2014–2015

61MJM01

HONDA

SERVICE MANUAL

VFR800F/FD

SERVICE RULES 1-2
MODEL IDENTIFICATION 1-3
SPECIFICATIONS 1-4
TORQUE VALUES 1-12
LUBRICATION & SEAL POINTS 1-17
CABLE & HARNESS ROUTING 1-20
EMISSION CONTROL SYSTEMS 1-33
TECHNICAL FEATURE 1-36

SERVICE RULES

1. Use Honda Genuine 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 show in the Cable and Harness Routing (page 1-20).
9. Do not bend or twist control cables. Damaged control cables will not operate smoothly and may stick or bind.

ABBREVIATION

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

Abbrev. term	Full term
ABS	Anti-lock Brake System
CKP sensor	Crankshaft Position sensor
CMP sensor	Camshaft Position sensor
DLC	Data Link Connector
DTC	Diagnostic Trouble Code
ECM	Engine Control Module
ECT sensor	Engine Coolant Temperature sensor
EEPROM	Electrically Erasable Programmable Read Only Memory
EOP switch	Engine Oil Pressure switch
EVAP	Evaporative Emission
IAC thermal valve	Idle Air Control thermal valve
IAT sensor	Intake Air Temperature sensor
MAP sensor	Manifold Absolute Pressure sensor
MCS	Motorcycle Communication System
MP sensor	Magnetic Pole sensor
MIL	Malfunction Indicator Lamp
PAIR	Pulsed Secondary Air Injection
PGM-FI	Programmed Fuel Injection
SCS service connector	Service Check Short service connector
TCS	Traction Control System
TP sensor	Throttle Position sensor
VLC solenoid valve	Valve Lift Control solenoid valve

DESTINATION CODE

Throughout this manual, the following codes are used to identify individual types for each region.

DESTINATION CODE	REGION
AC	50-State (meets California emission standards)
II AC	50-State (meets California emission standards): Type II
III CM	Canada: Type III

MODEL IDENTIFICATION

(II AC type shown)

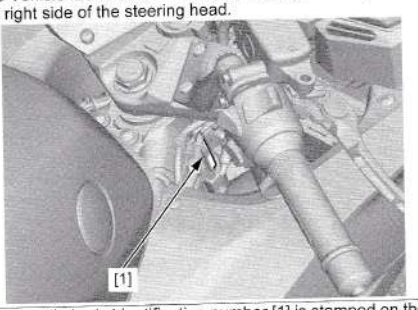
This manual covers 3 types of VFR800F models:

- AC: Conventional brake, EVAP canister
- II AC: ABS, TCS, Grip heater, Self-cancelling turn signal, EVAP canister
- III CM: ABS, TCS, Grip heater, Self-cancelling turn signal

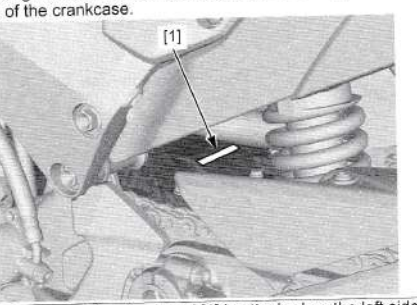
Be sure to refer to the procedure for the appropriate version.

SERIAL NUMBERS/LABELS

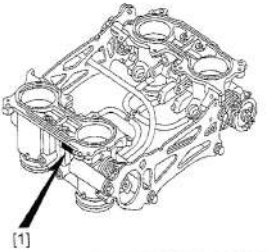
The Vehicle Identification Number (V.I.N.) [1] is stamped on the right side of the steering head.



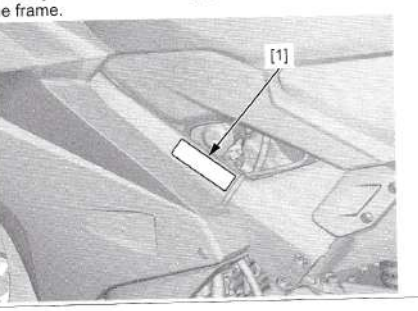
The engine serial number [1] is stamped on the upper rear side of the crankcase.



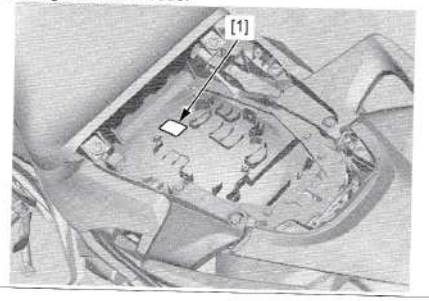
The throttle body identification number [1] is stamped on the front and rear sides of the throttle body as shown.



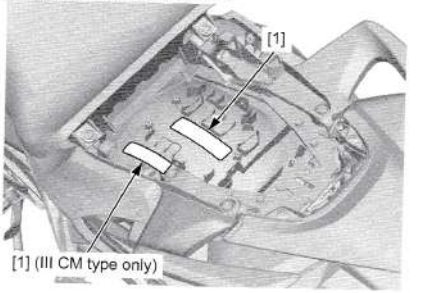
The Safety Certification Label [1] is attached on the left side of the frame.



The color label [1] is attached on the rear fender B under the rear seat. When ordering color-coded parts, always specify the designated color code.



The Emission Control Information Label [1] is attached on the rear fender B under the rear seat.



SPECIFICATIONS

GENERAL SPECIFICATIONS

ITEM			SPECIFICATIONS
DIMENSIONS	Overall length		2,140 mm (84.3 in)
	Overall width		750 mm (29.5 in)
	Overall height		1,210 mm (47.6 in)
	Wheelbase		1,460 mm (57.5 in)
	Seat height		810 mm (31.9 in)
	Footpeg height		356 mm (14.0 in)
	Ground clearance		135 mm (5.3 in)
	Curb weight	AC type	239 kg (527 lbs)
		II AC type	243 kg (536 lbs)
		III CM type	242 kg (534 lbs)
	Maximum weight capacity		176 kg (388 lbs)
FRAME	Frame type		Diamond
	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		180/55ZR17M/C (73W)
	Front tire brand		D222F K (DUNLOP), T30F G (BRIDGESTONE)
	Rear tire brand		D222 K (DUNLOP), T30R G (BRIDGESTONE)
	Front brake		Hydraulic double disc
	Rear brake		Hydraulic single disc
	Caster angle		25° 30'
	Trail length		95 mm (3.7 in)
	Fuel tank capacity		21.2 liters (5.60 US gal, 4.66 Imp gal)

ITEM				SPECIFICATIONS
ENGINE	Cylinder arrangement			4 cylinders 90° V transverse
	Bore and stroke			72.0 x 48.0 mm (2.83 x 1.89 in)
	Displacement			782 cm³ (47.7 cu-in)
	Compression ratio			11.8 : 1
	Valve train			Chain driven, DOHC with VTEC
	Intake valve	opens	at 1 mm (0.04 in) lift	15° BTDC
		closes	at 1 mm (0.04 in) lift	30° ABDC
	Exhaust valve	opens	at 1 mm (0.04 in) lift	35° BBDC
		closes	at 1 mm (0.04 in) lift	10° ATDC
	Lubrication system			Forced pressure and wet sump
	Oil pump type			Trochoid
	Cooling system			Liquid cooled
	Air filtration			Viscous paper element
	Engine dry weight			72.4 kg (159.6 lbs)
	Firing order			#1 - 180° - #3 - 270° - #2 - 180° - #4 - 90° - #1
	Cylinder number			⇦Front 4 3 2 1
FUEL DELIVERY SYSTEM	Type			PGM-FI
	Throttle bore			36 mm (1.4 in)
DRIVE TRAIN	Clutch system			Multi-plate, wet
	Clutch operation system			Hydraulically operating
	Transmission			Constant mesh, 6-speeds
	Primary reduction			1.939 (64/33)
	Final reduction			2.687 (43/16)
	Gear ratio		1st	2.846 (37/13)
			2nd	2.062 (33/16)
			3rd	1.578 (30/19)
			4th	1.291 (31/24)
			5th	1.111 (30/27)
			6th	0.965 (28/29)
	Gearshift pattern			Left foot operated return system, 1 - N - 2 - 3 - 4 - 5 - 6
ELECTRICAL	Ignition system			Full transistorized ignition
	Starting system			Electric starter motor
	Charging system			Triple phase output alternator
	Regulator/rectifier			Triple phase full-wave current phase control system
	Lighting system			Battery

PGM-FI SYSTEM SPECIFICATIONS

ITEM	SPECIFICATIONS
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)	10.5 – 14.5 Ω
CMP sensor peak voltage (at 20°C/68°F)	0.7 V minimum
CKP sensor peak voltage (at 20°C/68°F)	0.7 V minimum
O_2 sensor heater resistance (at 20°C/68°F)	10 – 20 Ω

IGNITION SYSTEM SPECIFICATIONS

ITEM	SPECIFICATIONS
Spark plug (Iridium)	IMR9D-9H (NGK)
	VNH27ZB (DENSO)
Spark plug gap	0.80 – 0.90 mm (0.031 – 0.035 in)
Ignition coil signal peak voltage	6 V minimum
Ignition timing ("F" mark)	8.3° BTDC at idle

ELECTRIC STARTER SPECIFICATION

Unit: mm (in)

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

FUEL SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS
Throttle body identification number	AC, II AC types	GQ3ZA
	III CM types	GQ3ZB
Idle speed		1,200 ± 100 rpm
Throttle grip freeplay		2 – 6 mm (0.1 – 0.2 in)
Fuel pressure at idle		343 kPa (3.5 kgf/cm^2, 50 psi)
Fuel pump flow (at 12 V)		206 cm^3 (7.0 US oz, 7.3 Imp oz) minimum/10 seconds
PAIR control solenoid valve resistance (20°C/68°F)		20 – 24 Ω
Intake duct control solenoid valve resistance (at 20°C/68°F)		28 – 32 Ω
EVAP purge control solenoid valve resistance (at 20°C/68°F)		30 – 34 Ω

COOLING SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS
Coolant capacity	Radiator and engine	2.52 liters (2.66 US qt, 2.22 Imp qt)
	Reserve tank (upper level)	0.16 liter (0.17 US qt, 0.14 Imp qt)
Radiator cap relief pressure		108 – 137 kPa (1.1 – 1.4 kgf/cm^2, 16 – 20 psi)
Thermostat	Begin to open	80.5 – 83.5°C (177 – 182°F)
	Fully open	95°C (203°F)
	Valve lift	8 mm (0.3 in) minimum
Recommended antifreeze		Pro Honda HP Coolant or an equivalent high quality ethylene glycol antifreeze containing silicate-free corrosion inhibitors
Standard coolant concentration		1:1 mixture with distilled water

LUBRICATION SYSTEM SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Engine oil capacity	At draining		2.9 liters (3.1 US qt, 2.6 Imp qt)	–
	At draining/filter change		3.1 liters (3.3 US qt, 2.7 Imp qt)	–
	At disassembly		3.9 liters (4.1 US qt, 3.4 Imp qt)	–
Recommended engine oil			Pro Honda GN4 4-stroke oil (U.S.A. & Canada) or equivalent motorcycle oil API service classification: SG or higher (except oils labeled as energy conserving on the circular API service label) JASO T903 standard: MA Viscosity: SAE 10W-30	–
Oil pressure at oil filter cartridge			490 kPa (5.0 kgf/cm², 71 psi) at 6,000 rpm/80°C (176°F)	–
Oil pump rotor	Feed pump	Tip clearance	0.15 (0.006)	0.20 (0.008)
		Body clearance	0.15 – 0.21 (0.006 – 0.008)	0.35 (0.014)
		Side clearance	0.02 – 0.09 (0.001 – 0.004)	0.10 (0.004)
	Cooler pump	Tip clearance	0.15 (0.006)	0.20 (0.008)
		Body clearance	0.15 – 0.22 (0.006 – 0.009)	0.35 (0.014)
		Side clearance	0.020 – 0.075 (0.0008 – 0.0295)	0.10 (0.004)

CYLINDER HEAD/VALVES SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression			1,575 kPa (16.1 kgf/cm², 228 psi) at 300 rpm	–
Valve clearance	Normal valve side	IN	0.20 ± 0.03 (0.008 ± 0.001)	–
		EX	0.35 ± 0.03 (0.014 ± 0.001)	–
	VTEC valve side	IN	0.20 ± 0.08 (0.008 ± 0.003)	–
		EX	0.35 ± 0.08 (0.014 ± 0.003)	–
Camshaft	Cam lobe height	IN	36.36 – 36.44 (1.431 – 1.435)	36.33 (1.430)
		EX	36.21 – 36.29 (1.426 – 1.429)	36.18 (1.424)
	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 (1.024 – 1.0246)	26.04 (1.025)
Valve, valve guide	Valve stem O.D.	IN	4.475 – 4.490 (0.1762 – 0.1768)	4.465 (0.1758)
		EX	4.465 – 4.480 (0.1758 – 0.1764)	4.455 (0.1754)
	Valve guide I.D.	IN/EX	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)	0.075 (0.0030)
		EX	0.020 – 0.047 (0.0008 – 0.0019)	0.085 (0.0033)
	Valve guide projection above cylinder head	Normal side	12.15 – 12.50 (0.478 – 0.492)	–
		VTEC side	19.65 – 20.00 (0.774 – 0.787)	–
	Valve seat width	IN/EX	0.90 – 1.10 (0.035 – 0.043)	1.5 (0.06)
Valve spring free length	Spring A outer		42.3 (1.67)	41.5 (1.63)
	Spring B outer		54.3 (2.14)	53.2 (2.09)
	Spring A inner		39.8 (1.57)	39.0 (1.54)
	Spring B inner		39.1 (1.54)	38.3 (1.51)
Cylinder head warpage			–	0.10 (0.004)

CLUTCH/STARTER CLUTCH SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Recommended clutch fluid		DOT 4 brake fluid	–
Clutch master cylinder	Cylinder I.D.	12.700 – 12.743 (0.5000 – 0.5017)	12.76 (0.502)
	Piston O.D.	12.657 – 12.684 (0.4983 – 0.4994)	12.65 (0.498)
Clutch	Spring free length	45.8 (1.80)	44.9 (1.77)
	Disc thickness	2.92 – 3.08 (0.115 – 0.121)	2.5 (0.10)
	Plate warpage	–	0.30 (0.012)
Clutch outer guide I.D.		24.995 – 25.012 (0.9841 – 0.9847)	25.08 (0.987)
Mainshaft O.D. at clutch outer guide		24.980 – 24.993 (0.9835 – 0.9840)	24.96 (0.983)
Starter driven gear boss O.D.		45.657 – 45.673 (1.7975 – 1.7981)	45.64 (1.797)

GEARSHIFT LINKAGE/CRANKCASE/TRANSMISSION/ALTERNATOR SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Transmission	Gear I.D.	M5, M6	28.000 – 28.021 (1.1024 – 1.1032)	28.04 (1.104)
		C1	26.007 – 26.028 (1.0239 – 1.0247)	26.04 (1.025)
		C2, C3, C4	31.000 – 31.025 (1.2205 – 1.2215)	31.04 (1.222)
	Gear bushing O.D.	M5, M6	27.959 – 27.980 (1.1007 – 1.1016)	27.94 (1.100)
		C2	30.970 – 30.995 (1.2193 – 1.2203)	30.95 (1.219)
		C3, C4	30.950 – 30.975 (1.2185 – 1.2195)	30.93 (1.218)
	Gear-to-bushing clearance	M5, M6	0.020 – 0.062 (0.0008 – 0.0024)	–
		C2	0.005 – 0.055 (0.0002 – 0.0022)	–
		C3, C4	0.025 – 0.075 (0.0010 – 0.0030)	–
	Gear bushing I.D.	M5	24.985 – 25.006 (0.9837 – 0.9845)	25.03 (0.985)
		C2	28.000– 28.021 (1.1024 – 1.1032)	28.04 (1.104)
	Mainshaft O.D.	at M5 bushing	24.959 – 24.980 (0.9826 – 0.9835)	24.95 (0.982)
	Countershaft O.D.	at C2 bushing	27.967 – 27.980 (1.1011 – 1.1016)	27.96 (1.101)
	Bushing-to-shaft clearance	M5	0.005 – 0.047 (0.0002 – 0.0019)	–
		C2	0.020 – 0.054 (0.0008 – 0.0021)	–
Shift fork, fork shaft	Fork I.D.		14.000 – 14.021 (0.5512 – 0.5520)	14.03 (0.552)
	Claw thickness		6.43 – 6.50 (0.253 – 0.256)	6.40 (0.252)
	Shift fork shaft O.D.		13.973 – 13.984 (0.5501 – 0.5506)	13.965 (0.5498)

CRANKSHAFT/PISTON/CYLINDER SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Crankshaft	Connecting rod side clearance		0.10 – 0.30 (0.004 – 0.012)	0.40 (0.016)
	Runout		–	0.05 (0.002)
	Main journal bearing oil clearance		0.019 – 0.037 (0.0007 – 0.0015)	0.05 (0.002)
Cylinder	I.D.		72.000 – 72.015 (2.8346 – 2.8352)	72.10 (2.839)
	Out-of-round		–	0.10 (0.004)
	Taper		–	0.10 (0.004)
	Warpage		–	0.10 (0.004)
Piston, piston rings	Piston O.D. at 18 mm (0.7 in) from bottom		71.965 – 71.985 (2.8333 – 2.8340)	71.90 (2.831)
	Piston pin bore I.D.		17.002 – 17.008 (0.6694 – 0.6696)	17.02 (0.670)
	Piston pin O.D.		16.994 – 17.000 (0.6691 – 0.6693)	16.98 (0.669)
	Piston -to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.04 (0.002)
	Piston ring end gap	Top	0.20 – 0.30 (0.008 – 0.012)	0.5 (0.02)
		Second	0.30 – 0.45 (0.012 – 0.018)	0.6 (0.02)
		Oil (side rail)	0.20 – 0.70 (0.008 – 0.028)	0.9 (0.04)
	Piston ring-to-ring groove clearance	Top	0.030 – 0.065 (0.0012 – 0.0026)	0.11 (0.004)
		Second	0.015 – 0.050 (0.0006 – 0.0020)	0.10 (0.004)
Cylinder-to-piston clearance			0.015 – 0.050 (0.0006 – 0.0020)	0.10 (0.004)
Connecting rod small end I.D.			17.016 – 17.034 (0.6699 – 0.6706)	17.04 (0.671)
Connecting rod-to-piston pin clearance			0.016 – 0.040 (0.0006 – 0.0016)	0.06 (0.002)
Crankpin bearing oil clearance			0.030 – 0.052 (0.0012 – 0.0020)	0.08 (0.003)

FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Minimum tire tread depth			–	1.5 (0.06)
Cold tire pressure	Up to 90 kg (200 lbs) load		250 kPa (2.50 kgf/cm², 36 psi)	–
	Up to maximum weight capacity		250 kPa (2.50 kgf/cm², 36 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.
Fork	Spring free length	AC type	386.4 (15.21)	379 (14.9)
		II AC, III CM types	352.9 (13.89)	346 (13.6)
	Tube runout		–	0.20 (0.008)
	Recommended fork fluid		Pro Honda HP Fork Oil SS-47 (10W)	–
	Fluid level	AC type	97 (3.8)	–
		II AC, III CM types	108 (4.3)	–
	Fluid capacity	AC type	527 ± 2.5 cm³ (17.8 ± 0.08 US oz, 18.6 ± 0.09 Imp oz)	–
		II AC, III CM types	506 ± 2.5 cm³ (17.1 ± 0.08 US oz, 17.8 ± 0.09 Imp oz)	–
	Pre-load adjuster standard position (II AC, III CM types)		4th groove/14 mm (0.2 in) from top	–
	Rebound damping adjuster initial setting (II AC, III CM types)		1 turn out from full hard	–
Steering head bearing pre-load			9.8 – 14.7 N (1.0 – 1.5 kgf, 2.2 – 3.3 lbf)	–

REAR WHEEL/SUSPENSION SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Minimum tire tread depth			–	2.0 (0.08)
Cold tire pressure	Up to 90 kg (200 lbs) load		290 kPa (2.90 kgf/cm², 42 psi)	–
	Up to maximum weight capacity		290 kPa (2.90 kgf/cm², 42 psi)	–
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	DID525HV3/110	–
		RK	RK525ROZ6/110	–
	Slack		25 – 35 (1.0 – 1.4)	–
Shock absorber	Pre-load adjuster standard position	AC type	2nd position from minimum	–
		II AC, III CM types	7 clicks from minimum	–
	Rebound damping adjuster initial setting		3/4 turns out from full hard	–

HYDRAULIC BRAKE SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Front	Specified brake fluid	DOT 4 brake fluid	–
	Brake disc thickness	4.3 – 4.6 (0.17 – 0.18)	3.5 (0.14)
	Brake disc warpage	–	0.30 (0.012)
	Master cylinder I.D.	14.000 – 14.043 (0.5512 – 0.5529)	14.055 (0.5533)
	Master piston O.D.	13.957 – 13.984 (0.5495 – 0.5506)	13.945 (0.5490)
	Caliper cylinder I.D.	30.280 – 30.330 (1.1921 – 1.1941)	30.330 (1.1941)
	Caliper piston O.D.	30.167 – 30.200 (1.1877 – 1.1890)	30.167 (1.1877)
Rear	Specified brake fluid	DOT 4	–
	Brake disc thickness	5.8 – 6.2 (0.23 – 0.24)	5.0 (0.20)
	Brake disc warpage	–	0.30 (0.012)
	Master cylinder I.D.	14.000 – 14.043 (0.5512 – 0.5529)	14.055 (0.5533)
	Master piston O.D.	13.957 – 13.984 (0.5495 – 0.5506)	13.945 (0.5490)
	Caliper cylinder I.D.	25.400 – 25.450 (1.0000 – 1.0020)	25.460 (1.0024)
	Caliper piston O.D.	25.318 – 25.368 (0.9968 – 0.9987)	25.31 (0.996)

BATTERY/CHARGING SYSTEM SPECIFICATIONS

ITEM			SPECIFICATIONS
Battery	Type		YTZ12S
	Capacity		12 V – 11 Ah (10 HR)
	Current leakage		1.0 mA max.
	Voltage (20°C/68°F)	Fully charged	13.0 – 13.2 V
		Needs charging	Below 12.4 V
	Charging current	Normal	1.1 A/5 – 10 h
		Quick	5.5 A/1 h
Alternator	Capacity		420 W/5,000 rpm
	Charging coil resistance (20°C/68°F)		0.1 – 0.5 Ω

LIGHTS/METERS/SWITCHES SPECIFICATIONS

ITEM			SPECIFICATIONS
Bulbs	Headlight	Hi	LED
		Lo	LED
	Position light		LED
	Brake/taillight		LED
	Turn signal light		12 V - 21 W x 4
	License light		12 V - 5 W
	Instrument light		LED
	Turn signal indicator		LED
	High beam indicator		LED
	Neutral indicator		LED
	Low oil pressure indicator		LED
	High coolant temperature indicator		LED
	Low fuel indicator		LED
	TCS indicator (II AC, III CM types)		LED
	TCS OFF indicator (II AC, III CM types)		LED
	MIL		LED
	ABS indicator (II AC, III CM types)		LED
Fuse	Main fuse		30 A
	FI fuse		20 A
	Sub-fuse		20 A x 2, 10 A x 8
	ABS power fuse (II AC, III CM types)		30 A
	ABS main fuse (II AC, III CM types)		10 A
Tachometer peak voltage			10.5 V minimum
ECT sensor resistance		50°C (122°F)	6.8 – 7.4 kΩ
		80°C (176°F)	2.1 – 2.6 kΩ
Fuel level sensor resistance (20°C/68°F)		Full	6 – 10 Ω
		Empty	260 – 280 Ω
Grip heater resistance (20°C/68°F) (II AC, III CM types)			7.3 – 9.1 Ω

TORQUE VALUES

STANDARD TORQUE VALUES

FASTENER TYPE	N·m (kgf·m, lbf·ft)
5 mm bolt and nut	5.2 (0.5, 3.8)
6 mm bolt and nut	10 (1.0, 7)
8 mm bolt and nut	22 (2.2, 16)
10 mm bolt and nut	34 (3.5, 25)
12 mm bolt and nut	54 (5.5, 40)

FASTENER TYPE	N·m (kgf·m, lbf·ft)
5 mm screw	4.2 (0.4, 3.1)
6 mm screw	9.0 (0.9, 6.6)
6 mm flange bolt (8 mm head, small flange)	10 (1.0, 7)
6 mm flange bolt (8 mm head, large flange)	12 (1.2, 9)
6 mm flange bolt (10 mm head) and nut	12 (1.2, 9)
8 mm flange bolt and nut	27 (2.8, 20)
10 mm flange bolt and nut	39 (4.0, 29)

ENGINE & FRAME TORQUE VALUES

FRAME/BODY PANELS/EXHAUST SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Front brake hose clamp cap nut	1	6	10 (1.0, 0.7)	
Front brake hose 3-way joint bolt	1	6	10 (1.0, 0.7)	
Tail reflex reflector nut	1	5	1.7 (0.2, 1.3)	
Windscreen screw	2	5	1.0 (0.1, 0.7)	
Exhaust pipe joint nut	8	6	12 (1.2, 9)	
Exhaust pipe band bolt	2	8	21 (2.1, 15)	
Muffler band bolt	2	8	21 (2.1, 15)	
Exhaust pipe stud bolt	8	6	–	See page 2-17
Passenger footpeg bracket bolt	4	8	32 (3.3, 24)	
Sidestand pivot bolt	1	10	10 (1.0, 7)	
Sidestand pivot nut	1	10	29 (3.0, 21)	
Centerstand left pivot bolt (II AC, III CM types)	1	10	54 (5.5, 40)	ALOC bolt; replace with a new one.
Centerstand right pivot bolt (II AC, III CM types)	1	10	54 (5.5, 40)	Left-hand threads. ALOC bolt; replace with a new one.

MAINTENANCE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Spark plug	4	10	16 (1.6, 12)	
Timing hole cap	1	45	18 (1.8, 13)	Apply grease to the threads.
Engine oil filter boss	1	20	–	See page 3-12 Apply locking agent to the threads.
Engine oil filter cartridge	1	20	26 (2.7, 19)	Apply engine oil to the threads.
Engine oil drain bolt	1	12	30 (3.1, 22)	
Throttle drum cover socket bolt	1	5	3.4 (0.3, 2.5)	
Axle bearing holder pinch bolt	1	16	88 (9.0, 65)	
Drive sprocket bolt	1	10	51 (5.2, 38)	
Driven sprocket nut	6	10	64 (6.5, 47)	
Front master cylinder reservoir cap screw	2	4	1.5 (0.2, 1.1)	
Rear master cylinder reservoir cap screw	2	4	1.5 (0.2, 1.1)	
Rear master cylinder push rod joint nut	1	8	18 (1.8, 13)	
Clutch master cylinder reservoir cap screw	2	4	1.5 (0.2, 1.1)	

PGM-FI SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
ECT sensor	1	12	23 (2.3, 17)	
CKP sensor bolt	2	6	12 (1.2, 9)	
O_2 sensor	1	12	24.5 (2.5, 18)	
Bank angle sensor nut	2	6	10 (1.0, 7)	

IGNITION SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Timing hole cap	1	45	18 (1.8, 13)	Apply grease to the threads.

FUEL SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Throttle cable holder socket bolt	2	5	3.4 (0.3, 2.5)	
Starter valve lock nut	4	10	1.8 (0.2, 1.3)	
Starter valve synchronization plate screw	5	3	0.9 (0.1, 0.7)	
IAC thermal valve joint plate screw	1	3	0.9 (0.1, 0.7)	
IAC thermal valve mounting screw	2	6	4.9 (0.5, 3.6)	
Fuel rail mounting bolt	4	6	9.8 (1.0, 7.2)	
Throttle drum cover socket bolt	1	5	3.4 (0.3, 2.5)	
Fuel fill cap bolt	3	4	1.8 (0.2, 1.3)	
Fuel feed hose sealing nut	1	12	22 (2.2, 16)	
Fuel pump mounting nut	6	6	12 (1.2, 9)	See page 7-9
Fuel tank rear mounting bolt	2	8	32 (3.3, 24)	
PAIR check valve cover bolt	4	6	12 (1.2, 9)	

COOLING SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Water pump cover bolt	2	6	13 (1.3, 10)	CT bolt
Water pump drain bolt	1	6	13 (1.3, 10)	CT bolt

LUBRICATION SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Oil pump assembly bolt	2	6	13 (1.3, 10)	CT bolt

CYLINDER HEAD/VALVES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cylinder head bolt	12	9	44 (4.5, 32)	Apply engine oil to the threads and seating surface.
Cylinder head orifice bolt	4	6	8.0 (0.8, 5.9)	
Camshaft holder bolt	24	6	12 (1.2, 9)	Apply engine oil to the threads and seating surface.
Cylinder head cover bolt	8	6	10 (1.0, 7)	
Cam sprocket bolt	8	7	20 (2.0, 15)	Apply locking agent to the threads.
Cam chain tensioner bolt	2	8	26 (2.7, 19)	Apply locking agent to the threads.
Cam chain guide A bolt	2	6	12 (1.2, 9)	Apply locking agent to the threads.
Cam chain guide B bolt	4	6	12 (1.2, 9)	Apply locking agent to the threads.
Timing hole cap	1	45	18 (1.8, 13)	Apply grease to the threads.

CLUTCH/STARTER CLUTCH

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Clutch spring bolt	5	6	12 (1.2, 9)	
Clutch center lock nut	1	22	128 (13.1, 94)	Lock nut; replace with a new one. Apply engine oil to the threads and seating surface. Stake.
Clutch slave cylinder bleed valve	1	8	9.0 (0.9, 6.6)	
Clutch hose oil bolt	2	10	34 (3.5, 25)	
Clutch master cylinder reservoir cap screw	2	4	1.5 (0.2, 1.1)	
Clutch lever pivot bolt	1	6	0.8 (0.1, 0.6)	
Clutch lever pivot nut	1	6	5.9 (0.6, 4.4)	
Clutch switch screw	1	4	1.2 (0.1, 0.9)	
Primary drive gear/starter clutch bolt	1	10	103 (10.5, 76)	Apply engine oil to the threads and seating surface.

GEARSHIFT LINKAGE/CRANKCASE/TRANSMISSION/ALTERNATOR

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Crankcase main journal bolt	8	9	20 (2.0, 15) + 90°	See page 12-13 Replace with a new one.
Crankcase 10 mm bolt	5	10	39 (4.0, 29)	
Crankcase 7 mm bolt	3	7	18 (1.8, 13)	
Mainshaft bearing set plate bolt	3	6	12 (1.2, 9)	Apply locking agent to the threads.
Shift drum center socket bolt	1	8	23 (2.3, 17)	Apply locking agent to the threads.
Shift drum stopper arm pivot bolt	1	6	12 (1.2, 9)	
Flywheel bolt	1	10	103 (10.5, 76)	Apply engine oil to the threads and seating surface.
Alternator stator bolt	4	6	12 (1.2, 9)	
Stator wire clamp socket bolt	1	6	12 (1.2, 9)	
Drive sprocket bolt	1	10	51 (5.2, 38)	

CRANKSHAFT/PISTON/CYLINDER

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Connecting rod bearing cap nut	8	8	33 (3.4, 24)	Apply engine oil to the threads and seating surface.

ENGINE REMOVAL/INSTALLATION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Front engine hanger nut	1	12	54 (5.5, 40)	
Rear engine hanger bolt	2	10	44 (4.5, 32)	
Center engine hanger bolt	2	10	44 (4.5, 32)	
Suspension lower bracket nut (upper)	1	10	42 (4.3, 31)	U-nut
Suspension lower bracket cap nut (lower)	1	10	39 (4.0, 29)	
Suspension lower bracket pinch bolt	1	8	26 (2.7, 19)	

FRONT WHEEL/SUSPENSION/STEERING

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Handlebar weight screw	2	6	10 (1.0, 7)	ALOC screw; replace with a new one.
Handlebar switch housing screw	4	5	2.5 (0.3, 1.8)	
Handlebar bolt	4	8	32 (3.3, 24)	
Front brake disc bolt	10	6	20 (2.0, 15)	ALOC bolt; replace with a new one.
Front pulser ring torx bolt (II AC, III CM types)	5	5	7.0 (0.7, 5.2)	ALOC bolt; replace with a new one.
Front axle bolt	1	14	59 (6.0, 44)	
Front axle pinch bolt	2	8	22 (2.2, 16)	
Front brake caliper mounting bolt	4	10	45 (4.6, 33)	ALOC bolt; replace with a new one.
Fork socket bolt	2	8	20 (2.0, 15)	Apply a locking agent to the threads.
Fork cap	2	39	23 (2.3, 17)	
Fork damper rod lock nut	2	10	19.6 (2.0, 14)	
Fork top bridge pinch bolt	2	8	22 (2.2, 16)	
Fork bottom bridge pinch bolt	2	10	49 (5.0, 36)	
Steering stem nut	1	24	103 (10.5, 76)	
Steering bearing adjustment nut	1	26	25 (2.5, 18)	See page 15-30 Apply grease to the threads.
Steering bearing adjustment lock nut	1	26	–	See page 15-30

REAR WHEEL/SUSPENSION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Rear wheel nut	5	12	108 (11.0, 80)	
Rear brake disc nut	5	8	34 (3.5, 25)	U-nut
Rear wheel pulser ring torx bolt (II AC, III CM types)	5	5	7.0 (0.7, 5.2)	ALOC bolt; replace with a new one.
Driven sprocket nut	6	10	64 (6.5, 47)	
Rear brake caliper mounting bolt	2	8	33 (3.4, 24)	ALOC bolt; replace with a new one.
Air guide bolt	2	5	4.2 (0.4, 3.1)	ALOC bolt; replace with a new one.
Rear axle nut	1	35	201 (20.5, 148)	Stake
Shock linkage nut	3	10	42 (4.3, 31)	U-nut
Rear shock absorber upper bracket nut	1	10	42 (4.3, 31)	U-nut
Rear shock absorber mounting nut	2	10	42 (4.3, 31)	U-nut
Rider footpeg bracket bolt	4	8	32 (3.3, 24)	
Swingarm pivot nut	1	18	93 (9.5, 69)	
Swingarm pivot pinch bolt	2	8	26 (2.7, 19)	
Drive chain slider bolt	3	6	9.0 (0.9, 6.6)	ALOC bolt; replace with a new one.
Drive chain guide bolt	2	5	4.2 (0.4, 3.1)	ALOC bolt; replace with a new one.

HYDRAULIC BRAKE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Front brake caliper bleed valve	2	8	8.0 (0.8, 5.9)	
Rear brake caliper bleed valve	1	8	5.4 (0.6, 4.0)	
Front master cylinder reservoir cap screw	2	4	1.5 (0.2, 1.1)	
Rear master cylinder reservoir cap screw	2	4	1.5 (0.2, 1.1)	
Front brake caliper pad pin	4	10	15 (1.5, 11)	
Rear brake caliper pad pin	1	10	18 (1.8, 13)	
Front brake lever pivot bolt	1	6	0.8 (0.1, 0.6)	
Front 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 push rod joint nut	1	8	18 (1.8, 13)	
Rear master cylinder hose joint screw	1	4	1.5 (0.2, 1.1)	Apply locking agent to the threads.
Rear master cylinder reservoir bolt	1	6	10 (1.0, 7)	
Front brake caliper mounting bolt	4	10	45 (4.6, 33)	ALOC bolt; replace with a new one.
Rear brake caliper pin bolt	1	12	27 (2.8, 20)	
Rear brake caliper mounting bolt	2	8	33 (3.4, 24)	ALOC bolt; replace with a new one.
Brake hose oil bolt	5	10	34 (3.5, 25)	
Rider footpeg bracket bolt	4	8	32 (3.3, 24)	

ABS (II AC, III CM types)

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

LIGHTS/METERS/SWITCHES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Rear combination light mounting bolt	2	6	9.8 (1.0, 7.2)	
License light mounting nut	2	5	3.8 (0.4, 2.8)	
Combination meter holder tapping screw	3	5	1.0 (0.1, 0.7)	
Ignition switch mounting bolt	2	8	26 (2.7, 19)	One-way bolt; replace with a new one.
EOP switch	1	PT 1/8	12 (1.2, 9)	Apply sealant to the threads.
Gear position switch	3	10	12 (1.2, 9)	
Sidestand switch bolt	1	6	10 (1.0, 7)	ALOC bolt; replace with a new one.

OTHERS

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Sidestand bracket socket bolt	1	10	39 (4.0, 29)	
Rider footpeg rubber bolt	2	5	5.1 (0.5, 3.8)	
Rider footpeg bank sensor cap bolt	2	6	12 (1.2, 9)	
Passenger footpeg bracket bolt	4	8	32 (3.3, 24)	
Upper cowl stay bolt	1	10	64 (6.5, 47)	
Upper cowl stay nut	1	8	46 (4.7, 34)	
Lateral reflex reflector nut	4	6	1.8 (0.2, 1.3)	U-nut
Brake pipe joint nut (AC type)	4	10	14 (1.4, 10)	Apply brake fluid to the threads.
Gearshift spindle return spring pin	1	8	23 (2.3, 17)	

LUBRICATION & SEAL POINTS

ENGINE

MATERIAL	LOCATION	REMARKS
Sealant (TB1207B manufactured by ThreeBond or an equivalent)	Crankcase mating surface	See page 12-12
	Oil pan mating surface	See page 9-7
	Crankcase mating areas (right side)	See page 11-9
	Crankcase mating areas (left side)	See page 12-21
	EOP switch threads	See page 20-18
Sealant (TB5211C manufactured by ThreeBond, KE45T manufactured by Shin-Etsu Silicone or an equivalent)	Cylinder head seal rubber semi-circular edges	See page 10-7
Sealant (TB1207, TB5211C manufactured by ThreeBond, KE45T manufactured by Shin-Etsu Silicone or an equivalent)	Alternator wire grommet seating surface	
	CKP sensor wire grommet seating surface	
Molybdenum oil solution (a mixture of engine oil and molybdenum disulfide grease in a ratio of 1:1)	Valve stem sliding surface	
	Valve lifter outer sliding surface	
	Camshaft lobes, journals and thrust surfaces	
	Clutch outer primary driven gear sliding areas	
	Primary drive gear and sub-gear sliding surface	
	Starter reduction and idle gear shafts sliding surfaces	
	Transmission gear bushing and needle bearing entire surface (M5, C1, C2)	
	Transmission gear spline bushing outer surface (M6, C3, C4)	
	Transmission gear shifter groove (M3/4, C5, C6)	
	Piston pin holes	
	Connecting rod small end inner surface	
	Crankshaft main journal bearing sliding surface	
	Crankpin bearing sliding surface	
	Crankshaft thrust surfaces	
Engine oil (without molybdenum additives)	Fuel injector seal and cushion rings	
	Oil strainer seal ring	
	Oil pump rotors and shaft	
	Oil filter cartridge threads	
	Throttle body insulator mating surfaces	
	VLC solenoid valve rubber seal/strainer	
	Camshaft holder bolt threads and seating surface	
	Cylinder head 9 mm bolt threads and seating surface	
	Clutch discs and plates	
	Clutch center lock nut threads and seating surface	
	Starter one-way clutch contacting surfaces	
	Primary drive gear/starter clutch bolt threads and seating surface	
	Gearshift spindle journals	
	Flywheel bolt threads and seating surface	
	Shift drum journals	
	Shift fork shaft outer surface	
	Piston outer surface	
	Piston ring entire surface	
	Connecting rod bearing cap nut threads and seating surface	
	Each bearing rotating area	
	Each gear teeth and rotating surface	
	Each O-ring	Except water passage O-rings
	Other rotating and sliding areas	
Multi-purpose grease	Timing hole cap threads	
	Each oil seal lips	

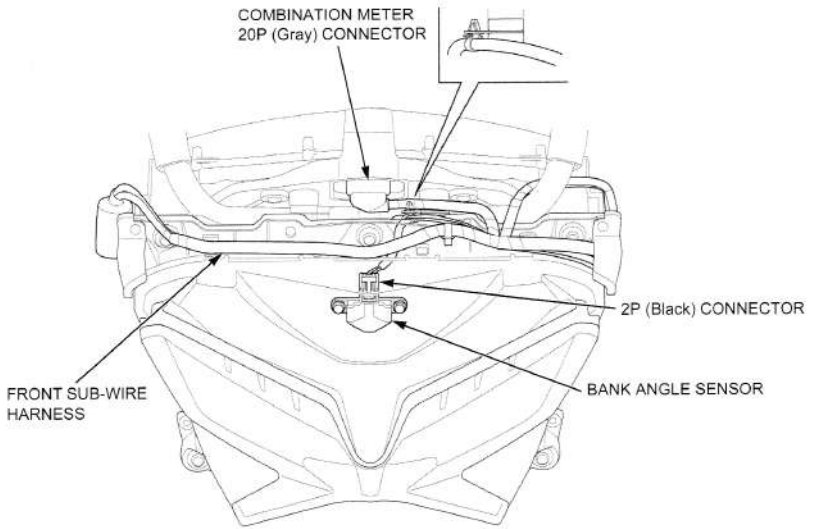
MATERIAL	LOCATION	REMARKS
Medium strength locking agent (TB1322N manufactured by ThreeBond, LOCTITE 648 manufactured by LOCTITE or equivalent)	Engine oil filter cartridge boss threads (crankcase side)	* Coating width: 6.5 mm (0.26 in) except 2 mm (0.1 in) from tip
	Oil pump driven sprocket bolt threads*	
	Cam sprocket bolt threads	
	Cam chain tensioner bolt threads*	
	Cam chain guide A bolt threads*	
	Cam chain guide B bolt threads	
	Shift drum center socket bolt threads	
	Gearshift linkage cover bolt threads (2 places; 6 x 22 mm)	
	Mainshaft bearing set plate bolt threads*	
	Shift drum bearing set plate bolt threads*	

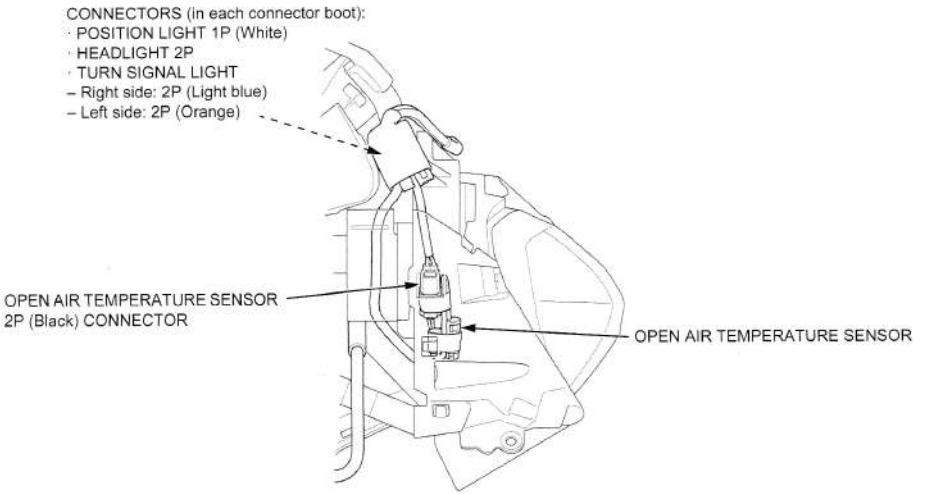
FRAME

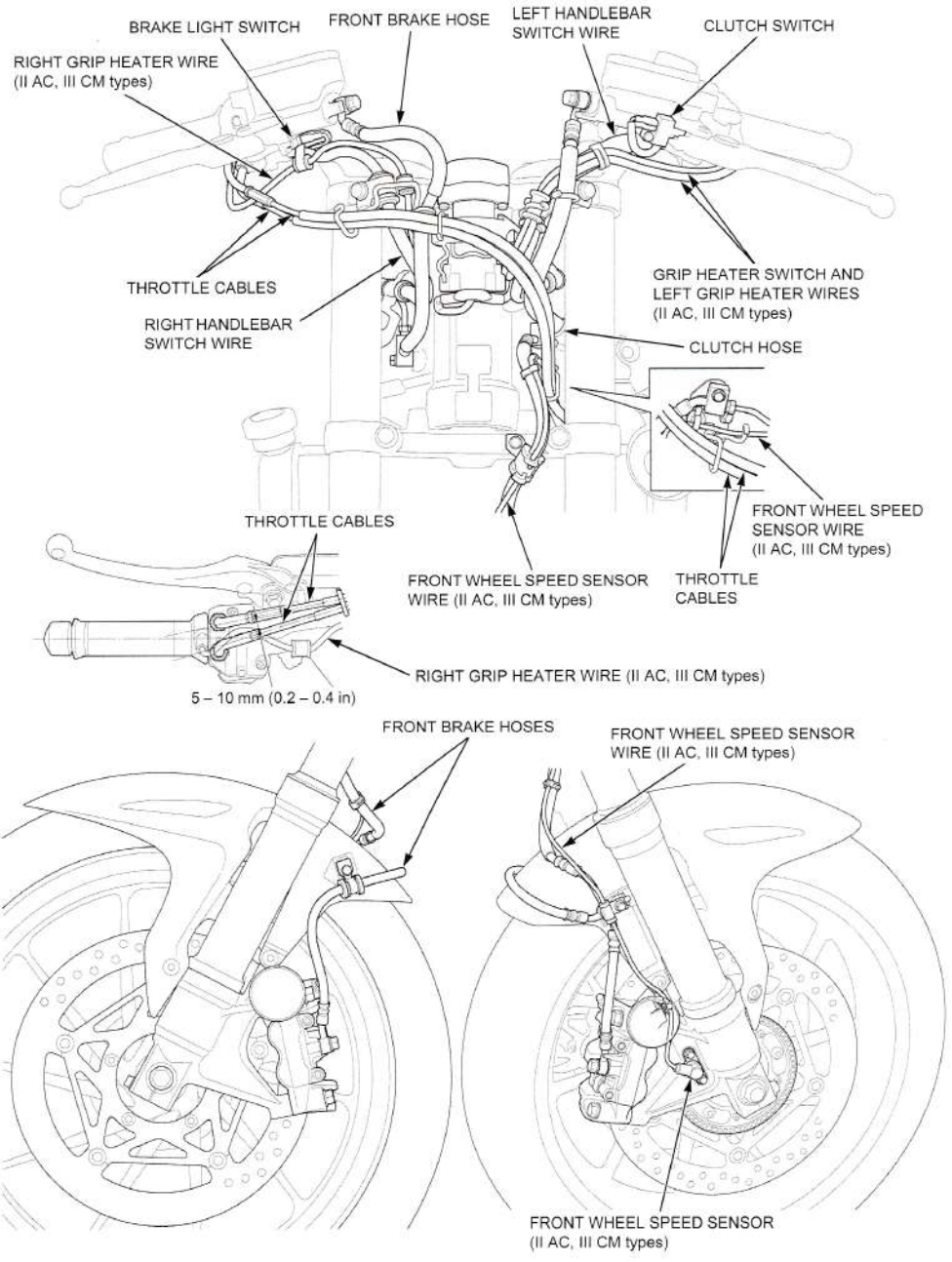
MATERIAL	LOCATION	REMARKS
Urea based multi-purpose extreme pressure grease NLGI #2 (EXCELITE EP2 manufactured by KYODO YUSHI CO., LTD., STAMINA EP2 manufactured by Shell or equivalent)	Steering bearing rotating area	3 – 5 g (0.1 – 0.2 oz) per each bearing
	Steering bearing adjustment nut threads	0.1 – 0.3 g
	Steering bearing dust seal lips	
Multi-purpose grease	Seat catch hook sliding area	
	Throttle grip cable groove and roll-up area	
	Front wheel dust seal lips	
	Rear brake pedal pivot sliding area (grease groove)	
	Footpeg pivot sliding area	
	Sidestand pivot sliding area	
	Centerstand pivot sliding areas (II AC, III CM types)	
Molybdenum disulfide grease	Swingarm pivot bearing rotating area	
	Swingarm pivot dust seal lips	
	Rear axle bearing holder dust seal lips	
	Rear axle bearing holder needle bearing rotating area and dust seal lips.	
	Driven sprocket hub dust seal lips	
	Driven flange O-ring	
	Shock linkage needle bearing rotating area	
	Shock linkage dust seal lips	
	Shock absorber needle bearing rotating area	
	Shock absorber dust seal lips	
Silicone grease	Front brake lever pivot bolt sliding area	0.1 g
	Front brake lever-to-master piston contacting area	0.1 g
	Clutch lever pivot sliding area	0.1 g
	Clutch lever push rod ends (master piston and joint piece contacting areas)	0.1 g per each ends
	Clutch slave cylinder oil seal lips	
	Clutch lifter rod-to-slave cylinder piston contacting area	
	Rear master cylinder push rod-to-master piston contacting area	0.1 g
	Rear master cylinder push rod boot fitting area (boot groove)	0.1 g
	Rear brake caliper pin bolt sliding surface	0.4 g
	Rear brake caliper bracket pin sliding surface	0.4 g
	Brake caliper dust seal	
	Rear brake caliper pad pin stopper ring	
DOT 4 brake fluid	Clutch slave piston outer surface and piston seal	
	Clutch master piston and cups	
	Brake master piston and cups	
	Brake caliper piston outer surface and piston seal	
	Brake pipe joint nut threads	
Pro Honda HP Fork Oil SS-47 (10W)	Fork cap O-ring	
	Fork oil seal lips	
	Fork dust seal lips	
Cable lubricant	Seat opener cable inside	

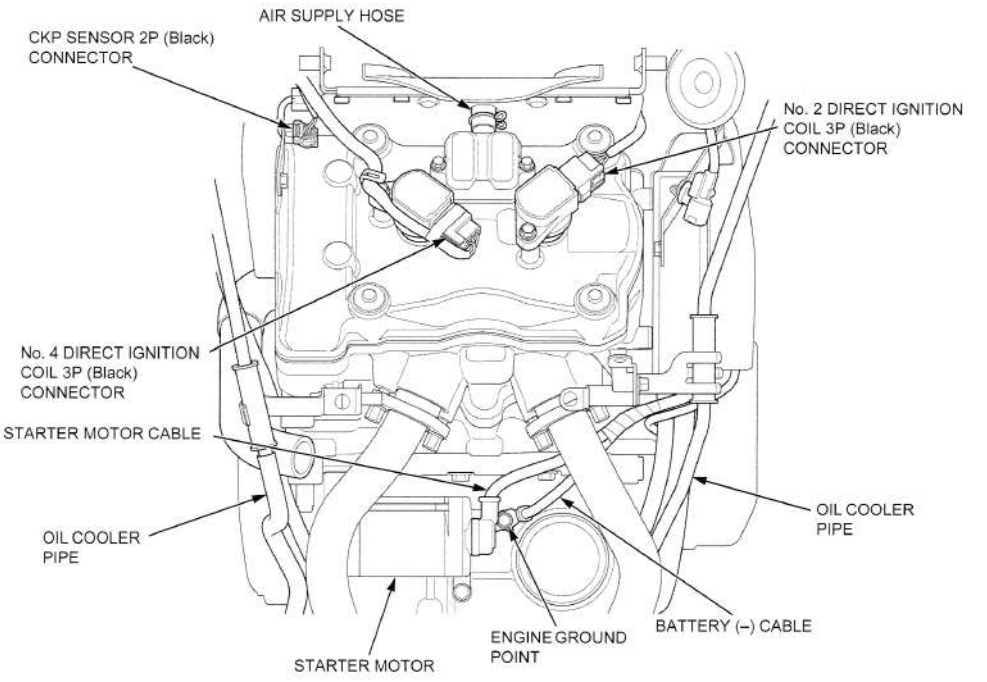
MATERIAL	LOCATION	REMARKS
Pro Honda HP Chain Lube or an equivalent	Drive chain entire surface	
Honda Bond A or Honda Hand Grip Cement (U.S.A. only)	Left handlebar grip (grip heater; II AC, III CM types) inner surface	See page 15-10
	Rear brake caliper pad retainer seating surface	
Locking agent	Fork socket bolt threads	
	Rear master cylinder hose joint screw threads	

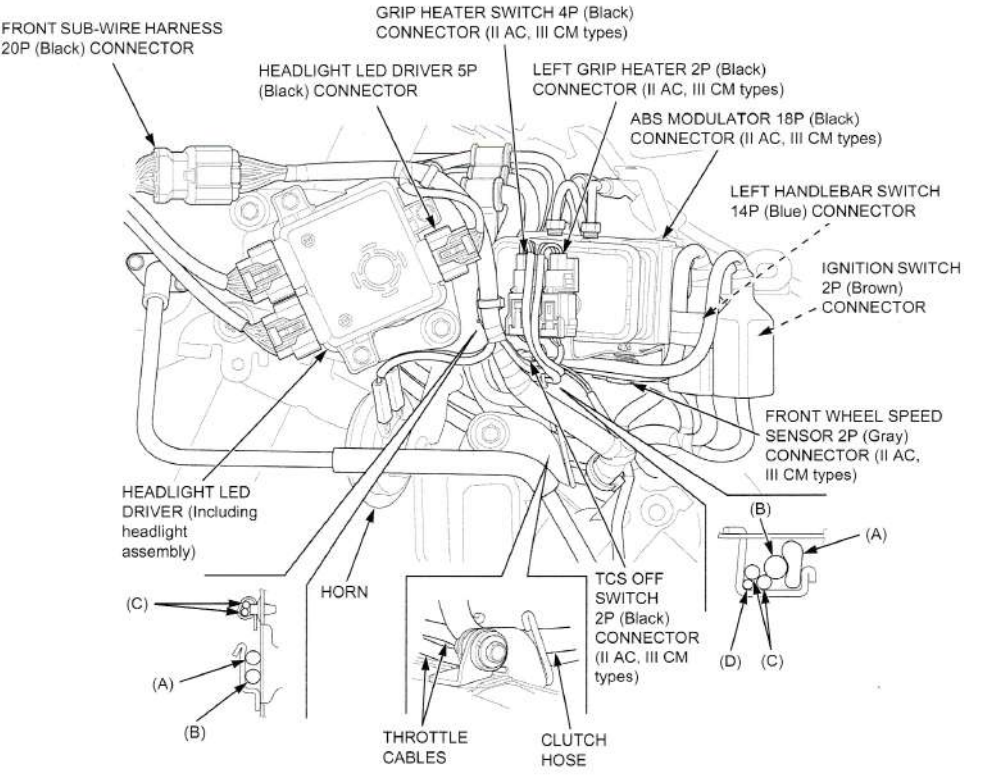
CABLE & HARNESS ROUTING



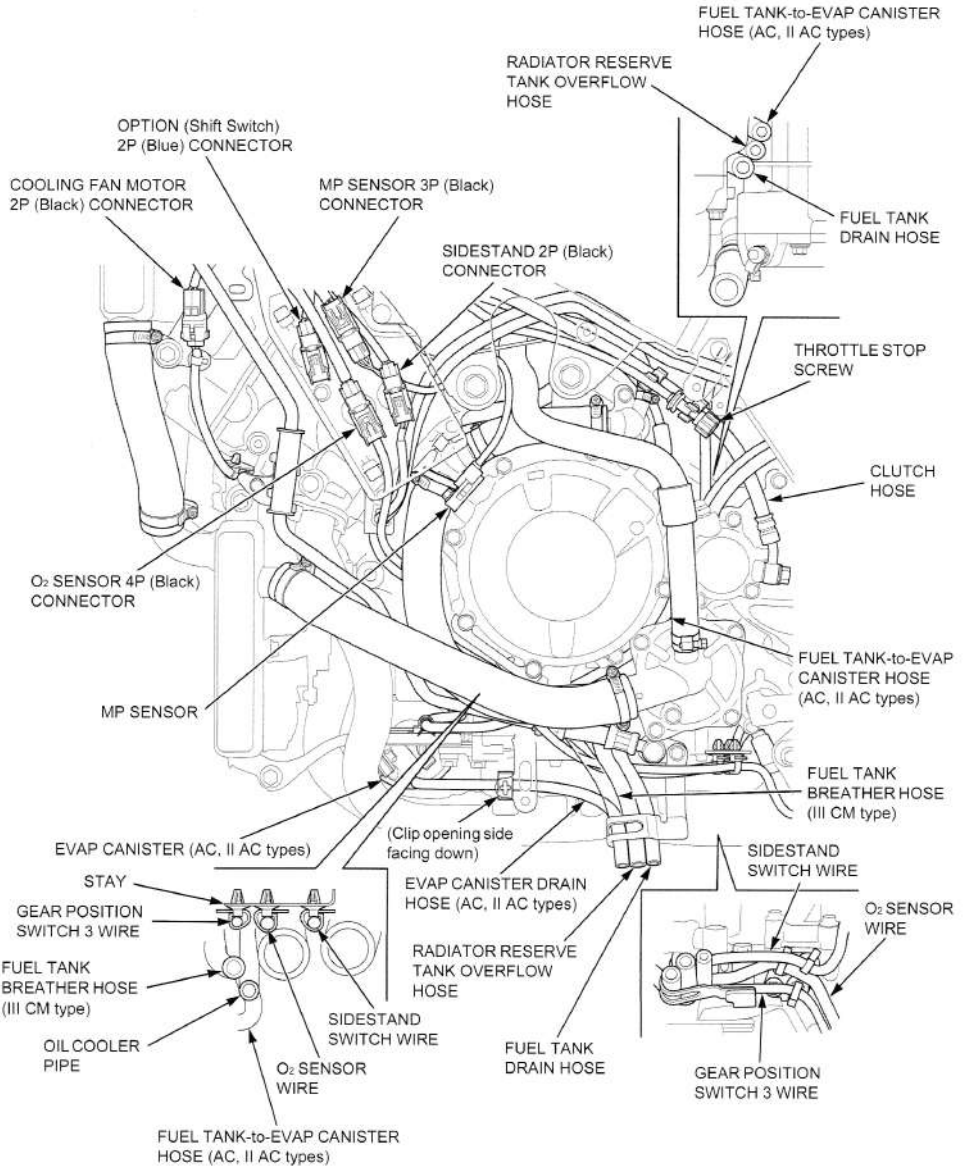


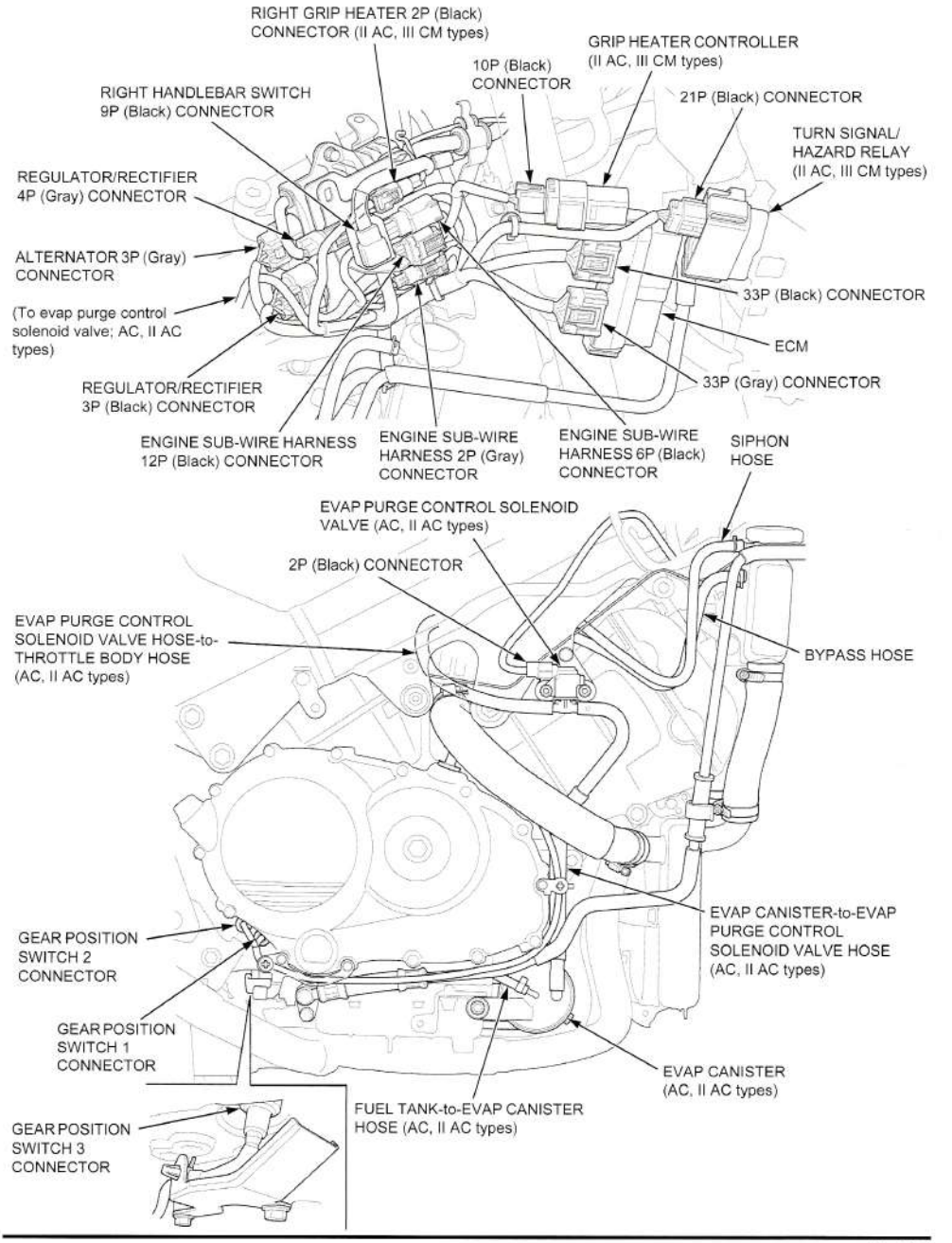

BRAKE LIGHT SWITCH
FRONT BRAKE HOSE
LEFT HANDLEBAR SWITCH WIRE
CLUTCH SWITCH
RIGHT GRIP HEATER WIRE (II AC, III CM types)
THROTTLE CABLES
RIGHT HANDLEBAR SWITCH WIRE
GRIP HEATER SWITCH AND LEFT GRIP HEATER WIRES (II AC, III CM types)
CLUTCH HOSE
FRONT WHEEL SPEED SENSOR WIRE (II AC, III CM types)
THROTTLE CABLES
FRONT WHEEL SPEED SENSOR WIRE (II AC, III CM types)
THROTTLE CABLES
RIGHT GRIP HEATER WIRE (II AC, III CM types)
5 – 10 mm (0.2 – 0.4 in)
FRONT BRAKE HOSES
FRONT WHEEL SPEED SENSOR WIRE (II AC, III CM types)
FRONT WHEEL SPEED SENSOR (II AC, III CM types)

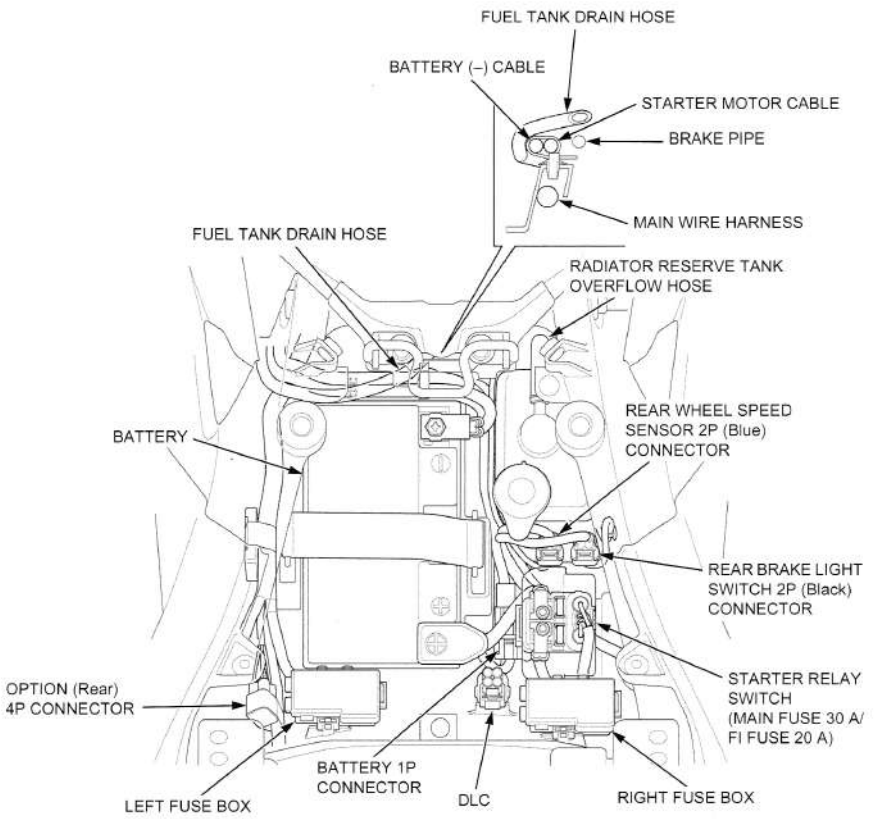

AIR SUPPLY HOSE
CKP SENSOR 2P (Black) CONNECTOR
No. 2 DIRECT IGNITION COIL 3P (Black) CONNECTOR
No. 4 DIRECT IGNITION COIL 3P (Black) CONNECTOR
STARTER MOTOR CABLE
OIL COOLER PIPE
OIL COOLER PIPE
BATTERY (–) CABLE
ENGINE GROUND POINT
STARTER MOTOR

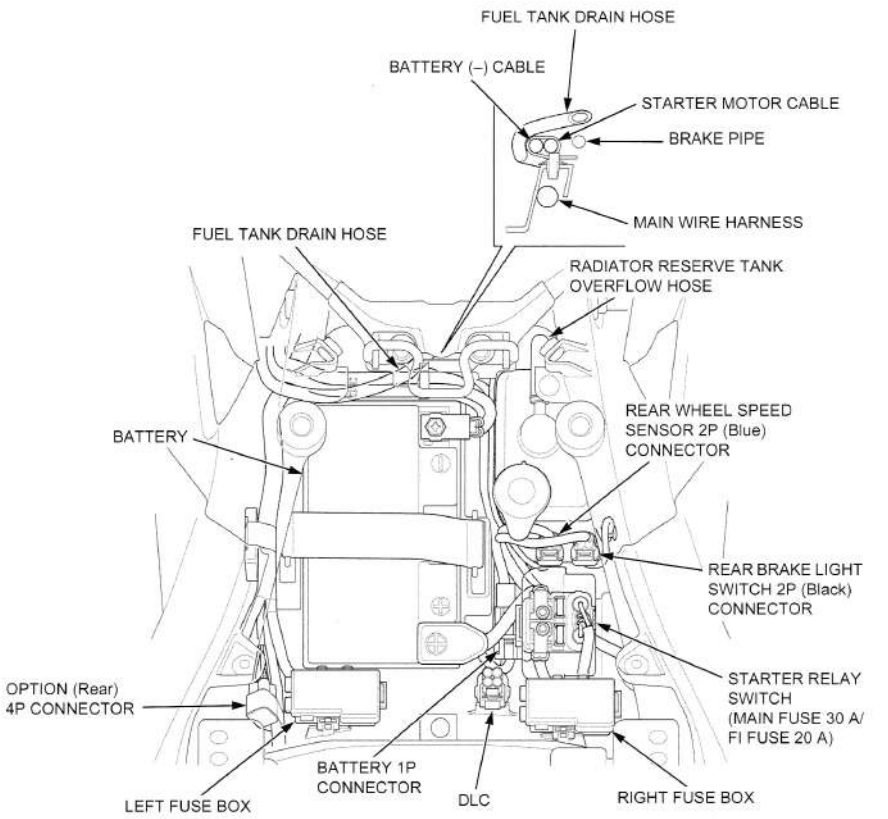


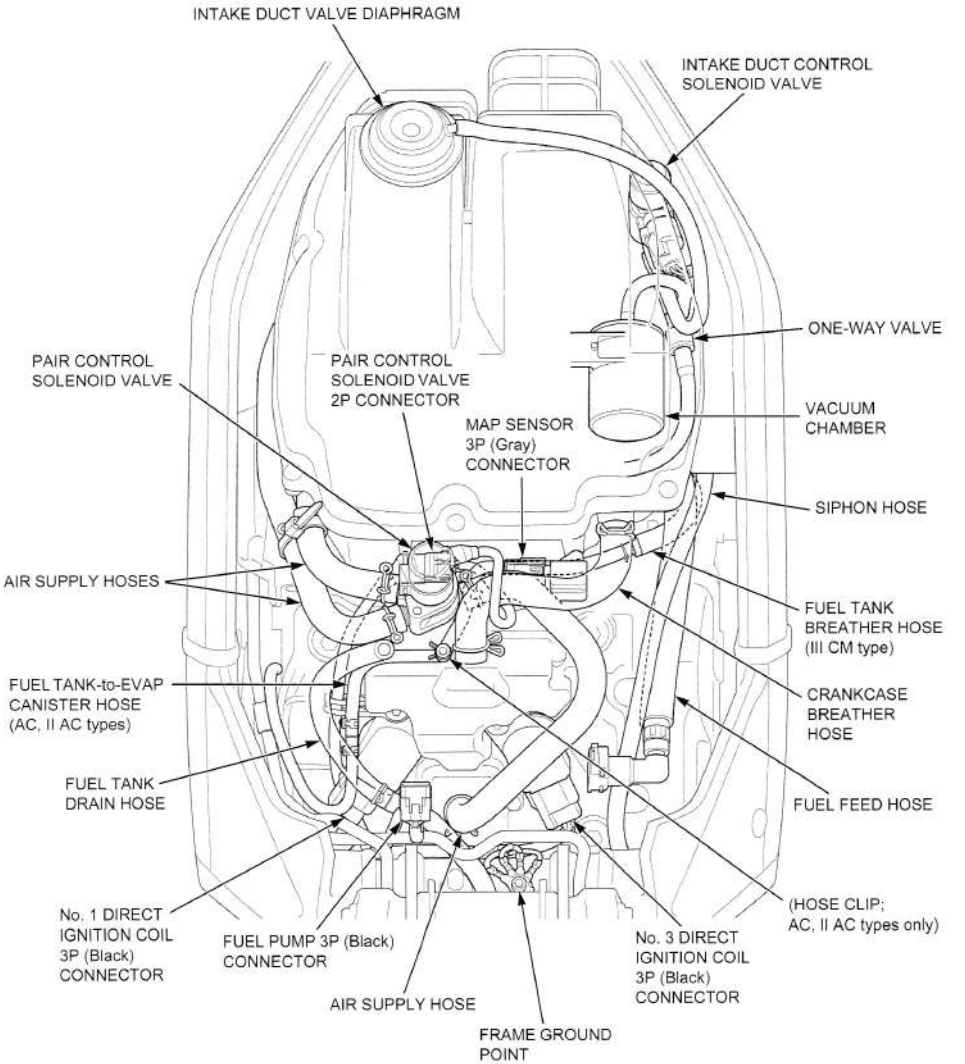
(A): LEFT HANDLEBAR SWITCH WIRE
(B): IGNITION SWITCH WIRE
(C): LEFT GRIP HEATER AND SWITCH WIRES (II AC, III CM types)
(D): TCS OFF SWITCH WIRE (II AC, III CM types)

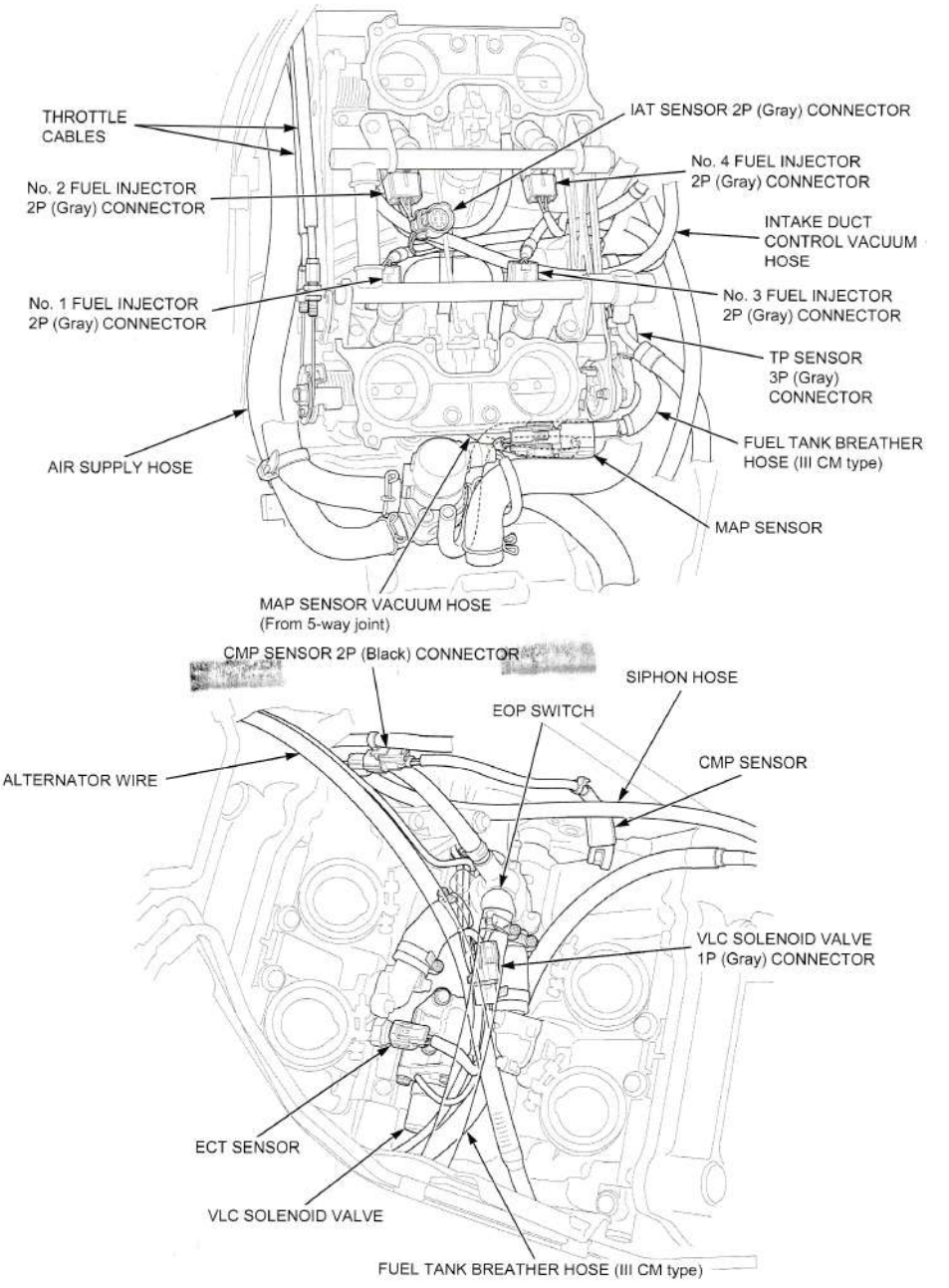

FUEL TANK-to-EVAP CANISTER HOSE (AC, II AC types)
RADIATOR RESERVE TANK OVERFLOW HOSE
OPTION (Shift Switch) 2P (Blue) CONNECTOR
COOLING FAN MOTOR 2P (Black) CONNECTOR
MP SENSOR 3P (Black) CONNECTOR
FUEL TANK DRAIN HOSE
SIDESTAND 2P (Black) CONNECTOR
THROTTLE STOP SCREW
CLUTCH HOSE
O2 SENSOR 4P (Black) CONNECTOR
FUEL TANK-to-EVAP CANISTER HOSE (AC, II AC types)
MP SENSOR
FUEL TANK BREATHER HOSE (III CM type)
EVAP CANISTER (AC, II AC types)
(Clip opening side facing down)
SIDESTAND SWITCH WIRE
STAY
EVAP CANISTER DRAIN HOSE (AC, II AC types)
O2 SENSOR WIRE
GEAR POSITION SWITCH 3 WIRE
RADIATOR RESERVE TANK OVERFLOW HOSE
FUEL TANK BREATHER HOSE (III CM type)
SIDESTAND SWITCH WIRE
OIL COOLER PIPE
O2 SENSOR WIRE
FUEL TANK DRAIN HOSE
GEAR POSITION SWITCH 3 WIRE
FUEL TANK-to-EVAP CANISTER HOSE (AC, II AC types)

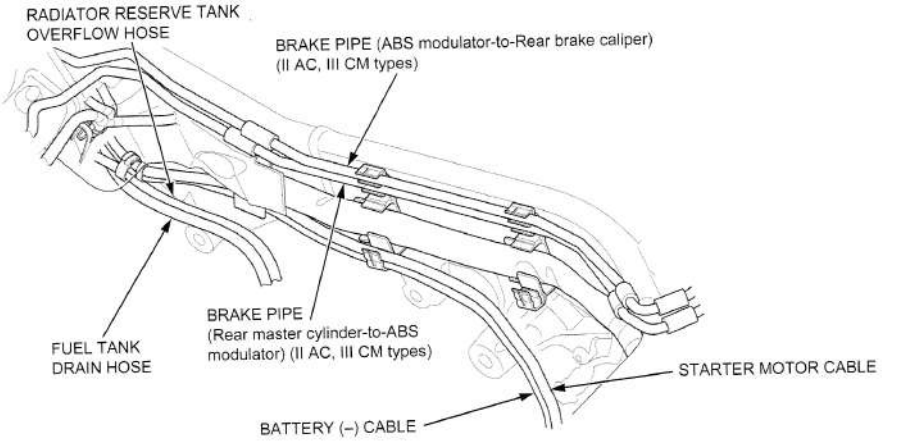

RIGHT GRIP HEATER 2P (Black) CONNECTOR (II AC, III CM types)
GRIP HEATER CONTROLLER (II AC, III CM types)
10P (Black) CONNECTOR
RIGHT HANDLEBAR SWITCH 9P (Black) CONNECTOR
21P (Black) CONNECTOR
TURN SIGNAL/ HAZARD RELAY (II AC, III CM types)
REGULATOR/RECTIFIER 4P (Gray) CONNECTOR
ALTERNATOR 3P (Gray) CONNECTOR
33P (Black) CONNECTOR
(To evap purge control solenoid valve; AC, II AC types)
ECM
33P (Gray) CONNECTOR
REGULATOR/RECTIFIER 3P (Black) CONNECTOR
ENGINE SUB-WIRE HARNESS 12P (Black) CONNECTOR
ENGINE SUB-WIRE HARNESS 2P (Gray) CONNECTOR
ENGINE SUB-WIRE HARNESS 6P (Black) CONNECTOR
SIPHON HOSE
EVAP PURGE CONTROL SOLENOID VALVE (AC, II AC types)
2P (Black) CONNECTOR
EVAP PURGE CONTROL SOLENOID VALVE HOSE-to-THROTTLE BODY HOSE (AC, II AC types)
BYPASS HOSE
EVAP CANISTER-to-EVAP PURGE CONTROL SOLENOID VALVE HOSE (AC, II AC types)
GEAR POSITION SWITCH 2 CONNECTOR
GEAR POSITION SWITCH 1 CONNECTOR
EVAP CANISTER (AC, II AC types)
FUEL TANK-to-EVAP CANISTER HOSE (AC, II AC types)
GEAR POSITION SWITCH 3 CONNECTOR

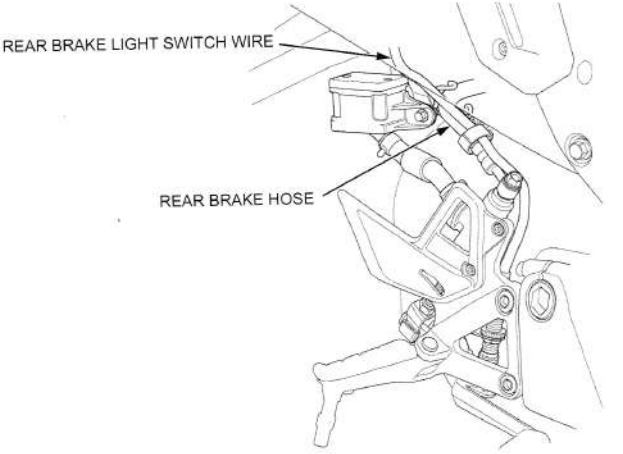

FUEL TANK DRAIN HOSE
BATTERY (–) CABLE
STARTER MOTOR CABLE
BRAKE PIPE
MAIN WIRE HARNESS
FUEL TANK DRAIN HOSE
RADIATOR RESERVE TANK OVERFLOW HOSE
REAR WHEEL SPEED SENSOR 2P (Blue) CONNECTOR
BATTERY
REAR BRAKE LIGHT SWITCH 2P (Black) CONNECTOR
STARTER RELAY SWITCH (MAIN FUSE 30 A/ FI FUSE 20 A)
OPTION (Rear) 4P CONNECTOR
BATTERY 1P CONNECTOR
DLC
LEFT FUSE BOX
RIGHT FUSE BOX


FUEL TANK DRAIN HOSE
BATTERY (–) CABLE
STARTER MOTOR CABLE
BRAKE PIPE
MAIN WIRE HARNESS
FUEL TANK DRAIN HOSE
RADIATOR RESERVE TANK OVERFLOW HOSE
REAR WHEEL SPEED SENSOR 2P (Blue) CONNECTOR
BATTERY
REAR BRAKE LIGHT SWITCH 2P (Black) CONNECTOR
STARTER RELAY SWITCH (MAIN FUSE 30 A/ FI FUSE 20 A)
OPTION (Rear) 4P CONNECTOR
BATTERY 1P CONNECTOR
DLC
LEFT FUSE BOX
RIGHT FUSE BOX

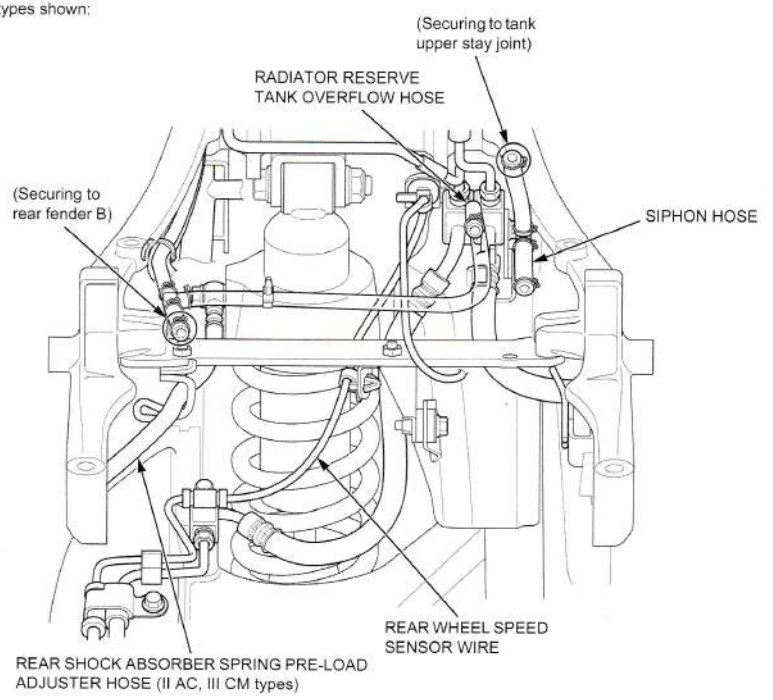

INTAKE DUCT VALVE DIAPHRAGM
INTAKE DUCT CONTROL SOLENOID VALVE
ONE-WAY VALVE
PAIR CONTROL SOLENOID VALVE
PAIR CONTROL SOLENOID VALVE 2P CONNECTOR
VACUUM CHAMBER
MAP SENSOR 3P (Gray) CONNECTOR
SIPHON HOSE
AIR SUPPLY HOSES
FUEL TANK BREATHER HOSE (III CM type)
FUEL TANK-to-EVAP CANISTER HOSE (AC, II AC types)
CRANKCASE BREATHER HOSE
FUEL TANK DRAIN HOSE
FUEL FEED HOSE
(HOSE CLIP; AC, II AC types only)
No. 1 DIRECT IGNITION COIL 3P (Black) CONNECTOR
FUEL PUMP 3P (Black) CONNECTOR
No. 3 DIRECT IGNITION COIL 3P (Black) CONNECTOR
AIR SUPPLY HOSE
FRAME GROUND POINT


THROTTLE CABLES
IAT SENSOR 2P (Gray) CONNECTOR
No. 4 FUEL INJECTOR 2P (Gray) CONNECTOR
No. 2 FUEL INJECTOR 2P (Gray) CONNECTOR
INTAKE DUCT CONTROL VACUUM HOSE
No. 1 FUEL INJECTOR 2P (Gray) CONNECTOR
No. 3 FUEL INJECTOR 2P (Gray) CONNECTOR
TP SENSOR 3P (Gray) CONNECTOR
AIR SUPPLY HOSE
FUEL TANK BREATHER HOSE (III CM type)
MAP SENSOR
MAP SENSOR VACUUM HOSE (From 5-way joint)
CMP SENSOR 2P (Black) CONNECTOR
SIPHON HOSE
EOP SWITCH
ALTERNATOR WIRE
CMP SENSOR
VLC SOLENOID VALVE 1P (Gray) CONNECTOR
ECT SENSOR
VLC SOLENOID VALVE
FUEL TANK BREATHER HOSE (III CM type)

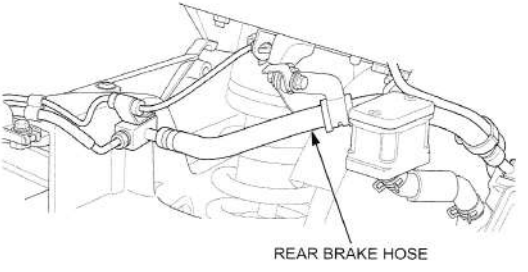

RADIATOR RESERVE TANK OVERFLOW HOSE
BRAKE PIPE (ABS modulator-to-Rear brake caliper) (II AC, III CM types)
BRAKE PIPE (Rear master cylinder-to-ABS modulator) (II AC, III CM types)
FUEL TANK DRAIN HOSE
STARTER MOTOR CABLE
BATTERY (–) CABLE

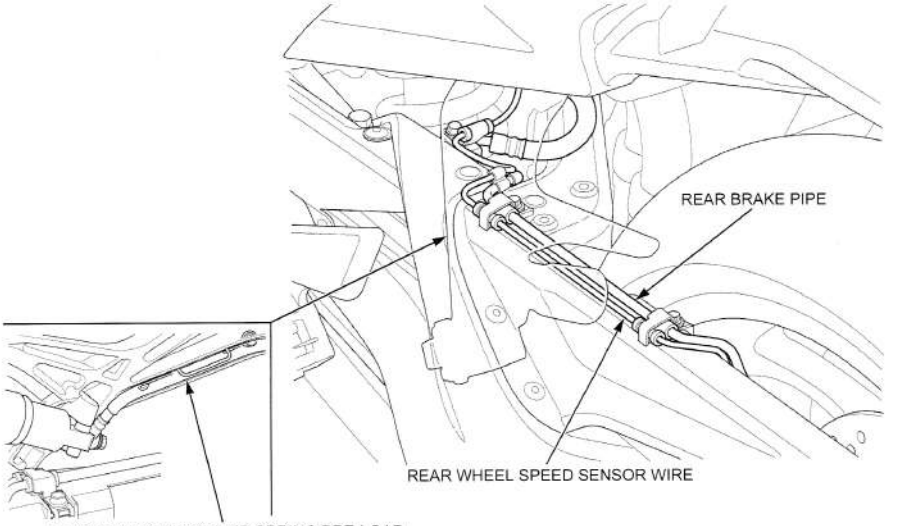

REAR BRAKE LIGHT SWITCH WIRE
REAR BRAKE HOSE

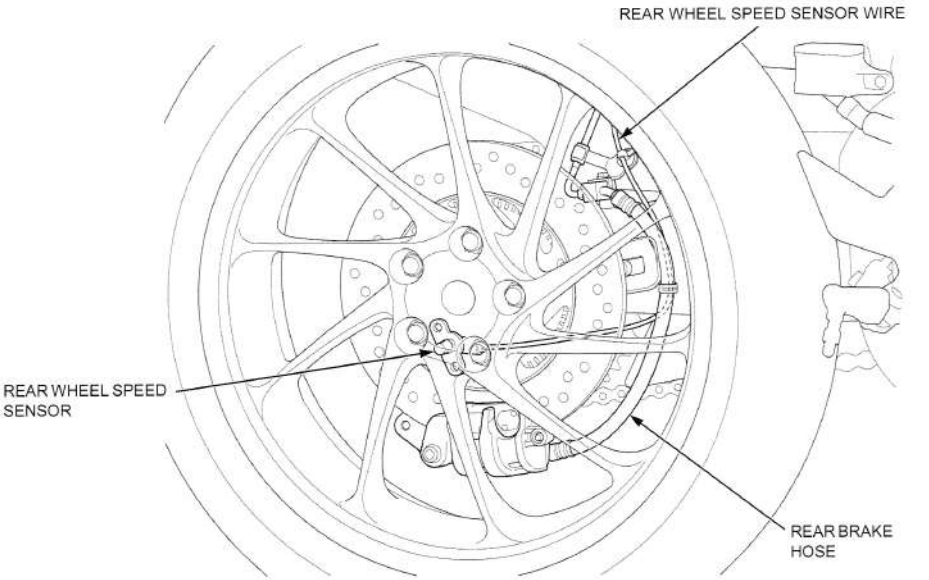
II AC, III CM types shown:



AC type:




REAR BRAKE PIPE
REAR WHEEL SPEED SENSOR WIRE
REAR SHOCK ABSORBER SPRING PRE-LOAD ADJUSTER HOSE (II AC, III CM types)


REAR WHEEL SPEED SENSOR WIRE
REAR WHEEL SPEED SENSOR
REAR BRAKE HOSE

EMISSION CONTROL SYSTEMS

EXHAUST EMISSION REQUIREMENT

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

NOISE EMISSION REQUIREMENT

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

WARRANTY COMPLIANCE

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

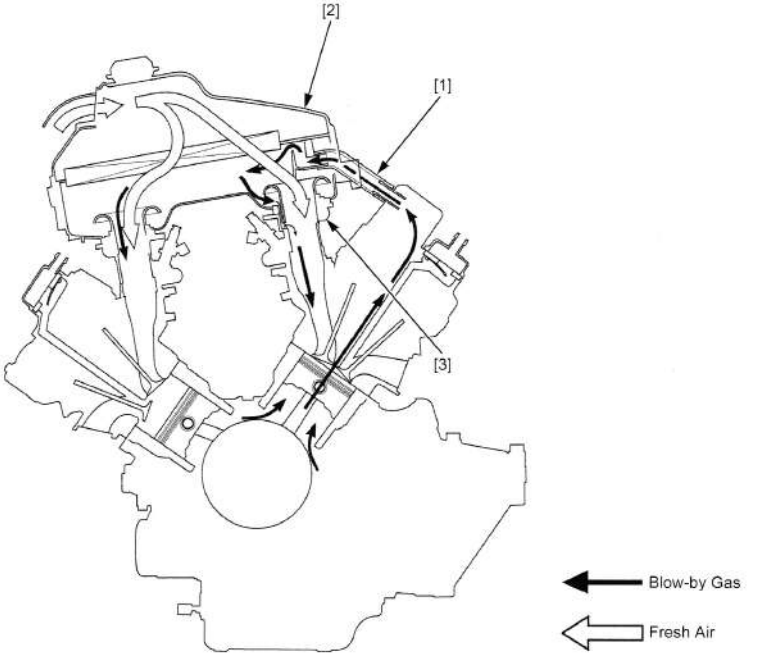
SOURCE OF EMISSIONS

The combustion process produces carbon monoxide (CO), oxides of nitrogen (NO_x), and hydrocarbons (HC). The control of hydrocarbons and oxides of nitrogen 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. Uncontrolled fuel evaporation also releases hydrocarbons to the atmosphere.

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

CRANKCASE EMISSION CONTROL SYSTEM

The engine is equipped with a closed crankcase system to prevent discharging crankcase emissions into the atmosphere. Blow-by gas is returned to the combustion chamber through the crankcase breather hose [1] air cleaner housing [2] and throttle body [3].



EXHAUST EMISSION CONTROL SYSTEM (SECONDARY AIR SUPPLY SYSTEM)

The exhaust emission control system is composed of a pulse secondary air supply system, 3-way catalytic converter and PGM-FI system.

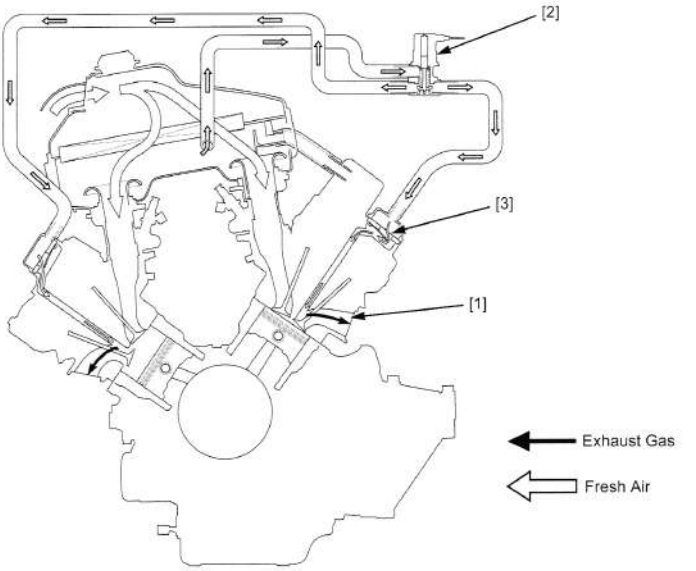
SECONDARY AIR SUPPLY SYSTEM

The pulse secondary air supply system introduces filtered air into the exhaust gases in the exhaust port [1]. Fresh air is drawn into the exhaust port by the function of the PAIR control solenoid valve [2].

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 PAIR check valve [3] prevents reverse air flow through the system. The PAIR control solenoid valve is controlled by the PGM-FI unit (ECM), and the fresh air passage is opened/closed according to running condition (ECT/IAT/TP/MAP sensor and engine revolution).

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

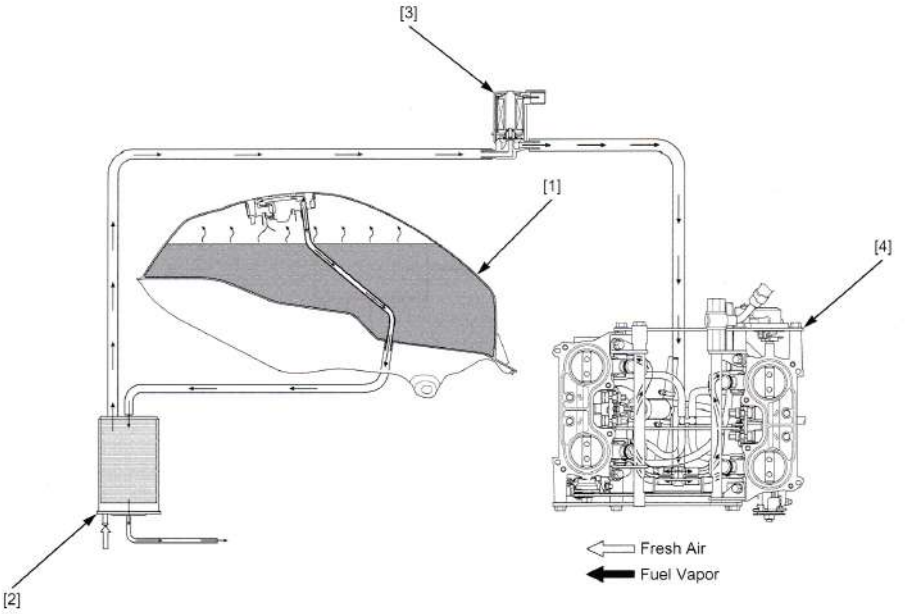


3-WAY CATALYTIC CONVERTER

This motorcycle is equipped with a 3-way catalytic converter. The 3-way catalytic converter is in the exhaust system. Through chemical reactions, they convert HC, CO, and NO_X in the engine's exhaust to carbon dioxide (CO_2), nitrogen (N_2), and water vapor.

EVAPORATIVE EMISSION CONTROL SYSTEM (AC, II AC types)

This model complies with California Air Resources Board (CARB) evaporative emission requirements. Fuel vapor from the fuel tank [1] is routed into the EVAP canister [2] where it is absorbed and stored while the engine is stopped. When the engine is running and the EVAP purge control solenoid valve [3] is open, fuel vapor in the EVAP canister is drawn into the engine through the throttle body [4].



NOISE EMISSION CONTROL SYSTEM

TAMPERING WITH THE NOISE CONTROL SYSTEM IS PROHIBITED: U.S. Federal law prohibits, or Canadian provincial law may prohibit the following acts or the causing 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 vehicle for the purpose of noise control prior to its sale or delivery to the ultimate customer or while it is in use; (2) the use of the vehicle after such device or element of design has been removed or rendered inoperative by any person.

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

1. Removal of, or puncturing of the muffler, baffles, header pipes or any other component which conducts exhaust gases.
2. Removal of, or puncturing of any part of the intake system.
3. Lack of proper maintenance.
4. Removing or disabling any emissions compliance component, or replacing any compliance component with a non-compliant component.

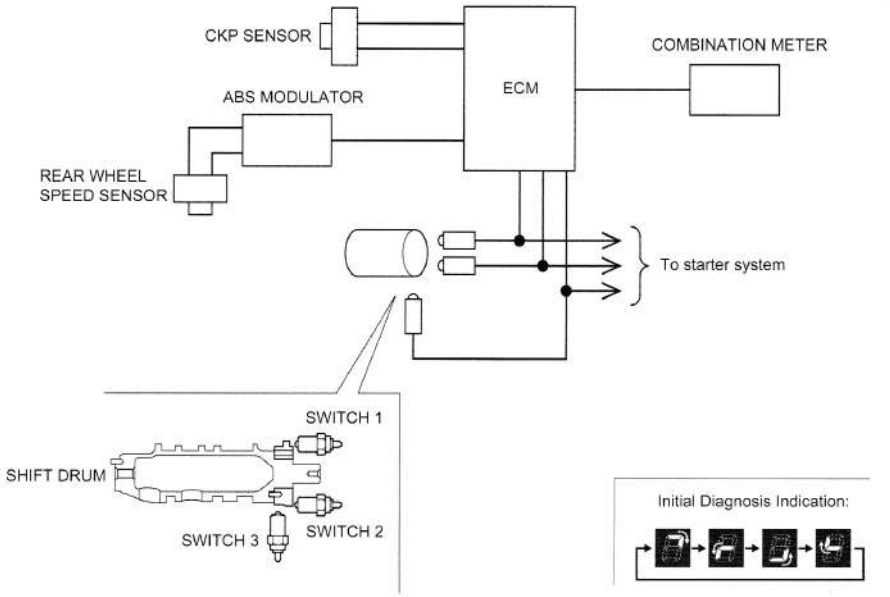
TECHNICAL FEATURE

3-CONTACT POINTS GEAR POSITION INDICATION SYSTEM

SUMMARY

The gear position detection section is composed of the three ON-OFF switches and the indicator displays the transmission gear position by combination of their switch signals. The ECM determines the gear position based on the status of the switches, vehicle speed, and engine rev and sends the position information to the combination meter via the serial communication line. Two gear position switches (1 and 2) are located in the axial direction of the shift drum and one switch (3) is located in the radial direction.

This system is equipped with a self-diagnosis system. The ECM starts the initial diagnosis when the ignition switch is turned ON. The self-diagnosis is also made while the vehicle is running to check whether each switch functions normally.



INDICATOR OPERATION

When system is normal:
With the transmission in neutral, the gear position indication will be blank and the neutral indicator comes on (When the transmission is not engaged temporarily, the gear position indicator indicates "–").
The indicator begins indicating (i.e. digit) when shifting the transmission into 1st or 2nd. However, the indicator displays the flow pattern "8" as shown during the initial diagnosis.

When any abnormality occurs, the gear position indicator blinks "–" (failure status as in DTC is not stored).

NOTE:

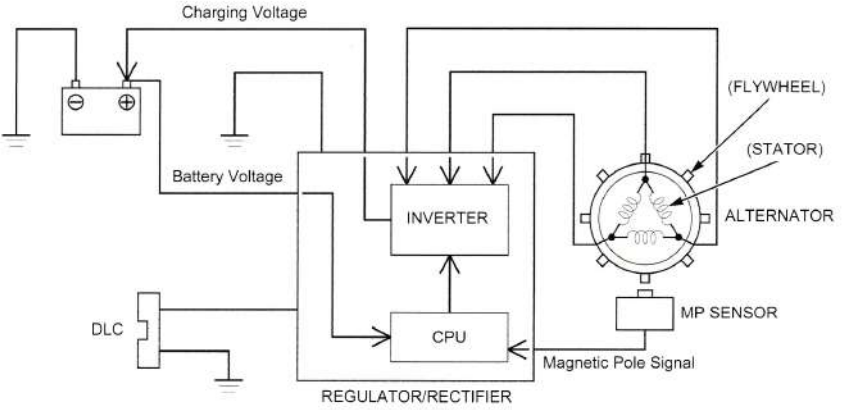
- If the engine stop switch is in "○", the indicator blinks "–" even when the system is normal.
- It is not a problem if the indicator displays initial diagnosis indication (flows "8") when the ignition switch is turned ON with the transmission 3rd or higher position. In this case, shift the transmission down to finish the initial diagnosis and the indicator indicates the gear position (ordinary indication).
- When the tire, drive or driven sprocket is replaced with other than specified parts, the indicator does not indicate the gear position properly.

CURRENT PHASE CONTROL GENERATING/CHARGING SYSTEM

The current phase control generating/charging system uses Fe magnets on the flywheel and it ensures the equal ability for performance of a Nd magnet (rare earth element).

The MP (magnetic pole) sensor detects the flywheel position by sensing the reluctors according to the pole pitch. The regulator/rectifier monitors the magnetic pole signal (synchronized with the alternator induced voltage) and battery voltage. It switches the drive timing of the built-in inverter as the basis for the magnetic pole signal and varies the output current to control the charging voltage.

This system is equipped with a self-diagnosis system. The DTC can be read with the MCS (page 19-8).

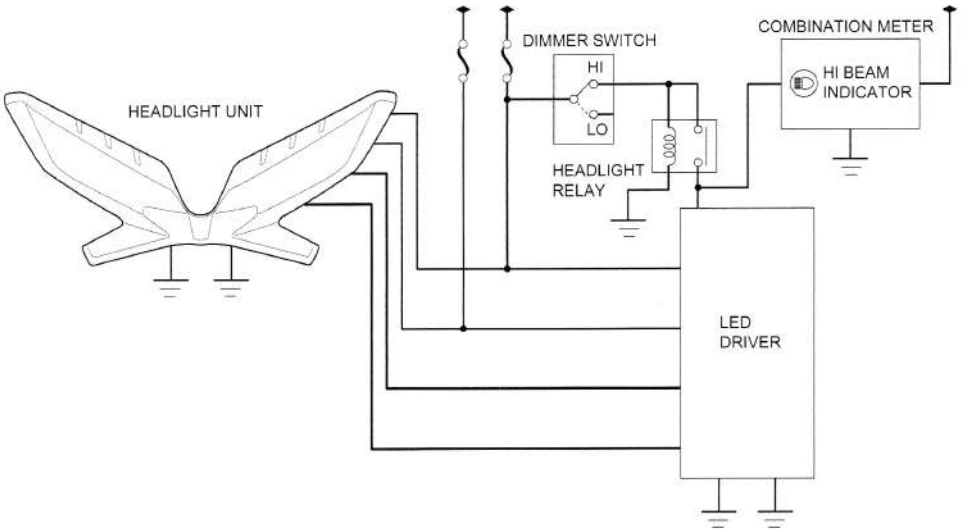


LED HEADLIGHT

LED headlights are used in the VFR800F.

Component parts:

- Headlight unit:
  - Has an integrated light source.
- LED driver:
  - Contains a voltage booster circuit, constant current circuit, and HI/LO switching circuit to turn the light on or off depending on the switching input.
    Handle the unit with care because the circuits are vulnerable to damage from impacts, magnetic force, static electricity, etc.
- Dimmer switch
- Headlight relay
- Combination meter



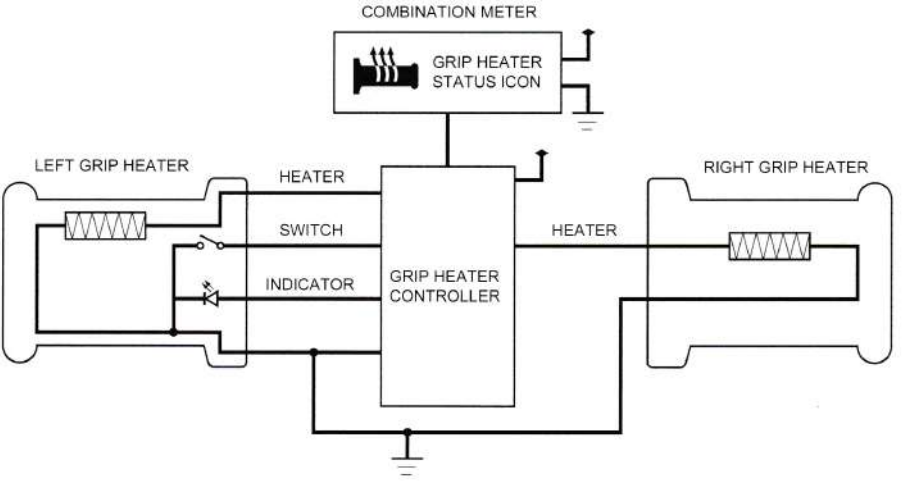
GRIP HEATER (II AC, III CM types)

The new-design grip heaters are applied to the VFR800F.

FEATURES

The temperature is adjustable in 5 levels.

The output state of the VFR800F grip heater can be displayed on the combination meter.



OPERATION

- Press the grip heater switch: Select the heater level
- Press and hold the grip heater switch: Grip heaters turn OFF
- Ignition switch OFF: Grip heaters are OFF
  - Pressing the Grip heater switch after turning on the ignition switch; starts at the level last used.
- When the grip heater system fails, the grip heater status icon and switch indicator blink.

COMBINATION METER	SWITCH INDICATOR	Probable Cause	Detection Conditions
"E1" blink	1 blink	• Low battery voltage	• Input voltage is out of the specified range
"E2" blink	2 blinks	• Short circuit in the grip heater or its circuit	• Abnormal current
"E3" blink	3 blinks	• Faulty grip heater switch	• Grip heater switch is turned ON for 10 seconds or more
		• Short circuit in the grip heater switch circuit	• Short circuit for 10 seconds or more
		• Open circuit in the grip heater	• Abnormal resistance
		• Open circuit in the grip heater circuit	• No voltage

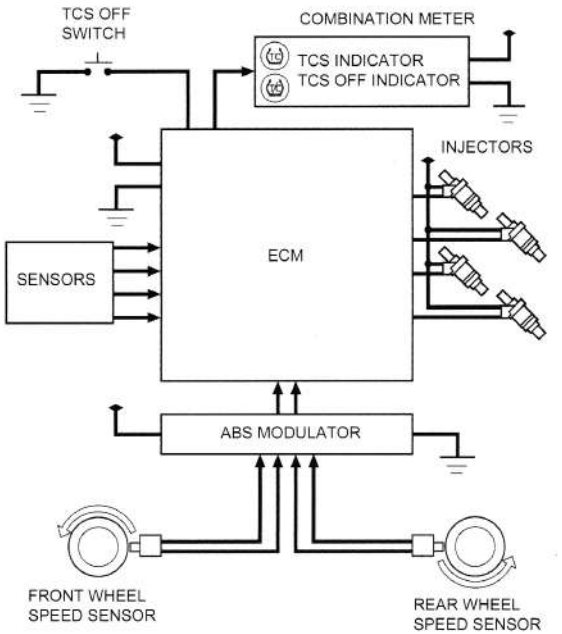
TRACTION CONTROL SYSTEM (TCS; II AC, III CM types)

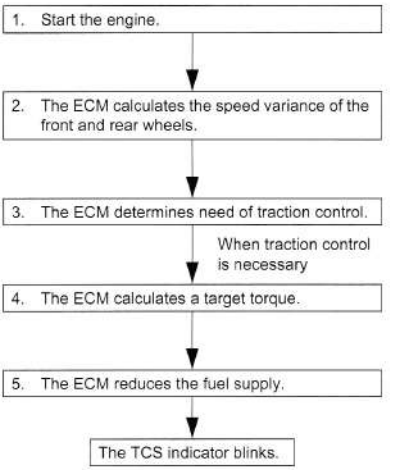
The traction control system regulates the engine torque to maintain motorcycle stability when opening the throttle rapidly or riding in rain.

The TCS of the VFR800F regulates torque by reducing the fuel supply. Riders can choose to turn off the TCS with the TCS OFF switch.

How the TCS works

The ECM constantly detects the speed variance between the front wheel and rear wheel. When the variance exceeds the specified limit, the ECM reduces the fuel supply on the basis of the target torque. Thus, the amount of fuel injection is regulated to maintain the wheel speed variance within the specified limit.





TCS indicator/TCS OFF indicator

When the traction control is active, the TCS indicator blinks.

When the traction control system fails, the system stops and the TCS indicator comes on.

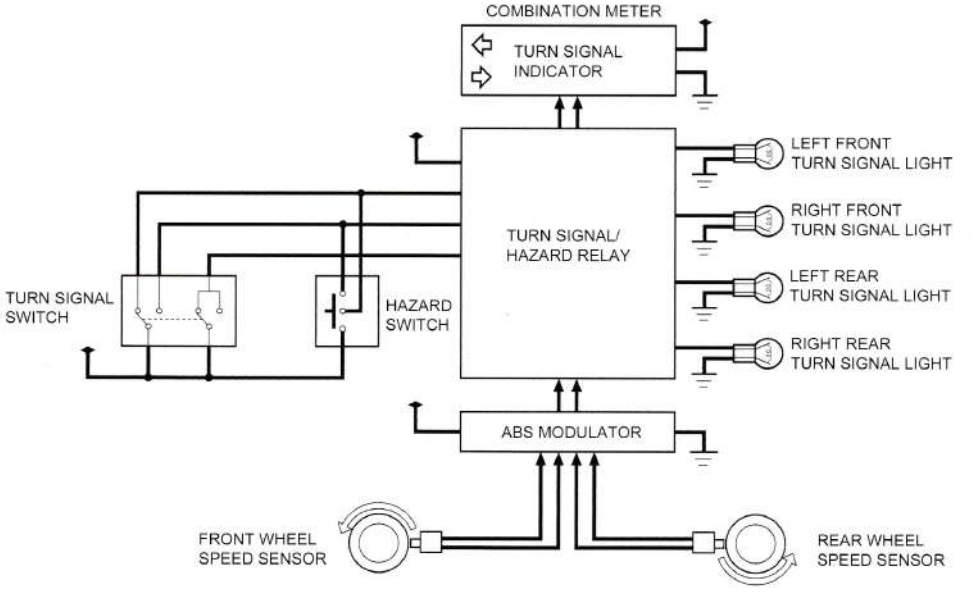
SYSTEM CONDITION	IGNITION SWITCH ON	DRIVING (stand-by)	TCS OPERATED	TCS OFF	TCS FAIL
TCS INDICATOR	ON	OFF	BLINK	OFF	ON
TCS OFF INDICATOR	OFF	OFF	OFF	ON	OFF

SELF-CANCELLING TURN SIGNALS WITHOUT STEERING SENSOR (II AC, III CM types)

The VFR800F is equipped with self-cancelling turn signals.

The turn signals are automatically turned off as soon as the motorcycle finishes making a turn. This prevents an undesired turn indication that may result when you forget to cancel the signals manually.

The state of cornering is identified on the basis of signals from the front and rear wheel sensors.



OPERATIONS

1. Turn on the turn signal switch

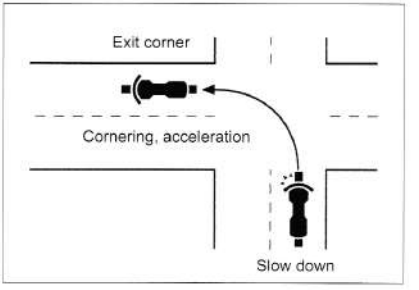
   When the rider operates the turn signal switch, an electric signal is sent to the turn signal/hazard relay and the signal light turns on.

2. During the corner

   The turn signal/hazard relay receives signals from the F/R wheel speed sensors. It judges the condition (during/exiting the corner) of speed between both wheels.

3. Self-cancelling

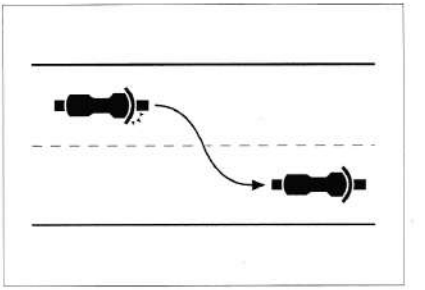
   When the turn signal/hazard relay judges that the vehicle exits a corner, the turn signals cancel automatically. If the vehicle is slowing down or stops, the signals will not cancel.



Lane change

The turn signal/hazard relay judges when the vehicle changes lanes and cancels the turn signals under the following conditions:

- The motorcycle is run 394 feet (120 m) at a speed less than 31 mph (50 Km/h).
- The turn signal is on longer than 7 seconds at a speed of 31 mph (50 Km/h) or greater.



2. FRAME/BODY PANELS/EXHAUST SYSTEM

SERVICE INFORMATION 2-2

TROUBLESHOOTING 2-2

SEAT 2-3

BATTERY COVER 2-3

SIDE COVER 2-4

UNDER COWL 2-4

RADIATOR GRILLE 2-5

INNER LOWER PANEL 2-5

MIDDLE COWL 2-6

INNER UPPER PANEL 2-7

INNER VISOR 2-7

WINDSCREEN 2-8

REARVIEW MIRROR 2-8

UPPER COWL 2-9

FRONT INNER COWL 2-9

FRONT FENDER 2-10

REAR CENTER COWL/
TURN SIGNAL LIGHT COVER 2-10

GRAB RAIL 2-11

REAR COWL 2-11

REAR FENDER A/FENDER STAY 2-12

REAR FENDER B 2-13

SIDESTAND 2-14

CENTERSTAND (II AC, III CM types) 2-14

MUFFLER 2-15

EXHAUST PIPE 2-16

SERVICE INFORMATION

GENERAL

- This section covers removal and installation of the body panels and exhaust system.
- When disassembling, mark and store the mounting fasteners to ensure that they are reinstalled in their original locations.
- When installing the covers, make sure the mating areas are aligned properly before tightening the fasteners.
- Always replace the gaskets with new ones after removing the exhaust system.
- When installing the exhaust system, loosely install all of the fasteners. Always tighten them in the sequence of the exhaust pipe joint nuts, band bolts and mounting nut.
- Always inspect the exhaust system for leaks after installation.
- Do not loosen the white painted fasteners on the seat rail assembly to disassemble it (except the seat adjusting plates). If replacement is necessary, be sure to replace as an assembly.

TROUBLESHOOTING

Excessive exhaust noise
- Broken exhaust system
- Exhaust gas leak

Poor performance
- Deformed exhaust system
- Exhaust gas leak
- Clogged muffler

SEAT

REMOVAL/INSTALLATION

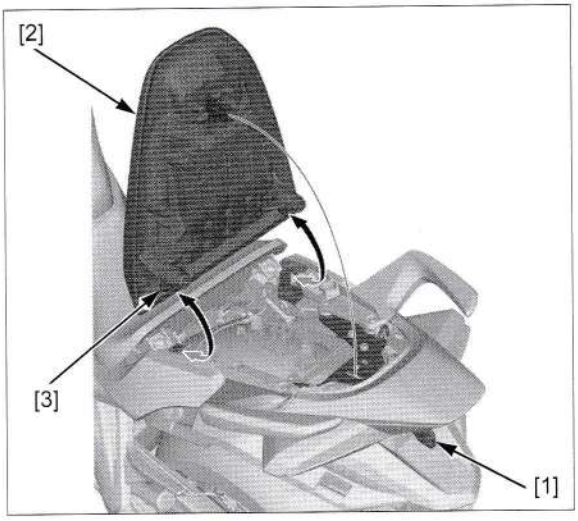
REAR SEAT

Unhook the seat with the ignition key [1].

Remove the rear seat [2] by pulling it rearward.

Install the rear seat by inserting the prongs [3] under the retainers of the frame.

Push down the rear of the seat securely to lock it.



FRONT SEAT

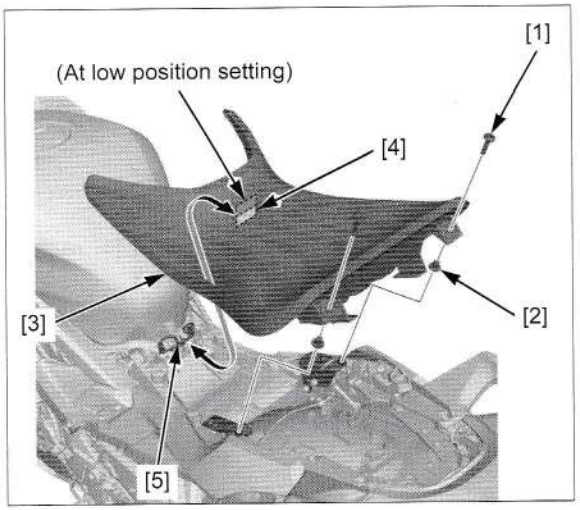
Remove the rear seat (page 2-3).

Remove the two socket bolts [1] and collars [2].

Remove the front seat [3] by pulling it rearward.

Install the front seat by aligning the recess [4] with the seat retainer [5].

Install the collars and socket bolts and tighten them.



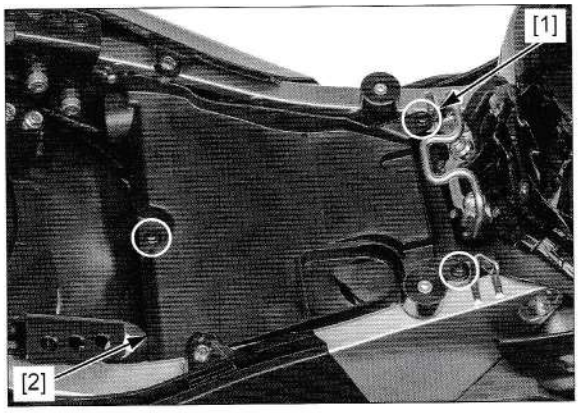
BATTERY COVER

REMOVAL/INSTALLATION

Remove the front seat (page 2-3).

Release the three trim clips [1] and remove the battery cover [2] from the front side.

Installation is in the reverse order of removal.



SIDE COVER

REMOVAL/INSTALLATION

Remove the two socket bolts [1].

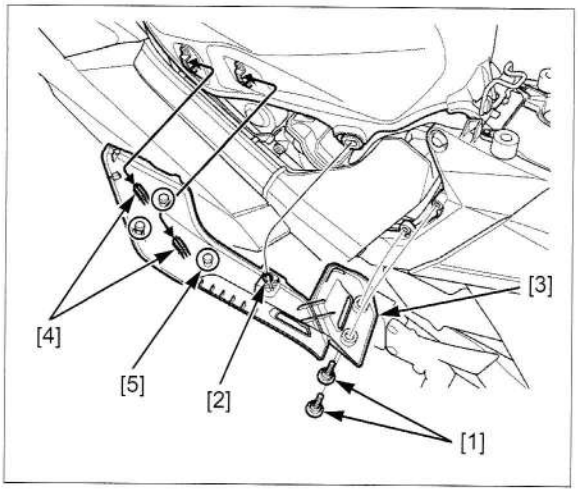
Release the boss [2] from the grommet.

Slide the side cover [3] rearward to release the two tabs [4] and remove it.

Installation is in the reverse order of removal.

NOTE:

- Be careful not to dislodge the three setting rubbers [5] on the cover and the grommet.



UNDER COWL

REMOVAL/INSTALLATION

Remove the following fasteners:

Left cowl:
- three trim clips [1]
- 5 mm socket bolt [2]
- two 6 mm socket bolts [3]

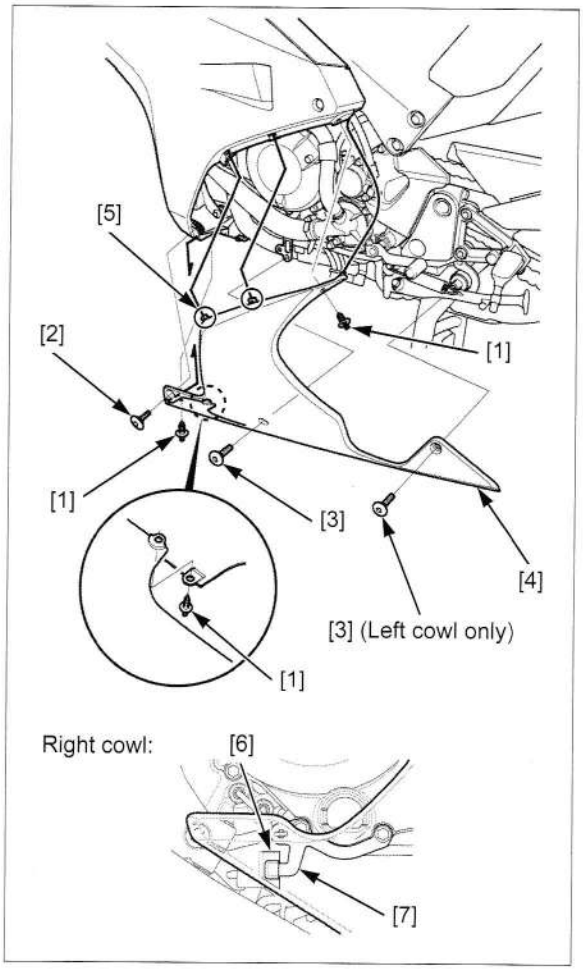
Right cowl:
- three trim clips
- 5 mm socket bolt
- 6 mm socket bolt

Slide the under cowl [4] rearward to release the two tabs [5] and remove it.

Installation is in the reverse order of removal.

NOTE:

- When installing the right under cowl, fit the cowl guide [6] to the stay [7].



RADIATOR GRILLE

REMOVAL/INSTALLATION

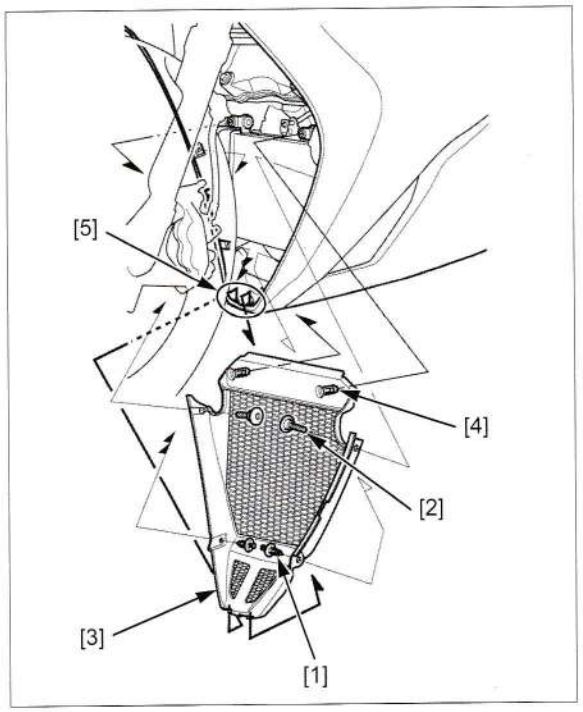
Remove the following fasteners:

- two trim clips [1]
- two socket bolts [2]

Pull the radiator grille [3] to the side and release the two bosses [4] from the grommets.

Slide the grille upward to release it from the two tabs [5] and remove it out of the middle cowls.

Installation is in the reverse order of removal.



INNER LOWER PANEL

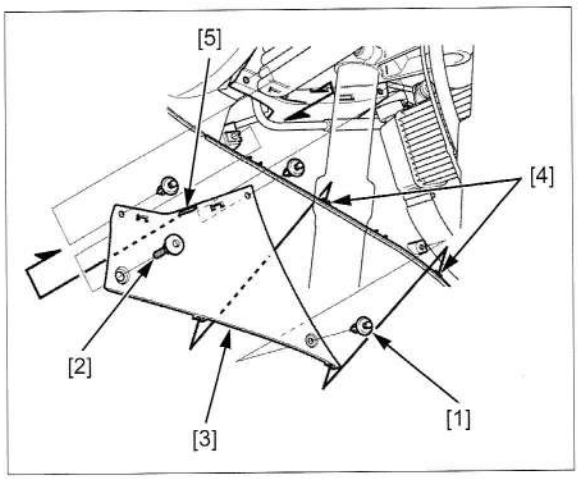
REMOVAL/INSTALLATION

RIGHT PANEL

Remove the three trim clips [1] and socket bolt [2].

Release the lower side of the lower panel [3] from the two tabs [4] and the upper tab [5], and remove the inner lower panel.

Installation is in the reverse order of removal.

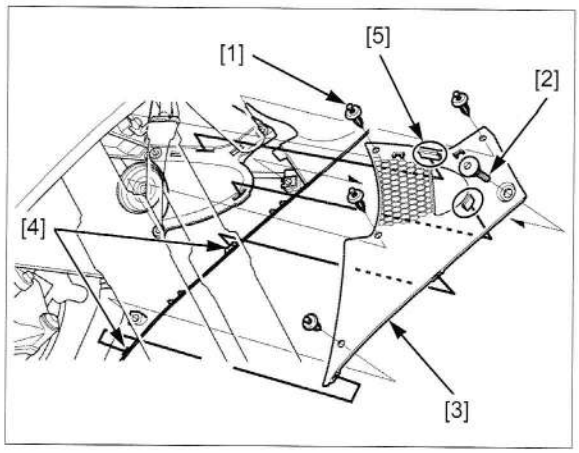


LEFT PANEL

Remove the four trim clips [1] and socket bolt [2].

Release the lower side of the lower panel [3] from the two tabs [4] and the two upper tabs [5], and remove the inner lower panel.

Installation is in the reverse order of removal.



MIDDLE COWL

REMOVAL/INSTALLATION

Remove the following:

- radiator grille (page 2-5)
- inner lower panel (page 2-5)
- under cowl (page 2-4)

Remove the following fasteners:

- trim clip [1]
- two 5 mm socket bolts [2]
- 5 mm socket bolt [3] and plastic washer [4]
- 6 mm socket bolt [5]

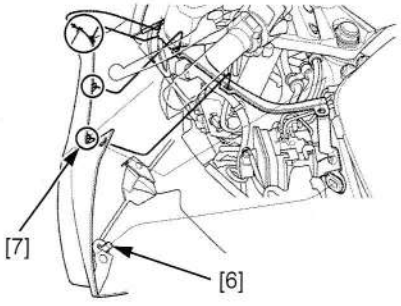
Release the boss [6] from the grommet and the four tabs [7] from the inner upper panel.

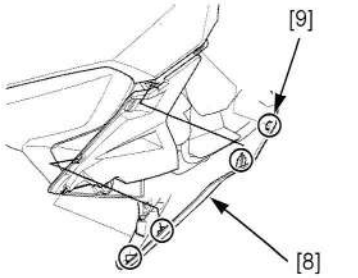
Slide the middle cowl [8] forward to release the four tabs [9] and remove it.

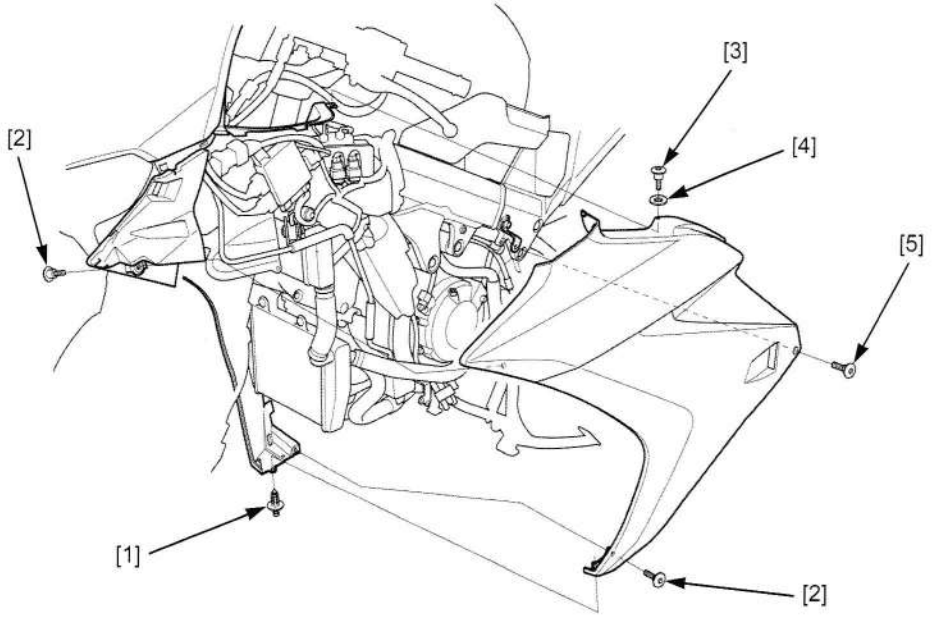
Installation is in the reverse order of removal.

NOTE:

- Place the middle cowl opening over the oil pipe.
- Be careful not to dislodge the grommet.
- Before installing the fasteners, be sure to set all the tabs into place properly.







INNER UPPER PANEL

REMOVAL/INSTALLATION

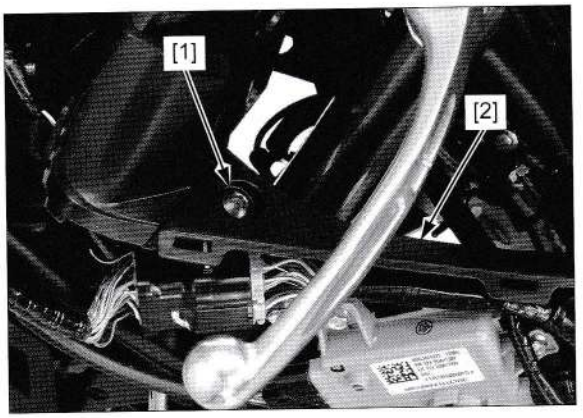
Remove the middle cowl (page 2-6).

Remove the socket bolt [1].

Left panel: Turn the handlebar all the way to the right and remove the inner upper panel [2].

Right panel: Turn the handlebar all the way to the left and remove the inner upper panel.

Installation is in the reverse order of removal.



INNER VISOR

REMOVAL/INSTALLATION

Remove the two socket bolts [1].

Slide the upper ends of the inner visor [2] downward and release the side faces from the tabs [3] of the upper cowl, and pull the lower tabs [4] out of the middle cowls.

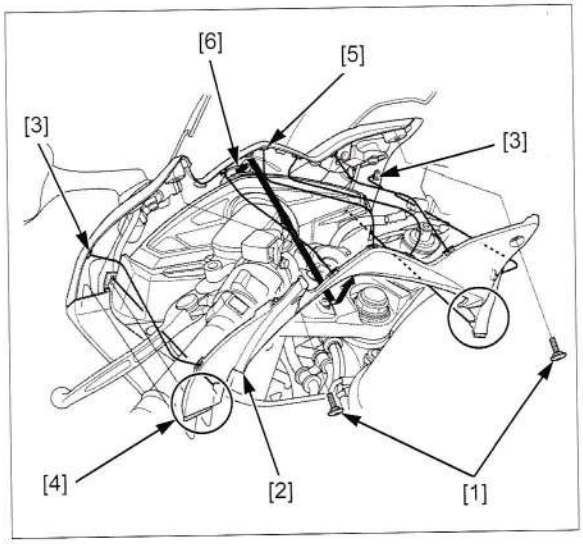
Release the upper side of the visor from the five tabs [5] by pushing it forward.

Remove the inner visor.

Installation is in the reverse order of removal.

NOTE:

- Align the visor front edge with the holder groove [6] carefully.



WINDSCREEN

REMOVAL/INSTALLATION

Remove the inner visor (page 2-7).

Remove the two socket bolts [1] and washers [2].

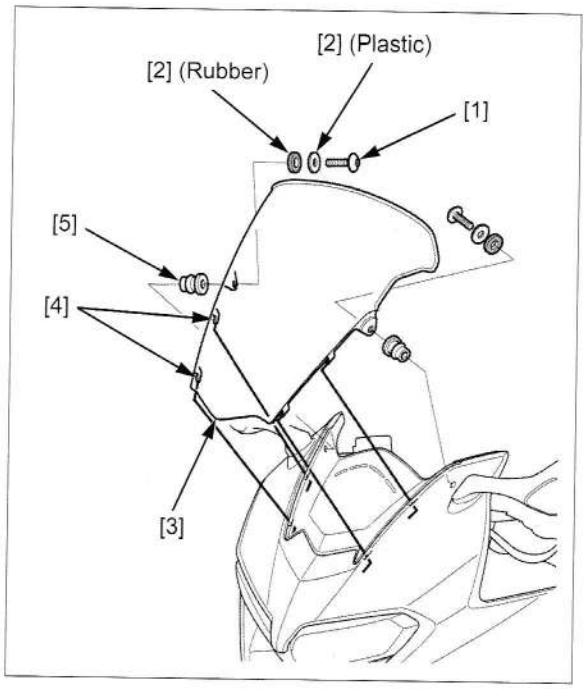
Slide the windscreen [3] rearward to release the four tabs [4] and remove it.

Remove the two setting nuts [5].

Installation is in the reverse order of removal.

TORQUE:

Windscreen screw: 1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)



REARVIEW MIRROR

REMOVAL/INSTALLATION

Remove the inner visor (page 2-7).

Disconnect the following located in the connector boot:

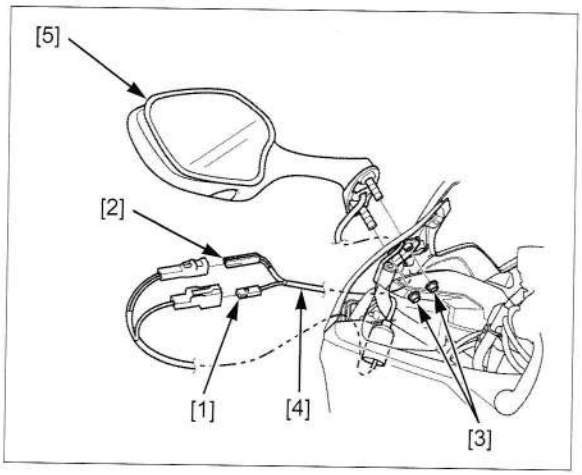
- position light 1P (White) connector [1]
- Left mirror; turn signal 2P (Orange) connector [2]
  Right mirror; turn signal 2P (Light blue) connector [2]

Remove the two nuts [3].

Remove the wire [4] out of the upper cowl to remove the rearview mirror [5].

For disassembly/assembly, refer to Lights/Meters/Switches section (page 20-6).

Installation is in the reverse order of removal.



UPPER COWL

REMOVAL/INSTALLATION

Remove the following:

- middle cowls (page 2-6)
- windscreen (page 2-8)
- rearview mirrors (page 2-8)

Remove the two socket bolts [1].

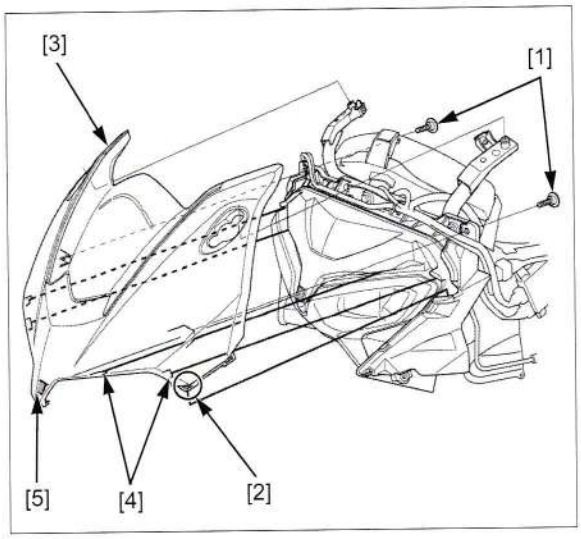
Release the both edges [2] of the upper cowl [3] from the grooves in the headlight housing.

Slide the upper cowl forward and remove it.

Installation is in the reverse order of removal.

NOTE:

- Carefully align the four guides [4] with the grooves in the headlight housing and press the hook-and-loop fastening area [5] of the cowl to attach it securely.



FRONT INNER COWL

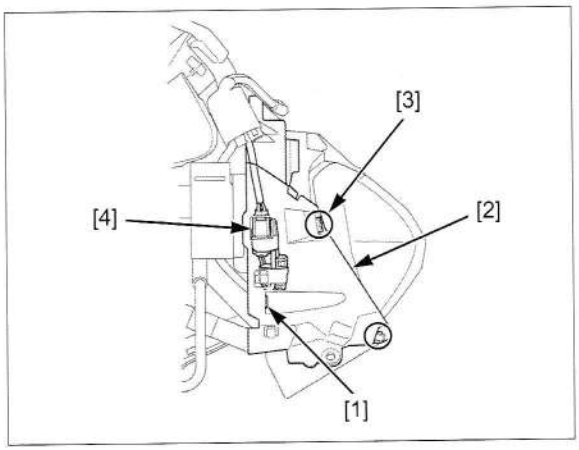
REMOVAL/INSTALLATION

Remove the upper cowl (page 2-9).

Remove the socket bolt [1] and the front inner cowl [2] from the two tabs [3].

Right cowl only: Remove the open air temperature sensor 2P (Black) connector [4] from the cowl.

Installation is in the reverse order of removal.



FRONT FENDER

REMOVAL/INSTALLATION

Remove the front wheel (page 15-13).

Remove the following:

- 3-way joint bolt [1] and clamp [2]
- cap nut [3] and clamp [4]
- four socket bolts [5]
- reflectors [6] and two collars [7]
- front fender [8]

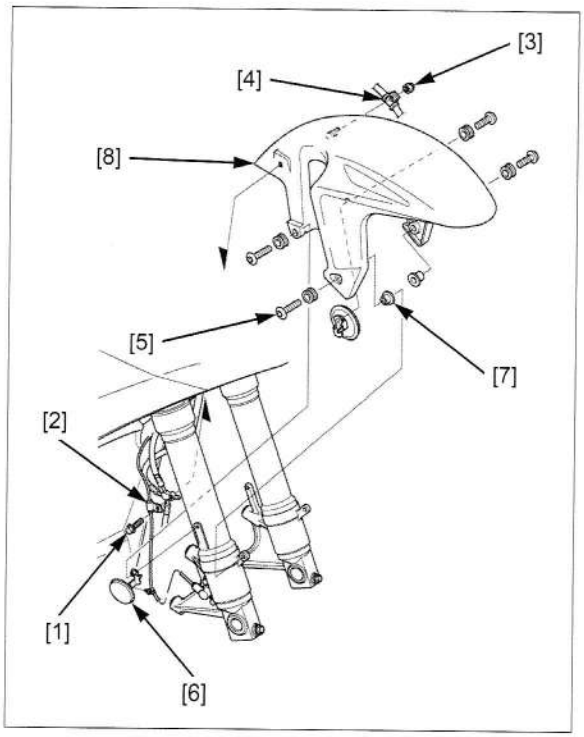
NOTE:

- Be careful not to scratch the fender on the fork legs.

Installation is in the reverse order of removal.

TORQUE:

Front brake hose clamp nut:
10 N·m (1.0 kgf·m, 7 lbf·ft)
Front brake hose 3-way joint bolt:
10 N·m (1.0 kgf·m, 7 lbf·ft)



REAR CENTER COWL/TURN SIGNAL LIGHT COVER

REMOVAL/INSTALLATION

Remove the rear seat (page 2-3).

Remove the two socket bolts [1].

Release the front portion of the rear center cowl [2] from the bolt hole studs [3].

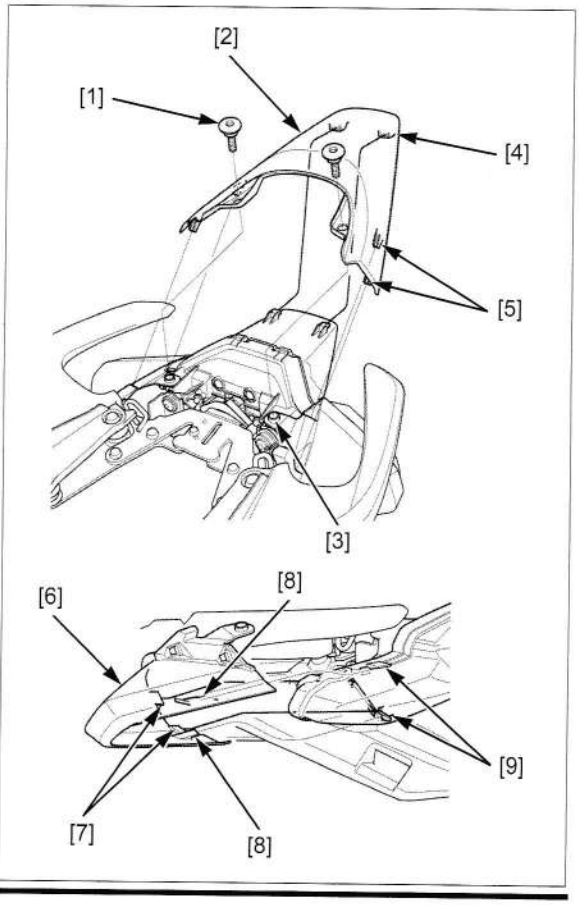
Slide the rear center cowl rearward to release the two guides [4] and four tabs [5] and remove it.

Raise the bottom of the turn signal light cover [6] and release the two tabs [7], then remove it.

Installation is in the reverse order of removal.

NOTE:

- When installing the turn signal light cover, align the two guides [8] with the grooves [9] in the lens properly.



GRAB RAIL

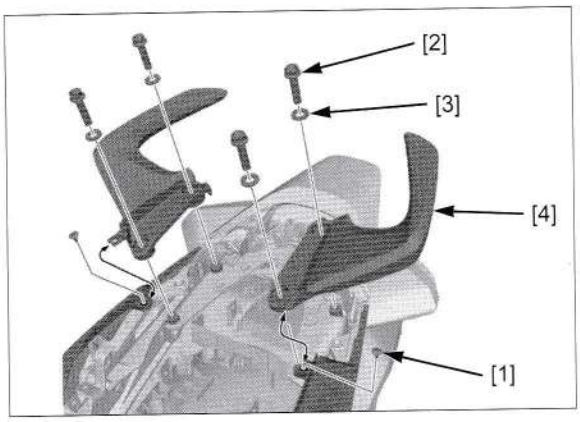
REMOVAL/INSTALLATION

Remove the rear seat (page 2-3).

Remove the following:

- socket bolt [1]
- bolts [2] and washers [3]
- grab rail [4]

Installation is in the reverse order of removal.



REAR COWL

REMOVAL/INSTALLATION

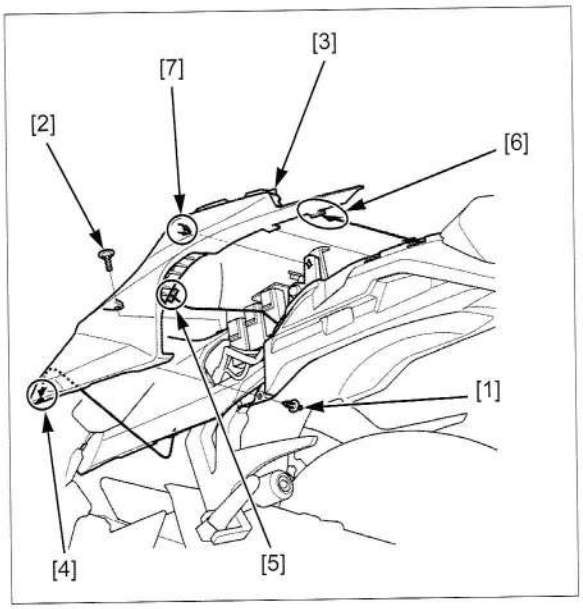
Remove the grab rail (page 2-11).

Remove the trim clip [1] and socket bolt [2].

Release the following in the sequence as follows and remove the rear cowl [3].

- front tab (out of the frame) [4]
- center tab [5]
- rear tab [6]
- snap fit clip [7]

Installation is in the reverse order of removal.



REAR FENDER A/FENDER STAY

REMOVAL/INSTALLATION

Remove the following:

- rear combination light (page 20-7)
- license light cover (page 20-8)
- rear cowls (page 2-11)

REAR FENDER A

Remove the following:

- nut [1]
- reflex reflector [2]
- collar [3]
- two socket bolts [4]
- rear fender A [5]
- two plate nuts [6]

REAR FENDER STAY

Remove the following:

- four tapping screws [7]
- four bolts [8]
- rear fender stay [9]
- four collars [10]

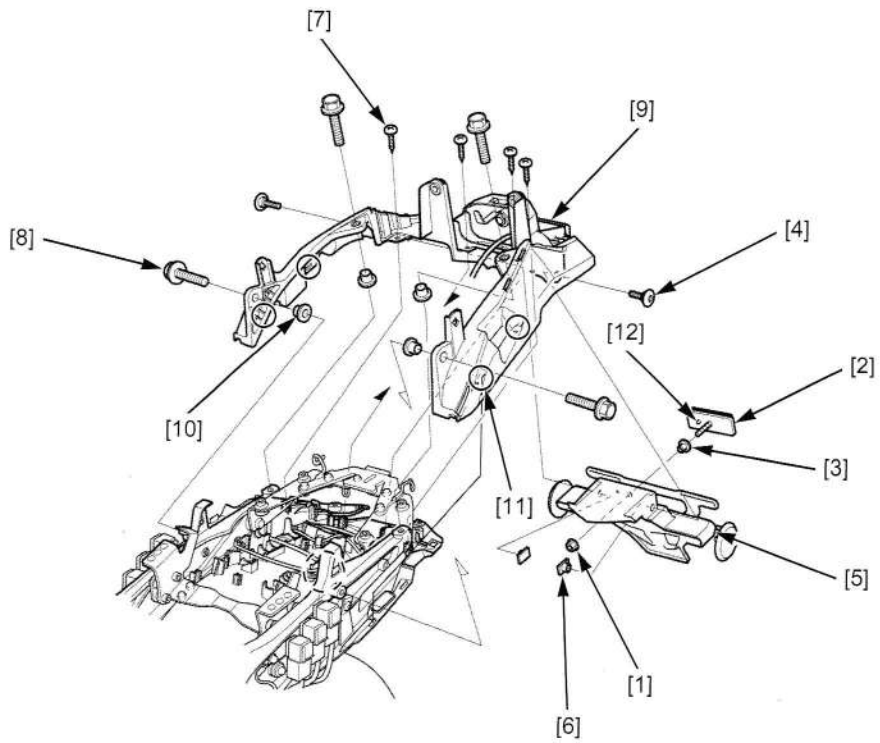
Installation is in the reverse order of removal.

NOTE:

- Align the four grooves [11] in the stay with the tabs of the rear fender B.
- Align the reflector locating pin [12] with the hole in the rear fender A.

TORQUE:

Tail reflex reflector nut:
1.7 N·m (0.2 kgf·m, 1.3 lbf·ft)



REAR FENDER B

REMOVAL/INSTALLATION

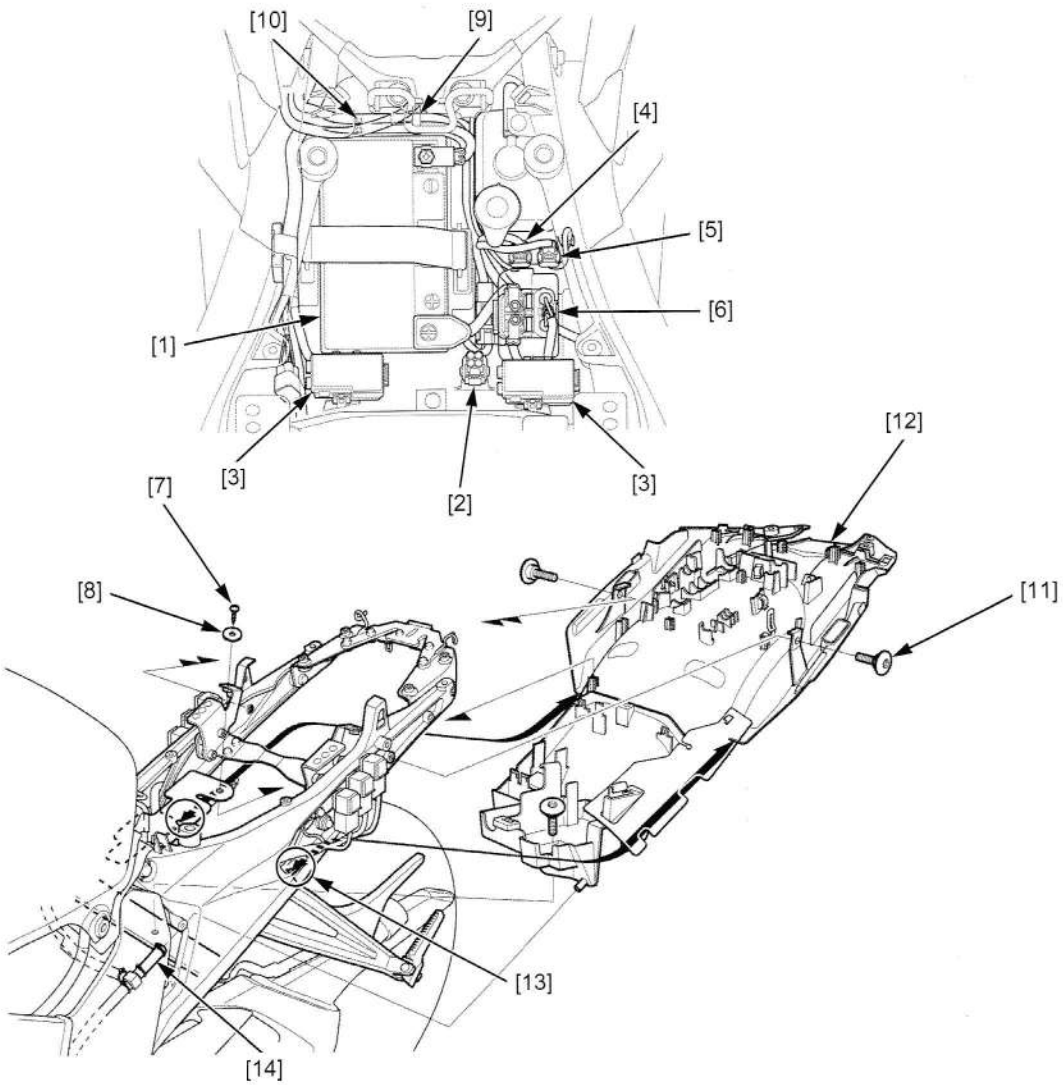
Remove the following:

- left side cover (page 2-4)
- turn signal/hazard relay (AC type only) (page 20-27)
- rear fender stay (page 2-12)
- battery [1] (page 19-6)
- DLC [2]
- fuse boxes [3]
- rear wheel speed sensor 2P (Blue) connector [4]
- rear brake light switch 2P (Black) connector [5]
- starter relay switch [6]
- tapping screw [7] and washer [8] (securing the rubber sheet)
- band clip [9]
- hose clip [10]
- three socket bolts [11]

Release the both edges of the rear fender B [12] from the stoppers [13] of the passenger footpeg brackets, and disconnect the radiator reserve tank overflow hose [14].

Remove the rear fender B out of the seat rail so the wire harness is not interfered.

Installation is in the reverse order of removal.



SIDESTAND

REMOVAL/INSTALLATION

Remove the left under cowl (page 2-4).

Remove the sidestand switch from the sidestand pivot (page 20-22).

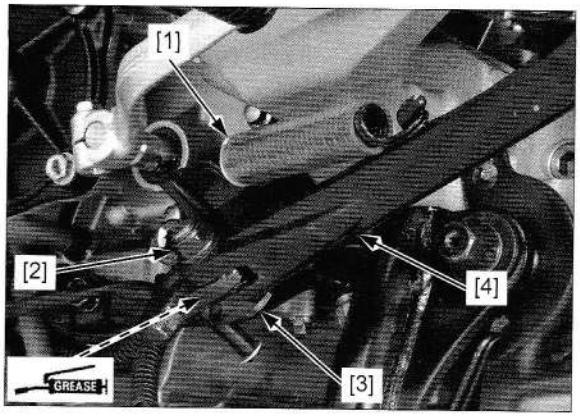
Retract the sidestand and remove the following:

- springs [1]
- pivot nut [2] and bolt [3]
- sidestand [4]

Installation is in the reverse order of removal.

NOTE:

- Apply grease to the pivot sliding area.
- When tightening the pivot nut, hold the pivot bolt securely.
- The spring is installed in the direction as shown.



TORQUE:

Sidestand pivot bolt: 10 N·m (1.0 kgf·m, 7 lbf·ft)
Sidestand pivot nut: 29 N·m (3.0 kgf·m, 21 lbf·ft)

CENTERSTAND (II AC, III CM types)

REMOVAL/INSTALLATION

Remove the exhaust pipe (page 2-16).

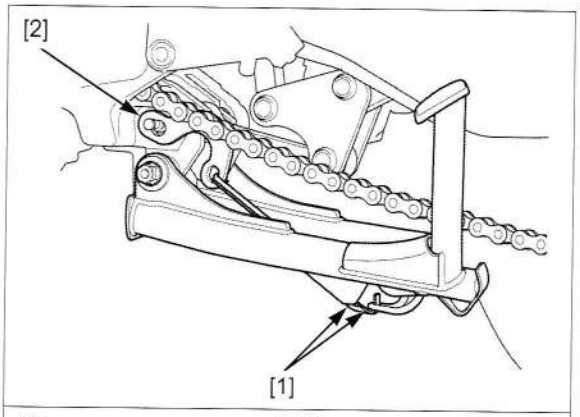
Retract the centerstand and remove the following:

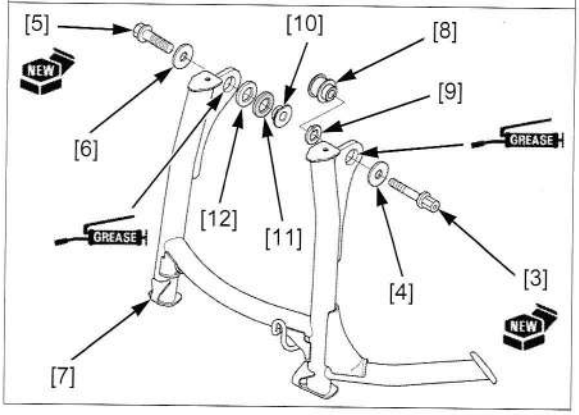
- springs [1]
- spring plate [2]
- left pivot bolt [3] and washer [4]
- right pivot bolt (Left-hand threads) [5] and washer [6]
- centerstand [7]
- left pivot collar [8] and spring washer [9]
- right pivot collar [10], rubber washer [11], and plastic washer [12]

Installation is in the reverse order of removal.

NOTE:

- Replace the pivot bolts with new ones.
- Apply grease to the pivot sliding areas.
- The springs are installed in the direction as shown.



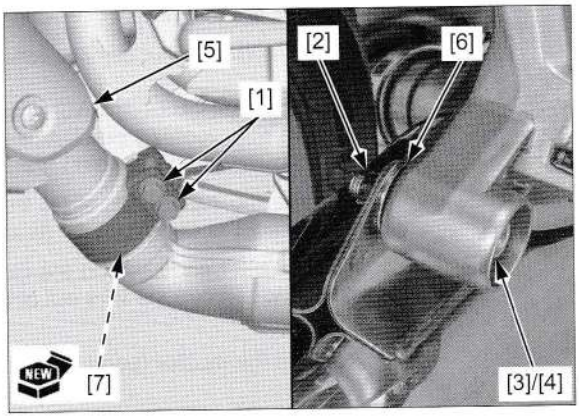


TORQUE:

Centerstand left pivot bolt:
54 N·m (5.5 kgf·m, 40 lbf·ft)
Centerstand right pivot bolt (Left-hand threads):
54 N·m (5.5 kgf·m, 40 lbf·ft)

MUFFLER

REMOVAL/INSTALLATION



Loosen the muffler band bolts [1].

Remove the following:

- nut [2]
- bolt [3] and washer [4]
- muffler [5]
- collar [6]
- gasket [7]

Install a new gasket and the collar.

Position the muffler band in the direction as shown to be sure that the band tab is aligned with the muffler groove.

Install the muffler with the bolt, washer and nut, and loosely tighten it.

Tighten the muffler band bolts first, then tighten the mounting nut to the specified torque.

TORQUE:
Muffler band bolt: 21 N·m (2.1 kgf·m, 15 lbf·ft)

DISASSEMBLY/ASSEMBLY

TAIL CAP

Remove the following:

- three socket bolts [1]
- tail cap [2]

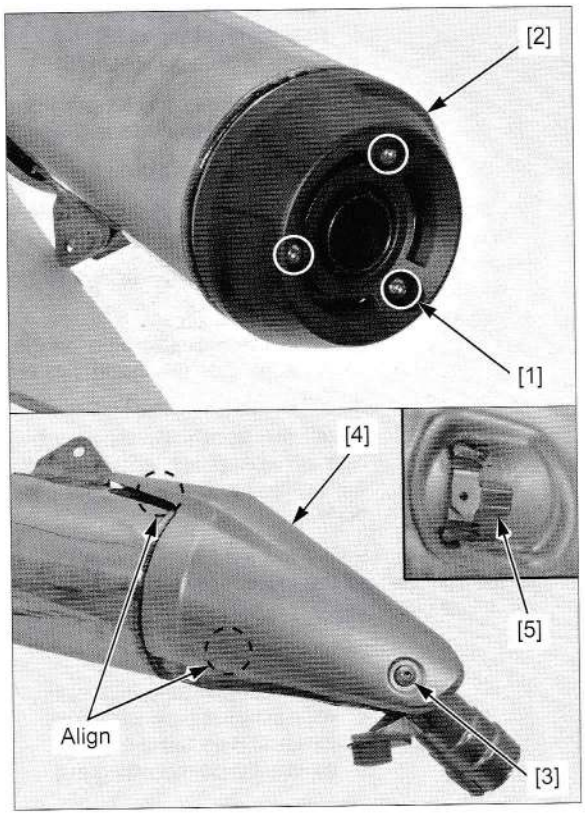
MUFFLER COVER

- socket bolt [3]
- muffler cover [4] (by sliding it forward)
- two setting rubbers [5]

Installation is in the reverse order of removal.

NOTE:

- The setting rubbers are installed with the ribs facing out.
- When installing the muffler cover, carefully align the holders with the setting rubbers so they are not dislodged from the muffler tabs.



EXHAUST PIPE

REMOVAL/INSTALLATION

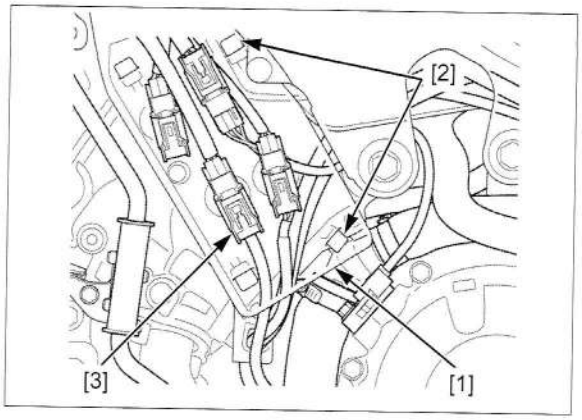
Remove the following:

- radiators (without disconnecting the hoses) (page 8-7)
- EVAP canister (AC, II AC types) (page 7-28)
- right rider footpeg bracket/heat guard assembly (by removing the three bolts) (page 17-10)

Release the rubber sheet [1] from the hooks [2] and disconnect the O_2 sensor 4P (Black) connector [3].

Release the band clips on the O_2 sensor wire from the stays and remove the wire out of the water hoses (page 1-20).

Remove the muffler (page 2-15).



Remove the bolt [1] and lower radiator stay [2].

Loosen the exhaust pipe band bolts [3].

Remove the following:

- front exhaust pipe joint nuts [4]
- exhaust pipe mounting nut [5] and bolt [6] (with the centerstand retracted)
- front exhaust pipe [7] (with the centerstand lowered)
- rear exhaust pipe joint nuts [8]
- rear exhaust pipes [9]
- exhaust pipe gaskets [10]

Be sure to verify the length from the stud bolt head to the cylinder head surface (page 2-17).

Install new gaskets onto the rear cylinder head.

Tighten the fasteners after installing all the exhaust pipe components.

Install the rear exhaust pipes with the joint nuts by setting each exhaust pipe flange onto the stud bolts.

Install new gaskets onto the front cylinder head and exhaust pipes.

