connection or installation



2. MAP Sensor Output Voltage Inspection

Connect the ECM test harness to ECM connectors (page 6-14).

Turn the ignition switch ON and engine stop switch "C".

Measure the voltage at the test harness terminals.

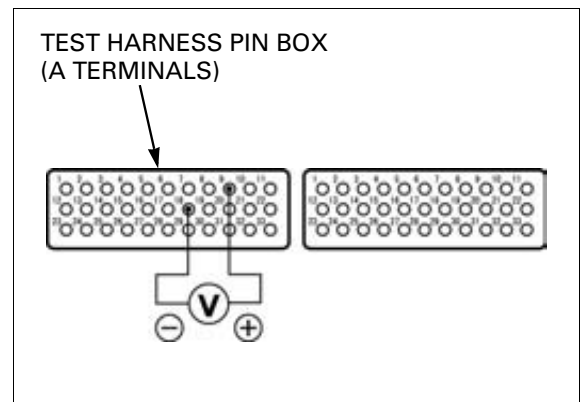
The MAP sensor voltage should be changed after engine started.

Connection: A9 (+) – A18 (-)

Is the MAP sensor voltage indicated normally?

YES – GO TO STEP 3.

No – Faulty MAP sensor



3. MAP Sensor Inspection

Replace the MAP sensor with a known good one (page 6-78).

Measure the voltage at the test harness terminals.

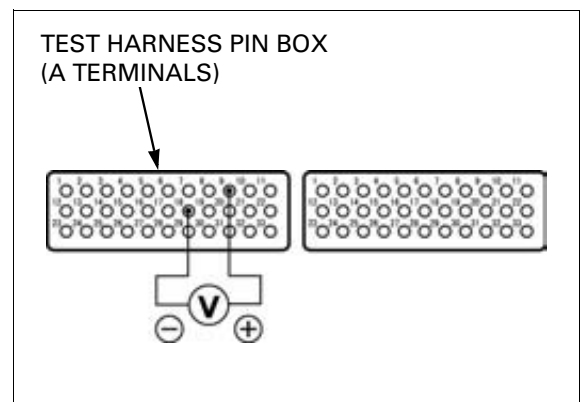
The MAP sensor voltage should be changed after engine started.

Connection: A9 (+) – A18 (-)

Is the MAP sensor voltage indicated normally?

YES – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 22-6)

NO – Faulty MAP sensor



FUEL SYSTEM (PGM-FI)

MIL 7 BLINKS (ECT SENSOR)

- Before starting the inspection, check for loose or poor contact on the ECT sensor 3P (Gray) connector and recheck the MIL blinking.

1. ECT Sensor Output Voltage Inspection

Turn the ignition switch OFF.
Connect the test harness to ECM 33P connectors (page 6-14).

Turn the ignition switch ON and engine stop switch "⏻".
Measure the voltage at the test harness terminals.

Connection: B13 (+) – A18 (-)

Standard: 2.7 – 3.1 V (20°C/68°F)

Is the voltage within 2.7 – 3.1 V?

YES – • Loose or poor contact on the ECM connectors
• Intermittent failure

No – GO TO STEP 2.

2. ECT Sensor Input Voltage Inspection

Turn the ignition switch OFF.
Disconnect the ECT sensor 3P (Gray) connector.

Turn the ignition switch ON and engine stop switch "⏻".
Measure the voltage at the test harness terminal and ground.

Connection: B13 (+) – Ground (-)

Is the voltage within 4.75 – 5.25 V?

NO – Faulty ECT sensor

YES – GO TO STEP 3.

3. ECT Sensor Resistance Inspection

Turn the ignition switch OFF.

Measure the resistance at the ECT sensor terminals.

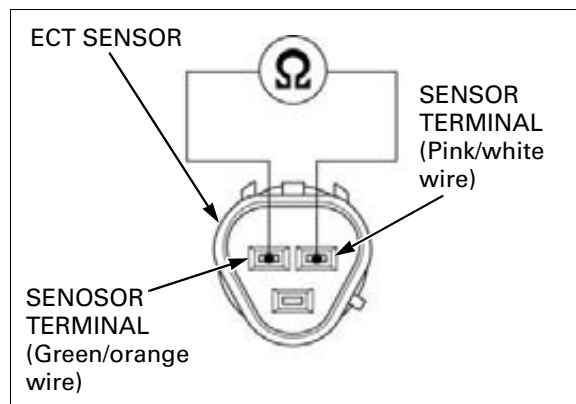
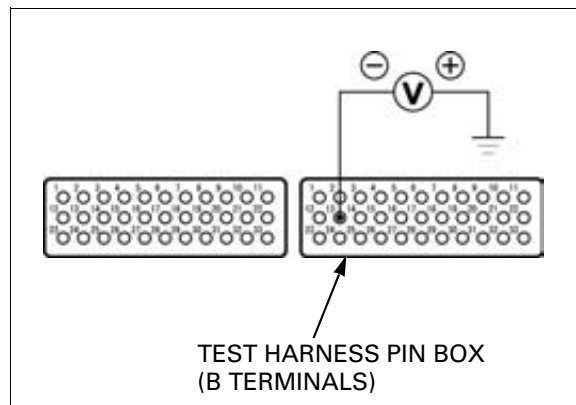
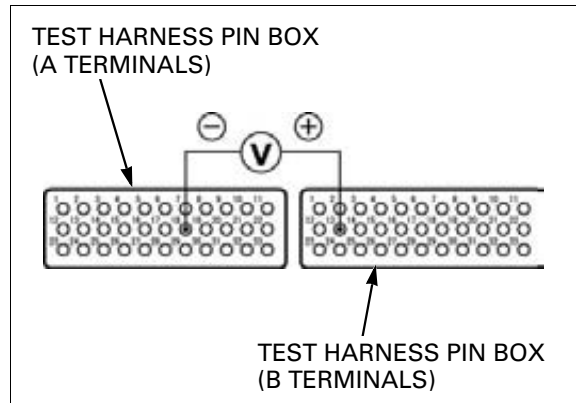
Connection: Pink/white – Green/orange
(Sensor side terminals)

Standard: 2.3 – 2.6 k Ω (20°C/68°F)

Is the resistance within 2.3 – 2.6 k Ω (20°C/68°F)?

NO – Faulty ECT sensor.

YES – GO TO STEP 4.



4. ECT Sensor Open Circuit Inspection

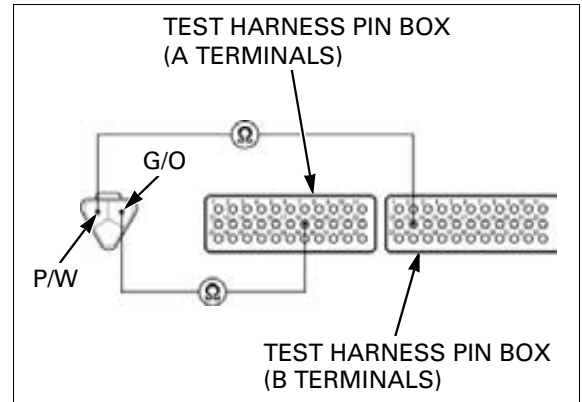
Check the continuity between the test harness terminals and ECT sensor connector of the wire harness side.

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

Is there continuity?

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

YES – GO TO STEP 5.



5. ECT Sensor Short Circuit Inspection

Disconnect the test harness and ECM 33P connectors disconnected.

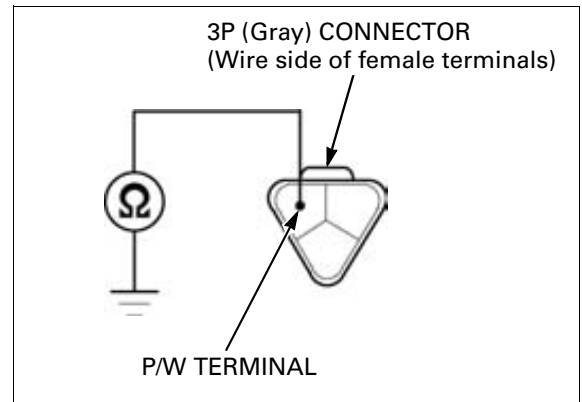
Check for continuity between the ECT sensor connector of the wire harness side and ground.

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; refer to Key Registration Procedures (page 22-6)



MIL 8 BLINKS (TP SENSOR)

- Before starting the inspection, check for loose or poor contact on the TP sensor 3P (Black) connector and recheck the MIL blinking.

1. TP Sensor Output Voltage

Turn the ignition switch OFF.
Connect the ECM test harness to ECM connectors (page 6-14).

Turn the ignition switch ON and engine stop switch "⏻".
Measure the TP sensor output voltage at the test harness terminals.

Connection: B31 (+) – A18 (-)

Standard: *0.4 – 0.6 V (throttle fully closed)

*4.2 – 4.8 V (throttle fully opened)

NOTE:

- A voltage marked * refers to the value of the ECM output voltage (STEP 3) when the voltage reading shows 5 V.

When the ECM output voltage reading shows other than 5 V, derive the TP sensor output voltage at the test harness as follows:

In the case of the ECM output voltage is 4.75 V:

$$0.4 \times 4.75/5.0 = 0.38 \text{ V}$$

$$0.6 \times 4.75/5.0 = 0.57 \text{ V}$$

Thus, the solution is "0.38 – 0.57 V" with the throttle fully closed.

Replace 0.4 and 0.6 with 4.2 and 4.8 respectively, in the above equations to determine the throttle fully opened range.

Is there standard voltage?

- YES** – • Intermittent failure
• Loose or poor contact on the ECM connectors

NO – GO TO STEP 2.

2. TP Sensor Input Voltage Inspection

Turn the ignition switch OFF.
Disconnect the TP sensor 3P (Black) connector.

Turn the ignition switch ON and engine stop switch "⏻".

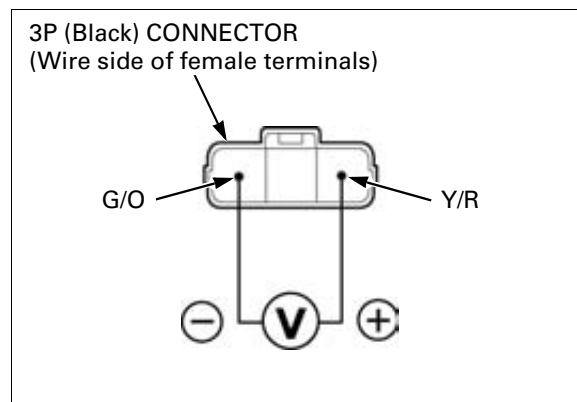
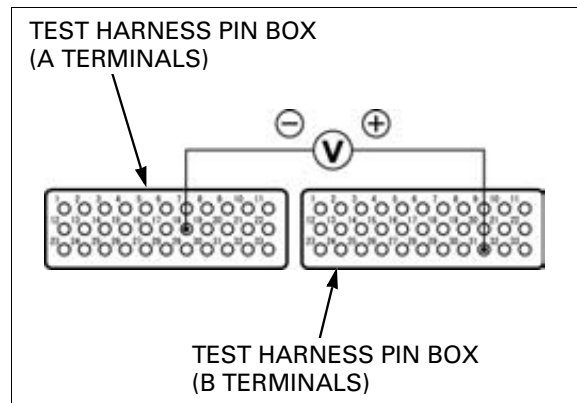
Measure the voltage at the wire harness side.

Connection: Yellow/red (+) – Green/orange (-)

Is the voltage within 4.75 – 5.25 V?

YES – GO TO STEP 4.

NO – GO TO STEP 3.



3. ECM Output Voltage Inspection

Turn the ignition switch OFF.
Connect the ECM test harness to ECM connectors (page 6-14).

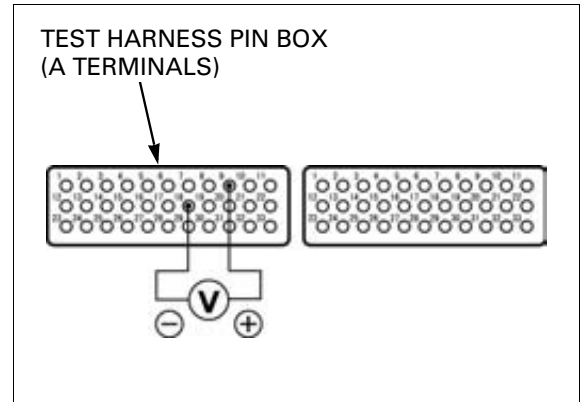
Turn the ignition switch ON and engine stop switch "⏻".
Measure the voltage at the test harness terminals.

Connection: A9 (+) – A18 (-)

Is the voltage within 4.75 – 5.25 V?

- YES** – • Open circuit in Yellow/red wire
• Open circuit in Green/orange wire

- NO** – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 22-6)



4. TP Sensor Output Line Inspection

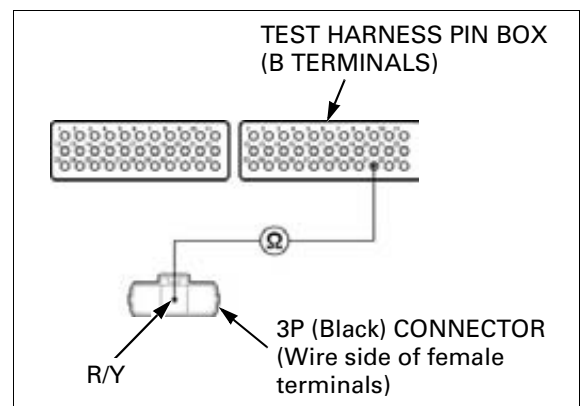
Check the continuity between the TP sensor 3P (Black) connector terminal of the wire harness side and the test harness terminal.

Connection: Red/yellow – B31

Is there continuity?

- YES** – GO TO STEP 5.

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



5. TP Sensor Output Line Short Circuit Inspection

Turn the ignition switch OFF.

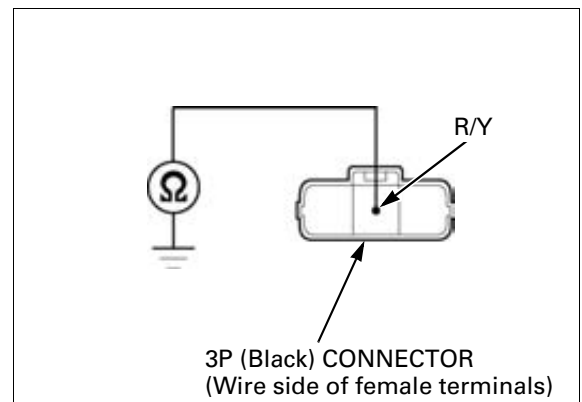
Check for continuity between the TP sensor 3P (Black) connector terminal of the wire harness side and ground.

Connection: Red/yellow (+) – Ground (-)

Is there continuity?

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

- NO** – Faulty TP sensor



MIL 9 BLINKS (IAT SENSOR)

- Before starting the inspection, check for loose or poor contact on the IAT sensor 2P (Gray) connector and recheck the MIL blinking.

1. IAT Sensor Output Voltage Inspection

Turn the ignition switch OFF.
Connect the ECM test harness to ECM connectors (page 6-14).

Turn the ignition switch ON and engine stop switch "⏻".
Measure the voltage at the test harness terminals.

Connection: B29 (+) – A18 (-)

Standard: 2.7 – 3.1 V (20°C/68°F)

Is the voltage within 2.7 – 3.1 V?

YES – • Intermittent failure
• Loose or poor contact on the ECM connectors

NO – GO TO STEP 2.

2. IAT Sensor Input Voltage Inspection

Turn the ignition switch OFF.
Disconnect the IAT sensor 2P (Gray) connector.

Turn the ignition switch ON and engine stop switch "⏻".
Measure the voltage at the wire harness side of IAT sensor connector.

Connection: Gray/blue – Green/orange

Is the voltage within 4.75 – 5.25 V?

YES – GO TO STEP 3.

NO – GO TO STEP 4.

3. IAT Sensor Resistance Inspection

Turn the ignition switch OFF.
Disconnect the IAT sensor 2P (Gray) connector.

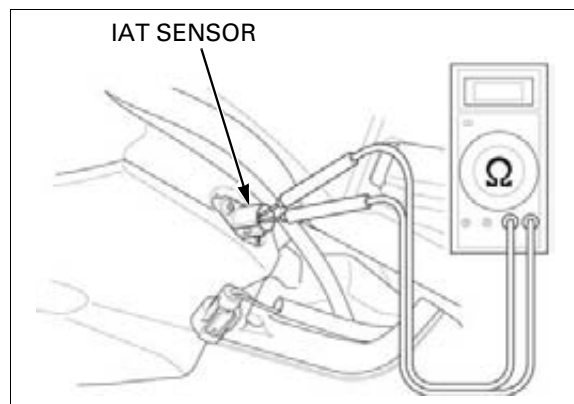
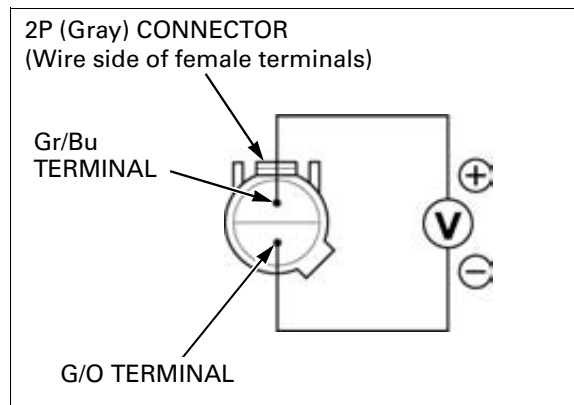
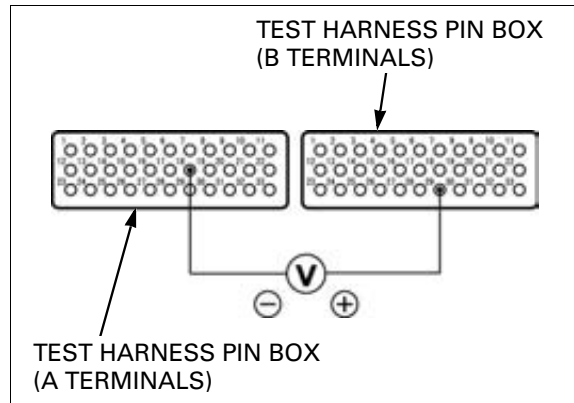
Measure the resistance at the IAT sensor terminals (at 20 – 30°C/68 – 86°F).

Standard: 1 – 4 k Ω (20 – 30°C/68 – 86°F)

Is the resistance within 1 – 4 k Ω ?

NO – Faulty IAT sensor.

YES – GO TO STEP 4.



4. IAT Sensor Open Circuit Inspection

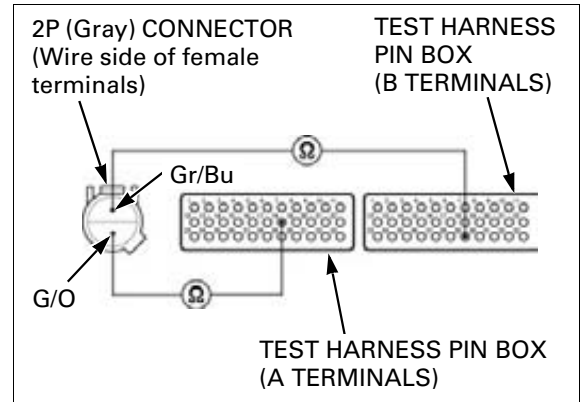
Turn the ignition switch OFF.
Check for continuity at the Gray/blue and Green/orange wires between the IAT sensor 2P (Gray) connector terminal and the test harness terminals.

Are there continuity?

YES - GO TO STEP 5.

NO -

- Open circuit in Gray/blue wire
- Open circuit in Green/orange wire



5. IAT Sensor Output Line Short Circuit Inspection

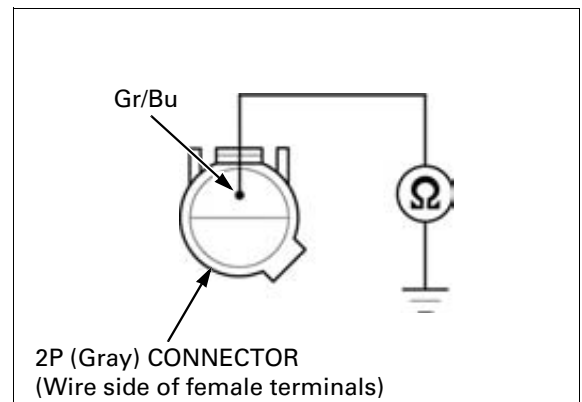
Check for continuity between the IAT sensor 2P (Gray) connector terminal of the wire harness side and ground.

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; refer to Key Registration Procedures (page 22-6)



MIL 11 BLINKS (VS SENSOR)

- Before starting the inspection, check for loose or poor contact on the VS sensor connector and recheck the MIL blinking.
- If there is failure in the speed meter indication, check the VS sensor (page 21-14).

1. VS Sensor Pulse Inspection At ECM

Turn the ignition switch OFF.
Connect the ECM test harness to the ECM connectors (page 6-14).

Raise the rear wheel off the ground using the center stand (CBF1000A) or other support tool.

Shift the transmission into gear.

Measure the voltage between the test harness terminal and ground with the ignition switch "ON" and engine stop switch "C" while slowly turning the rear wheel by hand.

Connection: B28 (+) - Ground (-)

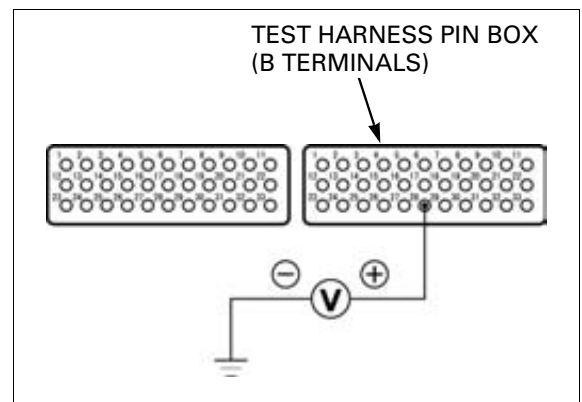
Standard: Repeat 0 to 5 V

Is the voltage at the standard value?

YES -

- Intermittent failure
- Loose or poor contact on the ECM connector

NO - GO TO STEP 2.



FUEL SYSTEM (PGM-FI)

2. VS Sensor Input Voltage Inspection

Turn the ignition switch OFF.
Disconnect the VS sensor 3P connector.

Turn the ignition switch ON and engine stop switch "C".

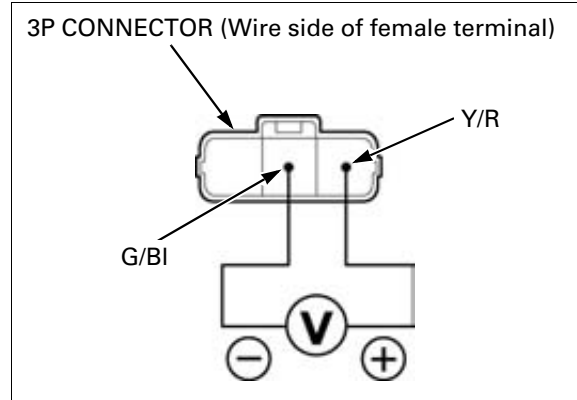
Measure the voltage at the VS sensor connector of the wire harness side.

Connection: Yellow/red (+) – Green/black (-)

Is there battery voltage?

- NO** –
- Open or short circuit in Yellow/red wire
 - Open circuit in Green/black wire

YES – GO TO STEP 3.



3. VS Sensor Pulse Line Open Circuit Inspection

Turn the ignition switch OFF.

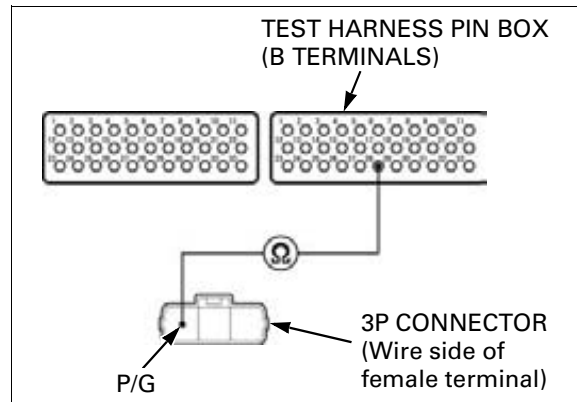
Check the continuity between the test harness terminal and VS sensor connector of the wire harness side.

Connection: B28 – Pink/green

Is there continuity?

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

YES – GO TO STEP 4.



4. VS Sensor Pulse Line Short Circuit Inspection

Disconnect the test harness and ECM 33P connectors disconnected.
Disconnect the combination meter 16P connector.

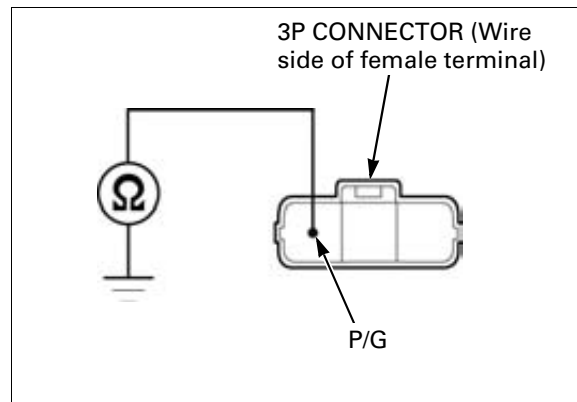
Check for continuity between the VS sensor connector and the ground.

Connection: Pink/green – Ground

Is there continuity?

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

NO – Inspect the VS sensor (page 21-14)



MIL 12 BLINKS (No.1 INJECTOR)

- Before starting the inspection, check for loose or poor contact on the injector 2P (Gray) connector and recheck the MIL blinking.

MIL	INJECTOR	POWER INPUT LINE	SIGNAL LINE	SIGNAL AT ECM
12	No.1	Black/white	Pink/yellow	A17
13	No.2	Black/white	Pink/blue	A6
14	No.3	Black/white	Pink/green	A8
15	No.4	Black/white	Pink/black	A7

1. Injector Input Voltage Inspection

Disconnect the injector 2P (Gray) connector.

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

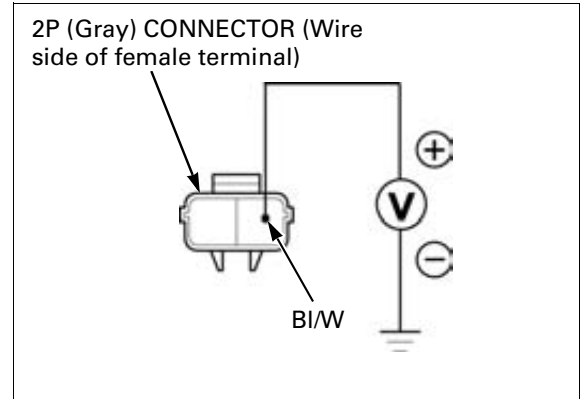
Measure the voltage between the injector 2P (Gray) connector of the wire harness side and ground.

Connection: Black/white (+) – Ground (-)

Does the battery voltage exist?

NO – Open or short circuit in Black/white wire

YES – GO TO STEP 2.



2. Injector Resistance Inspection

Turn the ignition switch OFF.

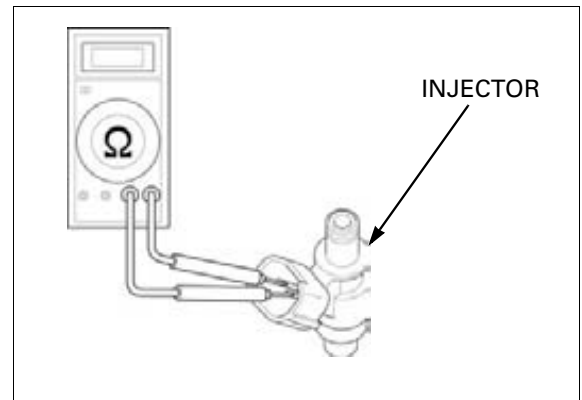
Measure the resistance of the injector connector terminals.

STANDARD: 11.1 – 12.3 Ω (20 °C/68 °F)

Is the resistance within 11.1 – 12.3 Ω (20°C/68°F)?

NO – Faulty injector

YES – GO TO STEP 3.



FUEL SYSTEM (PGM-FI)

3. Injector Circuit Resistance Inspection

Connect the test harness to the ECM 33P connector.

Connect the continuity between the test harness terminal and injector 2P (Gray) connector of the wire harness side.

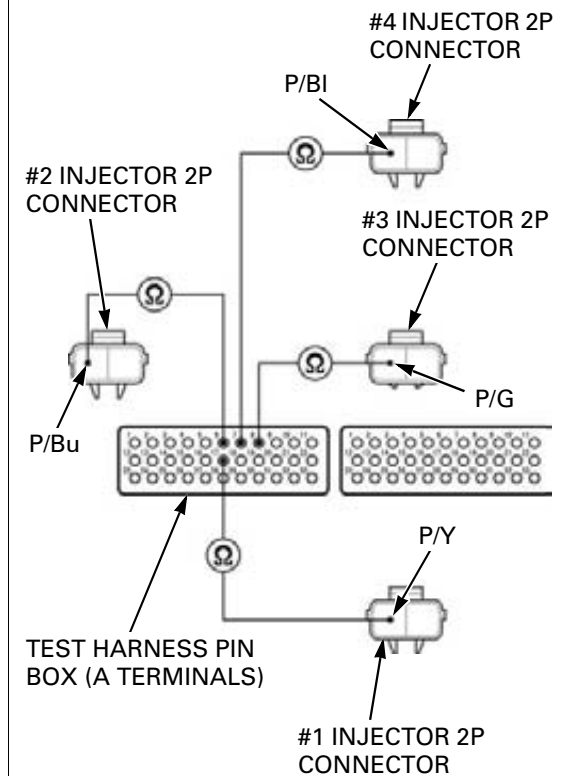
Connection: SIGNAL LINE – SIGNAL LINE

Is there continuity?

NO – Open circuit in SIGNAL line wire

YES – GO TO STEP 4.

INJECTOR 2P CONNECTORS
(Wire side of female terminal):



4. Injector Signal Line Short Circuit Inspection

Disconnect the test harness and ECM 33P (Black) connector disconnected.

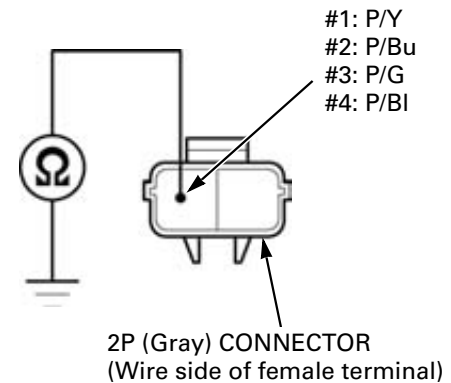
Check for continuity between the injector 2P (Gray) connector of the wire harness side and ground.

Connection: SIGNAL LINE – Ground

Is there continuity?

YES – Short circuit in SIGNAL line wire

NO – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 22-6)



MIL 13 BLINKS (No.2 INJECTOR)

(page 6-45)

MIL 14 BLINKS (No.3 INJECTOR)

(page 6-45)

MIL 15 BLINKS (No.4 INJECTOR)

(page 6-45)

MIL 21 BLINKS (O₂ SENSOR)

- Before starting the inspection, check for loose or poor contact on the O₂ sensor 4P connector and recheck the MIL blinking.

1. O₂ Sensor System Inspection

Start the engine and warm it up to coolant temperature is 80 °C (176 °F).

Test-ride the motorcycle and recheck the MIL blinking.

Is the MIL 21 blinks?

YES – GO TO STEP 2.

NO – Intermittent failure

2. O₂ Sensor Open Circuit Inspection

Turn the ignition switch OFF.

Disconnect the O₂ sensor 4P connector.

Check the continuity between the test harness terminals and the O₂ sensor connector terminals of the wire harness side.

Connection: B20 – Orange/white
A18 – Green/orange

Is there continuity?

- NO** –
- Open circuit in Orange/white wire
 - Open circuit in Green/black wire

YES – GO TO STEP 3.

3. O₂ Sensor Short Circuit Inspection

Connect the O₂ Sensor 4P (Black) connector.

Check for continuity between the ECM connector terminal and ground.

Connection: B20 – Ground

Is there continuity?

YES – Short circuit in the Orange/white wire

NO – GO TO STEP 4.

4. O₂ Sensor Inspection

Replace the O₂ sensor with a known good one (page 6-86).

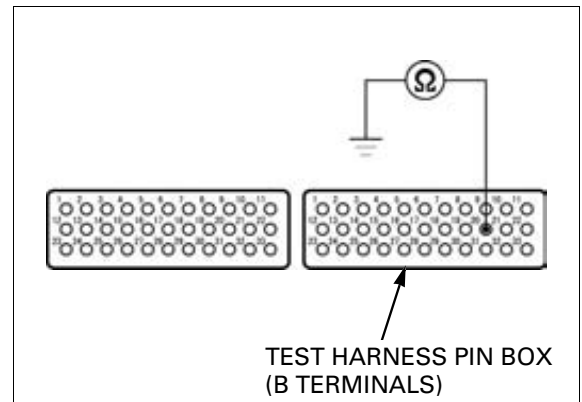
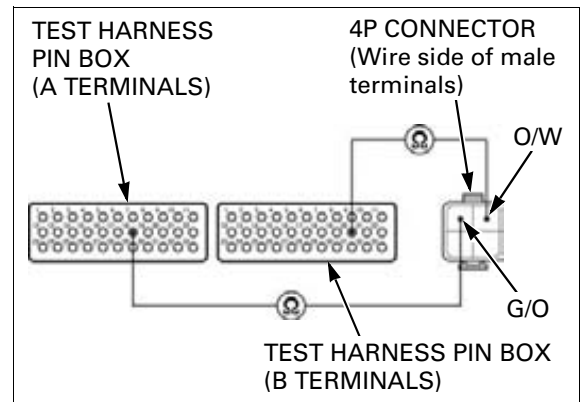
Start the engine and warm it up until the coolant temperature is 80 °C (176 °F).

Test-ride the motorcycle and recheck the MIL blinking.

Is the MIL 21 blinks?

YES – Faulty ECM. Replace it with new one and recheck

NO – Faulty original O₂ sensor



MIL 23 BLINKS (O₂ SENSOR HEATER)

- Before starting the inspection, check for loose or poor contact on the O₂ sensor connector and recheck the MIL blinking.

1. O₂ Sensor Heater Resistance Inspection

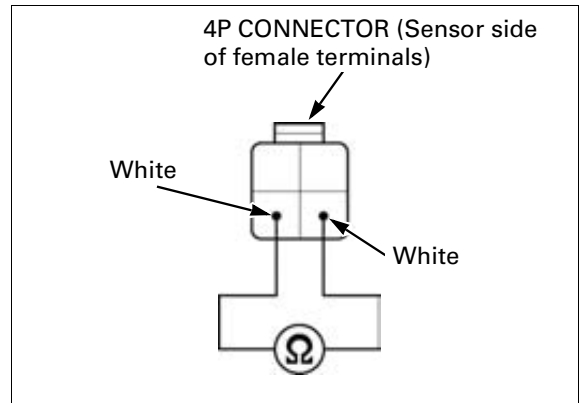
Turn the ignition switch OFF.

Disconnect the O₂ sensor 4P connector.
Measure the resistance at the sensor side connector white wire terminals.

Connection: White – White

Is the resistance within 10 – 40 Ω (20°C/68°F)?

- NO** – Faulty O₂ sensor
YES – GO TO STEP 2.



2. O₂ Sensor Heater Open Circuit Inspection 1

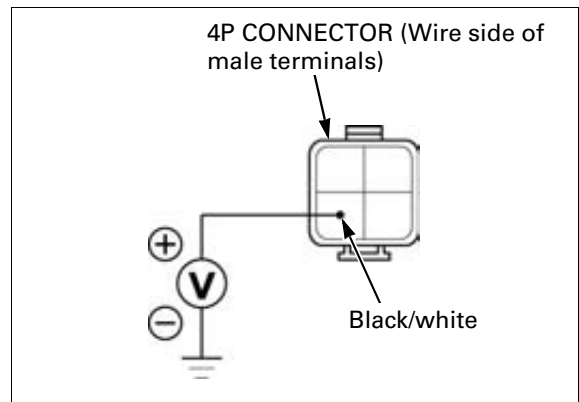
Turn the ignition switch ON.

Measure the voltage at the O₂ sensor 4P connector of the wire harness side.

Connection: Black/white (+) – Ground (-)

Does the battery voltage exist?

- NO** – Open or short circuit in Black/white wire
YES – GO TO STEP 3.



3. O₂ Sensor Heater Open Circuit Inspection 2

Turn the ignition switch OFF.

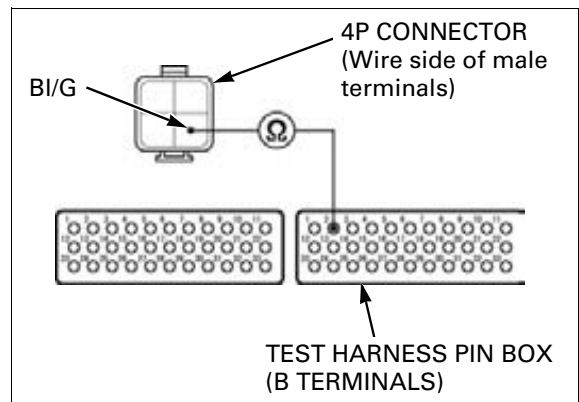
Connect the ECM test harness to the ECM connectors.

Check the continuity between the test harness terminal and O₂ sensor 4P connector of the wire harness side.

Connection: B2 – Black/green

Is there continuity?

- NO** – Open circuit in Black/green wire
YES – GO TO STEP 4.



4. O₂ Sensor Heater Short Circuit Inspection

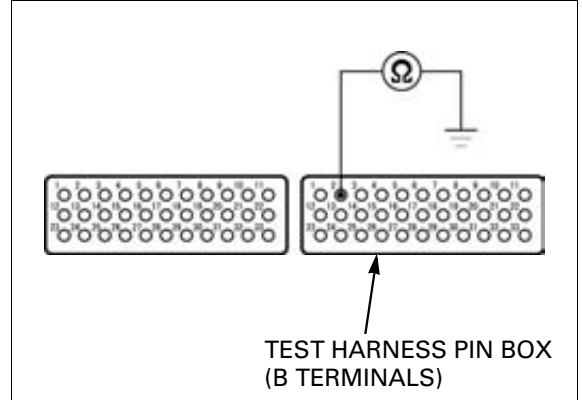
Check for continuity between the test harness terminals and ground.

Connection: B2 – Ground

Is there continuity?

YES – Short circuit in the Black/green wire

NO – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 22-6)



MIL 29 BLINKS (IACV)

1. IACV Short Circuit Inspection

Turn the ignition switch OFF.

Disconnect the IACV 4P connector. Check the connector for loose contacts or corroded terminals.

Check for continuities between the IACV 4P connectors and ground.

Connection: Black/yellow – Ground
Black/red – Ground
Black/blue – Ground
Black/orange – Ground

Are there continuities?

YES – • Short circuit in Black/yellow or Black/orange wire
 • Short circuit in Black/red or Black/blue wire

NO – GO TO STEP 2.

2. IACV Circuit Continuity Inspection

Connect the ECM test harness to ECM connectors.

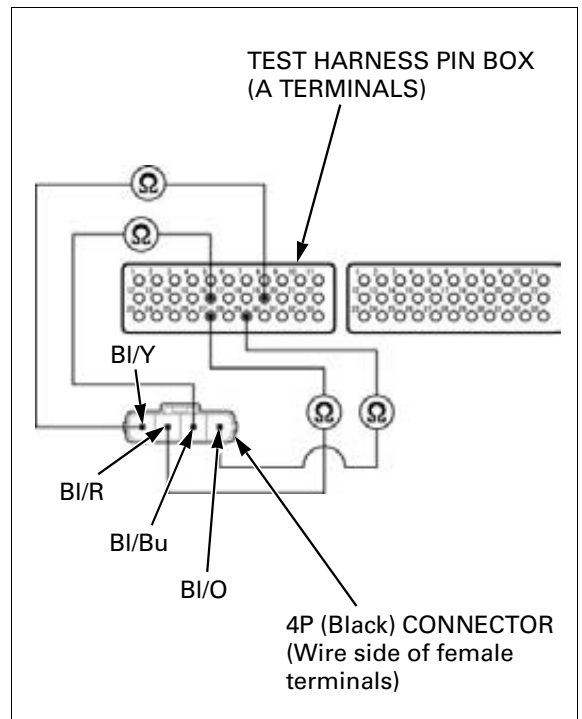
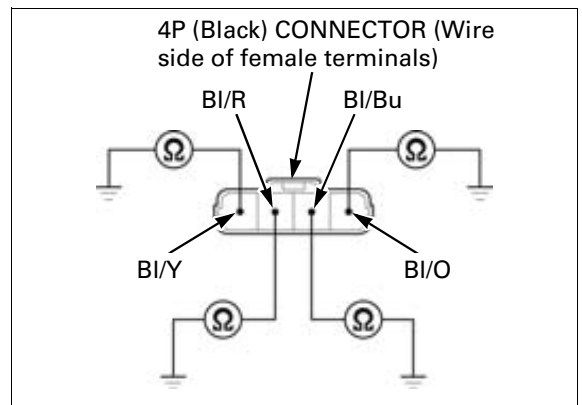
Check the continuities between the test harness and the IACV 4P connector.

Connection: A19 – Black/yellow
A27 – Black/red
A16 – Black/blue
A29 – Black/orange

Are there continuities?

YES – GO TO STEP 3.

NO – • Open or loose contact in Black/yellow or Black/orange wire
 • Open or loose contact in Black/red or Black/blue wire



FUEL SYSTEM (PGM-FI)

3. IACV Resistance Inspection

Connect the IACV 4P connector.
Measure the resistance at the test harness terminals.

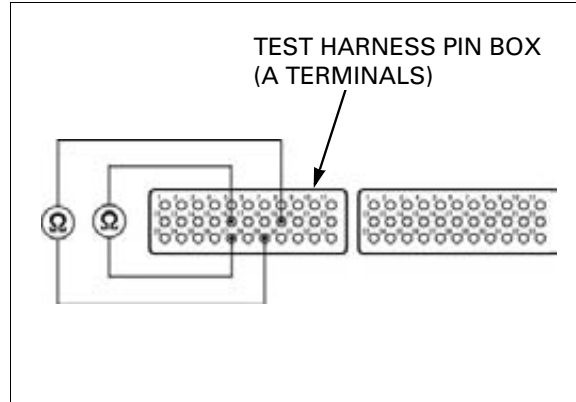
Connection: A19 – A29
A16 – A27

STANDARD: 120 – 140 Ω (20 °C/68 °F)

Is the resistance within 120 – 140 Ω (20 °C/68 °F)?

YES – Replace the ECM with a new one, and recheck; refer to Key Registration Procedures (page 22-6)

NO – Faulty throttle body (IACV)



MIL CIRCUIT TROUBLESHOOTING

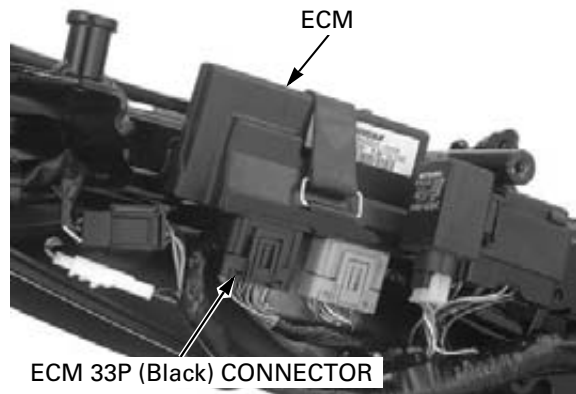
If the engine can be started but the MIL does not come on when the ignition switch is turned "ON" and the engine stop switch is in "OFF", check as follows:

Check other indicators function properly.

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

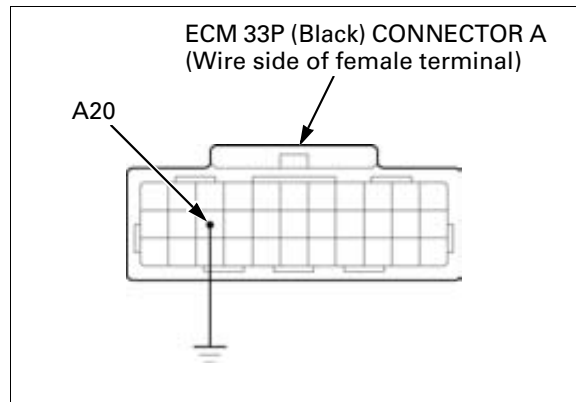
Remove the right rear cowl (page 3-8).

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



Ground the White/blue wire terminal of the wire harness side connector with a jumper wire. Turn the ignition switch to "ON", the MIL should come on.

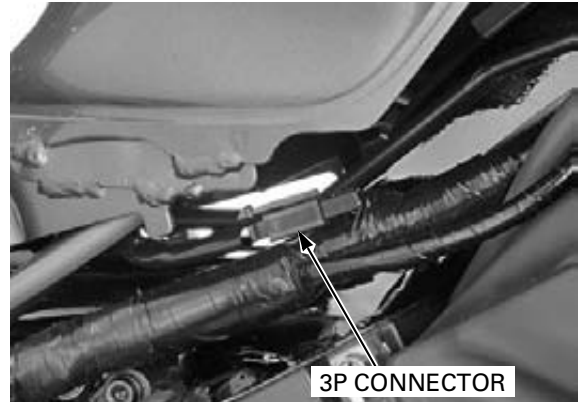
- If the MIL comes on, replace the ECM with a new one and recheck the MIL indication. Refer to Key Registration Procedures (page 22-6)
- If the MIL does not come on, check for open circuit in the White/blue wire between the combination meter and ECM. If the wire is OK, replace the combination meter.



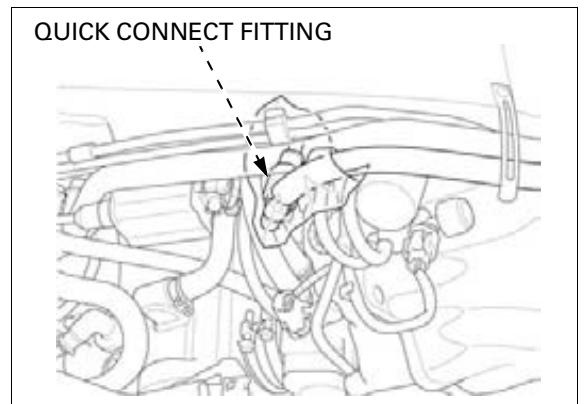
FUEL LINE INSPECTION

FUEL PRESSURE RELIEVING/QUICK CONNECT FITTING REMOVAL

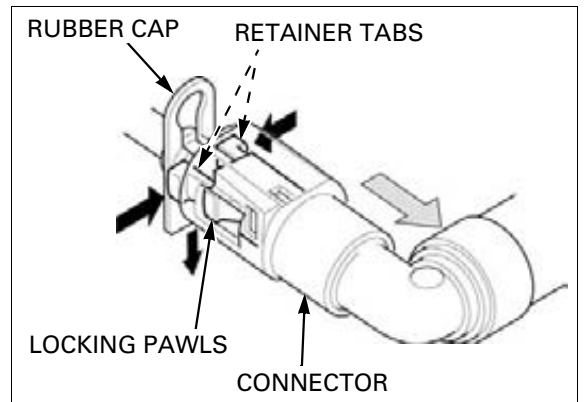
- Before disconnecting fuel feed hose, relieve pressure from the system as following procedures.
1. Turn the ignition switch OFF.
Lift and support the fuel tank (page 4-5).
 2. Disconnect the fuel pump 3P (Black) connector.
 3. Start the engine, and let it idle until the engine stalls.
 4. Turn the ignition switch OFF.
 5. Disconnect the battery cable (page 18-6).



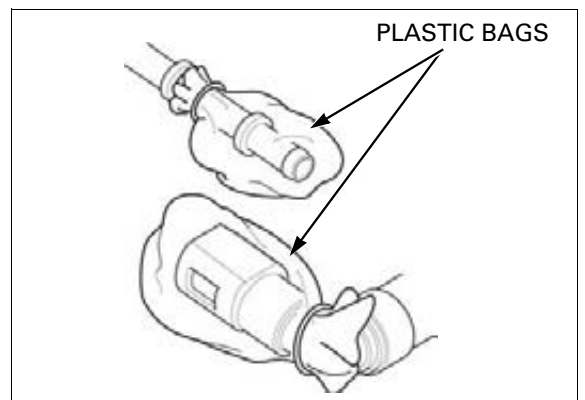
6. Check the fuel quick connect fitting for dirt, and clean if necessary.
Place a shop towel over the quick connect fitting.



7. Pull and release the rubber cap from the retainer.
 8. Hold the connector with one hand and squeeze the retainer tabs with the other hand to release them from the locking pawls.
Pull the connector off and remove the rubber cap from the fuel pipe.
- Prevent the remaining fuel in the fuel feed hose from following 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.

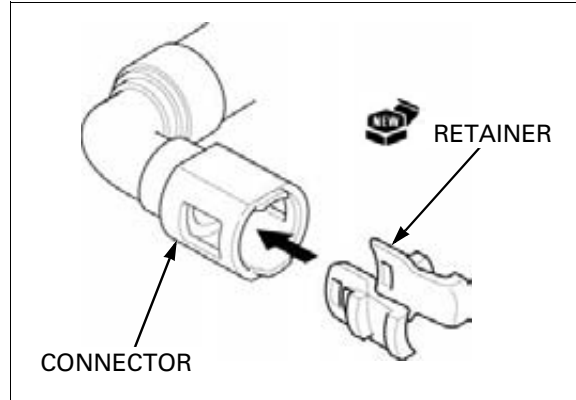


9. To prevent damage and keep foreign matter out, cover the disconnected connector and pipe end with the plastic bags.



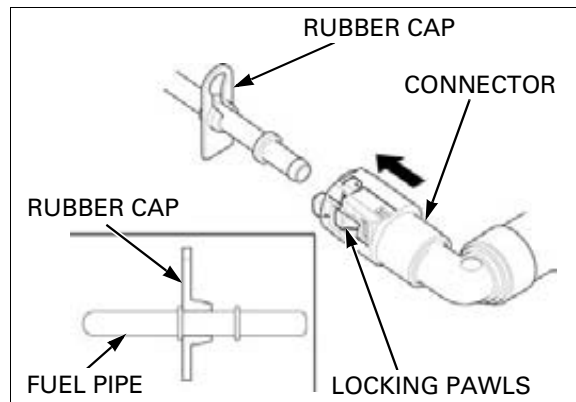
QUICK CONNECT FITTING INSTALLATION

- Always replace the retainer of the quick connect fitting when the fuel feed hose is disconnected.
 - If any damage or cut-out on the rubber cap, replace it with a new one.
 - Do not bent or twist fuel feed hose.
1. Insert a new retainer into the connector.

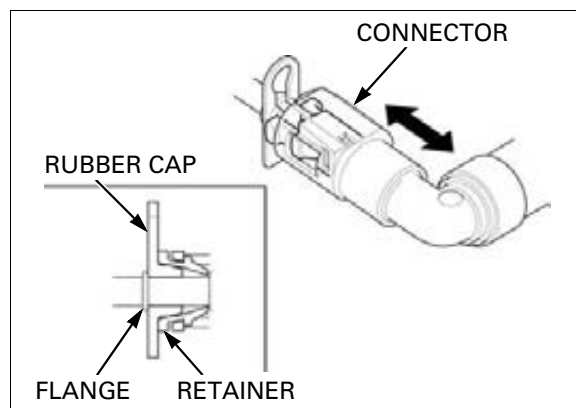


2. Install the rubber cap and seat it onto the fuel pipe flange as shown.
Align the quick connect fitting with the pipe and align the new retainer locking pawls with the connector grooves.
Then press the quick connect fitting onto the pipe until both retainer pawls lock with a "CLICK".

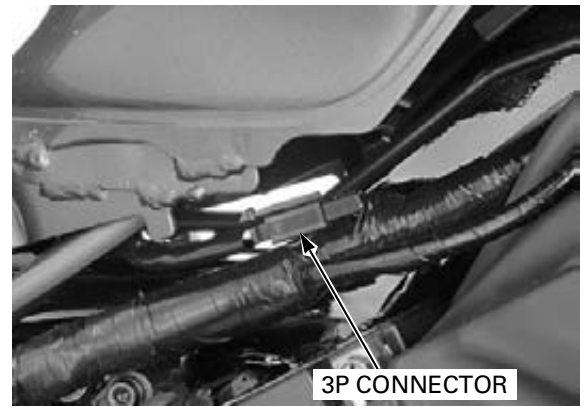
If it is hard to connect, put a small amount of engine oil on the pipe end.



3. Make sure the connection is secure and that the pawls are firmly locked into place; check visually and by pulling the connector.
4. Make sure the rubber cap is in place (between the flange and retainer tab).



- Connect the fuel pump 3P (Black) connector and clamp the wire.



- Connect the battery cables to the battery.

Do not start the engine.

- Turn the ignition switch ON and engine stop switch "⏻".

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.

Installation is in the reverse order of removal.



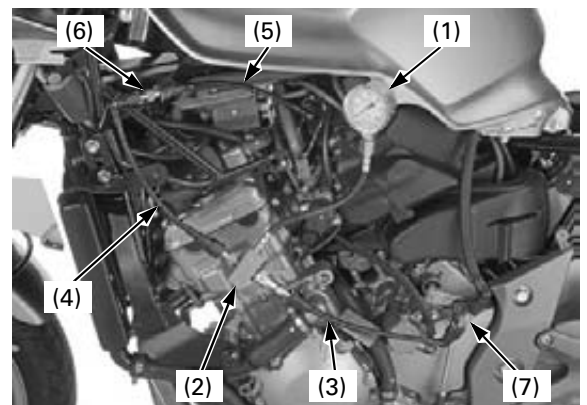
FUEL PRESSURE TEST

Relieve the fuel pressure and disconnect the quick connect fitting (page 6-51).

Attach the fuel pressure gauge, attachments and manifold.

TOOLS:

- | | |
|---------------------------------------|---------------|
| (1): Fuel pressure gauge | 07406-0040004 |
| (2): Pressure gauge manifold | 07ZAJ-S5A0110 |
| (3): Pressure gauge hose attachment A | 07ZAJ-S5A0120 |
| (4): Pressure gauge hose attachment B | 07ZAJ-S5A0130 |
| (5): Pressure gauge hose attachment C | 07ZAJ-S7C0100 |
| (6): Fuel attachment joint A | 07ZAJ-S5A0150 |
| (7): Fuel attachment joint B | 07ZAJ-S7C0200 |



Temporarily connect the positive cable and negative cable to the battery.

Start the engine and let it idle.

Read the fuel pressure.

STANDARD: 343 kPa (3.5 kgf/cm², 50 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
- Fuel pump (page 6-55)
- Clogged fuel filter (Assembly of the fuel pump: page 6-55)

FUEL SYSTEM (PGM-FI)

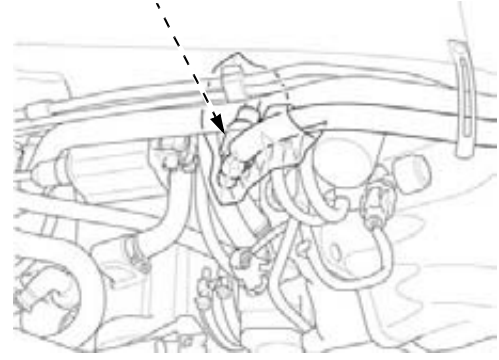
Wrap a shop towel around the attachment to soak up any spilled fuel.

After inspection, relieve the fuel pressure by starting the engine and let it idle until it stalls.

Remove the fuel pressure gauge, attachment and manifold from the fuel pump.

Connect the quick connect fitting (page 6-52).

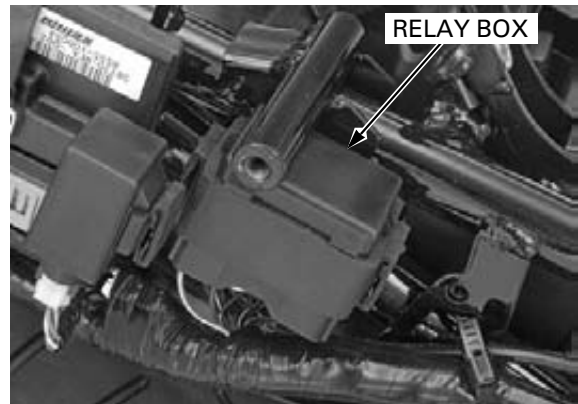
QUICK CONNECT FITTING



FUEL FLOW INSPECTION

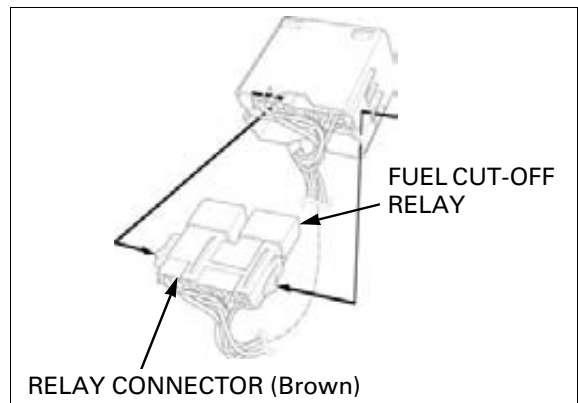
Remove the right rear cowl (page 3-8).

Remove the relay box from the bracket.



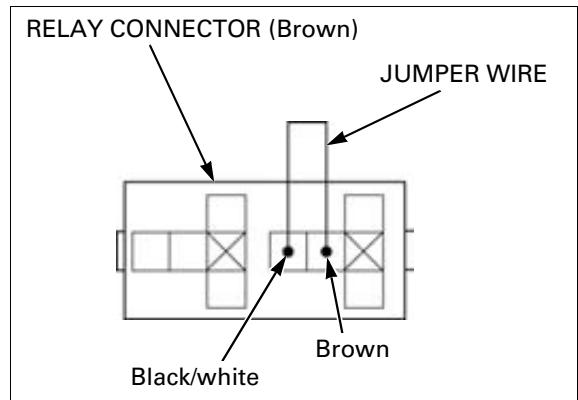
Release the retainers and remove the relay connector (Brown) from the relay box.

Remove the fuel cut-off relay from the connector.



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

- Place an approved gasoline container and drain the gasoline.
- Wipe off spilled out gasoline.



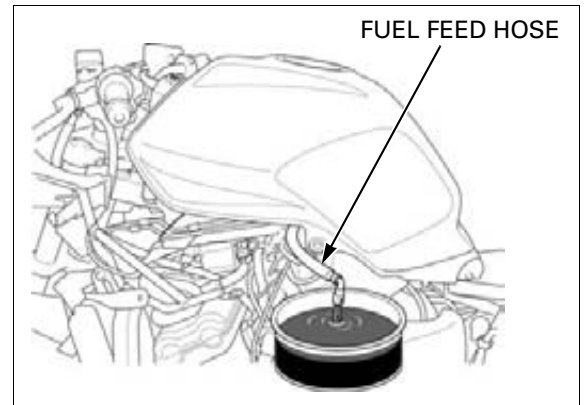
Turn the ignition switch ON for 10 seconds.
Measure the amount of fuel flow.

Amount of fuel flow:

**189 cm³ (6.4 US oz, 6.7 Imp oz) minimum
/10 seconds at 12 V**

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

- Pinched or clogged fuel hose
- Fuel pump unit (page 6-55)



FUEL PUMP

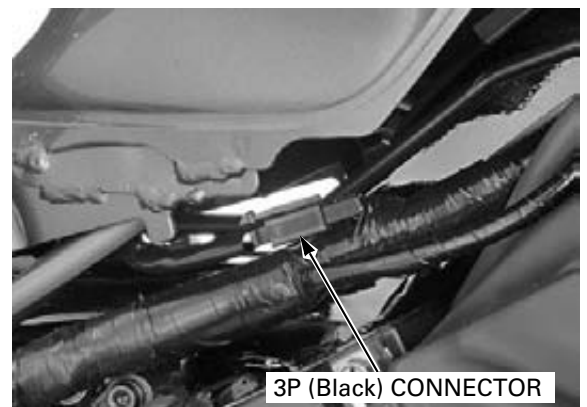
INSPECTION

Turn the ignition switch ON and confirm that the fuel pump operates for a few seconds.

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

Open and support the fuel tank (page 4-5).

Disconnect the fuel pump unit 3P (Black) connector.



Turn the ignition switch ON and measure the voltage between the terminals.

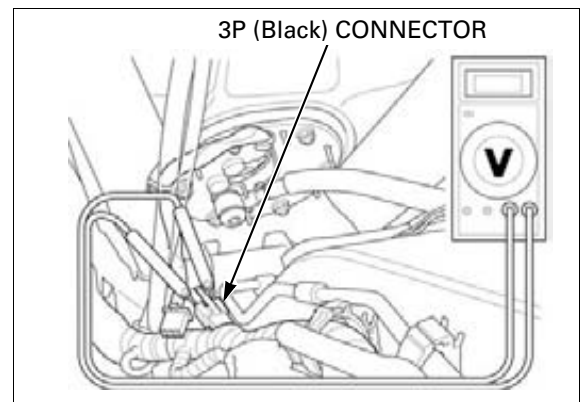
Connection: Brown (+) – Green (-)

There should be battery voltage for a few seconds.

If there is battery voltage a few seconds, replace the fuel pump unit.

If there is no battery voltage, inspect the following:

- Main fuse 30A
- Sub fuse 10A
- Engine stop switch (page 21-21)
- Fuel cut-off relay (page 6-57)
- Engine stop relay (page 6-81)
- Bank angle sensor (page 6-79)
- ECM (page 6-82)

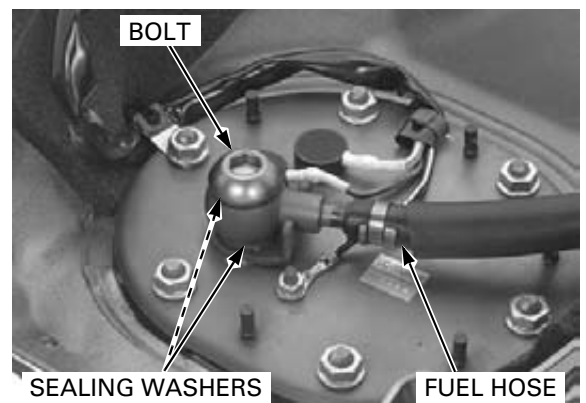


REMOVAL

- Always replace the sealing washers when the fuel feed hose banjo bolt is removed or loosened.

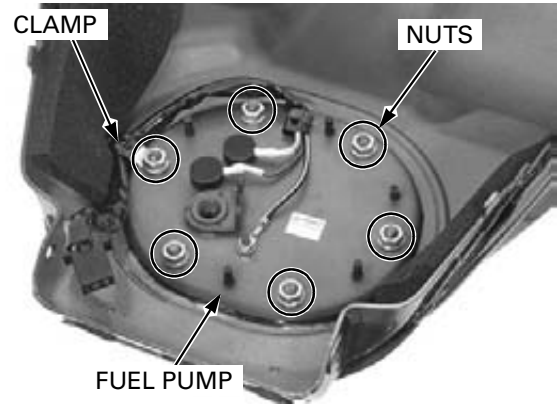
Remove the fuel tank (page 6-57).

Remove the banjo bolt, sealing washers and fuel hose.



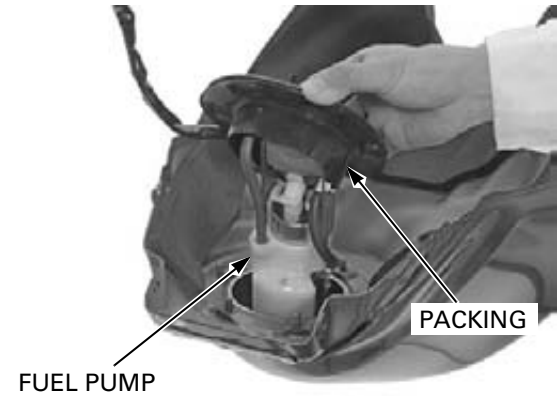
FUEL SYSTEM (PGM-FI)

Remove the nuts and wire clamp.



Be careful not to damage the pump wire and fuel level gauge.

Remove the fuel pump unit and packing.

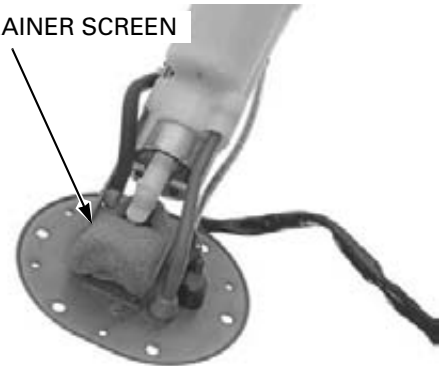


INSPECTION

Check the fuel pump unit for wear or damage, replace it if necessary.

Clean the fuel strainer screen with non-flammable or high flash point solvent.

FUEL STRAINER SCREEN



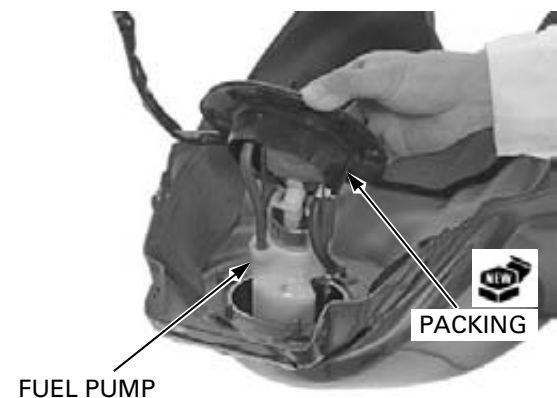
INSTALLATION

Always replace the packing with a new one.

Place a new packing onto the fuel pump unit.

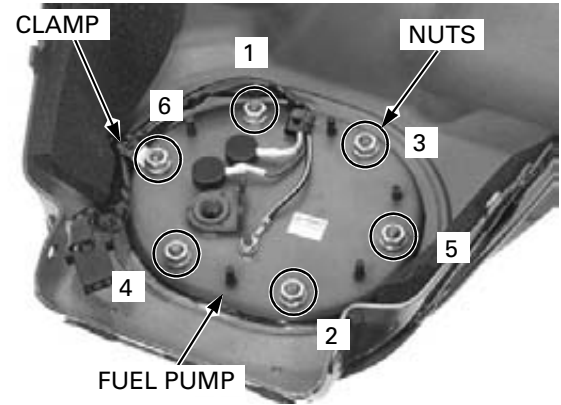
Be careful not to damage the pump wire and fuel level gauge.

Install the fuel pump unit into the fuel tank.



Install the clamps and tighten the fuel pump mounting nuts in the specified sequence as shown.

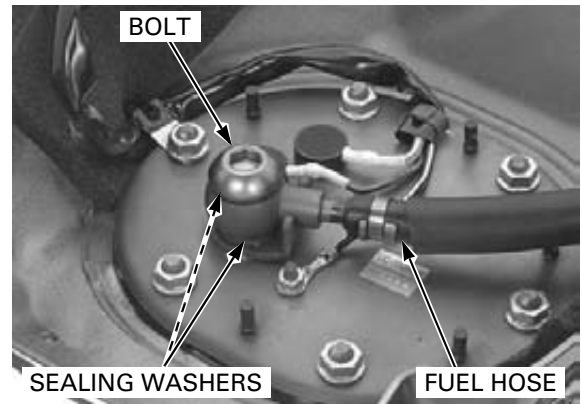
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Connect the fuel feed hose to the fuel pump with banjo bolt and new sealing washers.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

Install the fuel tank (page 6-59).



FUEL CUT-OFF RELAY

INSPECTION

Remove the fuel cut-off relay from the relay box (page 6-54).

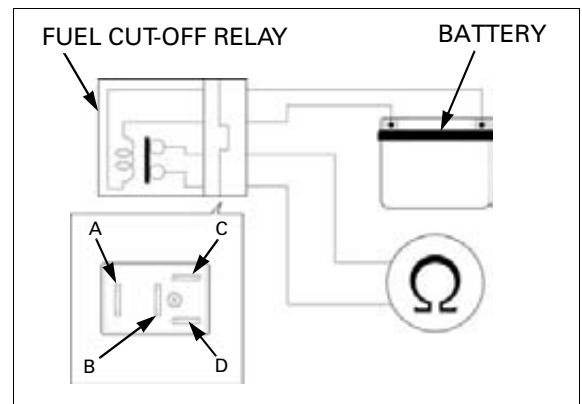
Connect the ohmmeter to the fuel cut-off relay connector terminals.

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.



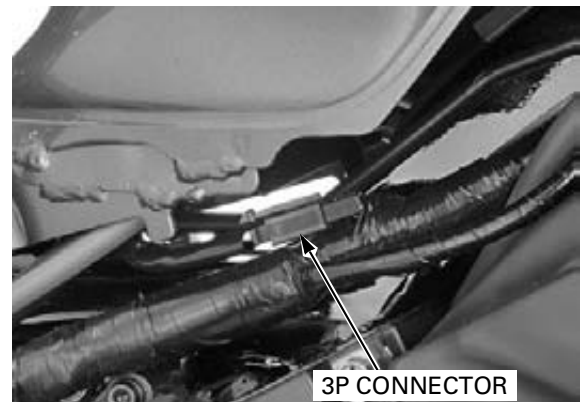
FUEL TANK

REMOVAL

- Before disconnecting fuel hoses, release the fuel pressure by loosening the fuel feed hose banjo bolt at the fuel tank.
- Failure to release the fuel pressure could result in fuel spilling onto painted or plastic parts, which will be damaged.
- Always replace the sealing washers when the fuel feed hose banjo bolt is removed or loosened.

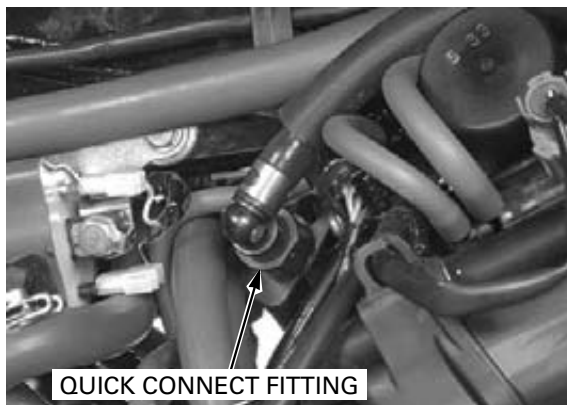
Lift and support the fuel tank.

Disconnect the fuel pump 3P (Black) connector.

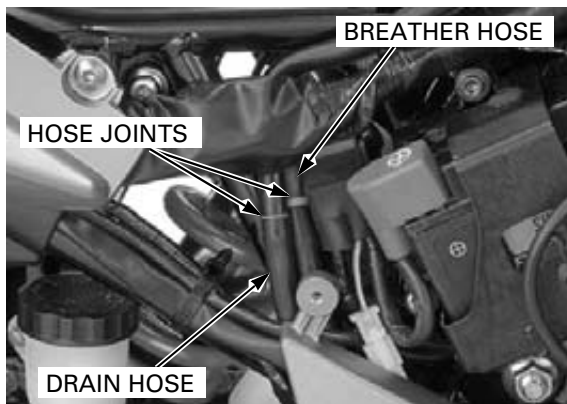


FUEL SYSTEM (PGM-FI)

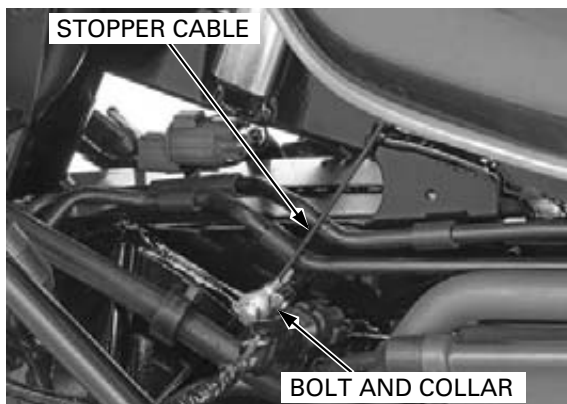
Relieve the fuel pressure (page 6-51).



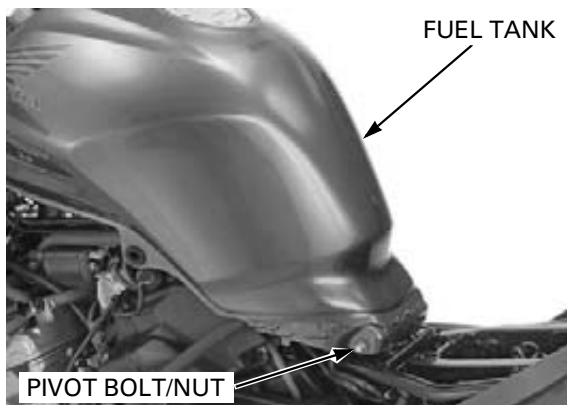
Disconnect the fuel tank drain hose and breather hose from the hose joints.



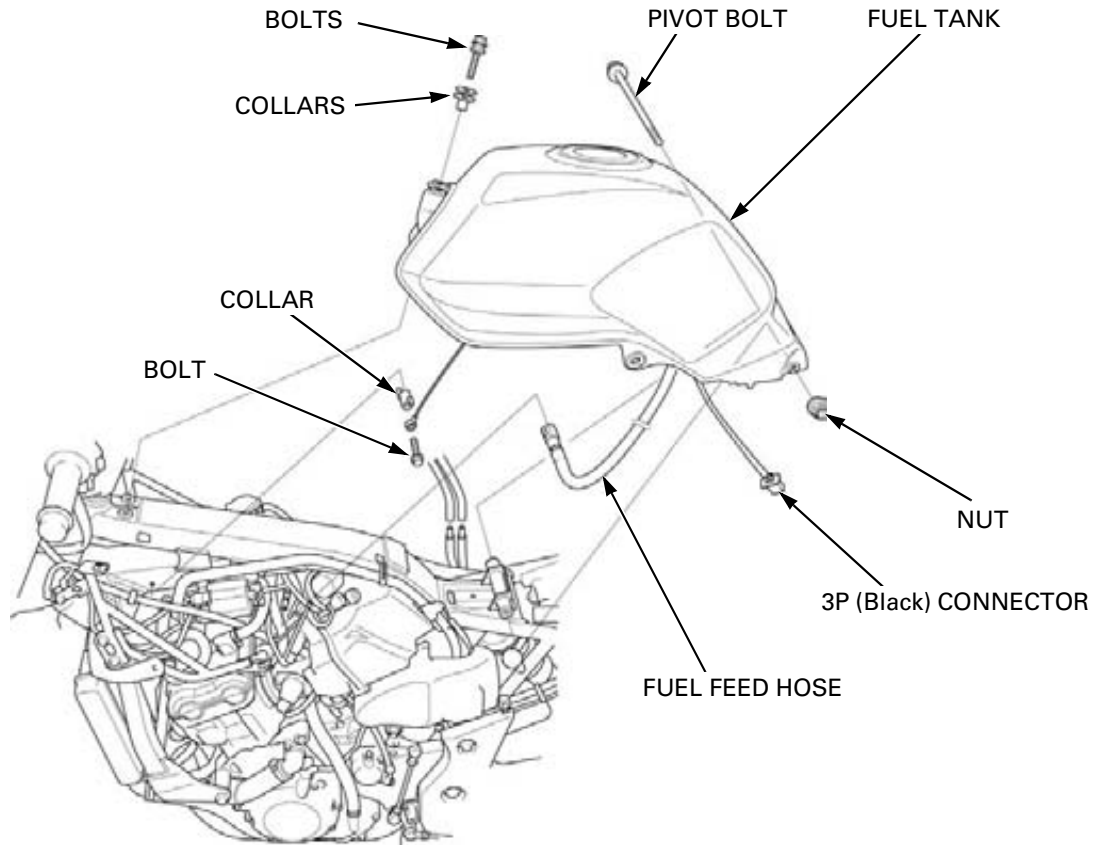
Remove the bolt and fuel tank stopper cable collar.



Remove the nut and pivot bolt, then remove the fuel tank.



INSTALLATION

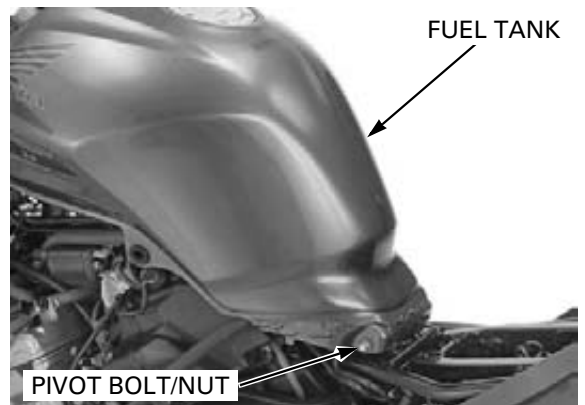


Install the fuel tank onto the frame, then install the pivot bolt and nut.

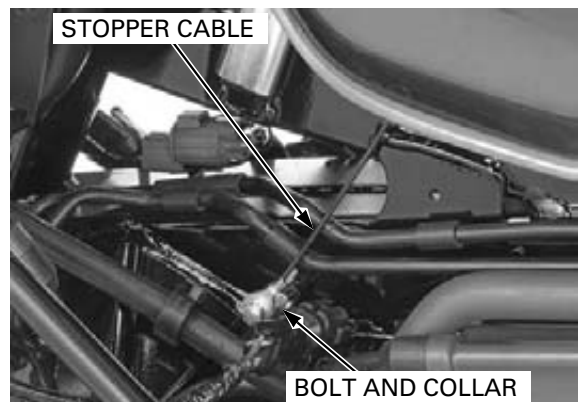
Hold the pivot bolt and tighten the nut to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Lift and support the fuel tank (page 4-5).



Connect the fuel tank stopper cable to the frame with the collar and bolt.



FUEL SYSTEM (PGM-FI)

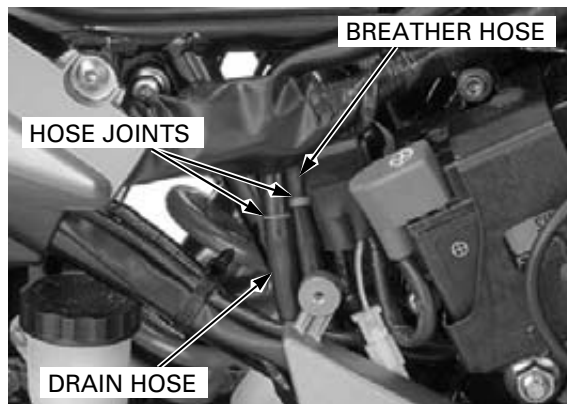
Connect the fuel feed hose (page 6-52).



Connect the fuel tank drain hose and breather hose to the hose joints.

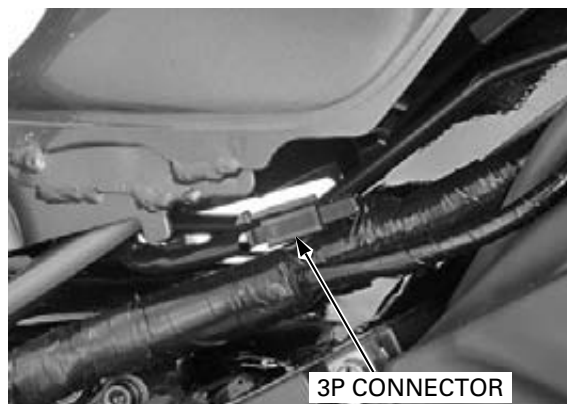
NOTICE

- Route the hoses, wires and harness properly (page 1-23).
- Be careful not to damage the harness and hoses.
- After installing the fuel tank, make sure the drain, breather and fuel hoses are not kinked or bound.



Connect the fuel pump 3P (Black) connector.

Remove the support tool, then install and tighten the fuel tank front mounting bolts and rear pivot nut (page 4-6).



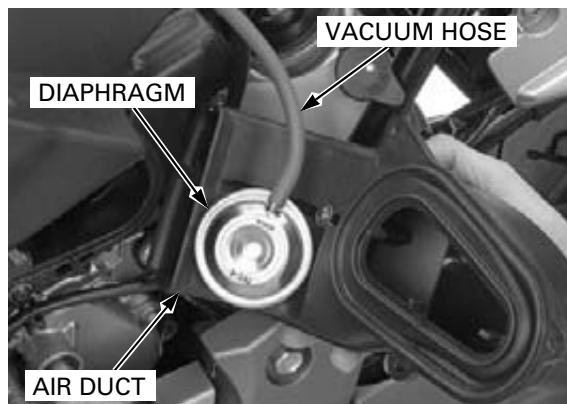
AIR CLEANER HOUSING

REMOVAL

Remove the fuel tank.

Remove the air cleaner element (page 4-7).

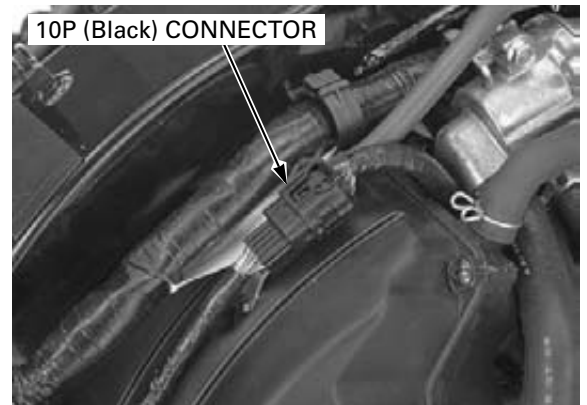
Disconnect the vacuum tube from the element cover diaphragm.



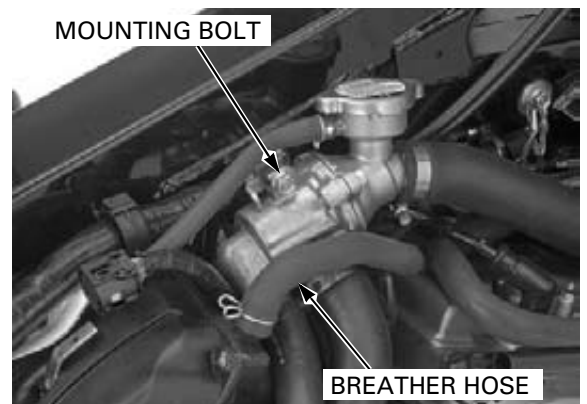
Disconnect the IAT sensor 2P connector.
Disconnect the PAIR air hose from the air cleaner housing.



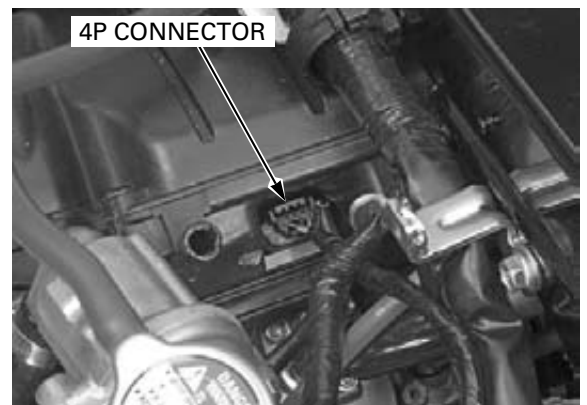
Disconnect the injector sub-harness 10P (Black) connector.



Disconnect the crankcase breather hose from the air cleaner housing.
Remove the thermostat housing mounting bolt.

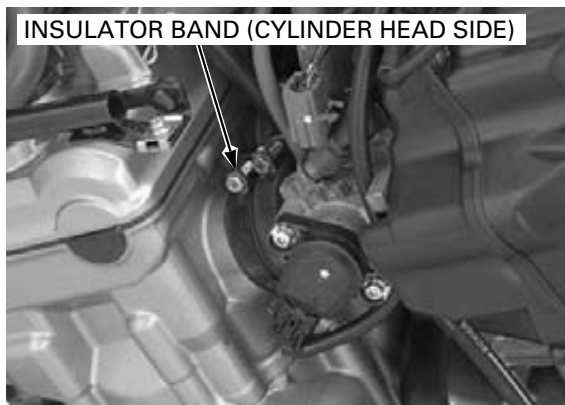


Disconnect the IACV 4P (Black) connector.



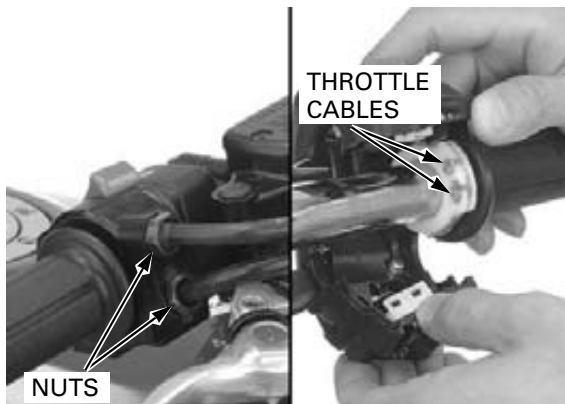
FUEL SYSTEM (PGM-FI)

Loosen the throttle body insulator bands (cylinder head side).

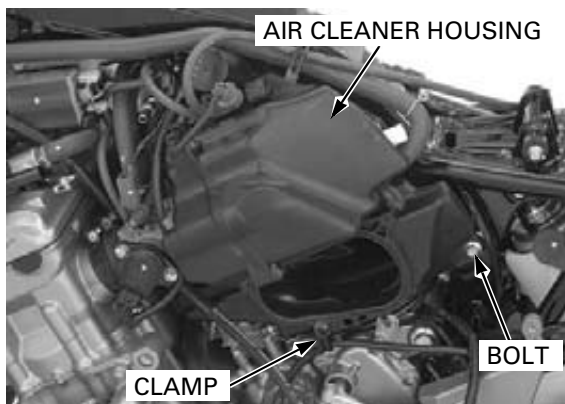


Make the throttle cable free play at the handlebar side (page 4-6).

Loosen the throttle cable nuts fully.
Disconnect the throttle cables from the throttle pipe.

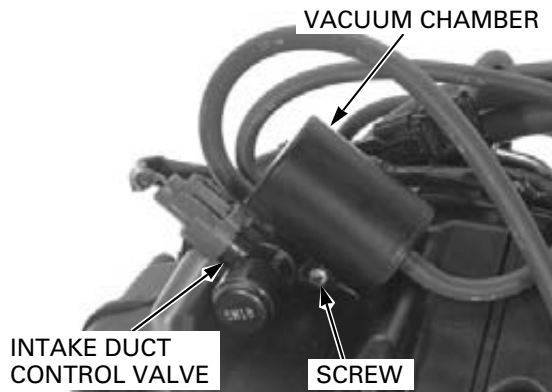


Release the alternator wire from the clamp.
Remove the air cleaner housing mounting bolt, then pull the housing backward and remove it.



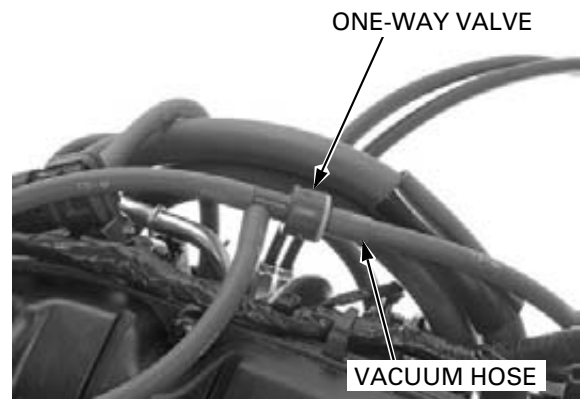
DISASSEMBLY

Remove the screw and intake duct control valve with the vacuum chamber.

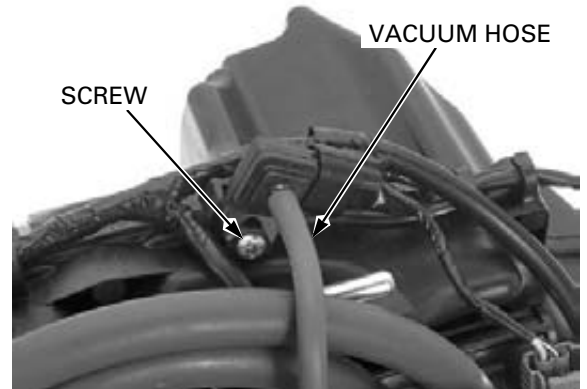


FUEL SYSTEM (PGM-FI)

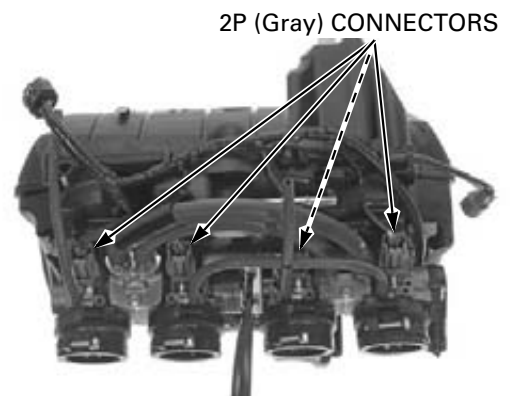
Remove the vacuum hose from the one-way valve.



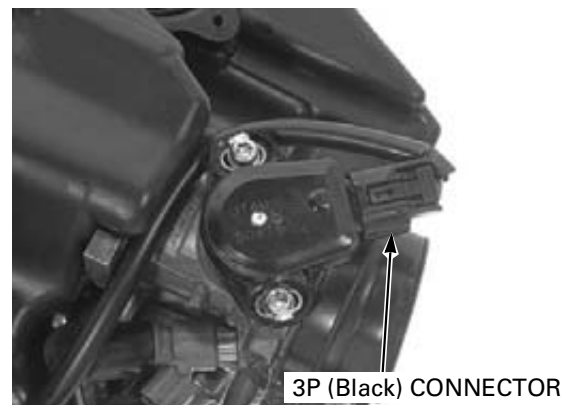
Disconnect the MAP sensor vacuum hose.
Remove the screw and MAP sensor from the air cleaner housing.



Disconnect the injector 2P (Gray) connectors.



Disconnect the TP sensor 3P (Black) connector.
Remove the injector sub-harness from the air cleaner housing and throttle body.



FUEL SYSTEM (PGM-FI)

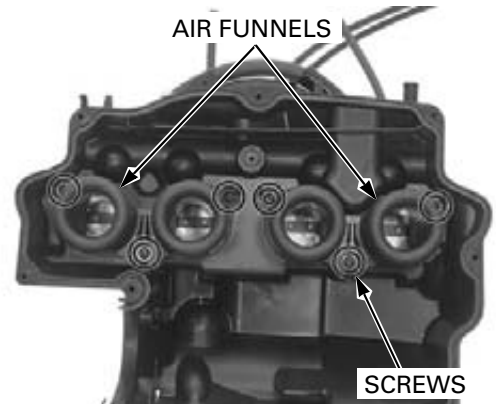
Remove the air cleaner duct packing.



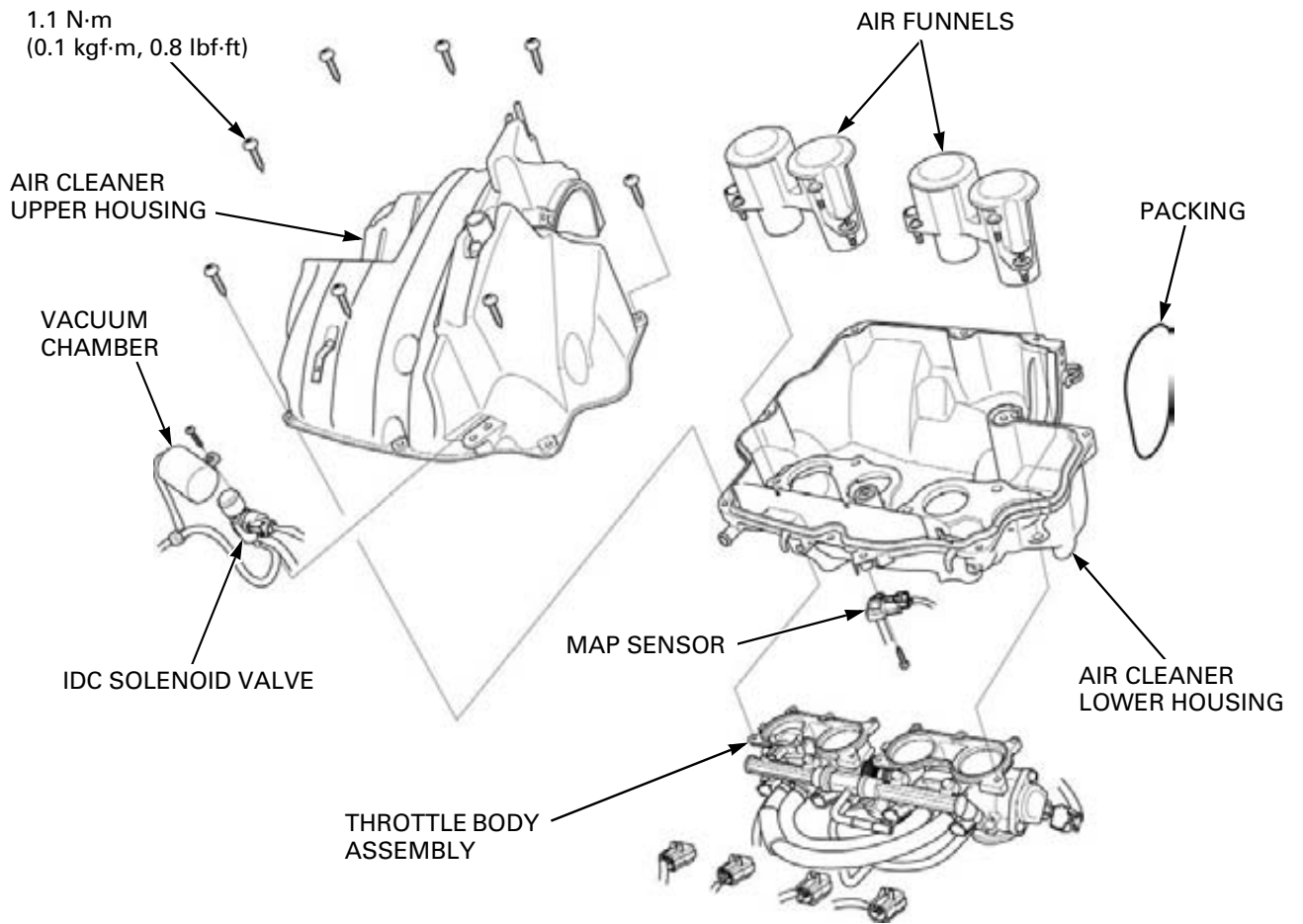
Remove the screws and air upper air cleaner housing.



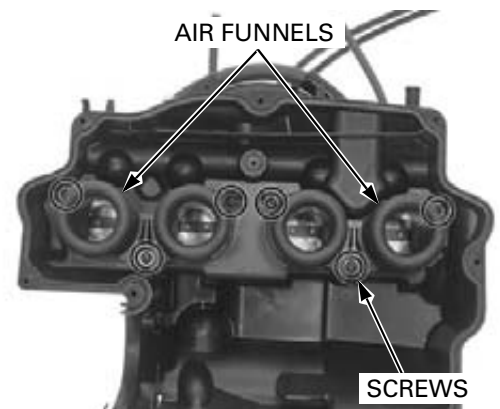
Loosen the screws, then remove the air funnels and throttle body from the lower air cleaner housing.



ASSEMBLY



Install the lower air cleaner housing onto the throttle body, then install the air funnels.
Tighten the air funnel screws securely.

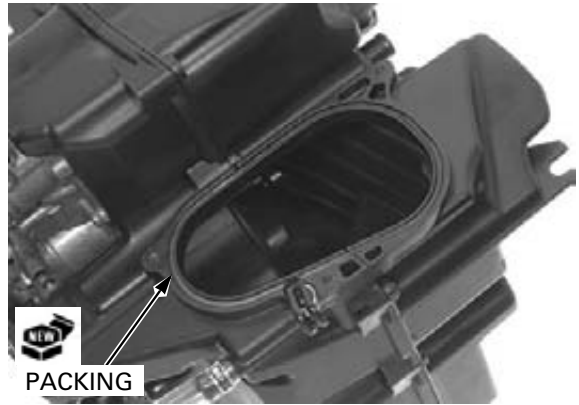


Install the upper air cleaner housing onto the lower housing.
Install and tighten the screws securely.

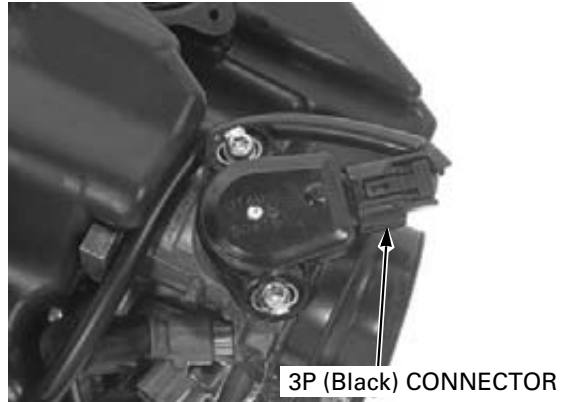


FUEL SYSTEM (PGM-FI)

Install the new air cleaner duct packing into the groove on the housing.

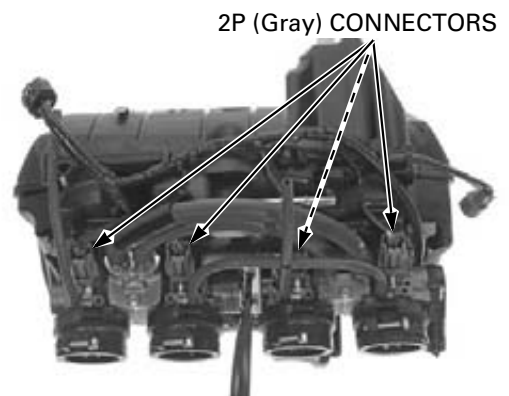


Connect the TP sensor 3P (Black) connector of the injector sub-harness.



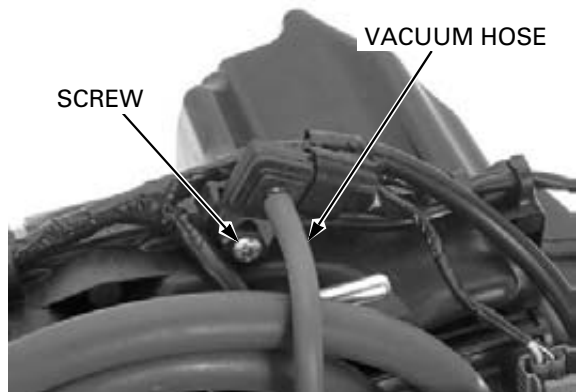
Route the injector sub-harness through the clamps of the air cleaner housing.

Connect the injector 2P (Gray) connectors.

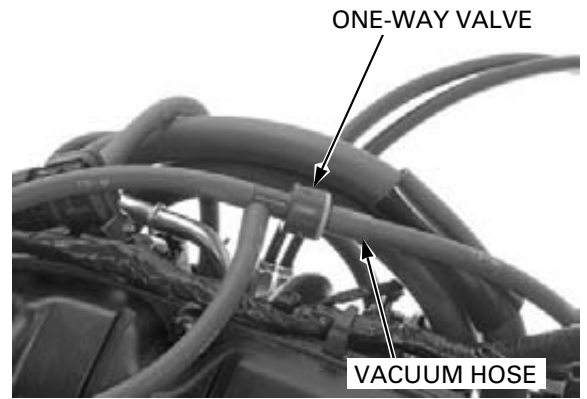


Install the MAP sensor and tighten the screw securely.

Connect the MAP sensor vacuum hose.

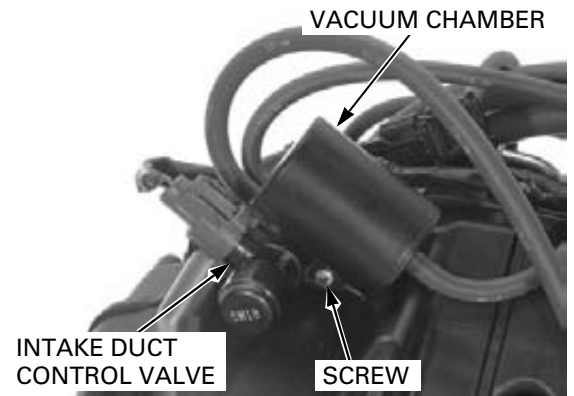


Connect the vacuum hose to the one-way valve.



Install the intake duct control valve with the vacuum chamber.

Install and tighten the screw securely.

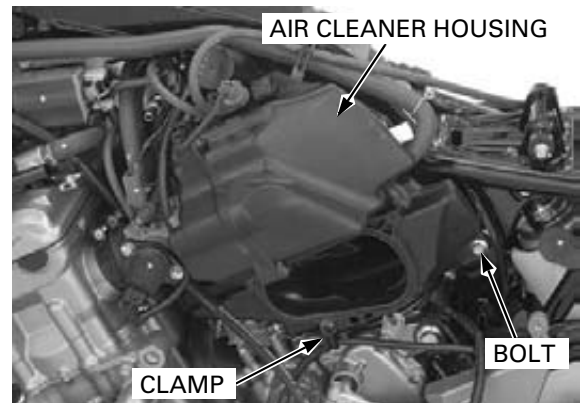


INSTALLATION

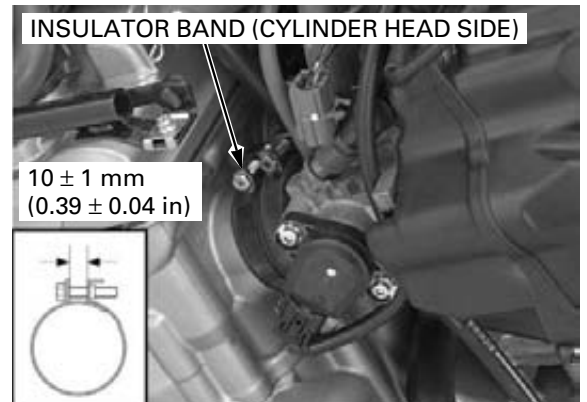
Install the air cleaner housing with the throttle body.

NOTE:

Make sure each insulator is firmly installed to the intake port.



Tighten the insulator band screws (cylinder head side) so that the interval of the band ends is 10 ± 1 mm (0.39 ± 0.04 in).

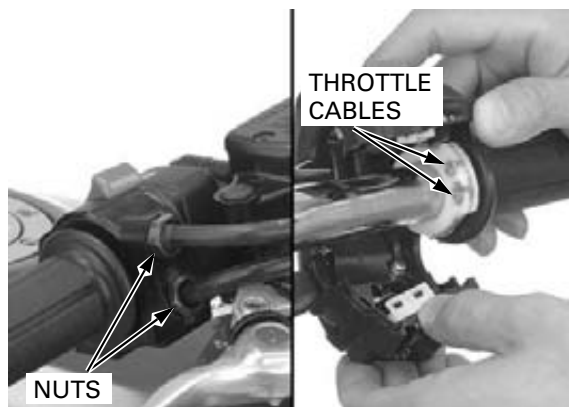


FUEL SYSTEM (PGM-FI)

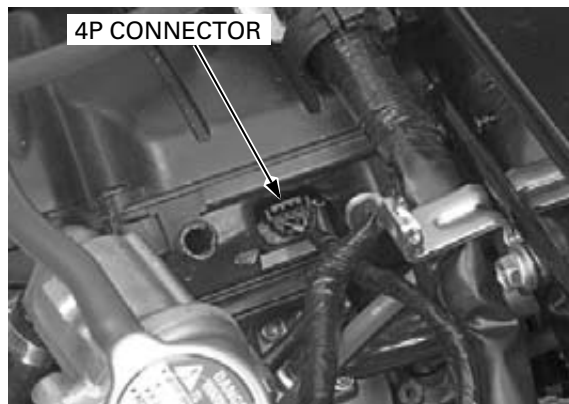
Connect the throttle cables to the throttle pipe.

Install the right handlebar switch housing (page 14-8).

Tighten the nuts securely.

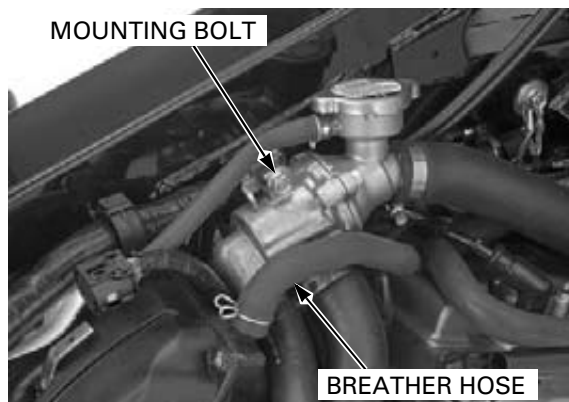


Connect the IACV 4P (Black) connector.

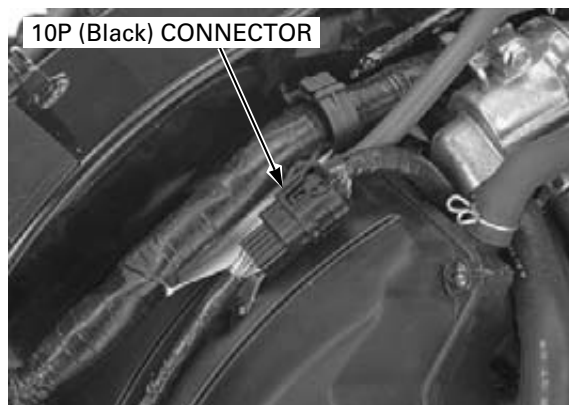


Install the thermostat housing to the frame and tighten the mounting bolt securely.

Connect the crankcase breather hose to the air cleaner housing.



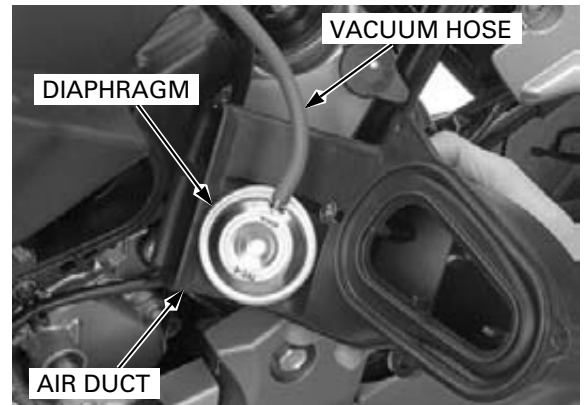
Connect the injector sub-harness 10P (Black) connector.



Connect the IAT sensor 2P (Gray) connector.



Connect the vacuum hose to the diaphragm.
Install the air cleaner element (page 4-7).

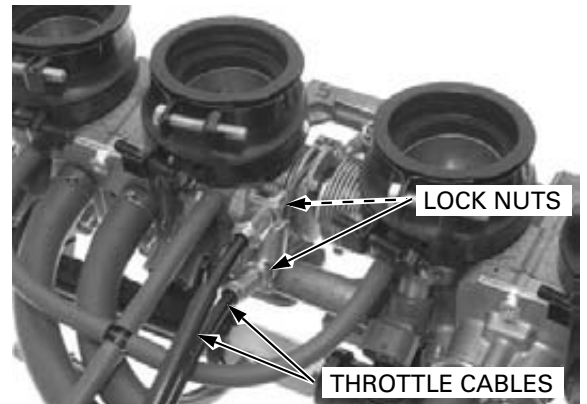


THROTTLE BODY

REMOVAL

Remove the throttle body from the air cleaner housing (page 6-62).

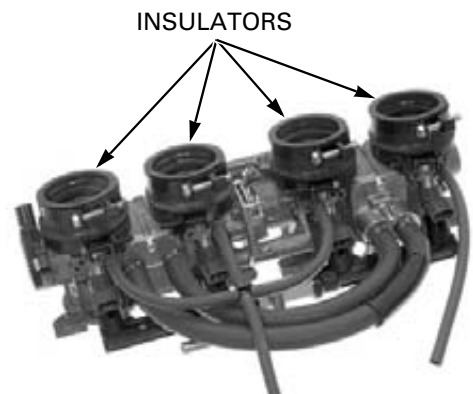
Loosen the lock nuts and disconnect the throttle cables from the throttle drum.



Loosen the insulator band screws and remove the insulators.

NOTE:

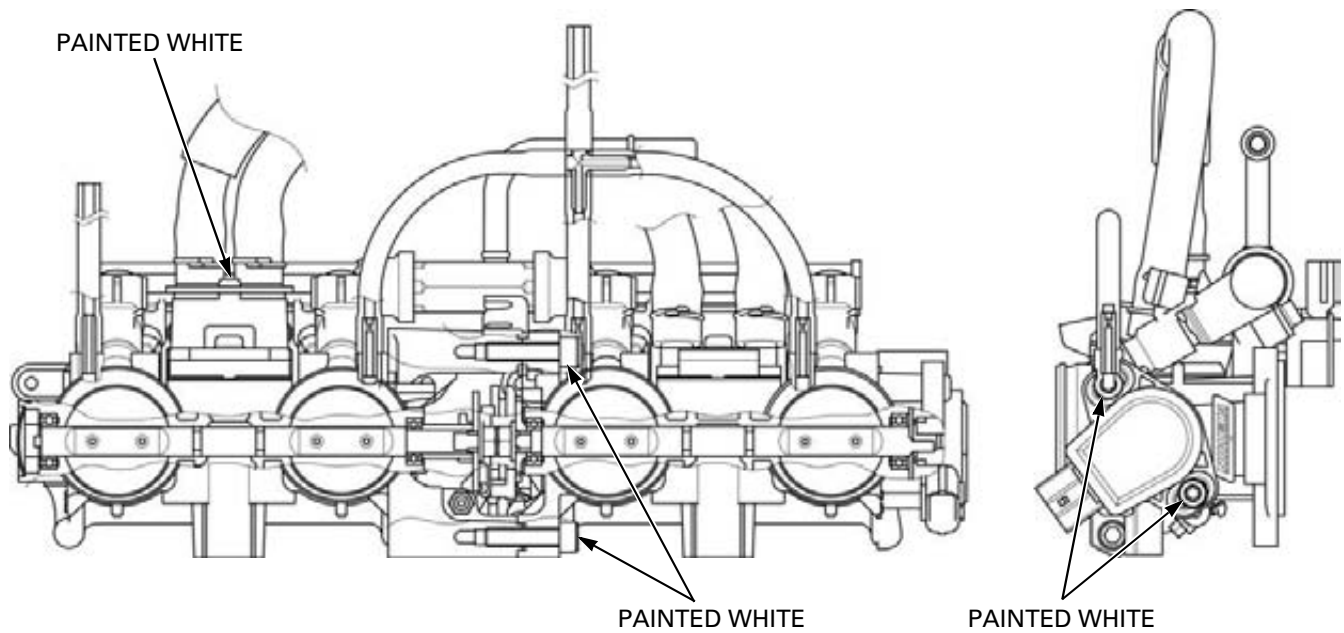
Mark each insulator to be sure of their insulator bands direction for reassembly.



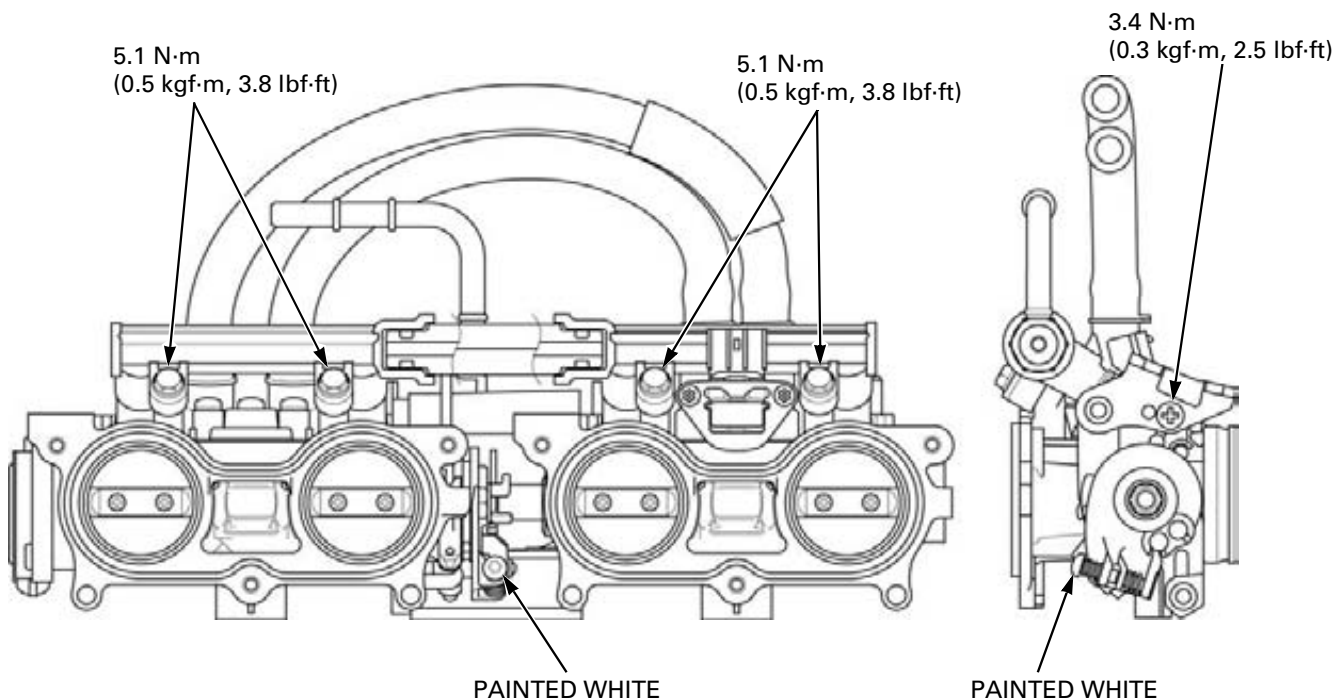
FUEL SYSTEM (PGM-FI)

- Do not damage the throttle body. It may cause incorrect throttle and idle valve synchronization.
- 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 painted white bolts, nut and screws of the throttle body. Loosening or tightening them can cause throttle valve and idle control failure.

Viewed from cylinder head side and throttle sensor side:

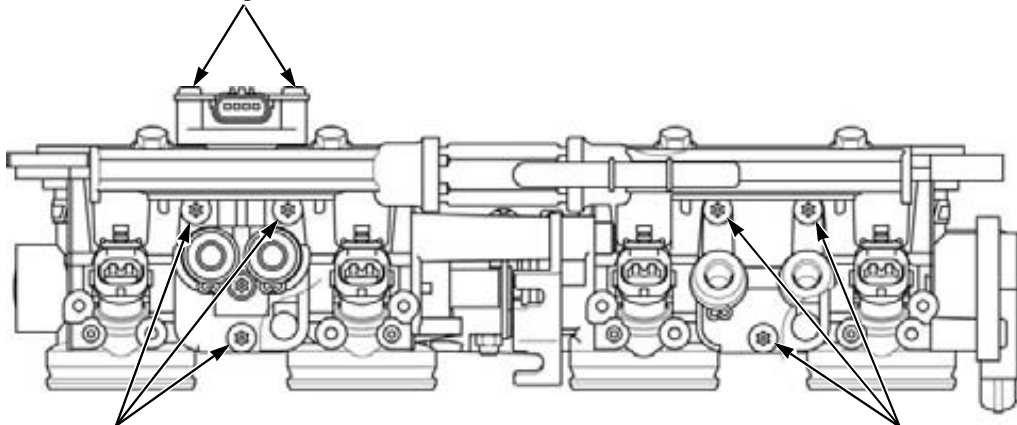


Viewed from air cleaner housing side and throttle drum side:



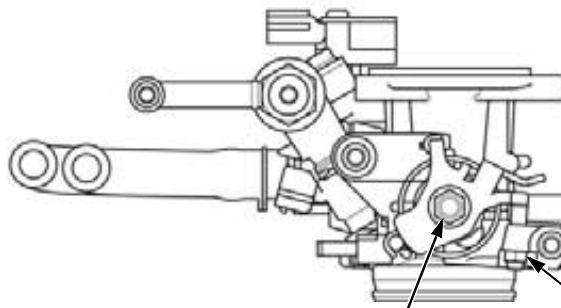
Viewed from top and throttle drum side:

3.4 N·m (0.3 kgf·m, 2.5 lbf·ft)



Do not loosen or remove

Do not loosen or remove

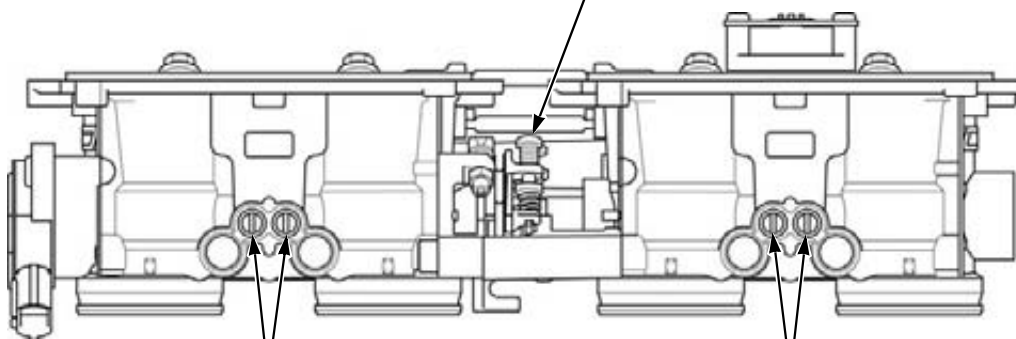


PAINTED WHITE

PAINTED WHITE

Viewed from bottom:

PAINTED WHITE



Do not loosen or tighten

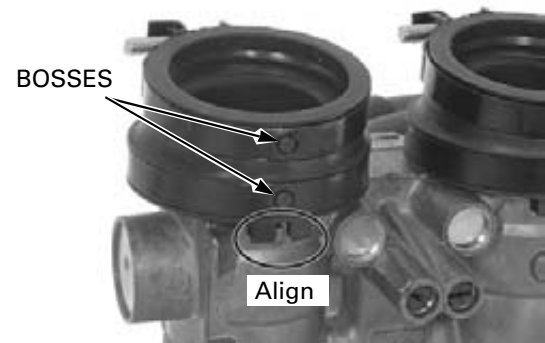
Do not loosen or tighten

FUEL SYSTEM (PGM-FI)

INSTALLATION

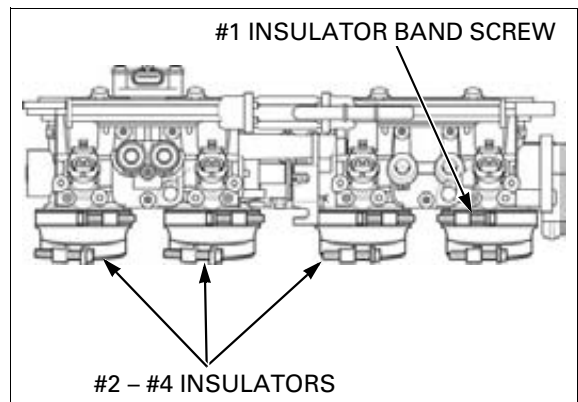
Install each insulator onto the throttle body while aligning its groove with the lug on the throttle body.

Align the hole on each insulator band with the boss on the insulator.

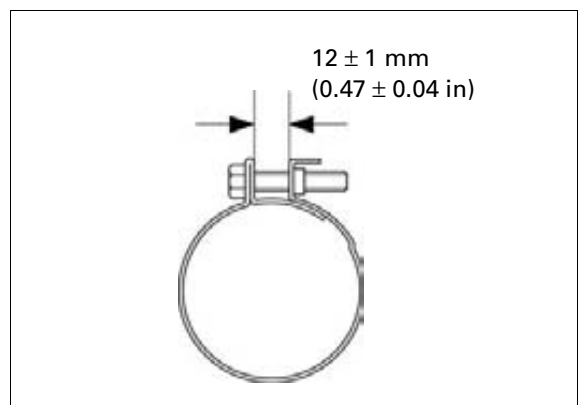


Confirm the direction of the insulator band screws according to the illustration.

#1 insulator band of the throttle body side is different from the others.

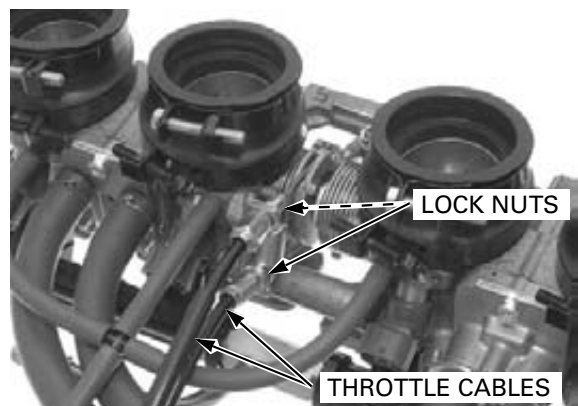


Tighten the throttle body side insulator band screws so that the width between the band ends is 12 ± 1 mm (0.47 ± 0.04 in).



Connect the throttle cables and tighten the lock nuts.

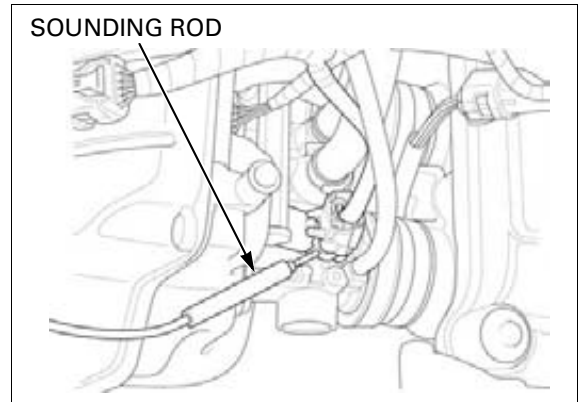
Install the throttle body onto the air cleaner housing (page 6-65).



INJECTOR

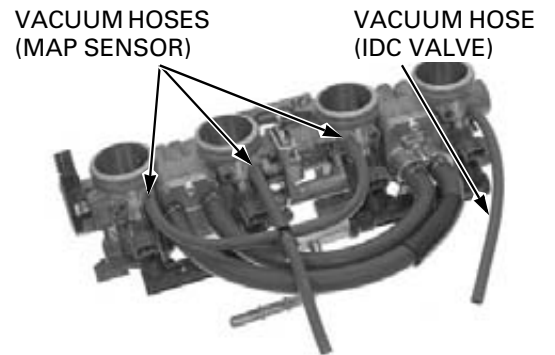
INSPECTION

Start the engine and let it idle.
 Confirm the injector operating sounds with a sounding rod or stethoscope.

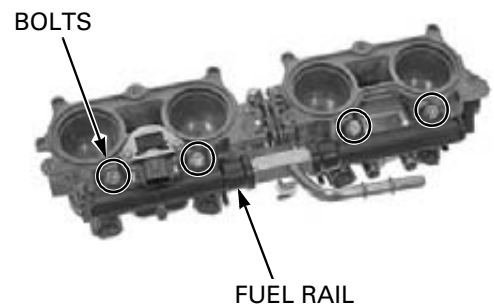


REMOVAL

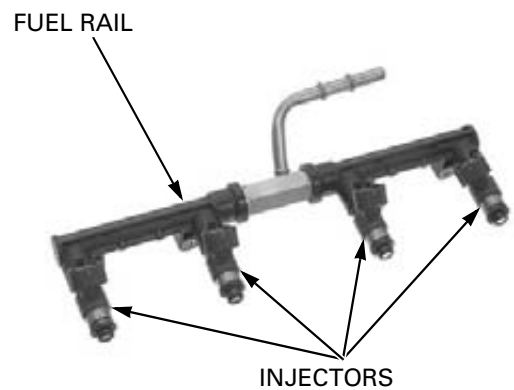
Remove the throttle body (page 6-69).
 Disconnect the MAP sensor vacuum hoses and IDC (Intake Duct Control) valve vacuum hose.



Remove the bolts and fuel rail.

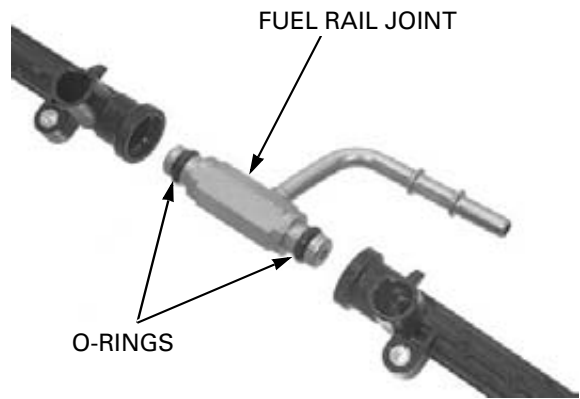


Remove the injectors from the fuel rail.

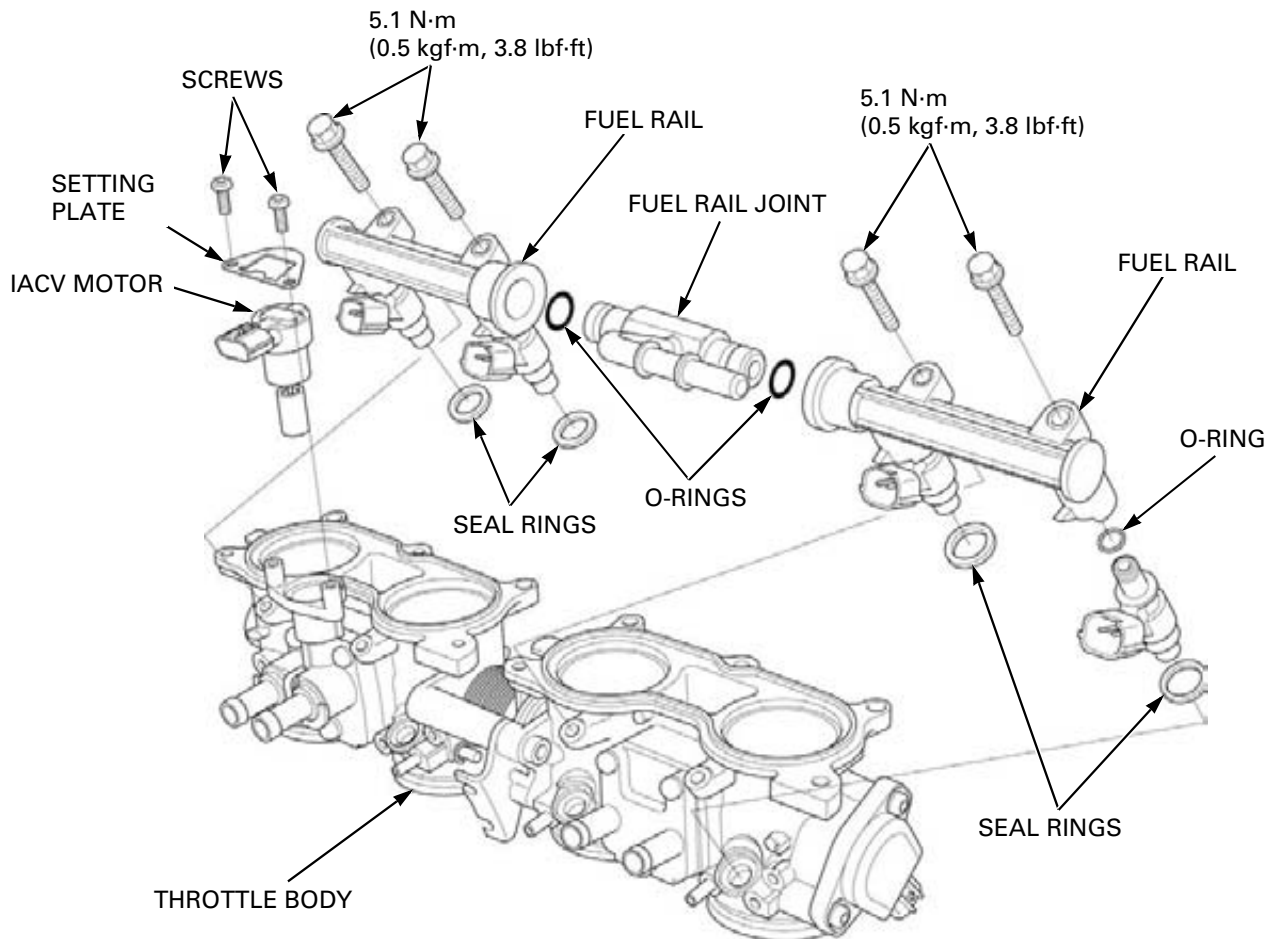


FUEL SYSTEM (PGM-FI)

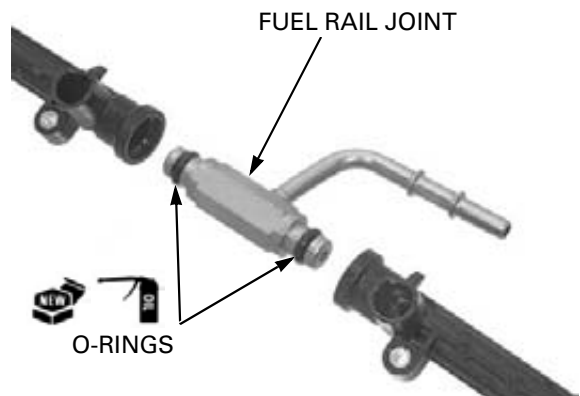
Remove the fuel rail joint.
Remove the O-rings from the fuel rail joint.



INSTALLATION

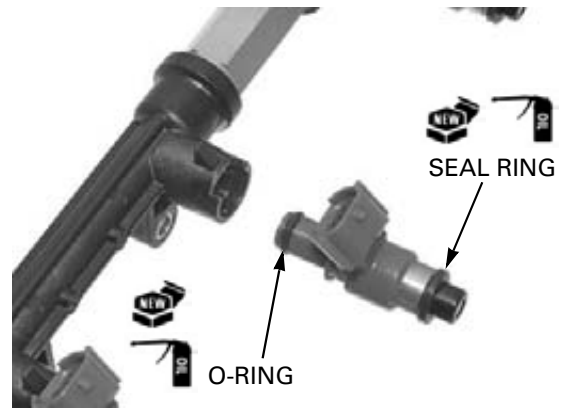


Apply oil to new O-rings of the fuel rail joint.
Install the O-rings onto the fuel rail joint.

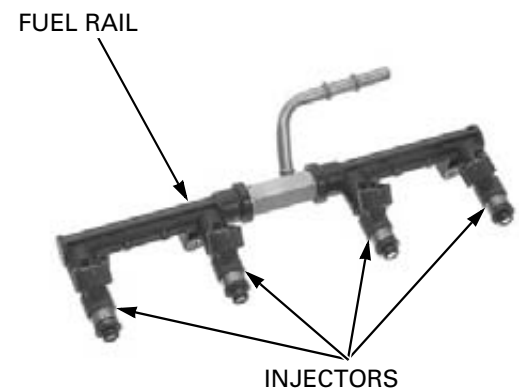


Apply small amount of engine oil to new seal rings and O-rings.

Install the seal ring and O-ring to each injector.

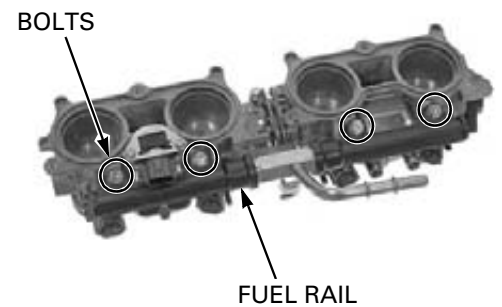


Install the injectors to the fuel rail.



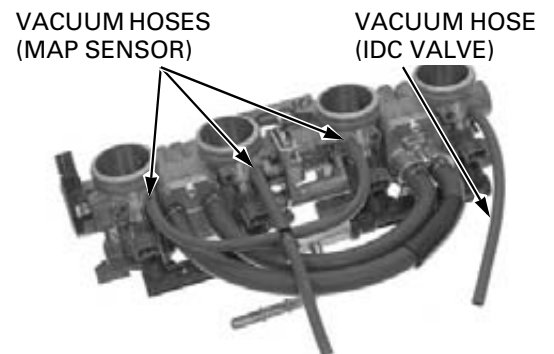
Install the injectors with the fuel rail.

Install and tighten the bolts to the specified torque.



Connect the MAP sensor vacuum hoses and IDC valve air hoses.

Install the throttle body to the air cleaner housing.



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 the following items.
 - No DTC and MIL blinking.
 - Spark plug condition (page 4-8).
 - Air cleaner condition (page 4-7).
- The engine must be warm for accurate idle speed inspection.
- This system eliminates the need for manual idle speed adjustment compared to previous designs.
- Use a tachometer with graduations of 50 min⁻¹ (rpm) or smaller that will accurately indicate a 50 min⁻¹ (rpm) change.

Lift and support the fuel tank (page 4-5).

Start the engine and warm it up to coolant temperature 80 °C (176 °F).

Stop the engine and connect a tachometer according to the tachometer manufacturer's operating instructions.

Start the engine and let it idle. Check the idle speed.

ENGINE IDLE SPEED: 1,200 ± 100 min⁻¹ (rpm)

If the idle speed is out of the specification, check the following:

- Throttle operation and throttle grip free play (page 4-6).
- Intake air leak or engine top-end problem (page 9-3).
- IACV operation (page 6-76).

IACV

INSPECTION

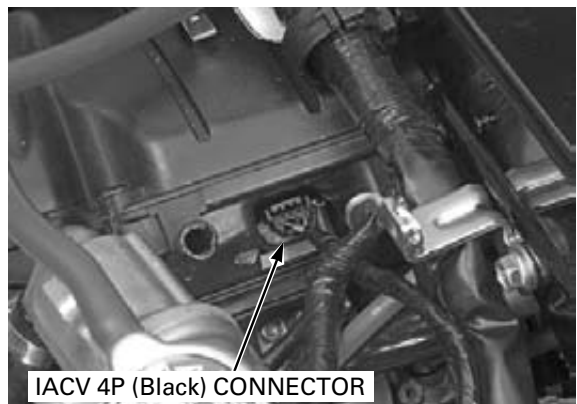
The IACV is installed on the throttle body and is operated by the step motor. When the ignition switch is turned ON, the IACV operates for a few seconds.

Check the step motor operating (beep) sound with the ignition switch turned ON.

NOTE:

The IACV operation can be checked visually as follows:

- Remove the IACV (page 6-77). Connect the 4P (Black) connector to the IACV, then turn the ignition switch ON.

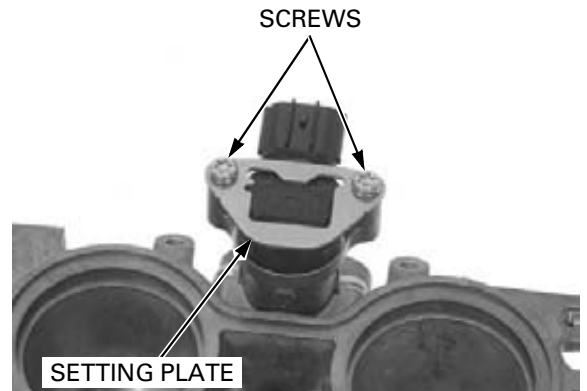


REMOVAL

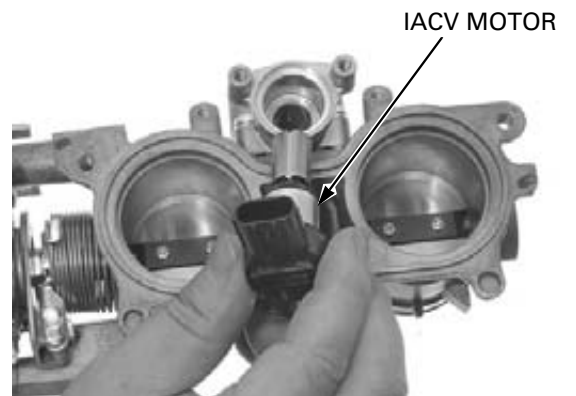
- Always clean the throttle body before the IACV removal to prevent dirt and debris from entering the IACV passage.

Remove the throttle body, then the fuel rail (page 6-73).

Remove the screws and setting plate.

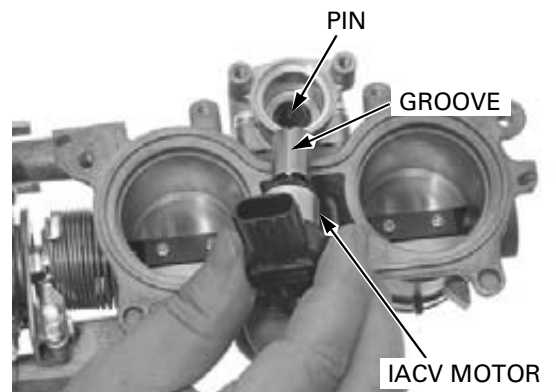


Remove the IACV motor.

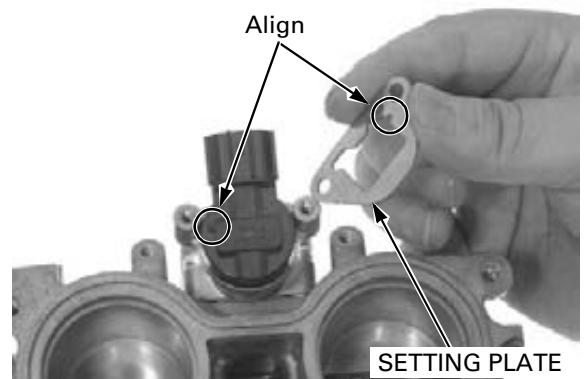


INSTALLATION

Install the IACV motor, aligning its groove with the pin inside the motor housing.

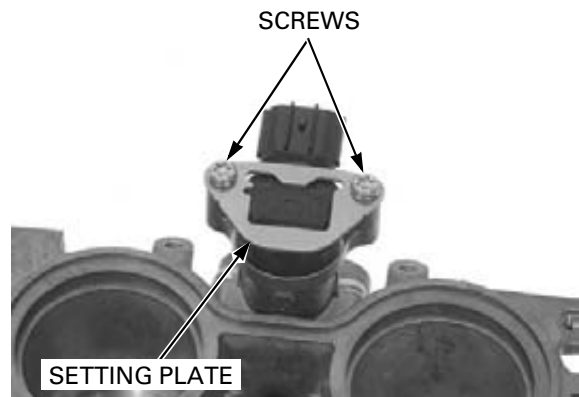


Install the setting plate while aligning the cut-out with the lug on the IACV motor.



FUEL SYSTEM (PGM-FI)

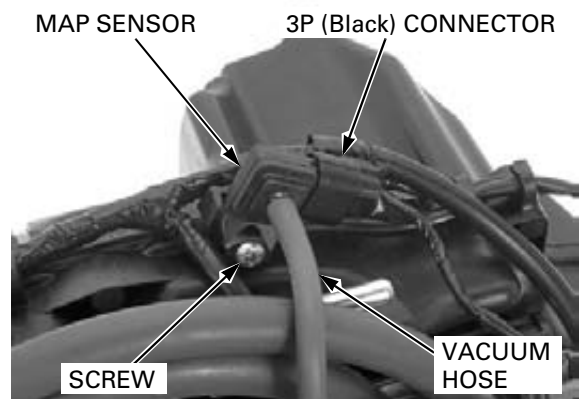
Install the screws and tighten them to the specified torque.



MAP SENSOR

REMOVAL/INSTALLATION

Remove the air cleaner housing (page 6-60).
Disconnect the MAP sensor 3P (Black) connector.
Disconnect the vacuum hose from the MAP sensor.
Remove the screw and MAP sensor.
Installation is in the reverse order of removal.



IAT SENSOR

REMOVAL/INSTALLATION

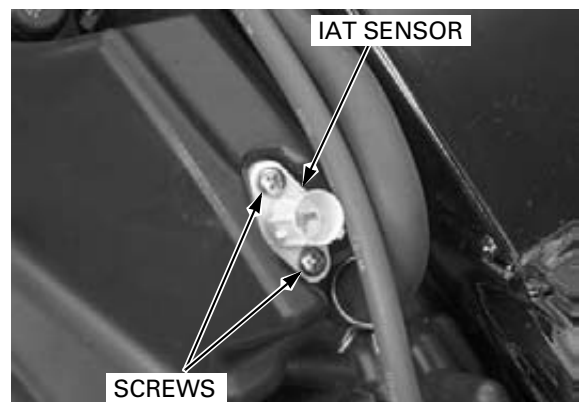
Remove the fuel tank.
Disconnect the IAT sensor 2P (Gray) connector.



Remove the screws and IAT sensor from the air cleaner housing.

Installation is in the reverse order of removal.

TORQUE: 1.2 N·m (0.12 kgf·m, 0.9 lbf·ft)



ECT SENSOR

Replace the ECT sensor while the engine is cold.

REMOVAL/INSTALLATION

Drain the coolant from the system (page 7-7).
 Disconnect the crankcase breather hose.
 Remove the thermostat case mounting bolt.

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

Remove the ECT sensor and sealing washer.

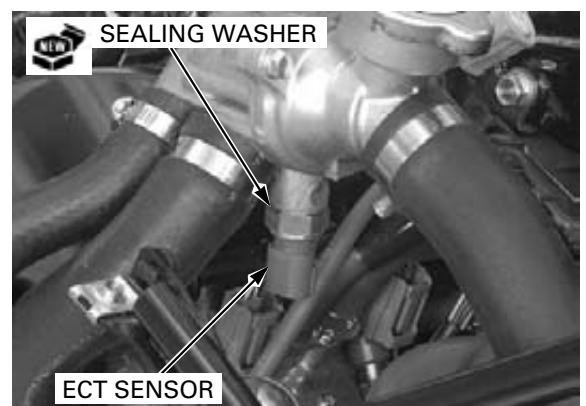
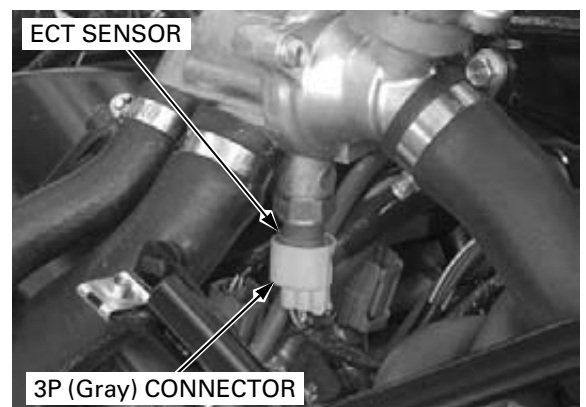
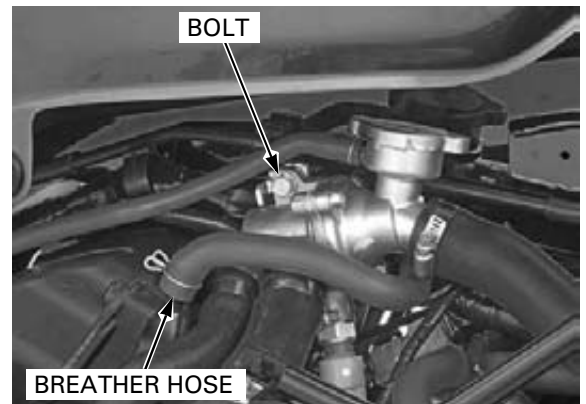
Always replace a sealing washer with a new one.

Install a new sealing washer and ECT sensor.
 Tighten the ECT sensor to the specified torque.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)

Connect the ECT sensor 3P (Gray) connector.

Fill the cooling system with recommended coolant (page 7-7).

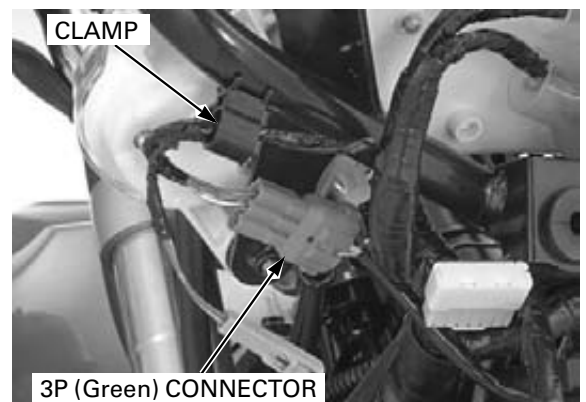


BANK ANGLE SENSOR

REMOVAL/INSTALLATION

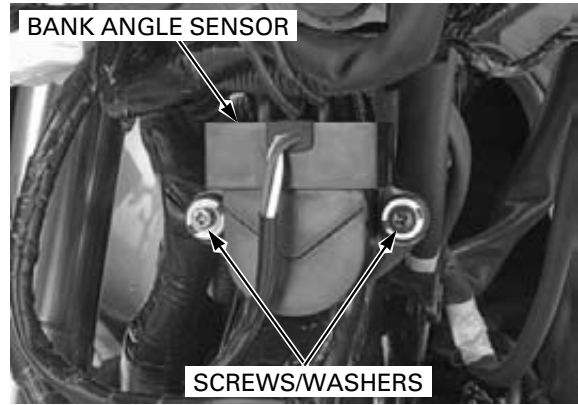
Remove the front center cowl (page 3-7).

Release the bank angle sensor wire from the harness clamp and disconnect the 3P (Green) connector.



FUEL SYSTEM (PGM-FI)

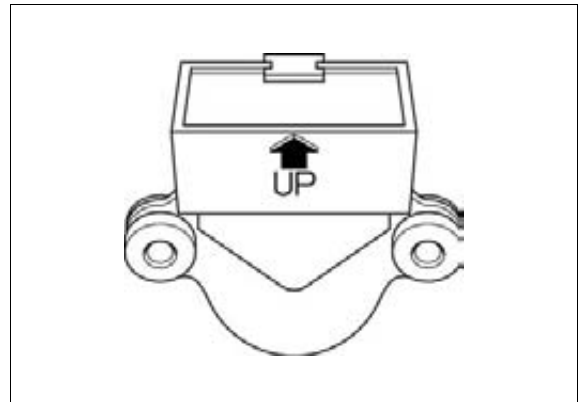
Remove the screws, washers and the bank angle sensor.



Install the bank angle sensor with its "UP" mark facing up.

Installation is in the reverse order of removal.

Tighten the mounting screws securely.



INSPECTION

Remove the front center cowl (page 3-7).

Disconnect the bank angle sensor 3P (Green) connector and connect the special tool between the connectors.

TOOL:

Inspection test harness 07GMJ-ML80100

Turn the ignition switch ON and engine stop switch "C".

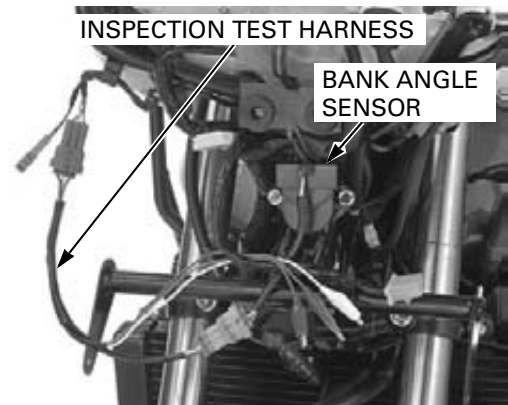
Measure the voltage between the following terminals of the test harness.

TERMINAL	STANDARD
White clip (+) – Red clip (-)	Battery voltage
Green clip (+) – Red clip (-)	0 – 1 V

Turn the ignition switch OFF and remove the inspection test harness.

Connect the bank angle sensor 3P (Green) connector.

Remove the screws, washers and the bank angle sensor.



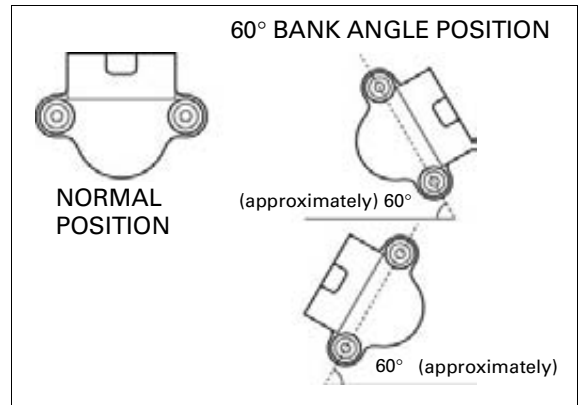
Place the bank angle sensor horizontal as shown, and turn the ignition switch ON and engine stop switch "⏻".

The bank angle sensor is normal if the engine stop relay clicks and power supply is closed.

Incline the bank angel sensor approximately 60 degrees to the left or right with keeping the ignition switch ON and engine stop switch "⏻".

The 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 OFF, then turn the ignition switch ON and engine stop switch "⏻".

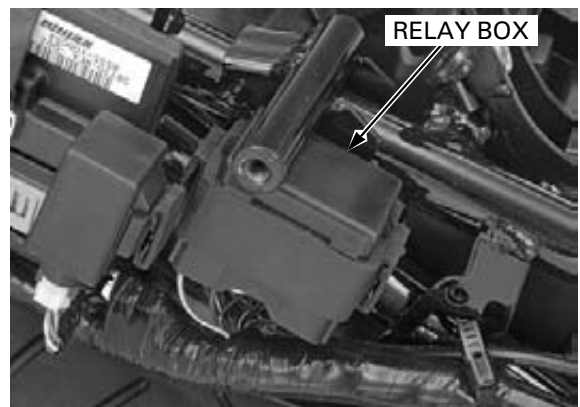


ENGINE STOP RELAY

INSPECTION

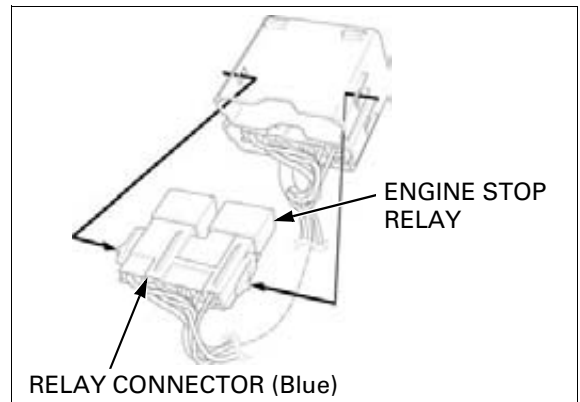
Remove the right rear cowl (page 3-8).

Remove relay box from the bracket.



Release the retainers and remove the relay connector (Blue) from the relay box.

Remove the engine stop relay from the connector.



Connect the ohmmeter to the engine stop relay connector terminals.

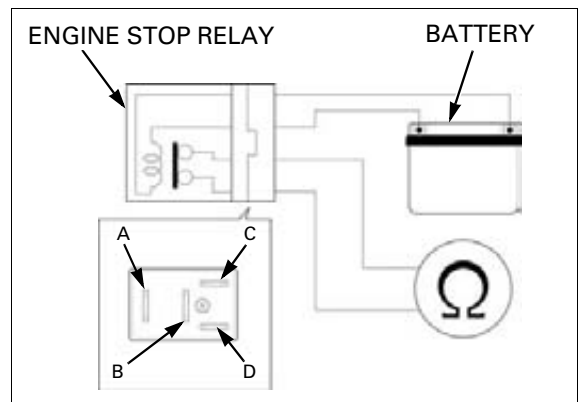
Connection: A – B

Connect a 12 V battery to the following engine stop 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.



ENGINE CONTROL MODULE (ECM)

REMOVAL/INSTALLATION

Remove the right rear cowl (page 3-8).

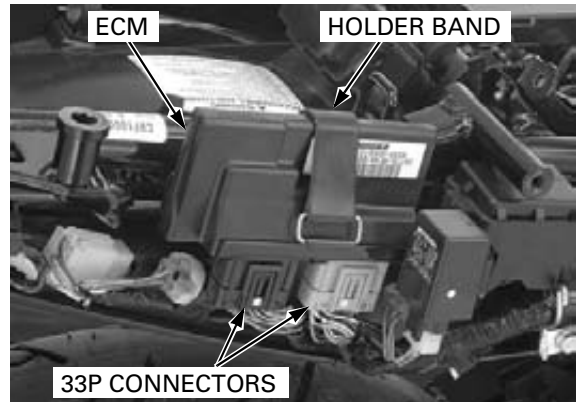
Disconnect the ECM 33P (Black) and 33P (Light gray) connectors.

Remove the holder band and the ECM.

Installation is in the reverse order of removal.

NOTE:

After replacing the ECM, register the new transponder keys (page 22-6).



ECM POWER/GROUND LINE INSPECTION

ENGINE DOES NOT START (No DTC and MIL blinking)

1. ECM Power Input Voltage Inspection

- Before starting the inspection, check for loose or poor contact on the ECM 33P connectors and recheck the MIL blinking.

Disconnect the ECM 33P (Black) connector.

Turn the ignition switch ON and engine stop switch "G".

Measure the voltage at the ECM 33P (Black) connector terminal and ground.

TOOL:

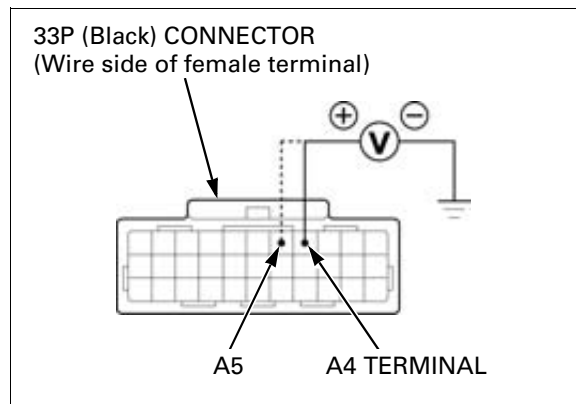
Test probe 07ZAJ-RDJA110

Connection: A4 (+) – Ground (-)
A5 (+) – Ground (-)

Is there battery voltage?

YES – GO TO STEP 2.

NO – GO TO STEP 3.



2. ECM Ground Line Inspection

Turn the ignition switch OFF.

Check the continuity between the ECM 33P (Black) connector terminals and ground.

TOOL:

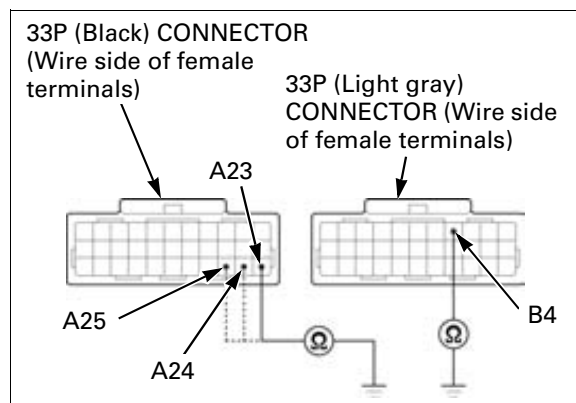
Test probe 07ZAJ-RDJA110

Connection: A23 – Ground
A24 – Ground
A25 – Ground

Are there continuities?

YES – Replace the ECM with a known good one, and recheck; refer to Key Registration Procedures (page 22-6)

NO – Open circuit in Green/pink (A23, A24 or A25) wires or Green wire (B4)



3. Engine Stop Relay Inspection 1

Turn the ignition switch OFF.
Remove the engine stop relay from the relay connector (Blue) (page 6-81).

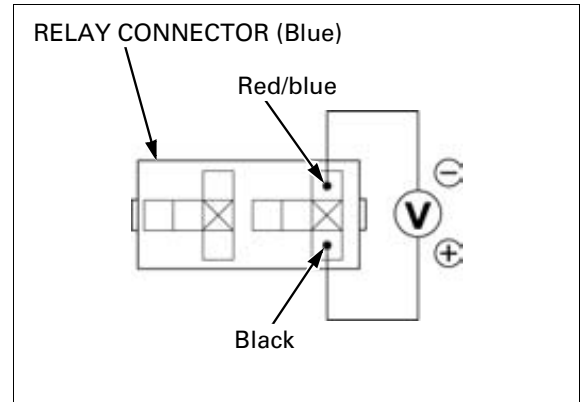
Turn the ignition switch ON and engine stop switch "⏻".
Measure the voltage at the engine stop relay connector terminals.

Connection: Black (+) – Red/blue (-)

Is there battery voltage?

YES – GO TO STEP 4.

- NO** –
- Blown sub-fuse
 - Open circuit in Black or Red/blue wire



4. Engine Stop Relay Inspection 2

Turn the ignition switch OFF.
Jump the engine stop relay connector terminals with jumper wire.

Connection: Red/white – Black/white

Turn the ignition switch ON and engine stop switch "⏻".
Measure the voltage at the ECM 33P connector terminal and ground.

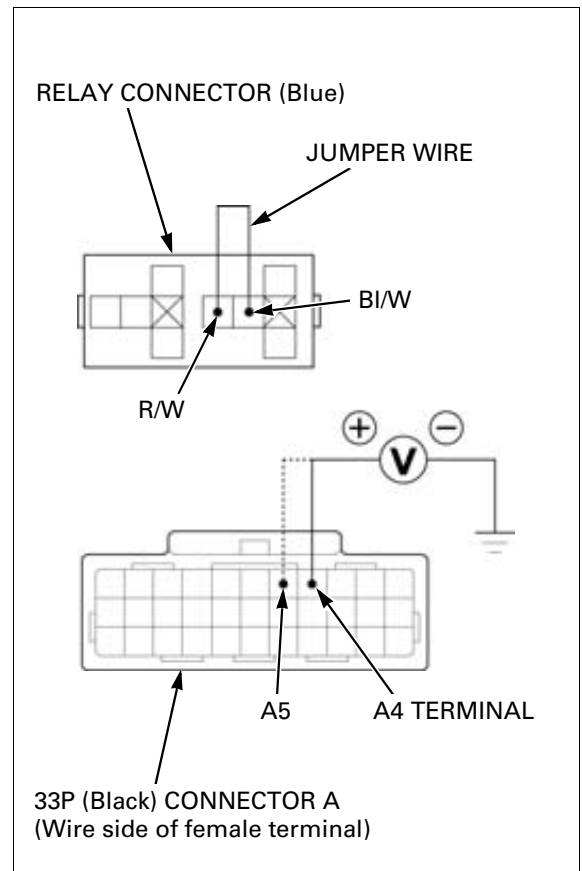
Connection: A4 (+) – Ground (-)

A5 (+) – Ground (-)

Is there battery voltage?

- YES** –
- Inspect the engine stop relay (page 6-81)
 - Inspect the engine stop switch (page 21-21)
 - Inspect the bank angle sensor (page 6-80)

- NO** – Open circuit in power input line (Black/white or Red/white) between the battery and the ECM



SECONDARY AIR SUPPLY SYSTEM

SYSTEM INSPECTION

Start the engine and warm it up until the coolant temperature is 80 °C (176 °F).

Stop the engine.

Remove the fuel tank (page 6-57).

Disconnect the air supply hose from the air cleaner housing.

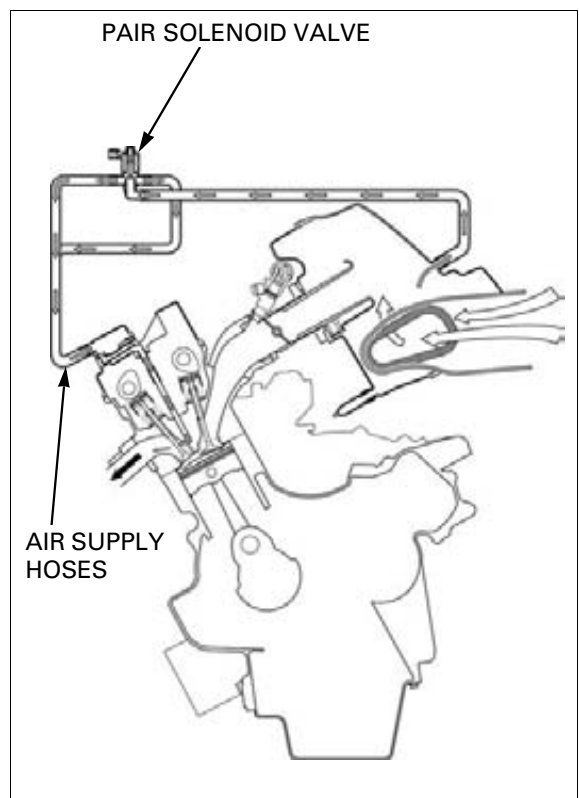
Check that the secondary air intake port is clean and free of carbon deposits.

Check the pulse secondary air injection (PAIR) check valves if the port is carbon fouled (page 9-6).



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

If the air is not drawn in, check the air supply hoses for clogs and the PAIR solenoid valve.

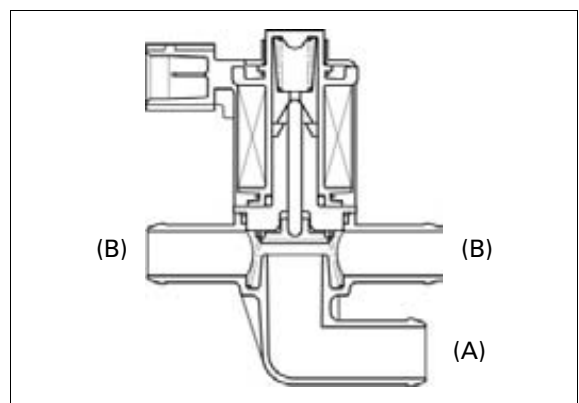


PAIR CONTROL SOLENOID VALVE

Inspection

Remove the PAIR control solenoid valve.

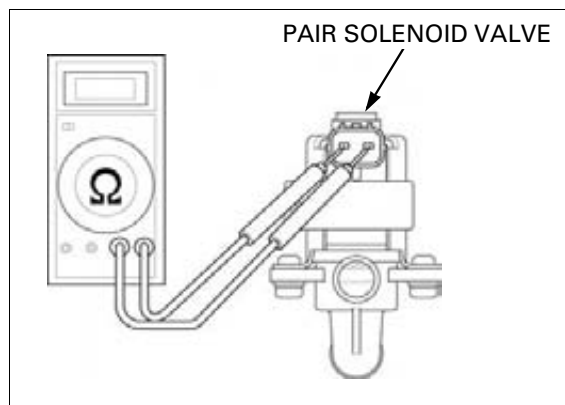
Check that air flows (A) to (B) when the 12 V battery is connected to the PAIR control solenoid valve terminals. Air should not flow (A) to (B) when the battery is disconnected.



Check the resistance between the terminals of the PAIR control solenoid valve.

STANDARD: 23 – 27 Ω (20 °C/68 °F)

If the resistance is out of specification, replace the PAIR control solenoid valve.



Removal/Installation

Lift and support the fuel tank (page 4-5).

Disconnect the right and left PAIR air hoses from the cylinder head cover.

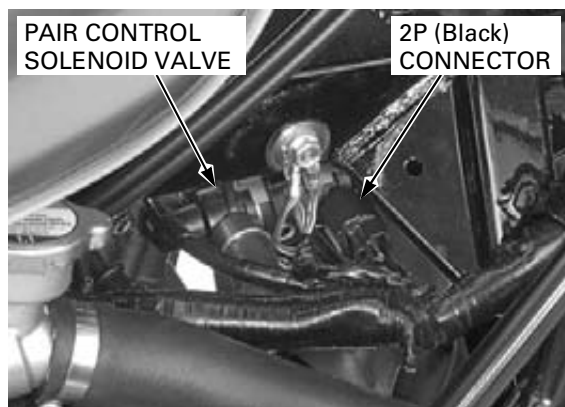


Remove the radiator mounting bolts and release the bosses from the grommet (page 7-11).

Disconnect the PAIR control solenoid valve 2P (Black) connector.

Remove the PAIR control solenoid valve from the stay.

Installation is in the reverse order of removal.

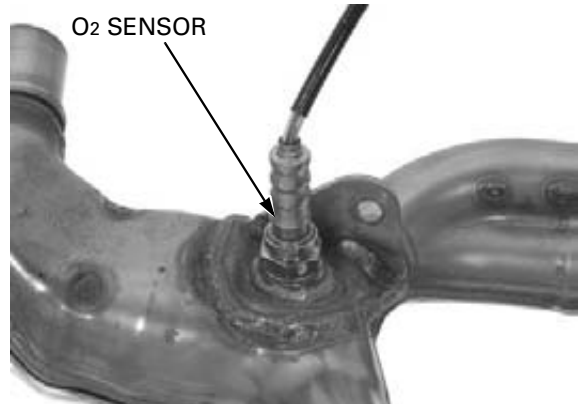


O₂ SENSOR

REMOVAL

- Handle the O₂ sensor with care.
- Do not get grease, oil or other materials in the O₂ sensor air hole, or it may be damaged.
- Do not service the O₂ sensor while it is hot.

Remove the exhaust pipe (page 3-13).



Remove the O₂ sensor using the special tool.

TOOL:

O₂ sensor wrench **07LAA-PT50101**

- Be careful not to damage the sensor wire.
- Do not use an impact wrench while removing or installing the O₂ sensor, or it may be damaged.

Install the O₂ sensor onto the exhaust pipe.

Tighten the unit to the specified torque.

TORQUE: 44 N·m (4.5 kgf·m, 33 lbf·ft)

Install the exhaust pipe (page 3-13).



INTAKE AIR DUCT

INTAKE DUCT VALVE DIAPHRAGM

Inspection

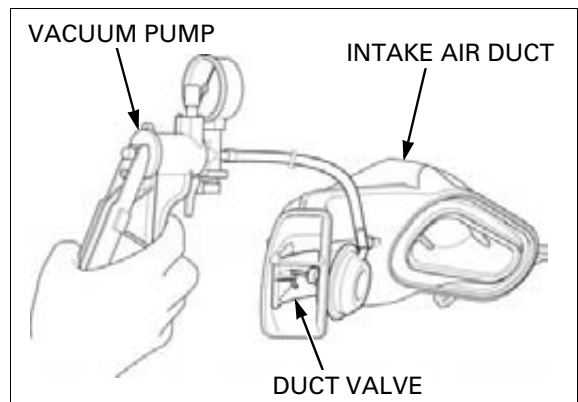
Remove the intake air duct from the air cleaner housing (page 4-7).

Disconnect the vacuum tube from the diaphragm.

Connect a vacuum pump to the diaphragm and apply specified vacuum.