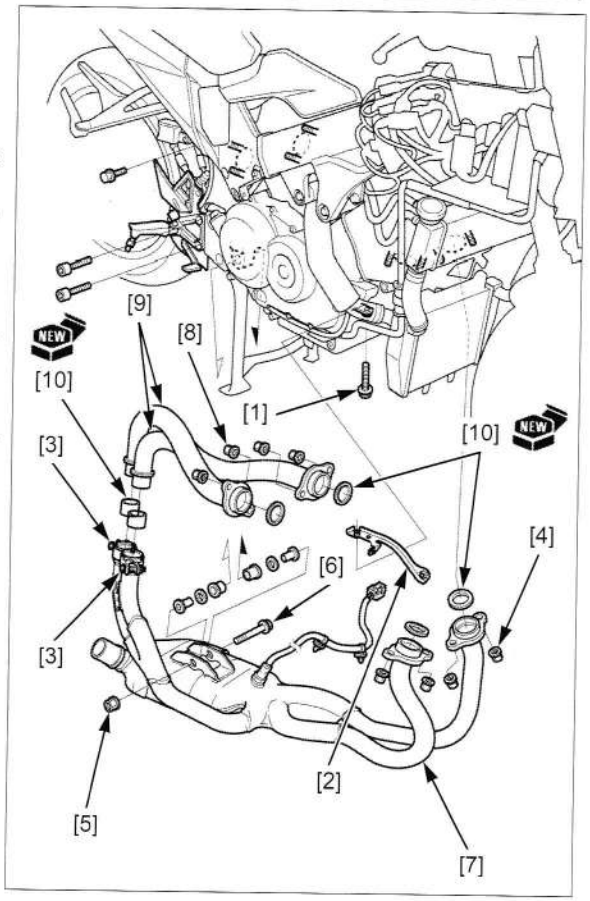
Position the exhaust pipe bands lengthwise as shown to be sure that the band tab is aligned with the pipe groove.

Install the front exhaust pipe by connecting it with the rear exhaust pipes, and setting the mounting stays over the bracket and the exhaust pipe flanges onto the stud bolts.

The mounting bolt is installed from the left side.

Install the joint nuts, mounting bolt and nut, and screw all the fasteners in fully.

Tighten the fasteners to the specified torque in the sequence as follows:



- front exhaust pipe joint nuts
- rear exhaust pipe joint nuts
- exhaust pipe band bolts
- exhaust pipe mounting nut

TORQUE:

Exhaust pipe joint nut: 12 N·m (1.2 kgf·m, 9 lbf·ft)
12 N·m (1.2 kgf·m, 9 lbf·ft)
Exhaust pipe band bolt:
21 N·m (2.1 kgf·m, 15 lbf·ft)

Install the lower radiator stay and tighten the bolt.

Install the muffler (page 2-15).

Install the removed parts in the reverse order of removal.

STUD BOLT REPLACEMENT

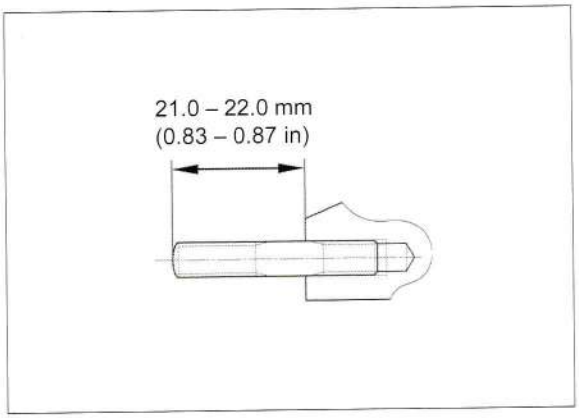
Remove the exhaust pipe (page 2-16).

Thread two nuts onto the stud bolt and tighten them together using a wrench on the inner nut to turn the stud bolt out.

Install a new stud bolt with the short threads facing the cylinder head.

Tighten the stud bolt so the length from the bolt head to the cylinder head surface is within specification.

Install the exhaust pipe (page 2-16).



MEMO

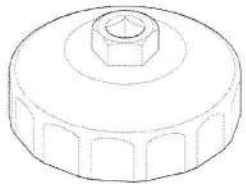
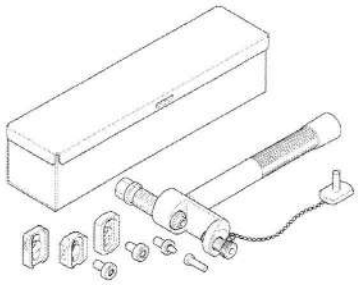
SERVICE INFORMATION 3-2
MAINTENANCE SCHEDULE 3-3
FUEL LINE 3-4
THROTTLE OPERATION 3-4
AIR CLEANER 3-5
SPARK PLUG 3-6
VALVE CLEARANCE 3-7
ENGINE OIL 3-10
ENGINE OIL FILTER 3-11
ENGINE IDLE SPEED 3-12
RADIATOR COOLANT 3-13
COOLING SYSTEM 3-13
SECONDARY AIR SUPPLY SYSTEM 3-14
EVAPORATIVE EMISSION CONTROL SYSTEM (AC, II AC types) 3-14
DRIVE CHAIN 3-14
BRAKE FLUID 3-18
BRAKE PADS WEAR 3-19
BRAKE SYSTEM 3-19
BRAKE LIGHT SWITCH 3-20
HEADLIGHT AIM 3-21
CLUTCH SYSTEM 3-21
CLUTCH FLUID 3-22
SIDESTAND 3-23
SUSPENSION 3-23
NUTS, BOLTS, FASTENERS 3-25
WHEELS/TIRES 3-26
STEERING HEAD BEARINGS 3-26

SERVICE INFORMATION

GENERAL

- Place the motorcycle on a level surface before starting any work.

TOOLS

Oil filter wrench 07HAA-PJ70101  or 07AMA-MFJA100 (U.S.A. only)	Drive chain tool set 07HMH-MR10103  or 07HMH-MR1010C (U.S.A. only)	Slide pin stopper 07XMZ-MCE0100  or 07XMZ-MCEA100 (U.S.A. only)

MAINTENANCE SCHEDULE

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

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

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

		ITEMS	NOTE	FREQUENCY (NOTE 1)								REFER TO PAGE
				x 1,000 mi	0.6	4	8	12	16	20	24	
				x 1,000 km	1.0	6.4	12.8	19.2	25.6	32.0	38.4	
EMISSION RELATED ITEMS	*	FUEL LINE					I		I		I	3-4
	*	THROTTLE OPERATION					I		I		I	3-4
		AIR CLEANER	NOTE 2					R			R	3-5
		SPARK PLUG			Every 25,600 km (16,000 mi): I Every 51,200 km (32,000 mi): R							3-6
	*	VALVE CLEARANCE							I			3-7
		ENGINE OIL			INITIAL = 1,000 km (600 mi) or 1 month: R, REGULAR = Every 12,800 km (8,000 mi) or 12 months: R							3-10
		ENGINE OIL FILTER			R		R		R		R	3-11
	*	ENGINE IDLE SPEED			I	I	I	I	I	I	I	3-12
		RADIATOR COOLANT	NOTE 4				I		I		R	3-13
	*	COOLING SYSTEM					I		I		I	3-13
	*	SECONDARY AIR SUPPLY SYSTEM							I			3-14
	*	EVAPORATIVE EMISSION CONTROL SYSTEM	NOTE 3					I			I	3-14
NON-EMISSION RELATED ITEMS		DRIVE CHAIN			Every 800 km (500 mi): I, L							3-14
		BRAKE FLUID	NOTE 4			I	I	R	I	I	R	3-18
		BRAKE PAD WEAR				I	I	I	I	I	I	3-19
		BRAKE SYSTEM			I		I		I		I	3-19
		BRAKE LIGHT SWITCH					I		I		I	3-20
		HEADLIGHT AIM					I		I		I	3-21
		CLUTCH SYSTEM					I		I		I	3-21
		CLUTCH FLUID	NOTE 4			I	I	R	I	I	R	3-22
		SIDESTAND					I		I		I	3-23
	*	SUSPENSION					I		I		I	3-23
	*	NUTS, BOLTS, FASTENERS			I		I		I		I	3-25
	**	WHEELS/TIRES					I		I		I	3-26
	**	STEERING HEAD BEARINGS			I		I		I		I	3-26

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

** In the interest of safety, we recommend these items be serviced only by a dealer.

NOTES:

1. At higher odometer readings, repeat at the frequency interval established here.
2. Service more frequently when riding in unusually wet or dusty areas.
3. AC, II AC types; 50-State (meets California emission standards)
4. Replace every 2 years, or at indicated odometer interval, whichever comes first. Replacement requires mechanical skill.

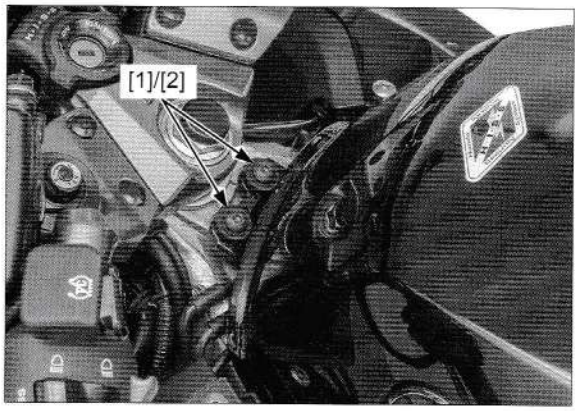
FUEL LINE

FUEL TANK LIFTING/LOWERING

Remove the following:

- front seat (page 2-3)
- side covers (page 2-4)

Remove the two socket bolts [1] and washers [2].



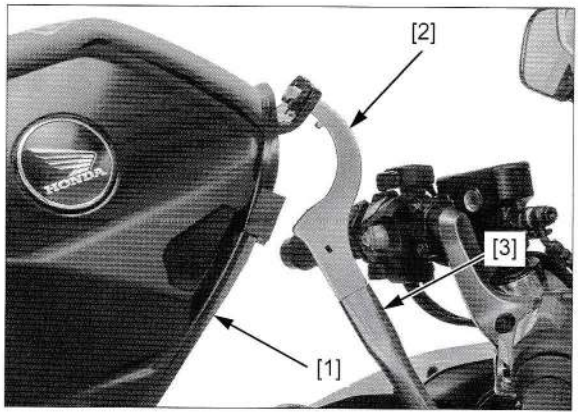
Temporarily install the removed socket bolt into either bolt hole in the frame.

Support the fuel tank [1] with the pin spanner [2] and extension bar [3] of the tool kit.

Installation is in the reverse order of removal.

NOTE:

- Be sure that the following hoses are not bent or pinched.
  - fuel feed hose
  - fuel tank drain hose
  - fuel tank-to-EVAP canister hose (AC, II AC types)
  - fuel tank breather hose (III CM type)



INSPECTION

Lift the fuel tank and support it (page 3-4).

Check the fuel feed hose for deterioration, damage or leakage.

Also, check the hose fittings for damage or looseness.

Replace the fuel feed hose if necessary (page 7-5).

THROTTLE OPERATION

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

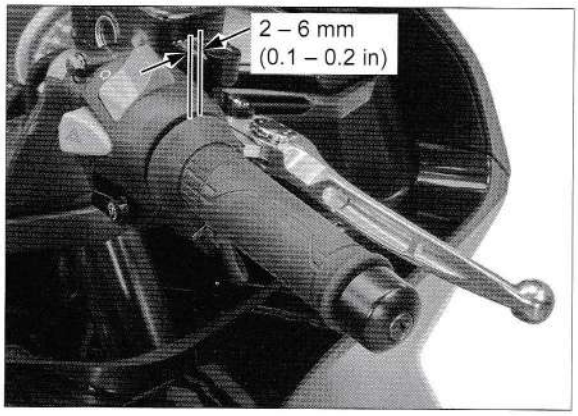
If the throttle grip does not return properly, lubricate and overhaul the throttle grip housing (page 15-11).

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

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

Measure the throttle grip freeplay at the throttle grip flange.

FREEPLAY: 2 – 6 mm (0.1 – 0.2 in)

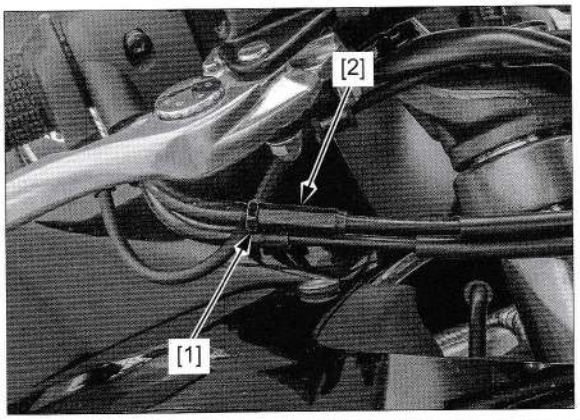


Throttle grip freeplay can be adjusted at either end of the throttle cable.

Minor adjustment is made with the upper adjuster of the throttle grip side.

Loosen the lock nut [1] and turn the adjuster [2] as required.

Tighten the lock nut while holding the adjuster.



Major adjustment is made with the lower adjuster on the throttle body.

Lift the fuel tank and support it (page 3-4).

Remove the socket bolt [1] and the throttle drum cover [2] by releasing the tab [3] from the throttle body plate.

Loosen the lock nut [4] and turn the adjuster [5] as required.

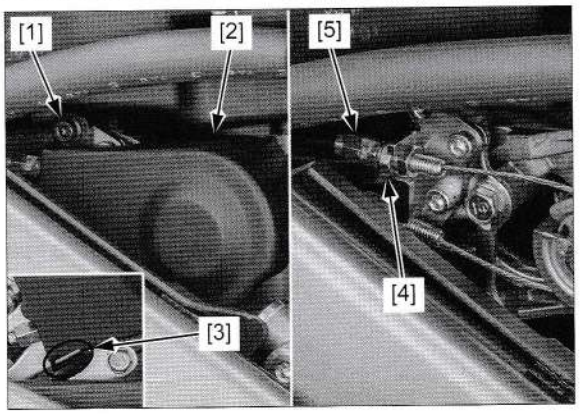
Tighten the lock nut while holding the adjuster.

After adjustment, recheck the throttle operation.

Install the throttle drum cover by setting the tab onto the plate edge and tighten the socket bolt.

TORQUE: 3.4 N·m (0.3 kgf·m, 2.5 lbf·ft)

Install the fuel tank (page 3-4).



AIR CLEANER

NOTE:

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

Lift the fuel tank and support it (page 3-4).

Disconnect the vacuum hose [1] from the intake duct valve diaphragm.

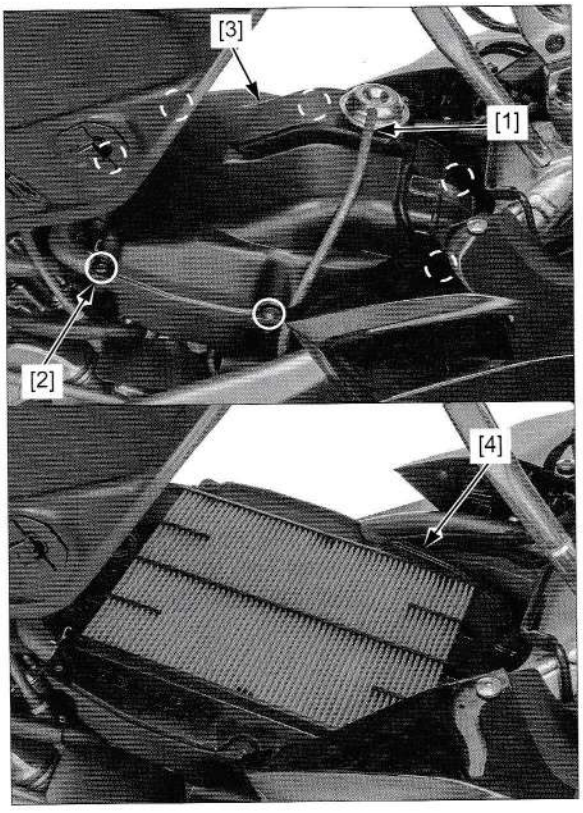
Remove the following:

- seven tapping screws [2]
- air cleaner cover [3]
- air cleaner element [4]

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

Clean the inside of the air cleaner cover and housing. Make sure the rubber seals in the cover and housing are in position and in good condition.

Installation is in the reverse order of removal.



SPARK PLUG

REMOVAL/INSTALLATION

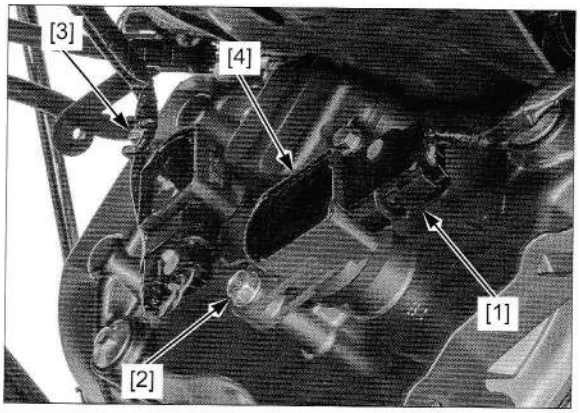
Front cylinder: Remove the following:

- horn (page 20-23)
- radiators (without disconnecting the hoses) (page 8-7)

Move the radiators forward and secure them with straps. Cover the radiator fins to prevent damaging them.

Disconnect the direct ignition coil 3P (Black) connector [1].

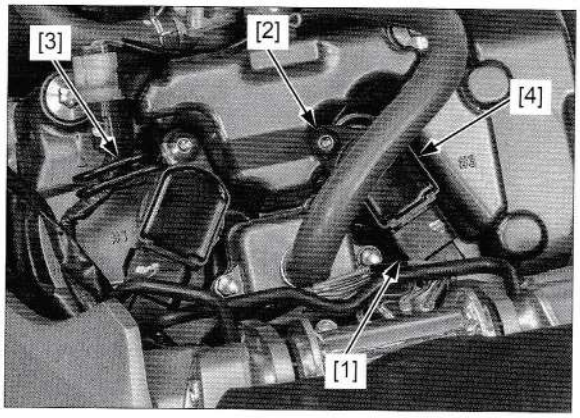
Remove the bolt [2], clamp [3] (No. 4; right only), and direct ignition coil [4].



Rear cylinder: Remove the fuel tank (page 7-11).

Disconnect the direct ignition coil 3P (Black) connector [1].

Remove the bolt [2], clamp [3] (No. 1; left only), and direct ignition coil [4] from the spark plug.



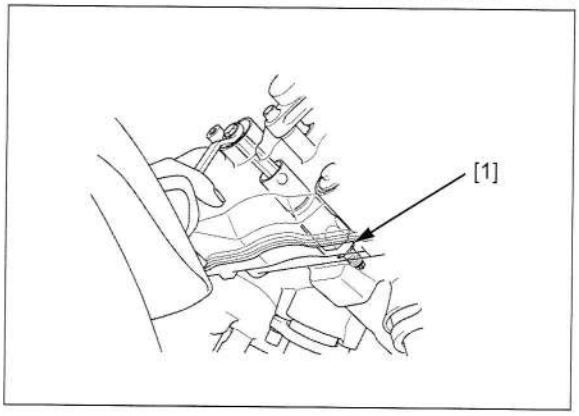
Clean around the spark plug base with compressed air before removing the plug, and be sure that no debris is allowed to enter into the combustion chamber.

Remove the spark plug [1]

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

TORQUE: 16 N·m (1.6 kgf·m, 12 lbf·ft)

Install the removed parts is in the reverse order of removal.



INSPECTION

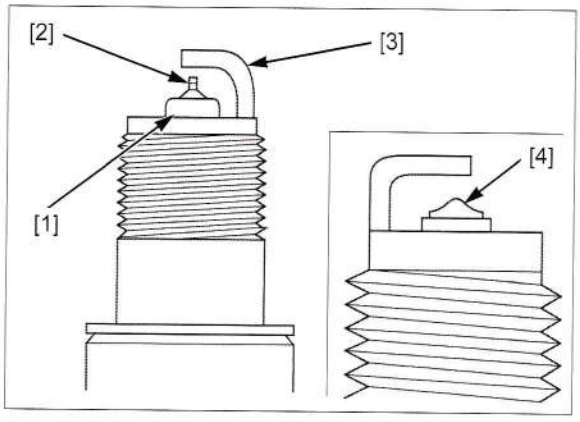
The spark plug is equipped with an iridium center electrode. Do not clean the electrodes.

Check the insulator [1] for cracks or damage and the center and side electrodes [2]/[3] for wear, fouling, or discoloration. Replace the plug if necessary.

Replace the plug if the center electrode is rounded [4] as shown.

Always use the specified spark plugs.

SPECIFIED SPARK PLUG:
IMR9D-9H (NGK)
VNH27ZB (DENSO)



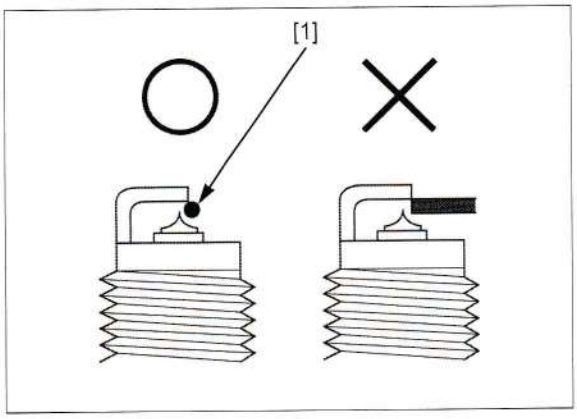
To prevent damaging the iridium center electrode, use a wire-type feeler gauge.

Measure the spark plug between the center and side electrodes with a wire-type feeler gauge [1].

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

Do not adjust the spark plug gap.

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



VALVE CLEARANCE

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

PREPARATION

Remove the valve lifters and slide pin holders from the VTEC side valve lifter bore (page 10-9).

Clean the valve contact areas in the slide pin holder and valve lifter with compressed air.

Install the slide pin stopper [1] into the slide pin hole in the slide pin holder [2].

While pushing in the stopper, install the slide pin holder in the original valve lifter [3] to lock it.

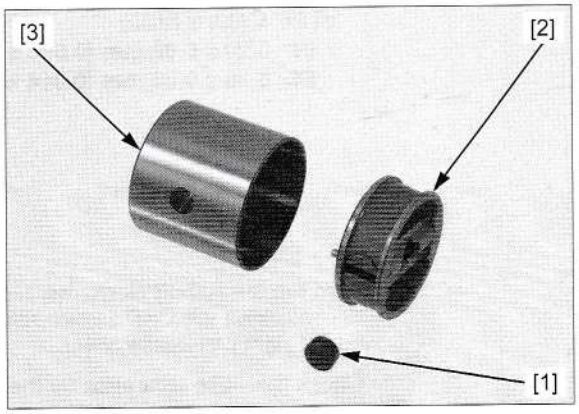
TOOL:

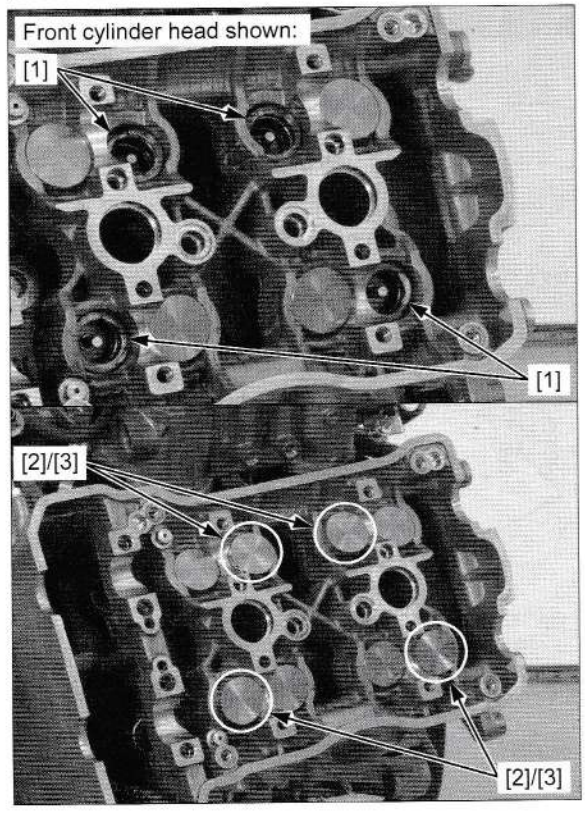
Slide pin stopper	**07XMZ-MCE0100**

Install the slide pin stoppers into all the slide pin holder in the same way.

Remove the VTEC side outer valve springs [1] and install the slide pin holders [2]/valve lifters [3] in their original locations.

Install the camshafts (page 10-13).





INSPECTION

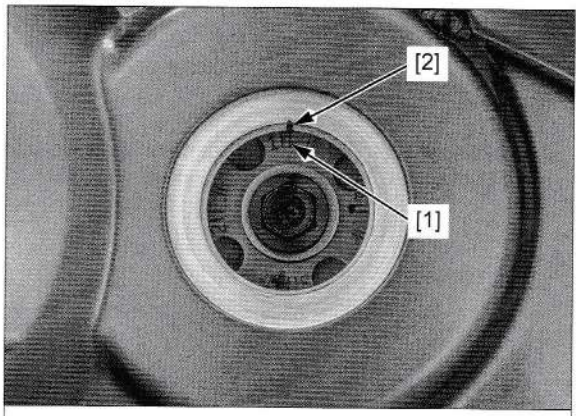
Install the slide pin stopper (page 3-7).

Remove the timing hole cap and O-ring.

Turn the crankshaft clockwise, align the "1T" mark [1] on the CKP sensor rotor with the index mark [2] on the right crankcase cover.

Make sure that the No. 1 piston is at TDC (Top Dead Center) on the compression stroke by checking the cam sprockets position as shown in the figure.

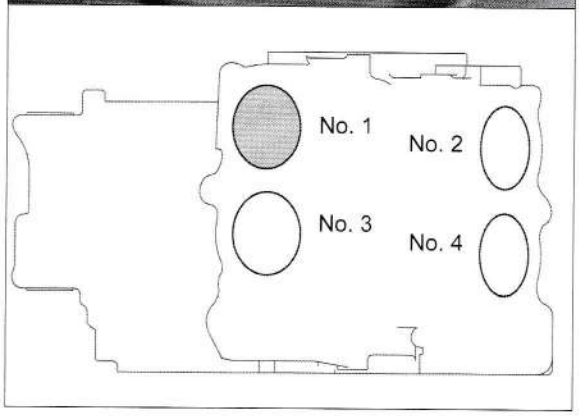
If not, rotate the crankshaft clockwise one full turn and realign the "1T" mark with the index mark.



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

Check the valve clearance for the No. 1 cylinder intake and exhaust valves by inserting a feeler gauge between the valve lifter and the cam lobe.

VALVE CLEARANCE:
NORMAL VALVE SIDE:
IN: 0.20 ± 0.03 mm (0.008 ± 0.001 in)
EX: 0.35 ± 0.03 mm (0.014 ± 0.001 in)
VTEC VALVE SIDE:
IN: 0.20 ± 0.08 mm (0.008 ± 0.003 in)
EX: 0.35 ± 0.08 mm (0.014 ± 0.003 in)



Turn the crankshaft clockwise 1/2 turn (180°), align the "3T" mark on the CKP sensor rotor with the index mark on the right crankcase cover.

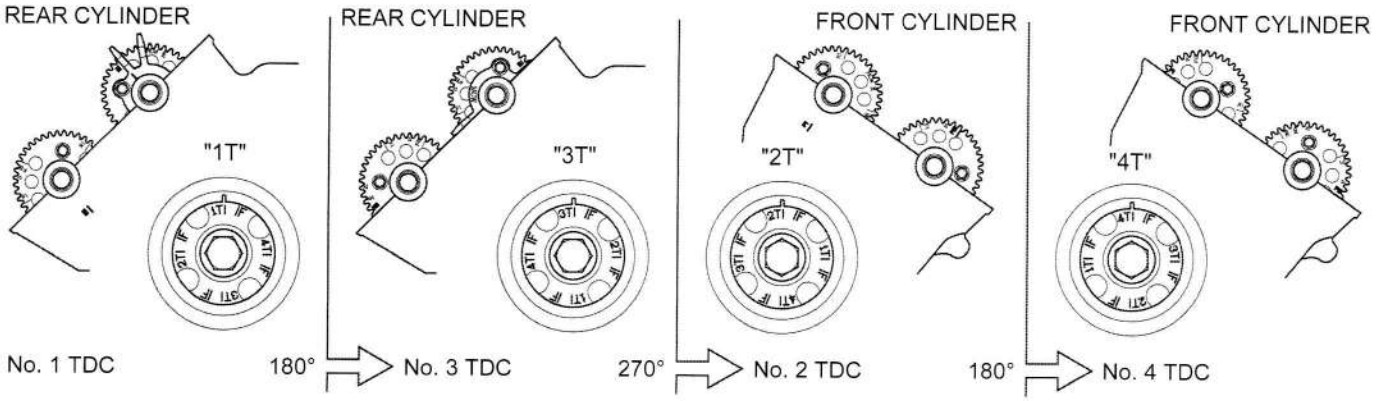
Check the valve clearance for the No. 3 cylinder.

Turn the crankshaft clockwise 3/4 turn (270°), align the "2T" mark on the CKP sensor rotor with the index mark on the right crankcase cover.

Check the valve clearance for the No. 2 cylinder.

Turn the crankshaft clockwise 1/2 turn (180°), align the "4T" mark on the CKP sensor rotor with the index mark on the right crankcase cover.

Check the valve clearance for the No. 4 cylinder.



ADJUSTMENT

NORMAL VALVE SIDE

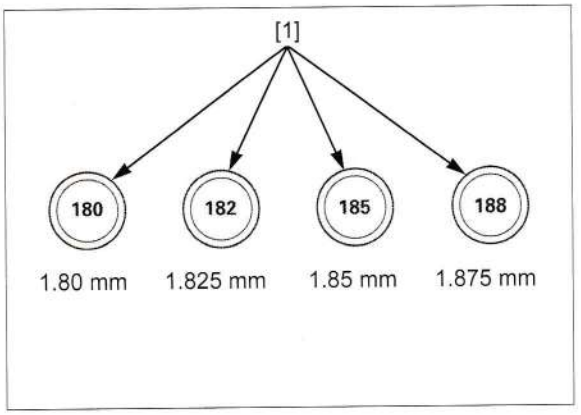
Remove the valve lifters and shims from the normal side valve lifter bores (page 10-9).

Clean the valve shim [1] contact area in the valve lifter with compressed air.

Measure the shim thickness and record it.

NOTE:

- Sixty-five different thickness shims are available from 1.200 mm to 2.800 mm thickness in intervals of 0.025 mm.



Calculate the new shim thickness using the equation below:

A = (B – C) + D
- A: New shim thickness
- B: Recorded valve clearance
- C: Specified valve clearance
- D: Old shim thickness

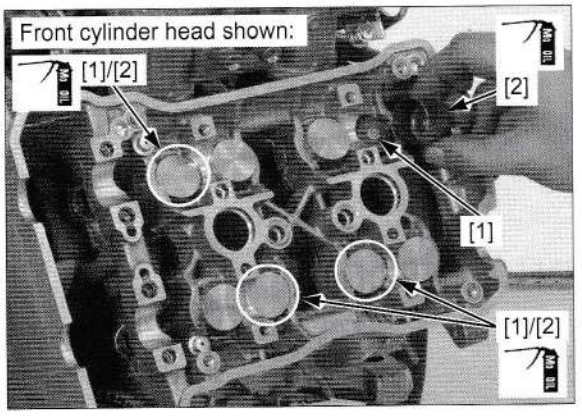
NOTE:

- Make sure of the correct shim thickness by measuring the shim with the micrometer.
- Reface the valve seat if carbon deposit result in a calculated dimension of over 2.800 mm.

Install the newly selected shims [1] onto the valve retainers.

Apply molybdenum oil solution to the valve lifters [2] outer sliding surface.

Install the valve lifters in their original locations.



VTEC VALVE SIDE

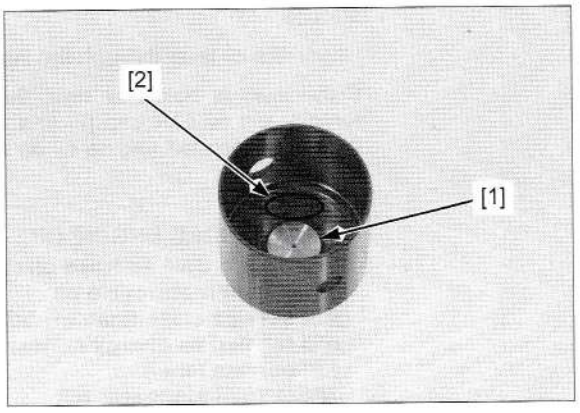
Remove the valve lifters and slide pin holders from the VTEC side valve lifter bores (page 10-9).

Clean the valve contact areas in the slide pin holder and valve lifter with compressed air.

Measure the valve lifter thickness of the slide pin holder contact area [1] and record it.

NOTE:

- Sixty-five different thickness valve lifters are available from 1.200 mm to 2.800 mm thickness in intervals of 0.025 mm (the thickness letter [2] is located near the contact area).



Calculate the new valve lifter thickness using the equation below:

A = (B – C) + D
- A: New valve lifter thickness
- B: Recorded valve clearance
- C: Specified valve clearance
- D: Old valve lifter thickness

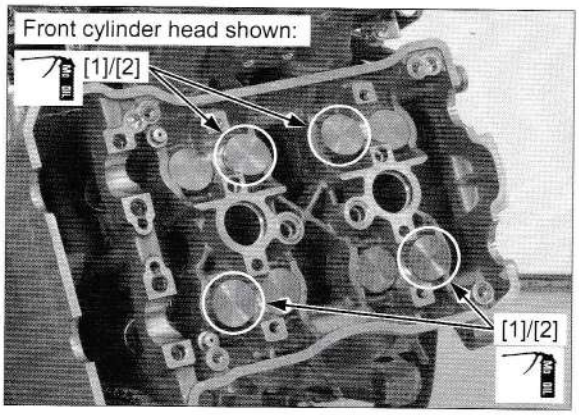
NOTE:

- Make sure of the correct valve lifter thickness by measuring the valve lifter with the micrometer.
- Reface the valve seat if carbon deposit result in a calculated dimension of over 2.800 mm.

Install the slide pin holder with the slide pin stopper into the newly selected valve lifter (page 3-7).

Apply molybdenum oil solution to the valve lifters outer sliding surface.

Install the slide pin holders [1]/valve lifters [2] in their original locations.



Install the camshafts (page 10-13).

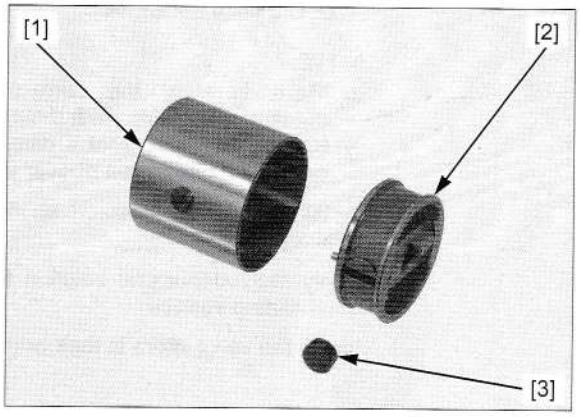
Rotate the camshafts by rotating the crankshaft clockwise several times.
Recheck the valve clearances (page 3-8).

Remove the camshafts (page 10-9).

Remove the VTEC side valve lifters [1] and slide pin holders [2] to remove the slide pin stoppers [3].

Install the following in their original locations (page 10-12).

- VTEC side outer valve springs
- slide pin holders
- camshafts



ENGINE OIL

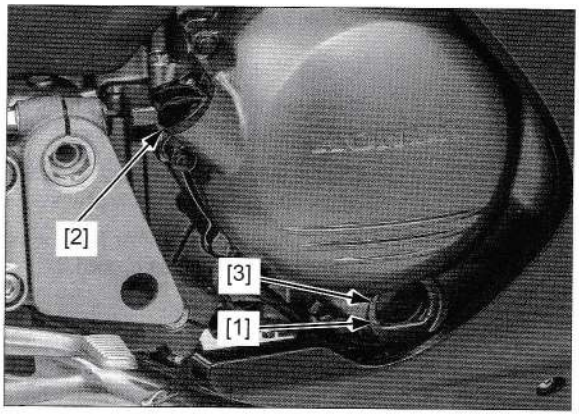
OIL LEVEL CHECK

Start the engine and let it idle for 3 – 5 minutes.
Stop the engine and wait 2 – 3 minutes.

Support the motorcycle in an upright position on a level surface.

Check the oil level through the inspection window.

If the level is below or near the lower level line [1], remove the oil filler cap [2] and fill the crankcase with the recommended engine oil up to the upper level line [3].



RECOMMENDED ENGINE OIL:

Pro Honda GN4 4-stroke oil (U.S.A. & Canada) or equivalent motorcycle oil
API service classification: SG or higher (except oils labeled as energy conserving on the circular API service label)
JASO T903 standard: MA
Viscosity: SAE 10W-30

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

Apply engine oil to the O-ring.

Install the filler cap.

OIL CHANGE

Remove the left under cowl (page 2-9).

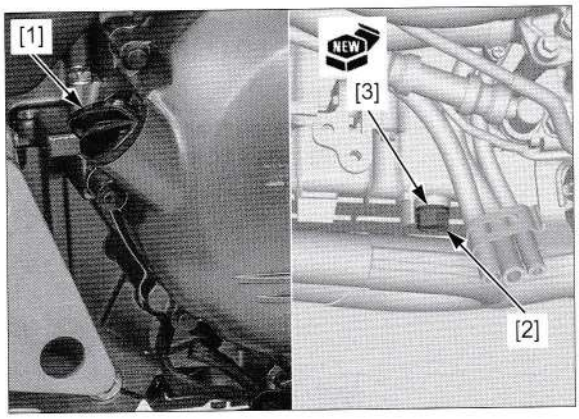
Warm up the engine.

Stop the engine and remove the oil filler cap [1].

Remove the oil drain bolt [2] and sealing washer [3] to drain the engine oil.

After draining the oil completely, install the drain bolt with a new sealing washer.
Tighten the drain bolt to the specified torque.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)



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

ENGINE OIL CAPACITY:
2.9 liters (3.1 US qt, 2.6 Imp qt) at draining
3.1 liters (3.3 US qt, 2.7 Imp qt) at oil filter change
3.9 liters (4.1 US qt, 3.4 Imp qt) at disassembly

Check the oil level (page 3-10).

Make sure there are no oil leaks.

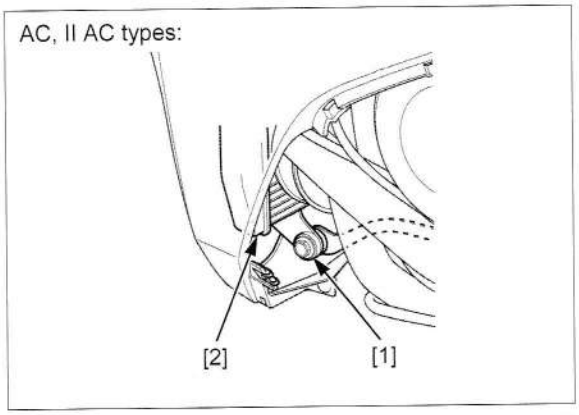
Install the left under cowl (page 2-4).

ENGINE OIL FILTER

Remove the under cowls (page 2-4).

AC, II AC types: Remove the radiator grille (page 2-5).
Remove the lower mounting bolt (washer-bolt) [1] of the lower radiator [2].

Drain the engine oil (page 3-11).



Loosen the oil filter cartridge [1] using the special tool.

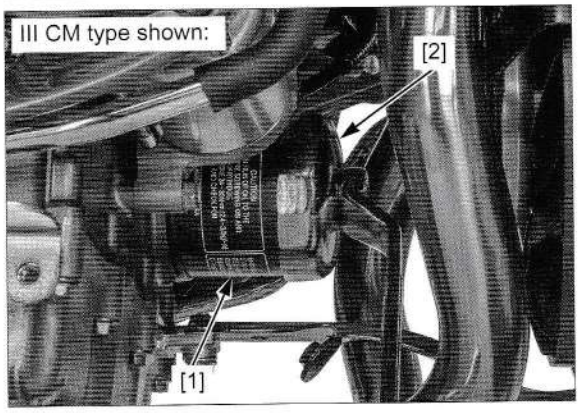
TOOL:
[2] Oil filter wrench 07HAA-PJ70101

III CM type: Remove the filter cartridge to the right side.

AC, II AC types: Slightly move the lower radiator forward and remove the filter cartridge through the exhaust pipes.

After draining the oil completely, install the drain bolt with a new sealing washer.
Tighten the drain bolt to the specified torque.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

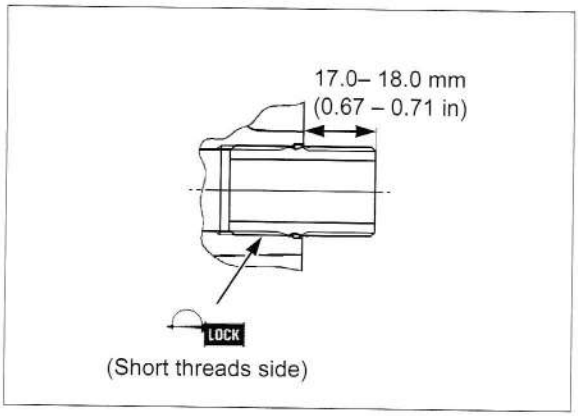


Check that the oil filter boss protrusion from the crankcase is specified length as shown.

SPECIFIED LENGTH: 17.0 – 18.0 mm (0.67 – 0.71 in)

NOTE:

- If the oil filter boss is removed, apply locking agent to the oil filter boss threads and install it (page 1-17).

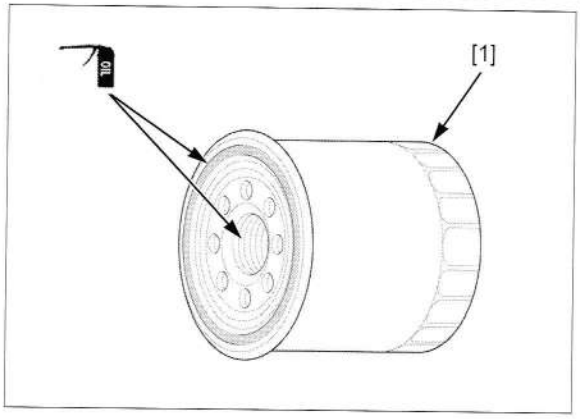


Apply engine oil to the threads and O-ring of a new oil filter cartridge [1].

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

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

TORQUE: 26 N·m (2.7 kgf·m, 19 lbf·ft)



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

AC, II AC types: Connect the lower radiator with the mounting bolt and tighten it.
Install the radiator grille (page 2-5).

Install the under cowls (page 2-4).

ENGINE IDLE SPEED

NOTE:

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

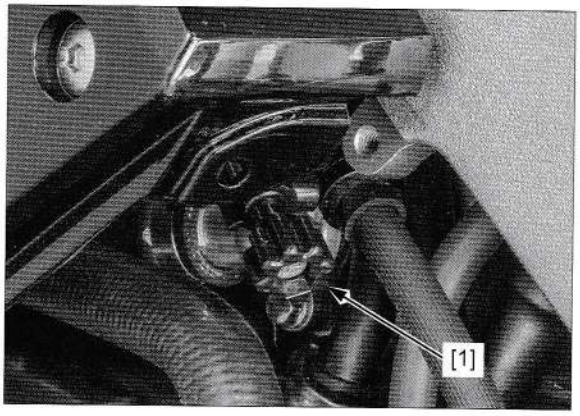
Remove the left under cowl (page 2-4).

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

Turn the throttle stop screw [1] as required to obtain the specified idle speed.

IDLE SPEED: 1,200 ± 100 rpm

Install the left under cowl (page 2-4).

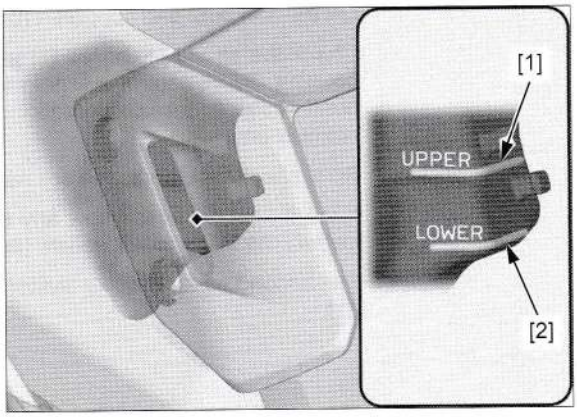


RADIATOR COOLANT

Check the coolant level of the reserve tank through the right side cover opening with the engine running at normal operating temperature.

The level should be between the "UPPER" [1] and "LOWER" [2] level lines with the motorcycle in an upright position on a level surface.

If the level is low, fill as follows:

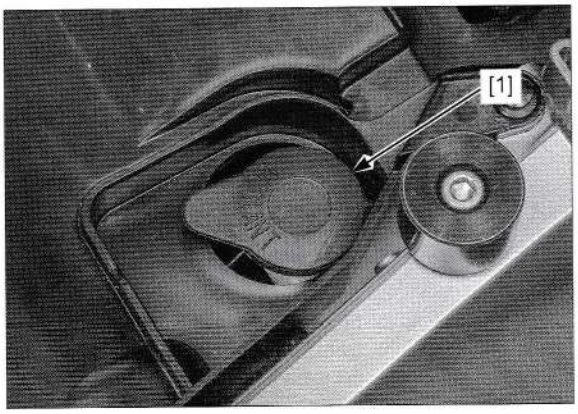


Remove the front seat (page 2-3).

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

RECOMMENDED ANTIFREEZE:

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



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

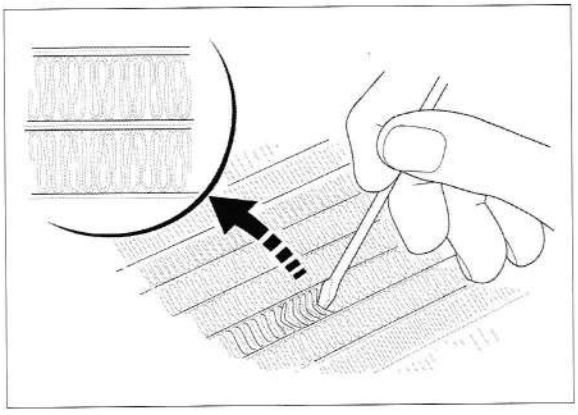
If the reserve tank becomes completely empty, there is a possibility of air getting into the cooling system.
Be sure to remove any air from the cooling system (page 8-5).

Install the reserve tank cap.

Install the front seat (page 2-3).

COOLING SYSTEM

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



Remove the radiator grille (page 2-5).

Check for any coolant leakage from the water hoses and hose joints.
Check the water hoses for cracks or deterioration and replace them if necessary.
Check that all hose clamps are tight.

Install the radiator grille (page 2-5).

SECONDARY AIR SUPPLY SYSTEM

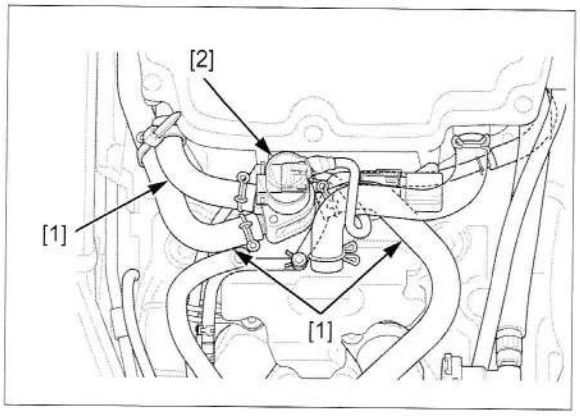
Lift the fuel tank and support it (page 3-4).

Check the air supply hoses [1] between the air cleaner housing, PAIR control solenoid valve [2], and cylinder head covers for deterioration, damage, or loose connections.

Also, check that the hoses are not kinked or pinched.

If the air supply hose show any signs of heat damage, inspect the PAIR check valves (page 7-24).

For secondary air supply system inspection (page 7-21).



EVAPORATIVE EMISSION CONTROL SYSTEM (AC, II AC types)

Remove the following:

- left under cowl (page 2-4)
- right middle cowl (page 2-6)

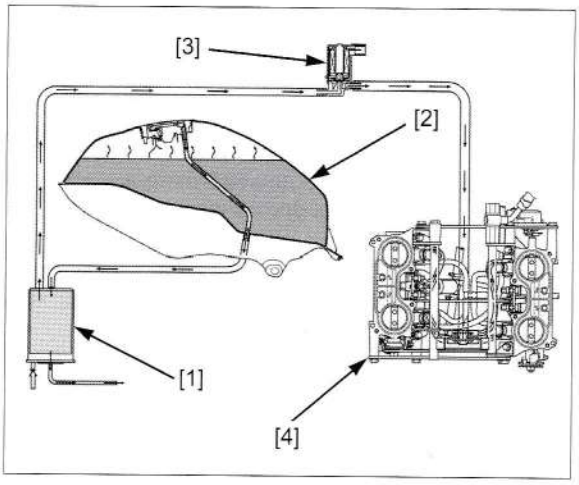
Lift the fuel tank and support it (page 3-4).

Check the EVAP canister [1] for cracks or damage.

Check the hoses between the fuel tank [2], EVAP canister, EVAP purge control solenoid valve [3], and throttle body [4] for deterioration, damage, or loose connections.

Also, check that the hoses are not kinked or pinched.

Refer to the Cable & Harness Routing for hose connections and routing (page 1-20).



DRIVE CHAIN

DRIVE CHAIN SLACK INSPECTION

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

Turn the ignition switch OFF.

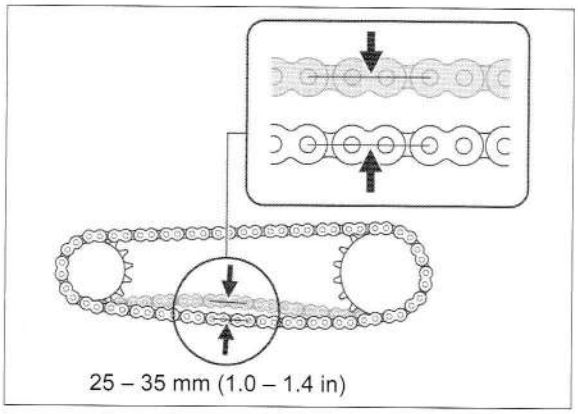
Place the motorcycle on its sidestand and shift the transmission into neutral.

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

DRIVE CHAIN SLACK: 25 – 35 mm (1.0 – 1.4 in)

NOTICE

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



ADJUSTMENT

Loosen the axle bearing holder pinch bolt [1].

Turn the axle bearing holder using the pin spanner and extension bar (tool kit) until the proper drive chain slack is obtained.

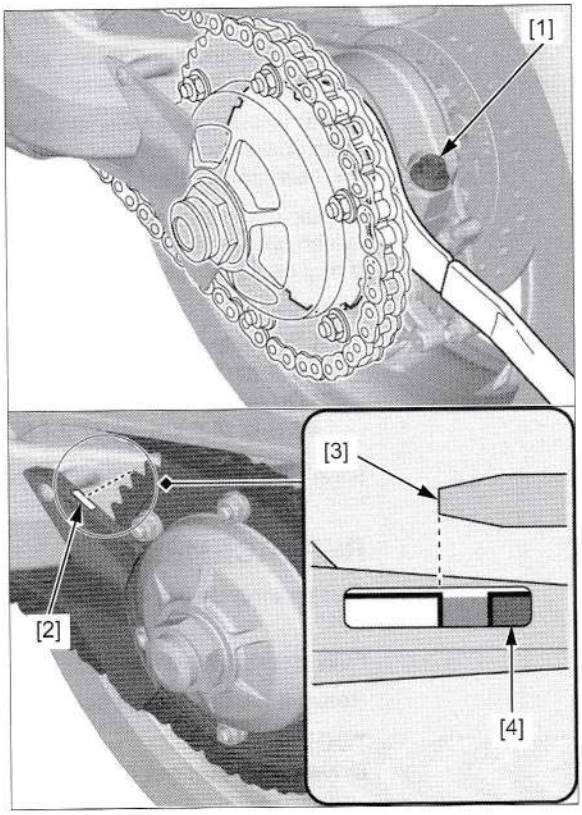
Check the drive chain wear indicator label [2] attached on the air guide.

If the tip of driven sprocket teeth [3] reaches red zone [4] of the indicator label after the chain has been adjusted to the proper slack, replace the drive chain with a new one (page 3-16).

Tighten the axle bearing holder pinch bolt to the specified torque.

TORQUE: 88 N·m (9.0 kgf·m, 65 lbf·ft)

Recheck the drive chain slack and free wheel rotation.



CLEANING AND LUBRICATION

Clean the drive chain [1] with a chain cleaner designed specifically for O-ring chains or a neutral detergent. Use a soft brush if the drive chain is dirty.

NOTICE

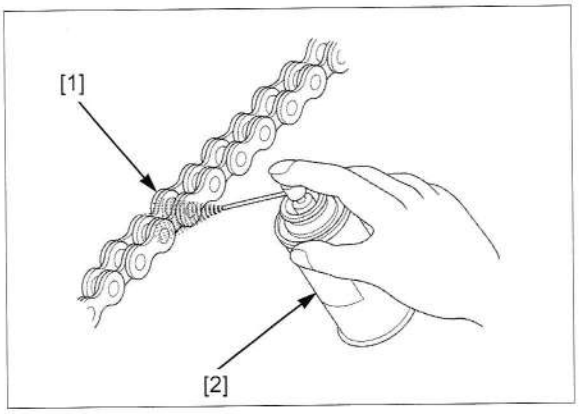
Do not use a steam cleaner, high pressure cleaner, wire brush, volatile solvent such as gasoline and benzene, abrasive cleaner, or a chain cleaner NOT designed specifically for O-ring chains to clean the drive chain.

Inspect the drive chain for possible damage or wear.

Replace any drive chain that has damaged rollers, loose fitting links, or otherwise appears unserviceable.

Be sure the drive chain has dried completely before lubricating.

Lubricate the drive chain with Pro Honda HP Chain Lube or an equivalent [2].



NOTICE

Do not use a chain lubricant NOT designed specifically for use with O-ring chains to lubricate the drive chain.

Wipe off the excess oil or drive chain lubricant.

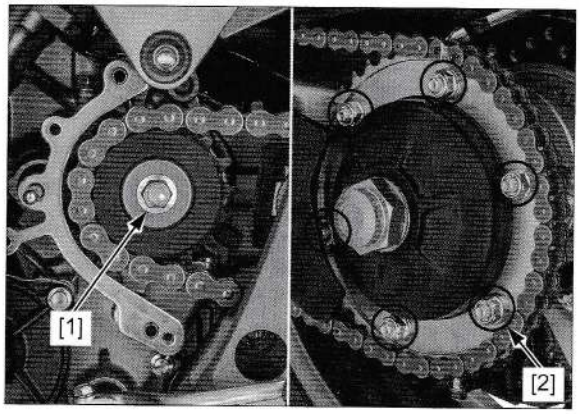
SPROCKET INSPECTION

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

Check the attaching bolt and nuts on the drive and driven sprockets.
If any are loose, torque them to the specified toque.



TORQUE:
[1] Drive sprocket bolt:
51 N·m (5.2 kgf·m, 38 lbf·ft)
[2] Driven sprocket nut:
64 N·m (6.5 kgf·m, 47 lbf·ft)

Install the drive sprocket cover (page 12-7).

REPLACEMENT

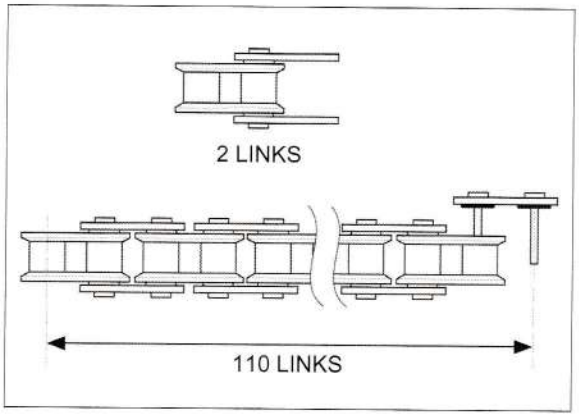
This motorcycle uses a drive chain with a staked master link.

Fully slacken the drive chain (page 3-15).

Remove the drive chain using the special tool.

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

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



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

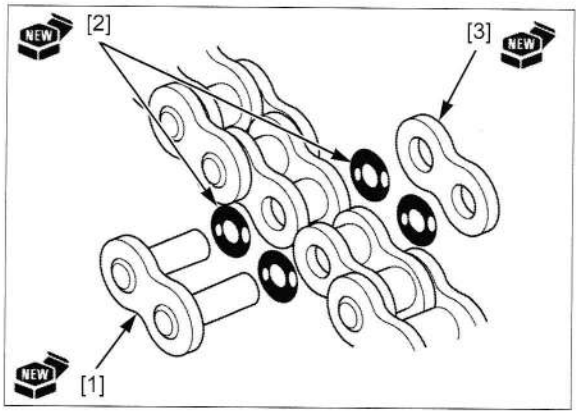
SPECIFIED LINKS: 110 LINKS
REPLACEMENT CHAIN:
DID: DID525HV3
RK: RK525ROZ6

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

Insert a new master link [1] with new O-rings [2] from the inside of the drive chain, and install a new plate [3] and O-rings with the identification mark facing out.

Assemble the master link, O-rings and plate.

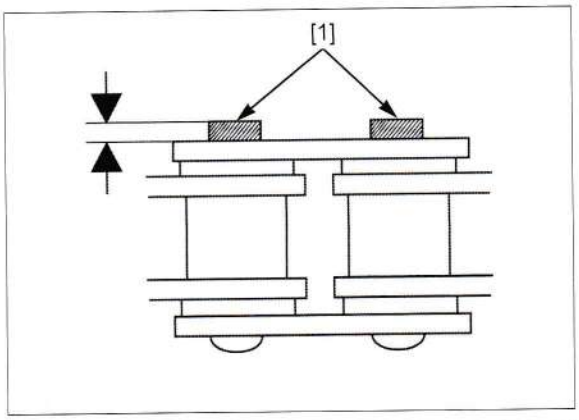
TOOL:
Drive chain tool set **07HMH-MR10103**



Make sure that the master link pins [1] are installed properly.
Measure the master link pin length projected from the plate.

STANDARD LENGTH:
DID: 1.3 – 1.5 mm (0.05 – 0.06 in)
RK: 1.2 – 1.4 mm (0.05 – 0.06 in)

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

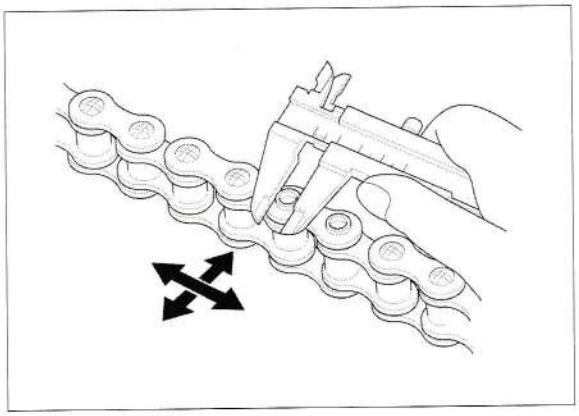


Make sure the pins are staked properly by measuring the diameter of the staked area.

DIAMETER OF STAKED AREA:
DID: 5.50 – 5.80 mm (0.217– 0.228 in)
RK: 5.30 – 5.70 mm (0.209 – 0.224 in)

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

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

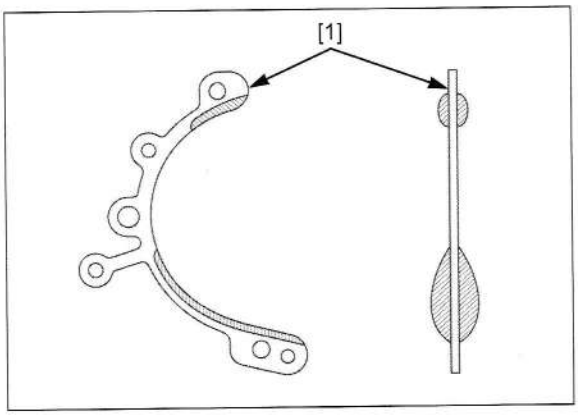


DRIVE CHAIN GUIDE PLATE INSPECTION

Remove the drive chain guide plate (page 12-7).

Avoid damaging the crankcase; periodically inspect the drive chain guide plate [1].

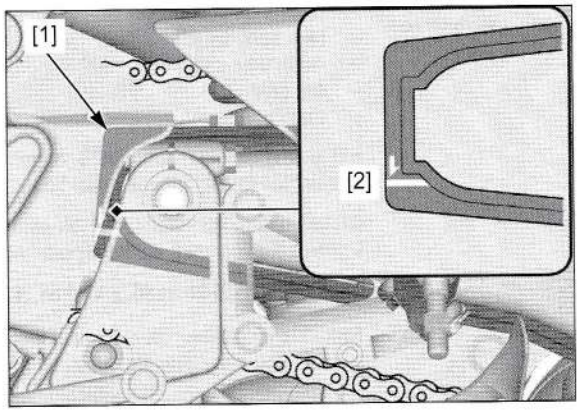
Check the guide plate for wear or damage.
If the drive chain guide plate is excessively worn or damaged, replace it with a new one.



DRIVE CHAIN SLIDER

Check the drive chain slider [1] for wear or damage.

The drive chain slider must be replaced if it is worn to the wear limit line [2] (page 16-16).



BRAKE FLUID

NOTICE

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

NOTE:

- Do not mix different types of fluid, as they are not compatible with each other.
- Do not allow foreign material to enter the system when filling the reservoir.
- When the fluid level is low, check the brake pads for wear (page 3-19).
  A low fluid level may be due to wear of the brake pads. If the brake pads are worn and caliper pistons are pushed out, this accounts for a low fluid level. If the brake pads are not worn and fluid level is low, check the entire system for leaks (page 3-19).

FRONT BRAKE

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

If the level is near the "LOWER" level line [1], fill the brake fluid as follows.

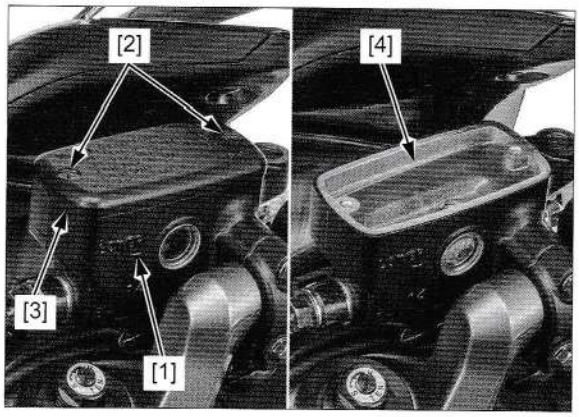
Remove the following:

- two screws [2]
- reservoir cap [3]
- set plate
- diaphragm

Fill the reservoir with DOT 4 brake fluid from a sealed container to the upper level line (casting ledge) [4].

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

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



REAR BRAKE

Support the motorcycle in an upright position on a level surface and check the rear brake fluid level.

If the level is near the "LOWER" level line [1], fill the brake fluid as follows.

Take care to not allow fluid to spill from the reservoir.

Remove the following:

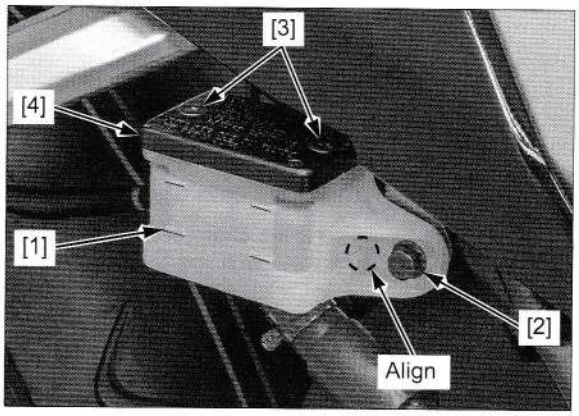
- reservoir mounting bolt [2]
- two screws [3]
- reservoir cap [4]
- set plate
- diaphragm

Fill the reservoir with DOT 4 brake fluid from a sealed container to the upper level line.

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

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

Install the reservoir, aligning the locating pin with the hole in the stay and tighten the mounting bolt.



BRAKE PADS WEAR

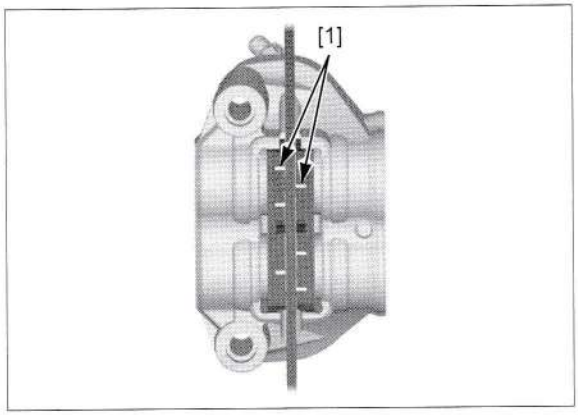
FRONT BRAKE PADS

Check the brake pads for wear from the front side of the caliper.

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

Replace the brake pads if either pad is worn to the bottom of wear limit groove [1].

For brake pad removal/installation (page 17-7).



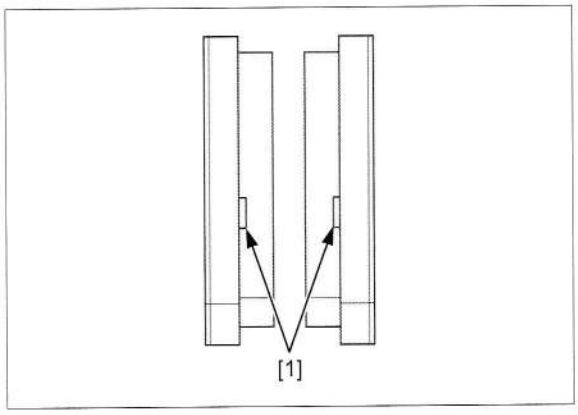
REAR BRAKE PADS

Check the brake pads for wear from the rear side of the caliper.

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

Replace the brake pads if either pad is worn to the wear limit groove [1].

For brake pad removal/installation (page 17-7).



BRAKE SYSTEM

INSPECTION

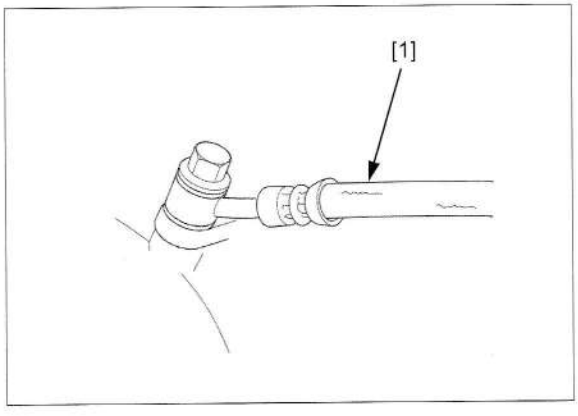
Firmly apply the brake lever or pedal, and check that no air has entered the system.

If the lever or pedal feels soft or spongy when operated, bleed the air from the system (page 17-5).

Inspect the brake hoses [1], pipes, and fittings for deterioration, cracks, damage, and signs of leakage.

Tighten any loose fittings.

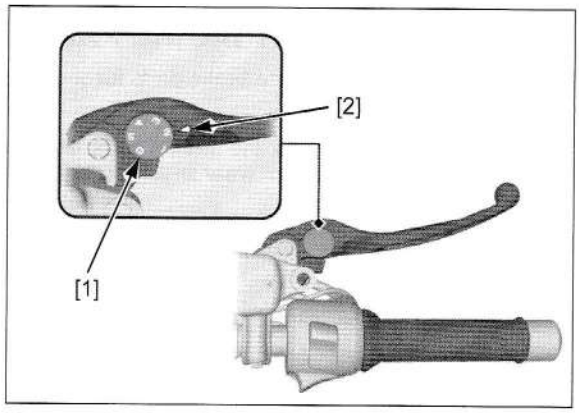
Replace hoses, pipes, and fittings as required.



BRAKE LEVER ADJUSTMENT

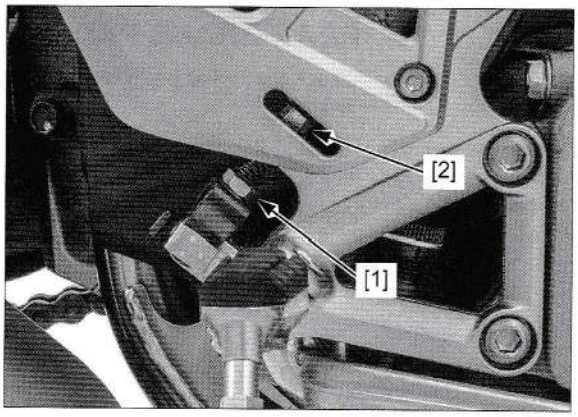
Align the arrow mark [2] on the brake lever with the index number on the adjuster.

Adjust the distance between the brake lever and grip by turning the adjuster [1] while pushing the lever forward in the desired position.



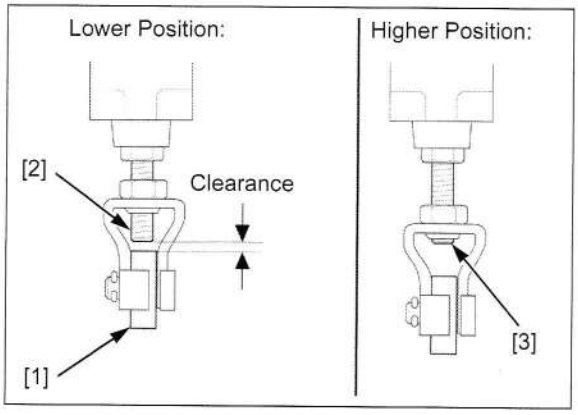
BRAKE PEDAL HEIGHT ADJUSTMENT

Loosen the push rod joint nut [1] and turn the push rod [2] to obtain the desired pedal height.



If the brake pedal [1] is adjusted to the lower position, make sure that the clearance between the lower end of the push rod [2] 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 [3] is visible inside the joint.



BRAKE LIGHT SWITCH

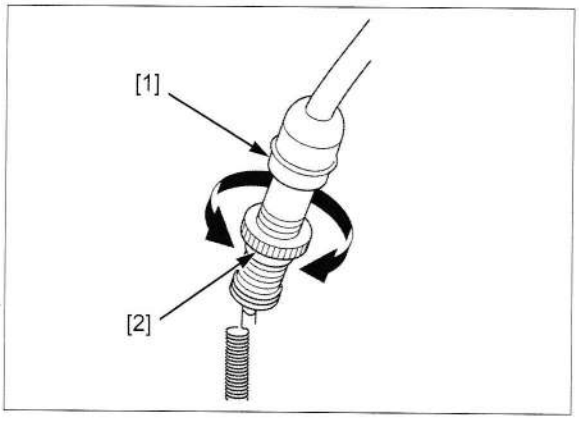
NOTE:

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

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

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

Hold the switch body [1] and turn the adjuster [2]. Do not turn the switch body.



HEADLIGHT AIM

NOTE:

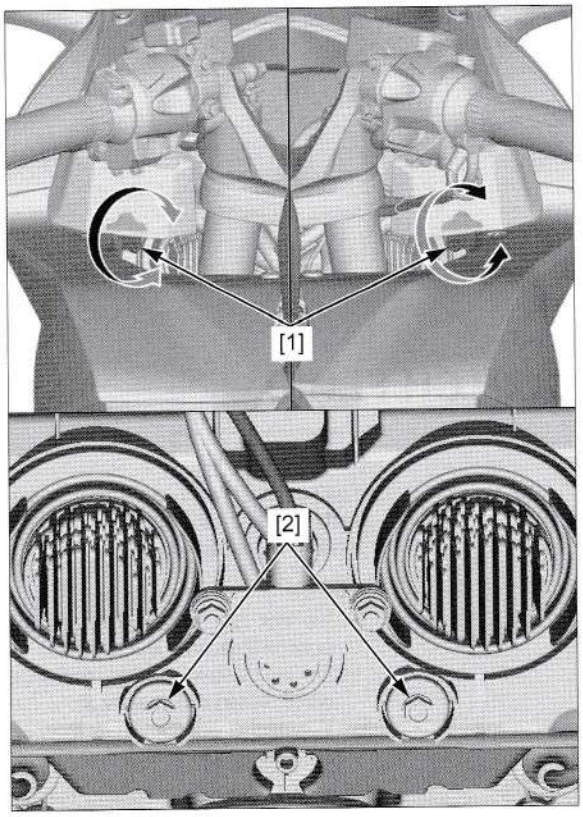
- Adjust the headlight aim as specified by local laws and regulations.

Support the motorcycle in an upright position on a level surface.

Adjust vertically by turning each vertical adjusting knob [1]. A clockwise rotation moves the beam up.

Adjust horizontally by turning each horizontal adjusting screw [2].

Left headlight: A clockwise rotation moves the beam toward the right.
Right headlight: A clockwise rotation moves the beam toward the left.



CLUTCH SYSTEM

INSPECTION

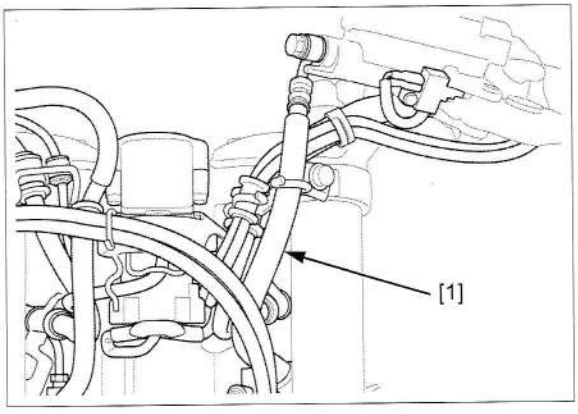
Operate the clutch lever and check that no air has entered the system.

If the clutch does not disengaged properly, or the lever feels soft or spongy, bleed the air from the system (page 11-5).

Inspect the clutch hose [1] and fittings for deterioration, cracks, damage, or signs of leakage.

Tighten any loose fittings.

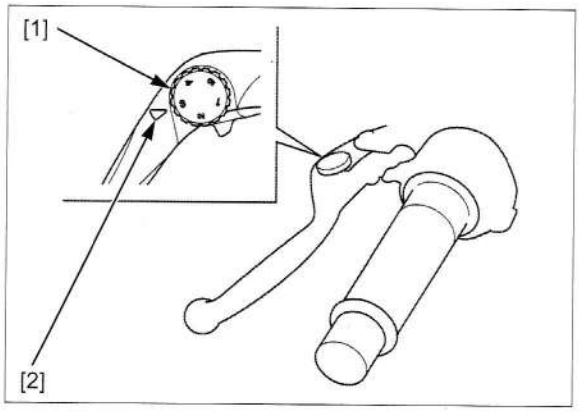
Replace hoses, pipes, and fittings as required.



CLUTCH LEVER ADJUSTMENT

Align the arrow mark [2] on the clutch lever with the index number on the adjuster.

Adjust the distance between the clutch lever and grip by turning the adjuster [1] while pushing the lever forward in the desired position.



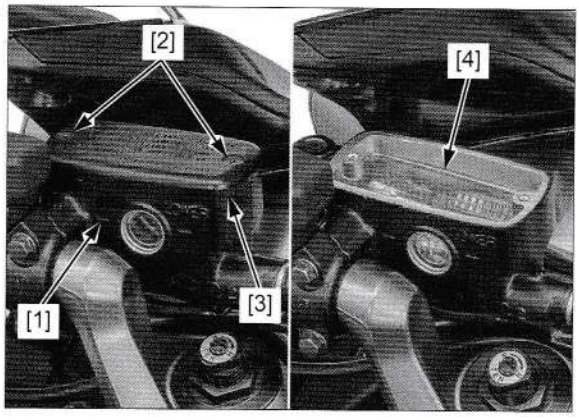
CLUTCH FLUID

NOTICE

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

NOTE:

- Do not mix different types of fluid, as they are not compatible with each other.
- Do not allow foreign material to enter the system when filling the reservoir.
- When the fluid level is low, check entire system for service (page 3-21).



Turn the handlebar so the reservoir is level and check the fluid level through the sight glass.

If the level is near the "LOWER" level line [1], fill the brake fluid as follows.

Remove the following:

- two screws [2]
- reservoir cap [3]
- set plate
- diaphragm

Fill the reservoir with DOT 4 brake fluid from a sealed container to the upper level line (casting ledge) [4].

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

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

SIDESTAND

Place the motorcycle on its centerstand (II AC, III CM types) or support the motorcycle using a safety stand or equivalent (AC type).

Check the sidestand spring for damage or loss of tension.

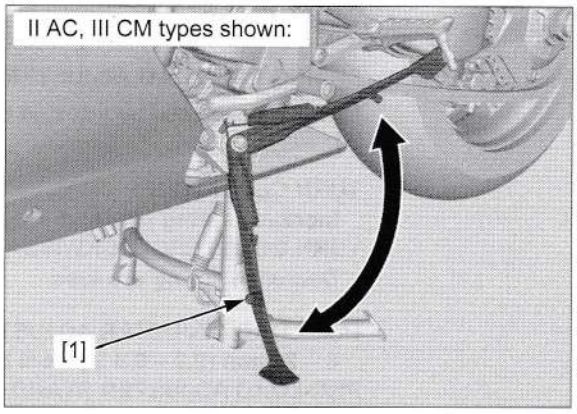
Check the sidestand [1] for movement and lubricate the sidestand pivot if necessary.

For sidestand removal/installation (page 2-14).

Check the sidestand ignition cut-off system:

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

If there is a problem with the system, check the sidestand switch (page 20-22).



SUSPENSION

FRONT SUSPENSION INSPECTION

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

Replace damaged components which cannot be repaired.

Tighten all fasteners.

For fork service (page 15-17).

REAR SUSPENSION INSPECTION

Check the action of the shock absorber by compressing it several times.
Check the entire shock absorber assembly for leaks, damage, or loose fasteners.

Replace damaged components which cannot be repaired.

Tighten all fasteners.

For shock absorber service (page 16-13).

Raise the rear wheel off the ground by placing the motorcycle on its centerstand (II AC, III CM types) or supporting the motorcycle securely using a hoist or equivalent (AC type).

Check for worn swingarm bearings by grabbing the swingarm end and attempting to move it side to side.

Replace the bearings if any looseness to noted.

For swingarm service (page 16-16).

FRONT SUSPENSION ADJUSTMENT (II AC, III CM types)

NOTE:

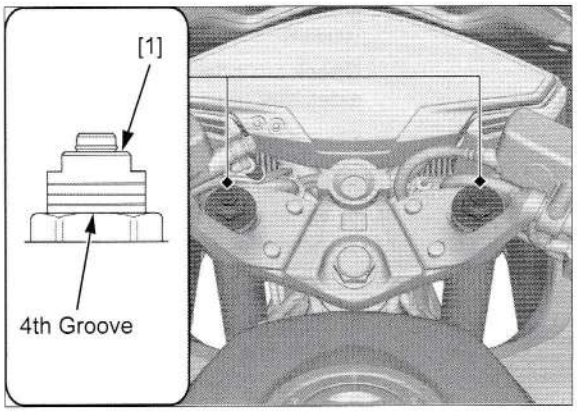
- To adjust both sides equally, set the right and left adjusters to the same position.

SPRING PRE-LOAD ADJUSTER

Spring pre-load can be adjusted by turning the adjuster [1].

TURN CLOCKWISE:
Increase spring pre-load
TURN COUNTERCLOCKWISE:
Decrease spring pre-load

PRE-LOAD ADJUSTER ADJUSTABLE RANGE:
6 – 21 mm (0.2 – 0.8 in) from top
PRE-LOAD ADJUSTER STANDARD POSITION:
4th groove/14 mm (0.2 in) from top



REBOUND DAMPING ADJUSTER

NOTICE

Do not turn the adjusters more than given positions or the adjusters may be damaged.

NOTE:

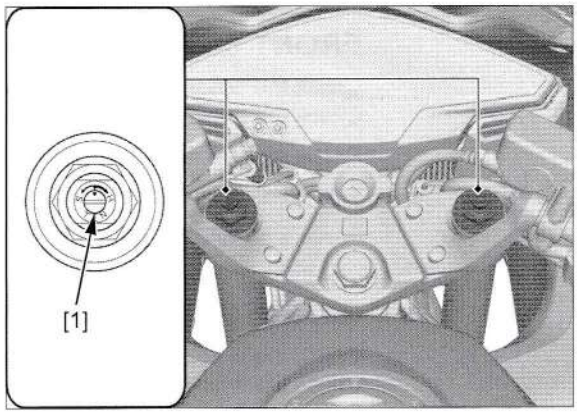
- Damping adjustment is referenced from the full hard position.

The rebound damping can be adjusted by turning the adjusters [1].

DIRECTION H: Increase damping force (hard)
DIRECTION S: Decrease damping force (soft)

Turn the rebound adjuster clockwise until it stops (fully hard position), then turn the adjuster counterclockwise.

REBOUND ADJUSTER ADJUSTABLE RANGE:
1-4/5 – 2-2/5 turns
REBOUND ADJUSTER STANDARD POSITION:
1 turn out from full hard



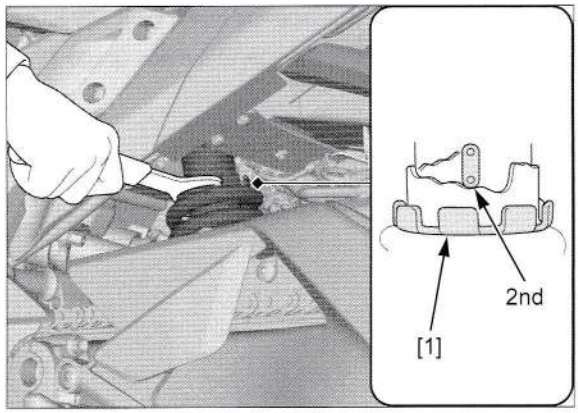
REAR SUSPENSION ADJUSTMENT

SPRING PRE-LOAD ADJUSTER (AC type)

Spring pre-load can be adjusted by turning the adjuster [1].

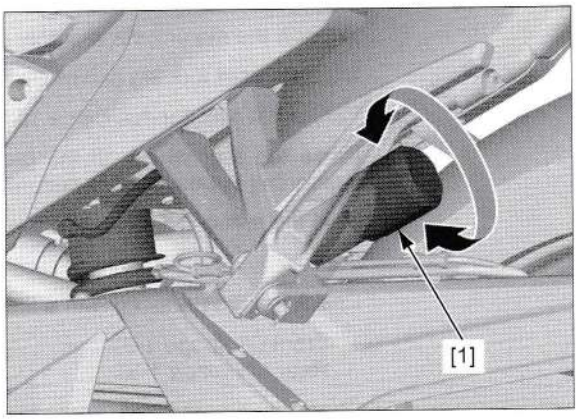
DIRECTION A:
Increase the spring pre-load
DIRECTION B:
Decrease the spring pre-load

PRE-LOAD ADJUSTER ADJUSTABLE RANGE:
7 positions
PRE-LOAD ADJUSTER STANDARD POSITION:
2nd position from minimum



SPRING PRE-LOAD ADJUSTER (II AC, III CM types)

Spring pre-load can be adjusted by turning the adjuster knob [1].



TURN CLOCKWISE:
Increase the spring pre-load
TURN COUNTERCLOCKWISE:
Decrease the spring pre-load

PRE-LOAD ADJUSTER ADJUSTABLE RANGE:
35 clicks
PRE-LOAD ADJUSTER STANDARD POSITION:
7 clicks from minimum

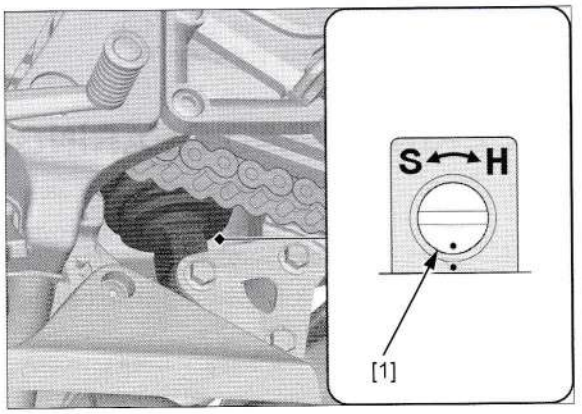
REBOUND DAMPING ADJUSTER

NOTICE

Do not turn the adjuster more than given positions or the adjuster may be damaged.

NOTE:

- Damping adjustment is referenced from the full hard position.



The rebound damping can be adjusted by turning the adjuster [1].

DIRECTION H: Increase damping force (hard)
DIRECTION S: Decrease damping force (soft)

Turn the rebound adjuster clockwise until it stops, (fully hard position) then turn the adjuster counterclockwise.

REBOUND ADJUSTER ADJUSTABLE RANGE:
2 – 3 turns
REBOUND ADJUSTER STANDARD POSITION:
3/4 turns out from full hard

NUTS, BOLTS, FASTENERS

Check that all chassis nuts, screws, and bolts are tightened to their correct torque values (page 1-12).

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

WHEELS/TIRES

Support the motorcycle securely using a hoist or equivalent and raise the front wheel off the ground.

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

For front wheel service (page 15-13).

Raise the rear wheel off the ground by placing the motorcycle on its centerstand (II AC, III CM types) or supporting the motorcycle securely using a hoist or equivalent (AC type).

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

For rear axle related service (page 16-6).

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

- Front tire (page 1-9)
- Rear tire (page 1-9)

Check the tires for cuts, embedded nails, or other damage.
Check the front and rear wheels for trueness.

Measure the tread depth at the center of the tires.
Replace the tires when the tread depth reaches the service limit.

- Front tire (page 1-9)
- Rear tire (page 1-9)

STEERING HEAD BEARINGS

Support the motorcycle securely using a hoist or equivalent and raise the front wheel off the ground.

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

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

If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering bearings (page 15-24).

4. PGM-FI SYSTEM

SERVICE INFORMATION 4-2

PGM-FI SYSTEM LOCATION 4-3

PGM-FI SYSTEM DIAGRAM 4-4

PGM-FI TROUBLESHOOTING INFORMATION 4-5

PGM-FI SYMPTOM TROUBLESHOOTING 4-8

DTC INDEX 4-9

DTC TROUBLESHOOTING 4-11

MIL CIRCUIT INSPECTION 4-42

ECM 4-42

MAP SENSOR 4-43

ECT SENSOR 4-44

IAT SENSOR 4-44

CMP SENSOR 4-44

CKP SENSOR 4-45

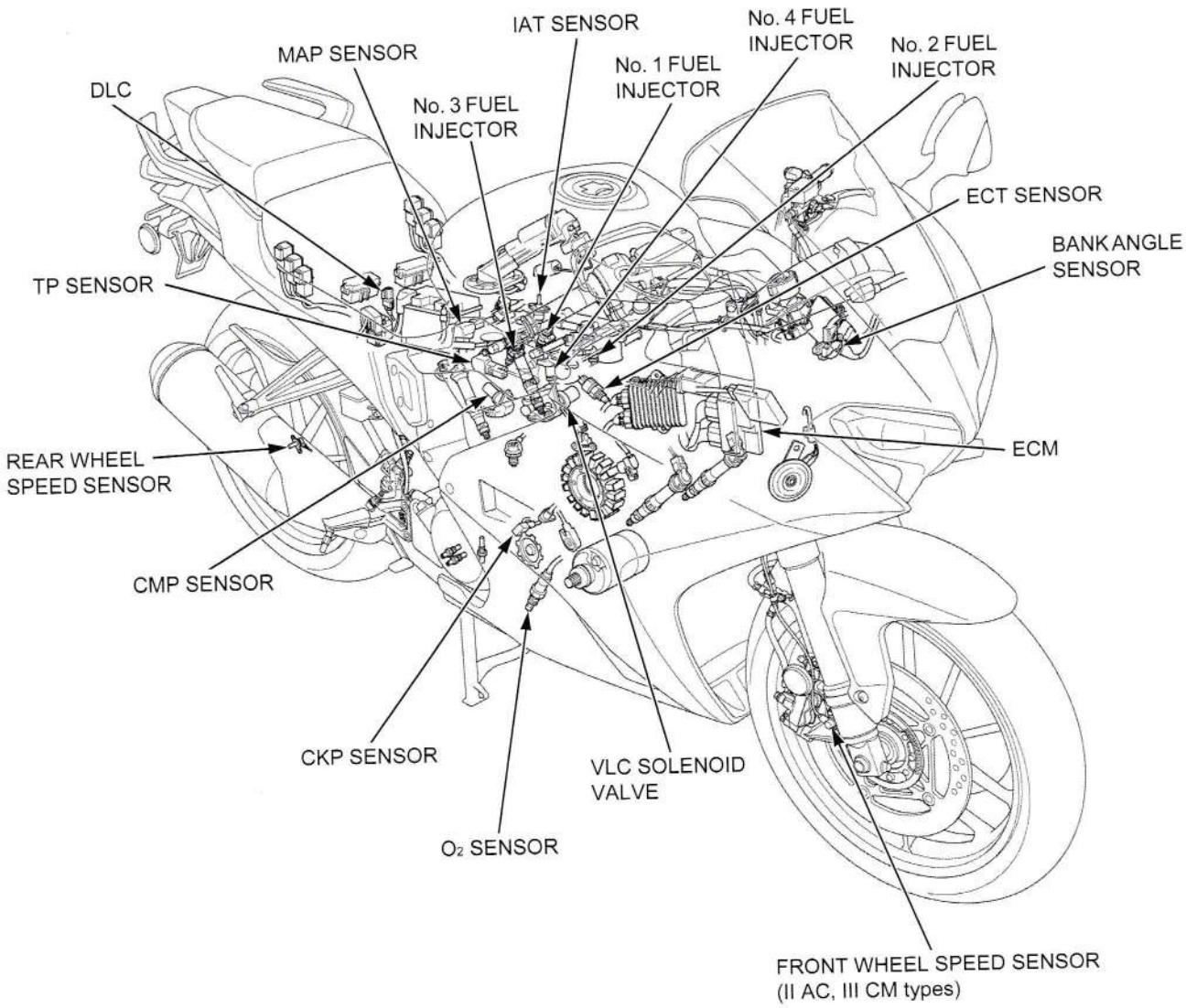
O_2 SENSOR 4-45

BANK ANGLE SENSOR 4-46

VLC SOLENOID VALVE 4-47

ENGINE STOP RELAY 4-47

PGM-FI SYSTEM LOCATION



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 ECM this can mean something may work, but not the way it's supposed to.

If the MIL has come on

Refer to DTC READOUT (page 4-6).

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 4-8).

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-programed value in the simulated program map. When any abnormality is detected in the injector, CKP sensor, and/or CMP sensor, the fail-safe function stops the engine to protect it from damage.

DTC

- 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 MCS.
  The digits in front of the hyphen are the main code, they indicate the component of function failure.
  The digits behind the hyphen are the sub code, they detail the specific symptom of the component or function failure.
  For example, in the case of the TP sensor:
  – DTC 08-1 = (TP sensor voltage) – (lower than the specified value)
  – DTC 08-2 = (TP sensor voltage) – (higher than the specified value)
- The MAP, ECT, TP and IAT sensor diagnosis will be made according to the voltage output of the affected sensor.
  If a failure occurs, the ECM determines the Function Failure, compares the sensor voltage output to the standard value, and then outputs the corresponding DTC to the MCS.
  For example:
  – If the output voltage line 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 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.

MIL BLINK PATTERN

- If the MCS is not available, DTC can be read from the ECM memory by the MIL blink pattern.
- The number of MIL blinks is the equivalent to 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 is turned ON with the engine stop switch "○" or idling with the sidestand down. The MIL will stay ON when the engine speed is over 3,100 rpm or with the sidestand up.
- The MIL has two types of blinks, a long blink and short blink. The long blinking lasts for 1.3 seconds, the short blinking lasts for 0.3 seconds. One long blink is the equivalent of ten short blinks. For example, when two long blinks are followed by seven short blinks, the DTC is 27 (two long blinks = 20 blinks, plus seven 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 with the engine stop switch "○", the MIL will stay on for a few seconds, then go off. If the MIL does not come on or stays on, inspect the MIL circuit (page 4-42).

ERASING DTC

NOTE:

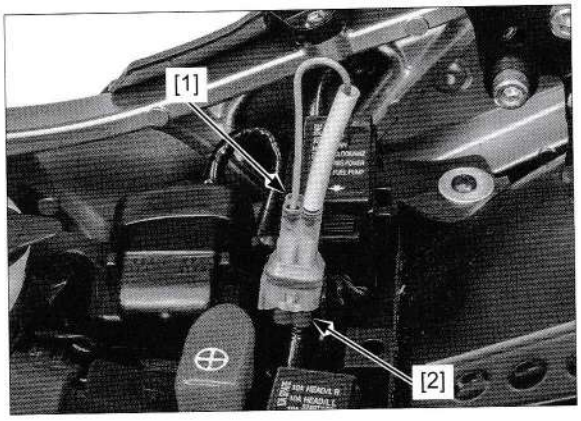
- The stored DTC can not be erased by simply disconnecting the battery negative cable.

Erase the DTC with the MCS while the engine is stopped.

How to erase the DTC without MCS

1. Connect the SCS service connector to the DLC (page 4-6).
2. Turn the ignition switch ON with the engine stop switch "○".
3. Disconnect the SCS service connector [1] from the DLC [2]. Connect the SCS service connector to the DLC again while the MIL stays ON within 5 seconds (reset receiving pattern).
4. The stored DTC is erased if the MIL goes off and starts blinking (successful pattern).

- The DLC must be jumped while the MIL lights. If not, the MIL will go off and stay on (unsuccessful pattern). In that case, turn the ignition switch OFF and try again.
- Note that the self-diagnostic memory cannot be erased if the ignition switch is turned OFF before the MIL starts blinking.



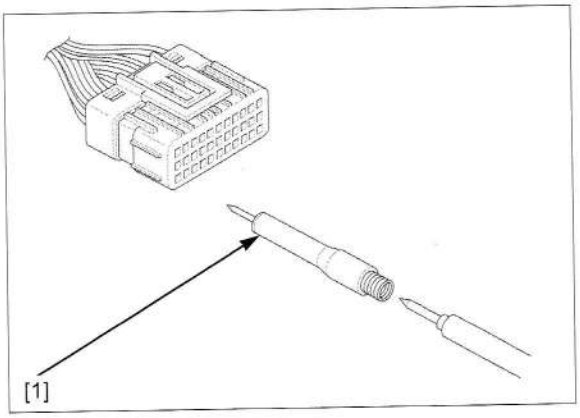
CIRCUIT INSPECTION

INSPECTION AT ECM CONNECTOR

- Always clean around and keep any foreign material away from the ECM 33P 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 33P connector terminal (wire harness side), always use the test probe. Insert the test probe into the connector terminal, then attach the digital multimeter probe to the test probe.

TOOL:

[1] Test probe (2 Pack) **07ZAJ-RDJA110**



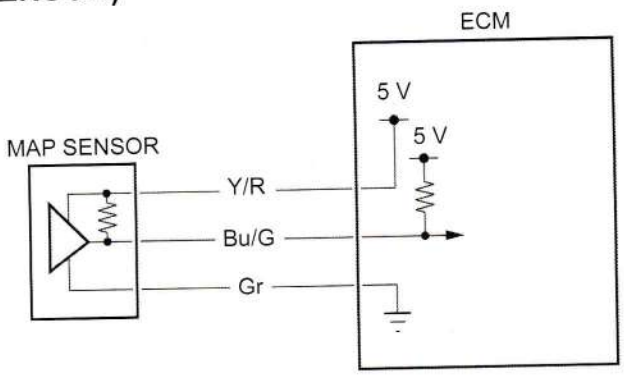
DTC INDEX

NOTE:
- If the MCS is not used, perform all of the inspection on the corresponding main code (digits in front of hyphen) of the DTC.

DTC	Function Failure	Symptom/Fail-safe function	Refer to page
1-1	MAP sensor circuit low voltage (less than 0.2 V) • MAP sensor or its circuit malfunction	• Engine operates normally • Pre-program value: 68 kPa (510 mmHg)	4-11
1-2	MAP sensor circuit high voltage (more than 3.8 V) • Loose or poor contact of the MAP sensor connector • MAP sensor or its circuit malfunction	• Engine operates normally • Pre-program value: 68 kPa (510 mmHg)	4-12
2-1	MAP sensor performance problem • Loose connection or damage of the MAP sensor vacuum hose • Faulty MAP sensor	• Engine operates normally	4-14
7-1	ECT sensor circuit low voltage (less than 0.06 V) • ECT sensor or its circuit malfunction	• Hard start at a low temperature • Pre-program value: 110°C (230°F) • Cooling fan turns on	4-15
7-2	ECT sensor circuit high voltage (more than 4.92 V) • Loose or poor contact of the ECT sensor connector • ECT sensor or its circuit malfunction	• Hard start at a low temperature • Pre-program value: 110°C (230°F) • Cooling fan turns on	4-16
8-1	TP sensor circuit low voltage (less than 0.3 V) • TP sensor or its circuit malfunction • Loose or poor contact of the TP sensor connector	• Poor engine acceleration • Pre-program value: 0°	4-17
8-2	TP sensor circuit high voltage (more than 4.97 V) • TP sensor or its circuit malfunction	• Poor engine acceleration • Pre-program value: 0°	4-19
9-1	IAT sensor circuit low voltage (less than 0.08 V) • IAT sensor or its circuit malfunction	• Engine operates normally • Pre-program value: 35°C (95°F)	4-21
9-2	IAT sensor circuit high voltage (more than 4.92 V) • Loose or poor contact of the IAT sensor connector • IAT sensor or its circuit malfunction	• Engine operates normally • Pre-program value: 35°C (95°F)	4-22
11-1	AC type: Rear wheel speed sensor signal circuit malfunction • Loose or poor contact of the speed sensor or combination meter connector • Rear wheel speed sensor, combination meter or speed sensor signal circuit malfunction	• Engine operates normally	4-23
	II AC, III CM types: Rear wheel speed sensor signal circuit malfunction • Loose or poor contact of the rear speed sensor connector • ABS modulator or rear wheel speed sensor signal circuit malfunction	• Engine operates normally	4-26
12-1	No. 1 fuel injector circuit malfunction • Loose or poor contact of the injector connector • Fuel injector or its circuit malfunction	• Engine does not start • Fuel injectors, fuel pump and ignition shut down	4-28
13-1	No. 2 fuel injector circuit malfunction • Loose or poor contact of the injector connector • Fuel injector or its circuit malfunction	• Engine does not start • Fuel injectors, fuel pump and ignition shut down	4-28
14-1	No. 3 fuel injector circuit malfunction • Loose or poor contact of the injector connector • Fuel injector or its circuit malfunction	• Engine does not start • Fuel injectors, fuel pump and ignition shut down	4-28
15-1	No. 4 fuel injector circuit malfunction • Loose or poor contact of the injector connector • Fuel injector or its circuit malfunction	• Engine does not start • Fuel injectors, fuel pump and ignition shut down	4-28
18-1	CMP sensor no signal • Loose or poor contact of the CMP sensor connector • CMP sensor or its circuit malfunction	• Engine does not start • Fuel injectors, fuel pump and ignition shut down	4-30
19-1	CKP sensor no signal • Loose or poor contact of the CKP sensor connector • CKP sensor or its circuit malfunction	• Engine does not start • Fuel injectors, fuel pump and ignition shut down	4-31
21-1	O_2 sensor malfunction • Loose or poor contact of the O_2 sensor connector • O_2 sensor or its circuit malfunction	• Engine operates normally	4-33

DTC TROUBLESHOOTING

DTC 1 (MAP SENSOR)



Probable cause
- Open circuit in the Yellow/red or Gray wire between the MAP sensor and ECM
- Open or short circuit in the Blue/green wire between the MAP sensor and ECM
- Faulty MAP sensor
- Faulty ECM

DTC 1-1 (MAP SENSOR LOW VOLTAGE)

1. **MAP Sensor System Inspection**

   Check the MAP sensor with the MCS.

   Is about 0 V or below indicated?

   YES – GO TO STEP 2.

   NO – Intermittent failure

2. **MAP Sensor Input Voltage Inspection**

   Remove the fuel tank (page 7-11).
   Turn the ignition switch OFF.
   Disconnect the MAP sensor 3P (Gray) connector [1].
   Turn the ignition switch ON with the engine stop switch "○".

   Measure the voltage between the wire harness side MAP sensor 3P (Gray) connector terminals.

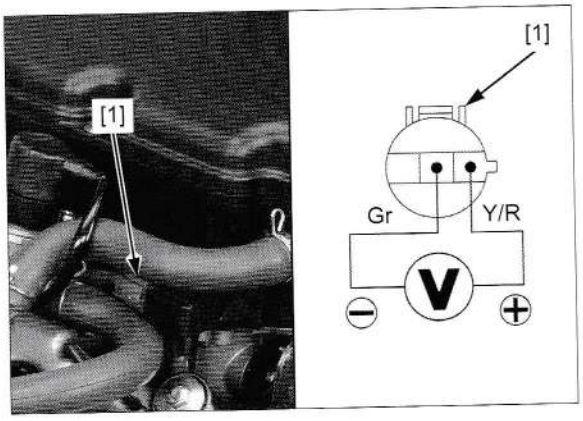
   CONNECTION: Yellow/red (+) – Gray (–)

   STANDARD: 4.75 – 5.25 V

   Is the voltage standard value?

   YES – GO TO STEP 3.

   NO – GO TO STEP 5.



2. **MAP Sensor Input Voltage Inspection**

Remove the fuel tank (page 7-11).
Turn the ignition switch OFF.
Disconnect the MAP sensor 3P (Gray) connector [1].
Turn the ignition switch ON with the engine stop switch "○".
Measure the voltage between the wire harness side MAP sensor 3P (Gray) connector terminals.

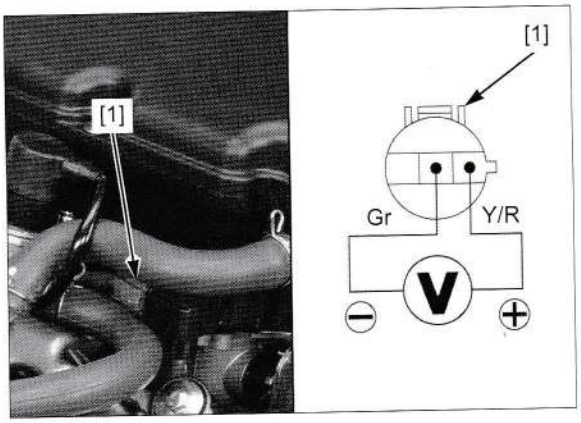
CONNECTION: Yellow/red (+) – Gray (–)

STANDARD: 4.75 – 5.25 V

Is the voltage within standard value?

YES – GO TO STEP 3.

NO – Open circuit in the Gray wire



3. **MAP Sensor System Inspection with Jumper Wire**

Turn the ignition switch OFF.
Connect the wire harness side MAP sensor 3P (Gray) connector [1] terminals with a jumper wire [2].

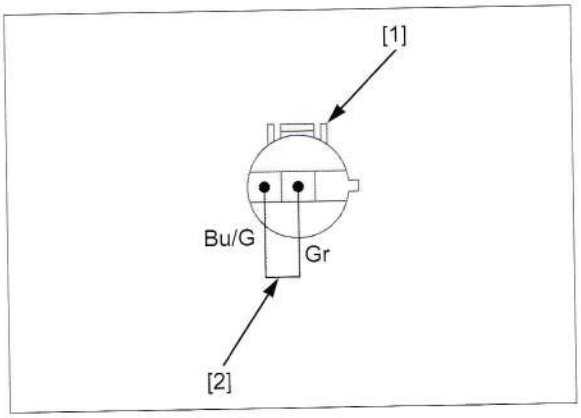
CONNECTION: Blue/green – Gray

Check the MAP sensor with the MCS.

Is about 0 V indicated?

YES – Faulty MAP sensor

NO – GO TO STEP 4.



4. **MAP Sensor Signal Line Open Circuit Inspection**

Turn the ignition switch OFF.
Remove the jumper wire.
Disconnect the ECM 33P (Gray) connector (page 4-42).
Check for continuity between the wire harness side MAP sensor 3P (Gray) connector [1] and ECM 33P (Gray) connector [2] terminals at the wire side.

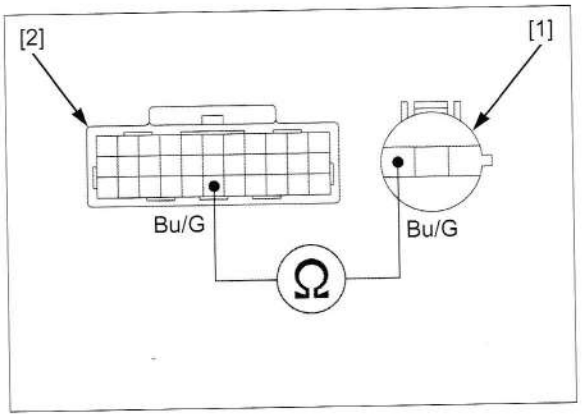
TOOL:
Test probe (2 Pack) **07ZAJ-RDJA110**

CONNECTION: Blue/green – Blue/green

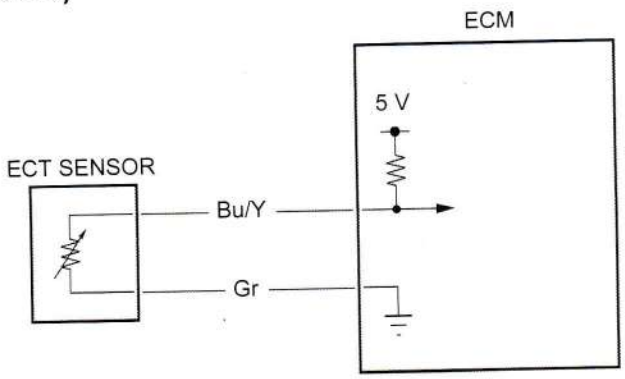
Is there continuity?

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

NO – Open circuit in the Blue/green wire



DTC 7 (ECT SENSOR)



Probable cause
- Open or short circuit in the Blue/yellow wire between the ECT sensor and ECM
- Open circuit in the Gray wire between the ECT sensor and ECM
- Faulty ECT sensor
- Faulty ECM

DTC 7-1 (ECT SENSOR LOW VOLTAGE)

1. **ECT Sensor System Inspection**

   Check the ECT sensor with the MCS.

   Is about 0 V indicated?

   YES – GO TO STEP 2.

   NO – Intermittent failure

2. **ECT Sensor System Inspection with Connector Disconnected**

   Turn the ignition switch OFF.
   Disconnect the ECT sensor 3P (Gray) connector (page 4-44).
   Check the ECT sensor with the MCS.

   Is about 0 V indicated?

   YES – GO TO STEP 3.

   NO – Faulty ECT sensor

3. **ECT Sensor Output Line Short Circuit Inspection**

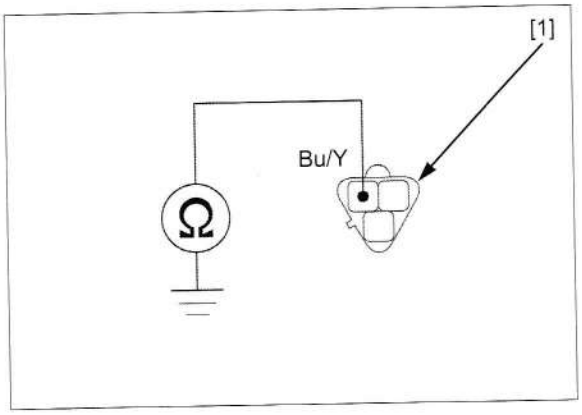
   Turn the ignition switch OFF.
   Disconnect the ECM 33P (Gray) connector (page 4-42).
   Check for continuity between the wire harness side ECT sensor 3P (Gray) connector [1] terminal and ground.

   CONNECTION: Blue/yellow – Ground

   Is there continuity?

   YES – Short circuit in Blue/yellow wire

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



4. **ECT Sensor Resistance Inspection**

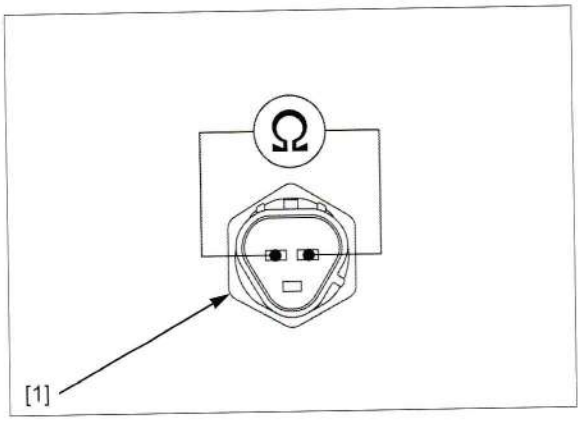
Turn the ignition switch OFF.
Remove the ECT sensor (page 4-44).
Measure the resistance between the connector terminals of the ECT sensor [1].

STANDARD: 2.3 – 2.6 kΩ (20°C/68°F)

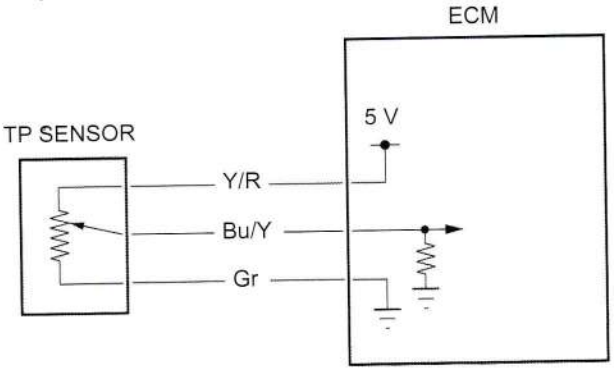
Is the resistance standard value?

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

NO – Faulty ECT sensor



DTC 8 (TP SENSOR)



Probable cause
- Open circuit in the Yellow/red or Gray wire between the sensor unit and ECM
- Open or short circuit in the Blue/yellow wire between the sensor unit and ECM
- Short circuit between the Yellow/red and Blue/yellow wires
- Faulty TP sensor
- Faulty ECM

DTC 8-1 (TP SENSOR LOW VOLTAGE)

NOTE:
- Before starting the inspection, check for loose or poor contact on the TP sensor 3P (Gray), engine sub-wire harness 12P (Black), ECM 33P (Black) and 33P (Gray) connectors, and recheck the DTC.

1. **TP Sensor System Inspection**

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

Is about 0 V indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

5. **TP Sensor Signal Line Short Circuit Inspection**

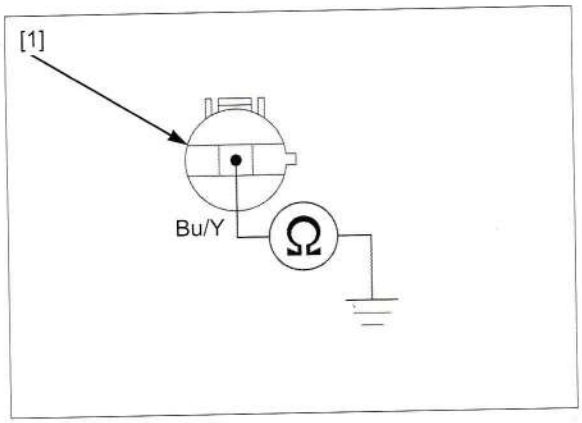
Check for continuity between the wire harness side TP sensor 3P (Gray) connector [1] terminal and ground.

CONNECTION: Blue/yellow – Ground

Is there continuity?

YES – Short circuit in the Blue/yellow wire

NO – GO TO STEP 6.



6. **TP Sensor Inspection**

Replace the TP sensor (throttle body assembly) with a known good one (page 7-14).
Connect the ECM 33P connectors.
Erase the DTC (page 4-7).
Check the TP sensor with the MCS.

Is the DTC 8-1 indicated?

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

NO – Faulty original TP sensor

DTC 8-2 (TP SENSOR HIGH VOLTAGE)

1. **TP Sensor System Inspection**

Check the TP sensor with the MCS.

Is about 5 V indicated?

YES – GO TO STEP 3.

NO – GO TO STEP 2.

2. **TP Sensor System Inspection with Throttle Operated**

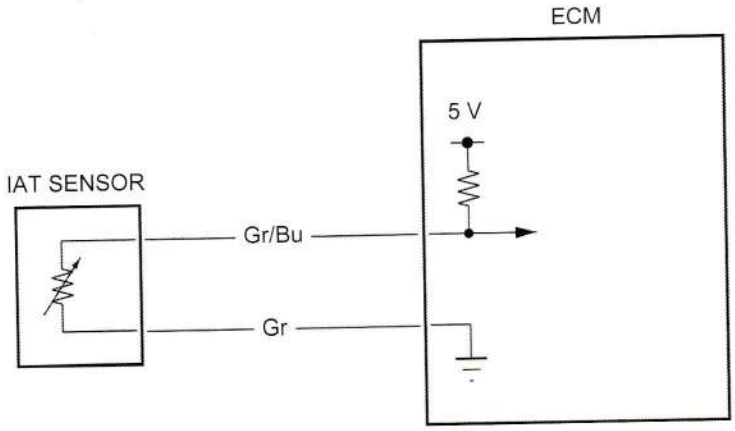
Check that the TP sensor voltage increases continuously when moving the throttle from fully closed position to fully opened position using the data list menu of the MCS.

Does the voltage increase continuously?

YES – Intermittent failure

NO – Faulty TP sensor

DTC 9 (IAT SENSOR)



Probable cause
- Open or short circuit in the Gray/blue wire between the sensor unit and ECM
- Open circuit in the Gray wire between the sensor unit and ECM
- Faulty IAT sensor
- Faulty ECM

DTC 9-1 (IAT SENSOR LOW VOLTAGE)

1. **IAT Sensor System Inspection**

   Check the IAT sensor with the MCS.

   Is about 0 V indicated?

   YES – GO TO STEP 2.

   NO – Intermittent failure

2. **IAT Sensor Inspection**

   Turn the ignition switch OFF.
   Disconnect the IAT sensor 2P (Gray) connector (page 7-12).
   Check the IAT sensor with the MCS.

   Is about 0 V indicated?

   YES – GO TO STEP 3.

   NO – Faulty IAT sensor

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

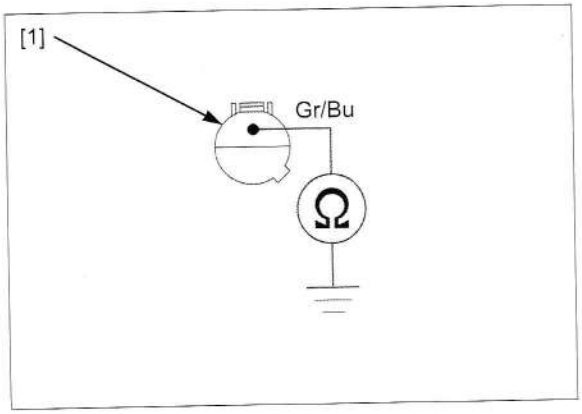
   Turn the ignition switch OFF.
   Disconnect the ECM 33P (Gray) connector (page 4-42).
   Check for continuity between the wire harness side IAT sensor 2P (Gray) connector [1] terminal and ground.

   CONNECTION: Gray/blue – Ground

   Is there continuity?

   YES – Short circuit in the Gray/blue wire

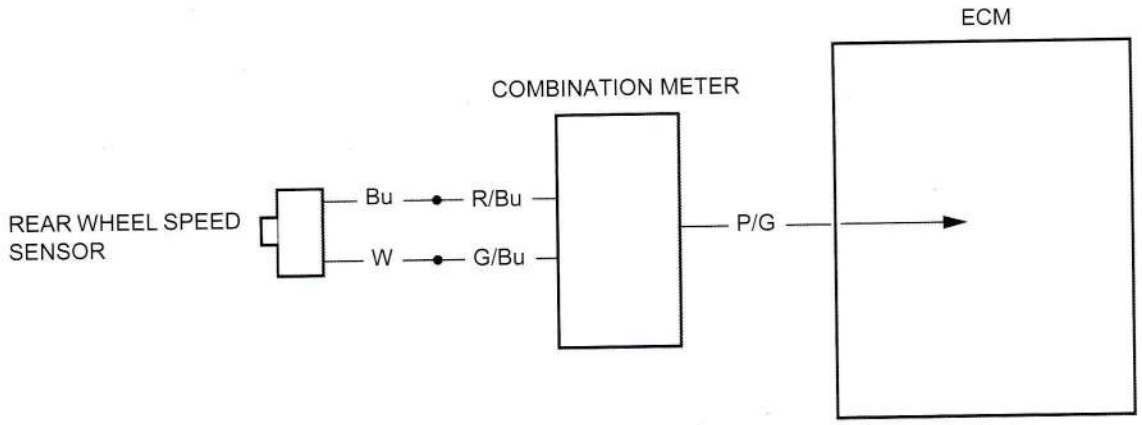
   NO – Replace the ECM with a known good one and recheck.



DTC 11; AC type (REAR WHEEL SPEED SENSOR)

NOTE:

- For information of the rear wheel speed sensor detecting the vehicle speed, refer to "ABS; II AC, III CM Types" section (page 18-21).



Probable cause

- Open or short circuit in the Red/blue or Green/blue wires between the rear wheel speed sensor
- Open or short circuit in the Pink/green wire between the combination meter and ECM
- Faulty rear wheel speed sensor
- Faulty combination meter
- Faulty ECM

DTC 11-1 (REAR WHEEL SPEED SENSOR)

NOTE:

- Before starting the inspection, check for loose or poor contact on the rear wheel speed sensor 2P (Blue), combination meter 20P (Gray), and ECM 33P (Gray) connectors, and recheck the DTC.

1. **Speedometer Function Check**

   Erase the DTC (page 4-7).
   Test-ride the motorcycle and check the operation of the speedometer.

   Does the speedometer function properly?

   YES – GO TO STEP 8.

   NO – GO TO STEP 2.

2. **Speed Sensor Air Gap Inspection**

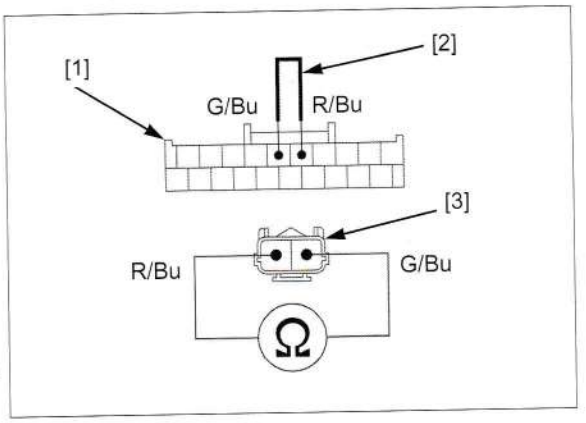
   Measure the air gap between the speed sensor and pulser ring (page 18-21).

   Is the air gap correct?

   YES – GO TO STEP 3.

   NO – Check each part for deformation or looseness and correct accordingly. Recheck the air gap.

6. **Rear Wheel Speed Sensor Line Open Circuit Inspection**



Short the wire harness side combination meter 20P (Gray) connector [1] terminals with a jumper wire [2].

CONNECTION: Red/blue – Green/blue

Check for continuity between the wire harness side rear wheel speed sensor 2P (Blue) connector [3] terminals.

CONNECTION: Red/blue – Green/blue

Is there continuity?

YES – GO TO STEP 7.

NO – Open circuit in the Red/blue or Green/blue wire

7. **Failure Reproduction with a New Speed Sensor**

Install the combination meter to connect the meter 20P (Gray) connector (page 20-11).
Replace the rear wheel speed sensor with a new one (page 18-22).
Erase the DTC (page 4-7).
Test-ride the motorcycle.
Check the rear wheel speed sensor with the MCS.

Is the DTC 11-1 indicated?

YES – Replace the combination meter with a known good one and recheck.

NO – Faulty original wheel speed sensor

8. **Recheck DTC**

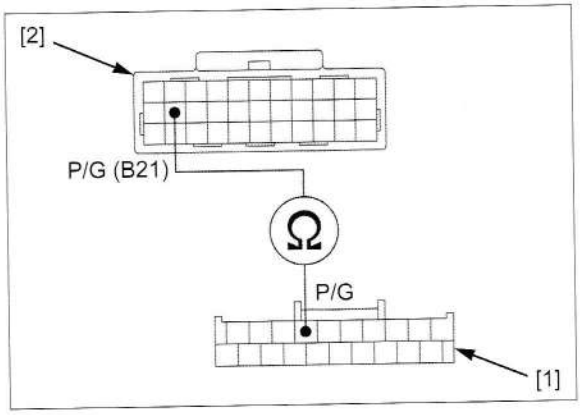
Check the rear wheel speed sensor with the MCS.

Is the DTC 11–1 indicated?

YES – GO TO STEP 9.

NO – Intermittent failure

9. **Combination Meter Signal Output Line Open Circuit Inspection**



Turn the ignition switch OFF.
Disconnect the ECM 33P (Gray) connector (page 4-42).
Remove the combination meter to disconnect the combination meter 20P (Gray) connector (page 20-11).
Check for continuity between the wire harness side combination meter 20P (Gray) connector [1] and ECM 33P (Gray) connector [2] terminals.

TOOL:
Test probe (2 Pack) **07ZAJ-RDJA110**

CONNECTION: Pink/green – Pink/green (B21)

Is there continuity?

YES – GO TO STEP 10.

NO – Open circuit in the Pink/green wire

2. **Rear Wheel Speed Sensor Signal Line Open Circuit Inspection**

Turn the ignition switch OFF.
Disconnect the ABS modulator 18P (Black) connector (page 18-8).
Disconnect the ECM 33P (Gray) connector (page 4-42).
Check for continuity between the wire harness side ABS modulator 18P (Black) connector [1] and ECM 33P (Gray) connector [2] terminals.

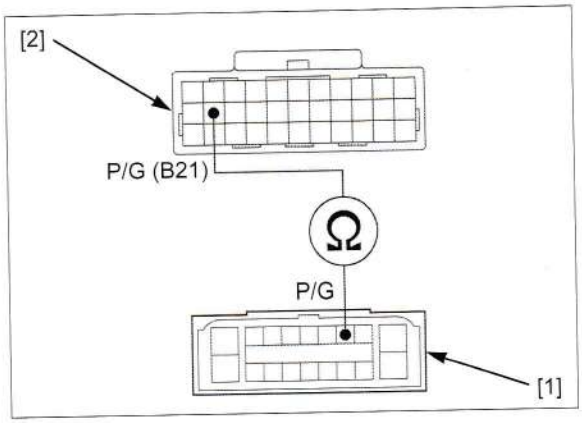
TOOL:
Test probe (2 Pack) 07ZAJ-RDJA110

CONNECTION: Pink/green – Pink/green (B21)

Is there continuity?

YES – GO TO STEP 3.

NO – Open circuit in the Pink/green wire



3. **Rear Wheel Speed Sensor Signal Line Short Circuit Inspection**

Check for continuity between the wire harness side ECM 33P (Gray) connector [1] terminal and ground.

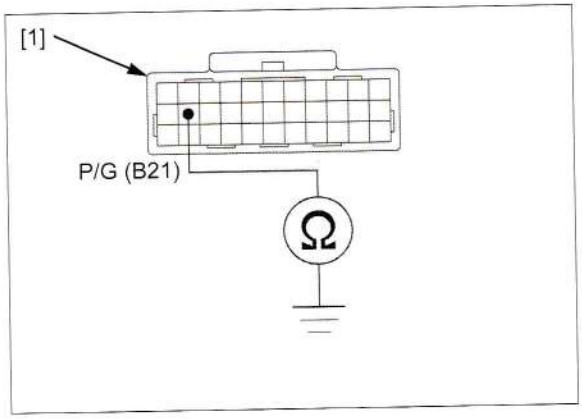
TOOL:
Test probe (2 Pack) 07ZAJ-RDJA110

CONNECTION: Pink/green (B21) – Ground

Is there continuity?

YES – Short circuit in the Pink/green wire

NO – GO TO STEP 4.



4. **Speedometer and Self-cancelling Turn Signal Function Check**

Connect the ABS modulator 18P (Black) and ECM 33P (Gray) connectors.
Test-ride the motorcycle and check the operation of the speedometer and self-cancelling turn signal.

Do they function properly?

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

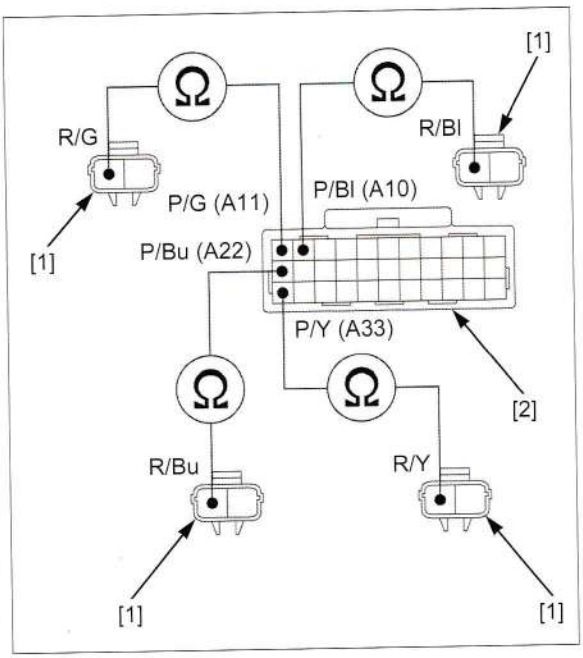
NO – Faulty ABS modulator

3. **Fuel Injector Signal Line Open Circuit Inspection**

Turn the ignition switch OFF.
Disconnect the ECM 33P (Black) connector (page 4-42).
Check for continuity between the fuel injector 2P (Gray) connector [1] and ECM 33P (Black) connector [2] terminals at the wire side.

TOOL:
Test probe (2 Pack) **07ZAJ-RDJA110**

CONNECTION:
No. 1: Red/yellow – Pink/yellow (A33)
No. 2: Red/blue – Pink/blue (A22)
No. 3: Red/green – Pink/green (A11)
No. 4: Red/black – Pink/black (A10)



Is there continuity?

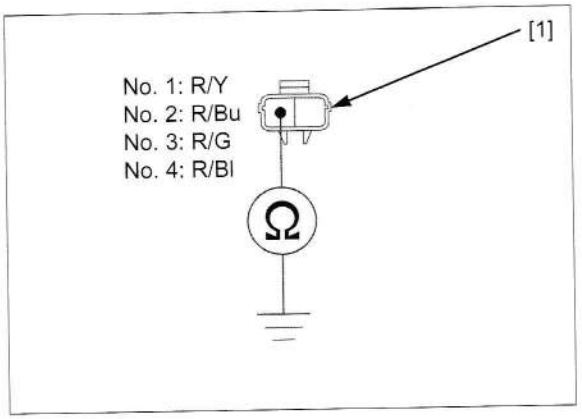
YES – GO TO STEP 4.

NO – • Open circuit in the Red/yellow or Pink/yellow wire
• Open circuit in the Red/blue or Pink/blue wire
• Open circuit in the Red/green or Pink/green wire
• Open circuit in the Red/black or Pink/black wire

4. **Fuel Injector Signal Line Short Circuit Inspection**

Check for continuity between the wire harness side fuel injector 2P (Gray) connector [1] terminal and ground.

CONNECTION: No. 1: Red/yellow – Ground
No. 2: Red/blue – Ground
No. 3: Red/green – Ground
No. 4: Red/black – Ground



Is there continuity?

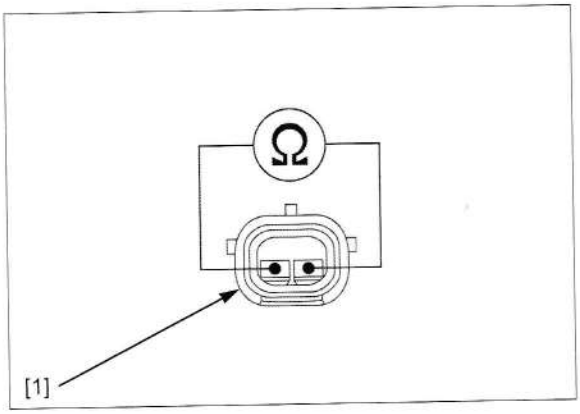
YES – • Short circuit in the Red/yellow wire
• Short circuit in the Red/blue wire
• Short circuit in the Red/green wire
• Short circuit in the Red/black wire

NO – GO TO STEP 5.

5. **Fuel Injector Resistance Inspection**

Measure the resistance between the 2P connector terminals of the fuel injector [1].

STANDARD: 10.5 – 14.5 Ω (20°C/68°F)



Is the resistance within standard value?

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

NO – Faulty fuel injector

2. CMP Sensor Line Open Circuit Inspection

Turn the ignition switch OFF.
Disconnect the ECM 33P (Black) and 33P (Gray) connectors (page 4-42).
Check for continuity between the CMP sensor 2P (Black) connector [1], and ECM 33P (Black) connector [2], and 33P (Gray) connector [3] terminals at the wire side.

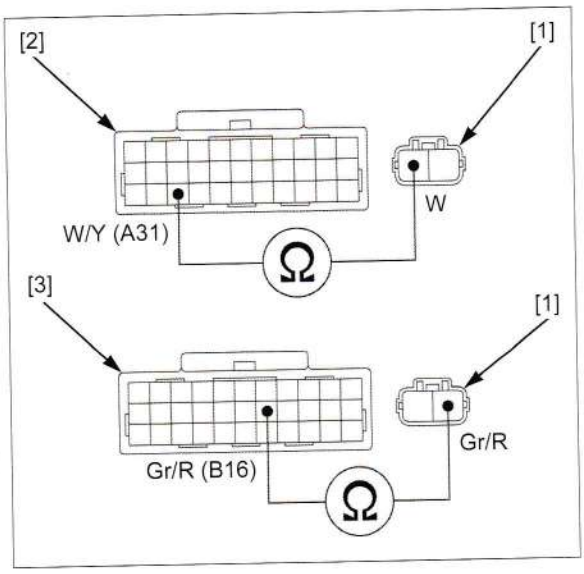
TOOL:
Test probe (2 Pack) 07ZAJ-RDJA110

CONNECTION: White – White/yellow (A31)
Gray/red – Gray/red (B16)

Is there continuity?

YES – GO TO STEP 3.

NO – • Open circuit in the White or White/yellow wire
• Open circuit in the Gray/red wire



3. CMP Sensor Line Short Circuit Inspection

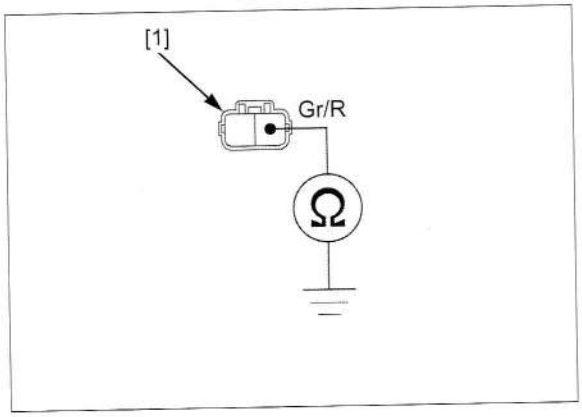
Check for continuity between the wire harness side CMP sensor 2P (Black) connector [1] and ground.

CONNECTION: Gray/red – Ground

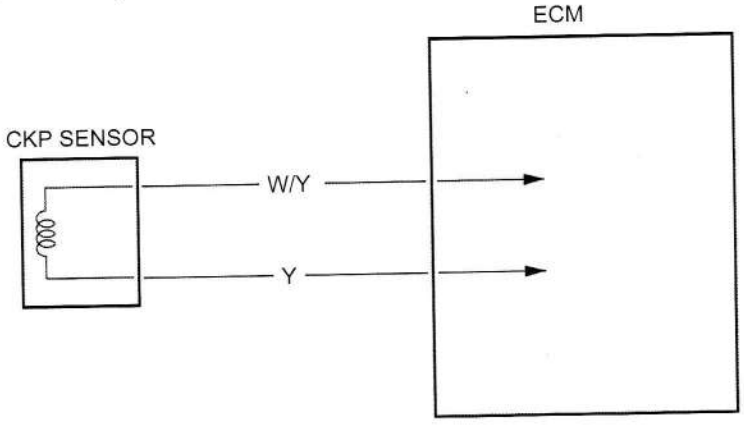
Is there continuity?

YES – Short circuit in the Gray/red wire

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



DTC 19 (CKP SENSOR)



Probable cause
- Open circuit in the White/yellow wire between the CKP sensor and ECM
- Open or short circuit in the Yellow wire between the CMP sensor and ECM
- Faulty CKP sensor
- Faulty ECM

3. **CKP Sensor Line Short Circuit Inspection**

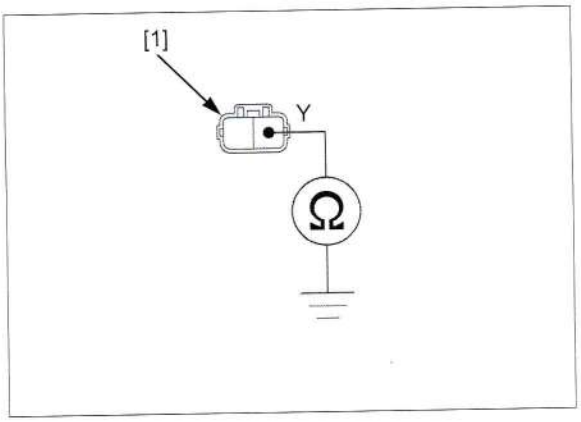
Check for continuity between the wire harness side CKP sensor 2P (Black) connector [1] and ground.

CONNECTION: Yellow – Ground

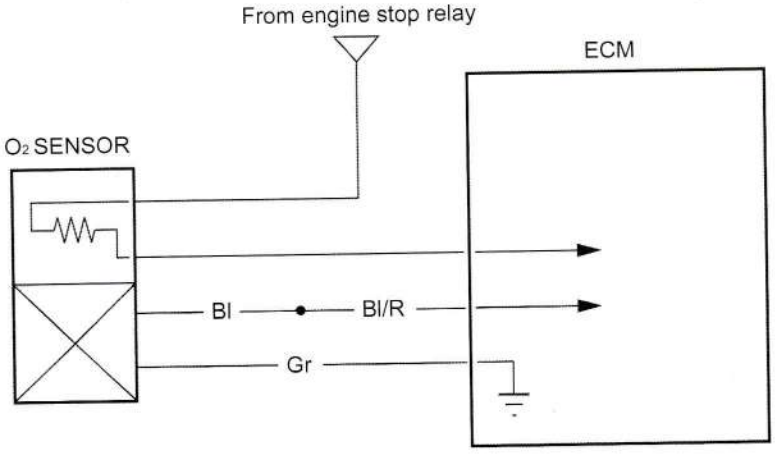
Is there continuity?

YES – Short circuit in the Yellow wire

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



DTC 21 (O_2 SENSOR)



Probable cause

- Open or short circuit in the Black/red wire between the ECM and O_2 sensor
- Open circuit in the Gray wire between the O_2 sensor and ECM
- Faulty O_2 sensor
- Faulty ECM

DTC 21-1 (O_2 SENSOR)

NOTE:

- Before starting the inspection, check for loose or poor contact on the O_2 sensor 4P (Black) and ECM 33P (Gray) connectors, and recheck the DTC.

1. **Recheck DTC**

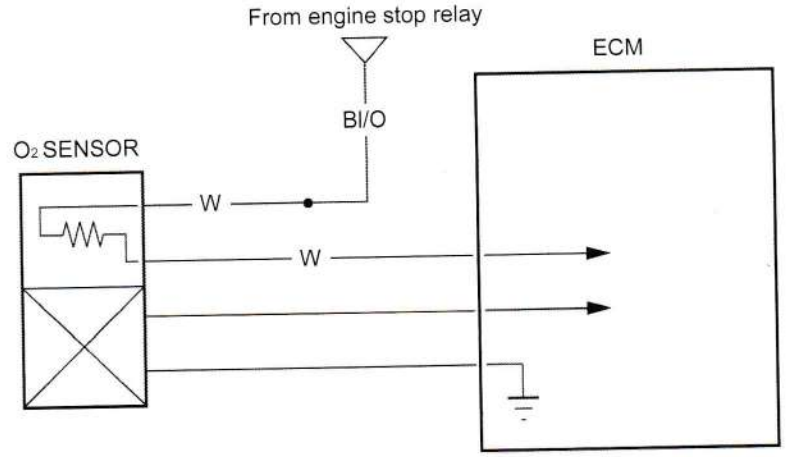
Erase the DTC (page 4-7).
Start the engine and warm it up until the coolant temperature is 80°C (176°F).
Stop the engine.
Check the O_2 sensor with the MCS.

Is the DTC 21-1 indicated?

YES – GO TO STEP 2.

NO – Intermittent failure

DTC 23 (O_2 SENSOR HEATER)



Probable cause
- Open circuit in the Black/orange wire between the engine stop relay and O_2 sensor
- Open or short circuit in the White wire between the O_2 sensor and ECM
- Faulty O_2 sensor
- Faulty ECM

DTC 23-1 (O_2 SENSOR HEATER)

NOTE:
- Before starting the inspection, check for loose or poor contact on the O_2 sensor 4P (Black) and ECM 33P (Gray) connectors, and recheck the DTC.

1. **Recheck DTC**

   Erase the DTC (page 4-7).
   Start the engine and check the O_2 sensor heater with the MCS.

   Is the DTC 23-1 indicated?

   YES – GO TO STEP 2.

   NO – Intermittent failure

2. **O_2 Sensor Heater Resistance Inspection**

   Turn the ignition switch OFF.
   Disconnect the O_2 sensor 4P (Black) connector (page 2-16).
   Measure the resistance between the sensor side O_2 sensor 4P (Black) connector [1] terminals.

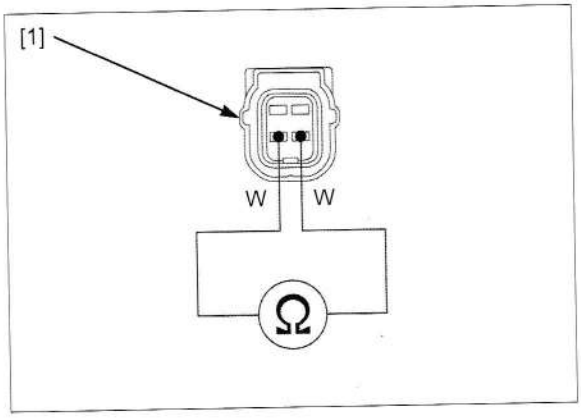
   CONNECTION: White – White

   STANDARD: 10 – 20 Ω (20°C/68°F)

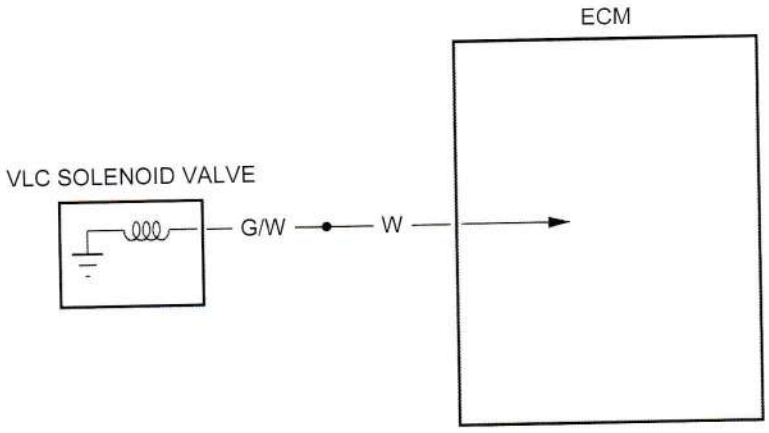
   Is the resistance within standard value?

   YES – GO TO STEP 3.

   NO – Faulty O_2 sensor



DTC 27 (VLC SOLENOID VALVE)



Probable cause
- Open circuit in the White wire between the VLC solenoid valve and ECM
- Faulty VLC solenoid valve
- Faulty ECM

DTC 27-1 (VLC SOLENOID VALVE)

NOTE:
- Before starting the inspection, check for loose or poor contact on the VLC solenoid valve 1P (Gray), engine sub-wire harness 6P (Black), and ECM 33P (Gray) connectors, and recheck the DTC.

1. **Recheck DTC**

   Erase the DTC (page 4-7).
   Check the VLC solenoid valve with the MCS.

   Is the DTC 27-1 indicated?

   YES – GO TO STEP 2.

   NO – Intermittent failure

2. **VLC Solenoid Valve Operation Inspection**

   Turn the ignition switch OFF.
   Disconnect the VLC solenoid valve 1P (Gray) connector (page 4-47).
   Connect the 12 V battery (+) terminal to the VLC solenoid valve side 1P (Gray) connector terminal and the 12 V battery (–) terminal to the ground.
   You should hear the solenoid "CLICK" when the battery voltage is applied.

   Does the solenoid click?

   YES – GO TO STEP 3.

   NO – Faulty VLC solenoid valve

2. **Bank Angle Sensor Signal Line Short Circuit Inspection**

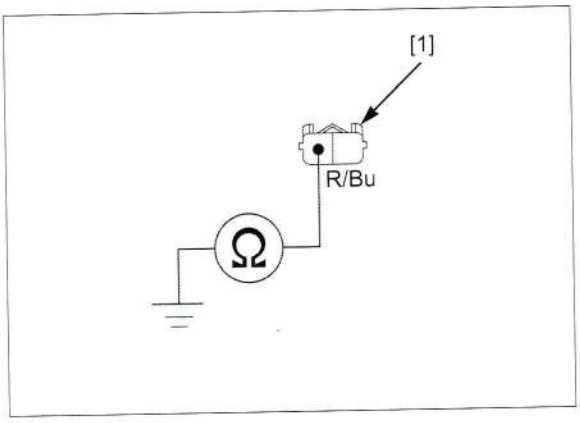
Turn the ignition switch OFF.
Disconnect the bank angle sensor 2P (Black) connector (page 4-46).
Check for continuity between the wire harness side bank angle sensor 2P (Black) connector [1] terminal and ground.

CONNECTION: Red/blue – Ground

Is there continuity?

YES – Short circuit in the Red/blue wire

NO – GO TO STEP 3.



3. **Bank Angle Sensor Signal Line Open Circuit Inspection**

Check for continuity between the wire harness side bank angle sensor 2P (Black) connector [1] and ECM 33P (Gray) connector [2] terminals.

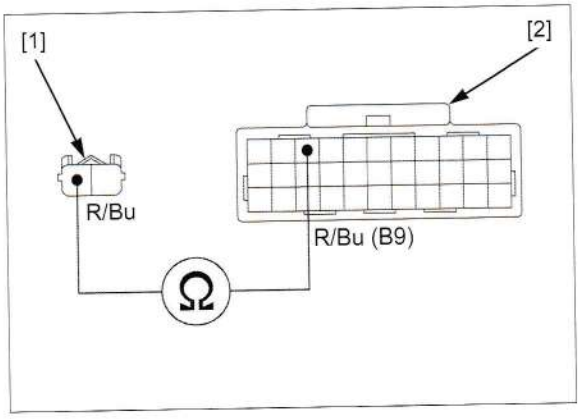
TOOL:
Test probe (2 Pack) **07ZAJ-RDJA110**

CONNECTION: Red/blue – Red/blue (B9)

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in the Red/blue wire



4. **Bank Angle Sensor Input Voltage Inspection**

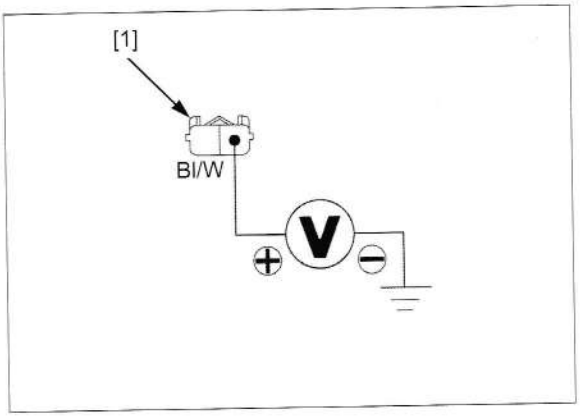
Connect the ECM 33P (Gray) connector.
Turn the ignition switch ON with the engine stop switch "○".
Measure the voltage between the wire harness side bank angle sensor 2P (Black) connector [1] terminal and ground.

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

Is there battery voltage?

YES – GO TO STEP 5.

NO – Open circuit in the Black/white wire



5. **Bank Angle Sensor Inspection**

Check the bank angle sensor (page 4-46).

Is the bank angle sensor normal?

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

NO – Faulty bank angle sensor

DTC 67-1 (FRONT WHEEL SPEED SENSOR)

NOTE:

- Before starting the inspection, check for loose or poor contact on the ABS modulator 18P (Black) and ECM 33P (Gray) connectors, and recheck the DTC.

1. **Recheck DTC**

   Erase the DTC (page 4-7).
   Test-ride the motorcycle.
   Check the rear wheel speed sensor with the MCS.

   Is the DTC 67-1 indicated?

   YES – GO TO STEP 2.

   NO – Intermittent failure

2. **Front Wheel Speed Sensor Signal Line Open Circuit Inspection**

   Turn the ignition switch OFF.
   Disconnect the following:

   – ABS modulator 18P (Black) connector (page 18-8)
   – ECM 33P (Gray) connector (page 4-42)

   Check for continuity between the wire harness side ABS modulator 18P (Black) connector [1] and ECM 33P (Gray) connector [2] terminals.

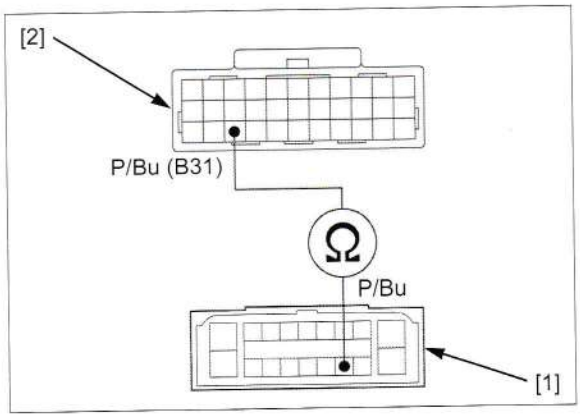
   TOOL:
   Test probe (2 Pack) **07ZAJ-RDJA110**

   CONNECTION: Pink/blue – Pink/blue (B31)

   Is there continuity?

   YES – GO TO STEP 3.

   NO – Open circuit in the Pink/blue wire



3. **Front Wheel Speed Sensor Signal Line Short Circuit Inspection**

   Check for continuity between the wire harness side ECM 33P (Gray) connector [1] terminal and ground.

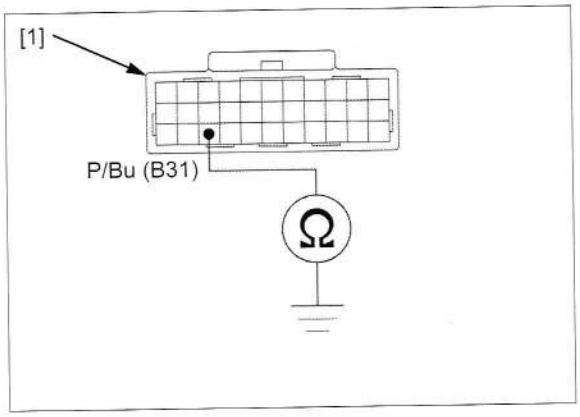
   TOOL:
   Test probe (2 Pack) **07ZAJ-RDJA110**

   CONNECTION: Pink/blue (B31) – Ground

   Is there continuity?

   YES – Short circuit in the Pink/blue wire

   NO – GO TO STEP 4.



4. **Self-cancelling Turn Signal Function Check**

   Connect the ABS modulator 18P (Black) and ECM 33P (Gray) connectors.
   Test-ride the motorcycle and check the operation of the self-cancelling turn signal.

   Does the self-cancelling function properly?

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

   NO – Faulty ABS modulator

POWER/GROUND LINE INSPECTION

Disconnect the ECM 33P (Black) and 33P (Gray) connectors (page 4-42).

POWER INPUT LINE

Measure the voltage between the wire harness side ECM 33P (Black) connector [1] terminal and ground.

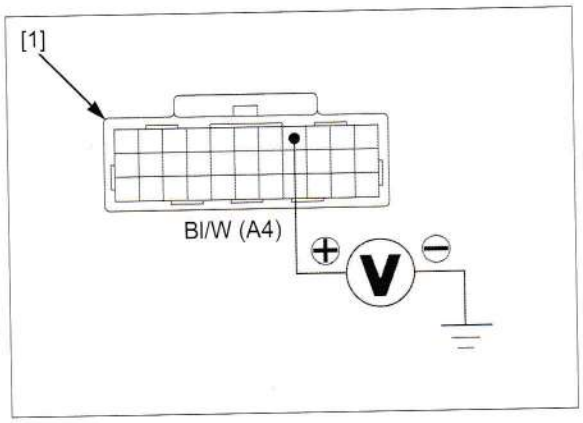
TOOL:
Test probe (2 Pack) 07ZAJ-RDJA110

CONNECTION: Black/white (A4) (+) – Ground (–)

There should be battery voltage with the ignition switch turned ON with the engine stop switch "○".

If there is no voltage, check the following:

- Black/white wire between the ECM and engine stop relay for an open circuit
- engine stop relay and its circuit (page 4-47)



GROUND LINE

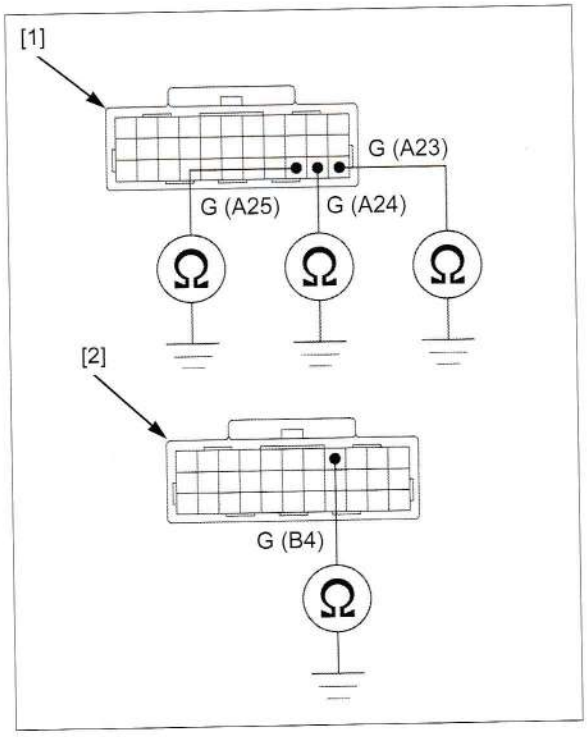
Check for continuity between the wire harness side ECM 33P (Black) connector [1] and 33P (Gray) connector [2] terminals, and ground.

TOOL:
Test probe (2 Pack) 07ZAJ-RDJA110

CONNECTION: Green (A23) – Ground
Green (A24) – Ground
Green (A25) – Ground
Green (B4) – Ground

There should be continuity at all times.

If there is no continuity, check for an open circuit in the Green wire.



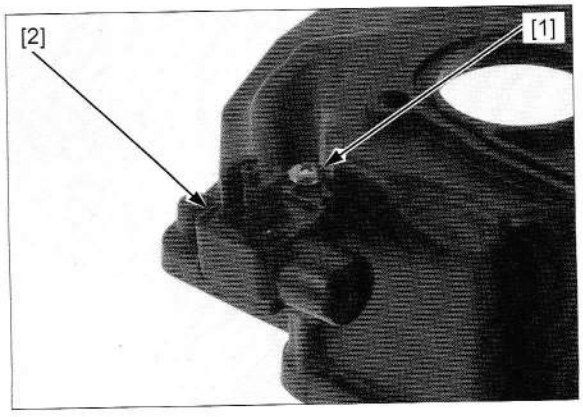
MAP SENSOR

REMOVAL/INSTALLATION

Remove the air cleaner housing (page 7-12).

Remove the tapping screw [1] and MAP sensor [2] from the air cleaner housing.

Installation is in the reverse order of removal.



CKP SENSOR

REMOVAL/INSTALLATION

Remove the right crankcase cover (page 11-9).

Remove the two bolts [1] and wire retainer [2].

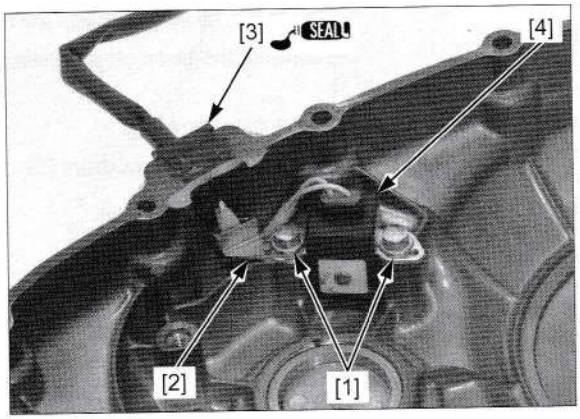
Release the wire grommet [3] and remove the CKP sensor [4].

Installation is in the reverse order of removal.

NOTE:

- Apply sealant to the wire grommet seating surface (page 1-17).

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



O_2 SENSOR

REMOVAL/INSTALLATION

NOTICE

- *Do not get grease, oil, or other materials in the O_2 sensor air hole.*
- *The O_2 sensor may be damaged if dropped. Replace it with a new one if dropped.*

NOTE:

- Do not service the O_2 sensor while it is hot.
- Do not use an impact wrench while removing or installing the O_2 sensor or it may be damaged.

Remove the exhaust pipe (page 2-16).

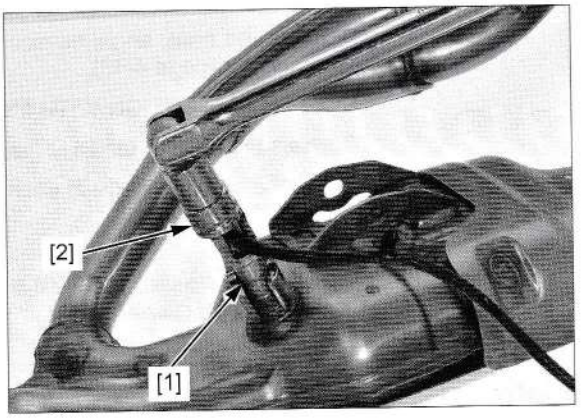
Remove the O_2 sensor [1] using a commercially available wrench.

TOOL:

[2] Socket wrench **Snap-on FRXM17 or equivalent**

Installation is in the reverse order of removal.

TORQUE: 24.5 N·m (2.5 kgf·m, 18 lbf·ft)



VLC SOLENOID VALVE

REMOVAL/INSTALLATION

Remove the throttle body (page 7-14).

Disconnect the ECT sensor 3P (Gray) connector [1].

Remove the VLC solenoid valve 1P (Gray) connector [2] from the stay on the wire and disconnect it.

Clean around the VLC solenoid valve with compressed air to prevent debris from falling into the oil passage.

Place a shop towel around the solenoid valve because oil will flow out.

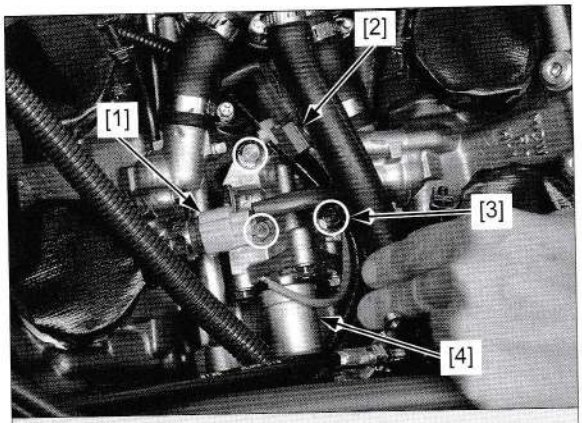
Remove the following while pulling the water hose and wires aside.

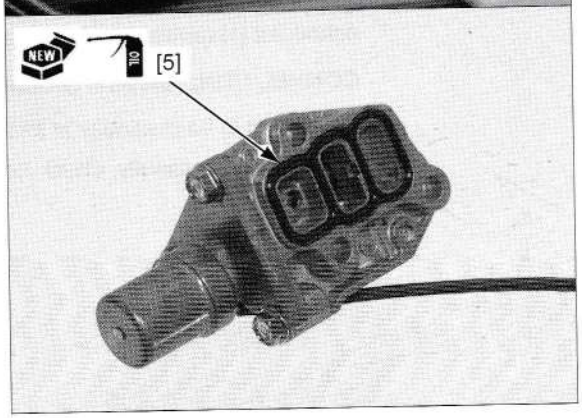
- three bolts [3]
- VLC solenoid valve assembly [4]
- rubber seal/strainer [5]

Installation is in the reverse order of removal.

NOTE:

- Replace the rubber seal/strainer with a new one and coat it with engine oil.





ENGINE STOP RELAY

CIRCUIT INSPECTION

For relay inspection (page 20-26).

Remove the engine stop relay (page 20-26).

RELAY COIL POWER INPUT LINE

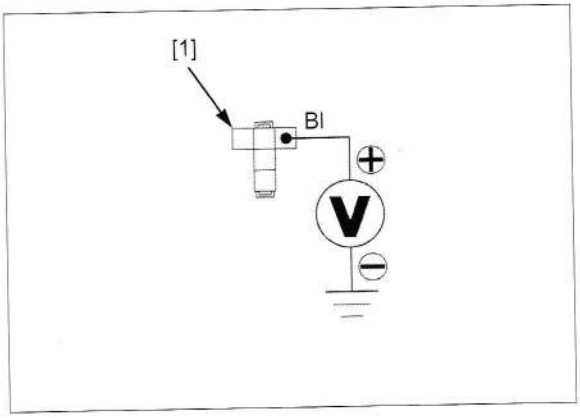
Measure the voltage between the engine stop relay 5P connector [1] terminal and ground.

CONNECTION: Black (+) – Ground (–)

There should be battery voltage when the ignition switch is turned ON with the engine stop switch "○".