SPECIFIED VACUUM: 250 mm Hg (9.8 in Hg)

The vacuum should hold and the duct valve should remain open.

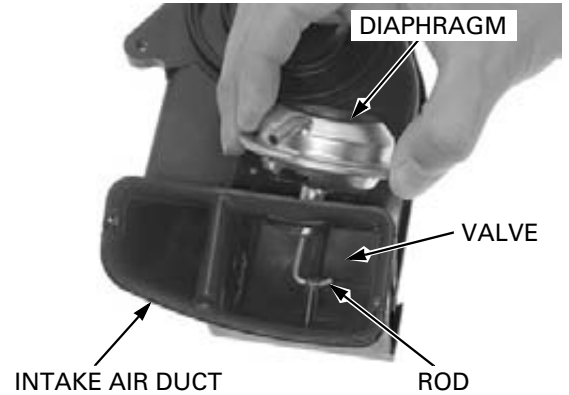


Removal/Installation

Remove the intake air duct from the air cleaner housing (page 4-7).

Disconnect the vacuum hose from the diaphragm. Turn the diaphragm counterclockwise and unhook the diaphragm rod from the duct valve.

Installation is in the reverse order of removal.



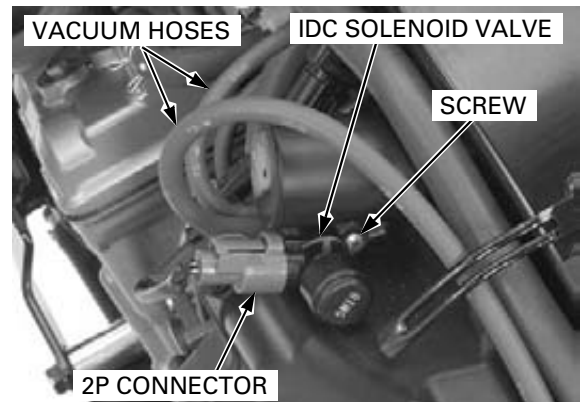
INTAKE DUCT CONTROL (IDC) SOLENOID VALVE

Removal/Installation

Remove the fuel tank (page 6-57).

Disconnect the vacuum hoses and 2P connector from the IDC solenoid valve.

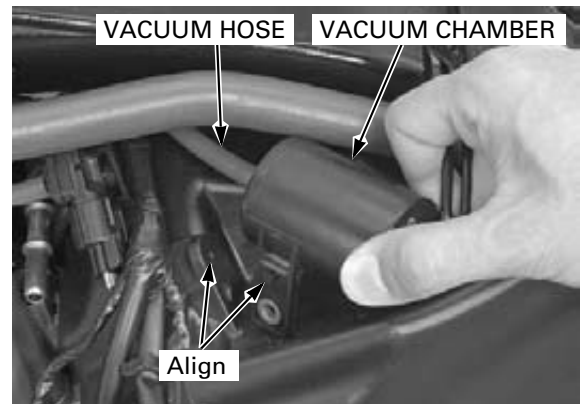
Remove the screw and IDC solenoid valve.



Disconnect the vacuum hose from the chamber.

Installation is in the reverse order of removal.

Align the vacuum chamber boss with the hole on the air cleaner housing.



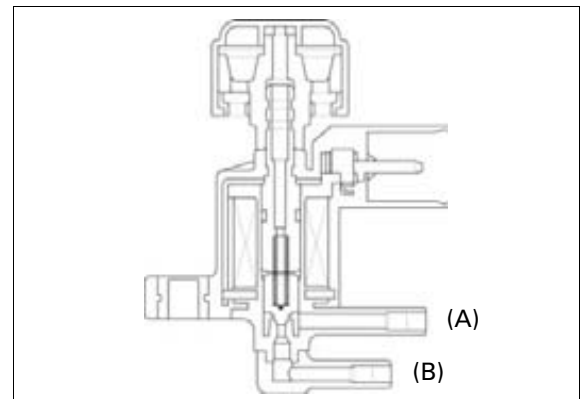
Inspection

Remove the IDC solenoid valve.

Check that the air should flow (A) to (B), only when the 12 V battery is connected to the IDC solenoid valve terminals.

CONNECTION:

- Battery (+) terminal – Black/white terminal**
- Battery (-) terminal – Yellow/black terminal**

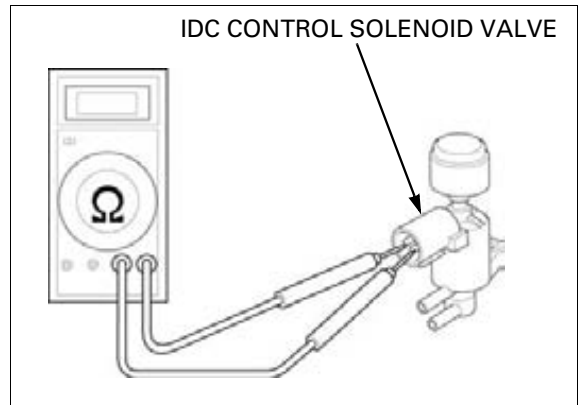


FUEL SYSTEM (PGM-FI)

Check the resistance between the terminals of the IDC solenoid valve.

STANDARD: 28 – 32 Ω (20 °C/68 °F)

If the resistance is out of specification, replace the IDC solenoid valve.



ONE-WAY VALVE

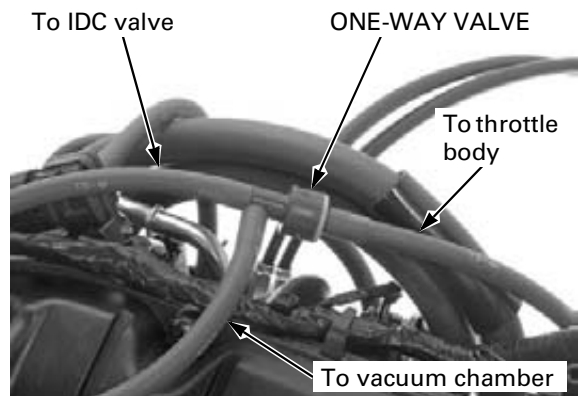
Removal/Installation

Remove the air cleaner housing (page 6-60).

Remove the one-way valve by disconnecting the vacuum hoses.

Installation is in the reverse order of removal.

Route the vacuum hoses correctly.

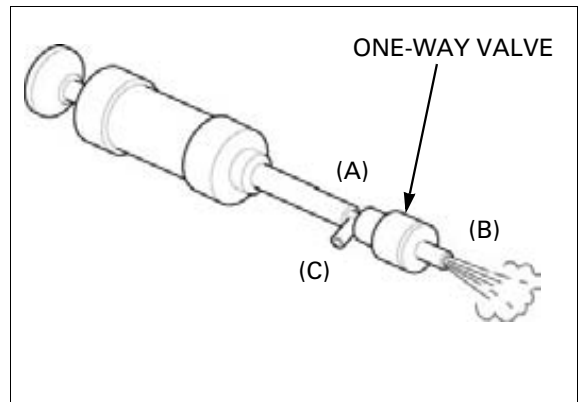


Inspection

Check the one-way valve operation as follows:

- Air should flow (A) to (B)
- Air should flow (A) to (C)
- Air should not flow (B) to (A)
- Air should not flow (B) to (C)

If the operation is incorrect, replace the one-way valve.

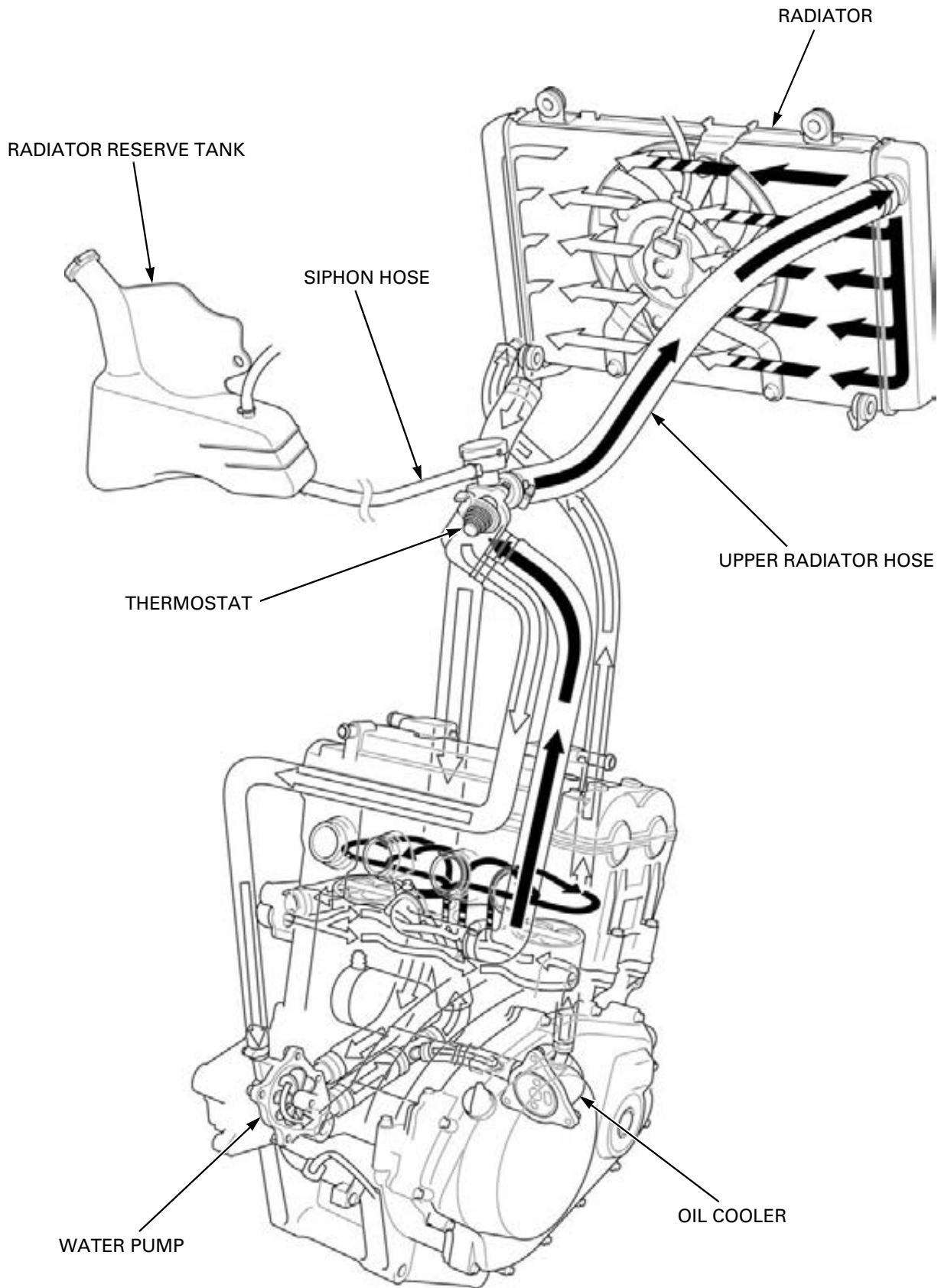


7. COOLING SYSTEM

SYSTEM FLOW PATTERN	7-2	THERMOSTAT	7-8
SERVICE INFORMATION	7-3	RADIATOR	7-10
TROUBLESHOOTING	7-4	WATER PUMP	7-16
SYSTEM TESTING	7-5	RADIATOR RESERVE TANK	7-20
COOLANT REPLACEMENT	7-6	FAN CONTROL RELAY	7-21

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

- Add cooling system at the reserve tank. Do not remove the radiator cap except to refill or drain the system.
- All cooling system services can be done with the engine installed in the frame.
- Avoid spilling coolant on painted surfaces.
- After servicing the system, check for leaks with a cooling system tester.
- Refer to the ECT sensor inspection (page 21-16).

SPECIFICATIONS

ITEM		SPECIFICATIONS
Coolant capacity	Radiator and engine	2.71 liter (2.86 US qt, 2.38 Imp qt)
	Reserve tank	0.30 liter (0.32 US qt, 0.26 Imp qt)
Radiator cap relief pressure		108 – 137 kPa (1.1 – 1.4 kgf/cm ² , 16 – 20 psi)
Thermostat	Begin to open	80 – 84 °C (176 – 183 °F)
	Fully open	90 °C (194 °F)
	Valve lift	8 mm (0.3 in) minimum
Recommended antifreeze		High quality ethylene glycol antifreeze containing corrosion protection inhibitors
Standard coolant concentration		1:1 mixture with distilled water

TORQUE VALUES

Coolant drain bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	CT bolt
Water pump assembly bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	CT bolt
Cooling fan nut	2.7 N·m (0.3 kgf·m, 2.0 lbf·ft)	
Fan motor nut	5.1 N·m (0.5 kgf·m, 3.8 lbf·ft)	
Fan motor bracket mounting bolt	8.4 N·m (0.9 kgf·m, 6.2 lbf·ft)	

COOLING SYSTEM

TROUBLESHOOTING

Engine temperature too high

- Faulty ECT sensor
- Thermostat stuck closed
- Faulty radiator cap
- Insufficient coolant
- Passage blocked in radiator, hoses or water jacket
- Air in system
- Faulty cooling fan motor
- Faulty fan control relay
- Faulty water pump

Engine temperature too low

- Faulty ECT sensor
- Thermostat stuck open
- Faulty cooling fan control relay

Coolant leak

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

SYSTEM TESTING

COOLANT (HYDROMETER TEST)

Lift and support the fuel tank (page 4-5).

Remove the radiator cap.

Always let the engine and radiator cool down before removing the radiator cap.



Test the coolant gravity using a hydrometer (see below for "Coolant gravity chart"). For maximum corrosion protection, a 1:1 solution of ethylene glycol and distilled water is recommended (page 7-3). 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	1.047	1.046	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 7-5).

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

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

RADIATOR CAP RELIEF PRESSURE:

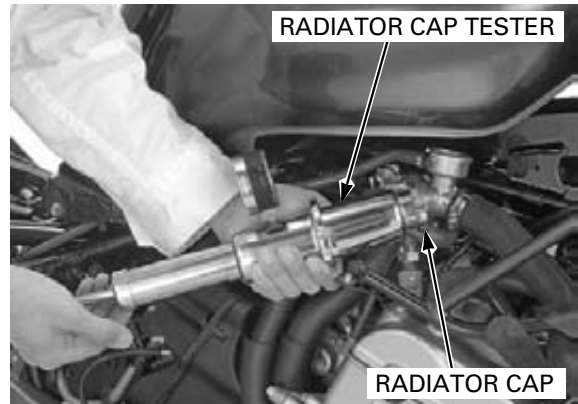
108 – 137 kPa (1.1 – 1.4 kgf/cm², 16 – 20 psi)

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

NOTICE

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

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



COOLANT REPLACEMENT

PREPARATION

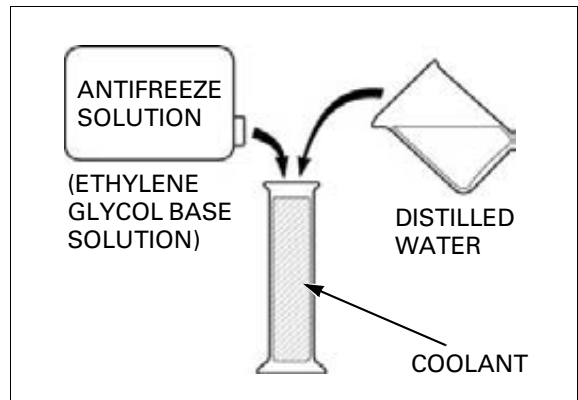
- The effectiveness of coolant decreases with the accumulation of rust or if there is a change in the mixing proportion during usage. Therefore, for best performance change the coolant regularly as specified in the maintenance schedule.
- Mix only distilled water with the antifreeze.

RECOMMENDED ANTIFREEZE:

High quality ethylene glycol antifreeze containing corrosion protection inhibitors

RECOMMENDED MIXTURE:

1:1 (distilled water and antifreeze)

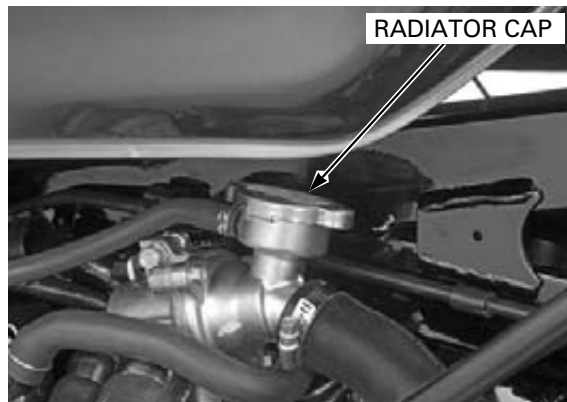


REPLACEMENT/AIR BLEEDING

Lift and support the fuel tank (page 4-5).

Remove the radiator cap.

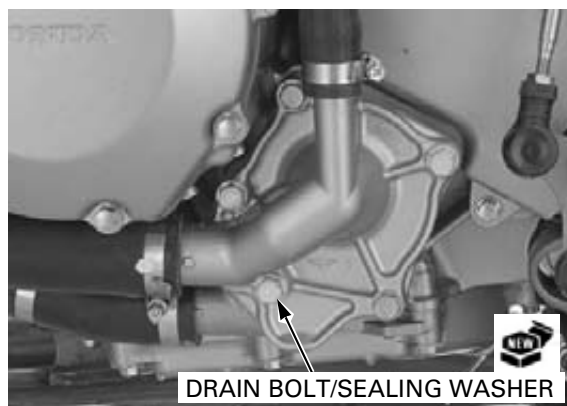
Always let the engine and radiator cool down before removing the radiator cap.



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

Reinstall the drain bolt with new sealing washer. Tighten the water pump drain bolt to the specified torque.

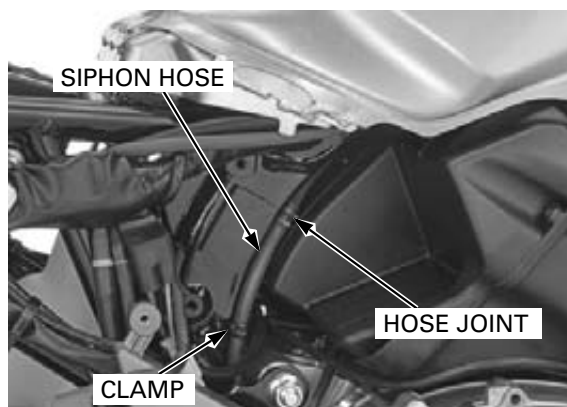
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Remove the battery (page 18-6).

Release the siphon hose from the clamp and disconnect it from the hose joint, then drain the coolant. Empty the coolant and rinse the inside of the reserve tank with water.

Connect the siphon hose and secure it with the clamp.



Remove the radiator reserve tank cap and fill the reserve tank to the upper level line.

Bleed air from the system as follows:

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

Install the radiator reserve tank cap.

Lower the fuel tank and install the front mounting bolts (page 4-5).

Install the removed parts in the reverse order.

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



COOLING SYSTEM

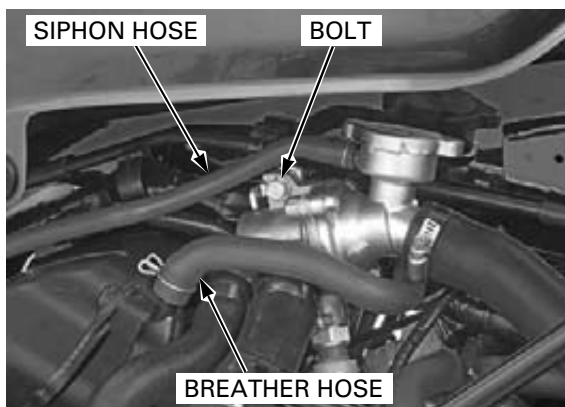
THERMOSTAT

REMOVAL

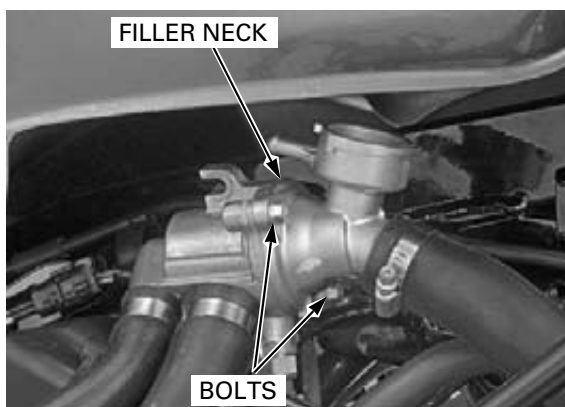
Drain the coolant (page 7-7).

Disconnect the crankcase breather hose from the air cleaner housing, and siphon hose from thermostat case.

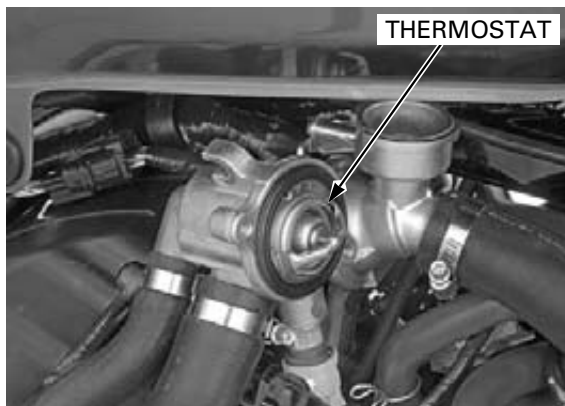
Remove the thermostat case mounting bolt.



Remove the filler neck bolts.



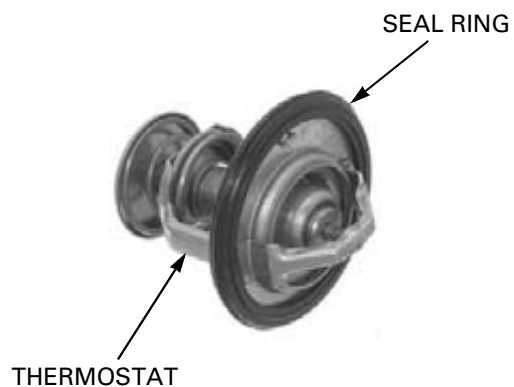
Remove the thermostat from the case.



INSPECTION

Visually inspect the thermostat for damage. Check for damage of the seal ring.

Replace the thermostat if the valve stays open at room temperature.



NOTICE

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

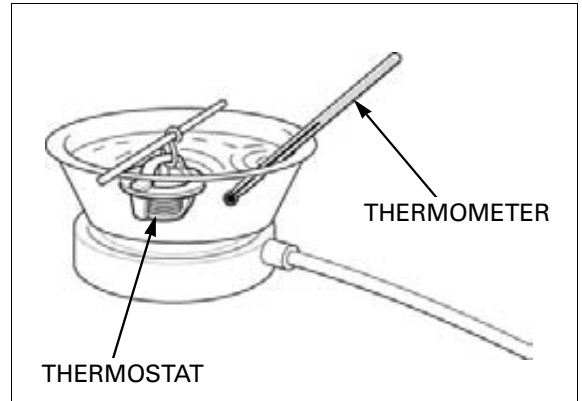
Do not let the thermostat or thermometer touch the pan, or you will get false reading.

Heat the water with an electric heating element to operating temperature for 5 minutes. Suspend the thermostat in heated water to check its operation.

THERMOSTAT BEGIN TO OPEN:
80 – 84 °C (176 – 183 °F)

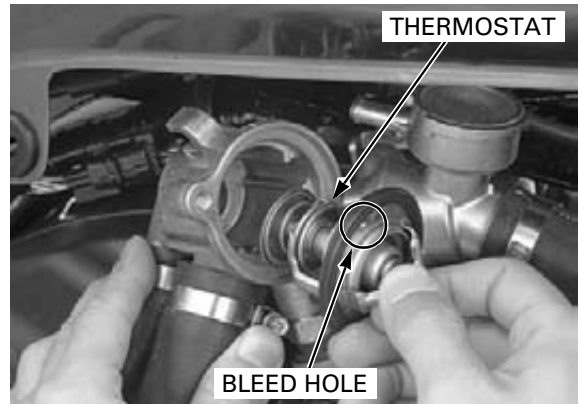
VALVE LIFT:
8 mm (0.3 in) minimum at 95 °C (203 °F)

Replace the thermostat if the valve responds at temperatures other than those specified.

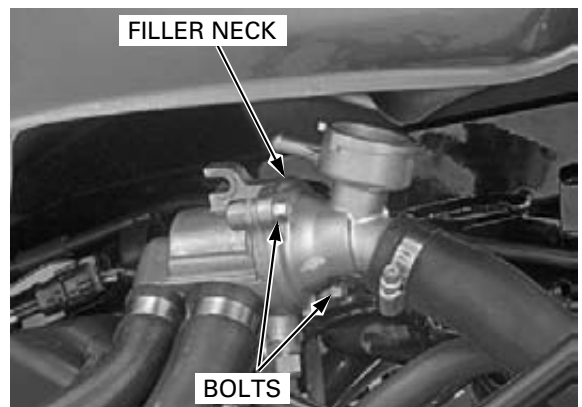


THERMOSTAT INSTALLATION

Install the thermostat into the case with its air bleed hole facing upward.



Install the filler neck onto the thermostat case. Install and tighten the filler neck bolts securely.



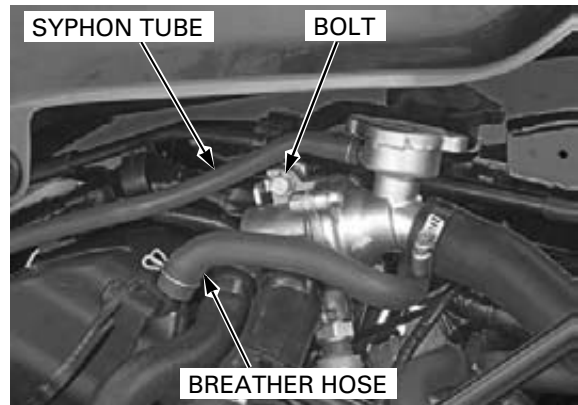
COOLING SYSTEM

Install the thermostat case onto the frame.

Route the crankcase breather hose properly and connect it to the air cleaner housing.

Connect the siphon hose to the filler neck.

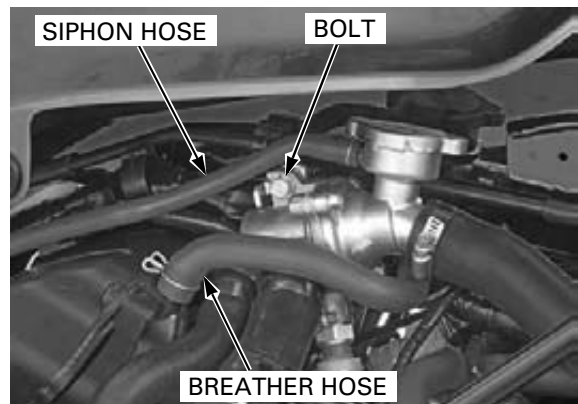
Fill the system with the recommended coolant and bleed any air (page 7-6).



THERMOSTAT CASE REMOVAL/ INSTALLATION

Drain the coolant (page 7-7).

Disconnect the crankcase breather hose.
Remove the thermostat case mounting bolt.

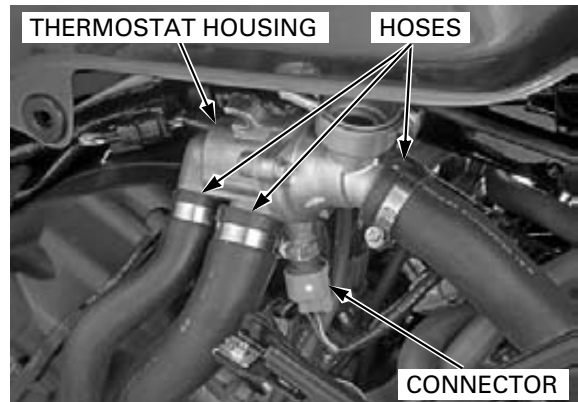


Disconnect the ECT sensor connector.
If necessary, remove the ECT sensor from the thermostat case (page 21-16).

Loosen the hose band screws and disconnect the water hoses from the thermostat case.

Installation is in the reverse order of removal.

Fill the system with the recommended coolant and bleed any air (page 7-6).



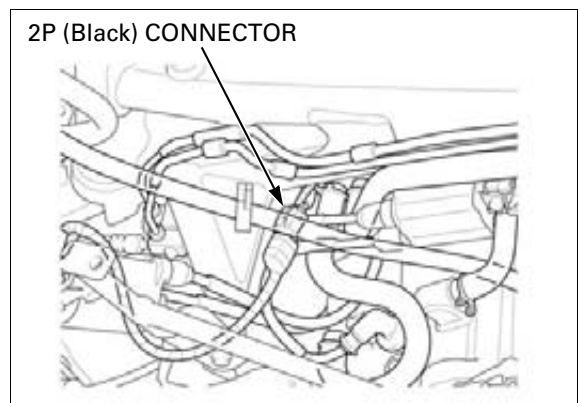
RADIATOR

REMOVAL

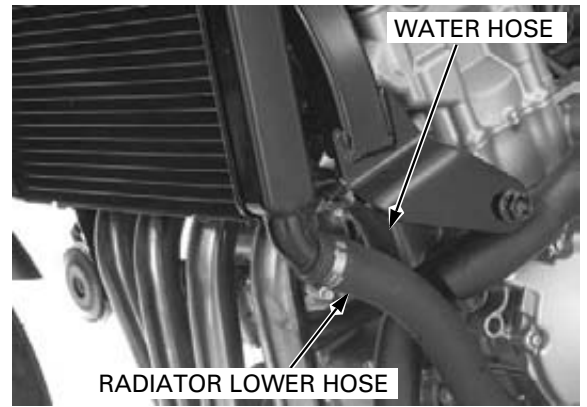
Lift and support the fuel tank (page 4-5).

Drain the coolant (page 7-7).

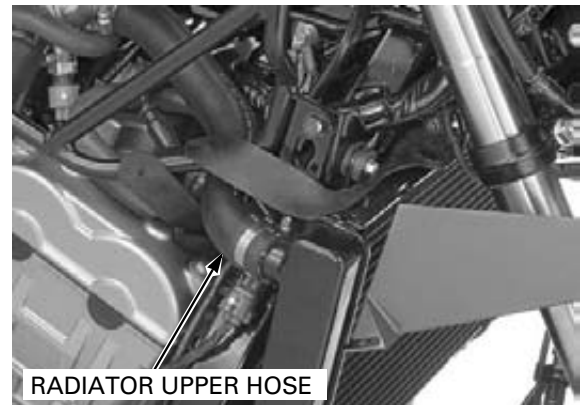
Disconnect the fan motor 2P (Black) connector.



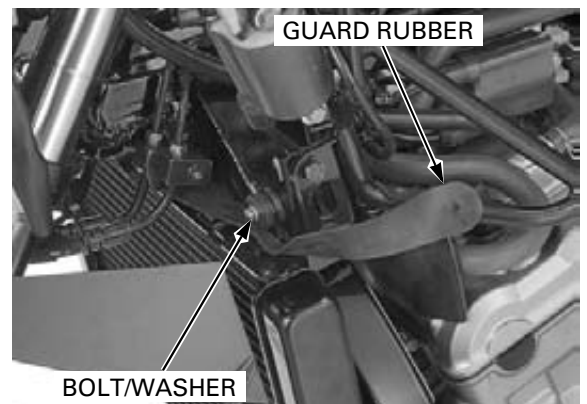
Loosen the hose band screws and disconnect the radiator lower hose and water hose.



Loosen the hose band screw and disconnect the radiator upper hose.

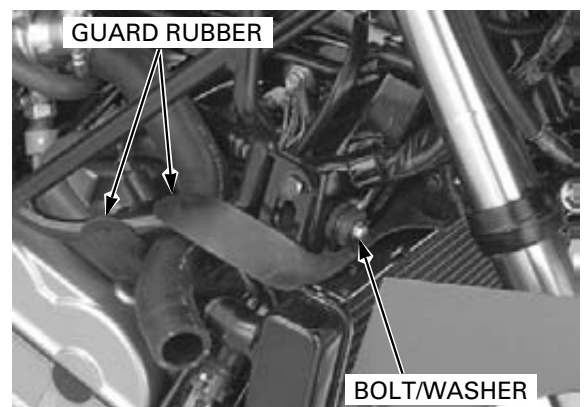


Remove the radiator upper mounting bolt and washer.
Unhook the heat guard rubber from the front left cowl stay boss.



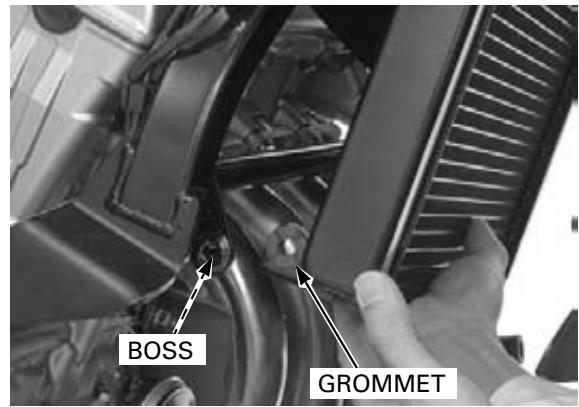
Remove the radiator upper mounting bolt and washer.

Unhook the heat guard rubber from the front right cowl stay bosses.



COOLING SYSTEM

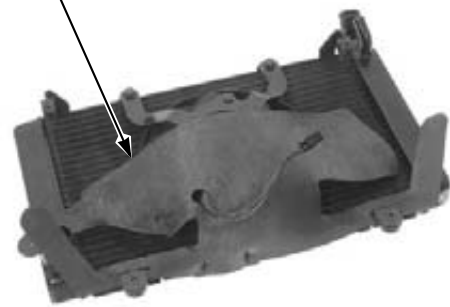
Be careful not to damage the radiator fins. Slide the radiator assembly and release the radiator lower grommets from the frame bosses, then remove the radiator assembly.



DISASSEMBLY

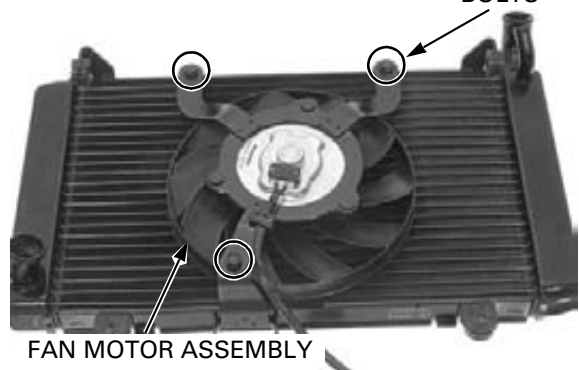
Remove the heat guard rubber from the radiator assembly.

HEAT GUARD RUBBER



Remove the three bolts and cooling fan motor assembly from the radiator.

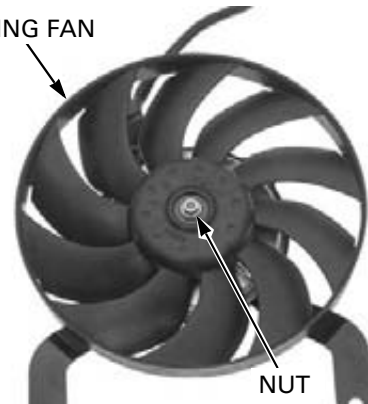
BOLTS



FAN MOTOR ASSEMBLY

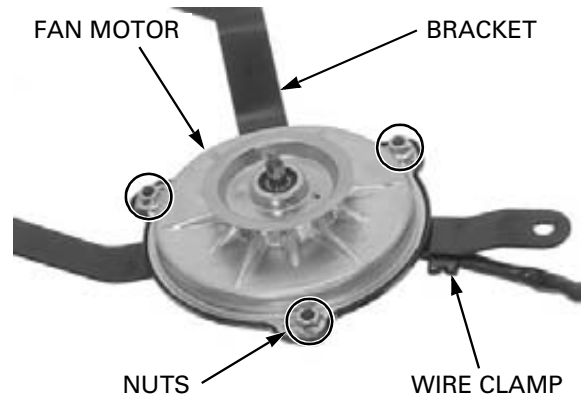
Remove the nut and cooling fan.

COOLING FAN

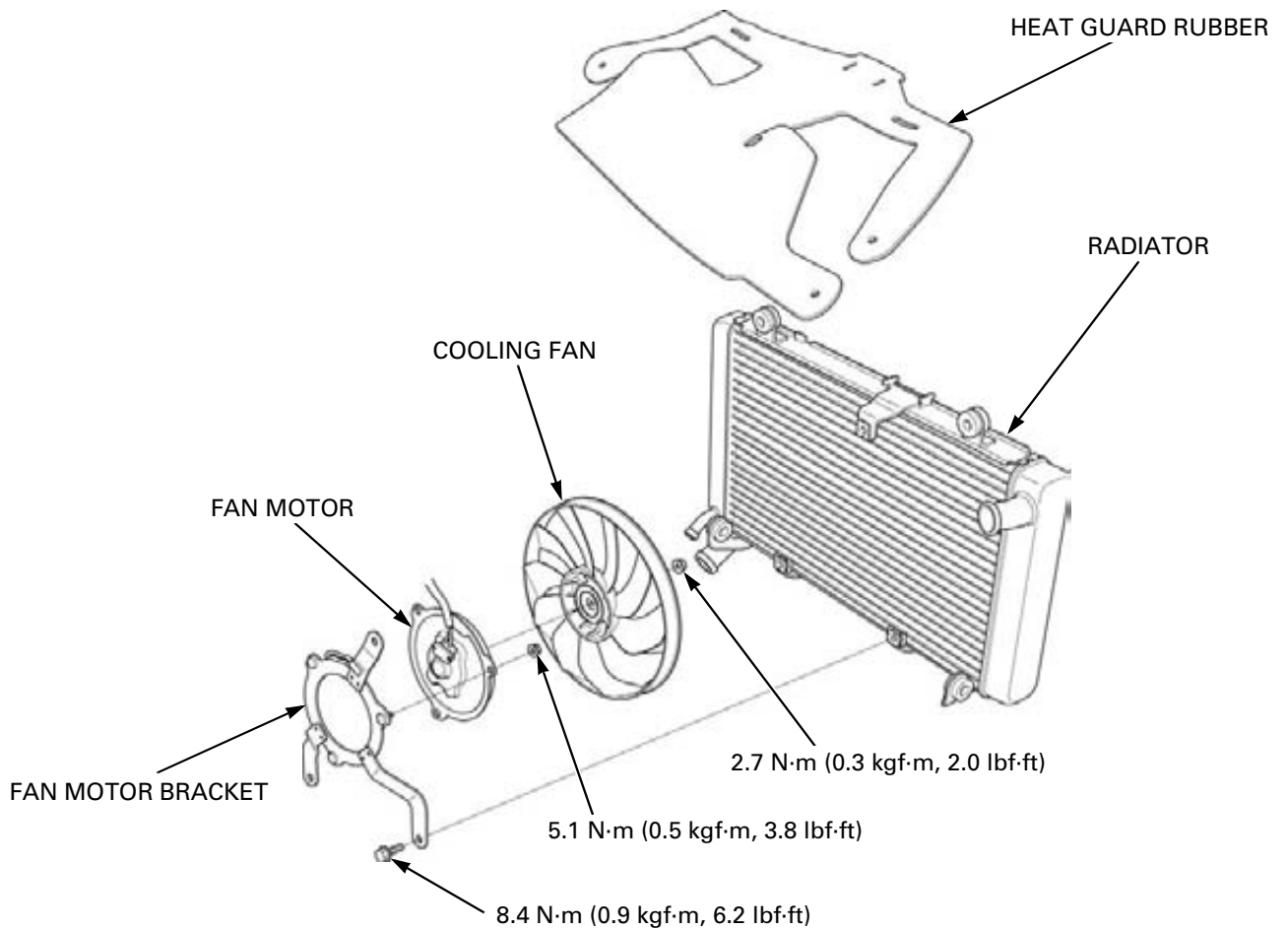


NUT

Release the fan motor wire from the wire clamp.
Remove the nuts and fan motor from the fan motor bracket.
Refer to the fan control relay information (page 7-21).



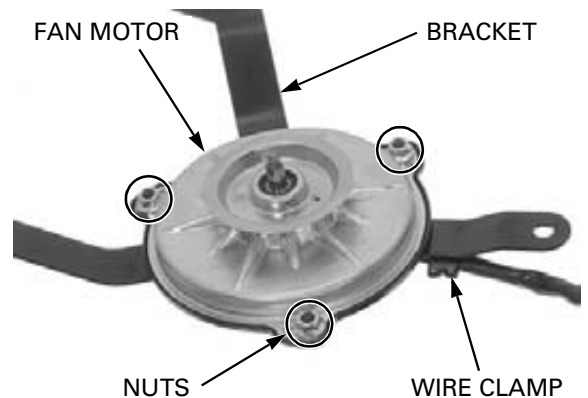
ASSEMBLY



Install the fan motor onto the fan motor bracket and tighten the nuts to the specified torque.

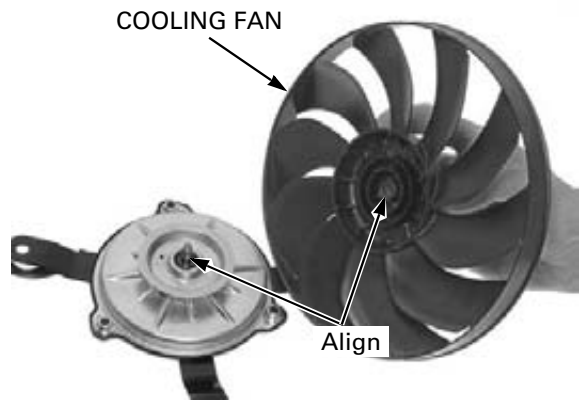
TORQUE: 5.1 N·m (0.5 kgf·m, 3.8 lbf·ft)

Secure the fan motor wire with the wire clamp



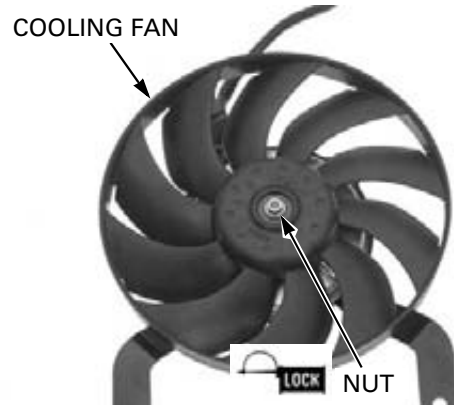
COOLING SYSTEM

Install the cooling fan onto the fan motor shaft by aligning the flats with each other.



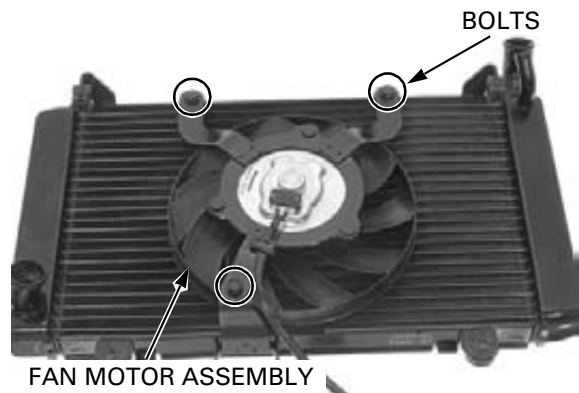
Apply a locking agent to the cooling fan nut threads. Install and tighten the nut to the specified torque.

TORQUE: 2.7 N·m (0.3 kgf·m, 2.0 lbf·ft)



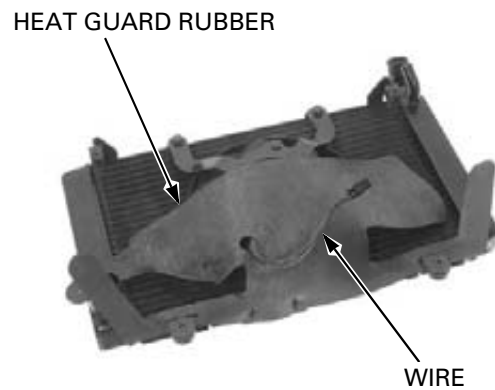
Install the fan motor assembly onto the radiator. Install and tighten the three bolts to the specified torque.

TORQUE: 8.4 N·m (0.9 kgf·m, 6.2 lbf·ft)



Set the radiator tabs in the protector cut-outs, also set the radiator bosses in the protector holes.

Route the fan motor wire through the hole of the heat guard rubber and install the protector on the radiator.

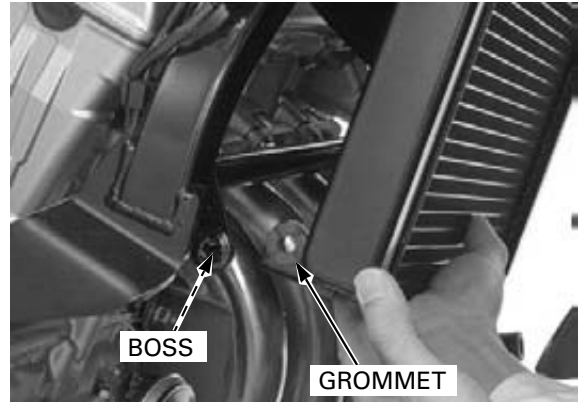


INSTALLATION

Be careful not to damage the radiator fins.

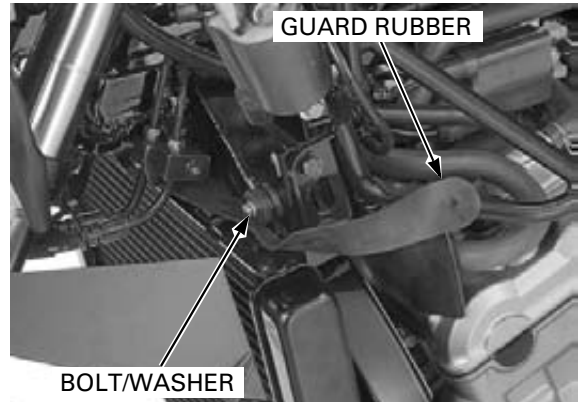
Align the radiator lower grommets with the frame bosses and install the radiator assembly.

Spread the heat guard rubber on the cylinder head cover.



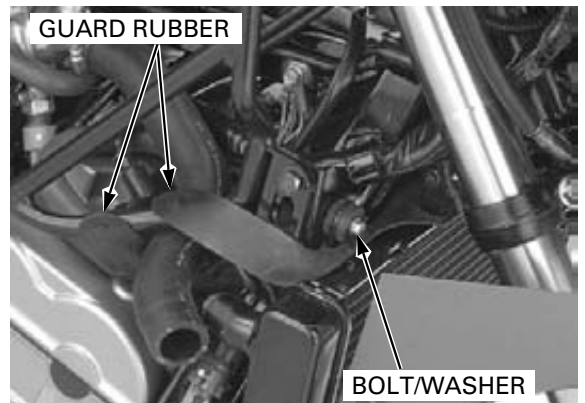
Install the washer and radiator upper mounting bolt, and tighten the bolt securely.

Hook the heat guard rubber on the side cowl stay boss.

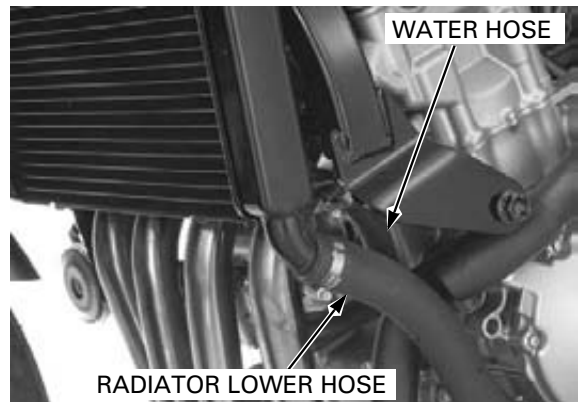


Install the washer and radiator upper mounting bolt, and tighten the bolt securely.

Hook the heat guard rubber on the side cowl stay bosses.



Connect the water hose and radiator lower hose. Tighten the hose band screws securely.



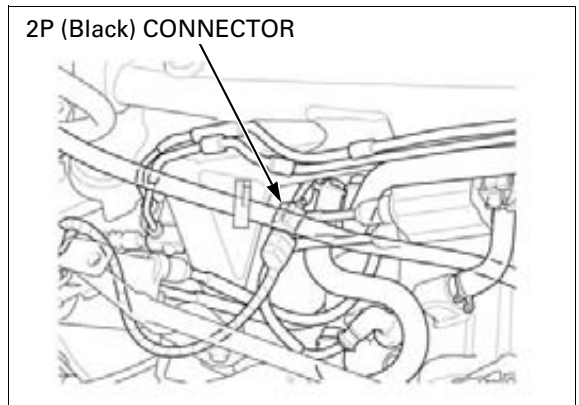
COOLING SYSTEM

Connect the radiator upper hose and tighten the hose band screw securely.



Route the fan motor wire properly and connect the fan motor 2P (Black) connector.

Fill the system with the recommended coolant (page 7-6).

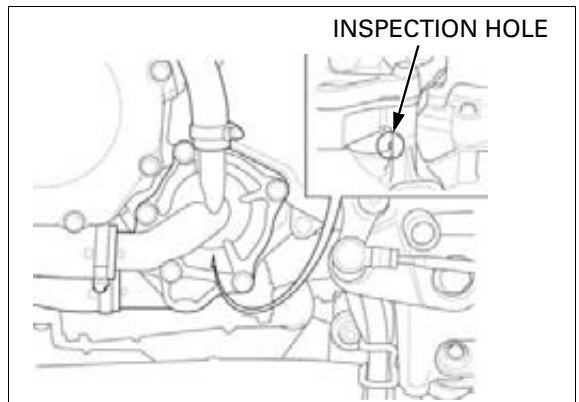


WATER PUMP

MECHANICAL SEAL INSPECTION

Inspect the inspection hole for signs of coolant leakage.

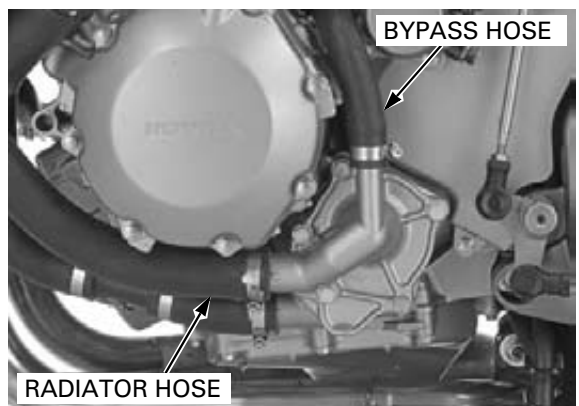
If there is leakage, the mechanical seal is defective and replace the water pump as an assembly.



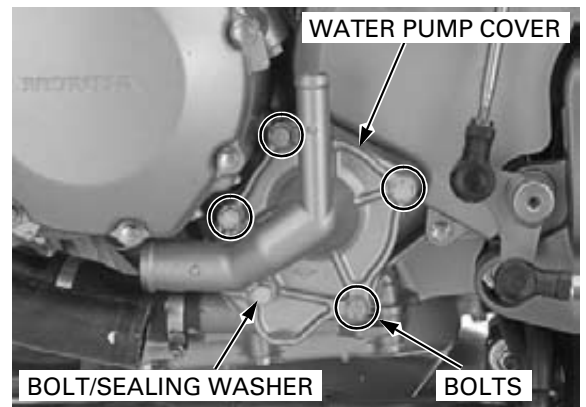
REMOVAL

Drain the coolant (page 7-7).

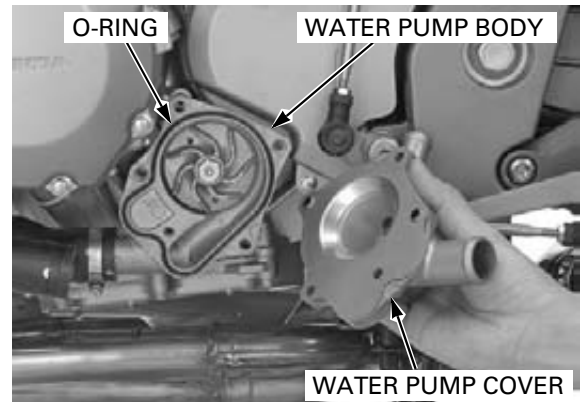
Disconnect the radiator lower hose and bypass hose from the water pump cover.



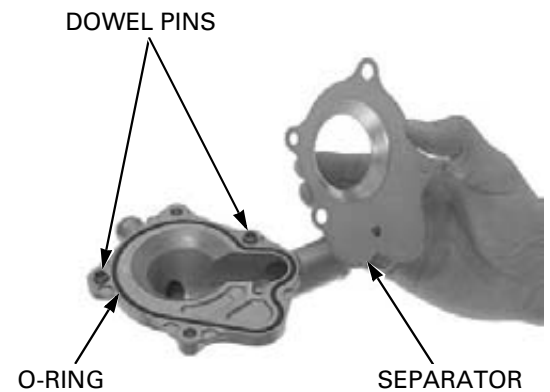
Remove the flange bolts, drain bolt and sealing washer.



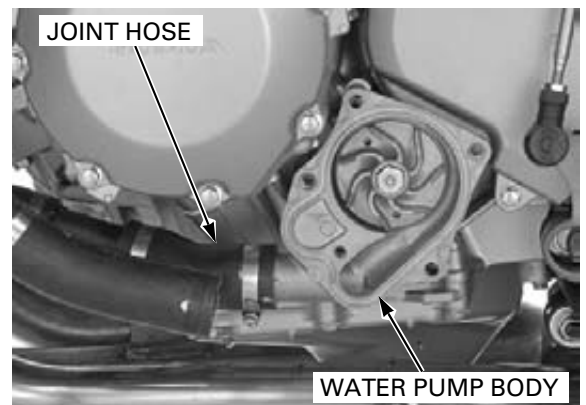
Remove the water pump cover assembly
Remove the O-ring from the water pump body.



Remove the separator plate from the water pump cover.
Remove the dowel pins and O-ring from the water pump cover.

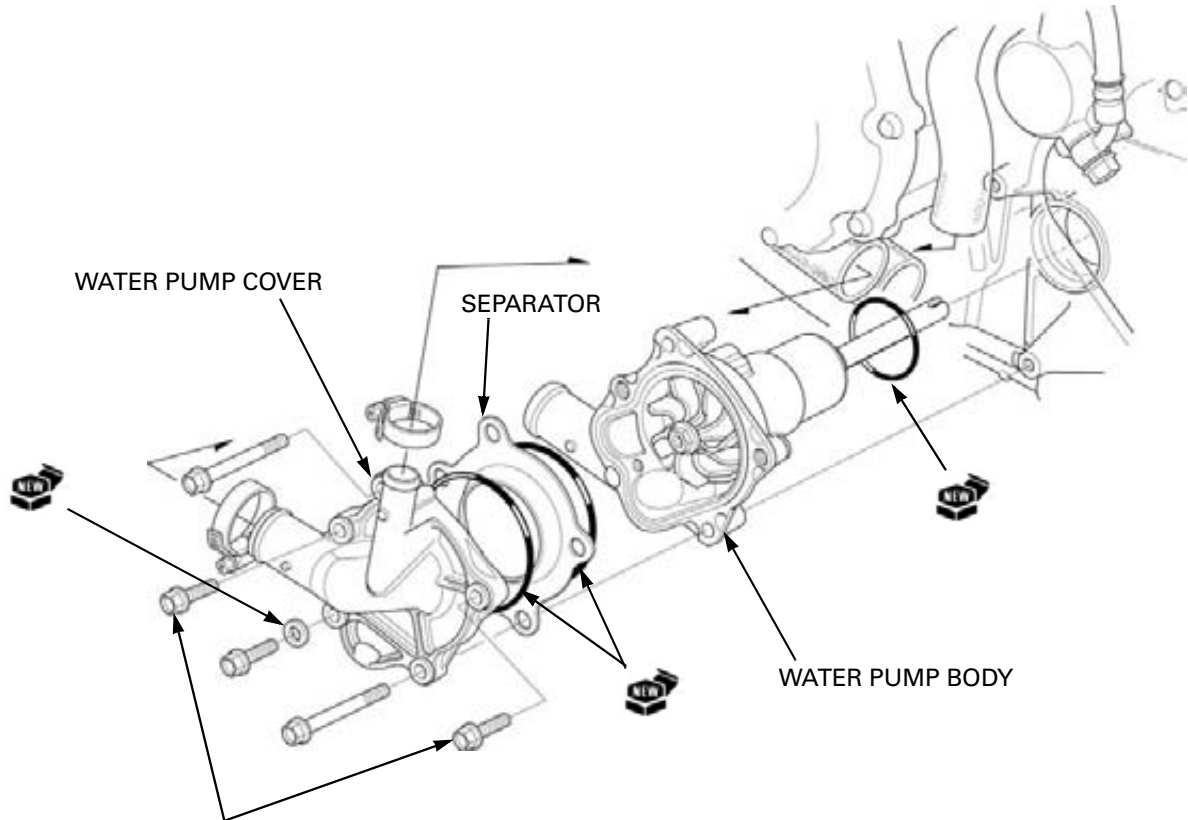


Disconnect the water joint hose from the water pump body.
Remove the water pump body from the crankcase.



COOLING SYSTEM

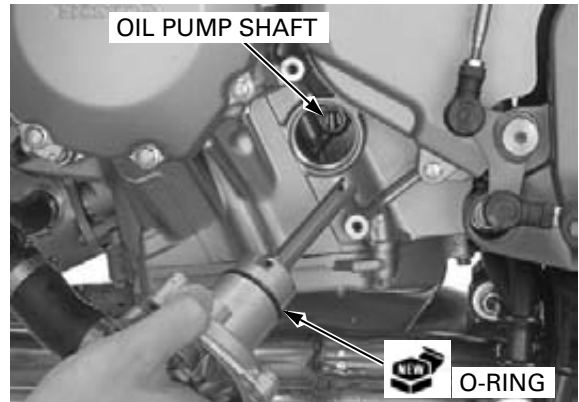
INSTALLATION



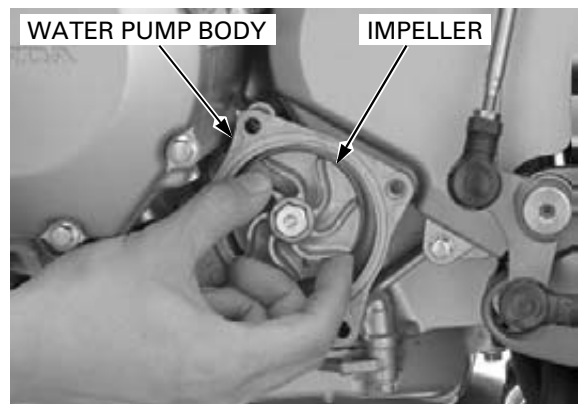
12 N·m (1.2 kgf·m, 9 lbf·ft)

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

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

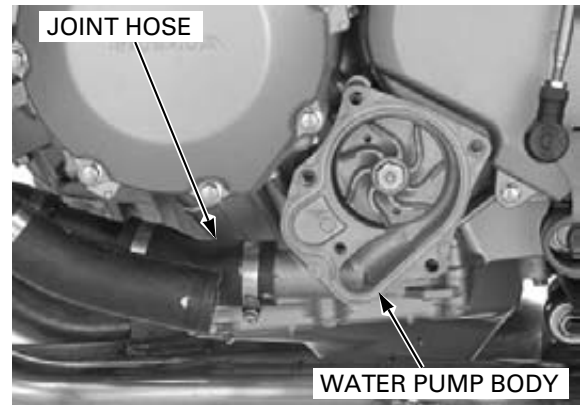


Align the water pump shaft groove with the oil pump shaft end by turning the water pump impeller.



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

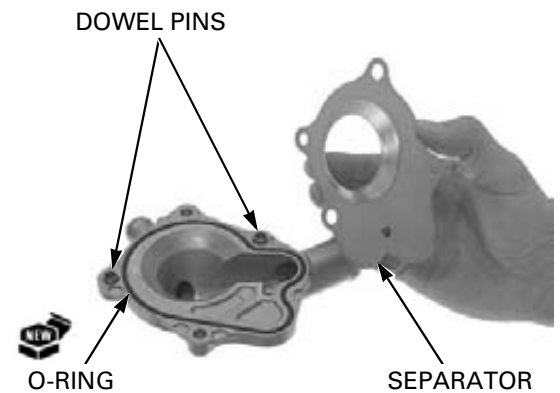
Connect the joint hose to the water pump body, and tighten the hose band screw.



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

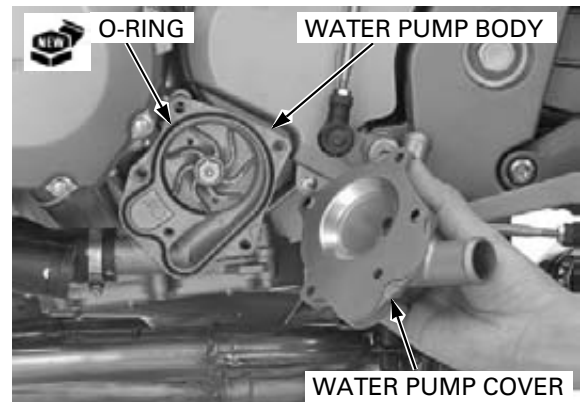
Install the dowel pins.

Install the separator onto the water pump cover.



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

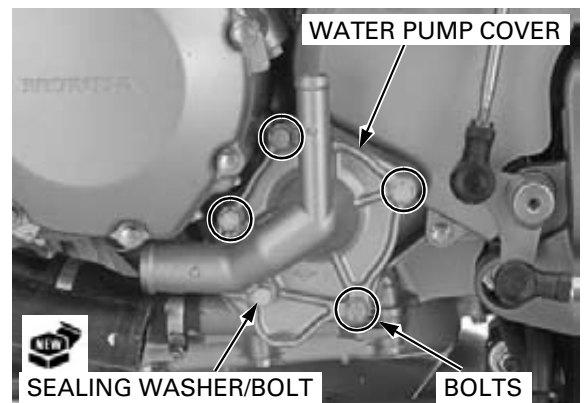
Install the water pump cover assembly onto the water pump body.



Install the water pump cover bolts and drain bolt with new sealing washer.

Tighten the bolts to the specified torque.

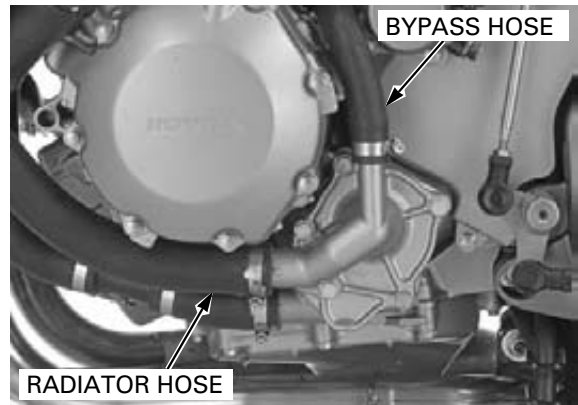
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



COOLING SYSTEM

Connect the radiator lower hose and bypass hose, then tighten the hose band screws.

Fill the system with the recommended coolant (page 7-6).



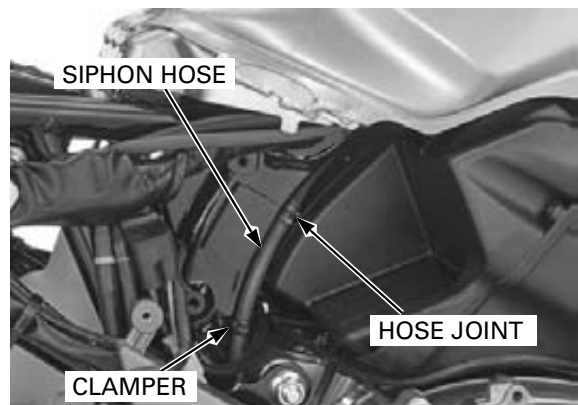
RADIATOR RESERVE TANK

REMOVAL

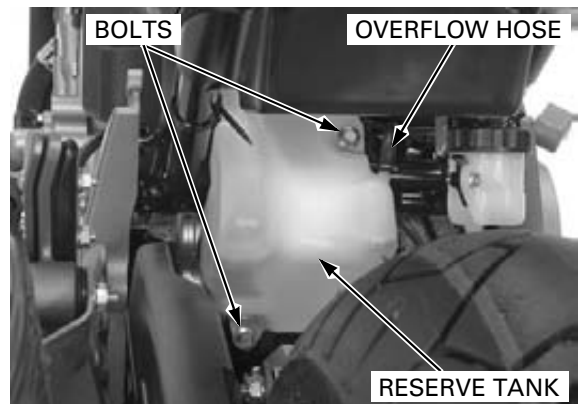
Remove the following:

- Shock absorber (page 15-13)
- Battery (page 18-6)

Release the siphon hose from the clammer and disconnect it from the hose joint, then drain the coolant.

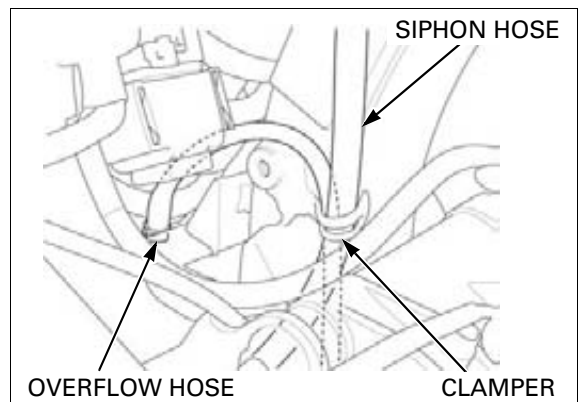


Remove the bolts and radiator reserve tank.
Installation is in the reverse order of removal.



- Secure the siphon hose and reserve tank overflow hose with the frame clammer as shown.

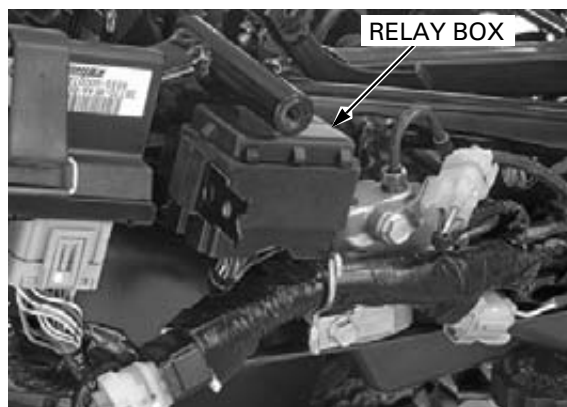
Fill the reserve tank with coolant (page 7-7).



FAN CONTROL RELAY

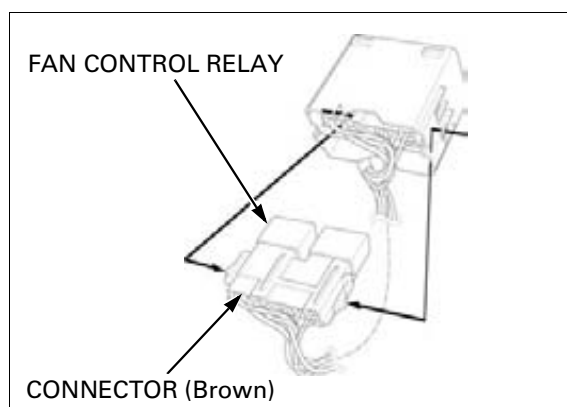
INSPECTION

- Remove the right rear cowl (page 3-8).
- Remove the relay box from the bracket.



Release the retainers and remove the relay connector (Brown).

Remove the fan control relay from the connector.



Connect the ohmmeter to the fan control relay connector terminals.

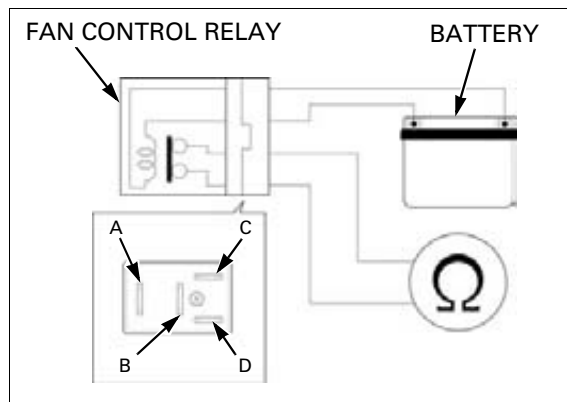
Connection: A (Red/green) – B (Black/blue)

Connect a 12 V battery to the following engine stop relay connector terminals.

Connection: C (Black/white) – D (Green/blue)

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.



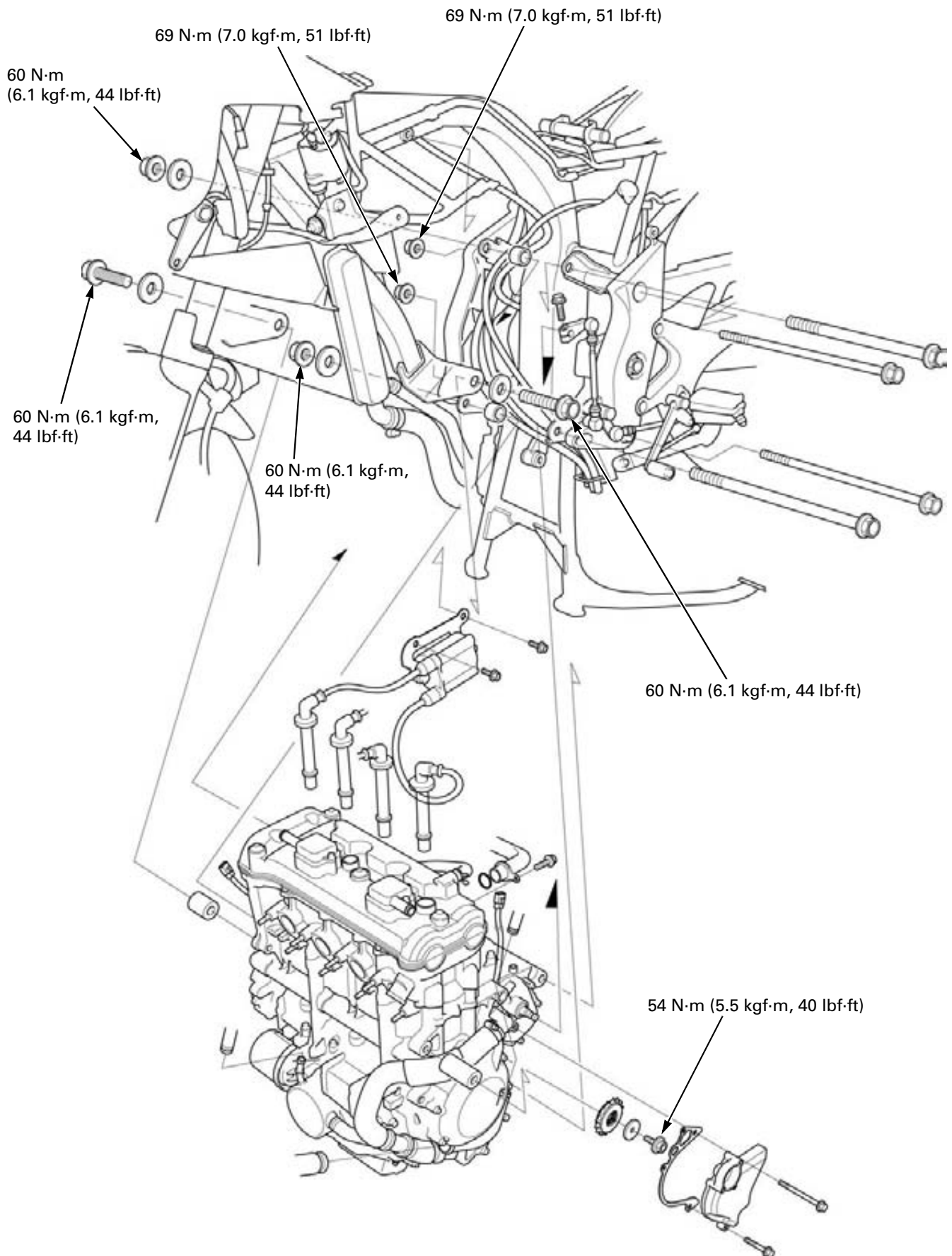
MEMO

8. ENGINE REMOVAL/INSTALLATION

COMPONENT LOCATION	8-2	ENGINE REMOVAL	8-4
SERVICE INFORMATION	8-3	ENGINE INSTALLATION.....	8-8

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.
- Do not use the oil filter and oil cooler as a jacking point.
- The following components can be serviced with the engine installed in the frame.
 - Alternator (page 11-4)
 - Clutch (page 10-17)
 - Camshaft (page 9-8)
 - Gearshift linkage (page 12-11)
 - Oil cooler (page 5-12)
 - Oil pump (page 5-8)
 - Transmission/gearshift linkage (page 12-11)
 - Water pump (page 7-16)
- The following components require engine removal for service.
 - Cylinder head (page 9-12)
 - Crankshaft (page 13-8)
 - Piston/cylinder (page 13-16)

SERVICE DATA

ITEM		SPECIFICATIONS
Engine dry weight		66.5 kg (146.6 lbs)
Engine oil capacity	After disassembly	3.8 liter (4.0 US qt, 3.3 Imp qt)
Coolant capacity	Radiator and engine	2.71 liter (2.86 US qt, 2.38 Imp qt)

TORQUE VALUES

Drive sprocket special bolt	54 N·m (5.5 kgf·m, 40 lbf·ft)
Front engine hanger bolt	60 N·m (6.1 kgf·m, 44 lbf·ft)
Rear engine hanger nut (upper)	60 N·m (6.1 kgf·m, 44 lbf·ft)
Rear engine hanger nut (lower)	60 N·m (6.1 kgf·m, 44 lbf·ft)
Swingarm pivot bracket nut	69 N·m (7.0 kgf·m, 51 lbf·ft)
Swingarm pivot nut	98 N·m (10.0 kgf·m, 72 lbf·ft)
Gearshift arm pinch bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)

ENGINE REMOVAL/INSTALLATION

ENGINE REMOVAL

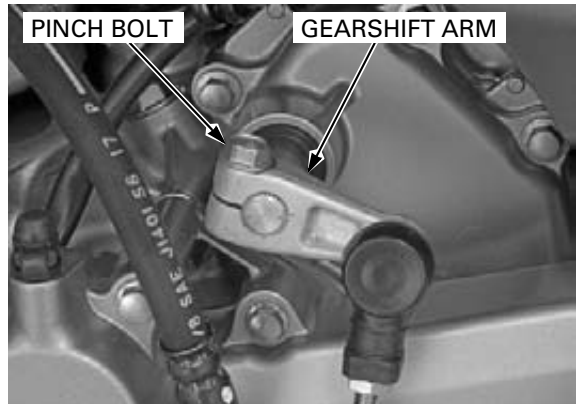
Drain the engine oil (page 4-16).
Drain the coolant (page 7-7).

Remove the following:

- Exhaust pipe (page 3-13)
- Air cleaner housing/throttle body (page 6-60)
- Left rear cowl (page 3-8)
- Clutch slave cylinder (page 10-13)

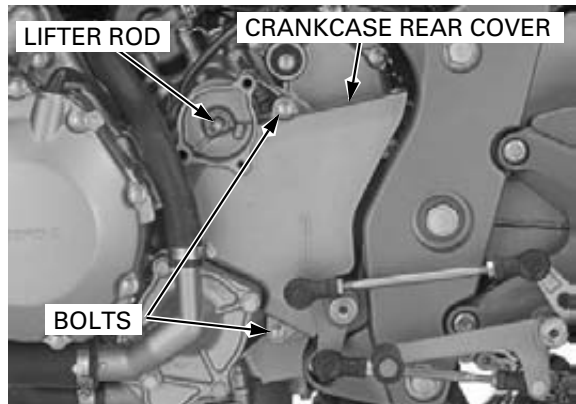
Loosen the lock nut, adjusting nut and rear axle nut to make a drive chain slack fully (page 4-21).

Remove the pinch bolt and gearshift arm.

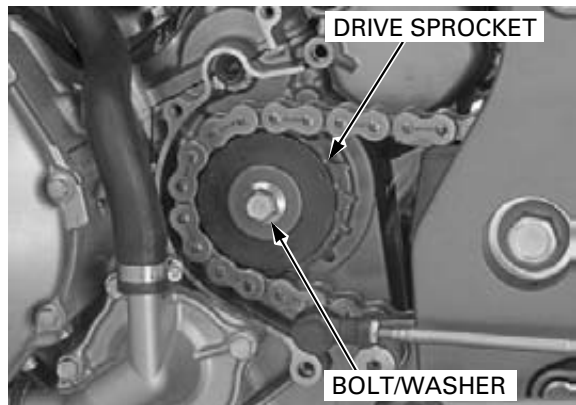


Remove the clutch lifter rod.

Remove the bolts, left crankcase rear cover, guide plate and dowel pins.



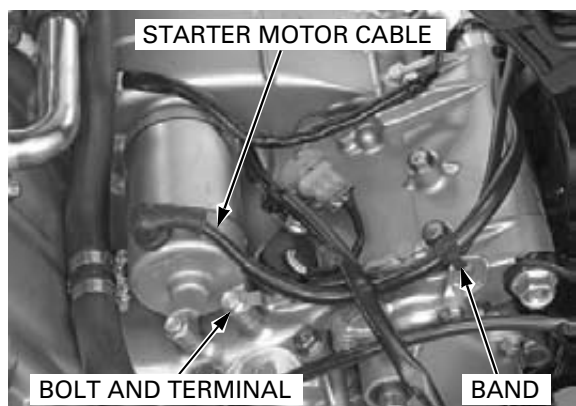
Remove the bolt, washer and drive sprocket from the countershaft.



Remove the wire band.

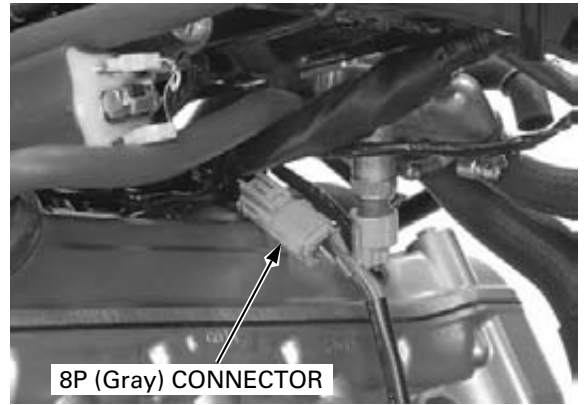
Remove the terminal nut and starter motor cable (page 20-6).

Remove the bolt and ground cable.

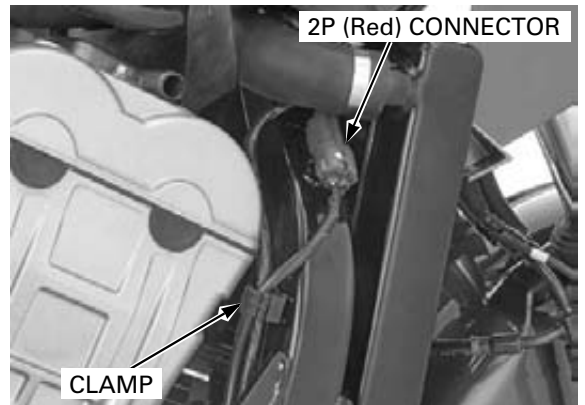


ENGINE REMOVAL/INSTALLATION

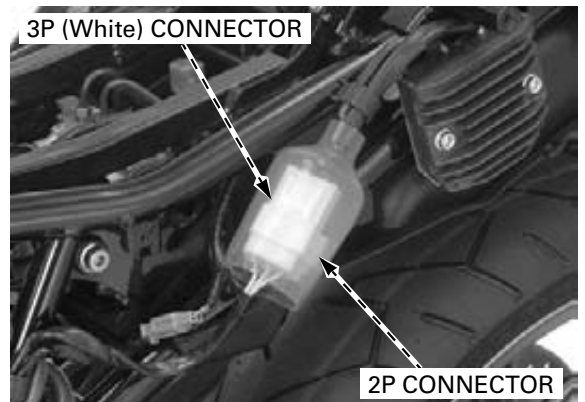
Disconnect the engine sub-harness 8P (Gray) connector.



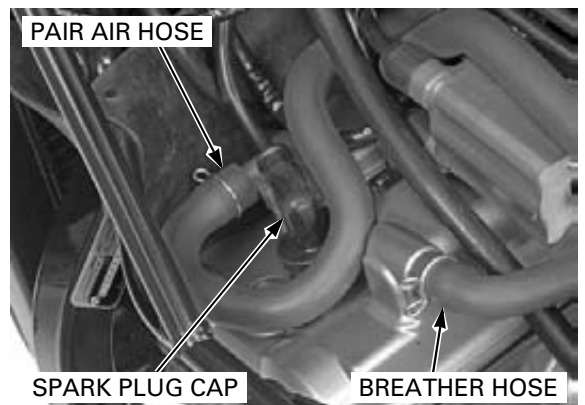
Release the CKP sensor wire from the clamp. Disconnect the CKP sensor 2P (Red) connector.



Disconnect the alternator 3P (White) connector and regulator/rectifier 2P connector.



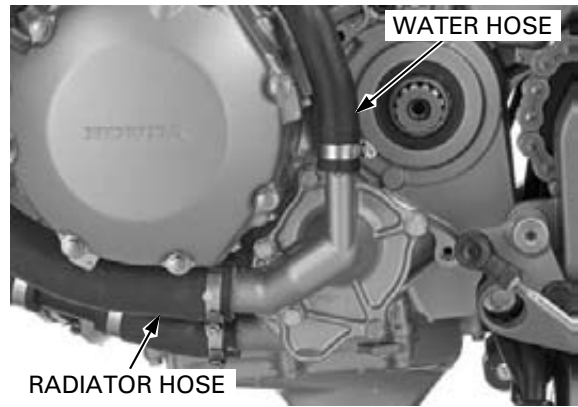
Disconnect the PAIR air hose and crankcase breather hose from the cylinder head cover. Remove the spark plug caps.



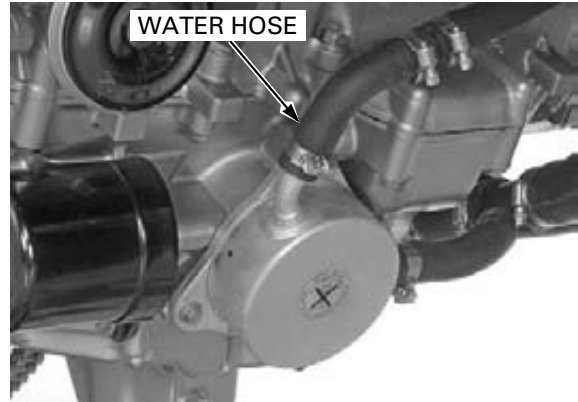
ENGINE REMOVAL/INSTALLATION

Remove the exhaust pipe (page 3-13).

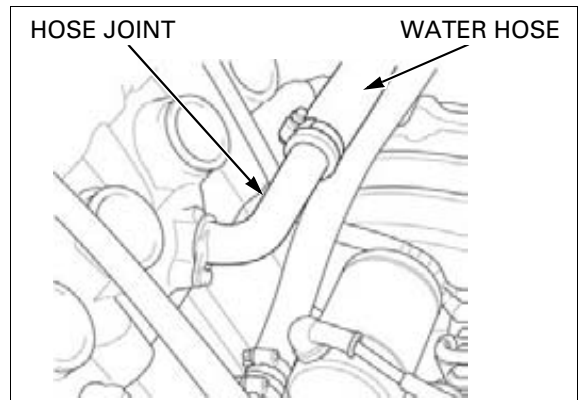
Loosen the hose band screws and disconnect the lower radiator hose and water hose from the water pump.



Loosen the hose band screw and disconnect the oil cooler water hose.

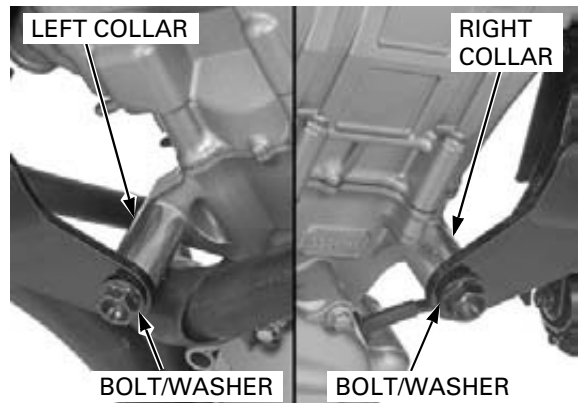


Loosen the hose band screw and disconnect the water hose from the hose joint.

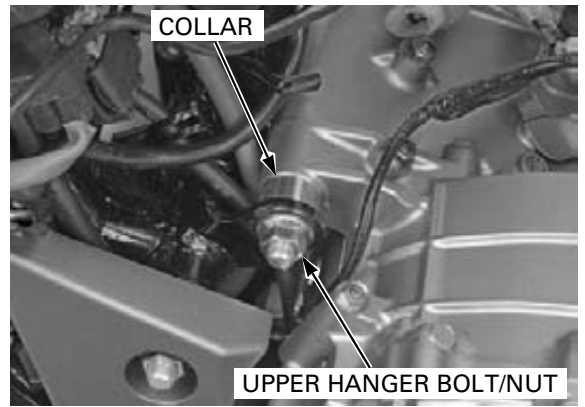


Support the engine using a jack or other adjustable support.

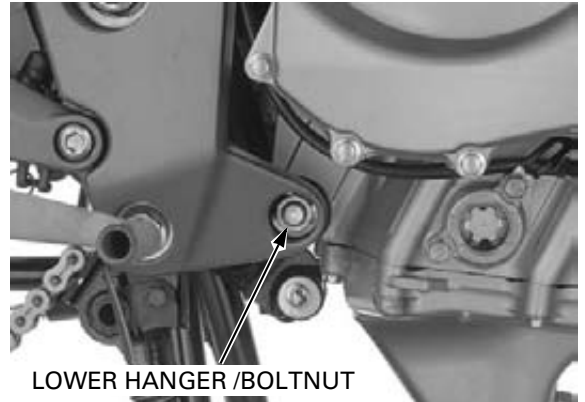
Remove the right and left front engine hanger bolts, washers and distance collars.



Loosen the rear upper engine hanger nut.



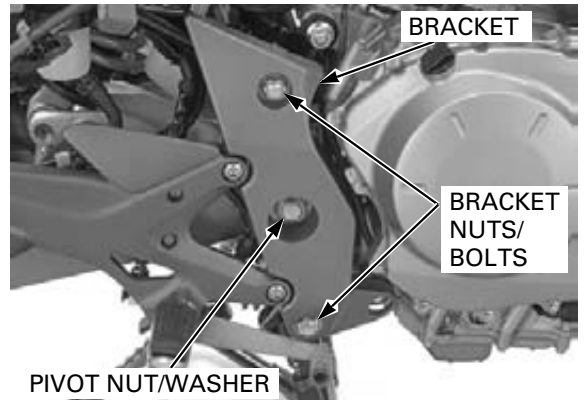
Loosen the rear lower engine hanger nut.



Loosen the swingarm pivot nut.

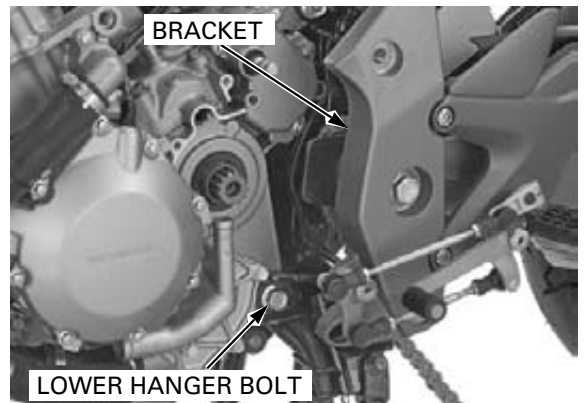
Do not remove the swingarm pivot shaft.

Remove the swingarm pivot bracket nuts/bolts and swingarm pivot nut/washer.



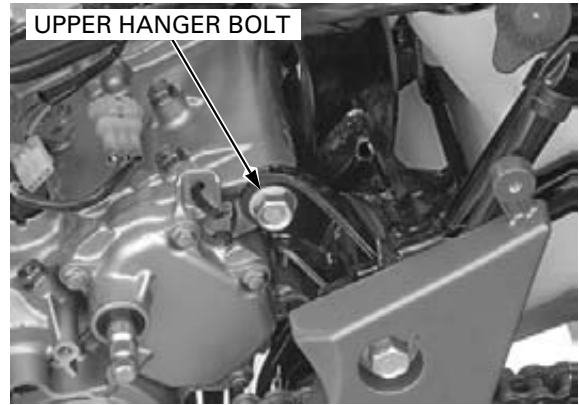
Slide the left swingarm pivot bracket outward and turn it counterclockwise slightly.

Remove the nut, washer, rear lower engine hanger bolt and distance collar.



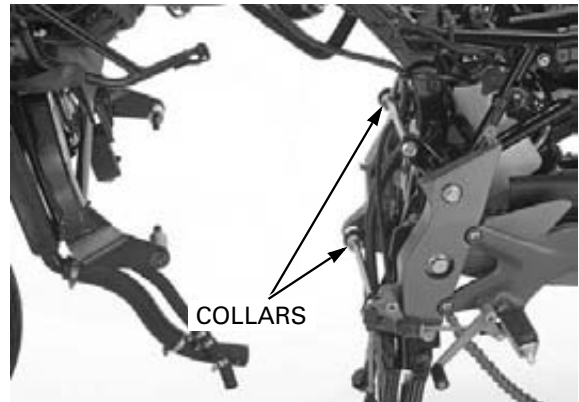
ENGINE REMOVAL/INSTALLATION

- Remove the collar from the right side.* Remove the nut, washer, rear upper engine hanger bolt and distance collar.
- Remove the engine from the frame.



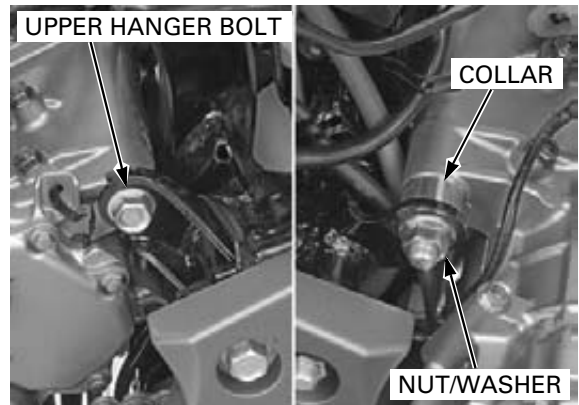
ENGINE INSTALLATION

- Note the direction of the engine hanger bolts and collars.
- The jack height must be continually adjusted to relieve stress from the mounting fasteners.
- Route the wire and cables properly (page 1-23).

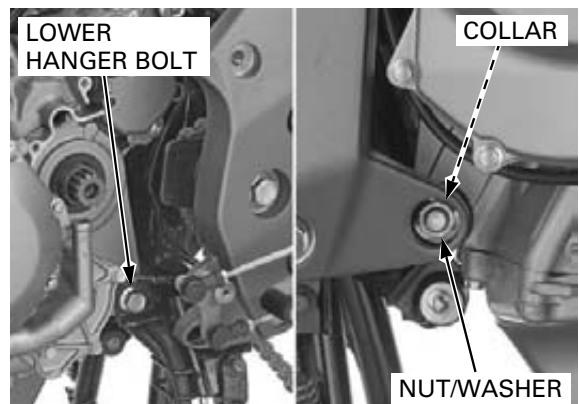


Carefully install the engine into the frame.

- Install the collar onto the right side engine mount.* Install the rear upper engine hanger bolt from the left side and install the collar between the engine and frame.
- Install the washer and upper engine hanger nut.



- Install the collar onto the right side engine mount.* Install the rear lower engine hanger bolt from the left side and install the collar between the engine and frame.
- Install the washer and lower engine hanger nut.



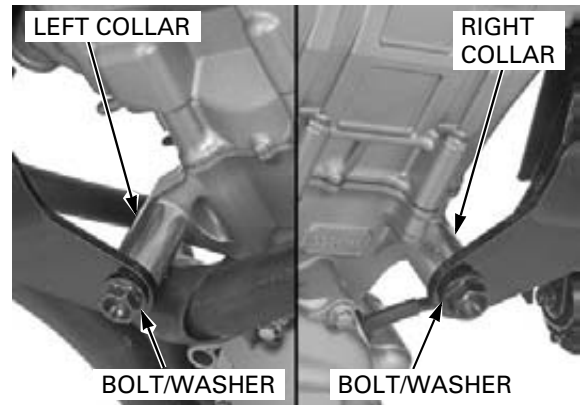
ENGINE REMOVAL/INSTALLATION

Install the right and left front engine hanger bolts/washers with the distance collars.

Tighten all of the engine hanger nut and bolts to the specified torque.

TORQUE:

- Front engine hanger bolt:
60 N·m (6.1 kgf·m, 44 lbf·ft)
- Rear upper engine hanger nut:
60 N·m (6.1 kgf·m, 44 lbf·ft)
- Rear lower engine hanger nut:
60 N·m (6.1 kgf·m, 44 lbf·ft)



Set the swingarm pivot bracket onto the frame and align the bolt holes.

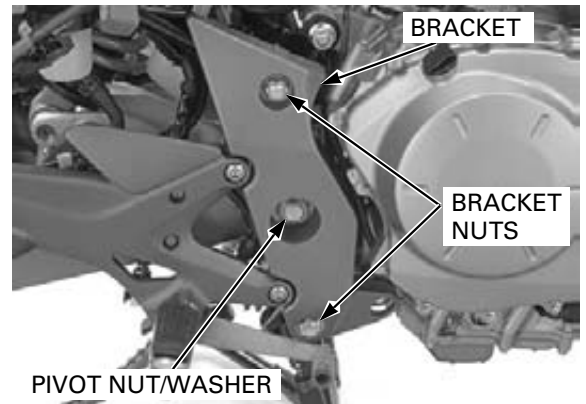
Install the bracket bolts and nuts.

Install the washer and swingarm pivot nut, and tighten the nut to the specified torque.

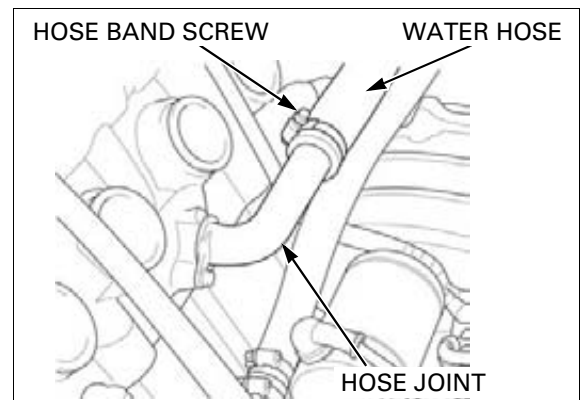
TORQUE: 98 N·m (10.0 kgf·m, 72 lbf·ft)

Tighten the bracket nuts to the specified torque.

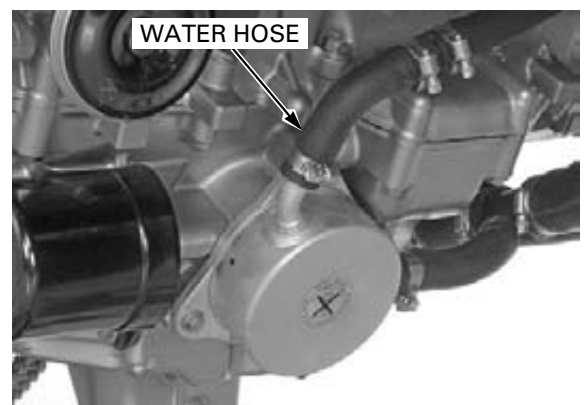
TORQUE: 69 N·m (7.0 kgf·m, 51 lbf·ft)



Install and tighten the hose joint bolt securely.

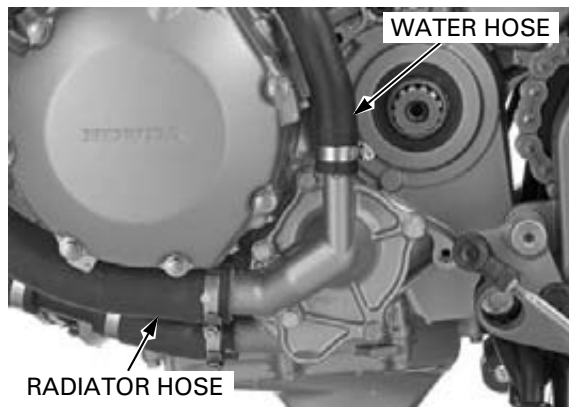


Connect the water hose to the oil cooler.



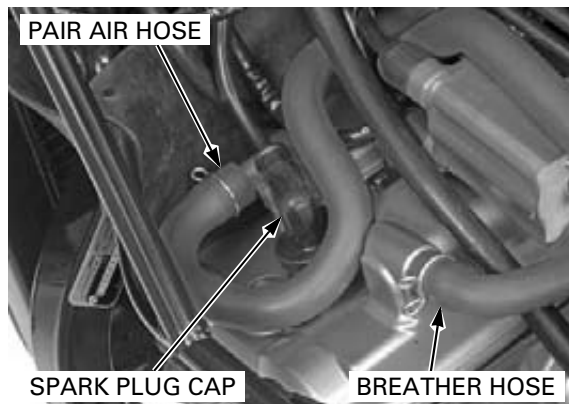
ENGINE REMOVAL/INSTALLATION

Connect the lower radiator hose and water hose to the water pump.

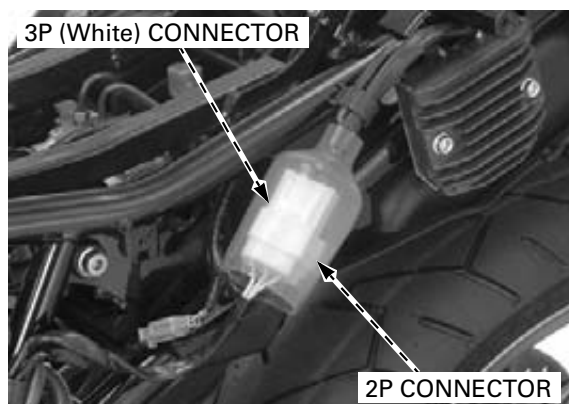


Connect the crankcase breather hose and PAIR air hoses.

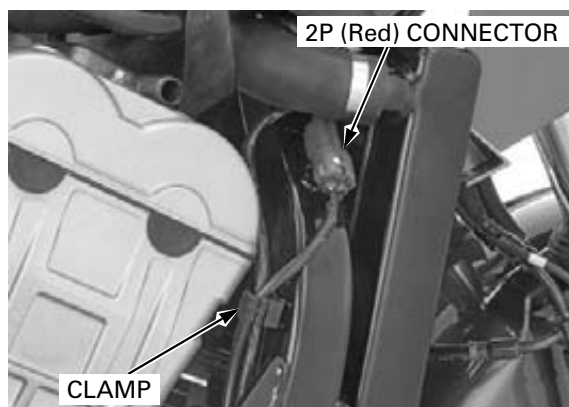
Install the spark plug caps.



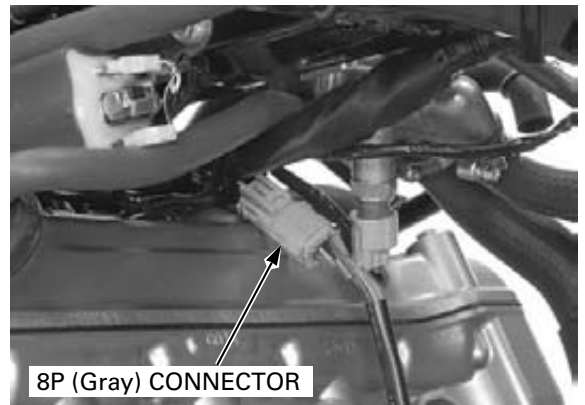
Connect the alternator 3P (White) connector and regulator/rectifier 2P connector.



Connect the CKP sensor 2P (Red) connector and secure the CKP sensor and horn wires with the harness clamp.



Connect the engine sub-harness 8P (Gray) connector.

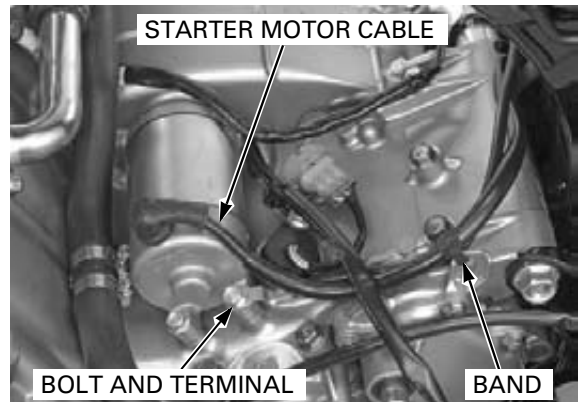


Install the starter motor cable to the motor terminal. Tighten the terminal nut to the specified torque and install the dust cover (page 20-12).

Install and tighten the starter motor mounting bolt with the ground cable.

Route the wire band through the hole on the gearshift linkage cover.

Secure the starter motor cable and ground cable with the wire band.

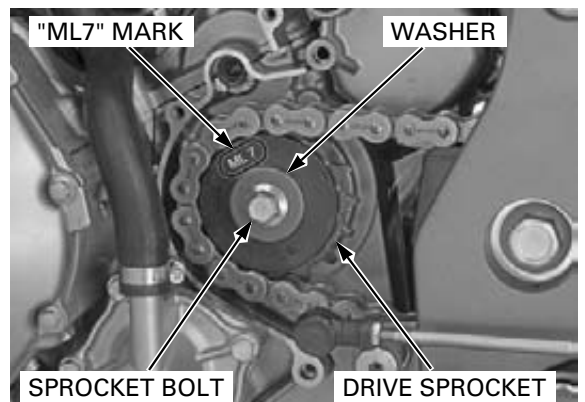


Install the drive sprocket with its "ML7" mark facing out.

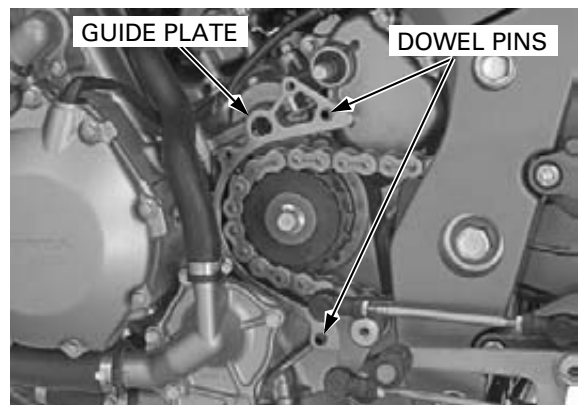
Install the washer and drive sprocket bolt, and tighten the drive sprocket bolt to the specified torque.

TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)

Install the drive sprocket cover and clutch slave cylinder (page 12-11).



Install the dowel pins and guide plate.

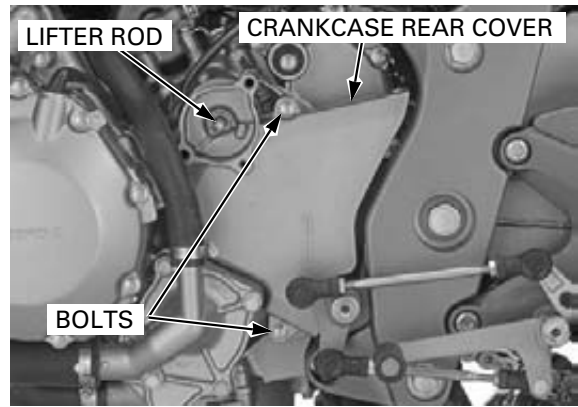


ENGINE REMOVAL/INSTALLATION

Install the left crankcase rear cover and tighten the cover bolts.

Install the clutch lifter rod.

Install the clutch slave cylinder (page 10-15).



Align the punch mark on the gearshift arm with the rear punch mark on the spindle.

Install the gearshift arm onto the gearshift spindle. Install and tighten the pinch bolt to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

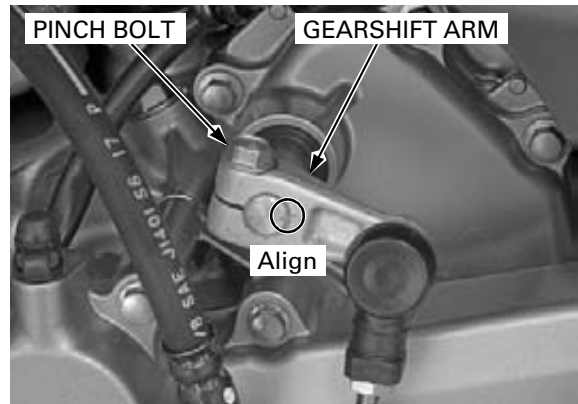
Install the following:

- Air cleaner housing/throttle body (page 6-67)
- Clutch slave cylinder (page 10-15)
- Exhaust pipe (page 3-13)
- Left rear cowl (page 3-8)

Adjust the drive chain slack (page 4-21).

Pour recommended engine oil up to the proper level (page 4-16).

Fill the cooling system with the recommended coolant and bleed any air (page 7-6).

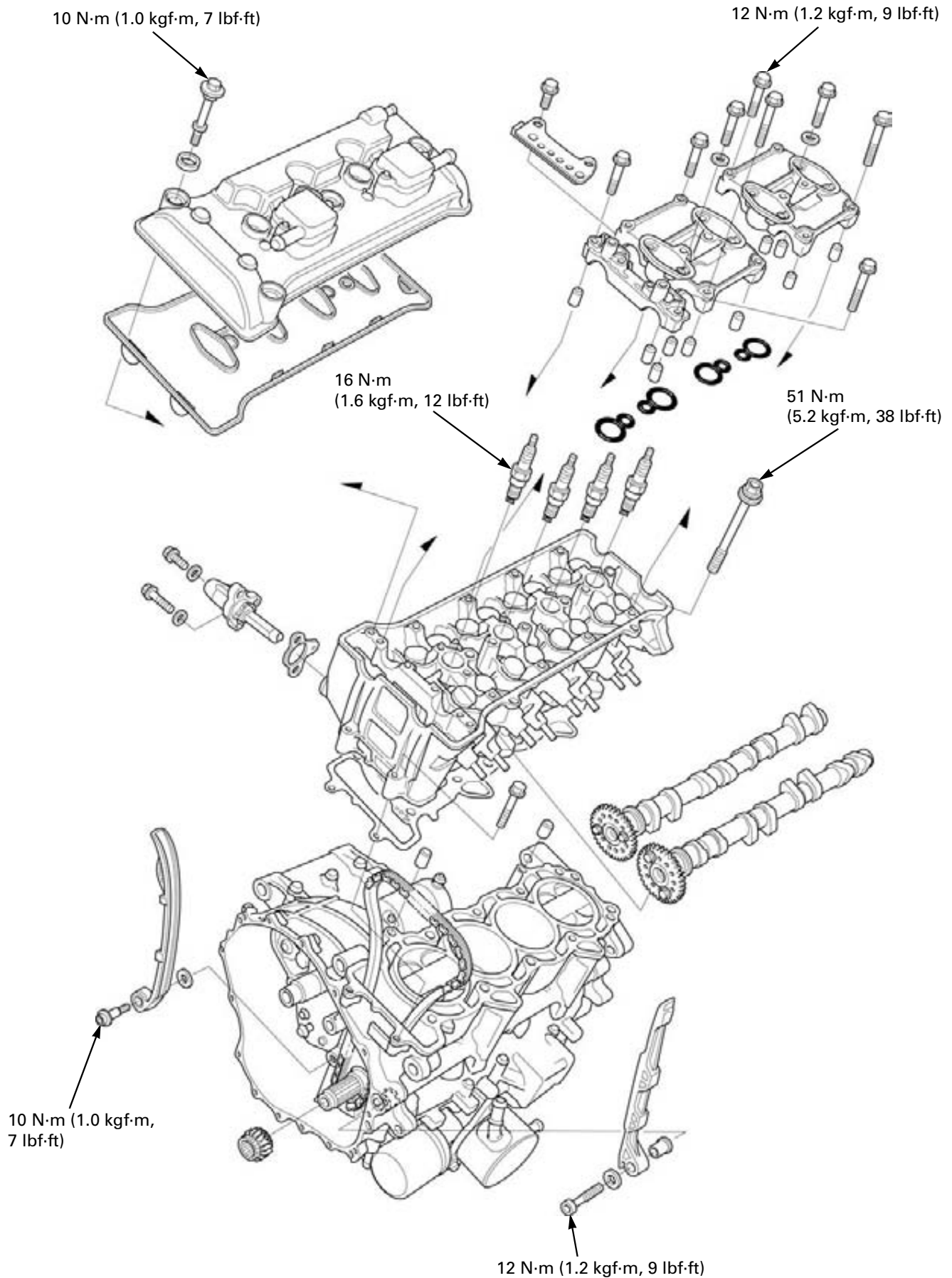


9. CYLINDER HEAD/VALVES

COMPONENT LOCATION	9-2	CYLINDER HEAD INSPECTION	9-15
SERVICE INFORMATION	9-3	VALVE GUIDE REPLACEMENT	9-17
TROUBLESHOOTING	9-5	VALVE SEAT INSPECTION/ REFACING	9-18
CYLINDER COMPRESSION TEST	9-6	CYLINDER HEAD ASSEMBLY	9-21
CYLINDER HEAD COVER REMOVAL	9-6	CYLINDER HEAD INSTALLATION	9-23
CYLINDER HEAD COVER DISASSEMBLY	9-7	CAMSHAFT INSTALLATION	9-25
CAMSHAFT REMOVAL	9-8	CYLINDER HEAD COVER ASSEMBLY	9-30
CYLINDER HEAD REMOVAL	9-12	CYLINDER HEAD COVER INSTALLATION	9-31
CYLINDER HEAD DISASSEMBLY	9-13		

CYLINDER HEAD/VALVES

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- This section covers service of the cylinder head, valves and camshafts.
- The camshaft services can be done with the engine installed in the frame. The cylinder head service requires engine 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 lubricating oil is fed through oil passages in the cylinder head. Clean the oil passages before assembling cylinder head.
- Be careful not to damage the mating surfaces when removing the cylinder head cover and cylinder head.

SPECIFICATIONS

Unit: mm (in)



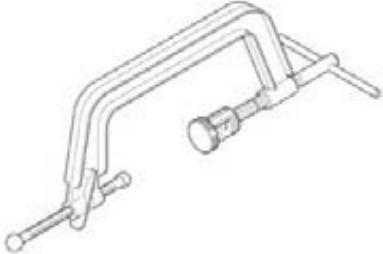









ITEM		STANDARD	SERVICE LIMIT
Cylinder compression		1,098 kPa (11.2 kgf/cm ² , 159 psi) at 350 min ⁻¹ (rpm)	–
Valve clearance		IN	0.16 ± 0.03 (0.006 ± 0.001)
		EX	0.32 ± 0.03 (0.013 ± 0.001)
Camshaft	Cam lobe height	IN	34.62 – 34.70 (1.363 – 1.366)
		EX	34.58 – 34.66 (1.361 – 1.365)
	Runout	–	0.05 (0.002)
	Oil clearance	0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
Valve lifter	Valve lifter O.D.	25.978 – 25.993 (1.0228 – 1.0233)	25.97 (1.022)
	Valve lifter bore I.D.	26.010 – 26.026 (1.0240 – 1.0246)	26.04 (1.025)
Valve, valve guide	Valve stem O.D.	IN	4.475 – 4.490 (0.1762 – 0.1768)
		EX	4.465 – 4.480 (0.1758 – 0.1764)
	Valve guide I.D.	4.500 – 4.512 (0.1772 – 0.1776)	4.540 (0.1787)
	Stem-to-guide clearance	IN	0.010 – 0.037 (0.0004 – 0.0015)
		EX	0.020 – 0.047 (0.0008 – 0.0019)
	Valve guide projection above cylinder head	16.0 – 16.3 (0.63 – 0.64)	–
	Valve seat width	0.90 – 1.10 (0.035 – 0.043)	1.5 (0.06)
Valve spring free length	39.55 (1.557)	38.76 (1.526)	
Cylinder head warpage		–	0.10 (0.004)

TORQUE VALUES

Cylinder head mounting bolt	51 N·m (5.2 kgf·m, 38 lbf·ft)	Apply molybdenum disulfide oil to the threads and seating surface.
Camshaft holder flange bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Cylinder head sealing bolt	28 N·m (2.9 kgf·m, 21 lbf·ft)	Apply a locking agent to the threads.
Cylinder head cover bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	
PAIR reed valve cover bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply a locking agent to the threads.
Cam sprocket flange knock bolt	20 N·m (2.0 kgf·m, 15 lbf·ft)	Apply a locking agent to the threads.
Cam chain tensioner pivot bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	Apply a locking agent to the threads.
Cam chain guide torx bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply a locking agent to the threads.
Exhaust pipe stud bolt	See page 3-13	

CYLINDER HEAD/VALVES

TOOLS

<p>Compression gauge attachment 07RMJ-MY50100</p>  <p>or equivalent commercially available.</p>	<p>Cam chain tensioner holder 07ZMG-MCAA400</p> 	<p>Valve spring compressor 07757-0010000</p> 
<p>Valve spring compressor attachment 07959-KM30101</p> 	<p>Tappet hole protector 07HMG-MR70002</p> 	<p>Valve guide driver 07HMD-ML00101</p> 
<p>Valve guide driver 07743-0020000</p> 	<p>Valve guide reamer, 4.5 mm 07HMH-ML00101</p> 	<p>Valve seat cutter, 29 mm (45° IN) 07780-0010300</p>  <p>or equivalent commercially available.</p>
<p>Valve seat cutter, 24.5 mm (45° EX) 07780-0010100</p>  <p>or equivalent commercially available.</p>	<p>Flat cutter, 30 mm (32° IN) 07780-0012200</p>  <p>or equivalent commercially available.</p>	<p>Flat cutter, 27 mm (32° EX) 07780-0013300</p>  <p>or equivalent commercially available.</p>

<p>Interior cutter, 30 mm (60° IN) 07780-0014000</p>  <p>or equivalent commercially available.</p>	<p>Interior cutter, 26 mm (60° EX) 07780-0014500</p>  <p>or equivalent commercially available.</p>	<p>Cutter holder, 4.5 mm 07781-0010600</p>  <p>or equivalent commercially available.</p>
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TROUBLESHOOTING

- Engine top-end problems usually affect engine performance. These problem can be diagnosed by a compression test or by tracing engine noises to the top-end with a sounding rod stethoscope.
- If the performance is poor at low speeds, check for white smoke in the crankcase breather hose. If the hose is smoky, check for a seized piston ring (page 13-17).

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

- Valves:
 - Incorrect valve adjustment
 - Burned or bent valve
 - Incorrect valve timing
 - Broken valve spring
 - Uneven valve seating
- Cylinder head:
 - Leaking or damaged head gasket
 - Warped or cracked cylinder head
- Worn cylinder, piston or piston rings (page 13-17)

Compression too high, overheating or knocking

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

Excessive smoke

- Cylinder head:
 - Worn valve stem or valve guide
 - Damaged stem seal
- Worn cylinder, piston or piston rings (page 13-17)

Excessive noise

- Cylinder head:
 - Incorrect valve adjustment
 - Sticking valve or broken valve spring
 - Damaged or worn camshaft
 - Loose or worn cam chain
 - Worn or damaged cam chain
 - Worn or damaged cam chain tensioner
 - Worn cam sprocket teeth
- Worn cylinder, piston or piston rings (page 13-17)

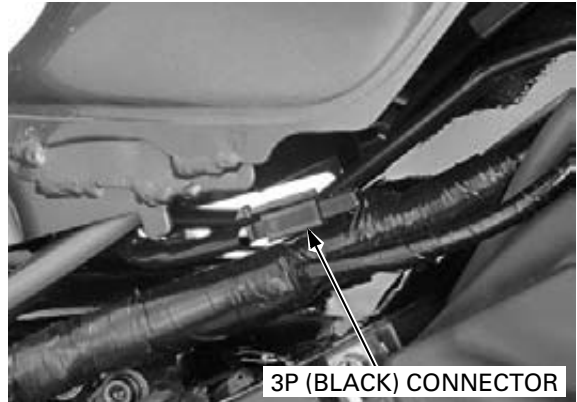
Rough idle

- Low cylinder compression

CYLINDER HEAD/VALVES

CYLINDER COMPRESSION TEST

Warm the engine to normal operating temperature.
Stop the engine and remove the all spark plug caps and spark plugs (page 4-8).
Lift and support the fuel tank (page 4-5).
Disconnect the fuel pump unit 3P (Black) connector.



Install a compression gauge into the spark plug hole.

TOOL:

Compression gauge attachment

07RMJ-MY50100 or equivalent commercially available

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:

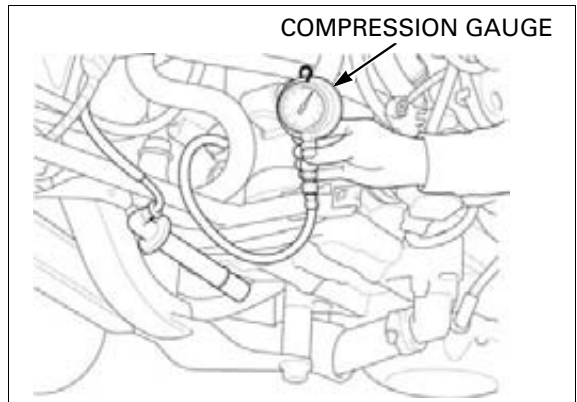
1,098 kPa (11.2 kgf/cm², 159 psi) at 350 min⁻¹ (rpm)

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:

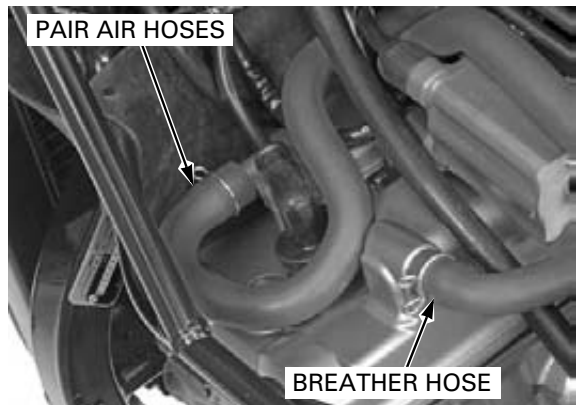
- Carbon deposits in combustion chamber or on piston head



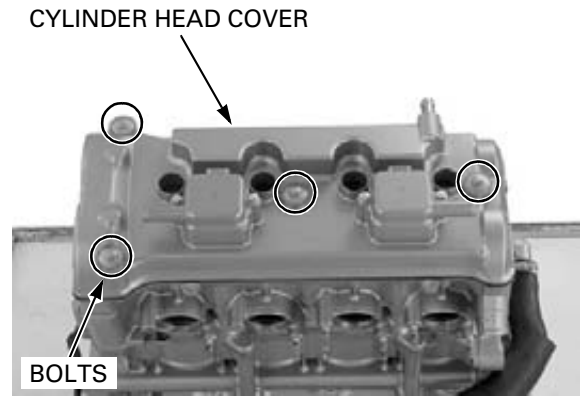
CYLINDER HEAD COVER REMOVAL

Remove the fuel tank (page 6-57).
Disconnect the spark plug caps (page 4-8).

Remove the crankcase breather hose.
Disconnect the PAIR air hoses from the cylinder head cover and remove the PAIR control solenoid valve (page 6-84).

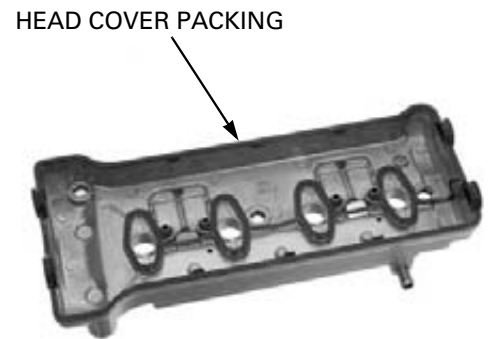


Remove the cylinder head cover bolts.
Remove the cylinder head cover from the cylinder head.

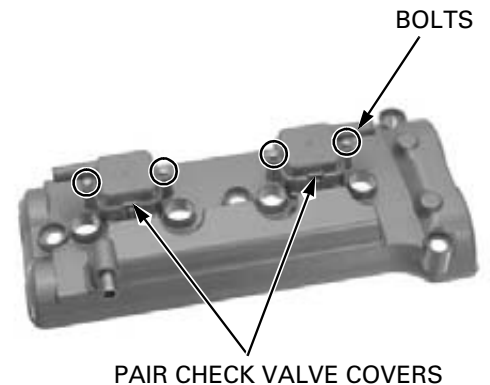


CYLINDER HEAD COVER DISASSEMBLY

Remove the cylinder head cover packing.

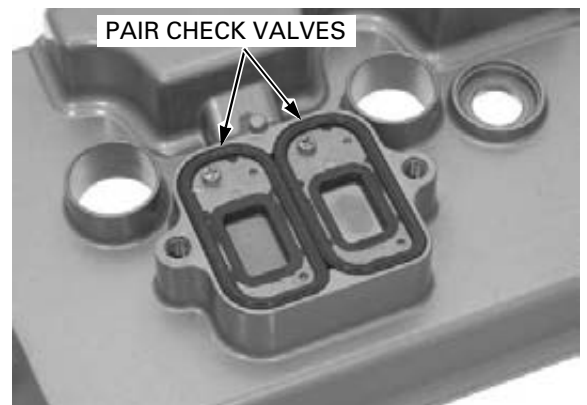


Remove the bolts and PAIR check valve cover.



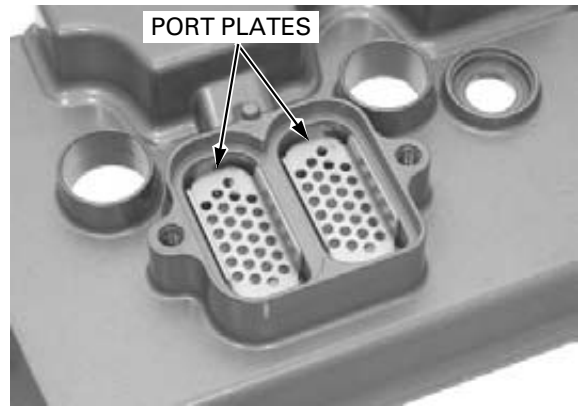
Remove the PAIR check valves from the cylinder head cover.

Check the PAIR check valve for wear or damage, replace if necessary.



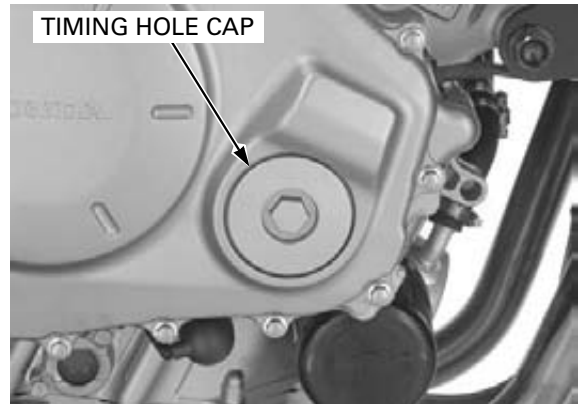
CYLINDER HEAD/VALVES

Remove the port plates from the cylinder head cover.

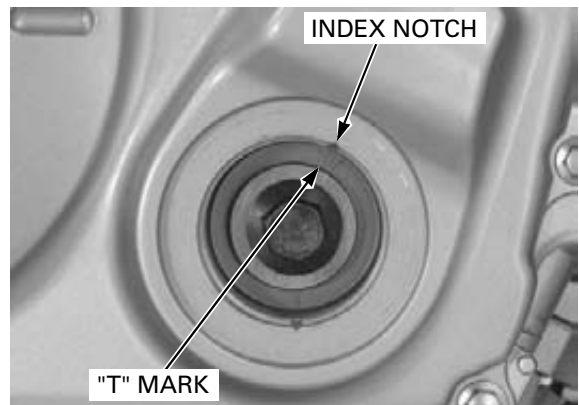


CAMSHAFT REMOVAL

Remove the cylinder head cover (page 9-6).
Remove the timing hole cap and O-ring.

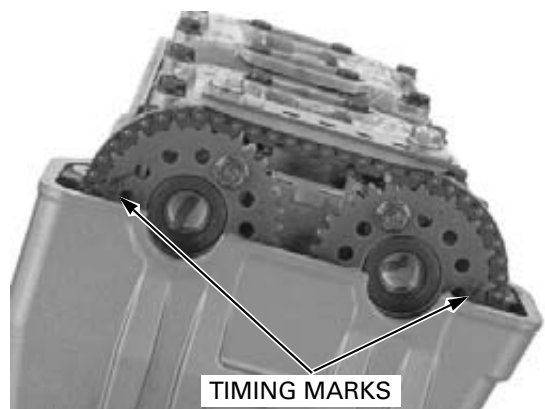


Turn the crankshaft clockwise, align the "T" mark on the starter clutch outer with the index notch on the right crankcase cover.

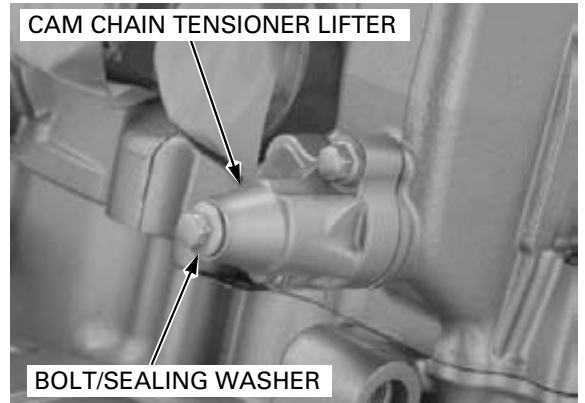


The timing marks ("IN" and "EX") on the cam sprockets must be flush with the cylinder head surface and facing outward as shown.

If the timing marks on the cam sprocket are facing inward, turn the crankshaft clockwise one full turn (360°) and realign the timing marks with the cylinder head surface so they are facing outward.



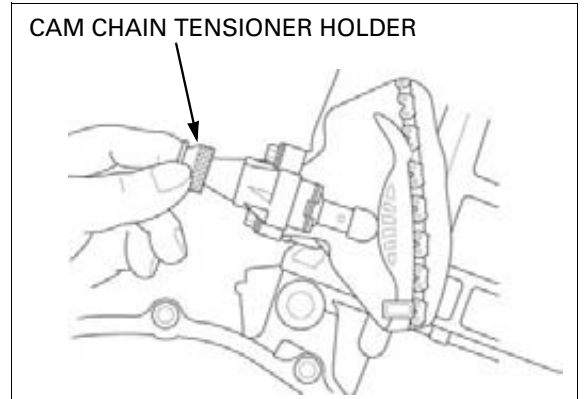
Remove the cam chain tensioner lifter sealing bolt and sealing washer.



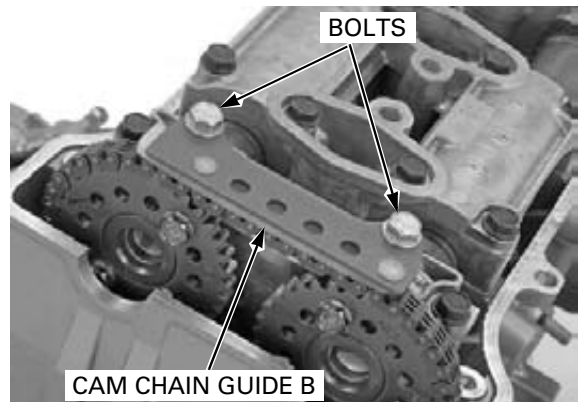
Turn the tensioner lifter shaft fully in (clockwise) and secure it using the special tool to prevent damaging the cam chain.

TOOL:

Cam chain tensioner holder 07ZMG-MCAA400



Remove the bolts and cam chain guide B.

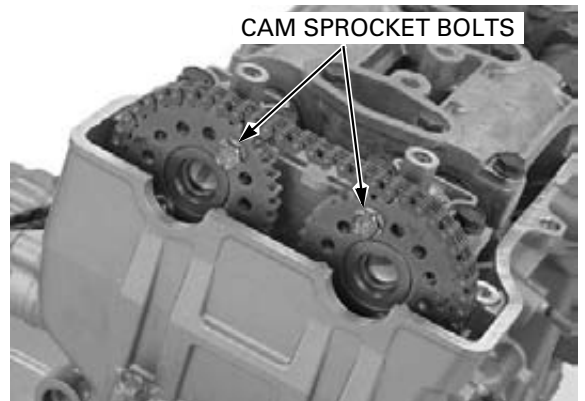


It is not necessary to remove the cam sprocket from the camshaft except when replacing the camshaft and/or cam sprocket.

If you plan to replace the camshaft and/or cam sprocket, loosen and remove the cam sprocket bolts as follows:

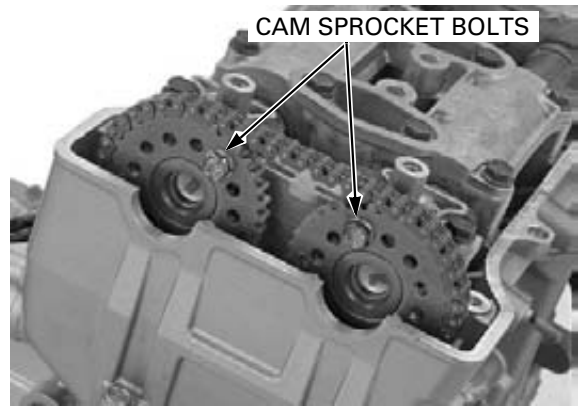
Be careful not to drop the cam sprocket bolts and cam sprocket into the crankcase.

- Remove the cam sprocket bolts from the intake and exhaust camshafts.



CYLINDER HEAD/VALVES

- Turn the crankshaft clockwise one full turn (360°), remove the other cam sprocket bolts from the camshafts.
- Remove the cam sprockets from the camshafts.



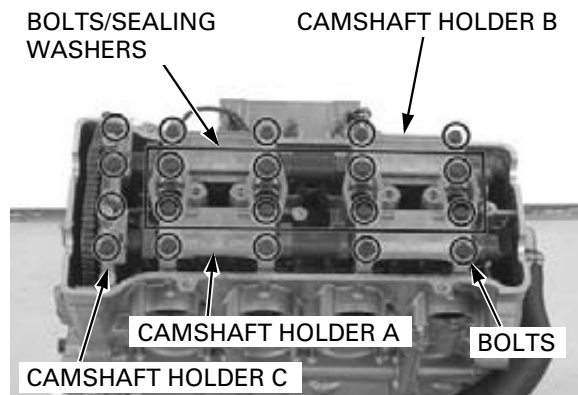
Suspend the cam chain with a piece of wire to prevent the chain from falling into the crankcase.

Loosen and remove the camshaft holder bolts/washers, then remove the camshaft holders and camshafts.

NOTE:

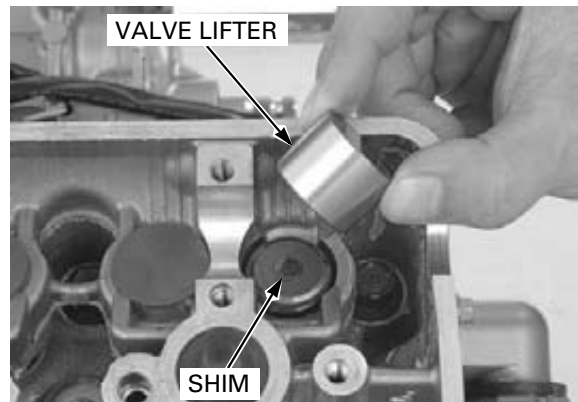
From outside to inside, loosen the bolts in a criss-cross pattern in several steps or the camshaft holder might break.

Do not forcibly remove the dowel pins from the camshaft holders.



Remove the valve lifters and shims.

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



INSPECTION

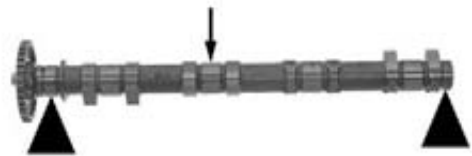
CAMSHAFT

Check the cam and journal surfaces of the camshaft for scoring, scratches or evidence of insufficient lubrication.

Check the oil holes in the camshaft for clogging.

Support both sides of the camshaft (at journals) with V-blocks and check the camshaft run out with a dial gauge.

SERVICE LIMIT: 0.05 mm (0.002 in)



Using a micrometer, measure each cam lobe height.

SERVICE LIMITS:

IN: 34.60 mm (1.362 in)

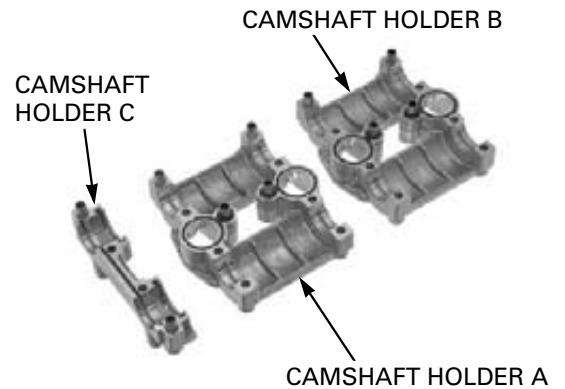
EX: 34.56 mm (1.361 in)



CAMSHAFT HOLDERS

Inspect the journals of the each camshaft holder for scoring, scratches, or evidence of insufficient lubrication.

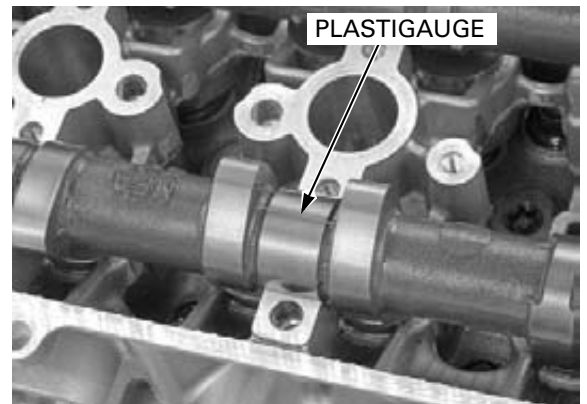
Inspect the oil orifices of the holders for clogging.



CAMSHAFT OIL CLEARANCE

Do not rotate the camshaft when using plastigauge.

Wipe any oil from the journals of the camshaft, cylinder head and camshaft holders. Lay a strip of plastigauge lengthwise on top of each camshaft journal.



Be sure the dowel pins in the camshaft holder align the holes in the cylinder head.

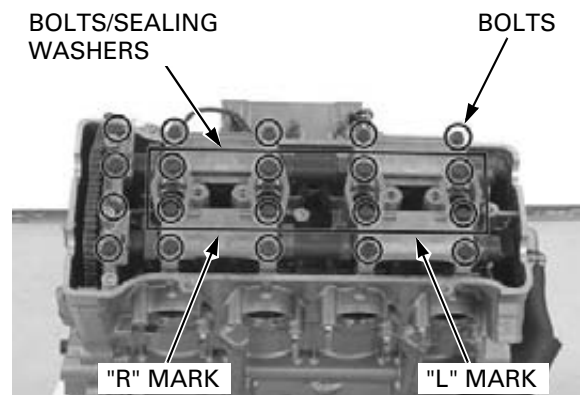
Install the each camshaft holder to the correct locations with the identification marks.

- "R" mark: center camshaft holder (Holder A)
- "L" mark: left camshaft holder (Holder B)

Apply engine oil to the threads and seating surfaces of the camshaft holder bolts.

Install the twenty holder bolts with the eight sealing washers.

Finger tighten the bolts.



CYLINDER HEAD/VALVES

First gradually tighten the four bolts (No.1 – No.2 – No.7 – No.8) in the numerical order cast on the camshaft holders.
Gradually tighten the other camshaft holder bolts until the camshaft holders lightly contact the cylinder head surface.

NOTICE

Failure to tighten the camshaft holder in a crisscross pattern might cause a camshaft holder to break.

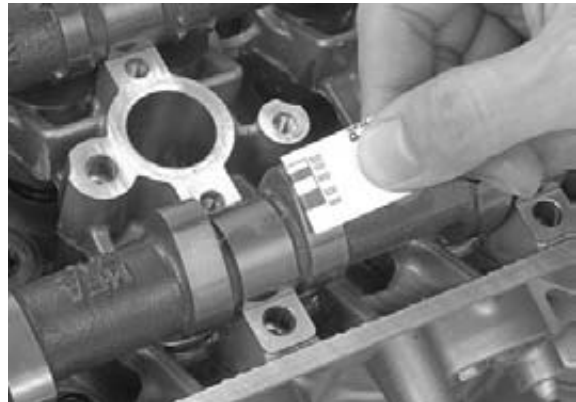
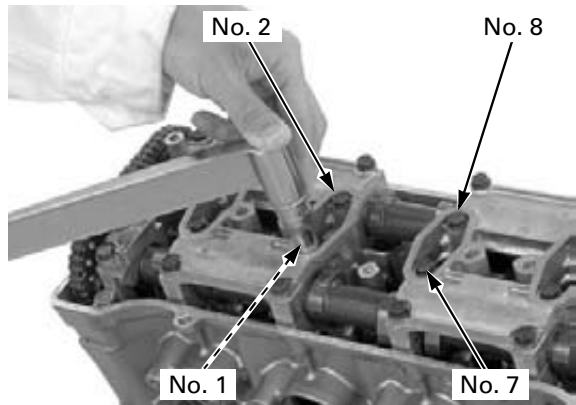
Tighten all camshaft holder bolts in the numerical order cast on the camshaft holders.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

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

SERVICE LIMIT: 0.10 mm (0.004 in)

When the service limits are exceeded, replace the camshaft and recheck the oil clearance.
Replace the cylinder head and camshaft holders as a set if the clearance still exceeds the service limit.



CYLINDER HEAD REMOVAL

Remove the engine from the frame (page 8-4).

Remove the camshafts (page 9-8).

Tilt the engine and drain the coolant from the cylinder head and cylinder.

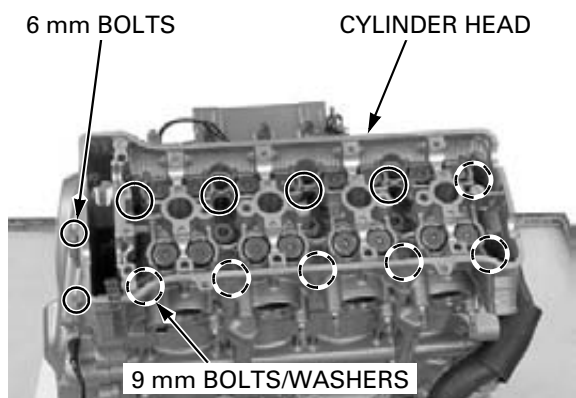
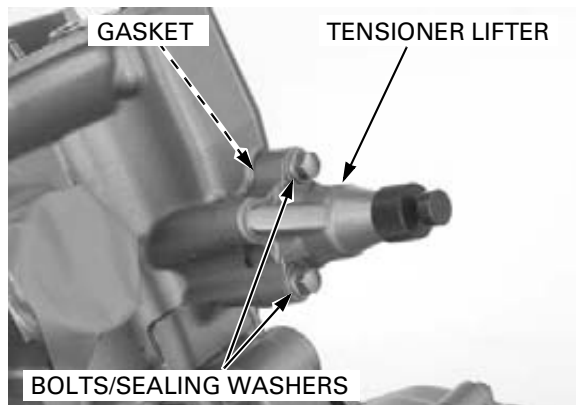
Remove the bolts, sealing washers, cam chain tensioner lifter and gasket.

Remove the two 6 mm bolts.

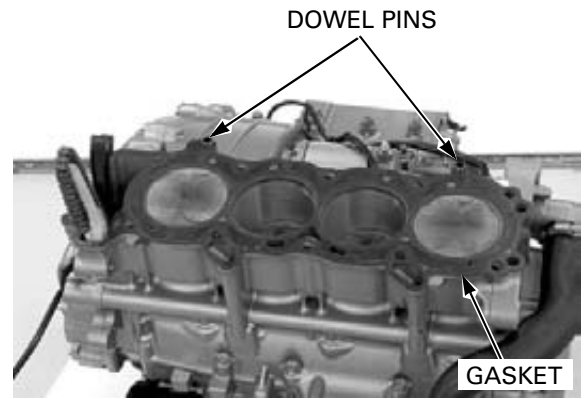
Remove the ten 9 mm bolts/washers.

Remove the cylinder head.

Loosen the 9 mm bolts in a crisscross pattern in two or three steps.



Remove the gasket and dowel pins.

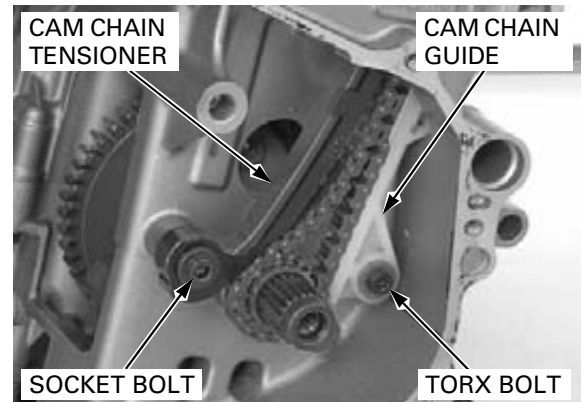


Remove the following:

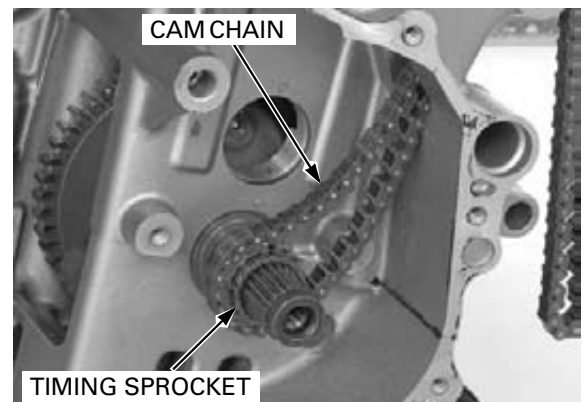
- Right crankcase cover (page 10-15)
- Starter clutch (page 10-28)

Remove the torx bolt, washer, cam chain guide and pivot collar.

Remove the socket bolt, cam chain tensioner and washer.



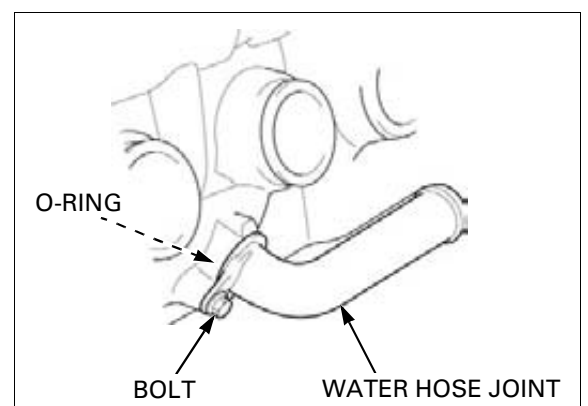
Remove the cam chain and timing sprocket from the crankshaft.



CYLINDER HEAD DISASSEMBLY

Remove the bolt and water hose joint from the cylinder head.

Remove the O-ring from the water hose joint.



CYLINDER HEAD/VALVES

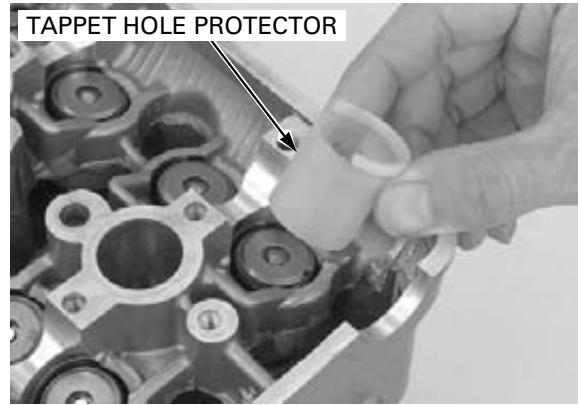
Remove the cylinder head (page 9-12).

Remove the spark plugs from the cylinder head.

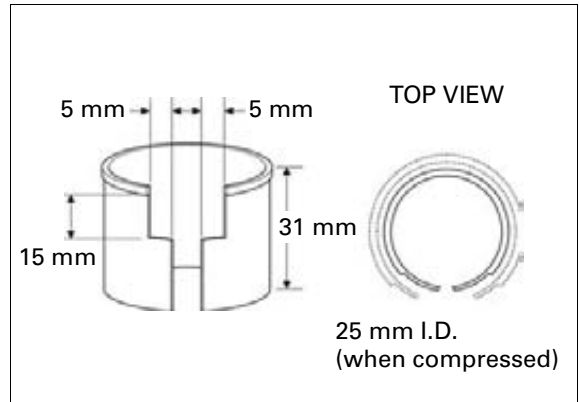
Install the tappet hole protector into the valve lifter bore.

TOOL:

Tappet hole protector **07HMG-MR70002**



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



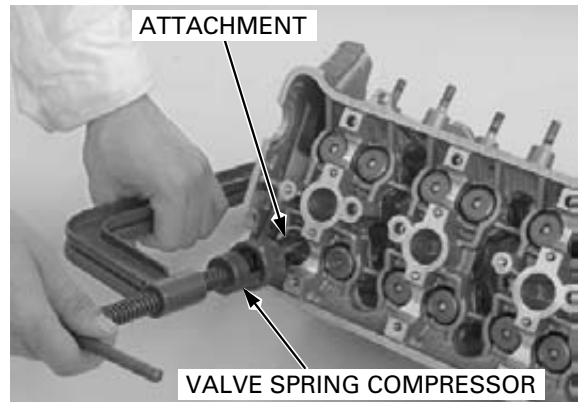
To prevent loss of tension, do not compress the valve springs more than necessary to remove the cotters.

Remove the valve spring cotters using the special tools as shown.

TOOLS:

Valve spring compressor **07757-0010000**

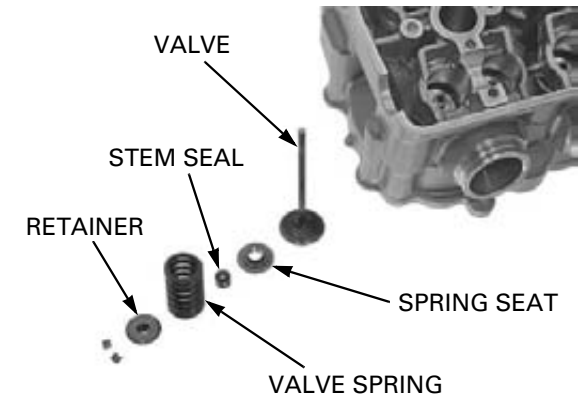
Valve spring compressor attachment **07959-KM30101**



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

Remove the following:

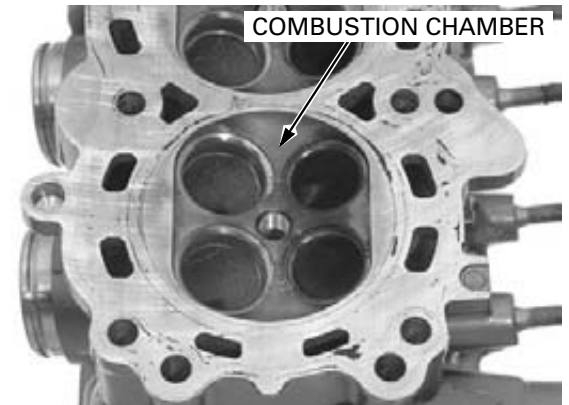
- Spring retainer
- Valve spring
- Valve
- Stem seal
- Valve spring seat



CYLINDER HEAD INSPECTION

CYLINDER HEAD

Avoid damaging the gasket surface. Remove carbon deposits from the combustion chambers. Check the spark plug hole and valve areas for cracks.



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

SERVICE LIMIT: 0.10 mm (0.004 in)



VALVE LIFTER BORE

Inspect each valve lifter bore for scratches or abnormal wear. Measure the each valve lifter bore I.D.

SERVICE LIMIT: 26.04 mm (1.025 in)



VALVE LIFTER

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

SERVICE LIMIT: 25.97 mm (1.022 in)



CYLINDER HEAD/VALVES

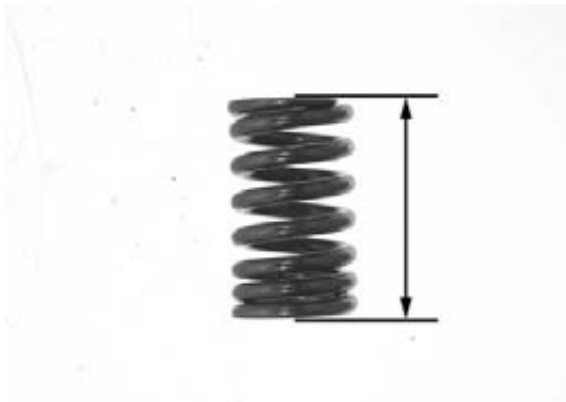
VALVE SPRING

Measure the free length of the valve springs.

SERVICE LIMITS:

IN/EX: 38.76 mm (1.526 in)

Replace the springs if they are shorter than the service limits.



VALVE/VALVE GUIDE

Check that the valve moves smoothly in the guide. Inspect each valve for bending, burning or abnormal stem wear.

Measure and record each valve stem O.D.

SERVICE LIMITS:

IN: 4.465 mm (0.1758 in)

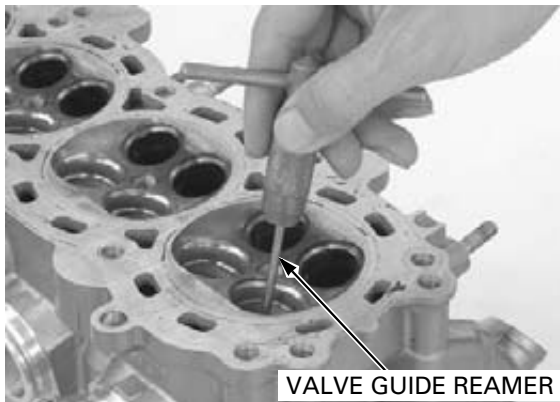
EX: 4.455 mm (0.1754 in)



Ream the guides to remove any carbon deposits before checking clearances. Insert the reamer from the combustion chamber side of the cylinder head and always rotate the reamer clockwise.

TOOL:

Valve guide reamer, 4.5 mm 07HMH-ML00101



Measure and record each valve guide I.D.

SERVICE LIMIT: IN/EX: 4.540 mm (0.1787 in)

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

SERVICE LIMIT:

IN: 0.075 mm (0.0030 in)

EX: 0.085 mm (0.0033 in)

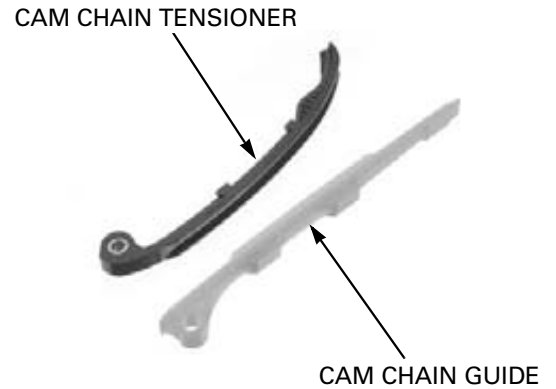


Reface the valve seats whenever the valve guides are replaced (page 9-19).

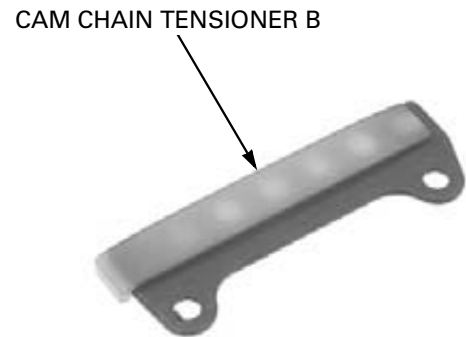
If the stem-to-guide clearance is out of standard, determine if a new guide with standard dimensions would bring the clearance within tolerance. If so, replace any guides as necessary and ream to fit. If the stem-to-guide clearance exceeds the service limit with the new guides, replace the valves and guides.

CAM CHAIN TENSIONER/CAM CHAIN GUIDE

Inspect the cam chain tensioner and cam chain guide for excessive wear or damage, replace them if necessary.



Inspect the cam chain tensioner B for excessive wear or damage, replace it if necessary.

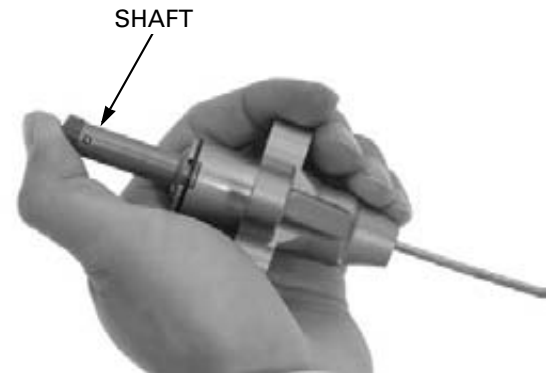


CAM CHAIN TENSIONER LIFTER

Check the cam chain tensioner lifter operation as follows.

The tensioner shaft should not go into the body when it is pushed.

When it is turned clockwise with the cam chain tensioner holder or a screwdriver, the tensioner shaft should be pulled into the body. The shaft springs out of the body as soon as the stopper tool is released.



VALVE GUIDE REPLACEMENT

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

Do not use a torch to heat the cylinder head; it may cause warping.

Heat the cylinder head to 100 – 150°C (212 – 300°F) with a hot plate or oven.

To avoid burns, wear heavy gloves when handling the heated cylinder head.

Support the cylinder head and drive out the valve guides from combustion chamber side of the cylinder head.

TOOL:

Valve guide driver

07HMD-ML00101



CYLINDER HEAD/VALVES

Drive in the guides to the specified depth from the top of the cylinder head.

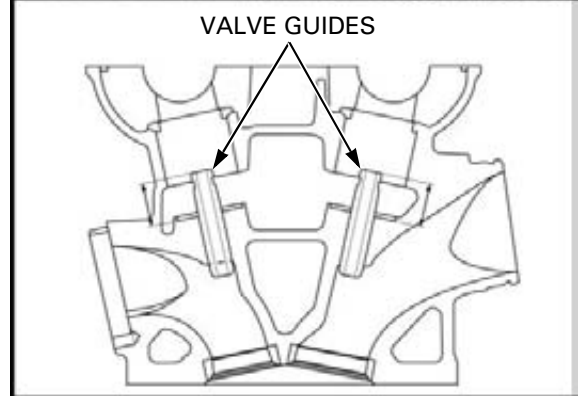
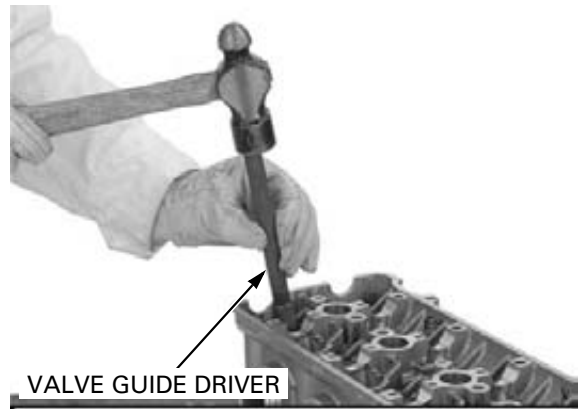
TOOL:

Valve guide driver **07743-002000**

SPECIFIED DEPTH:

IN/EX: 16.0 – 16.3 mm (0.63 – 0.64 in)

Let the cylinder head cool to room temperature.



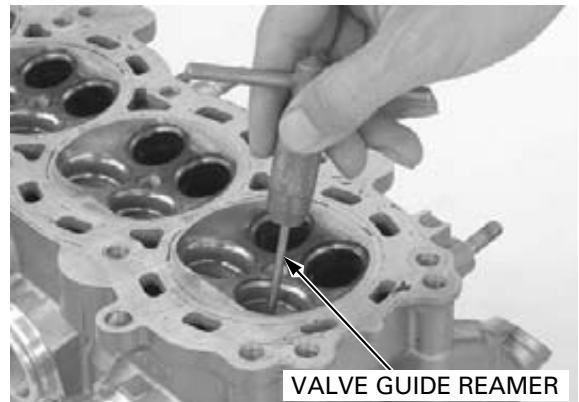
Use cutting oil on the reamer during this operation.

Ream the new valve guides after installation. Insert the reamer from the combustion chamber side of the head and also always rotate the reamer clockwise.

TOOL:

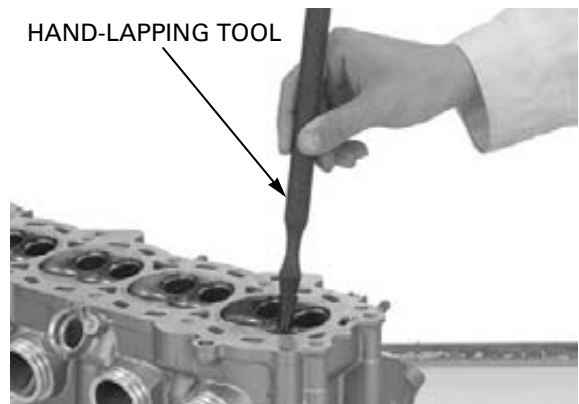
Valve guide reamer, 4.5 mm **07HMH-ML00101**

Clean the cylinder head thoroughly to remove any metal particles.
Reface the valve seat (page 9-19).



VALVE SEAT INSPECTION/REFACING

Clean the intake and exhaust valves thoroughly to remove carbon deposits.
Apply a light coating of Prussian Blue to the valve seats.
Tap the valves and seats using a rubber hose or other hand-lapping tool.



Remove the valve and inspect the valve seat face. The valve seat contact should be within the specified width and even all around the circumference.

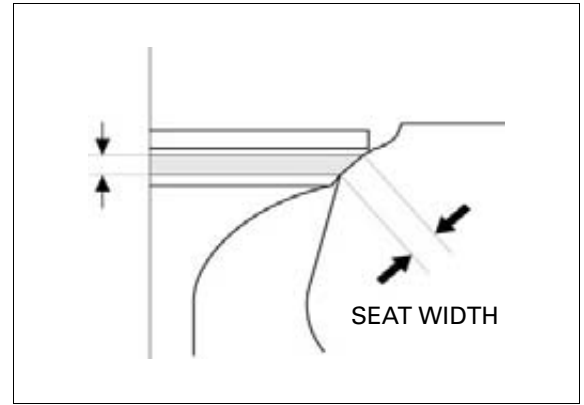
STANDARD:

IN/EX: 0.90 – 1.10 mm (0.035 – 0.043 in)

SERVICE LIMIT:

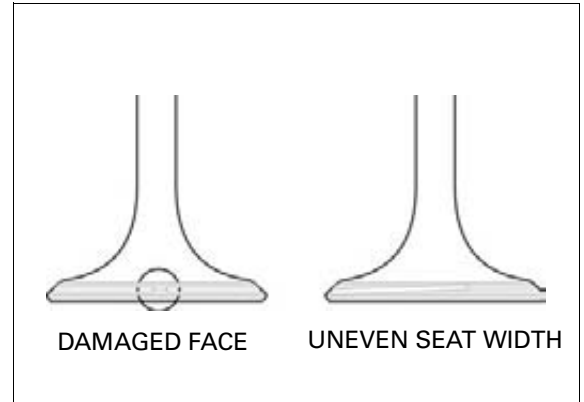
IN/EX: 1.5 mm (0.06 in)

If the seat width is not within specification, reface the valve seat (page 9-19).



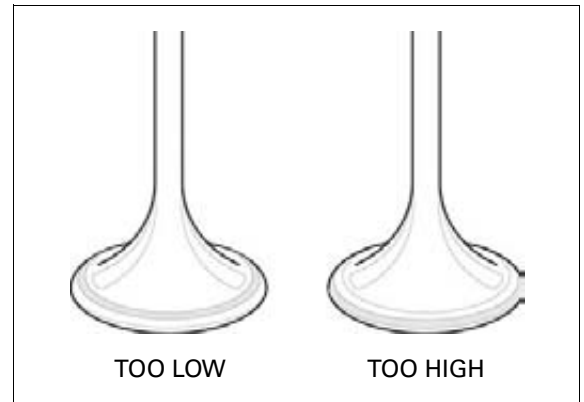
Inspect the valve seat face for:

- Uneven seat width:
 - Replace the valve and reface the valve seat.
- Damaged face:
 - Replace the valve and reface the valve seat.



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

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

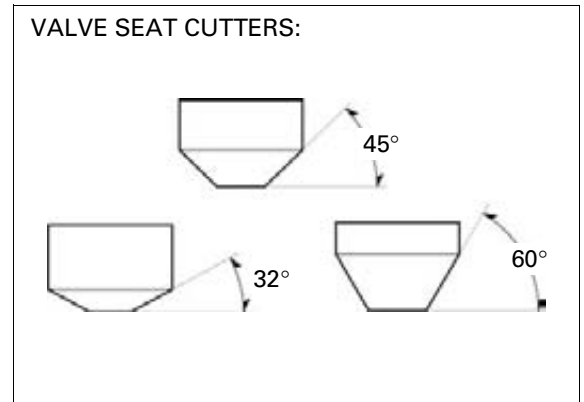


VALVE SEAT REFACING

Follow the refacing manufacturer's operating instructions.

Valve seat cutters/grinders or equivalent valve seat refacing equipment are recommended to correct worn valve seats.

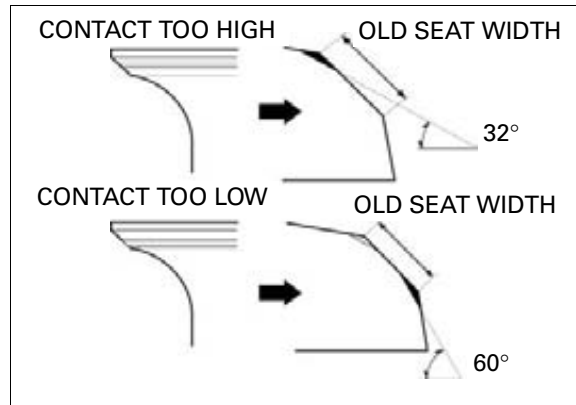
VALVE SEAT CUTTERS:



CYLINDER HEAD/VALVES

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

If the contact area is too low on the valve, the seat must be raised using a 60-degree interior cutter.

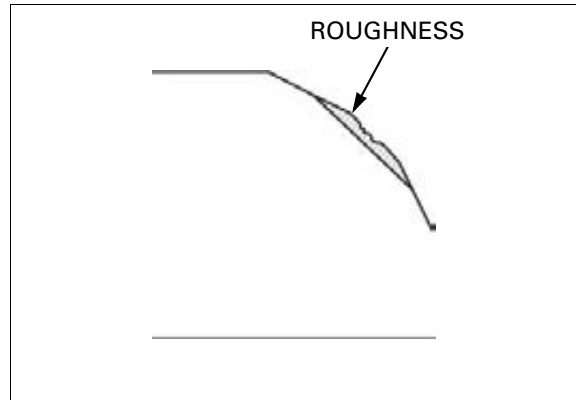


Reface the seat with a 45-degree cutter whenever a valve guide is replaced.

Use a 45-degree cutter to remove any roughness or irregularities from the seat.

TOOLS:

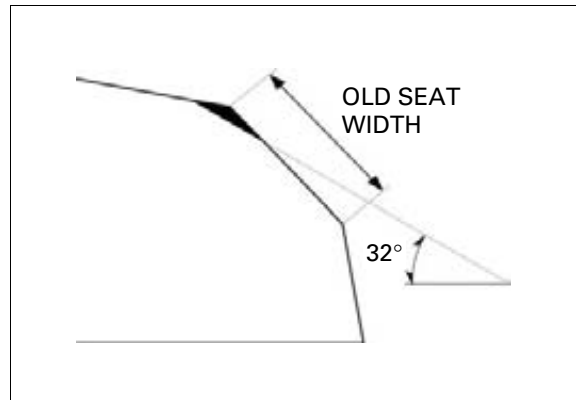
Seat cutter, 29 mm (IN) 07780-0010300
Seat cutter, 24.5 mm (EX) 07780-0010100
Cutter holder, 4.5 mm 07781-0010600
or equivalent commercially available



Use a 32-degree cutter to remove the top 1/4 of the existing valve seat material.

TOOLS:

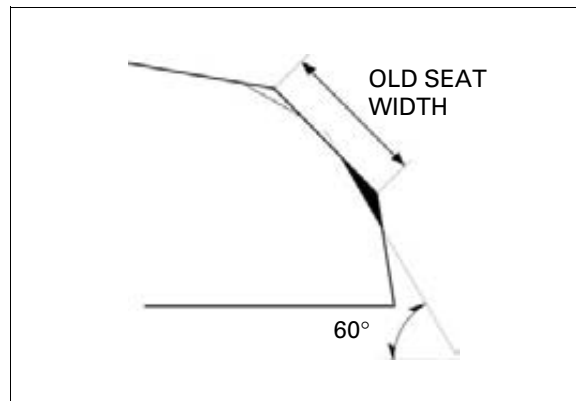
Flat cutter, 30 mm (IN) 07780-0012200
Flat cutter, 27 mm (EX) 07780-0013300
Cutter holder 07781-0010600
or equivalent commercially available



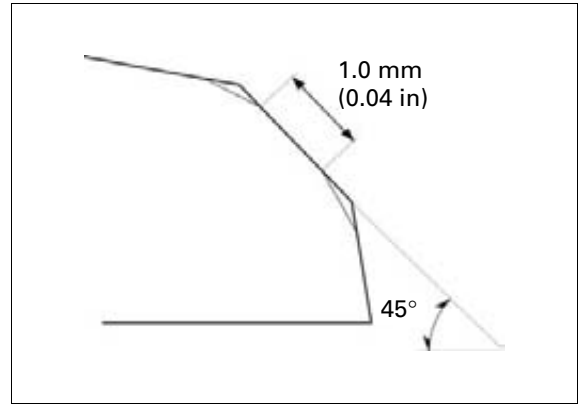
Use a 60-degree cutter to remove the bottom 1/4 of the old seat.

TOOLS:

Interior cutter, 30 mm (IN) 07780-0014000
Interior cutter, 26 mm (EX) 07780-0014500
Cutter holder 07781-0010600
or equivalent commercially available



Using a 45-degree seat cutter, cut the seat to the proper width. Make sure that all pitting and irregularities are removed. Refinish if necessary.



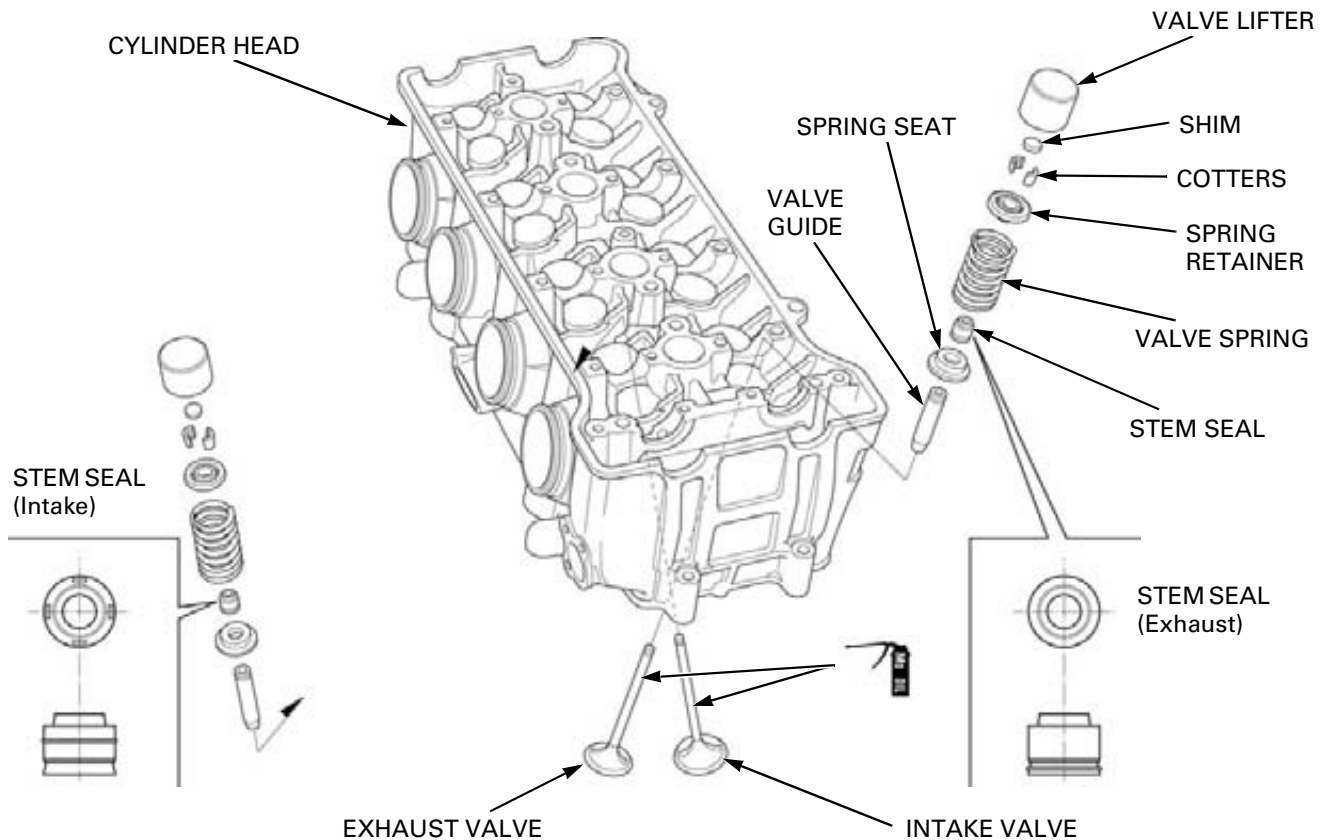
After cutting the seat, apply lapping compound to the valve face, and lap the valve using light pressure.

- Excessive lapping pressure may deform or damage the seat.
- Change the angle of lapping tool frequently to prevent uneven seat wear.
- Do not allow lapping compound to enter the guides.

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



CYLINDER HEAD ASSEMBLY



CYLINDER HEAD/VALVES

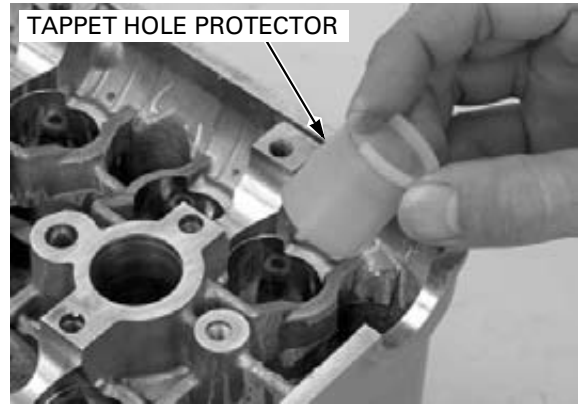
Blow through all oil passages in the cylinder head with compressed air.

Install the tappet hole protector into the valve lifter bore.

TOOL:

Tappet hole protector

07HMG-MR70002 or refer to page 9-14 for alternative tool

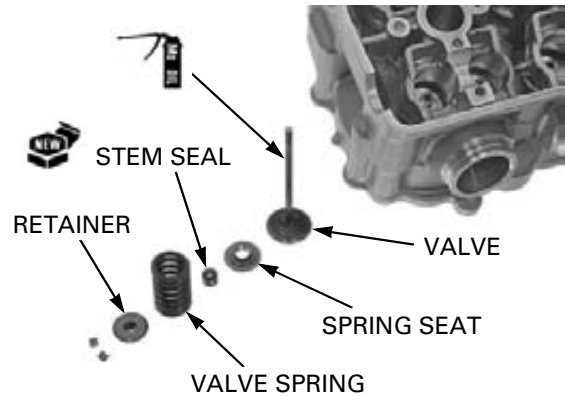


Install the valve spring seats.

Install the new stem seals.

Lubricate the valve stems with molybdenum oil solution.

Insert the valve into the valve guide while turning it slowly to avoid damage to the stem seal.



Install the valve springs with the tightly wound coils facing the combustion chamber.

Install the valve spring retainer.



COMBUSTION CHAMBER SIDE

Grease the cotters to ease installation.

Install the valve cotters using the special tools as shown.

NOTE:

To prevent loss of tension, do not compress the valve spring more than necessary.

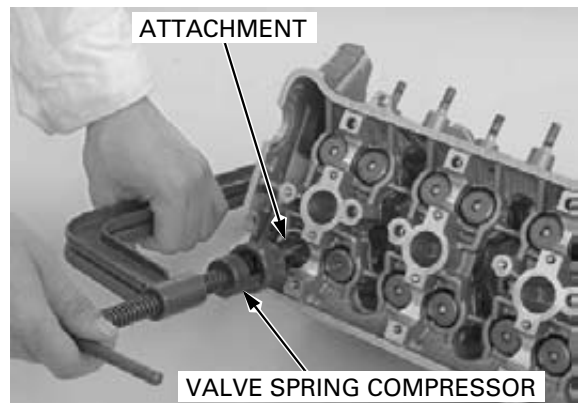
TOOLS:

Valve spring compressor

07757-0010000

Valve spring compressor attachment

07959-KM30101



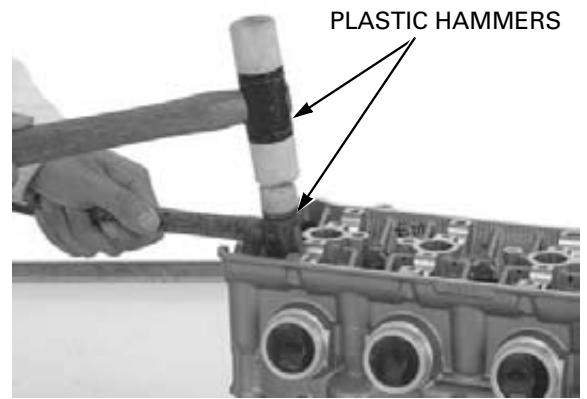
CYLINDER HEAD/VALVES

Support the cylinder head above the work bench surface to prevent possible valve damage.

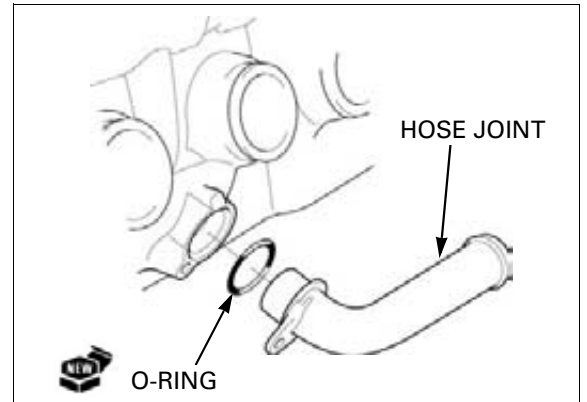
Tap the valve stems gently with two plastic hammers as shown to seat the cotters firmly.

Install and tighten the spark plugs.

TORQUE: 16 N·m (1.6 kgf·m, 12 lbf·ft)

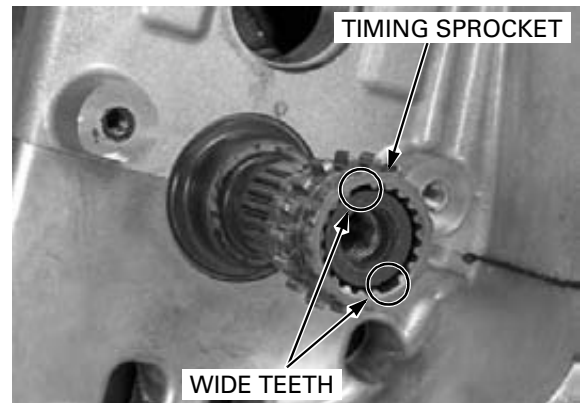


Install the new O-ring onto the water hose joint. Install the water hose joint to the cylinder head and tighten the bolt securely.

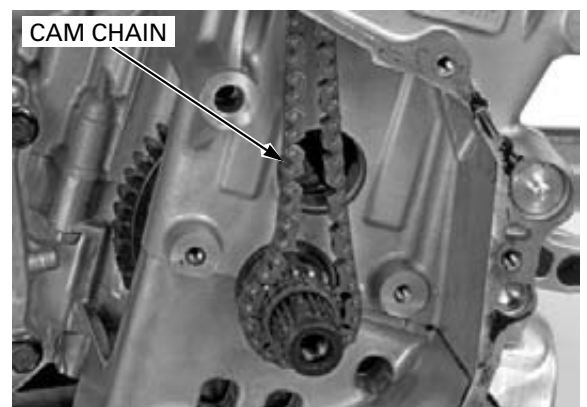


CYLINDER HEAD INSTALLATION

Install the timing sprocket by aligning the wide teeth between the crankshaft and timing sprocket.

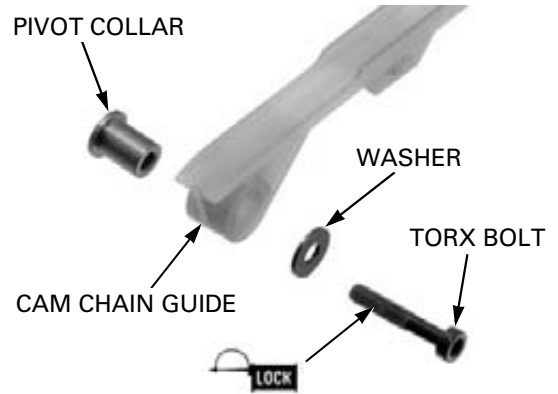


Install the cam chain.

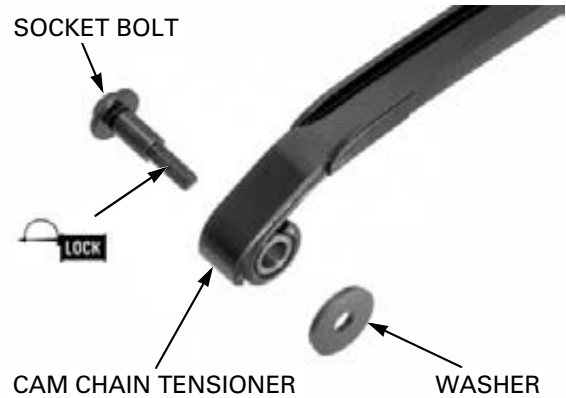


CYLINDER HEAD/VALVES

Apply a locking agent to the cam chain guide torx bolt threads.
Install the pivot collar, cam chain guide, washer and torx bolt.



Apply a locking agent to the cam chain tensioner socket bolt threads.
Install the washer, cam chain tensioner and socket bolt.



Tighten the cam chain guide torx bolt to the specified torque.

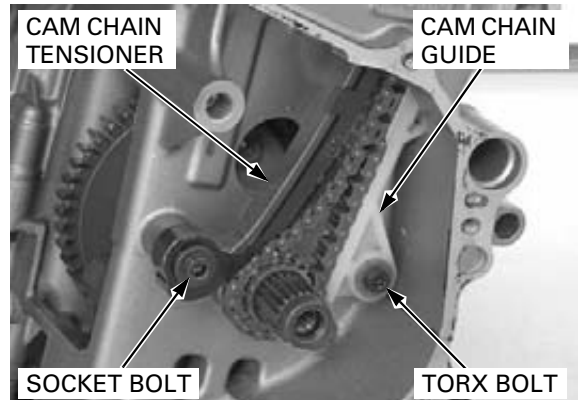
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Tighten the cam chain tensioner socket bolt to the specified torque.

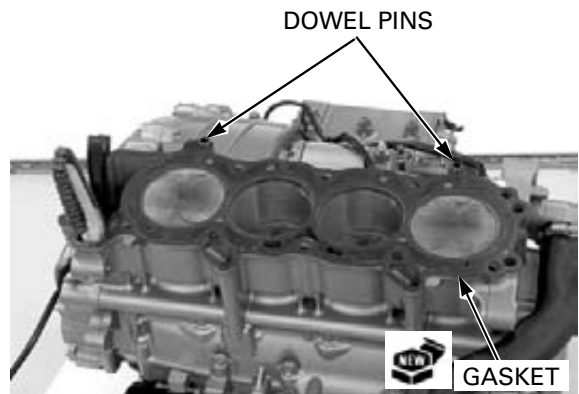
TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the following:

- Starter clutch (page 10-32)
- Right crankcase cover (page 10-33)



Install the dowel pins and a new cylinder head gasket as shown.



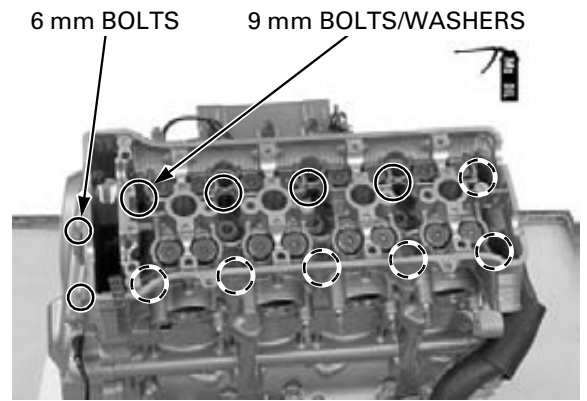
Apply molybdenum disulfide oil solution to the threads and seating surface of the 9 mm bolts/washers and install them.

Install the two 6 mm flange bolts.

Tighten the 9 mm bolts in a crisscross pattern in two or three steps to the specified torque.

TORQUE: 51 N·m (5.2 kgf·m, 38 lbf·ft)

Tighten the 6 mm flange bolts.



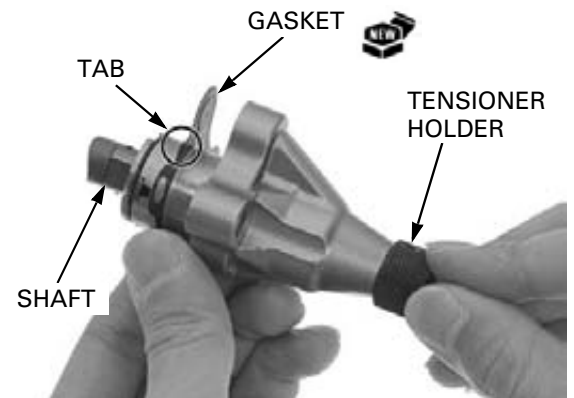
Retract the cam chain tensioner lifter shaft and secure it using the cam chain tensioner holder.

TOOL:

Cam chain tensioner holder 07ZMG-MCAA400

Point the gasket tab as shown.

Install a new gasket onto the cam chain tensioner lifter.



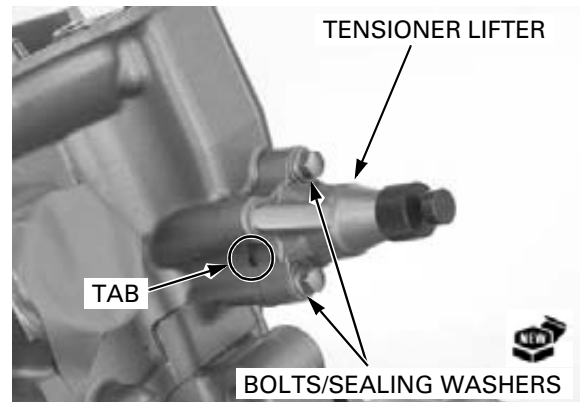
Make sure the gasket tab is in the direction as shown.

Install the cam chain tensioner lifter onto the cylinder head with new gasket.

Install the mounting bolts with the new sealing washers.

Tighten the mounting bolts securely.

Install the engine into the frame (page 8-8).

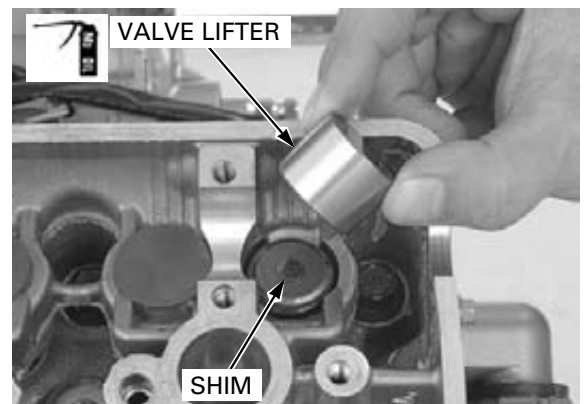


CAMSHAFT INSTALLATION

Apply molybdenum oil solution to the outer surface of the each valve lifter.

Install the shims and valve lifters in their original locations.

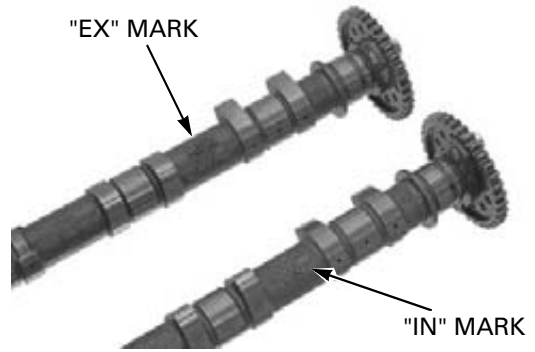
Install the shims on the retainers and valve lifters into the valve lifter bores.



CYLINDER HEAD/VALVES

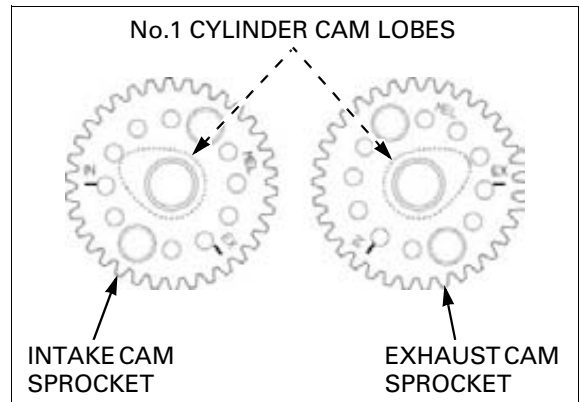
The each camshaft has identification mark.

- IN: Intake camshaft
- EX: Exhaust camshaft

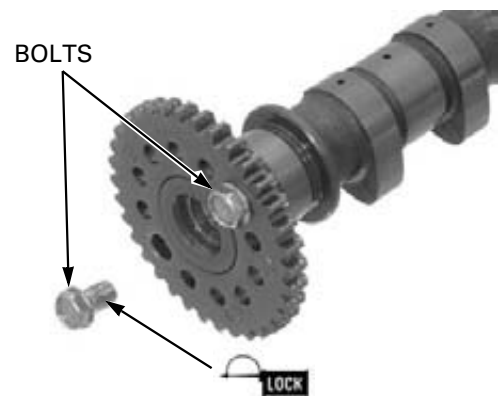


If the cam sprockets are removed, install the cam sprockets onto the camshafts.

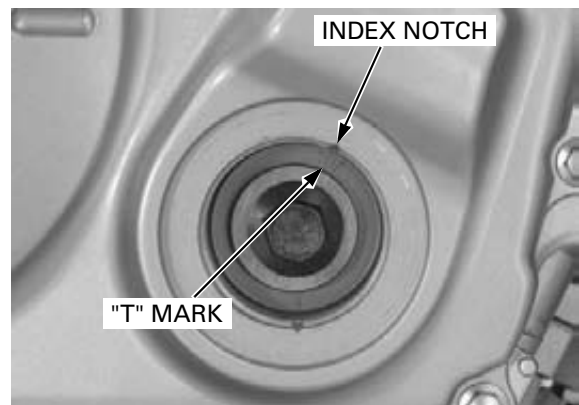
- Install the intake cam sprocket with the timing mark (IN) facing outward and the No.1 cam lobes facing up and out as shown.
- Install the exhaust cam sprocket with the timing mark (EX) facing outward and the No.1 cam lobes facing up and out as shown.



Clean the cam sprocket bolt threads and apply a locking agent.
Install the cam sprockets and bolts.

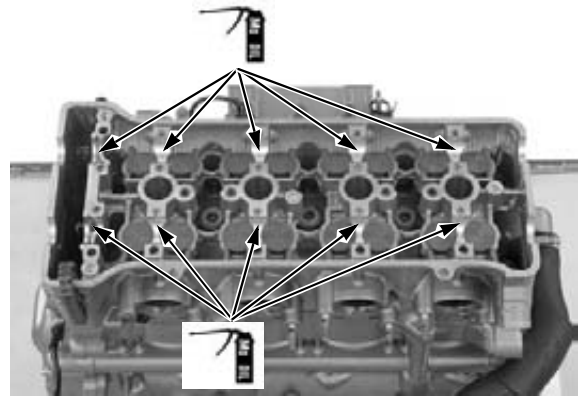


Turn the crankshaft clockwise and align the "T" mark on the starter clutch outer with the index notch on the right crankcase cover.



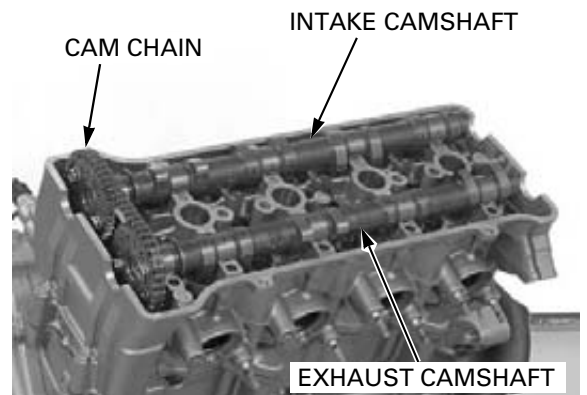
CYLINDER HEAD/VALVES

Apply molybdenum oil solution to the camshaft journal of the cylinder head.

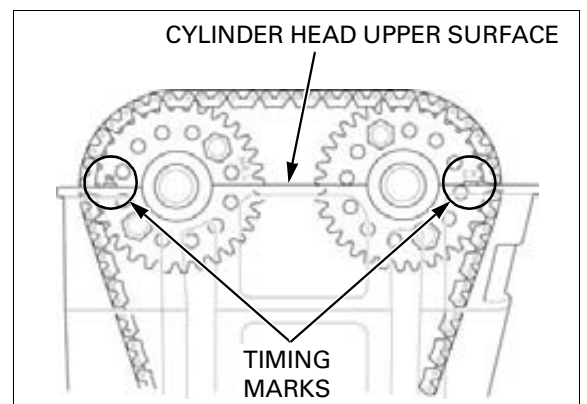


Install the cam chain over the cam sprockets and then install the intake and exhaust camshafts.

- Install each camshaft to the correct locations with the identification marks.
"IN": Intake camshaft
"EX": Exhaust camshaft



- Make sure that the timing marks on the cam sprockets are facing outward and flush with the cylinder head upper surface as shown.

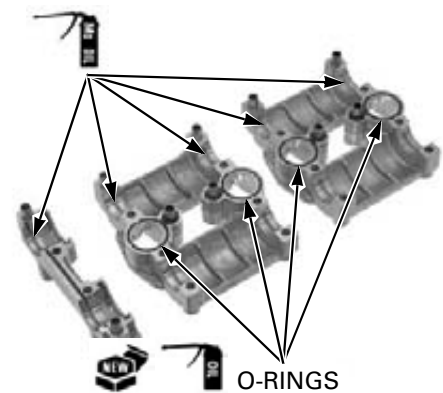


Coat new O-rings with clean engine oil and install them into the grooves in the camshaft holders.

Apply molybdenum oil solution to the camshaft journals of the camshaft holders.

Install each camshaft holder onto the camshafts.

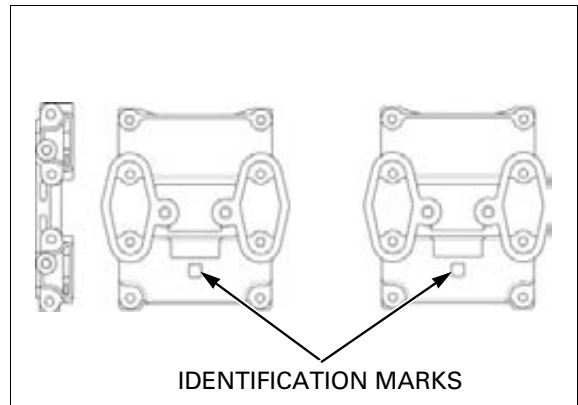
Be sure to align the dowel pins in the camshaft holder with the holes in the cylinder head.



CYLINDER HEAD/VALVES

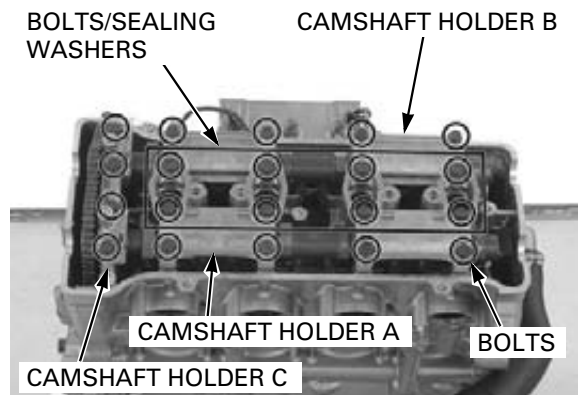
Note the correct locations with the identification marks as shown.

- No mark: right camshaft holder
- "R" mark: center camshaft holder
- "L" mark: left camshaft holder



Apply engine oil to the threads and seating surfaces of the camshaft holder bolts. Install the twenty holder bolts with new eight sealing washers as shown.

Finger tighten the bolts.



First gradually tighten the four bolts (No.1 – No.2 – No.7 – No.8) in the numerical order cast on the camshaft holders.

Gradually tighten the other camshaft holder bolts until the camshaft holders lightly contact the cylinder head surface.

NOTICE

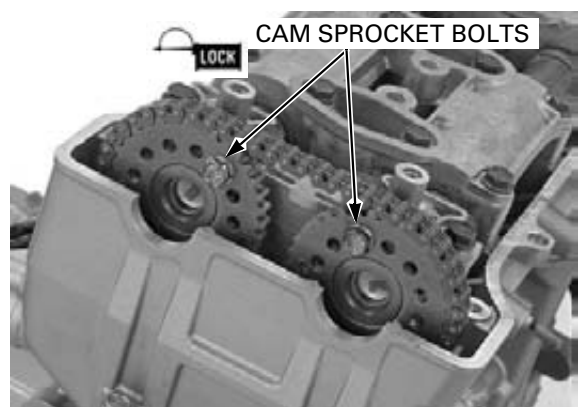
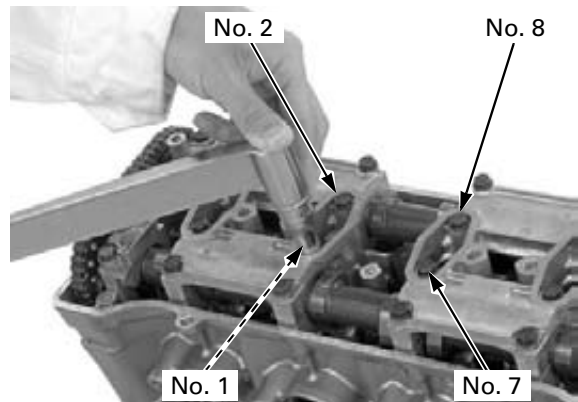
Failure to tighten the camshaft holder in a crisscross pattern might cause a camshaft holder to break.

Tighten all camshaft holder bolts in the numerical order cast on the camshaft holders.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

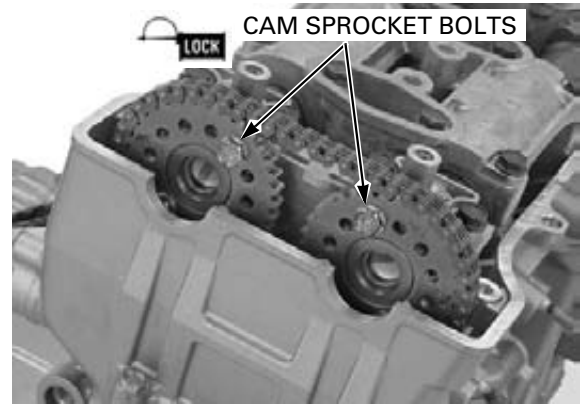
In case the cam sprockets were removed, apply a locking agent to the cam sprocket bolt threads. Tighten the cam sprocket bolts to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)

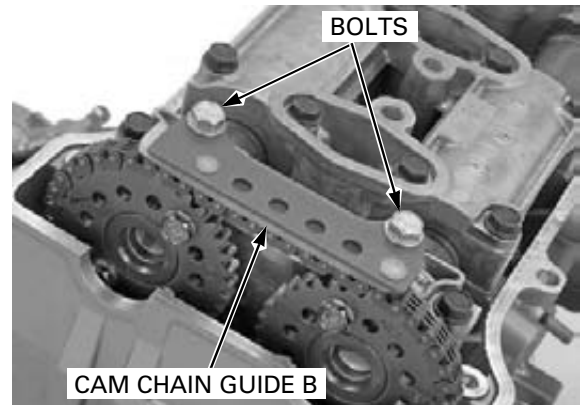


CYLINDER HEAD/VALVES

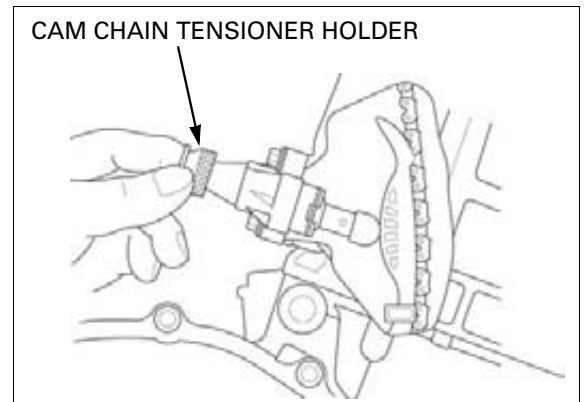
Turn the crankshaft clockwise one full turn (360°) and tighten the other cam sprocket bolts.



Install the cam chain guide B, and tighten the bolts.



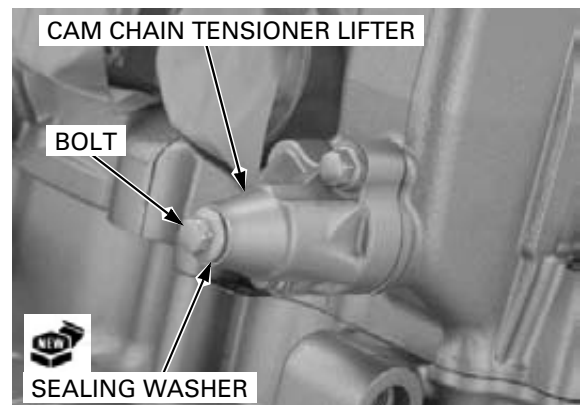
Remove the special tool from the cam chain tensioner lifter.



Install a new sealing washer and tighten the sealing bolt.

Recheck the valve timing.

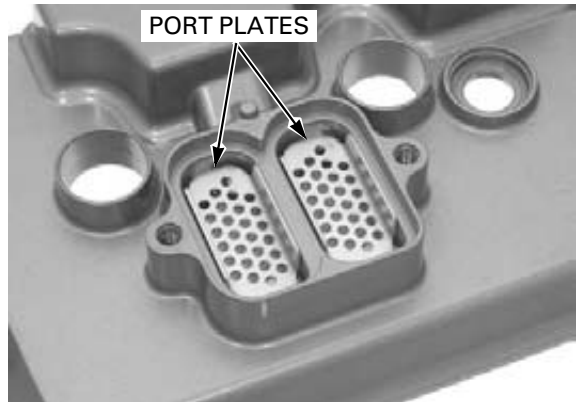
Install the cylinder head cover (page 9-31).



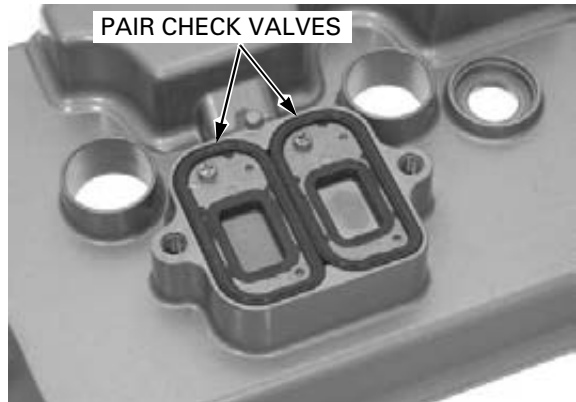
CYLINDER HEAD/VALVES

CYLINDER HEAD COVER ASSEMBLY

Install the PAIR check valve port plates into the cylinder head cover.



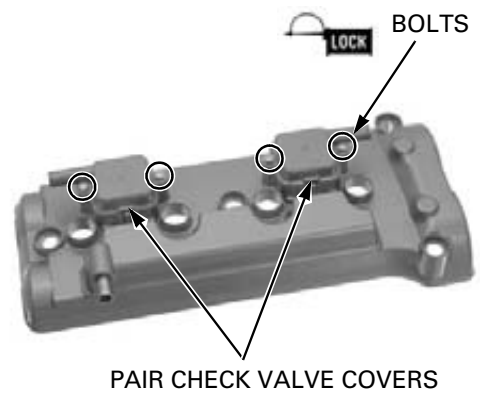
Install the PAIR check valves into the cylinder head cover.



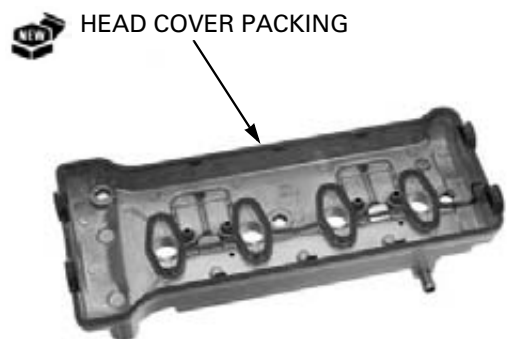
Apply a locking agent to the PAIR check valve cover mounting bolt threads.

Install the PAIR check valve cover and tighten the bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

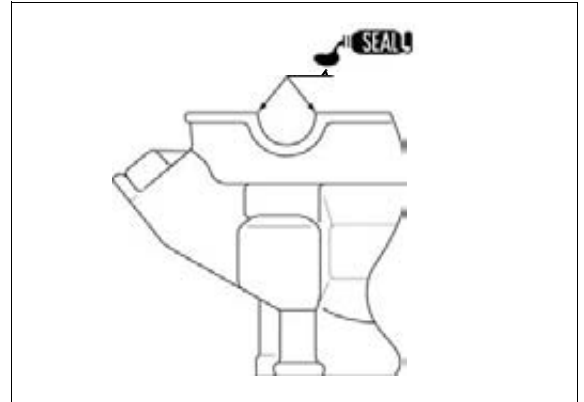


Install the new cylinder head cover packing into the cylinder head cover grooves.



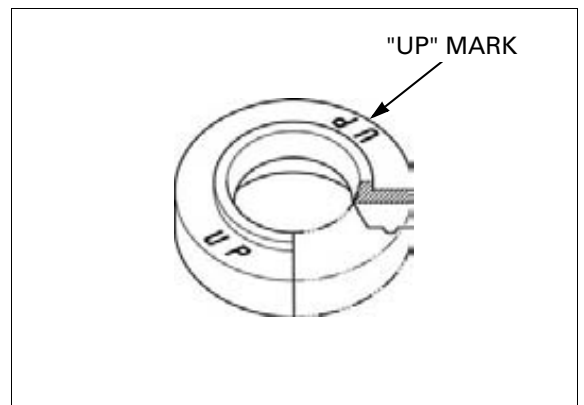
CYLINDER HEAD COVER INSTALLATION

Apply sealant to the cylinder head semi-circular cut-outs as shown.



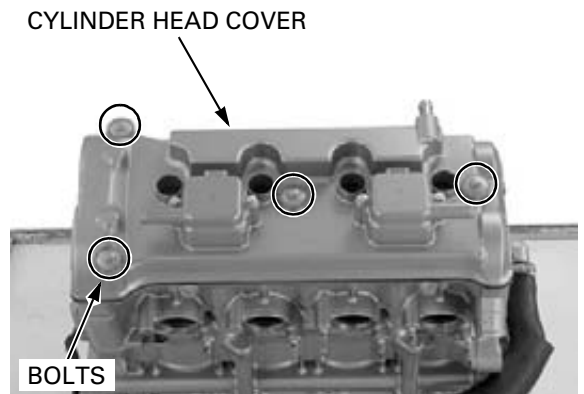
Install the cylinder head cover onto the cylinder head.

Install the washers to the cylinder head cover with their "UP" mark facing up.



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 to the cylinder head cover.

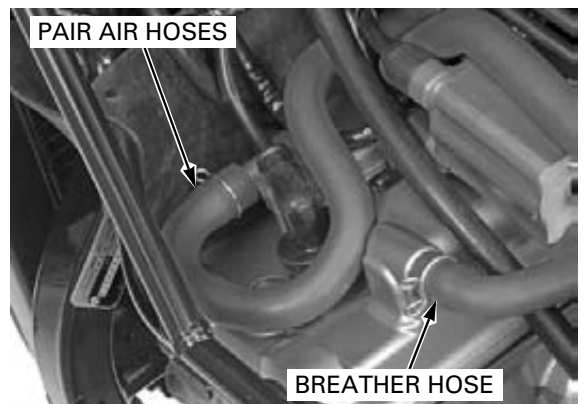
Install the PAIR control solenoid valve and connect the air hoses (page 6-85).

Connect the spark plug caps (page 4-10).

Install the fuel tank (page 6-59).

If the cylinder head was removed, perform as follows:

- Fill and bleed the cooling system (page 7-6)
- Fill the crankcase with engine oil (page 4-16)



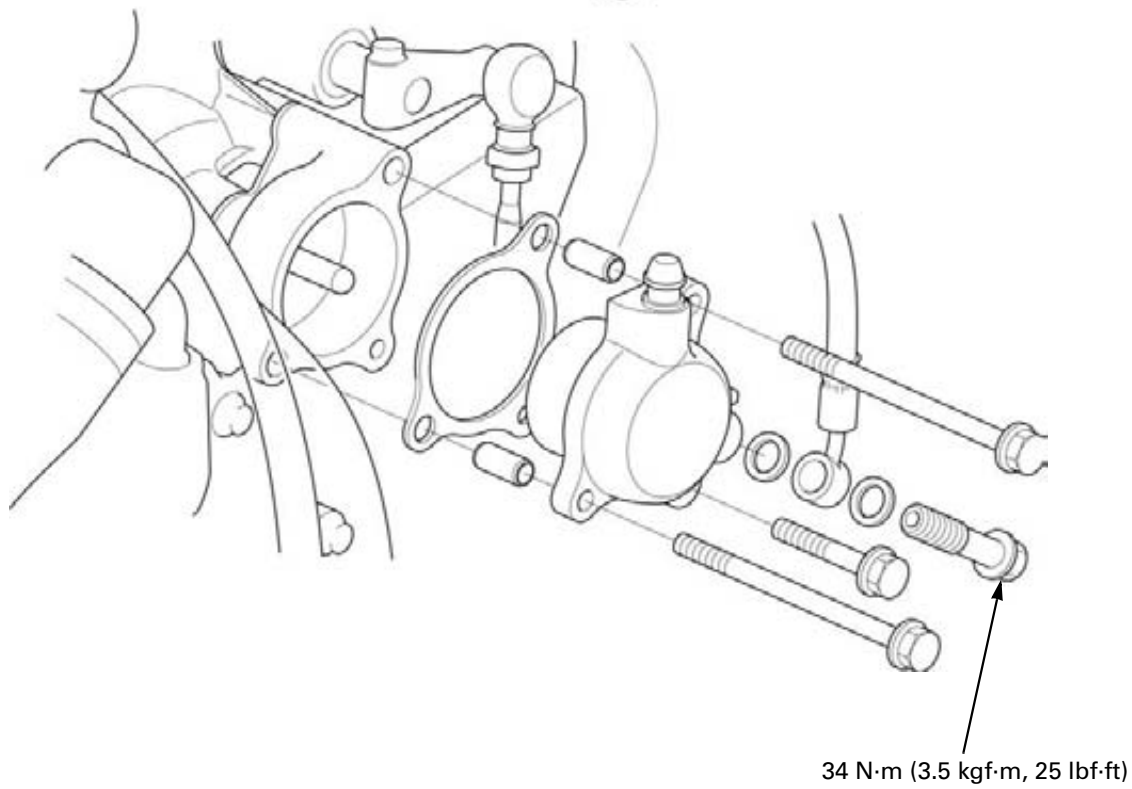
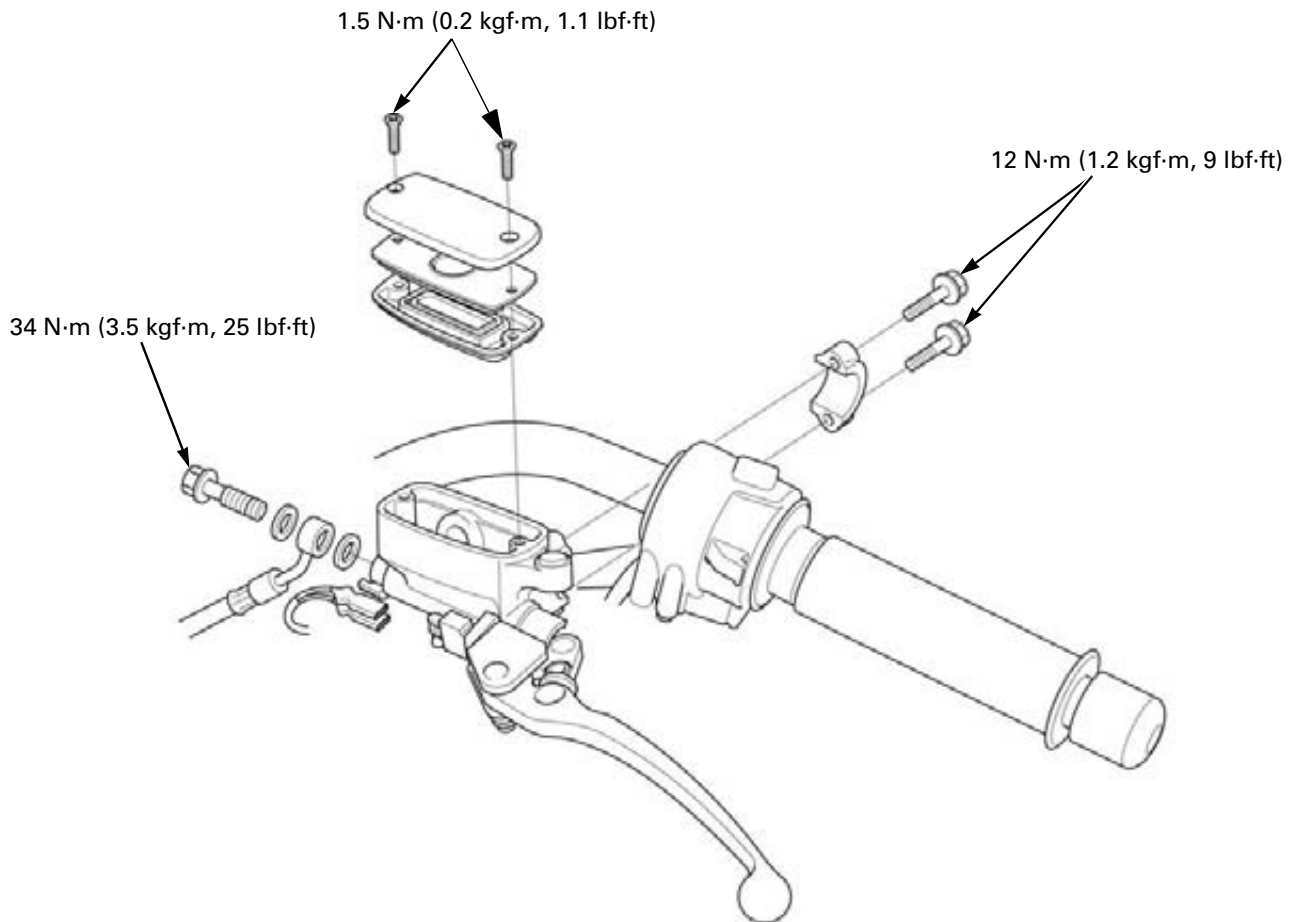
MEMO

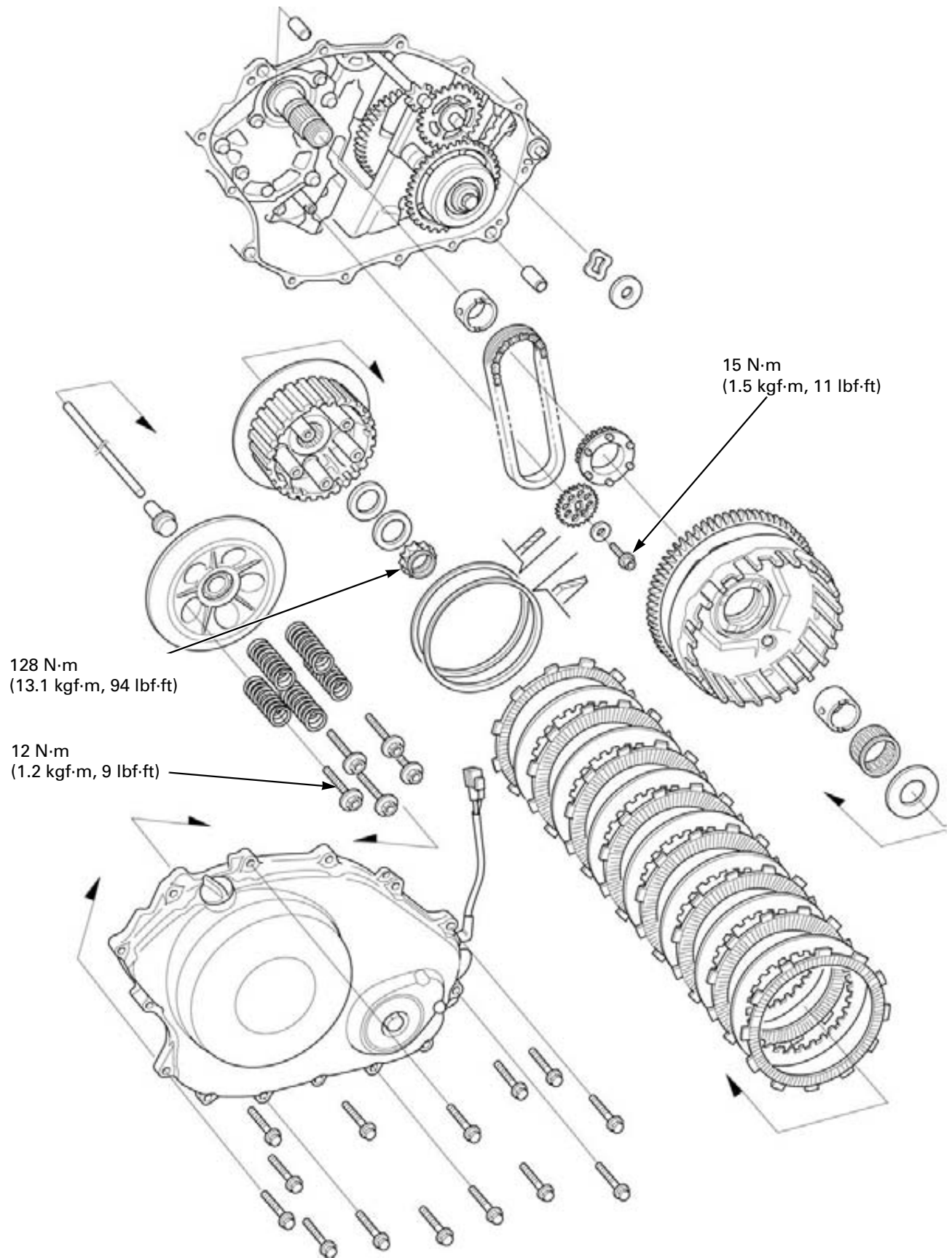
10. CLUTCH/STARTER CLUTCH

COMPONENT LOCATION	10-2	CLUTCH SLAVE CYLINDER.....	10-13
SERVICE INFORMATION	10-4	RIGHT CRANKCASE COVER REMOVAL	10-15
TROUBLESHOOTING	10-5	CLUTCH	10-17
CLUTCH FLUID REPLACEMENT/ AIR BLEEDING	10-6	STARTER CLUTCH	10-28
CLUTCH MASTER CYLINDER.....	10-8	RIGHT CRANKCASE COVER INSTALLATION	10-33

CLUTCH/STARTER CLUTCH

COMPONENT LOCATION





CLUTCH/STARTER CLUTCH

SERVICE INFORMATION

GENERAL

NOTICE

Spilled 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 reservoir is horizontal first.

- This section covers service of the clutch and starter clutch. All service can be done with the engine installed in the frame.
- Transmission oil viscosity and level have an effect on clutch disengagement. When the clutch does not disengage or the motorcycle creeps with clutch disengaged, inspect the transmission oil level before servicing the clutch system.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Specified clutch fluid		DOT 4 brake fluid	–
Clutch master cylinder	Master cylinder I.D.	12.700 – 12.743 (0.5000 – 0.5017)	12.755 (0.5022)
	Master piston O.D.	12.657 – 12.684 (0.4983 – 0.4994)	12.645 (0.4978)
Clutch	Spring free length	58.2 (2.29)	55.7 (2.19)
	Disc A thickness	3.72 – 3.88 (0.146 – 0.153)	3.4 (0.13)
	Disc B thickness	3.22 – 3.38 (0.127 – 0.133)	2.9 (0.11)
	Plate warpage	–	0.30 (0.012)
Clutch outer guide A (Without ID mark)	I.D.	27.993 – 28.003 (1.1021 – 1.1025)	28.012 (1.1028)
	O.D.	35.004 – 35.012 (1.3781 – 1.3784)	34.994 (1.3777)
Clutch outer guide B (With ID mark)	I.D.	27.993 – 28.003 (1.1021 – 1.1025)	28.012 (1.1028)
	O.D.	34.996 – 35.004 (1.3778 – 1.3781)	34.986 (1.3774)
Primary driven gear I.D.	A	41.008 – 41.016 (1.6145 – 1.6148)	41.026 (1.6152)
	B	41.000 – 41.008 (1.6142 – 1.6145)	41.018 (1.6149)
Oil pump drive sprocket guide	I.D.	28.000 – 28.021 (1.1024 – 1.1032)	28.030 (1.1035)
	O.D.	34.975 – 34.991 (1.3770 – 1.3776)	34.965 (1.3766)
Oil pump drive sprocket I.D.		35.025 – 35.145 (1.3789 – 1.3837)	35.155 (1.3841)
Mainshaft O.D. at clutch outer guide		27.980 – 27.990 (1.1016 – 1.1020)	27.96 (1.101)
Mainshaft O.D. at oil pump drive sprocket guide		27.980 – 27.990 (1.1016 – 1.1020)	27.96 (1.101)
Starter idle gear	Gear I.D.	10.013 – 10.035 (0.3942 – 0.3951)	10.05 (0.396)
	Shaft O.D.	9.991 – 10.000 (0.3933 – 0.3937)	9.98 (0.393)
Starter driven gear boss O.D.		45.657 – 45.673 (1.7975 – 1.7981)	45.642 (1.7969)

TORQUE VALUES

Clutch center lock nut	128 N·m (13.1 kgf·m, 94 lbf·ft)	Apply oil to the threads and seating surface. Stake the nut.
Clutch spring 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 a locking agent to the threads.
Right crankcase cover rubber plate bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply a locking agent to the threads. CT bolt
Starter clutch outer mounting bolt	83 N·m (8.5 kgf·m, 61 lbf·ft)	Apply oil to the threads and seating surface.
Clutch lever pivot bolt	1 N·m (0.1 kgf·m, 0.7 lbf·ft)	Apply silicone grease to the sliding surface.
Clutch lever pivot nut	5.9 N·m (0.6 kgf·m, 4.4 lbf·ft)	
Clutch master cylinder holder bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Clutch master cylinder reservoir cap screw	1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)	
Clutch switch mounting screw	1.2 N·m (0.1 kgf·m, 0.9 lbf·ft)	
Clutch hose oil bolt	34 N·m (3.5 kgf·m, 25 lbf·ft)	

TOOLS

<p>Snap ring pliers 07914-SA50001</p> 	<p>Clutch center holder 07724-0050002</p>  <p>or equivalent commercially available.</p>	<p>Gear holder, M2.5 07724-0010100</p> 
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TROUBLESHOOTING

Clutch lever soft or spongy

- Air in hydraulic system
- Low fluid level
- Hydraulic system leaking

Clutch lever too hard to pull in

- Sticking master cylinder piston
- Sticking slave cylinder
- Clogged hydraulic system
- Damaged clutch lifter mechanism
- Faulty clutch lifter bearing
- Clutch lifter piece installed improperly

Clutch slips when accelerating

- Hydraulic system sticking
- Worn clutch disc
- Weak clutch springs
- Transmission oil mixed with molybdenum or graphite additive

Clutch will not disengage or motorcycle creeps with clutch disengaged

- Air in hydraulic system
- Low fluid level
- Hydraulic system leaking or clogged
- Clutch plate warped
- Loose clutch lock nut
- Oil level too high
- Improper oil viscosity
- Damaged clutch lifter mechanism
- Clutch lifter piece installed improperly

Hard to shift

- Improper clutch operation
- Improper oil viscosity

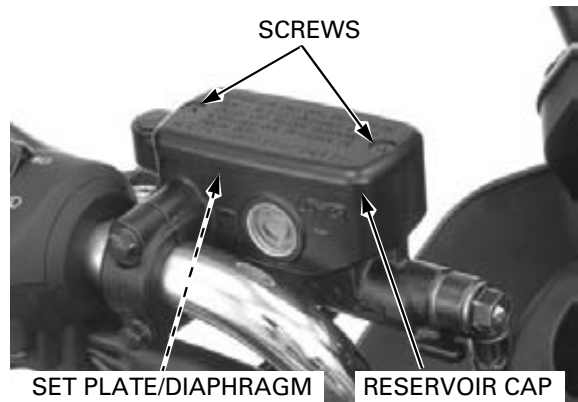
CLUTCH/STARTER CLUTCH

CLUTCH FLUID REPLACEMENT/AIR BLEEDING

CLUTCH FLUID DRAINING

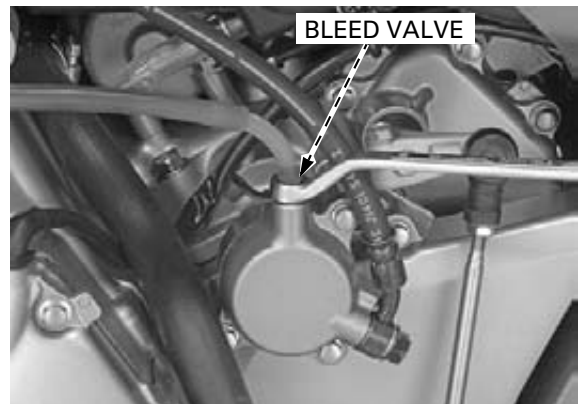
Turn the handlebar to the right until the reservoir is parallel to the ground, before removing the reservoir cap.

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



Connect a bleed hose to the bleed valve of the clutch slave cylinder.

Loosen the bleed valve and pump the clutch lever until fluid stops flowing out of the bleed valve.



CLUTCH FLUID FILLING/AIR 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.

Add brake fluid when the fluid level in the reservoir is low.

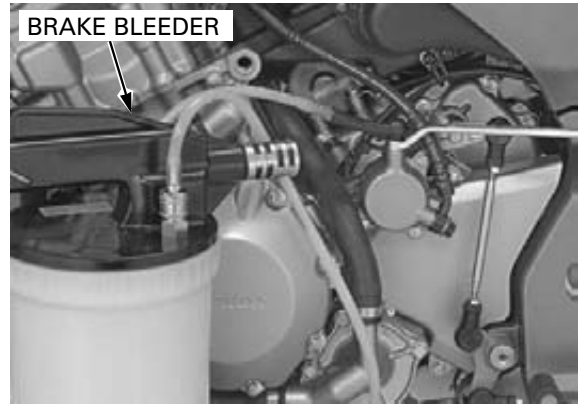
- Check the fluid level often while bleeding the clutch to prevent air from being pumped into the system.
- When using a brake bleeding tool, follow the manufacturer's operating instruction.



If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.

Repeat the above procedures until new fluid flows out of the bleed valve and air bubbles do not appear in the plastic hose.

Close the bleed valve and operate the clutch lever. If it is still spongy, bleed the system again.



If a brake bleeder is not available, use the following procedure.

Pump the clutch lever until lever resistance is felt.

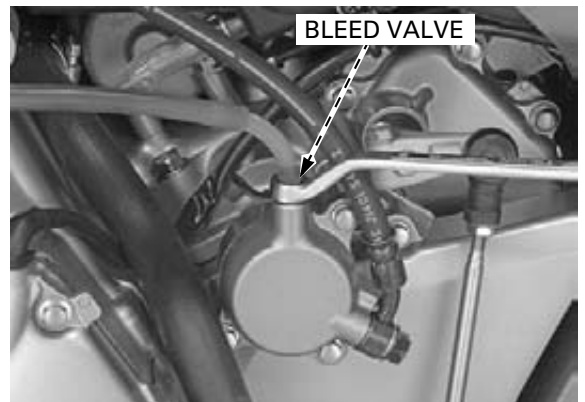
Connect a bleed hose to the bleed valve and bleed the system as follows:

1. Squeeze the clutch lever, open the bleed valve 1/4 of a turn and then close it. Do not release the clutch lever until the bleed valve has been closed.
2. Release the clutch lever slowly and wait several seconds after it reaches the end of its travel.



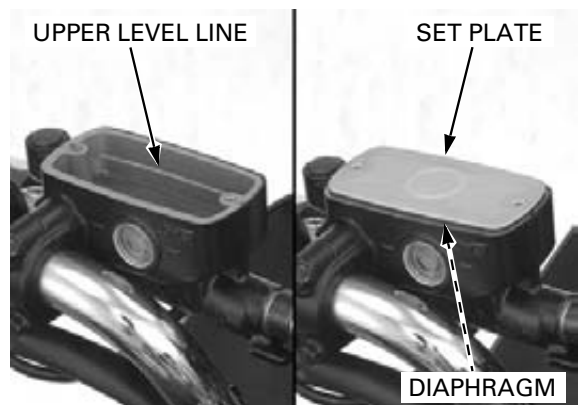
Repeat steps 1. and 2. until air bubbles do not appear in the bleed hose.

Tighten the bleed valve securely.



Fill the reservoir to the upper level line with DOT 4 brake fluid from a sealed container.

Install the diaphragm and set plate.

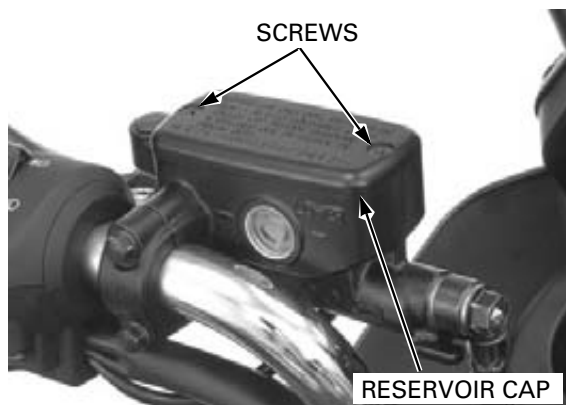


CLUTCH/STARTER CLUTCH

Install the reservoir cap and tighten the screws to the specified torque.

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

Check the clutch operation (page 4-28).



CLUTCH MASTER CYLINDER

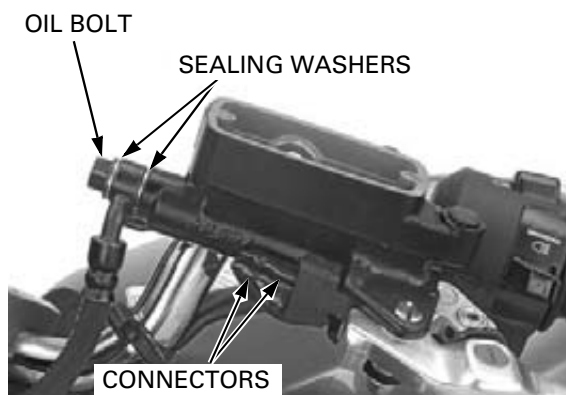
REMOVAL

NOTICE

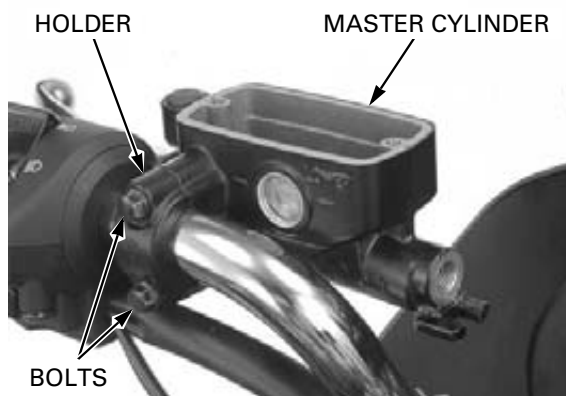
Spilled fluid can damage painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.

Drain the clutch hydraulic system (page 10-6).

Disconnect the clutch switch wire connectors. Remove the clutch hose oil bolt, sealing washers and clutch hose eyelet.

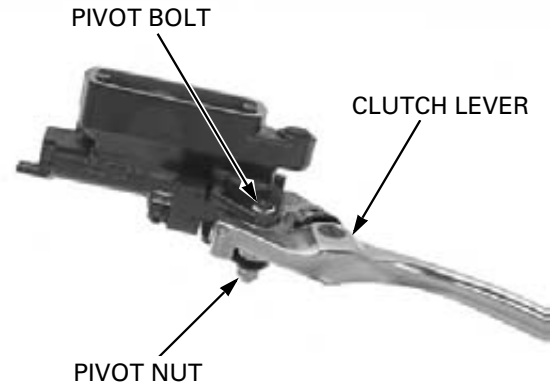


Remove the bolts, master cylinder and holder.

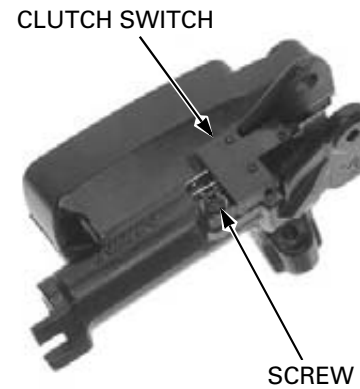


DISASSEMBLY

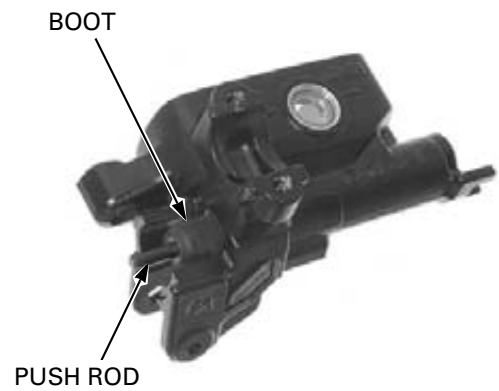
Remove the nut, pivot bolt and clutch lever assembly.



Remove the screw and clutch switch.



Remove the boot and push rod.

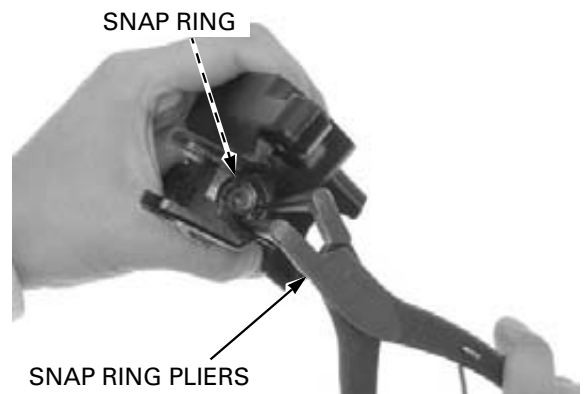


Remove the snap ring from the master cylinder body using the special tool as shown.

TOOL:

Snap ring pliers

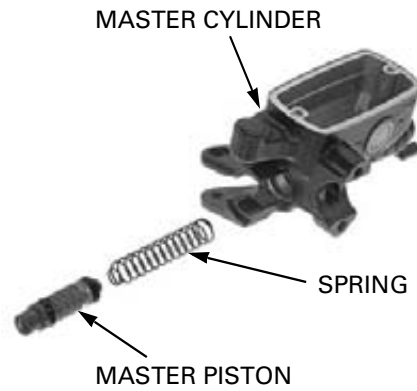
07914-SA50001



CLUTCH/STARTER CLUTCH

Remove the master piston assembly and spring.

Clean the inside of the master cylinder with brake fluid.



INSPECTION

Check the piston boot, primary cup and secondary cup for fatigue or damage.
Check the master cylinder and piston for abnormal scratches.

Measure the master cylinder I.D.

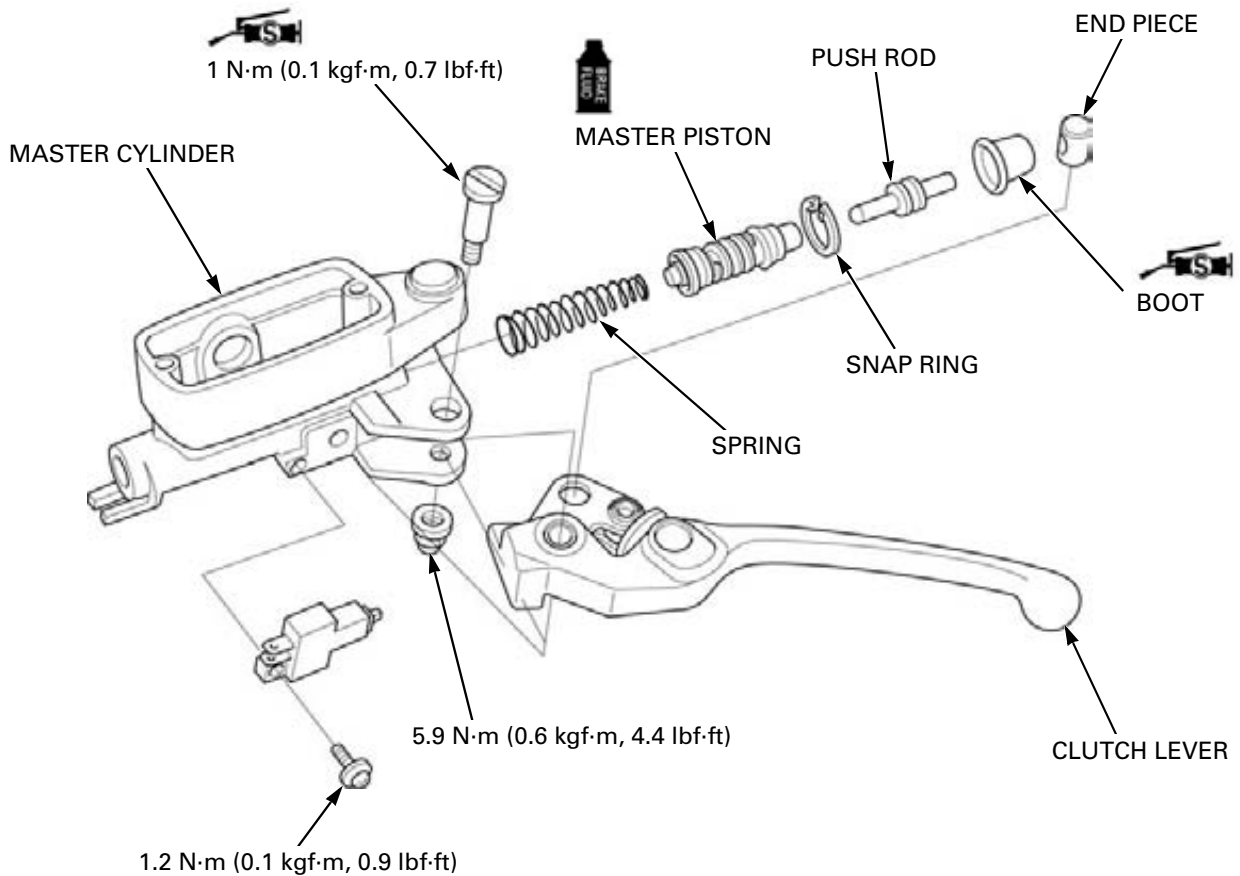
SERVICE LIMIT: 12.755 mm (0.5022 in)

Measure the master piston O.D.

SERVICE LIMIT: 12.645 mm (0.4978 in)



ASSEMBLY

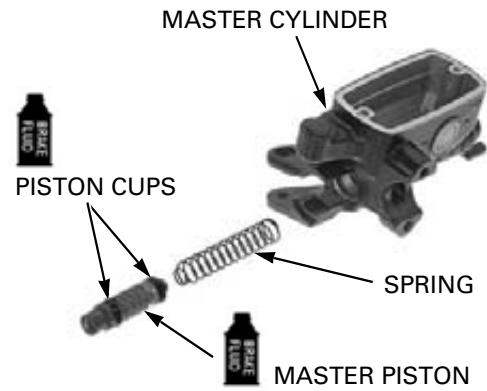


CLUTCH/STARTER CLUTCH

Coat all parts with clean brake fluid before assembly.
Dip the master piston in brake fluid.
Install the primary and secondary cups onto the master piston.

When installing the cups, do not allow the lips to turn inside out.

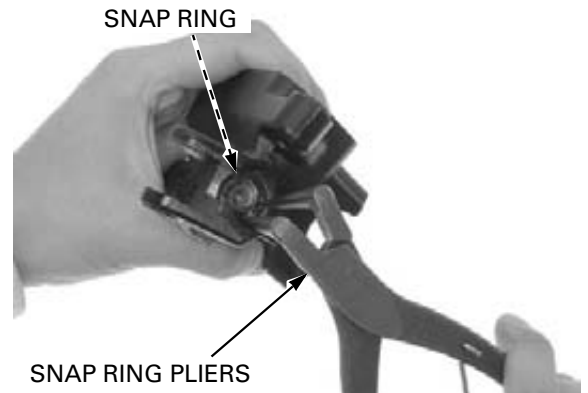
Install the spring and master piston assembly into the master cylinder.



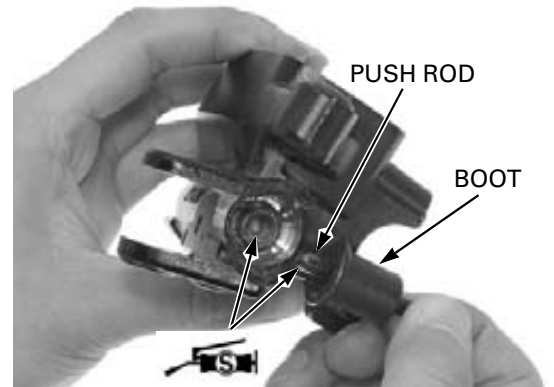
Be certain the snap ring is firmly seated in the groove.

Install the snap ring using the special tool.

TOOL:
Snap ring pliers **07914-SA50001**

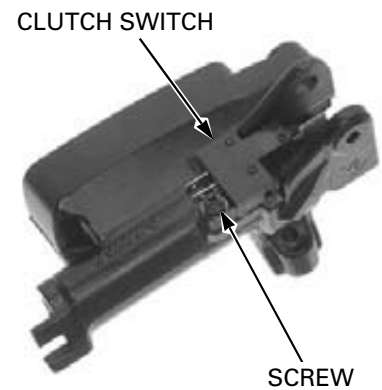


Apply silicone grease to the boot inside and tip of the push rod.



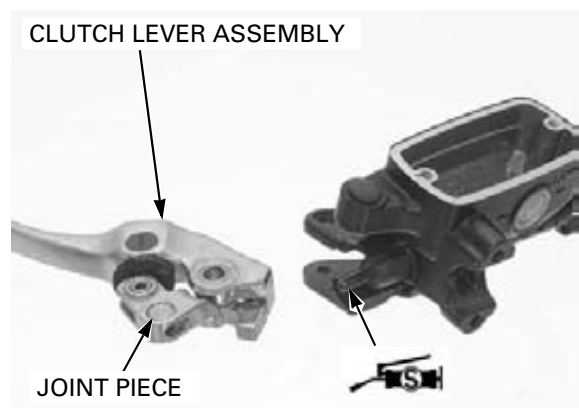
Install the clutch switch and tighten the screw to the specified torque.

TORQUE: 1.2 N·m (0.1 kgf·m, 0.9 lbf·ft)



CLUTCH/STARTER CLUTCH

Set the push rod in the joint piece hole. Apply silicone grease to the tip of the push rod, then install the joint piece and clutch lever assembly.



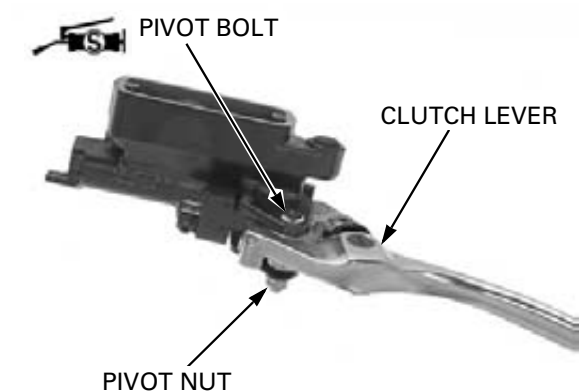
Apply silicone grease to the clutch lever pivot bolt sliding surface.

Install and tighten the pivot bolt to the specified torque.

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

Hold the pivot bolt and tighten the nut to the specified torque.

TORQUE: 5.9 N-m (0.6 kgf-m, 4.4 lbf-ft)



INSTALLATION

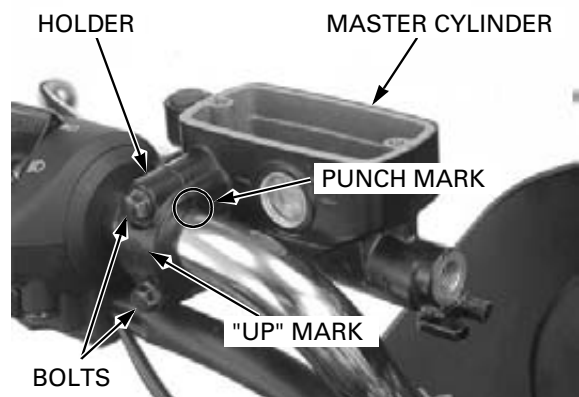
Install the master cylinder holder with the "UP" mark facing up.

Place the master cylinder assembly onto the handlebar and install the holder and bolts.

Align the end of the master cylinder with the punch mark on the handlebar.

Tighten the upper bolt first, then the lower bolt.

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



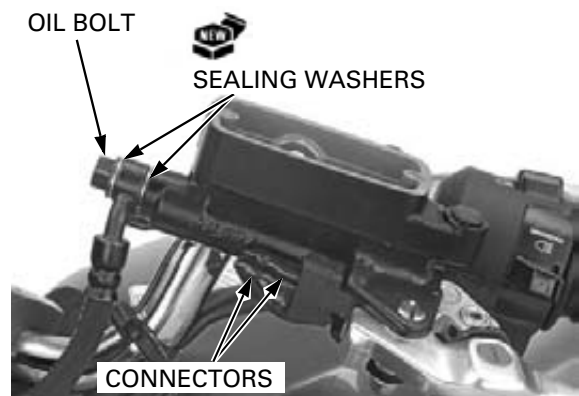
Install the clutch hose eyelet with the oil bolt and new sealing washers.

While pushing the clutch hose against the stopper, tighten the oil bolt to the specified torque.

TORQUE: 34 N-m (3.5 kgf-m, 25 lbf-ft)

Connect the clutch switch connectors.

Fill the reservoir to the upper level and bleed the hydraulic system (page 10-6).



CLUTCH SLAVE CYLINDER

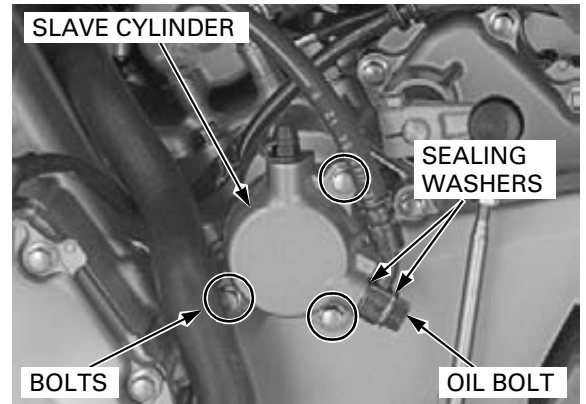
REMOVAL

Drain the clutch hydraulic system (page 10-6).

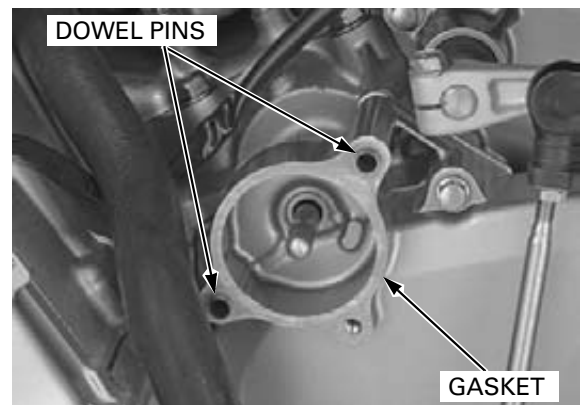
Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.

Remove the clutch hose oil bolt, sealing washers and clutch hose eyelet.

Remove the bolts and clutch slave cylinder assembly.



Remove the gasket and dowel pins.



DISASSEMBLY

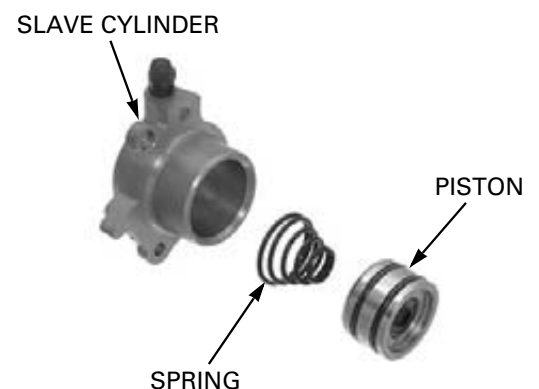
Place a shop towel over the piston to cushion the piston when it is expelled, and position the cylinder with the piston down.

Do not use high pressure air or bring the nozzle too close to the inlet.

Apply small squirts of air pressure to the fluid inlet to remove the piston.



Remove the piston and spring from the slave cylinder.



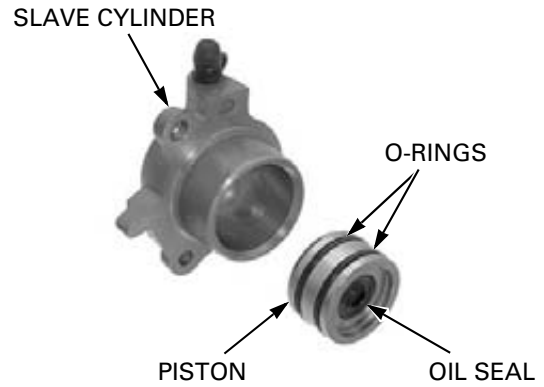
CLUTCH/STARTER CLUTCH

INSPECTION

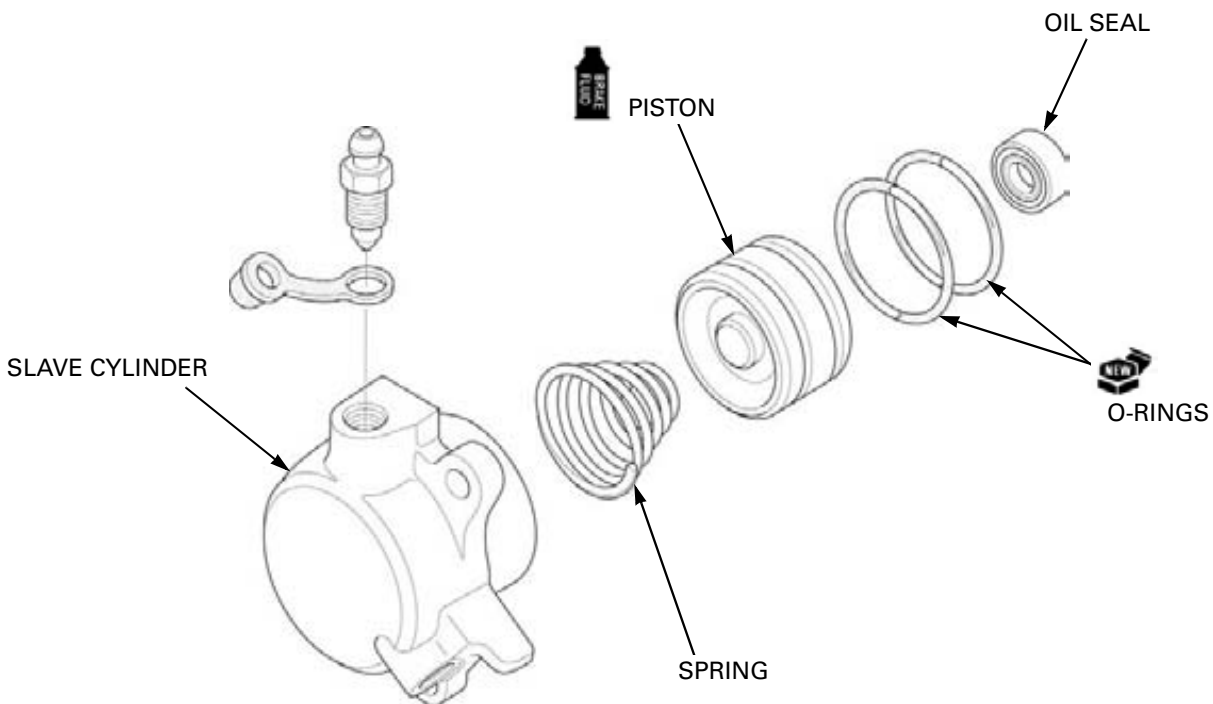
Check the piston spring for weakness or damage.
Inspect the oil seal and O-rings for damage or deterioration, replace if necessary.
Clean the O-ring grooves with clean brake fluid.

Check the slave cylinder for scoring or other damage.

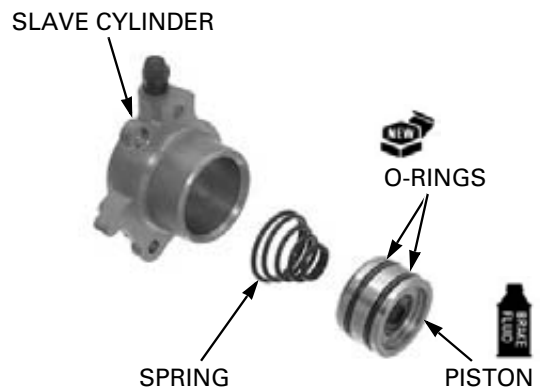
Check the piston for scratches, scoring or other damage.



ASSEMBLY

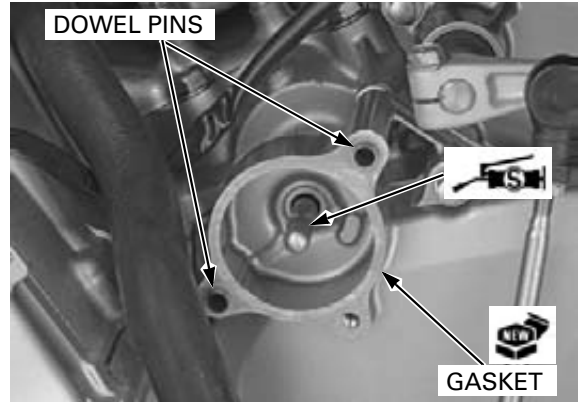


Lubricate the piston with clean brake fluid.
Apply grease (included in the slave cylinder O-ring set) to new O-rings and install them to the slave cylinder piston grooves.
Install the spring into the boss of the piston.
Install the spring and piston into the slave cylinder.



INSTALLATION

Install the dowel pins and new gasket.
 Apply silicone grease to the tip of the push rod.
 Install the slave cylinder onto the left crankcase rear cover.



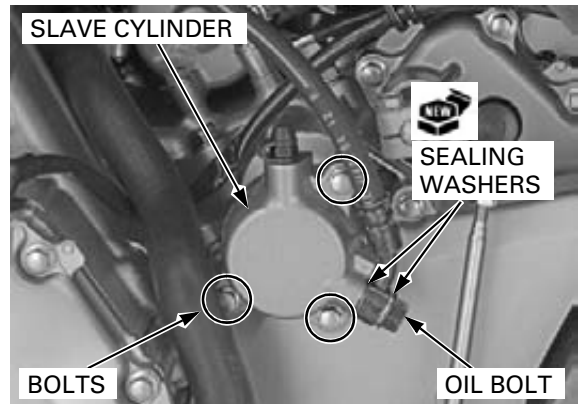
Install and tighten the bolts.

Install the clutch hose eyelet with the oil bolt and new sealing washers.

While pushing the clutch hose against the stopper, tighten the oil bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

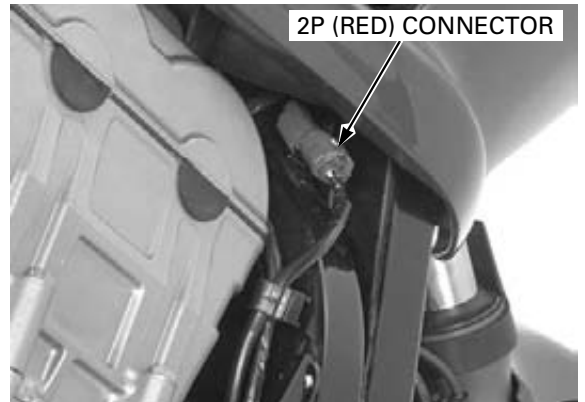
Fill the reservoir to the upper level and bleed the hydraulic system (page 10-6).



RIGHT CRANKCASE COVER REMOVAL

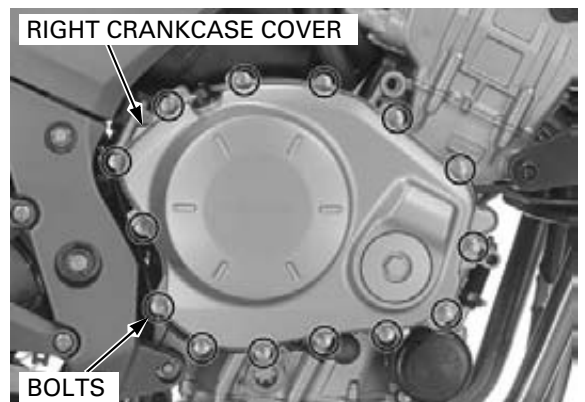
Drain the engine oil (page 4-16).

Disconnect the CKP sensor 2P (Red) connector.



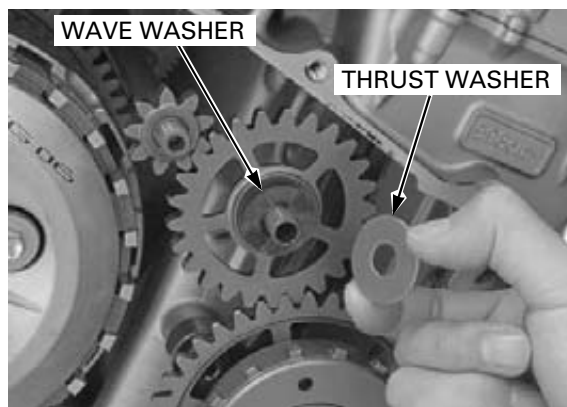
Be careful not to drop the thrust and wave washers into the crankcase.

Remove the bolts and right crankcase cover.



CLUTCH/STARTER CLUTCH

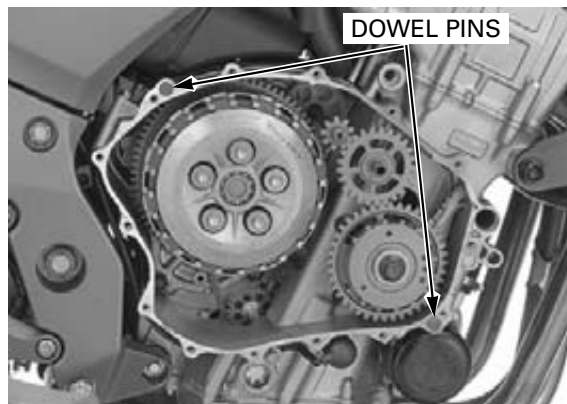
Remove the thrust washer and wave washer from the starter idle gear shaft.



Do not turn the crankshaft counterclockwise after removing the right crankcase cover to prevent the starter reduction gear from damage.

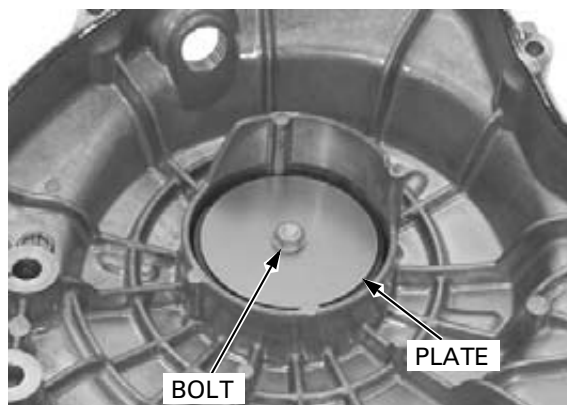
Remove the dowel pins.

Clean off any sealant from the right crankcase cover mating surfaces.



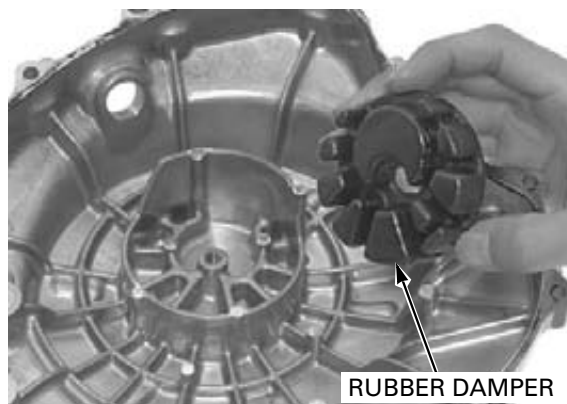
RUBBER DAMPER REMOVAL/INSTALLATION

Remove the bolt and set plate.



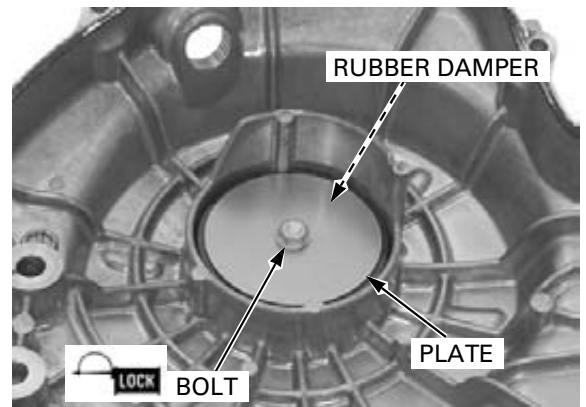
Remove the rubber damper.

Check the rubber damper for fatigue or damage, replace it if necessary.



Install the rubber damper into the right crankcase cover and install the set plate.
Apply a locking agent to the set plate bolt threads and install the set plate bolt.
Tighten the bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

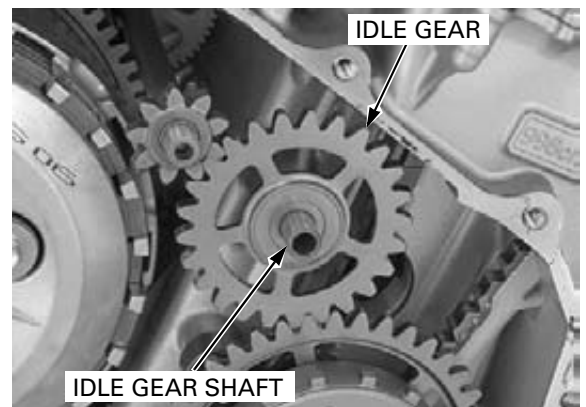


CLUTCH

REMOVAL

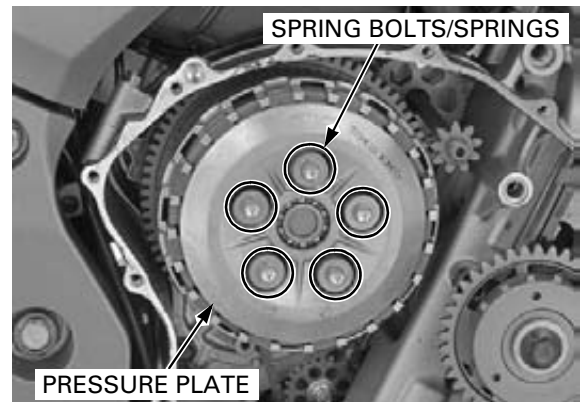
Remove the right crankcase cover (page 10-15).

To prevent damaging the starter reduction gear shaft, remove the starter idle gear and shaft from the crankcase.

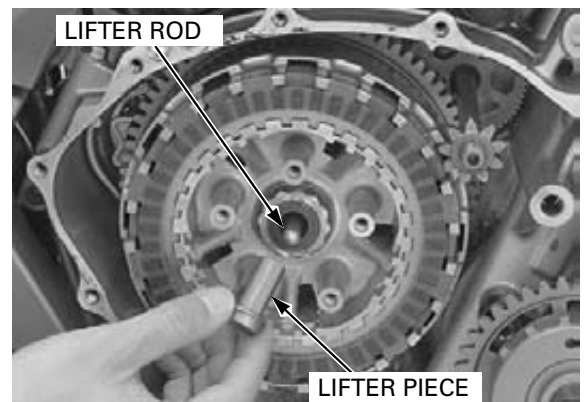


Loosen the clutch spring bolts in a crisscross pattern in two to three steps, then remove the clutch spring bolts and clutch springs.

Remove the pressure plate.



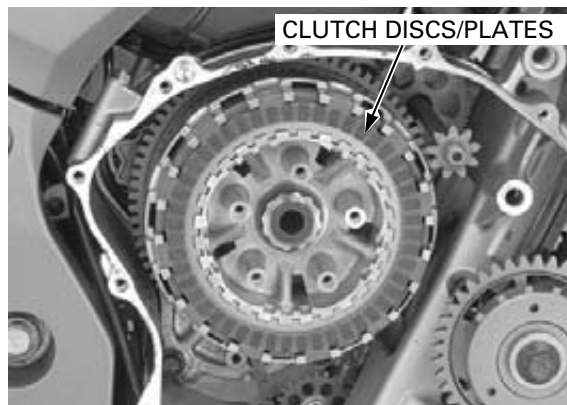
Remove the clutch lifter piece and lifter rod.



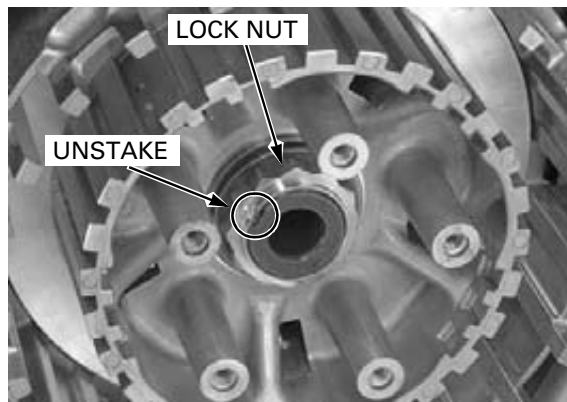
CLUTCH/STARTER CLUTCH

Remove the following:

- Two clutch disc A
- Six clutch disc B
- Seven clutch plates
- Friction spring
- Spring seat



Unstake the clutch center lock nut.



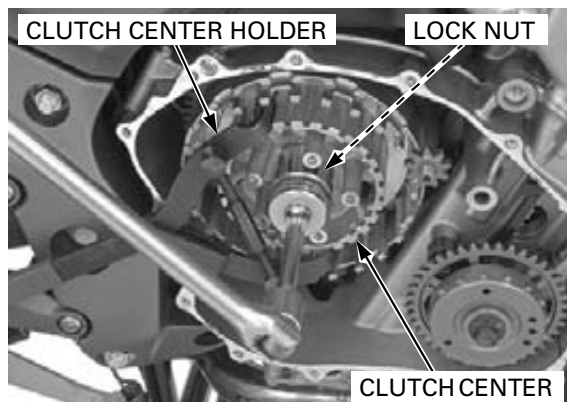
Hold the clutch center with the special tool and remove the clutch center lock nut.

TOOL:

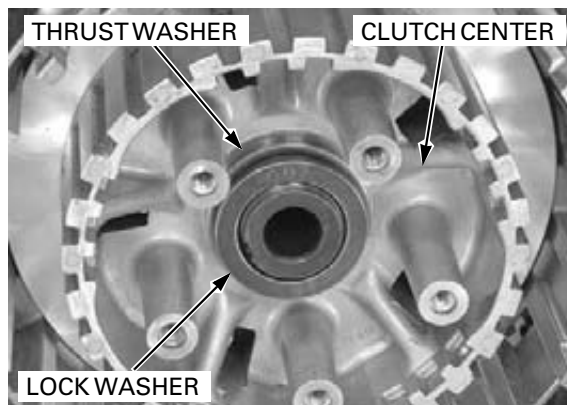
Clutch center holder

**07724-0050002 or
equivalent commercially
available**

Discard the lock nut.



Remove the lock washer, thrust washer and clutch center.

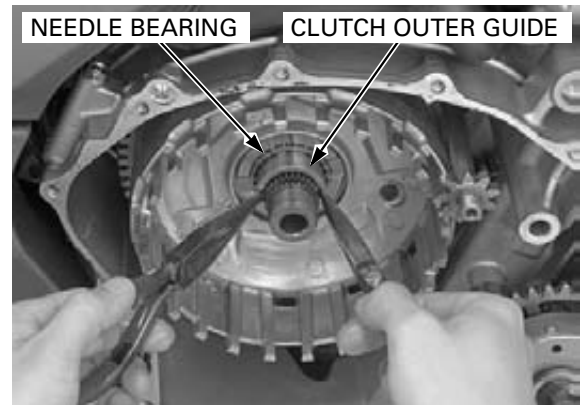


CLUTCH/STARTER CLUTCH

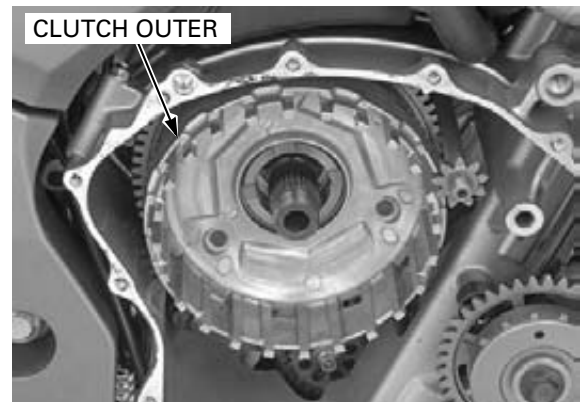
Remove the thrust washer.



Pull out the clutch outer guide, then remove the needle bearing.



Remove the clutch outer.

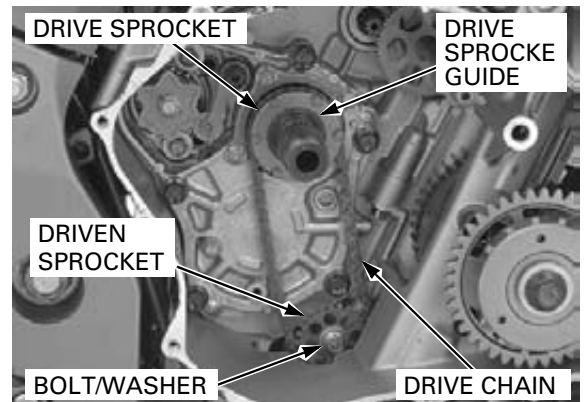


Be careful not to drop the sprocket bolt/washer in the crankcase.

Remove the oil pump driven sprocket bolt/washer.

Remove the oil pump drive and driven sprocket with the drive chain.

Remove the oil pump drive sprocket guide from the mainshaft.

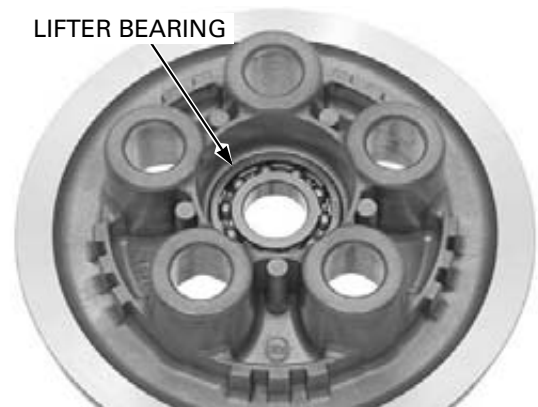


CLUTCH/STARTER CLUTCH

INSPECTION

Clutch lifter bearing

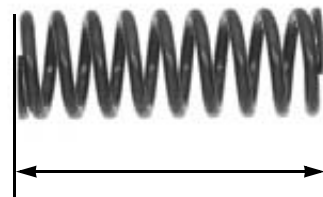
Turn the inner race of the lifter bearing with your finger.
The bearing should turn smoothly and freely without excessive play.
If necessary, replace the bearing.



Clutch spring

Replace the clutch springs as a set. Measure the clutch spring free length.

SERVICE LIMIT: 55.7 mm (2.19 in)



Clutch center

Check the grooves of the clutch center for damage or wear caused by the clutch plates.
Replace it if necessary.



Clutch lifter piece

Check the clutch lifter piece for damage or abnormal wear.



Clutch lifter rod

Check the clutch rod for bend or other damage.



Clutch disc

Replace the clutch discs and plates as a set.

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

Measure the disc thickness of each disc.

SERVICE LIMIT:

A (larger I.D.): 3.4 mm (0.13 in)

B: 2.9 mm (0.11 in)



Clutch plate

Replace the clutch discs and plates as a set.

Check the plates for discoloration.

Check the plate warpage on a surface plate using a feeler gauge.

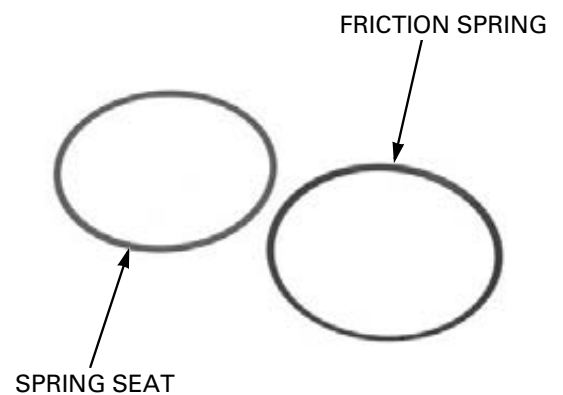
SERVICE LIMIT: 0.30 mm (0.012 in)



Friction spring/spring seat

Check the friction spring and spring seat for deformation, warpage or damage; replace as necessary.

- A damaged or warped spring seat will cause the friction spring to be pressed unevenly.
- A damaged friction spring also causes the weak contact between the discs and plates or uneven disc/plate contact.



CLUTCH/STARTER CLUTCH

Clutch outer/primary driven gear

Check the slots of the clutch outer for damage or wear caused by the clutch discs.

Check the primary driven gear for abnormal wear or damage.

Measure the I.D. of the primary driven gear.

SERVICE LIMITS:

A: 41.026 mm (1.6152 in)

B: 41.018 mm (1.6149 in)

Replace the clutch outer assembly if necessary.

When the clutch outer assembly is replaced, be sure to select the needle bearing according to the selective fit table (page 10-23).

Clutch outer guide/needle bearing

Measure the O.D. and I.D. of the clutch outer guide.

– I.D. mark indication of guide A or B (page 10-23)

SERVICE LIMITS:

A (without ID mark):

O.D.: 34.994 mm (1.3777 in)

I.D.: 28.012 mm (1.1028 in)

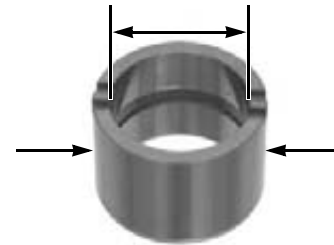
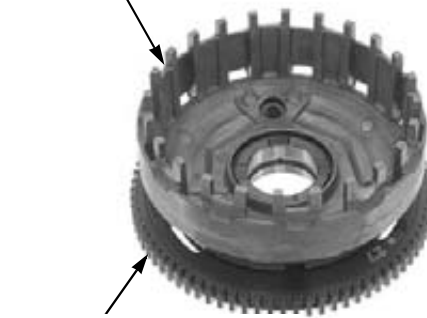
B (with ID mark):

O.D.: 34.986 mm (1.3774 in)

I.D.: 28.012 mm (1.1028 in)

CLUTCH OUTER

PRIMARY DRIVEN GEAR



Check the needle bearing for wear or damage.
Replace the bearing if necessary.

When the clutch outer guide and/or needle bearing is replaced, be sure to select the needle bearing according to the selective fit table (page 10-23).

NEEDLE BEARING



Oil pump drive sprocket/sprocket guide

Measure the O.D. and I.D. of the oil pump drive sprocket guide.

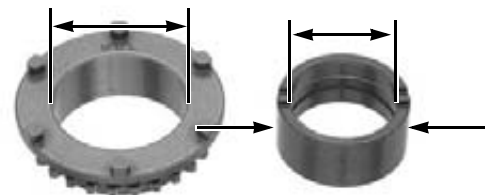
SERVICE LIMITS:

O.D.: 34.965 mm (1.3766 in)

I.D.: 28.030 mm (1.1035 in)

Measure the I.D. of the oil pump drive sprocket.

SERVICE LIMIT: 35.155 mm (1.3841 in)



Mainshaft

Measure the mainshaft O.D. at clutch outer guide and oil pump drive sprocket guide sliding surfaces.

SERVICE LIMITS:

- Oil pump drive sprocket guide position: 27.96 mm (1.101 in)**
- Clutch outer guide position: 27.96 mm (1.101 in)**



NEEDLE BEARING SELECTION

The primary driven gear has I.D. code letter as shown.

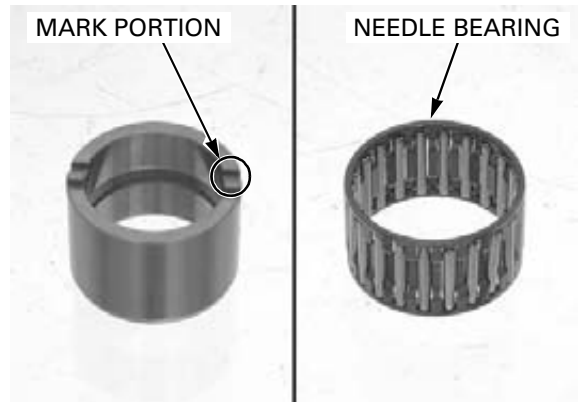


I.D. CODE LETTER

The clutch outer guide A has no identification mark and outer guide B has identification mark (2 mm hole).

Cross-reference the primary driven gear and clutch outer guide codes to determine the replacement needle bearing.

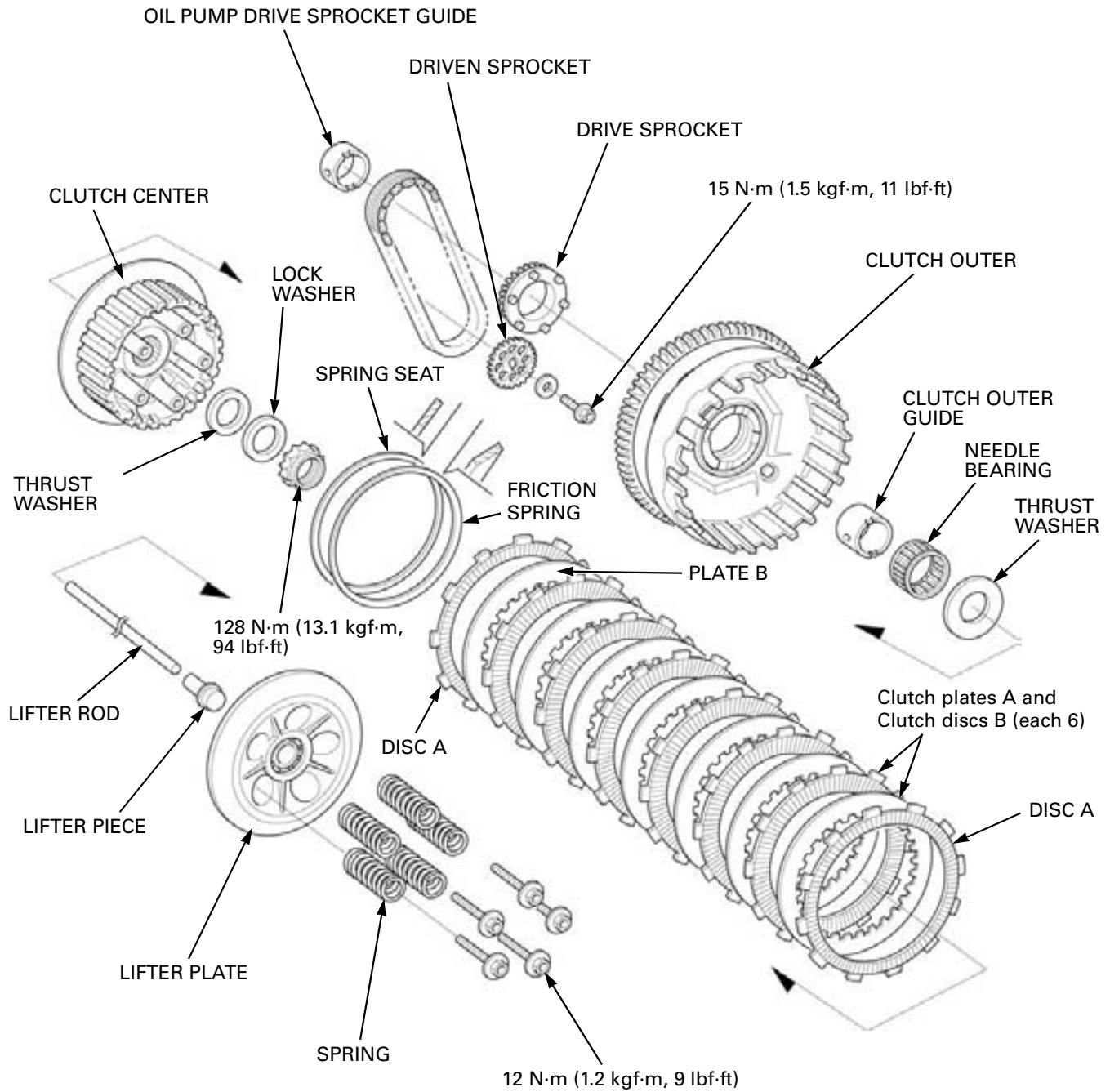
Refer to the selection table below for bearing selection.



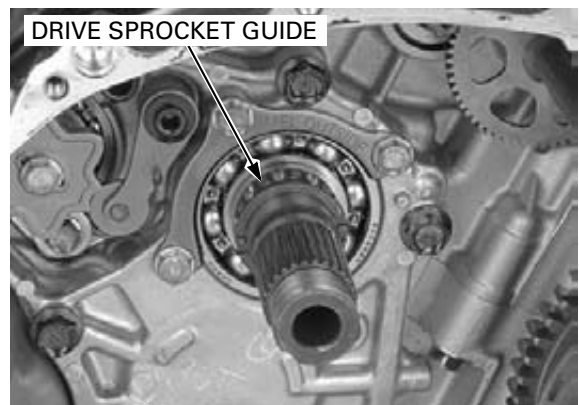
NEEDLE BEARING SELECTION TABLE:

			CLUTCH OUTER GUIDE ID MARK	
			GUIDE A (Without ID mark)	GUIDE B (With ID mark)
			35.004 – 35.012 mm (1.3781 – 1.3784 in)	34.996 – 35.004 mm (1.3778 – 1.3781 in)
PRIMARY DRIVEN GEAR I.D. MARK	A	41.008 – 41.016 mm (1.6145 – 1.6148 in)	NEEDLE BEARING B	NEEDLE BEARING A
	B	41.000 – 41.008 mm (1.6142 – 1.6145 in)	NEEDLE BEARING C	NEEDLE BEARING B

CLUTCH/STARTER CLUTCH INSTALLATION



Install the oil pump drive sprocket guide.



CLUTCH/STARTER CLUTCH

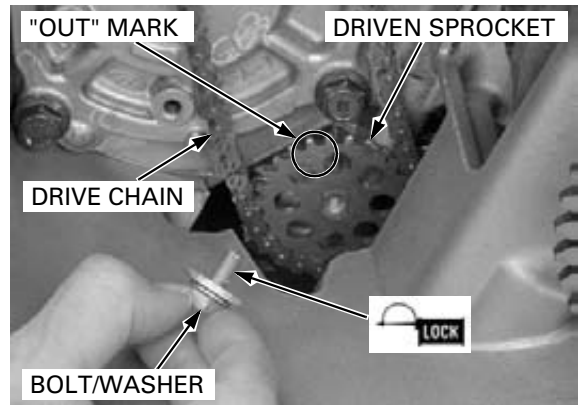
Install the oil pump driven sprocket with its "OUT" mark facing out.

Install the oil pump drive and driven sprocket with the drive chain.

Apply a locking agent to the threads of the oil pump driven sprocket bolt.

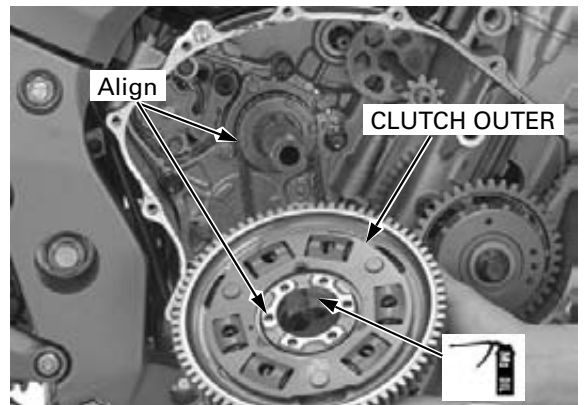
Install the oil pump driven sprocket bolt/washer and tighten the bolt to the specified torque.

TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft)



Apply molybdenum oil solution to the clutch outer sliding surface.

Install the clutch outer while aligning the bosses on the oil pump drive sprocket with holes in the clutch outer.

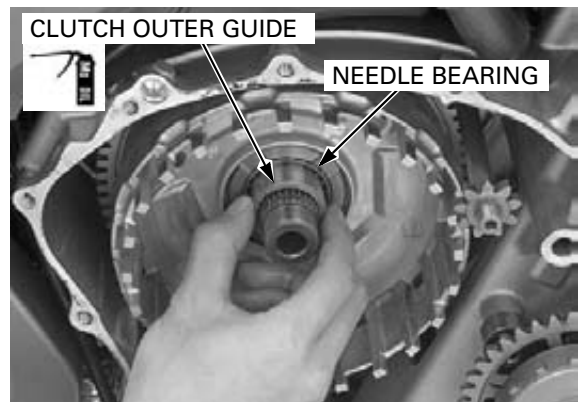


Apply molybdenum oil solution to the clutch outer guide sliding surface.

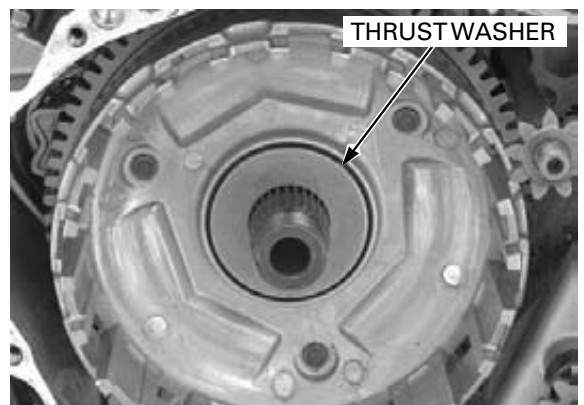
Install the clutch outer guide with its grooves facing out.

Install the clutch outer guide and needle bearing onto the mainshaft

Refer to the needle bearing selection (page 10-23).



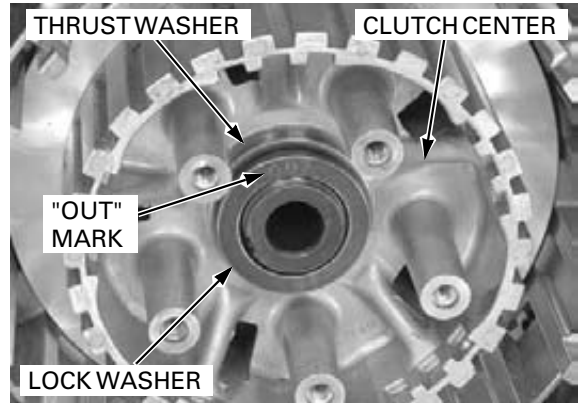
Install the thrust washer.



CLUTCH/STARTER CLUTCH

Install the clutch center and thrust washer.

Install the lock washer with its "OUT" mark facing out.



Apply oil to the threads and seating surface of a new clutch center lock nut, then install it onto the mainshaft.

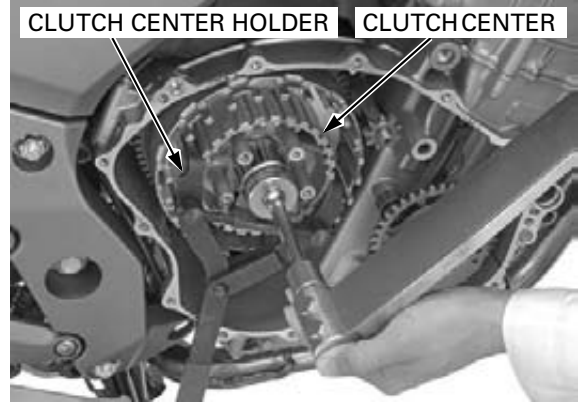
Hold the clutch center with the special tool and tighten the lock nut to the specified torque.

TOOL:

Clutch center holder

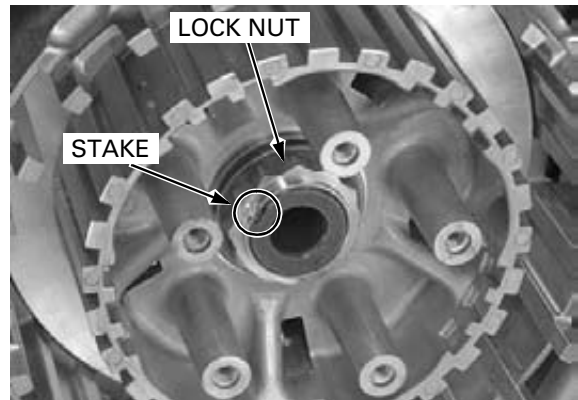
07724-0050002 or equivalent commercially available

TORQUE: 128 N·m (13.1 kgf·m, 94 lbf·ft)



Be careful not to damage the mainshaft threads.

Stake the lock nut into the mainshaft groove with a punch.



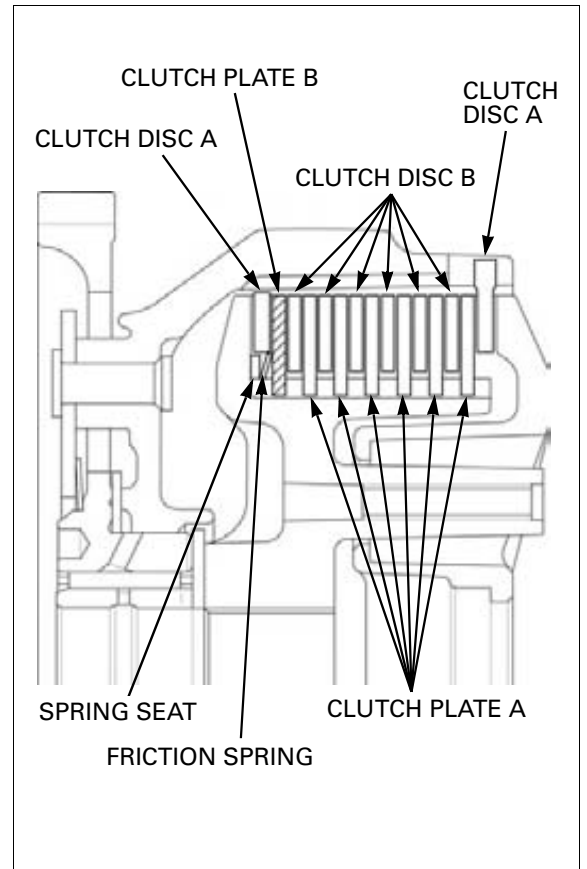
CLUTCH/STARTER CLUTCH

Install the spring seat and friction spring onto the clutch center as shown.

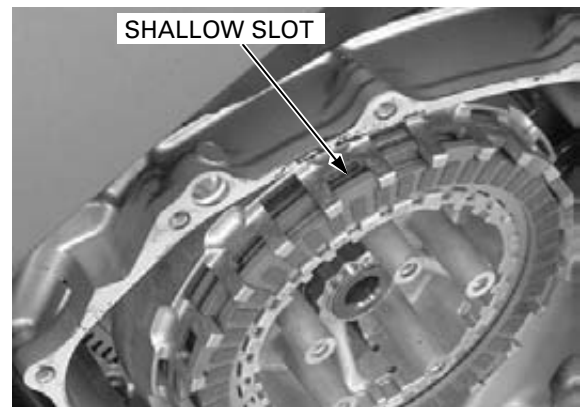
Coat the clutch discs and plates with clean engine oil.

Surface treatment of clutch plate B is different from that of plate A.

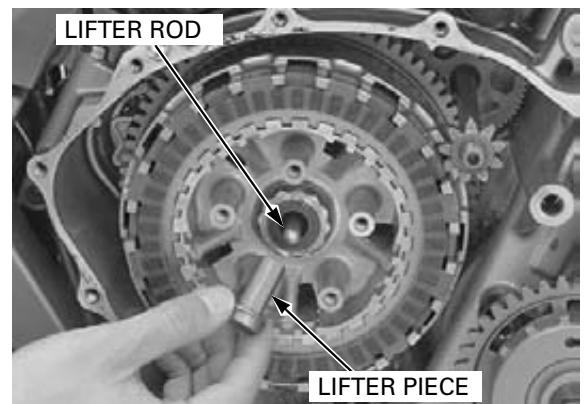
First install the clutch disc A (larger I.D. disc) onto the clutch center, and then install the clutch plate B. Stack the six clutch discs (B) and plates (A) alternately.



Install the tabs of outside clutch disc A (larger I.D. disc) into the shallow slots of the clutch outer.



Install the lifter rod and clutch lifter piece into the mainshaft.

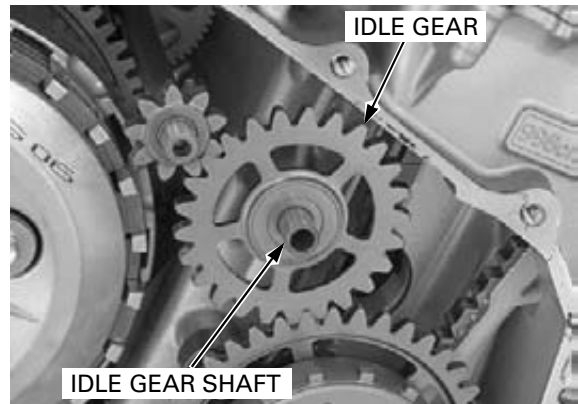
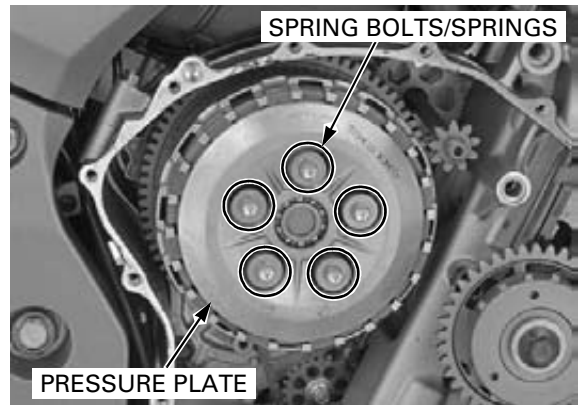


CLUTCH/STARTER CLUTCH

Install the pressure plate.
Install the clutch springs and spring bolts.
Tighten the bolts in a crisscross pattern in two to three steps, then torque them in specified value.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the shaft and starter idle gear.
Install the right crankcase cover (page 10-33).



STARTER CLUTCH

REMOVAL

Remove the clutch (page 10-17).
Remove the starter reduction gear from the crankcase.

Temporarily install the following:

- Oil pump drive sprocket outer guide
- Oil pump drive sprocket
- Clutch outer
- Clutch outer guide
- Needle bearing

Insert the gear holder between the primary drive and driven gear as shown.

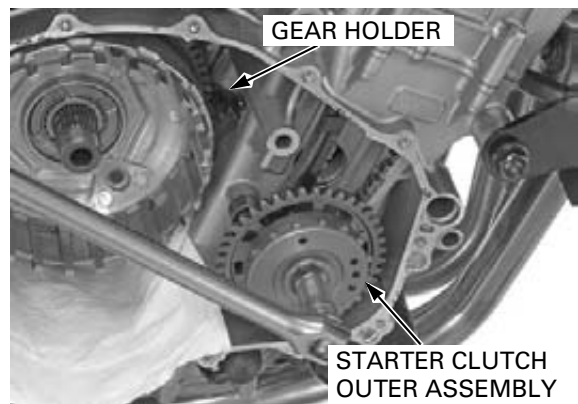
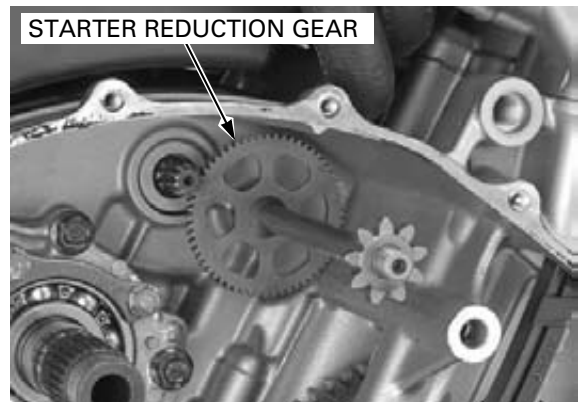
TOOL:

Gear holder, M2.5 07724-0010100

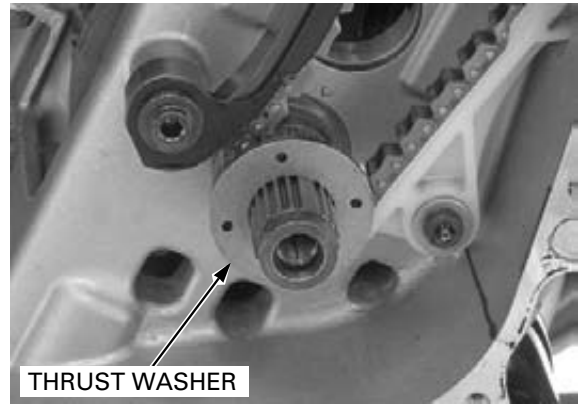
Remove the starter clutch outer special bolt and washer.

Remove the temporarily installed parts.

Remove the starter clutch outer assembly.



Remove the thrust washer.



INSPECTION

Check the operation of the one-way clutch by turning the driven gear. You should be able to turn the driven gear clockwise smoothly, but the gear should not turn counterclockwise.

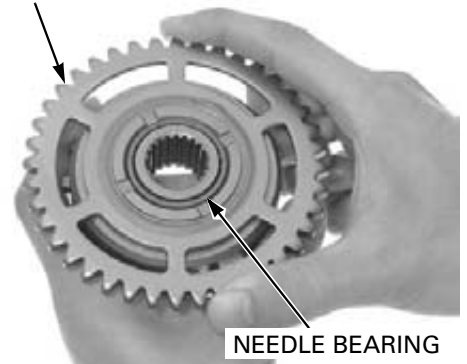


DISASSEMBLY

Remove the starter driven gear while turning it clockwise.

Remove the needle bearing.

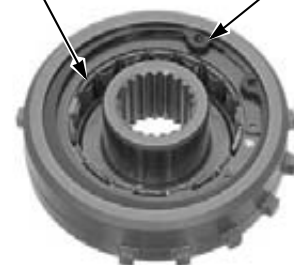
STARTER DRIVEN GEAR



Remove the snap ring and one-way clutch.

ONE-WAY CLUTCH

SNAP RING



CLUTCH/STARTER CLUTCH

Check the starter clutch outer inner surface and one-way clutch for abnormal wear or damage, and replace them if necessary.

STARTER CLUTCH OUTER



ONE-WAY CLUTCH



Check the starter driven gear for abnormal wear or damage.

Measure the starter driven gear boss O.D.

SERVICE LIMIT: 45.642 mm (1.7969 in)



Check the starter reduction gear for wear or damage, and replace it if necessary.

STARTER REDUCTION GEAR



Check the starter idle gear and shaft for wear or damage.

Measure the starter idle gear I.D. and shaft O.D.

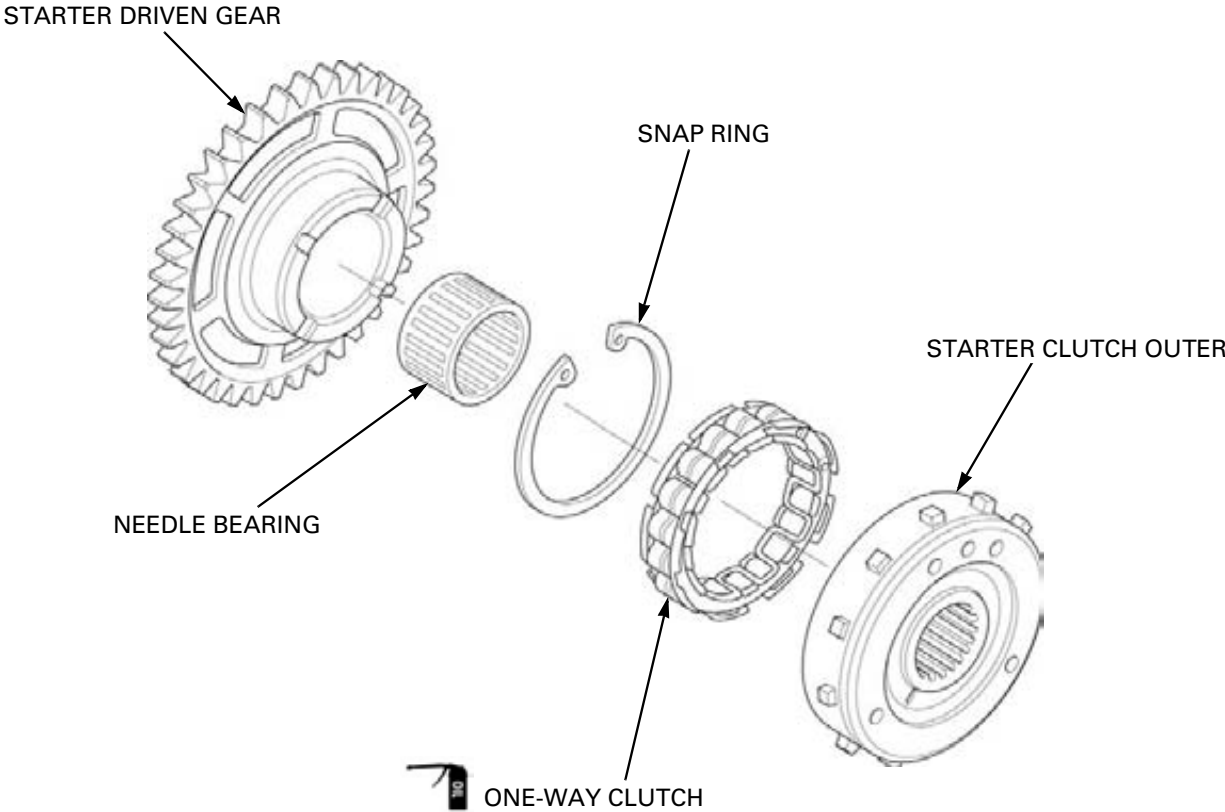
SERVICE LIMITS:

Shaft O.D.: 9.98 mm (0.393 in)

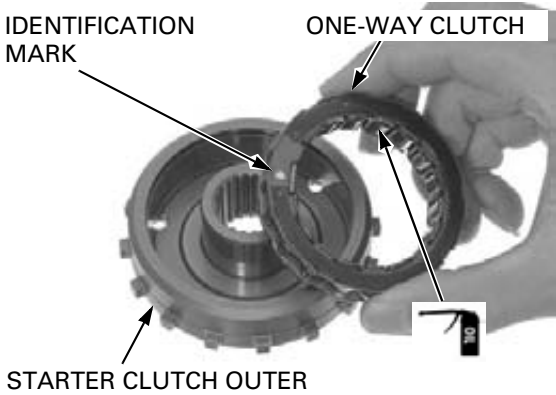
Gear I.D.: 10.05 mm (0.396 in)



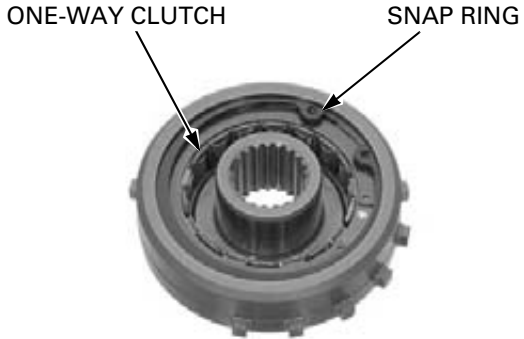
ASSEMBLY



Apply oil to the one-way clutch sliding surface.
Install the one-way clutch into the starter clutch outer with its identification mark (white paint) facing out.



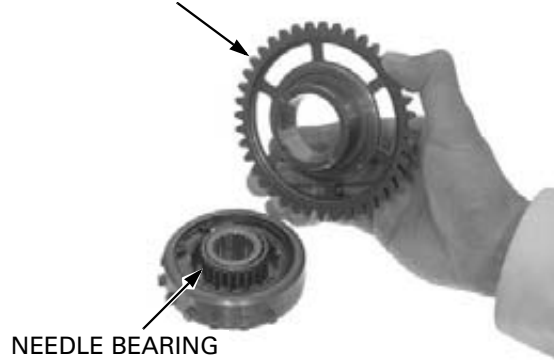
Install the snap ring into the starter clutch outer groove securely.



CLUTCH/STARTER CLUTCH

Install the needle bearing onto the starter clutch outer.

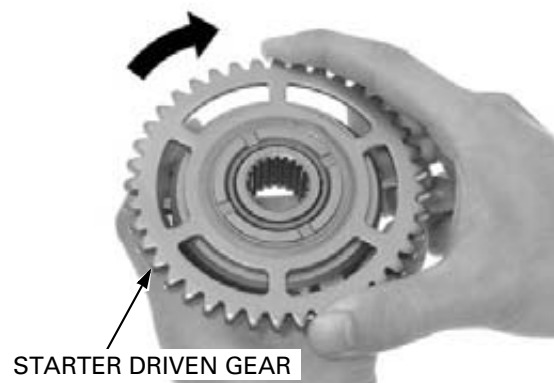
STARTER DRIVEN GEAR



NEEDLE BEARING

Install the starter driven gear into the starter clutch outer while turning the starter driven gear clockwise.

Recheck the one-way clutch operation (page 10-29).



STARTER DRIVEN GEAR

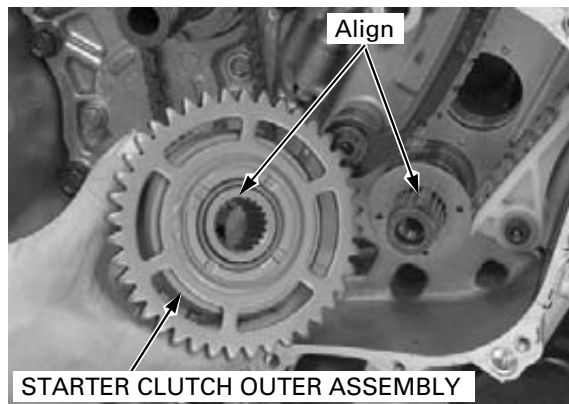
INSTALLATION

Install the thrust washer onto the crankshaft.



THRUST WASHER

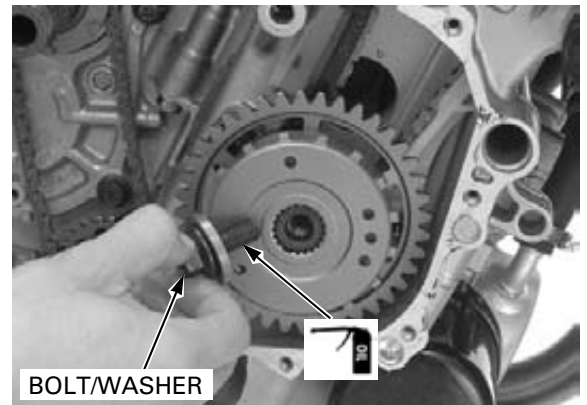
Install the starter clutch outer assembly onto the crankshaft while aligning its wide groove with the wide teeth of the crankshaft.



STARTER CLUTCH OUTER ASSEMBLY

Apply oil to the starter clutch outer special bolt threads and seating surface.

Install the washer and starter clutch outer special bolt.



Temporarily install the following:

- Oil pump drive sprocket outer guide
- Oil pump drive sprocket
- Clutch outer
- Clutch outer guide
- Clutch outer needle bearing

Be careful not to drop the gear holder into the crankcase. Attach the gear holder between the primary drive gear and driven gear.

TOOL:

Gear holder, M2.5 07724-0010100

Tighten the starter clutch special bolt to the specified torque.

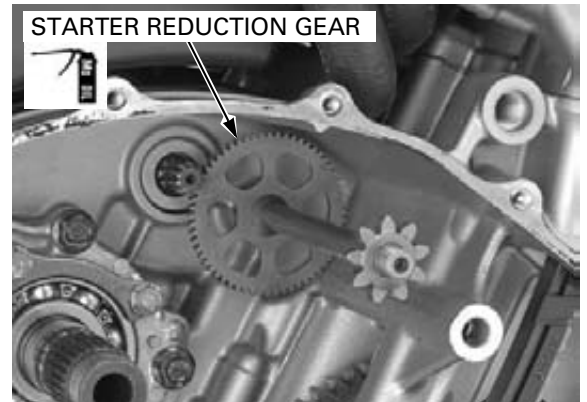
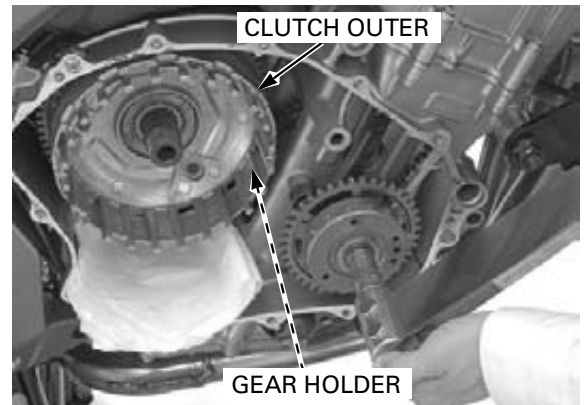
TORQUE: 83 N·m (8.5 kgf·m, 61 lbf·ft)

Remove the temporarily installed parts.

Apply molybdenum oil solution to the starter reduction gear sliding surface.

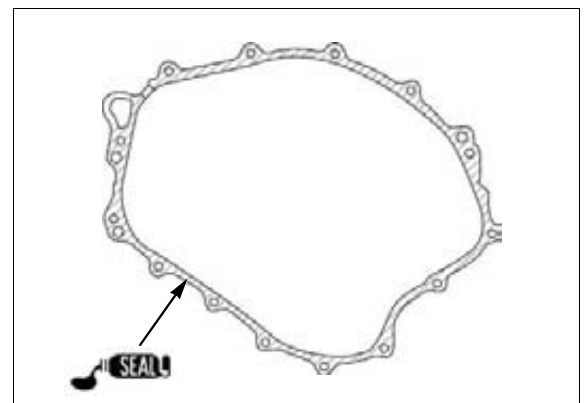
Install the starter reduction gear into the crankcase.

Install the clutch (page 10-24).



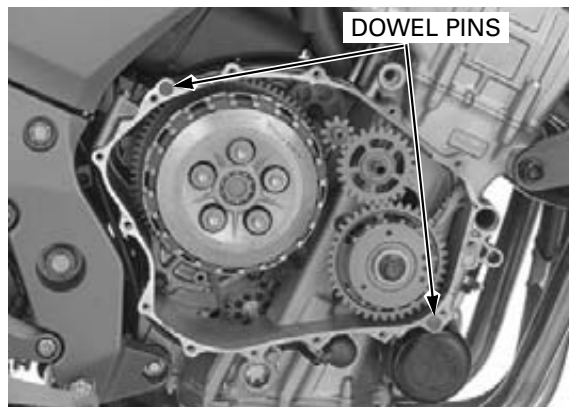
RIGHT CRANKCASE COVER INSTALLATION

Apply sealant (Three Bond 1207B) to the mating surface of the right crankcase cover.

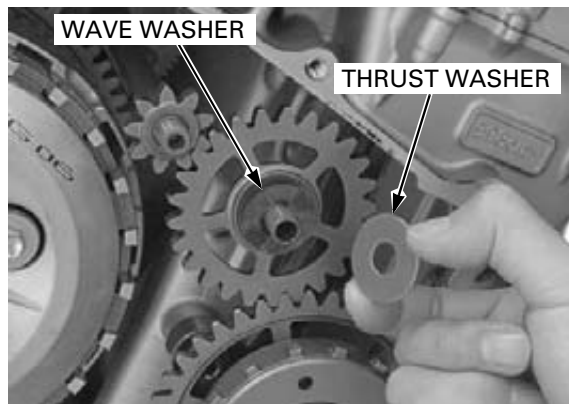


CLUTCH/STARTER CLUTCH

Install the two dowel pins.



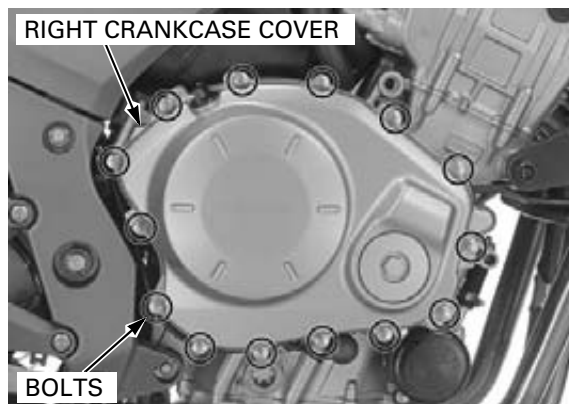
Install the wave washer and thrust washer onto the starter idle gear.



Install the right crankcase cover while aligning the starter idle gear shaft and reduction gear shaft with the holes in the right crankcase cover, then align the dowel pins with the cover holes.

Install the right crankcase cover bolts.

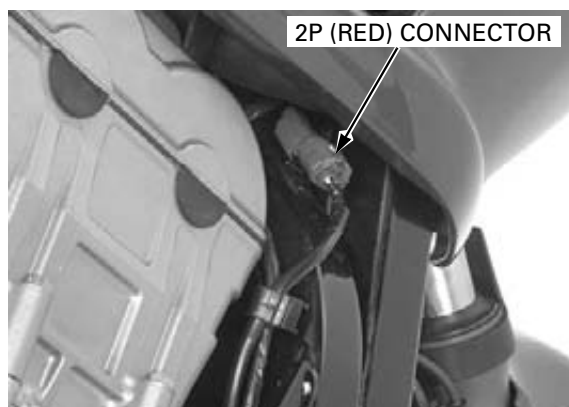
Tighten the right crankcase cover bolts in a criss-cross pattern in two to three steps.



Connect the CKP sensor 2P (Red) connector.

Add the recommended engine oil (page 4-16).

Check the clutch operation (page 4-28).

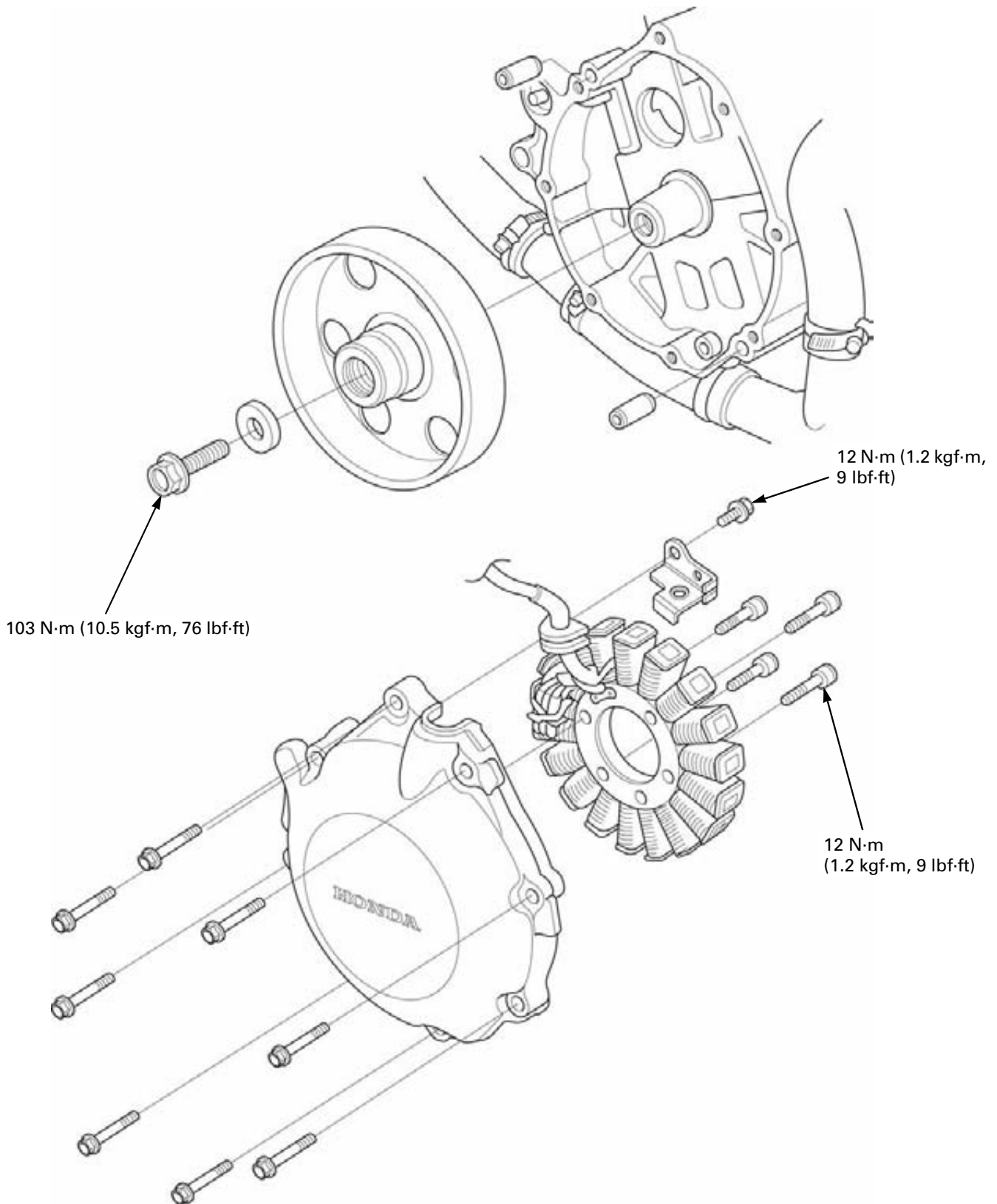


11. ALTERNATOR

COMPONENT LOCATION	11-2	STATOR	11-6
SERVICE INFORMATION	11-3	FLYWHEEL	11-7
ALTERNATOR COVER	11-4		

ALTERNATOR

COMPONENT LOCATION



SERVICE INFORMATION

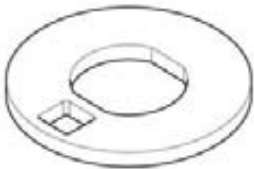
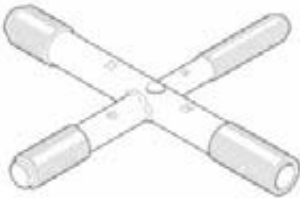
GENERAL

- This section covers service of the alternator stator and flywheel. All service can be done with the engine installed in the frame.
- Refer to procedures for alternator stator inspection (page 18-8).
- Refer to procedures for starter motor servicing (page 20-6).

TORQUE VALUES

Stator wire clamp bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	CT bolt Apply oil to the threads and seating surface.
Flywheel flange bolt	103 N·m (10.5 kgf·m, 76 lbf·ft)	
Stator mounting socket bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	

TOOLS

<p>Flywheel holder 070MB-MELC100</p> 	<p>Rotor puller 07733-0020001</p> 
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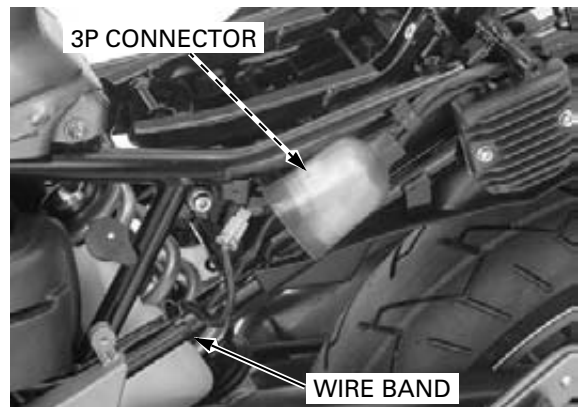
ALTERNATOR

ALTERNATOR COVER

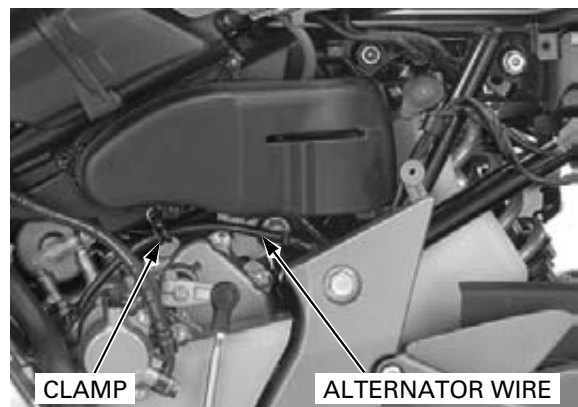
REMOVAL

Remove the left rear cowl (page 3-8).

Remove the wire band and disconnect the alternator 3P (White) connector.



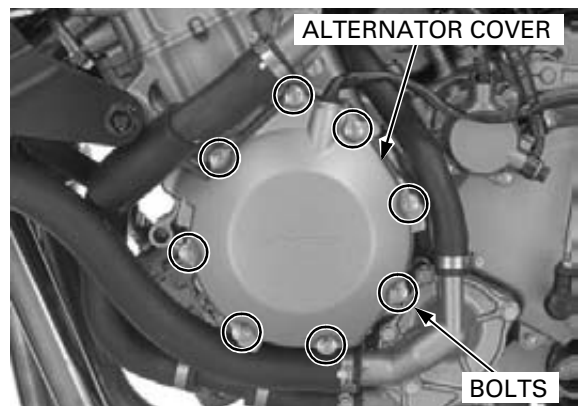
Unhook the alternator wire from the clamp.



The alternator cover (stator) is magnetically attached to the flywheel, be careful during removal.

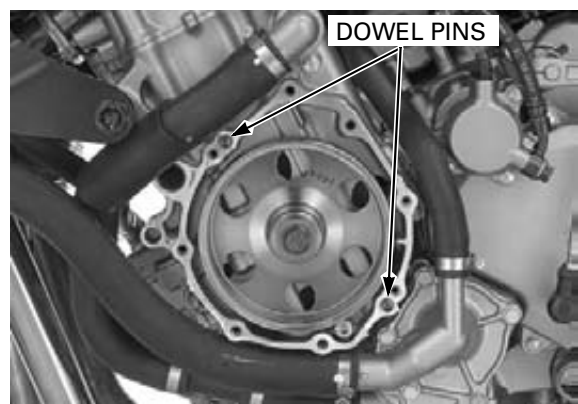
Remove the alternator cover bolts and alternator cover.

- Engine oil will run out when the alternator cover is removed. Set a clean oil pan under the engine and add the recommended oil to the specified level after installation.



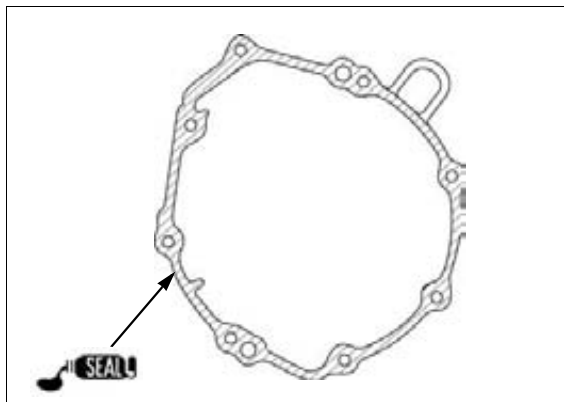
Remove the dowel pins.

Clean off any sealant from the crankcase mating surfaces.

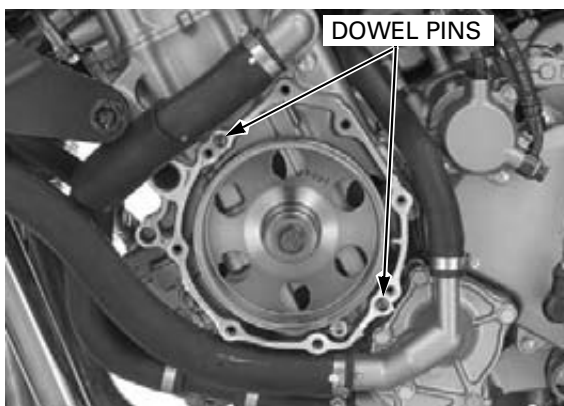


INSTALLATION

Apply a sealant (Three Bond 1207B) to the mating surface of the alternator cover.

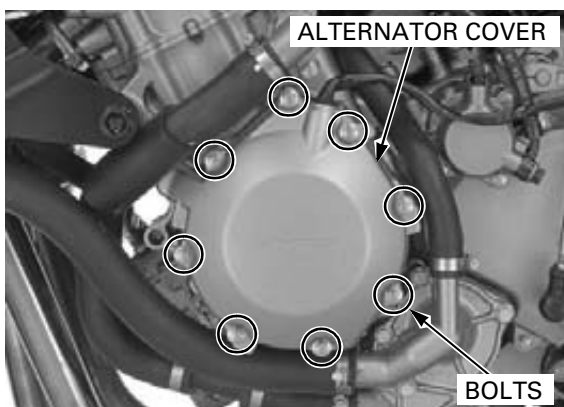


Install the dowel pins.

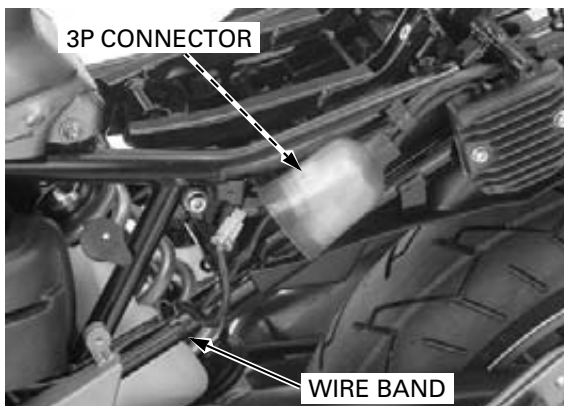


The alternator cover (stator) is magnetically attached to the flywheel, be careful during installation.

Install the alternator cover.
Install and tighten the bolts securely.

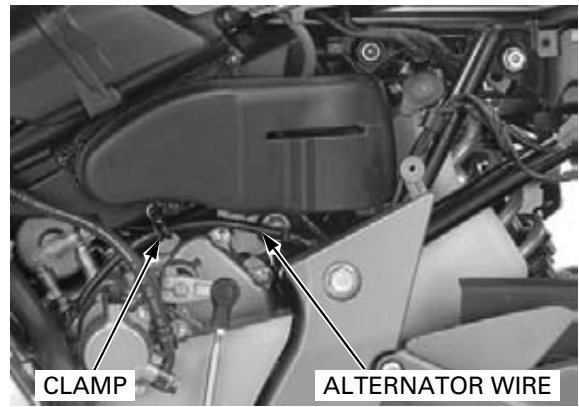


Connect the alternator 3P (White) connector.
Secure the alternator wire with the wire band.



ALTERNATOR

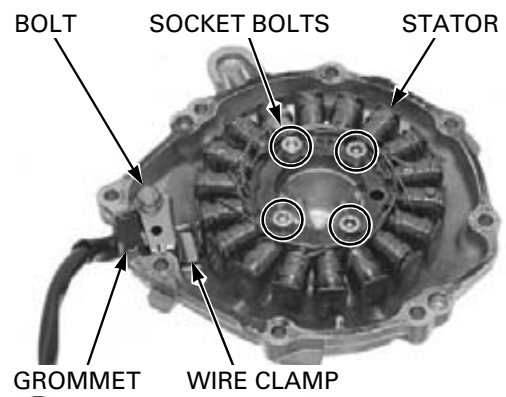
Hook the alternator wire on the clamp.
Install the left rear cowl (page 3-8).



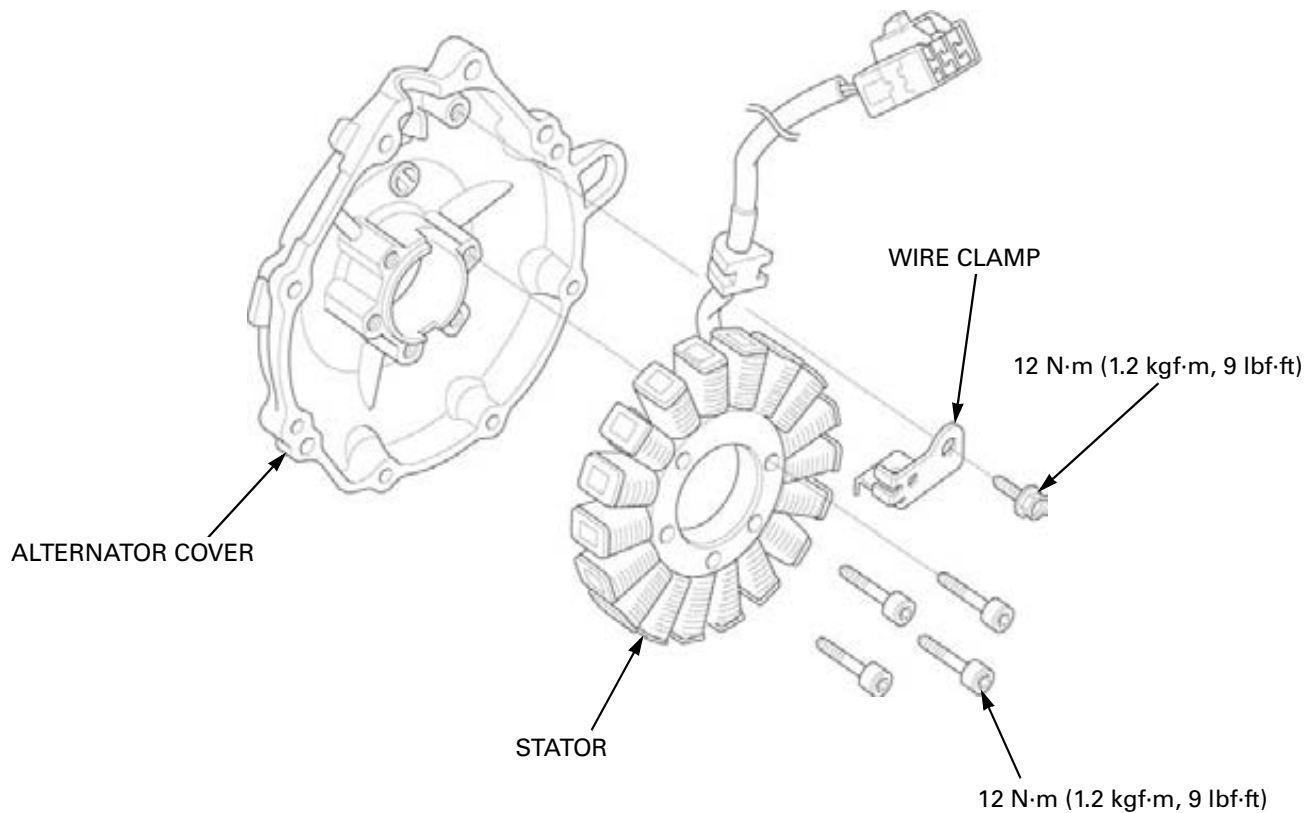
STATOR

REMOVAL

Remove the alternator cover (page 11-4).
Remove the bolt and stator wire clamp.
Remove the alternator wire grommet from the alternator cover.
Remove the socket bolts and stator.



INSTALLATION



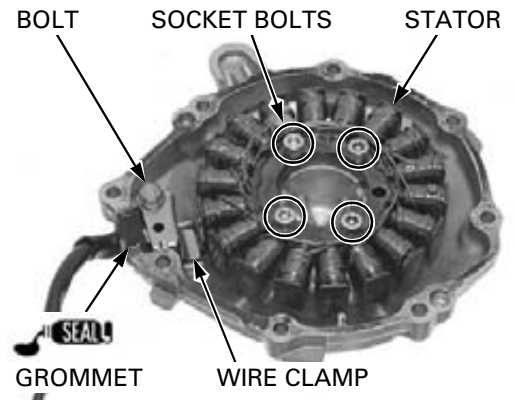
Install the stator into the alternator cover.

Apply sealant to the wire grommet, then install the wire grommet into the alternator cover groove securely.
Install and tighten the socket bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the wire clamp and tighten the flange bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



FLYWHEEL

REMOVAL

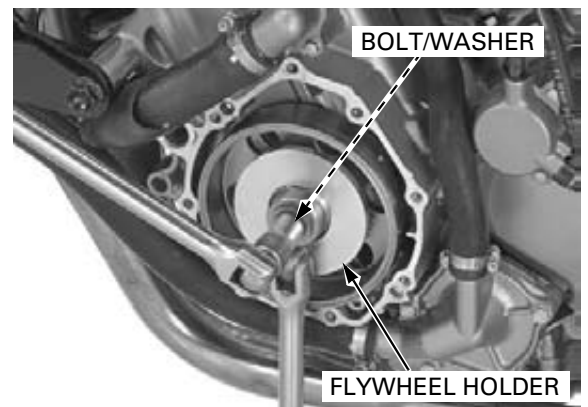
Remove the alternator cover (page 11-4).

Hold the flywheel using the special tool, then loosen the flywheel bolt.

TOOL:

Flywheel holder **070MB-MELC100**

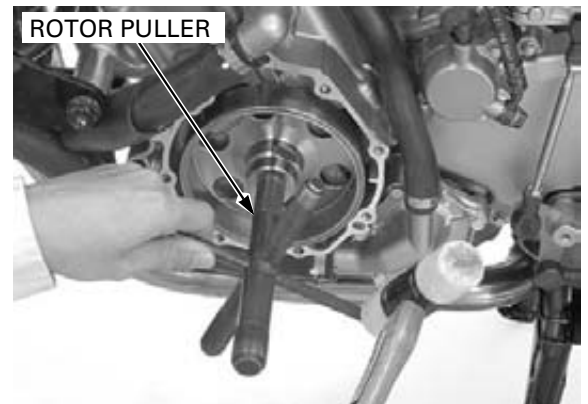
Remove the washer and flywheel bolt.



Remove the flywheel using the special tool.