If there is no voltage, check the following:

- Black wire between the relay and engine stop switch for an open circuit
- engine stop switch (page 20-21)
- Black/red or White/yellow wire between the engine stop switch and left fuse box for an open circuit
- START/HORN/STOP fuse (10 A)



5. IGNITION SYSTEM

SERVICE INFORMATION 5-2
SYSTEM LOCATION 5-3
SYSTEM DIAGRAM 5-4
TROUBLESHOOTING 5-5
IGNITION SYSTEM INSPECTION 5-6
IGNITION TIMING 5-7

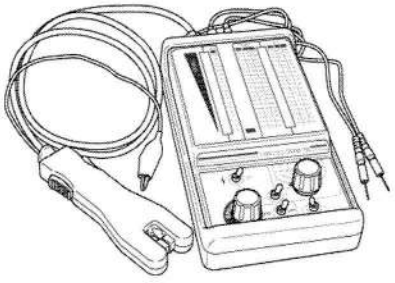
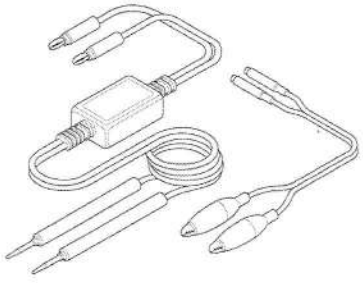
SERVICE INFORMATION

GENERAL

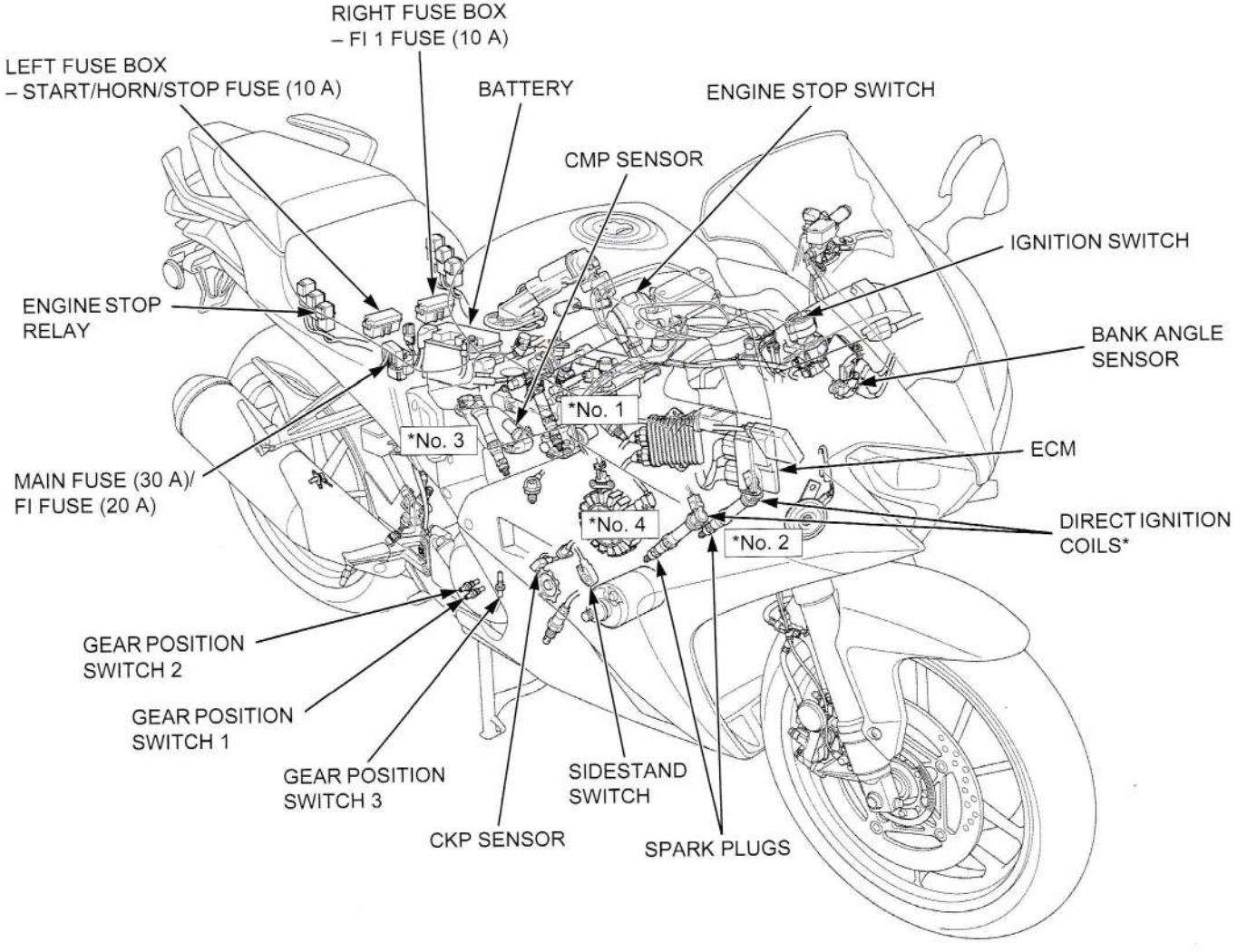
NOTICE

- *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 a 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 turned ON and current is present.
- A faulty ignition system is often related to poorly connected or corroded 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.
- The ignition timing cannot be adjusted since the ECM is factory preset.
- When servicing the ignition system, always follow the steps in the troubleshooting table (page 5-5).
- Direct ignition coils (ignition coil and spark plug cap are integrated) are adopted in this motorcycle. Also, the ignition coils are equipped with ignitors. The ignition coil signal voltage from the ECM is converted to high voltage in the ignition coil.
- For following components information, refer to each section.
  - ignition switch (page 20-20)
  - engine stop switch (page 20-21)
  - engine stop relay (page 4-47)
  - bank angle sensor (page 4-46)
  - CKP sensor (page 4-45)
  - CMP sensor (page 4-44)
  - sidestand switch (page 20-22)
  - gear position switches (page 20-24)

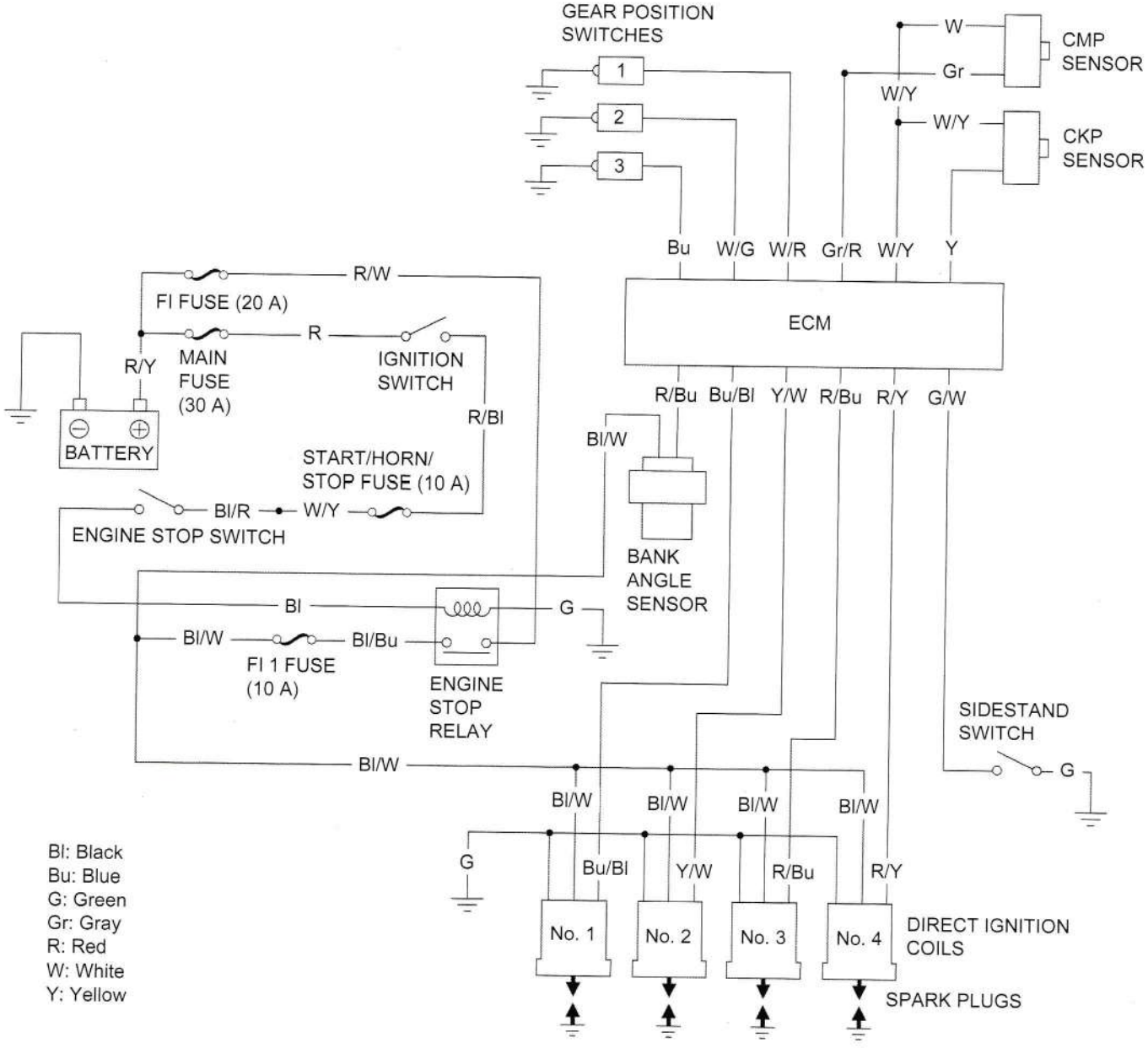
TOOLS

IgnitionMate peak voltage tester MTP07-0286 (U.S.A. only) 	Peak voltage adaptor 07HGJ-0020100  (not available in U.S.A.) with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)

SYSTEM LOCATION



SYSTEM DIAGRAM



TROUBLESHOOTING

- Inspect the following before diagnosing the system.
  - Faulty spark plug
  - Loose plug cap or direct ignition coil connector connection
  - Water got into the direct ignition coil (leaking the ignition coil secondary voltage)
- If there is no spark at either cylinder, temporarily exchange the direct ignition coil with a known good one and perform the spark test. If there is spark, the original direct ignition coil is faulty.

No spark at spark plug

Unusual condition		Probable cause (Check in numerical order)
Ignition coil signal voltage	No peak voltage	1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Cranking speed is too slow (Battery is undercharged). 3. The sampling timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the standard voltage at least once). 4. Open or short circuit in the ignition coil signal wire between the between the ECM and direct ignition coil (No. 1: Blue/black, No. 2: Yellow/white, No. 3: Red/blue, No. 4: Red/yellow). 5. Faulty peak voltage adaptor. 6. Faulty CKP sensor (Measure peak voltage). 7. Faulty ECM (in case when above No. 1 through 6 are normal).
	Peak voltage is normal, but no spark at plug	1. Open circuit in the direct ignition coil power input wire (Black/white). 2. Open circuit in the direct ignition coil power input wire (Green).

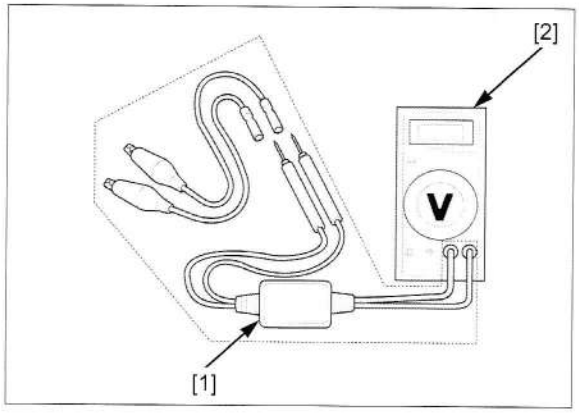
IGNITION SYSTEM INSPECTION

IGNITION COIL SIGNAL PEAK VOLTAGE

NOTE:

- If there is no spark at the plug, check all connections for loose or poor contact before measuring each peak voltage.
- Use a commercially available digital multimeter with an impedance of 10 MΩ/DCV minimum.
- The display value differs depending upon the internal impedance of the multimeter.
- If the peak voltage tester (U.S.A. only) is used, follow the manufacturer's instructions.

Use the peak voltage tester or connect the peak voltage adaptor [1] to the digital multimeter [2].



TOOL:

IgnitionMate peak voltage tester	**MTP07-0286 (U.S.A. only) or**
Peak voltage adaptor with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)	**07HGJ-0020100 (not available in U.S.A.)**

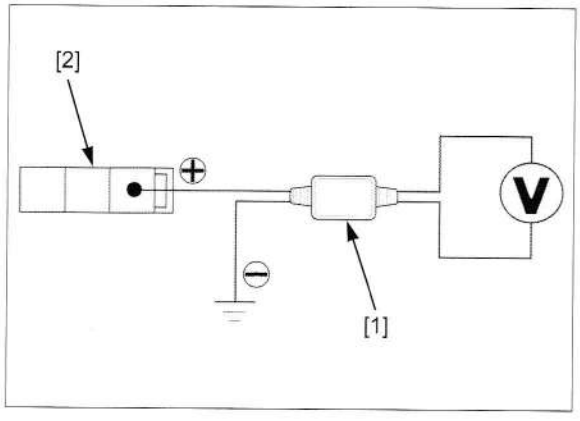
NOTE:

- Check the cylinder compression and check that the spark plugs are installed correctly in the cylinder head.

Disconnect the direct ignition coil 3P (Black) connector (page 3-6).

Disconnect the fuel pump 3P (Black) connector when the front cylinder side inspection is performed (page 7-5).

Connect the peak voltage tester or adaptor [1] probes to the wire harness side direct ignition coil 3P (Black) connector [2] terminal and ground.



CONNECTION:

No. 1 coil:
Blue/black (+) – Ground (–)
No. 2 coil:
Yellow/white (+) – Ground (–)
No. 3 coil:
Red/blue (+) – Ground (–)
No. 4 coil:
Red/yellow (+) – Ground (–)

Shift the transmission into neutral.
Turn the ignition switch ON with the engine stop switch "○".
Crank the engine with the starter motor and read ignition coil primary peak voltage.

PEAK VOLTAGE: 6 V minimum

NOTE:

- Although measured values are different for each ignition coil connector, they are normal as long as voltage is higher than the specified value.

If the peak voltage is lower than the standard value, follow the checks described in the troubleshooting table (page 5-5).

IGNITION COIL POWER/GROUND LINE

POWER INPUT LINE

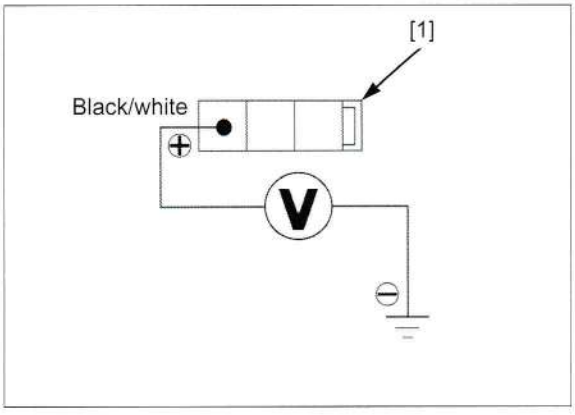
Turn the ignition switch ON with the engine stop switch "○".
Measure the voltage between the direct ignition coil 3P (Black) connector [1] terminal and ground.

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

There should be battery voltage.

If there is no battery voltage, check the following:

- Black/white wire between the right fuse box and ignition coil for an open circuit
- FI 1 fuse (10 A)



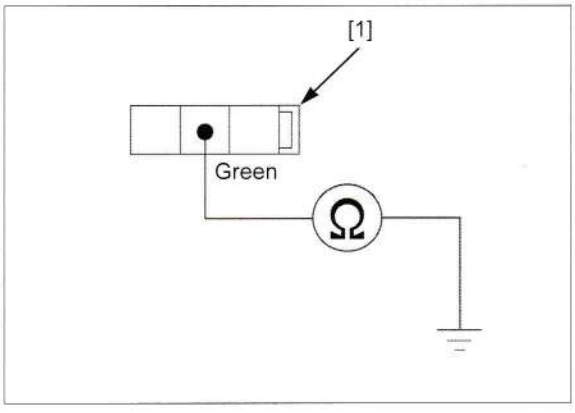
GROUND LINE

Check for continuity between the direct ignition coil 3P (Black) connector [1] terminal and ground.

CONNECTION: Green – Ground

There should be continuity at all times.

If there is no continuity, check for an open circuit in the Green wire.



IGNITION TIMING

NOTE:

- The ignition timing cannot be adjusted since the ECM is factory preset.

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

Remove the right under cowl (page 2-4) and the timing hole cap.

Read the instructions for timing light operation.

Lift the fuel tank and support it (page 3-4).
Connect the timing light [1] to the direct ignition coil wire.

Start the engine and let it idle.

IDLE SPEED: 1,200 ± 100 rpm

The ignition timing is correct if the "F" mark [2] aligns with the index notch [3] in the crankcase cover.

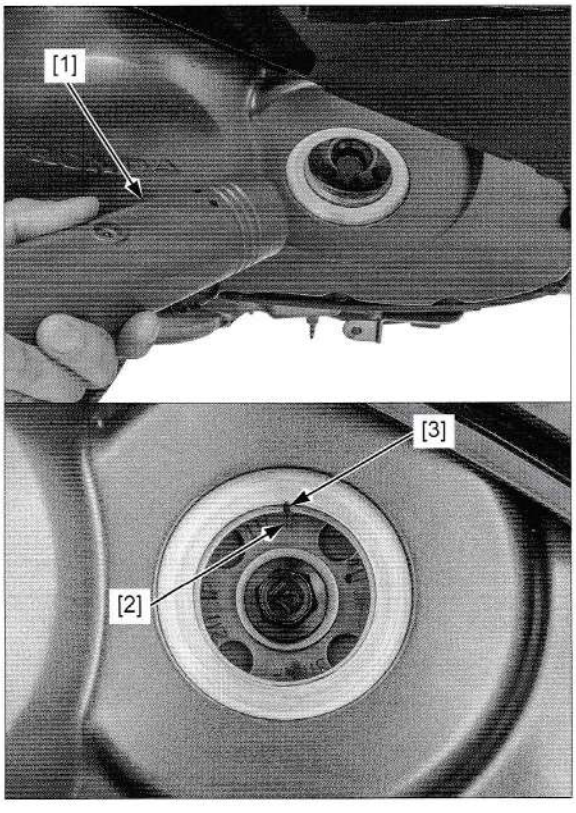
Coat a new O-ring with engine oil and install it onto the timing hole cap.
Apply grease to the cap threads.

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

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

Remove the timing light.

Install the removed parts in the reverse order of removal.



MEMO

6. ELECTRIC STARTER

SERVICE INFORMATION 6-2
TROUBLESHOOTING 6-3
SYSTEM LOCATION 6-4
SYSTEM DIAGRAM 6-5
STARTER MOTOR 6-5
STARTER RELAY SWITCH 6-8
STARTER INHIBITOR RELAY 6-9
DIODE 6-10

SERVICE INFORMATION

GENERAL

NOTICE

If the current is kept flowing through the starter motor turn it while the engine is not cranking over, the starter motor may be damaged.

- The starter motor can be serviced with the engine installed in the frame.
- Always turn the ignition switch OFF before servicing the starter motor. The motor could suddenly start, causing serious injury.
- A weak battery may be unable to turn the starter motor quickly enough, or supply adequate ignition current.
- When servicing the starter system, always follow the steps in the troubleshooting flow chart (page 6-3).
- For following components information, refer to Lights/Meters/Switches section.
  - ignition switch (page 20-20)
  - engine stop switch (page 20-21)
  - starter switch (page 20-21)
  - clutch switch (page 20-22)
  - sidestand switch (page 20-22)
  - gear position switch (page 20-24)
- The following color codes used are indicated through out this section.

Bl = Black	G = Green	Lg = Light Green	R = Red	Y = Yellow
Br = Brown	Gr = Gray	O = Orange	V = Violet	
Bu = Blue	Lb = Light Blue	P = Pink	W = White	

TROUBLESHOOTING

NOTE:
- Make sure the battery is fully charged and in good condition.
- Check for a blown main fuse (30 A) and sub-fuse (START/HORN/STOP; 10 A). (Check for a short circuit in the related wires if the fuse is blown again)
- The starter motor should operate with the following conditions:
  - transmission in neutral or clutch lever squeezed with sidestand retracted
  - ignition switch turned ON with engine stop switch turned "○"
  - starter switch pushed

Starter motor does not turn

1. **Starter Relay Switch Operation Inspection**

   Check the operation of the starter relay switch as above starting conditions (page 6-8).

   Does the starter relay switch click?

   YES – GO TO STEP 2.

   NO – GO TO STEP 3.

2. **Starter Motor Inspection**

   Apply battery voltage directly to the starter motor and check the operation. (A large amount of current flows, so do not use a thin wire)

   Does the starter motor turn?

   YES –
   - Poorly contacted starter motor cable
   - Faulty starter relay switch (page 6-9)

   NO – Faulty starter motor (page 6-5)

3. **Relay Coil Power Input Line Inspection**

   Check the power input line of the starter relay switch (page 6-8).

   Is the input line normal?

   YES – GO TO STEP 4.

   NO –
   - Faulty ignition switch (page 20-20)
   - Faulty engine stop switch (page 20-21)
   - Faulty starter switch (page 20-21)
   - Loose or poor contact of the related connector terminal
     Open circuit in wire harness

4. **Relay Coil Ground Line Inspection**

   Check the ground line of the starter relay switch (page 6-8).

   Is the ground line normal?

   YES – GO TO STEP 5.

   NO –
   - Faulty clutch diode (page 6-10)
   - Faulty clutch switch (page 20-22)
   - Faulty sidestand switch (page 20-22)
   - Faulty neutral diode (page 6-10)
   - Faulty starter inhibitor relay (page 20-26)
   - Faulty inhibitor relay related circuit (page 6-9)
   - Loose or poor contact of the related connector terminal
     Open circuit in wire harness

5. **Starter Relay Switch Inspection**

   Check the starter relay switch (page 6-9).

   Is the starter relay switch normal?

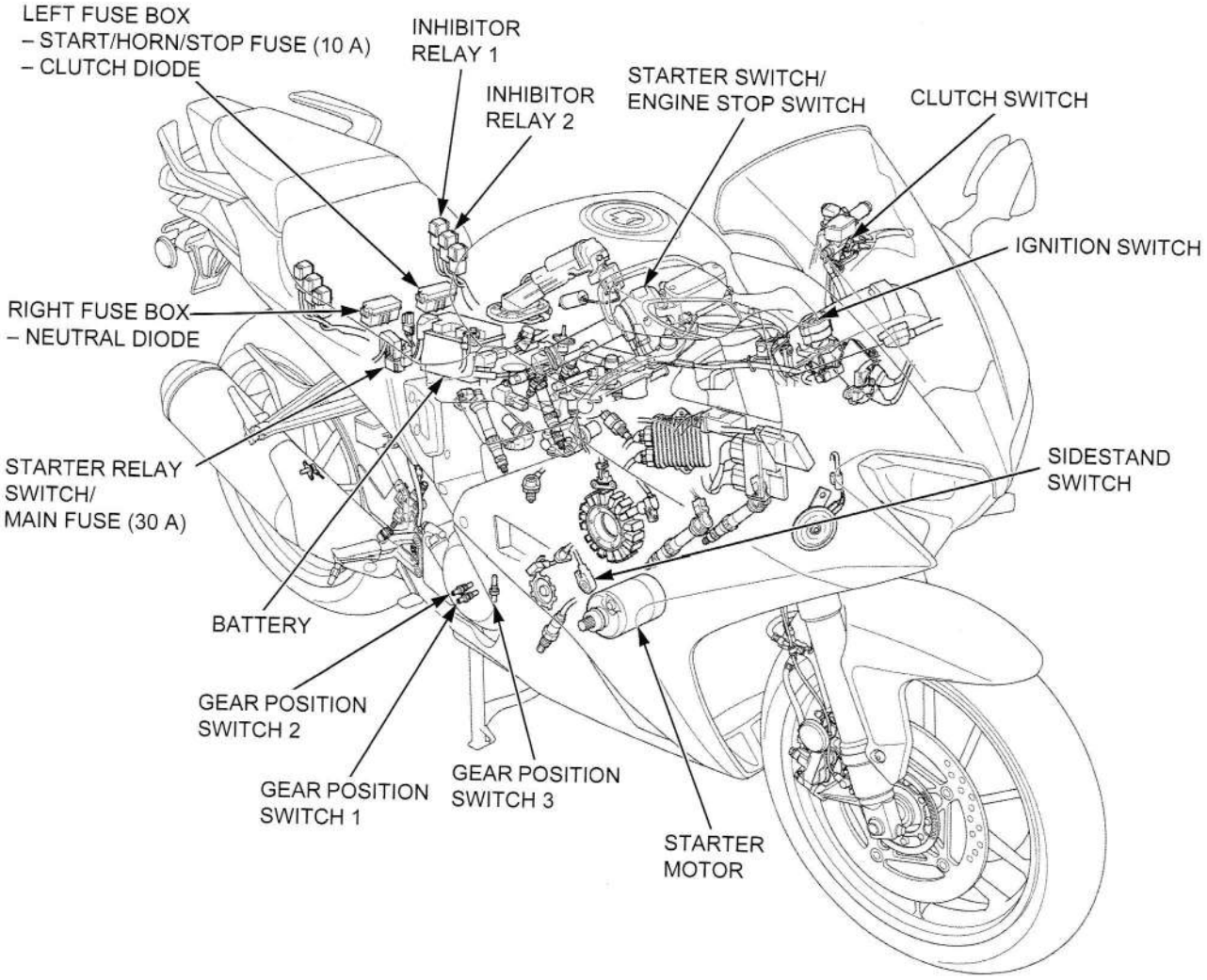
   YES – Loose or poor contact of the starter relay switch connector terminal

   NO – Faulty starter relay switch

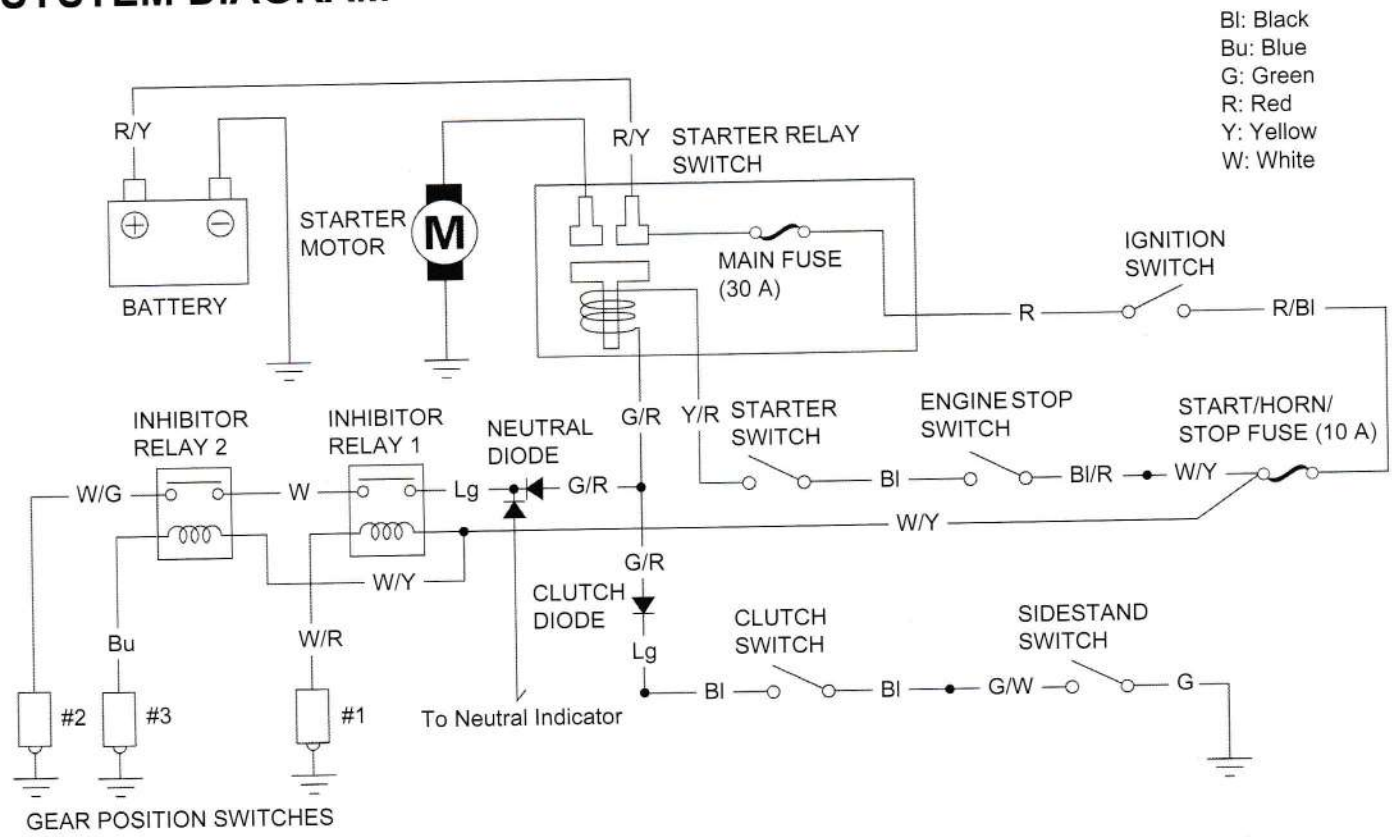
Starter motor turns slowly
- Low battery voltage
- Poorly connected battery cables
- Poorly connected starter motor cable
- Faulty starter motor

Starter motor turns, but engine does not turn
- Faulty starter clutch or starter gear train (page 11-15)
- Faulty ignition system (page 5-5)

SYSTEM LOCATION



SYSTEM DIAGRAM



STARTER MOTOR

REMOVAL/INSTALLATION

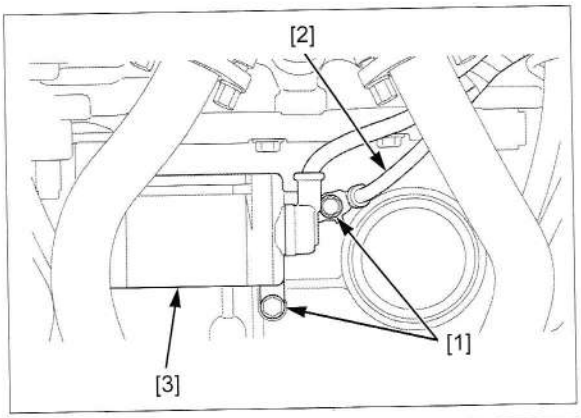
Disconnect the negative (–) cable from the battery (page 19-6).

Remove the radiators without disconnecting the hoses (page 8-7).

AC, II AC types: Remove the EVAP canister (page 7-28).

Remove the two mounting bolts [1] and (–) cable [2].

Remove the starter motor [3] from the crankcase.



Release the terminal cap [1].

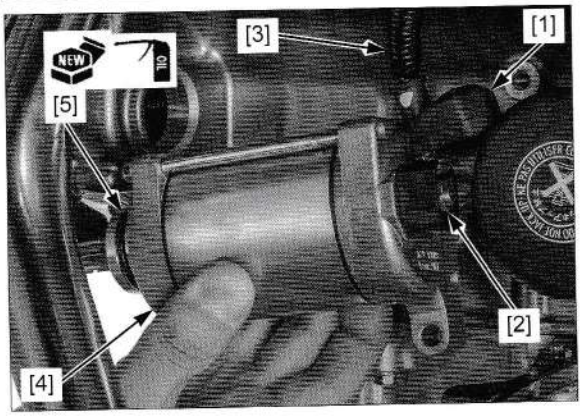
Remove the terminal nut [2] and disconnect the starter motor cable [3] to remove the starter motor [4].

Remove the O-ring [5].

Installation is in the reverse order of removal.

NOTE:

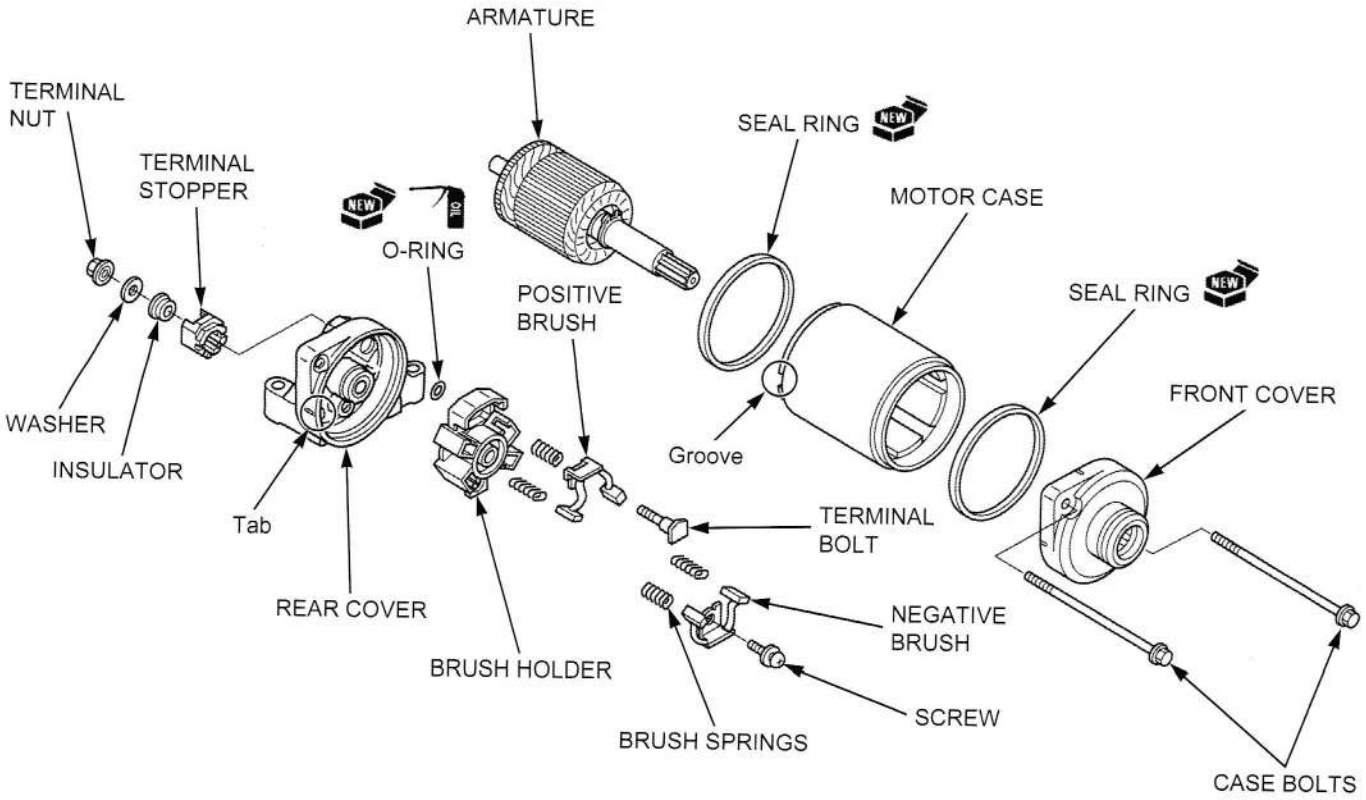
- Replace the O-ring with a new one and coat it with engine oil.



DISASSEMBLY/ASSEMBLY

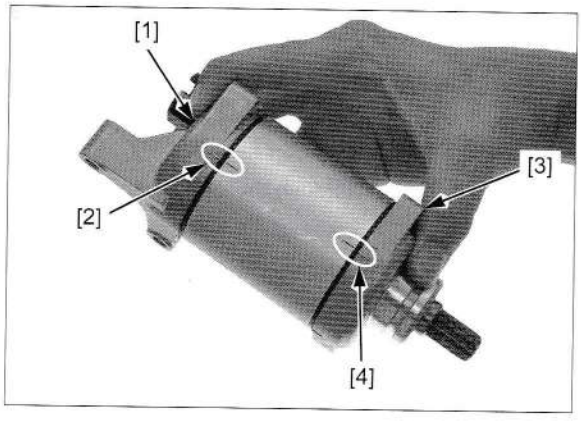
NOTICE

The coil may be damaged if the magnet pulls the armature against the motor case.



NOTE:

- Install the armature into the motor case from the case groove (rear) side so the commutator bars facing to the rear side.
- When installing the rear cover [1], align the tab with the groove (the index lines [2] are aligned).
- When installing the front cover [3], take care to prevent damaging the oil seal lip with the armature shaft. Align the index lines [4] on the front cover and motor case.



INSPECTION

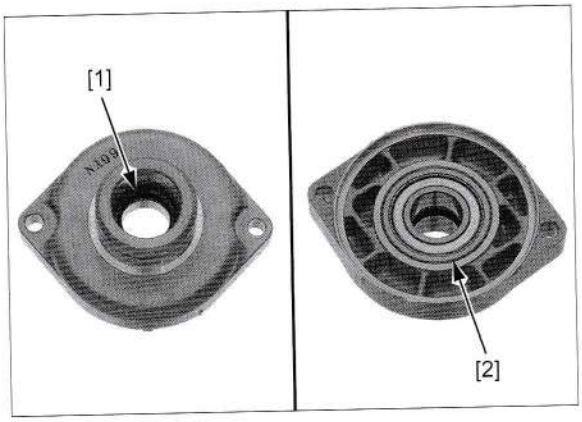
FRONT COVER

Check the oil seal [1] in the front cover for deterioration, wear, or damage.

Turn the inner race of bearing [2] with your finger.

The bearings should turn smoothly and quietly.

Also check that the outer race fits tightly in the front cover.



REAR COVER

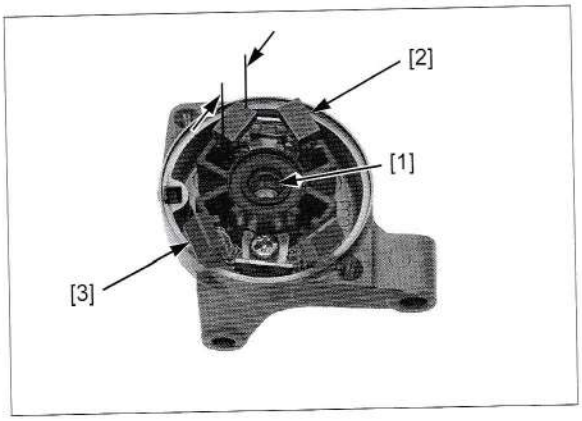
Check the bushing [1] in the rear cover for wear or damage.

Inspect the brushes for damage and measure the brush length.

SERVICE LIMIT: 6.5 mm (0.26 in)

Check for continuity on the rear cover as follows:

- between the positive brush [2] and cable terminal; there should be continuity.
- between the cable terminal and rear cover; there should be no continuity.
- between negative brush [3] and rear cover; there should be continuity.



ARMATURE

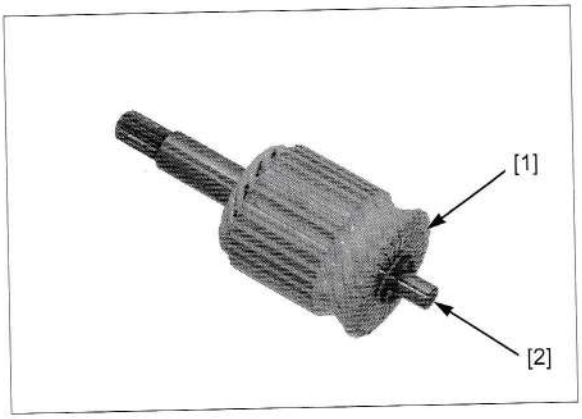
Do not use emery or sand paper on the commutator.

Clean any metallic debris off the commutator bars [1].

Check the commutator bars for discoloration.

Check for continuity on the armature as follows:

- between pair of commutator bars; there should be continuity.
- between each commutator bar and the armature shaft [2]; there should be no continuity.



STARTER RELAY SWITCH

OPERATION INSPECTION

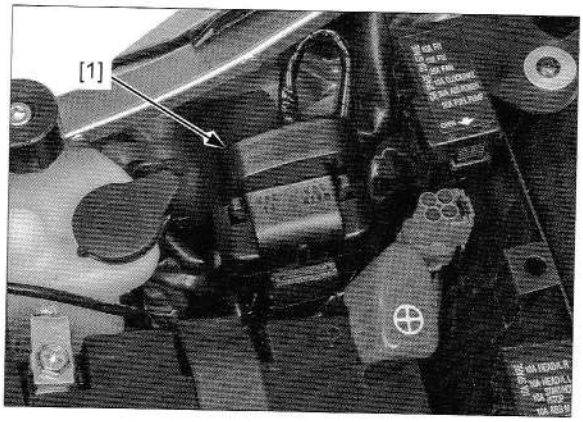
Remove the battery cover (page 2-3).

Shift the transmission into neutral or squeeze the clutch lever with the sidestand retracted.

Turn the ignition switch ON with the engine stop switch turned "○". Push the starter switch.

The coil is normal if the starter relay switch [1] clicks.

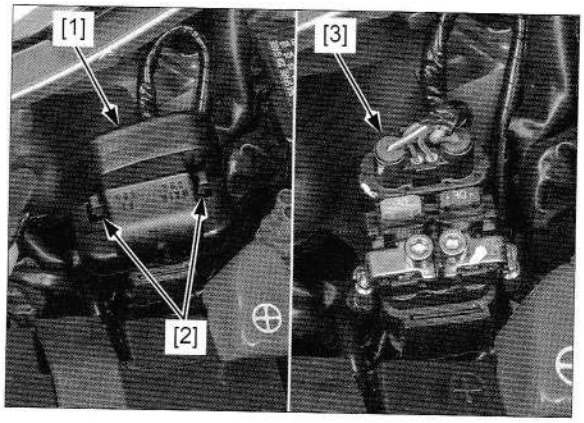
If you don't hear the starter relay switch "CLICK", inspect the relay coil circuits.



RELAY COIL CIRCUIT INSPECTION

Remove the switch cover [1] pushing the two tabs [2].

Disconnect the starter relay switch 4P (Black) connector [1].



POWER INPUT LINE

Check for continuity between the wire harness side 4P (Black) connector [1] terminals.

CONNECTION: Red – Yellow/red

There should be continuity when the starter switch is pushed with the ignition switch ON and the engine stop switch "○".

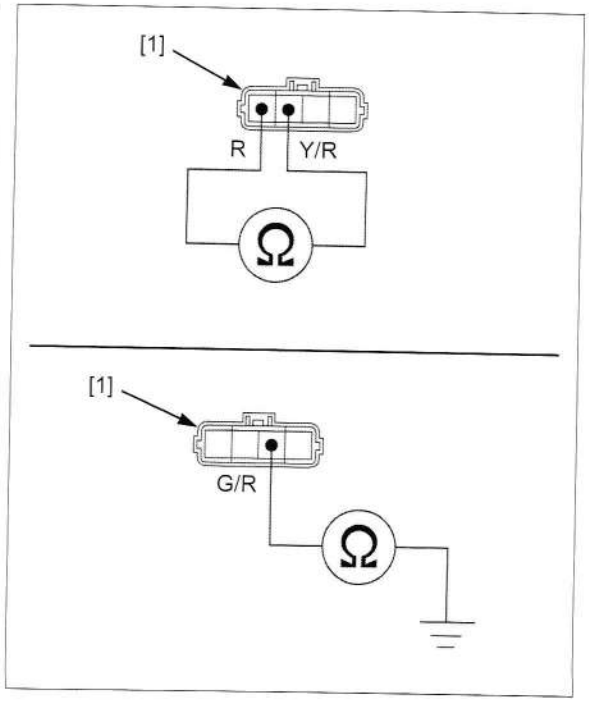
GROUND LINE

Check for continuity between the wire harness side 4P (Black) connector terminal and ground.

CONNECTION: Green/red – Ground

Gear position switch line:
There should be continuity when the transmission is in neutral with the ignition switch ON (there is a slight resistance due to the diode.

Clutch/sidestand switch line:
There should be continuity when the clutch lever is squeezed with the sidestand retracted (there is a slight resistance due to the diode).

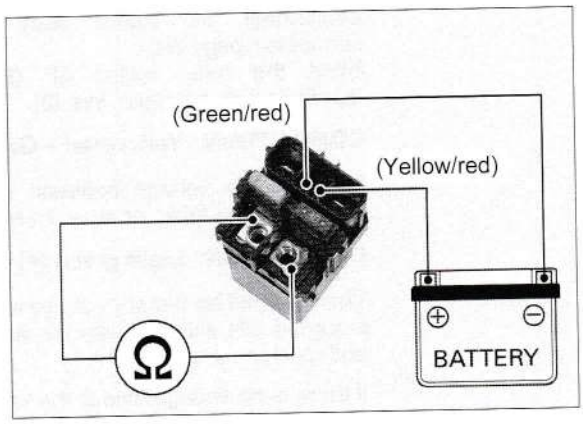


RELAY INSPECTION

Remove the starter relay switch (page 6-8).

Connect a 12 V battery to the starter relay switch as shown.

There should be continuity between the cable terminals when the battery is connected, and no continuity when the battery is disconnected.



REMOVAL/INSTALLATION

Remove the battery cover (page 2-3).

Disconnect the negative (–) cable from the battery (page 19-6).

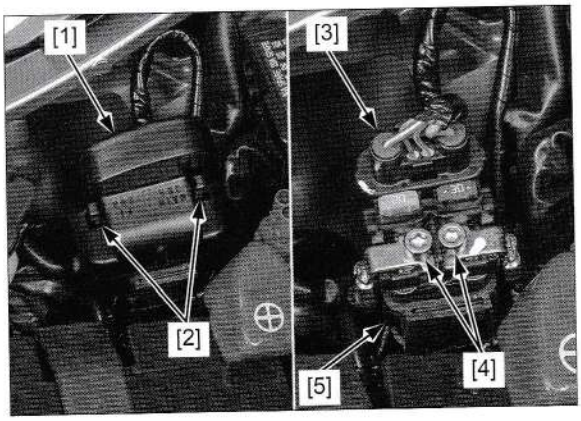
Remove the switch cover [1] pushing the two tabs [2].

Disconnect the starter relay switch 4P (Black) connector [3].

Remove the socket bolts [4] to disconnect the cables.

Remove the starter relay switch [5] from the stays.

Installation is in the reverse order of removal.



STARTER INHIBITOR RELAY

CIRCUIT INSPECTION

For relay inspection (page 20-26).

Remove the starter inhibitor relay 1 and 2 (page 20-26).

RELAY COIL POWER INPUT LINE

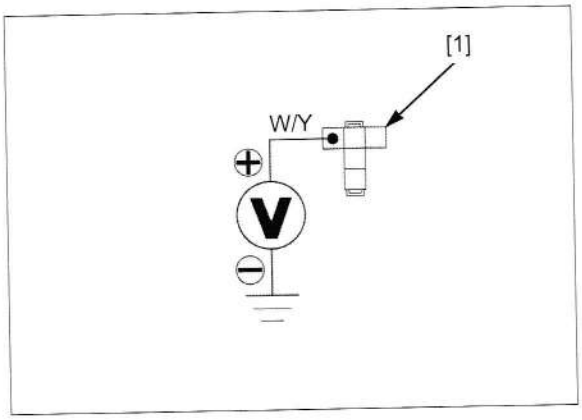
Measure the voltage between each inhibitor 5P connector [1] terminal and ground.

CONNECTION: White/yellow (+) – Ground (–)

There should be battery voltage when the ignition switch is turned ON.

If there is no voltage, check the following:

- White/yellow wire between the relay and left fuse box for an open circuit
- START/HORN/STOP fuse (10 A)



RELAY SWITCH POWER INPUT LINE

Disconnect the starter relay switch 4P (Black) connector (page 6-8).
Short the relay switch 4P (Black) connector [1] terminals with a jumper wire [2].

CONNECTION: Yellow/red – Green/red

Measure the voltage between the 5P connector [3] terminal of the inhibitor relay 1 and ground.

CONNECTION: Light green (+) – Ground (–)

There should be battery voltage when the starter switch is turned ON with the with the engine stop switch "○" and ignition switch ON.

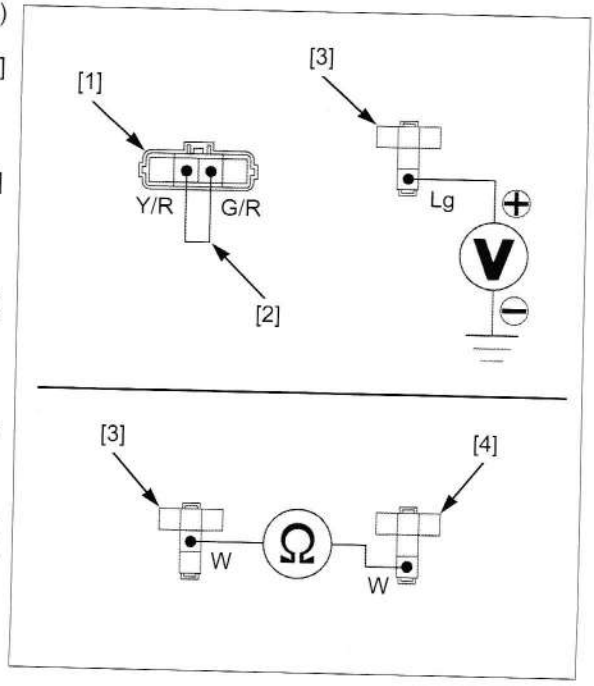
If there is no voltage, check the following:

- Light green or Green/red wire between the inhibitor relay 1 and starter relay switch for an open circuit
- neutral diode (page 6-10)

Check for continuity between the terminals of the 5P connector of the inhibitor relay 1 and 5P connector [4] of the inhibitor relay 2.

CONNECTION: White – White

There should be continuity.



GROUND LINE

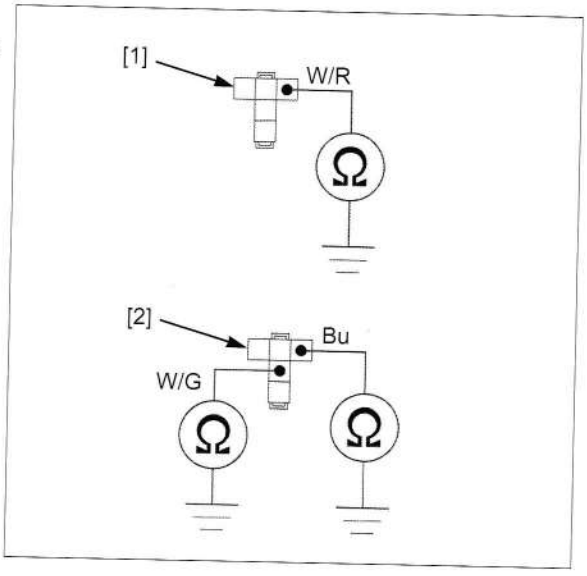
Shift the transmission into neutral.

Check for continuity between each inhibitor relay 5P connector terminal and ground.

CONNECTION:
[1] Relay 1 connector:
White/red – Ground
[2] Relay 2 connector:
Blue – Ground
White/green – Ground

There should be continuity.

If there is no continuity, check each wire between the relay and gear position switch for an open circuit.



DIODE

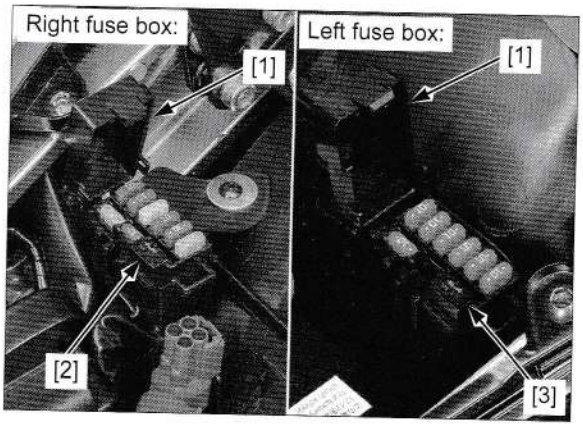
REMOVAL/INSTALLATION

Remove the battery cover (page 2-3).

Open the left and right fuse box covers [1].

Remove the neutral [2] and clutch [3] diodes.

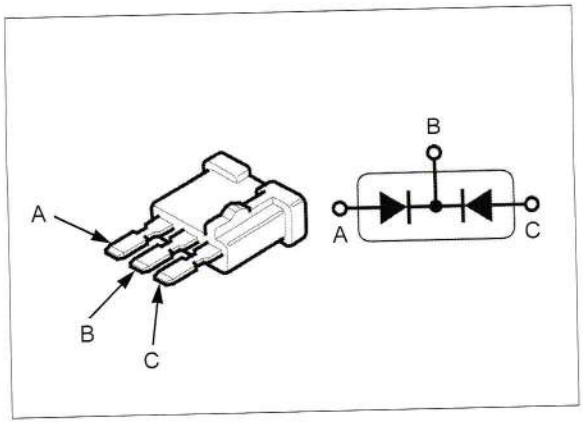
Installation is in the reverse order of removal.



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

7. FUEL SYSTEM

SERVICE INFORMATION 7-2

COMPONENT LOCATION 7-3

FUEL LINE INSPECTION 7-5

FUEL PUMP 7-8

FUEL TANK 7-11

AIR CLEANER HOUSING 7-12

FUEL INJECTOR 7-13

THROTTLE BODY 7-14

IAC THERMAL VALVE 7-19

STARTER VALVE 7-19

STARTER VALVE SYNCHRONIZATION 7-20

SECONDARY AIR SUPPLY SYSTEM 7-21

INTAKE DUCT CONTROL SYSTEM 7-24

EVAP PURGE CONTROL SOLENOID VALVE (AC, II AC types) 7-27

EVAP CANISTER (AC, II AC types) 7-28

FUEL PUMP RELAY 7-28

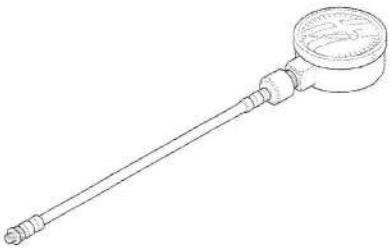
SERVICE INFORMATION

GENERAL

- Bending or twisting the control cable will impair smooth operation and could cause the cables to stick or bind, resulting in loss of vehicle control.
- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.
- Before disconnecting the fuel feed hose, relieve fuel pressure from the system (page 7-5).
- 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 ports with tape or clean shop towels to keep dirt and debris from entering the engine after the throttle body has been removed.
- Prevent dirt and debris from entering the throttle bores and air passages after the throttle body has been removed. Clean them using a compressed air if necessary.
- Do not damage the throttle body. It may cause incorrect throttle valve operation and idle speed synchronization.
- Do not loosen or tighten the white painted nuts and bolts of the throttle body. Loosening or tightening them can cause throttle body malfunction.
- Do not apply commercially available carburetor cleaners to the inside of the throttle bores.
- The parts of the throttle body not shown in this manual should not be disassembled.
- For fuel level sensor inspection (page 20-18).

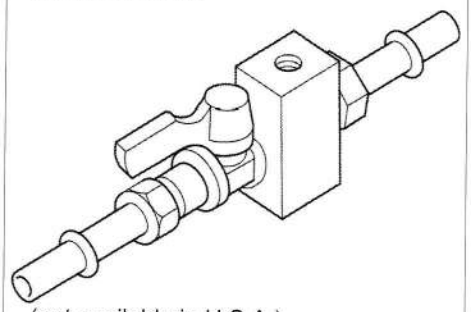
TOOLS

Fuel pressure gauge
07406-0040004



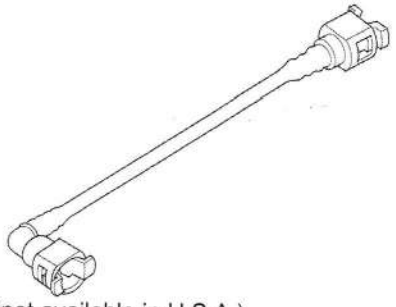
or 07406-004000C (U.S.A. only)
or 07406-004000B (U.S.A. only)

Pressure gauge manifold
07ZAJ-S5A0111



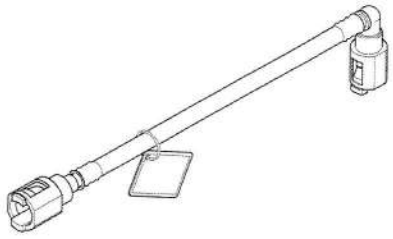
(not available in U.S.A.)

Hose attachment, 9 mm/9 mm
07ZAJ-S5A0120



(not available in U.S.A.)

Hose attachment, 8 mm/9 mm
07ZAJ-S7C0100

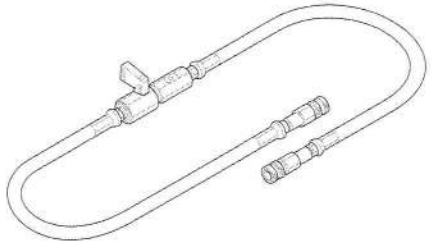


(not available in U.S.A.)

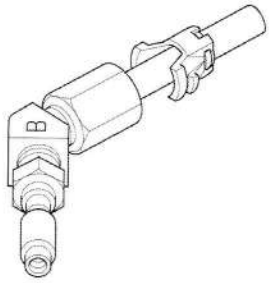
Attachment joint, 8 mm/9 mm
07ZAJ-S7C0200

(not available in U.S.A.)

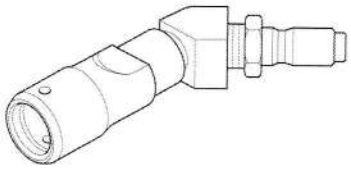
Pressure manifold hose
07AMJ-HW3A100 (U.S.A. only)



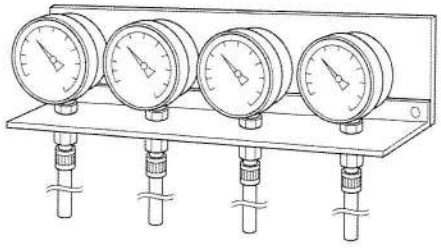
Adaptor, male
07AAJ-S6MA300 (U.S.A. only)



Adaptor, female
07AAJ-S6MA500 (U.S.A. only)

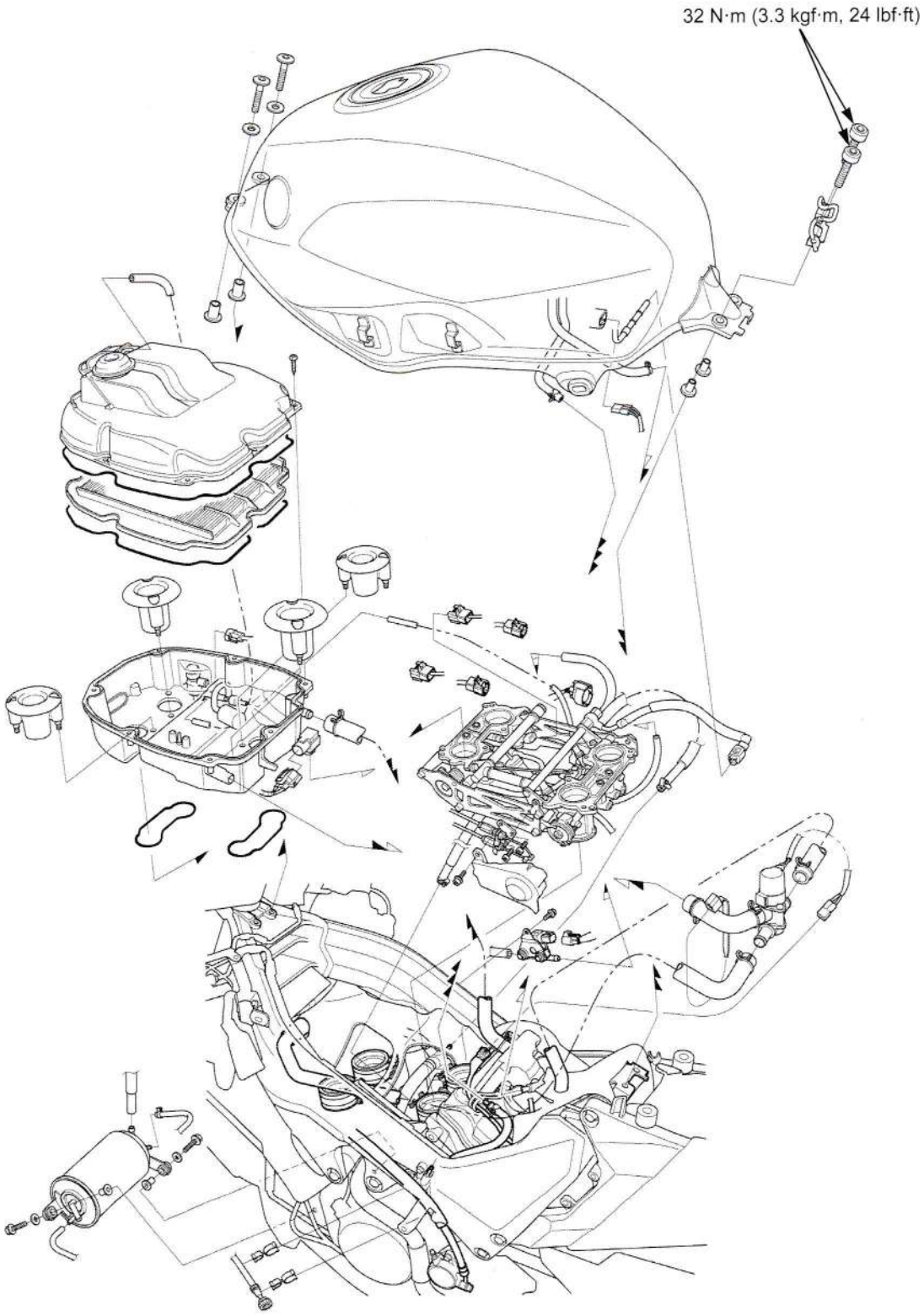


Vacuum gauge set
07LMJ-001000B (U.S.A. only)

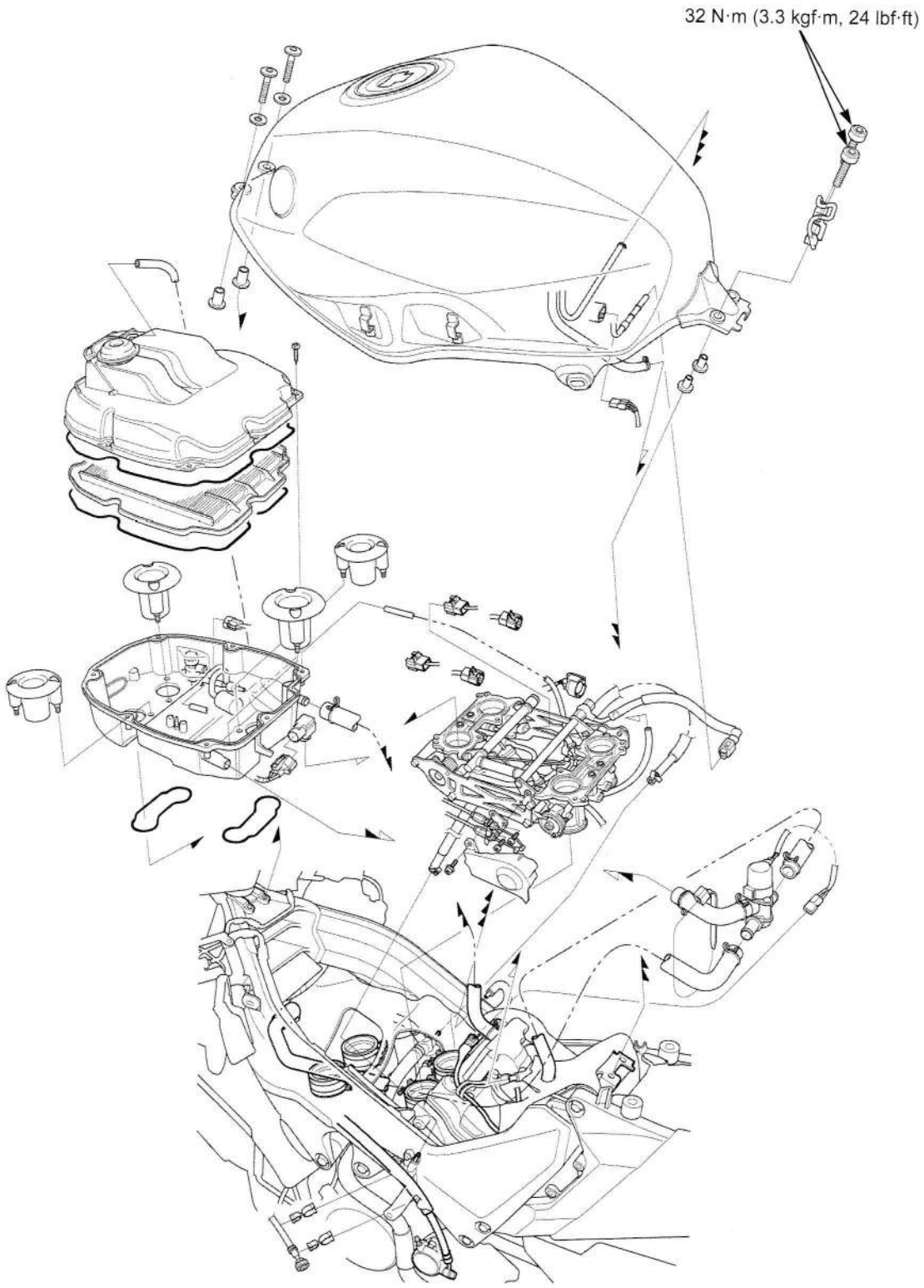


COMPONENT LOCATION

AC, II AC types



III CM type



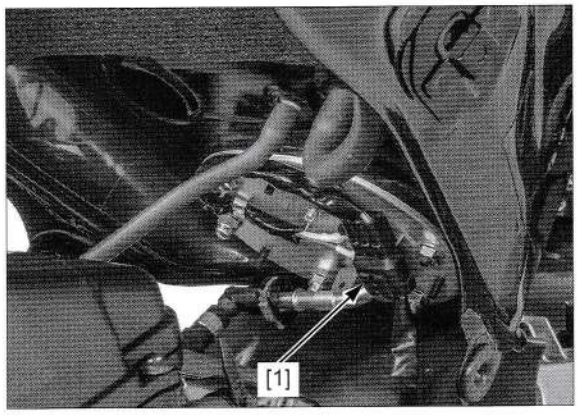
FUEL LINE INSPECTION

FUEL PRESSURE RELIEVING

NOTE:

- Before disconnecting fuel feed hose, relieve pressure from the system as follows.

1. Turn the ignition switch OFF.
2. Lift the fuel tank and support it (page 3-4).
3. Disconnect the fuel pump 3P (Black) connector [1].
4. Start the engine and let it idle until the engine stalls.
5. Turn the ignition switch OFF.



QUICK CONNECT FITTING REMOVAL

NOTE:

- Clean around the quick connect fitting before disconnecting the fuel feed hose, and be sure that no dirt is allowed to enter into the fuel system.
- Do not bend or twist the fuel feed hose.
- If the fuel feed hose is to be replaced, the air cleaner housing removal/installation is required (page 7-12).

1. Relive the fuel pressure (page 7-5).
2. Disconnect the negative (–) cable from the battery (page 19-6).
3. Place a shop towel over the quick connect fitting.
4. Pull the retainer [1] up fully to release the lock.

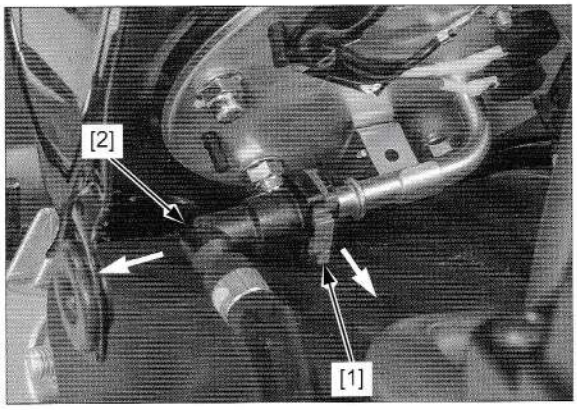
Do not pull on the retainer.

5. Pull the connector [2] and disconnect it.

NOTE:

- Be careful not to damage the connector parts. Do not use tools.
- Use a shop towel to prevent the remaining fuel in the fuel feed hose from flowing out.
- If the connector does not move, alternately pull and push the connector until it comes off easily.

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



QUICK CONNECT FITTING INSTALLATION

NOTE:

- Do not bend or twist the fuel feed hose.

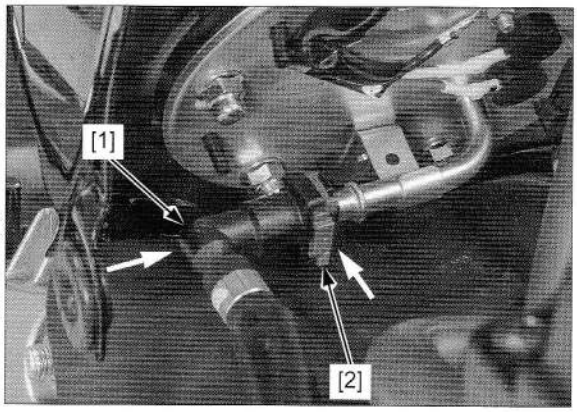
1. Press the connector [1] onto the joint pipe fully.

   Push the retainer [2] down to lock it.

NOTE:

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

2. Make sure that the retainer is in place and the connection is secure by pulling the connector.
3. Connect the battery negative (–) cable (page 19-6).
4. Normalize the fuel pressure (page 7-6).



FUEL PRESSURE NORMALIZATION

1. Be sure to connect the fuel pump 3P (Black) connector [1].
2. Turn the ignition switch ON with the engine stop switch "○".

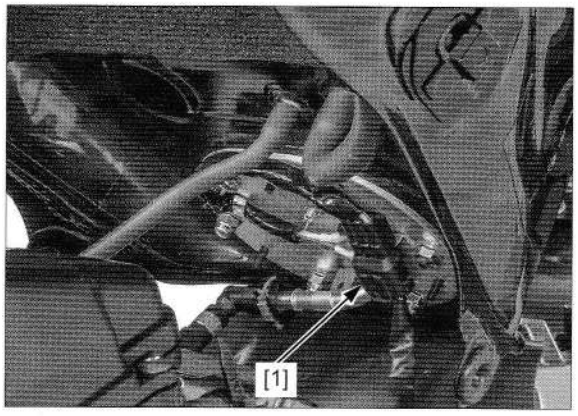
NOTE:

- Do not start the engine.

   The fuel pump will run for about 2 seconds and fuel pressure will rise.

   Turn the ignition switch OFF.

3. Repeat step 2 two or three times and check that there is no leakage.
4. Install the fuel tank (page 3-4).



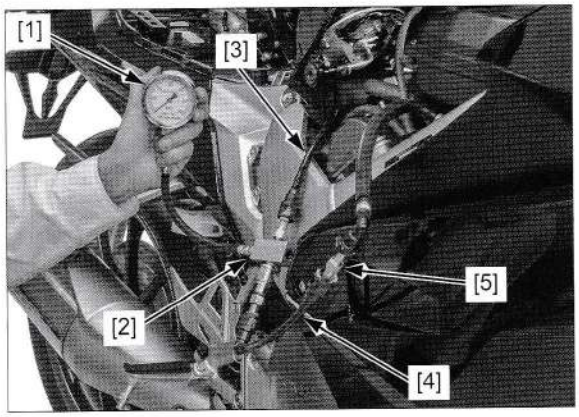
FUEL PRESSURE TEST

NOTE:

- Check the fuel tank-to-EVAP canister hose (AC, II AC types) or fuel tank breather hose (III CM type) for bends or pinches when the fuel tank is lifted.

Disconnect the quick connect fitting from the fuel tank (page 7-5).

Attach the special tools between the fuel feed hose and joint pipe of the fuel pump.



Except U.S.A. TOOLS:

[1] Fuel pressure gauge	**07406-0040004**
[2] Pressure gauge manifold	**07ZAJ-S5A0111**
[3] Hose attachment, 9 mm/9 mm	**07ZAJ-S5A0120**
[4] Hose attachment, 8 mm/9 mm	**07ZAJ-S7C0100**
[5] Attachment joint, 8 mm/9 mm	**07ZAJ-S7C0200**

U.S.A. TOOLS:

Fuel pressure gauge	**07406-004000C or 07406-004000B**
Pressure manifold hose	**07AMJ-HW3A100**
Adaptor, male	**07AAJ-S6MA300**
Adaptor, female	**07AAJ-S6MA500**

Temporarily connect the battery negative (–) cable.

Start the engine and let it idle.

Read the fuel pressure.

STANDARD: 343 kPa (3.5 kgf/cm^2, 50 psi)

If the fuel pressure is higher than specified pressure, replace the fuel pump unit.
If the fuel pressure is lower than specified pressure, inspect the following:

- fuel line for leakage
- fuel tank-to-EVAP canister hose (AC, II AC types) or fuel tank breather hose (III CM type) for pinches or clogs
- fuel filter (in fuel pump) for clogs
- fuel pump (page 7-8)

After inspection, relieve the fuel pressure (page 7-5).

Disconnect the negative (–) cable from the battery (page 19-6).

Remove the special tools.

Connect the quick connect fitting (page 7-6).

FUEL FLOW INSPECTION

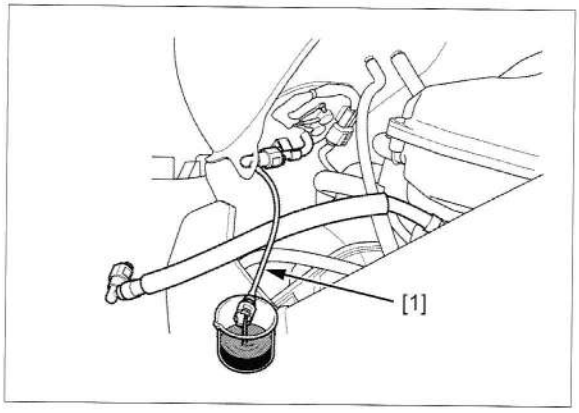
NOTE:

- Check the fuel tank-to-EVAP canister hose (AC, II AC types) or fuel tank breather hose (III CM type) for bends or pinches when the fuel tank is lifted.

Disconnect the quick connect fitting from the throttle body (page 7-5).

Connect the hose attachment [1] to the joint pipe of the fuel pump.

TOOLS:
Hose attachment, 9 mm/9 mm 07ZAJ-S5A0120



Wipe off spilled gasoline.

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

Temporarily connect the battery negative (–) cable.

Turn the ignition switch ON with the engine stop switch "○".
The fuel pump operates for 2 seconds. Repeat 5 times to meet the total measuring time.

NOTE:

- Return fuel to the fuel tank when the first fuel is flowed.

Measure the amount of fuel flow.

Amount of fuel flow:
206 cm^3 (7.0 US oz, 7.3 Imp oz) minimum/ 10 seconds at 12 V

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

- fuel feed hose for clogs
- fuel tank-to-EVAP canister hose (AC, II AC types) or fuel tank breather hose (III CM type) for pinches or clogs
- fuel filter (in fuel pump) for clogs
- fuel pump (page 7-8)

Remove the hose attachment.

Connect the quick connect fitting (page 7-6).

FUEL PUMP

INSPECTION

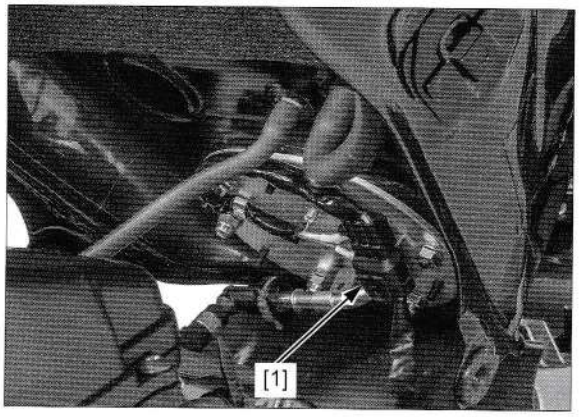
Turn the ignition switch ON with the engine stop switch "○" and confirm that the fuel pump operates for 2 seconds.

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

Turn the ignition switch OFF.

Lift the fuel tank and support it (page 3-4).

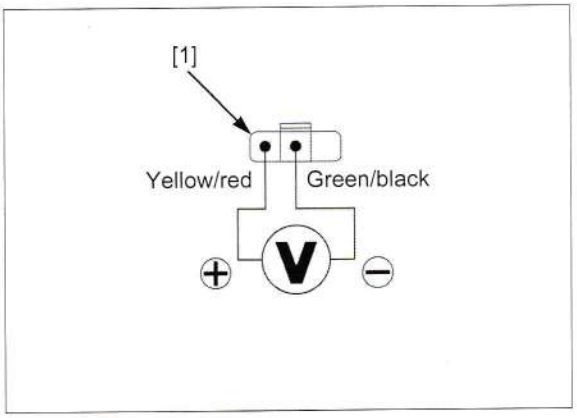
Disconnect the fuel pump 3P (Black) connector [1].



Turn the ignition switch ON with the engine stop switch "○".

Measure the voltage between the terminals of the wire harness side fuel pump 3P (Black) connector [1].

CONNECTION: Yellow/red (+) – Green/black (–)



There should be battery voltage for 2 seconds.

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

If there is no voltage, inspect the following:

- Green/black wire between the fuel pump and ground for an open circuit
- Yellow/red wire between the fuel pump relay and fuel pump for an open circuit
- fuel pump relay and its circuits (page 7-28)
- ECM (page 4-43)

REMOVAL/INSTALLATION

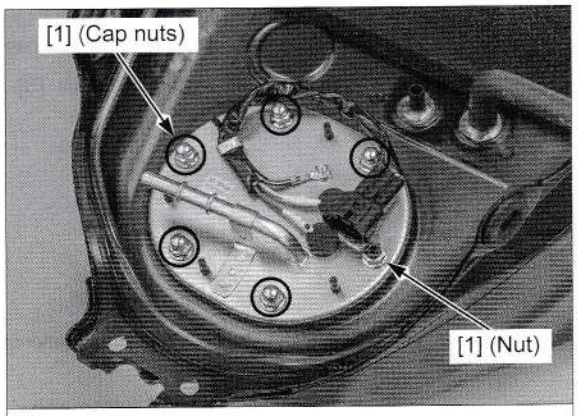
Remove the fuel tank (page 7-11).

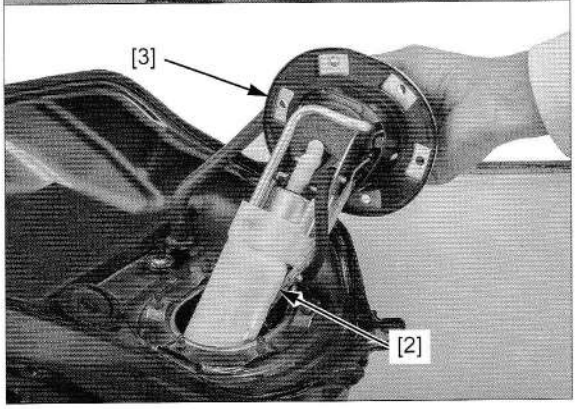
Clean around the fuel pump.

Loosen the six mounting nuts [1] in a crisscross pattern in several steps and remove them.

Be careful not to deform the float arm of the fuel level sensor.

Remove the fuel pump assembly [2] and the rubber seal [3].

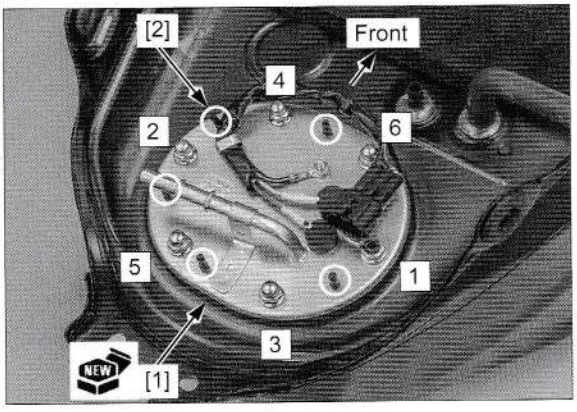




Installation is in the reverse order of removal.

NOTE:

- Replace the rubber seal [1] with a new one.
- Clean the rubber seal seating areas of the fuel tank and fuel pump base plate, and be sure that no foreign materials enter the tank.
- When installing the rubber seal, pull the five retaining pins [2] in the holes securely to seat it on the base plate.
- Tighten the six mounting nuts to the specified torque in the sequence as shown.



TORQUE:

Fuel pump mounting nut:
12 N·m (1.2 kgf·m, 9 lbf·ft)

FUEL FILTER REPLACEMENT

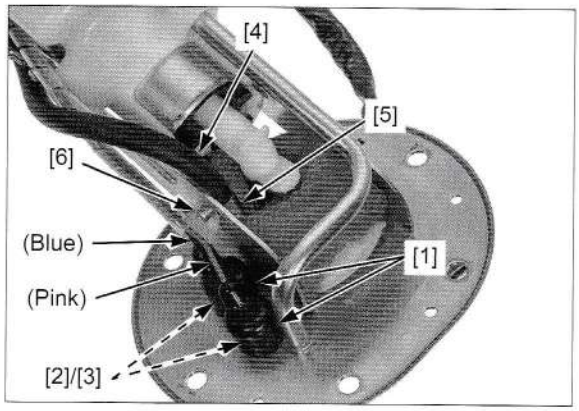
Remove the fuel pump assembly (page 7-9).

Release the terminal caps [1].

Remove the nuts [2] and spring washers [3] to disconnect the wires.

Release the return hose [4] from the hose guide [5].

Remove the screws [6] and hose guide.



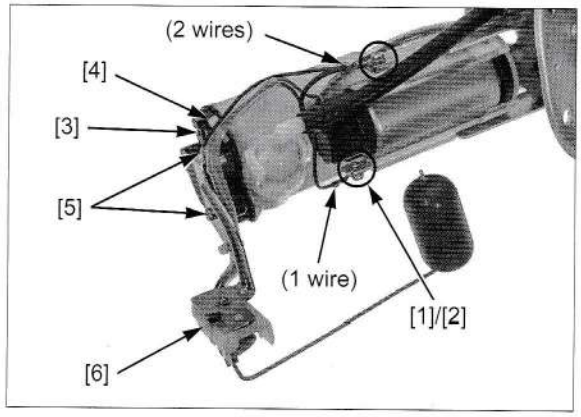
Remove the washer-screws [1] to disconnect the wires.

Remove the clip nuts [2].

Release the wire terminal [3] from the fuel filter.

Remove the spiral tube and wires out of the band [4].

Remove the washer-screws [5] and fuel level sensor assembly [6].

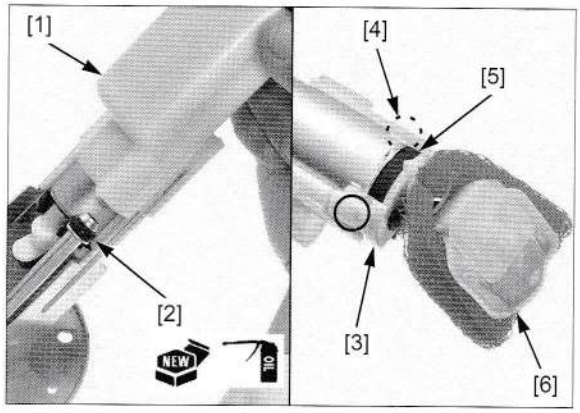


Slide the fuel pump/filter assembly [1] and remove it from the pump stays.

Remove the O-ring [2] from the joint pipe.

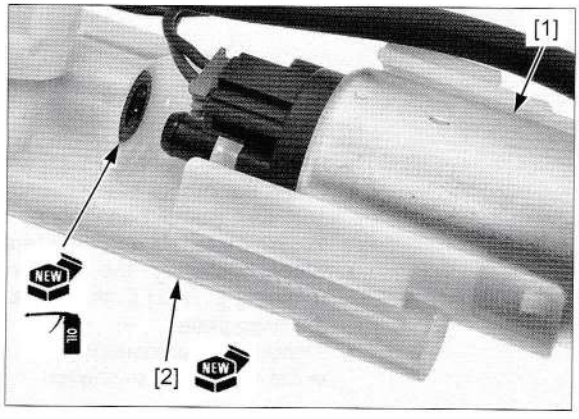
Release the pump holder [3] from hooks [4].

Remove the mounting rubber [5] and suction filter [6].



Pull the fuel pump [1] out from the fuel filter [2].

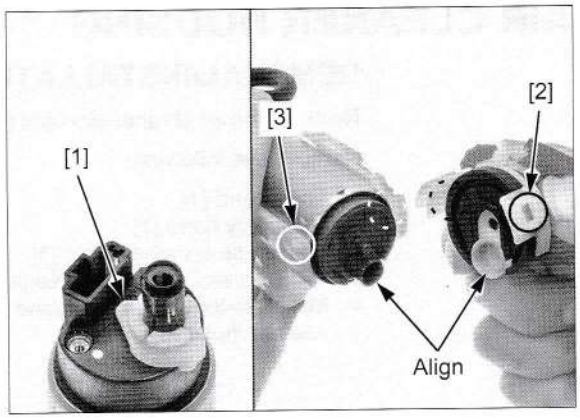
Replace the fuel filter with a new one.



Installation is in the reverse order of removal.

NOTE:

- Replace the O-ring and filter bushing with new ones and coat them with engine oil.
- When installing the fuel pump, be sure the set collar [1] is installed in the direction as shown.
- Align the hole with the pump joint properly and fit the slots [2] to the hooks [3] securely.



FUEL TANK

REMOVAL/INSTALLATION

Disconnect the quick connect fitting from the fuel tank (page 7-5).

Disconnect the following hoses at each hose joint [1].

- fuel tank drain hose [2]
- fuel tank-to-EVAP canister hose [3] (AC, II AC types)
- fuel tank breather hose [4] (III CM type)

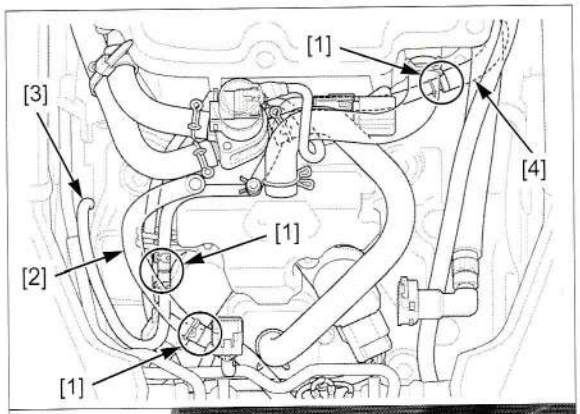
Lower the fuel tank, being careful not to pinch the wire and hoses.

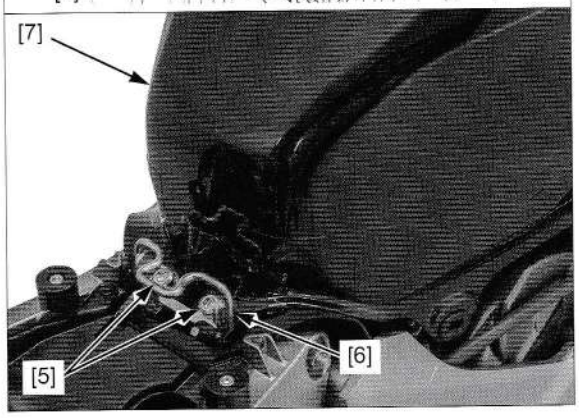
Remove the bolts [5], seat retainer [6], and fuel tank [7].

Installation is in the reverse order of removal.

TORQUE:
Fuel tank rear mounting bolt:
32 N·m (3.3 kgf·m, 24 lbf·ft)

Connect the quick connect fitting (page 7-6).





FUEL FILL CAP

Open the fuel fill cap [1] with the ignition key.

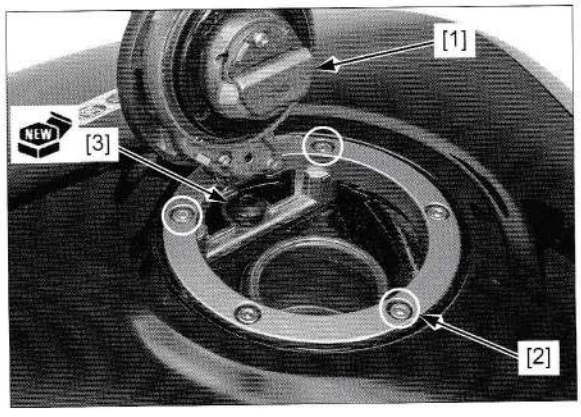
Remove the three bolts [2] and the fill cap.

Installation is in the reverse order of removal.

NOTE:

- Replace the breather seal [3] with a new one.

TORQUE:
Fuel fill cap bolt:
1.8 N·m (0.2 kgf·m, 1.3 lbf·ft)



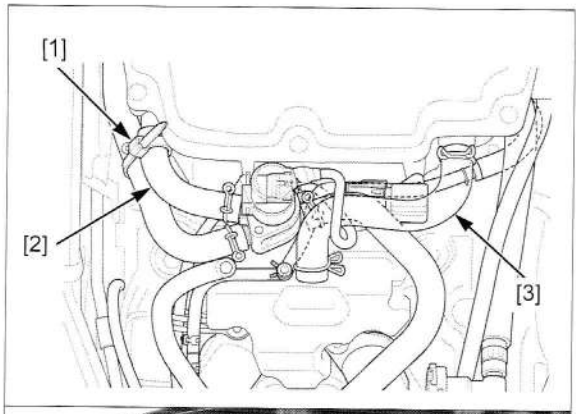
AIR CLEANER HOUSING

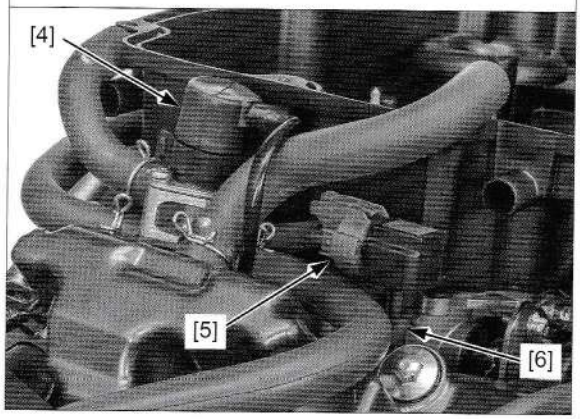
REMOVAL/INSTALLATION

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

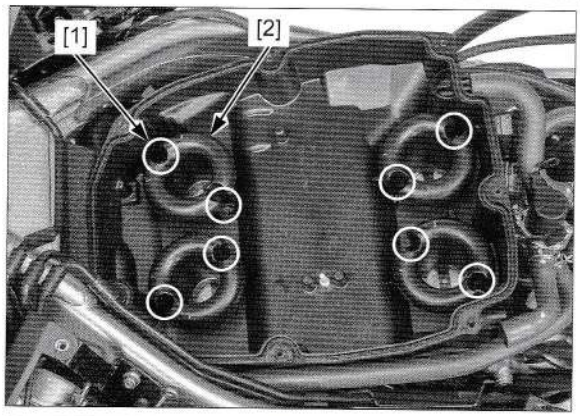
Remove the following:

- hose band [1]
- air supply hose [2]
- crankcase breather hose [3]
- PAIR control solenoid valve [4] (from the stays)
- MAP sensor 3P (Gray) connector [5]
- vacuum hose [6]

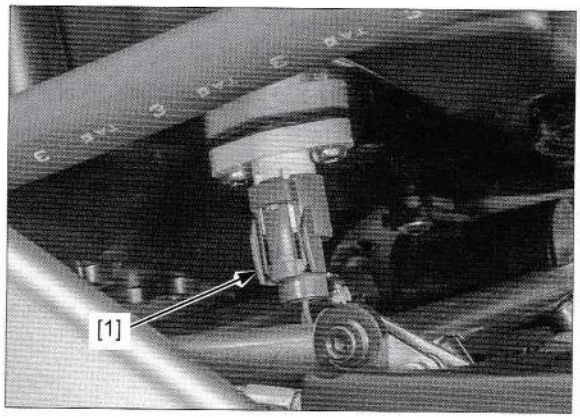




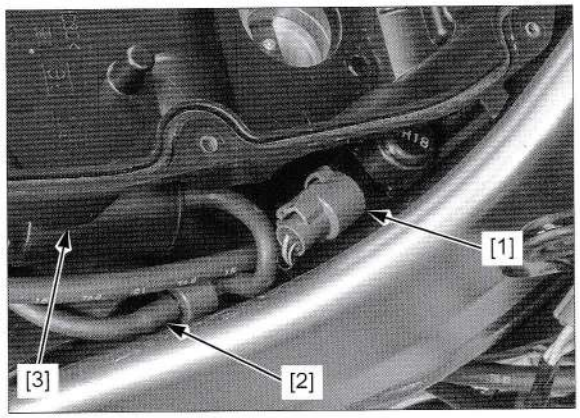
- eight screws [1]
- air funnels [2]



- IAT sensor 2P (Gray) connector [1]



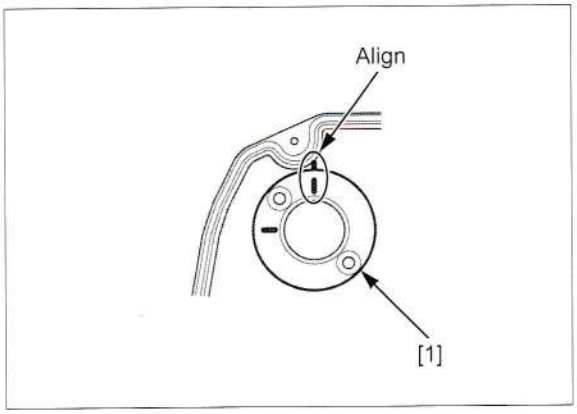
– intake duct control solenoid valve 2P (Gray) connector [1]
– vacuum hose [2] (from the one-way valve)
– air cleaner housing [3]



Installation is in the reverse order of removal.

NOTE:

• Align the index lines of each air funnel [1] and housing.



FUEL INJECTOR

REMOVAL/INSTALLATION

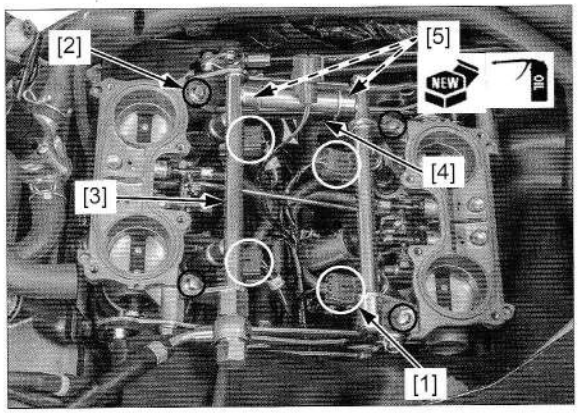
Relive the fuel pressure (page 7-5).

Remove the air cleaner housing (page 7-12).

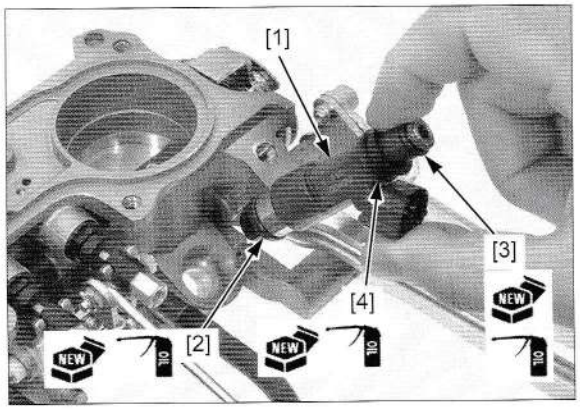
Disconnect the injector 2P (Gray) connectors [1].

Remove the following:

– four bolts [2]
– fuel rail assembly [3]
– rail joint [4]
– O-rings [5]



– fuel injector [1]
– seal ring [2]
– O-ring [3]
– cushion ring [4]



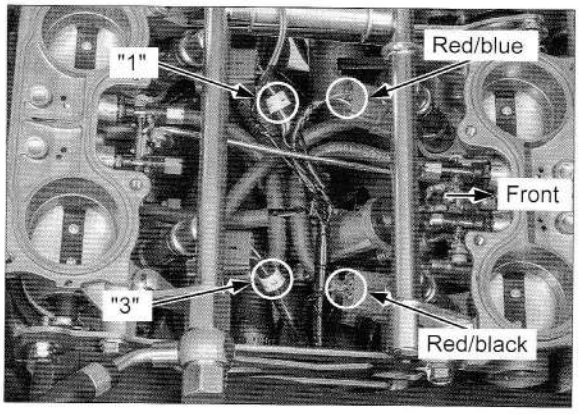
Installation is in the reverse order of removal.

NOTE:

- Replace the O-rings, seal rings, and cushion rings with new ones and coat them with engine oil.
- When installing the fuel injector and fuel rail assembly, be careful not to damage the rings.
- Connect the injector 2P (Gray) connectors in their correct injectors as shown.

TORQUE:

Fuel rail mounting bolt:
9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)



THROTTLE BODY

REMOVAL/INSTALLATION

Remove the following:

- fuel tank (page 7-11)
- air cleaner housing (page 7-12)

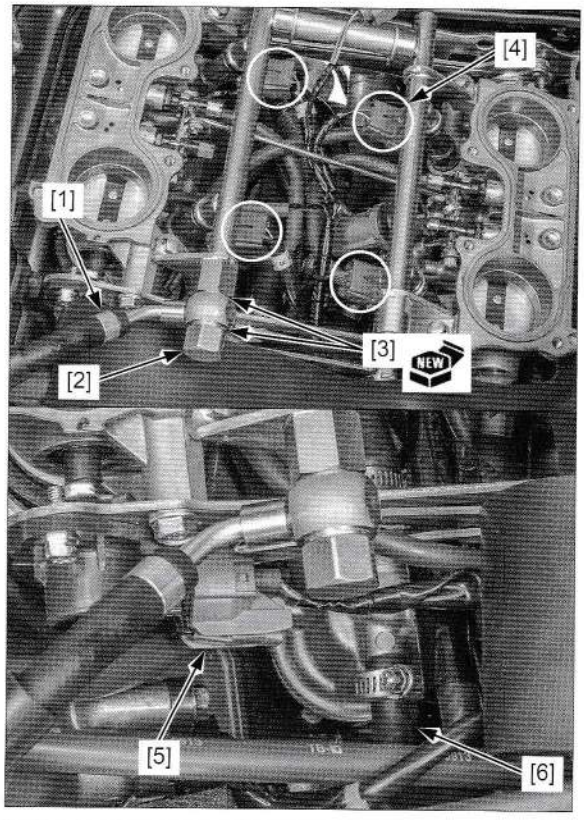
Remove the following for fuel feed hose [1] replacement.

- sealing nut [2]
- sealing washers [3]

Drain the coolant (page 8-5).

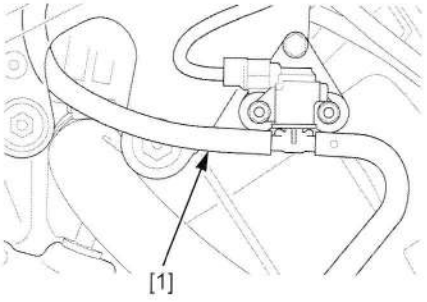
Disconnect the fuel injector 2P (Gray) connectors [4].

Disconnect the TP sensor 3P (Gray) connector [5] and water hose [6].



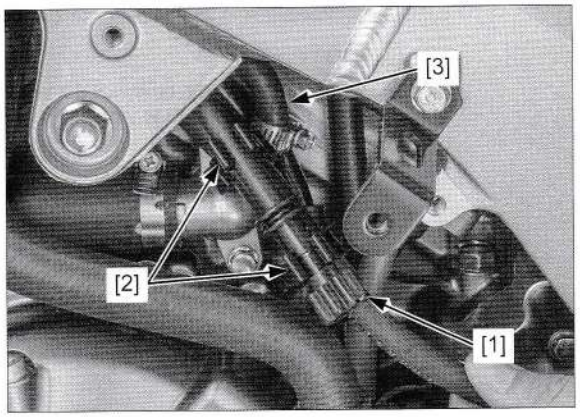
AC, II AC types: Disconnect the fuel tank-to-EVAP canister hose [1] from the EVAP purge control solenoid valve.

AC, II AC types:



Release the throttle stop screw [1] from the clips [2] securing with the clutch hose.

Disconnect the water hose [3].

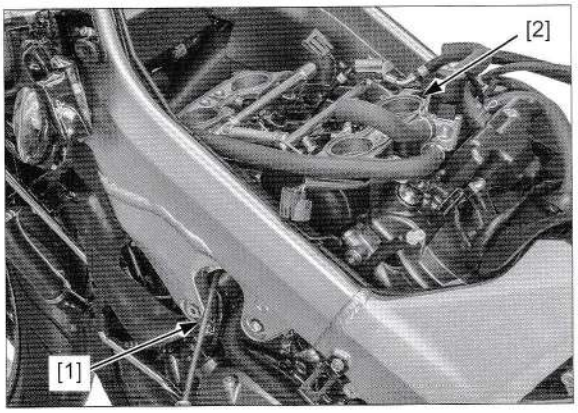


Loosen the insulator band screws (throttle body side) using a long phillips screwdriver [1].

Remove the throttle body [2] from the insulators.

NOTICE

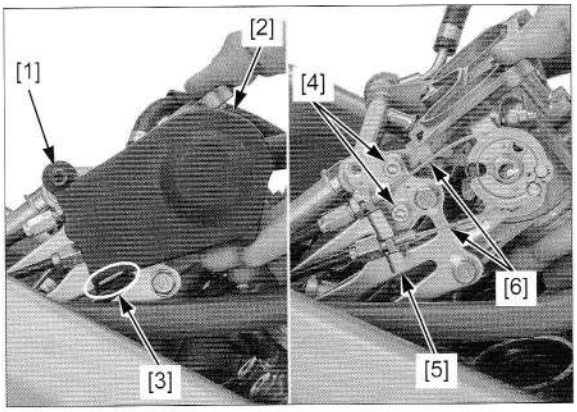
Do not hold the fuel rail on the throttle body while removing the throttle body.



Remove the socket bolt [1] and remove the throttle drum cover [2] by releasing the tab [3] from the connecting plate.

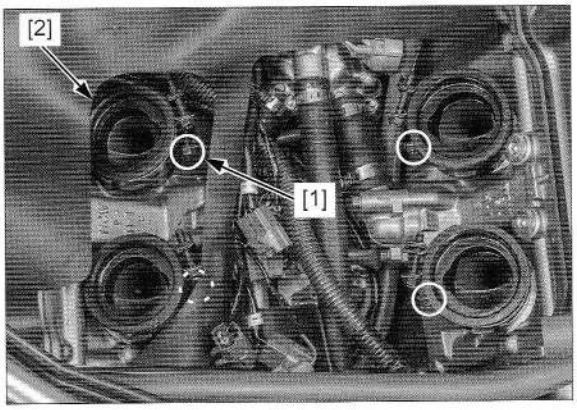
Do not snap the throttle valve. It may cause incorrect idle operation.

Remove the two socket bolts [4] to remove the cable holder [5] and disconnect the throttle cables [6] from the throttle drum.



Loosen the band screws [1] and remove the insulators [2] if necessary.

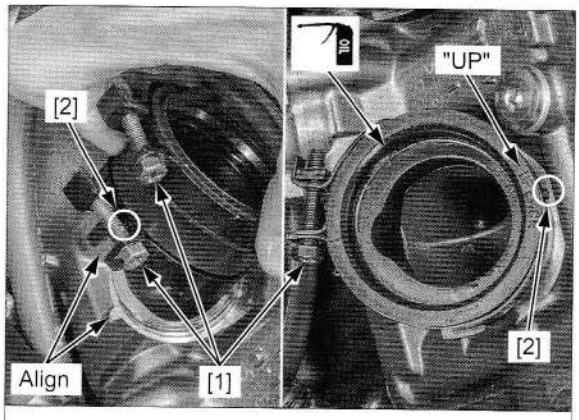
Seal the intake ports with tape or clean shop towels to keep dirt and debris from entering the engine.

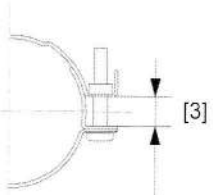


Installation is in the reverse order of removal.

NOTE:

- The insulator is installed with the "UP" mark facing up. Be sure that all the band screw heads [1] are facing to the left and each band hole [2] is aligned with the locating pin.
- Apply engine oil to the mating surfaces of the insulator.
- Install the insulator, aligning the groove with the lug.
- Tighten the insulator band screws so the distance [3] between the band ends is the specified value.
- Connect the injector 2P (Gray) connectors in their correct injectors (page 7-14).



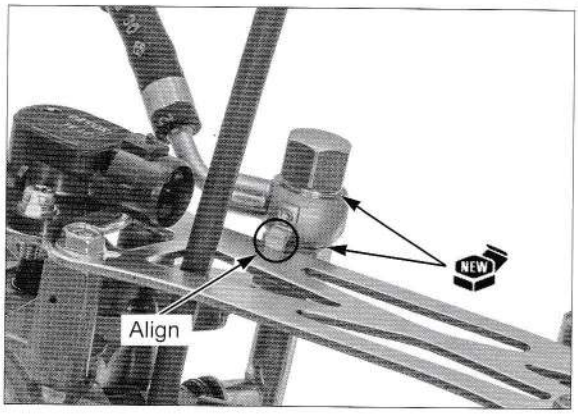


Throttle body side: 7 ± 1 mm (0.3 ± 0.04 in)
Cylinder head side: 10 ± 1 mm (0.4 ± 0.04 in)

- When installing the fuel feed hose, replace the sealing washers with new ones and align the tab with the groove.

TORQUE:

Throttle cable holder socket bolt:
3.4 N·m (0.3 kgf·m, 2.5 lbf·ft)
Fuel feed hose sealing nut:
22 N·m (2.2 kgf·m, 16 lbf·ft)
Throttle drum cover socket bolt:
3.4 N·m (0.3 kgf·m, 2.5 lbf·ft)



Check the throttle grip freeplay (page 3-4).

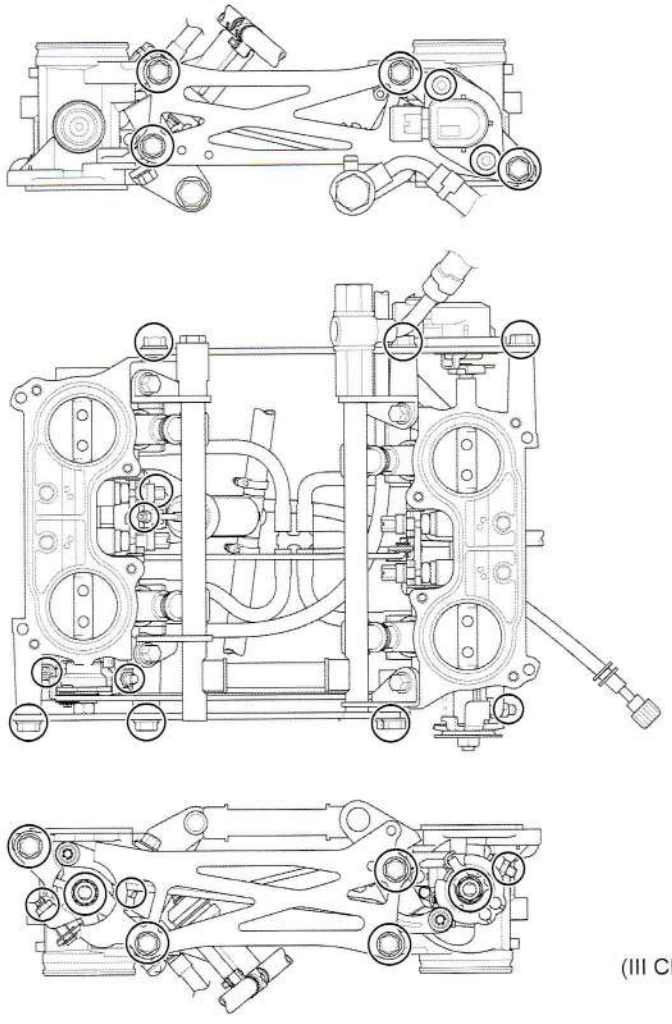
Fill and bleed the cooling system (page 8-5).

DISASSEMBLY/ASSEMBLY

NOTE:

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

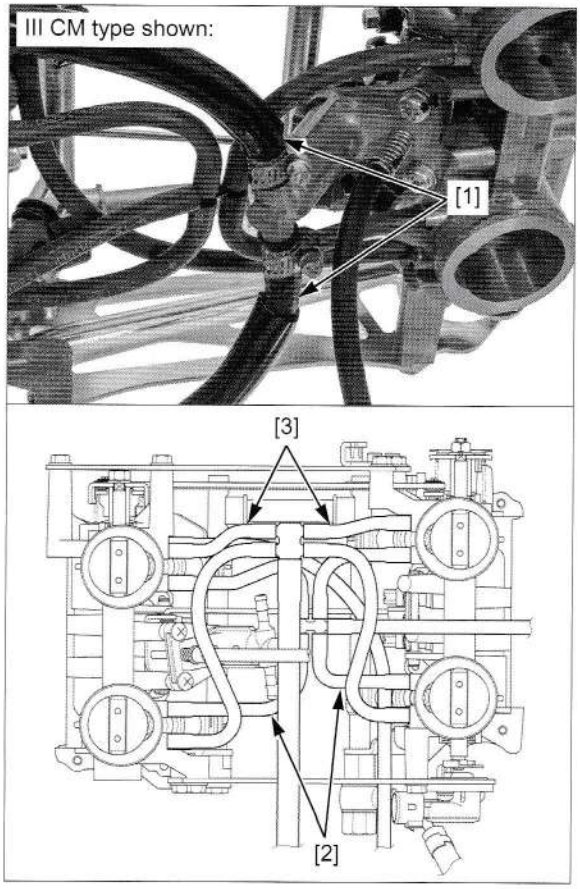
White painted nuts and bolts:



(III CM type shown)

Remove the following:

- water hoses [1]
- MAP sensor vacuum hoses [2]
- EVAP purge control solenoid valve hose-to-throttle body hoses (AC, II AC types) [3]

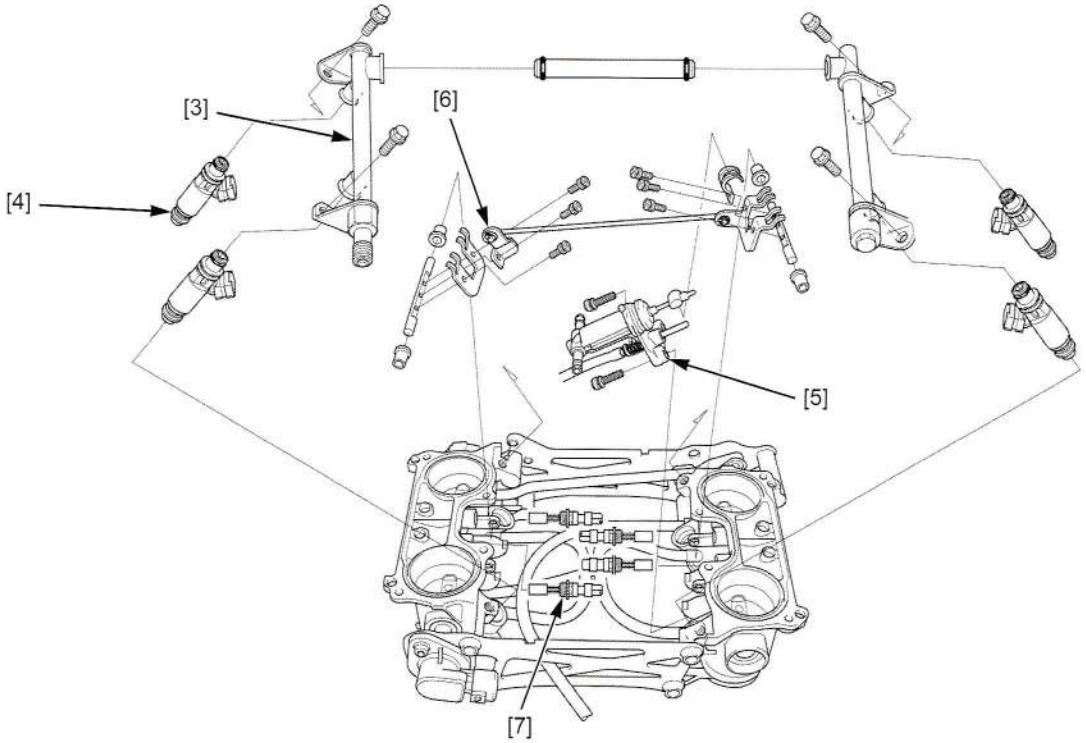


- fuel rails [3] and fuel injectors [4] (page 7-13)
- IAC thermal valve [5] (page 7-19)
- valve linkage [6] and starter valves [7] (page 7-19)

Clean the air passages in the throttle body with compressed air.

NOTE:

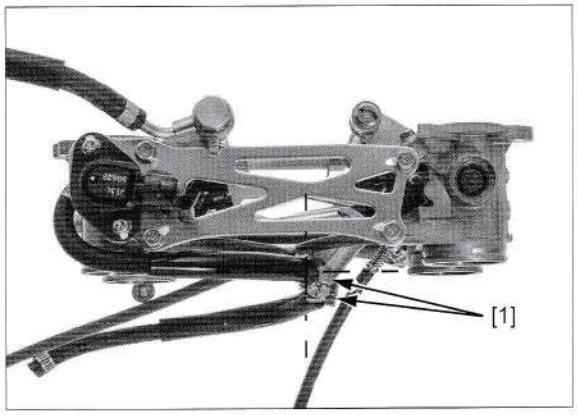
- Cleaning with the a piece of wire will damage the throttle body.



Assembly is in the reverse order of disassembly.

NOTE:

- When connecting the water hose, tighten the hose bands [1] in the direction as shown.
- Route the vacuum and EVAP hoses properly so they are not kinked or pinched (page 7-18).



IAC THERMAL VALVE

REMOVAL/INSTALLATION

Do not loosen the lock nut (white painted) on the thermal valve shaft.

Remove the throttle body (page 7-14).

Remove the two mounting screws [1].

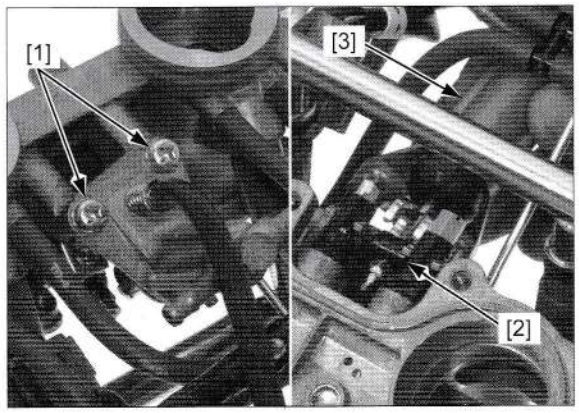
Release the shaft joint piece [2] from the joint plate, then remove the IAC thermal valve [3].

Do not disassemble the IAC thermal valve.

Installation is in the reverse order of removal.

TORQUE:
IAC thermal valve mounting screw:
4.9 N·m (0.5 kgf·m, 3.6 lbf·ft)

Install the throttle body (page 7-14).



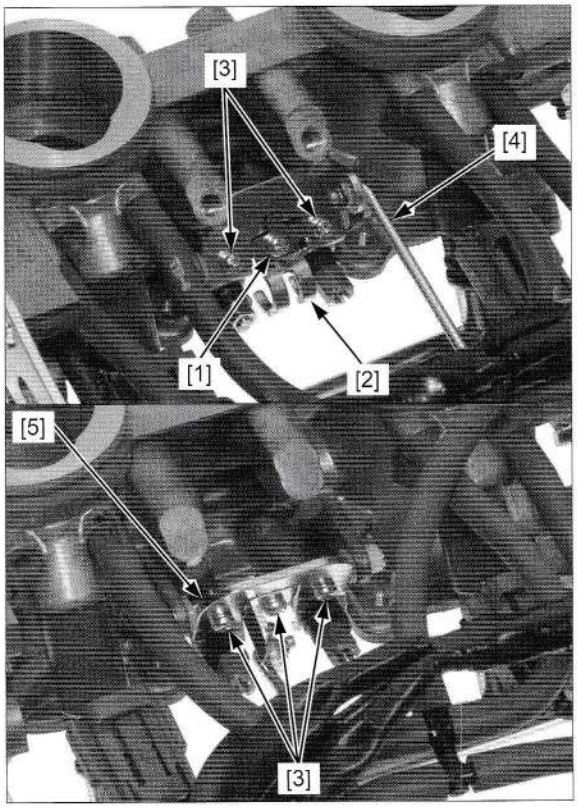
STARTER VALVE

REMOVAL/INSTALLATION

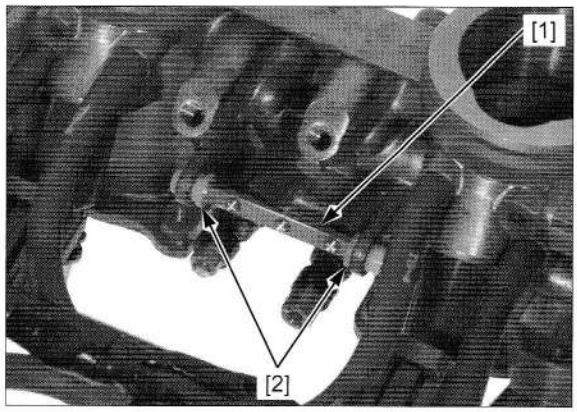
Remove the IAC thermal valve (page 7-19).

Remove the screw [1] and thermal valve joint plate [2].

Remove the screws [3], starter valve synchronization arm [4], and plate [5] from the starter valve shaft.

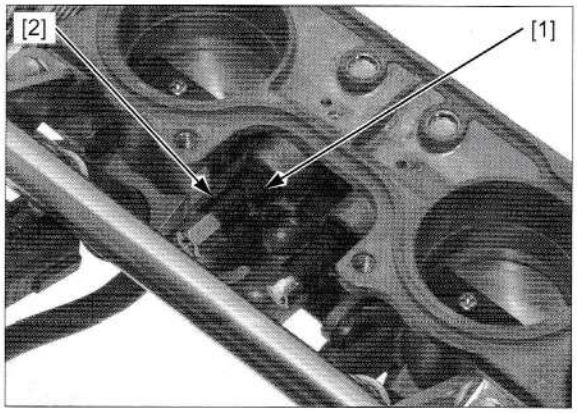


Remove the starter valve shafts [1] and collars [2].



Turn each starter valve adjusting screw in (except No. 4; white painted valve) and carefully count the number of turns until it seats lightly.
Make a note of this to use as a reference when reinstalling the starter valve.

Mark the starter valves to indicate the correct throttle bores.
Loosen the each lock nut [1] and remove the each starter valve [2].



Installation is in the reverse order of removal.

NOTE:

- Install the starter valves in their correct locations. Turn each adjusting screw in until it seats lightly, then back it out to its original position as noted during removal.
- Perform the starter valve synchronization if a new starter valve is installed (page 7-20).

TORQUE:

Starter valve lock nut:
1.8 N·m (0.2 kgf·m, 1.3 lbf·ft)
Starter valve synchronization plate screw:
0.9 N·m (0.1 kgf·m, 0.7 lbf·ft)
IAC thermal valve joint plate screw:
0.9 N·m (0.1 kgf·m, 0.7 lbf·ft)

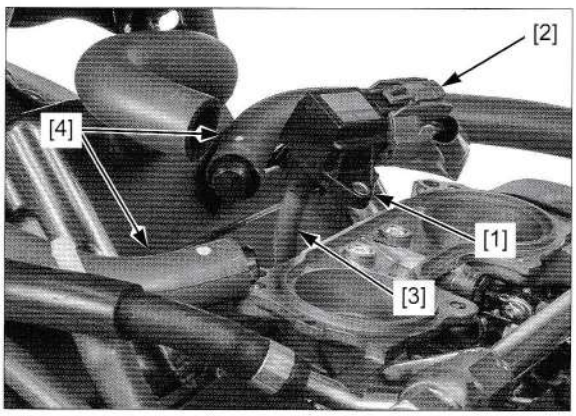
STARTER VALVE SYNCHRONIZATION

NOTE:

- Synchronize the starter valves with the engine at the normal operating temperature and with the transmission into neutral.
- Use a tachometer with graduations of 50 rpm or smaller that will accurately indicate a 50 rpm change.

Remove the following:

- PAIR control solenoid valve (page 7-22)
- MAP sensor (page 4-43)
- left under cowl (page 2-4)



Temporarily install the MAP sensor [1] by connecting the MAP sensor 3P (Gray) connector [2] and vacuum hose [3].

Plug the secondary air supply hoses [4].

Disconnect the four vacuum hoses (that go to the throttle body) [1] from the 5-way joint [2].

Connect the vacuum gauges [3] to the disconnected vacuum hoses.

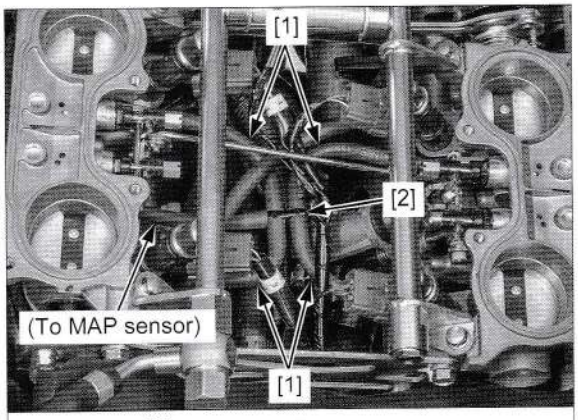
TOOL:

Vacuum gauge set	**07LMJ-001000B (U.S.A. only)**

Connect the tachometer.

Start the engine and adjust the engine idle speed (page 3-12).

IDLE SPEED: 1,200 ± 100 rpm



The No. 4 starter valve cannot be adjusted, it is the base valve.

Adjust the each intake vacuum pressure with the No. 4 cylinder by turning the No. 1, No. 2, and No. 3 starter valve adjusting screws [4].

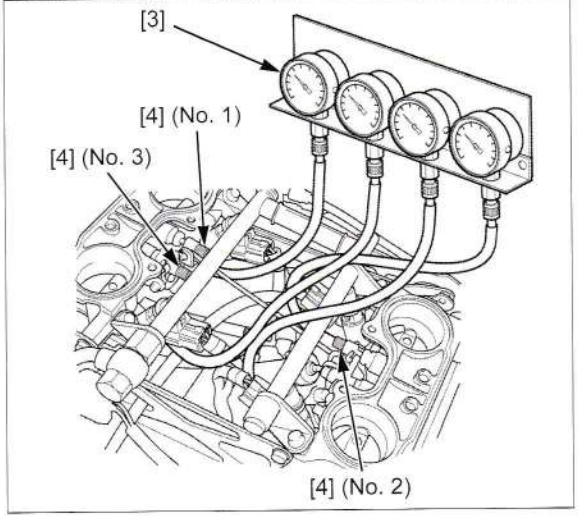
Stop the engine.

Remove the vacuum gauges.

Install the removed parts in the reverse order of removal.

Erase the DTC (page 4-7).

Adjust the idle speed if the idle speed differs from the specified speed (page 3-12).



SECONDARY AIR SUPPLY SYSTEM

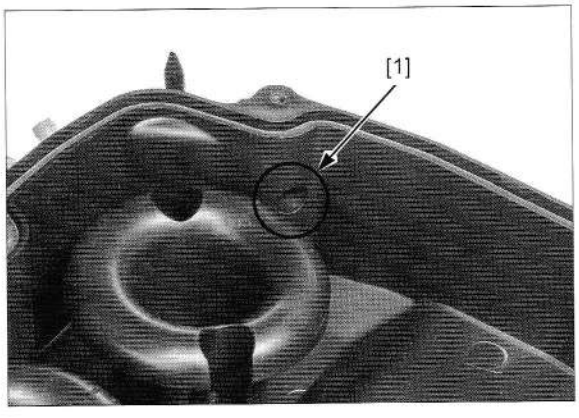
SYSTEM INSPECTION

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

Stop the engine.

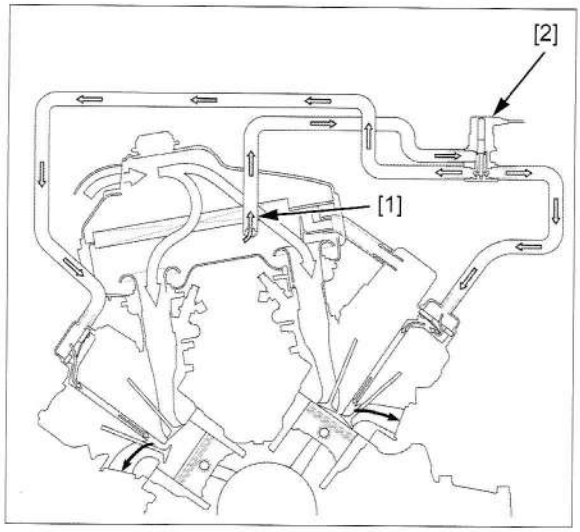
Remove the air cleaner element (page 3-5).

Check that the secondary air intake port [1] of the air cleaner housing is clean and free of carbon deposits. Check the PAIR check valve if the port is carbon fouled (page 7-24).



Start the engine and open the throttle slightly to be certain that air is sucked in through the disconnected air supply hose [1].

If the air is not drawn in, check the air supply hoses for clogs and inspect the PAIR control solenoid valve [2] (page 7-22).



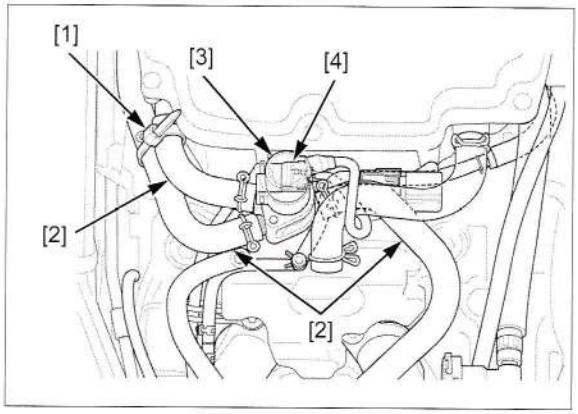
PAIR CONTROL SOLENOID VALVE REMOVAL/INSTALLATION

Remove the fuel tank (page 7-11).

Disconnect the following:

- hose band [1]
- air supply hoses [2]
- PAIR control solenoid valve [3] (from the stays)
- 2P connector [4]

Installation is in the reverse order of removal.



PAIR CONTROL SOLENOID VALVE INSPECTION

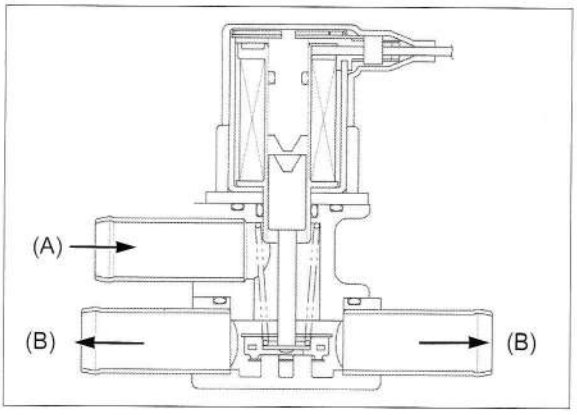
Remove the PAIR control solenoid valve (page 7-22).

Check the air flow through the solenoid valve.

Air should flow from input hose fitting (A) to output hose fittings (B).

Connect a 12 V battery to the 2P connector terminals of the PAIR control solenoid valve.

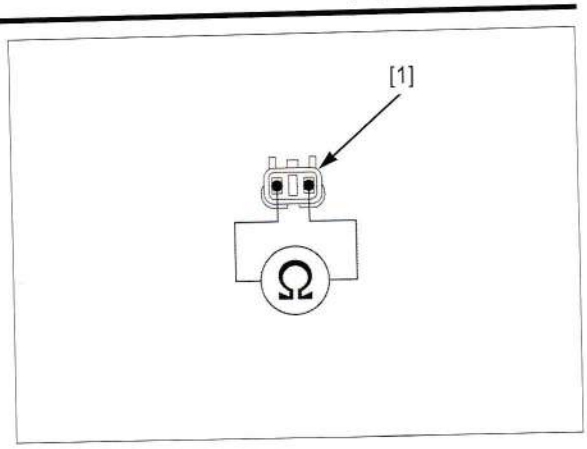
Air should not flow when the battery is connected.



Measure the resistance between the 2P connector [1] terminals of the PAIR control solenoid valve.

STANDARD: 20 – 24 Ω (20°C/68°F)

If the resistance is out of the specification, replace the PAIR control solenoid valve.

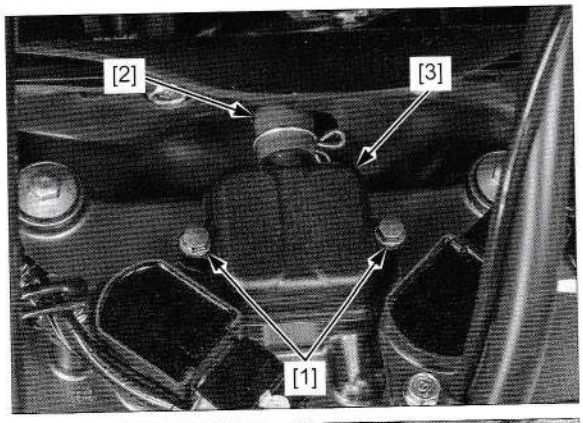


PAIR CHECK VALVE REMOVAL/ INSTALLATION

Front cylinder side: Remove the radiators without disconnecting the hoses (page 8-7).

Remove the two bolts [1].

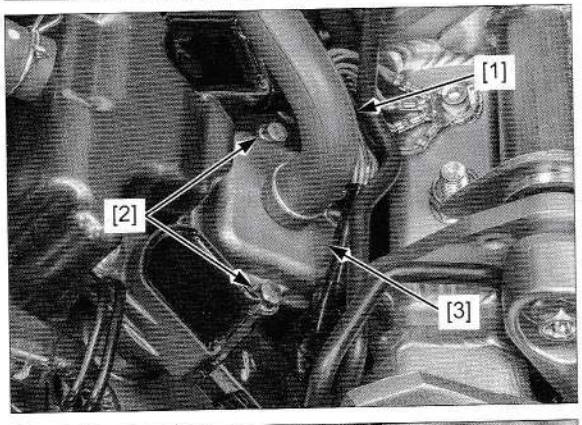
Disconnect the air supply hose [2] to remove the check valve cover [3].



Rear cylinder side: Remove the fuel tank (page 7-11).

Disconnect the air supply hose [1].

Remove the two bolts [2] and check valve cover [3].



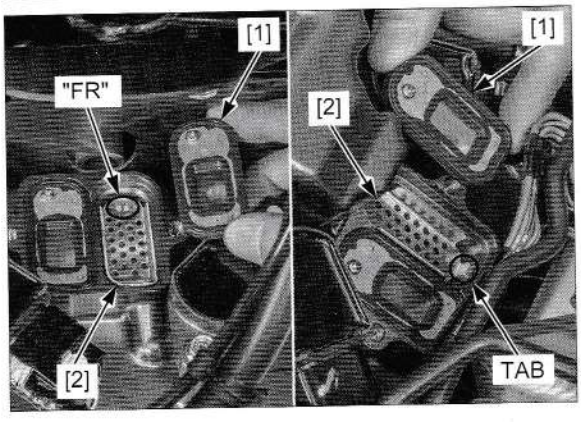
Remove the PAIR check valves [1] and baffle plates [2].

Installation is in the reverse order of removal.

NOTE:

- Baffle plate installation direction:
  - Front cylinder side: "FR" mark facing up
  - Rear cylinder side: small tab facing down

TORQUE:
PAIR check valve cover bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)

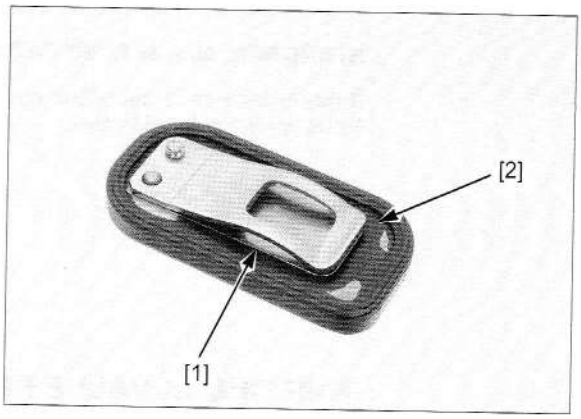


PAIR CHECK VALVE INSPECTION

Remove the PAIR check valves (page 7-23).

Check the reed [1] of the PAIR check valve for damage or fatigue. Replace if necessary.

Replace the PAIR check valve if the rubber seat [2] is cracked, deteriorated, damaged, or if there is clearance between the reed and seat.



INTAKE DUCT CONTROL SYSTEM

OPERATION INSPECTION

Raise the rear wheel off the ground by placing the motorcycle on its centerstand (II AC, III CM types) or supporting the motorcycle securely using a hoist or equivalent (AC type).

Lift the fuel tank and support it (page 3-4).

Shift the transmission into neutral.

Turn the ignition switch OFF and disconnect either connector of the gear position switch 1 [1] or 2 [2].

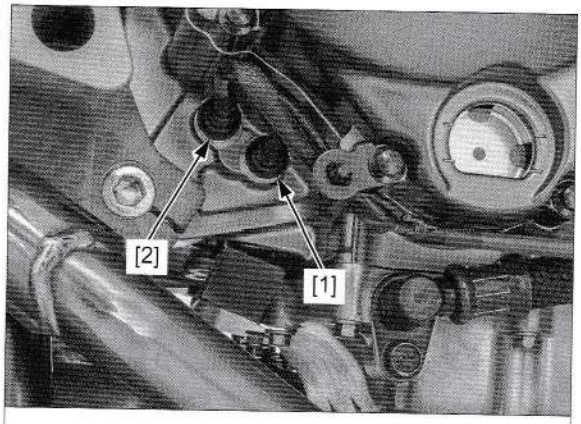
Start the engine with the sidestand up and clutch lever squeezed.

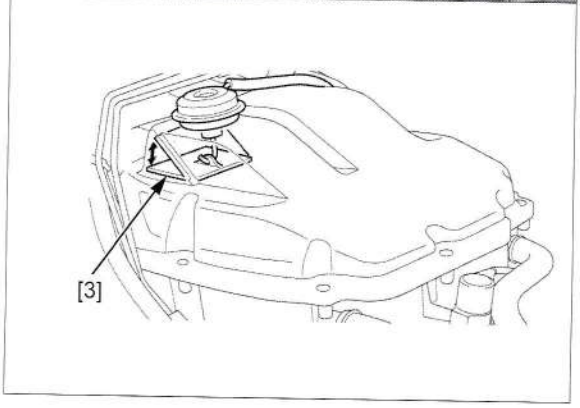
Check that the intake duct valve [3] is opened at idling.

Check that the valve closes in the following conditions.

- throttle opening: over 35°
- engine speed: below 7,800 rpm

After the above inspection, check the DTC and erase it (page 18-6).





INTAKE DUCT VALVE DIAPHRAGM

INSPECTION

Lift the fuel tank and support it (page 3-4).

Disconnect the vacuum hose from the diaphragm [1].

Connect a vacuum pump [2] to the diaphragm and apply specified vacuum.

SPECIFIED VACUUM: 33 kPa (250 mm Hg)

The vacuum should hold and the intake duct valve [3] should remain open.

REMOVAL/INSTALLATION

Lift the fuel tank and support it (page 3-4).

Disconnect the vacuum hose [1].

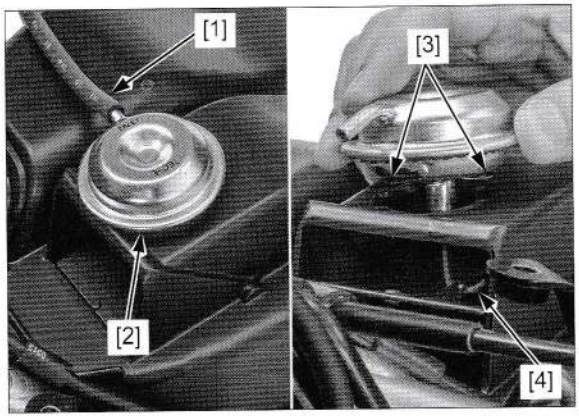
Turn the diaphragm [2] counterclockwise while holding down it to release the retainers [3].

Disconnect the rod [4] from the valve and remove the diaphragm.

Installation is in the reverse order of removal.

NOTE:

- When connecting the rod, insert the rod into the valve from the right side.
- Set the diaphragm so its hose joint is facing the right side.



INTAKE DUCT CONTROL SOLENOID VALVE

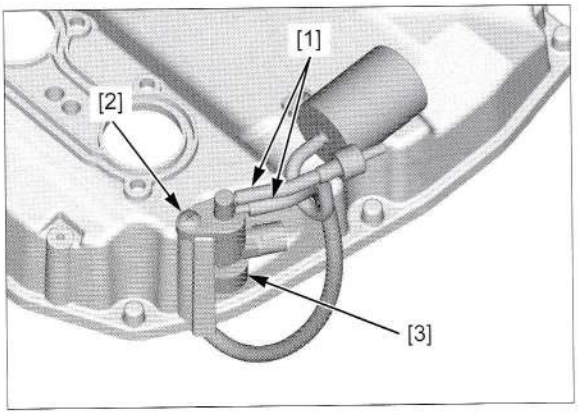
REMOVAL/INSTALLATION

Remove the air cleaner housing (page 7-12).

Disconnect the vacuum hoses [1].

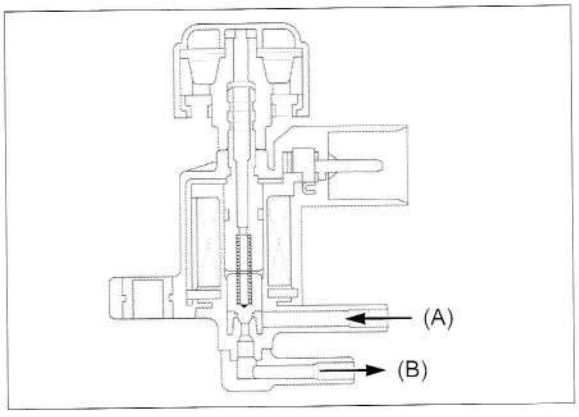
Remove the tapping screw [2] and solenoid valve [3].

Installation is in the reverse order of removal.



INSPECTION

Check that air flows (A) to (B) only when a 12 V battery is connected to the solenoid valve terminal.



REMOVAL/INSTALLATION

Lift the fuel tank and support it (page 3-4).

Disconnect the vacuum hose [1].

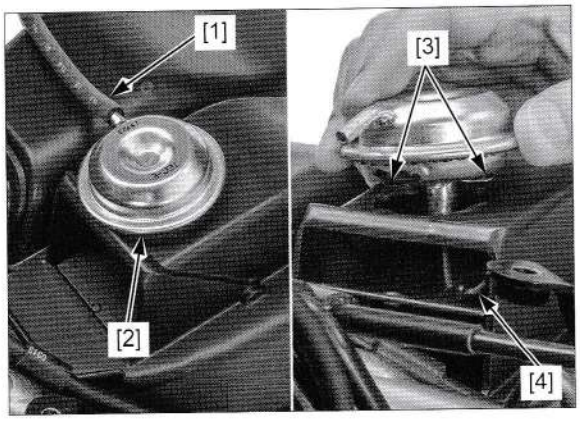
Turn the diaphragm [2] counterclockwise while holding down it to release the retainers [3].

Disconnect the rod [4] from the valve and remove the diaphragm.

Installation is in the reverse order of removal.

NOTE:

- When connecting the rod, insert the rod into the valve from the right side.
- Set the diaphragm so its hose joint is facing the right side.



INTAKE DUCT CONTROL SOLENOID VALVE

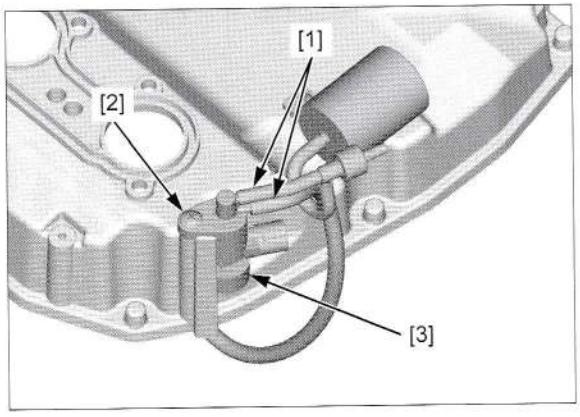
REMOVAL/INSTALLATION

Remove the air cleaner housing (page 7-12).

Disconnect the vacuum hoses [1].

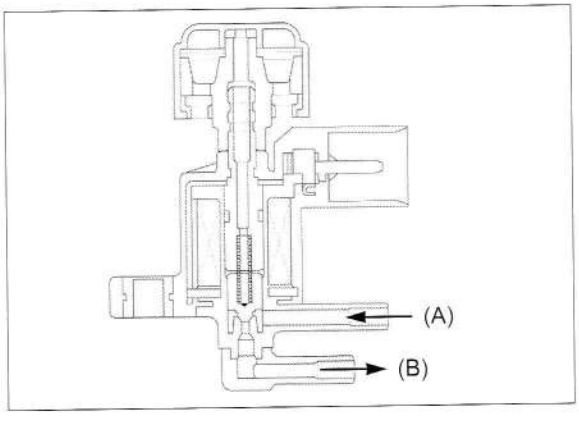
Remove the tapping screw [2] and solenoid valve [3].

Installation is in the reverse order of removal.



INSPECTION

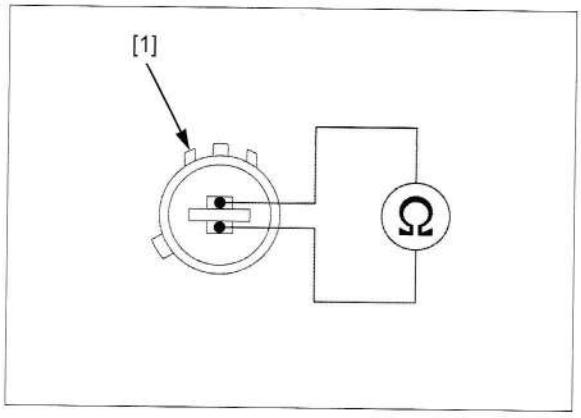
Check that air flows (A) to (B) only when a 12 V battery is connected to the solenoid valve terminal.



Check the resistance between the 2P connector [1] terminals of the solenoid valve.

STANDARD: 28 – 32 Ω (20°C/68°F)

If the resistance is out of specification, replace the solenoid valve.



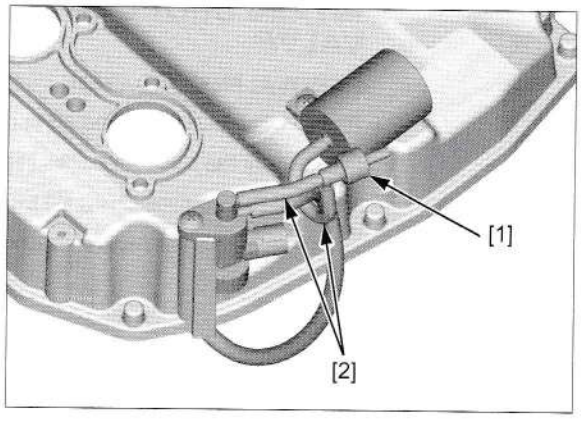
ONE-WAY VALVE

REMOVAL/INSTALLATION

Remove the air cleaner housing (page 7-12).

Remove the one-way valve [1] by disconnecting the vacuum hoses [2].

Installation is in the reverse order of removal.

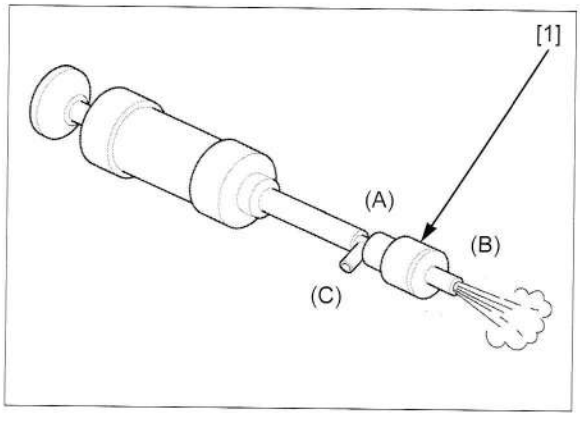


INSPECTION

Check the one-way valve [1] 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.



VACUUM CHAMBER

REMOVAL/INSTALLATION

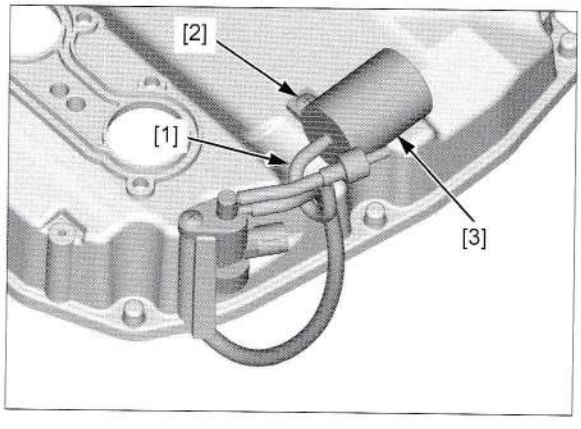
Remove the air cleaner housing (page 7-12).

Disconnect the vacuum hose [1].
Remove the screw [2] and vacuum chamber [3].

Installation is in the reverse order of removal.

INSPECTION

Check the vacuum chamber for damage or clacks and replace it if necessary.



EVAP PURGE CONTROL SOLENOID VALVE (AC, II AC types)

REMOVAL/INSTALLATION

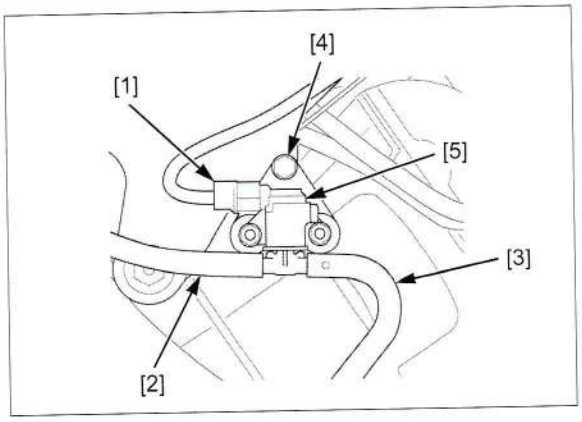
Remove the right middle cowl (page 2-6).

Disconnect the following:

- 2P (Black) connector [1]
- EVAP purge control solenoid valve-to-throttle body hose [2]
- EVAP canister-to-EVAP purge control solenoid valve hose [3]

Remove the bolt [4] and EVAP purge control solenoid valve assembly [5].

Installation is in the reverse order of removal.



INSPECTION

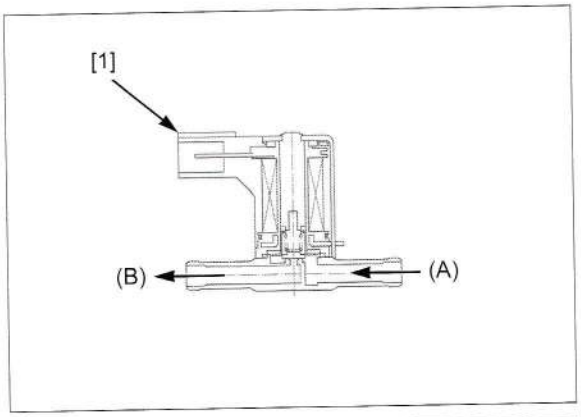
Remove the EVAP purge control solenoid valve (page 7-27).

Check the air flow through the solenoid valve.

Air should not flow from input hose fitting (A) to output hose fitting (B).

Connect a 12 V battery to the EVAP purge control solenoid valve 2P connector [1] terminals.

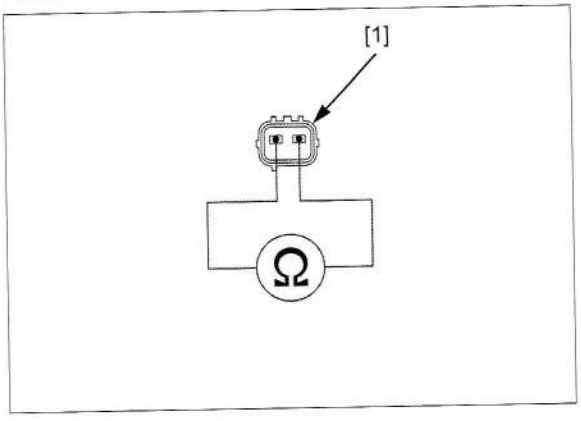
Air should flow when the battery is connected.



Measure the resistance between the 2P connector [1] terminals of the EVAP purge control solenoid valve.

STANDARD: 30 – 34 Ω (20°C/68°F)

If the resistance is out specification, replace the EVAP purge control solenoid valve.



EVAP CANISTER (AC, II AC types)

REMOVAL/INSTALLATION

Remove the following:

- under cowls (page 2-4)
- radiator grille (page 2-5)

Disconnect the following:

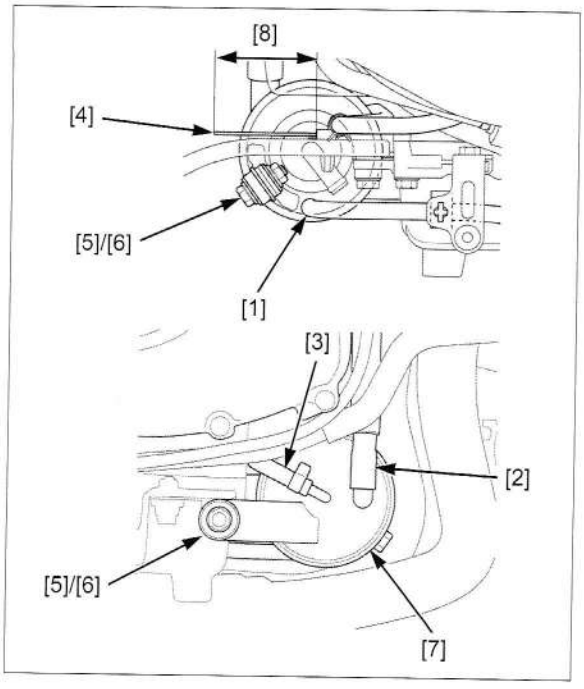
- EVAP canister drain hose [1]
- EVAP canister-to-EVAP purge control solenoid valve hose [2]
- fuel tank-to-EVAP canister hose [3] (release the hose band [4])

Remove the mounting bolts [5], washers [6], and the EVAP canister [7].

Installation is in the reverse order of removal.

NOTE:

- When routing the fuel tank-to-EVAP canister hose, secure the hose band so the band end length [8] is 52 – 55 mm (2.0 – 2.2 in).



FUEL PUMP RELAY

CIRCUIT INSPECTION

For relay inspection (page 20-26).

Remove the fuel pump relay (page 20-26).

RELAY SWITCH POWER INPUT LINE

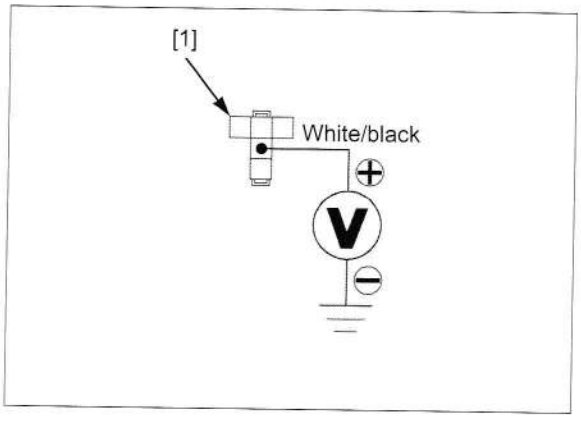
Measure the voltage between the fuel pump relay 5P connector [1] terminal and ground.

CONNECTION: White/black (+) – Ground (–)

There should be battery voltage at all times.

If there is no voltage, check the following:

- White/black wire between the right fuse box and fuel pump relay for an open circuit
- FUEL PUMP fuse (20 A)



RELAY COIL POWER INPUT LINE

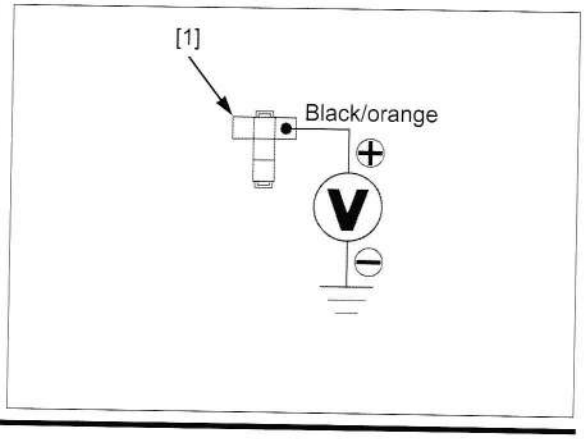
Measure the voltage between fuel pump relay 5P connector [1] terminal and ground.

CONNECTION: Black/orange (+) – Ground (–)

There should be battery voltage when the ignition switch is turned ON with the engine stop switch "○".

If there is no voltage, check the following:

- Black/orange wire between the right fuse box and fuel pump relay for an open circuit
- FI 2 fuse (10 A)



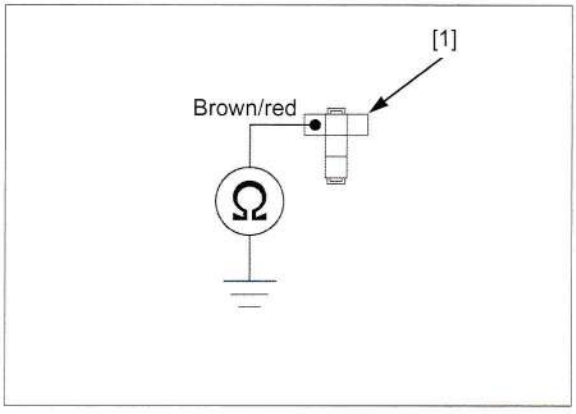
SIGNAL LINE

Check for continuity between the fuel pump relay 5P connector [1] and ground.

CONNECTION: Brown/red – Ground

There should be no continuity with the ignition switch OFF.
If there is continuity, check for a short circuit in the Brown/red wire between the fuel pump relay and ECM.

There should be continuity for a few seconds when the ignition switch is turned ON with the engine stop switch "Ω".
If there is no continuity, check for an open circuit in the Brown/red wire between the fuel pump relay and ECM.



MEMO

8. COOLING SYSTEM

SERVICE INFORMATION 8-2

TROUBLESHOOTING 8-2

SYSTEM FLOW PATTERN 8-3

SYSTEM TESTING 8-4

COOLANT REPLACEMENT 8-5

THERMOSTAT/HOSE JOINT 8-6

RADIATOR/COOLING FAN 8-7

WATER PUMP 8-9

RADIATOR RESERVE TANK 8-10

FAN MOTOR RELAY 8-10

SERVICE INFORMATION

GENERAL

⚠WARNING

Removing the radiator cap while the engine is hot can allow the coolant to spray out, seriously scalding you.
Always let the engine and radiator cool down before removing the radiator cap.

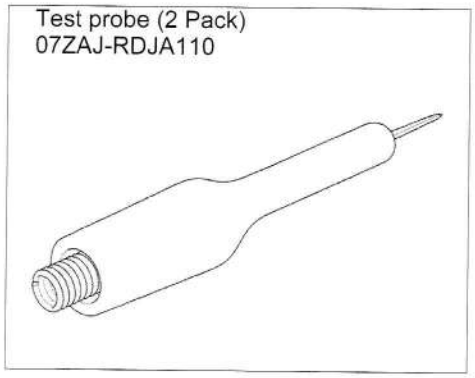
NOTICE

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

- Add coolant at the reserve tank. Do not remove the radiator cap except to refill or drain the system.
- All cooling system services can be done with the engine in the frame.
- Avoid spilling coolant on painted surfaces.
- After servicing the system, check for leaks with a cooling system tester.
- For coolant temperature gauge & indicator/ECT sensor inspection (page 20-15).
- For fan motor relay inspection (page 20-26).

TOOL

Test probe (2 Pack)
07ZAJ-RDJA110



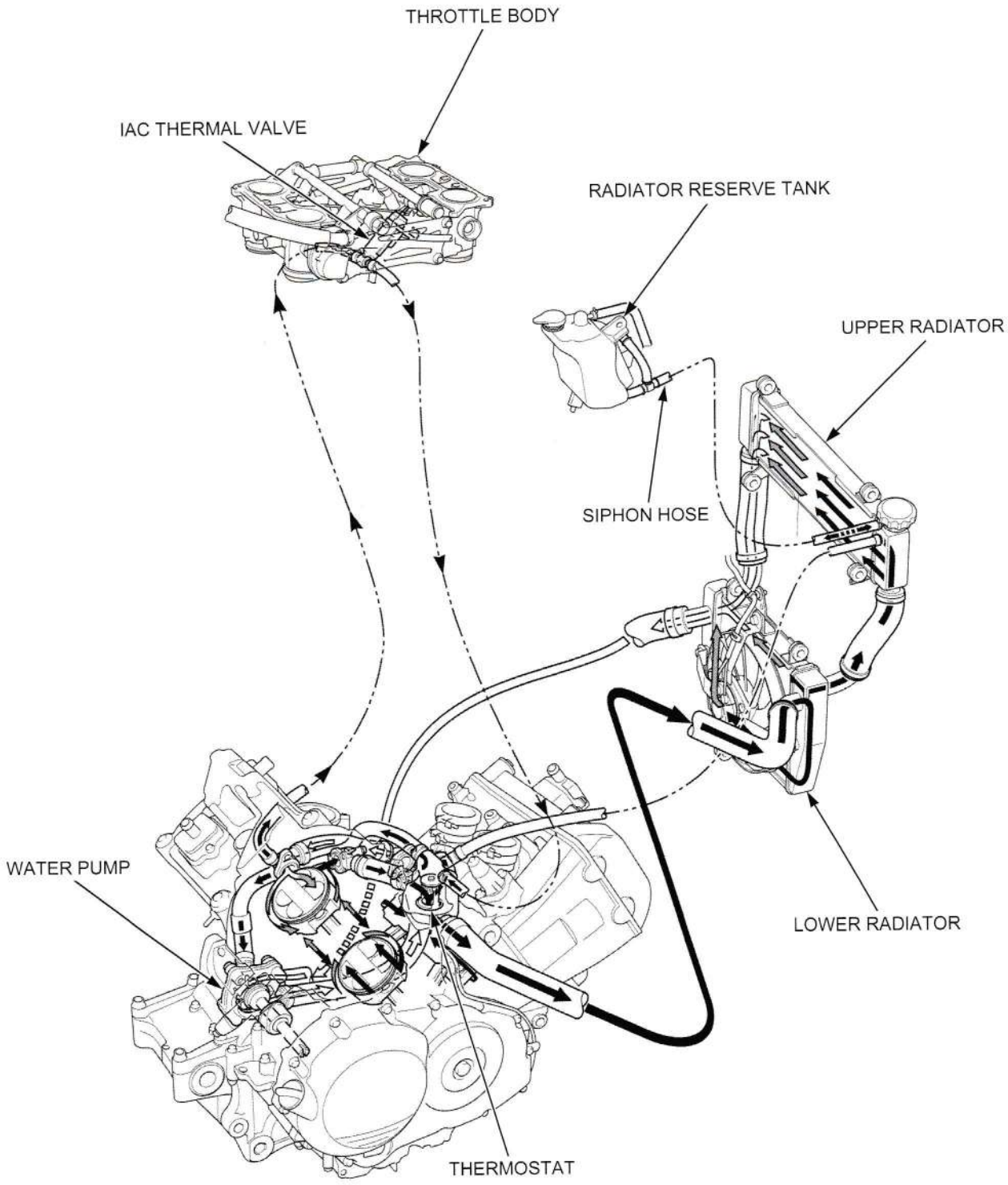
TROUBLESHOOTING

Engine temperature too high
- Faulty high coolant temperature indicator or ECT sensor (page 20-15)
- 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 motor relay (page 20-26)
- Faulty water pump

Engine temperature too low
- Faulty high coolant temperature indicator or ECT sensor (page 20-15)
- Thermostat stuck open
- Faulty fan motor 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
- Damaged radiator

SYSTEM FLOW PATTERN

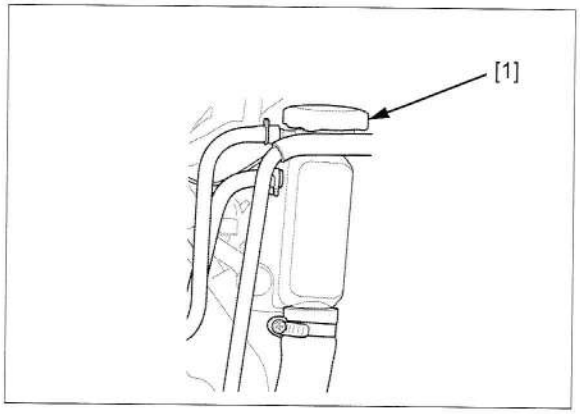


SYSTEM TESTING

RADIATOR CAP/SYSTEM PRESSURE INSPECTION

Remove the right middle cowl (page 2-6).

Remove the radiator cap [1].



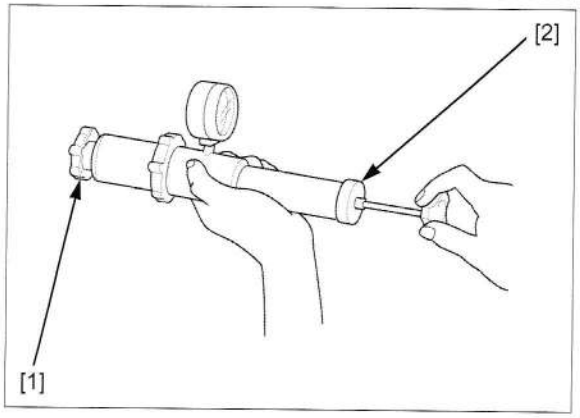
Wet the sealing surfaces of the cap [1], then install the cap onto the tester [2].

Pressurize the radiator cap using the tester.

Replace the radiator cap if it does not hold pressure, or if relief pressure is too high or too low.

The cap must hold the specified pressure for at least 6 seconds.

RADIATOR CAP RELIEF PRESSURE:
108 – 137 kPa (1.1 – 1.4 kgf/cm², 16 – 20 psi)



Connect the tester to the radiator.

Pressurize the radiator, engine, and hoses using the tester, and check for leaks.

NOTICE

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

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

COOLANT REPLACEMENT

REPLACEMENT/AIR BLEEDING

NOTE:

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

Remove the middle cowls (page 2-6).

Remove the water pump drain bolt [1] and sealing washer [2].

Remove the radiator cap [3] and drain the coolant.

Remove the cylinder drain bolt [4] and sealing washer [5], and drain the coolant from the cylinder.

Reinstall the drain bolts with new sealing washers.

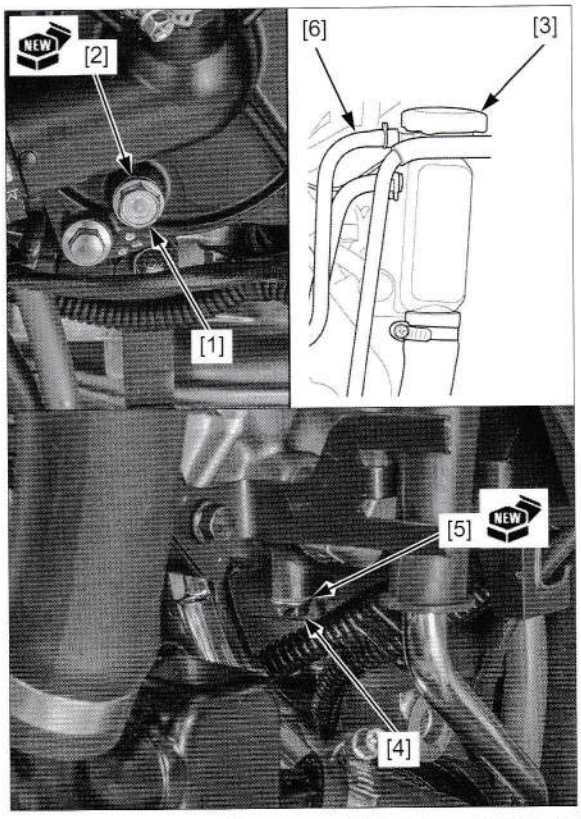
Tighten the drain bolts to the specified torque.

TORQUE:
Water pump drain bolt:
13 N·m (1.3 kgf·m, 10 lbf·ft)

Disconnect the siphon hose [6] from the radiator to drain the coolant from the reserve tank.

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

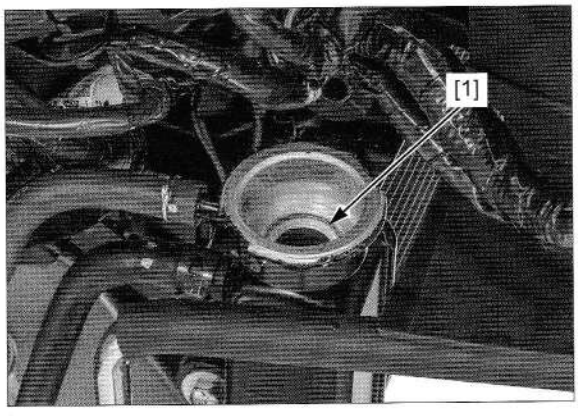
Connect the siphon hose to the radiator.



Fill the system with the recommended coolant through the filler opening up to filler neck [1].

RECOMMENDED ANTIFREEZE:
Pro Honda HP Coolant or an equivalent high quality ethylene glycol antifreeze containing silicate-free corrosion inhibitors

STANDARD COOLANT CONCENTRATION:
1:1 mixture with distilled water



Bleed air from the system as follow:

1. Shift the transmission into neutral.
   Start the engine and let it idle for 2 – 3 minutes.
2. Snap the throttle 3 – 4 times to bleed air from the system.
3. Stop the engine and add coolant up to the filler neck if necessary.
4. Install the radiator cap.

Fill the reserve tank with the recommended coolant (page 3-13).

Install the left middle cowls (page 2-6).

Install the radiator reserve tank cap.

After installation, check that are no coolant leaks.

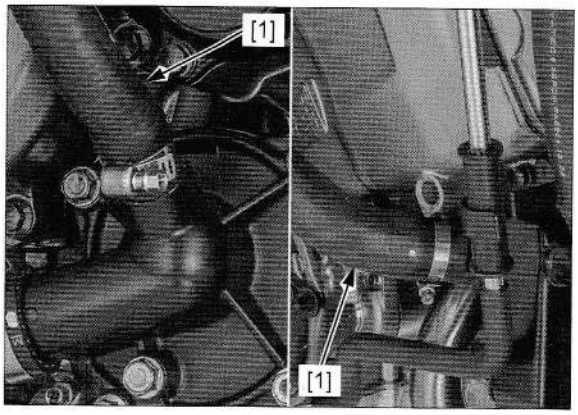
Install the removed parts in the reverse order of removal.

THERMOSTAT/HOSE JOINT

REMOVAL/INSTALLATION

Remove the throttle body (page 7-14).

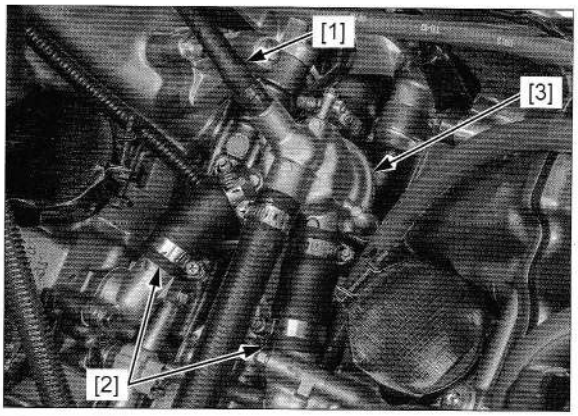
Disconnect the water hoses [1] from the water pump and right side of the lower radiator.



Disconnect the air bleed hose [1] from the thermostat housing.

Disconnect the water hoses [2] from the hose joints on the cylinders.

Remove the thermostat housing/hose assembly [3].



Remove the following:

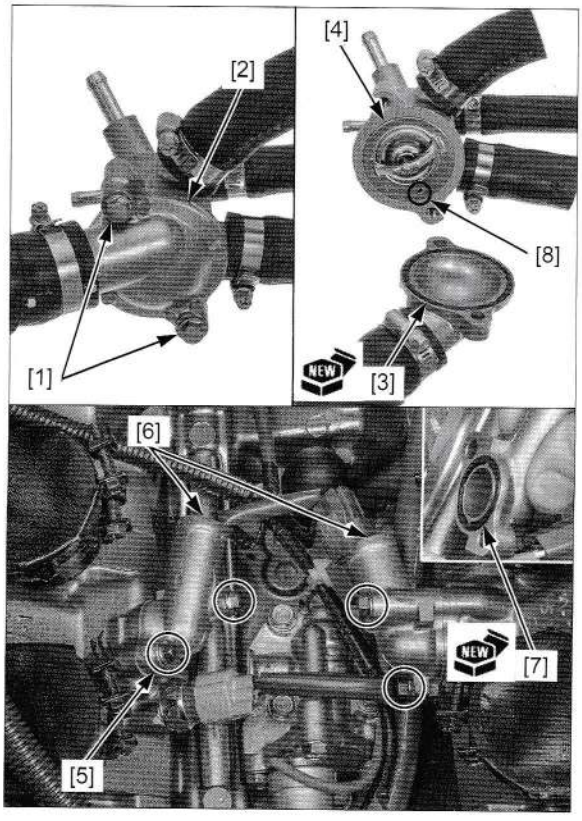
- two bolts [1]
- housing cover [2]
- O-ring [3]
- thermostat [4]
- four bolts [5]
- hose joints [6]
- O-rings [7]

Installation is in the reverse order of removal.

NOTE:

- Replace the O-rings with new ones.
- Before installing the housing cover, be sure that the bleed hole [8] is facing away from the hose joint and the thermostat flange is flush with the housing surface.

Fill and bleed the cooling system (page 8-5).



INSPECTION

Visually inspect the thermostat [1] for damage.

Replace the thermostat if the valve stays open at room temperature.

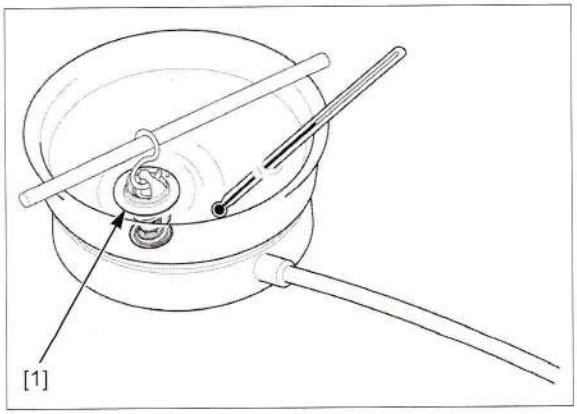
Do not let the thermostat or thermometer [2] touch the pan or you will get false reading.

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

NOTE:

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

Suspend the thermostat in heated water to check its operation.



THERMOSTAT BEGIN TO OPEN:
80.5 – 83.5°C (177 – 182°F)

VALVE LIFT:
8 mm (0.3 in) minimum at 95°C (203°F)

Replace the thermostat if it responds at temperatures other than those specified.

RADIATOR/COOLING FAN

NOTE:

- Take care not to damage the radiator fins while servicing.

REMOVAL/INSTALLATION

Drain the coolant (page 8-5).

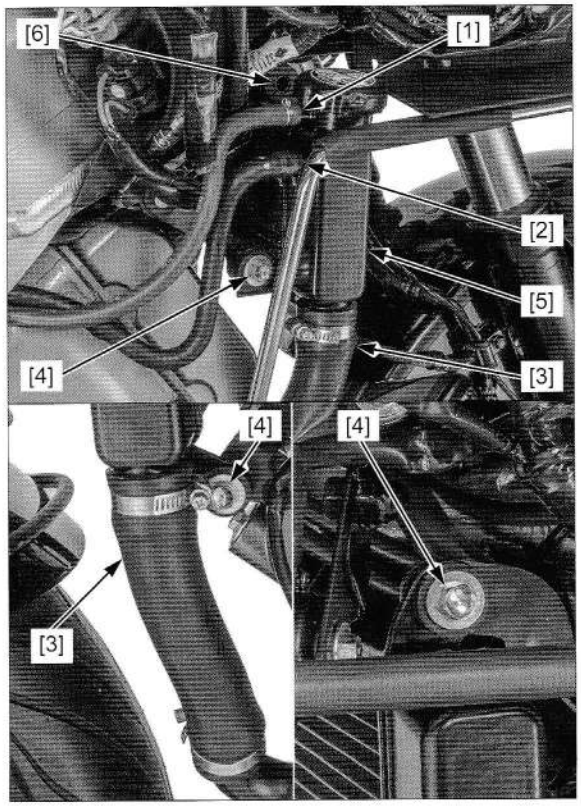
UPPER RADIATOR

Disconnect the following:

- siphon hose [1]
- air bleed hose [2]
- water hoses [3]

Remove the three washer-bolts [4].

Slide the radiator [5] to the right side to remove it from the mounting boss [6].



LOWER RADIATOR

Release the band clips [1] from the stays.

Release the fan motor 2P (Black) connector [2] from the stay and disconnect it.

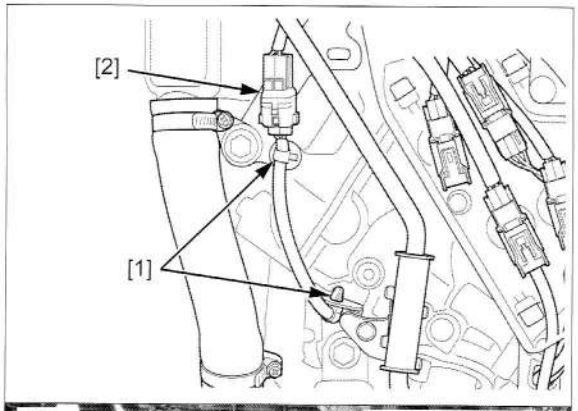
Disconnect the water hoses [3].

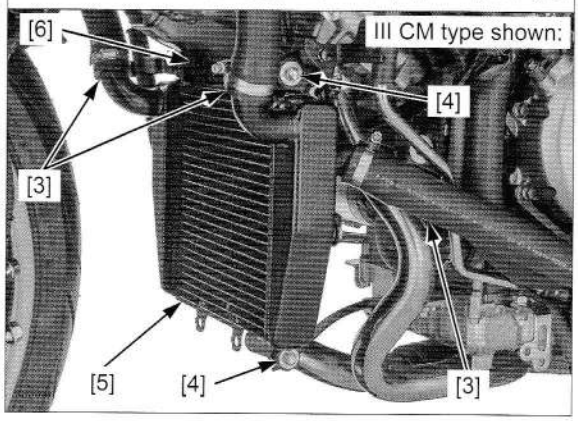
Remove the two washer-bolts [4].

Slide the lower radiator [5] to the left side to remove it from the mounting boss [6].

Installation is in the reverse order of removal.

Fill and bleed the cooling system (page 8-5).





DISASSEMBLY/ASSEMBLY

LOWER RADIATOR

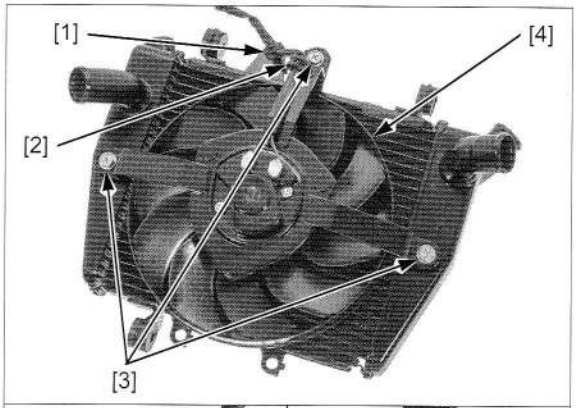
Remove the following:

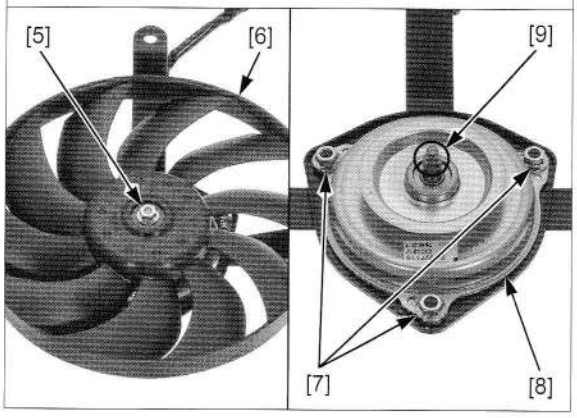
- band clip [1]
- wire (from the clamp [2])
- three bolts [3]
- fan motor assembly [4]
- fan nut [5]
- cooling fan [6]
- three nuts [7]
- fan motor [8]

Installation is in the reverse order of removal.

NOTE:

- Align the flat surfaces [9] of the fan and motor shaft properly.





WATER PUMP

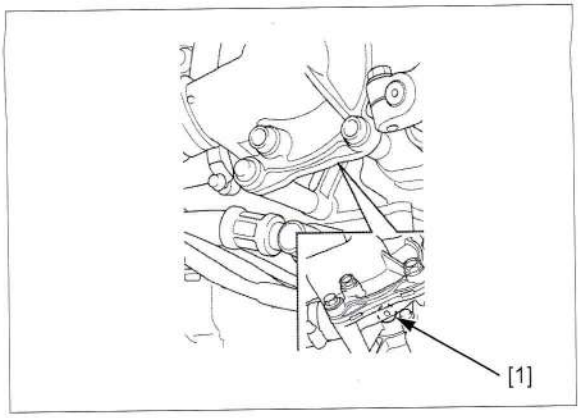
MECHANICAL SEAL INSPECTION

Remove the left under cowl (page 2-4).

Check the bleed hole [1] of the water pump for signs of coolant leakage.

- A small amount of coolant weeping from the bleed hole is normal.
- Make sure that there is no continuous coolant leakage from the bleed hole while operating the engine.

Replace the water pump as an assembly if necessary.



REMOVAL/INSTALLATION

Drain the coolant (page 8-5).

Disconnect the water hoses [1].

Remove the following:

- two cover bolts [2]
- two mounting bolts [3]
- pump cover [4]
- water pump [5]
- O-rings [6]

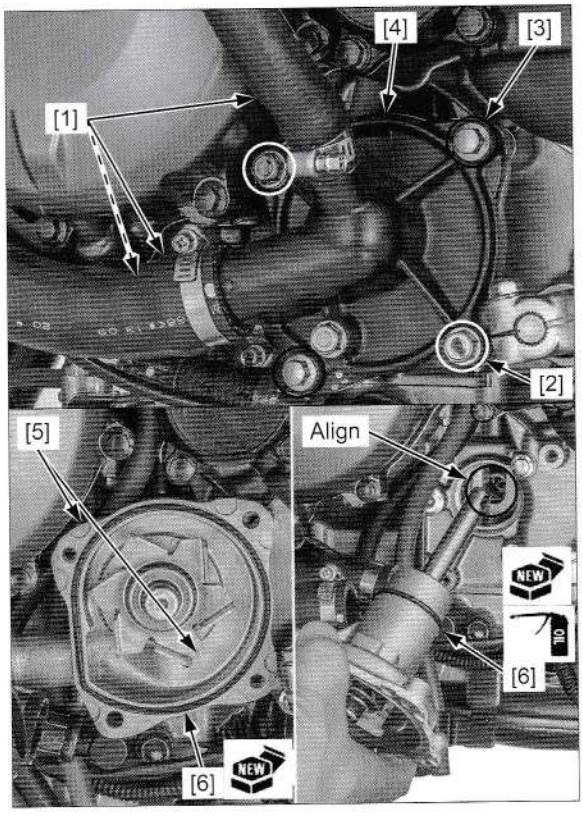
Installation is in the reverse order of removal.

TORQUE:
Water pump cover bolt:
13 N·m (1.3 kgf·m, 10 lbf·ft)

NOTE:

- Do not disassemble the water pump body.
- Replace the O-rings with new ones.
- Apply engine oil to the water pump body O-ring. Do not apply engine oil to the cover O-ring.
- Align the water pump shaft groove with the oil pump shaft end by turning the impeller.

Fill and bleed the cooling system (page 8-5).



RADIATOR RESERVE TANK

REMOVAL/INSTALLATION

Remove the rear fender B (page 2-13).

Drain the reserve tank with a fluid evacuator or by disconnecting the siphon hose from the radiator (page 8-5).

Disconnect the overflow hose [1].

Remove the mounting bolt [2] and release the locating pin [3] from the frame.

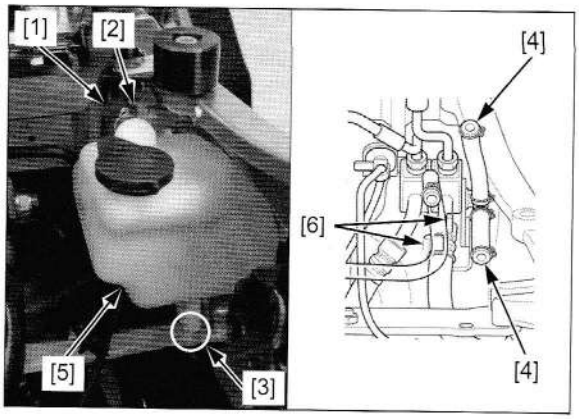
Disconnect the siphon hoses [4] to remove the reserve tank [5].

Installation is in the reverse order of removal.

NOTE:

- Install the overflow hose into the tabs [6] of the reserve tank.

Fill the reserve tank with the recommended coolant (page 8-5).



FAN MOTOR RELAY

CIRCUIT INSPECTION

For relay inspection (page 20-26).

Remove the fan motor relay (page 20-26).

RELAY SWITCH/COIL POWER INPUT LINE

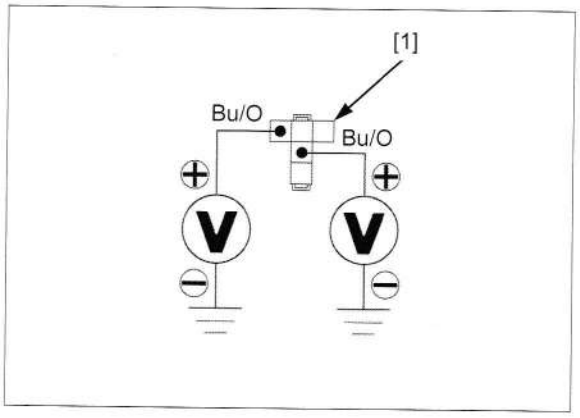
Measure the voltage between each terminal of the fan motor relay 5P connector [1] and ground.

CONNECTION: Blue/orange (+) – Ground (–)

There should be battery voltage at all times.

If there is no voltage, check the following:

- Blue/orange wire between the fan motor relay and right fuse box for an open circuit
- FAN (20 A) fuse



SIGNAL LINE

Disconnect the ECM 33P (Black) connector (page 4-42).

Check for continuity between the wire harness side ECM 33P (Black) connector [1] and fan motor relay 5P connector [2] terminals.

TOOL:
Test probe (2 Pack) **07ZAJ-RDJA110**

CONNECTION: Gray/blue – Gray/blue

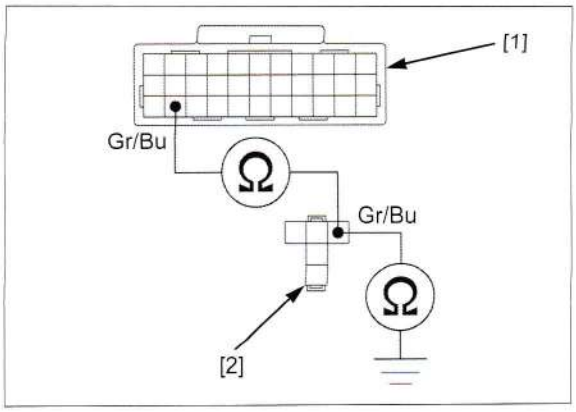
There should be continuity.
If there is no continuity, check for an open circuit in the Gray/blue wire between the fan motor relay and ECM.

Check for continuity between the fan motor relay 5P connector terminal and ground.

CONNECTION: Gray/blue – Ground

There should be no continuity.
If there is continuity, check for a short circuit in the Gray/blue wire between the fan motor relay and ECM.

If all of above inspections are normal, check for an open circuit in the Black/blue wire between the fan motor relay and fan motor.



MEMO

9. LUBRICATION SYSTEM

SERVICE INFORMATION 9-2

TROUBLESHOOTING 9-3

LUBRICATION SYSTEM DIAGRAM 9-4

OIL PRESSURE INSPECTION 9-5

OIL STRAINER/
PRESSURE RELIEF VALVE 9-5

OIL PUMP 9-8

OIL COOLER 9-10

SERVICE INFORMATION

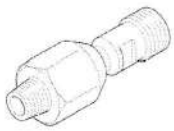
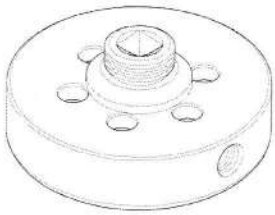
GENERAL

⚠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.

- This section covers service of the oil pump and oil cooler.
- 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.
- The oil pump has twin pump rotors; feed and cooler. The feed pump rotors draw oil from the oil cooler and crankcase and delivers it under pressure to the bearings and other important parts of the engine. The cooler pump rotors draw oil from the crankcase and sends it to the oil cooler.
- After the oil pump has been installed, check that there are no oil leaks and that oil pressure is correct.
- For engine oil pressure indicator/EOP switch inspection (page 20-17).

TOOLS

Oil pressure gauge attachment 07406-0030000  or equivalent commercially available in U.S.A.	Oil pressure gauge set 07506-3000001  or equivalent commercially available in U.S.A.	Gauge joint attachment 07RMK-MW40100  or 07AMJ-001A100 (U.S.A. only)

TROUBLESHOOTING

Oil level too low, high oil consumption
- Oil consumption
- External oil leaks
- Worn piston rings (page 13-14)
- Improperly installed piston rings (page 13-14)
- Worn cylinders (page 13-14)
- Worn valve stem seals (page 10-20)
- Worn valve guide (page 10-21)
- Worn or damage oil pump

Low oil pressure
- Oil pressure relief valve stuck open
- Oil level low
- Clogged oil strainer
- Faulty oil pump
- Internal oil leaks
- Incorrect oil being used

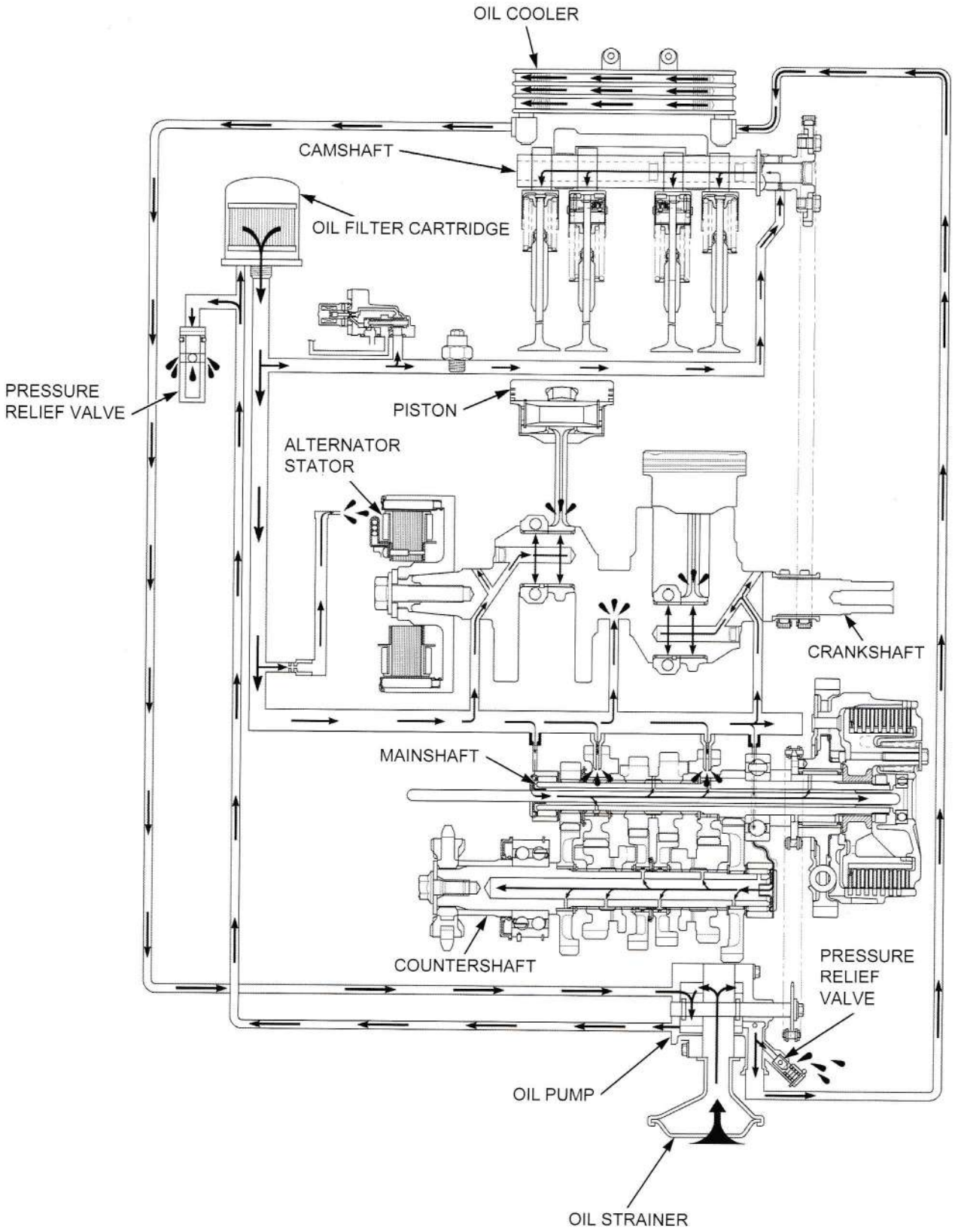
No oil pressure
- Oil level too low
- Oil pressure relief valve stuck open
- Broken oil pump drive chain
- Broken oil pump drive or driven sprocket
- Damaged oil pump
- Internal oil leaks

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

Oil contamination
- Oil or filter not changed often enough
- Worn piston rings
- Improperly installed piston rings
- Worn cylinder
- Worn valve stem seals
- Worn valve guide
- Blown cylinder head gasket

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

LUBRICATION SYSTEM DIAGRAM



OIL PRESSURE INSPECTION

NOTE:

- If the engine oil pressure indicator remains on while the engine is running, check the indicator system before checking the oil pressure (page 20-17).

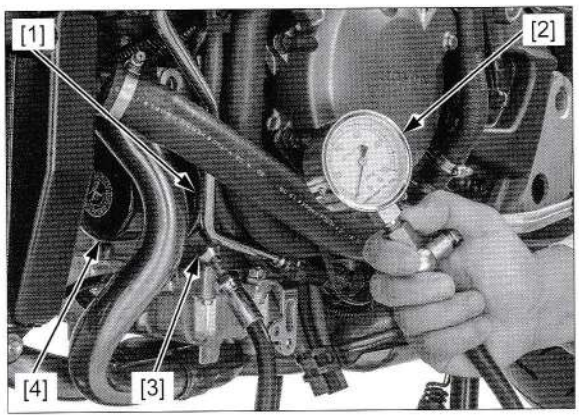
Remove the middle cowls (page 2-6).

Remove the oil filter cartridge (page 3-11).

Install the special tools.

TOOLS:

[1] Gauge joint attachment	**07RMK-MW40100 or 07AMJ-001A100 (U.S.A. only)**
[2] Oil pressure gauge set	**07506-3000001 or equivalent commercially available in U.S.A.**
[3] Oil pressure gauge attachment	**07406-0030000 or equivalent commercially available in U.S.A.**



Install the oil filter cartridge [4] onto the attachment.

Start the engine and warm it up to normal operating temperature (approximately 80°C/176°F).

Check the oil pressure at 6,000 rpm.

OIL PRESSURE:
490 kPa (5.0 kgf/cm², 71 psi) at 6,000 rpm/ 80°C (176°F)

Stop the engine and remove the special tools.

Install the oil filter cartridge (page 3-11).

OIL STRAINER/PRESSURE RELIEF VALVE

REMOVAL

Drain the engine oil (page 3-11).

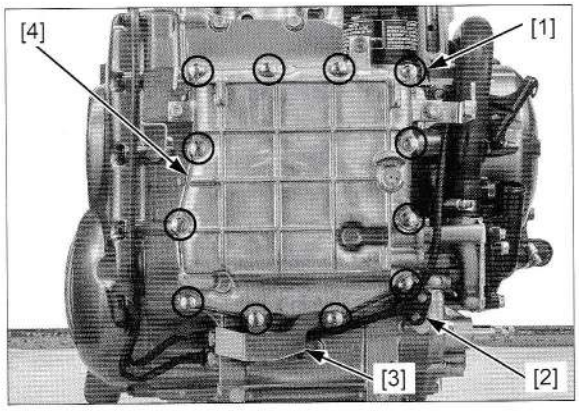
Remove the following:

- exhaust pipe (page 2-16)
- oil cooler pipe joints (from the oil pan) (page 9-10)

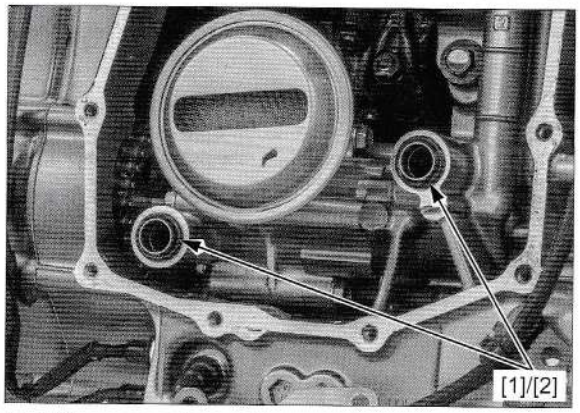
Loosen the oil pan bolts [1] in a crisscross pattern in 2 or 3 steps.

Remove the following:

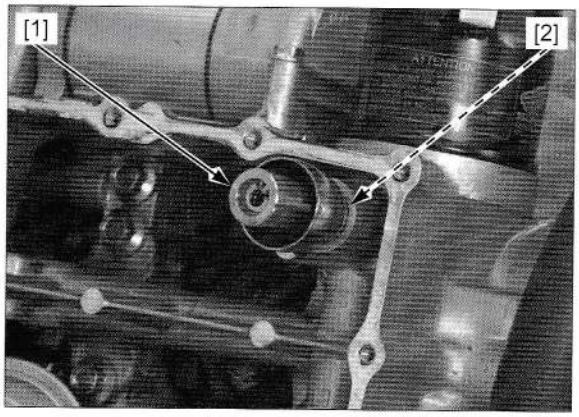
- 12 bolts
- wire stay [2]
- switch guard [3]
- oil pan [4]



Remove the two dowel pins [1] and O-rings [2].

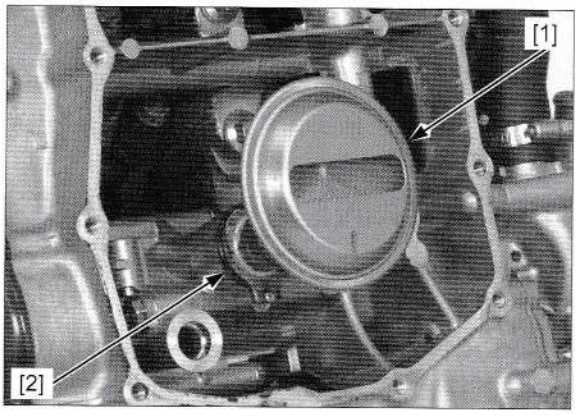


Remove the pressure relief valve [1] and O-ring [2].



Remove the oil strainer [1] and seal ring [2].

Clean the oil strainer screen and check for damage.



INSPECTION

Check the operation of the pressure relief valve by pushing on the piston [1].
Disassemble the relief valve by removing the snap ring [2].

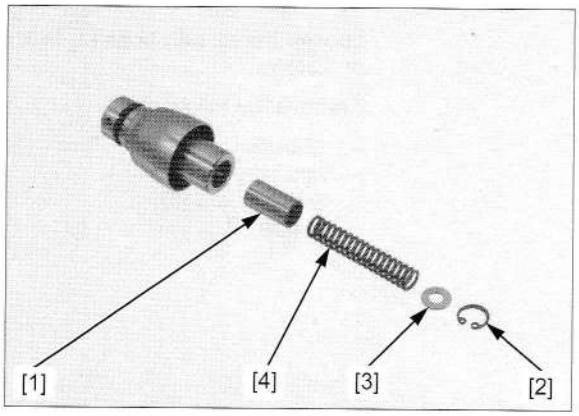
Remove the washer [3], spring [4], and piston.

Check the piston for wear, sticking, or damage.
Check the spring for weakness or damage.

Assemble the relief valve in the reverse order of disassembly.

NOTE:

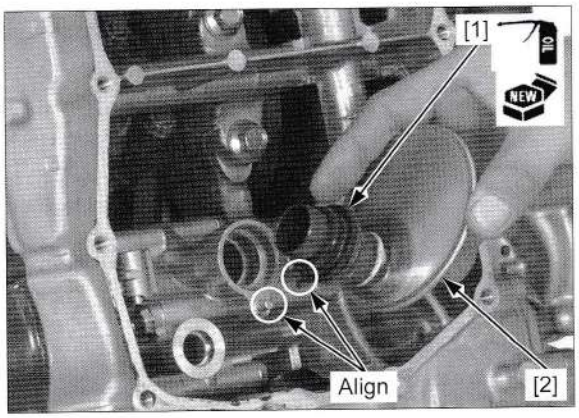
- Install the snap ring with the chamfered edge facing the thrust load side.
- Make sure the snap ring is seated in the groove.



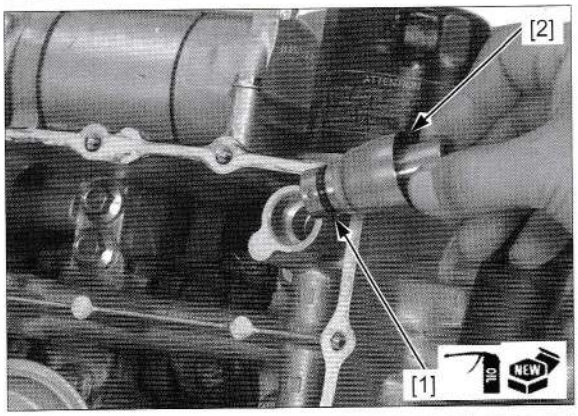
INSTALLATION

Apply engine oil to a new seal ring [1] and install it onto the oil strainer [2].

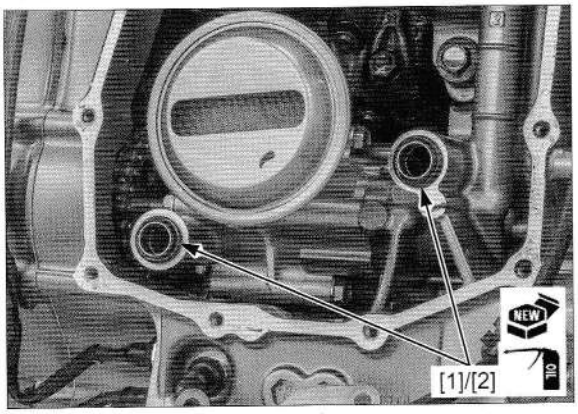
Install the oil strainer into the oil pump, aligning its groove with the pin.



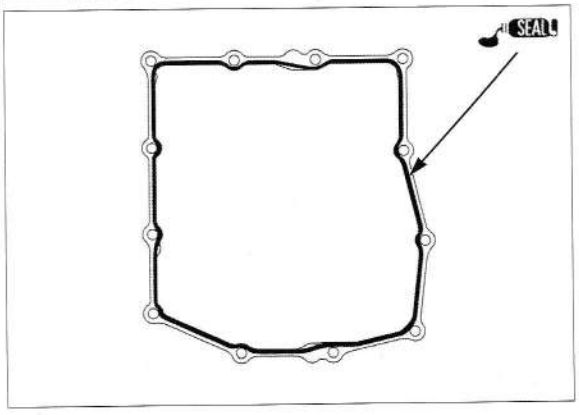
Apply engine oil to a new O-ring [1] and install it into the relief valve groove.
Install the pressure relief valve [2] into the crankcase.



Install the two dowel pins [1].
Apply engine oil to new O-rings [2] and install them onto the dowel pins.



Clean the mating surfaces of the oil pan and crankcase thoroughly.
Apply liquid sealant to the oil pan mating surface (page 1-17).

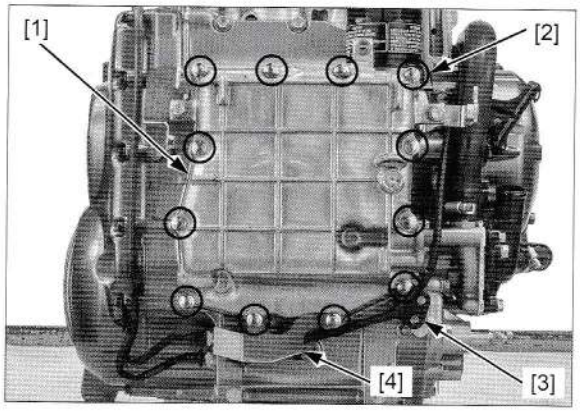


Install the oil pan [1] with the 12 bolts [2], wire stay [3], and switch guard [4].
Tighten the bolts in a crisscross pattern in 2 or 3 steps.

Install the following:

- exhaust pipe (page 2-16)
- oil cooler pipe joints (page 9-10)

Fill the engine with the recommended engine oil and check that there are no oil leaks (page 3-11).



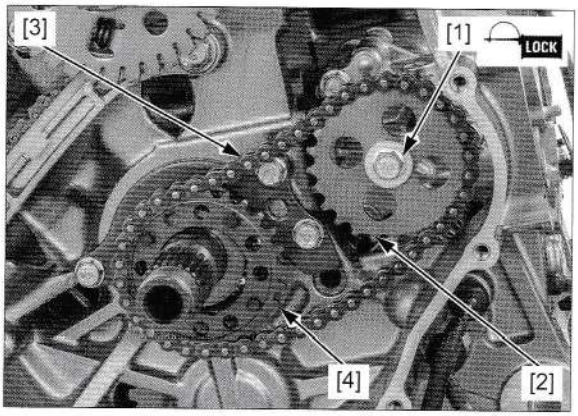
OIL PUMP

REMOVAL/INSTALLATION

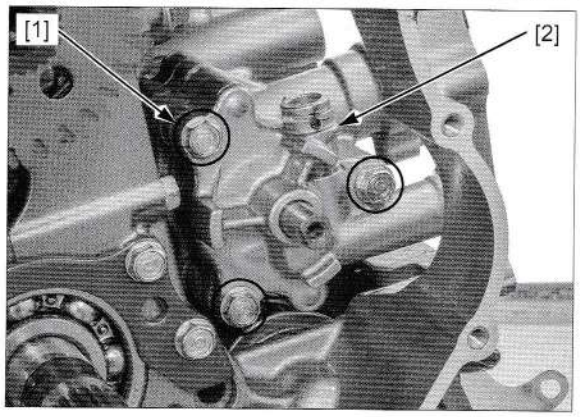
Remove the clutch outer (page 11-10).
Remove the oil pan and oil strainer (page 9-5).

Remove the following:

- washer-bolt [1]
- driven sprocket [2]
- drive chain [3]
- drive sprocket [4]



Remove three flange bolts [1] and oil pump assembly [2].

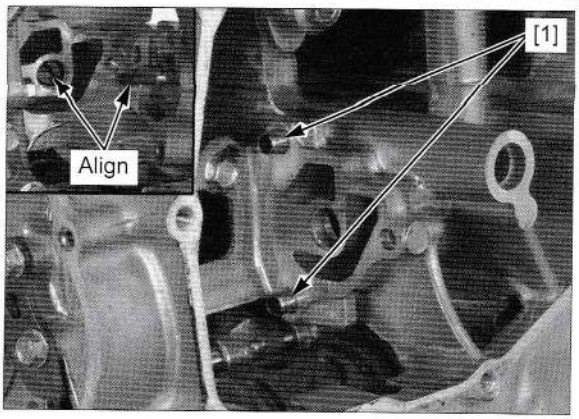


Remove two dowel pins [1].

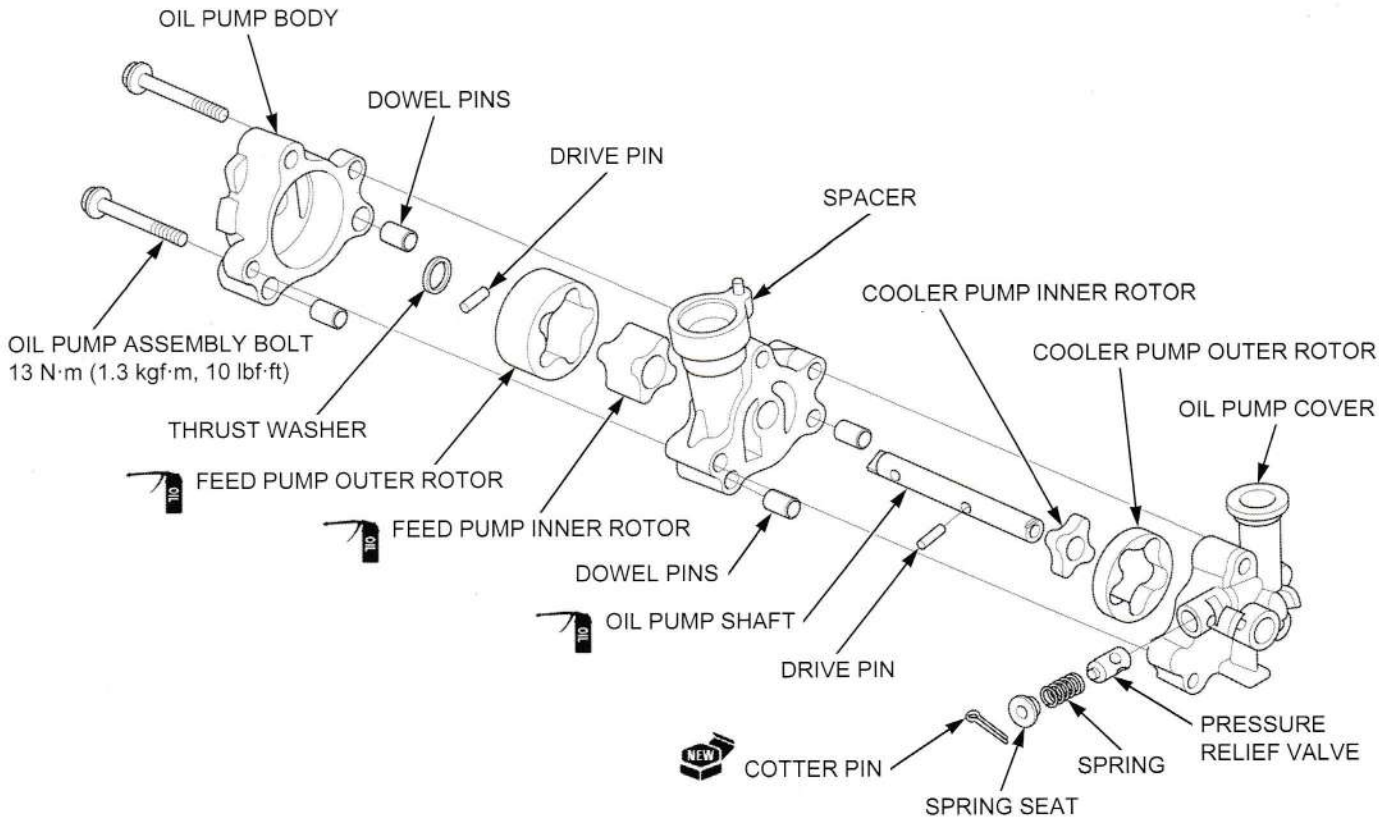
Installation is in the reverse order of removal.

NOTE:

- Align the oil pump shaft end with the water pump shaft groove.
- Apply locking agent to the threads of the driven sprocket washer-bolt (page 1-17).



DISASSEMBLY/ASSEMBLY



INSPECTION

Inspect the following parts for damage, abnormal wear, deformation, or burning.

- oil pump shaft
- drive pin
- inner rotor
- outer rotor
- oil pump body
- drive and driven sprockets
- drive chain

Inspect the pressure relief valve in the same manner as the relief valve on the crankcase (page 9-6).

Measure the oil pump clearances according to LUBRICATION SYSTEM SPECIFICATIONS (page 1-7).

If any measurement is out of the service limit, replace the oil pump as an assembly.

OIL COOLER

REMOVAL/INSTALLATION

NOTE:

- Take care not to damage the oil cooler fins while servicing.

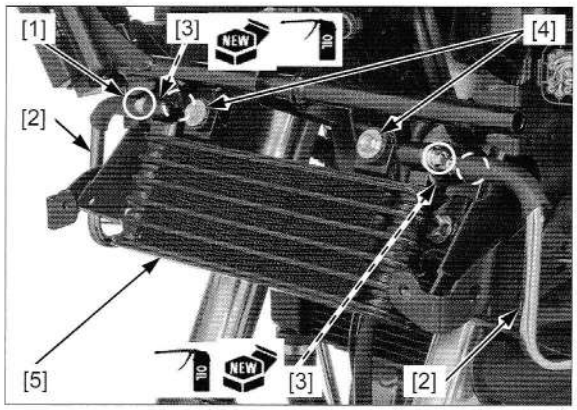
Drain the engine oil (page 3-11).

Remove the headlight assembly (page 20-5).

Remove the four bolts [1] and disconnect the oil pipes [2].

Remove the O-rings [3] from the oil pipes.

Remove the two washer-bolts [4] and oil cooler [5].



Remove the following:

- bolt [1]
- hose stay [2] (left pipe only)
- hose joint [3]
- O-rings [4]

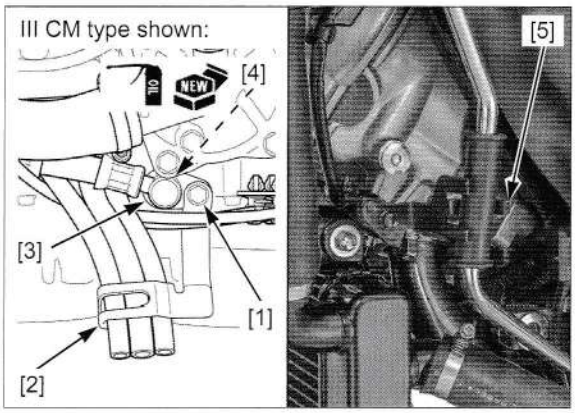
Release the oil pipe from the pipe guide [5] and remove it.

Installation is in the reverse order of removal.

NOTE:

- Replace the O-rings with new ones and coat them with engine oil.

Fill the engine with the recommended engine oil and check that there are no oil leaks (page 3-11).



INSPECTION

Check the oil cooler air passage for clogging or damage.

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

10. CYLINDER HEAD/VALVES

SERVICE INFORMATION 10-2

TROUBLESHOOTING 10-4

COMPONENT LOCATION 10-5

CYLINDER COMPRESSION TEST 10-6

CYLINDER HEAD COVER 10-6

CAMSHAFT 10-9

CYLINDER HEAD 10-19

CAM CHAIN TENSIONER LIFTER 10-29

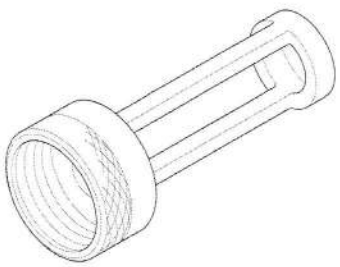
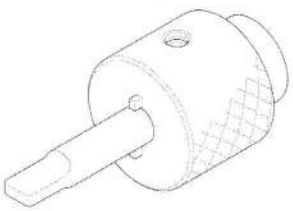
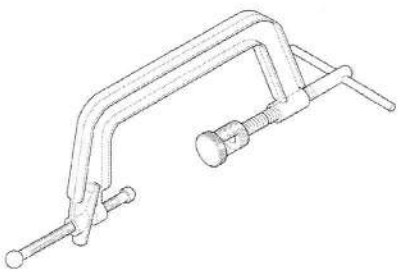
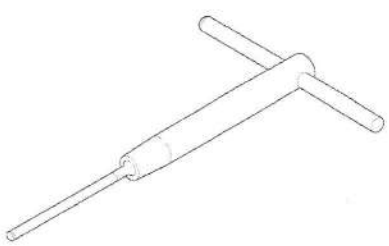
CAM CHAIN/TIMING SPROCKET 10-31

SERVICE INFORMATION

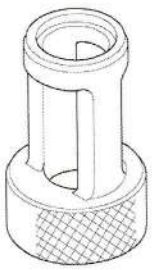
GENERAL

- This section covers service of the cylinder head, valves, and camshafts.
- The camshaft and cam chain tensioner lifter can be serviced with the engine installed in the frame. The cylinder head and valve 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 and camshaft holder. Clean the oil passages before assembling them.
- Be careful not to damage the mating surfaces when removing the cylinder head cover and cylinder head.

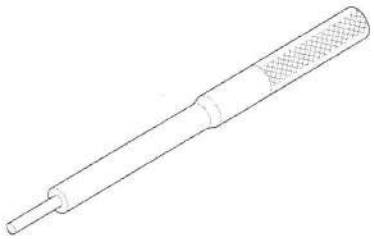
TOOLS

Valve spring compressor attachment 070ME-MCW0100 	Tensioner stopper 070MG-0010100  or 07AMG-001A100 (U.S.A. only) or 07AMG-MFJA100 (U.S.A. only)	Valve spring compressor 07757-0010000 
Seat cutter, 27.5 mm (EX, 45°) 07780-0010200  or equivalent commercially available in U.S.A.	Seat cutter, 29 mm (IN, 45°) 07780-0010300  or equivalent commercially available in U.S.A.	Flat cutter, 28 mm (EX, 32°) 07780-0012100  or equivalent commercially available in U.S.A.
Flat cutter, 30 mm (IN, 32°) 07780-0012200  or equivalent commercially available in U.S.A.	Interior cutter, 30 mm (IN/EX, 60°) 07780-0014000  or equivalent commercially available in U.S.A.	Cutter holder, 4.5 mm 07781-0010600  or equivalent commercially available in U.S.A.

Valve spring compressor attachment
07959-KM30101

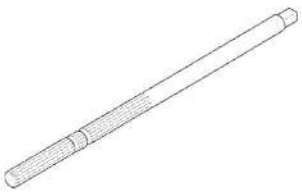


Valve guide driver, 4.5 mm
07HMD-ML00101



Tappet hole protector
07HMG-MR70002

Valve guide reamer, 4.5 mm
07HMH-ML00101



or 07HMH-ML0010B (U.S.A. only)

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 or 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 13-14).

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

- Valves:
  - Incorrect valve clearance adjustment
  - Burned or bent valve
  - Incorrect valve timing
  - Broken valve spring
  - Uneven valve seating
- Cylinder head:
  - Leaking or damaged cylinder head gasket
  - Warped or cracked cylinder head
  - Loose spark plug
- Worn cylinder, piston, or piston rings (page 13-14)

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 13-14)

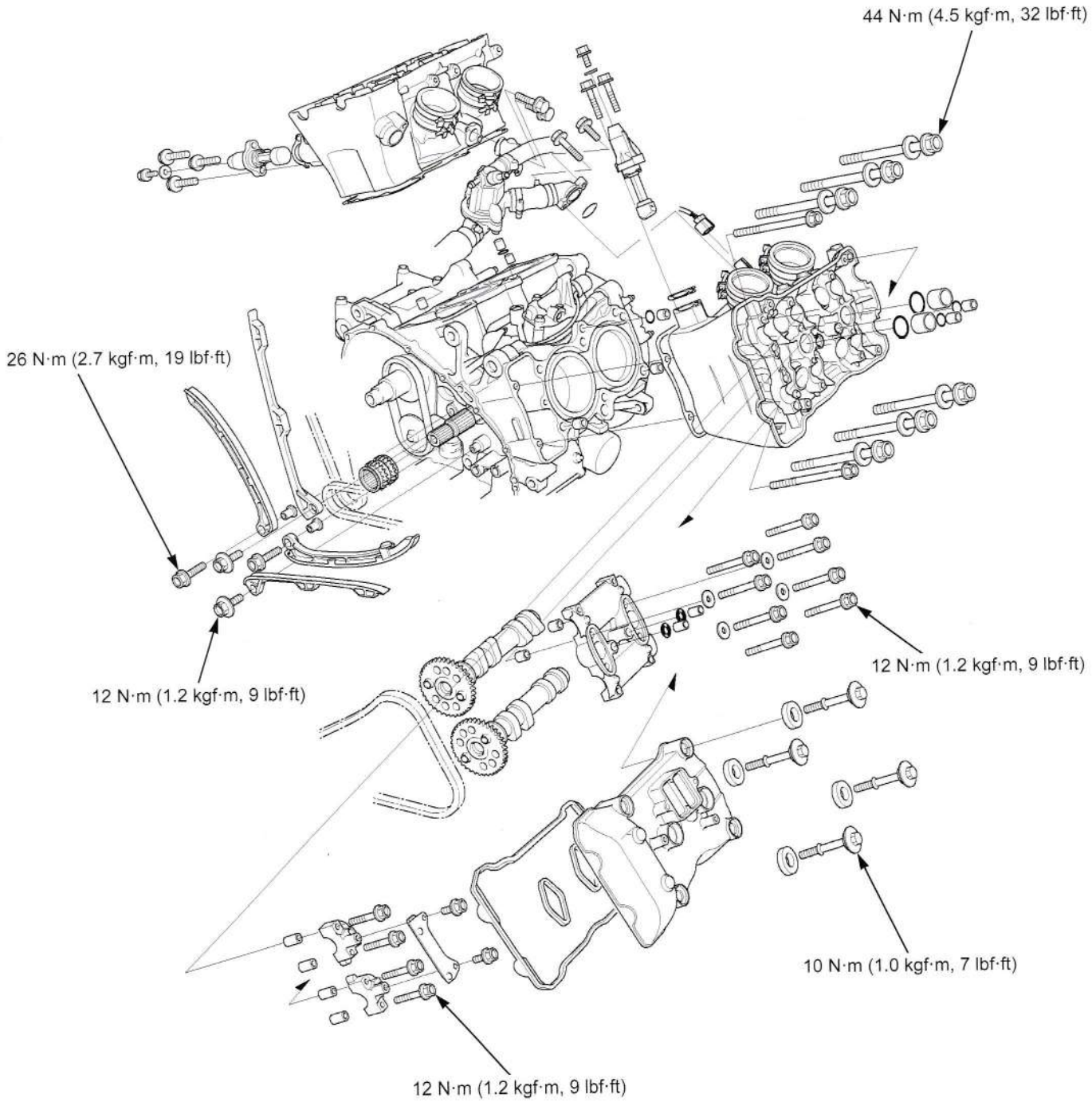
Excessive noise

- Cylinder head:
  - Incorrect valve clearance 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 13-14)

Rough idle

- Low cylinder compression

COMPONENT LOCATION



CYLINDER COMPRESSION TEST

Warm up the engine to normal operating temperature.

Stop the engine and remove all the spark plugs (page 3-6).

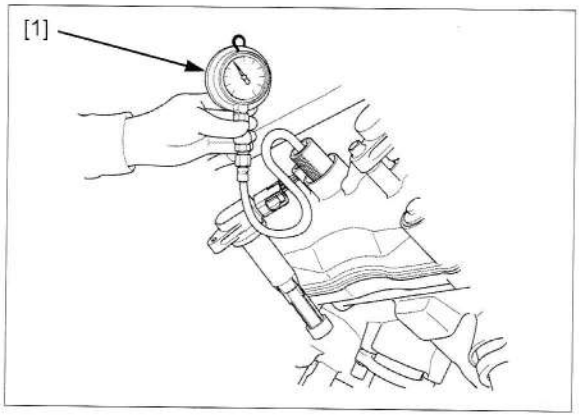
Disconnect the fuel pump 3P (Black) connector (page 7-5).

Install the compression gauge [1] into the spark plug hole.

Turn the ignition switch ON with the engine stop switch "○".

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:
1,575 kPa (16.1 kgf/cm², 228 psi) at 300 rpm

Low compression can be caused by:

- Blown cylinder head gasket
- Improper valve clearance 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

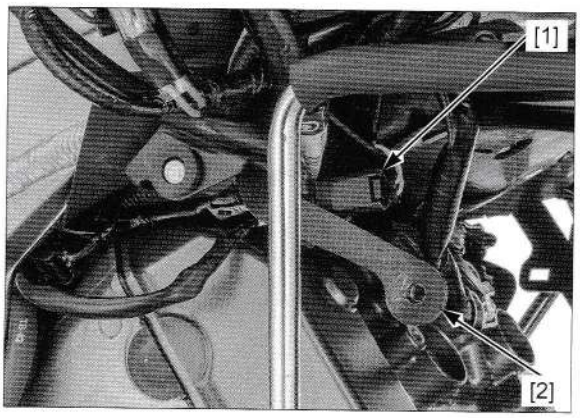
REMOVAL

Front: Remove the following:

- direct ignition coils (page 3-6)
- PAIR check valves (page 7-22)
- CKP sensor 2P (Black) connector [1]
- radiator stay [2]

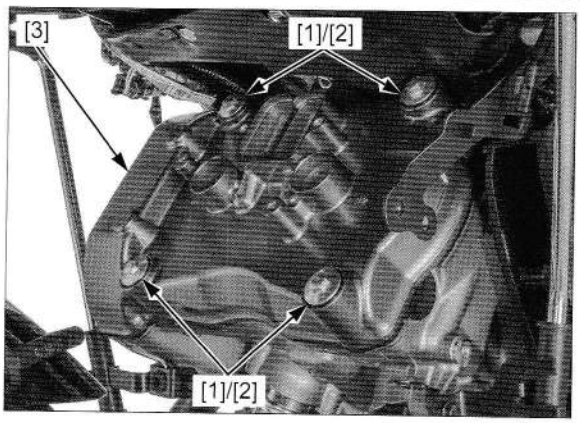
Rear: Remove the following:

- direct ignition coils (page 3-6)
- air cleaner housing (page 7-12)

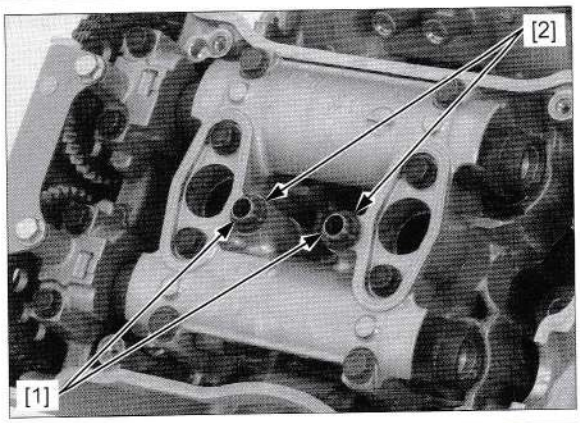


Remove the four bolts [1], mounting rubbers [2], and cylinder head cover [3].

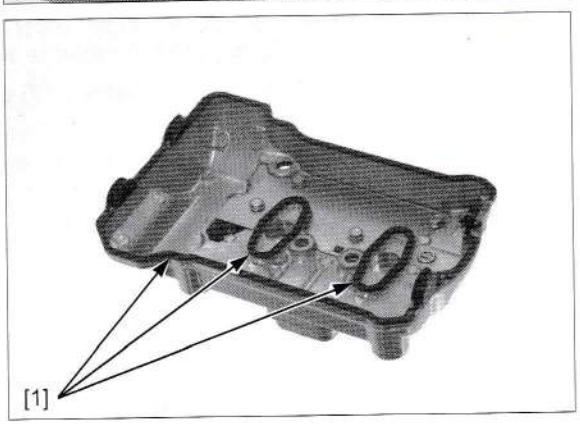
Check that the mounting rubbers are in good condition and replace if necessary.



Remove the air joint collars [1] and O-rings [2].

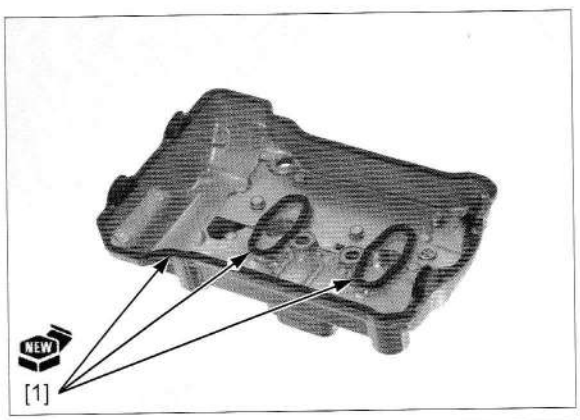


Remove the seal rubbers [1].

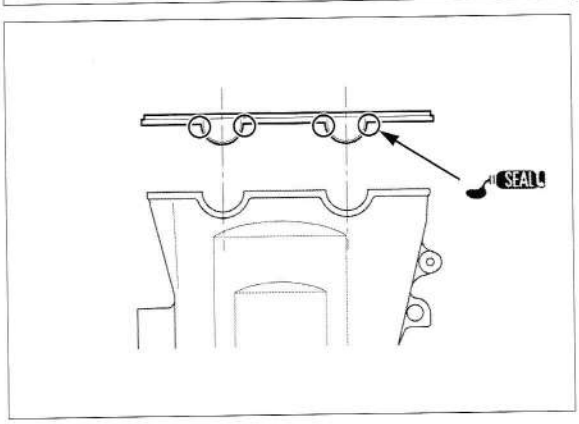


INSTALLATION

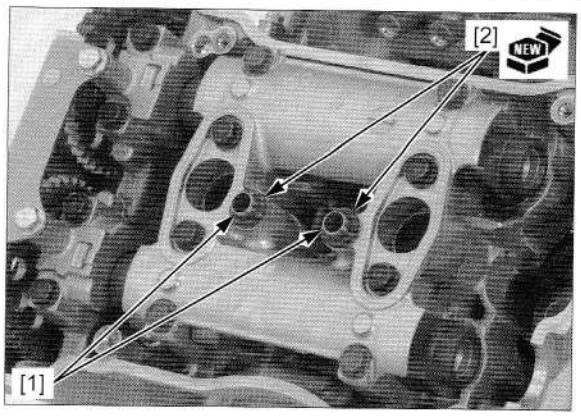
Install new seal rubbers [1] into the grooves in the cylinder head cover.



Apply sealant to all of the seal rubber semi-circular edges as shown (page 1-18).



Install the air joint collars [1] and new O-rings [2].



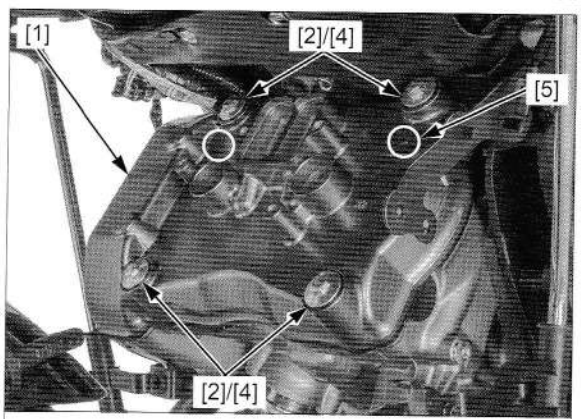
Install the cylinder head cover [1] onto the cylinder head, aligning the semi-circular areas properly.

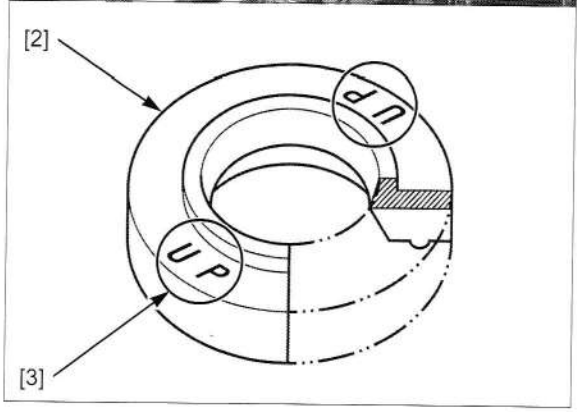
Install the mounting rubbers [2] with the "UP" mark [3] facing up.

Tighten the "△" marked [5] side bolts first.

Install and tighten the four cover bolts [4] to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



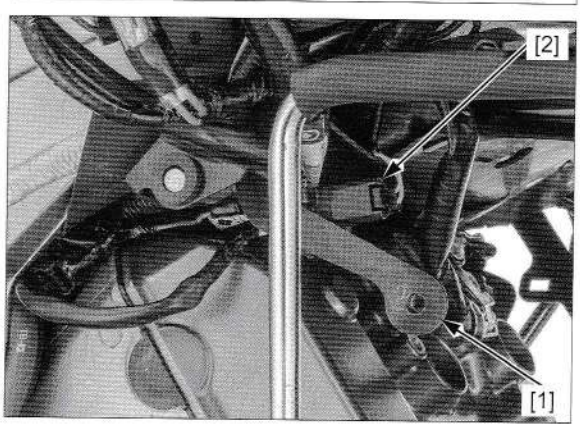


Rear: Install the following:

- air cleaner housing (page 7-12)
- direct ignition coils (page 3-6)

Front: Install the following:

- radiator stay [1]
- CKP sensor 2P (Black) connector [2]
- PAIR check valves (page 7-22)
- direct ignition coils (page 3-6)



CAMSHAFT

REMOVAL

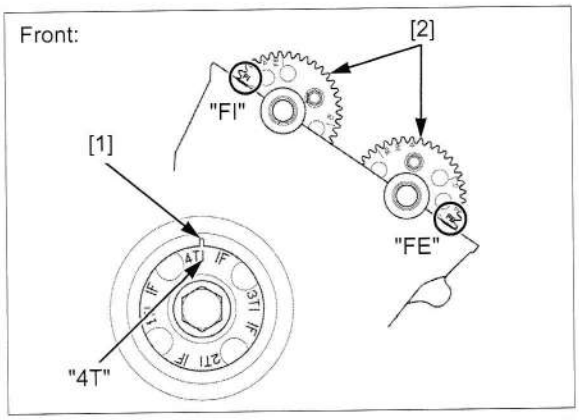
Front: Remove the following:

- front cylinder head cover (page 10-6)
- timing hole cap

Turn the crankshaft clockwise and align the "4T" mark on the CKP sensor rotor with the index mark [1] on the right crankcase cover.

Make sure that the outside index lines (Intake: "FI"/ Exhaust: "FE") on the cam sprockets [2] are flush with the cylinder head surface and that the No. 4 piston is at TDC (Top Dead Center) on the compression stroke.

If the index lines are not this position, turn the crankshaft clockwise one full turn and realign the "4T" mark with the index mark



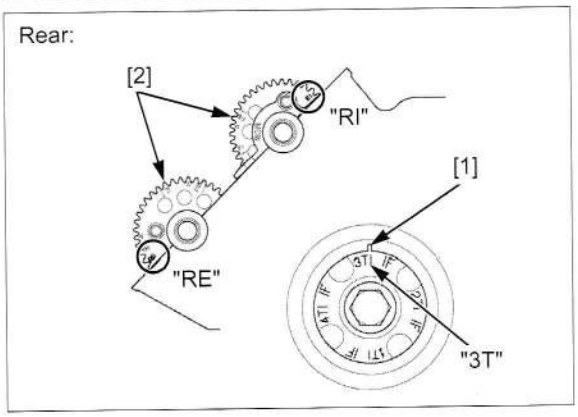
Rear: Remove the following:

- rear cylinder head cover (page 10-6)
- right under cowl (page 2-4)
- timing hole cap

Turn the crankshaft clockwise and align the "3T" mark on the CKP sensor rotor with the index mark [1] on the right crankcase cover.

Make sure that the outside index lines (Intake: "RI"/ Exhaust: "RE") on the cam sprockets [2] are flush with the cylinder head surface and that the No. 3 piston is at TDC (Top Dead Center) on the compression stroke.

If the index lines are not this position, turn the crankshaft clockwise one full turn and realign the "3T" mark with the index mark

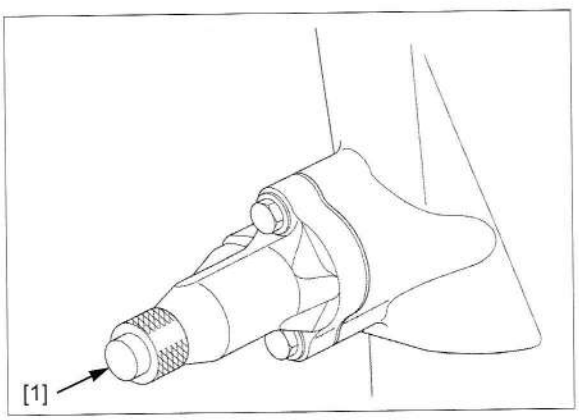


Remove the cam chain tensioner sealing bolt and sealing washer.

Turn the cam chain tensioner lifter shaft fully in (clockwise) and secure it using the tensioner stopper [1].

TOOL:

Tensioner stopper	**070MG-0010100 or 07AMG-001A100 (U.S.A. only) or 07AMG-MFJA100 (U.S.A. only)**



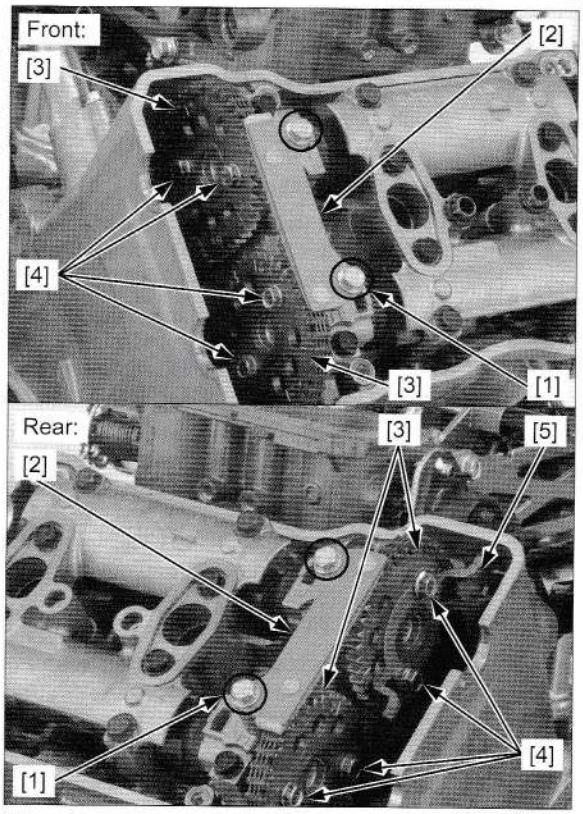
Be careful not to let the bolts fall into the crankcase.

Remove the bolts [1] and cam chain guide B [2].

If you plan to remove the cam sprocket [3], loosen the cam sprocket bolts [4] and remove them as follows.

Loosen the cam sprocket bolts. Turn the crankshaft clockwise one full turn (360°) (the cam sprockets turn 180°) and loosen the other cam sprocket bolts.

Remove the cam sprocket bolts. Turn the crankshaft clockwise one full turn (360°) and remove the other cam sprocket bolts, CMP sensor rotor [5] (rear cylinder intake side only), and cam sprockets from the camshafts.



Be careful not to let the bolts fall into the crankcase.

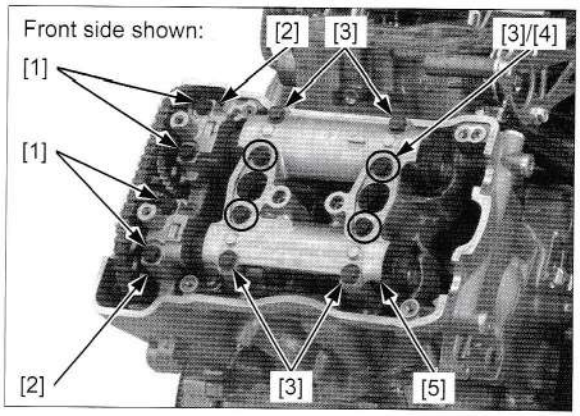
Loosen the camshaft holder B bolts [1] alternately in several steps and remove the bolts and camshaft holder B [2].

NOTICE

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

Loosen the camshaft holder A bolts [3] and remove the bolts, sealing washers [4], and camshaft holder A [5].

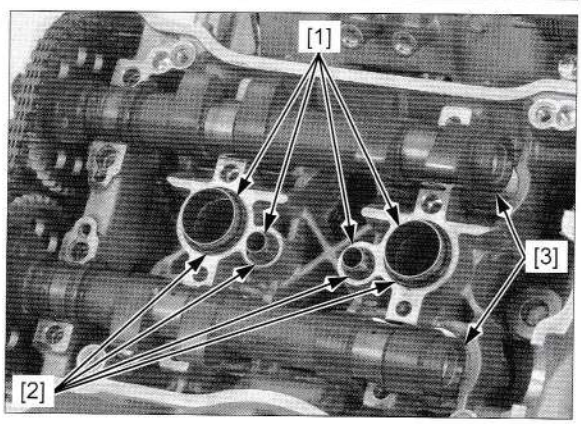
Do not forcibly remove the dowel pins from the camshaft holder.



Remove the joint collars [1] and O-rings [2] from the cylinder head.

Attach a piece of wire to the cam chain to prevent it from falling into the crankcase.

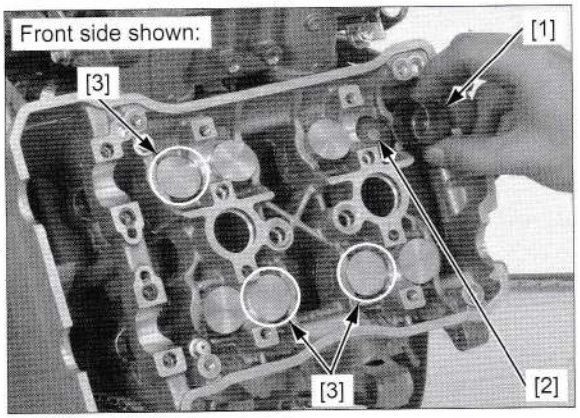
Release the cam chain and remove the camshafts [3].



Remove the valve lifters [1] and shims [2] from the normal valve lifter bores [3].

NOTE:

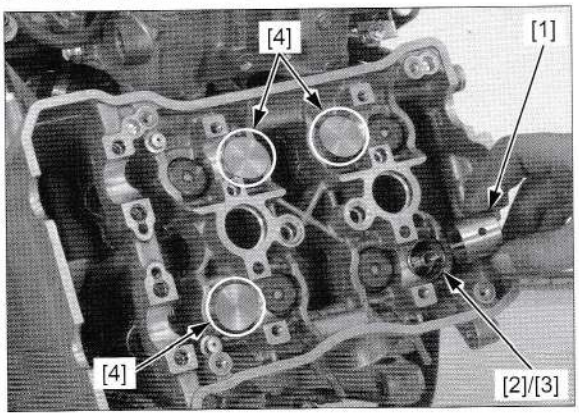
- Be careful not to damage the valve lifter bore.
- Shims may stick to the inside of the valve lifter. Do not allow the shims to fall.
- Mark all valve lifters and shims to ensure correct reassembly in their original locations.
- The valve lifter can be easily removed with a valve lapping tool or magnet.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



Remove the valve lifters [1], slide pin holders [2], and outer valve springs [3] from the VTEC valve lifter bores [4].

NOTE:

- Be careful not to damage the valve lifter bore.
- Mark all parts to ensure correct reassembly in their original locations.
- The valve lifter can be easily removed with a valve lapping tool or magnet.



INSPECTION

Inspect the following parts for damage, abnormal wear, deformation, burning, or clogs in oil passages.

- cam sprockets/camshafts
- camshaft holders/dowel pins
- cam chain guide B
- slide pin holders

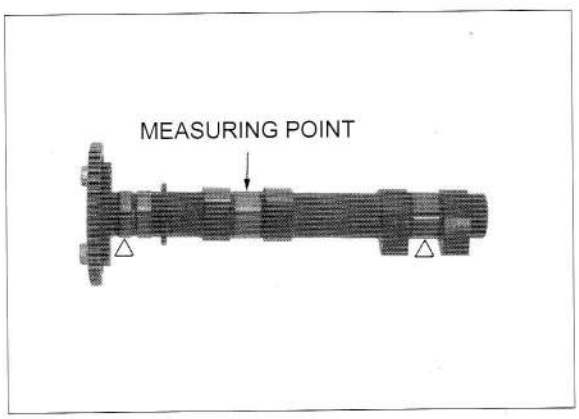
Measure each part according to CYLINDER HEAD/ VALVES SPECIFICATIONS (page 1-7).

Replace any part if it is out of service limit.

CAMSHAFT RUNOUT

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

SERVICE LIMIT: 0.05 mm (0.002 in)



CAMSHAFT OIL CLEARANCE

Wipe any oil from the journals of the camshaft, cylinder head, and camshaft holders.

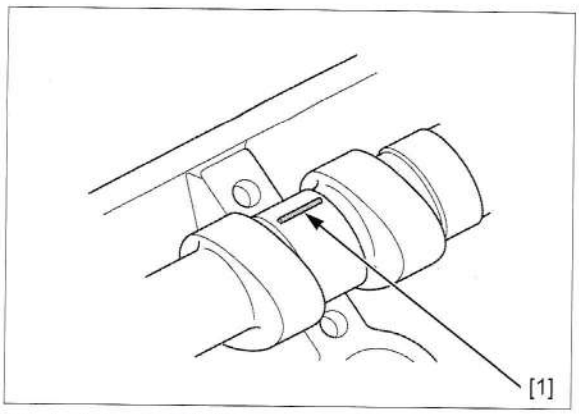
Install the intake and exhaust camshafts onto the cylinder head.

Lay a strip of plastigauge [1] lengthwise on top of each camshaft journal.

NOTE:

- Do not rotate the camshaft during inspection.

Install the camshaft holders A and B (page 10-13).



Apply engine oil to the threads and seating surfaces of the camshaft holder bolts [1] and install them.

NOTICE

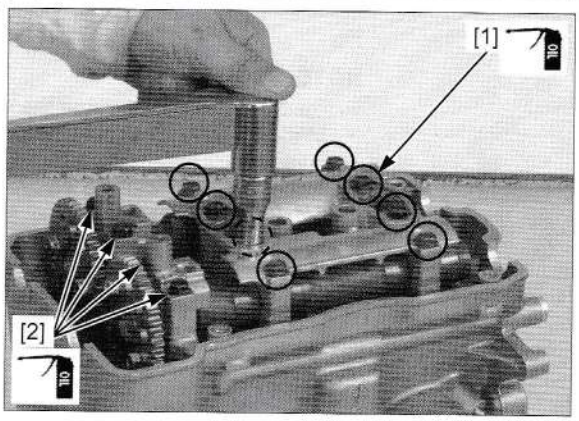
Failure to tighten the camshaft holder in a crisscross pattern may cause the camshaft holder to break.

Tighten the bolts by starting from the dowel pin positions.

From inside to outside tighten the camshaft holder bolts gradually until the camshaft holders seats on the cylinder head.

Tighten the camshaft holder A bolts [1] in a crisscross pattern in several steps to the specified torque, then the camshaft holder B bolts [2].

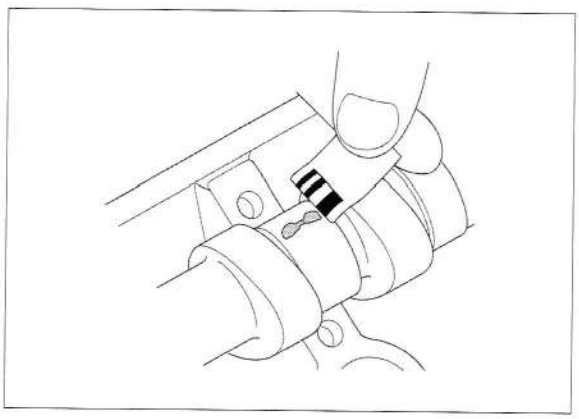
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



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

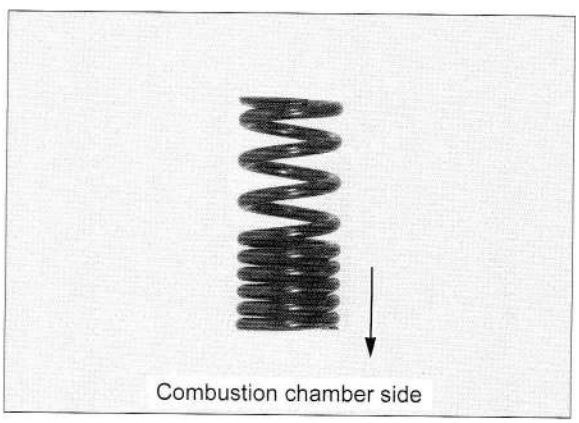
SERVICE LIMIT: 0.10 mm (0.004 in)

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.



INSTALLATION

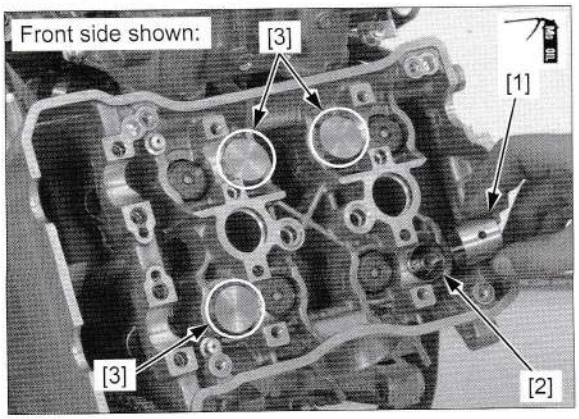
Install the VTEC side outer valve springs with the tightly wound coils facing the combustion chamber.



Apply molybdenum oil solution to the valve lifter [1] outer sliding surface.

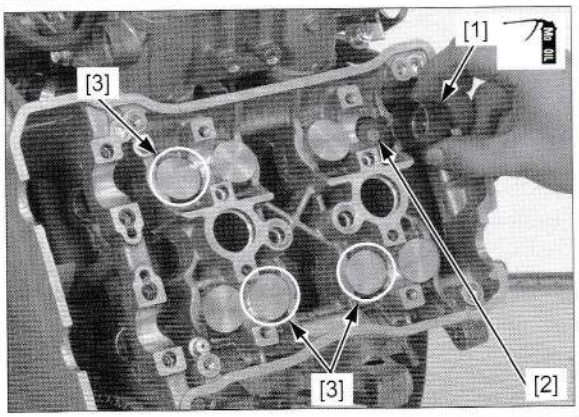
The side pin holder is installed with the protrusion pin facing up.

Install the slide pin holders [2] and valve lifters into the VTEC valve lifter bores [3] in their original locations.



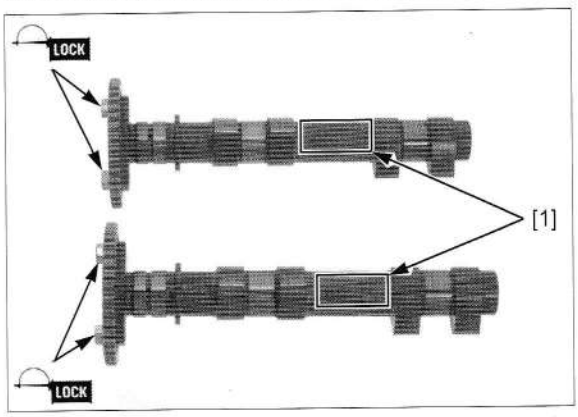
Apply molybdenum oil solution to the valve lifter [1] outer sliding surface.

Install the shims [2] and valve lifters into the normal valve lifter bores [3] in their original locations.

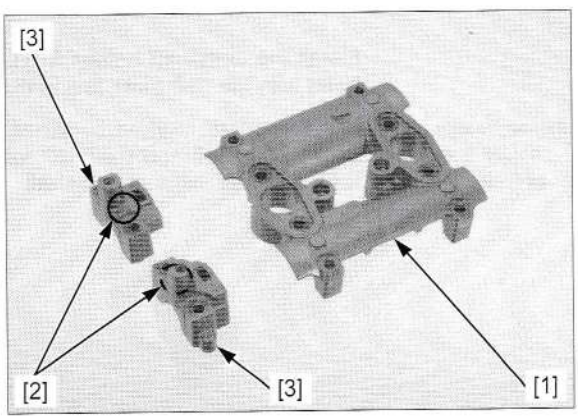


NOTE:

- If camshaft holder replacement is required, replace the holder and cylinder head as an assembly.
- Follow this procedure from beginning to end, even if you are only servicing one cylinder head.
- Check the camshaft marks so that you install each camshaft in its correct location.
- The identification marks [1] on the camshaft mean the following:
  - FR: Front cylinder camshaft
  - RR: Rear cylinder camshaft
  - IN: Intake camshaft
  - EX: Exhaust camshaft
- If the cam sprockets have been removed, apply locking agent to the sprocket bolt threads (page 1-17) and install the cam sprockets and CMP sensor rotor (on the rear cylinder intake camshaft).

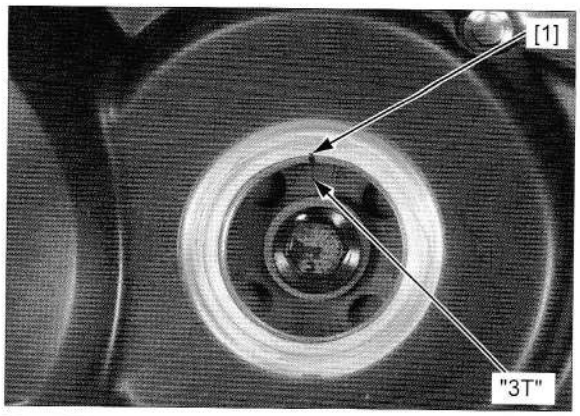


- Check the camshaft holder A [1] marks as noted during removal so that you install each camshaft holder in its correct location.
- The identification marks [2] on the camshaft holder B [3] mean the following:
  - FI: Front cylinder intake camshaft
  - FE: Front cylinder exhaust camshaft
  - RI: Rear cylinder intake camshaft
  - RE: Rear cylinder exhaust camshaft



WHEN BOTH THE FRONT AND REAR CAMSHAFTS WERE REMOVED:

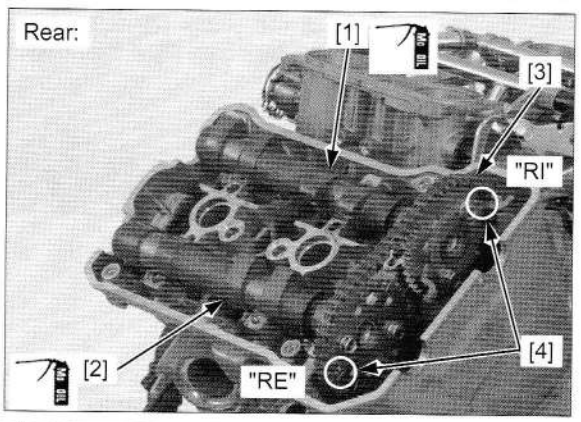
Turn the crankshaft clockwise and align the "3T" mark on the CKP sensor rotor with the index mark [1] on the right crankcase cover (No. 3 piston is at TDC).



Apply molybdenum oil solution to the cam lobes, journals, and thrust surface.

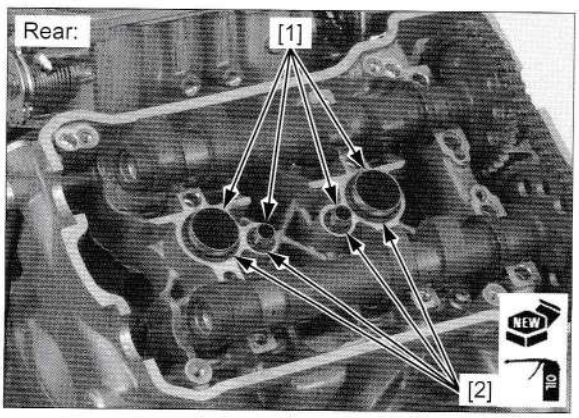
Install the rear cylinder intake [1] and exhaust [2] camshafts while installing cam chain [3] over the cam sprockets.

Position the index lines [4] ("RI" for intake/"RE" for exhaust) on the cam sprocket facing outward and align them with the cylinder head surface.



Install the joint collars [1] onto the rear cylinder head.

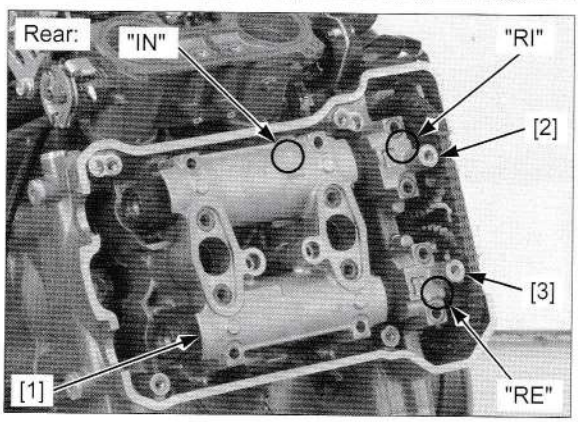
Coat new O-rings [2] with engine oil and install them.



Install the camshaft holder A [1] onto the rear cylinder head with the "IN" mark facing the intake side.

Install the camshaft holder B with the boss facing the cam sprocket.

Install the "RI" marked camshaft holder B [2] onto the intake camshaft and the "RE" marked camshaft holder B [3] onto the exhaust camshaft.



Apply engine oil to the threads and seating surfaces of the camshaft holder bolts [1].

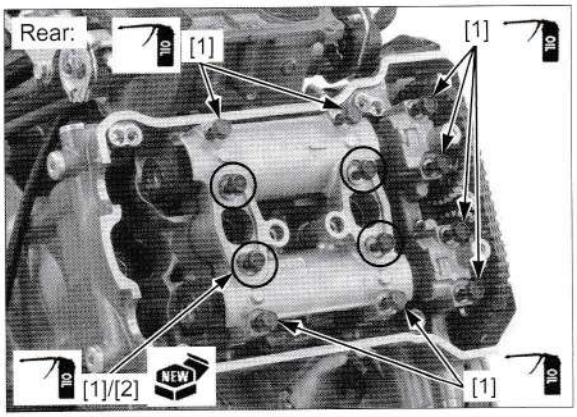
Install new sealing washer [2] and bolts.

NOTICE

Failure to tighten the camshaft holder in a crisscross pattern may cause the camshaft holder to break.

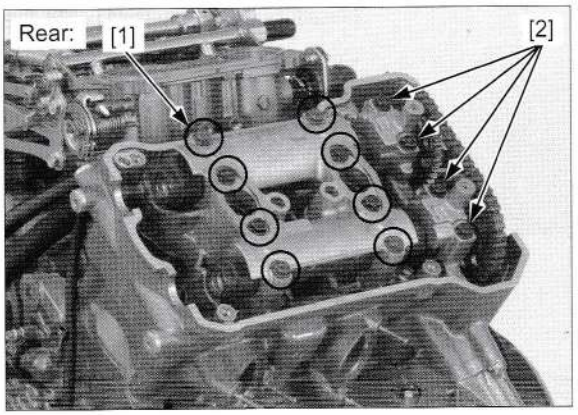
Tighten the bolts by starting from the dowel pin positions.

From inside to outside tighten the camshaft holder bolts gradually until the camshaft holders seat on the cylinder head.

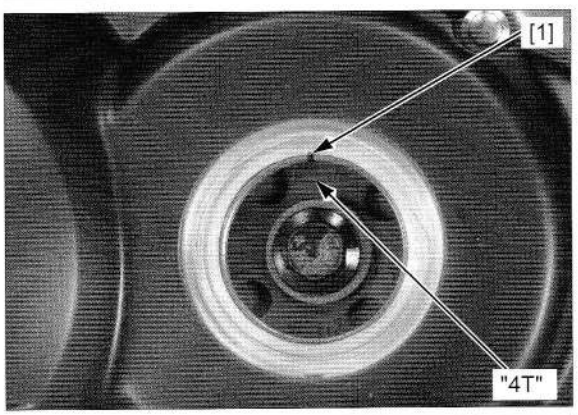


Tighten the camshaft holder A bolts [1] in a crisscross pattern in several steps to the specified torque, then the camshaft holder B bolts [2].

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



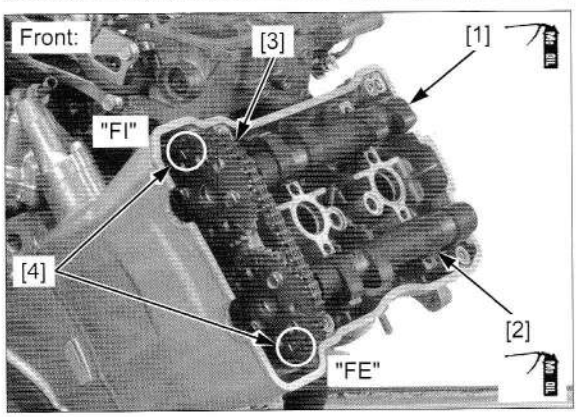
Turn the crankshaft clockwise 1-1/4 turn (450°) and align the "4T" mark on the CKP sensor rotor with the index mark [1] on the right crankcase cover (No. 4 piston is at TDC on the compression stroke).



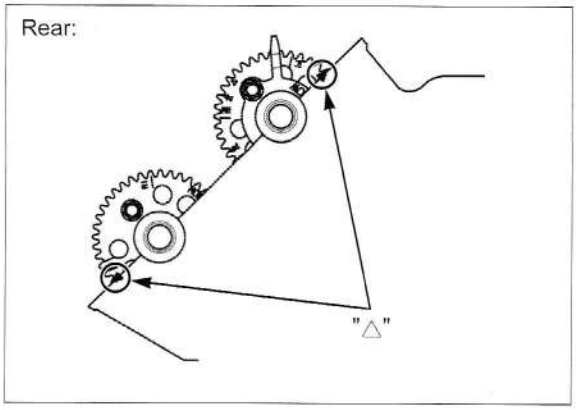
Apply molybdenum oil solution to the cam lobes, journals, and thrust surfaces.

Install the front cylinder intake [1] and exhaust [2] camshafts while installing cam chain [3] over the cam sprockets.

Position the index lines [4] ("FI" for intake/"FE" for exhaust) on the cam sprocket facing outward and align them with the cylinder head surface.

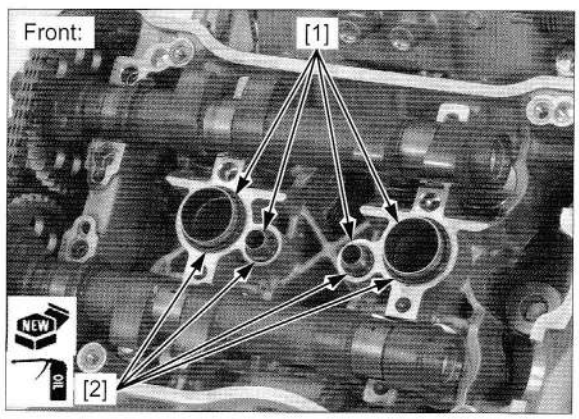


With the No. 4 piston at TDC on the compression stroke, make sure that the rear cylinder cam sprocket "△" marks are facing outward and flush with the cylinder head surface.



Install the joint collars [1] onto the front cylinder head.

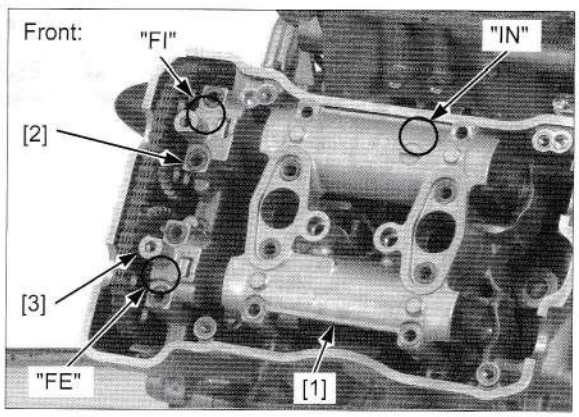
Coat new O-rings [2] with engine oil and install them.



Install the camshaft holder A [1] to the front cylinder head with the "IN" mark facing to the intake side.

Install the camshaft holder B with their boss facing the cam sprocket.

Install the "FI" marked camshaft holder B [2] onto the intake camshaft and the "FE" marked camshaft holder B [3] onto the exhaust camshaft.



Apply engine oil to the threads and seating surfaces of the camshaft holder bolts [1].

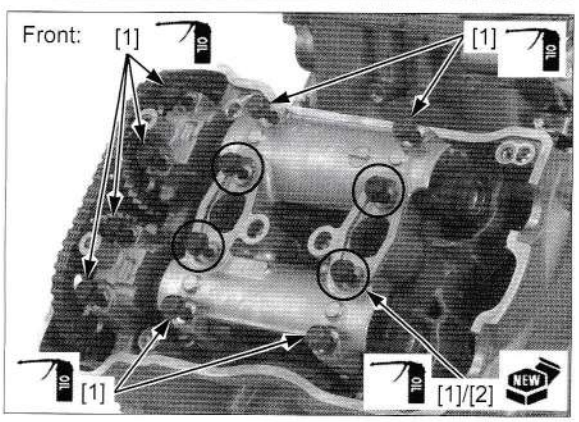
Install new sealing washers [2] and bolts.

NOTICE

Failure to tighten the camshaft holder in a crisscross pattern may cause the camshaft holder to break.

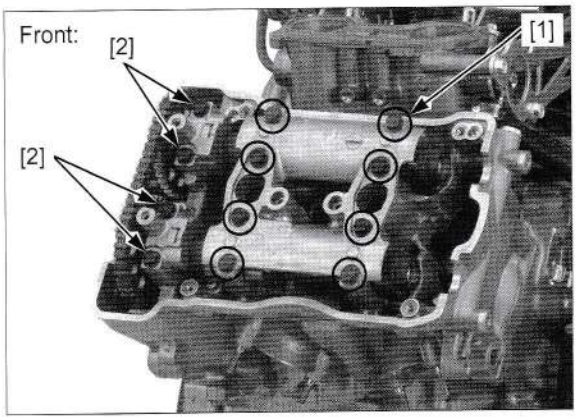
Tighten the bolts by starting from the dowel pin positions.

From inside to outside tighten the camshaft holder bolts gradually until the camshaft holders seats on the cylinder head.



Tighten the camshaft holder A bolts [1] in a crisscross pattern in several steps to the specified torque, then the camshaft holder B bolts [2].

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



If the cam sprockets are removed, tighten the cam sprocket bolts [1] to the specified torque.

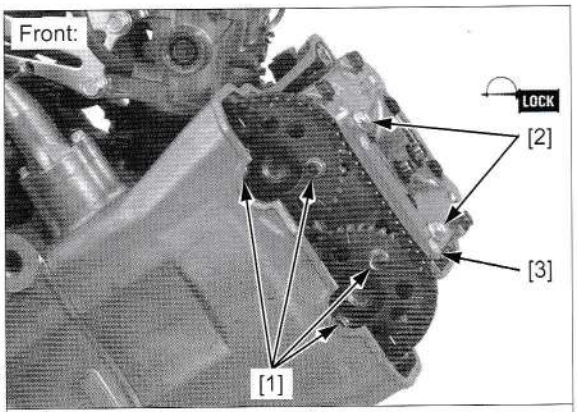
TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)

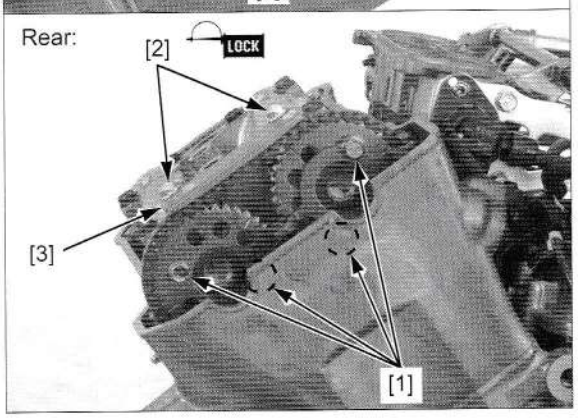
Apply locking agent to the threads of the cam chain guide B bolts [2] (page 1-17).

Install the cam chain guide B [3] and tighten the bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

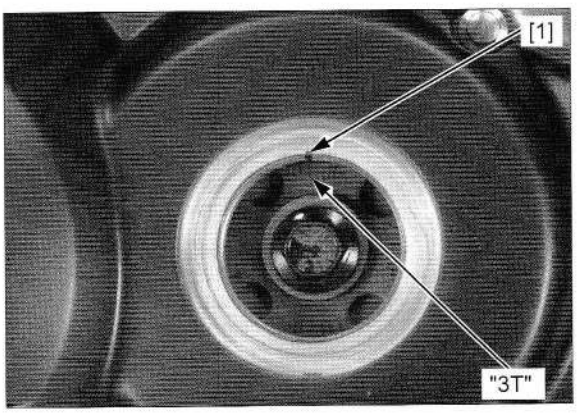
Remove the tensioner stopper from the cam chain tensioner lifter.
Install a new sealing washer and tighten the sealing bolt securely (page 10-29).



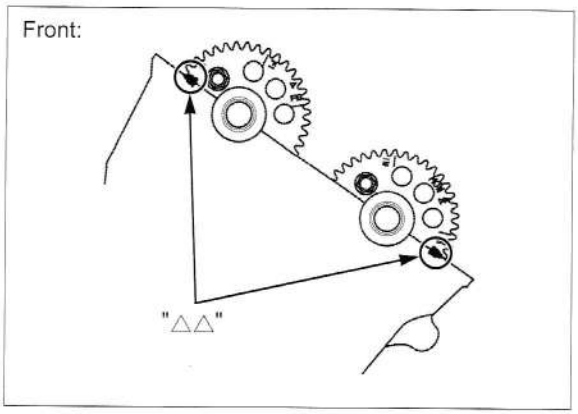


Turn the crankshaft clockwise and align the "3T" mark on the CKP sensor rotor with the index mark [1] on the right crankcase cover.

Make sure that the outside index lines (Intake: "RI"/ Exhaust: "RE") on the rear cylinder cam sprockets are flush with the cylinder head surface and that the No. 3 piston is at TDC on the compression stroke.



With the No. 3 piston at TDC on the compression stroke, make sure that the front cylinder cam sprocket "△△" marks are facing outward and flush with the cylinder head surface.



Install the cylinder head covers (page 10-7).

Coat a new O-ring with engine oil and install it onto the timing hole cap.
Apply grease to the cap threads.

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

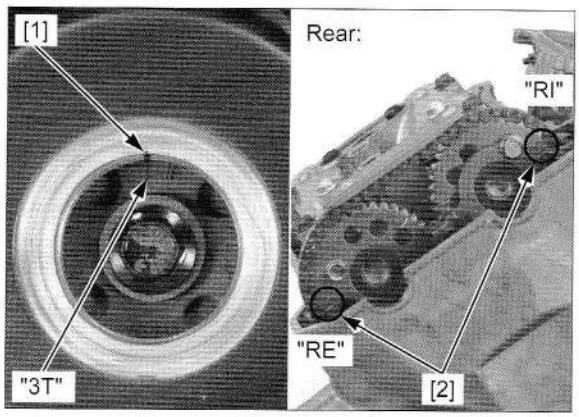
TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

IF ONLY THE FRONT CYLINDER CAMSHAFT WAS REMOVED:

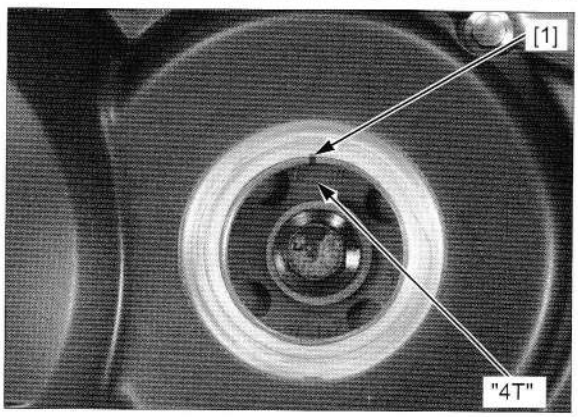
Remove the rear cylinder head cover (page 10-6).

Turn the crankshaft clockwise and align the "3T" mark on the CKP sensor rotor with the index mark [1] on the right crankcase cover.

Make sure that the index lines [2] (Intake: "RI"/Exhaust: "RE") on the rear cam sprockets are facing outward.
If they are not, turn the crankshaft clockwise one full turn (360°) and realign the "3T" mark with the index mark.



Turn the crankshaft clockwise 1-1/4 turn (450°) and align the "4T" mark on the CKP sensor rotor with the index mark [1] on the right crankcase cover.



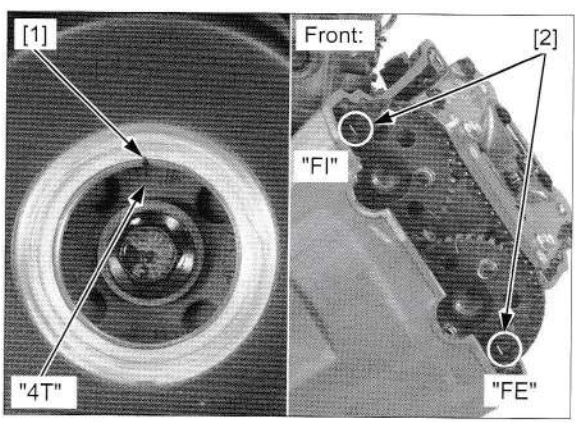
Install the front cylinder intake and exhaust camshafts in the same procedure as WHEN BOTH THE FRONT AND REAR CAMSHAFTS WERE REMOVED (page 10-15).

IF ONLY THE REAR CYLINDER CAMSHAFT WAS REMOVED:

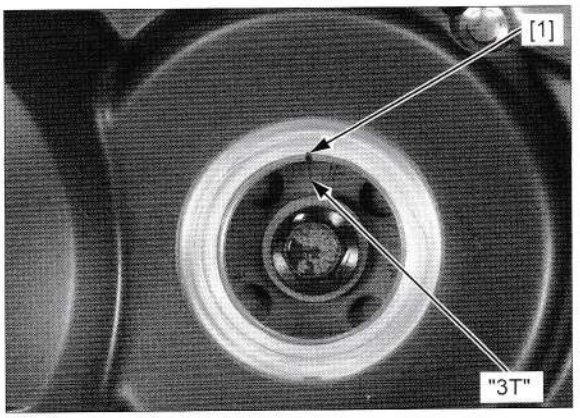
Remove the front cylinder head cover (page 10-6).

Turn the crankshaft clockwise and align the "4T" mark on the CKP sensor rotor with the index mark [1] on the right crankcase cover.

Make sure that the index lines [2] (Intake: "FI"/Exhaust: "FE") on the front cam sprockets are facing outward.
If they are not, turn the crankshaft clockwise one full turn (360°) and realign the "4T" mark with the index mark.



Turn the crankshaft clockwise 3/4 turn (270°) and align the "3T" mark on the CKP sensor rotor with the index mark [1] on the right crankcase cover.



Install the rear cylinder intake and exhaust camshafts in the same procedure as WHEN BOTH THE FRONT AND REAR CAMSHAFTS WERE REMOVED (page 10-14).

CYLINDER HEAD

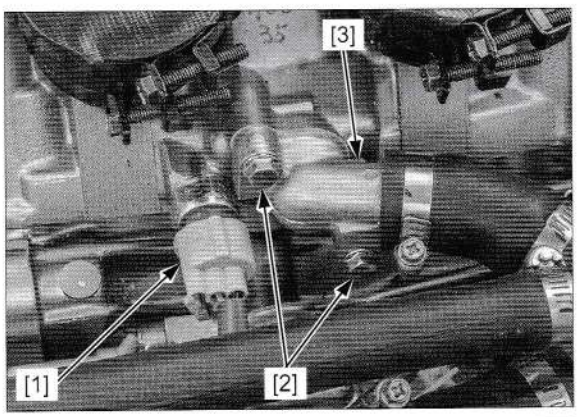
REMOVAL

Remove the following:

- engine (page 14-4)
- camshafts (page 10-9)
- cam chain tensioner lifter (page 10-29)

Disconnect the 3P (Gray) connector [1] from the ECT sensor on the front cylinder head.

Remove the bolts [2] and water hose joint [3].

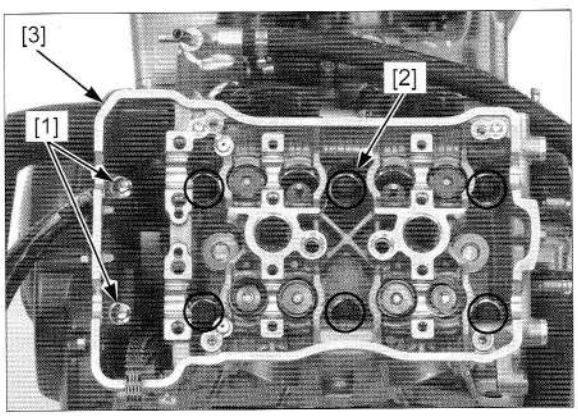


Remove the 6 mm bolts [1].

Loosen the 9 mm bolts in a crisscross pattern in 2 – 3 steps.

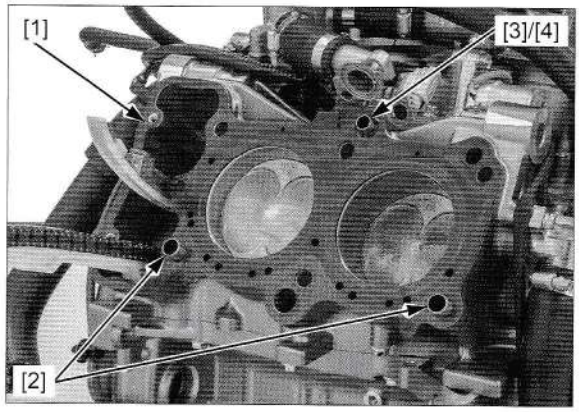
Remove the 9 mm washer-bolts [2].

Remove the cylinder head [3].



Remove the gasket [1] and dowel pins [2].

Remove the oil through collar [3] and O-ring [4].



DISASSEMBLY

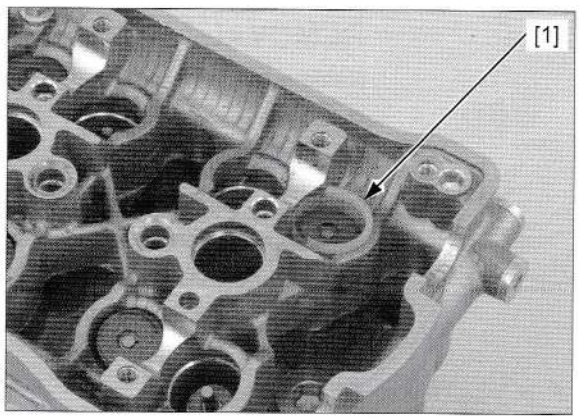
Remove the following:

- ECT sensor (front cylinder head) (page 4-44)
- insulators (page 7-15)
- spark plugs (page 3-6)

Install the tappet hole protector [1] into the valve lifter bore.

TOOL:

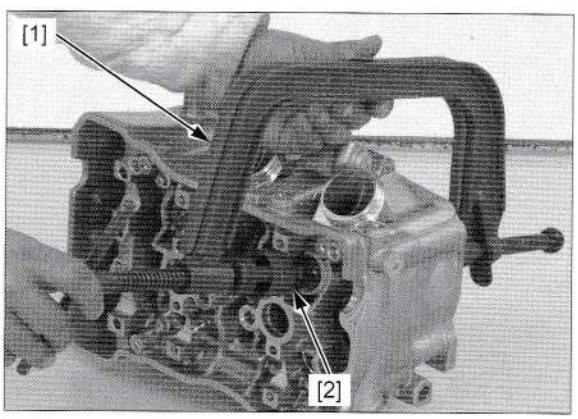
Tappet hole protector	**07HMG-MR70002**



Remove the normal side valve spring cotters using the special tools as shown.

TOOLS:

[1] Valve spring compressor	**07757-0010000**
[2] Valve spring compressor attachment	**07959-KM30101**



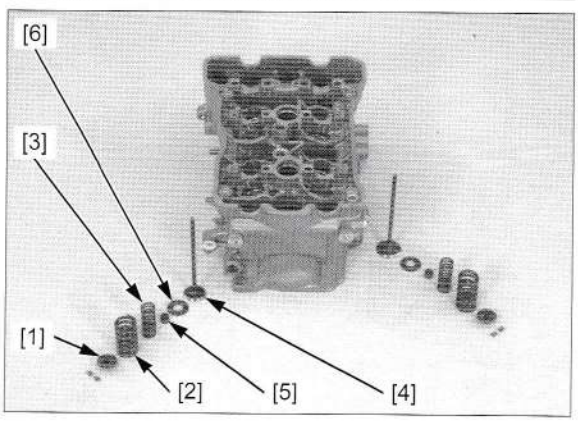
NOTICE

To prevent loss of tension, do not compress the valve springs more than necessary to remove the cotters.

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

Remove the following:

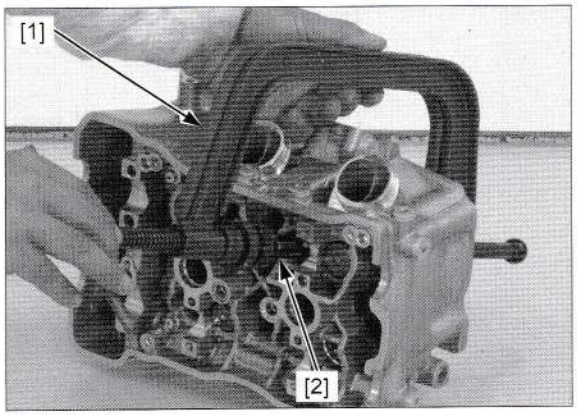
- spring retainers [1]
- outer valve springs [2]
- inner valve springs [3]
- valves [4]
- stem seals [5]
- valve spring seats [6]



Remove the VTEC side valve spring cotters using the special tools as shown.

TOOLS:

[1] Valve spring compressor	**07757-0010000**
[2] Valve spring compressor attachment	**070ME-MCW0100**



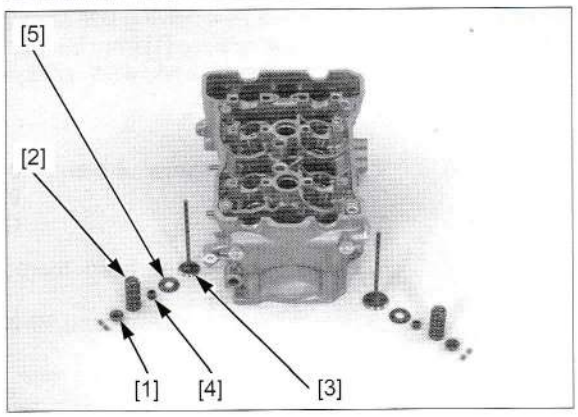
NOTICE

To prevent loss of tension, do not compress the valve springs more than necessary to remove the cotters.

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

Remove the following:

- spring retainers [1]
- inner valve springs [2]
- valves [3]
- stem seals [4]
- valve spring seats [5]



INSPECTION

Inspect the following parts for damage, abnormal wear, deformation, burning, or clogs in oil passages.

- cylinder heads
- inner/outer valve springs
- valve lifters
- valve lifter bores
- valves/valve guides

Measure each part and clearance according to CYLINDER HEAD/VALVES SPECIFICATIONS (page 1-7).

Replace any part if it is out of service limit.

- Ream the valve guide using the valve guide reamer to remove any carbon build up before measuring the guide (page 10-22).
- Refer to valve seat inspection (page 10-22).

VALVE GUIDE REPLACEMENT

Disassemble the cylinder head (page 10-20).

Chill the replacement valve guides in the freezer section of a refrigerator for about an hour.
Heat the cylinder head to 100 – 150°C (212 – 300°F) with a hot plate or oven.

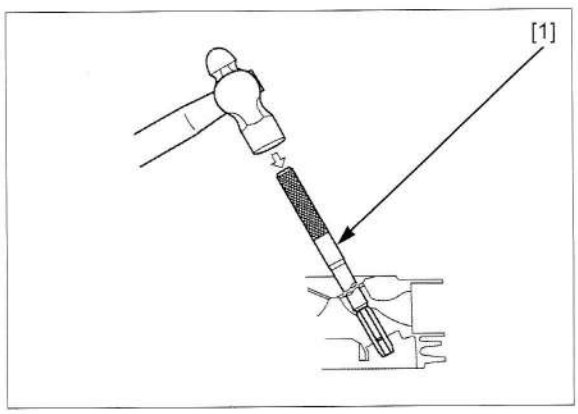
NOTICE

Do not use a torch to heat the cylinder head; it may cause warping.

Support the cylinder head and drive out the valve guides from combustion chamber side of the cylinder head.

TOOL:

[1] Valve guide driver, 4.5 mm 07HMD-ML00101

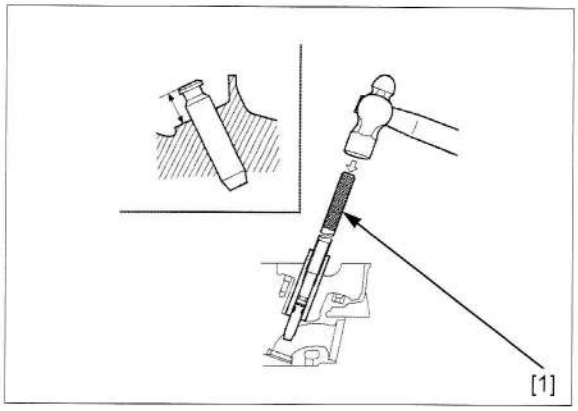


Drive in the guide to the specified height from the top of the cylinder head.

TOOL:
[1] Valve guide driver, 4.5 mm 07HMD-ML00101

SPECIFIED HEIGHT:
Normal side: 12.15 – 12.50 mm (0.478 – 0.492 in)
VTEC side: 19.65 – 20.00 mm (0.774 – 0.787 in)

Let the cylinder head cool to room temperature.

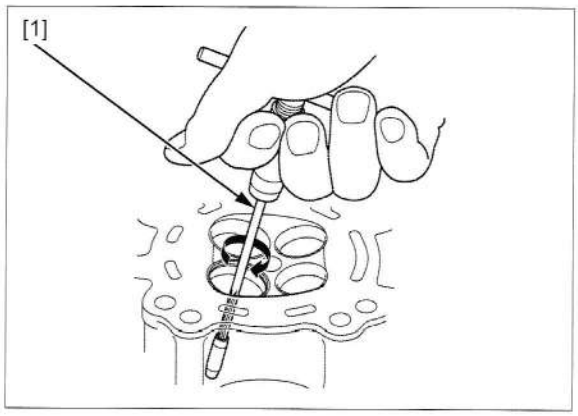


Use cutting oil on the reamer during this operation

Ream the new valve guide after installation.
Insert the reamer [1] from the combustion chamber side of the head and also always rotate the reamer clockwise.

TOOL:
Valve guide reamer, 4.5 mm 07HMH-ML00101 or 07HMH-ML0010B (U.S.A. only)

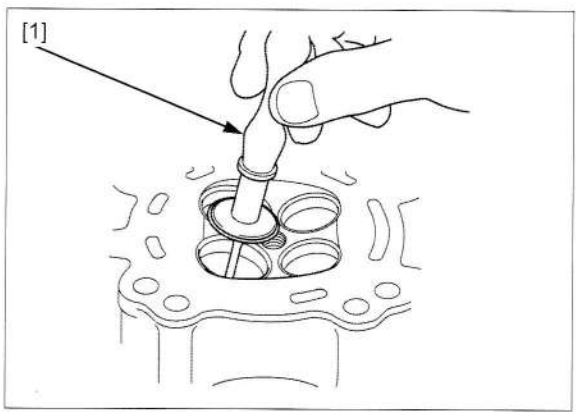
Clean the cylinder head thoroughly to remove any metal particles.
Reface the valve seat (page 10-22).



VALVE SEAT INSPECTION/REFACING

INSPECTION

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 [1].

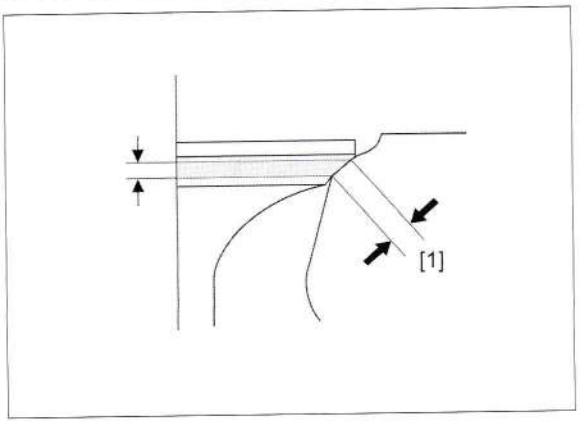


Remove the valve and inspect the valve seat face. The valve seat contact should be within the specified width and even all around the circumference.

STANDARD: 0.90 – 1.10 mm (0.035 – 0.043 in)

SERVICE LIMIT: 1.5 mm (0.06 in)

If the seat width [1] is not within specification, reface the valve seat (page 10-23).



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.

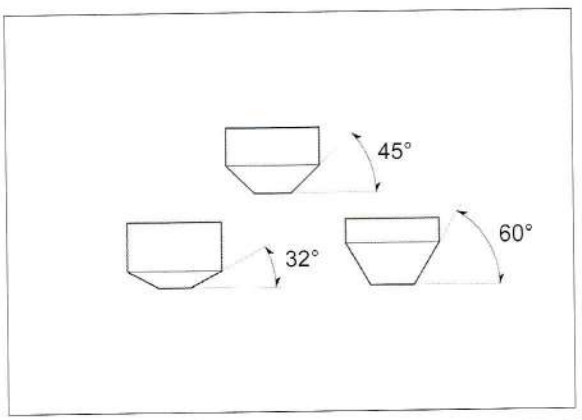
The valves cannot be ground. If a valve face is burned or badly worn or if it contacts the seat unevenly, replace the valve.

- Contact area (too high or too low)
  – Reface the valve seat.

REFACING

Follow the refacing manufacturer's operating instructions.

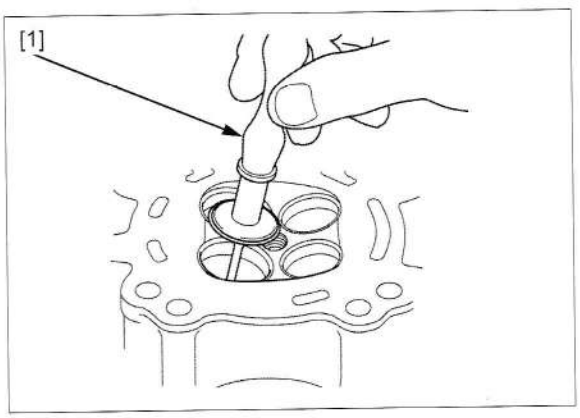
Valve seat cutters/grinders or equivalent valve seat refacing equipment are recommended to correct worn valve seats.



TOOLS:

Seat cutter, 29 mm (IN, 45°)	**07780-0010300**
Seat cutter, 27.5 mm (EX, 45°)	**07780-0010200**
Flat cutter, 30 mm (IN, 32°)	**07780-0012200**
Flat cutter, 28 mm (EX, 32°)	**07780-0012100**
Interior cutter, 30 mm (IN/EX, 60°)	**07780-0014000**
Cutter holder, 4.5 mm or equivalent commercially available in U.S.A.	**07781-0010600**

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



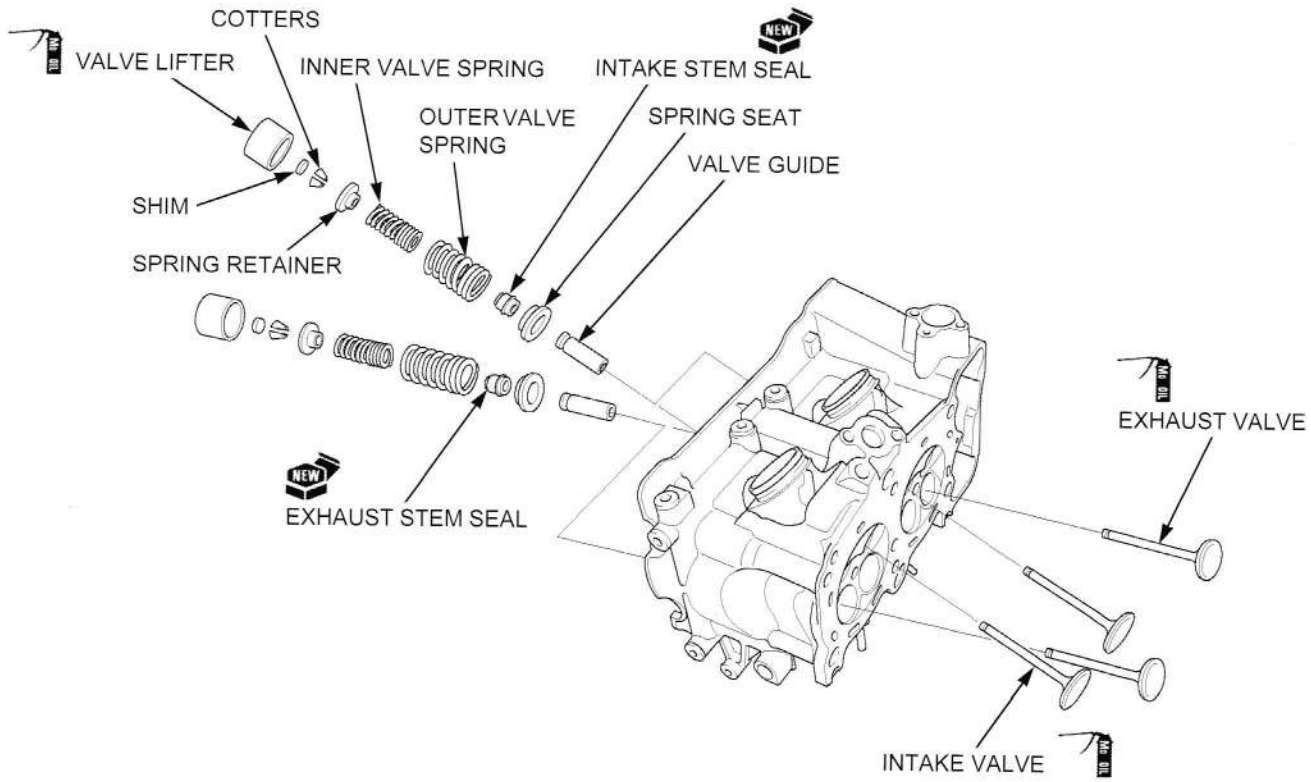
NOTICE

- *Excessive lapping pressure may deform or damage the seat.*
- *Change the angle of lapping tool [1] frequently to prevent uneven seat wear.*
- *Do not allow lapping compound to enter the guides.*

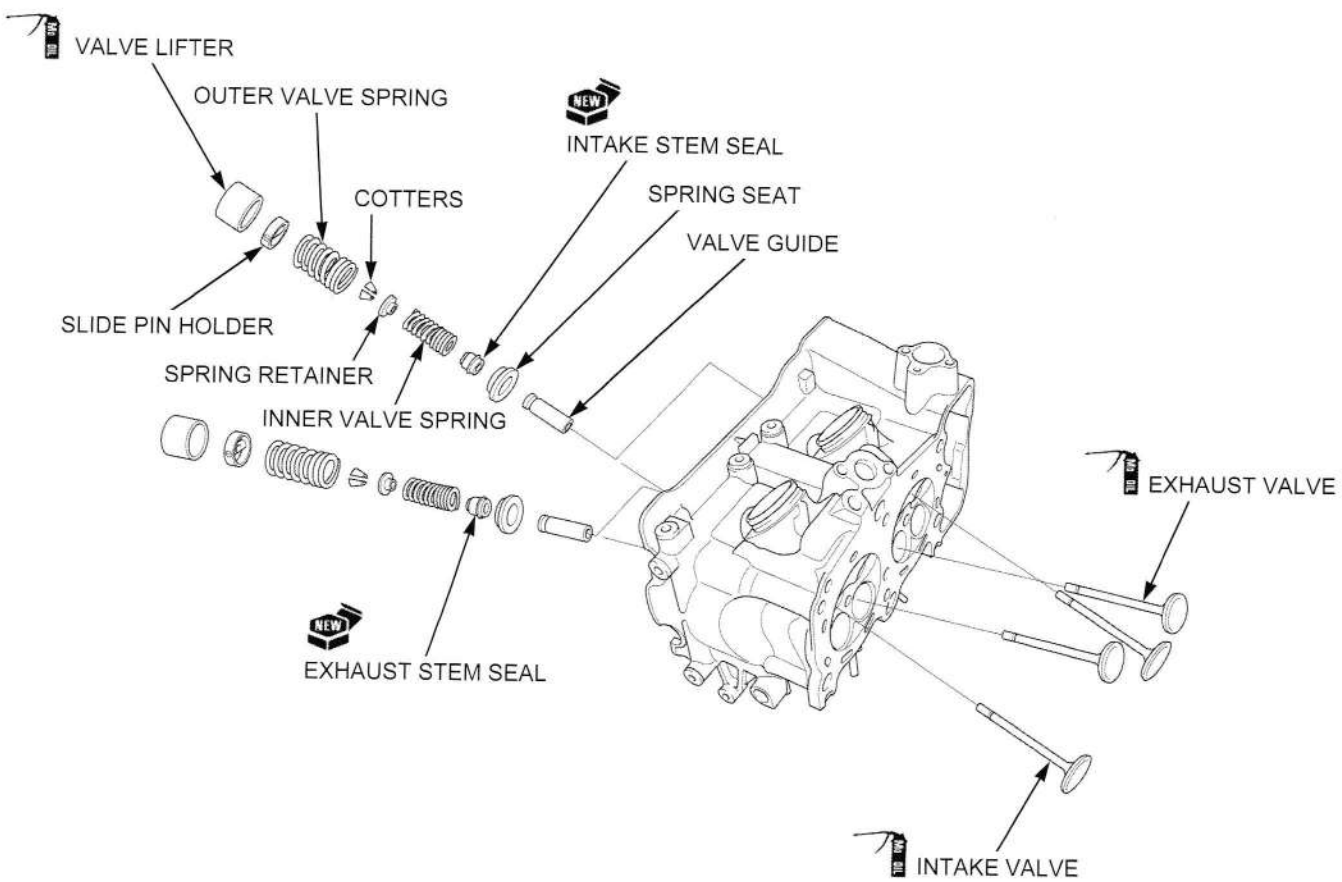
After lapping, wash all residual compound off the cylinder head and valve.

ASSEMBLY

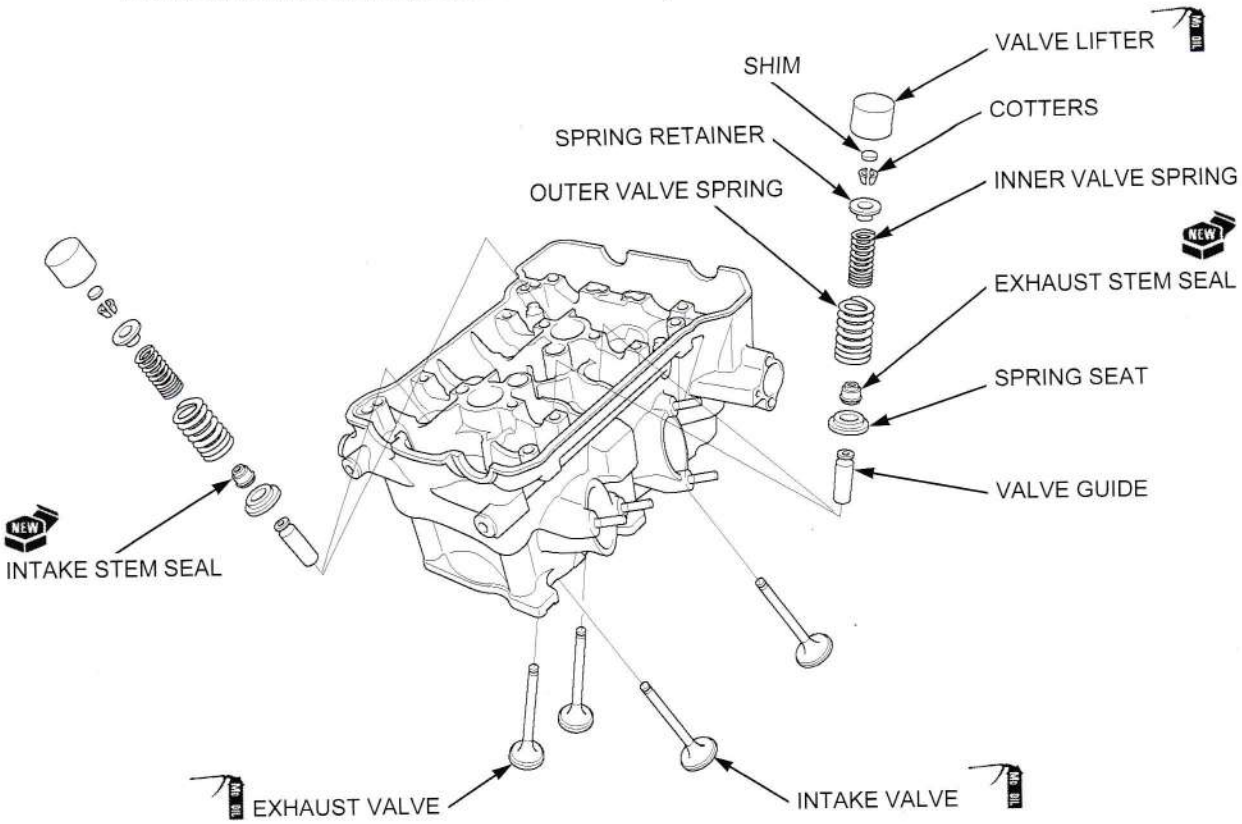
FRONT CYLINDER HEAD (NORMAL VALVE SIDE):



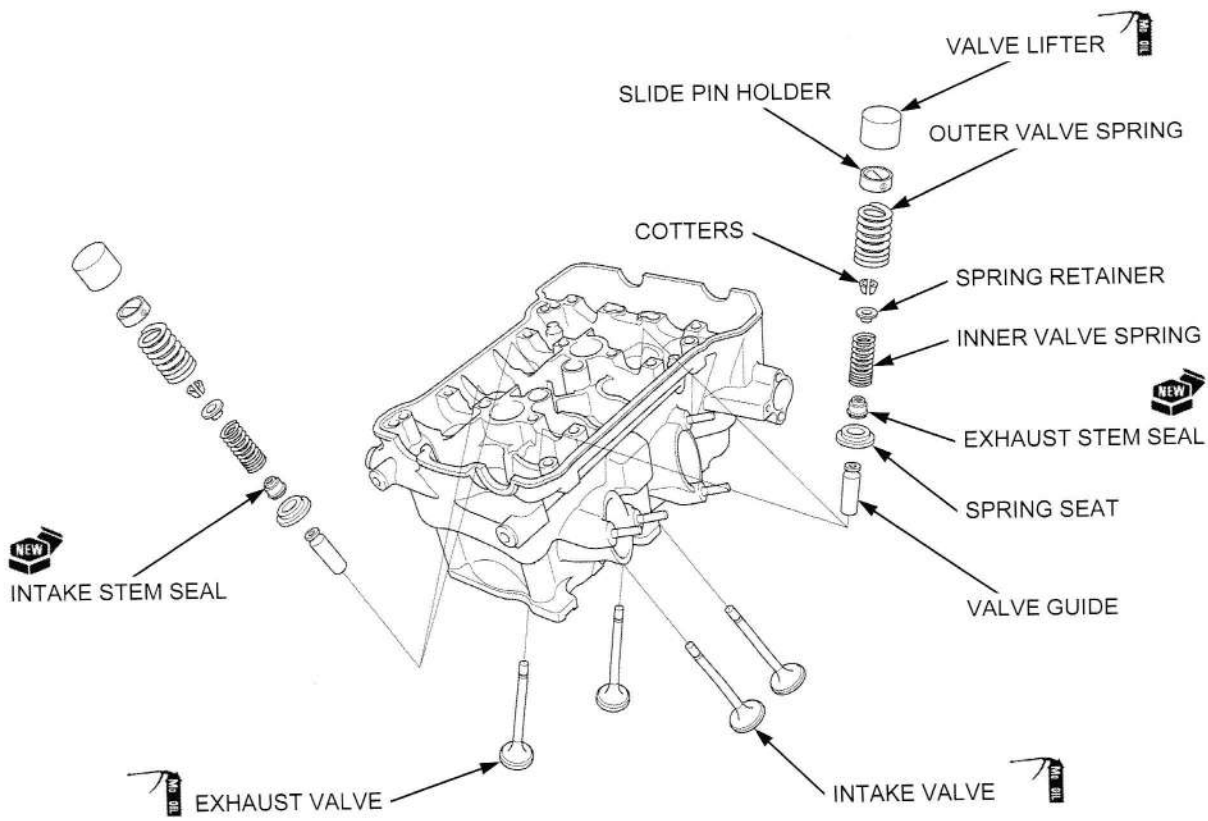
FRONT CYLINDER HEAD (VTEC VALVE SIDE):



REAR CYLINDER HEAD (NORMAL VALVE SIDE):



REAR CYLINDER HEAD (VTEC VALVE SIDE):



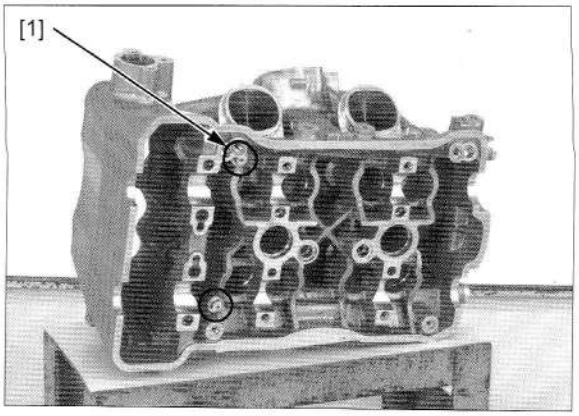
Remove the cylinder head orifice bolts [1] from the cylinder head.

Blow through all oil passages in the cylinder head with compressed air.

Blow through air bleed hole in the bleed bolt with compressed air.

Install the cylinder head orifice bolts to the specified torque.

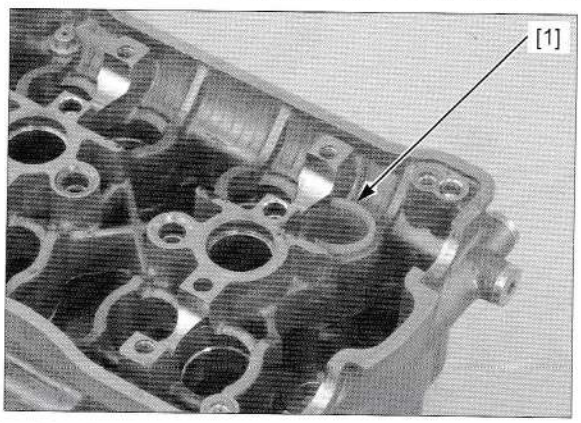
TORQUE: 8.0 N·m (0.8 kgf·m, 5.9 lbf·ft)



Install the tappet hole protector [1] into the normal side valve lifter bore.

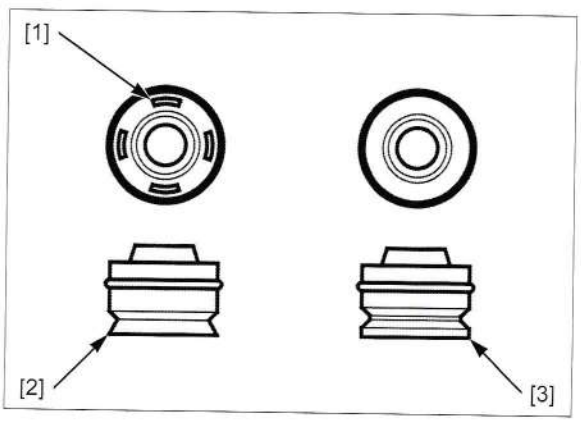
TOOL:

Tappet hole protector	**07HMG-MR70002**



Install the valve spring seats.

The intake stem seal has identification projections [1] on the top surface.
Install intake [2] and exhaust [3] stem seals in their proper position.

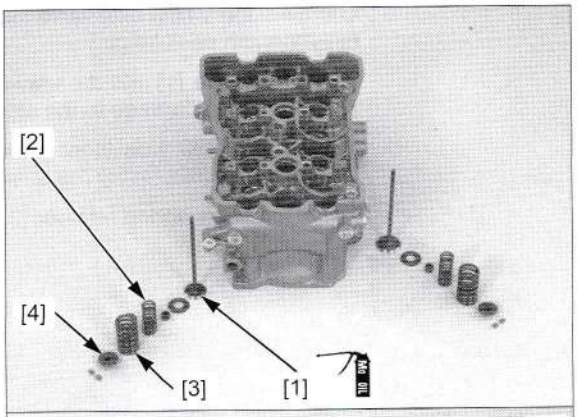


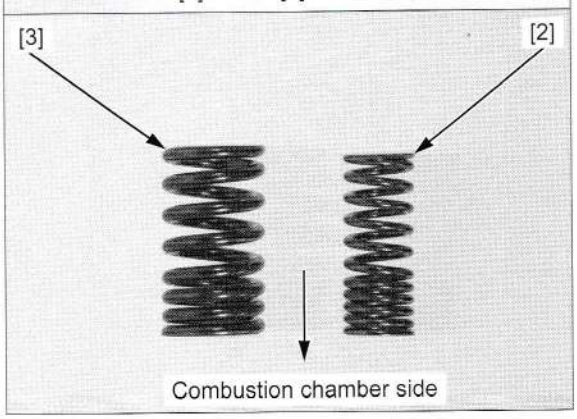
Lubricate the normal side valve stems with molybdenum oil solution.

Insert the valve [1] into the valve guide while turning it slowly to avoid damage to the stem seal.

Install the normal side inner [2] and outer [3] valve springs with the tightly wound coils facing the combustion chamber side.

Install the valve spring retainer [4].





Grease the cotters to ease installation.

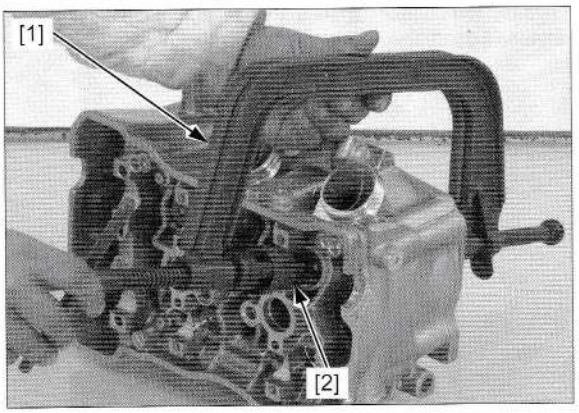
Install the normal side valve cotters using the special tool as shown.

NOTICE

To prevent loss of tension, do not compress the valve spring more than necessary.

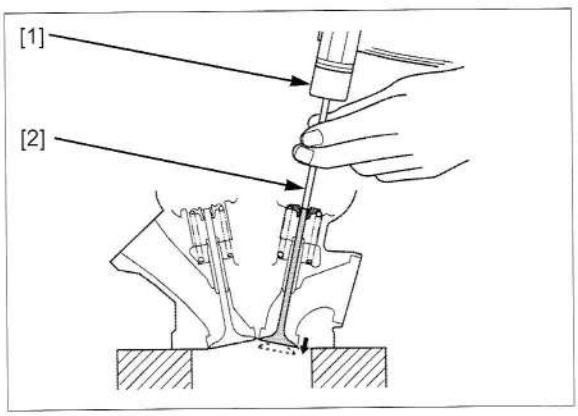
TOOLS:

[1] Valve spring compressor	**07757-0010000**
[2] Valve spring compressor attachment	**07959-KM30101**



Support the cylinder head above the work bench surface to prevent possible valve damage.

Tap the normal side valve stems gently with a hammer [1] and shaft [2] as shown to firmly seat the cotters.

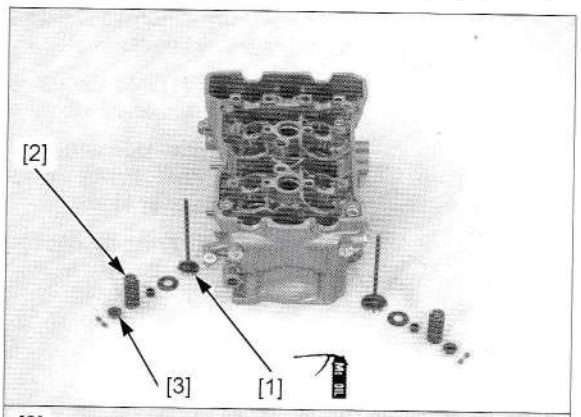


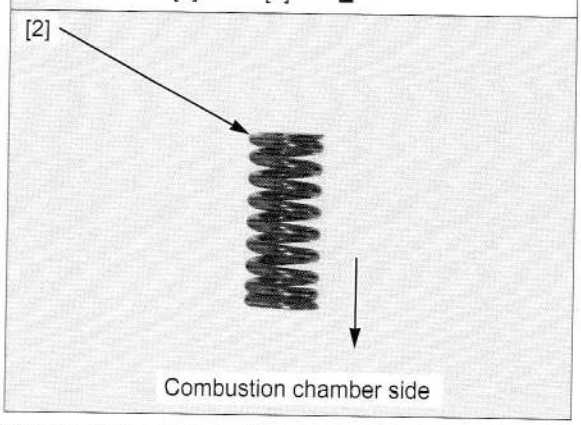
Lubricate the VTEC side valve stem sliding surface with molybdenum oil solution.

Insert the valve [1] into the valve guide while turning it slowly to avoid damage to the stem seal.

Install the VTEC side inner valve springs [2] with the tightly wound coils facing the combustion chamber side.

Install the valve spring retainer [3].





Grease the cotters to ease installation.

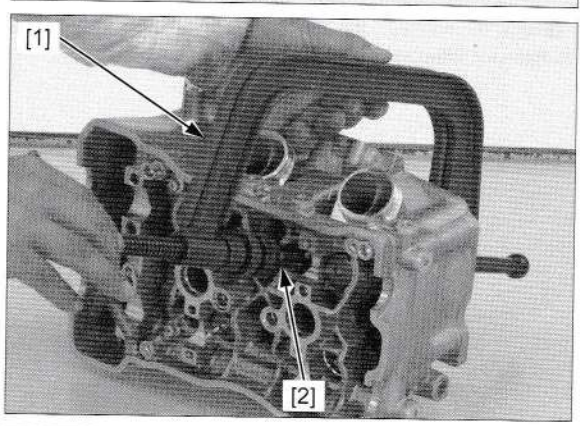
Install the VTEC side valve cotters using the special tool as shown.

NOTICE

To prevent loss of tension, do not compress the valve spring more than necessary.

TOOLS:

[1] Valve spring compressor	**07757-0010000**
[2] Valve spring compressor attachment	**070ME-MCW0100**

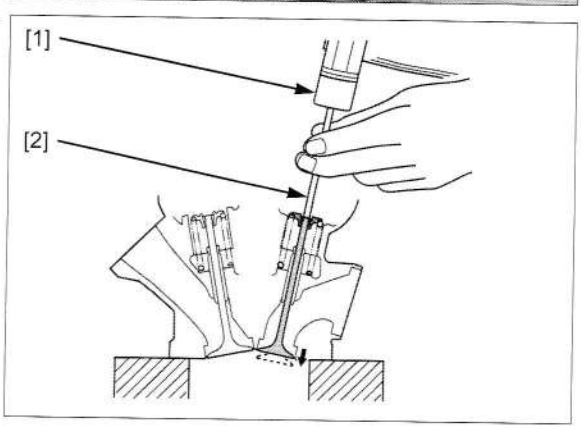


Support the cylinder head above the work bench surface to prevent possible valve damage.

Tap the VTEC side valve stems gently with a hammer [1] and shaft [2] as shown to firmly seat the cotters.

Install the following:

- spark plugs (page 3-6)
- insulators (page 7-16)
- ECT sensor (front cylinder head) (page 4-44)

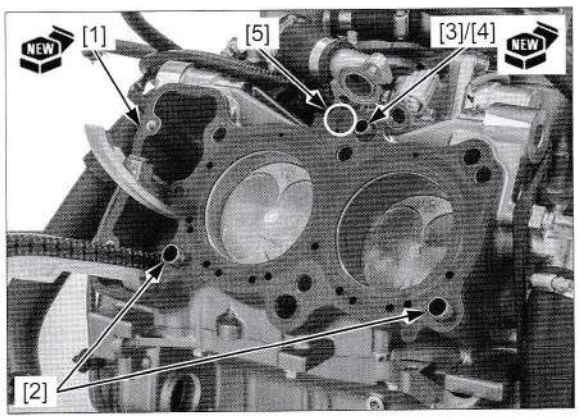


INSTALLATION

The cylinder head gasket has identification mark [5].
-Front: F
-Rear: R

Install a new gasket [1] and dowel pins [2].

Install the oil through collar [3] and a new O-ring [4].



Install the cylinder head [1] onto the cylinder block.

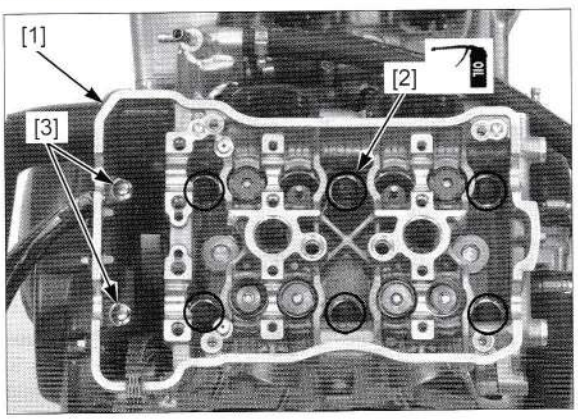
Apply engine oil to the threads and seating surface of the 9 mm washer-bolts [2] and install them.

Install the 6 mm bolts [3].

Tighten the 9 mm washer-bolts in a crisscross pattern in 2 – 3 steps to the specified torque.

TORQUE: 44 N·m (4.5 kgf·m, 32 lbf·ft)

Tighten the 6 mm bolts.



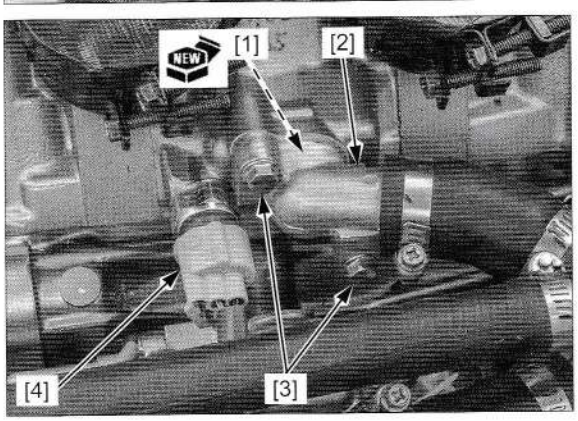
Install a new O-ring [1] into the groove in the water hose joint [2].

Install the water hose joint onto the cylinder head, then install and tighten the bolts [3].

Connect the 3P (Gray) connector [4] to the ECT sensor on the front cylinder head.

Install the following:

- cam chain tensioner lifter (page 10-29)
- camshafts (page 10-12)
- engine (page 14-7)



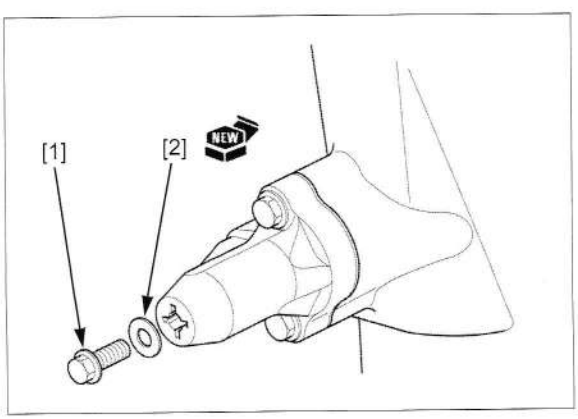
CAM CHAIN TENSIONER LIFTER

REMOVAL/INSTALLATION

Front: Remove the throttle body (page 7-14).

Rear: Remove the right rider footpeg bracket assembly (by removing the three bolts) (page 17-10).

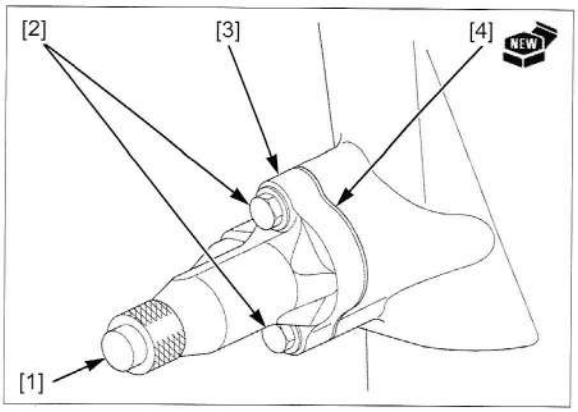
Remove the cam chain tensioner sealing bolt [1] and sealing washer [2].



Turn the cam chain tensioner lifter shaft fully in (clockwise) and secure it using the tensioner stopper [1].

TOOL:

Tensioner stopper	**070MG-0010100 or 07AMG-001A100 (U.S.A. only) or 07AMG-MFJA100 (U.S.A. only)**



Be careful not to allow dust and dirt to enter the cylinder head.

Remove the bolts [2] cam chain tensioner lifter [3] and gasket [4].

Installation is in the reverse order of removal.

NOTE:

- Replace the gasket and sealing washer with new ones.

INSPECTION

Check the cam chain tensioner lifter operation:

- The cam chain tensioner lifter shaft should not go into the cam chain tensioner lifter body when it is pushed.
- When it is turned clockwise with a tensioner stopper or a screwdriver, the cam chain tensioner lifter shaft should be pulled into the cam chain tensioner lifter body. The cam chain tensioner lifter shaft should spring out of the cam chain tensioner lifter body as soon as the stopper tool is released.

CAM CHAIN/TIMING SPROCKET

REMOVAL/INSTALLATION

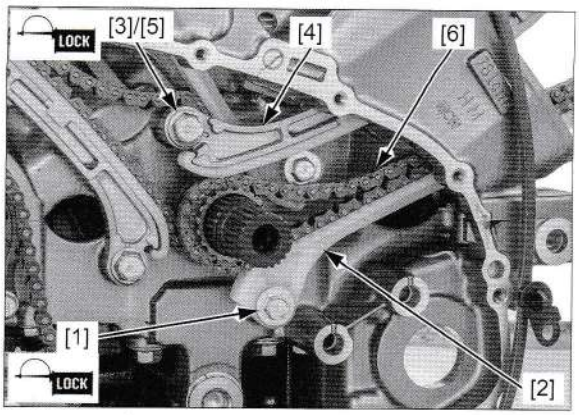
Remove the following:

- cylinder head (page 10-19)
- primary drive gear (page 11-14)
- clutch outer (page 11-10)

Remove the bolt [1] and front cam chain guide A [2].

Remove the bolt [3], front cam chain tensioner [4], and collar [5].

Remove the front cam chain [6].

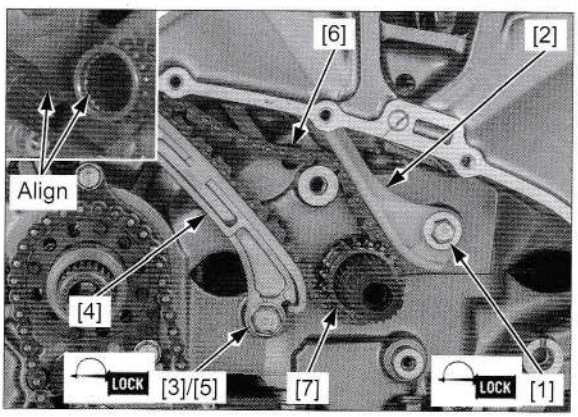


Remove the bolt [1] and rear cam chain guide A [2].

Remove the bolt [3], rear cam chain tensioner [4] and collar [5] (from the inside of the tensioner).

Remove the rear cam chain [6] and timing sprocket [7] from the crankshaft.

Installation is in the reverse order of removal.



NOTE:

- Install the timing sprocket with the flange facing out, aligning the wide groove with the wide tooth.
- Install each collar into the inside of the tensioner.
- Apply locking agent to the threads of the cam chain guide and tensioner bolts (page 1-17).

TORQUE:

Cam chain tensioner bolt:
26 N·m (2.7 kgf·m, 19 lbf·ft)

Cam chain guide A bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)

INSPECTION

Inspect the following parts for scratches, damage, abnormal wear, or deformation. Replace if necessary.

- cam chains
- cam chain guides
- cam chain tensioners
- timing sprocket

MEMO

11. CLUTCH/STARTER CLUTCH

SERVICE INFORMATION 11-2

TROUBLESHOOTING 11-3

COMPONENT LOCATION 11-4

CLUTCH FLUID REPLACEMENT/
AIR BLEEDING 11-5

CLUTCH MASTER CYLINDER 11-6

CLUTCH SLAVE CYLINDER 11-8

RIGHT CRANKCASE COVER 11-9

CLUTCH 11-10

PRIMARY DRIVE GEAR 11-14

STARTER CLUTCH 11-15

SERVICE INFORMATION

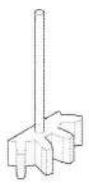
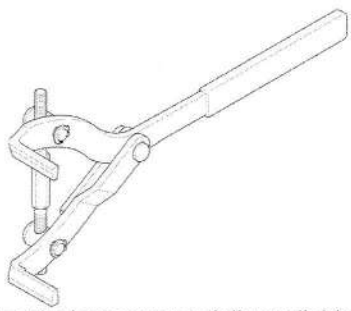
GENERAL

NOTICE

Spilled clutch (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 clutch, primary drive gear, and starter clutch. All service can be done with the engine installed in the frame.
- Brake fluid is used for the hydraulic clutch and is referred to as clutch fluid. Always use fresh DOT 4 brake fluid from a sealed container when servicing the system. Do not mix different types of fluid, they may not be compatible.
- Never allow contaminates (dirt, water, etc.) to get into an open reservoir.
- Once the hydraulic system has been opened, the system must be bled.
- Engine 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 engine oil level before servicing the clutch system.

TOOLS

Gear holder, 2.5 07724-0010100  or 07724-001A100 (U.S.A. only)	Clutch center holder 07724-0050002  or equivalent commercially available in U.S.A.

TROUBLESHOOTING

Clutch lever soft or spongy
- Air in hydraulic system
- Low fluid level
- Hydraulic system leaking

Clutch lever hard to pull in
- Sticking master cylinder piston
- Sticking slave cylinder piston
- Clogged hydraulic system
- Damaged clutch lifter mechanism
- Faulty clutch lifter bearing
- Clutch lifter piece installed improperly

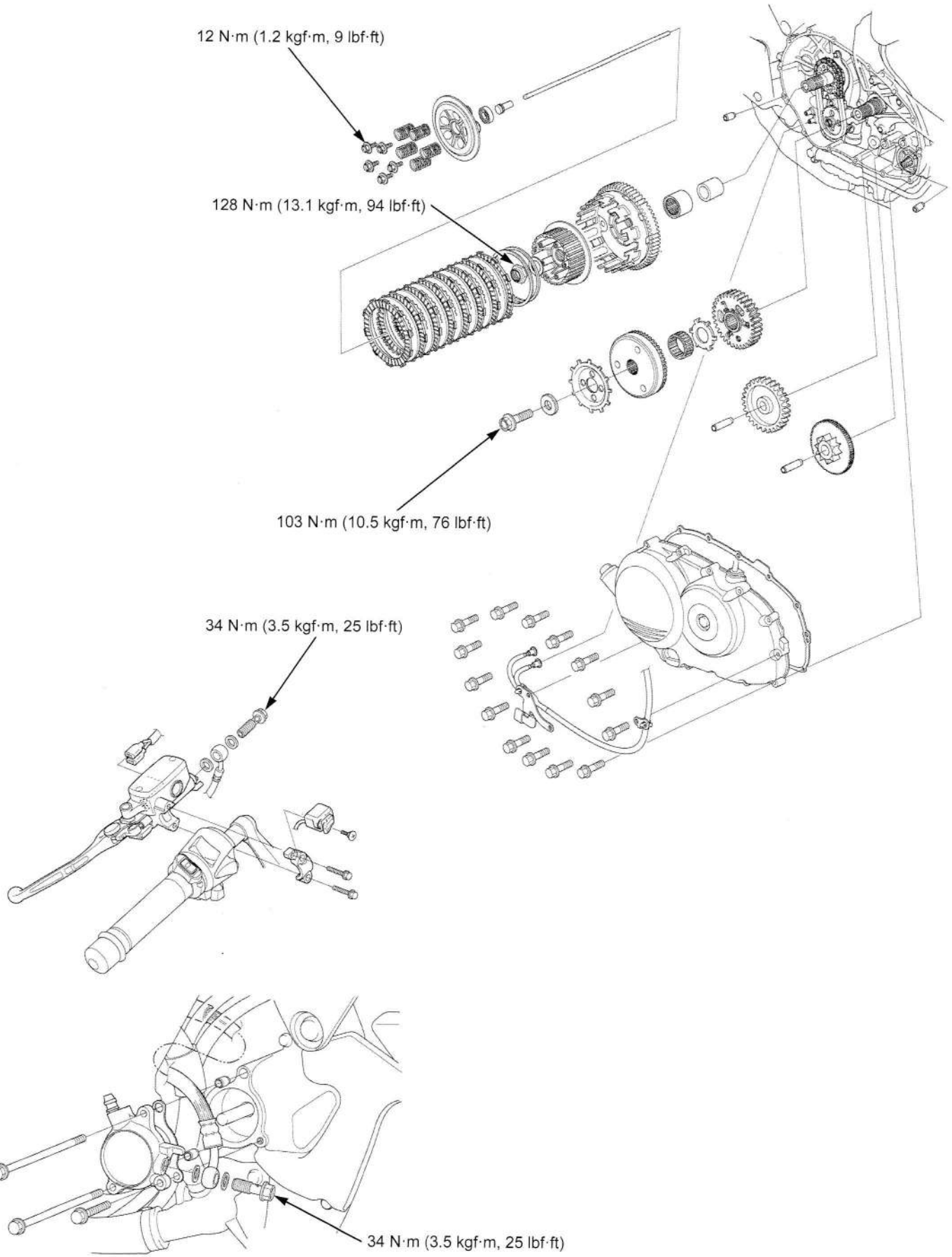
Clutch slips when accelerating
- Hydraulic system sticking
- Worn clutch disc
- Weak clutch spring
- Transmission oil mixed with molybdenum or graphite additive

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

Engine does not turn
- Faulty starter clutch
- Damaged reduction gear/shaft
- Damaged idle gear/shaft

COMPONENT LOCATION



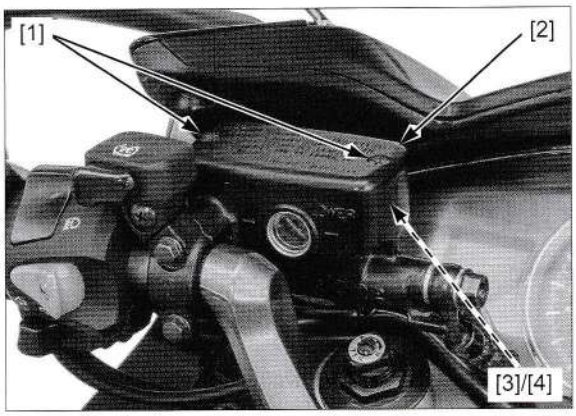
CLUTCH FLUID REPLACEMENT/AIR BLEEDING

CLUTCH FLUID DRAINING

Turn the handlebar so the reservoir is level.