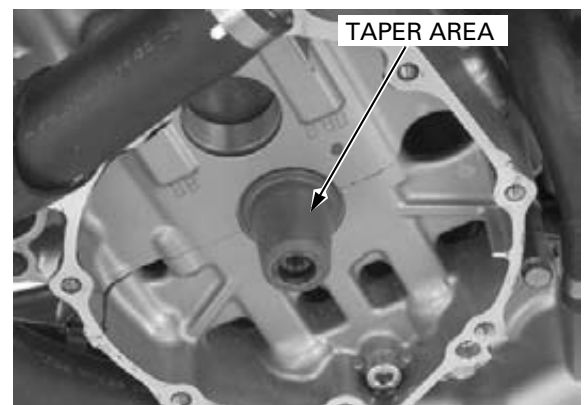
TOOL:

Rotor puller **07733-0020001**



INSTALLATION

Clean any oil from the crankshaft taper area.

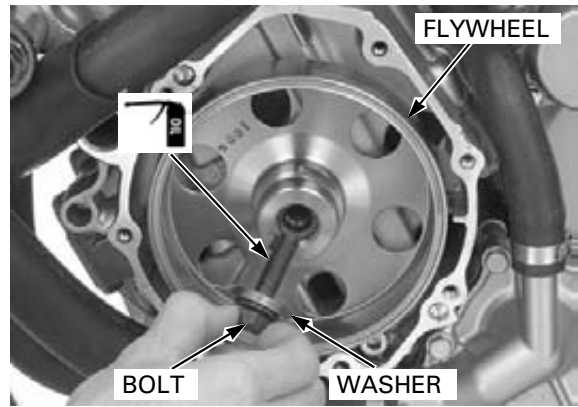


ALTERNATOR

Install the flywheel.

Apply oil to the flywheel bolt threads and seating surface.

Install the washer and flywheel bolt.



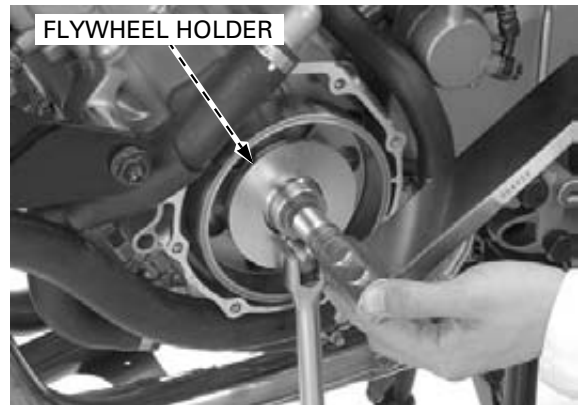
Hold the flywheel using the special tool, then tighten the bolt to the specified torque.

TOOL:

Flywheel holder 070MB-MELC100

TORQUE: 103 N·m (10.5 kgf·m, 76 lbf·ft)

Install the alternator cover (page 11-5).

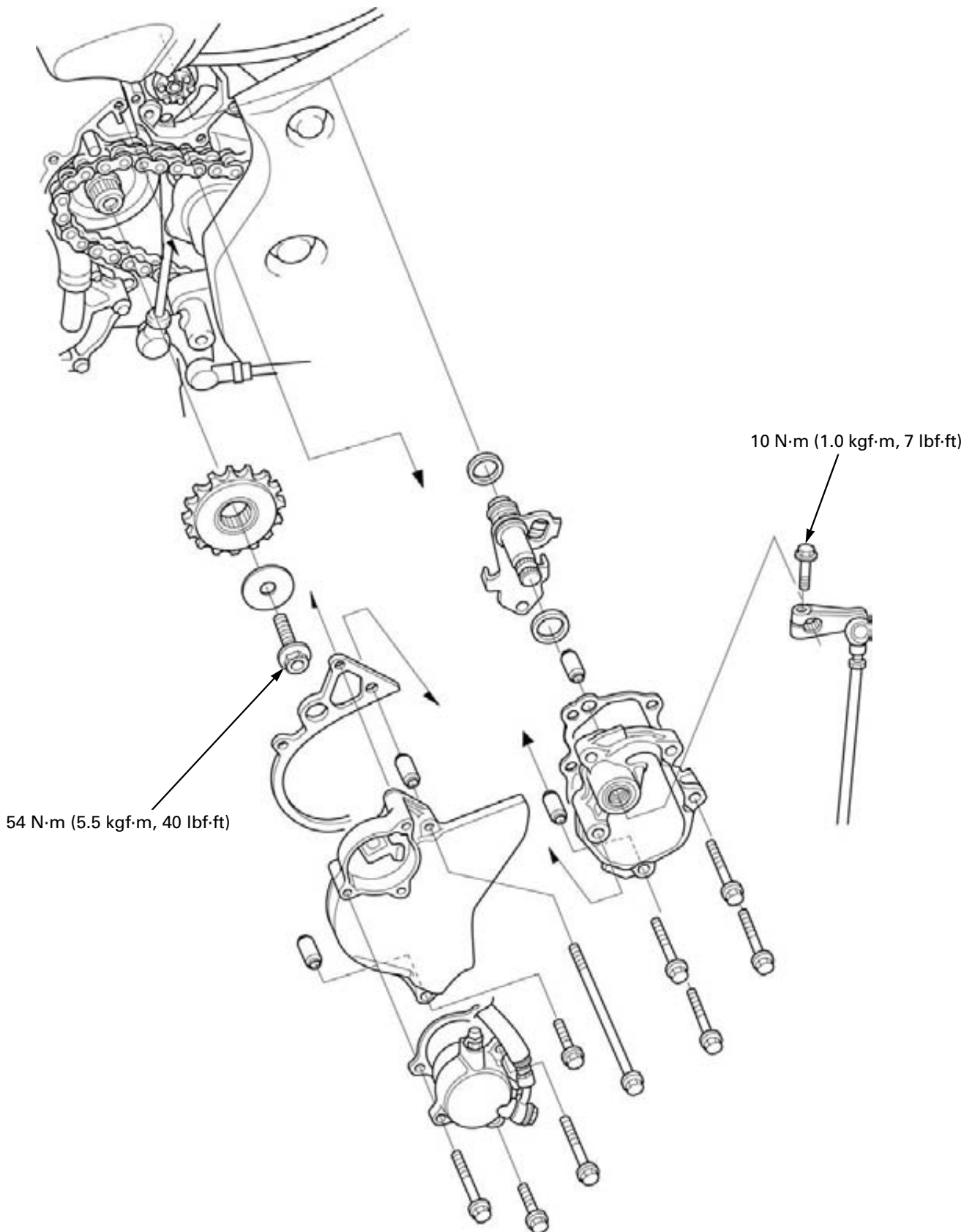


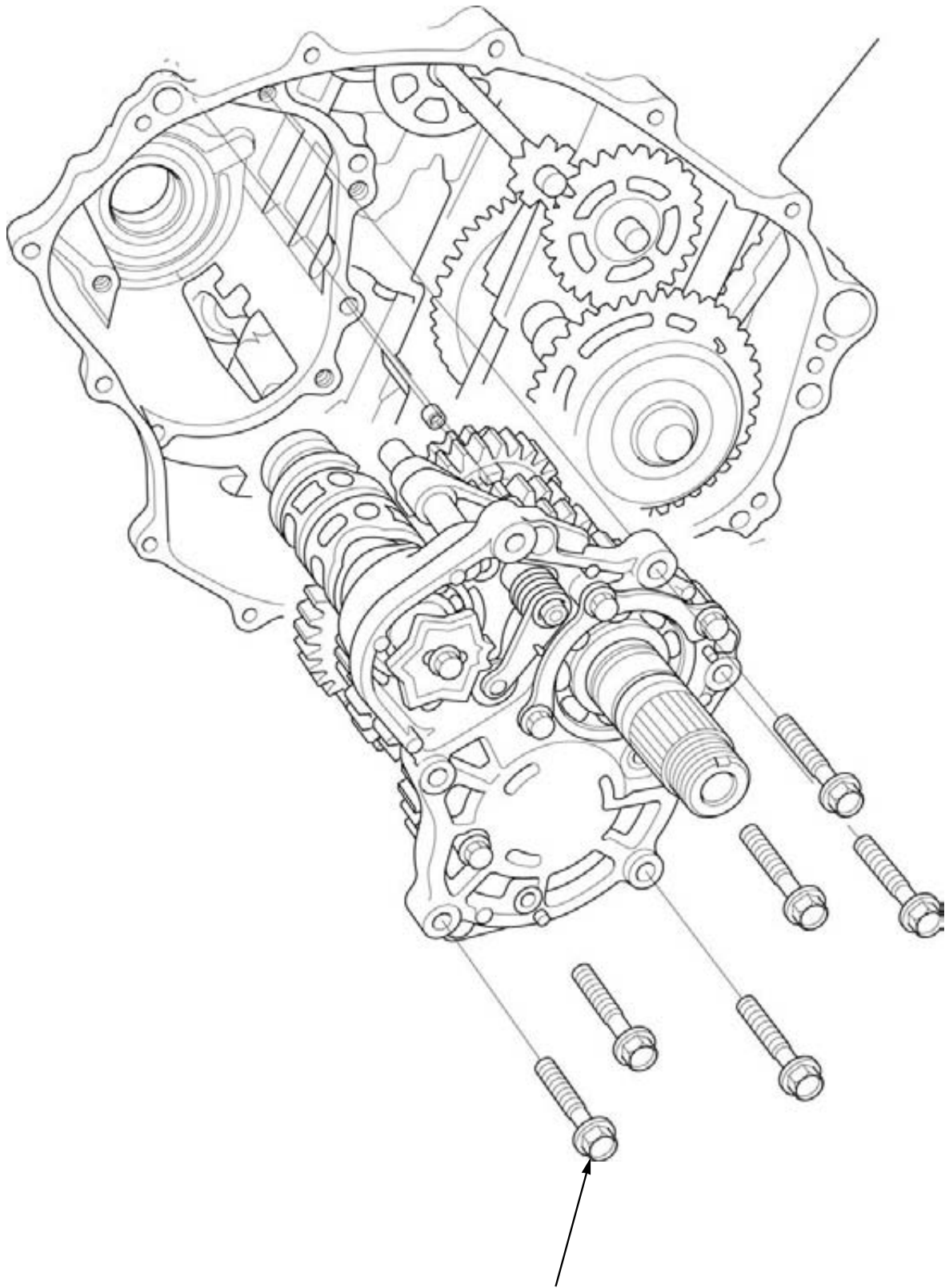
12. TRANSMISSION/GEARSHIFT LINKAGE

COMPONENT LOCATION	12-2	GEARSHIFT SPINDLE	12-7
SERVICE INFORMATION	12-4	TRANSMISSION.....	12-11
TROUBLESHOOTING	12-6		

TRANSMISSION/GEARSHIFT LINKAGE

COMPONENT LOCATION





29 N·m (3.0 kgf·m, 21 lbf·ft)

TRANSMISSION/GEARSHIFT LINKAGE

SERVICE INFORMATION

GENERAL

- This section covers the transmission and gearshift linkage service. These service can be done engine installed in the frame.

SPECIFICATIONS

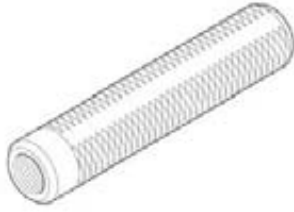

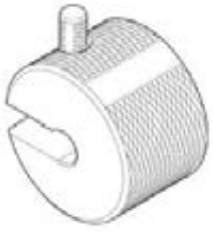
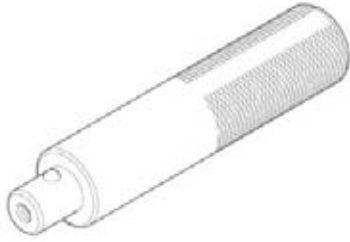







Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Shift fork	I.D.	12.000 – 12.018 (0.4724 – 0.4731)	12.03 (0.474)	
	Claw thickness	5.93 – 6.00 (0.233 – 0.236)	5.9 (0.23)	
Shift fork shaft O.D.		11.957 – 11.968 (0.4707 – 0.4712)	11.95 (0.470)	
Transmission	Gear I.D.	M5, M6	31.000 – 31.025 (1.2205 – 1.2215)	31.04 (1.222)
		C1	28.000 – 28.021 (1.1024 – 1.1032)	28.04 (1.104)
		C2, C3, C4	33.000 – 33.025 (1.2992 – 1.3002)	33.04 (1.301)
	Gear busing O.D.	M5, M6	30.955 – 30.980 (1.2187 – 1.2197)	30.935 (1.2179)
		C2	32.955 – 32.980 (1.2974 – 1.2984)	32.935 (1.2967)
		C3, C4	32.950 – 32.975 (1.2972 – 1.2982)	32.930 (1.2964)
	Gear-to-bushing clearance	M5, M6	0.020 – 0.070 (0.0008 – 0.0028)	0.10 (0.004)
		C2	0.020 – 0.070 (0.0008 – 0.0028)	0.10 (0.004)
		C3, C4	0.025 – 0.075 (0.0010 – 0.0030)	0.11 (0.004)
	Gear bushing I.D.	M5	27.985 – 28.006 (1.1018 – 1.1026)	28.016 (1.1030)
		C2	29.985 – 30.006 (1.1018 – 1.1026)	30.021 (1.1819)
	Mainshaft O.D.	at M5	27.967 – 27.980 (1.1011 – 1.1016)	27.957 (1.1007)
	Countershaft O.D.	at C2	29.967 – 29.980 (1.1798 – 1.1803)	29.960 (1.1795)
	Bushing to shaft clearance	M5	0.005 – 0.039 (0.0002 – 0.0015)	0.06 (0.002)
C2		0.005 – 0.039 (0.0002 – 0.0015)	0.06 (0.002)	

TORQUE VALUES

Transmission holder flange bolt	29 N·m (3.0 kgf·m, 21 lbf·ft)	Apply a locking agent to the threads.
Countershaft bearing set plate bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Mainshaft bearing set plate bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply a locking agent to the threads.
Shift drum center socket bolt	23 N·m (2.3 kgf·m, 17 lbf·ft)	(Apply a locking agent to the threads)
Shift drum stopper arm pivot bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply a locking agent to the threads.
Gearshift spindle return spring pin	23 N·m (2.3 kgf·m, 17 lbf·ft)	
Shift drum bearing setting bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Gearshift cam bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply a locking agent to the threads.
Gearshift arm pinch bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	

TOOLS

<p>Bearing remover handle 07936-3710100</p> 	<p>Bearing remover set, 20 mm 07936-3710600</p> 	<p>Remover weight 07741-0010201</p> 
<p>Driver 07749-0010000</p> 	<p>Attachment, 42 x 47 mm 07746-0010300</p> 	<p>Attachment, 52 x 55 mm 07746-0010400</p> 
<p>Attachment, 62 x 68 mm 07746-0010500</p> 	<p>Attachment, 42 x 47 mm 07746-0010300</p> 	<p>Pilot, 20 mm 07746-0040500</p> 
<p>Pilot, 25 mm 07746-0040600</p> 	<p>Pilot, 28 mm 07746-0041100</p> 	

TROUBLESHOOTING

Hard to shift

- Improper clutch operation
- Incorrect engine oil weight
- Bent shift fork
- Bent shift fork shaft
- Bent shift fork claw
- Damaged shift drum cam groove
- Bent gearshift spindle

Transmission jumps out of gear

- Worn gear dogs
- Worn gear shifter groove
- Bent shift fork shaft
- Broken shift drum stopper arm
- Broken shift drum stopper arm spring
- Worn or bent shift forks
- Broken gearshift spindle return spring

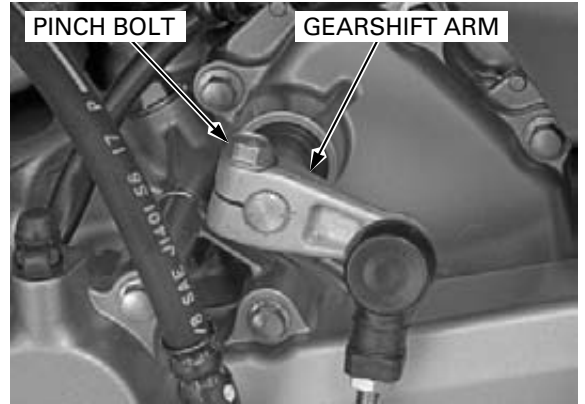
Excessive engine noise

- Worn or damaged transmission gear
- Worn or damaged transmission bearings

GEARSHIFT SPINDLE

REMOVAL

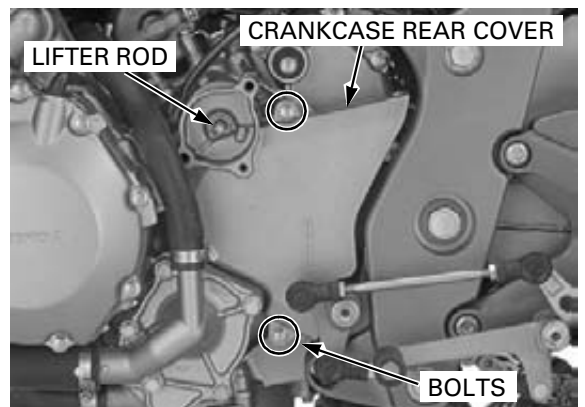
Remove the pinch bolt and remove the gear shift arm from the gear shift spindle.



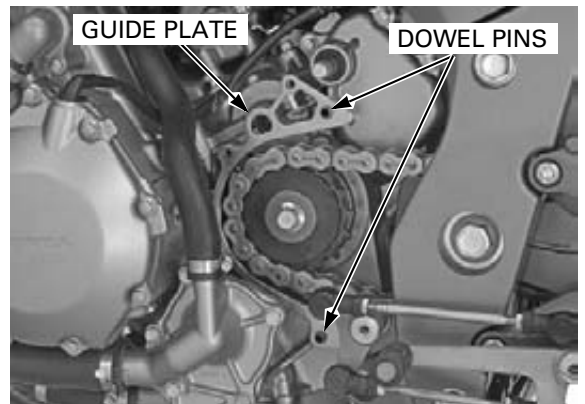
Remove the clutch slave cylinder (page 10-13).

Remove the clutch lifter rod.

Remove the bolts and left crankcase rear cover.

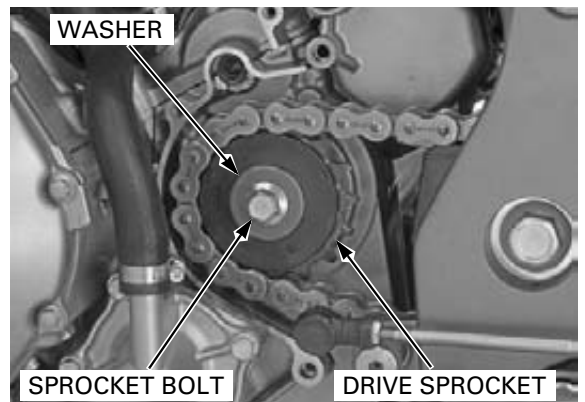


Remove the guide plate and dowel pins.



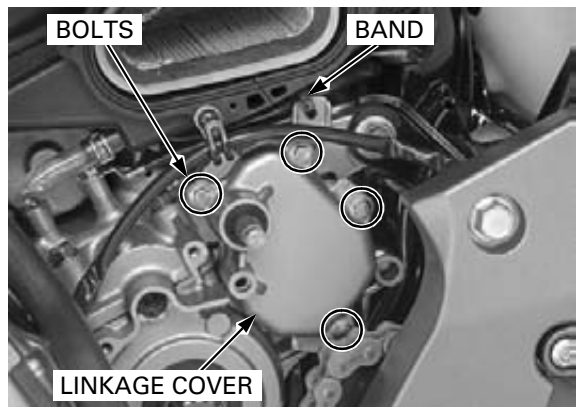
Loosen the rear axle nut and turn the drive chain adjusting bolts to make the drive chain slack fully (page 4-21).

Remove the drive sprocket bolt, washer and drive sprocket.

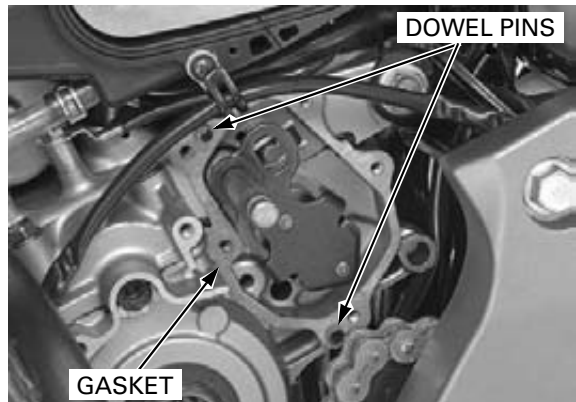


TRANSMISSION/GEARSHIFT LINKAGE

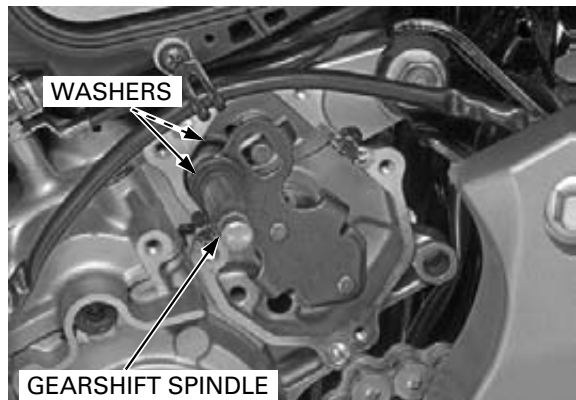
Remove the air cleaner duct (page 4-7).
Remove the wire band from the linkage cover.
Remove the bolts and gearshift linkage cover.



Remove the gasket and dowel pins.

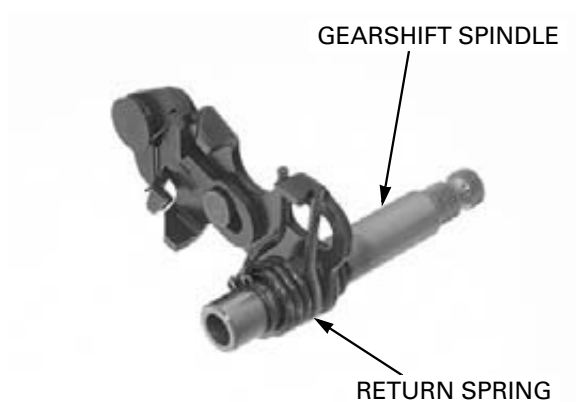


Remove the gearshift spindle and washers.

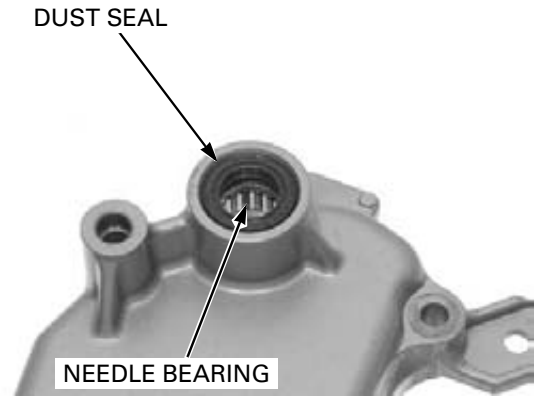


INSPECTION

Check the gearshift spindle for wear, damage or bending.
Check the return spring for fatigue or damage.
If the snap rings are removed, install them with their chamfered side facing the return spring.

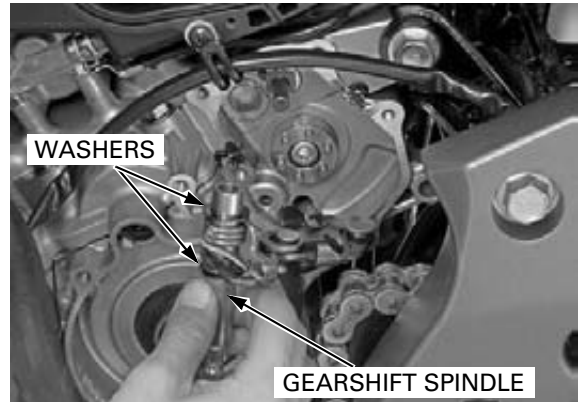


Check the dust seal for damage or deterioration.
Check the needle bearing for wear or damage.

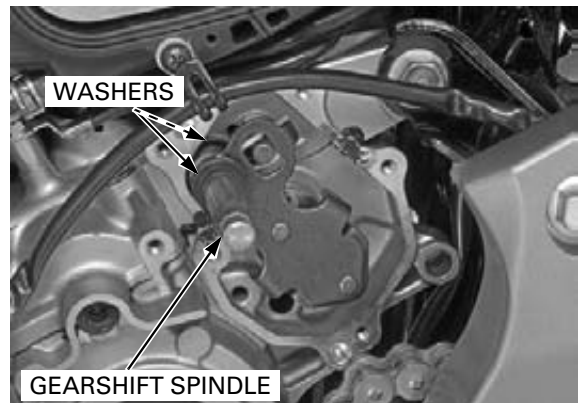


INSTALLATION

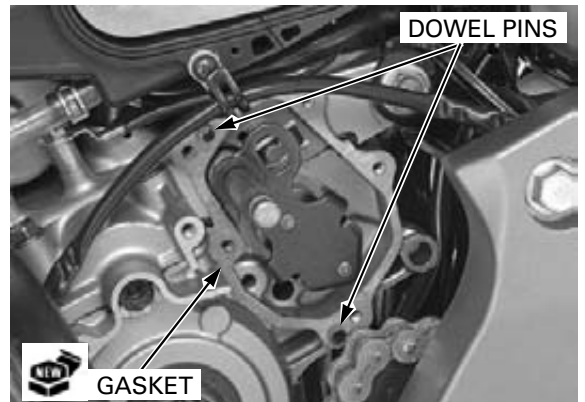
Install the washers to the gearshift spindle.



Install the gearshift spindle into the crankcase with the washers.



Install a dowel pins and new gasket.



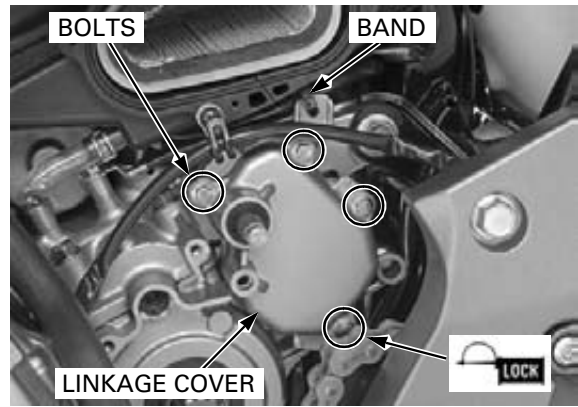
TRANSMISSION/GEARSHIFT LINKAGE

Install the gearshift linkage cover being careful not to damage the oil seal lips.

Apply a locking agent to the threads of the bolt indicated.

Install and tighten the linkage cover bolts.

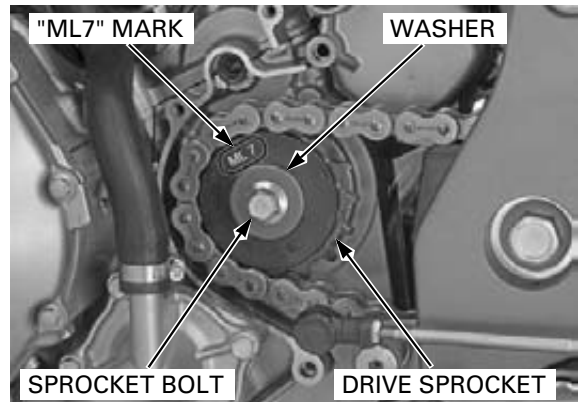
Secure the starter motor cable and ground cable with the wire band through the linkage cover hole.



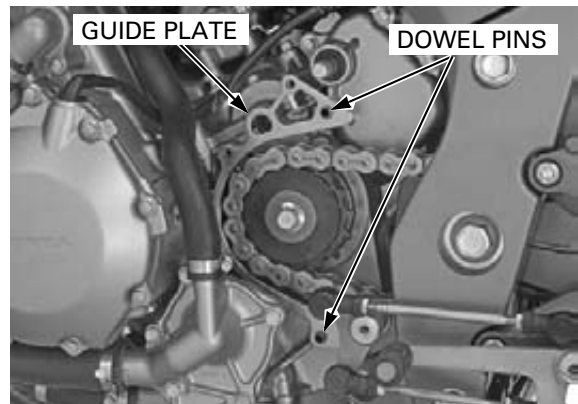
Install the drive sprocket with its "ML7" mark facing out.

Install the washer and drive sprocket bolt, then tighten the drive sprocket bolt to the specified torque.

TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)



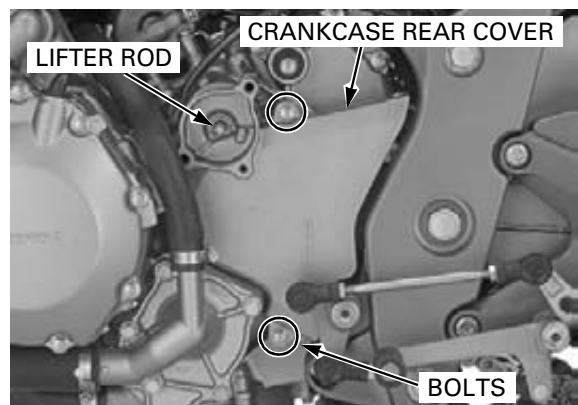
Install the dowel pins and guide plate.



Install the left crankcase rear cover and tighten the mounting bolts.

Install the clutch lifter rod.

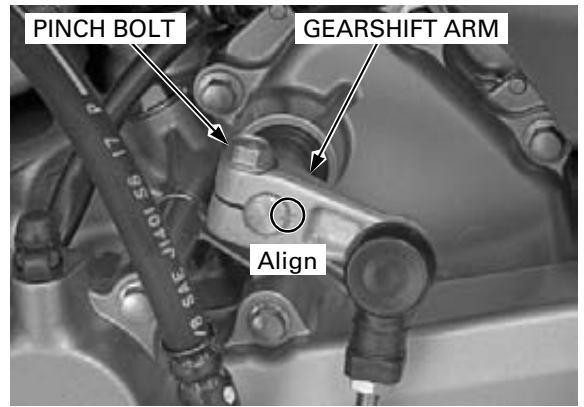
Install the clutch slave cylinder (page 10-13).



Align the punch mark on the gearshift arm with the rear punch mark on the spindle.

Install the gearshift arm onto the gearshift spindle, then tighten the pinch bolt.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

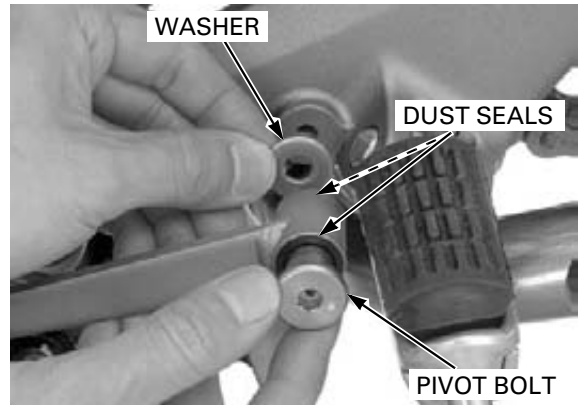


Check the pivot dust seals for deterioration or damage, replace them if necessary.

If the gearshift pedal has been removed, install the washer, gearshift pedal and pivot bolt onto the frame.

Tighten the pivot bolt to the specified torque.

TORQUE: 26 N·m (2.7 kgf·m, 20 lbf·ft)



TRANSMISSION

REMOVAL

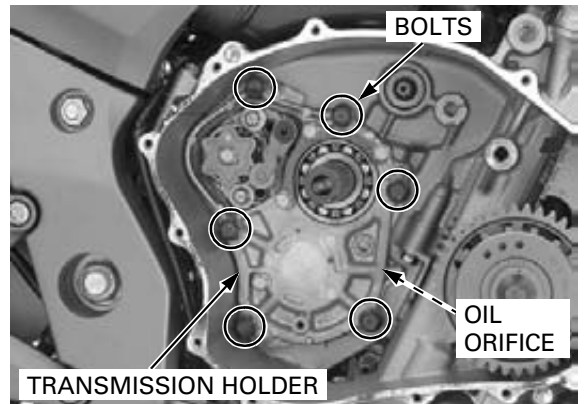
Remove the following:

- Right crankcase cover (page 10-15)
- Clutch (page 10-17)
- Drive sprocket (page 12-7)

Remove the transmission holder mounting bolts.

Pull out the transmission holder and transmission assembly from the crankcase.

Be careful not to fall the oil orifice into the crankcase when removing the transmission holder.



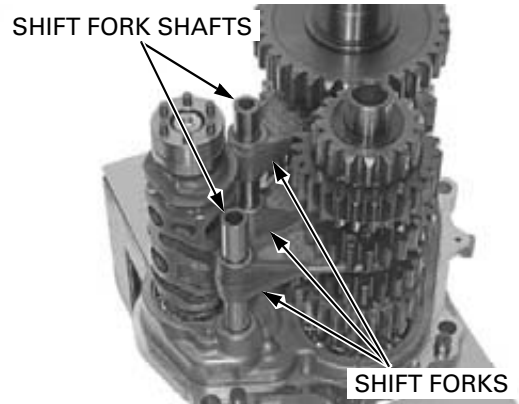
Remove the oil orifice from the crankcase.



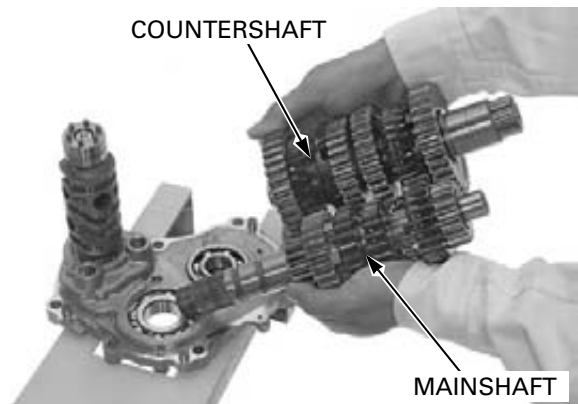
TRANSMISSION/GEARSHIFT LINKAGE

DISASSEMBLY

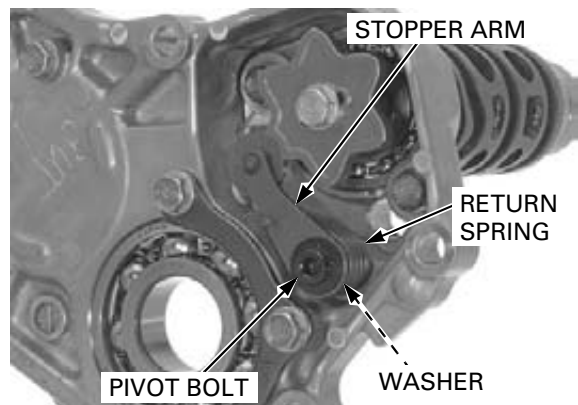
Remove the shift fork shafts and shift forks.



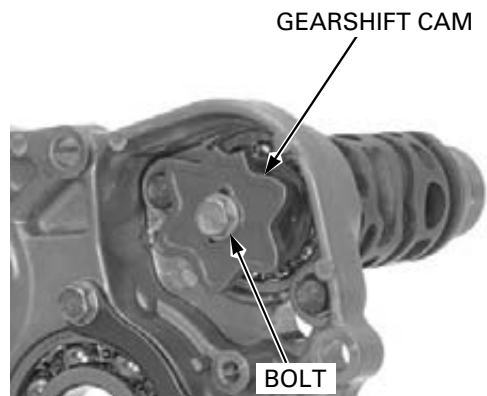
Remove the mainshaft and countershaft assembly.



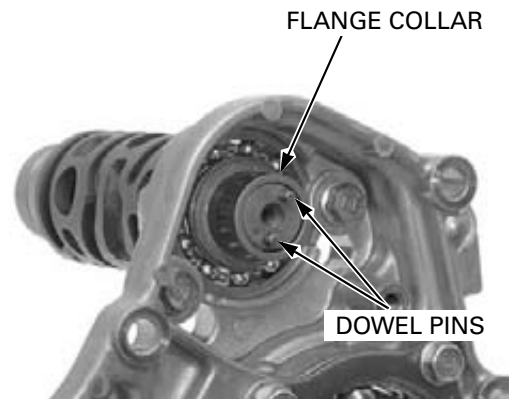
Remove the pivot bolt, washer, stopper arm and return spring.



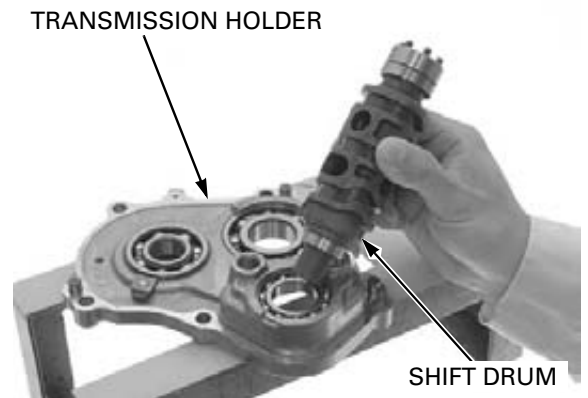
Remove the bolt and gearshift cam.



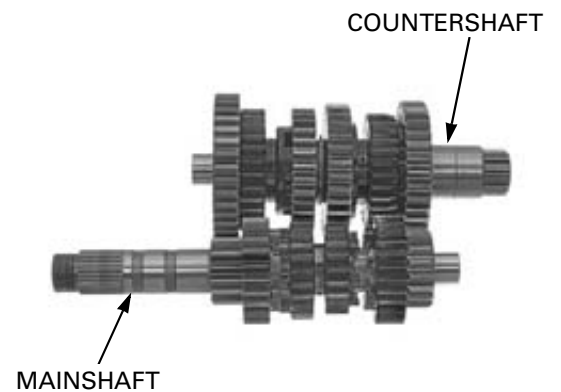
Remove the dowel pins from the shift drum.
Remove the flange collar.



Remove the shift drum from the transmission holder.



Disassemble the mainshaft and countershaft assembly.



INSPECTION

Check the shift fork guide pin for abnormal wear or damage

Measure the shift fork I.D.

SERVICE LIMIT: 12.03 mm (0.474 in)

Measure the shift fork claw thickness.

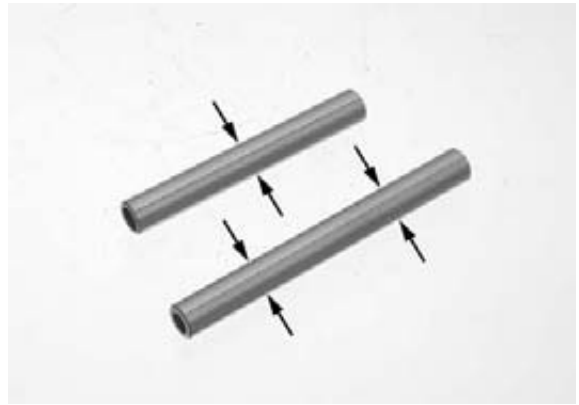
SERVICE LIMIT: 5.9 mm (0.23 in)



TRANSMISSION/GEARSHIFT LINKAGE

Measure the shift fork shaft O.D.

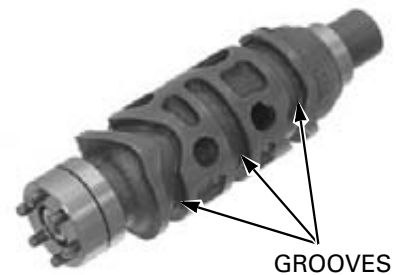
SERVICE LIMITS: 11.95 mm (0.470 in)



Turn the outer race of the shift drum bearing with your finger.
The bearing should turn smoothly and freely without excessive play.
If necessary replace the bearing.



Inspect the shift drum guide grooves for abnormal wear or damage.



Check the gear dogs, dog holes and teeth for abnormal wear or lack of lubrication.

Measure the I.D. of each gear.

SERVICE LIMITS:

M5, M6: 31.04 mm (1.222 in)

C1: 28.04 mm (1.104 in)

C2, C3, C4: 33.04 mm (1.301 in)



Measure the O.D. of each gear bushing.

SERVICE LIMITS:

M5, M6: 30.935 mm (1.2179 in)

C2: 32.935 mm (1.2967 in)

C3, C4: 32.930 mm (1.2964 in)

Measure the I.D. of each gear bushing.

SERVICE LIMITS:

M5: 28.016 mm (1.1030 in)

C2: 29.960 mm (1.1795 in)

Calculate the gear-to-bushing clearance.

SERVICE LIMITS:

M5, M6: 0.10 mm (0.004 in)

C2: 0.10 mm (0.004 in)

C3, C4: 0.11 mm (0.004 in)

Check the gear shifter groove for abnormal wear or damage.



SHIFTER GROOVE



Check the mainshaft and countershaft for abnormal wear or damage.

Measure the mainshaft O.D. at the M5 gear.

SERVICE LIMIT: 27.957 mm (1.1007 in)

Measure the countershaft O.D. at the C2 gear.

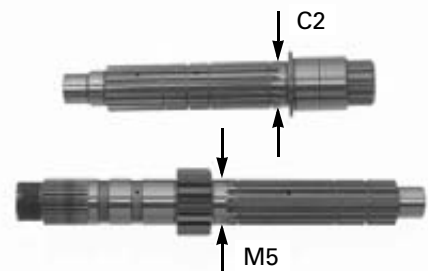
SERVICE LIMIT: 29.960 mm (1.1795 in)

Calculate the gear bushing-to-shaft clearance.

SERVICE LIMITS:

M5: 0.06 mm (0.002 in)

C2: 0.06 mm (0.002 in)



Turn the inner race of each transmission bearings with your finger.

The bearing should turn smoothly and freely without excessive play.

If necessary replace the bearing (page 12-16).



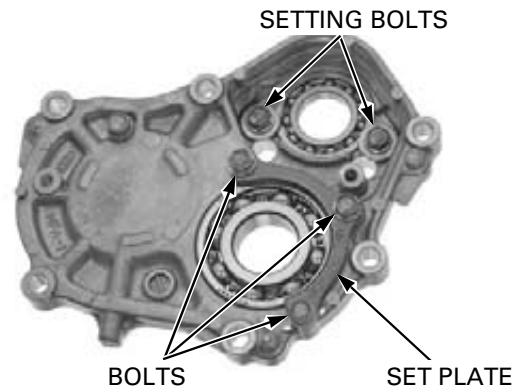
TRANSMISSION/GEARSHIFT LINKAGE

TRANSMISSION BEARING REPLACEMENT

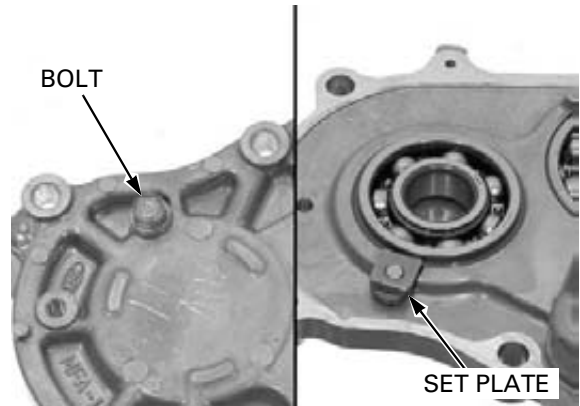
Replace the transmission holder and crankcase as a set.

Remove the bolts and shift drum bearing setting bolts.

Remove the bolts and mainshaft bearing set plate.



Remove the bolt and countershaft bearing set plate.

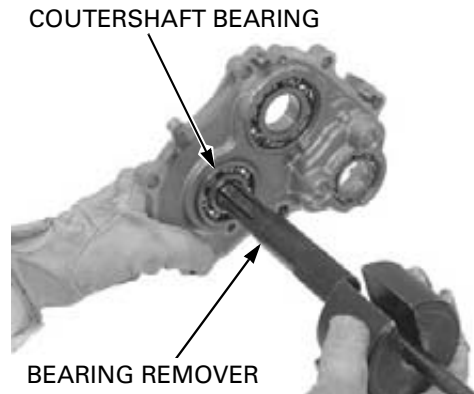


Remove the countershaft bearing using the special tools.

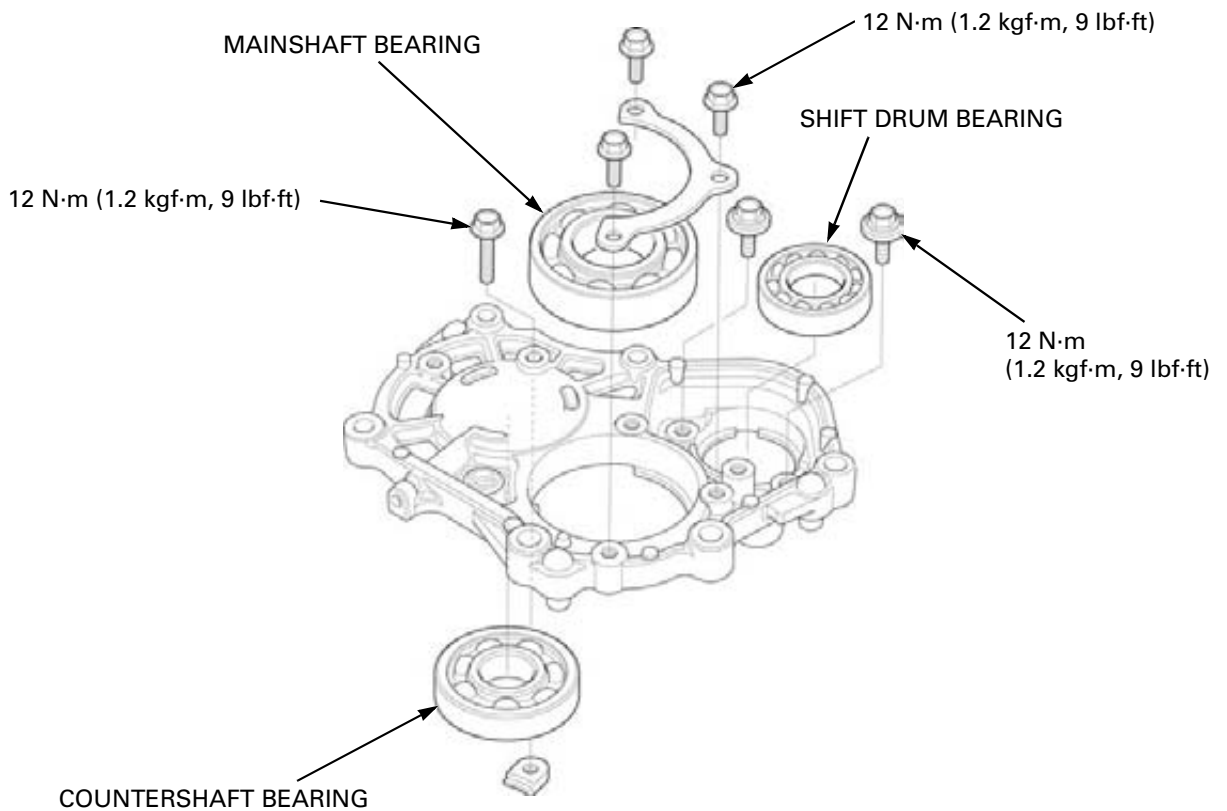
TOOLS:

Bearing remover handle	07936-3710100
Bearing remover set	07936-3710600
Remover weight	07741-0010201

Drive out the countershaft bearing and shift drum bearing.



Bearing Locations:



Drive the each bearing into the bearing holder using the special tools.

TOOLS:

Mainshaft bearing:

Driver	07749-0010000
Attachment, 62 x 68 mm	07746-0010500
Pilot, 28 mm	07746-0041100

Countershaft bearing:

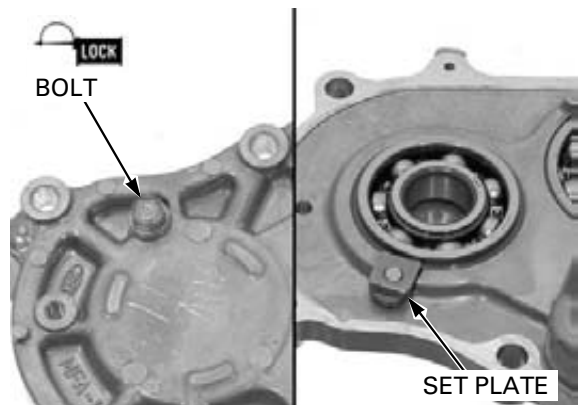
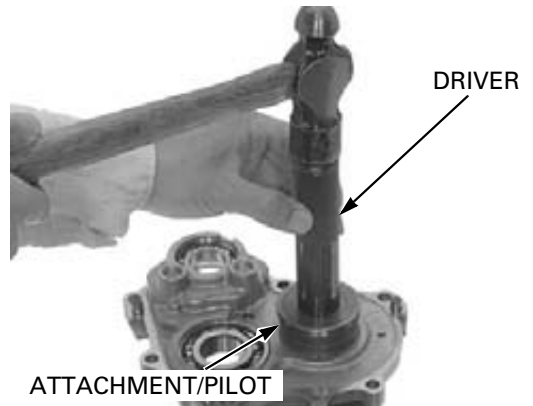
Driver	07749-0010000
Attachment, 52 x 55 mm	07746-0010400
Pilot, 20 mm	07746-0040500

Shift drum bearing:

Driver	07749-0010000
Attachment, 42 x 47 mm	07746-0010300
Pilot, 25 mm	07746-0040600

Apply a locking agent to the countershaft bearing set plate bolt threads. Install the set plate and tighten the bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



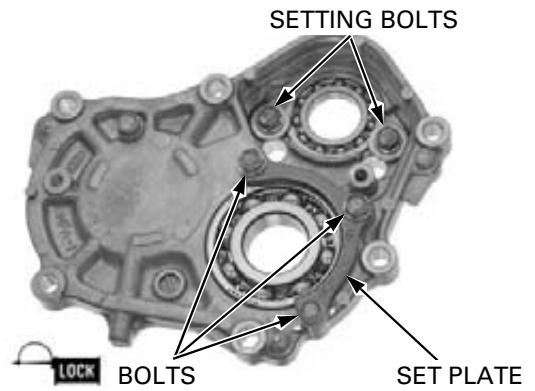
TRANSMISSION/GEARSHIFT LINKAGE

Apply a locking agent to the mainshaft bearing set plate bolt threads and shift drum bearing setting bolt threads.

Install the mainshaft bearing set plate with its "MEL OUTSIDE" mark facing out.

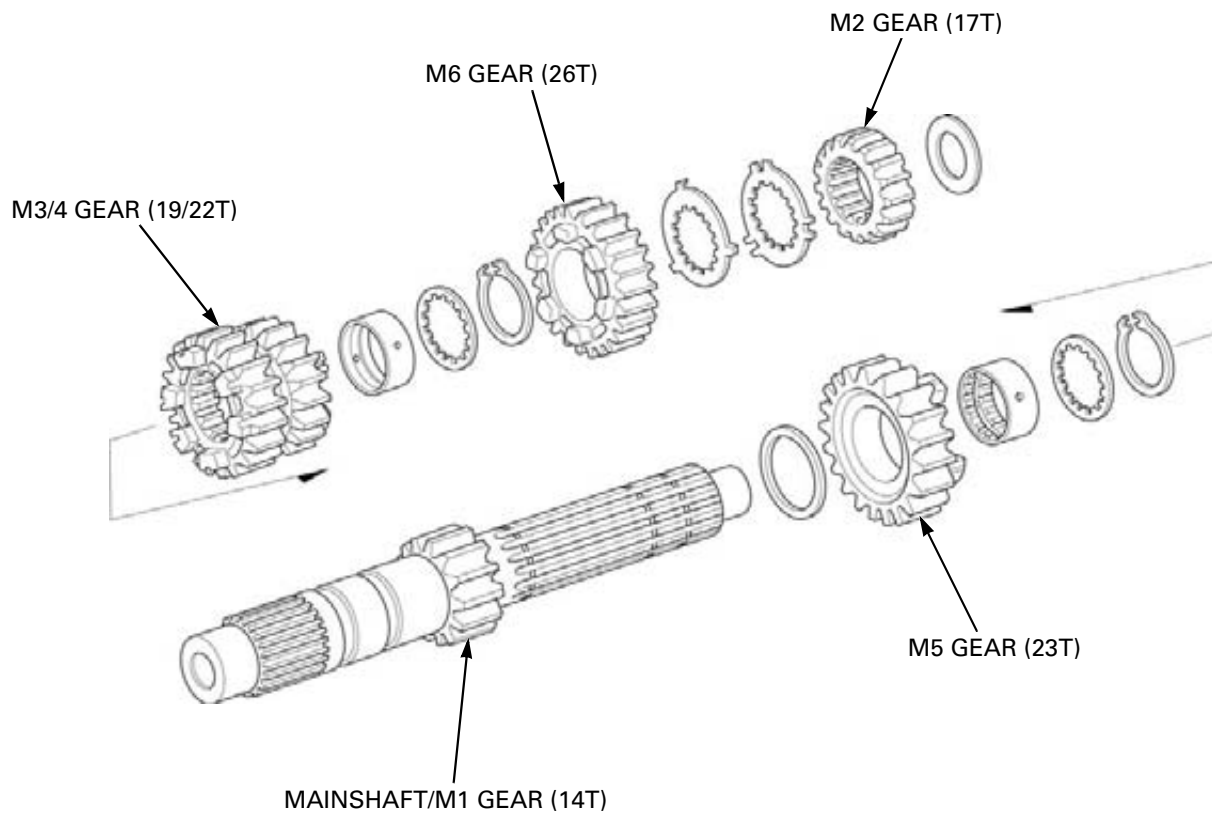
Install and tighten the bearing set plate bolts and setting bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

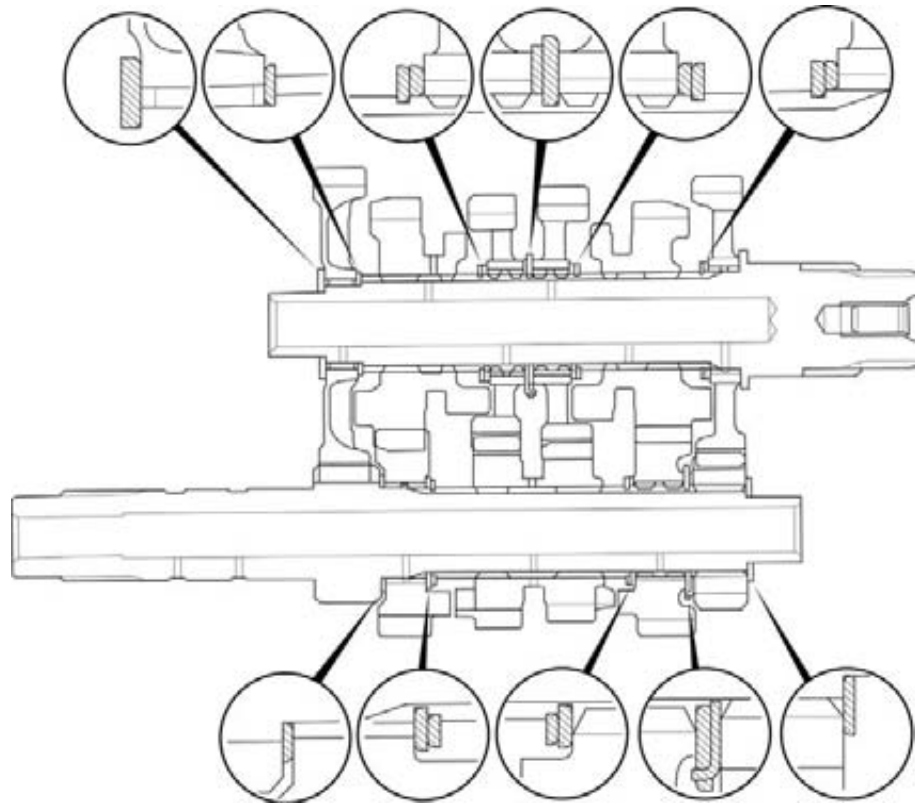
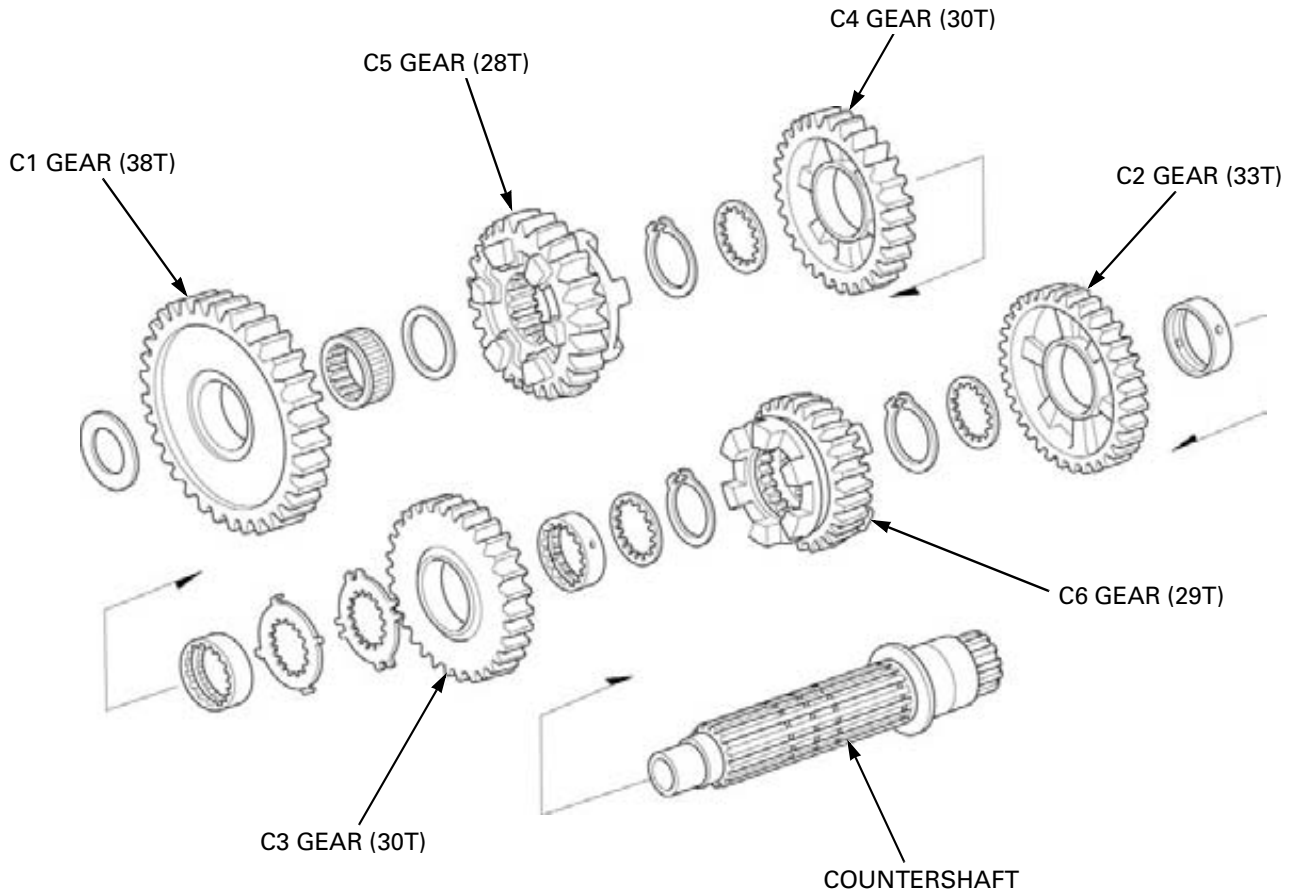


TRANSMISSION ASSEMBLY

Mainshaft:



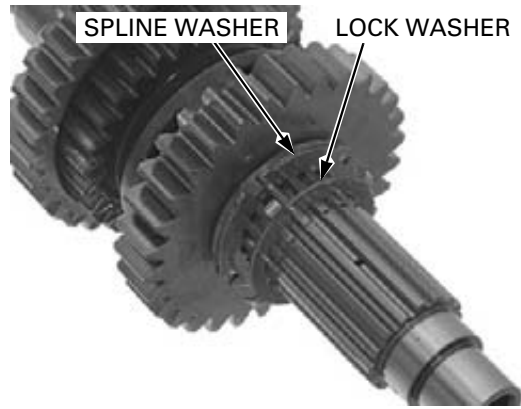
Countershaft:



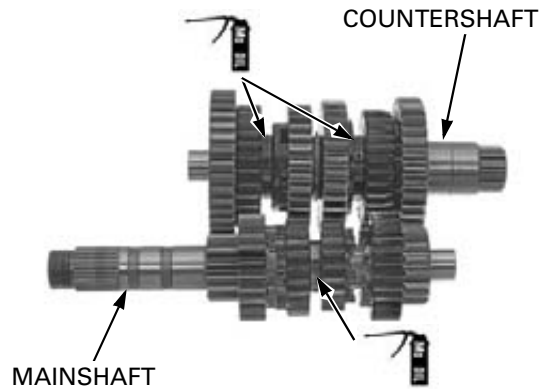
TRANSMISSION/GEARSHIFT LINKAGE

Apply clean engine oil to the gear teeth, sliding surfaces and the bushings.
Assemble the transmission gears and shafts.

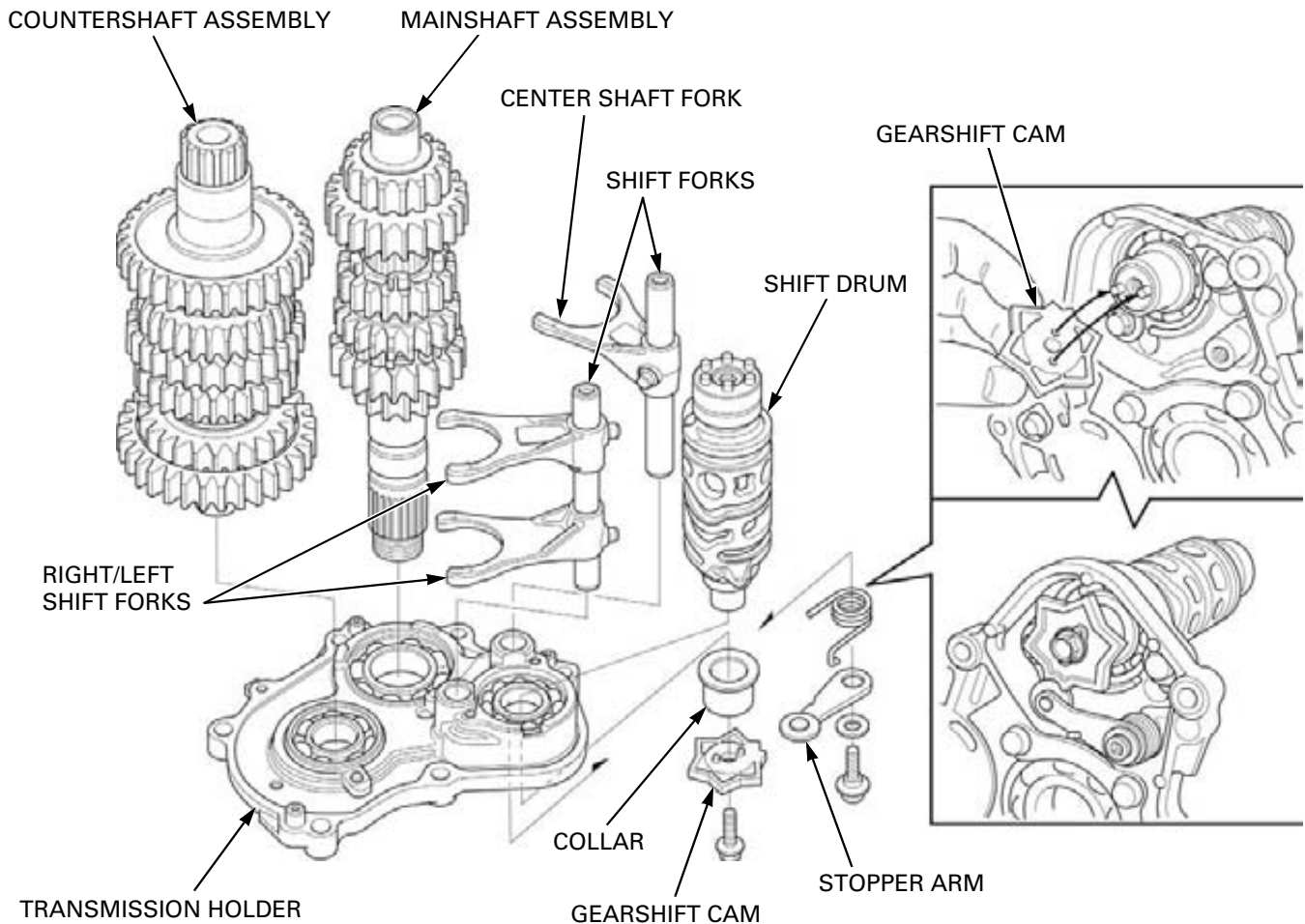
- Always install the thrust washer and snap ring with the chamfered (rolled) edge facing away from the thrust load.
- Install the snap ring so that its end gap aligns with the groove in the splines.
- Make sure that the snap ring is fully seated in the shaft groove after installing it.
- Align the lock washer tabs with the spline washer grooves.



Apply molybdenum oil solution to the shift fork grooves in the M3, C5 and C6 gear.

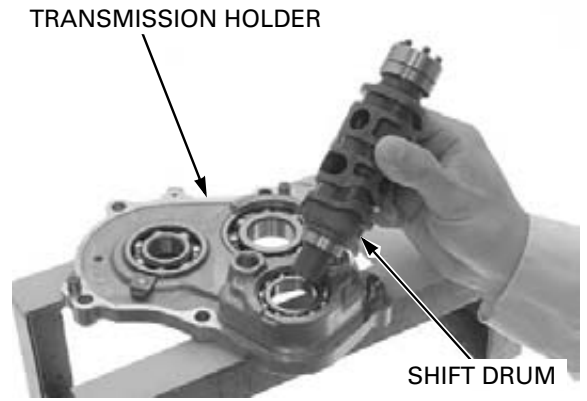


TRANSMISSION HOLDER ASSEMBLY

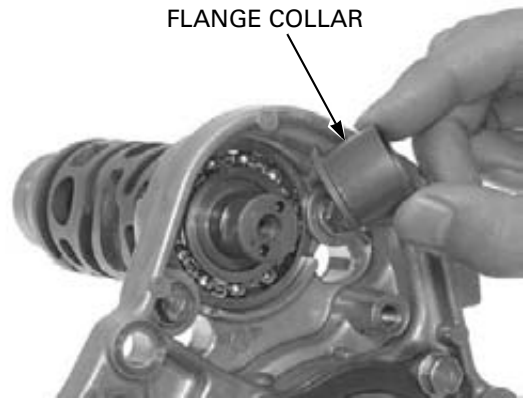


TRANSMISSION/GEARSHIFT LINKAGE

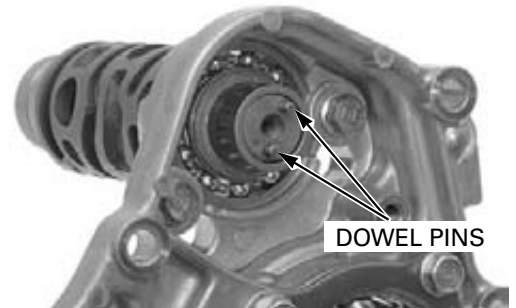
Install the shift drum into the transmission holder.



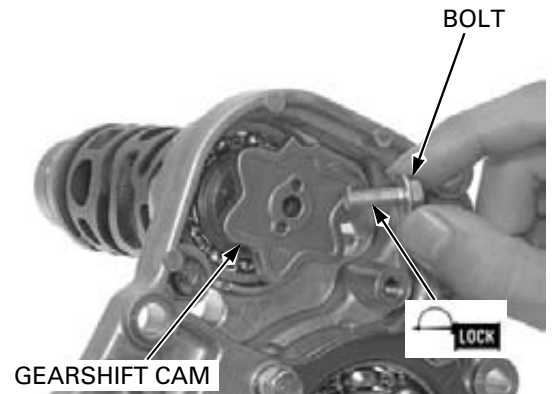
Install the flange collar with its flange facing in.



Install the dowel pins onto the gearshift cam.



Install the gearshift cam onto the gearshift drum.
Apply a locking agent to the gearshift cam bolt threads.
Install and tighten the bolt securely.



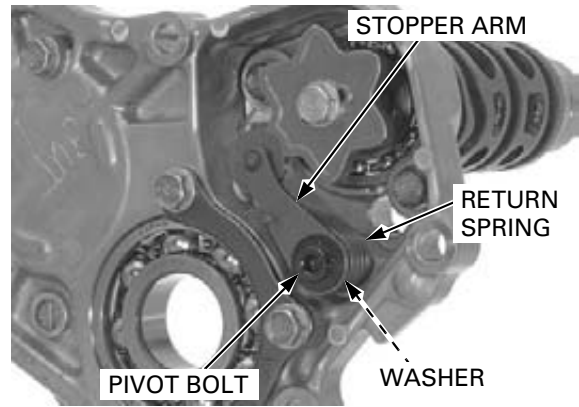
TRANSMISSION/GEARSHIFT LINKAGE

Install the following:

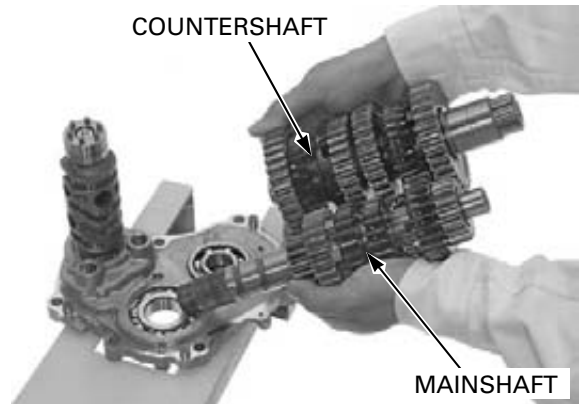
- Return spring
- Washer
- Stopper arm
- Pivot bolt

Tighten the stopper arm pivot bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

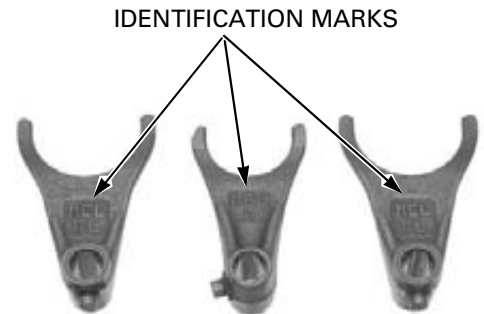


Install the mainshaft and countershaft as an assembly to the transmission holder.



The shift forks have location marks:

- "RL" for right and left
- "C" for center

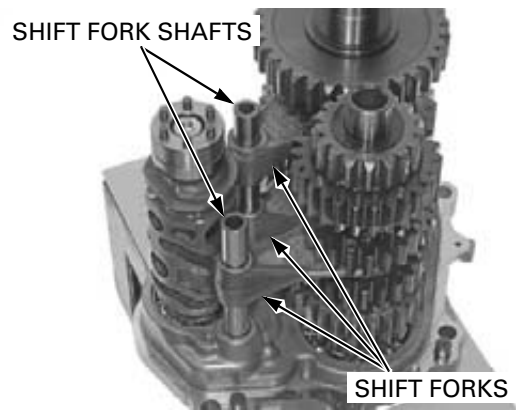


The shaft for center shift fork is shorter than that for right/left shift forks.

Install the shift fork shafts onto the transmission holder.

Install the shift forks with their identification marks facing up.

Install each shift fork and align its claw with each shifter groove.



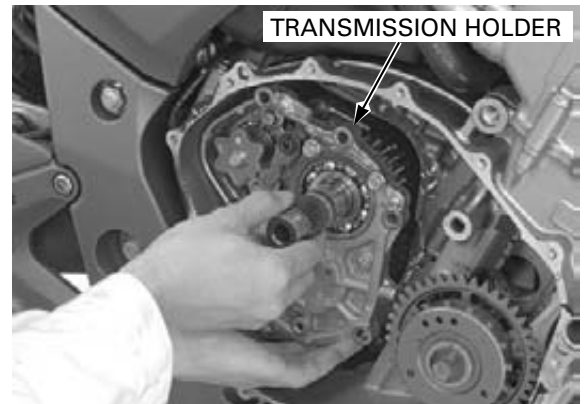
INSTALLATION

Install the oil orifice with its small I.D. side facing in.



Turn the shift drum while turning the mainshaft, and position the transmission into neutral.

Install the transmission holder and transmission assembly into the crankcase.

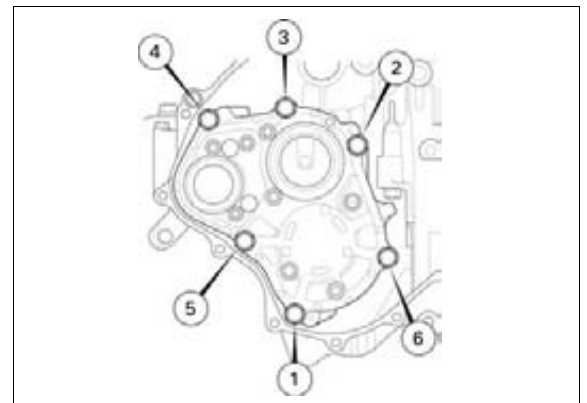


Install and tighten the bearing holder mounting bolts to the specified torque.

TORQUE: 29 N·m (3.0 kgf·m, 21 lbf·ft)

Install the following:

- Gearshift linkage (page 12-9)
- Clutch (page 10-24)
- Right crankcase cover (page 10-33)



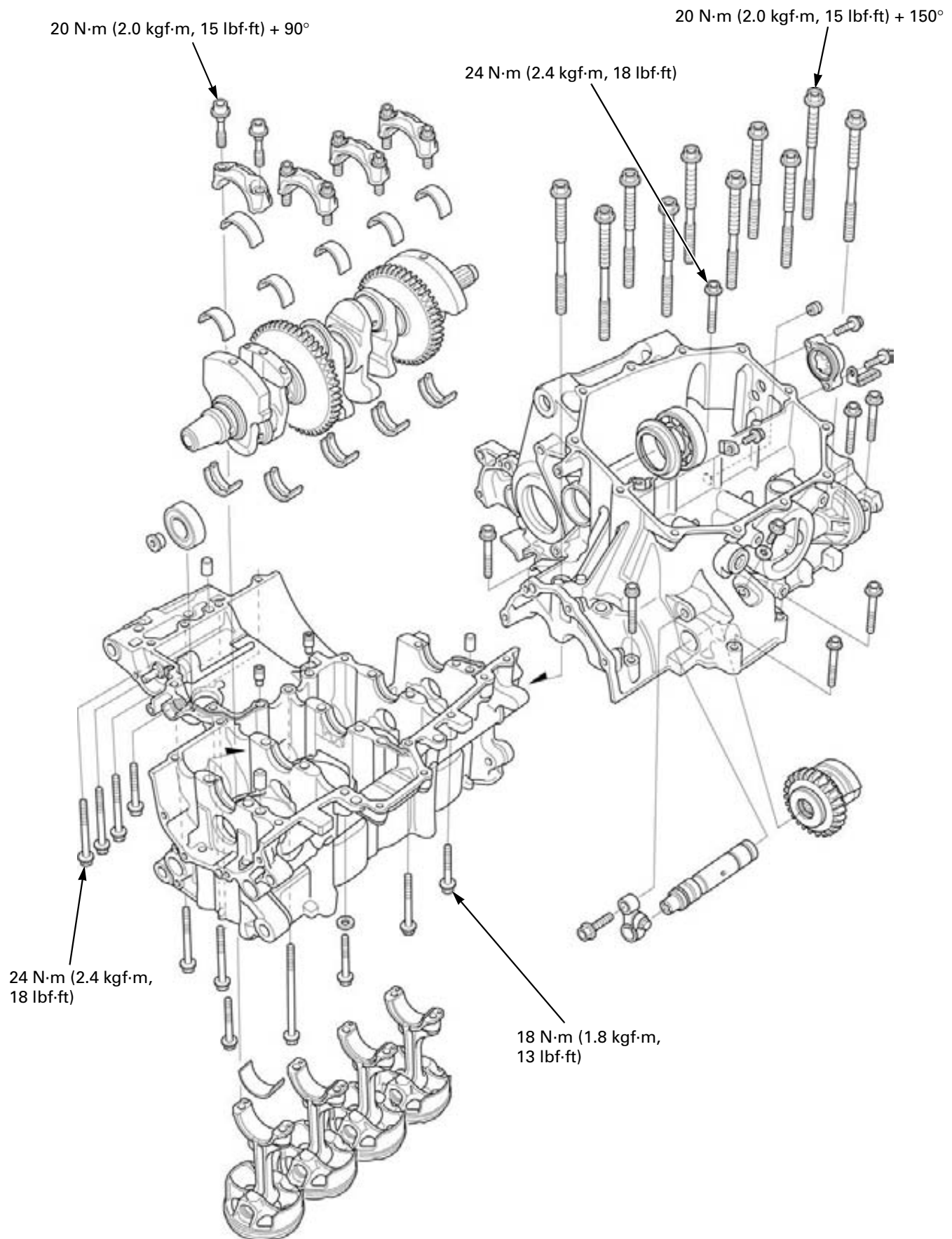
MEMO

13. CRANKCASE/CRANKSHAFT/BALANCER/PISTON/CYLINDER

COMPONENT LOCATION	13-2	CRANKPIN BEARING	13-12
SERVICE INFORMATION	13-3	PISTON/CYLINDER	13-15
TROUBLESHOOTING	13-4	COUNTERSHAFT BEARING REPLACEMENT	13-21
CRANKCASE SEPARATION	13-5	CRANKCASE ASSEMBLY	13-22
CRANKSHAFT	13-7	BALANCER	13-28
MAIN JOURNAL BEARING	13-9		

CRANKCASE/CRANKSHAFT/BALANCER/PISTON/CYLINDER

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- The crankcase must be separated to service the following:
 - Crankshaft (page 13-8)
 - Piston/connecting rod/cylinder (page 13-16)
 - Balancer (page 13-29)
- The following components must be removed before separating the crankcase:
 - Engine (page 8-4)
 - Clutch (page 10-17)
 - Cylinder head (page 9-12)
 - Flywheel (page 11-7)
 - Gearshift linkage/transmission (page 12-11)
 - Oil pan (page 5-6)
 - Oil pump (page 5-8)
 - Oil cooler (page 5-12)
 - Starter clutch (page 10-28)
 - Starter motor (page 20-6)
 - Water pump (page 7-16)
- Replace the crankcase and transmission holder as an assembly.
- Be careful not to damage the crankcase mating surfaces when servicing.
- Prior to assembling the crankcase halves, apply sealant to their mating surfaces. Wipe off excess sealant thoroughly.
- Mark and store the connecting rods, bearing caps and bearing inserts to be sure of their correct locations for reassembly.
- 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 with a plastigauge. Incorrect oil clearance can cause major engine damage.

SPECIFICATIONS

Unit: mm (in)

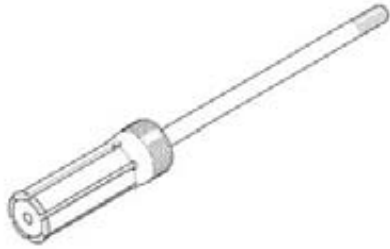
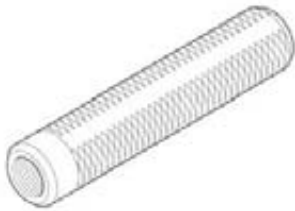

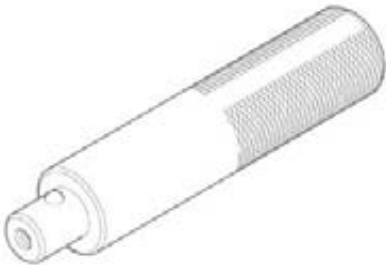


ITEM		STANDARD	SERVICE LIMIT	
Crankshaft	Connecting rod side clearance	0.05 – 0.20 (0.002 – 0.008)	0.25 (0.098)	
	Crankpin bearing oil clearance	0.030 – 0.052 (0.0012 – 0.0020)	0.06 (0.002)	
	Main journal bearing oil clearance	0.019 – 0.037 (0.0007 – 0.0015)	0.05 (0.002)	
	Runout	–	0.05 (0.002)	
Piston, piston rings	Piston O.D. at 9.0 (0.35) from bottom	74.960 – 74.980 (2.9512 – 2.9520)	74.895 (2.9486)	
	Piston pin bore I.D.	17.002 – 17.008 (0.6694 – 0.6696)	17.030 (0.6705)	
	Piston pin O.D.	16.994 – 17.000 (0.6690 – 0.6693)	16.980 (0.6685)	
	Piston-to-piston pin clearance	0.002 – 0.014 (0.0001 – 0.0006)	0.04 (0.002)	
	Piston ring end gap	Top	0.22 – 0.32 (0.009 – 0.013)	0.52 (0.020)
		Second	0.48 – 0.63 (0.019 – 0.025)	0.82 (0.032)
		Oil (side rail)	0.2 – 0.7 (0.01 – 0.03)	1.0 (0.04)
	Piston ring-to-ring groove clearance	Top	0.050 – 0.085 (0.0020 – 0.0033)	0.125 (0.0049)
Second		0.015 – 0.050 (0.0006 – 0.0020)	0.075 (0.0030)	
Cylinder	I.D.	75.000 – 75.015 (2.9528 – 2.9533)	75.15 (2.959)	
	Out of round	–	0.10 (0.004)	
	Taper	–	0.10 (0.004)	
	Warpage	–	0.10 (0.004)	
Cylinder-to-piston clearance		0.020 – 0.055 (0.0008 – 0.0022)	0.10 (0.004)	
Connecting rod small end I.D.		17.030 – 17.042 (0.6705 – 0.6709)	17.048 (0.6712)	
Connecting rod-to-piston pin clearance		0.030 – 0.046 (0.0012 – 0.0018)	0.07 (0.003)	

CRANKCASE/CRANKSHAFT/BALANCER/PISTON/CYLINDER

TORQUE VALUES

Crankcase	7 mm bolt	18 N·m (1.8 kgf·m, 13 lbf·ft)	
	8 mm bolt	24 N·m (2.4 kgf·m, 18 lbf·ft)	
	9 mm bolt (main journal bolt)	See page 13-23	
Lower crankcase sealing bolt (22 mm)		59 N·m (6.0 kgf·m, 44 lbf·ft)	Apply a locking agent to the threads.
Lower crankcase socket bolt (10 mm)		12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply a locking agent to the threads.
Lower crankcase sealing bolt (20 mm)		30 N·m (3.1 kgf·m, 22 lbf·ft)	Apply a locking agent to the threads.
Lower crankcase socket bolt (8 mm)		23 N·m (2.3 kgf·m, 18 lbf·ft)	Apply a locking agent to the threads.
Connecting rod bolt (new bolt)		See page 13-9	Apply oil to the threads and seating surface.
Connecting rod bolt (retightening)		See page 13-13	Apply oil to the threads and seating surface.

TOOLS:

Bearing remover shaft, 35 mm 07936-3710400 	Remover shaft handle 07936-3710100 	Remover weight 07741-0010201 
Driver 07749-0010000 	Attachment, 72 x 75 mm 07746-0010600 	Pilot, 35 mm 07746-0040800 

TROUBLESHOOTING

Cylinder compression is too low, hard to starting or poor performance at low speed

- Leaking cylinder head gasket
- Worn, stuck or broken piston ring
- Worn or damaged cylinder and piston

Cylinder compression too high, overheating or knocking

- Excessive carbon built-up on piston head or combustion chamber

Excessive smoke

- Worn cylinder, piston or piston ring
- Improper installation of piston rings
- Scored or scratched piston or cylinder wall

Abnormal noise

- Worn piston pin or piston pin hole
- Worn connecting rod small end
- Worn cylinder, piston or piston rings
- Worn main journal bearings or crankpin bearings

Engine vibration

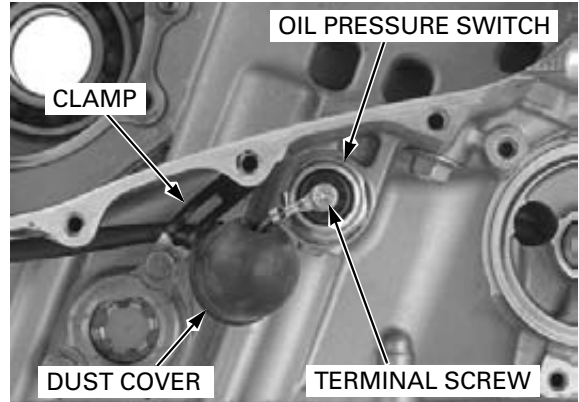
- Excessive crankshaft runout
- Incorrect balancer timing

CRANKCASE SEPARATION

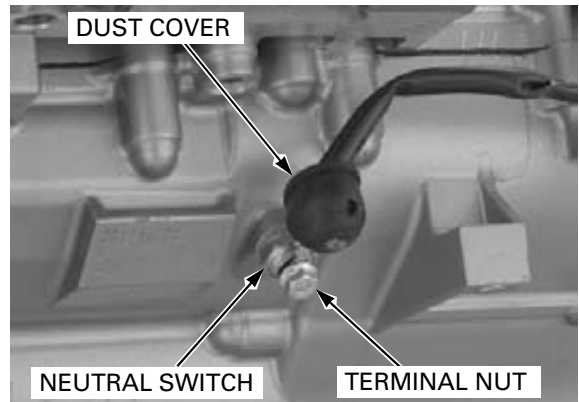
Refer to Service Information for removal of necessary parts before separating the crankcase (page 13-3).

Release the oil pressure switch wire from the clamp and remove the dust cover.

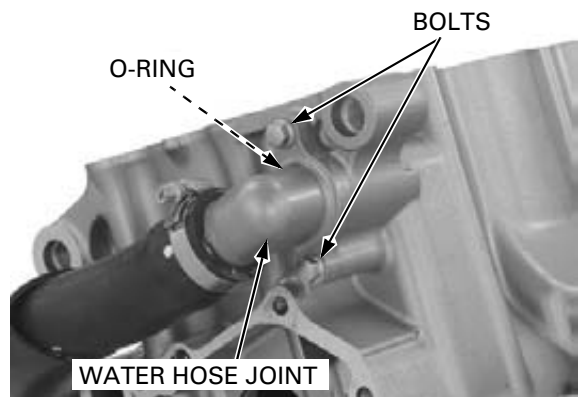
Remove the terminal screw and terminal eyelet from the oil pressure switch.



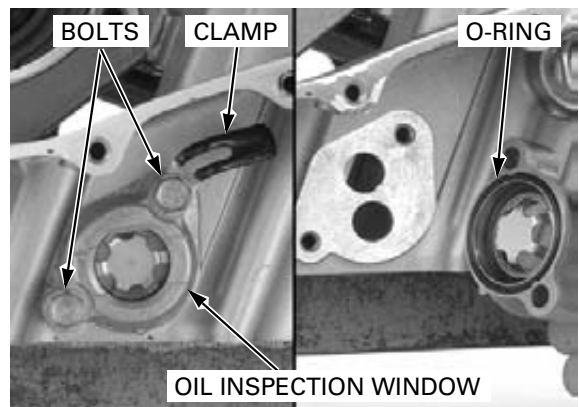
Remove the dust cover, terminal nut and terminal eyelet from the neutral switch.



Remove the bolts and water hose joint.
Remove the O-ring from the hose joint.



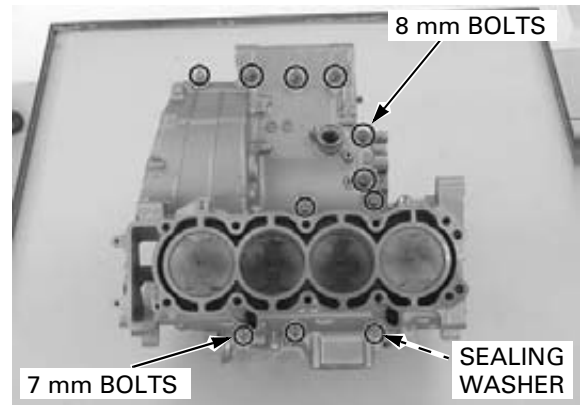
Remove the bolts, clamp and oil inspection window.
Remove the O-ring from the oil inspection window.



CRANKCASE/CRANKSHAFT/BALANCER/PISTON/CYLINDER

Loosen the 7 mm bolts (six) in two to three steps.
Loosen the 8 mm bolts (five) in two to three steps.

Remove the 8 mm bolts, 7 mm bolts and sealing washer.

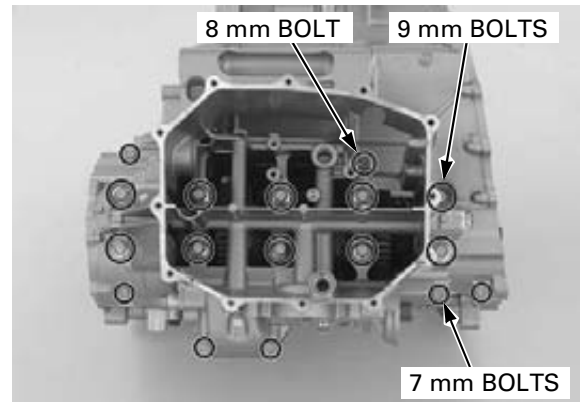


Place the engine upside down.

Loosen the 7 mm bolts (six) and 8 mm bolt in a crisscross pattern in two to three steps, then remove the bolts.

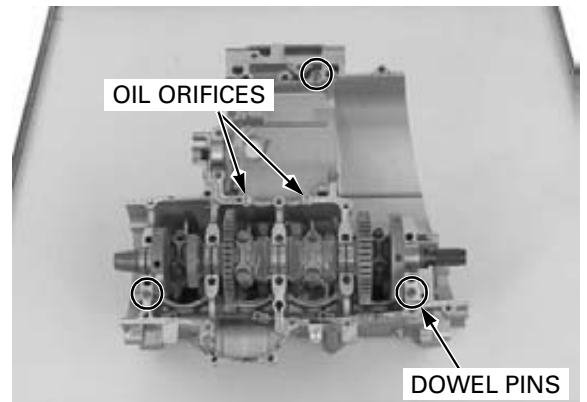
Loosen the 9 mm bolts (main journal bolts) in a crisscross pattern in two to three steps, then remove the bolts.

Separate the lower crankcase from the upper crankcase.

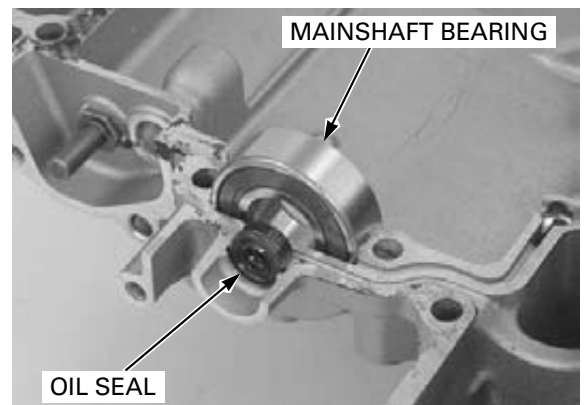


Remove the three dowel pins and two oil orifices.

Clean any sealant off from the crankcase mating surface.



Remove the mainshaft bearing and clutch lifter rod oil seal from the upper crankcase.



CRANKSHAFT

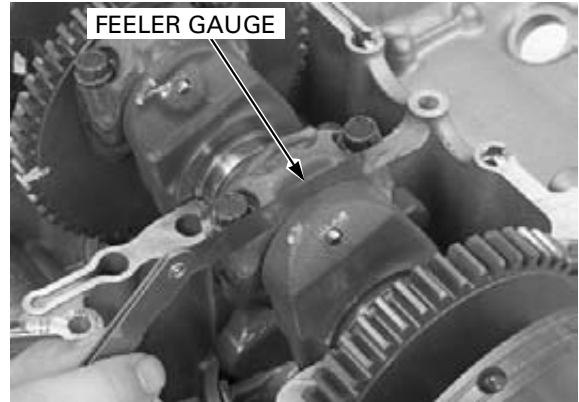
SIDE CLEARANCE INSPECTION

Separate the crankcase halves (page 13-6).

Measure the connecting rod side clearance.

SERVICE LIMIT: 0.25 mm (0.098 in)

If the clearance exceeds the service limit, replace the connecting rod.
Recheck and if still out of limit, replace the crankshaft.



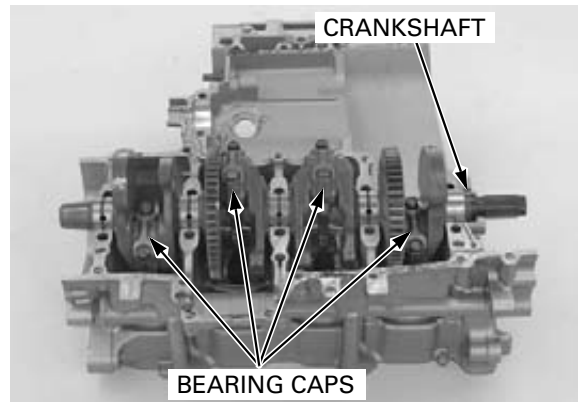
REMOVAL

Mark the bearing caps and bearings as you remove them to indicate the correct cylinder for reassembly.

Tap the side of the bearing cap lightly if it is hard to remove.

Remove the connecting rod bearing cap bolts and bearing caps.

Remove the crankshaft from the upper crankcase.



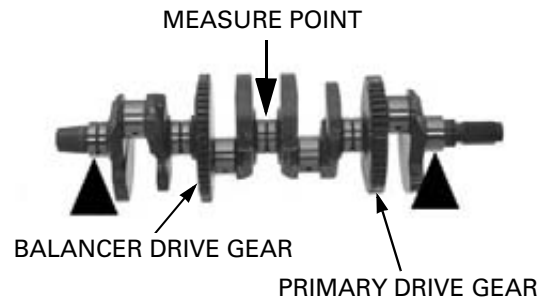
INSPECTION

Support the crankshaft on both end journals.
Set a dial gauge on the center main journal of the crankshaft.

Rotate the crankshaft two revolutions and read the runout.

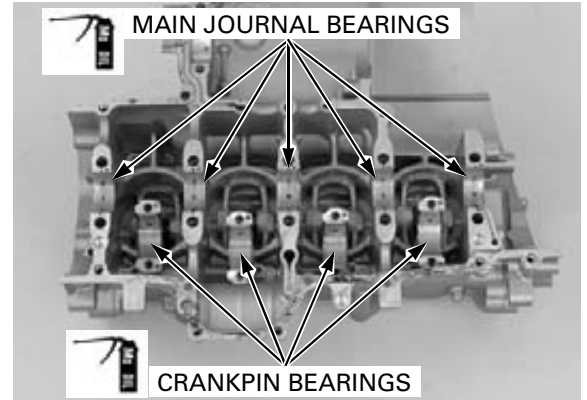
SERVICE LIMIT: 0.05 mm (0.002 in)

Check the primary drive gear and balancer drive gear teeth for abnormal wear or damage.

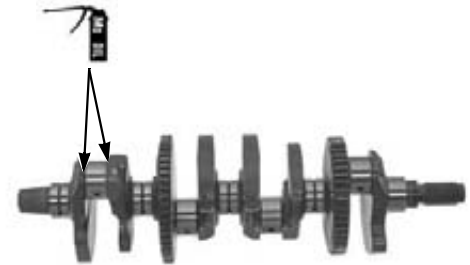


INSTALLATION

Apply molybdenum oil solution to the main journal bearing sliding surfaces on the upper crankcase and the crankpin bearing sliding surfaces on the connecting rods.



Apply molybdenum oil solution to each thrust surface of the crankshaft as shown.



NOTICE

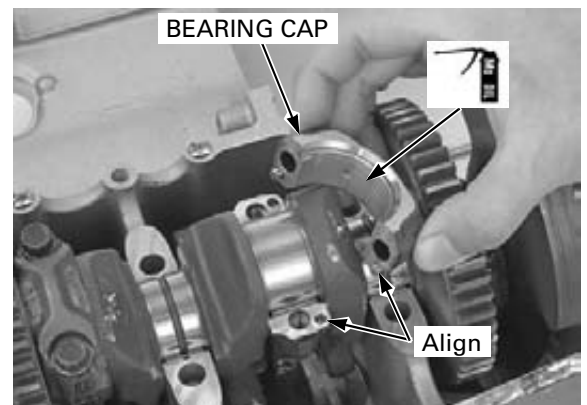
Position all the pistons at TDC (Top Dead Center) to prevent connecting rod from damaging the crankpin.

Install the crankshaft carefully onto the upper crankcase.

Set the connecting rods onto the crankpins.

Apply molybdenum oil solution to the crankpin bearing sliding surfaces on the connecting rod bearing caps.

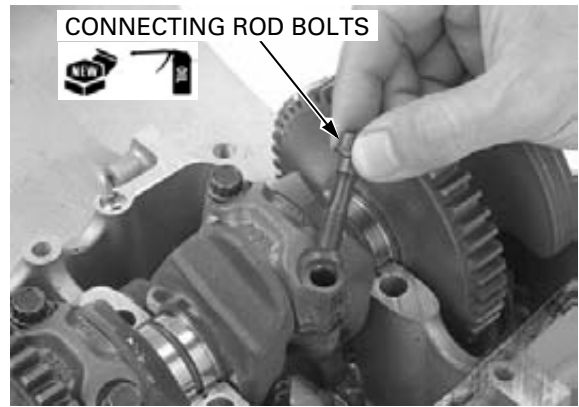
Install the connecting rod bearing caps, aligning the dowel pins with the holes in the connecting rods. Be sure each part is installed in its original position, as noted during removal.



CRANKCASE/CRANKSHAFT/BALANCER/PISTON/CYLINDER

The connecting rod bolts cannot be reused. Once the connecting rod bolts have been loosened, replace them with new ones.

Apply oil to new connecting rod bearing cap bolt threads and seating surfaces, and install the bolts.



Tighten the connecting rod bearing cap bolts with a Plastic Region Tightening Method.

Tighten the bolts in two to three steps alternately, then tighten the bolts to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)

Further tighten the connecting rod bearing cap bolts 90 degrees.

Assemble the upper and lower crankcase (page 13-23).



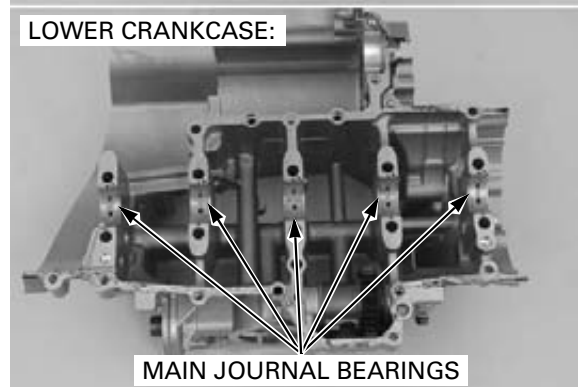
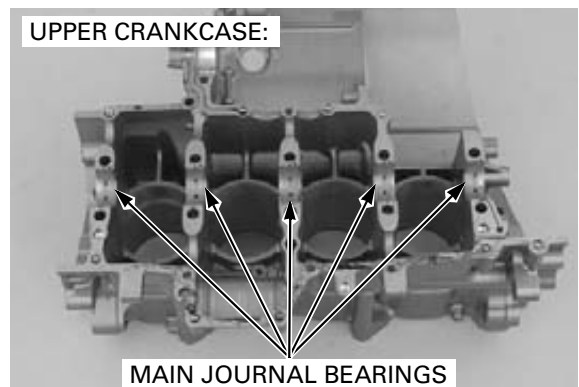
MAIN JOURNAL BEARING

BEARING INSPECTION

Remove the crankshaft (page 13-8).

Inspect the main journal bearing inserts on the upper and lower crankcase halves for unusual wear or peeling.

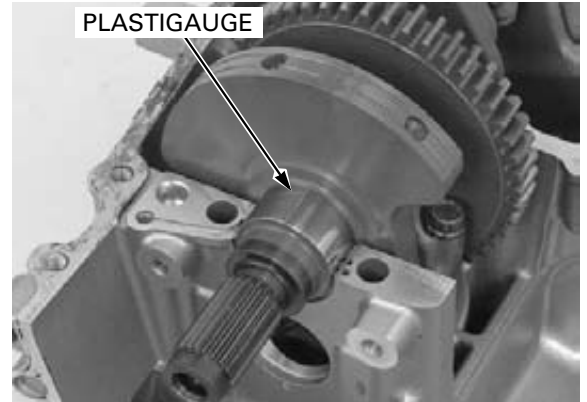
Check the bearing tabs for damage.



OIL CLEARANCE INSPECTION

Clean off any oil from the bearing inserts and main journals.
Install the crankshaft onto the upper crankcase.
Put a strip of plastigauge lengthwise on each main journal avoiding the oil hole.

- Do not rotate the crankshaft during inspection.

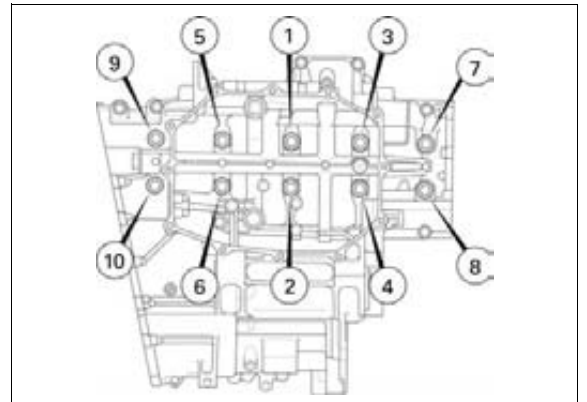


Install the three dowel pins (page 13-24).

Install the lower crankcase onto the upper crankcase, then install the crankcase 9 mm bolts (main journal bolts).

Tighten the 9 mm bolts in numerical order to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)



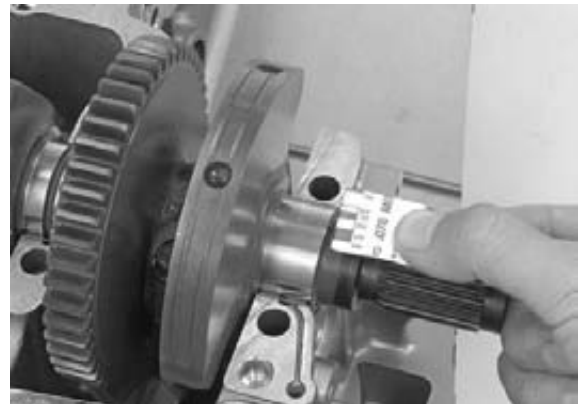
Further tighten the 9 mm bolts 150 degrees.



Remove the crankcase 9 mm bolts (main journal bolts) and the lower crankcase, measure the compressed plastigauge at its widest point on each main journal to determine the oil clearance.

SERVICE LIMIT: 0.05 mm (0.002 in)

If the oil clearance exceeds the service limit, select a replacement bearing (page 13-12).

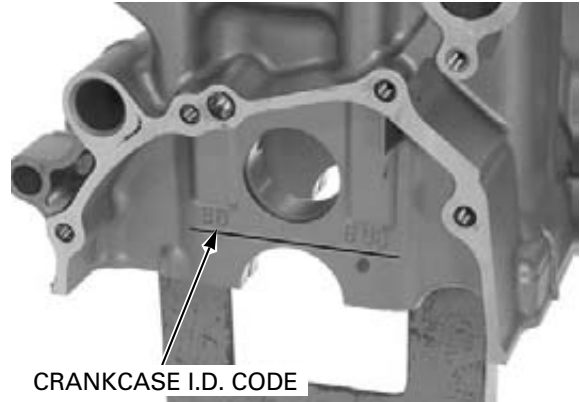


CRANKCASE/CRANKSHAFT/BALANCER/PISTON/CYLINDER

BEARING SELECTION

Letters (A, B or C) on the left side of upper crankcase are codes for the bearing support I.D. from left to right.

Record the crankcase bearing support I.D. code letters from the left side of the upper crankcase as shown.



Numbers (1, 2 or 3) on the crank weight are codes for the main journal O.D. from left to right.

Record the corresponding main journal O.D. code numbers from the crank weight.



Cross reference the main journal and bearing support codes to determine the replacement bearing color code.

MAIN JOURNAL BEARING SELECTION TABLE:

			BEARING SUPPORT I.D.CODE		
			A	B	C
			37.000 – 37.006 mm (1.4567 – 1.4569 in)	37.006 – 37.012 mm (1.4569 – 1.4572 in)	37.012 – 37.018 mm (1.4572 – 1.4574 in)
MAIN JOURNAL O.D. CODE	1	34.000 – 34.006 mm (1.3386 – 1.3388 in)	Red	Pink	Yellow
	2	33.994 – 34.000 mm (1.3383 – 1.3386 in)	Pink	Yellow	Green
	3	33.988 – 33.994 mm (1.3381 – 1.3383 in)	Yellow	Green	Brown

BEARING THICKNESS:

Brown: **Thickest**
Green:
Yellow: **↑**
Pink:
Red: **Thinnest**

NOTICE

After selecting new bearings, recheck the clearance with a plastigauge. Incorrect clearance can cause severe engine damage.

IDENTIFICATION COLOR

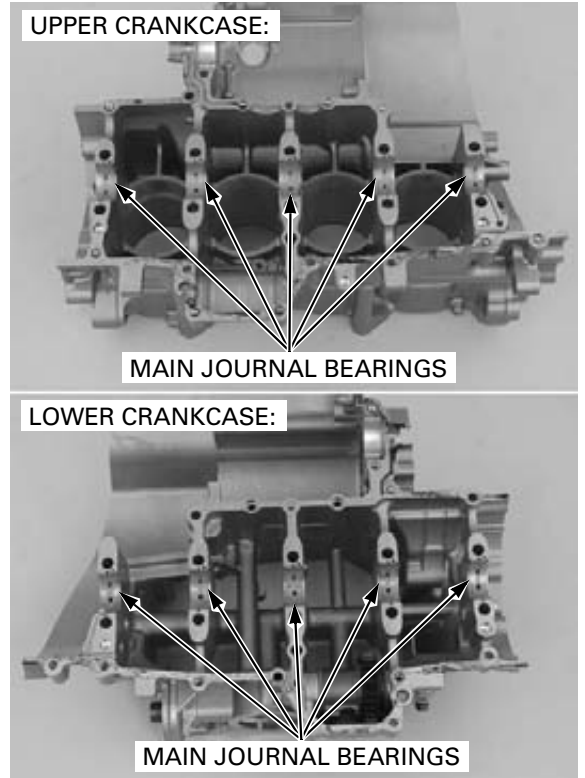


BEARING INSTALLATION

Clean the bearing outer surfaces and crankcase bearing supports.

Apply molybdenum oil solution to the main journal bearing sliding surfaces on the upper and lower crankcase.

Install the main journal bearing inserts onto the crankcase bearing supports, aligning each tabs with each grooves.



CRANKPIN BEARING

NOTICE

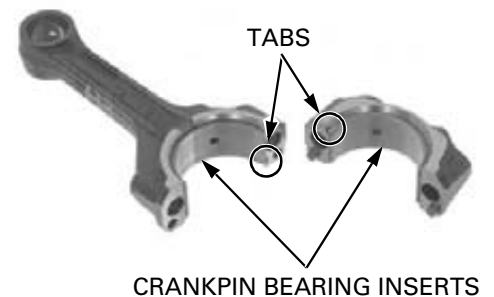
Do not interchange the bearing inserts. They must be installed in their original locations or the correct bearing oil clearance may not be obtained, resulting in engine damage.

Remove the crankshaft (page 13-8).

BEARING INSPECTION

Check the bearing inserts for unusual wear or peeling.

Check the bearing tabs for damage.



OIL CLEARANCE INSPECTION

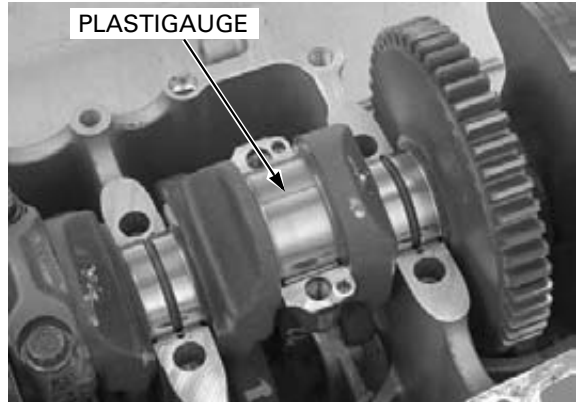
Clean off any oil from the bearing inserts and crankpins.

Carefully install the crankshaft onto the upper crankcase.

Set the connecting rods onto the crankpins.

Put a strip of plastigauge lengthwise on each crankpin avoiding the oil hole.

- Do not rotate the crankshaft during inspection.



Carefully install the connecting rod bearing caps, aligning the dowel pins with the holes in the connecting rods.

Use the removed connecting rod bolts when checking the oil clearance.

Apply oil to the connecting rod bearing cap bolt threads and seating surfaces and install the bolts.

Tighten the bolts in two to three steps alternately, then tighten the bolts to the specified torque.

TORQUE: 14 N·m (1.4 kgf·m, 10 lbf·ft)

Further tighten the connecting rod bearing cap bolts 90 degrees.



Remove the bolts and bearing caps, and measure the compressed plastigauge at its widest point on the crankpin to determine the oil clearance.

SERVICE LIMIT: 0.06 mm (0.002 in)

If the oil clearance exceeds the service limit, select the correct replacement bearings (page 13-14).



BEARING SELECTION

Numbers (1, 2 or 3) on the connecting rods are the codes for the connecting rod I.D.

Record the connecting rod I.D. code number (1, 2 or 3) or measure the I.D. with the connecting rod bearing cap installed without bearing inserts.

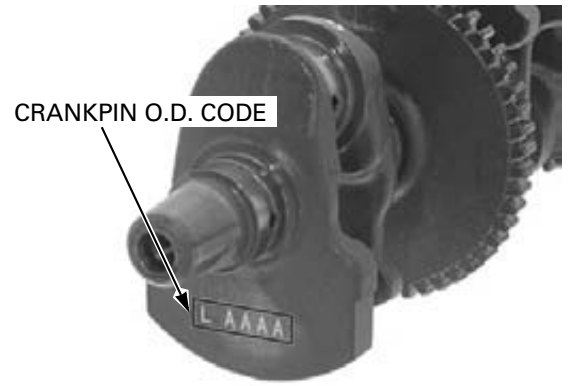


CRANKCASE/CRANKSHAFT/BALANCER/PISTON/CYLINDER

Letters (A, B or C) on the crankweight are the codes for the crankpin O.D.s from left to right.

If you are replacing the crankshaft, record the corresponding crankpin O.D. code letter (A, B or C).

If you are reusing the crankshaft, measure the crankpin O.D. with the micrometer.






Cross-reference the connecting rod and crankpin codes to determine the replacement bearing color.

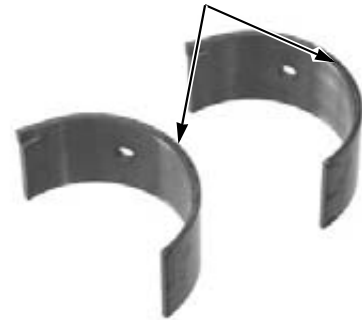
CRANKPIN BEARING SELECTION TABLE:

		CONNECTING ROD I.D.CODE			
		1	2	3	
		39.500 – 39.506 mm (1.5551 – 1.5554 in)	39.506 – 39.512 mm (1.5554 – 1.5556 in)	39.512 – 39.518 mm (1.5556 – 1.5558 in)	
CRANK PIN O.D.CODE	A	36.497 – 36.503 mm (1.4369 – 1.4371 in)	Yellow	Green	Brown
	B	36.491 – 36.497 mm (1.4367 – 1.4369 in)	Green	Brown	Black
	C	36.485 – 36.491 mm (1.4364 – 1.4367 in)	Brown	Black	Blue

BEARING THICKNESS:

- Blue:** Thickest
- Black:** 
- Brown:** 
- Green:** 
- Yellow:** Thinnest

IDENTIFICATION COLOR

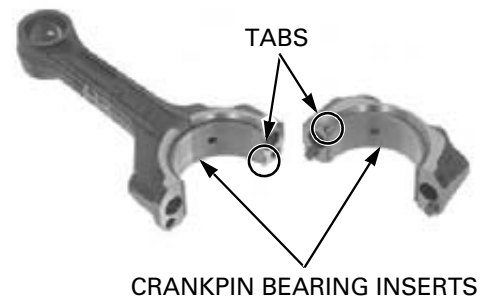


NOTICE

After selecting new bearings, recheck the clearance with a plastigauge. Incorrect clearance can cause severe engine damage.

BEARING INSTALLATION

Clean the bearing outer surfaces, connecting rod bearing cap and connecting rod. Install the crankpin bearing inserts onto the bearing cap and connecting rod, aligning each tab with each groove.



PISTON/CYLINDER

PISTON/CONNECTING ROD REMOVAL

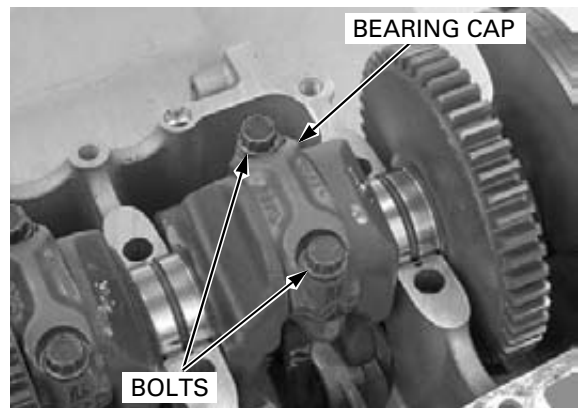
NOTICE

- This motorcycle is equipped with aluminum cylinder sleeves. Before piston removal, place a clean shop towel around the connecting rod to prevent damaging the cylinder sleeve.
- Do not try to remove the piston/connecting rod assembly from bottom of the cylinder; the assembly will get stuck in the gap between the cylinder liner and the upper crankcase.
- 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.

Separate the crankcase halves (page 13-6).

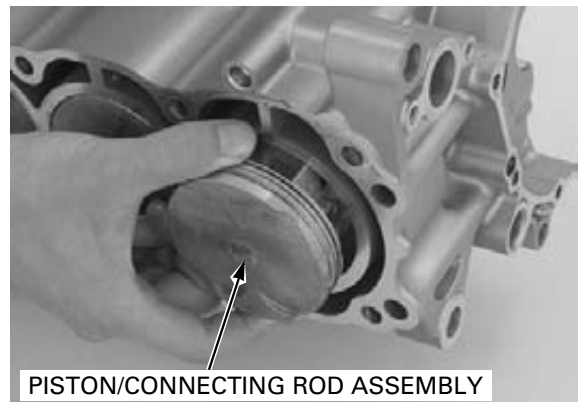
Remove the bolts and connecting rod bearing caps.

Mark all parts as you remove them to indicate the correct cylinder for reassembly.



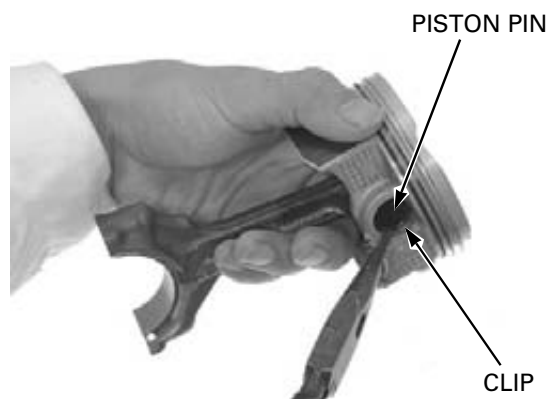
Remove the piston/connecting rod assembly from the top of the cylinder.

Do not try to remove the connecting rod/piston assembly from the bottom of the cylinder; the assembly will be locked so that the oil ring expands in the gap between the cylinder liner and the upper crankcase.



PISTON REMOVAL

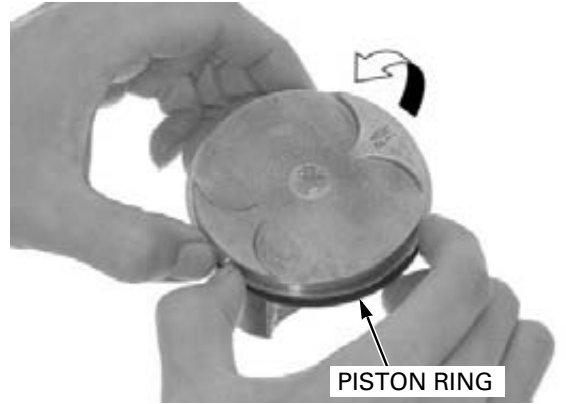
Remove the piston pin clip with pliers. Push the piston pin out of the piston and connecting rod, and remove the piston.



PISTON DISASSEMBLY

Be careful not to damage the piston ring by spreading the ends too far.

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



Never use a wire brush; it will scratch the groove.

Clean carbon deposits from the piston ring grooves with a ring that will be discarded.



PISTON INSPECTION

Inspect the piston rings for movement by rotating the rings. The rings should be able to move in their grooves without catching.

Push the ring until the outer surface of the piston ring is nearly flush with the piston and measure the ring-to-ring groove clearance.

SERVICE LIMITS:

Top: 0.125 mm (0.0049 in)
Second: 0.075 mm (0.0030 in)

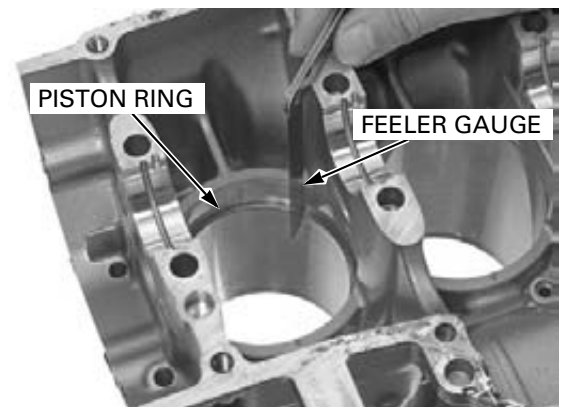


Push the rings into the cylinder with the piston head to be sure they are squarely in the cylinder.

Insert the piston ring squarely into the top of the cylinder and measure the ring end gap.

SERVICE LIMITS:

Top: 0.52 mm (0.020 in)
Second: 0.82 mm (0.032 in)
Oil (side rail): 1.0 mm (0.04 in)



CRANKCASE/CRANKSHAFT/BALANCER/PISTON/CYLINDER

Measure the piston pin bore.

SERVICE LIMIT: 17.030 mm (0.6705 in)



Measure the O.D. of the piston pin.

SERVICE LIMIT: 16.980 mm (0.6685 in)

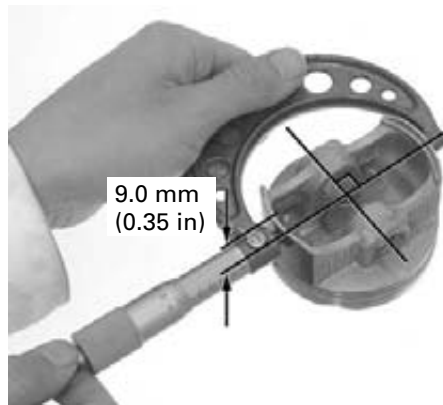
Calculate the piston-to-piston pin clearance.

SERVICE LIMIT: 0.04 mm (0.002 in)



Measure the diameter of the piston at 9.0 mm (0.35 in) from the bottom and 90 degrees to the piston pin hole.

SERVICE LIMIT: 74.895 mm (2.9486 in)



CONNECTING ROD INSPECTION

Measure the connecting rod small end I.D.

SERVICE LIMIT: 17.048 mm (0.6712 in)

Calculate the connecting rod-to-piston pin clearance.

SERVICE LIMIT: 0.07 mm (0.003 in)



CYLINDER INSPECTION

Inspect the cylinder bore for wear or damage.
Measure the cylinder I.D. in X and Y axis at three levels.
Take the maximum reading to determine the cylinder wear.

SERVICE LIMIT: 75.15 mm (2.959 in)

Calculate the piston-to-cylinder clearance.
Take a maximum reading to determine the clearance.
Refer to the procedures for measurement of the piston O.D. (page 13-18).

SERVICE LIMIT: 0.10 mm (0.004 in)

Calculate the taper and out-of-round at three levels in X and Y axis. Take the maximum reading to determine them.

SERVICE LIMITS:

Taper: 0.10 mm (0.004 in)

Out-of-round: 0.10 mm (0.004 in)

The cylinder must be rebored and an oversize piston fitted if the service limits are exceeded.

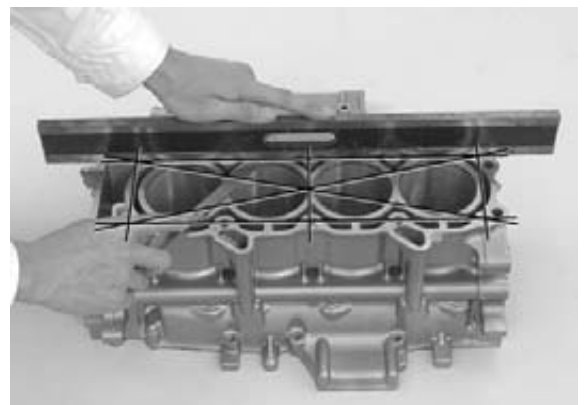
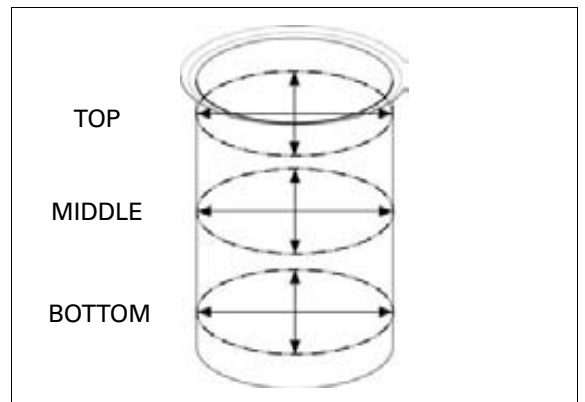
The following oversize piston is available:

0.25 mm (0.010 in)

The piston to cylinder clearance for the oversize piston must be: 0.015 – 0.050 mm (0.0006 – 0.0020 in).

Inspect the top of the cylinder for warp.

SERVICE LIMIT: 0.10 mm (0.004 in)



PISTON ASSEMBLY

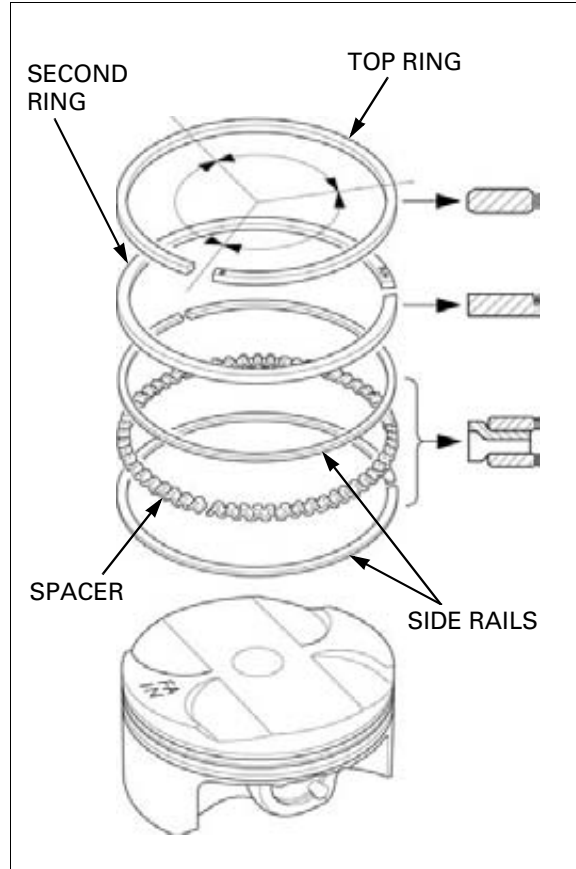
Clean the piston ring grooves thoroughly and install the piston rings.

- Apply oil to the piston rings.
- Avoid piston and piston ring damage during installation.
- Install the piston rings with the marking (R: top ring, RN: second ring) facing up. 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.

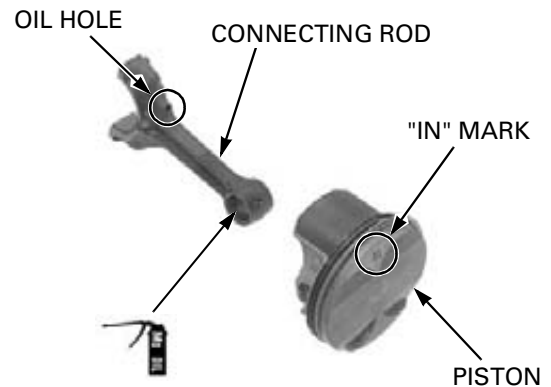
After installation, the rings should rotate freely in the ring groove.



PISTON INSTALLATION

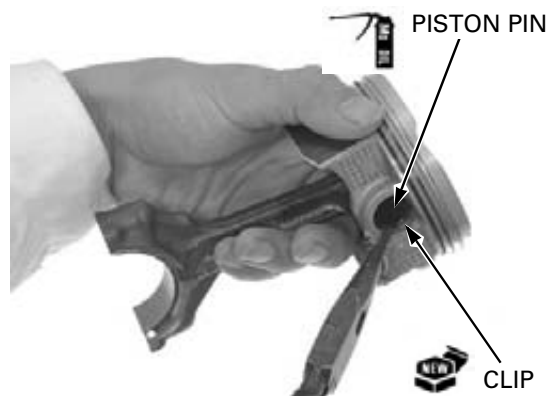
Apply molybdenum oil solution to the connecting rod small end inner surfaces and piston pin outer surfaces.

Assemble the piston and connecting rod so that the piston "IN" mark aligns with the oil hole on the connecting rod.



Install the piston pin and secure it using new piston pin clips.

- Make sure that the piston pin clips are seated in the groove securely.
- Do not align the piston pin clip end gap with the cut-out of the piston bore.



CRANKCASE/CRANKSHAFT/BALANCER/PISTON/CYLINDER

Coat the cylinder walls, piston outer surfaces and piston rings with engine oil.

Install the piston/ connecting rod assembly with the piston "IN" mark facing the intake side.

Install the piston/connecting rod assemblies into the cylinders using a commercially available piston ring compressor tool.

When reusing the connecting rods, they must be installed in their original locations.

NOTICE

- While installing the piston, be careful not to damage the top surface of the cylinder, especially around the cylinder bore.
- Be careful not to damage the cylinder sleeve and crankpin with the connecting rod.

Make sure the piston ring compressor tool sits flush on the top surface of the cylinder.

Use the handle of a plastic hammer or equivalent tool to tap the piston into the cylinder.

Install the crankshaft (page 13-9).

Apply molybdenum oil solution to the crankpin bearing sliding surface on the bearing caps.

Install the connecting rod bearing caps, aligning the dowel pins with the holes in the connecting rods.

The connecting rod bolts cannot be reused. Once the connecting rod bolts have been loosened replace them with new ones.

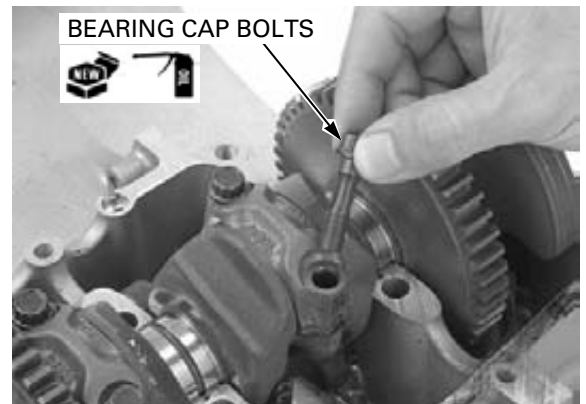
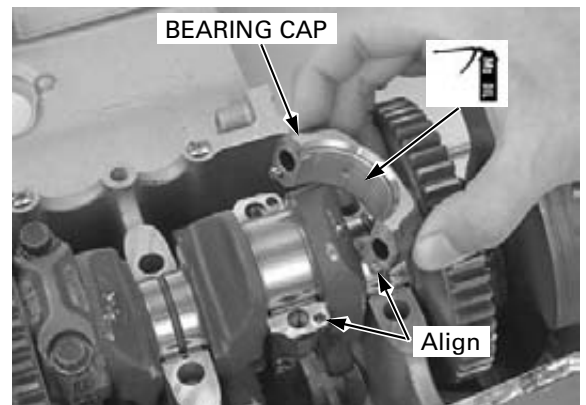
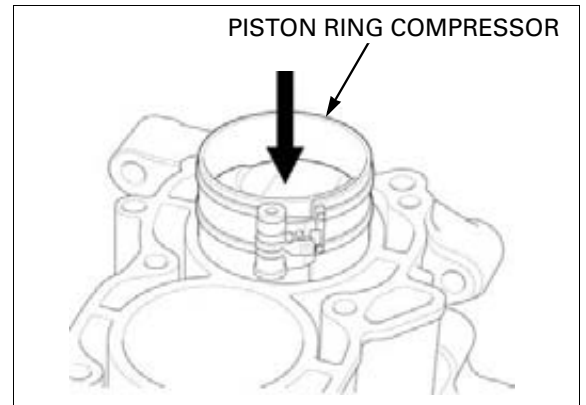
Apply oil to new connecting rod bearing cap bolt threads and seating surfaces, and install the bolts.

Tighten the bolts in two to three steps alternately.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)

Further tighten the connecting rod bearing cap bolts 90 degrees.

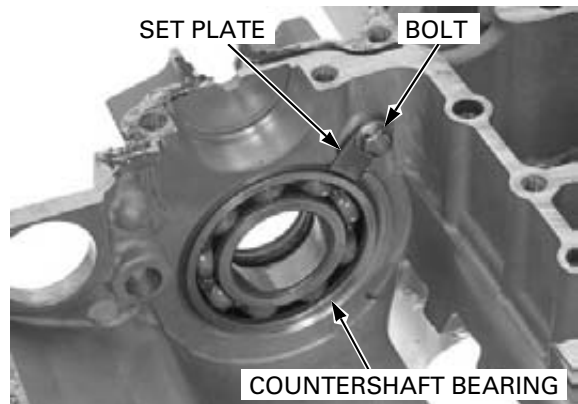
Assemble the crankcase halves (page 13-23).



COUNTERSHAFT BEARING REPLACEMENT

Separate the crankcase halves (page 13-6).
Remove the main journal bearings from the lower crankcase (page 13-10).

Remove the bolt and bearing set plate.



Remove the countershaft bearing from the lower crankcase using the special tool.

TOOLS:

Bearing remover shaft, 35 mm 07936-3710400

Remover shaft handle 07936-3710100

Remover weight 07741-0010201



Remove the countershaft oil seal from inside of the crankcase.

Apply grease to new countershaft oil seal lips and install it from inside of the crankcase.



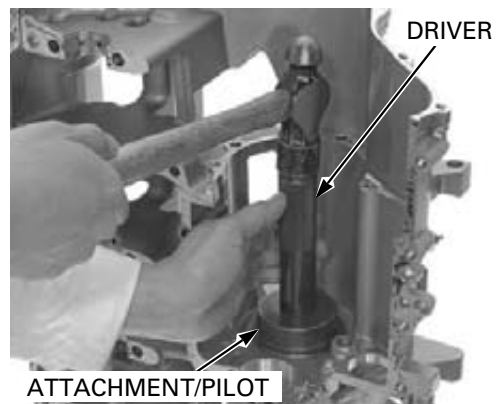
Drive the countershaft bearing into the lower crankcase using the special tool.

TOOLS:

Driver 07749-0010000

Attachment, 72 x 75 mm 07746-0010600

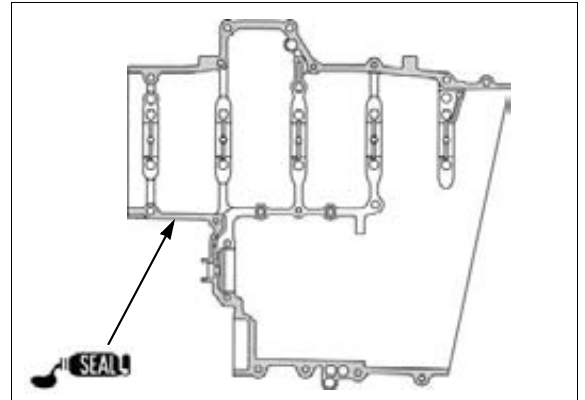
Pilot, 35 mm 07746-0040800



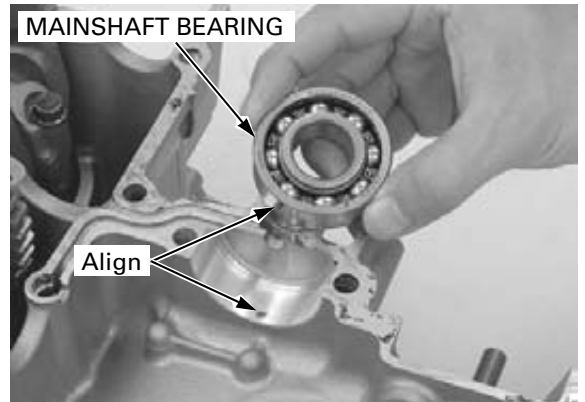
CRANKCASE ASSEMBLY

Replace the transmission bearing holder and crankcase as a set.

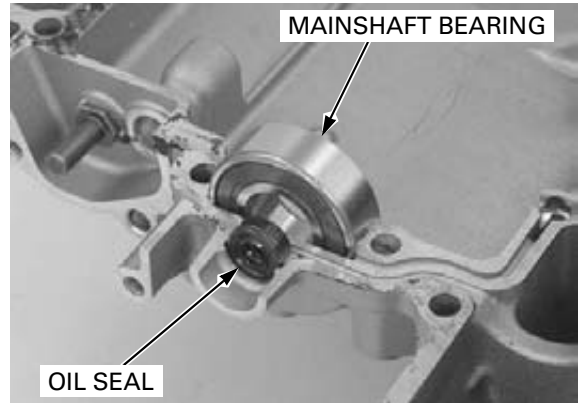
Apply a light, but thorough, coating of liquid sealant (Three Bond 1207B) to the crankcase mating surface. Do not apply sealant to the crankcase 9 mm bolt (main journal bolt) area and the oil passage area as shown.



Install the mainshaft bearing while aligning its locating pin with the crankcase hole.

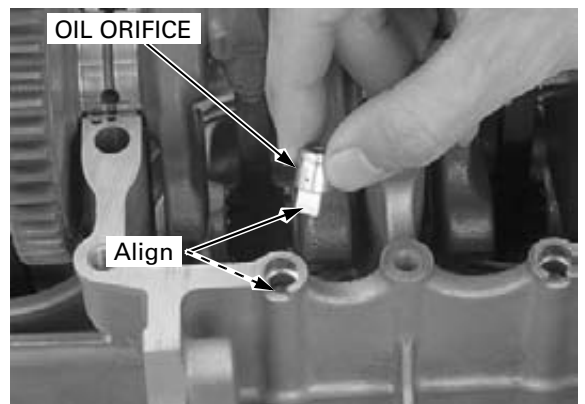


Install the clutch lifter rod oil seal.



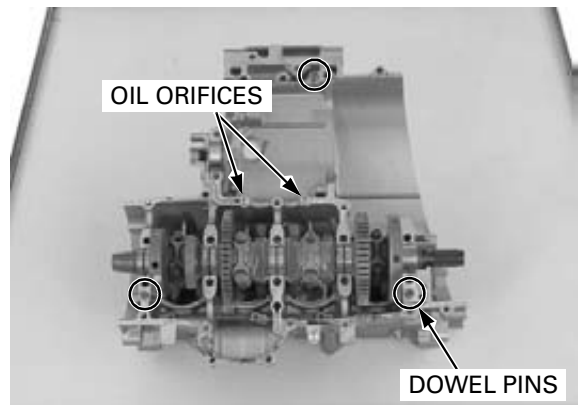
Align each flat of the oil orifice and crankcase.

Install the oil orifices in the upper crankcase.



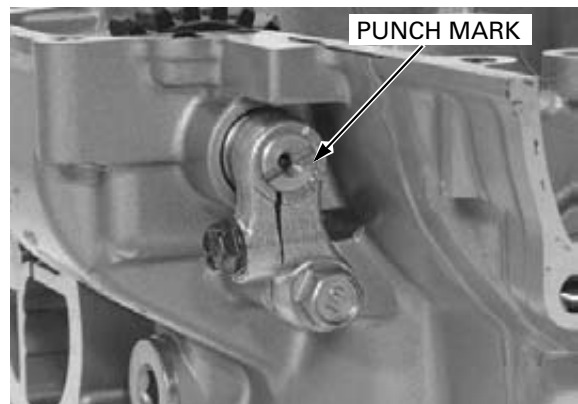
CRANKCASE/CRANKSHAFT/BALANCER/PISTON/CYLINDER

Install the three dowel pins.



BALANCER TIMING ALIGNMENT/ UPPER CRANKCASE INSTALLATION

1. Avoid damaging the balancer drive and driven gear, turn the balancer shaft and place the punch mark facing down, make the balancer backlash maximum.

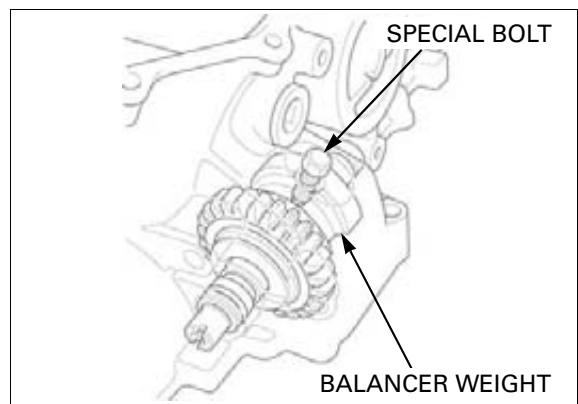


2. Remove the sealing bolt and sealing washer from the lower crankcase.



3. Temporarily install the special bolt into the sealing bolt hole, hold the balancer weight securely. Make sure the special bolt tip into the balancer weight hole.

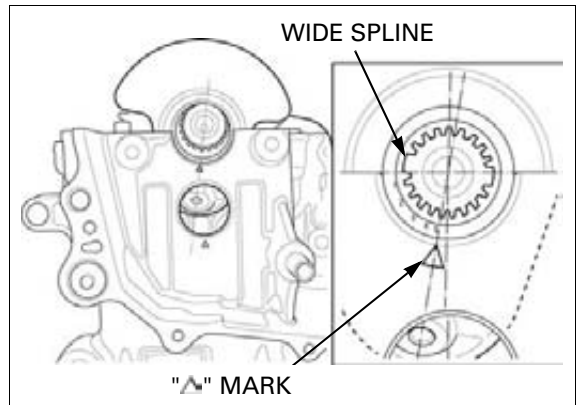
Special bolt, 6 x 18 mm: 90004-MM5-00



CRANKCASE/CRANKSHAFT/BALANCER/PISTON/CYLINDER

- Place the crankshaft onto the upper crankcase so that the No.1 piston at TDC (Top Dead Center).

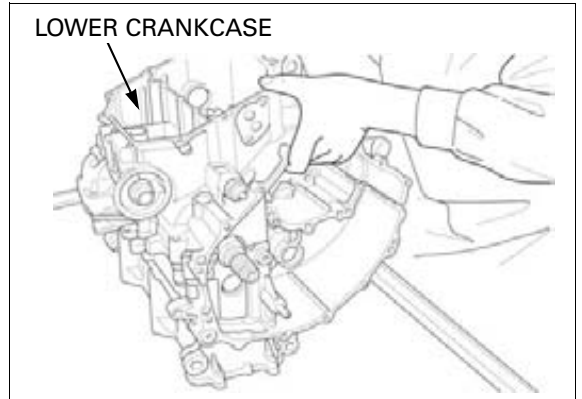
Slightly turn the crankshaft clockwise and align the crankshaft 5th spline center (from the wide spline) with the "▲" mark on the upper crankcase as shown.



- Carefully place the lower crankcase onto the upper crankcase.

NOTE:

The crankshaft will slightly move counterclockwise when engaging the balancer gears.



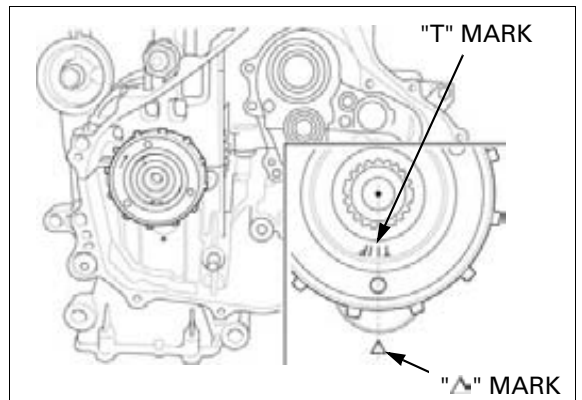
- Check that the upper and lower crankcase seats properly.

Check that the crankshaft 5th spline center aligns with the next "▲" mark on the upper crankcase as shown.

Temporarily install the starter clutch assembly to check the TDC.

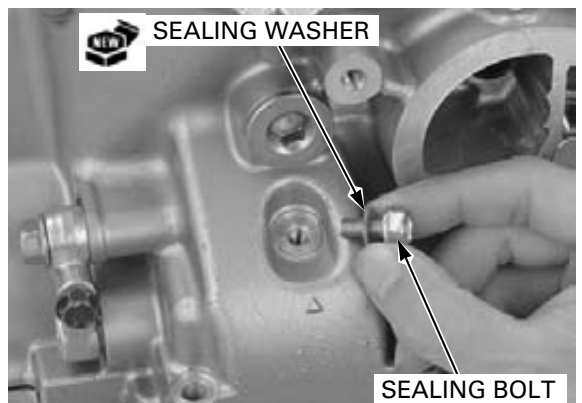
Make sure the No.1 piston at TDC (Top Dead Center).

If the crankshaft is not proper position, reassemble the crankcase halves from the beginning.



- Remove the temporarily installed special bolt from the balancer weight.

Install a new sealing washer and bolt, and tighten the bolt securely.



CRANKCASE BOLT TIGHTENING PROCEDURE

Install new crankcase 9 mm bolts (main journal bolts).

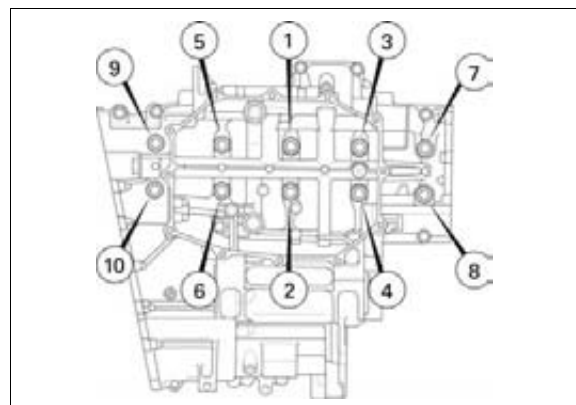
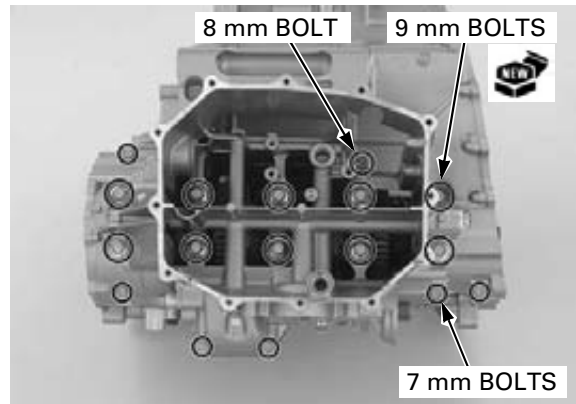
Loosely install all the lower crankcase bolts (8 mm bolt and 7 mm bolts).

Make sure the upper and lower crankcase are seated firmly.

- Tighten the crankcase 9 mm bolts (main journal bolts) using the Plastic Region Tightening Method described on next procedure.
- Do not reuse the crankcase 9 mm bolts (main journal bolts), because the correct axial tension will not be obtained.
- The crankcase 9 mm bolts (main journal bolts) are pre-coated with an oil additive for axial tension stability. Do not remove the oil additive from the new 9 mm bolts (main journal bolts) surface.

Tighten the crankcase 9 mm bolts (main journal bolts) in numerical order in the illustration in two to three steps to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)



Further tighten the crankcase 9 mm bolts (main journal bolts) 150 degrees.

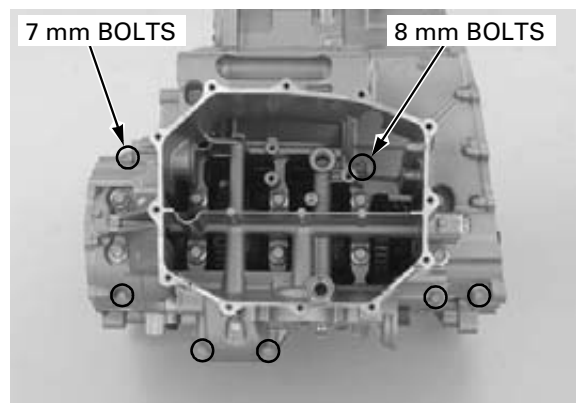


Tighten the 8 mm bolt to the specified torque.

TORQUE: 24 N·m (2.4 kgf·m, 18 lbf·ft)

From the inside to outside, tighten the 7 mm bolts to the specified torque.

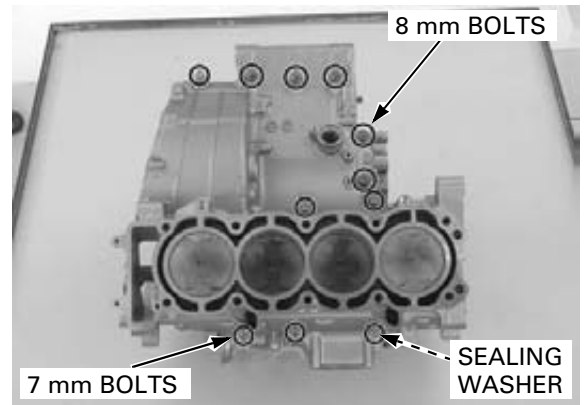
TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)



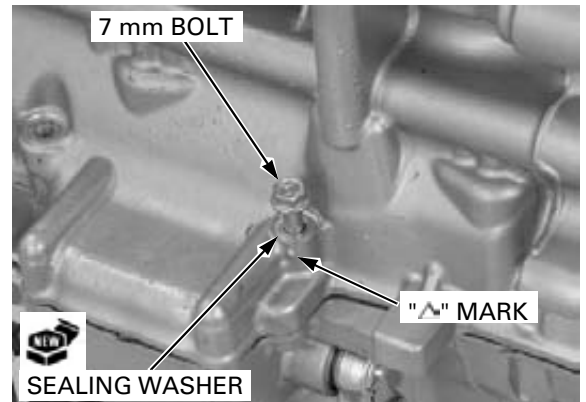
CRANKCASE/CRANKSHAFT/BALANCER/PISTON/CYLINDER

Place the engine with the lower side down.

Install the upper crankcase 8 mm bolts, sealing washer and 7 mm bolts.



The sealing washer locations are indicated on the upper crankcase using the "▲" mark.

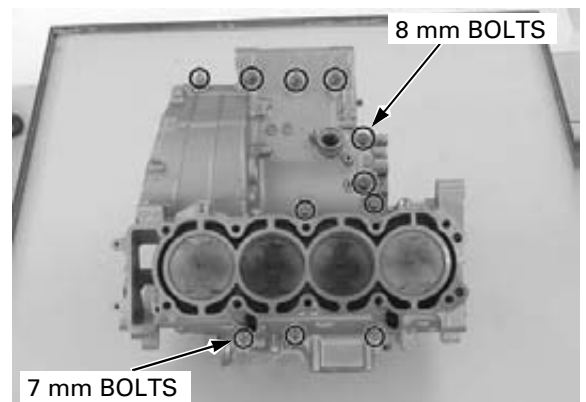


Tighten the 8 mm bolts in a crisscross pattern in 2 to 3 steps.

TORQUE: 25 N·m (2.5 kgf·m, 18 lbf·ft)

Tighten the 7 mm bolts in a crisscross pattern in 2 to 3 steps.

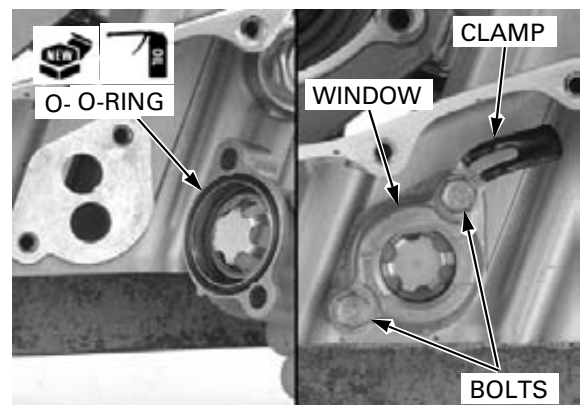
TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)



Apply oil to new O-ring and install it into the oil inspection window groove.

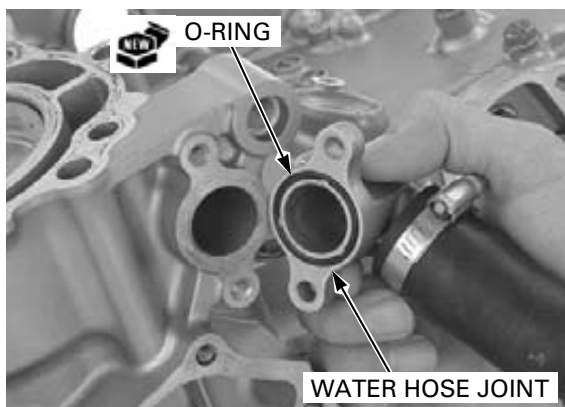
Install the oil inspection window onto the lower crankcase.

Install the bolts with the clamp, and tighten the bolts securely.

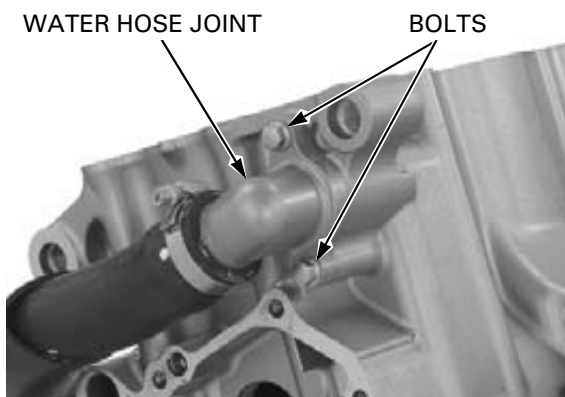


CRANKCASE/CRANKSHAFT/BALANCER/PISTON/CYLINDER

Install a new O-ring into the water hose joint groove.

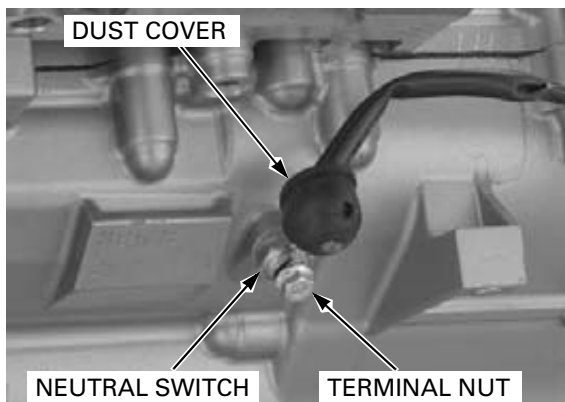


Install the water hose joint to the crankcase, then tighten the two bolts securely.

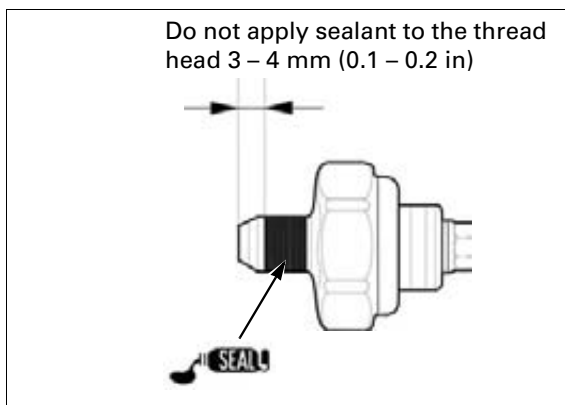


Connect the wire terminal to the neutral switch and tighten the terminal nut.

Install the dust cover over the neutral switch.



Apply a sealant (Three Bond 1207B) to the oil pressure switch threads as shown.



Tighten the oil pressure switch to the specified torque while holding the switch base.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

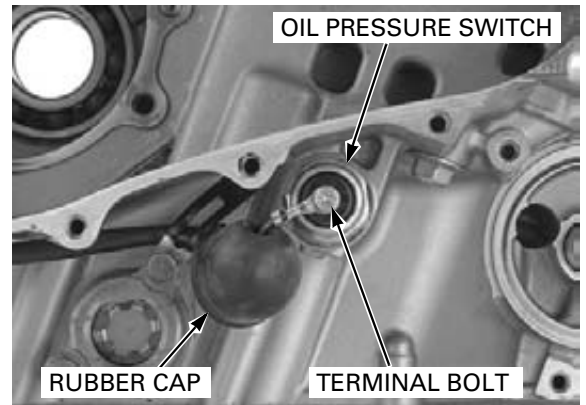
Connect the terminal eyelet to the oil pressure switch, and tighten the terminal bolt to the specified torque.

TORQUE: 2 N·m (0.2 kgf·m, 1.5 lbf·ft)

Refer to "Cable & Harness Routing" for EOP switch wire clamp (page 1-23).

Secure the EOP switch wire with the clamp and install the rubber cap.

Install the removed parts in the reverse order of removal.



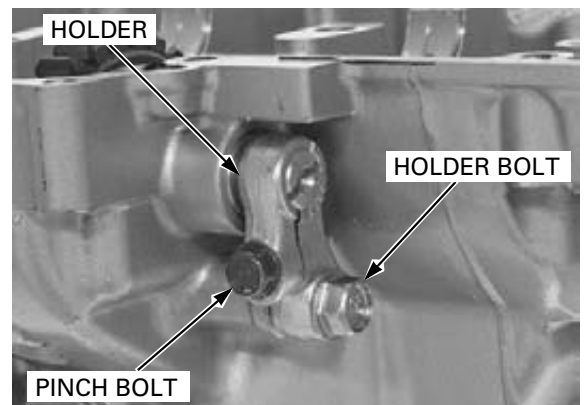
BALANCER

REMOVAL

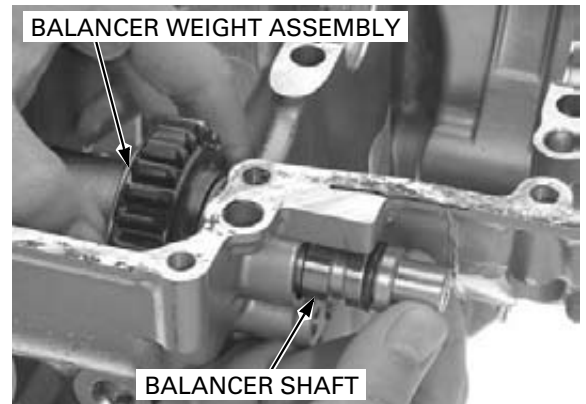
Separate the crankcase halves (page 13-6).

Loosen the balancer shaft pinch bolt.

Remove the balancer shaft holder bolt and balancer holder.



Pull the balancer shaft out and remove the balancer weight assembly from the lower crankcase.



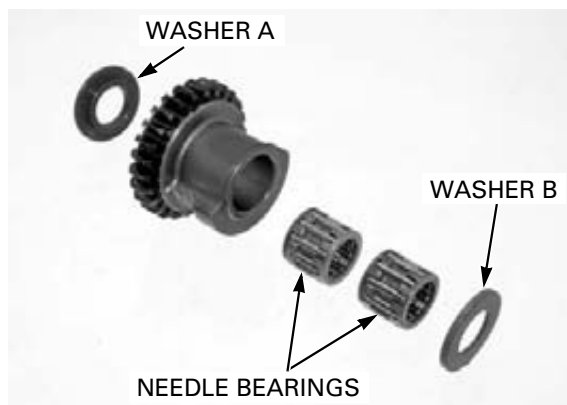
DISASSEMBLY

Remove the O-ring from the balancer shaft.

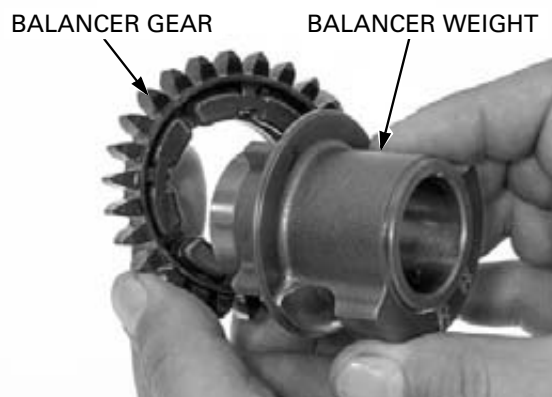


CRANKCASE/CRANKSHAFT/BALANCER/PISTON/CYLINDER

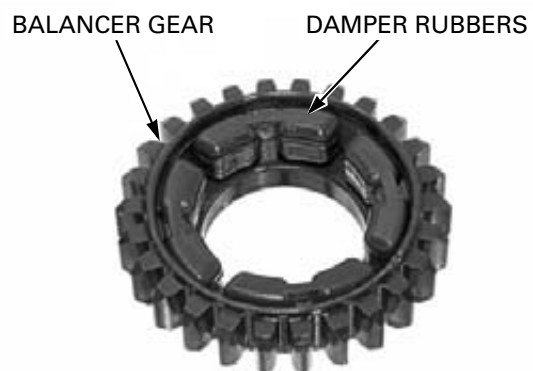
Remove the washers (A, B) and needle bearings from the balancer weight assembly.



Remove the balancer gear assembly from the balancer weight.



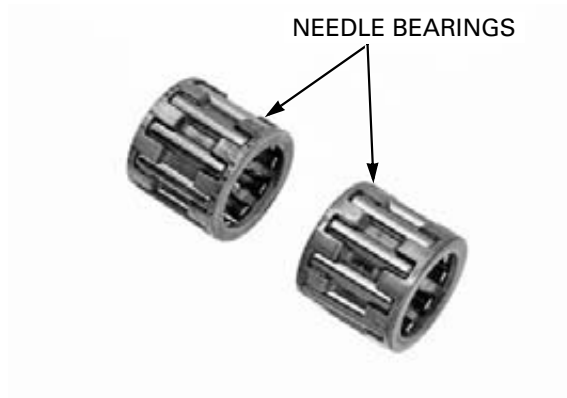
Remove the damper rubbers from the balancer gear.



INSPECTION

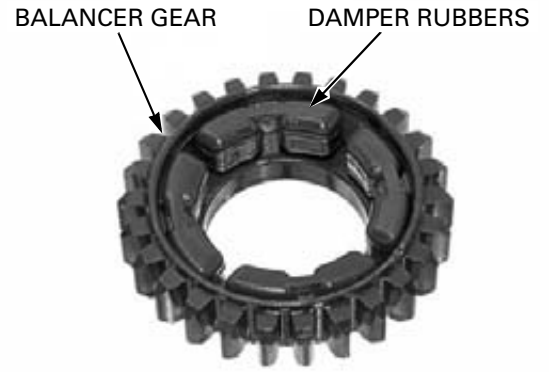
Replace the balancer weight, balancer shaft, needle bearings as a set

Check the needle bearing for wear or damage, replace if necessary.



CRANKCASE/CRANKSHAFT/BALANCER/PISTON/CYLINDER

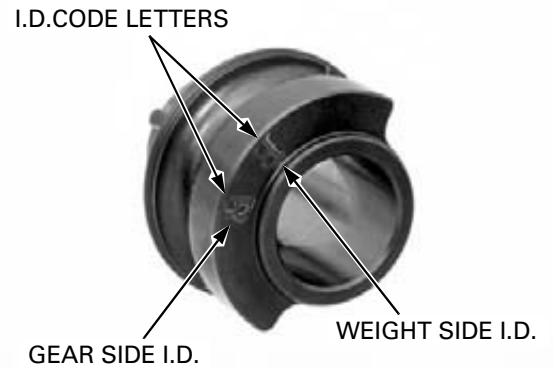
Check the balancer weight and gear for wear or damage.
Check the damper rubbers for fatigue or damage, replace if necessary.



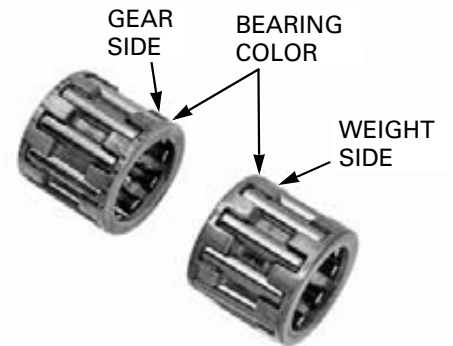
BALANCER BEARING SELECTION

The balancer weight and needle bearings are selected fitted.

The balancer weight has two I.D. code letters as shown. The marking identify each I.D. of the balancer weight as shown.



Reference the balancer weight I.D. code letters to determine the replacement bearing color. Refer to the selection table below for bearing selection.

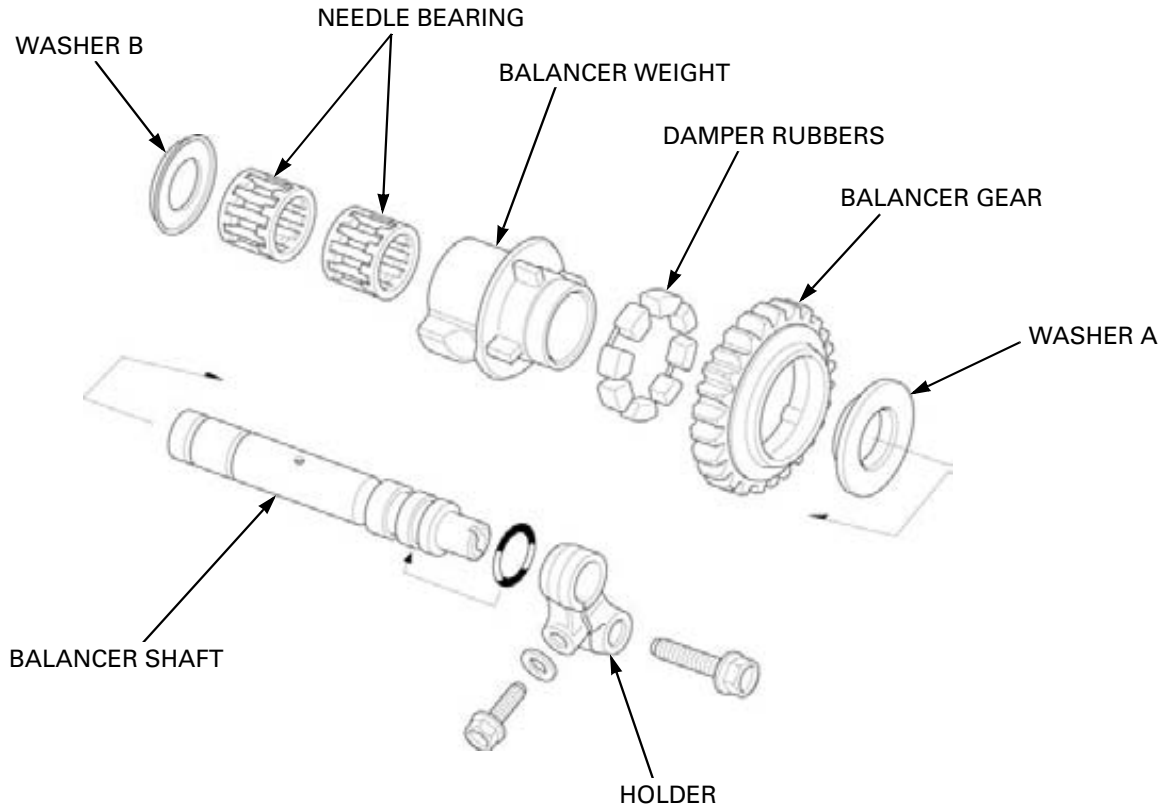


BALANCER BEARING SELECTION TABLE:

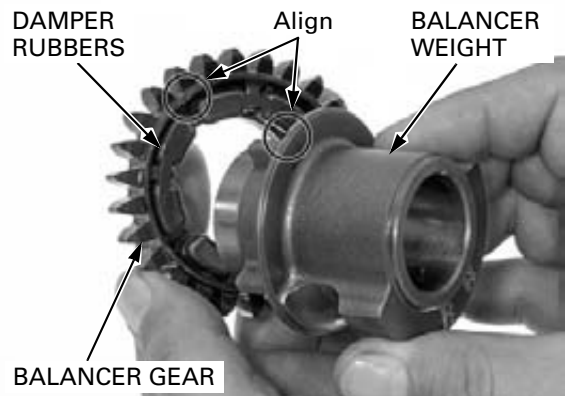
		BALANCER WEIGHT I.D. CODE		
		A	B	C
		27.000 – 27.004 mm (1.0630 – 1.0631 in)	26.991 – 26.996 mm (1.0626 – 1.0628 in)	26.987 – 26.991 mm (1.0624 – 1.0626 in)
BALANCER SHAFT	17.990 – 17.996 mm (0.7083 – 0.7085 in)	Blue	White	Green

CRANKCASE/CRANKSHAFT/BALANCER/PISTON/CYLINDER

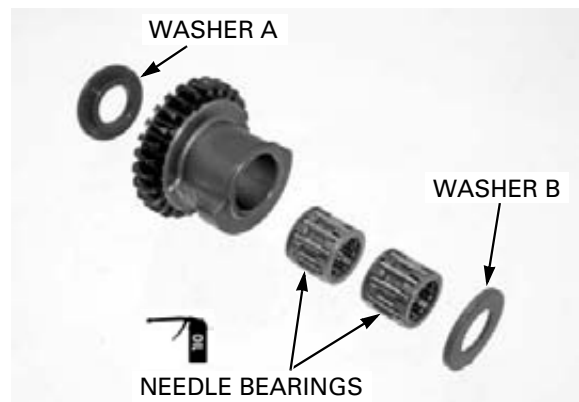
DISASSEMBLY



Install the damper rubbers into the balancer gear.
Assemble the balancer gear and weight while aligning the index marks.