Remove the following:

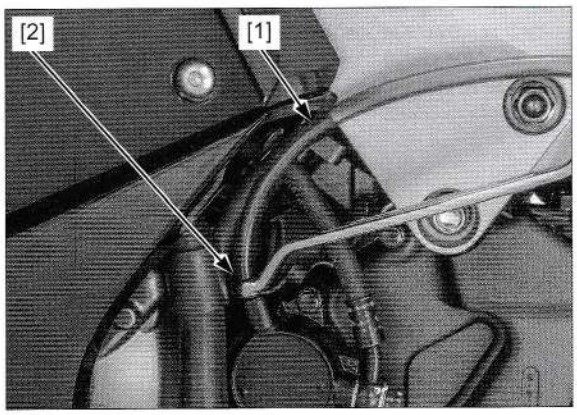
- two screws [1]
- reservoir cap [2]
- set plate [3]
- diaphragm [4]



Connect a bleed hose [1] to the slave bleed valve [2].

Loosen the bleed valve and pump the clutch lever until no more fluid flows out of the bleed valve.

Close the bleed valve.



CLUTCH FLUID FILLING/AIR BLEEDING

Fill the reservoir to the upper level line [1] with DOT 4 brake fluid from a sealed container.

Connect a commercially available brake bleeder to the bleed valve.

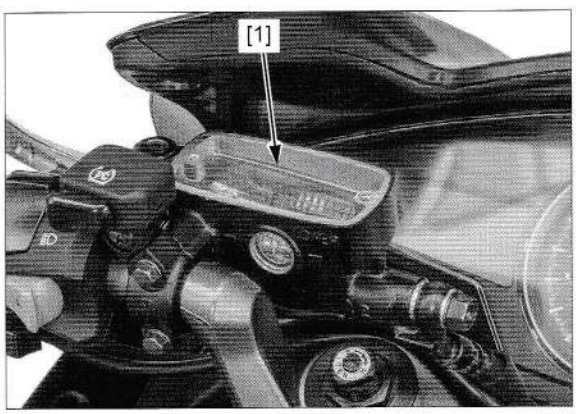
Operate the brake bleeder and loosen the bleed valve.

Check the fluid level often while bleeding to prevent air from being pumped into the system.

If an automatic refill system is not used, add fluid when the fluid level in the reservoir is low.

Perform the bleeding procedure until the system is completely flushed/bled.

Close the bleed valve and operate the clutch lever. If it still feels spongy, bleed the system again.



If the brake bleeder is not available, use the following procedure.

Connect a bleed hose to the bleed valve.

Pump up the system pressure with the clutch lever until the lever resistance is felt.

Do not release the cluck lever until the bleed valve has been closed.

1. Squeeze the clutch lever all the way, and loosen the bleed valve 1/4 of a turn. Wait several seconds and then close it.
2. Release the clutch lever slowly and wait several seconds after it reaches the end of its travel.
3. Repeat the steps 1 and 2 until there are no air bubbles in the bleed hose.

After bleeding the system completely, tighten the bleed valve to the specified torque.

TORQUE: 9.0 N·m (0.9 kgf·m, 6.6 lbf·ft)

Fill the reservoir to the upper level line with DOT 4 brake fluid.

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

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

CLUTCH MASTER CYLINDER

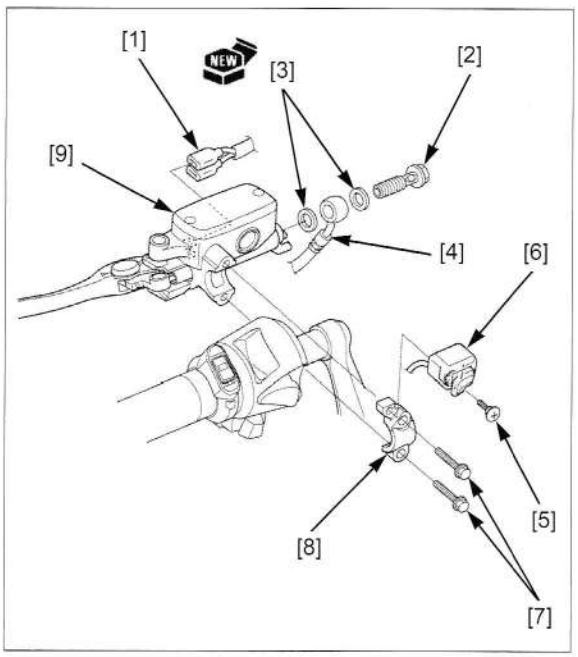
REMOVAL/INSTALLATION

Drain the clutch fluid from the hydraulic system (page 11-5).

Remove the following:

When removing the oil bolt, cover the end of the clutch hose to prevent contamination.

- clutch switch connectors [1]
- oil bolt [2]
- sealing washers [3]
- clutch hose [4]
- screw [5]
- TCS OFF switch [6] (II AC, III CM types)
- two bolts [7]
- master cylinder holder [8]
- master cylinder [9]



Installation is in the reverse order of removal.

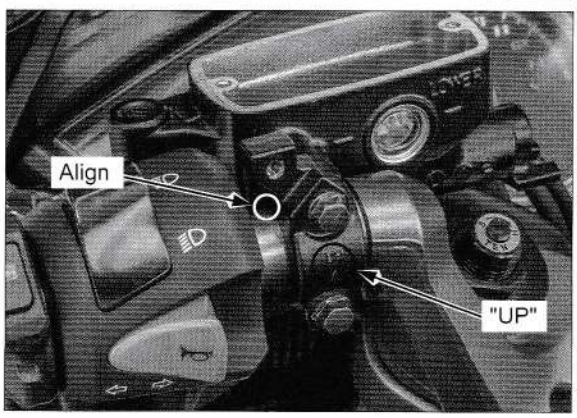
NOTE:

- Replace the sealing washers with new ones.
- Install the master cylinder holder with the "UP" mark facing up.
- Align the edge of the master cylinder with the punch mark on the handlebar, and tighten the upper bolt first then tighten the lower bolt.
- Be sure to set the eyelet joint into the groove when connecting the clutch hose.

TORQUE:

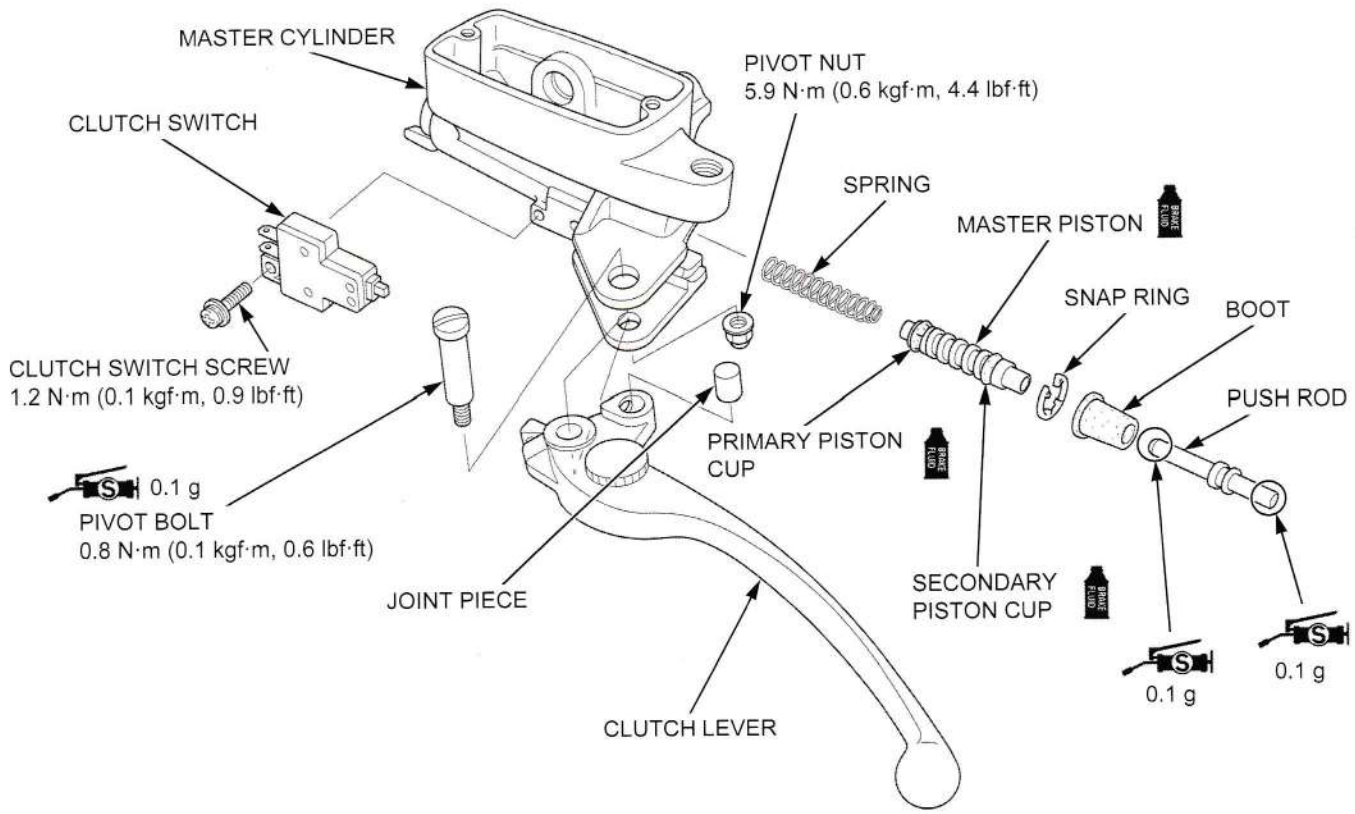
Oil bolt: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the hydraulic system (page 11-5).



DISASSEMBLY/ASSEMBLY

- Do not allow the piston cup lips to turn inside out.
- Install the snap ring with the chamfered edge facing the thrust load side and be certain it is firmly seated in the groove. Do not reuse the snap ring which could easily spin in the groove.
- Align the switch boss with the master cylinder hole properly.
- When tightening the pivot nut, hold the pivot bolt securely.



INSPECTION

Check the following parts for scoring, scratches, deterioration, or damage.

- master cylinder
- master piston
- piston cups
- spring
- boot

Measure the parts according to CLUTCH/STARTER CLUTCH SPECIFICATIONS (page 1-8) and replace if necessary.

CLUTCH SLAVE CYLINDER

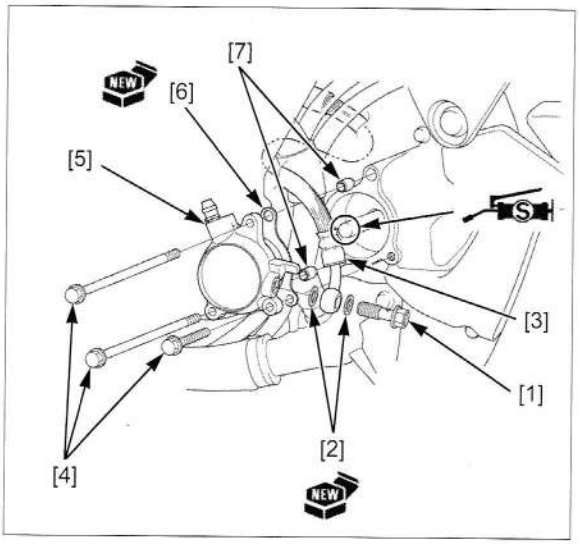
REMOVAL/INSTALLATION

Drain the clutch fluid from the hydraulic system (page 11-5).

Remove the following:

When removing the oil bolt, cover the end of the clutch hose to prevent contamination.

- clutch hose oil bolt [1]
- sealing washers [2]
- clutch hose [3]
- three bolts [4]
- clutch slave cylinder [5]
- gasket [6]
- dowel pins [7]



Installation is in the reverse order of removal.

NOTE:

- Replace the gasket and sealing washers with new ones.
- Apply silicone grease to the clutch lifter rod-to-slave cylinder piston contacting area.
- Be sure to rest the eyelet joint against the stopper when tightening the oil bolt.

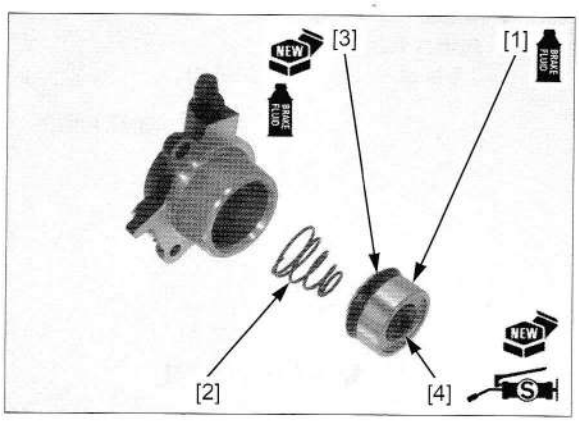
TORQUE: Oil bolt: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the hydraulic system (page 11-5).

DISASSEMBLY/ASSEMBLY

Remove the following:

- slave piston [1]
- spring [2]
- piston seal [3]
- oil seal [4]



Do not use high pressure air or bring the nozzle too close to the inlet.

If the piston is hard to remove, place a shop towel over the piston and apply small squirts of air pressure to the fluid inlet to remove it.

Assembly is in the reverse order of disassembly.

NOTE:

- Replace the oil and piston seals with new ones.
- Apply silicone grease to the oil seal lips.
- Apply brake fluid to the slave piston outer surface and piston seal.
- Install the spring onto the boss of the piston.
- Do not allow the piston seal lip to turn inside out.

INSPECTION

Check the following parts for scoring, scratches, deterioration, or damage.

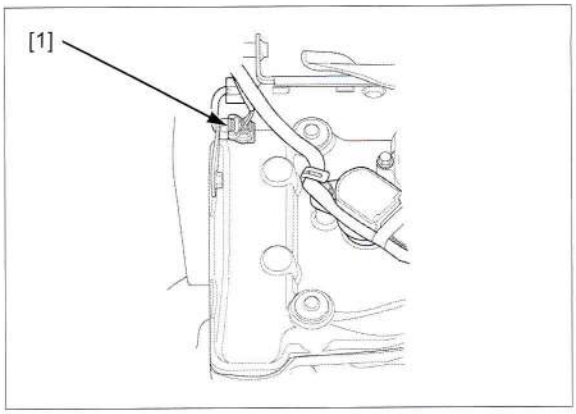
- slave cylinder
- slave piston
- spring

RIGHT CRANKCASE COVER

REMOVAL/INSTALLATION

Remove the right middle cowl (page 2-6).
Drain the engine oil (page 3-11).

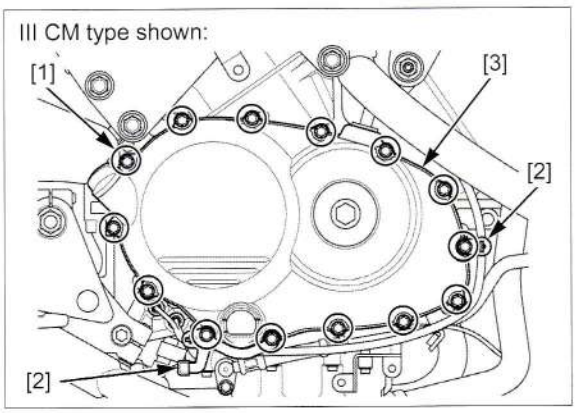
Disconnect the CKP sensor 2P (Black) connector [1].



Loosen the right crankcase cover bolts [1] in a crisscross pattern in 2 or 3 steps.

Remove the following:

- 14 bolts
- two stays [2]
- right crankcase cover [3]



Remove the dowel pins [1] and gasket [2].

Be careful not to damage the mating surfaces.

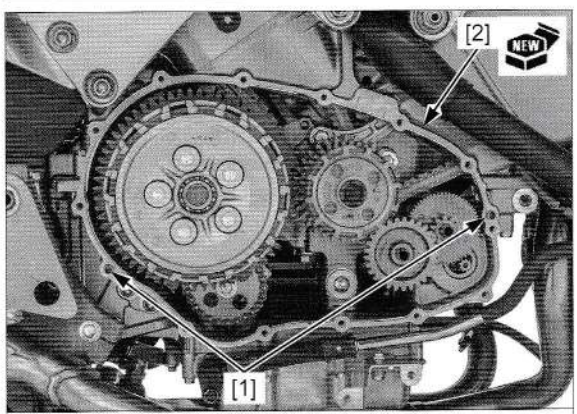
Clean any gasket material from the mating surfaces of the crankcase and cover.

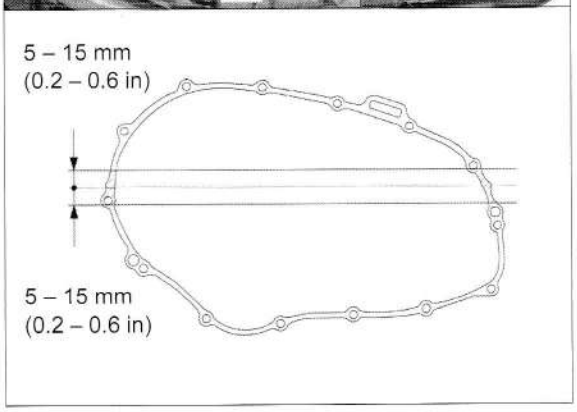
Installation is in the reverse order of removal.

NOTE:

- Apply liquid sealant to the mating areas of crankcase as shown (page 1-17).
- Replace the right crankcase cover gasket with a new one.

Fill the engine with the recommended engine oil and check that there are no oil leaks (page 3-11).



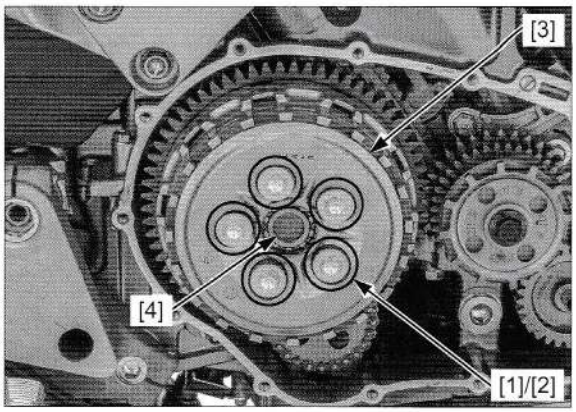


CLUTCH

REMOVAL

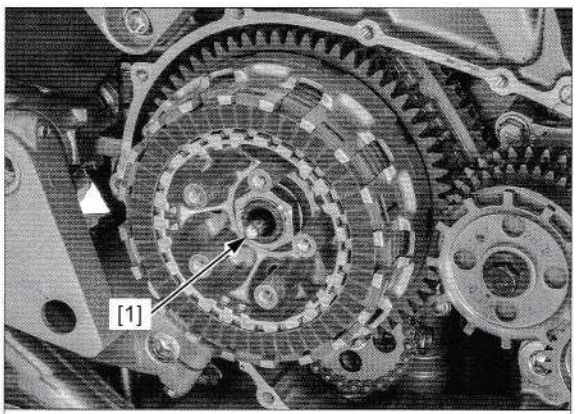
Remove the right crankcase cover (page 11-9).

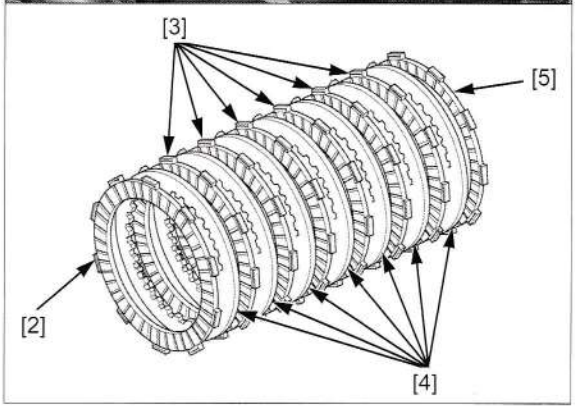
Loosen the clutch spring bolts [1] in a crisscross pattern in 2 or 3 steps and remove the bolts, springs [2], pressure plate [3], and clutch lifter piece [4].



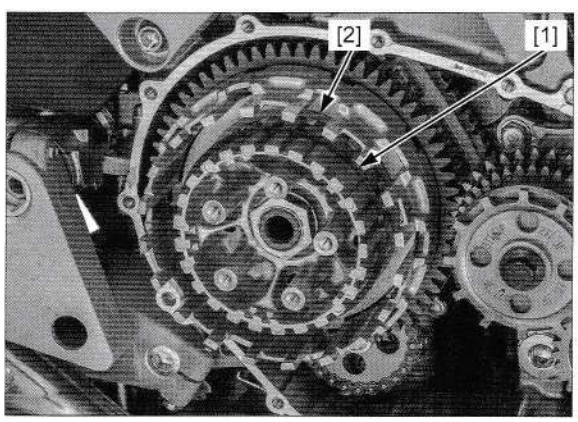
Remove the following:

- lifter rod [1]
- clutch disc A [2]
- six clutch discs C [3]
- seven clutch plates [4]
- clutch disc B [5]





- judder spring [1]
- spring seat [2]



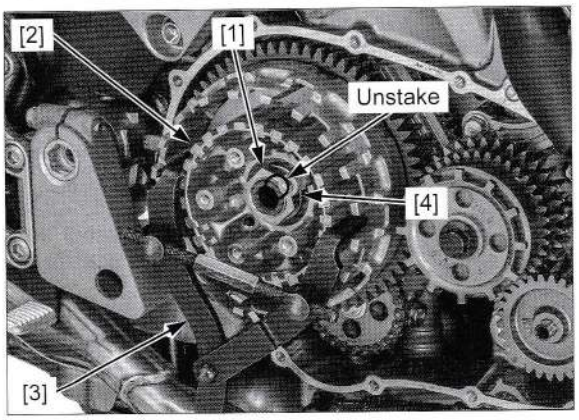
Unstake the clutch center lock nut [1].

Hold the clutch center [2] using a special tool and loosen the clutch center lock nut.

TOOL:

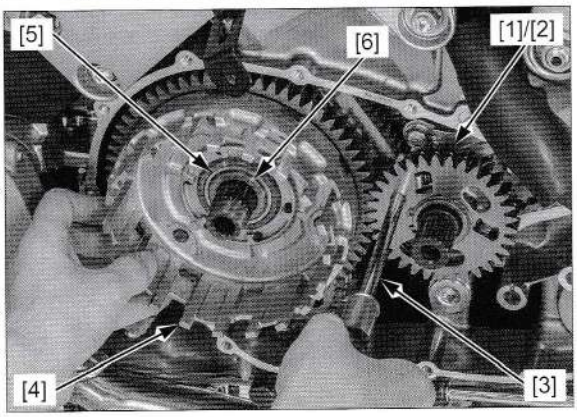
[3] Clutch center holder	**07724-0050002 or equivalent commercially available in U.S.A.**

Remove the lock nut, lock washer [4], and clutch center.



Remove the starter clutch (page 11-15).

Align the primary drive gear [1] and sub-gear [2] teeth with a screwdriver [3], then remove the clutch outer [4], needle bearing [5], and clutch outer guide [6].



INSPECTION

Inspect the following parts for scratches, damage, abnormal wear, or deformation. Replace if necessary.

- clutch lifter rod
- clutch lifter piece
- clutch lifter bearing
- pressure plate
- clutch springs
- clutch center
- clutch discs/plates
- judder spring/spring seat
- clutch outer/primary driven gear/needle bearing
- clutch outer guide
- mainshaft

Measure each part according to CLUTCH/STARTER CLUTCH SPECIFICATIONS (page 1-8).

Replace any part if it is out of service limit.

NOTE:

- Replace the clutch springs as a set.
- Replace the clutch discs and plates as a set.

INSTALLATION

Install the clutch outer guide [1] onto the mainshaft and fit it into the oil pump drive sprocket.

Apply engine oil to the clutch outer needle bearing, primary drive gear and driven gear teeth.

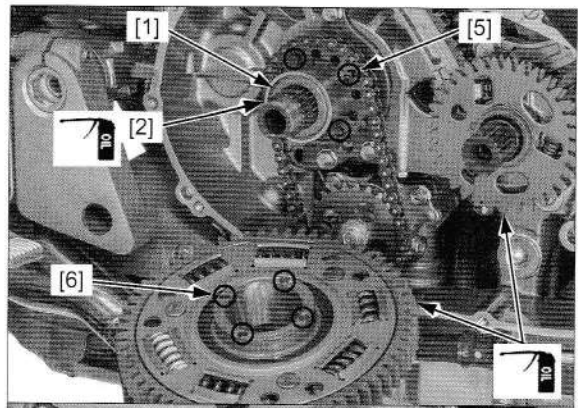
Install the needle bearing [2].

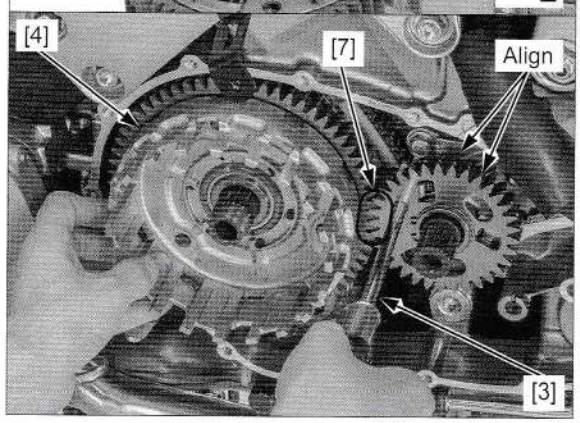
Align the primary drive gear and sub-gear teeth with a screwdriver [3], and install the clutch outer [4].

Fit the bosses [5] of the oil pump drive sprocket to the holes [6] in the clutch outer while turning the oil pump driven sprocket.

NOTE:

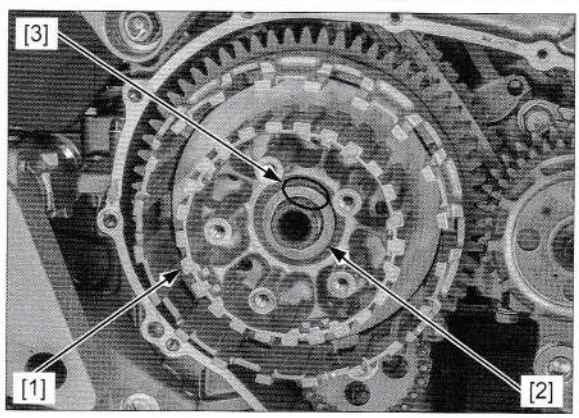
- Make sure the side surfaces [7] of the primary drive and driven gears are flush.





Install the clutch center [1].

Install the lock washer [2] with the "OUT" mark [3] facing out.



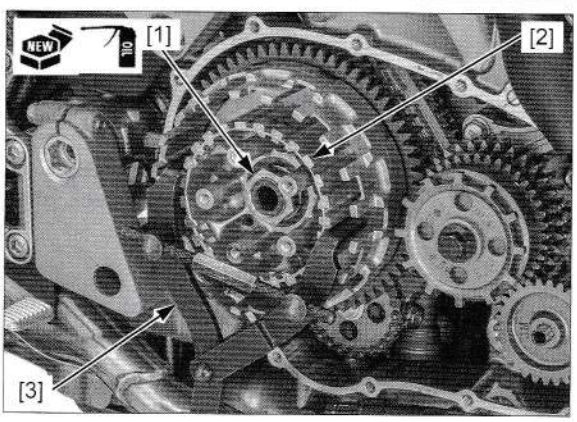
Apply engine oil to the threads and seating surface of a new clutch center lock nut [1].
Install the clutch center lock nut onto the mainshaft.

Hold the clutch center [2] with the special tool and tighten the lock nut to the specified torque.

TOOL:

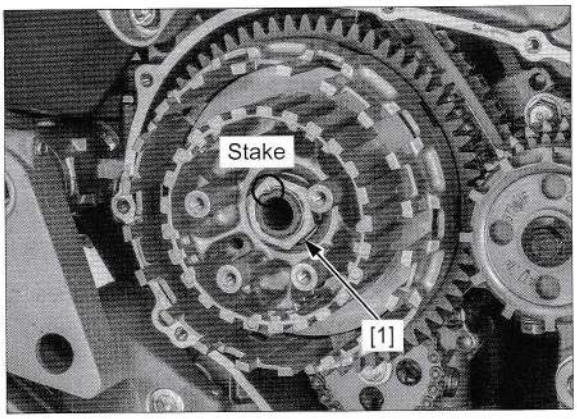
[3] Clutch center holder	**07724-0050002 or equivalent commercially available in U.S.A.**

TORQUE: 128 N·m (13.1 kgf·m, 94 lbf·ft)

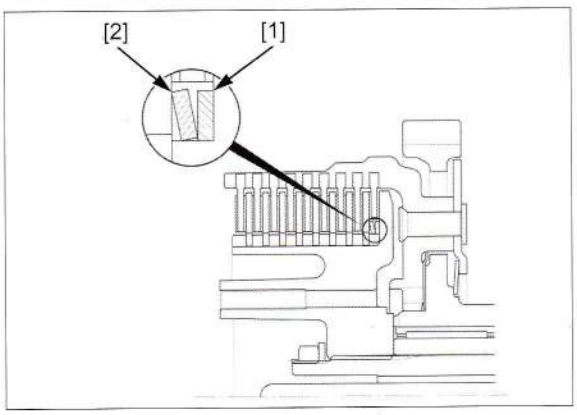


Be careful not to damage the mainshaft threads.

Stake the clutch center lock nut [1] into the mainshaft groove.



Install the spring seat [1] and judder spring [2] onto the clutch center as shown.

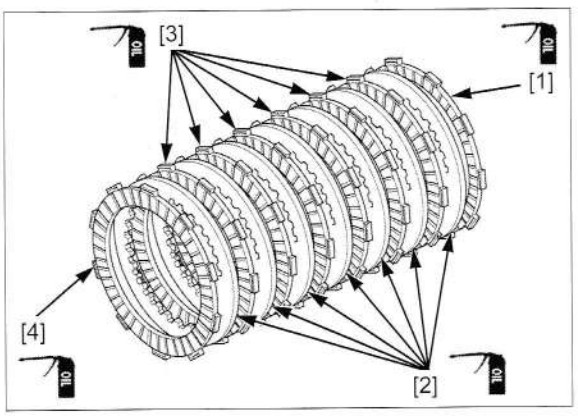


Coat the clutch discs and plates with engine oil.

Install the clutch disc B [1] (large I.D. disc) into the clutch outer.

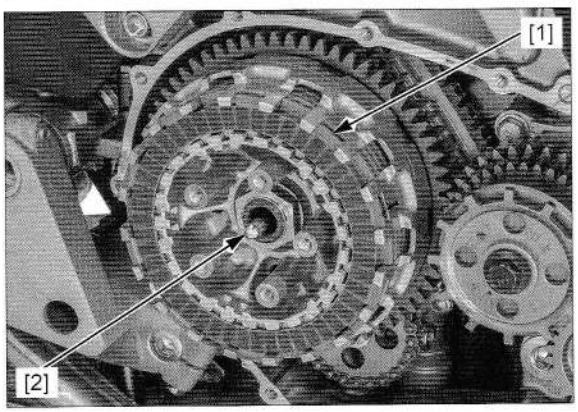
Stack the seven clutch plates [2] and six discs C [3] alternately.

Install the clutch disc A [4].



Set the tabs [1] of outside clutch disc A (outside disc) into the shallow slots in the clutch outer.

Install the clutch lifter rod [2] into the mainshaft.



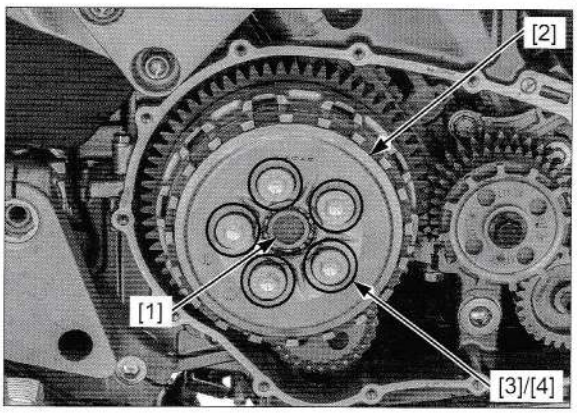
Install the following:

- clutch lifter piece [1]
- pressure plate [2]
- clutch springs [3]
- clutch spring bolts [4]

Tighten the bolts in a crisscross pattern in two or three steps, then tighten the bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the right crankcase cover (page 11-9).

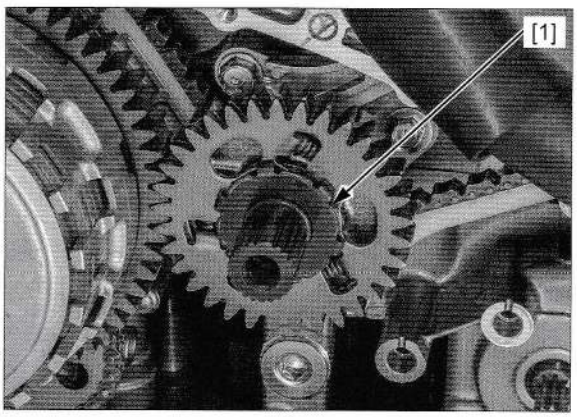


PRIMARY DRIVE GEAR

REMOVAL/INSTALLATION

Remove the stater clutch (page 11-15).

Remove the primary drive gear guide [1] from the crankshaft.



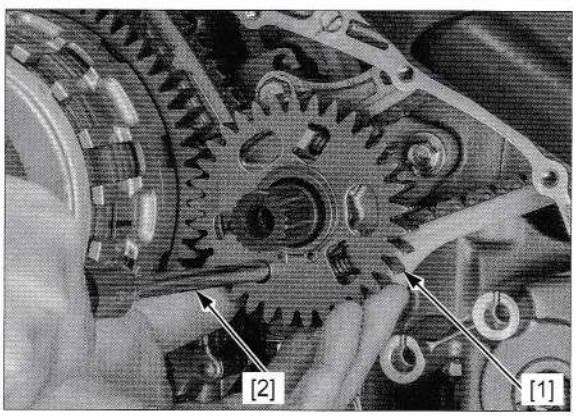
Remove the primary drive gear [1] while aligning the gear teeth with a screwdriver [2].

Installation is in the reverse of removal.

NOTE:

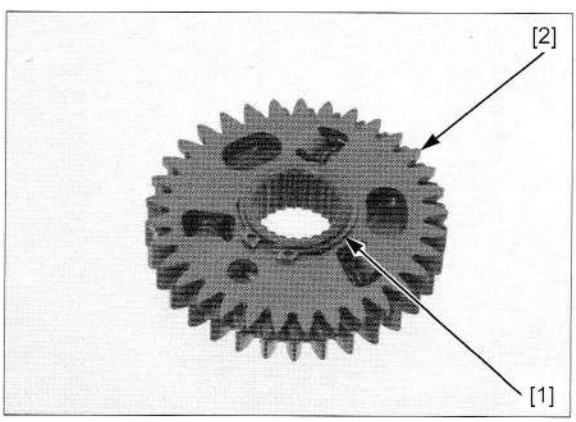
- Install the gear guide with its tabs facing the gear so they are avoiding the gear openings.

Install the starter clutch (page 11-18).



DISASSEMBLY/ASSEMBLY

Remove the snap ring [1] and primary drive sub-gear [2].

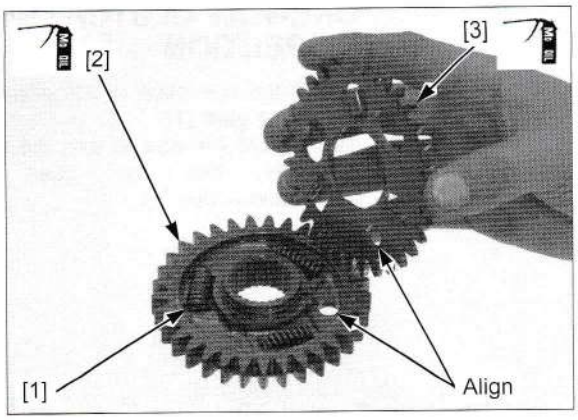


Remove the springs [1] from the primary drive gear [2].

Apply molybdenum oil solution to the sliding surfaces of the primary drive gear and sub-gear.

Install the springs into the primary drive gear grooves. Install the primary drive sub-gear [3] so that the tabs are positioned against the spring ends by aligning the holes.

Install the snap ring into the groove securely with the chamfered edge facing the gear.



INSPECTION

Inspect the following parts for scratches, damage, abnormal wear, or deformation. Replace if necessary.

- primary drive gear
- primary drive sub-gear
- springs

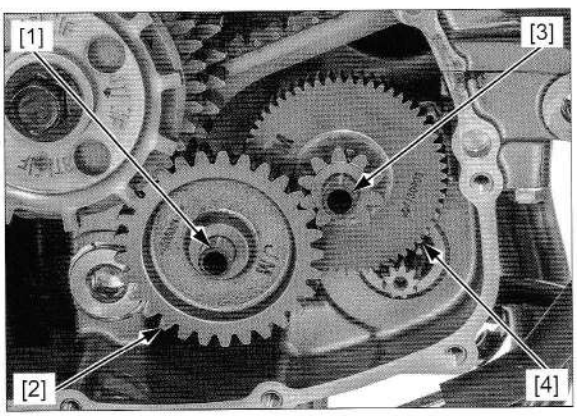
STARTER CLUTCH

REMOVAL

Remove the right crankcase cover (page 11-9).

Remove the following:

- idle gear shaft [1]
- starter idle gear [2]
- reduction gear shaft [3]
- starter reduction gear [4]



Hold the primary drive gear using the gear holder [1] as shown and loosen the primary drive gear/starter clutch bolt [2].

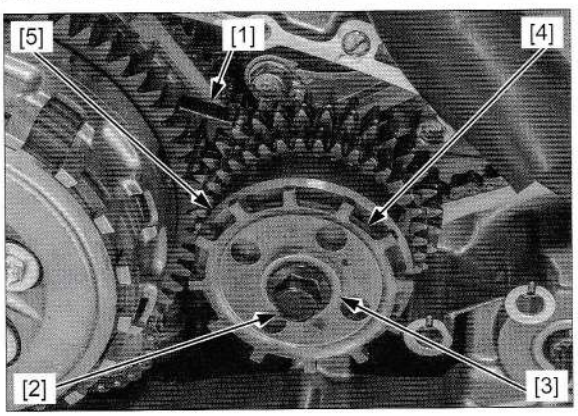
TOOL:

Gear holder, 2.5	**07724-0010100 or 07724-001A100 (U.S.A. only)**

Remove the gear holder.

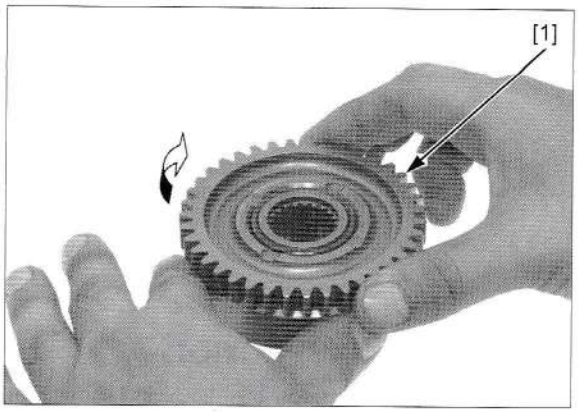
Remove the following:

- primary drive gear/starter clutch bolt
- washer [3]
- CKP sensor rotor [4]
- starter clutch assembly [5]



ONE-WAY CLUTCH OPERATION INSPECTION

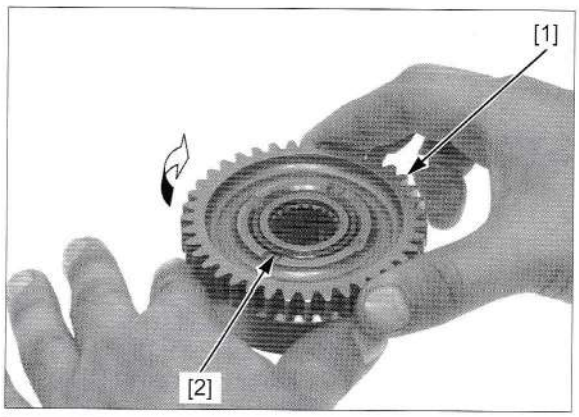
Check the operation of the one-way clutch by turning the driven gear [1].
You should be able to turn the driven gear clockwise smoothly, but the gear should not turn counterclockwise.



DISASSEMBLY

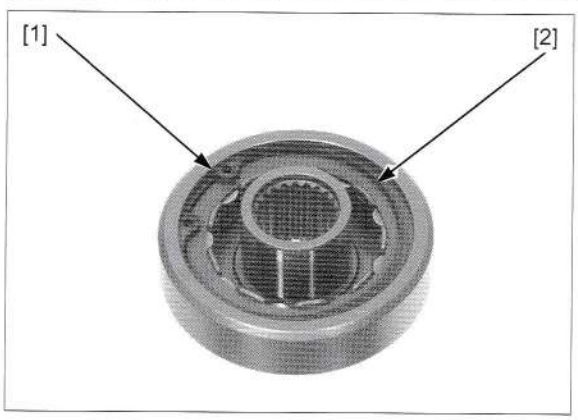
Remove the starter driven gear [1] while rotating it clockwise.

Remove the needle bearing [2].



Remove the snap ring [1].

Remove the starter one-way clutch [2] from the clutch outer by turning it counterclockwise.



INSPECTION

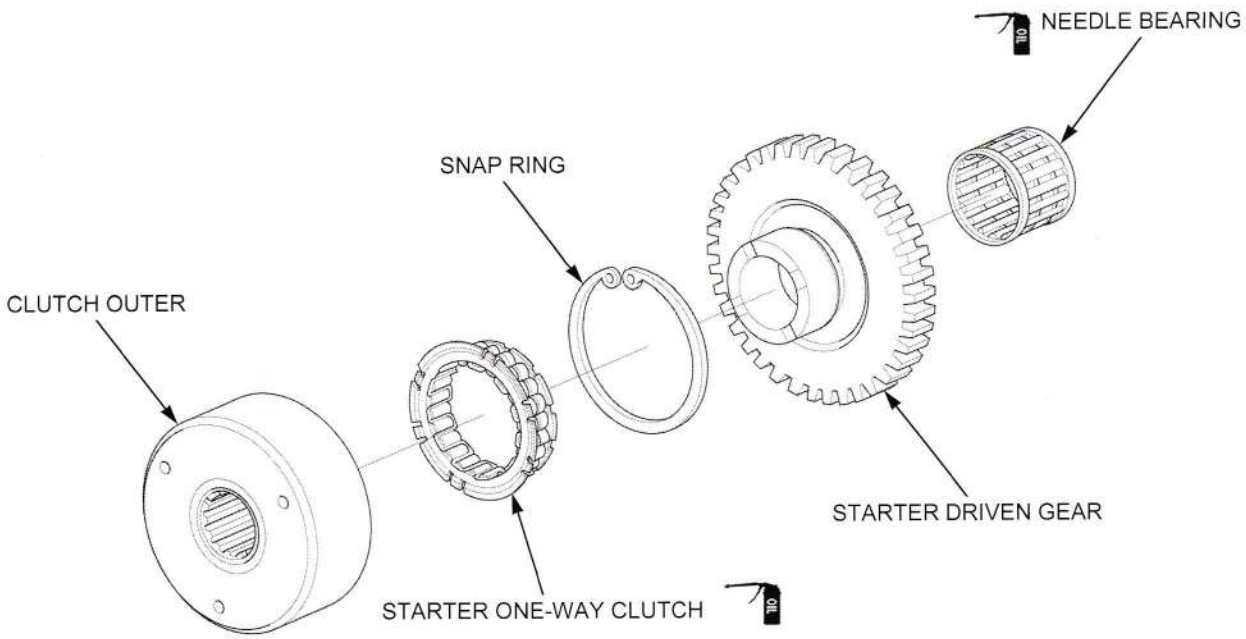
Inspect the following parts for scratches, damage, abnormal wear, or deformation. Replace if necessary.

- starter reduction gear
- starter idle gear
- gear shafts
- needle bearing
- starter driven gear
- starter clutch outer
- starter one-way clutch

Measure the stater driven gear boss O.D. according to CLUTCH/STARTER CLUTCH SPECIFICATIONS (page 1-8).

Replace if it is out of service limit.

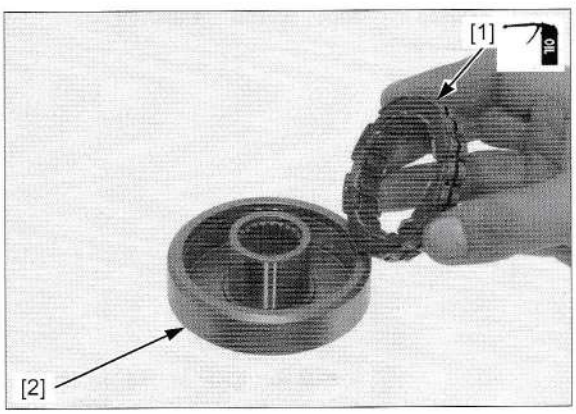
ASSEMBLY



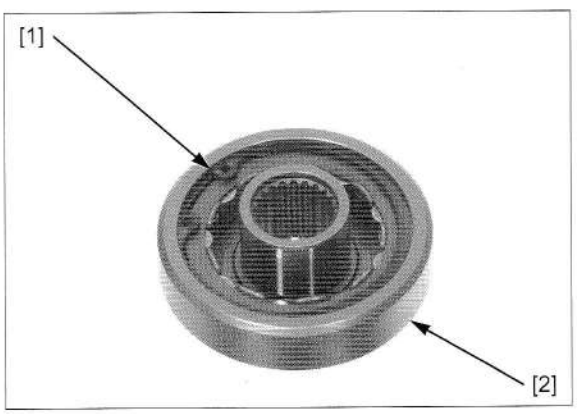
Apply engine oil to the starter one-way clutch contacting surfaces.

Install the one-way clutch with its flange side facing in.

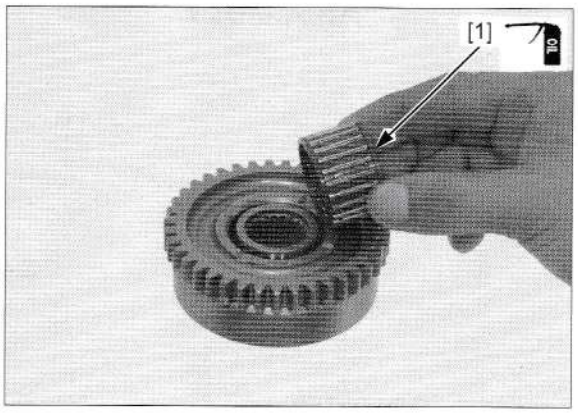
Install the starter one-way clutch [1] into the clutch outer [2] while rotating it counterclockwise.



Install the snap ring [1] into the groove in the clutch outer [2] securely.

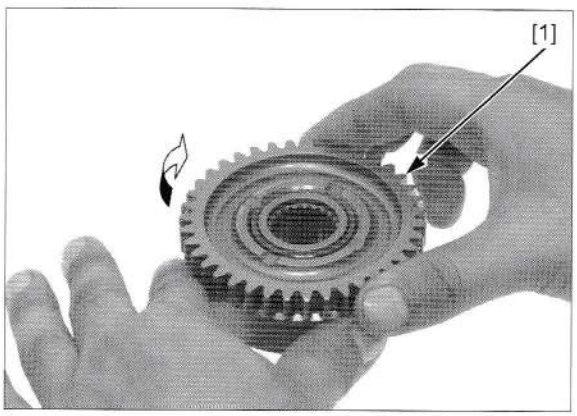


Apply engine oil to the needle bearing [1] and install it.



Install the starter driven gear [1] while rotating it clockwise.

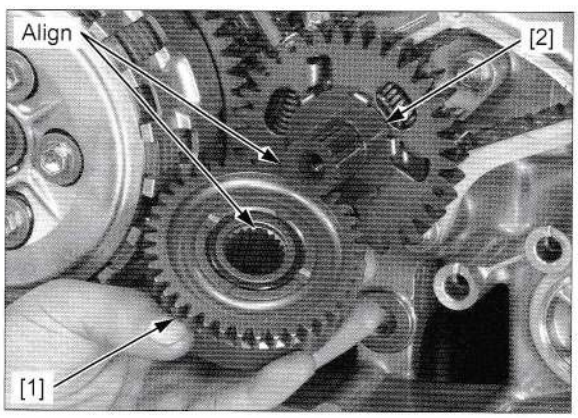
Check the one-way clutch operation (page 11-16).



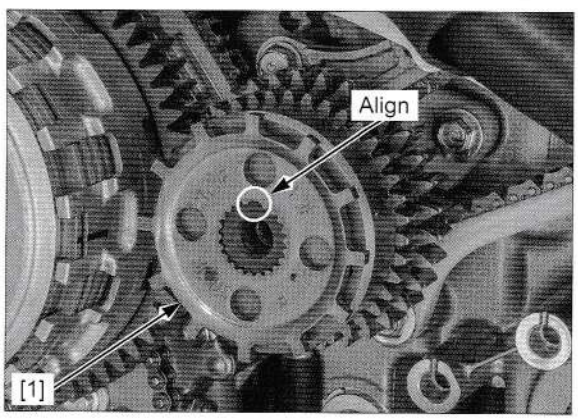
INSTALLATION

Be sure the gear guide [2] tabs are avoiding the primary drive sub-gear openings.

Install the starter clutch assembly [1] while aligning the wide groove in the starter clutch outer with the wide tooth on the crankshaft.



Install the CKP sensor rotor [1] while aligning the wide groove in the rotor with the wide tooth on the crankshaft.



Apply engine oil to the threads and seating surface of the primary drive gear/starter clutch bolt [1].

Install the washer [2] and bolt.

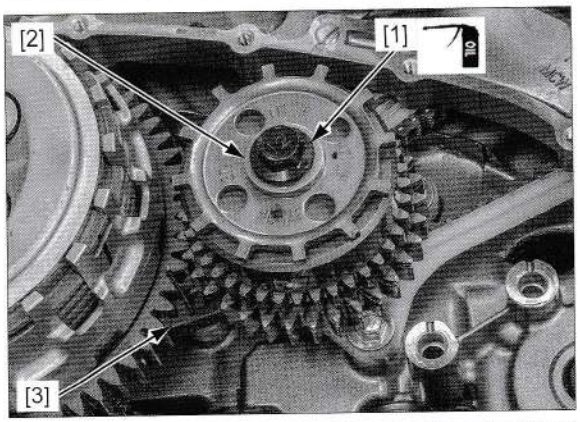
Hold the primary drive gear using the gear holder [3] as shown and tighten the bolt to the specified torque.

TOOL:

Gear holder, 2.5	**07724-0010100 or 07724-001A100 (U.S.A. only)**

TORQUE: 103 N·m (10.5 kgf·m, 76 lbf·ft)

Remove the gear holder.



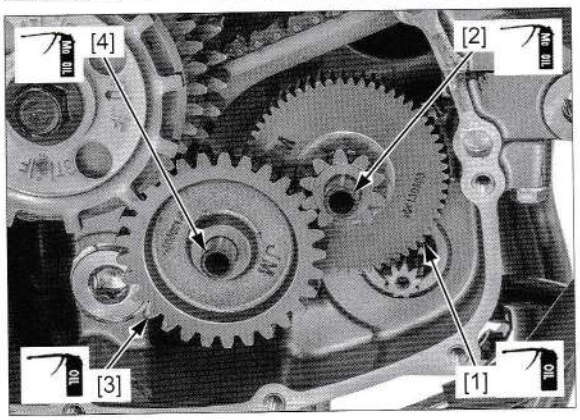
Apply engine oil to the gear teeth.

Apply molybdenum oil solution to the shaft sliding surfaces.

Install the following:

- starter reduction gear [1]
- reduction gear shaft [2]
- starter idle gear [3]
- idle gear shaft [4]

Install the right crankcase cover (page 11-9).



MEMO

12. GEARSHIFT LINKAGE/CRANKCASE/TRANSMISSION/ALTERNATOR

SERVICE INFORMATION 12-2

TROUBLESHOOTING 12-3

COMPONENT LOCATION 12-4

DRIVE SPROCKET 12-7

GEARSHIFT LINKAGE 12-7

CRANKCASE 12-11

TRANSMISSION 12-15

ALTERNATOR COVER 12-20

STATOR/MP SENSOR 12-21

FLYWHEEL 12-22

SERVICE INFORMATION

GENERAL

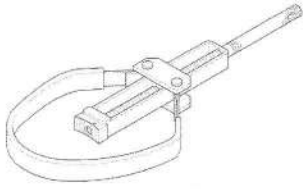
NOTICE

- *The main journal 9 mm bolts are tightened using the Plastic Region Tightening Method.*
- *Always use new main journal 9 mm bolts.*
- *The main journal 9 mm bolt is pre-coated with an oil additive for axial tension stability. Do not remove the oil additive from the new 9 mm bolt surface.*
- *The tightening procedure for the crankcase bolts must be followed (page 12-13).*

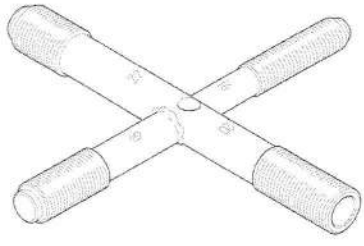
- The gearshift linkage service can be done with the engine installed in the frame.
- The crankcase must be separated to service the following:
  - transmission
  - crankshaft (page 13-4)
  - piston/connecting rod (page 13-13)
- The following components must be removed before separating the crankcase:
  - flywheel (page 12-22)
  - clutch (page 11-10)
  - gearshift linkage (page 12-7)
  - cylinder head (page 10-19)
  - engine (page 14-4)
  - oil pump (page 9-8)
  - starter motor (page 6-5)
  - water pump (page 8-9)
  - VLC solenoid valve (page 4-47)
  - gear position switches (page 20-25)
  - EOP switch (page 20-18)
- 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.
- For charging system inspection (page 19-5).

TOOLS

Flywheel holder
07725-0040001

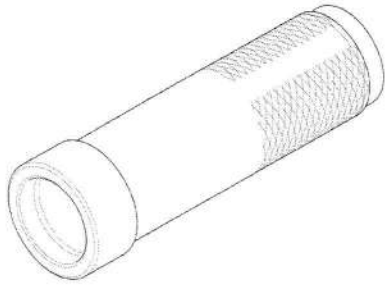


Rotor puller
07733-0020001



or 07933-3950000

Driver, 40 mm I.D.
07746-0030100



Attachment, 25 mm I.D.
07746-0030200

TROUBLESHOOTING

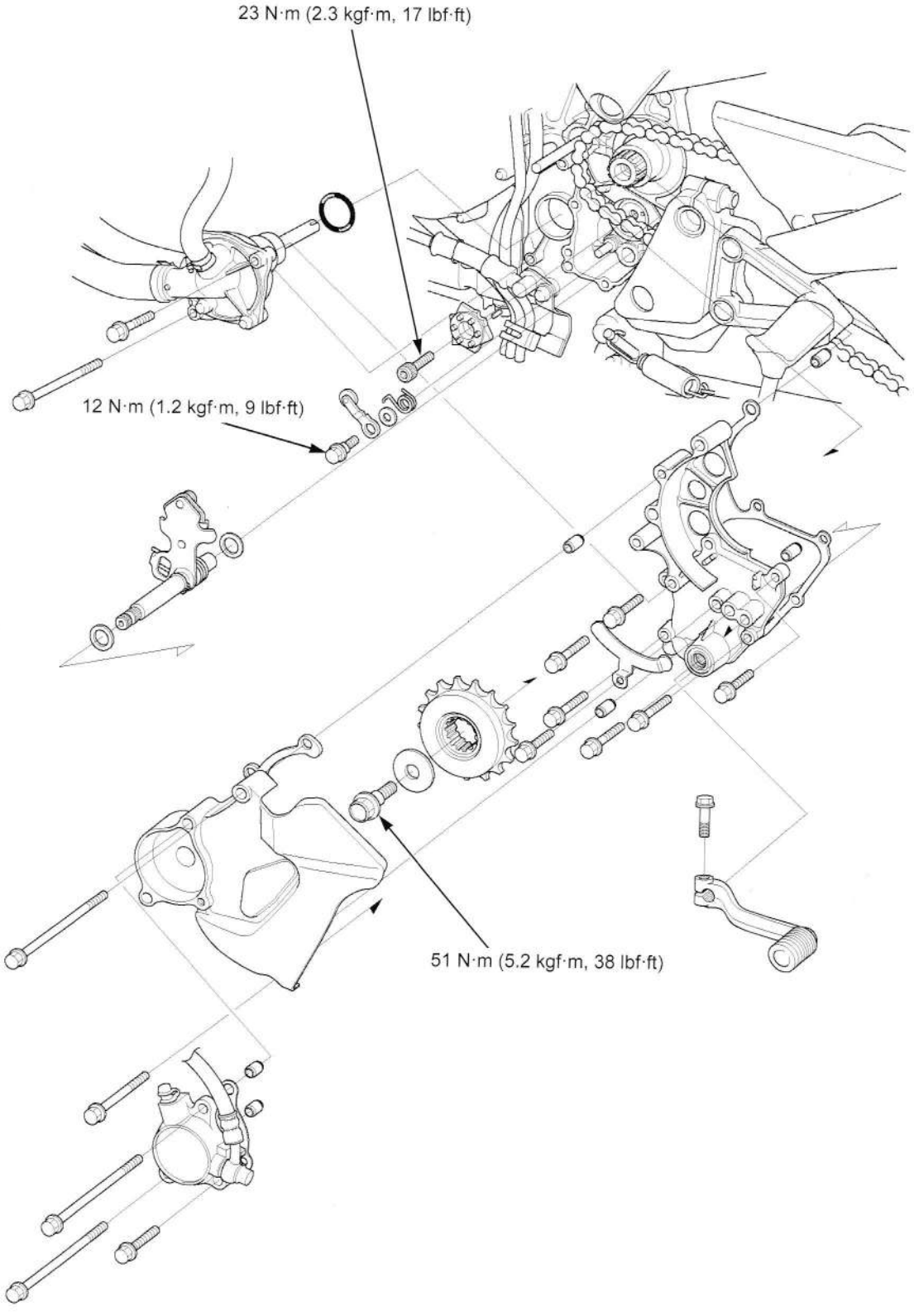
Hard to shift
- Improper clutch operation (page 11-10)
- Incorrect engine oil weight
- Bent shift fork
- Bent shift fork shaft
- Bent shift fork claw
- Damaged shift drum cam groove
- Bent gearshift spindle
- Improper oil viscosity
- Loose stopper plate bolt
- Damaged stopper plate and pin

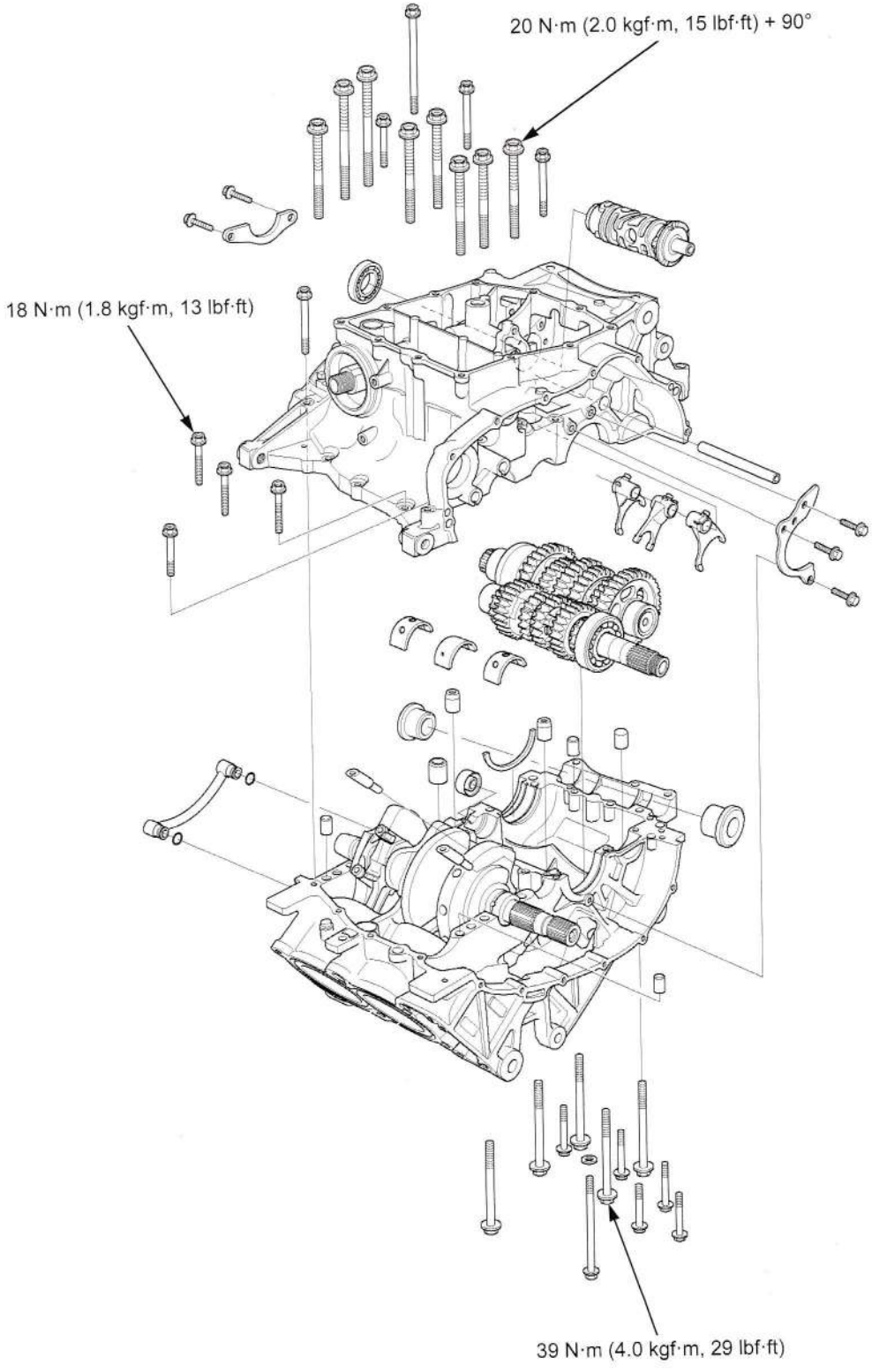
Transmission jumps out of gear
- Worn gear dogs
- Worn shift drum groove
- Bent shift fork shaft
- Broken shift drum stopper arm
- Broken shift drum stopper arm spring
- Worn or bent shift forks
- Broken gearshift spindle return spring
- Worn shift drum stopper arm
- Weak or broken shift arm return spring
- Loose stopper plate bolt
- Damaged shift drum cam groove
- Damaged or bent shift forks
- Worn gear engagement dogs or slots

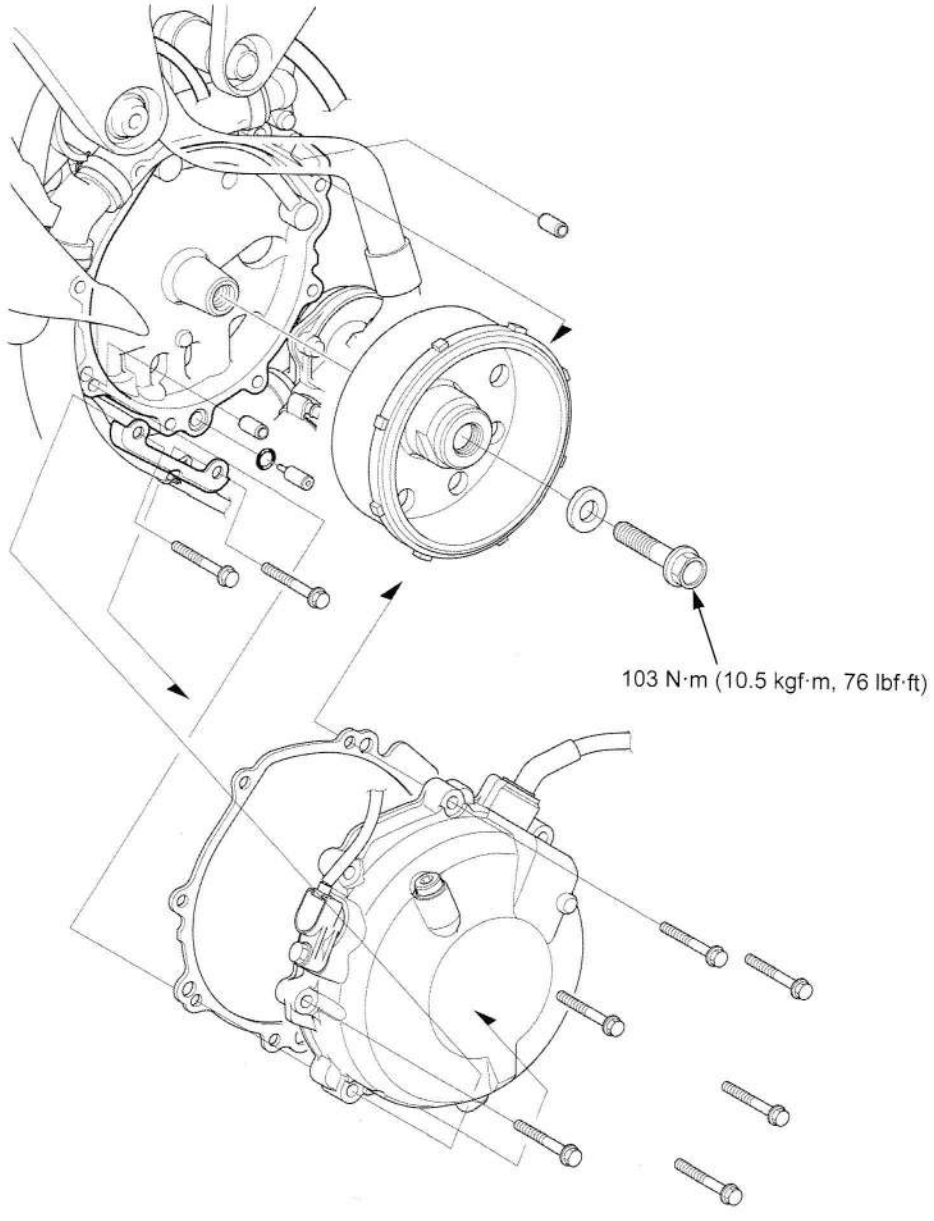
Excessive engine noise
- Worn or damaged transmission gear
- Worn or damaged transmission bearings

Gearshift pedal will not return
- Weak or broken gearshift spindle return spring
- Bent gearshift spindle

COMPONENT LOCATION




20 N·m (2.0 kgf·m, 15 lbf·ft) + 90°
18 N·m (1.8 kgf·m, 13 lbf·ft)
39 N·m (4.0 kgf·m, 29 lbf·ft)


103 N·m (10.5 kgf·m, 76 lbf·ft)

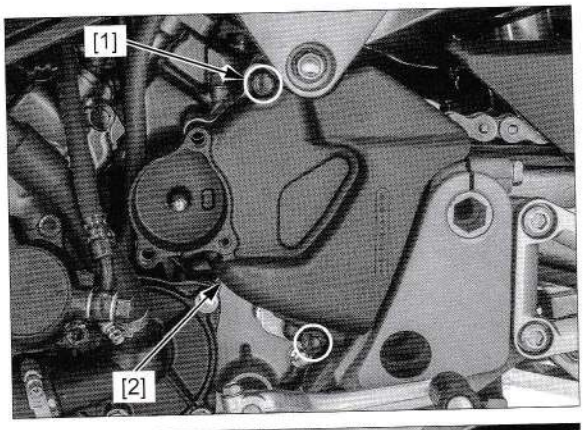
DRIVE SPROCKET

REMOVAL/INSTALLATION

Do not operate the clutch lever after the clutch slave cylinder is removed.

Remove the slave cylinder without disconnecting the clutch hose (page 11-8).

Remove the bolts [1] and drive sprocket cover [2].



Remove the drive chain guide plate [1] and dowel pins [2].

Loosen the drive sprocket bolt [3] while applying the rear brake.

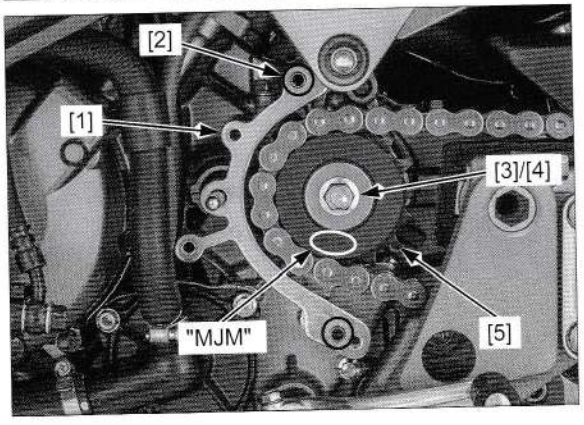
Fully slacken the drive chain (page 3-14).

Remove the drive sprocket bolt, washer [4], and drive sprocket [5].

Installation is in the reverse order of removal.

NOTE:

- Inspect the drive chain guide plate (page 3-17).
- Install the drive sprocket with the "MJM" mark facing out.



TORQUE:
Drive sprocket bolt: 51 N·m (5.2 kgf·m, 38 lbf·ft)

Adjust the drive chain slack (page 3-14).

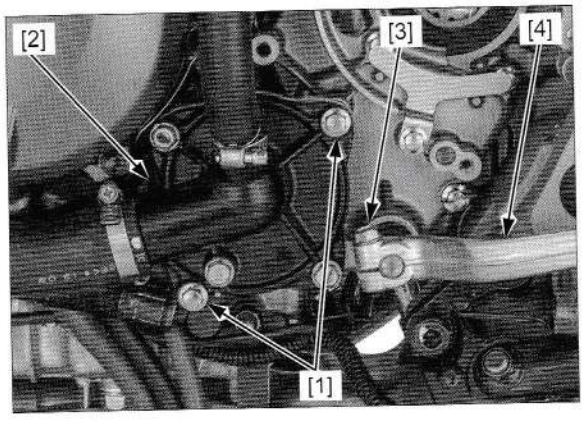
GEARSHIFT LINKAGE

REMOVAL

Drain the engine oil (page 3-10).
Remove the drive sprocket (page 12-7).

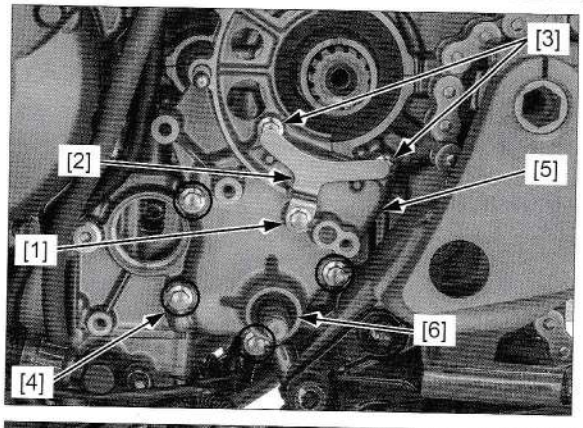
Remove the water pump mounting bolts [1], then remove the water pump [2] without disconnecting the water hoses.

Remove the pinch bolt [3] and gearshift pedal [4].

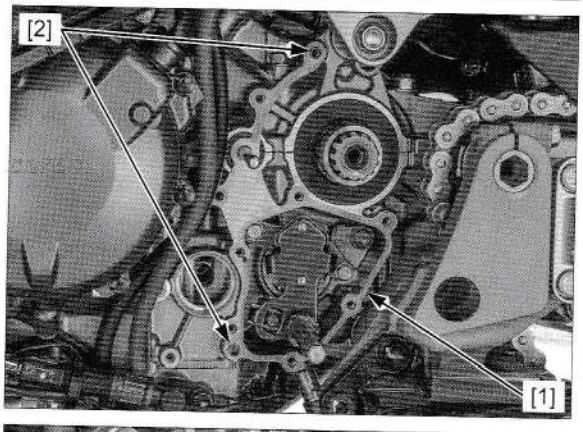


Remove the following:

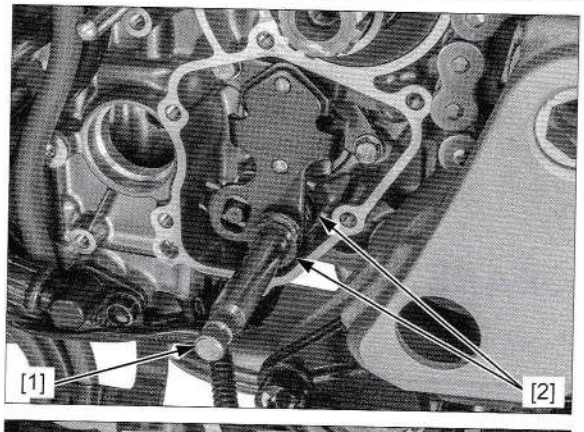
- 6 x 12 mm bolt [1]
- stopper plate [2]
- 6 x 22 mm bolts [3]
- 6 x 28 mm bolts [4]
- gearshift linkage cover [5]
- oil seal [6]



Remove the gasket [1] and dowel pins [2].



Remove the gearshift spindle [1] and washers [2].

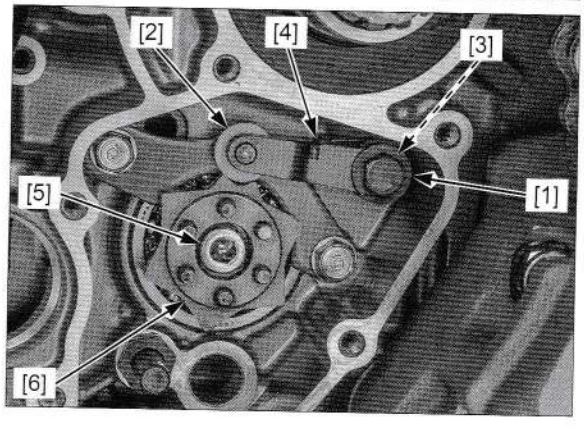


Remove the following:

- pivot bolt [1]
- shift drum stopper arm [2]
- washer [3]
- return spring [4]
- shift drum center socket bolt [5]
- shift drum center [6]

NOTE:

- Do not forcibly remove the dowel pin from the shift drum.

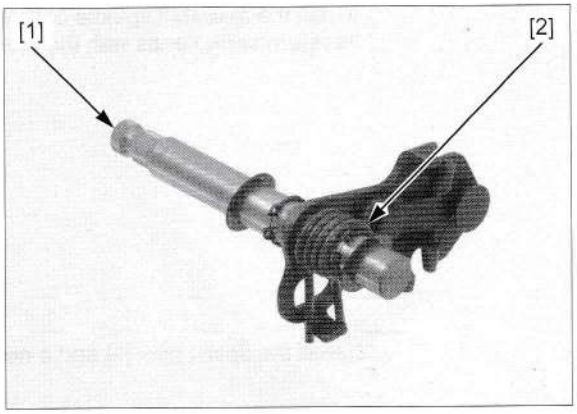


INSPECTION

GEARSHIFT SPINDLE

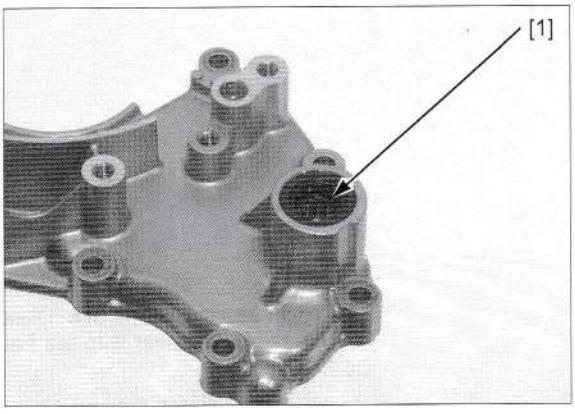
Check the gearshift spindle [1] for wear, damage, or bending.

Check the return spring [2] for fatigue or damage.



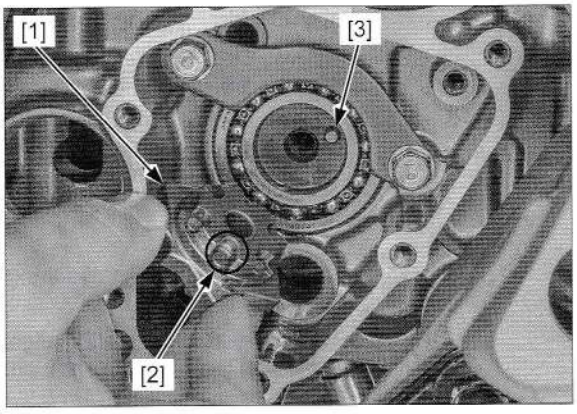
NEEDLE BEARING

Check the needle bearing [1] for wear or damage.



INSTALLATION

Install the shift drum center [1], aligning the chamfered groove [2] with the dowel pin [3] on the shift drum.



Apply locking agent to the threads of the shift drum center socket bolt [1].

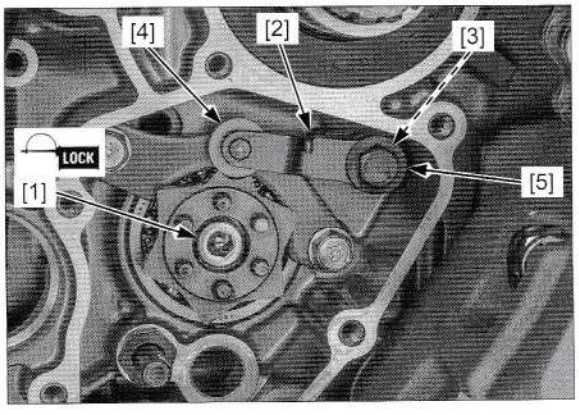
Install the following:

- shift drum center socket bolt
- return spring [2]
- washer [3] (in between the arm and crankcase)
- shift drum stopper arm [4]
- pivot bolt [5]

TORQUE:

Shift drum center socket bolt:
23 N·m (2.3 kgf·m, 17 lbf·ft)

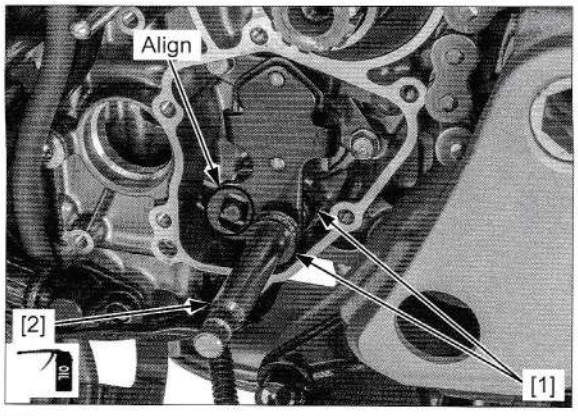
Shift drum stopper arm pivot bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)



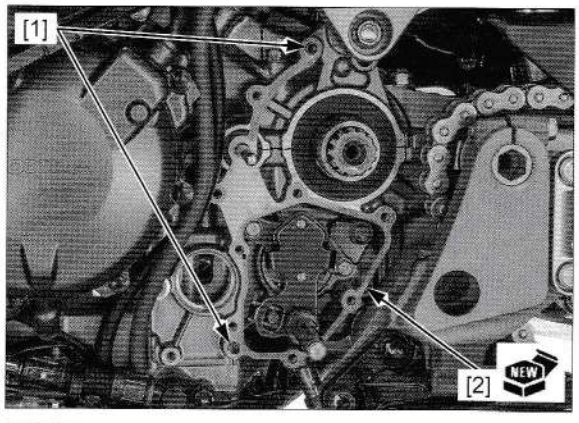
Apply engine oil to the gearshift spindle journals.

Install the washers [1] onto the gearshift spindle [2].

Install the gearshift spindle onto the crankcase, aligning its return spring ends with the return spring pin.



Install the dowel pins [1] and a new gasket [2].



Apply grease to the lips of a new oil seal [1] and install it into the linkage cover with the flat side facing out until it is fully seated.

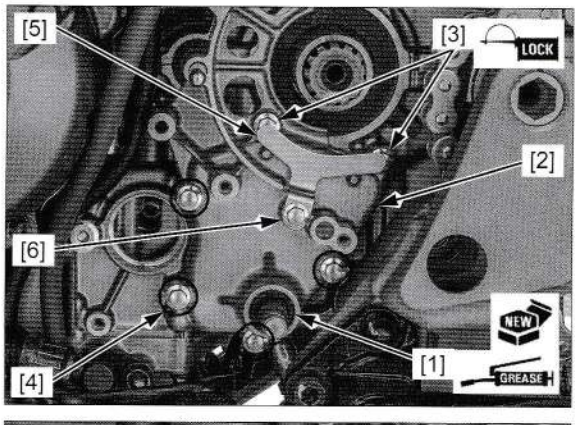
Install the gearshift linkage cover [2], being careful not to damage the oil seal.

Apply locking agent to the threads of the 6 x 22 mm bolts [3].

Install the following and tighten them.

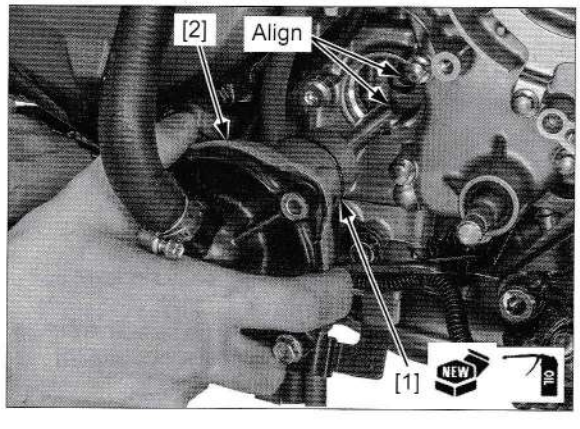
- 6 x 28 mm bolts [4]
- 6 x 22 mm bolts

Install the stopper plate [5] with the 6 x 12 mm bolt [6] and tighten it.



Apply engine oil to a new O-ring [1] and install it onto the water pump.

Install the water pump [2], aligning water pump shaft groove with the oil pump shaft end.



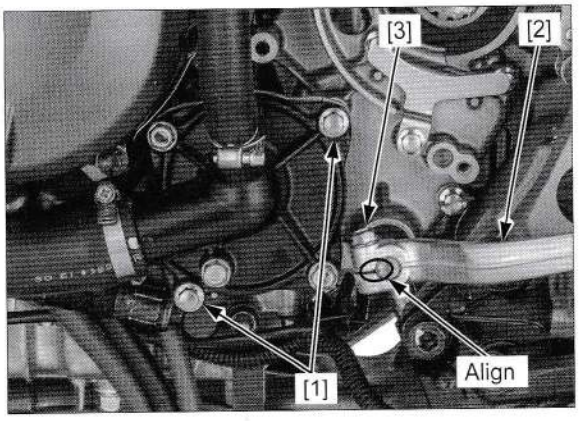
Install the water pump mounting bolts [1] and tighten them.

Install the gearshift pedal [2], aligning the slit with the punch mark.

Install the pinch bolt [3] and tighten it.

Install the drive sprocket (page 12-7).

Fill the engine with the recommended engine oil and check that there are no oil leaks (page 3-11).



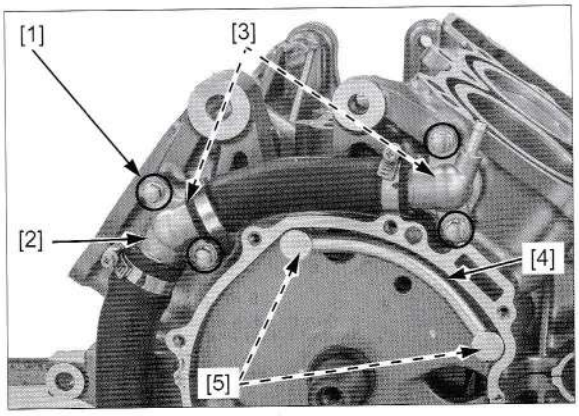
CRANKCASE

SEPARATION

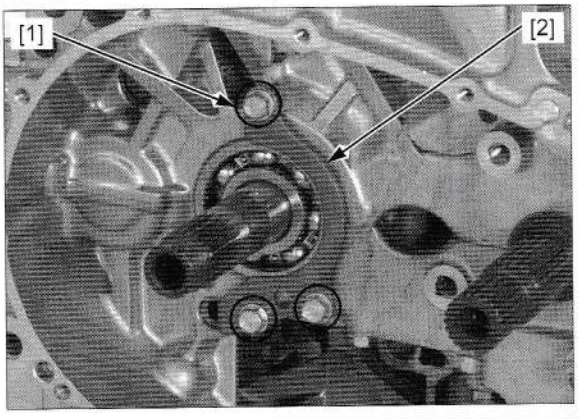
Refer to SERVICE INFORMATION for removal of necessary parts before separating the crankcase (page 12-2).

Remove the following:

- bolts [1]
- water hose joint assembly [2]
- O-rings [3]
- oil pass pipe [4]
- O-rings [5]

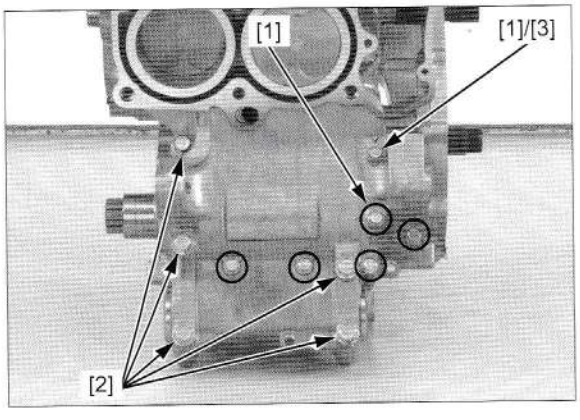


Remove the mainshaft bearing set plate bolts [1] and plate [2].



Loosen the upper crankcase 6 mm bolts [1] and 10 mm bolts [2] in a crisscross pattern in 2 or 3 steps.

Remove the 6 mm, 10 mm bolts, and sealing washer [3].

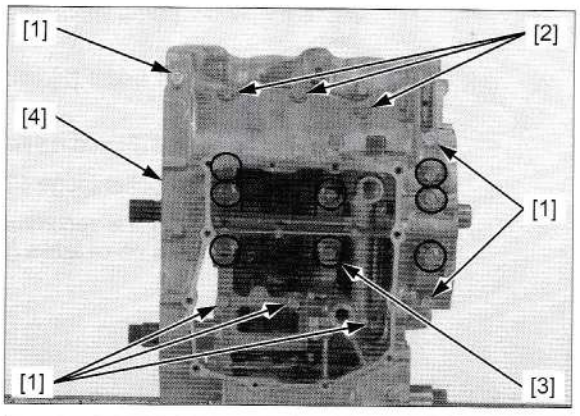


Remove the lower crankcase 6 mm bolts [1] and 7 mm bolts [2].

Loosen the main journal 9 mm bolts [3] in a crisscross pattern in 2 or 3 steps, then remove and discard the 9 mm bolts.

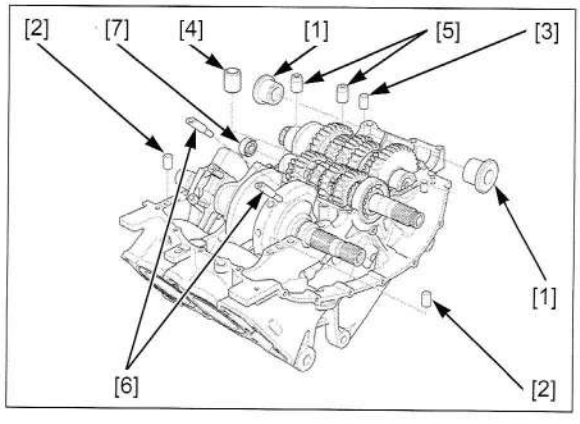
Do not pry the crankcase halves with a screwdriver.

Separate the lower crankcase [4] from the upper crankcase while tapping them at the several locations with a plastic hammer.



Remove the following:

- swingarm pivot collars [1]
- dowel pins (10 x 16 mm) [2]
- dowel pin (8 x 14 mm) [3]
- VTEC oil pass collar [4]
- oil orifices [5]
- transmission oil jets [6]
- lifter rod oil seal [7]

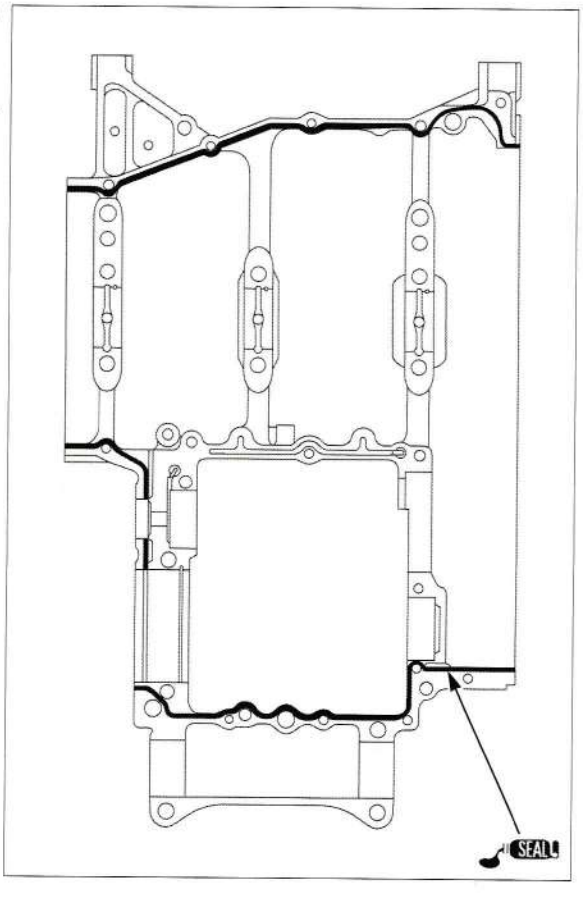


ASSEMBLY

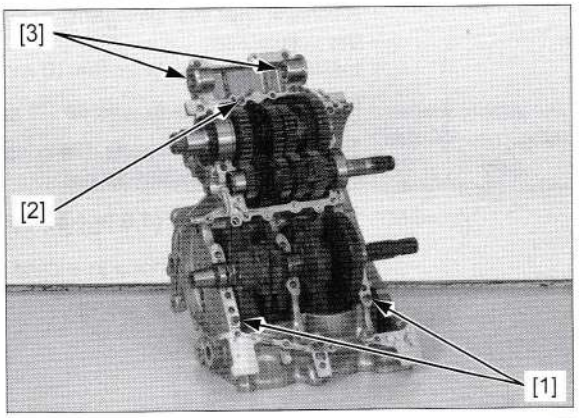
Apply liquid sealant to the crankcase mating surface as shown (page 1-17).

NOTE:

- Do not apply sealant to the main bearing bolt (lower crankcase bolt; 9 mm) and oil passage areas.

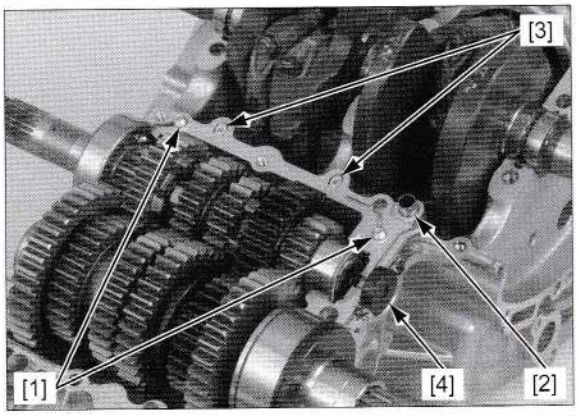


Install the 10 x 16 mm dowel pins [1] and 8 x 14 mm dowel pin [2].
Install the swingarm pivot collars [3].



Install the oil orifices with their large I.D. side facing the upper crankcase.

Install the oil orifices [1], VTEC oil pass collar [2], transmission oil jets [3], and lifter rod oil seal [4] into the upper crankcase.



Install the lower crankcase [1] onto the upper crankcase by aligning the shift forks into their proper grooves in the mainshaft and countershaft shifter gears.

Make sure the upper and lower crankcase are seated securely.

Check that the swingarm pivot collars [2] are seated in the crankcase.

NOTICE

- *The main journal 9 mm bolts are tightened using the Plastic Region Tightening Method.*
- *Always use new main journal 9 mm bolts.*
- *The main journal 9 mm bolt is pre-coated with an oil additive for axial tension stability. Do not remove the oil additive from the new 9 mm bolt surface.*
- *The tightening procedure for the crankcase bolts must be followed.*

Install new 9 mm bolts [3] into main journal bolt holes.
Install the 7 mm bolts [4] and 6 mm bolts [5].

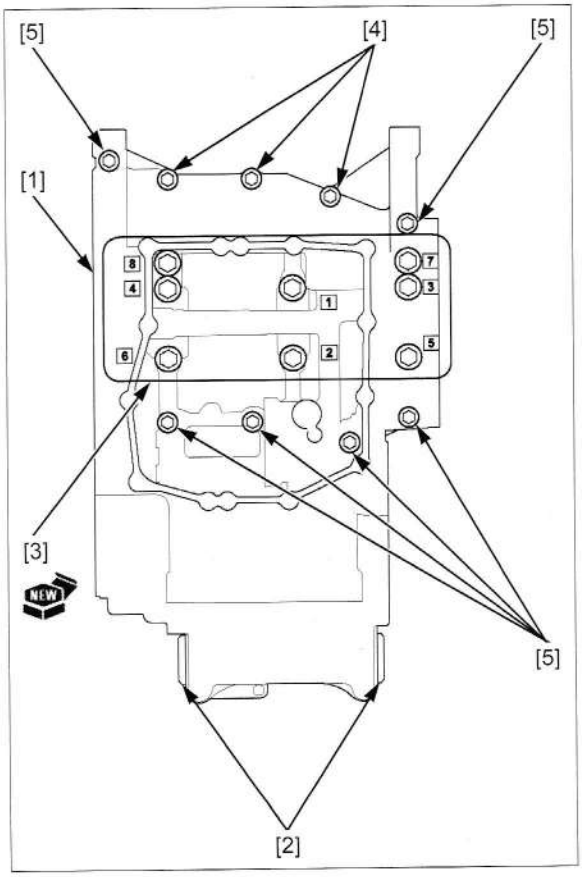
Tighten the 9 mm bolts in numerical order cast on the lower crankcase in several steps, then tighten them to the specified torque.

Further tighten the 9 mm bolts 90 degrees in numerical order cast on the lower crankcase.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft) + 90°

Tighten the lower crankcase 6 mm bolts and 7 mm bolts in a crisscross pattern in several steps.

TORQUE:
7 mm bolt:
18 N·m (1.8 kgf·m, 13 lbf·ft)



Recheck that the swingarm pivot collars are seated in the crankcase.
Install the upper crankcase 10 mm bolts [1].

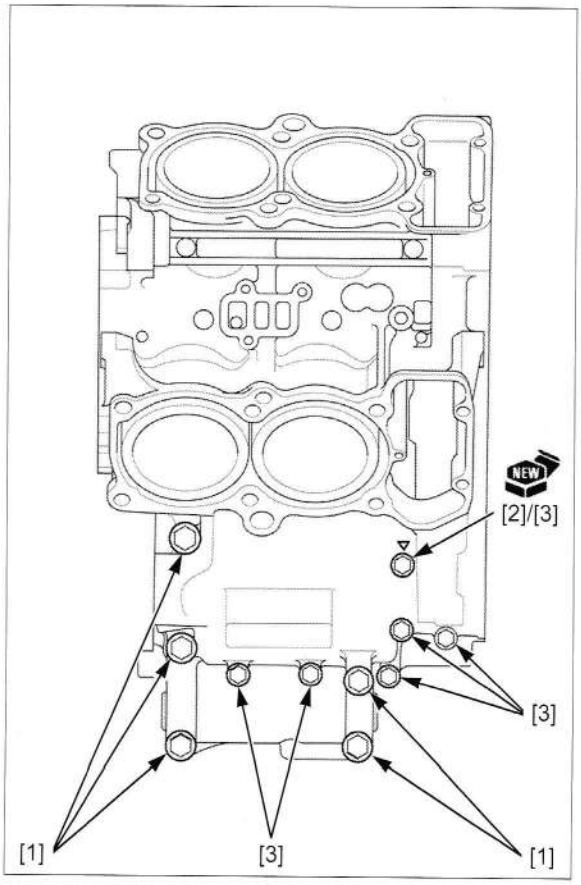
The sealing washer location is indicated on the upper crankcase using the "△" mark.

Install a new sealing washer [2] and 6 mm bolts [3].

Tighten the 10 mm bolts in a crisscross pattern in 2 or 3 steps to the specified torque.

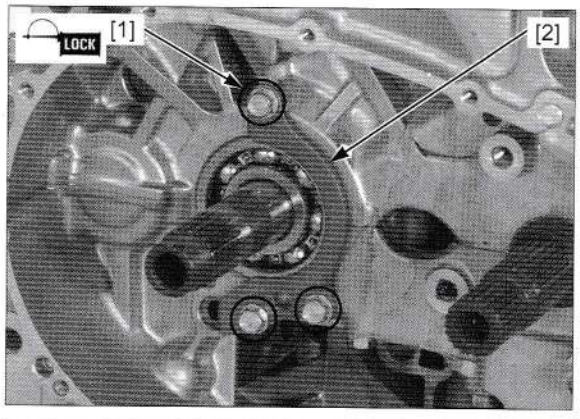
TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)

Tighten the 6 mm bolts in a crisscross pattern in 2 or 3 steps.



Apply locking agent to the set plate bolt [1] threads (page 1-17).

Install the mainshaft bearing set plate [2] and tighten the bolts securely.



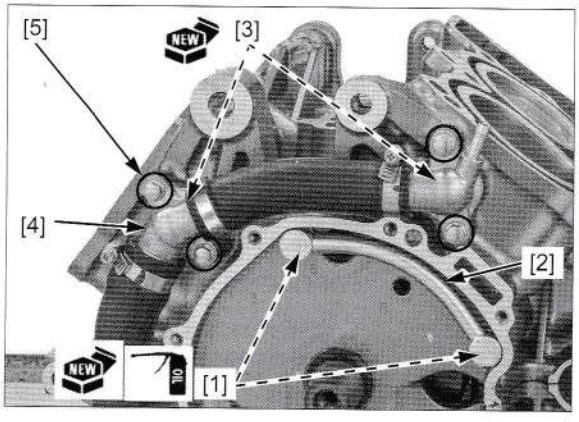
Apply engine oil to new O-rings [1] of the oil pass pipe and instal them into the pipe grooves.

Install the oil pass pipe [2] into the crankcase until it is fully seated.

Install new O-rings [3] into the grooves in the water hose joints.

Install the hose joint assembly [4] with the four bolts [5] and tighten them.

Install the removed parts (page 12-2).

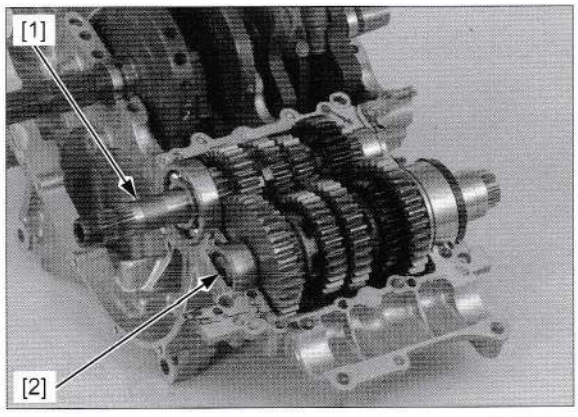


TRANSMISSION

REMOVAL/DISASSEMBLY

Separate the crankcase halves (page 12-11).

Remove the mainshaft [1] and countershaft [2] assemblies from the upper crankcase.

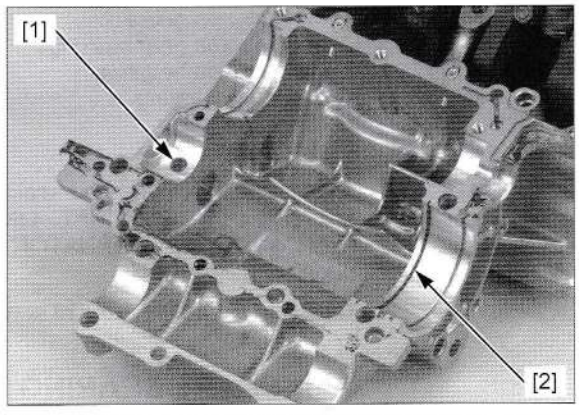


Disassemble the mainshaft assembly and countershaft assembly.

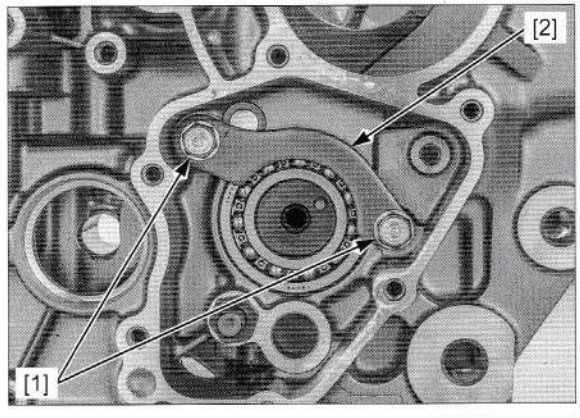
NOTE:

- Keep track of the disassembled parts (gears, bushings, washers, and snap rings) by sliding them onto a tool or a piece of wire.
- Do not expand the snap ring more than necessary for removal. To remove a snap ring, expand the snap ring and pull it off using the gear behind it.

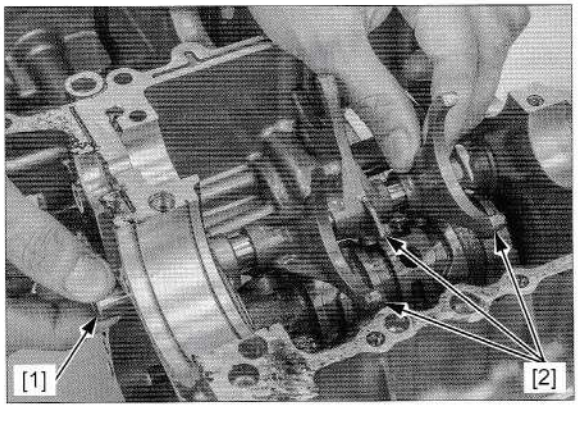
Remove the dowel pin [1] and countershaft bearing set ring [2].



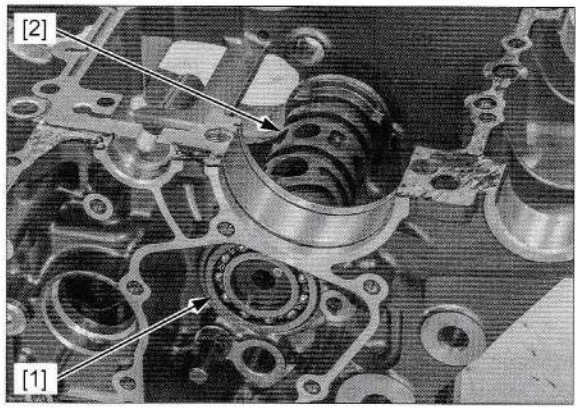
Remove the bolts [1] and shift drum bearing set plate [2].



Remove the shift fork shaft [1] and shift forks [2].



Slide the shift drum assembly off the crankcase, then remove the bearing [1] and shift drum [2].



INSPECTION

Inspect the following parts for scratches, damage, abnormal wear, or deformation. Replace if necessary.

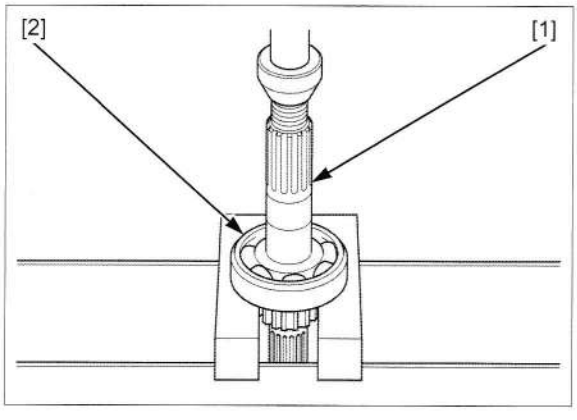
- transmission gears
- transmission gear bushings
- transmission bearings
- shift drum/bearing
- shift forks
- shift fork shaft

Measure each part and calculate the clearance according to GEARSHIFT LINKAGE/CRANKCASE/ TRANSMISSION/ALTERNATOR SPECIFICATIONS (page 1-8).

Replace any part if it is out of service limit.

MAINSHAFT BEARING REPLACEMENT

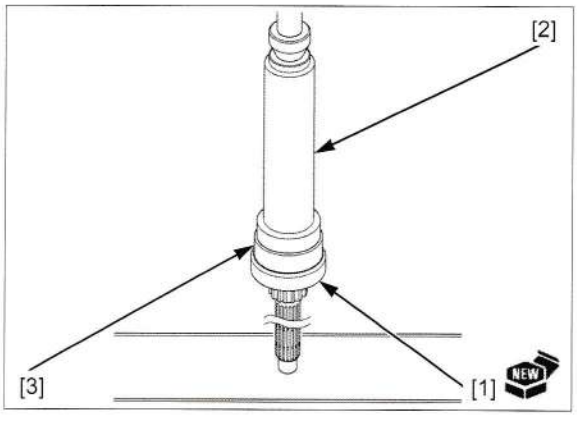
Press out the mainshaft [1] from the bearing [2] using a hydraulic press.



Install a new mainshaft bearing [1] onto the mainshaft by pressing the inner race using the special tools.

TOOLS:

[2] Driver, 40 mm I.D.	**07746-0030100**
[3] Attachment, 25 mm I.D.	**07746-0030200**



ASSEMBLY

Clean all parts in solvent and dry them thoroughly.

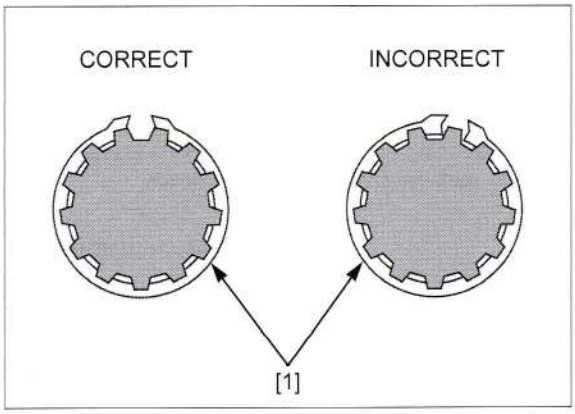
Apply engine oil to the gear teeth, rotating surfaces, and bearings.

Apply molybdenum oil solution to the gear spline bushing outer surface (M6, C3, C4) gear bushing and needle bearing entire surface (M5, C1, C2), and gear shifter grooves (M3/4, C5, C6).

Assemble the mainshaft and countershaft.

NOTE:

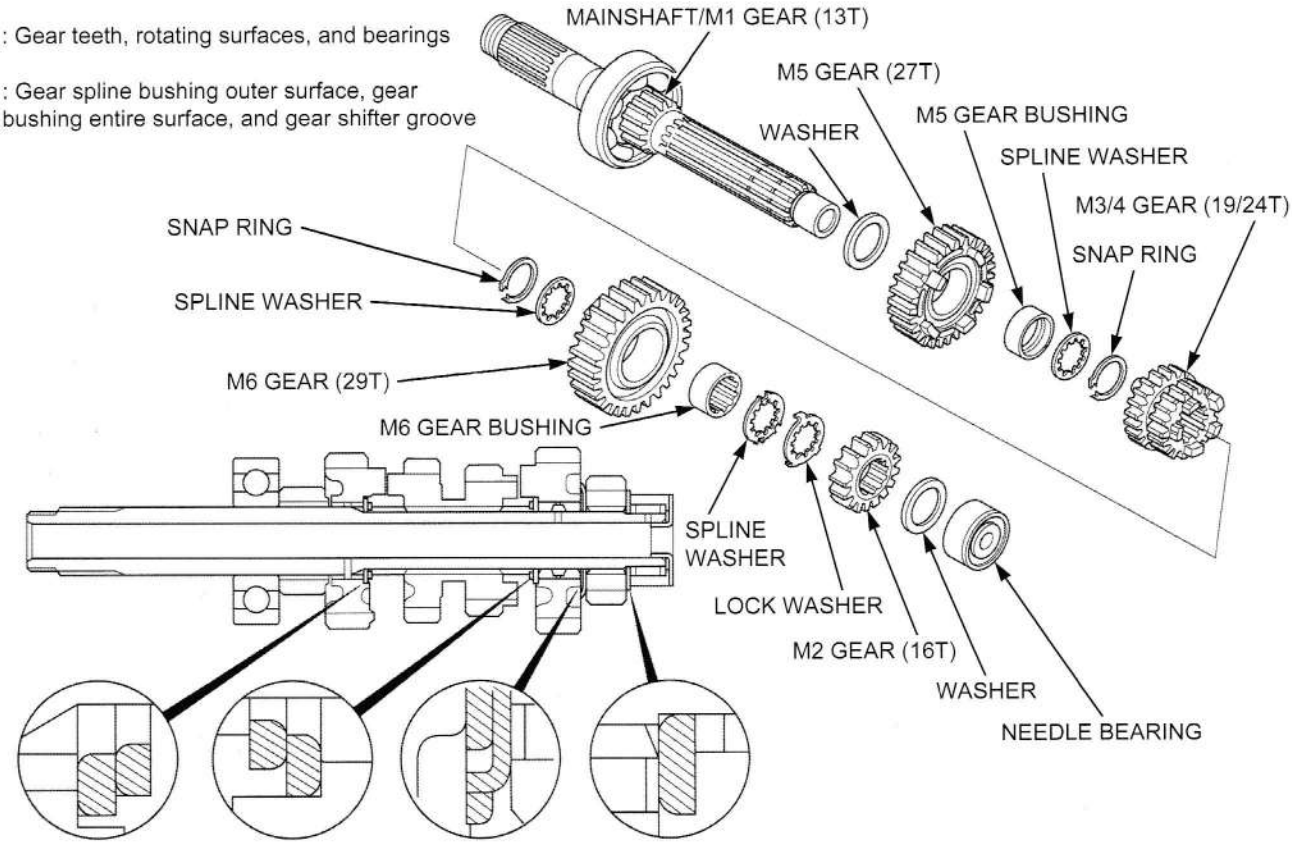
- Coat each gear with clean engine oil and check for smooth movement.
- Align the lock washer tabs with the spline washer grooves.
- Always install the thrust washers and snap rings with the chamfered (rolled) edge facing away from the thrust load.
- Install the snap rings [1] so that the end gap aligns with the groove of the splines.
- Make sure that the snap rings are fully seated in the shaft groove after installing them.



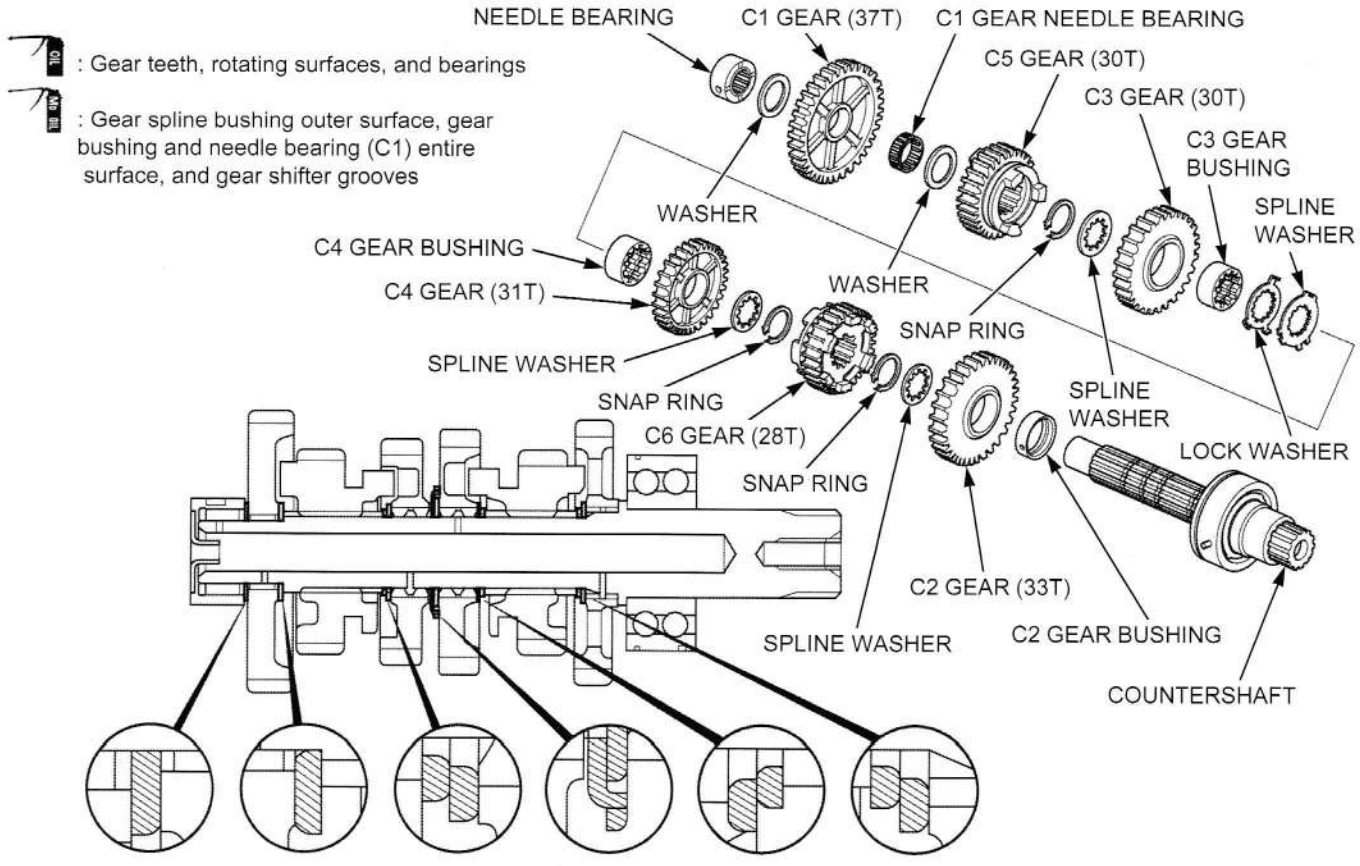
MAINSHAFT

: Gear teeth, rotating surfaces, and bearings

: Gear spline bushing outer surface, gear bushing entire surface, and gear shifter groove



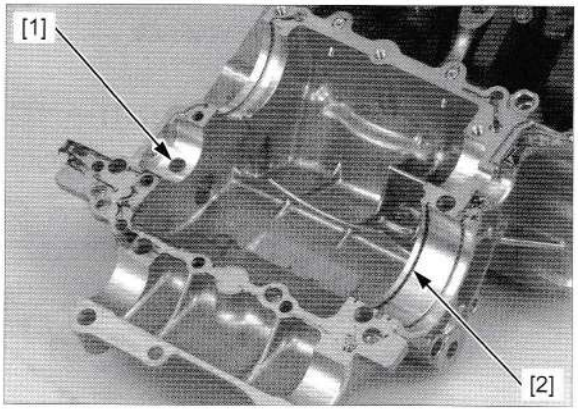
COUNTERSHAFT



INSTALLATION

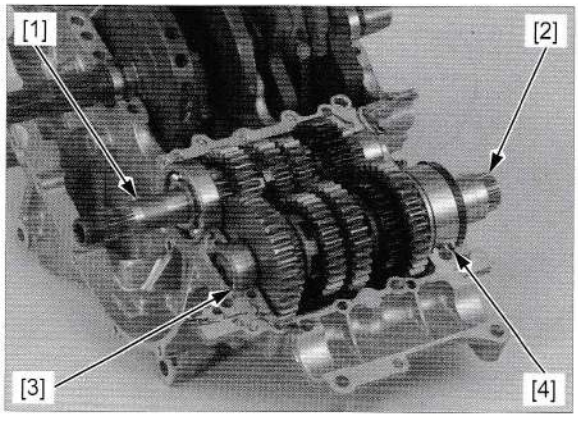
Install the dowel pin [1] in the upper crankcase hole.

Install the countershaft bearing set ring [2] into the upper crankcase groove.



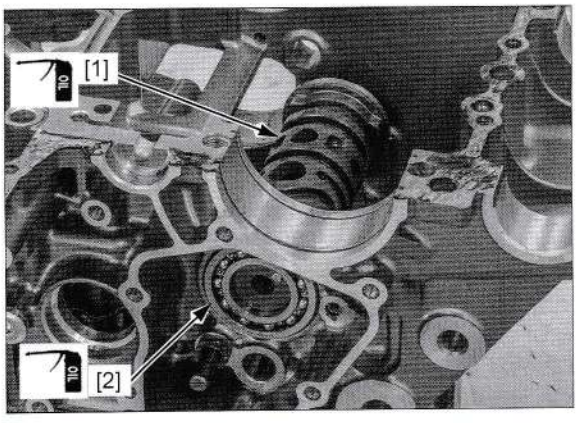
Install the mainshaft [1] and countershaft [2] by aligning the countershaft bearing groove with the set ring on the crankcase, and aligning the countershaft needle bearing cap [3] hole with the dowel pin.

Also align the countershaft bearing stopper pin [4] with the groove in the crankcase.



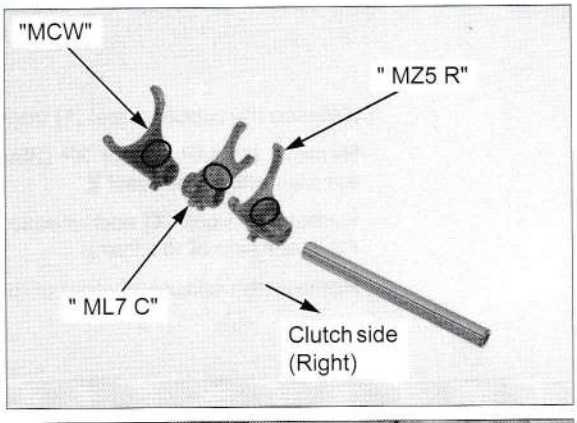
Apply engine oil to the bearing rotating area and shift drum journals.

Place the shift drum [1] in the bearing hole and install the bearing [2] onto the shift drum, then set the assembly into the crankcase.



The shift forks have the following identification marks:

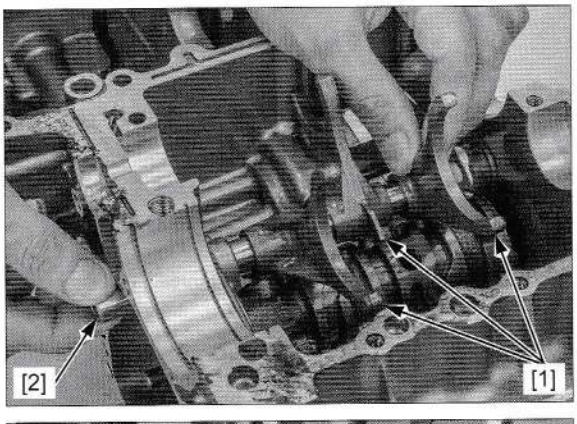
- "MCW" mark: left shift fork
- "ML7 C" mark: center shift fork
- "MZ5 R" mark: right shift fork



Face the shift fork identification marks to the clutch side.

Apply engine oil to the shift fork shaft outer surface.

Install the shift forks [1] and shift fork shaft [2] while inserting the shift fork guide pins into the shift drum grooves.

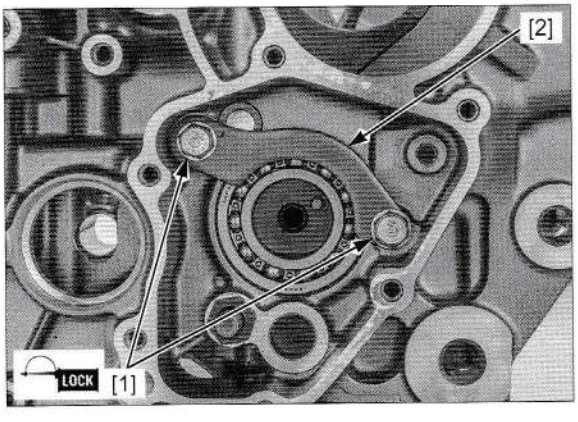


Apply locking agent to the shift drum bearing set plate bolt [1] threads (page 1-17).

Install the shift drum bearing set plate [2] and bolts.

Tighten the bolts securely.

Assemble the crankcase halves (page 12-11).



ALTERNATOR COVER

REMOVAL/INSTALLATION

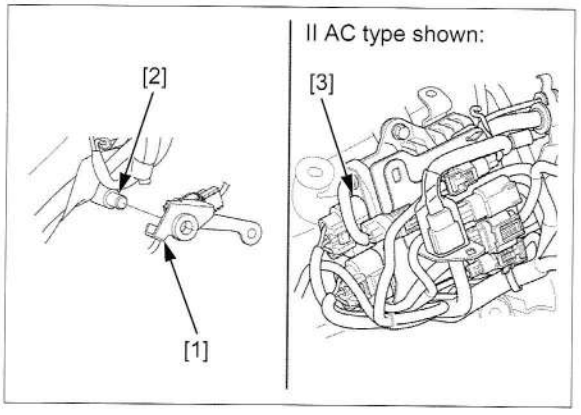
Remove the following:

- middle cowls (page 2-6)
- throttle body (page 7-14)
- radiator (without disconnecting the water hoses) (page 8-7)

Remove the radiator stay [1] from the boss [2] of the frame.

Disconnect the alternator 3P (Gray) connector [3].

Remove the alternator wire out of the frame.

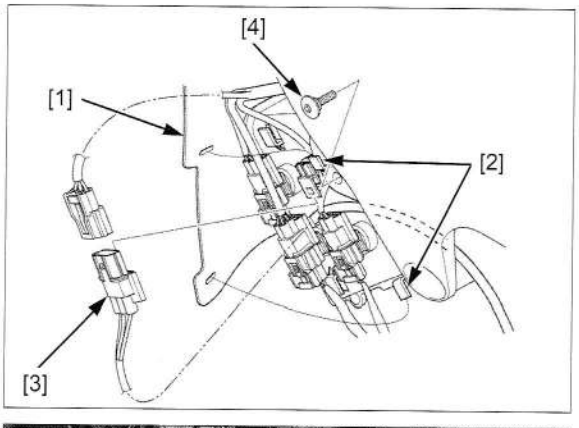


Release the rubber sheet [1] from the tabs [2].

Remove the MP sensor 3P (Black) connector [3] from the stay and disconnect it.

Remove the bolt [4] and release the hook-and-loop on the inner side of the frame.

Remove the sensor wire out of the frame.



Loosen the alternator cover bolts [1] in a crisscross pattern in 2 or 3 steps.

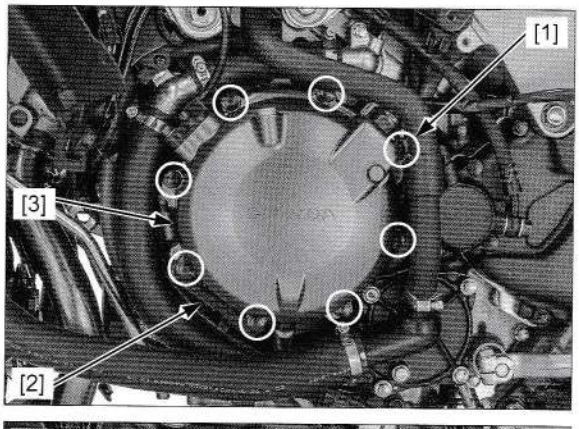
Remove the following:

The alternator cover (stator) is magnetically attached to the flywheel; be careful during removal.

- alternator cover bolts
- stay [2]
- alternator cover [3]

NOTE:

- Engine oil will run out when the alternator cover is removed. Set an oil pan under the engine.

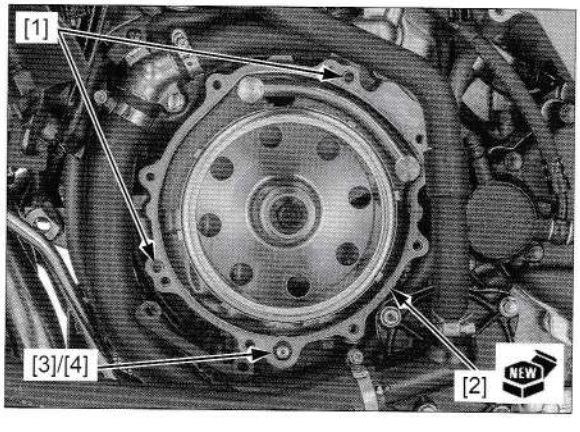


Remove the dowel pins [1] and gasket [2].

Remove the orifice [3] and O-ring [4].

Be careful not to damage the mating surfaces.

Clean any gasket material from the mating surfaces of the crankcase and cover.



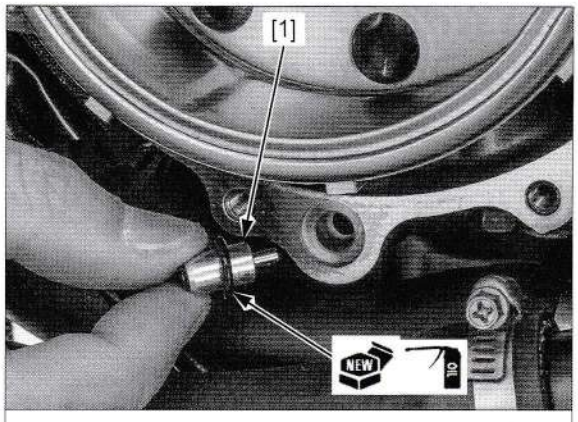
Installation is in the reverse order of removal.

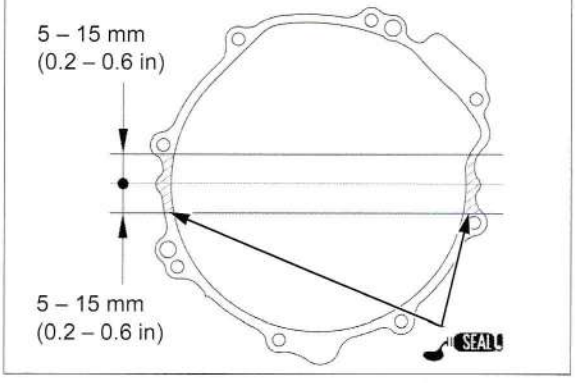
NOTE:

- Replace the alternator cover gasket and O-ring with new ones. Apply engine oil to the O-ring.
- Install the orifice [1] with the stepped side facing in.
- Apply liquid sealant to the mating areas of crankcase as shown (page 1-17).

Check the oil level (page 3-10).

Make sure there are no oil leaks.



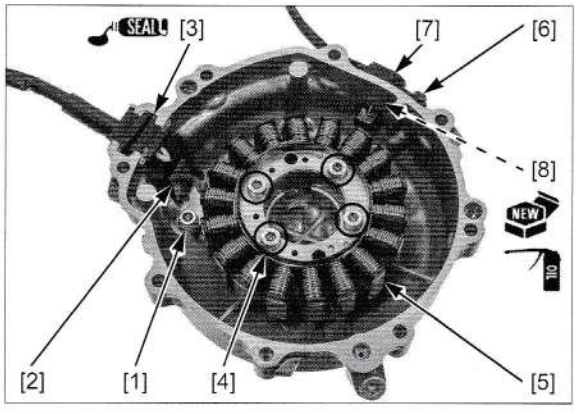


STATOR/MP SENSOR

REMOVAL/INSTALLATION

Remove the following:

- alternator cover (page 12-20)
- stator wire clamp socket bolt [1]
- stator wire clamp [2]
- alternator wire grommet [3]
- alternator stator bolts [4]
- stator [5]
- bolt [6]
- MP sensor [7]
- O-ring [8]



Installation is in the reverse order of removal.

TORQUE:

Alternator stator bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)

Stator wire clamp socket bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)

NOTE:

- Replace the O-ring with a new one and coat it with engine oil.
- Apply liquid sealant to the wire grommet seating surface (page 1-17).

FLYWHEEL

REMOVAL

Remove the alternator cover (page 12-20).

Hold the flywheel [1] using the special tool and loosen the flywheel bolt [2].

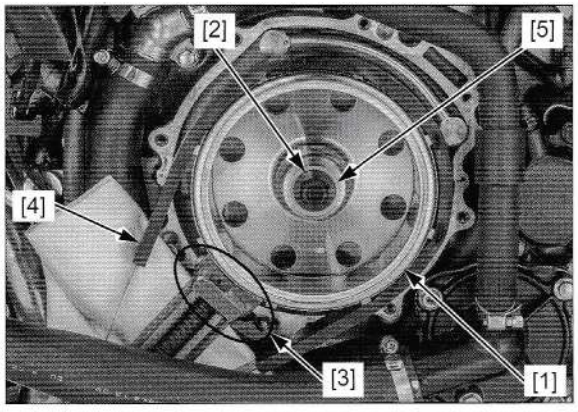
NOTE:

- Set the holding block [3] of the flywheel holder [4] avoiding the flywheel reluctors.

TOOL:

Flywheel holder	**07725-0040001**

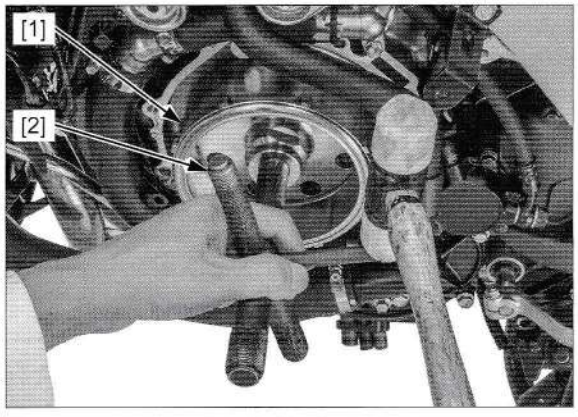
Remove the bolt and washer [5].



Remove the flywheel [1] using the special tool.

TOOL:

[2] Rotor puller	**07733-0020001 or 07933-3950000**



INSTALLATION

Clean any oil from the tapered areas of the crankshaft and flywheel thoroughly.

Install the flywheel [1].

Apply engine oil to the flywheel bolt threads and seating surface.

Install the washer [2] and flywheel bolt [3].

Hold the flywheel using the special tool and tighten the flywheel bolt to the specified torque.

NOTE:

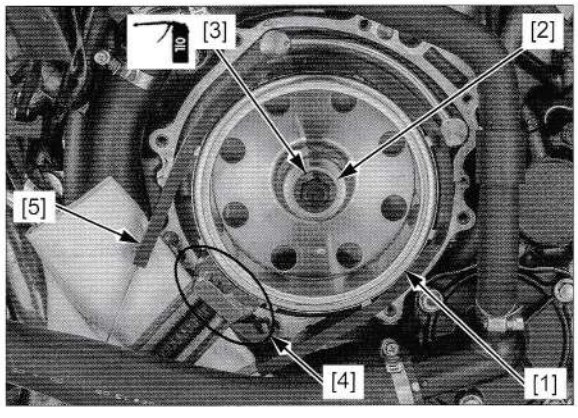
- Set the holding block [4] of the flywheel holder [5] avoiding the flywheel reluctors.

TOOL:

Flywheel holder	**07725-0040001**

TORQUE: 103 N·m (10.5 kgf·m, 76 lbf·ft)

Install the alternator cover (page 12-20).



13. CRANKSHAFT/PISTON/CYLINDER

SERVICE INFORMATION 13-2

TROUBLESHOOTING 13-2

COMPONENT LOCATION 13-3

CRANKSHAFT 13-4

MAIN JOURNAL BEARING 13-6

CRANKPIN BEARING 13-10

PISTON/CYLINDER 13-13

SERVICE INFORMATION

GENERAL

- The crankcase must be separated to service the crankshaft and piston/connecting rod. Refer to procedures for crankcase separation and assembly (page 12-11).
- Mark and store the connecting rods, bearing caps, pistons, 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.

TROUBLESHOOTING

Cylinder compression is too low, hard to start or poor performance at low speed
- Leaking cylinder head gasket
- Worn, stuck, or broken piston ring
- Worn or damaged cylinder and piston

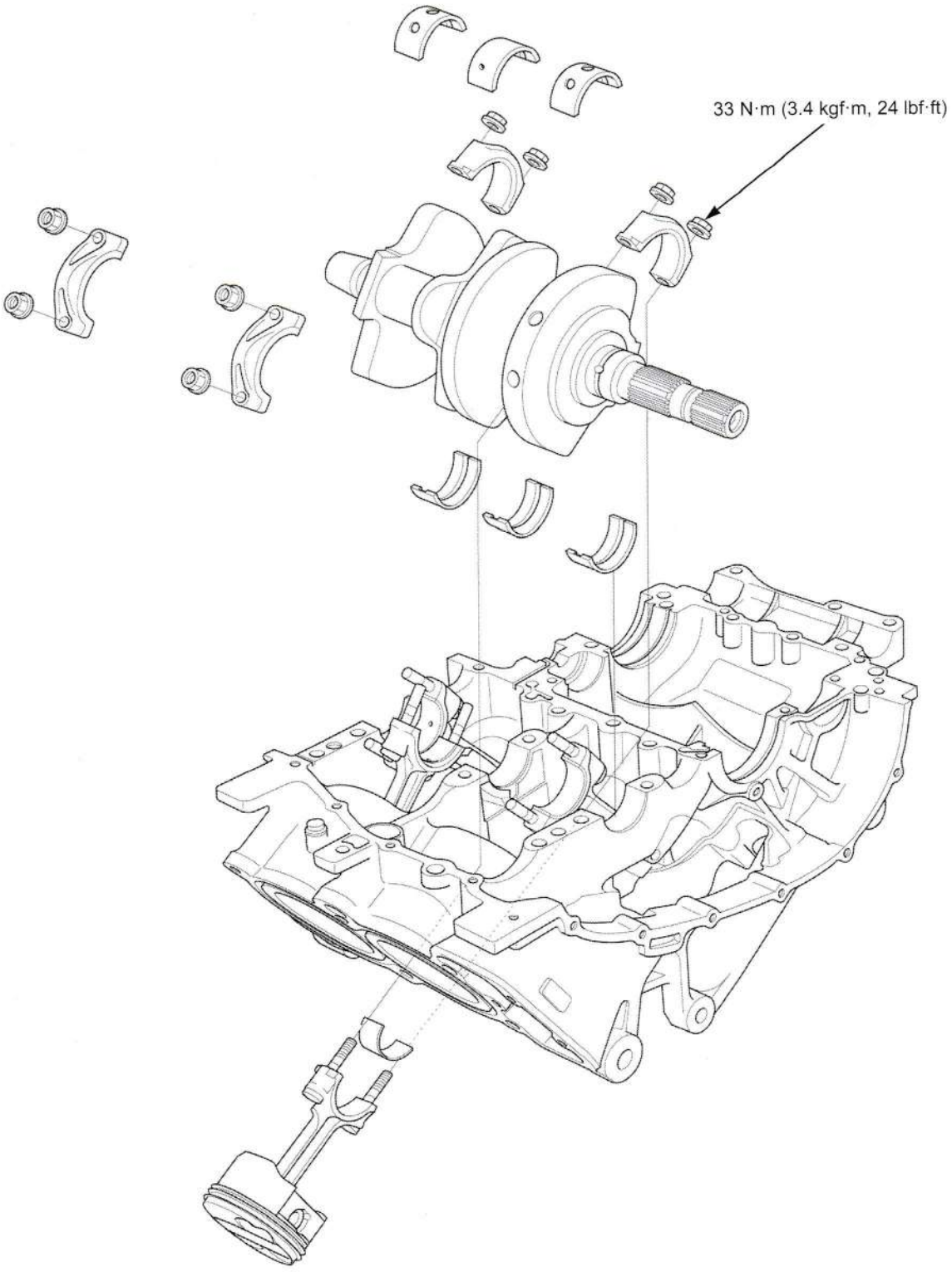
Cylinder compression too high, overheats or knocks
- Excessive carbon built-up on piston head or combustion chamber

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
- Worn crankpin bearings

Engine vibration
- Excessive crankshaft runout

COMPONENT LOCATION



CRANKSHAFT

SIDE CLEARANCE INSPECTION

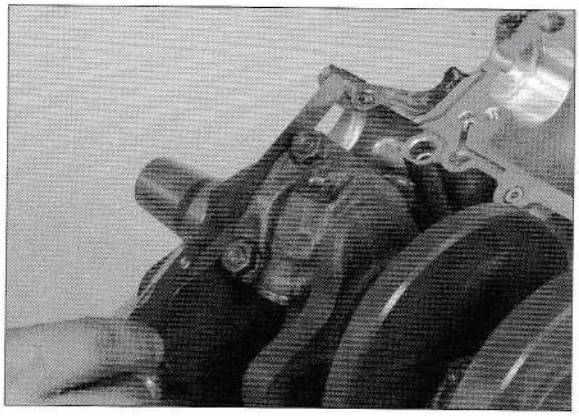
Separate the crankcase halves (page 12-11).

Measure the connecting rod side clearance.

SERVICE LIMIT: 0.40 mm (0.016 in)

If the clearance exceeds the service limit, replace the connecting rod (page 13-13).

Recheck and if still out of limit, replace the crankshaft (page 13-4).



REMOVAL

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.

Separate the crankcase halves (page 12-11).

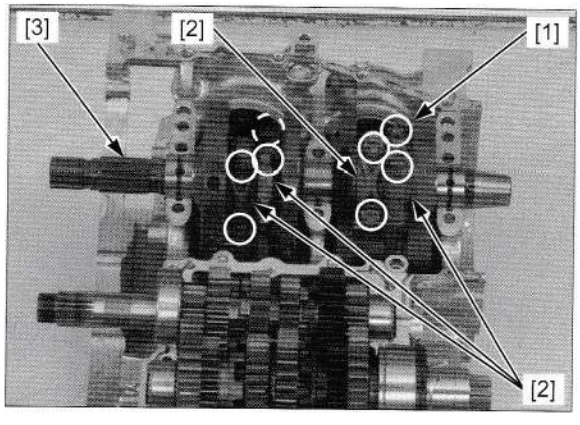
Mark the bearing caps and bearings as you remove them to indicate the correct cylinder for reassembly.

Be careful not to damage the crankpin, main journal, or bearing inserts.

Remove the connecting rod bearing cap nuts [1] and bearing caps [2].

- Tap the side of the cap lightly if the bearing cap is hard to remove.

Remove the crankshaft [3].

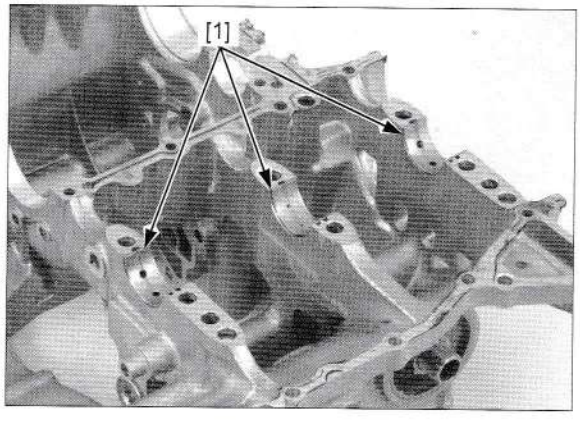


NOTICE

Before removal, position all the pistons at TDC (Top Dead Center) to prevent damaging the crankpin with the connecting rod.

Remove the main journal bearings [1] from both crankcase halves.

Remove the crankpin bearings from the connecting rods and bearing caps.



INSPECTION

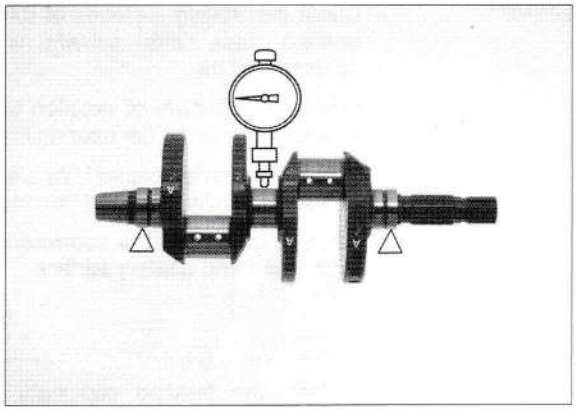
Support the crankshaft on both end journals.

Set a dial gauge on the center main journal of the crankshaft.

Rotate the crankshaft two revolutions (720°) and read the runout.

SERVICE LIMIT: 0.05 mm (0.002 in)

Check the crankshaft journal surfaces for damage, discoloration, or scratches.



INSTALLATION

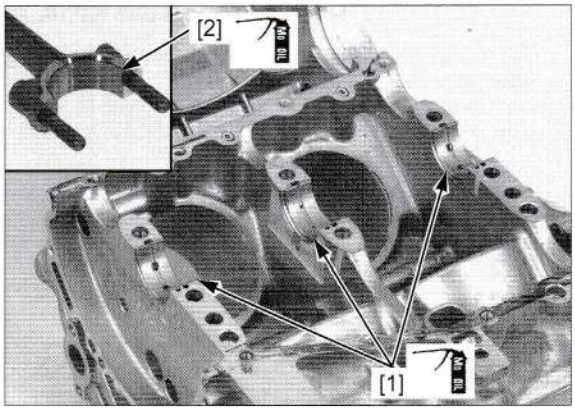
Install the main journal bearings [1] and crankpin bearings [2] in the original locations.

- main journal bearing (page 13-9)
- crankpin bearing (page 13-12)

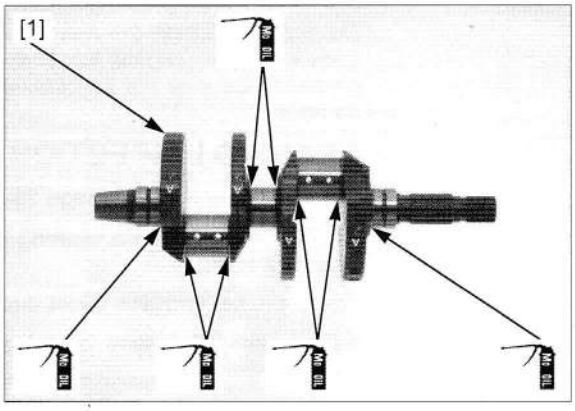
NOTICE

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.

Apply molybdenum oil solution to the main journal bearing sliding surfaces on the both crankcase and crankpin bearing sliding surfaces on the connecting rods.



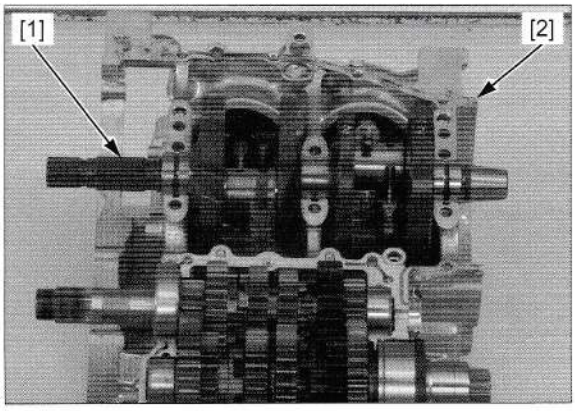
Apply molybdenum oil solution to the thrust surfaces of the crankshaft [1] as shown.



Install the crankshaft [1] onto the upper crankcase [2].

NOTICE

Before installation, position all the pistons at TDC (Top Dead Center) to prevent damaging the crankpin with the connecting rod bolt threads.



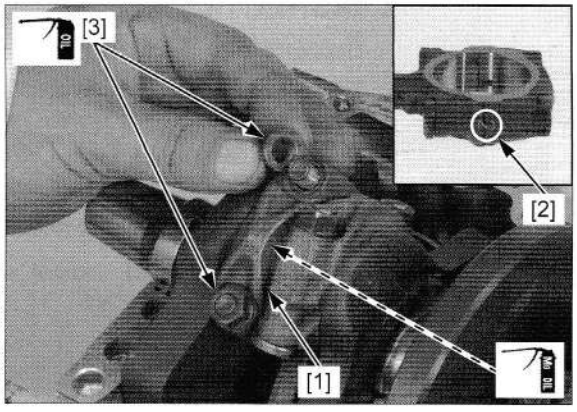
Set the connecting rods onto the crankpins.

Clean the mating surfaces of the connecting rods and bearing caps with solvent and blow them with compressed air.

Apply molybdenum oil solution to the crankpin bearing sliding surfaces on the bearing caps.

Install the bearing caps [1] by aligning the I.D. code [2] on the connecting rod and bearing cap.

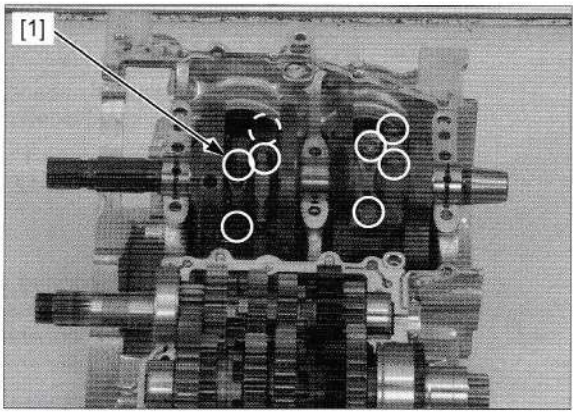
Apply engine oil to the connecting rod bearing cap nut [3] threads and seating surface.



Tighten the bearing cap nuts [1] in 2 or 3 steps alternately, then tighten them to the specified torque.

TORQUE: 33 N·m (3.4 kgf·m, 24 lbf·ft)

Assemble the crankcase halves (page 12-12).



MAIN JOURNAL BEARING

NOTICE

Do not interchange the bearing inserts. They must be installed in their original locations or the correct bearing oil clearance may not be obtained, resulting in engine damage.

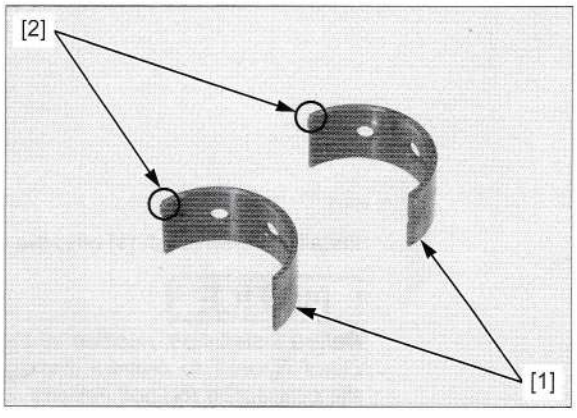
BEARING INSPECTION

Remove the crankshaft (page 13-4).

Check the main journal bearing inserts [1] for unusual wear or peeling.

Check the bearing tabs [2] for damage.

If the bearing damaged, select a replacement bearing (page 13-8).



OIL CLEARANCE INSPECTION

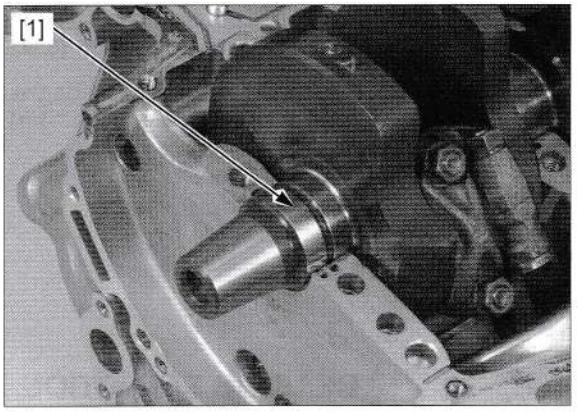
Remove the crankshaft (page 13-4).

Clean off any oil from the bearing inserts and main journals.

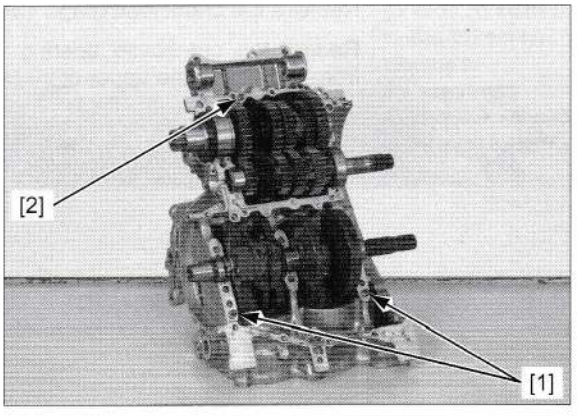
Install the crankshaft onto the upper crankcase (page 13-5).

Do not rotate the crankshaft during inspection.

Put a strip of plastigauge [1] lengthwise on each main journal avoiding the oil hole.



Install the 10 x 16 mm dowel pins [1] and 8 x 14 mm dowel pin [2].



Carefully install the lower crankcase [1] onto the upper crankcase.

Clean the crankcase main journal 9 mm bolts in solvent, and dry them thoroughly.

Apply engine oil to the crankcase main journal bolt threads and seating surfaces.

Install the crankcase main journal bolts [2].

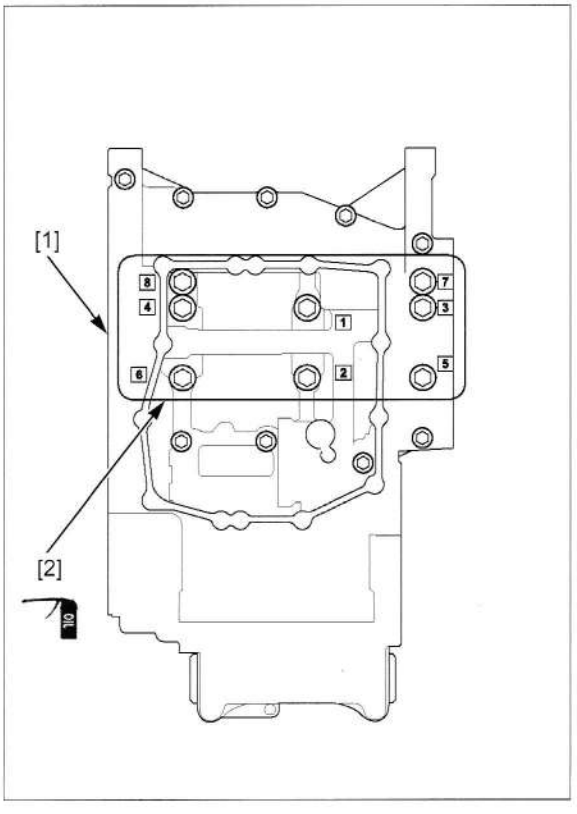
Make sure the upper and lower crankcase are seated securely.

Tighten the crankcase main journal bolts in numerical order cast on the lower crankcase in several steps to the specified torque.

Further tighten the crankcase main journal bolts 90°.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft) + 90°

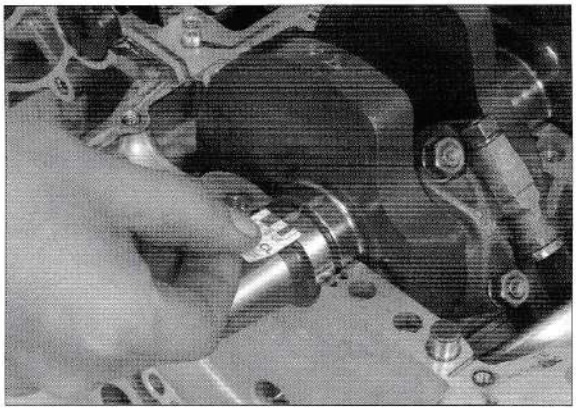
Remove the crankcase main journal 9 mm bolt and the lower crankcase.



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 13-8).

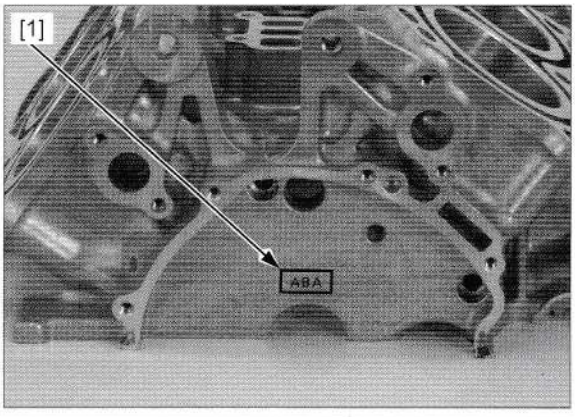


BEARING SELECTION

Letters (A, B, or C) on the left side of the upper crankcase are bearing support I.D. codes from left to right.

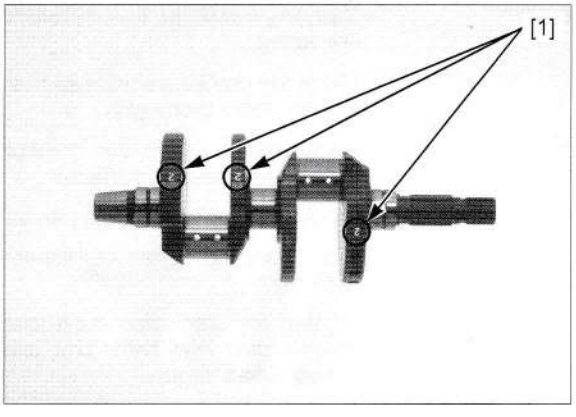
Remove the crankshaft (page 13-4).

Record the crankcase bearing support I.D. code [1] from left side of the upper crankcase.

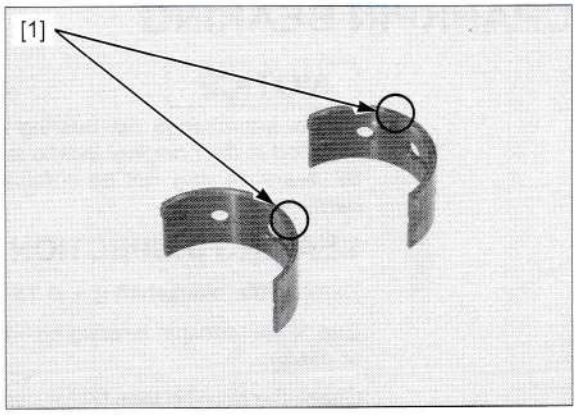


Numbers (1, 2, or 3) on the crank weights are main journal O.D. codes.

Record the corresponding main journal O.D. code [1] from the crank weight.



Cross reference the main journal and bearing support codes to determine the replacement bearing color code [1].



MAIN JOURNAL BEARING THICKNESS:

A: Blue: Thickest
B: Black:
C: Brown: ↕
D: Green:
E: Yellow: Thinnest

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	34.011 – 34.017 mm (1.3390 – 1.3392 in)	E (Yellow)	D (Green)	C (Brown)
	2	34.005 – 34.011 mm (1.3388 – 1.3390 in)	D (Green)	C (Brown)	B (Black)
	3	33.999 – 34.005 mm (1.3385 – 1.3388 in)	C (Brown)	B (Black)	A (Blue)

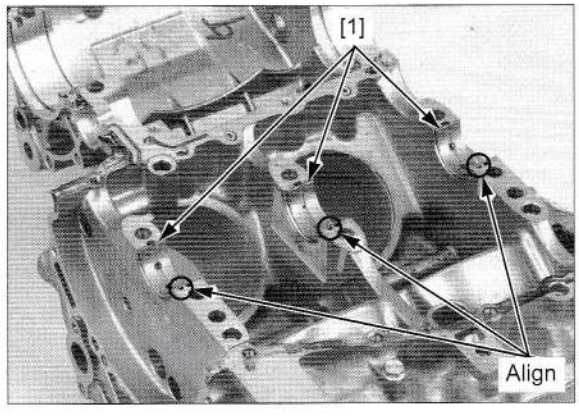
NOTICE

After selecting new bearings, recheck the clearance with a plastigauge. Incorrect clearance can cause severe engine damage.

BEARING INSTALLATION

Clean the bearing outer surfaces and crankcase bearing supports.

Install the main journal bearing inserts [1] onto the crankcase bearing supports, aligning each tab with each groove.



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.

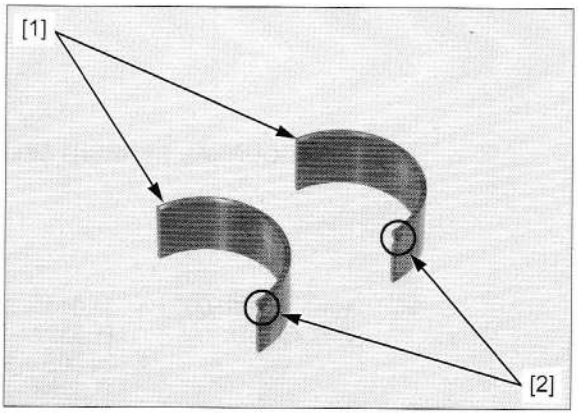
BEARING INSPECTION

Remove the crankshaft (page 13-4).

Check the crankpin bearing inserts [1] for unusual wear or peeling.

Check the bearing tabs [2] for damage.

If the bearing damaged, select a replacement bearing (page 13-11).



OIL CLEARANCE INSPECTION

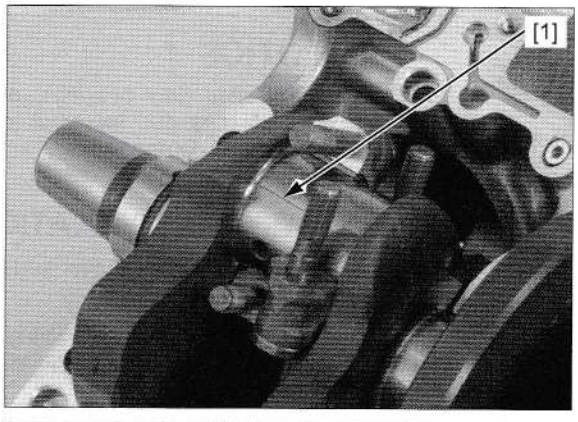
Remove the crankshaft (page 13-4).

Clean the mating surface of the connecting rod and bearing cap with solvent and blow them with compressed air.

Clean off any oil from the bearing inserts and crankpins.

Install the crankshaft onto the upper crankcase.
Set the connecting rods onto the crankpins.

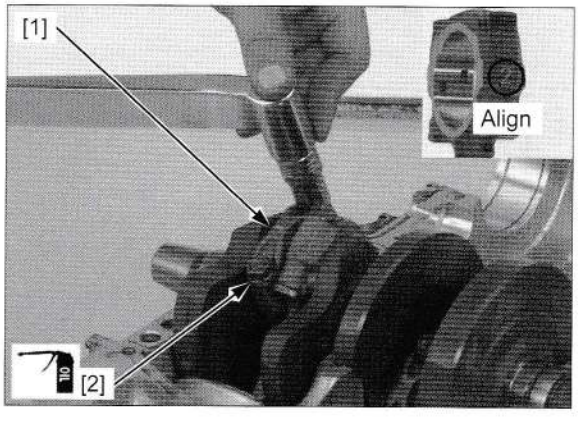
Put a strip of plastigauge [1] lengthwise on the crankpin avoiding the oil hole.



Install the bearing caps [1] by aligning the I.D. code.

Apply engine oil to the bearing cap nut [2] threads and seating surfaces and install them.
Tighten the cap nuts in 2 or 3 steps alternately.

TORQUE: 33 N·m (3.4 kgf·m, 24 lbf·ft)

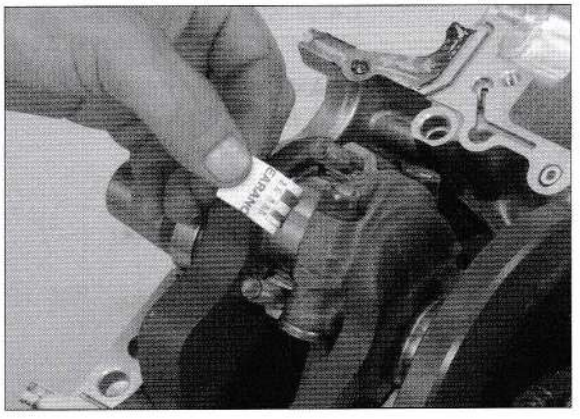


Remove the nuts and bearing cap.

Measure the compressed plastigauge at its widest point on the crankpin to determine the oil clearance.

SERVICE LIMIT: 0.08 mm (0.003 in)

If the oil clearance exceeds the service limit, select the correct replacement bearings (page 13-11).

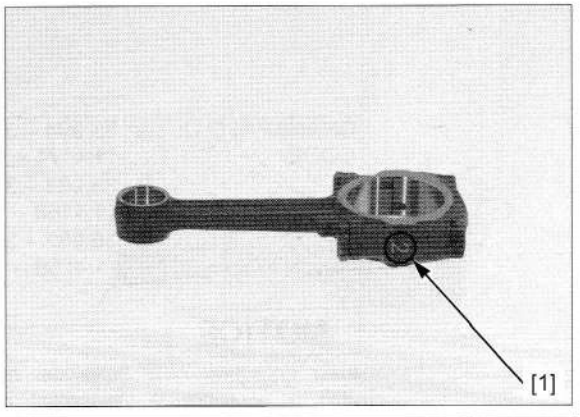


BEARING SELECTION

Numbers (1, 2, or 3) on the connecting rods are the connecting rod I.D. codes.

Remove the piston (page 13-13).

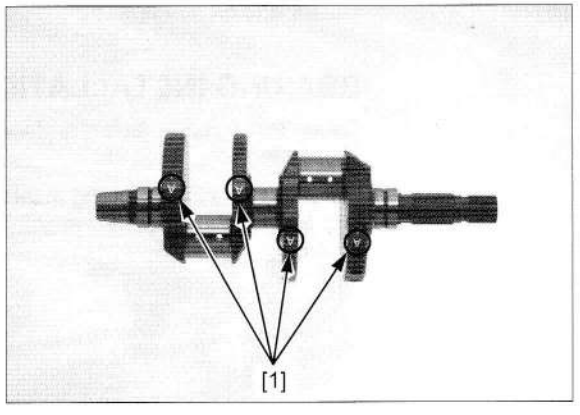
Record the connecting rod I.D. code [1] or measure the I.D. with the bearing cap installed without bearing inserts.



Letters (A, B, or C) on the crank weights are the crankpin O.D. codes.

If you are replacing the crankshaft, record the corresponding crankpin O.D. code [1].

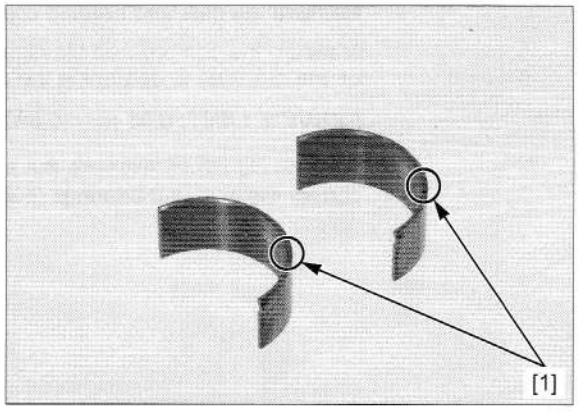
If you are reusing the crankshaft, measure the crankpin O.D. with a micrometer.



Cross-reference the connecting rod and crankpin codes to determine the replacement bearing color code [1].

CRANKPIN BEARING THICKNESS:

A: Blue: Thickest
B: Black:
C: Brown: ↕
D: Green:
E: Yellow: Thinnest



CRANKPIN BEARING SELECTION TABLE:

			CONNECTING ROD I.D. CODE		
			1	2	3
			39.000 – 39.006 mm (1.5354 – 1.5356 in)	39.006 – 39.012 mm (1.5357 – 1.5359 in)	39.012 – 39.018 mm (1.5359 – 1.5361 in)
CRANKPIN O.D. CODE	A	35.994 – 36.000 mm (1.4171 – 1.4173 in)	E (Yellow)	D (Green)	C (Brown)
	B	35.988 – 35.994 mm (1.4168 – 1.4171 in)	D (Green)	C (Brown)	B (Black)
	C	35.982 – 35.988 mm (1.4166 – 1.4168 in)	C (Brown)	B (Black)	A (Blue)

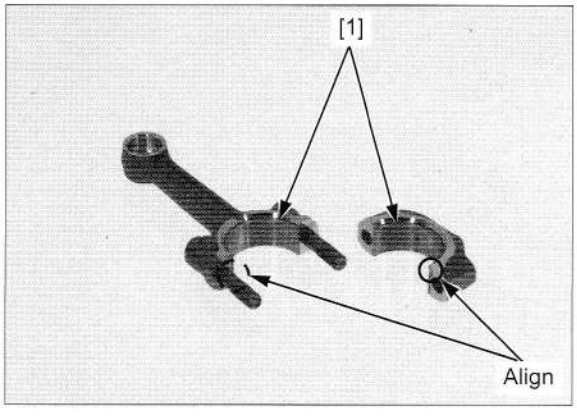
NOTICE

After selecting new bearings, recheck the clearance with a plastigauge. Incorrect clearance can cause severe engine damage.

BEARING INSTALLATION

Clean the bearing outer surfaces, bearing cap, and connecting rod.

Install the crankpin bearing inserts [1] onto the bearing cap and connecting rod, aligning each tab with each groove.



PISTON/CYLINDER

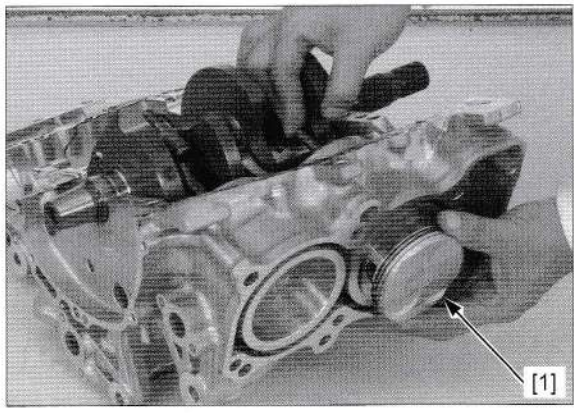
PISTON/CONNECTING ROD REMOVAL

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 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.*

Remove the connecting rod bearing cap (page 13-4).

Remove the piston/connecting rod assembly [1] from the top of the cylinder.

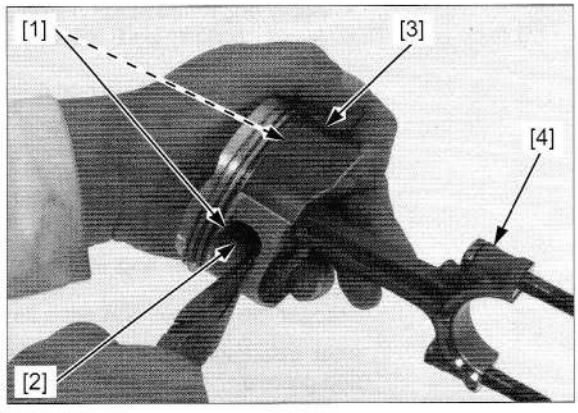


PISTON REMOVAL

Remove the piston/connecting rod assembly (page 13-13).

Remove the piston pin clips [1] with pliers.

Push the piston pin [2] out of the piston [3] and connecting rod [4], and remove the piston.

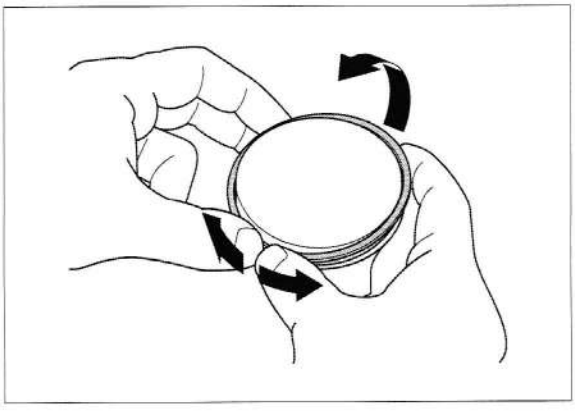


PISTON RING REMOVAL

Spread each piston ring ends and remove them by lifting up at a point opposite the gap.

NOTE:

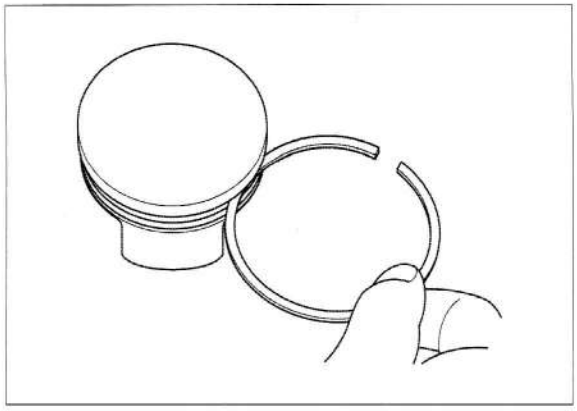
- Do not damage the piston ring by spreading the ends too far.
- Be careful not to damage the piston when removing the piston ring.



Clean carbon deposits from the piston ring grooves with a ring that will be discarded.

NOTE:

- Never use a wire brush; it will scratch the groove.



INSPECTION

Inspect the following parts for scratches, damage, abnormal wear, deformation, burning, or clogs in oil passages.

- cylinder
- piston
- piston rings
- piston pin
- connecting rod small end

Measure each part and calculate the clearance according to CRANKSHAFT/PISTON/CYLINDER SPECIFICATIONS (page 1-8).

Replace any part if it is out of service limit.

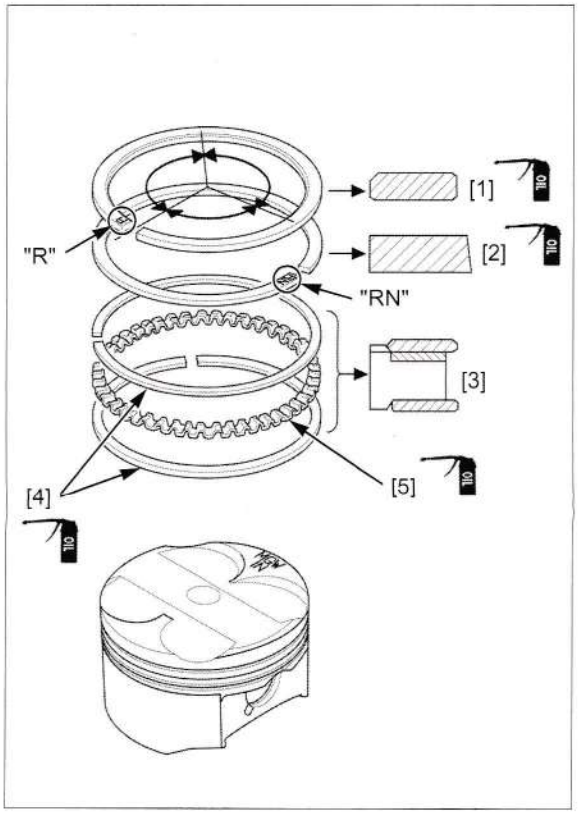
PISTON RING INSTALLATION

Clean the piston ring grooves thoroughly and install the piston rings.

- Apply engine oil to the piston ring entire surface.
- Avoid piston and piston ring damage during installation.
- Install the top and second rings with the marked side facing up.
  - "R": top ring [1]
  - "RN": second ring [2]
- To install the oil ring [3], install the spacer [4] first, then install the side rails [5].

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.

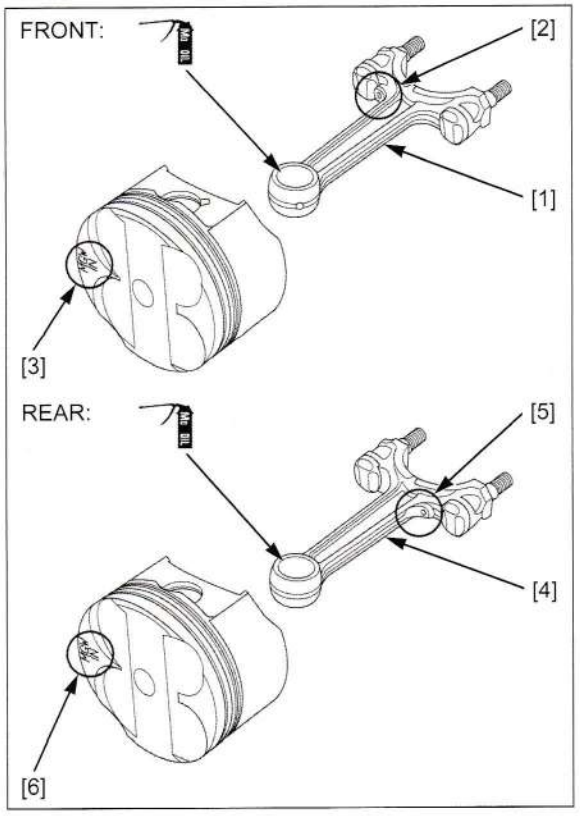


PISTON INSTALLATION

Assemble the piston and connecting rod.

- Install the front connecting rod [1] with its oil hole [2] side facing the "IN" mark [3] on the piston crown.
- Install the rear connecting rod [4] with its oil hole [5] side facing the opposite side of the "IN" mark [6] on the piston crown.

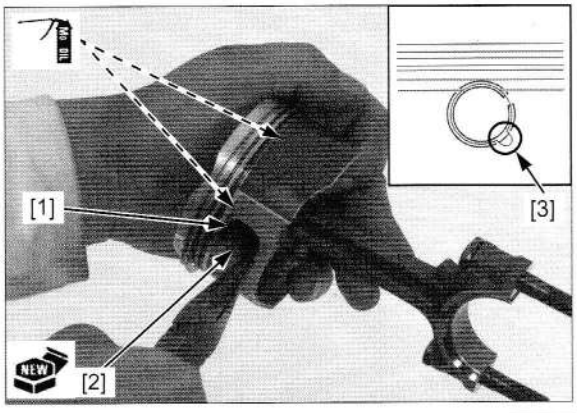
Apply molybdenum oil solution to the connecting rod small end inner surface.



Apply molybdenum oil solution to the piston pin holes.

Install the piston pin [1] and secure it with new piston pin clips [2].

- Make sure that the piston pin clips are seated securely.
- Do not align the piston pin clip end gap with the piston cutout [3].



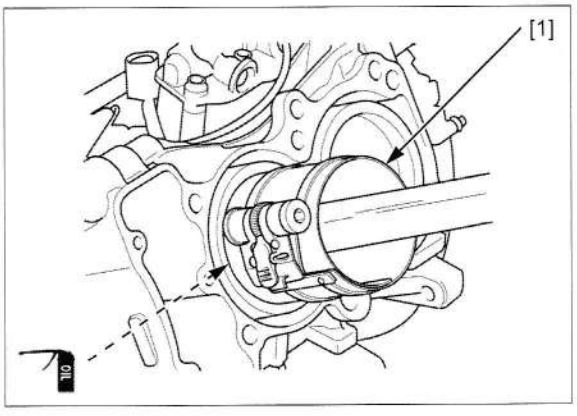
Apply engine oil to the piston outer surface and piston ring entire surfaces.

Install the piston/connecting rod assembly with the piston "IN" mark facing the intake side.

Install the piston/connecting rod assembly into the cylinder using a commercially available piston ring compressor tool [1].

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 bolt threads.*



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 connecting rod bearing cap (page 13-6)

MEMO

14. ENGINE REMOVAL/INSTALLATION

SERVICE INFORMATION 14-2

COMPONENT LOCATION 14-3

ENGINE REMOVAL 14-4

ENGINE INSTALLATION 14-7

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.

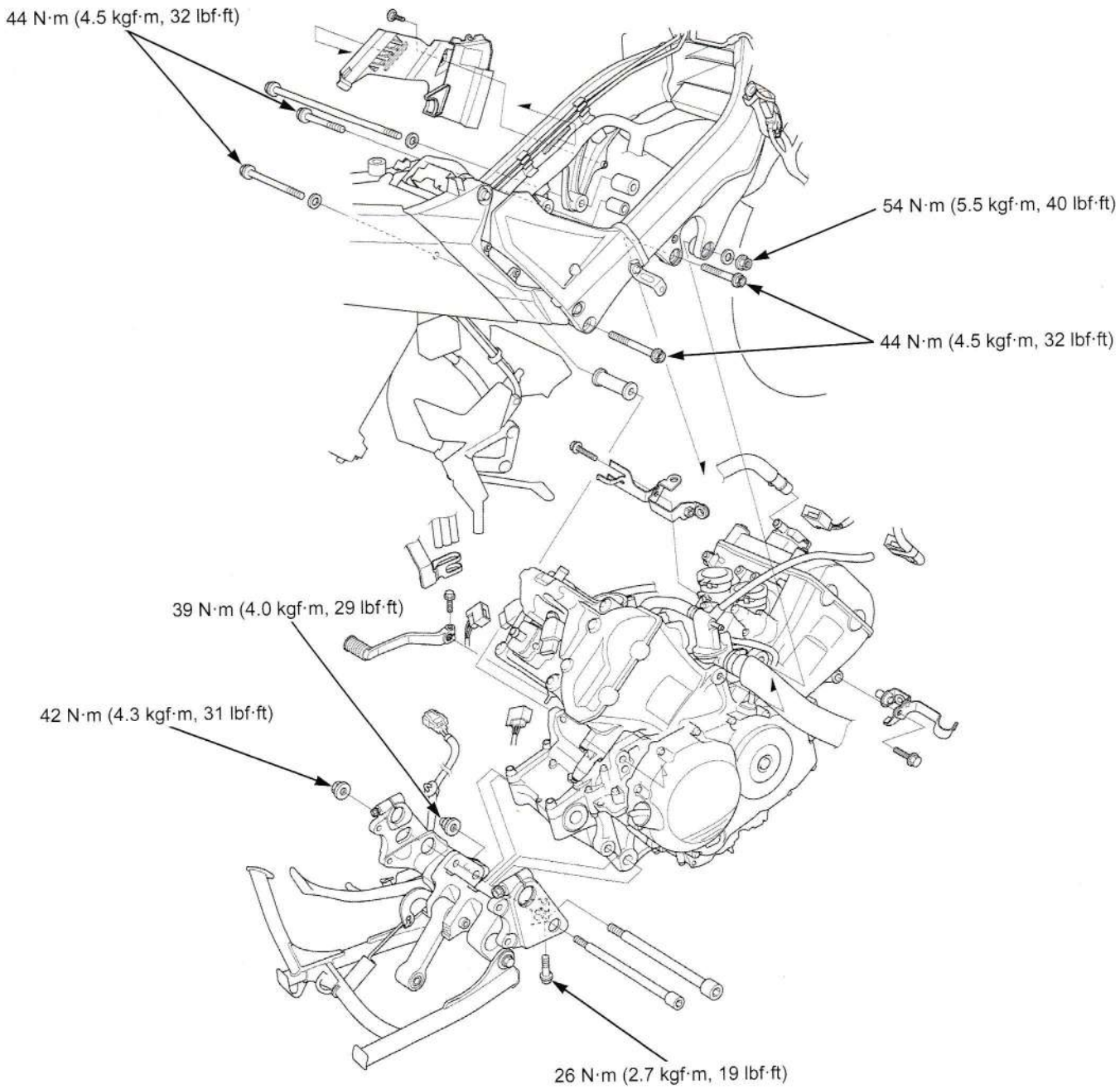
NOTICE

Do not use the oil filter as a jacking point.

- When removing/installing the engine, tape the frame around the engine beforehand for frame protection.
- When installing the engine, be sure to tighten the engine mounting fasteners to the specified torque in the specified sequence. If you mistake the torque or sequence, loosen all mounting fasteners, then tighten them again to the specified torque in the correct sequence.
- The following components can be serviced with the engine installed in the frame.
  - Starter motor (page 6-5)
  - Throttle body (page 7-14)
  - Water pump (page 8-9)
  - Oil pump (page 9-8)
  - Camshaft (page 10-9)
  - Clutch (page 11-10)
  - Primary drive gear (page 11-14)
  - Starter clutch (page 11-15)
  - Gearshift linkage (page 12-7)
  - Alternator stator (page 12-21)
  - Flywheel (page 12-22)
- The following components require engine removal for service.
  - Cylinder head/valves (page 10-19)
  - Transmission (page 12-15)
  - Crankshaft (page 13-4)
  - Piston/cylinder (page 13-13)

COMPONENT LOCATION

II AC, III CM types shown:



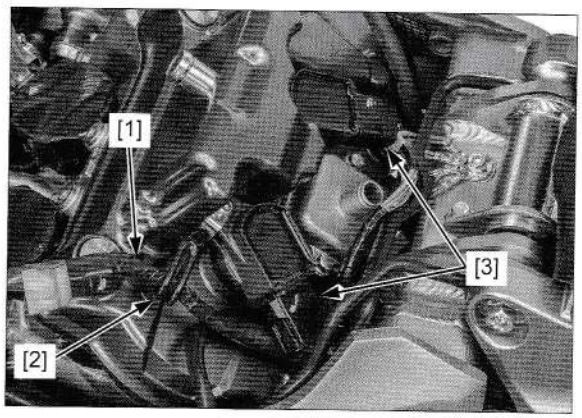
ENGINE REMOVAL

Drain the engine oil (page 3-11).

Remove the following:

- PAIR solenoid valve (page 7-22)
- throttle body (page 7-14)
- CMP sensor (page 4-44)
- radiators (page 8-7)
- exhaust pipe (page 2-16)
- swingarm (page 16-16)
- EVAP purge control solenoid valve (AC, II AC types) (page 7-27)

Release the wire [1] from the clamp [2] and disconnect the ignition coil 3P (Black) connectors [3].

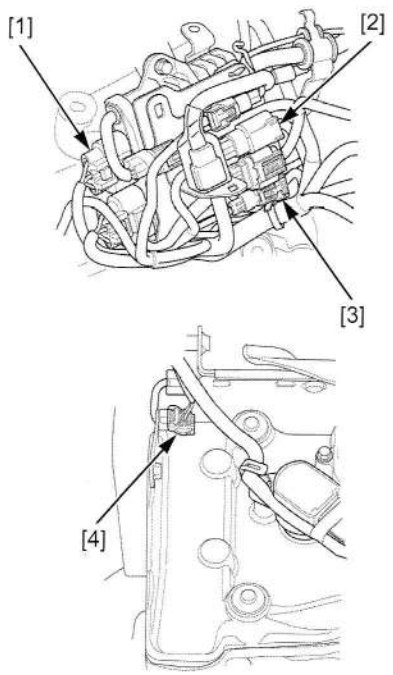


Disconnect the alternator 3P (Gray) connector [1].

Remove the following connectors from the stay and disconnect them.

- engine sub-wire harness 6P (Black) [2]
- engine sub-wire harness 2P (Gray) [3]
- CKP sensor 2P (Black) [4]

II AC type shown:



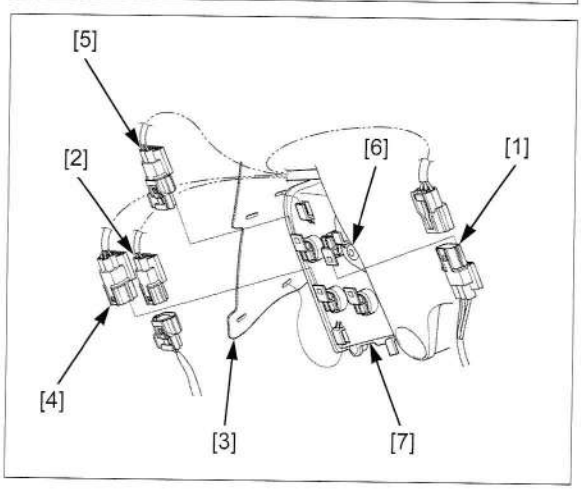
- MP sensor 3P (Black) [1]
- sidestand switch 2P (Black) [2]

Release the rubber seat [3] from the tabs.

Remove the following connectors from the stay.

- O_2 sensor 4P (Black) [4]
- option (shift switch) 2P (Blue) [5]

Release the hook-and-loop on the inner side of the frame and remove the bolt [6] and the connector plate [7].

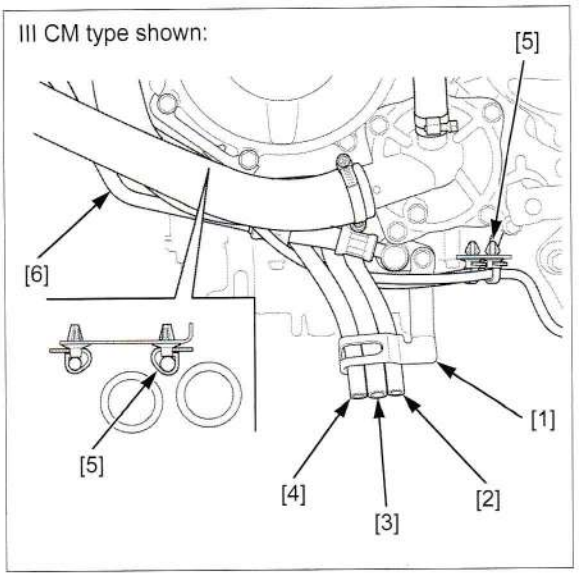


Release the following from the clamp [1] and remove them out of the engine.

- fuel tank drain hose [2]
- radiator reserve tank overflow hose [3]
- fuel tank breather hose [4] (III CM type)
  EVAP canister drain hose [4] (AC, II AC types)

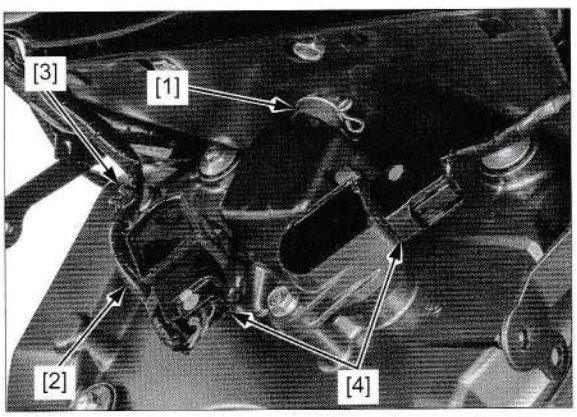
Release the band clips [5] on the sidestand switch wire from the stays and remove the wire out of the water hoses.

Remove the oil cooler pipes [6] (page 9-10).



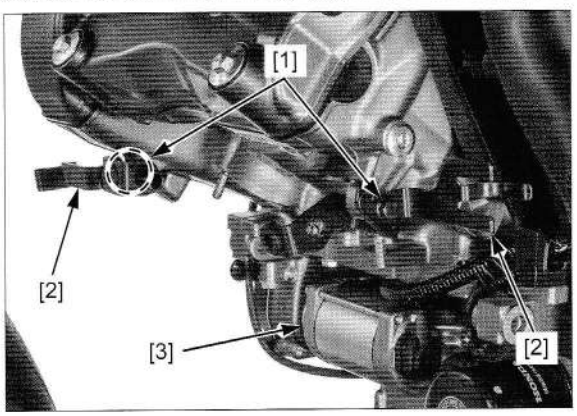
Disconnect the secondary air supply hose [1].

Release the wire [2] from the clamp [3] and disconnect the ignition coil 3P (Black) connectors [4].

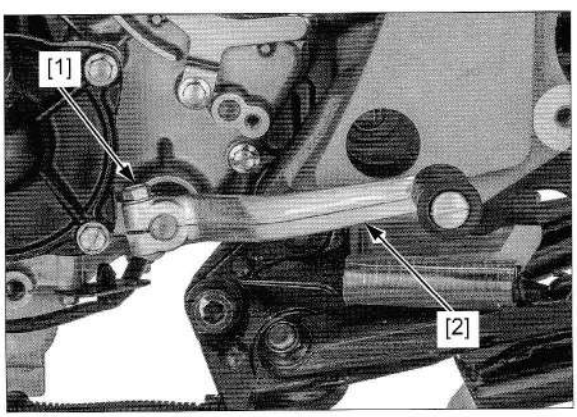


Remove the two bolts [1] and radiator stays [2].

Remove the starter motor [3] (page 6-5).



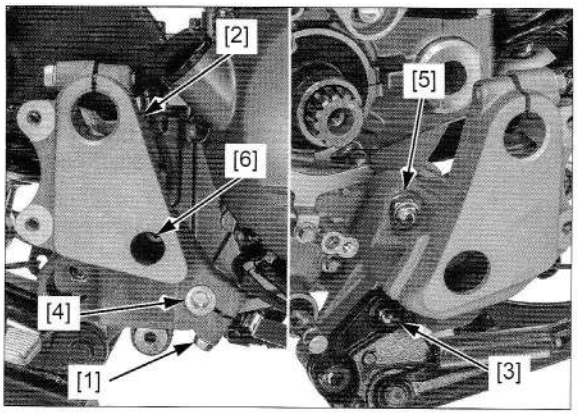
Remove the pinch bolt [1] and gearshift pedal [2].



Loosen the lower bracket pinch bolt [1].

Remove the following fasteners to remove the suspension lower bracket [2].

- cap nut [3] and bolt (lower) [4]
- nut [5] and bolt (upper) [6]



Support the motorcycle securely with a hoist or equivalent.

Do not use the oil filter as a jacking point.

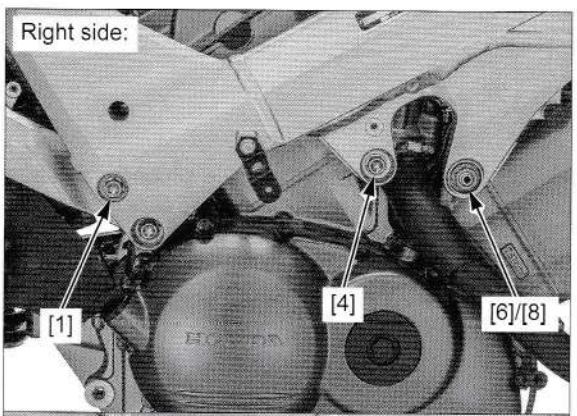
Place a floor jack or other adjustable support under the engine.

NOTE:

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

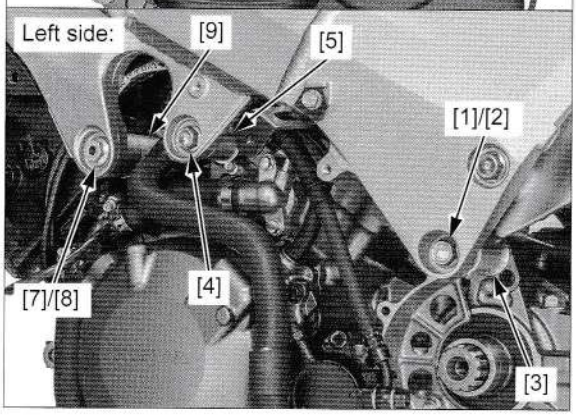
Remove the following:

- rear engine hanger bolts [1], washer [2], and flange collar [3]
- center engine hanger bolts [4] and collar [5]
- front engine hanger nut [6], bolt [7], washers [8], and collar [9]



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

Carefully lower the jack or adjustable support, then remove the engine from the frame.



ENGINE INSTALLATION

During engine installation, hold the engine securely and be careful not to damage the frame and engine.

Place the engine in the frame, then install all the fasteners and screw them in fully.

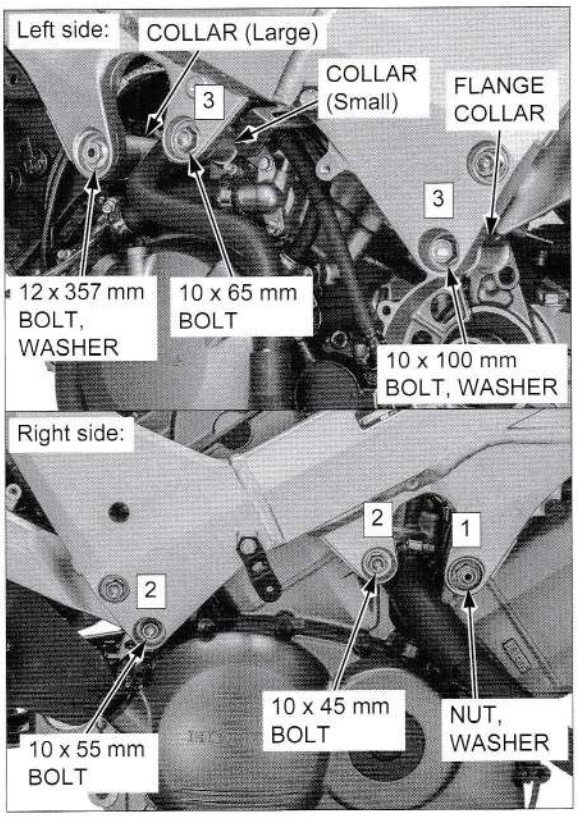
NOTE:

- Place a jack or other adjustable support under the engine.
- Do not use the oil filter as a jacking point.
- Carefully align the mounting points with the jack to prevent damage to the engine, frame, hoses, wires and cables.
- The jack height must be continually adjusted to relieve stress for ease bolt installation.

Tighten the nut and bolts to the specified torque in the sequence as follows.

TORQUE:

1. **Front engine hanger nut: 54 N·m (5.5 kgf·m, 40 lbf·ft)**
2. **Right center and rear engine hanger bolt: 44 N·m (4.5 kgf·m, 32 lbf·ft)**
3. **Left center and rear engine hanger bolt: 44 N·m (4.5 kgf·m, 32 lbf·ft)**



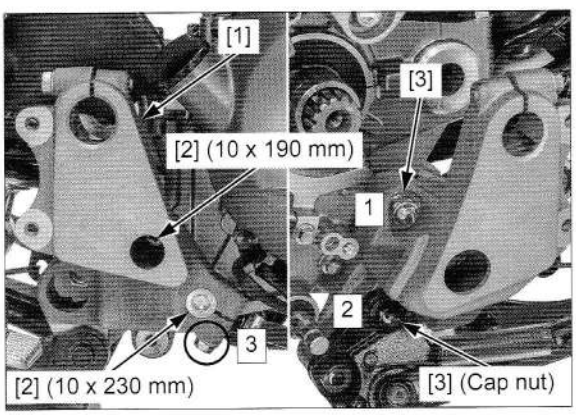
The bolts are installed from the right side.

Install the suspension lower bracket [1] with the bolts [2] and nuts [3].

Tighten the nuts and pinch bolt to the specified torque in the sequence as follows.

TORQUE:

1. **Suspension lower bracket nut (upper): 42 N·m (4.3 kgf·m, 31 lbf·ft)**
2. **Suspension lower bracket cap nut (lower): 39 N·m (4.0 kgf·m, 29 lbf·ft)**
3. **Suspension lower bracket pinch bolt: 26 N·m (2.7 kgf·m, 19 lbf·ft)**



Install the removed parts in the reverse order of removal.

NOTE:

- Align the slit of the gearshift pedal with the punch mark.

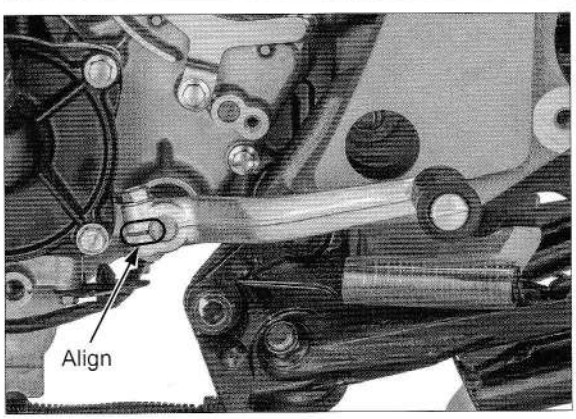
Adjust the following:

– throttle grip freeplay (page 3-4)
– drive chain slack (page 3-14)

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

Fill and bleed the cooling system (page 8-5).

Check the exhaust system and cooling system for leaks.



MEMO

15. FRONT WHEEL/SUSPENSION/STEERING

SERVICE INFORMATION 15-2

TROUBLESHOOTING 15-4

COMPONENT LOCATION 15-5

HANDLEBAR 15-6

FRONT WHEEL 15-13

FORK 15-17

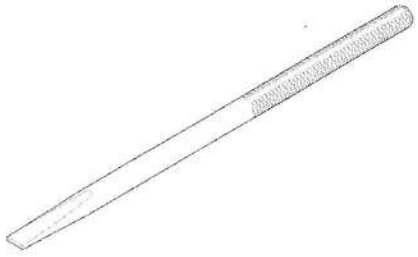
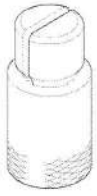
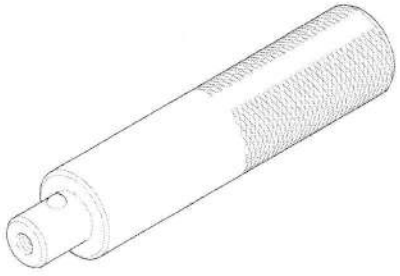
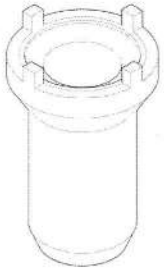
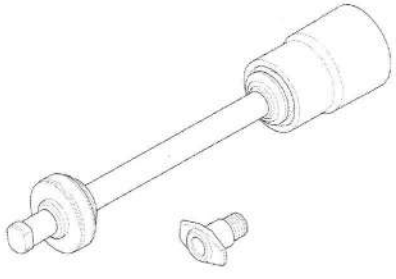
STEERING STEM 15-24

SERVICE INFORMATION

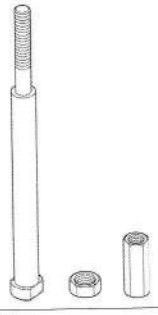
GENERAL

- 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.
- Do not operate the brake lever after removing the brake caliper when servicing the front wheel.
- Use only tires marked "TUBELESS" and tubeless valves on rim marked " FOR TUBELESS".
- After the front wheel installation, check the brake operation by applying the brake lever.
- After the front wheel installation, perform the air gap inspection (page 18-21).
- For brake system service (page 17-3).

TOOLS

Attachment, 42 x 47 mm 07746-0010300 	Pilot, 20 mm 07746-0040500 	Bearing remover shaft 07746-0050100 
Bearing remover head, 20 mm 07746-0050600 	Driver 07749-0010000 	Steering stem socket 07916-3710101 
Ball race remover set 07946-KM90002 	Driver attachment, A 07946-KM90100 	Driver attachment, B 07946-KM90200 

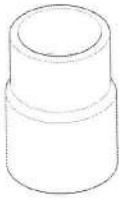
Driver shaft assembly
07946-KM90301



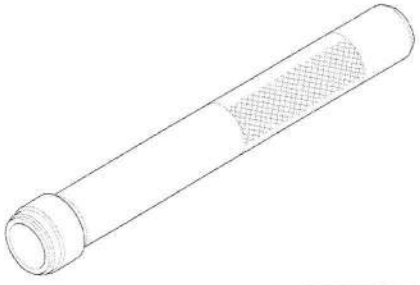
Bearing remover, A
07946-KM90401

Bearing remover, B
07946-KM90500

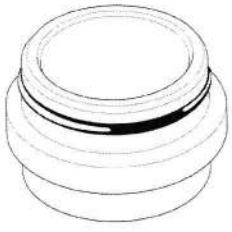
Assembly base
07946-KM90600



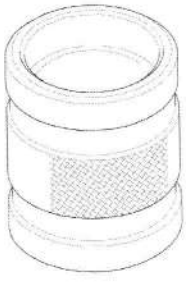
Steering stem driver
07946-MB00000



Fork seal driver attachment, 43 mm
07947-KA40200



Fork seal driver
07947-KA50100



TROUBLESHOOTING

Hard steering
- Insufficient tire pressure
- Faulty tire
- Steering stem adjustment nut too tight
- Worn or damaged steering beatings
- Worn or damaged steering beating races
- Bent steering stem

Steers to one side or does not track straight
- Bent axle
- Wheel installed incorrectly
- Worn or damaged wheel bearings
- Bent fork leg
- Damaged or loose steering bearings
- Damaged frame
- Faulty wheel bearing

Front wheel wobbles
- Bent rim
- Faulty tire
- Worn or damaged wheel bearings
- Loose axle
- Unbalanced tire and wheel

Wheel hard to turn
- Faulty wheel bearings
- Bent axle
- Brake drag (page 17-2)

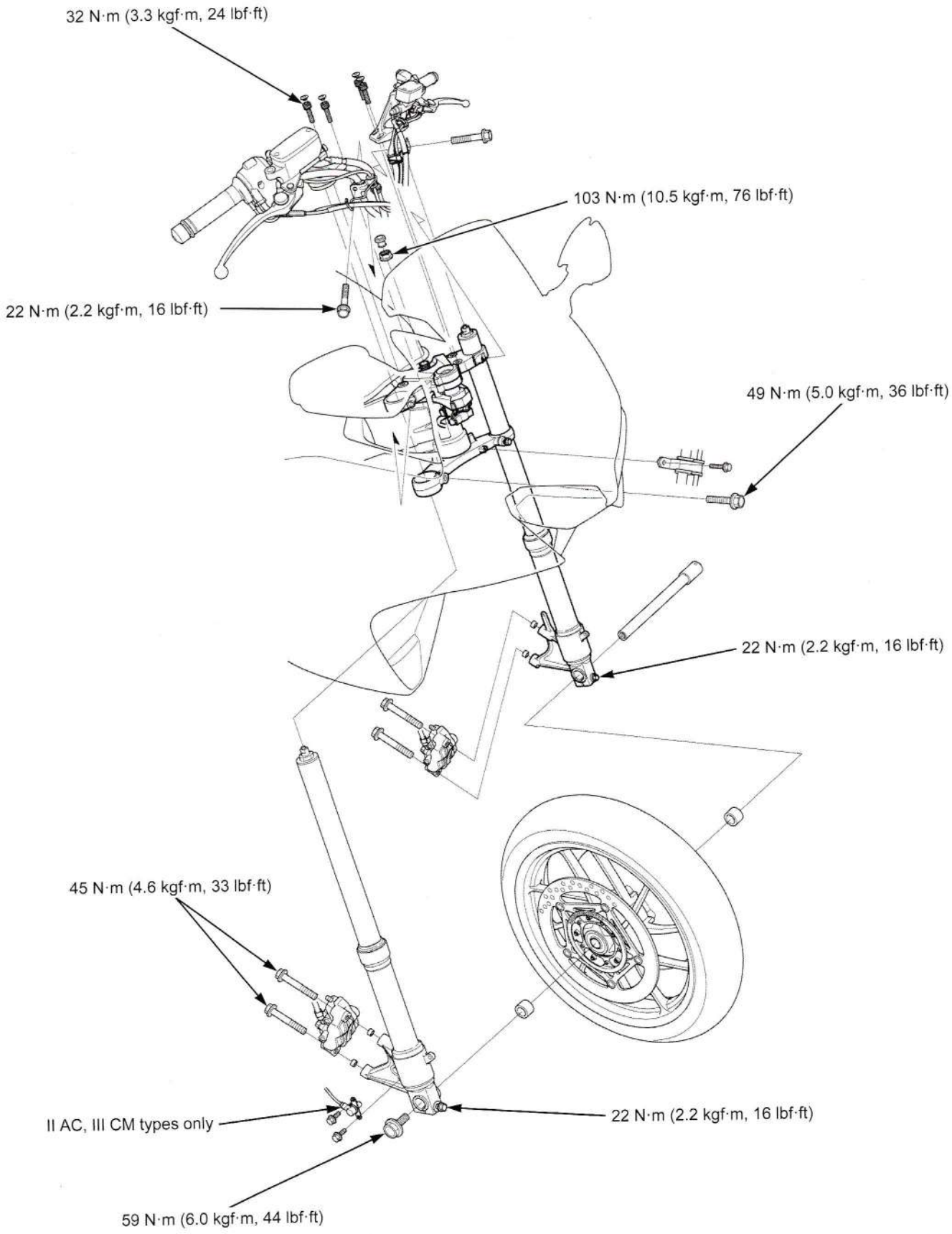
Soft suspension
- Low tire pressure
- Weak fork spring
- Low fluid level in fork
- Incorrect fork fluid weight (low viscosity)

Stiff suspension
- High tire pressure
- Bent fork tube
- Fork slider binds
- High fluid level in fork
- Incorrect fork fluid weight (high viscosity)
- Clogged fork fluid passage

Front suspension noise
- Loose fork fasteners
- Incorrect fork fluid weight (low viscosity)
- Worn slider of fork tube bushing

COMPONENT LOCATION

II AC, III CM types shown:



HANDLEBAR

REMOVAL

NOTE:

II AC, III CM types:

- The VFR800F has built-in grip heaters. The left handlebar grip must be replaced with a new one when it is removed from the handlebar.

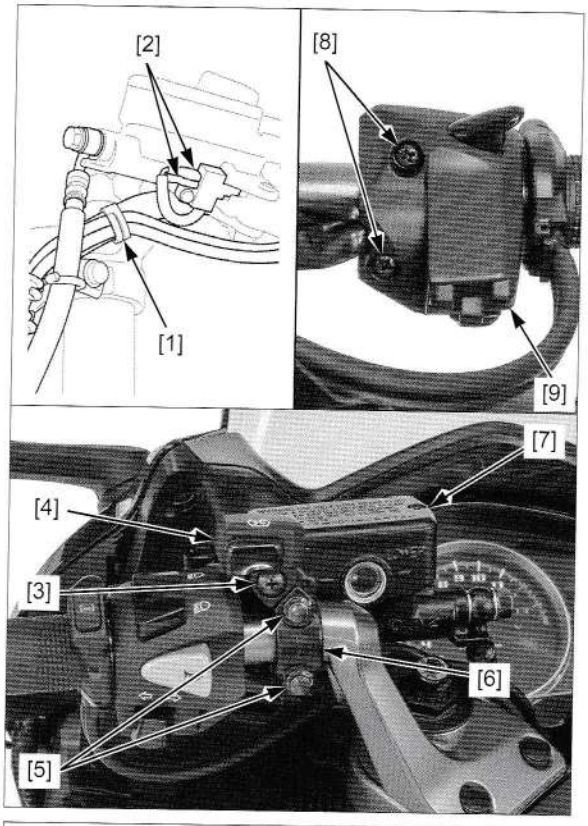
LEFT HANDLEBAR

Remove the left middle cowl (page 2-6).

Remove the following:

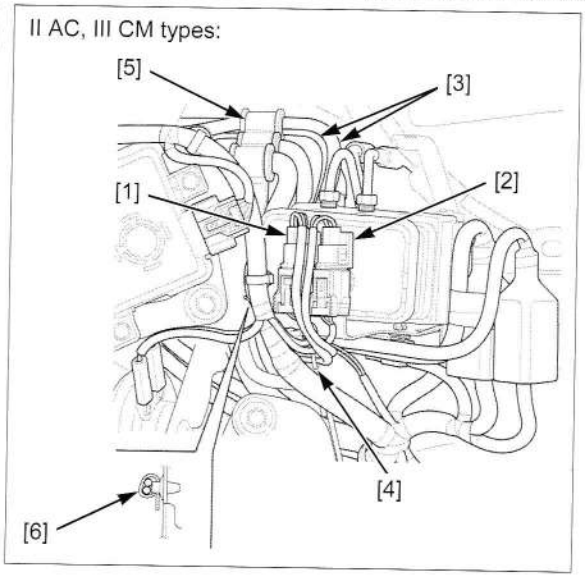
Keep the master cylinder reservoir upright to prevent air from entering the hydraulic system.

- wire clip [1] (II AC, III CM types)
- clutch switch connectors [2]
- screw [3] (II AC, III CM types)
- TCS off switch [4] (II AC, III CM types)
- two bolts [5]
- master cylinder holder [6]
- clutch master cylinder [7]
- two screws [8]
- left handlebar switch housings [9]



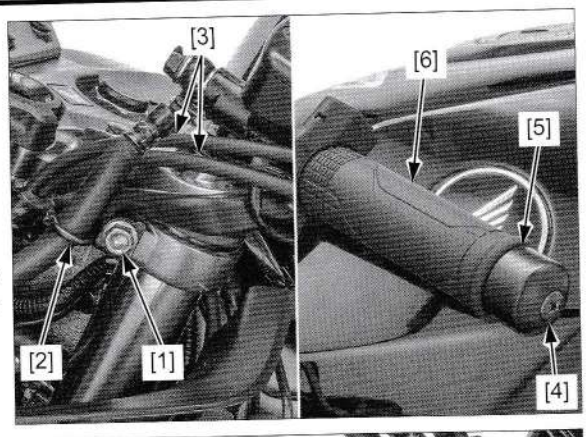
II AC, III CM types:

- grip heater switch 4P (Black) [1] and grip heater 2P (Black) [2] connectors (remove from the stays and disconnect them)
- grip heater wires [3] (from the wire guide [4] and clamp [5], and releasing its band clip [6])



Inject isopropyl alcohol to the inner side of the handlebar grip for easier removal.

- top bridge pinch bolt [1]
- wire guide [2]
- grip heater wires [3] (out of the frame) (II AC, III CM types)
- screw [4]
- handlebar weight [5]
- left handlebar grip [6]

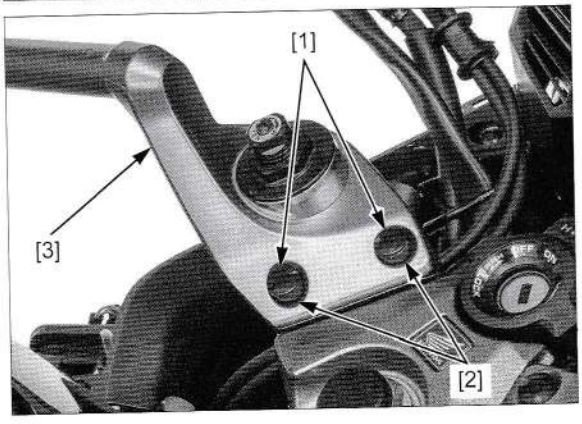


II AC, III CM types:

NOTE:

- Do not remove the left handlebar grip (i.e. grip heater) unless the handlebar or grip is necessary to replace it with a new one.

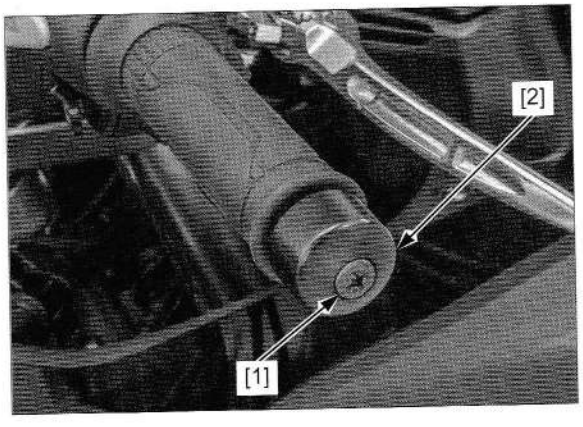
- two bolt caps [1]
- two socket bolts [2]
- left handlebar [3]



RIGHT HANDLEBAR

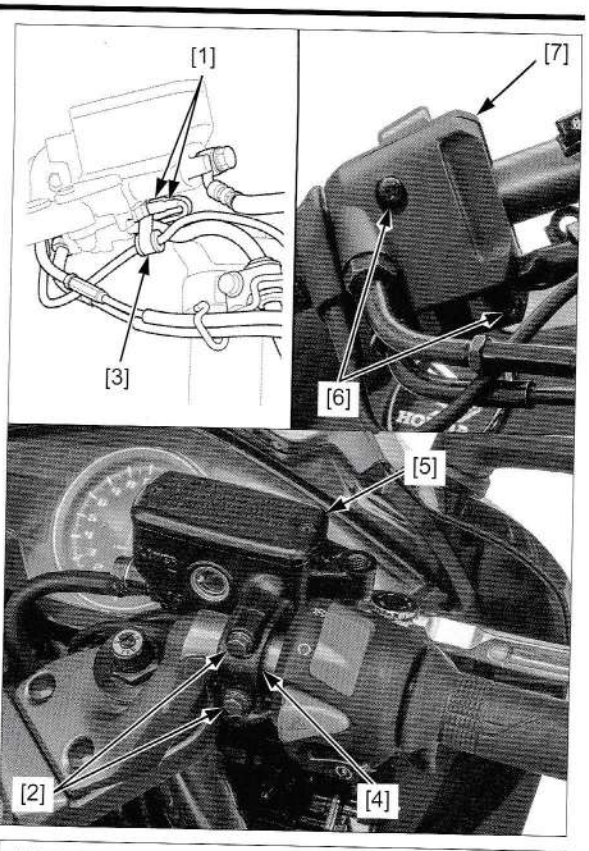
Remove the following:

- screw [1] (while holding the handlebar weight [2] securely)
- handlebar weight



Keep the master cylinder reservoir upright to prevent air from entering the hydraulic system.

- brake light switch connectors [1]
- two bolts [2]
- wire clamp [3] (II AC, III CM types)
- master cylinder holder [4]
- front master cylinder [5]
- two screws [6]
- upper right handlebar switch housing [7]

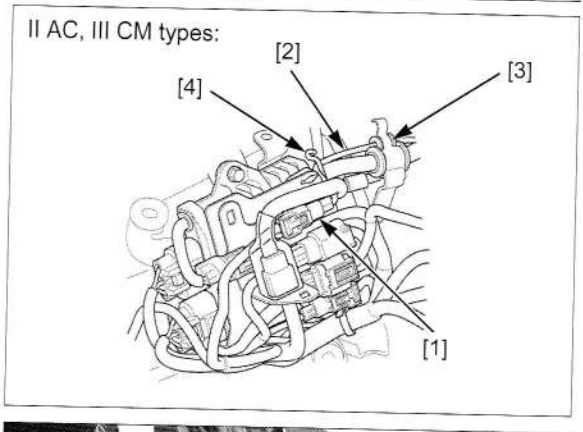


NOTE:

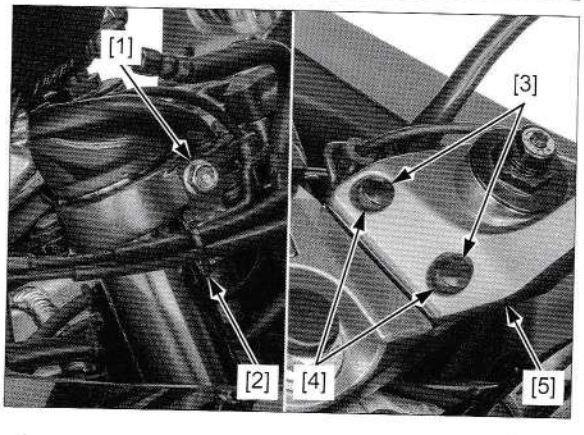
II AC, III CM types:

- If you plan to replace the throttle grip (i.e. grip heater), remove the following.

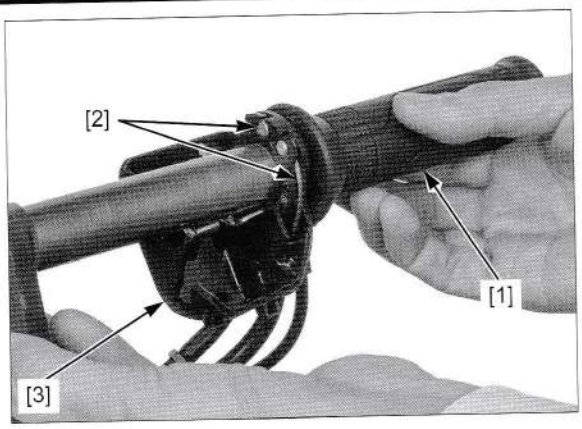
- right middle cowl (page 2-6)
- grip heater 2P (Black) connector [1] (remove from the stay and disconnect it)
- grip heater wire [2] (from the clamp [3] and guide [4])



- top bridge pinch bolt [1]
- wire guide [2]
- two bolt caps [3]
- two socket bolts [4]
- right handlebar [5]



- throttle grip [1] (from the handlebar)
- throttle cables [2]
- lower right handlebar switch housing [3] (from the throttle grip)



INSTALLATION

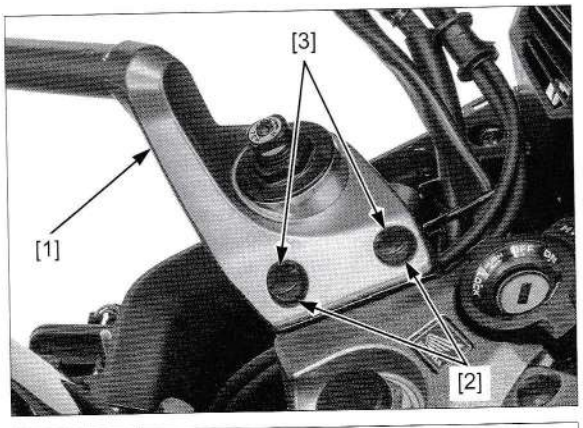
LEFT HANDLEBAR

Clean the mating surface of the handlebar and top bridge.

Install the left handlebar [1] over the fork tube and tighten the two socket bolts [2] to the specified torque.

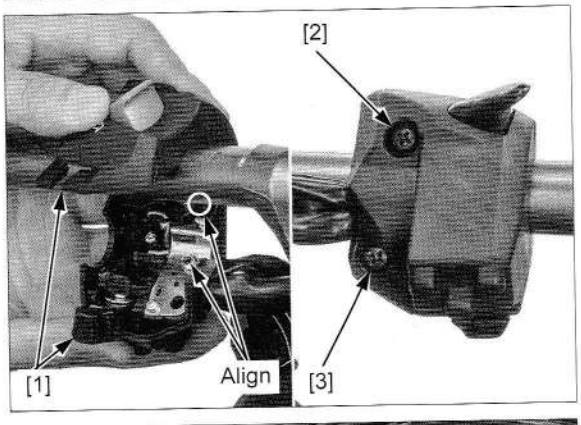
TORQUE: 32 N·m (3.3 kgf·m, 24 lbf·ft)

Install the bolt caps [3].



Install the left handlebar switch housings [1] by aligning the locating pin with the hole in the handlebar. Tighten the upper screw [2] first, then tighten the lower screw [3] to the specified torque.

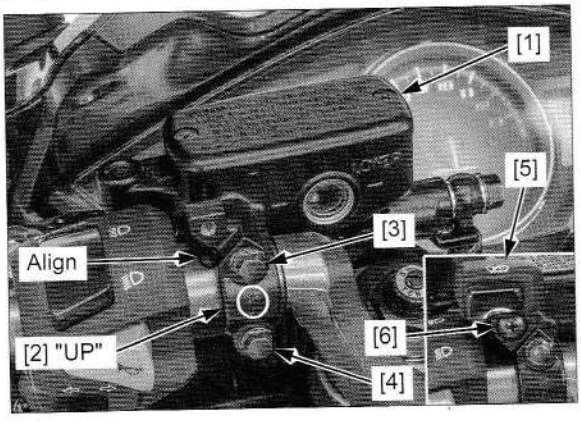
TORQUE: 2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)



Align the edge of the master cylinder with the punch mark on the handlebar.

Install the master cylinder [1] and holder [2] with the "UP" mark facing up. Tighten the upper bolt first [3], then the lower bolt [4].

Install the TCS off switch [5], routing its wire in front of the handlebar and tighten the screw [6] (II AC, III CM types).

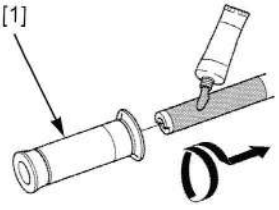


AC type: Clean the inside surface of the left handlebar grip [1] and the outside surface of the handlebar.

Apply Honda Bond A or Honda Hand Grip Cement (U.S.A. only) to the inside surface of the grip and to the outside surface of the handlebar.

Allow the adhesive to dry for 1 hour before using. Wait 3 – 5 minutes and install the grip. Rotate the grip for even application of the adhesive.

AC type:



II AC, III CM types: Remove any adhesive from the handlebar to clean it thoroughly.

NOTE:

- Before performing this service, support the motorcycle securely so it does not fall down.

1. Apply Honda Bond A or Honda Hand Grip Cement (U.S.A. only) [1] to the specified area of the handlebar outer surface.
2. Wait 5 minutes and spray isopropyl alcohol [2] to the inner surface of a new handlebar grip [3] and to the handlebar outer surface for easy installation.
3. Install the handlebar grip so it contacts with the switch housing and align the seams of grip and switch housing.

NOTICE

Note the following points during installation to prevent damaging the heater circuit.

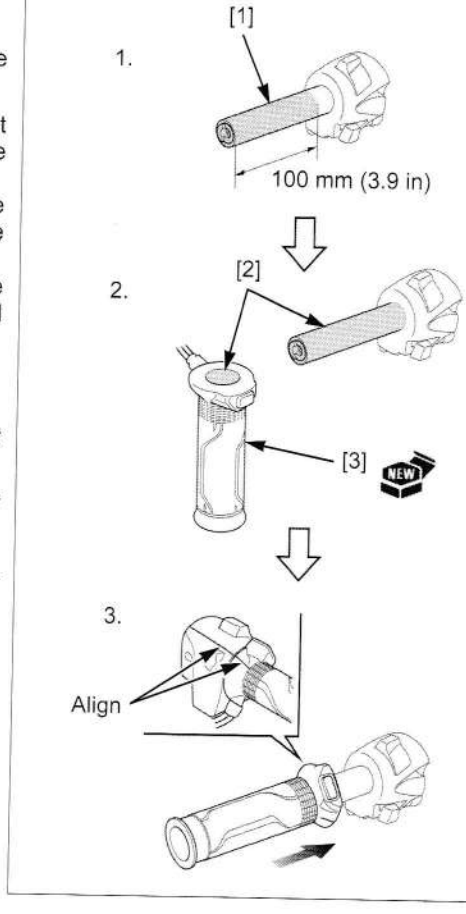
- *Do not twist the handlebar grip excessively and not press the grip flange around the switch.*
- *Do not use a hammer to strike the grip end.*
- *If the grip is stuck halfway, inject degreasing agent to the inner side of grip and remove it.*

Wipe off any excess adhesive.

NOTE:

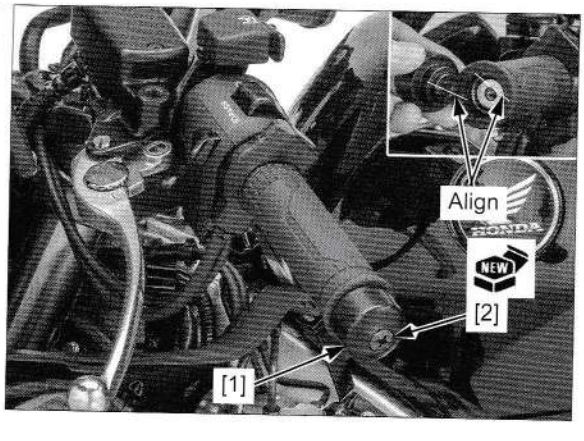
- Allow the adhesive to dry for at least 1 hour before using or checking the heater operation.
- When checking the heater operation, do not set the heater level higher than level 2.
- Make sure to turn off the heater switch after the operation check.
- Do not set the heater level higher than level 2 for the first week after installation.

II AC, III CM types:



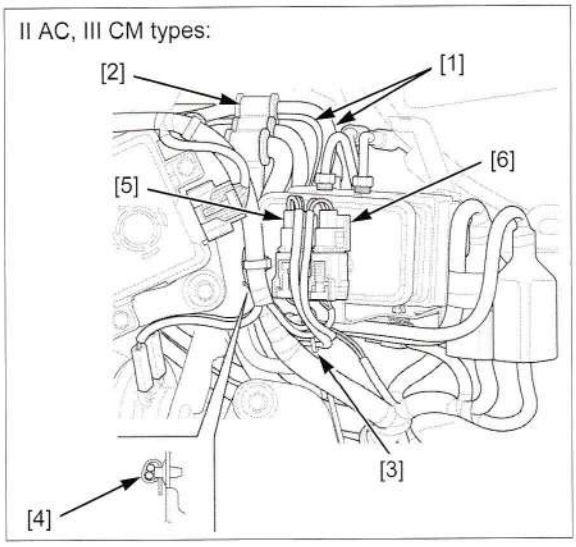
Install the handlebar weight [1] with a new weight screw [2] by aligning the flats and tighten it while holding the weight.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



II AC, III CM types: Route the grip heater wires [1] through the clamp [2] and guide [3] properly and secure the band clip [4].

Connect the grip heater switch 4P (Black) [5] and grip heater 2P (Black) [6] connectors and install them onto the stay.



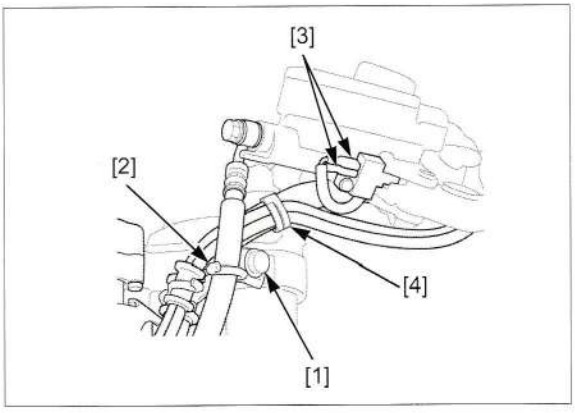
Install the top bridge pinch bolt [1] with the wire guide [2] and tighten it to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

Connect the clutch switch connectors [3].

Secure the grip heater and left handlebar switch wires with the clip [4] (II AC, III CM types).

Install the left middle cowl (page 2-6).



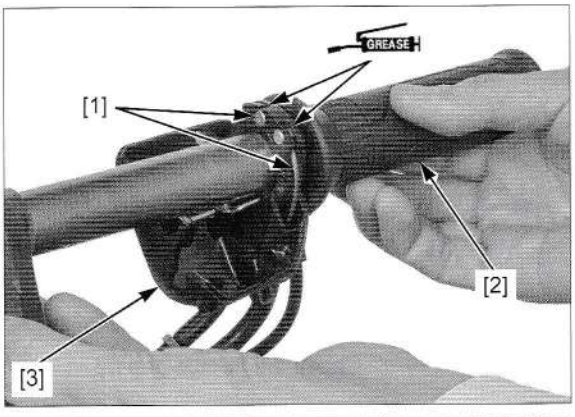
RIGHT HANDLEBAR

Clean the sliding surfaces of the throttle grip and right handlebar and the mating surfaces of the handlebar and top bridge.

Apply grease to the cable groove and roll-up area of the throttle grip.

Connect the throttle cables [1] to the throttle grip and set the throttle grip [2] into the lower right handlebar switch housing [3].

Install the throttle grip onto the handlebar.



Install the right handlebar [1] over the fork tube.

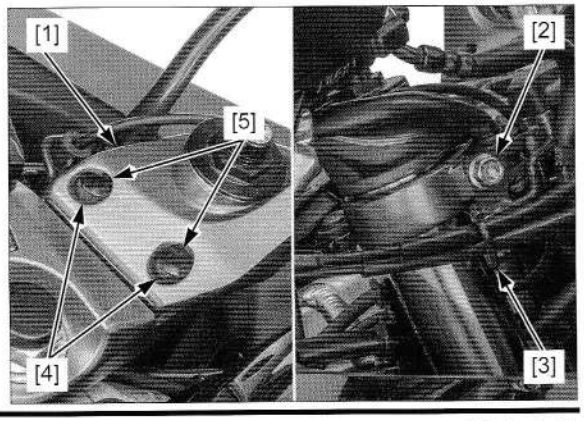
Install the top bridge pinch bolt [2] with the wire guide [3] and tighten it to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

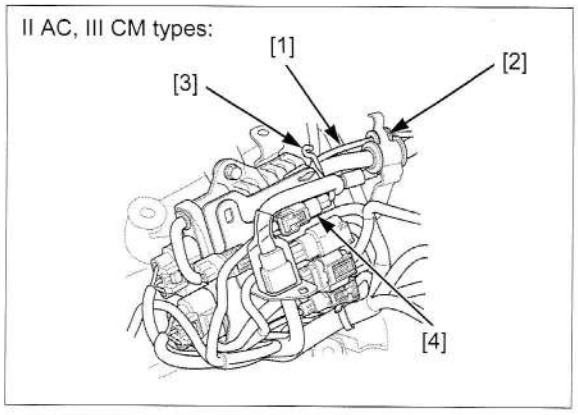
Install the two socket bolts [4] and tighten them to the specified torque.

TORQUE: 32 N·m (3.3 kgf·m, 24 lbf·ft)

Install the bolt caps [5].



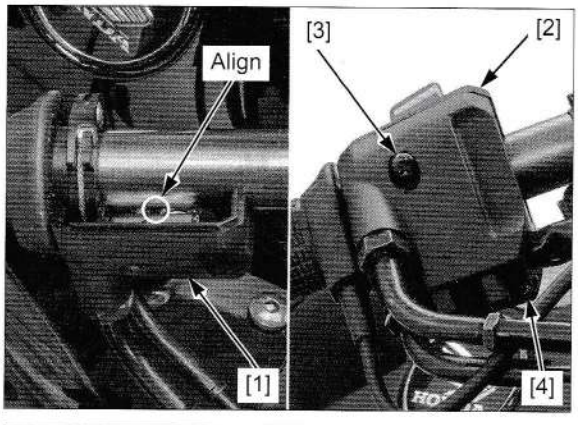
II AC, III CM types: Route the grip heater wire [1] through the clamp [2] and guide [3] properly and connect the grip heater 2P (Black) connector [4] and install it onto the stay.



Install the lower right handlebar switch housing [1] by aligning the locating pin with the hole in the handlebar.

Install the upper right handlebar switch housing [2]. Tighten the upper screw first [3], then tighten the lower screw [4] to the specified torque.

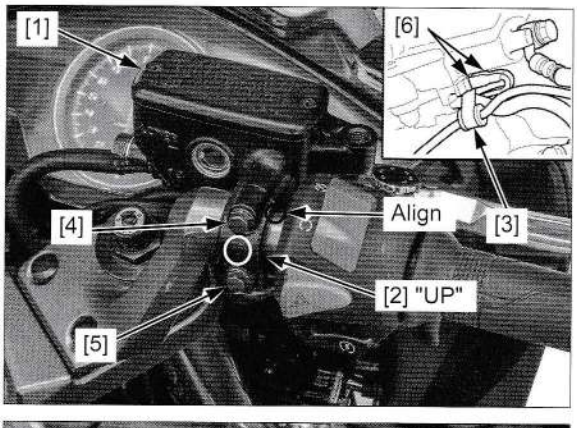
TORQUE: 2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)



Align the edge of the master cylinder with the punch mark on the handlebar.

Install the master cylinder [1], holder [2], and wire clamp [3] (II AC, III CM types) with the "UP" mark of the holder facing up. Tighten the upper bolt first [4], then the lower bolt [5].

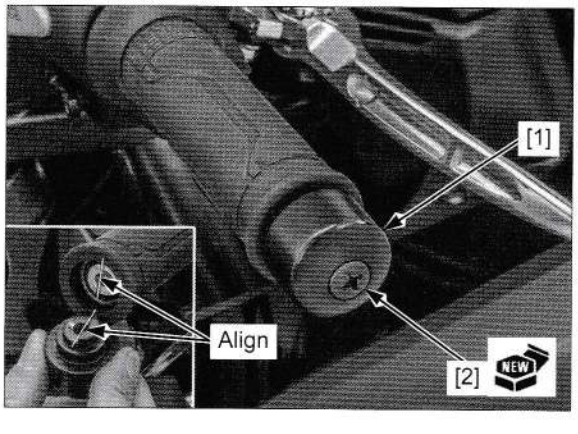
Connect the brake light switch connectors [6].



Install the handlebar weight [1] with a new weight screw [2] by aligning the flats and tighten it while holding the weight.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Check the throttle grip freeplay (page 3-4).



HANDLEBAR INNER WEIGHT REPLACEMENT

Remove the left handlebar grip and throttle grip (page 15-6).

Straighten the retainer tab [1] with a screwdriver or punch.

Apply soapy water through the tab locking hole [2] for easy removal.

Temporarily install the handlebar weight [3] with the screw [4], aligning the flats, and then remove the inner weight [5] by turning the handlebar weight.

Remove the following from the from the inner weight:

- screw
- handlebar weight
- weight retainer [6]
- rubber cushions [7]

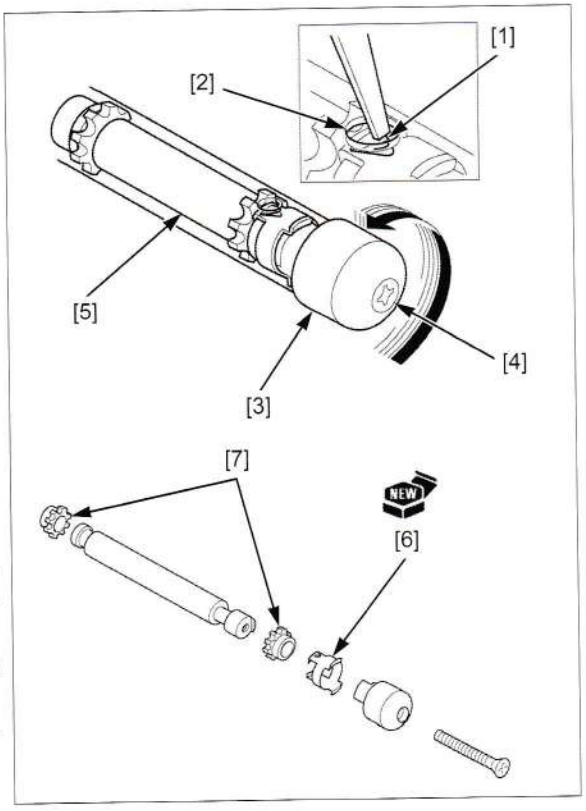
Install the rubber cushions and a new retainer onto the inner weight, aligning the inner retainer tabs with the cushion slit.

Temporarily install the handlebar weight with the screw, aligning the flats.

Insert the weight assembly into the handlebar. Turn the handlebar weight and hook the retainer tab with the hole in the handlebar to secure the inner weight.

Remove the screw while holding the handlebar weight securely.

Install the left handlebar grip and throttle grip (page 15-9).



FRONT WHEEL

REMOVAL/INSTALLATION

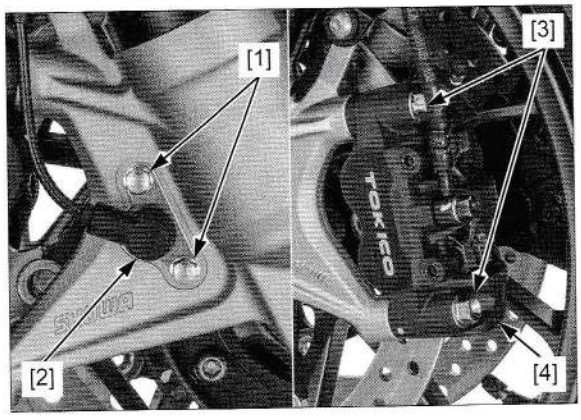
Remove the following:

Support the brake caliper so it does not hang from the brake hose. Do not twist the brake hose.

- two bolts [1] (II AC, III CM types)
- front wheel speed sensor [2] (II AC, III CM types)
- four bolts [3]
- front brake calipers [4]

NOTE:

- Cover the speed sensor to avoid damaging it.
- Do not operate the brake lever after removing the calipers.



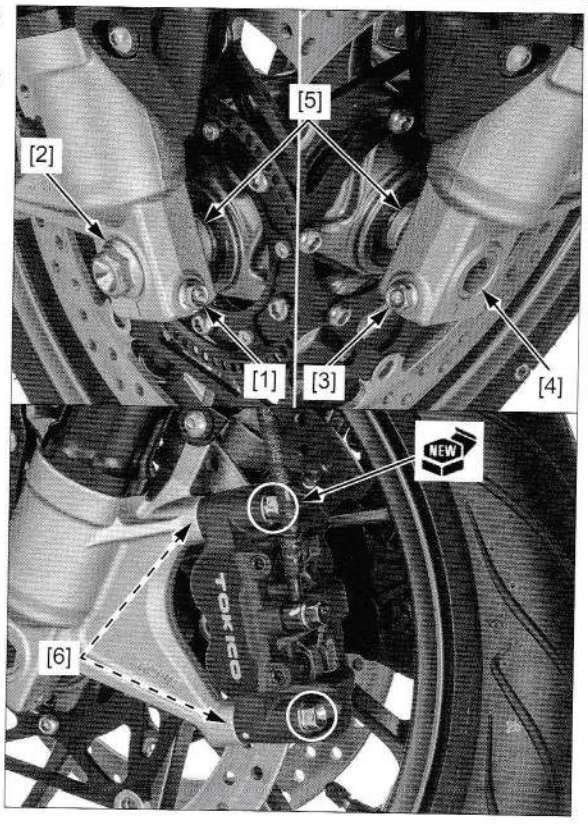
Loosen the right axle pinch bolt [1] and remove the axle bolt [2].

Support the motorcycle securely using a hoist or equivalent and raise the front wheel off the ground.

Loosen the left axle pinch bolt [3].

Pull the axle [4] out and remove the front wheel.

Remove the side collars [5].



Install the side collars.

Place the wheel between the fork legs. Carefully align the axle holes and insert the axle from the left side until it is flush with the fork leg.

Hold the axle and tighten the axle bolt to the specified torque.

TORQUE: 59 N·m (6.0 kgf·m, 44 lbf·ft)

Tighten the right axle pinch bolt to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

Make sure the collars [6] are installed in the fork leg.

Install the brake calipers with new mounting bolts and tighten them to the specified torque.

TORQUE: 45 N·m (4.6 kgf·m, 33 lbf·ft)

With the front brake applied, pump the forks up and down several times to seat the axle and check the brake operation.

Make sure the axle end is flush with the fork leg.

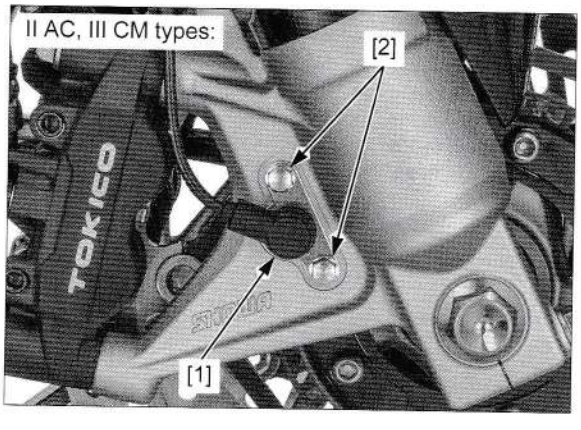
Tighten the left axle pinch bolt to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

II AC, III CM types: Wipe the tip of the front wheel speed sensor [1] and mounting area to remove any foreign material.

Install the wheel speed sensor and tighten the two bolts [2].

Check the air gap between the wheel speed sensor and pulser ring (page 18-21).



INSPECTION

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.

Inspect the following parts for damage, abnormal wear, deformation, or bends.

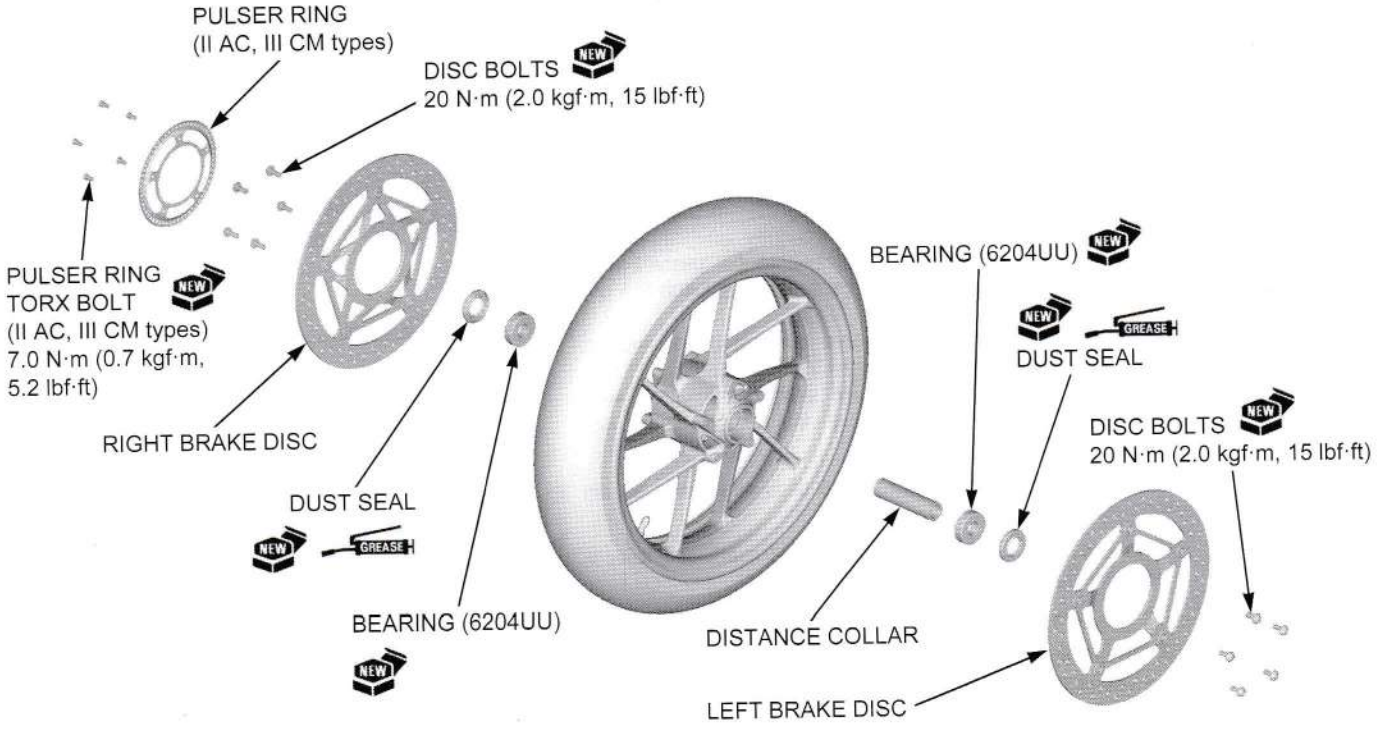
- front axle
- spoke
- wheel rim

Measure each part according to FRONT WHEEL/ SUSPENSION/STEERING SPECIFICATIONS (page 1-9).

Replace any part if it is out of service limit.

DISASSEMBLY/ASSEMBLY

- Install each dust seal with the flat side facing out so that it is flush with the wheel hub.
- Install the brake disc with the rotation mark (arrow) facing out.



BEARING REPLACEMENT

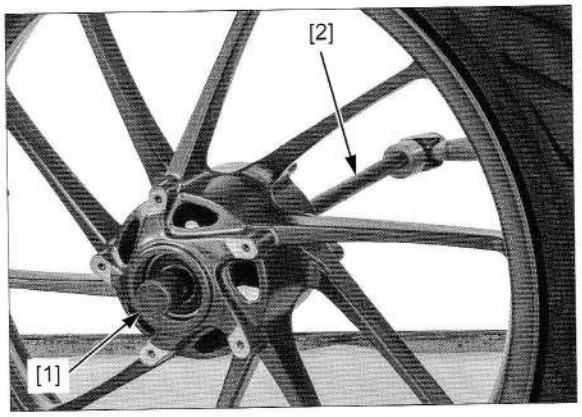
Install the remover head [1] into the bearing.

From the opposite side of the wheel, install the bearing remover shaft [2] and drive the bearing out of the wheel hub.

TOOLS:

Bearing remover head, 20 mm	**07746-0050600**
Bearing remover shaft	**07746-0050100**

Remove the distance collar and drive out the other bearing.



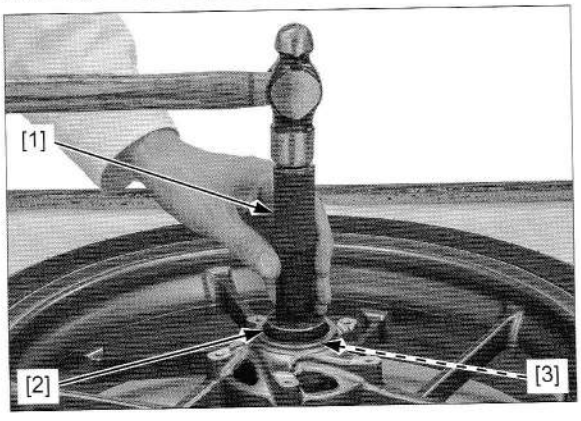
Drive in a new right side bearing (pulser ring side) squarely with the marked side facing up until it is fully seated.

Install the distance collar.

Drive in a new left side bearing squarely with the marked side facing up until it is fully seated.

TOOLS:

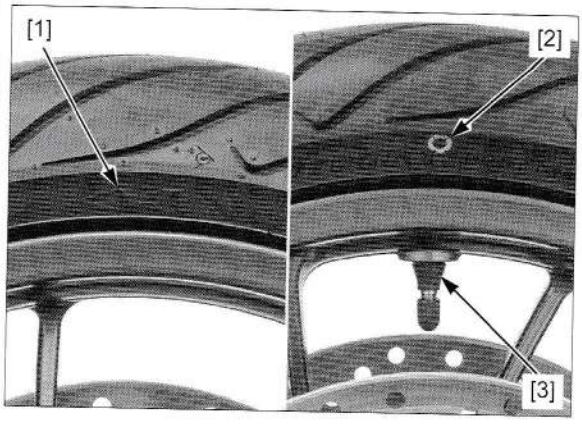
[1] Driver	**07749-0010000**
[2] Attachment, 42 x 47 mm	**07746-0010300**
[3] Pilot, 20 mm	**07746-0040500**



WHEEL BALANCE

NOTE:

- Mount the tire with the arrow mark [1] facing in the direction of rotation.
- For optimum balance, the tire balance mark [2] (light mass point: a paint dot on the side wall) must be located next to the valve stem [3]. Remount the tire if necessary.
- The wheel balance must be checked when the tire is remounted.
- Stick-type balance weights should be used on this motorcycle. Use genuine Honda balance weights.
  - Before installing the weights, remove any adhesive from the rim thoroughly and clean the area where new weights are to be placed with degreasing agent. Take care not to scratch the rim surface.
  - Do not touch the adhesive surface of the weight with your bare hands when installing.
  - The balance weights are always replaced with new ones whenever they are removed. Do not reuse them.



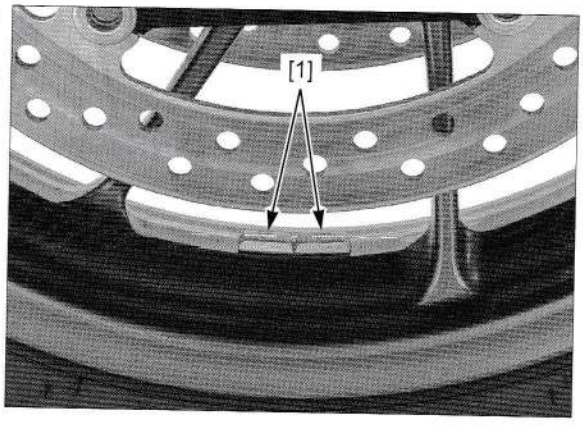
Mount the wheel, tire and brake disc assembly on an inspection stand.

Spin the wheel, allow it to stop, and mark the lowest (heaviest) part of the wheel with chalk.

Do this two or three times to verify the heaviest area.

If the wheel is balanced, it will not stop consistently in the same position.

To balance the wheel, install the wheel weights [1] on the highest 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 wheel.



Press the weights by your hands firmly and make sure they do not come off the rim.

NOTE:

- The weights are attached lengthwise to the center of the rim as shown.

FORK

REMOVAL

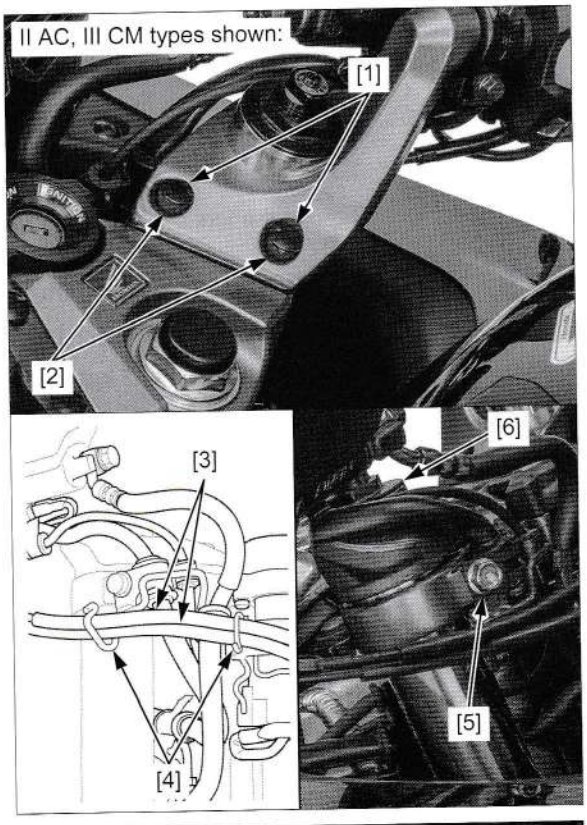
Remove the front fender (page 2-10).

Remove the bolt caps [1] and the handlebar bolts [2].

Release the throttle cables [3] from the guides [4]

Remove the top bridge pinch bolt [5] and guide.

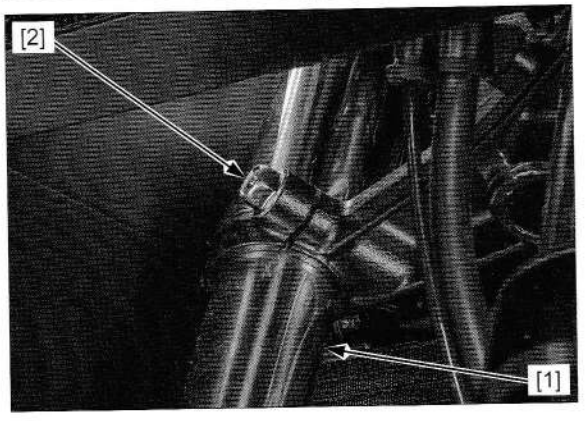
When the fork is ready to be disassembled, loosen the fork cap [6], but do not remove it.



Support the fork leg [1] securely.

Keep the master cylinder reservoir on the handlebar upright to prevent air from entering the hydraulic system.

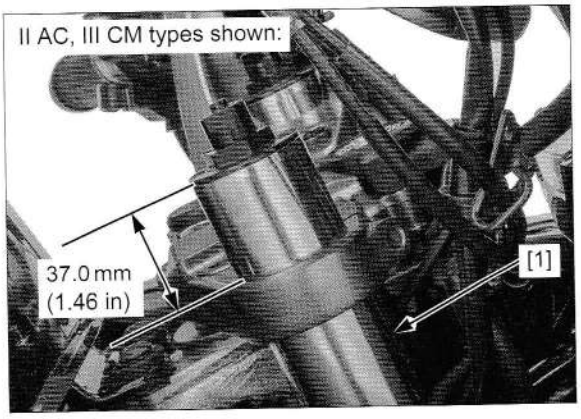
Loosen the bottom bridge pinch bolt [2] and pull the fork leg down, then remove it out of the handlebar, and top and bottom bridges.



INSTALLATION

Mark the fork tube at the specified height from the fork tube end, using a marker.

Insert the fork leg [1] into the bottom and top bridges so the fork tube height from the top bridge is specified value (at the mark), then temporarily tighten the bottom bridge pinch bolt.



Clean the mating surface of the handlebar and top bridge.

Install the handlebar [1] over the fork tube.

Install the top bridge pinch bolt [2] with the guide [3].

Install the throttle cables [4] into the guides [5].

Tighten the bottom bridge pinch bolt [6] to the specified torque.

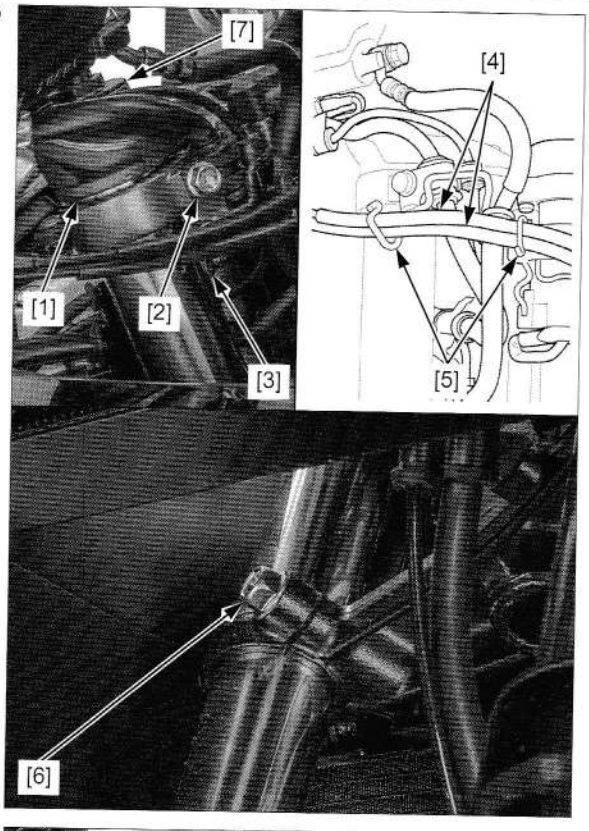
TORQUE: 49 N·m (5.0 kgf·m, 39 lbf·ft)

Tighten the fork cap [7] to the specified torque if it was removed.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)

Tighten the top bridge pinch bolt to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

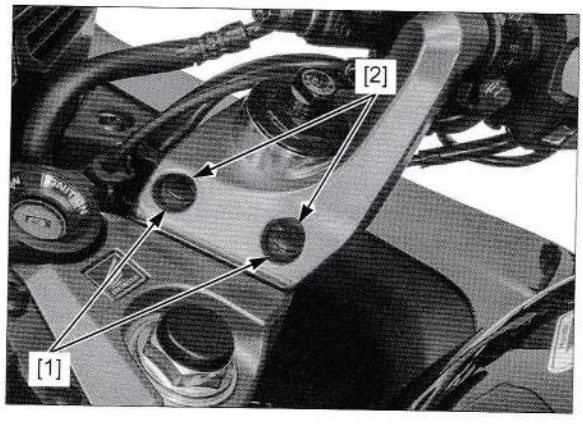


Install the handlebar bolts [1] and tighten them to the specified torque.

TORQUE: 32 N·m (3.3 kgf·m, 24 lbf·ft)

Install the bolt caps [2].

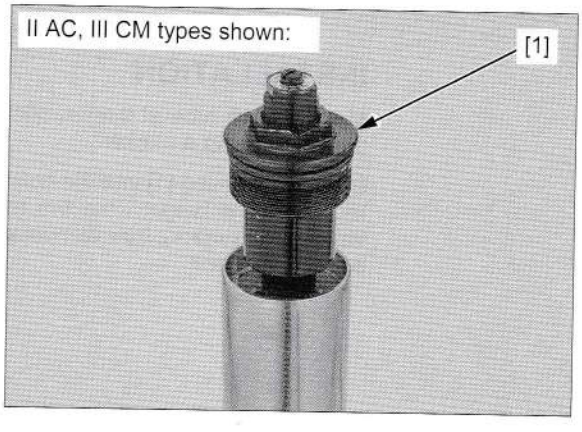
Install the front fender (page 2-10).



DISASSEMBLY

Fork cap is under spring pressure; use care when loosing it.

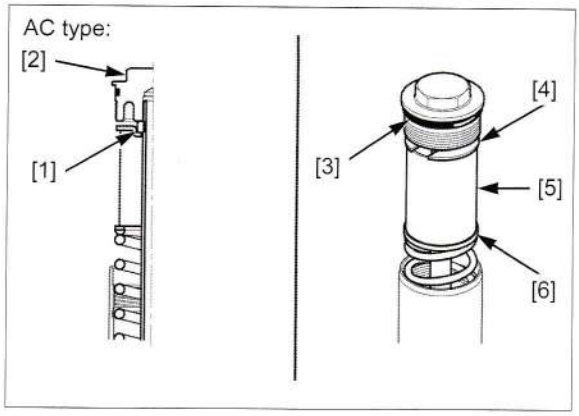
Remove the fork cap [1] from the fork tube.



AC type: Hold the lock nut [1] and loosen the fork cap [2].

Remove the following:

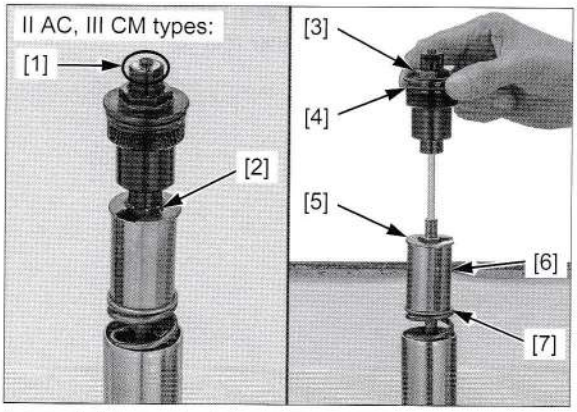
- fork cap
- O-ring [3]
- spring stopper [4] (while compressing the fork spiring)
- spring collar [5]
- spring seat [6]



II AC, III CM types: Hold the spring pre-load adjuster (width across flats; 14 mm) [1] and loosen the lock nut [2].

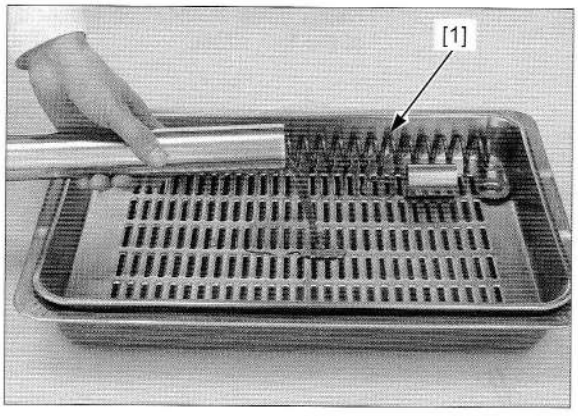
Remove the following:

- fork cap/adjuster rod [3] (from the damper rod)
- O-ring [4]
- spring stopper [5] (while compressing the fork spiring)
- spring collar [6]
- spring seat [7]



- fork spring [1]

Pour out the fork fluid by pumping the fork tube and damper rod several times.

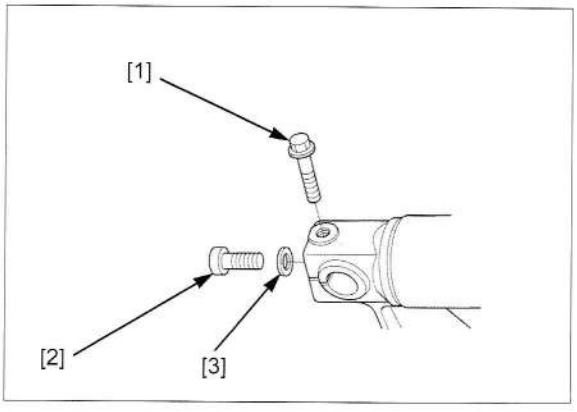


Hold the fork slider in a vise with soft jaws or shop towels.

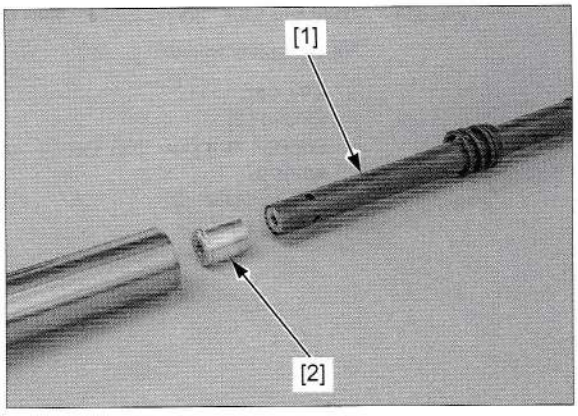
Remove the following:

If the fork damper turns with the socket bolt, temporarily install the above components.

- axle pinch bolt [1]
- fork socket bolt [2]
- sealing washer [3]

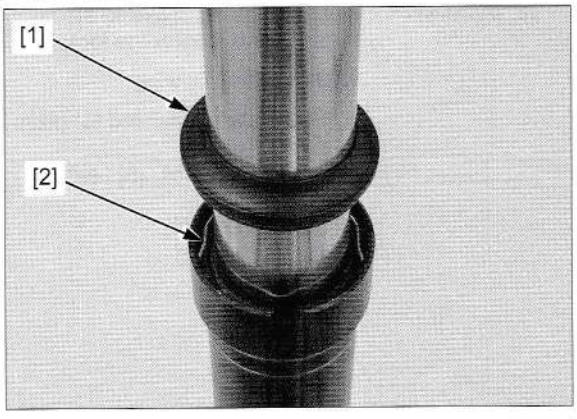


– fork damper [1]
– oil lock piece [2]

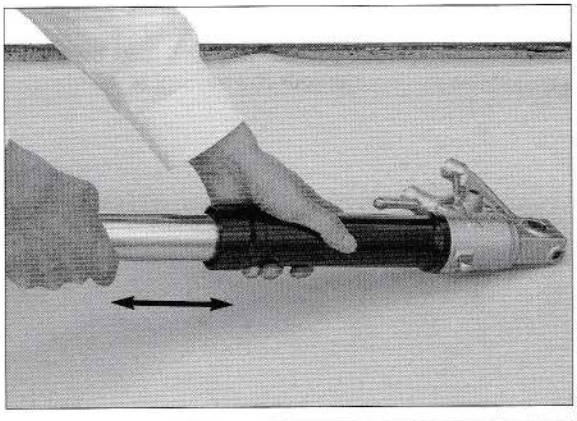


Be careful not to scratch the fork tube.

– dust seal [1]
– stopper ring [2]



Using quick successive motions, pull the fork tube out of the fork slider.

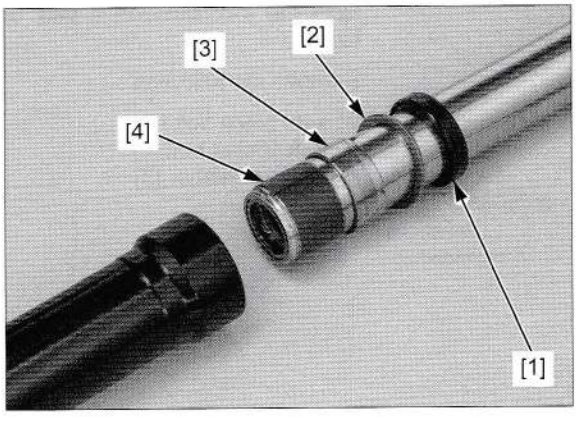


Remove the following:

– oil seal [1]
– back-up ring [2]
– guide bushing [3]

Do not remove the fork tube bushing, unless it is necessary to replace with a new one (page 15-21).

Carefully remove the fork tube bushing [4] by prying the slit with a flat blade screwdriver until the bushing can be pulled off by hand.



INSPECTION

FORK SPRING

Inspect the following parts for damage, abnormal wear, bends, deformation, scoring, or teflon coating wear (bushings).

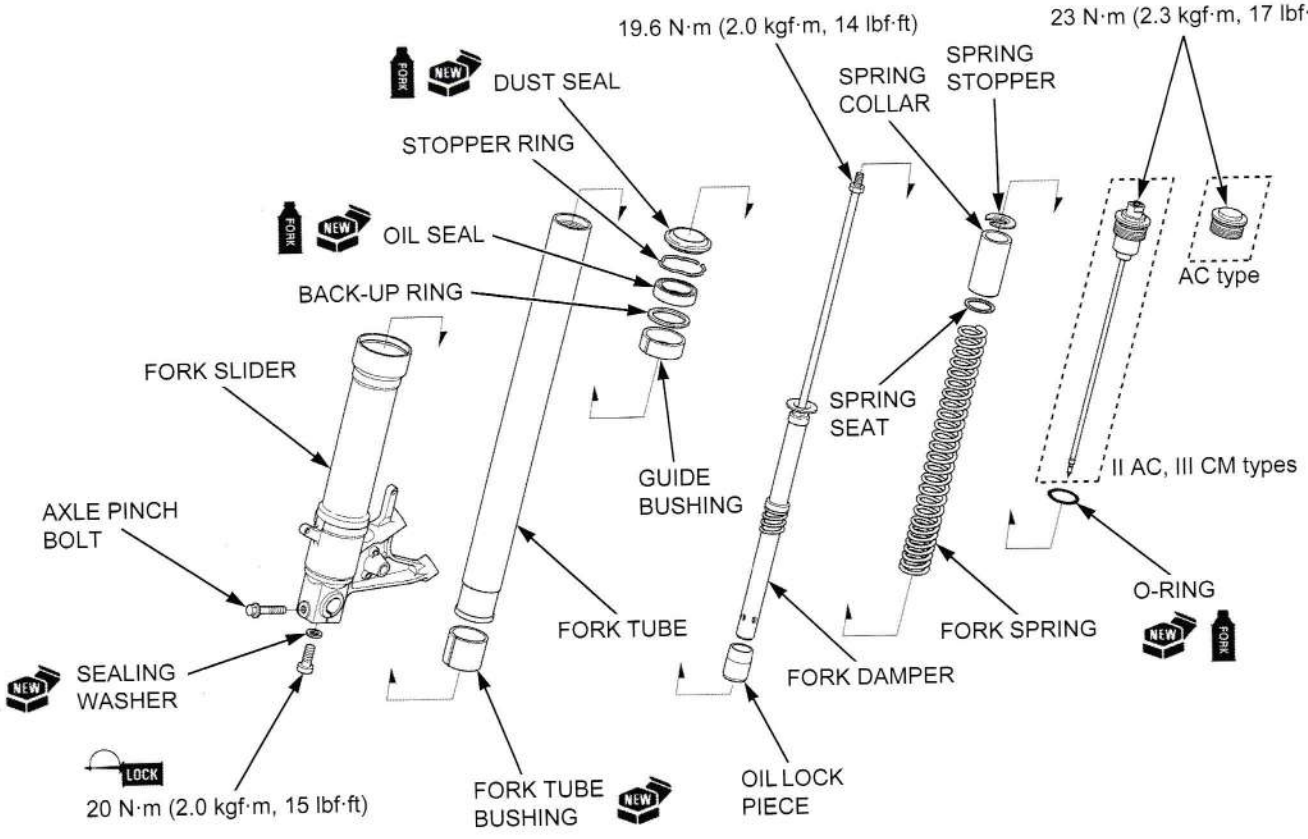
- fork tube
- fork slider
- fork spring
- rebound spring
- fork damper
- adjuster rod/needle
- oil lock piece
- guide bushing
- fork tube bushing
- back-up ring

Measure the each part according to FRONT WHEEL/ SUSPENSION/STEERING SPECIFICATIONS (page 1-9).

Replace any part if it is out of service limit.

ASSEMBLY

Before assembly, wash all parts with a high flash point or non-flammable solvent and wipe them off completely.



Be careful not to damage the coating on the bushing. Do not spread open the bushing more than necessary.

Install a new fork tube bushing [1] if it has been removed.

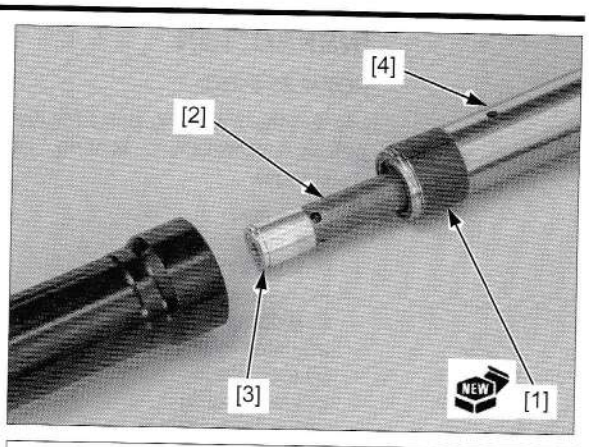
NOTE:

- Remove the burrs from the bushing mating surface, being careful not to peel off the coating.

Install the following:

- fork damper [2] (into the fork tube)
- oil lock piece [3] (onto the fork damper)

Install the fork tube [4] into the fork slider.



Hold the fork slider in a vise with soft jaws or shop towels.

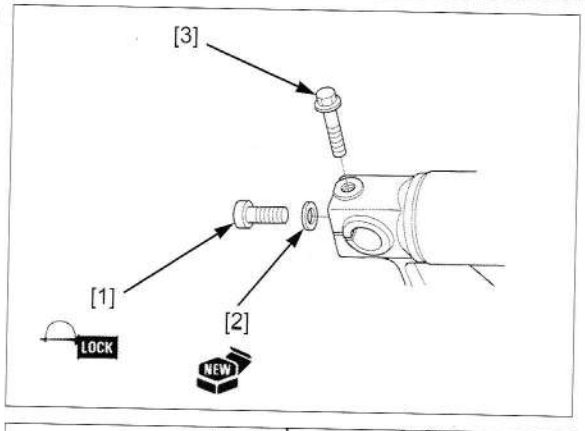
Apply locking agent to the threads of the fork socket bolt [1].

If the damper turns with the socket bolt, temporarily install the fork spring, spring seat, collar, stopper and fork cap/rod.

Install the socket bolt with a new sealing washer [2] and tighten it to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)

Install the axle pinch bolt [3].



Place the guide bushing [1] over the fork tube and rest it on the slider. Put the back-up ring [2] and an old bushing or equivalent tool on the guide bushing.

Drive the bushing into place, using the special tools.

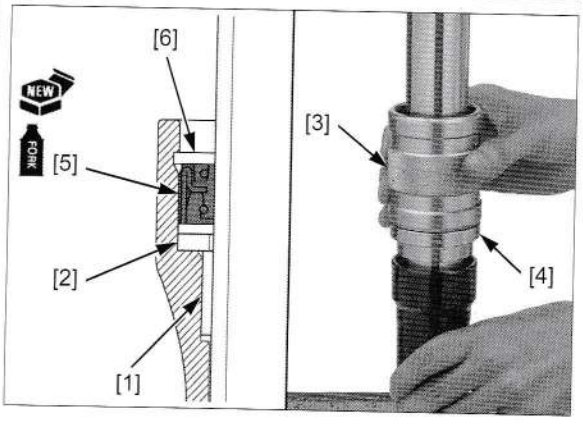
TOOLS:

[3] Fork seal driver **07947-KA50100**
[4] Fork seal driver attachment, 43 mm **07947-KA40200**

Wrap vinyl tape around the fork tube top end to avoid damaging the oil seal lip.

Apply fork fluid to the lips of a new oil seal [5] and install it with the marking facing up.

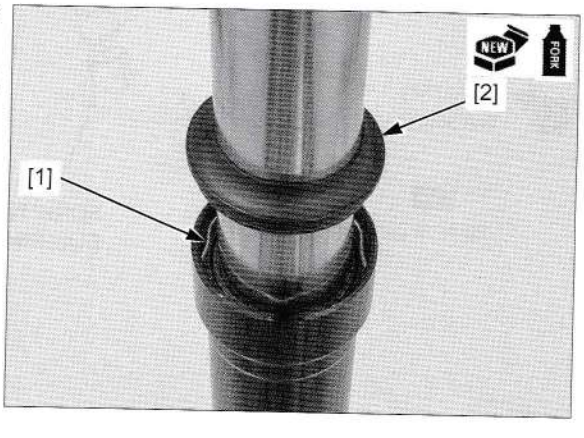
Drive the oil seal until the stopper ring groove [6] is visible using the same tools.



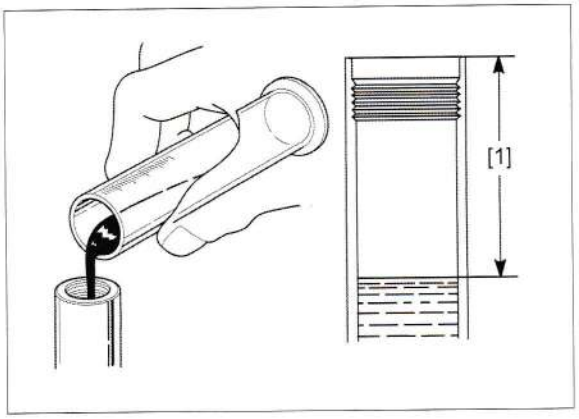
Be careful not to scratch the fork tube.

Install the stopper ring [1] into the groove in the fork slider.

Apply fork fluid to the lips of a new dust seal [2] and install it.



Pour the specified amount of recommended fork fluid into the fork tube.



RECOMMENDED FORK FLUID:
Pro Honda HP Fork Oil SS-47 (10W)

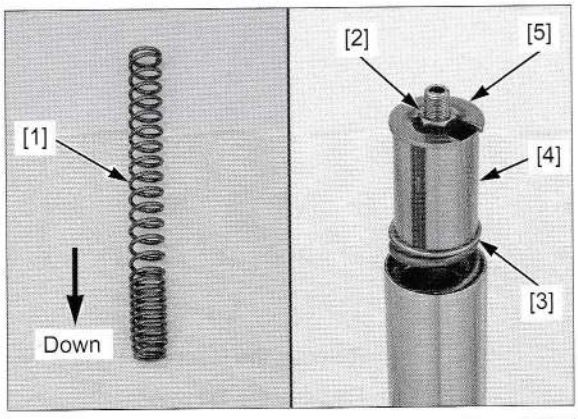
FORK FLUID CAPACITY:
AC type:
527 ± 2.5 cm³ (17.8 ± 0.08 US oz, 18.6 ± 0.09 Imp oz)
II AC, III CM types:
506 ± 2.5 cm³ (17.1 ± 0.08 US oz, 17.8 ± 0.09 Imp oz)

Slowly pump the fork tube and damper rod 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 end of the fork tube.

[1] FLUID LEVEL:
AC type: 97 mm (3.8 in)
II AC, III CM types: 108 mm (4.3 in)

Pull the fork tube up and install the fork spring [1] with the tightly wound coil side facing down.



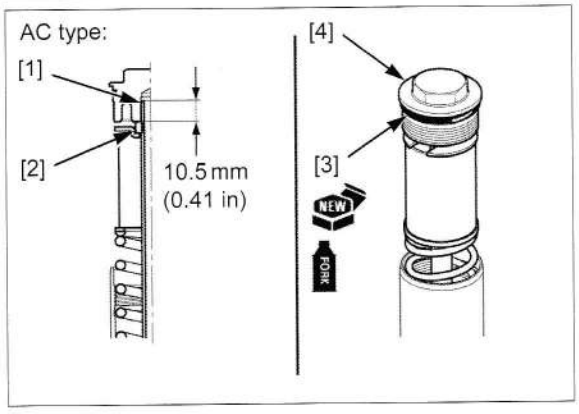
Screw the lock nut [2] to lower it all the way.

Install the spring seat [3] and collar [4].

Install the spring stopper [5] while compressing the fork spring.

AC type:

Adjust the lock nut [1] position so the thread length between the damper rod [2] end and nut is 10.5 mm (0.41 in).



Coat a new O-ring [3] with fork fluid and install it into the groove in the fork cap [4].

Install the fork cap onto the damper rod and screw it until it is just touches the lock nut.

Hold the lock nut and tighten the fork cap to the specified torque.

TORQUE: 19.6 N·m (2.0 kgf·m, 14 lbf·ft)

Tighten the fork cap after installing the fork tube into the fork bridges.

Install the fork cap into the fork tube.

II AC, III CM types: Coat a new O-ring [1] with fork fluid and install it into the groove in the fork cap.

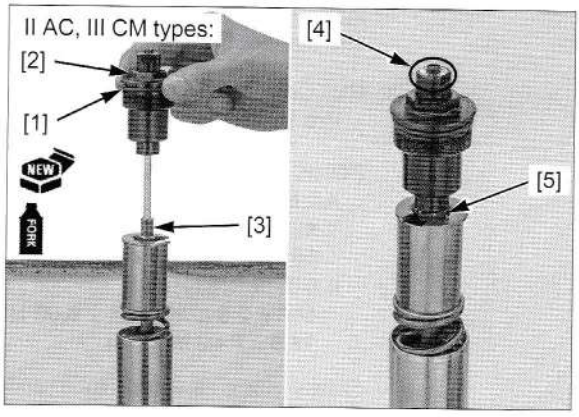
Insert the fork cap/adjuster rod [2] into the damper rod [3] and screw the cap until it is just touches the damper rod end.

Hold the spring pre-load adjuster (width across flats; 14 mm) [4] and tighten the lock nut [5] to the specified torque.

TORQUE: 19.6 N·m (2.0 kgf·m, 14 lbf·ft)

Tighten the fork cap after installing the fork tube into the fork bridges.

Install the fork cap into the fork tube.

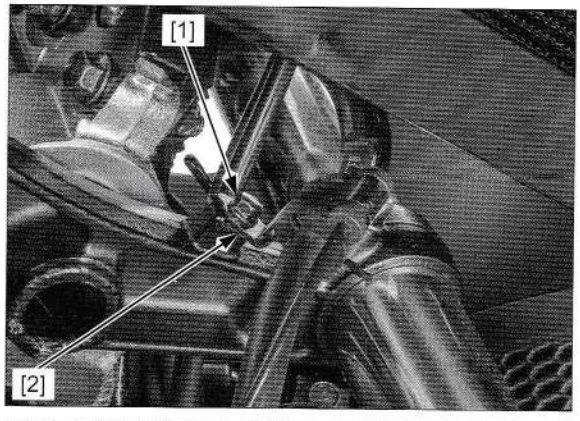


STEERING STEM

REMOVAL

Remove the front fender (page 2-10).

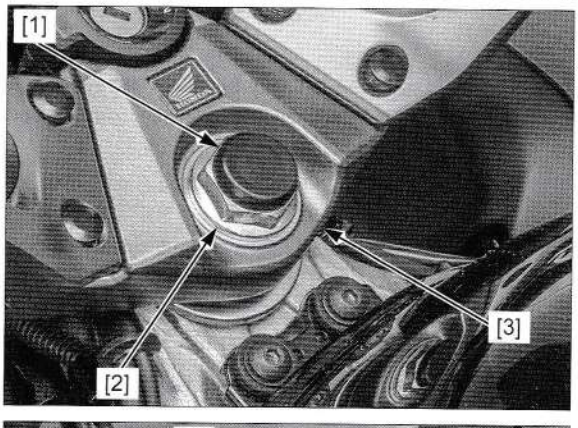
Remove the bolt [1] and clamp [2].



Remove the stem cap [1] and loosen the stem nut [2].

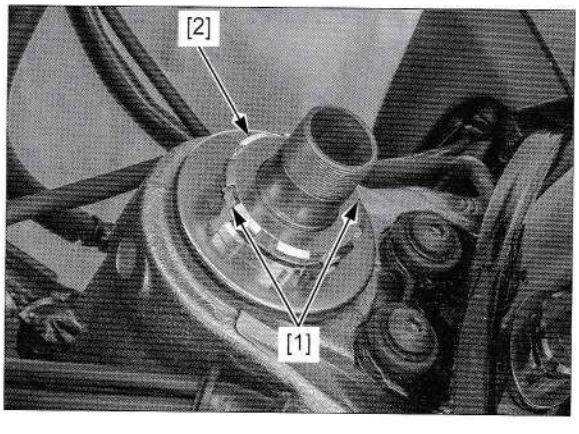
Remove the following:

- fork legs (page 15-17)
- stem nut
- top bridge [3]



Straighten the lock washer tabs [1].

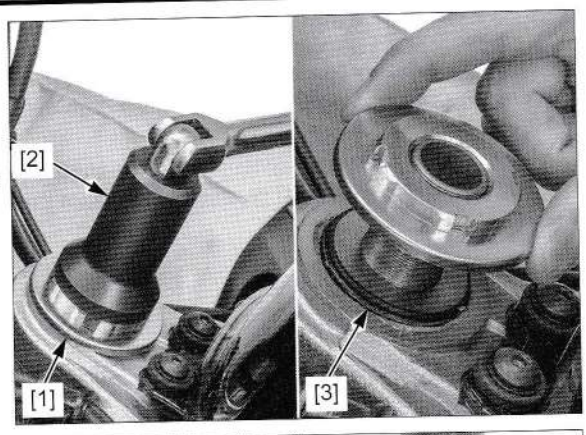
Remove the lock nut [2] and lock washer.



Loosen the steering bearing adjustment nut [1] using the special tool.

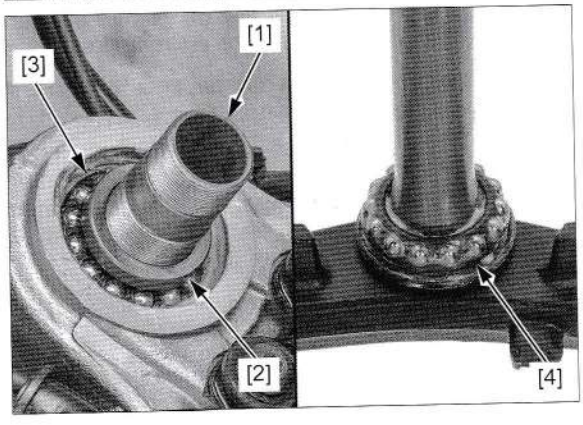
TOOL:
[2] Steering stem socket 07916-3710101

While holding the steering stem, remove the adjustment nut and upper dust seal [3].



Remove the following:

- steering stem [1]
- upper inner race [2]
- upper steering bearing [3]
- lower steering bearing [4]



BEARING REPLACEMENT

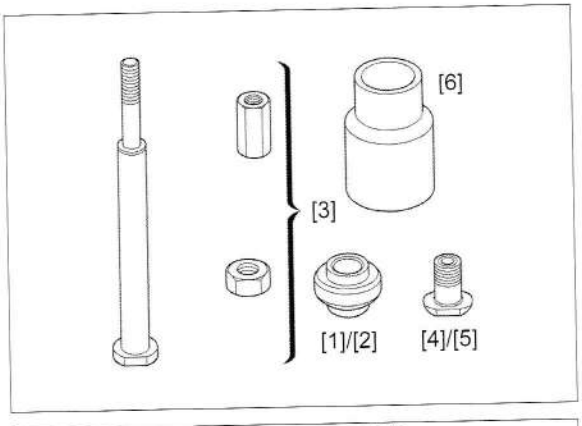
Except U.S.A.

Always replace the bearings and races as a set.

Replace the races using the Ball Race Remover Set as described in the following procedure.

TOOLS:

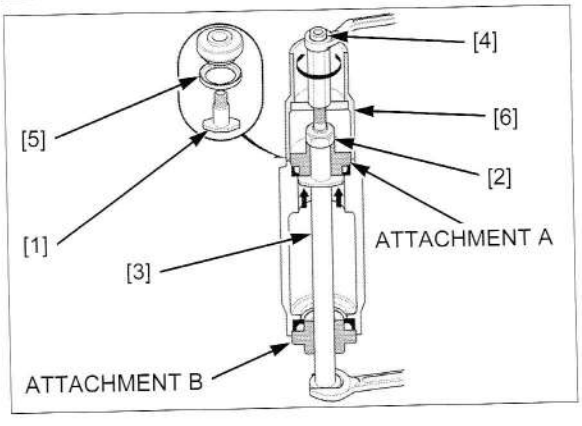
Ball race remover set	**07946-KM90002**
[1] Driver attachment, A	**07946-KM90100**
[2] Driver attachment, B	**07946-KM90200**
[3] Driver shaft assembly	**07946-KM90301**
[4] Bearing remover, A	**07946-KM90401**
[5] Bearing remover, B	**07946-KM90500**
[6] Assembly base	**07946-KM90600**



Note the installation direction of the assembly base [6], the large I.D. side facing down.

Install the ball race remover into the head pipe as shown.
Align bearing remover A [1] with the groove in the steering head. Lightly tighten the nut B [2] with a wrench.

While holding the driver shaft [3] with a wrench, turn the nut A [4] gradually to remove the upper outer race [5].

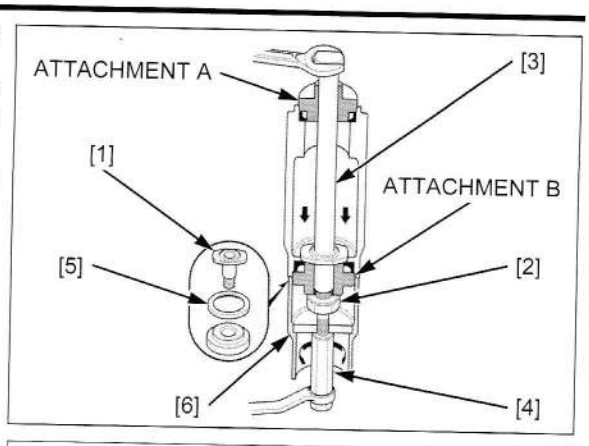


Note the installation direction of the assembly base [6], the large I.D. side facing up.

Install the ball race remover into the steering head pipe as shown.

Align bearing remover B [1] with the groove in the steering head. Lightly tighten the nut B [2] with a wrench.

While holding the driver shaft [3] with a wrench, turn the nut A [4] gradually to remove the lower outer race [5].

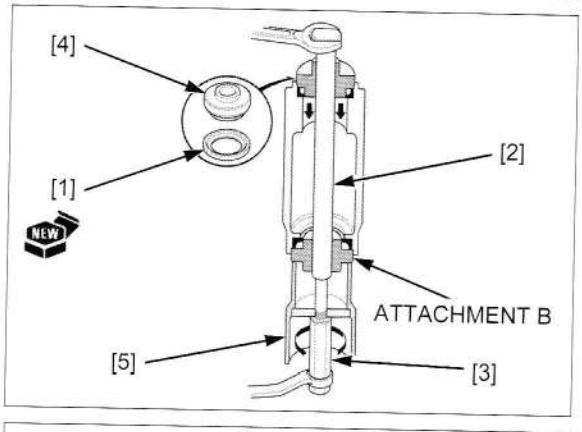


Remove any burrs from the outer race [1] installation surface of the steering head.

Note the installation direction of the assembly base [5], the small I.D. side facing up.

Install a new upper outer race and the ball race remover as shown.

While holding the driver shaft [2] with a wrench and turn the nut A [3] gradually until the groove in driver attachment A [4] aligns with the upper end of the steering head. This will allow you to install the upper outer race.

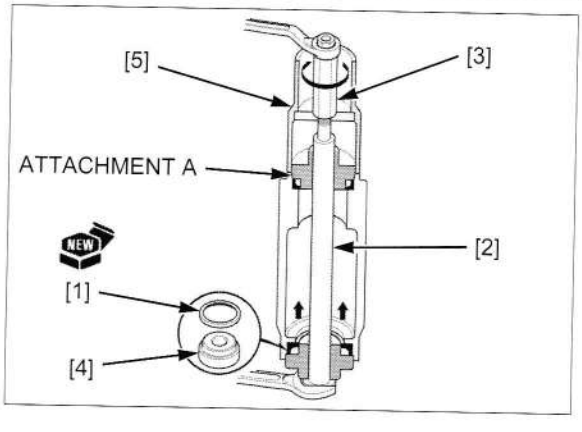


Remove any burrs from the outer race [1] installation surface of the steering head.

Note the installation direction of the assembly base [5], the large I.D. side facing down.

Install a new lower outer race and ball race remover as shown.

While holding the driver shaft [2] with a wrench and turn the nut A [3] gradually until the groove in driver attachment B [4] aligns with the lower end of the steering head. This will allow you to install the lower outer race.



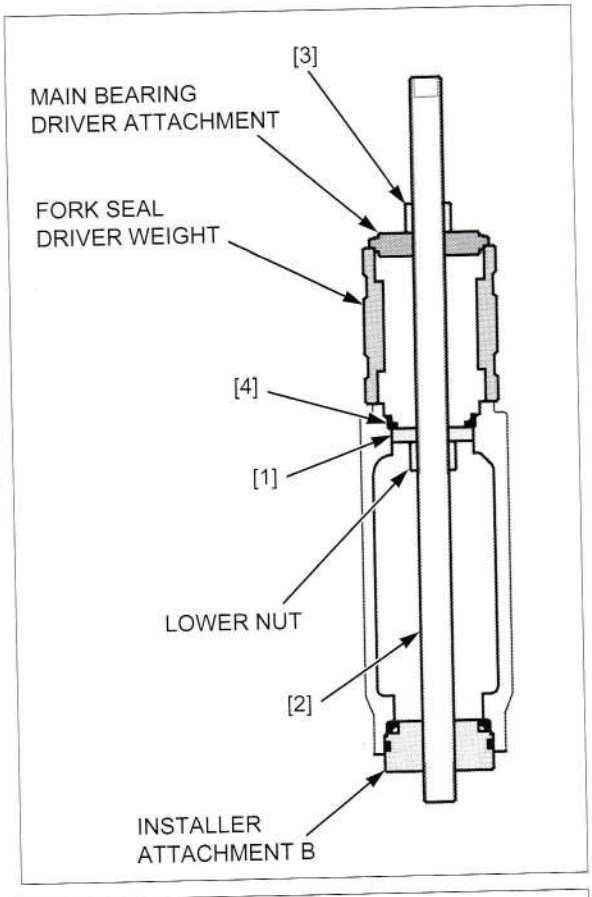
U.S.A. only:

Place the steering head bearing outer races using the special tools listed below.

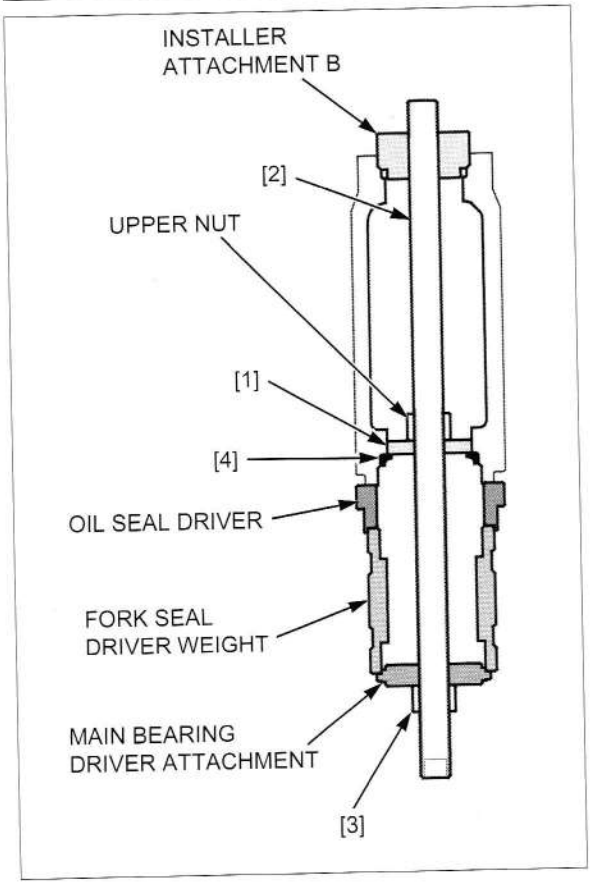
TOOLS:

Main bearing driver attachment	**07946-ME90200**
Fork seal driver weight	**07947-KA50100**
Oil seal driver	**07965-MA60000**
Installer shaft	**07VMF-KZ30200**
Installer attachment A	**07VMF-MAT0100**
Installer attachment B	**07VMF-MAT0200**
Remover attachment A	**07VMF-MAT0300**
Remover attachment B	**07VMF-MAT0400**

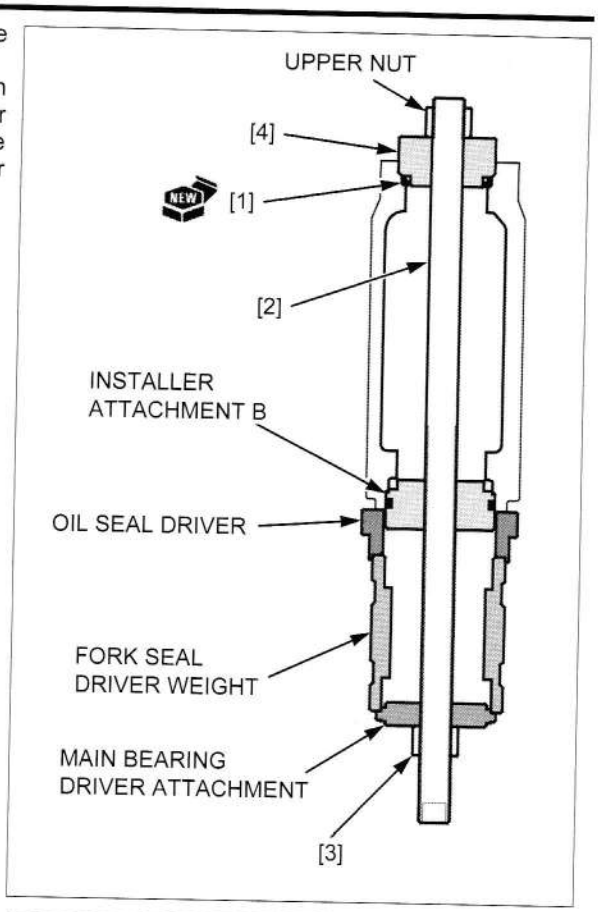
Install the special tools into the steering head pipe as shown.
Align remover attachment A [1] with the groove in the steering head.
While holding the installer shaft [2] with the wrench, turn the upper nut [3] gradually to remove the upper bearing outer race [4].



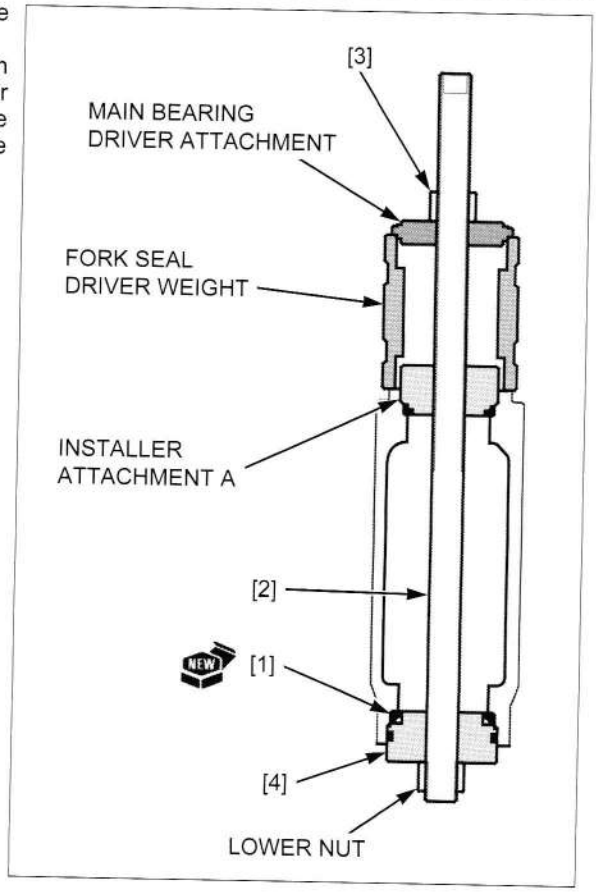
Install the special tools into the steering head pipe as shown.
Align remover attachment B [1] with the groove in the steering head.
While holding the installer shaft [2] with the wrench, turn the lower nut [3] gradually to remove the lower bearing outer race [4].



Install a new upper bearing outer race [1] and the special tools as shown.
While holding the installer shaft [2] with the wrench, turn the lower nut [3] gradually until the groove in installer attachment A [4] aligns with the upper end of the steering head. This will allow you to install the upper bearing outer race.



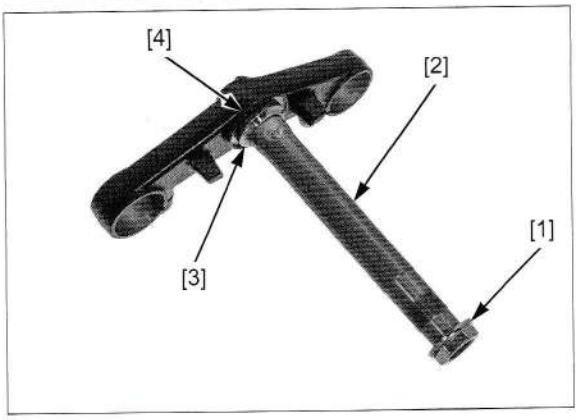
Install a new lower bearing outer race [1] and the special tools as shown.
While holding the installer shaft [2] with the wrench, turn the upper nut [3] gradually until the groove in installer attachment B [4] aligns with the lower end of the steering head. This will allow the installation of the lower bearing outer race.



Install the stem nut [1] onto the steering stem [2] to prevent the threads from being damaged when removing the lower inner race [3].

Remove the lower inner race with a chisel or equivalent tool, being careful not to damage the stem.

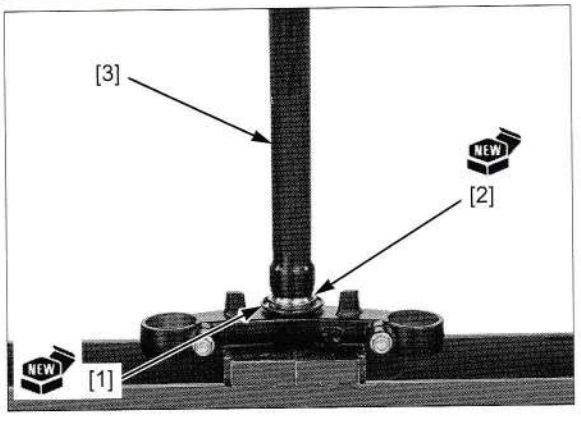
Remove the lower dust seal [4].



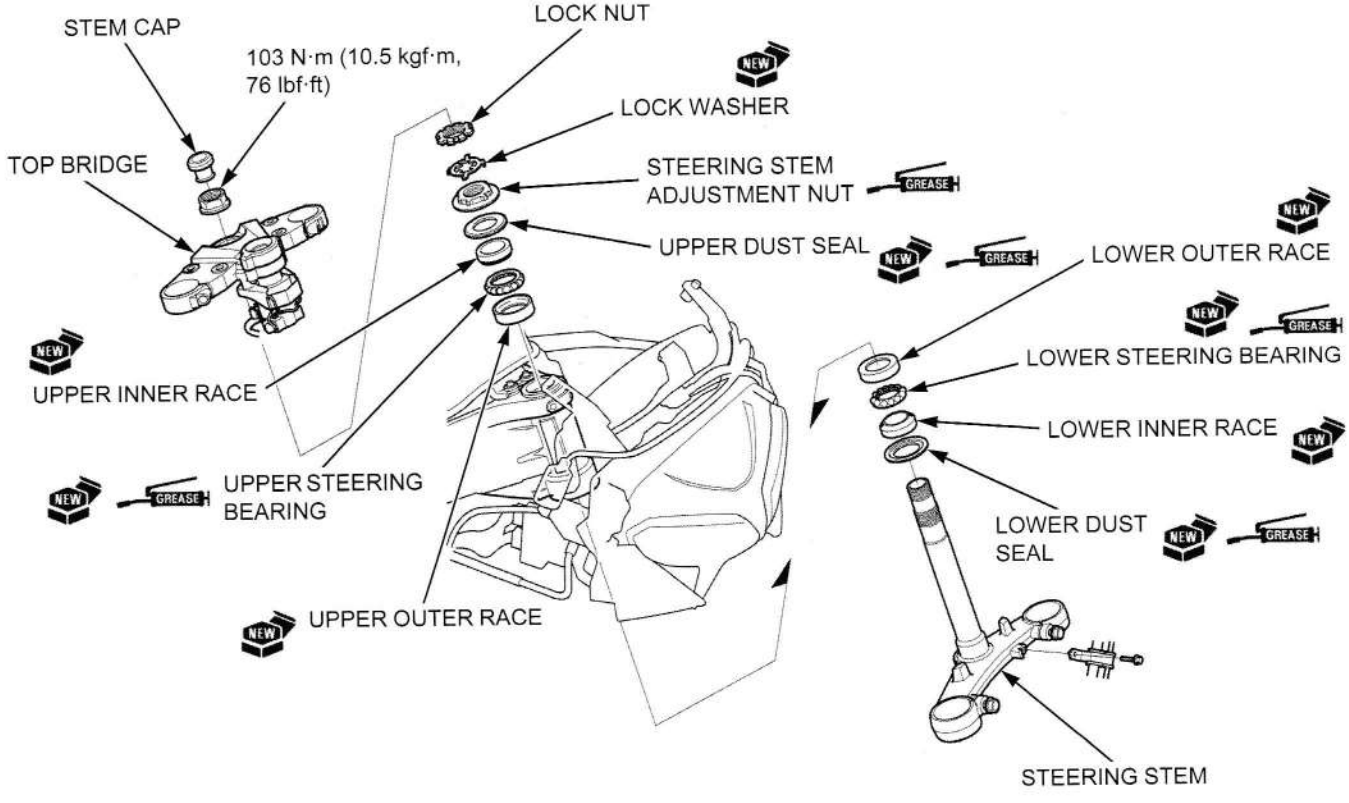
Install a new lower dust seal [1] onto the steering stem.

Press a new lower inner race [2] using the special tool.

TOOL:
[3] Steering stem driver 07946-MB00000



INSTALLATION



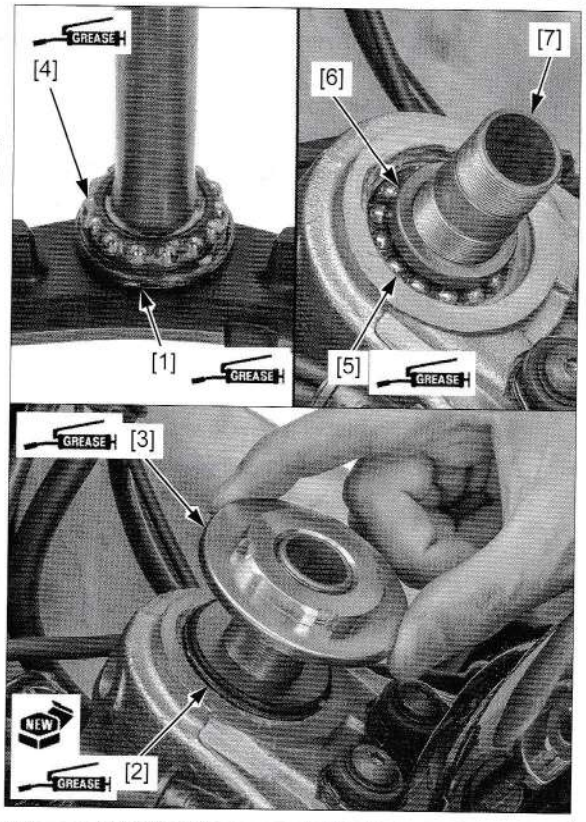
Apply specified grease to the following (page 1-18):

- lip of the lower dust seal [1]
- lip of a new upper dust seal [2]
- threads of the adjustment nut [3]

Apply 3 – 5 g (0.1 – 0.2 oz) (per each bearing) of specified grease to the rotating areas of steering bearings (page 1-18).

Install the following:

- lower steering bearing [4]
- upper steering bearing [5]
- upper inner race [6]
- steering stem [7]
- upper dust seal
- adjustment nut

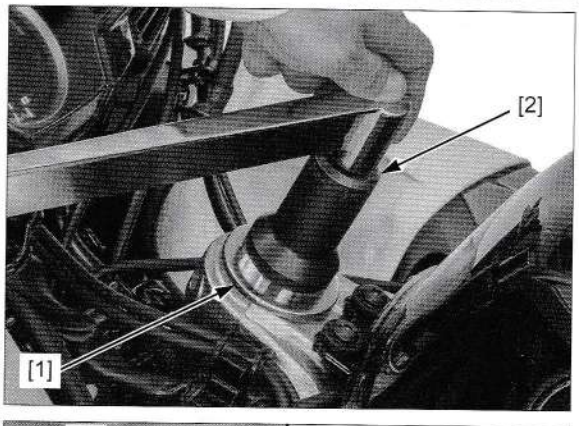


1. Tighten the adjustment nut [1] to the specified torque using the special tool.

   TOOL:
   [2] Steering stem socket 07916-3710101

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

2. Turn the steering stem left and right, lock-to-lock at least five times to seat the bearings.
3. Retighten the adjustment nut to the same torque.

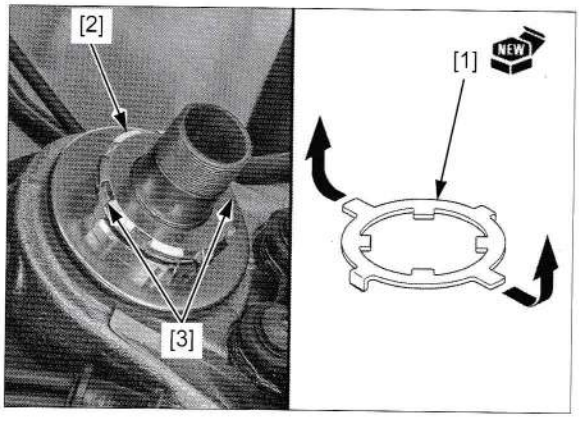


Install a new lock washer [1], aligning its bent tabs with the grooves in the adjustment nut.

Install the lock nut [2] and finger tighten it all the way.

Do not over tighten the lock nut, this will flatten the lock washer.

Further tighten the lock nut within 90° to align its grooves with the tabs of the lock washer.
Bend the lock washer tabs [3] up into the grooves in the lock nut.



Clean the threads of the stem with a degreasing agent.

Install the top bridge [1] and steering stem nut [2].

Do not tighten the top bridge pinch bolts.

Temporarily install the fork legs into the bottom and top bridges by tightening the bottom bridge pinch bolts.

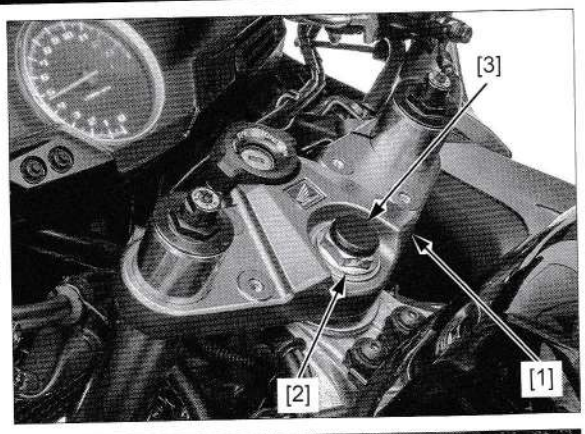
Tighten the stem nut to the specified torque.

TORQUE: 103 N·m (10.5 kgf·m, 76 lbf·ft)

Make sure the steering stem moves smoothly, without play or binding.

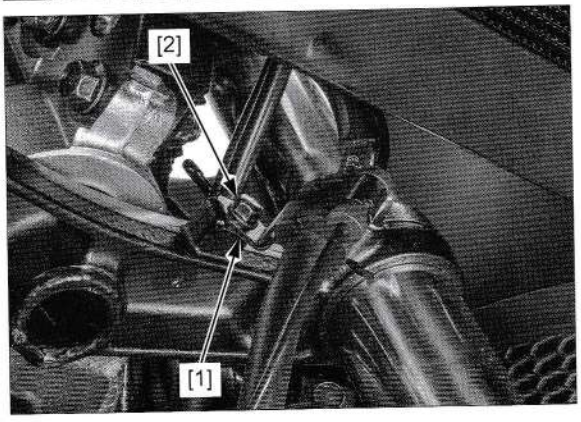
Install the stem cap [3].

Install the fork legs properly (page 15-17).



Install the clamp [1] onto the bottom bridge and tighten the bolt [2].

Install the front fender (page 2-10).



STEERING BEARING PRE-LOAD

Support the motorcycle securely using a hoist or equivalent 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.

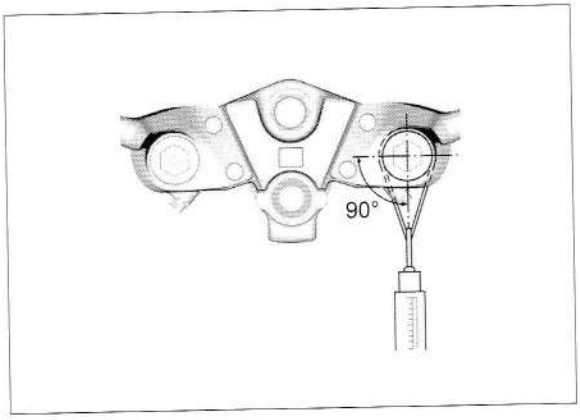
Make sure there is no cable, wire harness or hose interference.

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.

STANDARD: 9.8 – 14.7 N (1.0 – 1.5 kgf, 2.2 – 3.3 lbf)

If the readings do not fall within the limits, readjust the steering bearing adjustment nut (page 15-30).



MEMO

16. REAR WHEEL/SUSPENSION

SERVICE INFORMATION 16-2

TROUBLESHOOTING 16-4

COMPONENT LOCATION 16-5

REAR WHEEL 16-6

DRIVEN FLANGE/REAR AXLE 16-6

SUSPENSION LINKAGE/
SHOCK ABSORBER 16-13

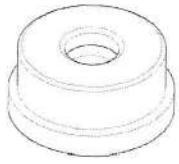
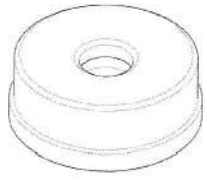
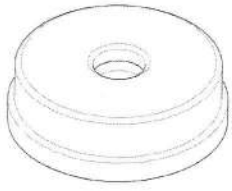
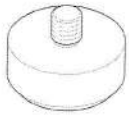
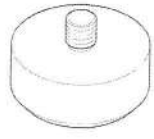
SWINGARM 16-16

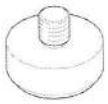
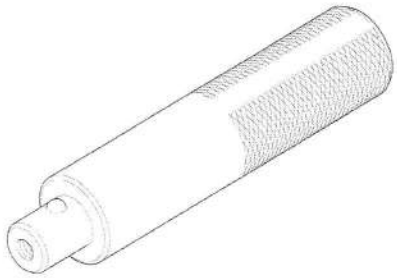
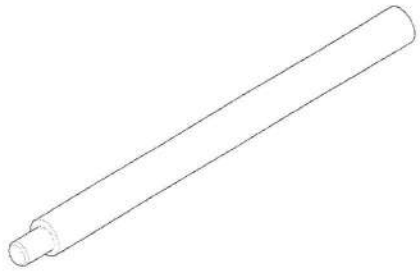
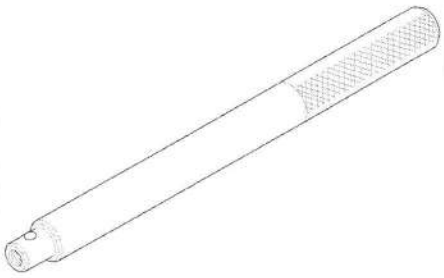
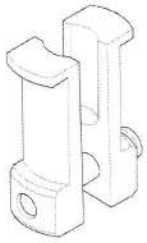
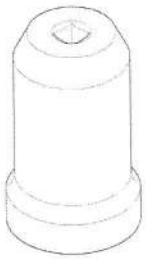
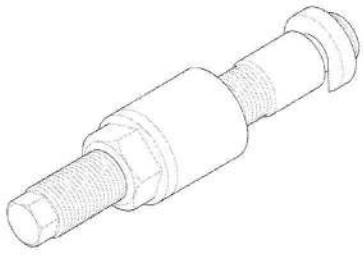
SERVICE INFORMATION

GENERAL

- A hoist or equivalent is required to support the motorcycle when servicing the rear wheel and suspension (AC type).
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Do not operate the brake pedal after removing the brake caliper when serving the rear axle.
- Use only tires marked "TUBELESS" and tubeless valves on rim marked "FOR TUBELESS".
- After servicing the axle components, check the brake operation by applying the brake pedal.
- After servicing the axle components, perform the air gap inspection (page 18-21).
- 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
- Use only genuine Honda replacement bolts and nuts for all suspension pivots and mounting points.
- For brake system service (page 17-2).

TOOLS

Attachment, 37 x 40 mm 07746-0010200 	Attachment, 42 x 47 mm 07746-0010300 	Attachment, 52 x 55 mm 07746-0010400 
Attachment, 62 x 68 mm 07746-0010500 	Attachment, 22 x 24 mm 07746-0010800 	Pilot, 17 mm 07746-0040400 
Pilot, 20 mm 07746-0040500 	Pilot, 35 mm 07746-0040800 	Pilot, 40 mm 07746-0040900 

Pilot, 28 mm 07746-0041100 	Driver 07749-0010000 	Driver shaft 07946-MJ00100  or 07946-MJ0A100 (U.S.A. only)
Driver 07949-3710001 	Needle bearing remover 07HMC-MR70100 	Socket Wrench, 46 mm 07JMA-MN50100 
Bearing remover set 07LMC-KV30100 	Attachment, 34 mm 07ZMD-MBW0100 	

TROUBLESHOOTING

Steers to one side or does not track straight
- Bent axle
- Damaged frame
- Worn swingarm pivot components

Rear wheel wobbles
- Bent rim
- Faulty tire
- Worn or damaged axle bearings
- Worn or damaged driven flange bearing
- Axle not tightened properly
- Faulty swingarm pivot bearings
- Suspension fasteners not tightened properly
- Unbalanced tire and wheel

Wheel hard to turn
- Faulty axle bearings
- Bent axle
- Faulty driven flange bearing
- Drive chain too tight (page 3-15)
- Brake drag (page 17-2)

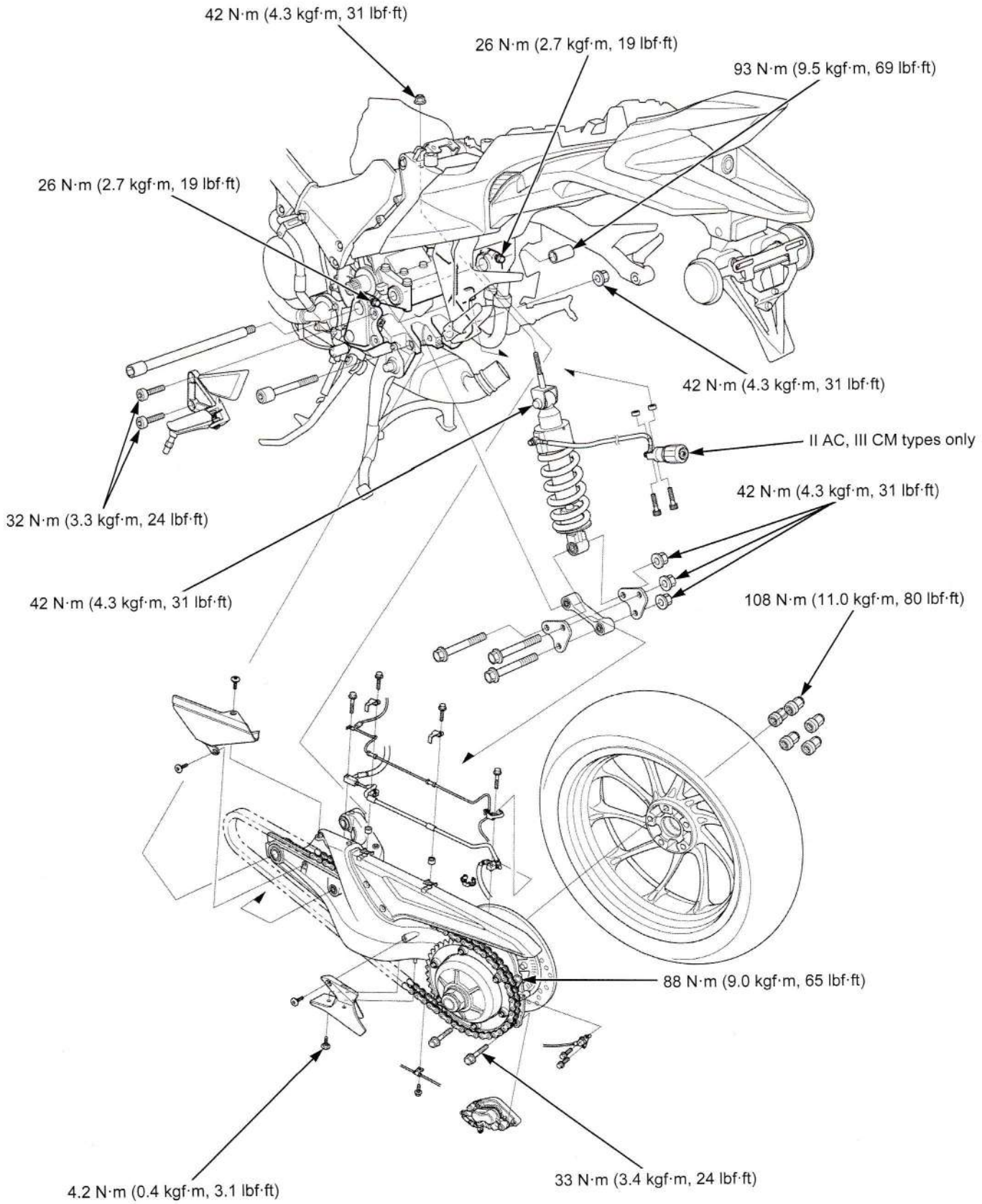
Soft suspension
- Low tire pressure
- Incorrect suspension adjustment
- Weak shock absorber spring
- Oil leakage from damper unit

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 or damaged suspension pivot bearings
- Faulty shock absorber

COMPONENT LOCATION

II AC, III CM types shown:



REAR WHEEL

REMOVAL/INSTALLATION

Remove the muffler (page 2-15).

Set the rear wheel on the ground and loosen the five wheel nuts while applying the rear brake.

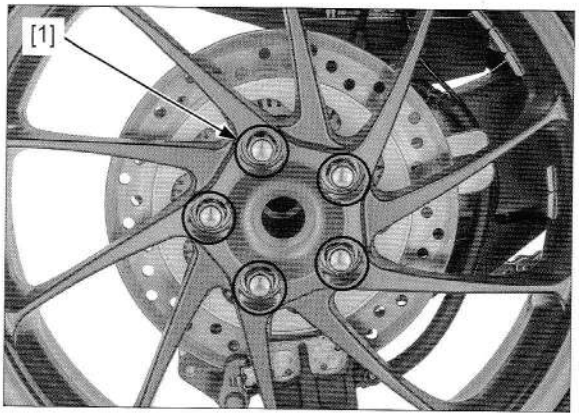
Raise the rear wheel off the ground by placing the motorcycle on its centerstand (II AC, III CM types) or supporting the motorcycle securely using a hoist or equivalent (AC type).

Remove the five wheel nuts [1] and the rear wheel.

Installation is in the reverse order of removal.

NOTE:

- Clean the mating surfaces of the rear wheel and brake disc and remove any foreign material.



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

INSPECTION

Check the following for deformation, clacks, abnormal wear, or other damage.

- bolt holes
- spoke
- wheel rim

Measure the rim runout according to REAR WHEEL/ SUSPENSION SPECIFICATIONS (page 1-9).

Replace the wheel if it is out of service limit.

For wheel balance service (page 15-16).

DRIVEN FLANGE/REAR AXLE

REMOVAL

Remove the following:

- two bolts [1]
- air guide plate [2]
- axle cap [3]

Unstake the axle nut [4].

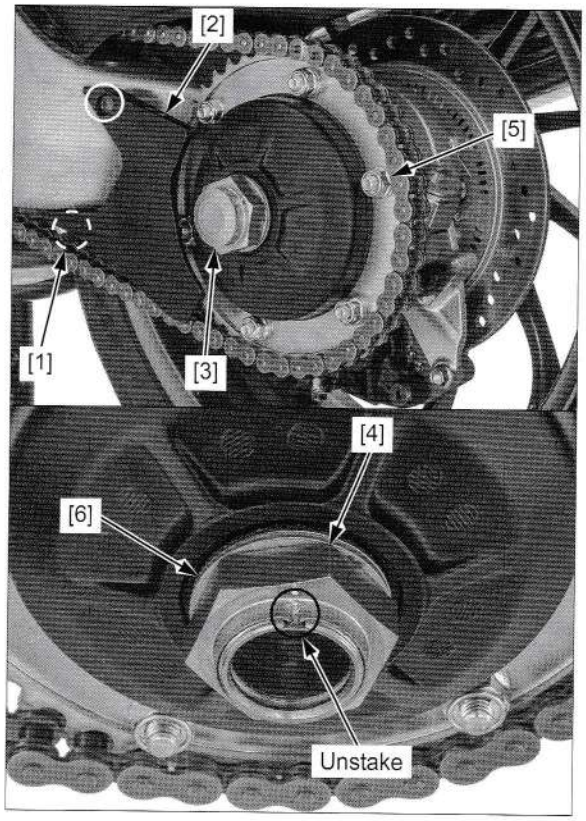
Loosen the axle nut and then the wheel nuts, and remove the rear wheel (page 16-6).

TOOL:

Socket wrench, 46 mm **07JMA-MN50100**

If the driven sprocket is to be removed, loosen the sprocket nuts [5].