Apply oil to the needle bearings, install them into the balancer weight.
Install the washer A and B.

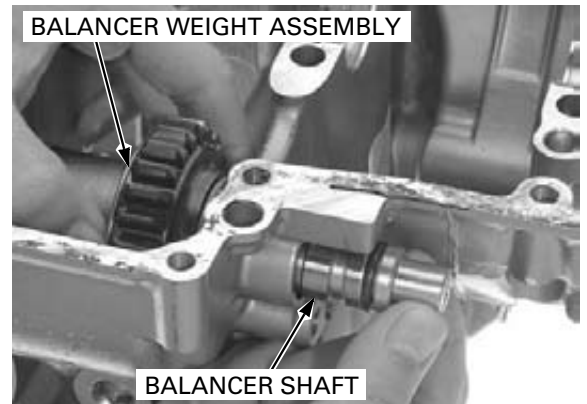


Install a new O-ring to the balancer shaft.

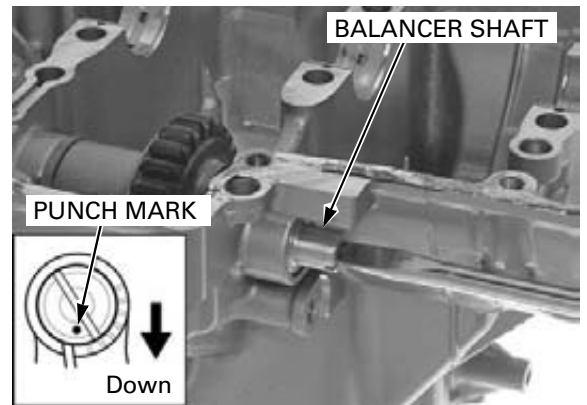


INSTALLATION

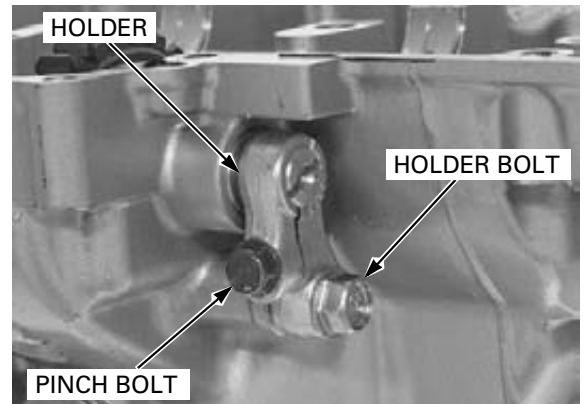
Install the balancer weight into the lower crankcase.
Install the balancer shaft.



Turn the balancer shaft and place the punch mark on the shaft facing down.



Install the balancer shaft holder.
Install and tighten the holder bolt securely.
Tighten the balancer shaft holder pinch bolt.
Assemble the crankcase halves (page 13-23).



BACKLASH ADJUSTMENT MEMO

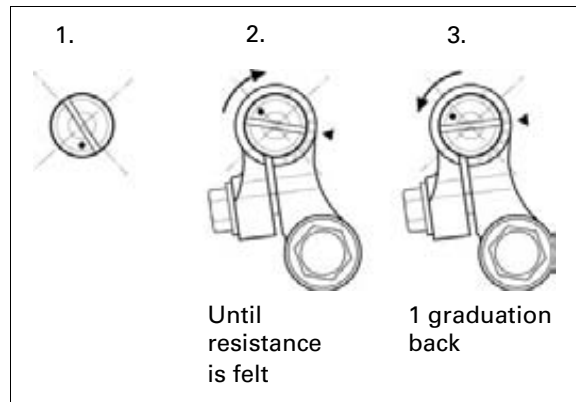
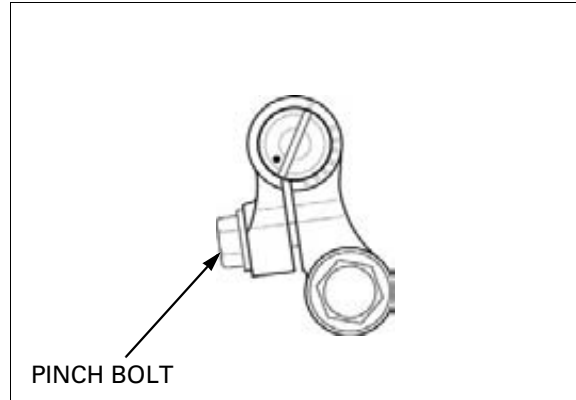
Install the engine into the frame (page 8-8).

Adjust the backlash while the engine is cold (below 35°C/95°F) and the engine is not running.

Loosen the balancer shaft holder pinch bolts.

Excessive force can cause balancer gear, bearing and shaft damage. Do not turn the shaft more than necessary.

Turn the balancer shaft clockwise until resistance is felt, then back it off one graduation using the punch mark as a measure.



Warm up the engine and let it idle.

If the balancer gear noises are excessive, adjust the balancer backlash as follows:

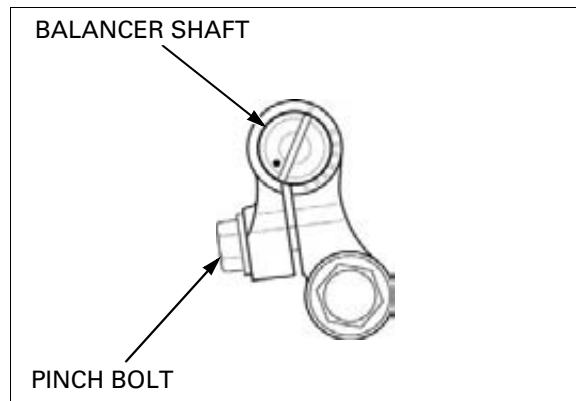
Turn the balancer gear shaft counterclockwise until the gears begin to make a "whining" noise. Then turn the gear shaft clockwise until the gear "whining" noise disappears.

Tighten the balancer shaft pinch bolt.

After all gear backlash adjustments are done, snap the throttle and make sure the gear noises are not excessive.

If the gear "whine" noise is excessive, the backlash is too small.

If the gear "rattling" noise is excessive, the backlash is excessive.

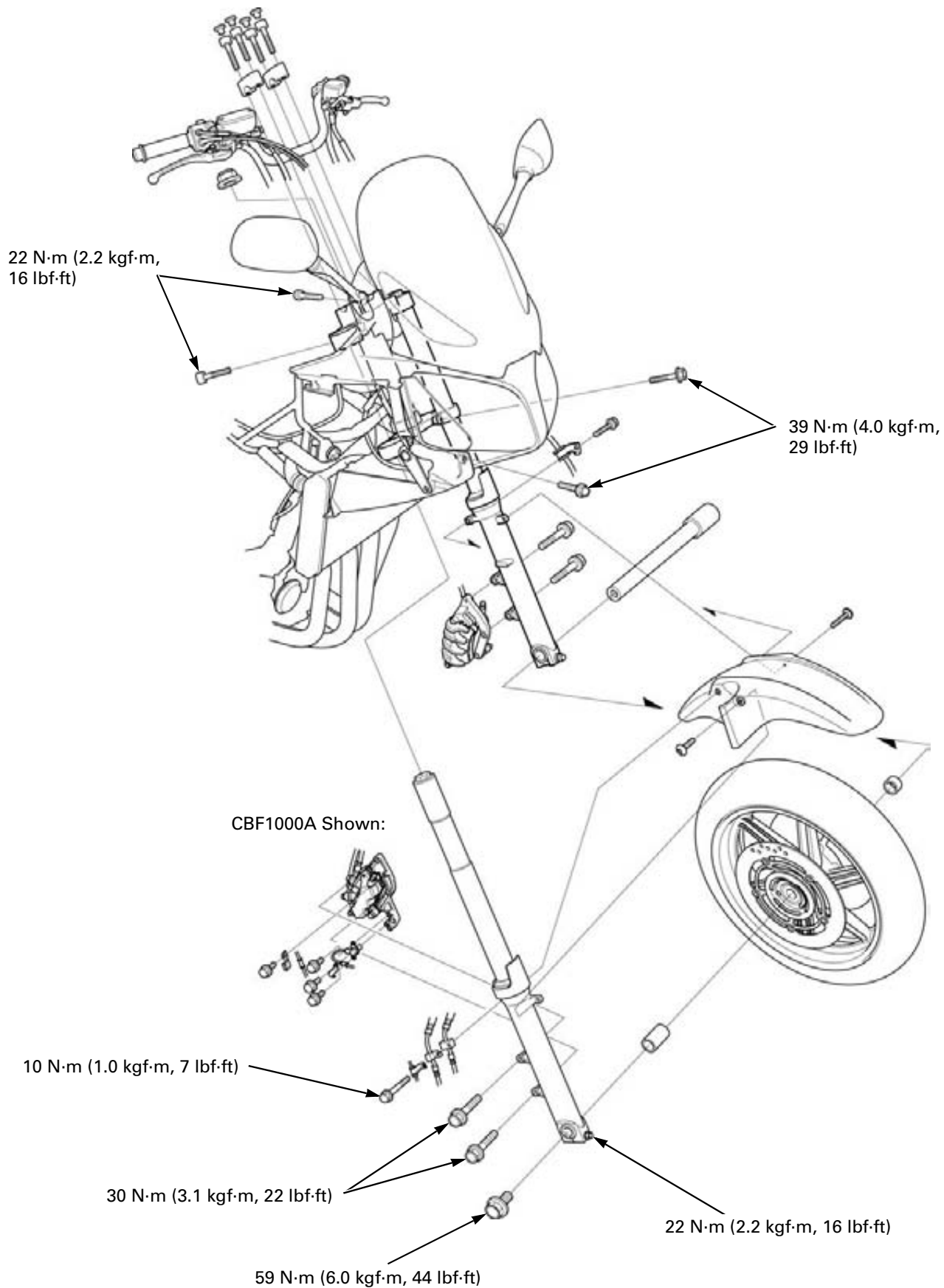


14. FRONT WHEEL/SUSPENSION/STEERING

SYSTEM COMPONENTS	14-2	FRONT WHEEL	14-13
SERVICE INFORMATION	14-3	FORK	14-19
TROUBLESHOOTING	14-5	STEERING STEM.....	14-30
HANDLEBAR	14-6		

FRONT WHEEL/SUSPENSION/STEERING

SYSTEM COMPONENTS



SERVICE INFORMATION

GENERAL

- A hoist or equivalent is required to support the motorcycle when servicing the front wheel, fork and steering stem.
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Riding on damaged rims impairs safe operation of the vehicle.
- Use only tires marked "TUBELESS" and tubeless valves on rim marked "TUBELESS TIRE APPLICABLE".
- Refer to page 16-2 for hydraulic brake system service.

SPECIFICATIONS

Unit: mm (in)



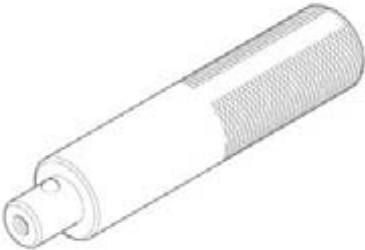






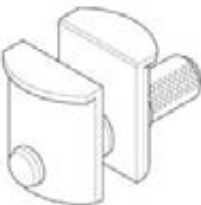
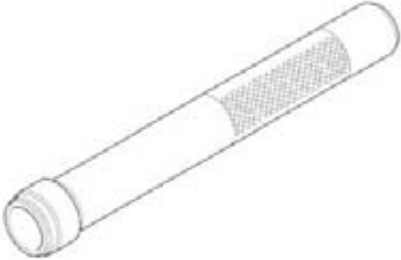

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		–	1.5 (0.06)
Cold tire pressure	Driver only	250 kPa (2.50 kgf/cm ² , 36 psi)	–
	Driver and passenger	250 kPa (2.50 kgf/cm ² , 36 psi)	–
Axle runout		–	0.2 (0.008)
Wheel rim runout	Radial	–	2.0 (0.08)
	Axial	–	2.0 (0.08)
Wheel balance weight		–	60 g (2.1oz) max.
Fork	Spring free length	358.8 (14.13)	352 (13.9)
	Fork pipe runout	–	0.20 (0.008)
	Recommended fork fluid	Honda ULTRA CUSHION OIL 10W or equivalent	–
	Fluid level	129 (5.1)	–
	Fluid capacity	437 ± 2.5 cm ³ (14.8 ± 0.08 US oz, 15.4 ± 0.09 Imp oz)	–
Steering head bearing pre-load		9.8 – 13.7 N (1.0 – 1.4 kgf, 2.2 – 3.1 lbf)	–

TORQUE VALUES

Steering stem adjusting lock nut	See page 14-34	
Steering stem adjusting nut	25 N·m (2.5 kgf·m, 18 lbf·ft)	Apply engine oil to the threads.
Steering stem nut	103 N·m (10.5 kgf·m, 76 lbf·ft)	
Bottom bridge pinch bolt	39 N·m (4.0 kgf·m, 29 lbf·ft)	
Top bridge pinch bolt	22 N·m (2.2 kgf·m, 16 lbf·ft)	
Fork cap	22 N·m (2.2 kgf·m, 16 lbf·ft)	
Fork cap lock nut	19.6 N·m (2.0 kgf·m, 14 lbf·ft)	
Fork center bolt	20 N·m (2.0 kgf·m, 15 lbf·ft)	Apply locking agent.
Front axle pinch bolt	22 N·m (2.2 kgf·m, 16 lbf·ft)	
Front axle bolt	59 N·m (6.0 kgf·m, 44 lbf·ft)	
Front brake disc bolt	20 N·m (2.0 kgf·m, 15 lbf·ft)	ALOC bolt; replace with new one.
Front master cylinder holder bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Wheel speed sensor pulse ring torx bolt	7 N·m (0.7 kgf·m, 5.2 lbf·ft)	ALOC bolt; replace with new one.
Brake caliper mounting bolt	30 N·m (3.1 kgf·m, 22 lbf·ft)	ALOC bolt; replace with new one.

FRONT WHEEL/SUSPENSION/STEERING

TOOLS

<p>Bearing remover shaft 07GGD-0010100</p> 	<p>Bearing remover head, 20 mm 07746-0050600</p> 	<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>Fork seal driver weight 07947-KA50100</p> 	<p>Fork seal driver attachment, 41 mm I.D. 07947-KF00100</p> 	<p>Steering stem socket 07916-3710101</p> 
<p>Bearing remover 07946-3710500</p> 	<p>Steering stem driver 07946-MB00000</p> 	<p>Ball race remover attachment 07953-MJ10100</p> 

Ball race remover handle
07953-MJ10200



TROUBLESHOOTING

Hard steering

- Steering stem adjusting nut too tight
- Worn or damaged steering head bearings
- Worn or damaged steering head bearing races
- Bent steering stem
- Insufficient tire pressure
- Faulty front tire

Steers to one side or does not track straight

- Bent fork leg
- Damaged steering head bearings
- Loose steering head bearings
- Bent frame
- Worn wheel bearings
- Bent front axle
- Worn swingarm pivot components (page 15-5)

Front wheel wobbles

- Bent rim
- Unbalanced tire and wheel
- Worn wheel bearings
- Faulty tire

Wheel turns hard

- Faulty wheel bearings
- Bent axle
- Brake drag (page 16-6)

Soft suspension

- Low tire pressure
- Weak fork spring
- Low fluid level in fork
- Incorrect fluid weight (low viscosity)

Stiff suspension

- High tire pressure
- Bent fork tube
- Fork slider binds
- High fluid level in fork
- Incorrect fluid weight (high viscosity)
- Clogged fork fluid passage

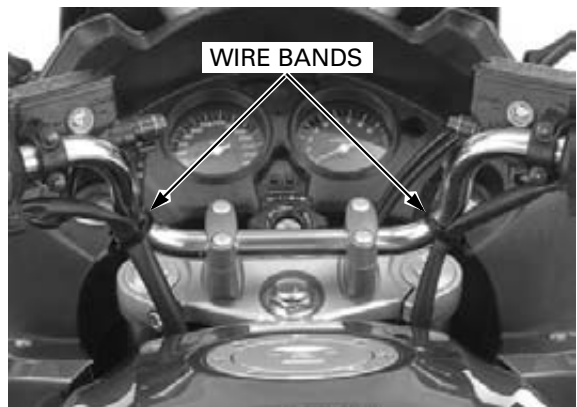
Front suspension noise

- Loose fork fasteners
- Incorrect fluid weight (low viscosity)
- Worn guide bushing or fork tube bushing

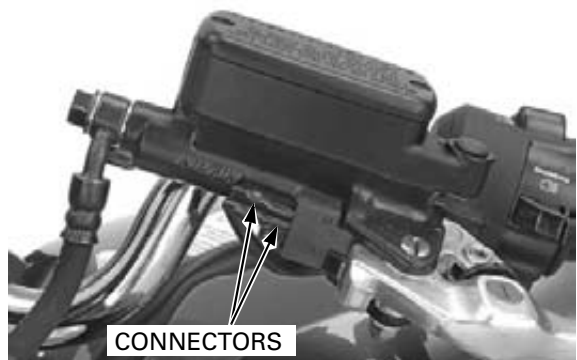
HANDLEBAR

REMOVAL

Remove the wire bands.

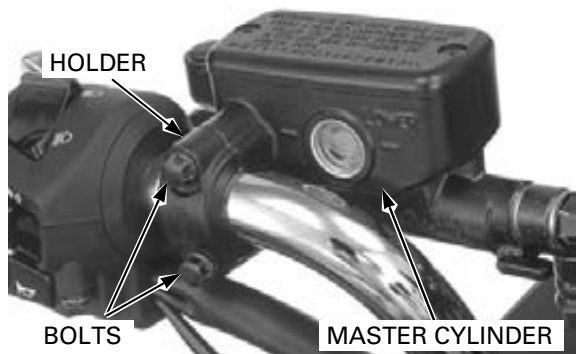


Disconnect the clutch switch wire connectors.

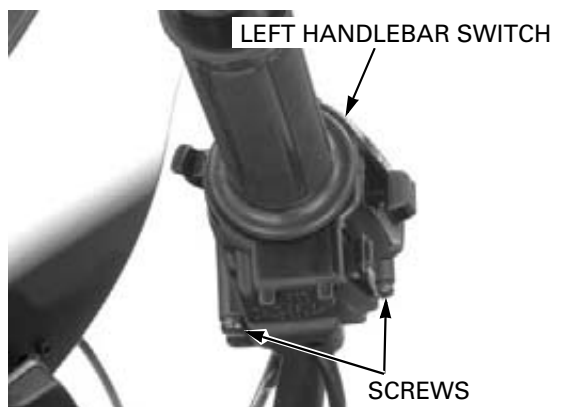


Keep the reservoir upright to prevent air from entering the hydraulic system.

Remove the holder bolts, holder and clutch master cylinder.



Remove the screws and left handlebar switch.

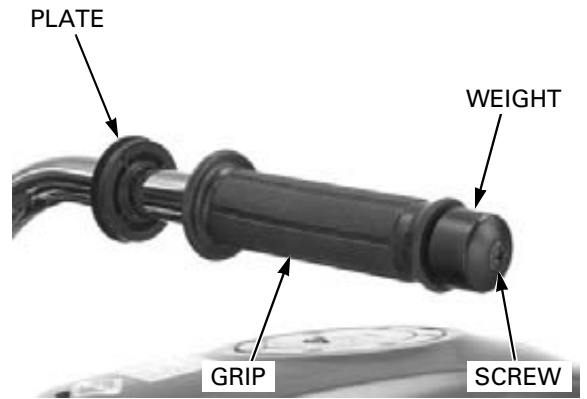


FRONT WHEEL/SUSPENSION/STEERING

For inner weight replacement, see page 14-13.

Remove the screw and left handlebar weight.

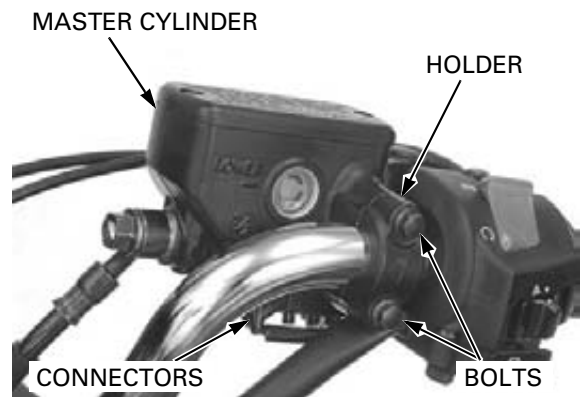
Remove the left handlebar grip and switch housing plate.



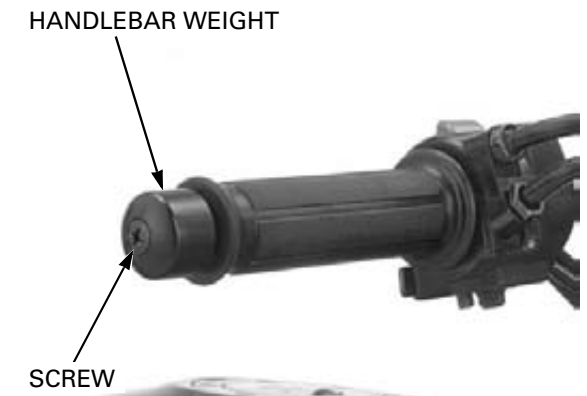
Disconnect the brake light switch wire connectors.

Keep the reservoir upright to prevent air from entering the hydraulic system.

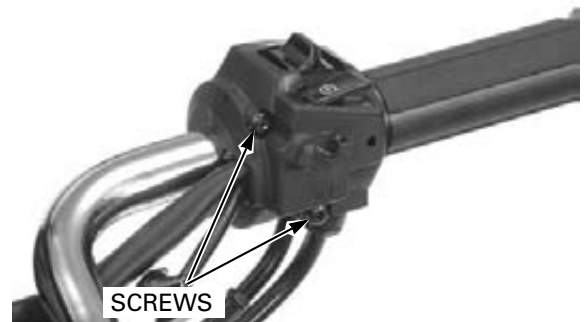
Remove the bolts, holder and brake master cylinder.



Remove the screw and right handlebar weight.

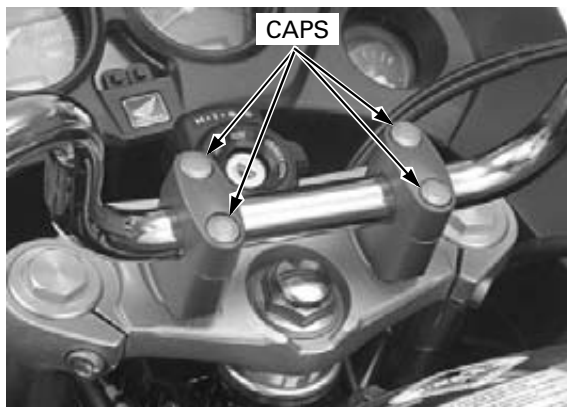


Remove the screws and right handlebar switch.

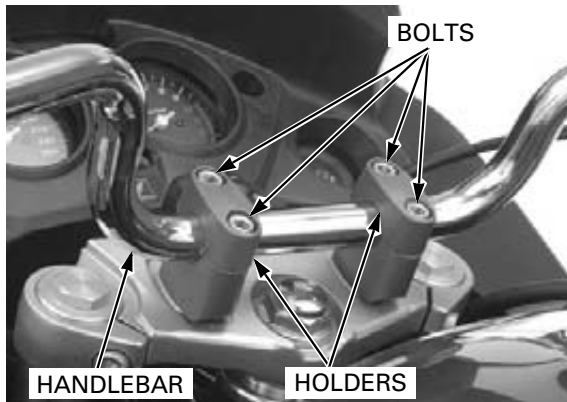


FRONT WHEEL/SUSPENSION/STEERING

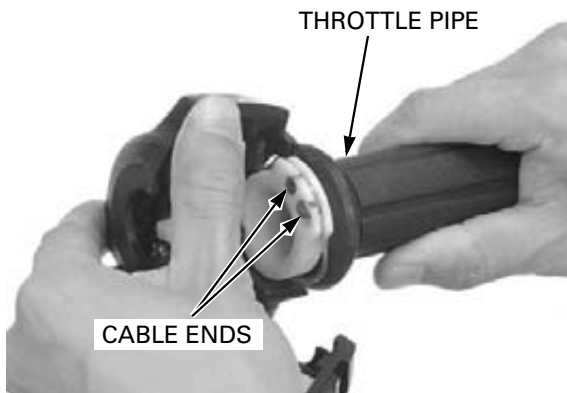
Remove the bolt caps from the handlebar upper holders.



Remove the bolts, handlebar upper holders and handlebar.

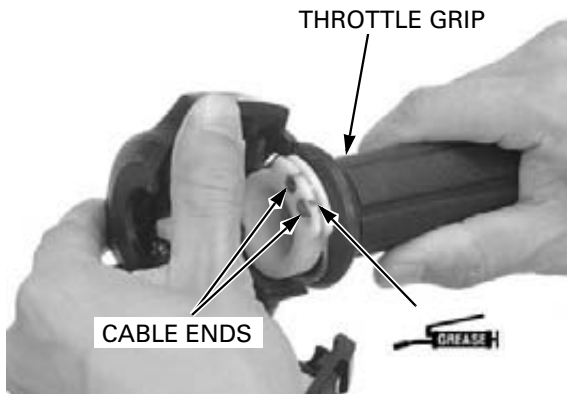


Remove the throttle pipe from the handlebar.
Disconnect the throttle cables from the throttle pipe.



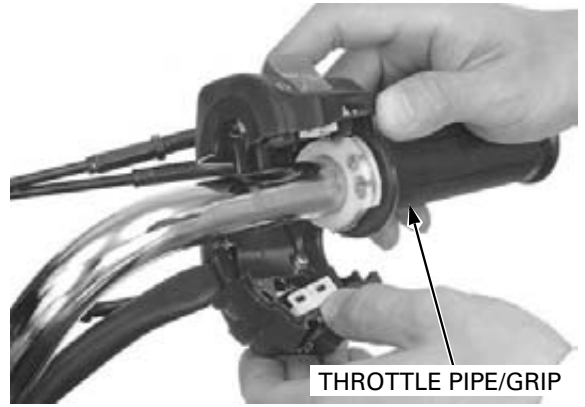
INSTALLATION

Apply grease to the throttle pipe flange groove and sliding areas.
Connect the throttle cables to the throttle pipe flange.

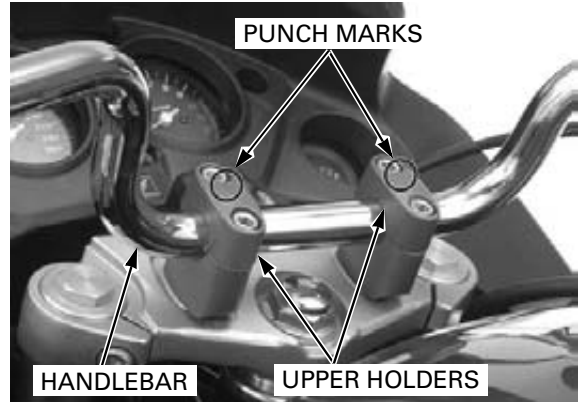


FRONT WHEEL/SUSPENSION/STEERING

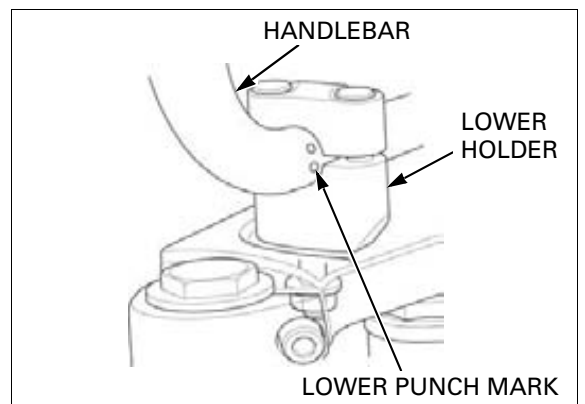
Clean the sliding surfaces of the throttle pipe and handlebar.
Install the throttle pipe onto the handlebar.



Install the handlebar onto the lower holders, then install the upper holders with the punch marks facing forward.

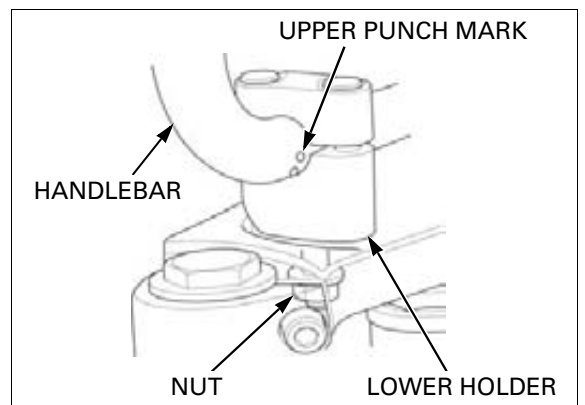


Standard position: Align the lower punch mark on the handlebar with the edge of the lower holder.



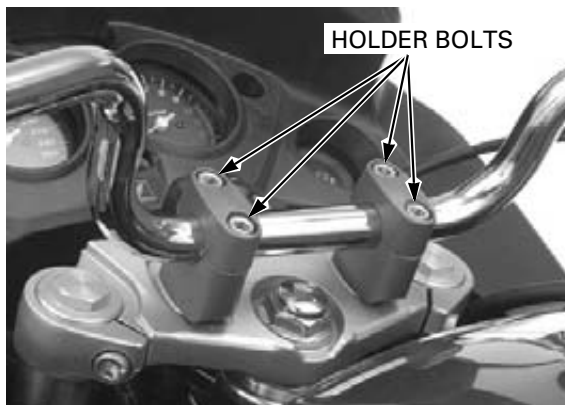
Forward position: If you wish the handlebar position forward, loosen the lower holder nuts and turn the lower holder 180 degrees.

Align the upper punch mark on the handlebar with the edge of the lower holder.

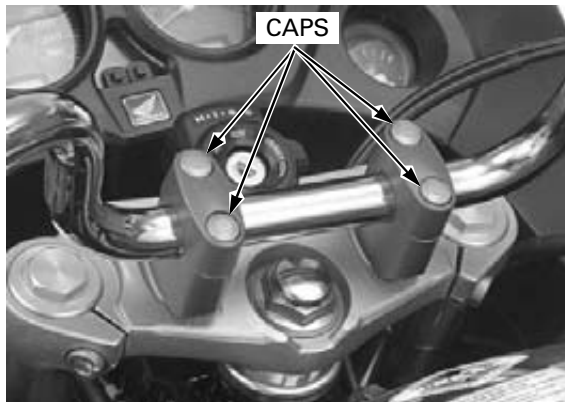


FRONT WHEEL/SUSPENSION/STEERING

Tighten the handlebar holder front bolt first, then the rear bolt.

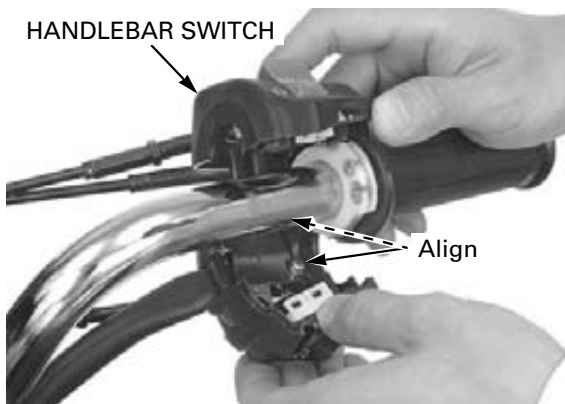


Install the bolt caps onto the handlebar upper holder.



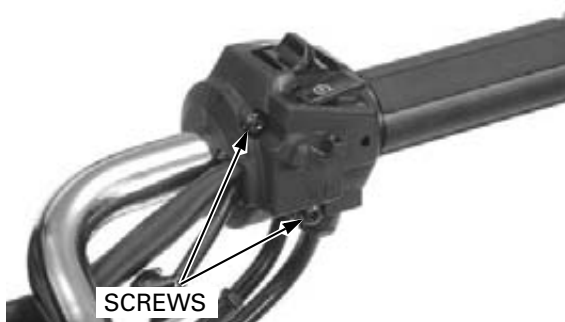
Align the locating pin on the housing with the hole in the handlebar.

Install the right handlebar switch housing.



Tighten the front screw (short) first, then tighten the rear screw (long).

Check the throttle grip for smooth operation (page 4-6).



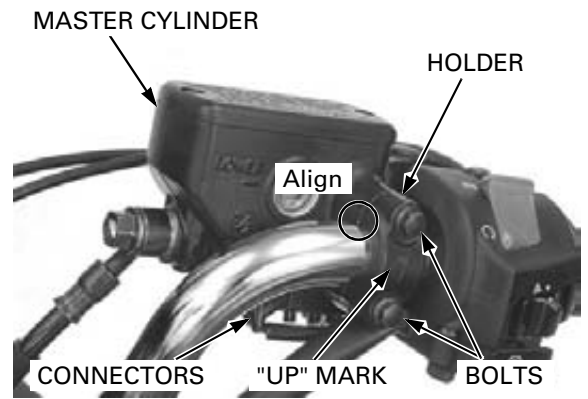
FRONT WHEEL/SUSPENSION/STEERING

Install the master cylinder holder with the "UP" mark facing up.

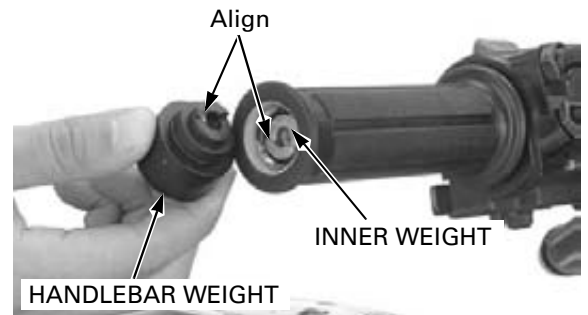
Install the brake master cylinder, holder and holder bolts.
Align the edge of the master cylinder with the punch mark on the handlebar.
Tighten the holder upper bolt first, then the lower bolt.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Connect the brake light switch wire connectors.



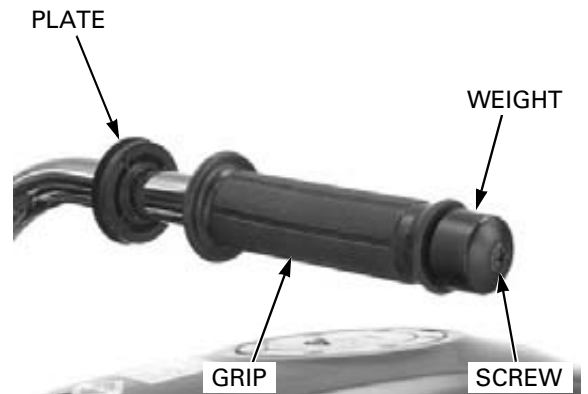
Install the right handlebar weight onto the inner weight, aligning each cut-out of the weights.
Tighten the screw while holding the weight securely.



Install the switch housing plate.
Apply Honda Bond A, Honda hand grip cement or equivalent to the inside surface of the left handlebar grip and to the clean surfaces of the handlebar.

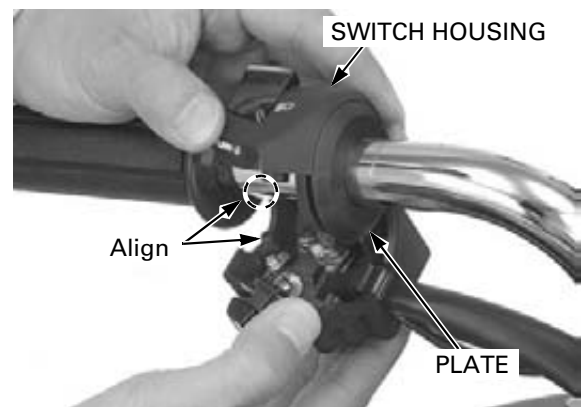
Allow the adhesive to dry for 1 hour before using.

Wait 3–5 minutes and install the grips. Rotate the grips for even application of the adhesive.
Install the handlebar weight in the same manner as above.



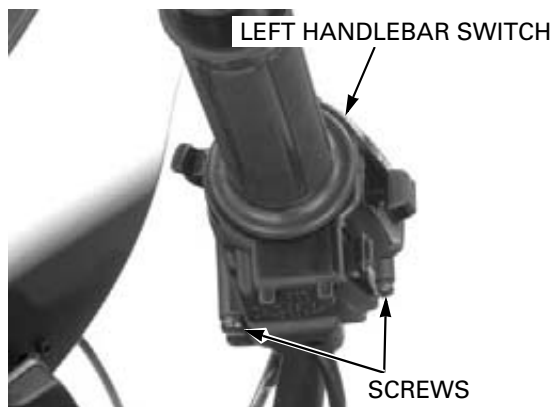
Set the housing ends into the plate groove.

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



FRONT WHEEL/SUSPENSION/STEERING

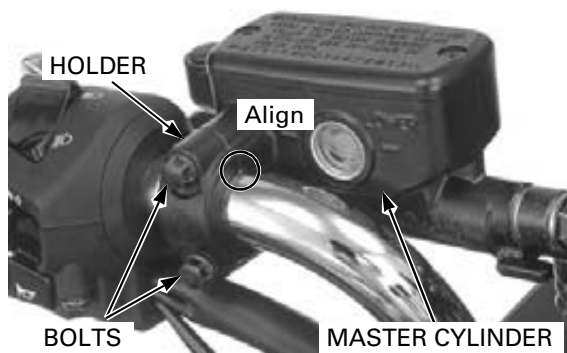
Tighten the front screw (long) first, then tighten the rear screw (short).



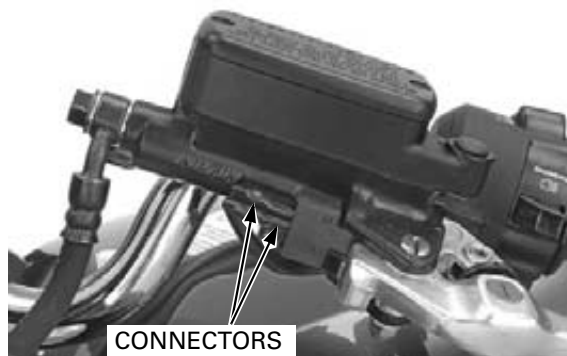
Install the master cylinder holder with the "UP" mark facing up.

Install the clutch master cylinder, holder and bolts. Align the edge of the master cylinder with the punch mark on the handlebar. Tighten the holder upper bolt first, then the lower bolt.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

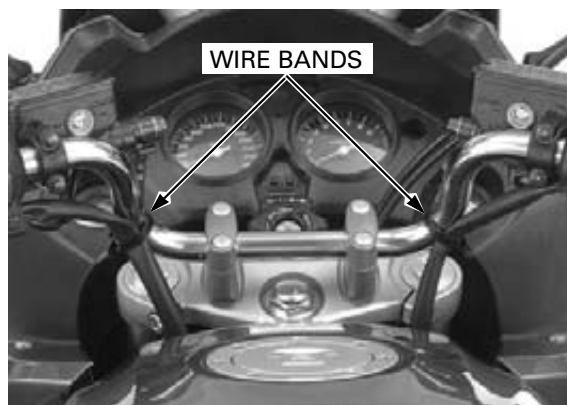


Connect the clutch switch wire connectors.



Secure the handlebar switch wires with the wire bands.

Check the throttle operation and grip free play (page 4-6).



HANDLEBAR INNER WEIGHT REPLACEMENT

Remove the left handlebar grip and throttle grip.

Straighten the retainer tab with a screwdriver or punch.

Apply lubricant spray through the tab locking hole for easy removal.

Temporarily install the handlebar weight and screw, then remove the inner weight by turning the handlebar weight.

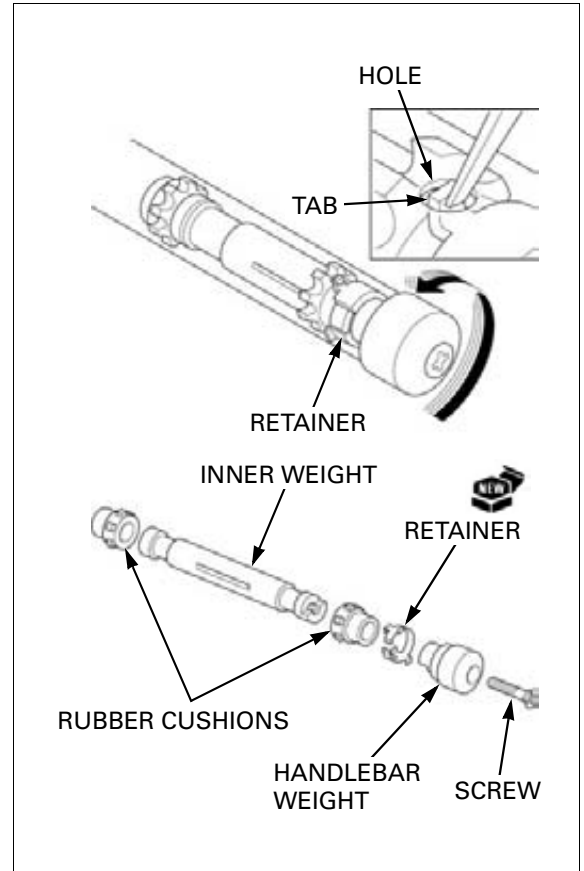
Remove the handlebar weight from the inner weight.

Discard the retainer.

Install the new retainer onto the inner weight, aligning the flats each other. Tighten the screw while holding the weight securely.

Insert the weight assembly into the handlebar. Turn the handlebar weight and hook the retainer tab with the hole in the handlebar.

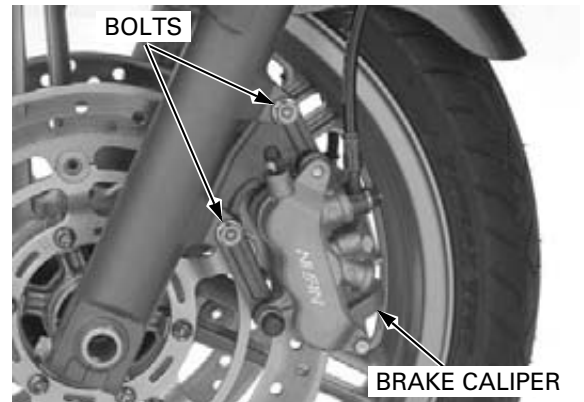
Install the left handlebar grip and throttle grip.



FRONT WHEEL

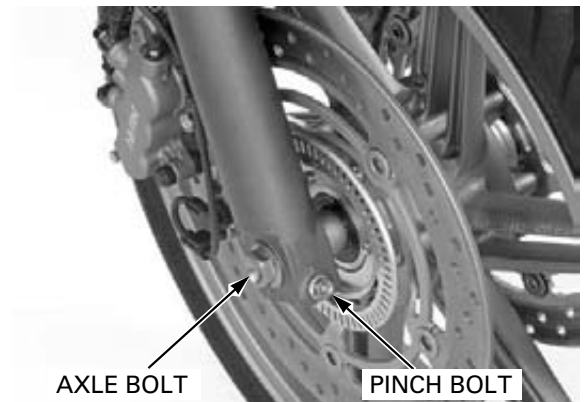
REMOVAL

Remove the mounting bolts and left brake caliper.



Remove the axle bolt and loosen the right axle pinch bolt.

Support the motorcycle securely using a hoist or equivalent and raise the front wheel off the ground.



FRONT WHEEL/SUSPENSION/STEERING

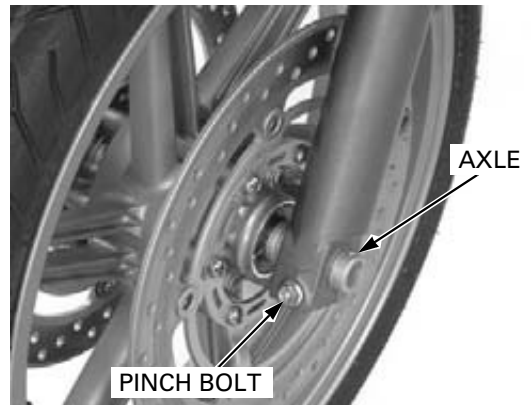
Loosen the left axle pinch bolt.

CBF1000A: Be careful not to damage the speed sensor on the brake caliper.

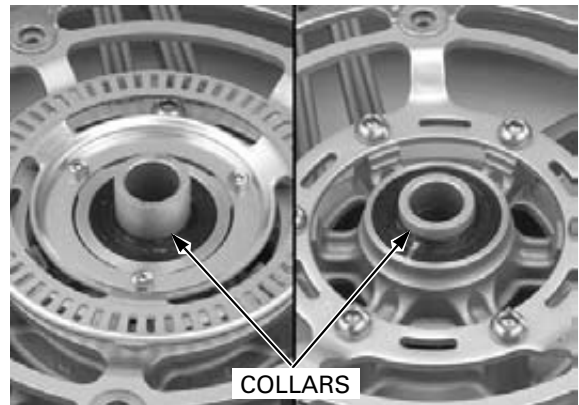
Pull the front axle out and remove the front wheel.

NOTE:

- Do not operate the brake lever after removing the wheel. To do so will cause difficulty in fitting the brake disc between the brake pads.



Remove the side collars.



INSPECTION

AXLE

Set the front 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.

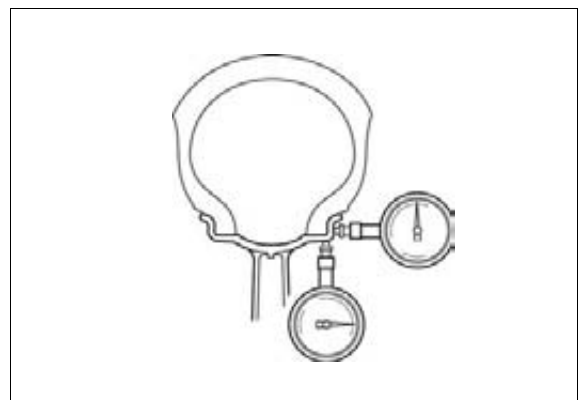
Spin the wheel slowly and read the runout using a dial indicator.

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)

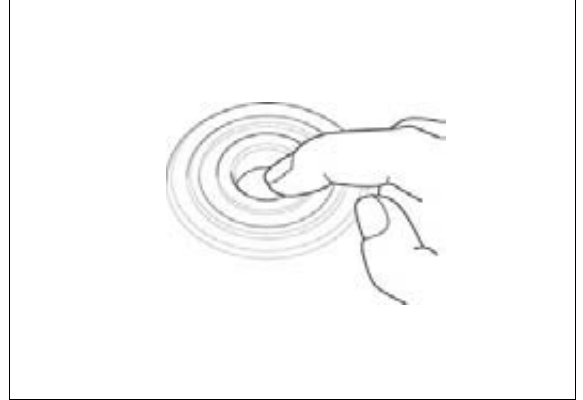


WHEEL BEARING

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.

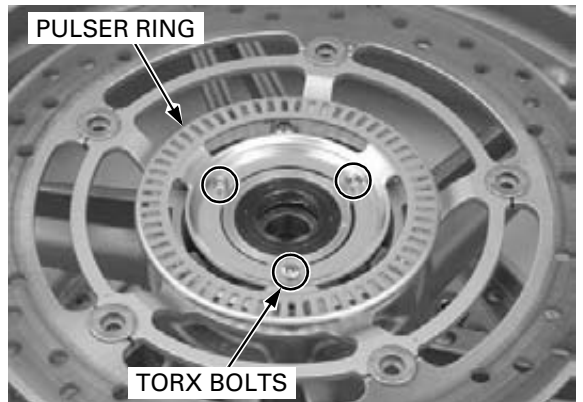
Replace the wheel bearings in pairs.

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



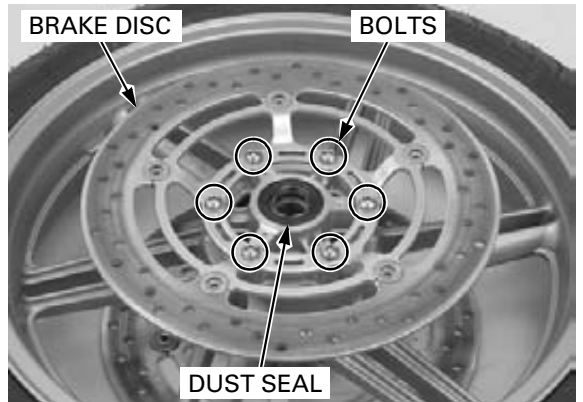
DISASSEMBLY

CBF1000A only: Remove the torx bolts and speed sensor pulser ring.



Remove the following (from both sides of the hub):

- Dust seals
- Bolts and brake discs

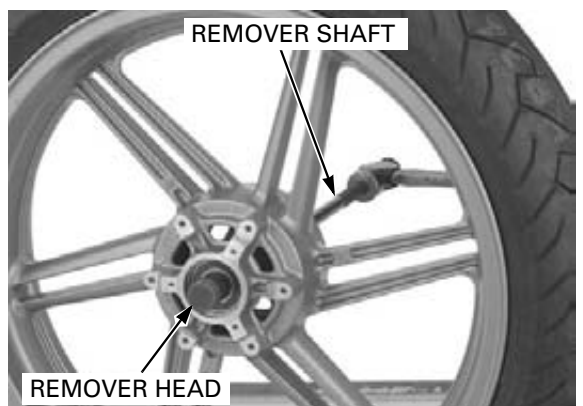


Replace the wheel bearings in pairs. Do not reuse old bearing.

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, then drive out the other side bearing.

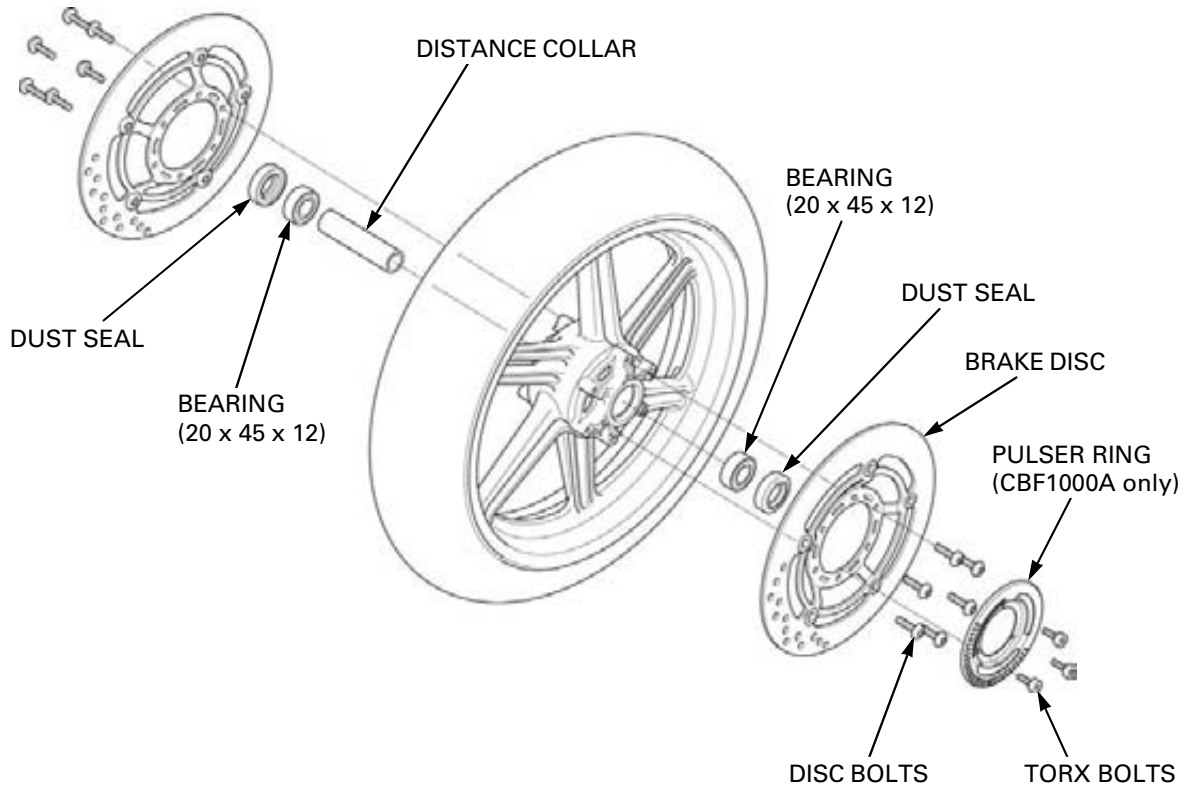
TOOLS:

- Bearing remover shaft** **07GGD-0010100**
- Bearing remover head, 20 mm** **07746-0050600**



FRONT WHEEL/SUSPENSION/STEERING

ASSEMBLY



Drive in new right wheel bearing squarely with the marked side facing up until it is fully seated.

Install the distance collar.

Drive in new left bearing squarely with the marked side facing up until it is fully seated on the distance collar.

TOOLS:

Driver

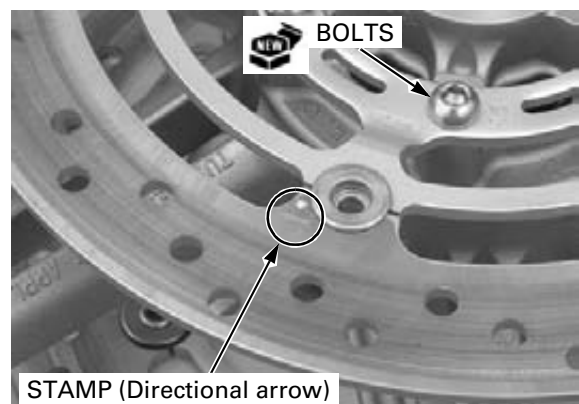
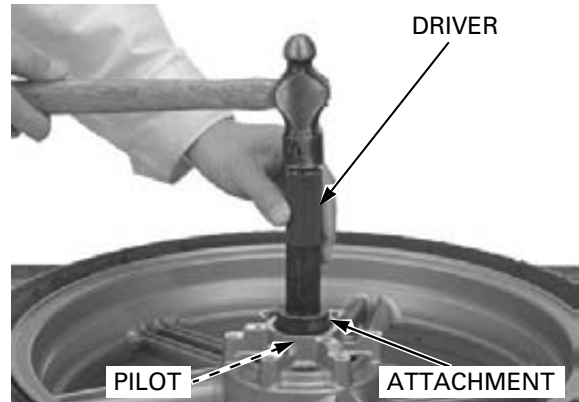
07749-0010000

Attachment, 42 x 47 mm

07746-0010300

Pilot, 20 mm

07746-0040500



Do not get grease on the brake disc or stopping power will be reduced.

Install the brake disc with the stamp facing out.

Install new disc bolts and tighten them in a criss-cross pattern in several steps.

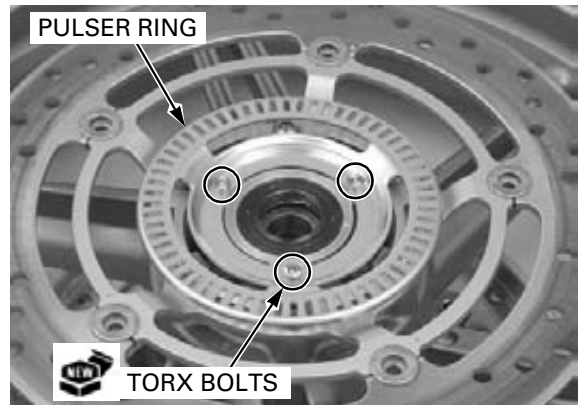
TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)

Install the other side brake disc.

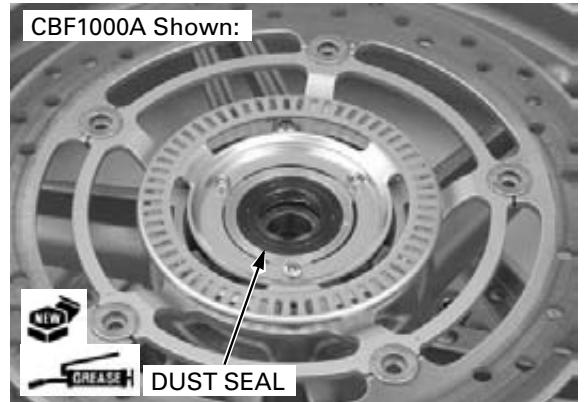
FRONT WHEEL/SUSPENSION/STEERING

CBF1000A only: Install the speed sensor pulser ring onto the right wheel hub.
Install the new torx bolts and tighten them to the specified torque.

TORQUE: 7 N·m (0.7 kgf·m, 5.2 lbf·ft)



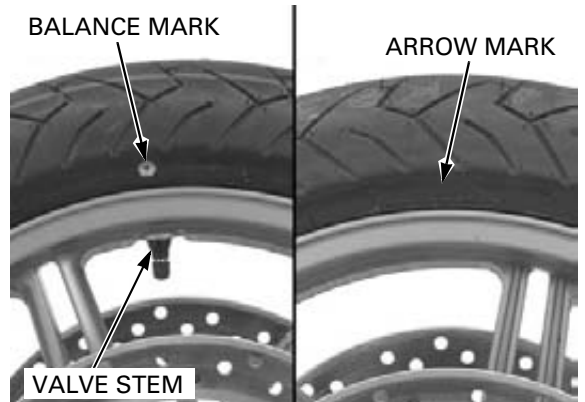
Apply grease to new dust seal lips and install the dust seals until they are flush with the wheel hub.



WHEEL BALANCE

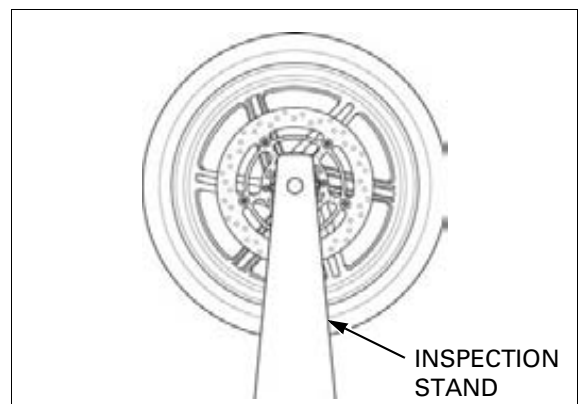
NOTE:

- 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 (and pulser ring; CBF1000A) 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.



FRONT WHEEL/SUSPENSION/STEERING

To balance the wheel, install a balance weight on the lightest side of the rim, 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 (2.1 oz) to the front wheel.

NOTE:

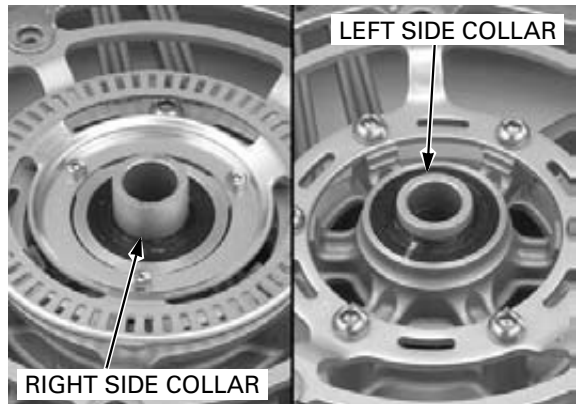
- This model is equipped with a new shape balance weight made of zinc spelter. This balance weight is incompatible with the conventional one in case of installation to the wheel.



INSTALLATION

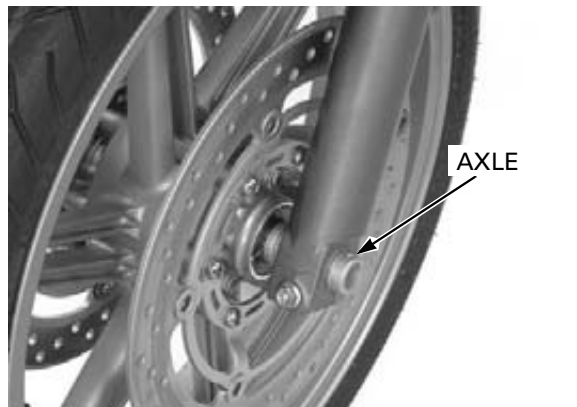
The right side collar is longer than the left side collar.

Install the right and left side collars.



Be careful not to damage the brake pads and wheel speed sensor (CBF1000A).

Coat the axle surface with thin layer of grease. Place the wheel between the fork legs so the right brake disc is positioned between the brake pads. Insert the axle from the left side.

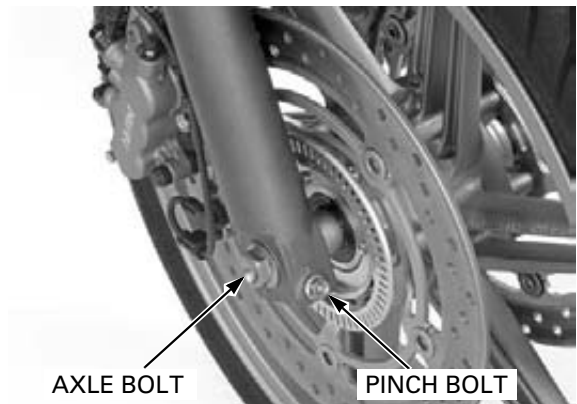


Install the axle bolt and tighten it while holding the axle.

TORQUE: 59 N·m (6.0 kgf·m, 44 lbf·ft)

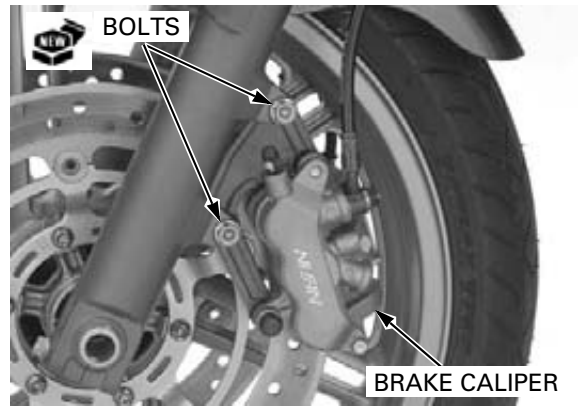
Tighten the right axle pinch bolt.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)



Install the left brake caliper.
Install new caliper bracket mounting bolts and tighten them to the specified torque.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)



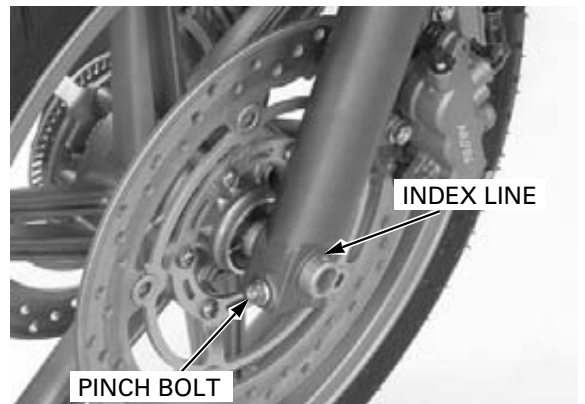
With the front brake applied, pump the forks up and down several times to seat the axle and check brake operation.



Make sure that the index line on the front axle aligns with the outer surface of the fork leg.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

CBF1000A only: Check the front wheel speed sensor air gap (page 17-25).



FORK

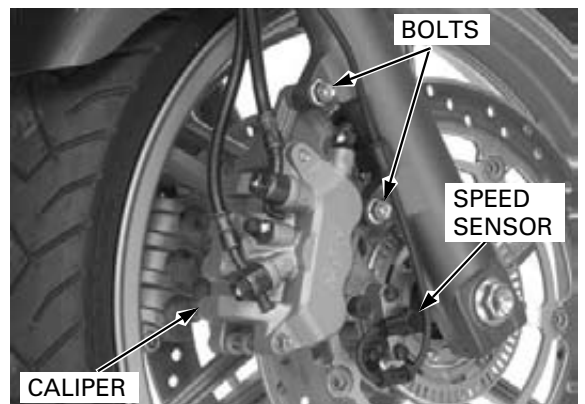
REMOVAL

Remove the front fender (page 3-9).

CBF1000A only: Remove the wheel speed sensor and clamp from the right brake caliper bracket (page 17-25).

Support the brake caliper so it does not hang from the brake hose. Do not twist the brake hose.

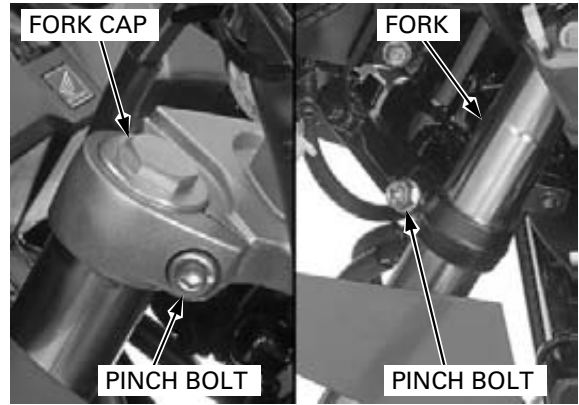
Remove the mounting bolts, and the right and left brake calipers.



FRONT WHEEL/SUSPENSION/STEERING

When the fork is ready to be disassembled, loosen the fork cap, but do not remove it.

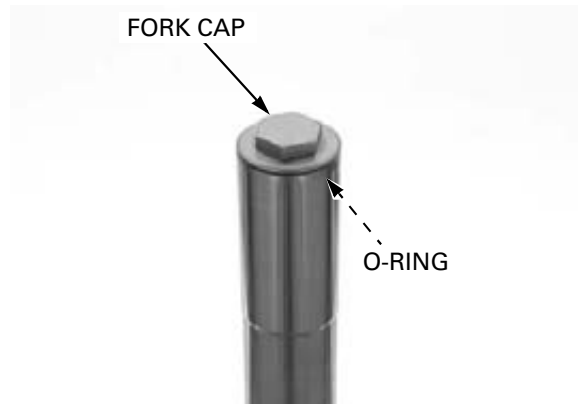
Support the fork leg.
Loosen the top and bottom bridge pinch bolts.
Pull the fork leg down and remove it out of the fork bridges.



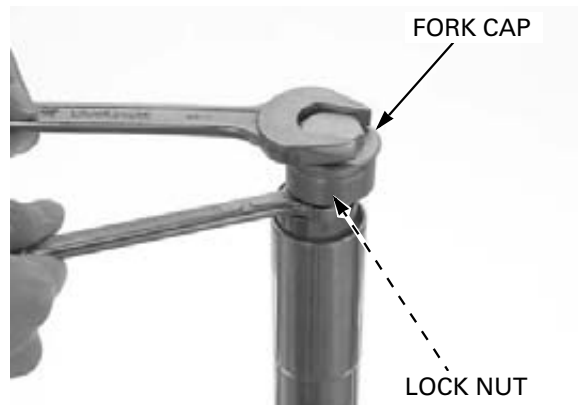
DISASSEMBLY

The fork cap is under spring pressure; use care when loosening it.

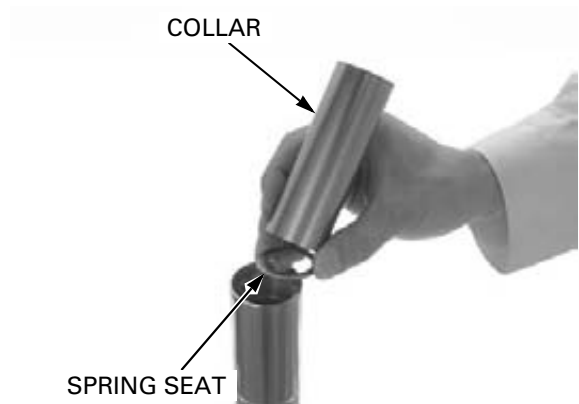
Remove the fork cap.
Remove the O-ring from the fork cap.



Hold the fork cap and loosen the lock nut.
Remove the fork cap from the fork damper.



Remove the spring collar and spring seat.

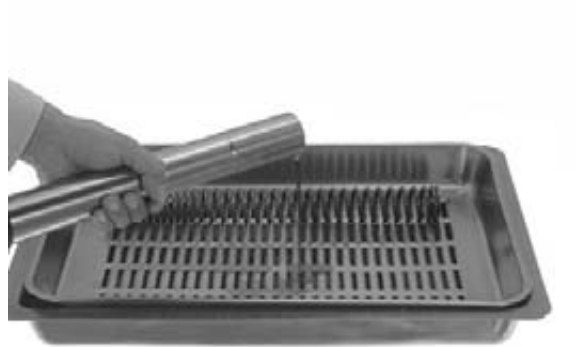


Remove the fork spring.

FORK SPRING



Pour out the fork fluid by pumping the fork tube up and down several times.

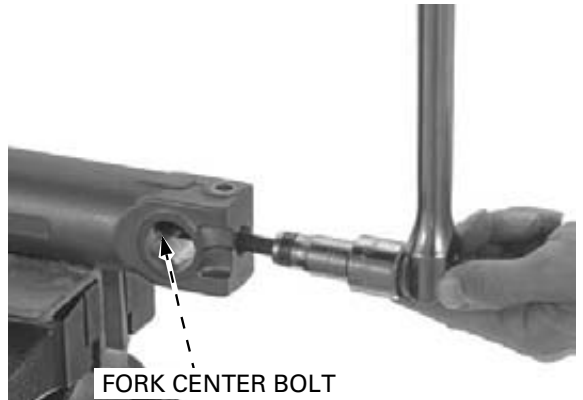


Hold the fork slider in a vise with soft jaws or shop towels.

Remove the axle pinch bolt.

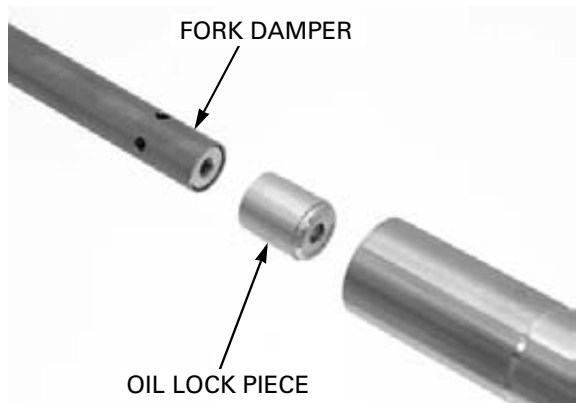
If the fork piston turns with the center bolt, temporarily install the fork spring, spring seat, collar and fork cap.

Remove the fork center bolt and sealing washer.



FORK CENTER BOLT

Remove the fork damper and oil lock piece.

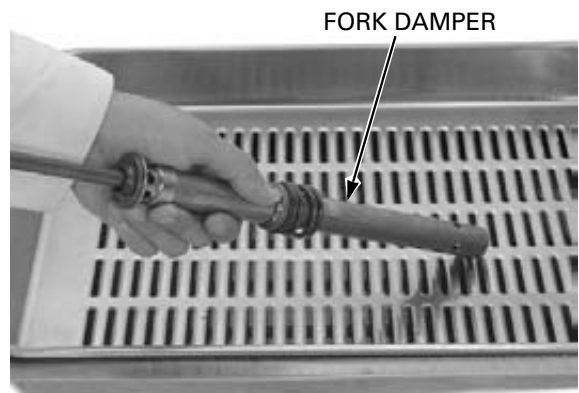


FORK DAMPER

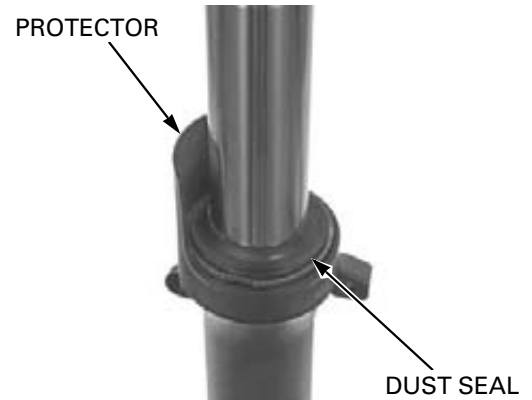
OIL LOCK PIECE

FRONT WHEEL/SUSPENSION/STEERING

Pump the fork damper several times to drain any excess fluid.



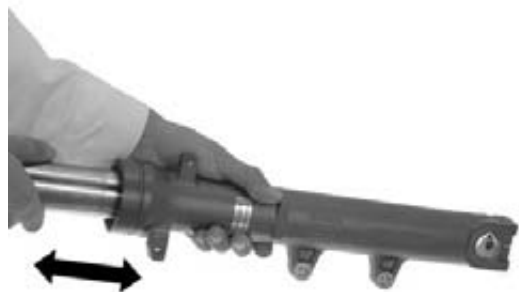
Be careful not to damage the fork slider. Remove the fork protector and dust seal.



Be careful not to scratch the fork tube sliding surface. Remove the stopper ring.



Using quick successive motions, pull the fork tube out of the fork slider.



Remove the oil seal, back-up ring and guide bushing.



Do not remove the fork tube bushing unless it is necessary to replace with new one (page 14-24).

Carefully remove the fork tube bushing by prying the slit with a flat blade screwdriver until the bushing can be pulled off by hand.

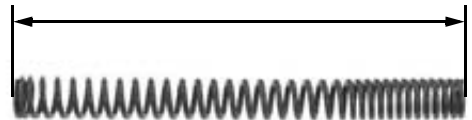


INSPECTION

FORK SPRING

Measure the fork spring free length.

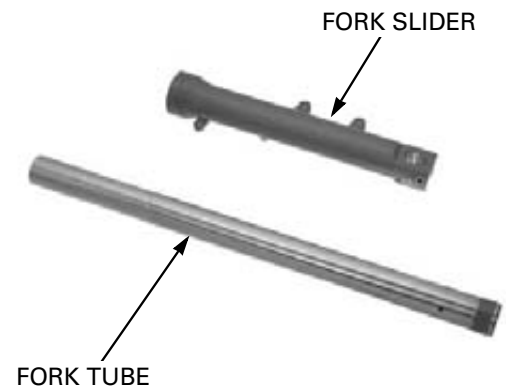
SERVICE LIMIT: 352 mm (13.9 in)



FORK TUBE/SLIDER/FORK DAMPER

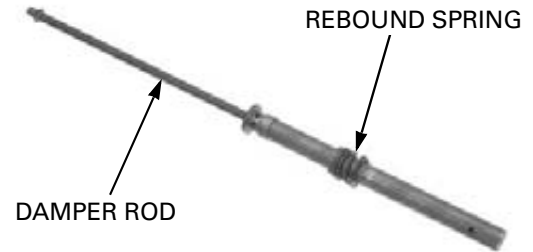
Check the fork tube, slider for score marks, and excessive or abnormal wear.

Replace any damaged component if necessary.



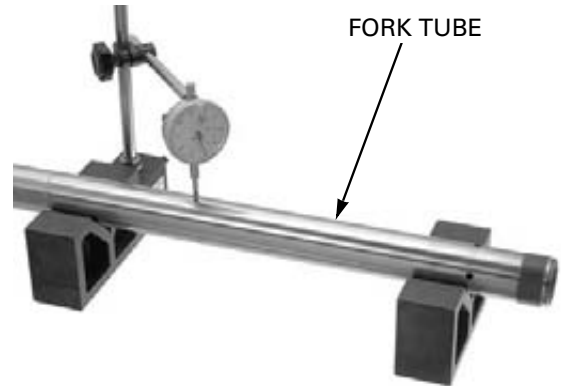
FRONT WHEEL/SUSPENSION/STEERING

Check the fork damper rod for bend or damage.
Check the rebound spring for fatigue or damage.
Replace the fork damper 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.

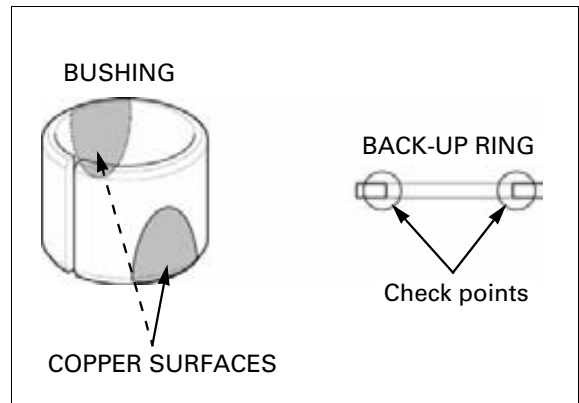
SERVICE LIMIT: 0.20 mm (0.008 in)



BUSHINGS

Visually inspect the guide and fork tube 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.

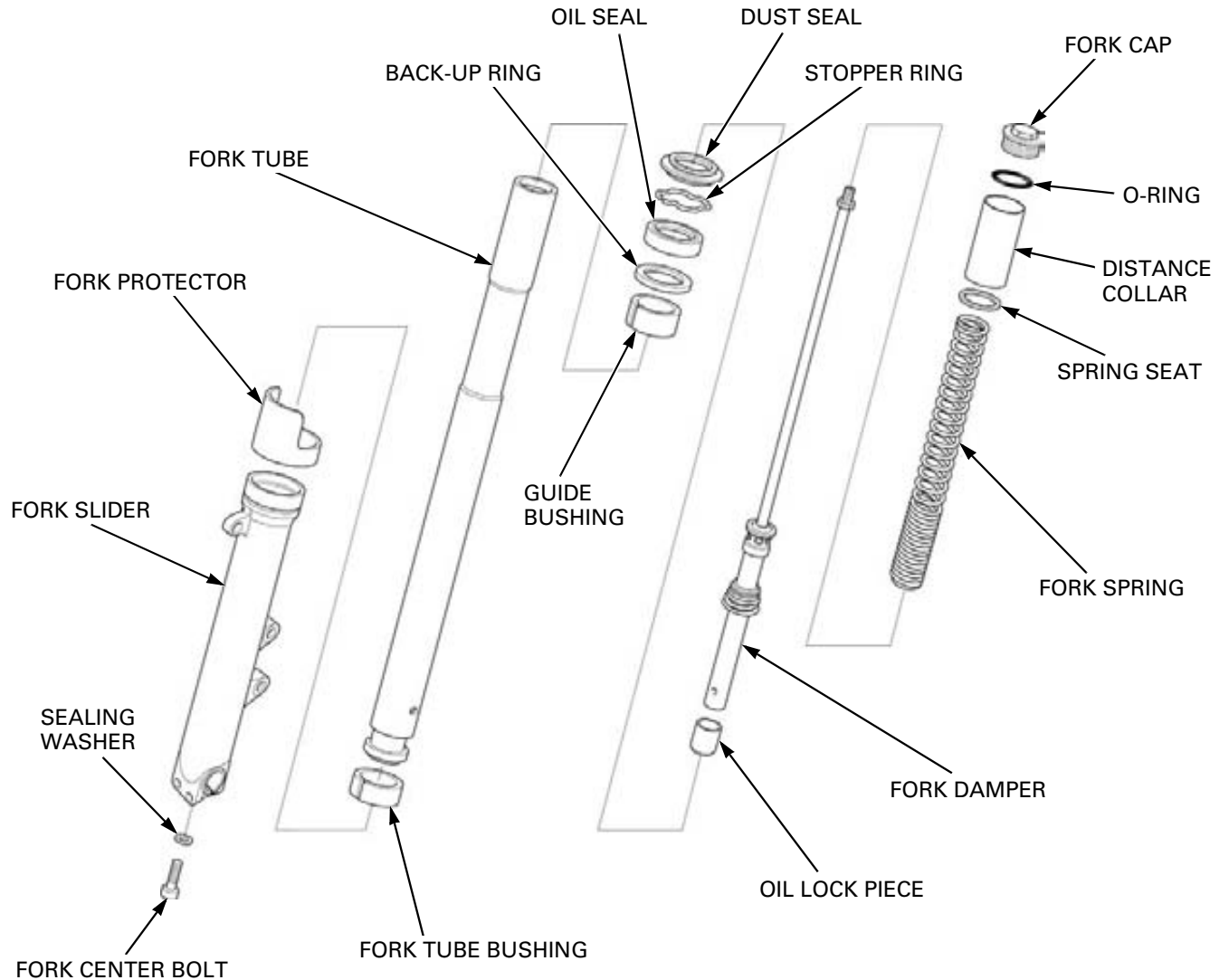
Check the back-up ring; replace it if there is any distortion at the points shown.



ASSEMBLY

NOTE:

- Before assembly, wash all parts with a high flash point or non-flammable solvent and wipe them off completely.
- When installing the oil seal and dust seal, wrap vinyl tape around the fork tube top end to avoid damaging the seal lips.

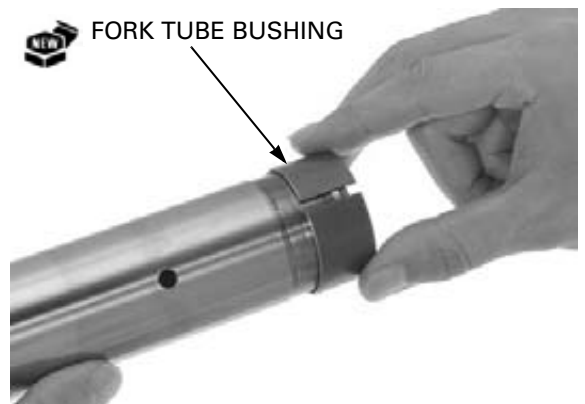


Do not open the bushing more than necessary.

Install new fork tube bushing if it has been removed.

NOTE:

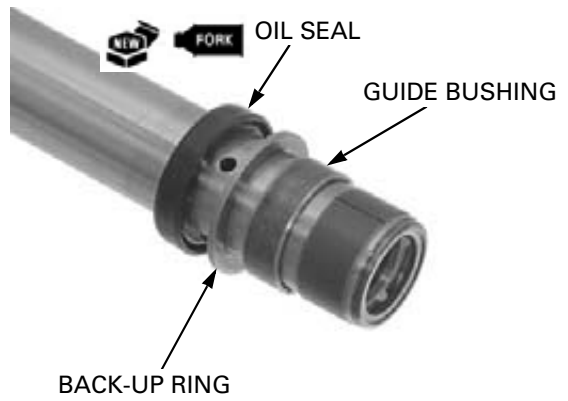
- Remove the burrs from the bushing mating surface, being careful not to peel off the coating.



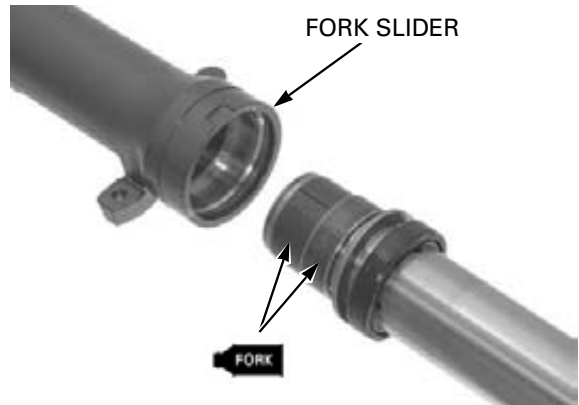
FRONT WHEEL/SUSPENSION/STEERING

Install the guide bushing and back-up ring onto the fork tube.

Apply fork fluid to new oil seal lips.
Install the oil seal with the marking side facing toward the fork tube top.



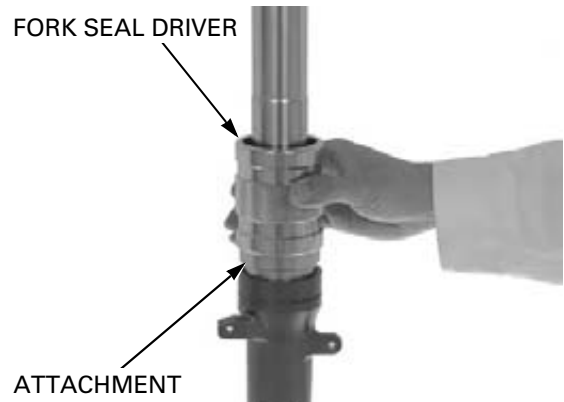
Apply fork fluid to the fork tube bushing and guide bushing, then install the fork tube into the fork slider.



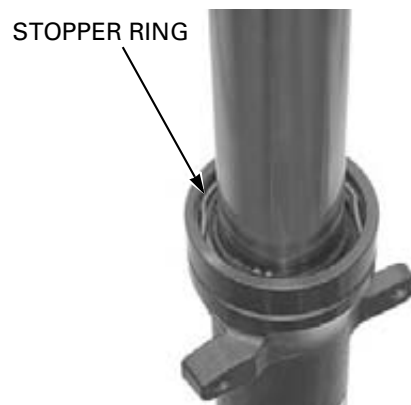
Drive the oil seal into the fork slider until the stopper ring groove is visible, using the special tools.

TOOLS:

Fork seal driver weight 07947-KA50100
Fork seal driver attachment, 07947-KF00100
41 mm I.D.



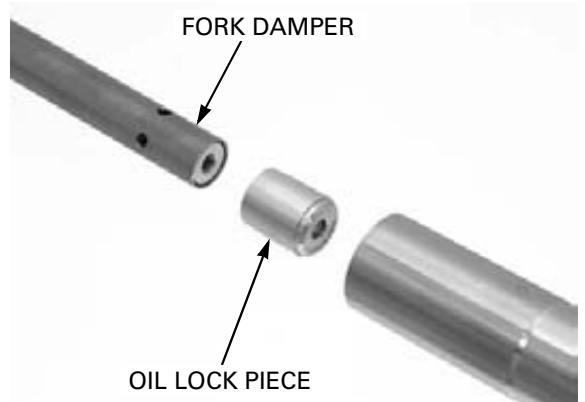
Install the stopper ring into the groove of the fork slider, being careful not to scratch the fork tube sliding surface.



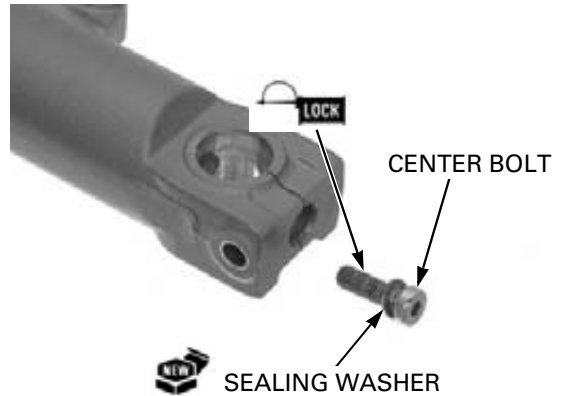
Apply fork fluid to new fork dust seal lips.
Install the dust seal in the fork slider.



Install the oil lock piece onto the fork damper and install them into the fork.



Apply locking agent to the fork center bolt threads.
Install the center bolt with new sealing washer and tighten it.

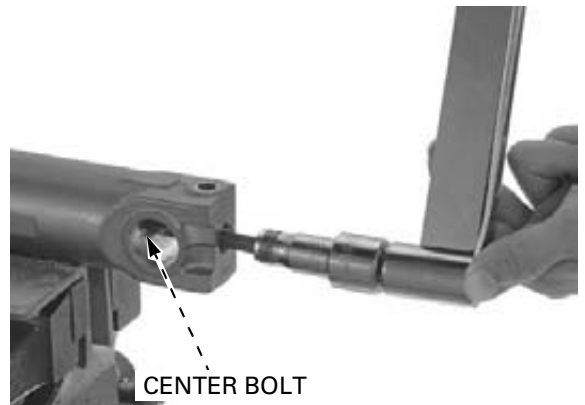


Hold the fork slider in a vise with soft jaws or shop towels.

If the fork damper turns with the center bolt, temporarily install the fork spring, spring seat, collar and fork cap.

Tighten the fork center bolt to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)



FRONT WHEEL/SUSPENSION/STEERING

Pour the specified amount of the recommended fork fluid into the fork tube.

RECOMMENDED FORK FLUID:
Honda Ultra Cushion Oil 10W or equivalent

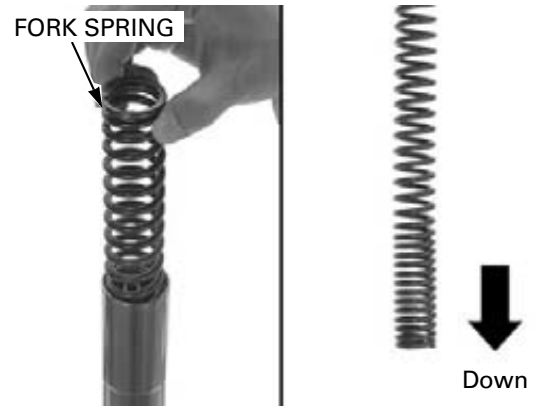
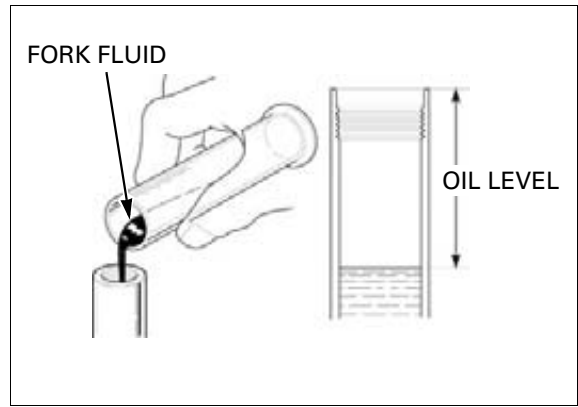
FORK FLUID CAPACITY:
 $437 \pm 2.5 \text{ cm}^3$ (14.8 \pm 0.08 US oz, 15.4 \pm 0.09 Imp oz)

Slowly pump the fork tube several times to remove any trapped air from the lower portion of the fork tube.

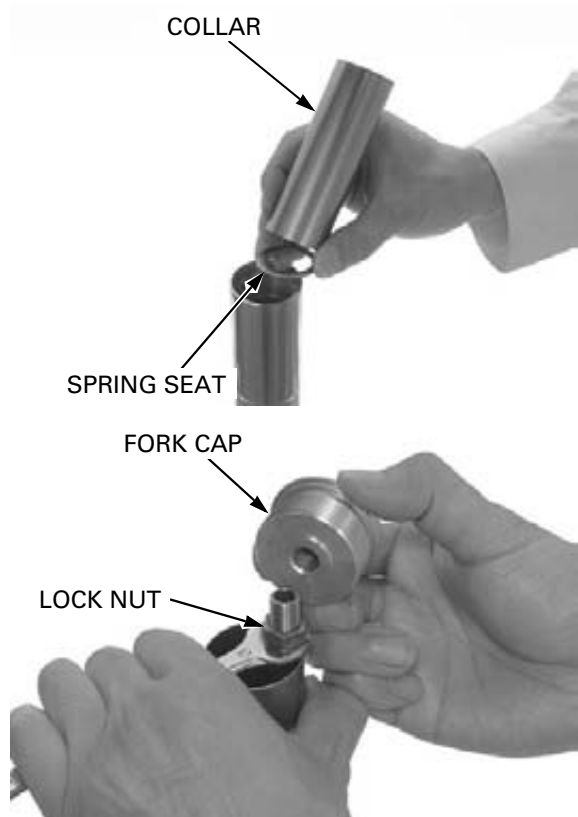
Compress the fork tube fully and measure the fluid level from the top of the fork tube.

FORK F LEVEL: 129 mm (5.1 in)

Pull the fork tube up and install the fork spring with the tightly wound coil side facing down.



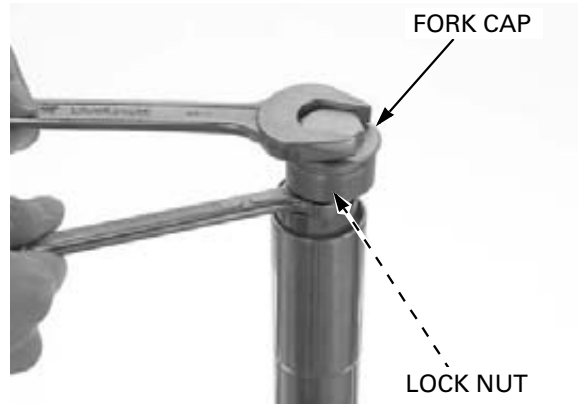
Install the spring seat and spring collar.



Pull up the damper rod end and install the wrench between the lock nut and spring collar, then hold the damper rod. Install and tighten the fork cap until the fork cap is lightly seated on the lock nut.

Hold the fork cap and tighten the lock nut to the specified torque.

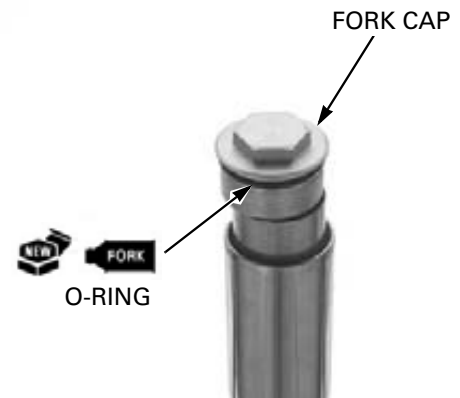
TORQUE: 19.6 N·m (2.0 kgf·m, 14 lbf·ft)



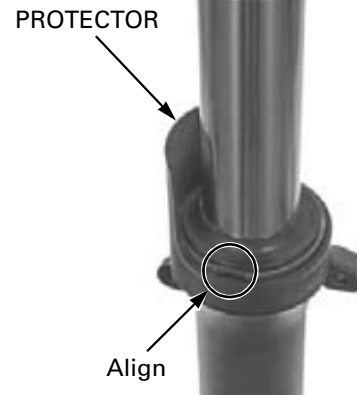
Coat a new O-ring with fork fluid and install it into the fork cap groove.

Be careful not to cross-thread the fork cap. Tighten the fork cap after installing the fork tube into the fork bridges.

Install the fork cap into the fork tube.



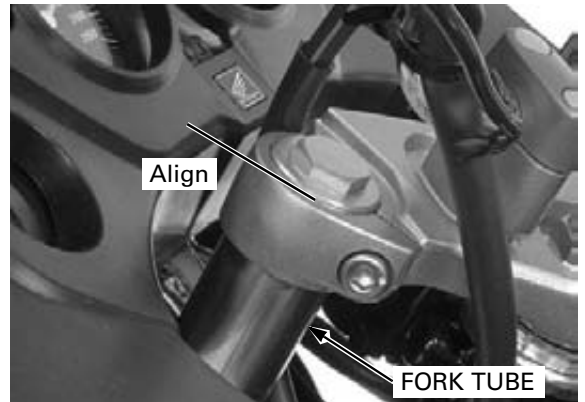
Install the fork protector over the fork slider by aligning the tab with the slider groove.



INSTALLATION

Route the hose, wires and cables properly (page 1-23).

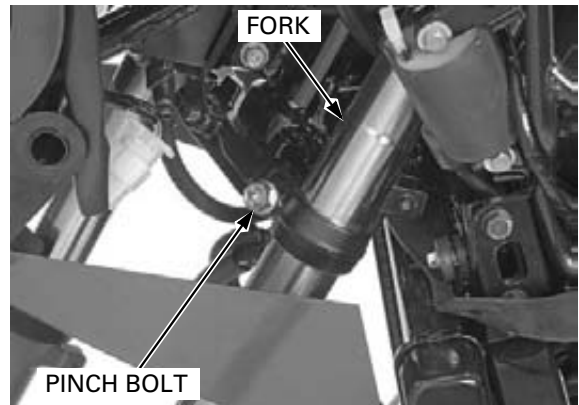
Install the fork tube into the bottom and top bridges. Align the top of the fork tube with the upper surface of the top bridge.



FRONT WHEEL/SUSPENSION/STEERING

Tighten the bottom bridge pinch bolt.

TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)

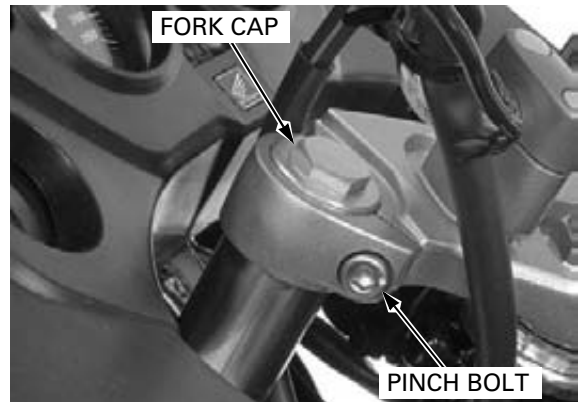


Tighten the fork cap to the specified torque if it was removed.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

Tighten the top bridge pinch bolt.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)



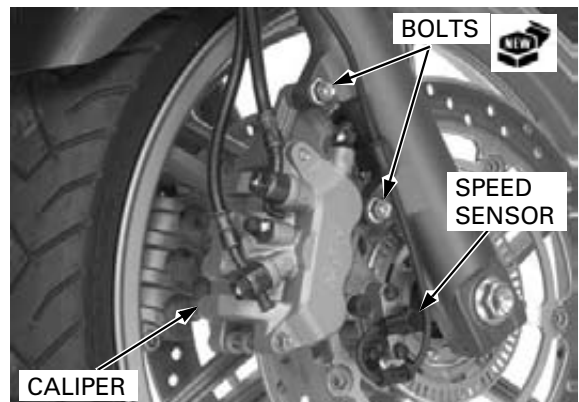
Install the following:

- Front fender (page 3-9)
- Front wheel (page 14-18)

Install the right and left brake calipers with new mounting bolts, and tighten the bolts to the specified torque.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

CBF1000A only: Install the wheel speed sensor and clamp (page 17-25).



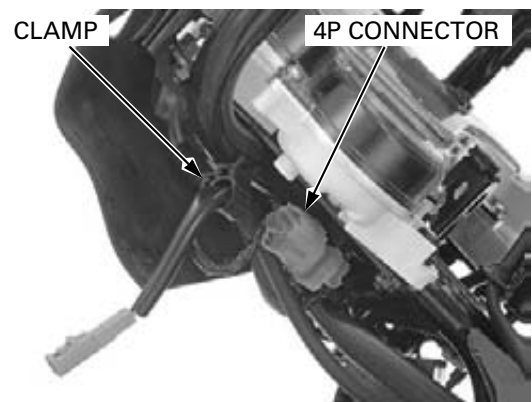
STEERING STEM

REMOVAL

Remove the following:

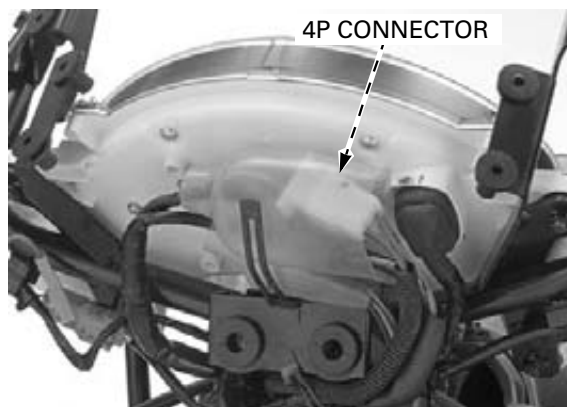
- Front center cowl (page 3-7)
- Front fender (page 3-9)
- Handlebar (page 14-6)
- Front wheel (page 14-13)

Release the immobilizer receiver wire from the harness clamp and disconnect the receiver 4P connector.

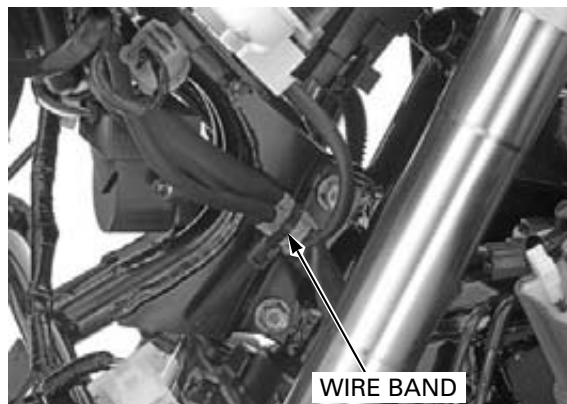


FRONT WHEEL/SUSPENSION/STEERING

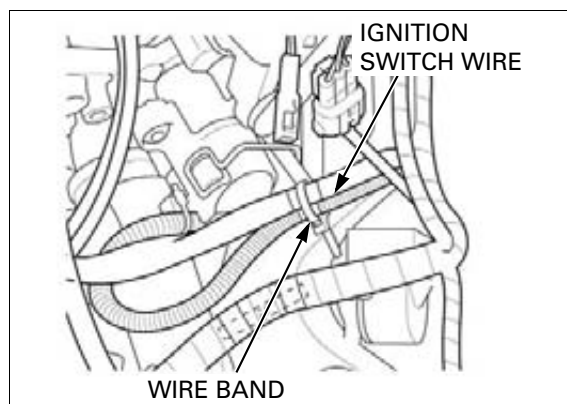
Disconnect the ignition switch 4P connector.



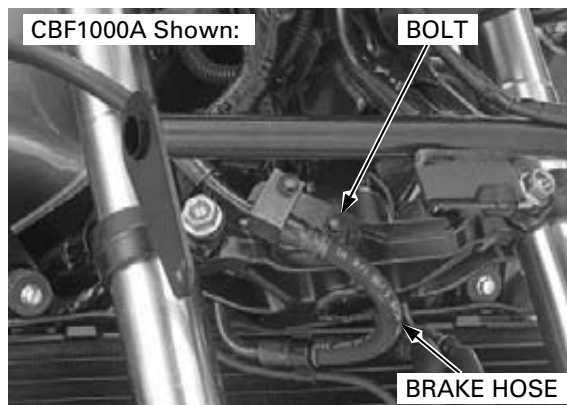
Release the immobilizer receiver wire from the wire band.



Release the ignition switch wire from the wire band.

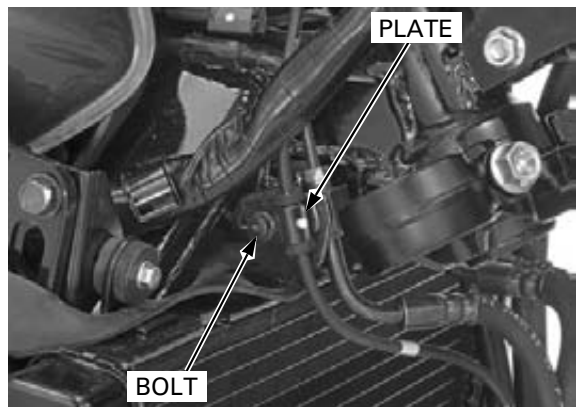


Remove the bolt and brake hose from the bottom bridge.

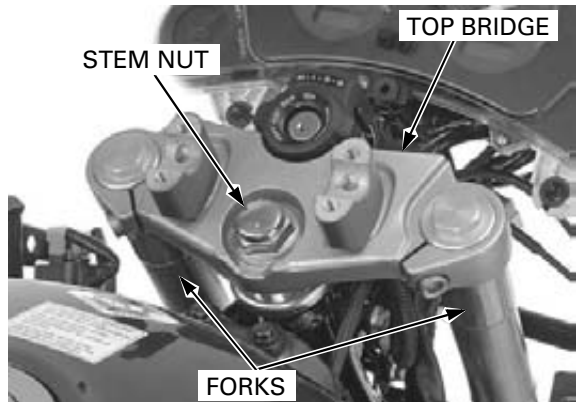


FRONT WHEEL/SUSPENSION/STEERING

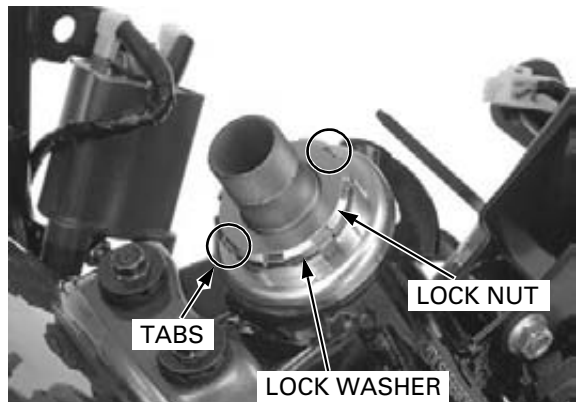
CBF1000A only: Remove the brake pipe mounting bolt and set plate.



Loosen the steering stem nut.
Remove the fork legs (page 14-19).
Remove the stem nut and the top bridge.



Straighten the lock washer tabs.
Remove the lock nut and lock washer.

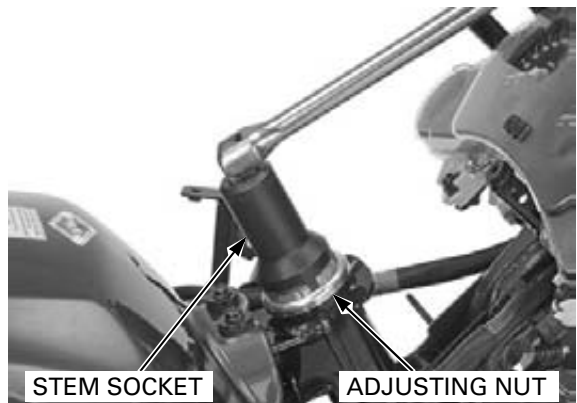


Loosen the steering stem adjusting nut.

TOOL:

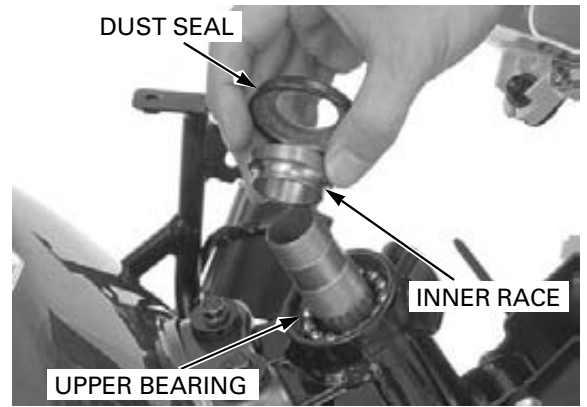
Steering stem socket **07916-3710101**

While holding the steering stem, remove the adjusting nut.

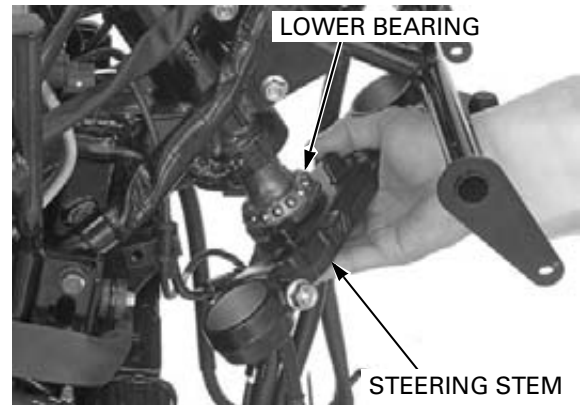


FRONT WHEEL/SUSPENSION/STEERING

Remove the upper dust seal, upper inner race and upper steering head bearing.



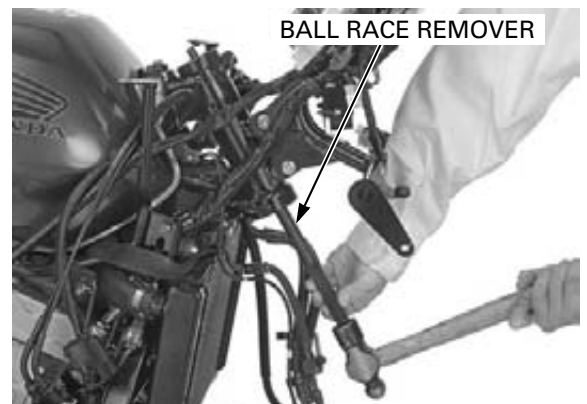
Remove the steering stem and lower steering head bearing.



Remove the upper bearing outer race from the steering head pipe using the special tools.

TOOLS:

Ball race remover set	07953-MJ10000
- Remove attachment	07953-MJ10100
- Remove handle	07953-MJ10200



Remove the lower bearing outer race using the special tool and a drift.

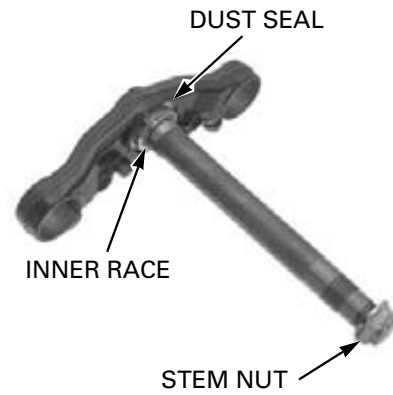
TOOL:

Bearing remover	07946-3710500
------------------------	----------------------

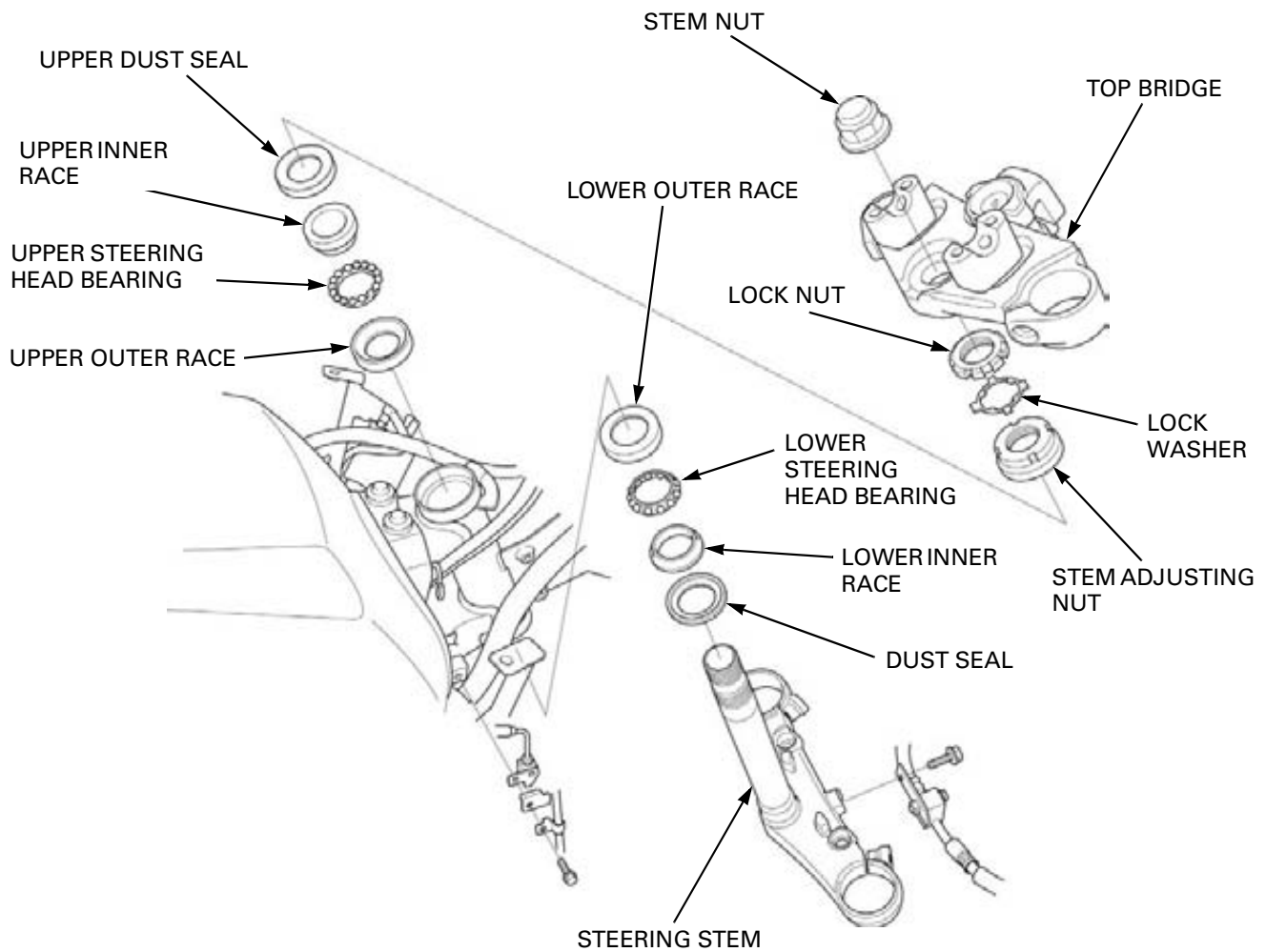


FRONT WHEEL/SUSPENSION/STEERING

Install the stem nut onto the 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.



INSTALLATION



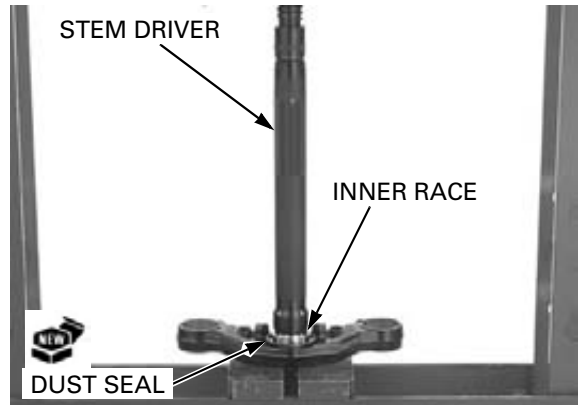
NOTE:

Use urea based multi-purpose grease with extreme pressure agent for the steering head bearings and dust seals:

- Excelite EP2 (Kyodo Yushi)
- Stamina EP2 (Shell) or equivalent or equivalent.

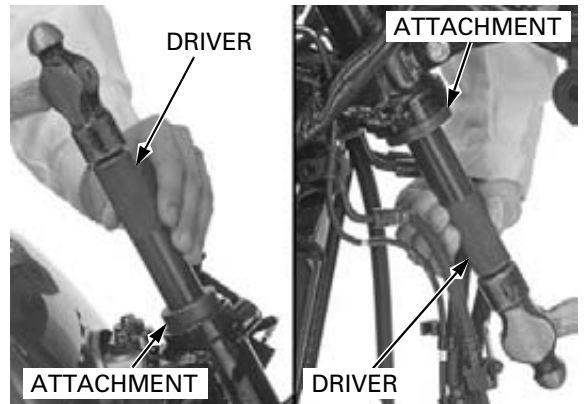
Apply grease to new dust seal lip and install it onto the steering stem.
Press new lower bearing inner race using the special tool and a hydraulic press.

TOOL:
Steering stem driver **07946-MB00000**

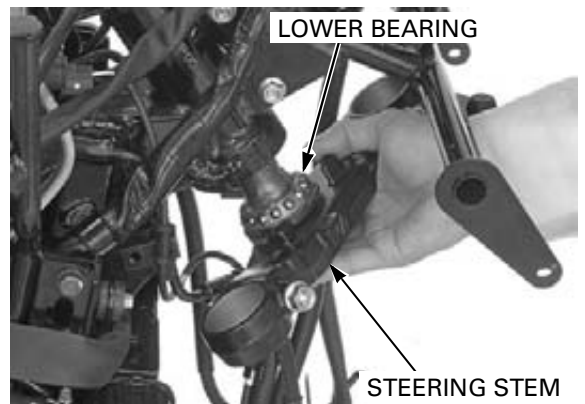


Drive in each new bearing outer race into the steering head pipe.

TOOLS:
Driver **07749-0010000**
Attachment, 42 x 47 mm (upper) **07746-0010300**
Attachment, 52 x 55 mm (lower) **07746-0010400**



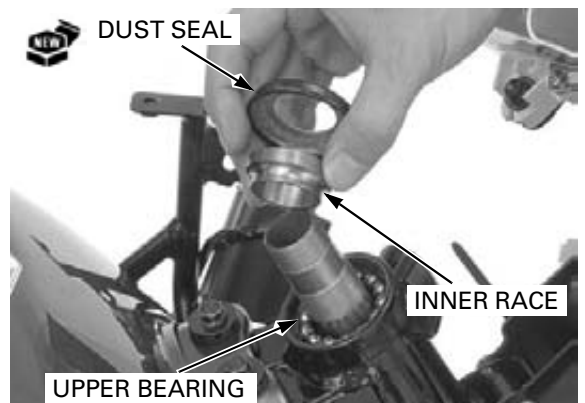
Apply 3 – 5 g (0.1 – 0.2 oz) of grease (page 14-34) to each new steering head bearing and fill it up.
Install the lower steering head bearing onto the stem.



Apply grease (page 14-34) to new upper dust seal lip.

Insert the steering stem into the steering head pipe and install the following while holding the stem:

- Upper steering head bearing
- Upper inner race
- Upper dust seal



FRONT WHEEL/SUSPENSION/STEERING

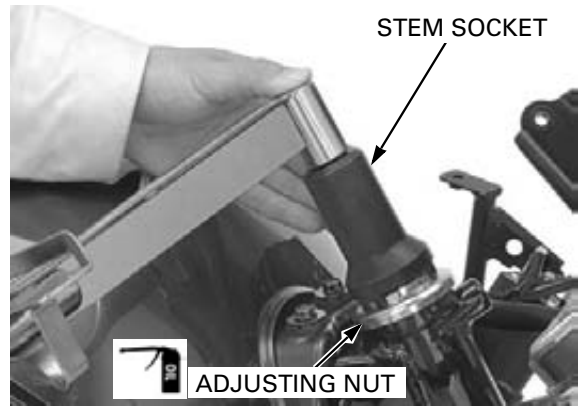
Apply engine oil to the steering stem adjusting nut threads.

Install the steering stem adjusting nut onto the steering stem and tighten it to the specified torque.

TOOL:

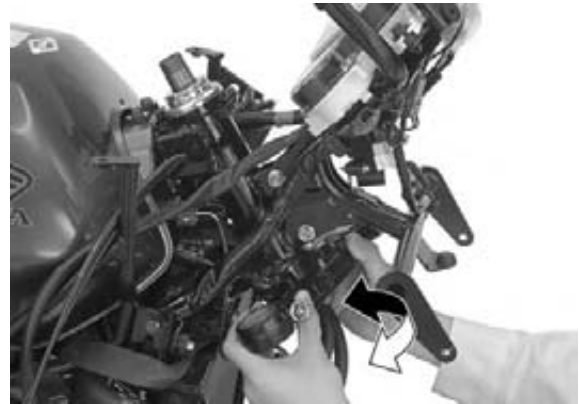
Steering stem socket 07916-3710101

TORQUE: 25 N·m (2.5 kgf·m, 18 lbf·ft)



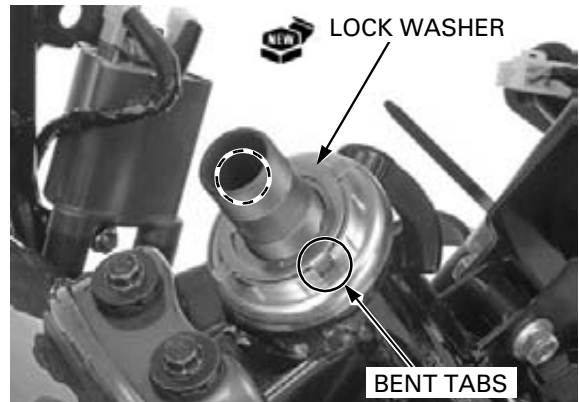
Turn the steering stem left and right, lock-to-lock at least five times to seat the bearings.

Retighten the adjustment nut to the same torque.



Align lock washer bent tabs with the groove in the stem adjusting nut.

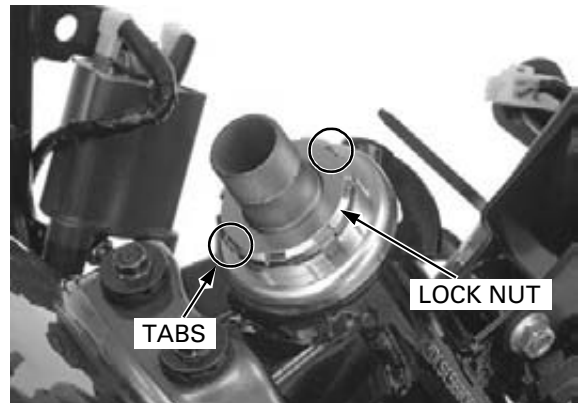
Install a new lock washer onto the steering stem.



Install the lock nut and finger tighten it all the way.

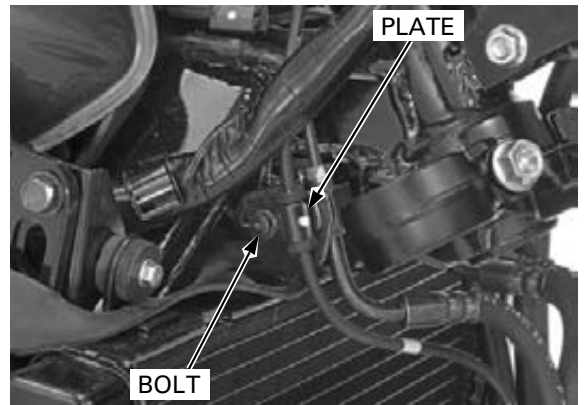
Do not over-tighten the lock nut until the lock washer is being flat.

Further tighten the lock nut, within 90 degrees, to align its grooves with the tabs of the lock washer. Bend up the lock washer tabs into the grooves of the lock nut.



FRONT WHEEL/SUSPENSION/STEERING

CBF1000A only: Install the brake pipe joint with the set plate, and tighten the bolt.



Install the top bridge onto the stem and temporarily tighten the stem nut.

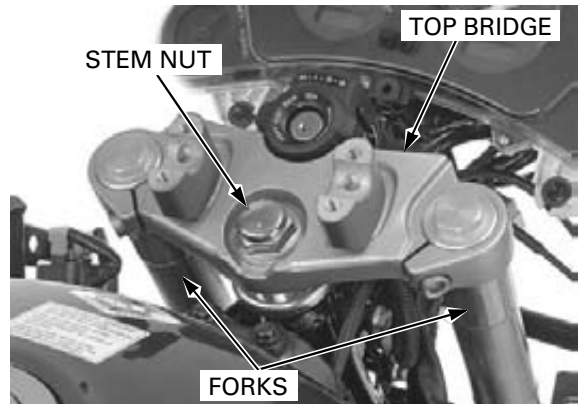
Make sure the hose, wires and cables are routed properly.

Temporarily install the fork legs into the bottom and top bridges and tighten the pinch bolts.

Tighten the stem nut to the specified torque.

TORQUE: 103 N·m (10.5 kgf·m, 76 lbf·ft)

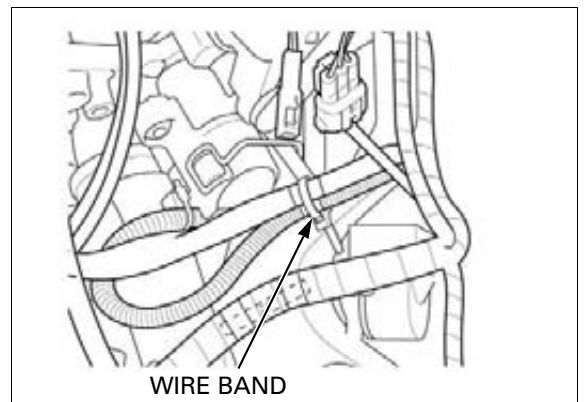
Make sure the steering stem moves smoothly, without play or binding.



Secure the ignition switch wire and handlebar switch wire with the wire band.

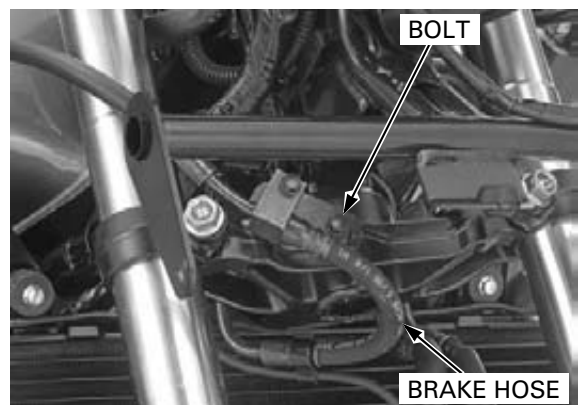
Loosen the fork bridge pinch bolts.

Align the top of the fork tube with the upper surface of the top bridge and tighten the pinch bolts (page 14-29).



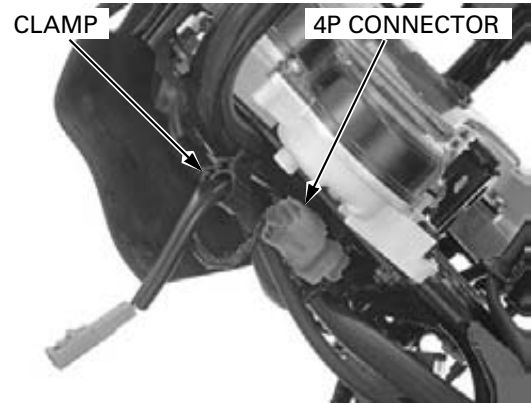
Install the brake hose onto the bottom bridge and tighten the bolt.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

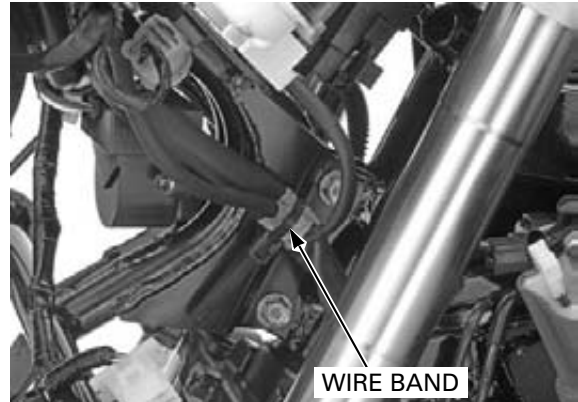


FRONT WHEEL/SUSPENSION/STEERING

Connect the immobilizer receiver 4P connector and install it onto the stay.
Secure the left turn signal light wire and immobilizer receiver wire with the harness clamp.



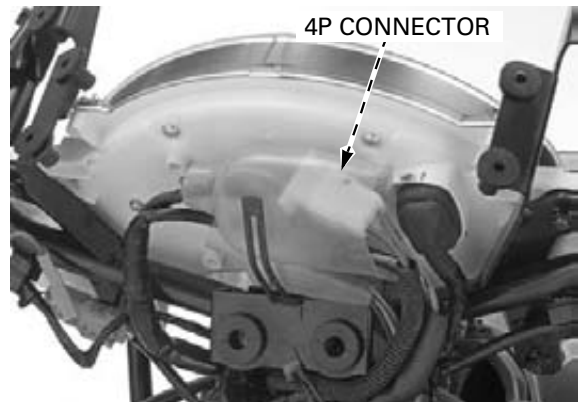
Secure the immobilizer wire and left handlebar switch wire with the wire band.



Connect the ignition switch 4P connector.

Install the following:

- Handlebar (page 14-8)
- Front fender (page 3-9)
- Front wheel (page 14-18)
- Front center cowl (page 3-7)



STEERING BEARING PRE-LOAD

Support the motorcycle securely using safety stands or a hoist and raise the front wheel off the ground.

Position the steering stem straight ahead.

Hook a spring scale to the fork tube between the fork top and bottom bridges.

Make sure there is no cable, wire harness or hoses interference.

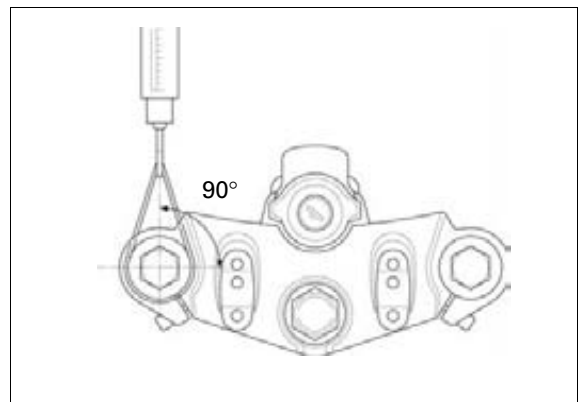
Pull the spring scale keeping it at a right angle to the steering stem.

Read the scale at the point where the steering stem just starts to move.

STEERING BEARING PRE-LOAD:

9.8 – 13.7 N (1.0 – 1.4 kgf, 2.2 – 3.1 lbf)

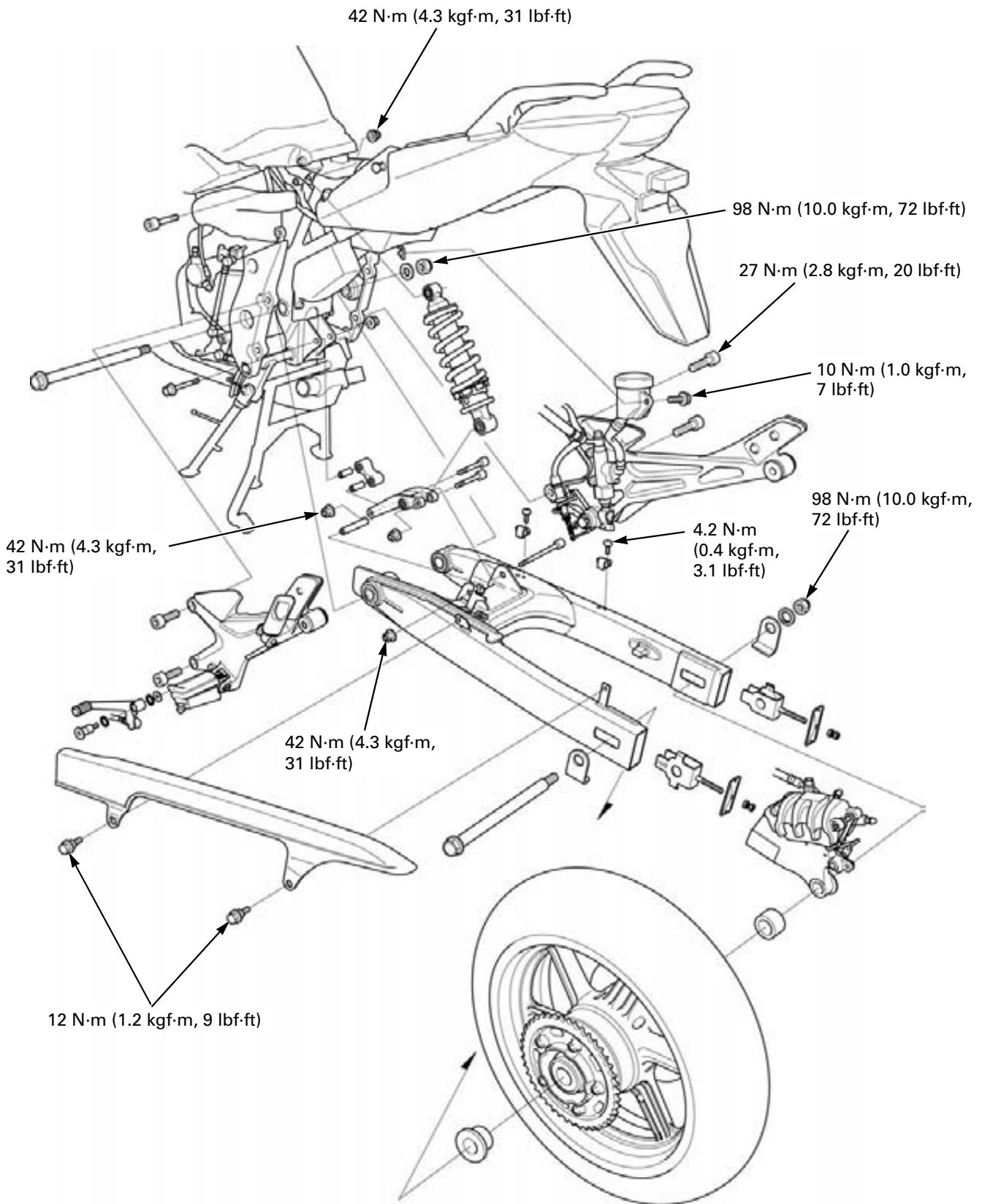
If the readings do not fall within the limits, readjust the steering bearing adjustment.



15. REAR WHEEL/SUSPENSION

SYSTEM COMPONENTS	15-2	REAR WHEEL.....	15-6
SERVICE INFORMATION	15-3	SHOCK ABSORBER.....	15-13
TROUBLESHOOTING	15-5	SWINGARM/SHOCK LINKAGE.....	15-15

REAR WHEEL/SUSPENSION SYSTEM COMPONENTS



SERVICE INFORMATION

GENERAL

- A hoist or equivalent is required to support the motorcycle when servicing the rear wheel and suspension.
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- The shock absorber contains nitrogen under high pressure. Do not allow fire or heat near the shock absorber. Before disposal of the shock absorber, release the nitrogen (page 15-14).
- Use only genuine Honda replacement bolts and nuts for all suspension pivot and mounting points; ordinary bolts lack adequate strength for these applications. Also take note of the installation direction of these bolts since they must be installed correctly.
- Riding on damaged rims impairs safe operation of the vehicle.
- Use only tires marked "TUBELESS" and tubeless valves on rim marked "TUBELESS TIRE APPLICABLE".
- Refer to page 16-2 for hydraulic brake system service.
- Refer to page 4-21 for drive chain information.

SPECIFICATIONS

Unit: mm (in)



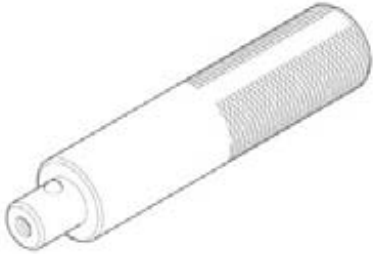
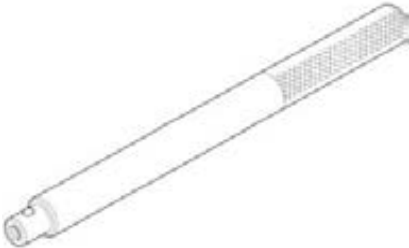








ITEM		STANDARD		SERVICE LIMIT
Minimum tire tread depth		-		2.0 (0.08)
Cold tire pressure	Driver only	290 kPa (2.90 kgf/cm ² , 42 psi)		-
	Driver and passenger	290 kPa (2.90 kgf/cm ² , 42 psi)		-
Axle runout		-		0.2 (0.01)
Wheel rim runout	Radial	-		2.0 (0.08)
	Axial	-		2.0 (0.08)
Wheel balance weight		-		60 g (2.1 oz) max.
Drive chain	Size/link	DID	DID50VA8-120LE	-
		RK	RK50HFOZ5-120LE	-
	Slack	20 - 30 (4/5 - 1-1/5)		-
Shock absorber spring pre-load adjuster standard position		Position 3		-



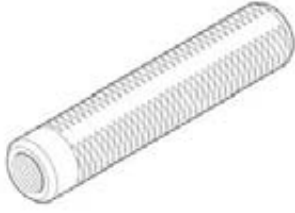


TORQUE VALUES

Drive chain case mounting bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Rear axle nut	98 N·m (10.0 kgf·m, 72 lbf·ft)	U-nut
Rear brake disc bolt	42 N·m (4.3 kgf·m, 31 lbf·ft)	ALOC bolt; replace with new one.
Driven sprocket nut	108 N·m (11.0 kgf·m, 80 lbf·ft)	
Shock absorber mounting nut	42 N·m (4.3 kgf·m, 31 lbf·ft)	U-nut
Shock arm nut	42 N·m (4.3 kgf·m, 31 lbf·ft)	U-nut
Shock link-to-frame nut	42 N·m (4.3 kgf·m, 31 lbf·ft)	U-nut
Swingarm pivot nut	98 N·m (10.0 kgf·m, 72 lbf·ft)	U-nut
Drive chain slider screw	6 N·m (0.6 kgf·m, 4.4 lbf·ft)	
Rear brake hose guide screw	4.2 N·m (0.4 kgf·m, 3.1 lbf·ft)	
Gearshift pedal pivot bolt	27 N·m (2.8 kgf·m, 20 lbf·ft)	
Wheel speed sensor pulser ring mounting bolt	7 N·m (0.7 kgf·m, 5.2 lbf·ft)	ALOC bolt; replace with new one.

REAR WHEEL/SUSPENSION

TOOLS

<p>Bearing remover shaft 07GGD-0010100</p> 	<p>Bearing remover head, 20 mm 07746-0050600</p> 	<p>Driver 07749-0010000</p> 
<p>Driver 07949-3710001</p> 	<p>Attachment, 22 x 24 mm 07746-0010800</p> 	<p>Attachment, 28 x 30 mm 07946-1870100</p> 
<p>Attachment, 32 x 35 mm 07746-0010100</p> 	<p>Attachment, 42 x 47 mm 07746-0010300</p> 	<p>Attachment, 52 x 55 mm 07746-0010400</p> 
<p>Attachment, 37 mm 07ZMD-MBW0200</p> 	<p>Pilot, 17 mm 07746-0040400</p> 	<p>Pilot, 20 mm 07746-0040500</p> 

<p>Pilot, 28 mm 07746-0041100</p> 	<p>Bearing remover shaft, 17 mm 07936-3710300</p> 	<p>Remover shaft handle 07936-3710100</p> 
<p>Remover weight 07741-0010201</p> 	<p>Attachment, 34 mm 07ZMD-MBW0100</p> 	

TROUBLESHOOTING

Rear wheel wobbles

- Bent rim
- Unbalanced tire and wheel
- Worn wheel bearings
- Faulty swingarm pivot bearings
- Bent frame or swingarm
- Improperly tightened axle fasteners
- Faulty rear tire

Wheel turns hard

- Faulty wheel bearings
- Bent axle
- Brake drag (page 16-6)
- Drive chain too tight (page 4-21)

Soft suspension

- Low tire pressure
- Incorrect suspension adjustment
- Weak shock absorber spring
- Oil leakage from damper unit

Stiff suspension

- High tire pressure
- Incorrect suspension adjustment
- Bent shock absorber damper rod
- Damaged suspension or swingarm pivot bearings
- Improperly tightened swingarm pivot

Rear suspension noise

- Loose suspension fasteners
- Worn suspension pivot bearings
- Faulty shock absorber

REAR WHEEL/SUSPENSION

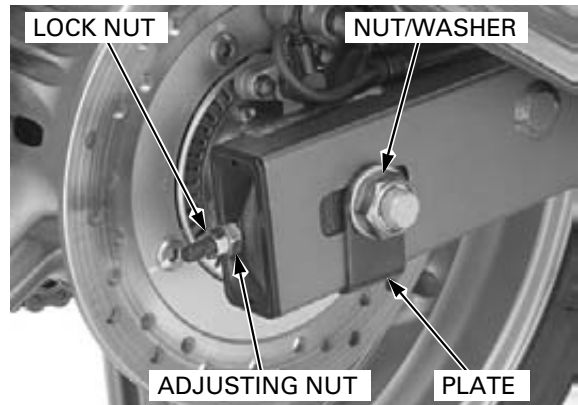
REAR WHEEL

REMOVAL

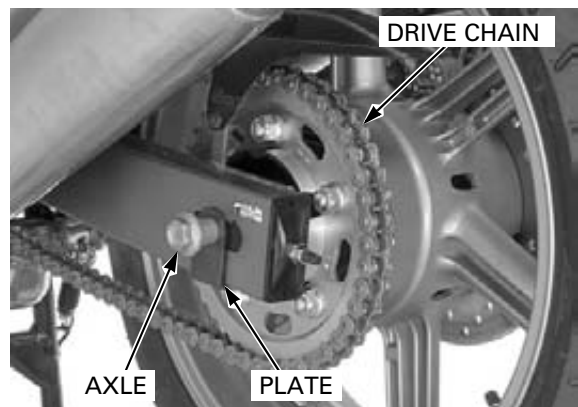
Loosen the drive chain adjuster lock nuts and adjusting nuts (both sides).
Loosen the rear axle nut.

Support the motorcycle securely using the center stand (CBF1000A) or hoist, and raise the rear wheel off the ground.

Remove the axle nut, washer and setting plate.



Push the rear wheel forward and derail the drive chain from the driven sprocket



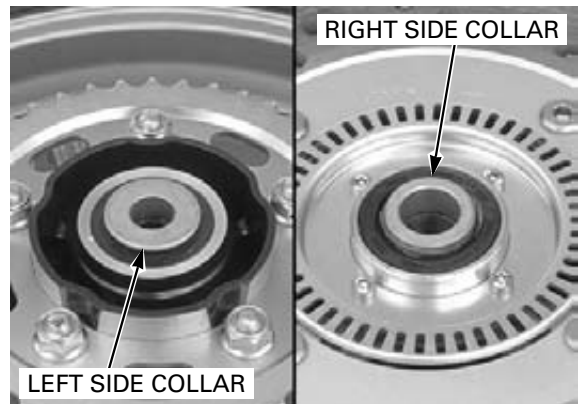
CBF1000A only: Be careful not to damage the speed sensor on the brake caliper.

Remove the rear axle, setting plate and the rear wheel.

NOTE:

- Do not operate the brake pedal after removing the wheel. To do so will cause difficulty in fitting the brake disc between the brake pads.

Remove the right and left side collars.

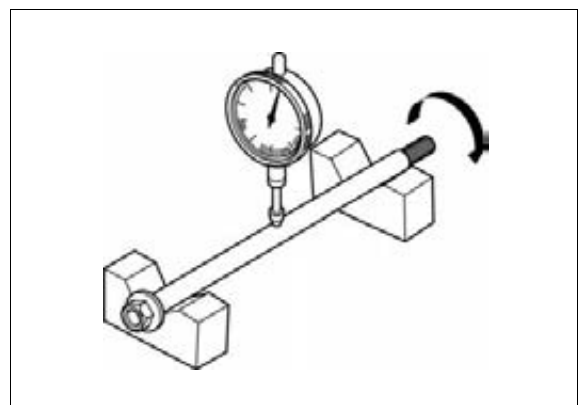


INSPECTION

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)



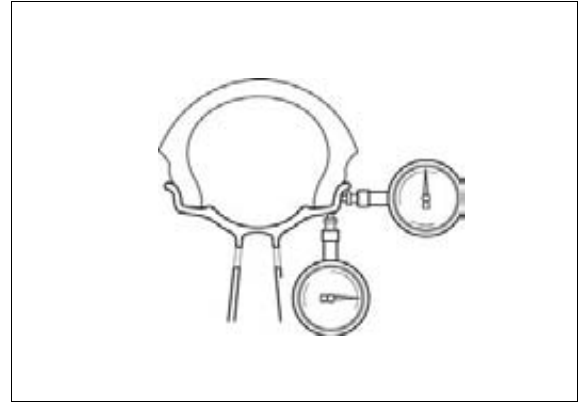
WHEEL RIM

Check the rim runout by placing the wheel in a truing stand. Spin the wheel by hand, and read the runout using a dial indicator. Actual runout is 1/2 the total indicator reading.

SERVICE LIMITS:

Radial: 2.0 mm (0.08 in)

Axial: 2.0 mm (0.08 in)

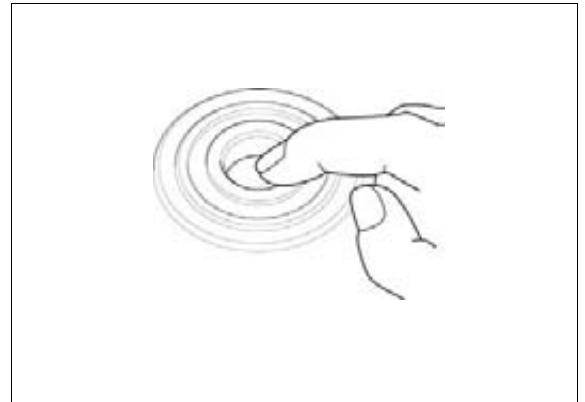


WHEEL BEARING

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 bearings in pairs.

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

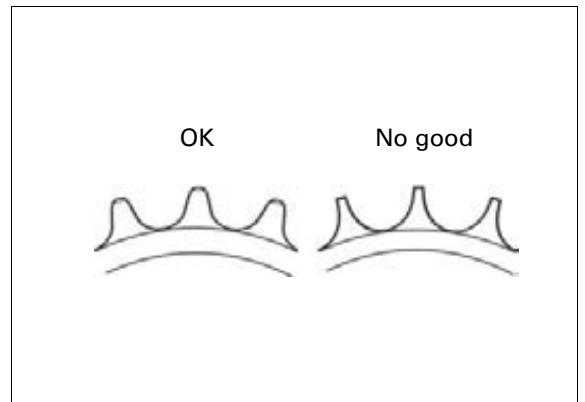


DRIVEN SPROCKET

Check the condition of the driven sprocket teeth. Replace the sprocket if it is worn or damaged.

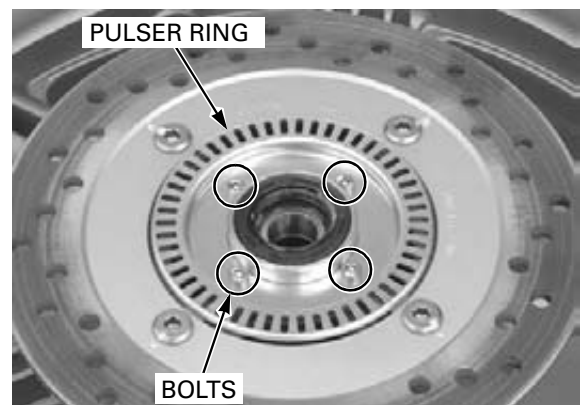
NOTE:

- If the driven sprocket requires replacement, inspect the drive chain and drive sprocket.
- Never install a new drive chain on a worn sprocket or a worn chain on new sprockets. Both chain and sprocket must be in good condition, or the replacement chain or sprocket will wear rapidly.



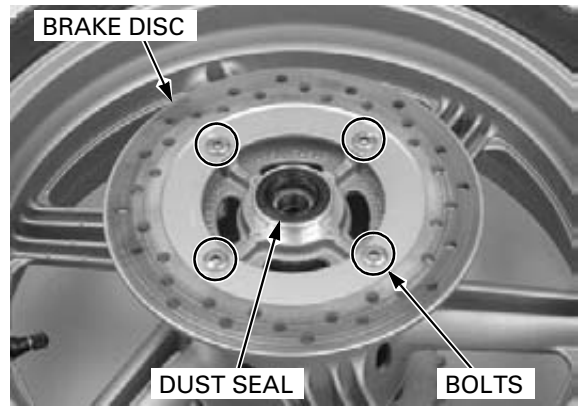
DISASSEMBLY

CBF1000A only: Remove the torx bolts and speed sensor pulser ring.



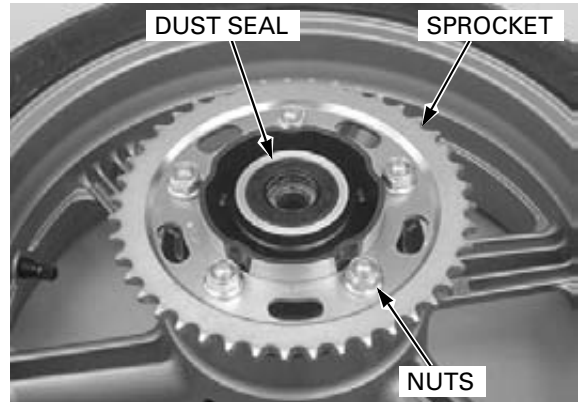
REAR WHEEL/SUSPENSION

Remove the right dust seal.
Remove the bolts and brake disc.

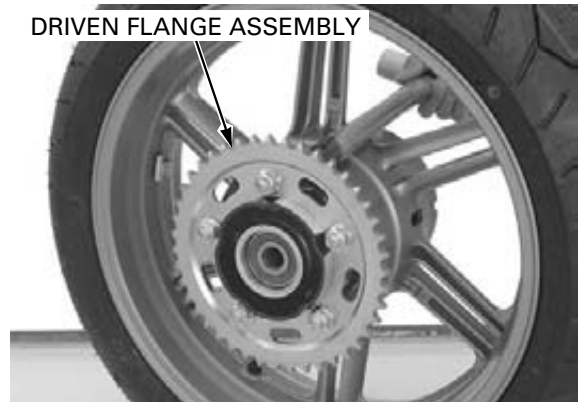


*If you will replace
the driven sprocket,
loosen the sprocket
nuts.*

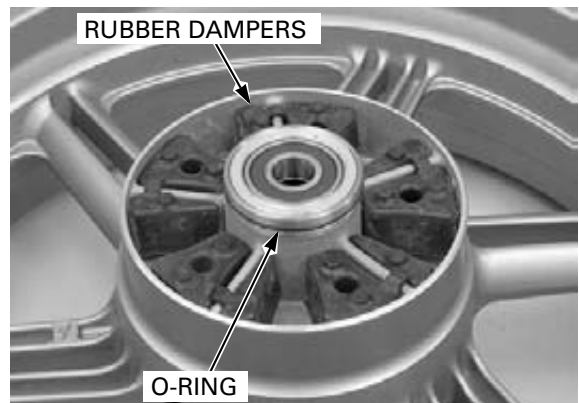
Remove the left dust seal.



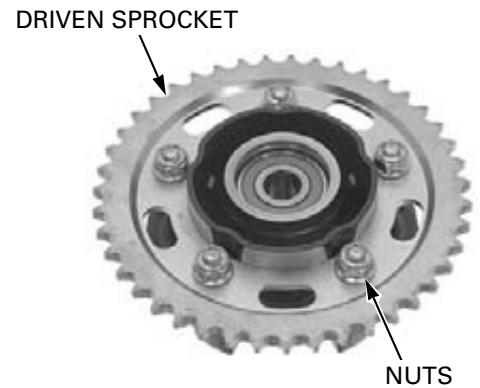
Remove the driven flange assembly from the left
wheel hub.



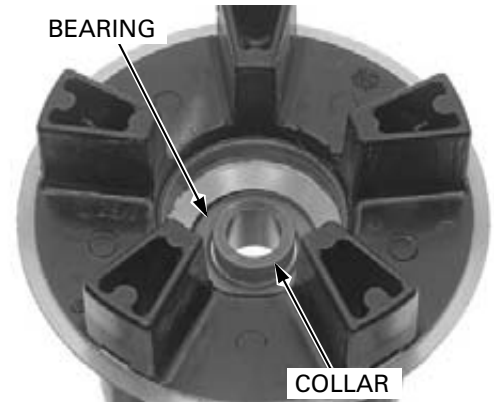
Remove the rubber dampers and O-ring.



Remove the nuts and driven sprocket.



Remove the driven flange collar and drive out the driven flange bearing.

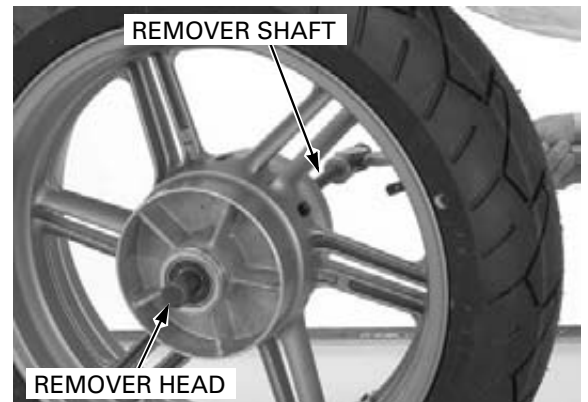


Replace the wheel bearings in pairs. Do not reuse old bearing.

Install the remover head into the bearing. From the opposite side, 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

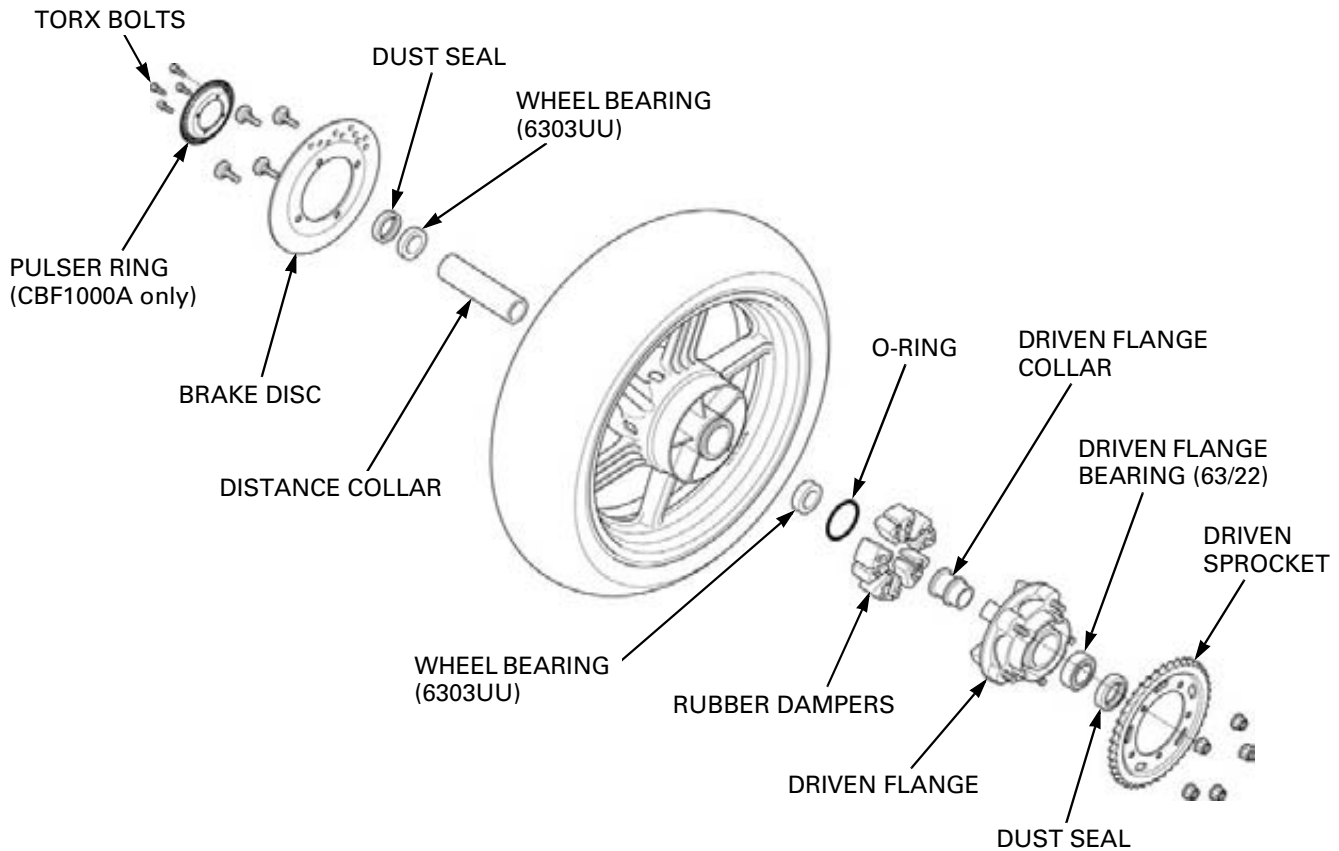


REAR WHEEL/SUSPENSION

ASSEMBLY

NOTE:

- Refer to page 14-17 for wheel balance.



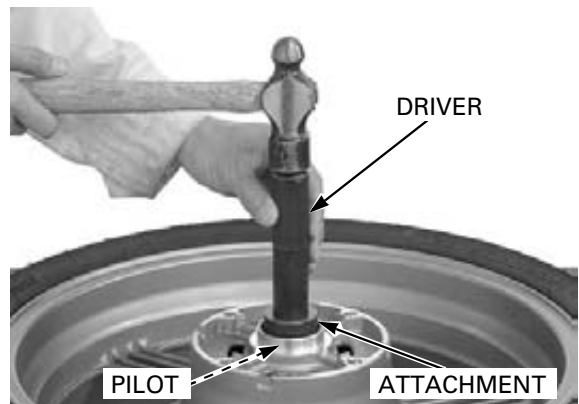
Drive in new right wheel bearing squarely with its marked side facing out, until it is fully seated.

TOOLS:

Driver	07749-0010000
Attachment, 42 x 47 mm	07746-0010300
Pilot, 20 mm	07746-0040500

Install the distance collar.

Using the same tools, drive in new left wheel bearing squarely with its marked side facing out, until it is fully seated on the distance collar.



Place a new driven flange bearing with its marked side facing down. Install the driven flange collar into the bearing until it is fully seated.

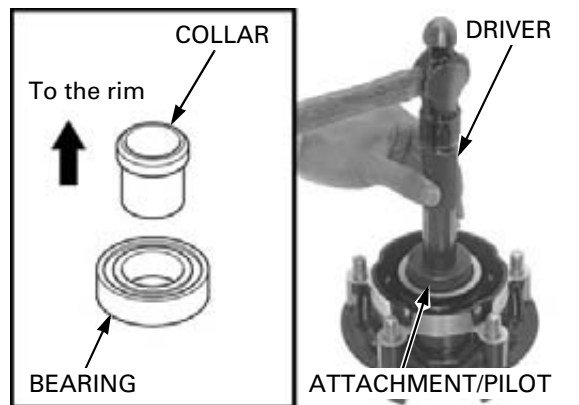
TOOLS:

Driver	07749-0010000
Attachment, 32 x 35 mm	07746-0010100
Pilot, 20 mm	07746-0040500

Drive in the driven flange bearing with the collar side facing in, until outer race is fully seated.

TOOLS:

Driver	07749-0010000
Attachment, 52 x 55 mm	07746-0010400
Pilot, 20 mm	07746-0040500

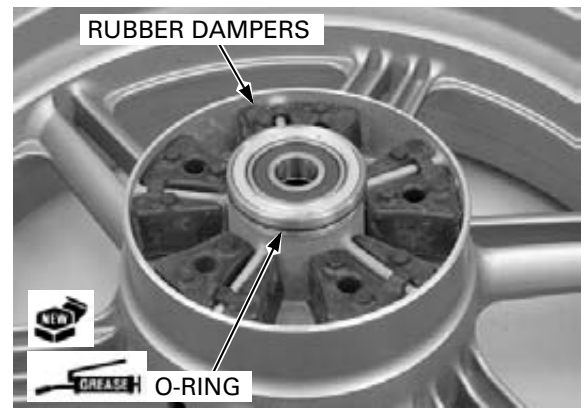


REAR WHEEL/SUSPENSION

Replace the rubber dampers as a set.

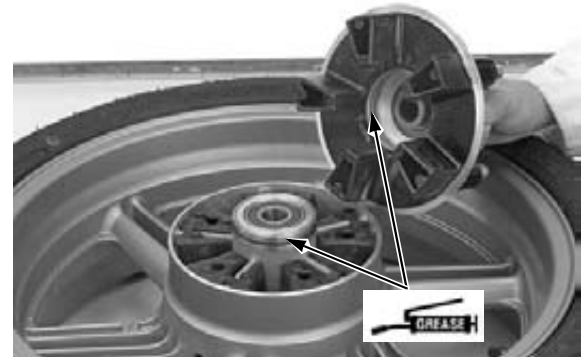
Install the rubber dampers as shown.

Coat a new O-ring with grease and install it into the groove in the sleeve.



Apply grease to the sleeve sliding surface of the driven flange.

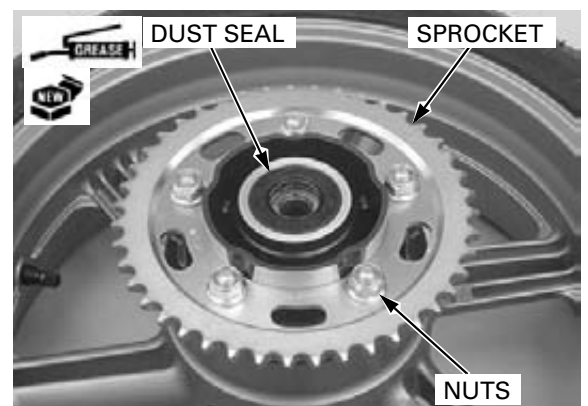
Install the driven flange assembly until it is fully seated.



If the driven sprocket was replaced, install the driven sprocket and tighten the nuts.

TORQUE: 108 N·m (11.0 kgf·m, 80 lbf·ft)

Apply grease to new dust seal lips and install the dust seal until it is flush with the driven flange.

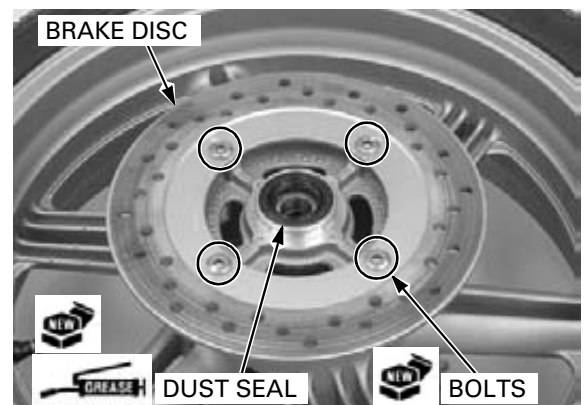


Install the brake disc with the stamp facing out. Install new disc bolts and tighten them to the specified torque.

TORQUE: 42 N·m (4.3 kgf·m, 31 lbf·ft)

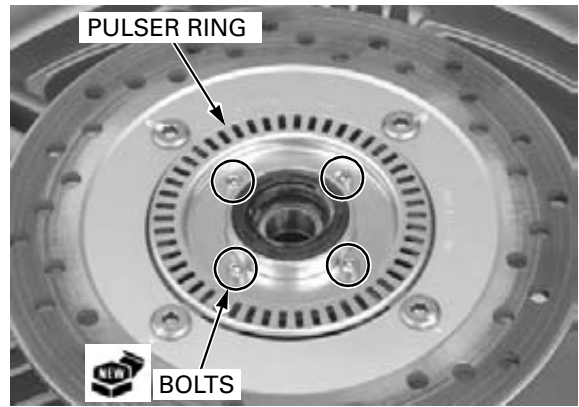
Do not get grease on the brake disc or stopping power will be reduced.

Apply grease to new dust seal lips and install the dust seal until it is flush with the wheel hub.



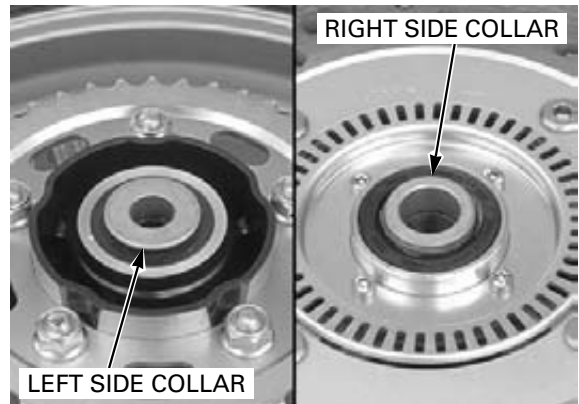
REAR WHEEL/SUSPENSION

CBF1000A only: Install the speed sensor pulser ring.
Install the new torx bolts and tighten them to the specified torque.
TORQUE: 7 N·m (0.7 kgf·m, 5.2 lbf·ft)

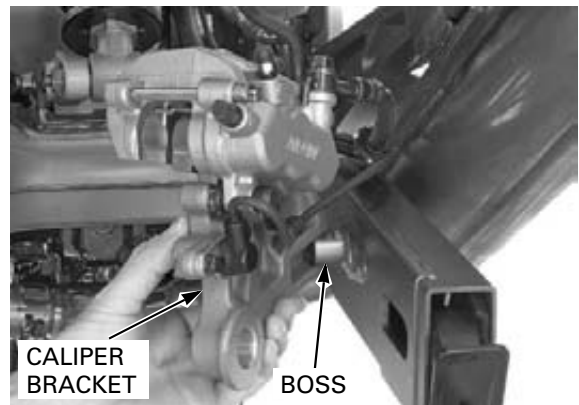


INSTALLATION

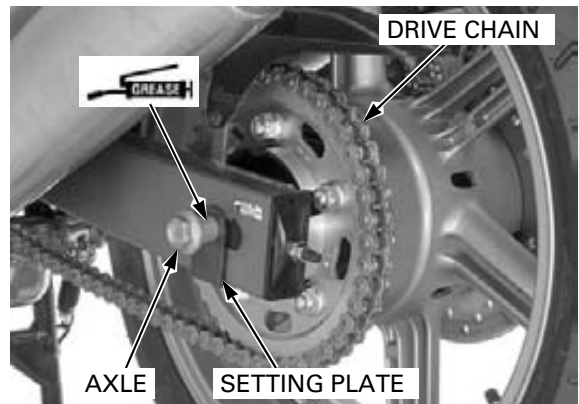
Install the right and left side collars.



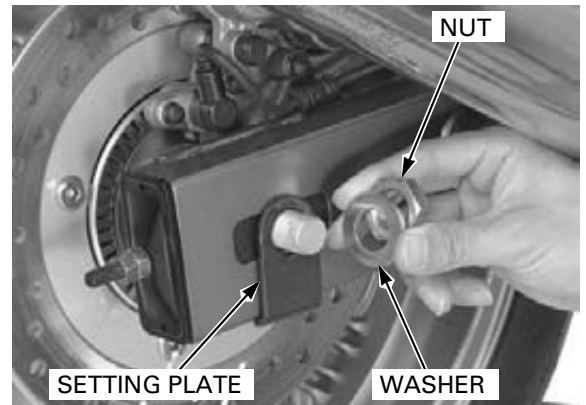
Install the brake caliper bracket onto the swingarm boss.



Be careful not to damage the brake pads and speed sensor (CBF1000A). Coat the axle surface with thin layer of grease. Place the rear wheel in the swingarm so the brake disc is positioned between the brake pads. Install the drive chain over the driven sprocket. Install the axle from the left side through the setting plate, swingarm, wheel and caliper bracket.



Install the setting plate, washer and axle nut.
Adjust the drive chain slack (page 4-21).



SHOCK ABSORBER

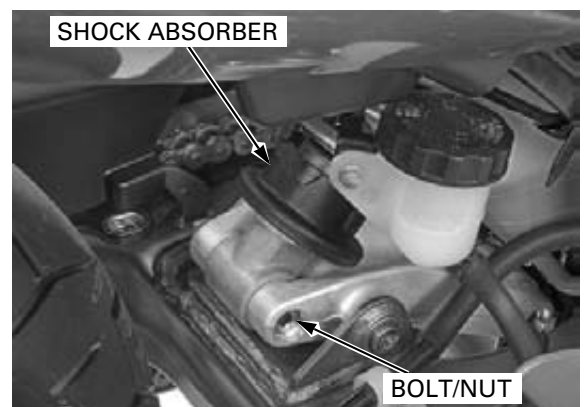
REMOVAL

Remove the following:

- Front seat/rear seat (page 3-3)
- Side covers (page 3-4)

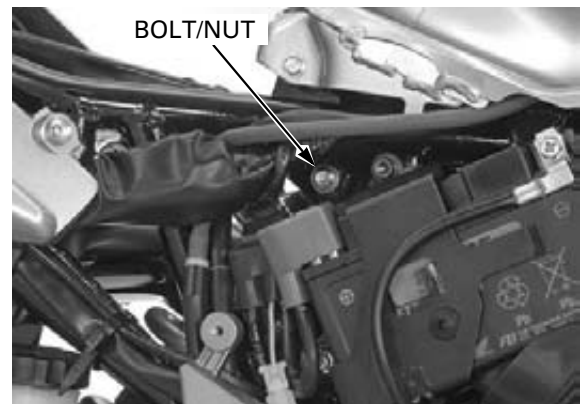
Support the motorcycle securely using the center stand (CBF1000A only) or hoist and raise the rear wheel off the ground.

Support the swingarm and remove the shock absorber lower mounting nut and bolt.



Remove the upper mounting nut and bolt.

Lower the swingarm and remove the shock absorber.

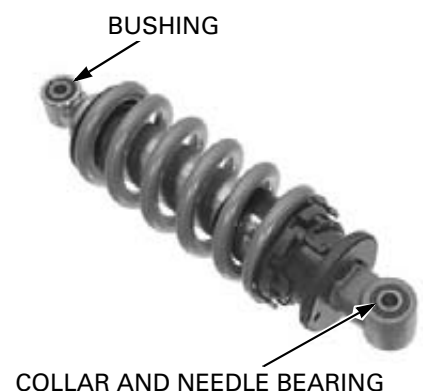


INSPECTION

Check the damper unit for leakage or other damage.
Check the upper bushing for wear or damage.
Replace the shock absorber assembly if necessary.

Remove the lower pivot collar.
Check the pivot collar and needle bearing for wear or damage.

If the shock absorber is replaced, refer to shock absorber disposal procedure (page 15-14).



REAR WHEEL/SUSPENSION

SHOCK ABSORBER DISPOSAL

Center punch the damper case at the point 35 mm (1.4 in) below the upper mounting hole to mark the drilling point.

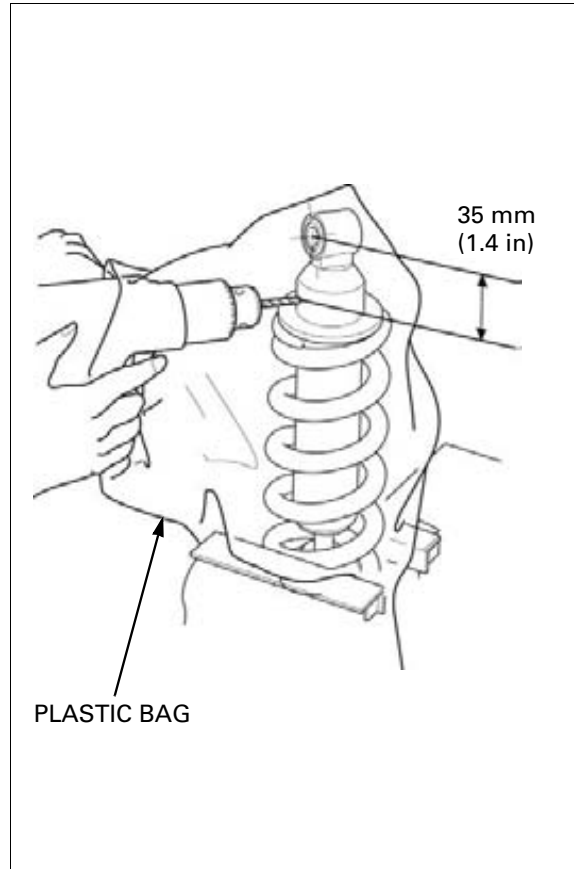
Wrap the shock absorber inside a plastic bag and support it upright in a vise as shown.

Through the open end of the bag, insert a drill motor with a sharp 2 – 3 mm (1/12 – 1/8 in) drill bit.

NOTE:

- Do not use a dull drill bit which could cause a build-up of excessive heat and pressure inside the damper, leading to explosion and severe personal injury.
- The shock absorber contains nitrogen gas and oil under high pressure. Do not drill any further down the damper case than the measurement given above, or you may drill into the oil chamber; oil escaping under high pressure may cause serious personal injury.
- Always wear eye protection to avoid getting metal shavings in your eyes when the gas pressure is released. The plastic bag is only intended to shield you from the escaping gas.

Hold the bag around the drill motor and briefly run the drill motor inside the bag; this will inflate the bag with air from the motor and help keep the bag from the getting caught in the bit when you start.



BEARING REPLACEMENT

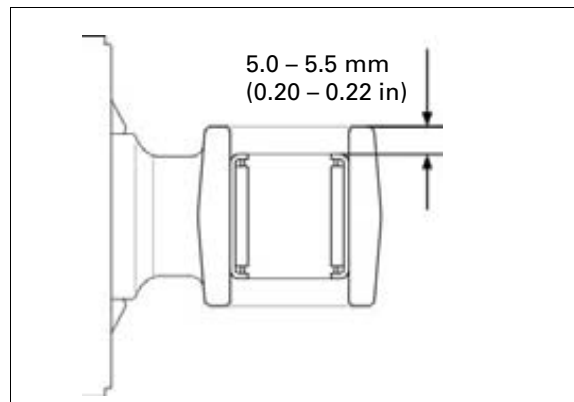
Remove the dust seals.

Press the needle bearing out of the lower pivot using the special tools and a hydraulic press.

TOOLS:

Driver attachment handle	07949-3710001
Attachment, 22 x 24 mm	07746-0010800
Pilot, 17 mm	07746-0040400

Carefully press the bearing in the pivot until the depth from the pivot outer surface is 5.0 – 5.5 mm (0.20 – 0.22 in), using the same tools.

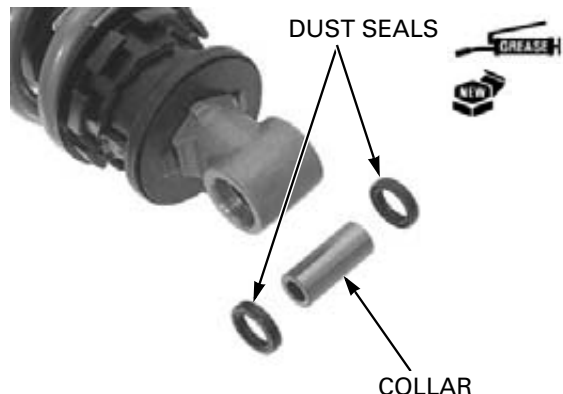


Make sure the needle rollers in the bearing are in position.

Apply grease to new dust seal lips.

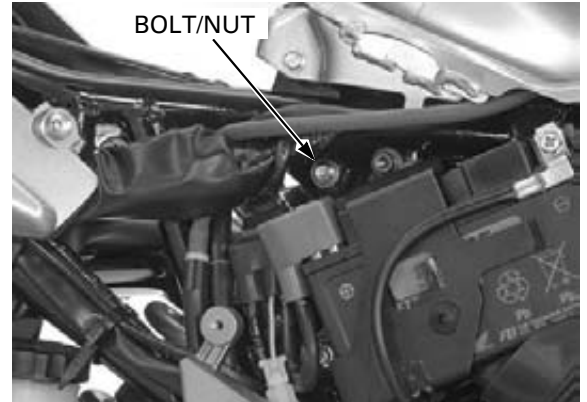
Install the dust seals with the flat surface facing out until they are flush with the lower pivot surface.

Install the pivot collar.



INSTALLATION

Install the shock absorber into the frame and swingarm.
Install the upper mounting bolt from the left side and install the nut.



Raise the swingarm and align the bolt holes.
Install the lower mounting bolt from the left side and install the nut.
Tighten the upper and lower mounting nuts to the specified torque.

TORQUE: 42 N·m (4.3 kgf·m, 31 lbf·ft)

Install the following:

- Side covers (page 3-4)
- Front and rear seat (page 3-3)



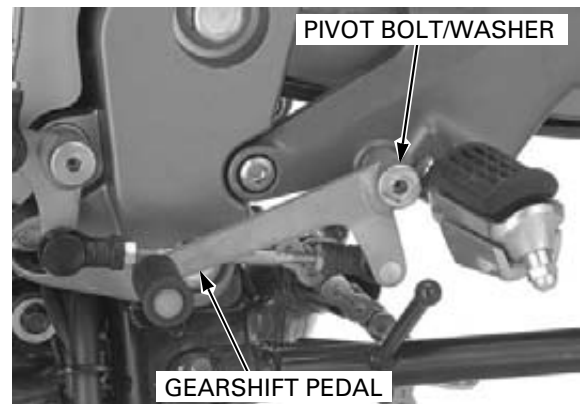
SWINGARM/SHOCK LINKAGE

REMOVAL

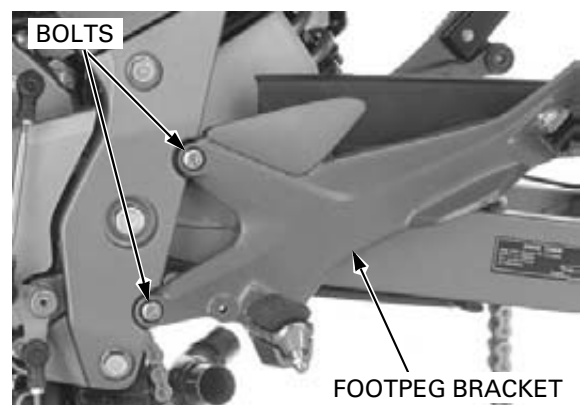
Remove the following:

- Mufflers (page 3-12)
- Rear wheel (page 15-6)

Remove the pivot bolt, washer and gearshift pedal.

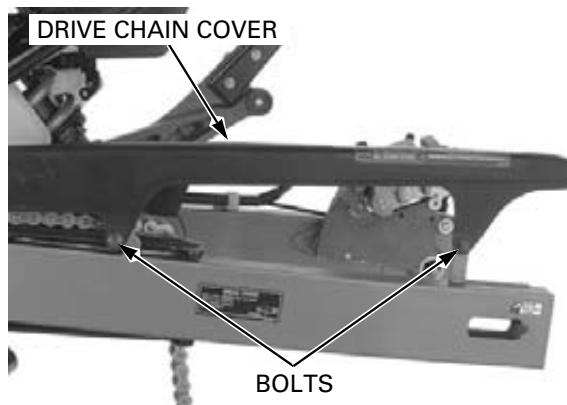


Remove the bolts and left footpeg bracket.

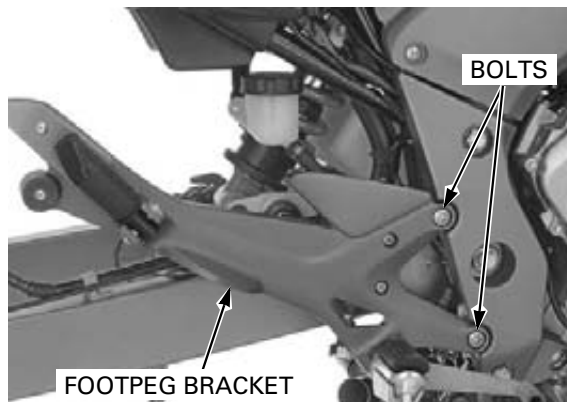


REAR WHEEL/SUSPENSION

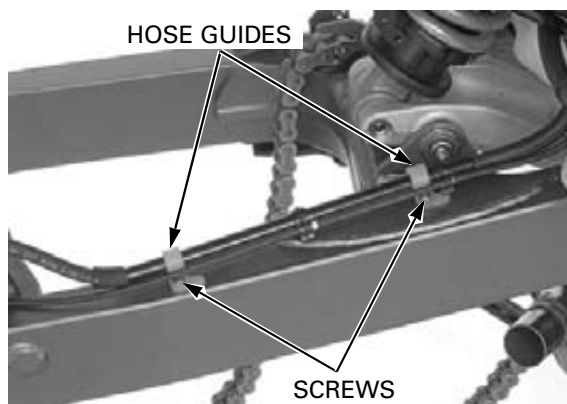
Remove the bolts and drive chain cover.



Remove the bolts and right footpeg bracket.

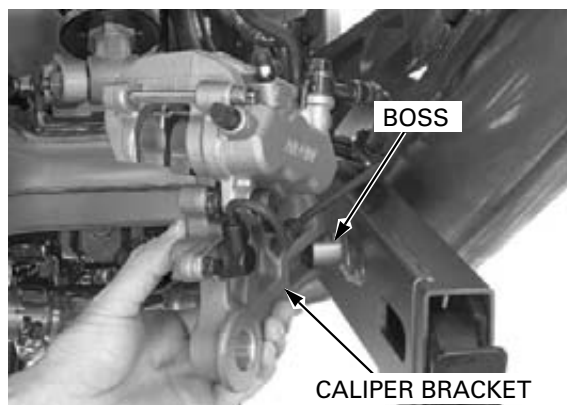


Remove the screws and brake hose guides.

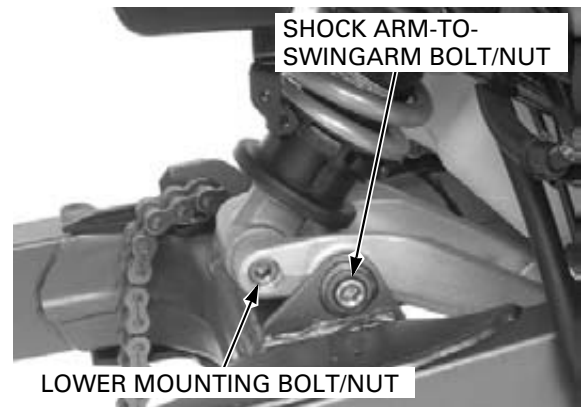


Support the brake caliper so it does not hang from the brake hose or speed sensor wire (CBF1000A). Do not twist the brake hose.

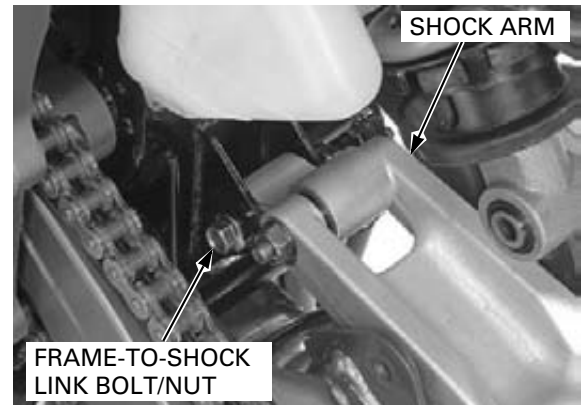
Remove the brake caliper bracket from the swingarm boss.



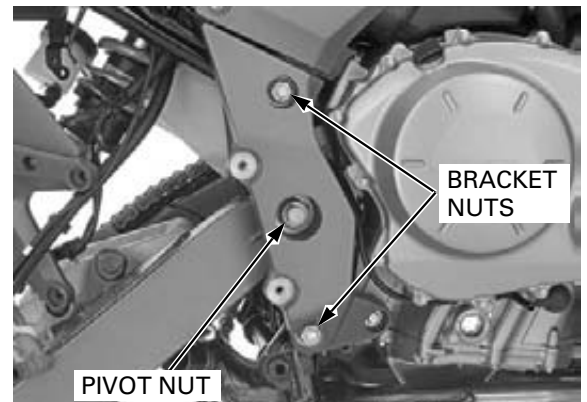
Remove the shock absorber lower mounting bolt/nut.
Remove the shock arm-to-swingarm bolt/nut.



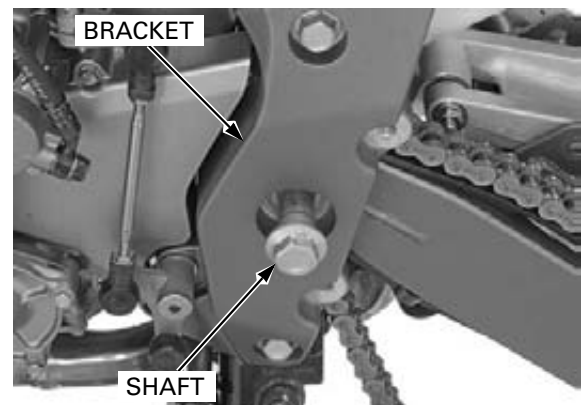
Remove the frame-to-shock link bolt/nut, then remove the shock link with the shock arm.



Loosen the swingarm pivot nut.
Remove the swingarm pivot bracket nuts.



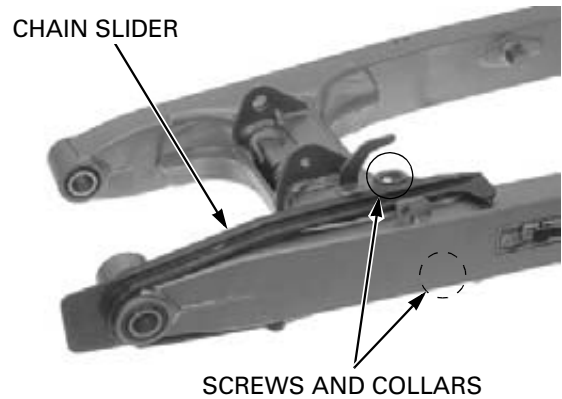
Slightly pull the pivot brackets outward.
Remove the swingarm pivot nut, pivot shaft and the swingarm.



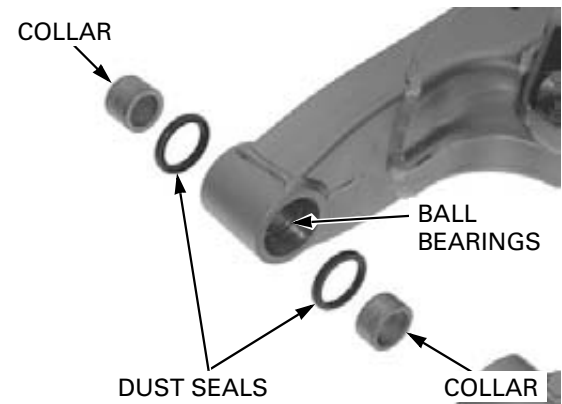
REAR WHEEL/SUSPENSION

DISASSEMBLY

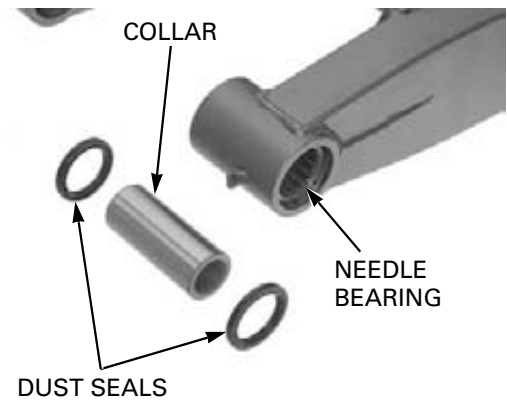
Remove the screws, setting collars and drive chain slider.



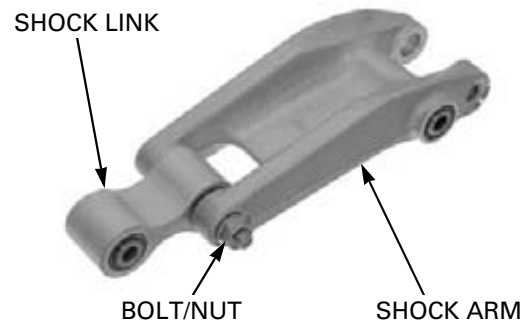
Remove the pivot collars and dust seals from the swingarm right pivot. Check the pivot collars and bearings for wear or damage, also check the swingarm pivot area for crack or damage.



Remove the pivot collar and dust seals from the swingarm left pivot. Check the pivot collar and needle bearing for wear or damage, also check the swingarm pivot area for crack or damage.

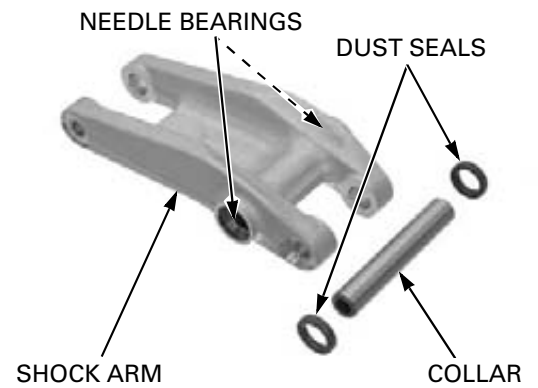


Remove the nut, bolt and shock link from the shock arm.

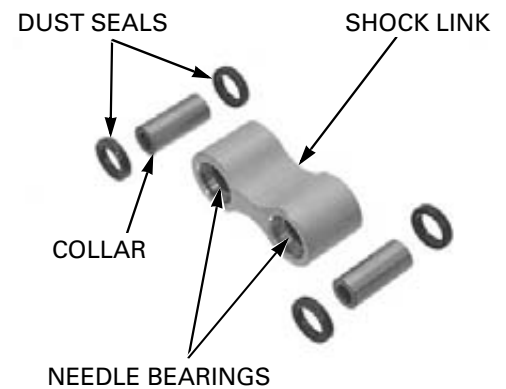


REAR WHEEL/SUSPENSION

Remove the pivot collar and dust seals from the shock arm.
Check the pivot collar for wear or damage.
Check the needle bearings for damage or loose fit.
Check the shock arm for cracks or damage.
If the needle bearings are damaged, replace them.



Remove the pivot collars and dust seals from the shock link.
Check the pivot collars for wear or damage.
Check the needle bearings for damage or loose fit.
Check the shock link for cracks or damage.
If the needle bearings are damaged, replace them.



PIVOT BEARING REPLACEMENT

Remove the snap ring from the right side pivot.



Press the ball bearings out of the right pivot using the special tools and a hydraulic press.

TOOLS:

Driver

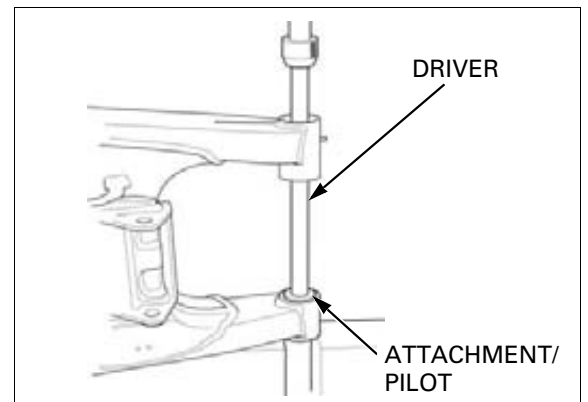
07949-3710001

Attachment, 34 mm

07ZMD-MBW0100

Pilot, 20 mm

07746-0040500

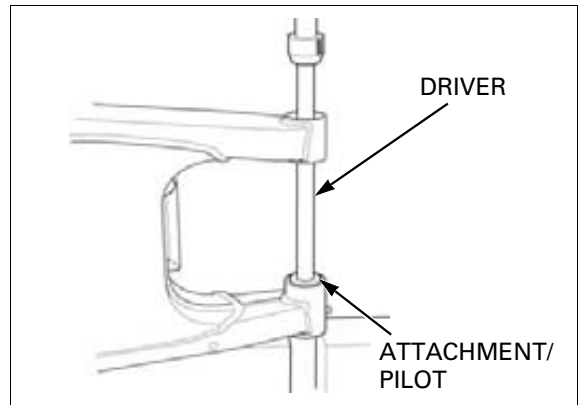


REAR WHEEL/SUSPENSION

Press the needle bearing out of the left pivot using the special tools and a hydraulic press.

TOOLS:

Driver	07949-3710001
Attachment, 37 mm	07ZMD-MBW0200
Pilot, 28 mm	07746-0041100

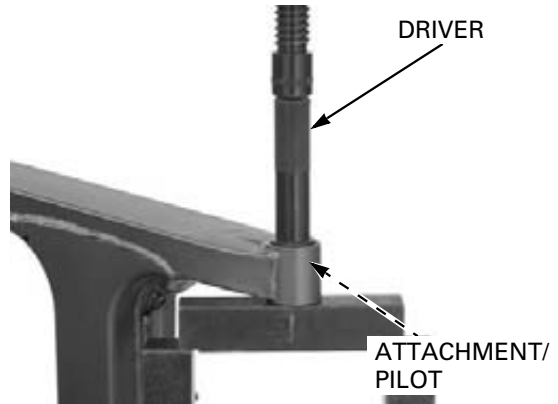


Pack new bearing cavities with grease. Using the special tools and a hydraulic press, carefully press the ball bearings in the right pivot with the marked side facing up until they are fully seated.

TOOLS:

Driver	07749-0010000
Attachment, 37 mm	07ZMD-MBW0200
Pilot, 20 mm	07746-0040500

Install the snap ring into the groove securely.



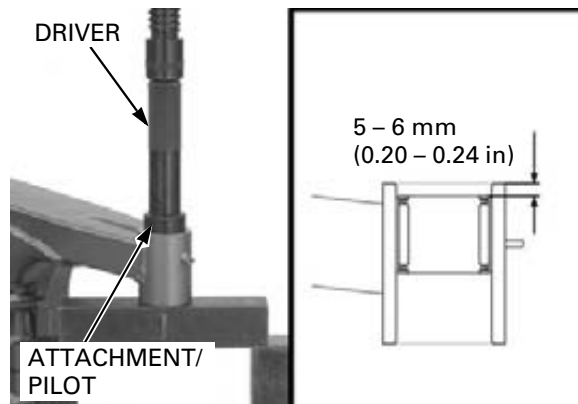
Fill up the new needle bearing with multi-purpose grease.

Press in the needle bearing with the marked side facing up.

Using the special tools and a hydraulic press, carefully press the needle bearing in the left pivot until the depth from the pivot outer surface is 5 – 6 mm (0.20 – 0.24 in).

TOOLS:

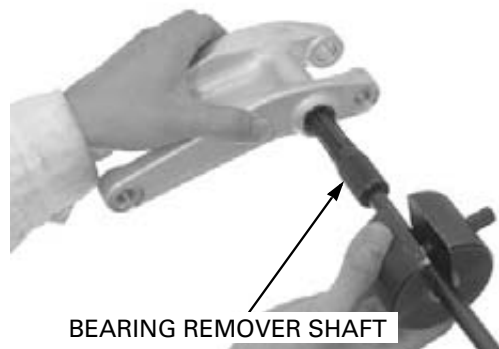
Driver	07749-0010000
Attachment, 37 mm	07ZMD-MBW0200
Pilot, 28 mm	07746-0041100



Remove the shock arm pivot needle bearings using the special tool.

TOOLS:

Bearing remover shaft, 17 mm	07936-3710300
Remove shaft handle	07936-3710100
Remover weight	07741-0010201



REAR WHEEL/SUSPENSION

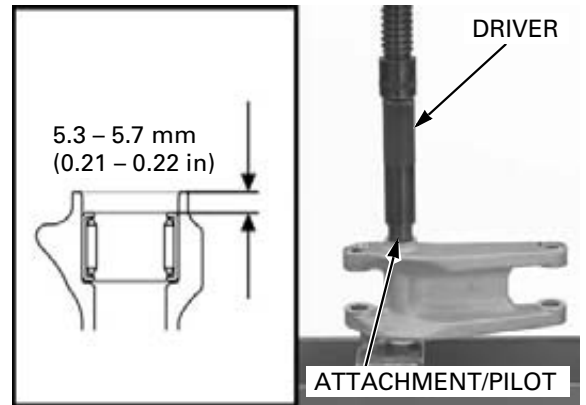
Fill up the new needle bearings with multi-purpose grease.

Press in the needle bearing with the marked side facing up.

Using the special tools and a hydraulic press, carefully press the needle bearings in the shock arm pivot until the depth from the pivot outer surface is 5.3 – 5.7 mm (0.21 – 0.22 in).

TOOLS:

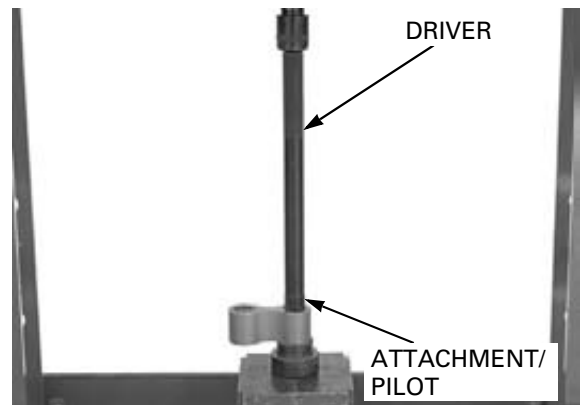
Driver	07749-0010000
Attachment, 22 x 24 mm	07746-0010800
Pilot, 17 mm	07746-0040400



Press the needle bearings out of the shock link using the special tools and a hydraulic press.

TOOLS:

Driver	07949-3710001
Attachment, 22 x 24 mm	07746-0010800
Pilot, 17 mm	07746-0040400



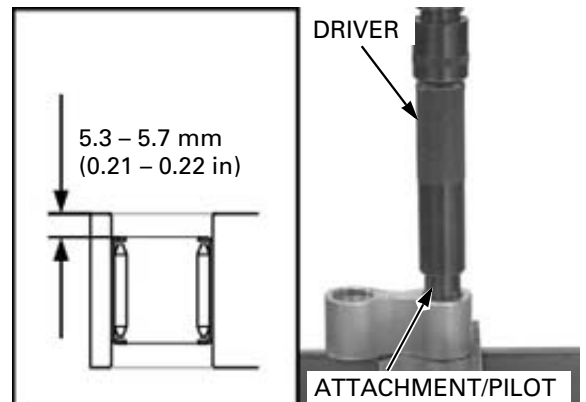
Fill up the new needle bearings with multi-purpose grease.

Press in the needle bearing with the marked side facing up.

Using the special tools and a hydraulic press, carefully press the needle bearings in the shock link pivot until the depth from the pivot outer surface is 5.3 – 5.7 mm (0.21 – 0.22 in).

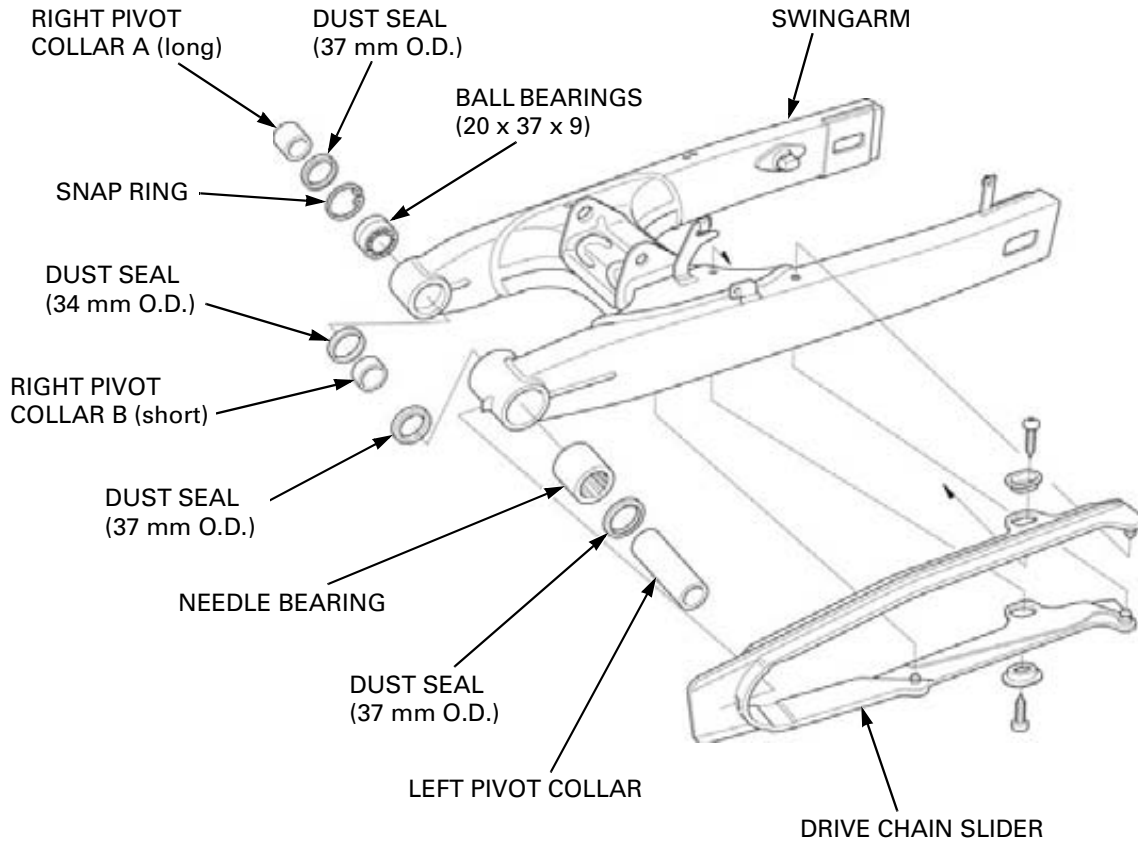
TOOLS:

Driver	07749-0010000
Attachment, 22 x 24 mm	07746-0010800
Pilot, 17 mm	07746-0040400



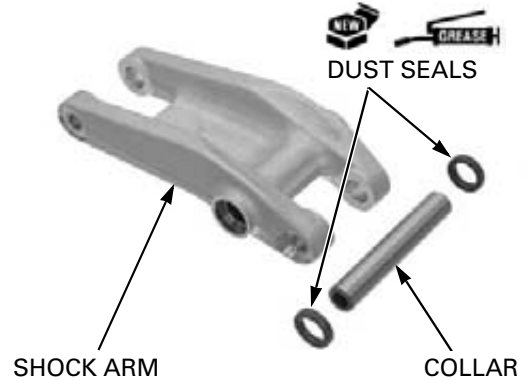
REAR WHEEL/SUSPENSION

ASSEMBLY



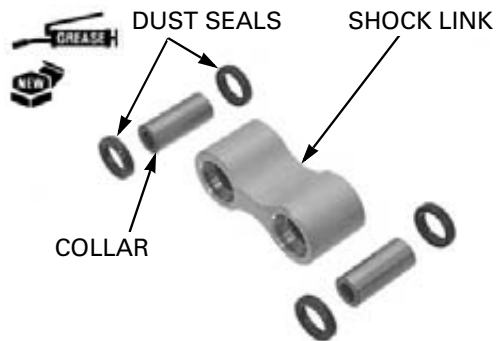
Apply multi-purpose grease to the shock arm dust seal lips.

Install the dust seals and pivot collar to the shock arm.



Apply multi-purpose grease to the shock link dust seal lips.

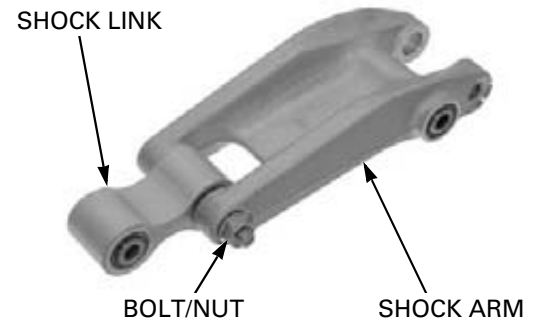
Install the dust seals and pivot collars to the shock link.



Install the shock link to the shock arm.

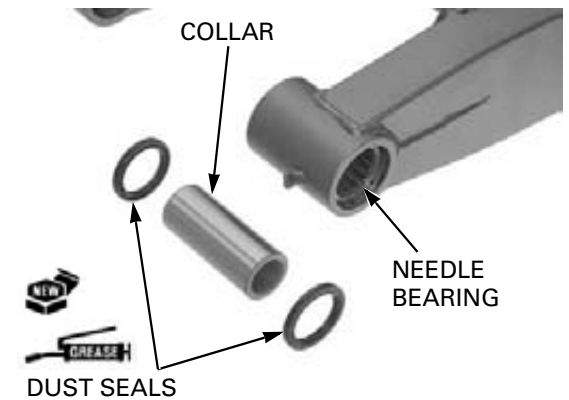
Install the pivot bolt and nut, then tighten the nut to the specified torque.

TORQUE: 42 N·m (4.3 kgf·m, 31 lbf·ft)

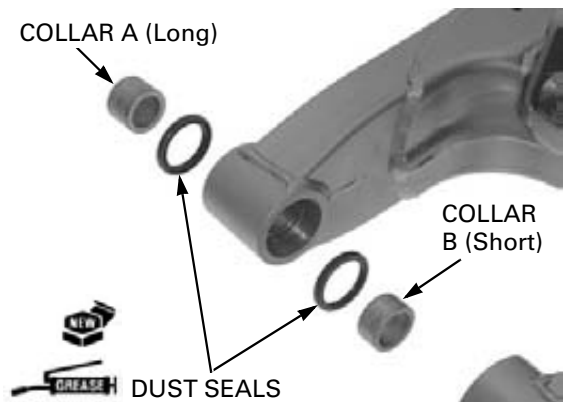


Make sure the needle rollers in the bearing are in position.

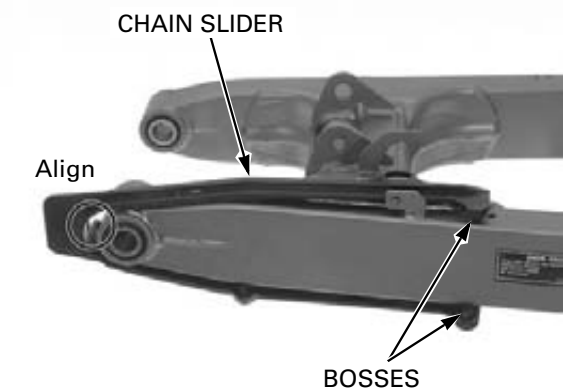
Apply grease to new dust seal lips.
Install the dust seals with the flat surface facing out until they are flush with the pivot outer surface.
Install the pivot collar.



Apply grease to new dust seal lips.
Install the dust seals with the flat surface facing out until they are flush with the pivot outer surface.
Install the swingarm right pivot collars (A and B) as shown.



Install the drive chain slider, aligning the slit with the lug on the swingarm.
Install the drive chain slider bosses into the holes on the swingarm.

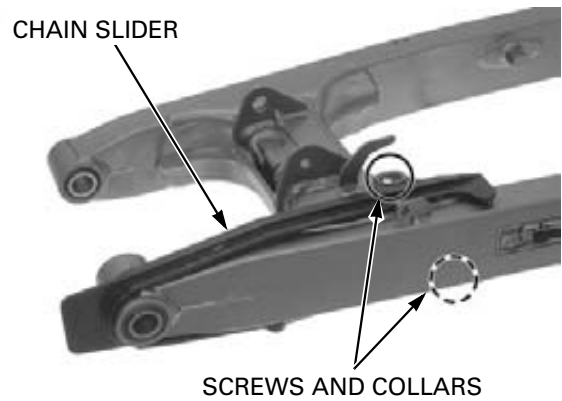


REAR WHEEL/SUSPENSION

Install the two screws with the setting collars and tighten them.

TORQUE: 6 N·m (0.6 kgf·m, 4.4 lbf·ft)

CHAIN SLIDER



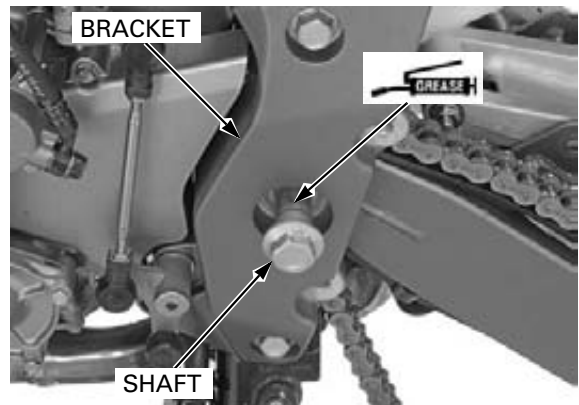
SCREWS AND COLLARS

INSTALLATION

Install the swingarm onto the frame.

Apply thin coat of grease to the swingarm pivot shaft surface and install the pivot shaft from the left side.

Install the washer and pivot nut.



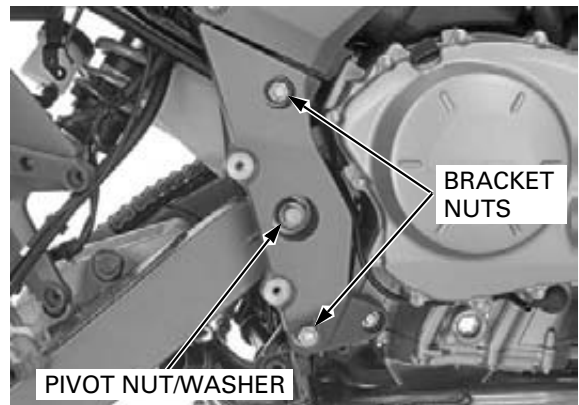
Install the pivot bracket nuts and tighten them to the specified torque.

TORQUE: 69 N·m (7.0 kgf·m, 51 lbf·ft)

Tighten the swingarm pivot nut to the specified torque.

TORQUE: 98 N·m (10.0 kgf·m, 72 lbf·ft)

Move the swingarm up and down several times and make sure it moves smoothly.

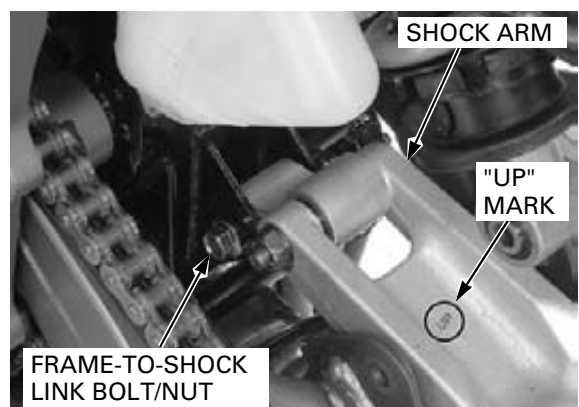


Install the shock arm with the "UP" mark facing up.

Install the shock link/shock arm into the frame.

Install the frame-to-shock link bolt/nut, and tighten the nut to the specified torque.

TORQUE: 42 N·m (4.3 kgf·m, 31 lbf·ft)



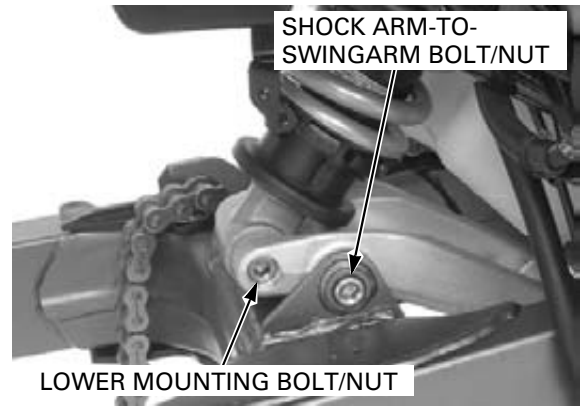
REAR WHEEL/SUSPENSION

Install the shock arm-to-swingarm bolt/nut and tighten the nut to the specified torque.

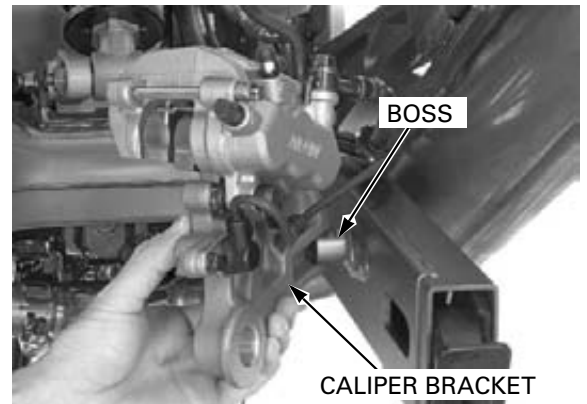
TORQUE: 42 N·m (4.3 kgf·m, 31 lbf·ft)

Install the shock absorber lower mounting bolt/nut and tighten the nut to the specified torque.

TORQUE: 42 N·m (4.3 kgf·m, 31 lbf·ft)

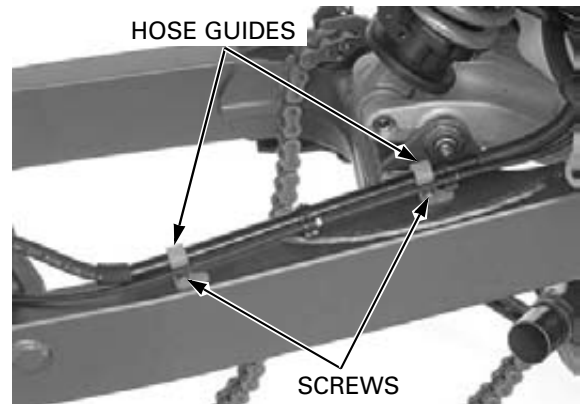


Install the brake caliper bracket onto the swingarm boss.



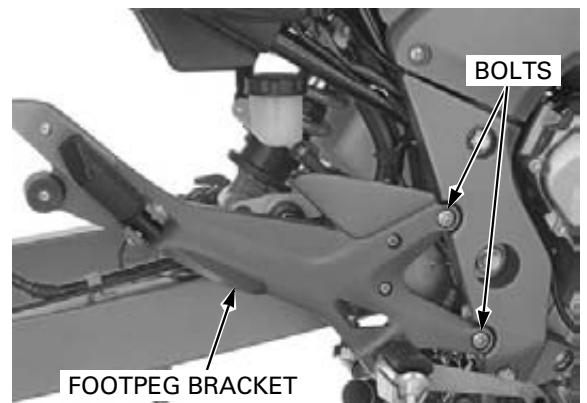
Install the hose guides, aligning the locating pin with the hole, and secure them with the screws.

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



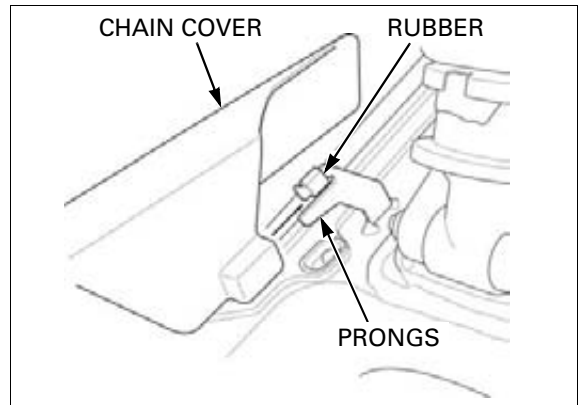
Install the right footpeg bracket and tighten the mounting bolts to the specified torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)



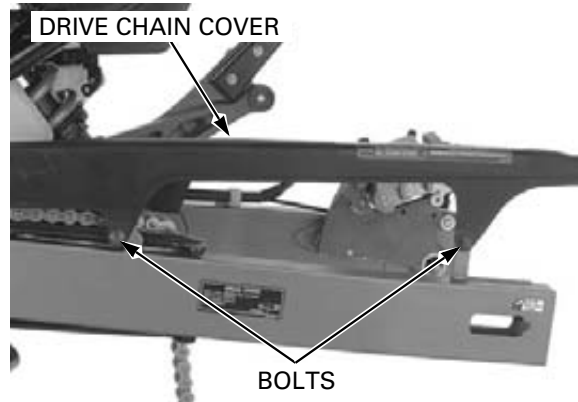
REAR WHEEL/SUSPENSION

Make sure that the protection rubber is in place. Install the drive chain cover by setting the lip of the chain cover between the prongs on the swingarm.



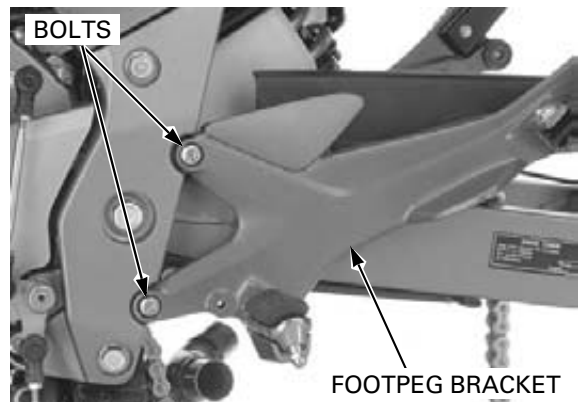
Install and tighten the bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



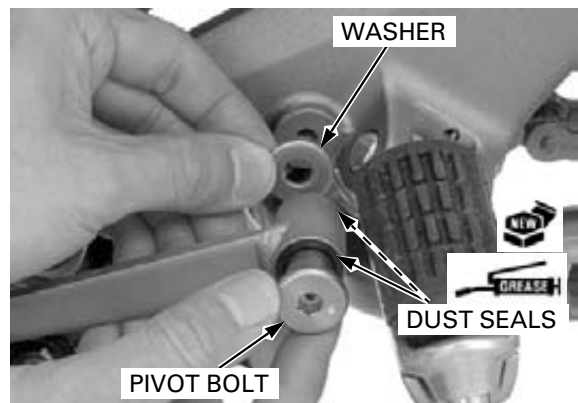
Install the left footpeg bracket and tighten the mounting bolts to the specified torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)



Apply grease to new dust seal lips.

Install the dust seals onto the gearshift pedal pivot. Install the washer, gearshift pedal and pivot bolt.



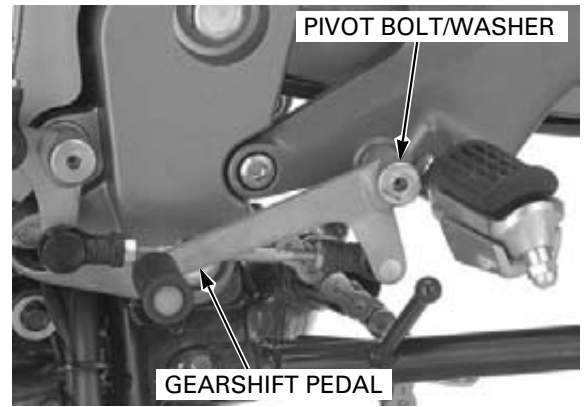
Tighten the gearshift pedal pivot bolt to the specified torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)

Install the following:

- Rear wheel (page 15-12)
- Muffler (page 3-12)

Inspect and adjust the drive chain slack (page 4-21).



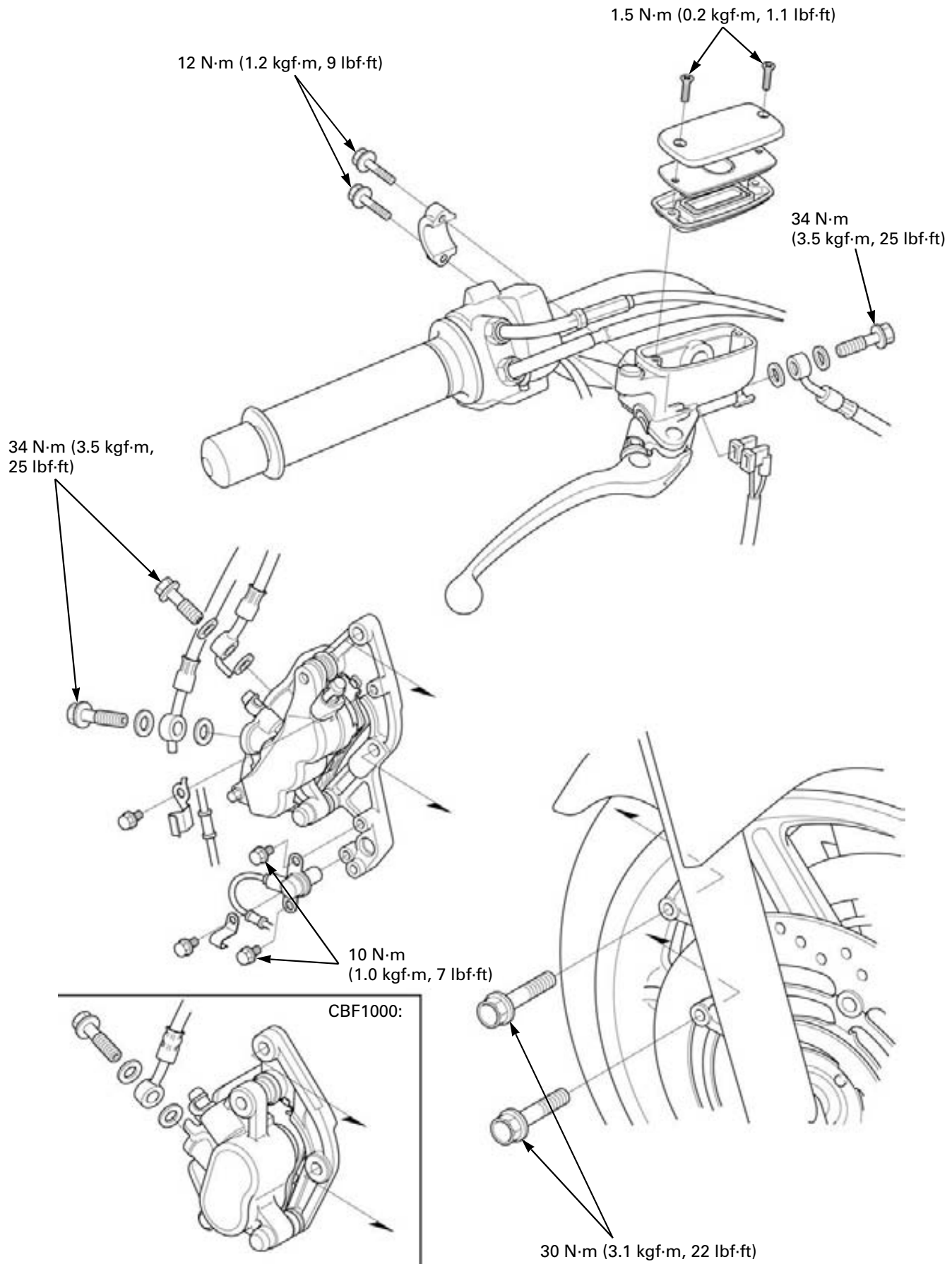
MEMO

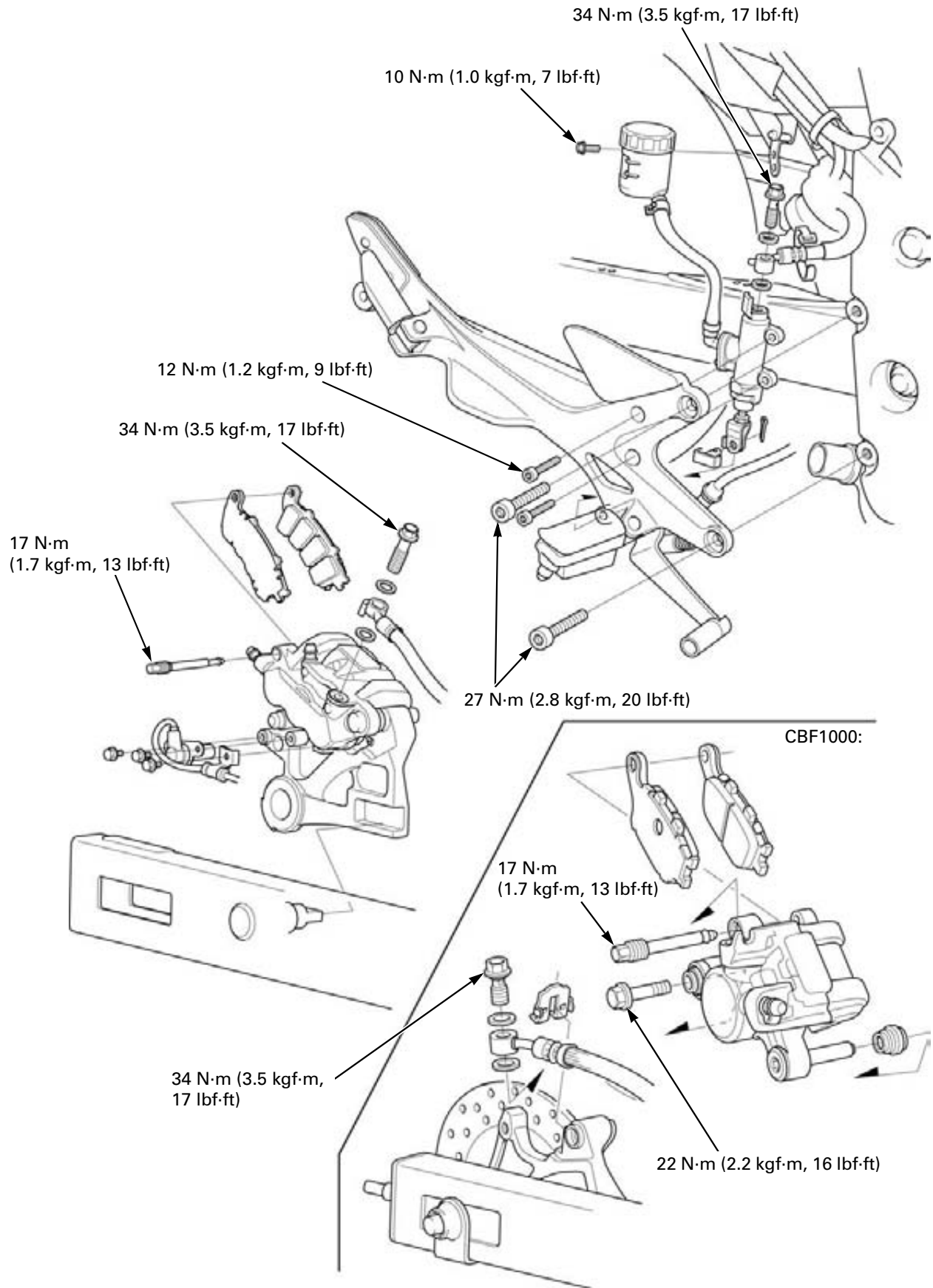
16. HYDRAULIC BRAKE

SYSTEM COMPONENTS	16-2	FRONT MASTER CYLINDER.....	16-20
SERVICE INFORMATION	16-4	REAR MASTER CYLINDER/ BRAKE PEDAL	16-25
TROUBLESHOOTING	16-6	FRONT BRAKE CALIPER (CBF1000A) ...	16-31
BRAKE FLUID REPLACEMENT/ AIR BLEEDING (CBF1000A)	16-7	FRONT BRAKE CALIPER (CBF1000).....	16-35
BRAKE FLUID REPLACEMENT/ AIR BLEEDING (CBF1000)	16-13	REAR BRAKE CALIPER (CBF1000A).....	16-39
BRAKE PAD/DISC.....	16-15	REAR BRAKE CALIPER (CBF1000)	16-43

HYDRAULIC BRAKE

SYSTEM COMPONENTS





HYDRAULIC BRAKE

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 and 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 17-4.
- 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 get into an open reservoir.
- Once the hydraulic system has been opened, or if the brake feels spongy, the system must be bled.
- Always use fresh DOT 4 brake fluid from a sealed container when servicing the system. Do not mix different types of fluid as they may not be compatible.
- Always check brake operation before riding the motorcycle.

SPECIFICATIONS

Unit: mm (in)

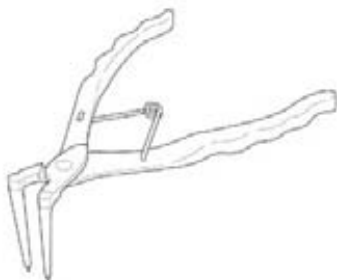
ITEM		STANDARD	SERVICE LIMIT	
Front	Specified brake fluid	DOT 4	–	
	Brake disc thickness	4.5 (0.18)	3.5 (0.14)	
	Brake disc runout	–	0.30 (0.012)	
	Master cylinder I.D.	12.700 – 12.743 (0.5000 – 0.5017)	12.755 (0.5022)	
	Master piston O.D.	12.657 – 12.684 (0.4983 – 0.4994)	12.650 (0.4980)	
	Caliper cylinder I.D.	CBF1000A:	22.650 – 22.700 (0.8917 – 0.8937)	22.710 (0.8941)
		CBF1000:	25.400 – 25.450 (1.0000 – 1.0020)	25.460 (1.0024)
	Caliper piston O.D.	CBF1000A:	22.585 – 22.618 (0.8892 – 0.8905)	22.560 (0.8882)
CBF1000:		25.318 – 25.368 (0.9968 – 0.9987)	25.310 (0.9965)	
Rear	Specified brake fluid	DOT 4	–	
	Brake disk thickness	CBF1000A:	6.0 (0.24)	5.0 (0.20)
		CBF1000:	5.0 (0.20)	4.0 (0.16)
	Brake disc runout	–	0.30 (0.012)	
	Master cylinder I.D.	CBF1000A:	17.460 17.503 (0.6874 0.6891)	17.515 (0.6896)
		CBF1000:	14.000 – 14.043 (0.5512 – 0.5529)	14.055 (0.5533)
	Master piston O.D.	CBF1000A:	17.417 – 17.444 (0.6857 – 0.6868)	17.405 (0.6852)
		CBF1000:	13.957 – 13.984 (0.5495 – 0.5506)	13.945 (0.5490)
	Caliper cylinder I.D.	CBF1000A:	25.400 – 25.450 (1.0000 – 1.0020)	25.460 (1.0024)
		CBF1000:	38.180 – 38.230 (1.5031 – 1.5051)	38.24 (1.506)
	Caliper piston O.D.	CBF1000A:	25.318 – 25.368 (0.9968 – 0.9987)	25.310 (0.9965)
		CBF1000:	38.098 – 38.148 (1.4999 – 1.5019)	38.09 (1.500)

TORQUE VALUES

Brake hose oil bolt	34 N·m (3.5 kgf·m, 25 lbf·ft)	
Front brake caliper mounting bolt	30 N·m (3.1 kgf·m, 22 lbf·ft)	ALOC bolt
Caliper bleed valve	5.4 N·m (0.6 kgf·m, 4.0 lbf·ft)	
Brake pad pin	17 N·m (1.7 kgf·m, 13 lbf·ft)	
Pad pin plug (CBF1000)	2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)	
Front brake caliper slide pin	22 N·m (2.2 kgf·m, 16 lbf·ft)	Apply a locking agent to the threads.
Front brake caliper bracket pin	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Rear brake caliper slide pin	27 N·m (2.8 kgf·m, 20 lbf·ft)	
Rear brake caliper bracket pin (CBF1000A)	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply a locking agent to the threads.
Rear brake caliper bolt (CBF1000)	22 N·m (2.2 kgf·m, 16 lbf·ft)	
Front master cylinder holder 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)	
Brake lever pivot bolt	1 N·m (0.1 kgf·m, 0.7 lbf·ft)	Apply silicone grease to the sliding surface.
Brake lever pivot nut	5.9 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)	
Rear master cylinder mounting bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Rear master cylinder reservoir hose joint screw	1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)	Apply a locking agent to the threads.
Rear master cylinder push rod lock nut	17 N·m (1.7 kgf·m, 13 lbf·ft)	
Rear master cylinder reservoir mounting bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Front brake hose clamp bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Front brake hose stay mounting bolt (CBF1000A)	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Rear brake hose guide screw	4.2 N·m (0.4 kgf·m, 3.1 lbf·ft)	

TOOL

Snap ring pliers
07914-SA50001



HYDRAULIC BRAKE

TROUBLESHOOTING

Brake lever/pedal soft or spongy

- Air in hydraulic system
- Leaking hydraulic system
- Contaminated brake pad/disc
- Worn caliper piston seals
- Worn master cylinder piston cups
- Worn brake pad/disc
- Contaminated caliper
- Contaminated master cylinder
- Caliper not sliding properly
- Low brake fluid level
- Clogged fluid passage
- Warped/deformed brake disc
- Sticking/worn caliper piston
- Sticking/worn master piston
- Bent brake lever/pedal

Brake lever/pedal hard

- Clogged/restricted fluid passage
- Sticking/worn caliper piston
- Sticking/worn master piston
- Caliper not sliding properly
- Worn caliper piston seals
- Bent brake lever/pedal

Brake drag

- Contaminated brake pad/disc
- Misaligned wheel
- Warped/deformed brake disc
- Caliper not sliding properly
- Clogged/restricted fluid passage
- Sticking caliper piston

BRAKE FLUID REPLACEMENT/AIR BLEEDING (CBF1000A)

BRAKE FLUID DRAINING

NOTICE

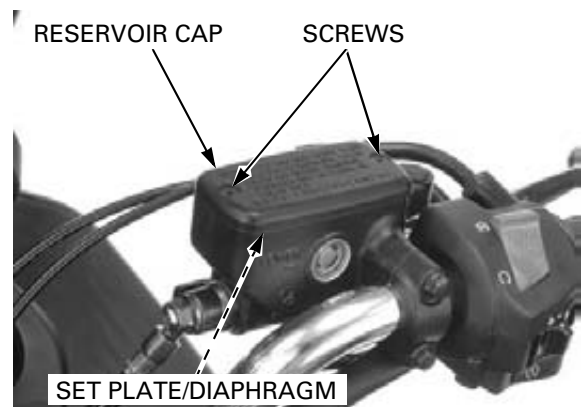
Spilled fluid can damage painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.

NOTE:

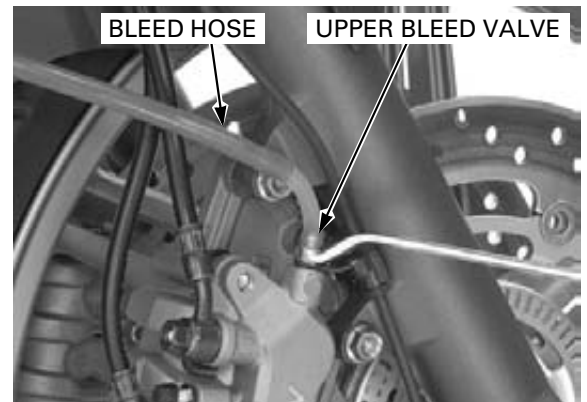
- Do not allow foreign material to enter the system when filling the reservoir.
- When using a commercially available brake bleeder, follow the manufacturer's operating instructions.

Lever Brake Line:

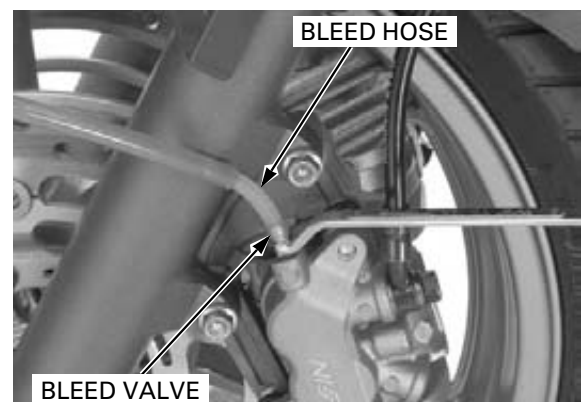
Turn the handlebar to the left until the front master cylinder reservoir is level before removing the reservoir cap.
Remove the screws, reservoir cap, set plate and diaphragm.



Connect a bleed hose to the right front caliper upper bleed valve.
Loosen the upper bleed valve and pump the brake lever until no more fluid flows out of the bleed valve.



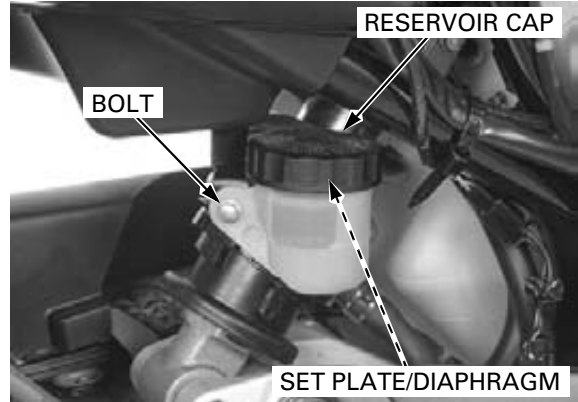
Connect a bleed hose to the left front caliper bleed valve.
Loosen the bleed valve and pump the brake lever until no more fluid flows out of the bleed valve.



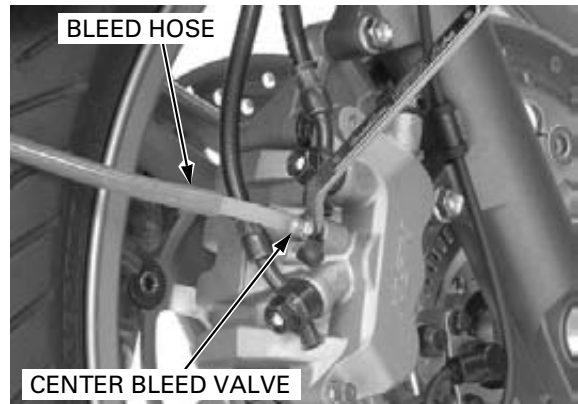
HYDRAULIC BRAKE

Pedal (Combined) Brake Line:

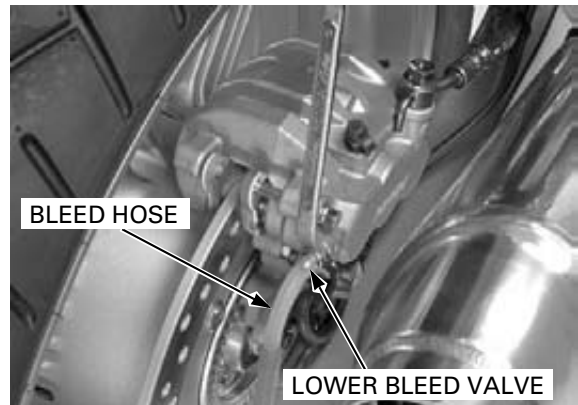
Remove the reservoir mounting bolt.
Remove the reservoir cap, set plate and diaphragm.
Secure the reservoir with the mounting bolt.



Connect a bleed hose to the right front caliper center bleed valve.
Loosen the bleed valve and pump the brake pedal until no more fluid flows out of the bleed valve.



Connect a bleed hose to the rear caliper lower bleed valve.
Loosen the bleed valve and pump the brake pedal until no more fluid flows out of the bleed valve.



FRONT BRAKE FLUID FILLING/AIR BLEEDING

Close the bleed valves.
Fill the reservoir with DOT 4 brake fluid from a sealed container.



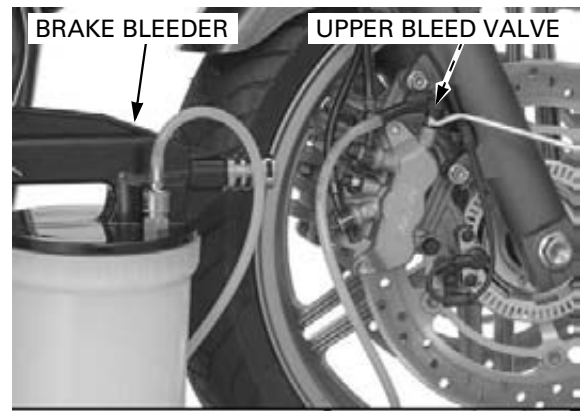
Connect a commercially available brake bleeder to the right caliper upper bleed valve. Operate the brake bleeder and loosen the bleed valve.

NOTE:

- If an automatic refill system is not used, add brake fluid when the fluid level in the reservoir is low.
- Check the fluid level often while bleeding the brake to prevent air from being pumped into the system.
- When using a brake bleeding tool, follow the manufacturer's operating instructions.
- If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.

Close the bleed valve to the specified torque.

TORQUE: 5.4 N-m (0.6 kgf-m, 4.0 lbf-ft)



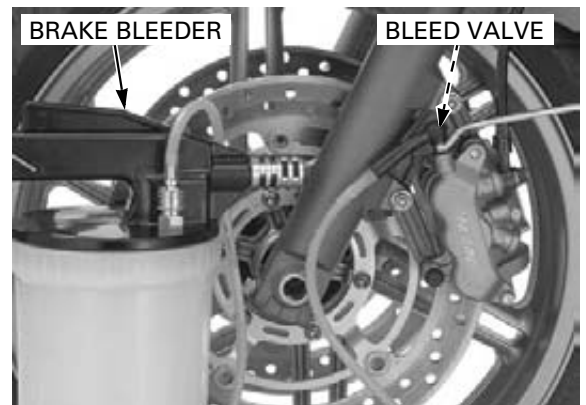
Connect a commercially available brake bleeder to the left caliper bleed valve. Operate the brake bleeder and loosen the bleed valve.

Close the bleed valve to the specified torque.

TORQUE: 5.4 N-m (0.6 kgf-m, 4.0 lbf-ft)

Perform the bleeding procedure until the system is completely flushed/bled.

Operate the brake lever. If it is still spongy, bleed the system again.

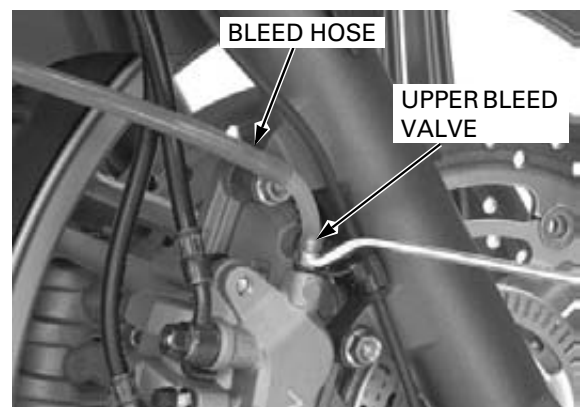


If a brake bleeder is not available, use the following procedure:

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

Connect a bleed hose to the right caliper upper bleed valve.

Pressurize the system with the brake lever until lever resistance is felt.



HYDRAULIC BRAKE

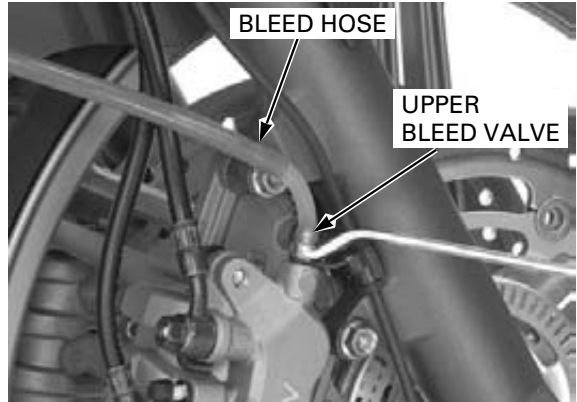
1. Squeeze the brake lever, open the bleed valve 1/4 of a turn and then close it.
 2. Release the brake lever slowly and wait several seconds after it reaches the end of its travel.
- Do not release the lever until the bleed valve has been closed.



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: 5.4 N·m (0.6 kgf·m, 4.0 lbf·ft)



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

Connect a bleed hose to the left caliper bleed valve.

1. Squeeze the brake lever, open the bleed valve 1/4 of a turn and then close it.
 2. Release the brake lever slowly and wait several seconds after it reaches the end of its travel.
- Do not release the lever until the bleed valve has been closed.

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.

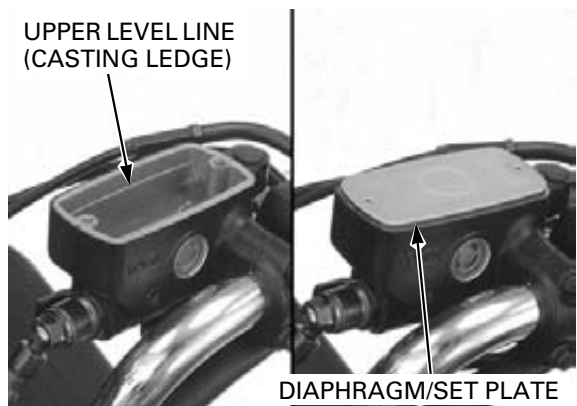
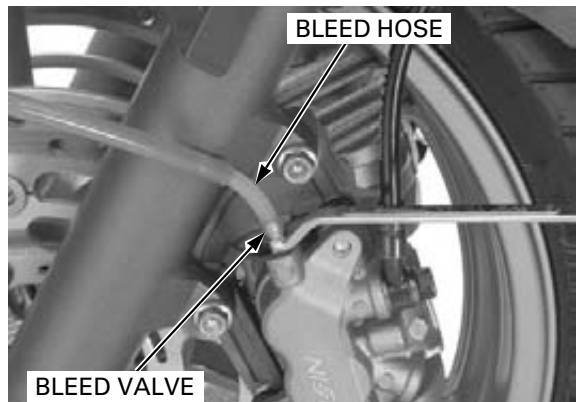
TORQUE: 5.4 N·m (0.6 kgf·m, 4.0 lbf·ft)

Fill the reservoir to the upper level line (casting ledge) with DOT 4 brake fluid.

Install the diaphragm and set plate.

Install the reservoir cap and tighten the screws to the specified torque.

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



REAR (COMBINED) BRAKE FLUID FILLING/AIR BLEEDING

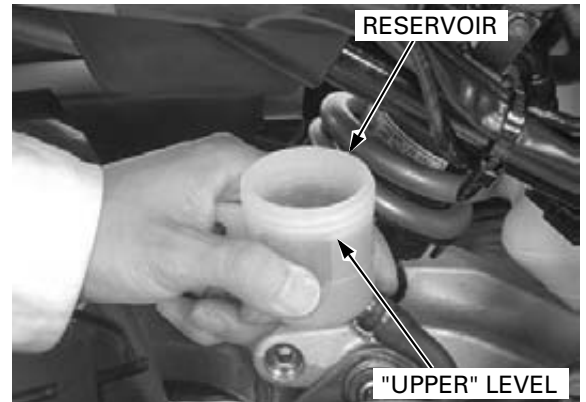
Brake Fluid Feeding:

Add fluid and bleed any air from the pedal brake line in the sequence as follow:

1. Right front brake caliper center bleed valve
2. Rear brake caliper lower bleed valve

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

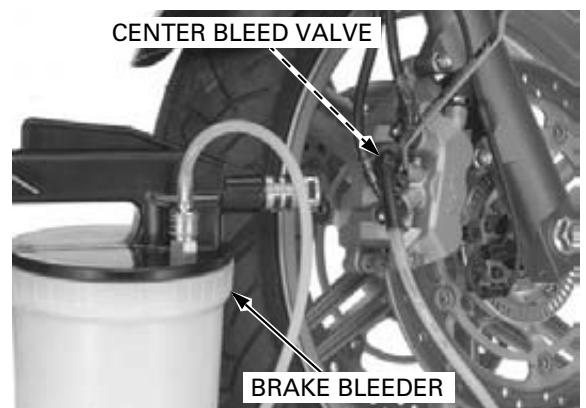
Operate the brake pedal several times to bleed any air from the master cylinder.



Connect a commercially available brake bleeder to the right front caliper center bleed valve.

NOTE:

- If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.
1. Operate the brake bleeder and loosen the right front caliper center bleed valve. Add fluid when the fluid level in the master cylinder is low to prevent drawing air into the system.
 2. Repeat the above procedures until a sufficient amount of fluid flows out of the caliper center bleed valve.

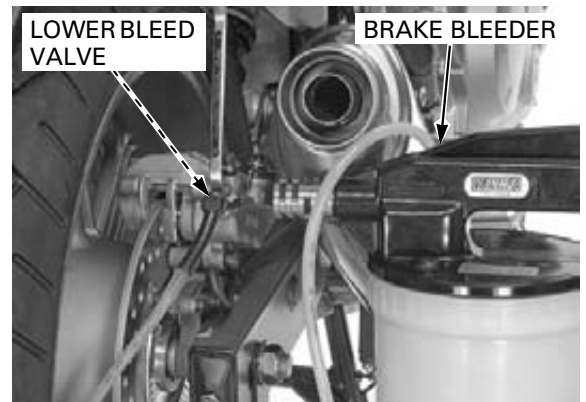


It is not problem if the fluid flowing out from the center bleed valve contains air bubbles because the lines will be bled later (page 16-12).

Connect a commercially available brake bleeder to the rear caliper lower bleed valve.

Repeat above step 1. and 2. for rear caliper lower bleed valve.

Bleed the hydraulic system (page 16-12).



HYDRAULIC BRAKE

If a brake bleeder is not available, perform the following procedure.

Connect a bleed hose to the right front caliper center bleed valve.

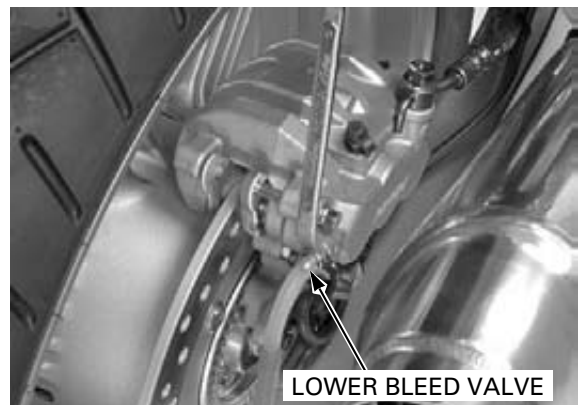
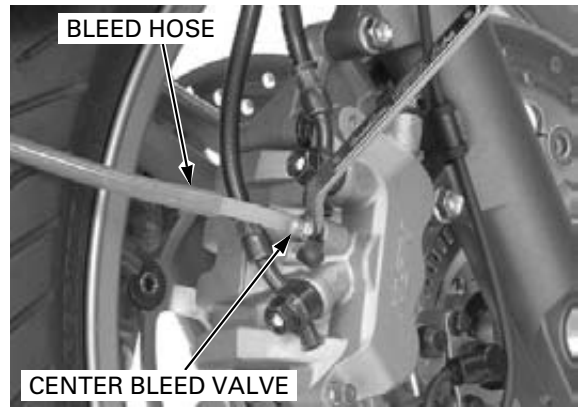
1. Pump the brake pedal several (5 – 10) times quickly, then push the brake pedal all the way down, loosen the right front caliper center bleed valve 1/4 of a turn.
Wait several seconds and close the bleed valve.
Release the brake pedal slowly and wait several seconds after it reaches the end of its travel.
2. Repeat the above procedures until a sufficient amount of the fluid flows out from the right front caliper center bleed valve.

It is not a problem if the fluid flowing out from the right front caliper center bleed valve contains air bubbles because the lines will be bled later (page 16-12).

Connect a bleed hose to the rear caliper lower bleed valve.

Repeat above steps 1. and 2. for the rear caliper lower bleed valve.

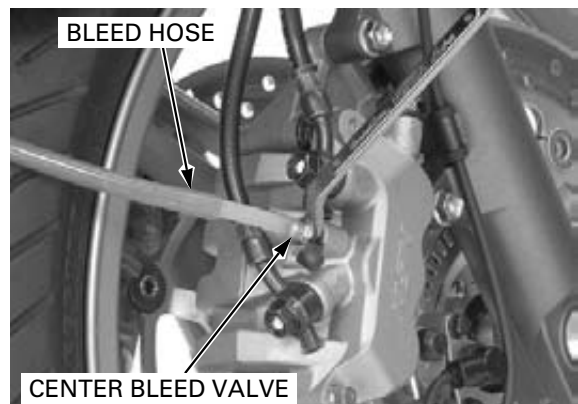
Bleed the hydraulic system (page 16-12).



Air Bleeding:

Connect a bleed hose to the right front caliper center bleed valve.

1. Pump the brake pedal several (5 – 10) times quickly, then push the brake pedal all the way down, loosen the right front caliper center bleed valve 1/4 of a turn.
Wait several seconds and close the bleed valve.
Release the brake pedal slowly and wait several seconds after it reaches the end of its travel.
2. Repeat the above procedures until air bubbles do not appear in the transparent hose.

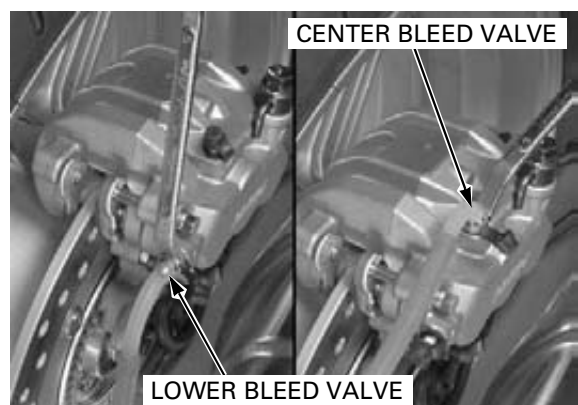


Connect a bleed hose to the rear caliper lower bleed valve.

Repeat above step 1. and 2. for the rear caliper lower bleed valve.

Connect a bleed hose to the rear caliper center bleed valve and bleed the air in the same manner as the lower bleed valve.

Note that you may feel strong resistance on the rear (combined) brake pedal during pumping when bleeding air from the caliper. This symptom is caused by the PCV (Proportional Control Valve) function. Be sure to apply the brake pedal fully.



After there are no more air bubbles in the fluid, repeat the air bleeding procedure about two or three times at each bleed valve.

Make sure the bleed valves are closed and operate the brake pedal. If it still feels spongy, bleed the system again.

After bleeding the air completely, tighten the bleed valves to the specified torque.

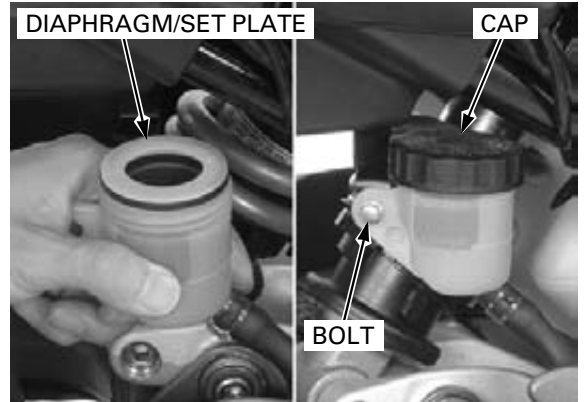
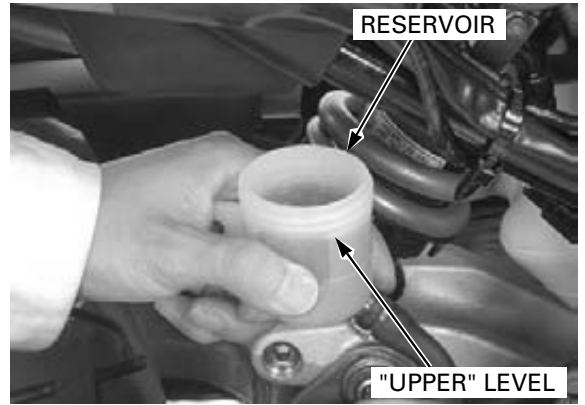
TORQUE: 5.4 N·m (0.6 kgf·m, 4.0 lbf·ft)

Fill the reservoir to the "UPPER" level with DOT 4 brake fluid.

Install the diaphragm, set plate and reservoir cap.

Install the reservoir onto the frame and tighten the mounting bolt to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

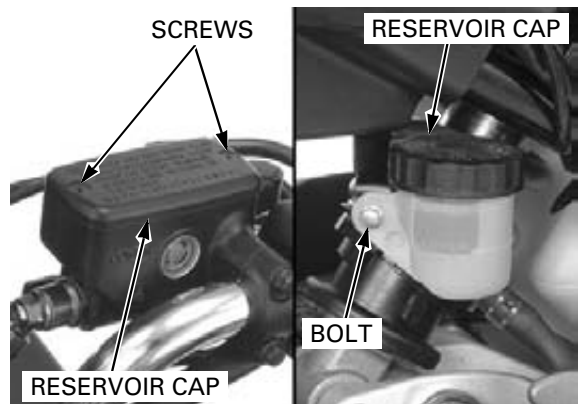


BRAKE FLUID REPLACEMENT/AIR BLEEDING (CBF1000)

BRAKE FLUID DRAINING

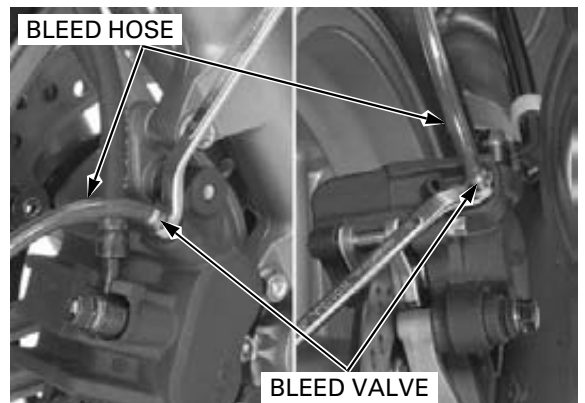
Front brake: Turn the handlebar to the left until the front master cylinder reservoir is level before removing the reservoir cap. Remove the screws, reservoir cap, set plate and diaphragm.

Rear brake: Remove the reservoir mounting bolt. Remove the reservoir cap, set plate and diaphragm. Secure the reservoir with the mounting bolt.



Connect a bleed hose to the brake caliper bleed valve.

Loosen the bleed valve and pump the brake lever (pedal) until no more fluid flows out of the bleed valve.



HYDRAULIC BRAKE

BRAKE FLUID FILLING/AIR BLEEDING

Close the bleed valve.

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.

NOTE:

- If an automatic refill system is not used, add brake fluid when the fluid level in the reservoir is low.
- Check the fluid level often while bleeding the brake to prevent air from being pumped into the system.
- When using a brake bleeding tool, follow the manufacturer's operating instructions.
- If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.

Perform the bleeding procedure until the system is completely flushed/bled.

Close the bleed valve and operate the brake lever (pedal). If it still feels spongy, bleed the system again.

If a brake bleeder is not available, use the following procedure:

Connect a bleed hose to the bleed valve.

Pressurize the system with the brake lever (pedal) until resistance is felt.

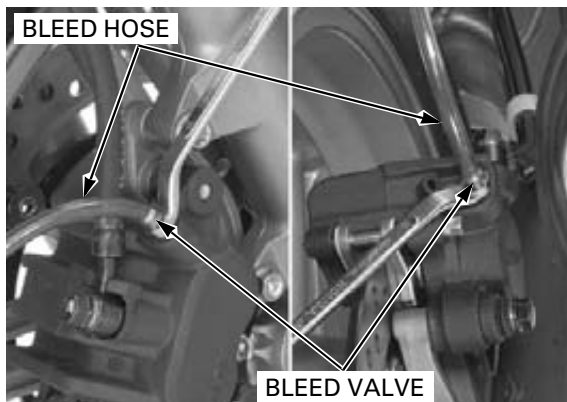
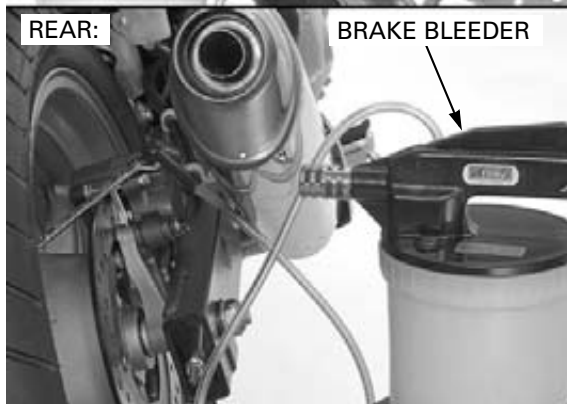
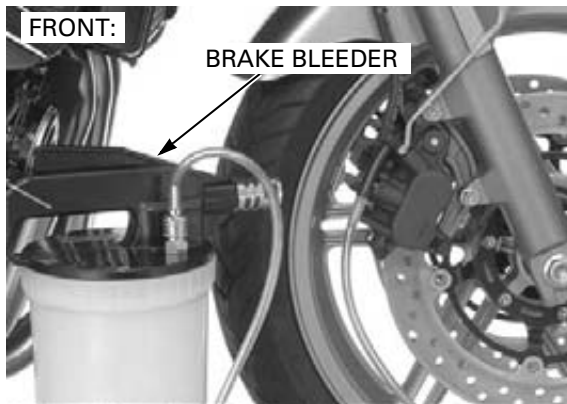
1. Squeeze the brake lever (depress the brake pedal), open the bleed valve 1/4 of a turn and then close it.
2. Release the brake lever (pedal) slowly and wait several seconds after it reaches the end of its travel.
3. Repeat steps 1. and 2. until air bubbles do not appear in the bleed hose.

After there are no more air bubbles in the fluid, repeat the air bleeding procedure about two or three times at each bleed valve.

Make sure the bleed valves are closed and operate the brake pedal. If it still feels spongy, bleed the system again.

After bleeding the air completely, tighten the bleed valves to the specified torque.

TORQUE: 5.4 N·m (0.6 kgf·m, 4.0 lbf·ft)

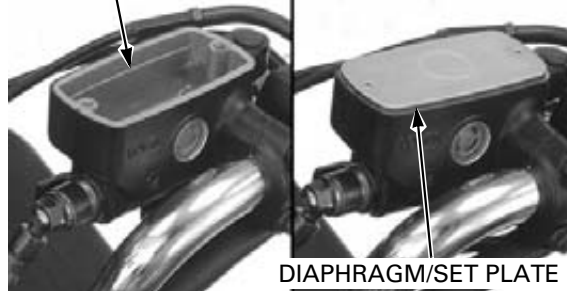


Fill the front brake reservoir to the upper level line (casting ledge) with DOT 4 brake fluid.

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

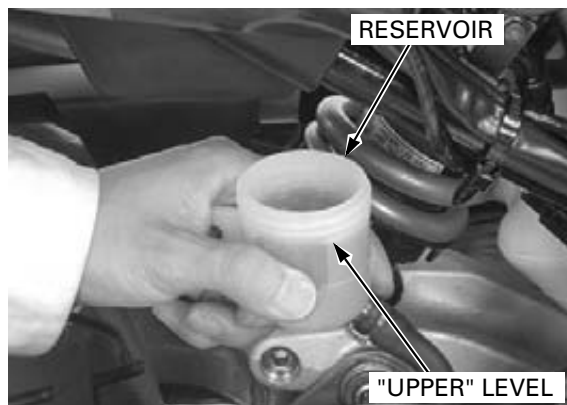
TORQUE: 1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)

UPPER LEVEL LINE
(CASTING LEDGE)



DIAPHRAGM/SET PLATE

Fill the rear brake reservoir to the upper level line with DOT 4 brake fluid.



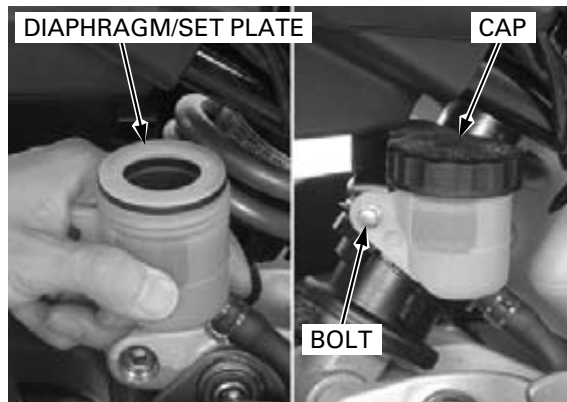
RESERVOIR

"UPPER" LEVEL

Install the diaphragm, set plate and reservoir cap.

Install the reservoir onto the frame and tighten the mounting bolt to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



DIAPHRAGM/SET PLATE

CAP

BOLT

BRAKE PAD/DISC

FRONT BRAKE PAD REPLACEMENT (CBF1000A)

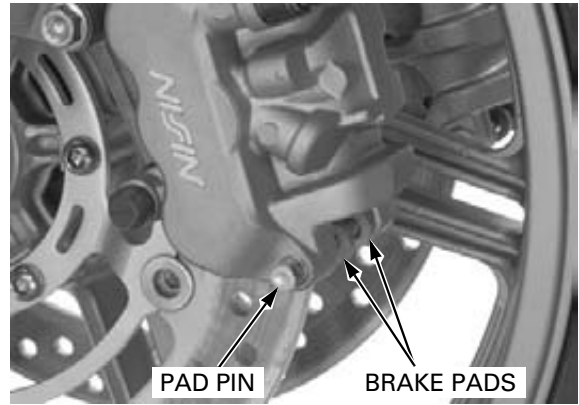
Check the brake fluid level in the reservoir as this operation causes the level to rise.

Push the caliper piston all the way in to allow installation of new brake pads by pushing the caliper body inward.



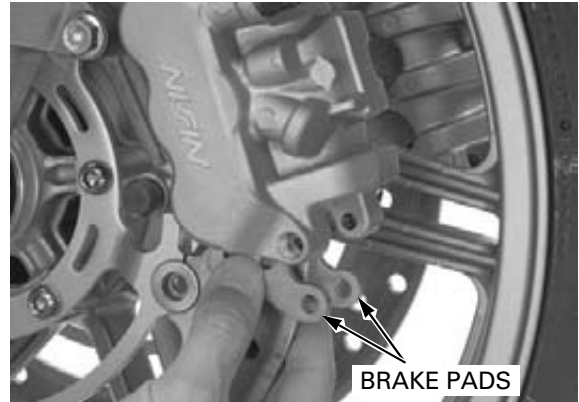
HYDRAULIC BRAKE

Loosen the pad pin.
Pull the pad pin out of the caliper body while holding the brake pads.



Remove the brake pads.

Make sure that the pad spring is in place.



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.

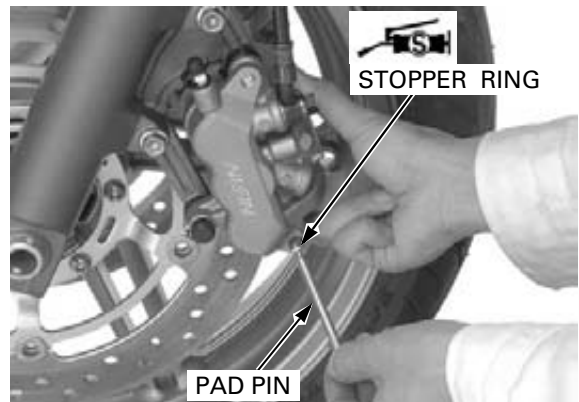
Coat the stopper ring on the pad pin end with the silicone grease.

Install the pad pin by pushing in the pads against the pad spring to align the pad pin holes in the pads and caliper body.

Tighten the pad pin to the specified torque.

TORQUE: 17 N·m (1.7 kgf·m, 13 lbf·ft)

Operate the brake lever to seat the caliper piston against the pads.



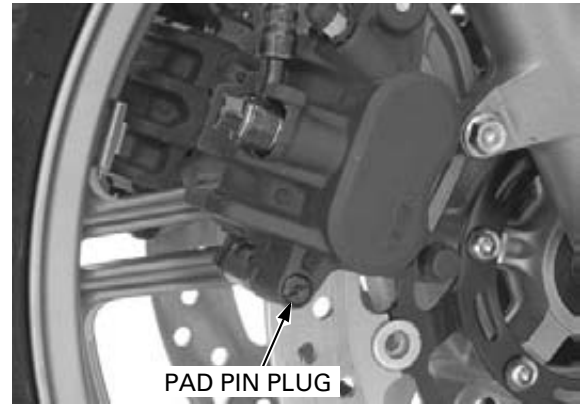
FRONT BRAKE PAD REPLACEMENT (CBF1000)

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 by pushing the caliper body inward.



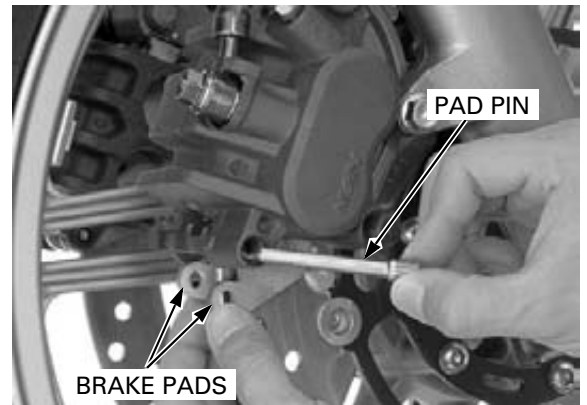
Remove the pad pin plug.



Remove the pad pin and brake pads.
Make sure that the pad spring is in place.

Always replace the brake pads in pairs to assure even disc pressure.

Install the new brake pads.
Push the brake pads against the pad spring, then install the pad pin.

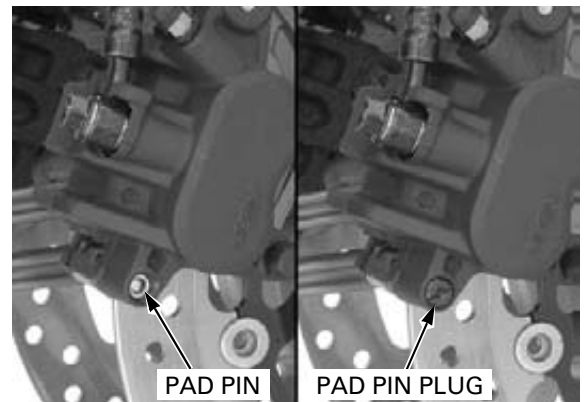


Tighten the pad pin to the specified torque.

TORQUE: 17 N·m (1.7 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)



REAR BRAKE PAD REPLACEMENT (CBF1000A)

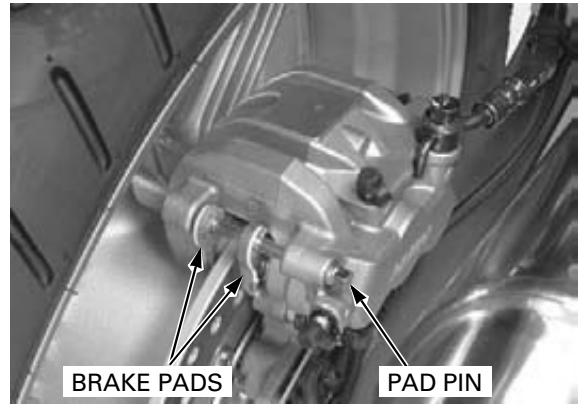
Check the brake fluid level in the reservoir as this operation causes the level to rise.

Push the caliper piston all the way in to allow installation of new brake pads by pushing the caliper body inward.



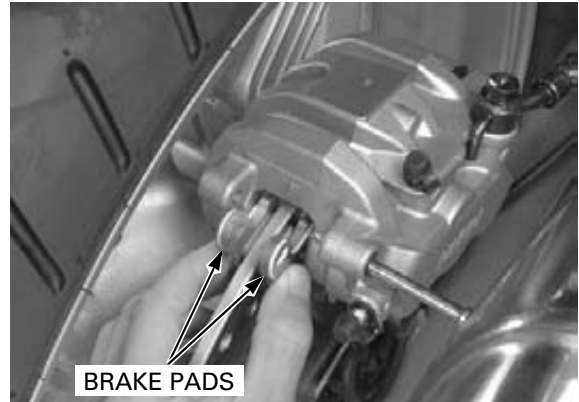
HYDRAULIC BRAKE

Loosen the pad pin.
Pull the pad pin out of the caliper body while holding the brake pads.



Remove the brake pads.

Make sure that the pad spring is in place.



Always replace the brake pads in pairs to assure even disc pressure.

Install new brake pads into the caliper so their ends rest into the pad retainer on the bracket properly.

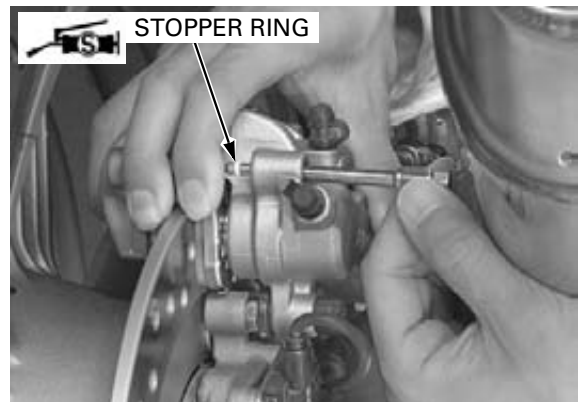
Coat the stopper ring on the pad pin end with the silicone grease.

Install the pad pin by pushing in the pads against the pad spring to align the pad pin holes in the pads and caliper body.

Tighten the pad pin to the specified torque.

TORQUE: 17 N·m (1.7 kgf·m, 13 lbf·ft)

Operate the brake pedal to seat the caliper piston against the pads.



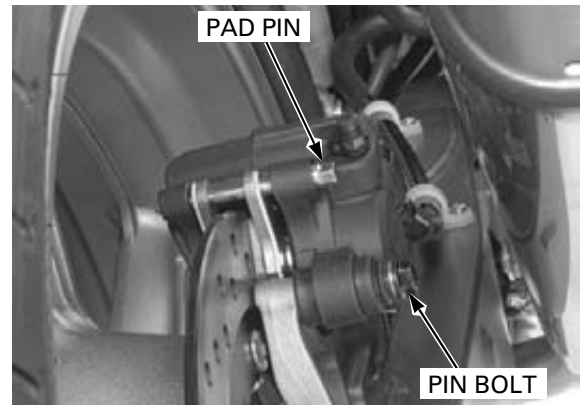
REAR BRAKE PAD REPLACEMENT (CBF1000)

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 by pushing the caliper body inward.



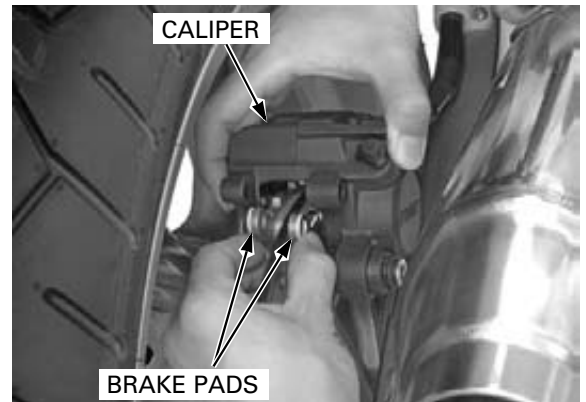
Remove the pad pin.
Remove the caliper sub slide pin bolt.



Pivot the caliper up and remove the brake pads.
Make sure that the brake pad spring is in place.

Always replace the brake pads in pairs to assure even disc pressure.

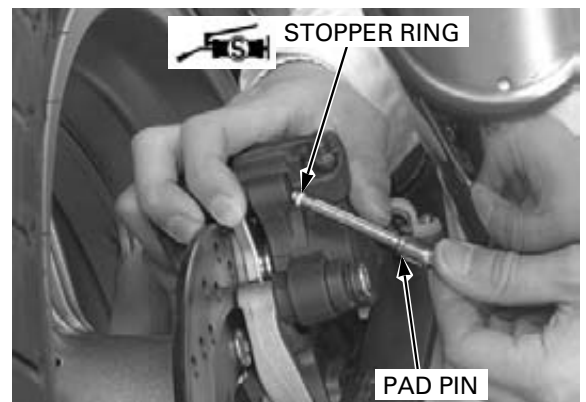
Install the new brake pads.



Coat the stopper ring on the pad pin end with the silicone grease.

Lower the caliper while pushing the pads against the pad spring so that the pad ends are positioned onto the retainer on the caliper bracket.

Install the pad pin.

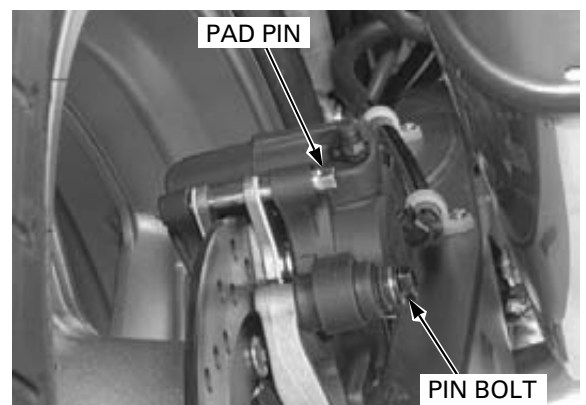


Install the caliper sub slide pin bolt and tighten it to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

Tighten the pad pin to the specified torque.

TORQUE: 17 N·m (1.7 kgf·m, 13 lbf·ft)



HYDRAULIC BRAKE

BRAKE DISC INSPECTION

Visually inspect the disc for damage or cracks.

Measure the brake disc thickness at several points.

SERVICE LIMITS: Front: 3.5 mm (0.14 in)

Rear:

CBF1000A: 5.0 mm (0.20 in)

CBF1000: 4.0 mm (0.16 in)



Measure the brake disc warpage with a dial indicator.

SERVICE LIMIT: Front/Rear: 0.30 mm (0.012 in)

Check the wheel bearing for excessive play, if the warpage exceeds the service limit.

Replace the brake disc if the bearings are normal.

Refer to brake disc replacement:

- Front brake disc (page 14-13)
- Rear brake disc (page 15-6)



FRONT MASTER CYLINDER

REMOVAL

NOTE:

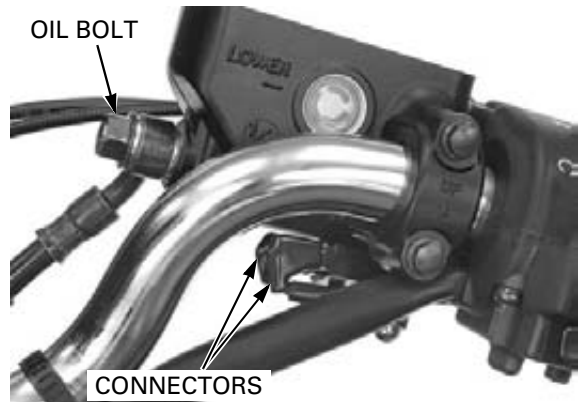
- Avoid spilling fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.

Drain the brake fluid from the front brake hydraulic system (page 16-7).

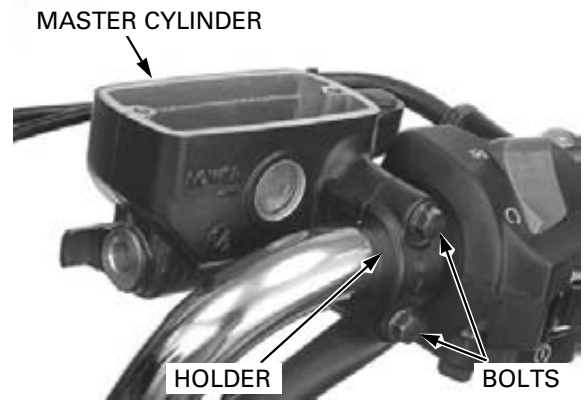
Disconnect the brake light switch wire connectors.

Remove the brake hose oil bolt and sealing washers.

When removing the oil bolt, cover the end of the hose to prevent contamination.

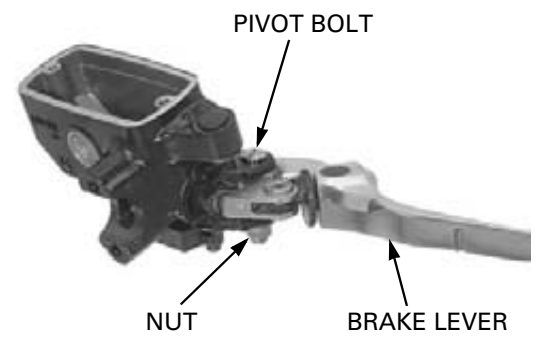


Remove the bolts from the master cylinder holder and remove the master cylinder assembly.

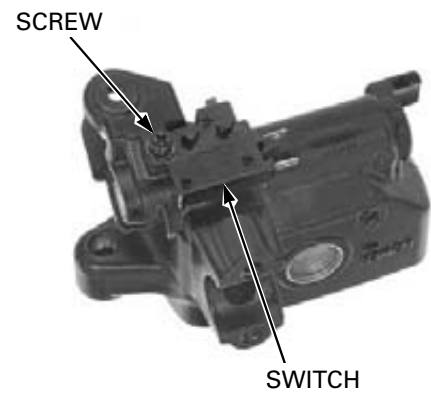


DISASSEMBLY

Remove the nut, pivot bolt and brake lever.



Remove the screw and brake light switch.



Remove the boot.



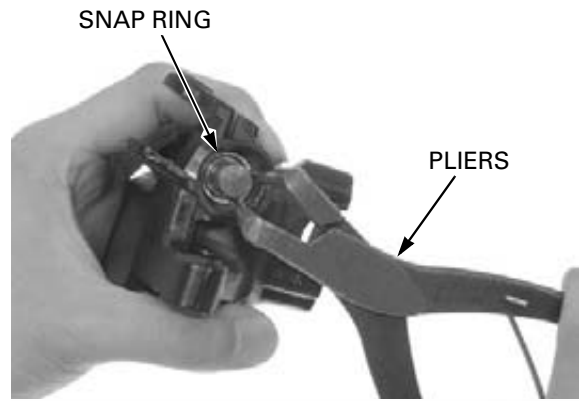
HYDRAULIC BRAKE

Remove the snap ring from the master cylinder body using the special tool.

TOOL:

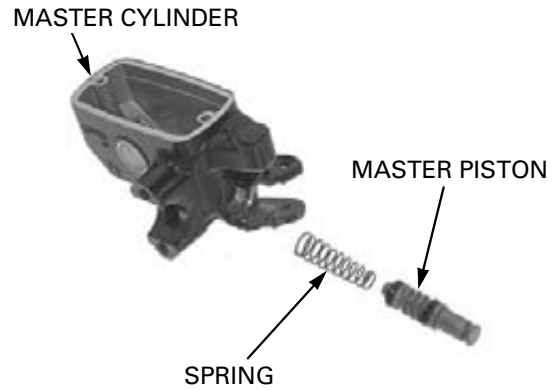
Snap ring pliers

07914-SA50001



Remove the master piston and spring.

Clean the inside of the master cylinder, reservoir and the master piston in clean brake fluid.



INSPECTION

Check the piston cups and boot for wear, deterioration or damage.

Check the spring for fatigue or damage.

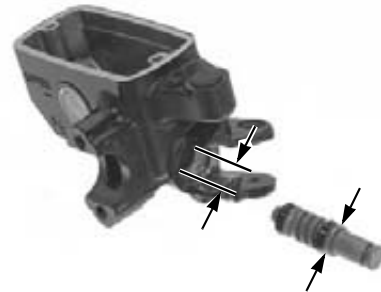
Check the master cylinder and piston for scoring, scratches or damage.

Measure the master cylinder I.D.

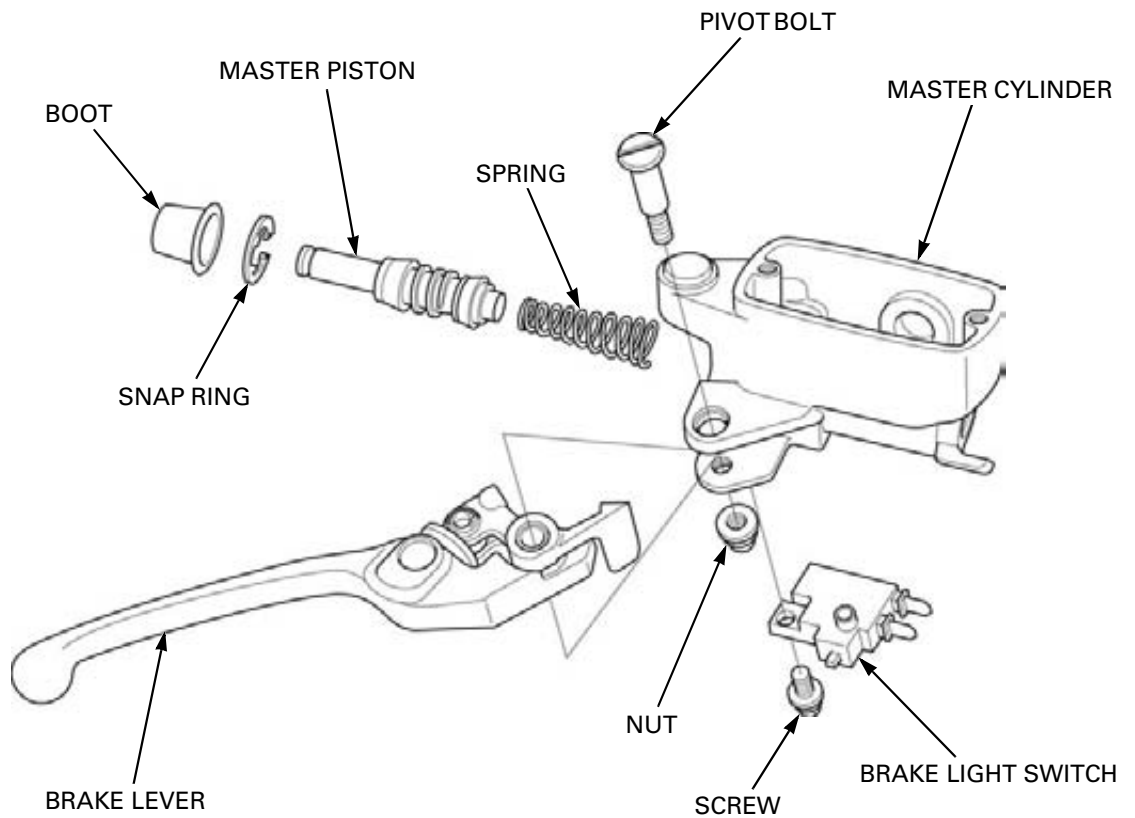
SERVICE LIMIT: 12.755 mm (0.5022 in)

Measure the master piston O.D.

SERVICE LIMIT: 12.650 mm (0.4980 in)



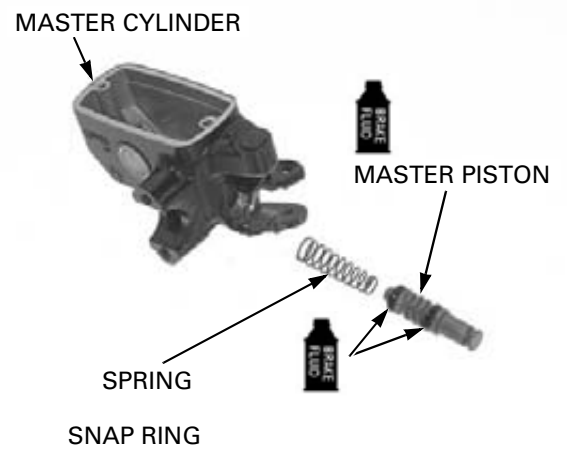
ASSEMBLY



Coat the master piston and piston cups with clean brake fluid.
Install the spring onto the piston end.

Do not allow the piston cup lips to turn inside out.

Install the master piston with the spring into the master cylinder.

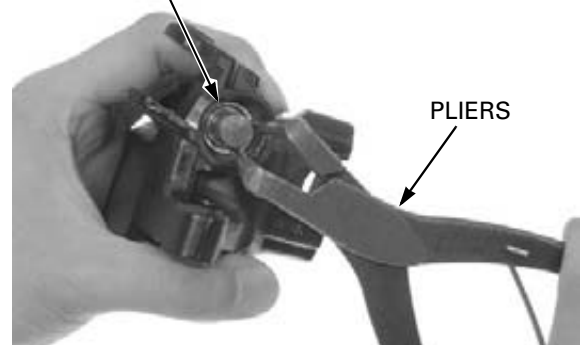


Make sure the snap ring is firmly seated in the groove.

Install the snap ring into the groove in the master cylinder.

TOOL:
Snap ring pliers

07914-SA50001

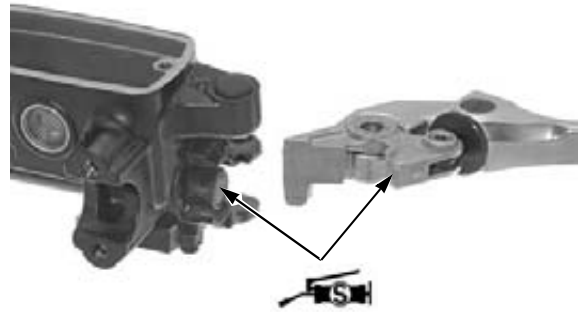


HYDRAULIC BRAKE

Apply silicone grease inside the boot.
Install the boot into the master cylinder and the piston groove.



Apply silicone grease to the brake lever contacting surface of the master piston.

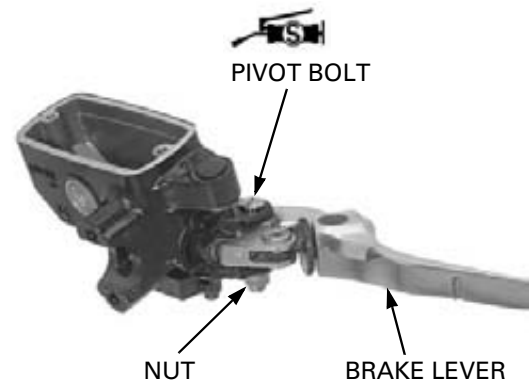


Apply silicone grease to the brake lever pivot bolt sliding surface.
Install the brake lever and pivot bolt, and tighten it.

TORQUE: 1 N·m (0.1 kgf·m, 0.7 lbf·ft)

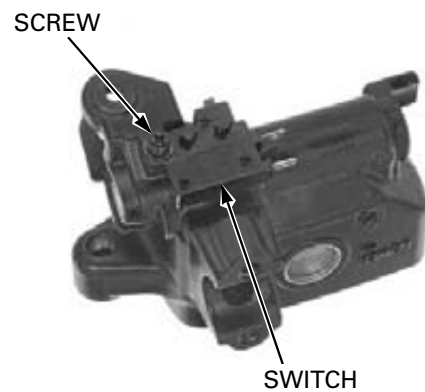
Install the nut and tighten it while holding the pivot bolt.

TORQUE: 5.9 N·m (0.6 kgf·m, 4.4 lbf·ft)



Install the brake light switch and tighten the screw.

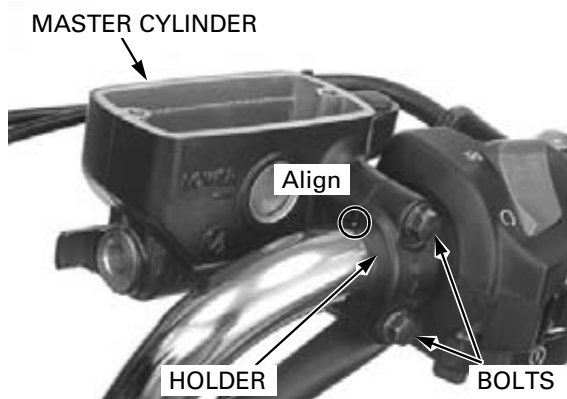
TORQUE: 1.2 N·m (0.1 kgf·m, 0.9 lbf·ft)



Install the master cylinder holder with its "UP" mark facing up.

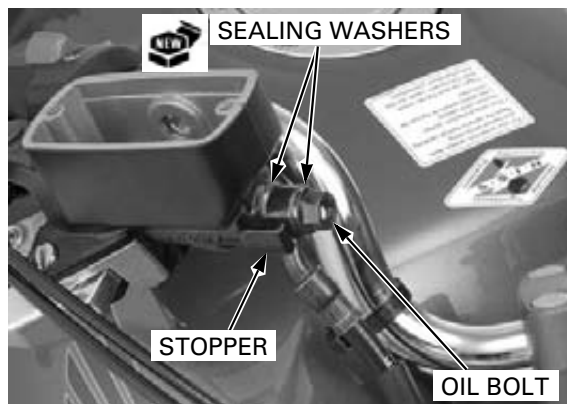
Install the master cylinder, holder and bolts. Align the edge of the master cylinder with the punch mark on the handlebar, and tighten the upper bolt first, then the lower bolt.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Connect the brake hose to the master cylinder with the oil bolt and new sealing washers. Tighten the oil bolt while holding the hose eyelet against the stopper.

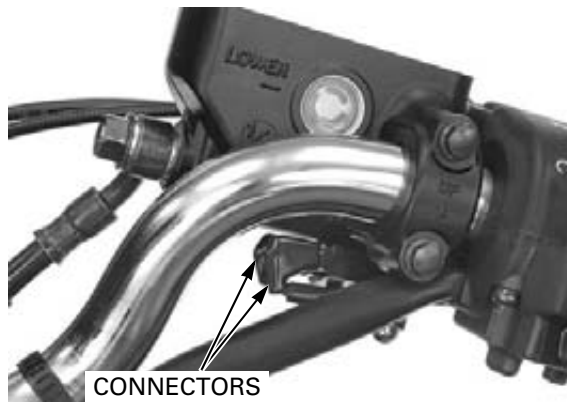
TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)



Connect the brake light switch wire connectors.

Fill and bleed the hydraulic system:

- CBF1000A (page 16-7)
- CBF1000 (page 16-13)

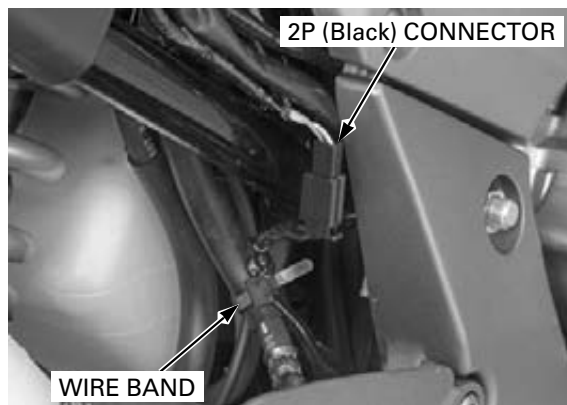


REAR MASTER CYLINDER/BRAKE PEDAL

REMOVAL

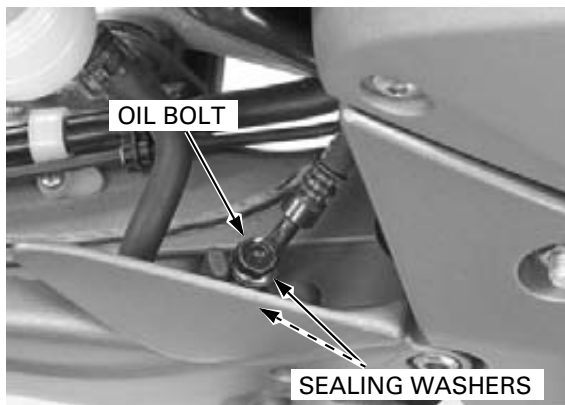
Drain the fluid from the brake hydraulic system (page 16-7).

Remove the wire band and disconnect the rear brake light switch 2P (black) connector.

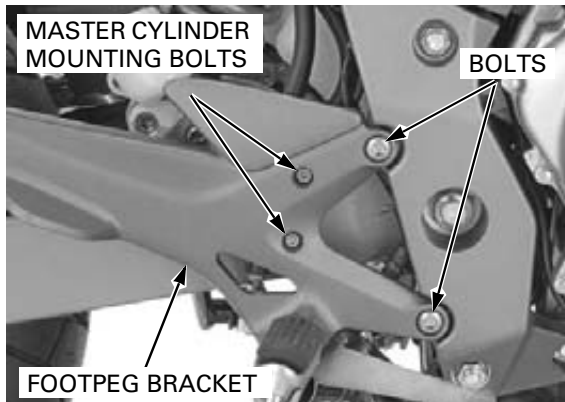


HYDRAULIC BRAKE

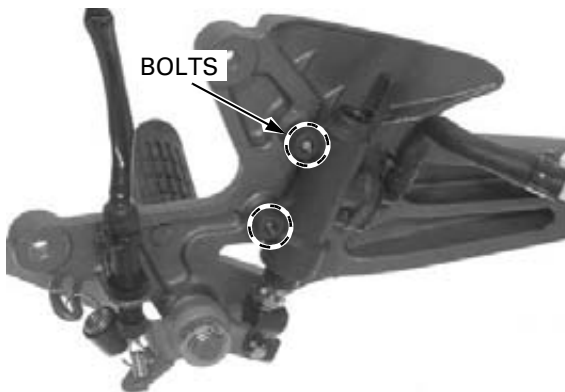
Remove the oil bolt and sealing washers.



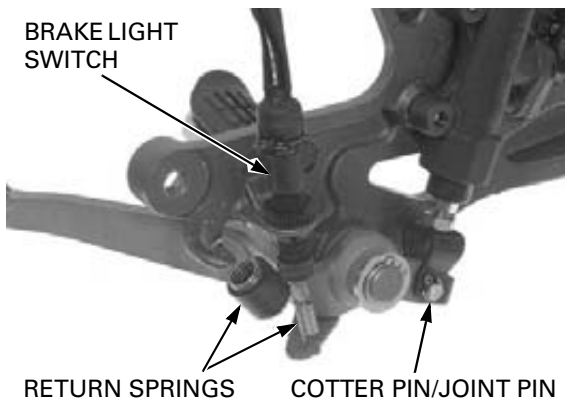
Remove the right muffler (page 3-12).
Loosen the rear master cylinder mounting bolts.
Remove the bolts and footpeg bracket.



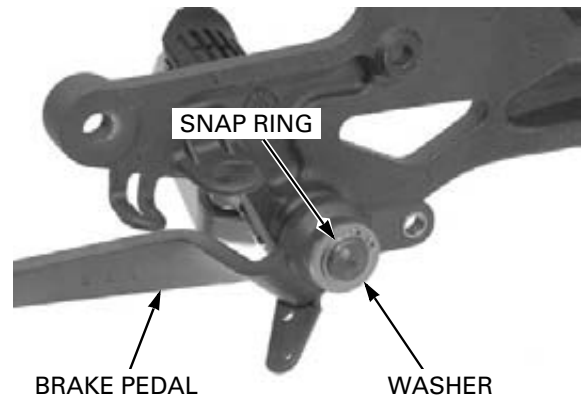
Remove the rear master cylinder mounting bolt.



Remove the return springs.
Remove the rear brake light switch.
Remove the cotter pin, joint pin and rear master cylinder.

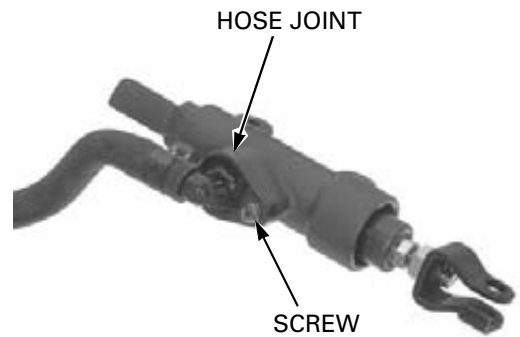


Remove the snap ring, washer and brake pedal.



MASTER CYLINDER DISASSEMBLY

Remove the screw and reservoir hose joint.



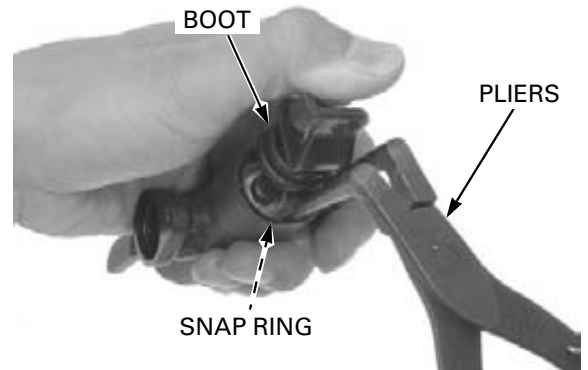
Pull the boot out of the master cylinder and remove the snap ring using the special tool.

TOOL:

Snap ring pliers

07914-SA50001

Remove the push rod, master piston, primary cup and spring.



INSPECTION

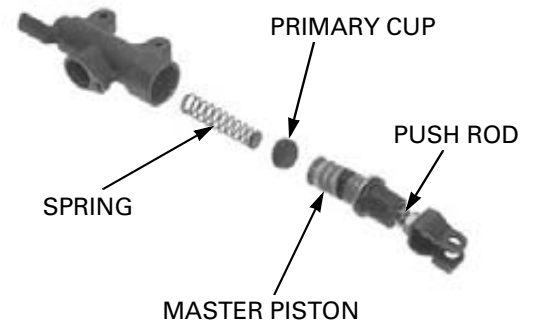
Clean inside of the master cylinder and the master piston with clean brake fluid.

Check the piston cups and boot for wear, deterioration or damage.

Check the spring for damage.

Check the master cylinder and piston for scoring, scratches or damage.

CBF1000A Shown:



HYDRAULIC BRAKE

CBF1000A: Measure the master cylinder I.D.

SERVICE LIMIT: 17.515 mm (0.6896 in)

Measure the master piston O.D.

SERVICE LIMIT: 17.405 mm (0.6852 in)



CBF1000: Measure the master cylinder I.D.

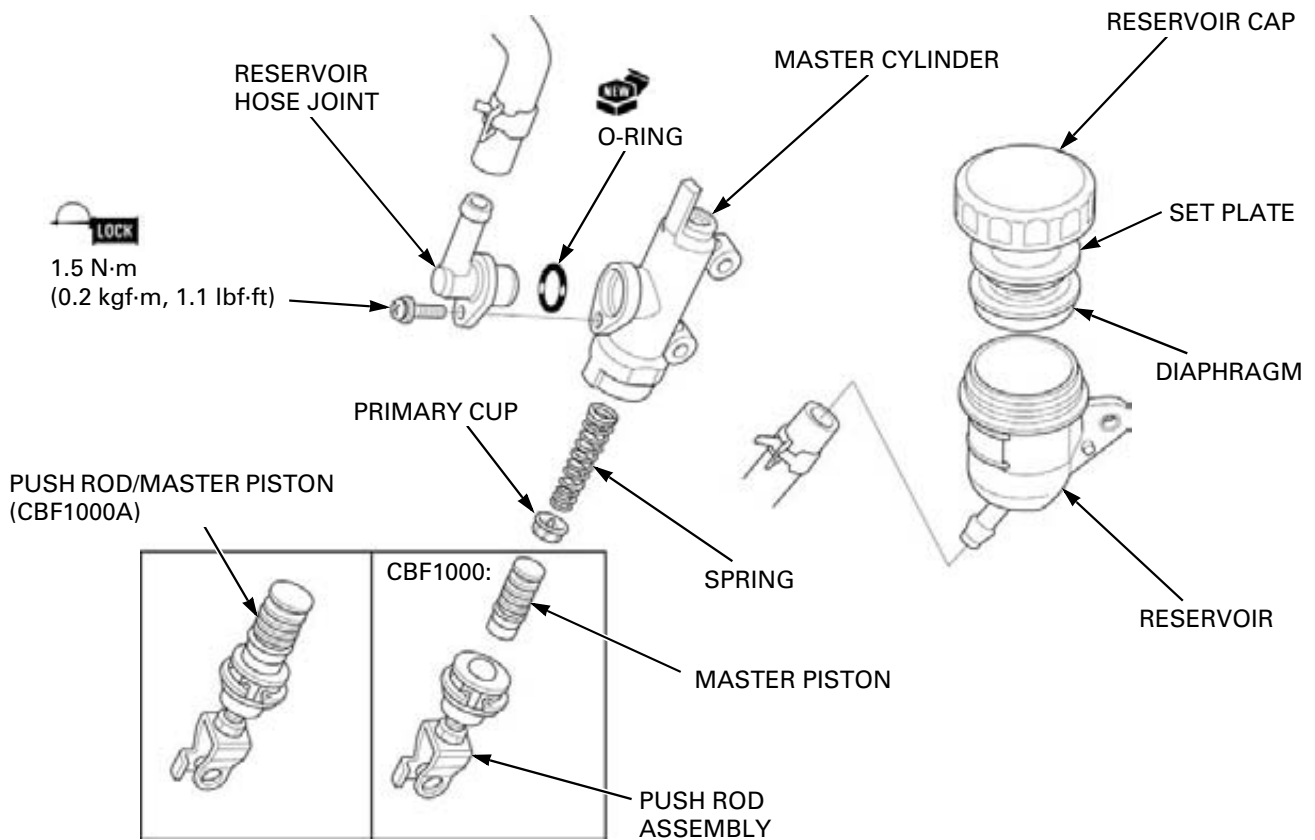
SERVICE LIMIT: 14.055 mm (0.5533 in)

Measure the master piston O.D.

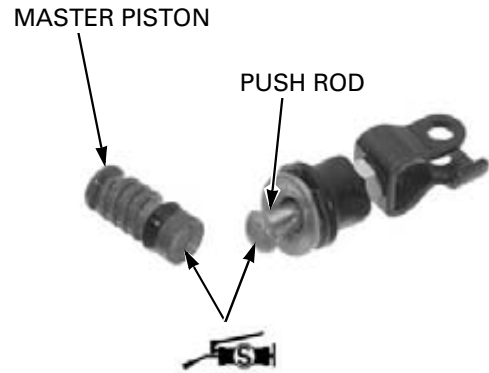
SERVICE LIMIT: 13.945 mm (0.5490 in)



MASTER CYLINDER ASSEMBLY



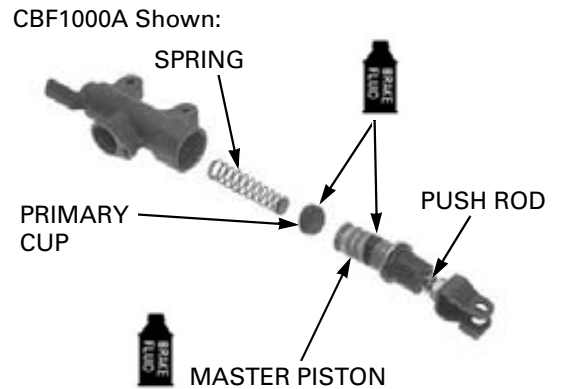
CBF1000: Apply silicone grease to the piston contacting surface of the push rod.



Coat the master piston and piston cups with clean brake fluid.
Install the primary cup onto the spring.

Do not allow the piston cup lips to turn inside out.

Install the spring and master piston with the push rod into the master cylinder.

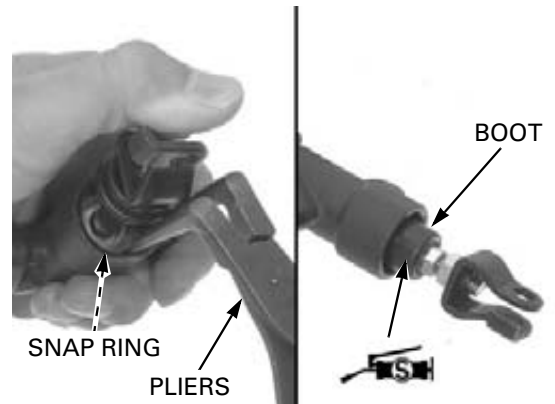


Make sure the snap ring is firmly seated in the groove.

Install the snap ring into the groove in the master cylinder.

TOOL:
Snap ring pliers **07914-SA50001**

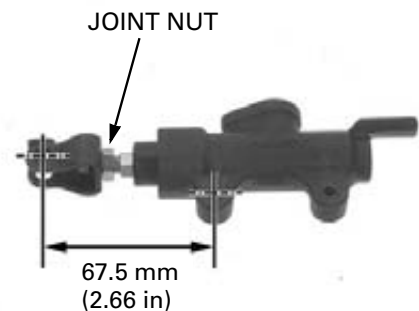
Apply silicone grease to the boot inside, and install the boot into the master cylinder.



If the push rod joint is reinstalled, adjust the push rod length so that the distance between the centers of the master cylinder lower mounting bolt hole and joint pin hole is 67.5 mm (2.66 in).

After adjustment, tighten the joint nut to the specified torque.

TORQUE: 17 N·m (1.7 kgf·m, 13 lbf·ft)

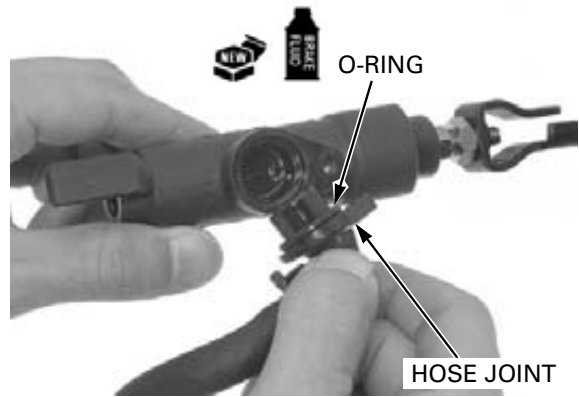


HYDRAULIC BRAKE

Coat a new O-ring with brake fluid and install it onto the reservoir hose joint. Install the hose joint into the master cylinder.

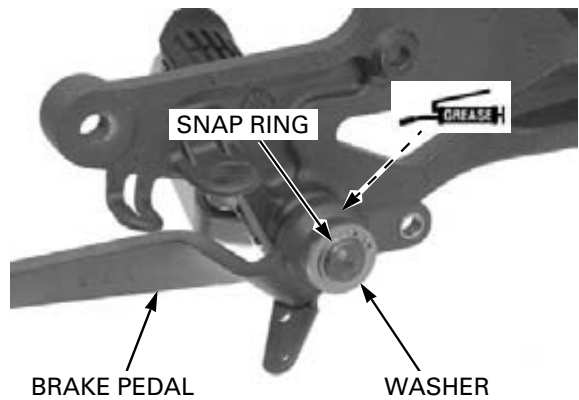
Apply a locking agent to the hose joint screw threads. Install the screw and tighten it.

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

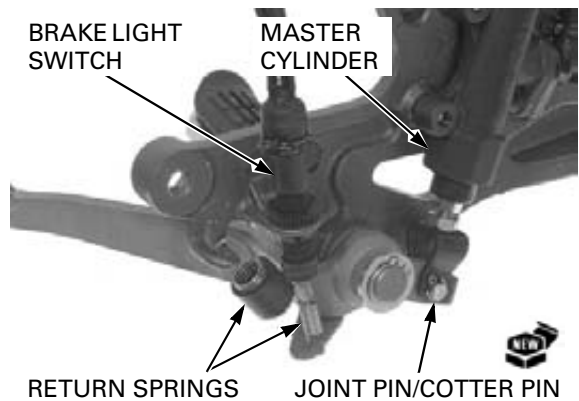


INSTALLATION

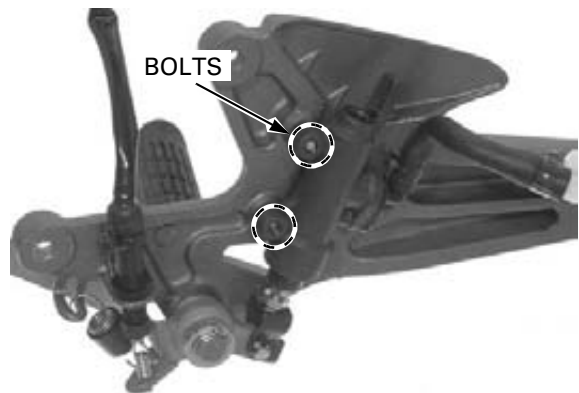
Apply grease to the groove in the pedal pivot. Install the brake pedal and secure it with the washer and snap ring.



Install the master cylinder onto the pedal with the joint pin and a new cotter pin. Install the rear brake light switch into the stay on the bracket. Install the switch spring and brake pedal return spring in the direction as shown.



Install the rear master cylinder mounting bolts.

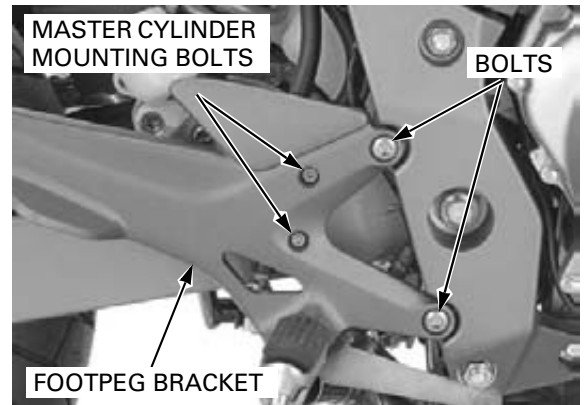


Install the right footpeg bracket and mounting bolts, then tighten the bolts to the specified torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)

Tighten the master cylinder mounting bolts to the specified torque.

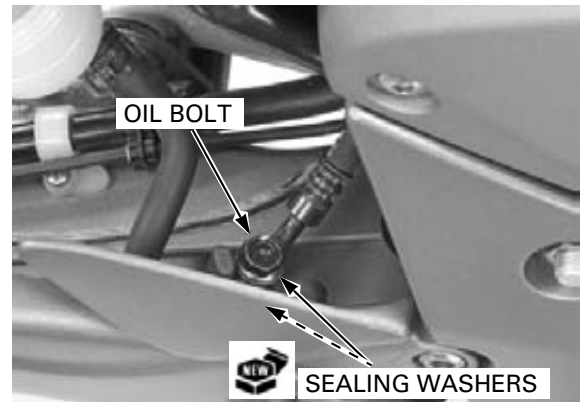
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Connect the brake hose to the rear master cylinder with the oil bolt and new sealing washers.

Tighten the oil bolt while holding the stopper of the hose eyelet against the master cylinder.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

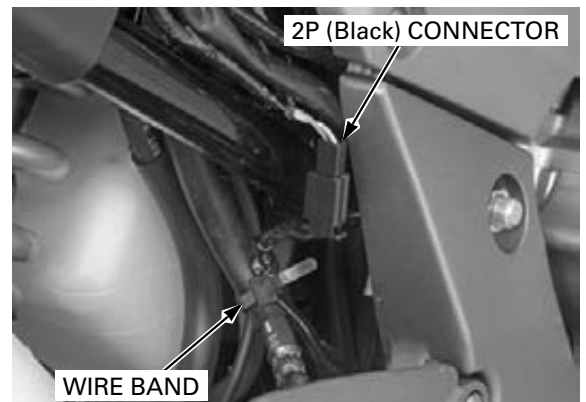


Connect the rear brake light switch 2P (black) connector.

Secure the brake light switch wire and brake hose with the wire band.

Fill and bleed the hydraulic system:

- CBF1000A (page 16-7)
- CBF1000 (page 16-13)



FRONT BRAKE CALIPER (CBF1000A)

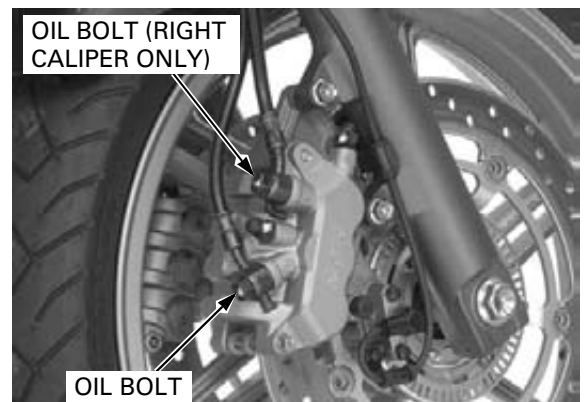
REMOVAL

Drain the brake fluid from the hydraulic system (page 16-7).

Remove the brake pads (page 16-15).

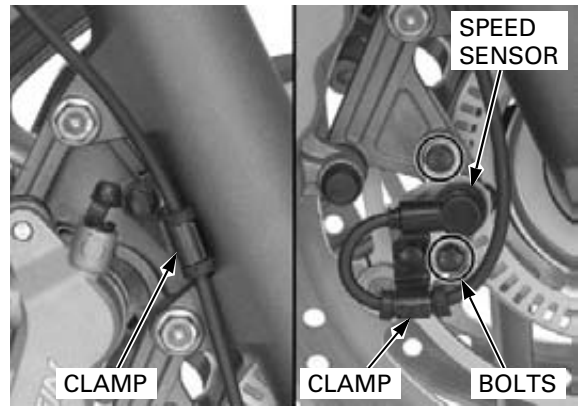
Remove the oil bolts and sealing washers.

When removing the oil bolt, cover the end of the hose to prevent contamination.

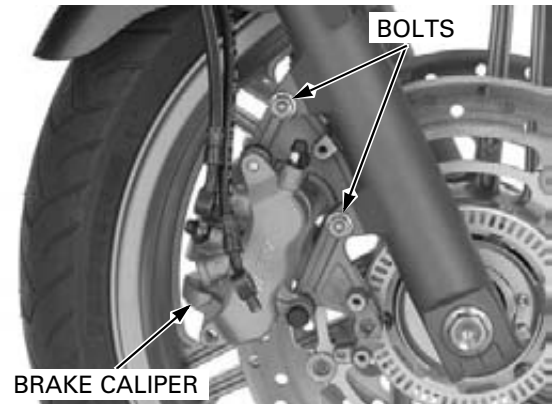


HYDRAULIC BRAKE

Right caliper only: Remove the bolts and sensor wire clamps. Remove the mounting bolts and wheel speed sensor from the caliper bracket.



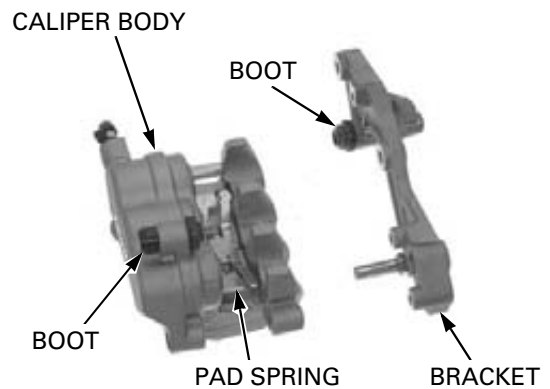
Remove the mounting bolts and brake caliper.



DISASSEMBLY

Remove the caliper bracket from the caliper body. Remove the pad spring and bracket pin boot from the caliper body. Remove the caliper pin boot from the caliper bracket.

If the caliper pin boot and bracket pin boot are hard, damaged or deteriorated, replace them with new ones.



Place a shop towel over the pistons.

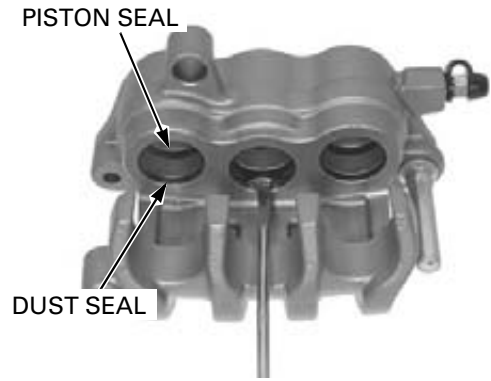
Do not use high pressure air or bring the nozzle too close to the inlet. Position the caliper body with the pistons facing down and apply small squirts of air pressure to the fluid inlet to remove the pistons.



Be careful not to damage the piston sliding surface.

Push the dust seals 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 and pistons for scoring, scratches or damage.

Measure each caliper cylinder I.D.

SERVICE LIMIT: 22.710 mm (0.8941 in)



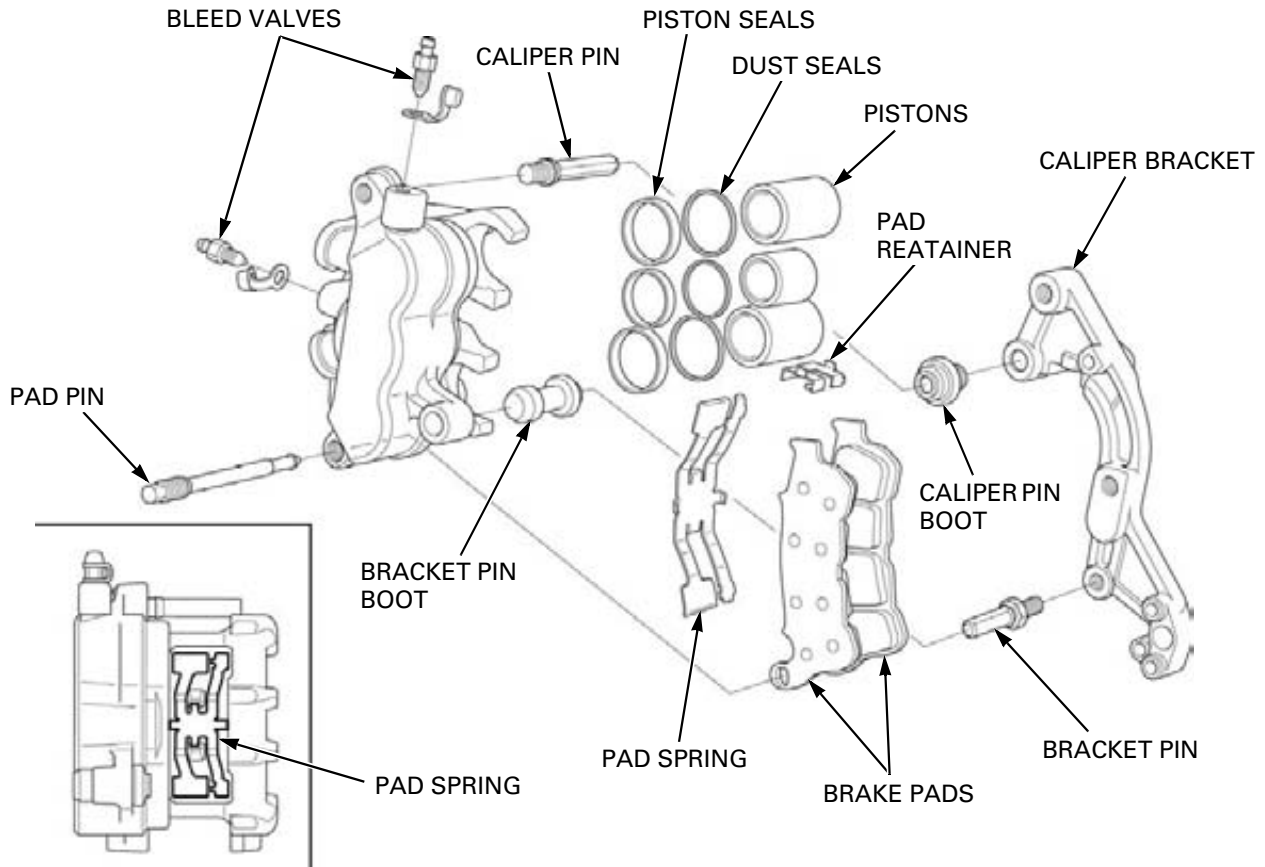
Measure each caliper piston O.D.

SERVICE LIMIT: 22.560 mm (0.8882 in)



HYDRAULIC BRAKE

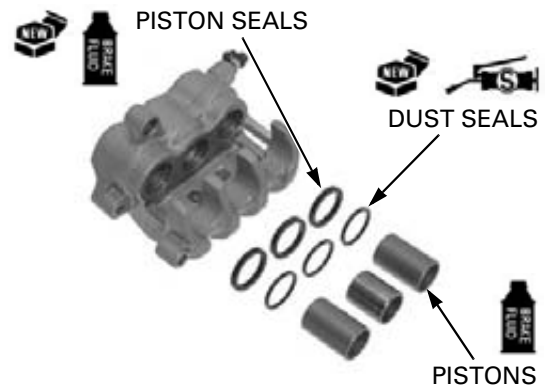
ASSEMBLY



Coat new piston seals with clean brake fluid and install them into the seal grooves in the caliper. Coat new dust seals with silicone grease and install them into the seal grooves in the caliper.

Install the shorter piston into the center cylinder.

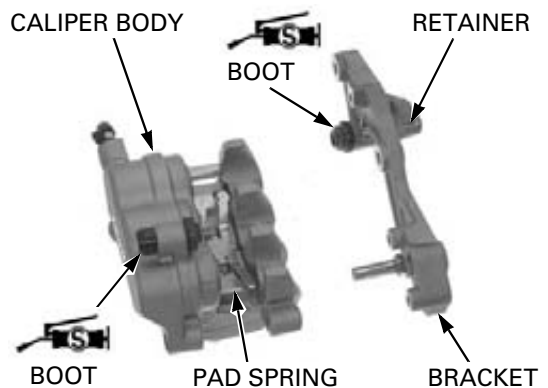
Coat the caliper pistons with clean brake fluid and install them into the caliper cylinders with the opening toward the pads.



Install the boots into the caliper and bracket.

Note the installation direction of the pad spring.

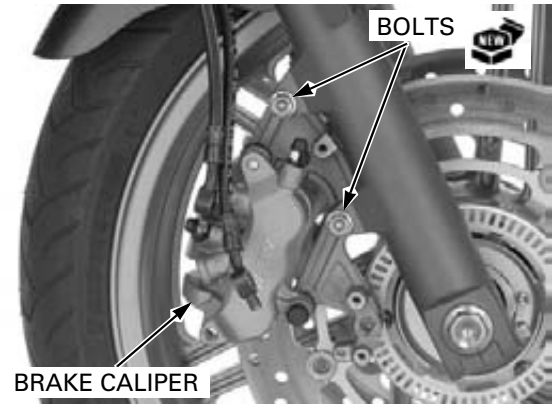
Install the pad spring onto the caliper body properly. Check that the pad retainer is in place on the caliper bracket. Apply silicone grease to the inside of the boots and the slide pins. Install the caliper bracket over the caliper body.



INSTALLATION

Install the brake caliper with new mounting bolts. Tighten the mounting bolts to the specified torque.

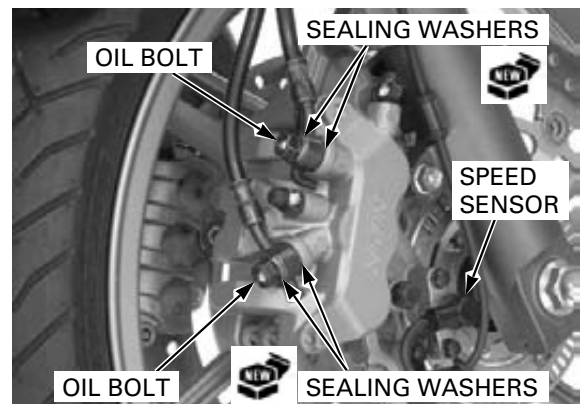
TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)



Connect the brake hose to the caliper with the oil bolt and new sealing washers, and tighten the oil bolt.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

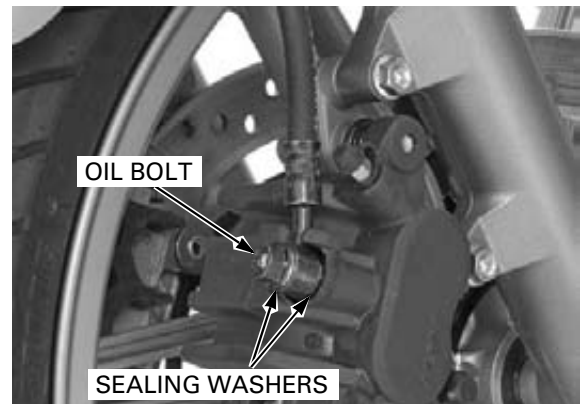
Install the brake pads (page 16-15).
Install the wheel speed sensor (page 17-25).
Fill and bleed the hydraulic system (page 16-7).



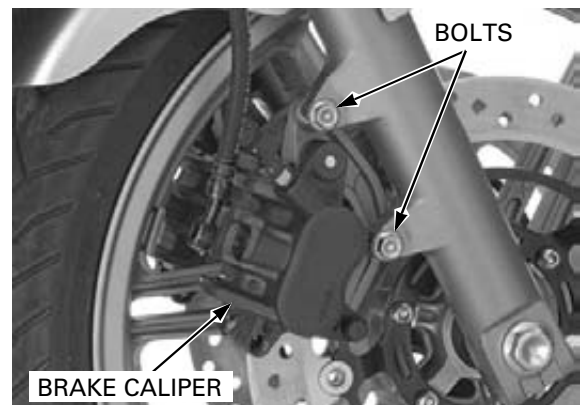
FRONT BRAKE CALIPER (CBF1000)

REMOVAL

Drain the brake fluid from the front brake hydraulic system (page 16-13).
Remove the brake pads (page 16-16).
Remove the oil bolt and sealing washers.



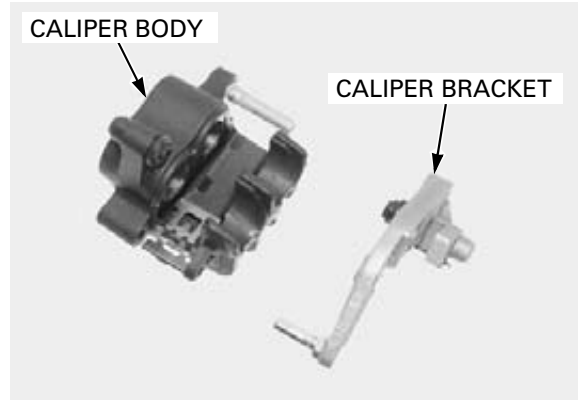
Remove the mounting bolts and brake caliper.



HYDRAULIC BRAKE

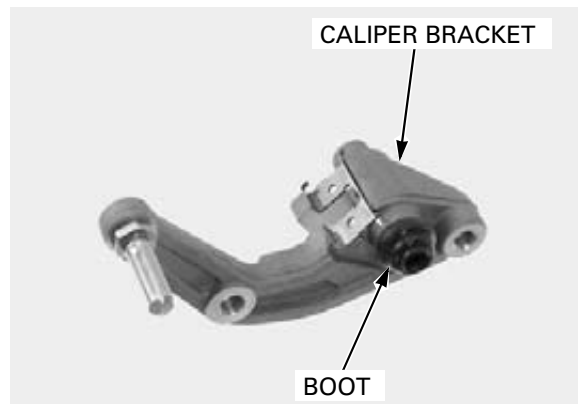
DISASSEMBLY

Remove the caliper bracket from the caliper body.



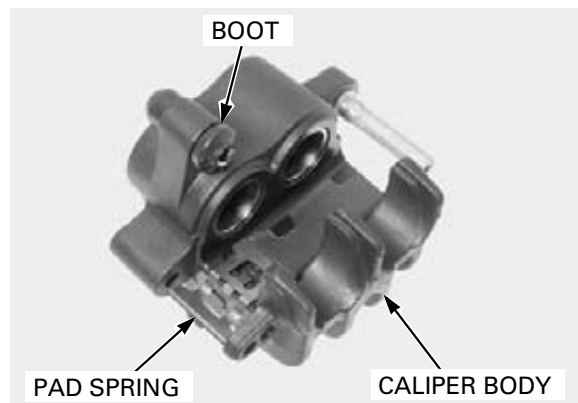
Remove the caliper pin boot from the caliper bracket.

If the caliper pin boot is hard or deteriorated, replace it with a new one.



Remove the pad spring and bracket pin boot from the caliper body.

If the bracket pin boot is hard or deteriorated, replace it with a new one.



Place a shop towel over the pistons.

Do not use high pressure air or bring the nozzle too close to the inlet.

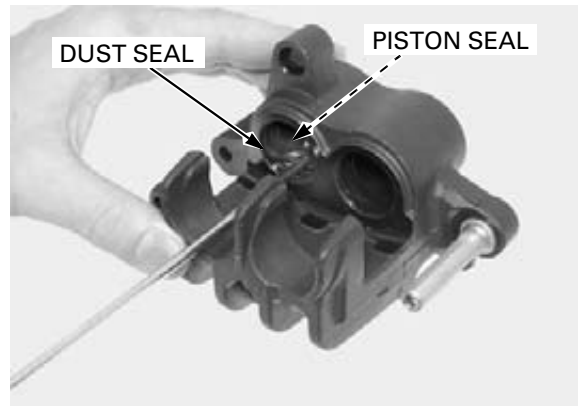
Position the caliper body with the pistons facing down and apply small squirts of air pressure to the fluid inlet to remove the pistons.



Be careful not to damage the piston sliding surface.

Push the dust seals 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 and pistons for scoring, scratches or damage.

Measure each caliper cylinder I.D.

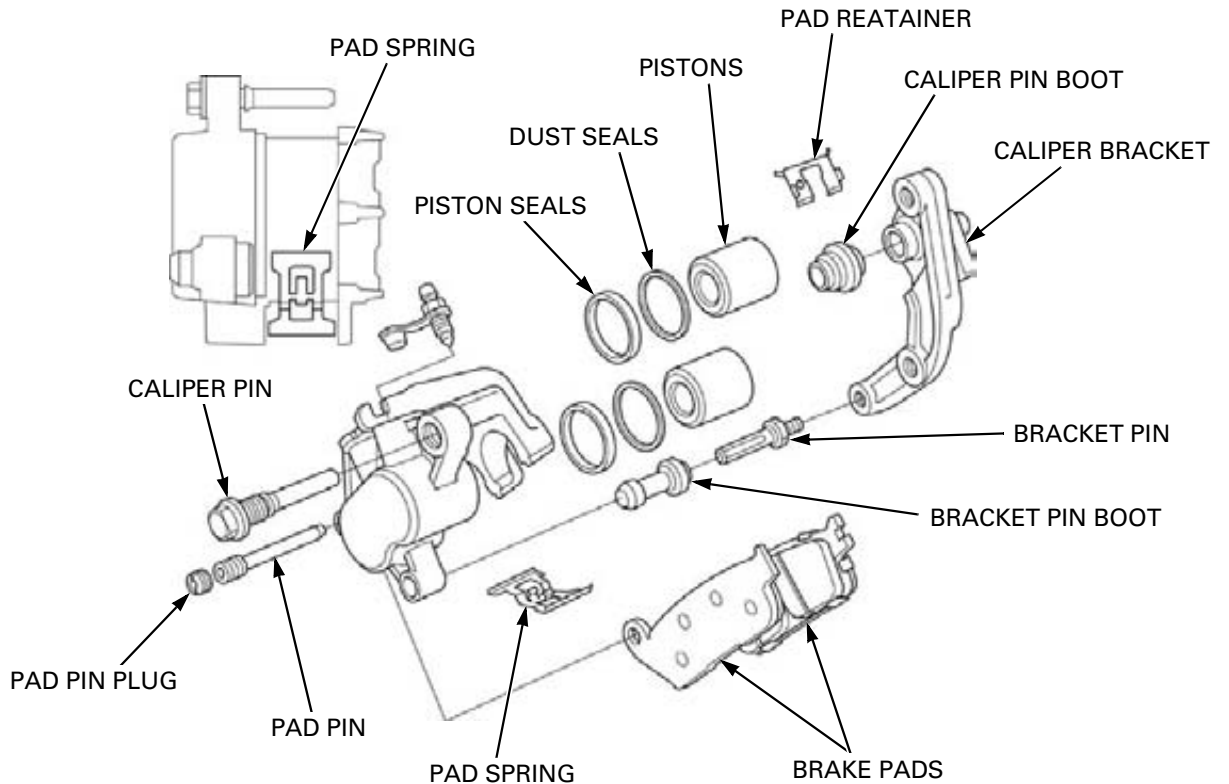
SERVICE LIMIT: 25.460 mm (1.0024 in)

Measure each caliper piston O.D.