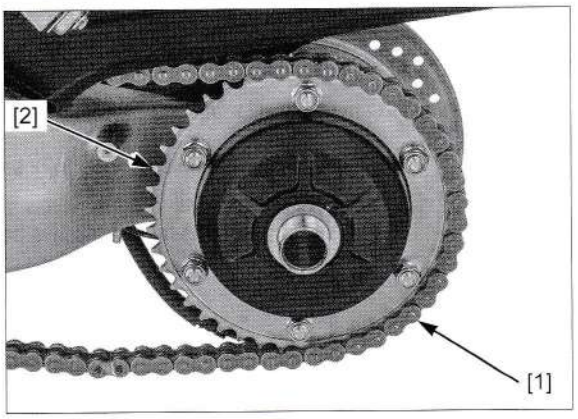
Remove the axle nut and cone washer [6].



Fully slacken the drive chain [1] (page 3-15) and derail it from the driven sprocket.

Remove the following:

– driven flange assembly [2]



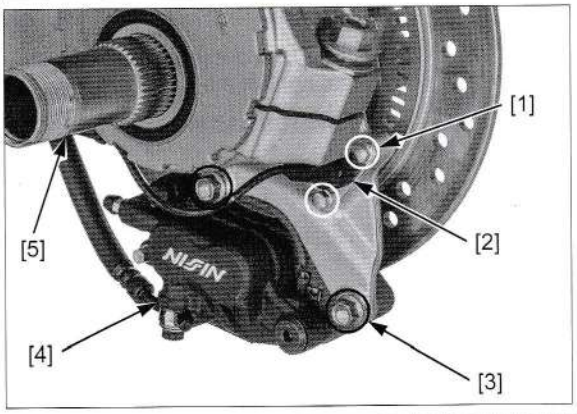
Support the brake caliper so it does not hang from the brake hose. Do not twist the brake hose.

– two bolts [1]
– rear wheel speed sensor [2]
– two bolts [3]
– rear brake caliper [4]

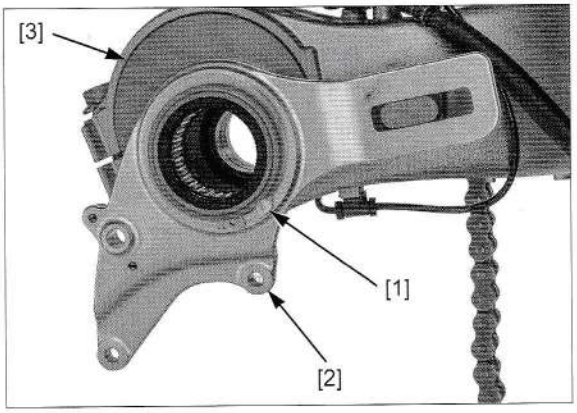
NOTE:

- Cover the speed sensor to avoid damaging it.
- Do not operate the brake pedal after removing the caliper.

– rear axle/disc assembly [5]



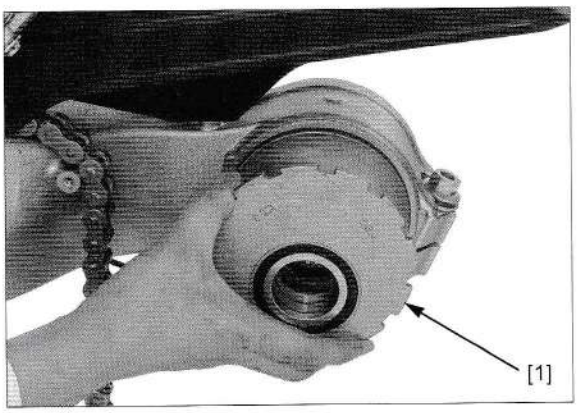
– snap ring [1]
– caliper stay [2]
– axle bearing holder [3]



INSTALLATION

Clean the mating surface of the axle bearing holder [1] and swingarm thoroughly.

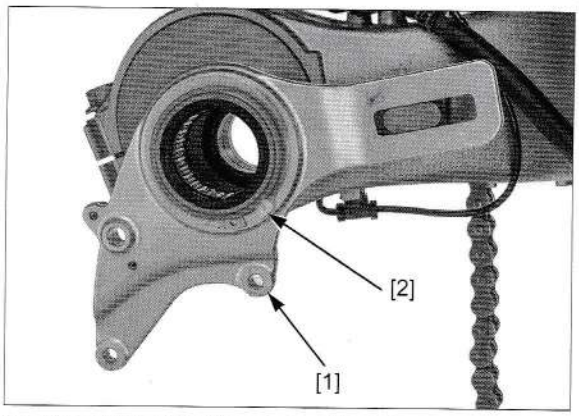
Install the bearing holder from the left side.



Install the caliper stay [1] onto the bearing holder sleeve and swingarm boss while adjusting the bearing holder position.

Install the snap ring [2] with the chamfered edge facing the stay
Make sure the snap ring is fully seated in the groove.

Move the caliper stay forward fully (drive chain fully slacked position) by turning the bearing holder.



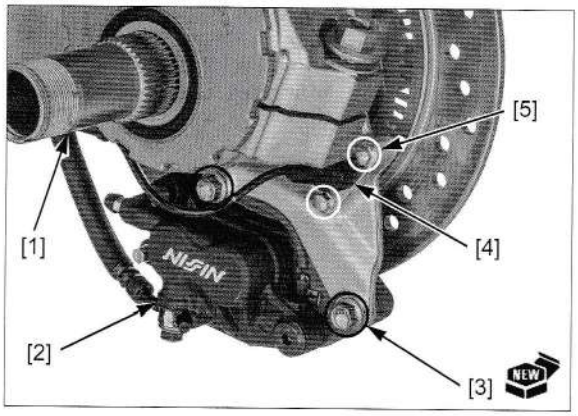
Install the rear axle/disc assembly [1].

Install the brake caliper [2] with new mounting bolts [3] and tighten them to the specified torque.

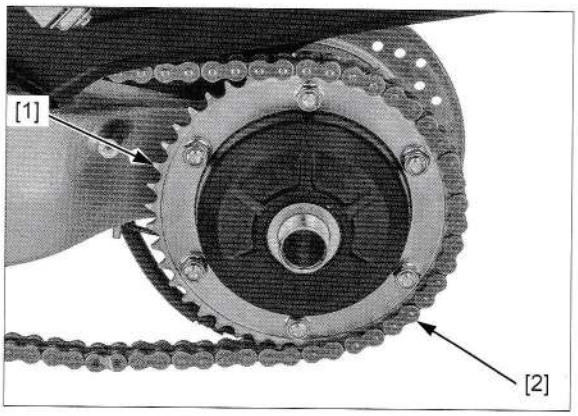
TORQUE: 33 N·m (3.4 kgf·m, 24 lbf·ft)

Wipe the tip of rear wheel speed sensor [4] and mounting area to remove any foreign material.

Install the wheel speed sensor and tighten the two bolts [5].



Install the driven flange assembly [1] and the drive chain [2] over the driven sprocket.



Install the cone washer [1] with the concave side facing in.

Install a new axle nut [2] and temporarily tighten it.

Install the rear wheel (page 16-6).

Tighten the axle nut to the specified torque while applying the rear brake.

TOOL:
Socket wrench, 46 mm 07JMA-MN50100

TORQUE: 201 N·m (20.5 kgf·m, 148 lbf·ft)

Stake the axle nut into the axle groove.

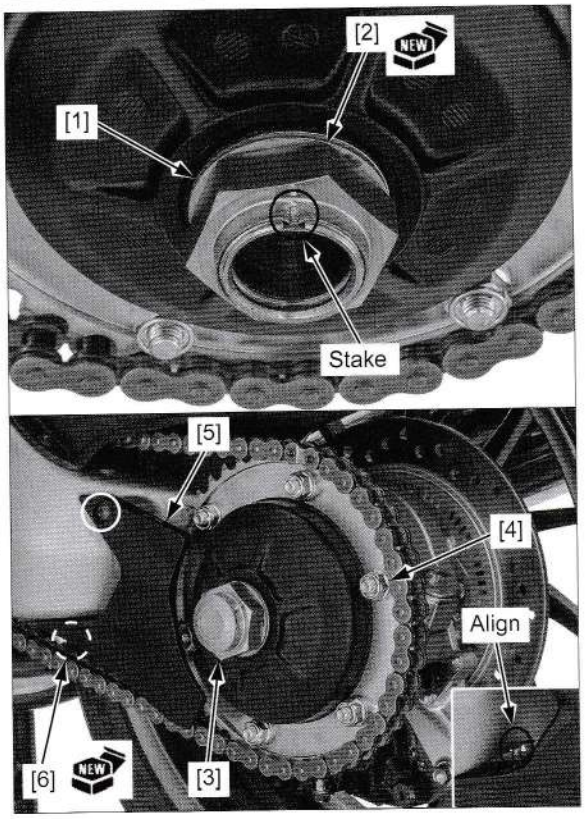
Install the axle cap [3].

Tighten the driven sprocket nuts [4] if the driven sprocket was removed.

Install the air guide plate [5] with new bolts [6], aligning the hole with locating pin of the swingarm and tighten them to the specified torque.

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

Adjust the drive chain slack (page 3-14).



INSPECTION

Turn the inner race of each ball bearing in the bearing holder and hub with your finger.
The bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the holder and hub.

Check the needle bearing in the bearing holder for wear or damage.

Check the following parts for damage, abnormal wear, deformation, or cracks.

- rear axle
- driven sprocket (page 3-16)
- damper rubbers (page 16-10)

DISASSEMBLY/ASSEMBLY

REAR AXLE/DISC

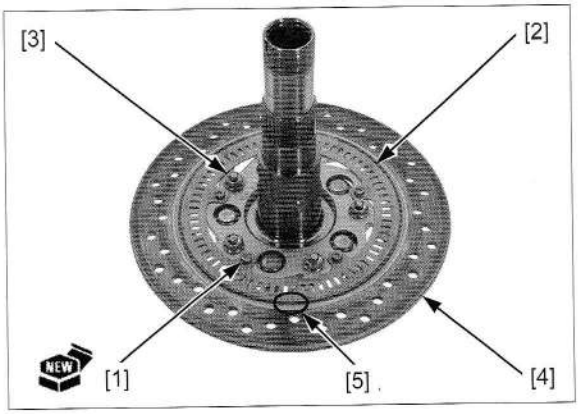
Remove the following.

- five torx bolts (II AC, III CM types) [1]
- rear pulser ring (II AC, III CM types) [2]
- five nuts [3]
- rear brake disc [4]

Installation is in the reverse order of removal.

NOTE:

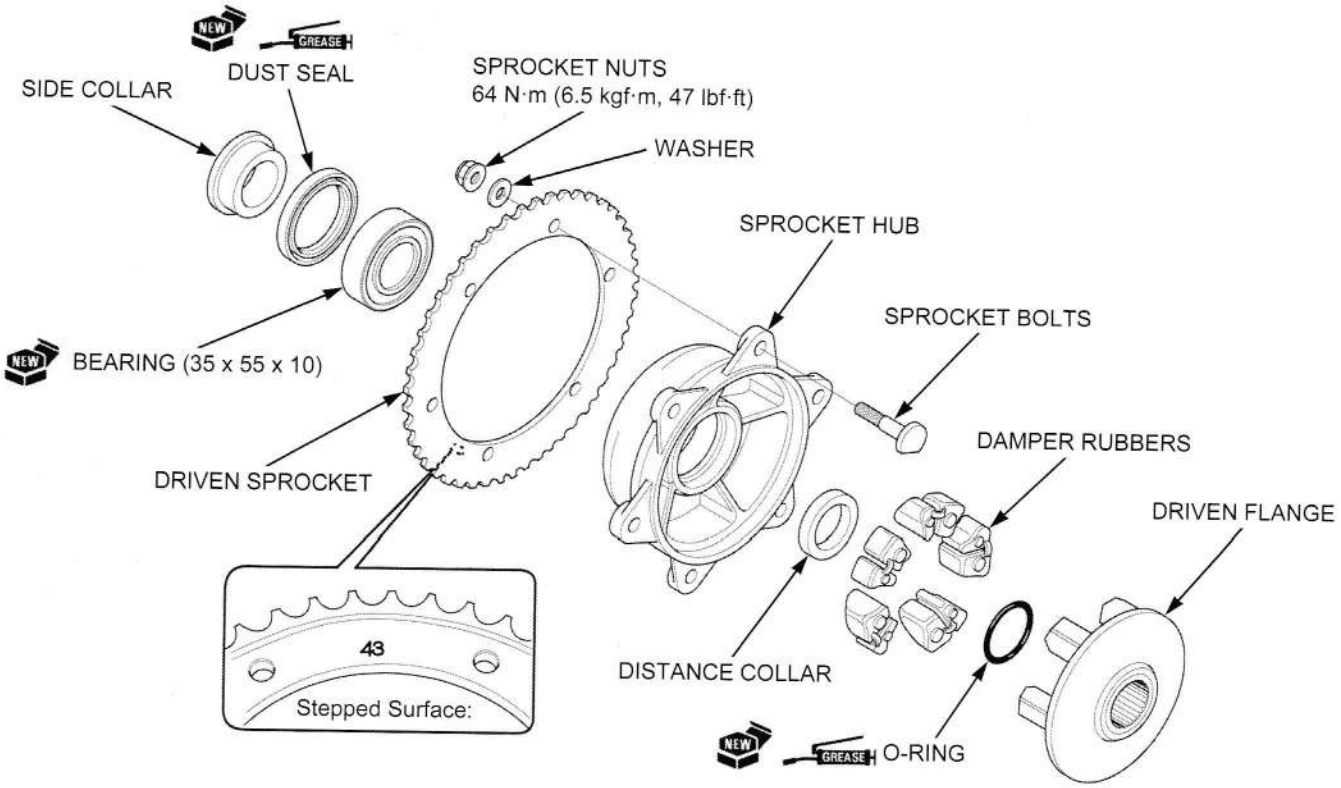
- Replace the pulser ring torx bolts with new ones.
- Install the brake disc with the rotation mark (arrow) [5] facing up (axle side).



TORQUE:
Rear brake disc nut:
34 N·m (3.5 kgf·m, 25 lbf·ft)
Rear wheel pulser ring torx bolt (II AC, III CM types):
7.0 N·m (0.7 kgf·m, 5.2 lbf·ft)

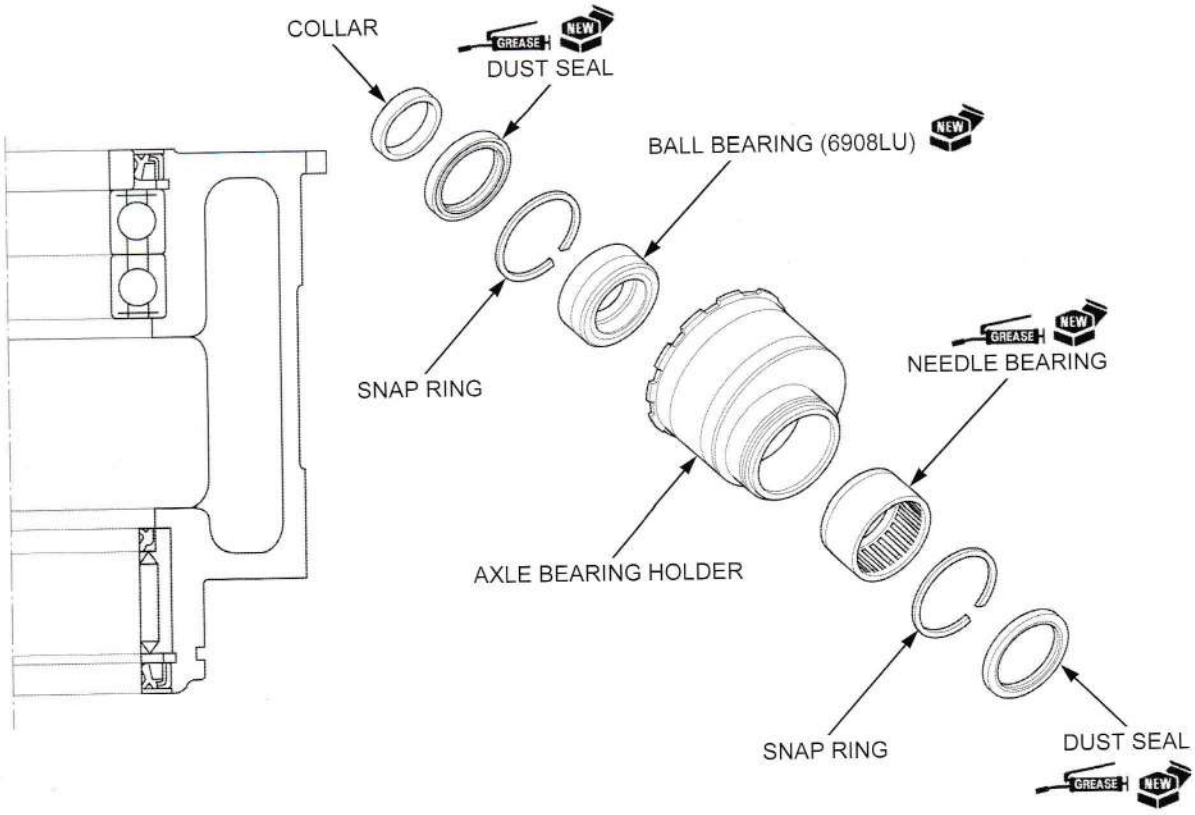
DRIVEN FLANGE

- Install the dust seal with the flat side facing out so that it is flush with the hub.
- Install the driven sprocket with the stepped surface facing out.



AXLE BEARING HOLDER

- Install the dust seal with the flat side facing out until it is fully seated.
- Install the snap ring with the chamfered edge facing the bearing side and be certain it is firmly seated in the groove. Do not reuse the snap ring which could easily spin in the groove.



BEARING REPLACEMENT

DRIVEN SPROCKET HUB

Press the bearing out of the sprocket hub using the special tools.

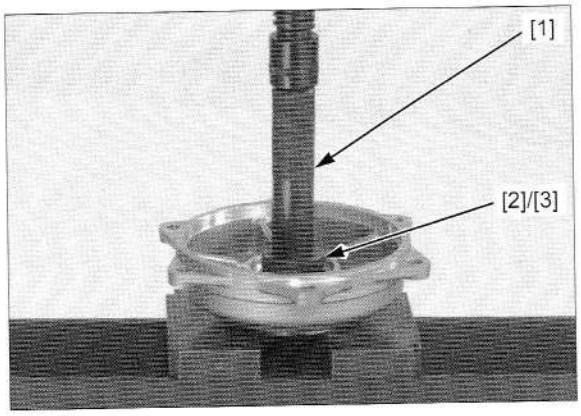
TOOLS:

[1] Driver	**07749-0010000**
[2] Attachment, 42 x 47 mm	**07746-0010300**
[3] Pilot, 35 mm	**07746-0040800**

Press a new bearing in the sprocket hub using the special tools until it is fully seated.

TOOLS:

Driver	**07749-0010000**
Attachment, 52 x 55 mm	**07746-0010400**
Pilot, 35 mm	**07746-0040800**



AXLE BEARING HOLDER

Press the ball bearing [1] out of the bearing holder using the special tools.

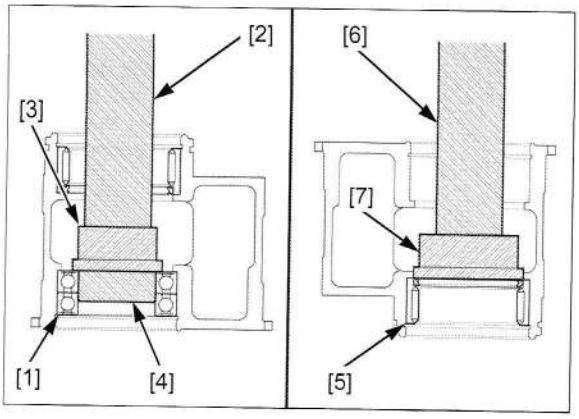
TOOLS:

[2] Driver	**07749-0010000**
[3] Attachment, 42 x 47 mm	**07746-0010300**
[4] Pilot, 40 mm	**07746-0040900**

Press the needle bearing [5] out from the bearing holder using the special tools.

TOOLS:

[6] Driver	**07749-0010000**
[7] Attachment, 52 x 55 mm	**07746-0010400**



Apply grease to the rotating area and dust seal lips of a new needle bearing [1].

Press in the needle bearing with the dust seal [2] (in the bearing) facing down until it is fully seated, using the special tools.

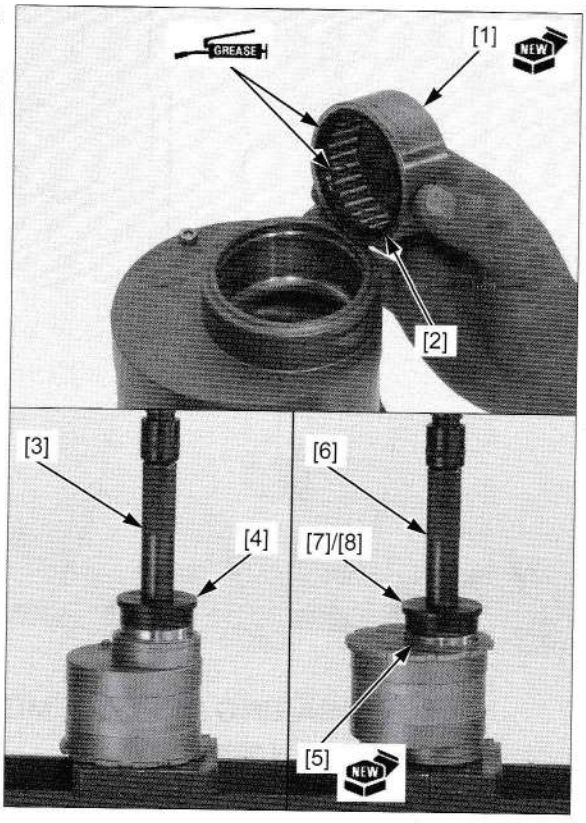
TOOLS:

[3] Driver	**07749-0010000**
[4] Attachment, 62 x 68 mm	**07746-0010500**

Press in a new ball bearing [5] with the marked side facing up, using the special tools.

TOOLS:

[6] Driver	**07749-0010000**
[7] Attachment, 62 x 68 mm	**07746-0010500**
[8] Pilot, 40 mm	**07746-0040900**



SUSPENSION LINKAGE/SHOCK ABSORBER

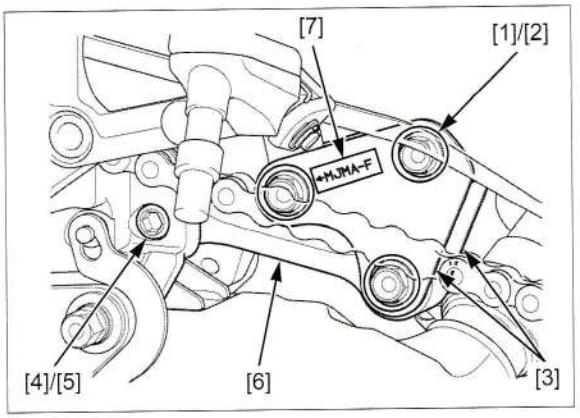
REMOVAL/INSTALLATION

SUSPENSION LINKAGE

Raise the rear wheel off the ground by placing the motorcycle on its centerstand (II AC, III CM types) or supporting the motorcycle securely using a hoist or equivalent (AC type).

Support the swingarm securely and remove the following:

- three nuts [1]
- three bolts [2]
- shock arm plates [3]
- nut [4]
- socket bolt [5]
- shock link [6]



Installation is in the reverse order of removal.

NOTE:

- Install each shock arm plate so the stamp [7] is facing up and its arrow faces forward.
- Install all the bolts from the left side.

TORQUE:
Shock linkage nut:
42 N·m (4.3 kgf·m, 31 lbf·ft)
Shock absorber mounting nut:
42 N·m (4.3 kgf·m, 31 lbf·ft)

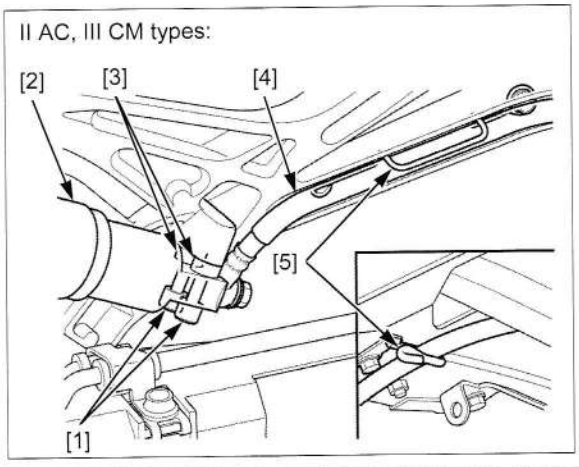
SHOCK ABSORBER

Remove the following:

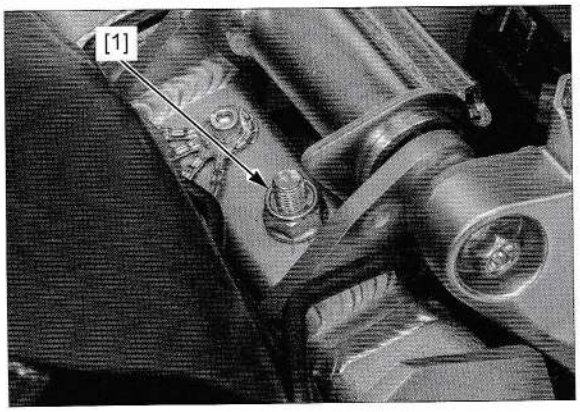
- fuel tank (page 7-11)
- shock arm plates (page 16-13)

II AC, III CM types: Remove the two bolts [1], spring pre-load adjuster [2], and collars [3].

Release the adjuster hose [4] from the hose guides [5].



Remove the bracket nut [1] while supporting the shock absorber securely.



Remove the shock absorber out of the frame.

Installation is in the reverse order of removal.

TORQUE:
Shock absorber bracket nut:
42 N·m (4.3 kgf·m, 31 lbf·ft)

DISASSEMBLY/ASSEMBLY

Remove the mounting nut [1], bolt [2], and upper bracket [3] from the shock absorber.

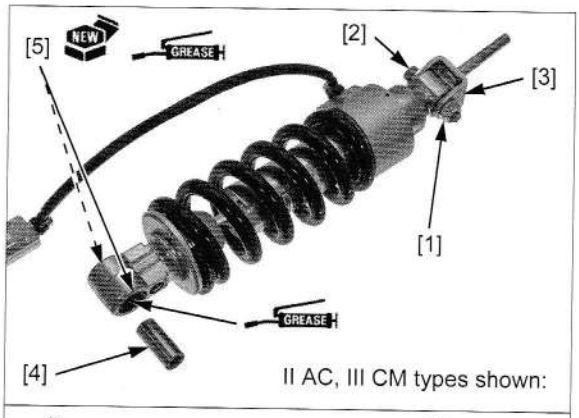
Remove the pivot collars [4] and dust seals [5].

Apply grease to rotating areas of the needle bearings.

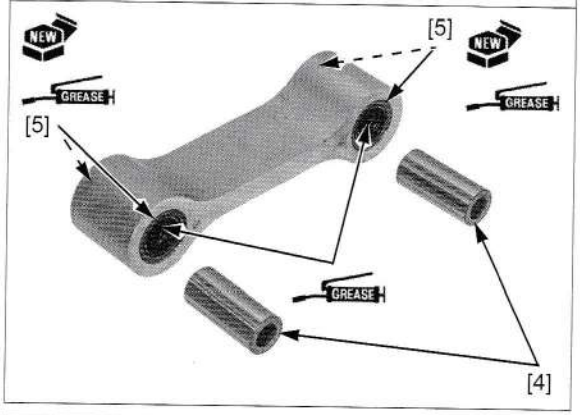
Apply grease to the lips of new dust seals.

Install each dust seal with the flat side facing out so that it is flush with the end surface.

Install the pivot collars.



II AC, III CM types shown:



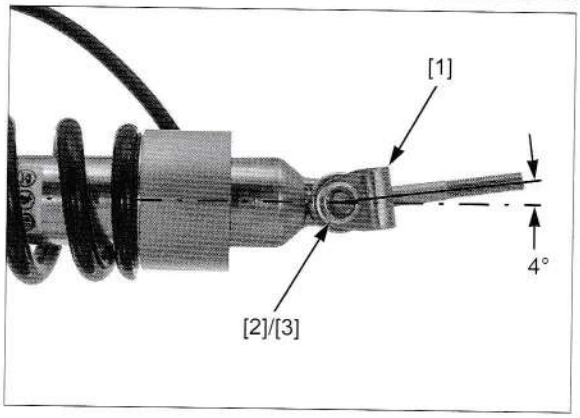
The mounting bolt is installed from the left side.

Install the upper bracket [1] with the bolt [2] and nut [3].

Tighten the mounting nut to the specified torque so the stud bolt is inclined to the rear side 4°.

TORQUE:

Shock absorber mounting nut:
42 N·m (4.3 kgf·m, 31 lbf·ft)



INSPECTION

Check the following parts of the shock linkage for damage, abnormal wear, deformation, or cracks.

- shock arm plates
- shock link
- pivot collars
- needle bearings

Check the following parts of the shock absorber for damage, abnormal wear, oil leakage, or bends.

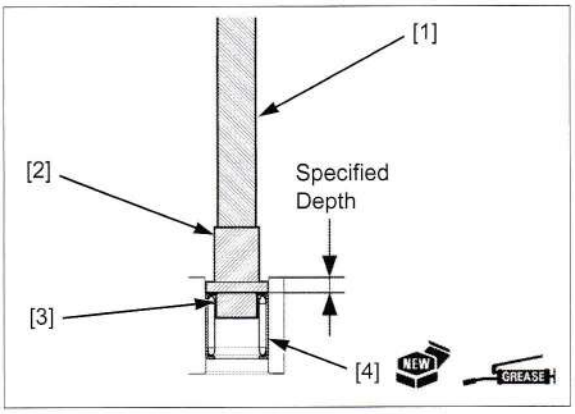
- damper unit
- pivot collar
- pivot bushing
- needle bearing
- adjuster hose and hose fittings

BEARING REPLACEMENT

NOTE:

- For linkage bearing in the swingarm (page 16-19).

Press the needle bearings out of the shock link and shock absorber lower pivot using the special tools.



TOOLS:

[1] Driver	**07949-3710001**
[2] Attachment, 22 x 24 mm	**07746-0010800**
[3] Pilot, 17 mm	**07746-0040400**

Apply grease to rotating areas of a new needle bearing [4].

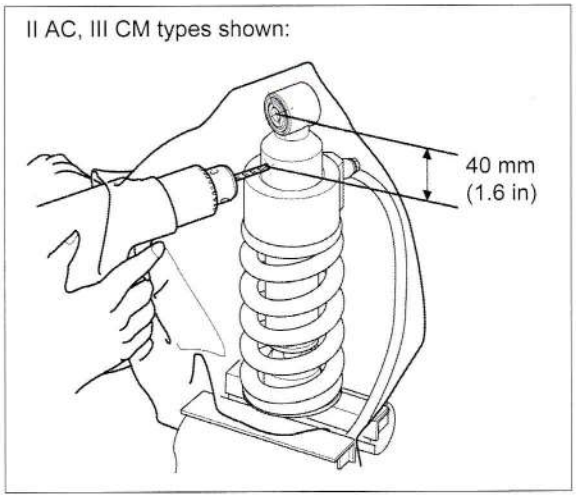
Carefully press in each bearing with the marked side facing up so that the depth from the pivot end surface is the specified value, using the same tools.

- Shock link: 5.2 – 5.7 mm (0.20 – 0.22 in)
- Shock absorber lower pivot: 8 mm (0.3 in)

SHOCK ABSORBER DISPOSAL PROCEDURE

Center punch the shock absorber to mark the drilling point.

Wrap the shock absorber inside a plastic bag.
Support the shock absorber in a vise as shown.
Through the open end of the bag, insert a drill with a sharp 2 - 3 mm (5/64 - 1/8 in) drill bit.



NOTICE

- *Do not use a dull drill bit which could cause a build-up of excessive heat and pressure inside the damper, leading to an explosion and severe 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. Then high pressure oil may cause serious 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 and briefly run the drill inside the bag; this will inflate the bag with air from the motor and help keep the bag from getting caught in the bit when you start.

SWINGARM

REMOVAL/INSTALLATION

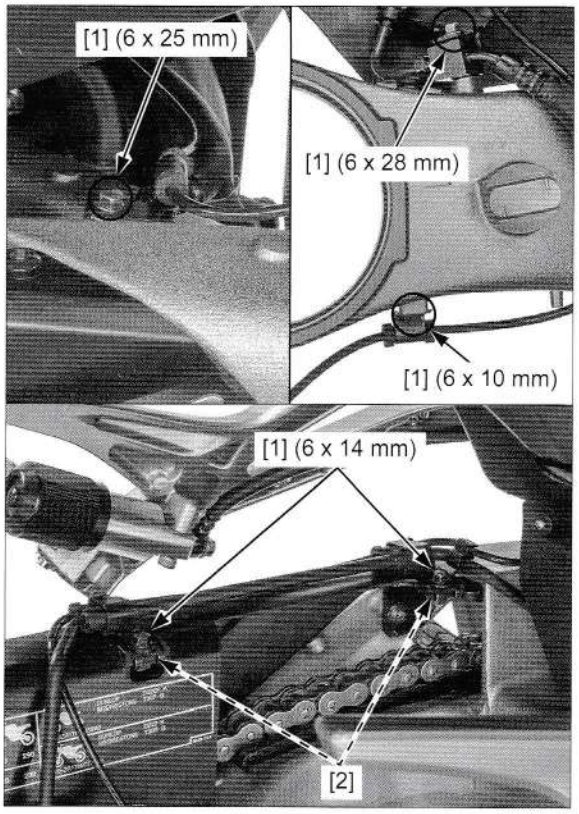
Remove the following:

- drive sprocket (page 12-7)
- bearing holder (page 16-6)
- shock arm plates (page 16-13)

Remove the right rider footpeg bracket assembly without disconnecting the brake hose and support it with a strap to avoid interfering with the swingarm (page 17-10).

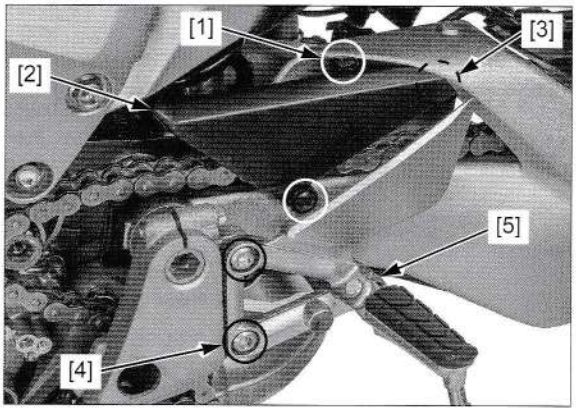
Remove the five bolts [1] to remove the clamps and hose joints.

Remove the two collars [2] from the chain case A.



Remove the two bolts [1] and the chain case B [2] by releasing the tab [3] from the chain guide.

Remove the two bolts [4] and left rider footpeg [5].



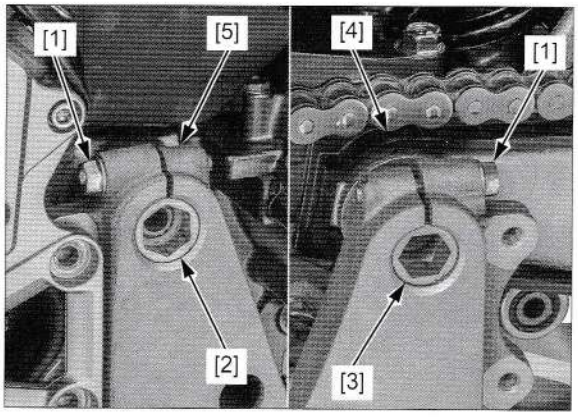
Loosen the left and right pivot pinch bolts [1].

Support the front side of the swingarm and remove the pivot nut [2] and bolt [3].

Support the caliper so the brake pipe does not bend. Take care not to damage the speed sensor.

Move the brake hose/pipe and speed sensor wire out of the way.

Raise the pivots of the swingarm [4] and remove it through the upper side of the bracket [5].



Installation is in the reverse order of removal.

NOTE:

- The pivot bolt is installed from the left side.
- Tighten the pivot nut first and then the pinch bolts.

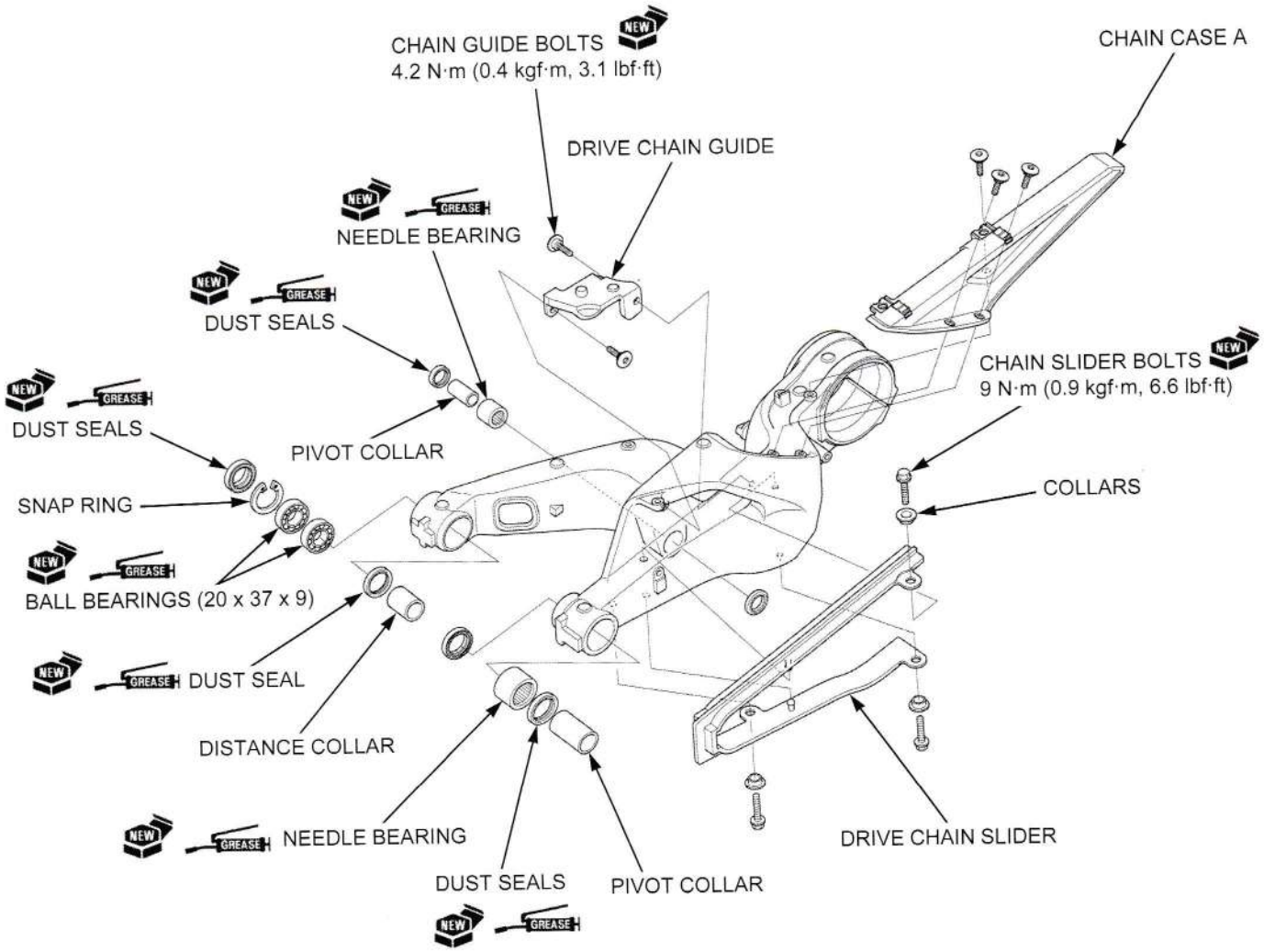
TORQUE:

Swingarm pivot nut:
93 N·m (9.5 kgf·m, 69 lbf·ft)

Swingarm pivot pinch bolt:
26 N·m (2.7 kgf·m, 19 lbf·ft)

DISASSEMBLY/ASSEMBLY

- Install the swingarm pivot dust seals with the flat side facing out so that they are flush with the pivot end surface.
- Install the suspension linkage pivot dust seals with the flat side facing out until they are fully seated.



INSPECTION

Check the following parts for damage, abnormal wear, or deformation.

- swingarm
- pivot collars
- bearings
- drive chain guide
- drive chain slider (page 3-17)

MEMO

17. HYDRAULIC BRAKE

SERVICE INFORMATION 17-2

TROUBLESHOOTING 17-2

COMPONENT LOCATION 17-3

BRAKE FLUID REPLACEMENT/
AIR BLEEDING 17-5

BRAKE PAD/DISC 17-7

FRONT MASTER CYLINDER 17-8

REAR MASTER CYLINDER/
BRAKE PEDAL 17-10

FRONT BRAKE CALIPER 17-12

REAR BRAKE CALIPER 17-14

SERVICE INFORMATION

GENERAL

⚠CAUTION

Frequent inhalation of brake pad dust, regardless of material composition could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

NOTICE

Spilled brake fluid will severely damage instrument lenses and painted surfaces. It is also harmful to some rubber parts. Be careful whenever you remove the reservoir cap; make sure the front reservoir is horizontal first.

- This section covers service of the conventional brake components of the brake system. For ABS service (page 18-4).
- This motorcycle is equipped with the ABS, however, the brake fluid replacement procedure is performed in the same manner as in the ordinary air bleeding procedure. Note that replacement and bleeding air from the brake fluid in the ABS modulator is not necessary, as it is sealed in the modulator.
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Always use fresh DOT 4 brake fluid from a sealed container when servicing the system. Do not mix different types of fluid, they may not be compatible.
- Never allow contaminates (dirt, water, etc.) to get into an open reservoir.
- Once the hydraulic system has been opened, or if the brake feels spongy, the system must be bled.
- Always check brake operation before riding the motorcycle.
- When the wheel speed sensor is removed, be sure to check the air gap between the wheel speed sensor and pulser ring after installing it (page 18-21).

TROUBLESHOOTING

Brake lever/pedal soft or spongy
- Air in hydraulic system
- Leaking hydraulic system
- Contaminated brake pad/disc
- Worn caliper piston seal
- Worn master 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

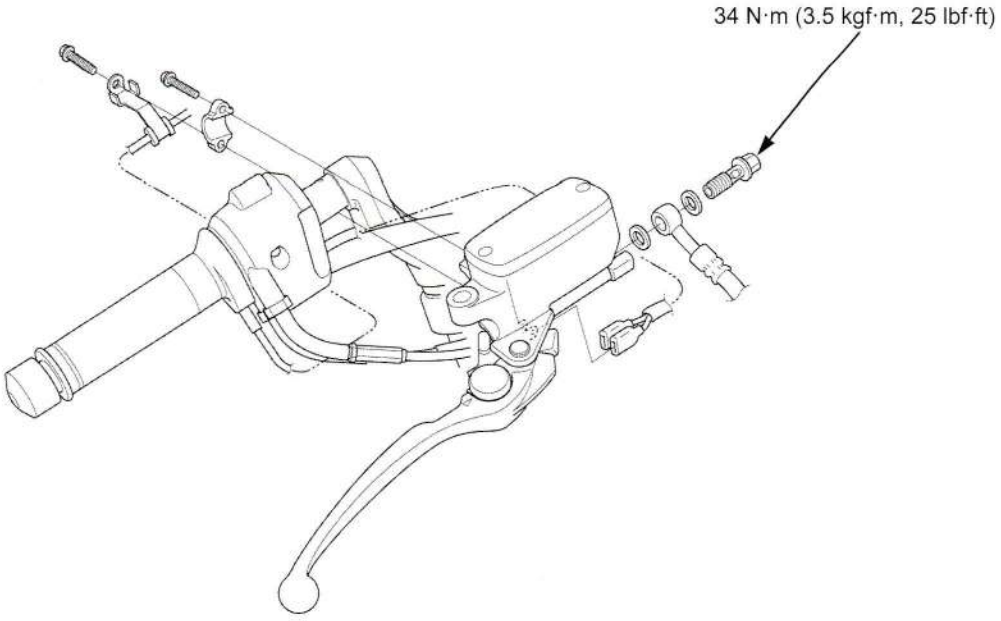
Brake lever/pedal hard
- Clogged/restricted fluid passage
- Sticking/worn caliper piston
- Caliper not sliding properly
- Worn caliper piston seal
- Sticking/worn master piston
- Bent brake lever/pedal

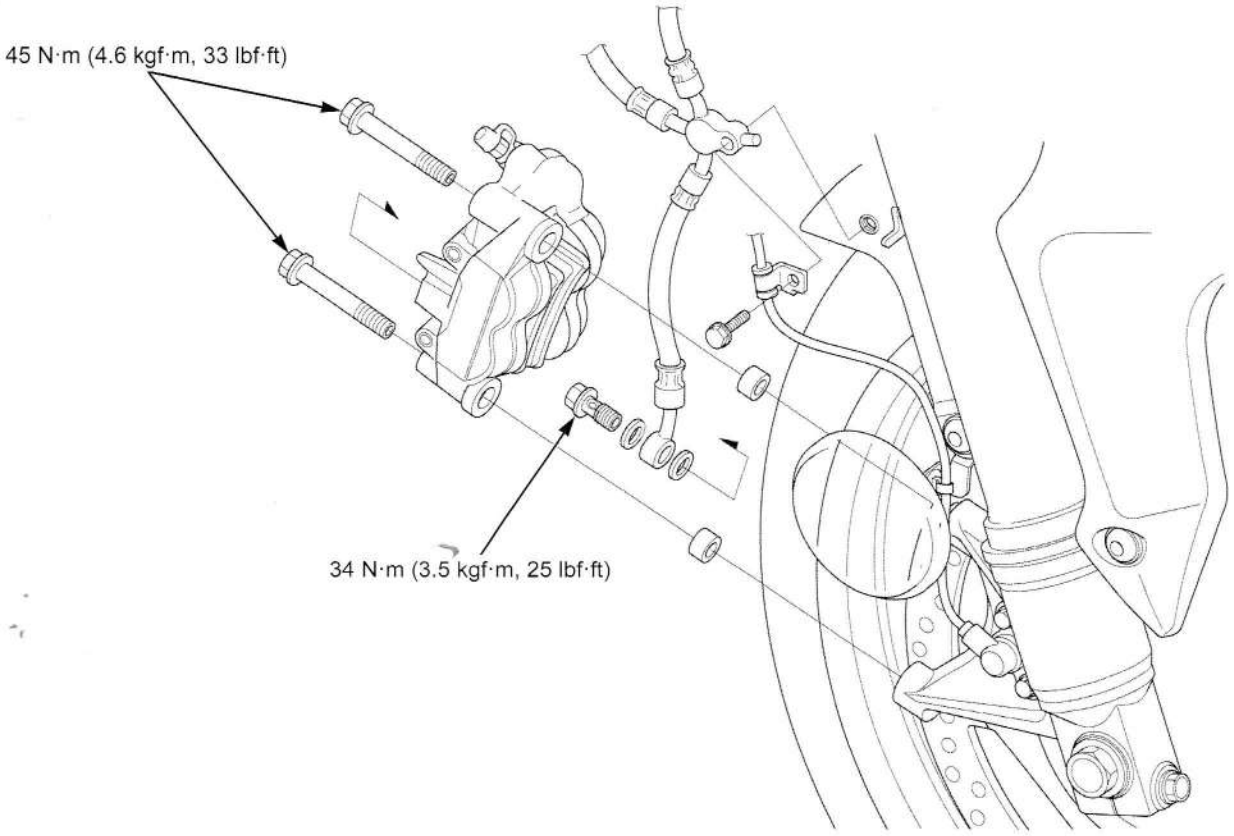
Brake drags
- Contaminated brake pad/disc
- Misaligned wheel
- Badly worn brake pad/disc
- Warped/deformed brake disc
- Caliper not sliding properly
- Clogged/restricted fluid passage
- Sticking caliper piston

COMPONENT LOCATION

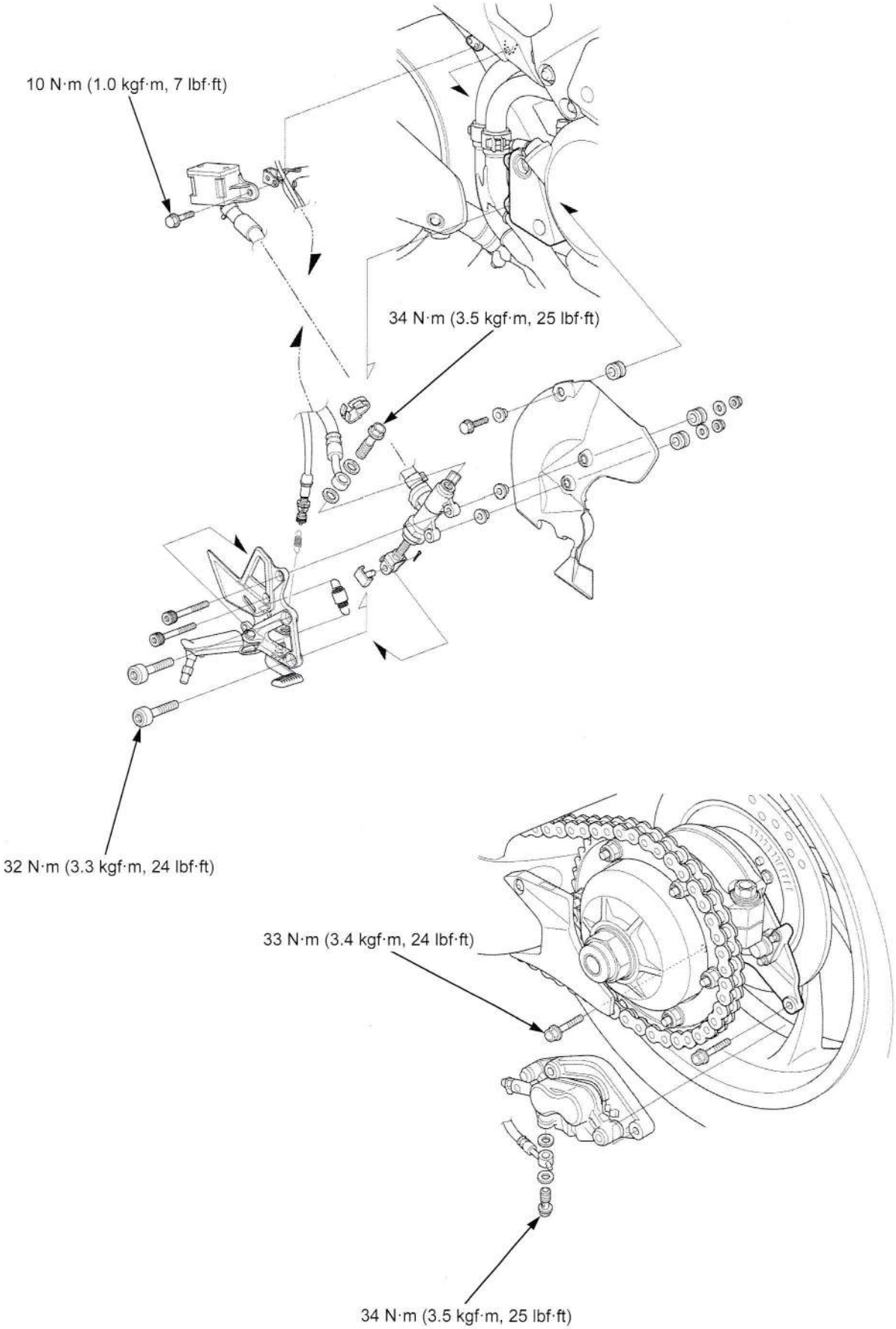
FRONT:

II AC, III CM types shown:





REAR:


10 N·m (1.0 kgf·m, 7 lbf·ft)
34 N·m (3.5 kgf·m, 25 lbf·ft)
32 N·m (3.3 kgf·m, 24 lbf·ft)
33 N·m (3.4 kgf·m, 24 lbf·ft)
34 N·m (3.5 kgf·m, 25 lbf·ft)

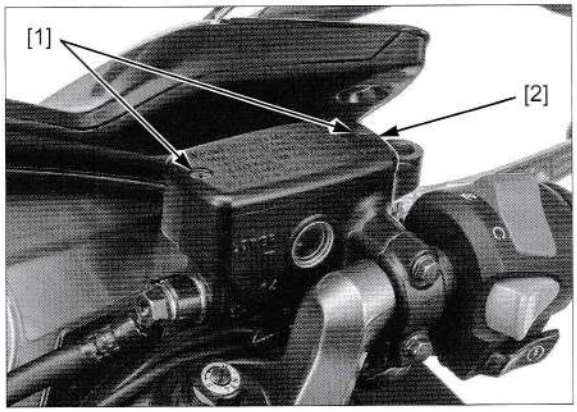
BRAKE FLUID REPLACEMENT/AIR BLEEDING

BRAKE FLUID DRAINING

For front brake: Turn the handlebar so the reservoir is level.

Remove the following:

- two screws [1]
- reservoir cap [2]
- set plate
- diaphragm



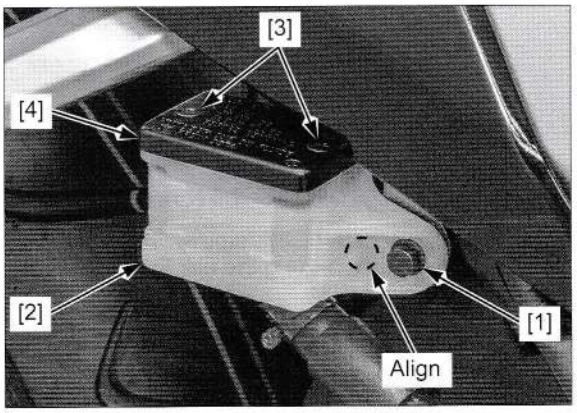
For rear brake: Remove the bolt [1] and reservoir [2] from the stay.

Take care to not allow fluid to spill from the reservoir.

Remove the following:

- two screws [3]
- reservoir cap [4]
- set plate
- diaphragm

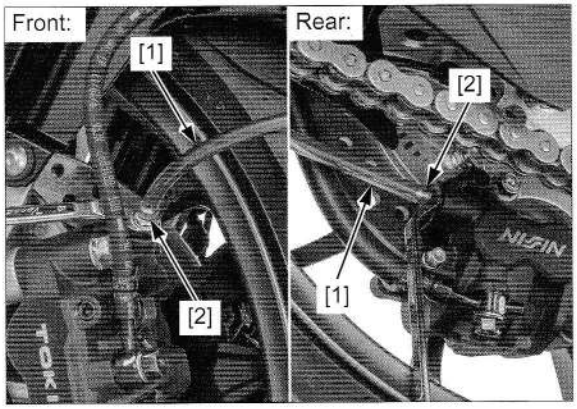
Temporarily install the reservoir onto the stay with the mounting bolt, aligning the locating pin with the hole.



Connect a bleed hose [1] to the caliper bleed valve [2].

Loosen the bleed valve and pump the brake lever or pedal until no more fluid flows out of the bleed valve.

Close the bleed valve.



BRAKE FLUID FILLING/AIR BLEEDING

Fill the reservoir to the upper level line [1] with DOT 4 brake fluid from a sealed container.

Connect a commercially available brake bleeder to the bleed valve.

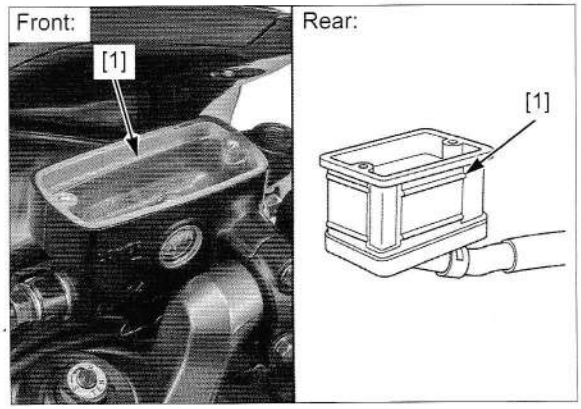
Operate the brake bleeder and loosen the bleed valve.

Check the fluid level often while bleeding to prevent air from being pumped into the system.

If an automatic refill system is not used, add fluid when the fluid level in the reservoir is low.

Perform the bleeding procedure until the system is completely flushed/bled.

Close the bleed valve and operate the brake lever or pedal. If it still feels spongy, bleed the system again.



If a brake bleeder is not available, use the following procedure.

Connect a bleed hose to the bleed valve.

Pump up the system pressure with the brake lever/pedal until the lever/pedal resistance is felt.

Do not release the brake lever or pedal until the bleed valve has been closed.

1. Squeeze the brake lever or depress the brake pedal all the way and loosen the bleed valve 1/4 of a turn. Wait several seconds 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 the steps 1 and 2 until there are no air bubbles in the bleed hose.

After bleeding the system completely, tighten the bleed valve to the specified torque.

TORQUE:
Front brake caliper bleed valve:
8.0 N·m (0.8 kgf·m, 5.9 lbf·ft)
Rear brake caliper bleed valve:
5.4 N·m (0.6 kgf·m, 4.0 lbf·ft)

Fill the reservoir to the upper level line with DOT 4 brake fluid.

For front brake:

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

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

For rear brake:

Carefully remove the reservoir [1] from the frame by removing the bolt [2].

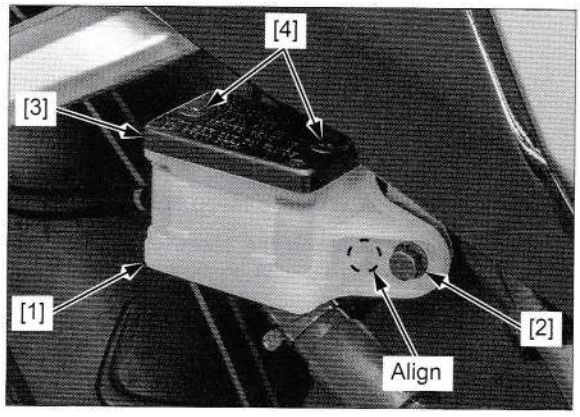
Take care to not allow fluid to spill from the reservoir.

Install the diaphragm, set plate, and reservoir cap [3] and tighten the screws [4] to the specified torque.

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

Install the reservoir, aligning the locating pin with the hole and tighten the bolt.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



BRAKE PAD/DISC

BRAKE PAD REMOVAL/ INSTALLATION

NOTE:

- Always replace the brake pads in pairs to ensure even disc pressure.

FRONT

Loosen the pad pins [1].

Do not operate the brake lever after removing the caliper.

Remove the two mounting bolts [2] and brake caliper [3].

Check the fluid level in the reservoir as this operation causes the fluid level to rise.

If you replace the brake pads with new ones, push the caliper pistons all the way in by pushing the brake pads [4] outward to allow installation of new pads.

Remove the pad pin [5] by pushing the pads against the pad spring, then the brake pads and pad spring [6].

Clean the inside of the caliper especially around the caliper pistons.

Install the pad spring with the bent side facing down as shown.

Install the brake pads and the pad pins by pushing the pads against the pad spring to align the pad pin holes.

Make sure the collars [7] are installed in the fork leg.

Install the brake caliper onto the fork leg with new mounting bolts, being careful not to damage the brake pads.

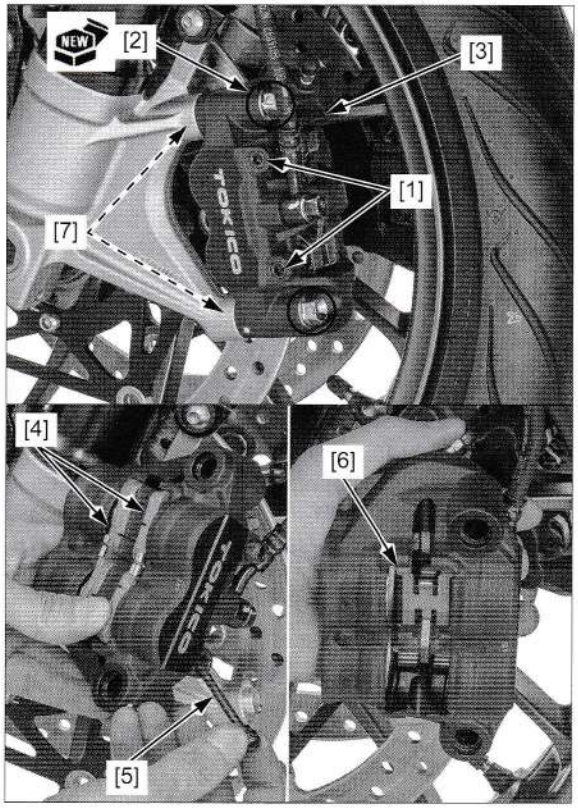
Tighten mounting bolts to the specified torque.

TORQUE: 45 N·m (4.6 kgf·m, 33 lbf·ft)

Tighten the pad pins to the specified torque.

TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft)

Operate the brake lever to seat the caliper pistons against the pads.



REAR

Check the fluid level in the reservoir as this operation causes the fluid level to rise.

If you replace the brake pads with new ones, push the caliper pistons all the way in by pushing the caliper body inward to allow installation of new brake pads.

Loosen the pad pin [1].

Cover the wheel rim with a shop towel to prevent damaging it.

Do not operate the brake pedal after removing the caliper.

Remove the two mounting bolts [2] and brake caliper [3].

Remove the pad pin by pushing the pads [4] against the pad spring, then the brake pads and pad spring [5].

Clean the inside of the caliper especially around the caliper pistons.

Install the pad spring as shown.

Be sure the stopper ring [6] on the pad pin is in good condition, and replace it with a new one if necessary.

Coat the stopper ring with silicone grease.

Install the pads so that their ends are set in the retainer [7] properly.

Install the pad pin by pushing the pads against the pad spring to align the pad pin holes.

Install the brake caliper onto the stay with new mounting bolts, being careful not to damage the brake pads.

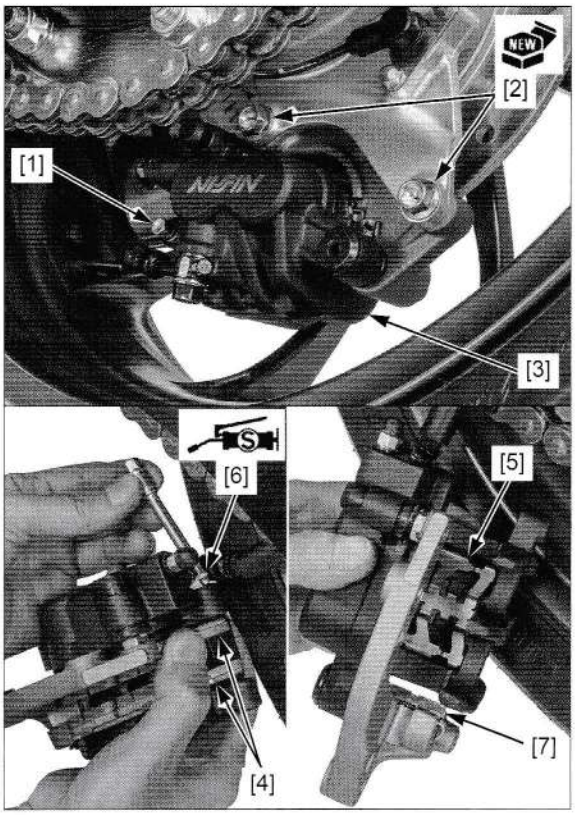
Tighten mounting bolts to the specified torque.

TORQUE: 33 N·m (3.4 kgf·m, 24 lbf·ft)

Tighten the pad pin to the specified torque.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

Operate the brake pedal to seat the caliper pistons against the pads.



BRAKE DISC INSPECTION

Visually inspect the brake disc for damage or cracks.

Measure the brake disc according to HYDRAULIC BRAKE SPECIFICATIONS (page 1-10) and replace if necessary.

FRONT MASTER CYLINDER

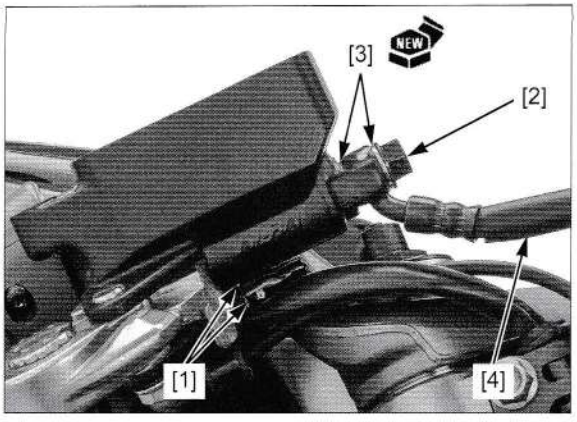
REMOVAL/INSTALLATION

Drain the brake fluid from the front brake hydraulic system (page 17-5).

Remove the following:

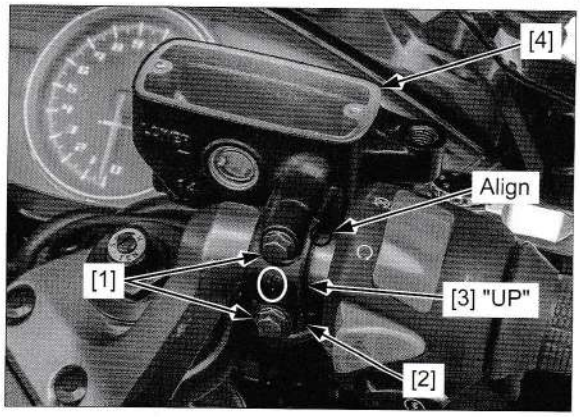
When removing the oil bolt, cover the end of the brake hose to prevent contamination.

- brake light switch connectors [1]
- oil bolt [2]
- sealing washers [3]
- brake hose [4]



- two bolts [1]
- wire clamp [2]
- master cylinder holder [3]
- master cylinder [4]

Installation is in the reverse order of removal.



NOTE:

- Replace the sealing washers with new ones.
- Install the master cylinder holder with the "UP" mark facing up.
- Align the edge of the master cylinder with the punch mark on the handlebar, and tighten the upper bolt first then tighten the lower bolt.
- Be sure to rest the eyelet joint against the stopper when tightening the oil bolt.

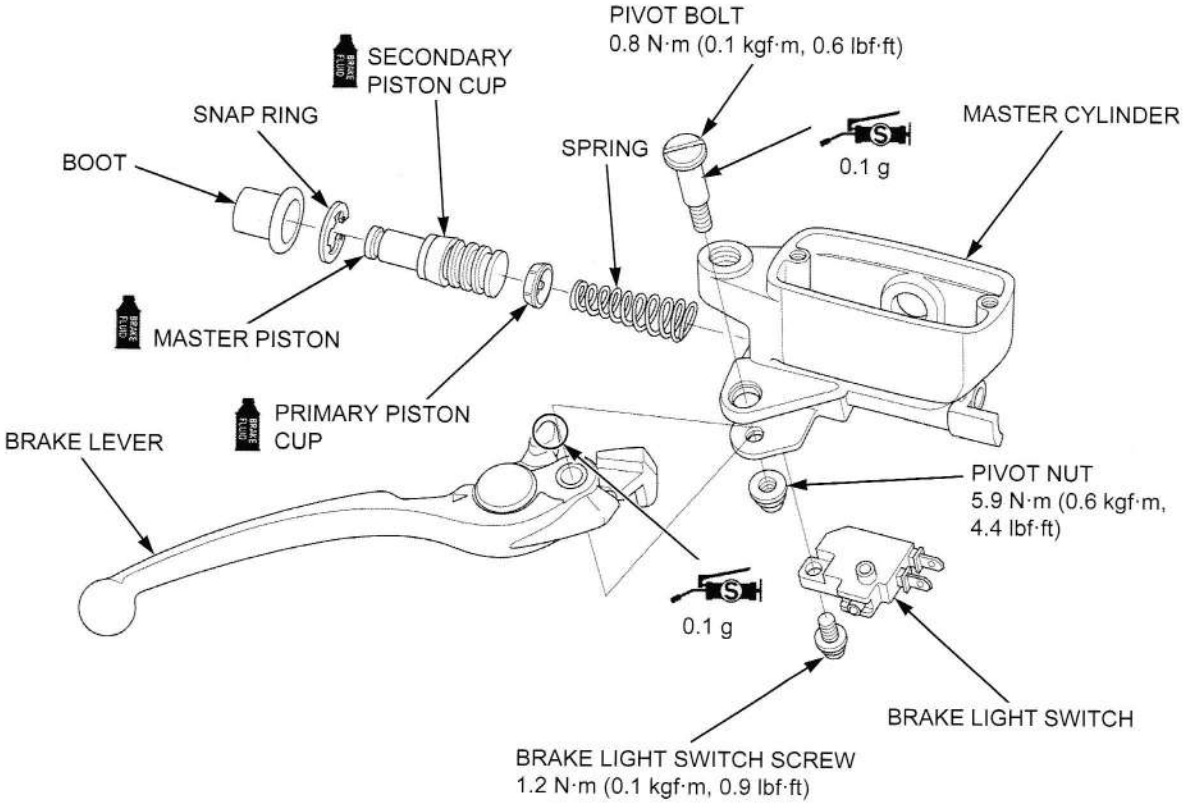
TORQUE:

Oil bolt: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the front brake hydraulic system (page 17-5).

DISASSEMBLY/ASSEMBLY

- Do not allow the piston cup lips to turn inside out.
- Install the snap ring with the chamfered edge facing the thrust load side and be certain it is firmly seated in the groove. Do not reuse the snap ring which could easily spin in the groove.
- Align the switch boss with the master cylinder hole properly.
- When tightening the pivot nut, hold the pivot bolt securely.



INSPECTION

Check the following parts for scoring, scratches, deterioration, or damage.

- master cylinder
- master piston
- piston cups
- spring
- boot

Measure the parts according to HYDRAULIC BRAKE SPECIFICATIONS (page 1-10) and replace if necessary.

REAR MASTER CYLINDER/BRAKE PEDAL

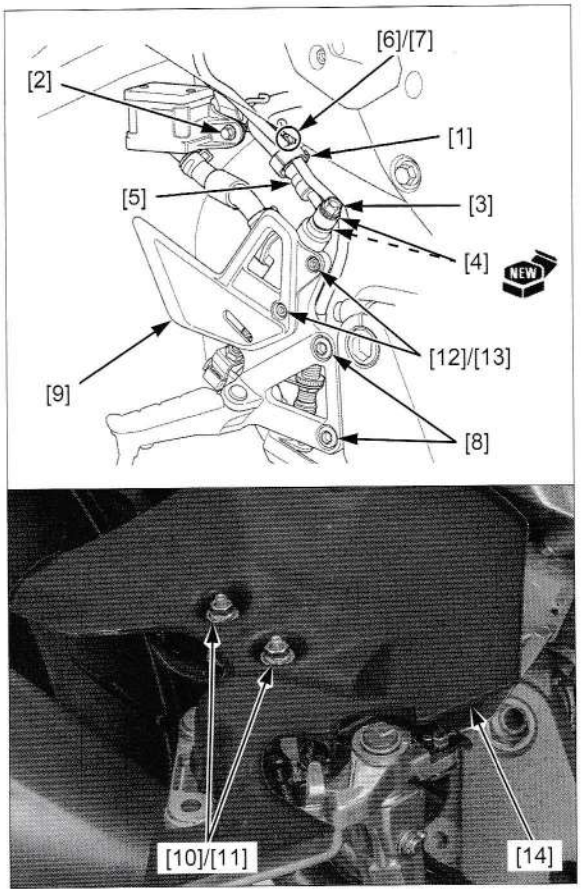
REMOVAL/INSTALLATION

Drain the brake fluid from the rear brake hydraulic system (page 17-5).

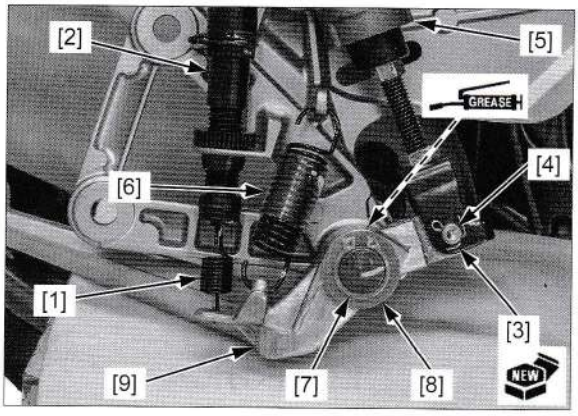
Remove the following:

When removing the oil bolt, cover the end of the brake hose to prevent contamination.

- wire clip [1]
- reservoir bolt [2]
- oil bolt [3]
- sealing washers [4]
- brake hose [5]
- heat guard bolt [6] and collar [7]
- two bracket bolts [8]
- footpeg bracket assembly [9] (and support it securely)
- two mounting nuts [10] and washers [11]
- two mounting bolts [12] and collars [13]
- heat guard [14]



- switch spring [1]
- brake light switch [2]
- cotter pin [3]
- joint pin [4]
- master cylinder assembly [5]
- return spring [6]
- snap ring [7] and washer [8]
- brake pedal [9]



NOTE:

- Apply grease to the brake pedal pivot sliding area (grease groove).
- Replace the cotter pin and sealing washers with new ones.
- Install the snap ring with the chamfered edge facing the thrust load side and be certain it is firmly seated in the groove. Do not reuse the snap ring which could easily spin in the groove.
- Install each spring in the direction as shown.
- Be sure to rest the eyelet joint against the stopper when tightening the oil bolt.

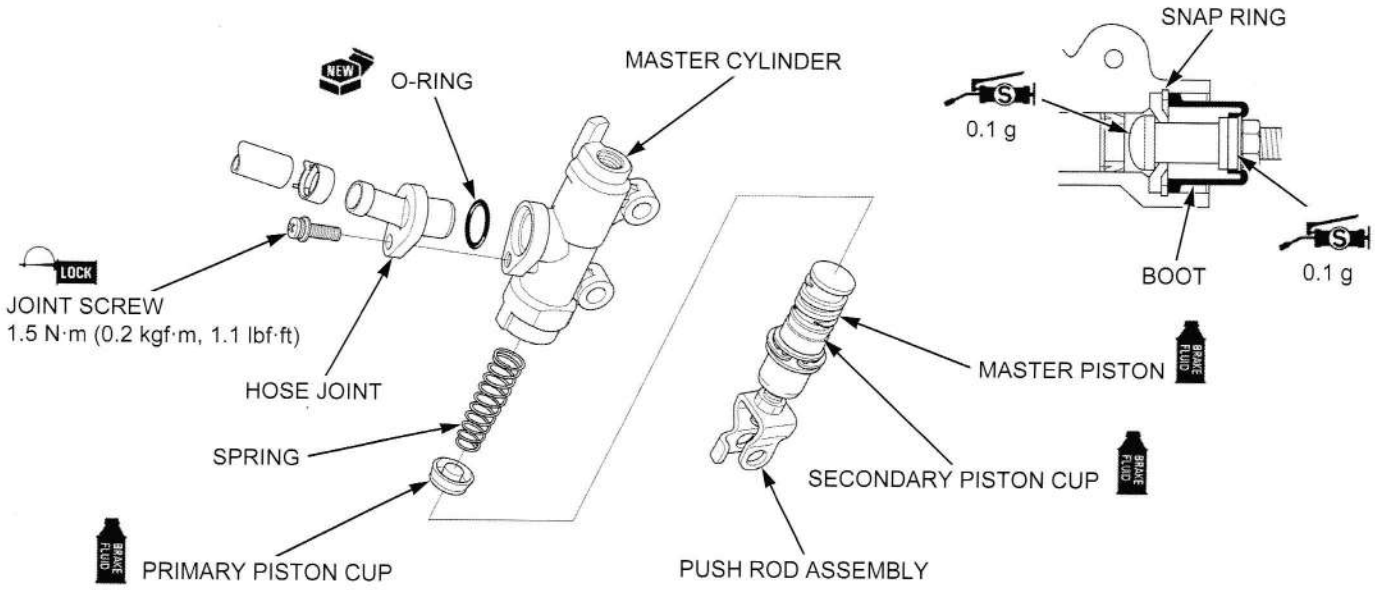
TORQUE:

Rider footpeg bracket bolt:
32 N·m (3.3 kgf·m, 24 lbf·ft)
Oil bolt:
34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the rear brake hydraulic system (page 17-5).

MASTER CYLINDER DISASSEMBLY/ ASSEMBLY

- Adjust the push rod length between the center of the lower mounting bolt hole and center of the joint pin hole when installing the push rod joint.
- Do not allow the piston cup lips to turn inside out.
- Install the snap ring with the chamfered edge facing the thrust load side and be certain it is firmly seated in the groove. Do not reuse the snap ring which could easily spin in the groove.

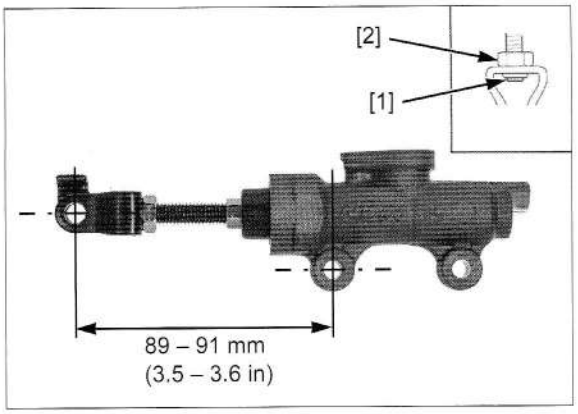


When the push rod has been disassembled, adjust the push rod length so that the distance from the center of the master cylinder lower mounting bolt hole to the center of the joint pin hole is standard length as shown.

If the length is adjusted to a longer position, make sure that the lower end of the push rod thread [1] is visible inside the joint.

After adjustment, tighten the joint nut [2] to the specified torque.

TORQUE:
Rear master cylinder push rod joint nut:
18 N·m (1.8 kgf·m, 13 lbf·ft)



INSPECTION

Check the following parts for scoring, scratches, deterioration, or damage.

- master cylinder
- master piston
- piston cups
- spring
- boot

Measure the parts according to HYDRAULIC BRAKE SPECIFICATIONS (page 1-10) and replace if necessary.

FRONT BRAKE CALIPER

REMOVAL/INSTALLATION

Drain the brake fluid from the front brake hydraulic system (page 17-5).

Remove the following:

When removing the oil bolt, cover the end of brake hose to prevent contamination.

- oil bolt [1]
- sealing washers [2]
- brake hose [3]
- brake caliper [4] (page 17-7)

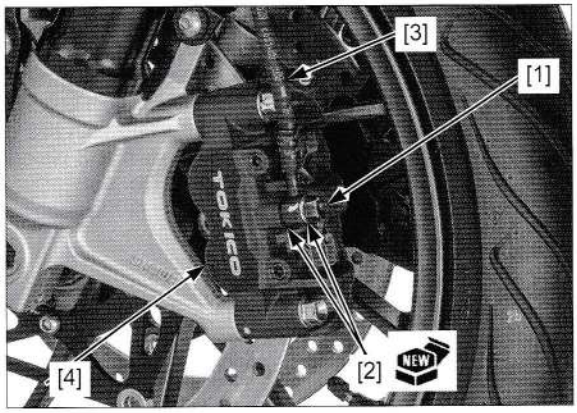
Installation is in the reverse order of removal.

NOTE:

- Replace the sealing washers with new ones.
- Be sure to rest the eyelet joint against the stopper when tightening the oil bolt.

TORQUE: Oil bolt: 34 N·m (3.5 kgf·m, 25 lbf·ft)

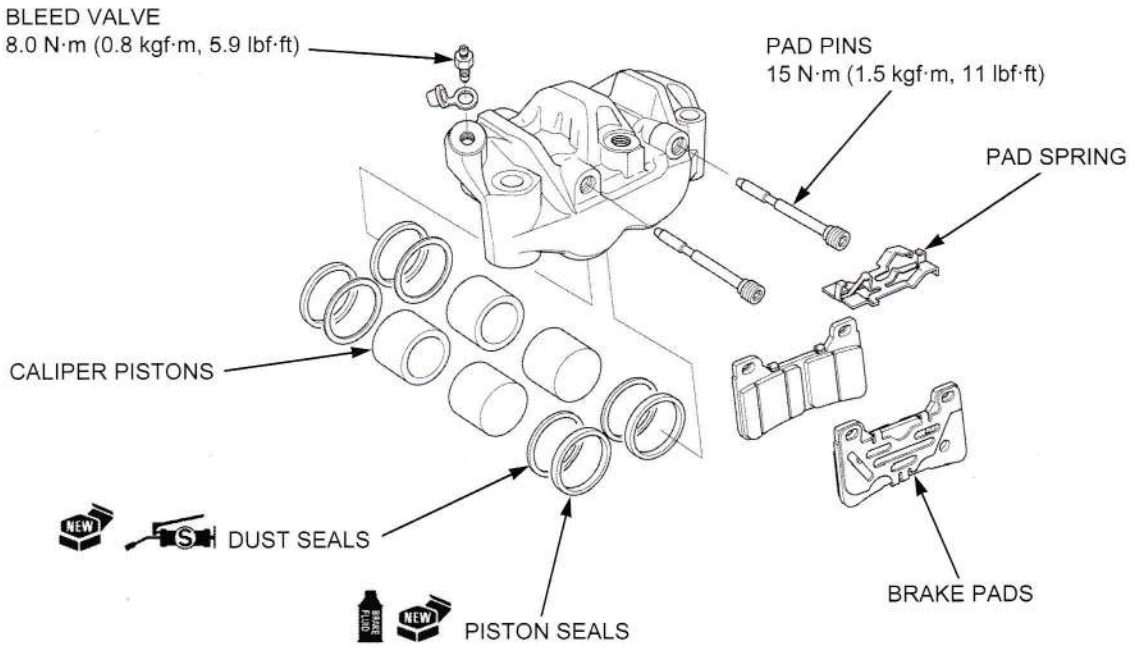
Fill and bleed the front brake hydraulic system (page 17-5).



DISASSEMBLY/ASSEMBLY

For brake pad removal/installation (page 17-7).

- Mark the pistons to ensure that they are reinstalled in their original locations.
- When removing the caliper pistons with compressed air, place a shop towel over the pistons to prevent damaging the pistons and caliper body. Do not use high pressure or bring the nozzle too close to the fluid inlet.
- Install the pistons with the opening toward the pads.



INSPECTION

Check the following parts for scoring, scratches, deterioration, or damage.

- caliper cylinders
- caliper pistons

Measure the parts according to HYDRAULIC BRAKE SPECIFICATIONS (page 1-10) and replace if necessary.

REAR BRAKE CALIPER

REMOVAL/INSTALLATION

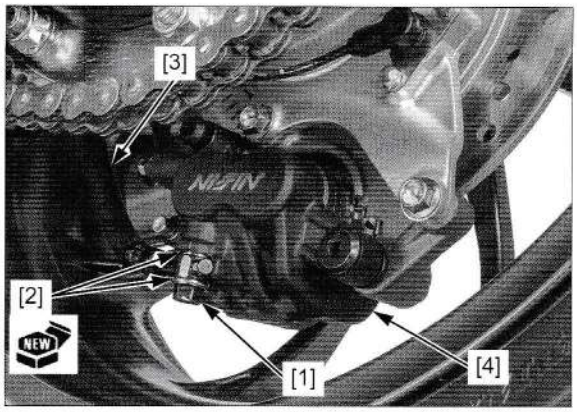
Drain the brake fluid from the rear brake hydraulic system (page 17-5).

Remove the following:

When removing the oil bolt, cover the end of brake hose to prevent contamination.

- oil bolt [1]
- sealing washers [2]
- brake hose [3]
- brake caliper [4] (page 17-8)

Installation is in the reverse order of removal.



NOTE:

- Replace the sealing washers with new ones.
- Be sure to rest the eyelet stopper pin against the caliper body when tightening the oil bolt.

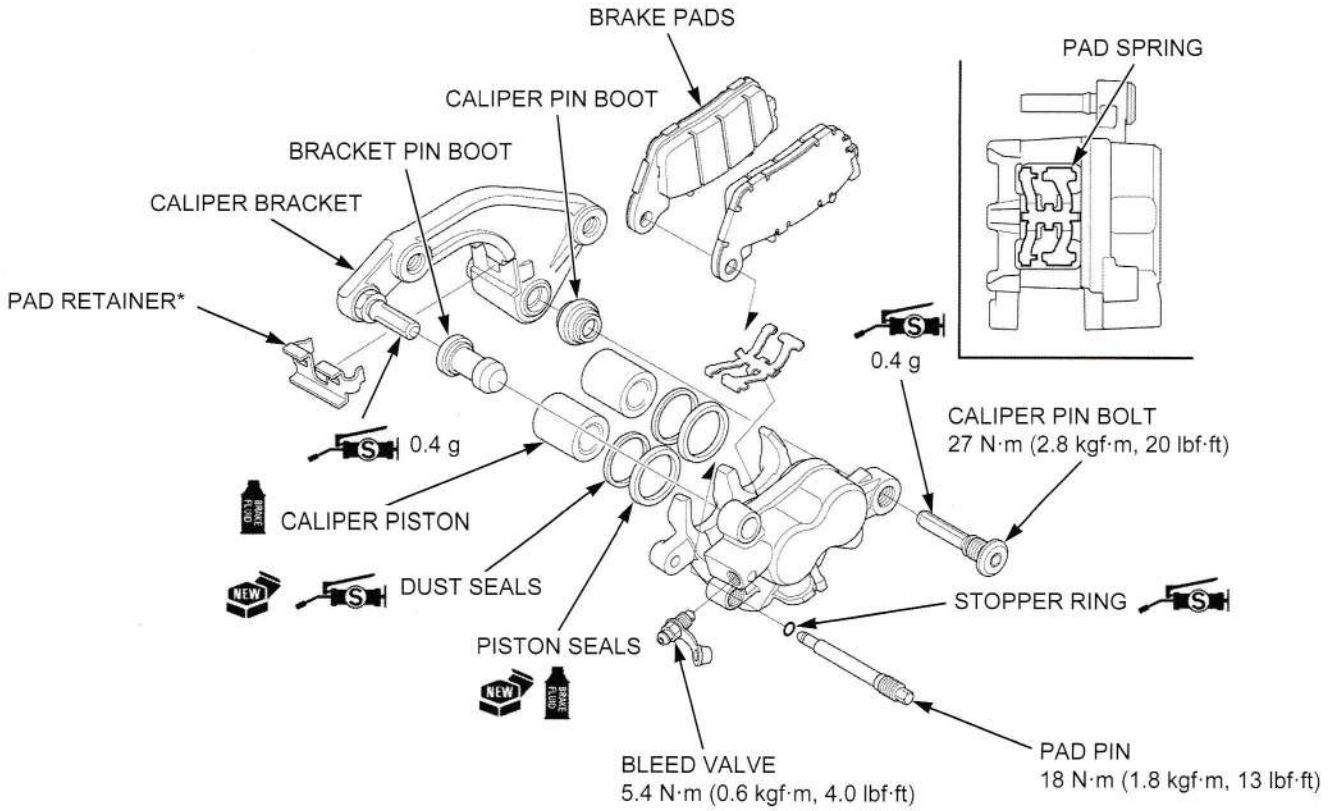
TORQUE: Oil bolt: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the rear brake hydraulic system (page 17-5).

DISASSEMBLY/ASSEMBLY

For brake pad removal/installation (page 17-8).

- When removing the caliper piston with compressed air, place a shop towel over the piston to prevent damaging the piston and caliper body. Do not use high pressure or bring the nozzle too close to the fluid inlet.
- Install the pistons with the opening toward the pads.



*Apply Honda Bond A or Honda Hand Grip Cement (U.S.A. only) to the retainer seating surface.

INSPECTION

Check the following parts for scoring, scratches, deterioration, or damage.

- caliper cylinders
- caliper pistons

Measure the parts according to HYDRAULIC BRAKE SPECIFICATIONS (page 1-10) and replace if necessary.

MEMO

18. ABS (II AC, III CM types)

SERVICE INFORMATION 18-2

SYSTEM LOCATION 18-3

SYSTEM DIAGRAM 18-4

ABS TROUBLESHOOTING INFORMATION 18-5

DTC INDEX 18-9

ABS INDICATOR CIRCUIT TROUBLESHOOTING 18-11

ABS TROUBLESHOOTING 18-13

WHEEL SPEED SENSOR 18-21

ABS MODULATOR 18-23

SERVICE INFORMATION

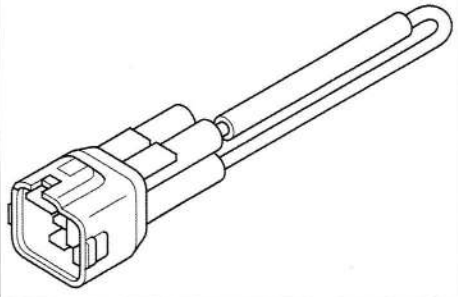
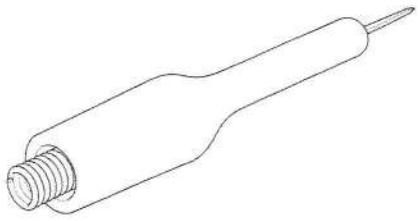
GENERAL

NOTICE

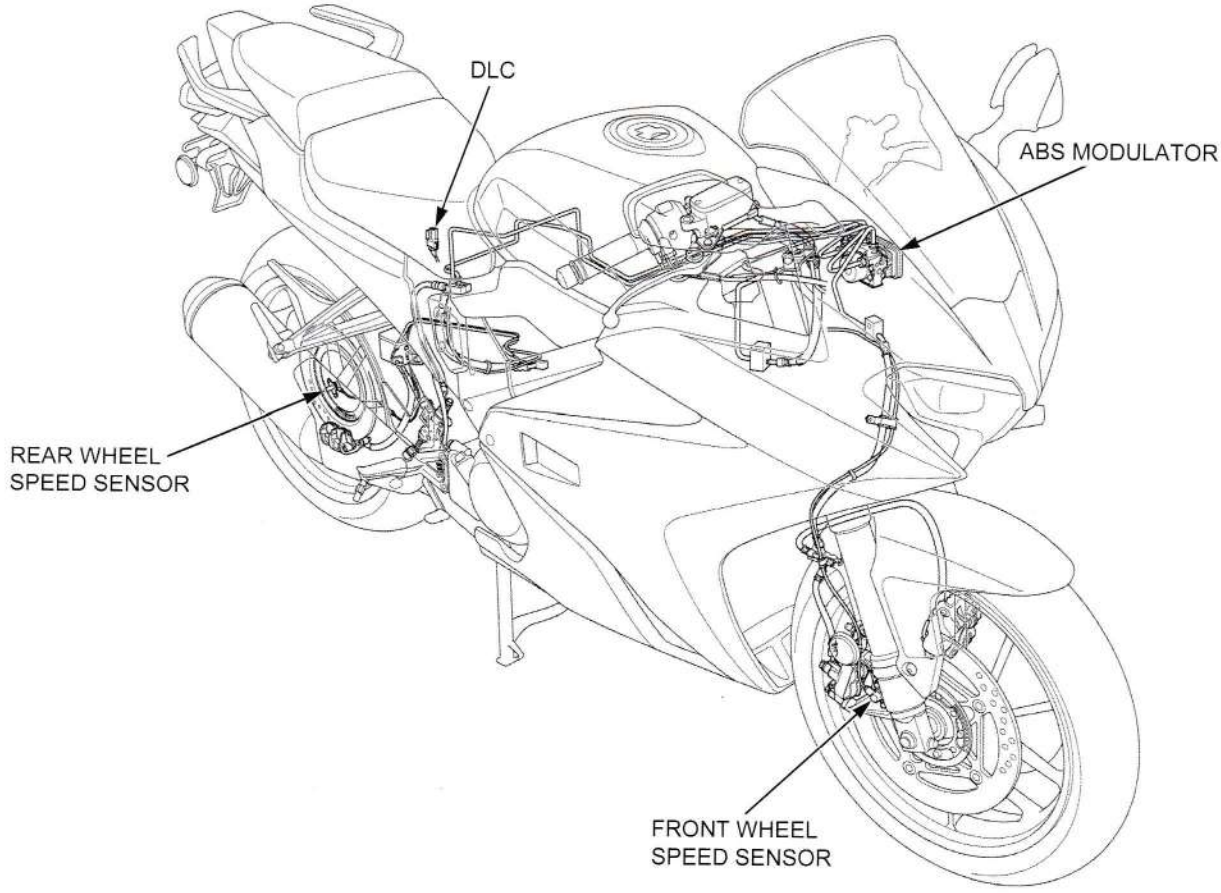
- *The ABS modulator may be damaged if dropped. Also if a connector is disconnected when current is flowing, the excessive voltage may damage the control unit. Always turn off the ignition switch before servicing.*
- *Spilling brake fluid will severely damage plastic parts and painted surfaces. It is also harmful to some rubber parts.*
- This section covers service of the Anti-lock Brake System (ABS). For other service (conventional brake) of the brake system, see Hydraulic Brake section (page 17-2).
- The ABS control unit is integrated in the modulator. Do not disassemble the ABS modulator. Replace the ABS modulator as an assembly when it is faulty.
- The ABS control unit performs pre-start self-diagnosis to check whether the ABS functions normally until the vehicle speed reaches 10 km/h (6 mph). After pre-start self-diagnosis, the ABS control unit monitors the ABS functions and vehicle running condition constantly until the ignition switch is turned OFF (ordinary self-diagnosis).
- 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.
- Read "ABS Troubleshooting Information" carefully, inspect and troubleshoot the ABS system according to the troubleshooting flow chart. Observe each step of the procedures one by one. Write down the DTC and probable faulty part before starting diagnosis and troubleshooting.
- Use a fully charged battery. Do not diagnose with a charger connected to the battery.
- After troubleshooting, erase the DTC and perform the pre-start self-diagnosis to be sure that the ABS indicator is operating normally (page 18-5).
- Troubles not resulting from a faulty ABS (e.g. brake disc squeak, unevenly worn brake pad) cannot be recognized by the ABS diagnosis system.
- When the wheel speed sensor and/or pulser ring is replaced, be sure to check the air gap (page 18-21).
- The following color codes are used throughout this section.

Bl = Black	Bu = Blue	O = Orange	R = Red	Y = Yellow
Br = Brown	G = Green	P = Pink	W = White	

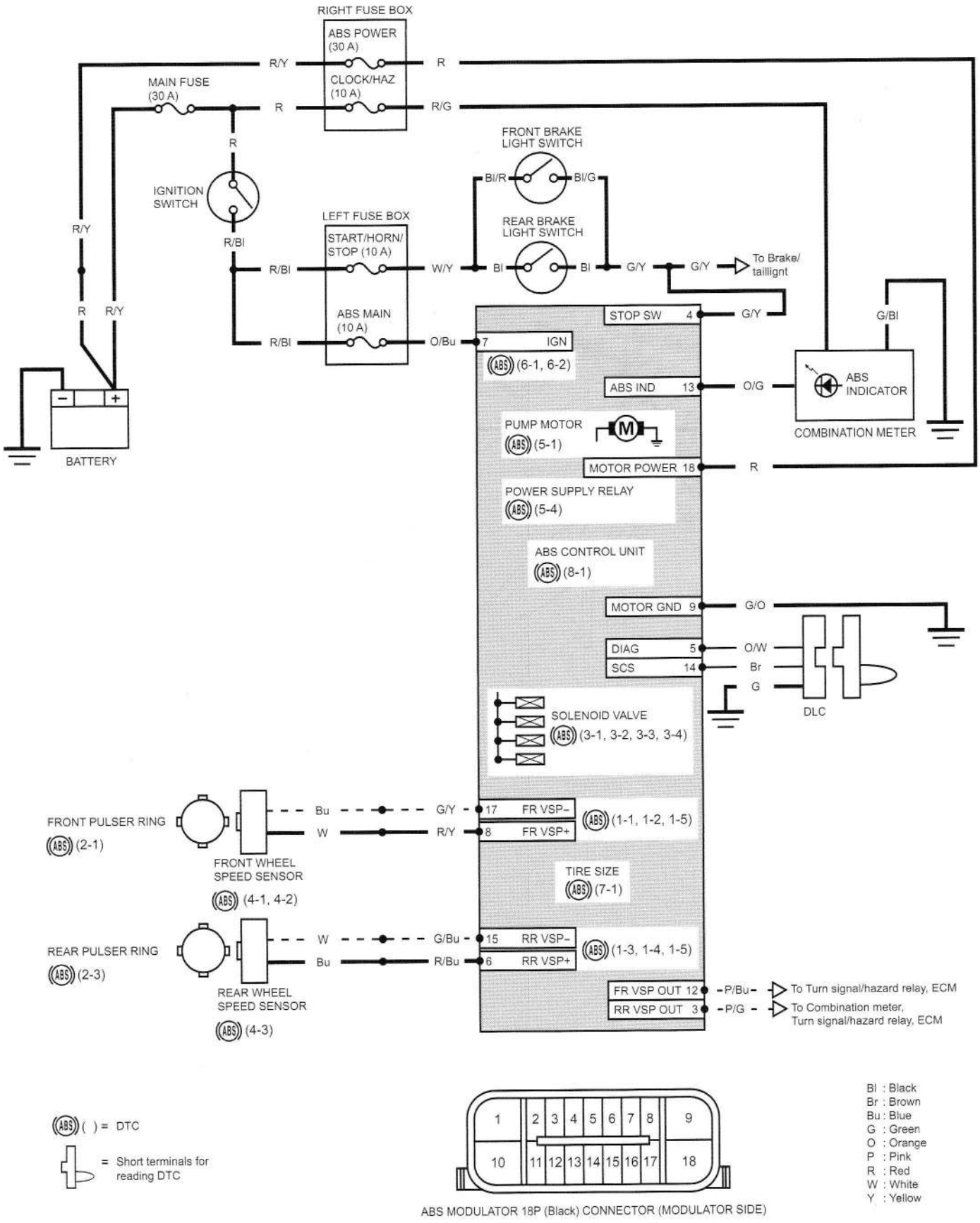
TOOLS

SCS service connector 070PZ-ZY30100	Test probe (2 Pack) 07ZAJ-RDJA110
	

SYSTEM LOCATION



SYSTEM DIAGRAM



(ABS) ( ) = DTC

= Short terminals for reading DTC

ABS MODULATOR 18P (Black) CONNECTOR (MODULATOR SIDE)

Bl : Black
Br : Brown
Bu : Blue
G : Green
O : Orange
P : Pink
R : Red
W : White
Y : Yellow

ABS TROUBLESHOOTING INFORMATION

SYSTEM DESCRIPTION

SUMMARY OF ABS PRE-START SELF-DIAGNOSIS SYSTEM

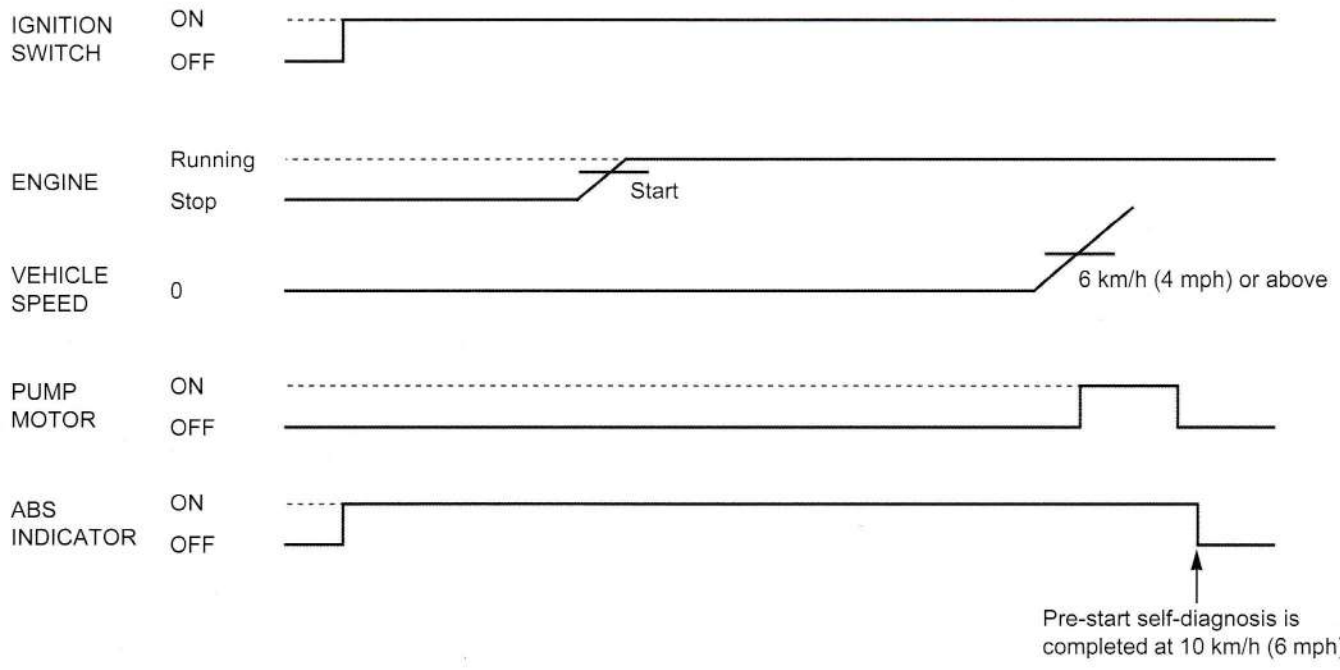
The ABS pre-start self-diagnosis system diagnoses the electrical system as well as the operating status of the modulator. When there is any abnormality, the problem and the associated part can be detected by reading the DTC.

When the motorcycle is running, pulse signals generated at the front and rear wheel speed sensors are sent to the ABS control unit. When the vehicle speed reaches approximately 6 km/h (4 mph), the ABS control unit operates the pump motor to check it. When the vehicle speed reaches 10 km/h (6 mph), the ABS control unit turns off the ABS indicator if the system is normal and the pre-start self-diagnosis is completed.

If any 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 ABS indicator blinks when a problem is detected.
When the ABS indicator blinks, the cause of the problem can be identified by reading the DTC (page 18-6).

If the ABS indicator does not come on when the ignition switch is turned ON, or the ABS indicator stays on after the pre-start self-diagnosis is completed although the ABS system is normal, the ABS indicator circuit may be faulty. Follow the troubleshooting (page 18-11).

Pre-start self-diagnosis when the system is normal:



PRE-START SELF-DIAGNOSIS PROCEDURE (Daily check)

1. Turn the ignition switch ON with the engine stop switch "○".
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.

MCS INFORMATION

- The MCS can read out and erase the DTC.

How to connect the MCS

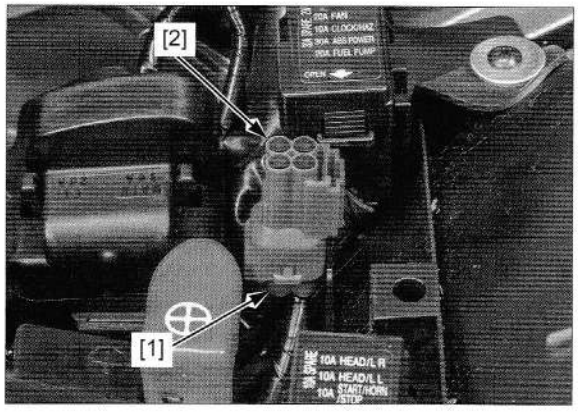
Remove the front seat (page 2-3).

Turn the ignition switch OFF.

Release the DLC [1] from the stay and remove the dummy connector [2].

Connect the MCS to the DLC.

Turn the ignition switch ON with the engine stop switch "○" and check the DTC.



DTC READOUT

NOTE:

- The DTC is not erased by turning the ignition switch OFF while the DTC is being output. Note that turning the ignition switch ON again does not indicate the DTC. To show the DTC again, repeat the DTC readout procedures from the beginning.
- Be sure to record the indicated DTC(s).
- After diagnostic troubleshooting, erase the DTC and perform the pre-start self-diagnosis procedure to be sure that there is no problem in the ABS (page 18-5).
- Do not apply the brake during DTC readout.

Connect the MCS to the DLC (page 18-6).

Read the DTC and follow the DTC index (page 18-9).

- If the MCS is not available, perform the following.

Reading DTC with the ABS indicator

Remove the front seat (page 2-3).

Turn the ignition switch OFF.

Release the DLC [1] from the stay and remove the dummy connector [2]. Short the DLC terminals using the special tool.

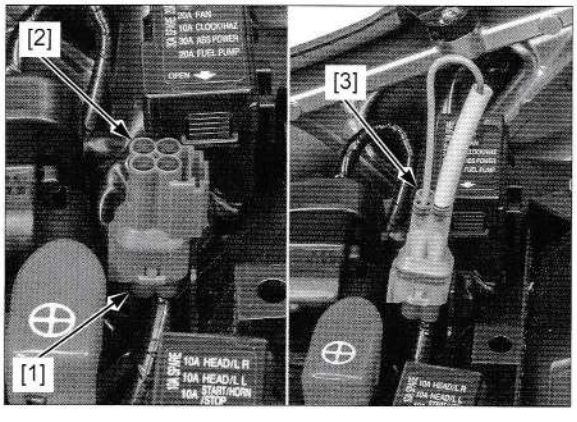
TOOL:
[3] SCS service connector 070PZ-ZY30100

CONNECTION: Brown – Green

Turn the ignition switch ON with the engine stop switch to "○".

The ABS indicator should come on for 2 seconds (start signal) (then goes off 3.6 seconds) and start DTC indication.

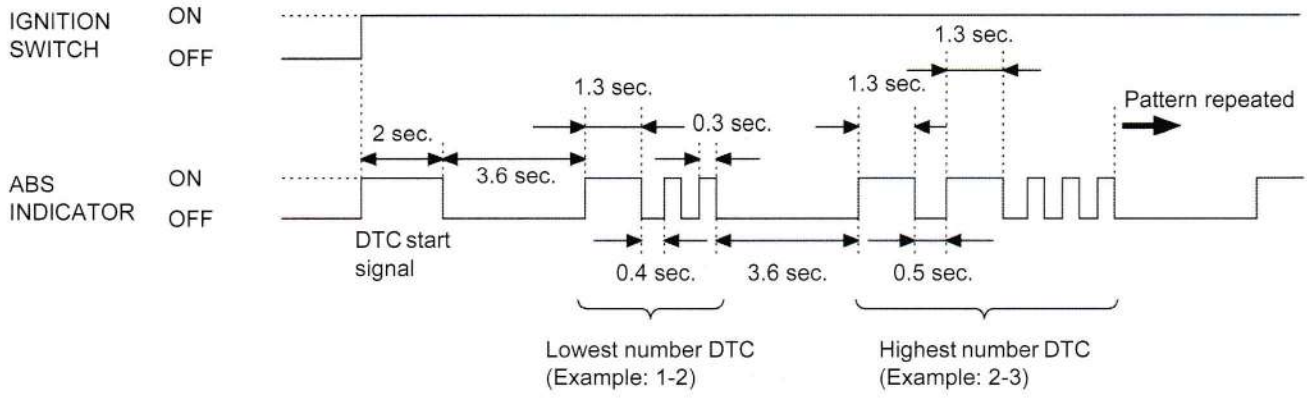
The DTC is indicated by the number of the times of the ABS indicator blinks. If the DTC is not stored, the ABS indicator stays on.



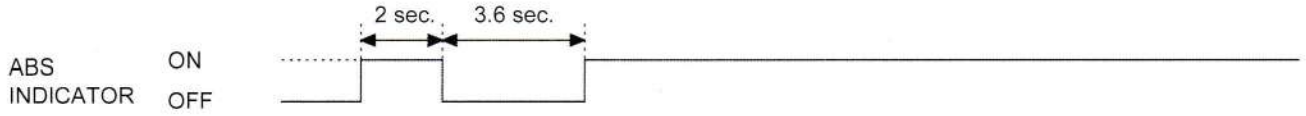
DTC INDICATION PATTERN

NOTE:

- The ABS indicator indicates the DTC by blinking a specified number of times. The indicator has two types of blinking, a long blink and short blink. The long blink lasts for 1.3 seconds, the short blink lasts for 0.3 seconds. For example, when one long blink is followed by two short blinks, the DTC is 1-2 (one long blink = 1 blink, plus two short blinks = 2 blinks).
- When the ABS control unit stores some DTCs, the ABS indicator shows the DTCs in the order from the lowest number to highest number. For example, when the ABS indicator indicates DTC 1-2, then indicates DTC 2-3, two failures have occurred.



When the DTC is not stored:



ERASING STORED DTC

NOTE:

- The stored DTC can not be erased by simply disconnecting the battery negative cable.

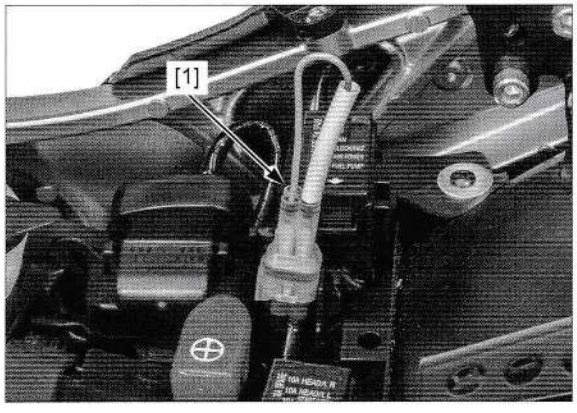
Erase the DTC with the MCS while the engine is stopped.

How to erase the DTC without MCS

1. Connect the SCS service connector [1] to the DLC (page 18-6).
2. While squeezing the brake lever, turn the ignition switch ON with the engine stop switch to "○". The ABS indicator should come on for 2 seconds and go off.
3. Release the brake lever immediately after the ABS indicator goes off. The ABS indicator should come on.
4. Squeeze the brake lever immediately after the ABS indicator comes on. The ABS indicator should go off.
5. Release the brake lever immediately after the ABS indicator goes off.

   When the DTC is erased, the ABS indicator blinks 2 times and stays on. If the ABS indicator does not blink 2 times, the self-diagnostic memory has not been erased, so try again.
6. Turn the ignition switch OFF and remove the SCS service connector from the DLC.

   Install the seats (page 2-3).



CIRCUIT INSPECTION

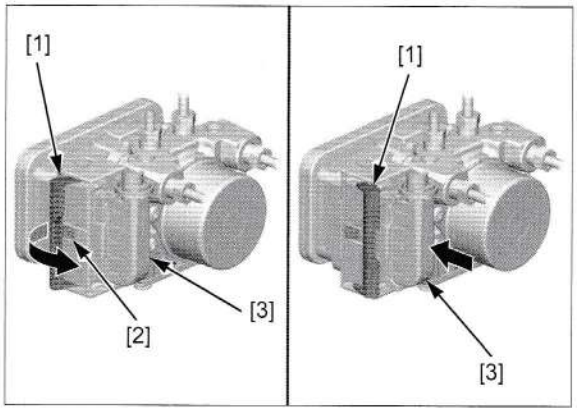
INSPECTION AT ABS MODULATOR CONNECTOR

Remove the left middle cowl (page 2-6).

Turn the ignition switch OFF.

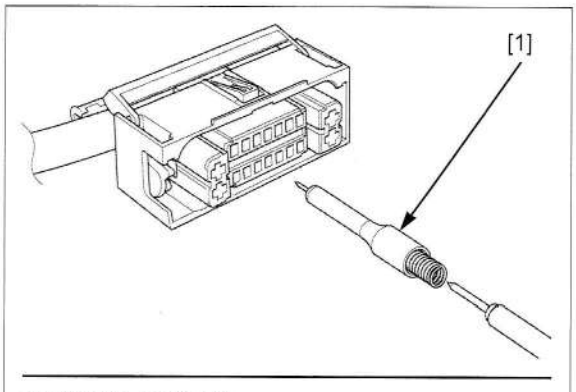
Disconnecting procedure:
Turn the lock lever [1] while pressing the lock tab [2] to release it.
Be sure the lock lever is turned all the way and disconnect the ABS modulator 18P (Black) connector [3].

Connecting procedure:
Be sure to fully seat the lock lever against the wire side of the connector.
Connect the ABS modulator 18P (Black) connector by pressing it straight at the area as shown (arrow) until the lock tab clicks.
Make sure the connector is locked securely.

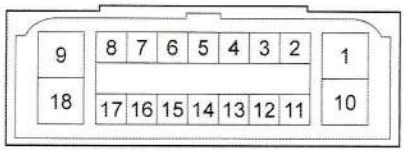


- Always clean around and keep any foreign material away from the connector before disconnecting it.
- A faulty ABS is often related to poorly connected or corroded connections. Check those connections before proceeding.
- In testing at ABS modulator 18P (Black) connector terminals (wire harness side; except No. 9 and No. 18 terminals), always use the test probe [1]. Insert the test probe into the connector terminal, then connect the digital multimeter probe to the test probe.

TOOL:
Test probe (2 Pack) **07ZAJ-RDJA110**



TERMINAL LAYOUT:



(Terminal side of the wire harness)

DTC 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. Be sure to erase the DTC (page 18-7). Then, test-ride the motorcycle above 30 km/h (19 mph) and check the DTC (page 18-6). 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).

DTC	Function failure	Detection		Symptom/Fail-safe function	Refer to
		A	B		
–	ABS indicator malfunction • ABS modulator voltage input line • Indicator related wires • Combination meter • ABS modulator • ABS MAIN fuse (10 A)			• ABS indicator never comes ON at all	18-11
				• ABS indicator stays ON at all times	18-11
1-1	Front wheel speed sensor circuit malfunction (open circuit) • Wheel speed sensor or related wires	○	○	• Stops ABS operation	18-13
1-2	Front wheel speed sensor malfunction • Wheel speed sensor, pulser ring or related wires • Electromagnetic interference		○	• Stops ABS operation	18-13
1-3	Rear wheel speed sensor circuit malfunction • Wheel speed sensor or related wires	○	○	• Stops ABS operation	18-15
1-4	Rear wheel speed sensor malfunction • Wheel speed sensor, pulser ring or related wires • Electromagnetic interference		○	• Stops ABS operation	18-15
1-5	Front or rear wheel speed sensor circuit malfunction (short circuit) • Wheel speed sensor or related wires	○	○	• Stops ABS operation	18-17
2-1	Front pulser ring • Pulser ring or related wires		○	• Stops ABS operation	18-13
2-3	Rear pulser ring • Pulser ring or related wires		○	• Stops ABS operation	18-15
3-1 3-2 3-3 3-4	Solenoid valve malfunction (ABS modulator)	○	○	• Stops ABS operation	18-18
4-1	Front wheel lock • Riding condition		○	• Stops ABS operation	18-13
4-2	Front wheel lock (Wheelie) • Riding condition		○		
4-3	Rear wheel lock • Riding condition		○	• Stops ABS operation	18-15
5-1	Pump motor lock • Pump motor (ABS modulator) or related wires • ABS POWER fuse (30 A)	○	○	• Stops ABS operation	18-19
5-4	Power supply relay malfunction • Power supply relay (ABS modulator) or related wires • ABS POWER fuse (30 A)	○	○	• Stops ABS operation	18-19

ABS (II AC, III CM types)

DTC	Function failure	Detection		Symptom/Fail-safe function	Refer to
		A	B		
6-1	Power circuit under voltage • Input voltage (too low) • ABS MAIN fuse (10 A)	O	O	• Stops ABS operation	18-20
6-2	Power circuit over voltage • Input voltage (too high)	O	O	• Stops ABS operation	
7-1	Tire malfunction • Tire size		O	• Stops ABS operation	18-21
8-1	ABS control unit • ABS control unit malfunction (ABS modulator)	O	O	• Stops ABS operation	18-21

(A) Pre-start self-diagnosis (page 18-5)

(B) Ordinary self-diagnosis: diagnoses while the motorcycle is running (after pre-start self-diagnosis)

ABS INDICATOR CIRCUIT TROUBLESHOOTING

ABS INDICATOR DOES NOT COME ON (when the ignition switch turned ON)

NOTE:

- Before starting this inspection, check the initial operation of the combination meter (page 20-9).

1. Indicator Operation Inspection

Turn the ignition switch OFF.
Disconnect the ABS modulator 18P (Black) connector (page 18-8).
Turn the ignition switch ON with the engine stop switch "○".
Check the ABS indicator.

Does the ABS indicator come on?

YES – Faulty ABS modulator

NO – GO TO STEP 2.

2. Indicator Signal Line Short Circuit Inspection

Turn the ignition switch OFF.
Check for continuity between the wire harness side ABS modulator 18P (Black) connector [1] terminal and ground.

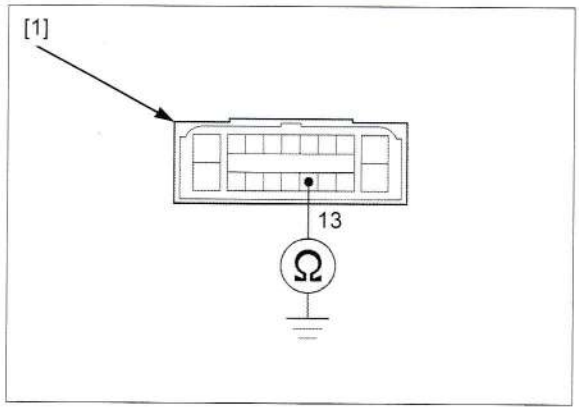
TOOL:
Test probe (2 Pack) **07ZAJ-RDJA110**

CONNECTION: 13 – Ground

Is there continuity?

YES – Short circuit in the Orange/green wire

NO – Faulty combination meter



ABS INDICATOR STAYS ON (Indicator does not go off when the motorcycle is running)

1. Service Check Line Short Circuit Inspection

Turn the ignition switch OFF.
Disconnect the ABS modulator 18P (Black) connector (page 18-8).
Check for continuity between the wire harness side ABS modulator 18P (Black) connector [1] terminal and ground.

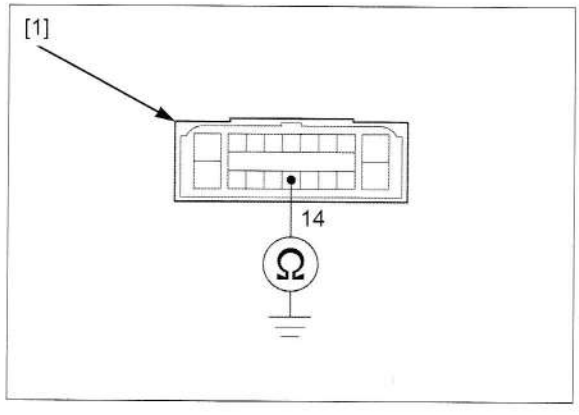
TOOL:
Test probe (2 Pack) **07ZAJ-RDJA110**

CONNECTION: 14 – Ground

Is there continuity?

YES – Short circuit in the Brown wire

NO – GO TO STEP 2.



2. Indicator Signal Line Open Circuit Inspection

Short the wire harness side ABS modulator 18P (Black) connector [1] terminal to the ground with a jumper wire [2].

TOOL:
Test probe (2 Pack) 07ZAJ-RDJA110

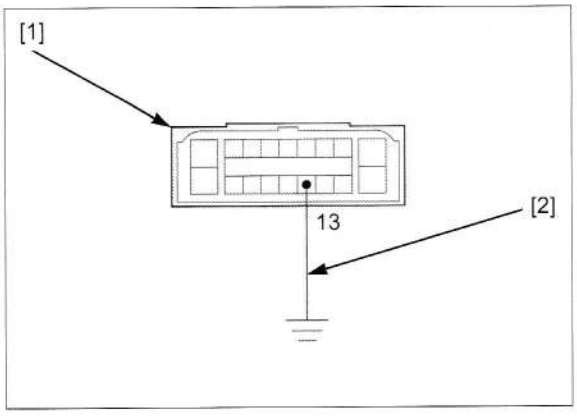
CONNECTION: 13 – Ground

Turn the ignition switch ON with the engine stop switch "○".
Check the ABS indicator.

Does it go off?

YES – GO TO STEP 3.

NO – • Open circuit in the Orange/green wire
• Faulty combination meter (if the Orange/green wire is OK)



3. Modulator Ground Line Open Circuit Inspection

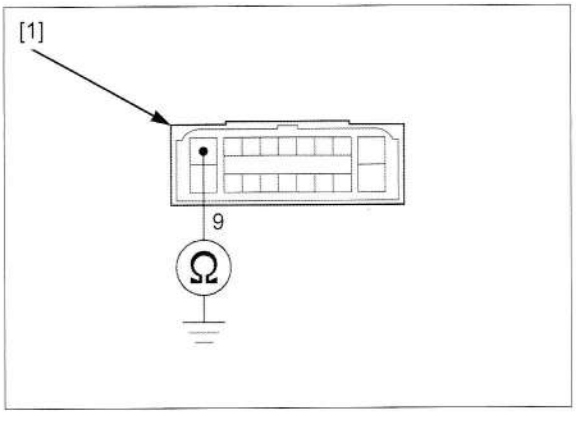
Turn the ignition switch OFF.
Check for continuity between the wire harness side ABS modulator 18P (Black) connector [1] terminal and ground.

CONNECTION: 9 – Ground

Is there continuity?

YES – GO TO STEP 4.

NO – Open circuit in the Green/orange wire



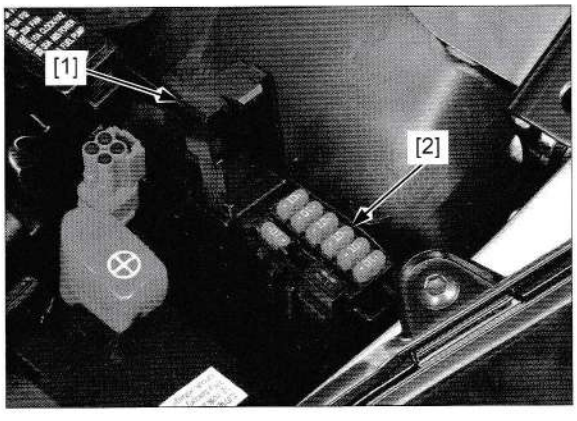
4. Fuse Inspection

Remove the front seat (page 2-3).
Remove the left fuse box cover [1].
Check for a blown ABS MAIN fuse (10 A) [2].

Is the fuse blown?

YES – GO TO STEP 5.

NO – GO TO STEP 6.



5. **Power Input Line Short Circuit Inspection**

With the ABS MAIN fuse (10 A) removed, check for continuity between the wire harness side ABS modulator 18P (Black) connector [1] and ground.

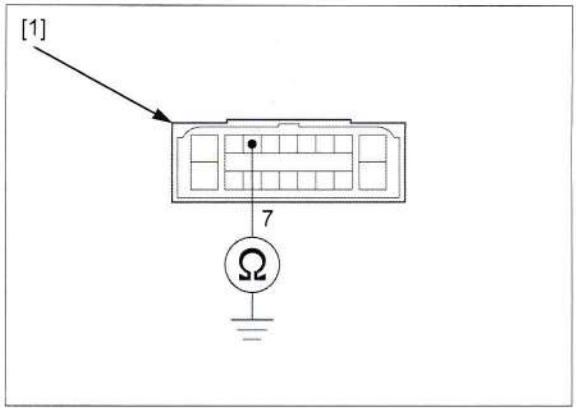
TOOL:
Test probe (2 Pack) **07ZAJ-RDJA110**

CONNECTION: 7 – Ground

Is there continuity?

YES – Short circuit in the Orange/blue wire

NO – Intermittent failure. Replace the ABS MAIN fuse (10 A) with a new one and recheck.



6. **Power Input Line Open Circuit Inspection**

Install the ABS MAIN fuse (10 A).
Turn the ignition switch ON with the engine stop switch "○".
Measure the voltage between the wire harness side ABS modulator 18P (Black) connector [1] terminal and ground.

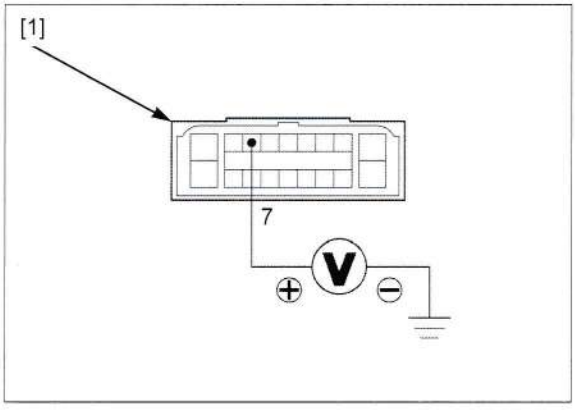
TOOL:
Test probe (2 Pack) **07ZAJ-RDJA110**

CONNECTION: 7 (+) – Ground (–)

Is there battery voltage?

YES – Faulty ABS modulator

NO – Open circuit in the Red/black or Orange/blue wire



ABS TROUBLESHOOTING

NOTE:
- Perform inspection with the ignition switch OFF, unless otherwise specified.
- 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 diagnostic troubleshooting, erase the DTC (page 18-7) and test-ride the motorcycle to check that the ABS indicator operates normally during pre-start self-diagnosis (page 18-5).

DTC 1-1, 1-2, 2-1, 4-1 or 4-2 (Front Wheel Speed Sensor Circuit/Front Wheel Speed Sensor/Front Pulser Ring/Front Wheel Lock)

NOTE:
- The ABS indicator might blink under unusual riding or conditions (page 18-9). This is a temporary failure.
  Erase the DTC (page 18-7) then test-ride the motorcycle above 30 km/h (19 mph) and check that the ABS indicator operates normally (page 18-5).
- If the DTC 4-1 is indicated, check the front brake for drag.

1. **Speed Sensor Air Gap Inspection**

   Measure the air gap between the speed sensor and pulser ring (page 18-21).

   Is the air gap correct?

   YES – GO TO STEP 2.

   NO – Check each part for deformation or looseness and correct accordingly. Recheck the air gap.

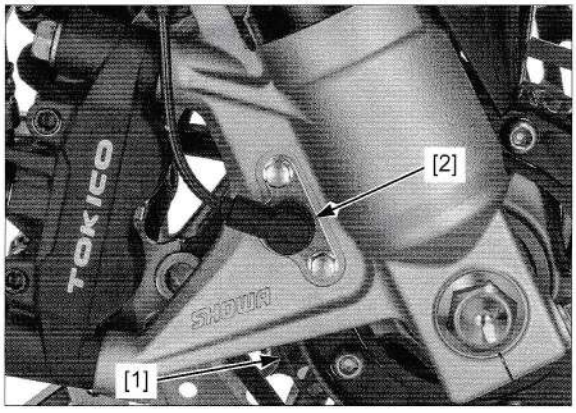
2. **Speed Sensor Condition Inspection**

   Inspect the area around the front wheel speed sensor:
   Check for iron or other magnetic deposits between the pulser ring [1] and wheel speed sensor [2] and check the pulser ring slots for obstructions.
   Check the installation condition of the pulser ring or wheel speed sensor for looseness.
   Check the pulser ring and sensor tip for deformation or damage (e.g., chipped pulser ring teeth).

   Are the sensor and pulser ring in good condition?

   YES – GO TO STEP 3.

   NO – Remove any deposits. Install properly or replace faulty part.



3. **Front Wheel Speed Sensor Line Short Circuit Inspection (at sensor side)**

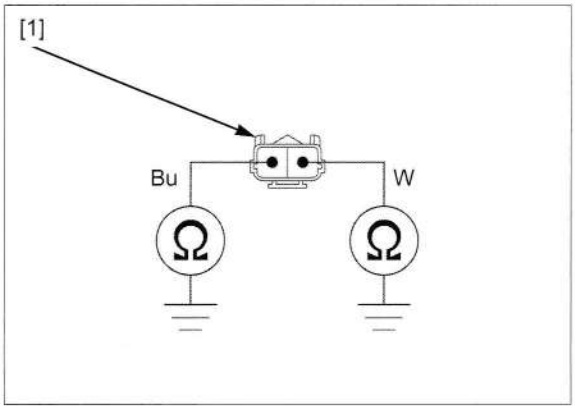
   Turn the ignition switch OFF.
   Disconnect the front wheel speed sensor 2P (Gray) connector (page 18-22).
   Check for continuity between each terminal of the sensor side front wheel speed sensor 2P (Gray) connector [1] and ground.

   CONNECTION: Blue – Ground
   White – Ground

   Is there continuity?

   YES – Faulty front wheel speed sensor

   NO – GO TO STEP 4.



4. **Front Wheel Speed Sensor Line Short Circuit Inspection**

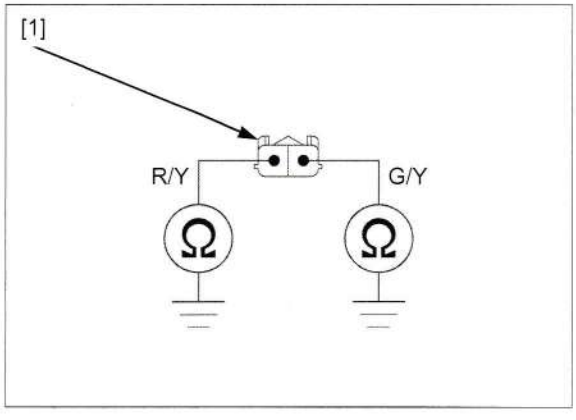
   Disconnect the ABS modulator 18P (Black) connector (page 18-8).
   Check for continuity between each terminal of the wire harness side front wheel speed sensor 2P (Gray) connector [1] and ground.

   CONNECTION: Red/yellow – Ground
   Green/yellow – Ground

   Is there continuity?

   YES – • Short circuit in the Red/yellow wire
   • Short circuit in the Green/yellow wire

   NO – GO TO STEP 5.



5. **Front Wheel Speed Sensor Line Open Circuit Inspection**

   Short the wire harness side ABS modulator 18P (Black) connector [1] terminals with a jumper wire [2].

   CONNECTION: 8 – 17

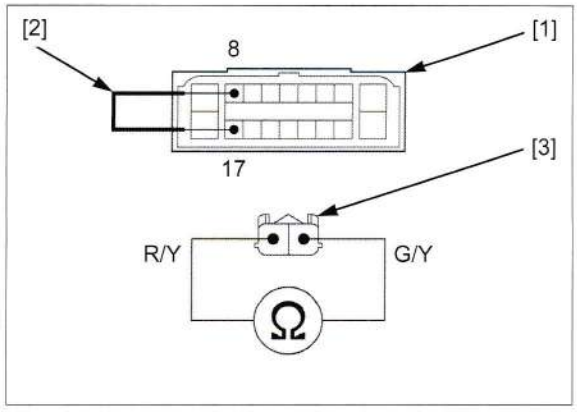
   Check for continuity between the wire harness side front wheel speed sensor 2P (Gray) connector [3] terminals.

   CONNECTION: Red/yellow – Green/yellow

   Is there continuity?

   YES – GO TO STEP 6.

   NO – Open circuit in the Red/yellow or Green/yellow wire



6. **Failure Reproduction with a New Speed Sensor**

   Replace the front wheel speed sensor with a new one (page 18-22).
   Connect the ABS modulator 18P (Black) and front wheel speed sensor 2P (Gray) connectors.
   Erase the DTC (page 18-7).
   Test-ride the motorcycle above 30 km/h (19 mph).
   Recheck the DTC (page 18-6).

   Is the DTC 1-1, 1-2, 2-1, 4-1 or 4-2 indicated?

   YES – Faulty ABS modulator

   NO – Faulty original wheel speed sensor

DTC 1-3, 1-4, 2-3, or 4-3 (Rear Wheel Speed Sensor Circuit/Rear Wheel Speed Sensor/Rear Pulser Ring/Rear Wheel Lock)

NOTE:

- The ABS indicator might blink under unusual riding or conditions (page 18-9). This is a temporary failure.
  Erase the DTC (page 18-7) then test-ride the motorcycle above 30 km/h (19 mph) and check that the ABS indicator operates normally (page 18-5).
- If the DTC 4-3 is indicated, check the front brake for drag.

1. **Speed Sensor Air Gap Inspection**

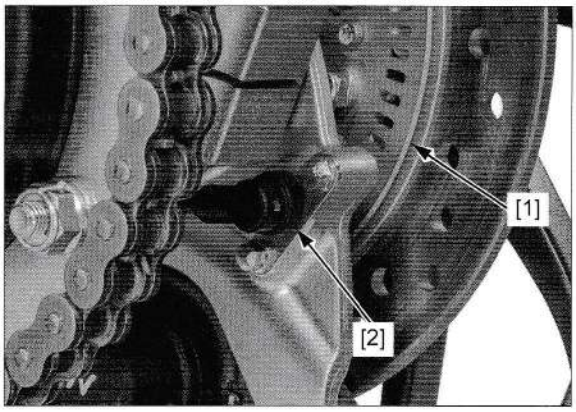
   Measure the air gap between the speed sensor and pulser ring (page 18-21).

   Is the air gap correct?

   YES – GO TO STEP 2.

   NO – Check each part for deformation or looseness and correct accordingly. Recheck the air gap.

2. **Speed Sensor Condition Inspection**



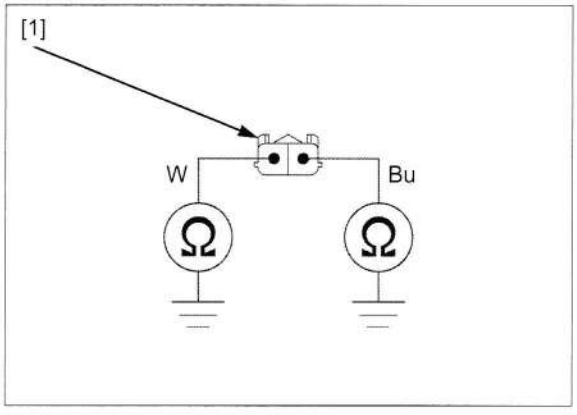
Inspect the area around the rear wheel speed sensor:
Check for iron or other magnetic deposits between the pulser ring [1] and wheel speed sensor [2] and check the pulser ring slots for obstructions.
Check the installation condition of the pulser ring or wheel speed sensor for looseness.
Check the pulser ring and sensor tip for deformation or damage (e.g., chipped pulser ring teeth).

Are the sensor and pulser ring in good condition?

YES – GO TO STEP 3.

NO – Remove any deposits. Install properly or replace faulty part.

3. **Rear Wheel Speed Sensor Line Short Circuit Inspection (at sensor side)**



Turn the ignition switch OFF.
Disconnect the rear wheel speed sensor 2P (Blue) connector (page 18-22).
Check for continuity between each terminal of the sensor side rear wheel speed sensor 2P (Blue) connector [1] and ground.

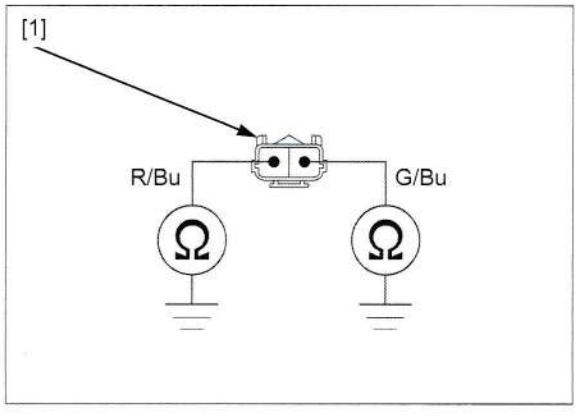
CONNECTION: White – Ground
Blue – Ground

Is there continuity?

YES – Faulty rear wheel speed sensor

NO – GO TO STEP 4.

4. **Rear Wheel Speed Sensor Line Short Circuit Inspection**



Disconnect the ABS modulator 18P (Black) connector (page 18-8).
Check for continuity between each terminal of the wire harness side rear wheel speed sensor 2P (Blue) connector [1] and ground.

CONNECTION: Red/blue – Ground
Green/blue – Ground

Is there continuity?

YES – • Short circuit in the Red/blue wire
• Short circuit in the Green/blue wire

NO – GO TO STEP 5.

5. **Rear Wheel Speed Sensor Line Open Circuit Inspection**

Short the wire harness side ABS modulator 18P (Black) connector [1] terminals with a jumper wire [2].

CONNECTION: 6 – 15

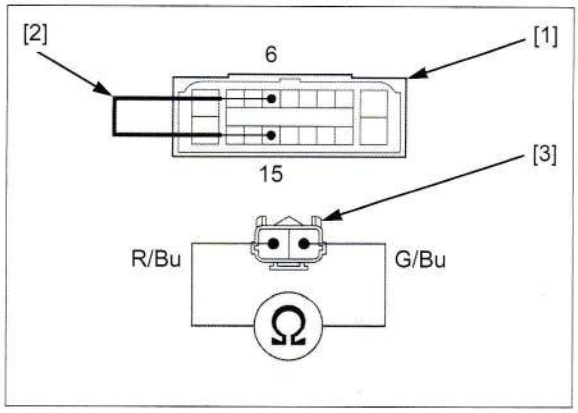
Check for continuity between the wire harness side rear wheel speed sensor 2P (Blue) connector [3] terminals.

CONNECTION: Red/blue – Green/blue

Is there continuity?

YES – GO TO STEP 6.

NO – Open circuit in the Red/blue or Green/blue wire



6. **Failure Reproduction with a New Speed Sensor**

Replace the rear wheel speed sensor with a new one (page 18-22).
Connect the ABS modulator 18P (Black) and rear wheel speed sensor 2P (Blue) connectors.
Erase the DTC (page 18-7).
Test-ride the motorcycle above 30 km/h (19 mph).
Recheck the DTC (page 18-6).

Is the DTC 1-3, 1-4, 2-3, or 4-3 indicated?

YES – Faulty ABS modulator

NO – Faulty original wheel speed sensor

DTC 1-5 (Front or Rear Wheel Speed Sensor Circuit; Short)

1. **Front Wheel Speed Sensor Line Short Circuit Inspection (at sensor side)**

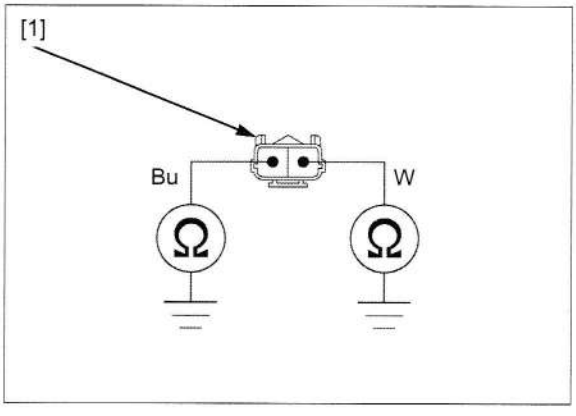
Turn the ignition switch OFF.
Disconnect the front wheel speed sensor 2P (Gray) connector (page 18-22).
Check for continuity between each terminal of the sensor side front wheel speed sensor 2P (Gray) connector [1] and ground.

CONNECTION: Blue – Ground
White – Ground

Is there continuity?

YES – Faulty front wheel speed sensor

NO – GO TO STEP 2.



2. **Front Wheel Speed Sensor Line Short Circuit Inspection**

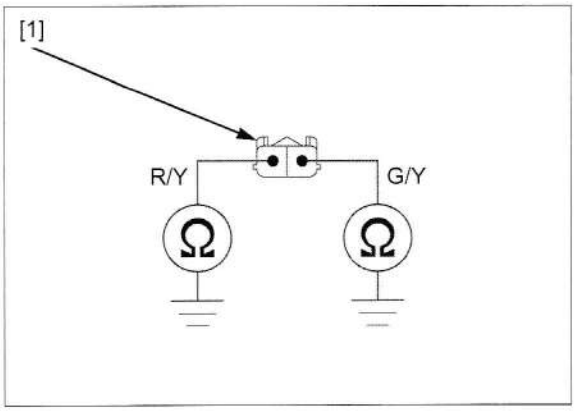
Disconnect the ABS modulator 18P (Black) connector (page 18-8).
Check for continuity between each terminal of the wire harness side front wheel speed sensor 2P (Gray) connector [1] and ground.

CONNECTION: Red/yellow – Ground
Green/yellow – Ground

Is there continuity?

YES – • Short circuit in the Red/yellow wire
• Short circuit in the Green/yellow wire

NO – GO TO STEP 3.



3. **Rear Wheel Speed Sensor Line Short Circuit Inspection (at sensor side)**

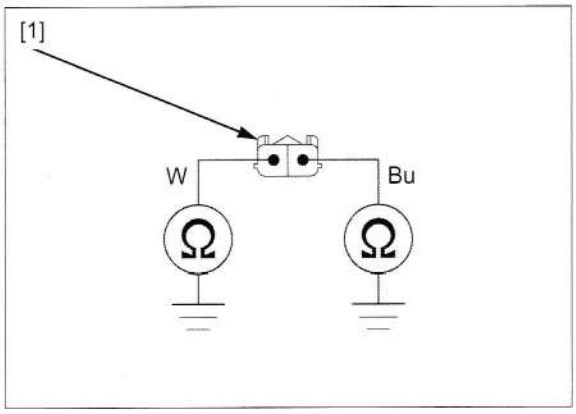
Disconnect the rear wheel speed sensor 2P (Blue) connector (page 18-22).
Check for continuity between each terminal of the sensor side rear wheel speed sensor 2P (Blue) connector [1] and ground.

CONNECTION: White – Ground
Blue – Ground

Is there continuity?

YES – Faulty rear wheel speed sensor

NO – GO TO STEP 4.



4. **Rear Wheel Speed Sensor Line Short Circuit Inspection**

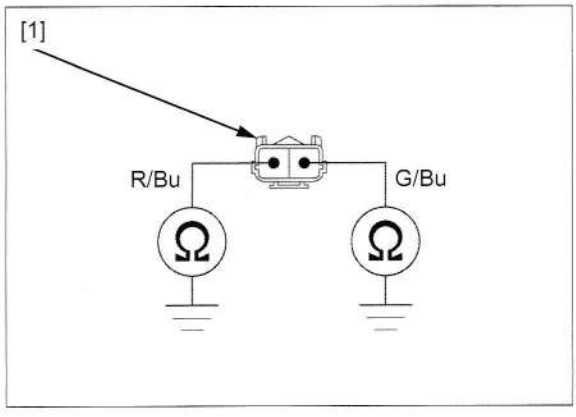
Check for continuity between each terminal of the wire harness side rear wheel speed sensor 2P (Blue) connector [1] and ground.

CONNECTION: Red/blue – Ground
Green/blue – Ground

Is there continuity?

YES – • Short circuit in the Red/blue wire
• Short circuit in the Green/blue wire

NO – Faulty ABS modulator



DTC 3-1, 3-2, 3-3 or 3-4 (Solenoid Valve)

1. **Failure Reproduction**

Erase the DTC (page 18-7).
Test-ride the motorcycle above 30 km/h (19 mph).
Recheck the DTC (page 18-6).

Is the DTC 3-1, 3-2, 3-3 or 3-4 indicated?

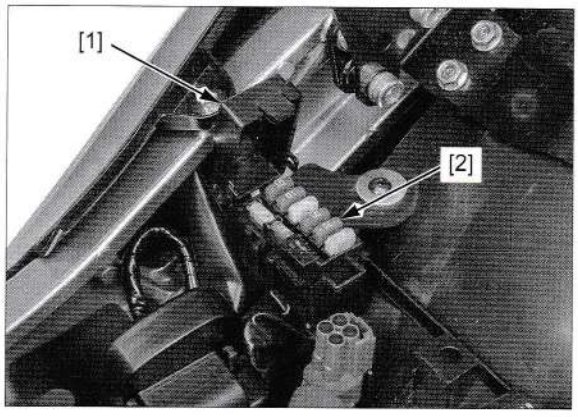
YES – Faulty ABS modulator

NO – Solenoid valve is normal (intermittent failure)

DTC 5-1 or 5-4 (Pump Motor Lock/ Power Supply Relay)

1. Fuse Inspection

Turn the ignition switch OFF.
Remove the front seat (page 2-3).
Open the right fuse box cover [1].
Check for a blown ABS POWER fuse (30 A) [2].



Is the fuse blown?

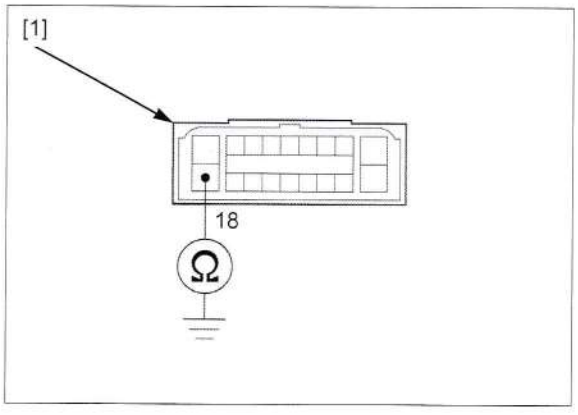
YES – GO TO STEP 2.

NO – GO TO STEP 3.

2. Motor Power Input Line Short Circuit Inspection

Disconnect the ABS modulator 18P (Black) connector (page 18-8).
With the ABS POWER fuse (30 A) removed, check for continuity between the wire harness side ABS modulator 18P (Black) connector [1] terminal and ground.

CONNECTION: 18 – Ground



Is there continuity?

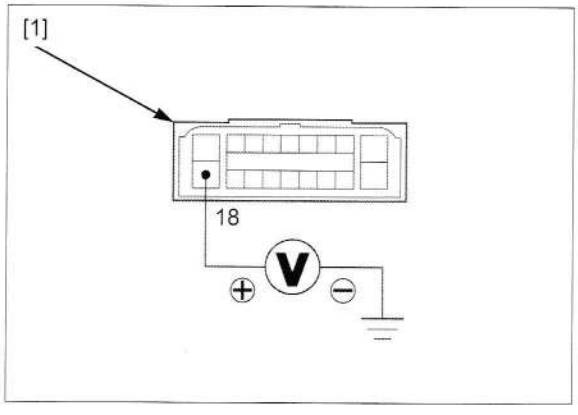
YES – Short circuit in the Red wire between the right fuse box and ABS modulator 18P (Black) connector

NO – Intermittent failure. Replace the ABS POWER fuse (30 A) with a new one and recheck.

3. Motor Power Input Line Open Circuit Inspection

Install the ABS POWER fuse (30 A).
Disconnect the ABS modulator 18P (Black) connector (page 18-8).
Measure the voltage between the wire harness side ABS modulator 18P (Black) connector [1] terminal and ground.

CONNECTION: 18 (+) – Ground (–)



Is there battery voltage?

YES – GO TO STEP 4.

NO – Open circuit in the Red or Red/yellow wire between the battery and ABS modulator 18P (Black) connector

4. Failure Reproduction

Turn the ignition switch OFF.
Connect the ABS modulator 18P (Black) connector.
Erase the DTC (page 18-7).
Test-ride the motorcycle above 30 km/h (19 mph).
Recheck the DTC (page 18-6).

Is the DTC 5-1 or 5-4 indicated?

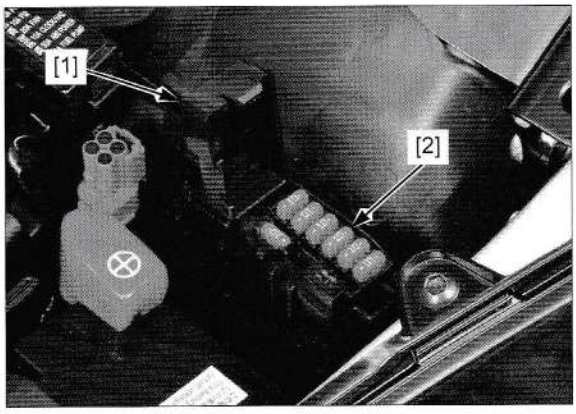
YES – Faulty ABS modulator

NO – Pump motor is normal (intermittent failure)

DTC 6-1 or 6-2 (Power Circuit)

1. Fuse Inspection

Turn the ignition switch OFF.
Remove the front seat (page 2-3).
Open the left fuse box cover [1].
Check for a blown ABS MAIN fuse (10 A) [2].



Is the fuse blown?

YES – GO TO STEP 2.

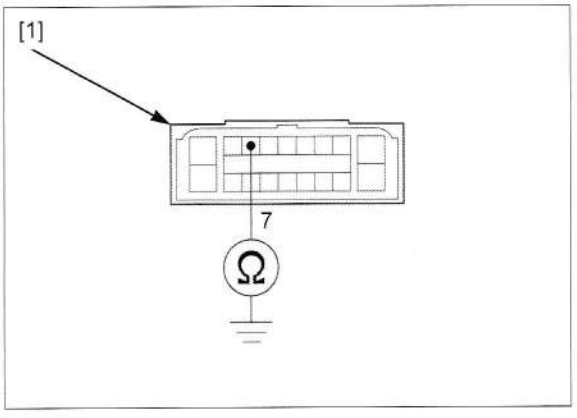
NO – GO TO STEP 3.

2. Power Input Line Short Circuit Inspection

Disconnect the ABS modulator 18P (Black) connector (page 18-8).
With the ABS MAIN fuse (10 A) removed, check for continuity between the wire harness side ABS modulator 18P (Black) connector [1] and ground.

TOOL:
Test probe (2 Pack) **07ZAJ-RDJA110**

CONNECTION: 7 – Ground



Is there continuity?

YES – Short circuit in the Orange/blue wire

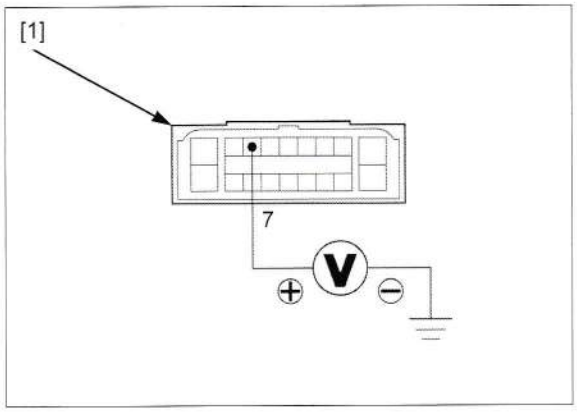
NO – Intermittent failure. Replace the ABS MAIN fuse (10 A) with a new one and recheck.

3. Power Input Line Open Circuit Inspection

Install the ABS MAIN fuse (10 A).
Turn the ignition switch ON with the engine stop switch "○".
Measure the voltage between the wire harness side ABS modulator 18P (Black) connector [1] terminal and ground.

TOOL:
Test probe (2 Pack) **07ZAJ-RDJA110**

CONNECTION: 7 (+) – Ground (–)



Is there battery voltage?

YES – GO TO STEP 4.

NO – Open circuit in the Red/black or Orange/blue wire

4. Failure Reproduction

Turn the ignition switch OFF.
Connect the ABS modulator 18P (Black) connector.
Erase the DTC (page 18-7).
Test-ride the motorcycle above 30 km/h (19 mph).
Recheck the DTC (page 18-6).

Is the DTC 6-1 or 6-2 indicated?

YES – Faulty ABS modulator

NO – Power circuit is normal (intermittent failure)

DTC 7-1 (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 DTC indication:
   Erase the DTC (page 18-7).
   Test-ride the motorcycle above 30 km/h (19 mph).
   Recheck the DTC (page 18-6).

   Is the DTC 7-1 indicated?

   YES – Faulty ABS modulator

   NO – Tire size is normal (intermittent failure)

DTC 8-1 (ABS Control Unit)

1. **Failure Reproduction**

   Erase the DTC (page 18-7).
   Test-ride the motorcycle above 30 km/h (19 mph).
   Recheck the DTC (page 18-6).

   Is the DTC 8-1 indicated?

   YES – Faulty ABS modulator

   NO – ABS control unit is normal (intermittent failure)

WHEEL SPEED SENSOR

AIR GAP INSPECTION

Raise the rear wheel off the ground by placing the motorcycle on its centerstand (front wheel speed sensor) or supporting the motorcycle securely using a hoist or equivalent (rear wheel speed sensor).

Measure the clearance (air gap) between the sensor and pulser ring at several points by turning the wheel slowly.

It must be within specification.

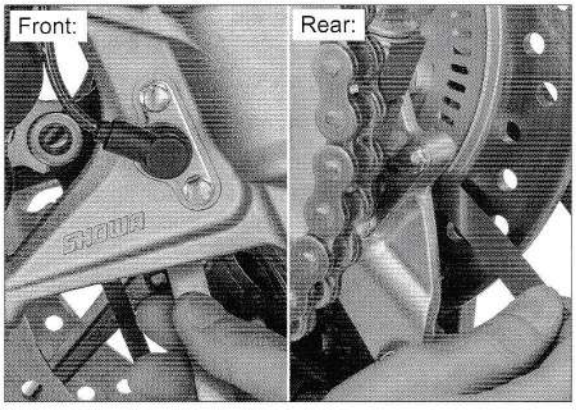
STANDARD: 0.4 – 1.2 mm (0.02 – 0.05 in)

The clearance (air gap) cannot be adjusted.
If it is not within specification, check each part for deformation, looseness, or damage.

Check the wheel speed sensor for damage and replace if necessary.

Check the pulser ring for deformation or damage and replace if necessary.

- Front pulser ring (page 15-15)
- Rear pulser ring (page 16-9)



REMOVAL/INSTALLATION

FRONT WHEEL SPEED SENSOR

Remove the left middle cowl (page 2-6).

Disconnect the front wheel speed sensor 2P (Gray) connector [1] from the stay and remove it.

Remove the clips, release the sensor wire [2] from the guides and clamps, and remove it out of the frame (page 1-20).

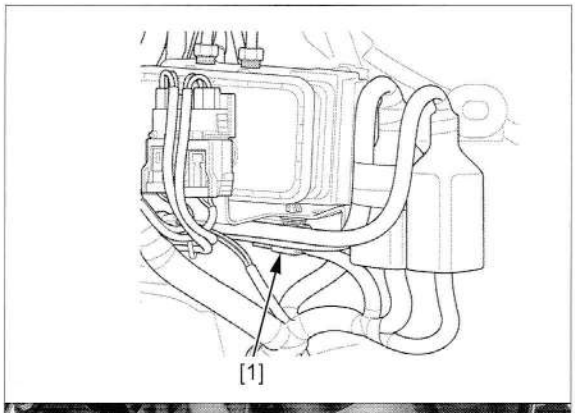
Remove the two bolts [3] and wheel speed sensor [4].

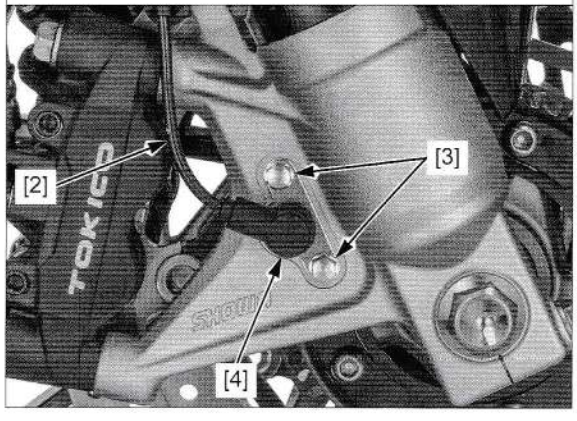
Installation is in the reverse order of removal.

NOTE:

- Clean the sensor tip and sensor fitting area (fork leg) thoroughly, and be sure that no foreign materials enter the hole.

After installation, check the air gap (page 18-21).





REAR WHEEL SPEED SENSOR

Remove the battery cover (page 2-3).

Remove the rear wheel speed sensor 2P (Blue) connector [1] from the stay and disconnect it.

Remove the clips, release the sensor wire [2] from the clamps, and remove it out of the frame (page 1-20).

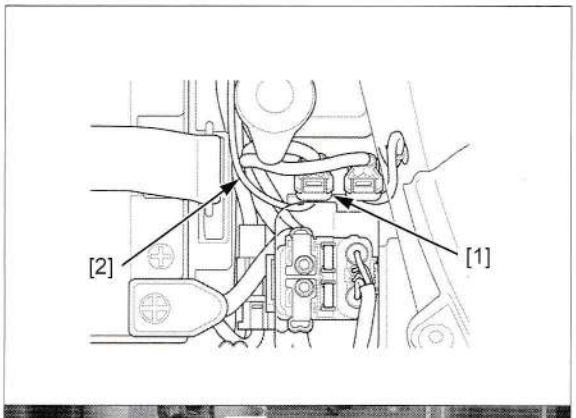
Remove the two bolts [3] and wheel speed sensor [4].

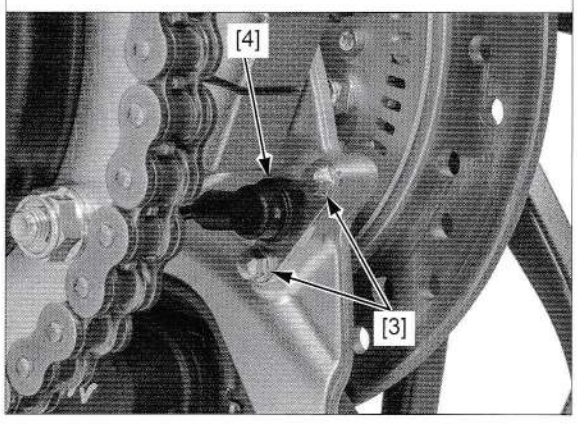
Installation is in the reverse order of removal.

NOTE:

- Clean the sensor tip and sensor fitting area (caliper bracket) thoroughly, and be sure that no foreign materials enter the hole.

After installation, check the air gap (page 18-21).





ABS MODULATOR

REMOVAL/INSTALLATION

Remove the inner upper panel (page 2-7).

Drain the brake fluid from the rear brake hydraulic systems (page 17-5).

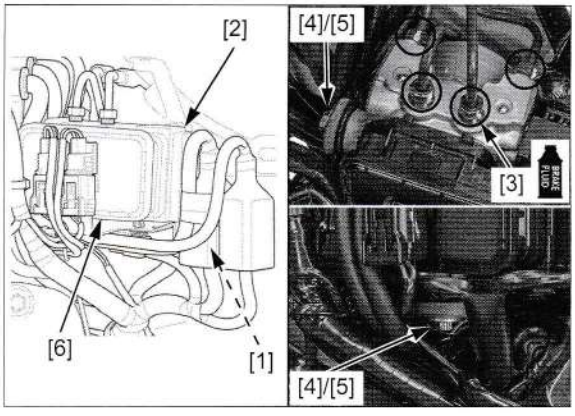
Remove the 14P (Blue) connector [1] from the modulator stay.

Disconnect the ABS modulator 18P (Black) connector [2] (page 18-8).

When disconnecting, cover the end of the brake pipes to prevent contamination.

Loosen the brake pipe joint nuts [3] to disconnect the brake pipes.

Remove the two mounting bolts [4] and washers [5].



Be careful not to bend or damage the brake pipes.

Remove the ABS modulator assembly [6].

Installation is in the reverse order of removal.

NOTE:

- Apply brake fluid to the threads of the brake pipe joint nuts.
- When tightening the joint nuts, align the nut with the nut hole in the modulator properly to prevent cross-threading.

TORQUE:

Brake pipe joint nut: 14 N·m (1.4 kgf·m, 10 lbf·ft)

Fill and bleed the front and rear brake hydraulic systems (page 17-5).

MEMO

19. BATTERY/CHARGING SYSTEM

SERVICE INFORMATION 19-2

SYSTEM LOCATION 19-4

SYSTEM DIAGRAM 19-4

TROUBLESHOOTING 19-5

BATTERY 19-6

CHARGING CONDITION INSPECTION 19-7

REGULATOR/RECTIFIER 19-8

PHASE CONTROLLED GENERATING CIRCUIT INSPECTION 19-8

ALTERNATOR CHARGING COIL 19-11

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 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.*

- 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 2 weeks.
- For a battery remaining in a stored motorcycle, disconnect the negative battery cable from the battery terminal.
- The maintenance free battery must be replaced when it reaches the end of its service life.
- The battery can be damaged if overcharged or undercharged, or if left to discharge for 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 tail light ON for long periods of time without riding the motorcycle.
- The battery will self-discharge when the motorcycle is not in use. For this reason, charge the battery every 2 weeks to prevent sulfation from occurring.
- The current phase control generating/changing system is used in this motorcycle. Refer to Technical Feature for configuration of this system (page 1-37).
- The regulator/rectifier has a self-diagnostic function that enables it to detect faults in the system and the DTC can be read by the MCS. However, the DTC is not stored. Refer to PGM-FI system section for MCS information (page 4-6).
- Inspect and troubleshoot the charging system according to the troubleshooting flow chart (page 19-5).
- For alternator stator and MP sensor service (page 12-21).
- The following color codes used are indicated through out this section.

Bl = Black	G = Green	Lg = Light Green	R = Red	Y = Yellow
Br = Brown	Gr = Gray	O = Orange	V = Violet	
Bu = Blue	Lb = Light Blue	P = Pink	W = White	

BATTERY CHARGING

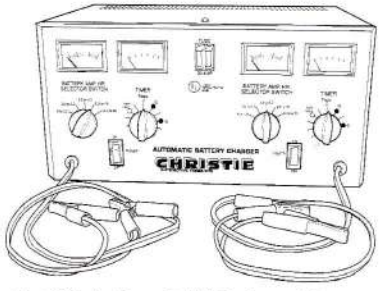
- Turn power ON/OFF at the charger, not at the battery terminal.
- For battery charging, do not exceed the charging current and time specified on the battery. Using excessive current or extending the charging time may damage the battery.
- Quick charging should only be done in an emergency; slow charging is preferred.