SERVICE LIMIT: 25.310 mm (0.9965 in)



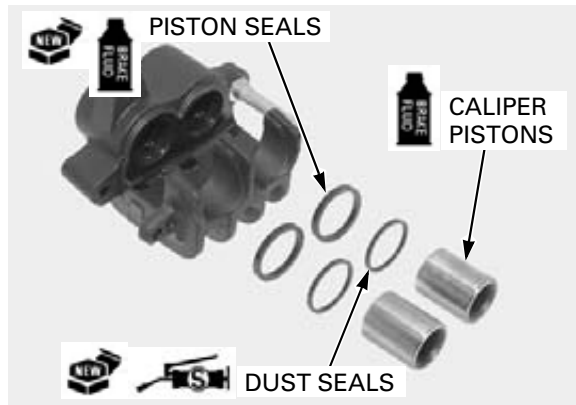
ASSEMBLY



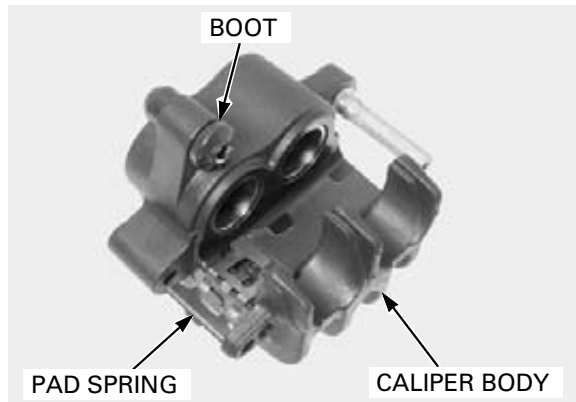
HYDRAULIC BRAKE

Coat new piston seals with clean brake fluid and install them into the seal grooves in the caliper. Coat new dust seals with silicone grease and install them into the seal grooves in the caliper.

Install the shorter piston into the center cylinder. Coat the caliper pistons with clean brake fluid and install them into the caliper cylinders with the opening toward the pads.

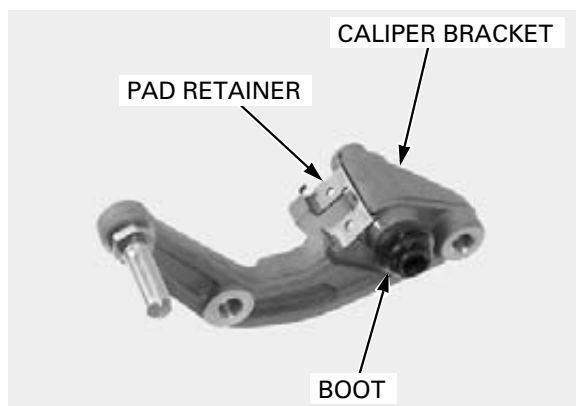


Note the installation direction of the pad spring. Install the pad spring in the caliper body. Install the bracket pin boot into the caliper body.



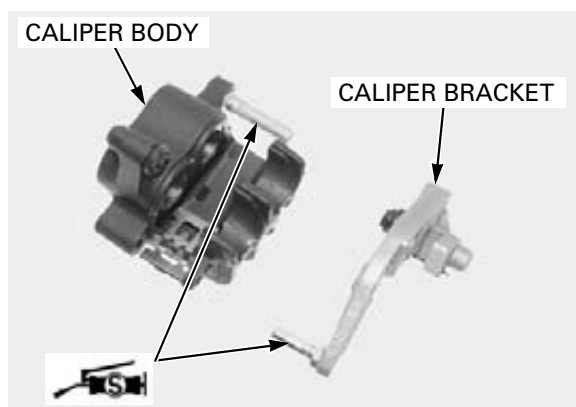
Check that the pad retainer is in place on the caliper bracket.

Install the caliper pin boot into the caliper bracket.



Apply silicone grease to the inside of the boots and the slide pins.

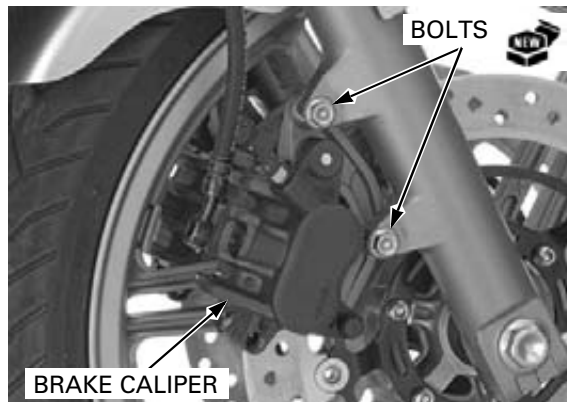
Install the caliper bracket over the caliper body.



INSTALLATION

Install the brake caliper with new mounting bolts. Tighten the mounting bolts to the specified torque.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

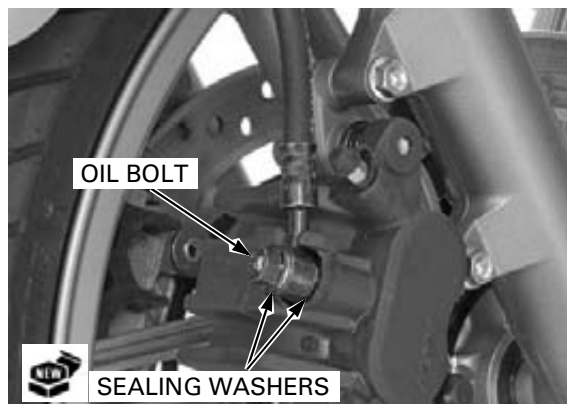


Hold the brake hose in the stopper groove on the caliper.

Connect the brake hose to the caliper with the oil bolt and new sealing washers.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the hydraulic system (page 16-14).



REAR BRAKE CALIPER (CBF1000A)

REMOVAL

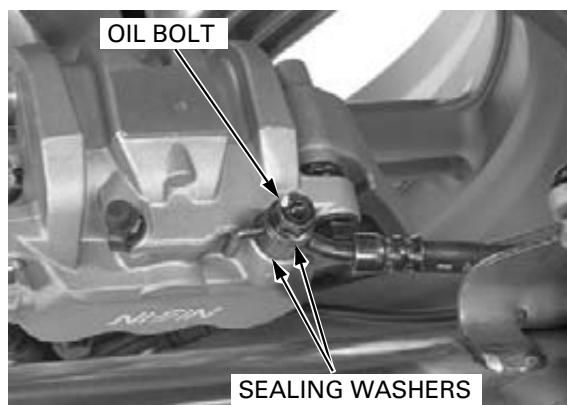
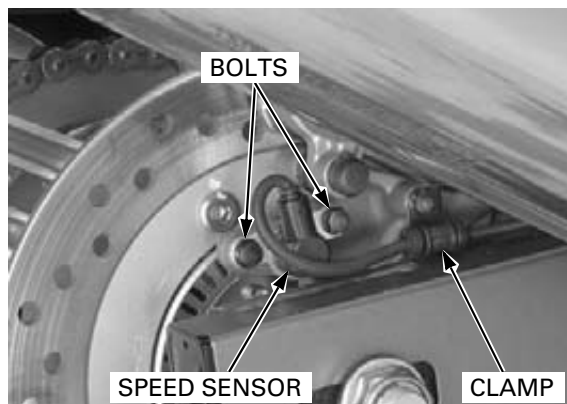
Drain the brake fluid from the hydraulic system (page 16-7).

Remove the rear brake pads (page 16-17).

Remove the bolt and sensor wire clamp. Remove the mounting bolts and speed sensor from the caliper bracket.

When removing the oil bolt, cover the end of the hose to prevent contamination.

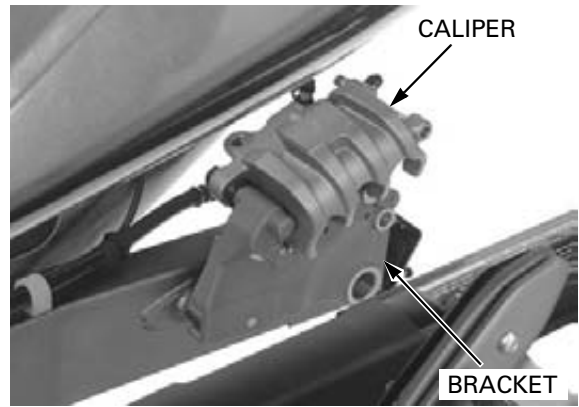
Remove the brake hose oil bolt and sealing washers.



HYDRAULIC BRAKE

Remove the rear wheel (page 15-6).

Remove the rear brake caliper with the caliper bracket.

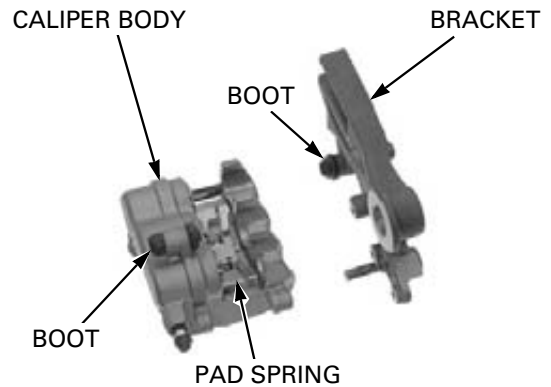


DISASSEMBLY

Remove the caliper bracket from the caliper body.
Remove the pad spring and bracket pin boot from the caliper body.

Remove the caliper pin boot from the caliper bracket.

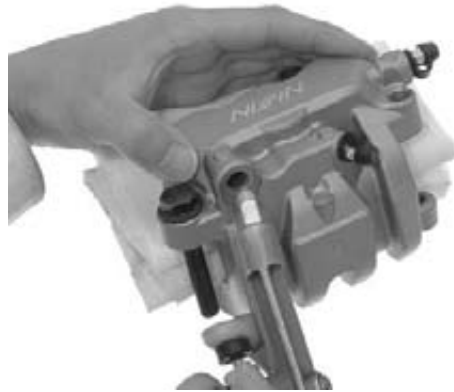
If the boots are hard, damaged or deteriorated, replace them with new ones.



Place a shop towel over the pistons.

Do not use high pressure air or bring the nozzle too close to the inlet.

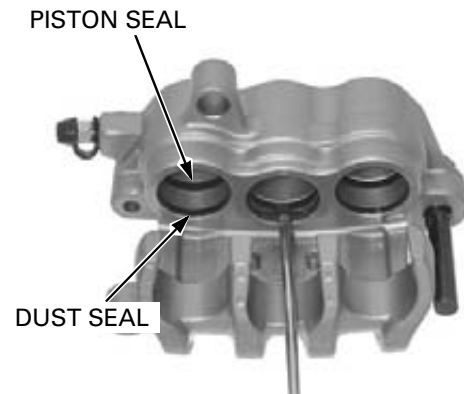
Position the caliper body with the piston facing down and apply small squirts of air pressure to the fluid inlet to remove the piston.



Be careful not to damage the piston sliding surface.

Push the dust seals 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 and pistons for scoring, scratches or damage.

Measure each caliper cylinder I.D.

SERVICE LIMIT: 25.460 mm (1.0024 in)

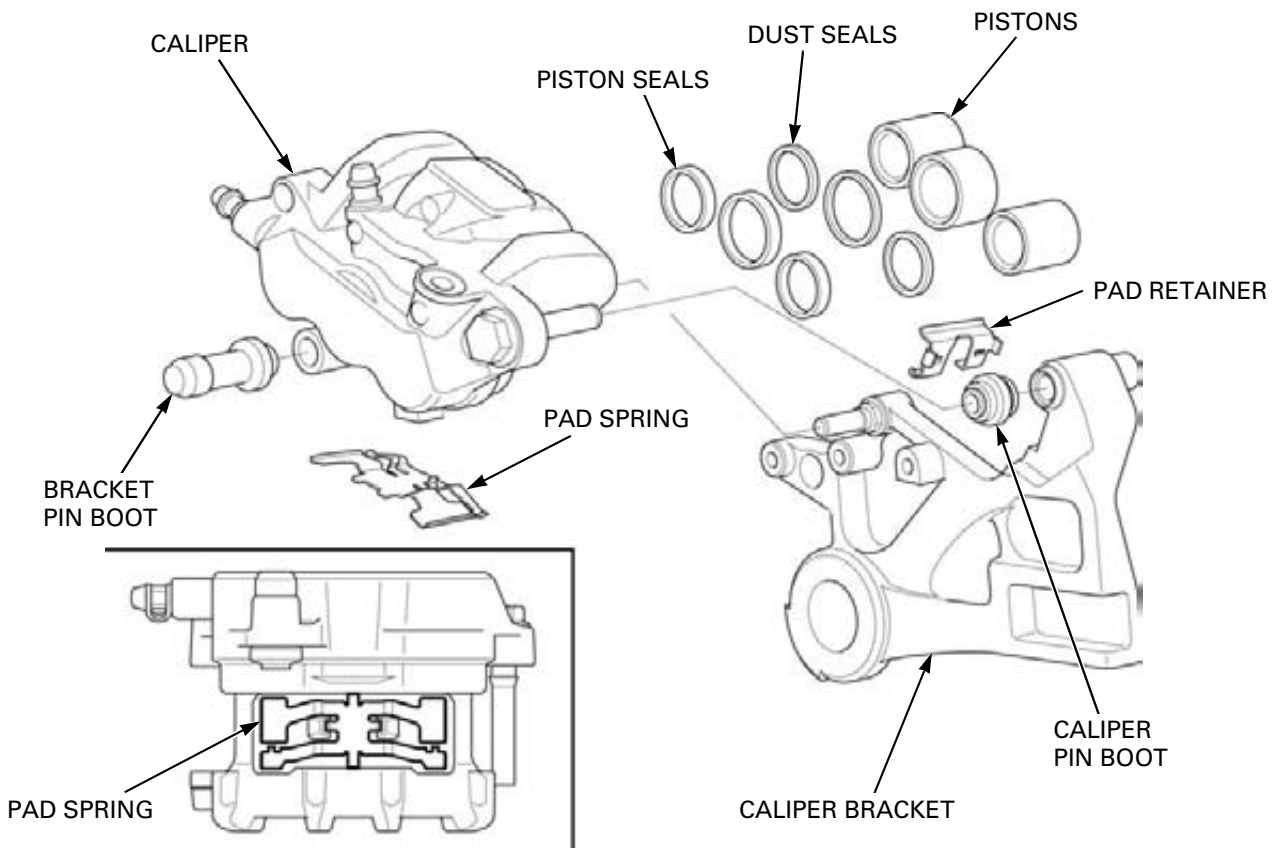


Measure each caliper piston O.D.

SERVICE LIMIT: 25.310 mm (0.9965 in)



ASSEMBLY

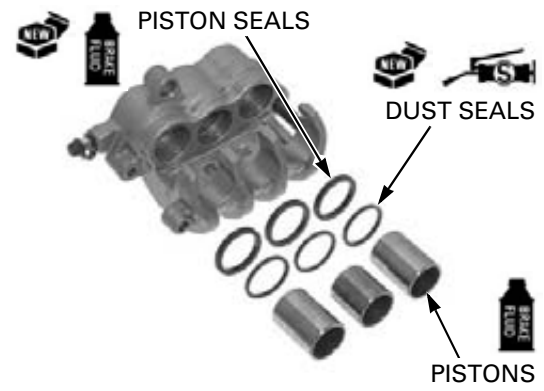


HYDRAULIC BRAKE

Coat new piston seals with clean brake fluid and install them in the seal grooves in the caliper.
Coat new dust seals with silicone grease and install them in the seal grooves in the caliper.

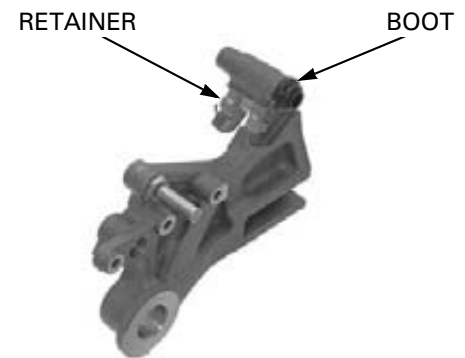
Install the shorter piston into the center cylinder.

Coat the caliper pistons with clean brake fluid and install them into the caliper cylinders with the opening toward the pads.

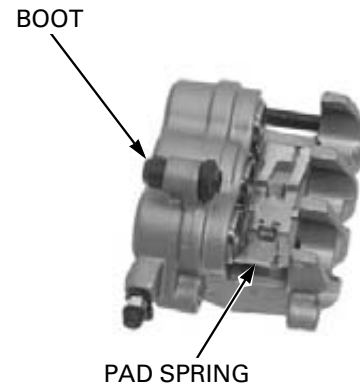


Check that the pad retainer is in place on the caliper bracket.

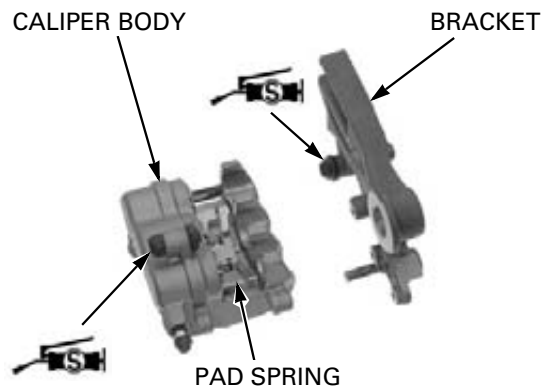
Install the boot into the caliper bracket.



Install the boot into the caliper.
Install the pad spring onto the caliper body properly as shown.

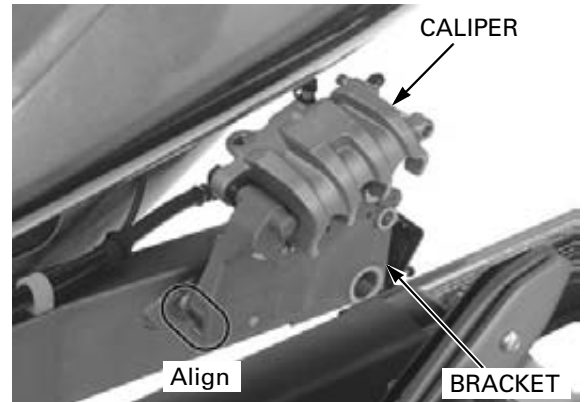


Apply silicone grease to the inside of the boots and the slide pins.
Install the caliper bracket over the caliper body.
Install the caliper body onto the bracket.



INSTALLATION

Install the rear brake caliper by aligning the caliper bracket groove with the lug on the swingarm.



Install the rear wheel (page 15-12).

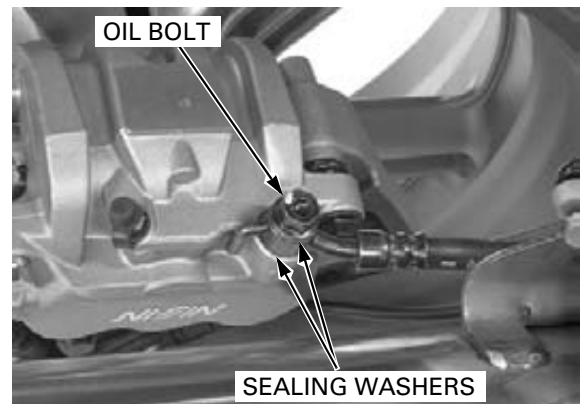
Connect the brake hose to the caliper with the oil bolt and new sealing washers, and tighten the oil bolt.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Install the rear brake pads (page 16-17).

Install the rear wheel speed sensor (page 17-26).

Fill and bleed the brake hydraulic system (page 16-7).

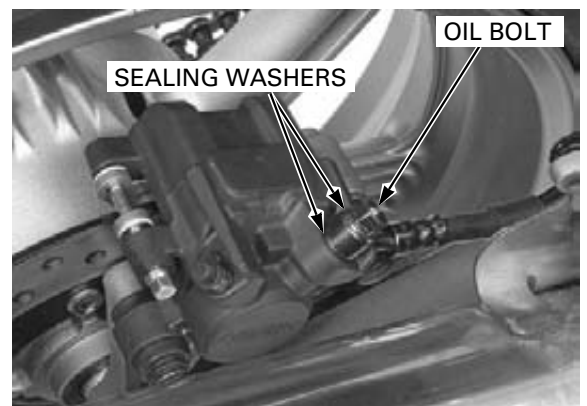


REAR BRAKE CALIPER (CBF1000)

REMOVAL

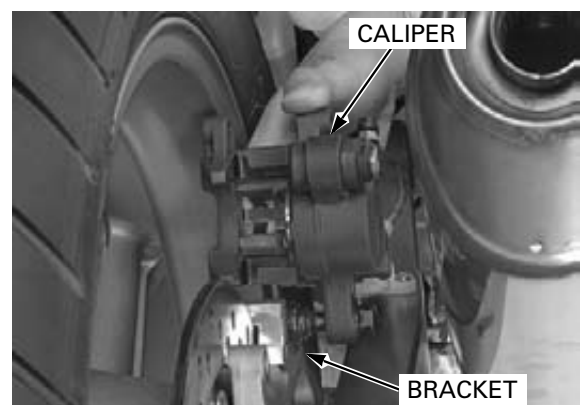
Drain the rear brake hydraulic system (page 16-13).

Remove the oil bolt and sealing washers.



Remove the rear brake pads (page 16-18).

Pivot the caliper up and slide it outward, then remove it from the caliper bracket.

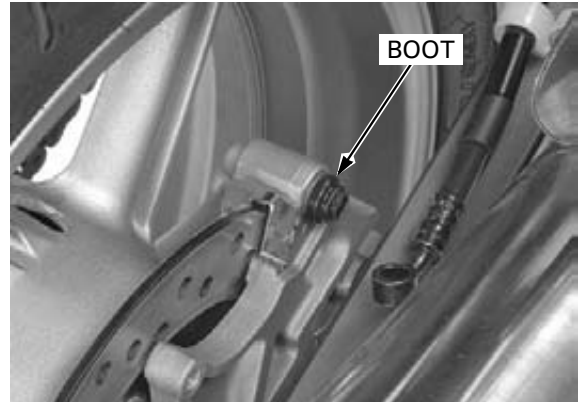


HYDRAULIC BRAKE

DISASSEMBLY

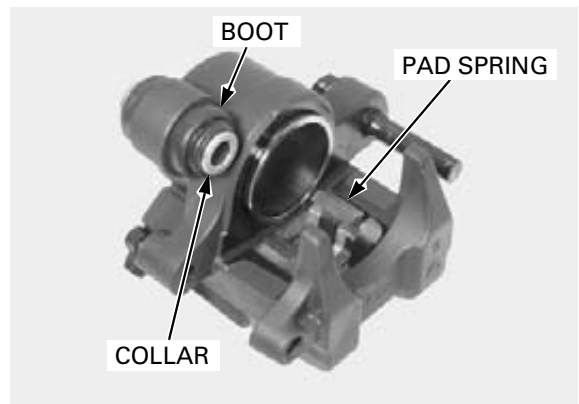
Remove the caliper main slide pin boot from the caliper bracket.

If the caliper main slide pin boot is hard or deteriorated, replace it with new one.



Remove the pad spring, collar and caliper sub slide pin boot from the caliper body.

If the caliper sub slide pin boot is hard or deteriorated, replace it with a new one.



Place a shop towel over the piston.

Do not use high pressure air or bring the nozzle too close to the inlet.

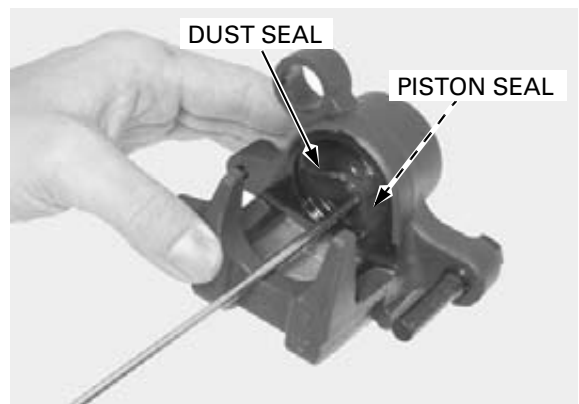
Position the caliper body with the piston down and apply small squirts of air pressure to the fluid inlet to remove the piston.



Be careful not to damage the piston sliding surface.

Push the dust seal and piston seal in and lift them out.

Clean the seal grooves, caliper cylinder and piston with clean brake fluid.



INSPECTION

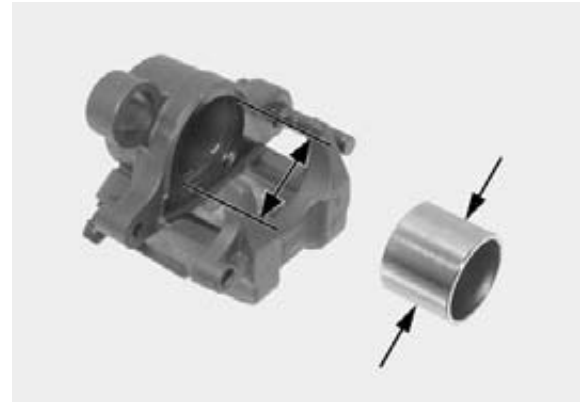
Check the caliper cylinder and piston for scoring, scratches or damage.

Measure the caliper cylinder I.D.

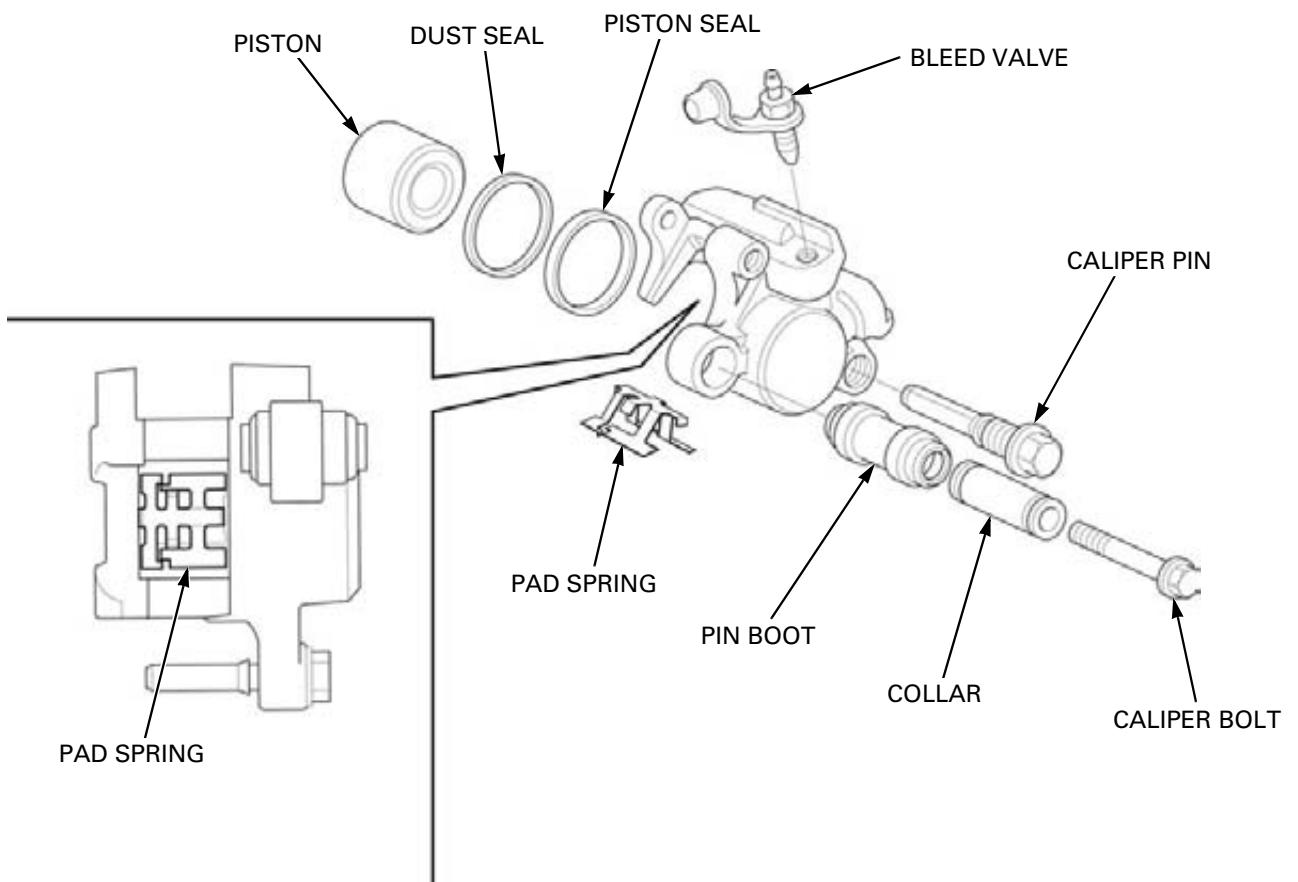
SERVICE LIMIT: 38.24 mm (1.506 in)

Measure the caliper piston O.D.

SERVICE LIMIT: 38.09 mm (1.500 in)



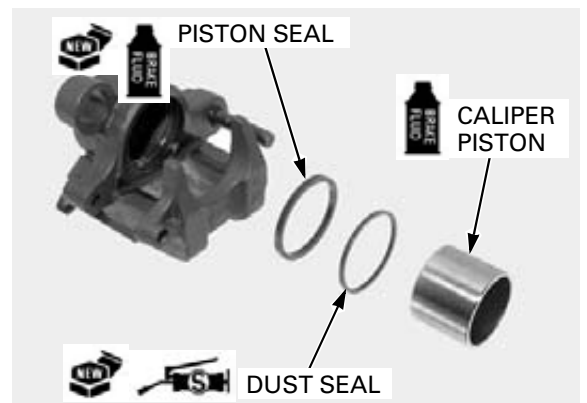
ASSEMBLY



Coat new piston seal with clean brake fluid and install it in the seal groove in the caliper.
 Coat new dust seal with silicone grease and install it in the seal groove in the caliper.

Install the shorter piston into the center cylinder.

Coat the caliper piston with clean brake fluid and install it into the caliper cylinder with the opening toward the pads.

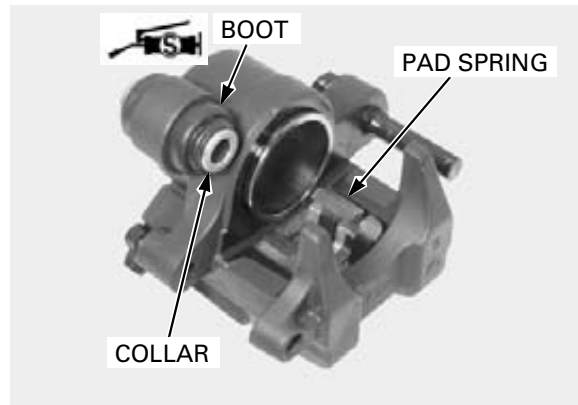


HYDRAULIC BRAKE

Install the pad spring onto the caliper body.

Apply silicone grease to the inside of the caliper sub slide pin boot.

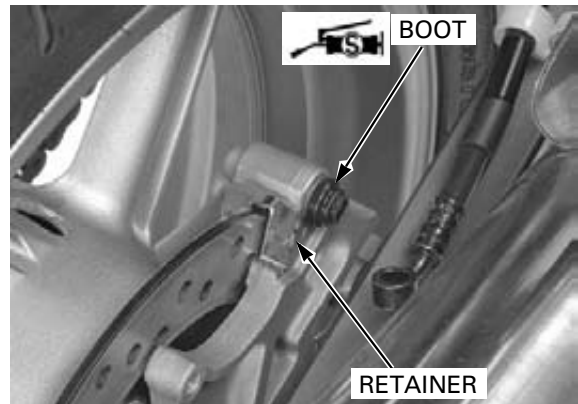
Install the caliper sub slide pin boot and collar into the caliper body.



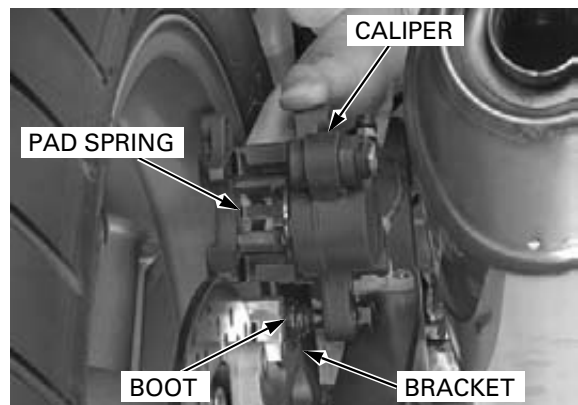
INSTALLATION

Check that the pad retainer is in place on the caliper bracket.

Apply silicone grease to the inside of the boot and install the boot into the bracket.



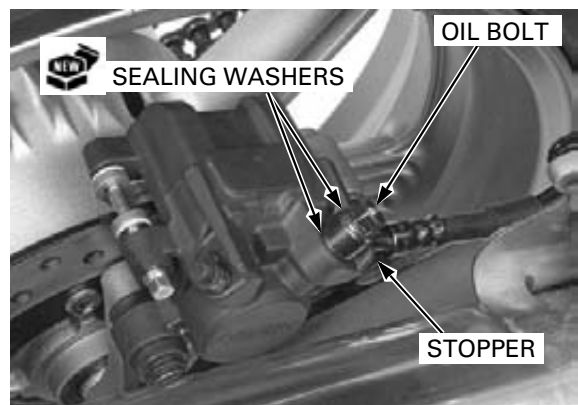
Be careful not to come the pad spring off from the caliper. Install the caliper main slide pin into the boot on the caliper bracket.



Hold the brake hose in the stopper groove on the caliper. Connect the brake hose to the rear caliper 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)

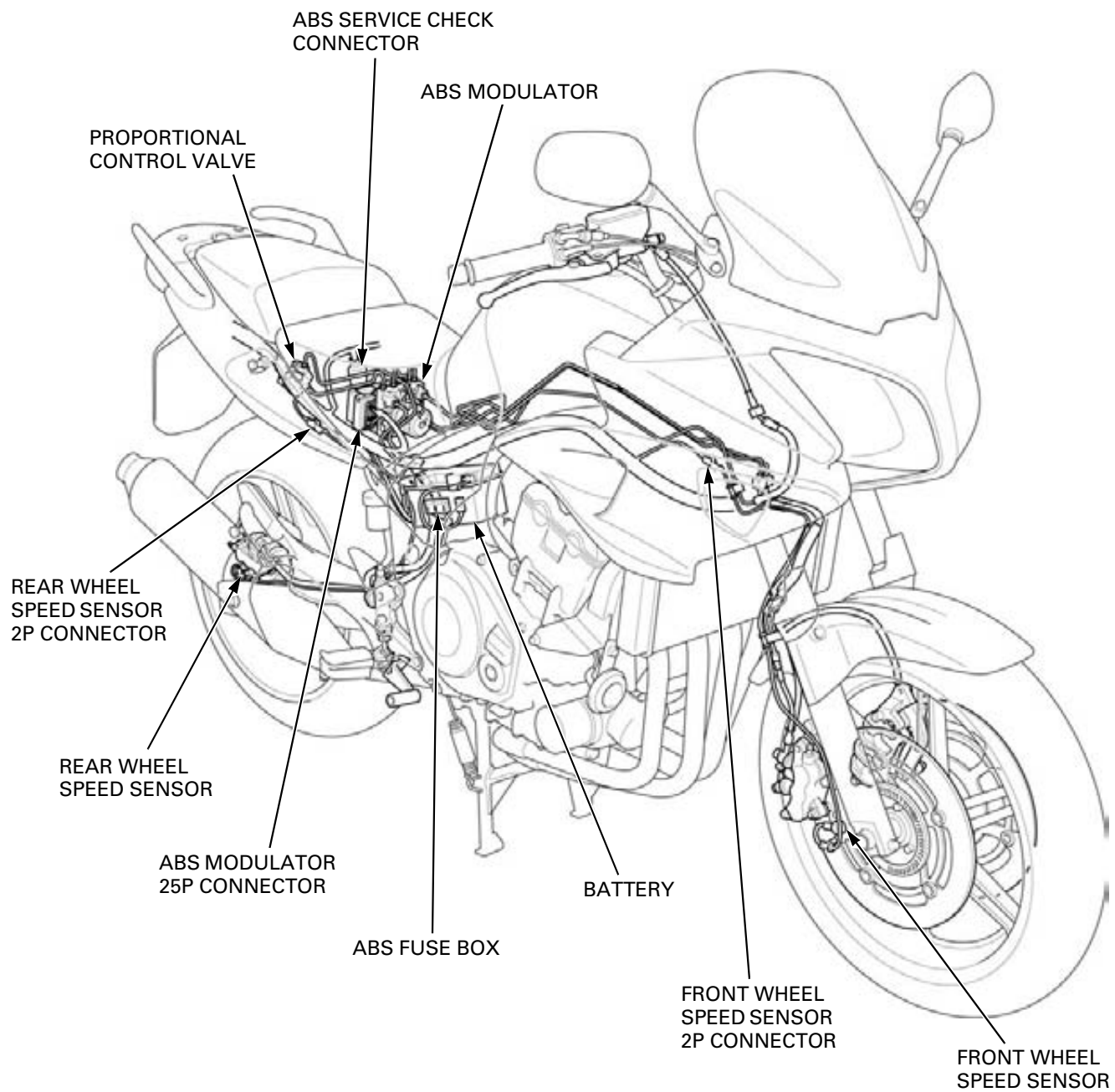
Fill and bleed the rear hydraulic system (page 16-14).



17. ANTI-LOCK BRAKE SYSTEM (ABS; CBF1000A)

ABS SYSTEM LOCATION	17-2	ABS TROUBLESHOOTING	17-12
ABS SYSTEM DIAGRAM	17-3	ABS INDICATOR CIRCUIT TROUBLESHOOTING.....	17-22
SERVICE INFORMATION	17-4	WHEEL SPEED SENSOR.....	17-25
ABS CONNECTOR LOCATIONS	17-5	ABS MODULATOR.....	17-27
ABS TROUBLESHOOTING INFORMATION	17-7	PROPORTIONAL CONTROL VALVE (PCV)	17-29
ABS PROBLEM CODE INDEX	17-11		

ABS SYSTEM LOCATION



ANTI-LOCK BRAKE SYSTEM (ABS; CBF1000A)

SERVICE INFORMATION

GENERAL

- This section covers service of the Anti-lock Brake System (ABS). For conventional brake service 16-2.
- 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

ABS modulator lower mounting bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	ALOC bolt; replace with new one.
ABS modulator left mounting bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Rear brake pipe stay bolt	12 N·m (1.2 kgf·m 9 lbf·ft)	
Front brake hose joint bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Wheel speed sensor mounting bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Front wheel speed sensor wire clamp bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	ALOC bolt; replace with a new one.
Brake pipe joint nut	17 N·m (1.7 kgf·m, 13 lbf·ft)	Apply brake fluid to the threads.

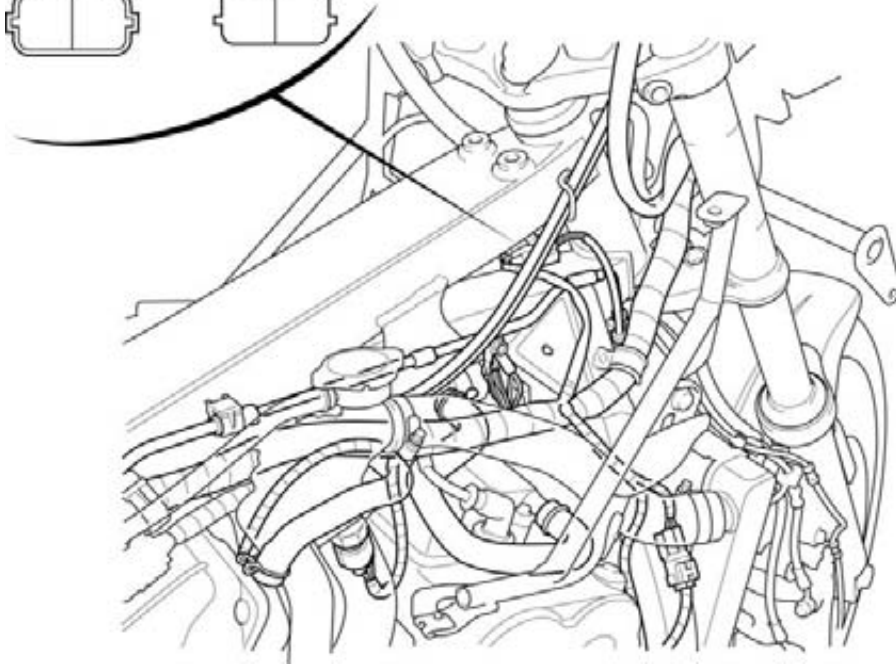
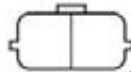
ABS CONNECTOR LOCATIONS

NOTE 1: Lift and support the fuel tank (page 4-5).

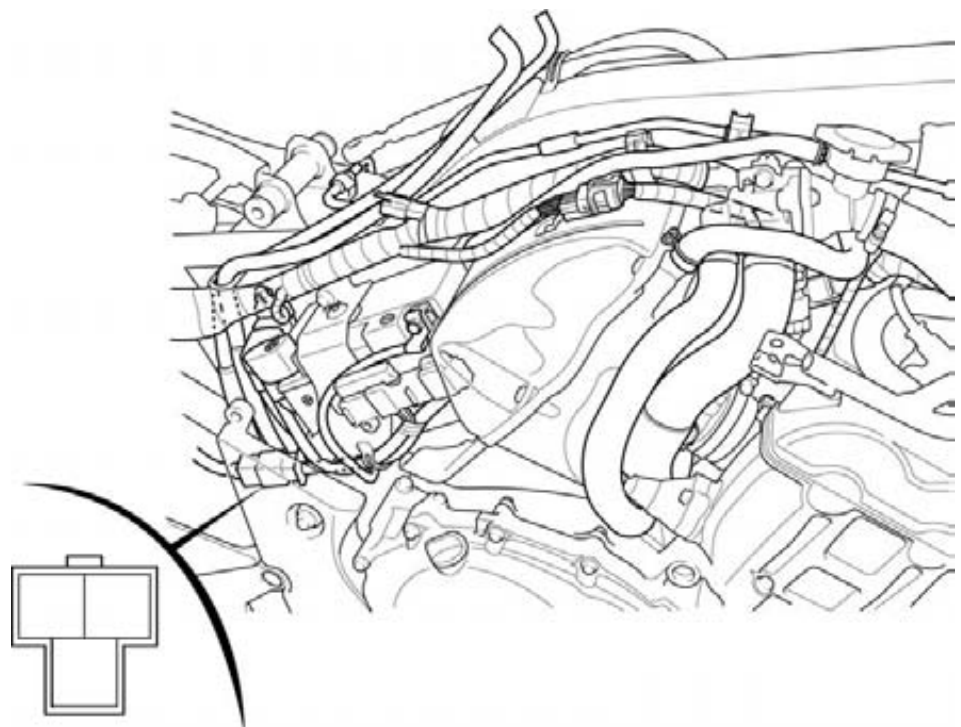
FRONT WHEEL SPEED SENSOR 2P (Blue) CONNECTOR
(NOTE 1)

Sensor side:

Main harness side:



NOTE 2: Remove the right side cover (page 3-4).

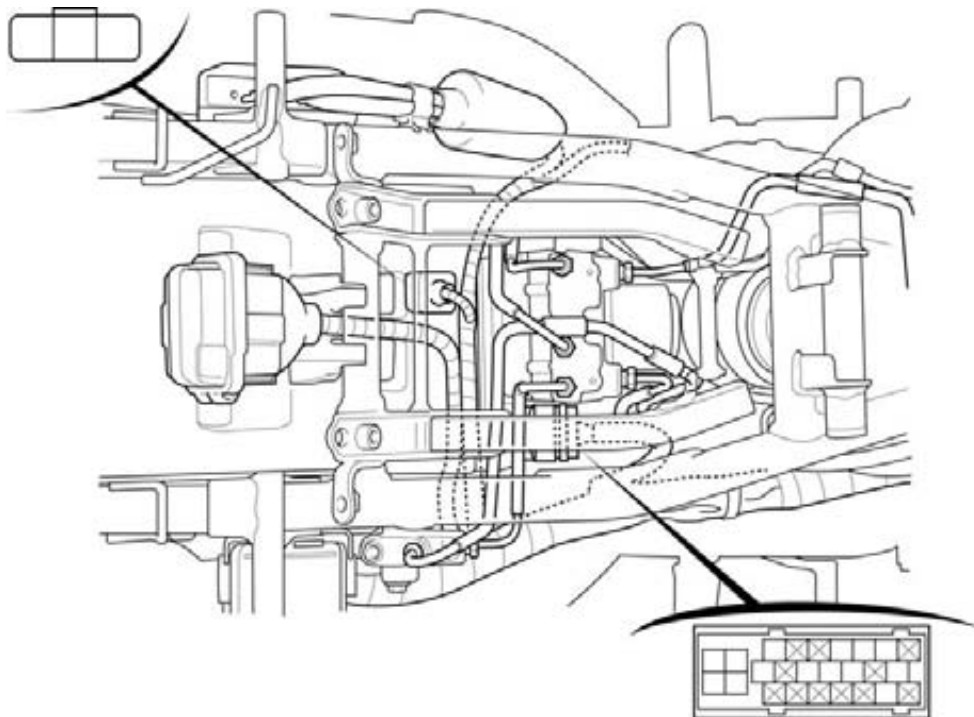


ABS FUSE BOX 3P CONNECTOR
(NOTE 2)

ANTI-LOCK BRAKE SYSTEM (ABS; CBF1000A)

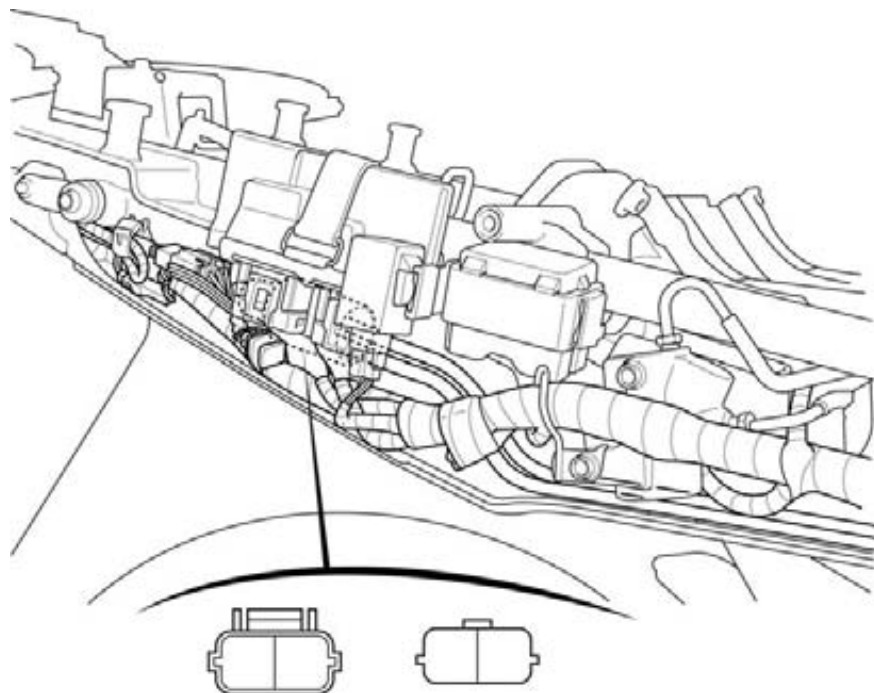
NOTE 1: Remove the seats and seat bracket (page 3-3).

ABS SERVICE CHECK CONNECTOR
(NOTE 1)



ABS MODULATOR 25P CONNECTOR
(NOTE 1)

NOTE 2: Remove the right rear cowl (page 3-8).



Main harness side:

Sensor side:

REAR WHEEL SPEED SENSOR 2P (Green) CONNECTOR
(NOTE 2: Inside of the connector boot behind the ECM)

ABS TROUBLESHOOTING INFORMATION

SYSTEM DESCRIPTION

ABS PRE-START SELF-DIAGNOSIS SYSTEM

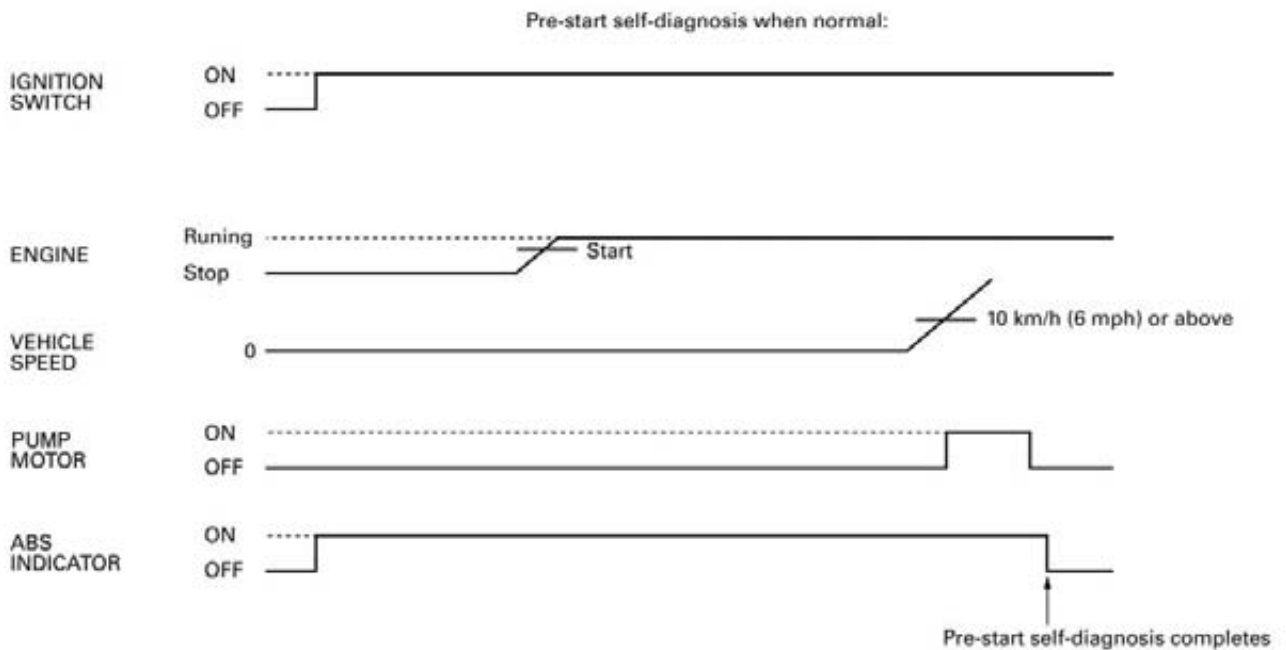
The ABS pre-start self-diagnosis system diagnoses the electrical system as well as the operating status of the modulator. When there is any abnormality, the problem and the problematic part can be detected by outputting the problem code.

When the vehicle speed is approximately 10 km/h (6mph) 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.

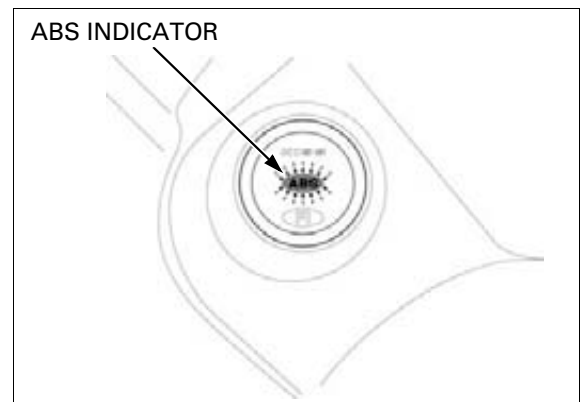
If a problem is detected, the ABS indicator blinks or comes on and stays on to notify the rider of the problem. The self-diagnosis is also made while the motorcycle is running, and the indicator blinks when a problem is detected.

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 PROCEDURE (Daily check)

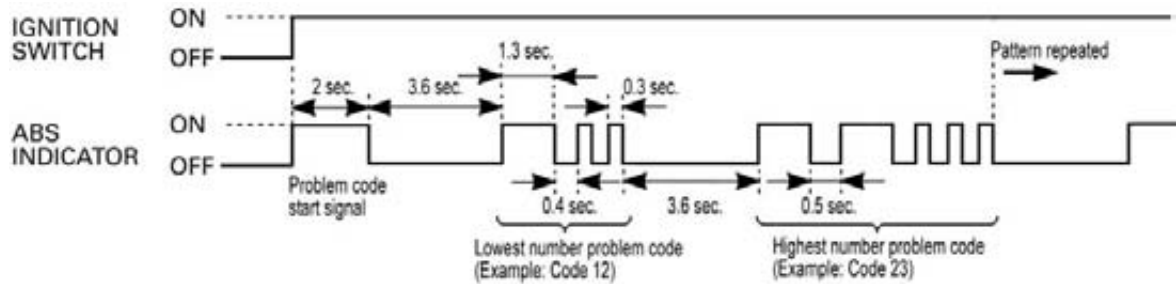
1. Turn the ignition switch to "ON".
2. Make sure the ABS indicator comes on.
3. Start the engine.
4. Ride the motorcycle and increase the vehicle speed to approximately 10 km/h (6 mph).
5. The ABS is normal if the ABS indicator goes off.



ANTI-LOCK BRAKE SYSTEM (ABS; CBF1000A)

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 two long blinks occur, and three short blinks, that problem code is 23 (two long blinks = 20 blinks, three short blinks = 3 blinks). Then, go to the troubleshooting and see problem code 23.
- 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:

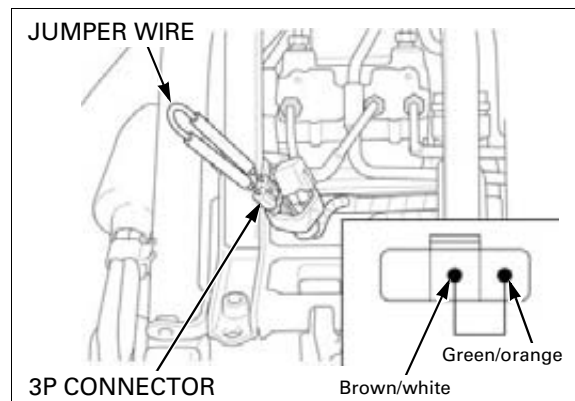
- The problem code is not erased by turning the ignition switch to "OFF" while the problem code is being output. Note that turning the ignition switch to "ON" again does not indicate the problem code. To show the problem code again, repeat the problem code retrieval procedures from the beginning.
- After 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 seats (page 3-3).
Remove the seat bracket (page 3-3).

Remove the dummy connector from the ABS service check 3P 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/orange

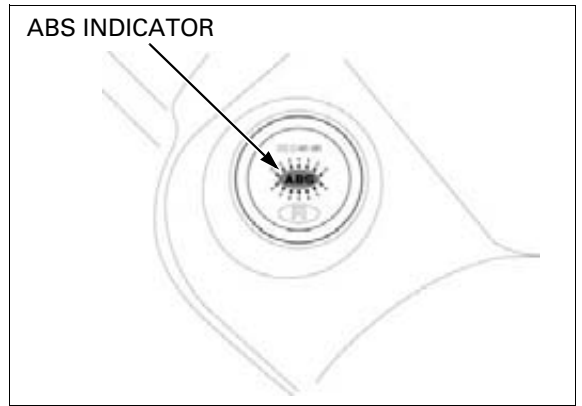


Do not apply the front or rear brake during retrieval.

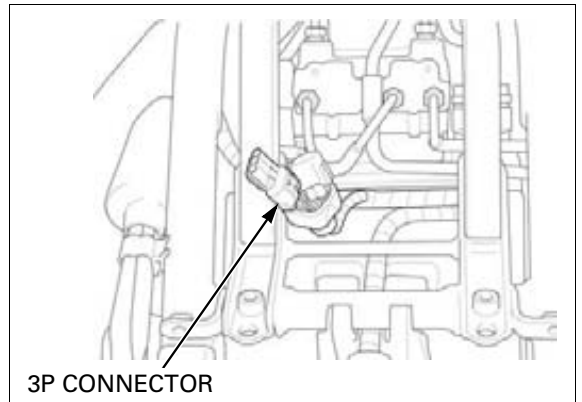
2. Turn the ignition switch to "ON". The ABS indicator should come on 2 seconds (start signal) (then goes off 3.6 seconds) and starts problem code indication.

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.



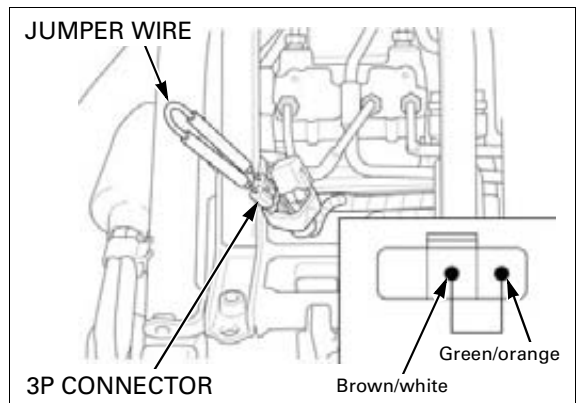
3. Turn the ignition switch to "OFF" and remove the jumper wire.



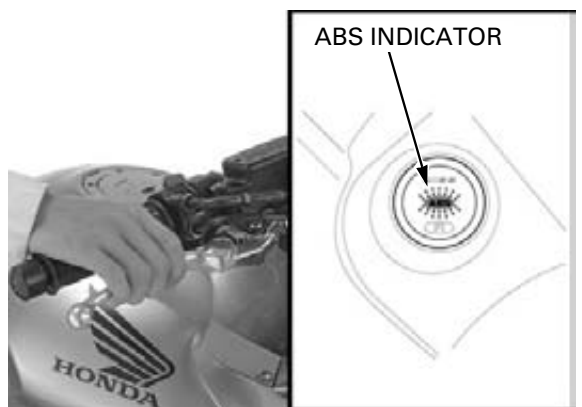
CLEARING PROBLEM CODE

1. Short the wire terminals of the service check connector with a jumper wire with the ignition switch turned to "OFF" in the same manner as retrieval.

CONNECTION: Brown/white – Green/orange

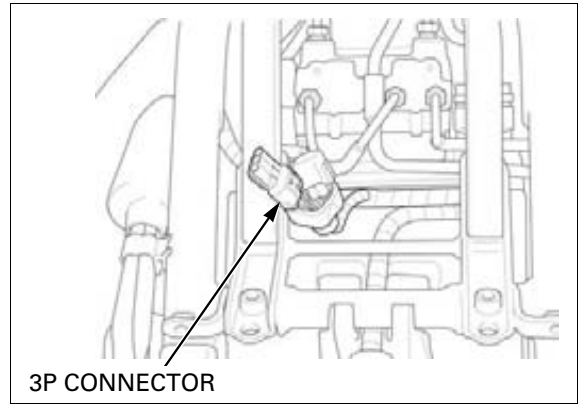


2. Turn the ignition switch to "ON" while squeezing the brake lever. The ABS indicator should come on 2 seconds and go off.
3. Release the brake lever immediately after the ABS indicator is off. The ABS indicator should come on.
4. Squeeze the brake lever immediately after the ABS indicator is on. The ABS indicator should go off.



ANTI-LOCK BRAKE SYSTEM (ABS; CBF1000A)

5. 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.
6. Turn the ignition switch to "OFF".



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 come ON at all	17-22
				• ABS indicator stays ON at all	17-22
11	Front wheel speed sensor circuit malfunction • Wheel speed sensor or related wires	C	C	• Stops ABS operation	17-12
12	Front wheel speed sensor malfunction • Wheel speed sensor or related wires • Electrical noise/intermittent interruption		C	• Stops ABS operation	17-12
13	Rear wheel speed sensor circuit malfunction • Wheel speed sensor or related wires	C	C	• Stops ABS operation	17-14
14	Rear wheel speed sensor • Wheel speed sensor or related wires • Electrical noise/intermittent interruption		C	• Stops ABS operation	17-14
21	Front speed sensor pulse • Pulser ring or wheel speed sensor		C	• Stops ABS operation	17-12
23	Rear speed sensor pulse • Pulser ring or wheel speed sensor		C	• Stops ABS operation	17-14
31	Solenoid valve malfunction	C	C	• Stops ABS operation	17-16
32					
33					
34					
37					
38					
41	Front wheel lock • Riding condition • Wheel speed sensor or related wires		C	• Stops ABS operation	17-12
42					
43	Rear wheel lock • Riding condition • Wheel speed sensor or related wires		C	• Stops ABS operation	17-14
51	Motor lock		C	• Stops ABS operation	17-16
52	Motor stuck OFF		C	• Stops ABS operation	
53	Motor stuck ON	C	C	• Stops ABS operation	
54	Fail-safe relay circuit malfunction	C		• Stops ABS operation	17-18
61	Power supply voltage low	C	C	• Stops ABS operation	17-20
62	Power supply voltage high		C	• Stops ABS operation	
71	Incorrect tire size		C	• Stops ABS operation	17-21
81	CPU (ABS control unit)	C	C	• Stops ABS operation	17-21

(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).

Perform the pre-start self-diagnosis to be sure that the ABS indicator is operating normally (page 17-7).

PROBLEM CODE 11, 12, 21, 41 or 42 (Front Wheel Speed Sensor)

NOTE:

- The ABS indicator might blink under unusual riding or conditions (page 17-11). 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 17-25).

Is the air gap correct?

NO – Check each part for deformation and looseness and correct accordingly. Recheck the air gap.

YES – GO TO STEP 2.



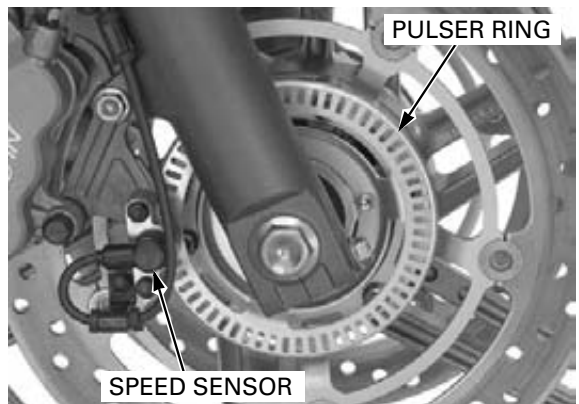
2. Speed Sensor Condition Inspection

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?

NO – Remove any deposits. Install properly or replace faulty part.

YES – GO TO STEP 3.



3. Speed Sensor Line Short Circuit Inspection (at control unit side)

Remove the following:

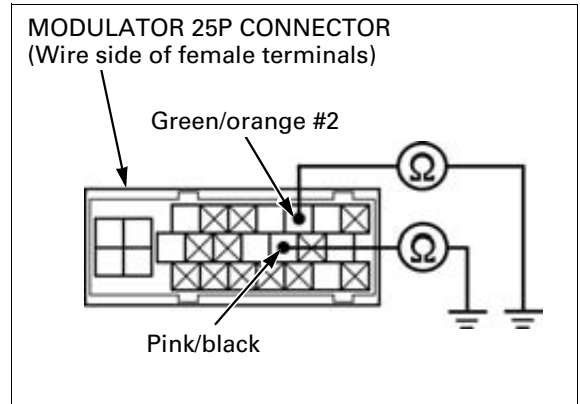
- Seats (page 3-3)
- Seat bracket (page 3-3)

Lift and support the fuel tank (page 4-5).

Disconnect the ABS modulator 25P connector and the speed sensor 2P (Blue) connector. Check for continuity between the Pink/black wire terminal of the connector and ground, and between the Green/orange #2 wire terminal of the connector and ground.

Is there continuity?

- YES** - Short circuit in wire between the ABS modulator and speed sensor.
- NO** - GO TO STEP 4.

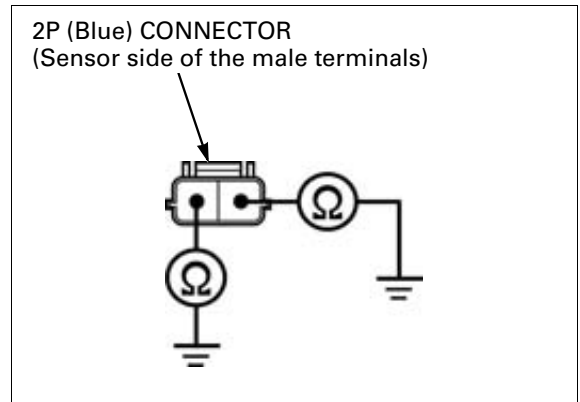


4. Speed Sensor Line Short Circuit Inspection (at sensor side)

Check for continuity between each terminal (Black and White) of the sensor side 2P connector and ground in the same manner as the previous step.

Is there continuity?

- YES** - Faulty front wheel speed sensor.
- NO** - GO TO STEP 5.



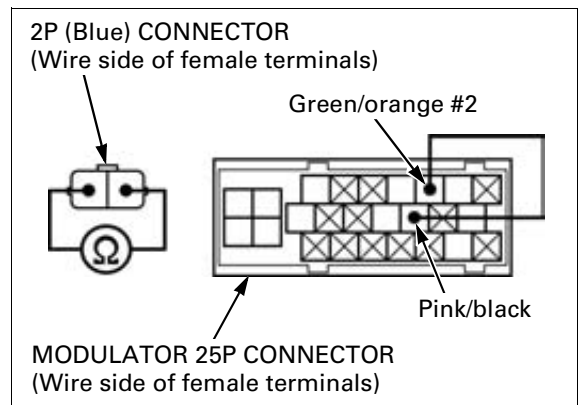
5. Speed Sensor Line Open Circuit Inspection

Short the Pink/black and Green/orange #2 wire terminals of the 25P connector with a jumper wire.

Check for continuity between the terminals of the wire harness side sensor 2P (Blue) connector.

Is there continuity?

- NO** - Open circuit in wire between the ABS modulator and speed sensor.
- YES** - GO TO STEP 6.



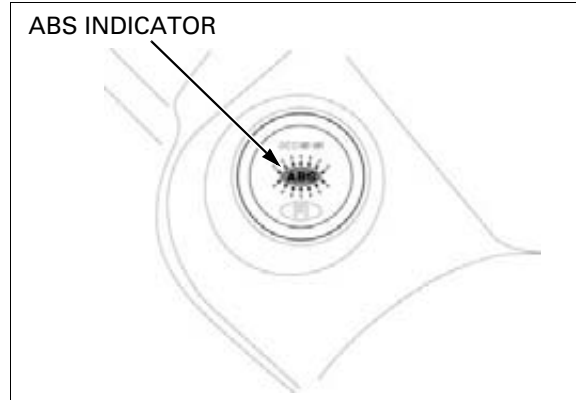
ANTI-LOCK BRAKE SYSTEM (ABS; CBF1000A)

6. Failure Reproduction with a New Speed Sensor

Replace the front wheel speed sensor with new one (page 17-25).
Connect the modulator 25P connector.
Erase the problem code (page 17-9).
Perform the pre-start self-diagnosis and check the ABS indicator (page 17-7).

Dose the indicator blink?

- NO** – Faulty removed wheel speed sensor.
YES – Faulty ABS modulator.



PROBLEM CODE 13, 14, 23 or 43 (Rear Wheel Speed Sensor)

NOTE:

- The ABS indicator might blink under unusual riding or conditions (page 17-11). 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 17-25).

Is the air gap correct?

- NO** – Check each part for deformation and looseness and correct accordingly. Recheck the air gap.
YES – GO TO STEP 2.

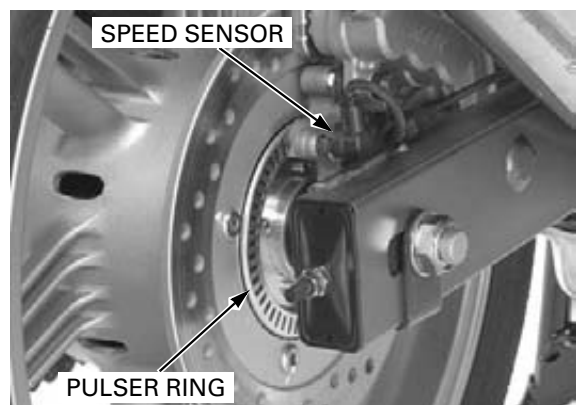


2. Speed Sensor Condition Inspection

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?

- NO** – Remove any deposits. Install properly or replace faulty part.
YES – GO TO STEP 3.



3. Speed Sensor Line Short Circuit Inspection (at control unit side)

Remove the following:

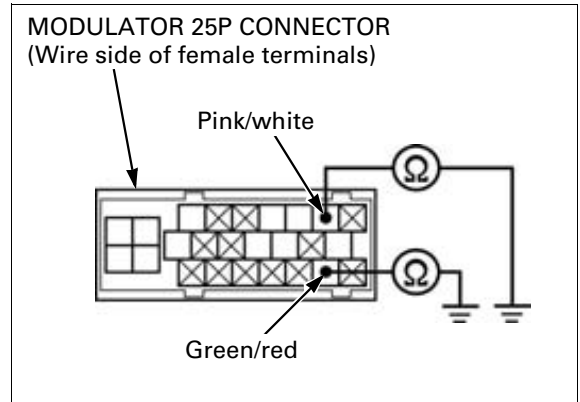
- Seats (page 3-3)
- Seat bracket (page 3-3)

Remove the right rear cowl (page 3-8).

Disconnect the ABS modulator 25P connector and the speed sensor 2P (Green) 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.

Is there continuity?

- YES** - Short circuit in wire between the ABS modulator and speed sensor.
- NO** - GO TO STEP 4.

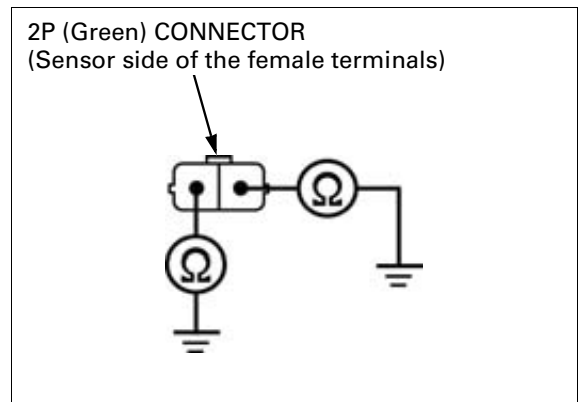


4. Speed Sensor Line Short Circuit Inspection (at sensor side)

Check for continuity between each terminal (Black and White) of the sensor side 2P connector and ground in the same manner as the previous step.

Is there continuity?

- YES** - Faulty rear wheel speed sensor.
- NO** - GO TO STEP 5.

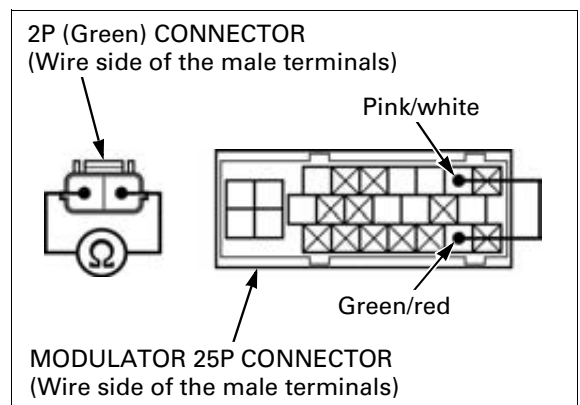


5. Speed Sensor Line Open Circuit Inspection

Short the Pink/white and Green/red wire terminals of the 25P connector with a jumper wire. Check for continuity between the terminals of the wire harness side sensor 2P (Green) connector.

Is there continuity?

- NO** - Open circuit in wire between the ABS modulator and speed sensor.
- YES** - GO TO STEP 6.



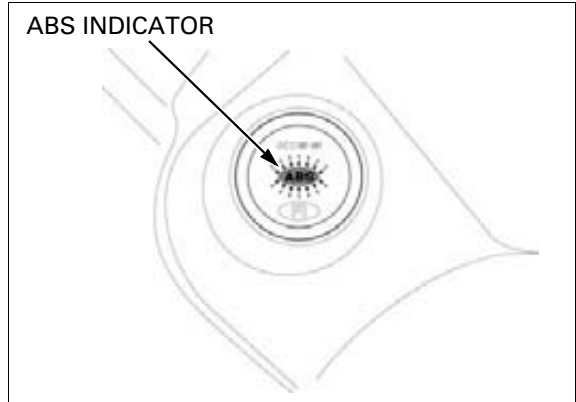
ANTI-LOCK BRAKE SYSTEM (ABS; CBF1000A)

6. Failure Reproduction with a New Speed Sensor

Replace the rear wheel speed sensor with new one (page 17-25).
Connect the modulator 25P connector.
Erase the problem code (page 17-9).
Perform the pre-start self-diagnosis and check the ABS indicator (page 17-7).

Does the indicator blink?

- NO** – Faulty removed wheel speed sensor.
- YES** – Faulty ABS modulator.



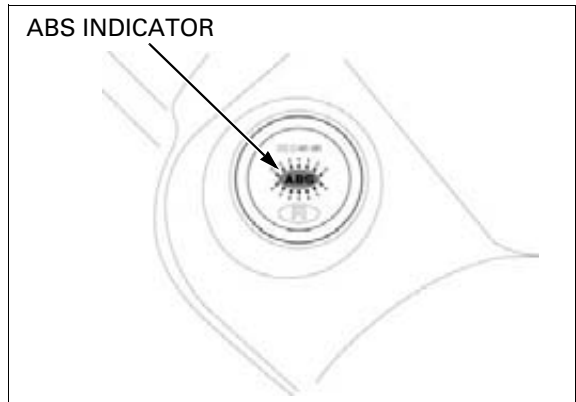
PROBLEM CODE 31, 32, 33, 34, 37 or 38 (Solenoid Valve)

1. Failure Reproduction

Erase the problem code (page 17-9).
Perform the pre-start self-diagnosis (page 17-7).
Retrieve the problem code (page 17-8).

Does the indicator indicate the code "31, 32, 33 or 34"?

- YES** – Faulty ABS modulator.
- NO** – Normal (problem code is not stored; temporary failure).



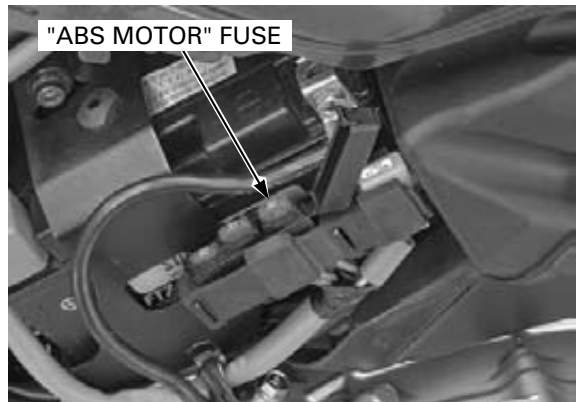
PROBLEM CODE 51, 52 or 53 (Pump Motor)

1. Fuse Inspection

Remove the right side cover (page 3-4).
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.



2. Motor Power Input Line Short Circuit Inspection

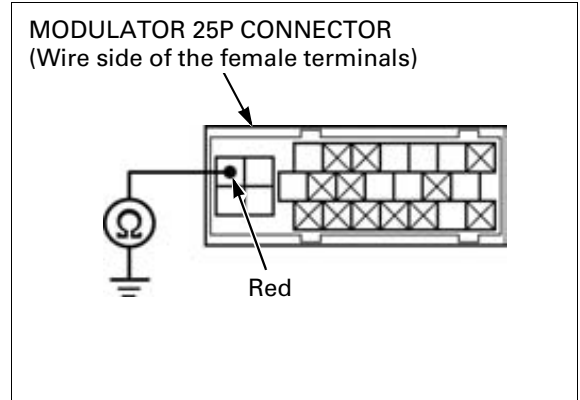
Remove the following:

- Seats (page 3-3)
- Seat bracket (page 3-3)

Disconnect the ABS modulator 25P connector. Check for continuity between the Red wire terminal of the 25P connector and 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)

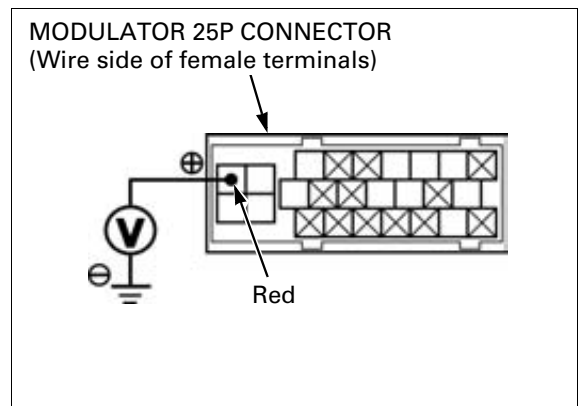
Remove the following:

- Seats (page 3-3)
- Seat bracket (page 3-3)

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.

Is there battery voltage?

- NO** - GO TO STEP 4.
- YES** - GO TO STEP 5.

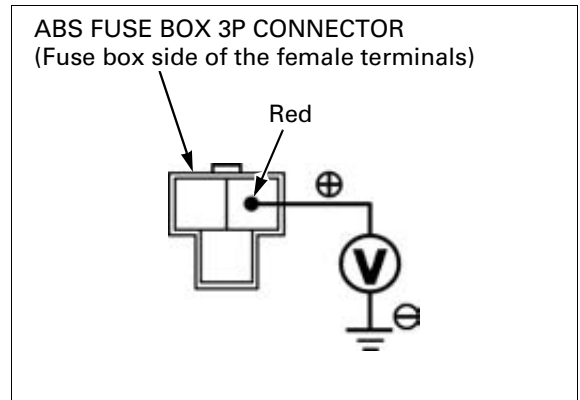


4. Motor Power Input Line Open Circuit Inspection (at fuse box side)

Disconnect the ABS fuse box 3P connector. Measure the voltage between Red wire terminal (+) of the fuse box side 3P connector and ground. There should be battery voltage at all times.

Is there battery voltage?

- YES** - Open circuit in Red wire between the fuse box and control unit.
- NO** - Open circuit in Red or Red/green wire between the battery and fuse box 3P connector.



ANTI-LOCK BRAKE SYSTEM (ABS; CBF1000A)

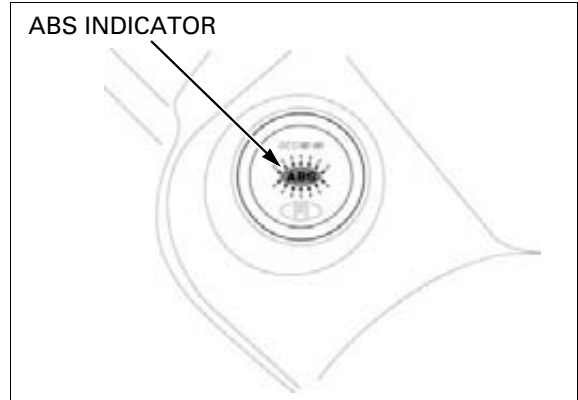
5. Failure Reproduction

Connect the modulator 25P connector.
Erase the problem code (page 17-9).
Perform the pre-start self-diagnosis (page 17-7).
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 right side cover (page 3-4).

Check the "ABS FAIL-SAFE RELAY" fuse (30A) 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

Remove the following:

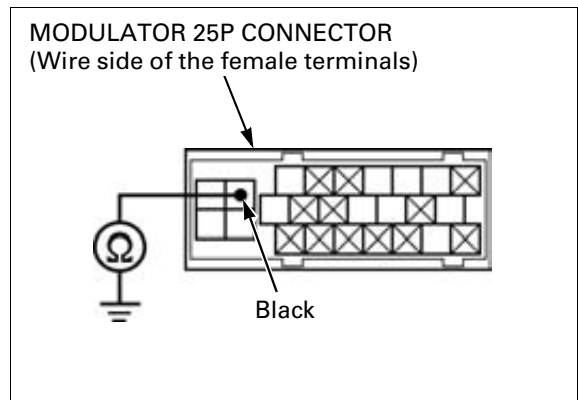
- Seats (page 3-3)
- Seat bracket (page 3-3)

Disconnect the ABS modulator 25P connector.
Check for continuity between the Black wire terminal of the 25P connector and 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)



**3. Relay Power Input Line Open Circuit Inspection
(at control unit side)**

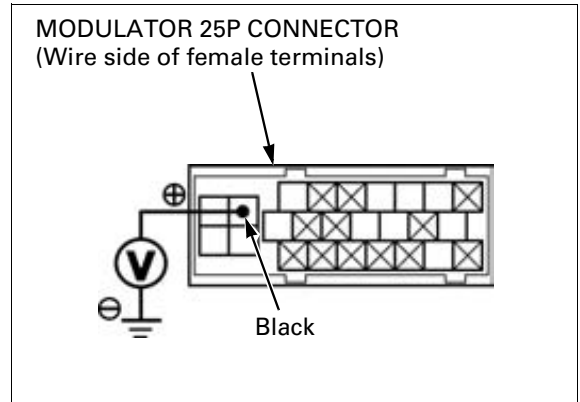
Remove the following:

- Seats (page 3-3)
- Seat bracket (page 3-3)

Disconnect the ABS modulator 25P connector. Measure the voltage between Black wire terminal (+) of the 25P connector and ground (-). There should be battery voltage at all times.

Is there battery voltage?

- NO** - GO TO STEP 4.
- YES** - GO TO STEP 5.

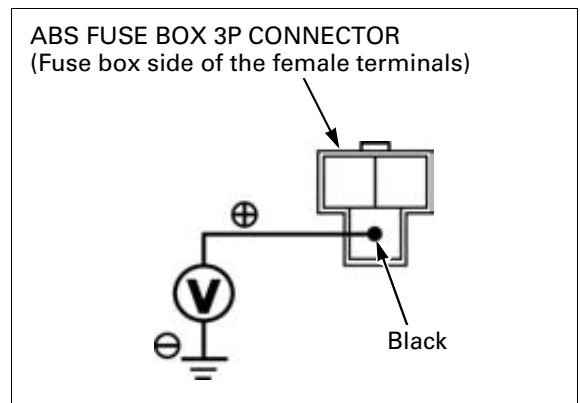


**4. Relay Power Input Line Open Circuit Inspection
(at fuse box side)**

Disconnect the ABS fuse box 3P connector. Measure the voltage between Black wire terminal (+) of the fuse box side 3P connector and ground. There should be battery voltage at all times.

Is there battery voltage?

- YES** - Open circuit in Black wire between the fuse box and control unit.
- NO** - Open circuit in Black or Red/green wire between the battery and fuse box 3P connector.

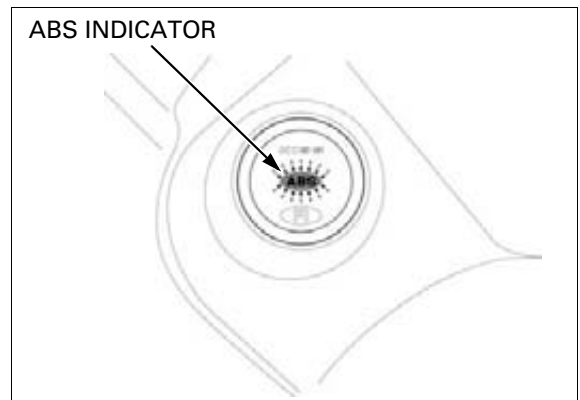


5. Failure Reproduction

Connect the modulator 25P connector. Erase the problem code (page 17-9). Perform the pre-start self-diagnosis (page 17-7). 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).



ANTI-LOCK BRAKE SYSTEM (ABS; CBF1000A)

PROBLEM CODE 61 or 62 (Power Circuit)

1. Fuse Inspection

Remove the rear seat (page 3-3).

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

Remove the following:

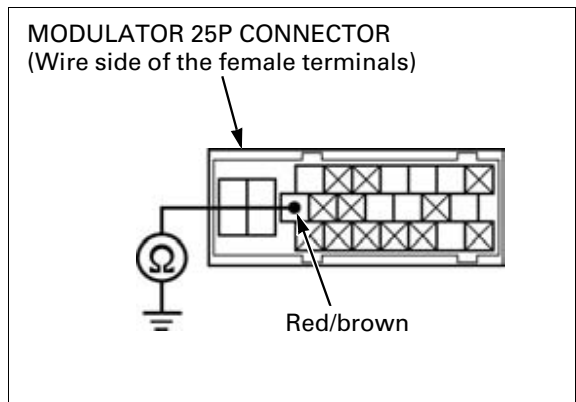
- Seats (page 3-3)
- Seat bracket (page 3-3)

Disconnect the ABS modulator 25P connector. With the ABS main fuse (10A) removed, check for continuity between the Red/brown wire terminal of the 25P connector and ground.

Is there continuity?

YES – Short circuit in Red/brown 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

Remove the following:

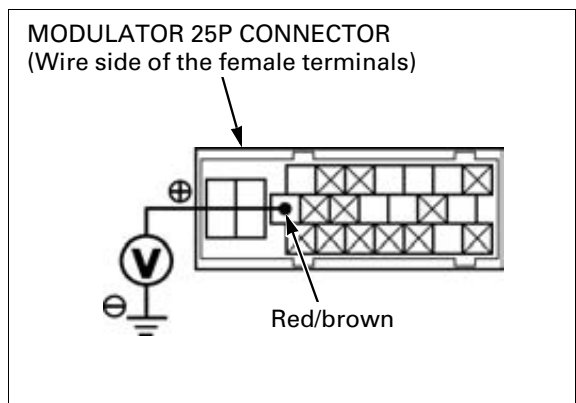
- Seats (page 3-3)
- Seat bracket (page 3-3)

Disconnect the ABS modulator 25P connector. Install the ABS main fuse. Measure the voltage between the Red/brown wire terminal of 25P connector and ground. There should be battery voltage with the ignition switch turned to "ON".

Is the voltage 10 – 17 V?

NO – • Open circuit in Red/brown or Red/black wire between the ignition switch and control unit.
• If the wire is OK, check the charging system (page 18-2).

YES – GO TO STEP 4.



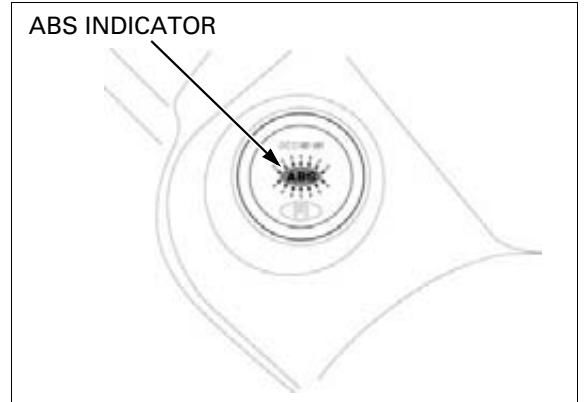
4. Failure Reproduction

Connect the modulator 25P connector.
Erase the problem code (page 17-9).
Perform the pre-start self-diagnosis (page 17-7).
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

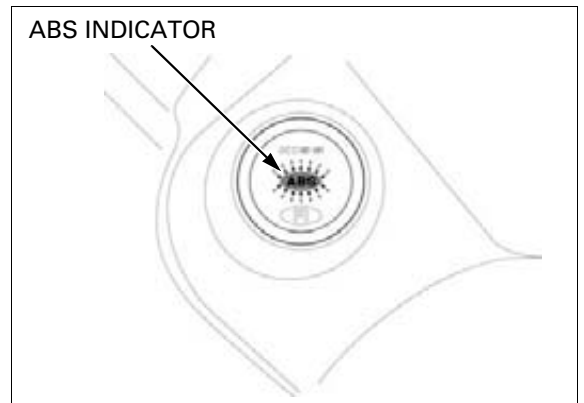
If the above items are normal, recheck the problem code indication:

Erase the problem code (page 17-9).
Perform the pre-start self-diagnosis (page 17-7).
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)

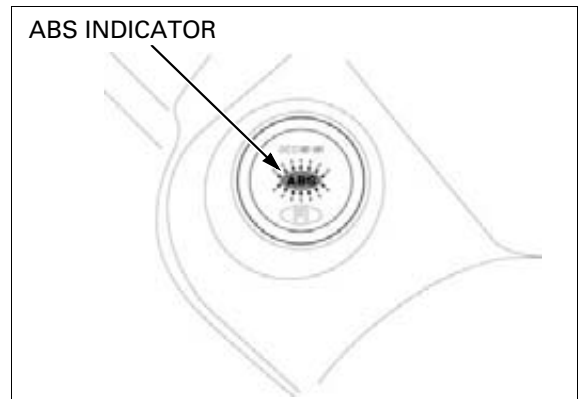
1. Failure Reproduction

Erase the problem code (page 17-9).
Perform the pre-start self-diagnosis (page 17-7).
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 combination meter power and ground lines (page 21-12).

Are the wires normal?

NO – Open circuit in related wires.

YES – GO TO STEP 2.

2. Indicator Operation Inspection

Remove the following:

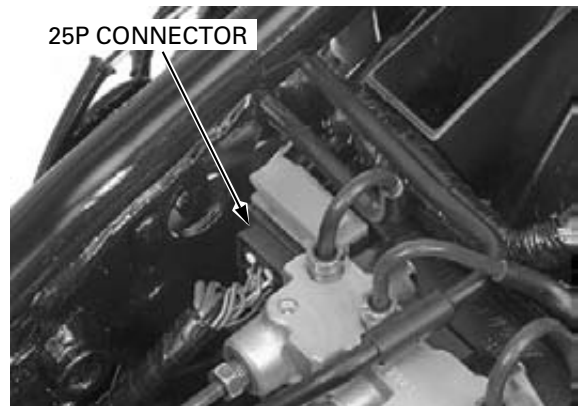
- Seats (page 3-3)
- Seat bracket (page 3-3)

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 front center cowl (page 3-7).

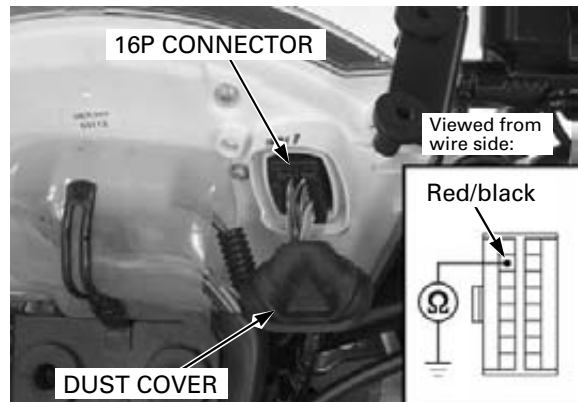
Disconnect the combination meter 16P connector.

Check for continuity between the Red/black wire terminal of the harness side connector and 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 rear seat (page 3-3).

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

Remove the following:

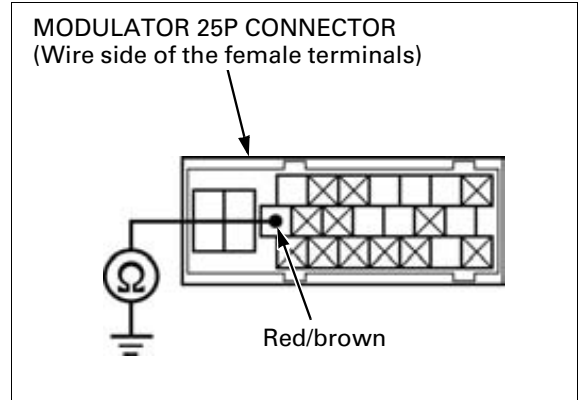
- Seats (page 3-3)
- Seat bracket (page 3-3)

Disconnect the ABS modulator 25P connector. With the ABS main fuse (10 A) removed, check for continuity between the Red/brown wire terminal of the 25P connector and body ground.

Is there continuity?

YES - Short circuit in Red/brown wire.

NO - Temporary failure (install a spare fuse and recheck from the first step).



3. Power Input Line Open Circuit Inspection

Remove the following:

- Seats (page 3-3)
- Seat bracket (page 3-3)

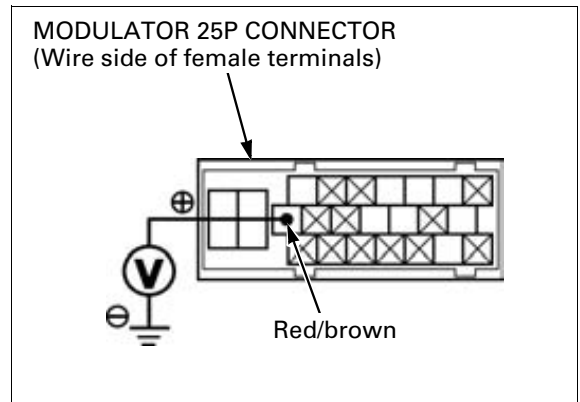
Disconnect the ABS modulator 25P connector. Measure the voltage between the Red/brown wire terminal of the 25P connector and body ground.

There should be battery voltage with the ignition switch turned to "ON".

Is the voltage 10 – 17 V?

NO - • Open circuit in Red/brown wire between the ignition switch and ABS modulator.
• If the wire is OK, check the charging system (page 18-7).

YES - GO TO STEP 4.



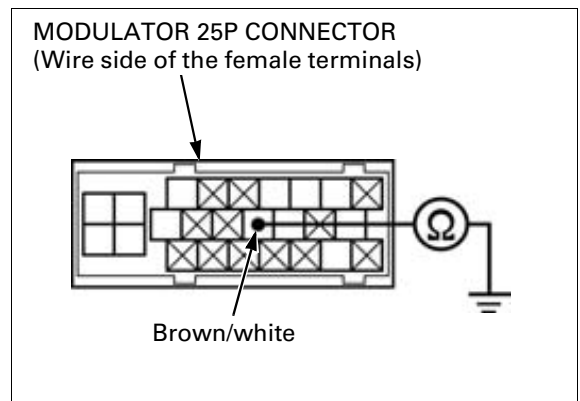
4. Service Check Line Short Circuit Inspection

Check for continuity between the Brown/white wire terminal of the 25P connector and body ground.

Is there continuity?

YES - Short circuit in Brown/white wire between the service check connector and ABS modulator.

NO - GO TO STEP 5.



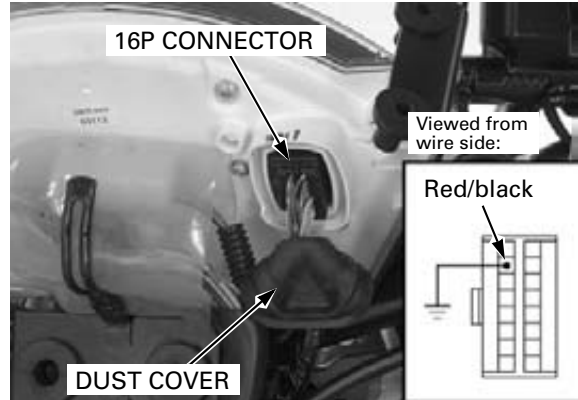
ANTI-LOCK BRAKE SYSTEM (ABS; CBF1000A)

5. Indicator Operation Inspection

Remove the front center cowl (page 3-7).
With the connector connected, short the Red/black wire terminal of the combination meter 16P connector and ground with a jumper wire.
Check the ABS indicator with the ignition switch turned to "ON".

Does it go off?

- NO** - Faulty combination meter.
YES - GO TO STEP 6.

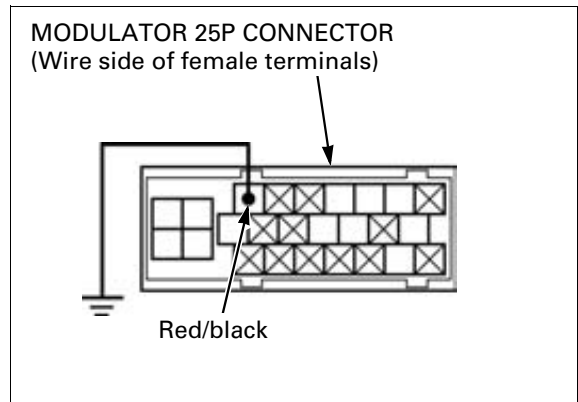


6. Indicator Signal Line Open Circuit Inspection

Remove the jumper wire from the combination meter 16P connector.
Short the Red/black wire terminal of the 25P connector and ground with a jumper wire.
Check the ABS indicator with the ignition switch turned to "ON".

Does it go off?

- NO** - Open circuit in Red/black wire between the combination meter and ABS modulator.
YES - GO TO STEP 7.

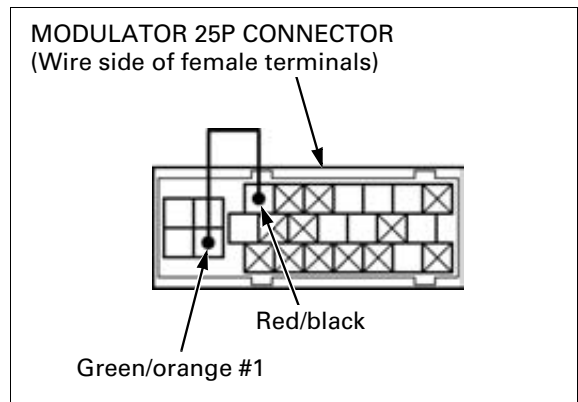


7. Logic Ground Line Open Circuit Inspection

Remove a jumper wire from the 25P connector.
Short the Red/black and Green/orange #1 wire terminals of the 25P connector with a jumper wire.
Check the ABS indicator with the ignition switch turned to "ON".

Does it go off?

- NO** - • Open circuit in Green/orange wire between the ABS modulator and body ground.
YES - • Faulty ABS modulator.



WHEEL SPEED SENSOR

AIR GAP INSPECTION

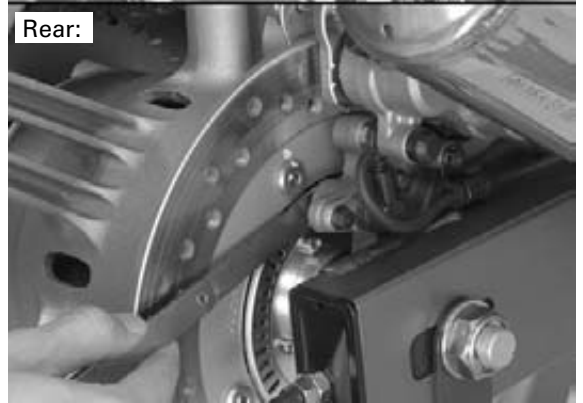
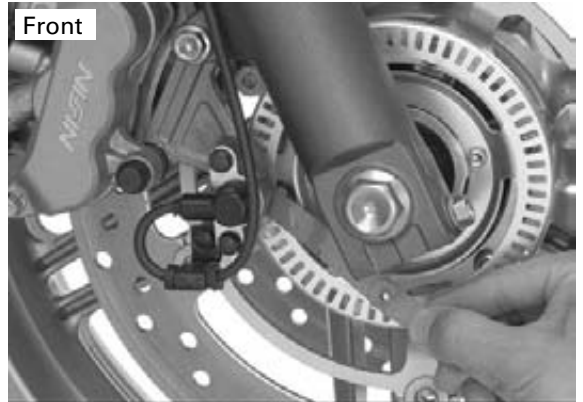
Support the motorcycle securely using a hoist or equivalent and raise the wheel off the ground.

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: 0.2 – 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.



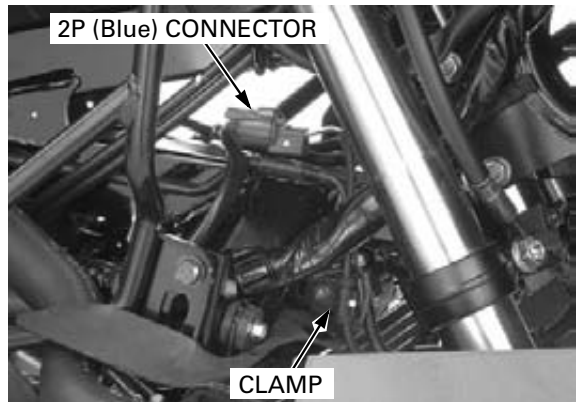
REPLACEMENT

FRONT WHEEL SPEED SENSOR

Lift and support the fuel tank (page 4-5).

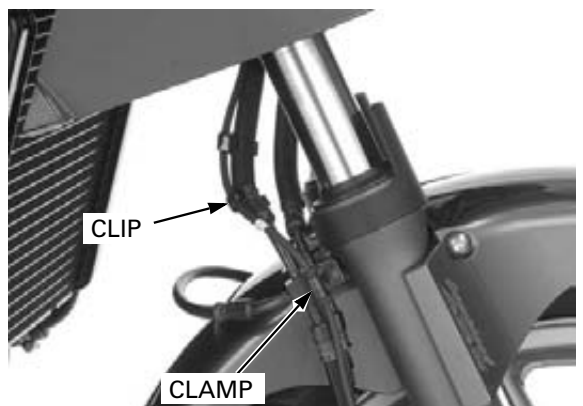
Disconnect the front wheel speed sensor 2P (Blue) connector.

Loosen the clamp bolt, and release the speed sensor wire.



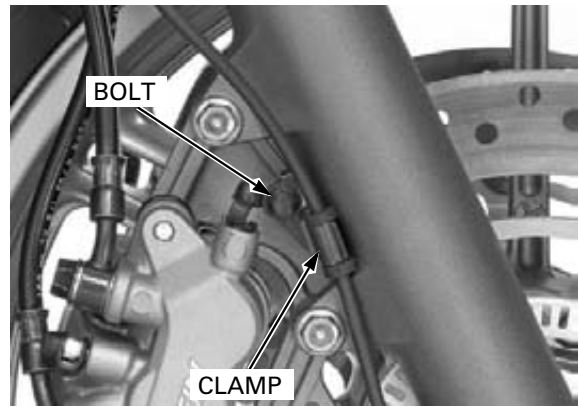
Release the sensor wire from the clip.

Remove the brake hose joint bolt (front fender mounting bolt) and clamp.



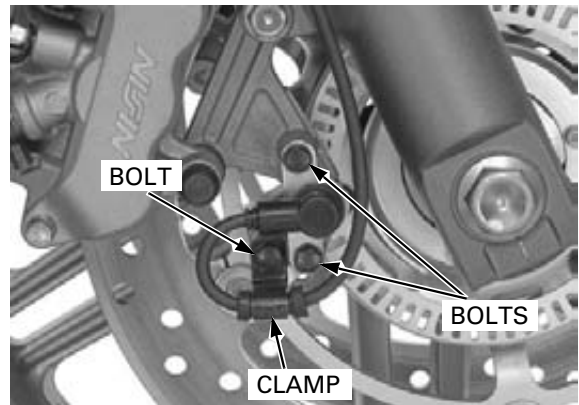
ANTI-LOCK BRAKE SYSTEM (ABS; CBF1000A)

Remove the bolt and clamp.



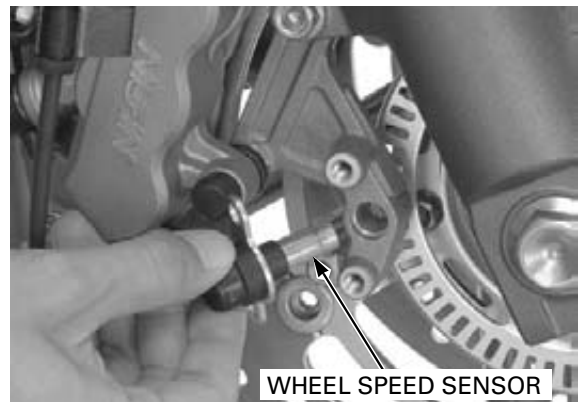
Remove the bolt and clamp.

Remove the wheel speed sensor mounting bolts.



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 1-23).

Install a new speed sensor in the reverse order of removal.

NOTE:

- Replace the clamp bolts at the caliper bracket with new ones.

TORQUE:

Sensor and clamp bolts:

10 N·m (1.0 kgf·m, 7 lbf·ft)

Fender bolt: 12 N·m (1.2 kgf·m, 9 lbf·ft)

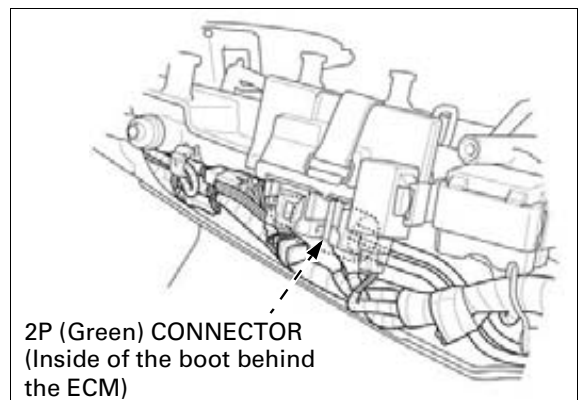
After installation, check the air gap (page 17-25).

REAR WHEEL SPEED SENSOR

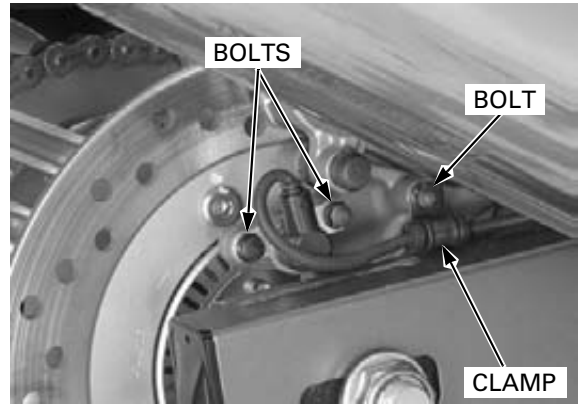
Remove the right rear cowl (page 3-8).

Disconnect the rear wheel speed sensor 2P (Green) connector.

Release the speed sensor wire from the wire band and clips.



Remove the bolt and sensor wire clamp.
Remove the wheel speed sensor mounting bolts.



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 1-23).

Install a new speed sensor in the reverse order of removal.

NOTE:

- Replace the clamp bolt with a new one.

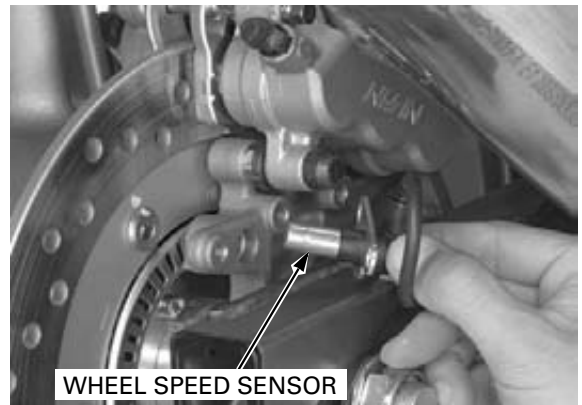
TORQUE:

Sensor and clamp bolts: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Brake pipe joint attaching bolt:

12 N·m (1.2 kgf·m, 9 lbf·ft)

After installation, check the air gap (page 17-25).



ABS MODULATOR

REMOVAL

Drain the brake fluid from the front and rear hydraulic systems (page 16-7).

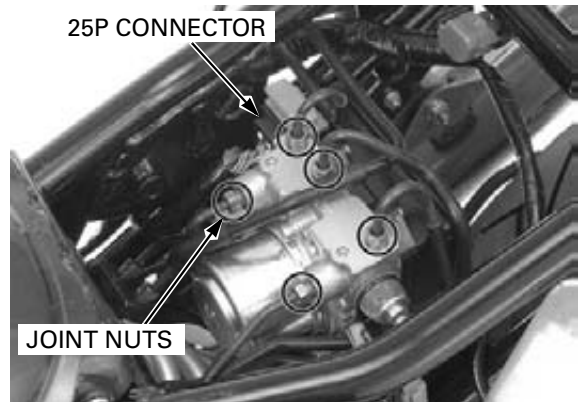
Remove the following:

- Seats (page 3-3)
- Side covers (page 3-4)
- Seat bracket (page 3-3)
- Rear fender (page 3-10)

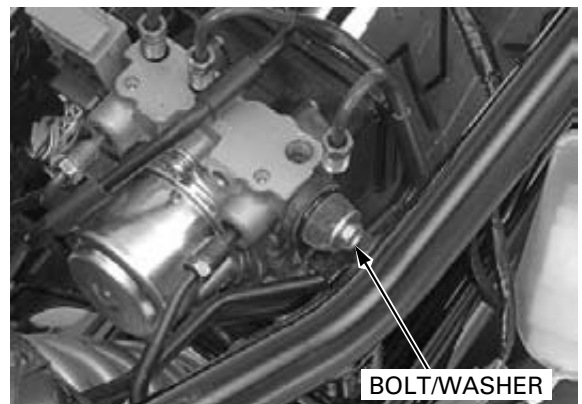
When loosening the joint nuts, cover the end of the brake pipes to prevent contamination.

Pull the lock lever up and disconnect the ABS modulator 25P connector.

Loosen the brake pipe joint nuts and disconnect the brake pipes.



Remove the modulator side mounting bolt.

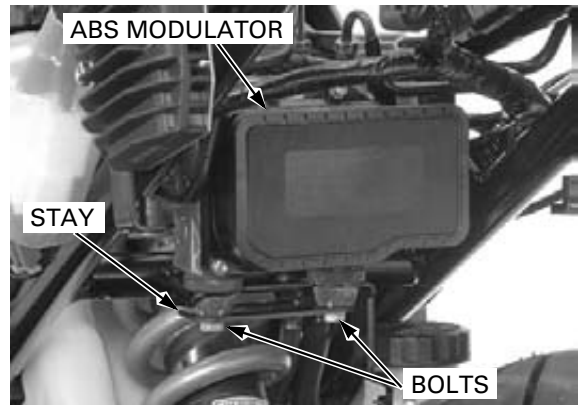


ANTI-LOCK BRAKE SYSTEM (ABS; CBF1000A)

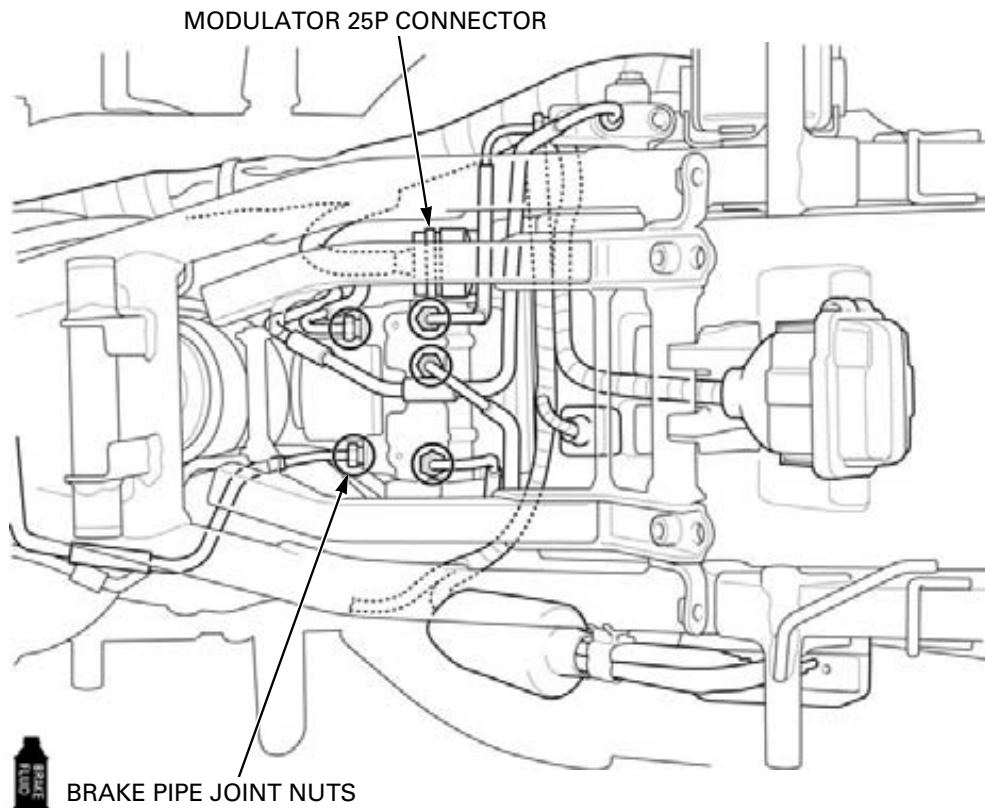
Remove the lower mounting bolts.

Be careful not to bend or damage the brake pipes during removal.

Remove the ABS modulator from the stay (so the modulator is not interfere with the brake pipes).



INSTALLATION



Installation is in the reverse order of removal by loosely tightening all the fasteners.

NOTE:

- Replace the lower mounting bolts with new ones.
- Apply brake fluid to the brake pipe joint nut threads.

Tighten the fasteners in the sequence as follows.

TORQUE:

Lower mounting bolt:

12 N·m (1.2 kgf·m, 9 lbf·ft)

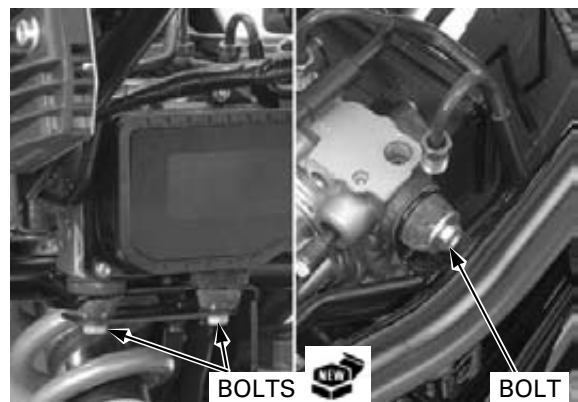
Left mounting bolt:

10 N·m (1.0 kgf·m, 7 lbf·ft)

Brake pipe joint nut:

17 N·m (1.7 kgf·m, 13 lbf·ft)

Fill and bleed the hydraulic systems (page 16-7).



PROPORTIONAL CONTROL VALVE (PCV)

REMOVAL/INSTALLATION

Remove the right rear cowl (page 3-8).

Remove the brake pipe joint nuts.

Remove the mounting bolts, main harness stay and the proportional control valve.

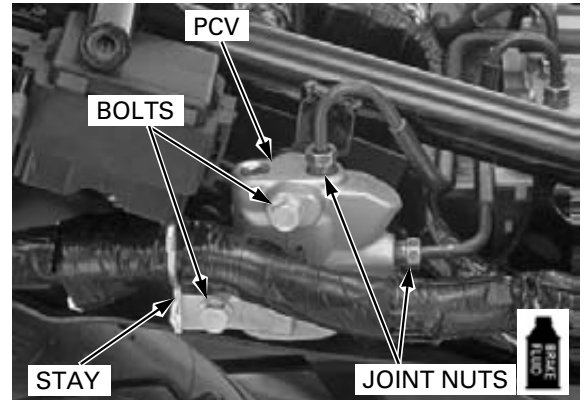
Installation is in the reverse order of removal.

TORQUE:

Brake pipe joint nut:

17 N·m (1.7 kgf·m, 13 lbf·ft)

Apply brake fluid to the brake pipe joint nut threads.



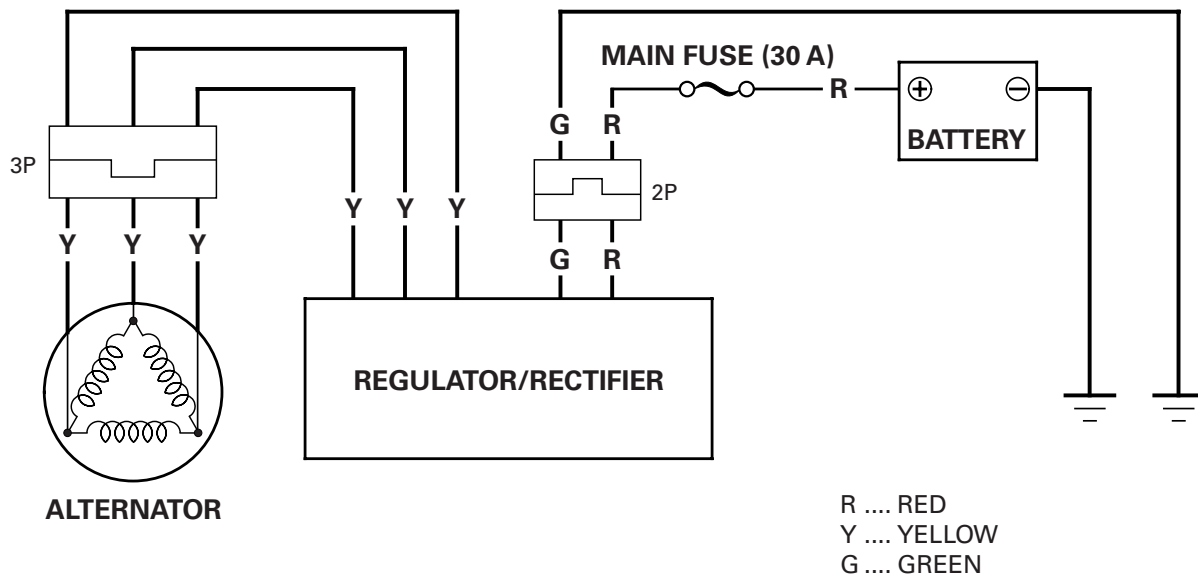
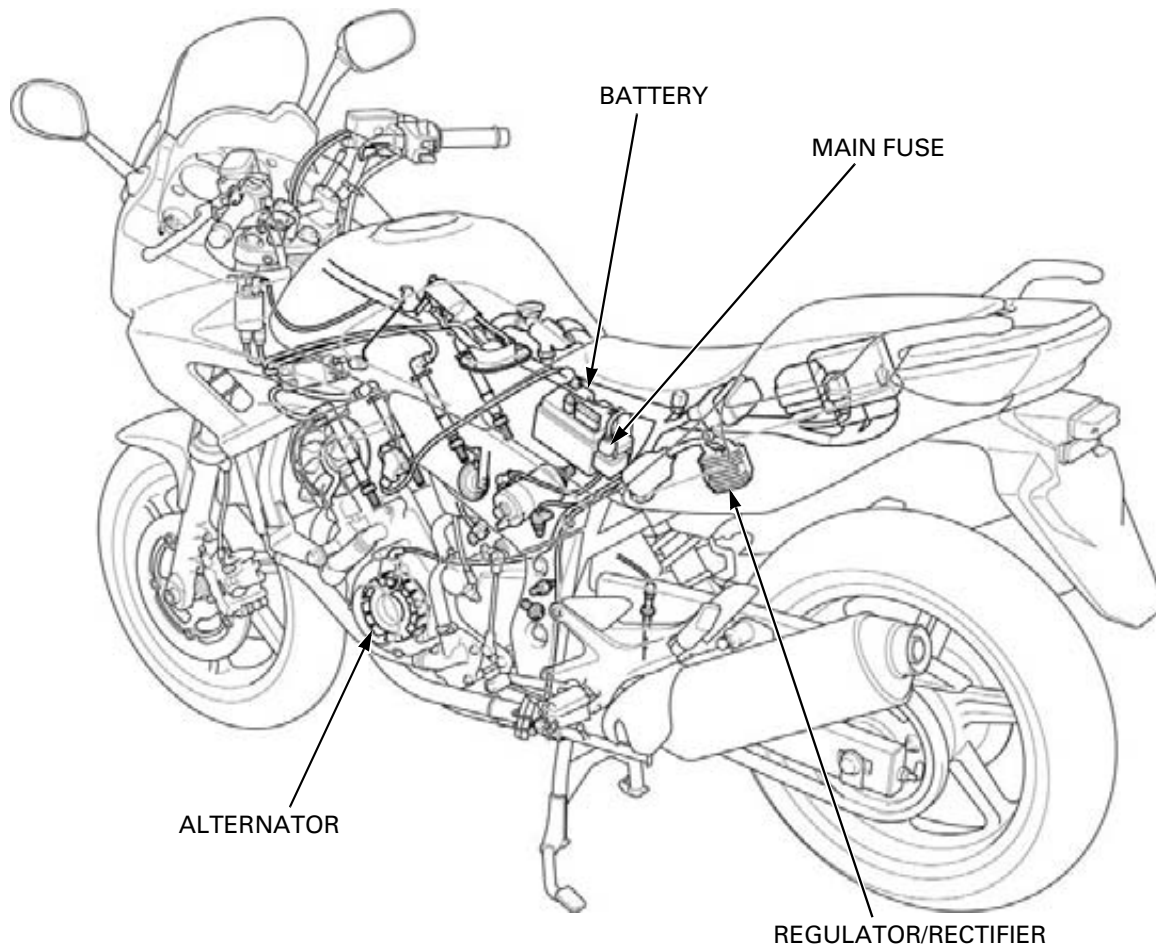
MEMO

18. BATTERY/CHARGING SYSTEM

SYSTEM DIAGRAM.....	18-2	CHARGING SYSTEM INSPECTION.....	18-7
SERVICE INFORMATION	18-3	ALTERNATOR CHARGING COIL	18-8
TROUBLESHOOTING	18-5	REGULATOR/RECTIFIER	18-8
BATTERY.....	18-6		

BATTERY/CHARGING SYSTEM

SYSTEM DIAGRAM



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 ON and current is present.*
- This model comes with a maintenance free (MF) battery. The maintenance free battery must be replaced when it reaches the end of its service life.
- For extended storage, remove the battery, give it a full charge, and store it in a cool, dry space. For maximum service life, charge the stored battery every two weeks.
- For a battery remaining in a stored motorcycle, disconnect the negative battery cable from the battery terminal.
- The battery can be damaged if overcharged or undercharged, or if left to discharge for a 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, 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 two weeks to prevent sulfation from occurring.
- When checking the charging system, always follow the steps in the troubleshooting flow chart (page 18-5).
- Refer to procedures for alternator removal and disassembly (page 11-3).

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 instructions in the Operation Manual for the recommended battery tester for details about battery testing. The recommended battery tester puts a "load" on the battery so that the actual battery condition can be measured.

Recommended battery tester: BM-210 or BATTERY MATE or equivalent

BATTERY/CHARGING SYSTEM

SPECIFICATIONS

ITEM		SPECIFICATIONS	
Battery	Capacity	12 V – 8.6 Ah	
	Current leakage	0.5 mA max.	
	Voltage (20°C/68°F)	Fully charged	13.0 – 13.2 V
		Needs charging	Below 12.4 V
	Charging current	Normal	0.9 A/5 – 10 h
Quick		4.5 A/1 h	
Alternator	Capacity	0.344 kW/5,000 min ⁻¹ (rpm)	
	Charging coil resistance (20°C/68°F)	0.1 – 1.0 Ω	

TROUBLESHOOTING

BATTERY IS DAMAGED OR WEAK

1. BATTERY TEST

Remove the battery (page 18-6).

Check the battery condition using the recommended battery tester.

RECOMMENDED BATTERY TESTER: BM210 or BATTERY MATE or equivalent

Is the battery in good condition?

NO – Faulty battery

YES – GO TO STEP 2.

2. CURRENT LEAKAGE TEST

Install the battery (page 18-6).

Check the battery current leakage (page 18-7).

Is the current leakage below 0.5 mA?

YES – GO TO STEP 4.

NO – GO TO STEP 3.

3. CURRENT LEAKAGE TEST WITHOUT REGULATOR/RECTIFIER CONNECTED

Disconnect the regulator/rectifier 2P connector and recheck the battery current leakage.

Is the current leakage below 0.5 mA?

YES – Faulty regulator/rectifier

NO – • Shorted wire harness
• Faulty ignition switch

4. ALTERNATOR CHARGING COIL INSPECTION

Check the alternator charging coil (page 18-8).

Is the alternator charging coil resistance within 0.1 – 1.0 Ω (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 18-6).

Start the engine and measure the charging voltage (page 18-7).

Compare the measurements to result of the following calculation.

STANDARD: Measured BV < Measured CV < 15.5 V

· **BV = Battery Voltage (page 18-6)**

· **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 at the regulator/rectifier connector (page 18-8).

Are the results of checked voltage correct?

YES – Faulty regulator/rectifier

NO – • Open circuit in related wire
• Loose or poor contacts of related terminal
• Shorted wire harness

BATTERY/CHARGING SYSTEM

BATTERY

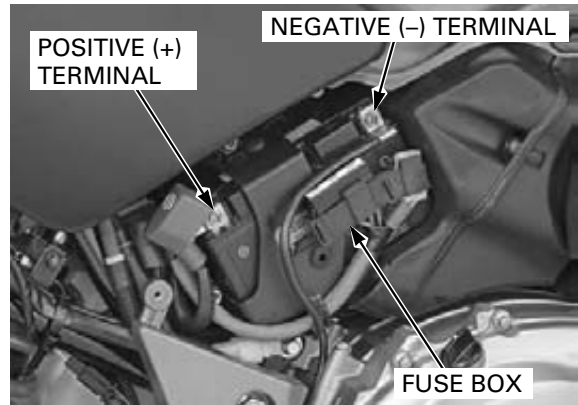
REMOVAL/INSTALLATION

- Always turn the ignition switch OFF before removing the battery.

Remove the right side cover (page 3-4).

CBF1000A only: Remove the ABS/FI fuse box.

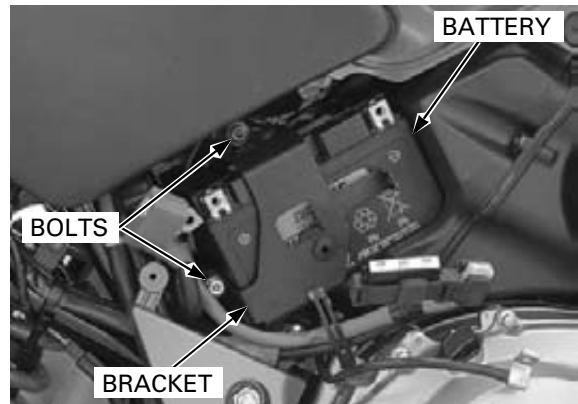
Disconnect the negative cable first, then the positive cable.



Remove the battery bracket mounting bolts, and then remove the battery with the bracket.

Connect the positive cable first and then the negative cable.

Install the battery in the reverse order of removal. After installing the battery, coat the terminals with clean grease.



VOLTAGE INSPECTION

Measure the battery voltage using a digital multimeter.

VOLTAGE:

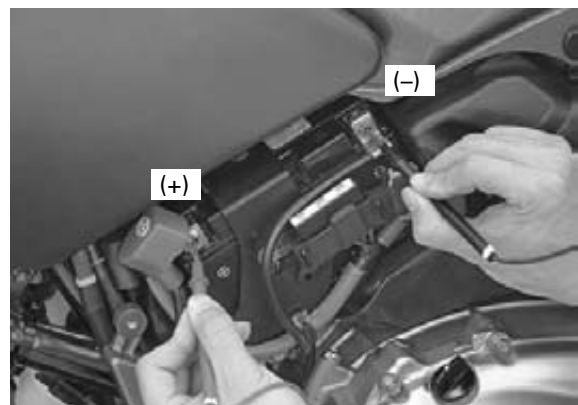
Fully charged: 13.0 – 13.2V

Under charged: Below 12.3V

TOOL:

Digital multimeter

Commercially available



CHARGING SYSTEM INSPECTION

CURRENT LEAKAGE INSPECTION

Remove the right side cover (page 3-4).

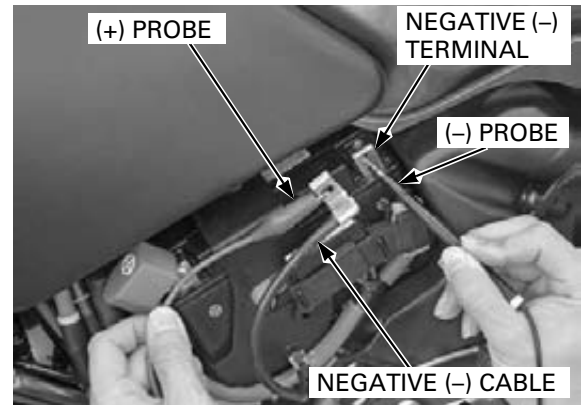
Do not disconnect the battery or any cable in the charging system without first switching off the ignition switch. Failure to follow this precaution can damage the tester or electrical components.

Turn the ignition switch OFF and disconnect the battery negative cable from the battery.

Connect the ammeter (+) probe to the negative cable and the ammeter (-) probe to the battery (-) terminal.

With the ignition switch OFF, check for current leakage.

- When measuring current using a tester, set it to a high range, and then bring the range down to an appropriate level. Current flow higher than the range selected may blow out the fuse in the tester.
- While measuring current, do not turn the ignition switch ON. A sudden surge of current may blow out the fuse in the tester.



SPECIFIED CURRENT LEAKAGE: 0.5 mA max.

If current leakage exceeds the specified value, a shorted circuit is likely.

Locate the short by disconnecting connections one by one and measuring the current.

CHARGING VOLTAGE INSPECTION

Be sure the battery is in good condition before performing this test.

Warm up the engine to normal operating temperature.

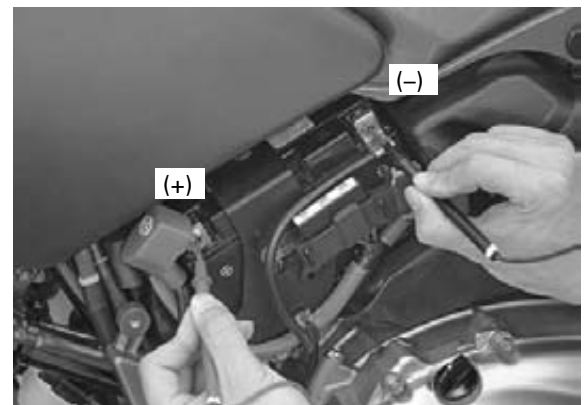
Stop the engine, and connect the multimeter between the positive and negative terminals of the battery.

NOTE:

To prevent a short, make absolutely certain which are the positive and negative terminals or cable.

Restart the engine.

With the headlight on Hi beam, measure the voltage on the multimeter when the engine runs at 5,000 min⁻¹ (rpm).



STANDARD:

Measured BV < Measured CV < 15.5 V

- BV = Battery Voltage (page 18-6)
- CV = Charging Voltage

BATTERY/CHARGING SYSTEM

ALTERNATOR CHARGING COIL

INSPECTION

- It is not necessary to remove the stator coil to make this test.

Remove the following:

- Left side cover (page 3-4)
- Left rear cowl (page 3-8)

Remove the wire band and disconnect the alternator 3P (White) connector.

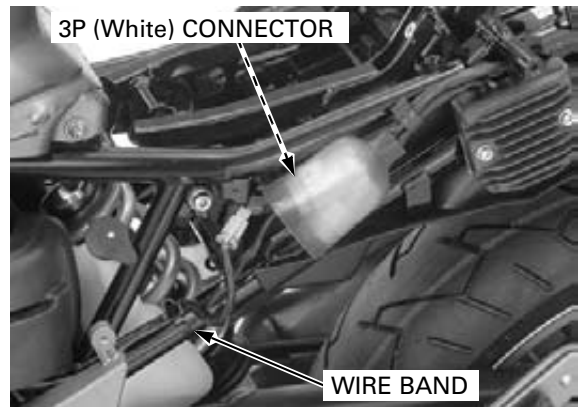
Check the resistance between three Yellow terminals of the alternator side connector.

STANDARD: 0.1 – 1.0 Ω (at 20°C/68°F)

Check for continuity between each terminal and ground.

There should be no continuity.

If resistance is out of specification, or if any wire has continuity to ground, replace the alternator stator. Refer to procedure for stator removal (page 11-6).



REGULATOR/RECTIFIER

WIRE HARNESS INSPECTION

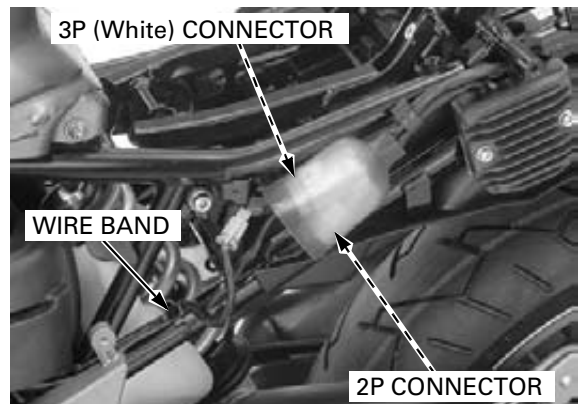
Remove the following:

- Left side cover (page 3-4)
- Left rear cowl (page 3-8)

Remove the wire band and disconnect the regulator/rectifier 2P connector and alternator 3P (White) connector.

Check the connectors for loose contacts or corroded terminals.

If the regulated voltage reading (page 18-7) is out of the specification, check the following at the wire harness side connector.



BATTERY LINE:

Measure the voltage between the red wire terminal and green wire terminal.

There should be battery voltage at all time.

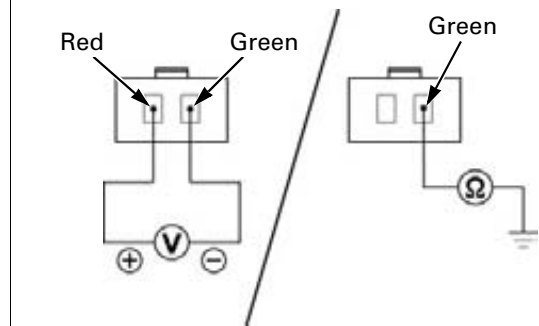
GROUND LINE:

Check the continuity between the green wire terminal and ground.

There should be continuity at all time.

If all components of the charging system are normal and there are no loose connections at the regulator/rectifier connectors, replace the regulator/rectifier (page 18-9).

REGULATOR/RECTIFIER 2P CONNECTOR
(Wire side of female terminals):

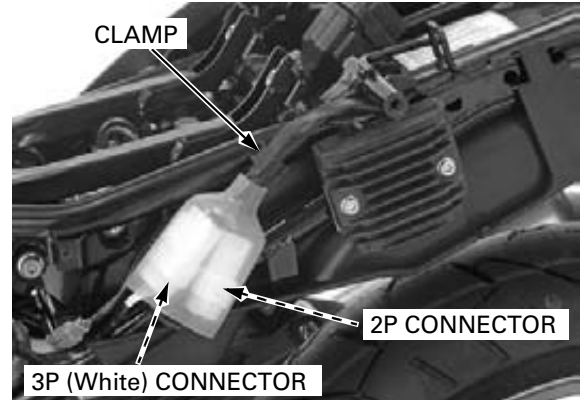


REMOVAL/INSTALLATION

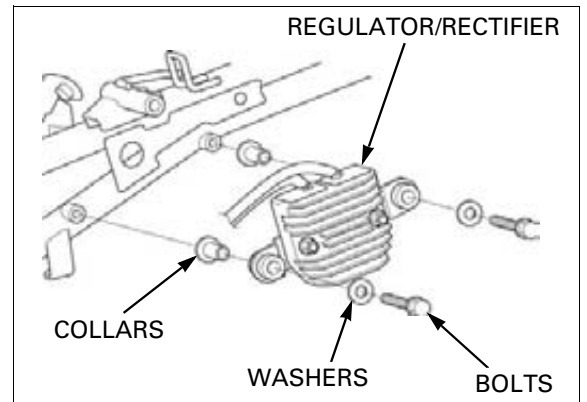
Remove the left rear cowl (page 3-8).

Disconnect the alternator 3P (White) connector and regulator/rectifier 2P connector.

Release the regulator/rectifier wire from the harness clamp.

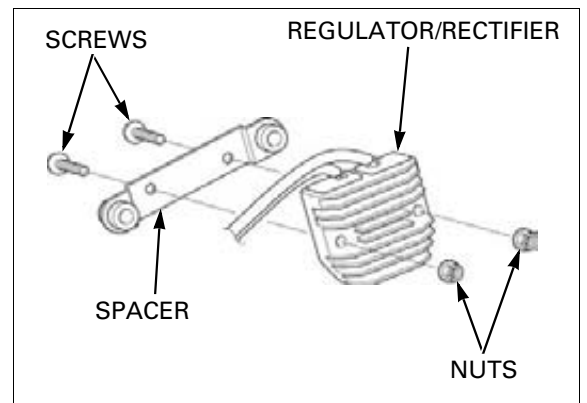


Remove the bolts, washers, collars and the regulator/rectifier with the spacer.



Remove the nuts and screws, then remove the spacer from the regulator/rectifier.

Install the regulator/rectifier in the reverse order of removal.



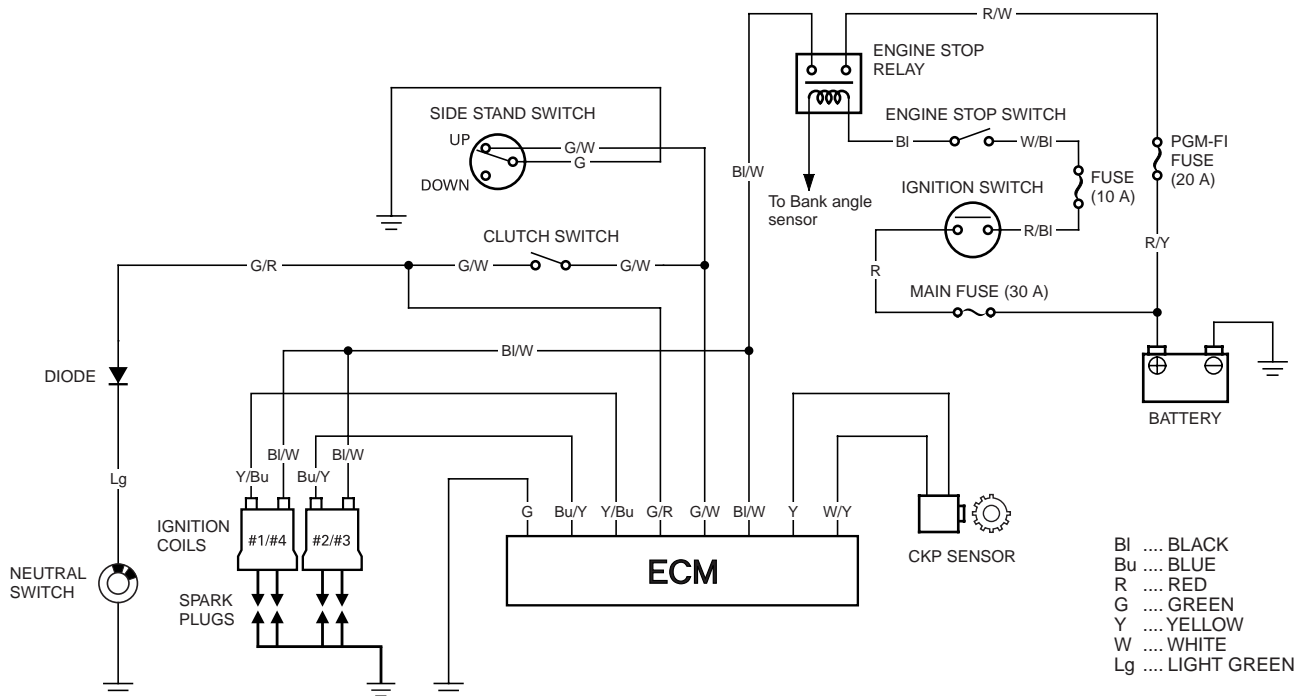
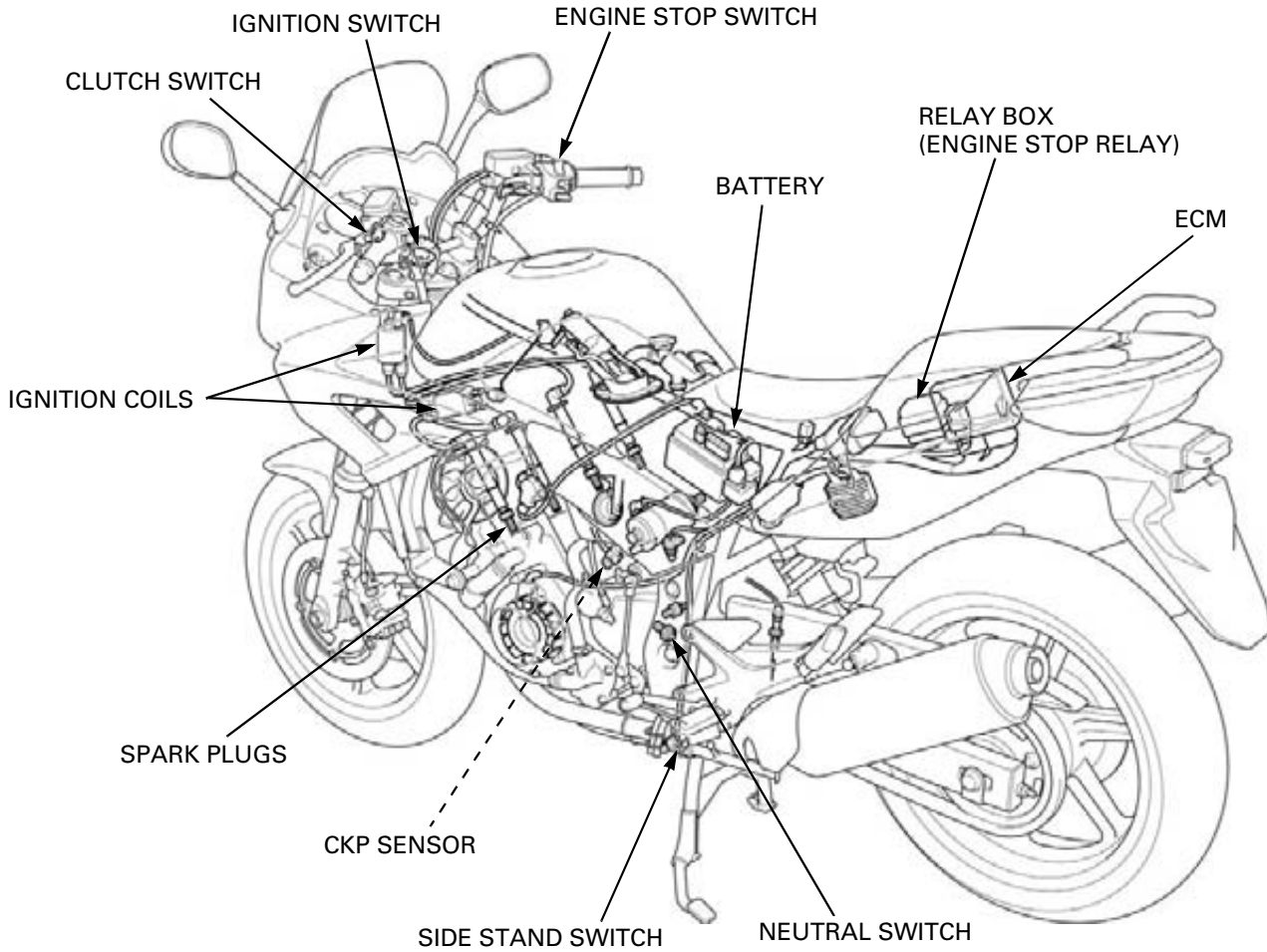
MEMO

19. IGNITION SYSTEM

SYSTEM DIAGRAM.....	19-2	IGNITION SYSTEM INSPECTION.....	19-5
SERVICE INFORMATION	19-3	CKP SENSOR.....	19-7
TROUBLESHOOTING	19-4	IGNITION TIMING	19-8

IGNITION SYSTEM

SYSTEM DIAGRAM



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 off the ignition switch before servicing.
- Use spark plug of the correct heat range. Using spark plug 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 ON and current is present.
- When servicing the ignition system, always follow the steps in the troubleshooting sequence (page 19-4).
- This motorcycle's Ignition Control Module (ICM) is built into the Engine Control Module (ECM).
- The ignition timing does not normally need to 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 plug.
- Refer to the ECM inspection (page 6-82).

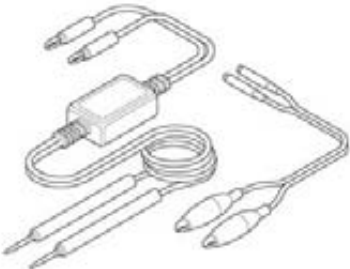

SPECIFICATIONS

ITEM		SPECIFICATIONS
Spark plug (Iridium)	NGK	CR8EH-9
	DENSO	U24FER9
Spark plug gap		0.80 – 0.90 mm (0.031 – 0.035 in)
Ignition coil peak voltage		100 V minimum
CKP (crankshaft position) sensor peak voltage		0.7 V minimum
Ignition timing ("F"mark)		5° BTDC at idle

TORQUE VALUE

Timing hole cap 18 N·m (1.8 kgf·m, 13 lbf·ft) Apply grease to the threads

TOOLS

<p>Imrie diagnostic tester (model 625) or Peak voltage adaptor 07HGJ-0020100</p>  <p>with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)</p>	<p>Test probe 07ZAJ-RDJA110</p> 
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IGNITION SYSTEM

TROUBLESHOOTING

- Inspect the following before diagnosing the system.
 - Faulty spark plug
 - Loose spark plug cap connection
 - Loose ignition coil connectors
 - Water got into the spark plug cap (shorting the ignition coil secondary voltage)
- If there is no spark at any cylinder, temporarily exchange the ignition coil with the other good one and perform the spark test. If there is spark, the exchanged ignition coil is faulty.
- "Initial voltage" of the ignition primary coil is the battery voltage with the ignition switch turned ON and engine stop switch turned "⏻" (When the engine is not cranked by the starter motor).

No spark at all plugs

Unusual condition		Probable cause (Check in numerical order)
Ignition coil primary voltage	No initial voltage with the ignition ON and engine stop switch turned "⏻" (other electrical components are normal).	<ol style="list-style-type: none"> 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 connect of the ignition coil connectors, or an open circuit in primary coil (Check at the ECM connector). 4. Faulty ECM (in case when the initial voltage is normal while disconnecting ECM connectors).
	Initial voltage is normal, but it drops down to 2 – 4 V while cranking the engine.	<ol style="list-style-type: none"> 1. Incorrect peak voltage adaptor connections. 2. Undercharged battery. 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. 5. An open circuit or loose connection in Yellow/blue or Blue/yellow wire between the ignition coils and ECM. 6. Faulty side stand switch or neutral switch. 7. An open circuit or loose connection: <ul style="list-style-type: none"> – Side stand switch line: Green/white wire – Neutral switch line: Light green or Green/red wire 8. Faulty CKP sensor (Measure the peak voltage). 9. Faulty ECM (in case when above No. 1 – 8 are normal).
	Initial voltage is normal, but no peak voltage while cranking the engine.	<ol style="list-style-type: none"> 1. Faulty peak voltage adaptor connections. 2. Faulty peak voltage adaptor. 3. Faulty CKP sensor (Measure the peak voltage). 4. Faulty ECM (in case when above No. 1 – 3 are normal).
	Initial voltage is normal, but peak voltage is lower than standard value.	<ol style="list-style-type: none"> 1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Faulty CKP sensor (Measure the peak voltage). 3. Cranking speed is too low (Battery is undercharged). 4. The sampling timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the specification at least once). 5. Faulty ECM (in case when above No. 1 – 4 are normal).
	Initial and peak voltage are normal, but does not spark.	<ol style="list-style-type: none"> 1. Faulty spark plug or leaking ignition coil secondary current ampere. 2. Faulty ignition coil(s).
CKP sensor	Peak voltage is lower than standard value.	<ol style="list-style-type: none"> 1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Cranking speed is too low (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 specification at least once). 4. Faulty CKP sensor (in case when above No. 1 – 3 are normal).
	No peak voltage.	<ol style="list-style-type: none"> 1. Faulty peak voltage adaptor. 2. Faulty CKP sensor.

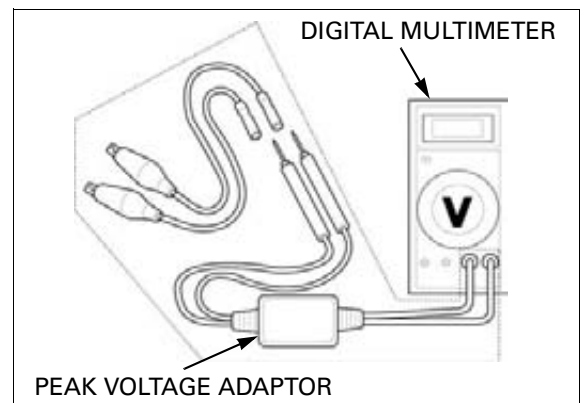
IGNITION SYSTEM INSPECTION

- If there is no spark at any plug, check all connections for loose or poor contact before measuring each peak voltage.
- Use recommended digital multimeter or commercially available digital multimeter with an impedance of 10 M Ω /DCV minimum.
- The display value differs depending upon the internal impedance of the multimeter.
- If the Imrie diagnostic tester (model 625) is used, follow the manufacturer's instruction.

Connect the peak voltage tester or peak voltage adaptor to the digital multimeter.

TOOLS:

**Imrie diagnostic tester (model 625) or
Peak voltage adaptor 07HGJ-0020100
with commercially available digital multimeter
(impedance 10 M Ω /DCV minimum)**



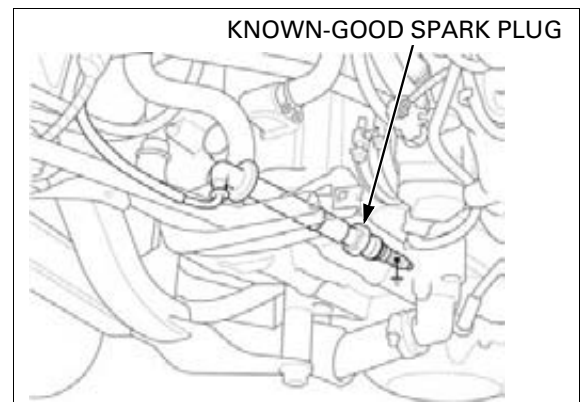
IGNITION COIL PRIMARY PEAK VOLTAGE

- Check all system connections before inspection. If the system is disconnected, incorrect peak voltage might be measured.
- Check cylinder compression and check that the spark plugs are installed correctly.

Remove the spark plug caps from the spark plugs (page 4-8).

Reinstall the ignition coils onto the frame and left front cowl stay.

Connect known-good spark plugs to the spark plug cap and ground the spark plug to the cylinder head as done in a spark test.



IGNITION SYSTEM

With the ignition coil primary terminal connected, connect the peak voltage adaptor or Imrie tester probes to the ignition coil primary wire terminal and ground.

For #2/#3 ignition coil inspection, remove the upper mounting bolt, nut and spacer.

Connect the peak voltage adaptor or Imrie diagnostic tester probes to the test harness terminals.

CONNECTIONS:

#1/#4 ignition coil:

Yellow/blue (+) – body ground (-)

#2/#3 ignition coil:

Blue/yellow (+) – body ground (-)

Avoid touching the spark plugs and tester probes to prevent electric shock.

Turn the ignition switch ON and engine stop switch "C".

Check for initial voltage at this time. Battery voltage should be present.

If the initial voltage cannot be measured, check the power supply circuit. Refer to the troubleshooting chart (page 19-4).

Shift the transmission into neutral.

Crank the engine with the starter motor with the throttle grip fully opened and read the ignition coil primary peak voltage.

PEAK VOLTAGE: 100 V minimum

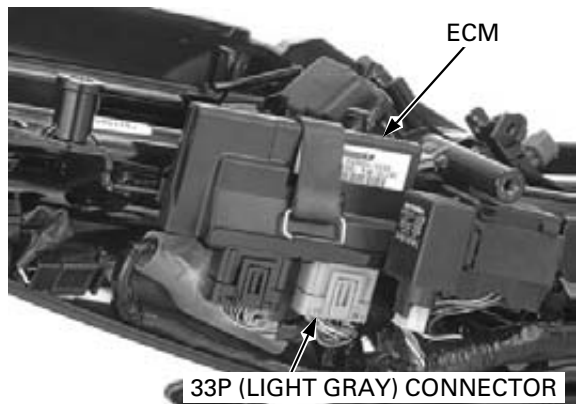
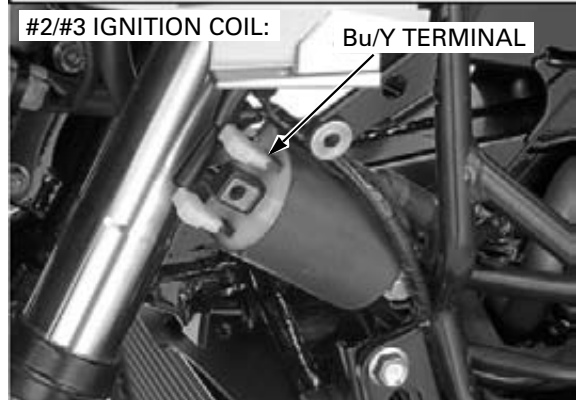
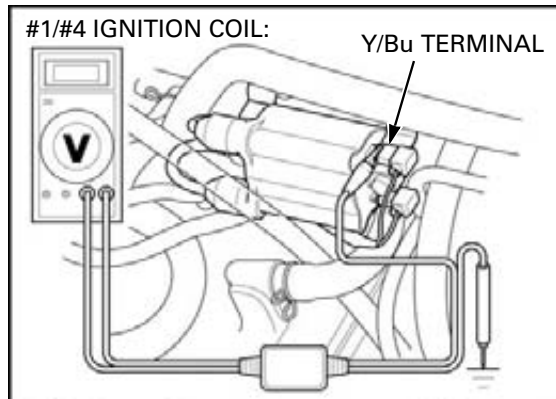
If the peak voltage is abnormal, refer to the troubleshooting chart (page 19-4).

CKP SENSOR PEAK VOLTAGE

- Check all system connections before inspection. If the system is disconnected, incorrect peak voltage might be measured.
- Check cylinder compression and check that the spark plugs are installed correctly.

Remove the right rear cowl (page 3-8).

Disconnect the ECM 33P (Light gray) connector from the ECM.



Connect the peak voltage adaptor or Imrie diagnostic tester probes to the connector terminal of the wire harness side and body ground.

TOOLS:

- Imrie diagnostic tester (model 625) or**
- Peak voltage adaptor 07HGJ-0020100**
- with commercially available digital multimeter**
- (impedance 10 MΩ/DCV minimum)**
- Test probe 07ZAJ-RDJA110**

CONNECTION:

Yellow terminal (+) – Body ground (–)

Crank the engine with the starter motor and read the peak voltage.

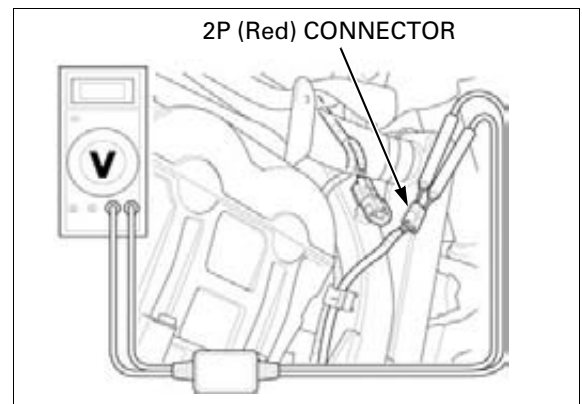
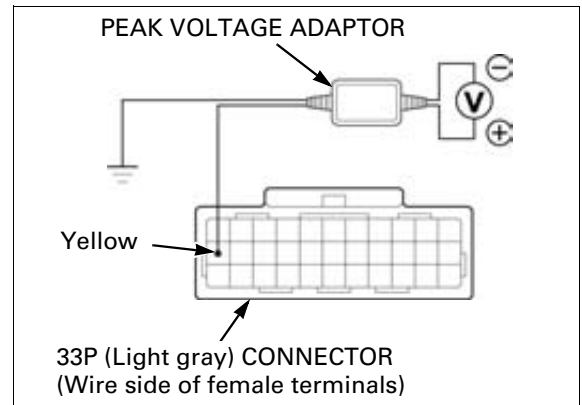
PEAK VOLTAGE: 0.7 V minimum

If the peak voltage measured at ECM connector is abnormal, measure the peak voltage at the CKP sensor connector.

Disconnect the CKP sensor 2P (Red) connector and connect the tester probes to the terminal (Yellow and White/yellow).

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, check the 2P (Red) connector for loose connection and the wire harness for an open circuit or loose connection.
- If both peak voltage measured are abnormal, check each item in the troubleshooting chart (page 19-4). If all items are normal, the CKP sensor is faulty. See following steps for CKP sensor replacement.



CKP SENSOR

REPLACEMENT

Remove the right crankcase cover (page 10-15).

Remove the wire grommet from the cover and remove the sensor wire setting bolt/washer. Remove the bolts and CKP sensor.

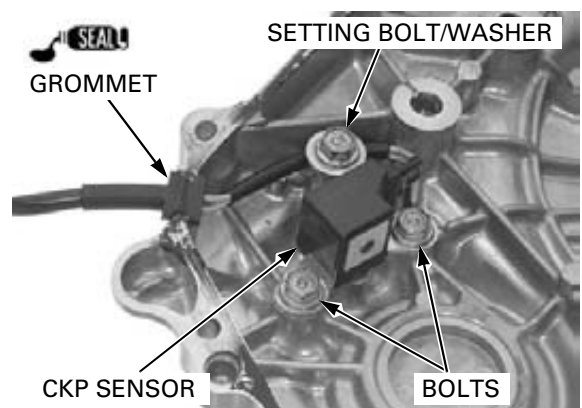
Install the new CKP sensor and tighten the mounting bolts securely.

Route the CKP sensor wire into the groove of the right crankcase cover.

Install the setting bolt/washer, then tighten it securely.

Apply sealant to the grommet seating surface and install the grommet into the cover groove properly.

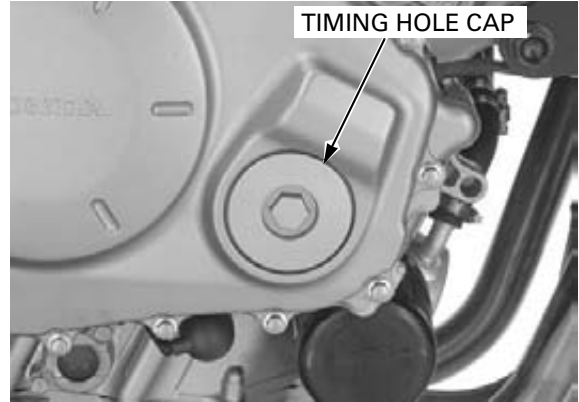
Install the right crankcase cover (page 10-33).



IGNITION SYSTEM

IGNITION TIMING

Warm up the engine.
Stop the engine and remove the timing hole cap.

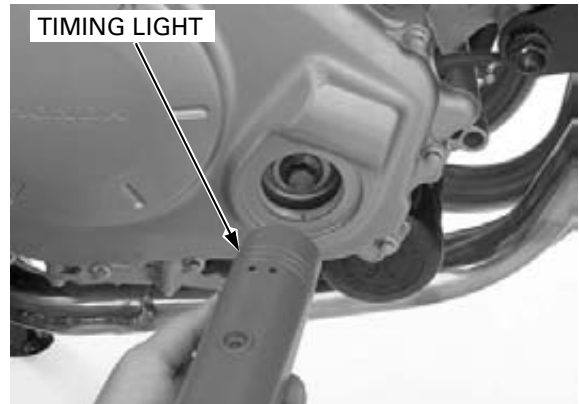


Lift and support the fuel tank (page 4-5).

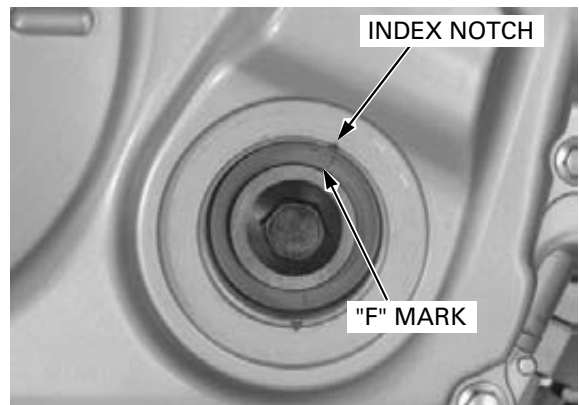
Rear the instructions for timing light operation.

Connect the timing light to the No.1 spark plug wire. Start the engine, let it idle and check the ignition timing.

IDLE SPEED: 1,200 ± 100 min⁻¹ (rpm)



The ignition timing is correct if the "F" mark on the CKP sensor rotor (starter clutch outer) aligns with the index notch on the right crankcase cover at idle.



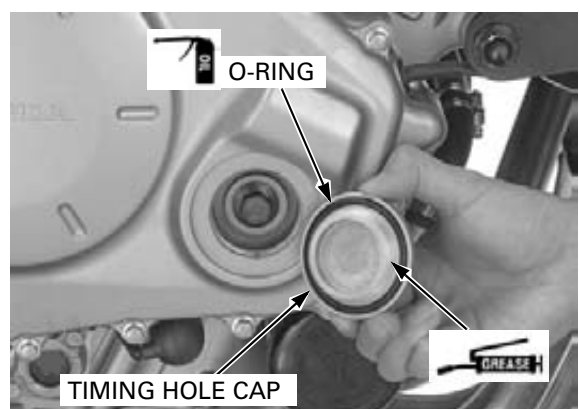
Check the O-ring is in good condition, replace it if necessary.

Apply oil to the O-ring.

Apply grease to the timing hole cap threads and install the timing hole cap.

Tighten the timing hole cap to the specified torque.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

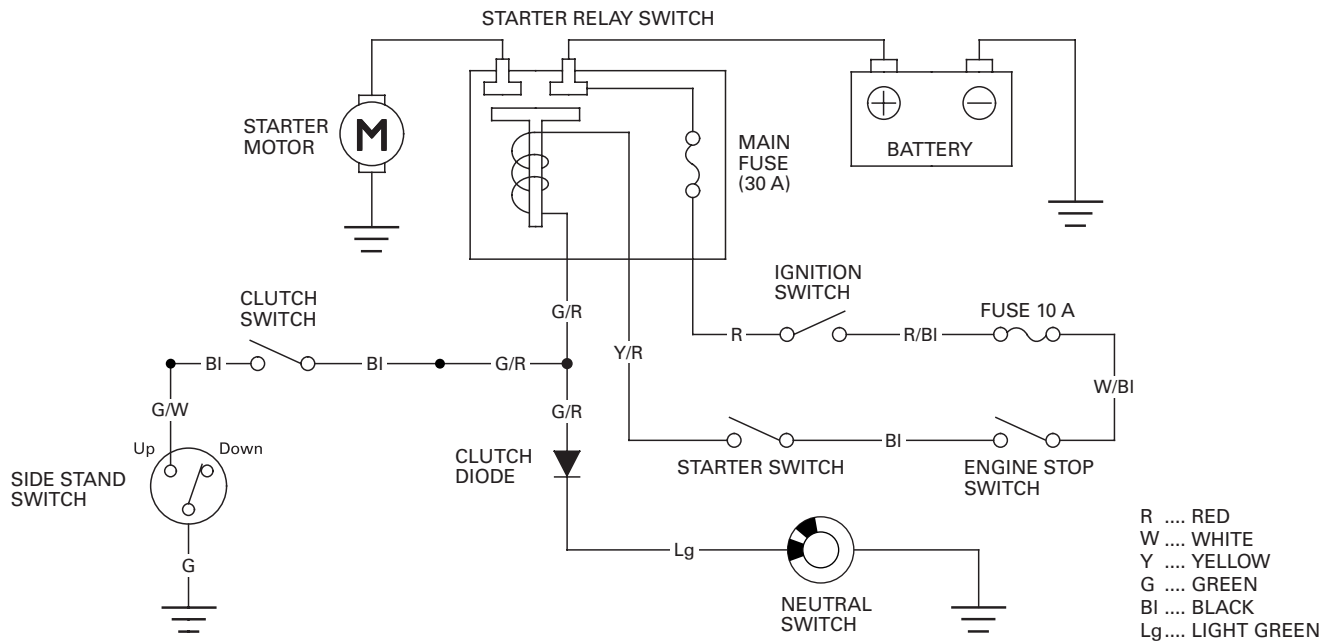
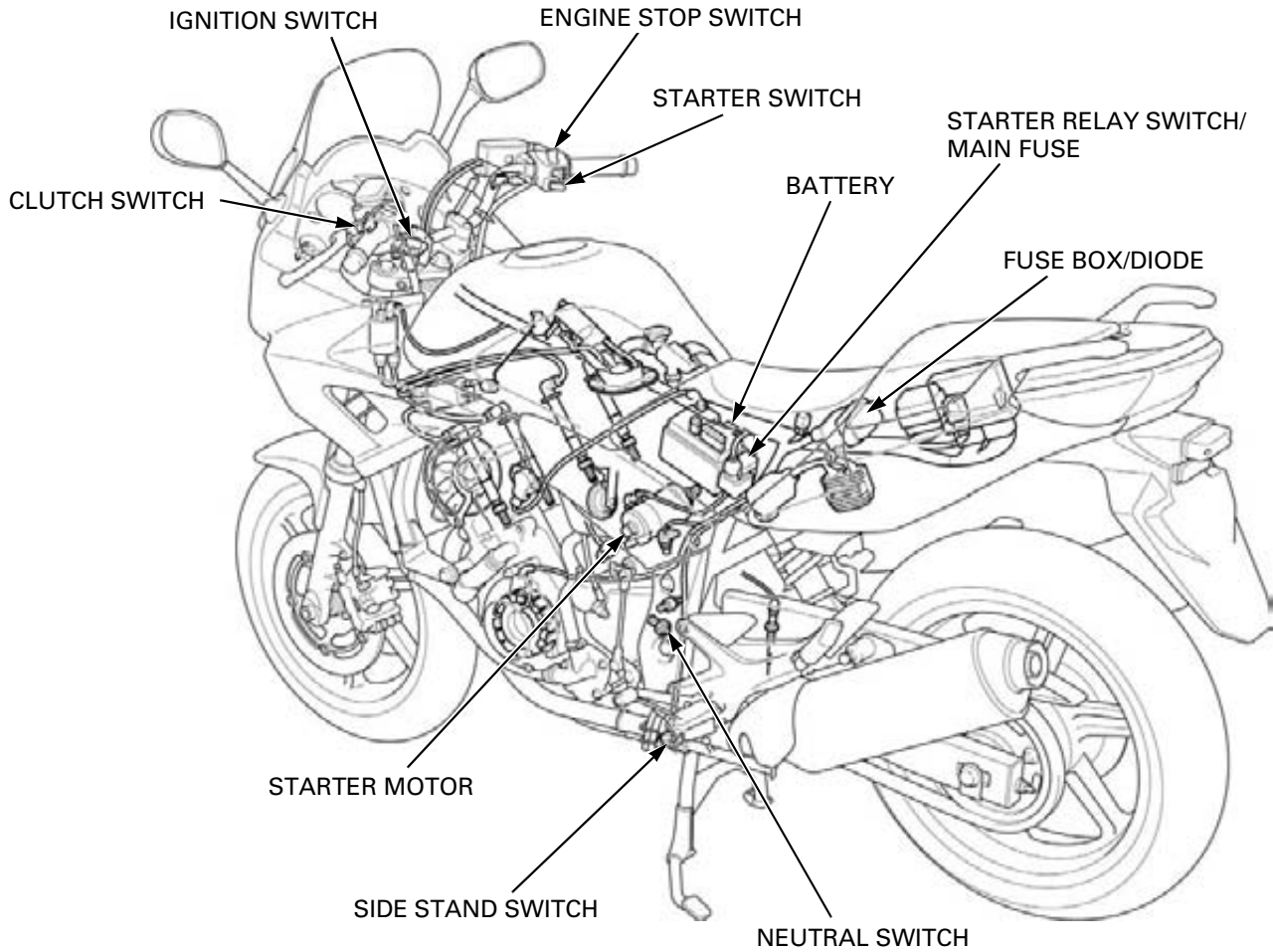


20. ELECTRIC STARTER

SYSTEM DIAGRAM.....	20-2	STARTER MOTOR.....	20-6
SERVICE INFORMATION	20-3	STARTER RELAY SWITCH.....	20-13
TROUBLESHOOTING	20-4	DIODE.....	20-15

ELECTRIC STARTER

SYSTEM DIAGRAM



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 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 20-4).
- A weak battery may be unable to turn the starter motor quickly enough, or supply adequate ignition current.
- Refer to the procedure for starter clutch servicing (page 10-28).
- Refer to the following components informations.
 - Ignition switch (page 21-20)
 - Starter switch (page 21-21)
 - Neutral switch (page 21-24)
 - Side stand switch (page 21-24)
 - Clutch switch (page 21-23)

SPECIFICATIONS

Unit: mm (in)

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

TORQUE VALUES

Starter motor terminal nut 12 N·m (1.2 kgf·m, 9 lbf·ft)

TROUBLESHOOTING

Starter motor does not turn

1. Fuse Inspection

Check for blown main fuse or sub fuse.