BATTERY TESTING

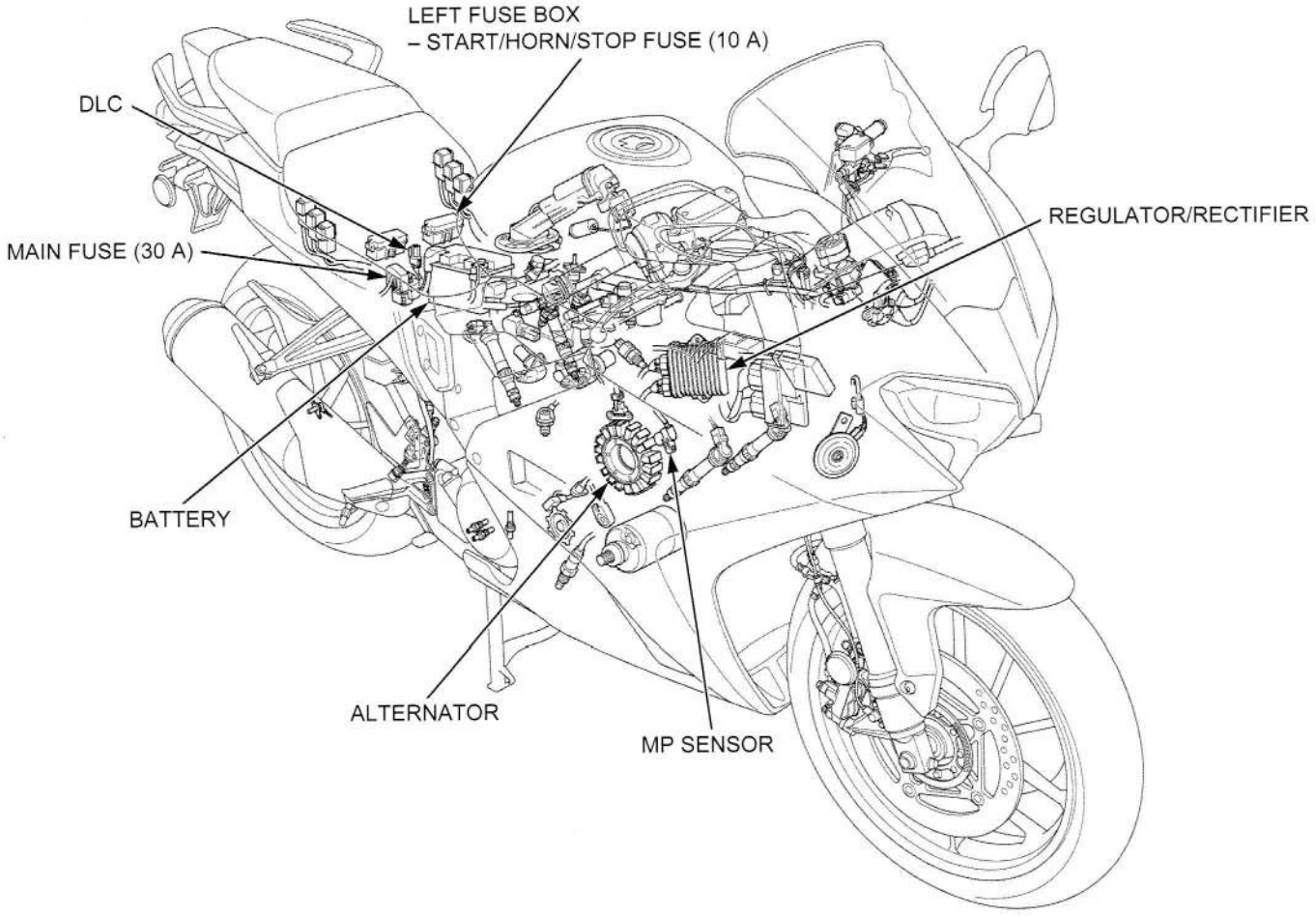
Refer to the instruction of the Operation Manual for the recommended battery tester for details about battery testing. The recommended battery tester puts a "load" on the battery so the actual battery condition can be measured.

RECOMMENDED BATTERY TESTER: Micro 404XL (U.S.A. only)

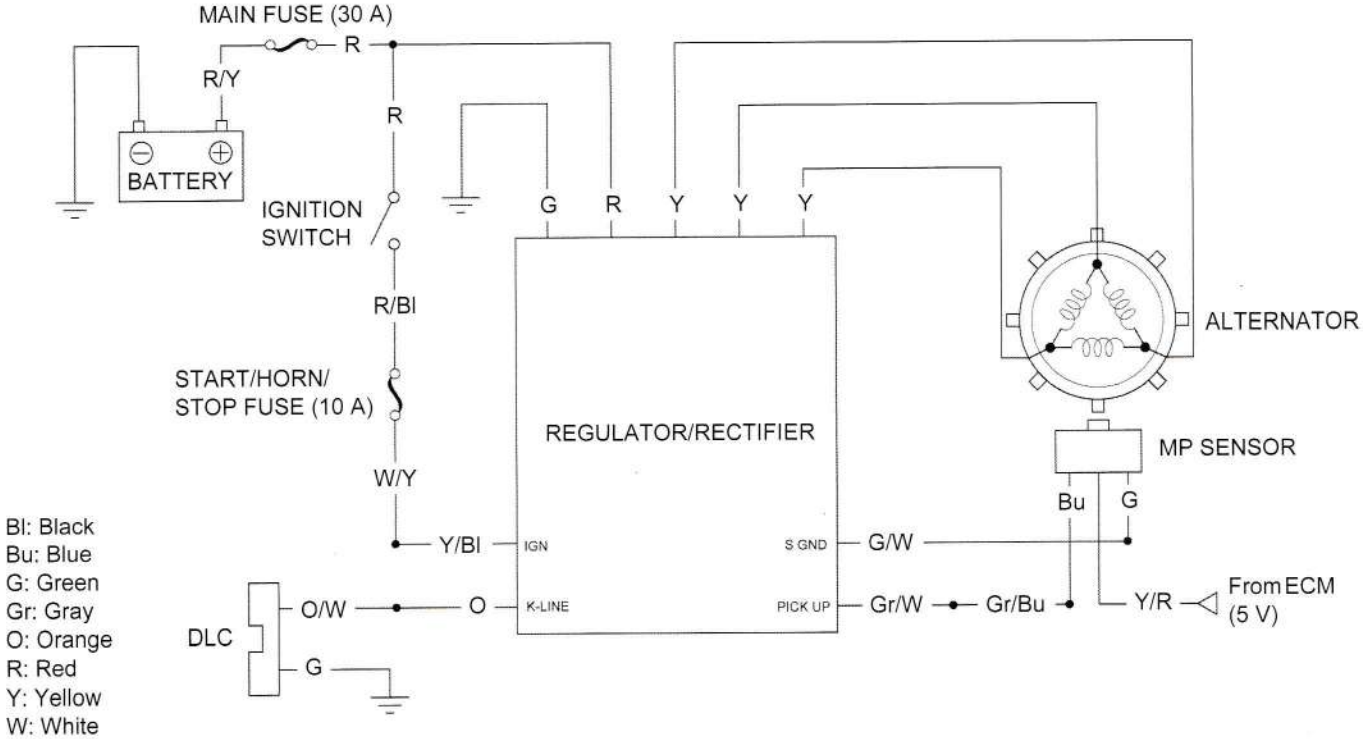
TOOLS

Motorcycle battery analyzer Micro 404XL (U.S.A. only) 	Christie battery charger MC1012/2T (U.S.A. only)  or OptiMate Pro-S (U.S.A. only)

SYSTEM LOCATION



SYSTEM DIAGRAM



TROUBLESHOOTING

Battery is damaged or weak

1. **Battery Test**

   Remove the battery (page 19-6).
   Check the battery condition using the recommended battery tester.

   RECOMMENDED BATTERY TESTER: Micro 404XL (U.S.A. only)

   Is the battery in good condition?

   YES – GO TO STEP 2.

   NO – Faulty battery

2. **Current Leakage Test**

   Install the battery (page 19-6).
   Check the battery current leakage using a digital multimeter (page 19-7).

   Is the current leakage below 1.0 mA?

   YES – GO TO STEP 4.

   NO – GO TO STEP 3.

3. **Current Leakage Test with Regulator/rectifier Connector Disconnected**

   Disconnect the regulator/rectifier 3P (Black) connector (page 19-8).
   Recheck the battery current leakage.

   Is the current leakage below 1.0 mA?

   YES – Faulty regulator/rectifier

   NO – • Shorted wire harness
   • Faulty ignition switch

4. **Charging Voltage Inspection**

   Measure and record the battery voltage using a digital multimeter (page 19-6).
   Start the engine.
   Measure the charging voltage (page 19-7).
   Compare the measurements to the results of the following calculation.

   STANDARD:
   Measured BV < Measured CV < 15.5 V
   - **BV = Battery Voltage**
   - **CV = Charging Voltage**

   Do the battery and charging voltages satisfy the calculation?

   YES – Faulty battery

   NO – GO TO STEP 5.

5. **Regulator/rectifier Wire Harness Inspection**

   Check the regulator/rectifier wire harness (page 19-8).

   Are the results of checked voltage and continuity correct?

   YES – GO TO STEP 6.

   NO – • Open circuit in related wire
   • Loose or poor contacts of related terminal
   • Shorted wire harness

6. **Phase Controlled Generating Circuit Inspection**

   Check the phase controlled generating circuit with the MCS (page 19-8).

   Is the circuit normal?

   YES – Faulty regulator/rectifier

   NO – • Repair the connection.
   • Replace the faulty component.

BATTERY

REMOVAL/INSTALLATION

Remove the battery cover (page 2-3).

Turn the ignition switch OFF.

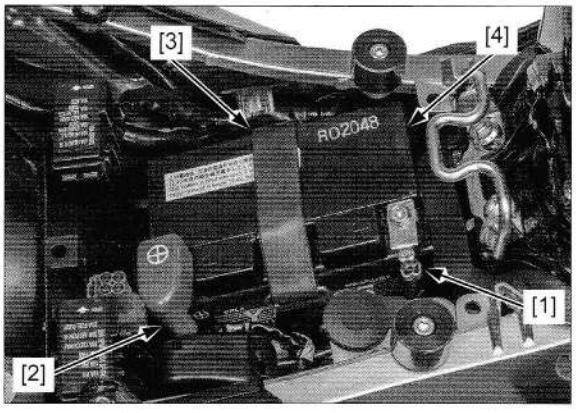
Disconnect the negative (–) cable [1] first and then disconnect the positive (+) cable [2] by removing the terminal bolts.

Remove the rubber strap [3] and the battery [4].

Installation is in the reverse order of removal.

NOTE:

- Connect the positive (+) cable first, then connect the negative (–) cable.
- For digital clock setting procedure (page 20-12).



VOLTAGE INSPECTION

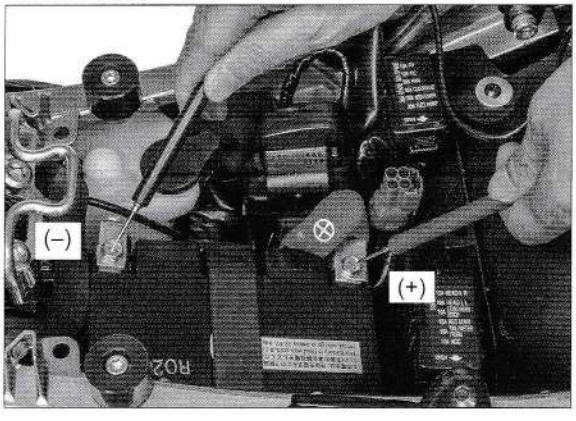
Remove the battery cover (page 2-3).

Measure the battery voltage using a digital multimeter.

VOLTAGE (20°C/68°F):
Fully charged: 13.0 – 13.2 V
Needs charging: Below 12.4 V

NOTE:

- Voltage fluctuates just after charging; wait at least 30 minutes before measuring.



BATTERY TESTING

Remove the battery (page 19-6).

Refer to the instructions that are appropriate to the battery testing equipment available to you.

TOOL:

Battery tester	**Micro 404XL (U.S.A. only)**

BATTERY CHARGING (U.S.A. only)

Remove the battery (page 19-6).

Refer to the instructions that are appropriate to the battery charging equipment available to you

TOOL:

Christie battery charger	**MC1012/2T (U.S.A. only) or OptiMate Pro-S (U.S.A. only)**

CHARGING CONDITION INSPECTION

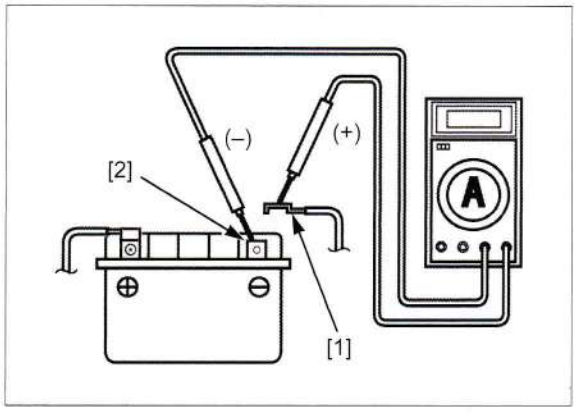
CURRENT LEAKAGE TEST

Remove the battery cover (page 2-3).

Turn the ignition switch OFF.

Remove the terminal bolt and disconnect the negative (–) cable [1] from the battery.

Connect the ammeter (+) probe to the negative (–) cable and the ammeter (–) probe to the battery negative (–) terminal [2].
With the ignition switch turned OFF, check for current leakage.



NOTE:

- When measuring current using a tester, set it to a high range, and then bring the range down to an appropriate level. Current flow higher than the range selected may blow out the fuse in the tester.
- While measuring current, do not turn the ignition switch ON. A sudden surge of current may blow out the fuse in the tester.

SPECIFIED CURRENT LEAKAGE: 1.0 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

NOTE:

- Be sure the battery is in good condition before performing this test.
- 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.

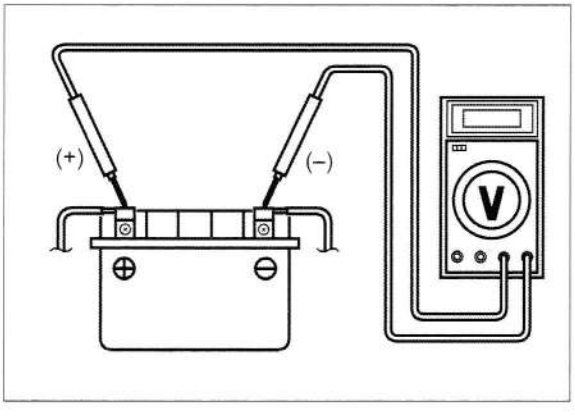
Warm up the engine to normal operating temperature. Stop the engine.

Remove the battery cover (page 2-3).

To prevent a short, make absolutely certain which are the positive (+) and negative (–) terminals or cables.

Connect the multimeter between the battery positive (+) terminal and negative (–) terminal of the battery.

With the headlight on high beam, restart the engine. Measure the voltage on the multimeter when the engine runs at 5,000 rpm.



STANDARD:

Measured BV < Measured CV < 15.5 V

- **BV = Battery Voltage (page 19-6)**
- **CV = Charging Voltage**

REGULATOR/RECTIFIER

REMOVAL/INSTALLATION

Remove the right middle cowl (page 2-6).

Turn the ignition switch OFF.

Remove the regulator/rectifier 4P (Gray) connector [1] from the stay and disconnect it.

Disconnect the following:

- alternator 3P (Gray) connector [2]
- regulator/rectifier 3P (Black) connector [3]

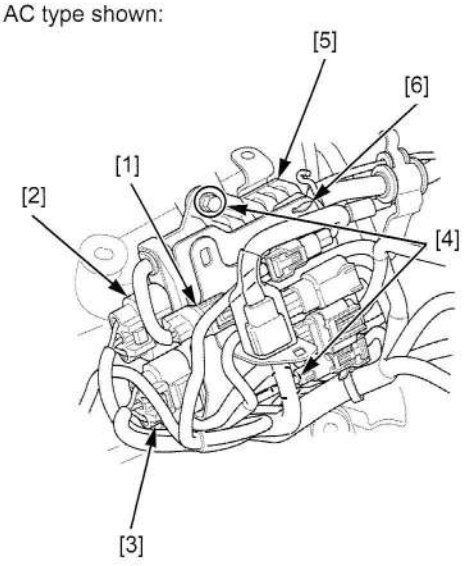
Remove the two bolts [4] and regulator/rectifier [5].

Installation is in the reverse order of removal.

NOTE:

- Be sure the rubber sheet [6] is install the in position as shown.

II AC type shown:



WIRE HARNESS INSPECTION

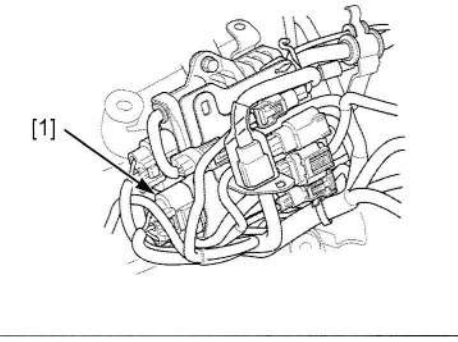
Remove the right middle cowl (page 2-6).

Disconnect the regulator/rectifier 3P (Black) connector [1].
Check the connector for loose contacts or corroded terminals.

Check the following at the wire harness side 3P (Black) connector.

- Battery Line:
  Measure the voltage between the Red wire terminal (+) and ground (–).
  There should be battery voltage at all times.
- Ground Line:
  Check for continuity between the Green wire terminal and ground.
  There should be continuity at all times.

II AC type shown:



PHASE CONTROLLED GENERATING CIRCUIT INSPECTION

DTC CHECK

Connect the MCS to the DLC (page 4-6).

Start the engine and check the DTC with the MCS, and inspect according to the DTC (it is not stored).

DTC	Function Failure	Refer to page
1-1	Battery voltage monitor line open circuit	19-9
1-2	Battery voltage monitor line short circuit	19-9
2-1	MP sensor or its circuit	19-10
3-1	Alternator stator No. 1 line open or short circuit	19-10
3-2	Alternator stator No. 2 line open or short circuit	
3-3	Alternator stator No. 3 line open or short circuit	

DTC 1-1 (BATTERY VOLTAGE MONITOR LINE; OPEN)

1. Monitor Line Input Voltage Inspection

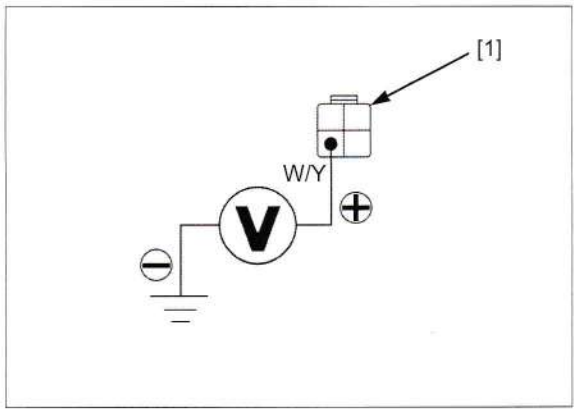
Disconnect the regulator/rectifier 4P (Gray) connector (page 19-8).
Turn the ignition switch ON and measure the voltage between the wire harness side 4P (Gray) connector [1] terminal and ground.

CONNECTION: White/yellow (+) – Ground (–)

Is there battery voltage?

YES – • Intermittent failure
• Loose or poorly connected regulator/ rectifier 4P (Gray) connector

NO – Open circuit in the White/yellow wire between the regulator/rectifier and left fuse box



DTC 1-2 (BATTERY VOLTAGE MONITOR LINE; SHORT)

1. Monitor Line Short Circuit Inspection

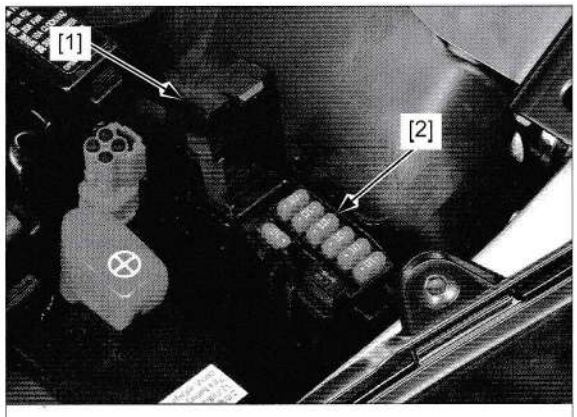
Disconnect the regulator/rectifier 4P (Gray) connector (page 19-8).
Open the left fuse box cover [1] and remove the START/HORN/STOP fuse (10 A) [2].
Check for continuity between the wire harness side regulator/rectifier 4P (Gray) connector [3] terminal and ground.

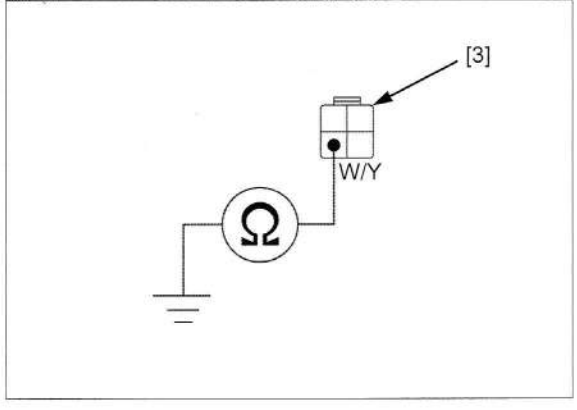
CONNECTION: White/yellow – Ground

Is there continuity?

YES – Short circuit in the White/yellow wire between the regulator/rectifier and left fuse box

NO – Intermittent failure





DTC 2-1 (MP SENSOR)

1. Sensor Input Voltage Inspection

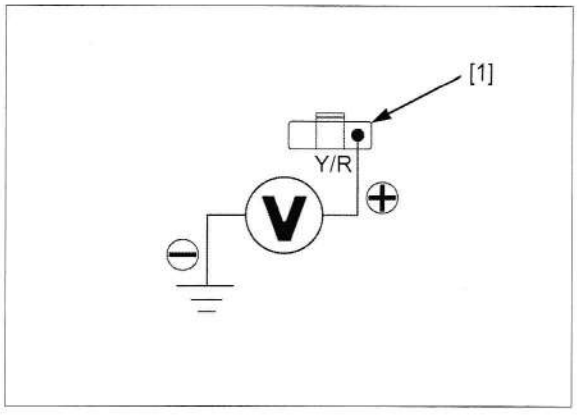
Disconnect the MP sensor 3P (Black) connector (page 12-20).
Turn the ignition switch ON and measure the voltage between the wire harness side 3P (Black) connector [1] terminal and ground.

CONNECTION: Yellow/red (+) – Ground (–)

Is there approximately 5 V?

YES – GO TO STEP 2.

NO – Open or short circuit in the Yellow/red wire between the MP sensor and ECM.



2. Sensor Signal/Ground Line Short Circuit Inspection

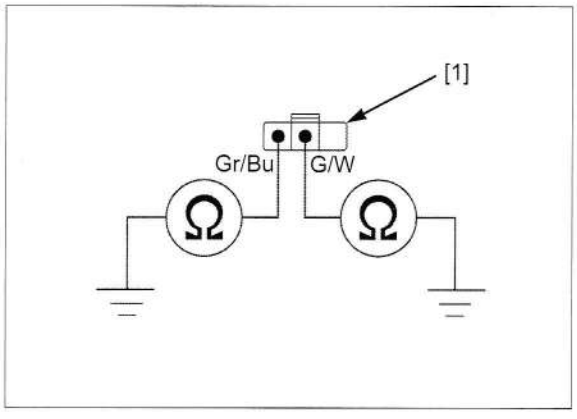
Turn the ignition switch OFF.
Disconnect the regulator/rectifier 4P (Gray) connector (page 19-8).
Check the for continuity between each terminal of the wire harness side MP sensor 3P (Black) connector [1] and ground.

CONNECTION: Gray/blue – Ground
Green/white – Ground

Is there continuity?

YES – • Short circuit in the Gray/blue wire
• Short circuit in the Green/white wire

NO – GO TO STEP 3.



3. Sensor Signal/Ground Line Open Circuit Inspection

Short the wire harness side regulator/rectifier 4P (Gray) connector [1] terminals with a jumper wire [2].

CONNECTION: Gray/blue – Green/white

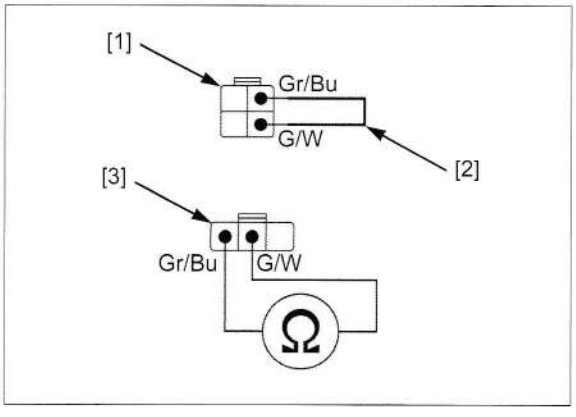
Check for continuity between the wire harness side MP sensor 3P (Black) connector [3] terminals.

CONNECTION: Gray/blue – Green/white

Is there continuity?

YES – Faulty MP sensor

NO – • Open circuit in the Gray/blue wire
• Open circuit in the Green/white wire



DTC 3-1, 3-2 or 3-3 (ALTERNATOR STATOR)

1. Alternator Charging Coil Inspection

Inspect the charging coil (page 19-11).

Are the charging coils normal?

YES – • Intermittent failure
• Loose or poorly connected alternator 3P (Gray) connector

NO – Faulty alternator stator

ALTERNATOR CHARGING COIL

INSPECTION

Remove the right middle cowl (page 2-6).

Disconnect the alternator 3P (Gray) connector [1] from the regulator/rectifier.
Check the connector for loose contacts or corroded terminals.

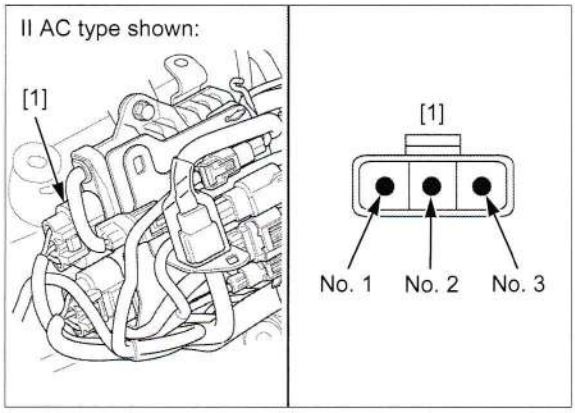
Measure the resistance between the Yellow wire terminals of the alternator side 3P (Gray) connector.

STANDARD: 0.1 – 0.5 Ω (20°C/68°F)

Check for continuity between each wire terminal of the alternator side 3P (Gray) connector and ground.
There should be no continuity.

Replace the alternator stator if the resistance is out of specification, or if any wire has continuity to ground.

For alternator stator replacement (page 12-21).



MEMO

20. LIGHTS/METERS/SWITCHES

SERVICE INFORMATION 20-2

SYSTEM LOCATION 20-3

HEADLIGHT 20-4

FRONT TURN SIGNAL/
POSITION LIGHT 20-6

REAR COMBINATION LIGHT 20-7

LICENSE LIGHT 20-8

COMBINATION METER 20-9

SPEEDOMETER 20-13

TACHOMETER 20-14

COOLANT TEMPERATURE GAUGE &
INDICATOR/ECT SENSOR 20-15

LOW OIL PRESSURE INDICATOR/
EOP SWITCH 20-17

FUEL GAUGE/FUEL LEVEL SENSOR ... 20-18

OPEN AIR TEMPERATURE SENSOR 20-19

IGNITION SWITCH 20-20

HANDLEBAR SWITCH 20-21

BRAKE LIGHT SWITCH 20-21

CLUTCH SWITCH 20-22

SIDESTAND SWITCH 20-22

HORN 20-23

GEAR POSITION SWITCH/
INDICATOR 20-24

RELAY INSPECTION 20-26

HEADLIGHT RELAY 20-26

TURN SIGNAL/HAZARD RELAY 20-27

GRIP HEATER (II AC, III CM types) 20-30

TCS (II AC, III CM types) 20-35

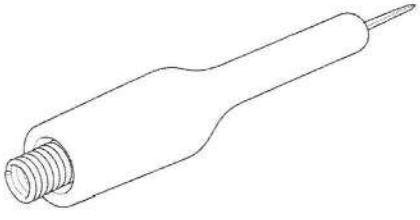
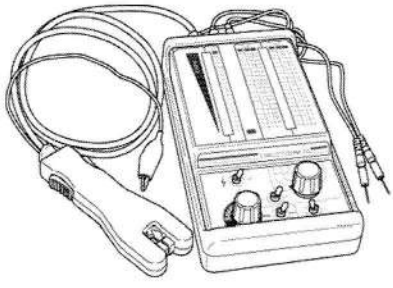
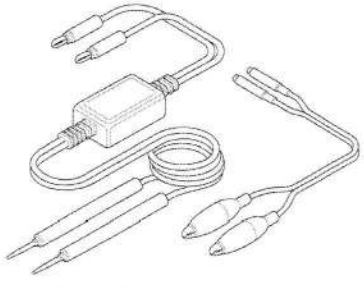
SERVICE INFORMATION

GENERAL

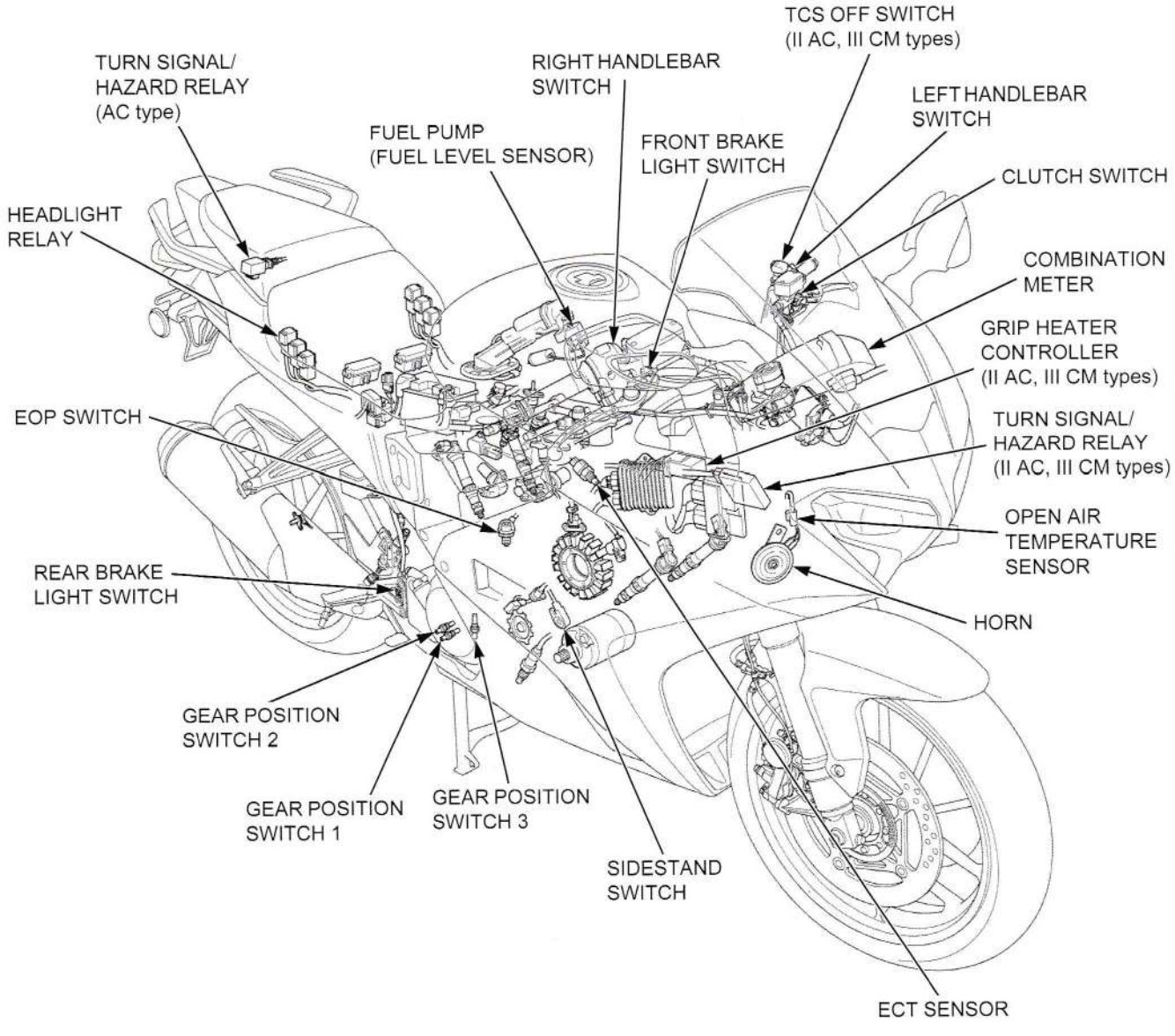
- Check the battery condition before performing any inspection that requires proper battery voltage.
- A continuity test can be made with the switches installed on the motorcycle.
- Use an electric heating element to heat the coolant for the ECT sensor inspection. Keep flammable materials away from the electric heating element. Wear protective clothing, insulated gloves, and eye protection.
- AC type: For information of the rear wheel speed sensor detecting the vehicle speed, refer to "ABS; II AC, III CM Types" section (page 18-21).
- The following color codes are used throughout this section.

Bl = Black	G = Green	Lg = Light Green	R = Red	Y = Yellow
Br = Brown	Gr = Gray	O = Orange	V = Violet	
Bu = Blue	Lb = Light Blue	P = Pink	W = White	

TOOLS

Test probe (2 Pack) 07ZAJ-RDJA110 	IgnitionMate peak voltage tester MTP07-0286 (U.S.A. only) 	Peak voltage adaptor 07HGJ-0020100  (not available in U.S.A.) with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)

SYSTEM LOCATION



HEADLIGHT

SYSTEM INSPECTION

NOTE:

- If the high beam does not function, inspect the headlight relay and its circuit first (page 20-26).

Remove the following:

- left middle cowl (page 2-6)
- combination meter (page 20-11)

Disconnect the headlight 2P connector in the connector boot located behind the combination meter and the LED driver 5P (Black) connector (page 20-5).

POWER INPUT LINE

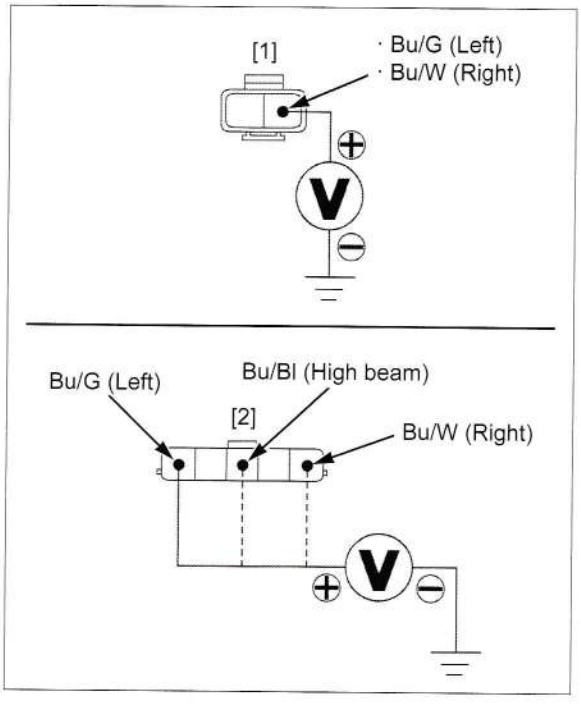
Measure the voltage between each wire harness side connector terminal and ground.

- headlight 2P connector [1]
- LED driver 5P (Black) connector [2]

There should be battery voltage when the ignition switch is turned ON.

If there is no voltage, check the following:

- Right headlight
  - Blue/white wire between each connector and left fuse box for an open circuit
  - HEAD/L R (10 A) fuse
- Left headlight
  - Blue/green wire between each connector and left fuse box for an open circuit
  - HEAD/L L (10 A) fuse
- High beam signal line
  - Blue/black wire between LED driver connector and headlight relay for an open circuit



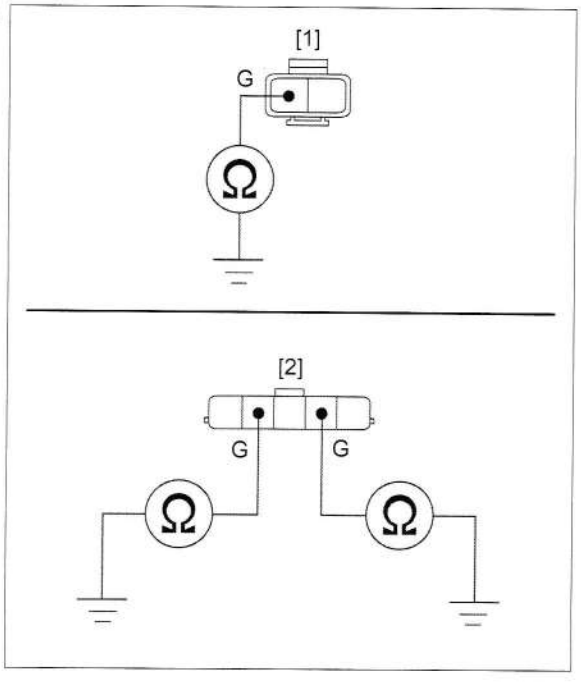
GROUND LINE

Check for continuity between each wire harness side connector terminal and ground.

- headlight 2P connector [1]
- LED driver 5P (Black) connector [2]

There should be continuity at all times.

If there is no continuity, check for an open circuit in the Green wire.



REMOVAL/INSTALLATION

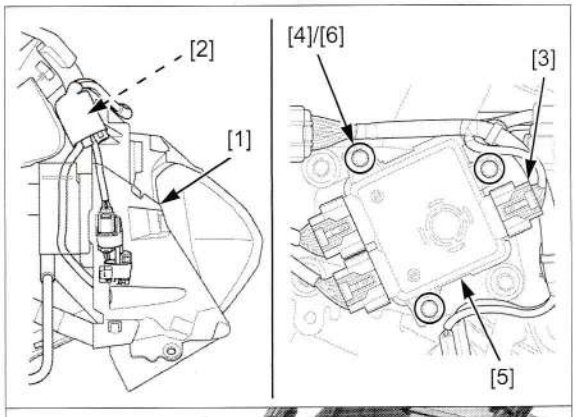
Remove the front inner cowls [1] (page 2-9).

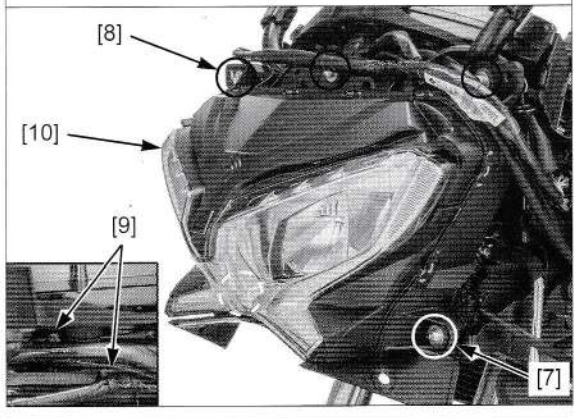
Disconnect the following:

- headlight 2P connectors [2]
- LED driver 5P (Black) connector [3]

Remove the following:

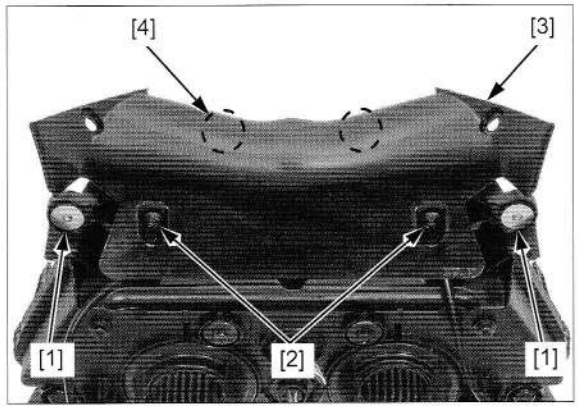
- three bolts [4]
- headlight LED driver [5]
- three collars [6] (from between the driver and stay)
- two washer-screws [7]
- three washer-bolts [8] (while supporting the headlight securely)
- band clips [9]
- headlight assembly [10]





- five collars [1] (from the mounting faster areas)
- two socket bolts [2]
- air guide plate [3] (slide the plate forward and release it from the two tabs [4])

Installation is in the reverse order of removal.

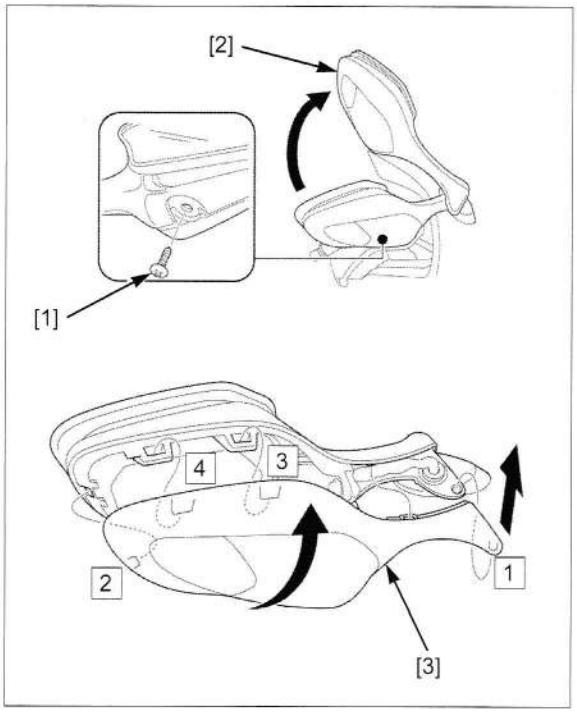


FRONT TURN SIGNAL/POSITION LIGHT

TURN SIGNAL LIGHT BULB REMOVAL/INSTALLATION

Remove the screw [1] and turn the rearview mirror [2].

Carefully release the boss and tabs in the sequence as shown and remove the mirror cover [3].



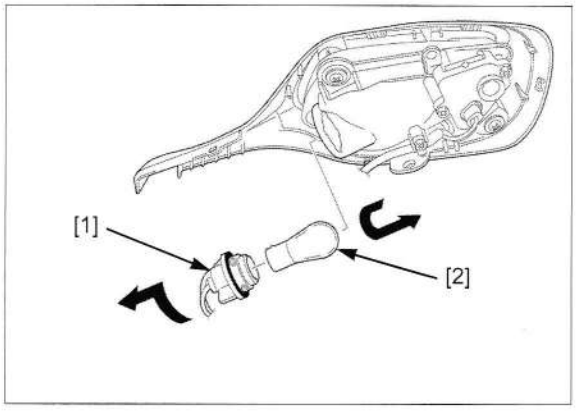
Remove the bulb socket [1] from the light housing by turning it counterclockwise.

While pushing the bulb [2] in, turn it counterclockwise to remove it.

Installation is in the reverse order of removal.

NOTE:

- Only use amber bulbs.



DISASSEMBLY/ASSEMBLY

Remove the rearview mirror (page 2-8).

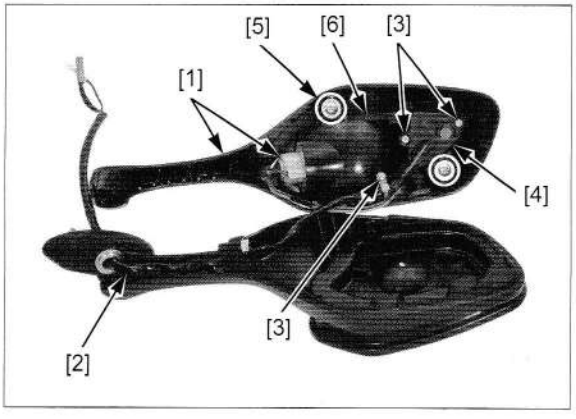
Remove the following:

- mirror cover and bulb socket [1] (page 20-6) (when turning the rearview mirror, set it into the upper cowl)
- wire [2] (out of the mirror assembly)
- three tapping screws [3]
- position light assembly [4]
- two tapping screws and washers [5]
- turn signal/position light lens [6]

Installation is in the reverse order of removal.

NOTE:

- When installing the lens, be careful not to dislodge the grommets in the lens housing.



REAR COMBINATION LIGHT

TURN SIGNAL LIGHT BULB REMOVAL/INSTALLATION

Remove the rear turn signal light cover (page 2-10).

Disconnect the turn signal light 2P connector [1].

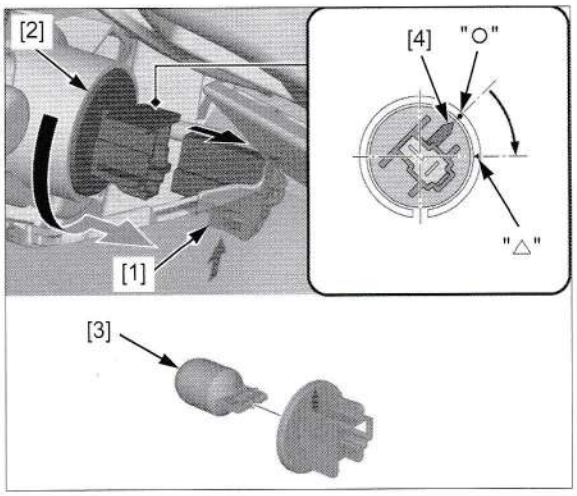
Remove the bulb socket [2] from the light housing by turning it counterclockwise.

Pull the bulb [3] out of the socket without turning it.

Installation is in the reverse order of removal.

NOTE:

- Only use amber bulbs.
- Make sure the rubber seal on the socket is installed in position and is in good condition.
- Install the socket by aligning the arrow mark [4] with "○", then turn it clockwise until aligning the arrow mark with "△" to lock it.



REAR COMBINATION LIGHT REMOVAL/INSTALLATION

Remove the rear turn signal light cover (page 2-10).

Release the connector boot [1] from the clamp [2].

Disconnect the following:

- turn signal light 3P (Blue) connector [3]
- brake/taillight 3P (Black) connector [4]

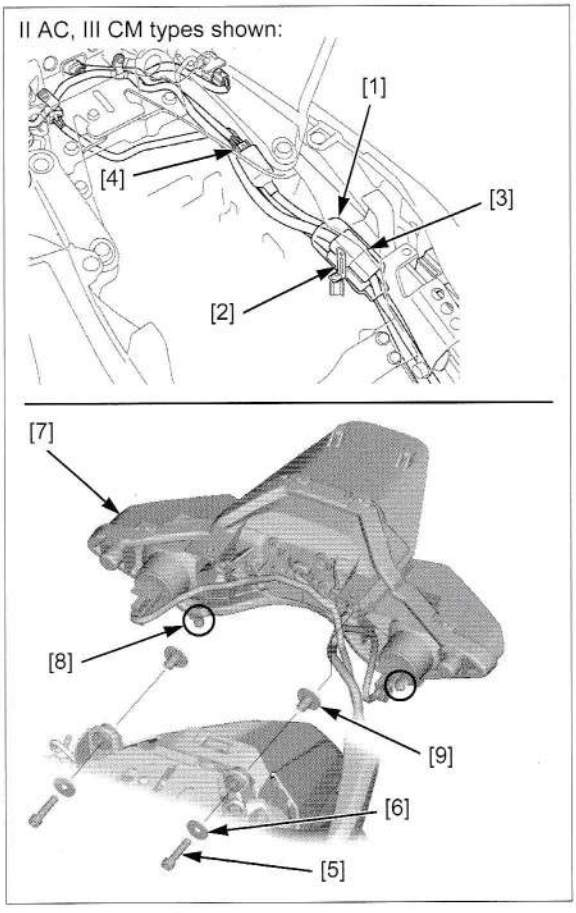
Remove the following:

- two socket bolts [5] and washers [6]
- rear combination light assembly [7] (releasing the two bosses [8])
- two collars [9]

Installation is in the reverse order of removal.

TORQUE:

Rear combination light mounting bolt:
9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)



LICENSE LIGHT

BULB REMOVAL/INSTALLATION

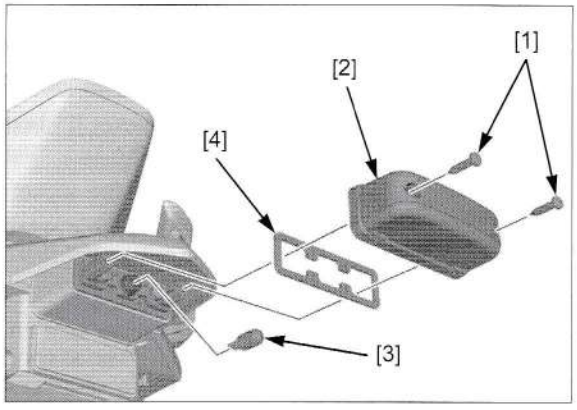
Remove the two tapping screws [1] and license light lens [2].

Pull the bulb [3] out of the socket without turning it.

Installation is in the reverse order of removal.

NOTE:

- Make sure the rubber seal [4] on the license light base is installed in position and is in good condition.



LICENSE LIGHT REMOVAL/ INSTALLATION

Remove the rear seat (page 2-3).

Release the connector boots [1] from the clamp [2] and disconnect the license light 2P connector [3].

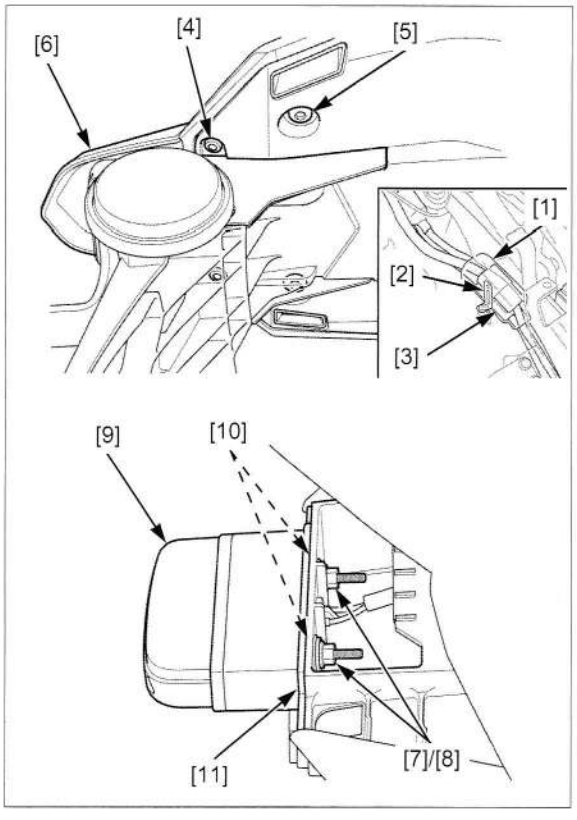
Remove the following:

- two trim clips [4]
- two socket bolts [5]
- license light cover [6] (while raising the rear combination light slightly)
- two nuts [7] and washers [8]
- license light assembly [9]
- two collars [10]
- seat rubber [11]

Installation is in the reverse order of removal.

TORQUE:

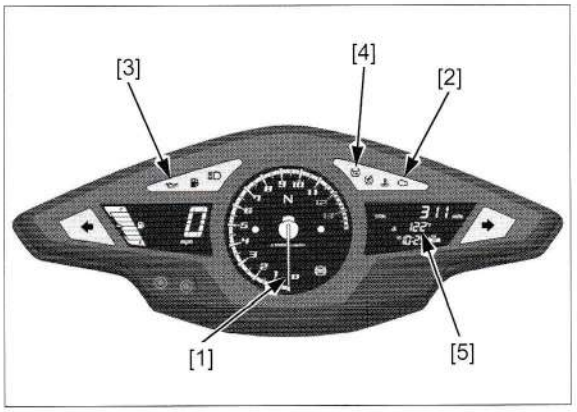
License light mounting nut:
3.8 N·m (0.4 kgf·m, 2.8 lbf·ft)



COMBINATION METER

INITIAL OPERATION CHECK

When the ignition switch is turned ON with the engine stop switch "○", the combination meter will show the entire digital display and the tachometer needle [1] moves to full scale, then returns to zero.



If the indicators and digital display do not function at all, inspect the combination meter power/ground line (page 20-9).
If the power and ground lines are OK, replace the combination meter (page 20-11).

If the combination meter displays the following conditions, inspect the serial communication line (page 20-10).

- MIL [2], low oil pressure indicator [3], and TCS indicator [4] (II AC, III CM types only) stay on
- fuel mileage meter [5] indicates "–" (while the engine is running)

NOTE:

- If the MIL stays on and the other indications function normally, inspect the MIL circuit (page 4-42).

POWER/GROUND LINE INSPECTION

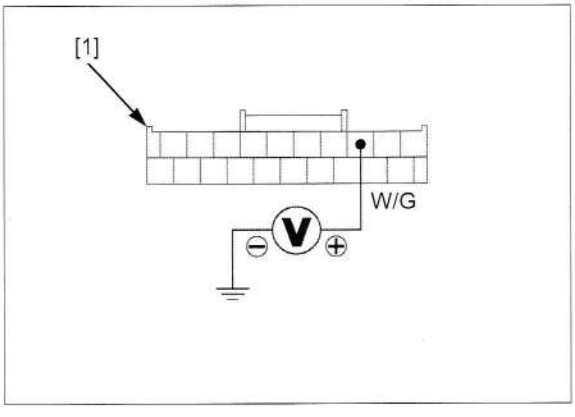
NOTE:

AC type:
- The DTC 11-1 (rear wheel speed sensor) will be stored in the ECM if the power or ground line is abnormal. After the service is completed, check the DTC and erase it (page 4-6).

Remove the combination meter to disconnect the combination meter 20P (Gray) connector (page 20-11).

POWER INPUT LINE

Measure the voltage between the combination meter 20P (Gray) connector [1] terminal and ground.



CONNECTION: White/green (+) – Ground (–)

There should be battery voltage when the ignition switch is turned ON.

If there is no battery voltage, check the following:

- White/green wire between the left fuse box and combination meter for an open circuit
- TAIL/METER/TURN fuse (10 A)

BACK-UP VOLTAGE LINE

Measure the voltage between the combination meter 20P (Gray) connector [1] terminal and ground.

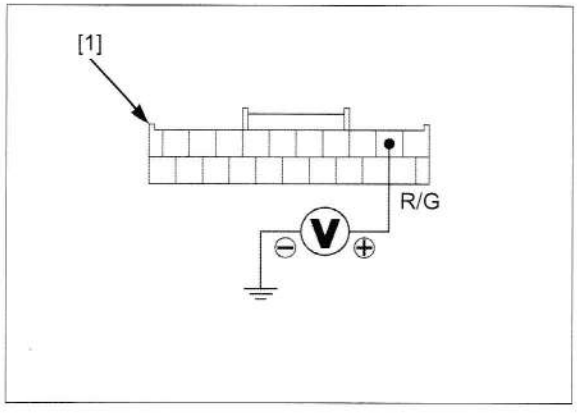
CONNECTION: Red/green (+) – Ground (–)

There should be battery voltage at all times.

If there is no voltage, check for an open circuit in the Red/green wire.

If there is no battery voltage, check the following:

- Red/green wire between the right fuse box and combination meter for an open circuit
- CLOCK/HAZ fuse (10 A)



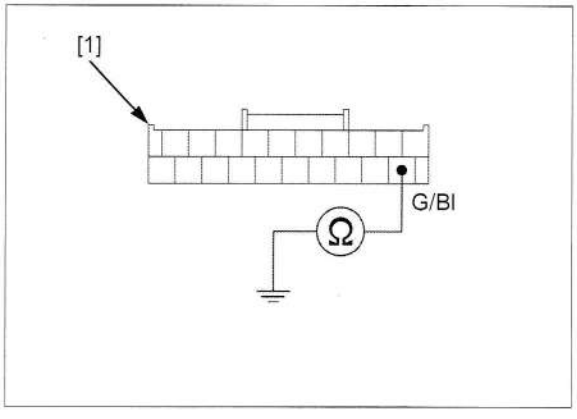
GROUND LINE

Check for continuity between the combination meter 20P (Gray) connector [1] terminal and ground.

CONNECTION: Green/black – Ground

There should be continuity at all times.

If there is no continuity, check for an open circuit in the Green/black wire.



SERIAL COMMUNICATION LINE INSPECTION

Remove the combination meter to disconnect the combination meter 20P (Gray) connector (page 20-11).

Disconnect the ECM 33P (Gray) connector (page 4-42).

1. **Serial Communication Line Short Circuit Inspection**

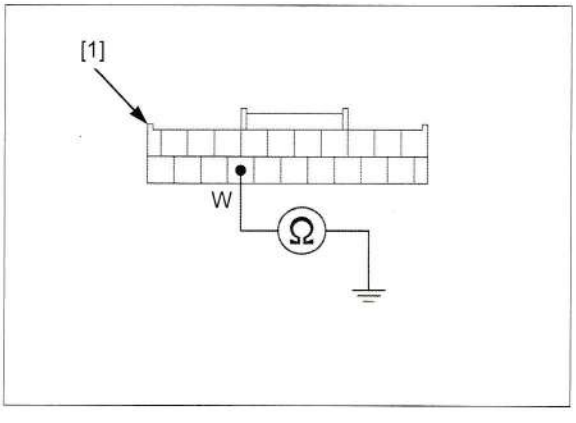
   Check for continuity between the wire harness side 20P (Gray) connector [1] terminal and ground.

   CONNECTION: White – Ground

   Is there continuity?

   YES – Short circuit in the White wire between the combination meter and ECM

   NO – GO TO STEP 2.



2. Serial Communication Line Open Circuit Inspection

Check for continuity between the wire harness side 20P (Gray) connector [1] and ECM 33P (Gray) connector [2] terminals.

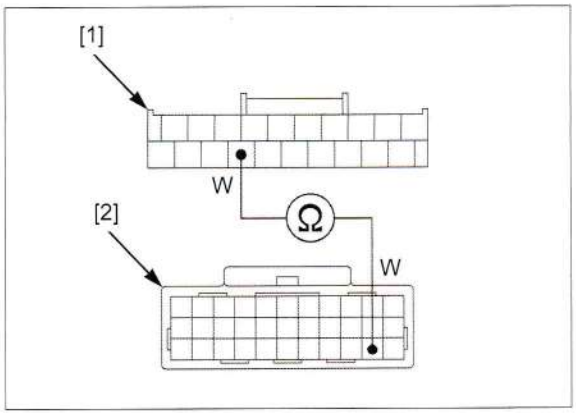
TOOL:
Test probe (2 Pack) **07ZAJ-RDJA110**

CONNECTION: White – White

Is there continuity?

YES – Loose or poor contact on the related connectors.

NO – Open circuit in the White wire between the combination meter and ECM



REMOVAL/INSTALLATION

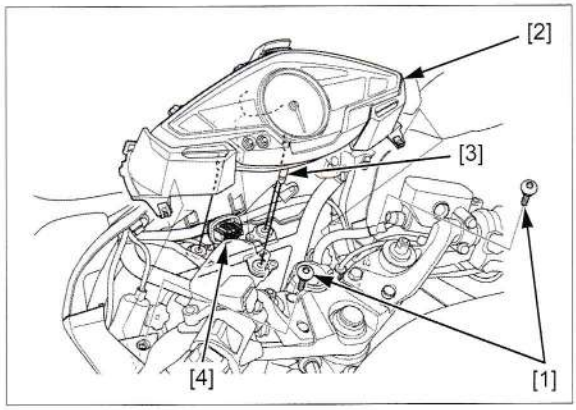
Remove the inner visor (page 2-7).

Remove the two socket bolts [1].

Raise the combination meter [2] and release the three bosses [3] from the grommets.

Disconnect the 20P (Gray) connector [4] to remove the combination meter assembly.

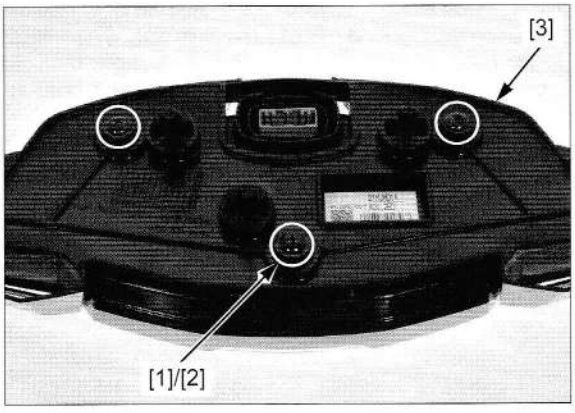
Installation is in the reverse order of the removal.



DISASSEMBLY/ASSEMBLY

Remove the combination meter assembly (page 20-11).

Remove the three tapping screws [1], washers [2], and meter holder [3]



Remove the 16 tapping screws [1].

Place the combination meter assembly with the lower case down and remove the following:

- upper case (lens) [2]
- two extension rods [3]
- reflecting plate [4]
- combination meter [5]

Make sure the rubber seal [6] and waterproof gaskets [7] in the lower case [8] are in good condition, and replace the lower case as an assembly if necessary.

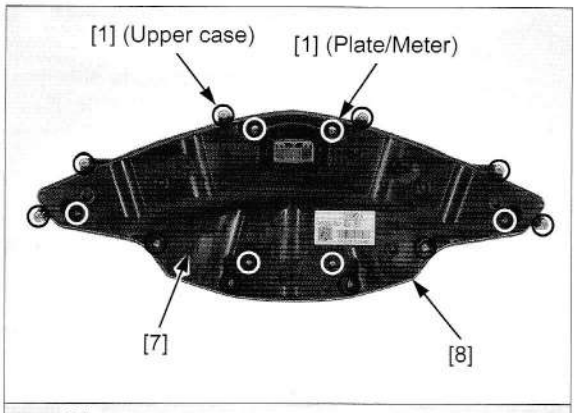
Assembly is in the reverse order of disassembly.

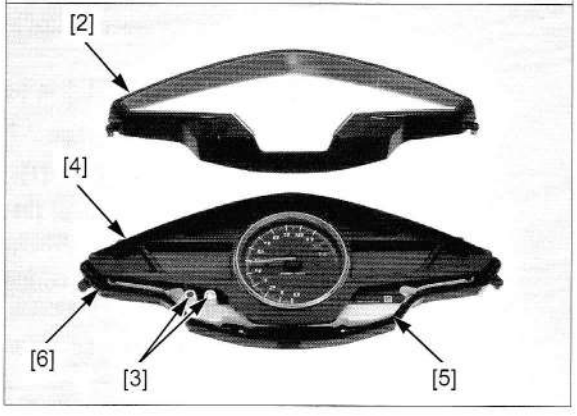
NOTE:

- Be sure the rubber seal is installed in the case groove properly.

TORQUE:

Combination meter holder tapping screw:
1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)



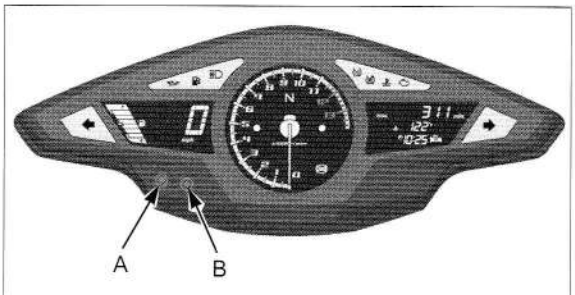


DIGITAL CLOCK SETTING PROCEDURE

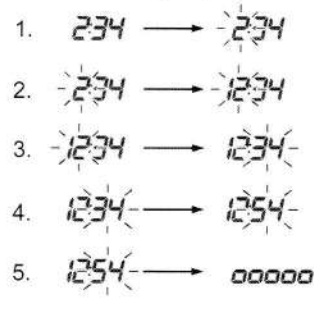
Turn the ignition switch ON.

The control is automatically switched from the setting mode to the ordinary display if the button is not pressed for about 30 seconds.

1. Press and hold the A and B buttons until the hour digits start flashing.
2. Press the A button until the desired hour is displayed (press and hold to advance the hour faster).
3. Press the B button. The minute digits start flashing.
4. Press the A button until the desired minute is displayed (press and hold to advance the minute faster).
5. Press the B button. The clock is set, and then the display moves to the backlight brightness adjustment ("o" – "ooooo" is indicated).
   Turn the ignition switch OFF.



Clock setting display flow:



SPEEDOMETER

SYSTEM INSPECTION (AC type)

If the speedometer does not operate, check the following:

- combination meter initial operation (page 20-9)
- MIL blinking; DTC 11-1 (page 4-9)

INSPECTION (II AC, III CM types)

NOTE:

- Before starting this inspection, check the following:
  - ABS indicator blinking; DTC 1-3 or 1-4 (page 18-9)
  - MIL blinking; DTC 11-1 (page 4-9)
  - combination meter initial operation (page 20-9)

Speedometer does not operate

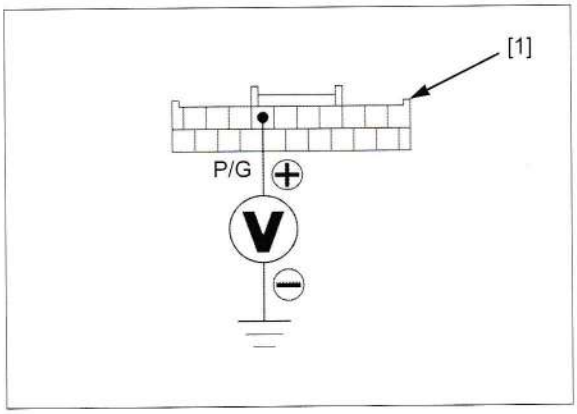
Remove the combination meter to disconnect the combination meter 20P (Gray) connector (page 20-11).

Raise the rear wheel off the ground by placing the motorcycle on its centerstand (II AC, III CM types) or supporting the motorcycle securely using a hoist or equivalent (AC type).

Shift the transmission into neutral.

Turn the ignition switch ON with the engine stop switch "○".

Measure the voltage between the combination meter 20P (Gray) connector [1] terminal and ground while slowly turning the rear wheel by hand.



CONNECTION: Pink/green (+) – Ground (–)

There should be 0 to 5 V pulse voltage.

- If pulse voltage appears, faulty combination meter.
- If pulse voltage does not appear, open or short circuit in the Pink/green wire between the ABS modulator and combination meter.

TACHOMETER

INSPECTION

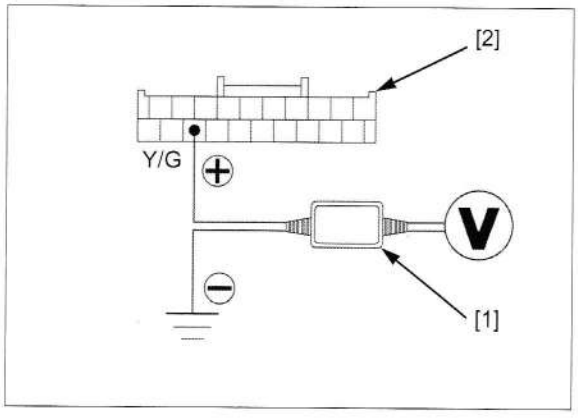
NOTE:

- Before starting this inspection, check the combination meter initial operation (page 20-9).

Tachometer does not operate

1. Tachometer Signal Voltage Inspection

Remove the combination meter to disconnect the combination meter 20P (Gray) connector (page 20-11).
Connect the peak voltage tester or adaptor [1] probes to the meter 20P (Gray) connector [2] terminal and ground.



TOOL:

IgnitionMate peak voltage tester	**MTP07-0286 (U.S.A. only) or**
Peak voltage adaptor with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)	**07HGJ-0020100 (not available in U.S.A.**

CONNECTION: Yellow/green (+) – Ground (–)

Start the engine and measure the tachometer signal peak voltage.

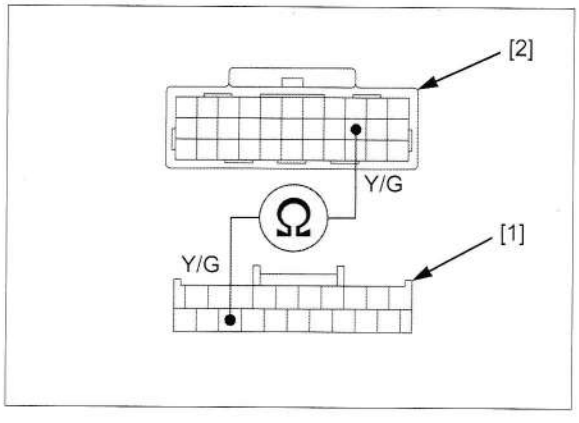
Is there 10.5 V or more?

YES – Faulty combination meter

NO – • Less than 10.5 V: Faulty ECM
• No voltage: GO TO STEP 2.

2. Signal Line Open Circuit Inspection

Disconnect the ECM 33P (Gray) connector (page 4-42).
Check for continuity between the meter 20P (Gray) connector [1] and ECM 33P (Gray) connector [2] terminals.



TOOL:

Test probe (2 Pack)	**07ZAJ-RDJA110**

CONNECTION: Yellow/green – Yellow/green

Is there continuity?

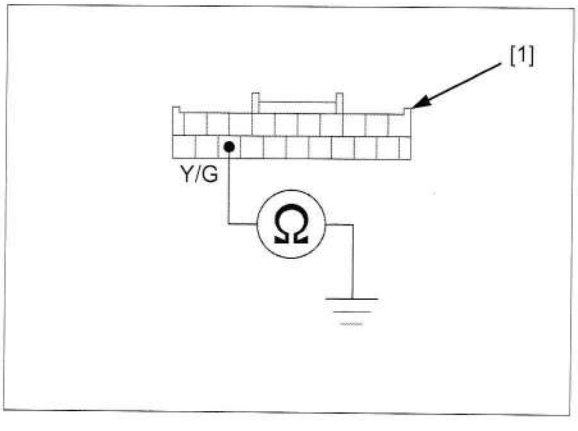
YES – GO TO STEP 3.

NO – Open circuit in the Yellow/green wire

3. Signal Line Short Circuit Inspection

Check the for continuity between the meter 20P (Gray) connector [1] and ground.

CONNECTION: Yellow/green – Ground



Is there continuity?

YES – Short circuit in Yellow/green wire

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

COOLANT TEMPERATURE GAUGE & INDICATOR/ECT SENSOR

INSPECTION

NOTE:

- Before starting this inspection, check the combination meter initial operation (page 20-9).
- The coolant temperature gauge displays "–" when the temperature is below 35°C (95°F).
- After the inspection procedure is completed, erase the DTC (page 4-7).

Coolant temperature gauge and indicator does not operate properly

1. **Indicator Operation Check**

   Disconnect the ECT sensor 3P (Gray) connector (page 4-44).
   Turn the ignition switch ON with the engine stop switch "⊠" and check the coolant temperature indicator.

   Does the indicator come on?

   YES – GO TO STEP 2.

   NO – GO TO STEP 3.

2. **ECT Sensor Indication Line Short Circuit Inspection**

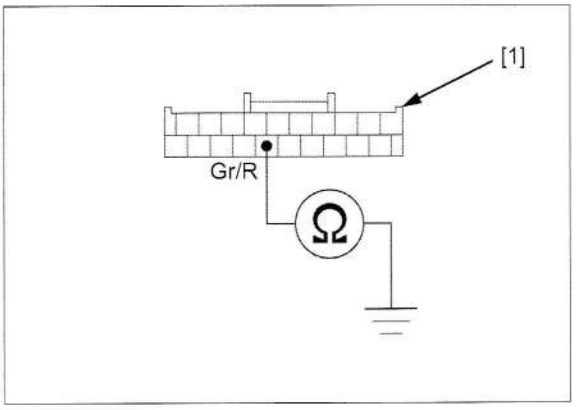
   Remove the combination meter to disconnect the meter 20P (Gray) connector (page 20-11).
   Check for continuity between the meter 20P (Gray) connector [1] terminal and ground.

   CONNECTION: Gray/red – Ground

   Is there continuity?

   YES – Short circuit in the Gray/red or Gray/black wire

   NO – Faulty combination meter



3. **Indicator Operation Check 2**

   Turn the ignition switch OFF.
   Ground the ECT sensor 3P (Gray) connector [1] terminal of the wire harness side with a jumper wire [2].

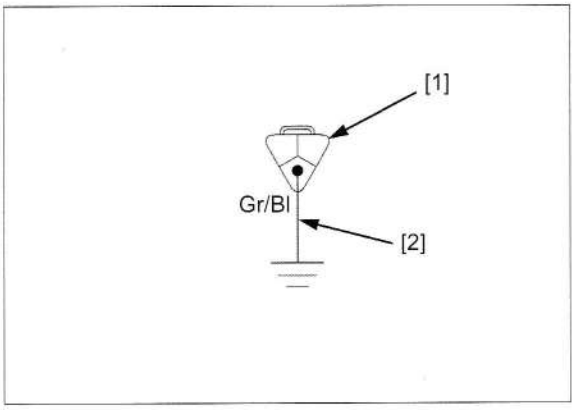
   CONNECTION: Gray/black – Ground

   Turn the ignition switch ON and check the coolant temperature indicator.

   Does the indicator come on?

   YES – Check the ECT sensor (page 20-16)

   NO – GO TO STEP 4.



4. ECT Sensor Indication Line Open Circuit Inspection

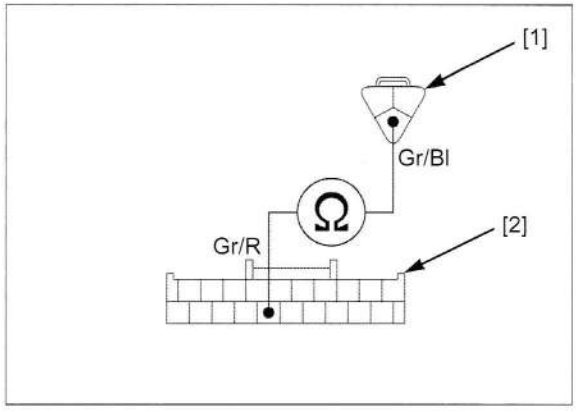
Turn the ignition switch OFF and remove the jumper wire.
Remove the combination meter to disconnect the meter 20P (Gray) connector (page 20-11).
Check for continuity between the ECT sensor 3P (Gray) connector [1] and meter 20P (Gray) connector [2] terminals.

CONNECTION: Gray/black– Gray/red

Is there continuity?

YES – Faulty combination meter

NO – Open circuit in the Gray/black or Gray/red wire



ECT SENSOR INSPECTION

Remove the ECT sensor (page 4-44).

Suspend the ECT sensor [1] in a pan of coolant (1:1 antifreeze and distilled water mixture) on an electric heating element and measure the resistance between the indication sensor terminal [2] and body as the coolant heats up.

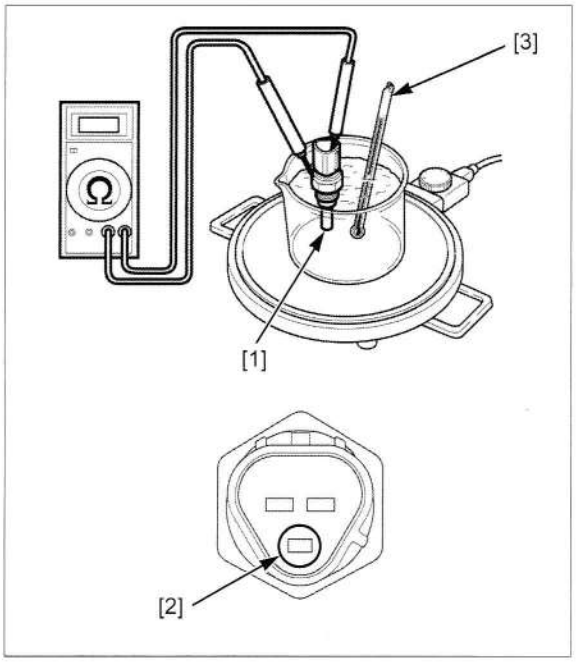
NOTE:

- Soak the ECT sensor in coolant up to its threads with at least 40 mm (1.6 in) from the bottom of the pan to the bottom of the sensor.
- Keep the temperature constant for 3 minutes before testing. A sudden change of temperature will result in incorrect readings. Do not let the thermometer [3] or ECT sensor touch the pan.

TEMPERATURE	50°C (122°F)	80°C (176°F)
RESISTANCE	6.8 – 7.4 kΩ	2.1 – 2.6 kΩ

Replace the ECT sensor if it is out of specification by more than 10% at any temperature listed.

Install the ECT sensor (page 4-44).



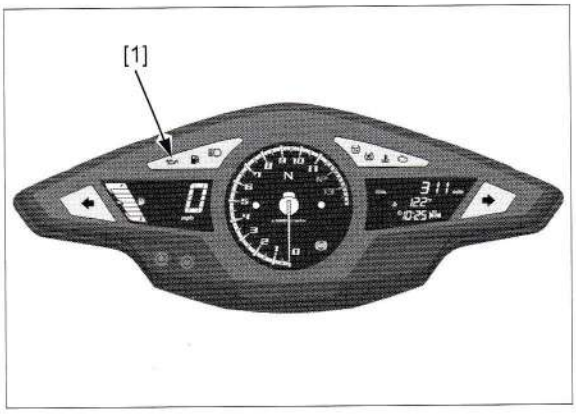
LOW OIL PRESSURE INDICATOR/EOP SWITCH

SYSTEM INSPECTION

NOTE:

- Before starting this inspection, check the combination meter initial operation (page 20-9).

When the system is normal, the low oil pressure indicator [1] comes on when the ignition switch is turned ON with the engine stop switch "○", and then goes off when the engine is started.



If the oil pressure indicator comes on for about 2 seconds and goes off when the ignition switch is turned ON, check the EOP switch line for an open circuit (page 20-17).

If the oil pressure indicator stays on and the other indications function normally after the engine is started, stop the engine immediately and check the following:

- engine oil level (page 3-10)
- engine oil pressure (page 9-5)
- EOP switch line for a short circuit (page 20-17)

If the above items are OK, replace the combination meter (page 20-11).

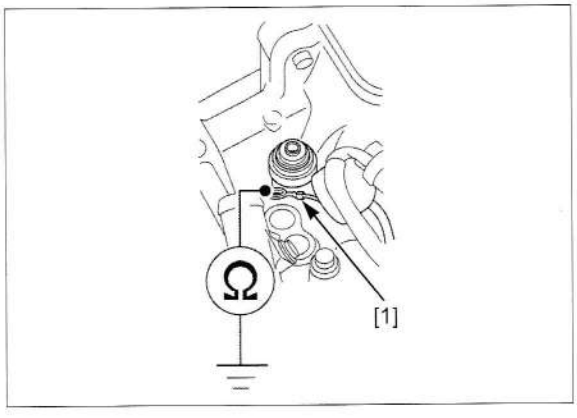
EOP SWITCH LINE INSPECTION

Turn the ignition switch OFF.

Disconnect the EOP switch wire (page 20-18).

Open Circuit Inspection

Check for continuity between the wire terminal [1] and ground.



There should be continuity.

- If there is no continuity, the EOP switch wire (Black or Light green) has an open circuit.
- If there is continuity, replace the EOP switch (page 20-18).

Short Circuit Inspection

Disconnect the ECM 33P (Gray) connector (page 4-42).

Check for continuity between the wire terminal and ground in the same manner as above.

There should be no continuity.

- If there is continuity, the EOP switch wire (Blue/red) has a short circuit.
- If there is no continuity, replace the EOP switch (page 20-18).

EOP SWITCH REMOVAL/ INSTALLATION

Remove the thermostat housing/hose assembly (page 8-6).

Release the rubber cap [1] from the EOP switch [2].

Remove the terminal screw [3] and disconnect the switch wire [4].

Place a shop towel around the switch and remove the EOP switch.

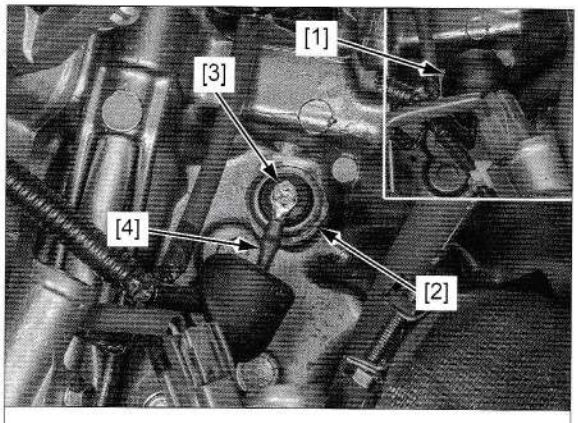
Installation is in the reverse order of removal.

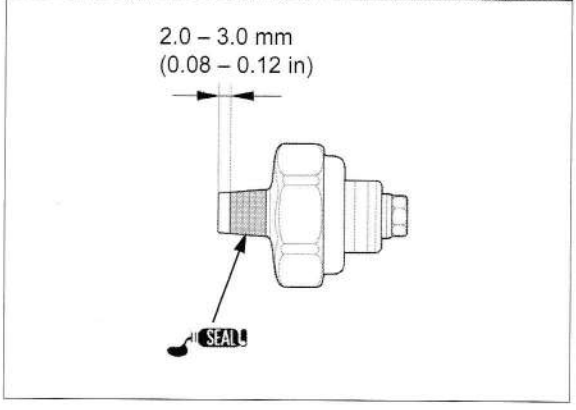
NOTE:

- Before installing the EOP switch, clean the threads in the crankcase with a degreasing agent thoroughly.
- Apply sealant to the EOP switch threads. Do not apply to the sensor tip in the area as shown (page 1-17).

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

Check the engine oil level (page 3-10).



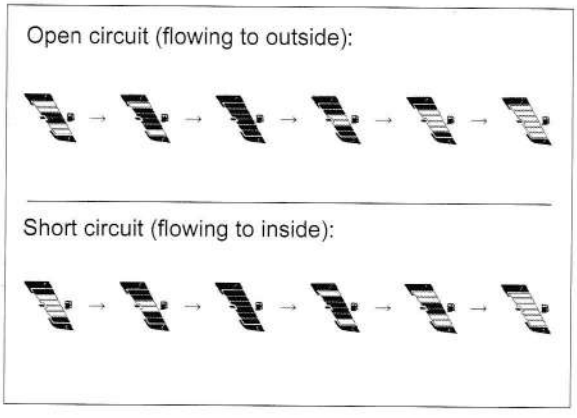


FUEL GAUGE/FUEL LEVEL SENSOR

FUEL GAUGE INSPECTION

When the circuit malfunction occurs, the combination meter displays a flow pattern in the fuel gauge. If it is indicated, check for an open or short circuit in Brown/black or Red/black wire between the combination meter and fuel pump unit.

If the wire is OK, check the fuel level sensor (page 20-18).
If the fuel level sensor is OK, replace the combination meter (page 20-11).



FUEL LEVEL SENSOR INSPECTION

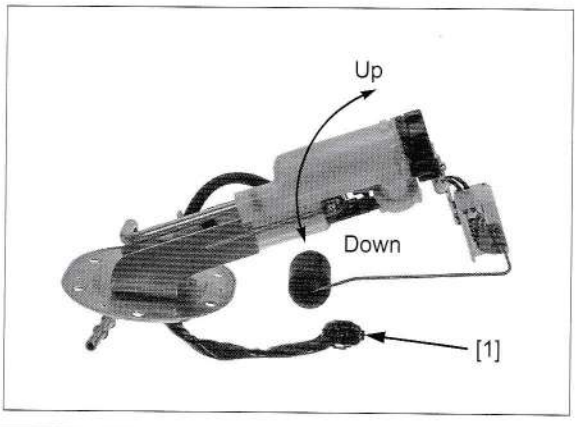
Remove the fuel pump assembly (page 7-9).

Measure the resistance between the fuel pump 3P (Black) connector [1] terminals.

CONNECTION: Red/black – Black/white

FLOAT POSITION	Up (Full)	Down (Empty)
RESISTANCE (20°C/68°F)	6 – 10 Ω	260 – 280 Ω

If the resistance is out of specification, replace the fuel pump as an assembly (page 7-9).



OPEN AIR TEMPERATURE SENSOR

SYSTEM INSPECTION

1. **Sensor Line Inspection**

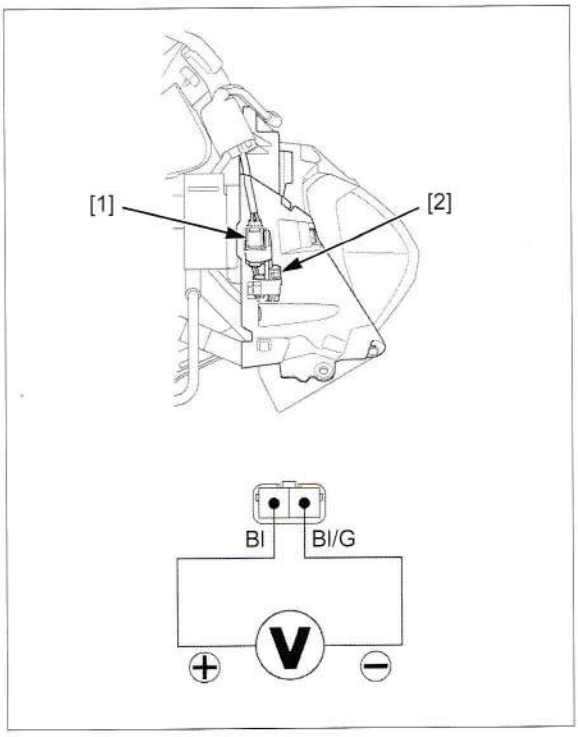
Remove the right front inner cowl (page 2-9).
Disconnect the 2P (Black) connector [1] to remove the open air temperature sensor [2].
Turn the ignition switch ON and measure the voltage between the wire harness side 2P (Black) connector terminals.

CONNECTION: Black (+) – Black/green (–)

Is there approximately 5 V?

YES – GO TO STEP 2.

NO – • Open circuit in the Black wire
• Open circuit in the Black/green wire



2. **Open Air Temperature Sensor Inspection**

Turn the ignition switch OFF.
Measure the resistance between the sensor side 2P (Black) connector terminals.

STANDARD:

Ambient Temperature:	Resistance (Approx.):
–5°C (23°F)	22.0 kΩ
0°C (32°F)	16.8 kΩ
10°C (50°F)	10.0 kΩ
20°C (68°F)	6.3 kΩ
30°C (86°F)	4.0 kΩ
40°C (104°F)	2.7 kΩ

Is the resistance correct?

YES – Faulty combination meter

NO – Faulty open air temperature sensor

IGNITION SWITCH

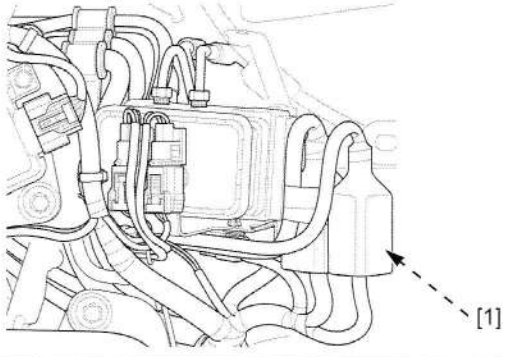
INSPECTION

Remove the left middle cowl (page 2-6).

Disconnect the ignition switch 2P (Brown) connector [1] and remove it from the stay on the 14P (Blue) connector.

Check for continuity between the switch side 2P (Brown) connector terminals in each switch position according to the continuity chart (page 21-2).

II AC, III CM types shown:



REMOVAL/INSTALLATION

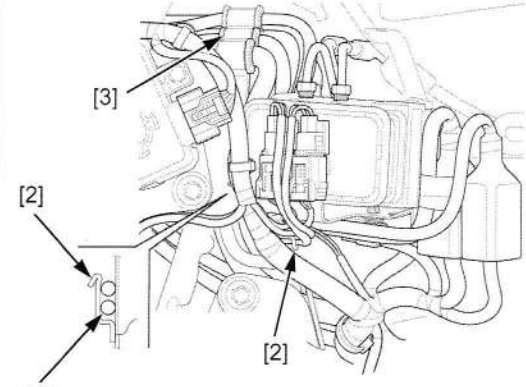
Remove the following:

- middle cowls (page 2-6)
- the top bridge (page 15-24)

Disconnect the ignition switch 2P (Brown) connector (page 20-20).

Release the switch wire [1] from the guides [2] and clamp [3] to remove the ignition switch.

II AC, III CM types shown:



Remove the two bolts [1], cable guide [2], and ignition switch [3].

NOTE:

- Use a drill or an equivalent tool when removing the ignition switch mounting bolts.

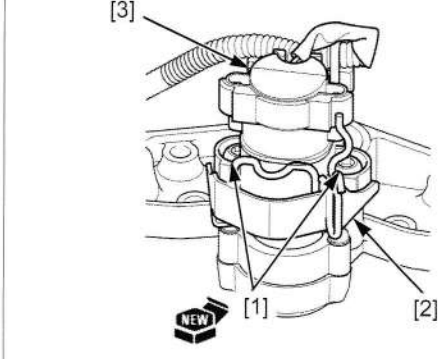
Installation is in the reverse order of removal.

NOTE:

- Replace the switch bolts with new ones.

TORQUE:

Ignition switch mounting bolt:
26 N·m (2.7 kgf·m, 19 lbf·ft)



HANDLEBAR SWITCH

INSPECTION

Left handlebar switch:

Remove the left middle cowl (page 2-6).

Remove the following from the stay and disconnect it.

- left handlebar switch 14P (Blue) connector [1]
- TCS OFF switch 2P (Black) connector [2]

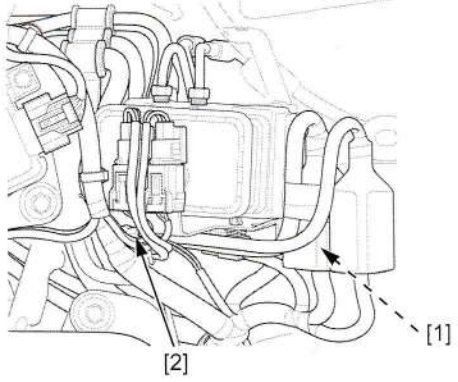
Right handlebar switch:

Remove the right middle cowl (page 2-6).

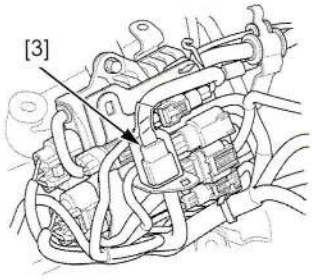
Disconnect the right handlebar switch 9P (Black) connector [3].

Check for continuity between the switch connector terminals in each switch position according to the continuity chart (page 21-2).

II AC, III CM types shown:



II AC type shown:



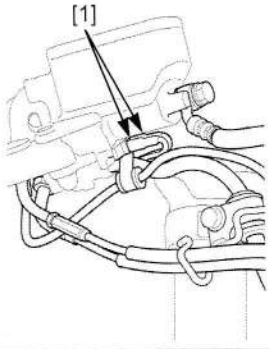
BRAKE LIGHT SWITCH

FRONT

Disconnect the brake light switch connectors [1] and check for continuity between the switch terminals.

There should be continuity with the brake lever squeezed, and no continuity when the brake lever is released.

II AC, III CM types shown:



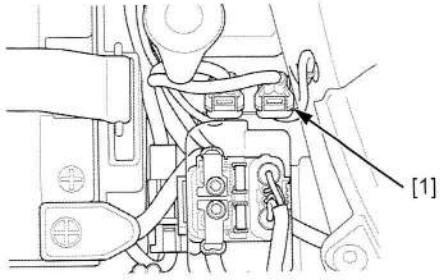
REAR

Remove the battery cover (page 2-3).

Remove the rear brake light switch 2P (Black) connector [1] from the stay and disconnect it.

Check for continuity between the switch side connector terminals.

There should be continuity with the brake pedal depressed, and no continuity when the brake pedal is released.

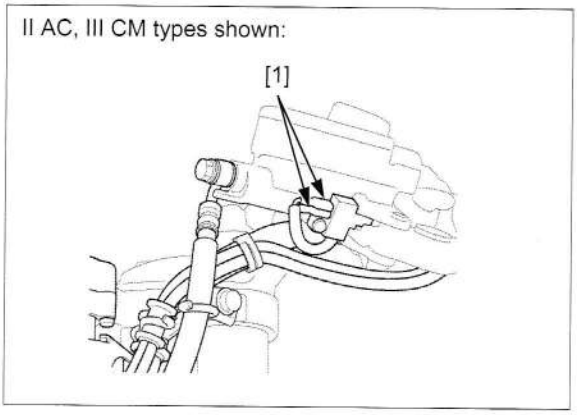


CLUTCH SWITCH

Disconnect the clutch switch connectors [1] and check for continuity between the switch terminals.

There should be continuity with the clutch lever squeezed, and no continuity when the clutch lever is released.

II AC, III CM types shown:



SIDESTAND SWITCH

INSPECTION

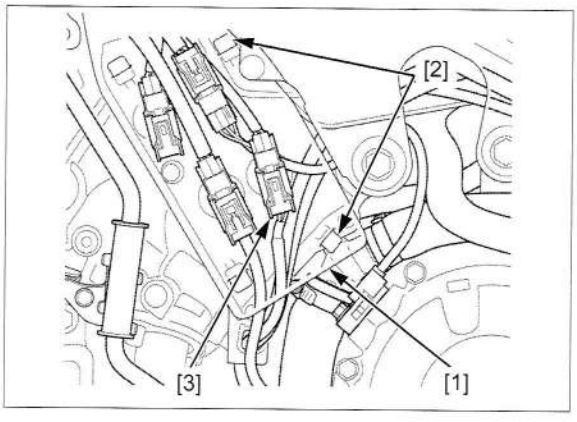
Remove the left middle cowl (page 2-6).

Release the rubber sheet [1] from the tabs [2].

Disconnect the sidestand switch 2P (Black) connector [3].

Check for continuity between the switch side connector terminals.

There should be continuity with the sidestand retracted, and, no continuity when the sidestand is lowered.



REMOVAL/INSTALLATION

Disconnect the sidestand switch 2P (Black) connector (page 20-22).

Release the band clips on the switch wire from the stays and remove the wire out of the water hoses (page 1-20).

Remove the bolt [1] and sidestand switch [2].

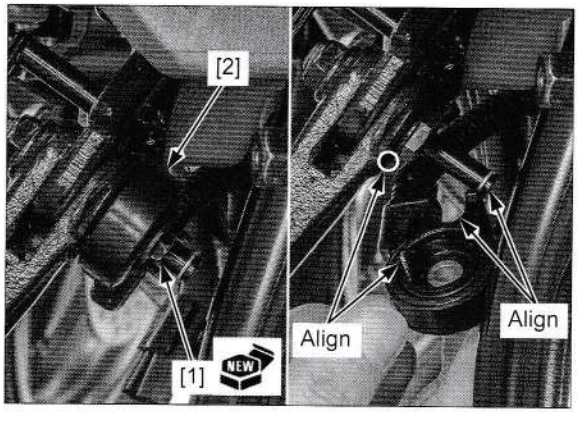
Installation is in the reverse order of removal.

NOTE:

- Align the switch pin with the hole in the sidestand and the switch groove with the stopper pin.
- Replace the switch bolt with a new one.

TORQUE:

Sidestand switch bolt: 10 N·m (1.0 kgf·m, 7 lbf·ft)



HORN

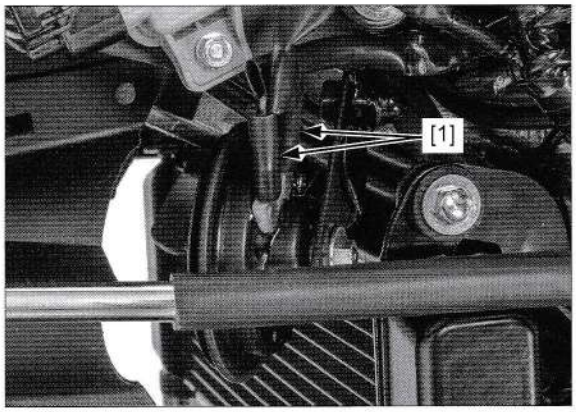
INSPECTION

Remove the left middle cowl (page 2-6).

Disconnect the connectors [1] from the horn.

Connect a 12 V battery to the horn terminals.

The horn is normal if it sounds when the 12 V battery is connected across the horn terminals.



REMOVAL/INSTALLATION

Remove the left middle cowl (page 2-6).

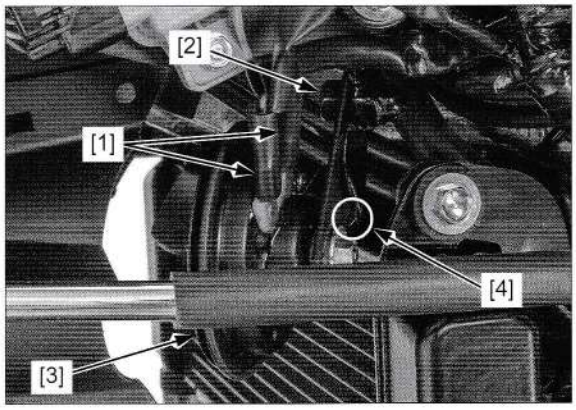
Disconnect the horn connectors [1].

Remove the bolt [2] and horn [3].

Installation in the reverse order of removal.

NOTE:

- Be sure to rest the horn stay against the stopper [4] properly when tightening the bolt.



GEAR POSITION SWITCH/INDICATOR

INSPECTION

NOTE:

- The 3-contact points gear position indication system is used in this motorcycle. Refer to Technical Feature for system configuration and indication conditions (page 1-36).
- Before starting this inspection, check the combination meter initial operation (page 20-9).
- Each switch continuity status can be read with the MCS (page 4-6).

Gear position indicator blinks "–"

Check the gear position switches using the MCS. The normal switch operations are shown in the table below.

GEAR POSITION	SWITCHES ("○": ON/"–": OFF)		
	1	2	3
1st	○	–	–
Neutral	○	○	○
2nd	○	○	–
3rd	–	○	○
4th	○	–	○
5th	–	○	–
6th	–	–	○

Inspect the corresponding line (switch 1, 2, and 3) as follows.

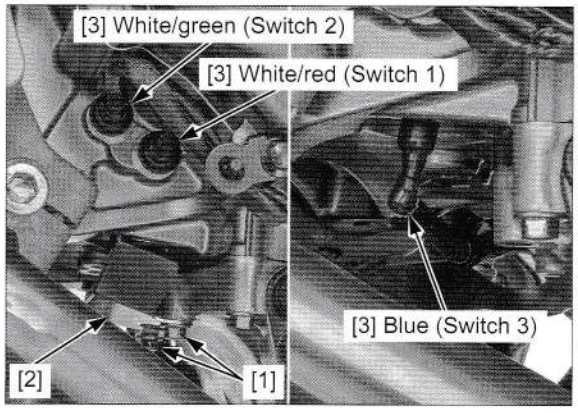
1. Switch Input Voltage Inspection

Turn the ignition switch OFF.
Remove the two bolts [1] and switch guard [2] (for switch 3).
Disconnect the gear position switch connector(s) [3].
Turn the ignition switch ON with the engine stop switch "○".
Measure the voltage between the wire harness side connector terminal and ground.

Is there battery voltage?

YES – GO TO STEP 2.

NO – GO TO STEP 3.



2. Gear Position Switch Inspection

Turn the ignition switch OFF.
Remove the gear position switch (page 20-25).
Check the switch for continuity between the switch terminal and body.

Is there continuity only when the switch contact point is pushed?

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

NO – Faulty gear position switch

3. **Gear Position Switch Line Inspection**

Turn the ignition switch OFF.
Disconnect the ECM 33P (Black) connector (page 4-42).
Remove the two bolts [1] and switch guard [2] (for switch 3).
Disconnect the gear position switch connector(s) [3].
Check the for continuity between the wire harness side ECM 33P (Black) connector [4] and gear position switch connector terminals.

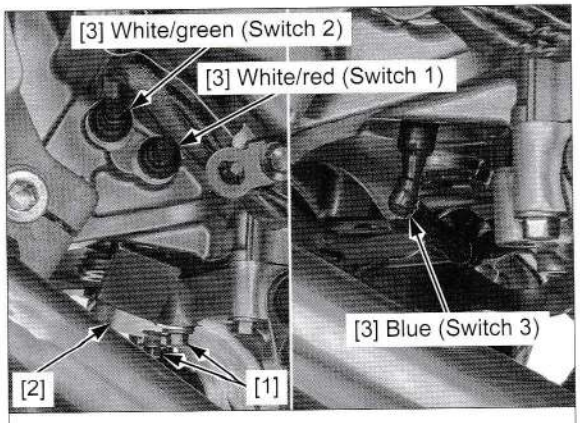
TOOL:
Test probe (2 Pack) **07ZAJ-RDJA110**

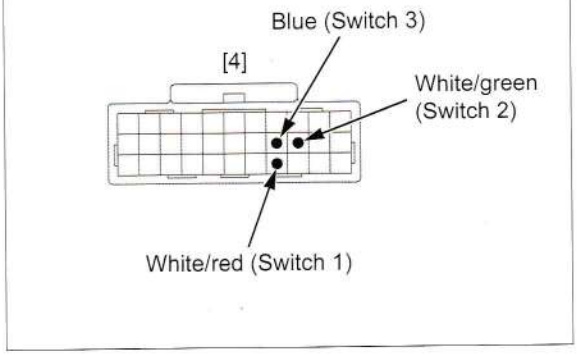
There should be continuity between the same color wire terminals.
Also, check for a short circuit between each terminal and ground. There should be no continuity.

Is the switch line normal?

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

NO – Open or short in the wire between the switch and ECM





GEAR POSITION SWITCH REMOVAL/ INSTALLATION

Disconnect the gear position switch connector (page 20-24).

Place the motorcycle on its sidestand on a level surface.

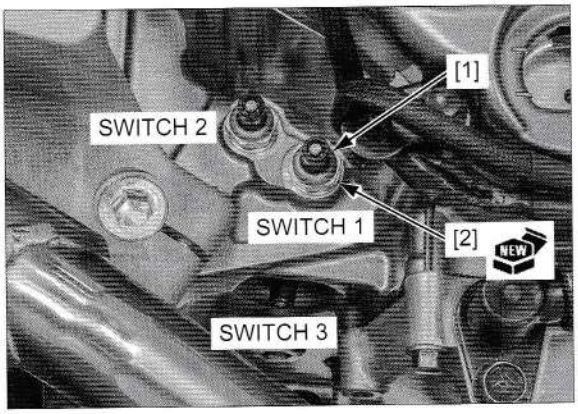
Remove the gear position switch [1] and sealing washer [2].

Installation is in the reverse order of removal.

NOTE:
- Replace the sealing washer with a new one.
- Be sure to connect the connectors in their correct switches (page 20-24). If they are interchanged, the gear position indicator will blink "–".

TORQUE:
Gear position switch: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Check the engine oil level (page 3-10).



CIRCUIT INSPECTION (AC type)

For related switch inspection (page 20-21).

Remove the turn signal/hazard relay (page 20-27).

Check the following at the wire harness side relay 4P connector.

1. Battery Power Source Line Open Circuit Inspection

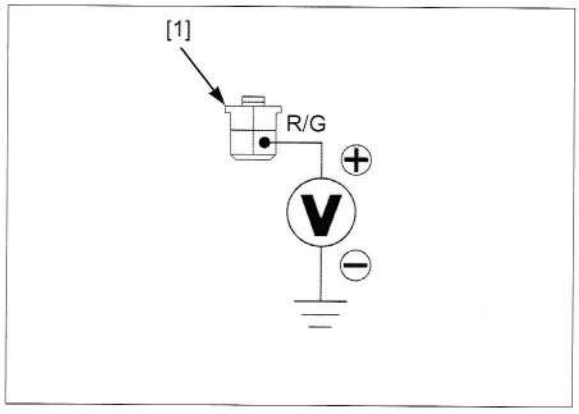
Measure the voltage between the 4P connector [1] terminal and ground.

CONNECTION: Red/green (+) – Ground (–)

Is there battery voltage?

YES – GO TO STEP 2.

NO – Open circuit in the Red/green wire



2. Ground Line Open Circuit Inspection

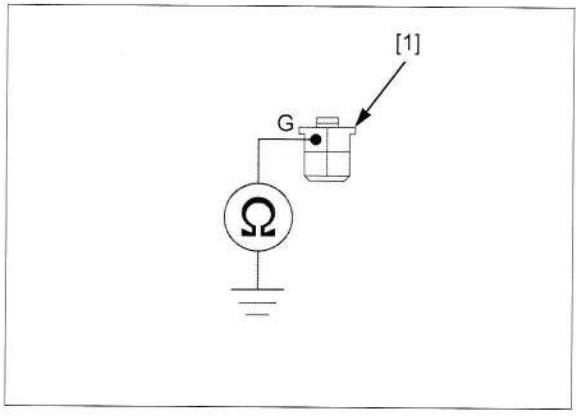
Check for continuity between the 4P connector [1] terminal and ground.

CONNECTION: Green – Ground

Is there continuity?

YES – GO TO STEP 3.

NO – Open circuit in the Green wire



3. Turn Signal/hazard Switch Line Open Circuit Inspection

Connect the 4P connector [1] terminals with a jumper wire.

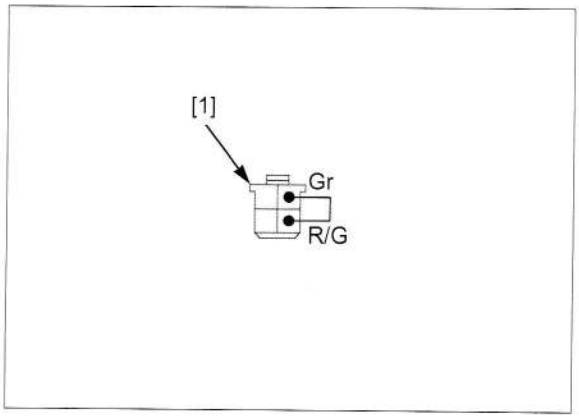
CONNECTION: Red/green – Gray

Operate the turn signal switch or push the hazard switch.

Do the turn signal lights illuminate?

YES – GO TO STEP 4.

NO – • Open circuit in the Gray wire
• Faulty turn signal switch or hazard switch
• Faulty turn signal or hazard light circuit



4. **Ignition Switch Power Source Line Open Circuit Inspection**

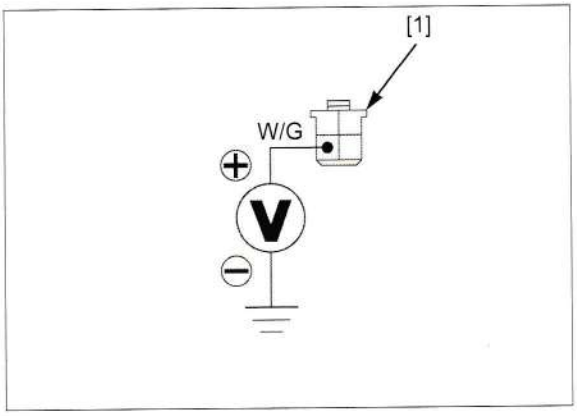
Turn the ignition switch ON.
Measure the voltage between the 4P connector [1] terminal and ground.

CONNECTION: White/green (+) – Ground (–)

Is there battery voltage?

YES – System is normal, replace the turn signal/ hazard relay.

NO – • Open circuit in the White/green wire
• Blown TAIL/METER/TURN (10 A) fuse



CIRCUIT INSPECTION (II AC, III CM types)

For related switch inspection (page 20-21).

Disconnect the turn signal/hazard relay 21P (Black) connector (page 20-27).

POWER INPUT/BACK-UP VOLTAGE LINE

Measure the voltage between each terminal of the relay 21P (Black) connector [1] and ground.

CONNECTION: White/green (+) – Ground (–)

There should be battery voltage when the ignition switch is turned ON.

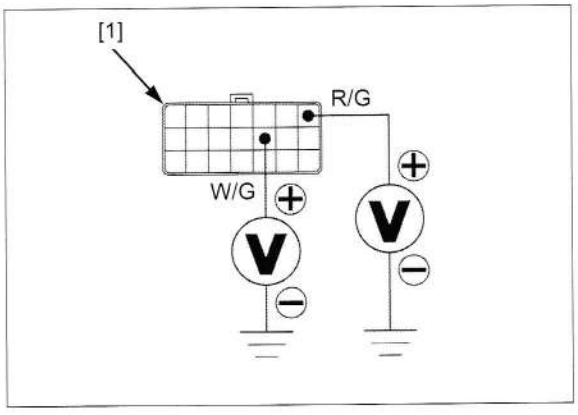
CONNECTION: Red/green (+) – Ground (–)

There should be battery voltage at all times.

If there is no voltage, check the following:

Power input line:
- White/green wire between the turn signal/hazard relay and left fuse box for an open circuit
- TAIL/METER/TURN (10 A) fuse

Back-up voltage line:
- Red/green wire between the turn signal/hazard relay and right fuse box for an open circuit
- CLOCK/HAZ (10 A) fuse



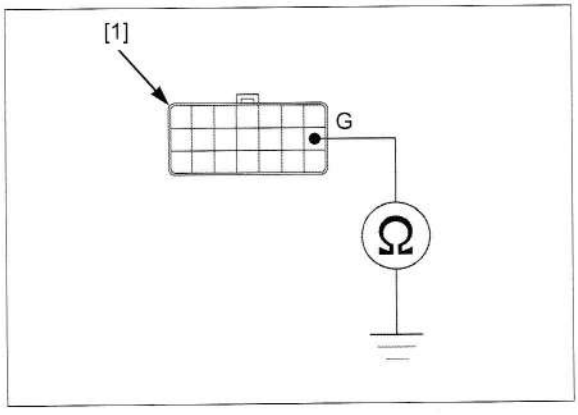
GROUND LINE

Check for continuity between the relay 21P (Black) connector [1] terminal and ground.

CONNECTION: Green – Ground

There should be continuity at all times.

If there is no continuity, check for an open circuit in the Green wire.

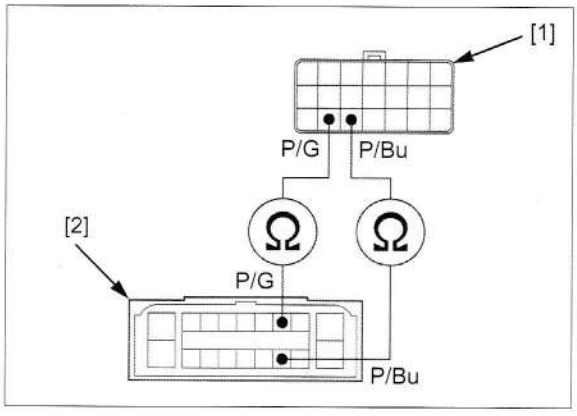


WHEEL SPEED SENSOR (SELF-CANCELLING) SIGNAL LINE

Disconnect the ABS modulator 18P (Black) connector (page 18-8).

Check for continuity between the wire harness side turn signal/hazard relay 21P (Black) connector [1] and ABS modulator 18P (Black) connector [2] terminals.

CONNECTION:
Front sensor: Pink/blue – Pink/blue
Rear sensor: Pink/green – Pink/green



There should be continuity.

If there is no continuity, check for an open circuit in the Pink/blue or Pink/green wire.

Also, check for a short circuit between each terminal of the relay 21P (Black) connector and ground.
There should be no continuity.

If there is continuity, check for a short circuit in the Pink/blue or Pink/green wire.

If all of the above inspections are normal, check the following for an open circuit:

- Switch input line wires between the turn signal switch and relay.
  - turn signal line: Orange and Light blue
  - turn signal cancel line: Light green/white
- Turn signal/hazard output line wires between the relay and each turn signal light
  - Left front turn signal: Orange/white
  - Right front turn signal: Light blue/white and Light blue
  - Left rear turn signal: Orange
  - Right rear turn signal: Light blue

GRIP HEATER (II AC, III CM types)

- Refer to Handlebar for grip heater removal/installation (page 15-6).

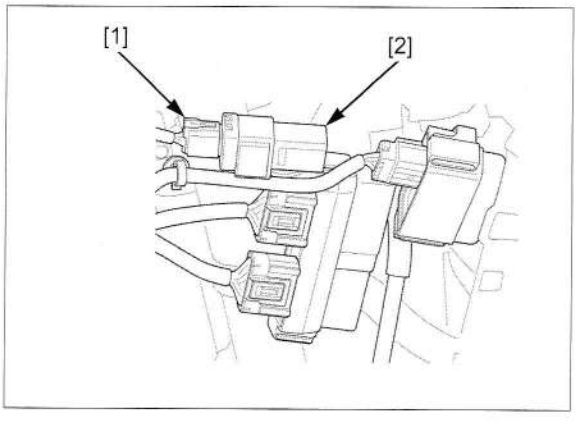
GRIP HEATER CONTROLLER REMOVAL/INSTALLATION

Remove the right middle cowl (page 2-6).

Disconnect the grip heater controller 10P (Black) connector [1].

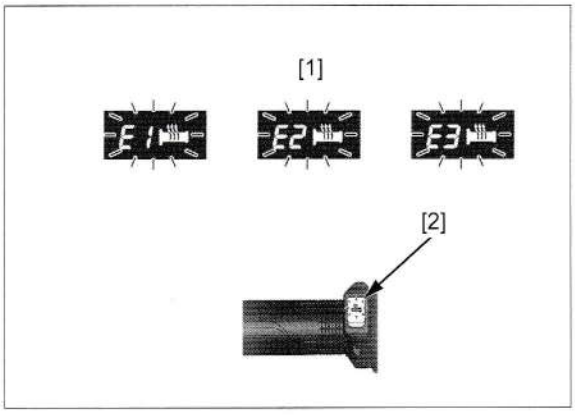
Remove the grip heater controller [2] from the stay.

Installation is in the reverse order of removal.



FAILURE SYMPTOM CHECK

- When any abnormality occurs, the heater level indication [1] of the combination meter blinks "E1", "E2" or "E3" and the heater switch indicator [2] on the left grip heater blinks according to the meter indication (1 blink, 2 blinks, or 3 blinks) at the same time.
  - E1: Low battery voltage (page 19-5)
  - E2:
    Short circuit in the grip heater (page 20-32)
    Short circuit in the grip heater circuit (page 20-33)
  - E3:
    Grip heater switch malfunction (page 20-32)
    Short circuit in the grip heater switch circuit (page 20-33)
    Open circuit in the grip heater (page 20-32)
    Open circuit in the grip heater circuit (page 20-33)
- If the grip heaters do not work at all, check the following:
  - ACC fuse (10 A)
  - Grip heater controller power/ground line (page 20-31)
  - Grip heater switch (page 20-32)
  - Open circuit in the grip heater switch circuit (page 20-34)
- Indicator on the combination meter or grip does not function (page 20-34)



GRIP HEATER CONTROLLER POWER/ GROUND LINE INSPECTION

POWER INPUT LINE

Turn the ignition switch OFF.

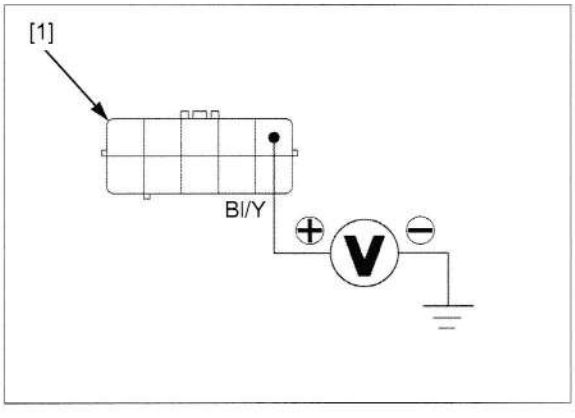
Disconnect the grip heater controller 10P (Black) connector (page 20-30).

Measure the voltage between the grip heater controller 10P (Black) connector [1] terminal of the wire harness side and ground.

CONNECTION: Black/yellow (+) – Ground (–)

There should be battery voltage when the ignition switch is turned ON.

If there is no voltage, check for an open circuit in the Black/yellow wire.



GROUND LINE

Turn the ignition switch OFF.

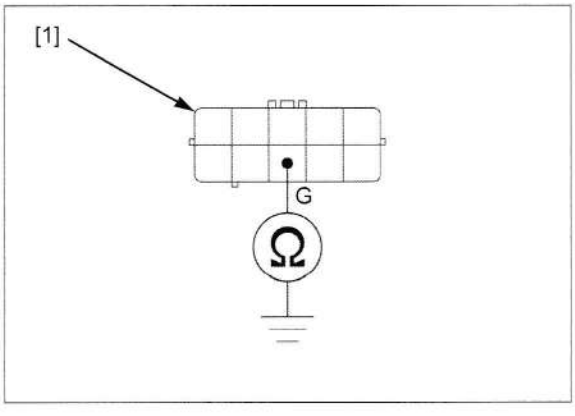
Disconnect the grip heater controller 10P (Black) connector (page 20-30).

Check for continuity between the grip heater controller 10P (Black) connector [1] terminal of the wire harness side and ground.

CONNECTION: Green – Ground

There should be continuity at all times.

If there is no continuity, check for an open circuit in the Green wire.



SWITCH LINE OPEN CIRCUIT INSPECTION

Turn the ignition switch OFF.

Disconnect the following connectors:

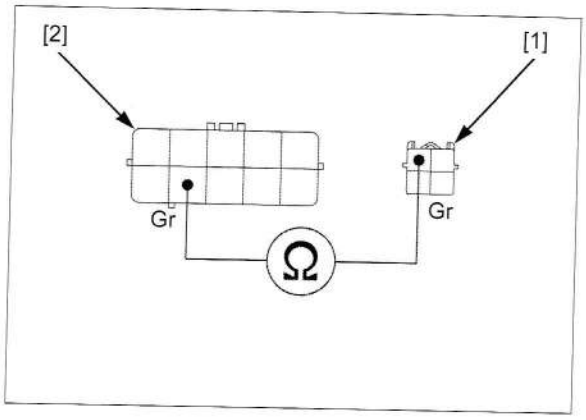
- grip heater controller 10P (Black) (page 20-30)
- heater switch 4P (Black) (page 20-32)

Check for continuity between the heater switch 4P (Black) connector [1] and grip heater controller 10P (Black) connector [2] terminals of the wire harness side.

CONNECTION: Gray – Gray

There should be continuity.

If there is no continuity, check for an open circuit in the Gray wire.



INDICATOR CIRCUIT INSPECTION

COMBINATION METER INDICATOR LINE INSPECTION

Turn the ignition switch OFF.

Disconnect the following connectors:

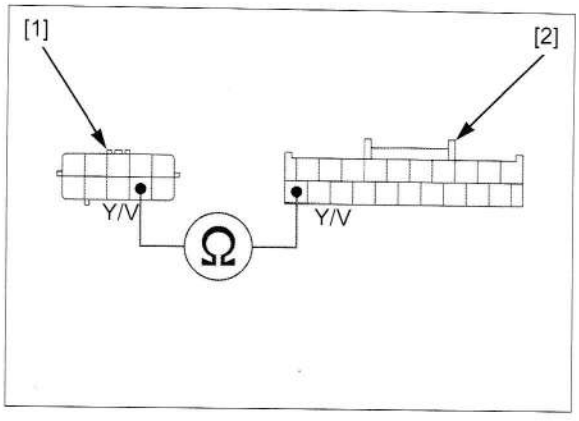
- grip heater controller 10P (Black) (page 20-30)
- combination meter 20P (Gray) (page 20-11)

Check for continuity between the grip heater controller 10P (Black) connector [1] and combination meter 20P (Gray) connector [2] terminals of the wire harness side.

CONNECTION: Yellow/violet – Yellow/violet

There should be continuity.

If there is no continuity, check for an open circuit in the Yellow/violet wire.



SWITCH INDICATOR LINE INSPECTION

Turn the ignition switch OFF.

Disconnect the following connectors:

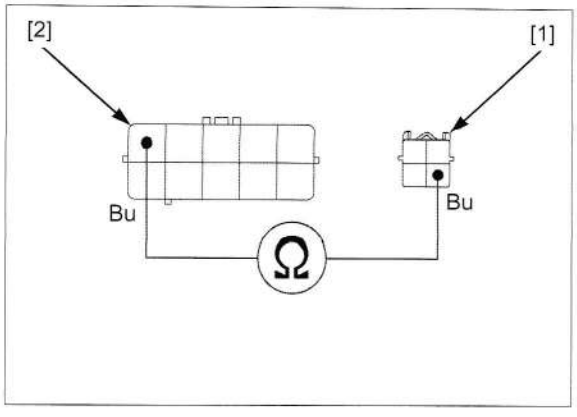
- grip heater controller 10P (Black) (page 20-30)
- heater switch 4P (Black) (page 20-32)

Check for continuity between the heater switch 4P (Black) connector [1] and grip heater controller 10P (Black) connector [2] terminals of the wire harness side.

CONNECTION: Blue – Blue

There should be continuity.

If there is no continuity, check for an open circuit in the Blue wire.



TCS (II AC, III CM types)

SYSTEM INSPECTION

NOTE:

- For TCS technical feature (page 1-40).
- TCS utilizes various PGM-FI/ABS components. If any of the related items and/or circuit has problem, TCS will fail and the TCS indicator will remain ON in order to notify the rider of the problem.
- If any PGM-FI DTC or ABS DTC is indicated, perform the corresponding troubleshooting first.

PRE-START SELF-DIAGNOSIS PROCEDURE

1. Turn the ignition switch ON with the engine stop switch "○".
2. The TCS indicator turns ON.
3. Start the engine.
4. Ride the motorcycle and increase the vehicle speed to approximately 10 km/h (6 mph).
5. The TCS is normal if the indicator goes off.

TCS indicator remains on after the pre-start self diagnosis is completed, or it comes on while riding

Check the following:

- No PGM-FI DTC indicated (page 4-5)
- No ABS DTC (page 18-5)
- Combination meter initial operation (page 20-9)

If all of above items are normal, replace the combination meter with a known good one and recheck the TCS indicator.

TCS indicator can not be turned off by pressing the TCS OFF switch

Check the following:

- Green/red and Gray wire between the TCS OFF switch and ECM for an open or short circuit
- TCS OFF switch (page 20-21)

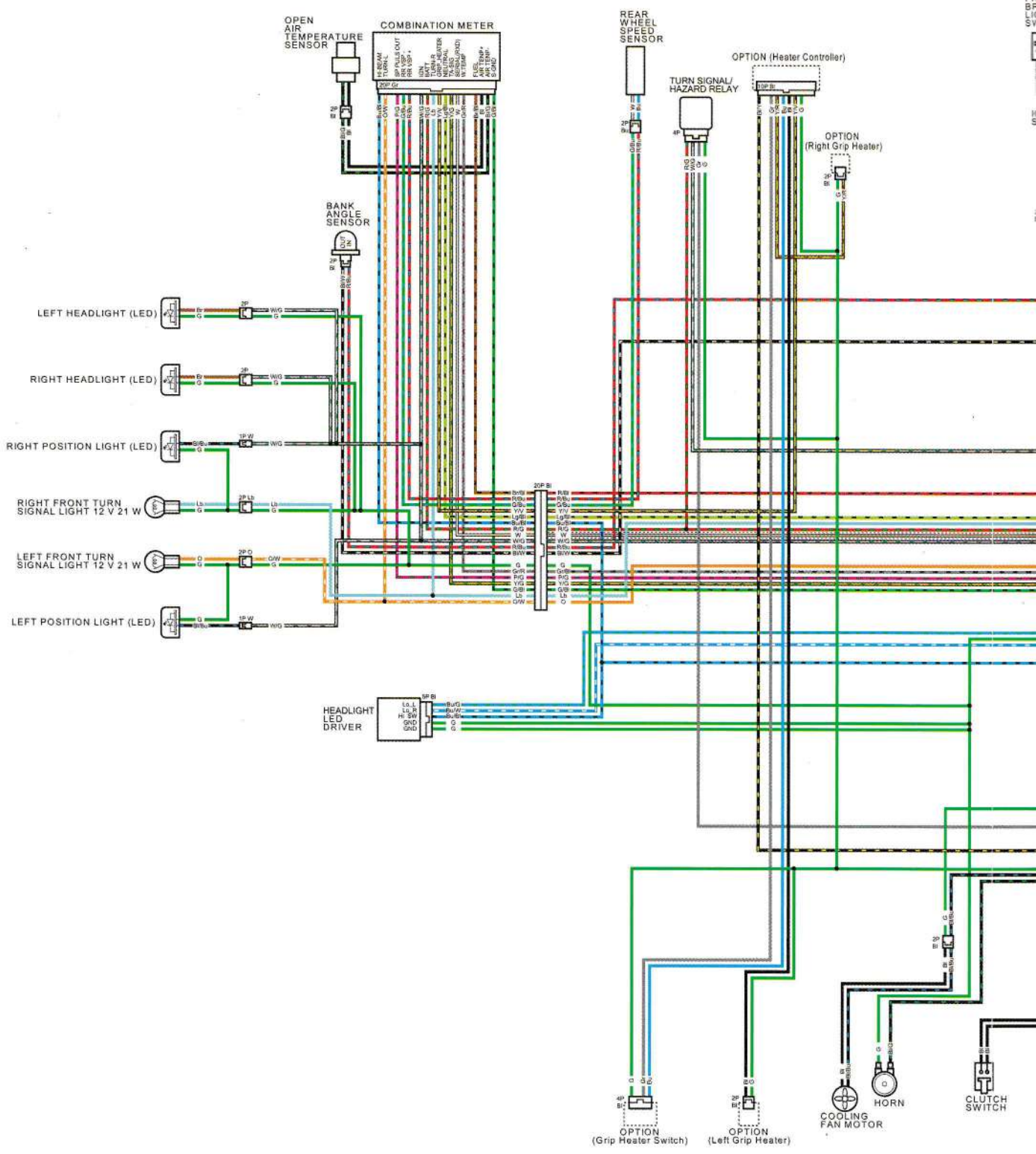
If all of above items are normal, replace the ECM with a known good one and recheck.

MEMO

MEMO

WIRING DIAGRAM

AC type



SWITCH CONTINUITY

DIMMER SWITCH

(N)	○		○
	○		○
COLOR	Bu/W	-	Bu

HORN SWITCH

FREE		
PUSH	○	○
COLOR	W/Bu	Bl/G

TURN SIGNAL SWITCH

	○	○	
N			
	○		○
COLOR	Gr	Lb	O

PASSING SWITCH

FREE		
PUSH	○	○
COLOR	Bl	Y/R

STARTER SWTICH

FREE		
PUSH	○	○
COLOR	Bl	Y/R

ENGINE STOP SWITCH

	○	○
COLOR	Bl/R	Bl

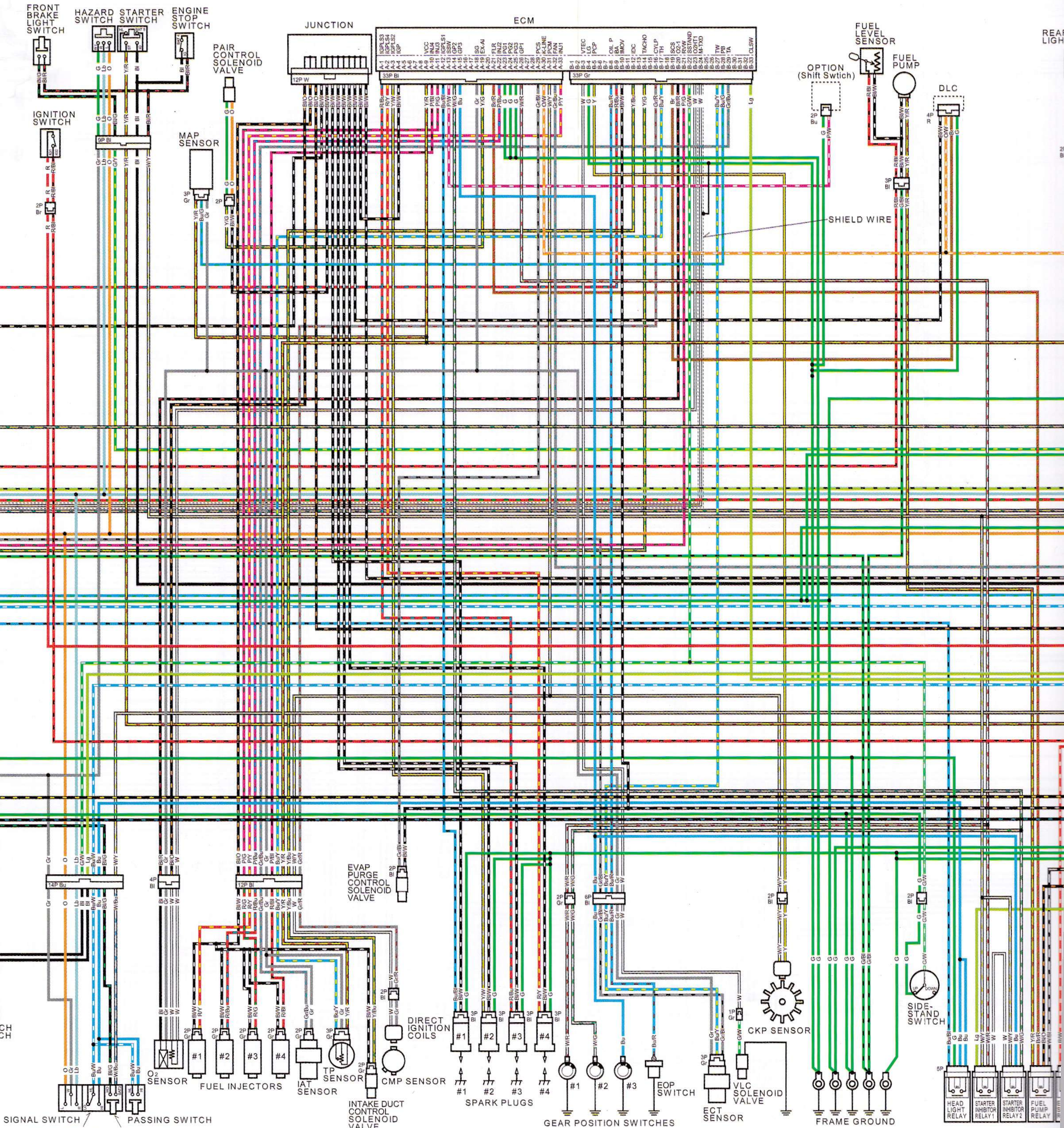
HAZARD SWITCH

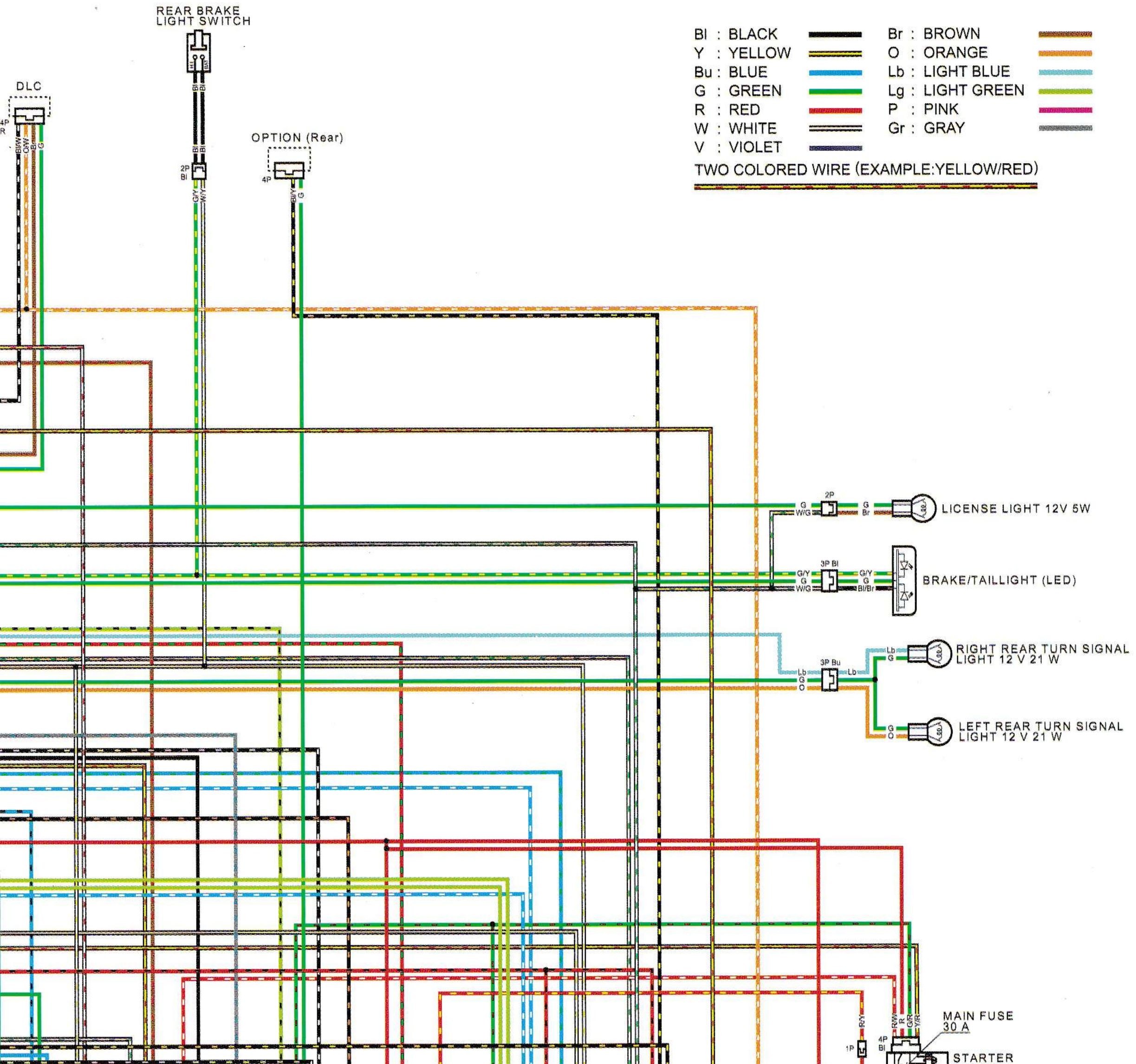
OFF			
ON	○	○	○
COLOR	G	Lb	O

IGNITION SWITCH

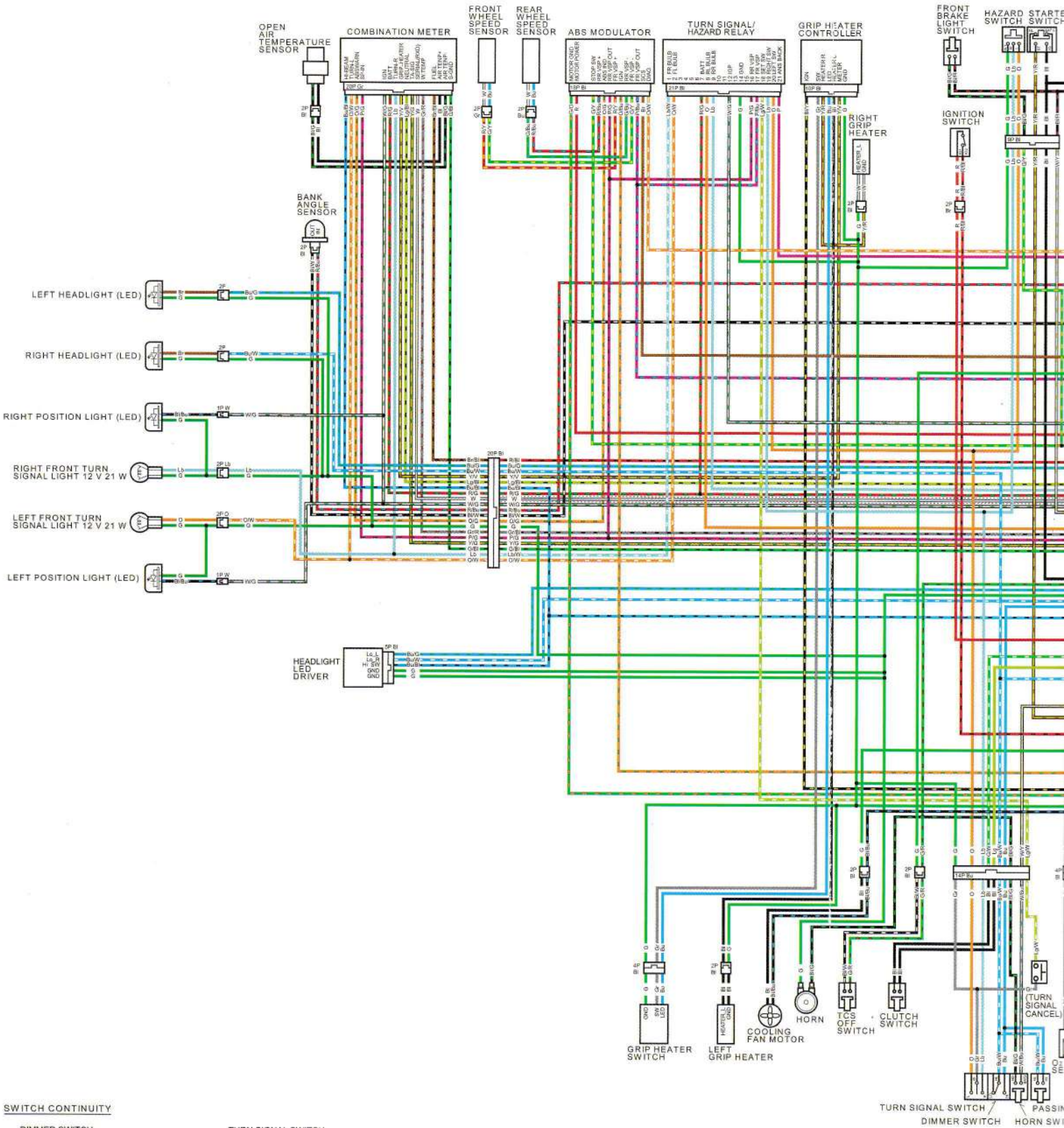
ON	○	○
OFF		
COLOR	R	R/Bl

TURN SIGNAL
DIMM


FRONT BRAKE LIGHT SWITCH
HAZARD SWITCH
STARTER SWITCH
ENGINE STOP SWITCH
IGNITION SWITCH
JUNCTION
ECM
PAIR CONTROL SOLENOID VALVE
MAP SENSOR
OPTION (Shift Swtich)
FUEL LEVEL SENSOR
FUEL PUMP
DLC
SHIELD WIRE
SIGNAL SWITCH
DIMMER SWITCH
HORN SWITCH
PASSING SWITCH
O2 SENSOR
FUEL INJECTORS
IAT SENSOR
TP SENSOR
CMP SENSOR
INTAKE DUCT CONTROL SOLENOID VALVE
EVAP PURGE CONTROL SOLENOID VALVE
DIRECT IGNITION COILS
SPARK PLUGS
GEAR POSITION SWITCHES
EOP SWITCH
ECT SENSOR
VLC SOLENOID VALVE
CKP SENSOR
SIDE-STAND SWITCH
FRAME GROUND
HEAD LIGHT RELAY
STARTER INHIBITOR RELAY1
STARTER INHIBITOR RELAY2
FUEL PUMP RELAY


Bl : BLACK
Y : YELLOW
Bu : BLUE
G : GREEN
R : RED
W : WHITE
V : VIOLET
Br : BROWN
O : ORANGE
Lb : LIGHT BLUE
Lg : LIGHT GREEN
P : PINK
Gr : GRAY
TWO COLORED WIRE (EXAMPLE:YELLOW/RED)
REAR BRAKE LIGHT SWITCH
DLC
OPTION (Rear)
LICENSE LIGHT 12V 5W
BRAKE/TAILLIGHT (LED)
RIGHT REAR TURN SIGNAL LIGHT 12 V 21 W
LEFT REAR TURN SIGNAL LIGHT 12 V 21 W
MAIN FUSE 30 A
STARTER RELAY SWITCH
FI FUSE 20 A
STARTER MOTOR
BATTERY
ENGINE GROUND
IGN
K-LINE
PICK UP
S GND
REGULATOR/RECTIFIER
ALTERNATOR
MP SENSOR
HEAD LIGHT RELAY
STARTER INHIBITOR RELAY 1
STARTER INHIBITOR RELAY 2
FUEL PUMP RELAY
ENGINE STOP RELAY
FAN MOTOR RELAY
NEUTRAL DIODE
10 A (FI 1)
10 A (FI 2)
20 A (FAN)
10 A (CLOCK/HAZ)
20 A (FUEL PUMP)
CLUTCH DIODE
10 A (HEAD/L R)
10 A (HEAD/L L)
10 A (START/HORN/STOP)
10 A (TAIL/METER/TURN)
10 A (ACC)
RIGHT FUSE BOX
LEFT FUSE BOX

II AC, III CM types



SWITCH CONTINUITY

DIMMER SWITCH

(HI)	○		
(N)	○		○
(LO)	○		○
COLOR	Bu/W	-	Bu

HORN SWITCH

FREE		
PUSH	○	○
COLOR	W/Bu	Bl/G

TURN SIGNAL SWITCH

(R)	○	○		○
N				
(L)	○		○	○
COLOR	Gr	Lb	O	Lg/W

PASSING SWITCH

FREE		
PUSH	○	○
COLOR	Bl	Y/R

TCS OFF SWITCH

FREE		
PUSH	○	○
COLOR	Bl	Y/R

STARTER SWTICH

FREE		
PUSH	○	○
COLOR	Bl	Y/R

ENGINE STOP SWITCH

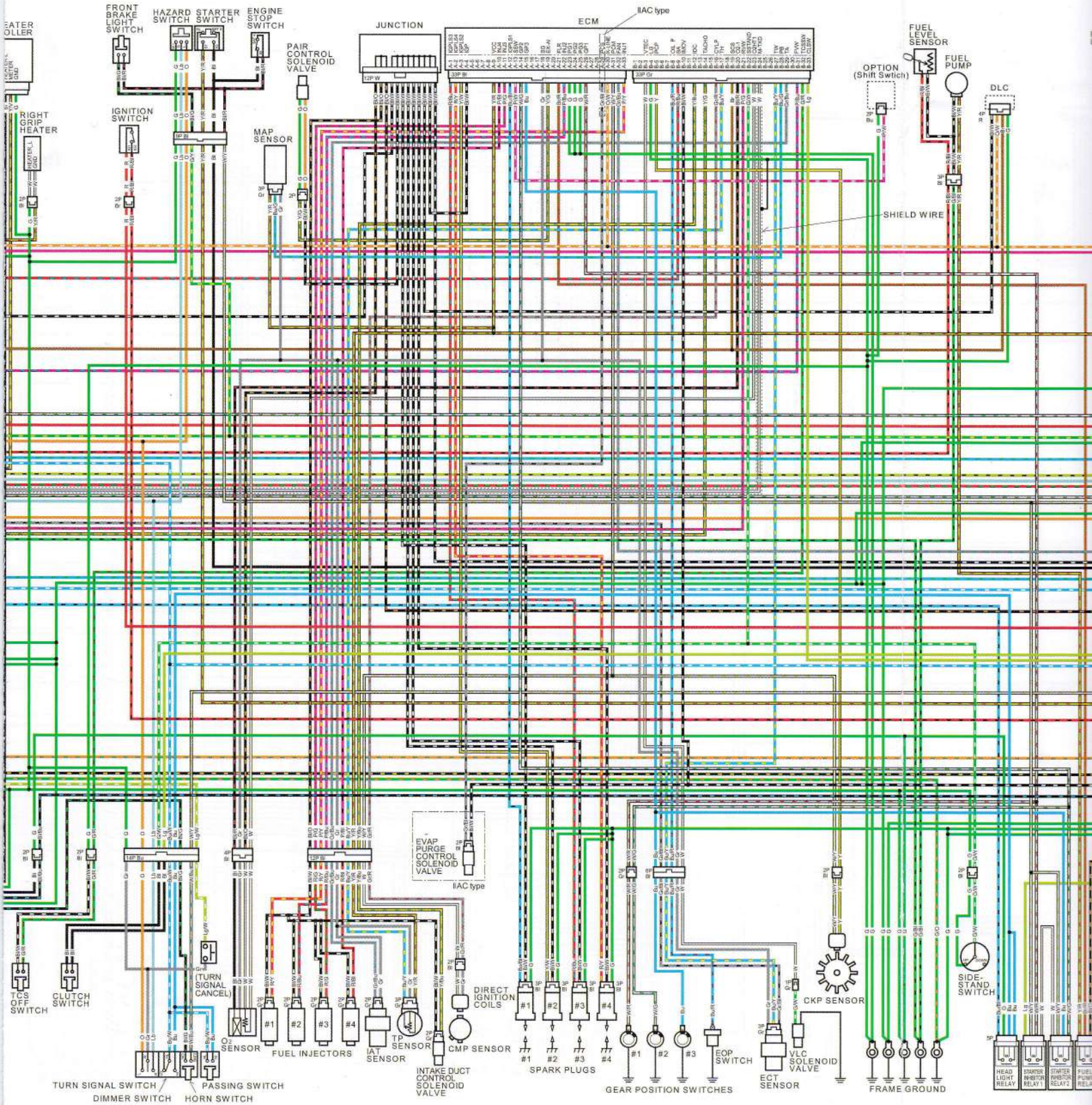
⊠		
Ω	○	○
COLOR	Bl/R	Bl

HAZARD SWITCH

OFF			
ON	○	○	○
COLOR	G	Lb	O

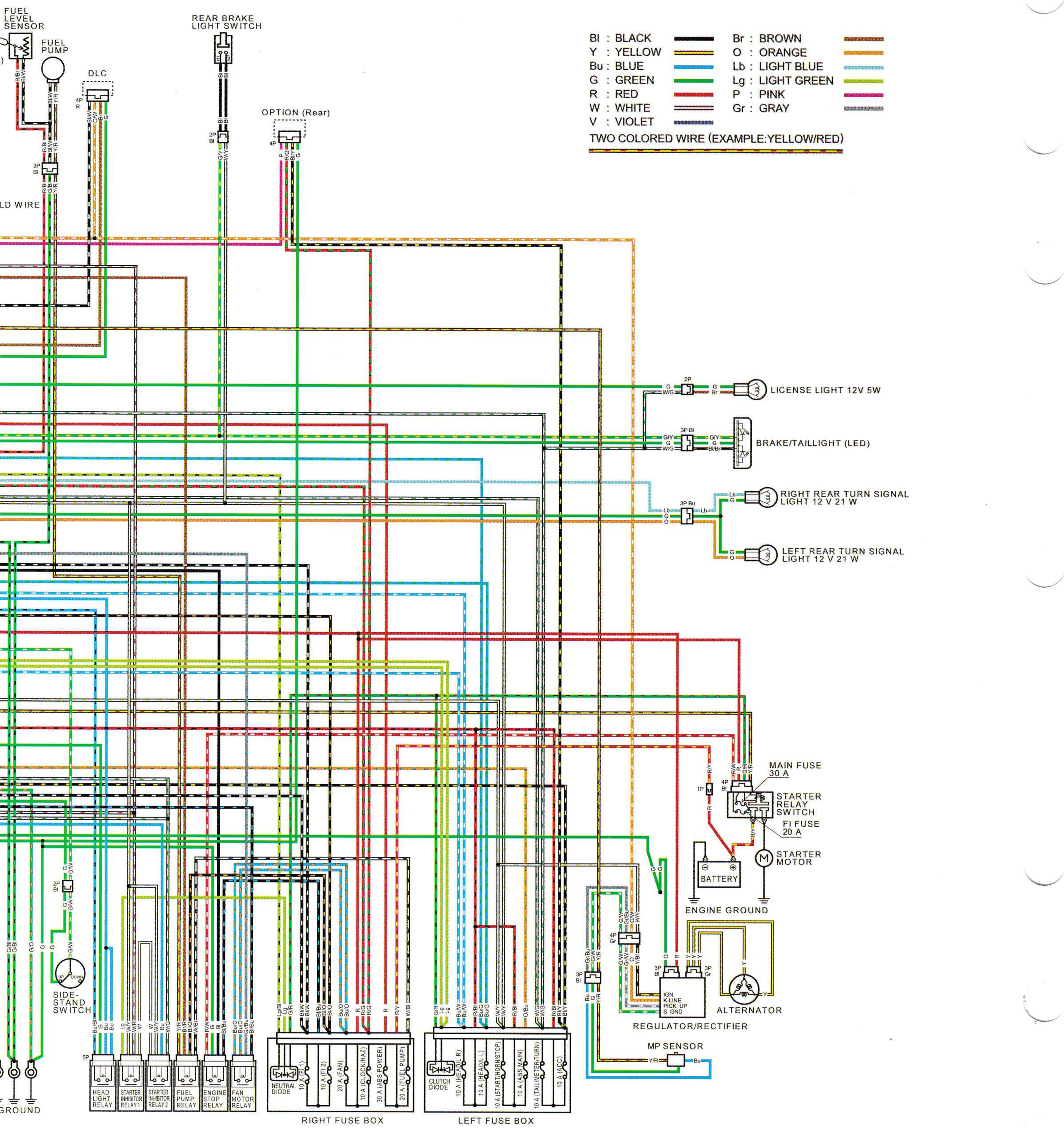
IGNITION SWITCH

ON	○	○
OFF		
COLOR	R	R/Bl



IGNITION SWITCH

ON	O—O	
OFF		
COLOR	R	R/BI


Bl : BLACK
Y : YELLOW
Bu : BLUE
G : GREEN
R : RED
W : WHITE
V : VIOLET
Br : BROWN
O : ORANGE
Lb : LIGHT BLUE
Lg : LIGHT GREEN
P : PINK
Gr : GRAY
TWO COLORED WIRE (EXAMPLE:YELLOW/RED)
FUEL LEVEL SENSOR
FUEL PUMP
DLC
REAR BRAKE LIGHT SWITCH
OPTION (Rear)
LD WIRE
LICENSE LIGHT 12V 5W
BRAKE/TAILLIGHT (LED)
RIGHT REAR TURN SIGNAL LIGHT 12 V 21 W
LEFT REAR TURN SIGNAL LIGHT 12 V 21 W
MAIN FUSE 30 A
STARTER RELAY SWITCH
FI FUSE 20 A
STARTER MOTOR
BATTERY
ENGINE GROUND
SIDE-STAND SWITCH
IGN K-LINE PICK UP S GND
ALTERNATOR
REGULATOR/RECTIFIER
MP SENSOR
HEAD LIGHT RELAY
STARTER INHIBITOR RELAY 1
STARTER INHIBITOR RELAY 2
FUEL PUMP RELAY
ENGINE STOP RELAY
FAN MOTOR RELAY
NEUTRAL DIODE
10 A (FI 1)
10 A (FI 2)
20 A (FAN)
10 A (CLOCK/HAZ)
30 A (ABS POWER)
20 A (FUEL PUMP)
RIGHT FUSE BOX
CLUTCH DIODE
10 A (HEAD/L R)
10 A (HEAD/L L)
10 A (START/HORN/STOP)
10 A (ABS MAIN)
10 A (TAIL/METER/TURN)
10 A (ACC)
LEFT FUSE BOX

INDEX

ABS INDICATOR CIRCUIT TROUBLESHOOTING 18-11
ABS MODULATOR 18-23
ABS TROUBLESHOOTING 18-13
ABS TROUBLESHOOTING INFORMATION 18-5
AIR CLEANER 3-5
AIR CLEANER HOUSING 7-12
ALTERNATOR CHARGING COIL 19-11
ALTERNATOR COVER 12-20
BANK ANGLE SENSOR 4-46
BATTERY 19-6
BATTERY COVER 2-3
BRAKE FLUID 3-18
BRAKE FLUID REPLACEMENT/AIR BLEEDING 17-5
BRAKE LIGHT SWITCH
  LIGHTS/METERS/SWITCHES 20-21
  MAINTENANCE 3-20
BRAKE PAD/DISC 17-7
BRAKE PADS WEAR 3-19
BRAKE SYSTEM 3-19
CABLE & HARNESS ROUTING 1-20
CAM CHAIN TENSIONER LIFTER 10-29
CAM CHAIN/TIMING SPROCKET 10-31
CAMSHAFT 10-9
CENTERSTAND (II AC, III CM types) 2-14
CHARGING CONDITION INSPECTION 19-7
CKP SENSOR 4-45
CLUTCH 11-10
CLUTCH FLUID 3-22
CLUTCH FLUID REPLACEMENT/AIR BLEEDING 11-5
CLUTCH MASTER CYLINDER 11-6
CLUTCH SLAVE CYLINDER 11-8
CLUTCH SWITCH 20-22
CLUTCH SYSTEM 3-21
CMP SENSOR 4-44
COMBINATION METER 20-9
COMPONENT LOCATION
  CLUTCH/STARTER CLUTCH 11-4
  CRANKSHAFT/PISTON/CYLINDER 13-3
  CYLINDER HEAD/VALVES 10-5
  ENGINE REMOVAL/INSTALLATION 14-3
  FRONT WHEEL/SUSPENSION/STEERING 15-5
  FUEL SYSTEM 7-3
  GEARSHIFT LINKAGE/CRANKCASE/ TRANSMISSION/ALTERNATOR 12-4
  HYDRAULIC BRAKE 17-3
  REAR WHEEL/SUSPENSION 16-5
COOLANT REPLACEMENT 8-5
COOLANT TEMPERATURE GAUGE & INDICATOR/ ECT SENSOR 20-15
COOLING SYSTEM 3-13
COOLING SYSTEM FLOW PATTERN 8-3
COOLING SYSTEM TESTING 8-4
CRANKCASE 12-11
CRANKPIN BEARING 13-10
CRANKSHAFT 13-4
CYLINDER COMPRESSION TEST 10-6
CYLINDER HEAD 10-19
CYLINDER HEAD COVER 10-6
DIODE 6-10
DRIVE CHAIN 3-14
DRIVE SPROCKET 12-7
DRIVEN FLANGE/REAR AXLE 16-6
DTC INDEX
  ABS (II AC, III CM types) 18-9
  PGM-FI SYSTEM 4-9
ECM 4-42
ECT SENSOR 4-44
EMISSION CONTROL SYSTEMS 1-33
ENGINE IDLE SPEED 3-12
ENGINE INSTALLATION 14-7
ENGINE OIL 3-10
ENGINE OIL FILTER 3-11
ENGINE REMOVAL 14-4
ENGINE STOP RELAY 4-47
EVAP CANISTER (AC, II AC types) 7-28
EVAP PURGE CONTROL SOLENOID VALVE (AC, II AC types) 7-27
EVAPORATIVE EMISSION CONTROL SYSTEM (AC, II AC types) 3-14
EXHAUST PIPE 2-16
FAN MOTOR RELAY 8-10
FLYWHEEL 12-22
FORK 15-17
FRONT BRAKE CALIPER 17-12
FRONT FENDER 2-10
FRONT INNER COWL 2-9
FRONT MASTER CYLINDER 17-8
FRONT TURN SIGNAL/POSITION LIGHT 20-6
FRONT WHEEL 15-13
FUEL GAUGE/FUEL LEVEL SENSOR 20-18
FUEL INJECTOR 7-13
FUEL LINE 3-4
FUEL LINE INSPECTION 7-5
FUEL PUMP 7-8
FUEL PUMP RELAY 7-28
FUEL TANK 7-11
GEAR POSITION SWITCH/INDICATOR 20-24
GEARSHIFT LINKAGE 12-7
GRAB RAIL 2-11
GRIP HEATER (II AC, III CM types) 20-30
HANDLEBAR 15-6
HANDLEBAR SWITCH 20-21
HEADLIGHT 20-4
HEADLIGHT AIM 3-21
HEADLIGHT RELAY 20-26
HORN 20-23
IAC THERMAL VALVE 7-19
IAT SENSOR 4-44
IGNITION SWITCH 20-20
IGNITION SYSTEM INSPECTION 5-6
IGNITION TIMING 5-7
INNER LOWER PANEL 2-5
INNER UPPER PANEL 2-7
INNER VISOR 2-7
INTAKE DUCT CONTROL SYSTEM 7-24
LICENSE LIGHT 20-8
LOW OIL PRESSURE INDICATOR/EOP SWITCH 20-17
LUBRICATION & SEAL POINTS 1-17
LUBRICATION SYSTEM DIAGRAM 9-4
MAIN JOURNAL BEARING 13-6
MAINTENANCE SCHEDULE 3-3
MAP SENSOR 4-43
MIDDLE COWL 2-6
MIL CIRCUIT INSPECTION 4-42
MODEL IDENTIFICATION 1-3
MUFFLER 2-15
NUTS, BOLTS, FASTENERS 3-25
O_2 SENSOR 4-45
OIL COOLER 9-10
OIL PRESSURE INSPECTION 9-5
OIL PUMP 9-8
OIL STRAINER/PRESSURE RELIEF VALVE 9-5
OPEN AIR TEMPERATURE SENSOR 20-19
PGM-FI SYMPTOM TROUBLESHOOTING 4-8
PGM-FI SYSTEM DTC TROUBLESHOOTING 4-11
PGM-FI TROUBLESHOOTING INFORMATION 4-5

INDEX

PHASE CONTROLLED GENERATING CIRCUIT INSPECTION 19-8
PISTON/CYLINDER 13-13
PRIMARY DRIVE GEAR 11-14
RADIATOR COOLANT 3-13
RADIATOR GRILLE 2-5
RADIATOR RESERVE TANK 8-10
RADIATOR/COOLING FAN 8-7
REAR BRAKE CALIPER 17-14
REAR CENTER COWL/TURN SIGNAL LIGHT COVER 2-10
REAR COMBINATION LIGHT 20-7
REAR COWL 2-11
REAR FENDER A/FENDER STAY 2-12
REAR FENDER B 2-13
REAR MASTER CYLINDER/BRAKE PEDAL 17-10
REAR WHEEL 16-6
REARVIEW MIRROR 2-8
REGULATOR/RECTIFIER 19-8
RELAY INSPECTION 20-26
RIGHT CRANKCASE COVER 11-9
SEAT 2-3
SECONDARY AIR SUPPLY SYSTEM
- FUEL SYSTEM 7-21
- MAINTENANCE 3-14

SERVICE INFORMATION
- ABS (II AC, III CM types) 18-2
- BATTERY/CHARGING SYSTEM 19-2
- CLUTCH/STARTER CLUTCH 11-2
- COOLING SYSTEM 8-2
- CRANKSHAFT/PISTON/CYLINDER 13-2
- CYLINDER HEAD/VALVES 10-2
- ELECTRIC STARTER 6-2
- ENGINE REMOVAL/INSTALLATION 14-2
- FRAME/BODY PANELS/EXHAUST SYSTEM 2-2
- FRONT WHEEL/SUSPENSION/STEERING 15-2
- FUEL SYSTEM 7-2
- GEARSHIFT LINKAGE/CRANKCASE/ TRANSMISSION/ALTERNATOR 12-2
- HYDRAULIC BRAKE 17-2
- IGNITION SYSTEM 5-2
- LIGHTS/METERS/SWITCHES 20-2
- LUBRICATION SYSTEM 9-2
- MAINTENANCE 3-2
- PGM-FI SYSTEM 4-2
- REAR WHEEL/SUSPENSION 16-2

SERVICE RULES 1-2
SIDE COVER 2-4
SIDESTAND
- FRAME/BODY PANELS/EXHAUST SYSTEM 2-14
- MAINTENANCE 3-23

SIDESTAND SWITCH 20-22
SPARK PLUG 3-6
SPECIFICATIONS 1-4
SPEEDOMETER 20-13
STARTER CLUTCH 11-15
STARTER INHIBITOR RELAY 6-9
STARTER MOTOR 6-5
STARTER RELAY SWITCH 6-8
STARTER VALVE 7-19
STARTER VALVE SYNCHRONIZATION 7-20
STATOR/MP SENSOR 12-21
STEERING HEAD BEARINGS 3-26
STEERING STEM 15-24
SUSPENSION 3-23
SUSPENSION LINKAGE/SHOCK ABSORBER 16-13
SWINGARM 16-16
SYSTEM DIAGRAM
- ABS (II AC, III CM types) 18-4
- BATTERY/CHARGING SYSTEM 19-4
- ELECTRIC STARTER 6-5
- IGNITION SYSTEM 5-4
- PGM-FI SYSTEM 4-4

SYSTEM LOCATION
- ABS (II AC, III CM types) 18-3
- BATTERY/CHARGING SYSTEM 19-4
- ELECTRIC STARTER 6-4
- IGNITION SYSTEM 5-3
- LIGHTS/METERS/SWITCHES 20-3
- PGM-FI SYSTEM 4-3

TACHOMETER 20-14
TCS (II AC, III CM types) 20-35
TECHNICAL FEATURE 1-36
THERMOSTAT/HOSE JOINT 8-6
THROTTLE BODY 7-14
THROTTLE OPERATION 3-4
TORQUE VALUES 1-12
TRANSMISSION 12-15
TROUBLESHOOTING
- BATTERY/CHARGING SYSTEM 19-5
- CLUTCH/STARTER CLUTCH 11-3
- COOLING SYSTEM 8-2
- CRANKSHAFT/PISTON/CYLINDER 13-2
- CYLINDER HEAD/VALVES 10-4
- ELECTRIC STARTER 6-3
- FRAME/BODY PANELS/EXHAUST SYSTEM 2-2
- FRONT WHEEL/SUSPENSION/STEERING 15-4
- GEARSHIFT LINKAGE/CRANKCASE/ TRANSMISSION/ALTERNATOR 12-3
- HYDRAULIC BRAKE 17-2
- IGNITION SYSTEM 5-5
- LUBRICATION SYSTEM 9-3
- REAR WHEEL/SUSPENSION 16-4

TURN SIGNAL/HAZARD RELAY 20-27
UNDER COWL 2-4
UPPER COWL 2-9
VALVE CLEARANCE 3-7
VLC SOLENOID VALVE 4-47
WATER PUMP 8-9
WHEEL SPEED SENSOR 18-21
WHEELS/TIRES 3-26
WINDSCREEN 2-8
WIRING DIAGRAM 21-2