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.

Is the battery in good condition?

YES – GO TO STEP 3.

NO – Replace the battery (page 18-6)

3. Starter Relay Switch Operation

Check the starter relay switch operation.

You should hear the relay "CLICK" when the engine 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 to the starter motor directly and check the operation.

Does the starter motor turn?

YES –

- Poorly connected starter motor cable
- Faulty starter relay switch (page 20-13)

NO – Faulty starter motor (page 20-6)

5. Relay Coil Ground Wire Lines Inspection

Disconnect the starter relay switch connector, and check the relay coil ground wire lines as below for continuity:

1. Green/red terminal – clutch diode – neutral switch line (with the transmission in neutral and clutch lever released).
2. Green/red terminal – clutch switch – side stand switch line (in any gear except neutral with the clutch lever pulled in, and the side stand up).

Is there continuity?

NO –

- Faulty neutral switch (page 21-24)
- Faulty clutch diode (page 20-15)
- Faulty clutch switch (page 21-23)
- Faulty side stand switch (page 21-24)
- 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 ON and the starter switch pushed, measure the voltage at the starter relay switch connector (between Yellow/red (+) and body ground (-)).

Is the starter relay switch operation correct?

NO –

- Faulty ignition switch (page 21-20)
- Faulty starter switch (page 21-21)
- Faulty engine stop switch (page 21-21)
- Loose or poor contact connector
- Open circuit in wire harness

YES – GO TO STEP 7.

7. Starter Relay Switch Continuity Inspection

Disconnect the starter relay switch 4P connector and cables.

Connect a fully charged 12 V battery positive wire to the relay switch Yellow/red wire terminal and negative wire to the Green/red wire terminal.

Check the 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 of the starter relay switch 4P 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 side stand up and the clutch lever pulled in.

1. Clutch Switch Inspection

Check the clutch switch operation (page 21-23).

Is the clutch switch operation normal?

NO – Faulty clutch switch

YES – GO TO STEP 2.

2. Side Stand Switch Inspection

Check the side stand switch operation (page 21-24).

Is the side stand switch operation normal?

NO – Faulty side stand switch (page 21-24)

YES – • Open circuit in wire harness
• Loose or poor contact connector

Starter motor turns engine slowly

- Low battery voltage
- Poorly connected battery terminal cables
- Poorly connected starter motor cable or ground cable
- Faulty starter motor

Starter motor turns, but engine does not turn

- Starter motor is running backwards
 - Starter motor assembled improperly
 - Terminals connected improperly
- Faulty starter clutch
- Damaged or faulty starter driven gear, idle gear and/or reduction gear

Starter relay switch "Clicks", but engine does not turn over

- Crankshaft does not turn due to engine problems

ELECTRIC STARTER

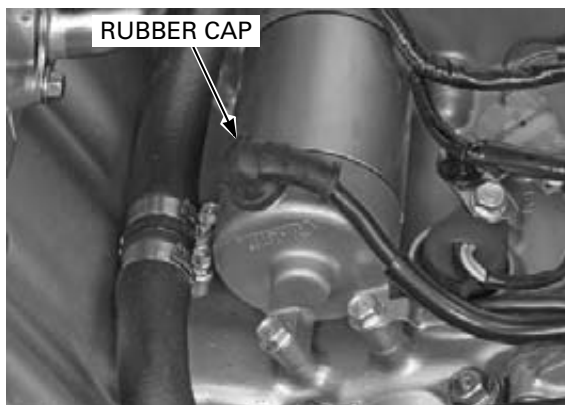
STARTER MOTOR

REMOVAL

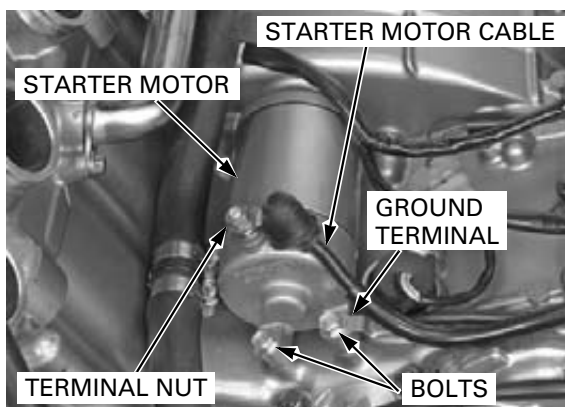
- With the ignition switch OFF, remove the negative cable at the battery before servicing the starter motor.

Remove the air cleaner housing (page 6-60).

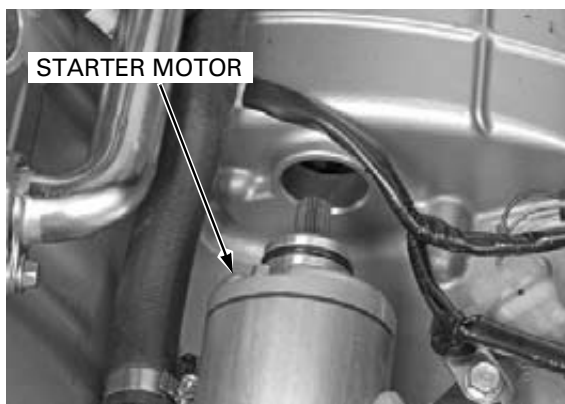
Remove the rubber cap.



Remove the terminal nut and starter motor cable.
Remove the two mounting bolts and ground cable.



Remove the starter motor from the crankcase.



DISASSEMBLY

Remove the following:

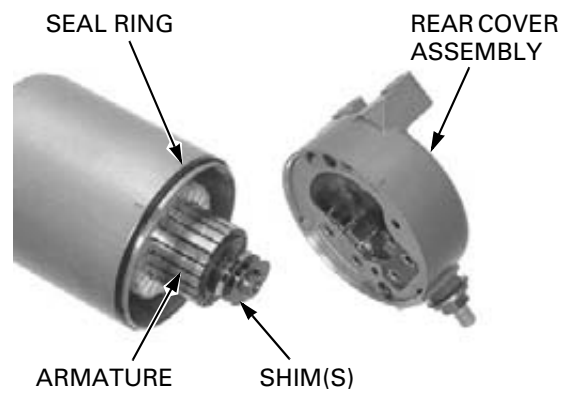
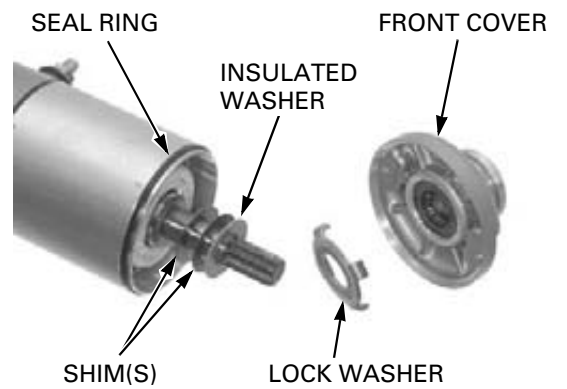
- Starter motor O-ring
- Starter motor case bolts/O-rings

Record the location and number of shims.

- Front cover
- Seal ring
- Lock washer
- Insulated washer
- Shim(s)

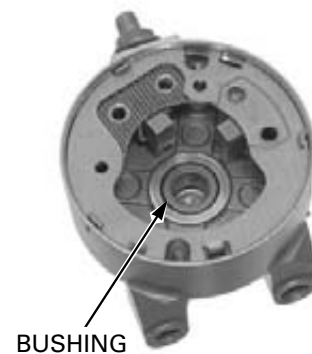
Record the location and number of shims.

- Rear cover assembly
- Seal ring
- Shim(s)
- Armature



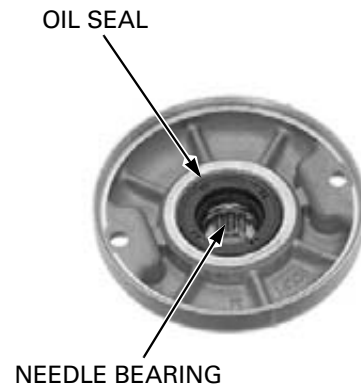
INSPECTION

Check the bushing in the rear cover for wear or damage.

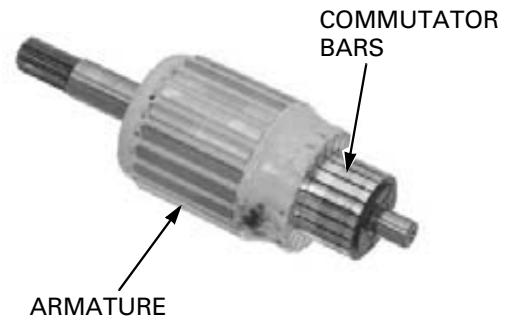


ELECTRIC STARTER

Check the oil seal for deterioration or damage, and needle bearing for wear or damage.



Do not use emery or sand paper on the commutator. Check the commutator bars of the armature for discoloration.



Check for continuity between pairs of commutator bars. There should be continuity.

Should be CONTINUITY:

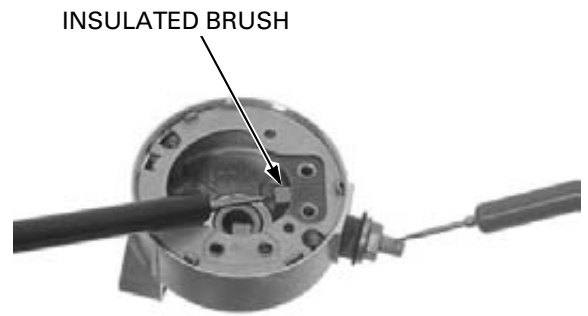


Check for continuity between each commutator bar and the armature shaft. There should be no continuity.

Should NOT be CONTINUITY:



Check for continuity between the insulated brush and cable terminal.
There should be continuity.



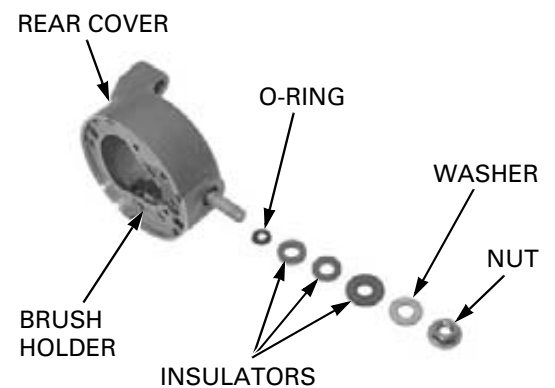
Check for continuity between the cable terminal and the rear cover.
There should be no continuity.



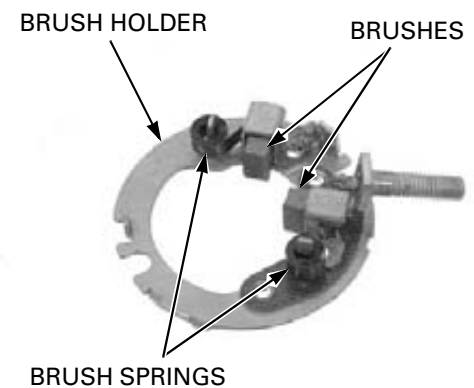
Record the location and number of insulators.

Remove the following:

- Nut
- Washer
- Insulators
- O-ring
- Brush holder assembly



Remove the brush springs and brushes from the brush holder.



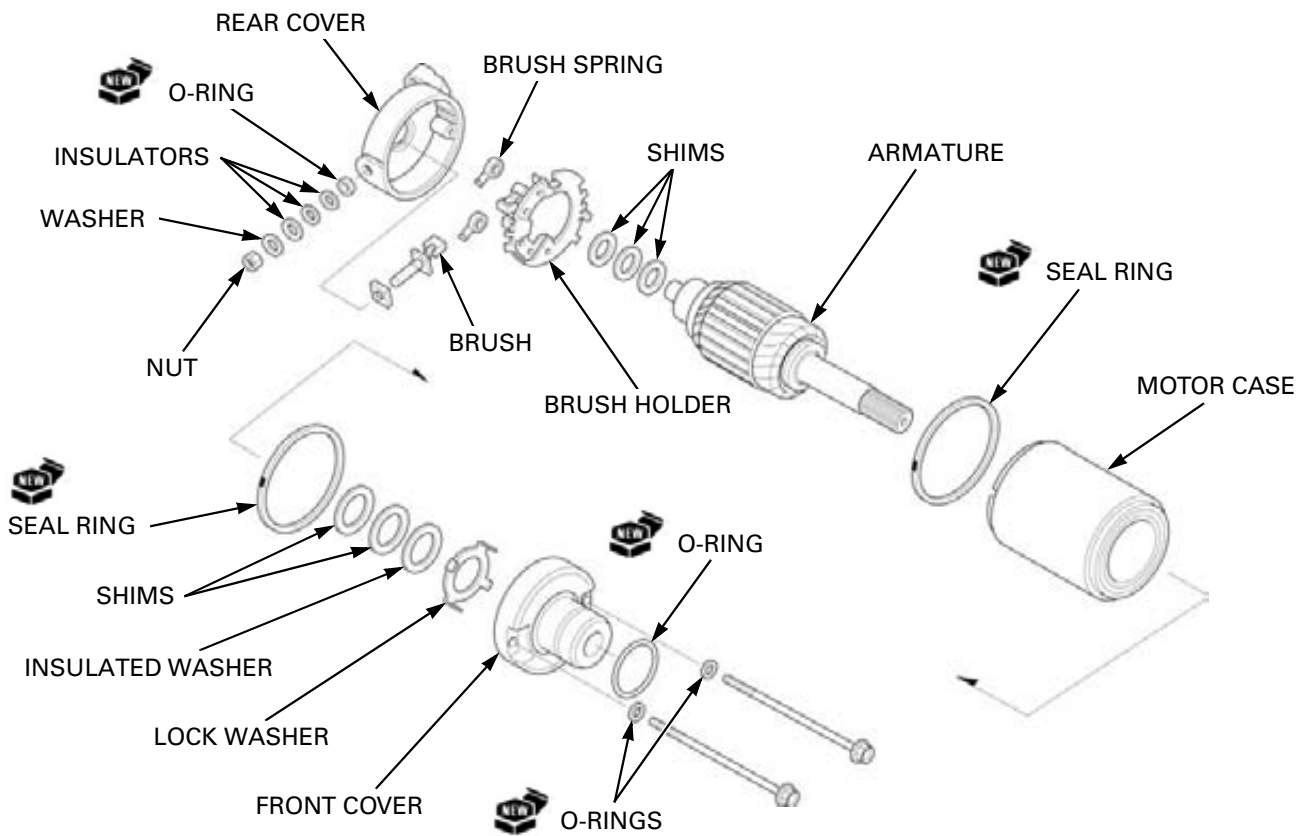
ELECTRIC STARTER

Inspect the brushes for damage and measure the brush length.

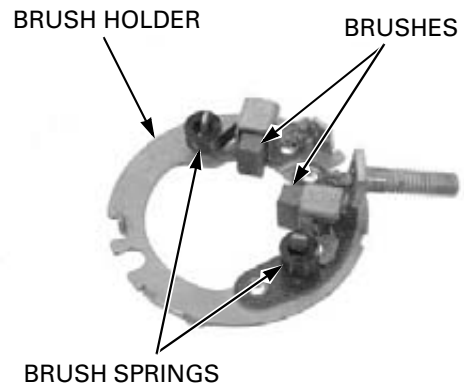
SERVICE LIMIT: 6.5 mm (0.26 in)



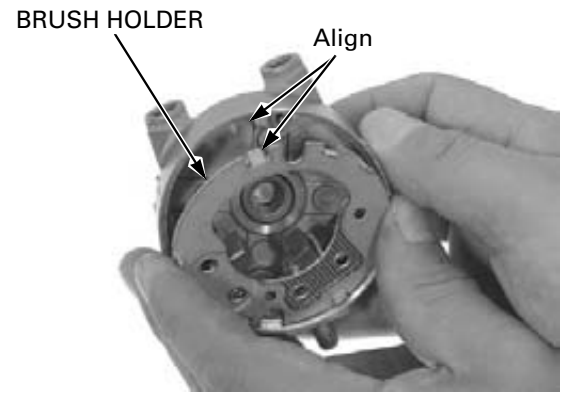
ASSEMBLY



Install the brushes and brush springs to the brush holder.



Install the brush holder into the rear cover, aligning the holder tab with the rear cover groove.



Install the insulators properly as noted during removal.

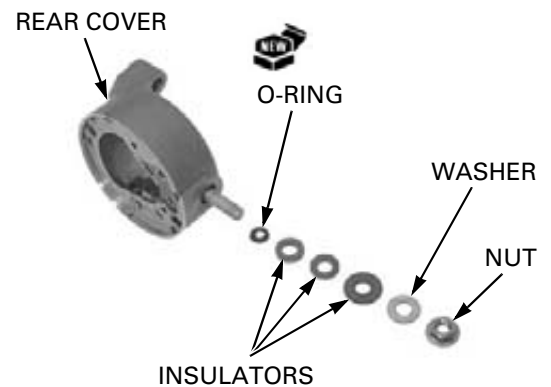
Install the following:

- New O-ring
- Insulators
- Washer
- Nut

Install the armature in the motor case. When installing the armature into the motor case, hold the armature tightly to keep the magnet of the case from pulling the armature against it.

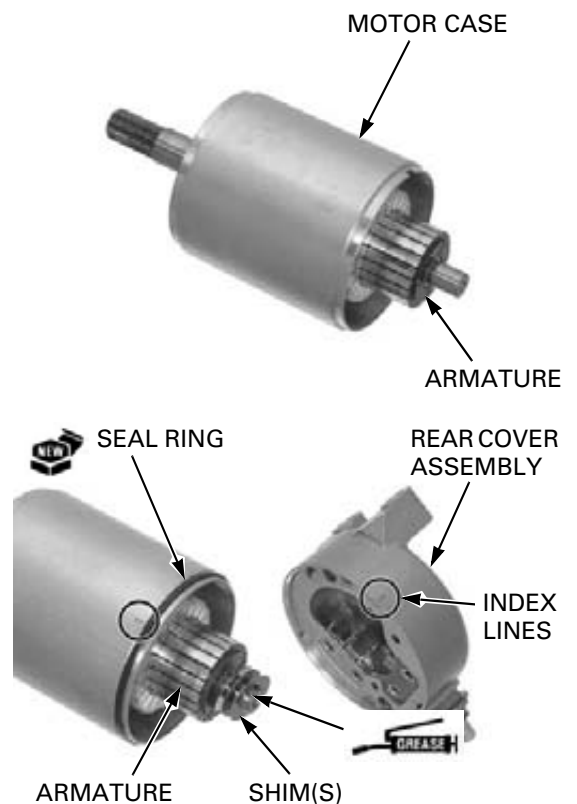
NOTICE

The coil may be damaged if the magnet pulls the armature against the case.



Install the shims properly as noted during removal.

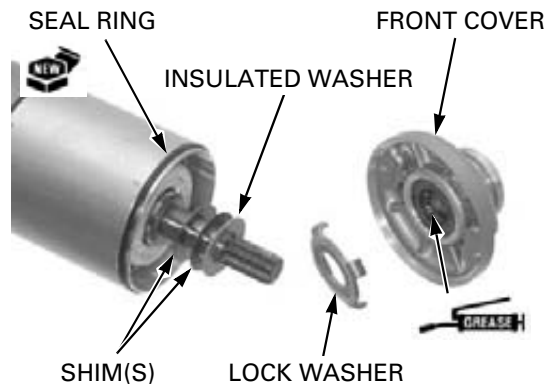
Install a new seal ring onto the motor case. Install the shim(s) onto the armature shaft. Apply thin coat of grease to the armature shaft end. Install the rear cover assembly, while pushing in the brushes into the brush holder and aligning with the index lines of the motor case and rear cover.



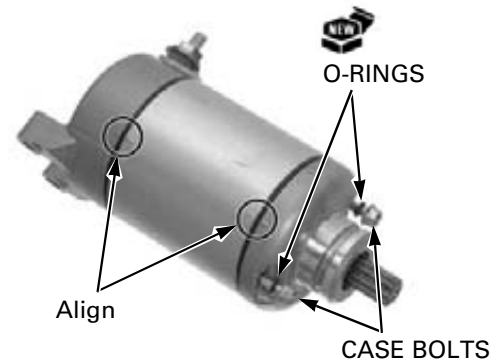
ELECTRIC STARTER

Install the shims properly as noted during removal.

Install the shim(s) and insulated washer onto the armature shaft.
Install a new seal ring onto the motor case.
Apply grease to the oil seal lip and needle bearing in the front cover.
Install the lock washer to the front cover with the lock washer tabs facing to front cover, and install them onto the armature shaft.

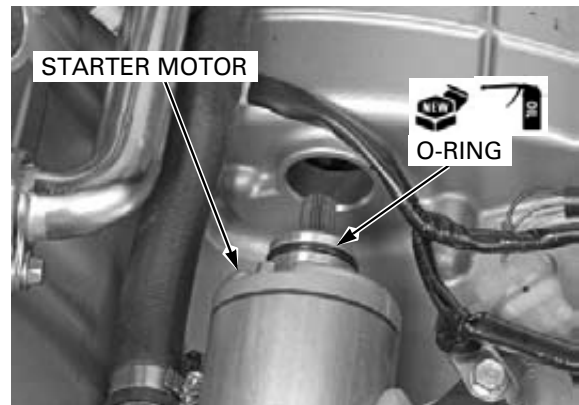


Align each index line of the front and rear cover with that of motor case.
Install the new O-rings onto the motor case bolts.
Install and tighten the case bolts securely.



INSTALLATION

Coat a new O-ring with oil and install it into the starter motor groove.
Install the starter motor into the crankcase.

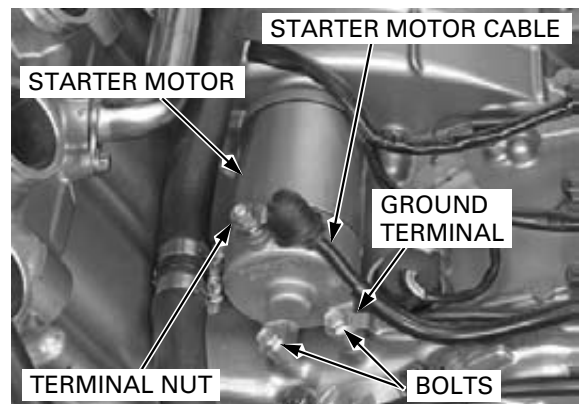


Route the starter motor cable and ground cable properly (page 1-23).

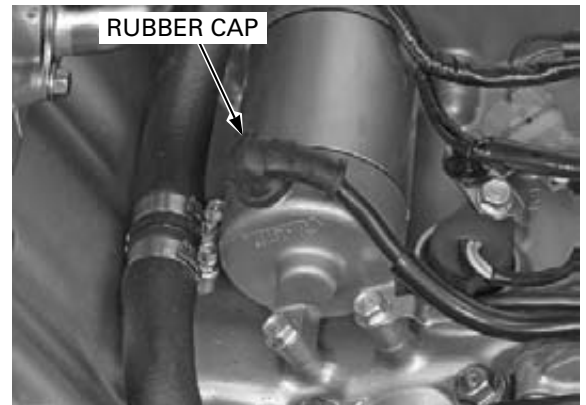
Install the ground cable and mounting bolts, and tighten the bolts securely.

Install the starter motor cable to the terminal, then tighten the terminal nut to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Install the rubber cap securely.
Install the air cleaner housing (page 6-67).



STARTER RELAY SWITCH

INSPECTION

OPERATION INSPECTION

Remove the right side cover (page 3-4).

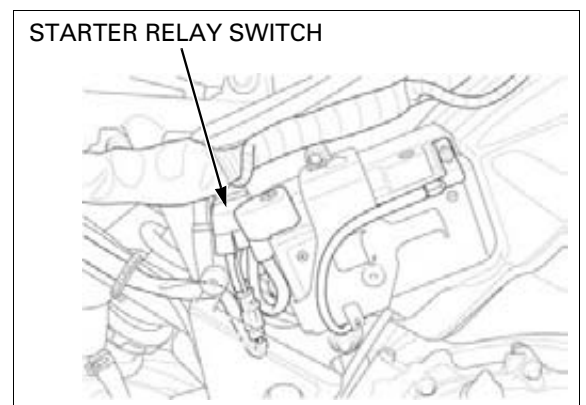
Shift the transmission into neutral.

Turn the ignition switch ON and engine stop switch "G".

Press the starter switch button.

The coil is normal if the starter relay switch clicks.

If you don't hear the switch "click", inspect the relay switch using the procedure below.

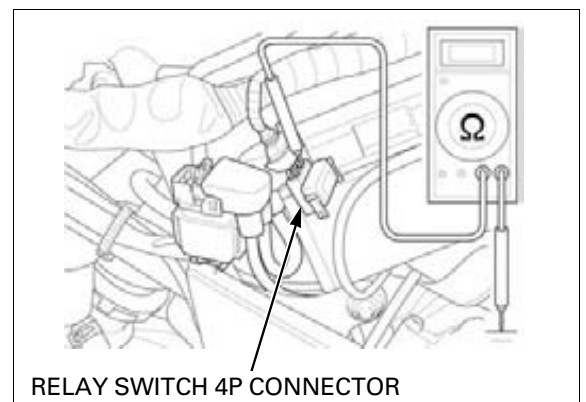


GROUND LINE INSPECTION

Remove the starter relay switch from the stay (page 20-15).

Disconnect the starter relay switch 4P connector.
Check for continuity between the Green/red wire (ground line) and ground.

If there is continuity when the transmission is in neutral and clutch lever released or when the clutch lever pulled and the side stand up, the ground circuit is normal (In neutral, there is a slight resistance due to the diode).



ELECTRIC STARTER

STARTER RELAY VOLTAGE INSPECTION

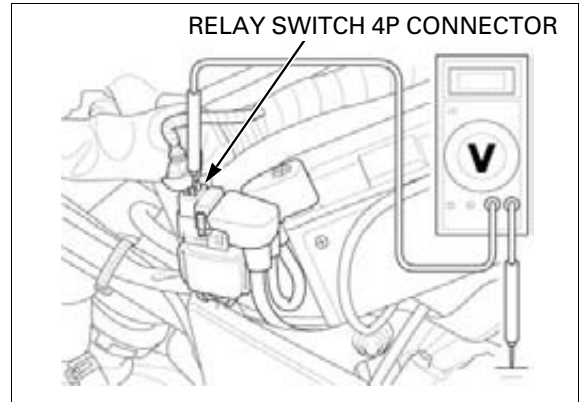
Connect the starter relay switch 4P connector.

Reinstall the battery (page 18-6).

Shift the transmission into neutral.

Measure the voltage between the Yellow/red wire terminal (+) and body ground (-).

If the battery voltage appears only when the starter switch is pushed with the ignition switch ON and engine stop switch "⏻", it is normal.

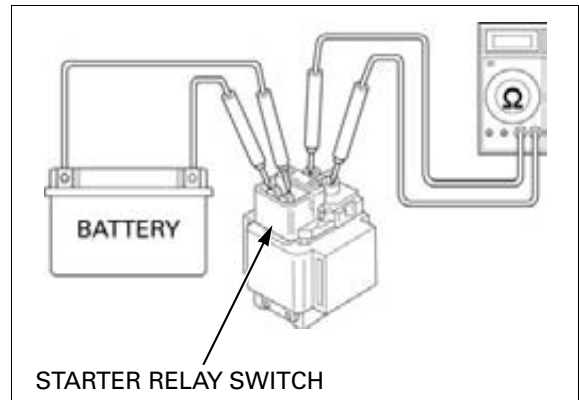


CONTINUITY INSPECTION

Disconnect the starter relay switch 4P connector and cables.

Connect a fully charged 12 V battery positive wire to the relay switch Yellow/red wire terminal and negative wire to the Green/red wire terminal.

There should be continuity between the large terminals while the battery is connected, and no continuity when the battery is disconnected.



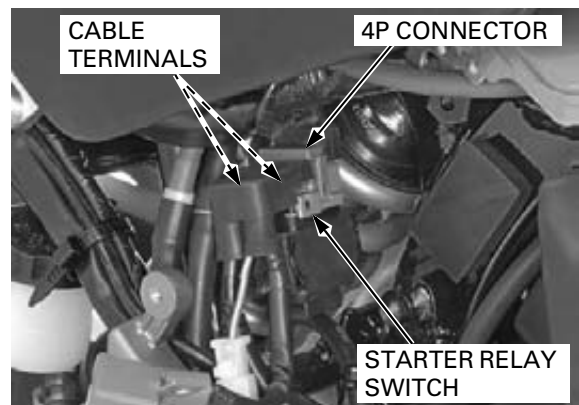
REMOVAL/INSTALLATION

Remove the battery (page 18-6).

Disconnect the starter relay switch 4P connector. Remove the terminal bolts and disconnect the starter relay switch cables.

Pull the starter relay out from the stay.

Installation is in the reverse order of removal.



DIODE

REMOVAL/INSTALLATION

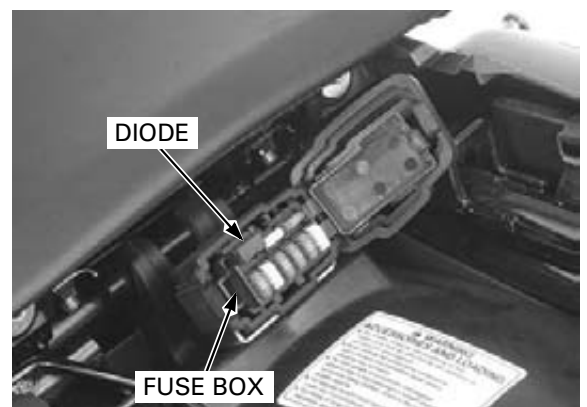
Remove the rear seat (page 3-3).

Open the fuse box dust cover.



Open the fuse box and remove the diode.

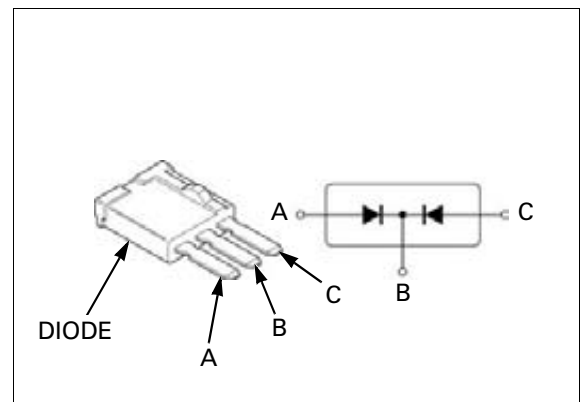
Install the diode in the reverse order of removal.



INSPECTION

Check for continuity between the diode terminals. When there is continuity, a small resistance value will register.

If there is continuity in one direction, the diode is normal.

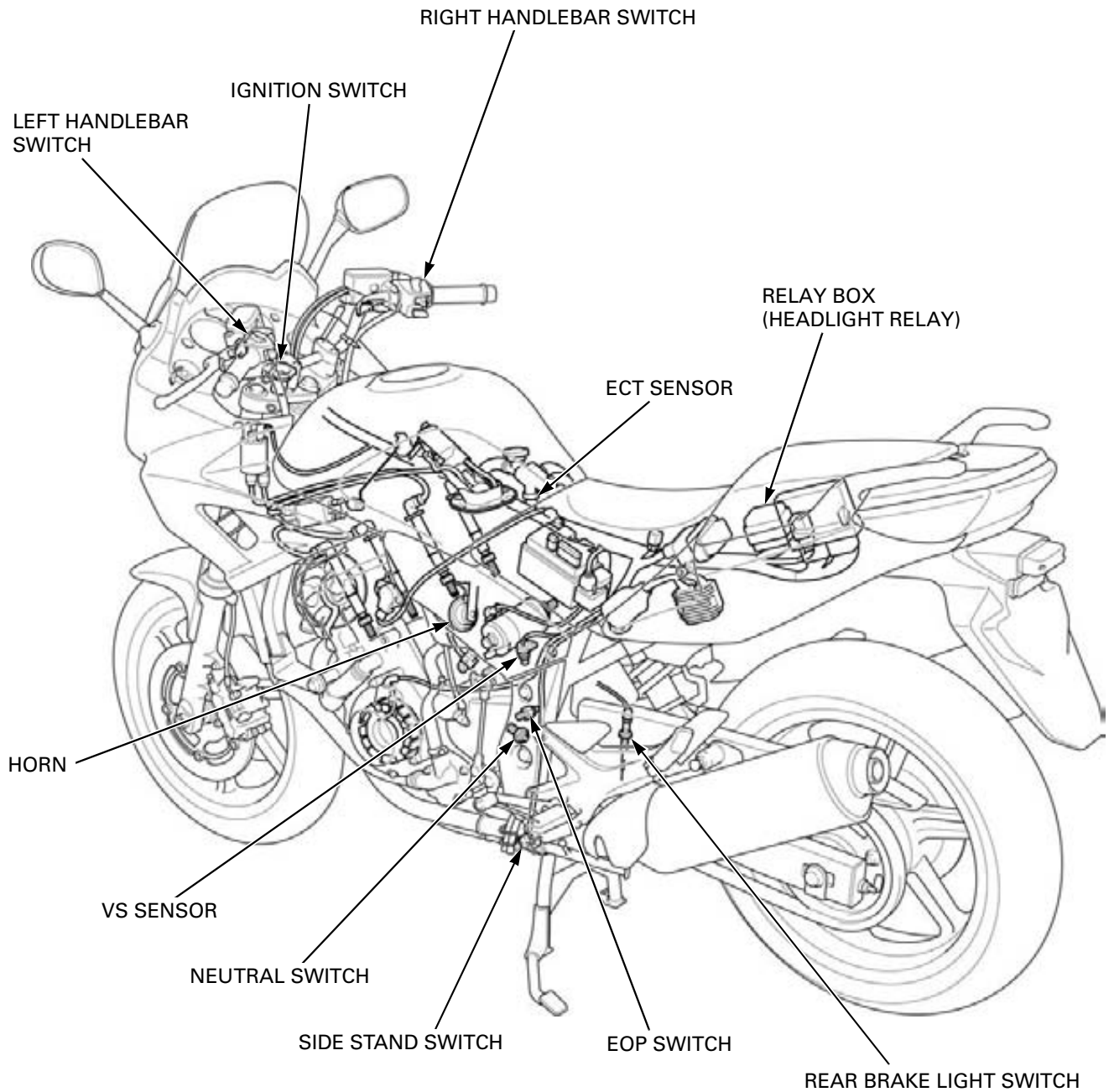


MEMO

21. LIGHTS/METERS/SWITCHES

SYSTEM LOCATION.....	21-2	OIL PRESSURE INDICATOR/ EOP SWITCH	21-18
SERVICE INFORMATION	21-3	FUEL LEVEL SENSOR.....	21-20
HEADLIGHT.....	21-5	IGNITION SWITCH	21-20
POSITION LIGHT	21-7	HANDLEBAR SWITCHES.....	21-21
TURN SIGNAL	21-7	BRAKE LIGHT SWITCH	21-23
TAIL/BRAKE LIGHT	21-9	CLUTCH SWITCH	21-23
LICENSE LIGHT.....	21-10	NEUTRAL SWITCH.....	21-24
COMBINATION METER.....	21-11	SIDE STAND SWITCH.....	21-24
SPEEDOMETER/ VEHICLE SPEED SENSOR (VSS).....	21-14	HORN	21-26
TACHOMETER	21-15	TURN SIGNAL RELAY	21-27
COOLANT TEMPERATURE INDICATOR/ ECT SENSOR	21-16	HEADLIGHT RELAY.....	21-27

SYSTEM LOCATION



SERVICE INFORMATION

GENERAL

NOTICE

- A halogen headlight bulb becomes very hot while the headlight is ON, and remain hot for a while after it is turned OFF. Be sure to let it cool down before servicing.
- Note the following when replacing the halogen headlight bulb.
 - Wear clean gloves while replacing the bulb. Do not put finger prints on the headlight bulb, as they may create hot spots on the bulb and cause it to fail.
 - If you touch the bulb with your bare hands, clean it with a cloth moistened with denatured alcohol to prevent its early failure.
 - Be sure to install the dust cover after replacing the bulb.
- Use an electric heating element to heat the water/coolant mixture for the ECT sensor inspection. Keep flammable materials away from the electric heating element. Wear protective clothing, insulated gloves and eye protection.
- 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 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

SPECIFICATIONS

ITEM		SPECIFICATIONS	
Bulbs	Headlight	Hi	12 V – 55 W
		Lo	12 V – 55 W
	Position light	12 V – 5 W x 2	
	Brake/tail light	12 V – 21/5 W	
	Turn signal light	12 V – 21 W x 4	
	Instrument light	LED	
	Turn signal indicator	LED	
	High beam indicator	LED	
	Oil pressure indicator	LED	
	Neutral indicator	LED	
	Temp. indicator	LED	
	Malfunction indicator lamp (MIL)	LED	
	Immobilizer indicator	LED	
	ABS indicator (CBF1000A)	LED	
Fuse	Main fuse	30 A	
	PGM-FI/IGN fuse	20 A	
	Sub fuse	10 A x 3, 20 A x 2	
	ABS main fuse (CBF1000A)	10 A	
	ABS fail-safe relay fuse (CBF1000A)	30 A	
	ABS motor fuse (CBF1000A)	30 A	
Tachometer peak voltage		10.5 V minimum	
ECT sensor resistance	80 °C (176 °F)	2.1 – 2.6 kΩ	
	120 °C (248 °F)	0.65 – 0.73 kΩ	

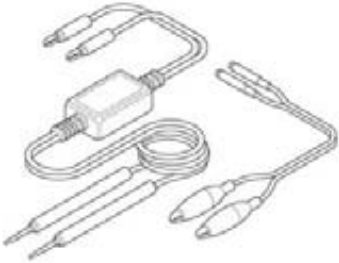
TORQUE VALUES

EOP switch	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply sealant to the threads.
EOP switch wire terminal bolt	2 N·m (0.2 kgf·m, 1.5 lbf·ft)	
Neutral switch	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Ignition switch mounting one-way bolt	25 N·m (2.5 kgf·m, 18 lbf·ft)	
License light mounting nut	1.8 N·m (0.2 kgf·m, 1.3 lbf·ft)	
Horn mounting bolt	32 N·m (3.3 kgf·m, 24 lbf·ft)	

LIGHTS/METERS/SWITCHES

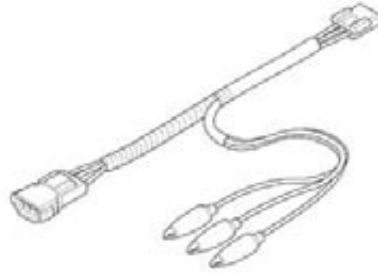
TOOLS

Imrie diagnostic tester (model 625)
or
Peak voltage adaptor
07HGJ-0020100



with commercially available digital
multimeter (impedance 10 M Ω /DCV
minimum)

Inspection test harness
07GMJ-ML80100



Test probe
07ZAJ-RDJA110



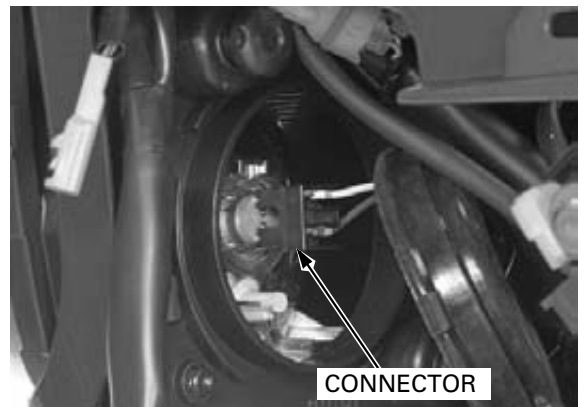
HEADLIGHT

BULB REPLACEMENT

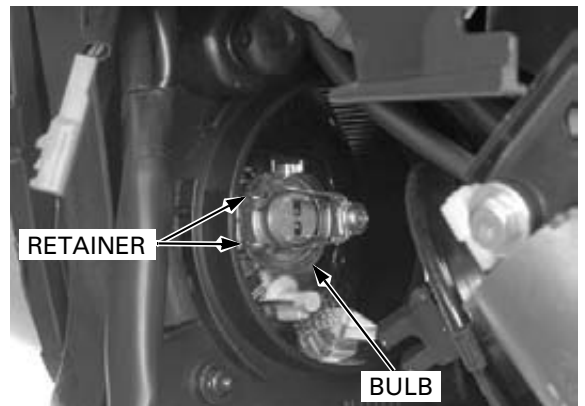
Remove the right and left front cowls (page 3-6).
Remove the dust cover.



Disconnect the headlight bulb connector.



Unhook the bulb retainer and remove the headlight bulb.



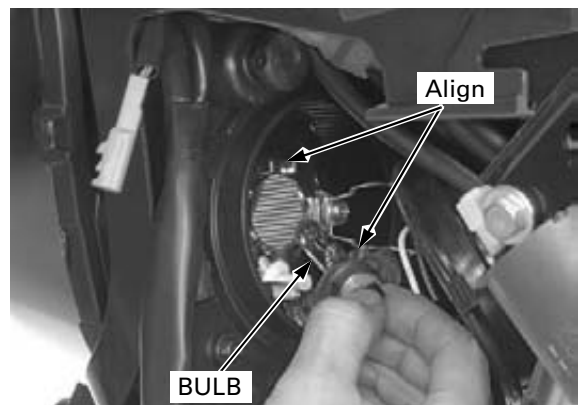
Align the bulb tab with the groove in the headlight case.

Install the new headlight bulb and hook the bulb retainer properly.

If you touch the bulb with your bare hands, clean it with a cloth moistened with denatured alcohol to prevent early bulb failure.

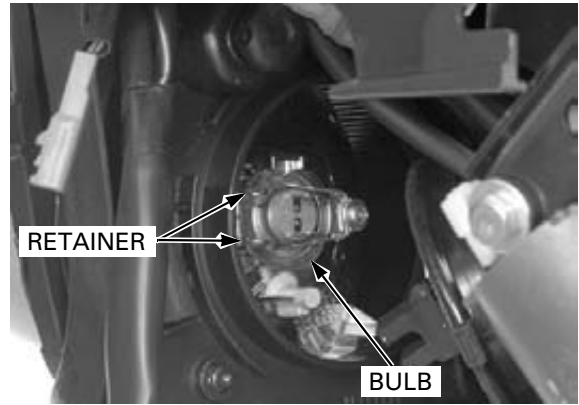
NOTICE

Avoid touching the halogen headlight bulb. Finger prints can create hot spots that cause a bulb to break.

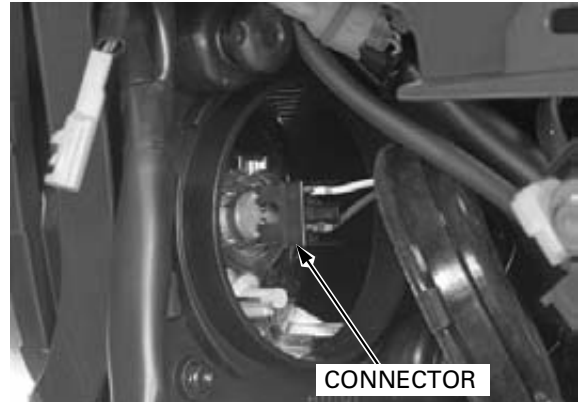


LIGHTS/METERS/SWITCHES

Hook the bulb retainer properly.

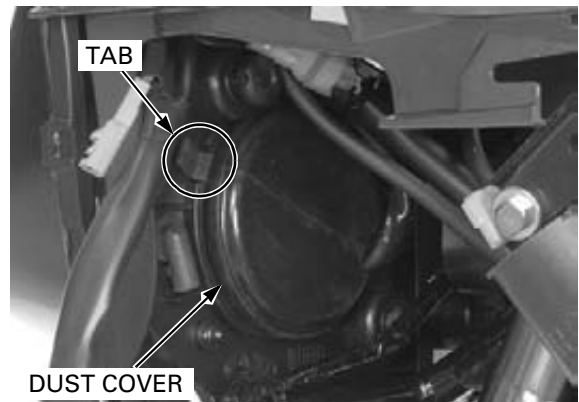


Connect the headlight bulb connector.



Set the dust cover tab in the cut-out of the headlight case.

Install the dust cover properly.
Install the right and left front cowls (page 3-6).

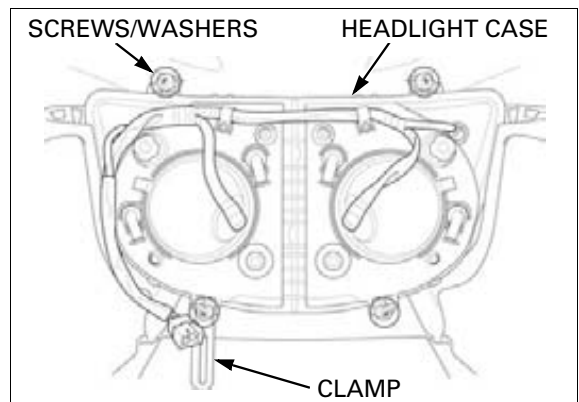


REMOVAL/INSTALLATION

Remove the front center cowl (page 3-7).

Remove the screws/washers, clamp and the headlight case.

Installation is in the reverse order of removal.

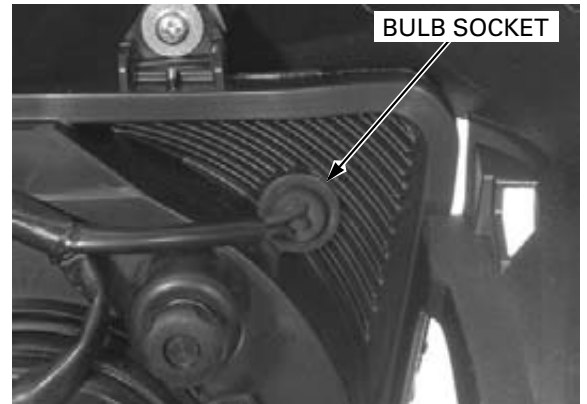


POSITION LIGHT

BULB REPLACEMENT

Remove the front center cowl (page 3-7).

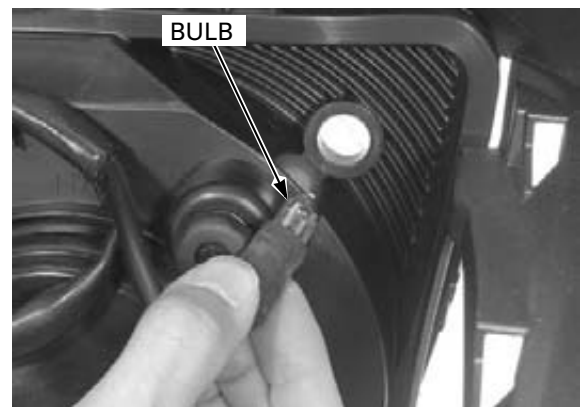
Remove the bulb socket from the headlight case.



Do not turn the bulb while removing it.

Remove the bulb from the socket, and replace it with new one.

Install the removed parts in the reverse order of removal.

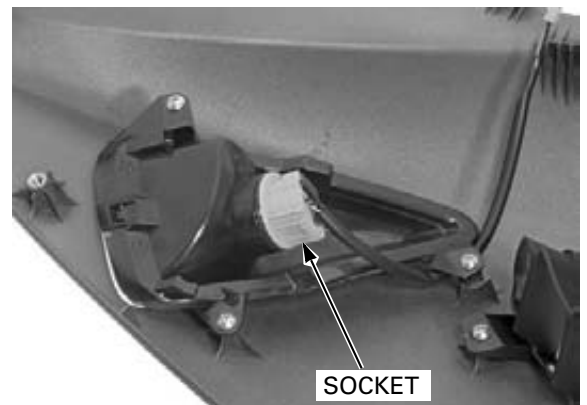


TURN SIGNAL

FRONT TURN SIGNAL BULB REPLACEMENT

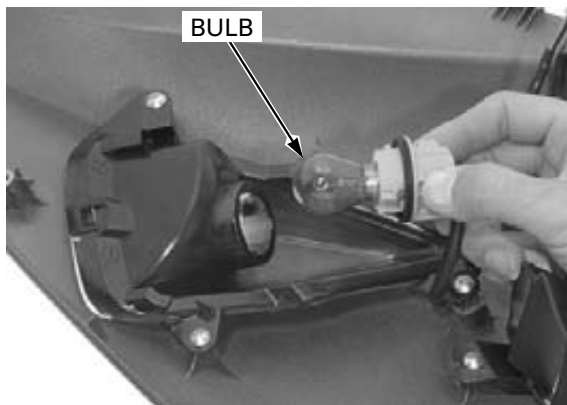
Remove the right and left front cowls (page 3-6).

Turn the bulb socket counterclockwise and remove it from the turn signal light case.



LIGHTS/METERS/SWITCHES

Slightly press the bulb and turn it counterclockwise.
Replace the bulb with new one.
Install the removed parts in the reverse order.



REAR TURN SIGNAL BULB REPLACEMENT

Remove the screws and tail/brake light lens.

TAIL/BRAKE LIGHT LENS



Remove the screw and turn signal light lens.

TURN SIGNAL LIGHT LENS

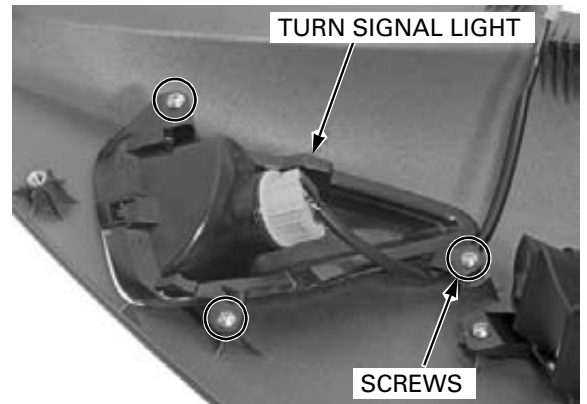


Slightly press the bulb and turn it counterclockwise.
Replace the bulb with new one.
Installation is in the reverse order of removal.



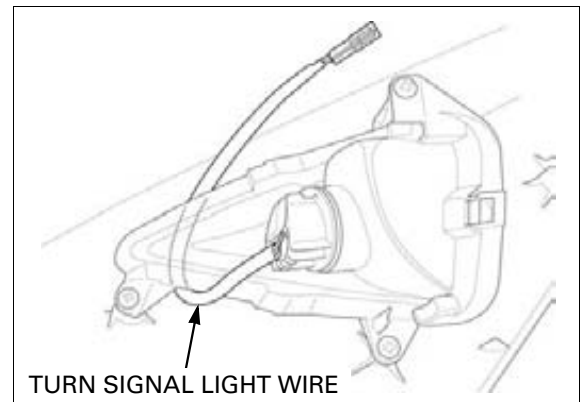
**FRONT TURN SIGNAL LIGHT
REMOVAL/INSTALLATION**

Remove the right and left front cowls (page 3-6).
Remove the screws and turn signal light.



Route the turn signal light wire between the turn signal light and front cowl.

Install the turn signal light in the reverse order of removal.



TAIL/BRAKE LIGHT

BULB REPLACEMENT

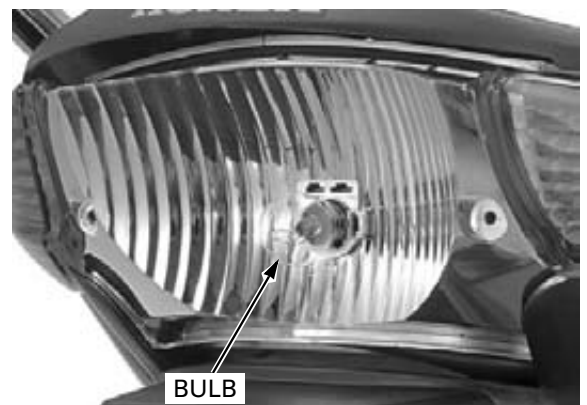
Remove the screws and tail/brake light lens.

TAIL/BRAKE LIGHT LENS



While pushing the bulb in, turn it counterclockwise to remove and replace it with new one.

Installation is in the reverse order of removal.



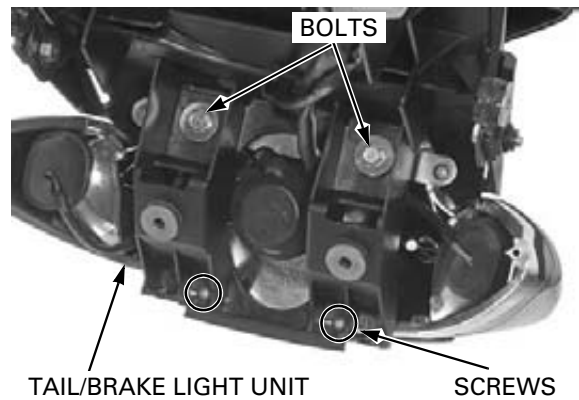
LIGHTS/METERS/SWITCHES

TAIL/BRAKE LIGHT UNIT REMOVAL/ INSTALLATION

Remove the rear fender (page 3-10).

Remove the screws, bolts and tail/brake light unit.

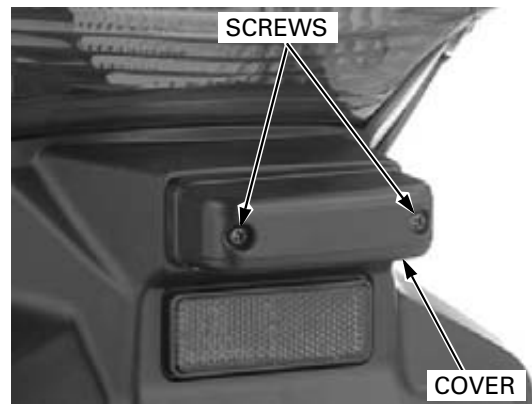
Install the removed parts in the reverse order of removal.



LICENSE LIGHT

BULB REPLACEMENT

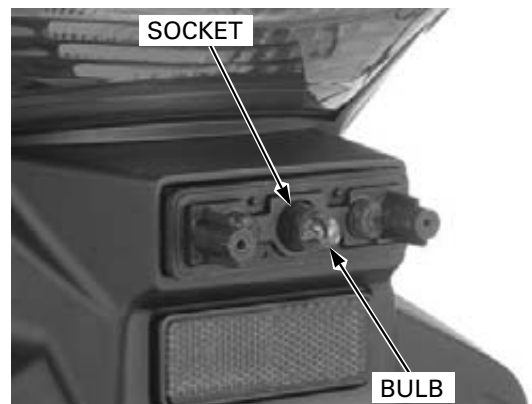
Remove the screws and license light cover.



Do not turn the bulb while removing it.

Pull out the bulb from the socket and replace it with new one.

Install the license light cover and tighten the screws securely.



REMOVAL/INSTALLATION

Remove the screws, license light cover, packing and bulb.

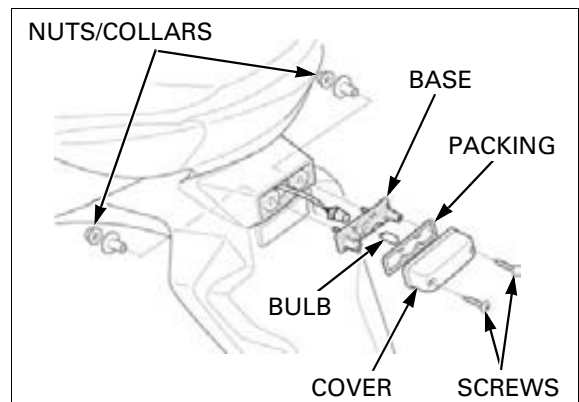
Remove the nuts and collars from the inside of the rear fender.

Remove the bulb socket from the license light base.

Install the license light in the reverse order of removal.

TORQUE:

License light mounting nut:
1.8 N·m (0.2 kgf·m, 1.3 lbf·ft)



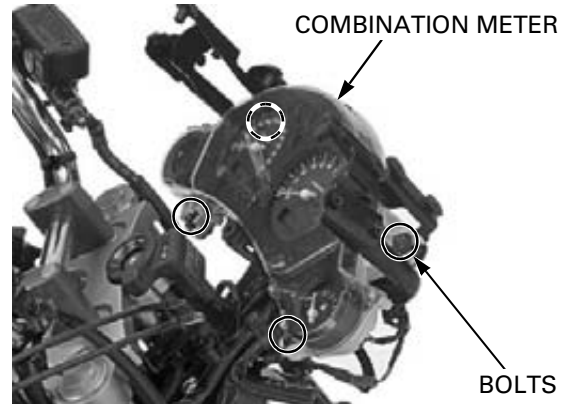
COMBINATION METER

REMOVAL/INSTALLATION

Remove the front center cowl (page 3-7).

Remove the mounting bolts and the combination meter from the bracket.

Install the combination meter in the reverse order of removal.



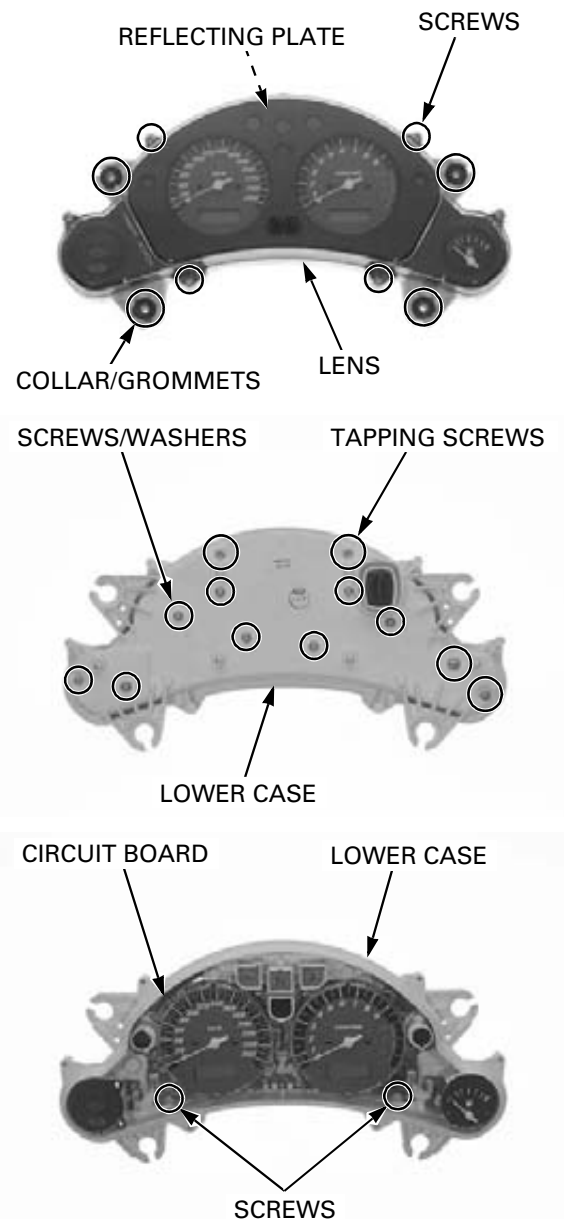
DISASSEMBLY

Remove the collars and grommets.

Remove the screws, combination meter lens and reflecting plate.

Remove the screws/washers and tapping screws.

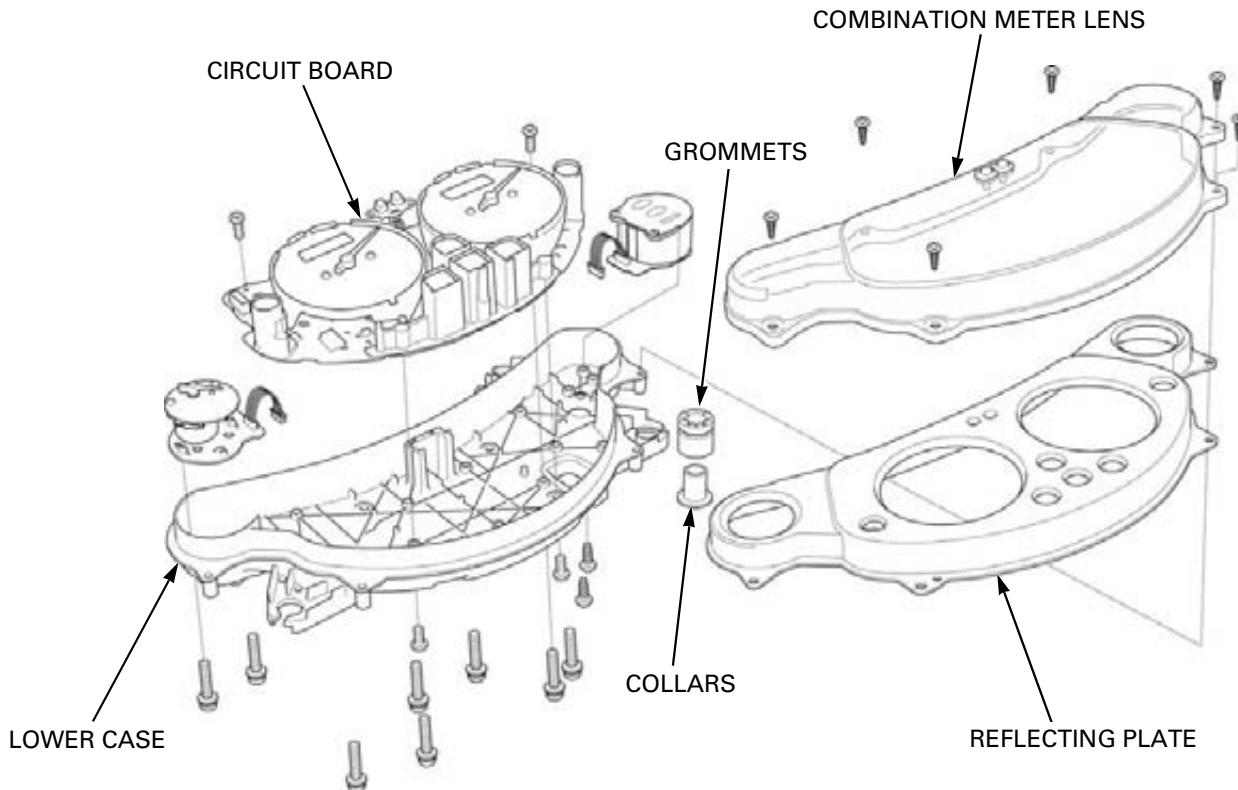
Remove the screws and combination meter circuit board from the lower case.



LIGHTS/METERS/SWITCHES

ASSEMBLY

Assembly is in the reverse order of disassembly.

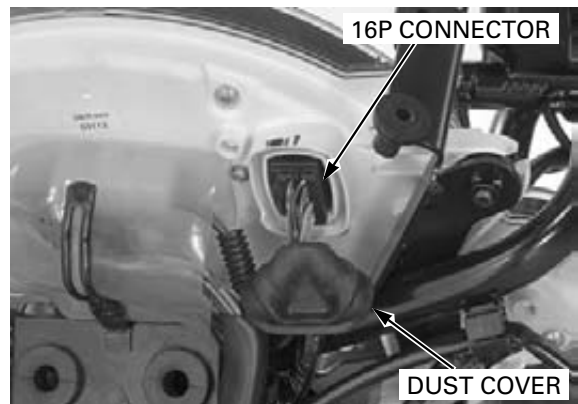


POWER/GROUND LINES INSPECTION

Remove the front center cowl (page 3-7).

Remove the combination meter connector dust cover.

Check the following with the 16P connector connected.



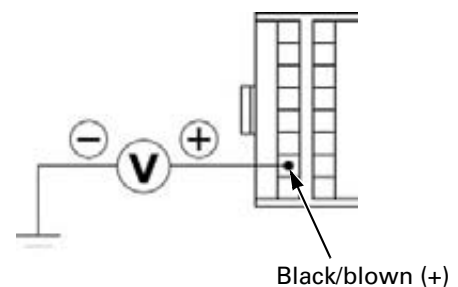
Power input line

Measure the voltage between the Black/brown wire terminal (+) and body ground (-).

There should be battery voltage with the ignition switch ON.

If there is no voltage, check the sub-fuse (10 A) and an open circuit in Brown/white wire.

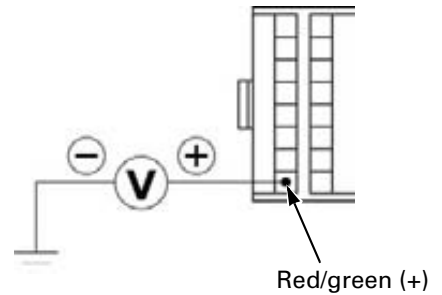
Viewed from harness side of the 16P connector:



Back-up voltage line

Measure the voltage between the Red/green wire terminal (+) and body ground (-). There should be battery voltage at all times. If there is no voltage, check the sub-fuse (10 A) and an open circuit in Red/green wire.

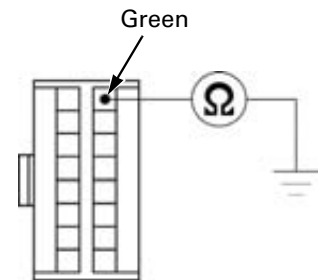
Viewed from harness side of the 16P connector:



Ground line

Check the continuity between the Green wire terminal and body ground. There should be continuity at all times. If there is no continuity, check for open circuit in Green wire.

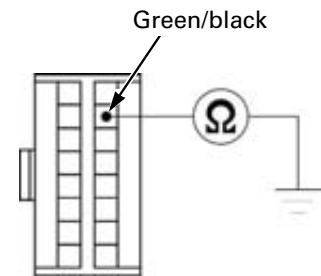
Viewed from harness side of the 16P connector:



Sensor ground line

Check the continuity between the Green/black wire terminal and body ground. There should be continuity at all times. If there is no continuity, check for open circuit in Green/black wire.

Viewed from harness side of the 16P connector:



SPEEDOMETER/VEHICLE SPEED SENSOR (VSS)

SYSTEM INSPECTION

Check that the neutral and oil pressure indicators function properly.

- If they do not function, perform the power and ground line inspection of the combination meter (page 21-12).
- If they function, remove the dust cover and disconnect the combination meter 16P (Black) connector. Shift the transmission into neutral and turn the ignition switch ON.

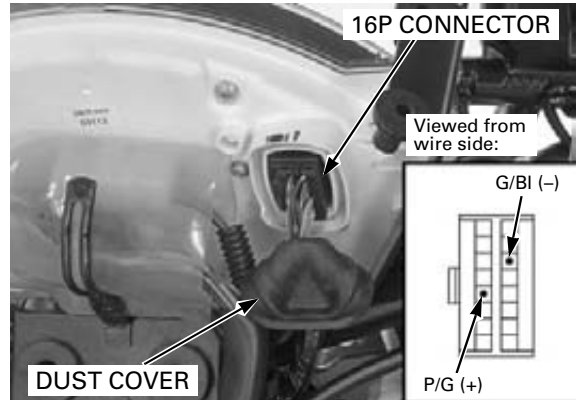
Measure the voltage between the Pink/green (+) and Green/black (-) wire terminals of the wire harness side connector.

Slowly turn the rear wheel by hand.

There should be 0 to 5 V pulse voltage.

- If pulse voltage appears, replace the combination meter printed circuit board (page 21-11).
- If pulse voltage does not appear, check for open or short circuit in the Pink/green and Green/black wires.

If the wire are OK, check the VSS (page 21-14).



VEHICLE SPEED SENSOR (VSS) INSPECTION

Remove the air cleaner housing (page 6-60).

Disconnect the VSS 3P (Natural) connector.

Measure the voltage between the Yellow/red (+) and Green/black (-) wire terminals at the harness side 3P connector.

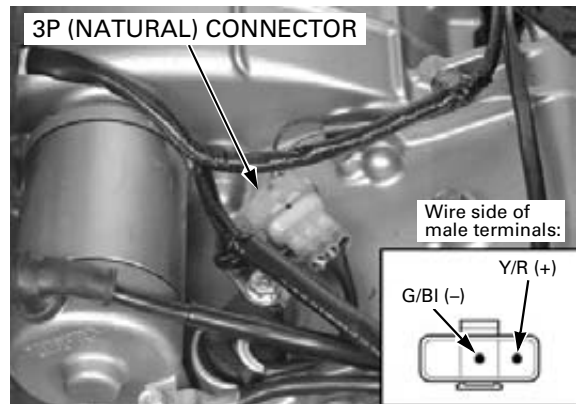
CONNECTION: Yellow/red (+) – Green/black (-)

STANDARD: Battery voltage

There should be battery voltage with the ignition switch ON.

If there is no voltage, check for open circuit in related wires.

If there is voltage, check the VSS as follows.



Support the motorcycle securely using a safety stand or hoist, and raise the rear wheel off the ground.

Connect the inspection adaptor to the sensor 3P connectors.

TOOL:

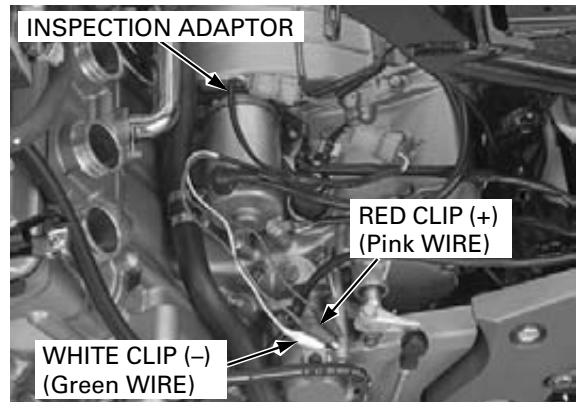
Inspection test harness 07GMJ-ML80100

Connect the Positive (+) and negative (-) cables to the battery.

Measure the voltage between the Red clip (+) and White clip (-).

CONNECTION: Red clip (+) – White clip (-)

STANDARD: Repeat 0 to 5V



Shift the transmission into neutral and turn the ignition switch ON.

Slowly turn the rear wheel by hand.

There should be 0 to 5 V pulse voltage.

If the pulse voltage does not appear, replace the VSS (page 21-15).

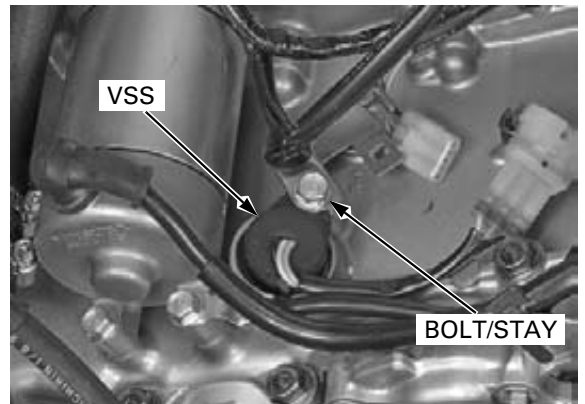
REMOVAL/INSTALLATION

Remove the air cleaner housing (page 6-60).

Remove the VSS 3P (Natural) connector from the stay and disconnect the connector.



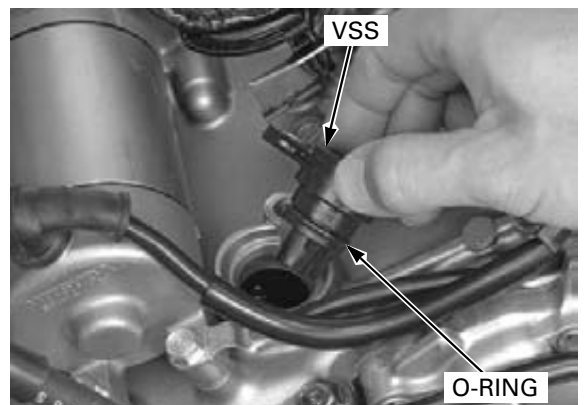
Remove the bolt, stay and the VSS.



Check the condition of the O-ring, replace it if necessary.

Install the VSS in the reverse order of removal.

Install the air cleaner housing (page 6-67).



TACHOMETER

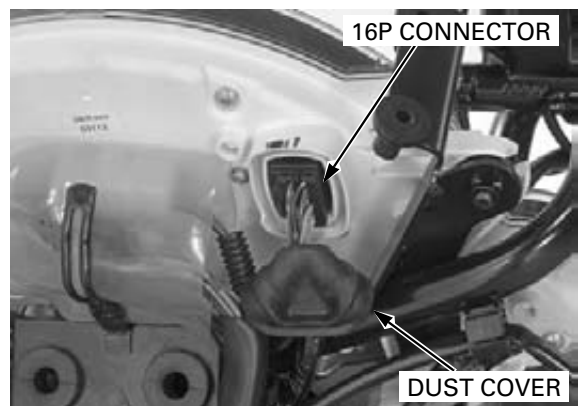
SYSTEM INSPECTION

Check that the neutral and oil pressure indicators function properly.

- If they do not function, perform the power and ground line inspection of the combination meter (page 21-12).

Remove the front center cowl (page 3-7).

Remove the dust cover and check for loose or poor contact terminals at the combination meter 16P (Black) connector.



LIGHTS/METERS/SWITCHES

Connect the peak voltage adaptor or Imrie diagnostic tester probe to the tachometer Yellow/green terminal and ground.

TOOLS:

**Imrie diagnostic tester (model 625) or
Peak voltage adaptor 07HGJ-0020100
with commercially available digital multimeter
(impedance 10 M Ω /DCV minimum)**

CONNECTION: Yellow/green (+) – body ground (-)

Start the engine and measure the tachometer input peak voltage.

PEAK VOLTAGE: 10.5 V minimum

If the peak voltage is normal, replace the combination meter printed circuit board (page 21-11).
If the measured value is below 10.5 V, replace the ECM (page 6-82).

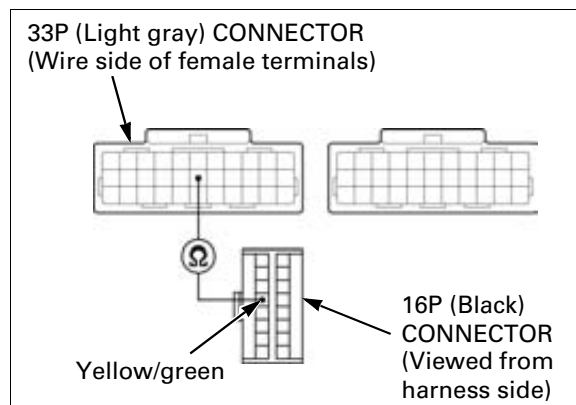
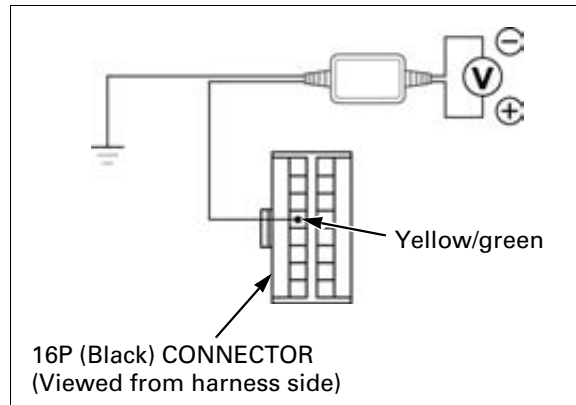
If the value is 0 V, check for continuity between the combination meter 16P (Black) connector and ECM 33P (Light gray) connector Yellow/green terminals.

TOOLS:

Test probe 07ZAJ-RDJA110

If there is no continuity, check the wire harness for an open circuit.

If there is continuity, replace the ECM (page 6-82).



COOLANT TEMPERATURE INDICATOR/ ECT SENSOR

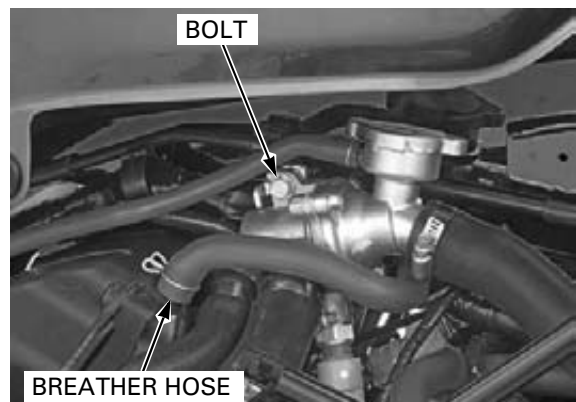
SYSTEM INSPECTION

Indicator stays lit while the engine is running under normal operating temperature

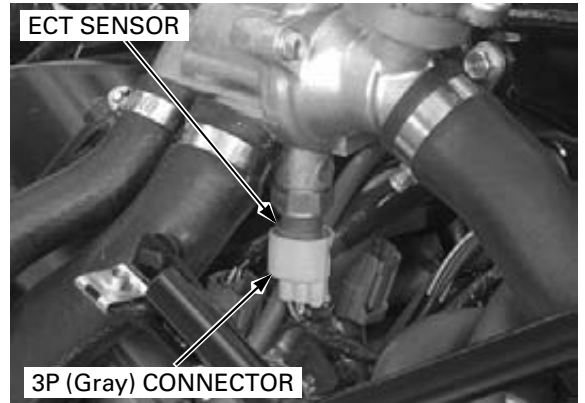
Lift and support the fuel tank (page 4-5).

Disconnect the crankcase breather hose.

Remove the thermostat case mounting bolt.



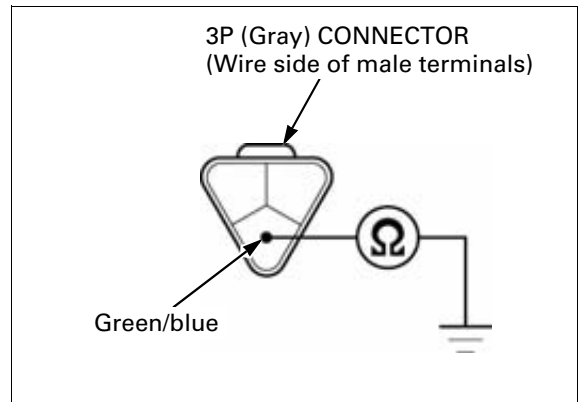
Disconnect the ECT sensor 3P (Gray) connector.



Check for continuity between the Green/blue terminal and ground.

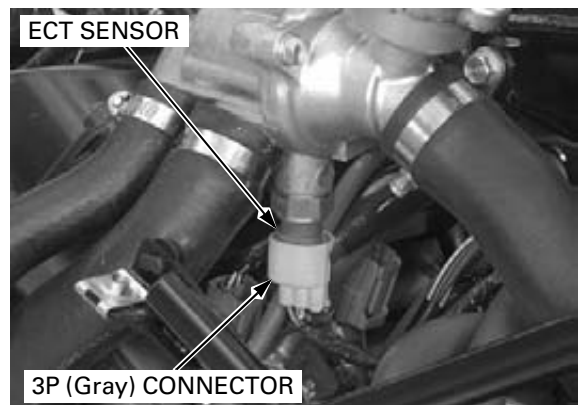
If there is continuity, check for short circuit in the Green/blue wire.

If there is no continuity, replace the ECT sensor (page 6-79).



SENSOR INSPECTION

Disconnect the 3P (Gray) connector and remove the ECT sensor from the thermostat housing (page 6-79).



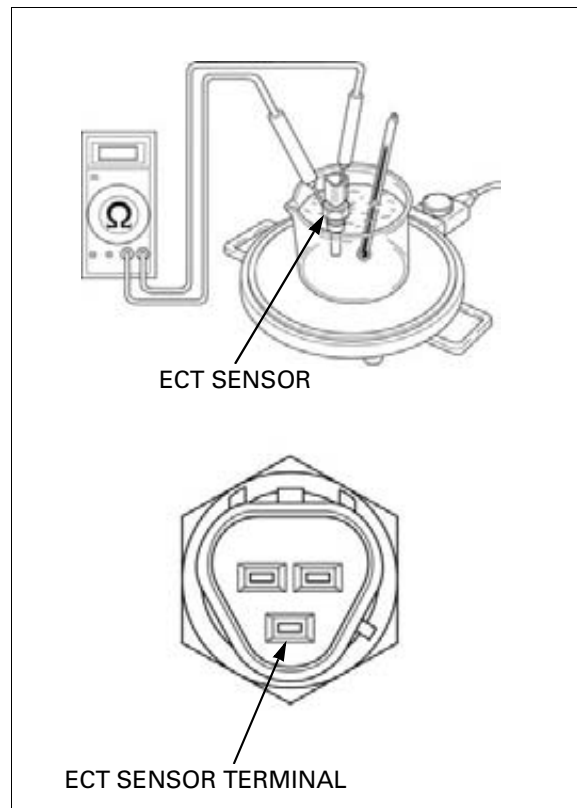
LIGHTS/METERS/SWITCHES

Suspend the ECT sensor in a pan of coolant (50 – 50 mixture) on an electric heating element and measure the resistance through the ECT sensor terminal (Green/blue) and sensor body as the coolant heats up.

- 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 the 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.

Replace the sensor if it is out of specification by more than 10% at any temperature listed.

Temperature	80°C (68°F)	120°C (248°F)
Resistance	2.1 – 2.6 kΩ	0.65 – 0.73 kΩ



OIL PRESSURE INDICATOR/EOP SWITCH

INSPECTION

Indicator does not light with the ignition switch turned to "ON"

Check that the neutral and ABS (CBF1000A) indicators function properly.

If they do not function properly, check the power input line of the combination meter (page 21-12).

Remove the rubber cap, and disconnect the oil pressure switch wire by removing the terminal bolt. Ground the wire terminal to the engine with a jumper wire.

Turn the ignition switch to "ON" and check the oil pressure indicator.

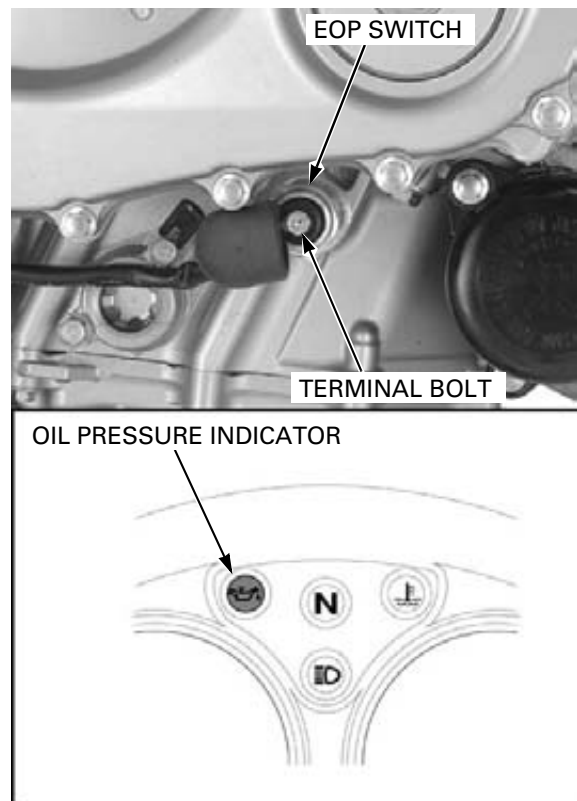
- If the indicator lights, replace the EOP switch.
- If the indicator does not light, check for loose or poor connections of the engine sub-harness 8P (Gray) connector, or an open circuit in the Blue/red wire.

Indicator stays lit while the engine is running

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

Check for continuity between the wire terminal and ground.

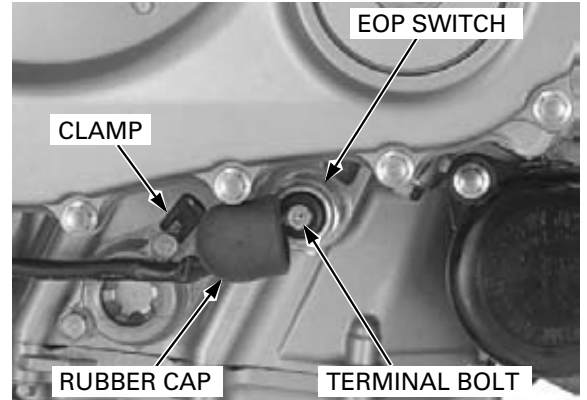
- If there is continuity, check for short circuit in the Blue/red wire.
- If there is no continuity, check the oil pressure (page 5-5). If the oil pressure is normal, replace the EOP switch.



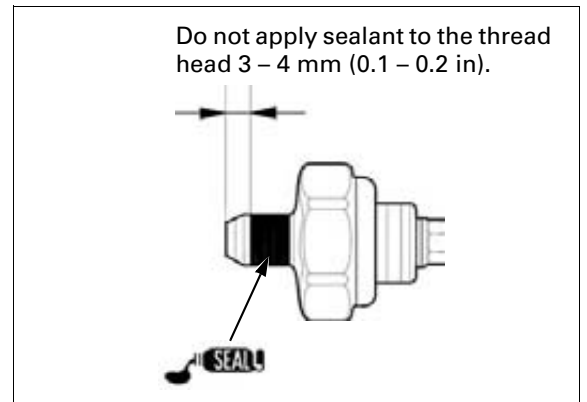
REMOVAL/INSTALLATION

Drain the engine oil (page 4-16).

Release the EOP switch wire from the clamp.
 Remove the rubber cap and terminal bolt, then disconnect the wire terminal.
 Remove the EOP switch while holding switch base.

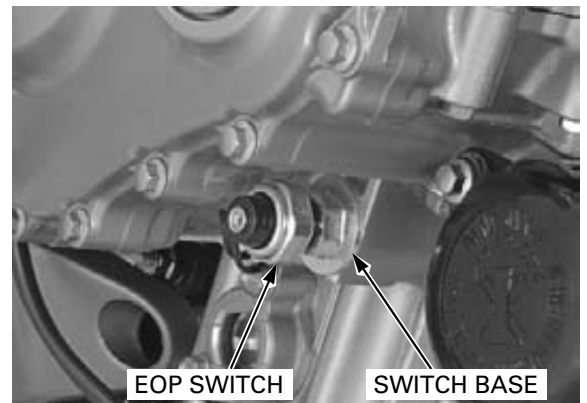


Apply sealant to the EOP switch threads as shown.



Install the EOP switch onto the switch base, and tighten the EOP switch to the specified torque while holding the switch base.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



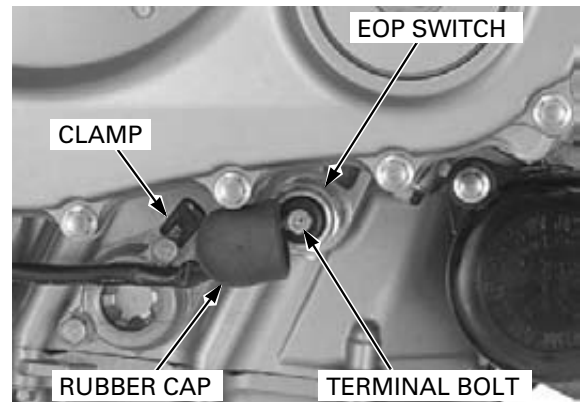
Connect the EOP switch wire to the switch and tighten the terminal bolt to the specified torque.

TORQUE: 2 N·m (0.2 kgf·m, 1.5 lbf·ft)

Refer to "Cable & Harness Routing" for EOP switch wire clamp (page 1-23).

Secure the EOP switch wire with the clamp and install the rubber cap.

Fill the crankcase with the recommended engine oil (page 4-16).



LIGHTS/METERS/SWITCHES

FUEL LEVEL SENSOR

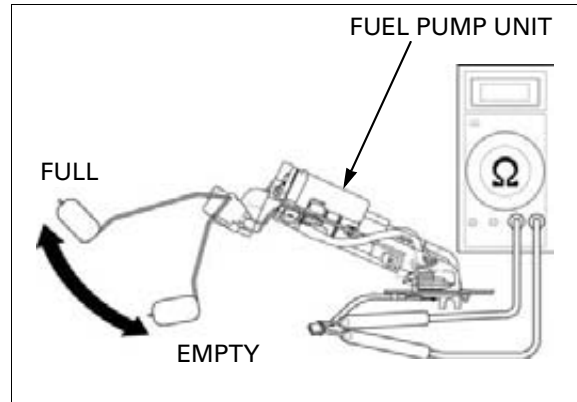
INSPECTION

Remove the fuel pump unit (page 6-55).

Connect the ohmmeter to the fuel level sensor Red/black and Black/white terminals.

Inspect the resistance of the float at the top and bottom positions.

	FULL	EMPTY
Resistance	4 – 10 Ω	90 – 100 Ω



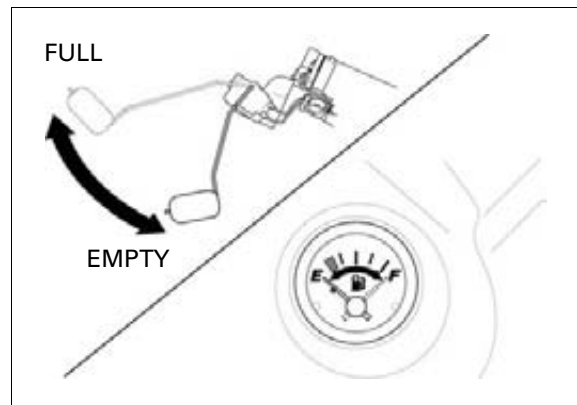
Connect the fuel pump unit 3P (Black) connector to the main wire harness.

Move the float from bottom (empty) to top (full) positions to check the fuel meter needle indication.

Turn the ignition switch ON.

If the fuel meter needle does not indicate properly, check for open or short circuit in wire harness.

If the wire harness is good, replace the combination meter printed circuit board with new one (page 21-11).



IGNITION SWITCH

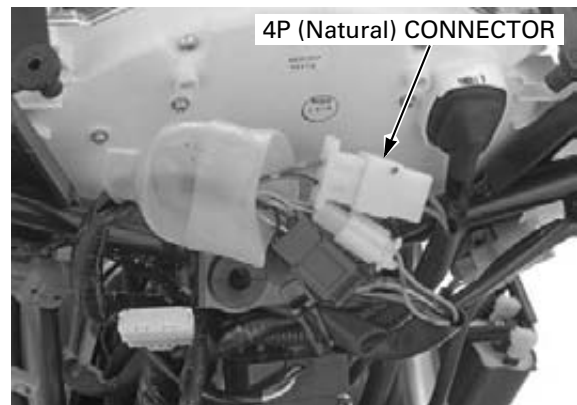
INSPECTION

Remove the front center cowl (page 3-7).

Disconnect the ignition switch 4P (Natural) connector.

Check for continuity between the wire terminals of the ignition switch connector in each switch position.

Continuity should exist between the color coded wires as follow:



IGNITION SWITCH CONTINUITY:

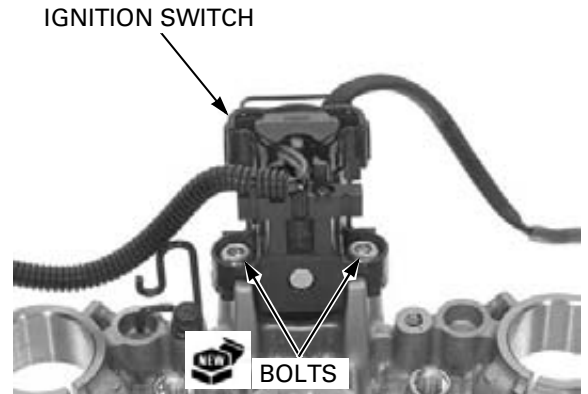
	IG	BAT1	KEY
ON	○	○	KEY ON
OFF			KEY OFF
LOCK			KEY OFF LOCK PIN
COLOR	R/BI	R	—

REMOVAL/INSTALLATION

Remove the top bridge (page 14-30).
 Remove the immobilizer receiver (page 22-15).
 Remove the mounting bolts and ignition switch.
 Install the ignition switch to the top bridge.
 Tighten the new ignition switch mounting bolts to the specified torque.

TORQUE: 25 N·m (2.5 kgf·m, 18 lbf·ft)

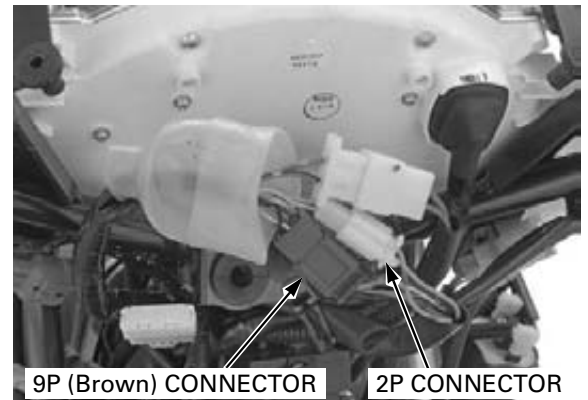
Install the removed parts in the reverse order of removal.



HANDLEBAR SWITCHES

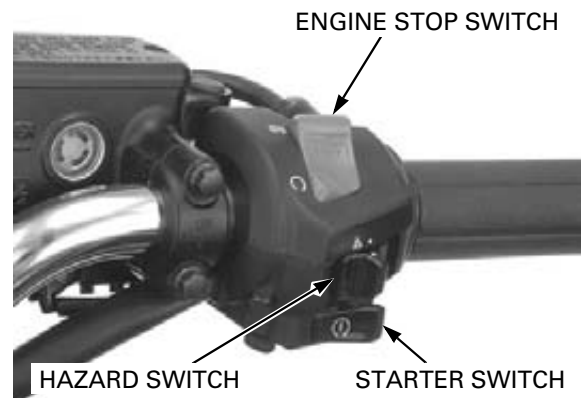
RIGHT HANDLEBAR SWITCH

Remove the front center cowl (page 3-7).
 Disconnect the right handlebar switch 9P (Brown) and 2P (Natural) connectors.



Check for continuity between the wire terminals of the handlebar switch connector.

Continuity should exist between the color coded wire terminals as follows:



RIGHT HANDLEBAR SWITCH CONTINUITY:

ENGINE STOP SWITCH

OFF	IG	BAT2
RUN	○—○	
COLOR	BI	W/BI

HAZARD SWITCH

OFF	W	R	L
ON	○—○—○		
COLOR	Gr	Lb	O

STARTER SWITCH

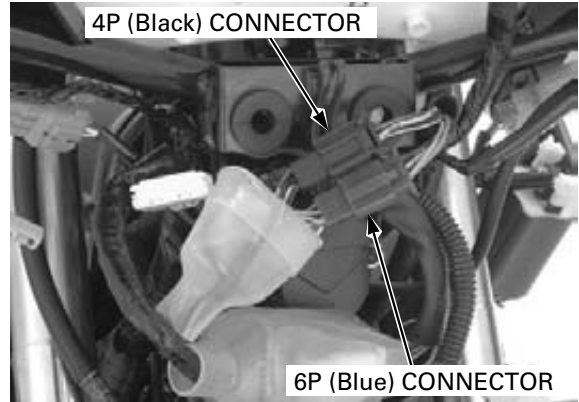
FREE	ST	IG	BAT4	HL
PUSH	○—○			
COLOR	Y/R	BI	BI/R	Bu/W

LIGHTS/METERS/SWITCHES

LEFT HANDLEBAR SWITCH

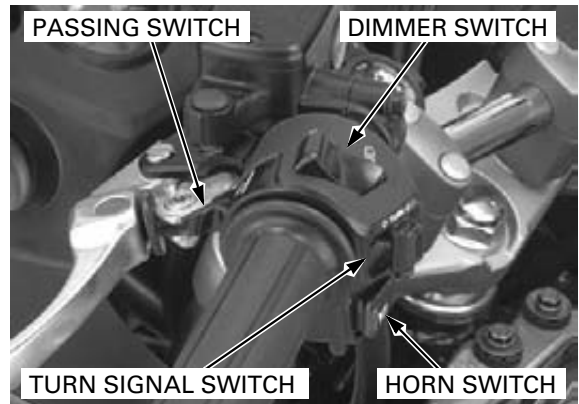
Remove the front center cowl (page 3-7).

Disconnect the left handlebar switch 4P (Black) and 6P (Blue) connectors.



Check for continuity between the wire terminals of the handlebar switch connector.

Continuity should exist between the color coded wire terminals as follows:



LEFT HANDLEBAR CONTINUITY:

TURN SIGNAL SWITCH

	W	R	L
R	○—○		
N			
L	○—○		○
COLOR	Gr	Lb	O

DIMMER/PASSING SWITCH

	BAT4	Hi		
FREE				
PUSH	○—○			
COLOR	Bl/R	●		

	HL	Lo	Hi
Lo			
(N)	○—○—○		
Hi	○—○		○
COLOR	Bu/W		Bu

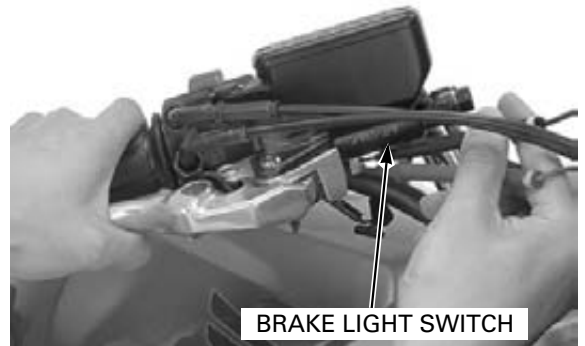
HORN SWITCH

	Ho	BAT3
FREE		
PUSH	○—○	
COLOR	Lg	Bl/Br

BRAKE LIGHT SWITCH

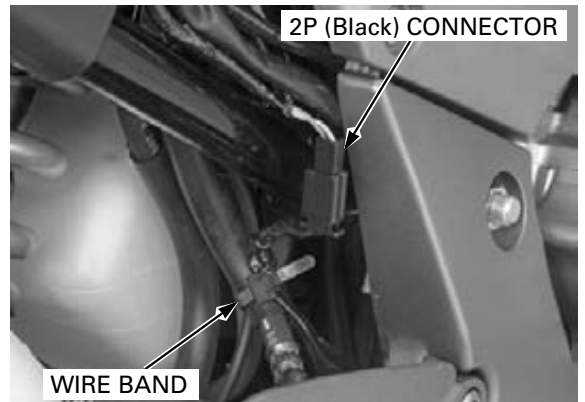
FRONT

Disconnect the front brake light switch connectors and check for continuity between the terminals. There should be continuity with the brake lever applied, and there should be no continuity with the brake lever is released.

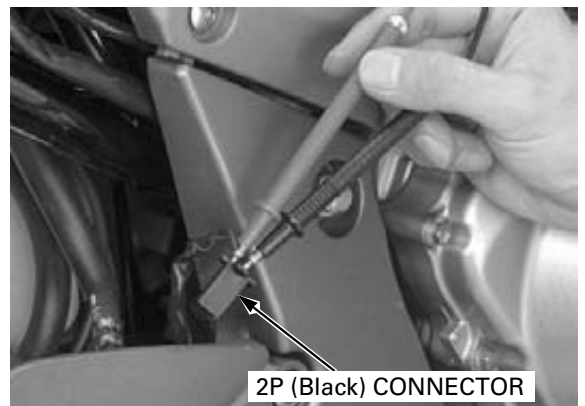


REAR

Remove the wire band. Disconnect the rear brake light switch 2P (Black) connector.



Check for continuity between the terminals. There should be continuity with the brake pedal applied, and there should be no continuity with the brake pedal is released.



CLUTCH SWITCH

Disconnect the clutch switch connectors.

There should be continuity with the clutch lever applied, and there should be no continuity when the clutch lever is released.



NEUTRAL SWITCH

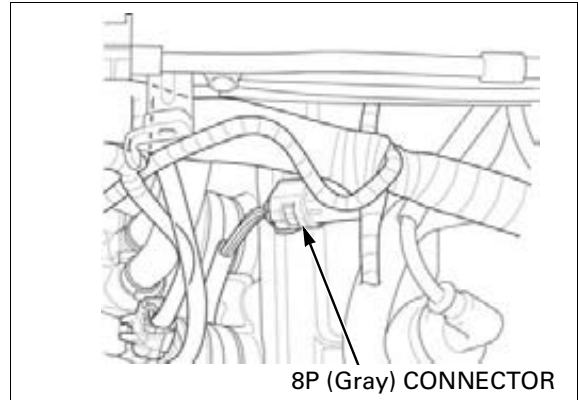
INSPECTION

Lift and support the fuel tank (page 4-5).

Disconnect the engine sub-harness 8P (Gray) connector.

Shift the transmission into neutral and check for continuity between the Light green wire terminal and body ground.

There should be continuity with the transmission in neutral, and no continuity when the transmission is in gear.



REMOVAL/INSTALLATION

Remove the engine from the frame (page 8-4).

Remove the rubber cap.

Remove the terminal nut and disconnect the neutral switch wire.

Remove the neutral switch and sealing washer.

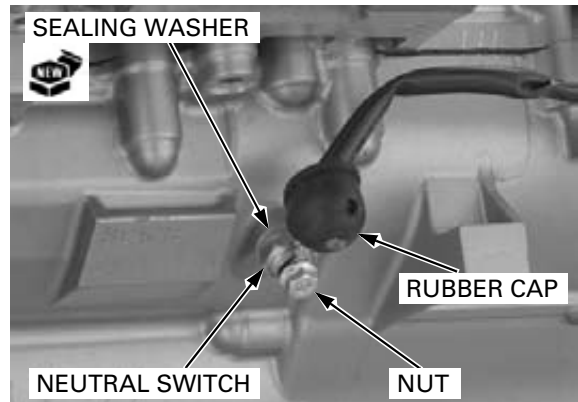
Installation is in the reverse order of removal.

TORQUE:

Neutral switch:

12 N·m (1.2 kgf·m, 9 lbf·ft)

Replace the sealing washer with new one.



SIDE STAND SWITCH

INSPECTION

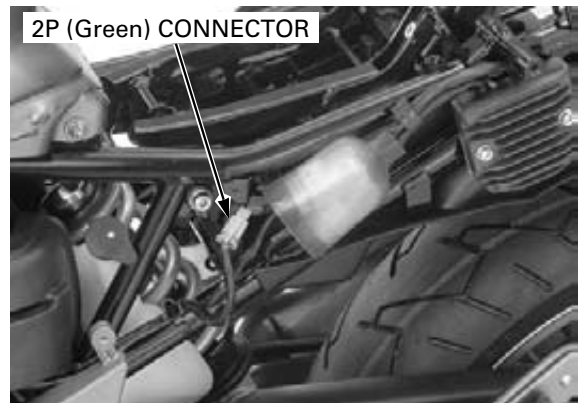
Remove the following:

- Left side cover (page 3-4)
- Left rear cowl (page 3-8)

Disconnect the side stand switch 2P (Green) connector.

Check for continuity between the wire terminals of the side stand switch 2P (Green) connector.

Continuity should exist only when the side stand is up.

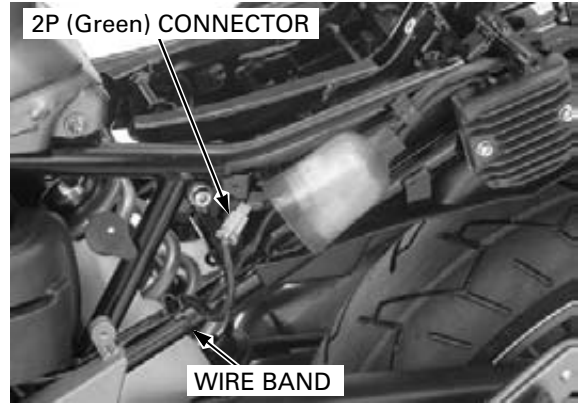


REMOVAL

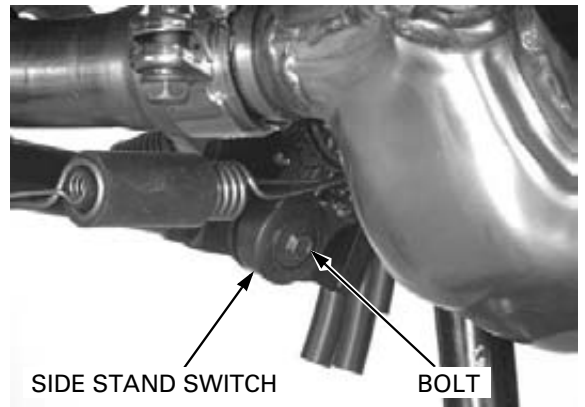
Remove the following:

- Left side cover (page 3-4)
- Left rear cowl (page 3-8)

Remove the wire band and disconnect the side stand switch 2P (Green) connector.



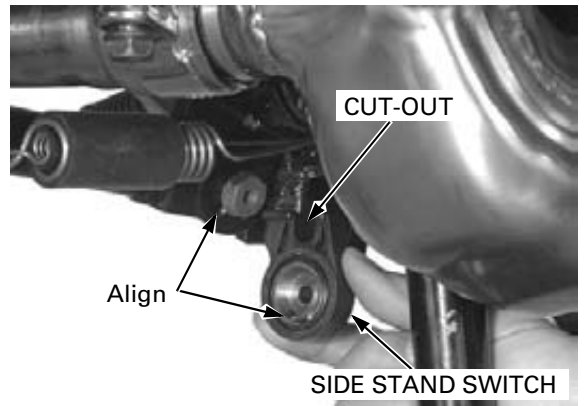
Remove the bolt and side stand switch.



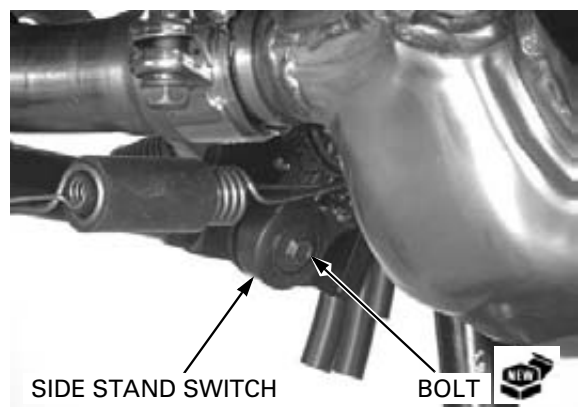
INSTALLATION

Route the side stand switch wire properly (page 1-23).

Install the side stand switch by aligning the switch pin with the side stand hole and switch groove with the return spring holding pin.



Secure the side stand switch with a new bolt.

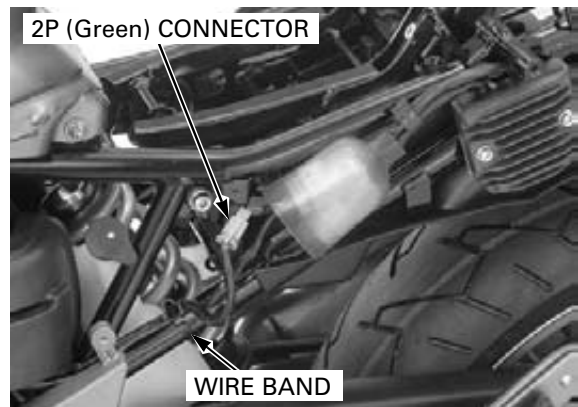


LIGHTS/METERS/SWITCHES

Connect the 2P (Green) connector.
Secure the side stand switch wire with the wire band.

Install the following:

- Left rear cowl (page 3-9)
- Left side cover (page 3-4)



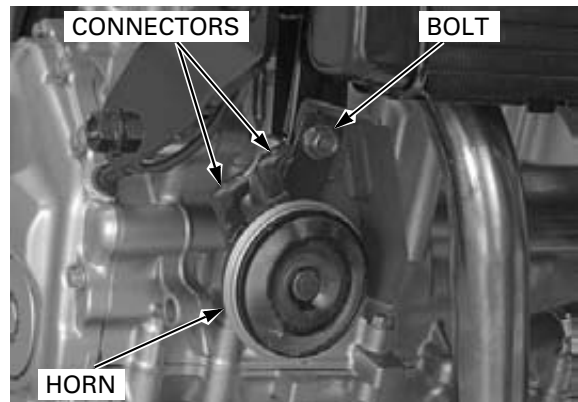
HORN

Disconnect the wire connectors from the horn.
Connect the 12 V battery to the horn terminal directly.
The horn is normal if it sounds when the 12 V battery is connected across the horn terminals.



REMOVAL/INSTALLATION

Disconnect the horn wire connectors.
Remove the mounting bolt and horn.
Installation is in the reverse order of removal.
TORQUE: 32 N·m (3.3 kgf·m, 24 lbf·ft)



TURN SIGNAL RELAY

INSPECTION

1. Related Circuit Inspection

Check the following:

- Burned bulb or non-specified wattage
- Blown fuse
- Ignition switch and turn signal switch function
- Loose connectors

Check for the above items.

Are the above items in good condition?

NO - Replace or repair the malfunction part(s)

YES - GO TO STEP 2.

2. Turn Signal Circuit Inspection

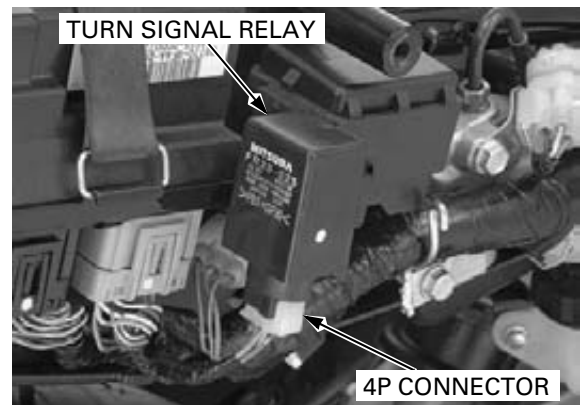
Remove the right rear cowl (page 3-8).

Disconnect the turn signal 4P connector and short the Gray and White/green terminals of the wire harness side connector with a jumper wire. Turn the ignition switch ON and check the turn signal light by turning the turn signal switch on.

Does the light come on?

YES - GO TO STEP 3.

NO - Open circuit in related wires



3. Ground Line Inspection

Check the continuity between the 4P connector Green terminal and ground.

Is there continuity?

- YES** -
- Faulty turn signal relay
 - Loose or poor contact of the connector terminals

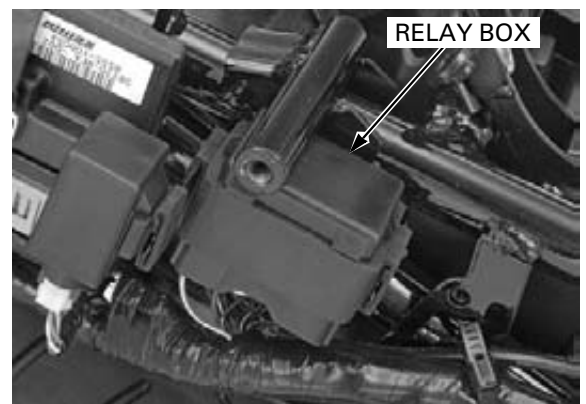
NO - Open circuit in Green wire

HEADLIGHT RELAY

INSPECTION

Remove the right rear cowl (page 3-8).

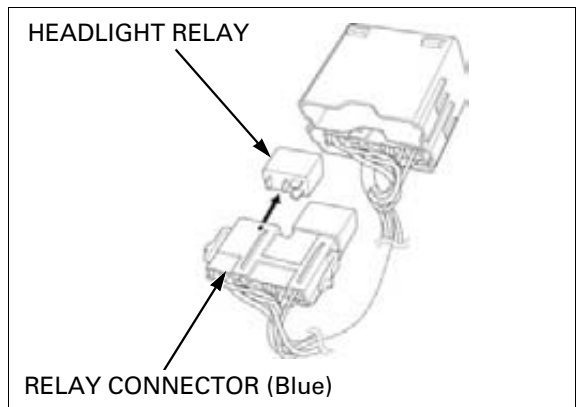
Remove the relay box from the bracket.



LIGHTS/METERS/SWITCHES

Release the retainers and remove the relay connector (Blue) from the relay box.

Remove the headlight relay from the relay connector (Blue).



Connect the ohmmeter to the following headlight relay terminals.

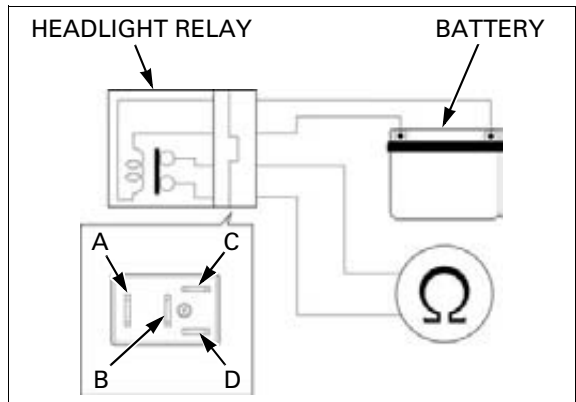
CONNECTION: A (Black/red) – B (Black/blue)

Connect the 12 V battery to the following headlight relay terminals.

CONNECTION: C (Blue) – D (Green)

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 headlight relay.

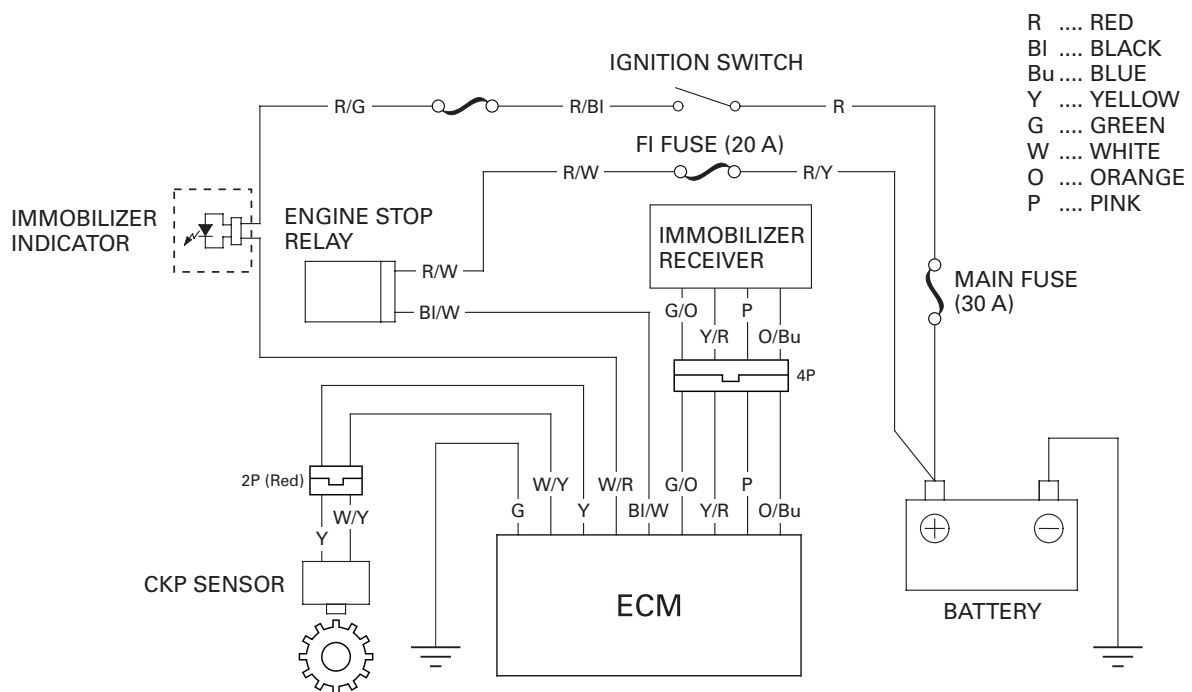
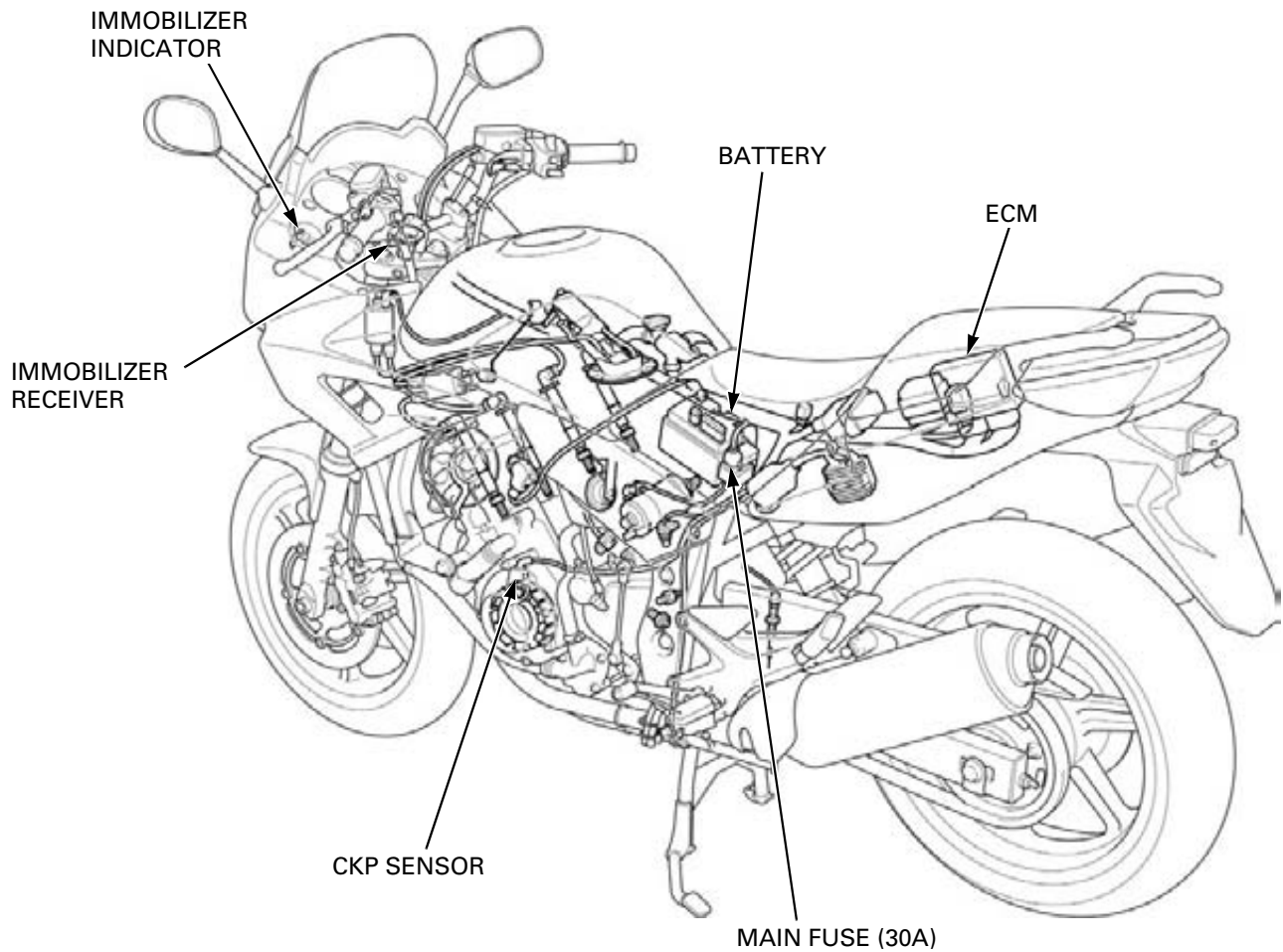


22. IMMOBILIZER SYSTEM (HISS)

SYSTEM DIAGRAM.....	22-2	TROUBLESHOOTING.....	22-9
SERVICE INFORMATION	22-3	IMMOBILIZER INDICATOR	22-12
KEY REGISTRATION PROCEDURES	22-4	ENGINE CONTROL MODULE (ECM).....	22-13
DIAGNOSTIC CODE INDICATION	22-7	IMMOBILIZER RECEIVER.....	22-14

IMMOBILIZER SYSTEM (HISS)


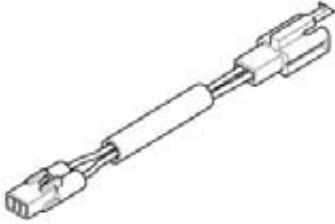

SYSTEM DIAGRAM



SERVICE INFORMATION**GENERAL**

- When checking the immobilizer system (HISS), follow the steps in the troubleshooting flow chart (page 22-9).
- Keep the immobilizer key away from the other vehicle's immobilizer key when using it. The jamming of the key code signal may occur and the proper operation of the system will be obstructed.
- The key has built-in electronic part (transponder). Do not drop and strike the key against a hard material object, and do not leave the key on the dashboard in the car, etc. where the temperature will rise. Do not leave the key in the water for a prolonged time such as by washing the clothes.
- The ECM as well as the transponder keys must be replaced if all transponder keys have been lost.
- The system does not function with a duplicated key code is registered into the transponder with the immobilizer system (HISS).
- The ECM can store up to four key codes. (The four keys can be registered.)
- Do not modify the immobilizer system as it can cause the system failure. (The engine cannot be started.)
- Refer to the ignition system inspection (page 19-5).
- Refer to the ignition switch servicing (page 21-20).

TOOLS

<p>Inspection harness 07XMZ-MBW0101</p>  A coiled cable with a connector at one end and two alligator clips at the other.	<p>Test harness adaptor 070MZ-MEC0100</p>  A long, thin cable with a connector at one end and a multi-pin connector at the other.	<p>Test probe 07ZAJ-RDJA110</p>  A long, thin probe with a threaded end and a pointed tip.
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IMMOBILIZER SYSTEM (HISS)

KEY REGISTRATION PROCEDURES

When the key has been lost, or additional spare key is required:

1. Obtain a new transponder key.
2. Grind the key in accordance with the shape of the original key.
3. Apply 12 V battery voltage to the CKP sensor lines of the ECM using the special tool (page 22-7).
4. Turn the ignition switch ON with the original key. The immobilizer indicator comes on and it remains on.
 - The code of the original key recognized by the ECM.
 - If there is any problem in the immobilizer system (HISS), the system will enter the diagnostic mode and the indicator will remain on for approx. ten seconds, then it will indicate the diagnostic code (page 22-7).
5. Disconnect the red clip of the inspection adaptor from the battery positive (+) terminal for two seconds or more, then connect it again. The indicator remains on for approx. two seconds, then it blinks four times repeatedly.



- The immobilizer system (HISS) enters the registration mode. Registrations of all key except the original key inserted in the ignition switch are cancelled. (Registration of the lost key or spare key is cancelled.)
The spare key must be registered again.
6. Turn the ignition switch OFF and remove the key.
 7. Turn the ignition switch ON with a new key or the spare key. (Never use the key registered in previous steps.) The indicator comes on for four seconds then it blinks four times repeatedly.



- The new key or spare key is registered in the ECM.
 - If there is any problem in the registration, the system will enter the diagnostic mode and the indicator will remain for approx. ten seconds, then it will indicate the diagnostic code (page 22-8).
 - Keep the other transponder key away from the immobilizer receiver more than 50 mm (2.0 in).
8. Repeat the steps 6 and 7 when you continuously register the other new key.
The ECM can store up to four key codes. (The four keys can be registered.)
 9. Turn the ignition switch OFF, remove the inspection adaptor and connect the CKP sensor 2P (Red) connector.
 10. Turn the ignition switch ON with the registered key.
 - The immobilizer system (HISS) returns to the normal mode.
 11. Check that the engine can be started using all registered keys.

When the ignition switch is faulty:

1. Obtain a new ignition switch and two new transponder keys.
2. Remove the ignition switch (page 21-21).
3. Apply 12 V battery voltage to the CKP sensor lines of the ECM using the special tool (page 22-7).
4. Set the original (registered) key near the immobilizer receiver so that the transponder in the key can communicate with the receiver.
5. Connect a new ignition switch to the wire harness and turn it ON with a new transponder key. (keep the ignition switch away from the receiver.) The immobilizer indicator comes on and it remains on.
 - The code of the original key recognized by the ECM.
 - If there is any problem in the immobilizer system (HISS), the system will enter the diagnostic mode and the indicator will remain on for approx. ten seconds, then it will indicate the diagnostic code (page 22-7).
6. Disconnect the red clip of the inspection adaptor from the battery positive (+) terminal for two seconds or more, then connect it again. The indicator remains on for approx. two seconds then it blinks four times repeatedly.



- The immobilizer system (HISS) enters the registration mode. Registrations of all key except the original key set near the receiver are cancelled.
7. Turn the ignition switch OFF and remove the key.
 8. Install the ignition switch onto the top bridge (page 21-21).
 9. Turn the ignition switch ON with a first new key. The indicator comes on for four seconds then it blinks four times repeatedly.



- The first new key is registered in the ECM.
 - If there is any problem in the registration, the system will enter the diagnostic mode and the indicator will remain for approx. ten seconds, then it will indicate the diagnostic code (page 22-8).
10. Turn the ignition switch OFF and disconnect the red clip of the inspection adaptor from the battery positive (+) terminal.
 11. Turn the ignition switch ON (with the first key registered in step 9). The immobilizer indicator comes on for two seconds then it goes off.
 - The immobilizer system (HISS) returns to the normal mode.
 12. Turn the ignition switch OFF and connect the red clip of the inspection adaptor to the battery positive (+) terminal.
 13. Turn the ignition switch ON (with the first key registered in step 9). The immobilizer indicator comes on and it remains on.
 - The code of the first key is recognized by the ECM.
 - If there is any problem in the immobilizer system (HISS), the system will enter the diagnostic mode and the indicator will remain on for approx. ten seconds, then it will indicate the diagnostic code (page 22-7).
 14. Disconnect the red clip of the inspection adaptor from the battery positive (+) terminal for two seconds or more, then connect it again. The indicator remains on for approx. two seconds then it blinks four times repeatedly.
 - The immobilizer system (HISS) enters the registration mode. Registration of the original key used in step 4 is cancelled.

IMMOBILIZER SYSTEM (HISS)

15. Turn the ignition switch OFF and remove the key.
16. Turn the ignition switch ON with a second new key. (Never use the key registered in previous step.) The indicator comes on for four seconds then it blinks four times repeatedly.
 - The second new key is registered in the ECM.
 - If there is any problem in the registration, the system will enter the diagnostic mode and the indicator will remain for approx. ten seconds, then it will indicate the diagnostic code (page 22-8).
 - Keep the other transponder key away from the immobilizer receiver more than 50 mm (2.0 in).
17. Repeat the steps 15 and 16 when you continuously register the other new key.

The ECM can store up to four key codes. (The four keys can be registered.)
18. Turn the ignition switch OFF, remove the inspection adaptor and connect the CKP sensor connector.
19. Turn the ignition switch ON with the registered key.
 - The immobilizer system (HISS) returns to the normal mode.
20. Check that the engine can be started using all registered keys.

When all keys have been lost, or the Engine Control Module (ECM) is faulty:

1. Obtain a new ECM and two new transponder keys.
2. Grind the keys in accordance with the shape of the original key (or use the key number plate when all keys have been lost).
3. Replace the ECM with a new one (page 6-82).
4. Turn the ignition switch ON with a first new key. The immobilizer indicator comes on for two seconds, then it blinks four times repeatedly.
 - The first key is registered in the ECM.
 - If there is any problem in the registration, the system will enter the diagnostic mode and the indicator will remain for approx. ten seconds, then it will indicate the diagnostic code (page 22-8).
5. Turn the ignition switch OFF and remove the first key.
6. Turn the ignition switch ON with a second new key. The immobilizer indicator comes on for two seconds, then it blinks four times repeatedly.
 - The second key is registered in the ECM.
 - If there is any problem in the registration, the system will enter the diagnostic mode and the indicator will remain for approx. ten seconds, then it will indicate the diagnostic code (page 22-8).
7. Turn the ignition switch OFF and remove the second key.
 - The system (ECM) will not enter the normal mode unless the two keys are registered in ECM.
 - The third new key cannot be continuously registered. When it is necessary to register the third key, follow the procedures "When the key has been lost, or additional key is required" (page 22-4).
8. Check that the engine can be started using all registered keys.

DIAGNOSTIC CODE INDICATION

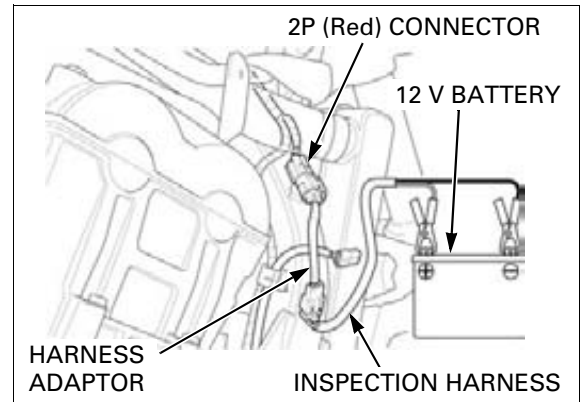
Disconnect the CKP sensor 2P (Red) connector.

Connect the inspection adaptor and harness adaptor to the wire harness side connector.

Connect the red clip of the adaptor to the 12 V battery positive (+) terminal and green clip to the negative (-) terminal.

TOOLS:

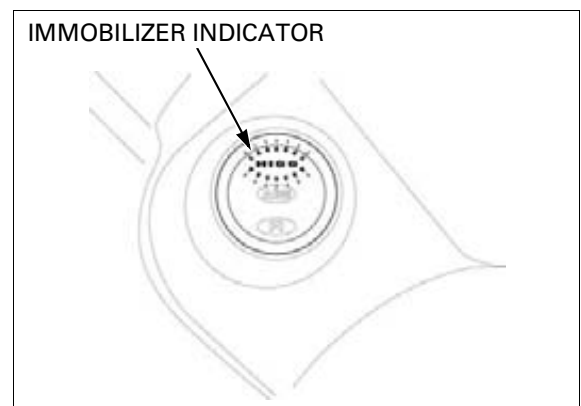
Inspection harness **07XMZ-MBW0101**
Test harness adaptor **070MZ-MEC0100**



Turn the ignition switch ON with the properly registered key.

The immobilizer indicator will come on for approx. ten seconds then it will start blinking to indicate the diagnostic code if the system is abnormal. The blinking frequency is repeated.

The immobilizer indicator remains on when the system is normal. (The system is in the normal mode and the diagnostic code does not appear.)



DIAGNOSTIC CODE

When the system (ECM) enters the diagnostic mode from the normal mode:

BLINKING PATTERN	SYMPTOM	PROBLEM	PROCEDURE
<p>ON --- OFF --- 10 sec.</p>	ECM data is abnormal	Faulty ECM	Replace the ECM
	Code signals cannot send or receive	Faulty immobilizer receiver or wire harness	Follow the troubleshooting (page 22-9)
	Identification code is disagree	Jamming by the other transponder	Keep the other vehicle's transponder key away from the immobilizer receiver more than 50 mm (2.0 in)
	Secret code is disagree		

IMMOBILIZER SYSTEM (HISS)

When the system (ECM) enters the diagnostic mode from the registration mode:

BLINKING PATTERN	SYMPTOM	PROBLEM	PROCEDURE
<p>ON OFF 10 sec.</p>	Registration is overlapped	The key is already registered properly	Use a new key or cancelled key
	Code signals cannot send or receive	Communication fails	Follow the troubleshooting (page 22-9)
	Registration is impossible	The key is already registered on the other system	Use a new key

TROUBLESHOOTING

The immobilizer indicator comes on for approx. two seconds then it goes off, when the ignition switch is turned ON with the properly registered key and the immobilizer system (HISS) functions normally. If there is any problem or the properly registered key is not used, the indicator will remain on.

Immobilizer indicator does not come on when the ignition switch is turned ON

1. Fuse Inspection

Check for blown fuse (10 A).

Is the fuse blown?

YES – Replace the fuse

NO – GO TO STEP 2.

2. Combination Meter Inspection

Check that the neutral indicator comes on with the ignition switch ON.

Does the indicator come on?

NO – GO TO STEP 3.

YES – GO TO STEP 4.

3. Combination Meter Power Input line Inspection

Check the power input line (Black/brown wire) at the combination meter connector (page 22-12).

Is the voltage specified value?

NO – • Open circuit in Black/brown wire
• Open circuit in Green wire

YES – Faulty combination meter

4. Immobilizer Indicator Line Inspection At The ECM Connector

Check the immobilizer indicator line (White/red wire) at the ECM connector (page 22-13).

Is the voltage specified?

NO – GO TO STEP 5.

YES – GO TO STEP 6.

5. Immobilizer Indicator Line Inspection At The Combination Meter Connector

Check the immobilizer indicator line (White/red wire) at the combination meter connector (page 22-12).

Is the voltage specified value?

NO – Open circuit in White/red wire

YES – • Faulty combination meter

6. Power Input Line Inspection At The ECM Connector

Check the power input line (Black/white wire) at the ECM connector (page 22-13).

Is the voltage specified?

NO – • Open circuit in Black/white wire
• Faulty engine stop relay
• Blown FI fuse (20 A)
• Open circuit in Red/yellow or Red/white wire between the battery and engine stop relay

YES – GO TO STEP 7.

7. Ground Line Inspection At The ECM Connector

Check the ground lines (Green and Green/pink wire) at the ECM connector (page 22-13).

Is there continuity?

NO – Open circuit in Green or Green/pink wire

YES – • Loose or poor ECM connector contact
• Faulty ECM

IMMOBILIZER SYSTEM (HISS)

Immobilizer indicator remains on with the ignition switch ON

1. Immobilizer Receiver Jamming Inspection

Check that there is any metal obstruction or the other vehicle's transponder key near the immobilizer receiver and key.

Is there any metal obstruction or the other key?

YES – Remove it and recheck.

NO – GO TO STEP 2.

2. First Transponder Key Inspection

Turn the ignition switch ON with the spare transponder key and check the immobilizer indicator. The indicator should come on for 2 seconds then go off.

Is there indicator go off?

YES – Faulty first transponder key

NO – GO TO STEP 3.

3. Diagnostic Code Inspection

Perform the diagnostic code indication procedure (page 22-7) and check that the immobilizer indicator comes on then it starts blinking.

Is there indicator Blinks or Stay Lit?

BLINKS–Read the diagnostic code (page 22-7).

STAY LIT–GO TO STEP 4.

4. Immobilizer Indicator Line Inspection At The ECM Connector

Check the immobilizer indicator line (White/red wire) at the ECM connector (page 22-13).

Is the voltage specified?

NO – Short circuit in White/red wire

YES – GO TO STEP 5.

5. CKP Sensor Line Inspection

Check the CKP sensor lines (Yellow and White/yellow wires) between the ECM and CKP sensor connectors (page 22-14).

Is there Continuity?

NO – Faulty ECM

YES – Open circuit in Yellow or White/yellow wire

Diagnostic code  is indicated (Code signals cannot send or receive)

1. Immobilizer Receiver Power Input Line Inspection

Check the power input line (Yellow/red) at the immobilizer receiver connector (page 22-14).

Is there approx. 5 V?

NO – Open or short circuit in Yellow/red wire

YES – GO TO STEP 2.

2. Immobilizer Receiver Ground Line Inspection

Check the ground line (Green/orange) at the immobilizer receiver connector (page 22-14).

Is there continuity?

NO – Open or short circuit in Green/orange wire

YES – GO TO STEP 3.

3. Immobilizer Receiver Signal Line Inspection

Check the signal lines (Pink and Orange/blue) between the immobilizer receiver and ECM connectors (page 22-15).

Is there continuity?

NO – • Open or short circuit in Pink wire
• Open or short circuit in Orange/blue wire

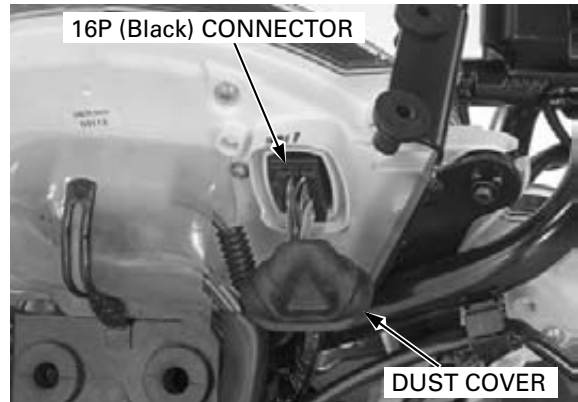
YES – Faulty immobilizer receiver

IMMOBILIZER SYSTEM (HISS)

IMMOBILIZER INDICATOR

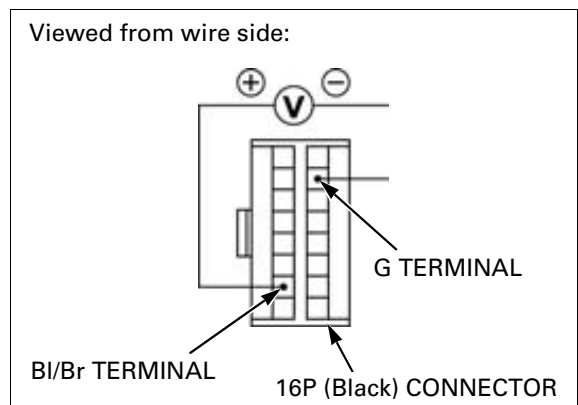
Remove the front center cowl (page 3-8).

Perform the following inspections with the combination meter 16P (Black) connector connected.



POWER INPUT LINE INSPECTION

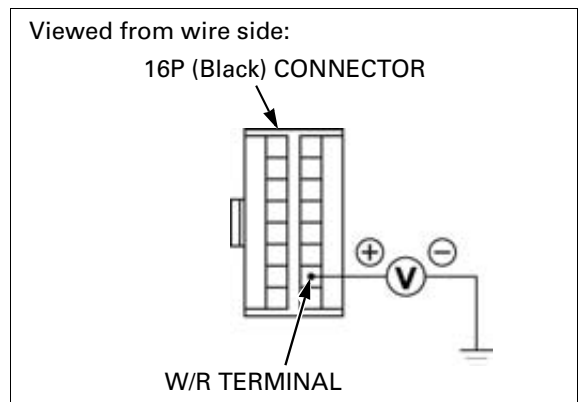
Measure the voltage between the Black/brown (+) and Green (-) wire terminals.
Turn the ignition switch ON.
There should be battery voltage.



IMMOBILIZER INDICATOR LINE INSPECTION

Measure the voltage between the White/red (+) and ground (-).
Turn the ignition switch ON.
There should be battery voltage.

There should be no voltage for approx. two seconds after the ignition switch is turned ON, then the battery voltage should appear, if the system is normal.



ENGINE CONTROL MODULE (ECM)

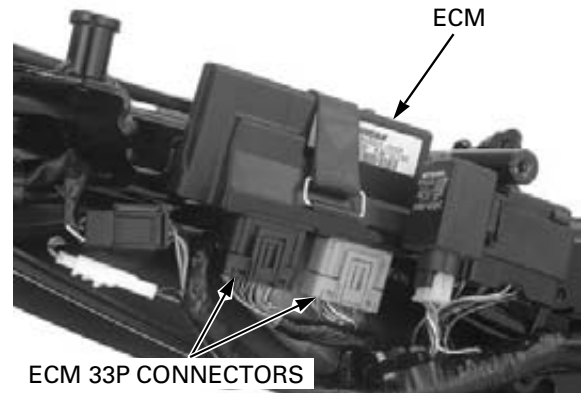
Remove the right rear cowl (page 3-8).

Disconnect the ECM 33P connectors.
Perform the following inspections at the wire harness side connector of the ECM.

TOOLS:

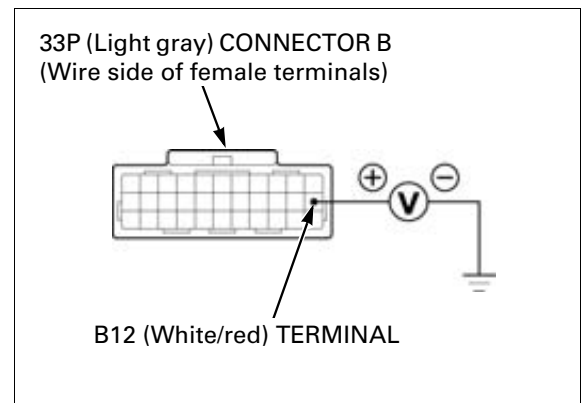
Test probe

07ZAJ-RDJA110



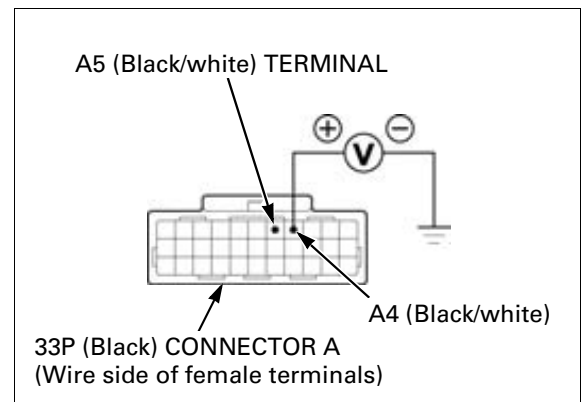
IMMOBILIZER INDICATOR LINE INSPECTION

Measure the voltage between the B12 (White/red) wire terminal (+) and ground (-).
Turn the ignition switch ON.
There should be battery voltage.



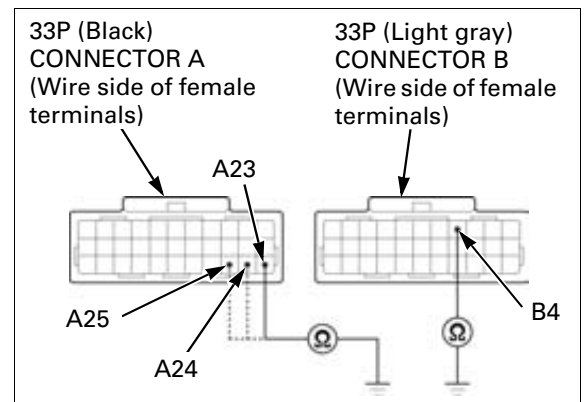
POWER INPUT LINE INSPECTION

Measure the voltage between the A4 and A5 (Black/white) wire terminal (+) and ground (-).
Turn the ignition switch ON.
There should be battery voltage.



GROUND LINE INSPECTION

Check the continuity between the B4 (Green) wire terminal and ground.
Also check the continuity between the A23, A24 and A25 (Green/pink) wire terminal and ground.
There should be continuity at all times.

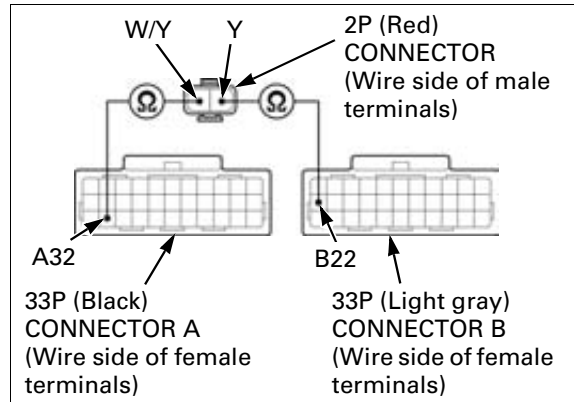


IMMOBILIZER SYSTEM (HISS)

CKP SENSOR LINE INSPECTION

Disconnect the CKP sensor 2P (Red) connector.
Check the Yellow wire for continuity between the ECM and CKP sensor connectors.
Also check the White/yellow wire for continuity between the ECM and CKP sensor connectors

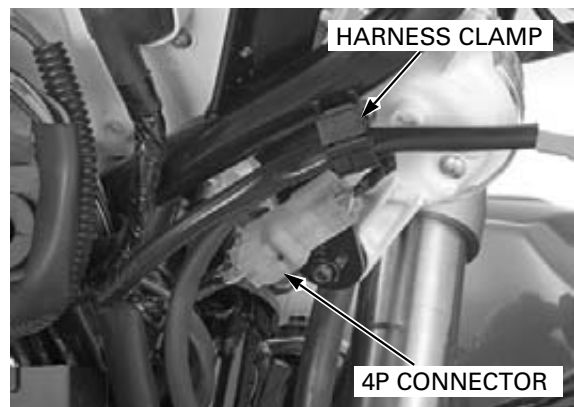
There should be continuity between the same color wire terminals.



IMMOBILIZER RECEIVER

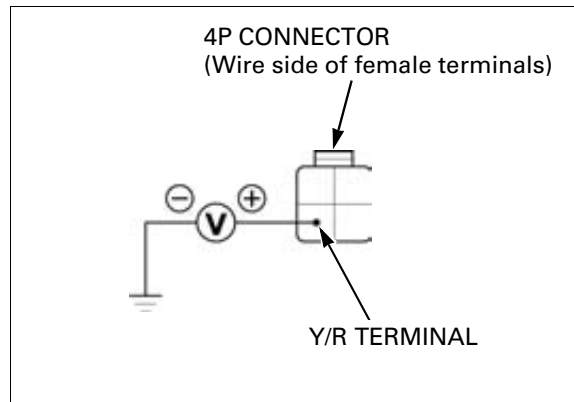
Remove the front center cowl (page 3-7).

Release the immobilizer receiver wire from the harness clamp and disconnect the 4P (Natural) connector.



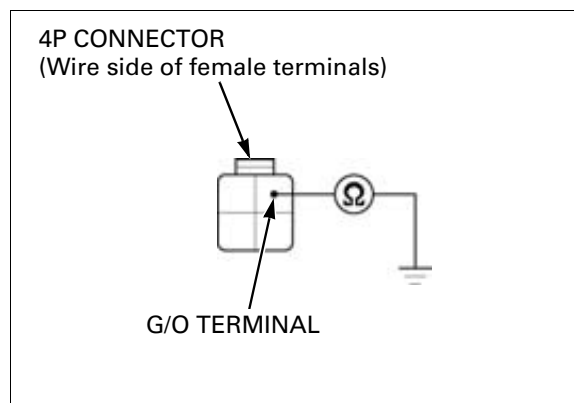
POWER INPUT LINE INSPECTION

Measure the voltage between the Yellow/red wire terminal (+) of the wire harness side connector and ground (-).
Turn the ignition switch ON.
There should be approx. 5 V.



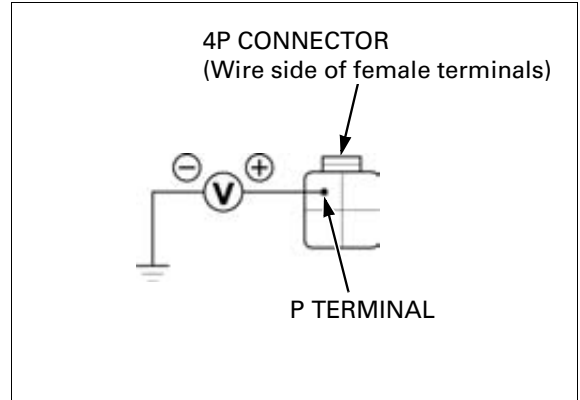
GROUND LINE INSPECTION

Check for continuity between the Green/orange wire terminal of the wire harness side connector and ground.
There should be continuity at all times.



SIGNAL LINE INSPECTION

Measure the voltage between the Pink wire terminal (+) of the wire harness side connector and body ground (-).
Turn the ignition switch ON.
There should be approx. 5 V.



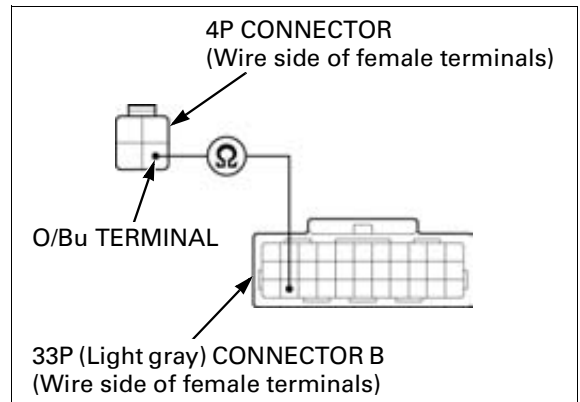
Disconnect the ECM 33P (Light gray) connector (page 22-13).

Check the Orange/blue wire for continuity between the immobilizer receiver and ECM connectors.

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

There should be continuity.

Check for continuity between the Orange/blue wire terminal and ground.
There should be no continuity.



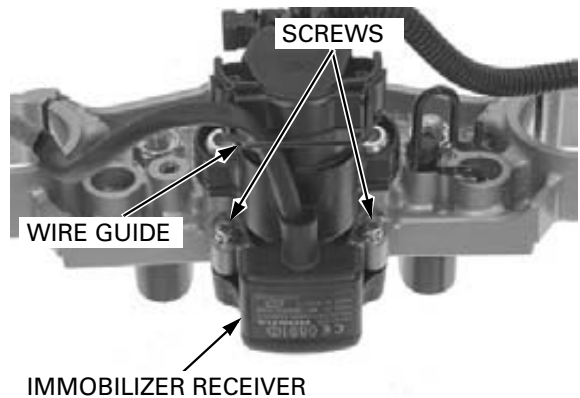
REPLACEMENT

Remove the top bridge (page 14-30).

Remove the wire guide.

Remove the two screws and immobilizer receiver.
Install new receiver and tighten the two screws.

Install the removed parts in the reverse order of removal.



REPLACEMENT PARTS FOR PROBLEM

Problem	Replacement parts				
	Transponder Key	Immobilizer receiver	ECM	Ignition switch	*Accessory lock and key
One Key has been lost, or additional spare key is required	C				
All key have been lost, or ECM is faulty	C		C		
Immobilizer receiver is faulty		C			
Ignition switch is faulty	C			C	
*Accessory lock is faulty					C

*Accessory lock means the seat lock and fuel fill cap.

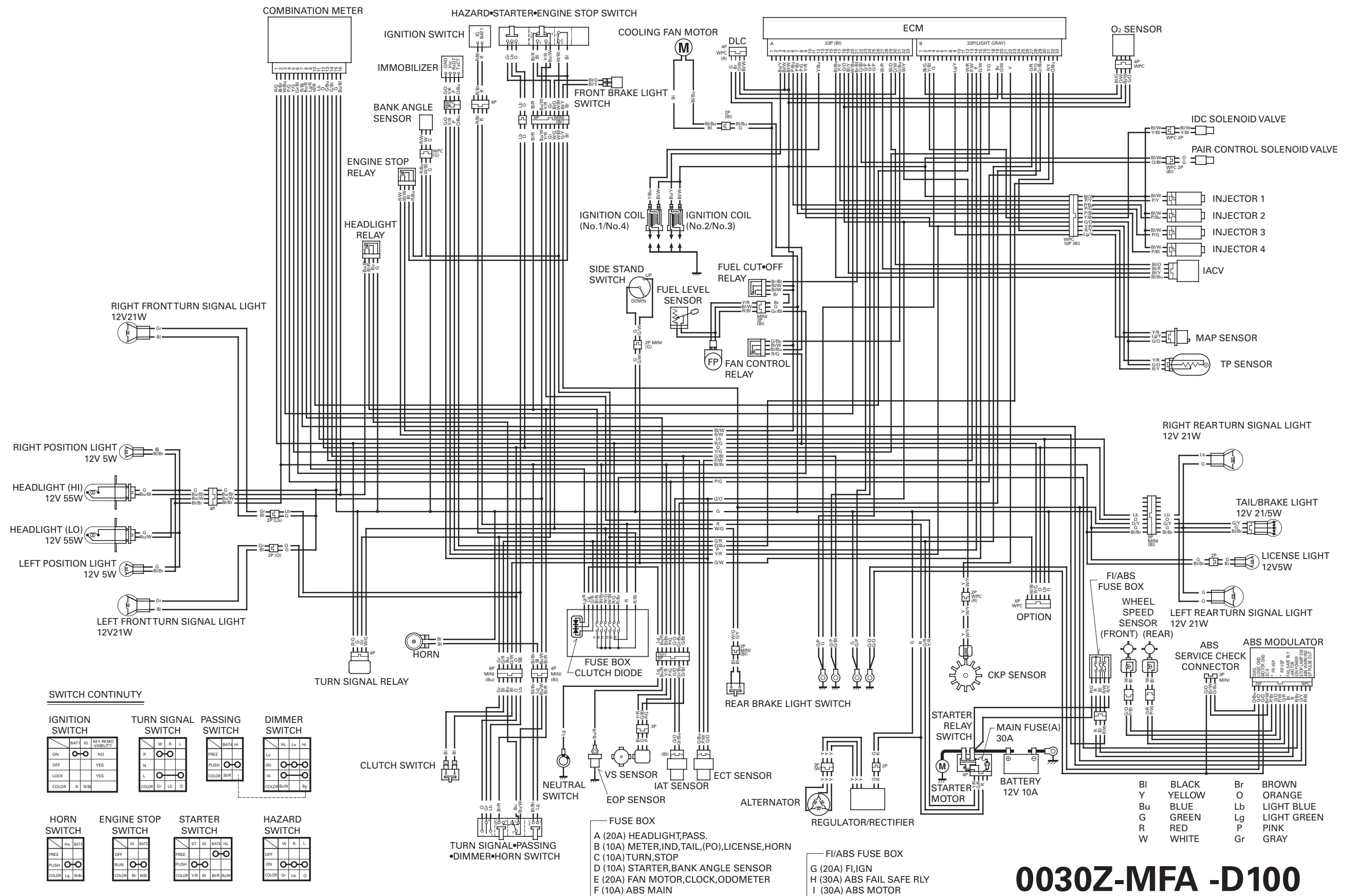
MEMO

23. WIRING DIAGRAMS

CBF1000A:..... 23-3

CBF1000:..... 23-4

CBF1000A:



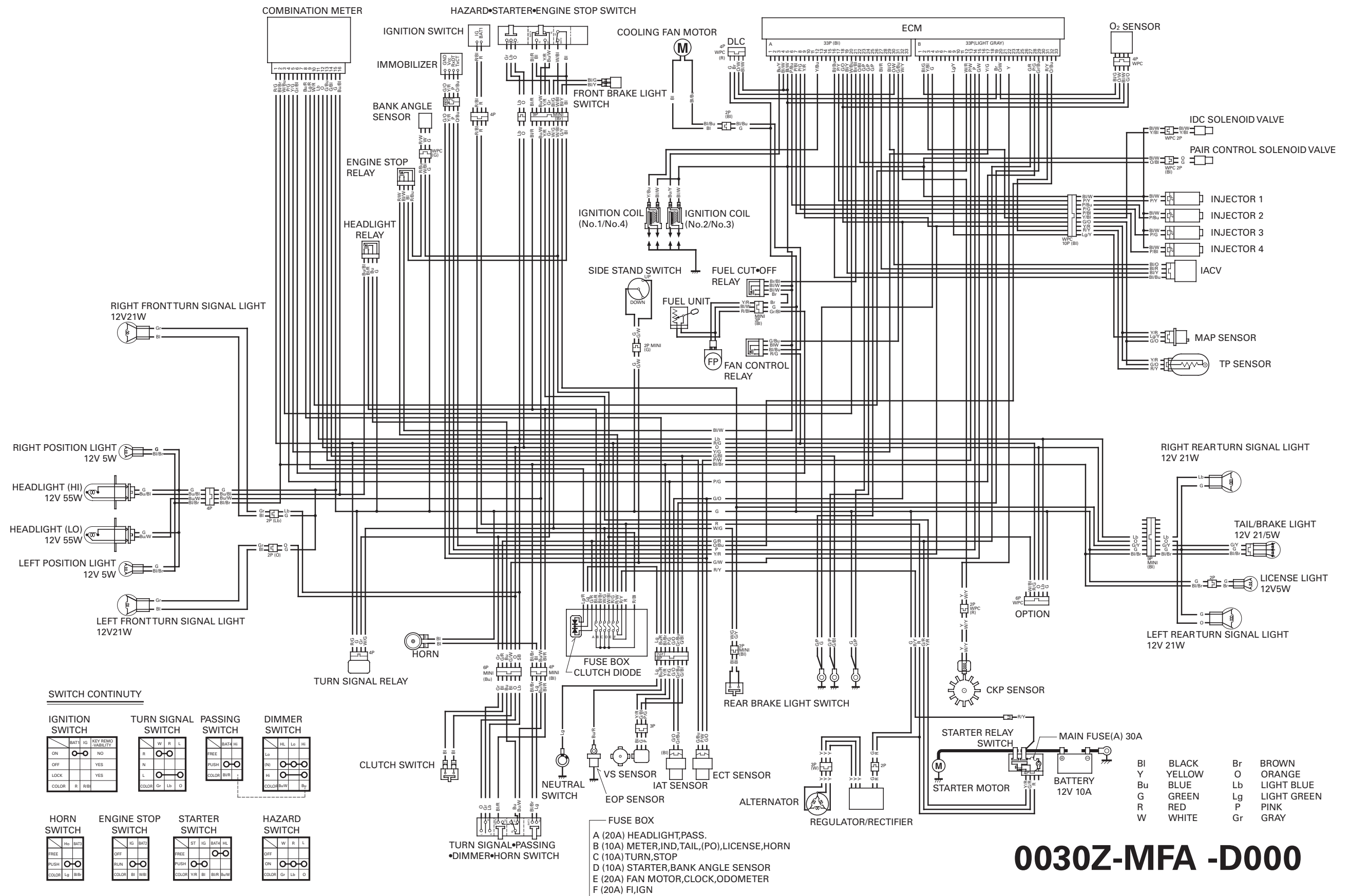
SWITCH CONTINUTY

IGNITION SWITCH		TURN SIGNAL SWITCH		PASSING SWITCH		DIMMER SWITCH	
ON	BAT/IG	R	W	FREE	BAT/HL	L	HL
OFF	NO	N	R	PUSH		L	Lg
LOCK	YES	L	L	COLOR	Bu/R	HI	Hi
COLOR	R/R	COLOR	Lb/O			LO	Lo

HORN SWITCH		ENGINE STOP SWITCH		STARTER SWITCH		HAZARD SWITCH	
FREE	Ho/BAT	OFF	IG/BAT	FREE	ST/IG	OFF	W
PUSH		RUN		PUSH		ON	R
COLOR	Lg/Bl	COLOR	Bl/W	COLOR	Y/R	ON	L
						OFF	R
							L
							L

- FUSE BOX**
- A (20A) HEADLIGHT,PASS.
 - B (10A) METER,IND,TAIL,(PO),LICENSE,HORN
 - C (10A) TURN,STOP
 - D (10A) STARTER,BANK ANGLE SENSOR
 - E (20A) FAN MOTOR,CLOCK,ODOMETER
 - F (10A) ABS MAIN
- FI/ABS FUSE BOX**
- G (20A) FI,IGN
 - H (30A) ABS FAIL SAFE RLY
 - I (30A) ABS MOTOR

0030Z-MFA -D100



24. TROUBLESHOOTING

ENGINE DOES NOT START OR IS HARD
TO START 24-2

ENGINE LACKS POWER 24-3

POOR PERFORMANCE AT LOW AND
IDLE SPEED 24-5

POOR PERFORMANCE AT
HIGH SPEED 24-6

POOR HANDLING 24-6

ENGINE DOES NOT START OR IS HARD TO START

1. Spark Plug Inspection

Remove and inspect spark plugs.

Are the spark plugs in good condition?

- NO** – • Incorrect spark plug heat range
• Incorrect spark plug gap
• Dirty air cleaner

YES – GO TO STEP 2.

2. Spark Test

Perform spark test.

Are there good sparks?

- NO** – • Loose or disconnected ignition system wires
• Faulty ignition coil
• Broken or shorted spark plug wires
• Faulty CKP sensor
• Faulty engine stop switch
• Faulty ignition switch
• Faulty ECM

YES – 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 (page 6-55).

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 (page 6-11).

YES – GO TO STEP 5.

5. Cylinder compression Inspection

Test the cylinder compression (page 9-6).

Is the compression specified?

- NO** – • Improper valve clearance
• Valve stuck open
• Worn cylinder and piston rings
• Damaged cylinder head gasket
• Seized valves
• Improper valve timing

YES – GO TO STEP 6.

6. Engine Start Condition

Start by following normal procedure.

Did the engine start but stops?

- YES** – • Leaking insulators or air cleaner housing
• Faulty starter valves
• Improper ignition timing (Faulty ECM or CKP sensor)
• Contaminated fuel

ENGINE LACKS POWER

1. Drive Train Inspection

Raise wheel off the ground and spin by hand.

Does the wheel spin freely?

- NO** – • Brake dragging
• Worn or damaged wheel bearings

YES – GO TO STEP 2.

2. Tire Pressure Inspection

Check the tire pressure.

Is the tire pressure correct?

- NO** – • Faulty tire valve
• Punctured tire

YES – GO TO STEP 3.

3. Clutch Inspection

Accelerate rapidly, shift from first to second.

Does the engine speed change accordingly when clutch is released?

- 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.

Are the spark plugs in good condition?

- NO** – • Plugs not serviced frequently enough
• Incorrect spark plug heat range
• Incorrect spark plug gap

YES – GO TO STEP 6.

6. Engine Oil Inspection

Check the oil level and condition.

Is the engine oil in good condition?

- NO** – • Oil level too high
• Oil level too low
• Contaminated oil

YES – GO TO STEP 7.

7. Ignition Timing Inspection

Check the ignition timing.

Is the ignition timing as specified?

- NO** – • Faulty ECM
• Faulty CKP sensor
• Improper valve timing

YES – GO TO STEP 8.

TROUBLESHOOTING

8. Cylinder compression Inspection

Test the cylinder compression.

Is the compression as specified?

- NO** – • Improper valve clearance
• Valve stuck open
• Seized valve
• Worn cylinder and piston rings
• Damaged cylinder head gasket
• Improper valve timing

YES – GO TO STEP 9.

9. Fuel Pump Inspection

Inspect the fuel flow.

Is the fuel pump unit normal?

NO – Faulty fuel pump unit (page 6-55).

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 (page 6-11).

YES – GO TO STEP 11.

11. Lubrication Inspection

Remove cylinder head cover and inspect lubrication.

Is the valve train lubricated properly?

- NO** – • Faulty oil pump
• Faulty pressure relief valve
• Clogged oil strainer
• Clogged oil passage

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
• Use of poor quality fuel
• Wrong type of fuel
• Clutch slipping

NO – GO TO STEP 13.

13. Engine Knocking Inspection

Accelerate or run at high speed.

Is the engine knocking?

- YES** – • Worn piston and cylinder
• Wrong type of fuel
• Excessive carbon build-up in combustion chamber
• Ignition timing too advance (Faulty ECM)
• Faulty CKP sensor

NO – • Engine does not knock

POOR PERFORMANCE AT LOW AND IDLE SPEED

1. Spark Plug Inspection

Remove and inspect spark plugs.

Are the spark plugs in good condition?

NO – • Plugs not serviced frequently enough
• Incorrect spark plug heat range
• Incorrect spark plug gap

YES – GO TO STEP 2.

2. Ignition Timing Inspection

Check the ignition timing.

Is the ignition timing as specified?

NO – • Faulty ECM
• Faulty CKP sensor
• Faulty VS sensor
• Improper valve timing

YES – GO TO STEP 3.

3. Fuel Pump Inspection

Inspect the fuel flow.

Is the fuel pump unit normal?

NO – Faulty fuel pump unit (page 6-55).

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 (page 6-11).

YES – GO TO STEP 5.

5. IACV Inspection

Check the IACV operation (page 6-76).

Does the IACV operate normally?

NO – Faulty IACV.

YES – GO TO STEP 6.

6. Intake Pipes Leaking Inspection

Check for leaks at the insulators or air cleaner housing.

Are there leaks?

YES – • Loose insulator
• Damaged insulator
• Damaged air cleaner housing

TROUBLESHOOTING

POOR PERFORMANCE AT HIGH SPEED

1. Ignition Timing Inspection

Check the ignition timing.

Is the ignition timing as specified?

- NO** – • Faulty ECM
• Faulty CKP sensor
• Faulty VS sensor
• Improper valve timing

YES – GO TO STEP 2.

2. Fuel Pump Inspection

Inspect the fuel flow.

Is the fuel pump unit operation normal?

NO – Faulty fuel pump unit (page 6-55).

YES – GO TO STEP 3.

3. PGM-FI System Inspection

Check the PGM-FI system.

Is the PGM-FI system normally?

NO – Faulty PGM-FI system (page 6-11).

YES – GO TO STEP 4.

4. Valve Timing Inspection

Check the valve timing (page 9-27).

Is the valve timing correct?

NO – Camshafts not installed properly

YES – GO TO STEP 5.

5. Valve Spring Inspection

Check the valve springs.

Are the valve spring free length as specified?

NO – Faulty valve springs

POOR HANDLING

Steering is heavy

- Steering stem adjusting nut too tight
- Damaged steering head bearings
- Insufficient tire pressure

Either wheel is wobbling

- Excessive wheel bearing play
- Bent rim
- Swingarm pivot bearing excessively worn
- Bent frame

The motorcycle pulls to one side

- Front and rear wheel not aligned
- Faulty shock absorber
- Bent fork
- Bent swingarm
- Bent axle
- Bent frame

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